SiC Schottky Diode

LFUSCD20065B, 650 V, 20 A, TO-247 3-lead

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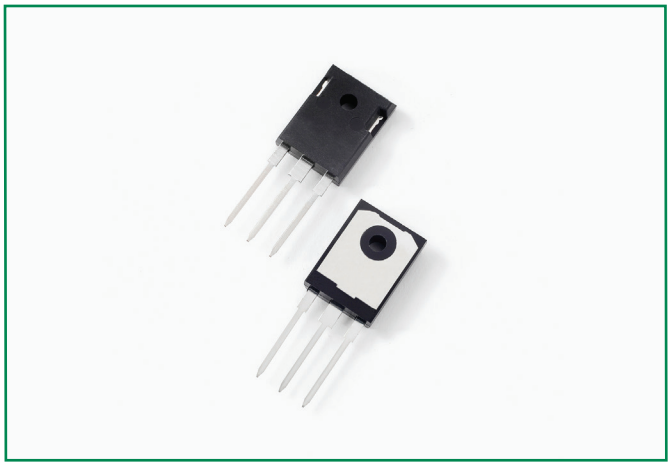
LFUSCD20065B

HF RoHS Pb



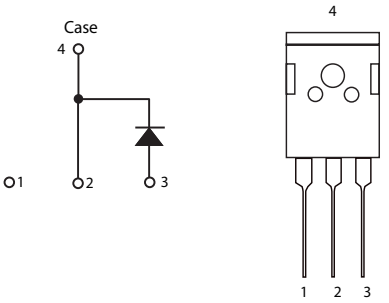
Description

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.	Unit
DC Blocking Voltage	V_R	-	650	V
Repetitive Peak Reverse Voltage, Tj = 25 °C	V_{RRM}		650	V
Surge Peak Reverse Voltage	V_{RSM}		650	V
Maximum DC Forward Current	I_F	T_C = 125 °C	20	A
Non-Repetitive Forward Surge Current	I_{FSM}	T_C = 25 °C, 8.3 ms, half sine pulse	90	A
Non-Repetitive Peak Forward Current	$I_{F,MAX}$	T_C = 25 °C, 10 µS	910	A
Non-Repetitive Avalanche Energy	E_{AS}	T_j = 25 °C, L = 5 mH, I_{pk} = 7.8 A,	168	mJ
Power Dissipation	P_{Tot}	T_C = 25 °C	136	W
		T_C = 125 °C	45	
Maximum Operating Junction Temperature	$T_{J,MAX}$		175	°C
Storage Temperature	T_{STG}		-55 to 175	°C

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Electrical Characteristics

Characteristics	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Forward Voltage	V_F	I_F = 20 A, T_J = 25 °C	-	1.5	1.7	V
		I_F = 20 A, T_J = 150 °C	-	1.8	2.1	
		I_F = 20 A, T_J = 175 °C	-	1.95	2.25	
Reverse Current	I_R	V_R = 650 V, T_J = 25 °C	-	50	500	µA
		V_R = 650 V, T_J = 175 °C	-	100	1600	
Total Capacitive Charge	Q_C	V_R = 400 V, I_F = 20 A, di/dt = 250 A/µs	-	32	-	nC
Total Capacitance	C	V_R = 1 V, f =1 MHz	-	580	-	pF
		V_R = 300 V, f = 1 MHz	-	62	-	
		V_R = 600 V, f = 1 MHz	-	56	-	

Footnote: T_J = +25 °C unless otherwise specified

Thermal Characteristics

Characteristics	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Thermal Resistance	$R_{\theta JC}$	-	-	-	1.1	°C/W

Figure 1: Typical Reverse Characteristics

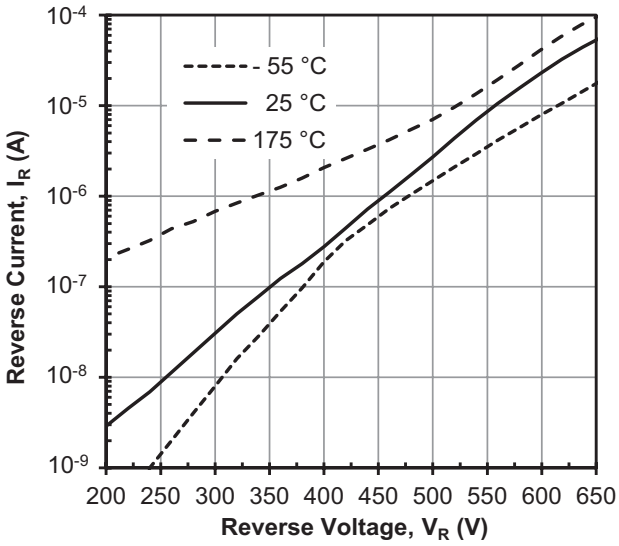

Figure 2: Typical Foward Characteristics

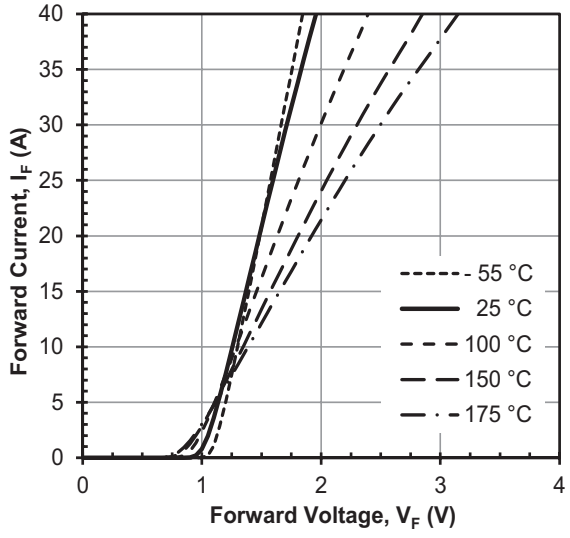

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Figure 3: Power Disipation

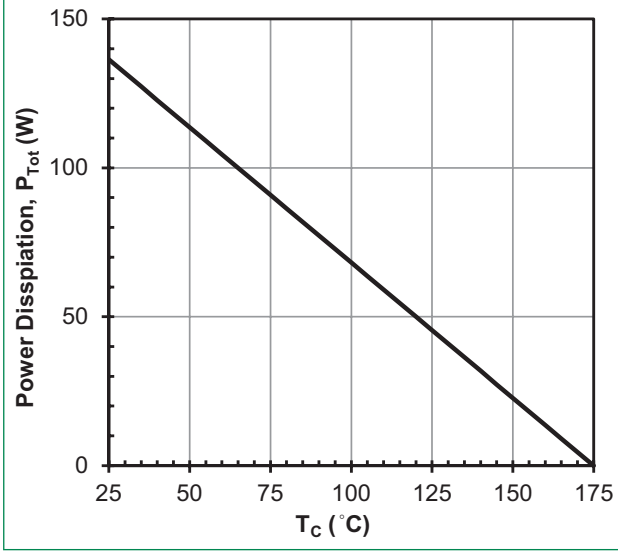


Figure 4: Diode Foward Current

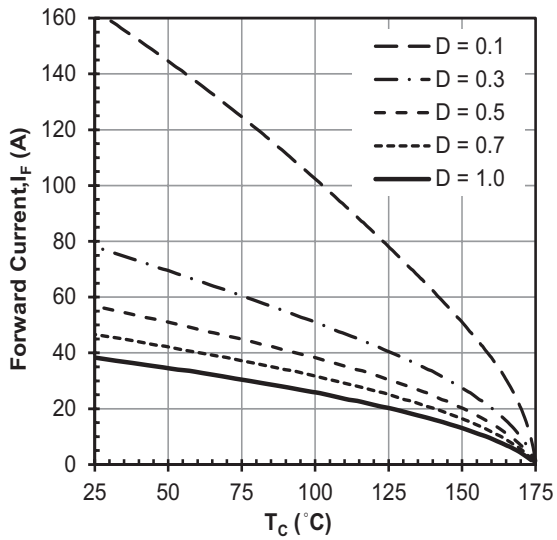


Figure 5: Capacitance vs. Reverse Voltage

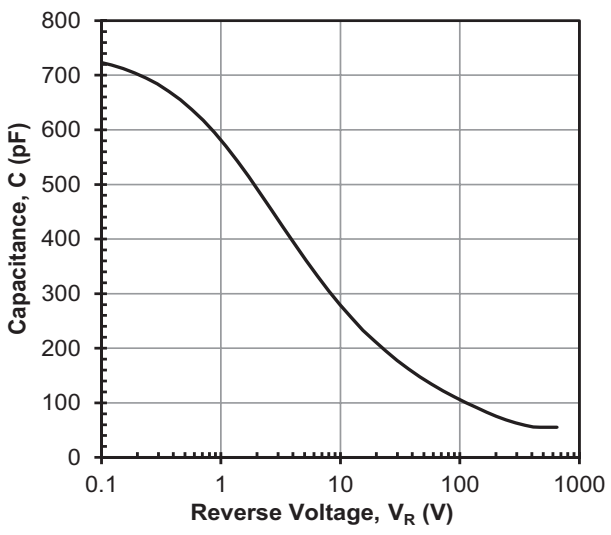
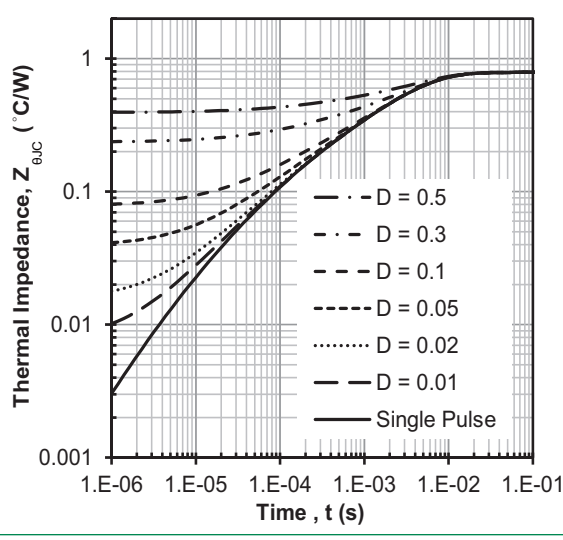


Figure 6: Transient Thermal Impedance



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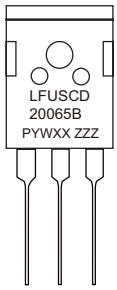
Part Marking System



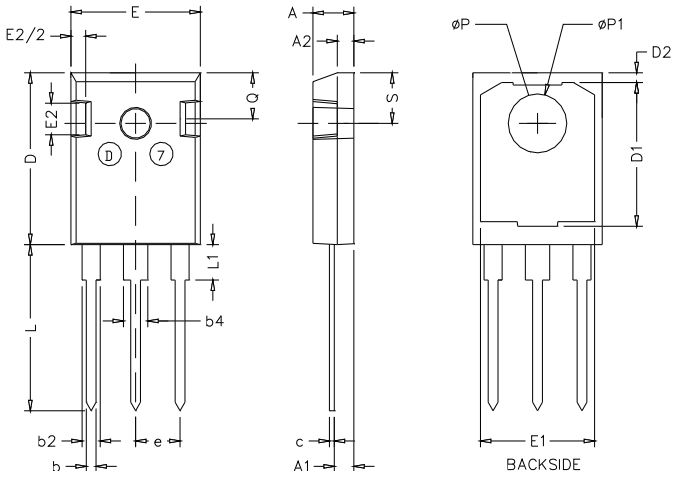
LFU = Littelfuse
SCD = SiC diode
20 = Current Rating (20A)
065 = Voltage Rating (650V)
B = TO-247-3 package
PYWXX = Date Code
ZZZ = Lot Number

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

Packing Options

Part Number	Marking	Packing Mode	M.O.Q
LFUSCD20065B	LFUSCD20065B	30 pcs / Tube	240

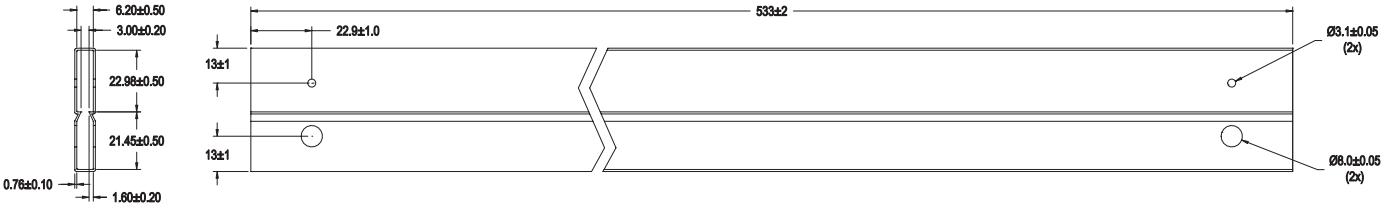
Dimensions-Package TO-247 3-lead



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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