

LFUSCD10065A



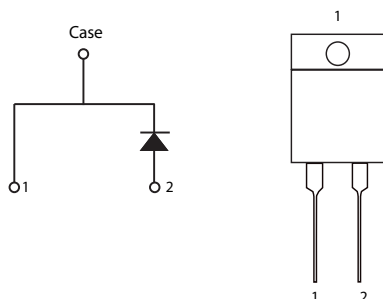
Description

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, $T_J = 25\text{ °C}$	V_{RRM}		650	V
Surge Peak Reverse Voltage	V_{RSM}		650	V
Maximum DC Forward Current	I_F	$T_C = 147\text{ °C}$	10	A
Non-Repetitive Forward Surge Current	I_{FSM}	$T_C = 25\text{ °C}$, 8.3 ms, half sine pulse	75	A
Non-Repetitive Peak Forward Current	I_{FMAX}	$T_C = 25\text{ °C}$, 10 μ S	455	A
Non-Repetitive Avalanche Energy	E_{AS}	$T_J = 25\text{ °C}$, $L = 5\text{ mH}$, $I_{pk} = 5.5\text{ A}$, $V_{DD} = 100\text{ V}$	84	mJ
Power Dissipation	P_{Tot}	$T_C = 25\text{ °C}$	125	W
		$T_C = 147\text{ °C}$	23	
Maximum Operating Junction Temperature	T_{JMAX}		175	°C
Storage Temperature	T_{STG}		-55 to 175	°C

Electrical Characteristics

Characteristics	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Forward Voltage	V_F	$I_F = 10 \text{ A}, T_J = 25^\circ \text{C}$	-	1.5	1.7	V
		$I_F = 10 \text{ A}, T_J = 150^\circ \text{C}$	-	1.8	2.1	
		$I_F = 10 \text{ A}, T_J = 175^\circ \text{C}$	-	1.95	2.25	
Reverse Current	I_R	$V_R = 650 \text{ V}, T_J = 25^\circ \text{C}$	-	25	250	μA
		$V_R = 650 \text{ V}, T_J = 175^\circ \text{C}$	-	50	800	
Total Capacitive Charge	Q_C	$V_R = 400 \text{ V}, I_F = 10 \text{ A}, di/dt = 250 \text{ A}/\mu\text{s}$	-	16	-	nC
Total Capacitance	C	$V_R = 1 \text{ V}, f = 1 \text{ MHz}$	-	290	-	pF
		$V_R = 300 \text{ V}, f = 1 \text{ MHz}$	-	31	-	
		$V_R = 600 \text{ V}, f = 1 \text{ MHz}$	-	28	-	

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

Thermal Characteristics

Characteristics	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Thermal Resistance	$R_{\theta JC}$	-	-	-	1.2	$^\circ\text{C}/\text{W}$

Figure 1: Typical Reverse Characteristics

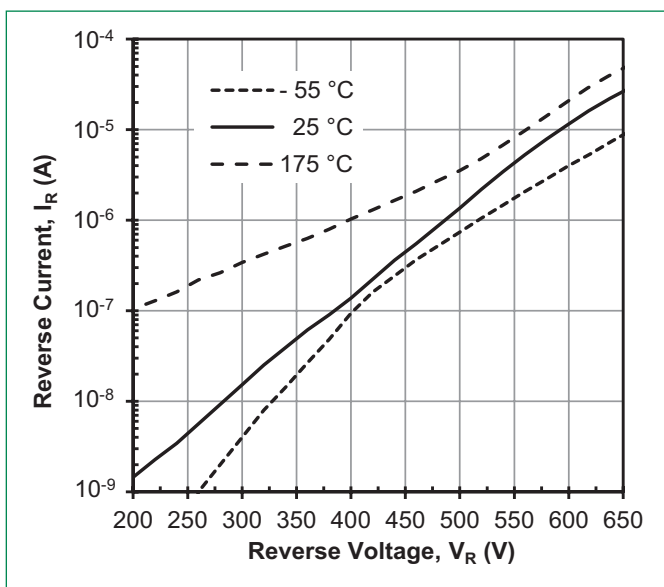


Figure 2: Typical Forward Characteristics

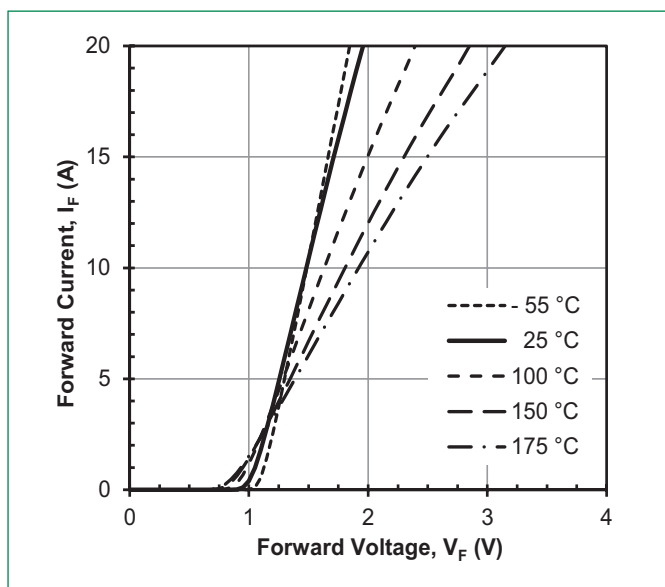


Figure 3: Power Disipation

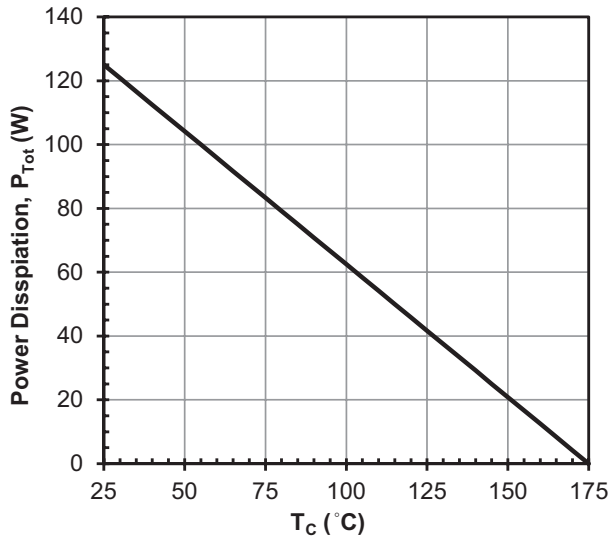


Figure 4: Diode Foward Current

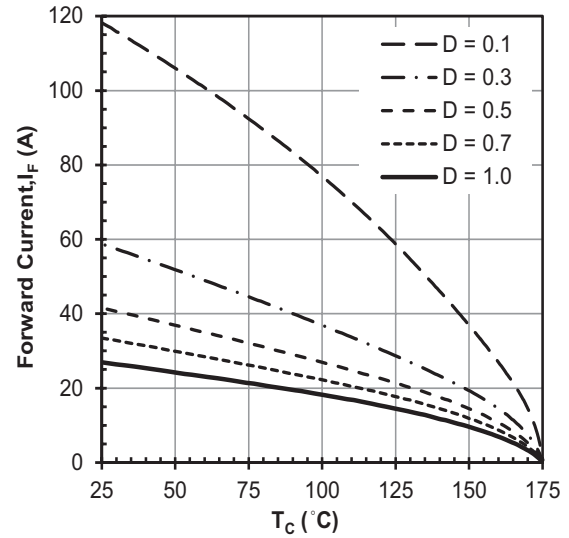


Figure 5: Capacitance vs. Reverse Voltage

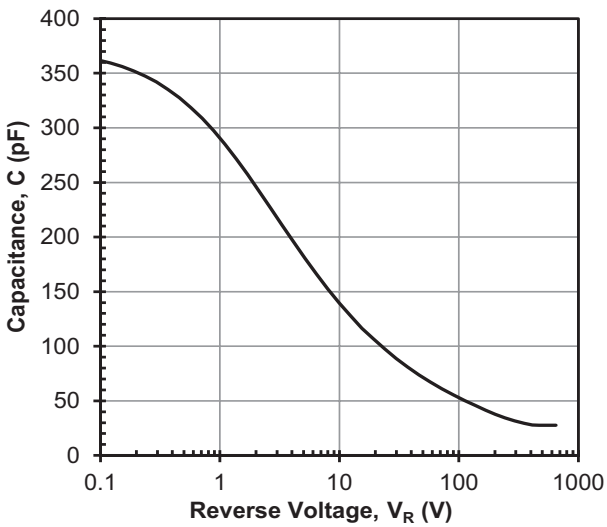
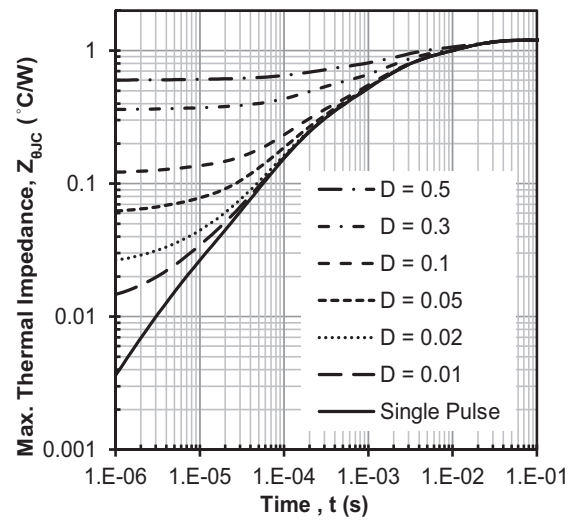
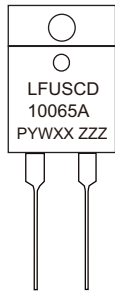


Figure 6: Maximum Transient Thermal Impedance



Part Marking System



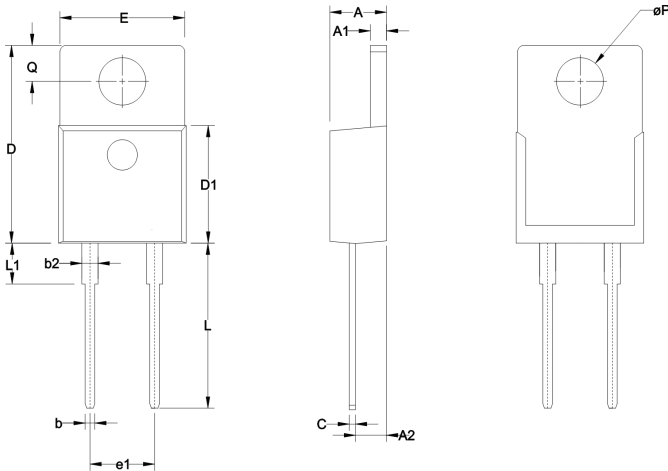
LFU = Littelfuse
SCD = SiC diode
10 = Current Rating (10 A)
065 = Voltage Rating (650 V)
A = TO-220-2 package
PYWXX = Date Code
ZZZ = Lot Number

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

Packing Options

Part Number	Marking	Packing Mode	M.O.Q
LFUSCD10065A	LFUSCD10065A	50 pcs / Tube	500

Dimensions-Package TO-220 2-lead



Symbol	Inches		Millimeters	
	Min	Max	Min	Max
A	0.165	0.185	4.19	4.70
A1	0.048	0.052	1.22	1.32
A2	0.094	0.098	2.39	2.49
b	0.025	0.035	0.64	0.89
b2	0.045	0.055	1.14	1.40
C	0.018	0.025	0.46	0.64
D	0.595	0.615	15.11	15.62
D1	0.355	0.365	9.02	9.27
E	0.381	0.391	9.68	9.93
e1	0.198	0.202	5.03	5.13
L	0.500	0.510	12.70	12.95
L1	0.120	0.150	3.05	3.81
øP	0.143	0.147	3.63	3.73
Q	0.100	0.120	2.54	3.05

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

Packing Specification (Tube for TO-220 2-lead)

Note: All units in Millimeters. Tolerances $\pm 0.25\text{mm}$ unless otherwise specified.

