SiC Schottky Diode

LFUSCD04065A, 650 V, 4 A, TO-220 2-lead

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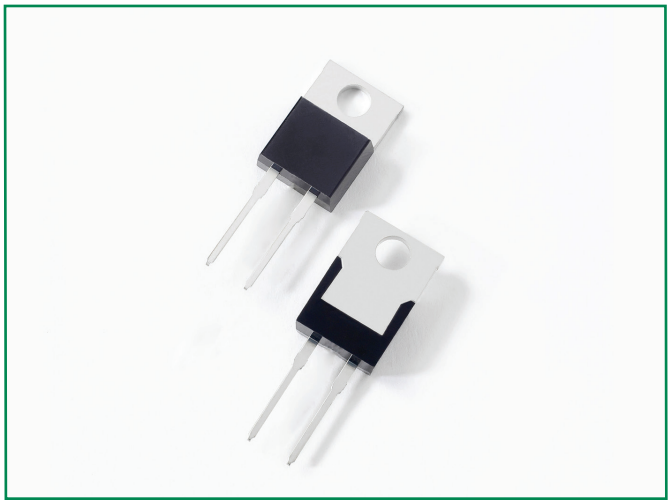
LFUSCD04065A

HF RoHS



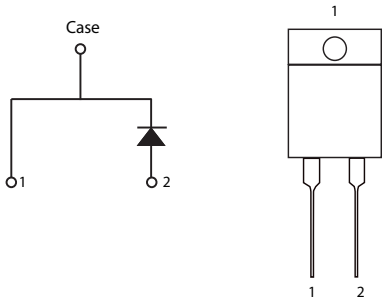
Description

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 = 156 °C	4	A
Non-Repetitive Forward Surge Current	I_{FSM}	T_C = 25 °C, 8.3 ms, half sine pulse	32	A
Non-Repetitive Peak Forward Current	$I_{F,MAX}$	T_C = 25 °C, 10 µS	235	A
Non-Repetitive Avalanche Energy	E_{AS}	T_j = 25 °C, L = 5 mH, I_{pk} = 3.55 A, V_{DD} = 100 V	33	mJ
Power Dissipation	P_{Tot}	T_C = 25 °C	71	W
		T_C = 156 °C	9	
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 = 4 A, T_J = 25 °C	-	1.5	1.7	V
		I_F = 4 A, T_J = 150 °C	-	1.8	2.1	
		I_F = 4 A, T_J = 175 °C	-	2.0	2.25	
Reverse Current	I_R	V_R = 650 V, T_J = 25 °C	-	10	170	µA
		V_R = 650 V, T_J = 175 °C	-	20	550	
Total Capacitive Charge	Q_C	V_R = 400 V, I_F = 4 A, di/dt = 110 A/µs	-	6	-	nC
Total Capacitance	C	V_R = 1 V, f =1 MHz	-	125	-	pF
		V_R = 300 V, f = 1 MHz	-	16	-	
		V_R = 600 V, f = 1 MHz	-	13	-	

Footnote: T_J = +25 °C unless otherwise specified

Thermal Characteristics

Characteristics	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Thermal Resistance	$R_{\theta JC}$	-	-	-	2.1	°C/W

Figure 1: Typical Reverse Characteristics

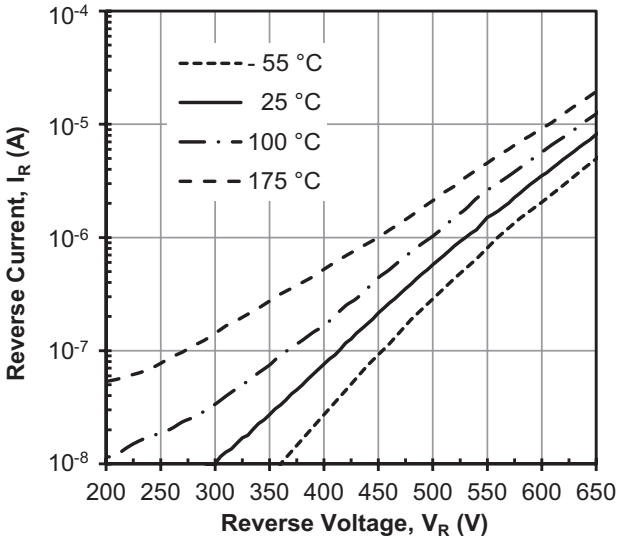

Figure 2: Typical Foward Characteristics

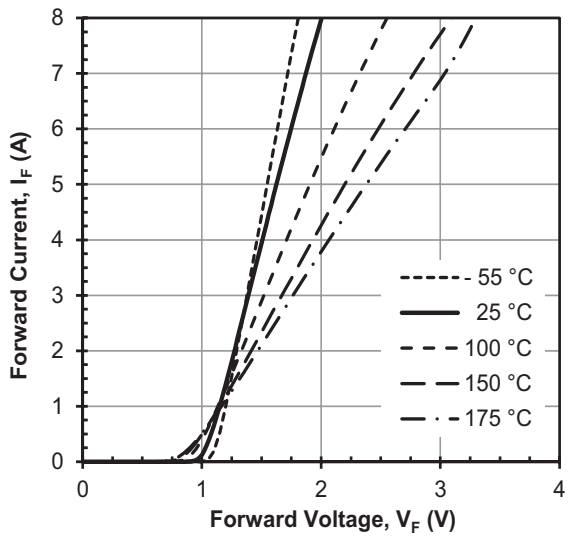

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Figure 3: Power Disipation

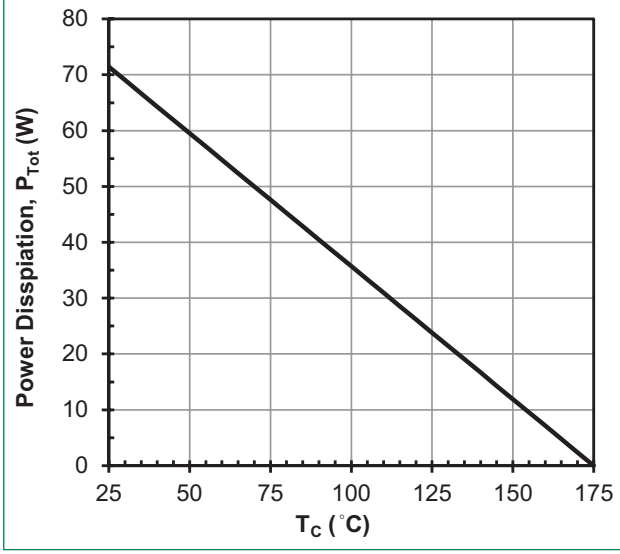


Figure 4: Diode Foward Current

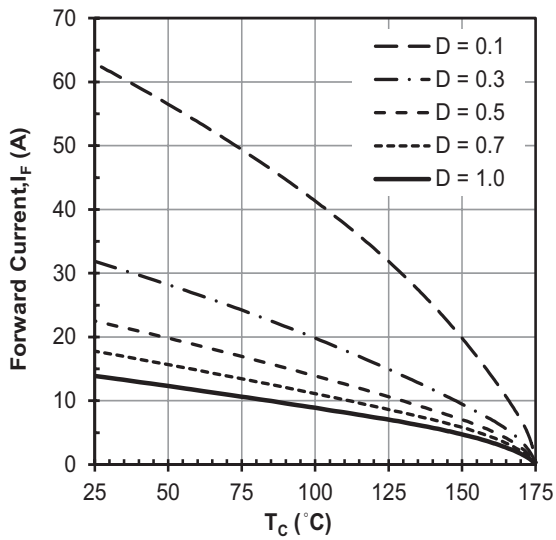


Figure 5: Capacitance vs. Reverse Voltage

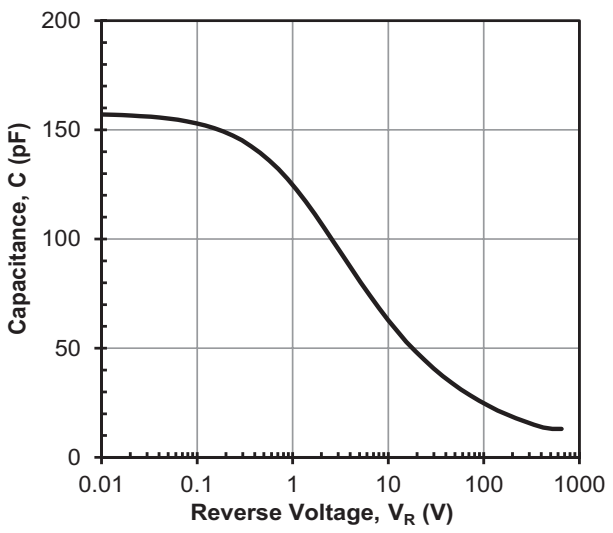
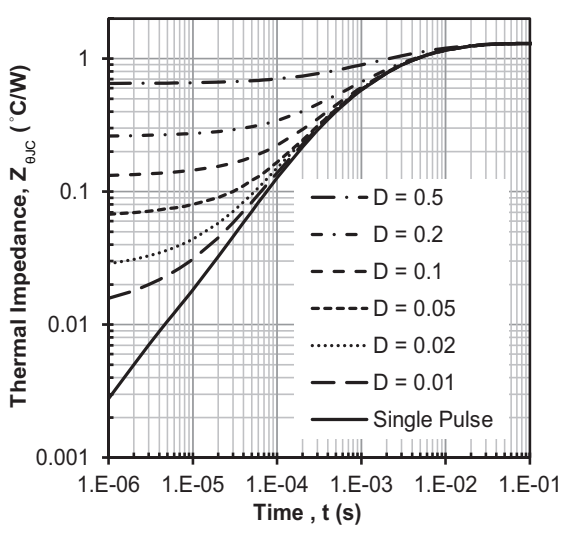


Figure 6: Maximum Transient Thermal Impedance



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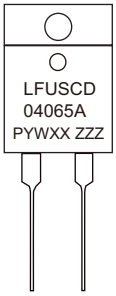
Part Marking System



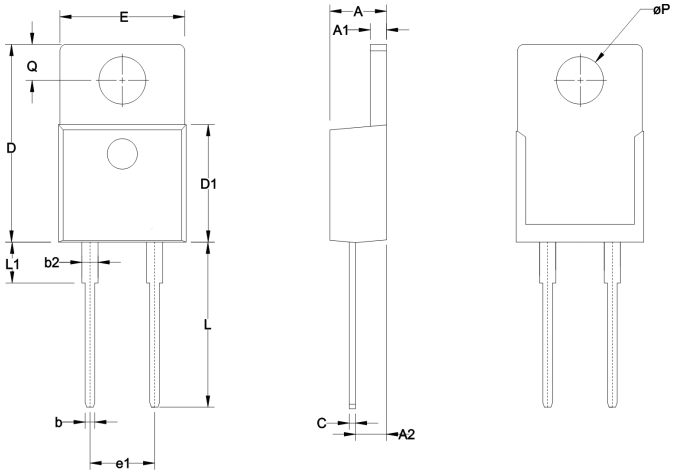
LFU = Littelfuse
SCD = SiC diode
04 = Current Rating(4A)
065 = Voltage Rating (650V)
A = TO-220-2 package
PYWXX = Date Code
ZZZ = Lot Number

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

Packing Options

Part Number	Marking	Packing Mode	M.O.Q
LFUSCD04065A	LFUSCD04065A	50 pcs / Tube	500

Dimensions-Package TO-220 2-lead

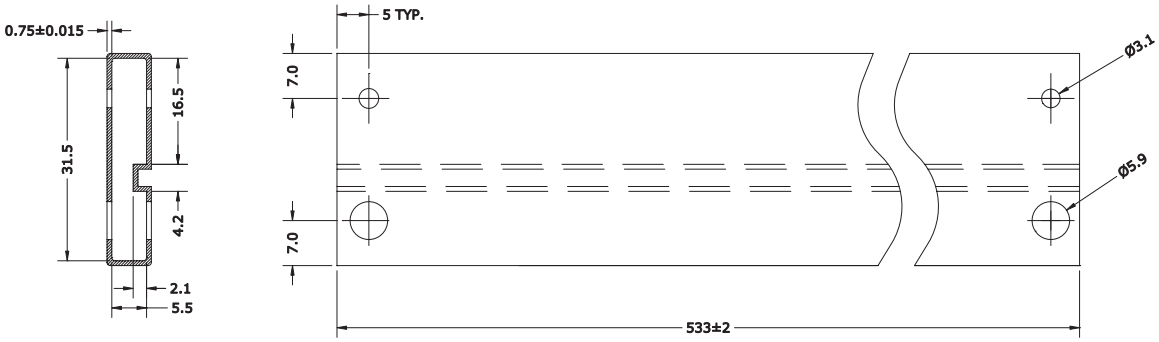


Symbol	Inches		Millimeters	
	Min	Max	Min	Max
A	0.165	0.185	4.19	4.70
A1	0.048	0.052	1.22	1.32
A2	0.094	0.098	2.39	2.49
b	0.025	0.035	0.64	0.89
b2	0.045	0.055	1.14	1.40
C	0.018	0.025	0.46	0.64
D	0.595	0.615	15.11	15.62
D1	0.355	0.365	9.02	9.27
E	0.381	0.391	9.68	9.93
e1	0.198	0.202	5.03	5.13
L	0.500	0.510	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 ± 0.25mm unless otherwise specified.



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