

LFUSCD04065A

 HF  

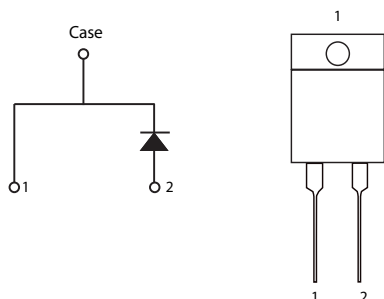

### Description

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	$I_F$	$T_C = 156\text{ °C}$	4	A
Non-Repetitive Forward Surge Current	$I_{FSM}$	$T_C = 25\text{ °C}$ , 8.3 ms, half sine pulse	32	A
Non-Repetitive Peak Forward Current	$I_{FMAX}$	$T_C = 25\text{ °C}$ , 10 $\mu$ S	235	A
Non-Repetitive Avalanche Energy	$E_{AS}$	$T_J = 25\text{ °C}$ , $L = 5\text{ mH}$ , $I_{pk} = 3.55\text{ A}$ , $V_{DD} = 100\text{ V}$	33	mJ
Power Dissipation	$P_{Tot}$	$T_C = 25\text{ °C}$	71	W
		$T_C = 156\text{ °C}$	9	
Maximum Operating Junction Temperature	$T_{J,MAX}$		175	°C
Storage Temperature	$T_{STG}$		-55 to 175	°C

**Electrical Characteristics**

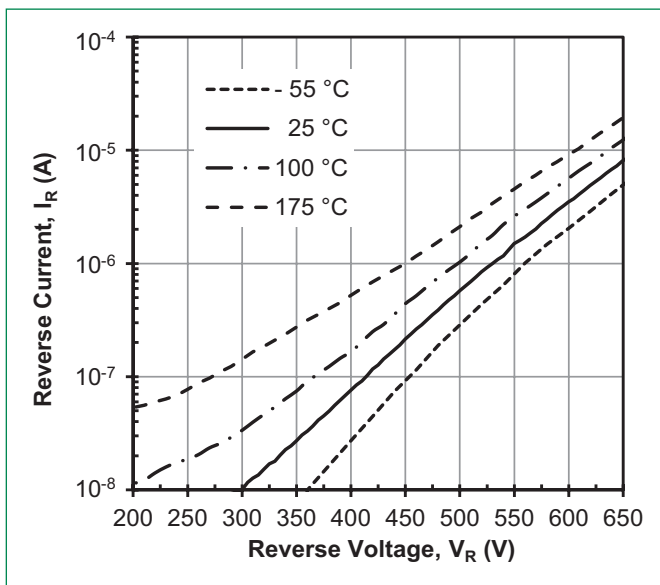
Characteristics	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Forward Voltage	$V_F$	$I_F = 4 \text{ A}, T_J = 25 \text{ }^\circ\text{C}$	-	1.5	1.7	V
		$I_F = 4 \text{ A}, T_J = 150 \text{ }^\circ\text{C}$	-	1.8	2.1	
		$I_F = 4 \text{ A}, T_J = 175 \text{ }^\circ\text{C}$	-	2.0	2.25	
Reverse Current	$I_R$	$V_R = 650 \text{ V}, T_J = 25 \text{ }^\circ\text{C}$	-	10	170	$\mu\text{A}$
		$V_R = 650 \text{ V}, T_J = 175 \text{ }^\circ\text{C}$	-	20	550	
Total Capacitive Charge	$Q_C$	$V_R = 400 \text{ V}, I_F = 4 \text{ A}, di/dt = 110 \text{ A}/\mu\text{s}$	-	6	-	nC
Total Capacitance	C	$V_R = 1 \text{ V}, f = 1 \text{ MHz}$	-	125	-	pF
		$V_R = 300 \text{ V}, f = 1 \text{ MHz}$	-	16	-	
		$V_R = 600 \text{ V}, f = 1 \text{ MHz}$	-	13	-	

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

**Thermal Characteristics**

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

**Figure 1: Typical Reverse Characteristics**



**Figure 2: Typical Forward Characteristics**

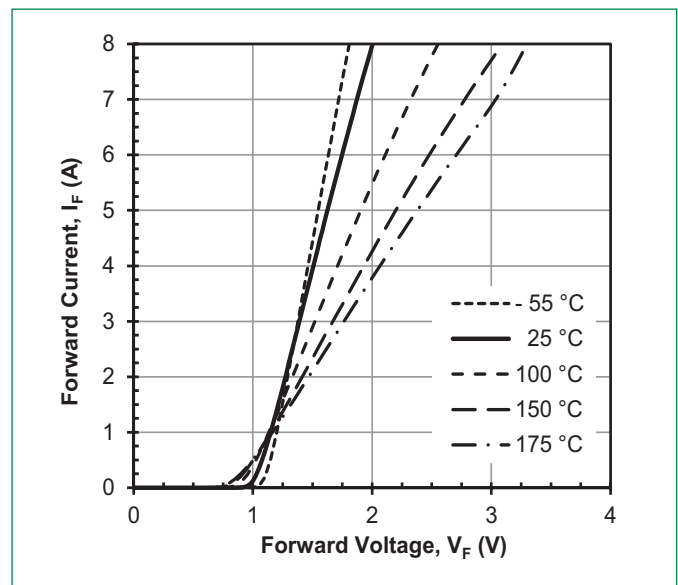


Figure 3: Power Dissipation

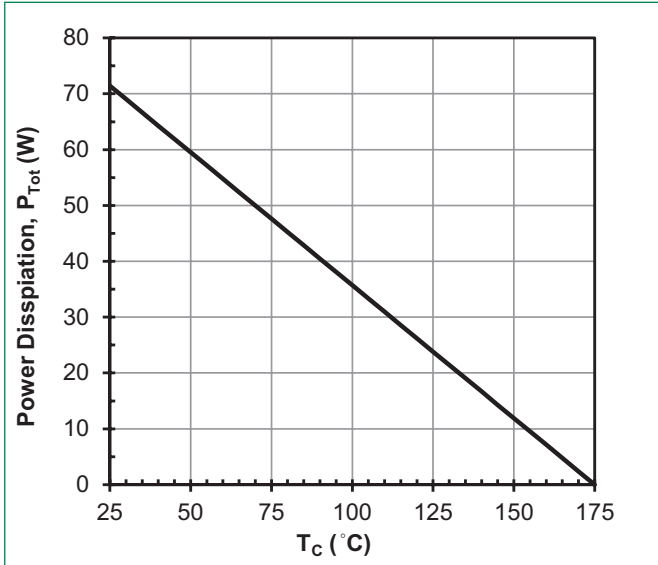


Figure 4: Diode Forward Current

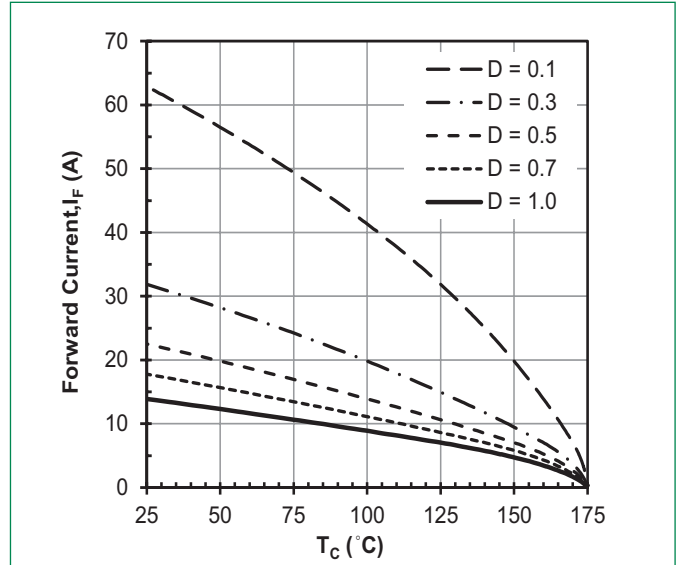


Figure 5: Capacitance vs. Reverse Voltage

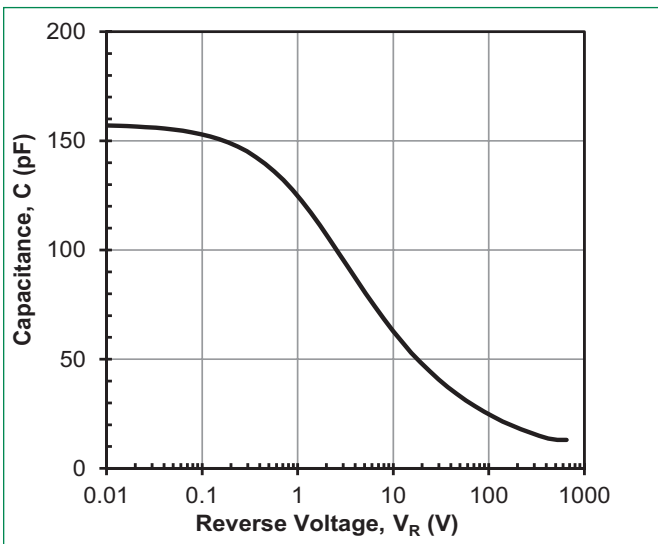
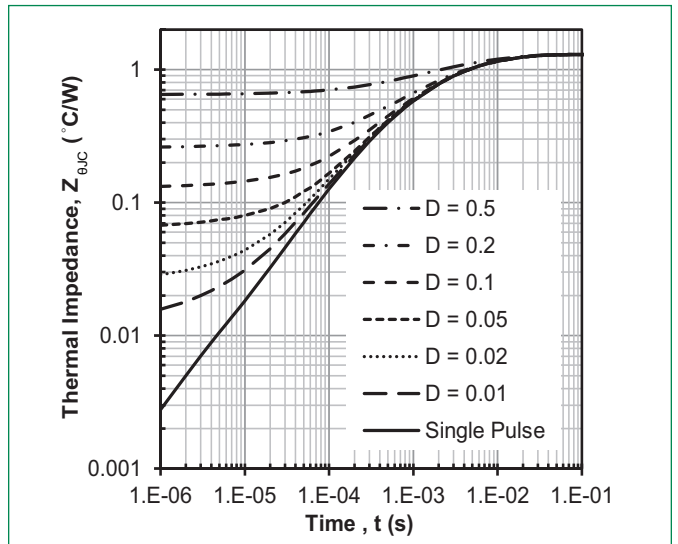
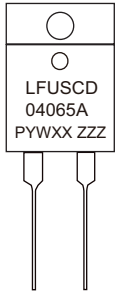


Figure 6: Maximum Transient Thermal Impedance



### Part Marking System



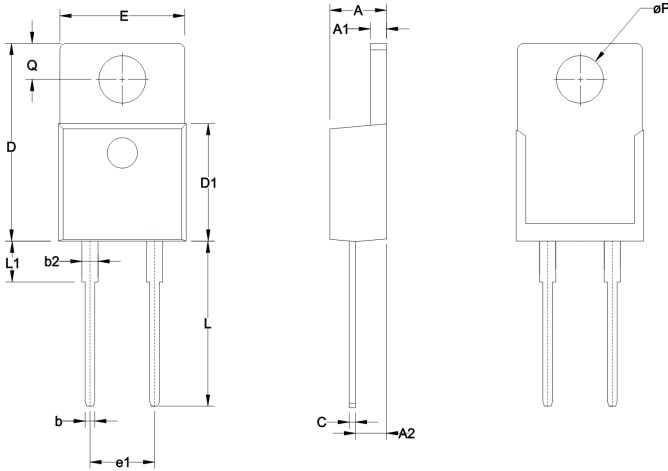
LFU = Littelfuse  
 SCD = SiC diode  
 04 = Current Rating(4A)  
 065 = Voltage Rating (650V)  
 A = TO-220-2 package  
 PYWXX = Date Code  
 ZZZ = Lot Number

**Date code notes:**  
 P = assembly code  
 Y = year  
 W = week  
 XX = sequential 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  $\pm 0.25\text{mm}$  unless otherwise specified.

