

LFUSCD15120A



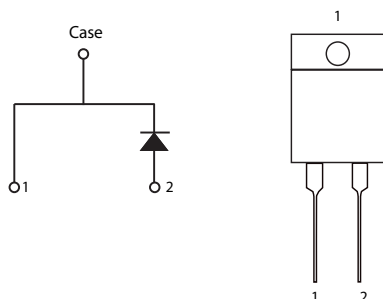
Description

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	-	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	A
Non-Repetitive Forward Surge Current	I_{FSM}	$T_C = 25\text{ °C}$, 8.3 ms, half sine pulse	120	A
Non-Repetitive Avalanche Energy	E_{AS}	$T_J = 25\text{ °C}$, $L = 10\text{ mH}$, $I_{pk} = 5\text{ A}$, $V_{DD} = 100\text{ V}$	132	mJ
Power Dissipation	P_{Tot}	$T_C = 25\text{ °C}$	187	W
		$T_C = 138\text{ °C}$	46	
Maximum Operating Junction Temperature	$T_{J,MAX}$		175	°C
Storage Temperature	T_{STG}		-55 to 175	°C
Soldering Temperatures, Wavesoldering Only Allowed at Leads	T_{sold}	1.6 mm from case for 10s	260	°C

Electrical Characteristics

Characteristics	Symbol	Conditions	Value			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	375	μA
		$V_R = 1200\text{ V}, T_J = 175\text{ }^\circ\text{C}$	-	90	1000	
Total Capacitive Charge	Q_C	$V_R = 600\text{ V}, I_F = 15\text{ A}, di/dt = 250\text{ A}/\mu\text{s}$	-	60	-	nC
Total Capacitance	C	$V_R = 1\text{ V}, f = 1\text{ MHz}$	-	750	-	pF
		$V_R = 300\text{ V}, f = 1\text{ MHz}$	-	75	-	
		$V_R = 600\text{ V}, f = 1\text{ MHz}$	-	54	-	

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

Thermal Characteristics

Characteristics	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Thermal Resistance	$R_{\theta JC}$	-	-	-	0.8	$^\circ\text{C}/\text{W}$

Figure 1: Typical Reverse Characteristics

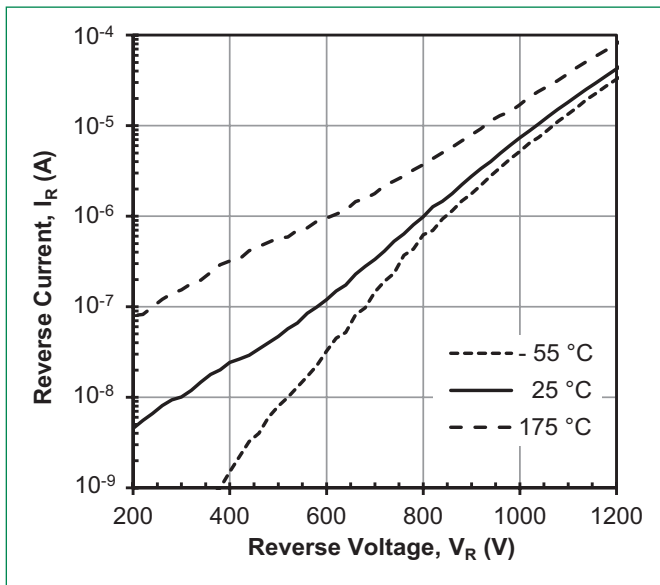


Figure 2: Typical Forward Characteristics

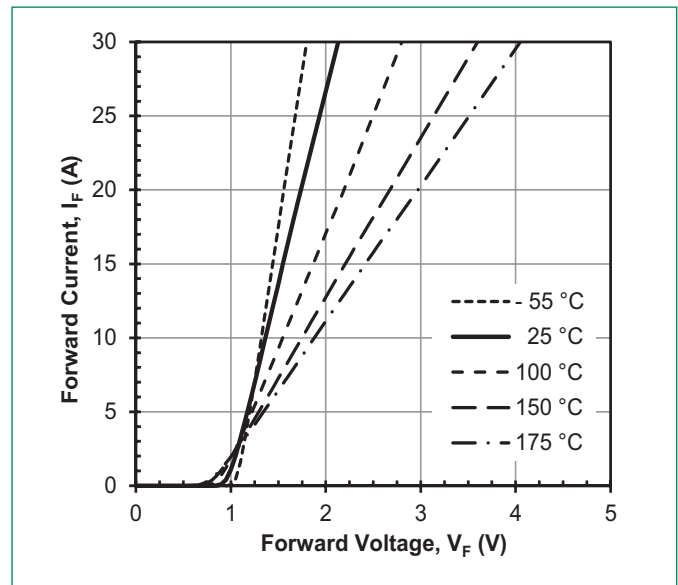


Figure 3: Power Dissipation

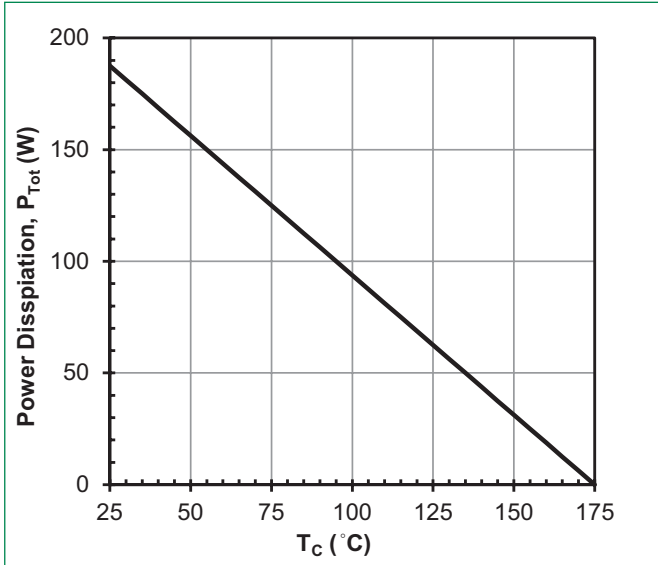


Figure 4: Diode Forward Current

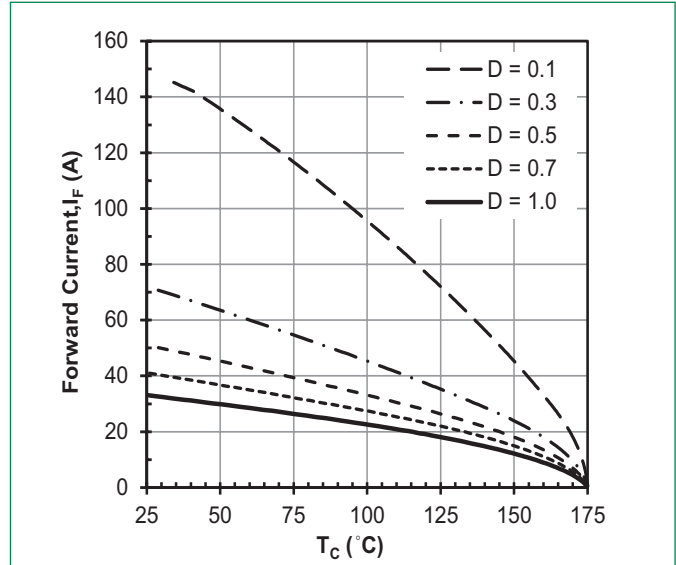


Figure 5: Capacitance vs. Reverse Voltage

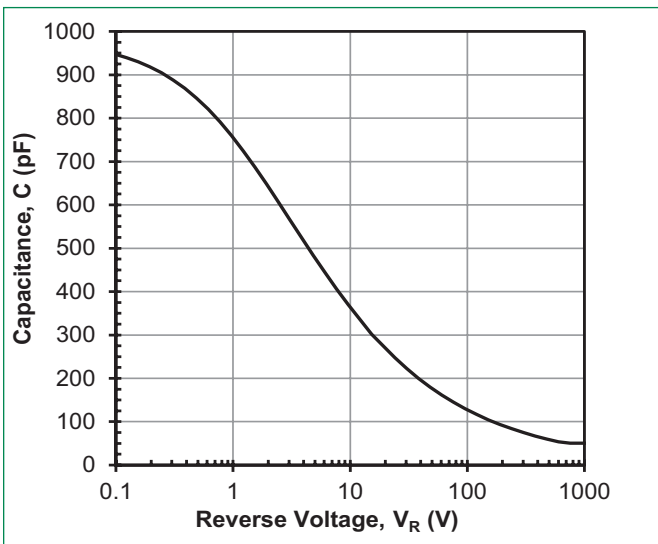
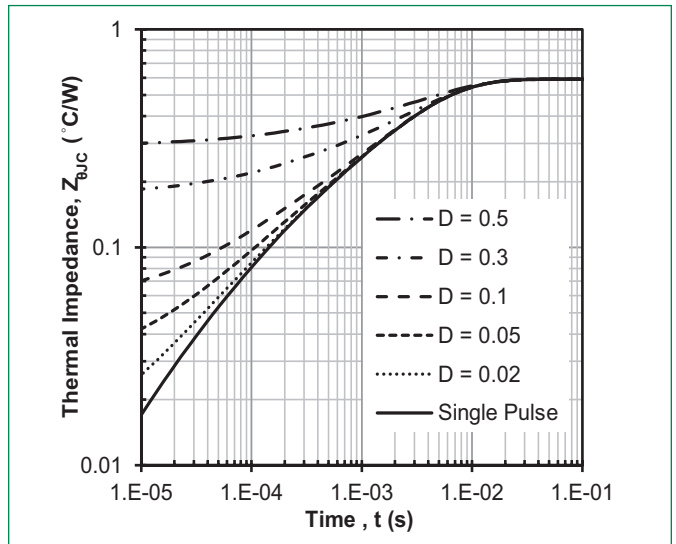
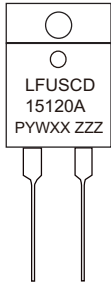


Figure 6: Transient Thermal Impedance



Part Marking System



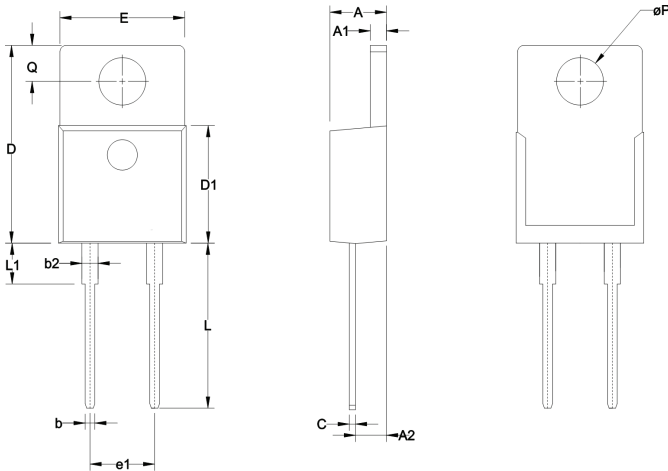
LFU = Littelfuse
 SCD = SiC diode
 15 = Current Rating (15 A)
 120 = Voltage Rating (1200 V)
 A = TO-220-2 package
 PYWXX = Date Code
 ZZZ = Lot Number

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

Packing Options

Part Number	Marking	Packing Mode	M.O.Q
LFUSCD15120A	LFUSCD15120A	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.

