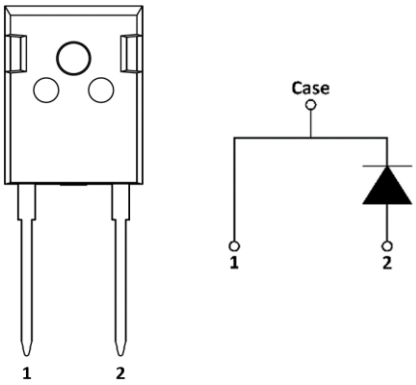
LSIC2SD170B50
1700 V, 50 A SiC Schottky Barrier Diode

Agency Approvals and Environmental

Environmental Approvals
RoHS, Pb-free, HF

Pinout Diagram



Product Summary

Characteristic	Value	Unit
V_{RRM}	1700	V
I_F ($T_C \leq$ 135 °C)	65	A
Q_C (V_R: 0-800 V)	353	nC

Features

- Positive temperature coefficient for safe operation and ease of paralleling
- 175 °C maximum operating junction temperature
- Excellent surge capability
- Extremely fast, temperature-independent switching behavior
- Dramatically reduced switching losses compared to Si bipolar diodes
- Zero reverse recovery current

Applications

- Boost diodes in PFC or DC/DC stages
- Switch-mode power supplies
- Solar inverters
- Uninterruptable power supplies
- Industrial motor drives
- Battery Chargers
- High speed rectifier

1. Maximum Ratings

Characteristic	Symbol	Conditions	Value	Unit
Repetitive Peak Reverse Voltage	V_{RRM}	-	1700	V
DC Blocking Voltage	V_R	-	1700	V
Continuous Forward Current	I_F	T_C = 25 °C	135	A
		T_C = 135 °C	65	
		T_C = 150 °C	50	
Non-repetitive Forward Surge Current	I_{FSM}	T_C = 25 °C, t_p = 10 ms, Half sine pulse	280	A
I^2t	$\int I^2dt$	T_C = 25 °C, t_p = 10 ms, Half sine pulse	390	A^2s
Power Dissipation	P_{Tot}	T_C = 25 °C	650	W
		T_C = 110 °C	280	
Operating Junction Temperature	T_J	-	-55 to 175	°C
Storage Temperature	T_{STG}	-	-55 to 150	°C
Mounting Torque	M_D	M3 or 6-32 screw	0.6	Nm

2. Thermal Characteristics

Characteristic	Symbol	Value	Unit
Thermal Resistance	$R_{thJC, max}$	0.23	°C/W

3. Electrical Characteristics

Characteristic	Symbol	Conditions	Value			Unit
			Min	Typ	Max	
Forward Voltage	V_F	I_F = 50 A, T_C = 25 °C	-	1.5	1.8	V
		I_F = 50 A, T_C = 175 °C	-	2.2	-	
Reverse Current	I_R	V_R = 1700 V, T_C = 25 °C	-	5	100	µA
		V_R = 1700 V, T_C = 175 °C	-	100	-	
Total Capacitance	C	V_R = 1 V, f = 1 MHz	-	3900	-	pF
		V_R = 400 V, f = 1 MHz	-	334	-	
		V_R = 800 V, f = 1 MHz	-	240	-	
Total Capacitive Charge	Q_C	V_R = 800 V, $Q_C = \int Q(V)\, dV$	-	353	-	nC
Capacitive Stored Energy	E_C	V_R = 800 V	-	77	-	µJ

4. Performance Curves

Figure 1. Typical Forward Characteristics

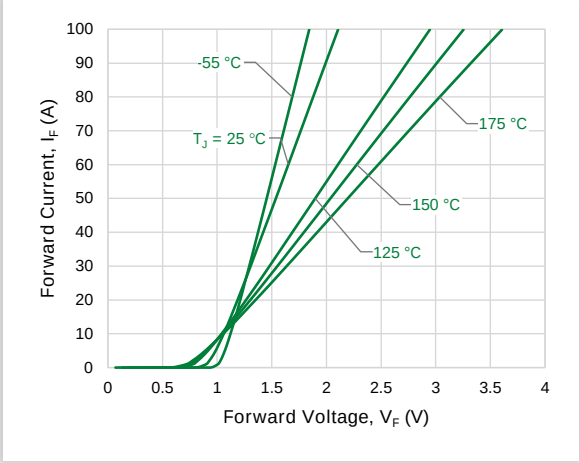


Figure 2. Typical Reverse Characteristics

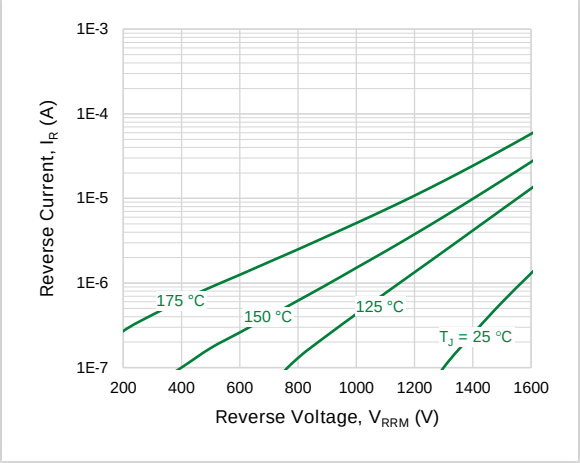


Figure 3. Power Derating

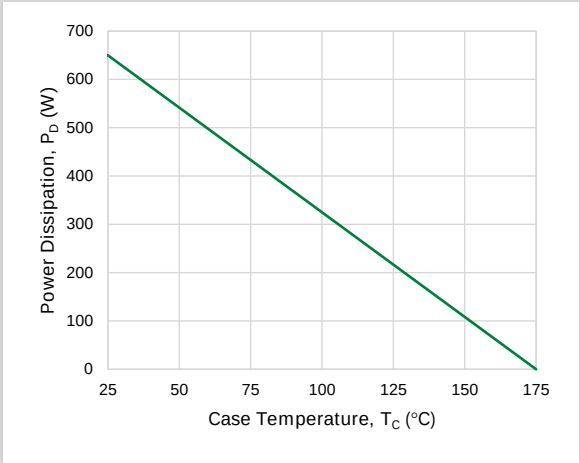


Figure 4. Current Derating

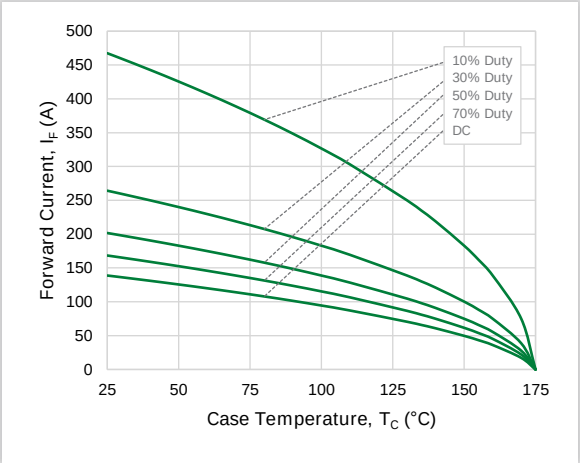


Figure 5. Capacitance vs. Reverse Voltage

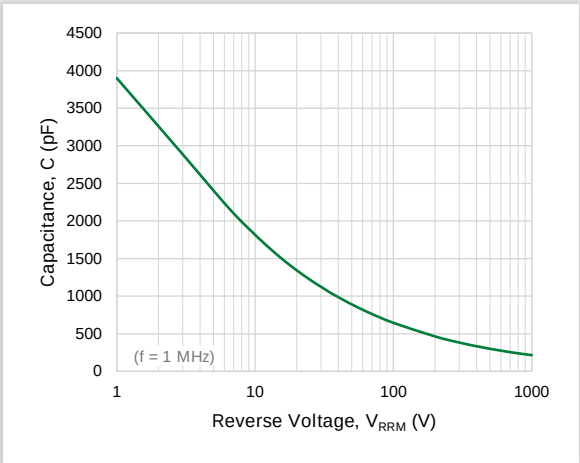


Figure 6. Capacitive Charge vs. Reverse Voltage

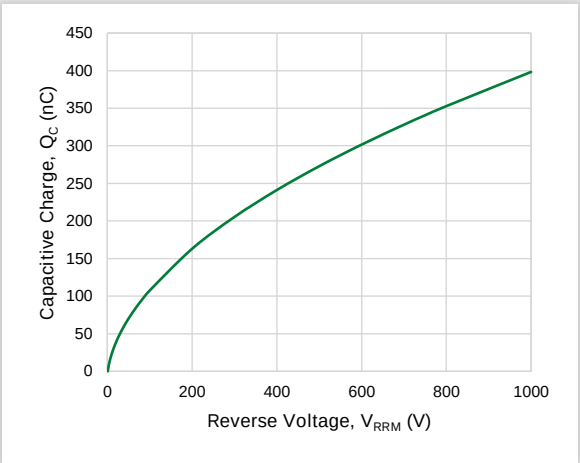


Figure 7. Stored Energy vs. Reverse Voltage

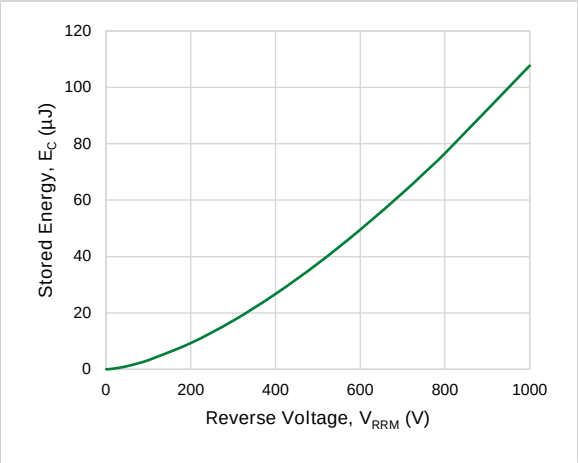
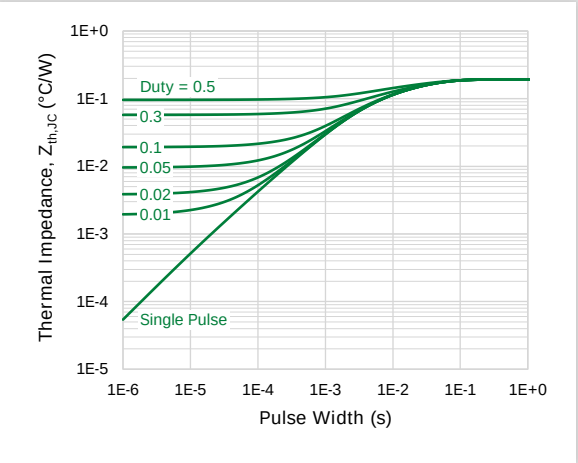
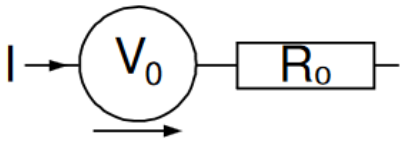


Figure 8. Transient Thermal Impedance



5. V_F Model for Simulation

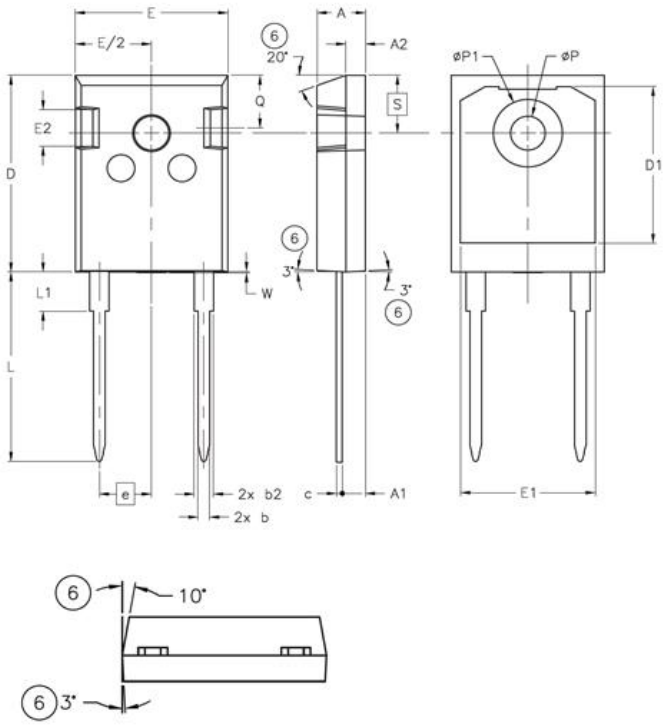


$$V_F(T_J) = V_0 + IR_0$$
$$V_0 = -1.15 \times 10^{-3} \cdot T_J + 9.90 \times 10^{-1}$$
$$R_0 = 3.25 \times 10^{-7} \cdot T_J^2 + 4.62 \times 10^{-5} \cdot T_J + 1.01 \times 10^{-2}$$

Notes:

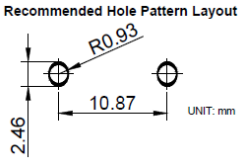
- T_J is junction temperature in °C
- Range valid from 25 °C to 175 °C
- Model represents performance of a typical part

6. Package Dimensions



Symbol	Millimeters		
	Min	Nom	Max
A	4.7	-	5.31
A1	2.21	-	2.59
A2	1.5	-	2.49
b	0.99	-	1.4
b2	1.65	-	2.39
c	0.38	-	0.89
D	20.8	-	21.46
D1	13.08	-	-
D2	0.51	-	1.35
e	5.44 BSC		
E	15.49	-	16.26
E1	13.46	-	
E2	3.43	-	3.99
L	19.81	-	20.32
L1		-	4.5
øP	3.56	-	3.66
øP1	7.06	-	7.39
Q	5.38		6.2
S	6.17 BSC		
W			0.15

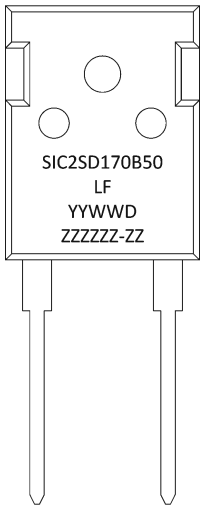
Recommended Hole Pattern Layout:



Notes:

1. Dimensions are in millimeters
2. Dimension D, E do not include mold flash. Mold flash shall not exceed 0.127 mm per side measured at outer most extreme of plastic body.
3. øP to have a maximum draft angle of 38.1 mm to the top of the part with a maximum hole diameter of 3.912 mm.

7. Part Numbering and Marking

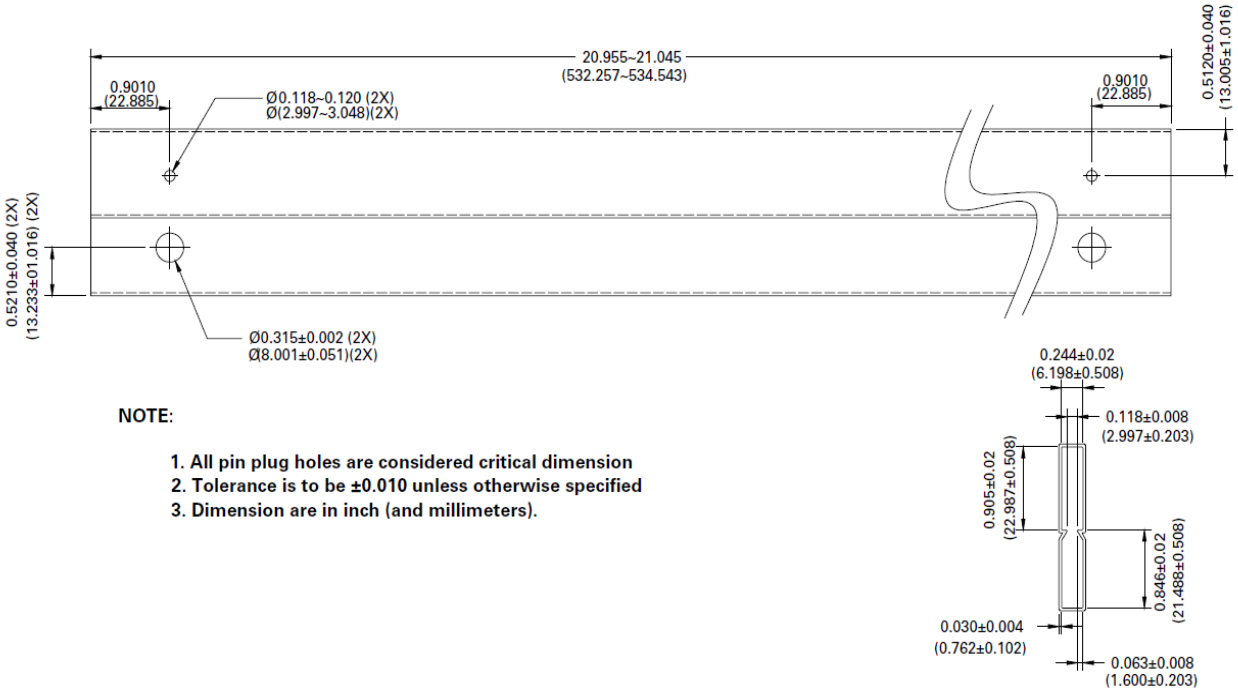


SiC	= SiC
2	= Gen 2
SD	= Schottky Barrier Diode
170	= Voltage Rating (1700 V)
B	= Package (TO-247-2L)
50	= Current Rating (50 A)
YY	= Year
WW	= Week
D	= Special Code
ZZZZZZ-ZZ	= Lot Number

8. Packing Options

Part Number	Marking	Packing Mode	M.O.Q.
LSIC2SD170B50	SIC2SD170B50	Tube (30 pcs)	30 pcs

9. Packing Specifications



NOTE:

1. **All pin plug holes are considered critical dimension**
2. **Tolerance is to be ±0.010 unless otherwise specified**
3. **Dimension are in inch (and millimeters).**

For additional information please visit www.Littelfuse.com/powersemi