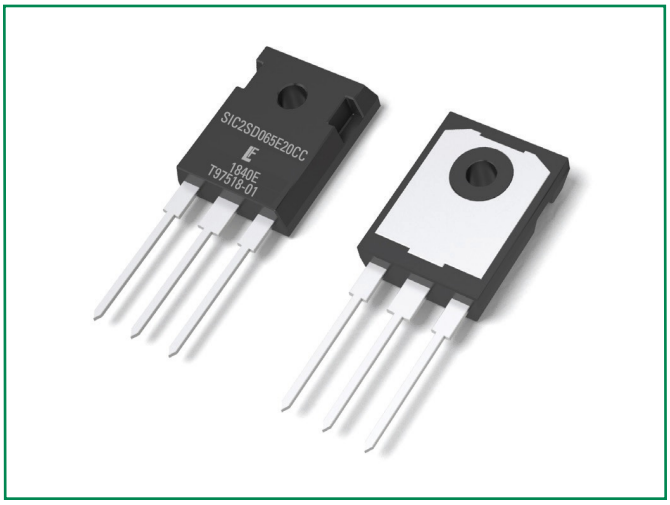
GEN2 SiC Schottky Diode
LSIC2SD065E20CCA, 650 V, 20 A, TO-247-3L

LSIC2SD065E20CCA 650 V, 20 A SiC Schottky Barrier Diode

AUTOMOTIVE GRADE HF RoHS Pb



Description

This series of silicon carbide (SiC) Schottky diodes has negligible reverse recovery current, high surge capability, and a maximum operating junction temperature of 175 °C. This diode series is ideal for applications where improvements in efficiency, reliability, and thermal management are desired.

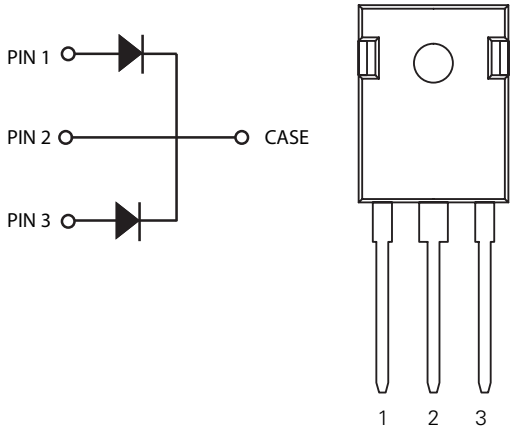
Features

- AEC-Q101 qualified
- 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

Applications

- Boost diodes in PFC or DC/DC stages
- Switch-mode power supplies
- Uninterruptible power supplies
- Solar inverters
- Industrial motor drives
- EV charging stations

Circuit Diagram TO-247-3L



Environmental

- Littelfuse "RoHS" logo = RoHS conform
- Littelfuse "HF" logo = HF Halogen Free
- Littelfuse "Pb-free" logo = Pb-free lead plating

Maximum Ratings

Characteristics	Symbol	Conditions	Value	Unit
Repetitive Peak Reverse Voltage	V_{RRM}	-	650	V
DC Blocking Voltage	V_R	T_J = 25 °C	650	V
Continuous Forward Current (Per Leg/Component)	I_F	T_C = 25 °C	27 / 54	A
		T_C = 147 °C	10 / 20	
Non-Repetitive Forward Surge Current (Per Leg)	I_{FSM}	T_C = 25 °C, t_P = 10 ms, Half sine pulse	50	A
Power Dissipation (Per Leg/Component)	P_{Tot}	T_C = 25 °C	100 / 200	W
		T_C = 110 °C	43 / 86	
Operating Junction Temperature	T_J	-	-55 to 175	°C
Storage Temperature	T_{STG}	-	-55 to 150	°C
Soldering Temperature	T_{sold}	-	260	°C

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Electrical Characteristics (T_J = 25 °C unless otherwise specified)

Characteristics	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Forward Voltage	V_F	I_F = 10 A, T_J = 25 °C	-	1.5	1.8	V
		I_F = 10 A, T_J = 175 °C	-	1.85	-	
Reverse Current	I_R	V_R = 650 V, T_J = 25 °C	-	<1	50	µA
		V_R = 650 V, T_J = 175 °C	-	25	-	
Total Capacitance	C	V_R = 1 V, f = 1 MHz	-	470	-	pF
		V_R = 200 V, f = 1 MHz	-	60	-	
		V_R = 400 V, f = 1 MHz	-	43	-	
Total Capacitive Charge	Q_C	V_R = 400 V, $Q_C = \int_0^{V_R} C(V)dV$	-	30	-	nC

Thermal Characteristics

Characteristics	Symbol	Value	Unit
Thermal Resistance (Per Leg/Component)	$R_{\theta JC}$	1.50 / 0.75	°C/W

Figure 1: Typical Foward Characteristics

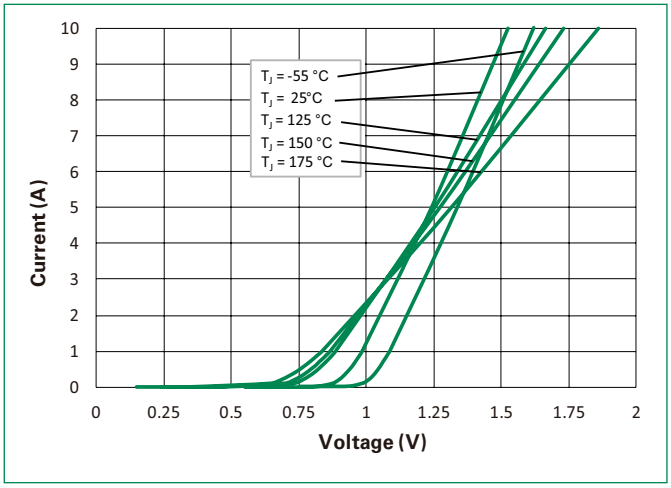

Figure 2: Typical Reverse Characteristics

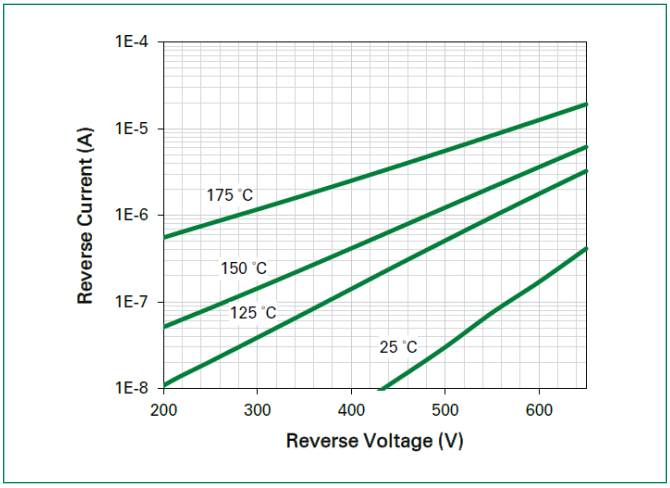

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Figure 3: Power Derating

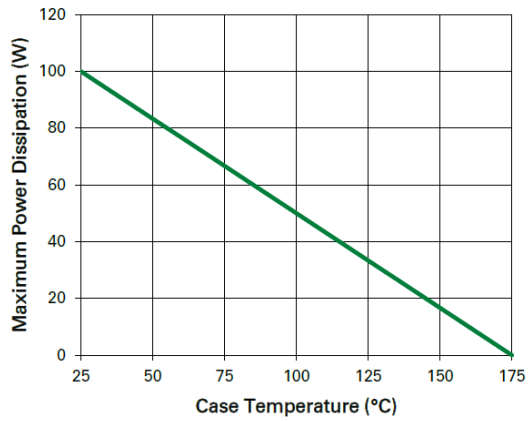


Figure 4: Current Derating

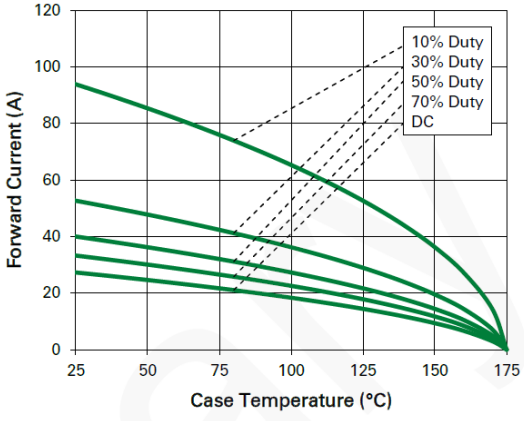


Figure 5: Capacitance vs. Reverse Voltage

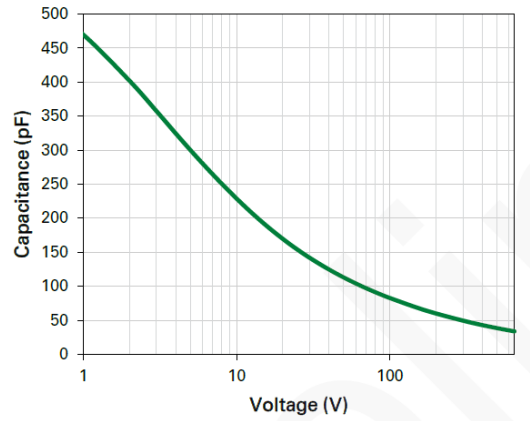


Figure 6: Capacitive Charge vs. Reverse Voltage

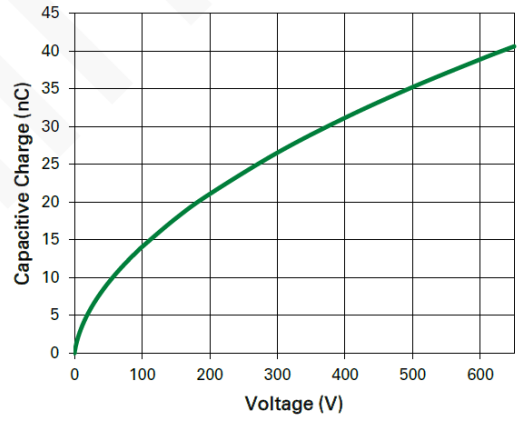


Figure 7: Stored Energy vs. Reverse Voltage

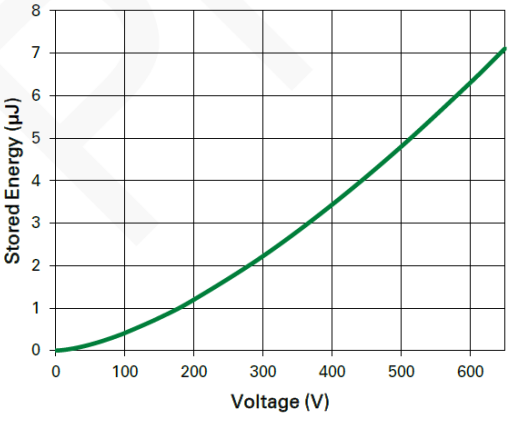
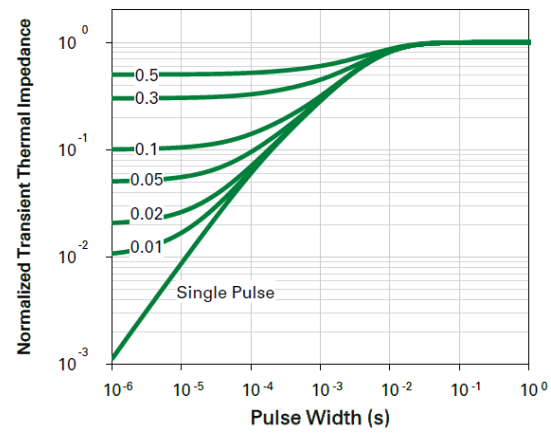


Figure 8: Transient Thermal Impedance



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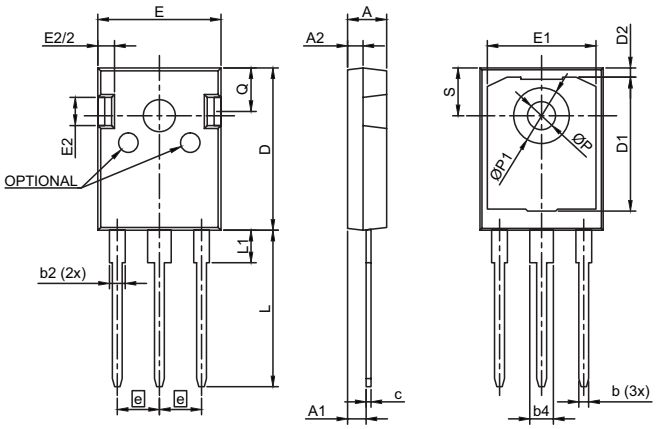
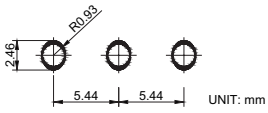
Package Dimensions TO-247-3L



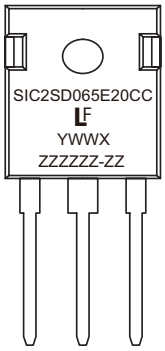
Symbol	Millimeters		
	Min	Nom	Max
A	4.80	5.03	5.20
A1	2.25	2.38	2.54
A2	1.85	1.98	2.11
b	0.99	-	1.40
b2	1.65	-	2.39
b4	2.59	-	3.43
c	0.38	0.64	0.89
D	20.80	20.96	21.34
D1	13.50	-	-
D2	0.51	1.19	1.35
e	5.44 BSC		
E	15.75	15.90	16.13
E1	13.06	14.02	14.15
E2	4.19	4.32	4.83
L	19.81	20.19	20.57
L1	3.81	4.19	4.45
øP	3.55	3.61	3.66
øP1	7.06	7.19	7.32
Q	5.49	5.61	6.20
S	6.05	6.17	6.30

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. These measured at the outermost extreme of plastic body.
3. øP to have a maximum draft angle of 1.5° to the top of the part with a maximum hole diameter of 0.154"

Part Numbering and Marking System



SIC	= SiC
2	= Gen2
SD	= Schottky Diode
065	= Voltage Rating (650 V)
E	= TO-247-3L
20	= Current Rating (20 A)
CC	= Common Cathode
Y	= Year
WW	= Week
X	= Special Code
ZZZZZZ-ZZ	= Lot Number

Packing Options

Part Number	Marking	Packing Mode	M.O.Q
LSIC2SD065E20CCA	SIC2SD065E20CC	Tube (30pcs)	450

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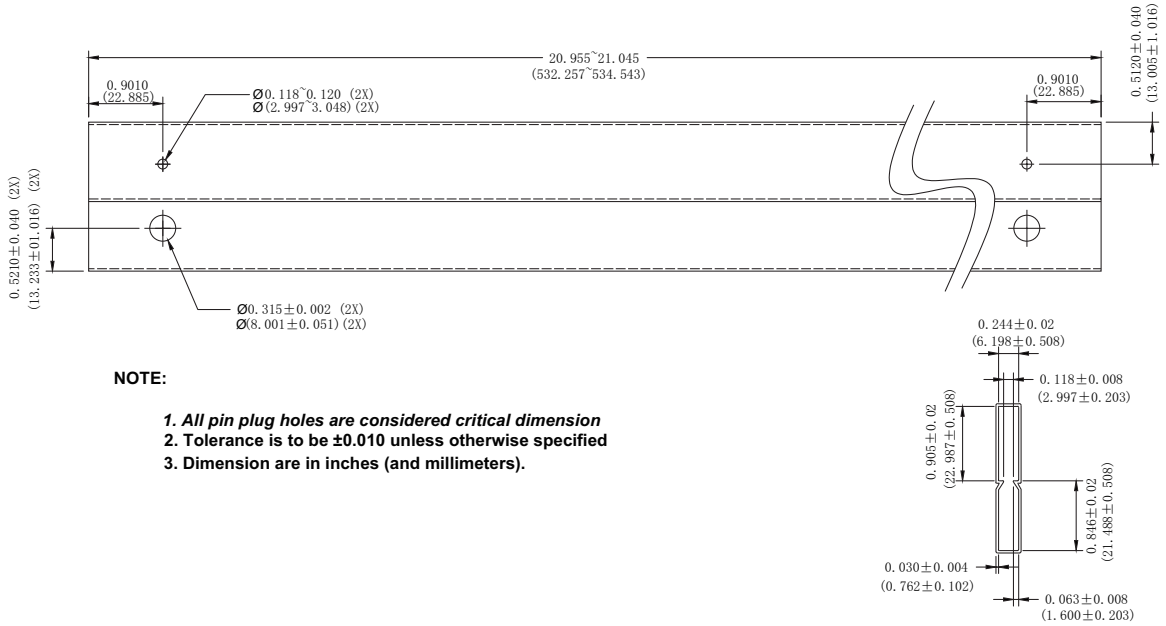
Packing Specification TO-247-3L



NOTE:

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

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