

LSIC2SD065E12CCA 650 V, 12 A SiC Schottky Barrier Diode



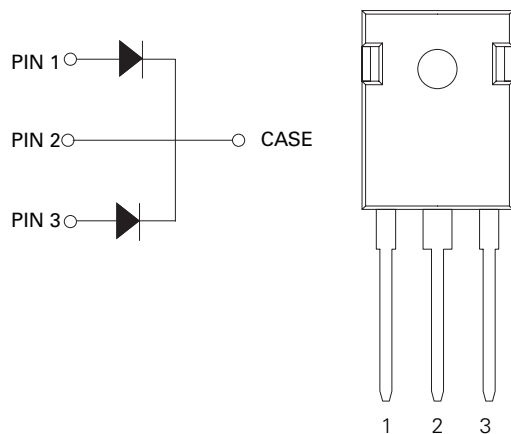
Description

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

Circuit Diagram TO-247-3L



Applications

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

Environmental

- Littelfuse "RoHS" logo = RoHS conform
- Littelfuse "HF" logo = 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	$T_J = 25\text{ °C}$	650	V
Continuous Forward Current (Per Leg/Component)	I_F	$T_C = 25\text{ °C}$	18.5 / 37	A
		$T_C = 152\text{ °C}$	6 / 12	
Non-Repetitive Forward Surge Current (Per Leg)	I_{FSM}	$T_C = 25\text{ °C}$, $t_p = 10\text{ ms}$, Half sine pulse	32	A
Power Dissipation (Per Leg/Component)	P_{Tot}	$T_C = 25\text{ °C}$	75 / 150	W
		$T_C = 110\text{ °C}$	32 / 64	
Operating Junction Temperature	T_J	-	-55 to 175	°C
Storage Temperature	T_{STG}	-	-55 to 150	°C
Soldering Temperature	T_{sold}	-	260	°C

Electrical Characteristics ($T_J = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)

Characteristics	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Forward Voltage	V_F	$I_F = 6\text{ A}, T_J = 25\text{ }^{\circ}\text{C}$	-	1.5	1.8	V
		$I_F = 6\text{ A}, T_J = 175\text{ }^{\circ}\text{C}$	-	1.85	-	
Reverse Current	I_R	$V_R = 650\text{ V}, T_J = 25\text{ }^{\circ}\text{C}$	-	<1	50	μA
		$V_R = 650\text{ V}, T_J = 175\text{ }^{\circ}\text{C}$	-	15	-	
Total Capacitance	C	$V_R = 1\text{ V}, f = 1\text{ MHz}$	-	300	-	pF
		$V_R = 200\text{ V}, f = 1\text{ MHz}$	-	39	-	
		$V_R = 400\text{ V}, f = 1\text{ MHz}$	-	28	-	
Total Capacitive Charge	Q_c	$V_R = 400\text{ V}, Q_c = \int_0^{V_R} C(V) dV$	-	20	-	nC

Thermal Characteristics

Characteristics	Symbol	Value	Unit
Thermal Resistance (Per Leg/Component)	$R_{\theta JC}$	2 / 1	$^{\circ}\text{C/W}$

Figure 1: Typical Forward Characteristics

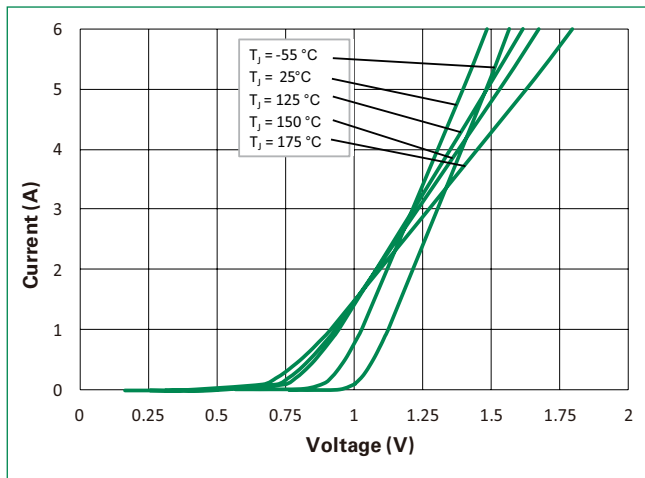


Figure 2: Typical Reverse Characteristics

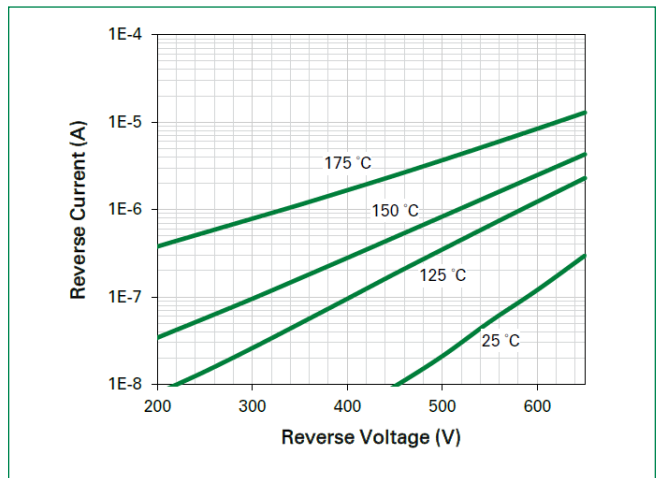


Figure 3: Power Derating

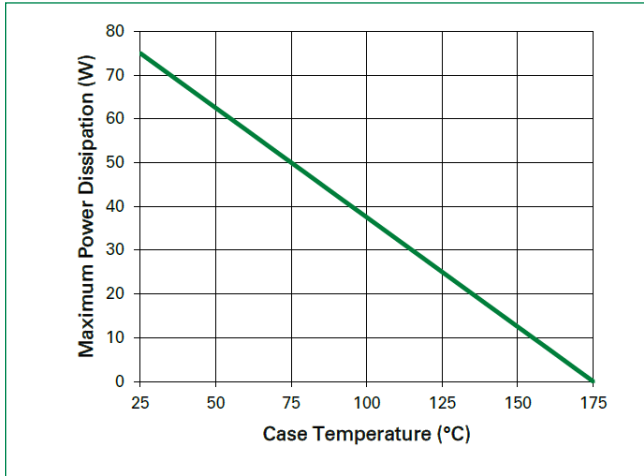


Figure 4: Current Derating

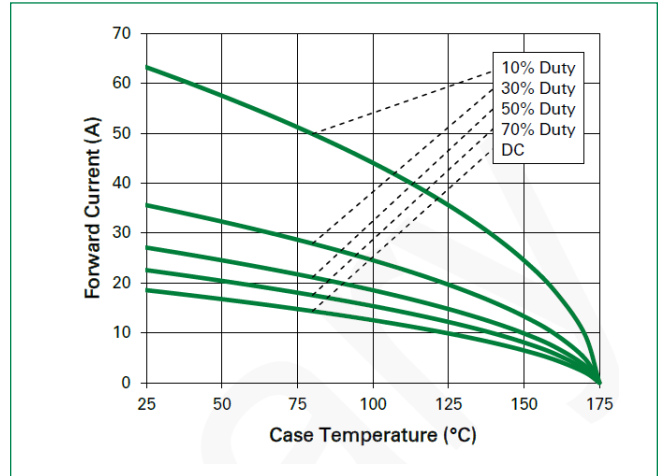


Figure 5: Capacitance vs. Reverse Voltage

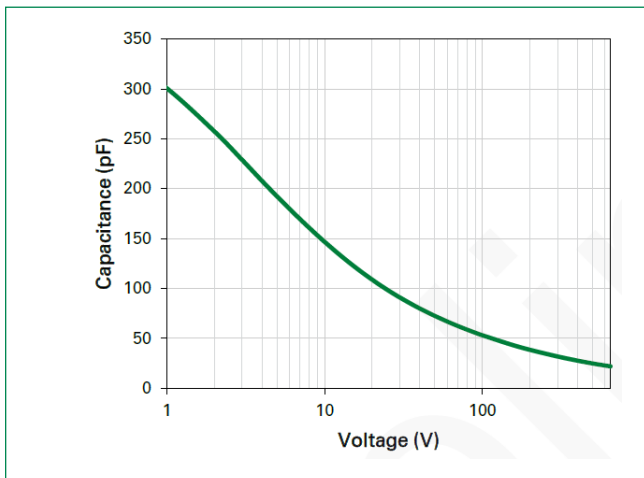


Figure 6: Capacitive Charge vs. Reverse Voltage

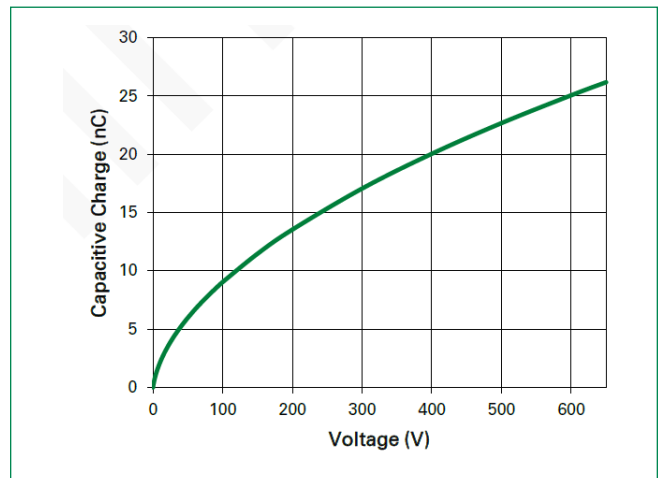


Figure 7: Stored Energy vs. Reverse Voltage

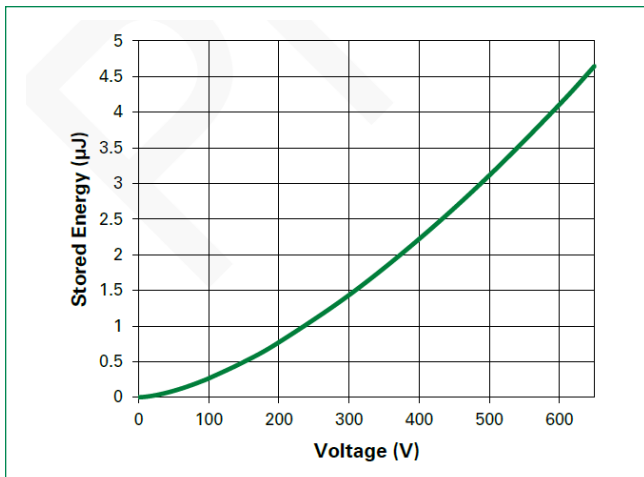
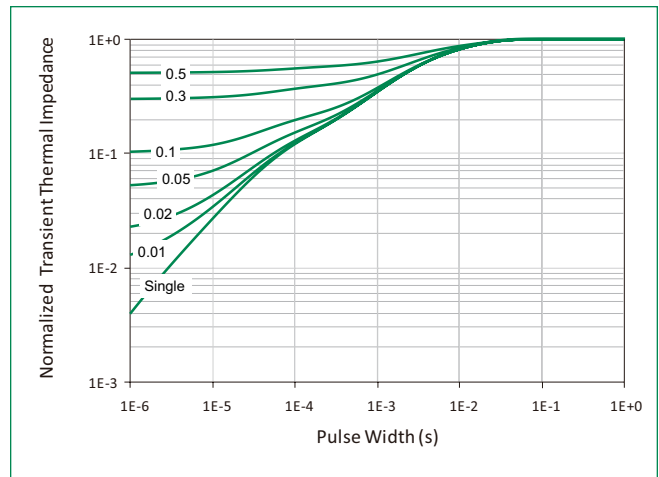
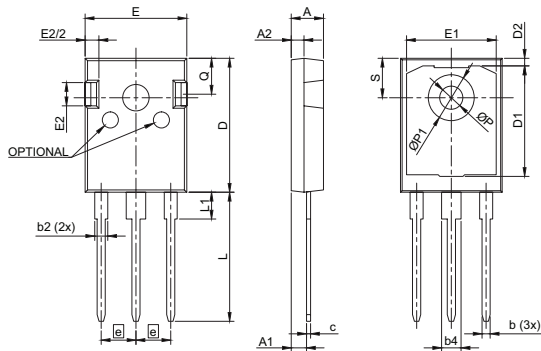


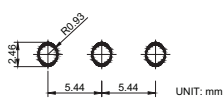
Figure 8: Transient Thermal Impedance



Package Dimensions TO-247-3L



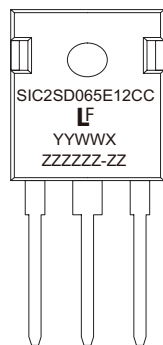
Recommended Hole Pattern Layout



- 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. ϕP to have a maximum draft angle of 1.5° to the top of the part with a maximum hole diameter of 0.154"

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
ϕP	3.55	3.61	3.66
$\phi P1$	7.06	7.19	7.32
Q	5.49	5.61	6.20
S	6.05	6.17	6.30

Part Numbering and Marking System

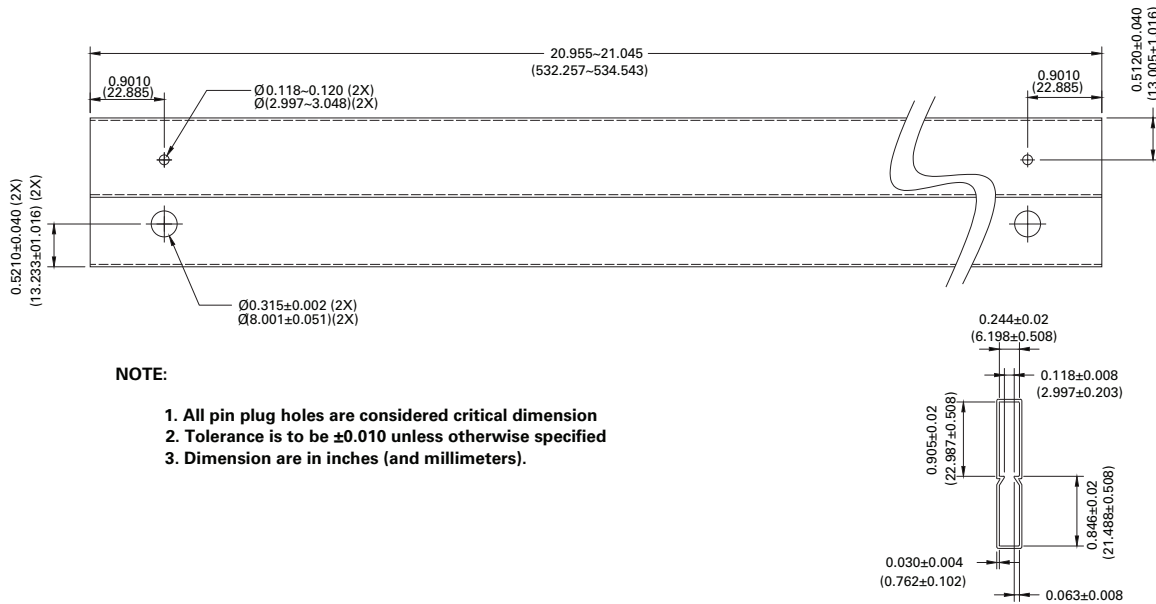


- SIC** = SiC
2 = Gen2
SD = Schottky Diode
065 = Voltage Rating (650 V)
E = TO-247-3L
12 = Current Rating (12 A)
CC = Common Cathode
YY = Year
WW = Week
X = Trace Code (Any Letter)
ZZZZZZ-ZZ = Lot Number

Packing Options

Part Number	Marking	Packing Mode	M.O.Q
LSIC2SD065E12CCA	SIC2SD065E12CC	Tube (30pcs)	450

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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