

LSIC2SD065E40CCA 650 V, 40 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.

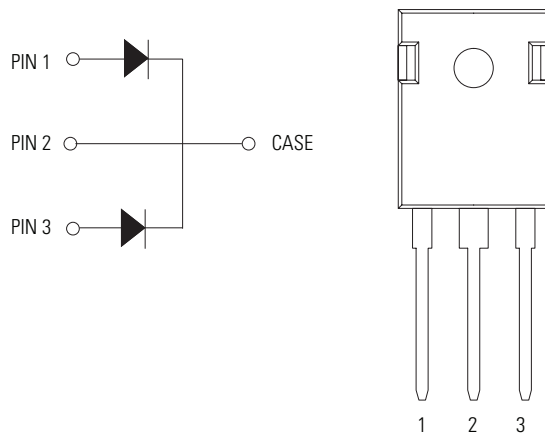
**Features**

- 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

**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 = 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	$V_R$	$T_J = 25\text{ }^\circ\text{C}$	650	V
Continuous Forward Current (Per Leg/Component)	$I_F$	$T_C = 25\text{ }^\circ\text{C}$	45 / 90	A
		$T_C = 135\text{ }^\circ\text{C}$	20 / 40	
Non-Repetitive Forward Surge Current (Per Leg)	$I_{FSM}$	$T_C = 25\text{ }^\circ\text{C}, T_p = 10\text{ ms}, \text{Half sine pulse}$	90	A
Power Dissipation (Per Leg/Component)	$P_{Tot}$	$T_C = 25\text{ }^\circ\text{C}$	135 / 270	W
		$T_C = 110\text{ }^\circ\text{C}$	60 / 120	
Operating Junction Temperature	$T_J$	-	-55 to 175	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-	-55 to 150	$^\circ\text{C}$
Soldering Temperature	$T_{sold}$	-	260	$^\circ\text{C}$

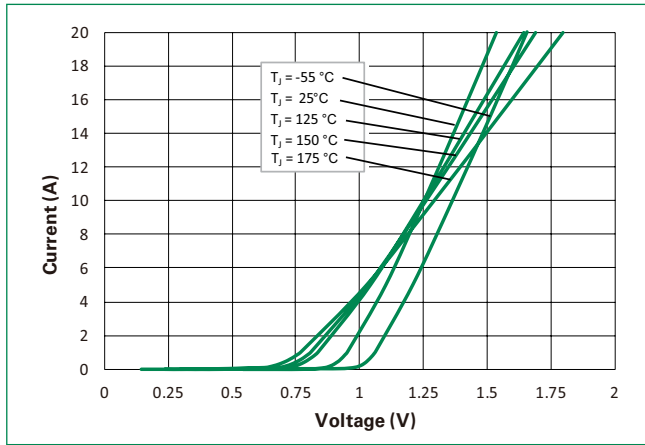
**Electrical Characteristics ( $T_J = 25\text{ }^\circ\text{C}$  unless otherwise specified)**

Characteristics	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Forward Voltage	$V_F$	$I_F = 20\text{ A}, T_J = 25\text{ }^\circ\text{C}$	-	1.5	1.8	V
		$I_F = 20\text{ A}, T_J = 175\text{ }^\circ\text{C}$	-	1.85	-	
Reverse Current	$I_R$	$V_R = 650\text{ V}, T_J = 25\text{ }^\circ\text{C}$	-	<1	50	$\mu\text{A}$
		$V_R = 650\text{ V}, T_J = 175\text{ }^\circ\text{C}$	-	60	-	
Total Capacitance	C	$V_R = 1\text{ V}, f = 1\text{ MHz}$	-	960	-	pF
		$V_R = 200\text{ V}, f = 1\text{ MHz}$	-	120	-	
		$V_R = 400\text{ V}, f = 1\text{ MHz}$	-	86	-	
Total Capacitive Charge	$Q_c$	$V_R = 400\text{ V}, Q_c = \int_0^{V_R} C(V)dV$	-	63	-	nC

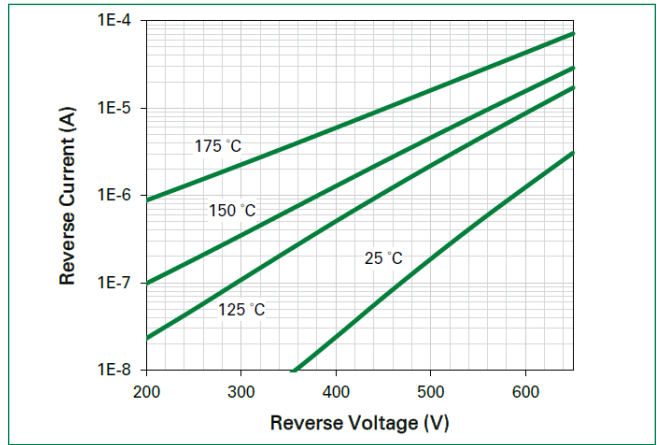
**Thermal Characteristics**

Characteristics	Symbol	Value	Unit
Thermal Resistance (Per Leg/Component)	$R_{\theta JC}$	1.10 / 0.55	$^\circ\text{C/W}$

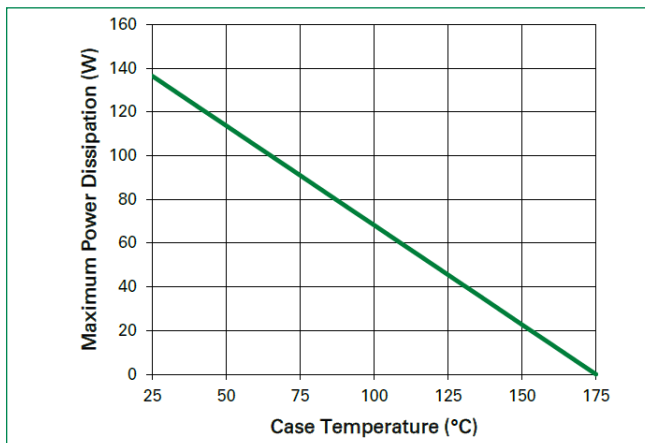
**Figure 1: Typical Forward Characteristics**



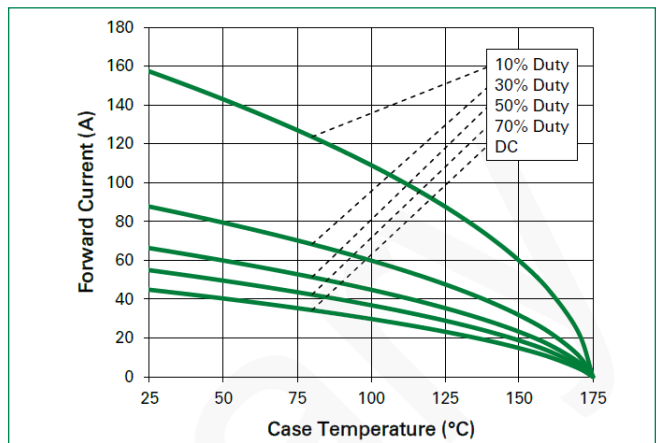
**Figure 2: Typical Reverse Characteristics**



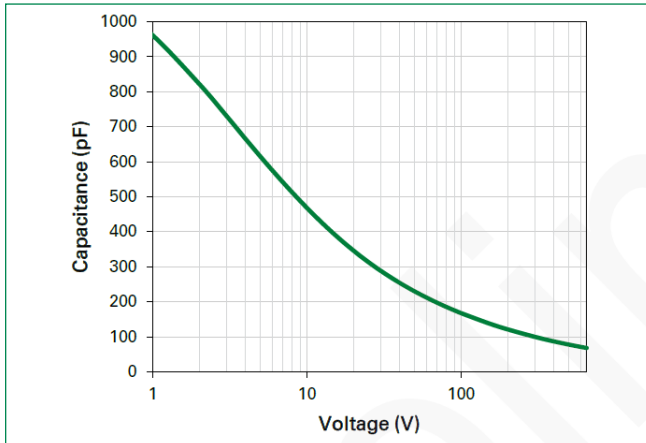
**Figure 3: Power Derating**



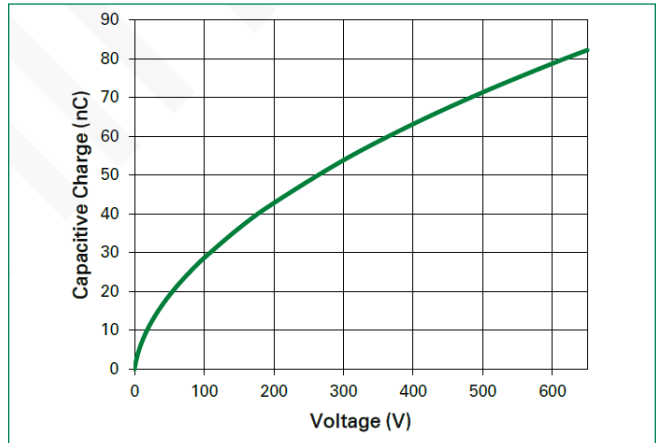
**Figure 4: Current Derating**



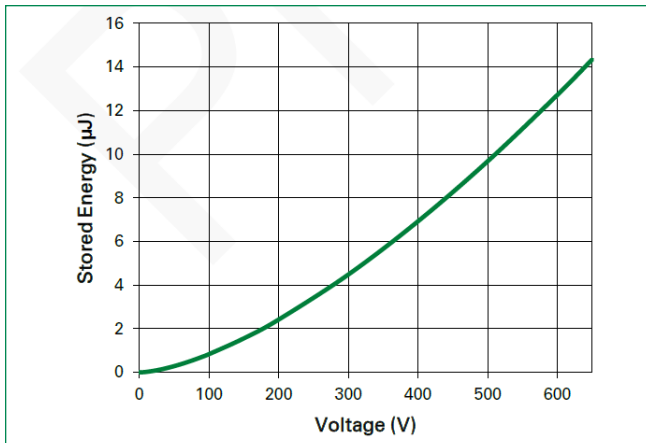
**Figure 5: Capacitance vs. Reverse Voltage**



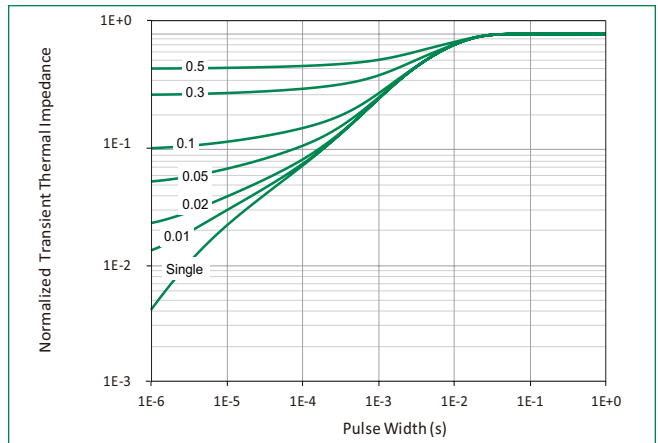
**Figure 6: Capacitive Charge vs. Reverse Voltage**



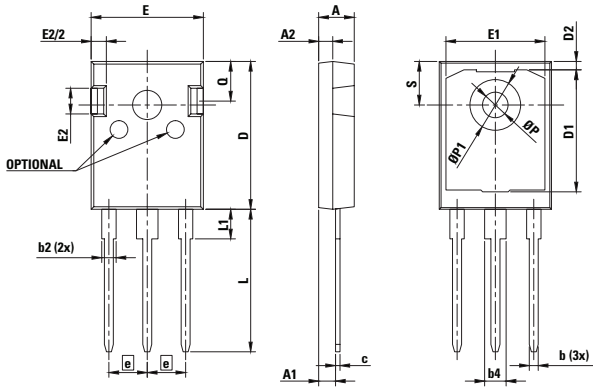
**Figure 7: Stored Energy vs. Reverse Voltage**



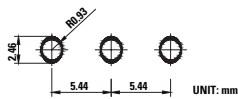
**Figure 8: Transient Thermal Impedance**



**Package Dimensions TO-247-3L**



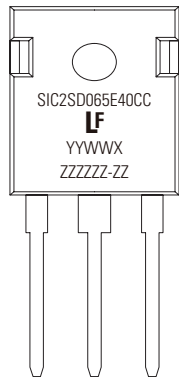
Recommended Hole Pattern Layout



- 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. øP 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
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

**Part Numbering and Marking System**

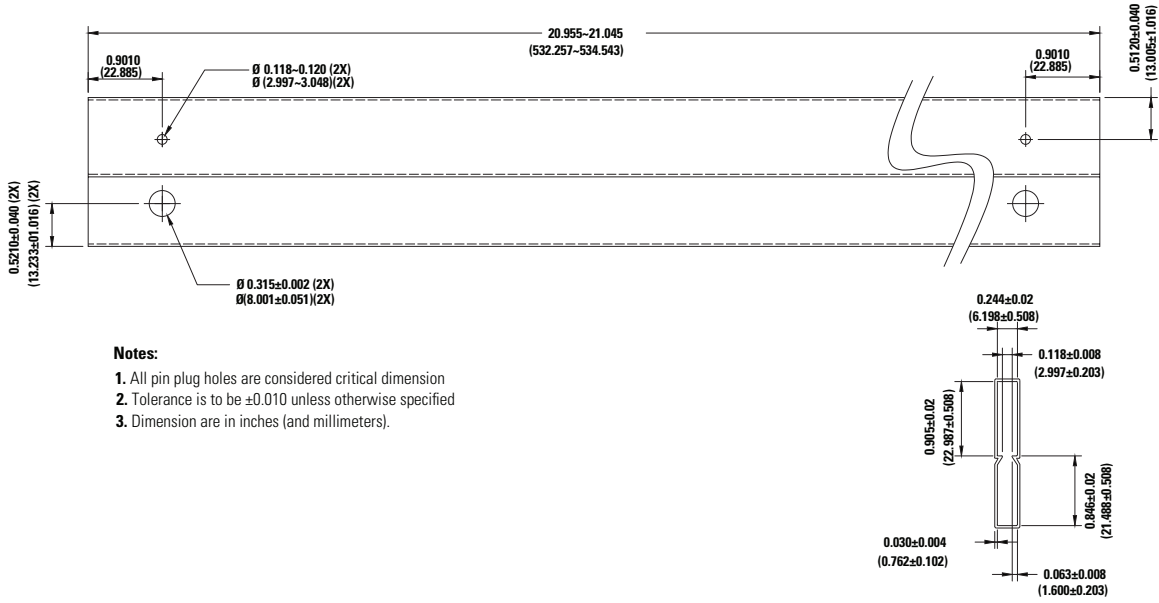


- |           |                           |
|-----------|---------------------------|
| SIC       | = SiC                     |
| 2         | = Gen2                    |
| SD        | = Schottky Diode          |
| 065       | = Voltage Rating (650 V)  |
| E         | = TO-247-3L               |
| 40        | = Current Rating (40 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
LSIC2SD065E40CCA	SIC2SD065E40CC	Tube (30pcs)	450

**Packing Specification TO-247-3L**



- Notes:**
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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