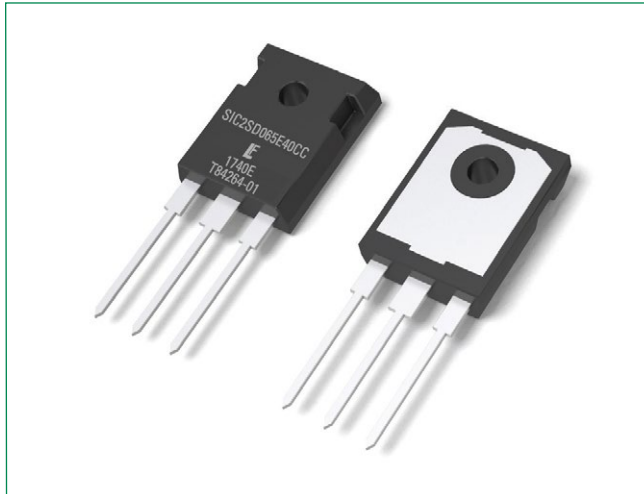


LSIC2SD120E40CC

HF RoHS Pb



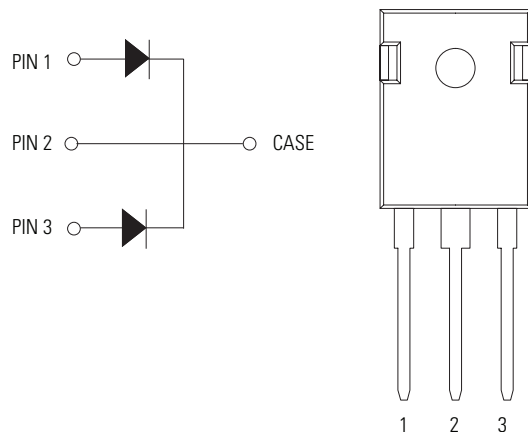
### Description

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

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

### Maximum Ratings

| Characteristics                                | Symbol     | Conditions                                                    | Value      | Unit |
|------------------------------------------------|------------|---------------------------------------------------------------|------------|------|
| Repetitive Peak Reverse Voltage                | $V_{RRM}$  | -                                                             | 1200       | V    |
| DC Blocking Voltage                            | $V_R$      | $T_J = 25\text{ °C}$                                          | 1200       | V    |
| Continuous Forward Current (Per Leg/Component) | $I_F$      | $T_C = 25\text{ °C}$                                          | 54.5/109   | A    |
|                                                |            | $T_C = 135\text{ °C}$                                         | 26/52      |      |
|                                                |            | $T_C = 150\text{ °C}$                                         | 20/40      |      |
| Non-Repetitive Forward Surge Current (Per Leg) | $I_{FSM}$  | $T_C = 25\text{ °C}$ , $T_p = 10\text{ ms}$ , Half sine pulse | 140        | A    |
| Power Dissipation (Per Leg/Component)          | $P_{Tot}$  | $T_C = 25\text{ °C}$                                          | 250/500    | W    |
|                                                |            | $T_C = 110\text{ °C}$                                         | 108/216    |      |
| 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 (Per Leg)

| Characteristics         | Symbol | Conditions                                        | Value |      |      | Unit          |
|-------------------------|--------|---------------------------------------------------|-------|------|------|---------------|
|                         |        |                                                   | Min.  | Typ. | Max. |               |
| Forward Voltage         | $V_F$  | $I_F = 20 \text{ A}, T_J = 25^\circ\text{C}$      | -     | 1.5  | 1.8  | V             |
|                         |        | $I_F = 20 \text{ A}, T_J = 175^\circ\text{C}$     | -     | 2.2  | -    |               |
| Reverse Current         | $I_R$  | $V_R = 1200 \text{ V}, T_J = 25^\circ\text{C}$    | -     | <1   | 100  | $\mu\text{A}$ |
|                         |        | $V_R = 1200 \text{ V}, T_J = 175^\circ\text{C}$   | -     | 15   | -    |               |
| Total Capacitance       | C      | $V_R = 1 \text{ V}, f = 1 \text{ MHz}$            | -     | 1142 | -    | pF            |
|                         |        | $V_R = 400 \text{ V}, f = 1 \text{ MHz}$          | -     | 108  | -    |               |
|                         |        | $V_R = 800 \text{ V}, f = 1 \text{ MHz}$          | -     | 82   | -    |               |
| Total Capacitive Charge | $Q_C$  | $V_R = 800 \text{ V}, Q_C = \int_0^{V_R} C(V) dV$ | -     | 115  | -    | nC            |

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

### Thermal Characteristics

| Characteristics                        | Symbol          | Conditions | Value |         |      | Unit               |
|----------------------------------------|-----------------|------------|-------|---------|------|--------------------|
|                                        |                 |            | Min.  | Typ.    | Max. |                    |
| Thermal Resistance (Per Leg/Component) | $R_{\theta JC}$ | -          | -     | 0.6/0.3 | -    | $^\circ\text{C/W}$ |

Figure 1: Typical Forward Characteristics (Per Leg)

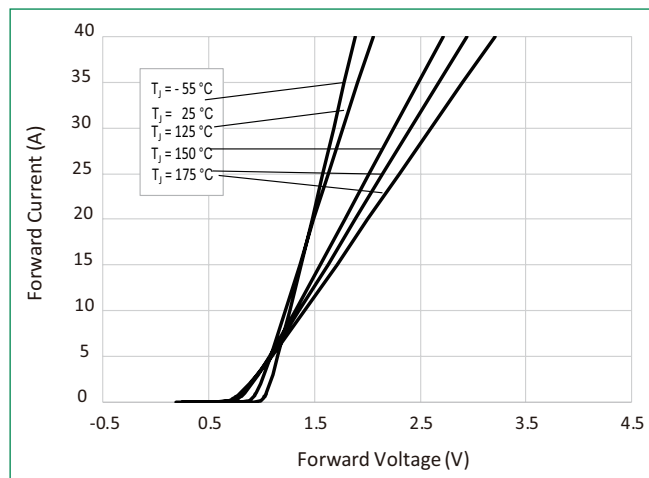
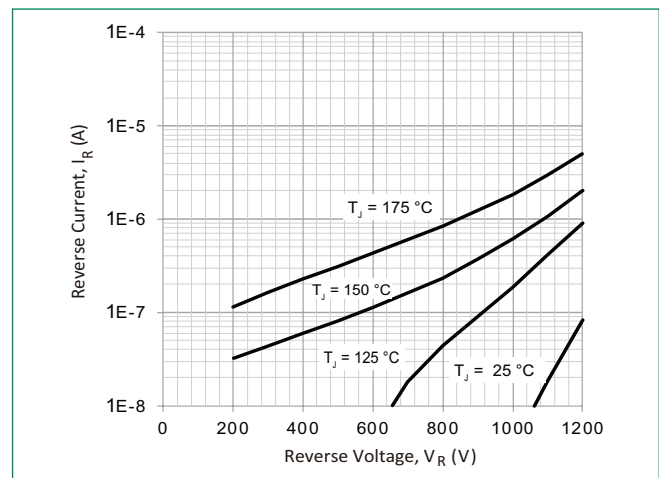
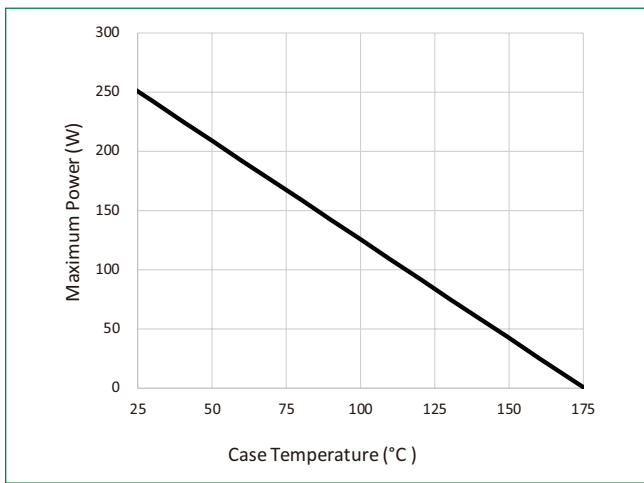


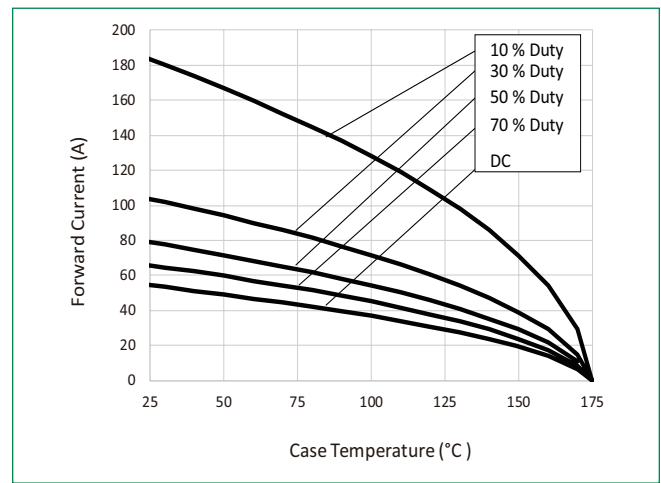
Figure 2: Typical Reverse Characteristics (Per Leg)



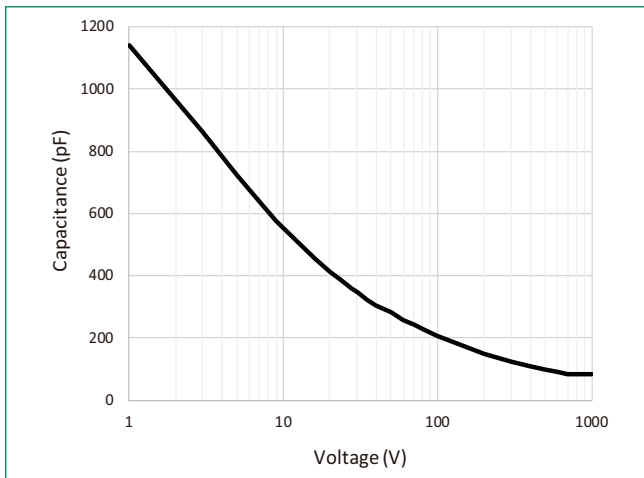
**Figure 3: Power Derating (Per Leg)**



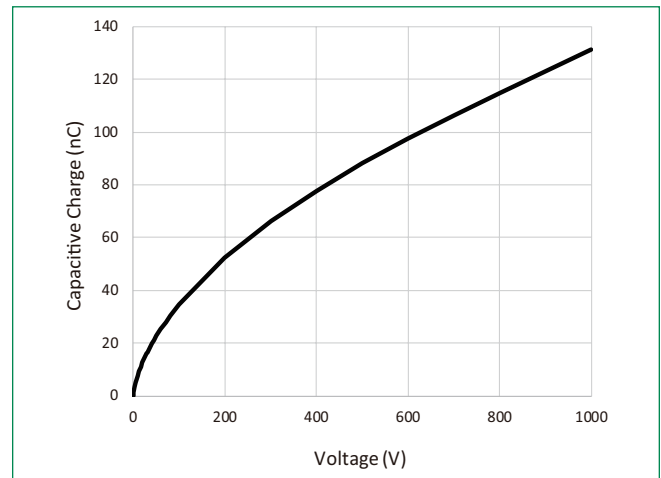
**Figure 4: Current Derating (Per Leg)**



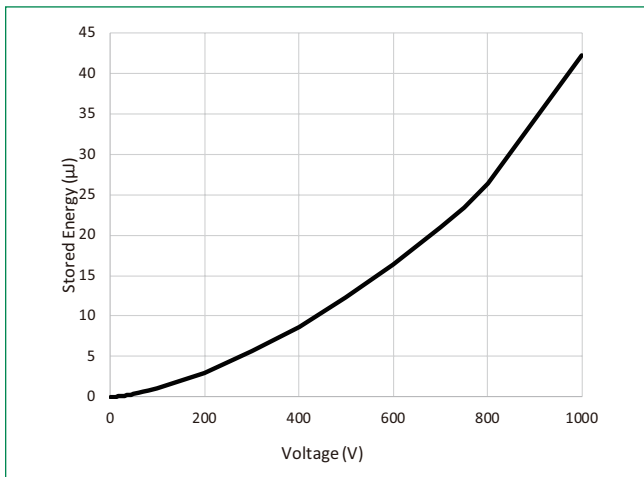
**Figure 5: Capacitance vs. Reverse Voltage (Per Leg)**



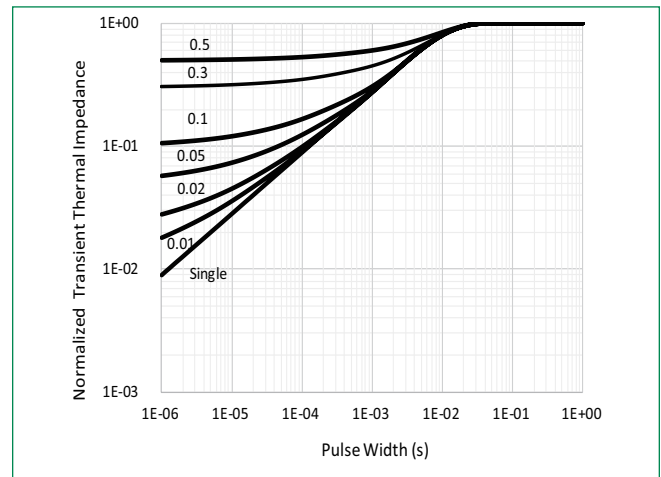
**Figure 6: Capacitive Charge vs. Reverse Voltage (Per Leg)**



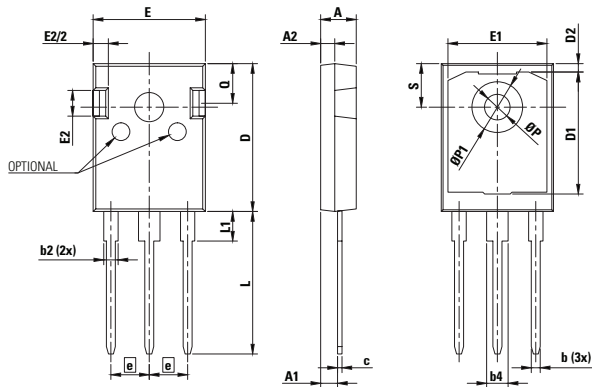
**Figure 7: Stored Energy vs. Reverse Voltage (Per Leg)**



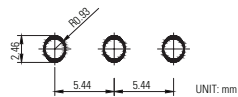
**Figure 8: Transient Thermal Impedance (Per Component)**



## Package Dimensions TO-247-3L



### Recommended Hole Pattern Layout

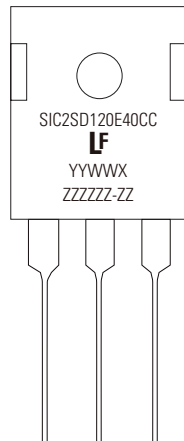


### Notes:

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.  $\phi P$  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         | Norm  | 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  |
| $\phi P$  | 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

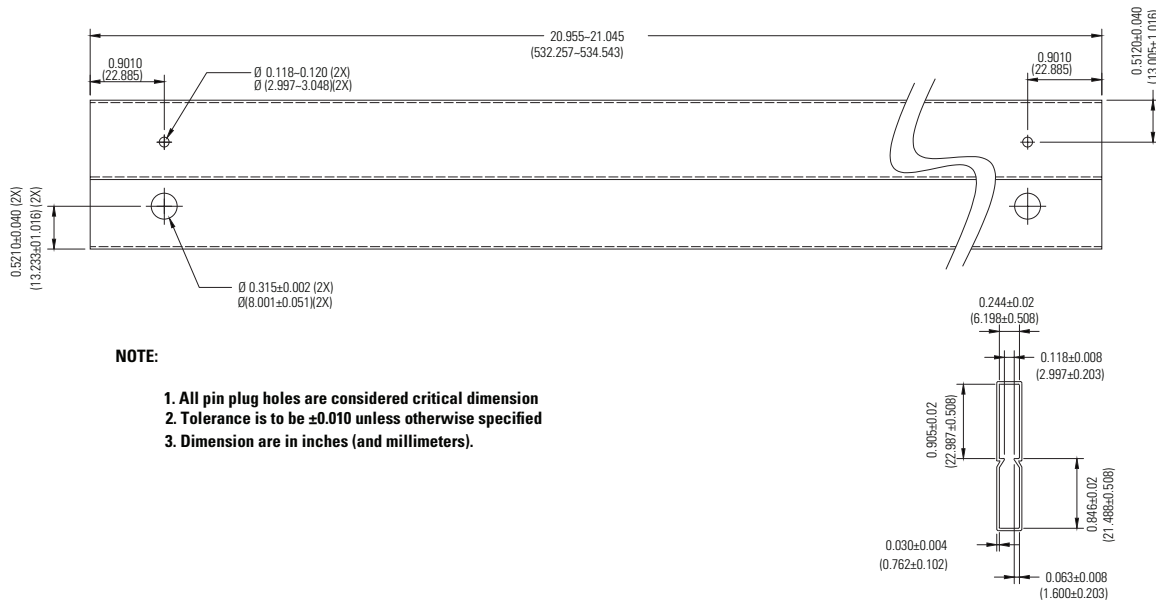


|           |                           |
|-----------|---------------------------|
| SIC       | = SiC                     |
| 2         | = Gen2                    |
| SD        | = Schottky Diode          |
| 120       | = Voltage Rating (1200 V) |
| E         | = TO-247-3L               |
| 40        | = 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 |
|-----------------|----------------|--------------|-------|
| LSIC2SD120E40CC | SIC2SD120E40CC | (30pcs)      | 450   |

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



**NOTE:**

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

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