

LSIC2SD120C08

HF RoHS Pb



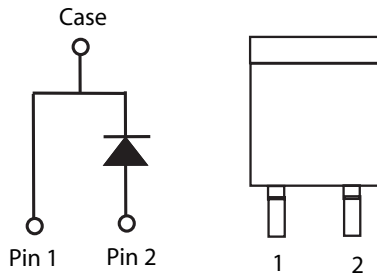
#### Description

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. These diodes series are 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-252-2L ( DPAK )



#### 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** 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           | $I_F$      | $T_C = 25\text{ °C}$                                             | 24.5       | A    |
|                                      |            | $T_C = 135\text{ °C}$                                            | 12         |      |
|                                      |            | $T_C = 154\text{ °C}$                                            | 8          |      |
| Non-Repetitive Forward Surge Current | $I_{FSM}$  | $T_C = 25\text{ °C}, T_P = 10\text{ ms}, \text{Half sine pulse}$ | 65         | A    |
| Power Dissipation                    | $P_{Tot}$  | $T_C = 25\text{ °C}$                                             | 125        | W    |
|                                      |            | $T_C = 110\text{ °C}$                                            | 54         |      |
| 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

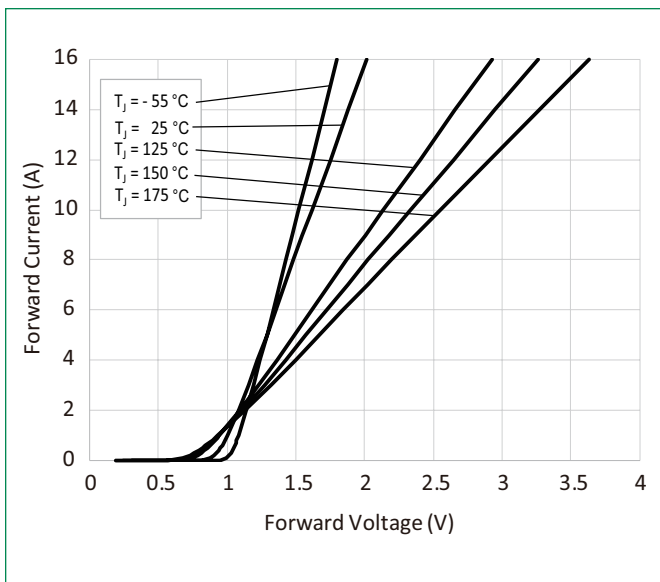
| Characteristics         | Symbol | Conditions                                        | Value |      |      | Unit          |
|-------------------------|--------|---------------------------------------------------|-------|------|------|---------------|
|                         |        |                                                   | Min.  | Typ. | Max. |               |
| Forward Voltage         | $V_F$  | $I_F = 8 \text{ A}, T_J = 25^\circ\text{C}$       | -     | 1.5  | 1.8  | V             |
|                         |        | $I_F = 8 \text{ A}, T_J = 175^\circ\text{C}$      | -     | 2.2  | -    |               |
| Reverse Current         | $I_R$  | $V_R = 1200 \text{ V}, T_J = 25^\circ\text{C}$    | -     | <1   | 100  | $\mu\text{A}$ |
|                         |        | $V_R = 1200 \text{ V}, T_J = 175^\circ\text{C}$   | -     | 10   | -    |               |
| Total Capacitance       | C      | $V_R = 1 \text{ V}, f = 1 \text{ MHz}$            | -     | 454  | -    | pF            |
|                         |        | $V_R = 400 \text{ V}, f = 1 \text{ MHz}$          | -     | 45   | -    |               |
|                         |        | $V_R = 800 \text{ V}, f = 1 \text{ MHz}$          | -     | 33   | -    |               |
| Total Capacitive Charge | $Q_C$  | $V_R = 800 \text{ V}, Q_C = \int_0^{V_R} C(V) dV$ | -     | 47   | -    | nC            |

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

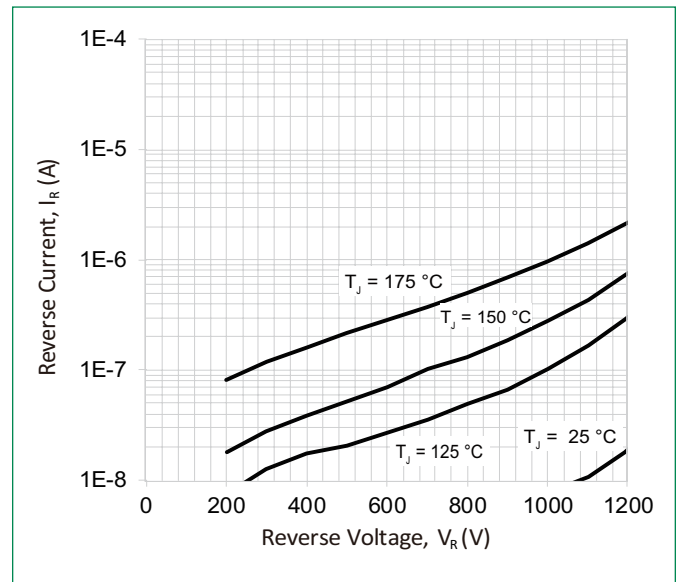
### Thermal Characteristics

| Characteristics    | Symbol          | Conditions | Value |      |      | Unit               |
|--------------------|-----------------|------------|-------|------|------|--------------------|
|                    |                 |            | Min.  | Typ. | Max. |                    |
| Thermal Resistance | $R_{\theta JC}$ | -          | -     | 1.2  | -    | $^\circ\text{C/W}$ |

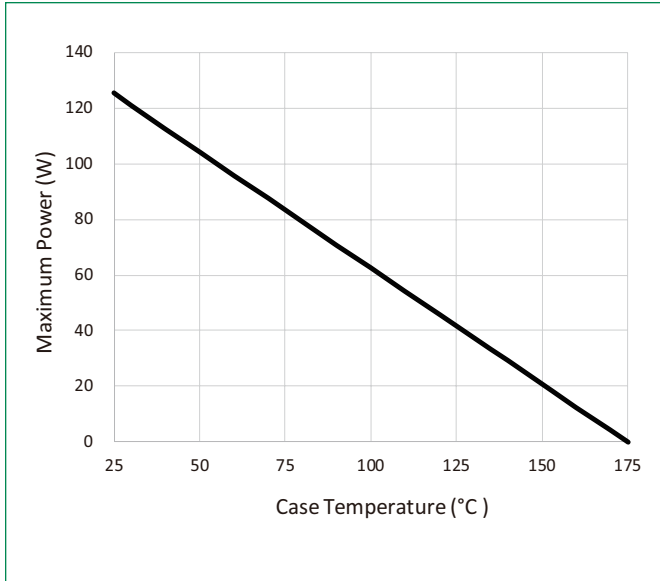
**Figure 1: Typical Forward Characteristics**



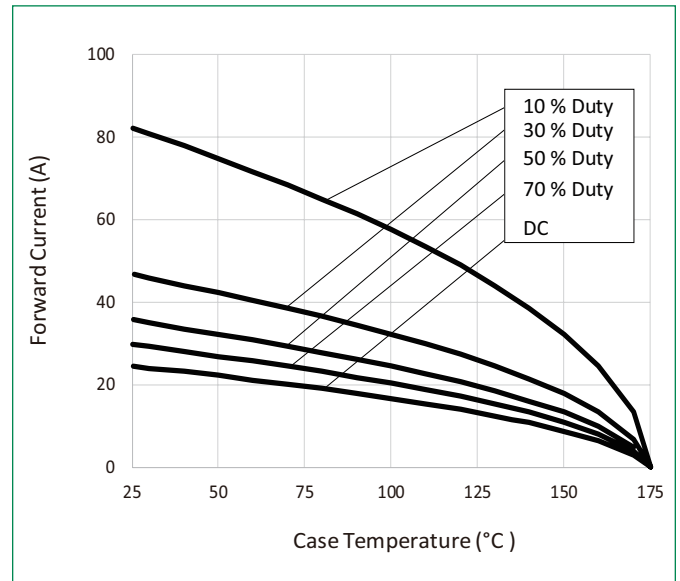
**Figure 2: Typical Reverse Characteristics**



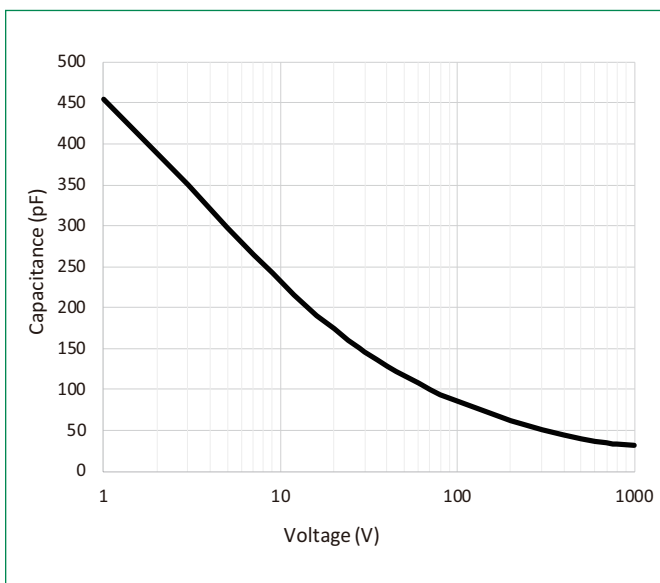
**Figure 3: Power Derating**



**Figure 4: Current Derating**



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



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

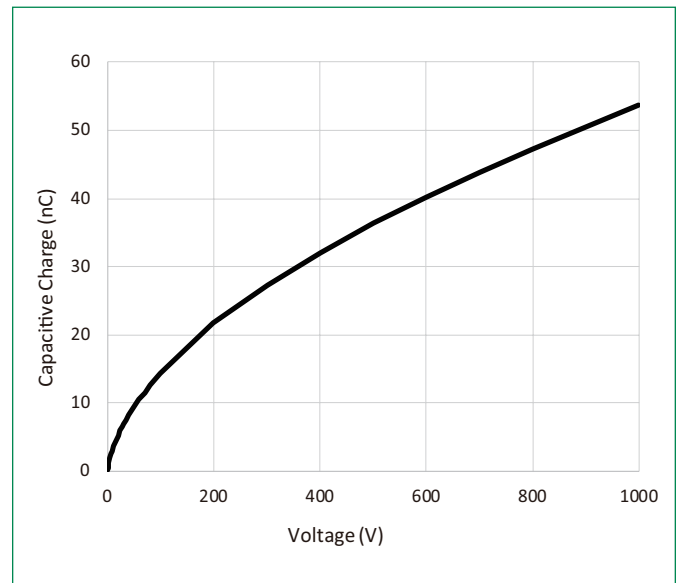


Figure 7: Stored Energy vs. Reverse Voltage

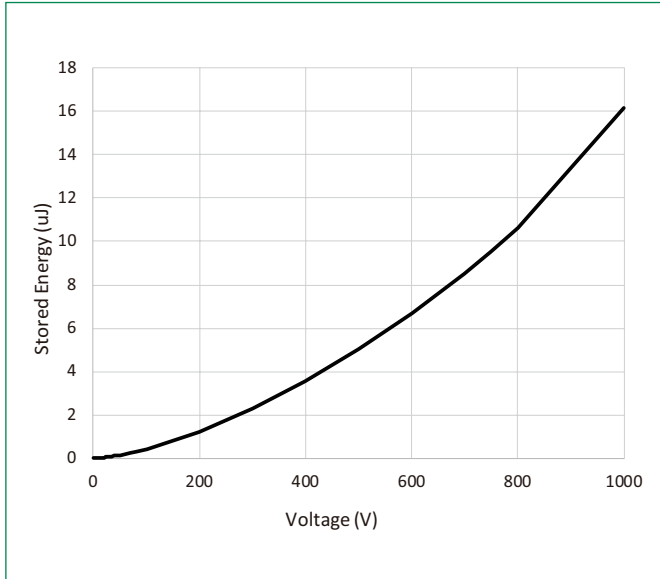
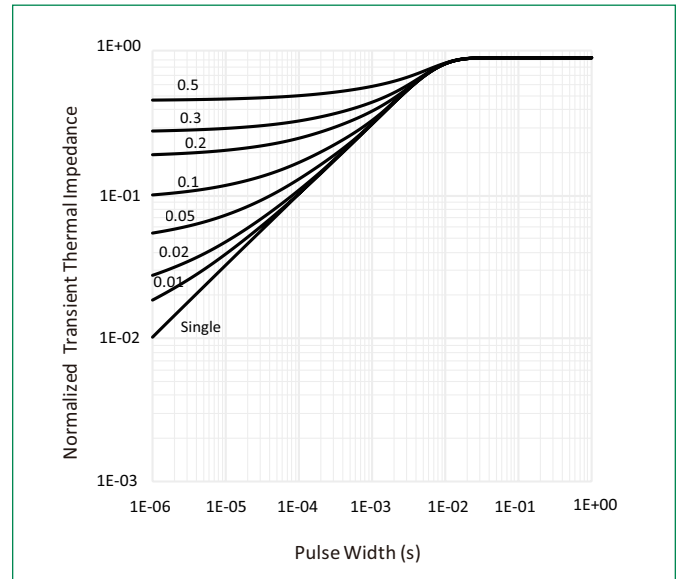
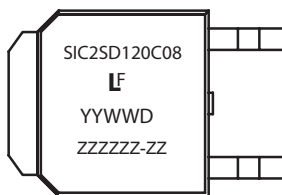


Figure 8: Transient Thermal Impedance



### Part Numbering and Marking System

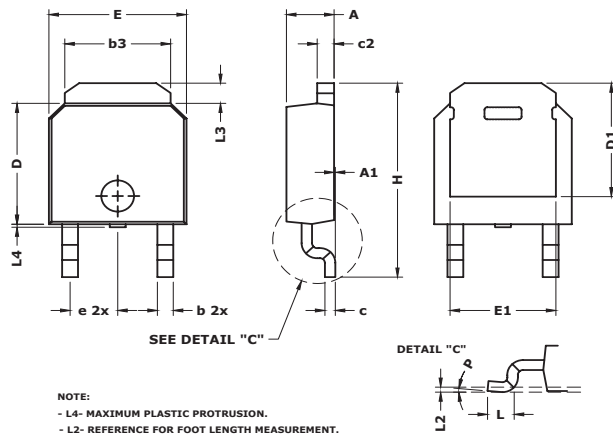


SIC = SiC Diode  
 2 = Gen2  
 SD = Schottky Diode  
 120 = Voltage Rating (1200 V)  
 C = TO-252 2-Lead Package  
 08 = Current Rating ( 8 A)  
 YY = Year  
 WW = Week  
 D = Special code (fixed)  
 ZZZZZZ-ZZ = Lot Number

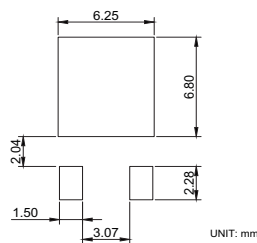
### Packing Options

| Part Number   | Marking      | Packing Mode  | M.O.Q |
|---------------|--------------|---------------|-------|
| LSIC2SD120C08 | SIC2SD120C08 | Tape and Reel | 2500  |

### Dimensions TO-252-2L (DPAK)

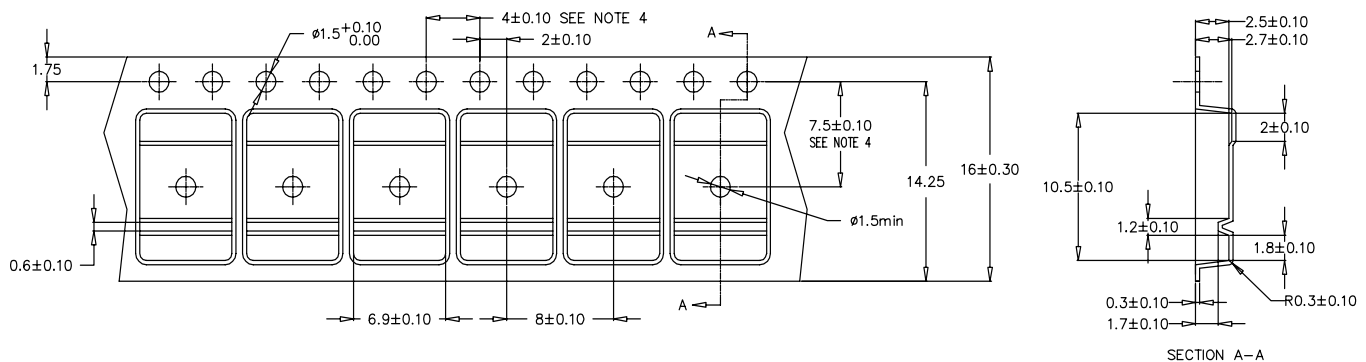


#### Recommended Solder Pattern Layout



| Symbol | Inches    |       |       | Millimeters |      |       |
|--------|-----------|-------|-------|-------------|------|-------|
|        | Min       | Nom   | Max   | Min         | Nom  | Max   |
| A      | 0.085     | 0.090 | 0.095 | 2.16        | 2.29 | 2.41  |
| A1     | 0         | 0.003 | 0.005 | 0           | 0.08 | 0.13  |
| b      | 0.025     | 0.030 | 0.035 | 0.64        | 0.76 | 0.89  |
| b3     | 0.195     | 0.200 | 0.215 | 4.95        | 5.08 | 5.46  |
| c      | 0.018     | 0.020 | 0.024 | 0.46        | 0.51 | 0.61  |
| C2     | 0.018     | 0.032 | 0.035 | 0.46        | 0.81 | 0.89  |
| D      | 0.235     | 0.240 | 0.245 | 5.97        | 6.10 | 6.22  |
| D1     | 0.205     | -     | -     | 5.21        | -    | -     |
| E      | 0.250     | 0.260 | 0.265 | 6.35        | 6.60 | 6.73  |
| E1     | 0.170     | -     | -     | 4.32        | -    | -     |
| e      | 0.090 BSC |       |       | 2.29 BSC    |      |       |
| H      | 0.370     | 0.387 | 0.410 | 9.40        | 9.83 | 10.41 |
| L      | 0.040     | 0.045 | 0.050 | 1.02        | 1.14 | 1.27  |
| L2     | 0.010 BSC |       |       | 0.25 BSC    |      |       |
| L3     | 0.035     | -     | 0.050 | 0.89        | -    | 1.27  |
| L4     | 0         | -     | 0.006 | 0           | -    | 0.15  |
| P      | 0°        | -     | 8°    | 0°          | -    | 8°    |

### Carrier Tape & Reel Specification TO-252-2L (DPAK)

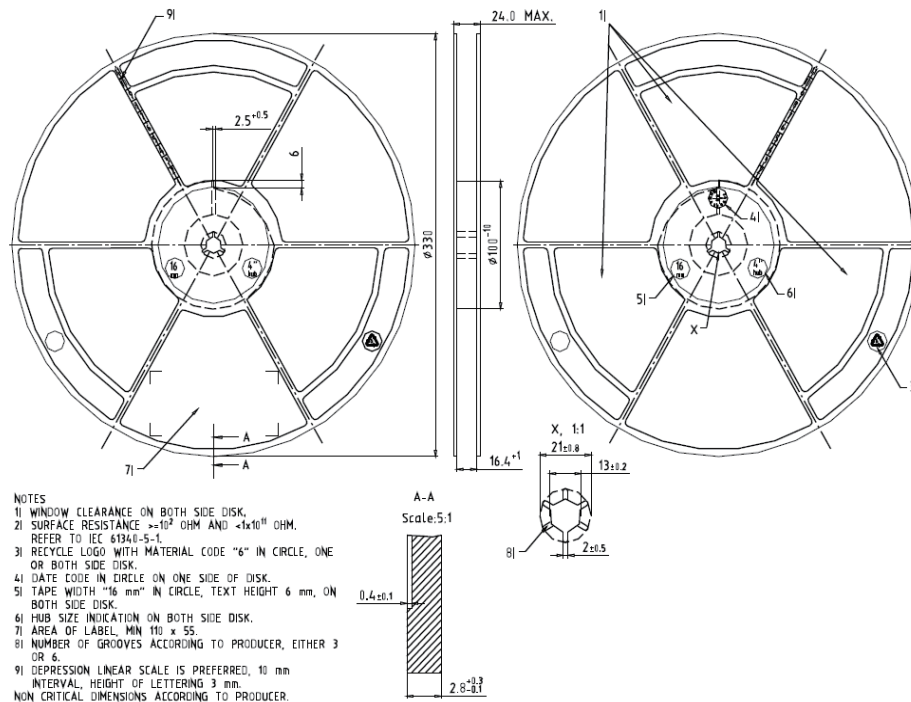


1. Material: Black Conductive Polyester
2. 10 sprocket hole pitch cumulative tolerance  $\pm 0.20$
3. Camber not to exceed 1 mm in 100 mm.
4. Pocket position relative to sprocket hole measured as true position of pocket, not pocket hole.
5. Device orientation: TRL (leads perpendicular to the sprocket)
6. General tolerance is  $\pm 0.10$  mm unless otherwise specified.

#### COVER TAPE SPECS:

|                  |                                                                                           |
|------------------|-------------------------------------------------------------------------------------------|
| Width            | : 13.5 mm                                                                                 |
| Base Material    | : less than $1.2 \times 10^{-9}$ ohms/square<br>Transparent polyester, static dissipative |
| Adhesive Layer   | : Polyethylene                                                                            |
| Total Thickness  | : 60 Micron                                                                               |
| Tensile Strength | : 4-6 kg/mm <sup>2</sup>                                                                  |
| Elongation       | : 91%                                                                                     |
| Tearing Strength | : 11 kg/mm <sup>2</sup>                                                                   |
| Shelf life       | : 2 years                                                                                 |

**Carrier Tape & Reel Specification TO-252-2L (DPAK)**



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