GEN2 SiC Schottky Diode
LSIC2SD120C10, 1200 V, 10 A, TO-252-2L (DPAK)

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

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-252-2L (DPAK)

Case

Pin 1 Pin 2

Maximum Ratings

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Symbol</th>
<th>Conditions</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Repetitive Peak Reverse Voltage</td>
<td>V_{RMT}</td>
<td>-</td>
<td>1200</td>
<td>V</td>
</tr>
<tr>
<td>DC Blocking Voltage</td>
<td>V_{R}</td>
<td>T_{j} = 25 °C</td>
<td>1200</td>
<td>V</td>
</tr>
<tr>
<td>Continuous Forward Current</td>
<td>I_{F}</td>
<td>T_{j} = 25 °C</td>
<td>33</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>T_{j} = 135 °C</td>
<td>16</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>T_{j} = 156 °C</td>
<td>10</td>
<td>A</td>
</tr>
<tr>
<td>Non-Repetitive Forward Surge Current</td>
<td>I_{FSM}</td>
<td>T_{j} = 25 °C, T_{F} = 10 ms, Half sine pulse</td>
<td>80</td>
<td>A</td>
</tr>
<tr>
<td>Power Dissipation</td>
<td>P_{TOT}</td>
<td>T_{j} = 25 °C</td>
<td>176</td>
<td>W</td>
</tr>
<tr>
<td></td>
<td></td>
<td>T_{j} = 110 °C</td>
<td>76</td>
<td>W</td>
</tr>
<tr>
<td>Operating Junction Temperature</td>
<td>T_{J}</td>
<td>-</td>
<td>-55 to 175</td>
<td>°C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>T_{STG}</td>
<td>-</td>
<td>-55 to 150</td>
<td>°C</td>
</tr>
<tr>
<td>Soldering Temperature</td>
<td>T_{SOLD}</td>
<td>-</td>
<td>260</td>
<td>°C</td>
</tr>
</tbody>
</table>

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Revised: 10/02/17
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### Electrical Characteristics

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Symbol</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Min.</td>
<td>Typ.</td>
</tr>
<tr>
<td>Forward Voltage</td>
<td>$V_F$</td>
<td>$I_F = 10 \ A, T_J = 25\ ^\circ C$</td>
<td>-</td>
<td>1.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_F = 10 \ A, T_J = 175\ ^\circ C$</td>
<td>-</td>
<td>2.2</td>
</tr>
<tr>
<td>Reverse Current</td>
<td>$I_R$</td>
<td>$V_R = 1200 \ V, T_J = 25\ ^\circ C$</td>
<td>-</td>
<td>&lt;1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_R = 1200 \ V, T_J = 175\ ^\circ C$</td>
<td>-</td>
<td>10</td>
</tr>
<tr>
<td>Total Capacitance</td>
<td>$C$</td>
<td>$V_R = 1 \ V, f = 1 \ MHz$</td>
<td>-</td>
<td>582</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_R = 400 \ V, f = 1 \ MHz$</td>
<td>-</td>
<td>53</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_R = 800 \ V, f = 1 \ MHz$</td>
<td>-</td>
<td>40</td>
</tr>
<tr>
<td>Total Capacitive Charge</td>
<td>$Q_C$</td>
<td>$V_R = 800 \ V, \int_{0}^{\infty} C V dV$</td>
<td>-</td>
<td>57</td>
</tr>
</tbody>
</table>

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

### Thermal Characteristics

<table>
<thead>
<tr>
<th>Characteristics</th>
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<th>Unit</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Min.</td>
<td>Typ.</td>
</tr>
<tr>
<td>Thermal Resistance</td>
<td>$R_{thC}$</td>
<td></td>
<td>-</td>
<td>0.85</td>
</tr>
</tbody>
</table>

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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
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Figure 7: Stored Energy vs. Reverse Voltage

Figure 8: Transient Thermal Impedance

Part Numbering and Marking System

SIC = SiC Diode  
Z = Gen2  
SD = Schottky Diode  
120 = Voltage Rating (1200 V)  
C = TO-252-2L (DPAK)  
10 = Current Rating (10 A)  
YY = Year  
WW = Week  
D = Special code (fixed)  
ZZZZZZ-ZZ = Lot Number

Packing Options

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Marking</th>
<th>Packing Mode</th>
<th>M.O.Q</th>
</tr>
</thead>
<tbody>
<tr>
<td>LSIC2SD120C10</td>
<td>SIC2SD120C10</td>
<td>Tape and Reel</td>
<td>2500</td>
</tr>
</tbody>
</table>

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Dimensions TO-252-2L (DPAK)

NOTE:
- A1: MAXIMUM PLASTIC PROTRUSION.
- A: REFERENCE FOR FOOT LENGTH MEASUREMENT.

Recommended Solder Pattern Layout

Symbol | 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 ± 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 ± 0.10 mm unless otherwise specified.

COVER TAPE SPECS:
- Width: 13.5 mm
- Base Material: less than 1.2x107 ohms/square
- Transparent polyester, static dissipative
- Adhesive Layer: Polyethylene
- Total Thickness: 60 Micron
- Tensile Strength: 4-6 kg/mm²
- Elongation: 91%
- Tearing Strength: 11 kg/mm²
- Shelf life: 2 years
Carrier Tape & Reel Specification TO-252-2L (DPAK)

NOTES
1) WIRING CLEARANCE ON BOTH SIDE DECK.
2) SURFACE RESISTANCE = 500,000 Ω AND ≤ 500,000 Ω.
3) MARKING DATA ON MATERIAL SIDE "A" IN CIRCLE. ONE ON BOTH SIDE DECK.
4) LACE CASE IN CIRCLE ON ONE SIDE OF DECK.
5) TAPE WIDTH "A" NOT IN CIRCLE, TEXT HEIGHT A MIN. ON BOTH SIDE DECK.
6) HAS NOT INERTION ON BOTH SIDE DECK.
7) AREA OF LABEL: MIN 10 x 35.
8) NUMBER OF CATEGORIES ACCORDING TO PRODUCER, ETP NO. 6.
9) EXPANSION LINEAR SCALE IS PREFERRED. 1 IN INTERVAL, EIGHT OF LETTERING 1 MIL.
10) NON-CRITICAL, CONTENTS ACCORDING TO PRODUCER.