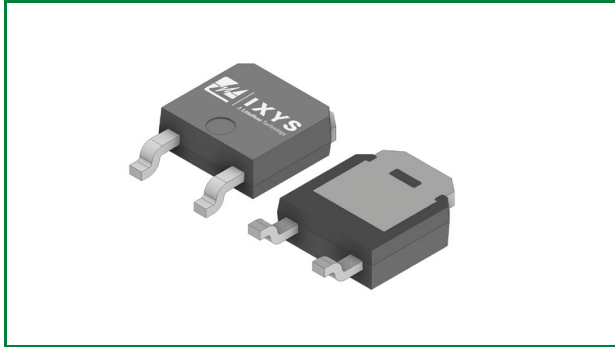



LSIC2SD120C08A  
1200 V, 8 A SiC Schottky Barrier Diode



Agency Approvals and Environmental

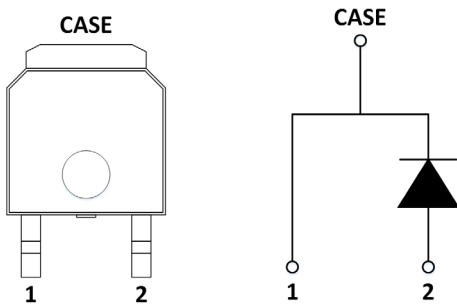
Environmental Approvals

RoHS



HF

Pinout Diagram



Product Summary

Characteristic	Value	Unit
$V_{RRM}$	1200	V
$I_F (T_C \le 135^\circ\text{C})$	12.5	A
$Q_C (V_R: 0-800\text{ V})$	47	nC

Features

- AEC-Q101 Qualified
- MSL 1 Rated
- 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
- RoHS compliant, lead-free, and halogen-free

Applications

- Boost diodes in PFC or DC/DC stages
- Switch-mode power supplies
- Solar inverters
- Uninterruptable power supplies
- Industrial motor drives
- Battery Chargers
- High speed rectifier

- 1. Maximum Ratings.....3
- 2. Thermal Characteristics .....3
- 3. Electrical Characteristics .....3
- 4. Performance Curves .....4
- 5.  $V_F$  Model for Simulation.....5
- 6. Package Dimensions.....6
- 7. Part Numbering and Marking.....6
- 8. Packing Options .....6
- 9. Packing Specifications.....7

## 1. Maximum Ratings

Characteristic	Symbol	Conditions	Value	Unit
Repetitive Peak Reverse Voltage	$V_{RRM}$	-	1200	V
DC Blocking Voltage	$V_R$	-	1200	V
Continuous Forward Current	$I_F$	$T_C = 25\text{ }^\circ\text{C}$	24.0	A
		$T_C = 135\text{ }^\circ\text{C}$	12.5	
		$T_C = 154\text{ }^\circ\text{C}$	8	
Non-repetitive Forward Surge Current	$I_{FSM}$	$T_C = 25\text{ }^\circ\text{C}$ , $t_p = 10\text{ ms}$ , Half sine pulse	65	A
$I^2t$	$\int I^2 dt$	$T_C = 25\text{ }^\circ\text{C}$ , $t_p = 10\text{ ms}$ , Half sine pulse	21	A <sup>2</sup> s
Power Dissipation	$P_{Tot}$	$T_C = 25\text{ }^\circ\text{C}$	125	W
		$T_C = 110\text{ }^\circ\text{C}$	54	
Operating Junction Temperature	$T_J$	-	-55 to 175	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-	-55 to 150	$^\circ\text{C}$
Lead Temperature for Soldering (MSL 1 Rated)	$T_{SOLD}$	-	260	$^\circ\text{C}$

## 2. Thermal Characteristics

Characteristic	Symbol	Value	Unit
Maximum Thermal Resistance, junction-to-case	$R_{thJC,MAX}$	1.2	$^\circ\text{C}/\text{W}$

## 3. Electrical Characteristics

Characteristic	Symbol	Conditions	Value			Unit
			Min	Typ	Max	
Forward Voltage	$V_F$	$I_F = 8\text{ A}$ , $T_J = 25\text{ }^\circ\text{C}$	-	1.5	1.8	V
		$I_F = 8\text{ A}$ , $T_J = 175\text{ }^\circ\text{C}$	-	2.1	-	
Reverse Current	$I_R$	$V_R = 1200\text{ V}$ , $T_J = 25\text{ }^\circ\text{C}$	-	<1	100	$\mu\text{A}$
		$V_R = 1200\text{ V}$ , $T_J = 175\text{ }^\circ\text{C}$	-	3	-	
Total Capacitance	C	$V_R = 1\text{ V}$ , $f = 1\text{ MHz}$	-	455	-	pF
		$V_R = 400\text{ V}$ , $f = 1\text{ MHz}$	-	45	-	
		$V_R = 800\text{ V}$ , $f = 1\text{ MHz}$	-	33	-	
Total Capacitive Charge	$Q_C$	$V_R = 800\text{ V}$ , $Q_C = \int C(V) dV$	-	47	-	nC
Capacitance Stored Energy	$E_C$	$V_R = 800\text{ V}$	-	10.6	-	$\mu\text{J}$

### 4. Performance Curves

Figure 1. Typical Forward Characteristics

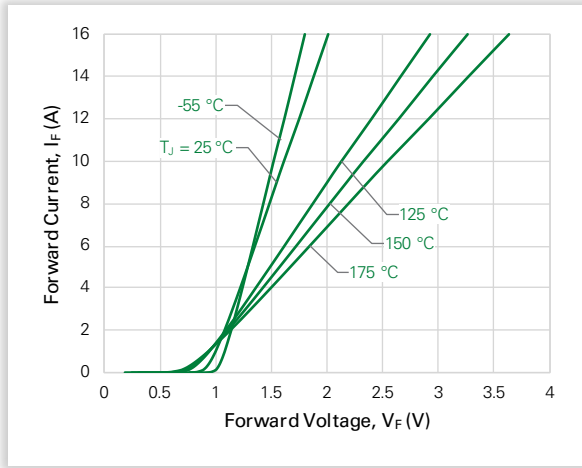


Figure 2. Typical Reverse Characteristics

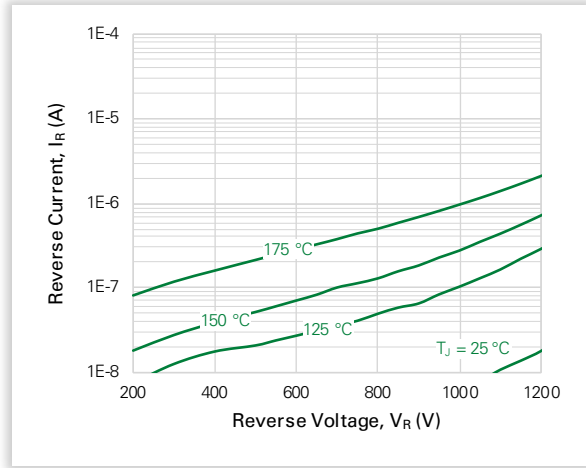


Figure 3. Power Derating

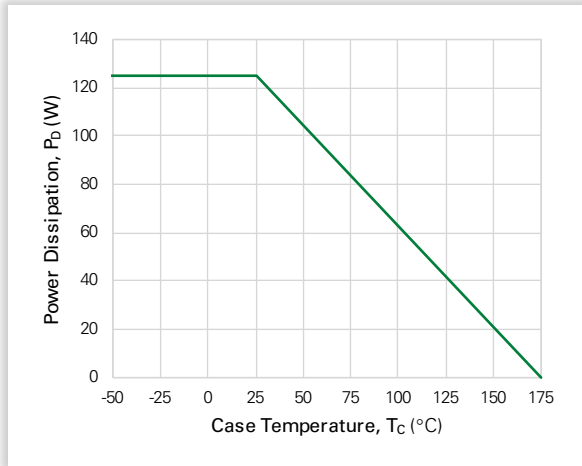


Figure 4. Current Derating

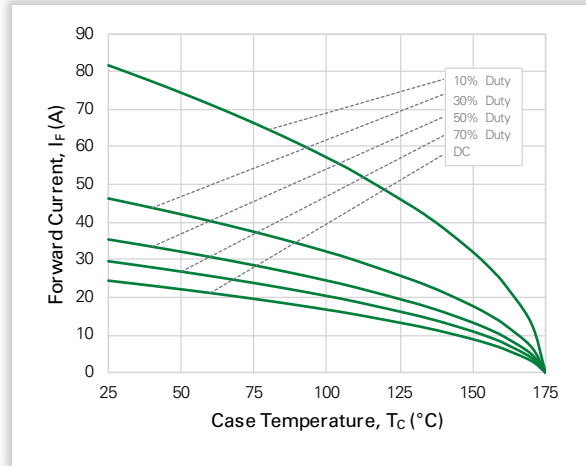


Figure 5. Capacitance vs. Reverse Voltage

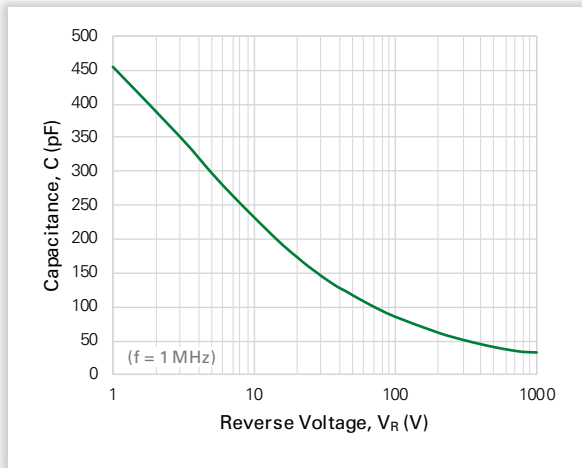


Figure 6. Capacitive Charge vs. Reverse Voltage

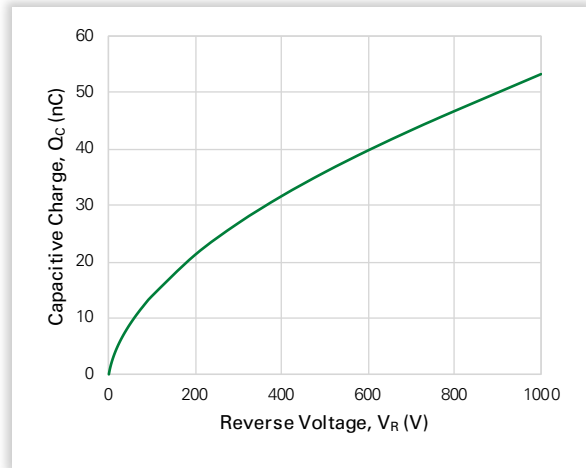


Figure 7. Stored Energy vs. Reverse Voltage

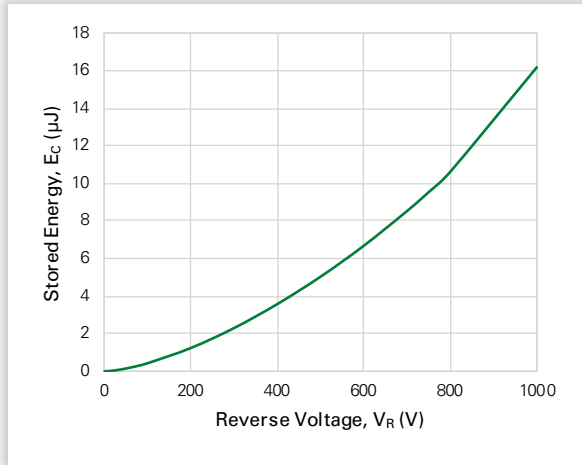
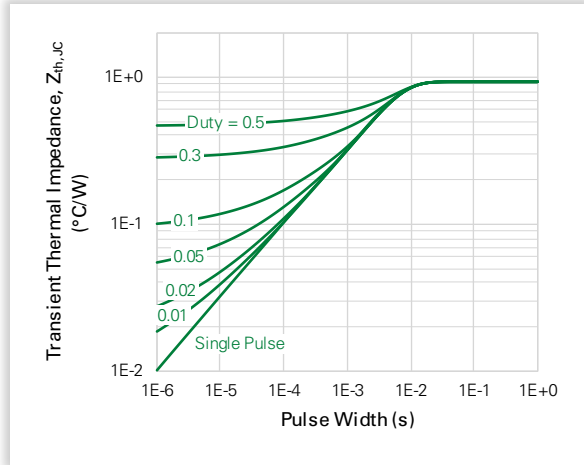
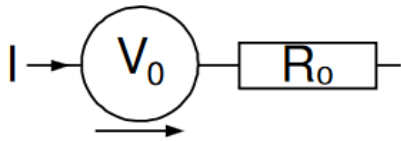


Figure 8. Transient Thermal Impedance



5. V<sub>F</sub> Model for Simulation



$$V_F(T_J) = V_0 + IR_0$$

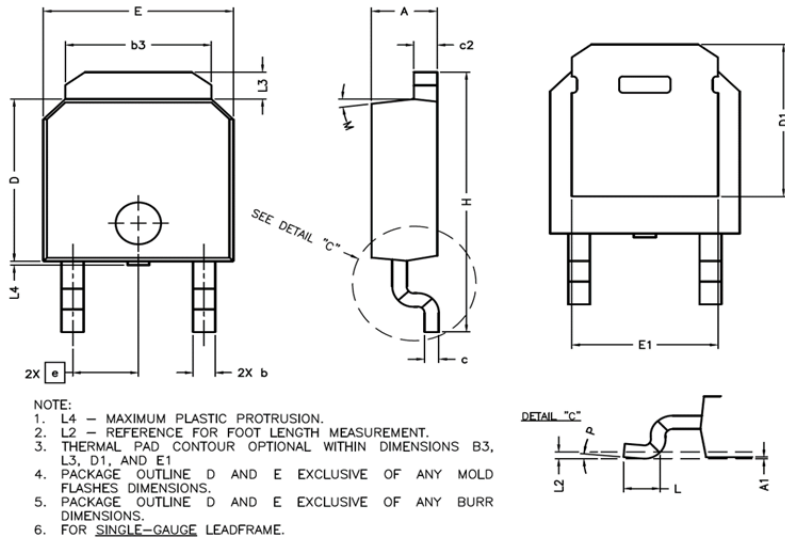
$$V_0 = -1.20 \times 10^{-3} \cdot T_J + 9.88 \times 10^{-1}$$

$$R_0 = 2.05 \times 10^{-6} \cdot T_J^2 + 3.38 \times 10^{-4} \cdot T_J + 5.61 \times 10^{-2}$$

Notes:

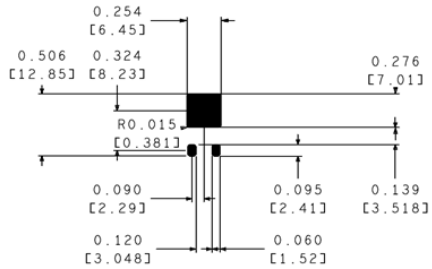
- T<sub>J</sub> is junction temperature in °C
- Range valid from 25 °C to 175 °C
- Model represents performance of a typical part

6. Package Dimensions



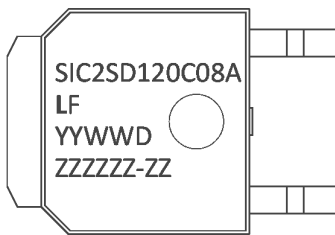
Symbol	Millimeters	
	Min	Max
A	2.159	2.413
A1	-	0.127
b	0.635	1.067
b3	4.953	5.461
c	0.457	0.610
c2	-	0.889
(c2)	0.457	0.610
D	5.969	6.223
D1	5.207	5.715
E	6.350	6.731
E1	4.318	5.207
e	2.29 REF.	
H	9.398	10.414
L	1.016	1.778
L2	0.25 REF.	
L3	0.889	1.270
L4	0.000	0.152
M	15°	
P	-	5°

Recommended Solder Pad Layout



UNIT: Inch [mm]

7. Part Numbering and Marking



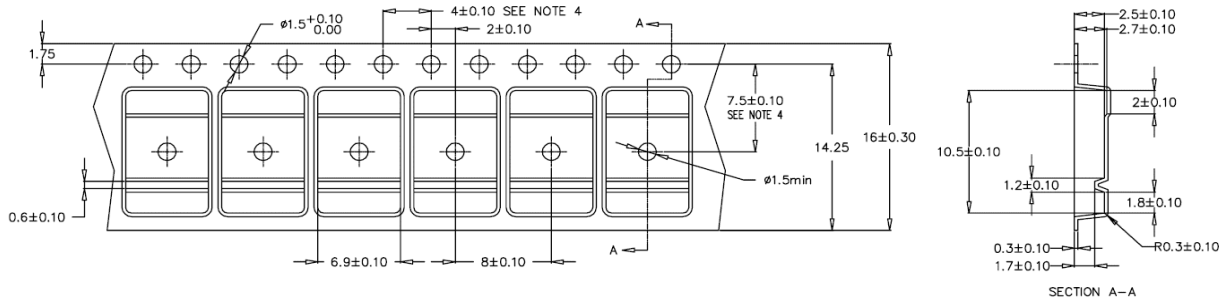
- SIC = SiC
- 2 = Gen 2
- SD = Schottky Barrier Diode
- 120 = Voltage Rating (1200 V)
- C = Package (TO-252-2L)
- 08 = Current Rating (8 A)
- A = AEC-Q101 qualified
- YY = Year
- WW = Week
- D = Special Code
- ZZZZZZ-ZZ = Lot Number

8. Packing Options

Part Number	Marking	Packing Mode	M.O.Q.
LSIC2SD120C08A	SIC2SD120C08A	Tape & Reel	2500

9. Packing Specifications

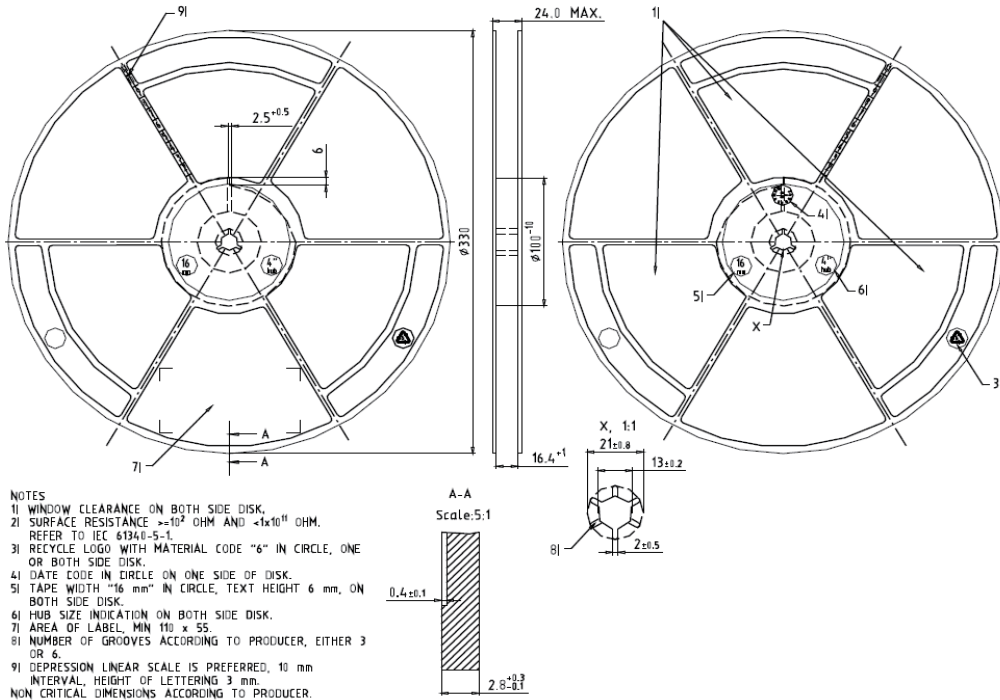
TO-252 Carrier Tape & Reel Specifications



1. Material: Black Conductive Polyesterene
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  $1.2 \times 10^{10}$  ohms/square  
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



- NOTES
- 1) WINDOW CLEARANCE ON BOTH SIDE DISK.
  - 2) SURFACE RESISTANCE  $\leq 10^9$  OHM AND  $\leq 1 \times 10^{11}$  OHM. REFER TO IEC 61340-5-1.
  - 3) RECYCLE LOGO WITH MATERIAL CODE "6" IN CIRCLE, ONE OR BOTH SIDE DISK.
  - 4) DATE CODE IN CIRCLE ON ONE SIDE OF DISK.
  - 5) TAPE WIDTH "16 mm" IN CIRCLE, TEXT HEIGHT 6 mm, ON BOTH SIDE DISK.
  - 6) HUB SIZE INDICATION ON BOTH SIDE DISK.
  - 7) AREA OF LABEL, MIN 110 x 55.
  - 8) NUMBER OF GROOVES ACCORDING TO PRODUCER, EITHER 3 OR 6.
  - 9) DEPRESSION LINEAR SCALE IS PREFERRED, 10 mm INTERVAL, HEIGHT OF LETTERING 3 mm. NON CRITICAL DIMENSIONS ACCORDING TO PRODUCER.

For additional information please visit [www.Littelfuse.com/powersemi](http://www.Littelfuse.com/powersemi)

**Disclaimer Notice** - Littelfuse products are not designed for, and shall not be used for, any purpose (including, without limitation, automotive, military, aerospace, medical, life-saving, life-sustaining or nuclear facility applications, devices intended for surgical implant into the body, or any other application in which the failure or lack of desired operation of the product may result in personal injury, death, or property damage) other than those expressly forth in applicable Littelfuse product documentation. Littelfuse shall not be liable for any claims or damages arising out of products used in applications not expressly intended by Littelfuse as set forth in applicable Littelfuse documentation.

Read complete Disclaimer Notice at [www.littelfuse.com/disclaimer-electronics](http://www.littelfuse.com/disclaimer-electronics)