

LSIC2SD120C05



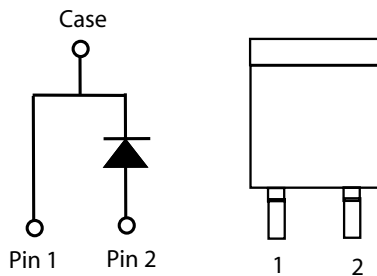
Description

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 = 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	I_F	$T_C = 25\text{ °C}$	18.1	A
		$T_C = 135\text{ °C}$	8.7	
		$T_C = 159\text{ °C}$	5	
Non-Repetitive Forward Surge Current	I_{FSM}	$T_C = 25\text{ °C}, T_P = 10\text{ ms}, \text{Half sine pulse}$	40	A
Power Dissipation	P_{Tot}	$T_C = 25\text{ °C}$	100	W
		$T_C = 110\text{ °C}$	43.3	
Operating Junction Temperature	T_J	-	-55 to 175	°C
Storage Temperature	T_{STG}	-	-55 to 150	°C
Soldering Temperature (reflow MSL 1)	T_{sold}	-	260	°C

Electrical Characteristics

Characteristics	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Forward Voltage	V_F	$I_F = 5\text{ A}, T_J = 25\text{ }^\circ\text{C}$	-	1.5	1.8	V
		$I_F = 5\text{ A}, T_J = 175\text{ }^\circ\text{C}$	-	2.1		
Reverse Current	I_R	$V_R = 1200\text{ V}, T_J = 25\text{ }^\circ\text{C}$	-	<1	100	μA
		$V_R = 1200\text{ V}, T_J = 175\text{ }^\circ\text{C}$	-	5		
Total Capacitance	C	$V_R = 1\text{ V}, f = 1\text{ MHz}$	-	310		pF
		$V_R = 400\text{ V}, f = 1\text{ MHz}$	-	29		
		$V_R = 800\text{ V}, f = 1\text{ MHz}$	-	21		
Total Capacitive Charge	Q_C	$V_R = 800\text{ V}, Q_C = \int_0^{V_R} C(V)dV$	-	30		nC

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

Thermal Characteristics

Characteristics	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Thermal Resistance	$R_{\theta JC}$	-	-	1.50		$^\circ\text{C/W}$

Figure 1: Typical Forward Characteristics

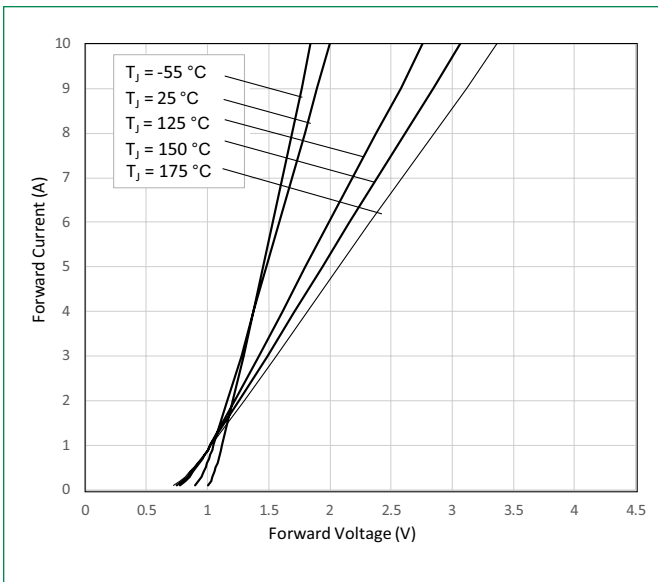


Figure 2: Typical Reverse Characteristics

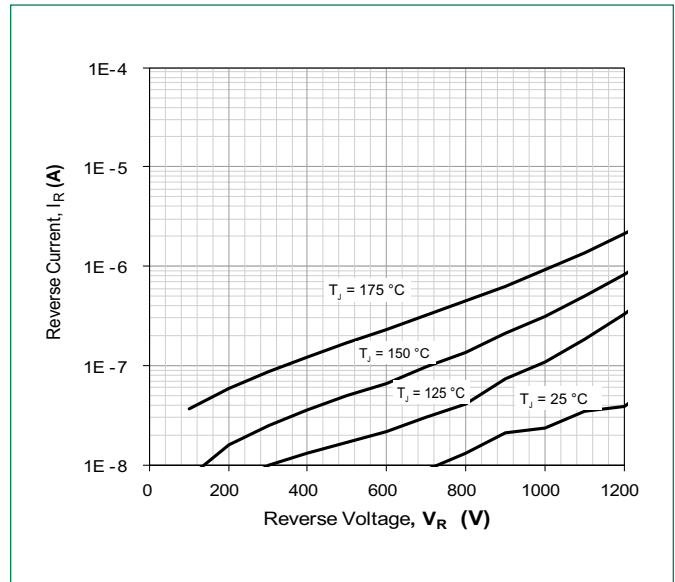


Figure 3: Power Derating

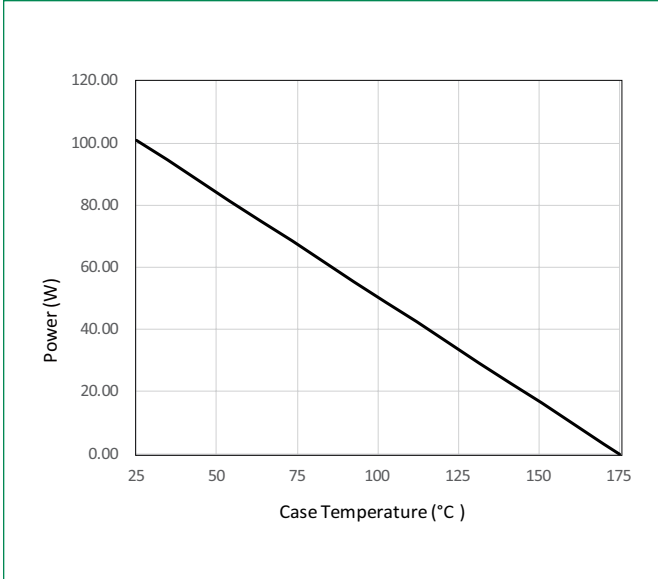


Figure 4: Current Derating

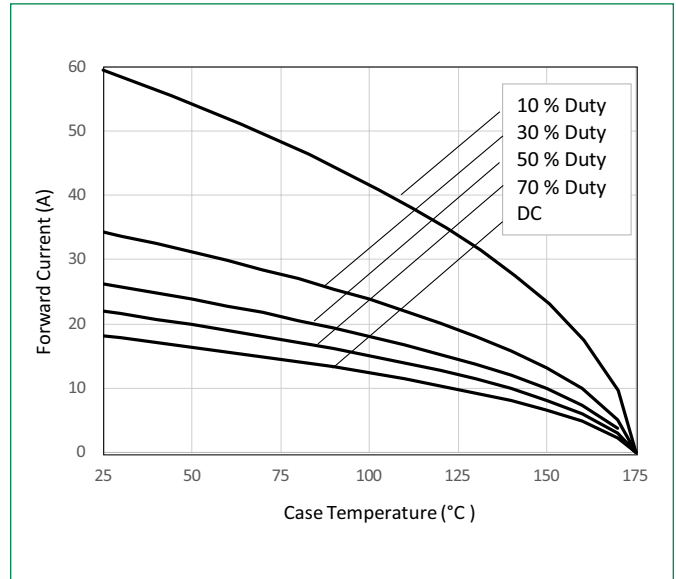


Figure 5: Capacitance vs. Reverse Voltage

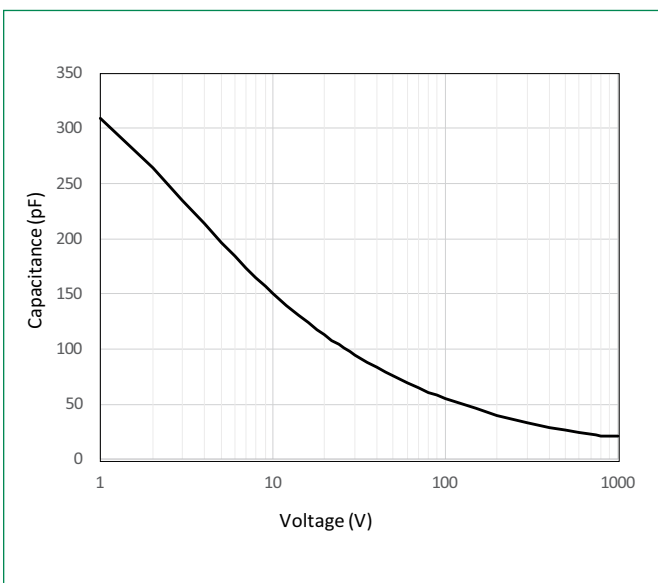


Figure 6: Capacitive Charge vs. Reverse Voltage

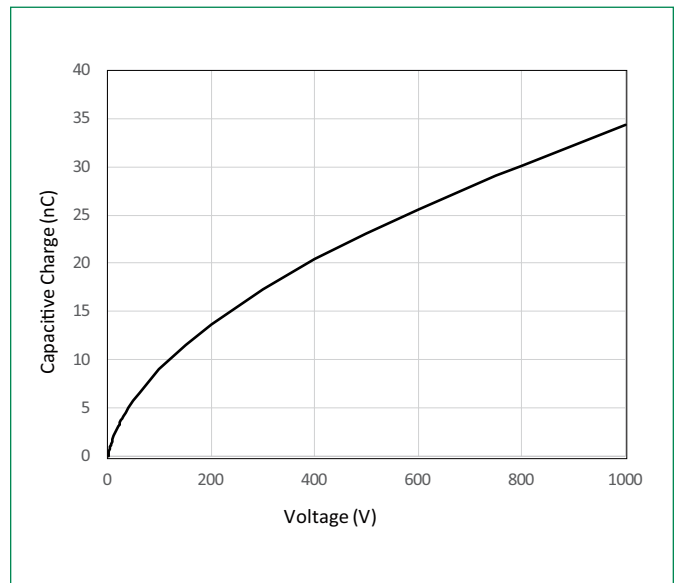


Figure 7: Stored Energy vs. Reverse Voltage

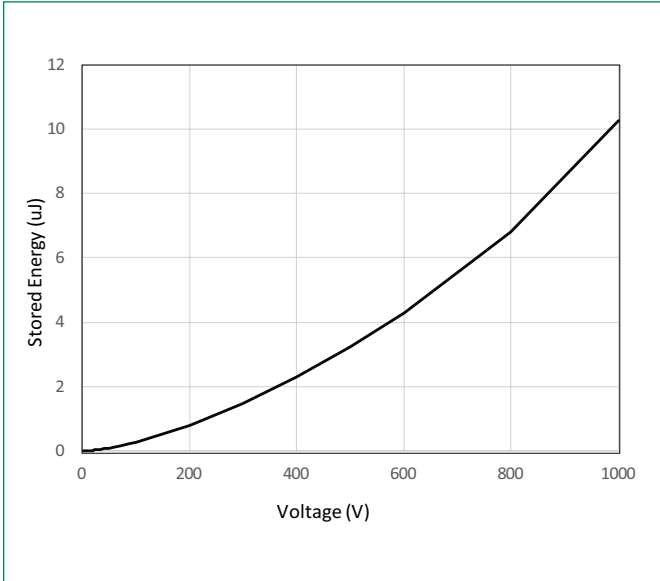
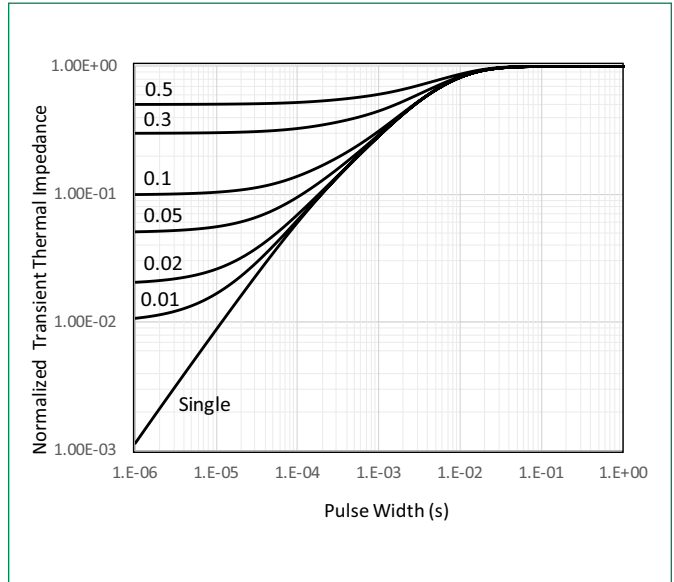
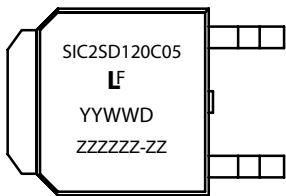


Figure 8: Transient Thermal Impedance



Part Numbering and Marking System

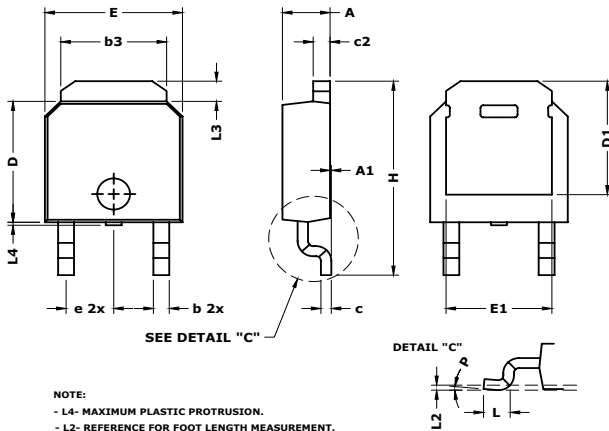


- SIC = SiC Diode
- 2 = Gen2
- SD = Schottky Diode
- 120 = Voltage Rating (1200 V)
- C = TO-252-2L (DPAK)
- 05 = Current Rating (5 A)
- YY = Year
- WW = Week
- D = Special code (fixed)
- ZZZZZZ-ZZ = Lot Number

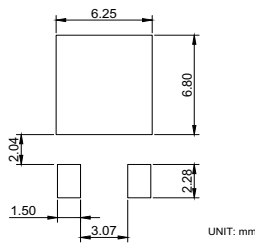
Packing Options

Part Number	Marking	Packing Mode	M.O.Q
LSIC2SD120C05	SIC2SD120C05	Tape and Reel	2500

Dimensions TO-252-2L (DPAK)

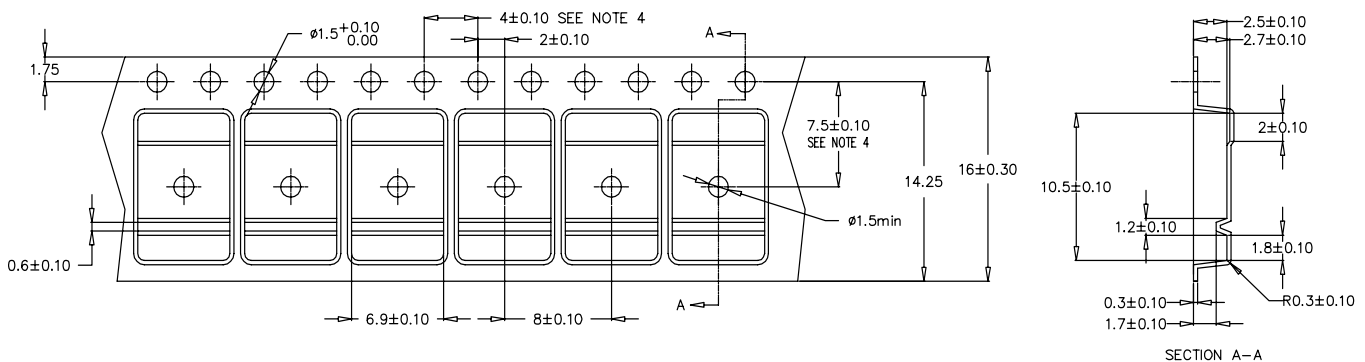


Recommended Solder Pattern Layout



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)

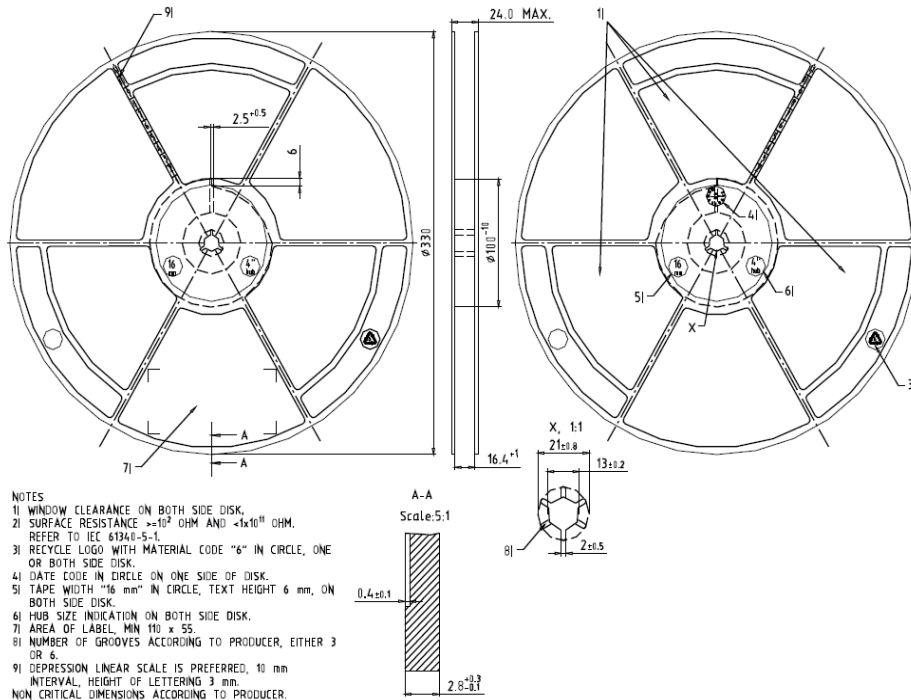


1. Material: Black Conductive Polyester
2. 10 sprocket hole pitch cumulative tolerance ± 0.20
3. Camber not to exceed 1 mm in 100 mm.
4. Pocket position relative to sprocket hole measured as true position of pocket, not pocket hole.
5. Device orientation: TRL (leads perpendicular to the sprocket)
6.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

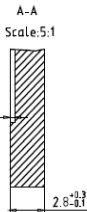
COVER TAPE SPECS:

Width	: 13.5 mm
Base Material	: less than 1.2×10^{12} ohms/square Transparent polyester, static dissipative
Adhesive Layer	: Polyethylene
Total Thickness	: 60 Micron
Tensile Strength	: 4-6 kg/mm ²
Elongation	: 91%
Tearing Strength	: 11 kg/mm ²
Shelf life	: 2 years

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



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



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