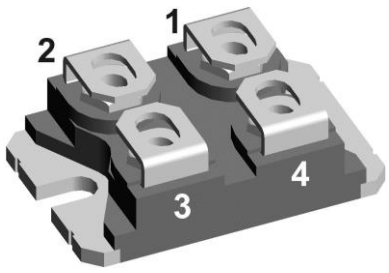
LSIC2SD120N40PA
1200 V, 2x20 A SiC Schottky Barrier Diode

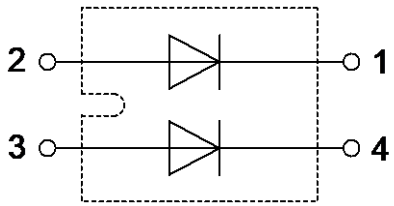


*Backside is isolated

Agency Approvals and Environmental

Environmental Approvals
RoHS, (pending)

Pinout Diagram



*Backside is isolated

Product Summary

Characteristic	Value	Unit
V_{RRM}	1200	V
I_F ($T_C \leq$ 130 °C)	2x20	A
Q_C (V_R: 0-800 V)	125*	nC

*per leg

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
- Zero reverse recovery current
- Copper base plate with AlN isolation for low thermal resistance
- Isolation voltage: 3000 V
- UL Recognition Pending under File E72873

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

Characteristic	Symbol	Conditions	Value	Unit
Repetitive Peak Reverse Voltage	V_{RRM}	-	1200	V
DC Blocking Voltage	V_R	-	1200	V
Continuous Forward Current (Per Leg / Component)	I_F	T_C = 25 °C	42 / 84	A
		T_C = 100 °C	28 / 56	
		T_C = 130 °C	20 / 40	
Non-repetitive Forward Surge Current (Per Leg)	I_{FSM}	T_C = 25 °C, t_p = 10 ms, Half sine pulse	145	A
I^2t (Per Leg)	$\int I^2dt$	T_C = 25 °C, t_p = 10 ms, Half sine pulse	105	A^2s
Power Dissipation (Per Leg / Component)	P_{Tot}	T_C = 25 °C	157 / 314	W
		T_C = 110 °C	68 / 136	
Operating Junction Temperature	T_J	-	-55 to 175	°C
Storage Temperature	T_{STG}	-	-55 to 150	°C

Note: All ratings are per leg unless otherwise specified

2. Package Specifications

Characteristic	Symbol	Conditions	Value			Unit
			Min	Typ	Max	
Mounting Torque	M_D	Screws to heatsink	-	-	1.5	Nm
		Terminal connection screws	-	-	1.3	
Creepage Distance on Surface	d_{Spp}	Terminal to terminal	10.5	-	-	mm
	d_{Spb}	Terminal to backside	8.5	-	-	
Striking Distance Through Air	d_{App}	Terminal to terminal	3.2	-	-	mm
	d_{Apb}	Terminal to backside	6.8	-	-	
Isolation Voltage	V_{ISOL}	50 / 60 Hz - RMS, $I_{ISOL} \leq$ 1 mA, t = 1 sec.	-	-	3000	V
		50 / 60 Hz - RMS, $I_{ISOL} \leq$ 1 mA, t = 1 min.	-	-	2500	
Weight	-	-	-	30	-	g

3. Thermal Characteristics

Characteristic	Symbol	Value	Unit
Maximum Thermal Resistance (Per Leg / Component)	$R_{th,JC,MAX}$	0.95 / 0.48	°C/W

Note: All ratings are per leg unless otherwise specified

4. Electrical Characteristics

Characteristic	Symbol	Conditions	Value			Unit
			Min	Typ	Max	
Forward Voltage	V_F	I_F = 20 A, T_J = 25 °C	-	1.5	1.8	V
		I_F = 20 A, T_J = 175 °C	-	2.1	-	
Reverse Current	I_R	V_R = 1200 V, T_J = 25 °C	-	<1	100	µA
		V_R = 1200 V, T_J = 175 °C	-	5	-	
Total Capacitance	C	V_R = 1 V, f = 1 MHz	-	1310	-	pF
		V_R = 400 V, f = 1 MHz	-	120	-	
		V_R = 800 V, f = 1 MHz	-	86	-	
Total Capacitive Charge	Q_C	V_R = 800 V, $Q_C = \int Q(V)\,dV$	-	125	-	nC
Capacitive Stored Energy	E_C	V_R = 800 V	-	28	-	µJ

Note: All ratings are per leg unless otherwise specified; T_J = 25 °C unless otherwise specified

5. Performance Curves

Note: All figures show per leg measurements unless otherwise specified

Figure 1. Typical Forward Characteristics

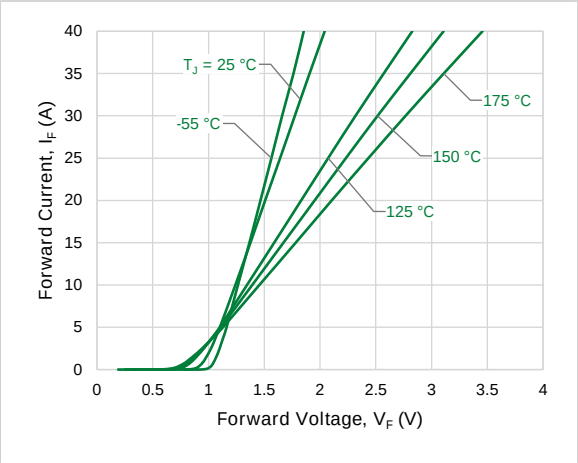


Figure 2. Typical Reverse Characteristics

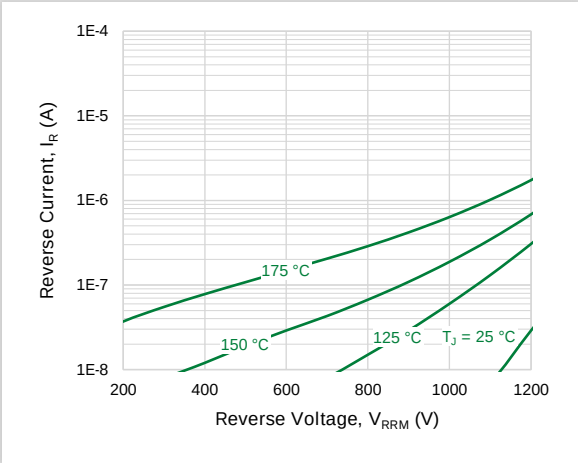


Figure 3. Power Derating

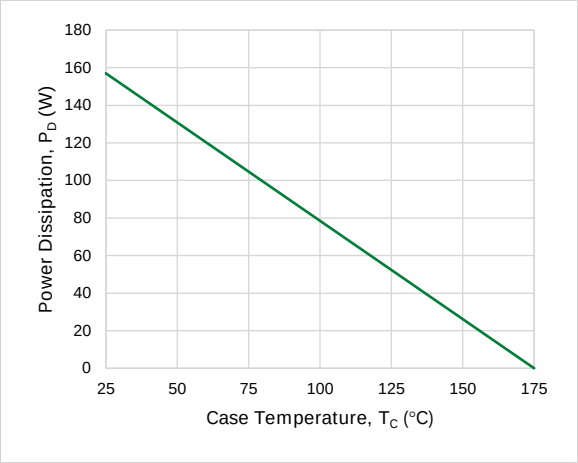


Figure 4. Current Derating

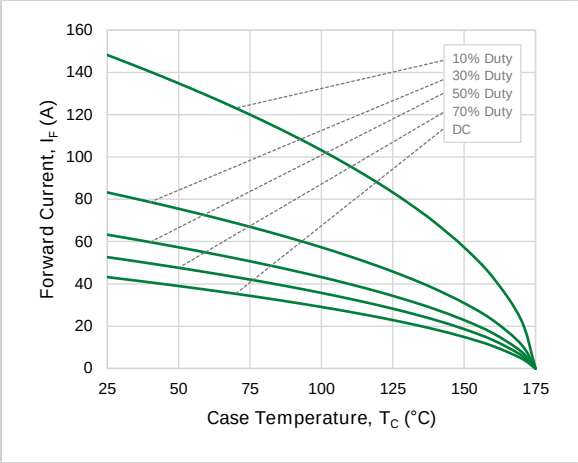


Figure 5. Capacitance vs. Reverse Voltage

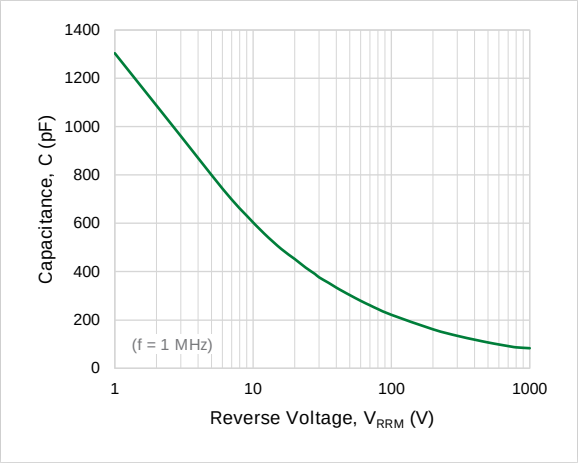


Figure 6. Capacitive Charge vs. Reverse Voltage

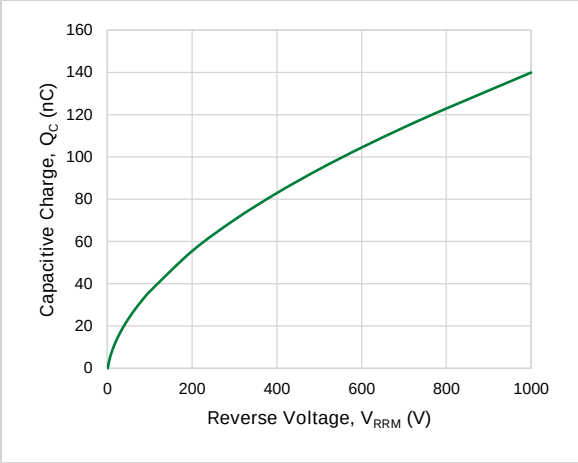


Figure 7. Stored Energy vs. Reverse Voltage

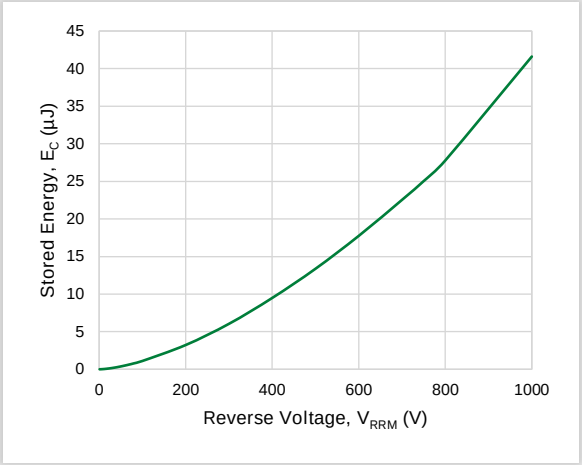
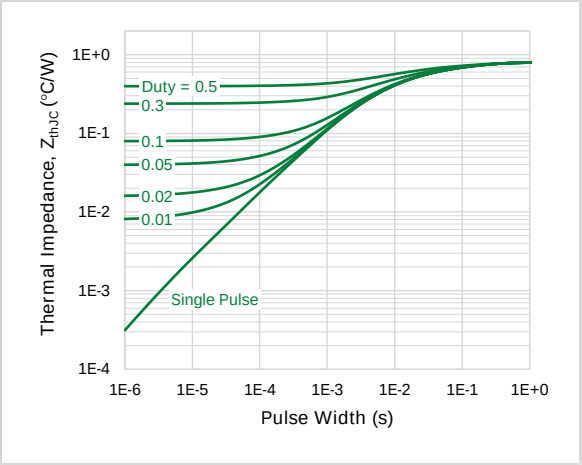
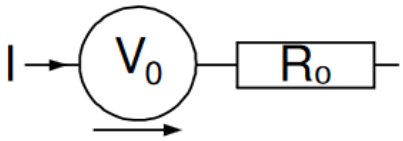


Figure 8. Transient Thermal Impedance



6. V_F Model for Simulation

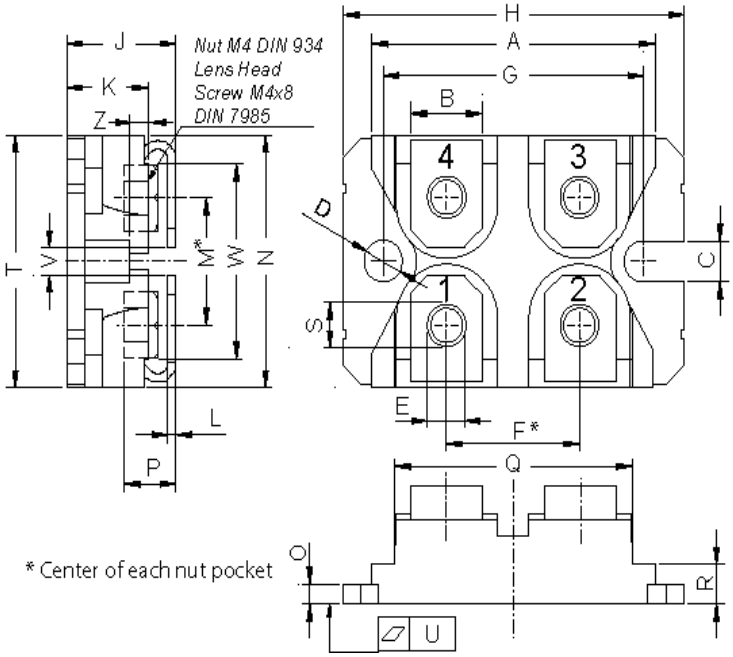


$$V_F(T_J) = V_0 + IR_0$$
$$V_0 = -1.30 \times 10^{-3} \cdot T_J + 1.01 \times 10^{0}$$
$$R_0 = 8.15 \times 10^{-7} \cdot T_J^2 + 1.03 \times 10^{-4} \cdot T_J + 2.36 \times 10^{-2}$$

Notes:

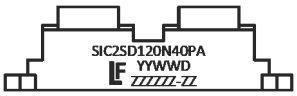
- T_J is junction temperature in °C
- Range valid from 25 °C to 175 °C
- Model represents performance of a typical part (per leg)

7. Package Dimensions



Symbol	Millimeters		
	Min	Nom	Max
A	31.50	-	31.88
B	7.80	-	8.20
C	4.09	-	4.29
D	4.09	-	4.29
E	4.09	-	4.29
F	14.91	-	15.11
G	30.12	-	30.30
H	37.80	-	38.26
J	11.68	-	12.22
K	8.92	-	9.60
L	0.74	-	0.84
M	12.50	-	13.10
N	25.15	-	25.42
O	1.95	-	2.13
P	4.95	-	6.20
Q	26.54	-	26.90
R	3.94	-	4.42
S	4.55	-	4.85
T	24.59	-	25.25
U	-0.05	-	0.10
V	3.20	-	5.50
W	19.81	-	21.08
Z	2.50	-	2.70

8. Part Numbering and Marking

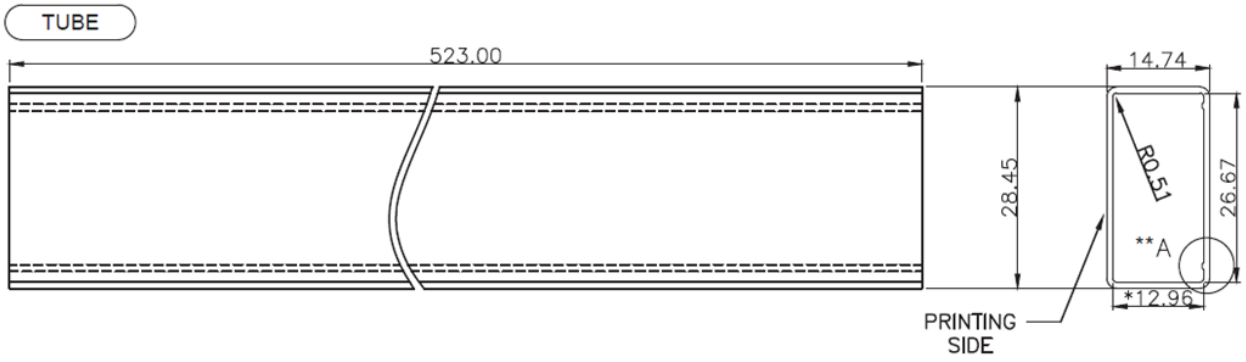


SiC	= SiC
2	= Gen 2
SD	= Schottky Barrier Diode
120	= Voltage Rating (1200 V)
N	= Package (SOT-227B - miniBLOC)
40	= Current Rating (40 A)
PA	= Parallel Configuration
YY	= Year
WW	= Week
D	= Special Code
ZZZZZZ-ZZ	= Lot Number

9. Packing Options

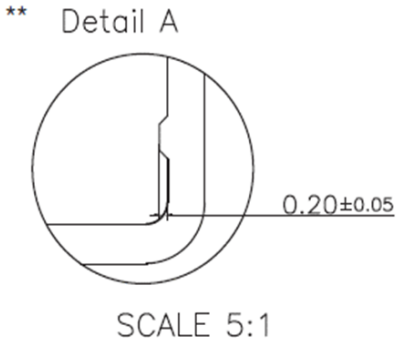
Part Number	Marking	Packing Mode	M.O.Q.
LSIC2SD120N40PA	SIC2SD120N40PA	Tube (10 pcs)	10

10. Packing Specifications



Note:

1. MATERIAL : CLEAR PVC WITH ANTISTATIC COATING.
2. MATERIAL THICKNESS : 0.89±0.13mm
3. COLOR : TRANSPARECENCY, RED
4. PRINTING : ALL GREEN COLOR, ARIAL STYLE
5. TUBE SURFACE RESISTANCE : 106 ~ 1010 Ω/square
6. ESD (Electro Static Discharge) : less than 100V, 6Months



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