

LSIC2SD065C20A 650 V, 20 A SiC Schottky Barrier Diode



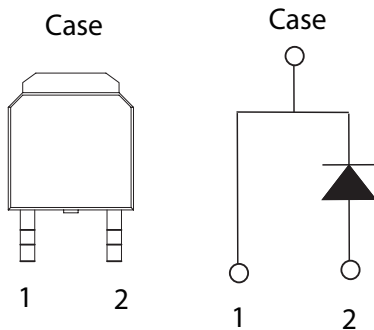
Description

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

- AEC-Q101 qualified
- 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-free lead plating

Maximum Ratings

Characteristics	Symbol	Conditions	Value	Unit
Repetitive Peak Reverse Voltage	V_{RRM}	-	650	V
DC Blocking Voltage	V_R	$T_J = 25\text{ °C}$	650	V
Continuous Forward Current	I_F	$T_C = 25\text{ °C}$	45	A
		$T_C = 135\text{ °C}$	20	
Non-Repetitive Forward Surge Current	I_{FSM}	$T_C = 25\text{ °C}, T_P = 10\text{ ms}, \text{Half sine pulse}$	90	A
Power Dissipation	P_{Tot}	$T_C = 25\text{ °C}$	135	W
		$T_C = 110\text{ °C}$	60	
Operating Junction Temperature	T_J	-	-55 to 175	°C
Storage Temperature	T_{STG}	-	-55 to 150	°C
Soldering Temperature (reflow MSL1)	T_{sold}	-	260	°C

Electrical Characteristics

Characteristics	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Forward Voltage	V_F	$I_F = 20\text{ A}, T_J = 25\text{ }^\circ\text{C}$	-	1.5	1.8	V
		$I_F = 20\text{ A}, T_J = 175\text{ }^\circ\text{C}$	-	1.85	-	
Reverse Current	I_R	$V_R = 650\text{ V}, T_J = 25\text{ }^\circ\text{C}$	-	<1	50	μA
		$V_R = 650\text{ V}, T_J = 175\text{ }^\circ\text{C}$	-	60	-	
Total Capacitance	C	$V_R = 1\text{ V}, f = 1\text{ MHz}$	-	960	-	pF
		$V_R = 200\text{ V}, f = 1\text{ MHz}$	-	120	-	
		$V_R = 400\text{ V}, f = 1\text{ MHz}$	-	86	-	
Total Capacitive Charge	Q_C	$V_R = 400\text{ V}, Q_C = \int_0^{V_R} C(V)dV$	-	63	-	nC

Thermal Characteristics

Characteristics	Symbol	Value	Unit
Thermal Resistance	$R_{\theta JC}$	1.1	$^\circ\text{C/W}$

Figure 1: Typical Forward Characteristics

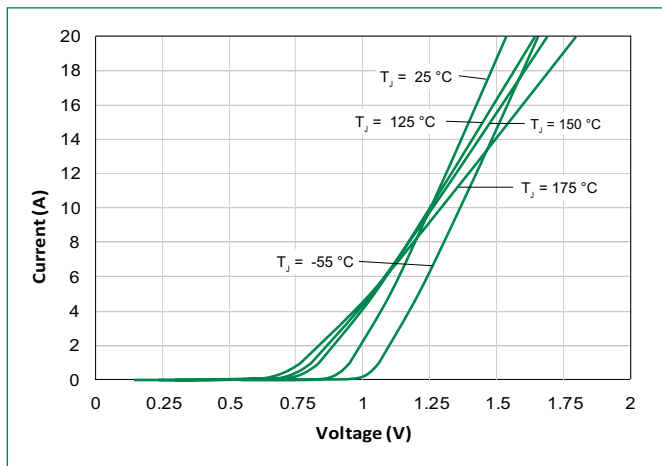


Figure 2: Typical Reverse Characteristics

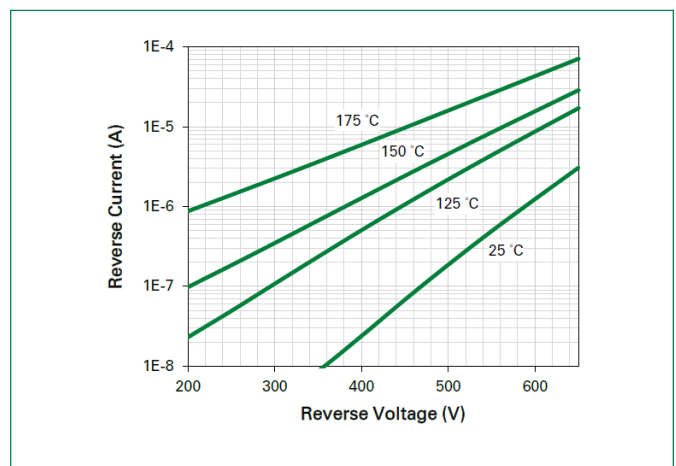


Figure 3: Power Derating

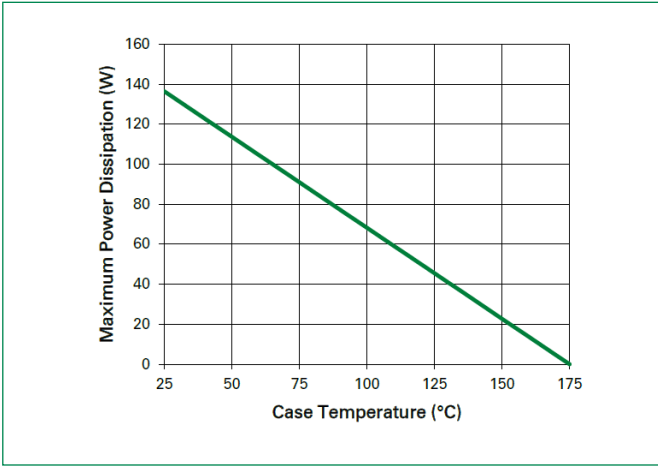


Figure 4: Current Derating

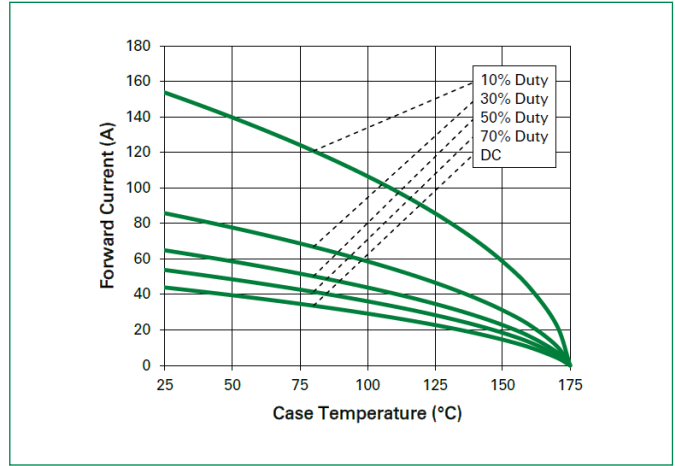


Figure 5: Capacitance vs. Reverse Voltage

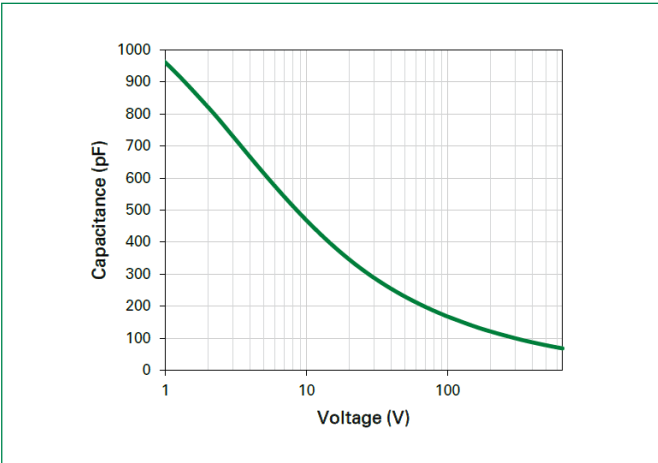


Figure 6: Capacitive Charge vs. Reverse Voltage

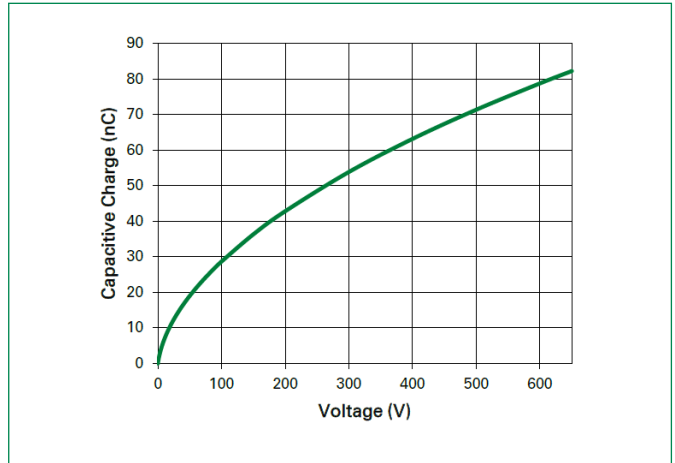


Figure 7: Stored Energy vs. Reverse Voltage

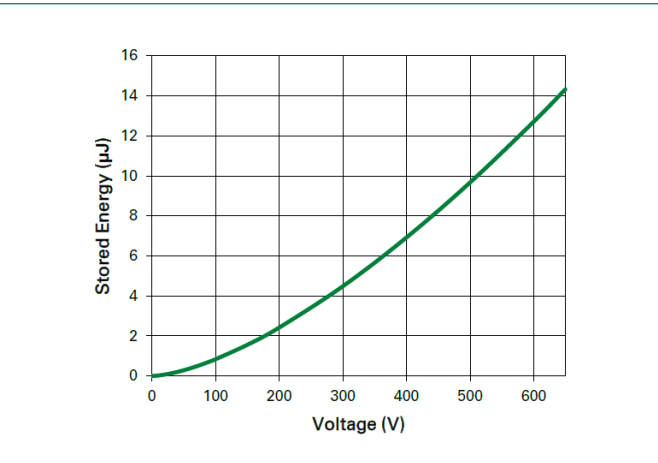
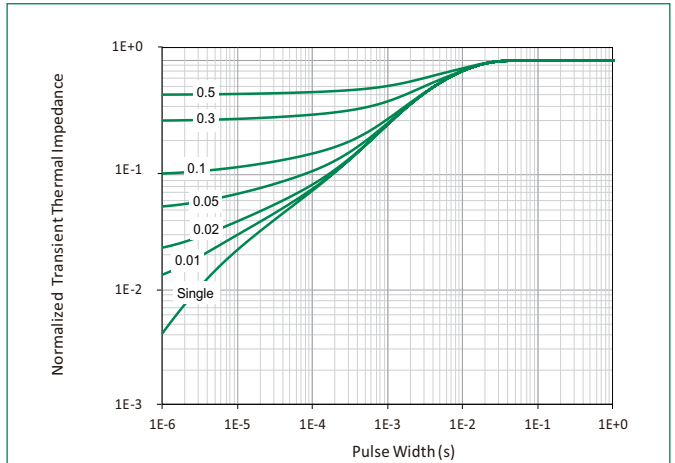
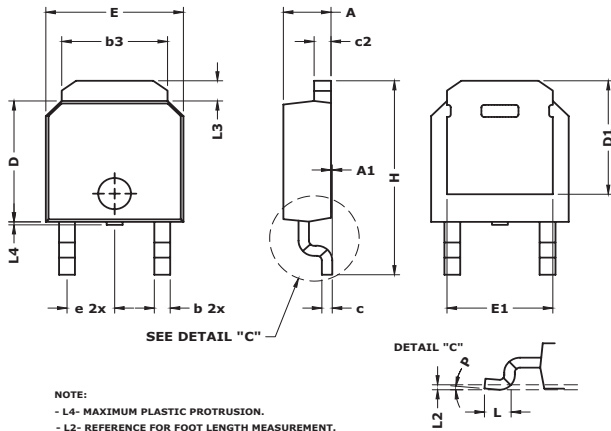


Figure 8: Transient Thermal Impedance

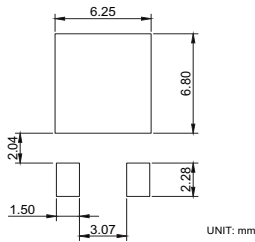


Dimensions TO-252-2L (DPAK)



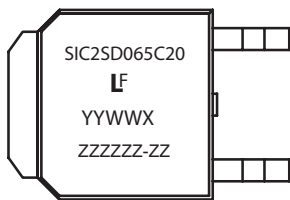
NOTE:
 - L4- MAXIMUM PLASTIC PROTRUSION.
 - L2- REFERENCE FOR FOOT LENGTH MEASUREMENT.

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°

Part Numbering and Marking System

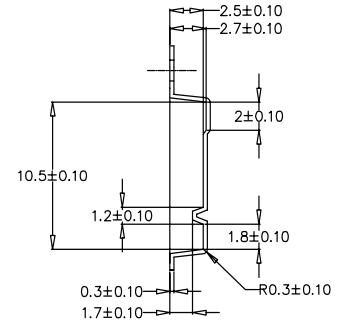
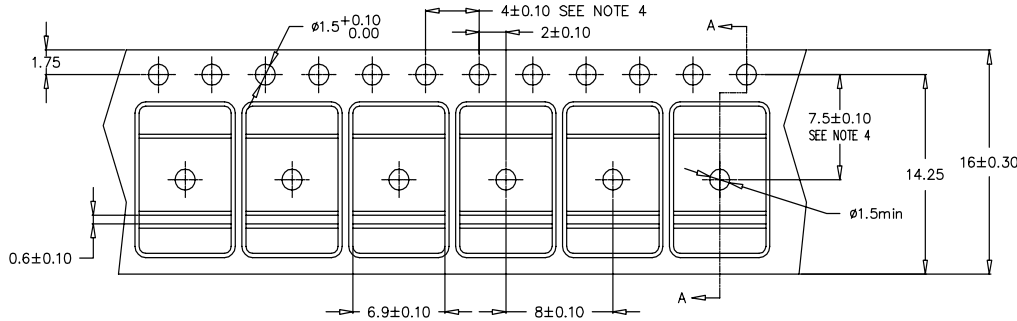


SIC = SiC Diode
 2 = Gen2
 SD = Schottky Diode
 065 = Voltage Rating (650 V)
 C = TO-252-2L (DPAK)
 20 = Current Rating (20 A)
 YY = Year
 WW = Week
 X = Special code
 ZZZZZZ-ZZ = Lot Number

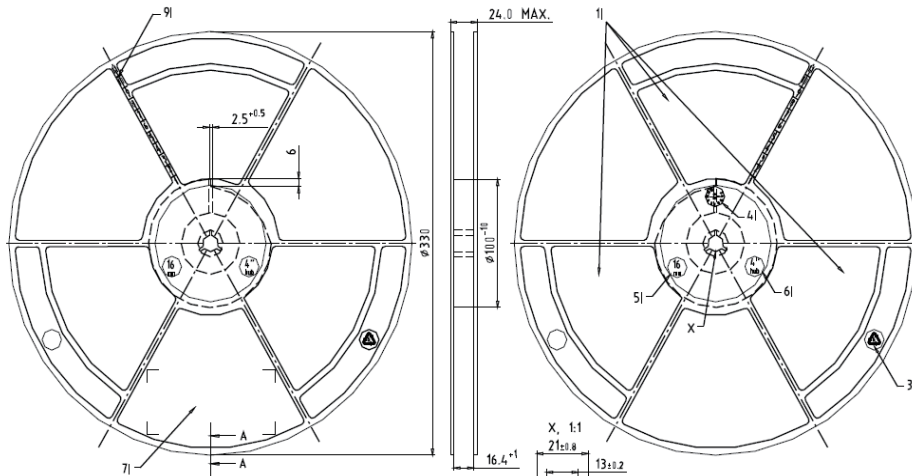
Packing Options

Part Number	Marking	Packing Mode	M.O.Q
LSIC2SD065C20A	SIC2SD065C20	Tape and Reel	2500

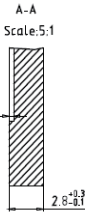
Carrier Tape & Reel Specification TO-252-2L (DPAK)



1. Material: Black Conductive Polyesterene
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.



- NOTES
- 1) WINDOW CLEARANCE ON BOTH SIDE DISK.
 - 2) SURFACE RESISTANCE $\geq 10^9$ OHM AND $< 1 \times 10^{11}$ 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.



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