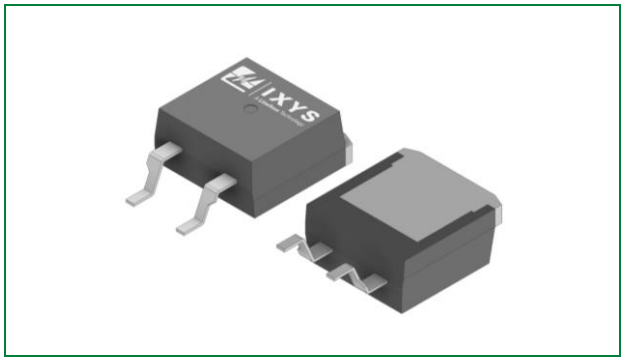
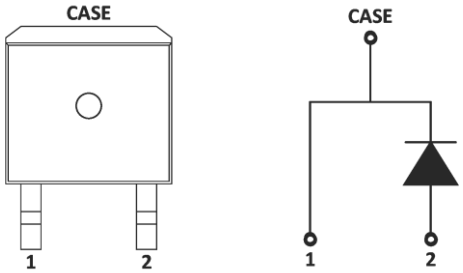
LSIC2SD065D08A
650 V, 8 A SiC Schottky Barrier Diode



Agency Approvals and Environmental

Environmental Approvals
RoHS HF

Circuit Diagram TO-263-2L



Product Summary

Characteristic	Value	Unit
V_{RRM}	650	V
I_F ($T_C \leq 135$ °C)	11	A
Q_C (V_R: 0-400 V)	28	nC

Features

- AEC-Q101 qualified
- MSL1 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

Characteristic	Symbol	Conditions	Value	Unit
Repetitive Peak Reverse Voltage	V_{RRM}	-	650	V
DC Blocking Voltage	V_R	-	650	V
Continuous Forward Current	I_F	T_C = 25 °C	24	A
		T_C = 135 °C	11	
		T_C = 150 °C	8	
Non-repetitive Forward Surge Current	I_{FSM}	T_C = 25 °C, t_p = 10 ms, Half sine pulse	40	A
I^2t	$\int I^2dt$	T_C = 25 °C, t_p = 10 ms, Half sine pulse	8	A^2s
Power Dissipation	P_{Tot}	T_C = 25 °C	88	W
		T_C = 110 °C	38	
Operating Junction Temperature	T_J	-	-55 to 175	°C
Storage Temperature	T_{STG}	-	-55 to 150	°C
Lead Temperature for Soldering (MSL 1 Rated)	T_{SOLD}	-	260	°C

2. Thermal Characteristics

Characteristic	Symbol	Value	Unit
Maximum Thermal Resistance, junction-to-case	$R_{th,JC,\ max}$	1.7	°C/W

3. Electrical Characteristics

Characteristic	Symbol	Conditions	Value			Unit
			Min	Typ	Max	
Forward Voltage	V_F	I_F = 8 A, T_J = 25 °C	-	1.5	1.8	V
		I_F = 8 A, T_J = 175 °C	-	1.75	-	
Reverse Current	I_R	V_R = 650 V, T_J = 25 °C	-	<1	100	µA
		V_R = 650 V, T_J = 175 °C	-	15	-	
Total Capacitance	C	V_R = 1 V, f = 1 MHz	-	415	-	pF
		V_R = 200 V, f = 1 MHz	-	56	-	
		V_R = 400 V, f = 1 MHz	-	41	-	
Total Capacitive Charge	Q_C	V_R = 400 V, $Q_C = \int Q(V)\,dV$	-	28	-	nC
Capacitance Stored Energy	E_C	V_R = 400 V		3.3		µJ

4. Performance Curves

Figure 1. Typical Forward Characteristics

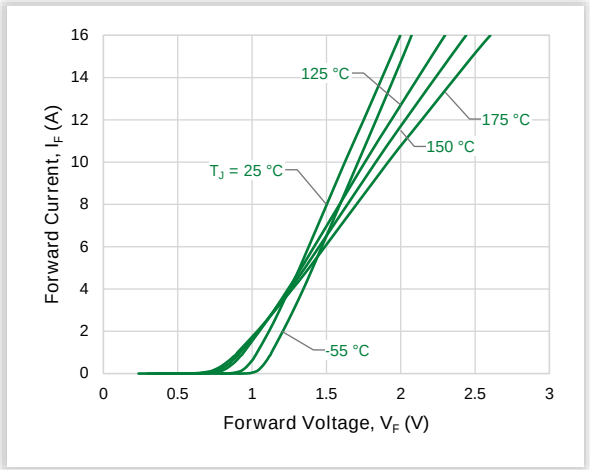


Figure 2. Typical Reverse Characteristics

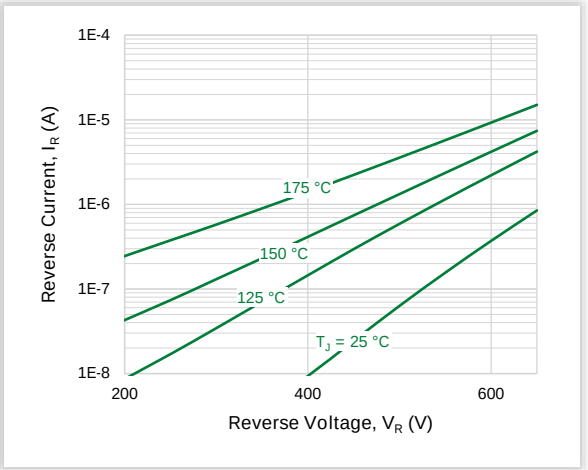


Figure 3. Power Derating

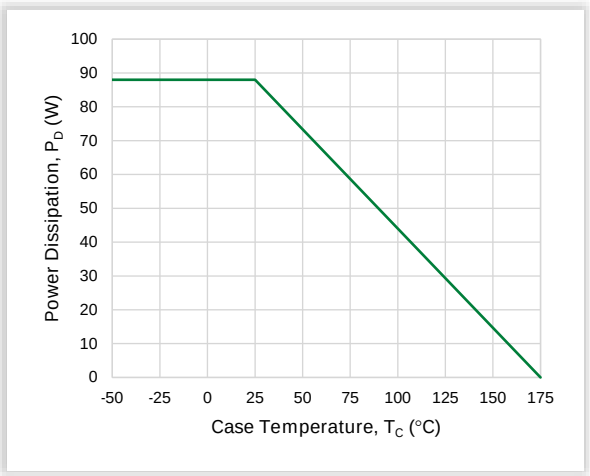


Figure 4. Current Derating

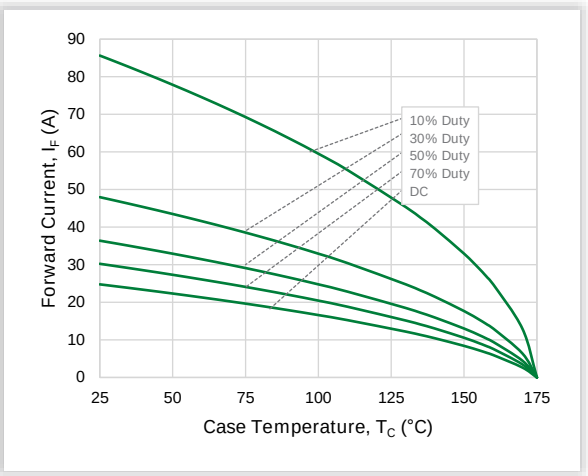


Figure 5. Capacitance vs. Reverse Voltage

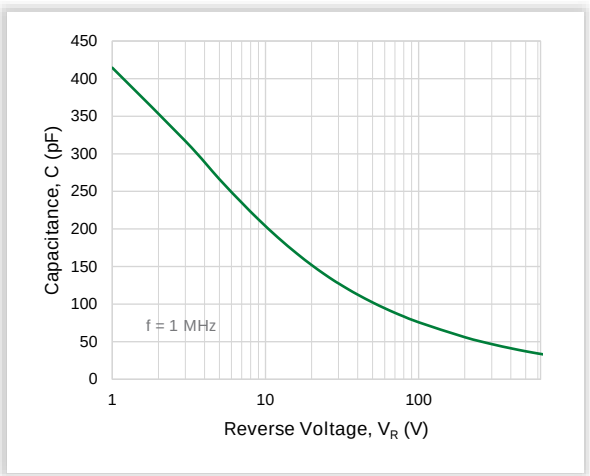


Figure 6. Capacitive Charge vs. Reverse Voltage

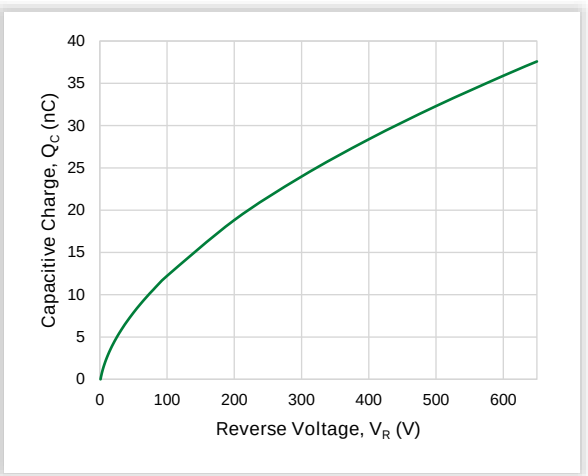


Figure 7. Stored Energy vs. Reverse Voltage

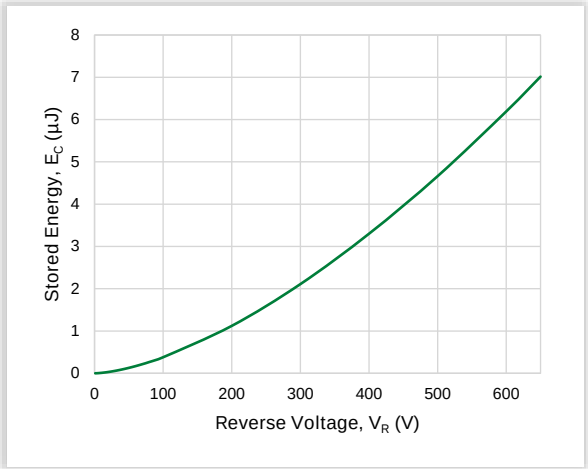
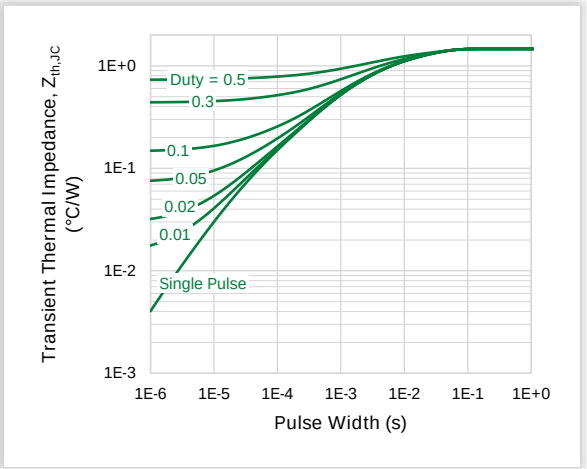
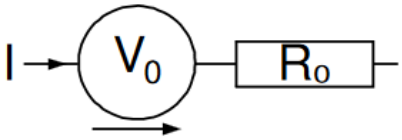


Figure 8. Transient Thermal Impedance



5. Diode V_F Model for Simulation



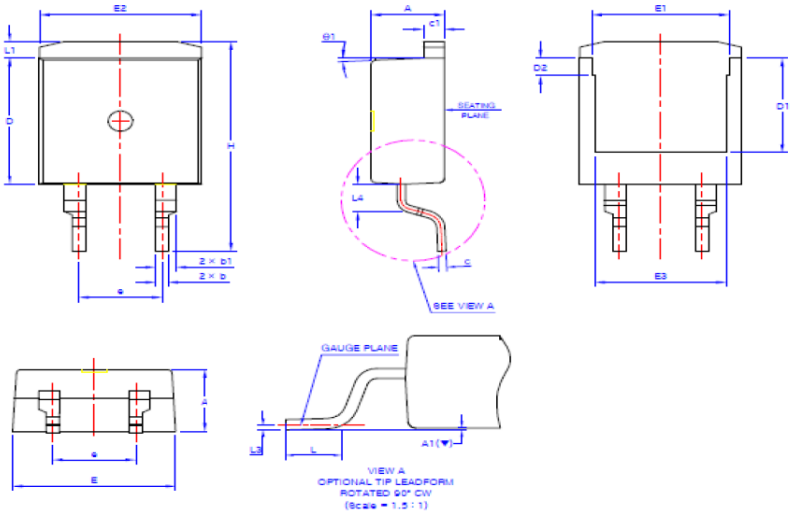
$$V_F(T_J) = V_0 + IR_0$$
$$V_0 = -1.17 \times 10^{-3} \cdot T_J + 1.03 \times 10^{0}$$
$$R_0 = 1.28 \times 10^{-6} \cdot T_J^2 + 6.61 \times 10^{-5} \cdot T_J + 6.02 \times 10^{-2}$$

Notes:

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

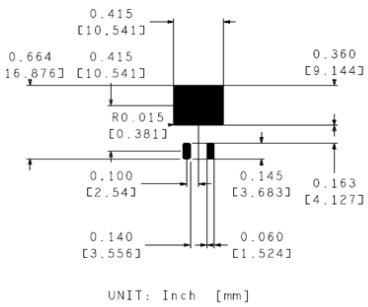
6. Package Dimensions

TO-263-2L Package



Symbol	Millimeters		
	Min	Nom	Max
A	4.30	4.60	4.70
A1(▼)	0.00	-	0.20
b	0.70	0.80	0.90
b1	1.18	1.28	1.38
c	0.45	0.50	0.60
c1	1.25	1.30	1.40
D	9.00	9.20	9.40
D1	6.70	6.90	7.10
D2	1.10	1.30	1.50
E	9.80	10.00	10.20
E1	8.20	8.40	8.60
E2	9.70	9.90	10.10
E3	7.80	8.00	8.20
e	5.08 BSC		
H	15.00	15.30	15.60
L	2.00	2.30	2.60
L1	1.00	1.20	1.40
L3	0.254 BSC		
L4	(2.00)		
Θ1	(3°)		

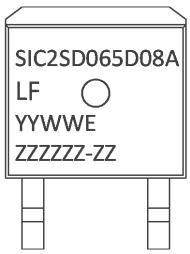
Recommended Solder Pad Layout



Notes:

1. These dimensions do not include protrusions of the mold.
2. The "( )" mark is the reference.
3. Coplanarity : Max 0.10mm
4. Metal finish – matte pure tin plating except trim area.
5. All plastic surface are polish finish.
6. Nominal 0.25 radius on all body edges and corners.

7. Part Numbering and Marking



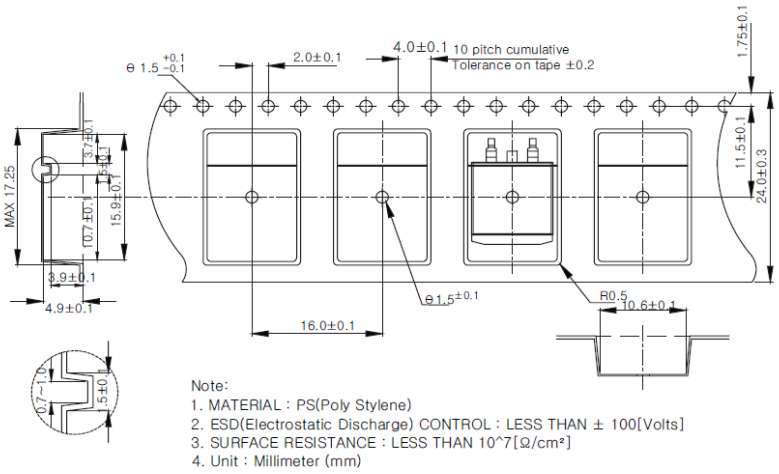
SIC	= SiC Diode
2	= Gen2
SD	= Schottky Diode
065	= Voltage Rating (650 V)
D	= TO-263-2L
08	= Current Rating (8 A)
A	= AEC-Q101 Qualified
YY	= Year
WW	= Week
E	= Special Code
ZZZZZZ-ZZ	= Lot Number

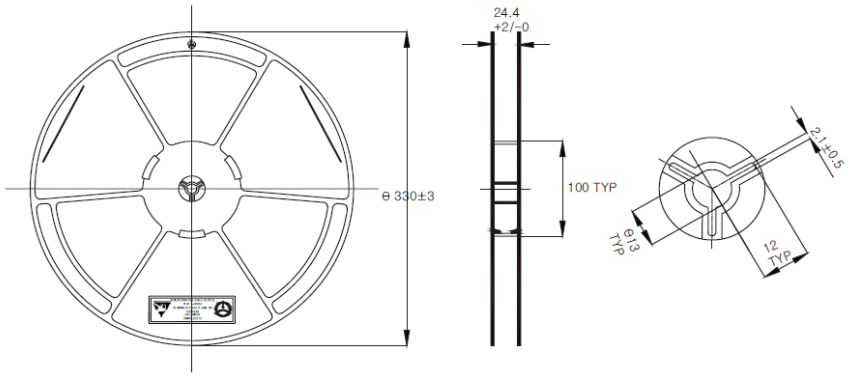
8. Packing Options

Part Number	Marking	Packing Mode	M.O.Q.
LSIC2SD065D08A	SIC2SD065D08A	Tape & Reel	800

9. Packing Specifications

TO-263 Carrier Tape and Reel Specifications





For additional information please visit www.Littelfuse.com/powersemi