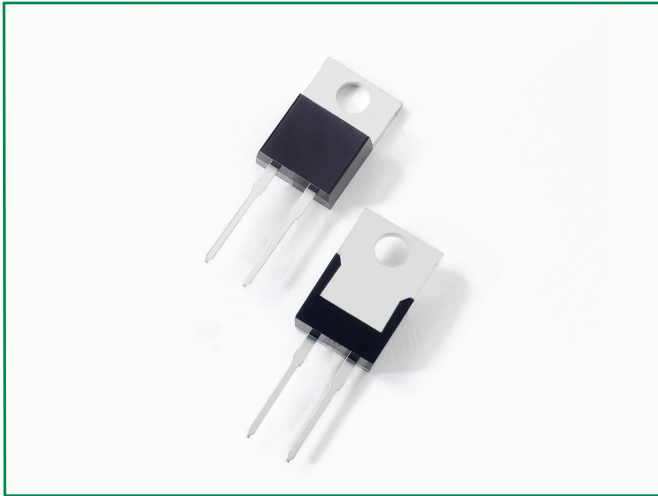


LFUSCD08065A

**HF** **RoHS** **Pb**


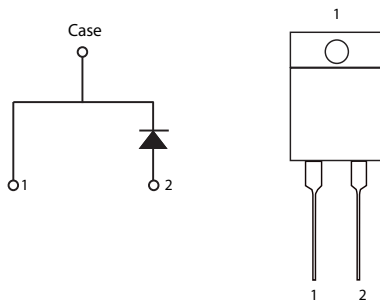
### Description

The LFUSCD series of silicon carbide (SiC) Schottky diodes has near-zero recovery current, high surge capability, and a maximum operating junction temperature of 175 °C. The diode series is 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
- Enhanced surge capability
- Extremely fast, temperature-independent switching behavior
- Dramatically reduced switching losses compared to Si bipolar diodes

### Circuit Diagram



### Applications

- Boost diodes in power factor correction
- Switch-mode power supplies
- Uninterruptible power supplies
- Solar inverters
- Industrial motor drives

### Maximum Ratings

| Characteristics                                       | Symbol     | Conditions                                                                                   | Max.       | Unit |
|-------------------------------------------------------|------------|----------------------------------------------------------------------------------------------|------------|------|
| DC Blocking Voltage                                   | $V_R$      | -                                                                                            | 650        | V    |
| Repetitive Peak Reverse Voltage, $T_J = 25\text{ °C}$ | $V_{RRM}$  |                                                                                              | 650        | V    |
| Surge Peak Reverse Voltage                            | $V_{RSM}$  |                                                                                              | 650        | V    |
| Maximum DC Forward Current                            | $I_F$      | $T_C = 152\text{ °C}$                                                                        | 8          | A    |
| Non-Repetitive Forward Surge Current                  | $I_{FSM}$  | $T_C = 25\text{ °C}$ , 8.3 ms, half sine pulse                                               | 64         | A    |
| Non-Repetitive Peak Forward Current                   | $I_{FMAX}$ | $T_C = 25\text{ °C}$ , 10 $\mu$ S                                                            | 385        | A    |
| Non-Repetitive Avalanche Energy                       | $E_{AS}$   | $T_J = 25\text{ °C}$ , $L = 5\text{ mH}$ , $I_{pk} = 4.9\text{ A}$ , $V_{DD} = 100\text{ V}$ | 67         | mJ   |
| Power Dissipation                                     | $P_{Tot}$  | $T_C = 25\text{ °C}$                                                                         | 115        | W    |
|                                                       |            | $T_C = 152\text{ °C}$                                                                        | 17.6       |      |
| Maximum Operating Junction Temperature                | $T_{JMAX}$ |                                                                                              | 175        | °C   |
| Storage Temperature                                   | $T_{STG}$  |                                                                                              | -55 to 175 | °C   |

### Electrical Characteristics

| Characteristics         | Symbol | Conditions                                                                  | Value |      |      | Unit          |
|-------------------------|--------|-----------------------------------------------------------------------------|-------|------|------|---------------|
|                         |        |                                                                             | Min.  | Typ. | Max. |               |
| Forward Voltage         | $V_F$  | $I_F = 8 \text{ A}, T_J = 25^\circ \text{C}$                                | -     | 1.5  | 1.7  | V             |
|                         |        | $I_F = 8 \text{ A}, T_J = 150^\circ \text{C}$                               | -     | 1.8  | 2.1  |               |
|                         |        | $I_F = 8 \text{ A}, T_J = 175^\circ \text{C}$                               | -     | 1.95 | 2.25 |               |
| Reverse Current         | $I_R$  | $V_R = 650 \text{ V}, T_J = 25^\circ \text{C}$                              | -     | 20   | 230  | $\mu\text{A}$ |
|                         |        | $V_R = 650 \text{ V}, T_J = 175^\circ \text{C}$                             | -     | 40   | 700  |               |
| Total Capacitive Charge | $Q_C$  | $V_R = 400 \text{ V}, I_F = 8 \text{ A}, di/dt = 250 \text{ A}/\mu\text{s}$ | -     | 13   | -    | nC            |
| Total Capacitance       | C      | $V_R = 1 \text{ V}, f = 1 \text{ MHz}$                                      | -     | 260  | -    | pF            |
|                         |        | $V_R = 300 \text{ V}, f = 1 \text{ MHz}$                                    | -     | 29   | -    |               |
|                         |        | $V_R = 600 \text{ V}, f = 1 \text{ MHz}$                                    | -     | 23   | -    |               |

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

### Thermal Characteristics

| Characteristics    | Symbol          | Conditions | Value |      |      | Unit                      |
|--------------------|-----------------|------------|-------|------|------|---------------------------|
|                    |                 |            | Min.  | Typ. | Max. |                           |
| Thermal Resistance | $R_{\theta JC}$ | -          | -     | -    | 1.3  | $^\circ\text{C}/\text{W}$ |

Figure 1: Typical Reverse Characteristics

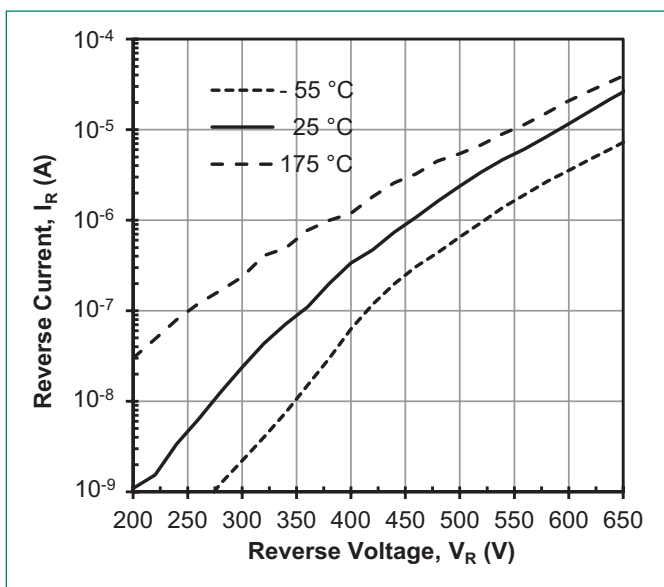


Figure 2: Typical Forward Characteristics

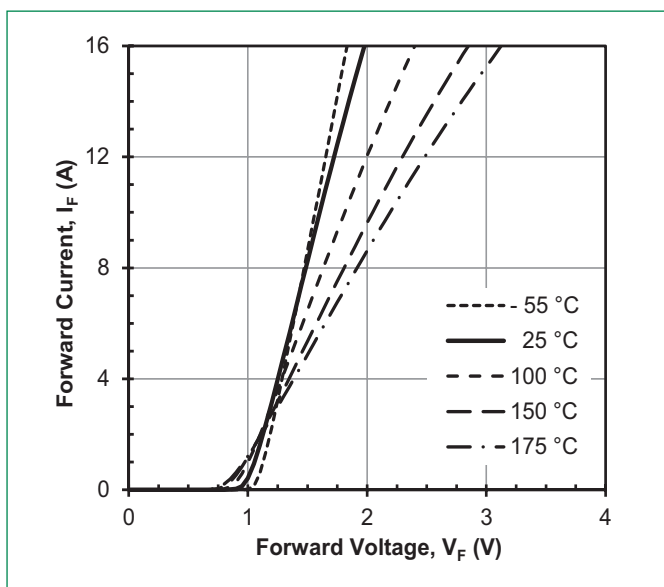


Figure 3: Power Disipation

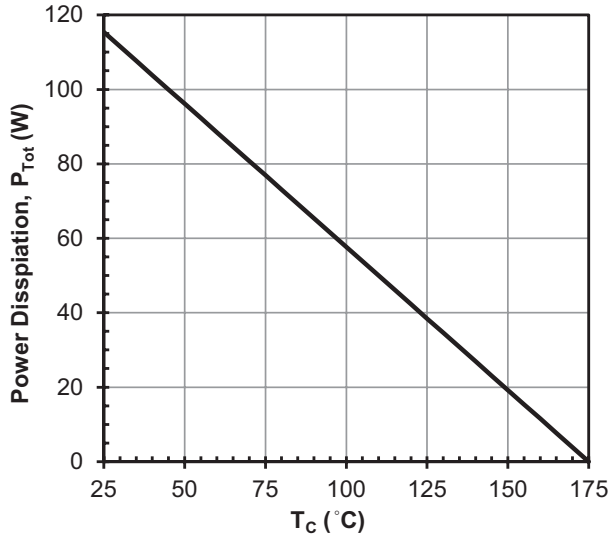


Figure 4: Diode Foward Current

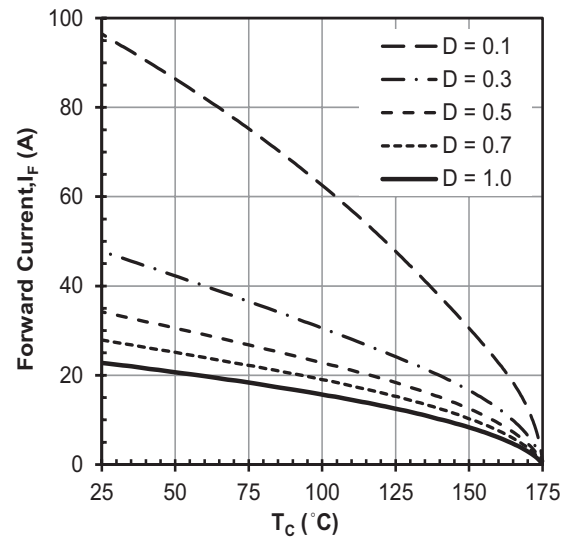


Figure 5: Capacitance vs. Reverse Voltage

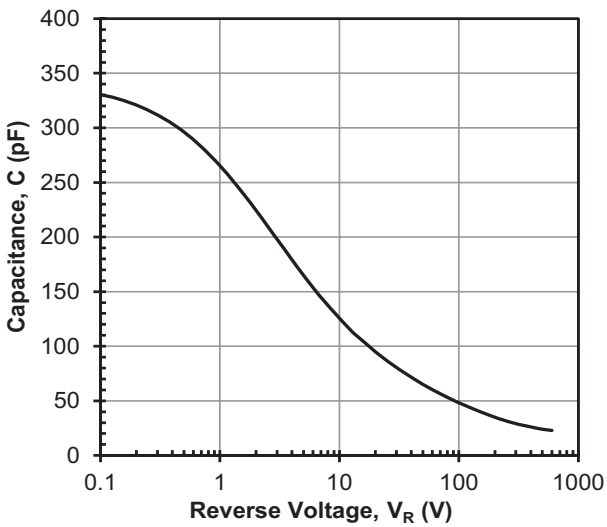
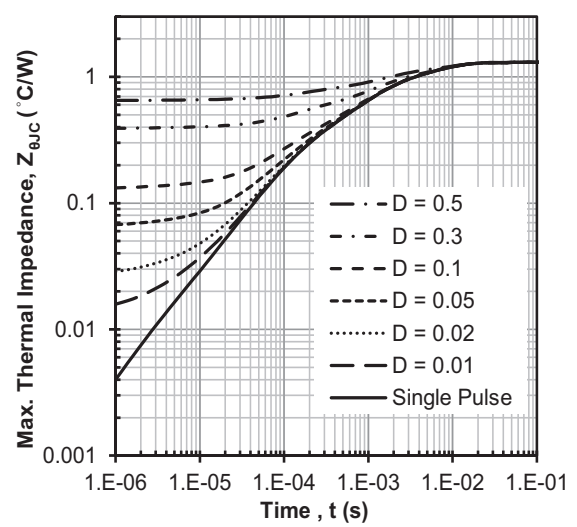
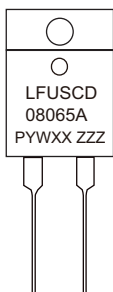


Figure 6: Maximum Transient Thermal Impedance



### Part Marking System



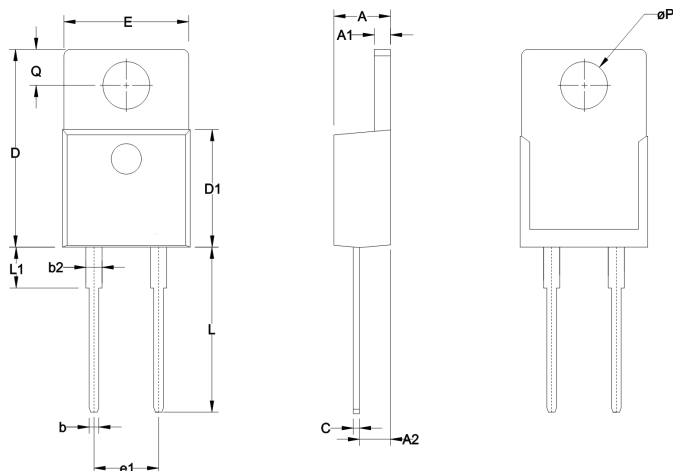
LFU = Littelfuse  
SCD = SiC diode  
08 = Current Rating (8 A)  
065 = Voltage Rating (650 V)  
A = TO-220-2 package  
PYWXX = Date Code  
ZZZ = Lot Number

Date code notes:  
P = assembly code  
Y = year  
W = week  
XX = sequential build number

### Packing Options

| Part Number  | Marking      | Packing Mode  | M.O.Q |
|--------------|--------------|---------------|-------|
| LFUSCD08065A | LFUSCD08065A | 50 pcs / Tube | 500   |

### Dimensions-Package TO-220 2-lead



| Symbol | Inches |       | Millimeters |       |
|--------|--------|-------|-------------|-------|
|        | Min    | Max   | Min         | Max   |
| A      | 0.165  | 0.185 | 4.19        | 4.70  |
| A1     | 0.048  | 0.052 | 1.22        | 1.32  |
| A2     | 0.094  | 0.098 | 2.39        | 2.49  |
| b      | 0.025  | 0.035 | 0.64        | 0.89  |
| b2     | 0.045  | 0.055 | 1.14        | 1.40  |
| C      | 0.018  | 0.025 | 0.46        | 0.64  |
| D      | 0.595  | 0.615 | 15.11       | 15.62 |
| D1     | 0.355  | 0.365 | 9.02        | 9.27  |
| E      | 0.381  | 0.391 | 9.68        | 9.93  |
| e1     | 0.198  | 0.202 | 5.03        | 5.13  |
| L      | 0.500  | 0.510 | 12.70       | 12.95 |
| L1     | 0.120  | 0.150 | 3.05        | 3.81  |
| øP     | 0.143  | 0.147 | 3.63        | 3.73  |
| Q      | 0.100  | 0.120 | 2.54        | 3.05  |

| Mounting | M3/M3.5 | 1Nm        |
|----------|---------|------------|
| Torque   | Screw   | 8.8 lbf-in |

### Packing Specification ( Tube for TO-220 2-lead )

Note: All units in Millimeters. Tolerances  $\pm 0.25\text{mm}$  unless otherwise specified.

