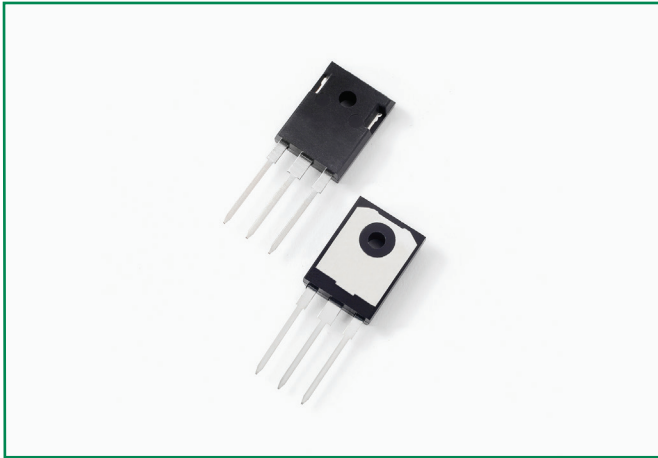


LFUSCD20065B

 HF RoHS Pb


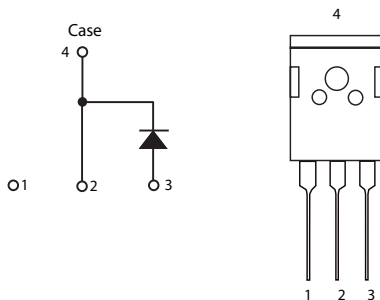
Description

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 | $T_C = 125\text{ °C}$ | 20 | A |
| Non-Repetitive Forward Surge Current | I_{FSM} | $T_C = 25\text{ °C}$, 8.3 ms, half sine pulse | 90 | A |
| Non-Repetitive Peak Forward Current | I_{FMAX} | $T_C = 25\text{ °C}$, 10 μ S | 910 | A |
| Non-Repetitive Avalanche Energy | E_{AS} | $T_j = 25\text{ °C}$, $L = 5\text{ mH}$, $I_{pk} = 7.8\text{ A}$, | 168 | mJ |
| Power Dissipation | P_{Tot} | $T_C = 25\text{ °C}$ | 136 | W |
| | | $T_C = 125\text{ °C}$ | 45 | |
| Maximum Operating Junction Temperature | $T_{J,MAX}$ | | 175 | °C |
| Storage Temperature | T_{STG} | | -55 to 175 | °C |

Electrical Characteristics

| Characteristics | Symbol | Conditions | Value | | | Unit |
|-------------------------|--------|---|-------|------|------|---------------|
| | | | Min. | Typ. | Max. | |
| Forward Voltage | V_F | $I_F = 20\text{ A}, T_J = 25\text{ }^\circ\text{C}$ | - | 1.5 | 1.7 | V |
| | | $I_F = 20\text{ A}, T_J = 150\text{ }^\circ\text{C}$ | - | 1.8 | 2.1 | |
| | | $I_F = 20\text{ A}, T_J = 175\text{ }^\circ\text{C}$ | - | 1.95 | 2.25 | |
| Reverse Current | I_R | $V_R = 650\text{ V}, T_J = 25\text{ }^\circ\text{C}$ | - | 50 | 500 | μA |
| | | $V_R = 650\text{ V}, T_J = 175\text{ }^\circ\text{C}$ | - | 100 | 1600 | |
| Total Capacitive Charge | Q_C | $V_R = 400\text{ V}, I_F = 20\text{ A}, di/dt = 250\text{ A}/\mu\text{s}$ | - | 32 | - | nC |
| Total Capacitance | C | $V_R = 1\text{ V}, f = 1\text{ MHz}$ | - | 580 | - | pF |
| | | $V_R = 300\text{ V}, f = 1\text{ MHz}$ | - | 62 | - | |
| | | $V_R = 600\text{ V}, f = 1\text{ MHz}$ | - | 56 | - | |

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

Thermal Characteristics

| Characteristics | Symbol | Conditions | Value | | | Unit |
|--------------------|-----------------|------------|-------|------|------|---------------------------|
| | | | Min. | Typ. | Max. | |
| Thermal Resistance | $R_{\theta JC}$ | - | - | - | 1.1 | $^\circ\text{C}/\text{W}$ |

Figure 1: Typical Reverse Characteristics

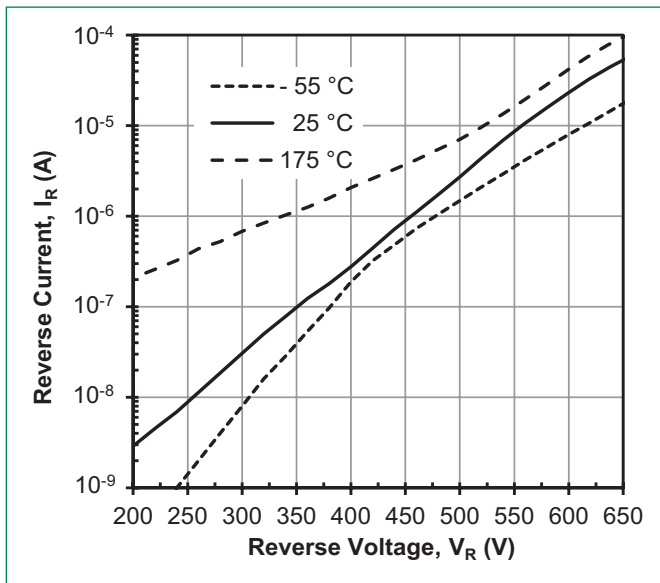


Figure 2: Typical Forward Characteristics

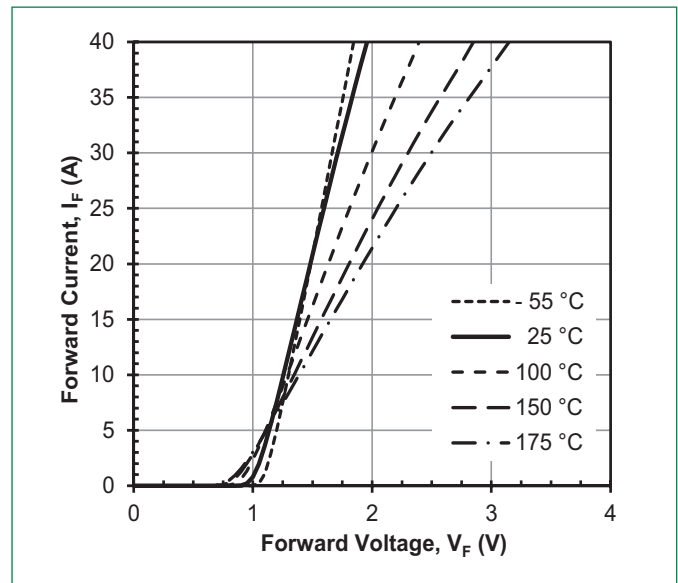


Figure 3: Power Dissipation

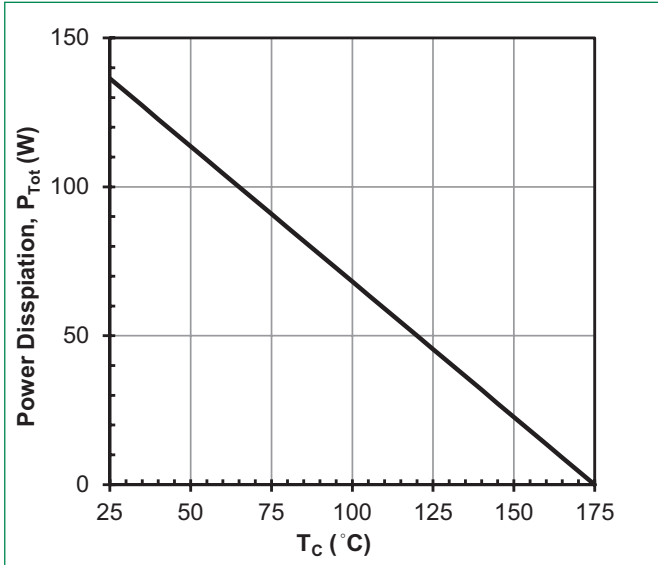


Figure 4: Diode Forward Current

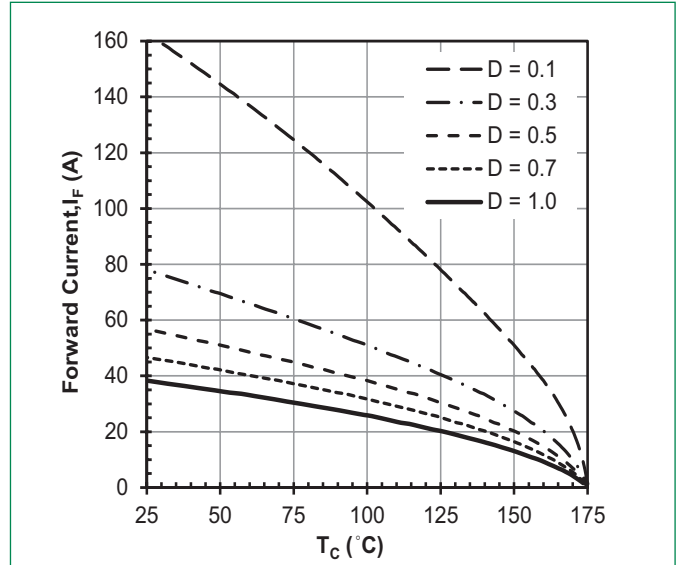


Figure 5: Capacitance vs. Reverse Voltage

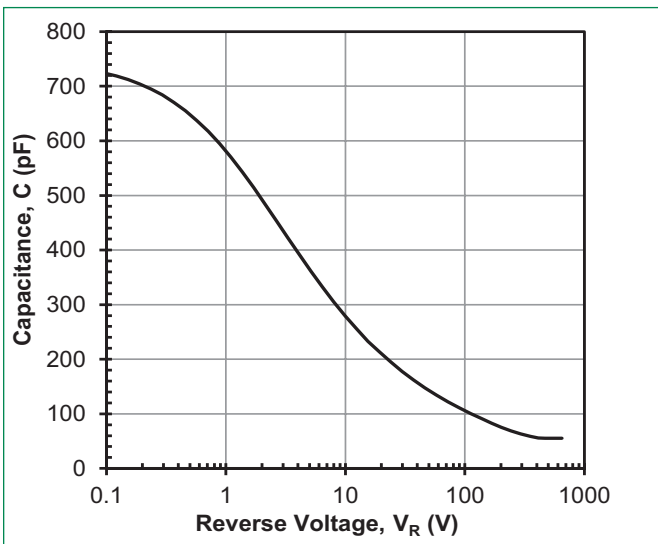
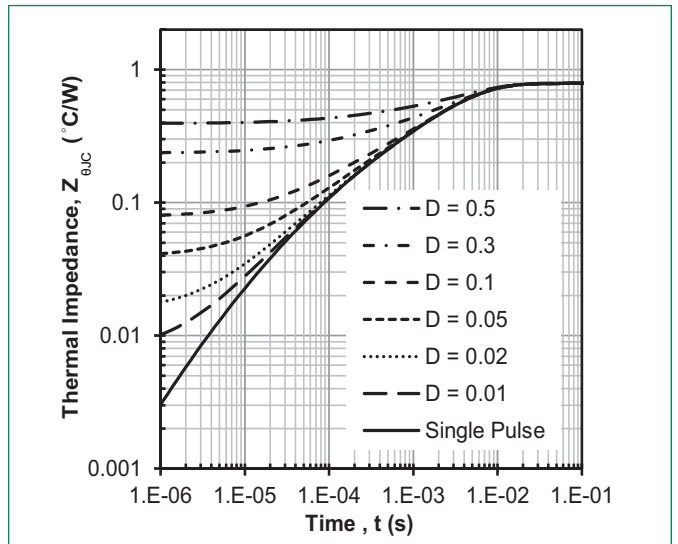
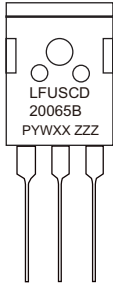


Figure 6: Transient Thermal Impedance



Part Marking System



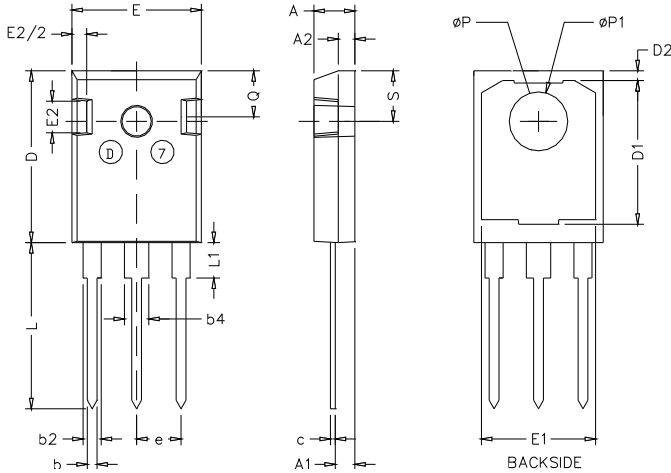
LFU = Littelfuse
 SCD = SiC diode
 20 = Current Rating (20A)
 065 = Voltage Rating (650V)
 B = TO-247-3 package
 PYWXX = Date Code
 ZZZ = Lot Number

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

Packing Options

| Part Number | Marking | Packing Mode | M.O.Q |
|--------------|--------------|---------------|-------|
| LFUSCD20065B | LFUSCD20065B | 30 pcs / Tube | 240 |

Dimensions-Package TO-247 3-lead



| Symbol | Inches | | |
|--------|-----------|-------|-------|
| | Min | Nom | Max |
| A | 0.193 | 0.198 | 0.203 |
| A1 | 0.900 | 0.950 | 0.100 |
| A2 | 0.073 | 0.078 | 0.083 |
| b | 0.042 | 0.047 | 0.052 |
| b2 | 0.075 | 0.080 | 0.094 |
| b4 | 0.113 | 0.118 | 0.133 |
| C | 0.022 | 0.024 | 0.027 |
| D | 0.820 | 0.825 | 0.830 |
| D1 | 0.684 | 0.690 | 0.696 |
| D2 | 0.042 | 0.047 | 0.052 |
| E | 0.621 | 0.626 | 0.631 |
| E1 | 0.547 | 0.552 | 0.557 |
| E2 | 0.135 | 0.146 | 0.157 |
| E2/2 | 0.081 | 0.088 | 0.095 |
| e | 0.215 BSC | | |
| L | 0.789 | 0.794 | 0.799 |
| L1 | 0.164 | 0.170 | 0.176 |
| phi P | 0.140 | 0.142 | 0.144 |
| phi P1 | 0.278 | 0.283 | 0.288 |
| Q | 0.216 | 0.221 | 0.226 |
| S | 0.238 | 0.243 | 0.248 |

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

Packing Specification (Tube for TO-247 3-lead)

