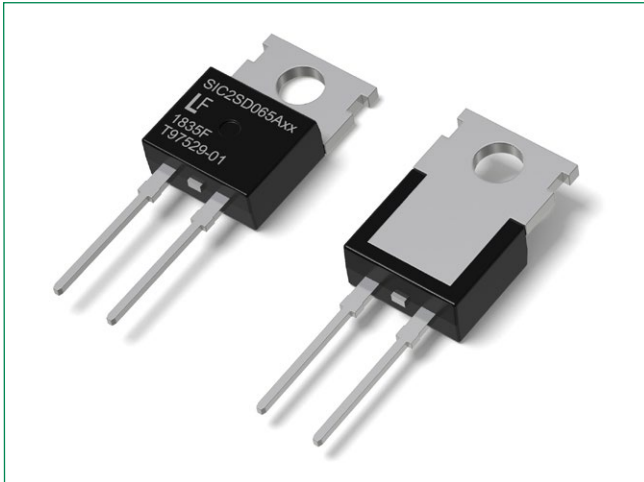


LSIC2SD065A20A 650 V, 20 A SiC Schottky Barrier Diode



\*Image for reference only, for details refer to Dimensions-Package.

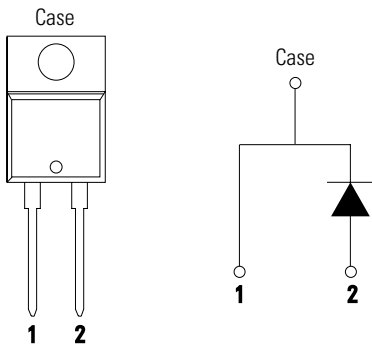
**Description**

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-220-2L**



**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                | $T_{SOLD}$ | -  | 260        | °C   |

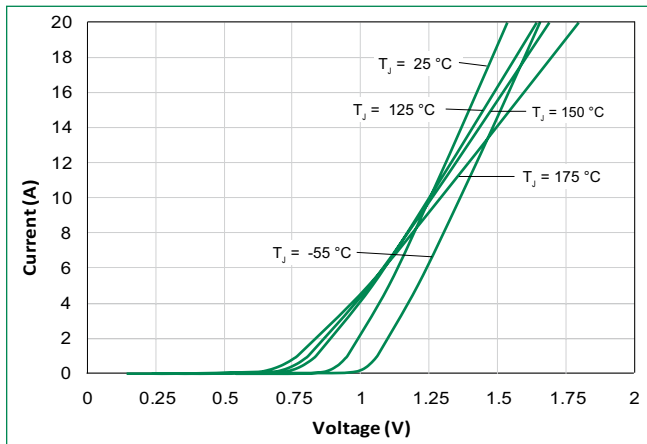
**Electrical Characteristics ( $T_J = 25\text{ }^\circ\text{C}$  unless otherwise specified)**

| 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   | $\mu\text{A}$ |
|                         |        | $V_R = 650\text{ V}, T_J = 175\text{ }^\circ\text{C}$ | -     | 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            |

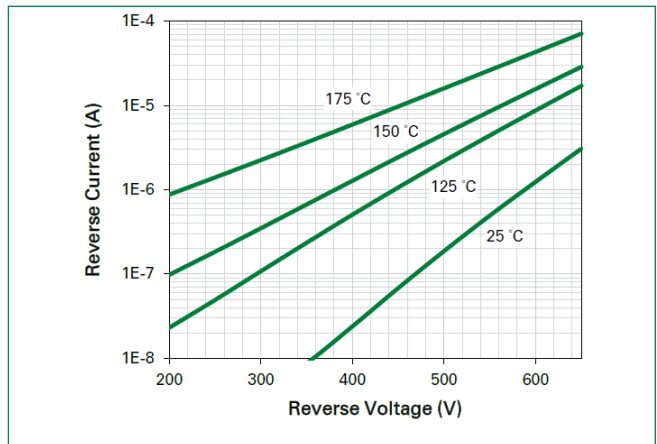
**Thermal Characteristics**

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

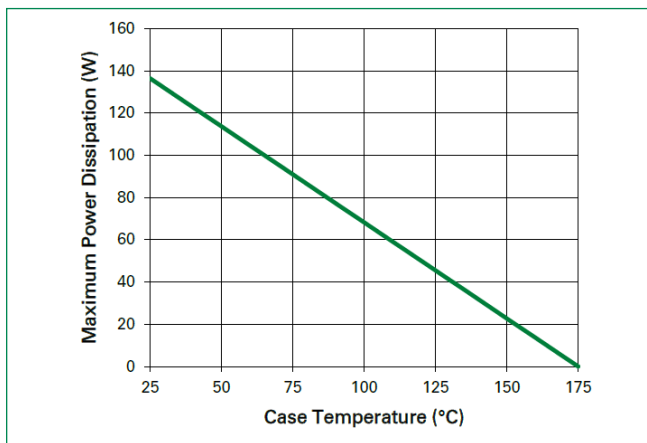
**Figure 1: Typical Forward Characteristics**



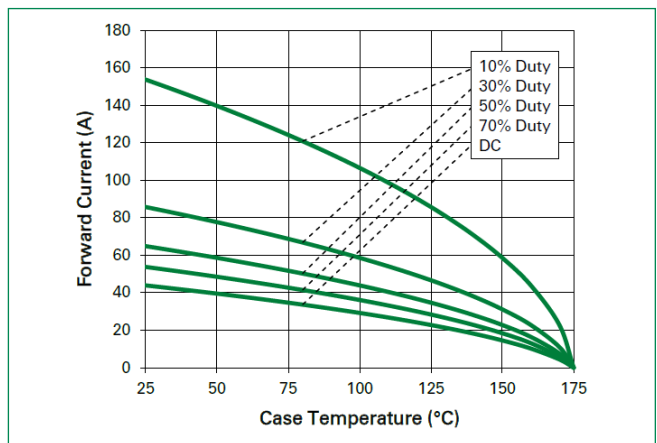
**Figure 2: Typical Reverse Characteristics**



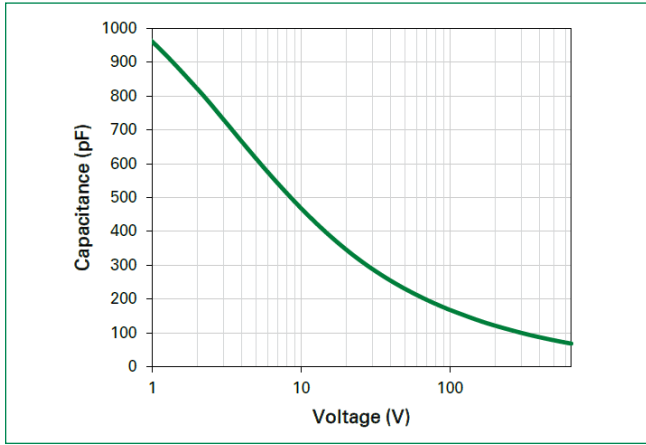
**Figure 3: Power Derating**



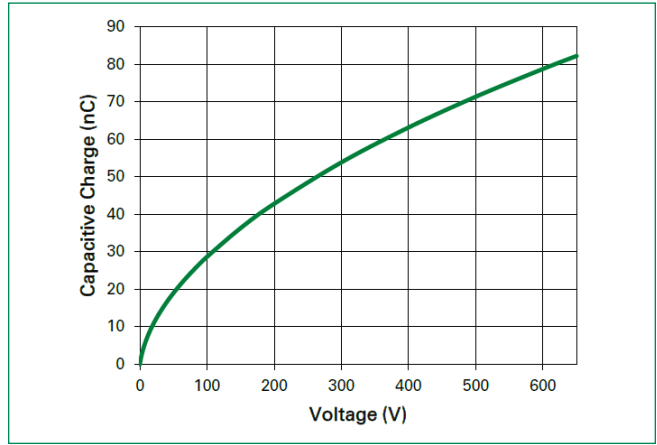
**Figure 4: Current Derating**



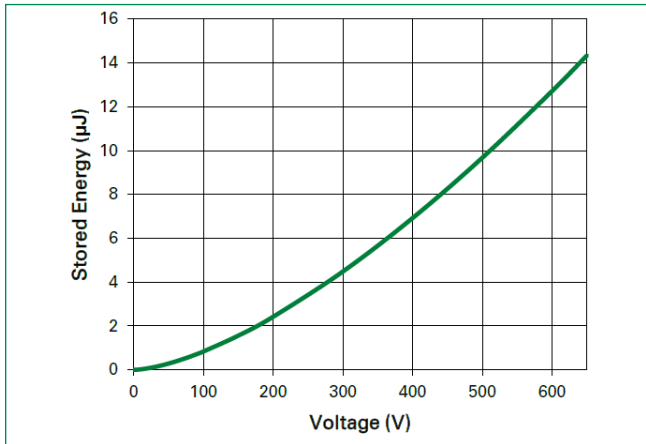
**Figure 5: Capacitance vs. Reverse Voltage**



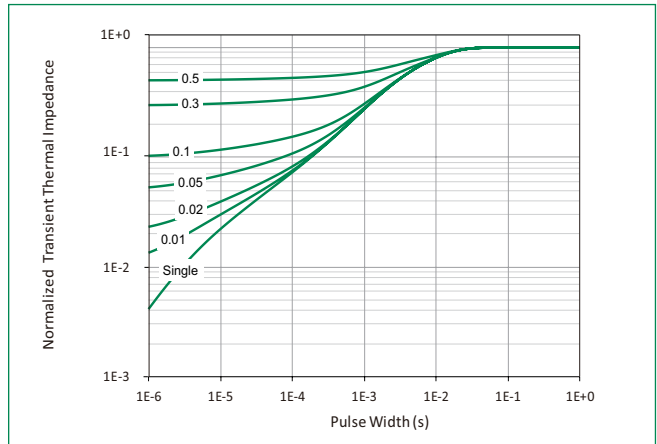
**Figure 6: Capacitive Charge vs. Reverse Voltage**



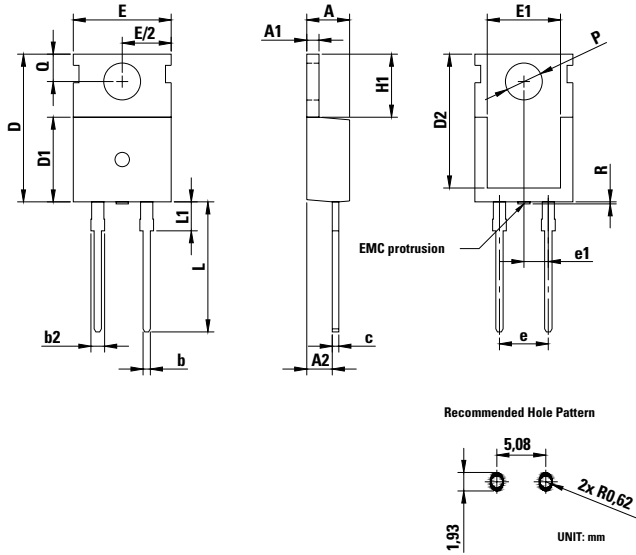
**Figure 7: Stored Energy vs. Reverse Voltage**



**Figure 8: Transient Thermal Impedance**

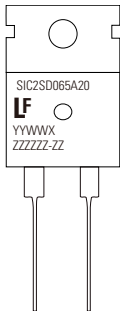


**Dimensions-Package TO-220-2L**



| Symbol | Millimeters |       |       |
|--------|-------------|-------|-------|
|        | Min         | Nom   | Max   |
| A      | 4.30        | 4.45  | 4.70  |
| A1     | 1.14        | 1.27  | 1.40  |
| A2     | 2.20        | -     | 2.74  |
| b      | 0.69        | -     | 0.90  |
| b2     | 1.17        | -     | 1.62  |
| c      | 0.36        | -     | 0.60  |
| D      | 14.90       | -     | 15.90 |
| D1     | 8.62        | -     | 9.40  |
| D2     | 12.50       | -     | 12.95 |
| E      | 9.70        | 10.18 | 10.36 |
| E1     | 7.57        | 7.61  | 8.30  |
| e1     | -           | 2.54  | -     |
| e      | 5.03        | 5.08  | 5.13  |
| H1     | 6.30        | 6.55  | 6.80  |
| L      | 12.88       | 13.50 | 14.00 |
| L1     | 2.39        | -     | 3.25  |
| øP     | 3.50        | 3.84  | 3.96  |
| Q      | 2.65        | -     | 3.05  |
| R      | -           | -     | 0.25  |

**Part Numbering and Marking System**

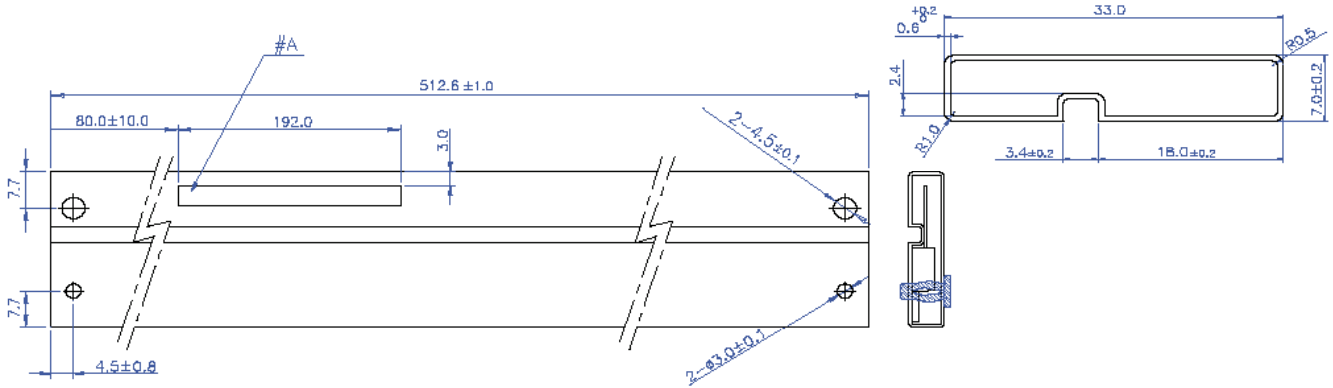


- SIC = SiC Diode
- 2 = Gen2
- SD = Schottky Diode
- 065 = Voltage Rating (650 V)
- A = TO-220 Package (2 Lead)
- 20 = Current Rating (20 A)
- YY = Year
- WW = Week
- X = Special Code
- ZZZZZ-ZZ = Lot Number

**Packing Options**

| Part Number    | Marking      | Packing Mode | M.O.Q |
|----------------|--------------|--------------|-------|
| LSIC2SD065A20A | SIC2SD065A20 | Tube(50pcs)  | 1000  |

**Packing Specification (Tube for TO-220-2L)**



**[ NOTE ]**

1. TUBE
  - MATERIAL : PVC / PET (WITH ANTISTATIC COATING)
  - COLOR : TRANSPARENCY, RED, YELLO
  - MARKING #A : BLACK COLOR, LETTER STYLE : Arial
  - Tube Surface Resistance :  $10^6 \sim 10^{11} \Omega$  /square
  - ESD (Electro Static Discharge) : less than 100 [volts], 6 Months
  - CAMBAR : 1.5 MAX
2. PIN
  - COLOR : GREEN (ONE PIN MUST BE INSERTED IN LEFT-SIDE OF "ANTISTATIC-" AND ANOTHER PIN IS FREE.)

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