

# GC2D008065E

## Silicon Carbide Schottky Diode

|                          |   |     |    |
|--------------------------|---|-----|----|
| $V_{RRM}$                | = | 650 | V  |
| $I_{F(Tc=150^{\circ}C)}$ | = | 8   | A  |
| $Q_C$                    | = | 22  | nC |

### Features

- Zero Reverse Recovery Current
- Zero Forward Recovery Voltage
- High-Frequency Operation
- Temperature-Independent Switching Behavior
- Positive Temperature Coefficient on VF

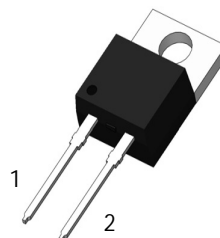
### Benefits

- Replace Bipolar with Unipolar Rectifiers
- Higher System Efficiency
- Reduced Cooling Requirements
- Parallel Devices Without Thermal Runaway

### Applications

- Switch Mode Power Supplies(SMPS)
- Server/TelecomPowerSupplies
- IndustrialPowerSupplies
- SolarInverters

### Package



| Part Number | Package   |
|-------------|-----------|
| GC2D008065E | TO-220-2L |

### Maximum Ratings ( $T_c = 25^{\circ}C$ unless otherwise specified)

| Symbol      | Parameter                                 | Value | Unit | Test Conditions                                      | Note   |
|-------------|---|-------|------|--|--------|
| $V_{RRM}$   | Repetitive Peak Reverse Voltage           | 650   | V    |  |        |
| $V_{RSM}$   | Surge Peak Reverse Voltage                | 650   | V    |  |        |
| $V_{DC}$    | DC Blocking Voltage                       | 650   | V    |  |        |
| $I_F$       | Continuous Forward Current                | 8     | A    | $T_c = 150^{\circ}C$                                 | Fig. 7 |
| $I_{FRM}$   | Repetitive Peak Forward Surge Current     | 60    | A    | $T_c = 25^{\circ}C$ , $t_p = 10$ ms, Half Sine Wave, |        |
| $I_{FSM}$   | Non-Repetitive Peak Forward Surge Current | 75    | A    | $T_c = 25^{\circ}C$ , $t_p = 10$ ms, Half Sine Wave  |        |
| $I_{F,Max}$ | Non-Repetitive Peak Forward Surge Current | 680   | A    | $T_c = 25^{\circ}C$ , $t_p = 10$ $\mu$ s, Pulse      |        |

|                                   |  |             |    |   |        |
|-----------------------------------|--|-------------|----|---|--------|
| P <sub>tot</sub>                  | Power Dissipation                          | 117         | W  | T <sub>C</sub> =25°C<br>T <sub>C</sub> =110°C | Fig. 6 |
|                                   |  | 51          |    |   |        |
| T <sub>J</sub> , T <sub>stg</sub> | Operating Junction and Storage Temperature | -55 to +175 | °C |   |        |

### Electrical Characteristics

| Symbol         | Parameter                 | Typ. | Max. | Unit | Test Conditions  | Note   |
|----------------|---------------------------|------|------|------|--|--------|
| V <sub>F</sub> | Forward Voltage           | 1.45 | 1.70 | V    | I <sub>F</sub> = 8 A T <sub>J</sub> =25°C<br>I <sub>F</sub> = 8 A T <sub>J</sub> =175°C  | Fig. 1 |
|                |                           | 1.75 | 2.00 |      |  |        |
| I <sub>R</sub> | Reverse Current           | 2    | 20   | μA   | V <sub>R</sub> = 650 V T <sub>J</sub> =25°C<br>V <sub>R</sub> = 650 V T <sub>J</sub> =175°C  | Fig. 2 |
|                |                           | 40   | 200  |      |  |        |
| Q <sub>C</sub> | Total Capacitive Charge   | 22   |      | nC   | V <sub>R</sub> = 400 V, T <sub>J</sub> = 25°C<br>Q <sub>C</sub> =∫ <sub>0</sub> <sup>V<sub>R</sub></sup> C(V)dV  | Fig. 4 |
| C              | Total Capacitance         | 440  |      | pF   | V <sub>R</sub> = 0 V, T <sub>J</sub> = 25°C, f = 1 MHz<br>V <sub>R</sub> = 200 V, T <sub>J</sub> = 25°C, f = 1 MHz<br>V <sub>R</sub> = 400 V, T <sub>J</sub> = 25°C, f = 1 MHz | Fig. 3 |
|                |                           | 44   |      |      |  |        |
|                |                           | 38   |      |      |  |        |
| E <sub>c</sub> | Capacitance Stored Energy | 5.8  |      | μJ   | V <sub>R</sub> = 400 V   | Fig. 5 |

### Thermal Characteristics

| Symbol           | Parameter                                | Typ. | Unit | Note   |
|------------------|--|------|------|--------|
| R <sub>θJC</sub> | Thermal Resistance from Junction to Case | 1.28 | °C/W | Fig. 8 |

### Typical Performance

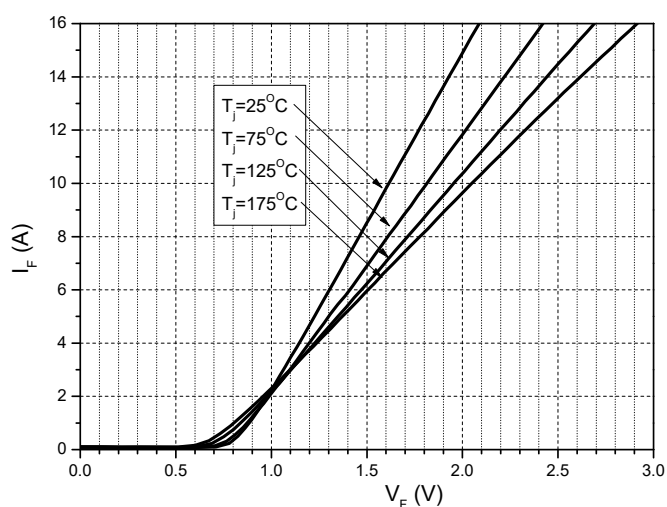


Figure 1. Forward Characteristics

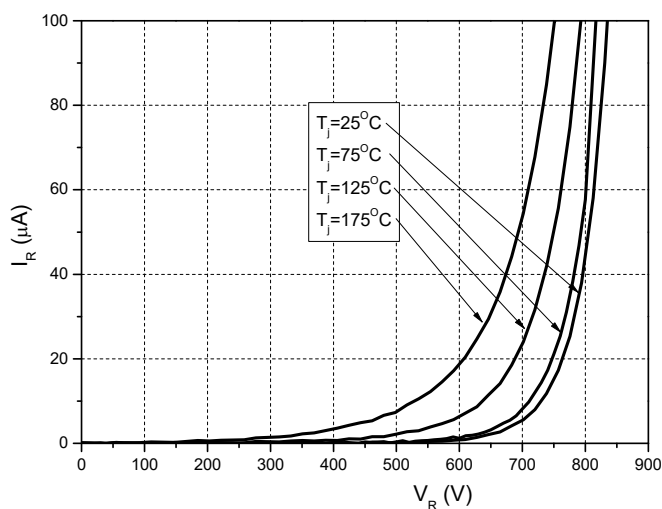


Figure 2. Reverse Characteristics

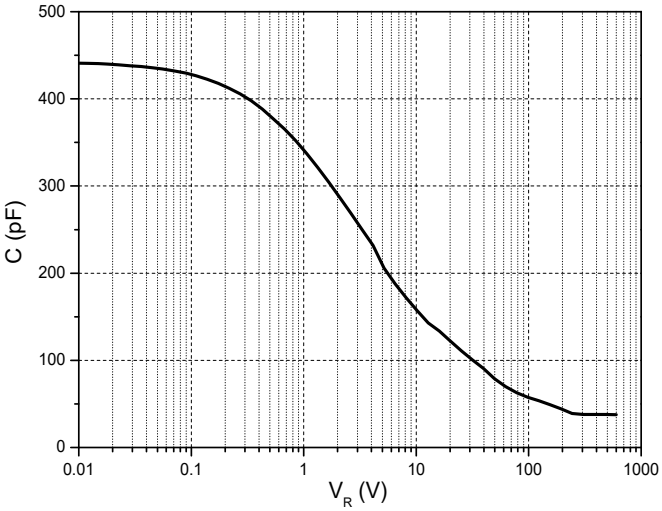


Figure 3. Capacitance vs. Reverse Voltage

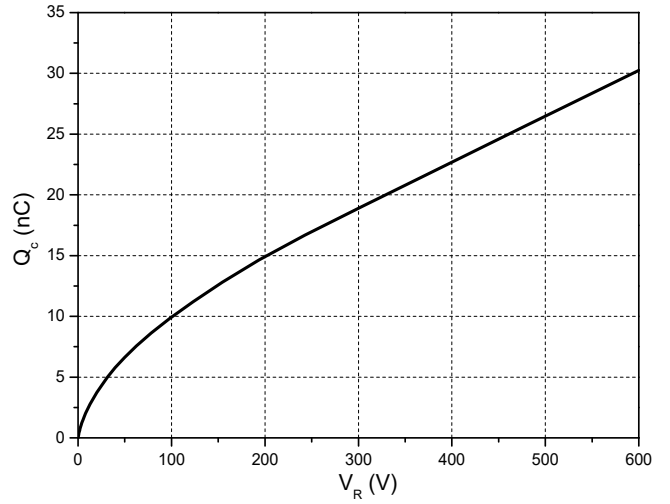


Figure 4. Total Capacitance Charge vs. Reverse Voltage

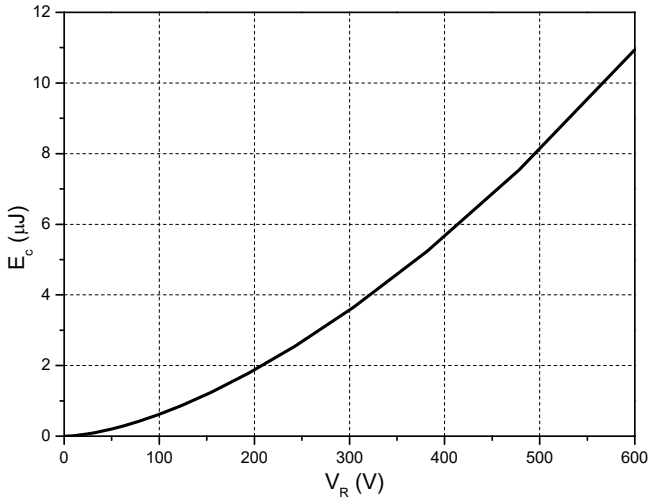


Figure 5. Capacitance Stored Energy

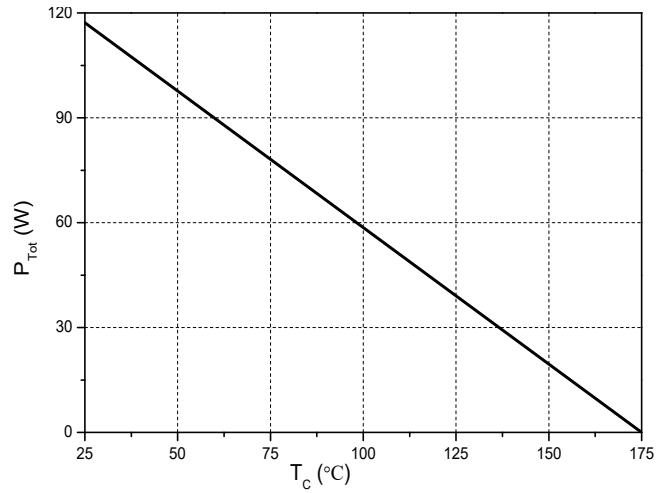


Figure 6. Power Derating

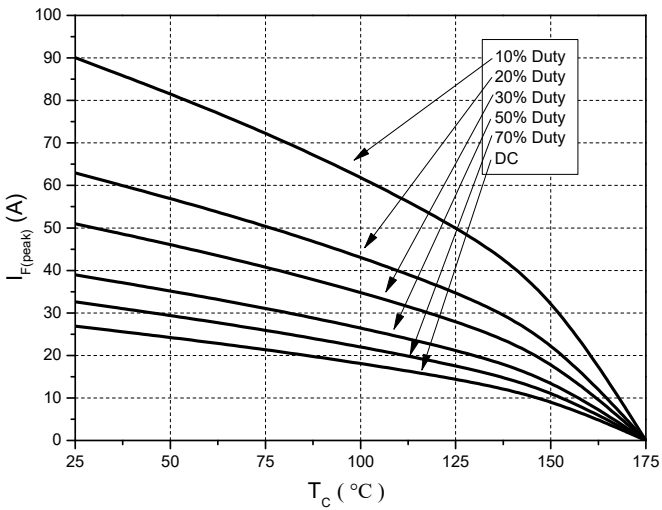


Figure 7. Current Derating

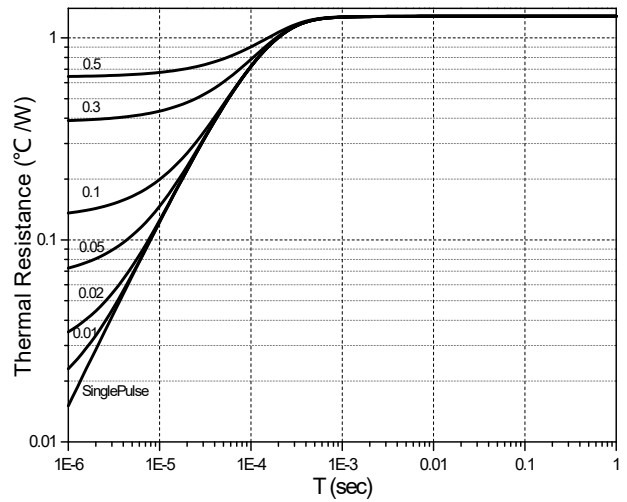


Figure 8. Transient Thermal Impedance

Package Dimensions: TO-220-2L

