

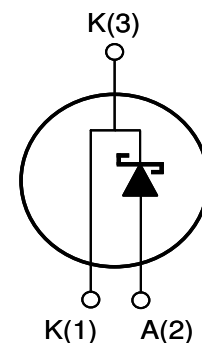
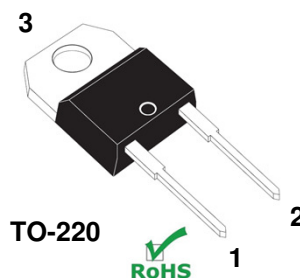
## Silicon Carbide Power Schottky Diode

### Features:

- Positive Temperature Coefficient for Ease of Paralleling
- Temperature Independent Switching Behavior
- 175 °C Maximum Operating Temperature
- Zero Reverse Recovery Current
- Zero Forward Recovery Voltage

### Applications:

- Solar Inverter
- SMPS
- Power Factor Correction
- Induction Heating
- UPS
- Motor Drive



Internal Schematic

## MAXIMUM RATINGS

| Parameter                            | Symbol            | Conditions                                                         | Value       | Unit               |
|--------------------------------------|-------------------|--------------------------------------------------------------------|-------------|--------------------|
| Repetitive Peak Reverse Voltage      | $V_{RRM}$         | $T_J = 25\text{ }^{\circ}\text{C}$                                 | 1200        | V                  |
| DC Blocking Voltage                  | $V_{DC}$          |                                                                    | 1200        |                    |
| Continuous Forward Current           | $I_F$             | $T_C < 145\text{ }^{\circ}\text{C}$                                | 10          | A                  |
|                                      |                   | $T_C < 100\text{ }^{\circ}\text{C}$                                | 17          |                    |
| Peak Repetitive Forward Current      | $I_{FRM}$         | $T_C = 125\text{ }^{\circ}\text{C}$ , $D = 0.1$                    | 50          |                    |
| Non-Repetitive Forward Surge Current | $I_{FSM}$         | $T_C = 25\text{ }^{\circ}\text{C}$ , $t_p = 10\text{ ms}$          | 45          |                    |
|                                      |                   | $T_C = 25\text{ }^{\circ}\text{C}$ , $t_p = 10\text{ }\mu\text{s}$ | 250         |                    |
| Power Dissipation                    | $P_{TOT}$         | $T_C = 25\text{ }^{\circ}\text{C}$                                 | 136         | W                  |
| Operating and Storage Temperature    | $T_J$ , $T_{stg}$ |                                                                    | -55 to +175 | $^{\circ}\text{C}$ |

## THERMAL CHARACTERISTICS

| Parameter                            | Symbol       | Conditions | Value |     |     | Unit                          |
|--------------------------------------|--------------|------------|-------|-----|-----|-------------------------------|
|                                      |              |            | Min   | Typ | Max |                               |
| Thermal Resistance, junction-case    | $R_{th\ JC}$ |            | -     | 1.1 | -   | $^{\circ}\text{C} / \text{W}$ |
| Thermal Resistance, junction-ambient | $R_{th\ JA}$ |            | -     | 62  | -   |                               |

ELECTRICAL CHARACTERISTICS, at  $T_j = 25\text{ C}$  unless otherwise stated

| Parameter               | Symbol | Conditions                                                            | Value |      |     | Unit          |
|-------------------------|--------|-----------------------------------------------------------------------|-------|------|-----|---------------|
|                         |        |                                                                       | Min   | Typ  | Max |               |
| Forward Voltage         | $V_F$  | $I_F = 10\text{ A}, T_j = 25\text{ }^{\circ}\text{C}$                 | -     | 1.6  | 1.8 | V             |
|                         |        | $I_F = 10\text{ A}, T_j = 175\text{ }^{\circ}\text{C}$                | -     | 2.4  | 2.9 |               |
| Reverse Current         | $I_R$  | $V_R = 1200\text{ V}, T_j = 25\text{ }^{\circ}\text{C}$               | -     | 10   | 100 | $\mu\text{A}$ |
|                         |        | $V_R = 1200\text{ V}, T_j = 175\text{ }^{\circ}\text{C}$              | -     | 200  | -   |               |
| Total Capacitive Charge | $Q_C$  | $V_R = 400\text{ V}, I_F = 10\text{ A},$<br>$di/dt = 500\text{ A/us}$ | -     | 40   | -   | nC            |
| Total Capacitance       | C      | $V_R = 1\text{ V}, f = 100\text{ kHz}$                                | -     | 1153 | -   | pF            |
|                         |        | $V_R = 300\text{ V}, f = 100\text{ kHz}$                              | -     | 48   | -   |               |
|                         |        | $V_R = 600\text{ V}, f = 100\text{ KHz}$                              | -     | 33   | -   |               |

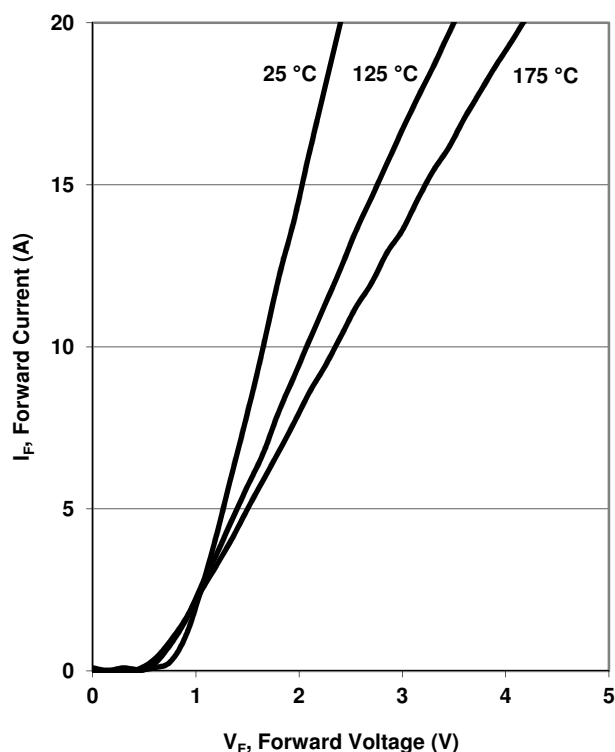


Figure 1. Typ. Forward Characteristics

$$I_F = f(V_F); \text{ parameter: } T_j$$

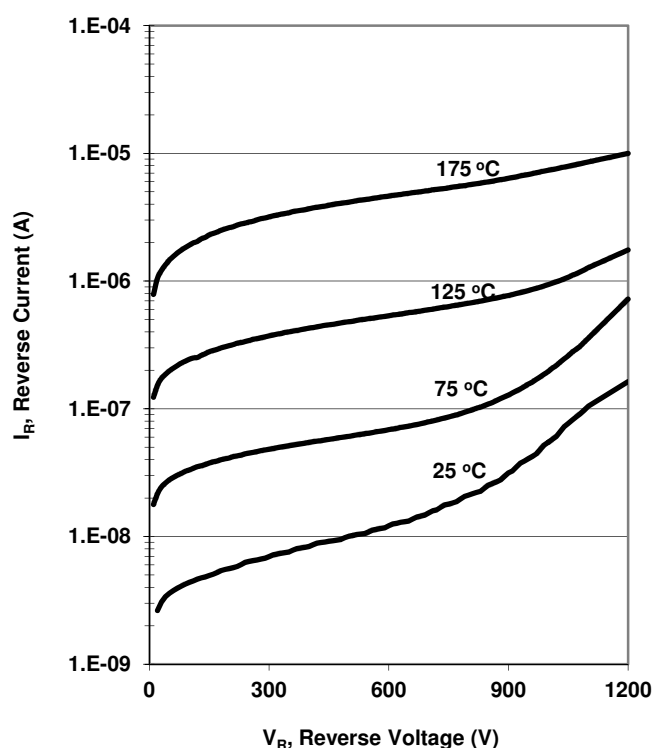


Figure 2. Typ. Reverse Characteristics

$$I_R = f(V_R)$$

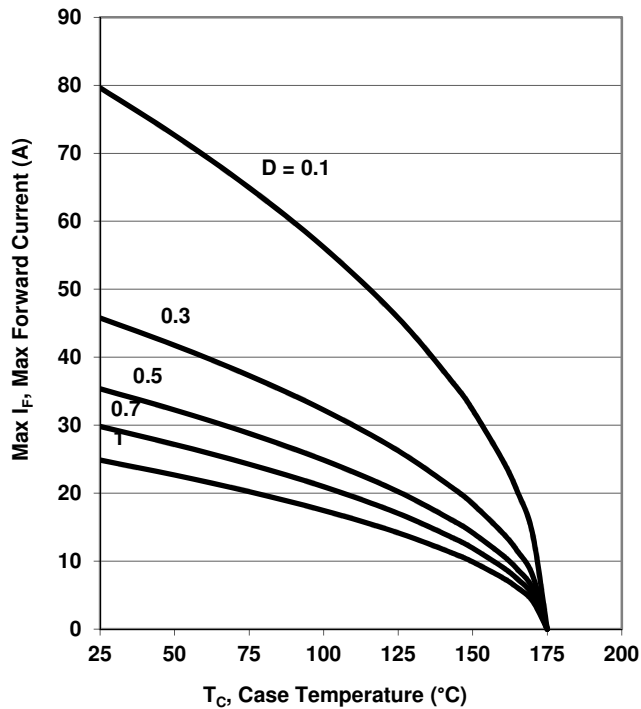


Figure 3. Max Forward Current  
 $I_F = f(T_C)$ ;  $T_j < 175\text{ }^{\circ}\text{C}$ ;  $R_{th,jc(max)}$

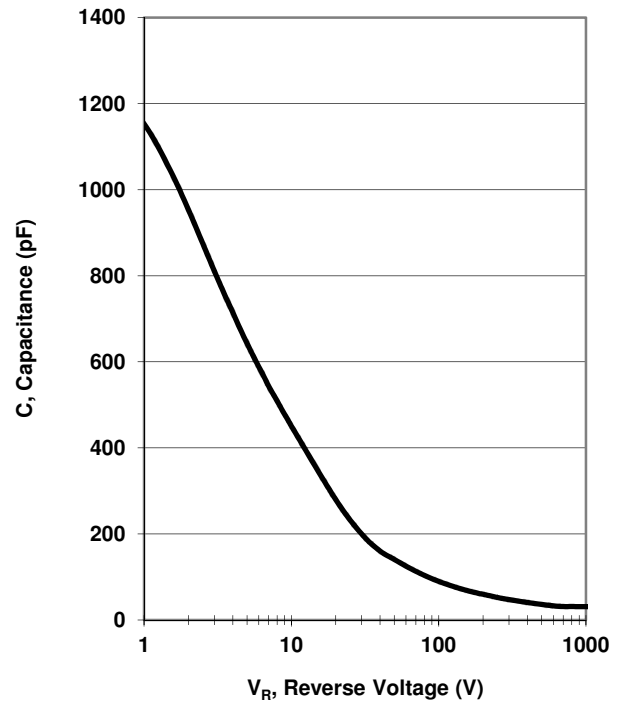


Figure 4. Typ. Capacitance vs.  
Reverse Voltage  
 $C = f(V_R)$ ;  $T_C = 25\text{ }^{\circ}\text{C}$ ;  $f = 1\text{ MHz}$

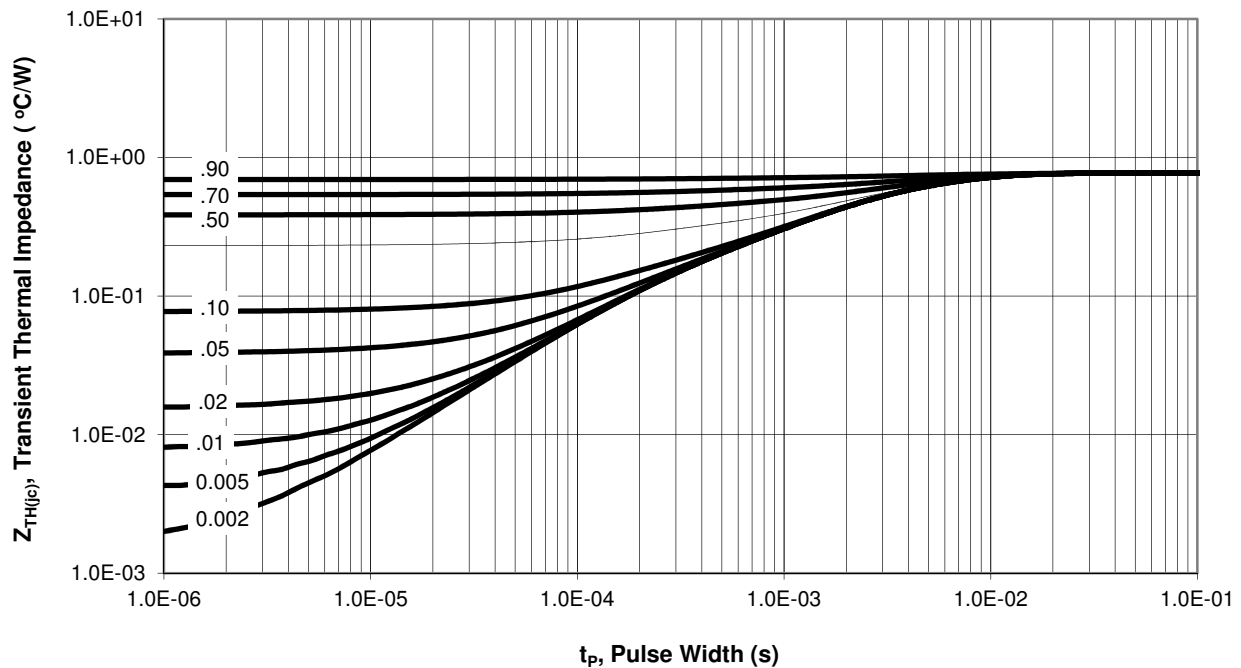
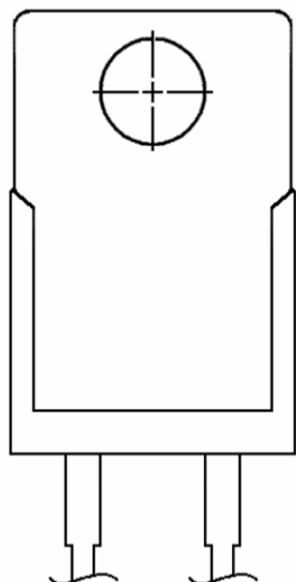
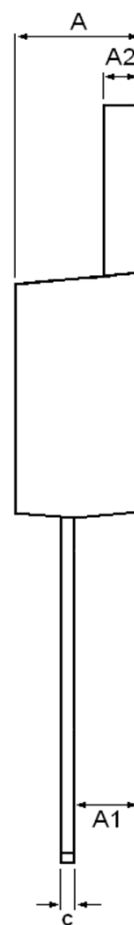
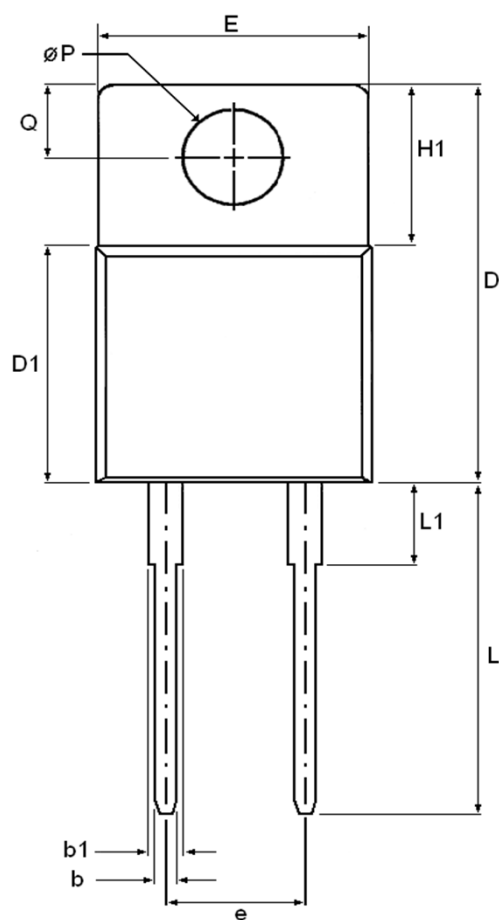


Figure 5. Transient Thermal Impedance  
 $Z_{th(jc)} = f(t_p)$ ; parameter: Duty Ratio

**Package Dimensions: TO-220**



| DIM | MILLIMETERS |        | INCHES |       |
|-----|-------------|--------|--------|-------|
|     | MIN         | MAX    | MIN    | MAX   |
| A   | 4.191       | 4.699  | 0.165  | 0.185 |
| A1  | 2.387       | 2.489  | 0.094  | 0.098 |
| A2  | 1.219       | 1.321  | 0.048  | 0.052 |
| b   | 0.635       | 0.889  | 0.025  | 0.035 |
| b1  | 1.143       | 1.397  | 0.145  | 0.055 |
| c   | 0.458       | 0.635  | 0.018  | 0.025 |
| D   | 15.113      | 16.621 | 0.595  | 0.615 |
| D1  | 9.017       | 9.271  | 0.355  | 0.365 |
| e   | 5.080       |        | 0.200  |       |
| E   | 9.677       | 9.931  | 0.381  | 0.391 |
| H1  | 6.096       | 6.350  | 0.240  | 0.250 |
| L   | 12.700      | 12.954 | 0.500  | 0.510 |
| L1  | 3.048       | 3.302  | 0.120  | 0.130 |
| Q   | 2.540       | 3.048  | 0.100  | 0.120 |
| ØP  | 3.632       | 3.734  | 0.143  | 0.147 |

Published by  
SemiSouth Laboratories, Inc.  
201 Research Boulevard  
Starkville, MS 39759 USA  
© SemiSouth Laboratories, Inc. 2011

Information in this document supersedes and replaces all information previously supplied.

Information in this document is provided solely in connection with SemiSouth products. SemiSouth Laboratories, Inc. reserves the right to make changes, corrections, modifications or improvements, to this document without notice.

No license, express or implied to any intellectual property rights is granted under this document.

Unless expressly approved in writing by an authorized representative of SemiSouth, SemiSouth products are not designed, authorized or warranted for use in military, aircraft, space, life saving, or life sustaining applications, nor in products or systems where failure or malfunction may result in personal injury, death, or property or environmental damage.