

**Silicon Carbide Schottky Diode**

|                                       |   |       |
|---------------------------------------|---|-------|
| $V_{RRM}$                             | = | 650 V |
| $I_F (T_C=157\text{ }^\circ\text{C})$ | = | 8 A   |
| $Q_C$                                 | = | 28 nC |

**Features**

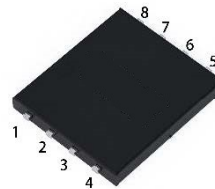
- 650 V Schottky Rectifier
- Zero Reverse Recovery Current
- High-Frequency Operation
- Temperature-Independent Switching
- Extremely Fast Switching

**Benefits**

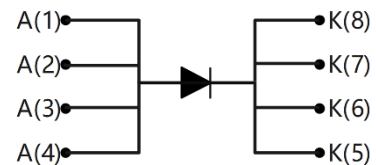
- Replace Bipolar with Unipolar Rectifiers
- Essentially No Switching Losses
- High Efficiency
- Reduction of Heat Sink Requirements
- Parallel Devices Without Thermal Runaway

**Applications**

- Switching Mode Power Supply
- Boost Diodes in PFC
- DC/DC Converters
- AC/DC Converters
- Free Wheeling Diodes in Inverter

**Package**


DFN 5\*6


**Maximum Ratings** (  $T_C = 25\text{ }^\circ\text{C}$  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                |                                                                                                      |        |
| $V_R$     | DC Peak Reverse Voltage              | 650            | V                |                                                                                                      |        |
| $I_F$     | Continuous Forward Current           | 32<br>15<br>8  | A                | $T_C=25\text{ }^\circ\text{C}$<br>$T_C=135\text{ }^\circ\text{C}$<br>$T_C=157\text{ }^\circ\text{C}$ | Fig. 3 |
| $I_{FSM}$ | Non-Repetitive Forward Surge Current | 55             | A                | $T_C=25\text{ }^\circ\text{C}$ , $t_p=10\text{ ms}$ , Half Sine Pulse                                |        |
| $P_{tot}$ | Power Dissipation                    | 150<br>65      | W                | $T_C=25\text{ }^\circ\text{C}$<br>$T_C=110\text{ }^\circ\text{C}$                                    | Fig. 4 |
| $T_J$     | Operating Junction Range             | -55 to<br>+175 | $^\circ\text{C}$ |                                                                                                      |        |
| $T_{stg}$ | Storage Temperature Range            | -55 to<br>+175 | $^\circ\text{C}$ |                                                                                                      |        |

## Silicon Carbide Schottky Diode

### Electrical Characteristics

| Symbol | Parameter                 | Typ.            | Max.        | Unit          | Test Conditions                                                                                                                                                                                                          | Note   |
|--------|---------------------------|-----------------|-------------|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| $V_F$  | Forward Voltage           | 1.38<br>1.8     | 1.65<br>2.4 | V             | $I_F = 8\text{ A}, T_J = 25\text{ }^\circ\text{C}$<br>$I_F = 8\text{ A}, T_J = 175\text{ }^\circ\text{C}$                                                                                                                | Fig. 1 |
| $I_R$  | Reverse Current           | 3<br>10         | 50<br>180   | $\mu\text{A}$ | $V_R = 650\text{ V}, T_J = 25\text{ }^\circ\text{C}$<br>$V_R = 650\text{ V}, T_J = 175\text{ }^\circ\text{C}$                                                                                                            | Fig. 2 |
| $Q_C$  | Total Capacitive Charge   | 28              |             | nC            | $V_R = 400\text{ V}, I_F = 8\text{ A},$<br>$T_J = 25\text{ }^\circ\text{C}$                                                                                                                                              | Fig. 6 |
| $C$    | Total Capacitance         | 540<br>56<br>42 |             | pF            | $V_R = 0\text{ V}, T_J = 25\text{ }^\circ\text{C}, f = 1\text{ MHz}$<br>$V_R = 200\text{ V}, T_J = 25\text{ }^\circ\text{C}, f = 1\text{ MHz}$<br>$V_R = 400\text{ V}, T_J = 25\text{ }^\circ\text{C}, f = 1\text{ MHz}$ | Fig. 5 |
| $E_C$  | Capacitance Stored Energy | 3.7             |             | $\mu\text{J}$ | $V_R = 400\text{ V}$                                                                                                                                                                                                     | Fig. 7 |

Note: This is a majority carrier diode, so there is no reverse recovery charge.

### Thermal Characteristics

| Symbol          | Parameter                                | Min. | Typ. | Max. | Unit               | Note  |
|-----------------|------------------------------------------|------|------|------|--------------------|-------|
| $R_{\theta JC}$ | Thermal Resistance from Junction to Case |      | 1.0  |      | $^\circ\text{C/W}$ | Fig.8 |

### Typical Performance

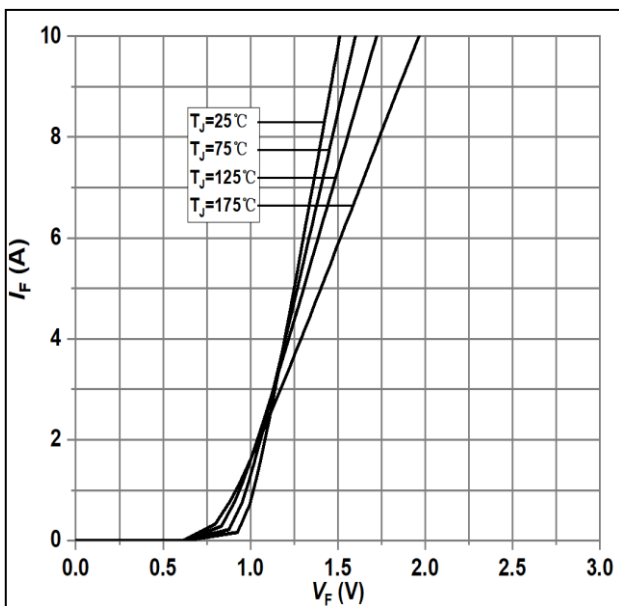


Figure 1: Forward Characteristics

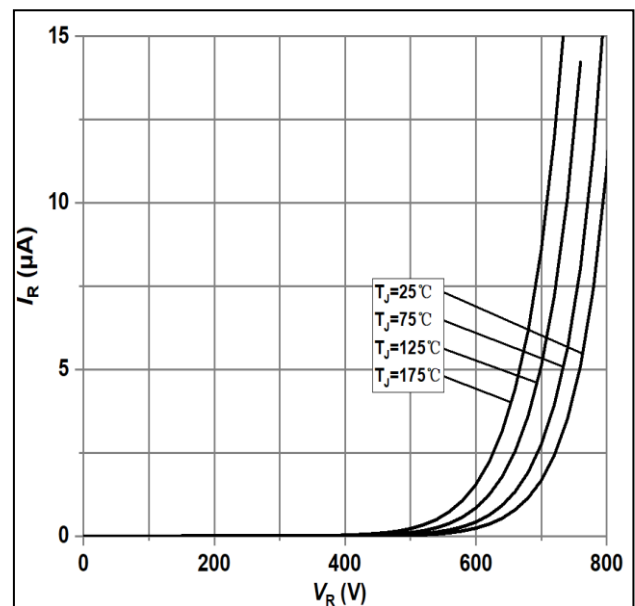


Figure 2: Reverse Characteristics

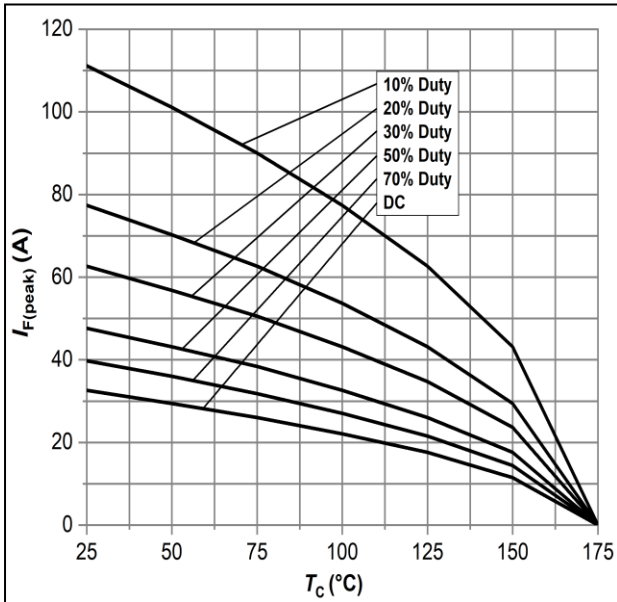
**Silicon Carbide Schottky Diode**
**Typical Performance**


Figure 3: Current Derating

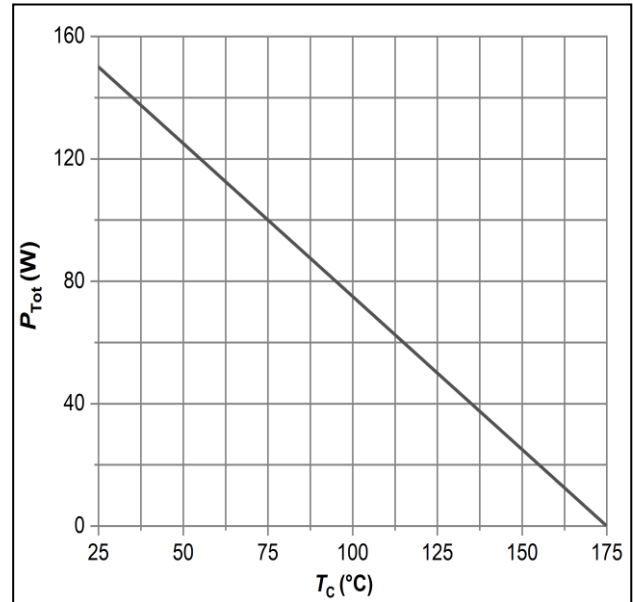


Figure 4: Power Derating

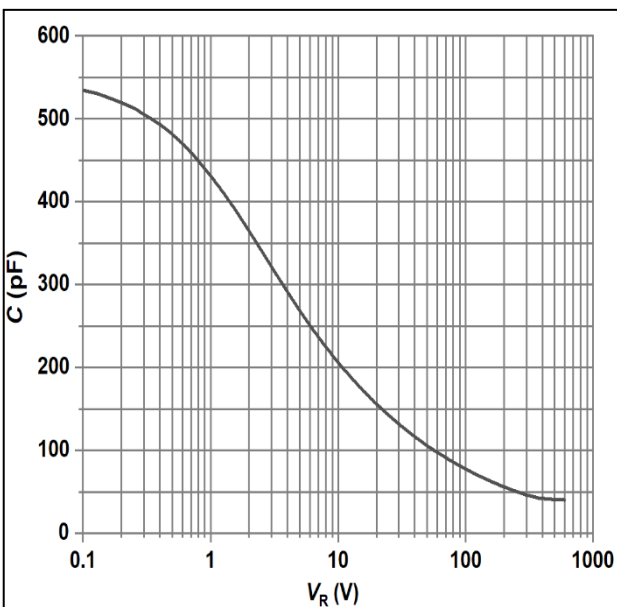


Figure 5: Capacitance vs. Reverse Voltage

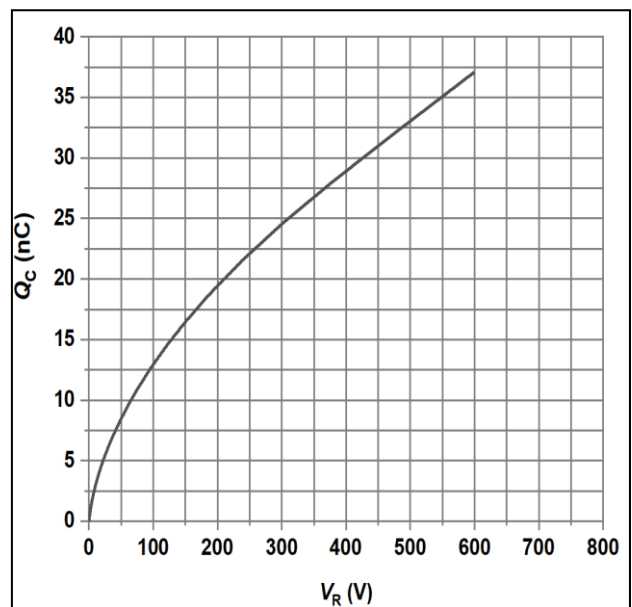


Figure 6: Total Capacitance Charge vs. Reverse Voltage

**Silicon Carbide Schottky Diode**

**Typical Performance**

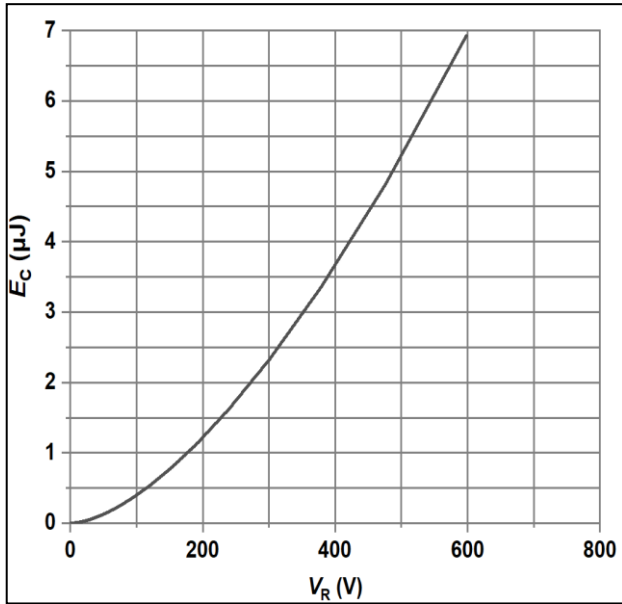


Figure 7: Typical Capacitance Stored Energy

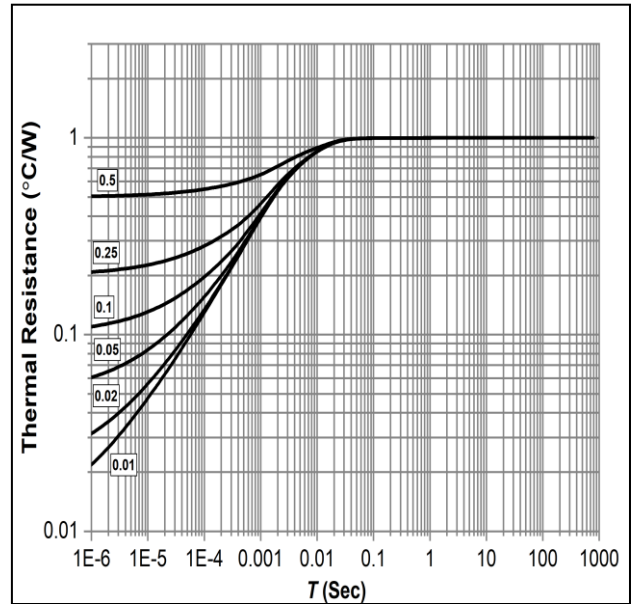
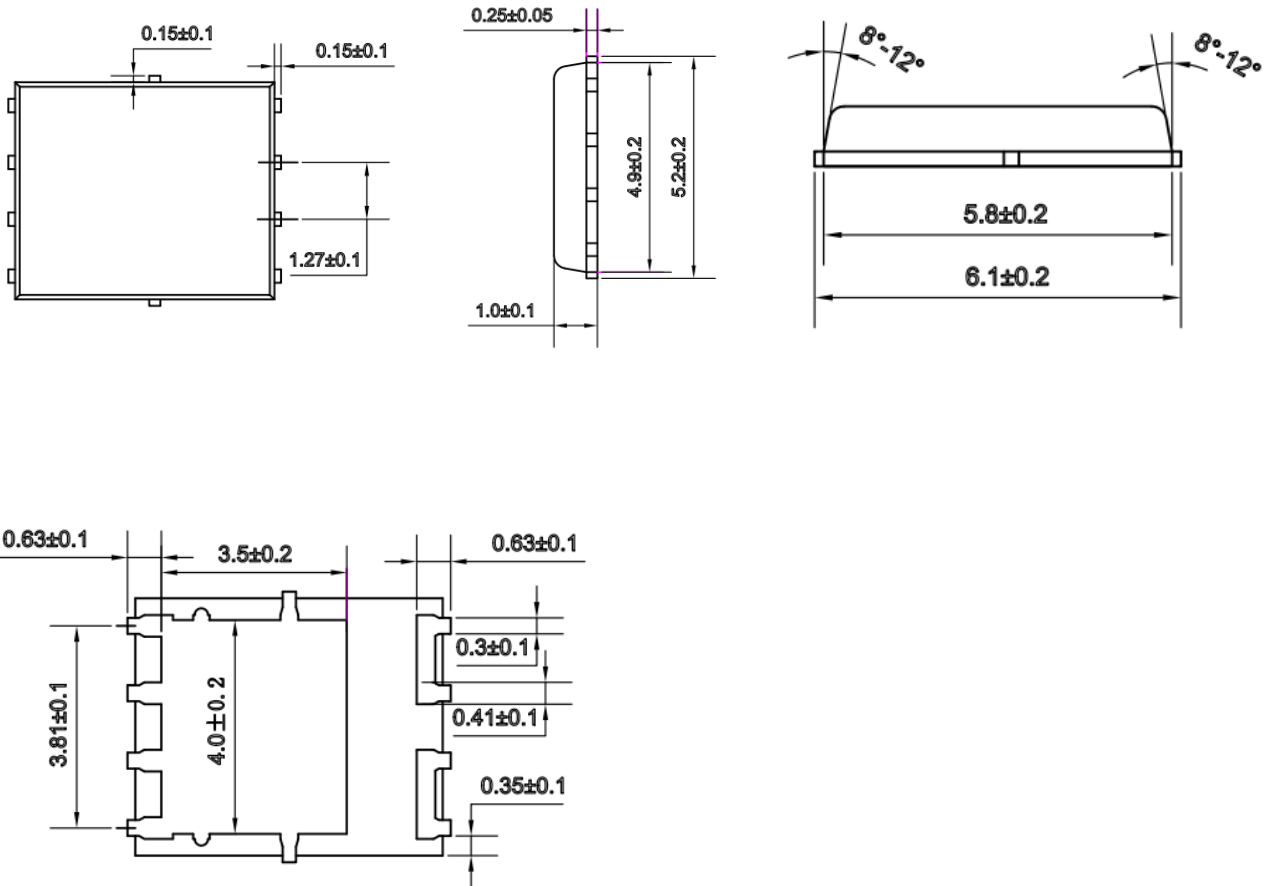


Figure 8: Transient Thermal Impedance

**Silicon Carbide Schottky Diode**
**Package Dimensions**

Package: DFN 5\*6



Note:

1. All Dimension Are In mm.
2. Package Body Sizes Exclude Mold Flash, Protrusion Gate Burrs.  
Mold Flash, Protrusion Or Gate Burrs Shall Not Exceed 0.10mm Per Side.