

## SiC Schottky Barrier Rectifier

### Features

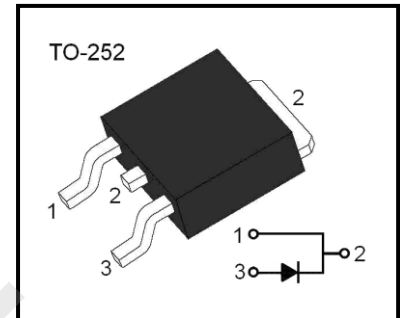
- Reverse withstand voltage 650V
- Zero reverse recovery current
- High working frequency
- Switch characteristics are not affected by temperature
- Fast switching speed
- Positive temperature coefficient of positive pressure drop

### Advantages

- Very low switching loss
- Higher efficiency
- Low dependence of the system on the heat sink
- No thermal collapse in parallel devices

### Application

- Switching mode power supply, AC/DC converter
- Power factor correction
- Motor drive
- PV inverter and wind turbine



### Absolute Maximum Rating (Ta=25°C)

| Parameter                        | Symbol      | Test conditions                                                                             | Value           | Unit |
|----------------------------------|-------------|---------------------------------------------------------------------------------------------|-----------------|------|
| Peak repetitive reverse voltage  | $V_{RRM}$   |                                                                                             | 600             | V    |
| Working peak reverse voltage     | $V_{RWM}$   |                                                                                             | 600             | V    |
| DC Blocking Voltage              | $V_{DC}$    |                                                                                             | 600             | V    |
| Average rectified output current | $I_{F(AV)}$ | $T_C=25^{\circ}C$<br>$T_C=125^{\circ}C$<br>$T_C=150^{\circ}C$                               | 5.8<br>2.8<br>2 | A    |
| Forward repetitive peak current  | $I_{FRM}$   | $T_C=25^{\circ}C$ , tp=10ms, Half Sine Wave<br>$T_C=110^{\circ}C$ , tp=10ms, Half Sine Wave | 10<br>6         | A    |
| Forward surge current            | $I_{SRM}$   | $T_C=25^{\circ}C$ , tp=10ms, Half Sine Wave<br>$T_C=110^{\circ}C$ , tp=10ms, Half Sine Wave | 20<br>15        | A    |
| Power dissipation                | $P_{tot}$   | $T_C=25^{\circ}C$<br>$T_C=110^{\circ}C$                                                     | 28<br>12        | W    |
| Junction temperature             | $T_j$       |                                                                                             | -55 ~ +175      | °C   |
| Storage temperature              | $T_{stg}$   |                                                                                             | -55 ~ +175      | °C   |

### Thermal characteristics

| Parameter                             | Symbol          | Value | Unit |
|---------------------------------------|-----------------|-------|------|
| Thermal Resistance - Junction to case | $R_{\theta JC}$ | 5.35  | °C/W |

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

| Parameter                 | Symbol | Test conditions                                                                                                                                                                | Min | Typ              | Max        | Unit          |
|---------------------------|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------------------|------------|---------------|
| Forward voltage           | $V_F$  | $I_F = 2\text{A}, T_J=25^\circ\text{C}$<br>$I_F = 2\text{A}, T_J=175^\circ\text{C}$                                                                                            |     | 1.5<br>2.1       | 1.7<br>2.5 | V             |
| Reverse current           | $I_R$  | $V_R = 650\text{V}, T_J=25^\circ\text{C}$<br>$V_R = 650\text{V}, T_J=175^\circ\text{C}$                                                                                        |     | 0.1<br>1.0       | 50<br>100  | $\mu\text{A}$ |
| Total capacitive charge   | $Q_C$  | $V_R = 400\text{V}, I_F = 2\text{A}$<br>$di/dt=500\text{A}/\mu\text{s}, T_J=25^\circ\text{C}$                                                                                  |     | 4                |            | nC            |
| Total capacitance         | C      | $V_R = 0\text{V}, T_J=25^\circ\text{C}, f=1\text{MHz}$<br>$V_R = 200\text{V}, T_J=25^\circ\text{C}, f=1\text{MHz}$<br>$V_R = 400\text{V}, T_J=25^\circ\text{C}, f=1\text{MHz}$ |     | 84.5<br>8.7<br>8 |            | pF            |
| Capacitance stored energy | $E_C$  | $V_R = 400\text{V}$                                                                                                                                                            |     | 1                |            | $\mu\text{J}$ |

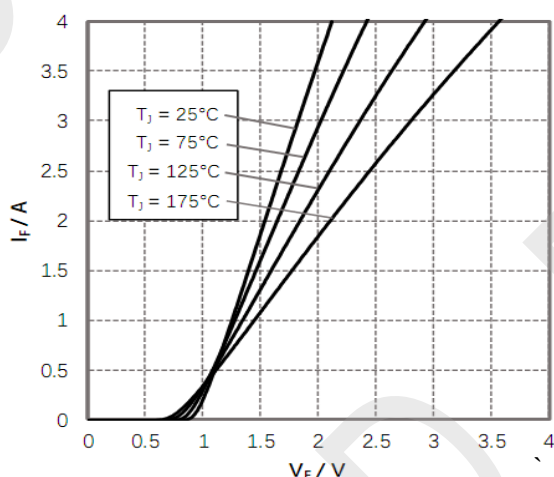
**Typical Characteristics**


Figure 1. Forward Characteristics

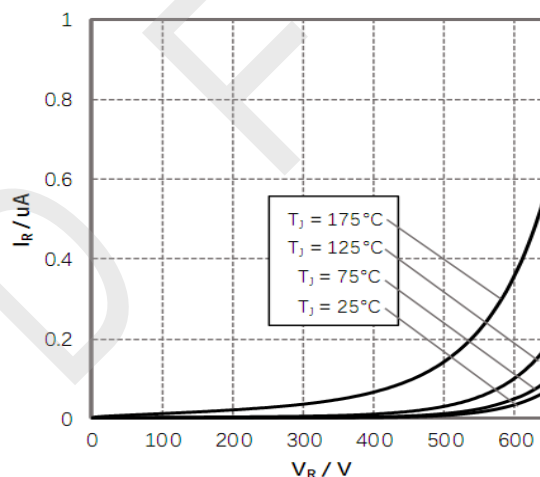


Figure 2. Reverse Characteristics

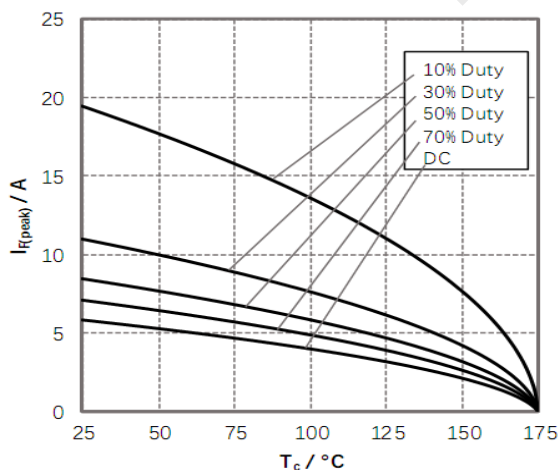


Figure 3. Load current

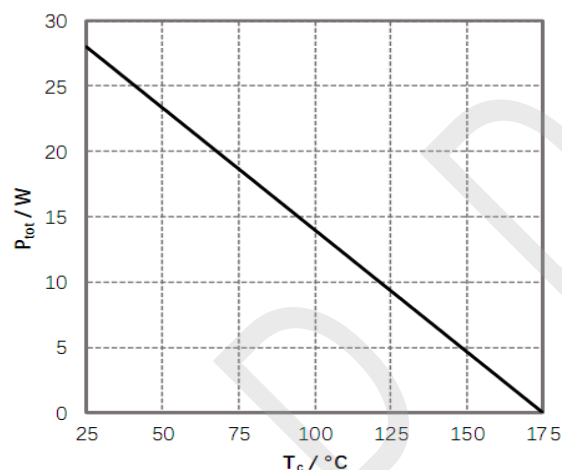


Figure 4. Dissipated power curve

## Typical Characteristics

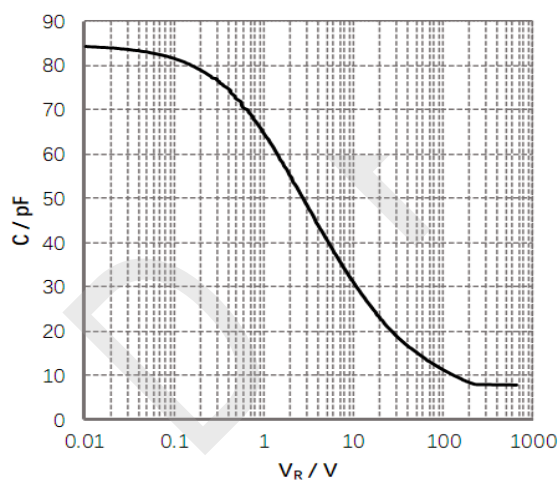


Figure 5. Capacitance vs reverse voltage

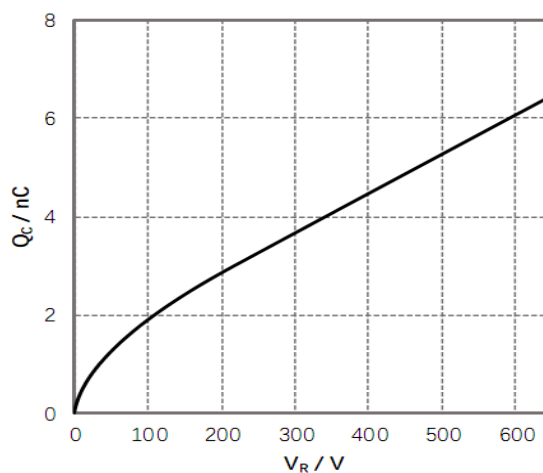


Figure 6. Total Capacitance charge vs. reverse voltage

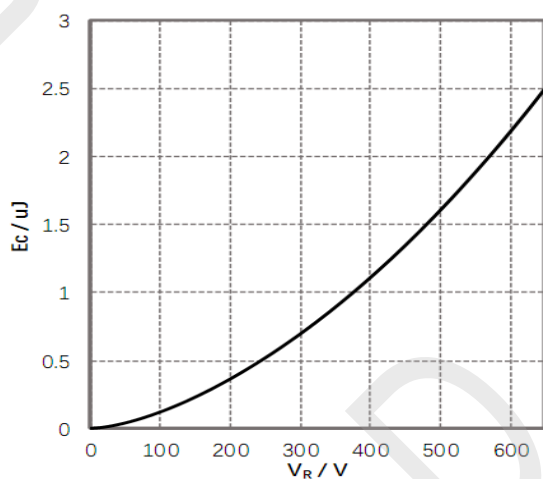


Figure 7. Capacitance stored energy

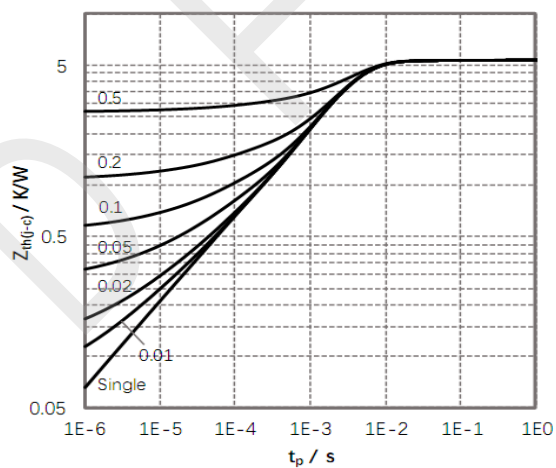


Figure 8. Transient thermal impedance

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TO-252 SiC Schottky Diodes

Package Dimensions

| Dim | Millimeter |       | Inches |       |
|-----|------------|-------|--------|-------|
|     | Min.       | Max.  | Min.   | Max.  |
| A   | 2.20       | 2.50  | 0.087  | 0.098 |
| A1  | 0.00       | 0.12  | 0.000  | 0.005 |
| A2  | 2.20       | 2.40  | 0.087  | 0.094 |
| B   | 1.20       | 1.60  | 0.047  | 0.063 |
| b   | 0.50       | 0.70  | 0.020  | 0.028 |
| b1  | 0.70       | 0.90  | 0.028  | 0.035 |
| c   | 0.40       | 0.60  | 0.016  | 0.024 |
| c1  | 0.40       | 0.60  | 0.016  | 0.024 |
| D   | 6.35       | 6.65  | 0.250  | 0.262 |
| D1  | 5.20       | 5.40  | 0.205  | 0.213 |
| E   | 5.40       | 5.70  | 0.213  | 0.224 |
| e   | 2.20       | 2.40  | 0.087  | 0.094 |
| e1  | 4.40       | 4.80  | 0.173  | 0.189 |
| L   | 9.60       | 10.20 | 0.378  | 0.402 |
| L1  | 2.70       | 3.10  | 0.106  | 0.122 |
| L2  | 1.40       | 1.80  | 0.055  | 0.071 |
| L3  | 0.90       | 1.50  | 0.035  | 0.059 |