



## Silicon Carbide Schottky Diode

|             |      |
|-------------|------|
| $V_{RRM}$   | 650V |
| $I_F$ 135°C |      |

## Features

- Positive temperature coefficient
- Temperature-independent switching
- Maximum working temperature at 175 °C
- Unipolar devices and zero reverse recovery current
- Zero forward recovery current
- Essentially no switching losses
- Reduction of heat sink requirements
- AEC-Q101 qualified
- High-frequency operation
- Reduction of EMI

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in v erter , electric car and charger.

## Mechanical Data

- **Package:** TO-263  
Molding compound meets UL 94 V-0 flammability rating, RoHS-compliant, halogen-free
- **Terminals:** Tin plated leads
- **Polarity:** As marked

■Maximum Ratings ( $T_c=25$  Unless otherwise specified)

| PARAMTETER                                                                                                   | SYMBOL         | UNIT                 | VALUE        |
|--------------------------------------------------------------------------------------------------------------|----------------|----------------------|--------------|
| Device marking code                                                                                          |                |                      | D106520BXQG2 |
| Reverse voltage (repetitive peak)<br>@ $T_j=25^{\circ}\text{C}$                                              | $V_{RRM}$      | V                    | 650          |
| Reverse voltage (Surge Peak)<br>@ $T_j=25^{\circ}\text{C}$                                                   | $V_{RSM}$      | V                    | 650          |
| Reverse voltage (DC)<br>@ $T_j=25^{\circ}\text{C}$                                                           | $V_{DC}$       | V                    | 650          |
| Continuous forward current @ $T_c=25^{\circ}\text{C}$                                                        | $I_F$          | A                    | 48           |
| Continuous forward current @ $T_c=135^{\circ}\text{C}$                                                       |                |                      | 22           |
| Continuous forward current @ $T_c=140^{\circ}\text{C}$                                                       |                |                      | 20           |
| Non-repetitive peak forward surge current<br>@ $T_c=25^{\circ}\text{C}$ , $t_p=10\text{ms}$ , Half Sine Wave | $I_{FSM}$      | A                    | 160          |
| Power Dissipation@ $T_c=25^{\circ}\text{C}$                                                                  | $P_{TOT}$      | W                    | 144          |
| Power Dissipation@ $T_c=110^{\circ}\text{C}$                                                                 |                |                      | 62           |
| $i^2t$ Value@ $T_c=25^{\circ}\text{C}$ , $t_p=10\text{ms}$                                                   | $\int i^2 dt$  | $\text{A}^2\text{S}$ | 128          |
| Operating junction and Storage temperature range                                                             | $T_j, T_{stg}$ | $^{\circ}\text{C}$   | -55 to +175  |



## ■Electrical Characteristics

| PARAMETER                 | SYMBOL | UNIT    | TEST CONDITIONS                                         | Typ.  | Max. |
|---------------------------|--------|---------|---------------------------------------------------------|-------|------|
| Forward voltage drop      | $V_F$  | V       | $I_F=20A, T_J=25^{\circ}C$                              | 1.35  | 1.55 |
|                           |        |         | $I_F=20A, T_J=175^{\circ}C$                             | 1.75  | -    |
| Reverse leakage current   | $I_R$  | $\mu A$ | $V_R=650V, T_J=25^{\circ}C$                             | 1     | 25   |
|                           |        |         | $V_R=650V, T_J=175^{\circ}C$                            | 5     | -    |
| Total capacitive charge   | $Q_C$  | nC      | $V_R=400V, T_J=25^{\circ}C, Q_C=\int_0^{V_R} I_C(V) dV$ | 62    | -    |
| Total capacitance         | C      | pF      | $V_R=0V, f=1MHz$                                        | 1157  | -    |
|                           |        |         | $V_R=200V, f=1MHz$                                      | 115.6 | -    |
|                           |        |         | $V_R=400V, f=1MHz$                                      | 107   | -    |
| Capacitance Stored Energy | $E_C$  | $\mu J$ | $V_R=400V$                                              | 7.8   | -    |

## ■Thermal Characteristics ( $T_a=25$ Unless otherwise specified)

| PARAMETER          | SYMBOL           | UNIT          | Value |
|--------------------|------------------|---------------|-------|
| Thermal resistance | $R_{\theta J-C}$ | $^{\circ}C/W$ | 1.04  |

## ■Typical Characteristics

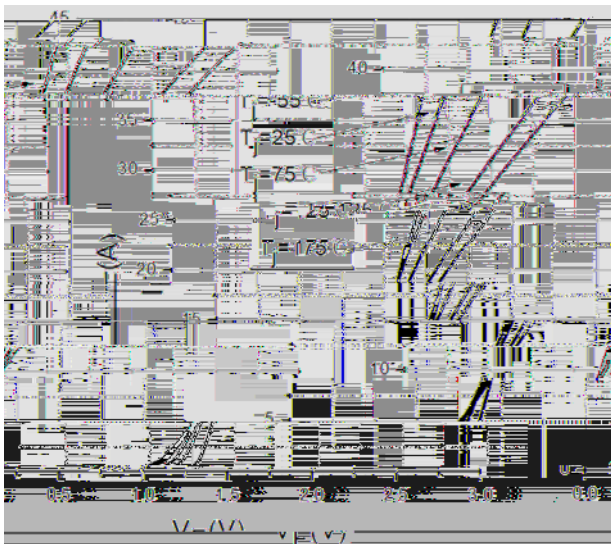


Figure 1. Forward Characteristics

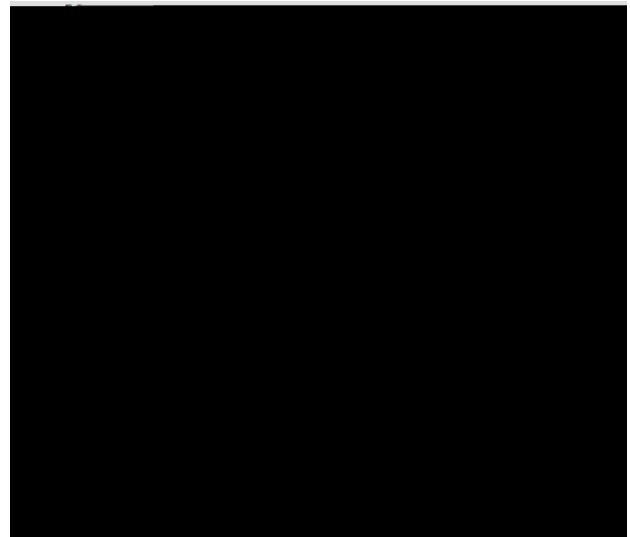


Figure2. Reverse Characteristic

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

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