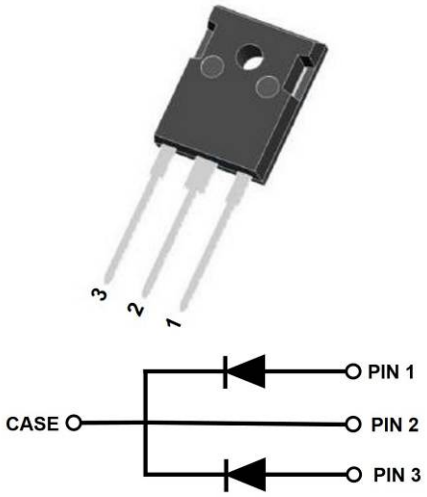
# Silicon Carbide Schottky Diode

| | |
|---|---|
| $V_{RRM}$ | 650V |
| $I_{F\ (135°C)}$ | 46A[2] |
| $Q_C$ | 122nC[2] |




## 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
- High-frequency operation
- Reduction of EMI

## Typical Applications

Typical applications are in power factor correction(PFC), solar inverter, uninterruptible power supply, motor drives, photovoltaic inverter, electric car and charger.

## Mechanical Data

- **Package**: TO-247AB
- **Terminals**: Tin plated leads
- **Polarity**: As marked

## ■Maximum Ratings ($T_a$=25℃ Unless otherwise specified)

| PARAMETER | SYMBOL | UNIT | VALUE |
|---|---|---|---|
| Device marking code | | | D106540NCTYG4 |
| Reverse voltage (Repetitive peak) @ $T_j$=25°C | $V_{RRM}$ | V | 650 |
| Reverse voltage (Surge peak) @ $T_j$=25°C | $V_{RSM}$ | V | 650 |
| Reverse voltage (DC) @ $T_j$=25°C | $V_{DC}$ | V | 650 |
| Continuous forward current @ $T_C$=25°C | $I_F$ | A | 51/102 |
| Continuous forward current @ $T_C$=135°C | | | 23/46 |
| Continuous forward current @ $T_C$=144°C | | | 20/40 |
| Non-repetitive peak forward surge current @ $T_C$=25°C, tp=10ms, Half Sine Wave | $I_{FSM}$ | A | 135[1] |
| Power Dissipation@ $T_C$=25°C | $P_{TOT}$ | W | 168/333 |
| Power Dissipation@ $T_C$=110°C | | | 73/144 |
| $i^2t$ Value@ $T_C$=25°C ,tp=10ms | $\int i^2dt$ | $A^2S$ | 91[1] |
| Operating junction and Storage temperature range | $T_j$ ,$T_{stg}$ | °C | -55 to +175 |

[1] Per Leg, [2] Per Device

## ■Electrical Characteristics (Per Leg)

| PARAMETER | SYMBOL | UNIT | TEST CONDITIONS | Typ. | Max. |
|---|---|---|---|---|---|
| Forward voltage drop | $V_F$ | V | $I_F$=20A, $T_j$=25°C | 1.38 | 1.60 |
| | | | $I_F$=20A, $T_j$=175°C | 1.75 | - |
| Reverse current | $I_R$ | μA | $V_R$=650V, $T_j$=25°C | 0.5 | 25 |
| | | | $V_R$=650V, $T_j$=175°C | 5 | - |
| Total capacitive charge | $Q_C$ | nC | $V_R$=400V, $T_j$=25°C , $Q_C=\int_0^{VR} C(V)dV$ | 61 | - |
| Total capacitance | C | pF | $V_R$=0V, f=1MHZ | 1150 | - |
| | | | $V_R$=200V, f=1MHZ | 113 | - |
| | | | $V_R$=400V, f=1MHZ | 107 | - |
| Capacitance stored energy | $E_C$ | μJ | $V_R$=400V | 9.4 | - |

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

| PARAMETER | SYMBOL | UNIT | VALUE |
|---|---|---|---|
| Thermal resistance | $R_{\theta J-C}$ | °C /W | 0.89(1)<br>0.45(2) |

(1) Per Leg, (2) Per Device

## ■Typical Characteristics (Per Leg)

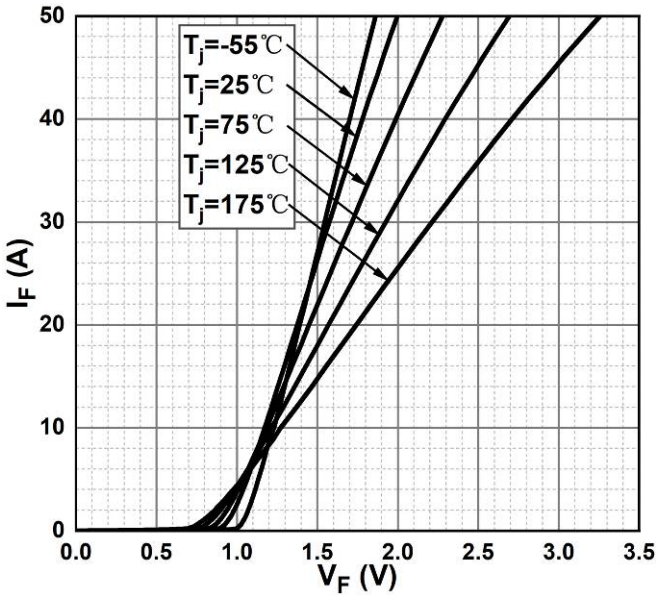



Figure 1. Forward Characteristics

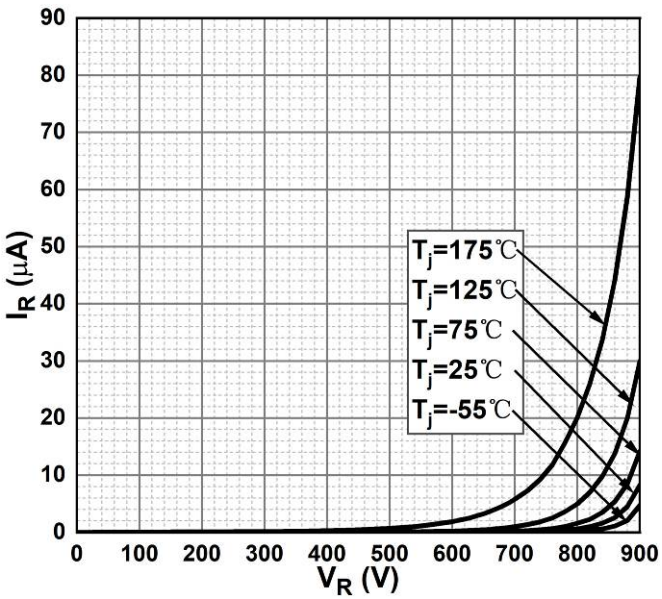



Figure 2. Reverse Characteristics

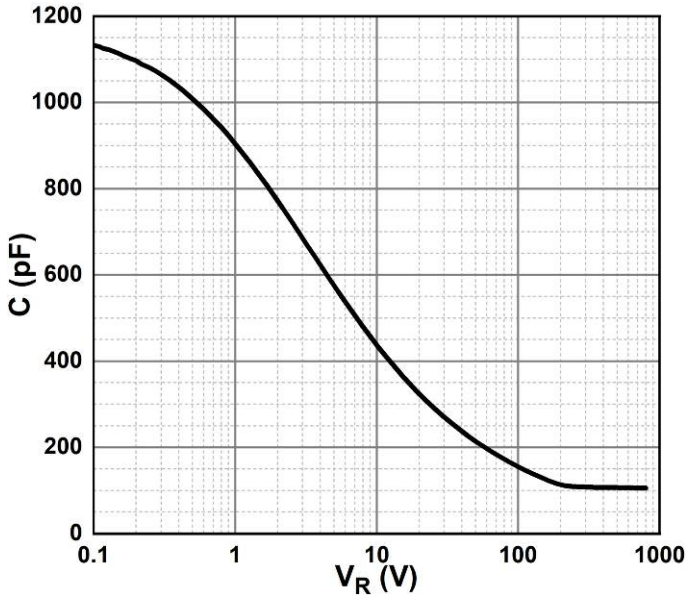



Figure 3. Capacitance vs. Reverse Voltage

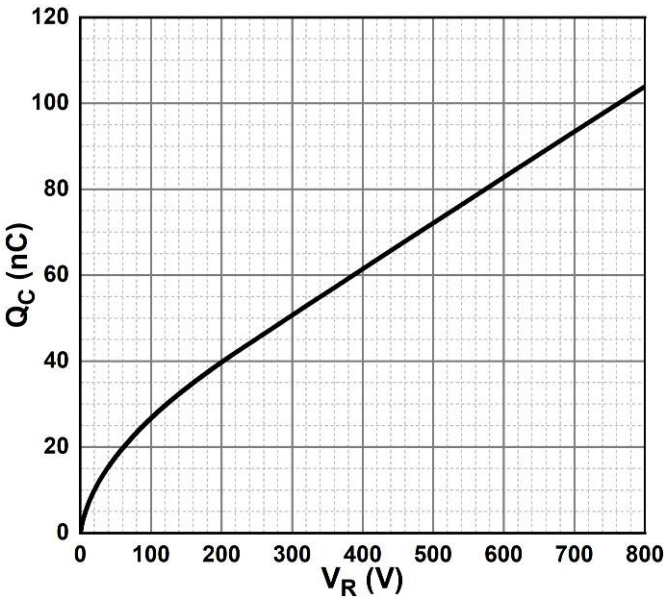



Figure 4. Total Capacitance Charge vs. Reverse Voltage

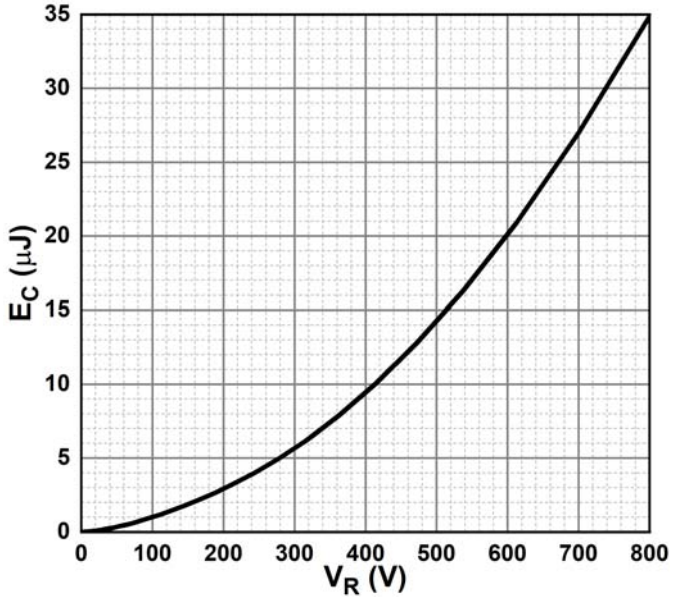



Figure 5. Capacitance Stored Energy

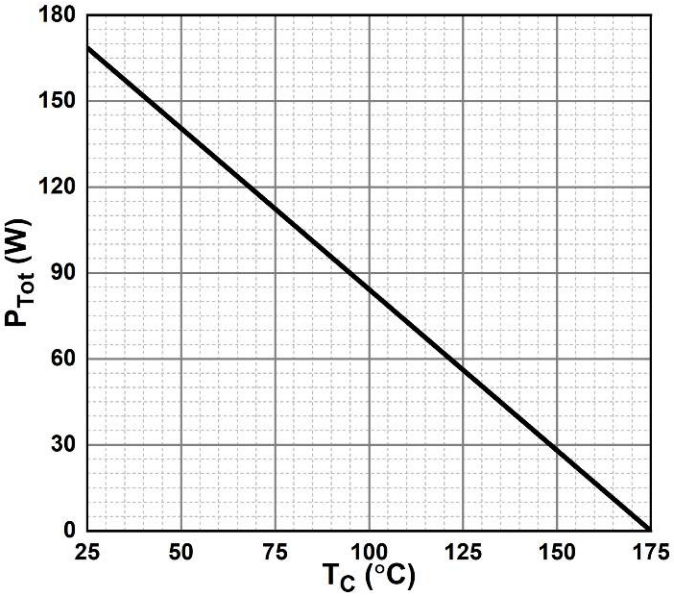



Figure 6. Power Derating

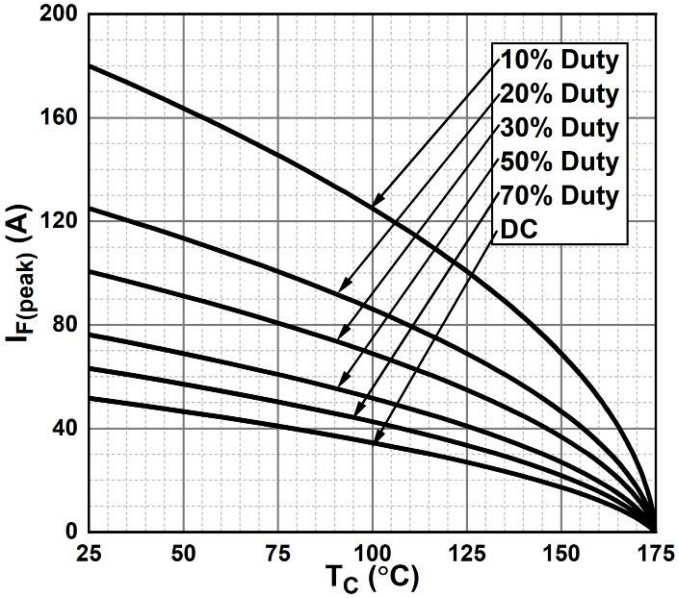



Figure 7. Current Derating

## ■Typical Characteristics (Device)

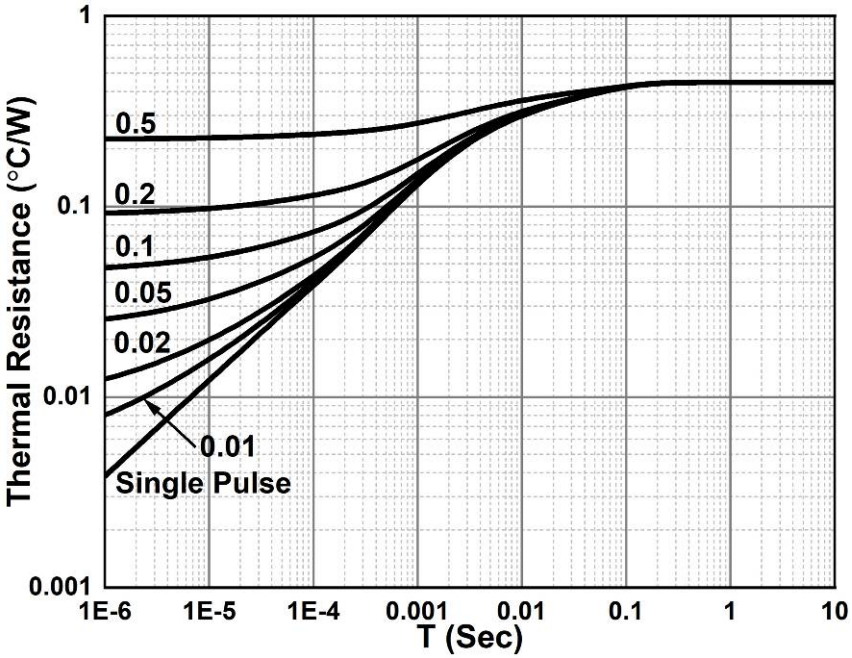
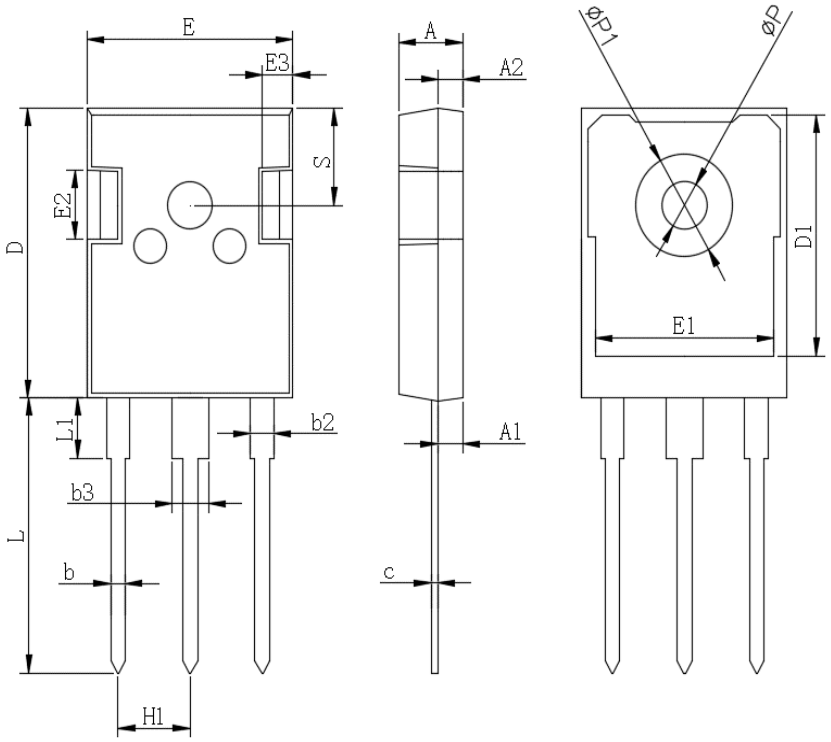



Figure 8. Transient Thermal Impedance

## ■Outline Dimensions

**TO-247AB**




| TO-247AB | | |
|---|---|---|
| Dim | Min | Max |
| A | 4.80 | 5.20 |
| A1 | 2.21 | 2.61 |
| A2 | 1.85 | 2.15 |
| b | 1.0 | 1.4 |
| b2 | 1.91 | 2.21 |
| C | 0.5 | 0.7 |
| D | 20.70 | 21.30 |
| D1 | 16.25 | 16.85 |
| E | 15.50 | 16.10 |
| E1 | 13.0 | 13.6 |
| E2 | 4.80 | 5.20 |
| E3 | 2.30 | 2.70 |
| L | 19.62 | 20.22 |
| L1 | - | 4.30 |
| ΦP | 3.40 | 3.80 |
| ΦP1 | - | 7.30 |
| S | 6.15TYP | |
| H1 | 5.44TYP | |
| b3 | 2.80 | 3.20 |

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