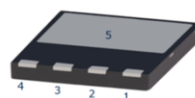


## IV1D06006F5 – 650V 6A SiC Schottky Diode

### Features

- Max Junction Temperature 175°C
- High Surge Current Capacity
- Extremely Fast Reverse Recovery Time
- Reduced Losses in Associated MOSFET
- High-Frequency Operation
- Temperature Independent Switching Behavior
- Positive Temperature Coefficient on  $V_F$

### Outline



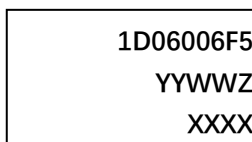
DFN8x8



### Applications

- PV Micro Inverter
- Adaptor
- TV Power
- Power Factor Correction
- Telecom / Server SMPS

### Marking Diagram



1D06006F5 = Specific Device Code  
 YY = Year  
 WW = Work Week  
 Z = Assembly Location  
 XXXX = Lot Traceability

### Absolute Maximum Ratings (Tc=25°C unless otherwise specified)

| Symbol        | Parameter  | Value      | Unit             |
|---------------|--|------------|------------------|
| $V_{RRM}$     | Reverse voltage (repetitive peak)  | 650        | V                |
| $V_{DC}$      | DC blocking voltage  | 650        | V                |
| $I_F$         | Forward current (continuous) @Tc=25°C  | 16.7       | A                |
|               | Forward current (continuous) @Tc=135°C   | 8.1        | A                |
|               | Forward current (continuous) @Tc=150°C   | 6          | A                |
| $I_{FSM}$     | Surge non-repetitive forward current<br>sine halfwave @Tc=25°C tp=10ms                       | 42         | A                |
| $I_{FRM}$     | Surge repetitive forward current (Freq=0.1Hz, 100cycles)<br>sine halfwave @Tamb=25°C tp=10ms | 30         | A                |
| $P_{tot}$     | Total power dissipation @ Tc=25°C  | 68.1       | W                |
|               | Total power dissipation @ Tc=150°C   | 11.3       |                  |
| $\int i^2 dt$ | $I^2t$ value @Tc=25°C tp=10ms  | 8.8        | A <sup>2</sup> s |
| Tstg          | Storage temperature range  | -55 to 175 | °C               |
| Tj            | Operating junction temperature range   | -55 to 175 | °C               |

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

## Electrical Characteristics

| Symbol         | Parameter                 | Typ. | Max. | Unit | Test Conditions  | Note   |
|----------------|---------------------------|------|------|------|--|--------|
| V <sub>F</sub> | Forward Voltage           | 1.45 | 1.65 | V    | I <sub>F</sub> = 6 A T <sub>J</sub> =25°C  | Fig. 1 |
|                |                           | 1.85 | 2.2  |      | I <sub>F</sub> = 6 A T <sub>J</sub> =175°C   |        |
| I <sub>R</sub> | Reverse Current           | 1    | 10   | μA   | V <sub>R</sub> = 650 V T <sub>J</sub> =25°C  | Fig. 2 |
|                |                           | 5    | 50   |      | V <sub>R</sub> = 650 V T <sub>J</sub> =175°C   |        |
| C              | Total Capacitance         | 212  |      | pF   | V <sub>R</sub> = 1 V, T <sub>J</sub> = 25°C, f = 1 MHz                                 | Fig. 3 |
|                |                           | 27.6 |      |      | V <sub>R</sub> = 200 V, T <sub>J</sub> = 25°C, f = 1 MHz                               |        |
|                |                           | 22.6 |      |      | V <sub>R</sub> = 400 V, T <sub>J</sub> = 25°C, f = 1 MHz                               |        |
| Q <sub>C</sub> | Total Capacitive Charge   | 14.3 |      | nC   | V <sub>R</sub> = 400 V, T <sub>J</sub> = 25°C,<br>$Q_C = \int_0^{V_R} C(V) dV$         | Fig. 4 |
| E <sub>C</sub> | Capacitance Stored Energy | 2.14 |      | μJ   | V <sub>R</sub> = 400 V, T <sub>J</sub> = 25°C,<br>$E_C = \int_0^{V_R} C(V) \cdot V dV$ | Fig. 5 |

## Thermal Characteristics

| Symbol               | Parameter                                | Typ. | Unit | Note  |
|----------------------|--|------|------|-------|
| R <sub>th(j-c)</sub> | Thermal Resistance from Junction to Case | 2.2  | °C/W | Fig.7 |

## Typical Performance

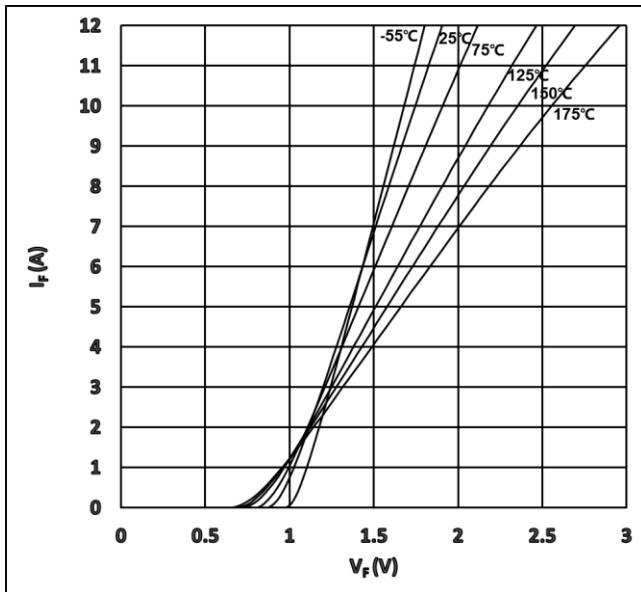


Figure 1. Typical Forward Characteristics

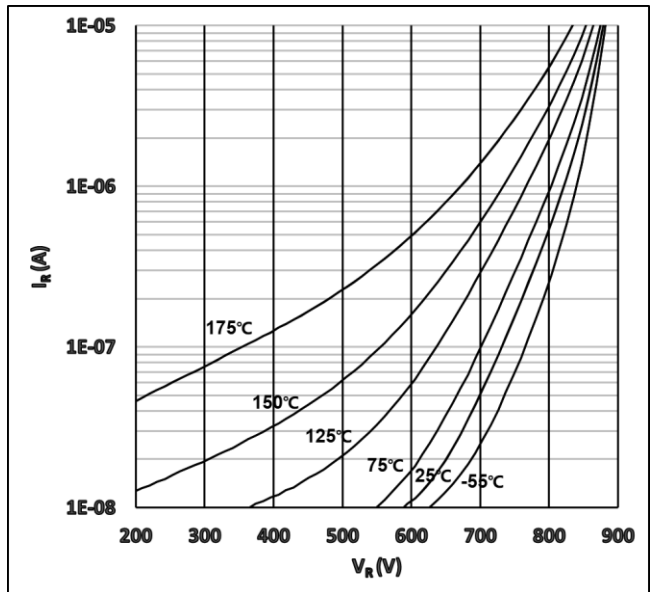


Figure 2. Typical Reverse Characteristics

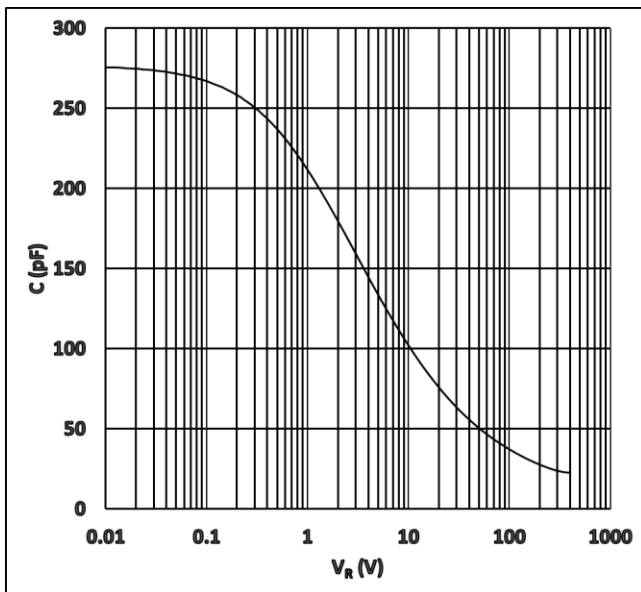


Figure 3. Capacitance vs. Reverse Voltage

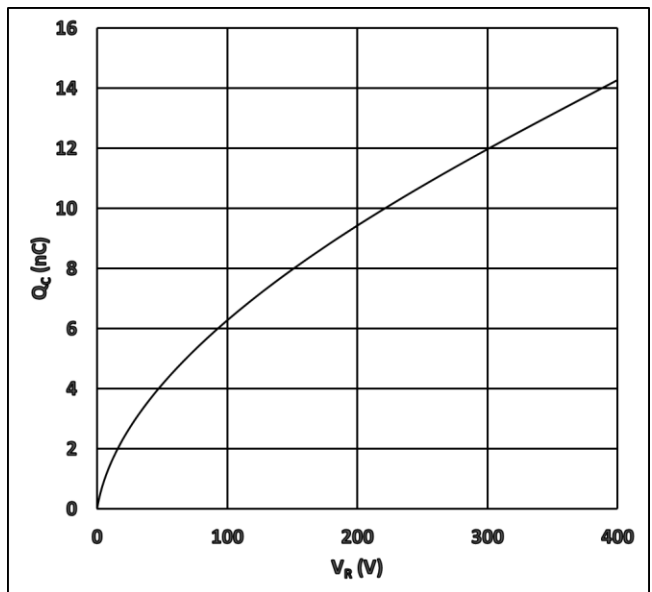


Figure 4. Recovery Charge vs. Reverse Voltage

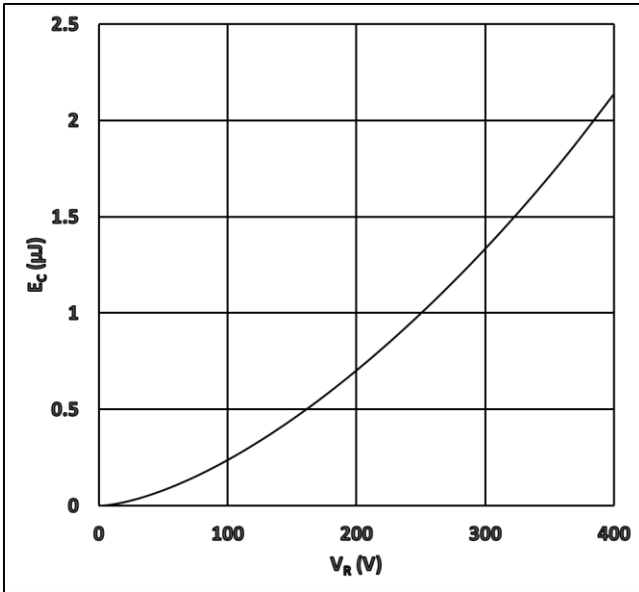


Figure 5. Capacitance Stored Energy

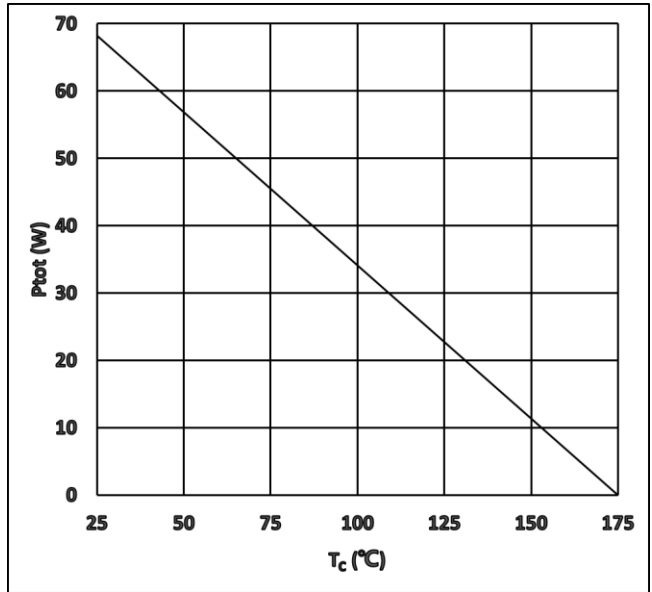


Figure 6. Power Derating

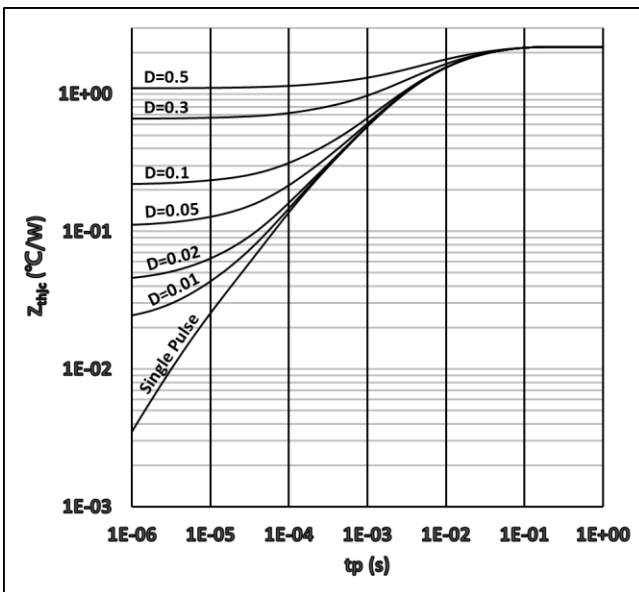


Figure 7. Transient Thermal Impedance

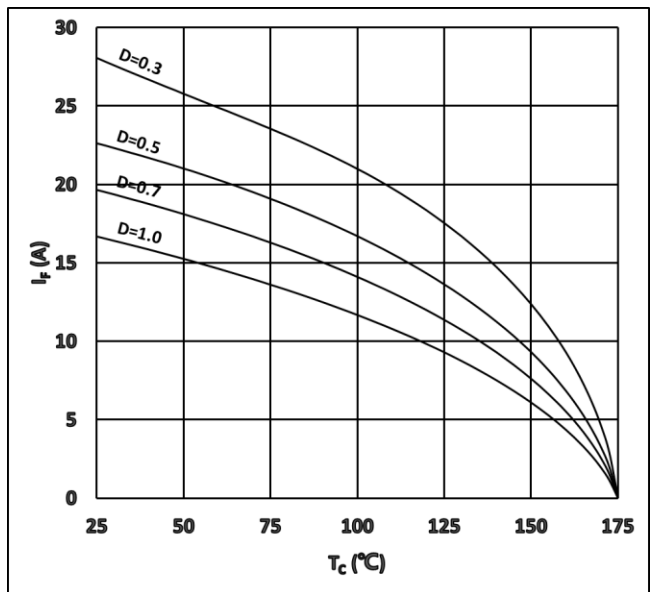
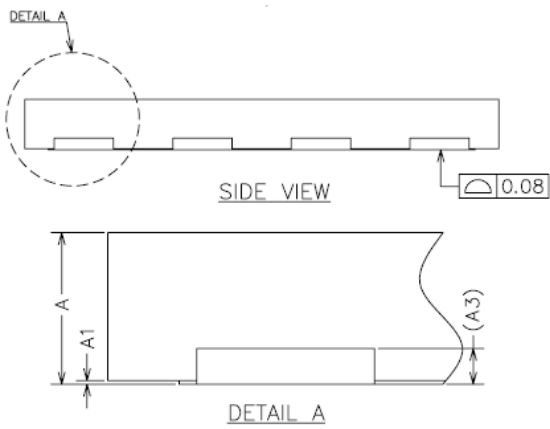
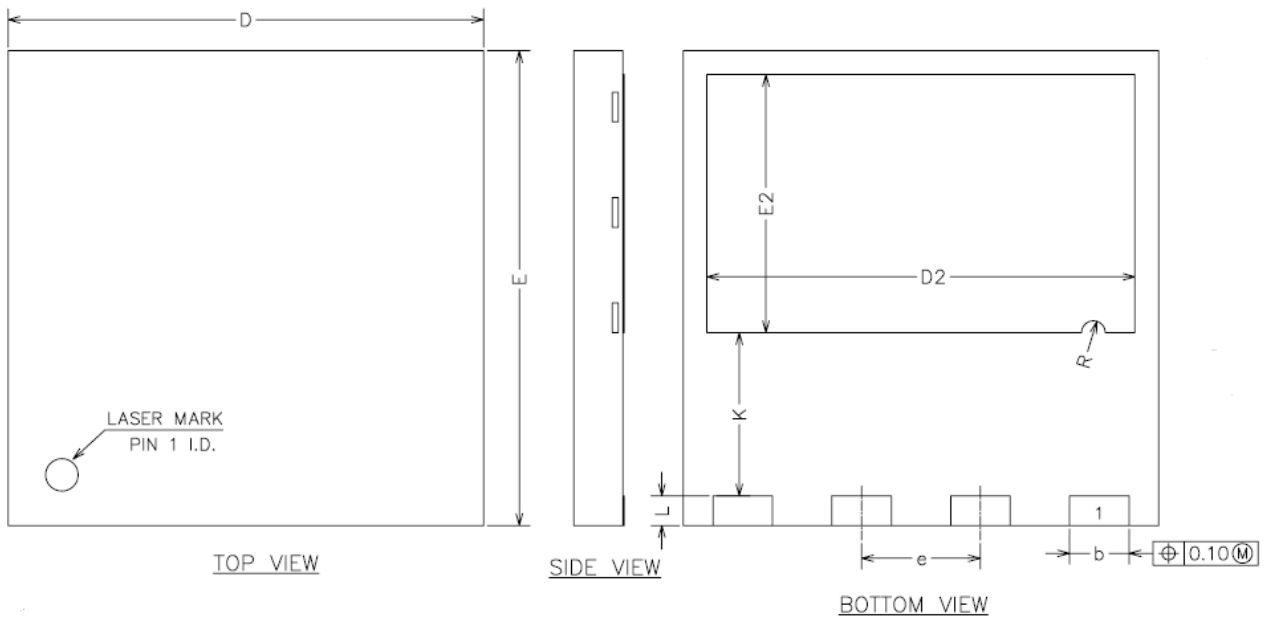


Figure 8.  $I_F$  as a Function of Temp.

## Package Dimensions



COMMON DIMENSIONS  
(UNITS OF MEASURE=MILLIMETER)

| SYMBOL | MIN     | NOM  | MAX  |
|--------|---------|------|------|
| A      | 0.80    | 0.85 | 0.90 |
| A1     | 0.00    | 0.02 | 0.05 |
| A3     | 0.20REF |      |      |
| b      | 0.90    | 1.00 | 1.10 |
| D      | 7.90    | 8.00 | 8.10 |
| E      | 7.90    | 8.00 | 8.10 |
| D2     | 7.10    | 7.20 | 7.30 |
| E2     | 4.25    | 4.35 | 4.45 |
| e      | 1.90    | 2.00 | 2.10 |
| K      | 2.65    | 2.75 | 2.85 |
| L      | 0.40    | 0.50 | 0.60 |
| R      | 0.20REF |      |      |

**Note:**

All dimensions do not include mold flash or protrusions.

## Notes

For further information please contact IVCT's Sales Office.

Copyright©2022 InventChip Technology Co., Ltd. All rights reserved.

The information in this document is subject to change without notice.

## Related Links

<http://www.inventchip.com.cn>

