



## General Description

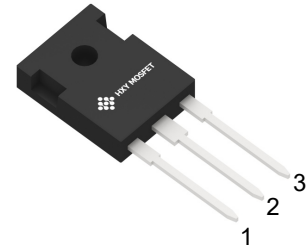
This product family offers state of the art performance. It is designed for high frequency applications where high efficiency and high reliability are required.

## Features

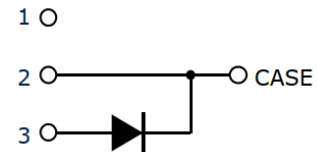
- Low conduction loss due to low  $V_F$
- Extremely low switching loss by tiny  $Q_c$
- Highly rugged due to better surge current
- Industrial standard quality and reliability

## Applications

- UPS
- Power Inverter
- High performance SMPS
- Power factor correction



TO-247



| Ordering Part Number | Package | Marking     |
|----------------------|---------|-------------|
| HC3D40065D1          | TO-247  | HC3D40065D1 |





**Maximum Ratings** (at  $T_j = 25^\circ\text{C}$ , unless otherwise specified)

| Parameter                                                                                                                                                                        | Symbol        | Value          | Unit                 |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|----------------|----------------------|
| Repetitive Peak Reverse Voltage                                                                                                                                                  | $V_{RRM}$     | 650            | V                    |
| Surge Peak Reverse Voltage                                                                                                                                                       | $V_{RSM}$     | 650            | V                    |
| DC Peak Reverse Voltage                                                                                                                                                          | $V_R$         | 650            | V                    |
| Continuous Forward Current<br>$T_C = 25^\circ\text{C}$<br>$T_C = 135^\circ\text{C}$<br>$T_C = 160^\circ\text{C}$                                                                 | $I_F$         | 98<br>50<br>40 | A                    |
| Repetitive Peak Forward Surge Current<br>$T_C = 25^\circ\text{C}, t_p=10\text{ms}, \text{Half Sine Pulse}$<br>$T_C = 110^\circ\text{C}, t_p=10\text{ms}, \text{Half Sine Pulse}$ | $I_{FRM}$     | 160<br>115     | A                    |
| Non-Repetitive Forward Surge Current<br>$T_C = 25^\circ\text{C}, t_p=10\text{ms}, \text{Half Sine Pulse}$<br>$T_C = 110^\circ\text{C}, t_p=10\text{ms}, \text{Half Sine Pulse}$  | $I_{FSM}$     | 270<br>220     | A                    |
| $i^2dt$ value<br>$T_C = 25^\circ\text{C}, t_p=10\text{ms}, \text{Half Sine Pulse}$<br>$T_C = 110^\circ\text{C}, t_p=10\text{ms}, \text{Half Sine Pulse}$                         | $\int i^2 dt$ | 364<br>242     | $\text{A}^2\text{s}$ |
| Power dissipation<br>$T_C = 25^\circ\text{C}$<br>$T_C = 110^\circ\text{C}$                                                                                                       | $P_{tot}$     | 267<br>116     | W                    |
| Operating junction Range                                                                                                                                                         | $T_j$         | -55 to +175    | $^\circ\text{C}$     |
| Storage temperature Range                                                                                                                                                        | $T_{stg}$     | -55 to +150    | $^\circ\text{C}$     |

**Thermal Resistance**

| Parameter                            | Symbol     | Value | Unit               |
|--------------------------------------|------------|-------|--------------------|
| Thermal resistance, junction – case. | $R_{thJC}$ | 0.56  | $^\circ\text{C/W}$ |



**Electrical Characteristic** (at  $T_j = 25^\circ\text{C}$ , unless otherwise specified)

| Parameter               | Symbol | Value |      |      | Unit          | Test Condition                                                                                        |
|-------------------------|--------|-------|------|------|---------------|-------------------------------------------------------------------------------------------------------|
|                         |        | min.  | typ. | max. |               |                                                                                                       |
| Forward Voltage         | $V_F$  | -     | 1.35 | 1.5  | V             | $I_F=40\text{A}$<br>$T_j=25^\circ\text{C}$<br>$T_j=175^\circ\text{C}$                                 |
| Reverse Current         | $I_R$  | -     | 4    | 80   | $\mu\text{A}$ | $V_R=650\text{V}$<br>$T_j=25^\circ\text{C}$<br>$T_j=175^\circ\text{C}$                                |
| Total Capacitive Charge | $Q_C$  | -     | 64   | -    | nC            | $V_R=400\text{V}$ , $T_j=25^\circ\text{C}$<br>$Q_C = \int_0^{V_R} C(V) dV$                            |
| Total Capacitance       | $C$    | -     | 2140 | -    | pF            | $T_j=25^\circ\text{C}$ , $f=1\text{MHz}$<br>$V_R=0\text{V}$<br>$V_R=200\text{V}$<br>$V_R=400\text{V}$ |

**Characteristics Curve:**

Fig 1: Forward Characteristics

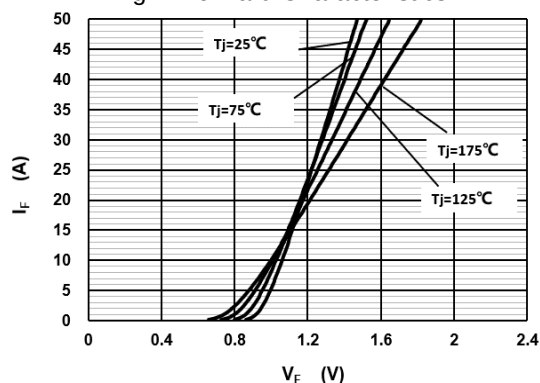


Fig 2: Reverse Characteristics

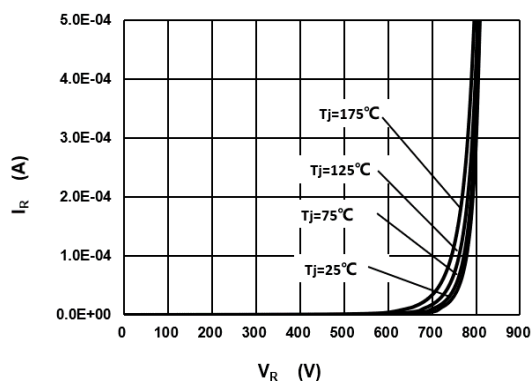


Fig 3: Current Derating

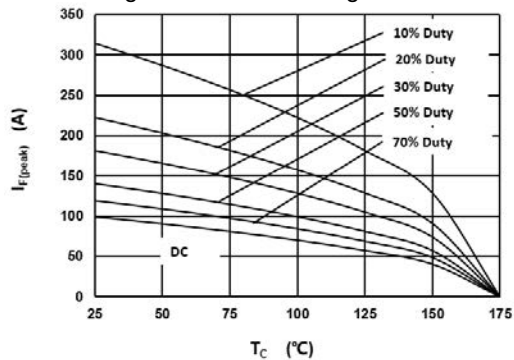


Fig 4: Power Derating

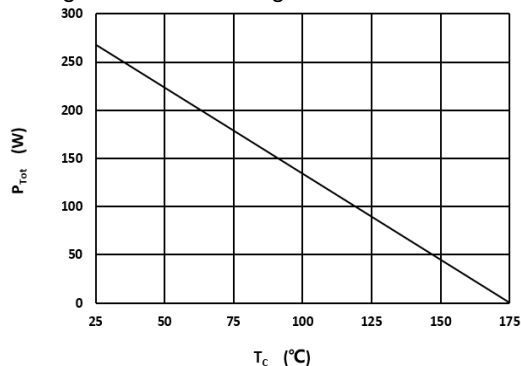




Fig 5: Capacitance vs. Reverse Voltage

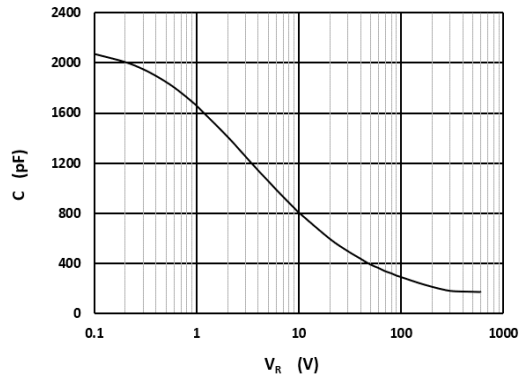


Fig 6: Reverse Charge vs. Reverse Voltage

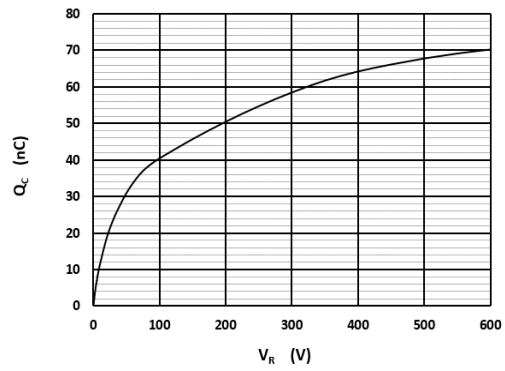


Fig 7: Typical Capacitance Stored Energy

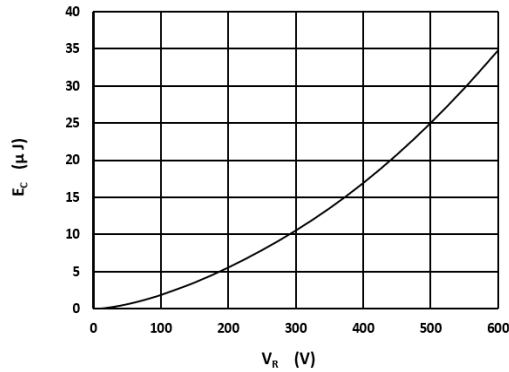
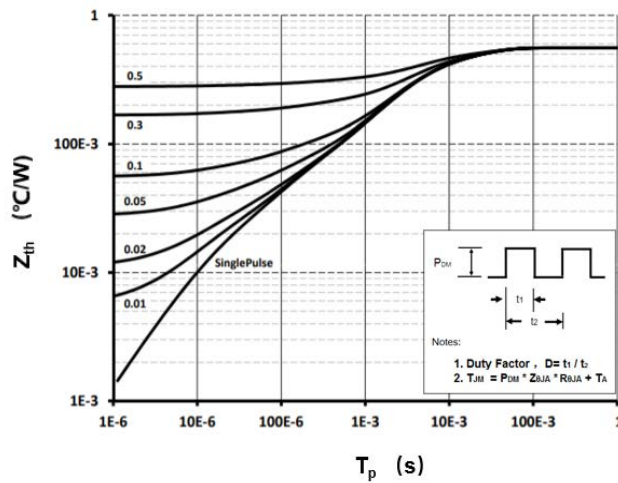
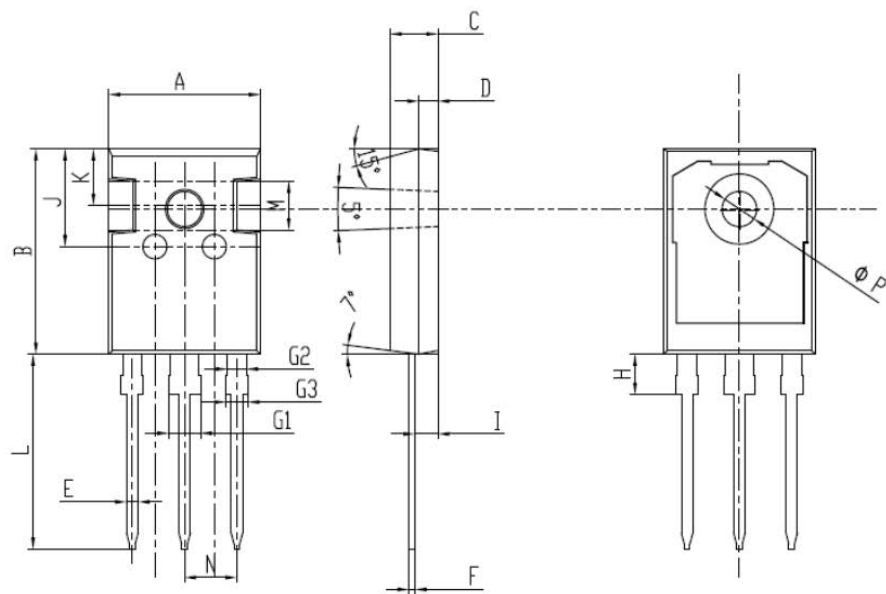


Fig 8: Transient Thermal Impandance





Package Dimensions  
Package TO-247



| 项目  | 规范(mm) |       |
|-----|--------|-------|
|     | MIN    | MAX   |
| A   | 15.70  | 15.90 |
| B   | 20.90  | 21.10 |
| C   | 4.90   | 5.10  |
| D   | 1.90   | 2.10  |
| E   | 1.10   | 1.30  |
| F   | 0.45   | 0.75  |
| G1  | 3.00   | 3.20  |
| G2  | 1.85   | 2.15  |
| G3  | 2.00   | 2.20  |
| H   | 4.00   | 4.30  |
| I   | 2.30   | 2.50  |
| J   | 9.90   | 10.10 |
| K   | 5.70   | 5.90  |
| L   | 19.80  | 20.20 |
| M   | 4.85   | 5.15  |
| N   | 5.286  | 5.586 |
| φ P | 3.40   | 3.60  |



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