



## 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-247-2L  
Package



| Ordering Part Number | Package   | Marking    |
|----------------------|-----------|------------|
| HC1D16065H           | TO-247-2L | HC1D16065H |





**Maximum Ratings** (at  $T_C = 25^\circ\text{C}$ , 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>$T_C = 159^\circ\text{C}$                                                                 | $I_F$         | 49<br>25<br>16 | A                    |
| Repetitive Peak Forward Surge Current<br>$T_C = 25^\circ\text{C}, t_p=10\text{ms}, \text{Half Sine Pulse}$<br>$T_C = 110^\circ\text{C}, t_p=10\text{ms}, \text{Half Sine Pulse}$ | $I_{FRM}$     | 70<br>56       | A                    |
| Non-Repetitive Forward Surge Current<br>$T_C = 25^\circ\text{C}, t_p=10\text{ms}, \text{Half Sine Pulse}$<br>$T_C = 110^\circ\text{C}, t_p=10\text{ms}, \text{Half Sine Pulse}$  | $I_{FSM}$     | 128<br>98      | A                    |
| $i^2dt$ value<br>$T_C = 25^\circ\text{C}, t_p=10\text{ms}, \text{Half Sine Pulse}$<br>$T_C = 110^\circ\text{C}, t_p=10\text{ms}, \text{Half Sine Pulse}$                         | $\int i^2 dt$ | 81<br>48       | $\text{A}^2\text{s}$ |
| Power dissipation<br>$T_C = 25^\circ\text{C}$<br>$T_C = 110^\circ\text{C}$                                                                                                       | $P_{tot}$     | 125<br>54      | 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     | Typ. | Unit               |
|--------------------------------------|------------|------|--------------------|
| Thermal resistance, junction – case. | $R_{thJC}$ | 1.20 | $^\circ\text{C/W}$ |



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

| Parameter               | Symbol | Value |      |      | Unit          | Test Condition                                                                                        |
|-------------------------|--------|-------|------|------|---------------|-------------------------------------------------------------------------------------------------------|
|                         |        | min.  | typ. | max. |               |                                                                                                       |
| Forward Voltage         | $V_F$  | -     | 1.3  | 1.5  | V             | $I_F=16\text{A}$<br>$T_j=25^\circ\text{C}$<br>$T_j=175^\circ\text{C}$                                 |
| Reverse Current         | $I_R$  | -     | -    | 100  | $\mu\text{A}$ | $V_R=650\text{V}$<br>$T_j=25^\circ\text{C}$<br>$T_j=175^\circ\text{C}$                                |
| Total Capacitive Charge | $Q_C$  | -     | 52   | -    | 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      | -     | 993  | -    | 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

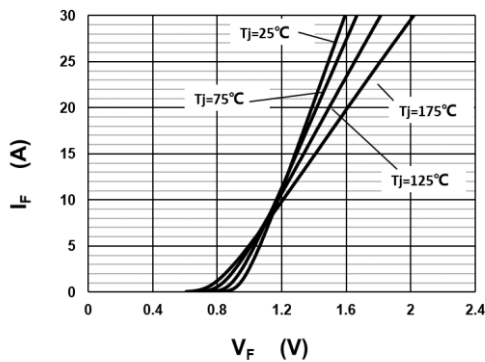


Fig 2: Reverse Characteristics

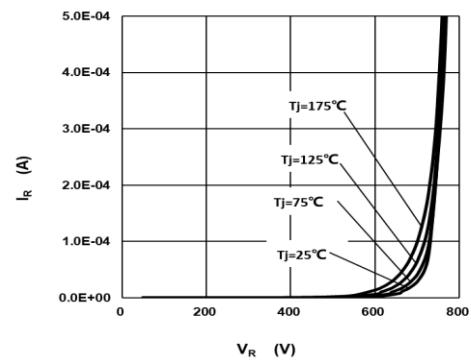


Fig 3: Current Derating

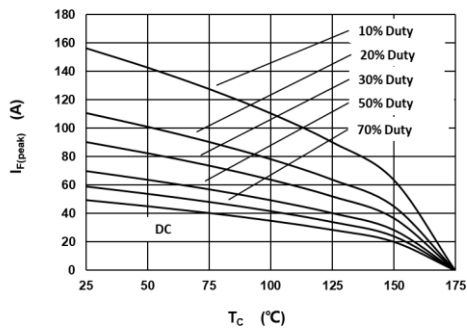


Fig 4: Power Derating

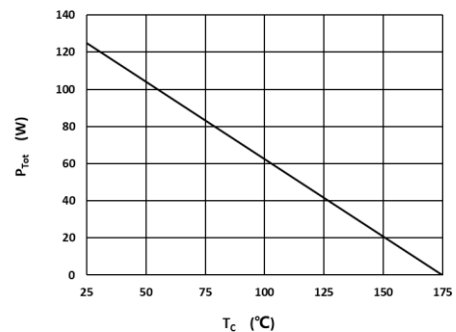




Fig 5: Capacitance vs. Reverse Voltage

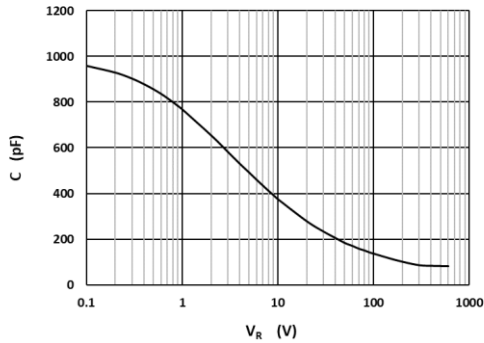


Fig 6: Reverse Charge vs. Reverse Voltage

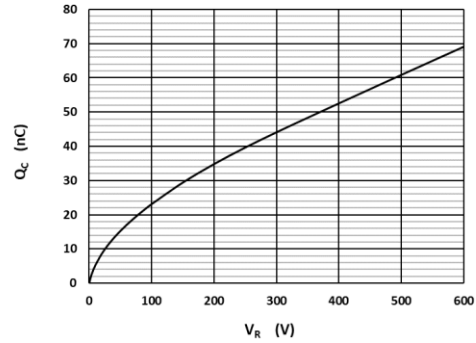


Fig 7: Typical Capacitance Stored Energy

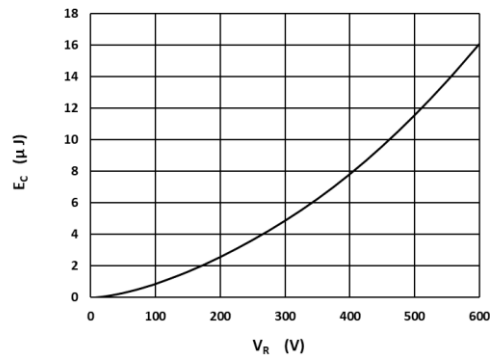
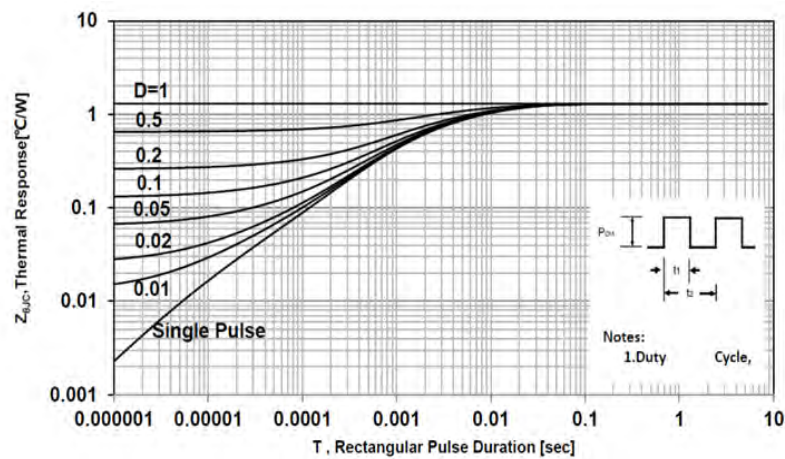


Fig 8: Transient Thermal Impedance

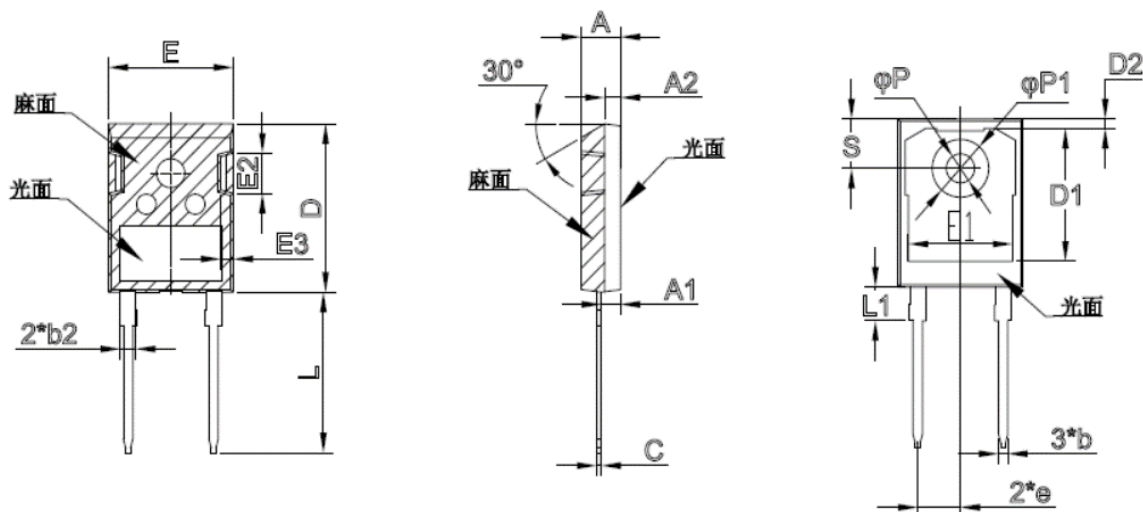




## Package Dimensions

Package TO-247-2L

Unit:mm



|    | Min   | Nom   | Max   |    | Min   | Nom   | Max   |
|----|-------|-------|-------|----|-------|-------|-------|
| A  | 4.70  | 5.00  | 5.20  | E1 | 13.06 | 13.26 | 13.56 |
| A1 | 2.30  |       | 2.50  | E2 | 4.90  | 5.00  | 5.10  |
| A2 | 1.90  | 2.00  | 2.10  | E3 | 1.50  | 1.60  | 1.70  |
| b  | 1.10  | 1.20  | 1.30  | e  | 5.34  | 5.44  | 5.54  |
| b2 |       | 2.00  |       | L  | 19.80 | 20.00 | 20.32 |
|    |       |       |       | L1 |       | 4.17  | 4.50  |
| C  | 0.5   | 0.6   | 0.7   | P  | 3.50  | 3.60  | 3.70  |
| D  | 20.8  | 20.95 | 21.1  | P1 | 7.00  | 7.19  | 7.40  |
| D1 |       | 16.55 |       | S  | 6.04  | 6.15  | 6.3   |
| D2 | 0.95  | 1.17  | 1.35  |    |       |       |       |
| E  | 15.48 | 15.88 | 16.28 |    |       |       |       |
|    |       |       |       |    |       |       |       |



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