



## General Description

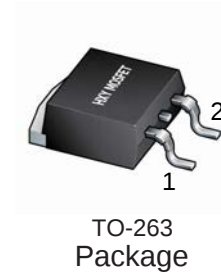
This product family offers state of the art performance. It is designed for high frequency applications where high efficiency and high reliability are required.

## 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



| Ordering Part Number | Package | Marking    |
|----------------------|---------|------------|
| HC3D12065G           | TO-263  | HC3D12065G |





**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>$T_C = 160^\circ\text{C}$                                                                 | $I_F$        | 30<br>15<br>12 | A                    |
| Repetitive Peak Forward Surge Current<br>$T_C = 25^\circ\text{C}, t_p=10\text{ms}, \text{Half Sine Pulse}$<br>$T_C = 110^\circ\text{C}, t_p=10\text{ms}, \text{Half Sine Pulse}$ | $I_{FRM}$    | 48<br>29       | A                    |
| Non-Repetitive Forward Surge Current<br>$T_C = 25^\circ\text{C}, t_p=10\text{ms}, \text{Half Sine Pulse}$<br>$T_C = 110^\circ\text{C}, t_p=10\text{ms}, \text{Half Sine Pulse}$  | $I_{FSM}$    | 90<br>70       | A                    |
| $i^2dt$ value<br>$T_C = 25^\circ\text{C}, t_p=10\text{ms}, \text{Half Sine Pulse}$<br>$T_C = 110^\circ\text{C}, t_p=10\text{ms}, \text{Half Sine Pulse}$                         | $\int i^2dt$ | 40.5<br>24.3   | $\text{A}^2\text{s}$ |
| Power dissipation<br>$T_C = 25^\circ\text{C}$<br>$T_C = 110^\circ\text{C}$                                                                                                       | $P_{tot}$    | 92<br>40       | 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. | $R_{thJC}$ | 1.62  | $^\circ\text{C/W}$ |



**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 | 1.55 | V             | $I_F=12\text{A}$<br>$T_j=25^\circ\text{C}$<br>$T_j=175^\circ\text{C}$                                 |
| Reverse Current         | $I_R$  | -     | -    | 50   | $\mu\text{A}$ | $V_R=650\text{V}$<br>$T_j=25^\circ\text{C}$<br>$T_j=175^\circ\text{C}$                                |
| Total Capacitive Charge | $Q_C$  | -     | 27   | -    | 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      | -     | 561  | -    | 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

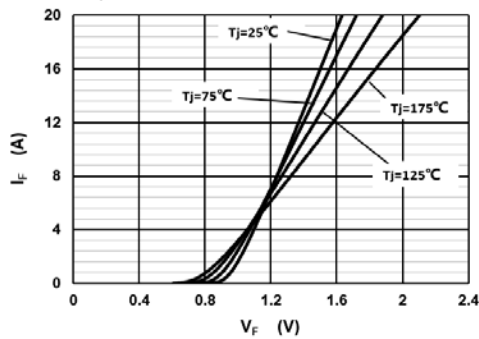


Fig 2: Reverse Characteristics

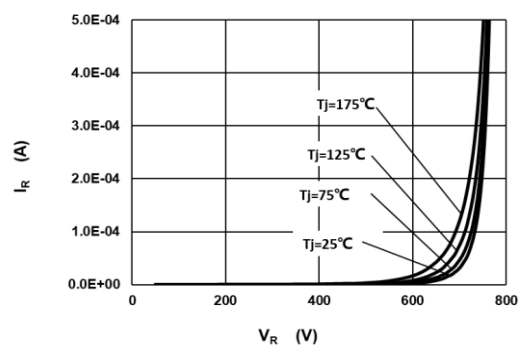


Fig 3: Current Derating

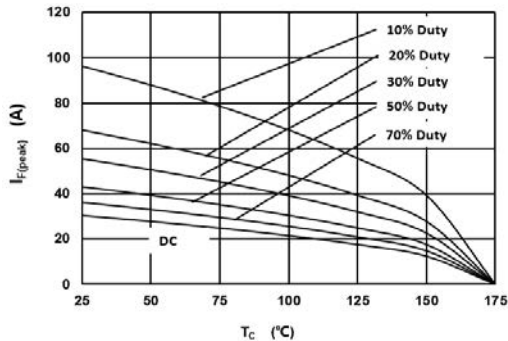


Fig 4: Power Derating

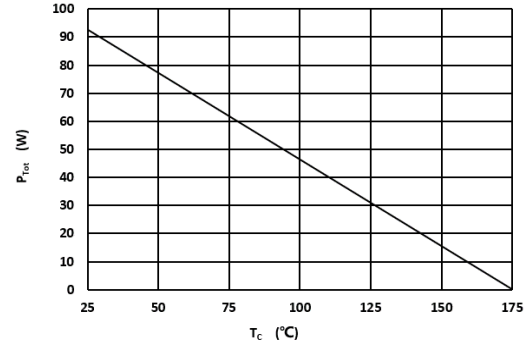




Fig 5: Capacitance vs. Reverse Voltage

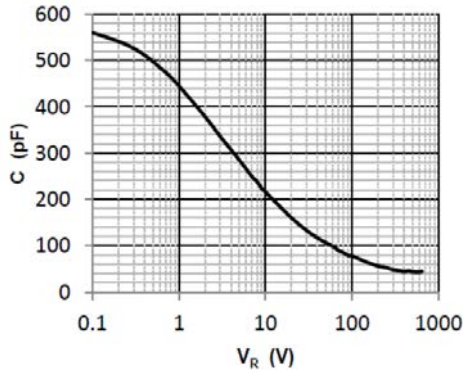


Fig 6: Reverse Charge vs. Reverse Voltage

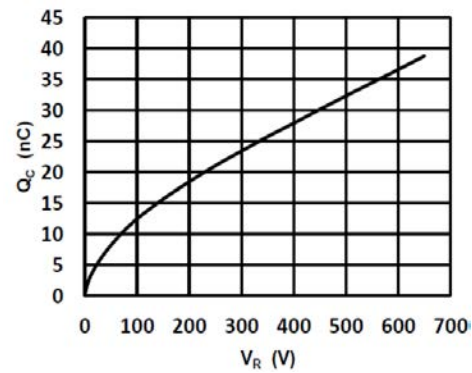


Fig 7: Typical Capacitance Stored Energy

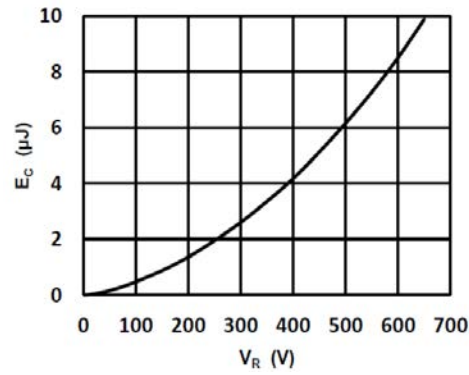
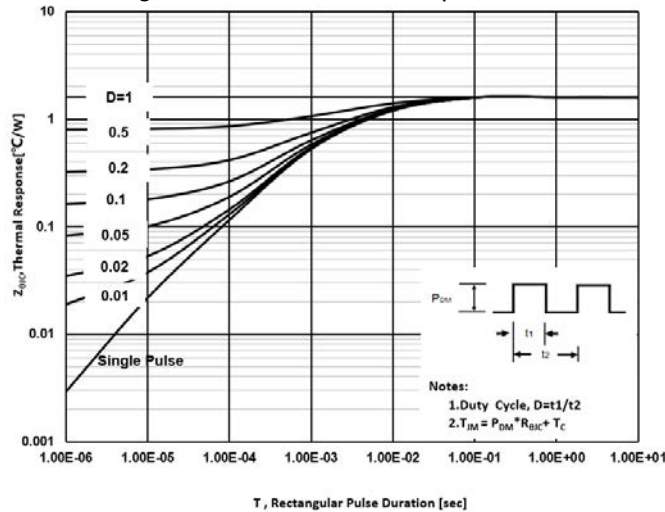


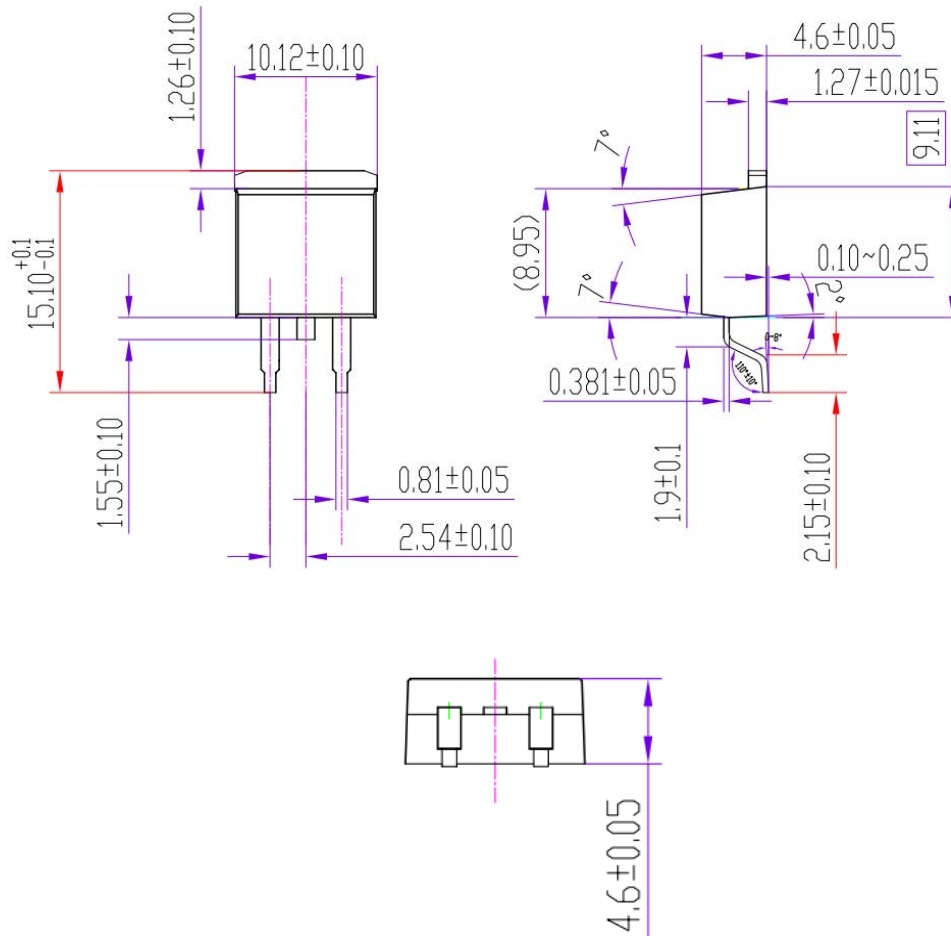
Fig 8: Transient Thermal Impandance





## Package Dimensions

Package TO-263





### **Attention**

- Any and all HUA XUAN YANG ELECTRONICS products described or contained herein do not have specifications that can handle applications that require extremely high levels of reliability, such as life-support systems, aircraft's control systems, or other applications whose failure can be reasonably expected to result in serious physical and/or material damage. Consult with your HUA XUAN YANG ELECTRONICS representative nearest you before using any HUA XUAN YANG ELECTRONICS products described or contained herein in such applications.
- HUA XUAN YANG ELECTRONICS assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all HUA XUAN YANG ELECTRONICS products described or contained herein.
- Specifications of any and all HUA XUAN YANG ELECTRONICS products described or contained herein stipulate the performance, characteristics, and functions of the described products in the independent state, and are not guarantees of the performance, characteristics, and functions of the described products as mounted in the customer's products or equipment. To verify symptoms and states that cannot be evaluated in an independent device, the customer should always evaluate and test devices mounted in the customer's products or equipment.
- HUA XUAN YANG ELECTRONICS CO.,LTD. strives to supply high-quality high-reliability products. However, any and all semiconductor products fail with some probability. It is possible that these probabilistic failures could give rise to accidents or events that could endanger human lives, that could give rise to smoke or fire, or that could cause damage to other property. When designing equipment, adopt safety measures so that these kinds of accidents or events cannot occur. Such measures include but are not limited to protective circuits and error prevention circuits for safe design, redundant design, and structural design.
- In the event that any or all HUA XUAN YANG ELECTRONICS products(including technical data, services) described or contained herein are controlled under any of applicable local export control laws and regulations, such products must not be exported without obtaining the export license from the authorities concerned in accordance with the above law.
- No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or any information storage or retrieval system, or otherwise, without the prior written permission of HUA XUAN YANG ELECTRONICS CO.,LTD.
- Information (including circuit diagrams and circuit parameters) herein is for example only ; it is not guaranteed for volume production. HUA XUAN YANG ELECTRONICS believes information herein is accurate and reliable, but no guarantees are made or implied regarding its use or any infringements of intellectual property rights or other rights of third parties.
- Any and all information described or contained herein are subject to change without notice due to product/technology improvement, etc. When designing equipment, refer to the "Delivery Specification" for the HUA XUAN YANG ELECTRONICS product that you intend to use.