



Features

- Low Forward Voltage (V_f) Drop with Positive Temperature Coefficient
- Zero Reverse Recovery Current / Forward Recovery Voltage
- Temperature-Independent Switching Behavior

Applications

- Battery Chargers
- Solar & Renewable Energy Power Conversion
- Industrial Power Supplies
- Boost Diodes in PFC & DC-DC



TO247-2L
Package



Part Number	Package	Marking
HC4D30120H	TO247-2L	HC4D30120H

Maximum Ratings (T = 25°C unless otherwise specified)

Parameter	Symbol	Value	Unit	Test Conditions	Note
Repetitive Peak Reverse Voltage	V_{RRM}	1200	V		
DC Blocking Voltage	V_{DC}	1200			
Continuous Forward Current	I_F	94	A	$T_J = 25^\circ\text{C}$	Fig. 3
		45		$T_J = 135^\circ\text{C}$	
		30		$T_J = 155^\circ\text{C}$	
Repetitive Peak Forward Surge Current	I_{FRM}	121	A	$T_c = 25^\circ\text{C}, t_p = 10\text{ ms}, \text{Half Sine Pulse}$	
		68		$T_c = 110^\circ\text{C}, t_p = 10\text{ ms}, \text{Half Sine Pulse}$	
Non-Repetitive Forward Surge Current	I_{FSM}	233	A	$T_c = 25^\circ\text{C}, t_p = 10\text{ ms}, \text{Half Sine Pulse}$	
		209		$T_c = 110^\circ\text{C}, t_p = 10\text{ ms}, \text{Half Sine Pulse}$	
Power Dissipation	P_{tot}	441	W	$T_c = 25^\circ\text{C}$	Fig. 4
		191		$T_c = 110^\circ\text{C}$	
i^2t Value	$\int i^2t$	271	A^2s	$T_c = 25^\circ\text{C}, t_p = 10\text{ ms}$	
		218		$T_c = 110^\circ\text{C}, t_p = 10\text{ ms}$	



Electrical Characteristics

Parameter	Symbol	Typ.	Max.	Units	Test Conditions	Note
Forward Voltage	V_F	1.5	1.8	V	$I_F = 30\text{ A}, T_J = 25\text{ }^\circ\text{C}$	Fig. 1
		2.2	3		$I_F = 30\text{ A}, T_J = 175\text{ }^\circ\text{C}$	
Reverse Current	I_R	40	250	μA	$V_R = 1200\text{ V}, T_J = 25\text{ }^\circ\text{C}$	Fig. 2
		70	450		$V_R = 1200\text{ V}, T_J = 175\text{ }^\circ\text{C}$	
Total Capacitive Charge	Q_C	152		nC	$V_R = 800\text{ V}, T_J = 25\text{ }^\circ\text{C}$	Fig. 5
Total Capacitance	C	2,177		pF	$V_R = 0\text{ V}, T_J = 25\text{ }^\circ\text{C}, f = 1\text{ MHz}$	Fig. 6
		136			$V_R = 400\text{ V}, T_J = 25\text{ }^\circ\text{C}, f = 1\text{ MHz}$	
		100			$V_R = 800\text{ V}, T_J = 25\text{ }^\circ\text{C}, f = 1\text{ MHz}$	
Capacitance Stored Energy	E_C	44		μJ	$V_R = 800\text{ V}$	Fig. 7

Note:
SiC Schottky Diodes are majority carrier devices, so there is no reverse recovery charge.

Thermal & Mechanical Characteristics

Parameter	Symbol	Value	Units	Note
Thermal Resistance, Junction to Case (Typ.)	$R_{\theta,JC}$	0.34	$^\circ\text{C} / \text{W}$	
Operating Junction & Storage Temperature	T_J, T_{stg}	-55 to +175	$^\circ\text{C}$	Fig. 8
Maximum Processing Temperature	T_{PROC}	325		10 min. Maximum

Electrostatic Discharge (ESD) Classifications

Parameter	Symbol	Value
Human Body Model	HBM	Class 3B ($\geq 8000\text{ V}$)
Charge Device Model	CDM	Class C3 ($\geq 1000\text{ V}$)



Typical Performance

Figure 1. Forward Characteristics

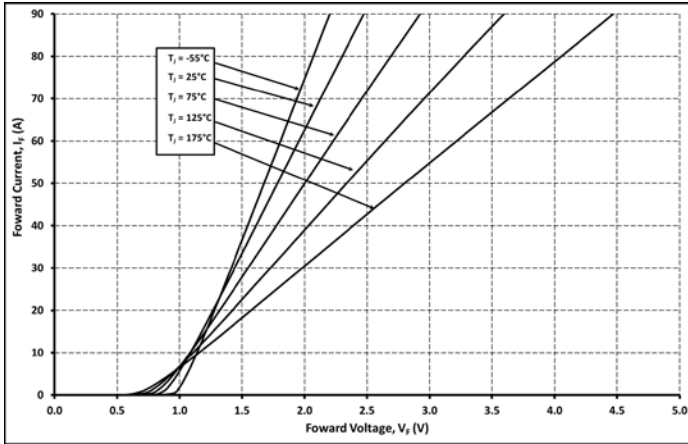


Figure 2. Reverse Characteristics

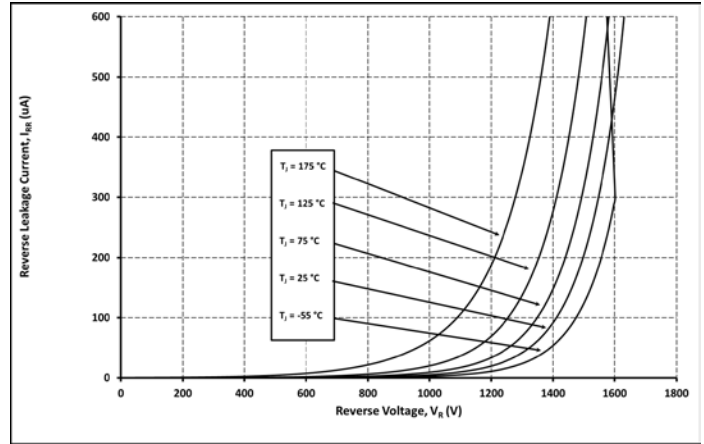


Figure 3. Current Derating

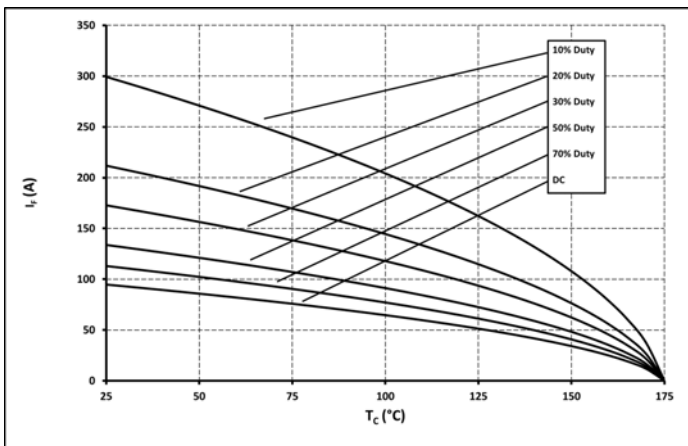


Figure 4. Power Derating

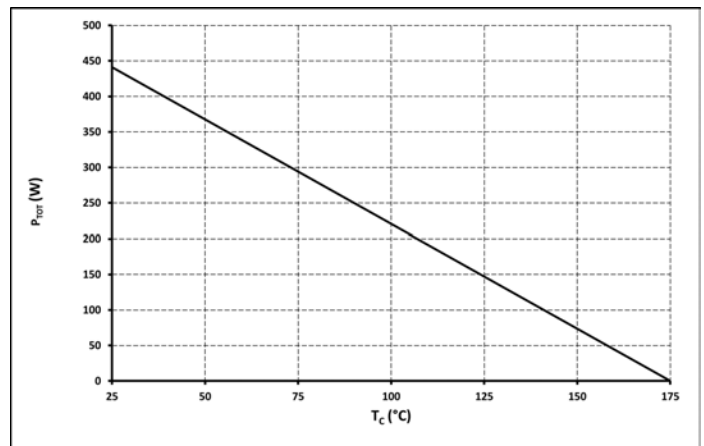


Figure 5. Total Capacitance Charge vs. Reverse Voltage

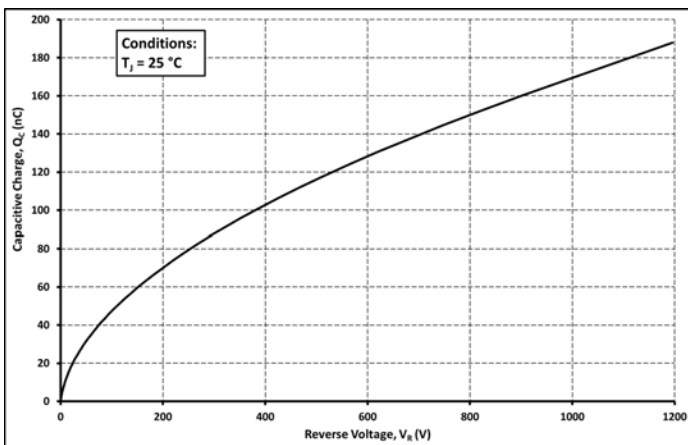
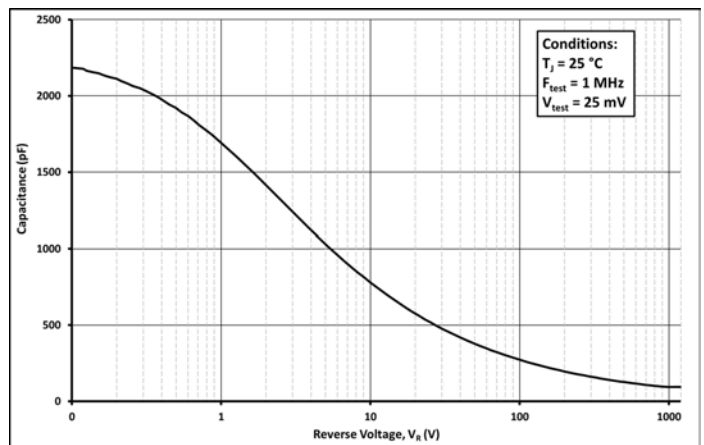


Figure 6. Capacitance vs. Reverse Voltage





Typical Performance

Figure 7. Capacitance Stored Energy

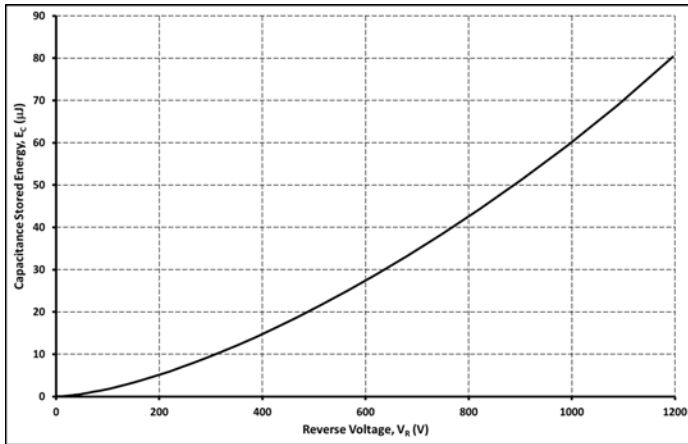
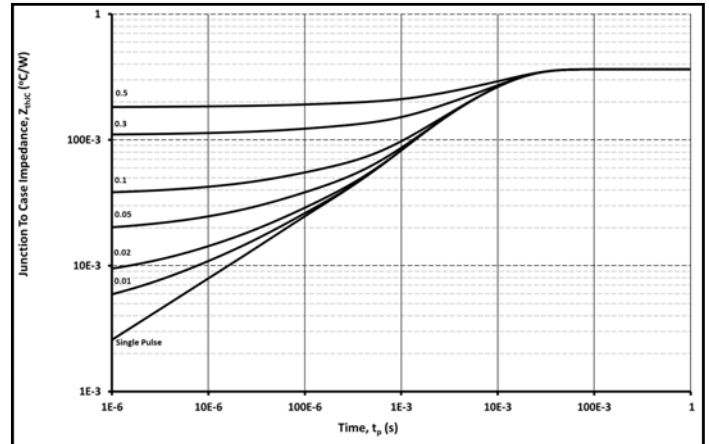


Figure 8. Transient Thermal Impedance

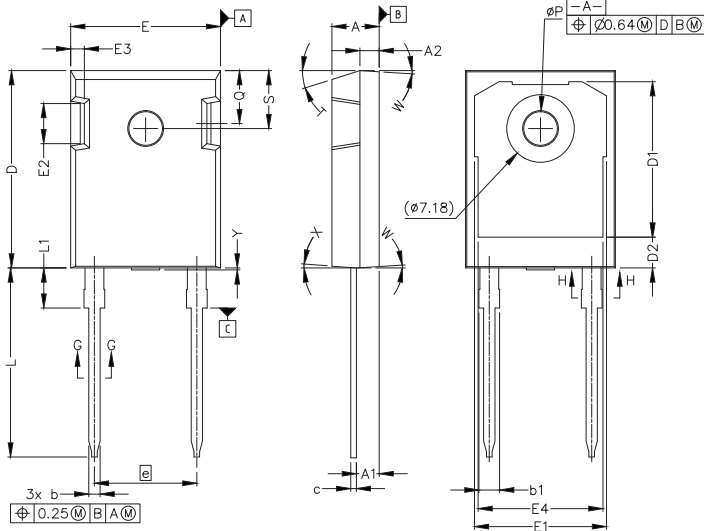




Package Dimensions

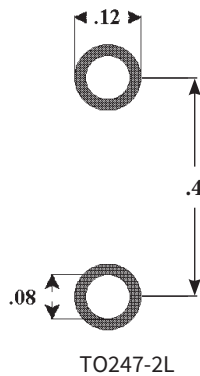
Package: TO247-2L

All dimensions in mm.



SYM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.83	5.21	.190	.205
A1	2.29	2.54	.090	.100
A2	1.91	2.16	.075	.085
b'	1.07	1.28	.042	.050
b	1.07	1.33	.042	.052
b1	1.91	2.41	.075	.095
b2	1.91	2.16	.075	.085
c'	0.55	0.65	.022	.026
c	0.55	0.68	.022	.027
D	20.80	21.10	.819	.831
D1	16.25	17.35	.640	.683
D2	2.86	3.16	.112	.124
E	15.75	16.13	.620	.635
E1	13.10	14.15	.516	.557
E2	3.68	5.10	.145	.201
E3	1.00	1.90	.039	.075
E4	12.38	13.43	.487	.529
e	10.88 BSC		.428 BSC	
L	19.81	20.32	.780	.800
L1	4.10	4.40	.161	.173
ϕP	3.51	3.65	.138	.144
Q	5.49	6.00	.216	.236
S	6.04	6.30	.238	.248
T	17.5° REF.			
W	3.5° REF.			
X	4° REF.			
Y	0	0.50	0	0.020

Recommended Solder Pad Layout



TO247-2L

all units are in inches



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.