

Diode – Power, Bare Die

Gen VII, Fast Recovery
1200 V, 45 A

PCFF45H120SWF

Features

- Advanced Gen VII Technology
- Fast and Soft Recovery
- Maximum Junction Temperature 175°C
- Low Forward Voltage: $V_F = 1.78 \text{ V}$ (Typ.) @ $I_F = 45 \text{ A}$
- Easy to Parallel Operation

Typical Applications

- Solar
- Energy Storage
- Industrial Motor Control

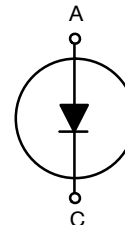
MECHANICAL PARAMETERS

Parameter	Value	Unit
Die Size (w/ Scribe Lane)	3,360 x 5,400	μm^2
Anode Pad Size	2,377 x 4,417	μm^2
Scribe Lane Width	80	μm
Die Thickness	119	μm
Top Metal	6 μm AlSiCu	
Back Metal	1.65 μm Ti/NiV/Ag	
Topside Passivation	Silicon Nitride plus Polyimide	
Wafer Diameter	200 mm	
Max Possible Die Per Wafer	1396	
Recommended Storage Environment	In original container, in dry nitrogen, < 6 months at an ambient temperature of 23°C	

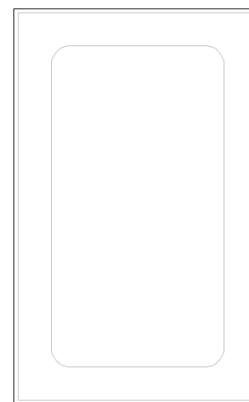
$$V_R = 1200 \text{ V}$$

$$I_F = 45 \text{ A}$$

DIODE DIE



DIE OUTLINE



ORDERING INFORMATION

Device	Inking	Shipping
PCFF45H120SWF	Yes	Sawn Wafer on Tape

PCFF45H120SWF

ABSOLUTE MAXIMUM RATINGS ($T_J = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Ratings	Unit
Repetitive Peak Reverse Voltage	V_{RRM}	1200	V
DC Forward Current, limited by $T_{J\max}$ (Note 1)	I_F	45	A
Pulsed Forward Current, t_p limited by $T_{J\max}$ (Note 2)	I_{FM}	135	A
Operating Junction Temperature	T_J	-40 to +175	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	+18 to +28	$^\circ\text{C}$

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.

1. Nominal forward current at $T_c = 100^\circ\text{C}$ when assembled in power module
2. Not subject to production test – verified by design/characterization.

ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
-----------	--------	----------------	-----	-----	-----	------

STATIC CHARACTERISTICS (Tested on Wafers)

Breakdown Voltage	V_{BR}	$I_R = 1\text{ mA}$	1200	–	–	V
Reverse Leakage Current	I_R	$V_R = 1200\text{ V}$	–	–	10	μA
Forward Voltage	V_F	$I_F = 45\text{ A}$	–	1.78	2.08	V

ELECTRICAL CHARACTERISTICS (Not subjected to production test – verified by design/characterization)

Breakdown Voltage	V_{BR}	$I_R = 1\text{ mA}$	$T_J = -40^\circ\text{C}$	1200	–	–	V
Forward Voltage	V_F	$I_F = 45\text{ A}$	$T_J = 175^\circ\text{C}$	–	1.9	–	V
Reverse Recovery Time	T_{rr}	$I_F = 45\text{ A}, V_R = 600\text{ V},$ $di_F/dt = 500\text{ A}/\mu\text{s}, T_J = 25^\circ\text{C}$		–	244.9	–	nS
Reverse Recovery Charge	Q_{rr}			–	2469	–	nC
Reverse Recovery Current	I_{RRM}			–	20.2	–	A
Reverse Recovery Time	T_{rr}	$I_F = 45\text{ A}, V_R = 600\text{ V},$ $di_F/dt = 500\text{ A}/\mu\text{s}, T_J = 175^\circ\text{C}$		–	376.5	–	nS
Reverse Recovery Charge	Q_{rr}			–	5407	–	nC
Reverse Recovery Current	I_{RRM}			–	28.8	–	A

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

NOTE: Switching characteristics and thermal properties are depending strongly on module design and mounting technology.

PCFF45H120SWF

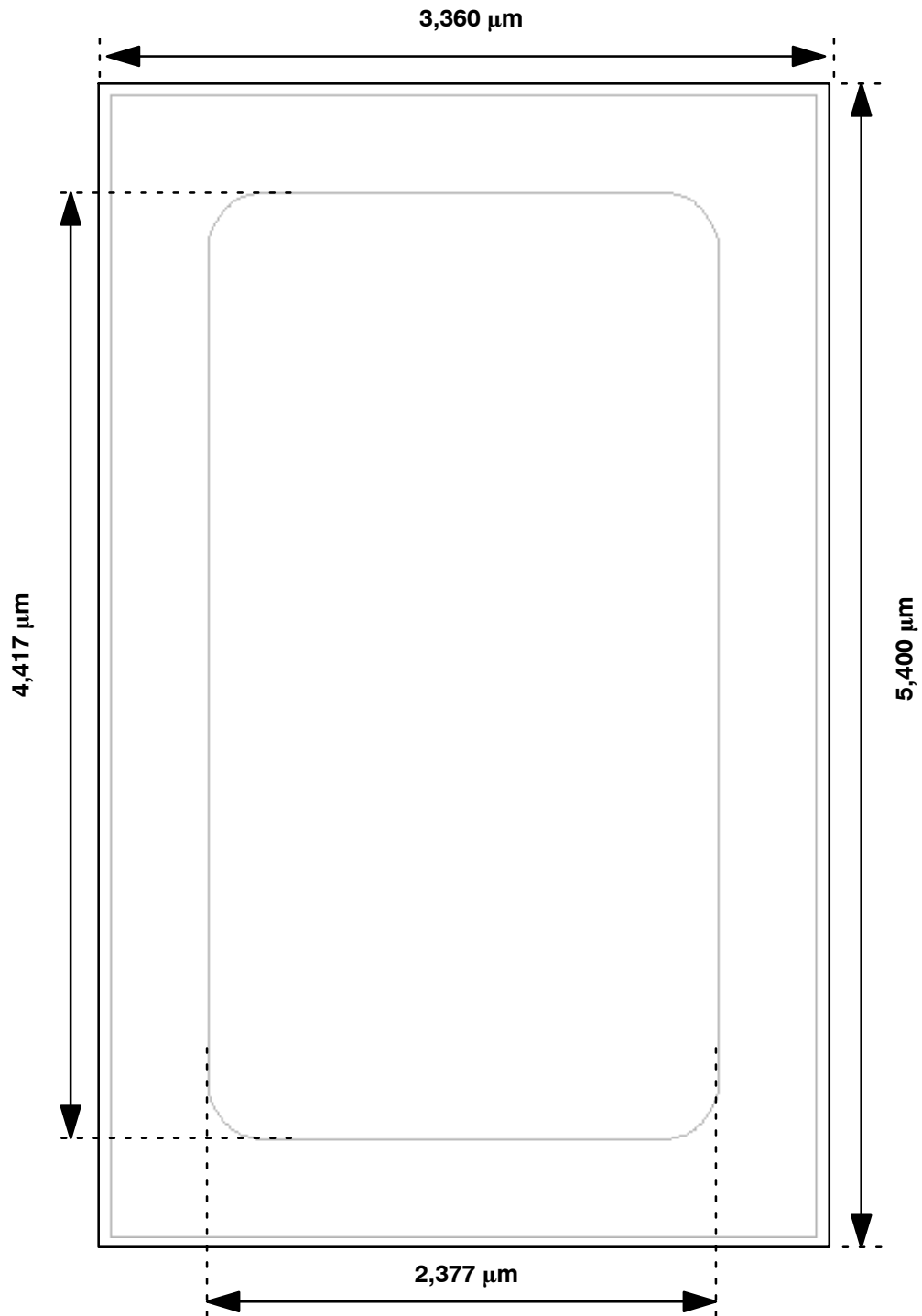


Figure 1. Die Layout

onsemi, **Onsemi**, and other names, marks, and brands are registered and/or common law trademarks of Semiconductor Components Industries, LLC dba "**onsemi**" or its affiliates and/or subsidiaries in the United States and/or other countries. **onsemi** owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of **onsemi**'s product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. **onsemi** reserves the right to make changes at any time to any products or information herein, without notice. The information herein is provided "as-is" and **onsemi** makes no warranty, representation or guarantee regarding the accuracy of the information, product features, availability, functionality, or suitability of its products for any particular purpose, nor does **onsemi** assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using **onsemi** products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by **onsemi**. "Typical" parameters which may be provided in **onsemi** data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. **onsemi** does not convey any license under any of its intellectual property rights nor the rights of others. **onsemi** products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use **onsemi** products for any such unintended or unauthorized application, Buyer shall indemnify and hold **onsemi** and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that **onsemi** was negligent regarding the design or manufacture of the part. **onsemi** is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

ADDITIONAL INFORMATION

TECHNICAL PUBLICATIONS:

Technical Library: www.onsemi.com/design/resources/technical-documentation
onsemi Website: www.onsemi.com

ONLINE SUPPORT: www.onsemi.com/support

For additional information, please contact your local Sales Representative at
www.onsemi.com/support/sales