

# Diode – Power, Bare Die

**Gen VII, Fast Recovery  
 1200 V, 55 A**

## PCFF55H120SWF

**Features**

- Advanced Gen VII Technology
- Fast and Soft Recovery
- Maximum Junction Temperature 175°C
- Low Forward Voltage:  $V_F = 1.78\text{ V (Typ.) @ } I_F = 55\text{ A}$
- Easy to Parallel Operation

**Typical Applications**

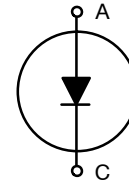
- Solar
- Energy storage
- Industrial motor control

**MECHANICAL PARAMETERS**

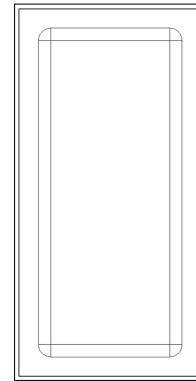
Parameter	Value	Unit
Die Size (w/ Scribe Lane)	3,400 x 6,400	$\mu\text{m}^2$
Anode Pad Size	2,437 x 5,437	$\mu\text{m}^2$
Scribe Lane Width	80	$\mu\text{m}$
Die Thickness	119	$\mu\text{m}$
Top Metal	6 $\mu\text{m}$ AlSiCu	
Back Metal	1.65 $\mu\text{m}$ Ti/NiV/Ag	
Topside Passivation	Silicon Nitride plus Polyimide	
Wafer Diameter	200 mm	
Max Possible Die Per Wafer	1145	
Recommended Storage Environment	In original container, in dry nitrogen, < 6 months at an ambient temperature of 23°C	

$V_R = 1200\text{ V}$   
 $I_F = 55\text{ A}$

**DIODE DIE**



**DIE OUTLINE**



**ORDERING INFORMATION**

Device	Inking	Shipping
PCFF55H120SWF	Yes	Sawn Wafer on Tape

# PCFF55H120SWF

## 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)	$I_F$	55	A
Pulsed Forward Current, $t_p$ limited by $T_{J\max}$ (Note 2)	$I_{FM}$	165	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
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### 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	$\mu\text{A}$
Forward Voltage	$V_F$	$I_F = 55\text{ A}$	–	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	$V_F$	$I_F = 55\text{ A}$	$T_J = 175^\circ\text{C}$	–	1.9	–	V
Reverse Recovery Time	$T_{rr}$	$I_F = 55\text{ A}, V_R = 600\text{ V},$ $di_F/dt = 500\text{ A}/\mu\text{s}, T_J = 25^\circ\text{C}$		–	287.4	–	nS
Reverse Recovery Charge	$Q_{rr}$			–	3.0	–	$\mu\text{C}$
Reverse Recovery Current	$I_{RRM}$			–	20.7	–	A
Reverse Recovery Time	$T_{rr}$	$I_F = 55\text{ A}, V_R = 600\text{ V},$ $di_F/dt = 500\text{ A}/\mu\text{s}, T_J = 175^\circ\text{C}$		–	481.5	–	nS
Reverse Recovery Charge	$Q_{rr}$			–	7.5	–	$\mu\text{C}$
Reverse Recovery Current	$I_{RRM}$			–	31.1	–	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.

PCFF55H120SWF

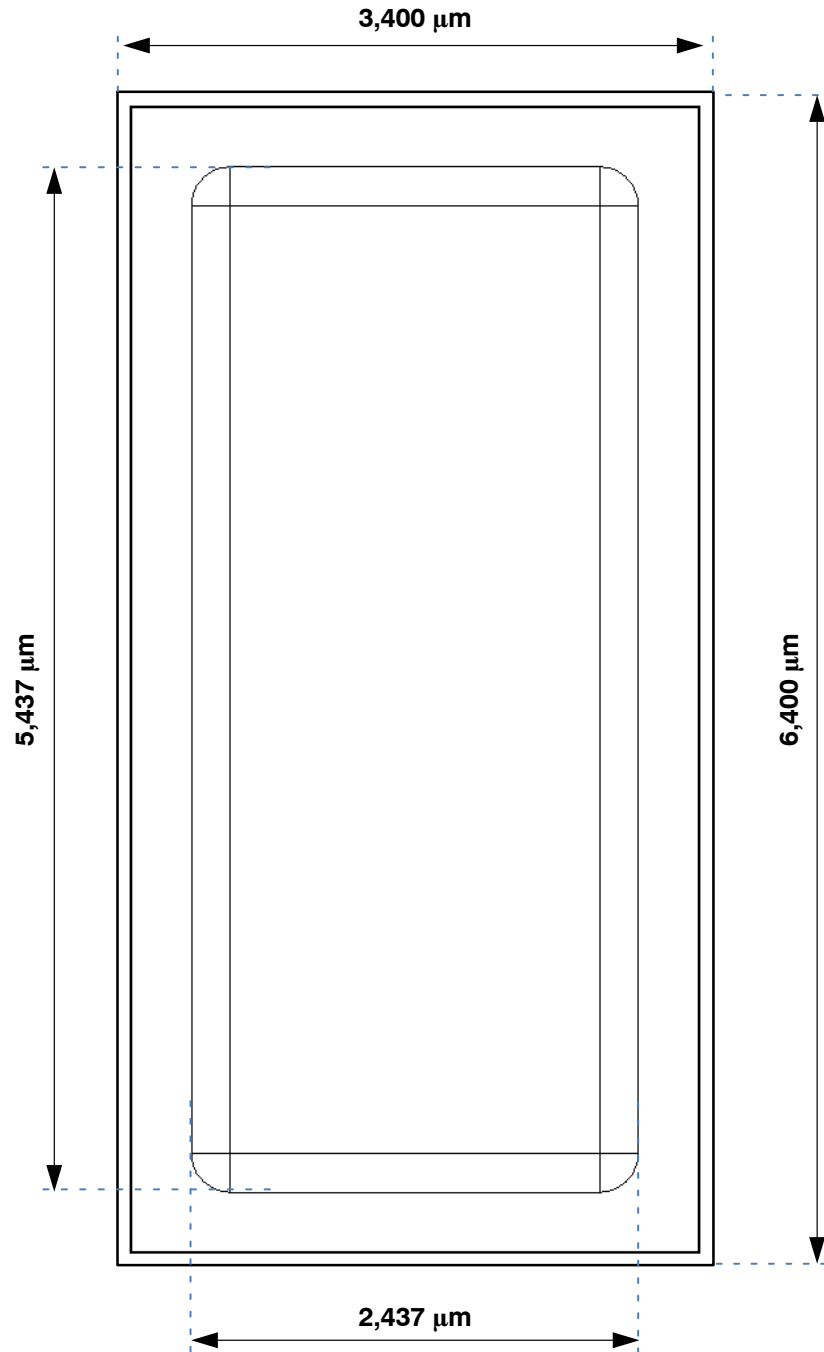


Figure 1. Die Layout

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