Diode – Power, Bare Die

Gen VII, Fast Recovery 1200 V, 45 A

PCFF45H120SWF

V_R = 1200 V
I_F = 45 A

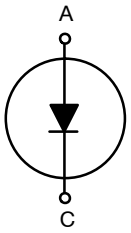
Features

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

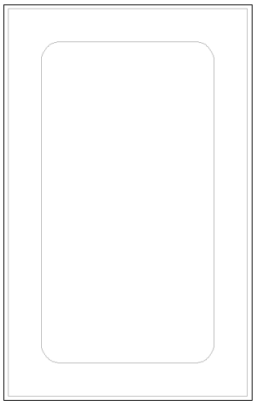
Typical Applications

- Solar
- Energy Storage
- Industrial Motor Control

DIODE DIE



DIE OUTLINE



MECHANICAL PARAMETERS

Parameter	Value	Unit
Die Size (w/ Scribe Lane)	3,360 x 5,400	μm²
Anode Pad Size	2,377 x 4,417	μm²
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	

ORDERING INFORMATION

Device	Inking	Shipping
PCFF45H120SWF	Yes	Sawn Wafer on Tape

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ABSOLUTE MAXIMUM RATINGS (T_J = 25°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, tp limited by $T_{J\ max}$ (Note 2)	I_{FM}	135	A
Operating Junction Temperature	T_J	−40 to +175	°C
Storage Temperature Range	Tstg	+18 to +28	°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 Tc = 100°C when assembled in power module
2. Not subject to production test − verified by design/characterization.

ELECTRICAL CHARACTERISTICS (T_J = 25°C unless otherwise specified)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
STATIC CHARACTERISTICS (Tested on Wafers)						
Breakdown Voltage	V_{BR}	I_R = 1 mA	1200	–	–	V
Reverse Leakage Current	I_R	V_R = 1200 V	–	–	10	μA
Forward Voltage	V_F	I_F = 45 A	–	1.78	2.08	V
ELECTRICAL CHARACTERISTICS (Not subjected to production test − verified by design/characterization)						
Breakdown Voltage	V_{BR}	I_R = 1 mA, T_J = −40°C	1200	–	–	V
Forward Voltage	V_F	I_F = 45 A, T_J = 175°C	–	1.9	–	V
Reverse Recovery Time	T_{rr}	I_F = 45 A, V_R = 600 V, dI_F/dt = 500 A/μs, T_J = 25°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 A, V_R = 600 V, dI_F/dt = 500 A/μs, T_J = 175°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.

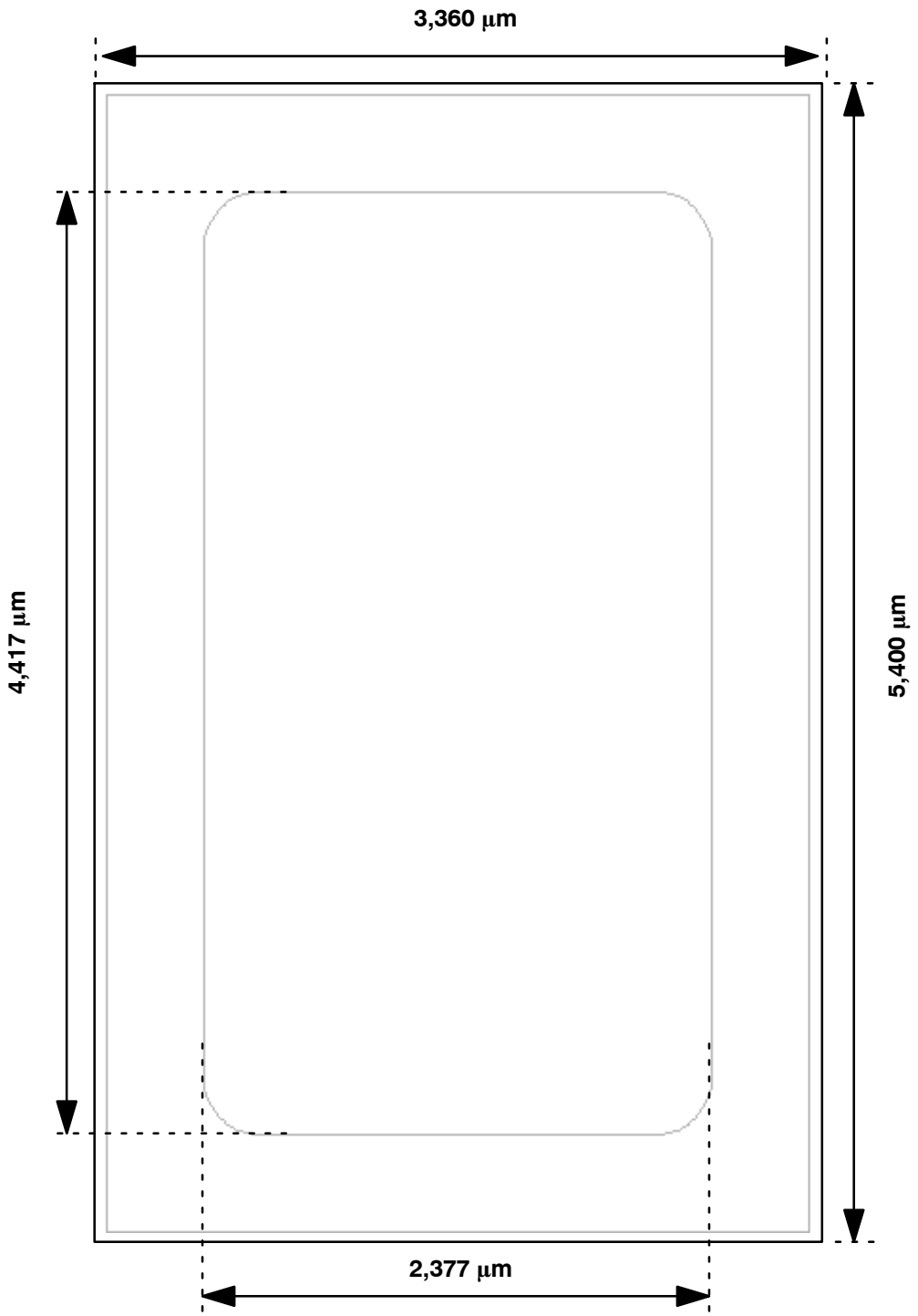

Figure 1. Die Layout

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