

Diode – Power, Bare Die

Gen VII, Fast Recovery 1200 V, 75 A

PCFF75H120SWF

Features

- Advanced Gen VII Technology
- Fast and Soft Recovery
- Maximum Junction Temperature 175°C
- Low Forward Voltage: $V_F = 1.78 \text{ V (Typ.) @ } I_F = 75 \text{ A}$
- Easy to Parallel Operation

Typical Applications

- Solar
- Energy Storage
- Industrial Motor Control

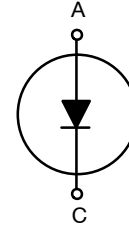
MECHANICAL PARAMETERS

| Parameter | Value | Unit |
|---------------------------------|---|-----------------|
| Die Size (w/ Scribe Lane) | 3,900 x 7,000 | μm^2 |
| Anode Pad Size | 2,917 x 6,017 | 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 | 910 | |
| Recommended Storage Environment | In original container, in dry nitrogen, < 6 months at an ambient temperature of 23°C | |

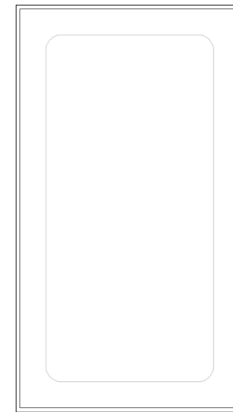
$$V_R = 1200 \text{ V}$$

$$I_F = 75 \text{ A}$$

DIODE DIE



DIE OUTLINE



ORDERING INFORMATION

| Device | Inking | Shipping |
|---------------|--------|-----------------------|
| PCFF75H120SWF | Yes | Sawn Wafer on Tape |

PCFF75H120SWF

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 | 75 | A |
| Pulsed Forward Current, t_p limited by $T_{J\max}$ (Note 2) | I_{FM} | 225 | 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.

- Nominal forward current at $T_c = 100^\circ\text{C}$ when assembled in power module
- 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 | $I_F = 75\text{ A}$ | – | 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 | $I_F = 75\text{ A}$ | $T_J = 175^\circ\text{C}$ | – | 1.9 | – | V |
| Reverse Recovery Time | T_{rr} | $I_F = 75\text{ A}, V_R = 600\text{ V},$ $di_F/dt = 500\text{ A}/\mu\text{s}, T_J = 25^\circ\text{C}$ | | – | 281.6 | – | nS |
| Reverse Recovery Charge | Q_{rr} | | | – | 3.5 | – | μC |
| Reverse Recovery Current | I_{RRM} | | | – | 24.6 | – | A |
| Reverse Recovery Time | T_{rr} | $I_F = 75\text{ A}, V_R = 600\text{ V},$ $di_F/dt = 500\text{ A}/\mu\text{s}, T_J = 175^\circ\text{C}$ | | – | 440.2 | – | nS |
| Reverse Recovery Charge | Q_{rr} | | | – | 8.1 | – | μC |
| Reverse Recovery Current | I_{RRM} | | | – | 37.0 | – | 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.

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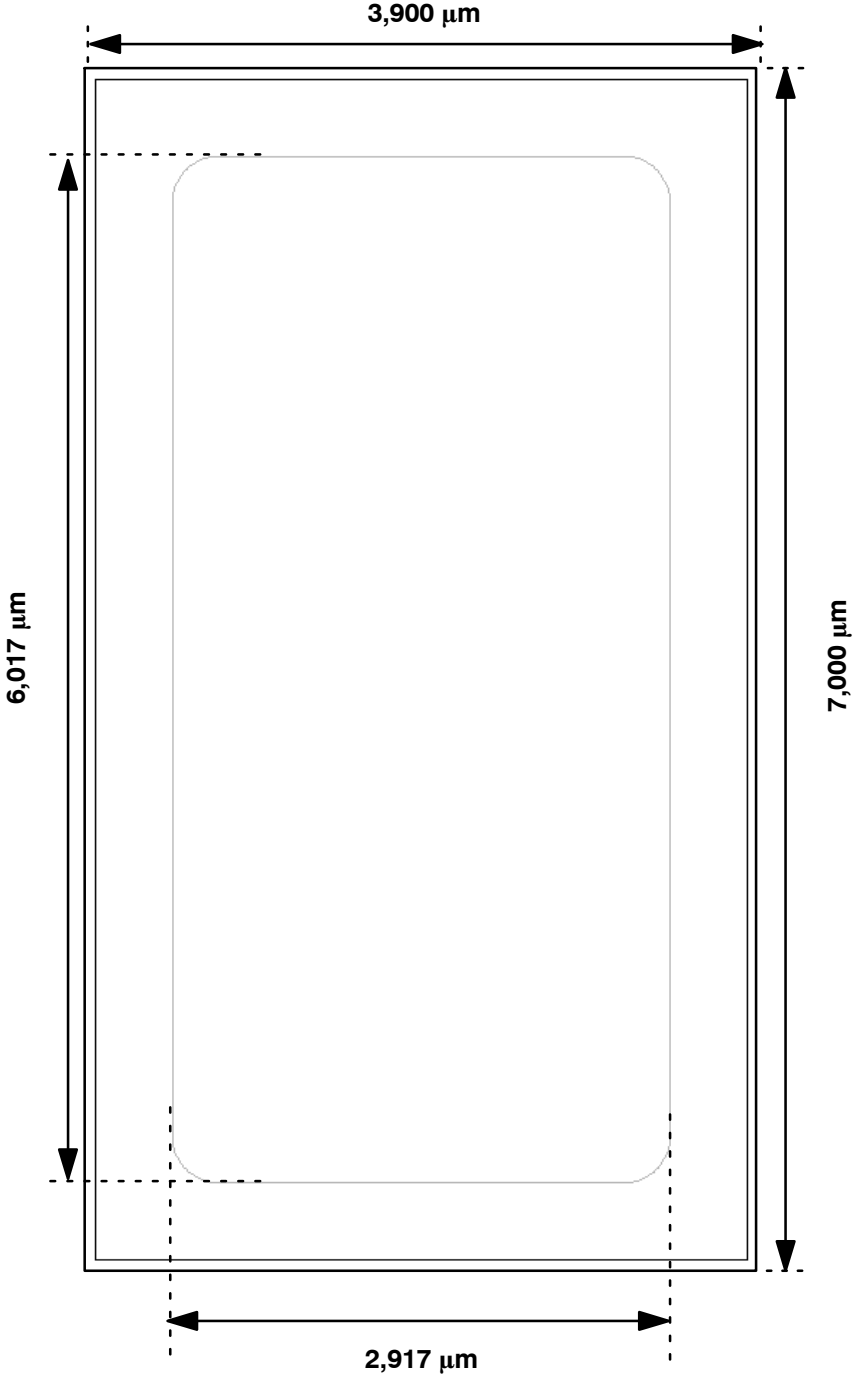


Figure 1. Die Layout

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