SwiftWing PDB-6S

3S–6S 120 A Power Distribution Board with Integrated 5V & 12V Buck Regulators

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Product Page: https://swiftwingtech.io/product/3s-6s-120a-power-distribution-board/

Product Overview

The SwiftWing PDB-6S is a high-current 3S–6S power distribution board designed for professional multirotor and UAV platforms. It supports up to 120 A total ESC distribution under proper thermal and wiring conditions. Supporting 11.1 V to 25.2 V LiPo battery input, this board integrates independent 5V (3A) and 12V (3A) switching buck regulators to deliver clean, stable power to flight controllers, ESCs, FPV systems, GPS modules, and onboard electronics. Built on a robust 4-layer, 2 oz copper PCB with ENIG finish, the SwiftWing PDB-6S ensures reliable power distribution with minimal voltage drop and improved thermal performance under high load conditions. Engineered for racing drones, aerial imaging platforms, industrial UAVs, and defense-grade multirotor systems, this power distribution board simplifies wiring architecture while maintaining electrical integrity

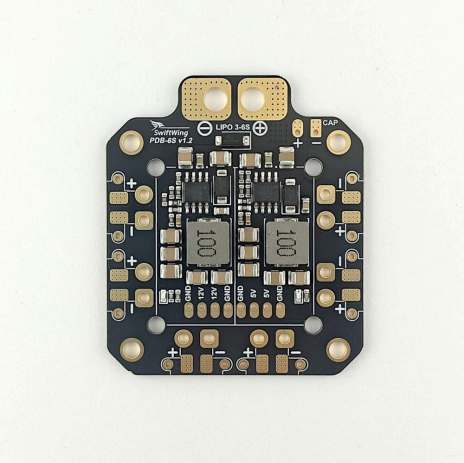

Figure 1: SwiftWing PDB-6S

Key Features

- Supports **3S–6S LiPo input (11.1 V–25.2 V)**
- Integrated **5V / 3A DC-DC buck regulator**
- Integrated **12V / 3A DC-DC buck regulator**
- High current ESC distribution up to 120 A total (PCB capability)
- 4-layer PCB with 2 oz copper planes
- Dual mounting patterns: **30.5 mm & 40 mm**
- XT30 and XT60 solder pad footprints
- Compact, lightweight design (16 g)

Typical Applications

- FPV racing and freestyle quadcopters
- Aerial photography drones
- Industrial inspection UAVs
- Long-range multirotor platforms
- Research and defense drone systems

Product Views

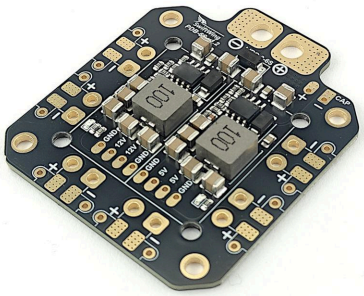

Figure 2: Top view (component side)

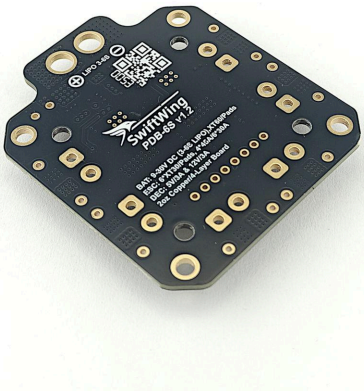

Figure 3: Bottom view

Absolute Maximum Ratings

The following ratings define the maximum limits beyond which permanent damage to the device may occur. Operation beyond these conditions is not recommended.

Parameter	Rating
Maximum Input Voltage	30V DC
Maximum Continuous Current (ESC Distribution – PCB Limited)	120 A
Maximum Burst Current	150 A
5 V Output Current (Peak, <3 s)	4 A
12 V Output Current (Peak, <3 s)	3.5 A
Operating Temperature	–10°C to +60°C
Storage Temperature	–20°C to +85°C
Maximum PCB Temperature	105°C

Note: Stresses above the listed ratings may cause permanent damage. Functional operation is not guaranteed under absolute maximum conditions. Actual usable system current may be limited by the external battery connector rating (e.g., XT60), wiring gauge, solder quality, and cooling conditions.

Electrical Specifications

Electrical characteristics measured under nominal operating conditions unless otherwise specified.

Parameter	Specification
Recommended Operating Voltage	3S–6S LiPo (11.1–25.2 V)
Maximum Continuous Current (ESC Outputs)	120 A total*
5 V Output	5.0 V ±3%, up to 3 A continuous
5 V Burst	4.5 A (<3 s)
12 V Output	12.0 V ±3%, up to 3 A continuous

12 V Burst	4 A (<3 s)
Regulation Type	Independent switching DC-DC buck regulators
Typical Efficiency	90–94%
Protection	Transient Protection (TVS)
Reverse Polarity Protection	Not provided
Input Filtering Capacitor Footprint Provided	External capacitor optional; 330 µF, 50 V low-ESR recommended for high-current builds

⚠️ External fusing and correct battery polarity are recommended.
Note: Installation of external input capacitor is recommended for high-current builds and long battery leads.
* Maximum current depends on external battery connector, wiring gauge, solder quality, and thermal conditions.

Mechanical Specifications

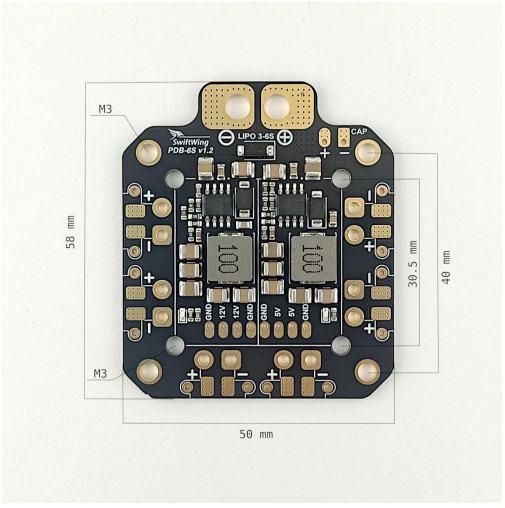

Figure 4: SwiftWing PDB-6S - Dimensions

Parameter	Value
Board Size (L x W)	58 mm × 50 mm
Maximum Height	6.35 mm
PCB Thickness	1.6 mm ±0.15 mm
Mounting Holes	4 × M3 (40 mm) 4 × M3 (30.5 mm)
Finish	ENIG
Weight	16 g
PCB Layers	4-Layer, 2 oz Copper

Compliance

- PCB materials comply with **RoHS directive requirements** for hazardous substance restrictions.
- ENIG (Electroless Nickel Immersion Gold) finish is lead-free.
- Designed in accordance with good engineering practices for UAV and multirotor electronic systems.

Formal third-party certification is not included unless explicitly stated.

Connector & Assembly Notes

Important - Connector Support

Battery Input Pads

- XT60 footprint is provided as solder pads only
- Direct wire soldering to battery input pads is supported
- For high-current applications approaching 120 A, direct soldering using appropriate wire gauge is recommended

ESC Output Pads

- XT30 footprints are provided as solder pads only
- Pads support direct wire soldering
- Ensure balanced load distribution across ESC outputs

Current Considerations

- PCB supports up to 120 A total ESC distribution
- System current may be limited by external connector rating (e.g., XT60 typically ~60 A, XT30 typically ~30 A)
- Direct wire soldering allows higher current handling when proper wire gauge and cooling are used

Assembly Notes

- Ensure adequate airflow under high load conditions
- The product is supplied as a bare PCB. Connectors and external capacitors are shown in certain images for illustrative purposes only and are not included.

Optional Input Filtering Capacitor

The SwiftWing PDB-6S includes a dedicated footprint for an external electrolytic input capacitor to improve voltage stability under high current transients.

Capacitor footprint is positioned close to the battery input pads to minimize loop inductance and improve transient suppression effectiveness.

An external **330 µF–470 µF, 50 V** (or higher) low-ESR electrolytic capacitor is recommended for high-current builds or installations with long battery leads.

Purpose

- Reduces voltage spikes caused by ESC switching
- Improves power stability during rapid throttle changes
- Provides additional transient suppression for high-current setups

Installation Notes

- Observe correct polarity when soldering
- Ensure capacitor voltage rating ≥ 50 V
- Use low-ESR capacitor for best performance
- Capacitor is optional and not required for normal board operation

Example Assembly Configuration

Figure 5: Example assembly with XT60, XT30 connectors and external input capacitor installed. Connectors and capacitor not included.

What's in the Box

- 1 × SwiftWing PDB-6S (bare PCB)

(No connectors, wires, or mounting hardware included)

Ordering Information

Product Name	SKU
SwiftWing PDB-6S with BEC 5V & 12V	SW-PDB-6S

Manufacturer Information

Manufacturer: SwiftWing Robotics
Product Category: Power Distribution Board (PDB)
Model: SwiftWing PDB-6S
SKU: SW-PDB-6S

Product Page:
https://swiftwingtech.io/product/3s-6s-120a-power-distribution-board/

Website:
https://swiftwingtech.io

Disclaimer

Specifications provided in this datasheet are subject to change without notice. While every effort has been made to ensure accuracy, SwiftWing Robotics makes no representations or warranties regarding the completeness or suitability of this information for any particular application.

This product is intended for integration into UAV and multirotor systems by qualified personnel. Incorrect installation, improper battery polarity, insufficient cooling, or operation beyond specified ratings may result in equipment damage or personal injury.

SwiftWing Robotics shall not be held liable for any direct, indirect, incidental, or consequential damages arising from the use or misuse of this product.

Users are responsible for verifying product suitability and ensuring safe system integration.

Revision History

Version	Date	Description
v1.0	January 2026	Initial Release
v1.2	February 2026	Layout refinement and specification updates