# SwiftWing PDB-14S

## 8S–14S High Voltage Power Distribution Board with Integrated Buck Regulators

**Official Technical Datasheet | Document ID: SW-PDB-14S-DS-v1.2 | Release Date: March 2026**
**SKU: SW-PDB-14S**

Product Page: https://swiftwingtech.io/product/swiftwing-pdb-14s-power-distribution-board-with-12v-5v-buck/

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## Product Overview

The SwiftWing PDB-14S is a high-voltage power distribution board designed for **8S–14S LiPo battery systems**, targeting industrial UAVs, heavy-lift multirotors, and high-power robotics platforms.

The board distributes high current to multiple ESCs while integrating regulated **5V and 12V outputs** for flight electronics, payload systems, and communication modules.

Built on a **4-layer PCB with 2 oz copper**, the design features **enlarged high-current pads** to support demanding power delivery requirements while maintaining low impedance paths and improved thermal performance.

The integrated buck regulators are conservatively rated for reliable operation, ensuring stable output even under dynamic load conditions.

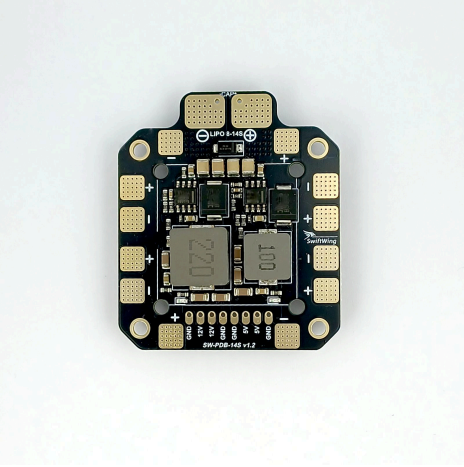


Figure 1: SwiftWing PDB-14S

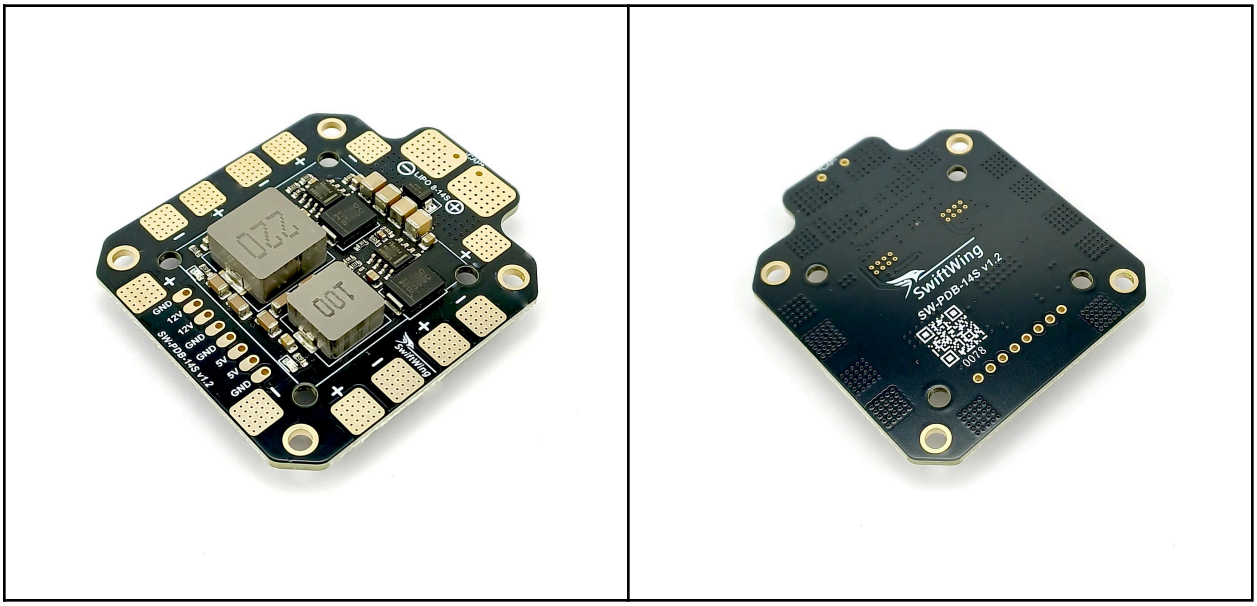
## Key Features

- Supports 8S–14S LiPo input (29.6 V – 58.8 V nominal)
- Integrated 5V / 3A buck regulator (tested up to 5A)
- Integrated 12V / 3A buck regulator (tested up to 5A)
- High-current ESC distribution with enlarged solder pads for improved current handling and reduced thermal stress
- 4-layer PCB with 2 oz copper planes
- Low impedance power distribution for high-load systems
- Optional external input capacitor footprint
- Dual mounting pattern support (30.5 mm & 40 mm)
- Compact, lightweight design (20 g)

## Typical Applications

- Heavy-lift multirotor UAVs
- Industrial and long-endurance drones
- High-voltage propulsion systems
- Robotics platforms using high-cell-count batteries
- Custom high-power electronics 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** | 65V DC |
| **Maximum Continuous Current** | 120 A |
| **Maximum Burst Current** | 150 A |
| **5 V Output Current (Peak, <3 s)** | 5 A |
| **12 V Output Current (Peak, <3 s)** | 5 A |
| **Operating Temperature** | –10°C to +60°C |
| **Storage Temperature** | –20°C to +85°C |
| **Maximum PCB Temperature** | 105°C |

**Note**:Operation beyond these limits may result in permanent damage.

## Electrical Specifications

Electrical characteristics measured under nominal operating conditions unless otherwise specified.

| Parameter | Specification |
|---|---|
| **Recommended Operating Voltage** | 8S–14S LiPo (29.6–58.8 V nominal) |
| **Design Operating Range** | 4S–14S LiPo (for internal design margin) |
| **Maximum Continuous Current (ESC Outputs)** | 120 A total* |
| **5 V Output** | 5.1 V ±3%, up to 3 A continuous |

| | |
|---|---|
| **5 V Burst** | 5 A (<3 s) |
| **12 V Output** | 12.2 V ±3%, up to 3 A continuous |
| **12 V Burst** | 5 A (<3 s) |
| **Regulation Type** | High-voltage synchronous buck converters |
| **Typical Efficiency** | 88–93% |
| **Protection** | Transient Protection (TVS) |
| **Reverse Polarity Protection** | Not provided |
| **Input Filtering Capacitor Footprint** | Provided<br>External capacitor optional;<br>≥100 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.
Note: Output voltages are intentionally regulated slightly above nominal (5V / 12V) to compensate for wiring and connector voltage drops under load.

# ⚠️ HIGH VOLTAGE CONSIDERATIONS

This board operates at significantly higher voltages than standard 3S–6S systems.

- Ensure proper insulation and wiring practices
- Use connectors and wires rated for ≥60V systems
- Avoid exposed conductive surfaces during operation
- Verify voltage compatibility of all connected components

# Mechanical Specifications

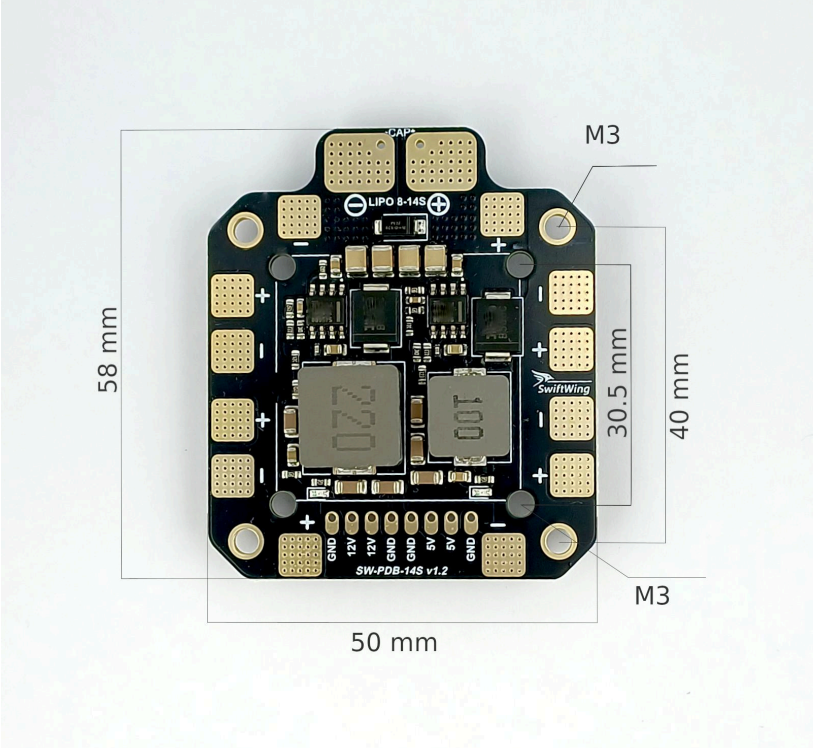



Figure 4: SwiftWing PDB-14S - Dimensions

| 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)<br>4 × M3 (30.5 mm) |
| **Finish** | ENIG |
| **Weight** | 20 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

- Supports direct soldering for battery and ESC connections
- Enlarged pads designed for high-current wiring
- Connector footprints may be used where applicable
- Ensure proper wire gauge selection for current levels
- Maintain solid solder joints to minimize resistive losses

# Optional Input Filtering Capacitor

The SwiftWing PDB-14S 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 **220 µF–470 µF, 100 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 ≥ 100 V
- Use low-ESR capacitor for best performance
- Capacitor is optional and not required for normal board operation

## What's in the Box

- 1 × SwiftWing PDB-14S (bare PCB)

*(No connectors, wires, or mounting hardware included)*

## Ordering Information

| Product Name | SKU |
|---|---|
| SwiftWing PDB-14S with BEC 5V & 12V | SW-PDB-14S |

## Manufacturer Information

**Manufacturer:** SwiftWing Robotics
**Product Category:** Power Distribution Board (PDB)
**Model:** SwiftWing PDB-14S
**SKU:** SW-PDB-14S

**Product Page:**
https://swiftwingtech.io/product/swiftwing-pdb-14s-power-distribution-board-with-12v-5v-buck/

**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 | February 2026 | Initial Release |
| v1.2 | March 2026 | Updated electrical specifications, added high-voltage guidelines, capacitor recommendations, and documentation refinements |