

Drone PCB Production Line - Technical Specification

1. Overview of PCB Applications

The PCBs are intended for use in drone systems, including:

- Flight Controllers (main control units)
- Video Transmitters (VTX)
- Sensor Boards (e.g., cameras, IMUs)
- Companion Computers (for ROS2, cloud communication)
- ELRS Receivers and Transmitters (for radio control, 2.4GHz / 900MHz)

2. PCB Dimensions

The typical size of boards ranges from 20x20 mm (micro-sized boards) to 50x50 mm (video transmitters and companion modules). Maximum board size rarely exceeds 100x100 mm.

In batch production, up to 20 flight controller boards (each 30.5x30.5 mm) are grouped on one panel. The total panel size should not exceed 200x200 mm.

3. Component Type and Count

Each PCB contains between 30 to 150 components, mainly SMD. Key components include:

- Microcontrollers (e.g., STM32, ESP32)
- Inertial sensors (IMUs, barometers)
- RF modules (e.g., SX1280, SX1276 for ELRS)
- Voltage regulators, RF amplifiers, filters
- LEDs, capacitors, resistors
- BGA and QFN packages are common

4. PCB Layer Configuration

Most PCBs are 4-layer boards. Some simple modules use 2 layers, while advanced flight controllers and RF systems may require up to 6 layers.

5. Target PCB Types

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The production line should support the following types:

- Double-layer PCB
- Multilayered PCB (4-6 layers)
- Rigid PCB
- High-Density Interconnect (HDI) PCB (for compact ELRS modules)
- High-TG PCB (for thermal stability)

Note: Flex, Rigid-Flex, Aluminum-backed, and Thick Copper PCBs are not currently required.