



## PCB & PCBA Manufacturing Services

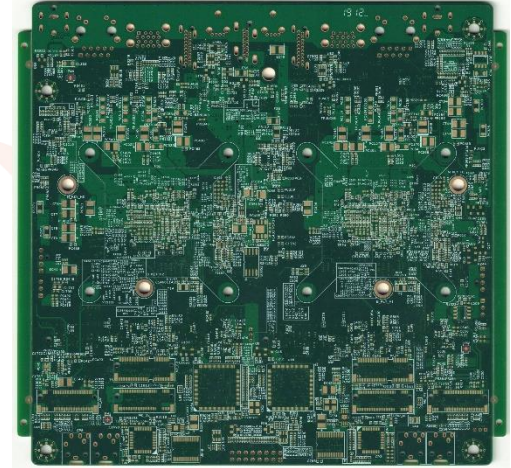
*High-Precision Fabrication • Intelligent Assembly • Quality-Driven Production*

### Overview

**ALQAQNOOS** Engineering provides complete PCB (Printed Circuit Board) and PCBA (Printed Circuit Board Assembly) Manufacturing Services for marine, industrial automation, power electronics, IoT, control systems, and special-purpose electronic equipment.

We deliver end-to-end manufacturing solutions from engineering review and prototyping to mass production, testing, and global delivery.

All fabrication and assembly facilities, production lines, and core manufacturing technologies are provided and technically supported by our certified manufacturing partner, while **ALQAQNOOS** ensures seamless project execution, quality compliance, and client coordination.



### 1. What is PCB & PCBA Manufacturing?

#### PCB (Printed Circuit Board) Manufacturing

PCB manufacturing is the process of **fabricating the physical board** that forms the electrical foundation of all electronic systems. It involves:

- ❖ Copper layering
- ❖ Circuit pattern imaging
- ❖ Etching
- ❖ Drilling & via plating
- ❖ Surface finishing

#### PCBA (Printed Circuit Board Assembly)

PCBA is the process of mounting and soldering electronic components onto the PCB using:

- SMT (Surface-Mount Technology)
- THT (Through-Hole Technology)
- Mixed technology assembly

The final product is a fully functional electronic control board ready for system integration.

### 2. Our PCB Manufacturing Capabilities

- ❖ Single-layer, double-layer & multi-layer PCBs
- ❖ High-density interconnect (HDI) boards
- ❖ Power & high-current boards
- ❖ Controlled impedance PCBs
- ❖ Rigid, flexible & rigid-flex PCBs
- ❖ Lead-free & RoHS-compliant production
- ❖ Prototype to high-volume mass production





## 3. Our PCBA Assembly Capabilities

- ❖ Fully automated SMT production lines
- ❖ Through-hole (DIP) assembly
- ❖ BGA, QFN & fine-pitch component placement
- ❖ Reflow soldering, wave soldering & selective soldering
- ❖ Conformal coating & protective encapsulation
- ❖ Manual & robotic assembly options

## 4. Engineering Support & DFM (Design for Manufacturability)



We support customers from the design stage, helping to:

- ❖ Optimize PCB layouts for manufacturability
- ❖ Improve long-term reliability
- ❖ Reduce production cost
- ❖ Avoid component placement & thermal issues
- ❖ Enhance signal integrity & power stability

Early DFM involvement significantly reduces rework, failure rate, and production delays.

## 5. Component Sourcing & Supply Chain Support



- ❖ Original OEM electronic components
- ❖ Fully validated alternative components
- ❖ Global multi-channel component sourcing
- ❖ Obsolescence management
- ❖ Shortage mitigation strategies

This ensures stable procurement even during global chip shortages.

## 6. Quality Control, Testing & Inspection

Every PCB & PCBA is subjected to strict quality procedures:

- ❖ Automated Optical Inspection (AOI)
- ❖ X-Ray inspection for BGA & hidden joints
- ❖ In-Circuit Testing (ICT)
- ❖ Functional Testing (FCT)
- ❖ Visual & dimensional inspection
- ❖ Electrical performance verification

All manufacturing follows international quality standards for industrial and marine electronics.

## 7. Prototype, Small Batch & Mass Production

We support:

- ❖ Rapid prototyping
- ❖ Engineering samples
- ❖ Pilot batch production
- ❖ Full-scale mass manufacturing



❖ Urgent production for critical projects  
This allows fast time-to-market and scalable production growth.

## 8. Industries We Serve

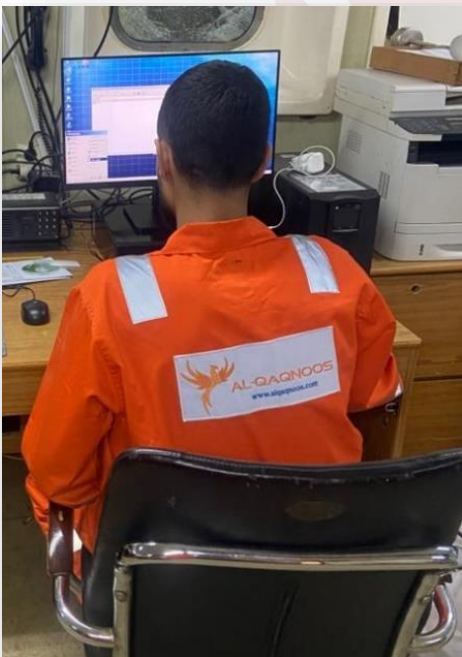
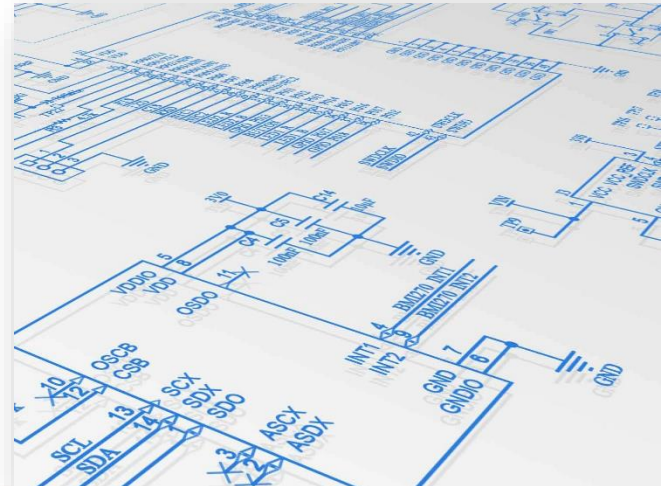
- ✓ Marine automation & navigation systems
- ✓ Industrial automation & control
- ✓ Power electronics
- ✓ Smart IoT & communication devices
- ✓ New energy & charging systems
- ✓ OEM & ODM electronics

## 9. Our Service Positioning

ALQAQNOOS acts as your:

- ✓ Project Management Partner
- ✓ Engineering & Quality Control Coordinator
- ✓ Procurement & Logistics Manager
- ✓ After-Sales & Technical Support Provider

While PCB fabrication plants, SMT lines, and electronic manufacturing facilities are operated and technically supported by our certified manufacturing partner.



## 10. Key Benefits for Our Clients

- ✓ High-precision & repeatable production
- ✓ Stable supply chain & component sourcing
- ✓ Lower production risk
- ✓ Flexible volume scaling
- ✓ Faster project delivery
- ✓ Long-term reliability of electronic products
- ✓ Reduced warranty & failure costs

## Your Trusted Partner for PCB & PCBA Manufacturing Solutions

With ALQAQNOOS PCB & PCBA Manufacturing Services, you receive engineering-driven production, strict quality management, flexible manufacturing scales, and reliable global delivery—all backed by certified manufacturing technology.