POE MANUFACTURING
YOUR GLOBAL TECHNOLOGY PARTNER

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POE MANUFACTURING
YOUR GLOBAL TECHNOLOGY PARTNER

Soldering Precautions and Solutions

for Different Encapsulated Components

- Through-Hole Technology (THT) Components
- Surface Mount Technology (SMT) Components

April - June

2025

PCB / FULLY TURNKEY PCB ASSEMBLY / EMS / OEM

POE MANUFACTURING
YOUR GLOBAL TECHNOLOGY PARTNER

OEM SERVICES FOR PCB AND PCBA.

Business is about building life-long relationships with attentive service, quality products and honest business practices.

Mr Hu Jiwei
General Manager

CATALOGUE.

01 ABOUT POE
COMPANY CULTURE

At POE, we strive to make the global products of your brand, POE" Partner Of your Electronics " Manufacturing, your global technology partner.

POE has established itself as a World well known Turnkey PCB assembly factory for quick turn prototype and mass production PCB fabrication and PCB assembly services with 700,000 components sourcing ability from 100+suppliers. POE is ISO9001:2015, ISO13485:2016, ISO14001:2015, UL, ROHS, Reach and IPC-A-600&IPC-A-610 compliant. Our PCB production capacity can reach 40000sq.m/month and EMS assembling capacity at 150,000,000 components per month.

With Imported State-of-the-Artfully Automatic production machines and our professional International Sales Team, Purchasing Team, production team, administration team and engineering team in Shenzhen China, HK, Singapore, USA and Germany, we are able to offer our customers low-cost, One-stop PCB Assembly Services, including PCB fabrication, parts procurement, PCB Assembly, Program, Cable Assembly, Final PCBA Testing, Final Case Assembly, Coating, Worldwide Shipping.

Currently, POE 4000+customers from 100+ countries and places are primarily in USA, Canada, Europe, South American, Australia, Israel, Asia and China in a wide variety of industries like appliance, medical, telecommunications, airplane recorder, cloud, smart home, solar panel engery, battery storage, wind, IOT, automobile, computer&database information, industrial automation photonics, LED products and home appliance.

POE China
1-40 LAYER
PCB&PCBA

ONE STOP
TURNKEY PCBA SERVICE

PCB Fabrication
(Prototype/Quick turn, Rigid, Rigid-Flex, Flexible)

PCB Assembly
(Turnkey Including Hardware)

3000㎡ dust-free factory

200+ Professional employees

150000k PCS PCB assembly capacity

700k Components sourcing ability

YOUR TRUSTED
TURNKEY PCBA MANUFACTURER

02 NEW PRODUCT

POE provides PCB assembly services from prototype to mass production. Our professional SMT factory has advanced equipment, such as the world-class stencil printing machine, SMT chip pick & place, nitrogen smt reflow oven, in-line testing and stencil manufacturing, AOI test machine and X-ray testing machines for quality check.

With automated SMT production lines and our dedicated international sales, procurement, and engineering teams in Shenzhen, Hong Kong, and the United States, we are capable of offering cost-effective and high-quality one-stop PCB manufacturing/assembly services.

Our clients span all continents across multiple industries, including security, aerospace, healthcare, telecommunications, and

POE MANUFACTURING

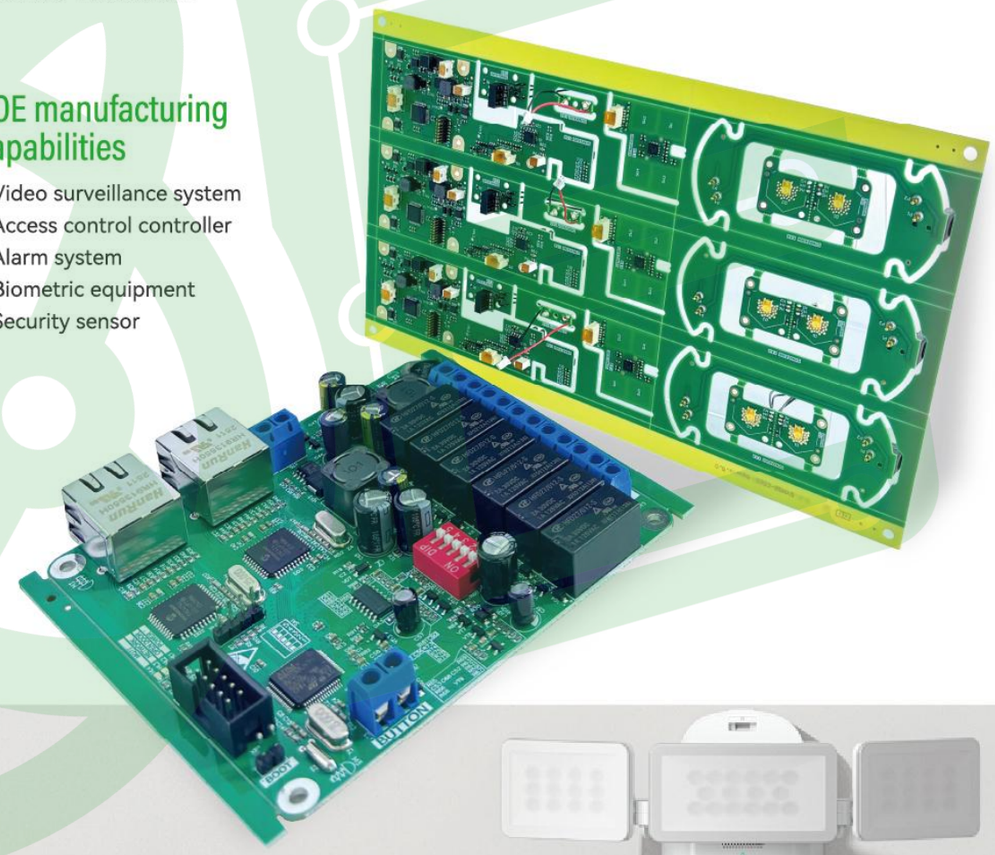
Precision PCBA Manufacturing with Proven Reliability

Security PCBA

Security PCBAs, or Printed Circuit Board Assemblies for security applications, are the core electronic components that make up a variety of security systems and devices. These PCBAs integrate cryptographic processors, sensors, communication modules, and proprietary security algorithms to provide security for homes, commercial establishments, government agencies, and critical infrastructure.

POE manufacturing capabilities

- Video surveillance system
- Access control controller
- Alarm system
- Biometric equipment
- Security sensor



Aerospace PCBA

As a trusted partner in the aerospace industry, we provide comprehensive support from prototype design to mass production, ensuring the highest quality outcomes at every stage of your project.

Our specialized team has extensive industry experience, understanding and meeting the stringent requirements of the aerospace sector to provide you with the most reliable PCB manufacturing and assembly solutions.

Professional solution for aerospace industry

- AS9100D aviation quality management system certification
- ISO 14001 environmental management system certification
- Military-Grade specialized material processing capability
- Implementation of IPC-A-610 Class 3 Acceptance Criteria
- Full-Process Traceability & Statistical Process Control
- Extreme Environment Reliability Validation

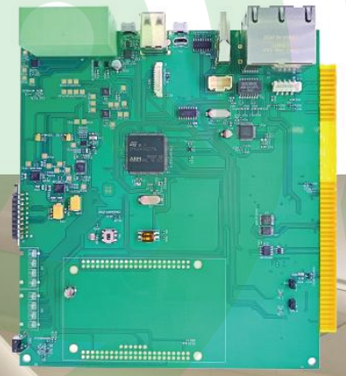
Medical-Grade PCBA

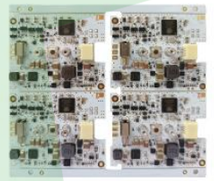
POE's biggest advantage in the field of medical PCBA is that it only manufactures products that fully comply with the latest standards of medical PCBA. We also have ISO 9001 and ISO 13485, two important certifications in the medical field.

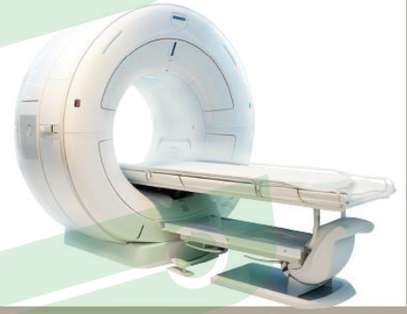
POE provides fully integrated Class I, II and III medical device manufacturing capabilities. From production, assembly, packaging and logistics, POE brings OEM medical technology to life.

POE Medical-Grade PCBA Services

- ISO 9001: International certification standard for quality management systems (QMS)
- ISO 13485: Quality management system standard for medical device manufacturers
- IPC-A-610: Standard for the acceptability of electronic components
- UL 94: Flammability standard for materials used in electronic products
- IPC III: Regulations for PCBA quality and reliability
- Clean, static-free working environment







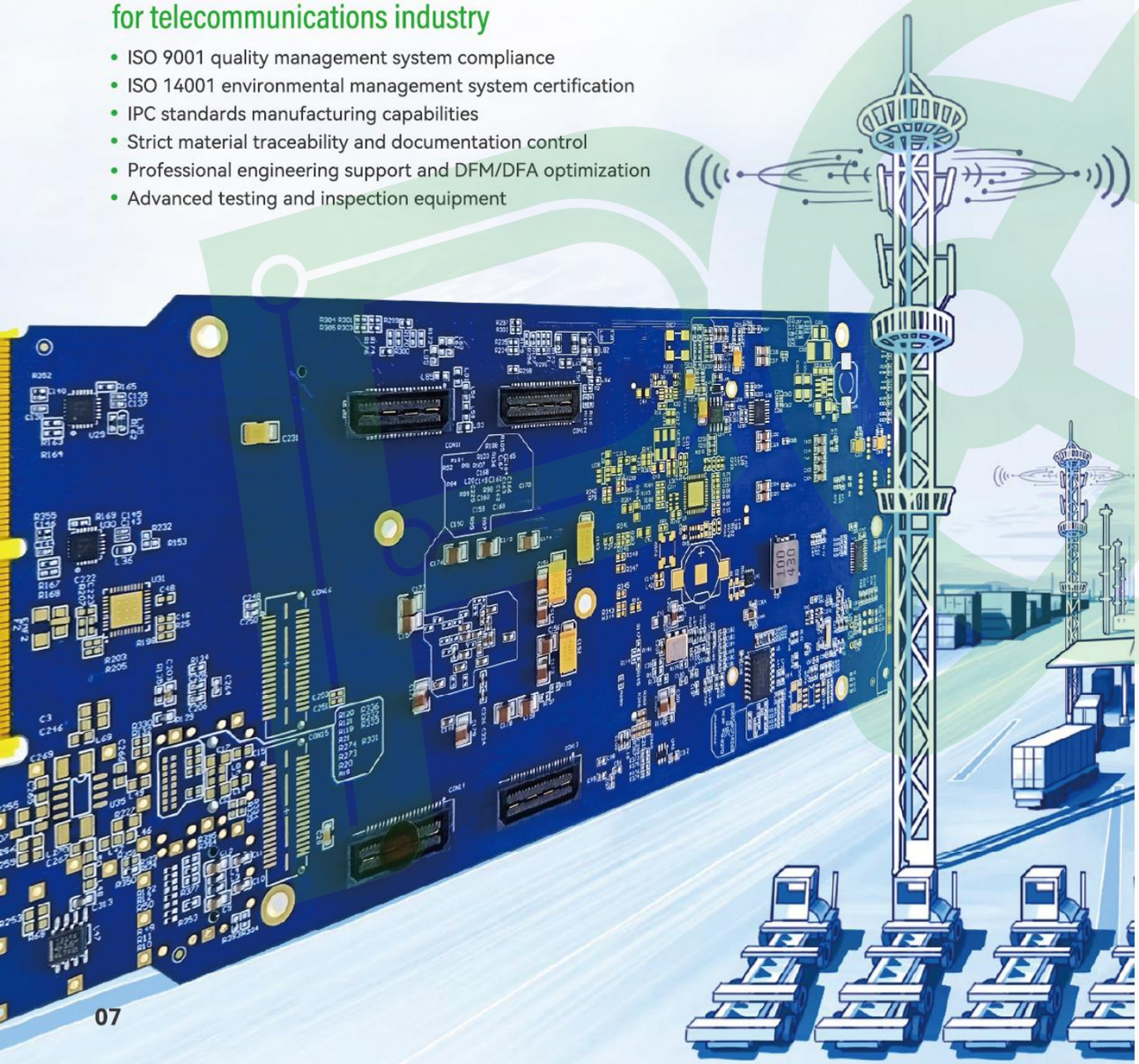
Telecommunications PCBA

As a trusted partner in the telecommunications industry, we provide comprehensive support from prototype to mass production, ensuring the highest quality outcomes at every stage of your project.

Our specialized team has extensive industry experience, understanding and meeting the stringent requirements of the telecommunications sector to provide you with the most reliable PCB manufacturing and assembly solutions.

Professional solution for telecommunications industry

- ISO 9001 quality management system compliance
- ISO 14001 environmental management system certification
- IPC standards manufacturing capabilities
- Strict material traceability and documentation control
- Professional engineering support and DFM/DFA optimization
- Advanced testing and inspection equipment



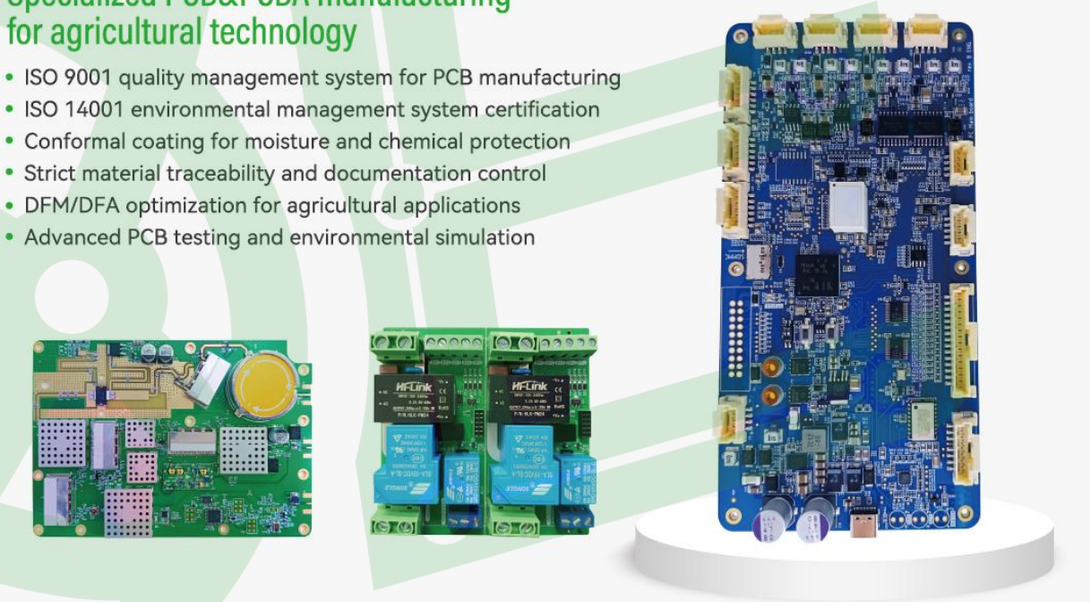
Agricultural PCBA

As a trusted PCB manufacturing partner in the agricultural industry, we provide comprehensive PCB assembly services, ensuring boards that perform reliably in challenging farming environments.

Our specialized PCB manufacturing team has extensive experience with agricultural electronics, understanding the unique requirements for moisture resistance, temperature tolerance, and vibration durability needed for farming equipment.

Specialized PCB&PCBA manufacturing for agricultural technology

- ISO 9001 quality management system for PCB manufacturing
- ISO 14001 environmental management system certification
- Conformal coating for moisture and chemical protection
- Strict material traceability and documentation control
- DFM/DFA optimization for agricultural applications
- Advanced PCB testing and environmental simulation



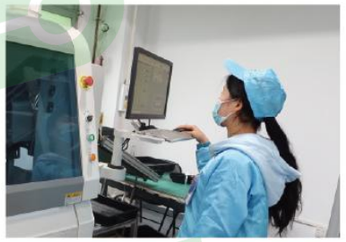
03 SOLDERING PRECAUTIONS AND SOLUTIONS

FOR DIFFERENT ENCAPSULATED COMPONENTS

In the field of PCBA, soldering technology is a critical factor in ensuring the performance and reliability of electronic products. With the continuous miniaturization and integration of electronic components, the diversity of encapsulation forms has placed higher demands on soldering processes. Here we will introduce POE's exceptional capabilities and technical advantages in soldering components with various encapsulations.

Through-Hole Technology (THT) Components

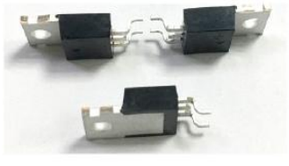
In electronic device assembly, the reliable soldering of through-hole components lays the foundation for electrical connections and mechanical stability. For through-hole components such as connectors and sockets, POE employs mature wave soldering and manual soldering techniques. In wave soldering, parameters like wave height, soldering time, and temperature are adjusted to ensure thorough immersion of component leads in solder, forming robust solder joints. Real-time monitoring during the process allows for timely parameter adjustments to prevent issues like cold solder joints or missed soldering. For special through-hole components unsuitable for wave soldering, our skilled manual soldering team ensures high-quality results, achieving a soldering yield of over 99.7%.



Soldering Precautions

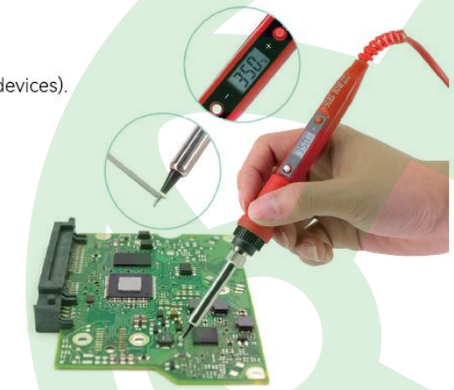
1.Lead Preparation

- Check for oxidation on leads before soldering; clean with fine sandpaper or alcohol if necessary.
- Avoid stressing the base when bending leads to prevent breakage.
- Trim leads to a length of 1.5–2 mm.


2. Temperature Control

- Soldering iron temperature: 300–350°C (can be increased to 400°C for high-power devices).
- Single-point soldering time: ≤3 seconds.
- Wave soldering: Preheat at 90–120°C, soldering zone at 250–270°C.

3. Special Component Handling

- Observe polarity for electrolytic capacitors; reverse connection may cause explosion.
- Reduce soldering time for plastic-encapsulated components like relays, which are sensitive to high temperatures.

Common Issues and Solutions

Issue	Cause	Solution
Rough solder joints	Insufficient temperature or poor solder quality	Increase temperature, use high-quality solder paste
Pad lifting	Overheating or prolonged soldering time	Limit soldering time to ≤3 seconds
Cold solder joints	Oxidized pads or insufficient temperature	Clean pads, increase temperature
Component damage	Excessive thermal stress	Use heat sinks or intermittent soldering

Surface Mount Technology (SMT) Components

1. Small Passive Components (0201, 0402, etc.)

These components are extremely small, requiring high soldering precision. The company utilizes high-precision pick-and-place machines with a positioning accuracy of ±0.01 mm to ensure accurate placement on PCB pads. For solder paste printing, ultra-fine stencils with a thickness of 0.08–0.12 mm are used to guarantee uniformity and precision. During reflow soldering, parameters like heating rate, dwell time, and peak temperature are tightly controlled to prevent component damage or poor soldering. Currently, the soldering yield for 01005 and 0201 components exceeds 99.5%.

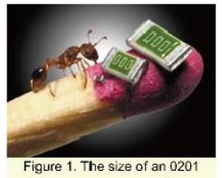
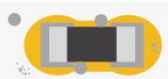


Figure 1. The size of an 0201 component as compared to an 0805 component, an 0603 component, an ant and a matchstick.

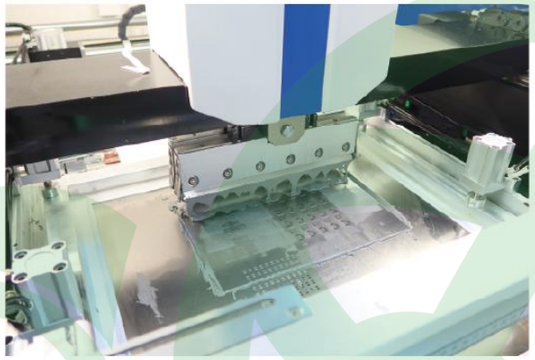

Nitrogen SMT reflow ovens with10 temperature zones

Common Issues and Solutions

Issue		Cause	Solution
Tombstoning		Uneven thermal capacity of pads	Optimize pad symmetry
Solder balls		Excessive solder paste or rapid heating	Reduce stencil aperture, adjust temperature profile
Misalignment Inaccurate placement		Poor placement accuracy	Calibrate the pick-and-place machine

2. Fine-Pitch ICs (QFP, SOP)

QFN packages offer excellent thermal performance but are prone to soldering defects due to their leadless design. The company optimizes solder paste printing for QFN packages, using high-precision stencils to ensure uniformity and accuracy. During reflow soldering, temperature and time are precisely controlled to ensure proper wetting of pads and chip leads, forming reliable solder joints. AOI (Automated Optical Inspection) equipment is used to inspect solder joints, maintaining a QFN soldering yield of over 99.0%.

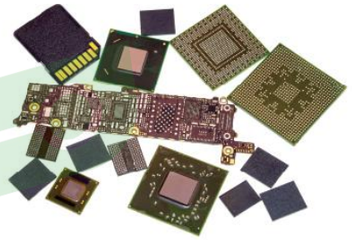


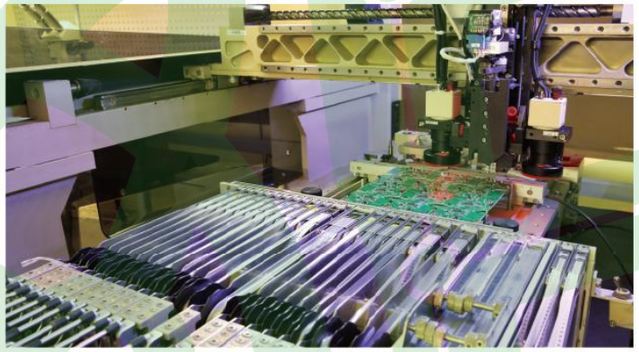
Common Issues and Solutions

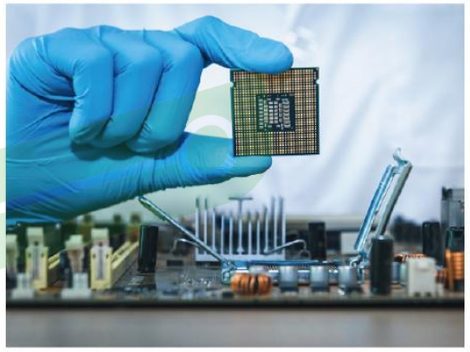
Issue	Cause	Solution
Bridging	Excessive solder paste or paste slump	Use solder wick to remove excess solder paste
Cold solder joints	Low solder paste activity	Replace with higher-activity solder paste
Lead lifting	Uneven thermal stress	Optimize temperature profile

3. BGA Packages

BGA packages feature high pin counts, fine pitch, and high integration, making soldering challenging. The company employs advanced BGA soldering techniques, including thorough cleaning of PCB pads and BGA solder balls to remove oxidation and contaminants. Optical alignment systems ensure placement accuracy within ±0.02 mm. Custom temperature profiles are used during reflow soldering to ensure complete melting and reliable solder joint formation. Post-soldering, X-ray inspection detects internal defects like voids or cold joints, achieving a BGA soldering yield of over 99.2%.







Common Issues and Solutions

Issue	Cause	Solution
Excessive voids	Incomplete solder paste volatilization	Extend preheating time
Solder ball cracking	Rapid cooling	Reduce cooling rate
Misalignment	Poor placement accuracy	Use optical alignment systems

Soldering Quality Control System

POE has established a comprehensive soldering quality control system, with strict measures covering raw material inspection, production processes, and final product testing. Raw materials like solder paste, flux, PCBs, and components undergo rigorous incoming inspections. During production, SPI (Solder Paste Inspection) equipment monitors printing quality in real time, while temperature profiles for reflow and wave soldering are recorded and adjusted. Post-soldering, AOI and X-ray inspections ensure defect detection.

- **100% AOI/SPI Inspection/X-ray**



Additionally, POE is equipped with industry-leading soldering equipment, including multi-zone reflow ovens for precise temperature control and advanced wave soldering machines. A skilled manual soldering team ensures reliable through-hole connections.

Technologically, POE has introduced nitrogen-protected soldering to reduce oxidation, significantly improving solder joint quality, especially for high-reliability applications like aerospace and medical devices.

- **Nitrogen SMT reflow ovens with 10 temperature zones**

Extend the lifespan of the PCB by 30%

Fill the reflow oven with nitrogen to reduce oxidation of the solder surface, making the solder paste play a better effect.

With advanced equipment, refined processes, and stringent quality control, POE excels in soldering components of various encapsulations, from standard SMT and THT to complex BGA, QFN, and CSP packages, delivering reliable PCBA products to meet diverse customer needs.

- **15-Stage Quality Tracking Points | 99.98% Real-Time FPY (First Pass Yield)**


1.File Reception and Verification


2.Flying Probe Test


3. E-test

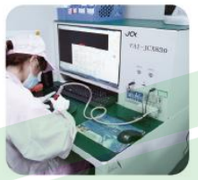

4. PCB Appearance Inspection


5.IQC


6.Solder Paste Inspection


7.Reflow Soldering


8.AOI


9.FAI


10.X-ray


11.Ware Soldering Oven


12.ICT


13.Manual Control Function Test

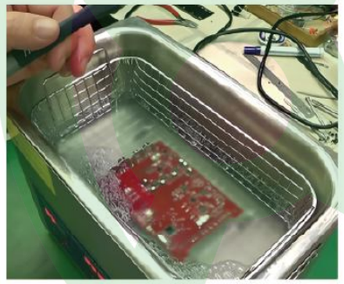

14. Fully Automatic Control Function Test


15. OQC

04 COMMON METHODS FOR REMOVING RESIDUES FROM PCB BOARDS

1. Aqueous Cleaning Characteristics

- **Applicable Scenarios:** Suitable for cleaning PCBs that are not heavily soiled or contaminated with insoluble chemical substances.
- **Operation:** Employs deionized water or specialized cleaning solutions to remove surface dirt and residues via immersion, spray, or ultrasonic cleaning.
- **Precautions:** Requires strict control of water temperature and cleaning duration to prevent damage to the circuit board.



2. Solvent Cleaning Characteristics

- **Solvents Used:** Common solvents include ethanol, isopropyl alcohol (IPA), acetone, etc.
- **Advantages:** Rapid and effective removal of oils, dust, and loosely adhered contaminants.
- **Disadvantages:** Solvents typically exhibit high volatility and toxicity, demanding strict safety protocols. Potential for solvent corrosion of the PCB must be mitigated.
- **Applicable Scenarios:** Suitable for cleaning high-value electronic components.

3. Ultrasonic Cleaning Characteristics

- **Principle:** Utilizes ultrasonic energy to generate microscopic cavitation bubbles within the cleaning fluid. The implosion of these bubbles creates intense localized scrubbing forces that dislodge contaminants.
- **Advantages:** High cleaning efficiency, particularly effective for high-density PCBs and miniature electronic components.
- **Disadvantages:** Intense pressure and vibration may potentially damage delicate components on the board.
- **Applicable Scenarios:** Ideal for removing contaminants like soldering paste and flux residues.

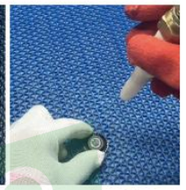
4. Dry Ice Blasting Characteristics

- **Principle:** Leverages the kinetic energy of accelerated dry ice particles and their extreme low temperature (-78.5°C) to thermally shock, embrittle, and sublimate contaminants away from the substrate.
- **Advantages:** Waterless, solvent-free, non-contact cleaning. Highly effective, environmentally friendly (no secondary waste), and non-damaging to PCBs and components.
- **Applicable Scenarios:** Particularly suited for high-value, complex electronic assemblies, such as in the semiconductor electronics industry.
- **Additional Benefit:** Dry ice sublimates (transitions directly from solid to gas) during cleaning, leaving zero residue. Dry ice is recyclable.

Flux cleaning

Tin slag cleaning

Fixture cleaning



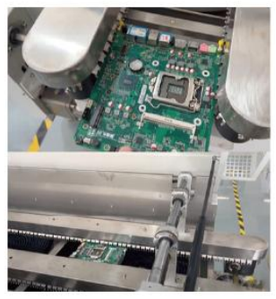
Burr cleaning

5. Semi-Aqueous Cleaning Characteristics

- **Operation:** Combines an initial wash using water and a suitable saponifying/detergent cleaner to remove polar/organic soils, followed by a rinse with an organic solvent to eliminate cleaner residues.
- **Advantages:** Cleaning effectiveness bridges aqueous and solvent cleaning. Generally considered more environmentally friendly and safer than pure solvent methods.
- **Applicable Scenarios:** Suitable for scenarios requiring thorough cleaning while adhering to environmental considerations.

6. Fully Automated PCBA Cleaning Machine Characteristics

- **High Automation:** Designed for high-volume production cleaning of flux residues from PCBA assemblies, semiconductors, etc.
- **Operation:** Typically employs spray cleaning technology, featuring multiple nozzles and often a rotary mechanism to ensure comprehensive coverage and thorough cleaning of complex assemblies.
- **Advantages:** Highly efficient and reliable. Meets user requirements for process optimization and cost control.

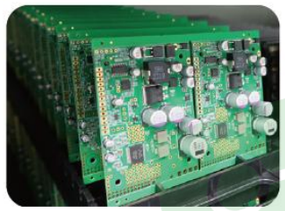


05 HOW TO PACK A PCBA AT POE

Static electricity is one of the main reasons for the failure of PCBA components, as integrated circuits become smaller and smaller, which means that PCBA becomes more susceptible to static damage, and POE is mostly for overseas customers, for long-distance transportation, international express delivery, etc. How to pack is particularly important!

1.Static bag+Bubble film+PE pearl cotton+Carton box

This is the most common type of packaging, for some conventional circuit boards, we usually take this way of packaging, can effectively protect the board to prevent damage in the process of transportation.



Products

Anti-static bag

Bubble film

PE pearl cotton

Carton box

Prepare for shipment

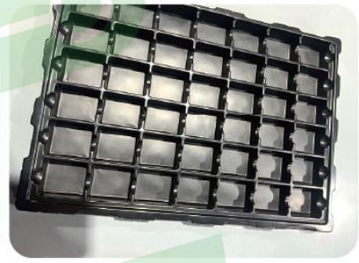
2.Customized Packaging in Carton or Foam Cotton

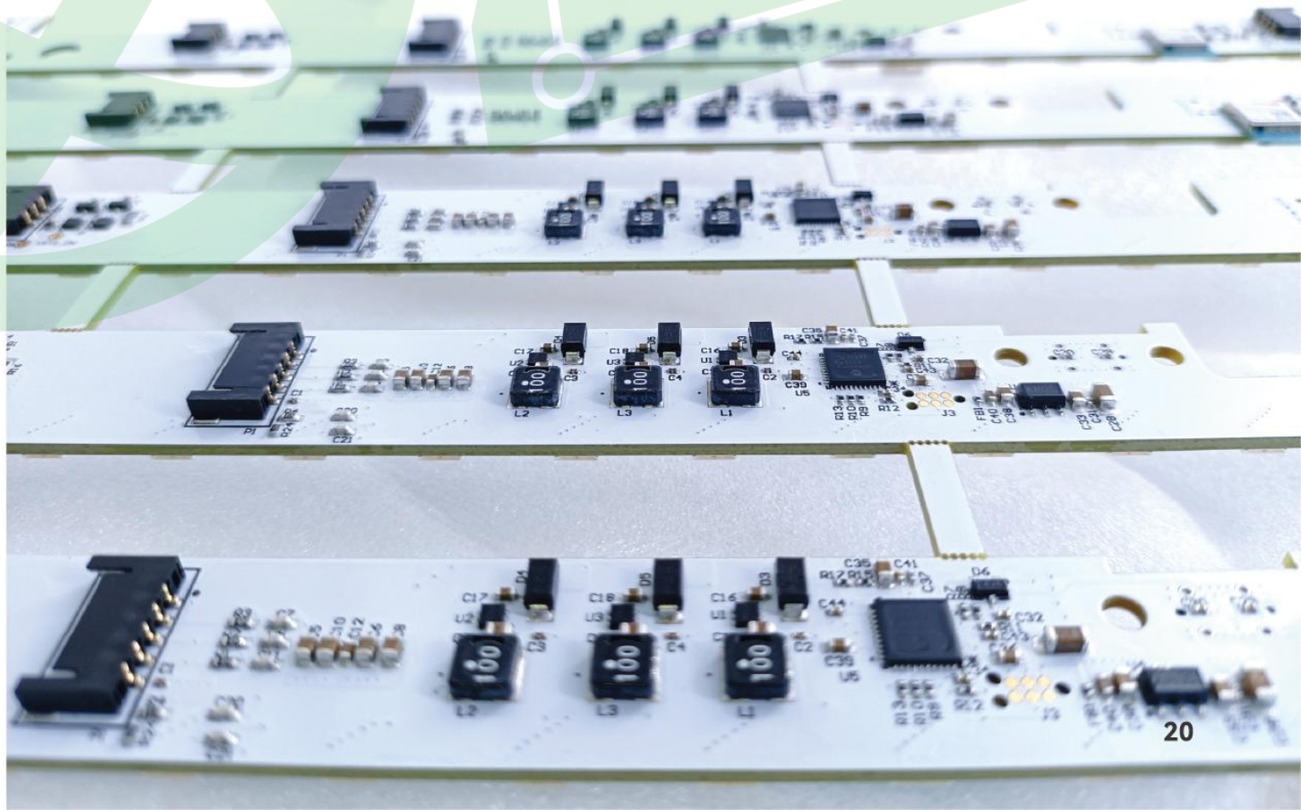
For some boards have special components, such as high height components, it is difficult to use static electricity bag packaging, or packaging in the transportation process is easy to cause impact damage. At this time we will recommend that customers customize the exclusive packaging paper shell or foam cotton, can effectively avoid the impact caused by the transportation process damage!

3.Anti-static PET Packing

For boards with special components, such as high-profile parts, electrostatic bags may not be suitable for packaging. During transportation, these components are prone to impact damage.

The blister packaging products are made of new environmentally friendly materials, strong biodegradability, no pollution to the environment, in line with the requirements of environmental protection and green packaging; strong customizability, the blister box can be customized according to the actual requirements of the customer's size, material, color, thickness, etc.,and antistatic treatment, the staggered structure can be made to avoid the product's extrusion when the stacking.





BIG NEWS

June 30, 2025

2025063 0100 0 6 6

On June 30, 2025, POE held a grand relocation celebration in its new office, marked by dazzling fireworks and joyful laughter. This day was not only a celebration but a declaration of a fresh start: we set sail with a renewed spirit, ready to navigate the broader seas of opportunity!

We bid farewell to the city center, which has witnessed countless struggles and growth, and stepped into an industrial hub symbolizing future and hope. Here, our technology and production departments seamlessly integrated, ushering in not just a new office environment but a new starting point for crafting our grand blueprint.

This relocation is not merely a change of space but an important milestone for POE as we advance to new heights. A new environment nurtures a fresh atmosphere; a new starting point opens the door to new journeys.

Leaving behind our glorious past, we prepare to set forth with greater determination, openness, and collaboration, ready to embrace future challenges and opportunities. This new land is our fertile ground for crafting grand blueprints and achieving remarkable dreams. As we navigate the seas of stars and waves, POE has anchored a new coordinate, and our future will undoubtedly shine even more brilliantly!