

# Welcome to O-leading

O-Leading strives to be your one stop solution partner [Printed circuit boards supplier](#) in EMS supply chain, including PCB design , PCB fabrication and PCB assembly (PCBA),We provide some of the most advanced PCB technology, including HDI PCBs,multilayer PCBs, Rigid-Flexible PCBs.We can support from quick turn prototype to medium & mass Production.

In general, our global customers are very impressed with our services:Rapid response, competitive price and quality commitment.Providing more valuable technical service and overall solution is the way O-leading forward.

Looking to the future, O-leading will concentrate on the innovation and development of electronics manufacturing technology as always, and make persistent efforts on PCB & PCBA one-stop service to provide first-class services and create more value for our customers.

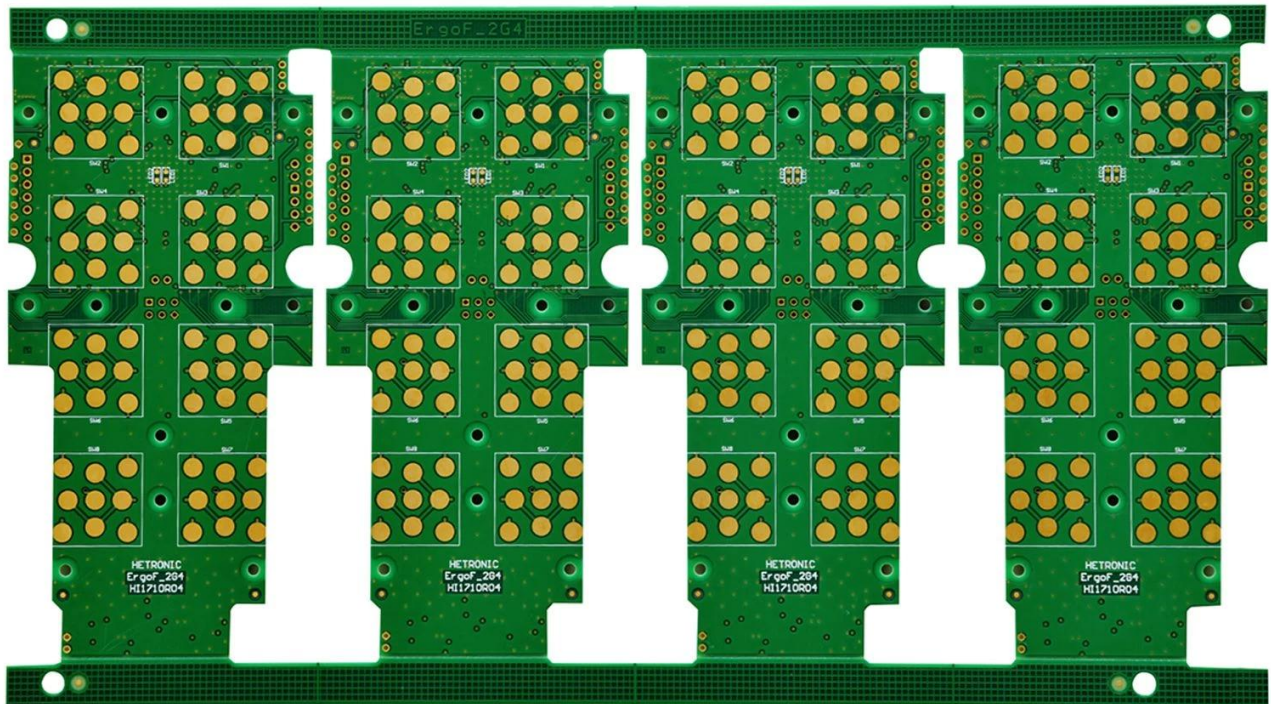
PLEASE CLICK THESE FOR MORE INFORMATION [OEM manufacture Multilayer+PCB Board Printed Circuit Boards PCB fabrication](#)



## Product Description

TOP QUALITY PCB

**O-LEADING**  
To Be Reliable, To Be Valuable



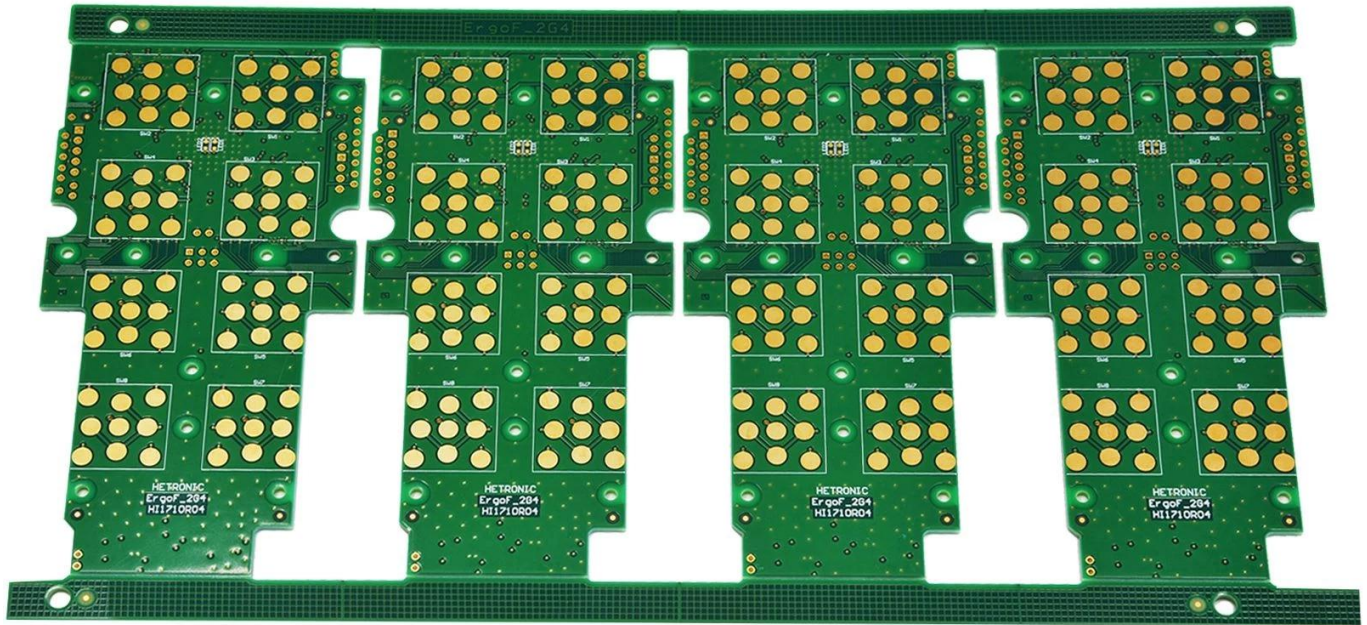
4L PCB WITH **HARD GOLD PLATING AU:20U"**

MAKE YOUR IDEA COME **TRUE**



TOP QUALITY PCB

**O-LEADING**  
To Be Reliable, To Be Valuable

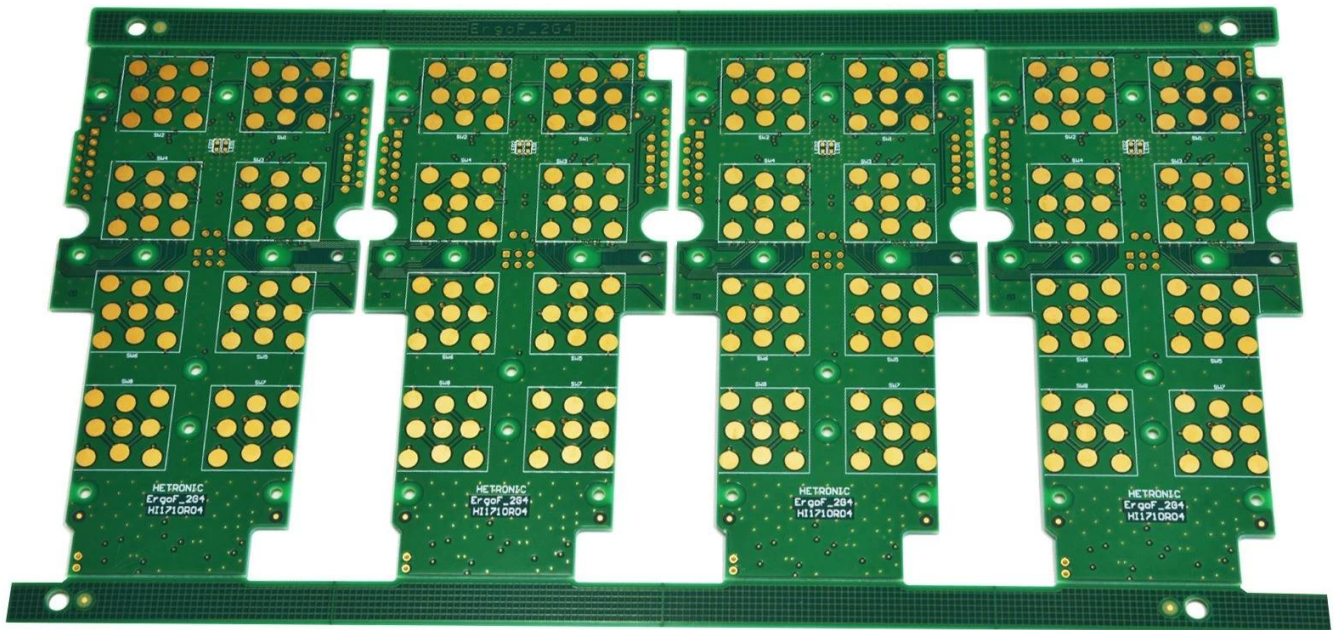


4L PCB WITH **HARD GOLD PLATING AU:20U"**

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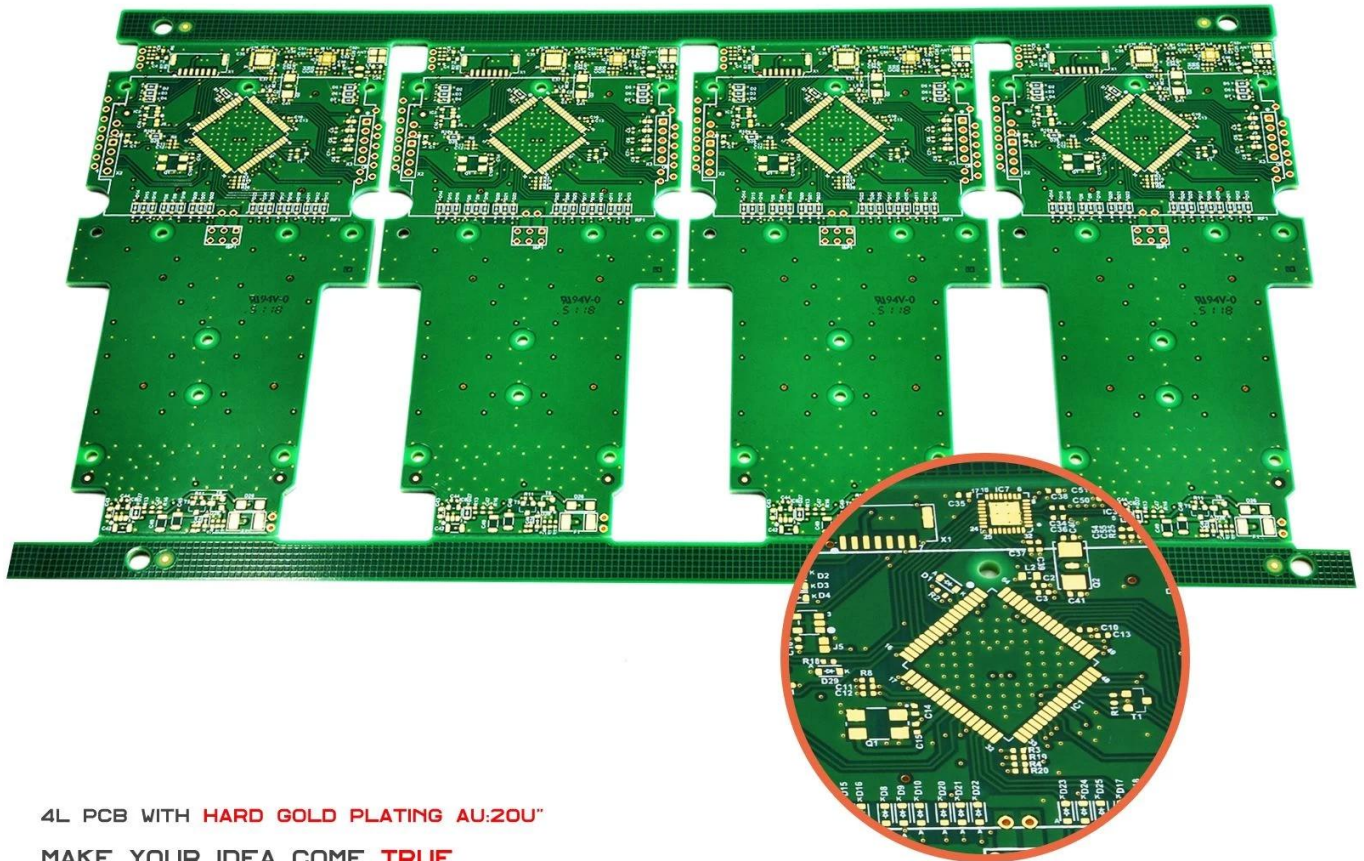
4L PCB WITH **HARD GOLD PLATING AU:20U"**

MAKE YOUR IDEA COME **TRUE**



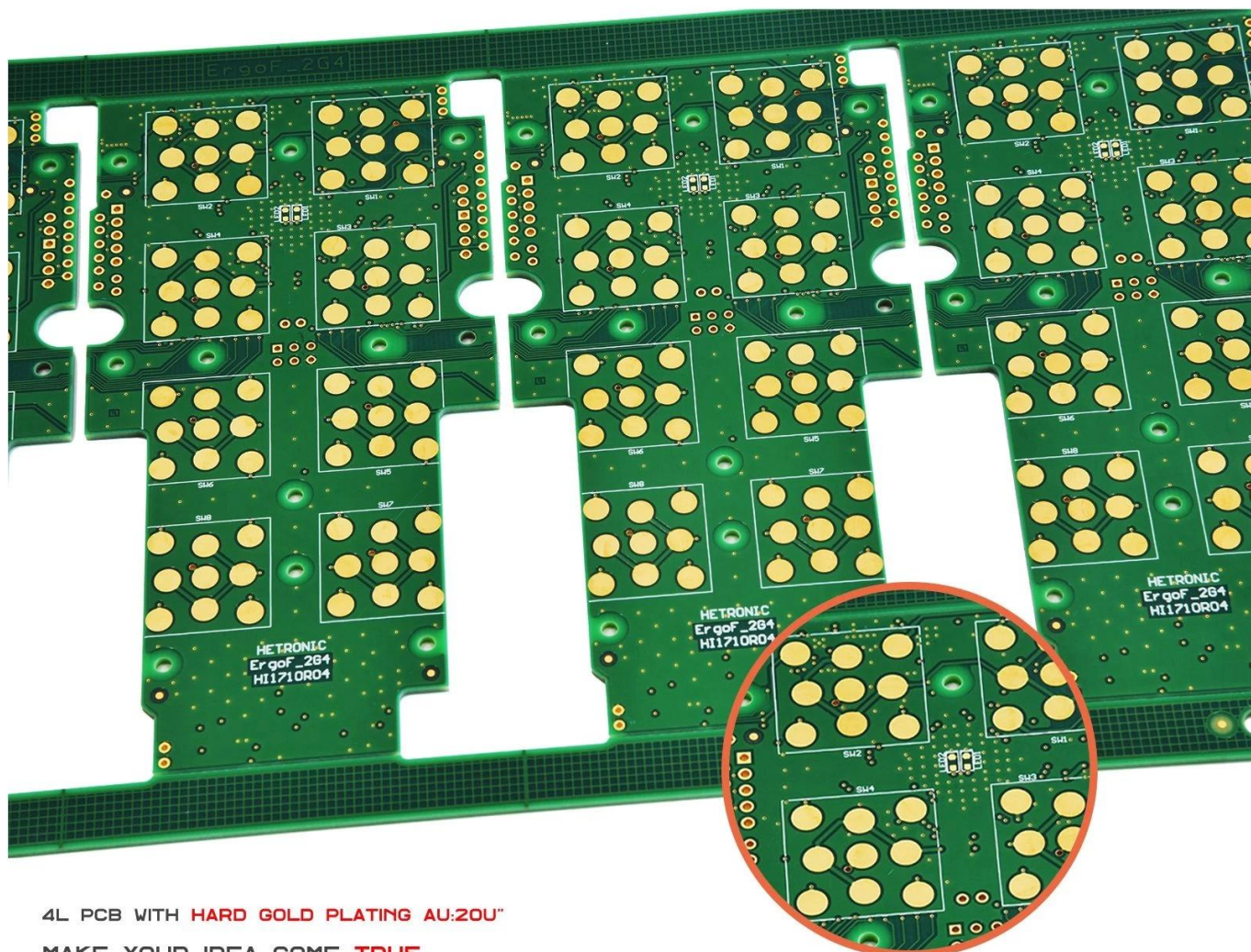
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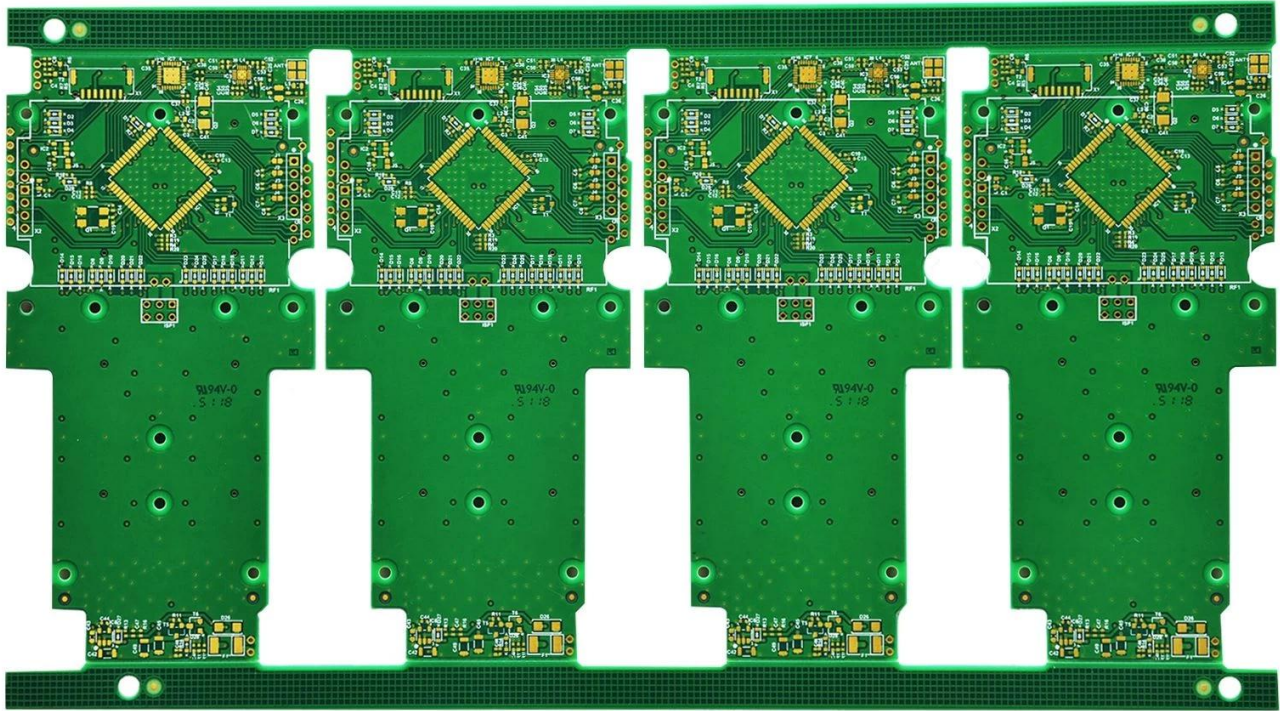


4L PCB WITH **HARD GOLD PLATING AU:20U"**  
MAKE YOUR IDEA COME **TRUE**



TOP QUALITY PCB

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4L PCB WITH **HARD GOLD PLATING AU:20U"**

MAKE YOUR IDEA COME **TRUE**

# Market Share

CONSUMER ELECTRONICS

AUTOMOTIVE ELECTRONICS

INDUSTRIAL CONTROL

INTELLECTUALIZED HOUSEHOLD CONTROL

OTHER



30%  
CONSUMER ELECTRONICS



12%  
OTHER

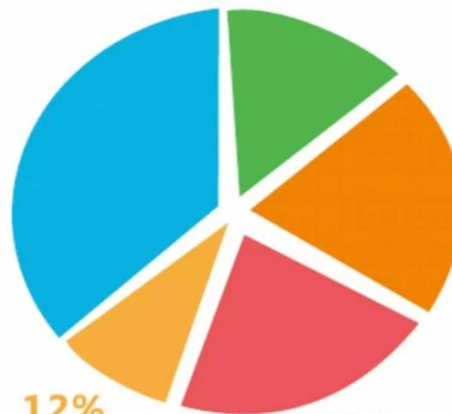


20%  
INDUSTRIAL CONTROL



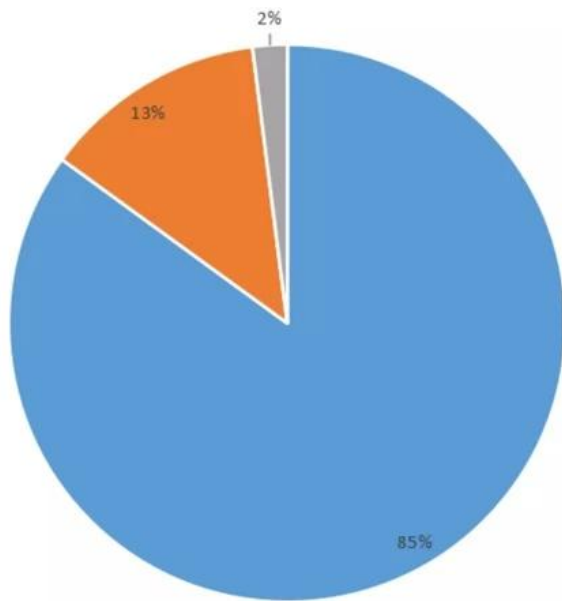
18%  
INTELLECTUALIZED HOUSEHOLD CONTROL

20%  
AUTOMOTIVE ELECTRONICS





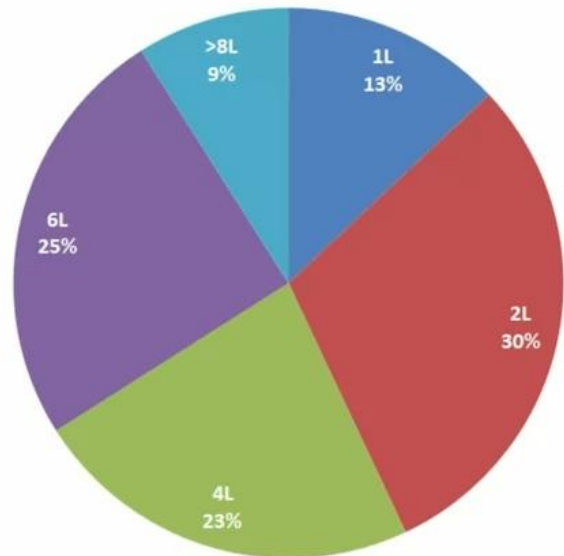
Product types



■ FR-4 PCB ■ MC PCB ■ rigid-flexible PCB

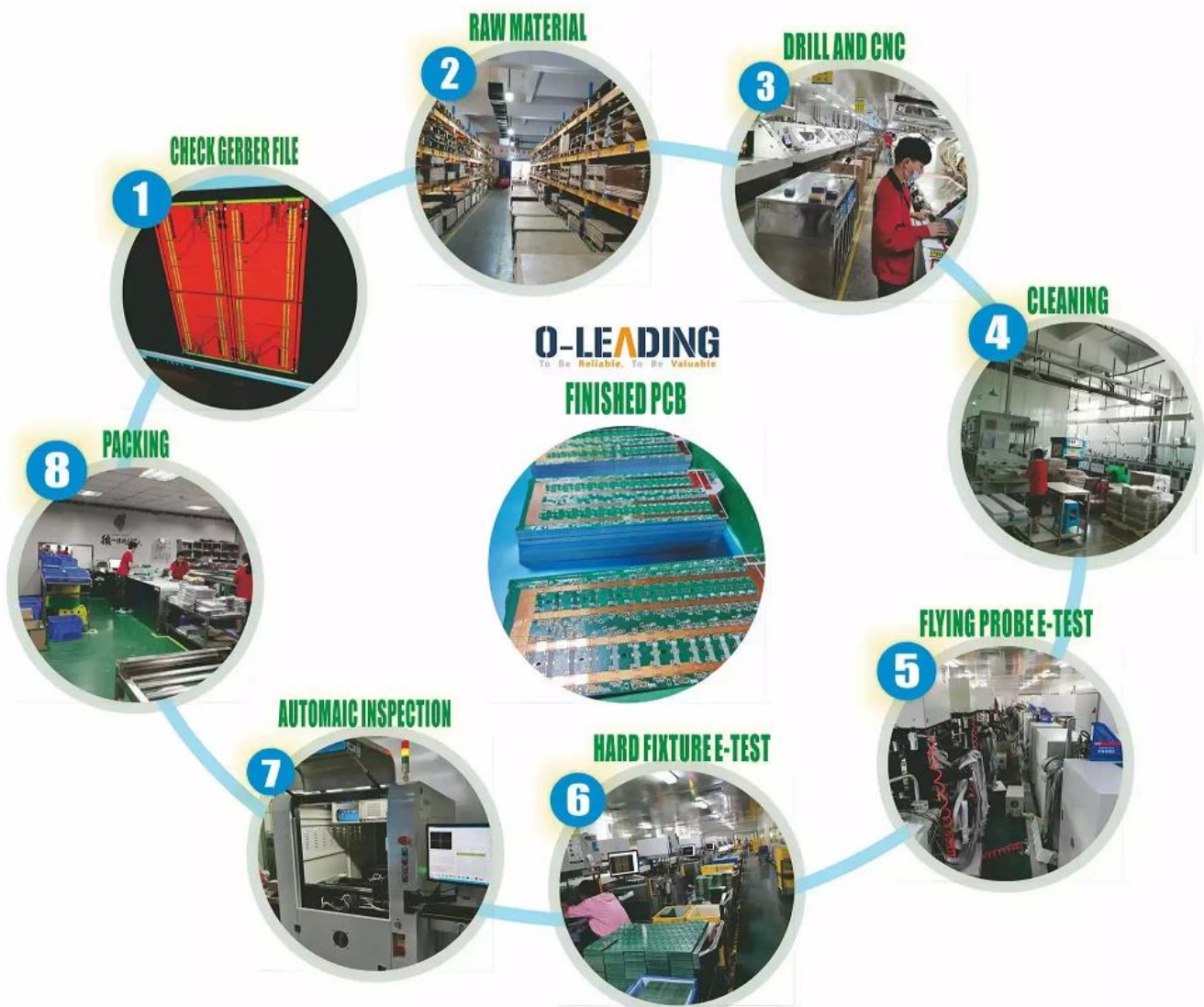
Product layers

■ 1L ■ 2L ■ 4L ■ 6L ■ >8L



# Production Process

18 years experience in one-stop PCB and PCBA, we can make your idea come true,



Our Team





## Factory PCB



Automatic vacuum press machine



Drilling Machine



Pattern Plating Machine



Scrubbing Machine



Developing Machine



Routing Machine



High-speed flying probe machine



E-test Machine

## Factory SMT



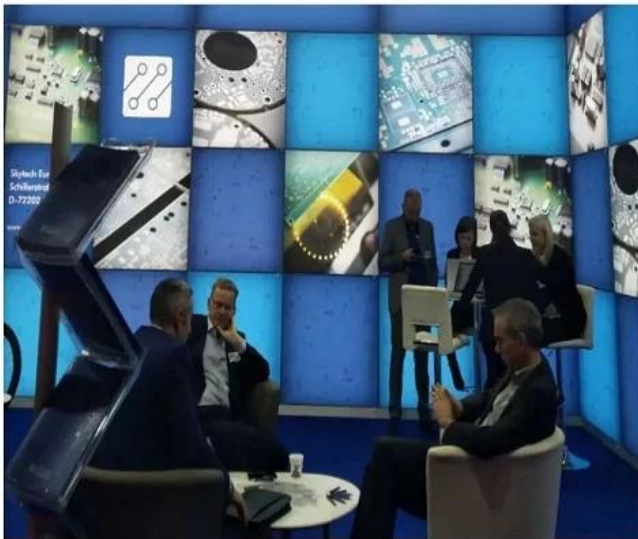


To be *RELIABLE*

**Q**uality first ,  
**C**ustomer supreme ,  
**S**cientifically management ,  
**S**triving for famous brand



*THE CUSTOMER IS KING*



To be *VALUABLE*

**S**cience and technology keeps head ,  
**P**ut people first ,  
**B**e precise and practical ,  
**C**ontribute sincerely

Skyworth 创维

**HAT** 和而泰  
HAT INTELLIGENT CONTROL

dongweikeji  
东威科技

美的 Midea

STAR-NET  
星网锐捷

FORYOU  
ADAYO 华阳集团

**EDIFIER**®

Cultraview 金锐显

3nod 三诺

**T&W**

**TCL**

AcBel 康舒科技  
ACBEL POLYTECH INC.

**Honeywell**

Schneider  
Electric

**ZTE中兴**

**EMERSON**

**BYD**

**PHILIPS**

**TE**  
connectivity


**VIDEOTON**




CUSTOMER VOICE IS **EXTREMELY IMPORTANT** TO US

订单编号: 49335463501024670

供应商服务: 非常满意 (5 stars) 按时发货: 非常满意 (5 stars)

 **High quality usb power pcb ,pcba manufacturer**  
★★★★★  
Fancy has done an excellent job, whenever we write, she answered us within 1 second, O-leading is very perfect with fast delivery, fast logistics, the most important thing is good quality, good packaging, thank you!


[回复该评论](#)

 **oem customized rohs pcb drawing schematic s...**  
★★★★★  
We received the boards, the quality is very good, the price is very reasonable, Fancy is very nice & smart & experienced, the logistics is super fast, I will come to see more in the future.


[回复该评论](#)

订单编号: 49298271001024670


供应商服务: 非常满意 (5 stars) 按时发货: 非常满意 (5 stars)

 **High TG180 FR-4 Circuit HDI PCB 94V0 Board ...**  
★★★★★  
perfect product, perfect PCB supplier!

[回复该评论](#)

 **oem customized rohs pcb drawing schematic s...**  
★★★★★  
Very good and professional PCB product as usual!


[回复该评论](#)


 **Strip LED Aluminum FR-4 lighting PCB board 9...**  
★★★★★  
High quality, fast delivery, good service, competitive price, lucky and happy to purchase from O-leading!

[回复该评论](#)

订单编号: 49024962001024670


供应商服务: 非常满意 (5 stars) 按时发货: 非常满意 (5 stars)

 **High TG180 FR-4 Circuit HDI PCB 94V0 Board ...**  
★★★★★  
This is a very difficult PCB design, but we are lucky to find O-leading to support the PCB for us very good to a PCB supplier.


 **universal FR4 Multilayer PCB washing machine...**  
★★★★★  
Fancy gives us very excellent service, very professional and experienced, O-leading is the best one of our suppliers, very happy to work with them.

订单编号: 40938623501024670

供应商服务: 非常满意 (5 stars) 按时发货: 非常满意 (5 stars)


 **High quality Keyboard pcb & pcba Factory SMT...**  
★★★★★  
Top quality, it's the right choice to choose O-leading to make the PCB & PCBA

[回复该评论](#)

 **Professional Printed Circuit Board Manufacturer...**  
★★★★★  
Very high quality PCB products, O-leading is the best PCB supplier that we have ever worked with.

订单编号: 44068794501024670


供应商服务: 非常满意 (5 stars) 按时发货: 非常满意 (5 stars)


 **High TG180 FR-4 Circuit HDI PCB 94V0 Board ...**  
★★★★★  
We bought two batches, one by DHL, the other one by air, good quality and fast delivery!


LISTEN TO **CUSTOMER VOICE**


订单编号: 4090347501024670


供应商服务: 非常满意 (5 stars) 按时发货: 非常满意 (5 stars)


 **Strip LED Aluminum FR-4 lighting PCB board 9...**  
★★★★★  
Very fast delivery! Fantastic, good job!!

 **Professional Printed Circuit Board Manufacturer...**  
★★★★★  
Very happy to great support from O-leading, they are not only professional on the PCB, but also provide good PCB products, very good supplier!

 **hot sale rigid-flexible PCB with 0.2mm BGA an...**  
★★★★★  
very professional supplier


 **High Quality custom FPCB/Flex PCB/FPC/Flexi...**  
★★★★★  
Good product



 **OEM ODM PCBA Bluetooth Wireless Marking G...**  
★★★★★  
high soldering quality


 **Electronic parts haptic pcba Circuit Board asse...**  
★★★★★  
Very Good product

订单编号: 37378603001024670

供应商服务: 非常满意 (5 stars) 按时发货: 非常满意 (5 stars)


 **Raspberry pi 0 Zero Raspberry Pi Zero Pi W ver...**  
★★★★★  
Fantastic products!!


 


 **double layer pcb with red S/M and LF-HASL su...**  
★★★★★  
Good!


订单编号: 36919647001024670


供应商服务: 非常满意 (5 stars) 按时发货: 非常满意 (5 stars)


 **AML-S802 Quad-core Android embedded board...**  
★★★★★  
Good products


 **Fast delivery low cost pcb fabrication O-leadin...**  
★★★★★  
Good supplier


 **Lidar IR Sensor board pcba(H08R6x)**  
★★★★★  
perfect product

 **Customized PCBA design PCB design**  
★★★★★  
perfect

 **Audio Speaker and Headphone Jack (H07R3x)**  
★★★★★  
High quality, good

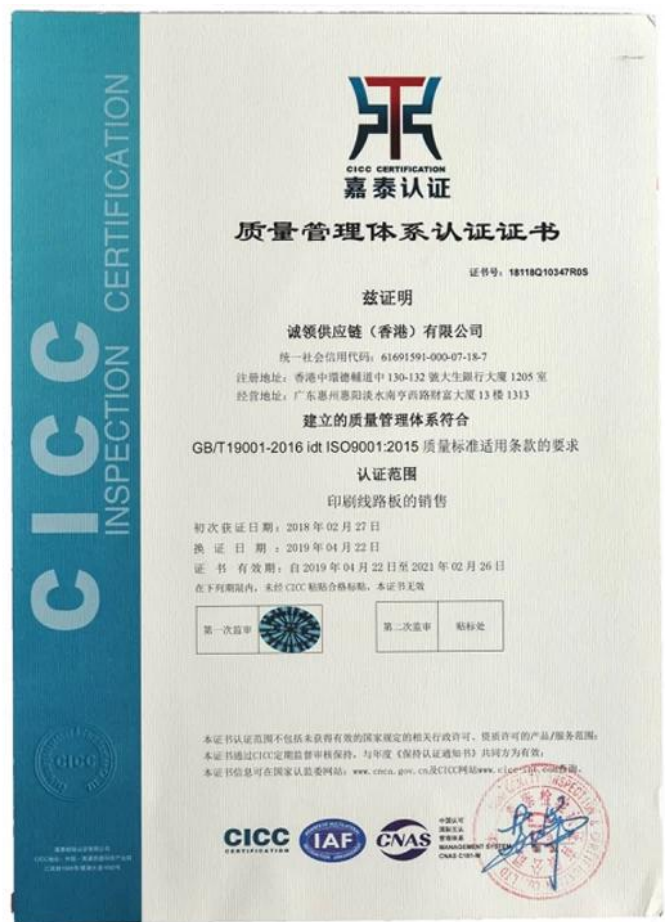
 **half hole pcb, half hole pcb module, half hole m...**  
★★★★★  
Top half hole pcb supplier, very perfect goods

 **High Quality custom FPCB/Flex PCB/FPC/Flexi...**  
★★★★★  
this rigid-flexible pcb quality is perfect!

 **Electronic parts haptic pcba Circuit Board asse...**  
★★★★★  
Very satisfied with O-leading products and quality, especially their on-time delivery, fantastic!

Be **kind** to your client,  
because he has many choices,  
but he chooses you instead.

# Certifications







No. SZXEC1900530401

Date: 30 Mar 2019

Page 1 of 6

O-LEADING SUPPLY CHAIN (HK) CO., LIMITED

1313, FLOOR 13, FORTUNE BUILDING, DANSHUI TOWN, HUIYANG DISTRICT, HUIZHOU, GUANGDONG,  
CHINA

The following sample(s) was/were submitted and identified on behalf of the clients as : OSP

SGS Job No. : RP19-005089 - SZ

Date of Sample Received : 22 Mar 2019

Testing Period : 22 Mar 2019 - 30 Mar 2019

Test Requested : Selected test(s) as requested by client.

Test Method : Please refer to next page(s).

Test Results : Please refer to next page(s).

Conclusion : Based on the performed tests on submitted sample(s), the results of Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBBs), Polybrominated diphenyl ethers (PDBEs) and Phthalates such as Bis(2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP), and Diisobutyl phthalate (DIBP) comply with the limits as set by RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.

Signed for and on behalf of  
SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

Tina Fan  
Approved Signatory



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中国·苏州·工业园区阳澄湖半岛430号江都工业园4楼SGS大楼 邮编: 215129 | (86-756) 25326888 | (86-756) 83106190 | e: sgs.china@sgs.com

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No. SZXEC1900530401

Date: 30 Mar 2019

Page 2 of 6

Test Results :

Test Part Description:

| Specimen No. | SGS Sample ID    | Description |
|--------------|------------------|-------------|
| SN1          | SZX19-005304.001 | Green™PCB   |

Remarks :

(1)  $1 \text{ mg/kg} = 1 \text{ ppm} = 0.0001\%$

(2) MDL = Method Detection Limit

(3) ND = Not Detected ( < MDL )

(4) "-" = Not Regulated

RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU

Test Method : With reference to IEC 62321-4:2013+A1:2017, IEC62321-5:2013, IEC62321-7-2:2017, IEC 62321-6:2015 and IEC62321-8:2017, analyzed by ICP-OES, UV-Vis and GC-MS.

| Test Item(s)                 | Limit | Unit  | MDL | Q27 |
|------------------------------|-------|-------|-----|-----|
| Cadmium (Cd)                 | 100   | mg/kg | 2   | ND  |
| Lead (Pb)                    | 1,000 | mg/kg | 2   | 8   |
| Mercury (Hg)                 | 1,000 | mg/kg | 2   | ND  |
| Hexavalent Chromium (Cr(VI)) | 1,000 | mg/kg | 8   | ND  |
| Sum of PBBs                  | 1,000 | mg/kg | -   | ND  |
| Monobromobiphenyl            | -     | mg/kg | 5   | ND  |
| Dibromobiphenyl              | -     | mg/kg | 5   | ND  |
| Tri bromobiphenyl            | -     | mg/kg | 5   | ND  |
| Tetrabromobiphenyl           | -     | mg/kg | 5   | ND  |
| Pentabromobiphenyl           | -     | mg/kg | 5   | ND  |
| Hexabromobiphenyl            | -     | mg/kg | 5   | ND  |
| Heptabromobiphenyl           | -     | mg/kg | 5   | ND  |
| Octabromobiphenyl            | -     | mg/kg | 5   | ND  |
| Nonabromobiphenyl            | -     | mg/kg | 5   | ND  |
| Decabromobiphenyl            | -     | mg/kg | 5   | ND  |
| Sum of PBDEs                 | 1,000 | mg/kg | -   | ND  |
| Monobromodiphenyl ether      | -     | mg/kg | 5   | ND  |
| Dibromodiphenyl ether        | -     | mg/kg | 5   | ND  |
| Tri bromodiphenyl ether      | -     | mg/kg | 5   | ND  |
| Tetrabromodiphenyl ether     | -     | mg/kg | 5   | ND  |
| Pentabromodiphenyl ether     | -     | mg/kg | 5   | ND  |



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Printed and e-Certificate. Please contact us at [info@spa.com](mailto:info@spa.com) or at <tel:+34915183071>

SGS B.V., Leiden, The Netherlands  
SGS B.V., CN, Dongchuan Industrial Park, No.430, Shua Road, Baidian, Longgang District, Shenzhen, China 518129 t. (86-755) 25328888 f. (86-755) 83106190 www.sgsgroup.com.cn  
中国·深圳·龙岗区田田路430号江田工业园4楼SGS大厦 邮编: 518129 t. (86-755) 25328888 f. (86-755) 83106190 e. sgs.china@sgs.com

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## ZPMV2.E490354 - WIRING, PRINTED - COMPONENT

## Wiring, Printed - Component

See General Information for Wiring, Printed - Component

**O-LEADING SUPPLY CHAIN (HK) CO LTD**

E490354

ROOM 1205, 12/F  
TAI SANG BANK BLDG  
130-132 DES VOEUS ROAD  
CENTRAL, HONG KONG

| Type  | Cond Width    |               | Cond<br>Thk<br>mic(mil) | SS/<br>DS/<br>DSO | Max        | Max    |      | Meets C | C     |       |   |
|---|---------------|---------------|-------------------------|-------------------|------------|--------|------|---------|-------|-------|---|
|   | Min           | Min           |                         |                   | Area       | Solder | Oper |         |       | Flame |   |
|   | mm(in)        | mm(in)        |                         |                   | Diam       | Limits | Temp |         |       | UL796 |   |
|   |               |               |                         |                   | mm(in)     | C      | sec  | C       | Class | DSR   | I |
| Multilayer (mass laminate) printed wiring boards. |               |               |                         |                   |            |        |      |         |       |       |   |
| O-LEADING-401                                     | 0.1 (0.004)   | 0.3 (0.012)   | 34 (1.34)               | DS                | 12.7 (0.5) | 260    | 10   | 130     | V-0   | -     | - |
| O-LEADING-407                                     | 0.08 (0.003)  | 0.2 (0.008)   | 17 (0.67)               | DS                | 9.7 (0.4)  | 260    | 10   | 130     | V-0   | All   | - |
| Multilayer printed wiring boards.                 |               |               |                         |                   |            |        |      |         |       |       |   |
| O-LEADING-408                                     | 0.125 (0.005) | 0.125 (0.005) | 12 (0.47)<br>Int:136    | DS                | 50.8 (2.0) | 280    | 20   | 130     | V-0   | All   | * |
| Single layer printed wiring boards.               |               |               |                         |                   |            |        |      |         |       |       |   |
| O-LEADING-002                                     | 0.38 (0.015)  | 1.14 (0.045)  | 34 (1.34)               | SS                | 19.1 (0.8) | 260    | 10   | 105     | V-0   | All   | - |
| O-LEADING-003                                     | 0.38 (0.015)  | 1.14 (0.045)  | 34 (1.34)               | SS                | 19.1 (0.8) | 260    | 10   | 130     | V-0   | ▲     | - |
| O-LEADING-033                                     | 0.15 (0.006)  | 0.3 (0.012)   | 34 (1.34)               | SS                | 25.4 (1.0) | 260    | 10   | 120     | V-0   | All   | - |
| O-LEADING-205                                     | 0.1 (0.004)   | 0.3 (0.012)   | 34 (1.34)               | DS                | 69.6 (2.7) | 260    | 10   | 130     | V-0   | All   | - |
| O-LEADING-206                                     | 0.15 (0.006)  | 0.33 (0.013)  | 17 (0.67)               | DS                | 69.6 (2.7) | 260    | 10   | 130     | V-0   | All   | - |
| O-LEADING-D01                                     | 0.14 (0.006)  | 0.15 (0.006)  | 33 (1.30)               | DS                | 25.4 (1.0) | 260    | 10   | 130     | V-0   | All   | * |
| O-LEADING-S01                                     | 0.25 (0.010)  | 0.25 (0.010)  | 17 (0.67)               | SS                | 25.4 (1.0) | 260    | 4    | 130     | V-0   | All   | * |

## WIRING, PRINTED - COMPONENT | UL Product iQ

|                      |              |              |           |    |            |     |   |     |     |     |   |
|----------------------|--------------|--------------|-----------|----|------------|-----|---|-----|-----|-----|---|
| <b>O-LEADING-S02</b> | 0.2 (0.008)  | 0.2 (0.008)  | 17 (0.67) | SS | 25.4 (1.0) | 260 | 4 | 130 | HB  | ▲   | * |
| <b>O-LEADING-S03</b> | 0.25 (0.010) | 0.25 (0.010) | 34 (1.34) | SS | 25.4 (1.0) | 260 | 4 | 130 | V-0 | All | * |

\* - CTI marking is optional and may be marked on the printed wiring board.

Marking: Company name or file number and type designation. May be followed by a suffix to denote factory identification or burning test classification.

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# Process Capability

## PCB Production Capabilities

|                                     |   |
|-------------------------------------|---|
| Layer Count                         | 1Layer-32Layer  |
| Finished copper thickness           | 1/3oz-12oz  |
| Min Line width/spacing internal     | 3.0mil/3.0mil   |
| Min Line width/spacing external     | 4.0mil/4.0mil   |
| Max Aspect Ratio                    | 10:1  |
| Board thickness                     | 0.2mm-5.0mm   |
| Max Panel size(inches)              | 635*1500mm  |
| Minimum Drilled Hole Size           | 4mil  |
| Plated Hole Tolerance               | +/-3mil   |
| Blind/Buried Vias (All Types)       | YES   |
| Via Fill(Conductive,Non-Conductive) | YES   |
| Base Material                       | FR-4,FR-4high Tg,Halogen free material,Rogers,Aluminium base,Polyimide,Heavy Copper |
| Surface finishes                    | HASL,OSP,ENIG,HAL-LF,Immersion silver,Immersion Tin,Gold fingers,Carbon ink         |

## SMT Production Capabilities

|                              |   |
|------------------------------|---|
| PCB Material                 | FR-4,CEM-1,CEM-3,Aluminum-based board,FPC |
| Max PCB size                 | 510x1500mm                                |
| Min PCB size                 | 50x50mm                                   |
| PCB Thickness                | 0.5mm-4.5mm                               |
| Board thickness              | 0.5-4mm                                   |
| Min Components size          | 0201                                      |
| Standard chip size component | 0603 and larger                           |
| Component max height         | 15mm                                      |
| Min lead pitch               | 0.3mm                                     |
| Min BGA ball pitch           | 0.4mm                                     |
| Placement precision          | +/-0.03mm                                 |

# Packaging & Delivery



# Shipping service



| Quick Turn Lead Time |          |                     |
|----------------------|----------|---------------------|
| Layer Count:         | Lead Tim | Special Requirement |
| 1L/2L                | 2-3days  | 24 Hours,48 Hours   |
| 4L                   | 3-4days  | 48 Hours            |
| 6L                   | 4-5days  | 72 Hours            |
| 8L                   | 5-6days  | NA                  |
| 10L                  | 6-7days  | NA                  |
| 12L                  | 7-8days  | NA                  |
| 14L                  | 8-9days  | NA                  |

| Standard Lead Time |                  |                        |
|--------------------|------------------|------------------------|
| Layer Count:       | Sample Lead Time | Volume order lead time |
| 2L                 | 4 days           | 10 days                |
| 4L                 | 5 days           | 11 days                |
| 6L                 | 6 days           | 12 days                |
| 8L                 | 8 days           | 14 days                |
| 10L                | 10 days          | 16 days                |
| 12L                | 12 days          | 18 days                |
| 14L                | 14 days          | 20 days                |
| 16-32L             | 18 days          | 24 days                |

## FAQ

### 1. How do O-Leading ensure quality?Our high quality standard is achieved with the following.

- 1.1 The process is strictly controlled under ISO 9001:2008 standards.
- 1.2 Extensive use of software in managing the production process
- 1.3 State-of-art testing equipments and tools. E.g. Flying Probe, X-ray Inspection, AOI (Automated Optical Inspector) and ICT(in-circuit testing).
- 1.4.Dedicated quality assurance team with failure case analysis process
- 1.5.Continuous staff training and education

### 2. How do O-Leading keep your price competitive?

Over the last decade, prices of many raw materials (e.g. copper, chemicals) had doubled, tripled or quadrupled; Chinese currency RMB had appreciated 31% over US dollar; And our labor cost also increased significantly.

However, O-Leading have kept our pricing steady. This owns entirely to our innovations in reducing cost, avoiding wastes and improving efficiency. Our prices are very competitive in the industry at the same quality level.

We believe in a win-win partnership with our customers. Our partnership will be mutually beneficial if we can provide you anedgeon cost and quality.

### **3. What kinds of boards can O-Leading process?**

Common FR4, high-TG and halogen-free boards, Rogers, Arlon, Telfon, aluminum/copper-based boards, PI, etc.

### **4. What data are needed for PCB & PCBA production?**

4.1 BOM (Bill of Materials) with reference designators: component description, manufacturer's name and part number.

4.2 PCB Gerber files.

4.3 PCB fabrication drawing and PCBA assembly drawing.

4.4 Test procedures.

4.5 Any mechanical restrictions such as assembly height requirements.

### **5. What's the typical process flow for multi-layer PCB?**

Material cutting → Inner dry film → inner etching → Inner AOI → Multi-bond → Layer stack up Pressing → Drilling → PTH → Panel Plating → Outer Dry Film → Pattern Plating → Outer etching → Outer AOI → Solder Mask → Component Mark → Surface finish → Routing → E/T → Visual Inspection.

### **6. What's the key equipments for HDI manufacturing?**

Key equipment list is as following: Laser drilling machine, Pressing machine, VCP line, Automatic Exposing machine, LDI and etc. The equipments we have are the best in the industry, laser drilling machines are from Mitsubishi and Hitachi, LDI machines are from Screen(Japan), Automatic Exposing machines are also from Hitachi, all of them make we can meet customer's technical requirements.

### **7. How many types of surface finish O-lead can do?**

O-the leader has the full series of surface finish, such as: ENIG, OSP, LF-HASL, gold plating (soft/hard), immersion silver, Tin, silver plating, immersion tin plating, carbon ink and etc. .. OSP, ENIG, OSP + ENIG commonly used on the HDI, we usually recommend that you use a client or OSP OSP + ENIG if BGA PAD size less than 0.3 mm.

### **8. What's your capability for FPC? Can O-Leading provide SMT service also?**

O-Leading can fabricate FPC from single layer to 8layer, the working panel size can be as large as 2000mm\*240mm, please find the details in the page "Flex Capability". We also provide SMT one stop service to customer.

### **9. What are the main factors which will affect the price of PCB?**

Material;

Surface finish;

Technology difficulty;

Different quality criteria;

PCB characteristics;

Payment terms;

Different manufacturing countries.

### **10. What's the definition of PCB, PWB and FPC and what's the difference?**

PCB is short for Printed Circuit Board;

PWB is short for Printed Wire Board, same meaning as Printed Circuit Board;

FPC is short for Flexible Printed Board.

### **11. What factors should be considered when choosing the material for a PCB board?**

Below factors should be considered when we choose the material for PCB:

The material's Tg value should be greater than the operation temperature;

Low CTE material has good performance of thermal stability;

Good thermal resistance performance: Normally PCBs are required to resist 250°C for at least 50s.



Good flatness; In consideration of the electrical properties, low loss/high permittivity material is used on high frequency PCB;  
Polyimide glass fiber substrate used for flexible PCB; Metal core is used when the product has strict requirement of heat dissipation.

## **12. What's the merits of O-leading's rigid-flex PCB?**

O-leading's rigid-flex PCB has the characters of both FPC and PCB, so it can be used in some special products. Some part is flexible while the other part rigid, it can help save product's interior space, reduce product volume and improve performance.

## **13. How to you make the impedance calculation?**

The impedance control system is done using some test coupons, the SI6000 soft and the CITS 500s equipment from POLAR INSTRUMENTS. The equipment measures the impedance on a representative track configuration coupon of which the client has given us a determinate value and tolerance.