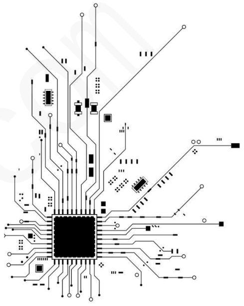
# 深圳智博微波电路有限公司

## Shenzhen Zhibo Microwave Circuit Co., Ltd.



1、**Suining RF&HDI factory process capabilities**

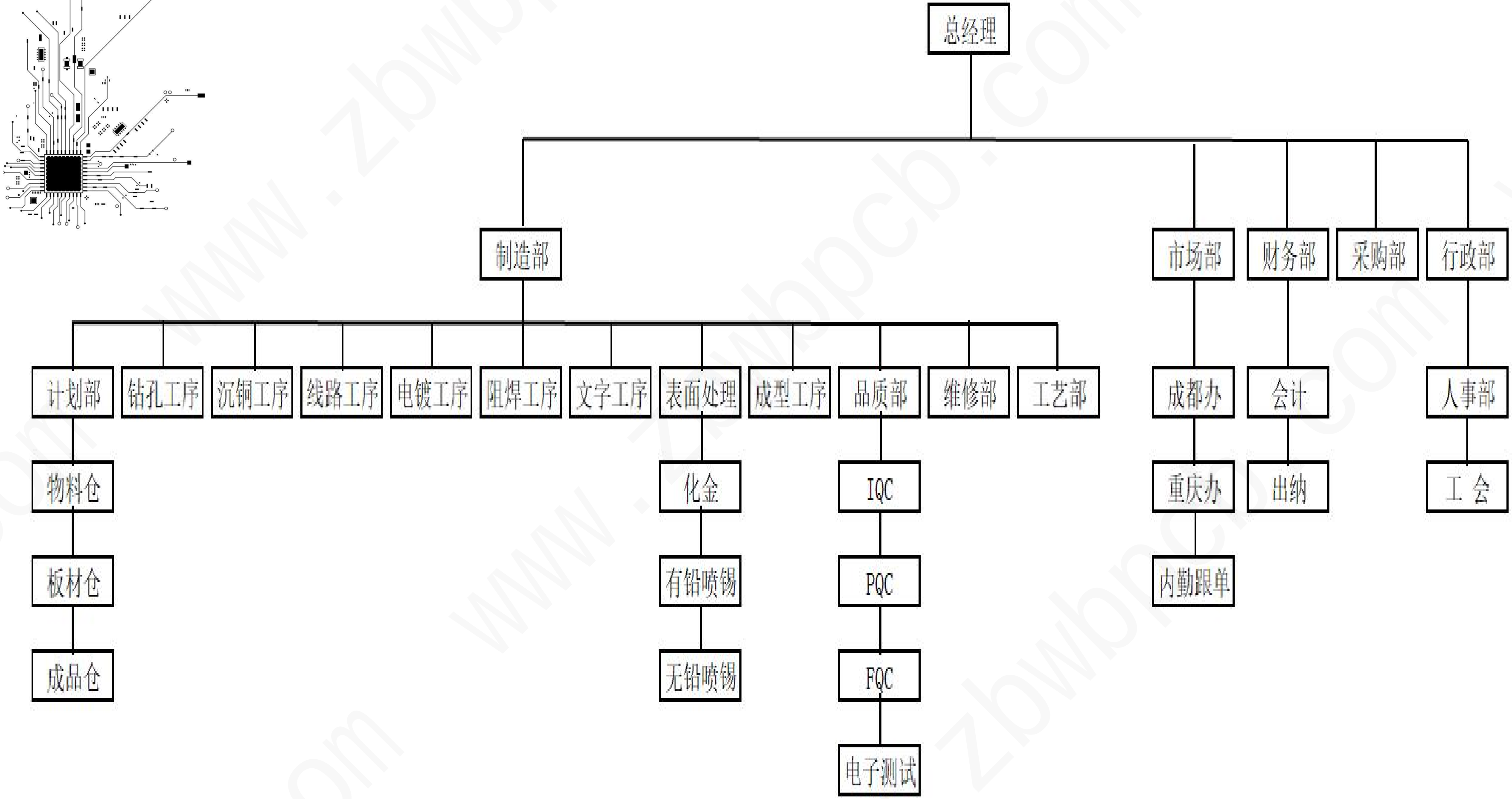
2、**Jiangxi Factory Process Capabilities**

3、**Shenzhen  Factory Process Capability**

4、**Hunan Changsha   PCBA Factory Process Capabilities**

5、 **Materials Stock  &CHD  Material COC**

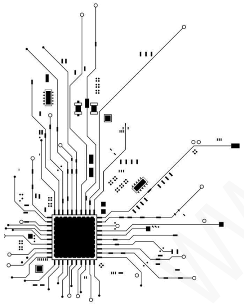
# Factory Architecture



- 总经理
  - 制造部
    - 计划部
      - 物料仓
      - 板材仓
      - 成品仓
    - 钻孔工序
    - 沉铜工序
    - 线路工序
    - 电镀工序
    - 阻焊工序
    - 文字工序
    - 表面处理
      - 化金
      - 有铅喷锡
      - 无铅喷锡
    - 成型工序
    - 品质部
      - IQC
      - PQC
      - FQC
      - 电子测试
    - 维修部
    - 工艺部
  - 市场部
    - 成都办
    - 重庆办
    - 内勤跟单
  - 财务部
    - 会计
    - 出纳
  - 采购部
  - 行政部
    - 人事部
    - 工 会

# *Suining RF&HDI factory Process Capabilities & Equipment*

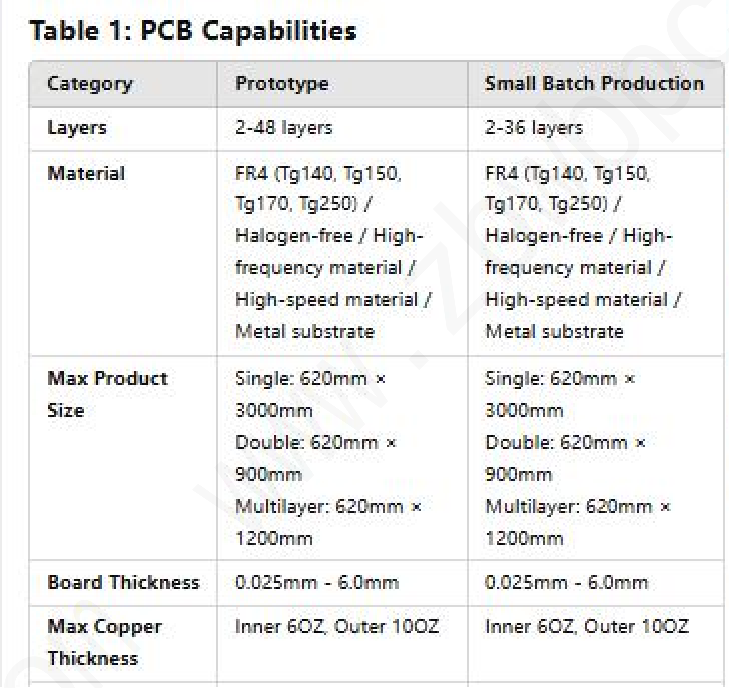
## Product Type:



| Product Type | Sample Process | Mass Production Process | Description |
|---|---|---|---|
| Thick Copper Board | Mature Process | Mature Process | Inner copper thickness ≥6oz, outer copper thickness ≥10oz |
| Back Drilling Board | Mature Process | Mature Process | |
| Metal Substrate | Mature Process | Mature Process | Copper-based, aluminum-based |
| Metal Core Board | Mature Process | Mature Process | Copper core, aluminum core |
| Multilayer High-Frequency Board | Mature Process | Mature Process | Material types: Rogers, Arlon, Taconic, Nelco, Wangling, Shengyi, etc.<br>Product structure: Hybrid pressing, pure pressing<br>Application fields: 5G, 24GHz, 77GHz automotive radar |
| High-Speed Board | Mature Process | Mature Process | Panasonic, Shengyi, Nanya, ITEQ, Taiguang, etc. |
| Step Board | Mature Process | Mature Process | Includes step groove |
| Buried & Blind Via Board | Mature Process | Mature Process | |

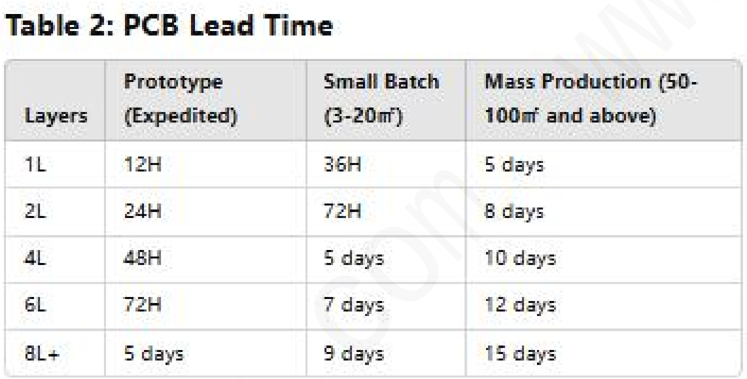
# Suining RF&HDI factory Process Capabilities & Equipment

## Capabilities



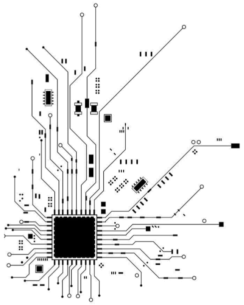

### Table 1: PCB Capabilities

| Category | Prototype | Small Batch Production |
|---|---|---|
| Layers | 2-48 layers | 2-36 layers |
| Material | FR4 (Tg140, Tg150, Tg170, Tg250) / Halogen-free / High-frequency material / High-speed material / Metal substrate | FR4 (Tg140, Tg150, Tg170, Tg250) / Halogen-free / High-frequency material / High-speed material / Metal substrate |
| Max Product Size | Single: 620mm × 3000mm<br>Double: 620mm × 900mm<br>Multilayer: 620mm × 1200mm | Single: 620mm × 3000mm<br>Double: 620mm × 900mm<br>Multilayer: 620mm × 1200mm |
| Board Thickness | 0.025mm - 6.0mm | 0.025mm - 6.0mm |
| Max Copper Thickness | Inner 6OZ, Outer 10OZ | Inner 6OZ, Outer 10OZ |
| Min Drilling Hole Diameter | 0.15mm | 0.20mm |
| Aspect Ratio | 16:1 | 10:1 |
| Min Line Width/Spacing | 3.0mil / 3.0mil | 4.0mil / 4.0mil |
| Min Solder Mask Bridge | Green 3mil, Others 4mil | Green 4mil, Others 5mil |
| Drill Diameter Tolerance | 0.20mm - 0.6mm | 0.20mm - 0.6mm |
| Impedance Control | ±5% | ±10% |
| Solder Mask Colors | Green / White / Black / Red / Yellow / Blue / Purple / Matte Green / Matte Black | Green / White / Black / Red / Yellow / Blue / Purple / Matte Green / Matte Black |
| Surface Finish | OSP / Immersion Gold / Lead-Free HASL / HASL / Immersion Silver / Immersion Tin / Electrolytic Gold / ENIG / ENIG+OSP | OSP / Immersion Gold / Lead-Free HASL / HASL / Immersion Silver / Immersion Tin / Electrolytic Gold / ENIG / ENIG+OSP |

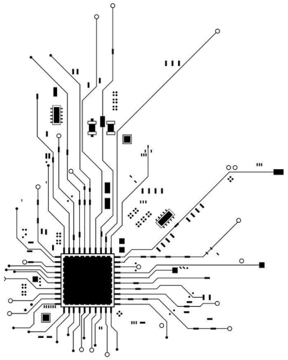


### Table 2: PCB Lead Time

| Layers | Prototype (Expedited) | Small Batch (3-20㎡) | Mass Production (50-100㎡ and above) |
|---|---|---|---|
| 1L | 12H | 36H | 5 days |
| 2L | 24H | 72H | 8 days |
| 4L | 48H | 5 days | 10 days |
| 6L | 72H | 7 days | 12 days |
| 8L+ | 5 days | 9 days | 15 days |

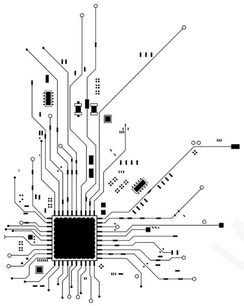


# Extra long flexible board shipment inspection standards



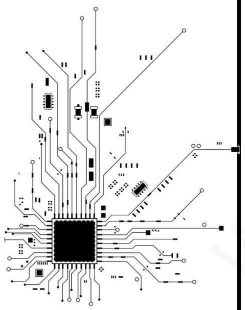
| Inspection Station | Test items | Indicators and scope | Sampling method | Detection Method | Inspection frequency |
|---|---|---|---|---|---|
| Substrate material | Substrate Brand | Substrate Incoming Material Report | Substrate Incoming Material Report | Visual | Per Volume |
| | Substrate thickness | Substrate Incoming Material Report | Cutting angle measurement | Micrometer | Per Volume |
| | Base material copper thickness | Substrate Incoming Material Report | Cutting angle measurement | Copper Thickness Measuring Instrument | Per Volume |
| Circuit film | The film is bubbling and wrinkling | No blistering or wrinkling on the film | 1PNL | Visual | 100% |
| | Sheet wrinkles | No visible dead folds on the substrate | 1PNL | Visual | 100% |
| Line exposure | Poor exposure | No exposure defects | 1PNL | Visual | 100% |
| Line Development | Line width, line spacing | According to MI requirements | 1PNL | 100x Mirror | First piece |
| | Unclean development | No incomplete development | 1PNL | Visual | 100% |
| | Copper leakage | No copper leaks | 1PNL | Visual | 100% |
| | Dry film scratch | No dry film scratches | 1PNL | Visual | 100% |
| Etching | Line width, line spacing | According to MI requirements | 1PNL | 100x Mirror | First piece |
| | Etching is not clean | No etching impurities | 1PNL | Visual | 100% |
| | Film removal is not clean | No film stripping impurities | 1PNL | Visual | 100% |
| | Rub the flower | No scratches on the copper surface and substrate | 1PNL | Visual | 100% |

# Extra long flexible board shipment inspection standards



| Inspection Station | Test items | Indicators and scope | Sampling method | Detection Method | Inspection frequency |
|---|---|---|---|---|---|
| Etching | Residual Copper | No Residual Copper | 1PNL | Visual | 100% |
| | Sheet wrinkles | No dead folds on copper surface and substrate | 1PNL | Visual | 100% |
| Sandblasting | Scratches | No scratches on copper surface and substrate | 1PNL | Visual | 100% |
| | Sandblasting effect | Copper surface roughening and uniform color | 1PNL | Visual | 100% |
| | Dirty | No dirty spots on copper surface and substrate | 1PNL | Visual | 100% |
| | Sheet wrinkles | No dead folds on copper surface and substrate | 1PNL | Visual | 100% |
| ENIG | Coating thickness | According to MI requirements | 1PNL | X-ray coating thickness measuring instrument | First piece |
| | Coating color difference | No visible color difference | 1PNL | Visual | 100% |
| | Gold surface scratch | No gold surface scratches | 1PNL | Visual | 100% |
| | Dirty gold surface | Gold surface without dirty spots | 1PNL | Visual | 100% |
| | Wrinkle | No dead folds on metal area and substrate | 1PNL | Visual | 100% |

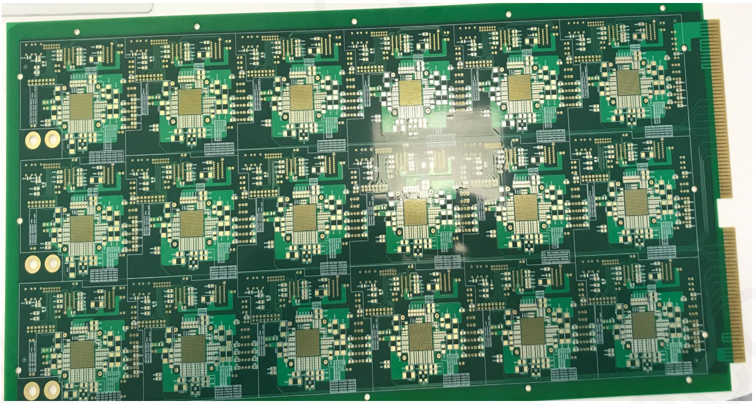
# Extra long flexible board shipment inspection standards



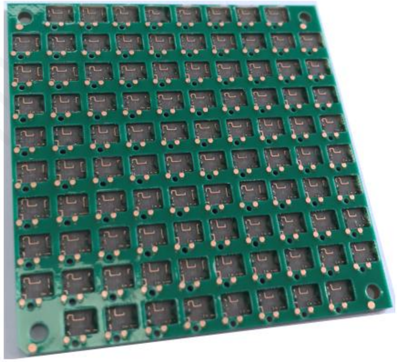
| Inspection Station | Test items | Indicators and scope | Sampling method | Detection Method | Inspection frequency |
|---|---|---|---|---|---|
| FQC | Final inspection | No dead folds in the metal area and substrate | 1PNL | Visual | 100% |
|  |  | No tearing on the surface | 1PNL | Visual | 100% |
|  |  | The surface should not have coating cracks, wire breakage, delamination, or blistering | 1PNL | Visual | 100% |
|  |  | No defects are allowed in the middle of the substrate or near the metal strip | 1PNL | Visual | 100% |
|  |  | Aperture | 1PNL | Needle Gauge | First piece |
|  |  | Line width and line spacing | 1PNL | 100x Mirror | First piece |
|  |  | There shall be no holes in the board that are not designed for the printed board. | 1PNL | Visual | 100% |
|  |  | White base coating is not allowed | 1PNL | Visual | 100% |
|  |  | No excess copper (excess material) is allowed on the surface of the printed circuit board. | 1PNL | Visual | 100% |
|  |  | No dead folds on metal surface and substrate | 1PNL | Visual | 100% |
|  |  | No dense folds are allowed on the metal strip line | 1PNL | Visual | 100% |
|  |  | On a microstrip line with a width less than 1.5 mm, there is no concave point with a diameter greater than 1 mm and the number of concave points less than 1 mm does not exceed 2 | 1PNL | Visual | 100% |
|  |  | Obvious scratches are not allowed and the scratches cannot expose the copper foil or substrate | 1PNL | Visual | 100% |
|  |  | No more than one pinhole (with a diameter not exceeding 0.1 mm) is allowed in every 300*300 mm area on the copper foil surface. | 1PNL | Visual | 100% |
|  |  | Dimensions | 1PNL | Film alignment comparison | First piece |
|  |  | Through hole location | 1PNL | Visual | 100% |

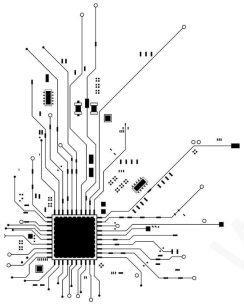
# Suining RF&HDI factory Products Show

Twelve-layer gold finger aging test board



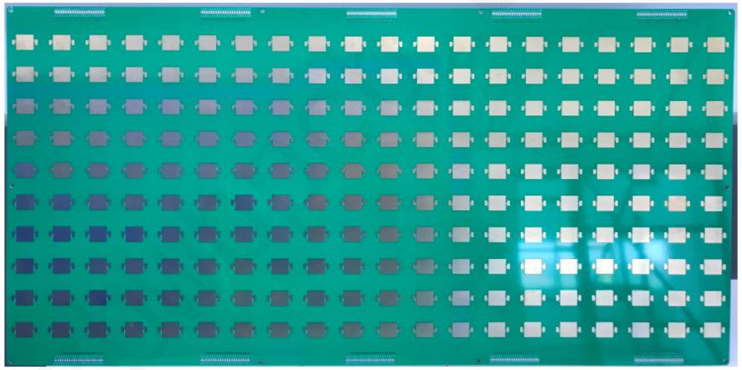
6-layer HDI step board



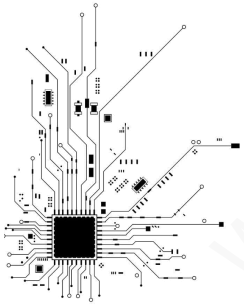


Extra long immersion gold flexible board, finished product size 400mm*2800mm

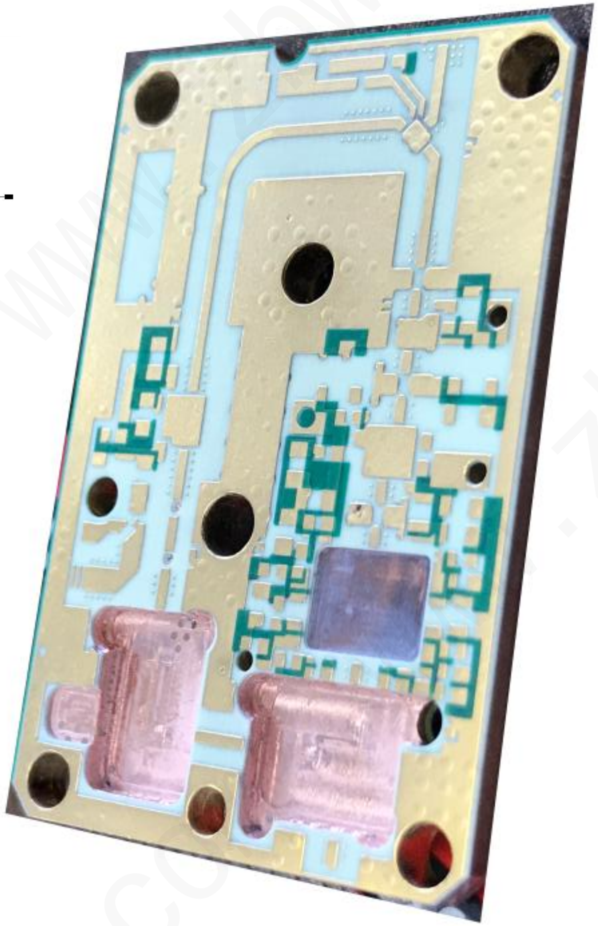
4-layer ultra-large high-frequency board, finished product size 450mm*800mm



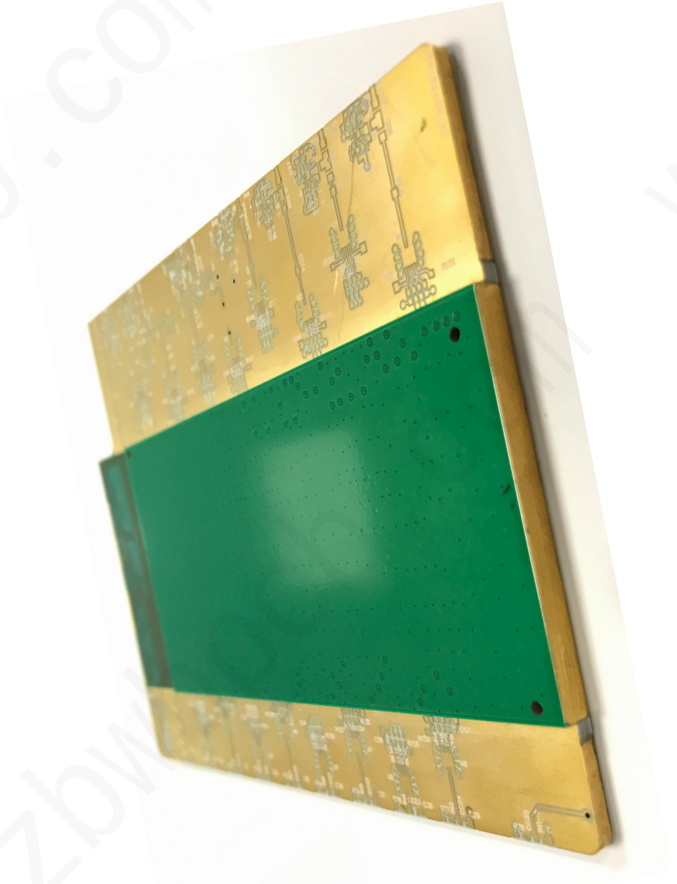
# Suining RF&HDI factory Products Show



4-layer buried thick copper block HDI various depth step board



24-layer convex step HDI board



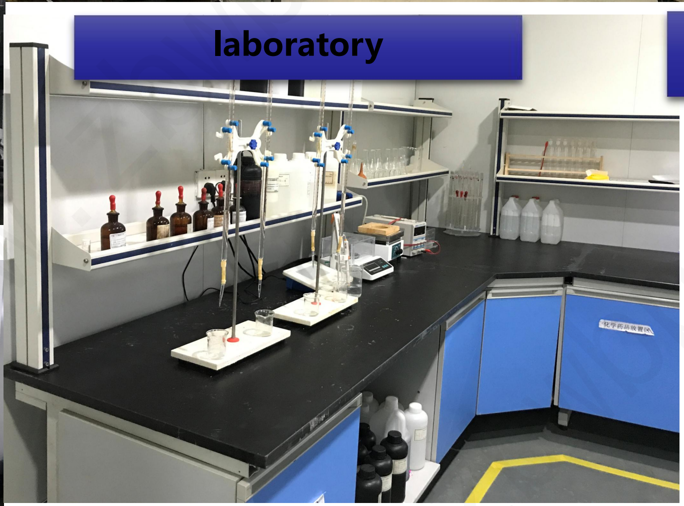
# *Suining RF&HDI factory Equipment Show*

Testing workshop

Wet process workshop

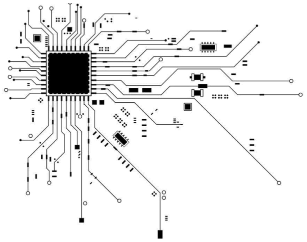
Tin spraying workshop

Drying workshop



laboratory

Multi-axis V-groove machine



# Suining RF&HDI factory Equipment Show

**High speed CNC drilling machin**

**Circuit film machine**

**High temperature oven**

**LED Exposure Machine**

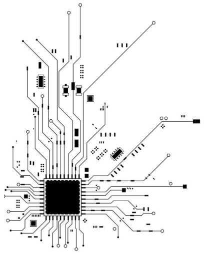
**High-precision character ink jet printer**

**Dry area pre-treatment line**

**Ultra-large size precision exposure machine**

**DES Etching Line**

**Dry Area Developing Line**



# Suining RF&HDI factory Equipment Show

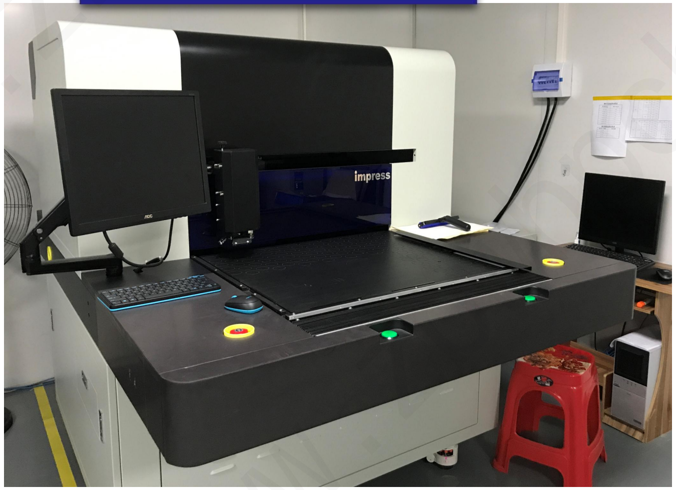
**Chemical Immersion Gold Wire**

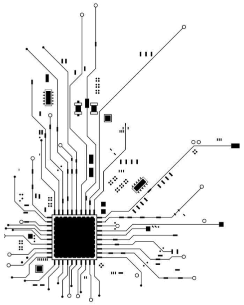
**CNC forming machine**

**Composite mold testing machine**

**High speed flying probe tester**

**AOI**



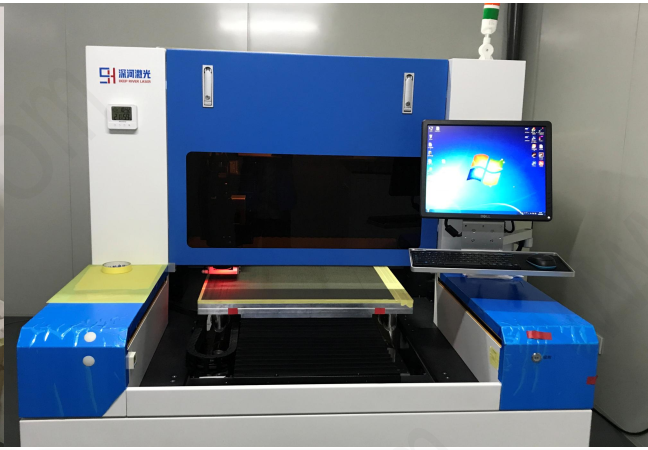


# Suining RF&HDI factory Equipment Show

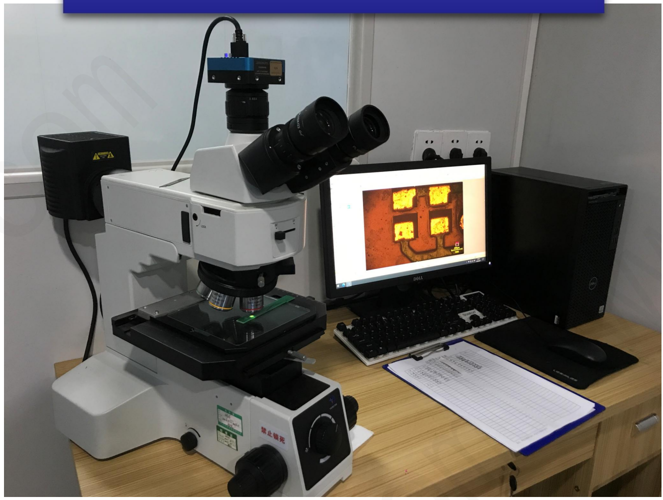
**Ultra-large size precision exposure machine**

**X-Ray**

**Laser cutting machine**

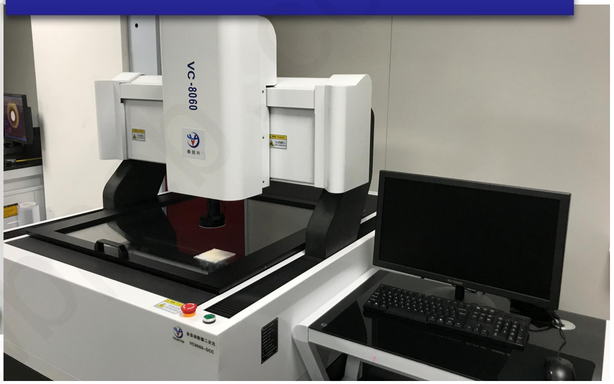


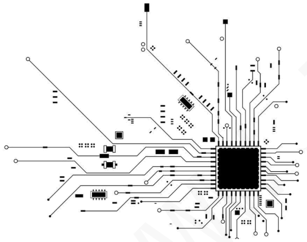
**Metallographic microscope**



**Oxford coating thickness gauge**

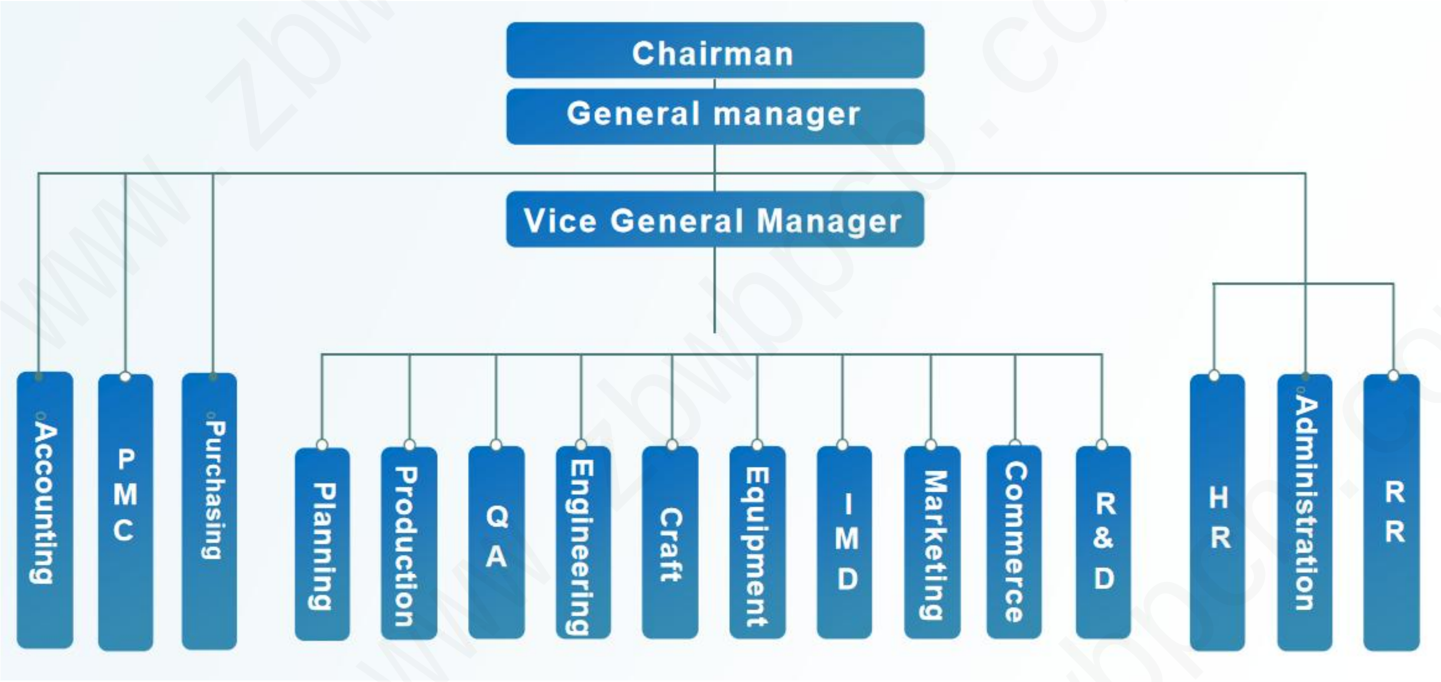
**Second dimension measuring instrument**

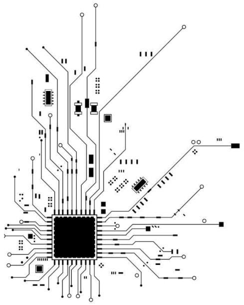




# Jiangxi Ganzhou Factory

## Factory Architecture


Chairman
General manager
Vice General Manager
Accounting
PMC
Purchasing
Planning
Production
QA
Engineering
Craft
Equipment
IMD
Marketing
Commerce
R&D
HR
Administration
RR

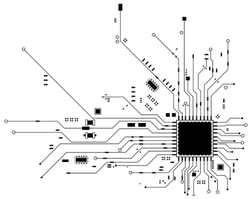


# Jiangxi Ganzhou Factory

| Capability | Standard | Advanced |
|---|---|---|
| line width space | 2.36/2.36mil | 2.0/2.0mil |
| Max Copper foil thickness | 3oz | 4oz |
| min via hole size | Min：0.2mm | Min：0.1mm |
| min blind hole size | Min：0.1mm | Min：0.05mm |
| Minimum semi-metallized hole | Min：0.45mm | Min：0.40mm |
| Buried hole | 4-16 layer | 24 layer |
| Max production borad size | 540mmX620mm | 540mmX640mm |
| Max Aspect ratio | 16:1 | 20:1 |
| Line width space | ±20% | ±10% |
| Pth Aperture size | ±3mil | ±2mil |

| Capability | Standard | Advanced |
|---|---|---|
| NPth Aperture size | ±2mil | ±1.5mil |
| Hole location Accuracy | ±3mil | ±2mil |
| Distance from the center of the hole to the center of the hole | ±4mil | ±3mil |
| Hole to Edge Precision | ±3mil | ±2mil |
| Layer to layer tolerance | ±4mil | ±3mil |
| Shape Size tolerance | ±100μ m | ±75μ m |
| Impedance tolerances | ±10%， Max＞50ohm +/- 5% | ±8%， Max＞50ohm +/- 5% |
| Min.Solder Mask Dam Width | Green Oil：3mil | Green Oil：2.5mil |
|  | Other: 4.5mil | Other: 4mil |
| S/M Registration | ±1.5mil | ±1.2mil |

| Capability | Standard | Advanced |
|---|---|---|
| Min. SMT/QFP Pitch | 10mil | NA |
| Min.BGA Pitch | 12mil | NA |
| lax.Test Points/Board (Universal ET) | Bed of Nail Test: 16000 | Flying Probe Test：1-∞ |
| v-cut Depthing | ±100μ m | ±75μ m |
| v-cut Angel | 20°、30°、45° | NA |
| v-cut precision | ±100μ m | ±75μ m |
| Warpage % | Max ≤0.75% | Max ≤0.5% |



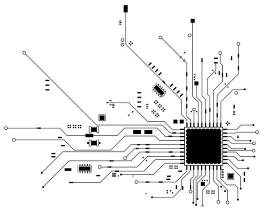
# Jiangxi Ganzhou Factory

## Dood at product type

- HDI products, the pioneer of industrial HDI in China. At present, the third order has been in batch production, and the fourth order is in small batch proofing.
  (1) Each laser hole is shot 4 shots, the industry in order to solve the cost of three shots. Our pore size is 0.1mm (equivalent to the size of the smallest mechanical hole), while other companies in the industry use the size of 0.075mm to save costs. Reliability is comparable to mechanical drilling.
  (2) Our surface copper thickness is controlled at 25-30 microns. The rest of the industry in order to save costs are controlled in about 18 microns, thickness is the most important guarantee of reliability.
  (3) Our line adopts laser exposure, the resolution is 25 microns, the equipment imported from Japan, greatly ensures the line yield and accuracy. Other companies in the industry use the traditional film exposure machine, yield, accuracy, stability, reliability is not comparable.
- High aspect ratio board
- High multilayer through-hole plate
- VOP plate
- Impedance version
- Half an orifice
- High frequency and high speed boards
- Strange DESIGN OF THE BOARD (1) VARIOUS composite surface treatment forms (2) complex laminated structure (3) various PCB shape processing methods

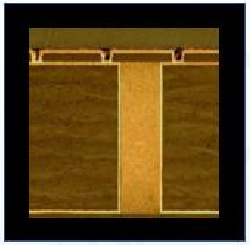
## Not good at product type

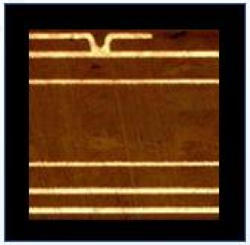
- Low end dual panel
- Line width line spacing above 3MIL design
- 4 ounces or more of thick copper
- The LED panel

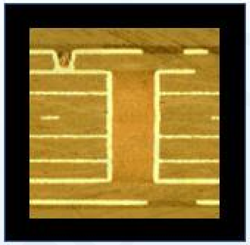


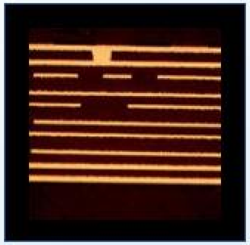
# Jiangxi Ganzhou Factory

## First order HDI

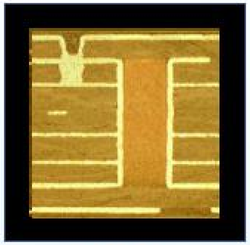

1+2+1

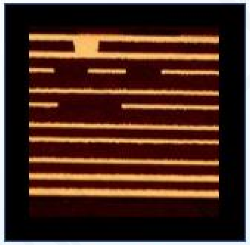

1+4+1

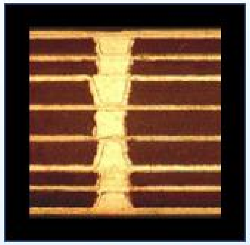

1+6+1


1+8+1

## High order HDI


2+4+2


2+6+2


3+2+3


4+2+4

# Jiangxi Ganzhou Factory

## Equipment List-1


Cutting (Yoshi Taiwan)


Chemical pretreatment machine (Universe Hong Kong)


Edging (Jiehui Taiwan)


Coating machine (Ruirong, China)


I/L Exposure (Duopu China)


DES (Universe·Hong Kong)


In-line Automatic Optical Inspection (AOI) (AOTIMA China)


Alternative Oxide (Universe, Hong Kong)


Fully automatic CCD fusion machine (Qiyuan, China)


Lamination Press (Jiahui Italy)


Hydraulic vacuum pressure (OEMC China)


Press plate (Jiahui Italy)

# Jiangxi Ganzhou Factory

## Equipment List-2

Target drilling/edge grinding (Jiahui/Intuo Taiwan)

LDD copper reduction browning line (Universe Hong Kong)

Mitsubishi fourth generation laser machine (Mitsubishi · Japan

Laser (Han's China)

Drilling (Dazu/Daliang·China)

Black hole line (Universe·Hong Kong)

VCP Line (Universe·Hong Kong)

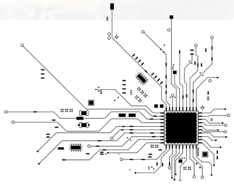
DVCP Line (Universe·Hong Kong)

Grinding plate sandblasting machine (Universe·Hong Kong)

Sub-outer layer line super-roughening pre-processor (Universe, Hong Kong, China)

Outer film (Zhisheng Taiwan)

Double pressure laminating machine (Zhisheng, China Taiwan)



# Jiangxi Ganzhou Factory

## Equipment List-3

Digital stepper and scanner lithography machine LDI (Yuanzhuo China)

Fully automatic LED line exposure machine (Ono, Japan)

External exposure (Chuanbao Taiwan)

Outer layer LDI exposure (Core China)

Outer layer acid etching (Universe Hong Kong)

In-line Automatic Optical Inspection AOI (Eagle Eye China)

Optical Inspection AOI (Orbotech Israel)

Outer layer AOI (Motorcycle Taiwan)

Screen printing machine (Hengda China)

Solder mask sandblasting machine (Universe Hong Kong)

Solder mask exposure (Chuanbao/Duopu Taiwan/China)

Solder mask development (Universe Hong Kong)

# Jiangxi Ganzhou Factory

## Equipment List-4


Text inkjet printer (Hanyin, China)


Automatic screen printing machine (Dongyuan Taiwan)


IR Tunnel Oven (Xinjinhui China)


Text screen printing machine (Hengda China)


Pre-processor (Universe Hong Kong)


Gold Thread (Asia-Pacific China)


Post-processor (Universe Hong Kong)

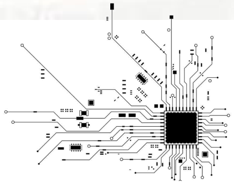

CNC V-cutting (Yintuo Taiwan)


CNC gong machine (Han's China)


Finished product cleaning machine (Universe·Hong Kong)


Fully automatic testing machine (Kai Ma/Ming Xin · China)


Flying probe tester (Microtronics China)



# Jiangxi Ganzhou Factory

## Equipment List-5


Antioxidant Machine (Universe Hong Kong)


Appearance inspection machine (Screen Japan)


Final inspection FQC


Packaging and shipment (Xinmin Taiwan)


Atomic absorption spectrometer


Laboratory Instruments


Hole Inspection Machine

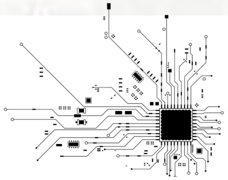

Secondary element detector


Ionic contamination test

Film inspection machine


Metallographic microscope


Gold Nickel Layer Thickness Tester



# Jiangxi Ganzhou Factory

| | | | |
|---|---|---|---|
| 开料<br>Cutting | 开料机 | 香港 | 1 |
| | 清洗线 | 香港 | 1 |
| 内层<br>Inner layer | 化学前处理 | 香港 | 2 |
| | 涂布机 | 台湾 | 1 |
| | 贴膜机 | 台湾 | 1 |
| | DES | 香港 | 1 |
| 光学检查<br>AOI | 光学检查机 | 以色列 | 8 |
| | VRS机 | 以色列 | 9 |
| 层压<br>Laminating | 压机（电压） | 意大利、中国 | 3、2 |
| | 冷压机 | 德国 | 3 |
| | 棕化线 | 香港 | 2 |
| | 热熔机 | 意大利 | 1 |
| | 热熔机 | 中国 | 1 |
| | OPE冲孔 | 台湾 | 1 |
| | X-RAY自动钻靶机 | 台湾 | 4 |
| | 磨钢板线 | 香港 | 2 |
| 钻孔<br>Drilling | 激光钻孔laser drilling | 日本、韩国 | 20、5 |
| | 机械钻孔机 | 中国 | 42 |
| | 机械钻孔机 | 台湾 | 24 |
| | 磨针机 | 台湾 | 4 |
| | X-RAY检查机 | 香港 | 1 |
| | 检孔机 | 台湾 | 1 |
| 电镀<br>Electroplating | 粗磨机 | 香港 | 2 |
| | 沉铜线（水平线） | 香港 | 2 |
| | 板电镀（水平线） | 香港 | 2 |
| | 盲孔填孔线（垂直） | 香港 | 1 |
| | 盲孔填孔线（垂直） | 中国 | 1 |
| | 脉冲图形电镀线（垂直） | 香港 | 1 |

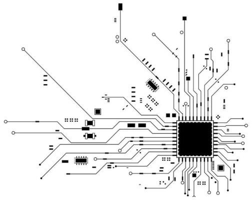
Main Equipment

| 工序<br>Process | 设备名称<br>Equipment | 原产地<br>Origin | 数量<br>Quantity |
|---|---|---|---|
| 干、湿菲林<br>Film | 喷砂线/超粗化 | 香港 | 2 |
| | 自动贴膜线 | 台湾 | 3 |
| | 自动曝光机 | 台湾 | 1<br>2 |
| | DI（按照单机算） | 广东、日本 | 3、 |
| | 显影线 | 香港 | 6 |
| 防焊<br>Solder prevent mask | 喷砂线 | 香港 | 2 |
| | DES | 香港 | 2 |
| | 印刷机 | 台湾 | 10 |
| | 低温隧道式烤炉 | 台湾 | 1 |
| | 自动曝光机 | 台湾 | 6 |
| | 显影线 | 香港 | 2 |
| | 立式烤箱 | 广东 | 10 |
| 丝印文字<br>Screen printing | 全自动丝印机 | 台湾 | 2 |
| | 高温隧道炉 | 广东 | 2 |
| | 树脂塞孔机 | 台湾 | 4 |
| | 树脂研磨机 | 广东 | 2 |
| | 文字喷墨机 | 中国 | 3 |
| 沉金<br>Gold depositing | 喷砂线 | 香港 | 2 |
| | 自动沉金线 | 广东 | 2 |
| | 沉金后处理线 | 香港 | 2 |
| 锣板<br>Route cutting | 锣机 | 台湾 | 27 |
| | 二次元测量 | 台湾 | 1 |
| | 全自动V-cut | 香港 | 3 |
| 电子测试<br>Electrical testing | 电测试机 | 广东 | 20 |
| | 飞针测试机 | 中国 | 10 |
| | 四线测试机 | 中国 | |
| 终检FQC | 整平机 | 台湾 | 4 |
| | 抗氧化线 | 香港 | 2 |
| | 外观检查机 | 日本+台湾 | 3 |
| 包装Pack | 真空包装机 | 广东 | 2 |
| | 真空保护包装机 | 广东 | 2 |

Main Equipment

| | | | |
|---|---|---|---|
| 铜箔测厚仪 | 1 | 冷热冲击机 | 1 |
| 原子吸收光度计 | 1 | 温湿测试室 | 1 |
| 紫外可见分光光度计 | 1 | 热油测试机 | 1 |
| CVS机 | 1 | 阻抗测试仪 | 1 |
| 铜厚测试仪 | 4 | 能量色散型X射线莹光 分析仪 | 1 |
| 离子污染机 | 1 | 8温区带电脑无铅回流焊 | 1 |
| 高压测试机 | 1 | 自动取样机 | 2 |
| 绝缘测试机 | 1 | 电镜SEM | 1 |
| 金像显微镜 | 2 | 能谱EDS | 1 |
| X-RAY测厚仪 | 1 | micro-vu三次元接触 式影象量测系统 | 1 |
| 凝胶时间测试仪 | 1 | XRF 测试仪 | 1 |
| 金镍厚度测量仪 | 1 | | |

Keep all equipment in good condition with regular maintenance.



# Jiangxi Ganzhou Factory

## High technology and patents

Through the national high-tech enterprise certification. At present, 2 invention patents and 12 utility model patents have been certified. There are also a number of independent research and development patents in the process of review.

## Medical device Category

It has business record certificate, production license and medical device registration certificate of Type II medical devices.

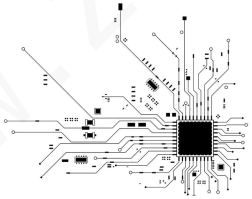
## Automotive electronics

It has 16949 certification.

## Military class

Military certificate and GJB9001 in the application and certification.

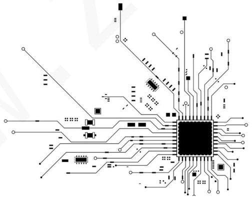
# ShenZhen Factory



## PCB process capability/conventional hard board

| Process parameters | 2022年 | | 2023 | |
|---|---|---|---|---|
| | Sample | Batch | Sample | Batch |
| Layer | 40 L | 32 L | 50 L | 36 L |
| Finished plate thickness | 0.2-7.0 mm | 0.4-6.0mm | 0.2-15.0 mm | 0.3-7.0 mm |
| Plate thickness tolerance | ± 8% | ± 10% | ± 8% | ± 8% |
| Minimum line width/line spacing | 2 mil/2mil | 3 mil/ 3 mil | 1.5mil/1.5mil | 2 mil/2mil |
| Minimum distance between hole and line | 5mil | 6mil | 5mil | 5mil |
| Copper thickness | ⅓ - 10 oz | ⅓ - 6 oz | ⅓ - 12 oz | ⅓ - 8 oz |
| Inter-layer alignment accuracy | 1mil | 1mil | 0.8mil | 1mil |
| Minimum through hole diameter | 0.1mm | 0.15mm | 0.075mm | 0.10mm |
| Minimum blind hole diameter | 0.075mm | 0.075mm | 0.05mm | 0.075mm |
| Maximum aspect ratio | 30:1 | 25:1 | 35:1 | 30:1 |
| Etching tolerance | ±10% / ±1mil | ±10% / ±1mil | ±10% / ±0.8mil | ±10% / ±1mil |
| Minimum solder bridge | 3 mil | 4 mil | 2 mil | 3mil |
| Impedance Control Tolerance | ±5% | ±8% | ±5% | ±7% |
| HDI level | 7阶 | 3阶 | 9阶 | 5阶 |
| Surface treatment process | Immersion gold, electroplating gold, HASL, NiPdAu, electroplating thick gold, immersion tin, immersion silver, OSP, Carbon | Immersion gold, electroplating gold, HASL, NiPdAu, electroplating thick gold, immersion tin, immersion silver, OSP, Carbon | Immersion gold, electroplating gold, HASL, NiPdAu, electroplating thick gold, immersion tin, immersion silver, OSP, Carbon | Immersion gold, electroplating gold, HASL, NiPdAu, electroplating thick gold, immersion tin, immersion silver, OSP, Carbon |
| Sheet Type | Shengyi / Taiyao / Jiantao / Nanya / Lianmao / Rogers / Huazheng / Taiguang / Iso la (TG 135 / TG150 / TG 170 / CAF resistance / CTI > 600 / halogen / halogen-free) | | | |

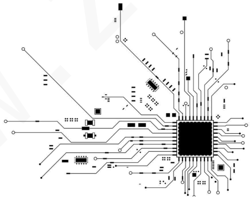
# ShenZhen Factory



## FPC process capability

| Process parameters | | Batch | Sample |
|---|---|---|---|
| Layer | | 12 | 16 |
| Minimum medium thickness（um) | | 12.5 | 12.5 |
| Min.BGA（um) | | 150 | 100 |
| Min. PCB thickness（um) | | 50 | 50 |
| Max.Pnal Size（mm) | | 610×1200 | 610×1200 |
| Min.Base copper thickness（um) | | 9 | 6 |
| Max.Base copper thickness（um) | | 35 | 35 |
| MinLineWidth Line Spacing(um) | | 40/40 | 35/35 |
| Graphicalignmenttolerance（um) | | ±50 | ±20 |
| Minimum pattern to board edge tolerance（mm) | | 0.1 | 0.07 |
| Etching tolerance（um) | | ±20 | ±15 |
| Min.Aperture（mm) | Via Hole | 0.1 | 0.075 |
| | Blind Via | 0.05 | 0.05 |
| Hole position tolerance (mm) | | ±0.05 | ±0.05 |
| Impedance Control | | ±10% | ±5% |
| Shape tolerance（mm) | | ±0.1 | ±0.05 |
| Surface treatment | | Spray tin, gold, silver, OSP, nickel palladium gold, electroplating gold | |
| Reinforcement type | | FR4/PI/Steel | |
| Reinforcement alignment tolerance (mm) | | ±0.2 | ±0.1 |
| HDI | | Layer 4 Any-to-any interconnect | 6-layer arbitrary interconnection |
| Multilayer FPC | LCP Materials | OK | OK |

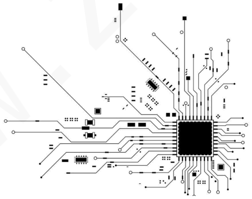
# ShenZhen Factory



## PCB process capability/rigid-flexible board

| Process parameters | 2022年 | | 2023 | |
|---|---|---|---|---|
| | Sample | Batch | Sample | Batch |
| Layer | 18 L | 12 L | 20 L | 18 L |
| Layout Size | 400mm* 540m | 400mm* 540m | 400mm* 540m | 400mm* 540m |
| PCBThickness | 0.25-3.2mm | 0.25-3.2mm | 0.25-5.0mm | 0.25-3.2mm |
| Min. line width/line spacing | 2mil/2mil | 2.5mil/2.5mil | 1.5mil/1.5mil | 2mil/2mil |
| Minimum distance between hole and line | 5mil | 5mil | 4mil | 5mil |
| Copper Thickness | ⅓ - 2 oz | ⅓ - 2 oz | ⅓ - 3 oz | ⅓ - 2 oz |
| Inter-Layer Alignment Accuracy | 1 mil | 1 mil | 0.8mil | 1 mil |
| Minimum through hole diameter | 0.1mm | 0.15mm | 0.075mm | 0.1mm |
| Minimum blind hole diameter | 0.05mm | 0.075mm | 0.05mm | 0.05mm |
| Maximum aspect ratio | 12:1 | 10:1 | 16:1 | 12:1 |
| Etching tolerance | ±10% / ±1mil | ±10% / ±1mil | ±10% / ±0.8mil | ±10% / ±1mil |
| Minimum solder bridge | 3mil | 4mil | 2mil | 3mil |
| Impedance Control Tolerance | ±5% | ±8% | ±5% | ±7% |
| Surface treatment process | Immersion gold, electroplating gold, tin spraying, nickel-palladium gold, electroplating thick gold, immersion tin, immersion silver, OSP | Immersion gold, electroplating gold, tin spraying, nickel-palladium gold, electroplating thick gold, immersion tin, immersion silver, OSP | Immersion gold, electroplating gold, tin spraying, nickel-palladium gold, electroplating thick gold, immersion tin, immersion silver, OSP | Immersion gold, electroplating gold, tin spraying, nickel-palladium gold, electroplating thick gold, immersion tin, immersion silver, OSP |
| Producible structures | Single-layer soft board-symmetrical structure, multi-layer soft board structure, soft board finger structure, Air gap structure, up and down asymmetric structure, HDI structure soft board outermost layer structure (pressed board structure), book structure, high frequency and high speed, etc. | | | |
| Sheet Type | Shengyi/Hongren/Taihong/Dupont/Panasonic/Rogers/Lianmao | | | |

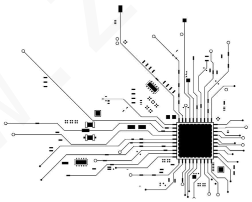
# ShenZhen Factory



## PCB process capability/high frequency and high speed board

| Technical indicators | Process parameters | Sample | Batch |
|---|---|---|---|
| Material Type | PTFE, hydrocarbon resin, other types | PTFE + ceramic, PTFE + glass fiber + ceramic, PTFE + glass fiber | |
| Processing layers | Number of layers | 24 L | 20 L |
| Shape tolerance | Maximum size | 850*700 mm | 720*650 mm |
| | Shape tolerance | ±0.05 mm | ±0.10 mm |
| | Slot size tolerance | Normal slot ± 0.08; short slot ± 0.1 | Normal slot ± 0.1; short slot ± 0.13 |
| Pressing capacity | Inter-layer alignment accuracy | 2 mil | 3 mil |
| | Mixing and pressing capability | PTFE + carbon hydrogen ceramic + FR4 | |
| Hole Processing Technology | Minimum aperture | 0.075 mm | 0.1 mm |
| | Minimum hole wall spacing | 0.2mm | 0.25mm |
| | Aperture tolerance | ±0.05 mm | ±0.075 mm |
| Plating Capabilities | Maximum aspect ratio | 16:1 | 12:1 |
| | Hole copper uniformity | COV≤5% | COV≤7% |
| Resin plug hole | Resin plug hole aspect ratio | 12:1 | 12:1 |
| | Hole processing type | Through hole / blind buried via | Through hole / blind buried via |
| Line width control | Line width tolerance | ±0.6mil | ±1mil |
| Impedance Control | Impedance Control | ±5% | ±8% |
| Other parameters | Warpage | 0.50% | 0.75% |
| | Special Process | POFV (VIPPO), mixed pressing, partial mixed pressing, long/short/graded/segmented gold fingers, step groove, back drilling, sidewall metallization, N+N structure, double-sided press-fit mechanical blind via, partial thick copper, high temperature pressing, copper paste/silver paste plugging, skip via, HDI | |
| High frequency / high speed materials | Partner Brands | Shengyi, Lianmao, Taiyao, Panasonic (M4, M6, M7, M8 series), Rogers, Taikangli, Wangling, Ruilong, Guoneng, etc. | |

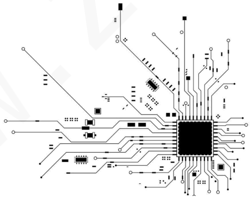
# ShenZhen Factory



## PCB process capability/package substrate

| Process parameters | | Batch | Sample |
|---|---|---|---|
| PCB Material Type | | BT:Shengyi,Mitsubishi,Doushan,Toshiba,LG; ABF:Ajinomoto Buildup Film | |
| Layer | | 2-8 layer | 2-10 layer |
| Max.Size | | 520*622mm | 520*850mm |
| Max.PCB Thickness | | 5.0 mm | 7.0 mm |
| PP_Min.Thickness | | 40μm | 25μm |
| Min.CNC drilling | | 100μm | 75μm |
| Min.Laser drilling | | 50μm | 35μm |
| Binding fingers | Min.Pitch | 75μm | 70μm |
| | Min.Width | 40μm | 35μm |
| Line | Min.Pitch | 110μm | 95μm |
| | Min.Width | 35μm | 30μm |
| | Min.Space | 35μm | 30μm |
| Min.Pad. | | 80μm | 80μm |
| Min.Thickness | 2L | 100μm | 90μm |
| | 4L | 300μm | 200μm |
| | 6L | 400μm | 300μm |
| Finished plate thickness tolerance | | Thickness < 1.0 mm: ± 0.02 mm; Thickness > 1.0 mm: ± 10%; | |

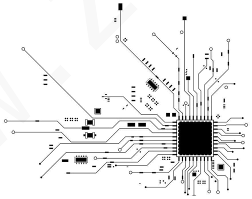
# ShenZhen Factory



## PCB process capability/ packaging substrate

| Process parameters | | Batch | Sample |
|---|---|---|---|
| Inter-layer alignment accuracy | | Adjacent layer: 25 µm Max; Any layer: 50 µm Max | |
| Ink alignment | | ±20µm | |
| Impedance Control | | 5% | 3% |
| Line to Pad/Edge | | 100µm | 100µm |
| Solder Mask | Solder PAD | 50µm | 50µm |
| | Solder Dam | 80µm | 70µm |
| | Thickness | 25+/-5µm | 20+/-5µm |
| | Flatness | ≤6µm | ≤5µm |
| Surface treatment | Hard Gold | Ni:5-15µm,Au:0.2-2 µm | Ni:5-15µm,Au:0.2-2 µm |
| | Soft Gold | Au:0.3-2 µm | Au:0.3-2 µm |
| | ENEPIG-WB | Ni:3-8 µm,Pd:0.1-0.2 µm,Au:0.1-0.2 µm | Ni:3-8 µm,Pd:0.1-0.2 µm,Au:0.1-0.2µm |
| | OSP | OSP:0.1-0.3µm | OSP:0.1-0.3 µm |

# ShenZhen Factory



## PCB Delivery Capabilities

| PCB | | | | | |
|---|---|---|---|---|---|
| **Layer** | 2L | 4L | 6L | 8L | > 10L |
| **Sample** | 5-6 | 6-7 | 7-8 | 8-9 | 12-15 |
| **Batch** | 8-15 | 9-16 | 10-18 | 11-20 | 12-22 |

| FPC | | | | | |
|---|---|---|---|---|---|
| **Layer** | 2L | 4L | 6L | 8L | > 10L |
| **Sample** | 11-12 | 13-14 | 15-16 | 17-18 | 20 |
| **Batch** | 14-16 | 16-18 | 18-20 | 20-22 | 22-24 |

| Special Process | Half hole process | Thick copper | Laser drilling | Resin plug hole | VCP Copper | Gold Finger |
|---|---|---|---|---|---|---|
| Add days | 2 | 1 | 1 | 1-2 | 2 | 2 |

| Single work takes too long | Drilling super hole | Super long stroke | Aluminum sheet plugging |
|---|---|---|---|
| Add days | 2 | 2 | 2 |

***Note: *The above data is for reference only. The actual production cycle will fluctuate, depending on the order difficulty, order area and production line load, and calculated according to the comprehensive scheduling of factory orders; 1. The above delivery time is the factory time, not the arrival time***
***2. Usually September to February of the following year is the PCB peak season, and the delivery period needs to be appropriately extended***
***3. If there are circuit boards that exceed the process difficulty listed above, the delivery period also needs to be appropriately extended***

# ShenZhen Factory

## PCB production equipment display 1

Fully automatic cutting machine


E IE photoplotter

Film AOI inspection machine


Vertical coating and baking machine

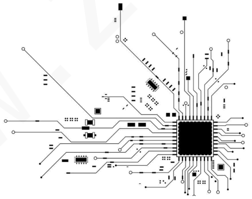

LDI exposure machine


Automatic film laminating machine


Inner layer etching line

Inner layer online AOI scanner

# ShenZhen Factory



## PCB production equipment display 2

Fully automatic typesetting line

CCD hot melt machine

Fully automatic reflow line

Multilayer board laminating machine

Laser drilling machine

CNC drilling machine

Optical hole inspection machine

Secondary element testing machine

# ShenZhen Factory

## PCB production equipment display 3


Automatic copper wire


Graphic plating line


Tunnel baking oven


Solder mask developing line


High voltage testing machine


Low resistance flying needle machine

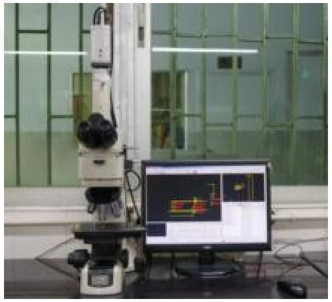

V-CUT Machine


Automatic appearance inspection machine

# ShenZhen Factory

## PCB Equipment Display 4/laboratory Equipment


Hole Copper Thickness Gauge


Gold Image Microscope


Line width/line spacing measuring instrument


Impedance Tester

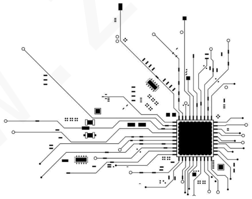

ROHS Tester


Ion contamination detector

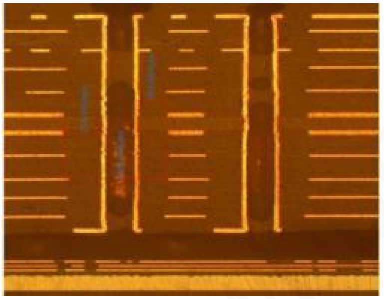

X-RAY coating thickness gauge


Plasma equipment

# ShenZhen Factory



## FPC Show



Number of floors/type: 12 floors

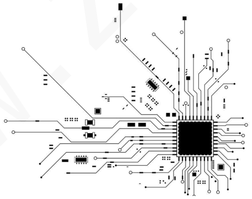
(structure 4R+4F+4R)

Surface treatment:ENIG
Min. hole diameter: 0.2 mm
Finished PCB thickness: 1.6 mm

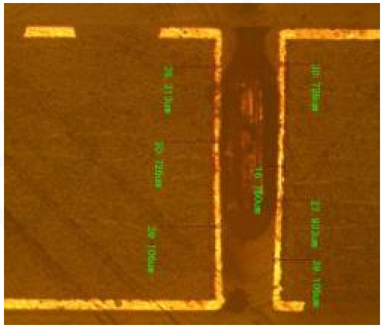
Board material: Lianmao IT180 + DuPont AP9141R
Product application: high-end industrial connector

Manufacturing difficulty: high-layer soft-hard combination board

# ShenZhen Factory



## PCB:5G high frequency board



Number of layers/type: 2 layers

Surface treatment: ENIG

Min. hole diameter: 0.3 mm

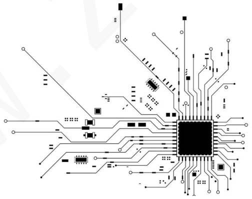
Finished board thickness: 1.2 mm

Plate material: Rogers 4350B

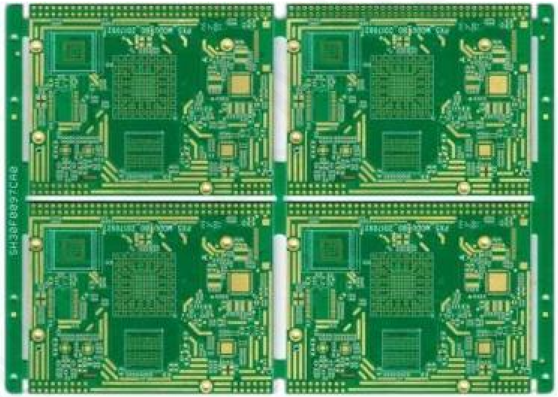
Product application: 5G optical fiber interface

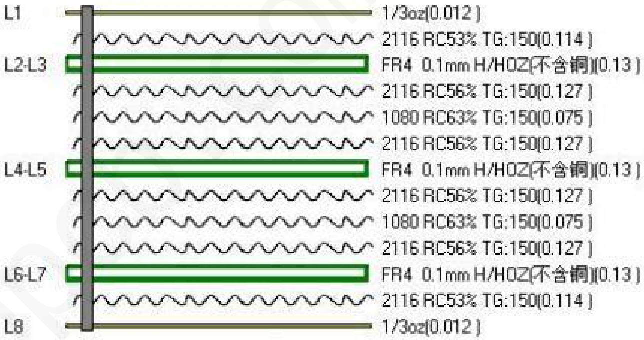
Manufacturing difficulties: strict requirements on line/line spacing, ink and other details

# ShenZhen Factory



## PCB:Automotive Electronics



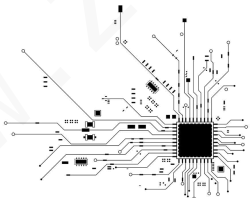


Number of layers/type: 8 layers

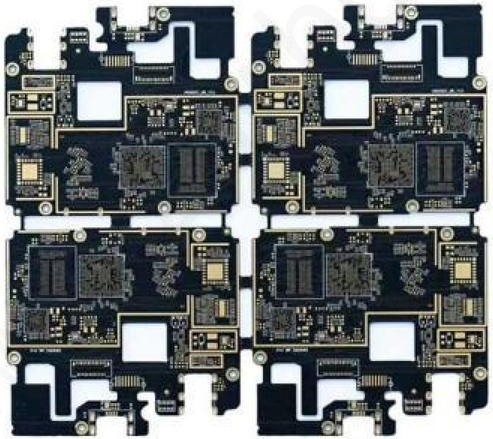
Surface treatment: ENIG
Min. hole diameter: 0.15mm
Finished plate thickness: 1.2mm

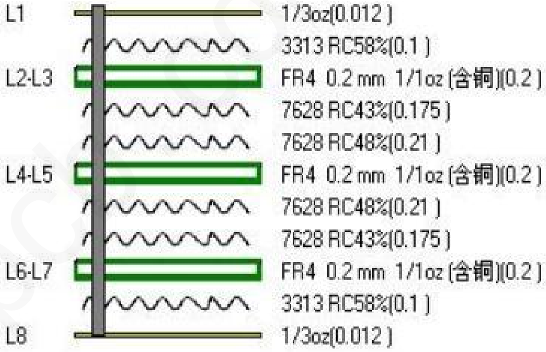
Board material: Shengyi TG150
Product application: Car navigation core board
Manufacturing difficulty: ⅓ oz copper foil + 0.5mm half hole process

# ShenZhen Factory



## PCB: Security monitoring





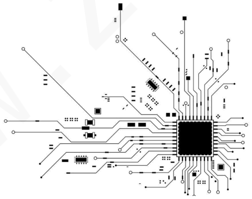
| | |
|---|---|
| L1 | 1/3oz(0.012 ) |
| | 3313 RC58%(0.1 ) |
| L2-L3 | FR4 0.2 mm 1/1oz (含铜)(0.2 ) |
| | 7628 RC43%(0.175 ) |
| | 7628 RC48%(0.21 ) |
| L4-L5 | FR4 0.2 mm 1/1oz (含铜)(0.2 ) |
| | 7628 RC48%(0.21 ) |
| | 7628 RC43%(0.175 ) |
| L6-L7 | FR4 0.2 mm 1/1oz (含铜)(0.2 ) |
| | 3313 RC58%(0.1 ) |
| L8 | 1/3oz(0.012 ) |

Number of layers/type: 8 layers

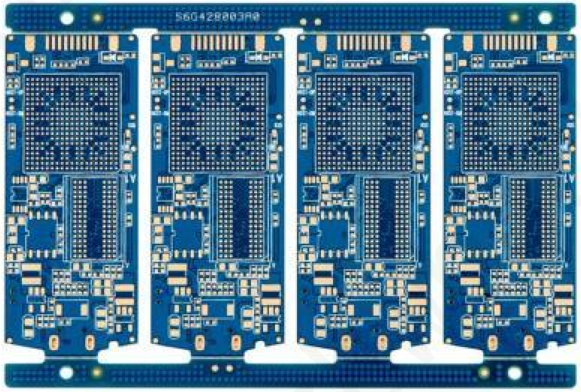
Surface treatment: tin spraying
Min. hole diameter: 0.25 mm
Finished board thickness: 1.6 mm

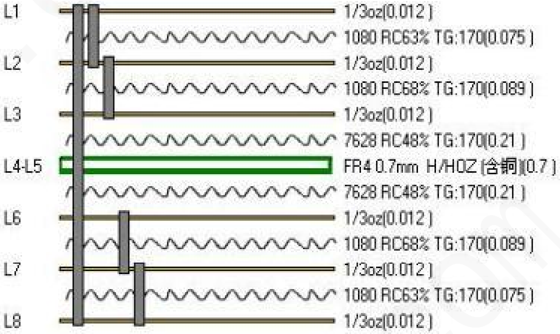
Plate material: Shengyi TG150
Product application: security monitoring
Manufacturing difficulty: ⅓ oz copper foil
+ 0.5mm half-hole process

# ShenZhen Factory



## PCB:Consumer Electronics





Number of layers/type: 8 layers

Finished board thickness: 1.6mm

Manufacturing Difficulty: HDI Structure + Impedance Control

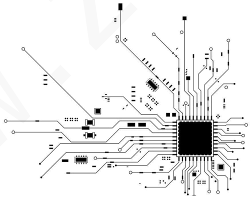
Surface treatment: ENIG

Board material: Shengyi TG170

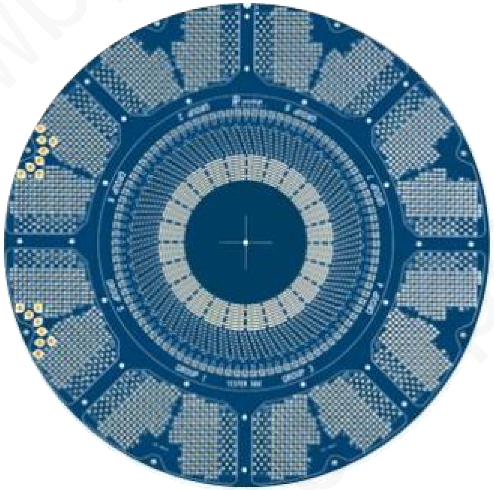
Min. aperture: 0.10 mm

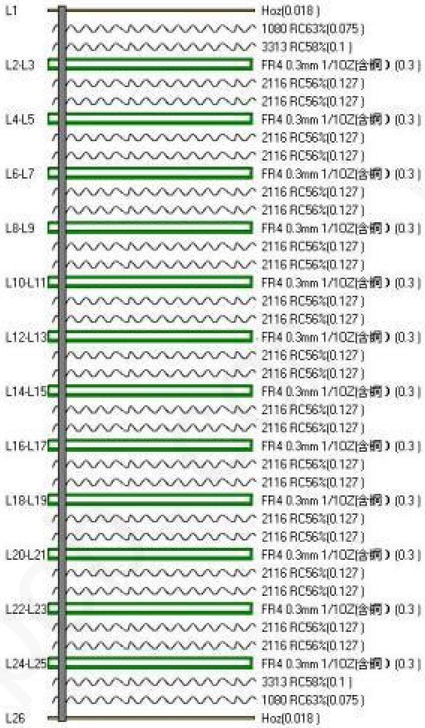
Product use: Same screen connector

# ShenZhen Factory



## PCB:Semiconductor



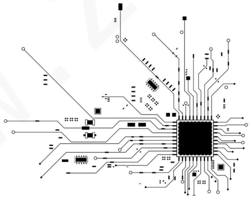


Number of layers/type: 26 layers

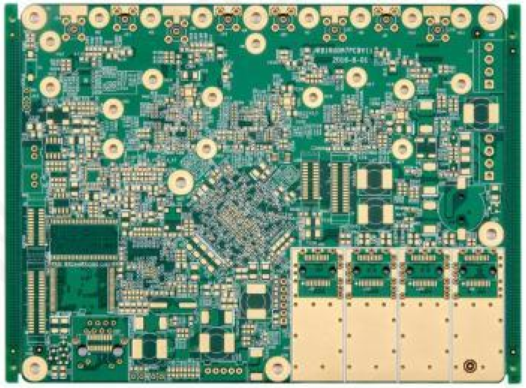
Surface treatment: ENIG
Min. hole diameter: 0.8 mm
Finished plate thickness: 6.6 mm

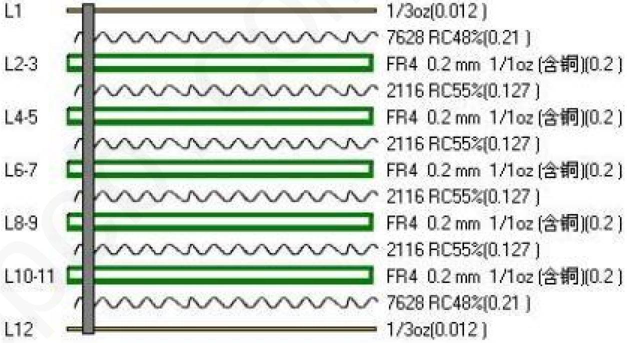
Board material: Panasonic M6
Product application: IC tester
Manufacturing difficulty: 50U” electroplating + high multi-layer board impedance

# ShenZhen Factory



## PCB:Communication Electronics



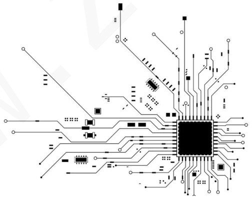


*Number of layers/type: 12 layers*

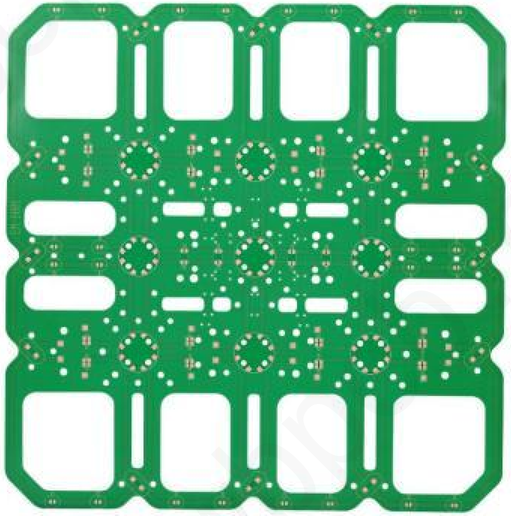
*Surface treatment: ENIG*
*Min. hole diameter: 0.25 mm*
*Finished plate thickness: 2.0 mm*

*Board material: Shengyi TG170*
*Product application: base station motherboard*
*Manufacturing difficulty: high multi-layer structure*

# ShenZhen Factory



## PCB: Medical Electronics



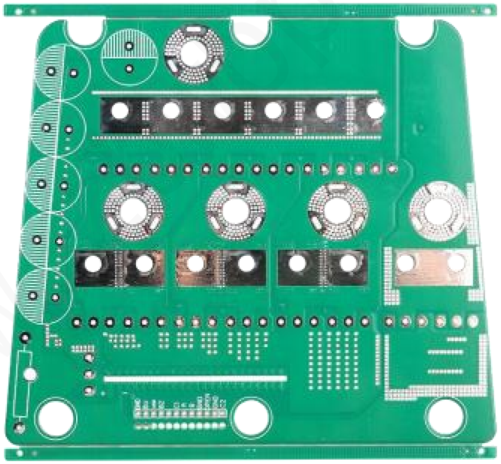
Number of layers/type: 4 layers (FR4+FCCL bonding)

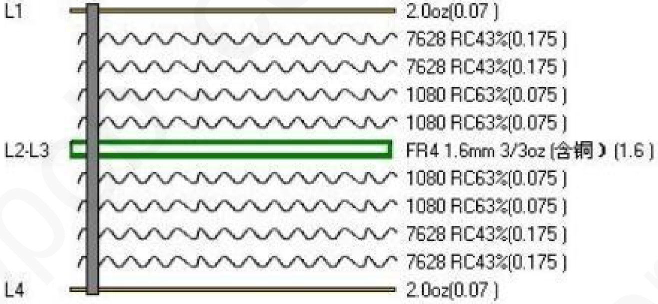
Surface treatment: OSP
Min. hole diameter: 0.2mm
Finished board thickness: 0.6mm

Board material: Shengyi
Product use: Nuclear magnetic co-structured board
Manufacturing difficulty: Super large size 555*545+hard board covered membrane structure

# ShenZhen Factory

## PCB: Power supply





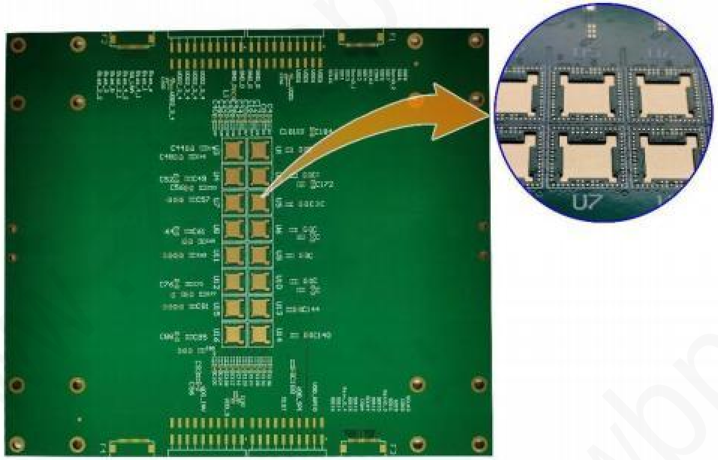
*Number of layers/type: 4 layers*

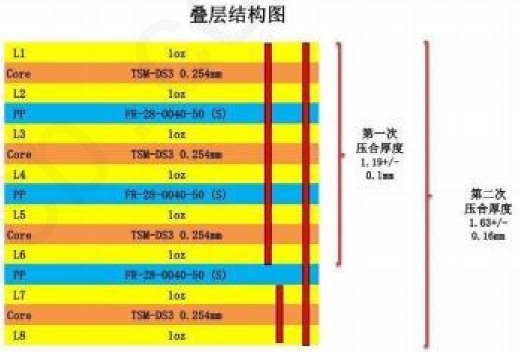
*Surface treatment: tin spraying*
*Min. hole diameter: 0.4mm*
*Finished board thickness: 3.0mm*

*Plate material: Shengyi CTI>600V*
*Product application: inverter power supply board*
*Manufacturing difficulty: 5OZ thick copper plate*

# ShenZhen Factory

## PCB: Step Microwave Board





叠层结构图

| | |
|---|---|
| L1 | 1oz |
| Core | TSM-DS3 0.254mm |
| L2 | 1oz |
| PP | FR-28-0040-50 (S) |
| L3 | 1oz |
| Core | TSM-DS3 0.254mm |
| L4 | 1oz |
| PP | FR-28-0040-50 (S) |
| L5 | 1oz |
| Core | TSM-DS3 0.254mm |
| L6 | 1oz |
| PP | FR-28-0040-50 (S) |
| L7 | 1oz |
| Core | TSM-DS3 0.254mm |
| L8 | 1oz |

第一次
压合厚度
1.19+/-
0.1mm

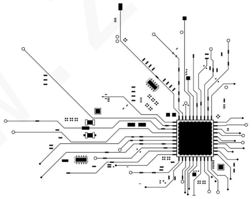
第二次
压合厚度
1.63+/-
0.16mm

Number of layers/type: 8 layers

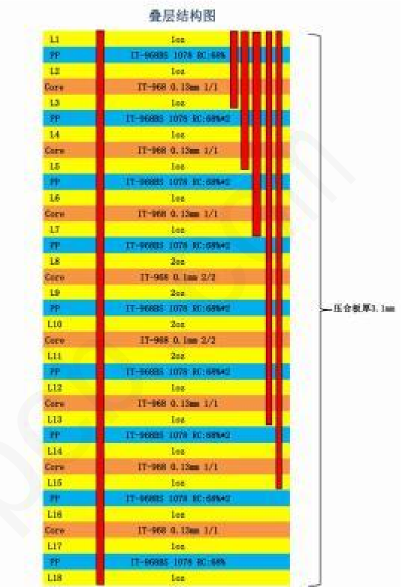
Surface treatment: electroplating
Min. hole diameter: 0.15mm
Finished plate thickness: 1.6mm

Plate: Taikangli TSM-DS3
Product application: microwave radio frequency
Manufacturing difficulties: 8 layers, 2 steps, gong steps, thick gold on the whole plate

# ShenZhen Factory



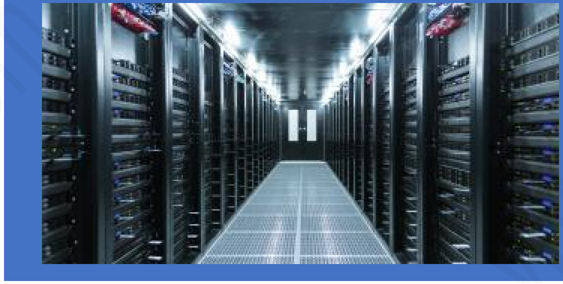
## PCB: High-speed server communication board



叠层结构图

| | |
|---|---|
| L1 | 1oz |
| PP | IT-968BS 1078 RC:68% |
| L2 | 1oz |
| Core | IT-968 0.13mm 1/1 |
| L3 | 1oz |
| PP | IT-968BS 1078 RC:68%*2 |
| L4 | 1oz |
| Core | IT-968 0.13mm 1/1 |
| L5 | 1oz |
| PP | IT-968BS 1078 RC:68%*2 |
| L6 | 1oz |
| Core | IT-968 0.13mm 1/1 |
| L7 | 1oz |
| PP | IT-968BS 1078 RC:68%*2 |
| L8 | 2oz |
| Core | IT-968 0.1mm 2/2 |
| L9 | 2oz |
| PP | IT-968BS 1078 RC:68%*2 |
| L10 | 2oz |
| Core | IT-968 0.1mm 2/2 |
| L11 | 2oz |
| PP | IT-968BS 1078 RC:68%*2 |
| L12 | 1oz |
| Core | IT-968 0.13mm 1/1 |
| L13 | 1oz |
| PP | IT-968BS 1078 RC:68%*2 |
| L14 | 1oz |
| Core | IT-968 0.13mm 1/1 |
| L15 | 1oz |
| PP | IT-968BS 1078 RC:68%*2 |
| L16 | 1oz |
| Core | IT-968 0.13mm 1/1 |
| L17 | 1oz |
| PP | IT-968BS 1078 RC:68% |
| L18 | 1oz |

压合板厚3.1mm



*Number of floors/types: 18 floors*

*Surface treatment: electroplating*

*Min. hole diameter: 0.15mm*

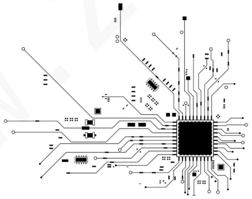
*Finished plate thickness: 3.1mm*

*Plate material: IT-968*

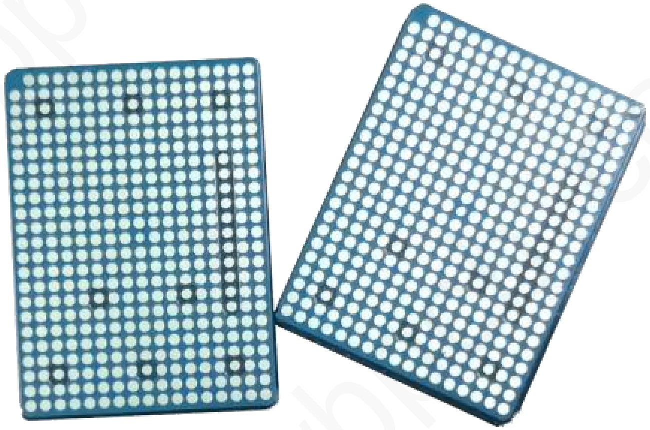
*Product application: AI high-speed server*

*Manufacturing difficulties: high-rise, blind holes, thick metal on the whole plate*

# ShenZhen Factory



## PCB: SIP Package Substrate



Number of layers/type: 6 layers

Surface treatment: nickel-palladium-gold

Finished board thickness: 0.8mm

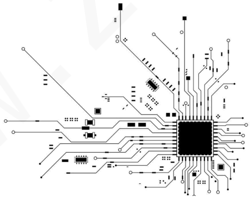
Packaging solution: compatible with BGA, LGA, Flip Chip, Hybrid and other solutions

Plate material: BT material (HL832NS)

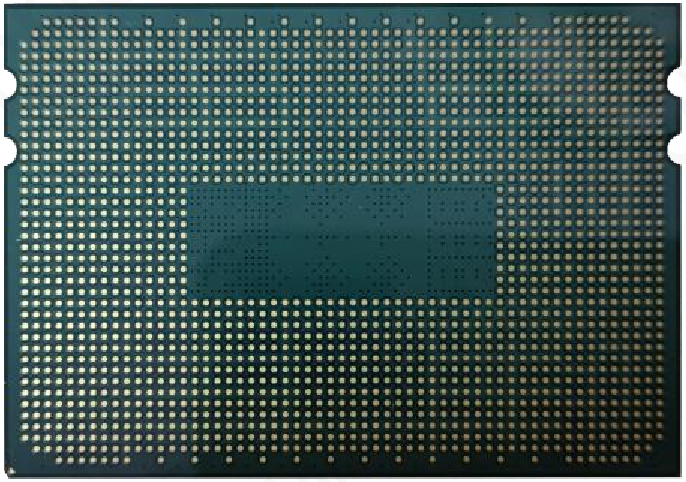
Product application: antenna, MEMS sensor, passive components

Manufacturing difficulty: 6-layer 2-order cross blind, fine line

# ShenZhen Factory



## PCB: FCBGA Package Substrate



Number of layers/type: 12 layers

Surface treatment: ENPIG

Finished board thickness: 1.2mm

Board material: ABF (Japan Ajinomoto)

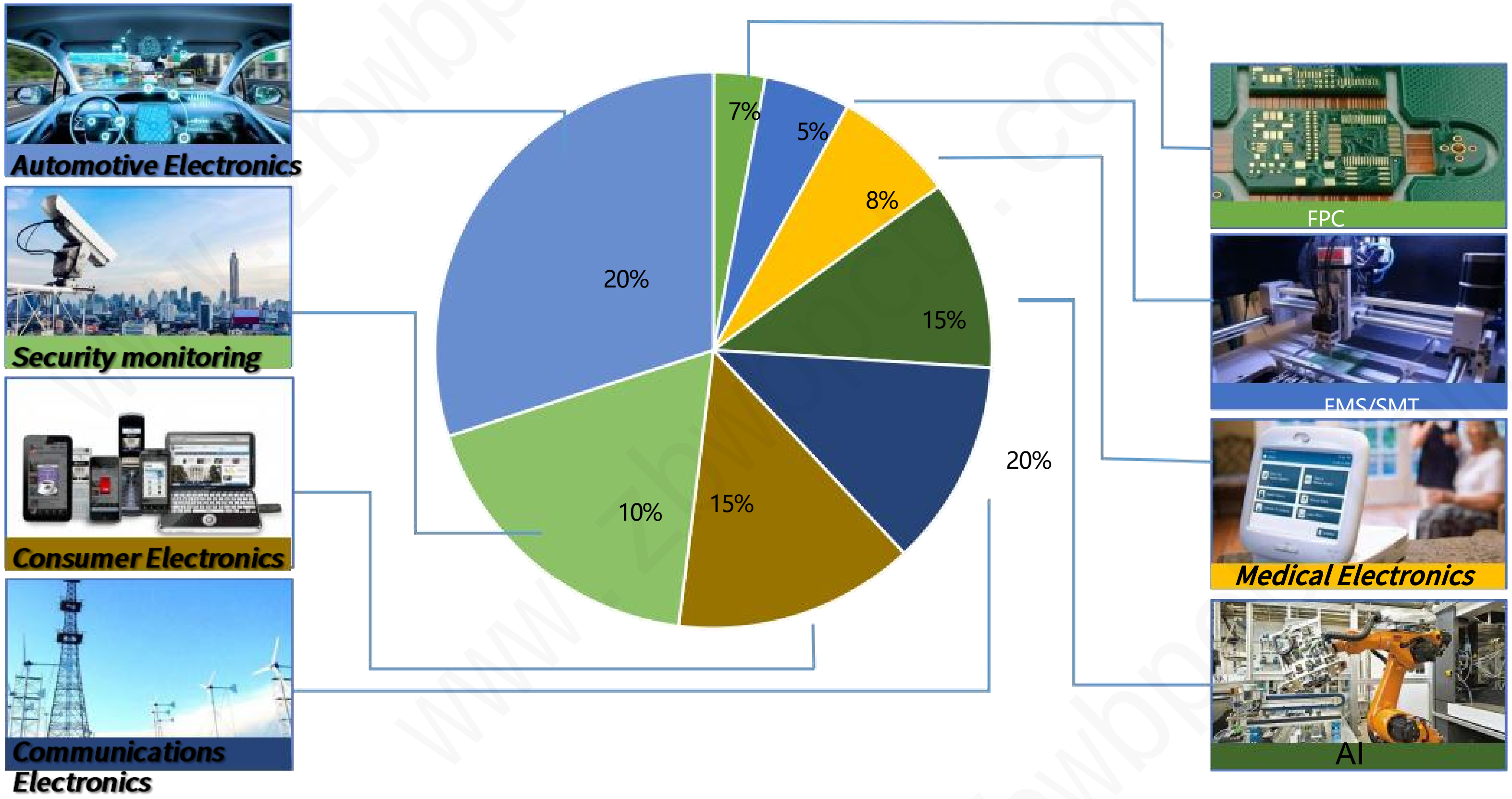
Product use: AI, 5G, big data, high-performance computing, smart cars, data centers and other new demand applications

CPU, graphics processor (GPU)

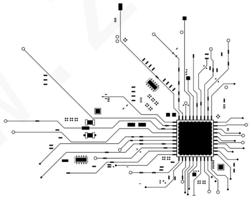
Manufacturing difficulties: 12 layers of 4-level arbitrary interconnection, fine lines

# ShenZhen Factory

## Application Areas



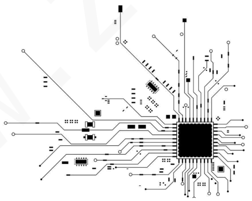
# ShenZhen Factory



## Technical Planning

| Type | Background | Development |
|---|---|---|
| <br>FPC | At present, the development trend of rigid-flex boards is very obvious: thin and light, with higher and higher integration. Another obvious feature is that rigid-flex boards have not yet been applied to high-reliability fields such as aviation. | Finished board thickness: Mass production of 0.2-0.25 thick hard-flex boards<br>Hole processing capability: Mass production of 5-level/arbitrary-level HDI hard-flex boards Line width/line spacing capability: Mass production of 1.5mil fine lines<br>Lamination capability: Same peel strength as hard boards |
| <br>Security monitoring | Automotive electronic circuit boards have always been known for their high reliability, especially in the field of engine ECU, which has very high requirements for product consistency; another issue that cannot be ignored is that the field of new energy vehicles will surely become the mainstream of future automobile development. | Plating capability: Face/hole copper thickness tolerance is controlled to ±1.5 um<br>Max. copper thickness: Achieve mass production of inner layer＞8 OZ products |
| <br>Communications Electronics | In the next few years, 5G products will completely replace 4G products, and 6G is also booming, which will bring huge and profound changes to our lives and work.<br>Communication electronic products have higher and higher requirements for transmission speed and quality. | Materials: Processing capabilities for different high-frequency materials should be available<br>Number of laminated layers: Achieve mass production of 36L or higher circuit boards<br>Circuit etching tolerance: Achieve mass production capabilities of ±10% / ±0.8mil |
| <br>Overall capability improvement | The common problems currently faced by the PCB industry may also be the common problems faced by all Chinese manufacturing industries: slowing demand, increasing price pressure, higher quality requirements, short product life cycle, short product development cycle, more batches and shorter L/T. | Engineering capability: Participate in customer product design and help customers design more outstanding products. At the same time, continuously optimize the design structure and actively help customers reduce costs<br>Quality capability: In addition to ensuring functionality, the appearance needs to be refined<br>Delivery capability: Continuously promote delivery improvements and cooperate with customers to quickly occupy the market. |

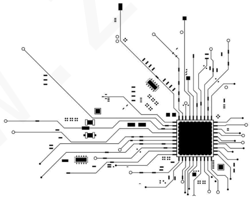
# HuNan ChangSha PCBA Factory



## PCBA Process Capability

| Process parameters | | | | Batch(mm) | | Sample(mm) | |
|---|---|---|---|---|---|---|---|
| | | | | Conventional process | Unconventional Process | Conventional process | Unconventional Process |
| SMT Assembly | PCB规格 | 长*宽 (L*W) | Min. | L ≥ 50， W ≥ 50 | L < 50 | L ≥ 50， W ≥ 30 | L < 50 |
| | | | Max. | L ≤ 460， W ≤ 400 | L > 460， W > 400 | L ≤ 1200,<br>W ≤ 460 | L > 1200,<br>W > 460 |
| | | Thickness（T） | Thinnest | 0.5 | T < 0.5 | 0.3 | T < 0.3 |
| | | | Thickest | 3.0 | T > 3.0 | 8 | T > 8 |
| | Component specifications | Dimensions | Min. | 0.6*0.3 | 0.3*0.15 | 0.6*0.3 | 0.3*0.15 |
| | | | Max. | 200*125 | 200*125 | 200*125 | 200*125 |
| | | | Thickness | T ≤ 6.5 | 6.5 < T ≤ 25 | T ≤ 6.5 | 6.5 < T ≤ 25 |
| | | QFP, SOP, SQJ and other multi-pin types | Minimum PIN spacing | 0.4 | 0.3 ≤ Pitch < 0.4 | 0.4 | 0.3 ≤ Pitch < 0.4 |
| | | CSP 、 BGA | Min. Ball Spacing | 0.5 | 0.3 ≤ Pitch < 0.5 | 0.5 | 0.3 ≤ Pitch < 0.5 |
| DIP mounting | PCB Specifications | 长*宽 (L*W) | Min. | L ≥ 50， W ≥ 50 | L < 50 | L ≥ 50， W ≥ 30 | L < 50 |
| | | | Max. | L ≤ 500， W ≤ 400 | L ≥ 500.W ≥ 400 | L ≤ 500， W ≤ 400 | L ≥ 500， W ≥ 400 |
| | | Thickness (T) | Thinnest | 0.6 | T < 0.6 | 0.6 | T < 0.6 |
| | | | Thickest | 2.5 | T > 2.5 | 2.5 | T > 2.5 |

# HuNan ChangSha PCBA Factory



## PCBA production equipment display

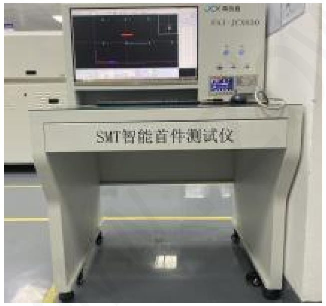
DM-900A Board Loading Machine

First Article Tester

YSM20R High Speed Mounting Machine

JUKI FX-3RAL High Speed Mounter

NIUF X-RAY

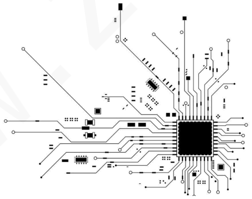


SMT first article tester

Nitto reflow oven (nitrogen oven)

3D AOI

# HuNan ChangSha PCBA Factory



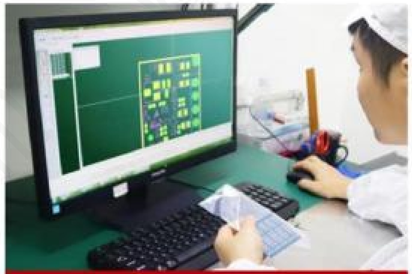
## PCBA Production Workshop1

1. 报价

2. 原材料仓库

3. IQC 检测

4. 智能货架



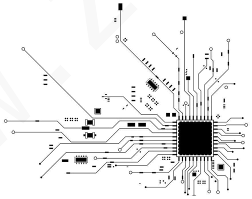
5. 过程评估

6. 钢网制作

7. 锡膏印刷

8. SPI 检测

# HuNan ChangSha PCBA Factory



## PCBA Production Workshop2


9. SMT贴片


10. IPQC 首件检测


11. 炉温测试


12. AOI 检测

13. X-ray


14. QA 检测


15. 治具


16. 波峰焊

# HuNan ChangSha PCBA Factory

## PCBA Production Workshop3


17. AOI 检测


18. 三防漆


19. 分板


20.功能检测


21. 成品组装


22. QA 检测


23. 包装

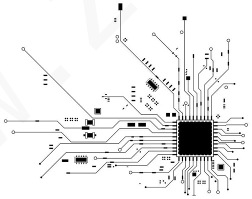
FedEx

SF EXPRESS 顺丰速运

DHL

24. 物流

# HuNan ChangSha PCBA Factory



## BOM/Components Services

BOM (Bill Of Materials) service refers to the company's provision of BOM optimization, component selection, procurement and technical support services to customers. With the rapid development of the electronics industry, the demand for downstream terminal products continues to develop towards personalization and diversification, and the types of electronic components are also increasing, making component selection and small-batch procurement in the R&D stage more challenging. Jinshengda has a BOM service center equipped with professional component procurement service engineers. With the support of the company's design and engineering technical resources, it uses global procurement channels to accurately and quickly select suitable components for customers, provide professional component procurement services, and help customers achieve component procurement costs.Max. save.

MICROCHIP
SAMSUNG ELECTRONICS
IOR
maxim integrated™
ANALOG DEVICES

TEXAS INSTRUMENTS
ST life.augmented
AKM
FAIRCHILD SEMICONDUCTOR®
NXP

DIODES INCORPORATED®
LRC
JCST
Winbond Electronics Corp.
TOSHIBA Leading Innovation

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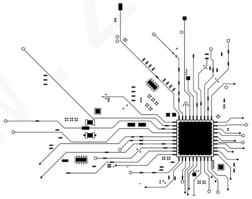
# HuNan ChangSha PCBA Factory



## Quality Assurance

### 1 Customer requirement identification and conversion

Transform all customer requirements into operational and executable requirements and measures within each business unit. Implement customer requirements by organizing training for the executive department.

### 2 SQE

The SQE department is responsible for systematic management of suppliers, providing a smooth information exchange mechanism, and continuously tracking and promoting supplier quality improvement activities.

### 3 Process quality control

Establish a systematic quality management system, take standard operating instructions as the outline, establish a complete training mechanism, implement standardized operations and regular equipment maintenance, strictly control change management, strengthen product and equipment abnormality management, follow up and implement traceability management, sort out key process control items and focus on monitoring to ensure product quality requirements.

### 4 Shipping quality control

Strictly control the quality of shipments, and strictly inspect and control the quality of shipments in accordance with international IPC standards and customer standards

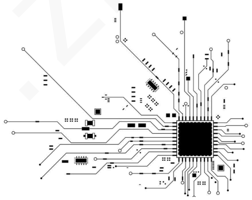
### 5 Customer Service

With customers at the center, the sales team and customer service team promptly follow up on the quality performance of products after shipment, and take quick and effective improvement actions for customers' feedback on abnormal quality. The factory provides a 24-hour docking window to respond to customer needs at any time.

### Continuous Improvement

**Continuous improvement and constant refinement of production processes ensure that the products manufactured are high-quality products.**

# Materials Stock



## Material List---FR4

| Brand | Part Number | |
|---|---|---|
| KB | FR4 | KB-6160A/KB-6165F/KB-6167F |
| ITEQ | | IT180<br>IT968G |
| SY | | S1000-2M/S1170/S1141/S1000H/S1170G |
| NANYA | | NP155F/NP175F |
| TUC | | TU768/TU862HF/TU872SLK/TU863/TU933/TU933+/ |
| Panasonic | | M4/M6/M7 |
| Isola | | 370HR/FR408/FR406/TACHYON100G/MT77/IS400/IS410/185HR/I-SPEED/IS415 |
| Ventec | | VT441/VT47/VT901/VT481 |
| Rogers | | Ro4003C/Ro4350B/Ro4350G/Ro4730/Ro4533/Ro4535/Ro3006/Ro3010/Ro3035/Ro3203 |
| | | RT5870/RT5880/Ro3003/Ro3210/Ro6002/Ro6006/TTM3/TTM4/RT6035HTC/Kappa 438 |
| Arlon | | AD255C/AD250C/AD300D/TC350/CuClad217/CuClad250 |
| Taconic | | TLX-0/TLX-9/TLX-8/TLX-7/TLX-6/RF35 |
| Wangling | | F4BK225/F4BK265/F4BK300/F4BK350/F4BM220/F4BM225/F4BM265/F4BM300/F4BM350/WL-CT300/WL-CT330 |
| ZhongYing | | ZYF220DB/ZYF220D/ZYF250D/ZYF255DA/ZYF260D/ZYF265D/ZYF300CA-C/ZYF300CA-P/ZYF350CA |

## Rogers Material

| | |
|---|---|
| RO3000 Series | RO3003 / RO3006 / RO3010 / RO3035 |
| RO3210 | |
| Rogers 3001 | Bonding Film |
| RO4000 Series | RO4003C / RO4350B |
| RO4400 Series | RO4450T / RO4450F / RO4460G2 |
| RO4500 Series | RO4533 / RO4534 / RO4535 |
| RO4730 | |
| RT / duroid | 5870 / 5880 |
| RT / duroid | 5880LZ |
| RT / duroid | 6002 |
| RT / duroid | 6006 / 6010LM |
| RT / duroid | 6202 |
| RT / duroid | 6202PR |
| RT / duroid | 6035HTC |
| ULTRALAM 3000 | 3850 |
| ULTRALAM 3000 | 3908 |
| XT / duroid | 8100 |
| XT / duroid | 8000 |
| SYRON 7000 | |
| SYRON 7100 | |
| TMM | TMM3/TMM4/TMM6/TMM10/TMM101 |
| MAGTREX 555 | |

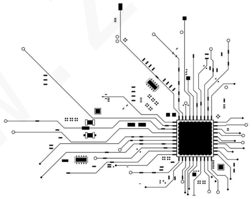
# Materials Stock

## FR4 and other conventional material warehouse

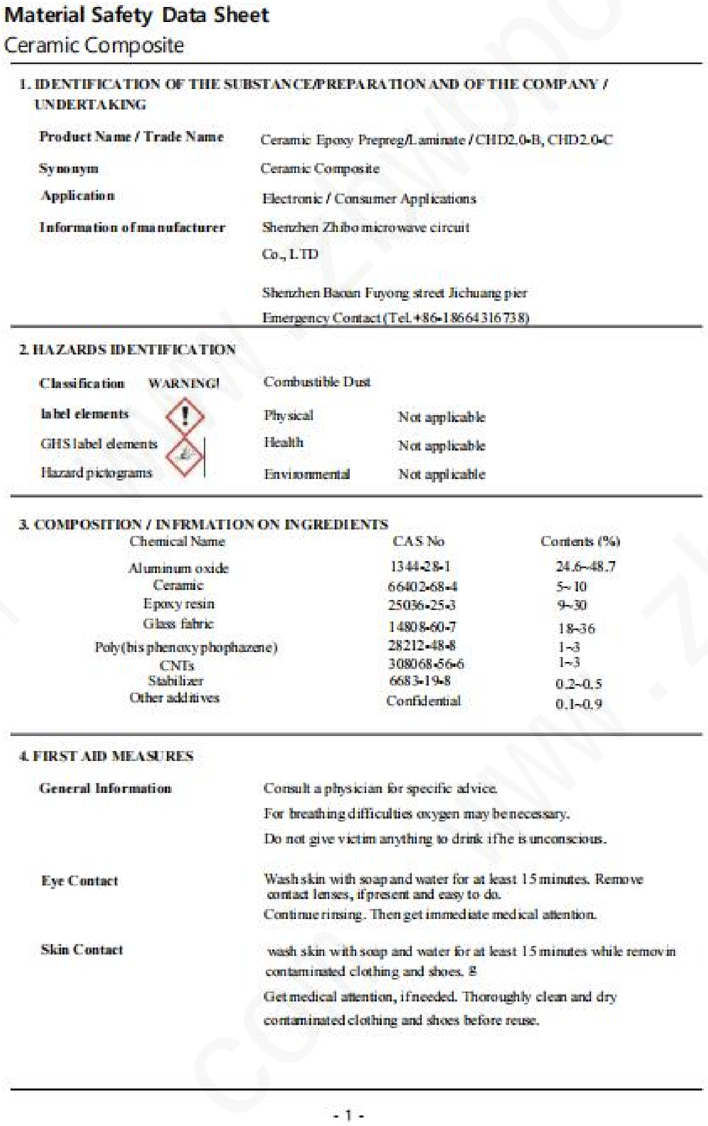
# Materials Stock

- ***Rogers and other imported material warehouses***

# NEW Materials CHD COC



## CHD heat dissipation copper clad laminate COC



### Material Safety Data Sheet
Ceramic Composite

#### 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY / UNDERTAKING

| | |
|---|---|
| **Product Name / Trade Name** | Ceramic Epoxy Prepreg/Laminate / CHD2.0-B, CHD2.0-C |
| **Synonym** | Ceramic Composite |
| **Application** | Electronic / Consumer Applications |
| **Information of manufacturer** | Shenzhen Zhibo microwave circuit<br>Co., LTD<br>Shenzhen Baoan Fuyong street Jichuang pier<br>Emergency Contact (Tel.+86-18664316738) |

#### 2. HAZARDS IDENTIFICATION

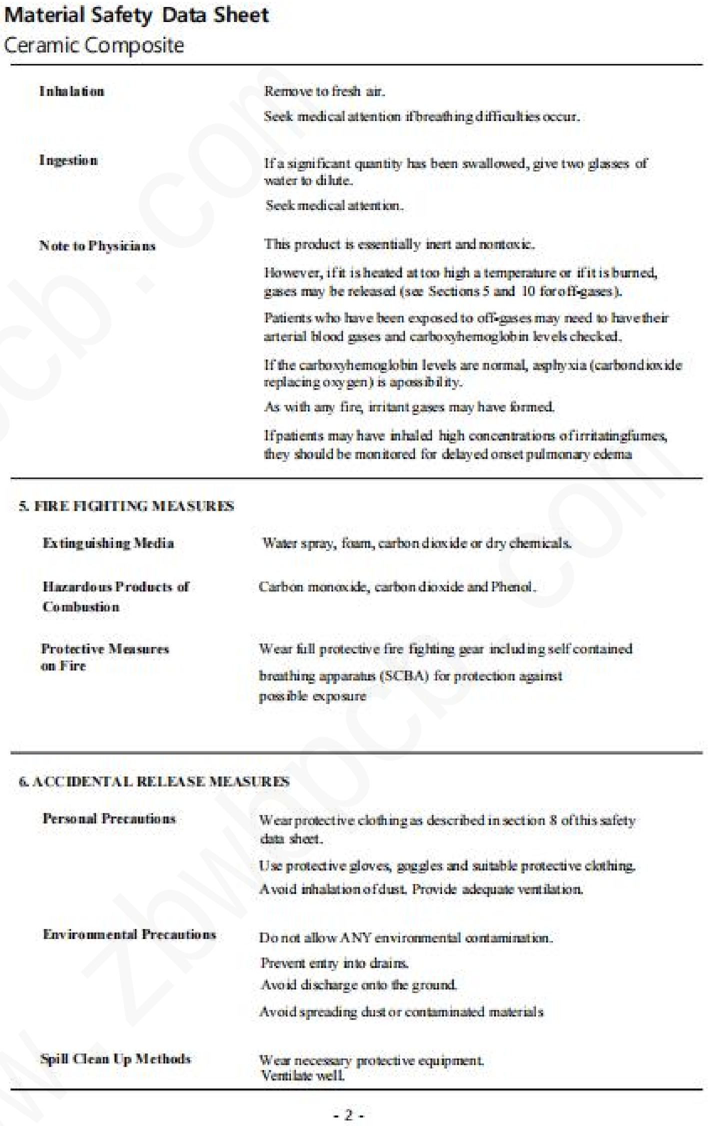
| | | | |
|---|---|---|---|
| **Classification** | **WARNING!** | Combustible Dust | |
| **label elements** | | Physical | Not applicable |
| GHS label elements | | Health | Not applicable |
| Hazard pictograms | | Environmental | Not applicable |

#### 3. COMPOSITION / INFRMATION ON INGREDIENTS

| Chemical Name | CAS No | Contents (%) |
|---|---|---|
| Aluminum oxide | 1344-28-1 | 24.6~48.7 |
| Ceramic | 66402-68-4 | 5~10 |
| Epoxy resin | 25036-25-3 | 9~30 |
| Glass fabric | 14808-60-7 | 18~36 |
| Poly(bis phenoxy phophazene) | 28212-48-8 | 1~3 |
| CNTs | 308068-56-6 | 1~3 |
| Stabilizer | 6683-19-8 | 0.2~0.5 |
| Other additives | Confidential | 0.1~0.9 |

#### 4. FIRST AID MEASURES

| | |
|---|---|
| **General Information** | Consult a physician for specific advice.<br>For breathing difficulties oxygen may be necessary.<br>Do not give victim anything to drink if he is unconscious. |
| **Eye Contact** | Wash skin with soap and water for at least 15 minutes. Remove contact lenses, if present and easy to do.<br>Continue rinsing. Then get immediate medical attention. |
| **Skin Contact** | wash skin with soap and water for at least 15 minutes while remov in contaminated clothing and shoes.<br>Get medical attention, if needed. Thoroughly clean and dry contaminated clothing and shoes before reuse. |



### Material Safety Data Sheet
Ceramic Composite

| | |
|---|---|
| **Inhalation** | Remove to fresh air.<br>Seek medical attention if breathing difficulties occur. |
| **Ingestion** | If a significant quantity has been swallowed, give two glasses of water to dilute.<br>Seek medical attention. |
| **Note to Physicians** | This product is essentially inert and nontoxic.<br>However, if it is heated at too high a temperature or if it is burned, gases may be released (see Sections 5 and 10 for off-gases).<br>Patients who have been exposed to off-gases may need to have their arterial blood gases and carboxyhemoglobin levels checked.<br>If the carboxyhemoglobin levels are normal, asphyxia (carbondioxide replacing oxygen) is a possibility.<br>As with any fire, irritant gases may have formed.<br>If patients may have inhaled high concentrations of irritatingfumes, they should be monitored for delayed onset pulmonary edema |

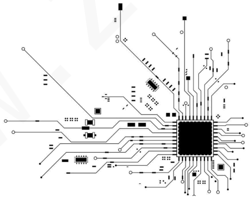
#### 5. FIRE FIGHTING MEASURES

| | |
|---|---|
| **Extinguishing Media** | Water spray, foam, carbon dioxide or dry chemicals. |
| **Hazardous Products of Combustion** | Carbon monoxide, carbon dioxide and Phenol. |
| **Protective Measures on Fire** | Wear full protective fire fighting gear including self contained breathing apparatus (SCBA) for protection against possible exposure |

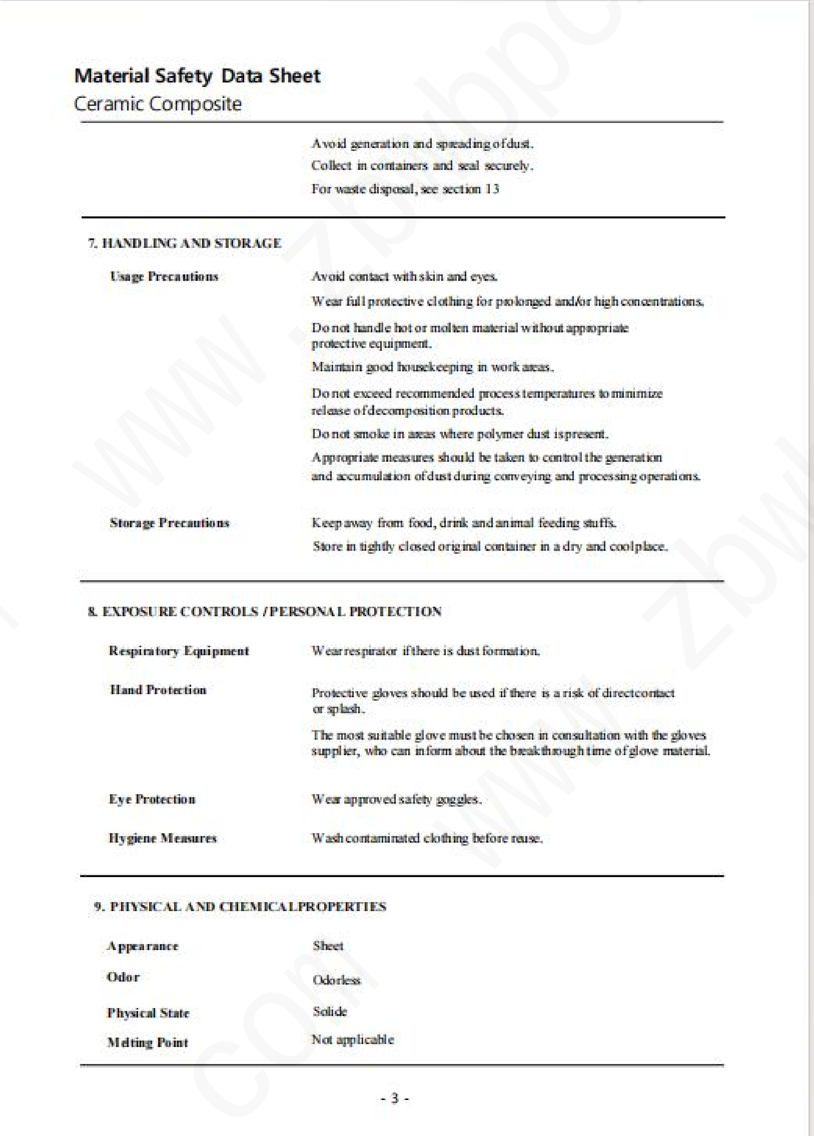
#### 6. ACCIDENTAL RELEASE MEASURES

| | |
|---|---|
| **Personal Precautions** | Wear protective clothing as described in section 8 of this safety data sheet.<br>Use protective gloves, goggles and suitable protective clothing.<br>Avoid inhalation of dust. Provide adequate ventilation. |
| **Environmental Precautions** | Do not allow ANY environmental contamination.<br>Prevent entry into drains.<br>Avoid discharge onto the ground.<br>Avoid spreading dust or contaminated materials |
| **Spill Clean Up Methods** | Wear necessary protective equipment.<br>Ventilate well. |

# NEW Materials CHD COC



## CHD heat dissipation copper clad laminate COC



**Material Safety Data Sheet**
Ceramic Composite

Avoid generation and spreading of dust.
Collect in containers and seal securely.
For waste disposal, see section 13

### 7. HANDLING AND STORAGE

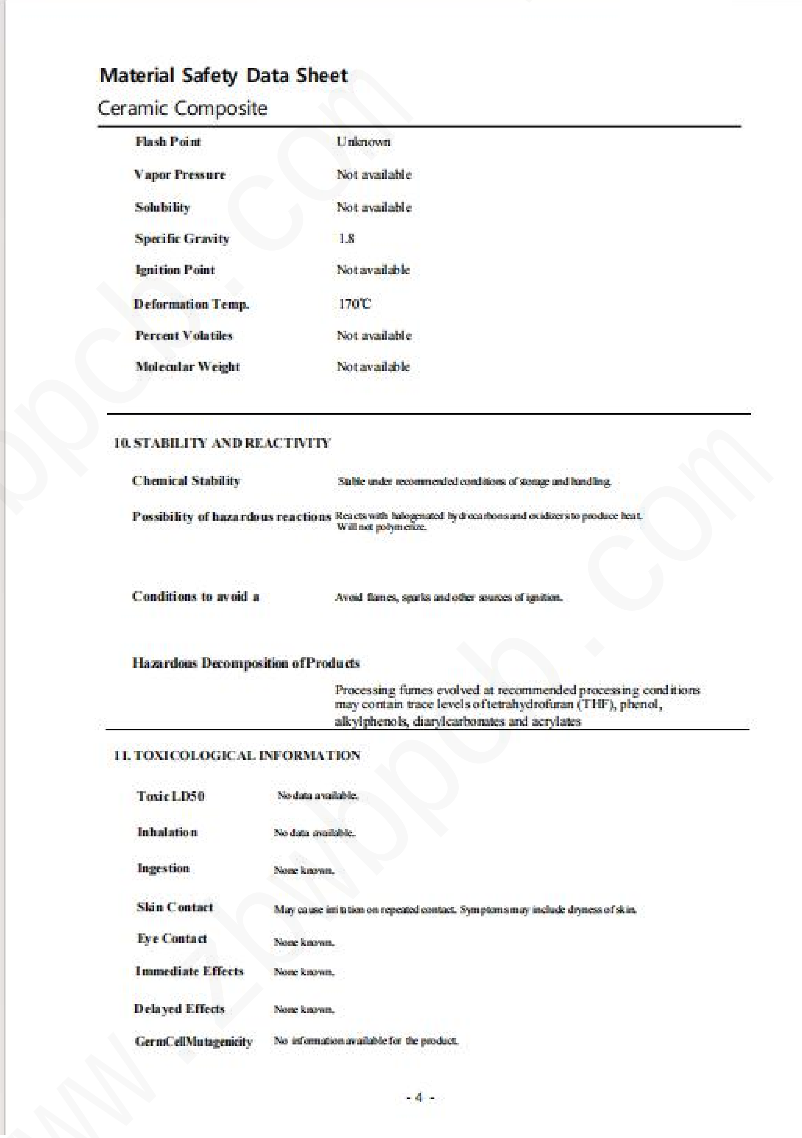
| | |
|---|---|
| **Usage Precautions** | Avoid contact with skin and eyes.<br>Wear full protective clothing for prolonged and/or high concentrations.<br>Do not handle hot or molten material without appropriate protective equipment.<br>Maintain good housekeeping in work areas.<br>Do not exceed recommended process temperatures to minimize release of decomposition products.<br>Do not smoke in areas where polymer dust is present.<br>Appropriate measures should be taken to control the generation and accumulation of dust during conveying and processing operations. |
| **Storage Precautions** | Keep away from food, drink and animal feeding stuffs.<br>Store in tightly closed original container in a dry and cool place. |

### 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

| | |
|---|---|
| **Respiratory Equipment** | Wear respirator if there is dust formation. |
| **Hand Protection** | Protective gloves should be used if there is a risk of direct contact or splash.<br>The most suitable glove must be chosen in consultation with the gloves supplier, who can inform about the breakthrough time of glove material. |
| **Eye Protection** | Wear approved safety goggles. |
| **Hygiene Measures** | Wash contaminated clothing before reuse. |

### 9. PHYSICAL AND CHEMICAL PROPERTIES

| | |
|---|---|
| **Appearance** | Sheet |
| **Odor** | Odorless |
| **Physical State** | Solide |
| **Melting Point** | Not applicable |



**Material Safety Data Sheet**
Ceramic Composite

| | |
|---|---|
| **Flash Point** | Unknown |
| **Vapor Pressure** | Not available |
| **Solubility** | Not available |
| **Specific Gravity** | 1.8 |
| **Ignition Point** | Not available |
| **Deformation Temp.** | 170℃ |
| **Percent Volatiles** | Not available |
| **Molecular Weight** | Not available |

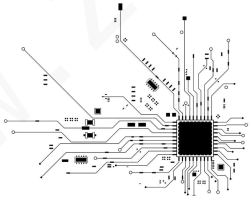
### 10. STABILITY AND REACTIVITY

| | |
|---|---|
| **Chemical Stability** | Stable under recommended conditions of storage and handling. |
| **Possibility of hazardous reactions** | Reacts with halogenated hydrocarbons and oxidizers to produce heat.<br>Will not polymerize. |
| **Conditions to avoid a** | Avoid flames, sparks and other sources of ignition. |
| **Hazardous Decomposition of Products** | Processing fumes evolved at recommended processing conditions may contain trace levels of tetrahydrofuran (THF), phenol, alkylphenols, diarylcarbonates and acrylates |

### 11. TOXICOLOGICAL INFORMATION

| | |
|---|---|
| **Toxic LD50** | No data available. |
| **Inhalation** | No data available. |
| **Ingestion** | None known. |
| **Skin Contact** | May cause irritation on repeated contact. Symptoms may include dryness of skin. |
| **Eye Contact** | None known. |
| **Immediate Effects** | None known. |
| **Delayed Effects** | None known. |
| **GermCellMutagenicity** | No information available for the product. |

# NEW Materials CHD COC



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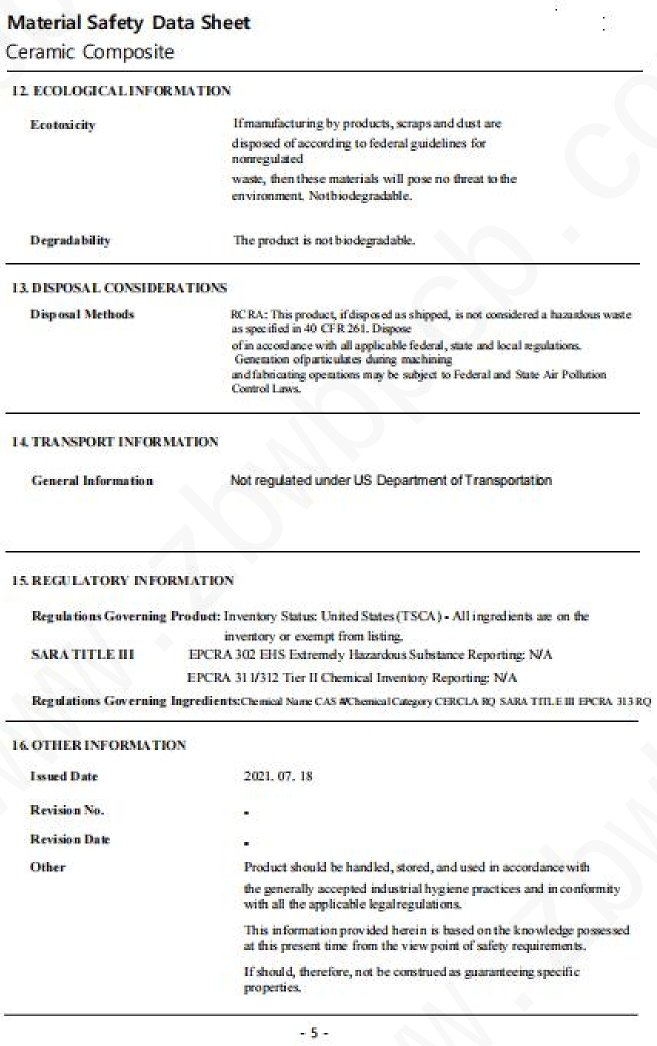


### Material Safety Data Sheet

Ceramic Composite

#### 12. ECOLOGICAL INFORMATION

| | |
|---|---|
| **Ecotoxicity** | If manufacturing by products, scraps and dust are disposed of according to federal guidelines for nonregulated<br>waste, then these materials will pose no threat to the environment. Not biodegradable. |
| **Degradability** | The product is not biodegradable. |

#### 13. DISPOSAL CONSIDERATIONS

| | |
|---|---|
| **Disposal Methods** | RCRA: This product, if disposed as shipped, is not considered a hazardous waste as specified in 40 CFR 261. Dispose<br>of in accordance with all applicable federal, state and local regulations.<br>Generation of particulates during machining<br>and fabricating operations may be subject to Federal and State Air Pollution Control Laws. |

#### 14. TRANSPORT INFORMATION

| | |
|---|---|
| **General Information** | Not regulated under US Department of Transportation |

#### 15. REGULATORY INFORMATION

**Regulations Governing Product:** Inventory Status: United States (TSCA) - All ingredients are on the inventory or exempt from listing.

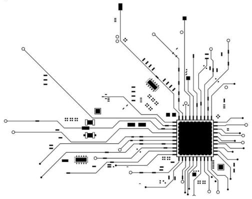
**SARA TITLE III** EPCRA 302 EHS Extremely Hazardous Substance Reporting: N/A

EPCRA 311/312 Tier II Chemical Inventory Reporting: N/A

**Regulations Governing Ingredients:** Chemical Name CAS # Chemical Category CERCLA RQ SARA TITLE III EPCRA 313 RQ

#### 16. OTHER INFORMATION

| | |
|---|---|
| **Issued Date** | 2021. 07. 18 |
| **Revision No.** | - |
| **Revision Date** | - |
| **Other** | Product should be handled, stored, and used in accordance with<br>the generally accepted industrial hygiene practices and in conformity with all the applicable legal regulations.<br>This information provided herein is based on the knowledge possessed at this present time from the view point of safety requirements.<br>If should, therefore, not be construed as guaranteeing specific properties. |



# ThankYou!

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