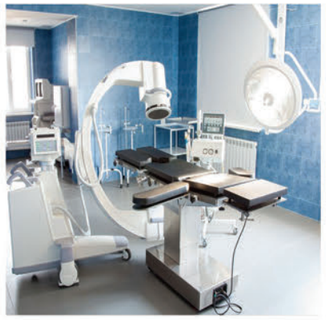
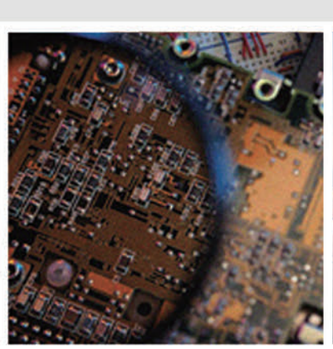




麦可罗泰克（常州）产品服务有限公司
Microtek (Changzhou) Product Services Co.,Ltd


麦可罗泰克（常州）产品服务有限公司
Microtek (Changzhou) Product Services Co.,Ltd
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Http://www.thetestlab.cn E-mail: microtek@thetestlab.cn
地址：江苏省常州市新北区电子科技产业园新科路19号
Address: No. 19 Xinke Road, Electronic Technology Park,
Xinbei District, Changzhou, Jiangsu, China

第三方专业检测认证实验室
A Professional Third Party Testing Lab

CMA 151009010401 · ILAC-MRA · CNAS 中国认可 国际互认 检测 TESTING CNASL2963 · IPC Validation Services · CPCA · CQC

企业介绍 | Company Profile

麦可罗泰克（常州）产品服务有限公司是全球电子及聚合材料制造行业中主要的第三方检测机构，是按 ISO/IEC17025: 2017 管理体系运作的，通过 CNAS 和 CMA 认可，并能出具具有国际公信力的检测分析报告。是中国质量中心 (CQC) 授权的“非金属材料（线路板、覆铜箔板、塑料等）”签约实验室；是 CPCA 产品服务中心，也是 IPC 在中国国内授权的 IPC–6012、IPC–A–610 和 IPC–A–600 培训机构，是 IPC 授权的 IPC–6012C 认证实验室；实验室具备 CNAS 认可的温湿度校准能力。我们的客户来自全球 PCB 和 CCL 的生产商和终端客户。

Microtek (Changzhou) Product Services Co., Ltd. is a leading third-party testing agency, serving electronic and polymeric material manufacturing industry world wide. It is operated in accordance with the ISO/IEC17025: 2017 management system, accredited by CNAS and CMA and capable of issuing internationally recognized test and analysis reports. The lab is a CQC licensed lab for "Non-metal materials" including printed circuit boards (PCB), copper-clad laminates (CCL) and plastics. We are also the product service center for CPCA, an authorized training center for IPC-6012, IPC-A-610 & IPC-A-600, as well as a Validation Services Certified Test Laboratory for IPC-6012C. In addition, our lab has the capability of temperature and humidity calibration as recognized by CNAS and we serve the PCB and CCL manufacturers and end customers all over the world.

专业第三方检测实验室
Professional Third-party Testing Laboratory

麦可罗泰克（常州）实验室在美国、德国、印度、越南、韩国、日本、香港、台湾和中国大陆拥有 2500 多家客户，员工均具有 PCB 和 CCL 的制作经验。实验室占地 4000 平方米。有 3000 多平方米的现代化实验室主楼和 500 多套先进的专业检测设备，以满足对汽车、高铁、通讯、航空航天、电子信息产品等制造业提供 PCB、CCL、塑料的国内外先进标准的符合性验证需求为己任，提供科学、公正的 PCB\PCBA\CCL\ 塑料等产品检测、技术服务、CQC 认证，IPC–6012、IPC–4101 认证实验室。

Microtek (Changzhou) Lab has more than 2,500 customers in the United States, Germany, India, Vietnam, South Korea, Japan, Hong Kong and the Chinese Mainland. All of our staff have hands-on experience in PCB or CCL Manufacturing. The lab covers an area of 4000 square meters, including a lab building of 3000 square meters and 500 pieces of specialized testing equipment. The lab serves the needs of PCB, CCL, Plastics along with other national & international standard testing and conformance verification for automotive, high-speed rail, telecommunication, aerospace & aviation, electronic information products and other industries. Microtek (Changzhou) Laboratory provides scientific and high integrity testing, technical services, CQC recognition on PCB\ PCBA\ CCL\ Plastics and other products and is an IPC-6012, IPC-4101 Validation Services laboratory.

培训 Training | IPC-6012 / IPC-A-600 / IPC-A-610

IPC-6012 标准培训：为刚性印制线路板企业技术人员提供培训服务，取得 IPC 培训证书。
IPC-6012 Training: provide training services for technical staff from rigid PCB manufacturers so as to help them obtain IPC training certificates.

麦可罗泰克（常州）实验室是美国 IPC 授权的 IPC–6012 培训机构，我们具有 2 位 IPC–6012 培训师，可以为企业技术人员提供 IPC6012 标准的讲解。
Microtek (Changzhou) Laboratory is licensed by IPC as an IPC-6012 training center. With 2 IPC-6012 trainers, we can provide training on IPC-6012 standard to technical staff from enterprises.

为帮助中国企业更好地理解 IPC–A–610 和 IPC–A–600 标准，美国 IPC 授权麦可罗泰克（常州）实验室为中国 IPC 标准培训基地，具有独立培训 IPC 认可印制板认证检验员及讲师证书的资格。
In order to assist Chinese enterprises to gain a better understanding of IPC-A-610 and IPC-A-600 standards, Microtek (Changzhou) Laboratory is licensed by IPC as an IPC training center for IPC-A-610 and IPC-A-600. The lab has the qualification to independently train CIS and CIT.

如果您有兴趣，请拨打电话：0519–85487818
If interested, please call 0519–85487818.

大事件

实验室主要历程

LABORATORIES MILESTONES

2003 年

麦可罗泰克（常州）实验室成立。

Microtek (Changzhou) Laboratories was established.

2004 年

经中国印制电路行业协会 (CPCA) 批准，成为印制电路行业产品检测中心。

获得美国 UL 授权的 UL-AA 证书。

Designated as CPCA Service Center.

Qualified as UL-AA by UL.

2005 年

经美国电子电路互连与封装协会 (IPC) 批准，成 IPC-600/IPC-610 培训基地。

Designated as Licensed IPC Training Center for IPC-A-600 and IPC-A-610.

2006 年

获得美国 UL 授权的 UL-EA* 证书；

获得江苏省省级外商研发机构。

Qualified as UL-EA* by UL.

Approved as a Provincial Foreign-Invested R&D Facility.

2007 年

获得“中国实验室合格评定委员会”的实验室认可资质，

即 CNAS 资格认可 CNAS L2963；

获得“江苏省高新技术企业”称号。

获得“常州市优秀国际合作奖”称号。

Qualified by CNAS as CNAS L2963 and designated as High-Tech. Enterprise of Jiangsu Province.

Won the "Changzhou Excellent International Cooperation Award".

2008 年

获得“中国质量认证中心”授权实验室资质，CQC V084；

获美国德尔福认可实验室。

获江苏省优秀外商研发机构称号。

Qualified by CQC as CQC V084.

Approved by Delphi.

Awarded as Jiangsu Excellent Foreign-invested R&D Facility.

2009 年

获得江苏省实验室资质认定（CMA 证书）。

江苏省电子基础材料检测认证服务平台主要成员。

Qualified as CMA and is the primary member of electronic basic material testing and recognition service platform of Jiangsu Province.

2014 年

获得 IPC-6012 认证服务测试实验室资质以及 IPC-6012 培训中心资质。

Qualified as an authorized IPC-6012 validation services test lab and achieved IPC-6012 Training Center Status.

2015 年

再次获得“江苏省高新技术企业”称号。

获江苏省科技服务骨干机构能力提升项目奖励。

Achieved the title of“New and High Technology Enterprise in Jiangsu Province”again.

Received the reward of “Capability Improvement project for Technology Services Key Institutions of Jiangsu Province”

2017 年

获常州市新北区国家标准制定奖励。

Rewarded by Xinbei District government of Changzhou City for presiding over and formulating the national technical standard.

2018 年

获得常州市中小企业专项发展资金奖励。

获得 IPC-4101 认证授权。

再次获得“江苏省高新技术企业”称号。

Received the “Special Development Fund for Small and Mini-sized Enterprises in Changzhou”.

Certified as the qualified test lab for IPC-4101 Validation Services Project.

Achieved the title of“New and High Technology Enterprise in Jiangsu Province” again.

2019 年

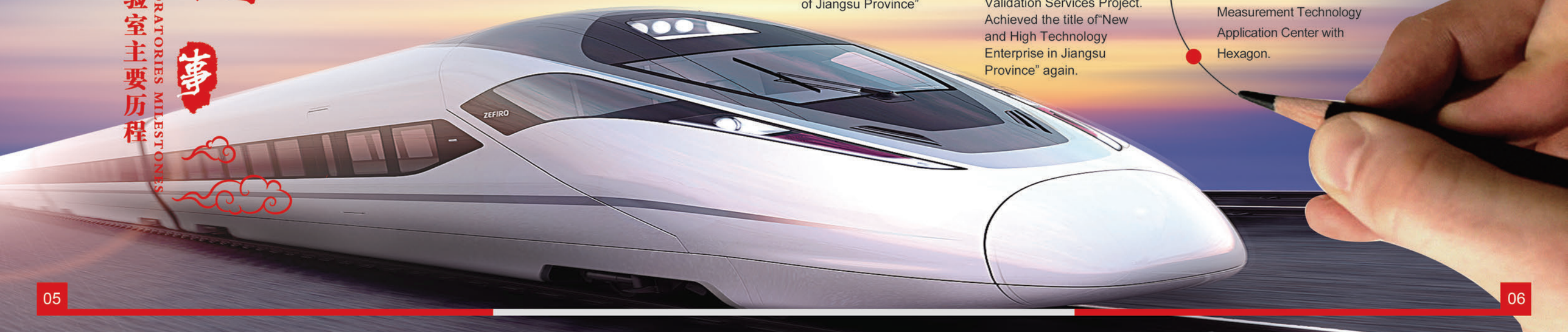
获得市“三位一体”专项资金奖励。实验室与特斯拉正式达成合作。

Received the “Special Fund Used to Support and Accelerate the Innovative Development and Upgrading of Qualified Enterprises” from Changzhou municipal government; and officially reached cooperation with Tesla.

2020 年

通过 CNAS 复评审，实验室与海克斯康达成战略合作，共建华东集成电路测量技术应用中心。

Passed the CNAS review; formed the partnership of strategic cooperation with Hexagon and cofounded the East China Measurement Technology Application Center with Hexagon.



Mr. Bob Neves' Bio

Chairman/ CTO of Microtek (Changzhou) Laboratory

麦可罗泰克（常州）实验室　董事长兼技术总监

Bob 先生简介

IPC 特殊贡献奖 | IPC 名人堂奖 | 获得荣誉市民称号

CPCA 产品服务中心授牌仪式 | 获优秀研发机构奖

Bob Neves 先生——国际电子工业连接协会 (IPC) 现任董事会副主席、名人堂奖获得者，因对电子行业的长期贡献获 IPC 总裁奖和 IPC Dieter Bergman 技术专家奖。曾作为 (IPC) 刚性板总务委员会主席、高密度互连板总务委员会主席、刚性板测试方法任务组主席、实验室规范 (IPC–QL–653) 委员会主席、技术活动执行委员会 (TAEC) 主席、EXPO 项目委员会委员、技术路标委员会委员、未来焦点圆桌会议成员、国际电子技术委员会 (IEC): IEC T91 第 101 作组一印制线路测试方法组织者、IEC T91 第 41 作组一印制线路板成员、加利福尼亚线路协会 (CCA) 董事会会长，为 PCB 行业做了大量的工作。他在美国著名的专业杂志上，发表了具有价值的专业论文近 50 篇。中国 CPCA 技术顾问姚守仁老先生，曾通过网络统计过 Bob 先生发表过的论文，大约有 120 篇左右。同时，作为行业中的失效分析及测试程序专家，他经常为企业技术人员举办一些培训班，教授知识，使企业在生产过程中及时了解产品的失效程度，及时得到整改。他积极探索检测技术，不断改革和创新检测方法。

目前，汽车在大众生活中的普及，对汽车安全、舒适、智能、环保等性能提出了更高的要求，也推动了电子新技术在汽车领域的广泛和深入应用。据悉，汽车电子已占据了整车成本的 25%–40%，这给汽车电子及上游印制电路板带来了新的机遇和挑战，如何降低因复杂电子系统的引入带来的故障风险，测试技术就成了确保整车质量的重要一环。Bob 先生就企业所关心和关注的“ 汽车电路板的 CAF 测试、RTC 单孔测试 ”等进行了研究，这些测试在整个测试过程中，测试方法（人、机、料、环、法）都非常重要，且这些测试时间大都在 1000 小时以上，一旦在一些细小的环节中出现问题，将造成测试的失败，会给企业造成严重损失。在他的带领下，实验室通过多年大量的 CAF 测试和 RTC 测试，积累了丰富的检测经验，受到业内企业的广泛信任和认同。

Bob Neves is the current Board Vice Chair of IPC, the association connecting electronics Industries. He was inducted into the IPC Hall of Fame, the IPC's highest lifetime honor. He has earned the IPC Presidents Award and Dieter Bergman IPC Fellow Award for his long term service to the electronics industry. He has served as the IPC's TAEC Chairman, Rigid Board General Committee chairman, HDI General Committee chairman, Rigid Board Test Method Task Group chairman, Laboratory Qualifications (IPC-QL-653) Committee chairman, EXPO project committee member, Technology Roadmap Committee member and Future Focus Round Table member. He also served as a member of IEC TC91 Working Group 10 Printed Wiring Test Methods and IEC T91 Working Group- Printed Circuit Board. He served as Chairman of California Circuit Board Association and has done lots of work for PCB industry. Bob has published more than 50 articles on well-known magazines in USA. Mr. Yao, the technical advisor of CPCA has collected near 120 articles published by Mr. Bob Neves. Also, as an expert in failure analysis and testing procedures in the industry, he has taught many classes for people to learn the failures in fabrication and correct them. He has been actively searching and researching testing technology, continuously reforming and creating new test methods.

Now, the wide use of cars in daily life has raised higher requirements on the safety, comfort, intelligence and environmental friendliness of automobiles, which pushes an expanded and more in-depth application of new electronic technologies in automobile sector. It's reported that the electronics accounts for 25% - 40% of the total vehicle cost, bringing new challenges and opportunities to automobile electronics and upstream PCB. As to how to minimize the failure risks introduced by the application of complex electronic systems, testing technologies become a key aspect in the assurance of vehicle quality. Mr. Neves conducted research in “CAF testing and RTC single hole testing for PCB in automobiles”. For those tests, the test method (Man, Machine, Material, Method and Environment) are the important factors throughout the whole process. As those tests often last for more than 1,000 hours, any problem in even tiny aspects will cause a test failure, which will cause significant loss to the enterprises. Under his leadership, our lab has successfully conducted CAF tests and RTC tests for several years, gaining rich experience in testing, and is widely trusted and recognized by enterprises in related industries.

我们的主要服务项目
Our Main Services

我们为各行业服务 Industries We Serve

1、材料供应商：覆铜板、挠性覆铜板、半固化片、树脂、阻焊剂、玻璃纤维、聚合材料
Material Suppliers: CCL, FCCL, Prepreg, Resin, Solder Mask, Glass Fabric, Composites.
2、印刷电子 Printed Electronics
3、PCB 生产商：刚性板、挠性板、HDI 高密度互连板、金属芯板、芯片封装
PCB Manufacturers: Rigid, Flex, HDI, Metal Core, Chip Packaging
4、EMS. OEMS. CEMS. PCBA 生产商：高铁、航空航天、通信电路、汽车电路、医疗设备、手持设备、仪器
EMS, OEMs, CEMs and PCBA Manufacturers: High-speed rail, Aerospace & Aviation, Telecommunication, Automotive, Medical Equipment, Handheld Devices, Instruments
5、塑料及复合材料行业 Plastics and Composites Industry

我们的主要服务项目 Our Main Services

一、产品认证服务项目 Product Certification Service Items

CQC 认证试验和 CQC 确认检测：非金属材料 –PCB. CCL、塑料。
CQC Certification Testing, CQC Conformance Testing: Non-metal materials– PCB, CCL. Plastics.
IPC–6012 认证服务：为刚性印制线路板企业提供产品认证服务，取得 IPC 认证证书。
IPC–6012 Validation Services: product certification testing services for rigid PCB manufacturers so as to help them obtain IPC certificates.
IPC–4101 认证服务：为覆铜箔板企业提供产品验证服务。
IPC–4101 Validation Services: to provide IPC–4101 validation testing for CCL manufacturers.

二、环境可靠性试验项目 Environmental Reliability Test

1、高温储存试验； 2、低温储存试验；3、温湿度储存试验；4、高低温冲击试验 5、温度循环试验；
6、温湿度循环试验；7、热老化试验； 8、盐雾试验和盐雾交变试验；9、振动试验；
10、机械冲击试验； 11、跌落试验； 12、高压蒸煮试验；13、加速热冲击（HATS）试验
14、回流焊测试； 15、高加速寿命试验（HAST）等
1. Hot Storage; 2. Cold Storage；3. Temperature and Humidity Storage；4. Thermal Shock；5. Thermal Cycling；
6. Temperature and Humidity Cycling；7. Thermal Aging；8. Salt Mist Test & Alternating Salt Mist Test；9. Vibration Test；
10. Mechanical Shock；11. Drop Test；12. Pressure Cooker Test；13. HATS；
14. Reflow；15. HAST

三、失效分析 Failure Analysis

1、CAF 失效点分析；2、可焊性验证分析；3、生产及组装工艺；4、SEM/EDS 分析；5、结构完整性分析；
6、盲孔 / 埋孔切片分析；7、BGA 焊点质量分析；8、线宽线距验证分析；9、绝缘电阻偏小分析
1. CAF Failure Analysis; 2. Solderability Verification and Analysis; 3. Fabrication and Assembly Process; 4.SEM/EDS Analysis;
5. Structural Integrity; 6. Blind/Buried Via Microsectional Analysis; 7. BGA Solder Joint Quality Analysis;
8. Conductor Width and Space Verification; 9. Low Insulation Resistance Analysis

四、环境模拟试验 Environmental Simulation Test

1、CAF 试验；2、耐蚀性；3、电化学迁移；4、可燃性；5、恒温恒湿；6、低温试验；7、温湿度循环；8、盐雾试验；
9、蒸汽老化；10、高温试验；11、热冲击；12、热应力试验；13、吸水率；14、热丝引燃；15、加速热冲击（HATS）试验；
16、高加速寿命试验（HAST）
1. CAF Testing; 2. Corrosion Resistance; 3. Electrochemical Migration; 4. Flammability; 5. Constant Temperature and Humidity;
6. Low-temperature Test; 7. Thermal Cycling; 8. Salt Mist; 9. Steam Aging; 10. High-temperature Test; 11.Thermal Shock;
12. Thermal Stress; 13. Water Absorption; 14. HWI; 15. HATS; 16. HAST

五、机械性能试验 Mechanical Performance Test

1、粘合强度；2、拉伸试验；3、延展率； 4、耐折性； 5、剪切强度；
6、压缩强度；7、拉脱强度；8、弯曲强度； 9、拉伸 (弯曲) 模量
1. Bond Strength; 2. Tensile Strength; 3. Ductility; 4. Flexural Fatigue; 5. Shear Strength;
6. Compression Strength; 7. Peel Strength; 8. Flexural Strength; 9. Tensile (Bending) Modulus

六、物理性能试验 Physical Performance Test

1、尺寸稳定性；2、尺寸测量；3、金相切片；4、镀层附着力；5、镀涂层厚度；6、玻璃化温度；7、固化因素； 8、膨胀系数；
9、热分层时间；10、热分层温度；11、热分解温度；12、模拟返工；13、红外光谱；14、电镜 / 能谱； 15、导热系数、热阻
1. Dimensional Stability; 2. Dimensional Measurement; 3. Microsection; 4. Plating Adhesion; 5. Coating Thickness;
6. Glass-Transition Temperature; 7. Curing Factor; 8. Coefficient of Expansion; 9. Time to Delamination;
10. Temperature of Delamination; 11. Decomposition Temperature; 12. Rework; 13.FTIR; 14. SEM/EDS;
15. Thermal Conductivity Coefficient, Thermal Resistance

七、电气性能试验 Electrical Test

1、耐电弧；2、相对漏电起痕指数；3、互连电阻；4、电路连通性；5、介质击穿电压；6、电气强度；7、绝缘电阻；
8、介电常数和介质损耗因素；9、表面绝缘电阻；10. 表面电阻率和体积电阻率；11、铜箔电阻
1. Arc Resistance; 2. CTI; 3. Interconnection Resistance; 4. Circuit Continuity; 5. Dielectric Breakdown;
6. Electrical Strength; 7. Insulation Resistance; 8. Dk/Df; 9. Surface Insulation Resistance;
10. Surface and Volume Resistivity; 11. Resistance of Copper Foil

我们的特色服务项目 Special Testing Services

1、离子迁移 (CAF) 试验； 2、单孔阻值测量 (RTC 方法)； 3、离子色谱 (IC) 分析； 4、C3 试验； 5、离子清洁度；
6、加速热冲击 (HATS) 试验； 7、红外光谱 (FTIR) 分析； 8、导热系数、热阻； 9、SEM/EDS；10、复合盐雾试验
1. CAF Testing; 2. Resistance Measurement of Single Holes (RTC method); 3. Ion Chromatography Analysis;
4. C3 Test; 5. Ionic Cleanliness; 6. HATS; 7.FTIR; 8. Thermal Conductivity Coefficient, Thermal Resistance; 9. SEM/EDS;
10. Compound Salt Spray Test

为您提供材料分析检测服务
Analysis and Testing Services on Materials

麦可罗泰克（常州）实验室所提供的 FTIR 检测分析服务广泛用于有机化合物的定性鉴定和结构分析；除单原子分子及单核分子外，几乎所有有机物均有红外吸收。固、液、气态样均可用，且用量少。设备自带显微镜及 ATR 功能，不破坏样品；无需大量试剂，安全无污染。

The FTIR testing and analysis service Microtek (Changzhou) Laboratories provides is widely used on qualitative identification and structure analysis for organic materials. Other than single atom and molecule and mononuclear molecules, almost all the organic materials have infrared absorption. It can be used on solid, liquid and gas. With the microscope and ATR attachment, the test amount is very small and the test does not damage samples. There is no need of large amount of reagents. It is a safe and pollution–free test.

特点 Features：

1) 红外光谱是吸收光谱，红外吸收只有振－转跃迁，能量低；
Infrared spectroscopy is absorption spectroscopy. Infrared absorption only has vibrational–rotational transitions and is of low energy.

2) 配合谱图分析和谱库检索，可做未知物鉴定；
With the spectrum analysis and data base, identification can be done for unknown materials.

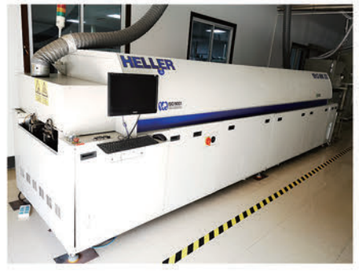
3) 分子结构更为精细的表征，通过 IR 谱的波数位置、波峰数目及强度确定分子基团、分子结构，可进行微小样品（证物）及微型污染的鉴定；
More precise characterization of the molecular structure; The molecular groups and molecular structure can be determined by the wave location of the IR spectrum, peak number and strength. It can be used on identifying small samples and contaminants.

4) 定量分析；
Quantitative analysis；

材料 (覆铜箔板及塑料产品) 的 CQC 认证及确认检验
CQC certification testing and conformance testing for material (CCL and plastics products)

材料可靠性试验: 如高 / 低温贮存试验、高低温循环 / 冲击试验、恒定湿热试验、湿热循环、PCT、热老化试验、盐雾试验等
Reliability testing for materials like hot/ cold storage, thermal cycling/ thermal shock, damp heat, temperature and humidity cycling, PCT, thermal aging, salt mist test, etc.

材料性能及失效分析检测 : 如 FTIR 分析，SEM/EDS 分析等
Performance testing and failure analysis for materials: FTIR, SEM/ EDS analysis, etc.



CAF 试验是把特制的 CAF 试验样板在高温高湿条件下放置 500 到 1000 小时，并施加偏置电压，以加快离子迁移并促进在 PCB 测试样板中 CAF 的形成。
Conductive Anodic Filament (CAF) testing consists of placing customized CAF test coupons in a test chamber for 500 to 1000 hours under the high temperature and humidity conditions, and then adding the bias voltage to try to accelerate Ion Migration and CAF formation in the PCB test coupons.

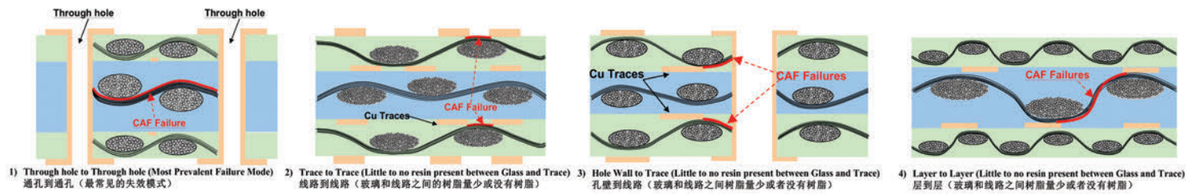
为了确定离子迁移和 CAF 成形在何处发生，需要定期进行电阻测量，从而探测两个原定绝缘的导体图形间精确的电流移动。测试通常在相邻通孔之见进行，但是测试也常常在孔－电路、电路－电路、层－层进行。
In order to determine where the Ion Migration and CAF formation is progressing, a periodical measurement of electrical resistance is necessary, which is to measure the actual electric current between two original insulative conductor patterns. Testing is primarily performed between adjacent through holes but testing is also commonly performed from Hole to Circuit, Circuit to Circuit and Layer to layer.

CAF 的形成要求一条电流移动的通道和电解质（通常是溴化物或氯化物）的存在，从而让铜细丝能够形成。在常规的表面电化学迁移（ECM）的形成中，金属离子从电路的阳极流出、往阴极流动，然后再阴极累积、并往阳极方向生长。在CAF的形成中，金属直接从阳极往阴极方向生长，因为离子移动的通道通常非常紧缩、常规类型的生长不可能出现。CAF 的生长是一个多重步骤、有序的过程，这个过程有以下组成：（1）通道的形成 \ 生成、（2）沿着通道的离子迁移、（3）实体铜丝的生长。
CAF formation requires a path for current to flow along and the presence of an electrolyte (typically Br or Cl based) so that the copper filament can form. In typical surface Electrochemical Migration (ECM) formation, metallic ions flow from the anode of the circuit toward the cathode where they pile up and grow back toward the anode source. In CAF formation, metals grow directly from the anode toward the cathode as the path for ions to flow is typically constricted and the traditional type of growth is not possible. CAF formation is a sequential process consisting of multiple steps of (1) pathway formation/ creation, (2) ion migration along the pathway, and (3) growth of a solid copper filament.

在 PCB 内部 CAF 或离子迁移失效有四种可能的模式：（1）内部通孔到通孔的失效；（2）内部线路到线路的失效；（3）内部通孔到线路或到层的失效；（4）内部层到层的失效。
There are four potential modes of CAF or (IM) failure within the PCB: (1) Internal Through hole to Through hole; (2) Internal Trace to Trace; (3) Internal Through hole to Trace or plane; (4) Internal Layer to Layer.

最常见的 CAF 失效模式发生在通孔与通孔壁之间。这一 CAF 失效模式是玻璃纤维直接连接了两个通孔、从一个铜孔到另一个通孔之间形成一条直行通道的结果。
The most prevalent mode of CAF failure occurs between a through hole wall and another through hole wall. This mode results from the direct connection by the glass fiber between two through holes, which forms a direct pathway between two through holes.

以下的 4 张图给出了 CAF 或离子迁移更完整的图示 :
The four diagrams below give a more complete perspective on the four modes of CAF or Ion Migration failure:



1) Through hole to Through hole (Most Prevalent Failure Mode) 通孔到通孔（最常见的失效模式）
2) Trace to Trace (Little to no resin present between Glass and Trace) 线路到线路（玻璃和线路之间的树脂量少或没有树脂）
3) Hole Wall to Trace (Little to no resin present between Glass and Trace) 孔壁到线路（玻璃和线路之间树脂量少或者没有树脂）
4) Layer to Layer (Little to no resin present between Glass and Trace) 层到层（玻璃和线路之间树脂量少或者没有树脂）

如需了解详情敬请关注 www.thetestlab.cn

高加速热冲击试验 2TM

Highly Accelerated Thermal Shock (HATS2TM) Testing for PCB Via Reliability

高加速热冲击试验 2TM (HATS2TM) 用于 PCB 孔可靠性测试

HATS2TM Test System

HATS2TM 测试系统

Highly Accelerated Thermal Shock (HATS2TM)

高加速热冲击试验 2TM (HATS2TM)

Reflow Simulation & Thermal Shock/Cycling Capability

回流焊模拟 & 热冲击 / 循环测试能力

- Temperature Range from −55 ℃ to +265 ℃
- 温度范围从 −55 ℃到 +265 ℃
- Reflow Simulation & Thermal Cycling/Shock
- 回流焊模拟 & 热冲击 / 循环试验
- Replicate any Convection Reflow Profile
- 复制任何对流回流焊曲线
- Reliability and Robustness Requirements
- 可靠性及稳健性测试

High−Speed "Air" Methodology with Stationary Coupons

高速 “ 空气 ” 原理测试静态试样

- Coupon Core Temperature Reached in 3−6 Minutes
- (5−10 Cycles per Hour)
- 3−6 分钟内达到试样核心温度（即每小时测 5−10 个循环）
- Rapid Temperature Cycles between −55 ℃ to +265 ℃
- (~1000 Cycles per Week)
- 温度范围 −55 ℃到 +265 ℃ 之间的快速高低温循环
- (1000 个循环约在一周完成）
- 72 (2−net) IPC−2221B "D" coupons, 36 (4−net) Traditional
- HATS™ Coupons or 36 (7−net) HATS²™ Single Via Coupons
- 每箱 72 个 IPC−2221B "D" 试样（每个 2 个通道）、或 36 个传统
- HATS™试样（每个 4 个通道）、或 36 个 HATS²™单孔试样
- （每个 7 个通道）

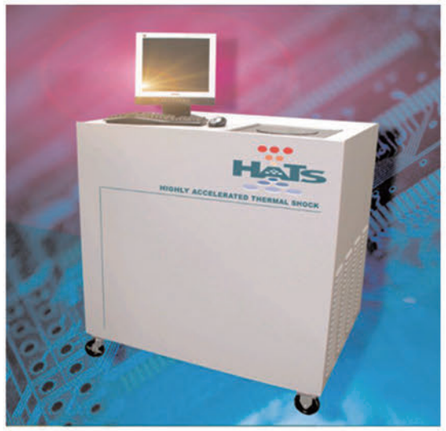
Data Acquisition

数据采集

- Measurements with a 4−Wire System
- 4 线桥测量系统
- High Current (up to 1A) Allows Accurate Measurements to
- Micro−ohms
- 大电流（最高 1A）可进行到毫欧级别的精确测量
- High Speed Measurement Readings (Realtime Measurement)
- 高速测量读数（实时测量）

HATS2TM System

HATS2TM 系统



Online Coupon Generator

在线试样生成器

www.HATS−Tester.com

Design Your Coupons Online

在线设计你自己的试样

Gerber Files Immediately Emailed

Gerber 文件立即发送到你邮箱里

Nets can be “Through”, “Blind”, “Buried” or “Stacked”

通道可为通孔、盲孔、埋孔或叠孔结构等

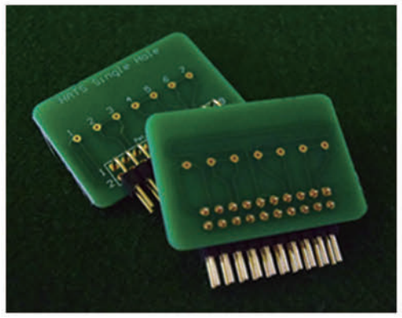
Parameters for each Net: Hole size, Land size, Grid size,

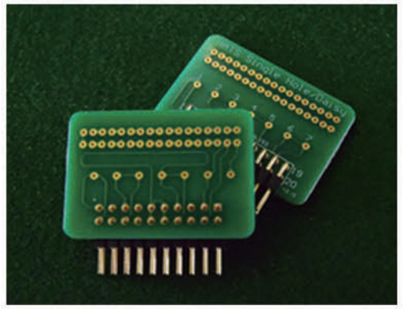
Interconnect Sequences, etc.

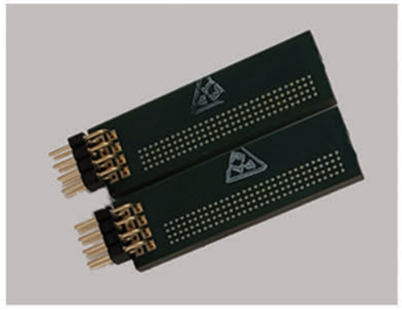
每个通道参数：孔径、盘径、格距、互连顺序等等

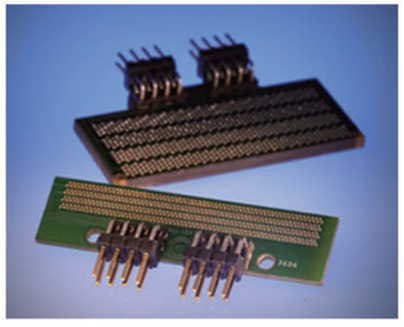
HATS2TM Test Coupons

HATS2TM 测试试样图例



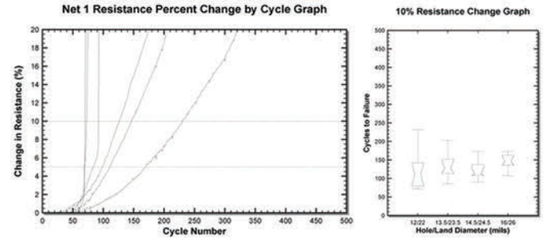






HATS2TM Test Data

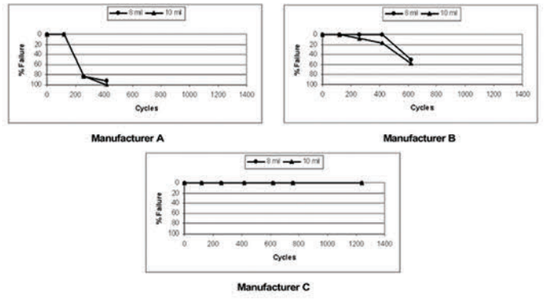
HATS2TM 测试数据示例



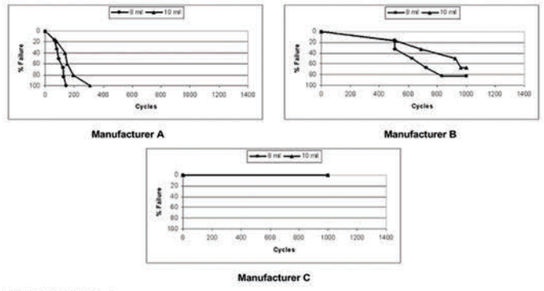
Delphi/PCQR 2 Reliability Study

Hole (mils)	Land (mils)	Annular Ring (mils)	Aspect Ratio	Interconnect Sequence
8	14	3	3.8:1	1-4-2-5-3-6
8	20	6	3.8:1	1-4-2-5-3-6
10	16	3	3.1:1	1-4-2-5-3-6
10	22	6	3.1:1	1-4-2-5-3-6

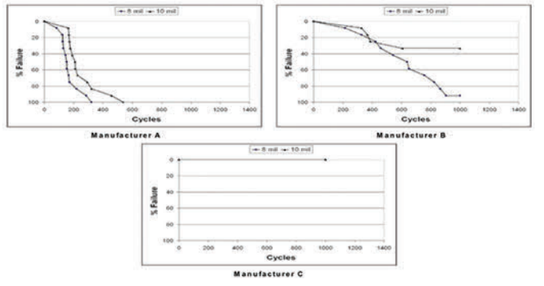
Delphi Data



IST Data



HATS ™ Data



HAST 高加速寿命试验
HAST Highly Accelerated Life Test

* 用于对印制板及电子元器件在高环境应力及工作应力下进行可靠性试验。
  HAST is used to perform reliability test on printed circuit boards and electronic components under high environmental and working stress.

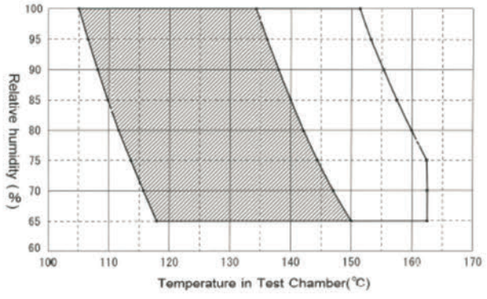
* 特点：Features
  应用范围 Range of application
  印制线路板、IC、晶体管、阻容器件、聚脂薄膜等。
  Printed circuit board; IC; Transistor; Resistance–capacitance device; Polyester film etc.

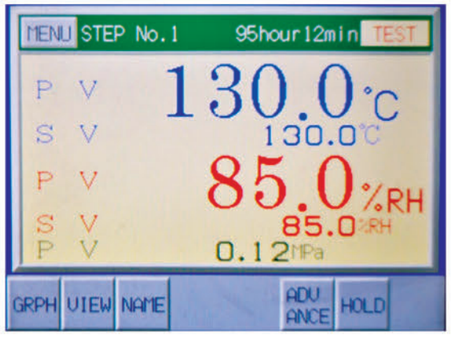
* 高加速因子 High acceleration factor
  HAST 的加速度因子是常规高温高湿试验（如：85℃，85% RH）的 5–100 倍。可以大大缩短产品或系统的寿命试验时间。
  HAST test has 5–100 times of acceleration factor when compared with the high temperature and high humidity test (for example, the test condition of 85℃ at 85% RH), thus shortening greatly the life test of products or systems.

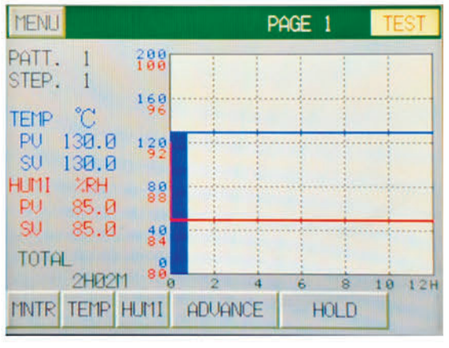
* 多通道 Multichannel
  119 通道 119 channels

* 应用标准 : Application standard
  IEC 60068–2–66

* 工作范围 Working range







高低温冲击—单孔电阻测量
Thermal Shock– Single Hole Resistance Measurement

可以准确评定孔镀层的变化。
The changes in the hole plating can be evaluated accurately.

单孔电阻测量的特点
Characteristics of single hole resistance measurement

1. 单孔电阻非常小（约 1mΩ), 对测量设备精度要求高；
Single hole resistance is very small (about 1mΩ); it requires high precision measurement equipment.

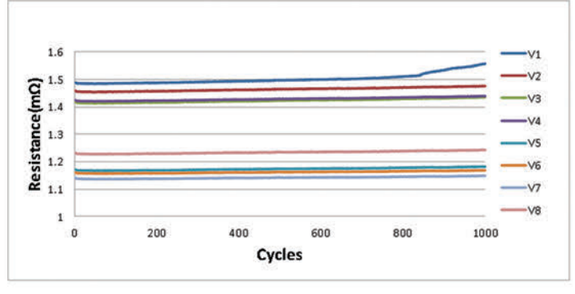
2. 测量方法和传统的低电阻测量不同；
Measurement method is different from the one of the traditional low resistance measurement.

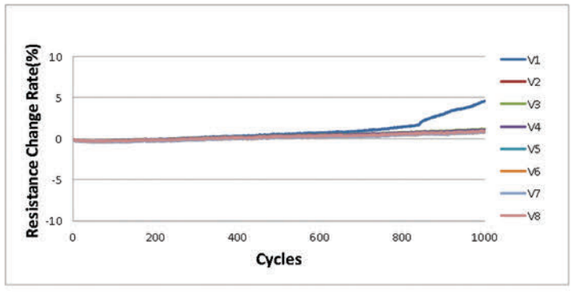
3. 需要在线精确测量大量数据的在线测量系统；
It requires the online measurement system capable of making accurate online measurement of large volume of data.

单孔阻值测量及评定 Single hole resistance measurement and evaluation
前处理：无铅回流焊，3 次或其他
Pretreatment: lead–free reflow, 3 times or other requirements
高低温冲击（可以选择不同的测试等级，如 –40℃/30 min、125℃/30min、500、1000 或更多循环）
Thermal shock (different options of conditions, eg: –40℃/30 min, 125℃/30min, 500, 1000 or more cycles)

4. 端法测量每个循环高温状态下的单孔电阻，
Single hole resistance at high temperature of each cycle is measured by 4–wire measurement method.
测量电流 1.1A、测量时间（1 ± 0.05）s
Measuring current 1.1 A; Measuring time (1 ± 0.05) s

评定要求：电阻变化率不超过 5% 或 10%
Evaluation requirement: a resistance change <5 or <10%

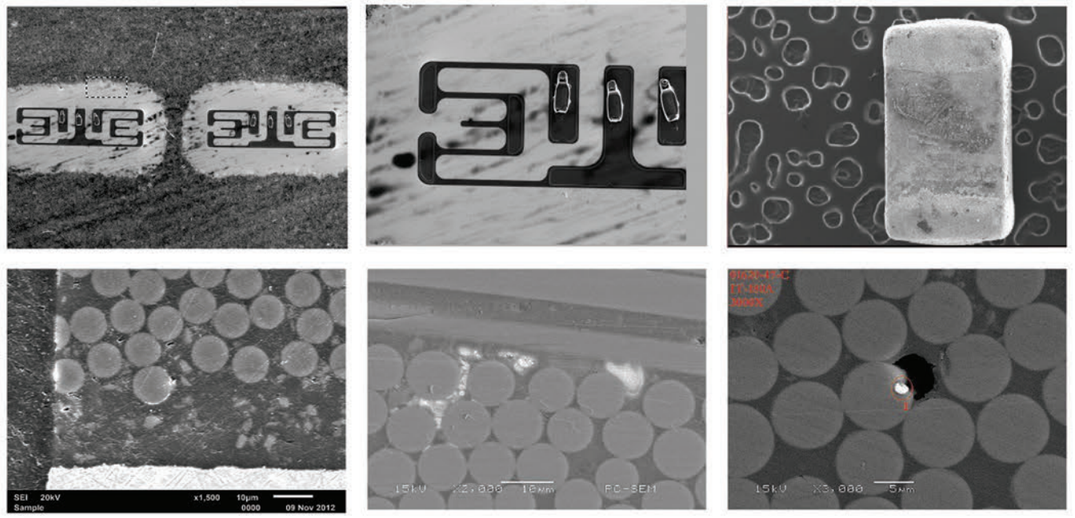




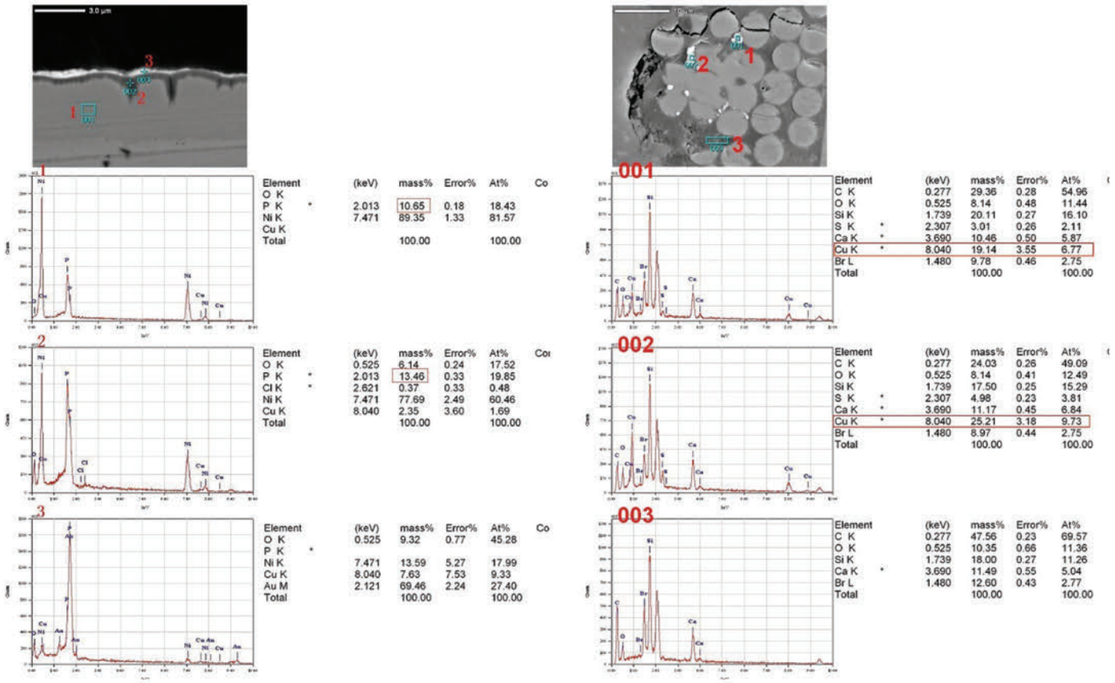
SEM/EDS 检测分析服务
SEM/EDS Testing and Analysis Services

麦可罗泰克（常州）实验室所提供的 SEM/EDS 检测分析服务作为一项相对独立的分析技术，是新材料或新工艺研发、工艺监控、质量控制和失效分析不可或缺的工具。它将我们的视野带入具有丰富信息的材料和器件的微观世界，直接看到材料的结构、工艺处理后的结果以及失效的原因。广泛应用于冶金、机械、陶瓷、化工、半导体、电子器件、纺织、生物学等行业领域，适用于科学研究、工业产品失效分析、产品可靠性控制。是一种使用最经济、破解问题最高效的分析手段。

Microtek (Changzhou) Laboratories provides SEM/EDS testing and analysis service, which is a necessary tool for R&D on new materials and new processes, process monitoring, quality control and failure analysis. It brings our view into the informative microscopic world for materials and componems, which leads us directly to the structure of materials, results after process treatment and cause of failures. It is broadly used in industries such as metallurgy, machinery, ceramics, chemical industry, semiconductor, electronics, textile, biology and is applicable for scientific research and failure analysis on industrial products and product reliability control. It is one of the most cost–effective and most effective analytical tools for solving problems.



SEM 分析图 SEM Scans



EDS 分析图 EDS Scans