

IPC一览

帮助世界更好地
制造电子产品

IPC简介

IPC是一个全球会员驱动性的行业组织，一直引领着电子制造业的巨大变革，旨在帮助OEM原始设备制造商、EMS电子制造服务商、PCB印制电路板制造商、线缆线束制造商以及电子行业供应商更好地制造电子产品。

世界各地现有3000多家会员企业使用IPC服务来进一步提升其竞争优势和获得财务成功。IPC会员企业代表电子行业产业链的各个环节，包括设计、印制电路板制造、电子产品组装和测试。

IPC提供的服务主要有：行业标准、培训认证、市场研究和环境保护，并且通过开展各种类型的工业项目来满足这个全球产值达2万亿美元的行业需求。

IPC历史



1957-1966

- IPC正式成立
- 出版《IPC-A-600印制电路板的可接受性》



1967-1976

- IPC活跃于IEC
- 出版第一份《印制电路板市场调研报告》



1977-1986

- 接受ANSI认证
- 出版《IPC-A-610电子组件的可接受性》



1987-1996

- 定义EMS行业(电子制造服务业)
- 发起IPC印刷电路博览会 (IPC Expo)



1997-NOW

- 中国办事处成立
- 出版《IPC/WHMA-A-620 线缆及线束组件的要求与验收》
- 成立设备制造商、焊料、无铅化等理事会、委员会

IPC使命

IPC致力于帮助会员增加竞争优势和商业成功，这些会员们都是电子行业的参与者。为实现这些目标，IPC将投入资源用于管理改进和技术增强计划、制定相关标准、保护环境以及相关的政府关系。IPC鼓励其所有成员积极参与这些活动，并承诺与所有相关组织充分合作。

IPC的目标

标准 Standards

成为最受尊敬且具有领导力的组织，为全球电子行业提供标准和质量项目。

倡导 Advocacy

成为业界最具影响力的商业环境法规倡导者，帮助会员提高全球竞争力。

行业洞察 Industry Intelligence

IPC将收集电子制造业的最新数据，为行业数字化转型提供最佳实践。

教育 Education

成为全球电子行业领域内，提供专业教育与知识的领导者。

解决方案 Solutions

与整个电子行业联合一起，共同寻找解决方案以应对行业面临的挑战。

IPC在中国的服务

制造业是立国之本、强国之基。电子制造业是中国经济重要的战略性产业和经济增长的重要引擎之一，也是全球竞争的战略要点。电子制造产业由设计、制造、装配和服务电子产品的公司组成。这些产品由材料、零件、组件和设备组成，它们利用电子原理来实现其主要功能。电子制造产业兴起于20世纪中叶，今天全球最大的产业之一。行业目前主要涉及航空航天、医疗电子、工业电子、消费电子、计算机设备、通信设备及汽车电子等领域。

IPC作为历史悠久且具有国际影响力的组织之一，结合中国“十四五”规划和2035年远景目标，聚焦产业标准、高技能人才教育、科技创新解决方案等项目，集聚全球产业链资源，与行业相关企业、行业组织、政府组织等开展积极合作，共同促进中国电子制造业的竞争力提升和高质量发展。

行业标准

工厂审核与认证

标准培训认证

职业教育

会员服务

行业活动

行业倡导

未来工厂解决方案

中车参与IPC国际及行业标准化活动，极大助推了中国轨道交通产业的高速高质发展，有效促进了技术与产业的引进来和走出去，将继续为中车的开放创新、协同创新提供舞台，也将为轨道交通产业全球发展、企业转型升级提供源源不断的生机和动力。同时，期待未来双方在标准化作业、在职培训、在岗培训、校企合作及工匠培养等方面深入探讨及合作，开创更多新局面境界，坚强有力地支撑起高铁电子产品稳定、可靠、高速奔驰在世界各地，载着梦想和责任感，高质高效驶向未来。

中国中车股份有限公司副总裁
王军

通用汽车在中国的供应商为通用汽车全球工厂提供零部件，而IPC标准在提高供应商的质量方面发挥了重要的作用。通过执行贯彻IPC的标准，2019年共有29家电子组的供应商获得通用汽车中国质量优秀奖，占比30%，打破了往年记录。未来，通用汽车中国将与IPC共同履行Build Electronics Better的承诺，推动电子行业的发展。

通用汽车中国及上汽通用供应商质量与发展总监
顾明

IPC标准概况

IPC标准在全球范围内被业界广泛采纳,现有的超过300份IPC标准和指南覆盖电子制造的各个环节,帮助制造商提升产品质量、可靠性、一致性;使产品生产过程更规范,废品率更低,从而降低成本;改善制造、质量等部门之间,设计、工艺、操作及检验等人员之间乃至行业上下游之间更好的沟通。

- 1 全球**70+**个国家的**5000+**专家志愿者参与制定(中国活跃的专家志愿者约**500**名)。
- 2 为整个供应链提供普遍接受的标准和语言;最受欢迎的IPC-A-610和IPC-J-STD-001标准已被翻译成近**20**种语言在近**70**个国家应用。
- 3 涵盖电子产品设计、材料、PCB制造、组装、测试、验收等各环节。
- 4 提高产品设计可制造性,质量可靠性。
- 5 提高生产效率,控制成本,减少返工和浪费。



IPC标准开发简要流程

01 立项申请

提交IPC Project Initiation Notification (PIN)申请,审批通过后启动;

02 工作草案

是一个持续开发和更新标准文件草案的阶段,工作组起草大纲拟定草案内容,收集来自工作组或行业的意见或建议;

03 最终草案 的行业评审

Final Draft for Industry Review 简称FDIR,最终草案完成后将接受为期30天的行业评审,以征求意见;

04 标准提案 的投票

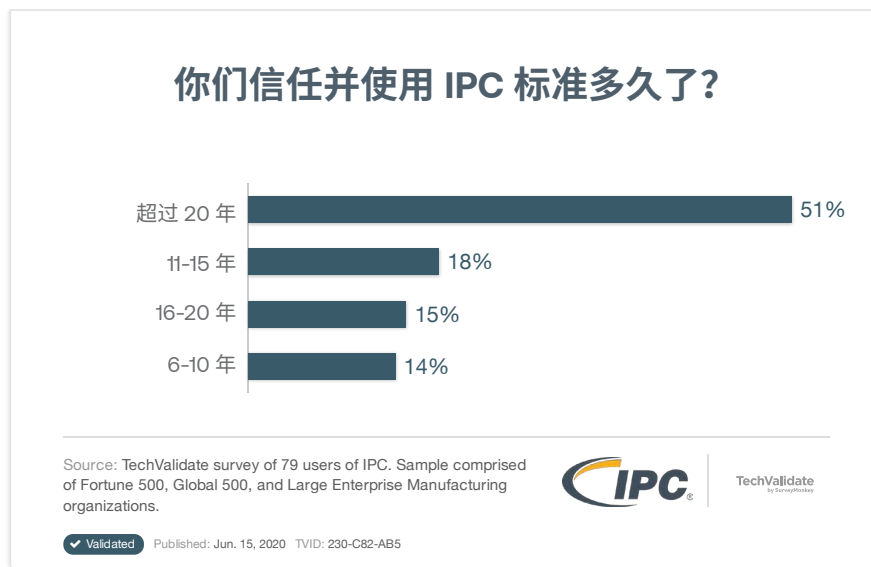
在FDIR完成后将进行标准草案的投票,参与投票小组需要提前注册且向业界开放;

05 发布

投票通过排程完成,IPC向业界发布标准。

行业认可

通过使用 IPC 标准，您的产品可实现卓越的质量、高可靠性和一致性从而获得认可。



AcBel Polytech Inc.
Acuity Brands inc.
Airbus Group
Air Products and Chemicals Inc.
Amazon.com, Inc.
Amphenol Printed Circuits
Apple inc.
Askey
AT&S Austria Technologie & Systemtechnik AG
AZTECH Communication Device (DG) Ltd
BAE SYSTEMS, Inc.
Benchmark Electronics, Inc.
British Sky Broadcasting Group Inc.
Celestica Inc.
Cisco Systems, Inc.
Compeq International Corp
Compeq Manufacturing Co. Ltd.
Continental Automotive
Conti Temic Microelectronic GmbH
Cummins, Inc.
Deere & Company
Delta products Corp.
Ericsson AB
FlexNet Inc

Flextronics International Ltd.
FoxConn Technologies
Fujikura Automotive Guangzhou Co. Ltd.
Fujitsu Ltd.
Fyrnetics
Garddien Services USA
Heraeus Holding GmbH
Hitachi Chemical
Hitachi High-Tech Analytical Science
Hong Fu Jin Precision Component (SZ) Co. Ltd.
Honeywell International Inc.
Intel Corp
Jabil
Juki Corporation
Lab126
Lockheed Martin Corp.
L3Harris
L3 Technologies, Inc.
Maxway Technology co., Ltd.
MBDA Systems
Nokia
Nordson Asymtek
Northrop Grumman Corp.
Panasonic Corp

Parker Hannifin Corp.
Philips International
Plexus Group
Rafael
Raytheon Company
Robert Bosch GmbH
Rockwell Collins
Sanmina-SCI
Schlumberger Limited
Schneider Electric SA
Shengyi Technology Co. Ltd.
Siemens AG
Telephonics Corp
Thales
The Boeing Company
Tokai Rika Co., Ltd.
Toyota Motor North America
TTM Technologies
United Technologies Corp
VEONEER Inc
ViaSat, Inc.
Viasystems Group Inc.
Woodward Governor
Zardoya Otis, S.A.
Zentech Manufacturing
Zollner Elektronik AG

IPC主要技术组

1-10 Printed Board Design Committee

This committee provides a forum for the exchange of technical information and for the preparation of guidelines and standards in the following areas: - Artwork generation & Computer aided design - Surface Mount Land Patterns - Printed Board and Assembly Complexity - Dimensional Tolerancing

1-13 Land Pattern Subcommittee

This subcommittee is responsible for land pattern design concepts through the development of IPC-IPC-7352 - Generic Guideline for Land Pattern Design.

1-14 DFX Standards Subcommittee

This subcommittee is developing guidelines for the application of industry standards in DFM (design for manufacturing), DFR (design for reliability) DFA (design for assembly), etc. The group has a goal of publishing these guidelines in early 2015.

2-10 Electronic Product Data Description Committee

This committee is responsible for the exchange of technical information and for the development of standards and guidelines in computer data format standardization. Included in these concepts are descriptions for products as well as machine-to-machine communication structures.

2-12 Digital Twin Subcommittee

2-15 Supply Chain Communication Subcommittee

This subcommittee is responsible for maintenance and further development of a series of standards dedicated to communication between supply chain partners. The format, identified as Product Data eXchange (PDX), is documented in the standard series IPC-257X. The effort is focused on communicating product content information between Original Equipment Manufacturers, Electronics Manufacturing Services providers, and component suppliers. The standard is based on XML DTD (Document Type Definition) and provides a simple flexible way to encode structured data into a format that is both human and machine-readable. The PDX standard consists of the Generic descriptions (IPC-2571), the as built descriptions (IPC-2576), and product design configuration data (IPC-2578).

2-16 Digital Product Model Exchange (DPMX) Subcommittee

This subcommittee is responsible for the maintenance and further development of IPC-2581.

2-17 Connected Factory Initiative Subcommittee

This committee is responsible for creating a data & control interface standard related to machine, sensor, IT host system, and the cyber-physical device communications within and surrounding the entire electronics manufacturing operations. The committee mission is to identify what Industry 4.0 and 'Industrial Internet of Things' (IIoT) mean in the context of electronics product assembly, and then to define the data content and communications method to enable free, standardized, and open non-proprietary methods to support the identified Industry 4.0 needs. The resulting standard shall adhere to two fundamental guidelines: First it shall not define logic, analytics, or decision making upon any data, nor shall it define what an end-user should do with the data. Secondly, it shall call for a minimum base level of 'plug and play' functionality in its final technical implementation such that customization is not required for its use in any given environment. The plug and play aspect of the standard relates to both data content and transport, in that there shall be a certain data sets and a transport that is considered minimally required by the standard, but the standard won't restrict additional transport and data content extensions to allow support for further needs.

2-19 Supply Chain Traceability and Trust Subcommittee

This subcommittee is responsible for developing the strategy and base structure for and overseeing a series of standards for the traceability of critical parts and products used in the manufacture of printed wiring assemblies, as well as mechanical assemblies. These standards will establish minimum requirements for traceability throughout the entire supply chain. Minimum traceability requirements will be based on a new set of categories of compliance (e.g., Good, Better, Best, MIL-Standard 882-E, etc.) as identified to meet the business model/economic needs of the end-use market for the final product (telecom, aerospace, appliances, cable TV, automotive and/or consumer electronics) or a part within that product.

2-30 Terms and Definitions Committee

This committee is responsible for the generation of terms and definitions applicable to the electronics interconnect industry through the updating and maintenance of IPC-T-50, Terms and Definitions for Interconnecting and Packaging Electronic Circuitry.

2-40 Electronic Documentation Technology Committee

This committee is responsible for the development of strategies and recommendations for the conversion of design and manufacturing information into electronic formats representing final product. Various graphic drivers as well as methodologies for information capture are addressed by this committee in order to establish intelligent electronic documentation that can be communicated between design and manufacturing. This committee also includes concepts for configuration management.

3-10 Printed Board Base Materials Committee

The Printed Board Base Materials General Committee provides the specification foundation on which all printed boards and printed board assemblies are based. This committee provides a forum for developing: Standards for all base material grades in terms of laminates and prepregs. Specifications and characterization methods for strategic components of base materials. Guidelines for improving base material processing and performance consistency. An effective interface with UL and other regulating agencies such as CSA and IEC. Test data supporting critical performance requirements of base materials versus printed board reliability.

3-11 Laminate Prepreg Materials Subcommittee

This subcommittee provides a forum for developing meaningful performance requirements and characterization methods for rigid laminates, thin laminates, composite laminates and prepregs for PWB manufacture. The primary focus of this subcommittee is to improve base material performance and processing consistency via industry-accepted and user-friendly standards and test methods. This subcommittee is responsible for the maintenance of IPC-4101.

4-10 Fabrication Processes Committee

This committee provides a forum for the exchange of technical information and development of guidelines in the areas of: Fabrication processes control as well as Drilling and routing. This committee also provides a forum for the exchange of technical information and support of test methods, process standards and other technical documents relating to: Circuitization by subtractive and additive technologies; Electroplating and electroless plating; Direct metallization processes and interplane adhesion enhancement.

4-12 Drilling and Routing Subcommittee

This subcommittee is responsible for maintaining IPC-DR-570,

4-30 Environment, Health & Safety Steering Committee

The EHS committee is responsible for promoting cleaner, safer manufacturing worldwide through exchanging information, assisting

the industry to achieve regulatory compliance, and promoting the development of reasonable, science-based environmental, safety and health regulations. Activities include reviewing proposed legislative and regulatory proposals that may impact members, drafting industry comments, and lobbying Congress and relevant federal agencies on EHS legislation and regulatory proposals.

4-33 Halogen-Free Materials Subcommittee

This subcommittee serves as a clearing house for information regarding the term: Halogen-Free as to laminate materials.

4-35CN Corporate Social Responsibility and Sustainability in the Supply Chain in China

This subcommittee will develop a standard for manufacturers in China which will allow them to demonstrate that their supply chain members are socially responsible (CSR) and adhere to a code which promotes sustainability.

5-20 Assembly & Joining Committee

This committee provides a forum for the exchange of technical information and preparation of guidelines and standards in the following areas: - Joining techniques o Soldering requirements - Solderability testing - Soldering materials

5-21 Component Mounting Subcommittee

This subcommittee is responsible for the development of documentation related to component mounting techniques.

5-22 Soldering Subcommittee

This IPC subcommittee maintains soldered assembly material and process specifications.

5-23 Solderability Subcommittee

This subcommittee is the focal point for developing procedures and processes for evaluating the solderability of surface metallizations. It also has the responsibility to position itself in the critical path of all soldering and solder related specifications for reviewing, commenting and recommending acceptance.

5-24 Assembly & Joining Materials

This subcommittee is responsible for the development of IPC documents, Joint Industry Standards, and Internationally Recognized Standards (ISO) for materials used in the assembly and joining processes. Significant in these documents and standards are the associated Test Methods to evaluate and test the materials. Current efforts are directed towards flux, solder paste, solder alloys, adhesives, and surface mount component underfill material.

5-26 Green Cleaners Subcommittee

5-30 Cleaning and Coating Committee

This general committee provides a forum for the exchange of technical information and for the preparation of guidelines and standards in the following areas: cleaning technologies, cleanliness testing and contamination control, bare board and assembly cleanliness assessment, solder mask, and conformal coating. They are responsible for verification and assessment of the associated test methods: ROSE, SIR, ECM, HPLC and IC.

5-31 Cleaning and Alternatives Subcommittee

This subcommittee addresses issues associated with electronics cleaning. Task groups actively address cleaning materials compatibility testing, ultrasonics cleaning, and maintain cleaning handbooks compiling information on solvents cleaning, aqueous cleaning, semi-aqueous cleaning and general cleaning.

5-32 Cleanliness Assessment Subcommittee

This subcommittee is responsible for all technologies for assessing cleanliness, including test methods and their application.

5-33 Coating Subcommittee

This general committee is responsible for the development of standards for uniform qualification and performance of coatings, solder mask, and potting/encapsulants used to protect printed wiring boards and the components. The committee is responsible to assure consistency with other IPC documents attempting to maintain synergy with other industry criteria (i.e. ISO, UL, IEC, etc.).

6-10 Product Reliability Committee

This committee provides a forum for the exchange of technical information and for the preparation of guidelines and standards related to product reliability issues. These issues relate to all forms of electronic packaging.

7-10 Testing Committee

This committee provides a forum for the exchange of technical information and for the preparation of guidelines and standards in the following areas: - Test Methodology and Materials Characterization - Microsectioning - Test Laboratories

7-11 Test Methods Subcommittee

This committee is responsible for the maintenance of all test methods of the IPC-TM-650 Test Method Manual. This committee reviews, approves, and insures proper validation of the test methods and is responsible for maintenance of the Methods Development Packet (MDP).

7-12 Microsection Subcommittee

This committee is responsible for the maintenance and development of concepts, guidelines, and tutorials for manual and automated microsection preparation (test method 2.1.1) which are used to evaluate the printed board and assembly quality.

7-20 Process Control Management Committee

This committee provides a forum for the exchange of technical information and preparation of guidelines and standards in the following areas: o Process effects o Troubleshooting o Statistical process control (SPC) concepts

7-24 Printed Board Fabrication and Assembly Process Effects Subcommittee

This subcommittee is responsible for the management of IPC-9121, Troubleshooting for Printed Board Fabrication Processes. This handbook provides problems, causes and possible corrective actions related to printed board manufacturing processes.

7-30 Product Assurance Committee

This committee provides a forum for the exchange of technical information and for the preparation of guidelines and standards in the following areas: Automated optical inspection; Printed board acceptability; Printed board assembly acceptability; Cable and wire harness assemblies; Inspection aids; Quality assurance; Incoming inspection of raw materials; Clean rooms; Repairability

7-31 Acceptability Subcommittee

This subcommittee organizes the activities related to acceptability of printed board, printed board assembly products, and cable/wire harness assemblies. They foster technical discussions on printed board acceptability.

7-33 Quality Assurance Subcommittee

This subcommittee organizes the activity related to quality assurance requirements. They provide a forum for active discussions in the area of quality assurance, and are the developers of the quality assurance inspection and microsectioning workshops. (Not currently active)

7-34 Repairability Subcommittee

This subcommittee oversees all repair and modification standards activity.

7-35 Assembly and Joining Handbook Subcommittee

This subcommittee is responsible for maintaining the IPC-AJ-820 handbook by incorporating and updating the best parts of IPC-AJ-820, IPC-HDBK-001, IPC-HDBK-610 and other documents.

8-40 Roadmap Executive Committee

This committee is responsible for developing a strategy for the Technology Roadmap Subcommittee.

9-80 OEM Management Council Steering Committee

The goal of this committee is the standardization of critical commodities including but not limited to air moving devices, power supplies, connectors, heatsinks and cabling.

B-10 Packaged Electronic Components Committee

This committee provides a forum for the exchange of technical information on all types of packaged electronic components, both through-hole and surface mountable.

B-11 3-D Electronic Packages Subcommittee

This subcommittee is responsible for the management of IPC-7091, Design and Assembly Process Implementation of 3D Components. This document describes design and assembly challenges and ways to address them and focuses on achieving optimum functionality, process assessment, end-product reliability and repair issues associated with 3D semiconductor package assembly and processing.

D-10 Flexible Circuits Committee

In order to keep pace with the ever evolving flexible circuits industry, this committee is dedicated to maintaining and developing quality-driven, focused, technical standards for the proper design, manufacture and inspection of flexible circuits, rigid-flex circuits and flexible circuit materials. This committee also represents its industry through work with UL on flexible circuit Recognition and through joint activities with the Japan Printed Circuit Association (JPCA).

D-11 Flexible Circuits Design Subcommittee

This subcommittee is responsible for maintaining IPC-2223, Sectional Design Standard for Flexible and Rigid-Flexible Printed Boards.

D-12 Flexible Circuits Specifications Subcommittee

This subcommittee is responsible for maintaining IPC-6013, Qualification and Performance Specification for Flexible and Rigid-Flexible Printed Boards.

D-13 Flexible Circuits Base Materials Subcommittee

This subcommittee serves as a forum for the discussion and development of new base materials for use in the manufacture of flexible PWBs. This subcommittee is responsible for the maintenance of flexible circuits base materials standards covering flexible base dielectrics (IPC-4202), adhesive-coated dielectric films (IPC-4203) and flexible metal clad dielectrics (IPC-4204).

D-15 Flexible Circuits Test Methods Subcommittee

This Subcommittee is responsible for generating, verifying and revising test methods which relate to all aspects (design, base materials and performance) of the D-10 Flexible Circuits Committee. All changes to existing test methods and additional test methods formulated by the D-15, Flexible Circuits Test Methods Subcommittee will be submitted to the 7-11, Test Methods Subcommittee for inclusion into the IPC-TM-650, Test Methods Manual.

D-20 High Speed-High Frequency Committee

This committee provides a forum for the exchange of technical information and for the development of guidelines and standards for industry use and information in the following areas: - High speed/frequency design - High speed/frequency board performance - High speed/frequency raw materials - High speed/frequency test methods

D-21 High Speed High Frequency Design Subcommittee

This subcommittee is responsible for developing guidelines and

specifications for products requiring high speed, high frequency, controlled impedance or microwave characteristics. The subcommittee is working to develop an IPC-2228 design standard for RF/Microwave printed boards.

D-22 High Speed High Frequency Board Performance Sub-committee

This subcommittee is responsible for the development of IPC-6018, Qualification and Performance Specification for High Frequency (Microwave) Printed Boards.

D-23 High Speed High Frequency Base Materials Subcommittee

This subcommittee is responsible for the development/update of IPC-4103.

D-24 High Speed-High Frequency Test Methods Subcommittee

This subcommittee is responsible for developing test methods to specifically evaluate high speed/high frequency boards and materials.

D-30 Rigid Printed Board Committee

This committee provides a forum for the exchange of technical information and for the preparation of guidelines and standards in the areas of rigid printed board design standards and rigid printed board performance specifications and their supporting standards.

D-31 Rigid Printed Board Design Subcommittee

This subcommittee is responsible for: o Assessing design needs of the rigid printed board industry and establishing programs to address these needs o Maintenance and technical input to IPC rigid printed board design standards

D-32 Thermal Stress Test Methodology Subcommittee

This subcommittee is responsible for developing and maintaining test protocols for assessing the reliability and material/design robustness of test coupons/vehicles through the use of thermal profiles. This will aid in establishing the acceptability of a printed board exposed to multiple thermal cycles in both tin-lead and lead-free processing environments.

D-33 Performance Standards Subcommittee

This subcommittee is responsible for keeping the rigid single, double and multilayer specifications current with state-of-the art performance requirements and evaluation procedures.

D-35 Printed Board Storage and Handling Subcommittee

This subcommittee is responsible for maintaining the IPC-1601, Printed Board Handling and Storage Guidelines.

D-36 PB Process Capability-Qual Relative Reliab. Bench

This subcommittee is responsible for establishing and maintaining a family of process capability panel designs and standards for use by printed board suppliers and OEMs/CEMs in benchmarking fabricator capability.

D-50 Embedded Components Committee

This Committee is responsible for assessing design, material, performance and test method needs of the printed board industry in terms of boards utilizing embedded component devices. To that end, the committee will work with the relevant subcommittees underneath it (D-51 through D-54) to synchronize development of standards, specifications and test methods in the four aforementioned areas.

D-52 Embedded Component Materials Subcommittee

The objective of this subcommittee is to develop specifications for materials serving embedded device functions being incorporated into printed boards under the IPC-4811 for embedded resistors and IPC-4821 for embedded capacitors.

D-54 Embedded Devices Test Methods Subcommittee

This subcommittee will be responsible for developing test methods which are specific to the needs of the D-50 Embedded Components Committee and its subcommittees. As these Embedded Component Devices-specific test methods are developed, they will then be sent to the 7-11 Test Methods Subcommittee for inclusion in the IPC-TM-650 Test Methods Manual.

D-55 Embedded Devices Process Implementation Subcommittee

This subcommittee is working on revision A of IPC-6017, Qualification and Performance Specification for Printed Boards Containing Embedded Active and Passive Circuitry. This specification covers qualification and performance of embedded active and passive circuitry within the finished printed board.

D-60 Printed Electronics Committee

The IPC Printed Electronics Committee plans, guides and coordinates the development of materials, processes, design, reliability and terms and definitions standards and educational resources to support the advancement of printed electronics.

D-63 Printed Electronics Functional Materials Subcommittee

This subcommittee is responsible for the management of IPC-4591, Requirements for Printed Electronics Functional Conductive Materials. This standard establishes the classification system and the qualification and quality conformance requirements for functional conductive materials used in printed electronics applications.

D-64 Printed Electronics Final Assembly Subcommittee

This subcommittee is developing IPC-6902, Qualification and Performance Specifications for Printed Electronics on Flexible Substrates. This standard will establish and define the qualification and performance requirements for printed electronic applications and their forms of component mounting and interconnecting structures on flexible substrates.

D-70 E-Textiles Committee

This committee strategizes, plans, guides and coordinates the development of standards and education for e-textiles.

D-71 E-Textiles Joining and Interconnection Techniques Subcommittee

This subcommittee is developing IPC-8941, Guideline on Connections for E-Textiles. This guideline will provide key considerations and best practices for connecting e-textiles to components. The components can be the commodity to which the e-textile will provide functionality or components which are attached to e-textiles to augment their performance. This document will help users and manufacturers to work together to make best decisions for selecting connector types, connection materials and connection processes based on the e-textile technology to be used and the component to which the e-textile will be connected.

D-72 E-Textiles Materials Subcommittee

This subcommittee is developing IPC-8921, Requirements for Electronic Textiles (E-Textiles), Conductive Fibers and Conductive Yarns. This standard establishes the classification system as well as qualification and quality conformance requirements affecting electrical/electronic performance of electronically-integrated textiles (e-textiles). This standard also covers similar requirements for conductive fibers and conductive yarns. E-textiles according to this standard include Woven Textiles, Knitted Textiles, Nonwoven Textiles, Laminated Textiles, Braided Textiles, Embroidered Textiles, Printed Textiles, Coated Textiles and other textile constructions with a conductive element.

D-73 E-Textiles Design Subcommittee

This subcommittee develops and manages standards for designing electrical and electronic functionality of printed electronics of e-textiles.

D-74 E-Textile Test Methods Development and Validation Subcommittee

This subcommittee works with other subcommittees and task groups of the D-70 Committee on validating industry test methods and forms task groups within the subcommittee to develop new IPC Test Methods for e-textiles or to work with other standards bodies on joint test standards efforts.

D-75 E-Textiles Quality and Reliability Subcommittee

This subcommittee is responsible for overseeing the development of standards focused on quality and reliability of e-textiles products.

E-30 Materials and Supplier Declarations Committee

This committee oversees the preparation of standards and related documentation for materials declaration and electronic exchange processes.

E-31 Supplier Declaration Subcommittee

Establish the principles necessary for the exchange of declaration information between supply chain partners relating to a product and the purpose of a declaration (sectional standards). The requirements for declaring information about a specific declaration topic are specified in the IPC-175x sectional standards. Develop and maintain a framework for the IPC-175x series of standards on supplier declaration. The framework includes a specification for common data elements shared across the sectional standards related to the supply chain partners and the product. Coordination and alignment across IPC-175x sectional standards (IPC E-31x sectional committees). A process will be developed for coordination and alignment. Develop and maintain the IPC-1751 standard to provide the principles and details necessary for declarations between members of a supply chain. Develop and maintain the attributes related to product and partners (i.e., requester and responder). Specify the framework and rules by which sectional standards specify the sectional schemas.

V-ESSC IPC European Standards Steering Committee

The IPC European Standards Steering Committee provides a forum to discuss new ideas, standards and hot topics of interest at the European level.

V-TAEC Technical Activities Executive Committee

The IPC Technical Activities Executive Committee (TAEC) is responsible for the management function related to the standardization and technical activity within IPC. The TAEC will review, prioritize and approve the standards and solutions related programs of IPC and recommend allocation of appropriate resources to the Board of Directors.

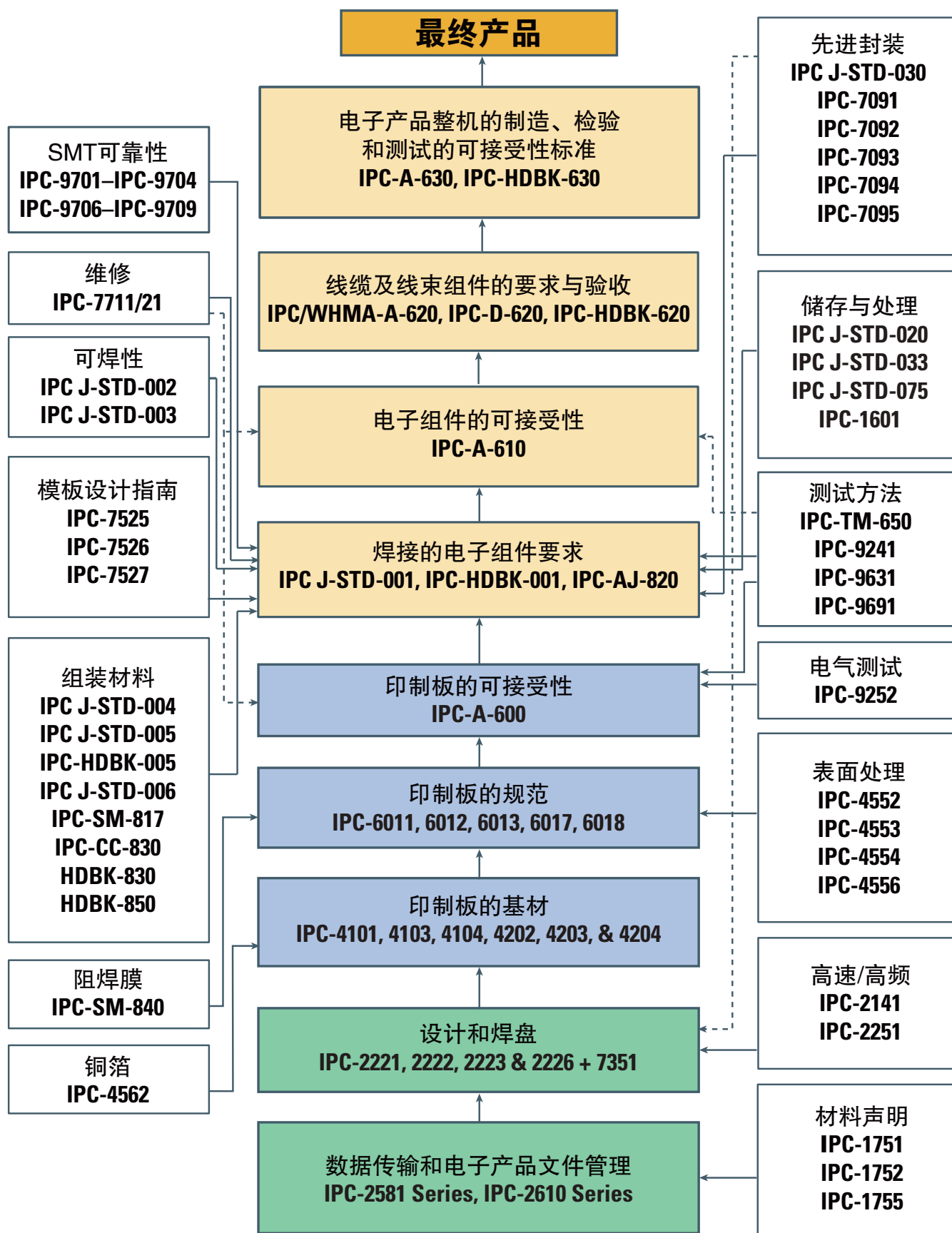
V-TSL Technology Solutions Committee

This committee provides direction for existing and potential technical challenges for the electronics interconnection industry. This committee guides, manages and produces succinct, informative technical and IPC Technology Solutions white papers for IPC members and/or the entire electronics community.

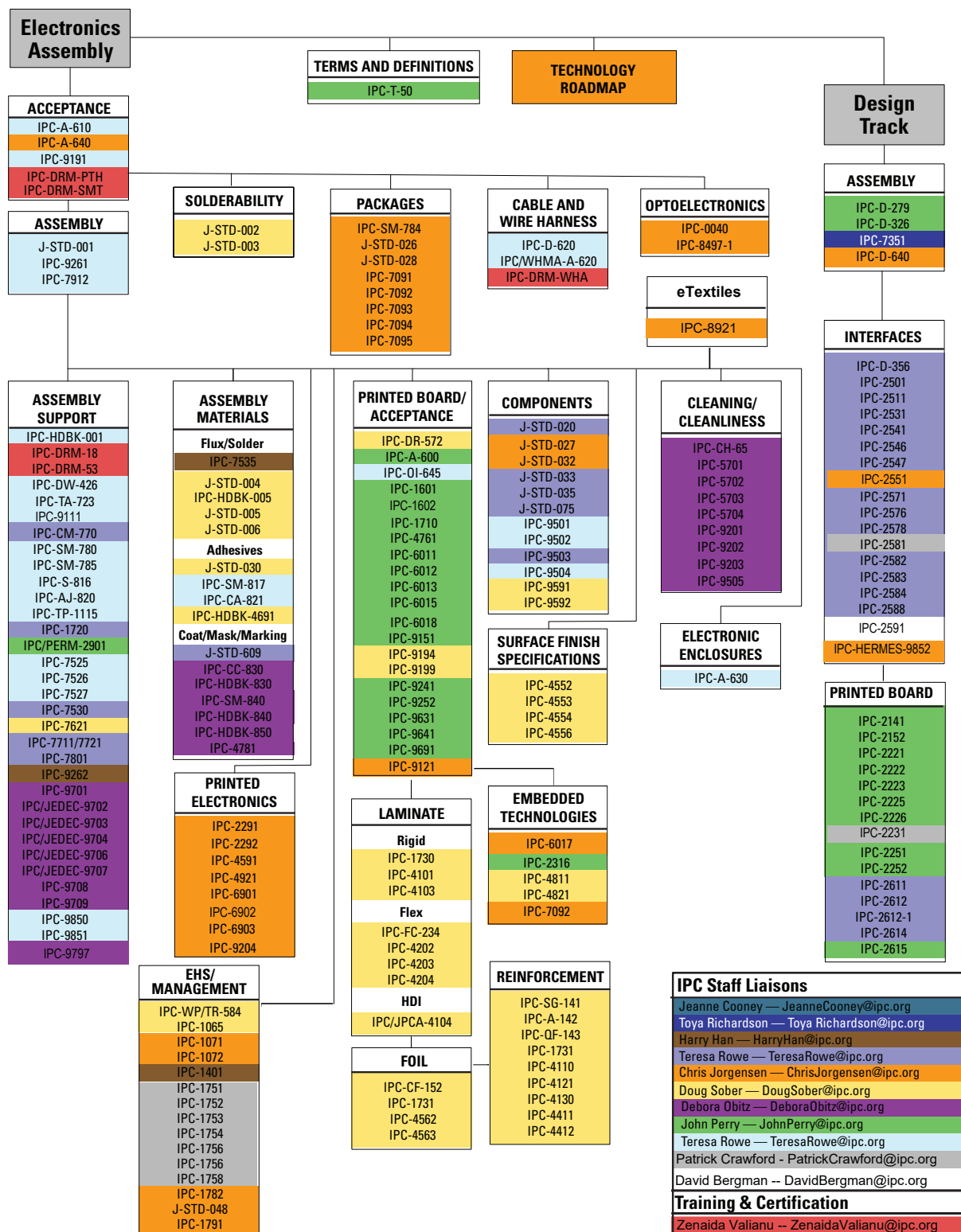
V-TSL-MVIA Weak Interface Microvia Failures Technology Solutions Subcommittee

This subcommittee is developing additional resources, such as white papers, technical presentations and webinars, to supplement IPC-WP-023 on weak microvia interfaces. In addition, subject matter experts with companies from the printed board supply chain have joined this subcommittee to share data and experiences about microvia interfaces and to strategize industry solutions to overcome this problem. IPC V-TSL-MVIA is an invitation-only subcommittee at this point, limited to those with direct experience with the problem. Email the staff liaison or chairs for more information or if your company would like to participate. At a later date, a different, more open structure is anticipated.

IPC 标准 - 覆盖供应链的每道工序



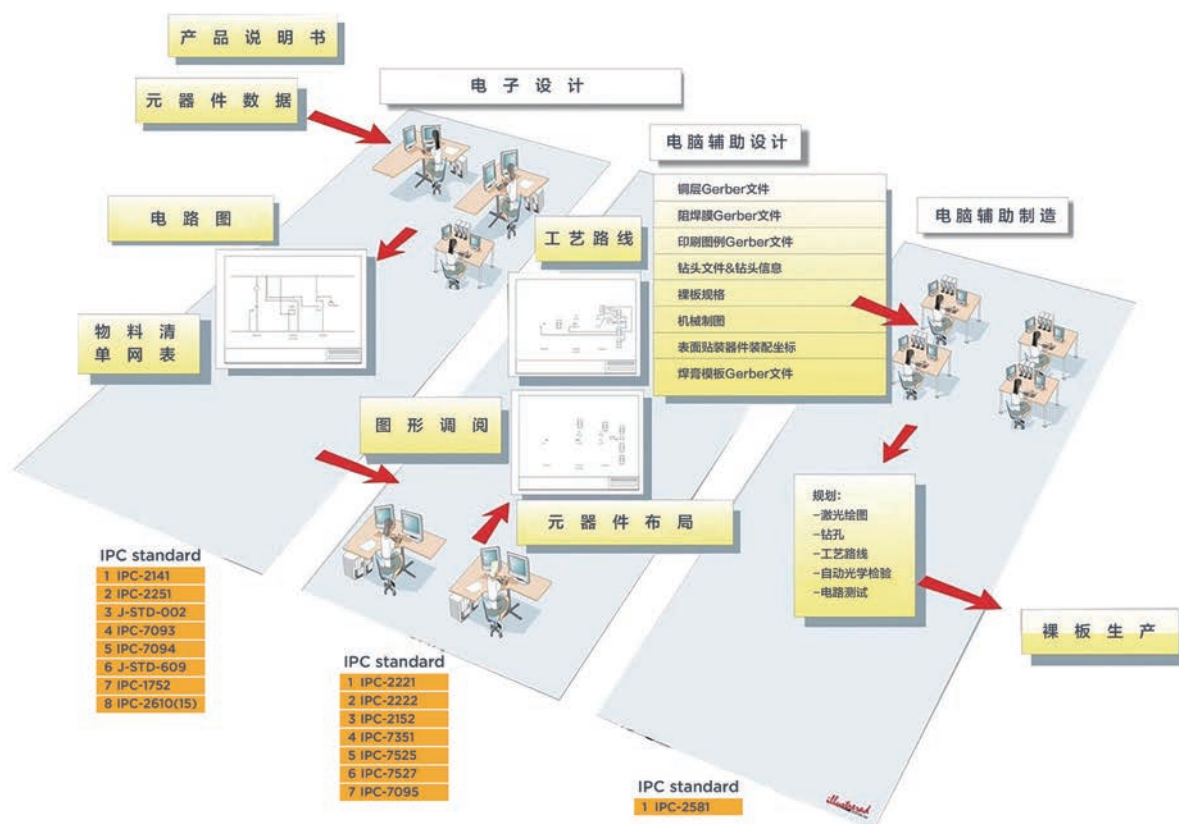
IPC 标准树



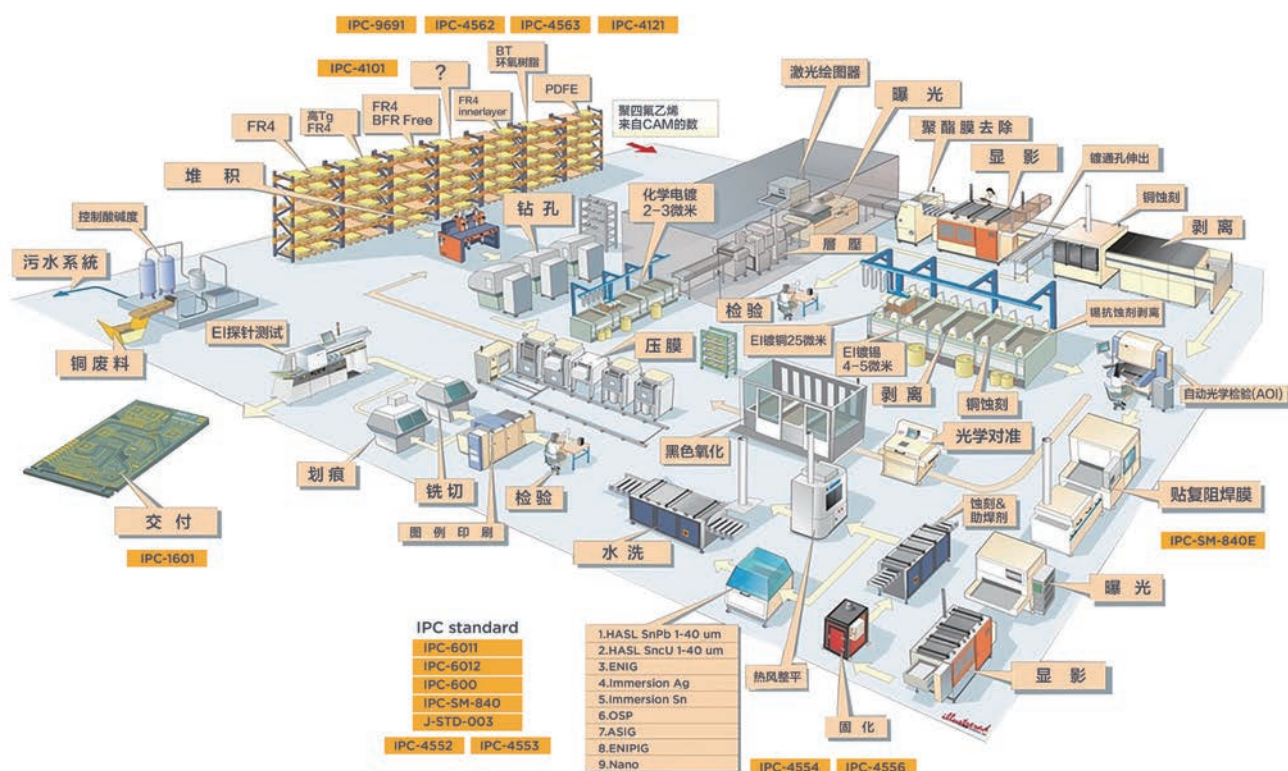
For more details on these standards, visit the IPC Document Revision Table located at www.ipc.org/revisions
 IPC Headquarters • 3000 Lakeside Drive, Suite 105N., Bannockburn, IL USA • www.ipc.org

March 2021

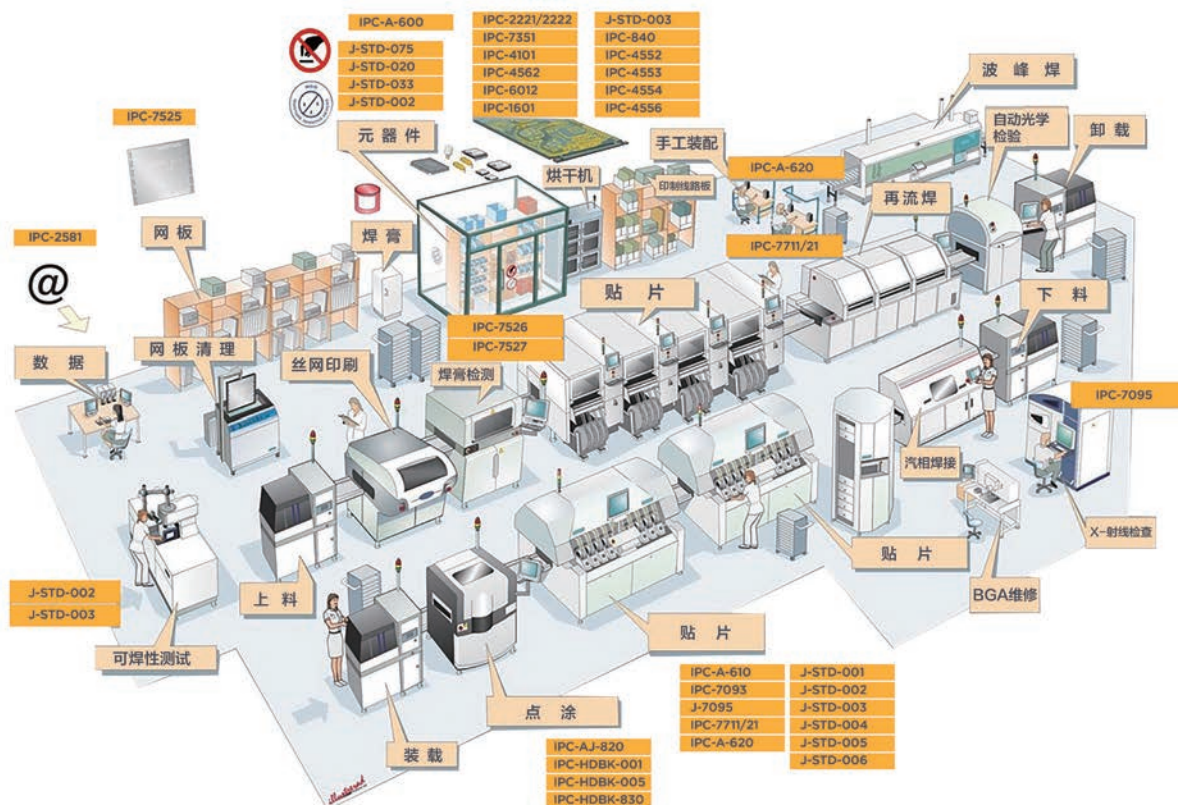
IPC印制板及电子产品设计标准



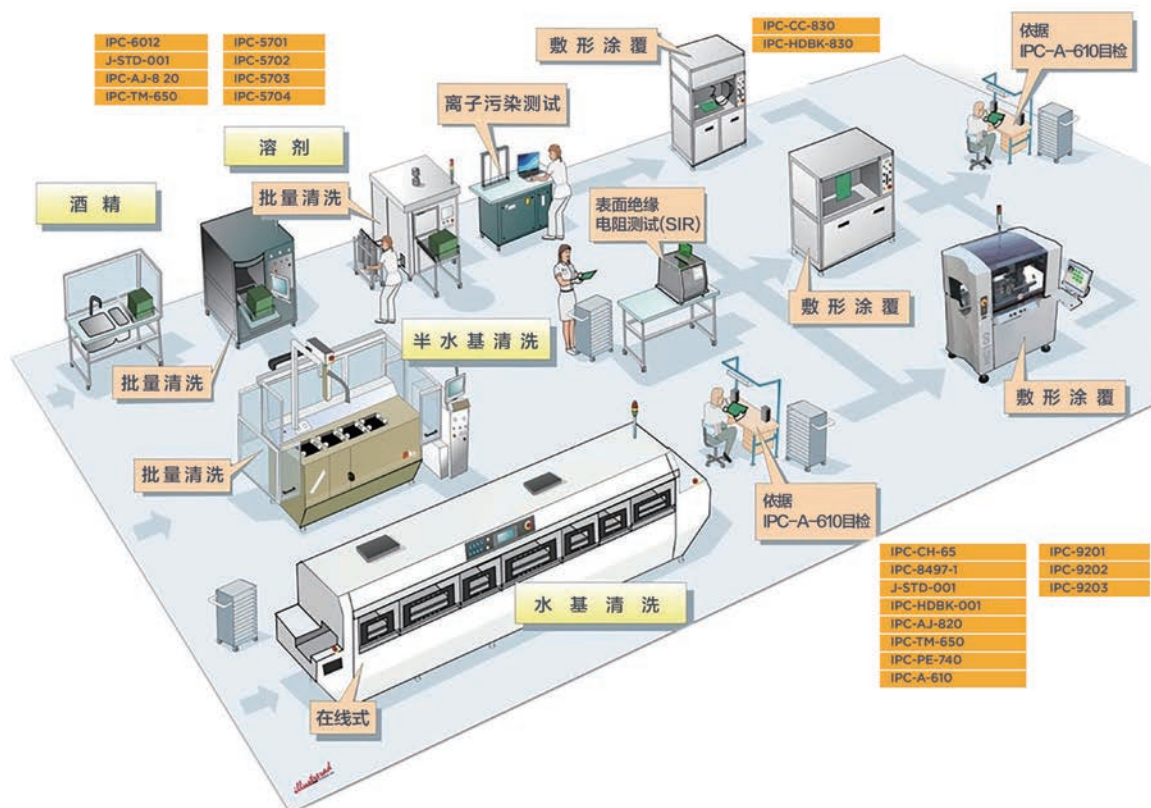
IPC印制板制造标准



IPC电子产品焊接和组装标准



IPC清洗和敷形涂覆标准

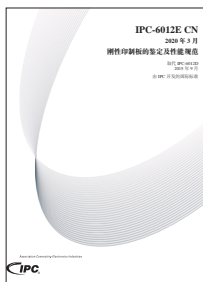


IPC六大畅销标准



IPC-A-600 印制电路板的可接受性

- 印制电路板行业广泛应用的验收标准。
- 印制电路板外观检验详细的指导手册。
- 针对印制板裸板，从内部和外观可观察的目标、可接受和不符合情况提供了图片和解释。



IPC-6012 刚性印制板鉴定与性能规范

- 本规范涵盖了刚性印制板的鉴定和性能。
- 该规范涉及最终成品和表面镀层涂覆要求、导体、通孔 / 过孔、验收测试的频率和质量一致性以及电气、机械和环境要求。



IPC-A-610 电子组件的可接受性

- 全球范围内广泛应用的电子组件验收标准。
- 被国际电工委员会（IEC）推荐为电子组件的首选验收标准。
- 美国国防部 (DOD) 声明采用 IPC-A-610 标准。



IPC-J-STD-001 焊接的电气和电子组件要求

- 全球达成行业共识的涵盖焊接材料和工艺的标准。
- 电子组件可接受性问题的生产过程中的全面解决方案。
- 美国航空协会指定为对供应商的验收规范。
- NASA 的焊接标准建议采纳 IPC-J-STD-001 航天和军事应用电子部件补充标准。



IPC/WHMA-A-620 线缆线束的要求和验收

- 业界认可的线缆、线束组装要求和验收标准，被全球范围的 OEM 和 EMS 公司广泛采用。
- 由 IPC 和线束线缆制造商协会（WHMA）共同开发。



IPC-7711/7721 电子组件的返工、维修和修改

- 本指南提供了印刷电路板组件的返工、维修和修改程序。
- 包括第一部分基本信息和通用程序、第二部分返工（7711）、第三部分修改和维修（7721）。

IPC特定行业补充标准

汽车

- **IPC-6012-Automotive:**

《刚性印制板的鉴定及性能规范》汽车要求补充标准

- **IPC-A-610-Automotive:**

《电子组件的可接受性》汽车应用补充标准

- **IPC-J-STD-001-Automotive:**

《焊接的电气和电子组件要求》汽车应用补充标准

- **IPC-9797-Automotive:**

符合汽车应用要求及其他高可靠性应用要求的压接标准

航空 & 航天

- **IPC/WHMA-A-620-Space:**

《线缆及线束组件的要求与验收》航天和军事应用电子部件补充标准

- **IPC-J-STD-001-Space:**

《焊接的电气和电子组件要求》航天和军事应用电子部件补充标准

- **IPC-6018-Space:**

《高频（微波）印制板的鉴定及性能规范》航天和军事航空应用补充标准

- **IPC-6012-Space:**

《刚性印制板的鉴定与性能规范》航天和军事航空应用补充标准

电信

- **IPC-6018-Telecom:**

《高频（微波）印制板的鉴定及性能规范》电信应用补充标准

- **IPC-A-610-Telecom:**

《电子组件的可接受性》电信应用补充标准

轨道交通

- **IPC/WHMA-A-620-Rail Transit:**

《线缆及线束组件的要求与验收》轨道交通应用补充标准

- **IPC-A-610-Rail Transit:**

《电子组件的可接受性》轨道交通应用补充标准

医疗行业

- **IPC-6012-Medical:**

《刚性印制板的鉴定及性能规范》医疗应用补充标准

IPC Validation-企业的质量解决方案

IPC Validation Service 工厂审核与认证，包含 SGA，QML&QPL；是一系列基于 IPC 标准，面向工厂和产线进行诊断、改善及认证的服务。此项服务提供专家级的技术解决方案，旨在帮助企业提高产品质量、可靠性及一致性，以降低风险，提升企业价值。

• SGA（Standard Gap Analysis）标准差距分析：

SGA 项目旨在由 IPC 技术专家对企业制造过程进行全面的分析诊断，找出当前的方法与 IPC 标准的差距，定位纰漏、补齐短板。

• QML（Qualified Manufacturer List）认证制造商名录：

QML 项目旨在验证企业是否能够按照 IPC 标准进行产品的制造、组装和供应。该项目聚焦产品的可靠性和一致性，帮助企业评估其在质量管理、工艺改进和最佳实践等方面的水平。通过认证的制造商将被列入 IPC QML 认证制造商名录，进一步提升其企业价值。

• QPL（Qualified Product List）认证产品名录：

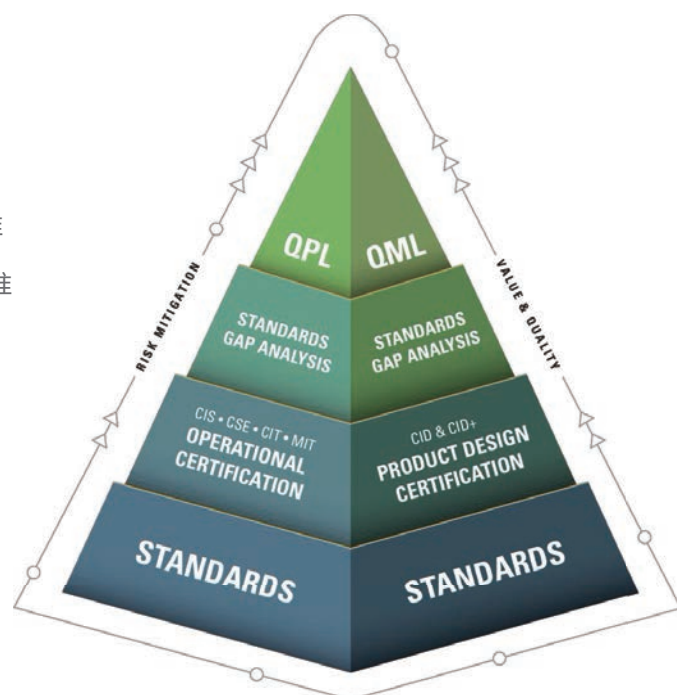
QPL 项目旨在评审供应商及其生产的产品是否符合 IPC 标准。一旦通过资格认证，供应商及其产品将列入 IPC QPL 认证产品名录，从而在行业中获得较高的可信度。

IPC 工厂认证审核项目有：

- EMS/OEM 制造工厂认证：依照IPC J-STD-001/IPC-A-610标准
- 航天军工制造工厂认证：依照IPC J-STD-001航天军工附加标准
- PCB工厂认证：依照IPC-6012/IPC-A-600标准
- 线缆线束工厂认证：依照IPC/WHMA-A-620标准

访问以下链接可查询获得IPC Validation认可的企业名录：

<https://ipcvalidation.org/qualifications/qpl-qml-list/>



IPC 培训和认证项目概况

IPC认证项目旨在促进专业发展,并认可在特定标准中表现出相应能力水平的个人。IPC认证是全球公认的电子制造行业国际标准认证。所有IPC认证项目应在IPC认证政策与程序的指导下进行。全球每年有约10万专业人士获得IPC认证。

- IPC认证证书可在<https://my.ipcedge.org/> 查验真伪

IPC标准认证培训级别



MIT-Master IPC Trainer 主任培训师 获得IPC授权可培训特定标准CIT的个人

- 只有IPC授权培训中心的雇员才能担任MIT
- MIT证书由IPC认证项目总监签发
- MIT可以培训CIT、CIS



CIT-Certified IPC Trainer IPC认证培训员 具备培训特定课程CIS能力的个人

- 适用电子企业的内部培训员和设计/制造/工艺/质量等技术人员
- 针对某个项目的 CIT 只能对该项目进行 CIS 培训和认证



CIS-Certified IPC Specialist IPC认证专员 具有能力使用或运用特定IPC标准的个人

- 适用生产/检验等人员和设计/制造/工艺/质量等技术人员
- 基于标准的 CIS 培训是模块化的
- 由强制性模块确立的认证到期日将适用于所有可选模块

IPC认证培训员 (CIT) 和IPC认证专员 (CIS) 证书的有效期均为2年,到期后需参加相应的挑战考试或认证课程保持认证的有效性。

课程大纲用于规定课程的内容分类与时长安排。以下课程大纲仅供指导之用,培训老师负责具体培训计划各方面的时间管理。通常推荐的笔试时间是每题3-4 分钟。

IPC-A-600 印制板的可接受性

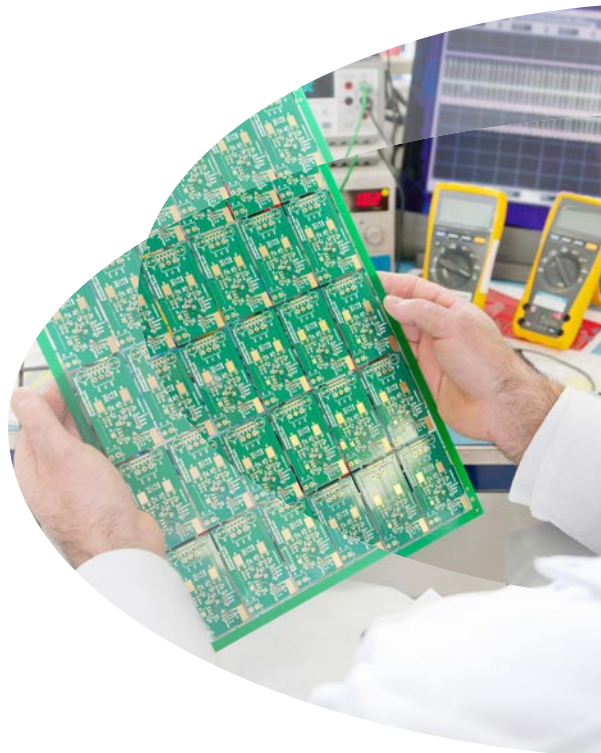
标准介绍：

IPC-A-600是关于印制板裸板从内部和外观可观察的目标、可接受和不符合情况而制定的验收规范,是针对印制电路板验收条件的详细指导手册,是印制电路板行业广泛应用的验收标准。

教材配置：

CIS: IPC-A-600中文标准。

CIT: IPC-A-600中文标准、IPC-A-600英文标准、IPC-6012 中文标准。



IPC-A-600K课程大纲

日期	模块	内容	时长
D1	介绍	介绍、IPC政策与程序（CIS必修）	0.5h
	M1	引言和清洁度测试（CIS必修）	3.5h
	M2	外部可观察的特性	2.5h
D2	M3	内部可观察的特性	3.5h
	M4	其他类型板	3.0h
		CIT：培训员技能、认证系统使用	1.5h
D3		CIS：M1-M4开卷考试	5.0h
		CIT：ESS/P&P考试+开卷考试	6.0h

IPC-6012

刚性印制板鉴定与性能规范

标准介绍：

IPC-6012 是针对刚性印制线路板生产工艺进行质量控制的要求。印制板选材至每个生产流程上各个工艺的质量指标,涵盖了刚性印制板的鉴定和性能规范。涉及最终成品和表面镀层涂覆要求、导体、通孔/过孔、验收测试的频率和质量一致性以及电气、机械和环境要求。本规范侧重于刚性印制电路板裸板的制造要求。

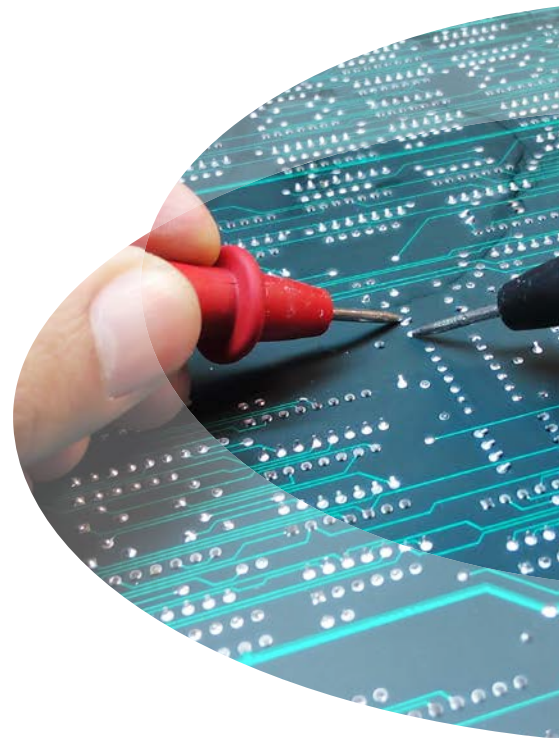
教材配置：

CIS: IPC-6012中文标准。

CIT: IPC-6012中文标准、IPC-6012 英文标准、IPC-A-600中文标准。

IPC-6012E课程大纲

日期	模块	内容	时长
D1	介绍	介绍、IPC政策与程序	0.5h
	M1	范围/适用文件	2.5h
	M2	总则与材料要求	3.5h
D2	M3	外观要求	2.0h
	M4	尺寸和导体要求	3.0h
	M5	结构完整性要求	3.0h
D3	M6	阻焊膜、电气要求和清洁度	2.5h
	M7	特殊要求	1.5h
	M8	质量保证条款	2.5h
		CIT: 培训员技能、认证系统使用	1.5h
D4		CIS: 开卷考试	5.0h
		CIT: ESS/P&P考试+开卷考试	6.0h



IPC-A-610

电子组件的可接受性

标准介绍：

IPC-A-610是全球广泛应用的电子组件验收标准。该标准用来规范电子组件最终产品的可接受条件以及明确其缺陷条件,并通过彩色图片和插图描述了电子组件业界公认的验收要求,是质保、采购、组装、工艺等部门必备的宝典。该标准常与IPC-J-STD-001焊接的电气与电子组件要求配套使用。

教材配置：

CIS: IPC-A-610中文标准。

CIT: IPC-A-610中文标准、IPC-A-610英文标准、IPC-T-50 中英双语标准、

IPC-AJ-820 中文手册。

IPC-A-610H课程大纲:

日期	模块	内容	时长
D1	介绍	介绍、IPC政策与程序 (CIS必修)	0.5h
	M1	综述、前言、适用文件、电子组件的操作 (CIS必修)	3.0h
	M2	焊接和高电压	2.5h
D2	M3	元器件损伤 & 印制电路板	3.0h
	M4	端子连接 (要求M2)	3.0h
	M7	机械零部件	1.5h
D3	M5	通孔技术 & 跳线 (要求M2和M3)	3.5h
	M6	表面贴装技术 & 跳线 (要求M2和M3)	4.0h
D4		CIS: M1-M7开卷考试	6.5h
		CIT: ESS/P&P考试+开卷考试+闭卷考试	6.5h
		CIT: 培训员技能、认证系统使用	1.5h



IPC-J-STD-001

焊接的电气和电子组件要求

标准介绍:

IPC-J-STD-001是全球达成行业共识的涵盖焊接材料和工艺的标准,全面提供电子组件可接受性问题在生产过程中的解决方案。该标准描述了生产焊接的电气和电子组件的材料、方法和验收标准,通过制程控制方法来确保电子组件产品质量的一致性。

教材配置:

CIS: IPC-J-STD-001中文标准、实操套件。

CIT: IPC-J-STD-001中文标准、IPC-J-STD-001英文标准、IPC-T-50 中英双语标准、IPC-AJ-820 中文手册、实操套件。



IPC-J-STD-001H 课程大纲

日期	模块	内容	时长
D1	介绍	介绍、IPC政策与程序 (CIS必修)	0.5h
	M1	综述; 适用文件和材料、元器件和设备的要求; 焊接和组装的通用要求; 清洁和残留物要求; 返工和维修 (CIS 必修) CIS M1 开卷考试	6.0h
D2	M2	导线和端子连接 (不含跳线) 示范&操作 CIS M2开卷考试	4.5h
	M3	印制板要求; 涂敷, 灌封和加固; 证据条纹 CIS M3开卷考试	2.5h
D3	M4	通孔安装和端接(含PTH跳线)(要求M3) 示范&操作 CIS M4开卷考试	6.0h
D4	M5	元器件的表面贴装 (含SMT跳线)(要求M3) 示范&操作 CIS M5开卷考试	7.0h
D5	M6	CIS检验技能 (导线和端子连接、通孔安装和端接、元器件的表面贴装、印制板要求、涂敷, 灌封和加固、证据条纹) CIS检验技能评估、M6开卷考试	7.0h
		CIT: ESS/P&P考试+开卷考试+闭卷考试 CIT: 培训员技能、认证系统使用	6.5h 1.5h

IPC/WHMA-A-620

线缆及线束组件的要求与验收

标准介绍：

IPC/WHMA-A-620是业界一致认可的线缆、线束组装要求和验收的标准，描述了用于压接、机械紧固与焊接互连材料、方法、测试和可接受性标准以及其它线缆线束组件组装活动的相关标准。该标准作为线缆线束行业进行工艺、材料、方法和检验管理的指导标准，已被全球范围内的OEM和EMS广泛采用。该标准的目的是依靠过程控制方法，以确保线缆线束组件制造过程中产品质量的一致性。

教材配置：

CIS: IPC/WHMA-A-620中文标准。

CIT: IPC/WHMA-A-620中文标准、IPC/WHMA-A-620 英文标准。

IPC/WHMA-A-620D 课程大纲

日期	模块	内容	时长
D1	介绍	介绍、IPC政策与程序（CIS必修）	0.5h
	M1	S1:通用要求(第1章)、适用文件(第2章)（CIS必修） S2:备线(第3章)（CIS必修） S10:线缆组件和导线的测量(第11章)（CIS必修） S17:测试(第19章)（CIS必修）	3.5h
	M2	S4:压接端子(第5章) S5:绝缘皮穿刺连接（IDC）(第6章)	2.5h
D2	M3	S3:焊接端子(第4章) S18:高电压应用(第20章)	3.0h
	M4	S8:连接器连接(第9章) S9:二次成型/灌塑成型(第10章)	2.5h
	M5	S6:超声熔接(第7章) S7:衔接(第8章)	1.5h
D3	M6	S11:标记/标签(第12章) S13:紧固(第14章) S16:成品组件安装(第17章)	2.5h
	M7	S12:同轴及双轴线缆组件(第13章)	2.0h
	M8	S14:线束/线缆的电气屏蔽(第15章) S15:线缆/线束防护层(第16章)	1.5h
		CIT：培训员技能、认证系统使用	1.5h
D4		CIS M1-M8开卷考试	7.0h
		CIT：ESS/P&P考试+开卷考试+闭卷考试	6.5h



IPC-7711/7721

电子组件的返工、修改和维修

标准介绍：

IPC-7711/7721提供了印制电路板组件的返工、维修和修改的程序，适用于无铅和传统锡铅焊接的电子组件。第一部分(通用要求)包含返工、返修和修改的通用程序。第二部分(IPC-7711)涉及在拆除和更换表面贴装元器件及通孔元器件时所使用的工具、材料和方法。第三部分(IPC-7721)涵盖更改组件的规程和维修层压板及导体的程序。

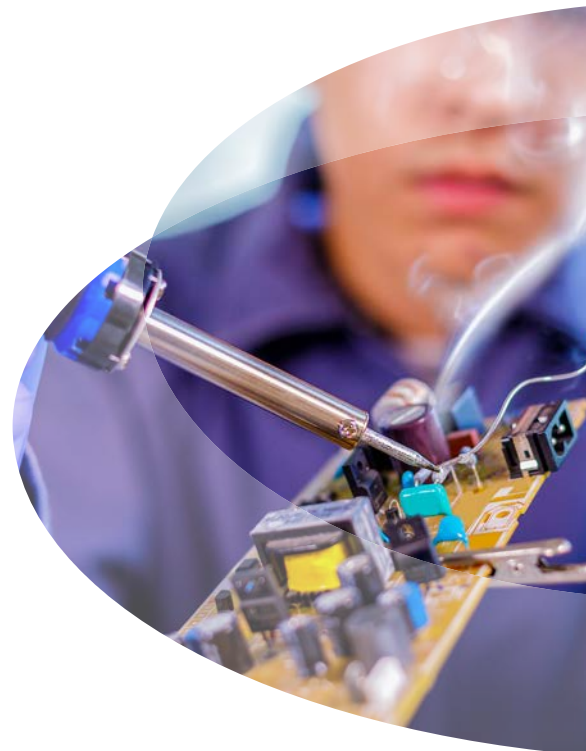
教材配置：

CIS: IPC-7711/7721中文标准、实操套件。

CIT: IPC-7711/7721中文标准、IPC-7711/7721 英文标准、实操套件。

IPC-7711 / 7721C 课程大纲

日期	模块	内容	时长
D1	M1	介绍、基本信息和通用程序 (CIS必修)	4.5h
	M2	导线衔接 讲解、示范&操作	3.0h
D2	M3	敷形涂覆 讲解、示范&操作	2.0h
	M4	通孔元件 讲解、示范&操作	5.5h
D3	M5	片式&柱形元件 讲解、示范&操作	3.0h
	M6	鸥翼型引线元件 讲解、示范&操作	5.0h
D4	M7	J型引线元件 讲解、示范&操作	2.0h
	M8	BGA可选 – 公司特定实验室 (CIS不含此模块)	0.5h
	M9	基材维修 讲解、示范&操作	2.0h
	M10	线路维修 讲解、示范&操作	3.5h
D5		CIS: M1开卷考试 + 实操评估	6.0h
		CIT: ESS/P&P考试+开卷考试+闭卷考试 CIT: 培训员技能、认证系统使用	4.5h 1.5h



IPC EDGE – 在线学习

IPC EDGE, 是IPC于2016年7月推出的一种在线学习解决方案, 通过在线课程、网络研讨会、视频、白皮书、技术知识和技术演示等工具来提升您在电子行业的知识。您可以在任何时候通过笔记本电脑、平板电脑或手机轻松访问IPC EDGE。



**IPC
EDGE**

IPC 教育项目EAE及EAO教学大纲



“Electronics Assembly for Engineers” (EAE):

本课程介绍电子装联工程师的关键工具、材料和工艺。旨在涵盖整个组装过程, 以解决工程师和组织的当前需求和未来目标。



“Electronics Assembly for Operators” (EAO):

本课程介绍电子装联操作员工作中所需要了解的关键概念、工具、材料和流程。学员完成核心模块后可获得资格证书。

EAE电子装联工程师课程-教学安排

12 大模块

模块 1:	电子行业简介	模块 7:	表面贴装技术
模块 2:	印制电路板 (PCB) 简介	模块 8:	通孔技术
模块 3:	印制电路组件 (PCA) 简介	模块 9:	线束、线缆和组件技术
模块 4:	元器件识别	模块 10:	敷形涂敷
模块 5:	工程文档和测量	模块 11:	机械零部件
模块 6:	手工焊接	模块 12:	质量保证

EAO电子装联操作员课程-教学安排

9 大必修模块

模块 1:	电子行业简介
模块 2:	印制电路组件 (PCA) 简介
模块 3:	电子组装及焊接概览
模块 4:	生产安全
模块 5:	防静电及生产处置
模块 6:	元器件识别
模块 7:	图纸、规格书及测量
模块 8:	印刷电路板及组件的缺陷
模块 9:	IPC 标准

9 大选修模块

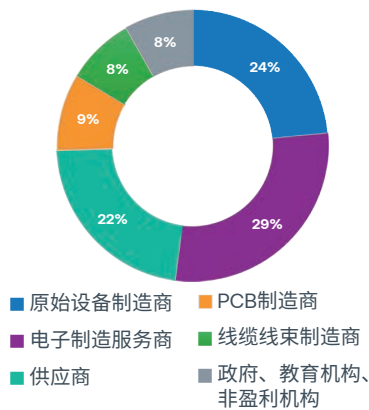
模块 10:	手工焊接
模块 11:	表面贴装技术
模块 12:	通孔技术
模块 13:	线束线缆准备
模块 14:	导线及端子技术
模块 15:	线束线缆技术
模块 16:	机械零部件
模块 17:	敷形涂覆
模块 18:	压接插针

更多信息请登录<https://my.ipcedge.org/>

IPC会员裨益

	会员	非会员
行业标准		
加入IPC标准开发委员会, 参与国际标准开发	✓	✓
担任IPC标准开发委员会主席, 引领行业标准开发	✓	
获悉最新标准动态, 在会员有效期内下载第一语言发布或修订的新标准, 下载时效90天(账号数量根据公司收入类别而定)	✓	
培训认证		
* IPC大中华区会员享有一定数量的CIS中文培训名额, IPC-A-600、IPC-6012、IPC-A-610、IPC-J-STD-001、IPC/WHMA-A-620、IPC-7711/7721六大认证课程	✓	
* 参与IPC主办的技能竞赛	✓	✓
在线会员社区		
* 行业标准讨论区	✓	
* 供需发布	✓	
* 专用小组	✓	
* 发布和获取会员动态信息	✓	
使用IPC会员Logo, 提升品牌形象和影响力	✓	
行业倡导		
加入IPC政府关系委员会	✓	
参与全球政府关系和环境政策宣传	✓	✓
获悉涵盖全球市场、技术和商业趋势的经济分析和统计研究	✓	
成本节约		
购买IPC标准和材料	50% off	原价
参加IPC培训	40% off	原价
购买IPC认证服务	40% off	原价
购买IPC咨询服务	40% off	原价
* 标注的裨益暂时只提供中文语言服务		
全新会员首年会费50%优惠与赠送CIS名额裨益不可同时享受		

全球会员行业分布



部分会员列举

- OEM 航天军工 :** AVIC/ BAE SYSTEMS/ BOEING/ CASC/ LOCKHEED MARTIN/ L3HARRIS/ NASA/ NORTHROP GRUMMAN/ RAYTHEON/ ROCKWELL COLLINS/ UNITED TECHNOLOGIES
- OEM 汽车交通 :** BOSCH/ BOMBARDIER/ CRRC/ CONTINENTAL/ FORD/ GENERAL MOTORS/ GROUP PSA/ TOYOTA/ TRW/ VOLKSWAGEN/ ZF FRIEDRICHSHAFEN
- OEM 通讯 & 消费电子 :** AMPHENOL/ AMAZON/ CISCO/ FACEBOOK/ HUAWEI/HP/ IBM/ INTEL/ MICROSOFT
- OEM 工业 & 其他 :** ABB/ EMERSON/ GENERAL ELECTRIC/ HONEYWELL/ MEDTRONIC/ ROCKWELL AUTOMATION/ SCHNEIDER ELECTRIC/ SIEMENS/ TEXAS INSTRUMENTS
- EMS 电子制造服务商 :** BENCHMARK ELECTRONICS/ CELESTICA/ FLEX/ FOXCONN/ INVENTEC/ JABIL/ PEGATRON/ SANMINA/ WISTRON
- PCB 制造商 :** COMPEQ/ KINWONG/ SCC/ SYTECH/ SUMITOMO ELECTRIC/ TTM TECHNOLOGIES

五大核心裨益

行业标准

培训认证

在线会员社区

行业倡导

成本节约

72%提升质量

53%提升竞争力

43%减少返工

39%降低不必要的报废

33%减少现场失效

28%提升产量

20%提升盈利能力



IPC APEX EXPO 是印刷电路板和电子制造行业内独一无二的为期五天的活动。来自世界各地的专业人士齐聚一堂，参加展览、技术会议、职业发展、标准制定委员会会议和认证项目。



Trade Show Executive's
FASTEST 50
AWARDS & SUMMIT



IPC APEX EXPO自2001年以来一直被美国贸易展新闻网(TSNN)评为美国250强贸易展之一，并被评为2012年、2013年和2017年增长最快的25个展会之一。

IPC APEX EXPO被贸易展新闻网(TSNN)评为2016-2018年美国出席人数增长最快的协会展会。

IPC APEX EXPO 每年吸引来自45个国家的9000多名专业人士。从行业领先的技术会议和专业发展课程，到创新驱动的展厅，IPC APEX EXPO为您提供了一个超越以往极限的机会，让您参与到行业的革新中。



9,000+
Attendees



100+
Education
Opportunities

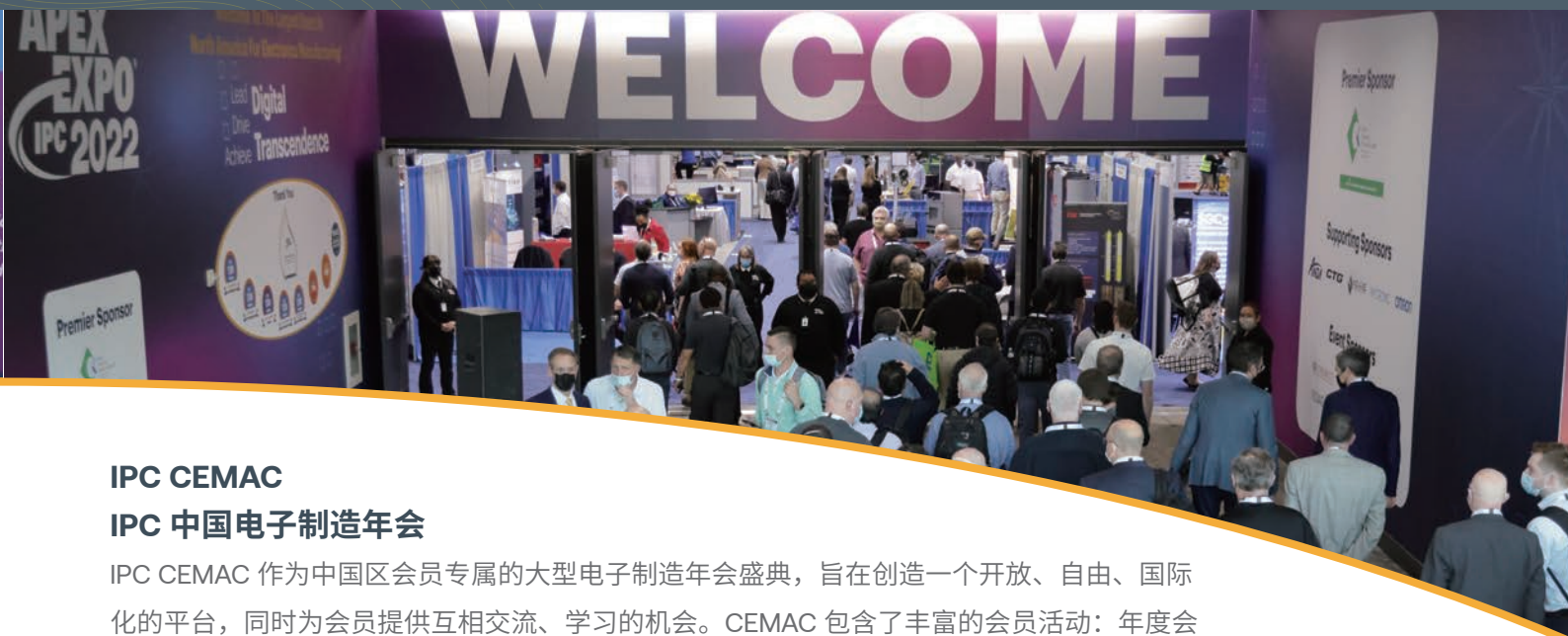


45+
Countries



400+
Exhibitions





IPC CEMAC

IPC 中国电子制造年会

IPC CEMAC 作为中国区会员专属的大型电子制造年会盛典，旨在创建一个开放、自由、国际化的平台，同时为会员提供互相交流、学习的机会。CEMAC 包含了丰富的会员活动：年度会员答谢晚宴、标准技术开发组志愿者表彰典礼，以及业内前沿动态、技术交流等主题论坛。

Electrical Wire Processing Technology Expo

线缆制程技术博览会

自 2001 年以来，在美国 Milwaukee（密尔沃基）举办的线缆制程技术博览会已经成为综合性的行业资源。作为线缆，线束和组件加工行业的独家展示，博览会将买家与全球制造商和分销商联系起来。这是一个面向行业的全方位展会，您不仅可以在现场看到各类运行的设备设施，现场更有行业专家和应用人员随时为您解答最具挑战性的问题。如果您是设计、采购、安装、销售、维护或制造电子电缆组件、线束和其他相关产品的决策者，这正是您需要参加的博览会。

欢迎访问活动网站：www.electricalwireshow.com

M-EXPO

线缆制程博览会(墨西哥)

M-EXPO 由线束线缆制造商协会 (WHMA) 和 IPC 自 2017 年开始联合举办，是 Ciudad Juárez(华雷斯城地区) 的第一个线缆制程技术博览会。The El Paso/Juárez (埃尔帕索 / 华雷斯地区) 是世界上最大的制造中心之一。仅在华雷斯，就有 300 多家加工厂，其中超过 25% 的公司属于线束或相关行业，提供超过 30 万个制造工作岗位。

欢迎访问活动网站：www.mexpowire.com



手工焊接竞赛

IPC手工焊接竞赛 (HSC) 源于2010年斯堪的纳维亚电子竞技。手工焊接竞赛的意义旨在表彰娴熟制造工人的杰出技能和专业成就。随着HSC竞赛在全球热度不断攀升,IPC推出了世界HSC锦标赛,在更大的舞台向世界证明这些专业人士在电子行业的价值。IPC手工焊接竞赛为电子行业从业者提供了一个可以充分展示自己专业技能的平台。

历届手工焊接竞赛冠军

中国赛冠军			全球总决赛冠军	
年份	公司	姓名	公司	姓名
2011	中国航天科工集团第三研究院第8357研究所	陈洁	未举办	
2012	北京铁路信号工厂	付春艳	北京铁路信号工厂	付春艳
2013	陕西西安合顺航院有限公司	赵红燕	CAMtek	Brian Wade
2014	中国电子科技集团公司第29研究所	潘玉华	Samsung Thales	Min Seok Kim
2015	中国电子科技集团公司第38研究所	李莹	UMC Electronics Vietnam	Vn Thi Xuan
2016	成都航天通信设备有限责任公司	唐秋英	成都航天通信设备有限责任公司	唐秋英
2017	中国电子科技集团公司第38研究所	汪颖	中国电子科技集团第10研究所	张易
2018	株洲中车时代电气股份有限公司	杨艳	PWB	Ryosuke Matsunami
2019	株洲中车时代电气股份有限公司	郭红英	PT.SIIX EMS INDONESIA	Indra Setiawan
2020	株洲中车时代电气股份有限公司	郭红英	未举办	

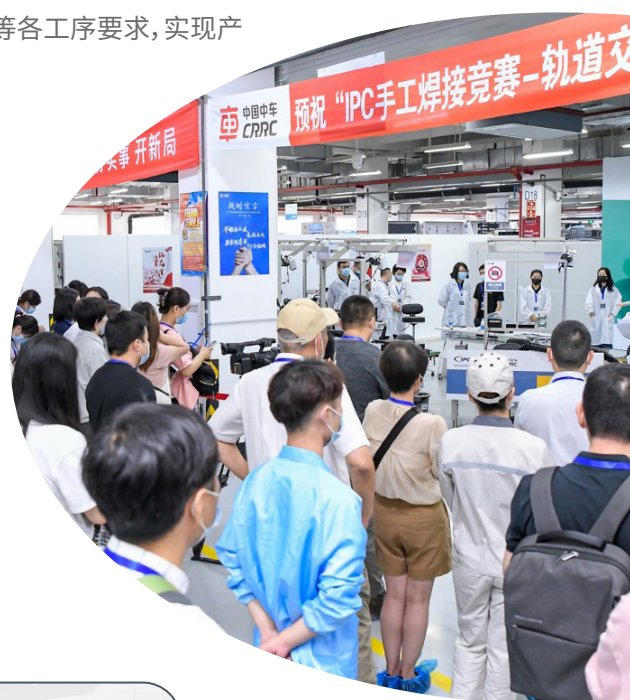


线缆线束竞赛

随着全球制造业面临日益复杂和严苛的挑战，高品质的线缆线束对于电气电子系统的性能及可靠性至关重要，对先进技术标准、精湛装配技能提出更高要求。IPC于2018年开始举办IPC线缆线束竞赛。竞赛要求选手在规定时间内完成一个线缆线束的焊接、压接、装配、测试等各工序要求，实现产品的设计功能。

历届线缆线束竞赛冠军

年份	公司	选手
2018	江苏金陵机械制造总厂	邓旭远
2019	江苏金陵机械制造总厂	金昆
2020	株洲中车时代电气股份有限公司	成莉



每次参加IPC竞赛，
对我来说都是一次成长的过程。
作为一名航修人，
IPC标准让我在工作中更加严格要求自己。

IPC 2020手工焊接竞赛-中国区亚军
江苏金陵机械制造总厂-高立恒



把手中的产品做好做精，技能报国，
助力中国轨道交通信号控制技术
在世界不断领先，不断领跑。

IPC 2020手工焊接竞赛-中国区季军
沈阳铁路信号有限责任公司-王显超



勤学苦练，内外兼修，
把技能从“技术”升格到“艺术”。

IPC 2020手工焊接竞赛-中国区总冠军
株洲中车时代电气股份有限公司-郭红英

IPC市场调研 | 行业动态 市场地位 实时掌控 研究及报告：

- IPC 北美 PCB 市场报告
- IPC 北美 EMS 市场报告
- 北美 EMS 企业绩效报告
- 市场行情概览
- PCB 技术趋势
- 军工与航天领域无铅电子应用的问题与前景
- WECC 全球 PCB 生产报告
- 北美 PCB 行业分析与预测
- 全球 PCB 生产报告
- 北美电子制造服务 (EMS) 行业分析与预测
- 拉丁美洲电子行业报告
- IPC 北美电子制造业劳动力储备研究报告
- IPC 电子制造服务 (EMS) 行业质量基准研究报告
- 电子制造商区域战略路线图
- 北美电子行业回迁：最新趋势及影响
- IPC 北美 PCB 组装设备行业薪资报告
- IPC 北美 EMS 行业薪资报告
- IPC 北美 PCB 行业薪资报告
- IPC 北美电子行业管理层薪资报告

市场调研报告

作为电子行业可靠的行业情报数据来源，IPC提供涵盖全球市场、技术和业务趋势的研究和统计项目。这些服务为企业的商业决策、标杆管理、计划和预测等方面提供了很大的帮助。

IPC市场调研报告提供了独特的数据和见解，为行业高管带来以下竞争优势：

- 看到发展中的市场趋势
- 识别市场的增长和衰退
- 比较贵企业的业绩与行业平均水平和世界基准
- 使用可靠的数据做出明智的业务决策

政府关系和环境政策

IPC是电子行业全球政策的领导者。IPC与其会员企业一起积极参与全球政府关系和环境政策倡导，这一行动符合IPC使命的要求：即促进会员企业的竞争优势和财务成功又保护环境。

无论是面对华盛顿特区、欧盟政策的制定者还是中国的监管委员会，IPC及其会员企业都在积极寻求机会，教育、告知、影响政策制定者制定出促进创新、发展和公平竞争的政策，以及符合科学的环境保护政策。

倡议成效

冲突矿物 2017

美国证券交易委员会 (SEC) 暂停执行其冲突矿物规则中代价高昂的要求。代理主席的声明特别提到了IPC在这个问题上的倡导。

有毒物质改革 2016

要求通过协商形式制定法规，以减少TSCA对副产品回收所带来的负担。IPC通过不断向国会议员和工作人员灌输我们所关切的问题，来推行健全的政策，寻求国会议员的支持。

2014 国际武器贸易条例 (ITAR)

经过多年的出口管制改革倡导，美国军火清单第六类军用电子产品的最终规定发布，明确了为国防“专门设计”的电路板将归入美国军火清单第六类产品进行管制。此外，与“专门设计”的电路板有关的任何设计或数字数据都将作为技术数据进行控制。

2015 中国负责的矿物供应链

鉴于不同的企业正受到多德-弗兰克法案冲突矿物规定更严格的限制，IPC代表其会员向中国提出意见，敦促中国金属、矿产和化工进出口商会仔细审查其尽职调查准则的预定范围。IPC敦促中国金属、矿产和化工进出口商会首抓锡、钨、钼和黄金四种金属产品，因为许多企业已经在制定供应链的责任机制。IPC还建议让准则更加贴合经合组织准则，并留给企业自愿遵守。



IPC Factory of the Future未来工厂解决方案

IPC CFX互联工厂数据交换标准

面向未来工业4.0、中国制造2025的战略转型升级，互联互通是基础、数据是核心，如何从用户角度来定义设备加工数据的内容完整性、有效性、可扩展性将是工厂通讯的工作重点。

IPC CFX标准初始版本于2019年3月发布。遵循IPC CFX标准可实现设备与设备、设备与MES的互联互通，实现工业大数据实时采集、连接、传输、分析与建模、泛化及应用等过程。此标准进而为上下游企业提供更具优势的解决方案，以及更加完整的终端到终端的体系结构，是实现智能制造数字化转型工业大数据应用的基石。



CFX的目的：

- 电子组装制造业的全球工业物联网通信标准
- 支持工业4.0、智慧工厂及数字化工厂的解决方案

CFX的裨益：

- 为降低成本和复杂性，每台机器只需一个完整可视的接口
- 即插即用的IT解决方案

应用领域：

- 机器与机器之间的通信
- 机器数据到工厂的交换
- 事务性交换，如：物流、工单等

CFX的重点：

- 全方位保护的AMQP v1.0传输协议
- JSON data 数据编码
- 定义了制造领域的数据内容和信息结构

可持续性：

- 为各方创造业务机会，并降低成本
- 支持工业4.0、智慧工厂和数字化工厂的应用
- 根据需要添加CFX的特性

进行 CFX QPL认证的部分企业



数据截止到2021年10月

更多信息，请登录：www.ipc-cfx.org

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