



**IPC-1782B**

# **Standard for Manufacturing and Supply Chain Traceability of Electronic Products**

Developed by the Critical Components Traceability Task Group (2-19a)  
of the Electronic Product Data Description Committee (2-10) of IPC

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Users of this publication are encouraged to participate in the  
development of future revisions.

Contact:

IPC  
3000 Lakeside Drive, Suite 105N  
Bannockburn, Illinois  
60015-1249  
Tel 847 615.7100  
Fax 847 615.7105

# Table of Contents

<b>1</b>	<b>SCOPE</b> .....	1	1.6.22	Raw Materials.....	4
1.1	Purpose.....	1	1.6.23	Risk .....	4
1.1.1	About This Standard and the Concept of Traceability.....	1	1.6.24	Risk Analysis.....	5
1.1.2	Internal and External Traceability .....	2	1.6.25	Risk Assessment .....	5
1.1.2.1	Application of This Standard .....	2	1.6.26	Risk Management.....	5
1.1.3	Sectional Traceability Standards and the Maintenance of This Standard .....	2	1.6.27	Serial Number.....	5
1.2	Classification.....	3	1.6.28	Serialization.....	5
1.3	Definition of Requirements .....	3	1.6.29	Subassembly .....	5
1.4	Order of Precedence .....	3	1.6.30	Traceability.....	5
1.4.1	Conflict.....	3	1.6.31	Unique Assembly ID.....	5
1.4.2	Clause References.....	3	1.6.32	Unique Materials.....	5
1.4.3	Appendices.....	3	1.6.33	Work-Order .....	5
1.5	Abbreviations and Acronyms .....	3	<b>2</b>	<b>APPLICABLE DOCUMENTS</b> .....	5
1.6	Terms and Definitions.....	3	2.1	IPC .....	5
1.6.1	As Agreed Between User and Supplier (AABUS).....	3	2.2	Joint Industry Standards .....	5
1.6.2	Authorized Supplier.....	4	2.3	Electrostatic Discharge Association (ESD)....	5
1.6.3	Automated Data Collection / Data- Gathering Automation .....	4	2.4	International Organization for Standardization (ISO).....	5
1.6.4	Batch Code.....	4	2.5	JEDEC .....	5
1.6.5	Cell.....	4	<b>3</b>	<b>GENERAL REQUIREMENTS</b> .....	6
1.6.6	Cell Structure .....	4	3.1	Guidance on the Use of This Standard.....	6
1.6.7	Common Materials.....	4	3.1.1	Conduct Risk Assessment.....	6
1.6.8	Component.....	4	3.1.2	Determine Traceability Level.....	6
1.6.9	Dashboard.....	4	3.1.3	Document Action in User Agreement.....	6
1.6.10	Data Integrity .....	4	3.1.4	Monitor Risk / Update Traceability Level ....	6
1.6.11	Date Code .....	4	3.2	Nonconforming Items.....	6
1.6.12	Individual Material Traceability .....	4	3.3	Scope and Application of Traceability Recording .....	7
1.6.13	Lot Number .....	4	3.4	Requirement for Computerized Systems ....	7
1.6.14	Manual Data Management.....	4	3.4.1	Internal Traceability Computerized System .....	7
1.6.15	Material Traceability.....	4	3.4.2	External Traceability Computerized System .....	7
1.6.16	Materials .....	4	<b>4</b>	<b>LEVELS OF TRACEABILITY</b> .....	8
1.6.17	Mechanical Assembly.....	4	4.1	Levels of Internal Traceability .....	8
1.6.18	Process Identification (ID).....	4	4.1.1	Material and Process Traceability Levels....	8
1.6.19	Process Traceability.....	4	4.1.1.1	Level 1 Traceability: Basic.....	8
1.6.20	Product Build Records .....	4	4.1.1.2	Level 2 Traceability: Standard.....	9
1.6.21	Production Lot .....	4			

4.1.1.3	Level 3 Traceability: Advanced.....	9	5.5.2.8	Manual Printed Board Assembly Traceability Cell .....	21
4.1.1.4	Level 4 Traceability: Comprehensive.....	9	5.5.2.9	Reflow Traceability Cell .....	21
4.1.1.5	Individual Material Traceability .....	9	5.5.2.10	Wave Solder/Selective Solder/Wash Traceability Cell .....	22
4.2	Levels of External Traceability .....	10	5.5.2.11	Manual Visual Inspection Traceability Cell .....	22
4.2.1	Material and Process Traceability Levels...	10	5.5.2.12	Automated Optical Inspection (AOI) and X-Ray Inspection Traceability Cell .....	22
4.3	Guideline for Anticounterfeit Use .....	10	5.5.2.13	In-Circuit Test (ICT) Traceability Cell .....	22
4.4	Guidelines for Classification and Internal Traceability Levels.....	10	5.5.2.14	Press-Fit Operations Traceability Cell .....	23
4.5	Guidelines for Classification and External Traceability Levels.....	11	5.5.2.15	Touch-Up Operations Traceability Cell.....	23
<b>5</b>	<b>CELL STRUCTURE AND CONTENTS .....</b>	<b>12</b>	5.5.2.16	Encapsulation Traceability .....	23
5.1	Assembly Cell .....	12	5.5.2.17	System/Sub/Final Assembly (Mechanical Assembly by Robot or Manually) Traceability Cell .....	23
5.2	Work-Order Information Cell .....	15	5.5.2.18	Software/Firmware Programming Traceability Cell .....	24
5.3	Bill of Materials Cell.....	15	5.5.2.19	Quality Assurance Check/Test/Inspection Traceability Cell .....	24
5.4	Material Traceability Cell.....	15	5.5.2.20	Repair/Rework Station Traceability Cell ...	24
5.4.1	Unique Material/Subassembly Traceability Cell .....	16	5.5.2.21	Functional Test Traceability Cell .....	24
5.4.2	Individual Material Traceability Cell .....	16	5.5.2.22	Burn-In/Extended Test Traceability Cell....	25
5.4.3	Software/Firmware Material Traceability Cell .....	17	5.5.2.23	Shipping/End-User/Postmanufacturing Environment Test Traceability Cell.....	25
5.4.4	Packing and Shipping Material Traceability Cell .....	17	5.5.2.24	Packing and Shipping Traceability Cell ....	25
5.4.5	Label Material Traceability Cell .....	17	5.5.2.25	Process Deviations Traceability Cell .....	25
5.4.6	Hazardous Substance Cell .....	17	5.5.2.26	Labeling Traceability Cell .....	26
5.4.7	Material Test Cell .....	18	5.5.2.27	Printed Board Etching Process Traceability Cell .....	26
5.5	Process Traceability Data Cell .....	18	5.5.2.28	Printed Board Oxide Process Traceability Cell.....	26
5.5.1	Common Process Traceability Data Cell ...	18	5.5.2.29	Printed Board Plating Process Traceability Cell.....	26
5.5.2	Unique Process Traceability Data Cell .....	19	5.5.2.30	Printed Board Developer Process Traceability Cell .....	26
5.5.2.1	Unique Printed Board Marking Traceability Cell .....	19	5.5.2.31	Other Printed Board Wet Process Traceability Cell .....	27
5.5.2.2	Product Routing Station, Printed Board Flip/Turn, Storage/Stock/Waiting Area Traceability Cell .....	19	5.5.2.32	Exceptions Cell .....	27
5.5.2.3	Screen Printer Traceability Cell.....	19	5.6	Process Maintenance Cell.....	27
5.5.2.4	Automated Paste Inspection Traceability Cell.....	19	<b>6</b>	<b>EXTERNAL TRACEABILITY (SECURE SUPPLY CHAIN) .....</b>	<b>28</b>
5.5.2.5	Glue Dispenser Traceability Cell .....	20			
5.5.2.6	SMT Placement Traceability Cell.....	20			
5.5.2.7	Pin Through-Hole Insertion (Automated and Manual) Traceability Cell .....	21			

6.1	Supply Chain Event .....	28	Table 5-2	Assembly Cell Material Traceability .....	14
6.1.1	Event Types .....	28	Table 5-3	Assembly Cell Process Traceability .....	14
6.1.2	Packages .....	28	Table 5-4	Work-Order Information Cell Process Traceability.....	15
6.1.3	Unique ID .....	29	Table 5-5	Bill of Materials Cell Traceability .....	15
6.1.4	Material Information .....	29	Table 5-6	Materials Traceability Cell .....	16
6.1.5	Process Information .....	30	Table 5-7	Unique Material/Subassembly Traceability Cell .....	16
6.1.6	Asset Owner .....	30	Table 5-8	Individual Material Traceability Cell .....	16
6.1.7	Process Owner .....	30	Table 5-9	Software/Firmware Material Traceability Cell.....	17
6.1.8	Event Location .....	30	Table 5-10	Packaging and Shipping Material Traceability Cell .....	17
6.1.9	Event Processing Tasks .....	31	Table 5-11	Label Material Traceability Cell .....	17
6.1.9.1	Material Packing (MP).....	31	Table 5-12	Common Process Traceability Cell .....	18
6.1.9.2	Material Package Logistics (MPL) .....	31	Table 5-13	Common Process Traceability Cell .....	19
6.1.9.3	Material Package Processing (MPP).....	31	Table 5-14	Product Routing Station, Printed Board Flip/Turn, Storage/Stock/Waiting Area Traceability Cell .....	19
6.1.9.4	Material Package Consumption (MPC).....	32	Table 5-15	Screen Printer Traceability Cell.....	19
6.2	Secure Supply Chain Database .....	32	Table 5-16	Automated Paste Inspection Traceability Cell.....	19
6.2.1	Database Structure .....	32	Table 5-17	Glue Dispenser Traceability Cell .....	20
6.2.1.1	Tamper-Proof Event Records .....	33	Table 5-18	SMT Placement Traceability Cell.....	20
6.2.1.2	Tamper-Evident Shared Data .....	33	Table 5-19	Pin Through-Hole Insertion (Automated and Manual) Traceability Cell .....	21
6.2.1.3	Updating the Shared Data.....	33	Table 5-20	Manual Printed Board Assembly Traceability Cell .....	21
6.2.2	Access to External Traceability Data .....	33	Table 5-21	Reflow Traceability Cell .....	21
<b>Tables</b>			Table 5-22	Wave Solder/Selective Solder/Wash Traceability Cell .....	22
Table 3-1	Typical Risk Assessment Matrix .....	6	Table 5-23	Manual Visual Inspection Traceability Cell.....	22
Table 4-1	Internal Traceability Levels .....	8	Table 5-24	Automated Optical Inspection (AOI) and X-Ray Inspection Traceability Cell.....	22
Table 4-2	External Traceability Levels .....	10	Table 5-25	In-Circuit Test (ICT) Traceability Cell.....	22
Table 4-3	Traceability Levels to IPC Product Classification System Matrix .....	10	Table 5-26	Press-Fit Operations Traceability Cell .....	23
Table 4-4	Traceability Level Recommendations for IPC Product Class 1 .....	11	Table 5-27	Touch-Up Operations Traceability Cell.....	23
Table 4-5	Traceability Level Recommendations for IPC Product Class 2 .....	11	Table 5-28	Encapsulation Traceability Cell.....	23
Table 4-6	Traceability Level Recommendations for IPC Product Class 3 .....	11	Table 5-29	System/Sub/Final Assembly (Mechanical Assembly by Robot or Manually) Traceability Cell .....	23
Table 4-7	Traceability Level Recommendations for IPC Product Class 3 Plus Market Addenda.....	11			
Table 4-8	Traceability Levels to IPC Product Classification System Matrix .....	11			
Table 4-9	Internal vs. External Traceability Levels .....	11			
Table 5-1	Abbreviated Process Traceability Level Matrix .....	13			

Table 5-30	Software/Firmware Programming Traceability Cell .....	24	Table 6-1	Packages External Traceability Cell .....	29
Table 5-31	Quality Assurance Check/Test/Inspection Traceability Cell .....	24	Table 6-2	Packages Unique ID External Traceability Cell.....	29
Table 5-32	Repair/Rework Station Traceability Cell ...	24	Table 6-3	Material Information External Traceability Cell.....	29
Table 5-33	Functional Test (FT) Traceability Cell.....	24	Table 6-4	Process Information External Traceability Cell.....	30
Table 5-34	Burn-In/Extended Test Traceability Cell....	25	Table 6-5	Process Owner External Traceability Cell.....	30
Table 5-35	Shipping/End-User/Postmanufacturing Environment Test Traceability Cell .....	25	Table 6-6	Event Location External Traceability Cell.....	30
Table 5-36	Packing and Shipping Traceability Cell ....	25	Table 6-7	Data Creator Access Rights.....	33
Table 5-37	Process Deviations Traceability Cell .....	25	Table 6-8	Data Consumer Access Rights .....	33
Table 5-38	Labeling Traceability Cell .....	26	<b>Figures</b>		
Table 5-39	Printed Board Etching Process Traceability Cell .....	26	Figure 1-1	Typical Supply Chain .....	2
Table 5-40	Printed Board Oxide Process Traceability Cell.....	26	Figure 5-1	Traceability Cell Structure .....	12
Table 5-41	Printed Board Plating Process Traceability Cell.....	26	Figure 6-1	The Secure Supply-Chain Event Elements .....	28
Table 5-42	Printed Board Developer Process Traceability Cell .....	26	Figure 6-2	Secure Supply-Chain Database External Traceability Data Architecture .....	32
Table 5-43	Other Printed Board Wet Process Traceability Cell .....	27	<b>APPENDIX A Index of Acronyms and Abbreviations .....</b>		
Table 5-44	Exceptions Traceability Cell.....	27			
Table 5-45	Process Maintenance Traceability Cell .....	27			

# IPC-1782B

## Standard for Manufacturing and Supply Chain Traceability of Electronic Products

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### 1 SCOPE

This standard establishes minimum requirements for manufacturing and supply chain traceability based on perceived risk. This standard applies to all products, processes, assemblies, parts, components, equipment used and other items as defined by users and suppliers in the manufacture of printed board assemblies, as well as mechanical assembly and printed board fabrication. This standard is applicable both for internal traceability (i.e., traceability within the environment in which the product is assembled) and external traceability (i.e., as products and materials are moved between locations as part of their supply chain).

Minimum requirements are based on four levels of traceability for materials and processes. These levels can correlate to the IPC Product Classification System (Class 1, Class 2, Class 3 and Space/Defense/Medical) and/or another set of categories of compliance, based on the business model/economic needs of the end-use market for the final product (e.g., telecom, aerospace, automotive, medical device, consumer electronics) or a subassembly within that product.

**1.1 Purpose** Historically, the lack of a uniform component traceability standard has caused an unnecessary consumption of resources (e.g., time, people, money) to track events or parts to their sources and to remedy any quality, reliability, etc., issues. Lack of a standard has also made it difficult to uniformly create and appropriately enforce the necessary contracts.

The traceability information detailed in this standard is intended to improve operational efficiency and productivity, quality and reliability as well as to enable activities such as predictive maintenance in the manufacturing environment but not necessarily to be distributed outside of the organization. This standard can help organizations more easily ensure end users / consumers will receive products and services that meet or exceed their expectations in the timeliest and most economically viable method.

This standard can also aid in reducing counterfeit components in an organization's supply chain, whether using an authorized supplier or not.

**1.1.1 About This Standard and the Concept of Traceability** Traceability has grown from being a specialized need for safety-critical segments of industry to a recognized tool that adds value to industry as a whole. Disparate standards that have evolved, mainly dictated by large original equipment manufacturers (OEMs), can create confusion in the market, as a multitude of requirements and definitions proliferate. The intent of this standard is to bring the whole principle of traceability up to date. Traceability, as further described in this standard, represents both the most effective quality tool available internally within assembly operations, which can become an intrinsic part of best-practice operations, as well as the traceability of packages between locations of material manufacture and product assembly, ensuring contents of transported items are not compromised (i.e., by ingress of counterfeit materials). This is accomplished with the encouragement of automated data collection from systems already integrating quality, manufacturing, engineering and supply chain, thus reducing cost of ownership and ensuring timeliness and accuracy.

The wealth of analysis data accessible from traceability can yield information that can raise expectations for very significant quality and performance improvements, as well as provide the necessary protection against the costs in the market as a result of adverse issues.

This standard creates a flexible data architecture that can be adopted to represent all levels of traceability that are required across industry. This includes support for the most demanding instances for detail and integrity (e.g., critical-safety systems) through to situations in which only basic traceability may be needed (e.g., simple consumer products). This standard presents a cellular-based structure to provide required flexibility and create an efficient format in which unnecessary duplication of data is avoided. The format also allows data to be added after the completion of production, enabling further detail to be added as it becomes available.

Throughout the design of this standard, different key usage models of traceability were considered. It is written to explain how access to critical data, when needed to identify the exact scope of any market issues, can be ensured, while also being capable of providing "live" access to detailed product-build records for advanced quality analysis.

This standard also demonstrates the benefits of best-practice data collection through automated means. This is reflected in the definitions of the different levels of traceability.