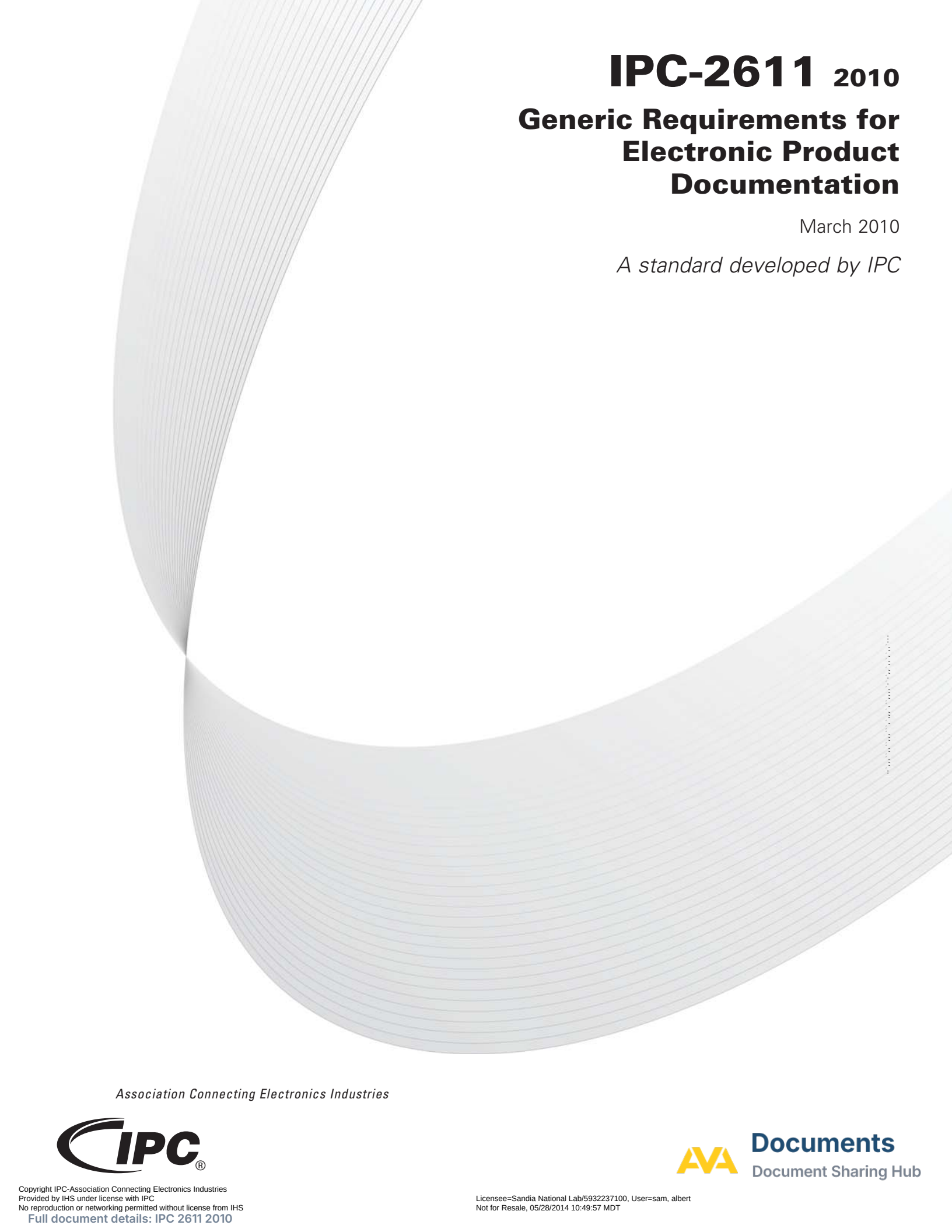




IPC-2611 2010

Generic Requirements for Electronic Product Documentation

March 2010

A standard developed by IPC

Association Connecting Electronics Industries



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- Minimize time to market
- Contain simple (simplified) language
- Just include spec information
- Focus on end product performance
- Include a feedback system on use and problems for future improvement

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- Increase time-to-market
- Keep people out
- Increase cycle time
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IPC-2611-2010

Generic Requirements for Electronic Product Documentation

Developed by the Electronic Documentation Technology Committee
(2-40) of IPC

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

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Any document involving a complex technology draws material from a vast number of sources. While the principal members of the Electronic Documentation Technology Committee (2-40) are shown below, it is not possible to include all of those who assisted in the evolution of this standard. To each of them, the members of the IPC extend their gratitude.

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Documents

Document Sharing Hub

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Generic Requirements for Electronic Product Documentation

1 SCOPE

This standard establishes the generic requirements for a document set describing electronic products, and the methodology used for revision control and configuration management of the information. The generic descriptions defined in this standard apply to the entire document set. They are used to define and maintain the electronic product. The requirements pertain to both hard copy and electronic data descriptions.

1.1 Purpose

The purpose of the standard is to establish a methodology that permits different grades or completeness of documentation, as well as identifying the various products, packaging and interconnection techniques for which unambiguous documentation is required.

The electronic product documentation package usually consists of multiple pieces of information (data) that describe the characteristics and functional performance requirements of the unit to which the documentation pertains. The documentation package may include electronic diagrams, electronic assembly descriptions, printed board fabrication data (master drawing), conductive/nonconductive pattern details, wire cable harness requirements, specification performance control documents, and material identification descriptions (BOMs).

The documentation package may consist of a variety of completeness and a variation of hard copy and electronic data. Hard copy may be fully formatted in accordance with ANSI Y14.1, ANSI Y14.1M, or free-form various size paper or film; electronic data may be static information (bitmap type) or intelligent descriptions that are computer processable in order to communicate directly to manufacturing equipment with minimal human intervention.

1.2 Classification

Two sets of classification (grade and completeness) have been established to reflect documentation differences as well as the product descriptions for which the documentation requirements **shall** be defined. The methodology permits identification for documentation completeness as well as the intermix of hard copy and electronic format, either intelligent (ready for machine usage) or non-intelligent (ready for printing hard copy). The concepts may be used in contractual agreements or implemented within a private company domain in order to facilitate communication between users and their suppliers. The following Grades are described as requirements:

Grade A	All hard copy; completeness 1, 2 and 3
Grade B	Mixed hard copy and electronic data, completeness 1, 2 and 3
Grade C	All electronic data, completeness 1, 2, and 3

Figure 1-1 provides an illustration indicating approximate variation in the degree of mixture between electronic and hard copy documentation. Electronic documentation is considered non-intelligent (ready for printing hard copy), while Data is considered as being intelligent (ready for machine usage).

Documentation Package
Grade Requirements

A	B	C
60-90% Hard Copy (Drawings)	0-60% Hard Copy (Drawings)	0-40% Soft Copy (Drawings)
	10-40% Soft Copy (Drawings)	
10-40% Minimal Data	10-80% Nominal Data	40-100% Maximum Data

Figure 1-1 Documentation Package Grade Requirements

In order to clarify the term “document package,” a characterization has been made to highlight the variation between different media methodologies. The term “drawing” can be provided in either hard or soft copy; where soft copy is a bitmap in an electronic format. Since the goal is to remove all forms of paper, another term for computer transfer methodology embodies the two methods of providing information that is sent via internet or electronic computer transfer. This may also be accomplished with soft copy or data; soft copy requires human interpretation, data requires machine execution. Figure 1-2 shows an example of the overlap between drawings and computer transfer.

A customized program can be written to extract data from a soft copy drawing. These programs are usually customized to a specific company format of the soft copy drawing. The customized program is usually not transferrable to other formats or data structures. In this case, the human interpretation is being done by the person coding the interface.

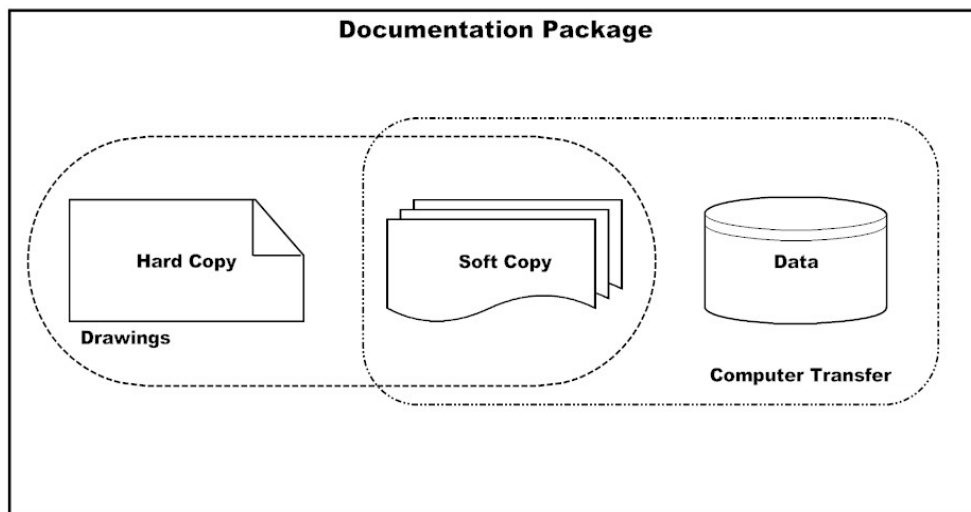


Figure 1-2 Documentation Package

Product description are based on the Jisso concept which represent a “Total packaging solution” that assigns level to the bare die and its use in a standard package, application specific module, product board assembly, backplane or system. All of these product descriptions require some form of documentation to facilitate building the product(s); however, the IPC-2610 series deals with documentation for the module, assembly and backplane primarily.

Jisso Level 2	Electronic Package Documentation
Jisso Level 3	Electronic Module Documentation
Jisso Level 4	Electronic Unit Documentation

Note: Classification of documentation requirements should not be confused with the classification of end item use, as referenced in other IPC standards and specifications which refer to: Class 1) consumer products; Class 2) general industrial; and Class 3) high reliability equipment or the design producibility level which identifies the tolerances required to manufacture the product. The need to apply documentation practices to a particular class of equipment should depend on the complexity of the interface required to produce the product; therefore, any documentation grade may be applied to any of the end product equipment categories (classes) or their producibility conditions as required;

An example would be that a product description identifier of 2B-B3 would represent a Class 2 product (general industrial), level B producibility (moderate design standard), grade B documentation (mixed hard copy and electronic data), and grade 3 completeness (full disclosure).

1.3 Interpretation

The word “**shall**”, the emphatic form of the verb, is used throughout this standard whenever a requirement is intended to express a provision that is mandatory. Deviation from a “**shall**” requirement may be considered if sufficient data is supplied to justify the exception. The words “should” and “may” are used whenever it is necessary to express non-mandatory provisions. “Will” is used to express a declaration of purpose. To assist the reader, the word “**shall**” is presented in bold characters.

1.4 Presentation

All dimensions and tolerances in this standard are expressed in metric units with millimeters being the main form of dimensional expression. Inches may be shown in brackets as appropriate and are not always a direct conversion depending on the round-off concept or the required precision. Users are cautioned to employ a single dimensioning system, and not intermix millimeters and inches. Reference information is shown in parentheses (). Dimensioning **shall** be in accordance with IPC-2615.

1.5 Order of Precedence

In the event of conflict, the order of precedence, from top to bottom as follows, **shall** prevail:

- a) The procurement contract
- b) An approved documentation package (supplemented by an approved deviation list, if applicable)
- c) Company specific manufacturing standard
- d) This standard
- e) Other applicable documents
- f) Documentation Hierarchy

This standard represents the generic requirements for electronic product documentation. The details of documentation requirements are contained in the specific part of the IPC-2610 series of standards. Each standard has a specific focus and **shall** be used, as appropriate, to describe a particular part of the electronic product details. The sectional standards and their focus are:

- IPC-2611-1 *Generic Requirements for Electronic Product Data Base Storage Recommendations**
- IPC-2612 *Sectional Requirements for Electronic Diagramming Documentation (Schematic and Logic Descriptions)*
- IPC-2612-1 *Sectional Requirements for Electronic Diagramming Symbol Generation Methodology*
- IPC-2613 *Electrical, Mechanical and Discrete Wiring Part Descriptions Documentation (Specification Control, Source Control, Wire Harness and Cabling)**
- IPC-2614 *Sectional Requirements for Board Fabrication Documentation*
- IPC-2615 *Printed Board Dimensions and Tolerance**
- IPC-2616 *Sectional Requirements for Assembly Documentation (Electronic Printed Board and Module Assembly Descriptions)**
- IPC-2617 *Sectional Requirements for Board and Assembly Testing (Electrical, Environmental HAST, HALT, etc. Test)**
- IPC-2618 *Sectional Requirements for Bill of Material Documentation (Complete Listing of Parts, Materials, and Procurement Documents)**

1.6 Documentation Package

The communication between the design function and the manufacturing facilities is the most important element in managing the development and maintenance of any electronic product, whether it is designed and built by a company that is vertically integrated (all functions under the same organization) or if the product is being outsourced to one or multiple suppliers each of which provides a particular function or service in the development, manufacture or maintenance of the product. The documentation package and the degree of detail will determine the success or failure of all the factors that make up the life cycle of the end product.

In order to provide the ultimate degree of flexibility in the communication between disciplines, especially since some close relationships between partners often foster reduced descriptions, the documentation package has been segmented into five descriptive sections. Each section is considered a stand-alone set of requirements, and is made up of a set of data that encompasses a variety of techniques or media in order to foster the data transfer of the descriptions needed to establish the degree of detail for producing the final product.

Figure 1-3 shows the information flow that is required in most development cycles in order to provide information that establishes requirements and acceptability characteristics. Depending on the completeness of each segment, product information can range from a minimal set suitable for prototype development to a fully documented structure that permits re-procurement of identical product from multiple suppliers, located in multiple regions of the world.

* under consideration

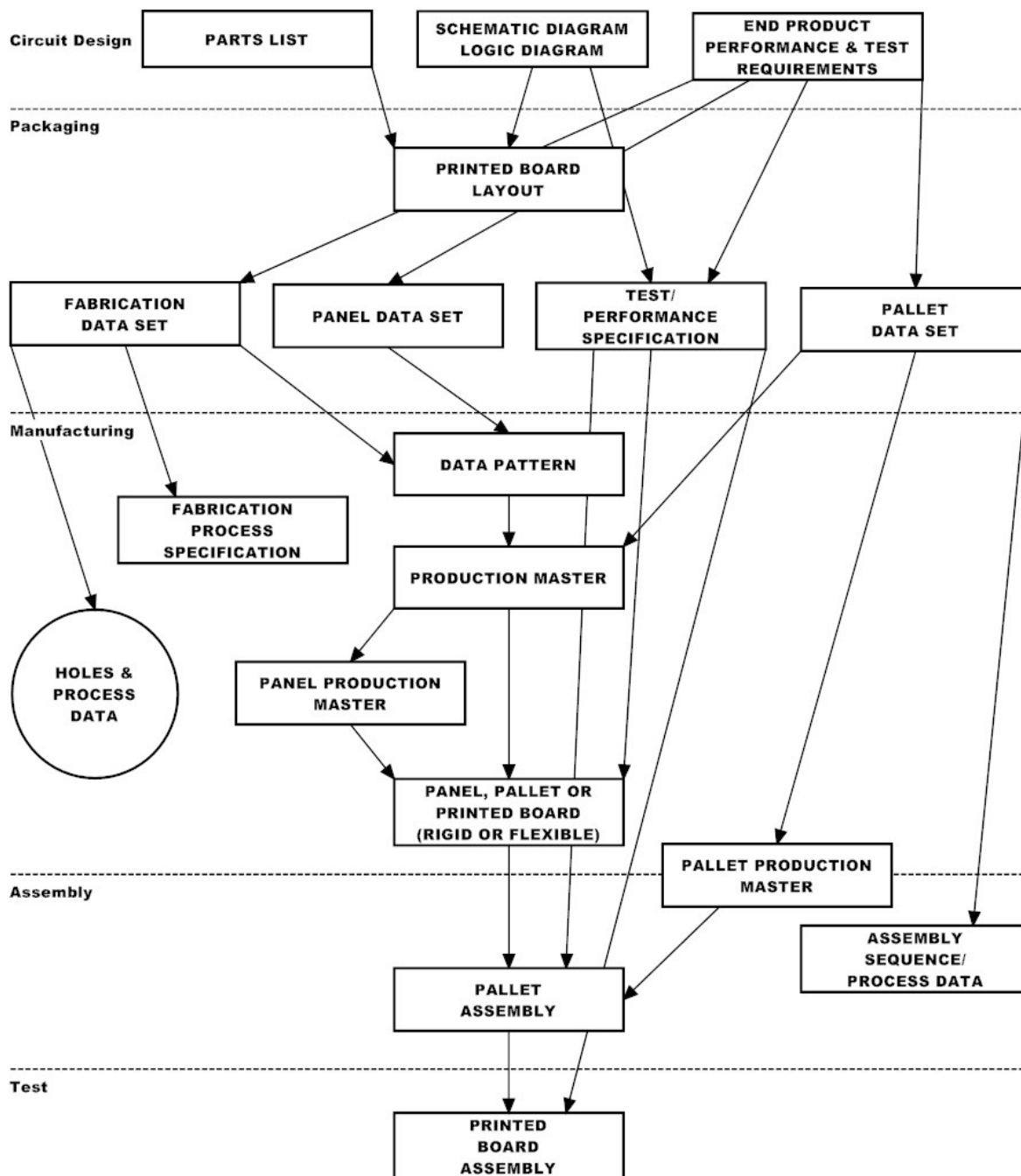


Figure 1-3 Documentation Package Hierarchy Sectional Descriptions and Data Flow

Each of the sections are related and portions are interchanged between manufacturing disciplines in order to move the product through the various stages of manufacturing, maintenance and upgrading functions. Since the information is multi-faceted, each combination of documents is referred to as a data set. All five data sets make use of the generic requirement standard (IPC-2611) and the archiving standard (2611-1). The five data sets, and additional standards needed, are:

- Electronic Data Set (IPC-2612, 2612-1, 2617, 2618)
- Design Data Set (IPC-2613, 2617, 2618)