IPC STANDARDS

Agenda

- What is IPC?
- What IPC standard is in common in inspection systems?
- What is the definition of Class in IPC-A-610?
- Algorithms meeting IPC-A-610 standard

What is IPC?

- Founded in 1957 as the **Institute of Printed Circuits** with six member companies
- Strong foundation as Technical Organization Dedicated to meeting industry needs
- Focus on design, PCB manufacturing and electronics assembly

IPC Today

IPC is an international industry association dedicated to furthering the competitive excellence and financial success of more than 3,700 member companies that make, use, specify and design printed boards and assemblies, including those in:

- advanced microelectronics
- aerospace and military
- automotive
- computer
- industrial equipment
- medical equipment and devices
- telecommunications industries

IPC®

KOH YOUNG TECHNOLOGY
INTELLIGENT INSPECTION

What IPC standard is in common in inspection systems?

and Packaging Electronic Circuits

Standards [edit]

IPC standards are used by the electronics manufacturing industry. IPC-A-610, *Acceptability of Electronic Assemblies*, is used worldwide by original equipment manufacturers and EMS companies. There are more than 3600 trainers worldwide who are certified to train and test on the standard. Standards are created by committees of industry volunteers. Task groups have been formed in China, the United States, and Denmark.

Standards published by IPC include:

General documents

- IPC-T-50 Terms and Definitions
- IPC-2615 Printed Board Dimensions and Tolerances
- IPC-D-325 Documentation Requirements for Printed Boards
- IPC-A-31 Flexible Raw Material Test Pattern
- IPC-ET-652 Guidelines and Requirements for Electrical Testing of Unpopulated Printed Boards

Design specifications

- IPC-2612 Sectional Requirements for Electronic Diagramming Documentation (Schematic and Logic Descriptions)
- IPC-2221 Generic Standard on Printed Board Design
- IPC-2223 Sectional Design Standard for Flexible Printed Boards
- IPC-7351B Generic Requirements for Surface Mount Design and Land Pattern Standards

Material specifications

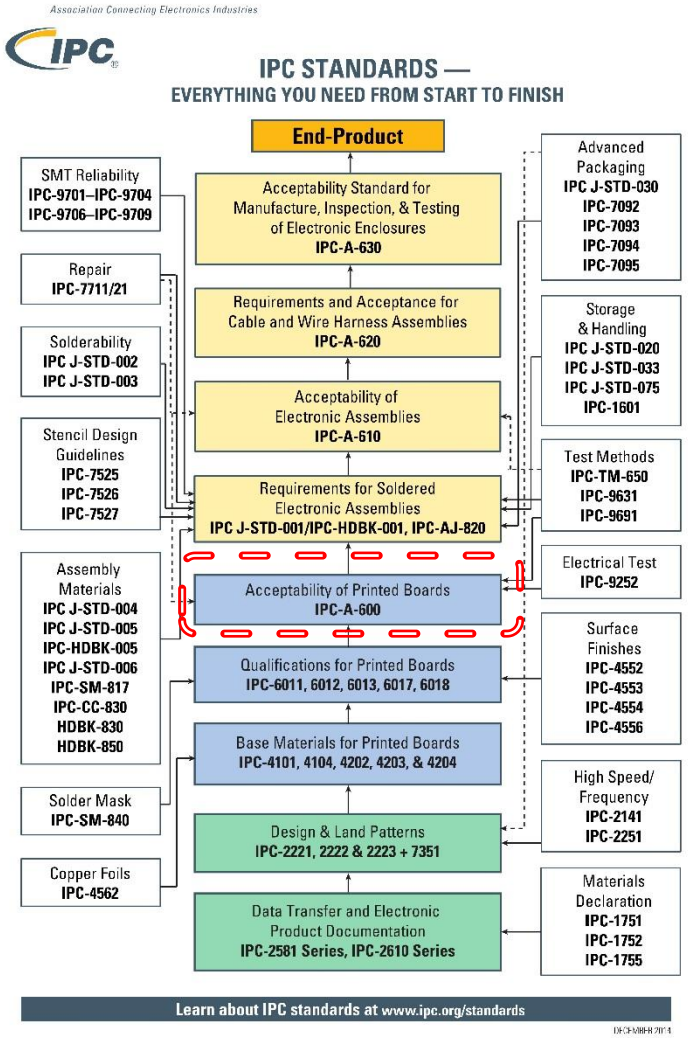
- IPC-FC-234 Pressure Sensitive Adhesives Assembly Guidelines for Single-Sided and Double-Sided Flexible Printed Circuits
- IPC-4562 Metal Foil for Printed Wiring Applications
- IPC-4101 Laminate Prepreg Materials Standard for Printed Boards
- IPC-4202 Flexible Base Dielectrics for Use in Flexible Printed Circuitry
- IPC-4203 Adhesive Coated Dielectric Films for Use as Cover Sheets for Flexible Printed Circuitry and Flexible Adhesive Bonding Films
- IPC-4204 Flexible Metal-Clad Dielectrics for Use in Fabrication of Flexible Printed Circuitry

Performance and inspection documents

- IPC-A-600 Acceptability of Printed Boards
- IPC-A-610 Acceptability of Electronic Assemblies
- IPC-6011 Generic Performance Specification for Printed Boards
- IPC-6013 Specification for Printed Wiring, Flexible and Rigid-Flex
- IPC- 6202 IPC/JPCA Performance Guide Manual for Single- and Double-Sided Flexible Printed Wiring Boards
- PAS-62123 Performance Guide Manual for Single & Double Sided Flexible Printed Wiring Boards
- IPC-TF-870 Qualification and Performance of Polymer Thick Film Printed Boards

Flex assembly and materials standards

- IPC-FA-251 Assembly Guidelines for Single and Double Sided Flexible Printed Circuits
- IPC-3406 Guidelines for Electrically Conductive Surface Mount Adhesives
- IPC-3408 General Requirements for Anisotropically Conductive Adhesives Films



What is the definition of Class in IPC-A-610?

each class specifies the acceptable range

8 Surface Mount Assemblies

8.2.2.1 Chip Components – Rectangular or Square End Components – 1, 3 or 5 Side Termination, Side Overhang (A)

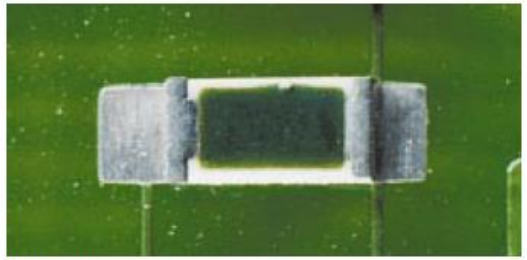


Figure 8-11

Target - Class 1,2,3

- No side overhang.

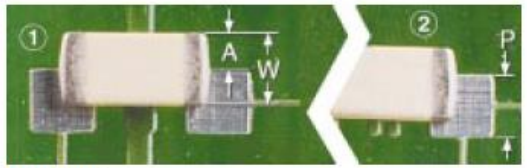


Figure 8-12
1. Class 2
2. Class 3

Acceptable - Class 1,2

- Side overhang (A) is less than or equal to 50% width of component termination area (W) or 50% width of land (P), whichever is less.

Acceptable - Class 3

- Side overhang (A) is less than or equal to 25% width of component termination area (W) or 25% width of land (P), whichever is less.

An example

Class 1 — General Electronic Products

Includes products suitable for applications where the major requirement is function of the completed assembly.

Class 2 — Dedicated Service Electronic Products

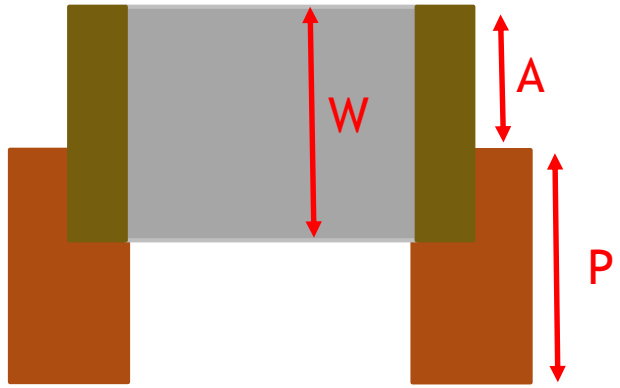
Includes products where continued performance and extended life is required, and for which uninterrupted service is desired but not critical. Typically the end-use environment would not cause failures.

Class 3 — High Performance Electronic Products

Includes products where continued high performance or performance-on-demand is critical, equipment downtime cannot be tolerated, end-use environment may be uncommonly harsh, and the equipment must function when required, such as life support or other critical systems.

Algorithms meeting IPC-A-610 standard(1)

Applicable classes – Class 1, 2, 3
Aim - No side overhang



Definition of Class 1, 2
- Side overhang (A) is less than or equal to 50% of width of component termination area(W) or 50% width of land(P)

Definition of Class 3
- Side overhang (A) is less than or equal to 25% of width of component termination area(W) or 25% width of land(P)

Algorithms meeting IPC-A-610 standard(2)

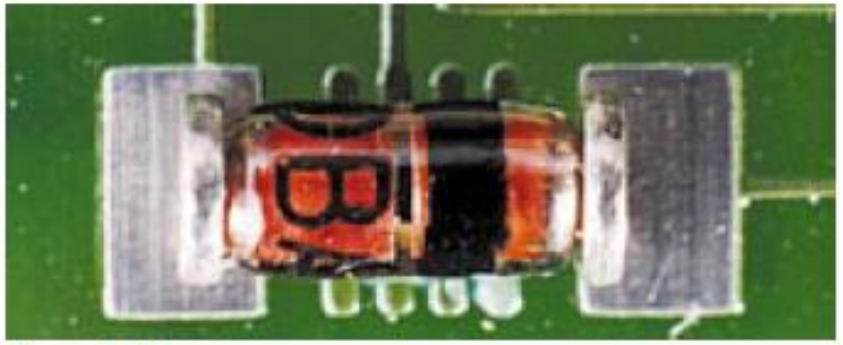


Figure 8-42

Target - Class 1,2,3

- No side overhang.

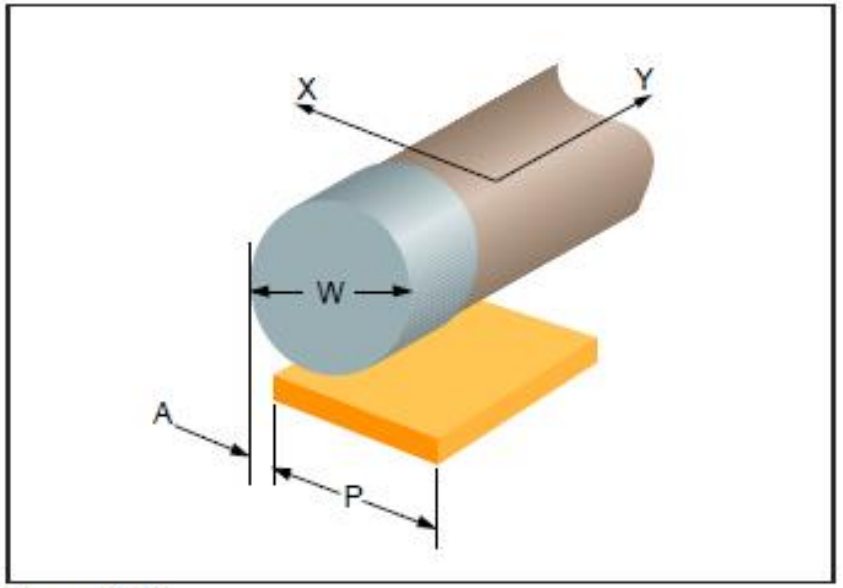


Figure 8-43

Acceptable - Class 1,2,3

- Side overhang (A) is 25% or less of the diameter of component width (W) or land width (P), whichever is less.

Algorithms meeting IPC-A-610 standard(3)

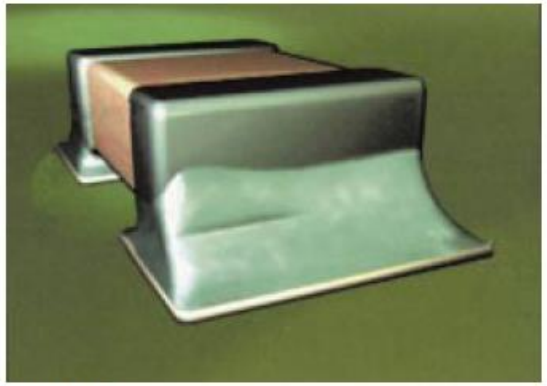


Figure 8-18

Target - Class 1,2,3

- End joint width is equal to component termination width or width of land, whichever is less.

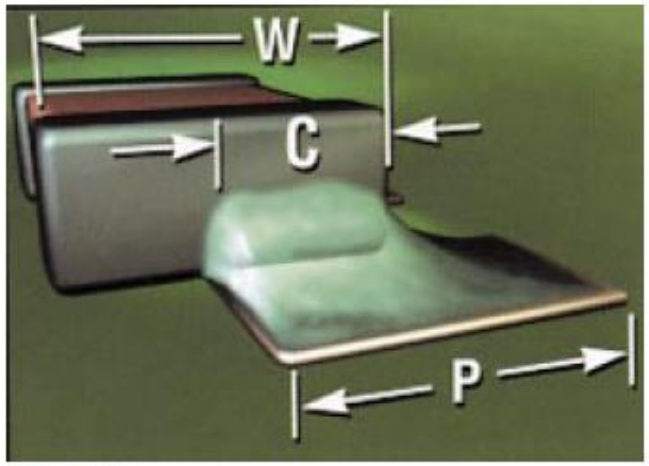


Figure 8-19

Acceptable - Class 1,2

- End joint width (C) is minimum 50% of component termination width (W) or 50% land width (P), whichever is less.

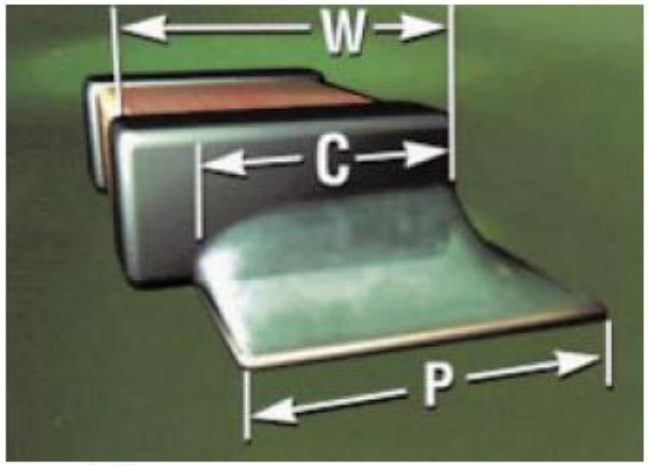


Figure 8-20

Acceptable - Class 3

- End joint width (C) is minimum 75% of component termination (W) or 75% land width (P), whichever is less.

Algorithms meeting IPC-A-610 standard(4)

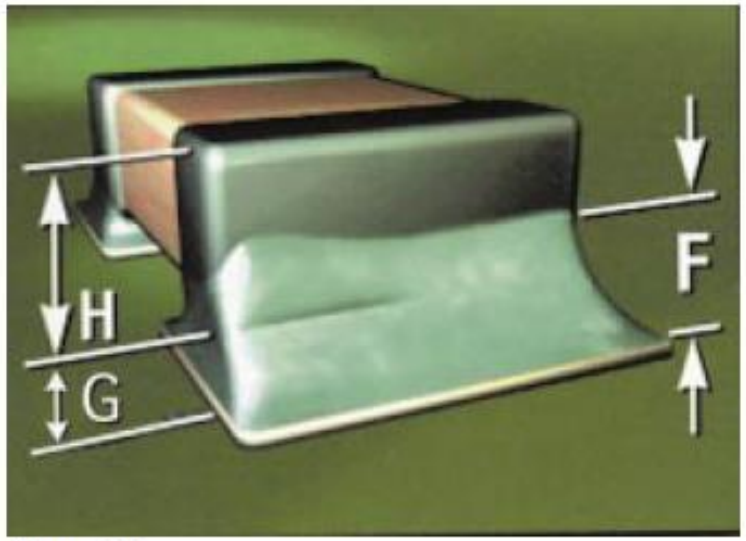


Figure 8-26

Acceptable - Class 1,2

- Wetting is evident on the vertical surface(s) of the component termination.

Acceptable - Class 3

- Minimum fillet height (F) is solder thickness (G) plus 25% termination height (H), or 0.5 mm [0.02 in], whichever is less.

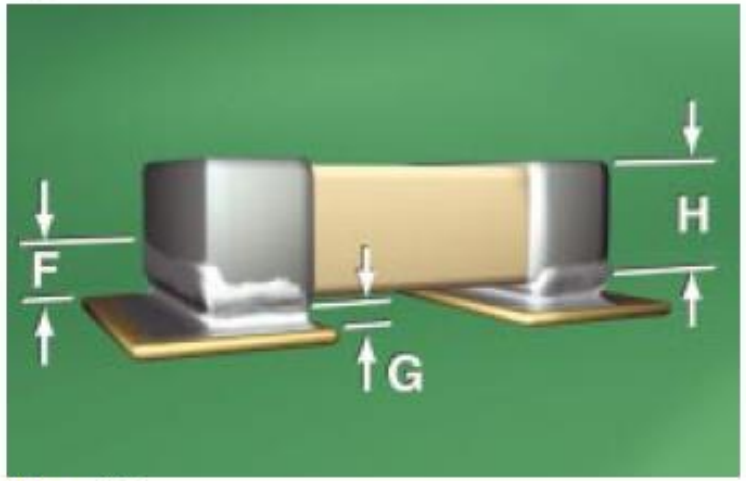


Figure 8-27

Defect - Class 1,2

- No fillet height evident on face of component.

Defect - Class 3

- Minimum fillet height (F) is less than solder thickness (G) plus 25% (H), or solder thickness (G) plus 0.5 mm [0.02 in], whichever is less.

Absolute No.1 Inspection Company

Thank You