IPC-7711/7721D

Rework, Modification and Repair of Electronic Assemblies

If a conflict occurs between the English language and translated versions of this document, the English version will take precedence.

Developed by the Repairability Subcommittee (7-34) of the Product Assurance Committee (7-30) of IPC

Supersedes:
Revision C – January 2017
IPC-7711/7721
with Changes 1 and 2
Revision B – November 2007
Change 1 – February 2013
Change 2 – March 2014
IPC-7711A/7721A –
October 2003
IPC-R-700C – January 1988

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

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1.0 General

1.1 Scope This document provides guidance on procedures for rework, repair and modification of printed board and cable or wire harness assemblies.

This document does not limit the maximum number of rework, repair or modification actions to an assembly.

1.2 Purpose This document provides the requirements, tools and materials to be used in the rework, repair and modification, of electronic products and for cable or wire harness assembles. Although this document is based in large part on the Product Class definitions used in IPC documents, this document should be considered applicable to any type of electronic equipment. When invoked by contract as the controlling document for the rework, repair or modification of products, requirements flow down of product class will apply.

The most common equipment and process to perform a specific rework, repair or modification is identified. If alternate equipment or processes are used, such equipment/processes:

- Must not damage the assembly.
- Must meet the intent of 1.6.1 Level of Conformance.

1.3 Product Class The User should identify the product class. If the User does not identify the product class, the Manufacturer should do so. The procedure selected for action to be taken must be consistent with the identified product class. The three product classes are:

Class 1 – General Electronic Products

Includes products suitable for applications where the major requirement is the 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/Harsh Environment 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 and other critical systems.

1.4 Measurement Units This Standard uses International System of Units (SI) units per ASTM SI10, IEEE/ASTM SI 10, Section 3 [Imperial English equivalent units are in brackets for convenience]. The SI units used in this Standard are millimeters (mm) [in] for dimensions and dimensional tolerances, Celsius (°C) [°F] for temperature and temperature tolerances, grams (g) [oz] for weight, and lux [footcandles] for illuminance.

1.5 Definition of Requirements This document is intended to be used as a guide and there are no specific requirements or criteria unless separately and specifically called out in a contractual agreement or other documentation. When statements such as "must" or "should" are used, they are stressing an important point. If these important recommendations are not followed, the end result may not be satisfactory and additional damage could be caused.

When required by the contractual agreement to produce product to a specific Product Class, this document should be used in conjunction with J-STD-001, IPC-A-610 or IPC-WHMA-A-620. When IPC-7711/21 is invoked by contract as the controlling document for the rework, repair or modification, the requirements of product flow down would apply.

1.6 Applicability, Process Controls and Acceptability Although the terms rework, repair and modification may seem very similar, applicability of such procedures may not be the same due to conditions and objectives involved. Procedures and guidelines of this document may be used during manufacturing of products or to products that have been delivered and/or failed in use.

In general, rework, repair or modification process controls during manufacturing are different from the process controls applied to products that fail after being placed in service and should be considered when dispositioning hardware.

When a defect or functional problem is discovered during the assembly process, a decision must be made whether to rework or repair the product, use it as is or discard it. Other than rework, this decision is typically the responsibility of a Material Review Board (MRB).

When a product fails after it has been placed in service, the term "repair" is commonly applied to actions taken in the service environment that restore operational use. Unlike the manufacturing process, there is no Material Review Board to disposition the failed assembly. How that decision is made is beyond the scope of this document.