



**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.

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

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## Table of Contents

1.0	General.....	1
1.1	Scope.....	1
1.2	Purpose.....	1
1.3	Product Class.....	1
1.4	Measurement Units.....	1
1.5	Definition of Requirements.....	1
1.6	Applicability, Process Controls and Acceptability.....	1
1.6.1	Level of Conformance.....	2
1.6.2	Compliance.....	2
1.7	Terms and Definitions.....	3
1.7.1	Diameter, Wire or Conductor.....	3
1.7.1.1	Conductor Diameter.....	3
1.7.1.2	Wire Diameter.....	3
1.7.2	Disposition.....	3
1.7.3	Electrostatic Discharge (ESD).....	3
1.7.4	Electrical Overstress (EOS).....	3
1.7.5	Modification.....	3
1.7.6	Repair.....	3
1.7.7	Rework.....	3
1.7.8	Tack Solder.....	3
1.7.9	User.....	3
1.8	Board Types.....	3
1.9	Basic Considerations.....	4
1.9.1	Rework Process Goals.....	4
1.9.2	Selecting a Process.....	4
1.9.3	Nondestructive Component Removal.....	5
1.9.3.1	Component Installation.....	5
1.9.4	Time Temperature Profile (TTP).....	5
1.10	Training.....	5
1.11	Skill Level.....	6
1.12	Workstations, Tools and Materials.....	6
1.12.1	Vision Systems.....	6
1.12.2	Lighting.....	6
1.12.3	Fume Extraction.....	6
1.12.4	Soldering Tools.....	6
1.12.5	Primary Heating Methods.....	6
1.12.5.1	Conductive (by contact) Heating Tools and Methods.....	6
1.12.5.2	Convective (Hot Gas) and IR (Infrared) Heating Tools and Methods.....	7
1.12.6	Preheating (Auxiliary) Heating.....	7

1.12.7	Handheld Drilling and Grinding Tool.....	7
1.12.8	Precision Drill/Mill System.....	7
1.12.9	Eyelets and Eyelet Press System.....	7
1.12.10	Gold Plating System.....	8
1.12.11	Tools.....	8
1.12.12	Materials.....	8
1.12.12.1	Solder.....	8
1.12.12.2	Flux.....	8
1.12.12.3	Replacement Conductors and Lands.....	8
1.12.12.4	Epoxy.....	8
1.12.12.5	Adhesives.....	8
1.12.12.6	Consumables.....	8
1.12.13	Cleaning Station/System.....	8
1.12.14	Conformal Coating Area.....	8
1.13	High Temperature Solder Alloys.....	8
1.13.1	Pb-free.....	8
1.13.2	High Melting Point (HMP).....	9
1.14	Common Procedures.....	9
1.14.1	Cleaning.....	10
1.14.2	Coating Removal.....	12
1.14.2.1	Coating Removal — Identification of Conformal Coating.....	12
1.14.2.2	Coating Removal — Solvent Method.....	16
1.14.2.3	Coating Removal — Peeling Method.....	18
1.14.2.4	Coating Removal — Thermal Method.....	19
1.14.2.5	Coating Removal — Grinding/Scraping Method.....	21
1.14.2.6	Coating Removal — Micro Blasting Method.....	23
1.14.3	Coating Replacement.....	25
1.14.3.1	Coating Replacement — Solder Resist.....	25
1.14.3.2	Coating Replacement — Conformal Coatings/Encapsulants.....	26
1.14.4	Conditioning.....	27
1.14.4.1	Conditioning — Baking and Preheating.....	27
1.14.5	Epoxy Mixing and Handling.....	29
1.14.6	Legend/Marking.....	31
1.14.6.1	Legend/Marking — Stamping Method.....	31
1.14.6.2	Legend/Marking — Hand Lettering Method.....	33
1.14.6.3	Legend/Marking — Stencil Method.....	34
1.14.7	Tip Care and Maintenance.....	35
2.0	Applicable Documents.....	36
2.1	IPC.....	36
2.2	Joint Industry Standards.....	36

2.3	ASTM .....	37
2.4	ESD Association .....	37
2.5	Military Standards .....	37
<b>IPC-7711</b>	.....	<b>7711-1</b>
3.0	Rework .....	7711-2
3.1	Through-Hole Desoldering .....	7711-2
3.1.1	Through-Hole Desoldering — Continuous Vacuum Method .....	7711-2
3.1.2	Through-Hole Desoldering — Continuous Vacuum Method – Partial Clinch .....	7711-4
3.1.3	Through-Hole Desoldering — Continuous Vacuum Method – Full Clinch .....	7711-5
3.1.4	Through-Hole Desoldering — Full Clinch Straightening Method .....	7711-7
3.1.5	Through-Hole Desoldering — Full Clinch Wicking Method .....	7711-8
3.2.1	PGA and Connector Removal — Solder Fountain Method .....	7711-10
3.3.1	Chip Component Removal — Bifurcated Tip .....	7711-11
3.3.2	Chip Component Removal — Tweezer Method .....	7711-12
3.3.3	Chip Component Removal (including bottom termination) — Hot Air Method .....	7711-13
3.4.1	Leadless Component Removal — Solder Wrap Method – Tweezer .....	7711-14
3.4.2	Leadless Component Removal — Flux Application Method – Tweezer .....	7711-15
3.4.3	Leadless Component Removal — Hot Gas (Air) Reflow Method .....	7711-16
3.5.1	SOT Removal — Flux Application Method .....	7711-17
3.5.2	SOT Removal — Flux Application Method – Tweezer .....	7711-18
3.5.3	SOT Removal — Hot Air Pencil .....	7711-19
3.6.1	Gull Wing Removal (two-sided) — Bridge Fill Method .....	7711-20
3.6.2	Gull Wing Removal (two-sided) — Solder Wrap Method .....	7711-21
3.6.3	Gull Wing Removal (two-sided) — Flux Application Method .....	7711-22
3.6.4	Gull Wing Removal (two-sided) — Bridge Fill Method – Tweezer .....	7711-23
3.6.5	Gull Wing Removal (two-sided) — Solder Wrap Method – Tweezer .....	7711-24
3.6.6	Gull Wing Removal (two-sided) — Flux Application Method – Tweezer .....	7711-25
3.6.7	Gull Wing Removal (two-sided) — Hot Gas (Air) Reflow Method .....	7711-26
3.7.1	Gull Wing Removal (four-sided) — Bridge Fill Method – Vacuum Cup .....	7711-27
3.7.1.1	Gull Wing Removal (four-sided) — Bridge Fill Method – Surface Tension .....	7711-28
3.7.2	Gull Wing Removal (four-sided) — Solder Wrap Method – Vacuum Cup .....	7711-29
3.7.2.1	Gull Wing Removal (four-sided) — Solder Wrap Method – Surface Tension .....	7711-30
3.7.3	Gull Wing Removal (four-sided) — Flux Application Method – Vacuum Cup .....	7711-31
3.7.3.1	Gull Wing Removal (four-sided) — Flux Application Method – Surface Tension .....	7711-32
3.7.4	Gull Wing Removal (four-sided) — Bridge Fill Method – Tweezer .....	7711-33
3.7.5	Gull Wing Removal (four-sided) — Solder Wrap Method – Tweezer .....	7711-34
3.7.6	Gull Wing Removal (four-sided) — Flux Application Method – Tweezer .....	7711-35
3.7.7	Gull Wing Removal (four-sided) — Hot Gas (Air) Reflow Method .....	7711-36
3.8.1	J-Lead Removal — Bridge Fill Method – Tweezer .....	7711-37
3.8.1.1	J-Lead Removal — Bridge Fill Method – Surface Tension .....	7711-38

3.8.2	J-Lead Removal — Solder Wrap Method – Tweezer .....	7711-39
3.8.2.1	J-Lead Removal — Solder Wrap Method – Surface Tension .....	7711-40
3.8.3	J-Lead Removal — Flux Application Method – Tweezer .....	7711-41
3.8.4	J-Lead Removal — Flux & Tin Tip Only .....	7711-42
3.8.5	J-Lead Removal — Hot Gas Reflow System .....	7711-43
3.9.1	BGA/CSP Removal — Hot Gas Reflow System .....	7711-44
3.9.1.2	BGA/CSP Removal — Focused IR Reflow System (with integral preheater) .....	7711-46
3.9.2	BGA Removal — Vacuum Method .....	7711-48
3.10.1	PLCC Socket Removal — Bridge Fill Method .....	7711-49
3.10.2	PLCC Socket Removal — Solder Wrap Method .....	7711-50
3.10.3	PLCC Socket Removal — Flux Application Method .....	7711-51
3.10.4	PLCC Socket Removal — Hot Air Pencil Method .....	7711-52
3.11.1	Bottom Terminated Component Removal — Hot Air Method .....	7711-53
3.12.1	D-Pak Removal — Tweezer Method .....	7711-55
4.1.1	Surface Mount Land Preparation — Individual Method .....	7711-56
4.1.2	Surface Mount Land Preparation — Continuous Method .....	7711-57
4.1.3	Surface Solder Removal — Braid Method .....	7711-58
4.2.1	Pad Releveling — Using Blade Tip .....	7711-59
4.3.1	SMT Land Tinning — Using Blade Tip .....	7711-60
4.4.1	Cleaning SMT Lands — Using Blade Tip and Solder Braid .....	7711-61
5.2.1	PGA and Connector Installation — Solder Fountain Method with Plated Through-Hole Prefilled .....	7711-62
5.3.1	Chip Installation — Solder Paste Method/Hot Air Pencil .....	7711-64
5.3.2	Chip Installation — Point-to-Point Method .....	7711-65
5.4.1	Leadless Component Installation — Hot Gas (Air) Reflow Method .....	7711-66
5.5.1	Gull Wing Installation — Multi-Lead Method – Top of Lead .....	7711-67
5.5.2	Gull Wing Installation — Multi-Lead Method – Toe Tip .....	7711-68
5.5.3	Gull Wing Installation — Point-to-Point Method .....	7711-69
5.5.4	Gull Wing Installation — Solder Paste Method/Hot Air Pencil .....	7711-70
5.5.5	Gull Wing Installation — Hook Tip w/Wire Layover .....	7711-71
5.5.6	Gull Wing Installation — Blade Tip with Wire .....	7711-72
5.5.7	Gull Wing Installation — Adhesive Backed Stencil – Solder Paste Method/Hot Air .....	7711-73
5.6.1	J-Lead Installation — Solder Wire Method .....	7711-75
5.6.2	J-Lead Installation — Point-to-Point Method .....	7711-76
5.6.3	J-Lead Installation — Solder Paste Method/Hot Air Pencil .....	7711-77
5.6.4	J-Lead Installation — Multi-Lead Method .....	7711-78
5.7.1	BGA/CSP Installation — Using Solder Wire to Prefill Lands .....	7711-79
5.7.1.2	BGA/CSP Installation — Focused IR Reflow System (with integral preheater) .....	7711-81
5.7.2	BGA/CSP Installation — Using Solder Paste to Prefill Lands .....	7711-83
5.7.2.1	BGA/CSP Installation — Stay-in-Place Stencil .....	7711-85
5.7.3	BGA Reballing Procedure — Fixture Method .....	7711-87

5.7.4	BGA Reballing Procedure — Paper Carrier Method .....	7711-88
5.7.5	BGA Reballing Procedure — Polyimide Stencil Method .....	7711-90
5.7.6	BGA Reballing Procedure — Polyimide Solder Ball Stencil Carrier .....	7711-91
5.8.1.1	Bottom Terminated Device Installation Pre-bump and Place .....	7711-92
5.8.1.2	Bottom Terminated Device Installation Pre-bump and Place with Stay in Place Stencil.....	7711-94
5.8.1.3	Bottom Terminated Device Installation Pre-Hand Soldering Plus Centered Ground Bump .....	7711-96
5.9	D-Pak Installation Point-to-Point Method .....	7711-98
6.1.1	Removing Shorts on J-Leads — Draw Off Method .....	7711-100
6.1.2	Removing Shorts on J-Leads — Respread Method.....	7711-101
6.1.2.1	Removing Shorts on J-Leads — Braid Method.....	7711-102
6.1.3	Removing Shorts Between Gull Wing — Draw Off Method.....	7711-103
6.1.4	Removing Shorts Between Gull Wing — Respread Method.....	7711-104
6.1.4.1	Removing Shorts on Gull Wings — Braid Method.....	7711-105
<b>IPC-7721</b>	.....	7721-1
3.1	Delamination/Blister Repair — Injection Method.....	7721-2
3.2	Bow and Twist Repair .....	7721-4
3.3.1	Hole Repair — Epoxy Method .....	7721-6
3.3.2	Hole Repair — Transplant Method .....	7721-8
3.4.1	Key and Slot Repair — Epoxy Method.....	7721-10
3.4.2	Key and Slot Repair — Transplant Method .....	7721-12
3.5.1	Base Material Repair — Epoxy Method.....	7721-14
3.5.2	Base Material Repair — Area Transplant Method.....	7721-16
3.5.3	Base Material Repair — Edge Transplant Method .....	7721-18
3.5.4	Base Material Repair — Corner or Edge Delamination Epoxy Method .....	7721-20
4.1.1	Lifted Conductor Repair — Epoxy Seal Method .....	7721-22
4.1.2	Lifted Conductor Repair — Film Adhesive Method.....	7721-24
4.2.1	Conductor Repair — Foil Jumper – Epoxy Method.....	7721-26
4.2.2	Conductor Repair — Foil Jumper – Film Adhesive Method .....	7721-29
4.2.3	Conductor Repair — Welding Method .....	7721-31
4.2.4	Conductor Repair — Surface Wire Method .....	7721-33
4.2.5	Conductor Repair — Through Board Wire Method .....	7721-36
4.2.6	Conductor Repair/Modification — Conductive Ink Method .....	7721-39
4.2.7	Conductor Repair — Inner Layer Method.....	7721-41
4.3.1	Conductor Cut — Surface Conductors .....	7721-44
4.3.2	Conductor Cut — Inner Layer Conductors .....	7721-46
4.3.3	Deleting Inner Layer Connection At A Plated Hole — Drill Through Method.....	7721-48
4.3.4	Deleting Inner Layer Connection At A Plated Hole — Spoke Cut Method .....	7721-50
4.4.1	Lifted Land Repair — Epoxy Method .....	7721-52
4.4.2	Lifted Land Repair — Film Adhesive Method .....	7721-54
4.5.1	Land Repair — Epoxy Method .....	7721-56

4.5.2	Land Repair — Film Adhesive Method .....	7721-59
4.6.1	Edge Contact Repair — Epoxy Method .....	7721-62
4.6.2	Edge Contact Repair — Film Adhesive Method.....	7721-65
4.6.3	Edge Contact Repair — Plating Method.....	7721-68
4.7.1	Surface Mount Pad Repair — Epoxy Method .....	7721-73
4.7.2	Surface Mount Pad Repair — Film Adhesive Method .....	7721-76
4.7.3	Surface Mount — BGA Pad Repair – Film Adhesive Method .....	7721-79
4.7.4	Surface Mount — BGA Land with Integral Via Repair Film Adhesive Method .....	7721-82
4.7.4.1	Surface Mount Pad with Integral Via Repair Film Adhesive Method — No Conductor Bend.....	7721-85
4.7.5	Surface Mount — BGA Land with Integral Via Repair Circuit Extension Film Adhesive Method.....	7721-88
5.0	Plated Hole Repair .....	7721-91
5.1	Plated Hole Repair — No Inner Layer Connection.....	7721-91
5.2	Plated Hole Repair — Double Wall Method.....	7721-93
5.3	Plated Hole Repair — Inner Layer Connection.....	7721-95
5.4	Plated Hole Repair — No Inner Layer Connection – Clinched Jumper Wire Method .....	7721-98
6.1	Jumper Wires.....	7721-100
6.2.1	Jumper Wires — BGA Components – Foil Jumper Method.....	7721-109
6.2.2	Jumper Wires — BGA Components – Through Board Method .....	7721-111
6.3	Component Modifications and Additions.....	7721-113
7.1.1	Flexible Conductor Repair.....	7721-117
8.1	Splicing .....	7721-120
8.1.1	Mesh Splice .....	7721-123
8.1.2	Wrap Splice .....	7721-124
8.1.3	Hook Splice .....	7721-125
8.1.4	Lap Splice .....	7721-126

# 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 assemblies. 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.