

Gold Contact Plating Repair Procedure

December 1998

Revision: 1.0

Page 1 of 5

Outline

This method is used to replate gold contact areas or fingers by selective plating. Contacts may require replating if they have become contaminated with solder, or scratched during handling. Other applications may arise when the existing plating does not meet the required specification, or if the specification changes.

The electroplating process uses a DC power supply. One lead, the cathode, is connected to the contact area to be plated. A second lead, the anode, is connected to the Mini Plating Pen. When the Pen is swabbed across the contact area the metal contained in the solution contained in the Pen is plated wherever electrical contact is made.

If the repair is required because of solder contamination, it is important to remove all the solder contamination prior to replating.

Caution

This method can be used to replate any metal surface, but it is essential that the surface is free from deep scratches, nicks, pin holes or other defects. If gold contacts or fingers are too damaged to be replated by this procedure, please contact INTERTRONICS for advice and other methods.

Safety

A thorough review of this method should be made before repairs are attempted. Operators should become familiar with the tools included and should practice on scrap printed circuit boards (pcb's).

To achieve the best results a clean work environment is essential. A smooth work surface and good lighting are recommended.

We recommend that safety glasses and gloves should be worn during the procedure, and that the work area should be adequately ventilated or extraction should be used. The Health & Safety Data Sheets which are included in the IPS CRK-01 Gold Contact Plating Repair Kit should be read and appropriate precautions taken in compliance with them, legal requirements and good industrial practice.

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Gold Contact Plating Repair Procedure

December 1998

Revision: 1.0

Page 2 of 5

Tools & Materials

The following will or may be required during this procedure:

Part No	Description	Supplied in kit
IPS ER-01	Eraser	•
IPS GL-01	Antistatic Gloves	•
TEC 1815-5F	Desoldering Braid	•
TEC 1816-5F	Desoldering Braid	•
TEC 1610PK	IPA Cleaning Wipe	•
TEC 2357	Absorbent Wipe	•
TEC 2032	Cleaning Brush	•
RAR-WB-8-ESD	ESD Safe Water Bottle	•
INT 701-012	Kapton Masking Tape	•
INT 871	Plating Testing Tape	•
IPS SG-01	Safety Glasses	•
HUN PL-1001	Connector Cables	•
HUN PL-1002	Absorbent Pen	•
HUN PL-1003	24k Gold Pen	•
HUN PL-1016	24k Gold Pen - Heavy	•
HUN PL-1006	Nickel Pen	•
HUN PL-1020	Nickel Pen - Heavy	•
	Power Supply 0-12V DC, 100mA	
	Soldering Iron	
	DI Water	

Preparation

Remove Solder Contamination

- Clean the rework area with TEC 1610PK IPA Cleaning Wipe or similar.
- Apply INT 701-012 Kapton Masking Tape to the pcb surface surrounding the area to be reworked. The masking tape will protect adjacent components and pcb surface from unwanted exposure to cleaning and plating solutions.
- Remove the bulk of the solder contamination using desoldering braid. In order to provide a more even surface for replating, solder may be reflowed over the entire contact area prior to desoldering.
- Clean the area.
- Using the IPS ER-01 Eraser, remove the remaining thin layer of solder until the underlying nickel surface is exposed.
- Thoroughly rinse the area with DI water (the RAR-WB-8-ESD ESD Safe Water Bottle is supplied for this). Use a TEC 2357 Absorbent Wipe to remove any residue.

Remove Poor Plating

- Clean the rework area with TEC 1610PK IPA Cleaning Wipe or similar.
- Apply INT 701-012 Kapton Masking Tape to the pcb surface surrounding the area to be reworked. The masking tape will protect adjacent components and pcb surface from unwanted exposure to cleaning and plating solutions.

Gold Contact Plating Repair Procedure

December 1998

Revision: 1.0

Page 3 of 5

- Buff the contacts using the IPS ER-01 Eraser until all defective or poor plating is removed.
- Thoroughly rinse the area with DI water (the RAR-WB-8-ESD ESD Safe Water Bottle is supplied for this). Use a TEC 2357 Absorbent Wipe to remove any residue.

Plating Process

- Place the pcb on a TEC 2357 Absorbent Wipe. This will help to protect the work surface.
- **Masking & Bussing**

Masking of surrounding areas which are not be plated will protect adjacent components, pcb surface and other contacts from unwanted exposure to cleaning and plating solutions. Also, precautions must be taken to prevent the plating voltage from being applied through other parts of the pcb, which might cause electrical damage.

 - If only one gold contact requires plating, mask off the area where plating is not required and the adjacent contacts with INT 701-012 Kapton Masking Tape.
 - If more than one contact requires plating, either plate the contacts individually, masking off each one in turn

or

 - Use a bussbar of conductive ink or copper wire across all the contacts to be plated. This will ensure that the plating voltage is confined to that area.
- Set the current limit on the power supply to 100mA and the voltage to 0 volts.
- Connect the HUN PL-1001 Connector Cables to the power supply, red cable to positive (+ve) and black cable to negative (-ve).
- Connect the PL-1002 Absorbent Pen to the +ve lead and adjust the voltage to 10 volts.
- Contact the -ve lead to a convenient point in the rework area and lightly rub the Absorbent Pen across the area to be plated. Small bubbles will form to remove oil and grease.
- Set the power supply voltage to 0 volts.
- Remove the Absorbent Pen and store (vertically, with the tip pointing upwards).
- Thoroughly rinse the area with DI water using a TEC 2357 Absorbent Wipe to remove any residue.
- Connect the PL-1006 Nickel Pen to the +ve lead and adjust the voltage to 6 volts.
- Contact the -ve lead to a convenient point in the rework area and lightly rub the Pen across the area to be plated. In moving the Pen lightly back and forth, nickel will be deposited on the contact area.
- Set the power supply voltage to 0 volts.
- Remove the Nickel Pen and store.
- Thoroughly rinse the area with DI water using a TEC 2357 Absorbent Wipe to remove any residue.
- Connect the PL-1003 Gold Pen to the +ve lead and adjust the voltage to 6 volts.
- Contact the -ve lead to a convenient point in the rework area and lightly rub the Pen across the area to be plated. In moving the Pen lightly back and forth, gold will be deposited on the contact area.
- Set the power supply voltage to 0 volts.
- Remove the Gold Pen and store.
- Remove masking tape.

Gold Contact Plating Repair Procedure

December 1998

Revision: 1.0

Page 4 of 5

- Thoroughly rinse the area with DI water using a TEC 2357 Absorbent Wipe to remove any residue, and dry.

Evaluation

- Visually examine the rework area for colour and lustre.
- The plating bond may be checked using INT 871 Plating Testing Tape.

Additional Information

CAUTION - Store the Mini Plating Pens vertically, with the tips pointing upward.

If the temperature is very low, the plating adhesion may be poor. In this case warm the plating area and Pen to not more than 40°C.

Wait until the plating solution seeps out of the end of the Mini Plating Pen. Do not shake the Pen to force the solution out.

Rinsing must be thorough. Rinse the area with DI water after each stage of the plating process including degreasing. Leave the area damp to prevent oxidation between stages.

The working voltage is indicated on each Pen. Using too high a voltage will result in burning and excessive use of solution.

Keep the work surface clean. If it is stained with plating solution, ensure this is wiped off.

Replace the Mini Plating Pen cap immediately after use.

Plating Coverage

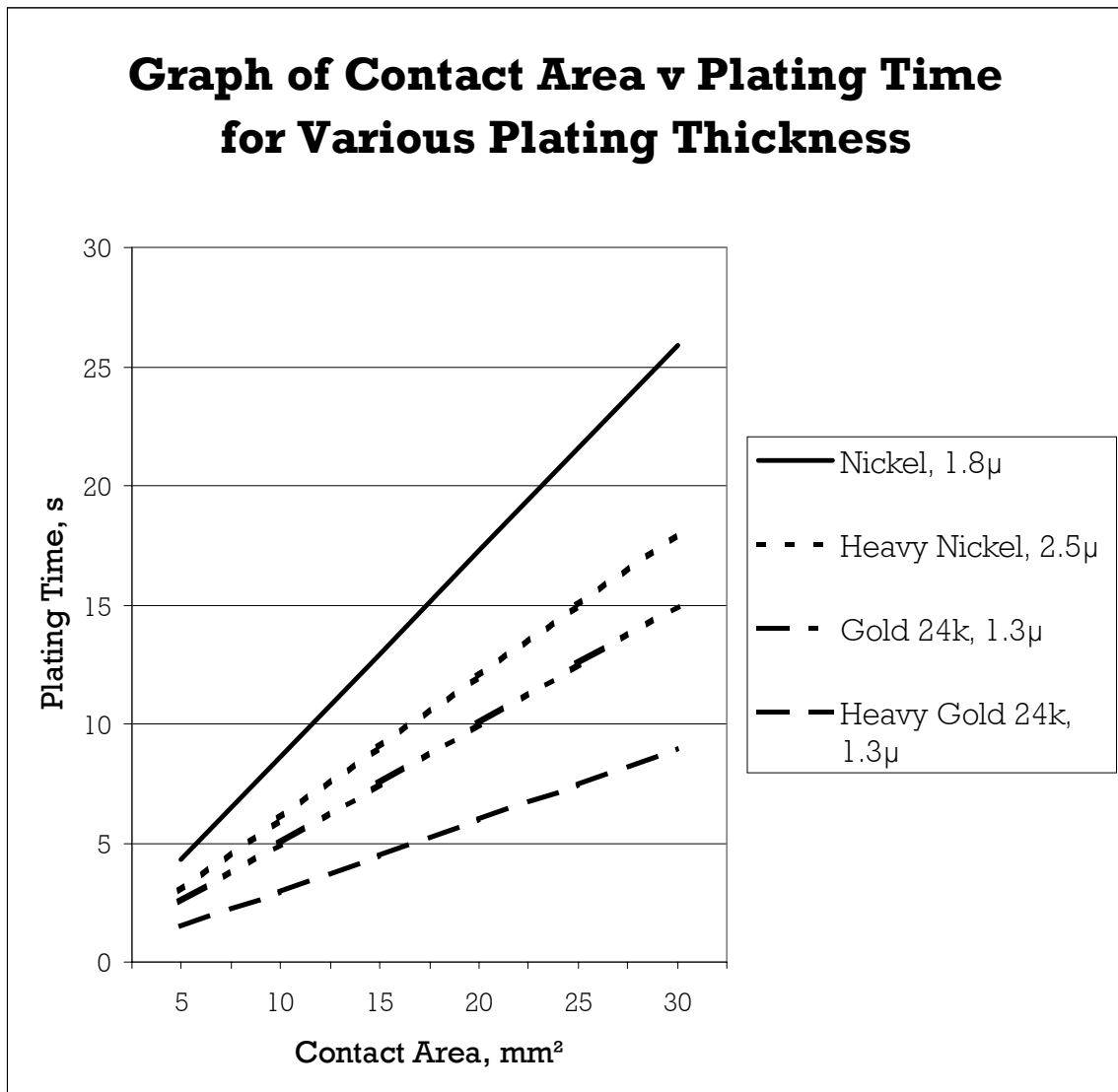
The following specifications are meant as a guide only and the user should establish the correct plating times to meet their requirements.

Plating times given are typical to achieve a 1 micron thickness on 25mm x 25mm copper surface:

PL-1006 Nickel	300 seconds
PL-1020 Nickel - Heavy	150 seconds
PL-1003 Gold 24k	240 seconds
PL-1016 Gold 24k - Heavy	150 seconds

Therefore, for a typical edge connector pad 7mm x 1.5mm the approximate plating times would be:

PL-1006 Nickel	1.8 microns	9 seconds
PL-1020 Nickel - Heavy	2.5 microns	6 seconds
PL-1003 Gold 24k	1.3 microns	5 seconds
PL-1016 Gold 24k - Heavy	1.3 microns	3 seconds



References

- IPC-7721 Repair and Modification of Printed Boards and Electronic Assemblies
- ANSI/IPC-A-610 Acceptability of Electronic Assemblies
- ANSI/IPC-A-600 Acceptability of Printed Boards