Ironwood ELECTRONICS
A HEICO COMPANY

ATE PicoRaptor 2

Maintenance & Inspection Guide

1. TYPE OF PINS & ELASTOMER

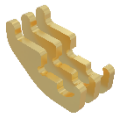
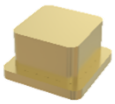
a. Perimeter Pin

- There are several pins with different thickness based on design requirement. Part Number of the pins will be specify inside drawing for respective project.

Type	Pin part number	Description
PicoRaptor 2	P-R100A	PicoRaptor 2 Straight Footed Pin 0.20/0.15mm Thick
	P-R101A	PicoRaptor 2 Straight Footed Pin 0.25/0.15mm Thick
	P-R102A	PicoRaptor 2 Straight Pin 0.15 Thick
	P-R103A	PicoRaptor 2 Straight Pin 0.20 Thick
	P-R104A	PicoRaptor 2 Straight Pin 0.25 Thick
	P-R105A	PicoRaptor 2 Straight Pin 0.30 Thick
	P-R106A	PicoRaptor 2 Straight Pin 0.50 Thick

b. Ground Pin

- There are several type of grounding based on design requirement. Part Number for Ground pin kindly refer to the drawing for respective project. Below are the availability design for Ground pins:

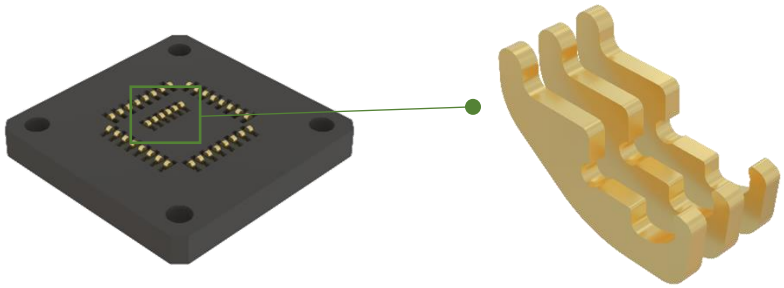
PicoRaptor 2 Pin	PicoRaptor 2 Short Pin	Hinged Contact Insert (HCI)	Bell Contact (BC)	Ground Block	Ground Block with pin
					

c. Elastomer

- Different elastomer will be used for different pins.
- Below are the part number for elastomer

Elastomer	Description	Used in
R7126	P-Shape Elastomer for PicoRaptor 2 pin	PicoRaptor 2
R7128	Round Shape Elastomer 0.60mm Diameter Red	Hinged Contact Insert
R7129	Round Shape Elastomer 0.30mm Diameter Purple	Retaining elastomer for PicoRaptor 2
R7130	Round Shape Elastomer 0.60mm Diameter Purple	Bell Contact (BC)

2. ATE PICORAPTOR 2 PIN'S SPECIFICATIONS



Below table show mechanical & electrical specification:

MECHANICAL SPECIFICATION	PicoRaptor 2
Uncompressed Height (mm)	1.60
Compressed Height (mm)	1.40
Pin Compliance (mm)	0.20
Pin Tip Co-planarity (mm)	±0.05
Wipe Length (mm)	~0.10
Contact Force (per contact)	20~40
Temperature	-45°C to +155°C
Socket Frame Material	Torlon 5030 or Equivalent
Contact Cartridge Material	Cirlex® Polyimide
Contact Pin Material	BeCu - NiAu

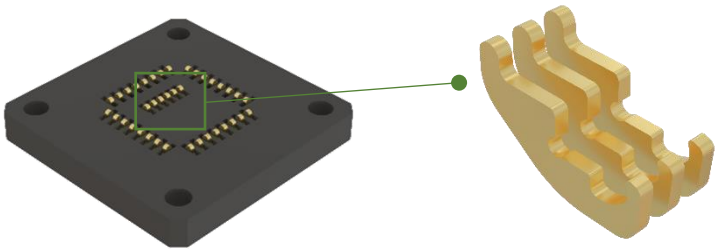
Note: Above value are based on internal laboratory testing.

ELECTRICAL SPECIFICATION	PicoRaptor 2
Self Inductance (nH)	0.76
Mutual Inductance (nH)	0.46
Ground Capacitance (pF)	0.15
Mutual Capacitance (pF)	0.11
S21 Insertion Loss (GSG)	-1dB @ 18GHz
S11 Return Loss (GSG)	-20dB @ 3GHz
S41 Far End Crosstalk (GSSG)	-20dB @ 12GHz
Contact DC Resistance (mΩ)	≤25
Current Carrying Capacity (A)	9A
Current Leakage (pA) @ 10V	≤1

Note: Above value are simulated data. PicoRaptor 2 electrical simulation based on 0.50mm pitch with 1010mils pin, CCC use 0808mils pin.

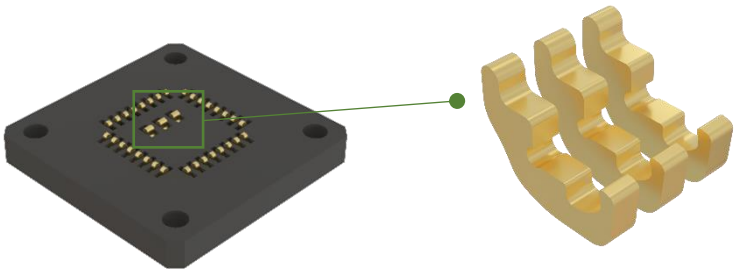
3. GROUND'S SPECIFICATION

a. *PicoRaptor 2 Pin*



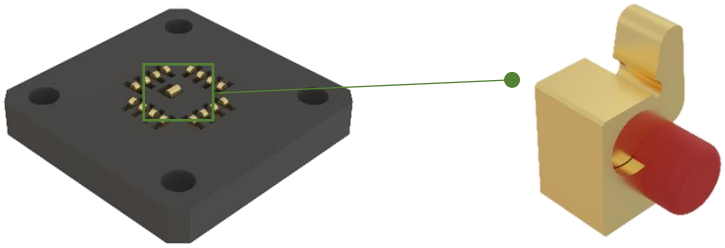
Part Number and specification are same for PicoRaptor 2 pin.

b. *PicoRaptor 2 Short Pin*



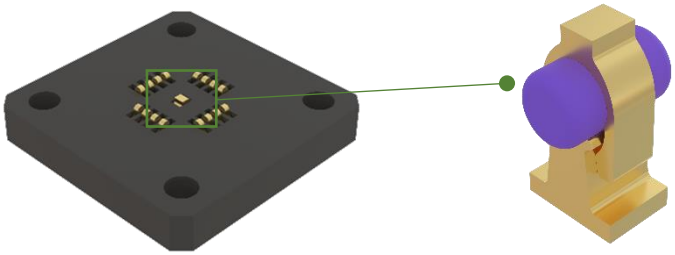
Specification are same with PicoRaptor 2.

c. *Hinged Contact Insert (HCI)*



MECHANICAL SPECIFICATION	Hinged Contact Insert (HCI)
Uncompressed Height (mm)	1.60
Compressed Height (mm)	1.40
Pin Compliance (mm)	0.20
Contact Force (per contact)	35~50g
Temperature	-45°C to +155°C
Contact Pin Material	BeCu - NiAu

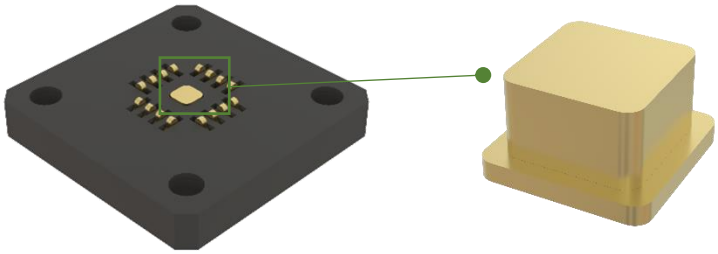
d. Bell Contact (BC)



MECHANICAL SPECIFICATION	Bell Contact (BC)
Uncompressed Height (mm)	1.55
Compressed Height (mm)	1.40
Pin Compliance (mm)	0.15
Contact Force (per contact)	~80g
Temperature	-45°C to +155°C
Contact Pin Material	BeCu - NiAu

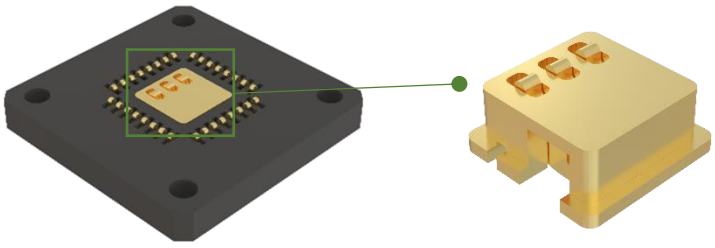
e. Ground Block

Size and shape based on design.



f. Ground Block with Pins

Size and shape based on design.



Note: This is for general reference only, final design will be provided based on requirement.

4. RECOMMENDED MAINTENANCE TOOL

NO.	TOOL	IMAGE
1	Tweezer *Purpose:* *Pin replacement.*	
2	Plastic spudger *Purpose:* *Remove Cartridge / Housing.*	
3	MS-121 Vacuum Pick-Up Tool *Purpose:* *Used in manual testing, to pick up the device into socket/from socket.*	
4	Magnifier / Microscope *Purpose:* *For inspection (i.e. imprint).*	
5	8PK-022 Seven (7) Pieces Miniature L Shaped Hex Key Set (Metric & Inch) *Purpose:* *For socket installation (i.e. fix onto the paddle board).*	
6	Screwdriver with flat head and Philips head (M1, M1.6, M2, M2.5, M3, #2-56, #4-40 etc.) *Purpose:* *For socket installation (i.e. fix onto the paddle board).*	
7	Energizer AA Torch Batteries – X215 – Energizer *Purpose:* *For inspection.*	

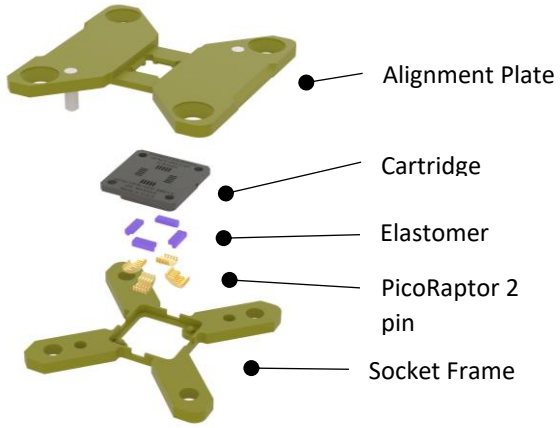
5. TORQUE RANGE VALUE

SCREW SIZE	TORQUE VALUES	
	in-lb	Nm
M1 x 0.25	0.22	0.0195
M1.4 x 0.3	0.4	0.04
M1.6 x 0.35	0.6	0.06
M2 x 0.40	1.3	0.15
M2.5 x 0.45	2.5	0.28
M3 x 0.5	4.5	0.51
M4 x 0.7	8.0	0.90
#0-80	1.0	0.11
#2-56	2.0	0.23
#4-40	5.0	0.56

6. FULL SOCKET & MANUAL ACTUATOR OVERVIEW

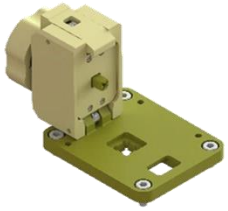
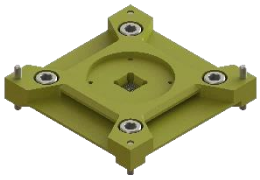
The overview of the ATE PicoRaptor 2 Socket, Single Latch Z-Actuated Manual Actuator and Double Latch Z-Actuated Manual Actuator provides a general idea of the PicoRaptor 2 Socket Configuration.

a. Socket

ATE PicoRaptor 2 Model	Standard Components
Socket Components  	The socket consists of 3 main components: i. Alignment Plate *(if applicable)*; *Purpose: to guide the package on the target spot in order to achieve ultimate test performance.* ii. Socket Frame*;* iii. Cartridge; iv. Elastomer; v. PicoRaptor 2 pin Basically an Alignment Plate will come together with the socket, unless existing handler already has alignment feature. Cartridge will come with pins inside as one set. *Note: The images used in this document is for illustration purposes only.*

b. Type of Manual Actuator (MA)

Manual Actuator (MA) is used for manual test application. MA has few types of design:

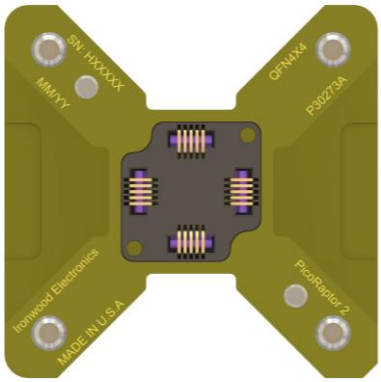
Socket	Single Latch Z-Actuated Manual Actuator	Socket and Single Latch Z-Actuated Manual Actuator
		
Socket	**Double Latch Z-Actuated Manual Actuator**	**Socket and Double Latch Z-Actuated Manual Actuator**
		

Note: Z-Actuated MA has knob and it is a spring loaded MA too.

7. SOCKET COMPONENTS IDENTIFICATION

a. ATE PicoRaptor 2 Socket Identification

The information on the product allows the identification of the Socket and Manual Actuator for order or tracking reference.



Engraving definition:
SN: Serial Number

MM/YY (Work week in Month & Year)

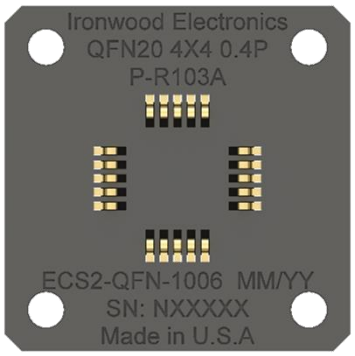
QFN – Package type
4X4 – Package size (body in mm)

P30273A – Part Number & Revision

Ironwood Electronics – Manufacturer

PicoRaptor 2 – Product name

b. ATE PicoRaptor 2 Cartridge Identification



Engraving definition:
Ironwood Electronics – Manufacturer

QFN – Package type
20 – Pin count
4X4 – Package size (body in mm)
0.4P – Pitch (in mm)

P-R103A – Pin's part number

ECS2-QFN-1006 – Cartridge's Product number;
(ECS2 refer to PicoRaptor 2)

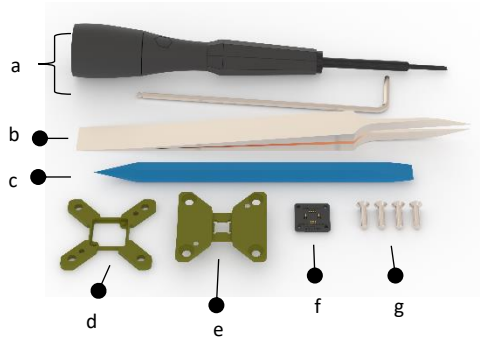
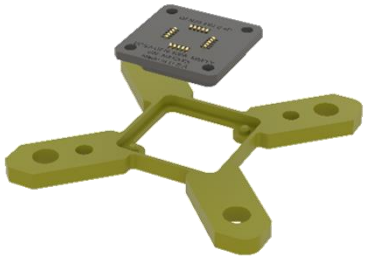
MM/YY (Work week in Month & Year)

SN – Serial Number

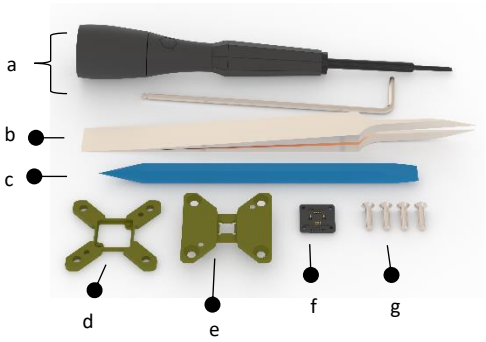
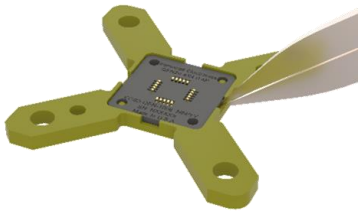
8. ATE PicoRaptor 2 Socket Assembly and Components Replacement

a. ATE PicoRaptor 2 Socket

i. ATE PicoRaptor 2 Socket Assembly

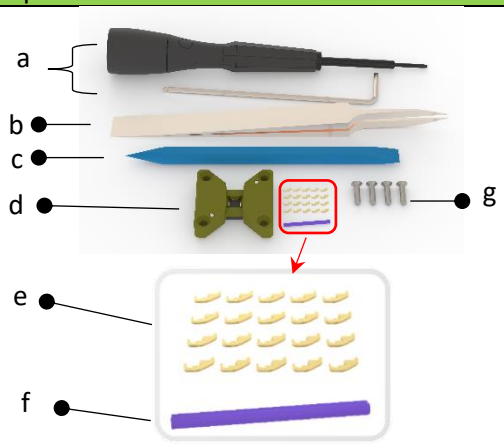
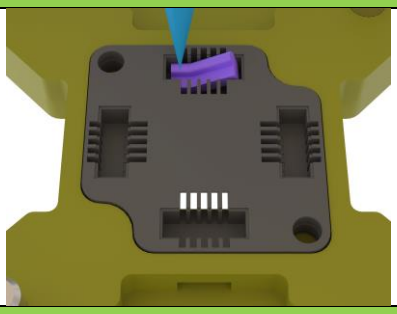
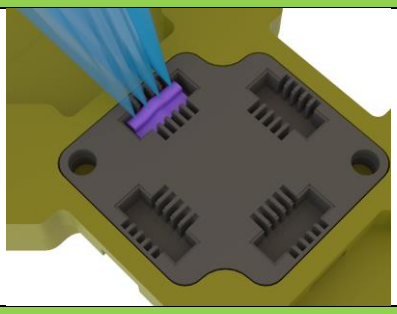
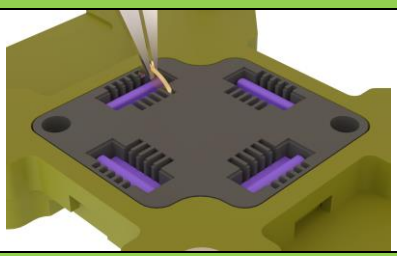
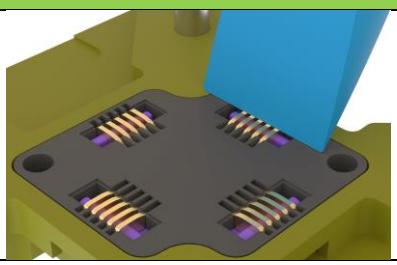
Step 1:	
	Tools required: a. Screwdriver / Allen Key b. Tweezer c. Plastic spudger Prepare items below: d. Socket Frame e. Alignment Plate f. Cartridge with PicoRaptor 2 pin and elastomer g. Screws
Step 2:	
	Insert Cartridge to Socket Frame. Make sure Cartridge sit properly inside and flat to Socket Frame. *Note: Use plastic spudger to press the Cartridge. Do not use tweezer to press as tweezer will scratch the surface of Cartridge or pin.*
Step 3:	
	Insert Alignment Plate onto Socket Frame. Make sure no gap between Alignment Plate and Socket Frame.
Step 4:	
	After that, screw the whole assembly onto PCB board.

ii. ATE PicoRaptor 2 Socket Replacement

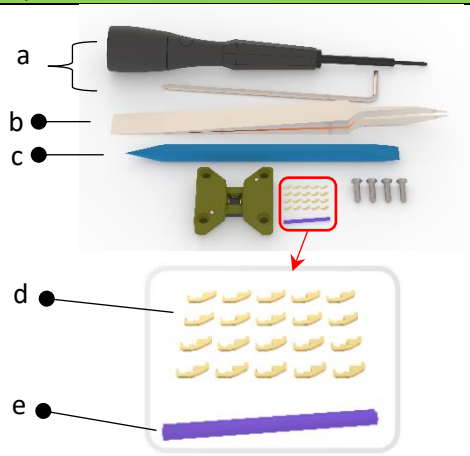
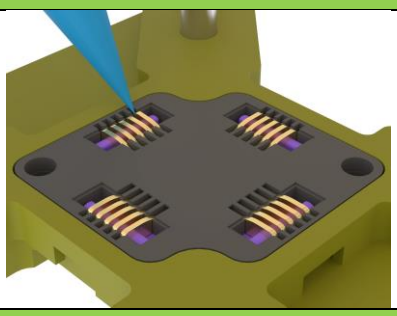
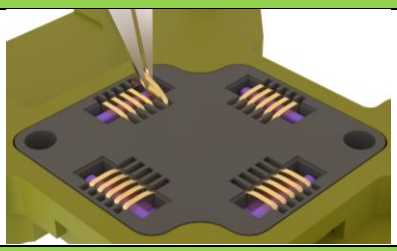
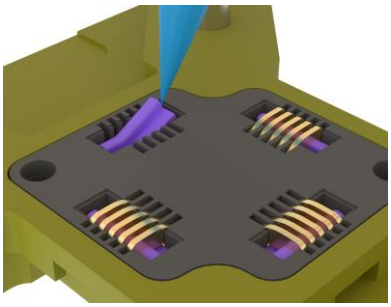
Step 1:	
	Tools required: a. Screwdriver / Allen Key b. Tweezer c. Plastic spudger Prepare items below: d. New Socket Frame, or e. New Alignment Plate, or f. New Cartridge Unmount Socket from PCB board.
Step 2:	
	To replace the Alignment Plate, remove from existing assembly and replace with new part.
Step 3:	
	To replace the Cartridge, remove Alignment Plate as shown in Step 2, then carefully pull Cartridge from top side by using Tweezer and replace with new Cartridge.
Step 4:	
	To replace the Socket Frame, remove Cartridge and Alignment Plate from existing Socket Frame, and install to new Socket Frame.

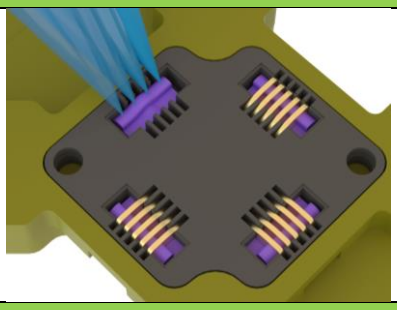
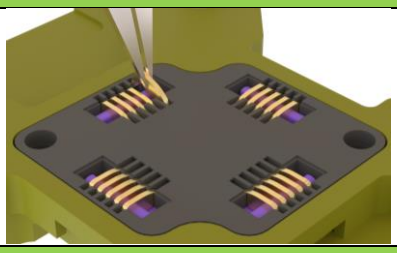
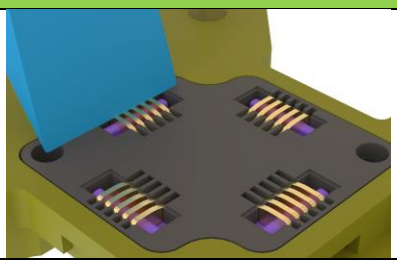
b. ATE PicoRaptor 2 Pin & Elastomer

i. ATE PicoRaptor 2 Pin & Elastomer Assembly

Step 1:	
	Tools required: a. Screwdriver / Allen Key b. Tweezer c. Plastic spudger Prepare items below: d. Socket assembly e. PicoRaptor 2 pin f. PicoRaptor 2 elastomer g. Necessary screw
Step 2:	
	Clean the new elastomer with IPA solution to ensure that the elastomer is free from particles and debris. Insert the elastomer into the elastomer slot using plastic spudger. *Note: The bulging side of the elastomer should face outwards from the socket*
Step 3:	
	Ensure that the elastomer sits perfectly in the elastomer slot by pushing down on the elastomer with the plastic spudger. Repeat steps 2 and 3 for all the elastomers. *Note: Make sure that the elastomer is not twisted or bulging.*
Step 4:	
	Hold the pin in the correct orientation by using tweezer and insert the pin into the pin slot. *Note: Pin tip should be facing inside towards the center of the socket.*
Step 5:	
	Once all the pins are installed, press down on all the pins with the plastic spudger to ensure that the pins are sitting firmly with the elastomer.

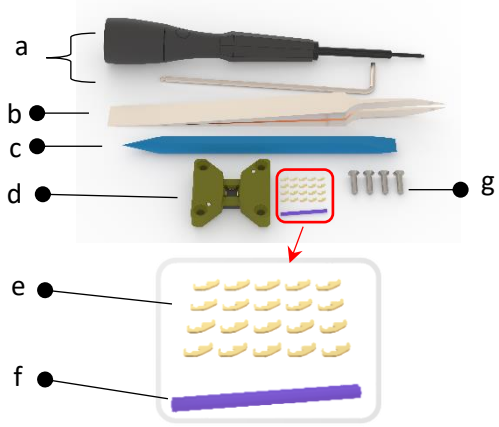
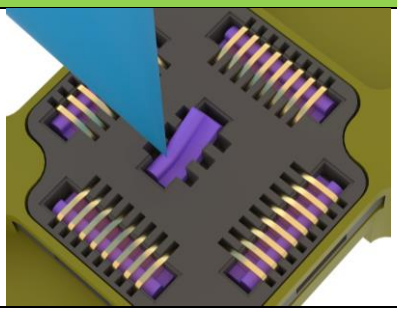
ii. ATE PicoRaptor 2 Pin & Elastomer Replacement

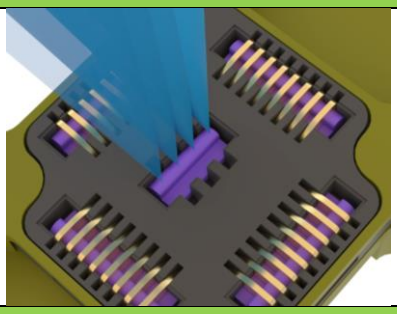
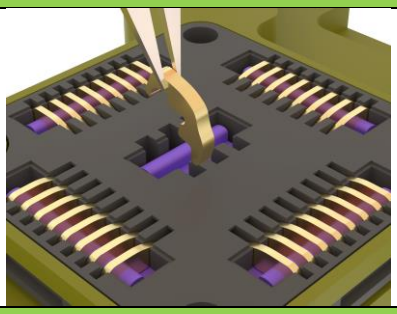
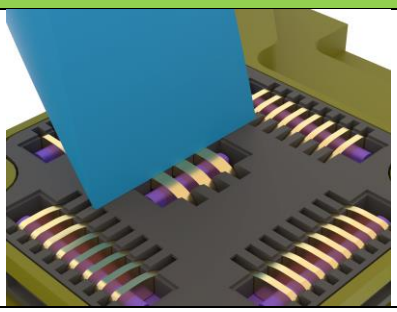
Step 1:	
	Tools required: a. Screwdriver / Allen Key b. Tweezer c. Plastic spudger Prepare items below: d. New PicoRaptor 2 pin, or e. New PicoRaptor 2 elastomer Unmount Socket from PCB Board
Step 2:	
	Carefully remove the pin tail from the pin slot with a plastic spudger.
Step 3:	
	To change damaged pin, use tweezer to remove the pin (at affected side). Then, insert a new pin by holding the new pin in the correct orientation using tweezer and insert the pin into the pin slot.
Step 4:	
	To change damaged elastomer, after removing the pin from affected side, then remove damaged elastomer. Clean the new elastomer with IPA solution to ensure that the elastomer is free from particles and debris. Slug the elastomer into the elastomer slot by using the tweezer. *Note: The bulging side of the elastomer should face outwards from the socket.*

Step 5:	
	Ensure that the elastomer sits perfectly flat in the elastomer slot by pushing down on the elastomer with the plastic spudger. *Note: Make sure that the elastomer is not twisted or bulging.*
Step 6:	
	Install pins. Hold the pin in the correct orientation by using tweezer and insert the pin into the pin slot.
Step 7:	
	Press down on all the pins with the plastic spudger to ensure that the pins are sitting firmly with the elastomer.

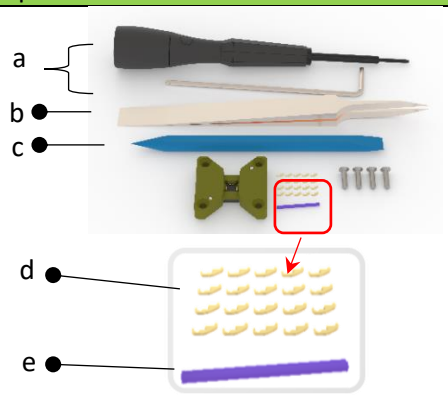
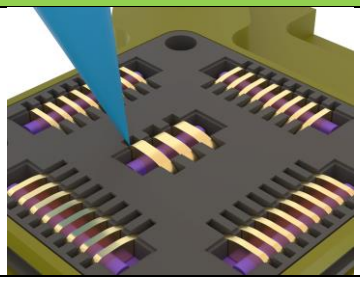
c. Socket Assembly with PicoRaptor 2 Ground Pin

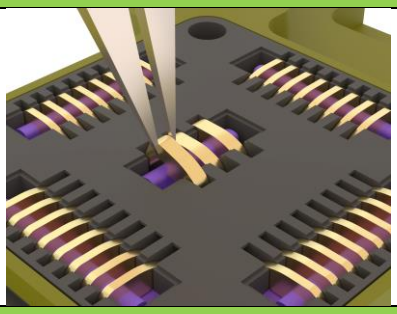
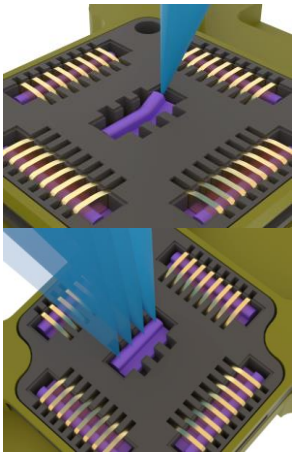
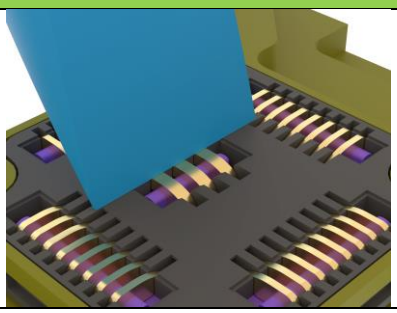
i. ATE PicoRaptor 2 Socket Assembly – PicoRaptor 2 Ground Pin

Step 1:	
	Tools required: a. Screwdriver / Allen Key b. Tweezer c. Plastic spudger Prepare items below: d. Socket assembly e. Ground pin f. Elastomer g. Necessary screws
Step 2:	
	Clean the new elastomer with IPA solution to ensure that the elastomer is free from particles and debris. Insert the elastomer into the elastomer slot using plastic spudger.

Step 3:	
	Ensure that the elastomer sits perfectly flat in the elastomer slot by pushing down on the elastomer with the plastic spudger. *Note: Make sure that the elastomer is not twisted or bulging.*
Step 4:	
	Hold the ground pin by its body firmly and place it into the pin slot using the tweezer.
Step 5:	
	Press down on the ground pins with the plastic spudger to ensure that the pins are sitting firmly with the elastomer.

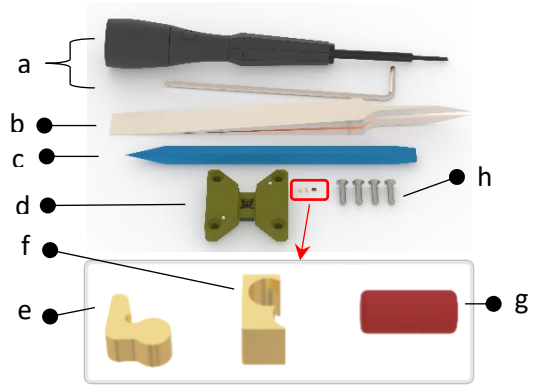
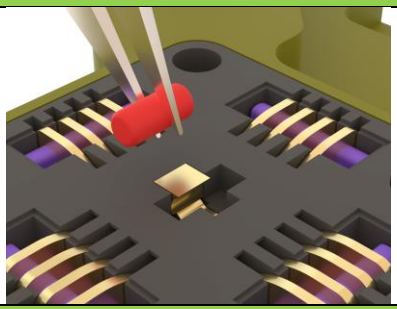
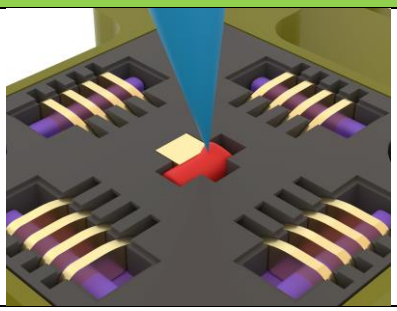
ii. ATE PicoRaptor 2 Socket Replacement – PicoRaptor 2 Ground Pin

Step 1:	
	Tools required: a. Screwdriver / Allen Key b. Tweezer c. Plastic spudger Prepare items below: d. New PicoRaptor 2 pin, or e. New elastomer Unmount Socket from PCB board.
Step 2:	
	Carefully remove the pin tail from the pin slot with a plastic spudger.

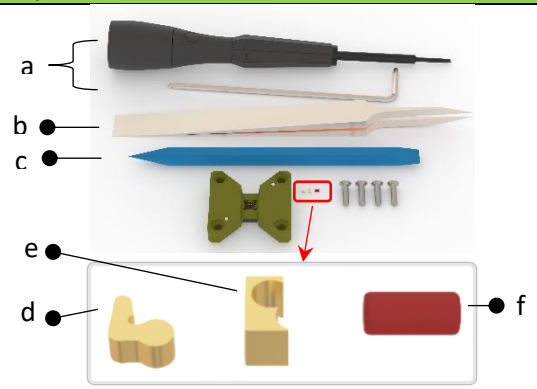
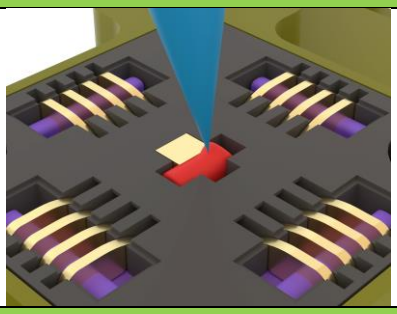
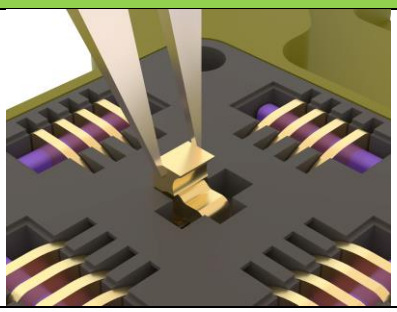
Step 3:	
	Use tweezer to remove the damaged pin (at affected side). Then, insert a new pin by holding the new pin in the correct orientation using tweezer and insert the pin into the pin slot.
Step 4:	
	To replace damaged elastomer, remove the pin and replace with new elastomer. Clean the new elastomer with IPA solution to ensure that the elastomer is free from particles and debris. Insert the elastomer into the elastomer slot by using the tweezer. Ensure that the elastomer sits perfectly in the elastomer slot by pushing down on the elastomer with the plastic spudger. *Note: Make sure that the elastomer is not twisted or bulging.*
Step 5:	
	After installing back the pin, press down on the ground pins with the plastic spudger to ensure that the pins are sitting firmly with the elastomer.

d. ATE PicoRaptor 2 Socket with Hinged Contact Insert (HCI) Ground Pin

i. ATE PicoRaptor 2 Socket Assembly – HCI Ground Pin

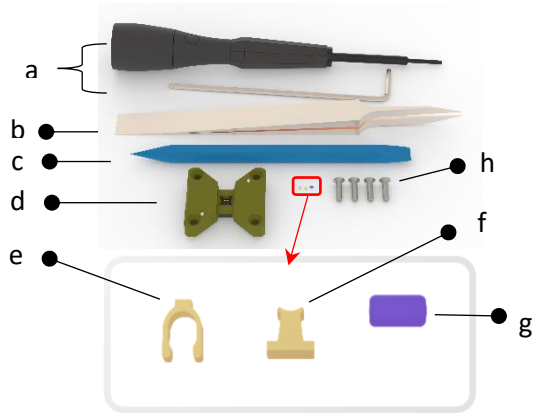
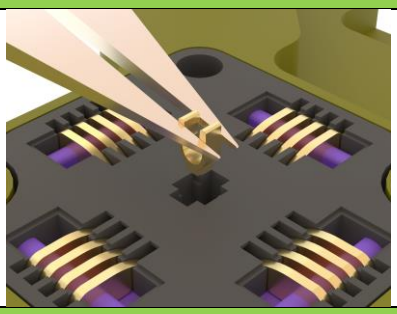
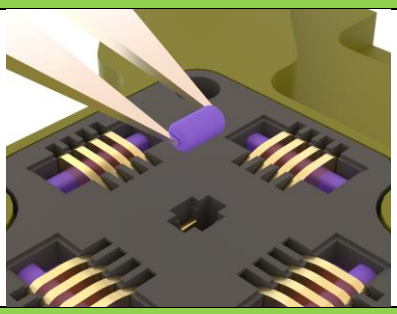
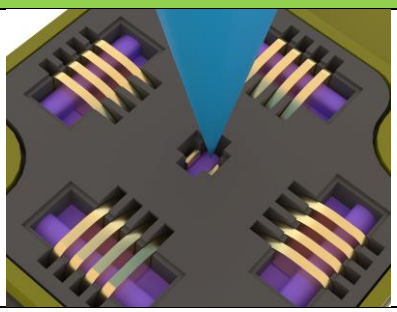
Step 1:	
	Tools required: a. Screwdriver / Allen Key b. Tweezer c. Plastic spudger Prepare items below: d. Socket Assembly e. HCI Pivot f. HCI Holder g. Elastomer h. Necessary Screws
Step 2:	
	Hold the HCI pivot firmly in the correct orientation by using the tweezer and insert it into the HCI block's opening.
Step 3:	
	Insert the assembled HCI into the socket's HCI slot in the correct orientation using the tweezer.
Step 4:	
	Insert the HCI elastomer into the HCI elastomer slot with the tweezer.
Step 5:	
	Gently slug in the HCI elastomer into its slot with the plastic spudger.

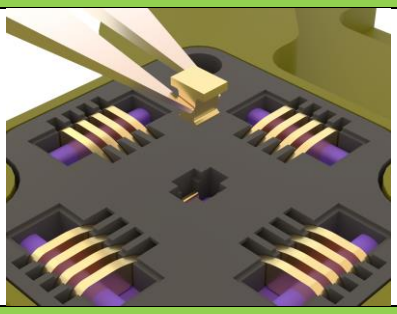
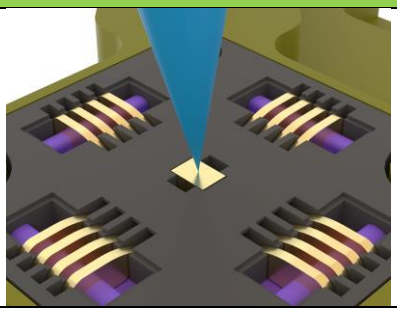
ii. ATE PicoRaptor 2 Socket Replacement – HCI Ground Pin

Step 1:	
	Tools required: a. Screwdriver / Allen Key b. Tweezer c. Plastic spudger Prepare items below: d. New HCI Pivot, or e. New HCI Holder, or f. New elastomer for HCI Unmount Socket from PCB board.
Step 2:	
	Hold the new HCI Top firmly in the correct orientation by using the tweezer and insert it into the HCI Bottom's opening.
Step 3:	
	Gently remove the damaged elastomer from the HCI pin. If replacing new elastomer only, then insert new elastomer. Gently insert the HCI elastomer into its slot with the plastic spudger.
Step 4:	
	If replacing new HCI, gently remove the HCI from the housing with tweezer. Refer to Page 19 and follow step 2 to 5 to install the new HCI.

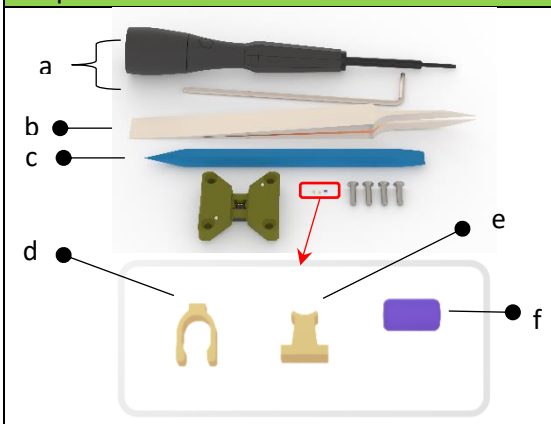
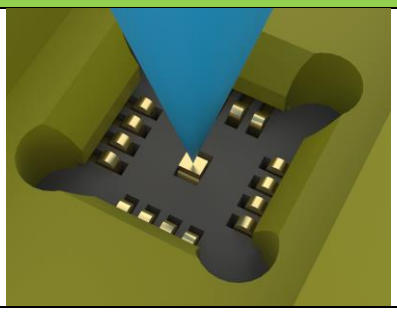
e. ATE PicoRaptor 2 Socket with Bell Contact (BC) Ground Pin

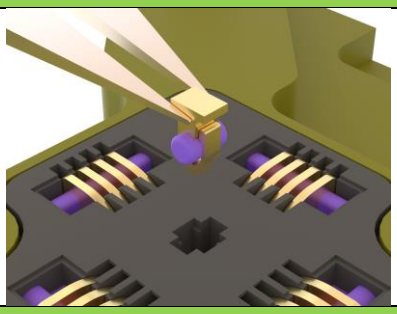
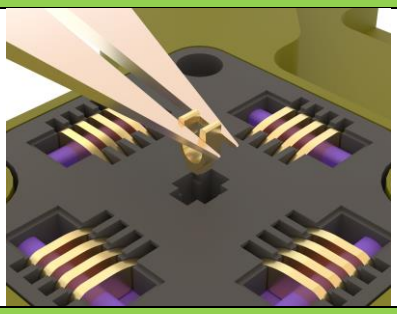
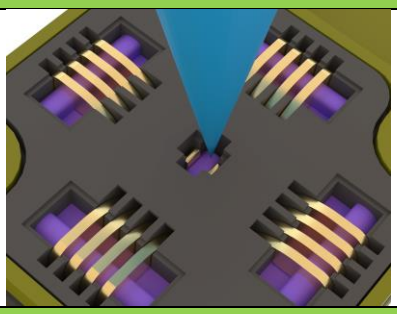
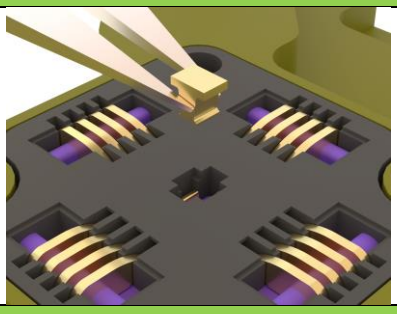
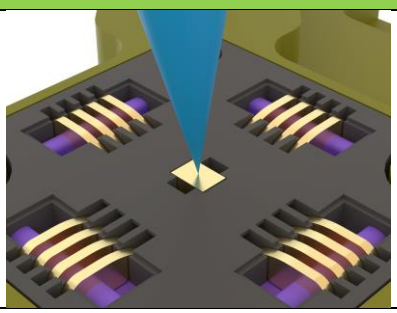
i. ATE PicoRaptor 2 Socket Assembly – BC Ground Pin

Step 1:	
	Tools required: a. Screwdriver / Allen Key b. Tweezer c. Plastic spudger Prepare items below: d. Socket Assembly e. BC Top f. BC Bottom g. Elastomer for BC h. Necessary Screw
Step 2:	
	Hold the Bell Top firmly in the correct orientation with the tweezer and insert it into the socket's Bell Contact slot.
Step 3:	
	Insert the Bell elastomer into the Bell Contact's elastomer slot using the tweezer.
Step 4:	
	Gently insert Bell elastomer into the Bell Top opening with the plastic spudger.

Step 5:	
	Insert the Bell Bottom into the socket's Bell Contact slot after the Bell elastomer with the tweezer.
Step 6:	
	Gently press Bell Bottom using plastic spudger to make sure Bell Bottom is engaged with Bell Top properly. *Note: Do not use tweezer to press pin.*

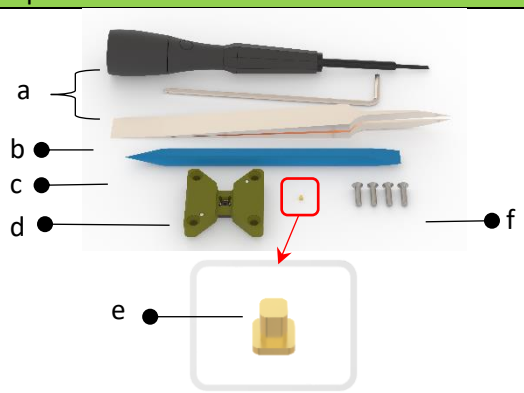
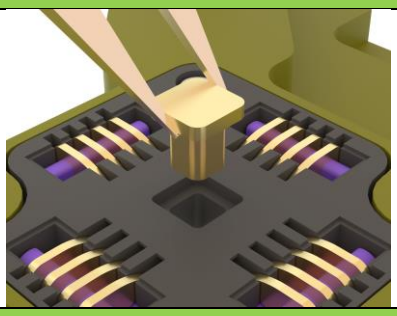
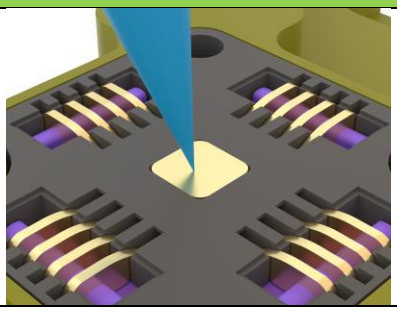
ii. ATE PicoRaptor 2 Socket Replacement – BC Ground Pin

Step 1:	
	Tools required: a. Screwdriver / Allen Key b. Tweezer c. Plastic spudger Prepare items below: d. New Bell Contact Top, or e. New Bell Contact Bottom, or f. New elastomer for Bell Contact Unmount Socket from PCB board.
Step 2:	
	Gently press Bell Contact from top side by using plastic spudger.

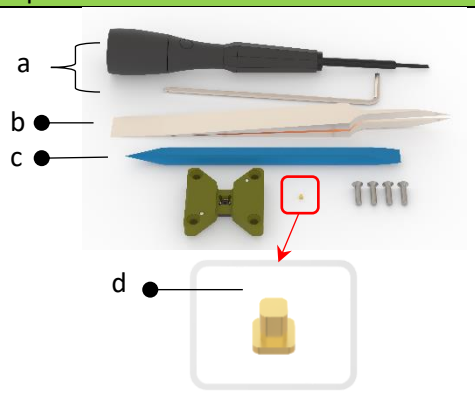
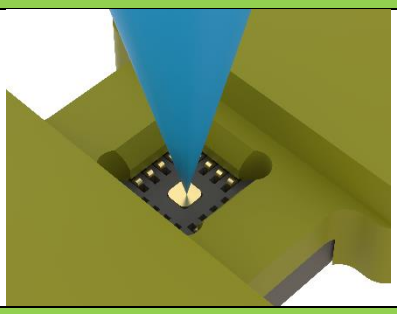
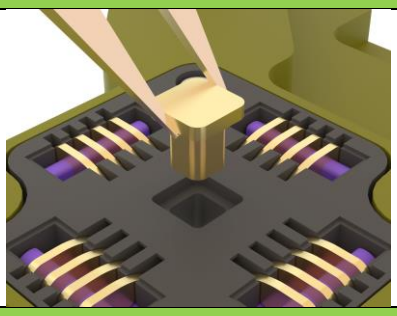
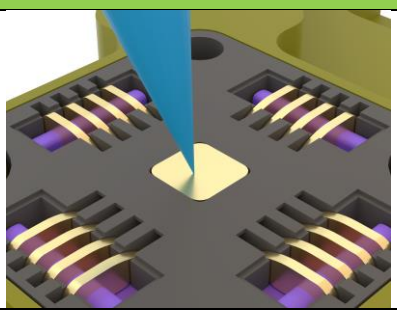
Step 3:	
	Gently remove the Bell Contact from the housing using tweezer.
Step 4:	
	Hold new Bell Top firmly in the correct orientation with the tweezer and insert it into the socket's Bell Contact slot.
Step 5:	
	Gently insert new Bell elastomer into the Bell Top opening with the plastic spudger.
Step 6:	
	Insert new Bell Bottom into the socket's Bell Contact slot after the Bell elastomer with the tweezer.
Step 7:	
	Gently press Bell Bottom using plastic spudger to make sure Bell Bottom is engaged with Bell Top properly. *Note: Do not use tweezer to press pin.*

f. ATE PicoRaptor 2 Socket with Ground Block

i. ATE PicoRaptor 2 Socket Assembly – Ground Block

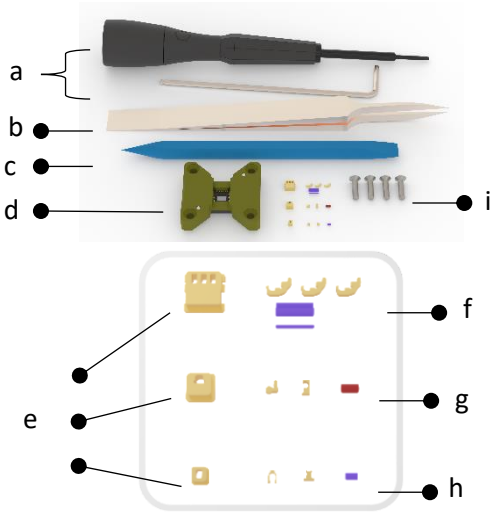
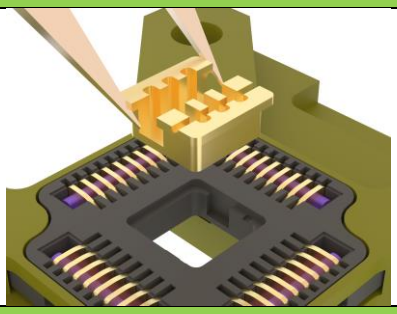
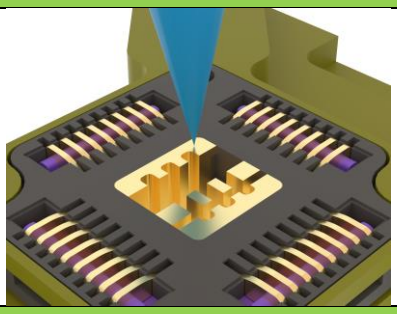
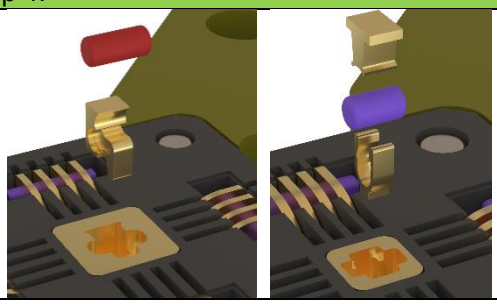
Step 1:	
	Tools required: a. Screwdriver / Allen Key b. Tweezer c. Plastic spudger Prepare items below: d. Socket Assembly e. Ground Block f. Necessary Screw
Step 2:	
	Insert the ground block into housing's center hole as shown.
Step 3:	
	Push the ground block into housing's center hole. Make sure that the ground block is inserted firmly into the housing center hole to prevent from falling out.

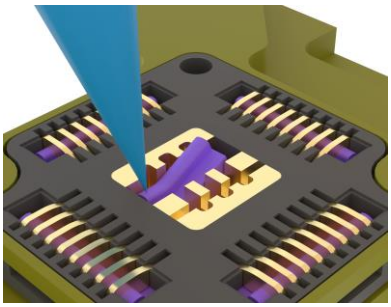
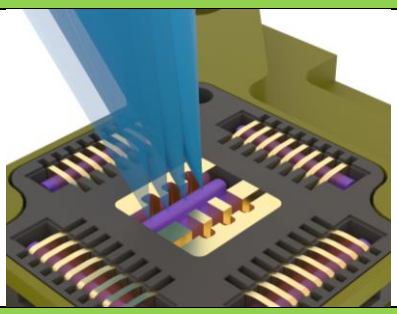
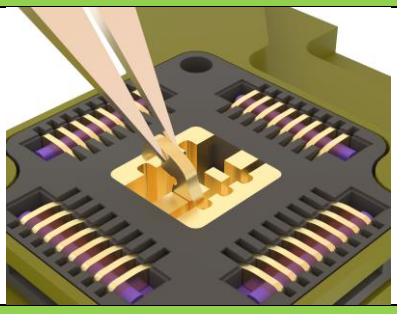
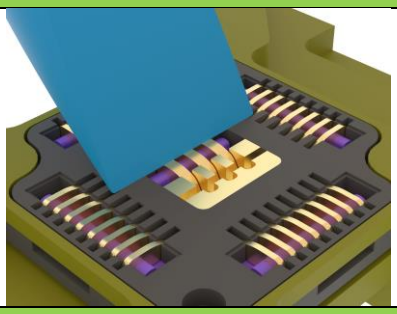
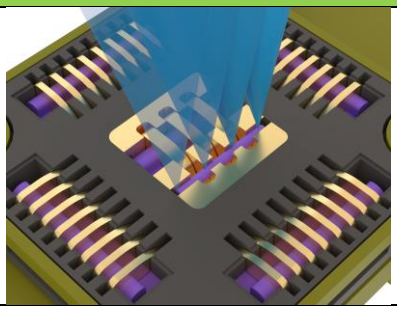
ii. ATE PicoRaptor 2 Socket Replacement – Ground Block

Step 1:	
	Tools required: a. Screwdriver / Allen Key b. Tweezer c. Plastic spudger Prepare items below: d. New Ground Block Unmount Socket from PCB board.
Step 2:	
	Gently push damaged ground block out of the housing from the top side of the socket with a plastic spudger to dislodge it.
Step 3:	
	Insert new ground block into housing's center hole as shown.
Step 4:	
	Push the ground block into housing's center hole. Make sure that the ground block is inserted firmly into the housing center hole to prevent from falling out.

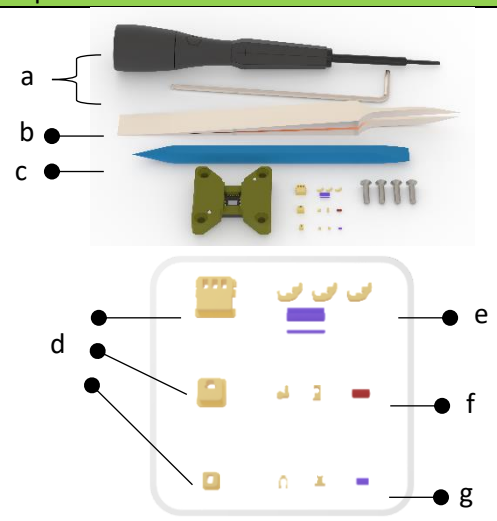
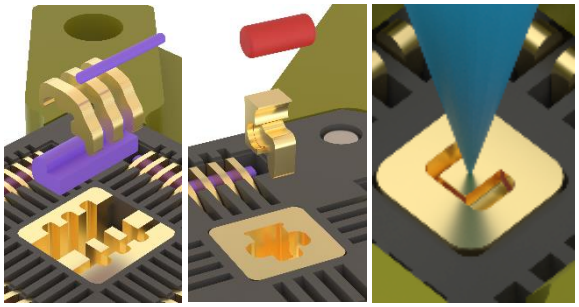
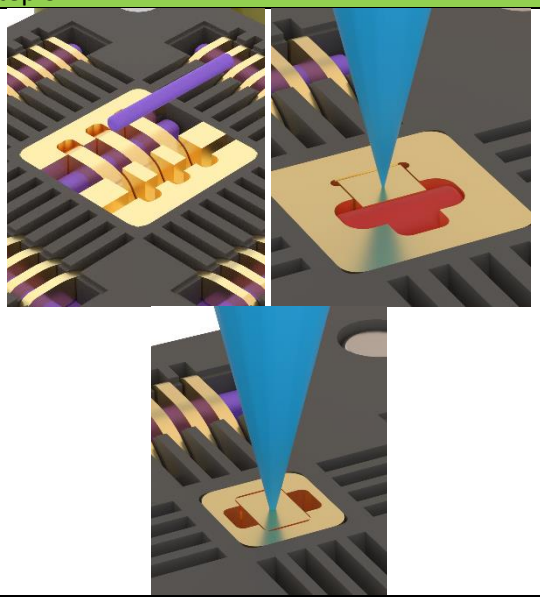
g. ATE PicoRaptor 2 Socket with Ground Block with Pin

i. ATE PicoRaptor 2 Socket Assembly – Ground Block with Pin

Step 1:	
	Tools required: a. Screwdriver / Allen Key b. Tweezer c. Plastic spudger Prepare items below: d. Socket Assembly e. Ground Block f. PicoRaptor 2 pin & elastomer, or g. HCI Top, HCI Bottom & HCI elastomer, or h. Bell Top, Bell Bottom & Bell elastomer, or i. Necessary Screw
Step 2:	
	Insert the corresponding Ground Block into housing's center hole as shown.
Step 3:	
	Push Ground Block into housing's center hole. Make sure that the Ground Block is inserted firmly into the housing center hole to prevent from falling out.
Step 4:	
	Insert corresponding ground pin based on design: • HCI pin – *Refer step 19 for installation method* • BC pin – *Refer Page 21-22 for installation method*

Step 5:	
	If ground pin is the PicoRaptor 2 pin, kindly follow Step 5 to Step 9 below for installation method. Clean the new elastomer with IPA solution to ensure that the Elastomer is free from particles and debris. Insert the elastomer into the elastomer slot using plastic spudger.
Step 6:	
	Ensure that the elastomer sits perfectly in the elastomer slot by pushing down on the Elastomer with the plastic spudger. *Note: Make sure that the elastomer is not twisted or bulging.*
Step 7:	
	Hold the ground pin by its body firmly and place it into the pin slot using the tweezer.
Step 8:	
	Press down on the ground pins with the plastic spudger to ensure that the pins are sitting firmly with the elastomer.
Step 9:	
	Place the retaining elastomer and slug it into the slot until it is seated firmly in the slot.

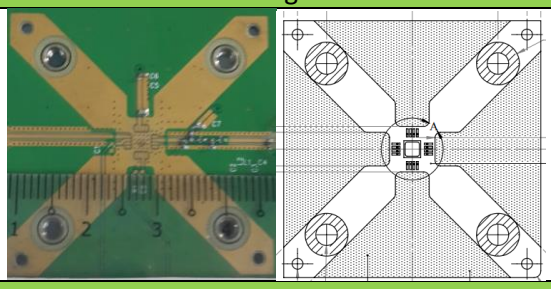
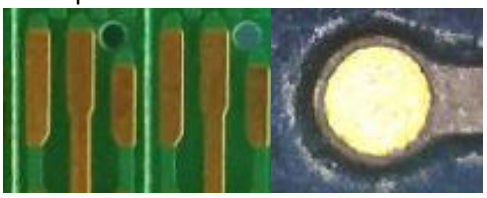
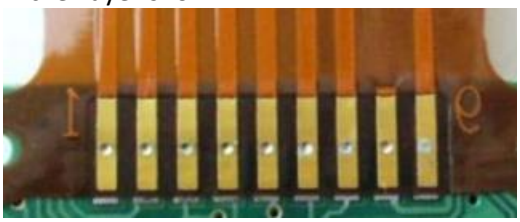
ii. ATE PicoRaptor 2 Socket Replacement – Ground Block with Pin

Step 1:	
	Tools required: a. Screwdriver / Allen Key b. Tweezer c. Plastic spudger Prepare items below: d. New Ground Block, or e. New PicoRaptor 2 pin & elastomer, or f. New HCI Top, HCI Bottom & HCI elastomer, or g. New Bell Top, Bell Bottom & Bell elastomer Unmount Socket from PCB board.
Step 2:	
	To replace damaged pin: For PicoRaptor 2 & HCI pin, remove front elastomer before removing pin. Then, use plastic spudger to remove the damaged pin (at affected side) from pin slot. For BC, remove pin by pushing the pin from top side. If replacing the elastomer, remove damaged elastomer and replace with new elastomer.
Step 3:	
	After changing pin or elastomer, press down on the ground pins with the plastic spudger to ensure that the pins are sitting firmly with the elastomer. Remember to insert retaining elastomer for PicoRaptor 2 pin.

9. SOCKET COMPONENTS INSPECTION

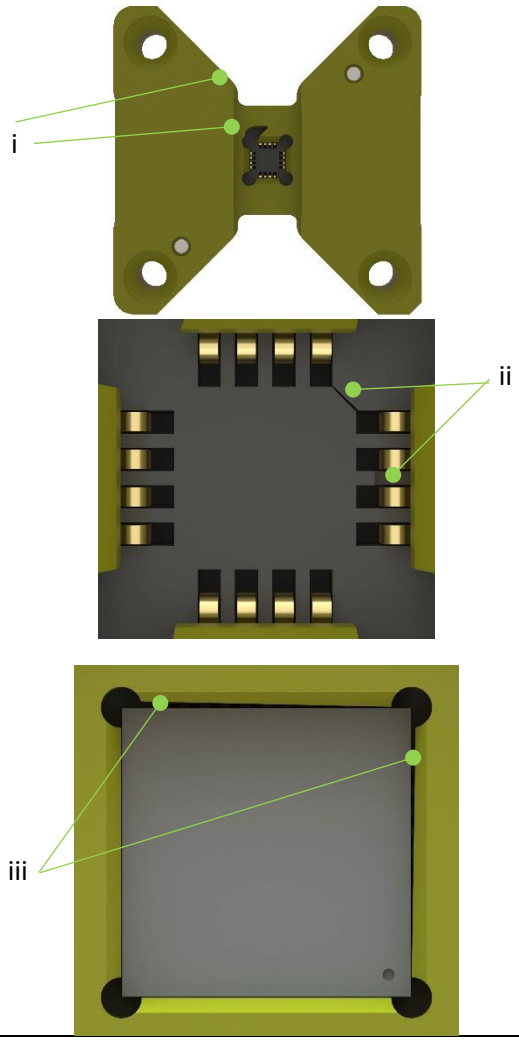
a. Load Board Inspection

Before install Socket onto Load Board, it is recommended to conduct a thorough inspection of the Load Board.

Image	Description
	Verify Load Board with footprint drawing.
Image	**Description**
Good pad:  Nickel layer shown:  *Check the depth of the wearing and resistance whether it can be used for testing.* Bad pad (pad oxidized): 	Check the condition of the contact pad whether there is sign of wear. If Nickel layer, make sure it is not excessive and it is still acceptable to be used for testing. If some sensitive testing such as RF application, then signal will be affected. If Copper layer, then the Load Board will need to be replaced or repaired.

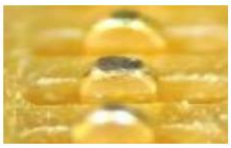
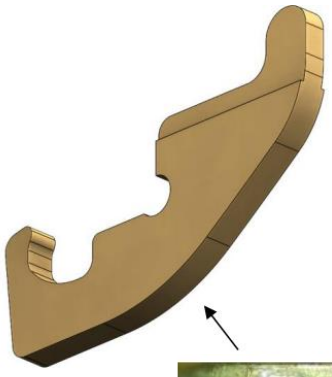
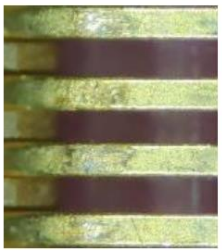
b. Socket Inspection

Use microscope to check condition of the Socket:

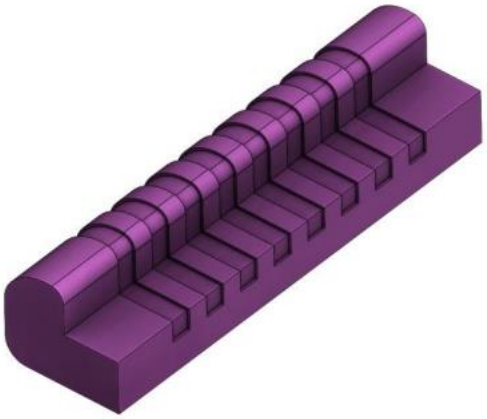
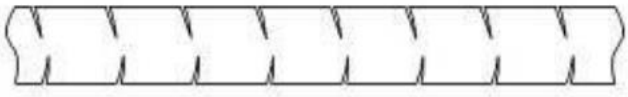
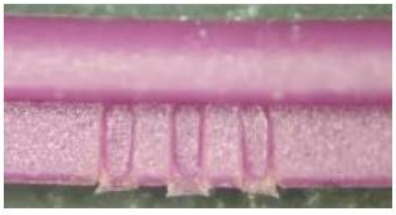
Image	Description
	**i. Crack or chipping in Socket Frame, Alignment Plate or Ground Block.** *Check the crack or chipping area will affect functionality, if will affect functionality, then damage component need to be changed.* **ii. Crack, chipping or missing on the pin slot's wall.** *Check if the pin can be move left right easily, change whole Cartridge if the pin can be shift with big move.* **iii. Excessive wear on Alignment Plate's device pocket.** *For the wearing happened on Alignment Plate's pocket, can perform manual testing with Manual Actuator to check device imprint. If the imprint does not appear within device pad, this indicates Alignment Plate pocket is out of specification and need to be changed.*

c. Pin Inspection

Use microscope to check condition of the pin:

Image	Description
Device side: Should be replaced if worn-out  Pin need to be replaced or changed   Loadboard side: Should be replaced if worn-out. It is advisable to replace the pin also when exposed nickel is observed.	**Inspect pin for any abnormality or signs as listed below:** • *Excessive worn-out tip* • *Worn-out on load board side* • *Imbalanced worn-out tip* Imbalanced wearing at the pin tip is an indication of potential test contactor misalignment issue.

d. Elastomer Inspection

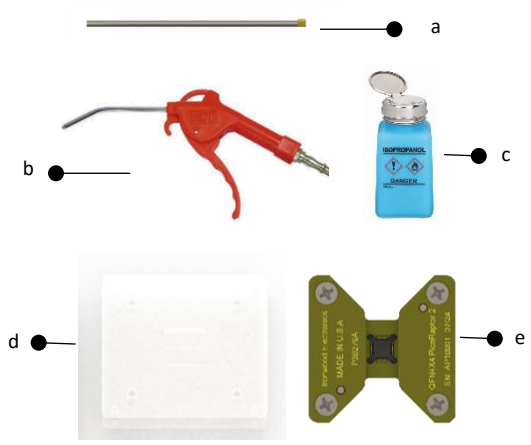
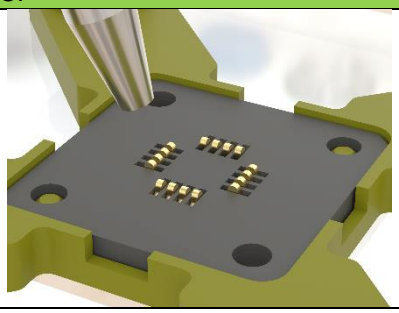
Image	Description
Good condition   Bad condition – Need to be replaced The cut is beyond 50 micron and above.    Compressed and worn out elastomer needs to be replaced.	**Abnormality on the elastomer as listed below** • *Cuts* • *Tears* • *Deformation (Compression)* All these defects will cause the socket performance to deteriorate. Hence, elastomer must always be maintained at its optimum condition.

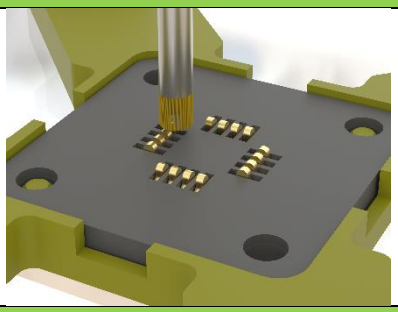
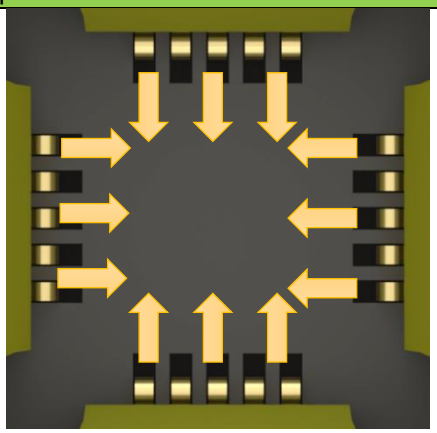
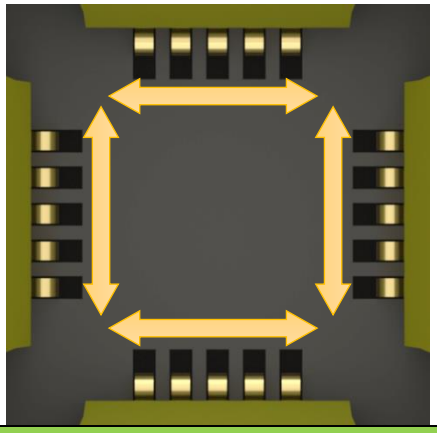
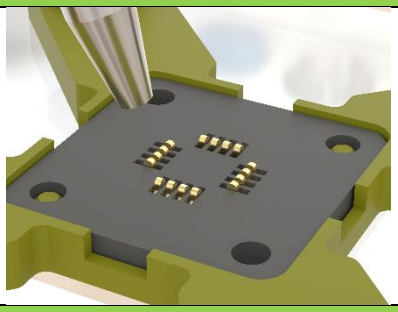
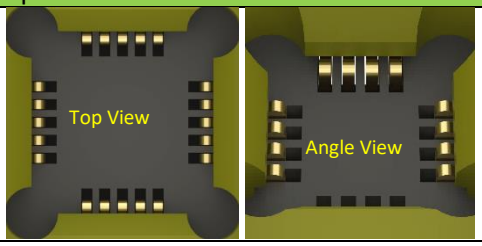
10. IRONWOOD RECOMMENDED SOCKET CLEANING METHOD

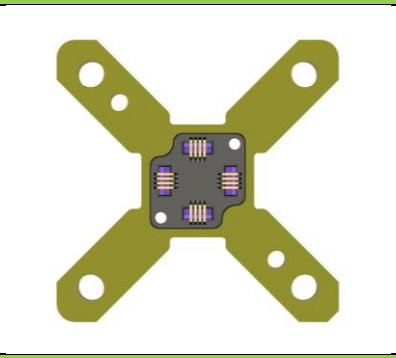
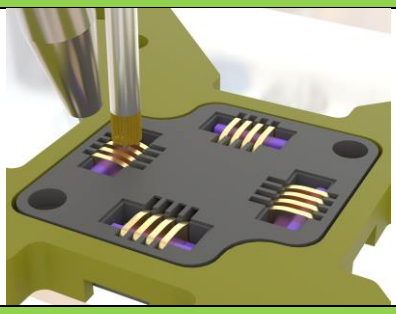
Cleaning is important to prolong lifespan of pin and elastomer which increasing testing yield. Due to different testing environment and set up, test floor must determine optimal cleaning frequency. Recommended frequency is once per shift but subject to device plating, testing environment, testing condition etc.

Even some handlers possess a cleaning feature to clean on critical area but offline inspection and cleaning need to be performed too.

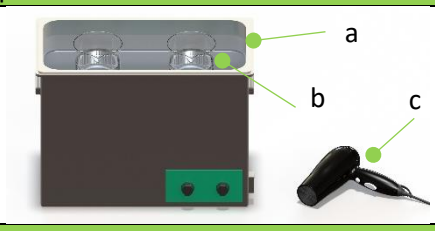
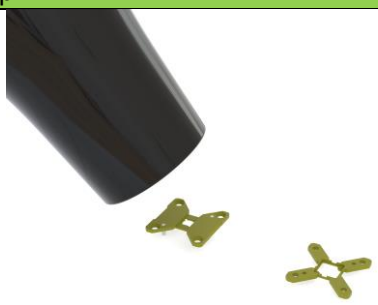
a. Light Cleaning Method

Step 1:	
	Tools required: a. Nylon brush b. Low pressure clean dry air (CDA) c. IPA cleaning solution d. Acrylic Plate e. Socket Unmount the Socket from Load Board.
Step 2:	
Remove Alignment Plate and put socket onto acrylic plate.	
Step 3:	
	Use low pressure clean dry air (CDA) (10-20 psi) to blow away debris from socket. *Note: The CDA gun nozzle from the test socket should be distance by 10cm approx.*

Step 4:	
	Mildly soak the bristles of the brush with IPA solution. To ensure that the bristles of the brush are not drenched, dry the bristles slightly after immersing with IPA on a piece of paper or equivalent material that can absorb moisture.
Step 5:	
 	Sweep the pins gently with the nylon brush that was mildly soaked with IPA solution. Use the brush mildly soaked with IPA and brush along the pin tip in the direction as shown in yellow color.
Step 6:	
	Use CDA to dry up excessive IPA to avoid staining on socket.
Step 7:	
	Check condition of pin tip by using microscope. Make sure tip is cleaned and do not have excessive debris, stain or contamination on pin tip and between the tips.

Step 8:	
	Remove Socket from acrylic plate and flip Socket to back side.
Step 9:	
	Clean pin tail by repeating Step 3 to Step 6. Remove Socket from acrylic plate and mount back onto Load Board after cleaning.
Step 10:	
	Precaution: Ensure that no residues / contamination / debris is present after cleaning.

b. Ultrasonic Cleaning Method (For Socket Frame and Alignment Plate only)

Step 1:	
	Tools required: a. Ultrasonic Cleaner b. Beaker c. Dryer
Step 2:	
	Remove Cartridge & Alignment Plate from the socket.
Step 3:	
	Put Socket Frame & Alignment Plate into Beaker. Then put Beaker into Ultrasonic for 10 minutes.
Step 4:	
	Dry the Socket Frame & Alignment Plate with a dryer.

11. DO'S & DON'TS

DO'S	DON'TS
• Use plastic spudger to touch pin tip and critical area • Use nylon brush or laser cleaner for pin's cleaning • Use nylon brush or ultrasonic for socket cleaning. • Use plastic spudger to remove Ground Block or Alignment Plate.	• Sharp and metallic item such as screwdriver, tweezer and stainless-steel brush are NOT ALLOWED to use on the pin tip and critical area.

12. COMPANY INFORMATION

Phone Us:
P: (952)229-8200
Toll Free: (800)404-0204

Fax Us:
F: (952)229-8201

Office Address:
Ironwood Electronics
1335 Eagandale Ct.
Eagan, MN 55121

Website:
https://www.ironwoodelectronics.com/

13. REVISION HISTORY

Revision	Description	Created by	Approved by	Date
A	Initial Release	MC Chin	Andy Tjan	12 Nov 2024