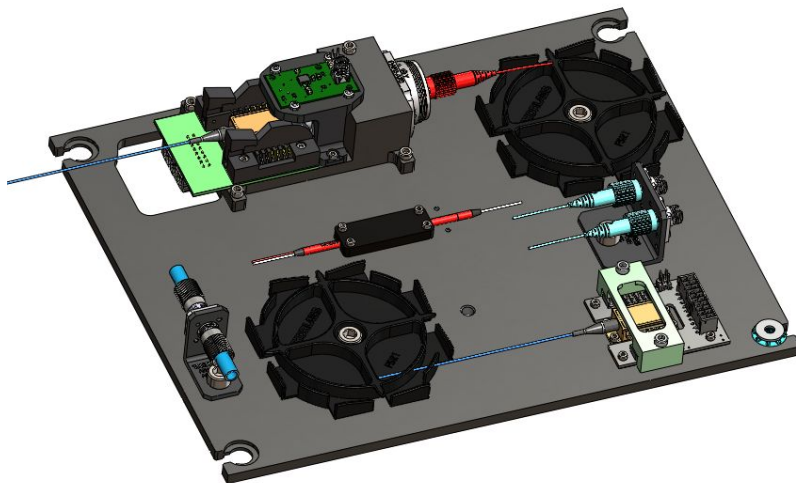


Laser Source Module Overview, Assembly, and Test

Overview

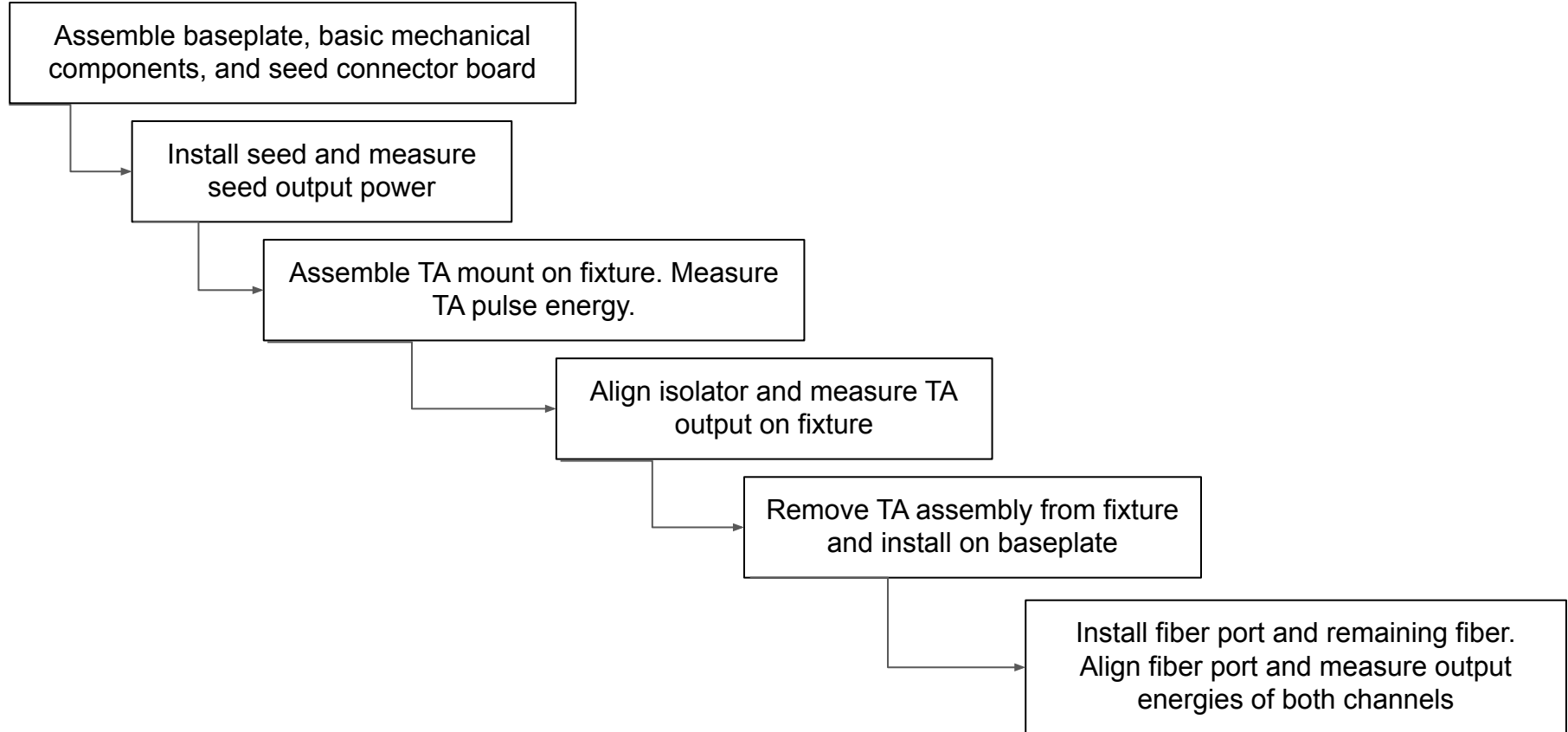
- Class 4 785 nm fiber coupled laser source assembly
- Consists of several optical components and printed circuit assemblies attached to an aluminum baseplate
- Approximate size: 255 x 205 x 40 mm, 1.5 kg



Summary of Manufacturing Tests

Test	Rationale
Seed output power	Basic performance check, helpful for troubleshooting
TA output energy before isolator	Easy check during assembly, helpful for troubleshooting
Output energy after free space isolator alignment	Required for alignment
Output energy after fiber port alignment (both channels)	Required for alignment Output of both channels is critical
Beam profile	Characterize laser component performance. Not required if already performed by supplier.
Beam trace on oscilloscope	
Speckle contrast	

High Level Assembly and Test Sequence



Assembly and Test Sequence

Safety and Handling Precautions

- Seed and TA are both Class 4 laser products
- Seed and TA are both ESD sensitive, damage thresholds below 125 V
- Several sensitive optical surfaces including TA output window, isolator optics, and fiber port optic

Install baseplate onto
holding fixture



Install

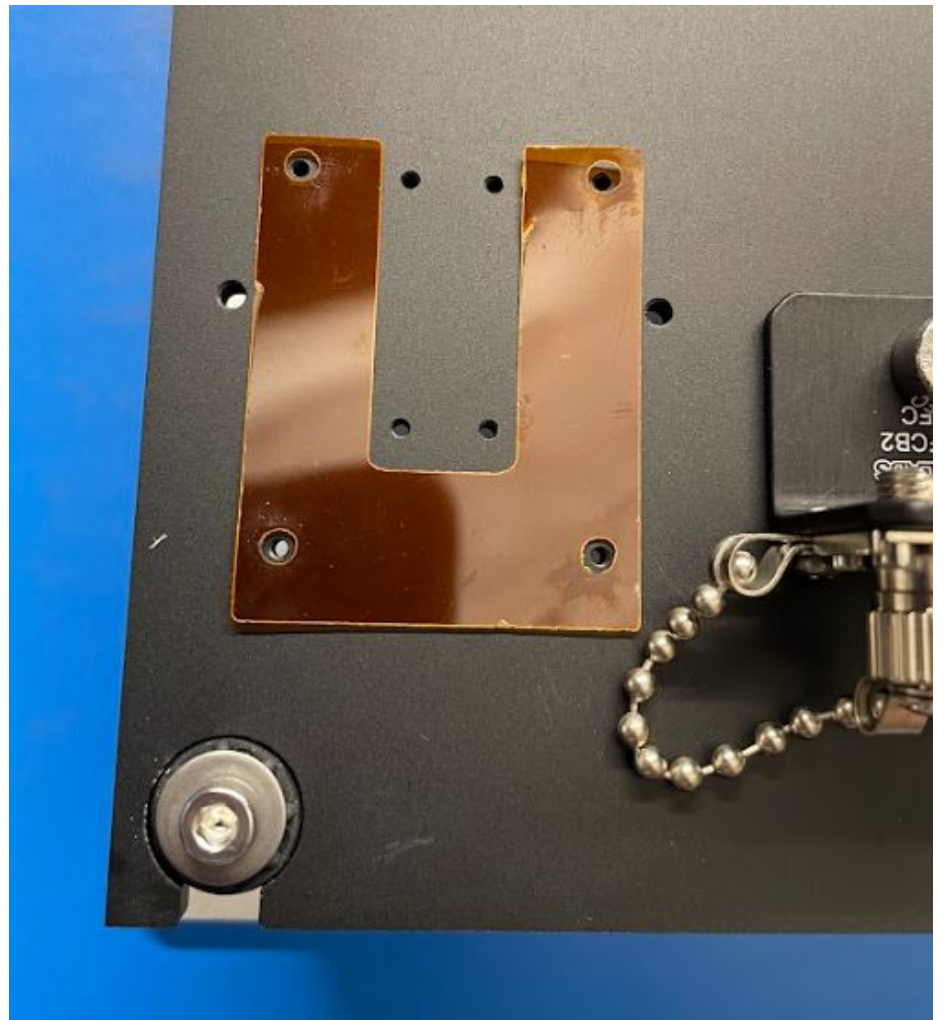
2x fiber trays

1x ADAFCB3 (caps on)

1x ADAFCB1 (caps off)



Lay down seed kapton shim
in position shown



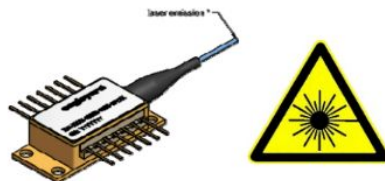
Install seed connector board on top
of insulating shim

Secure with 4x m2x6 screws



Carefully lay down seed butterfly package

Ensure pins are generally centered on spring contacts



IEC-60825-1



Complies with 21 CFR 1040.10 and 1040.40



Carefully install and torque
4x m2x6 screws to secure
seed package

Ensure that pins stay
centered on spring contacts
as well as possible during
screw installation

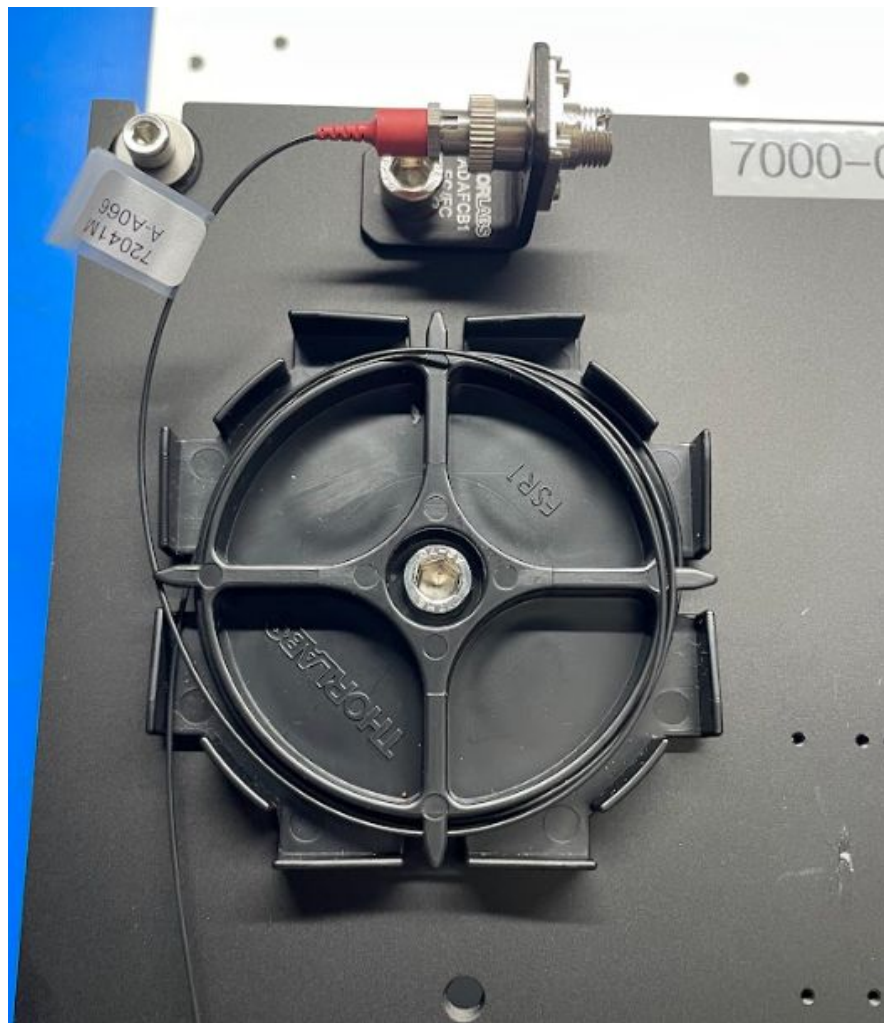


Install G10 clamp and carefully secure with 2 m3 screws, alternating back and forth and incrementally torquing them down

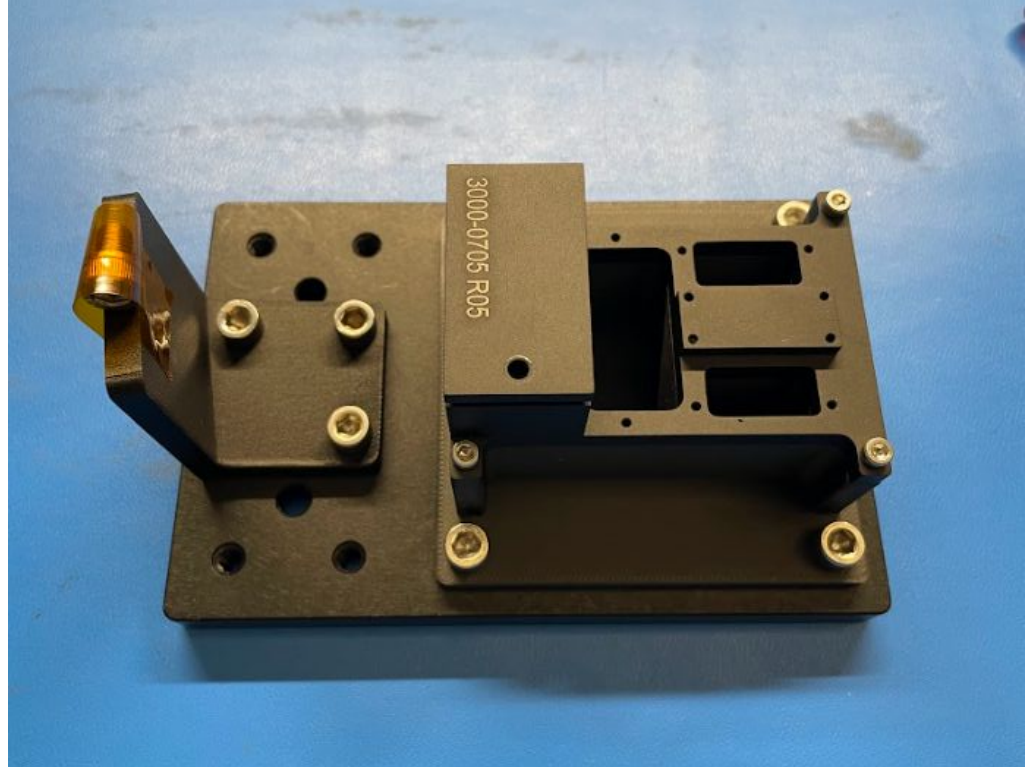


Wrap seed fiber around tray

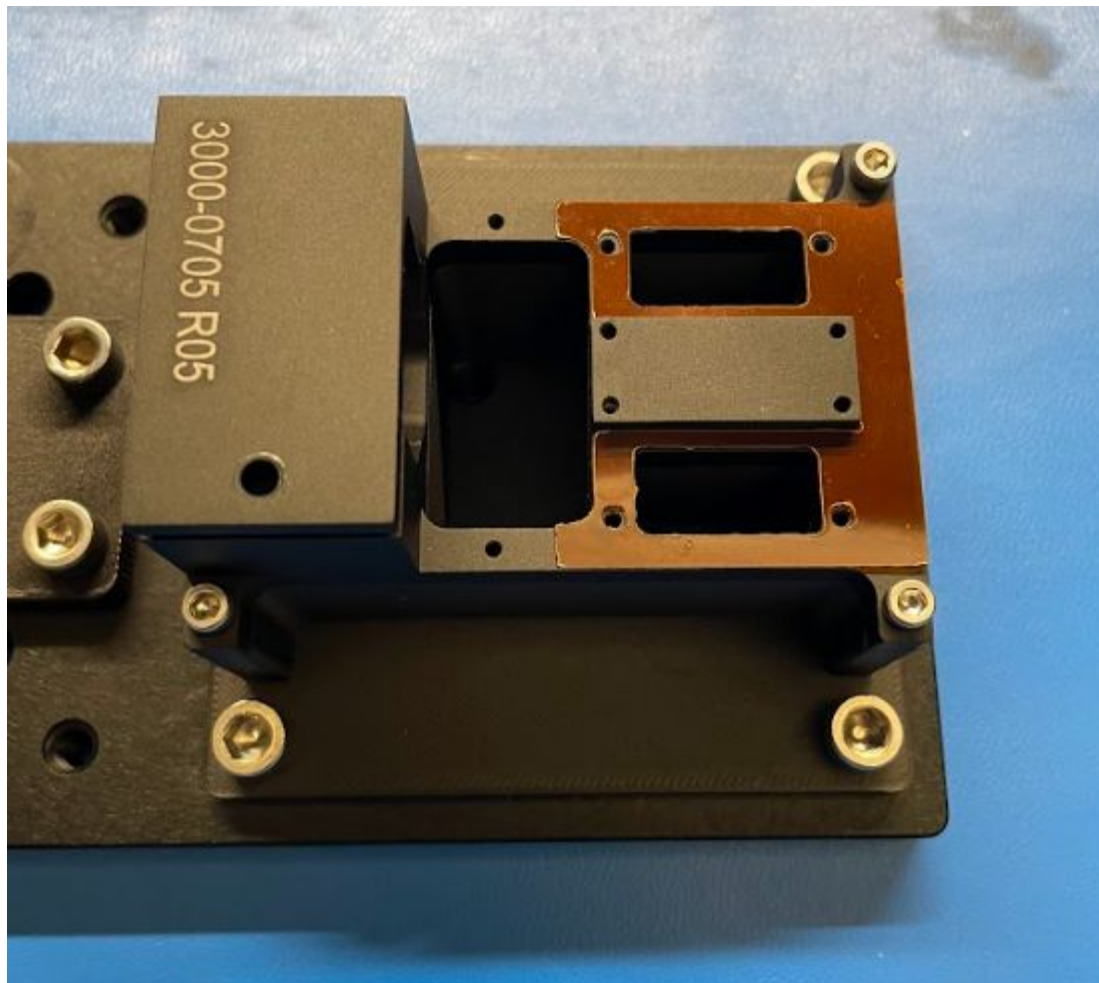
Carefully mate APC
connector to mating sleeve



Install TA mount onto TA
assembly and test fixture
with 4x m3x8 screws

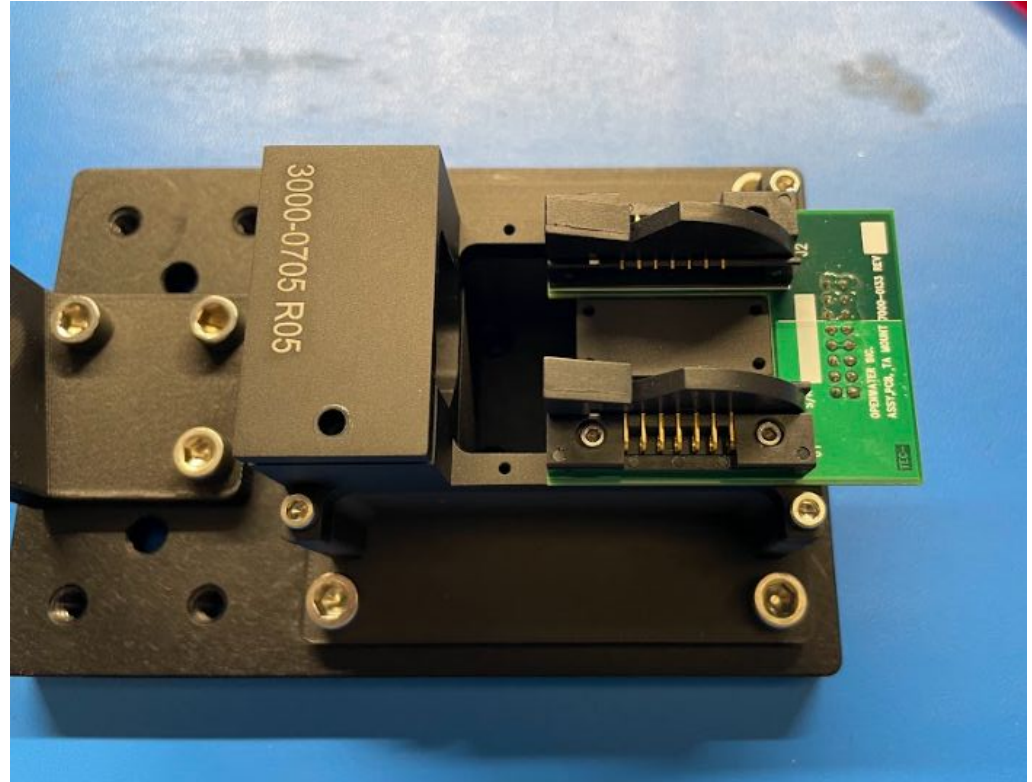


Lay down TA kapton shim in position shown



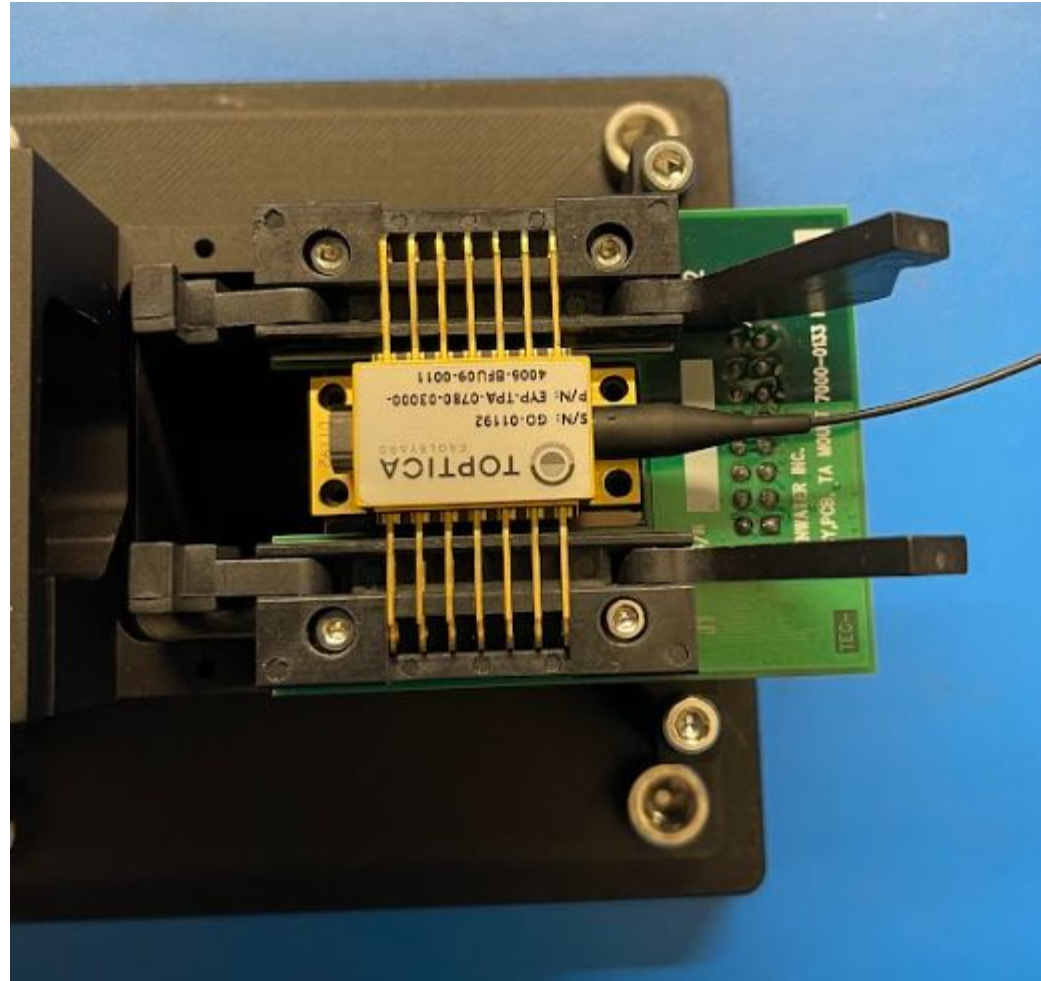
Install TA connector board on top
of insulating shim

Secure with 4x m2x12 screws



Carefully lay down TA butterfly package

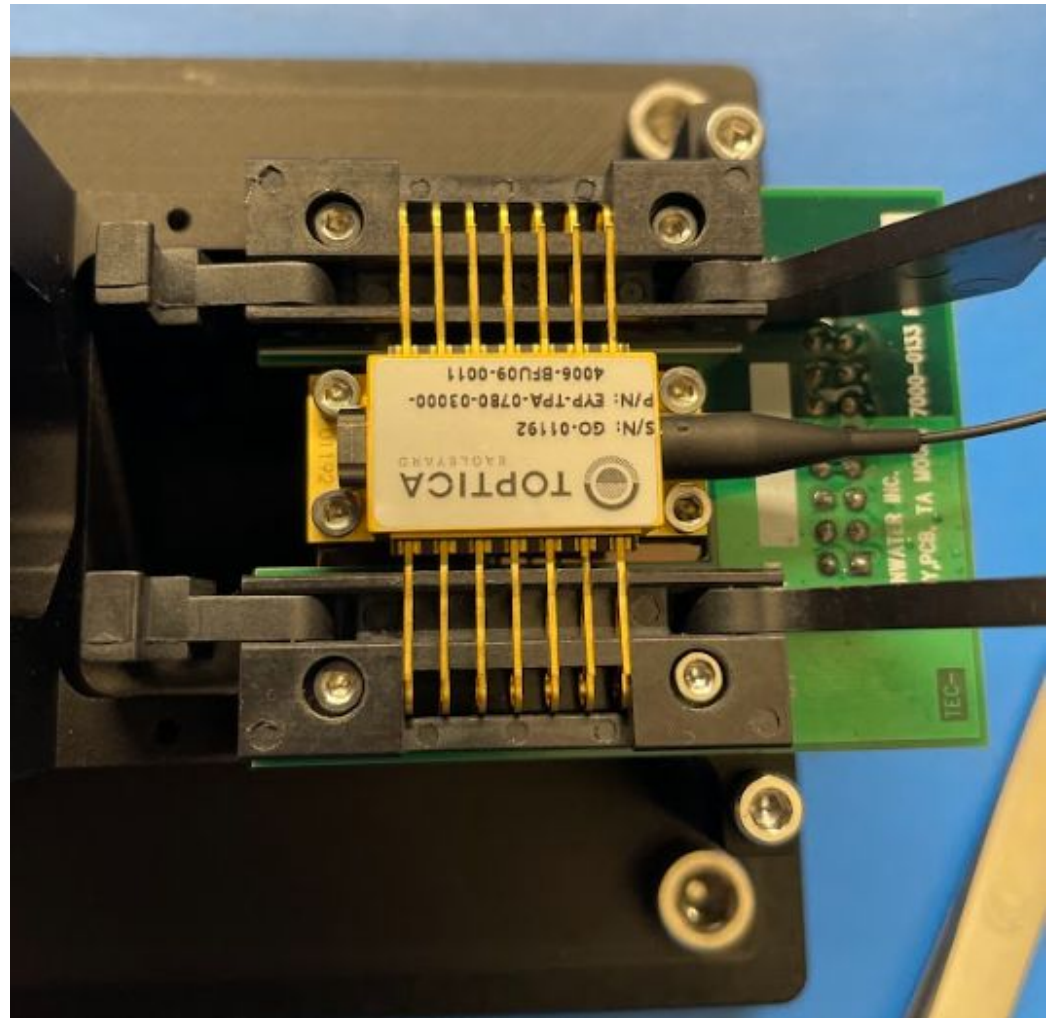
Ensure that pins are correctly positioned on connector, and that attachment screw holes are approximately aligned



Carefully secure the butterfly package with 4x m2x6 screws, carefully bringing up the torque on each one

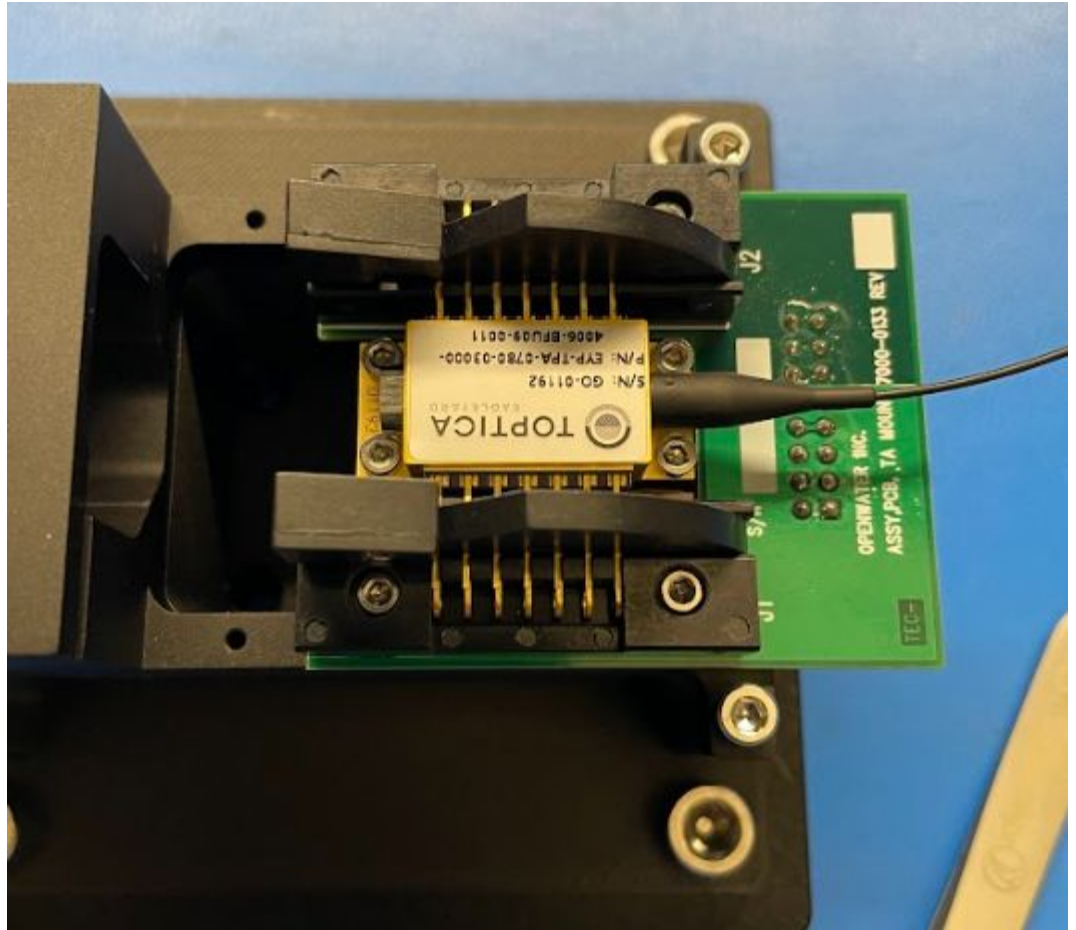
Stay aware of any gaps below the butterfly package and avoid forcing large movements or causing pin bending when torqueing screws

Avoid any contact to the TA output window

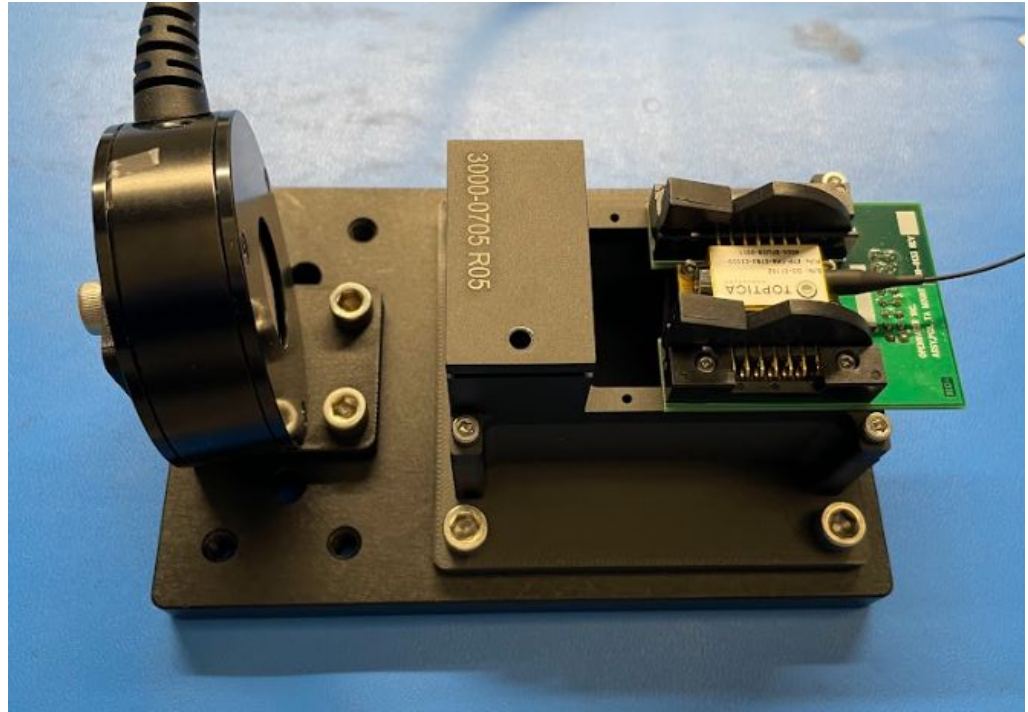


Snap the two ZIF connector arms closed. They should snap firmly, without rattling or overly straining the components

Note that the orientation of the ZIF connector is backwards in this image - the angled arms should be on the same side of the board as the exiting fiber



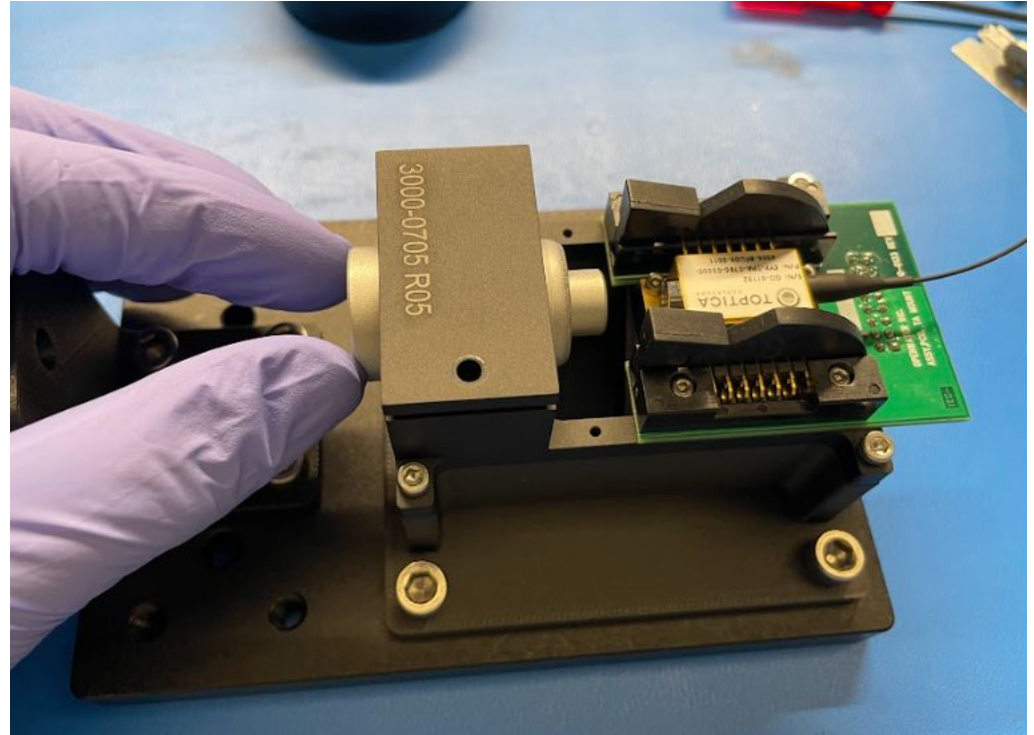
Install the ophir sensor to
the assembly and measure
TA output energy



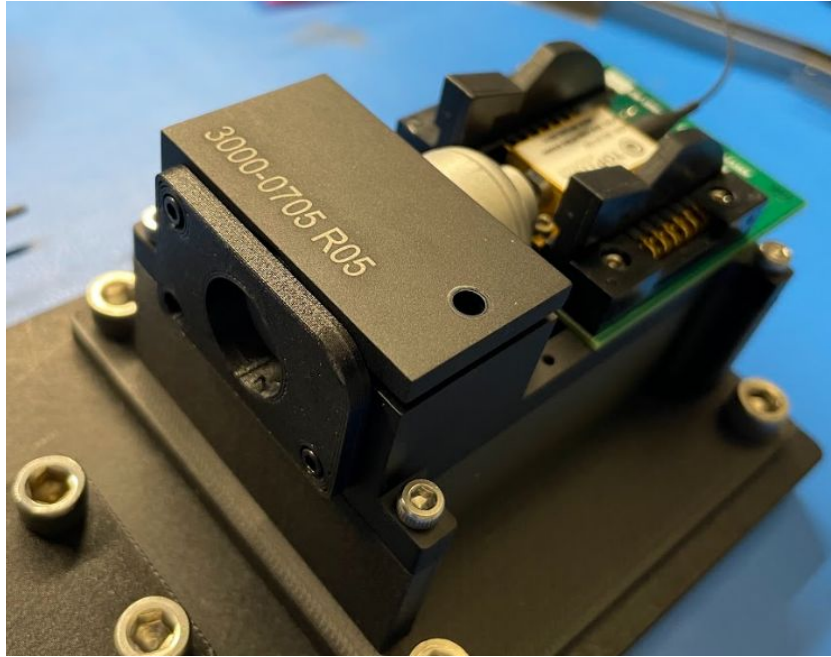
Carefully install the free space isolator as shown

Note the orientation of the isolator - the small stepped section should face the TA

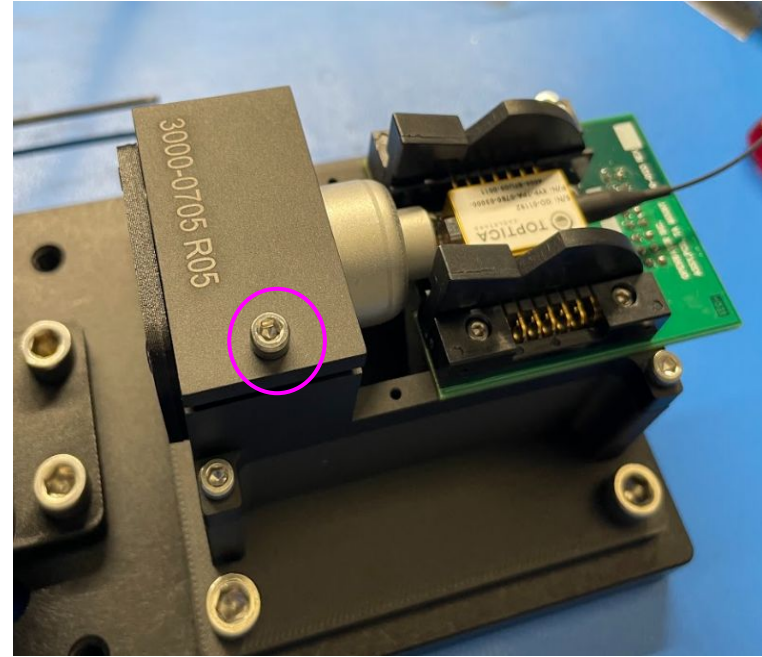
Avoid contacting the isolator optical windows. Also note that the isolator contains a magnet, and is prone to attracting screws and tools



Install isolator locating tool
with 3x 2-56 screws



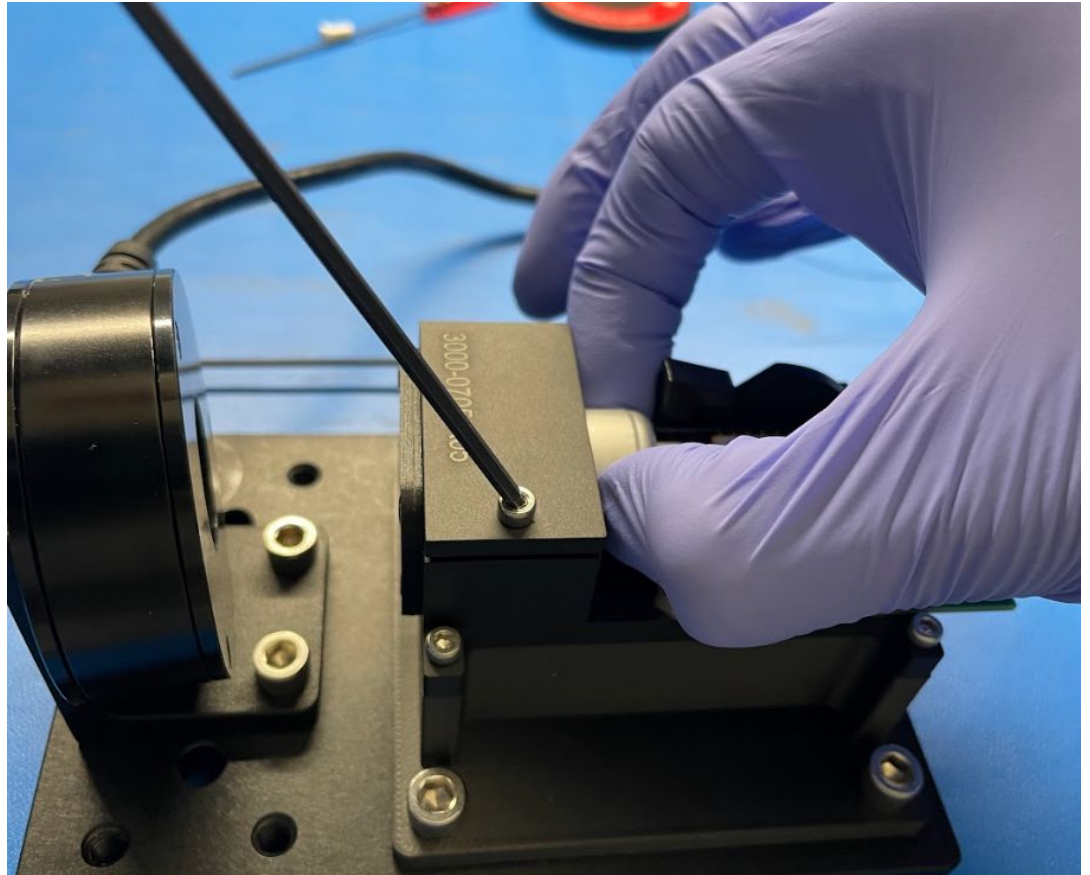
Install m3 isolator flexure adjustment
screw. Screw in until it just touches the
surface of the flexure arm



Perform isolator alignment,
rotating manually to
maximize output. See
detailed procedure

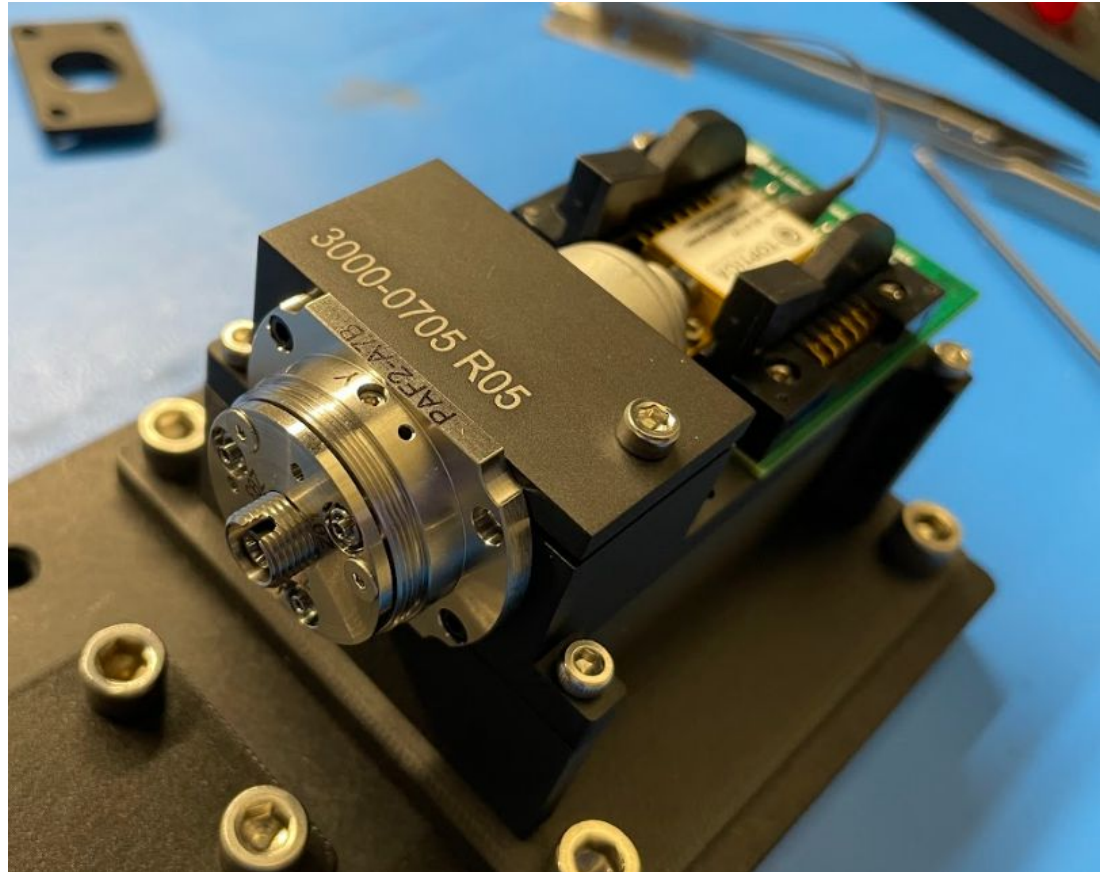
Keep the isolator seated
against the positioning tool

Torque the flexure
adjustment screw until the
isolator can no longer rotate



Remove the isolator locating tool

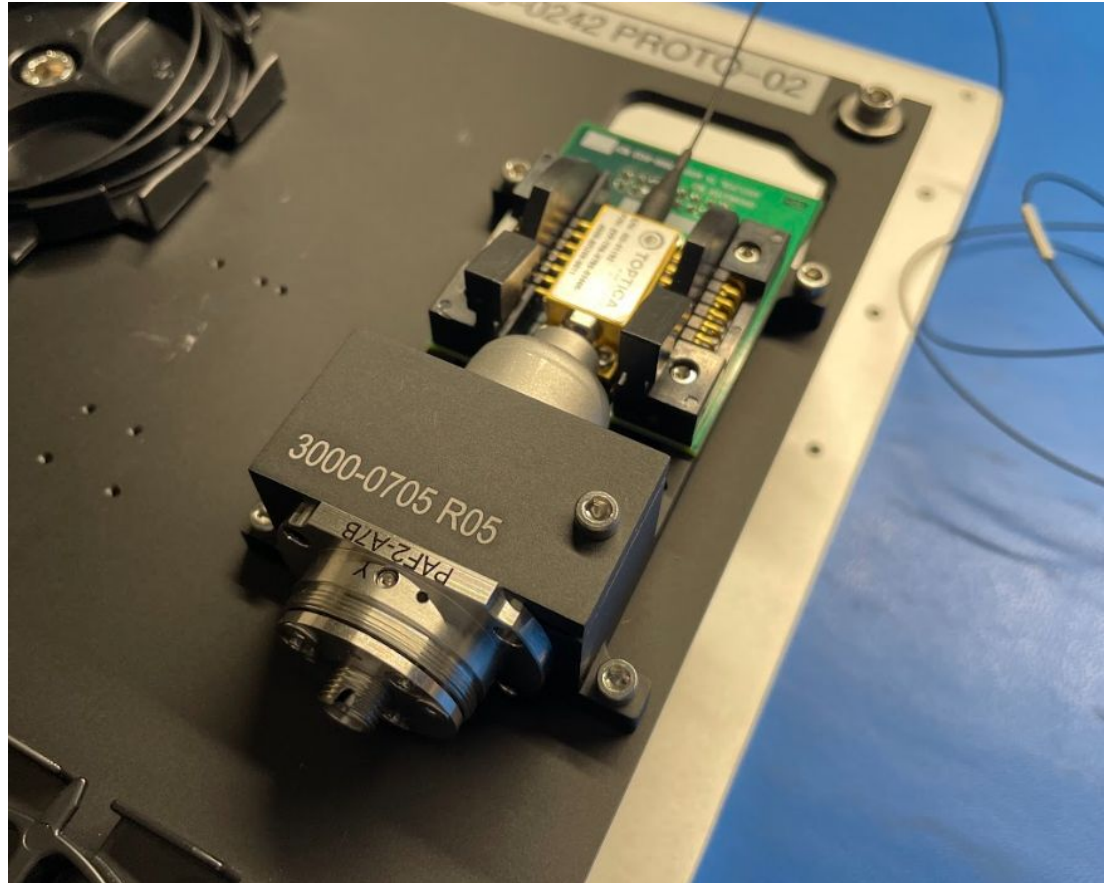
Install the fiber port with 3x 2-56 screws



Transfer the TA assembly to the baseplate and secure with 4x m3 screws

Wrap excess TA fiber around fiber tray and mate to APC sleeve

Perform fiber port alignment process

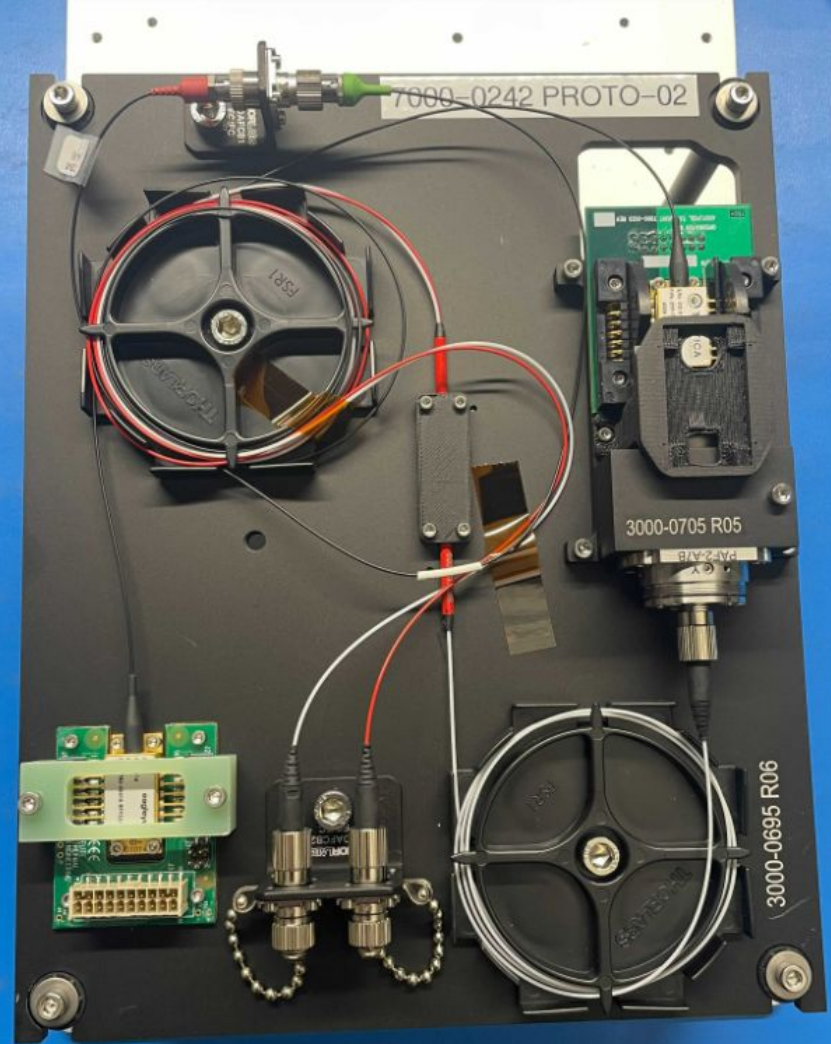


Clamp down the body of the 50:50 splitter in location shown

Use a dab of RTV in the clamp groove

Note the orientation of the splitter - the two 50:50 arms exit upwards in this view

Tape down any stray fiber length with kapton tape

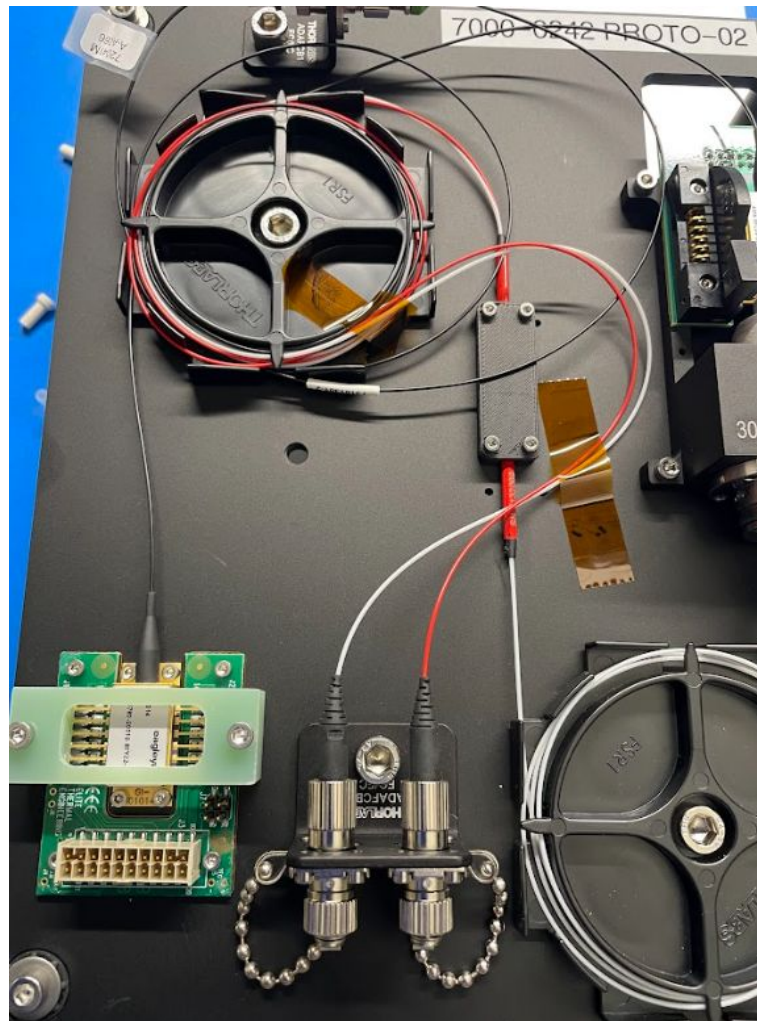


Wrap the two splitter output fibers around the other fiber tray

Mate the FC/PC connectors to the two output channel sleeves as shown

Secure any loose fiber with kapton tape

Perform energy measurements for both output channels



Perform output channel energy measurements

Install PEEK photodiode board holder with 4x m2 screws.

Install photodiode board and secure with adhesive

Install photodiode cover with 4x m3 screws

