Installation Instructions PPEB086

Application note

The PPEB086 is an 8-trace RF board that accepts a micro-ICR formfactor Integrated Coherent Receiver. It integrates mechanical mounting, heatsinking, DC connections and RF connections. The RF lines are specified at 40GHz BW, making this product suitable for class 20 and class 40 micro-ICRs. The RF outputs are 8x SMPM connectors (female).

This Application note describes how to install the micro-ICR on the PPEB086 and how to integrate the PPEB076 (ICR control board) with the PPEB086.

1. Table of Contents

2. Versions and Configurations

The PPEB086 has 2 different versions (rev 2 and rev3). The latest revision (rev3) is the default version and is tailored towards the class 40 micro-ICR that is currently still available (class 20 has been End-Of-Life for quite some time now). The rev2 version was backwards compatible with the Neophotonics micro-ICR motherboard, in dimensions, electrical connections and pin-out. The rev3 version does not plug onto the Neophotonics legacy motherboard anymore but can be connected by ribbon cable. It remains pin-out compatible.

The PPEB076 has 3 different versions (rev2, rev3 and rev4). Rev 2 was designed for compatibility with the Neophotonics micro-ICR daughterboard (replacement of the motherboard). It is currently only available for legacy customers. Rev 3 was designed for compatibility with the rev2 PPEB086 board (and as the PPEB086 rev2 board is backwards compatible to the Neophotonics products, the rev3 board is similar to the rev2 board). The rev4 board is smaller and designed to integrate with the PPEB086 rev3 board. It makes a tighter and smaller integration and does not require a bulky ribbon cable anymore. The rev4 board can be connected to the rev3 and rev2 PPEB086 board by ribbon cable (using the top connector) if that is so desired.

Most often, a user will purchase the PPEB076, PPEB086 and micro-ICR together. In that configuration, the micro-ICR is soldered in place by Pure Photonics and the whole assembly is put together (and tested).

It is also possible to purchase the PPEB076 and/or the PPEB086 separately and do your own integration. In the case of the PPEB086, the user would need to solder their own micro-ICR into place. For that work care has to be taken to practice ESD precautions.

3. PPEB086 integration

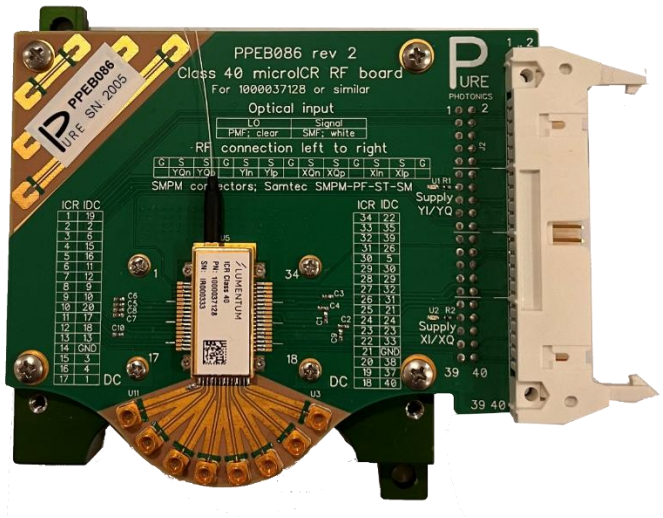
Typically, the purchased micro-ICR is installed on the PPEB086 board by Pure Photonics. The below instructions are only relevant if you need to install your own micro-ICR on the PPEB086.

The micro-ICR is installed by placing it on the PPEB086 board. It is recommended to add some thermal paste below the module (in contact with the exposed metal heatsink. Make sure that paste does not spill below the leads. The whole metal pad below the device is grounded and mostly acts as heatsink, so this is the proper location to apply the thermal paste. Make sure to spread it evenly (or to place the micro-ICR and move it around a bit).

The RF and DC pins are aligned with the pads. At the 4 corners M1.2 screws need to be inserted through the tabs of the micro-ICR. After inserting the M1.2 screws and loosely tightening them, carefully monitor the alignment. Once alignment is good, tighten the screws gradually. Move around from screw to screw to ensure all screws are equally tightened. Keep checking on the alignment and correct when needed. There is no need to overtighten. We generally recommend to only use 2 screws on a diagonal.

For a new board, the M1.2 screws should be properly aligned and the pad below the board should be punctured. If for some reason the M1.2 screws do not easily screw in, loosen the M2 (4x) and M3 (4x) screws a bit and make sure the board is well aligned to the M1.2 screws. After that the other screws can be tightened.

Solder all leads onto the contacts. Make sure **to apply appropriate ESD precautions** and to limit the heating time for each lead. This is not an easy soldering task and should only be attempted by experienced experts.



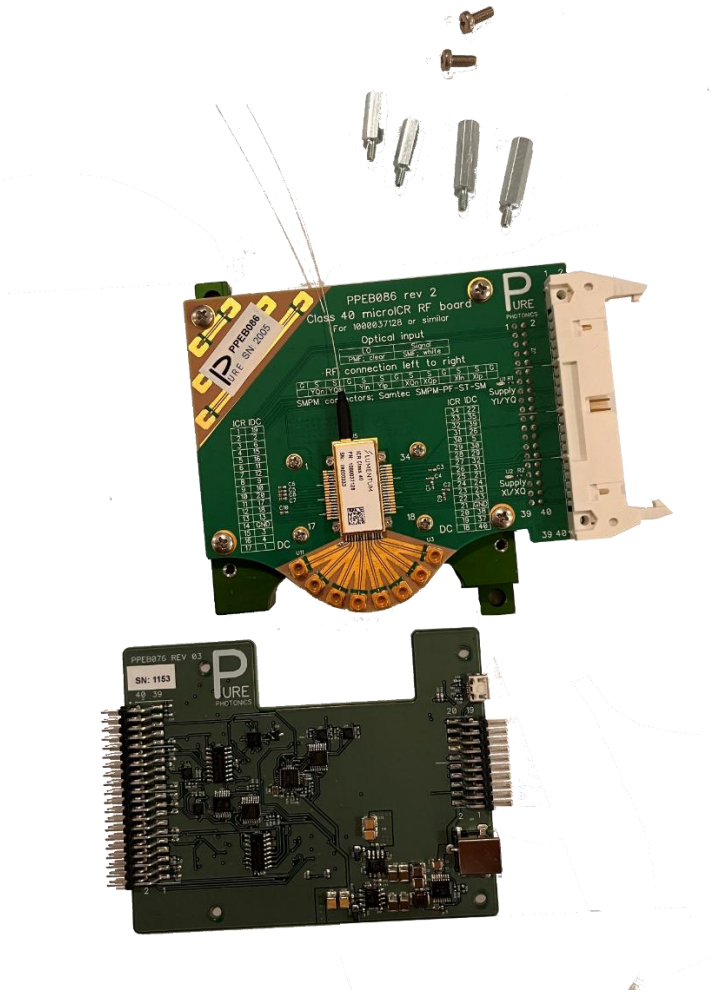
After completion the assembly should look as above (rev2). The rev3 looks the same, but the board is less wide and the connector is between the two left M3 screws.

4. Installing PPEB076

To install the PPEB076, stand-offs need to be installed.

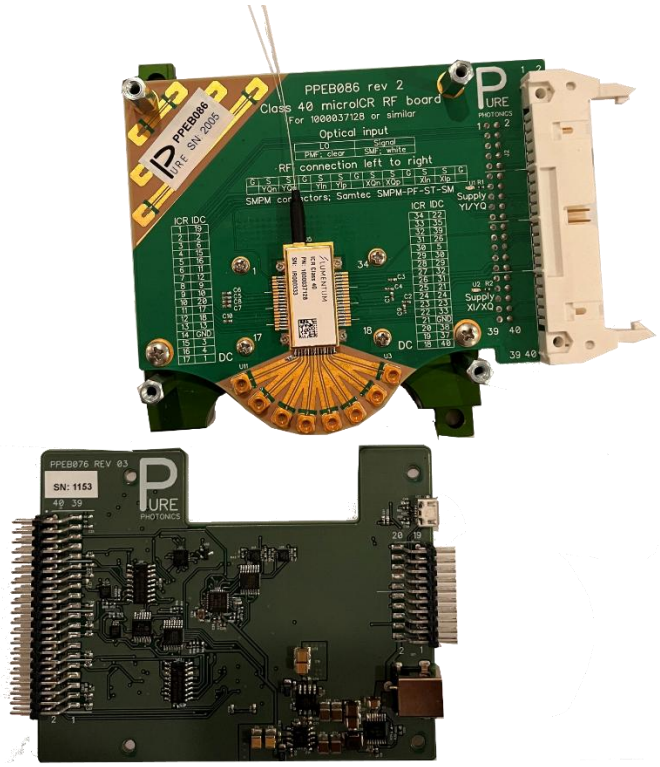
First prepare the material:

- PPEB086 with micro-ICR
- PPEB076
- For rev2/3 PPEB076
  - 2x 20mm M3 standoff
  - 2x 14mm M3 standoff
  - 2x M3 screw
- For rev4 PPEB076
  - 4x 14mm M3 standoff

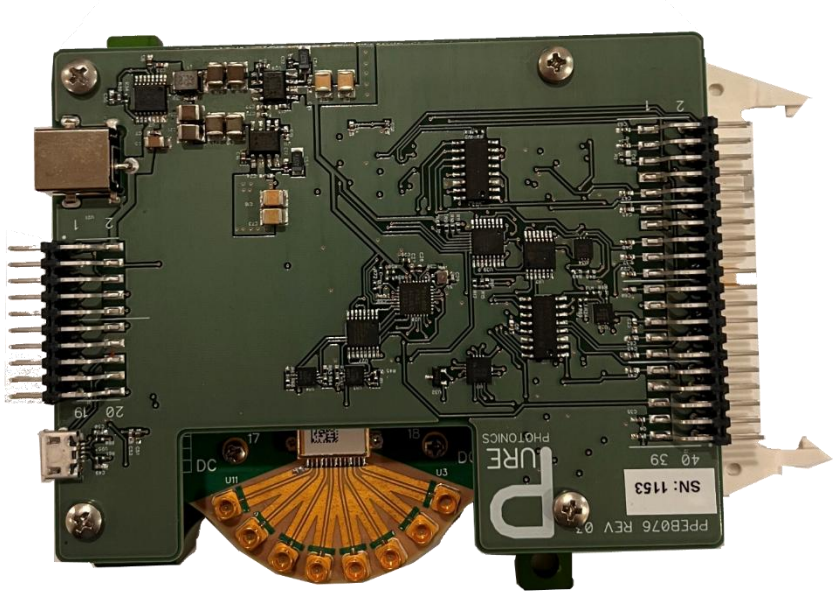


For PPEB076 rev 2/3: remove the 2 M3 screws in the upper corners of the PPEB086 (making the total number of screws 4), Replace them by the 14mm stand-offs. Add the 20 mm standoffs in the open M3 holes

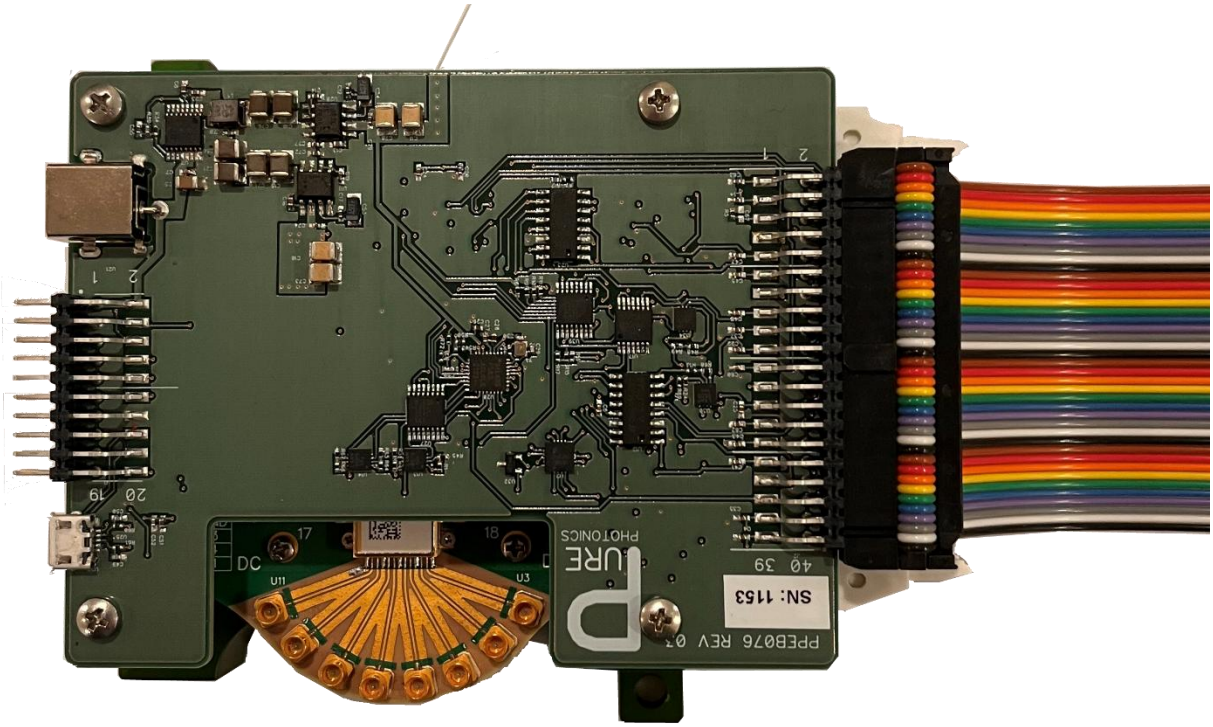
For PPEB076 rev4: remove all M3 screws and replace them by the 14mm stand-offs. After this you have 4 left-over M3 screws.



Mount the PPEB076 on top and align the holes with the standoffs. Insert the M3 screws into the standoffs. The 40pin connectors should be on the same side. For PPEB076 rev4, the 40 pin connector on top of the PPEB086 will align with the 40pin connector on the bottom of the PPEB076. Push these connectors together. For connecting a PPEB076 rev3 to a PPEB086 rev3, make sure the ribbon cable is inserted before inserting the M3 screws.



Add the 40pin IDC cable. For PPEB076 rev4/PPEB086 rev3 there is no need for a ribbon cable. If a ribbon cable is desired to be used, then plug it on the top connector of the PPEB076 rev4.



5. Connection

The unit is now operational and can be operated by connecting a 10-25V voltage supply on the 2.5mm/5.5mm barrel plug. For communications add a micro-USB cable.

The unit will install on a connected PC as a virtual COM port. It can be operated by our Command Line Interface (CLI), our latest GUI (version 2025.02.15 and later) and directly through a user script. The software is available at www.PurePhotonics.com under the Support section (https://purephotonics.com/support/) at the bottom. The latest revision of the GUI is 2025.08.09 and the latest version of the CLI is 3.2.11.

For the GUI, the GUI will connect to the COM port, detect that it is talking to a PPEB076 and bring up the appropriate controls.

For the CLI, the ICR commands are initially disabled. After connecting to the unit do it.setICR(True) and then the commands are available for use.