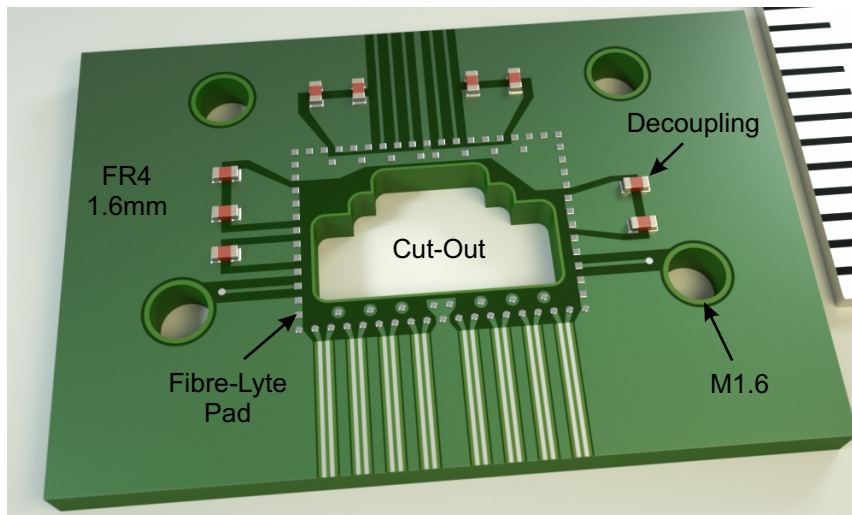


Fibre-Lyte V10 Integration (1/6)



Base PCB

The PCB to the left is a 4x25G duplex based on DOC-000237. Note that this document has further discussion on the assembly process.

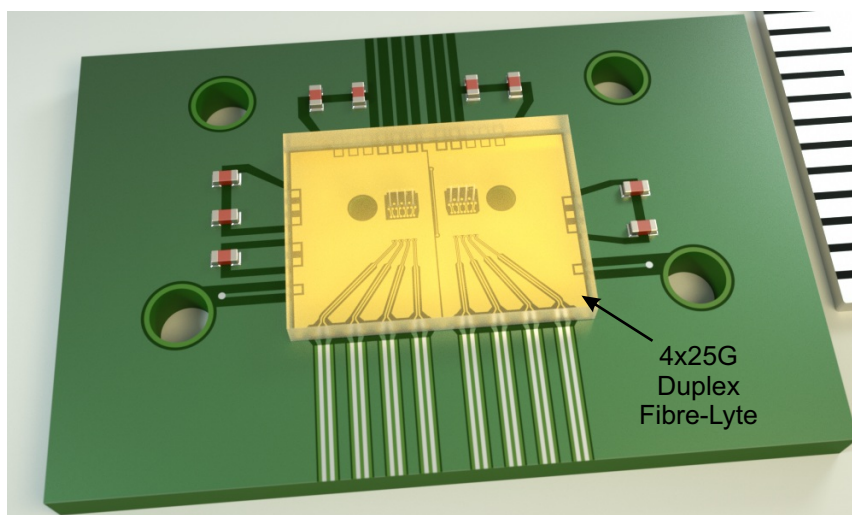
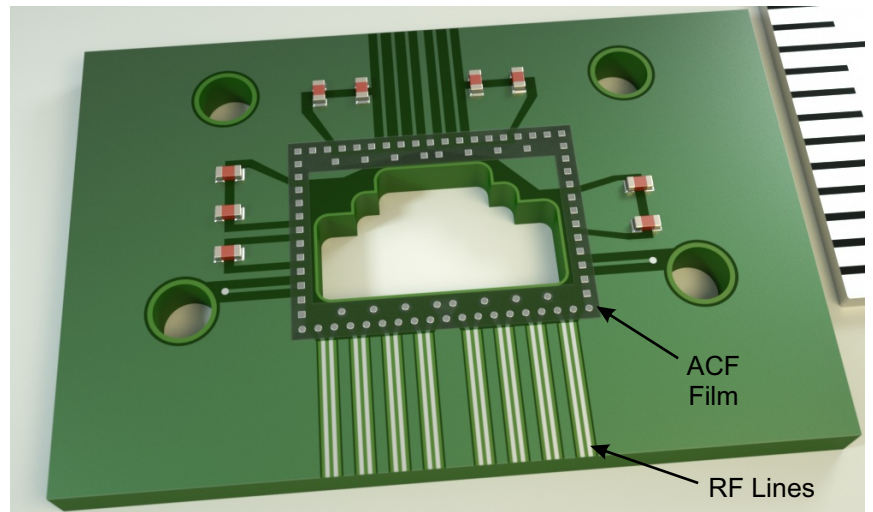
The PCB is 1.6mm thick and the cut-out size is sufficient for the heat sink to be put through.

This image assumes that Fibre-Lyte will be solder reflowed to the PCB.

ACF Connection

Anisotropic conductive film (ACF) can be used to make Fibre-Lyte electrically replaceable. The film is normally a couple of hundred microns thick and only conducts vertically.

When Fibre-Lyte is pressed in place, connections are made through the film to any pads below.



Placement

This image shows a Fibre-Lyte part soldered in place. Under most circumstances, a part attached in this manner should also be underfilled to ensure stability and reliability.

The order of assembly is situation dependent: it could be placed before, after or along with other solder reflow components.

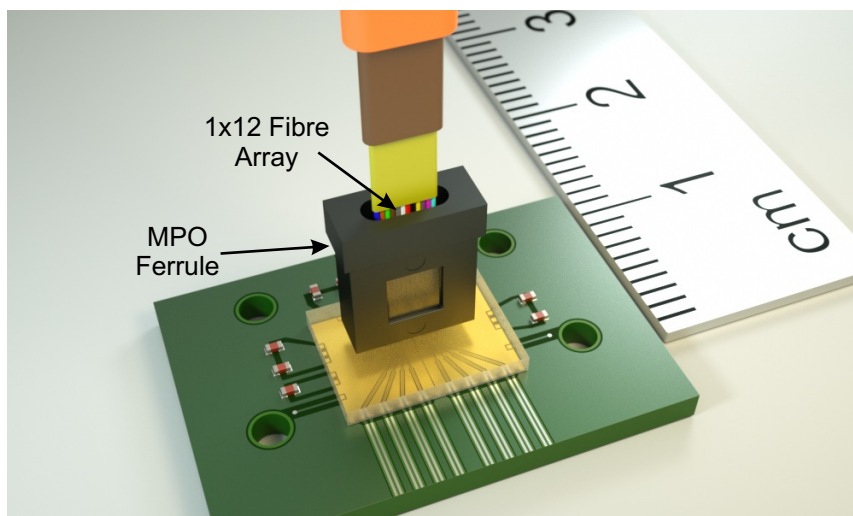
This is a waveguide part with no pin holes.

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Fibre-Lyte V10 Integration (2/6)



MPO Ferrule

The optical output of Fibre-Lyte is on the top surface. The image on the left shows an MPO ferrule in the correct position to couple with Fibre-Lyte.

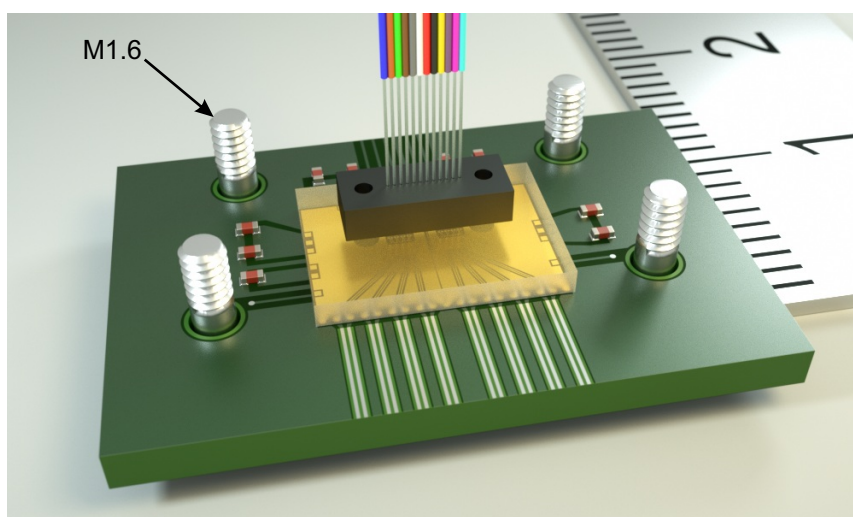
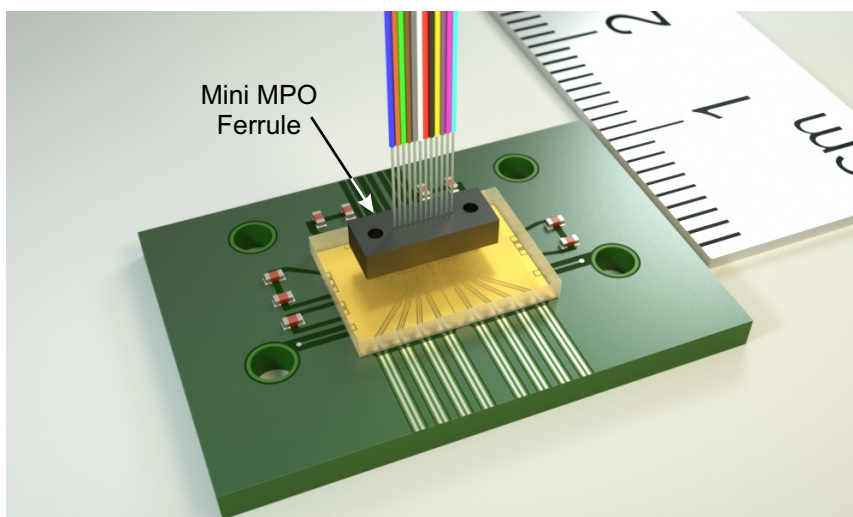
Positioning and attach is with flip chip bond style equipment (some tooling required). Glue is dispensed, the ferrule aligned and then tacked with a UV. If successful, the assembly is cured. If not, it can be reworked.

Mini MPO Ferrule

For more compact designs, a cut down ferrule could be used. This enables a low profile 90 degree part.

The first stage is to align/attach the mini ferrule to Fibre-Lyte. Underfill should be used to stabilise the assembly.

Note that Fibre-Lyte is designed for direct to MPO coupling and performs best under these circumstances.



Bolts

This image shows M1.6 bolts being placed through the PCB from the rear. These are used to hold mechanical fixtures in place.

Note that the following examples focus on mid-board mounts. This assumes that the fibres should turn just under 90 degrees.

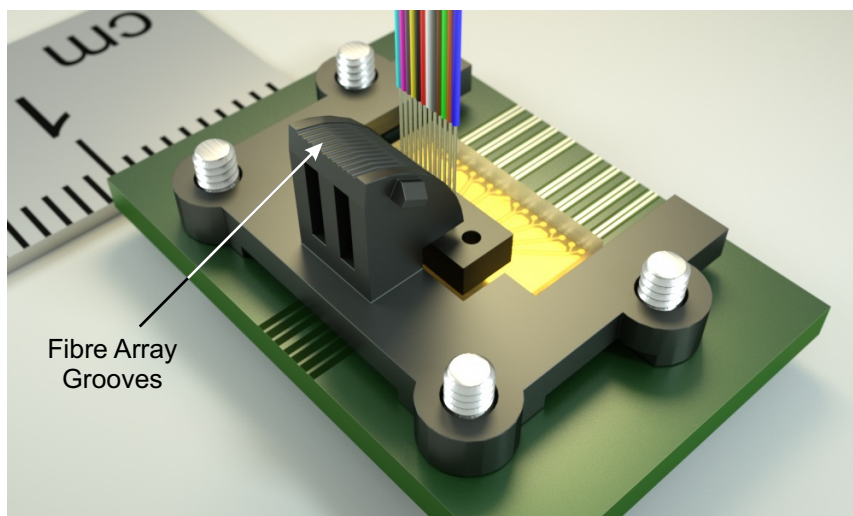
A vertical design can be extrapolated from this example.

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Fibre-Lyte V10 Integration (3/6)



90 Degree Base Piece

The 90 degree piece is in two parts. This allows the fibre to be encased and held from both sides avoiding the need to thread it through another part.

The piece shown left is the base piece; an array of grooves are used to roughly align (and grip) the fibres.

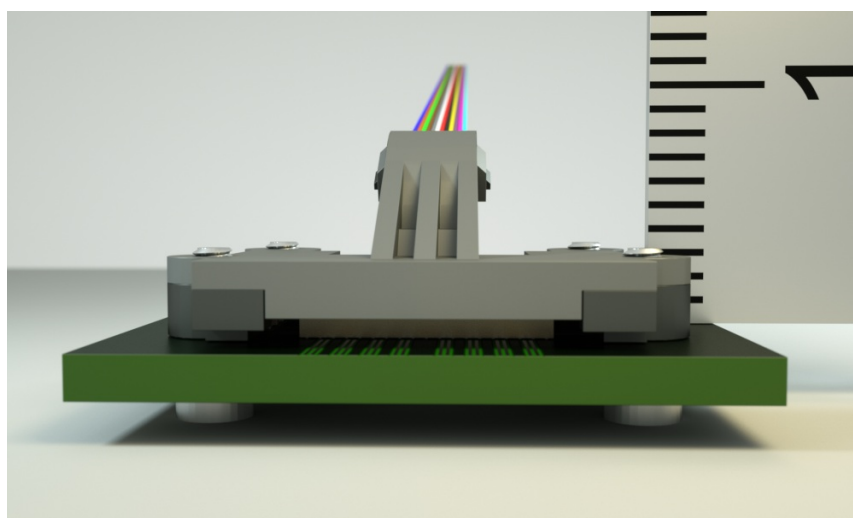
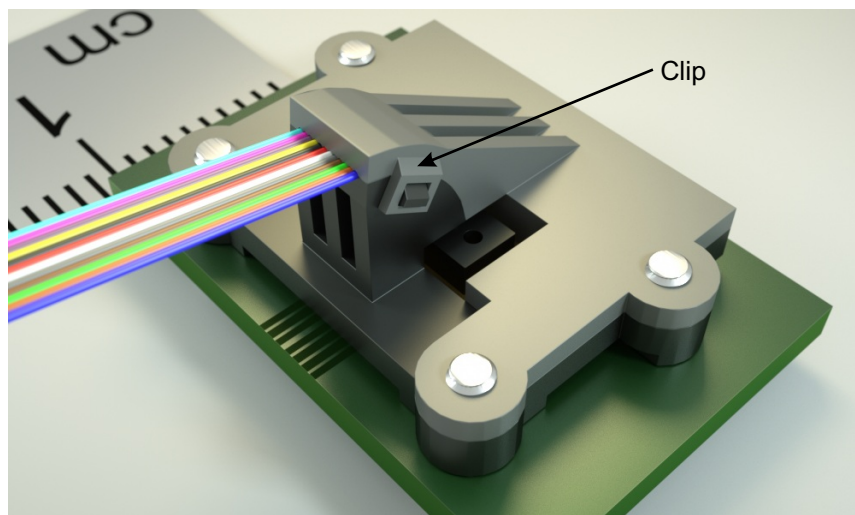
For extra strength, glue could be used if the part was not replaceable.

90 Degree Top Piece

The top piece shown right is added after the fibre array is bent towards the base piece.

The top piece clips in place in the first instance and then needs to be screwed in position for longer term stability.

The fibre used is bend insensitive multimode (BIMM) and the total bend loss is typically less than 0.2dB (5mm bend radius).



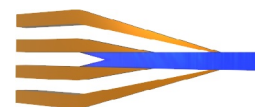
90 Degree Piece Height

The image to the left shows the height of this 90 degree piece design (0.8cm).

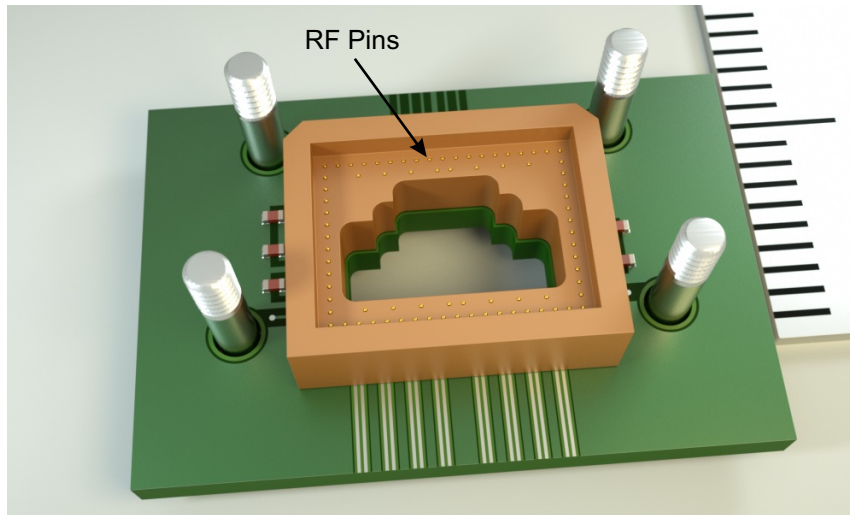
Other 90 degree solutions on the market are of a similar order and Fibre-Lyte can be married with these solutions. However, avoiding lens based solutions ensures optimal coupling as well as minimising crosstalk since the beam is never expanded.

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Fibre-Lyte V10 Integration (4/6)



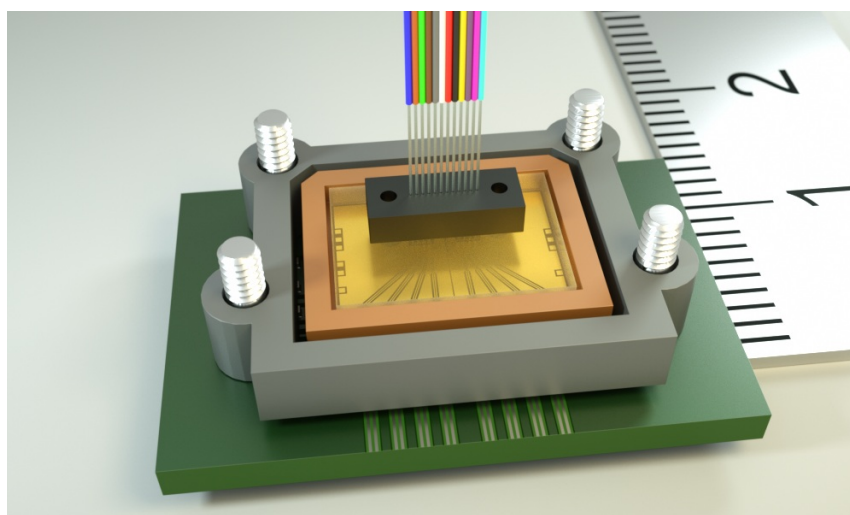
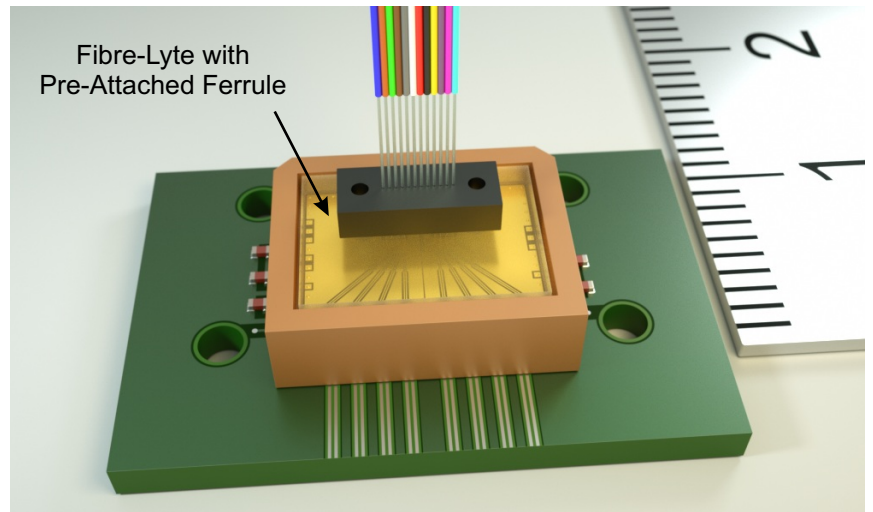
Socket Design

It is possible to use a socket for Fibre-Lyte as can be seen left.

The main technical limitation is bandwidth. At time of writing, 25G per channel is not possible with off the shelf pins but 10G per channel is well supported.

Socket Insertion

The assumption with this design is that Fibre-Lyte is "pigtailed" with a 1x12 fibre array. This is simply inserted in to the socket and clamped in place.



Socket Spacer

A spacer is used to get the PCB level up to the same as the top of the socket.

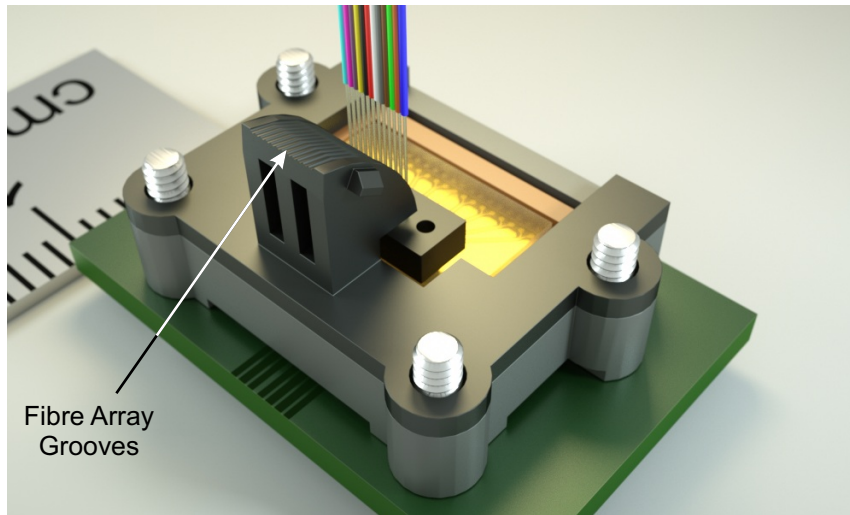
Optionally the socket/spacer can be moulded as a single piece.

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Fibre-Lyte V10 Integration (5/6)



90 Degree Mid Piece

Again, the 90 degree piece is in two parts. This allows the fibre to be encased and held from both sides avoiding the need to thread it through another part.

The piece added left is a mid piece; an array of grooves are used to roughly align (and grip) the fibres.

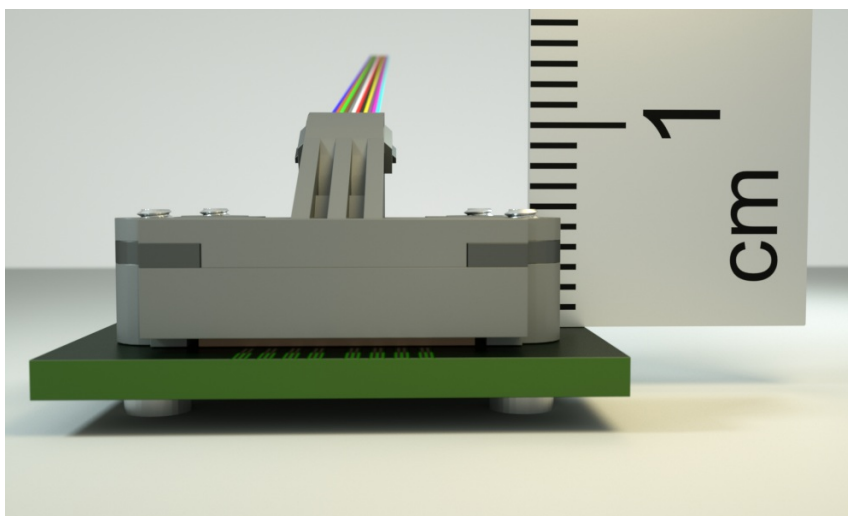
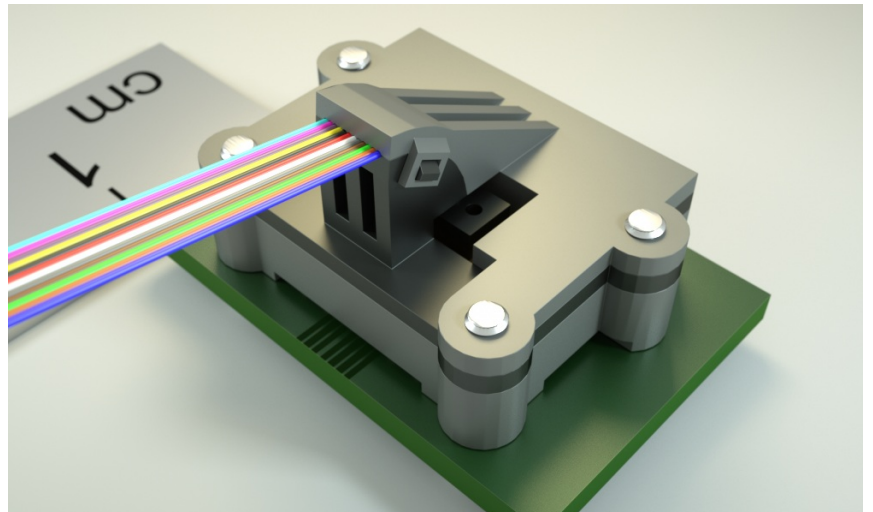
For extra strength, glue could be used if the part was not replaceable.

90 Degree Top Piece

The top piece shown right is added after the fibre array is bent towards the mid piece.

The top piece clips in place in the first instance and then needs to be screwed in position for longer term stability.

The fibre used is bend insensitive multimode (BIMM) and the total bend loss is typically less than 0.2dB (5mm bend radius).



90 Degree Piece Height

The image to the left shows the height of this 90 degree piece design (10.5cm).

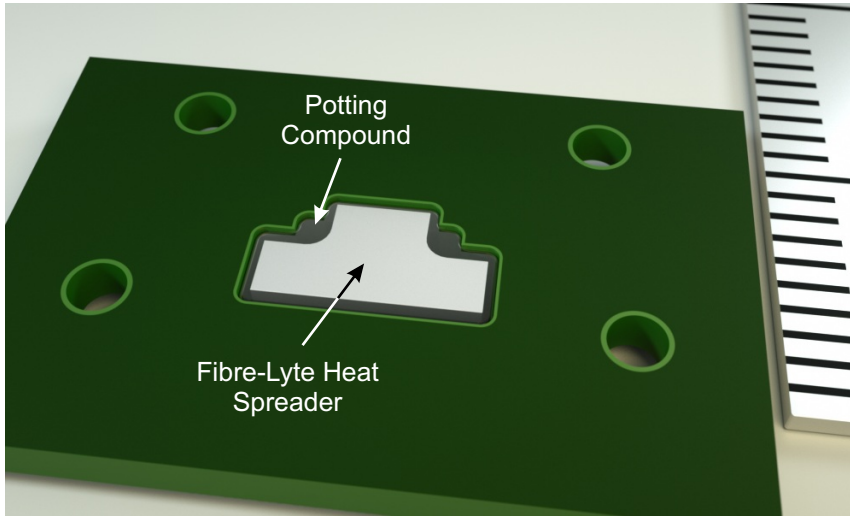
The height increase is purely to do with the socket: 2.5mm is considered low profile.

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Fibre-Lyte V10 Integration (6/6)



Silicone Potting Compound

Optionally, potting compound can be added between heat spreader and PCB. This is designed to improve mechanical stability.

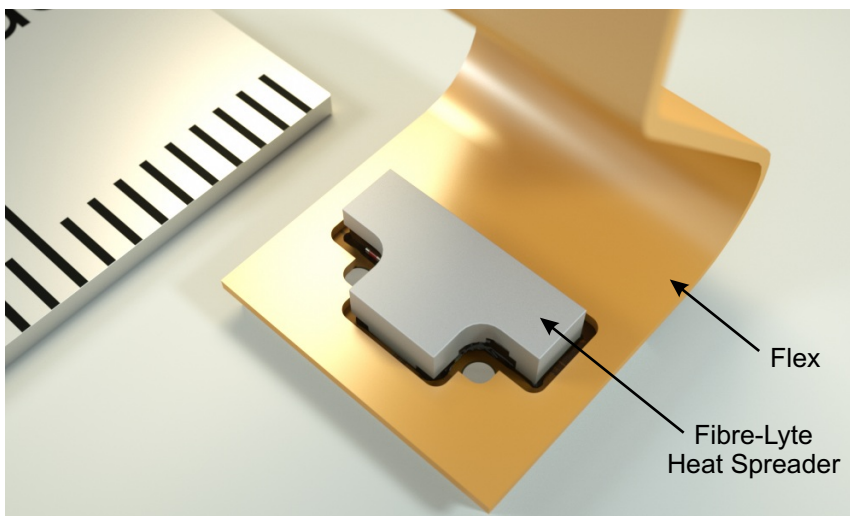
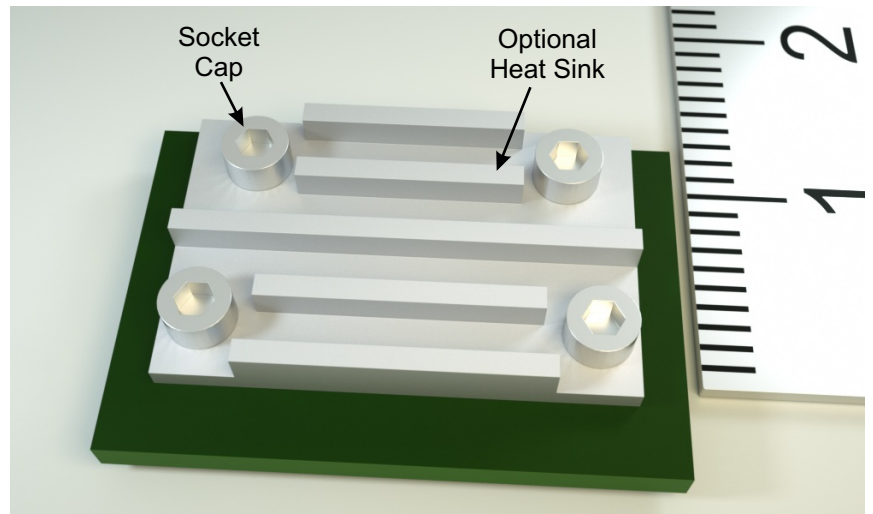
Under most circumstances, the device can be left like this as there is no need for extra heat sinking.

Optional Heat Sink

Fibre-Lyte does not normally need a heat sink at 10G. At 25G, a heat sink is only required to meet performance extremes.

If the packaged parts have an integrated CDR, it is likely that a heat sink will be required.

Fibre-Lyte is designed to be flush with the rear of the PCB. This optimises heat transfer between heat spreader and heat sink.



Flex

A flex tail can also be used for electrical attach or to move the link through 90 degrees.

The image left shows a flex tail on to which Fibre-Lyte is soldered.

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