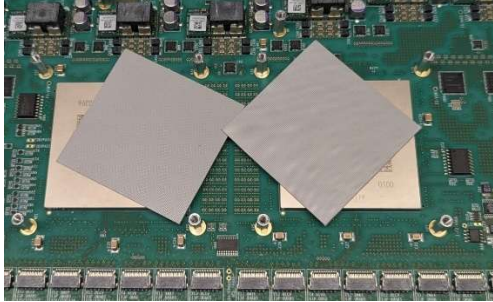


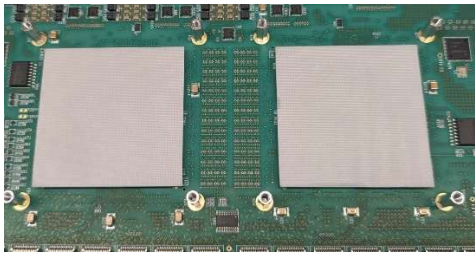
6089-127 Rev A Heatsink and FireFly Installation

Install FPGA Heatsinks

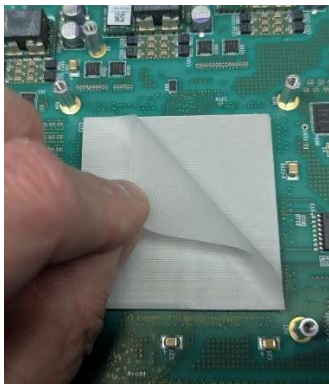
1) Cut a 54 mm square of 0.3 mm thick Sarcon GR130A TIM (Thermal Interface Material) for each FPGA.



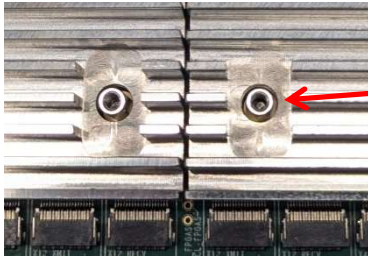
2) Peel the protective plastic from one side of each square and place them on top of the FPGAs. The FPGAs are 52.5 mm square, so there should be some overhang. Run a finger over each square to firmly adhere it to the FPGA. This will keep the TIM from lifting off the FPGA during the next step.



3) Carefully peel the protective plastic from the top of each square.

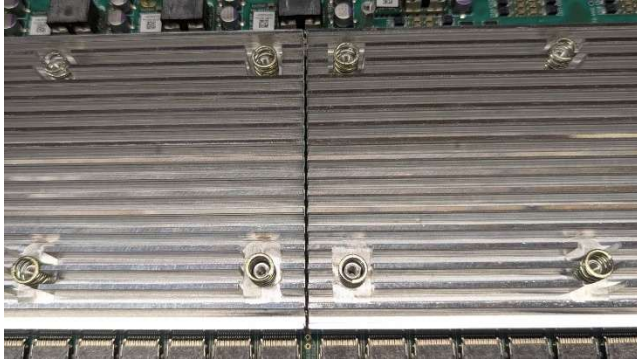


4) Place the heatsinks over the standoffs, trying to center the standoffs in the holes. Note that the two heatsinks are different. Gently press on each heatsink in the area above the FPGA.



Center the standoffs in the holes

5) Place S001YJ24 springs over each standoff (8 places total).



6) Place an M3 lock-washer on an M3x8 mm screw. Then place a flat-washer that has an OD of at least 7.7 mm on the screw. (NOTE: The OD of the flat-washer should approximately match the OD of the spring. A standard M3 flat-washer will be too small to stay on the entire top of the spring. A #4-40 flat-washer is usually appropriate.) Insert the screws into the standoffs. Drive the screws partway until the springs just start to compress. One-by-one, turn each screw a few turns (like when putting a tire on a car). After a few turns, the flat-washer should contact the top of the standoff. Using a torque driver, tighten the screws to 4 in-lbs. The spring will not be fully compressed, and the spring pressure will be pressing the heatsink onto the FPGA.



Install LGA80D heatsink

- 1) Place a 10-mm x 15-mm rectangle of 1.7 mm thick pink heatsink foam (Laird Tflex HD300) on top of the inductors on each LGA80D. Place an 8-mm x 8-mm square of the same heatsink foam on top of the big chip on each LGA80D.



Large piece on inductors (7 places)

Small piece on big chip (7 places)

- 2) Place an LGA80D heatsink over the two tall cover standoffs. Loosely place an M2.5x6 screw plus an M2.5 lockwasher in each of the four mounting holes. One-by-one, turn each screw a few turns (like when putting a tire on a car). After a few turns, the heatsink should contact the top of the standoff. Using a torque driver, tighten the screws to 3 in-lbs. The heatsink will be compressing the foam until making mechanical contact with the standoffs.



Install FireFly modules

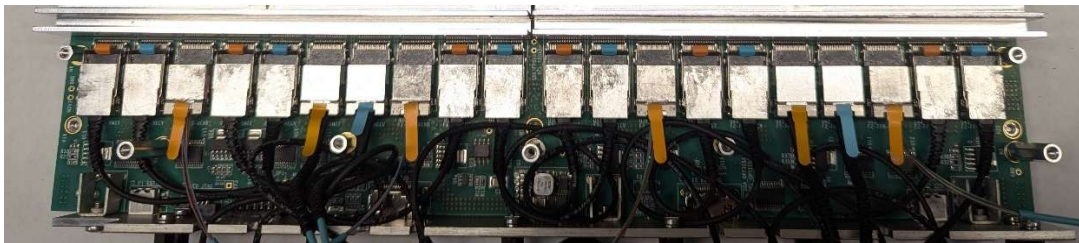
1) Figure out which FireFly modules to use for the end application. The current choices are listed below. Unless the paired devices are “Y” connected to a single optical connector, there may be applications that use only a transmitter or only a receiver.

- 4-lane 25Gx4 transceiver in a single package
- 12-lane 14Gx12 transmit/receive pair in two packages
- 12-lane CERN LPGBT x12 transmit/receive pair in two packages
- 12-lane 25Gx12 transmit/receive pair in two packages

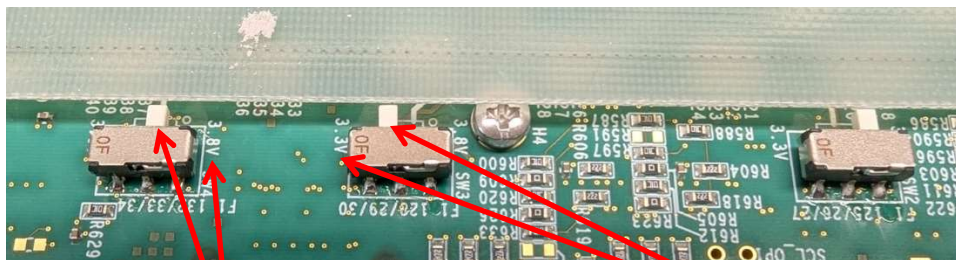
ADD SPECIFIC LOADING INFO FOR TF AND IT-DTC

2) Plug in all the required FireFly modules. The sites are labeled for the type of module as follows:

- X12 XMIT: 12 lane transmitter
- X12 RECV: 12 lane receiver
- X4 XCVR: 4 lane transmit/receive



3) Check the positions of the 12-lane transmitter voltage select switches on the bottom of the board. They should be set to 3.3V for CERN-B and 14Gx12 transmitters, and to 3.8V for 25Gx12 transmitters. The photo below shows the switch on the center for quads 128/29/30 set to 3.3 volts. The switch on the left for quads 132/33/34 and the right for quads 125/26/27 are set to 3.8 volts.

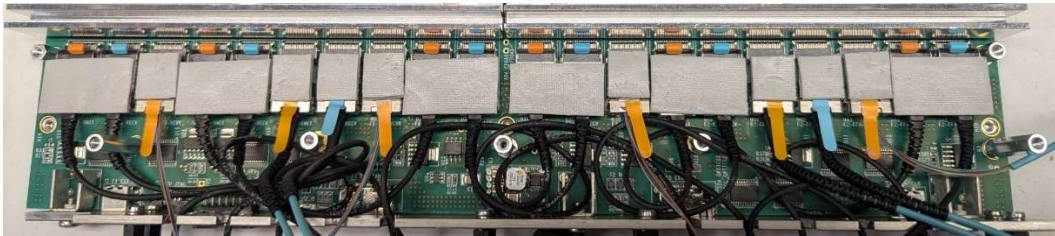


3.8V position for 25Gx12 transmitters

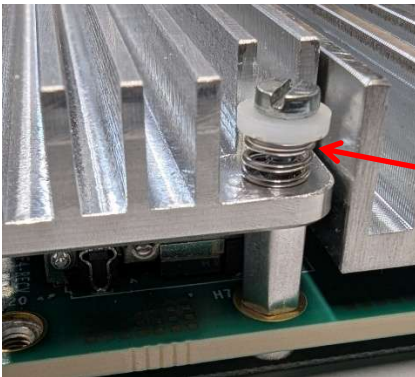
3.3V position for all transmitters
EXCEPT 25Gx12

4) Cut strips of thermal interface material. They should be large enough to cover the entire top of the package. Apply them to the top of the FireFlies. Do not allow the foam to overlap the latch clips that are on all FireFlies except for the 25Gx12 packages. The three on the left in the photo below are an example. If it does, it will interfere with the compression of the TIM under the FireFly heatsink. **The specific heatsink material is still to be determined. The pink foam**

is easier to remove, but conducts less heat. The grey foam conducts more heat, but requires that the heatsink be warmed in order to be removed.



5) Place the heatsink on top of the FireFlies with the mounting holes aligned with the standoffs. Mount the FireFly heatsink using 4 M2.5x12 screws, 4 M2.5 shoulder washers, and 4 S001YJ1D springs. Tighten the screws just until the springs are almost fully compressed.



Spring not totally compressed, gaps visible between the coils.

6) Plug the MTP connectors into the front panel junction blocks. Generally put them in the same order as they are installed on the board. Carefully dress the cables to fit between the heatsink and the front panel.



7) Label the junction blocks with the FireFly type and the quad number(s). The possible types for FireFLys that we have purchased thus far are:

- T 12x25G -> 12-lane 25-Gbps Transmitter in 12-fiber MTP
- R 12x25G-> 12-lane 25-Gbps Receiver in 12-fiber MTP
- X 12x25G-> 12-lane 25-Gbps Transmitter/Receiver "Y" connected in 24-fiber MTP
- CERN-B-> 12-lane CERN-B Transmitter/Receiver "Y" connected in 24-fiber MTP
- 4x25G-> 4-lane 25-Gbps Transceiver in 12-fiber MTP
- X 12x14G-> 12-lane 14-Gbps Transmitter/Receiver "Y" connected in 24-fiber MTP

The quad numbers associated with each site, counting from the top of the board towards the bottom, are:

- Site 1: 12-lane transmitter in quads 121/22/23
- Site 2: 12-lane receiver in quads 121/22/23
- Site 3: 4-lane transceiver in quad 124
- Site 4: 12-lane transmitter in quads 125/26/27
- Site 5: 12-lane receiver in quads 125/26/27
- Site 6: 12-lane transmitter in quads 128/29/30
- Site 7: 12-lane receiver in quads 128/29/30
- Site 8: 4-lane transceiver in quad 131
- Site 9: 12-lane transmitter in quads 132/33/34
- Site 10: 12-lane receiver in quads 132/33/34

ADD SPECIFIC LABELING INFO FOR TF AND IT-DTC