HRPPD Meeting #22 Update

2026-06-30

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U.S. DEPARTMENT of ENERGY

Current Status

Tasks:

- Priority tasks
  - HRPPD order status
    - Submitted 6/17, due 10/21
  - FCFD
    - Is Ray testing at BNL in July for hpDIRC needs?
  - Interposer order to be submitted by July 1
    - RFQ in progress
    - Final thickness reduced to 3mm
    - Order qty 208 covers 13 HRPPDs
  - Review preliminary mechanical envelope and cooling
- Upcoming items
  - FCFD specs for pfRICH and hpDIRC to be finalized end of July?
    - Will review at Glasgow Collab
  - Analyze signal path length and test on-board terminations to FCFD
  - FCFDv1.2 FEBs
  - Aiming for backplane order submitted by mid-August
    - Need to select HV connectors and reroute signals to reduce length
    - Start finalizing LV/HV power distribution, bridge card + VTRX+ for ASIC cards
  - Spacer/shims/sidewall/window need to be ordered by HRPPD arrival

No update

- Open items:
  - N/A
- FCFD Test Board
  - Will resume in July
- Backplane Changes
  - See action item list

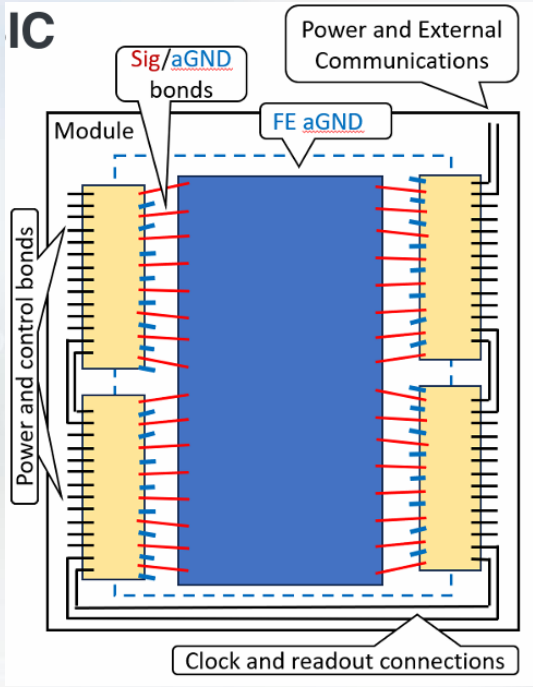
Mechanical Envelope

Notes

- Link to model
- Maximum height is 50 mm
  - Measured from window or lip?
- ASIC cards
  - FCFD estimated size 15x3 mm for 32 channels
    - Will need to be mindful of thickness of final board and connector, will require 10-12 layers
  - Used card edge connector on top side for expediency, probably a better solution
  - Connector height is estimated from FNAL estimate
  - ASICs may be wirebonded so no room for cooling pipes on ASIC side
    - Wirebonds will need protection
- Bridge card
  - bPOL model based off OTS CERN module, not sure if we will use custom
  - 2x VTRX+ modules included in model
    - Brian suggested more modules for redundancy and limit data loss on part failure
- How to reduce height?
  - Ballpark target height = 45 mm ± 10%?
  - ASIC card height could be reduced by ~2 mm
  - Shorten top side ASIC card connector

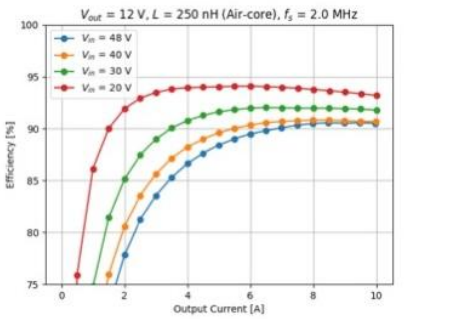
Chip	3mm
Sensor-ASIC gap	2-3mm
Back-side bonds	1mm
Extra routing area	2mm
pcb edge clearance	0.5mm
Total	**8.5-9.5mm**

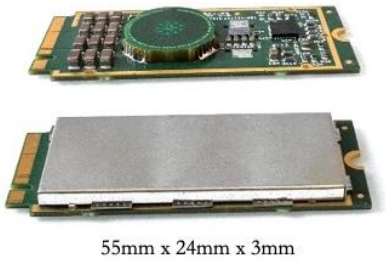
FNAL Estimate



bPOL48V module

Module optimised in volume, available in large numbers
Hosting:
- CERN GaN_controller ASIC
- CERN custom PCB air core inductor
- Commercial Gallium Nitride power stage





55mm x 24mm x 3mm

CERN Module

Appendix