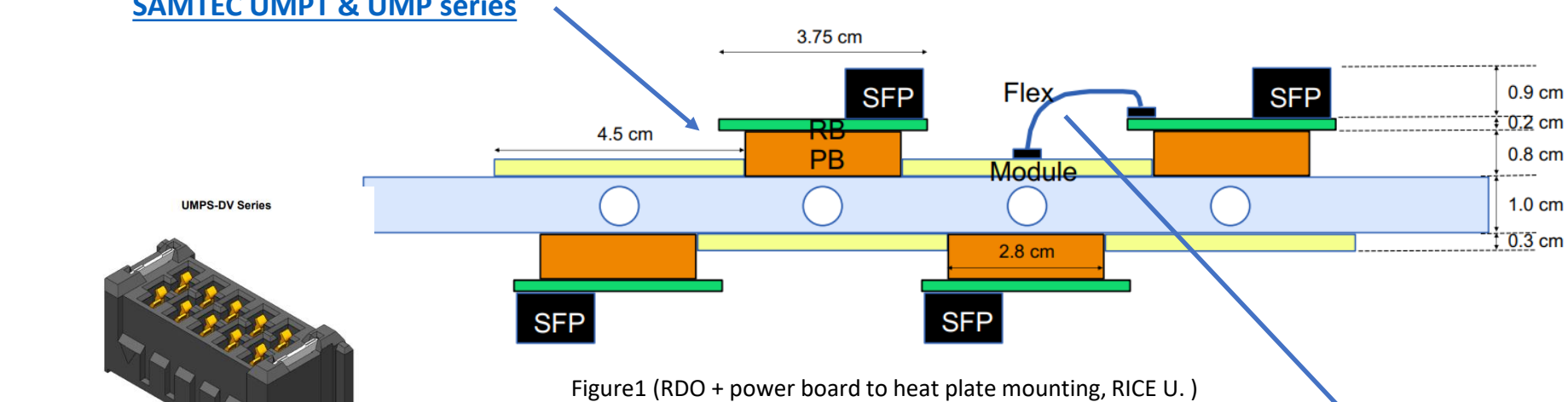


DC|DC ASIC + RDO POWER BOARD

Board to board connector
SAMTEC UMPT & UMP series

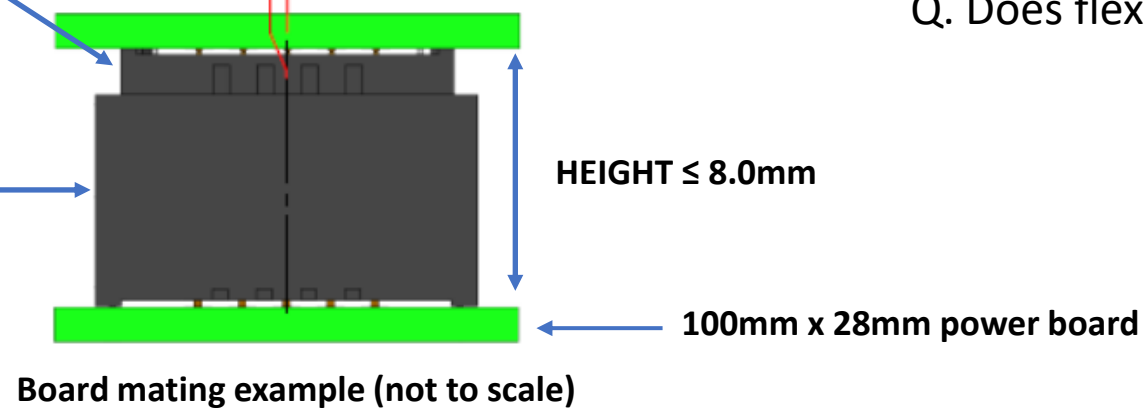
DRAFT



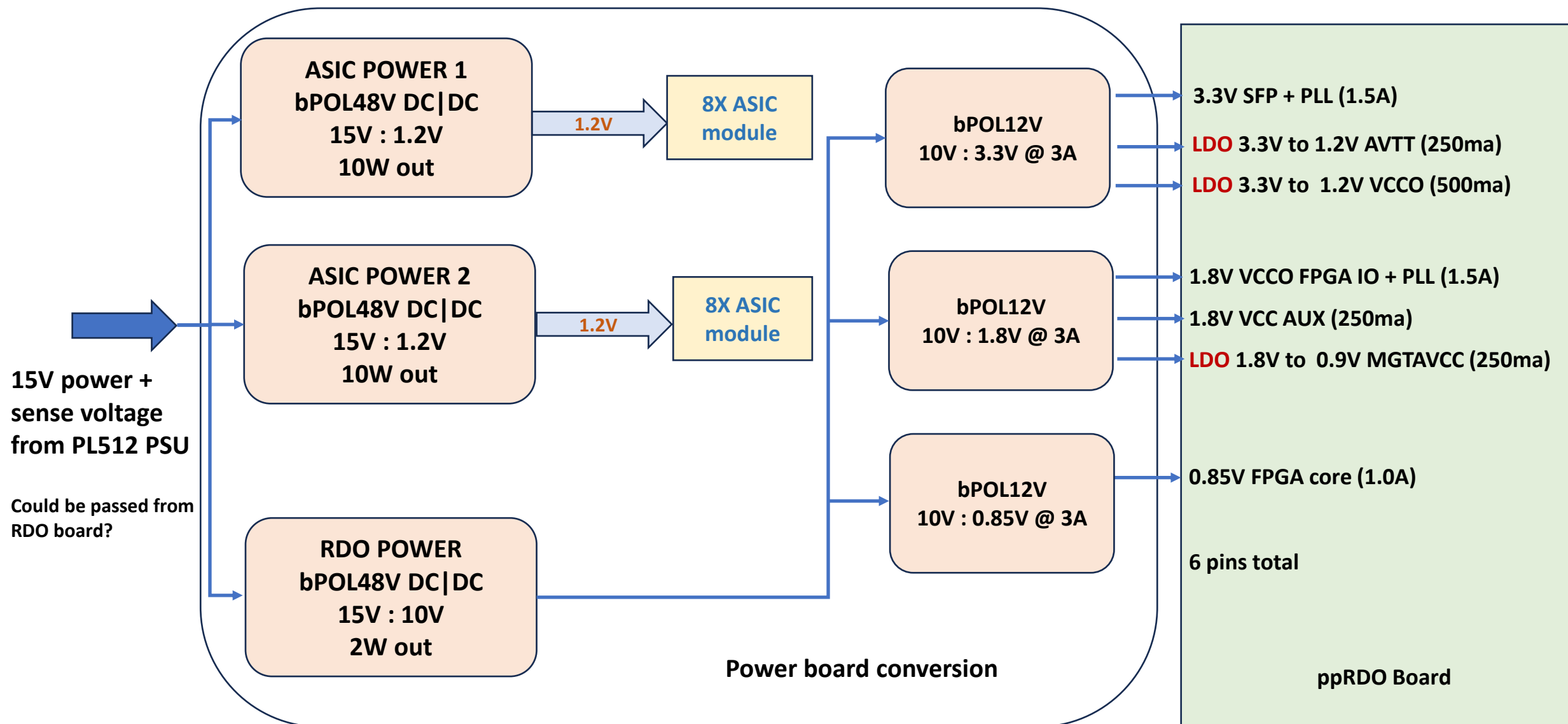
UMPS "socket"

UMPT "plug"

Q. Does flex cable bring power to ASIC module?



POWER BOARD POWER DISTRIBUTION BLOCK



POWER BOARD PROTOTYPE DEVELOPMENT

Layers:	4x to 6x 2.0 mm thick
Copper Weight:	2oz top/bottom
Heat transfer:	Bottom copper w/ gold finish Thermal compound or sil-pad mount to plate w/2.0mm screws
Component Mount:	Top only
Power Dissipation:	~50W (~75% efficiency)

1.PBv0 schematics 50% complete, Order major parts

Date: January 2025

2.PBv0 schematics 100% complete (with internal review); Order all parts

Date: March 2025

3.PBv0 PCB layout complete (with internal review)

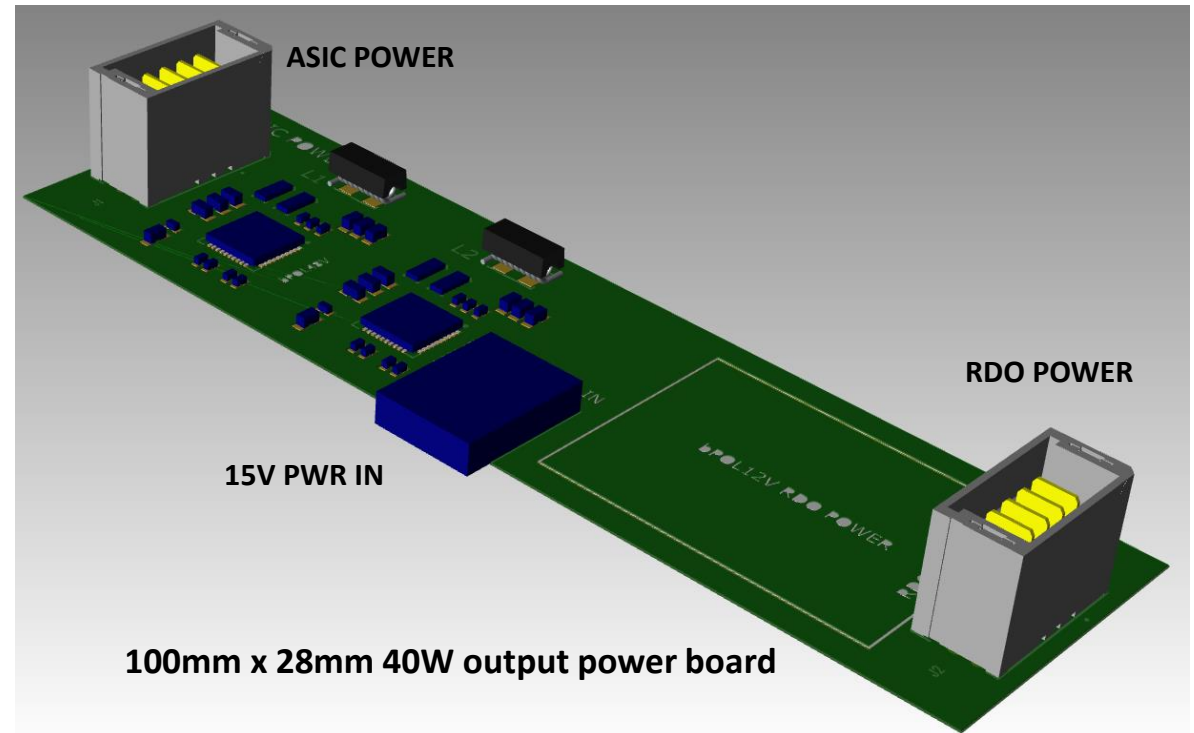
Date: May 2025

4.PBv0 fabrication and assembly complete. Boards delivered.

Date: July 2025

5.Basic electrical, power QA, acceptance testing.

Date: September 2025



sTGC VMM FEB 30W power board (105mm x 35mm)

Label	Vout	VSHUNT	IAMPS	WVREG(OUT)	VDROP	WLOSS	Eff
3.3FMC	3.3	0	0.000	0.000	0.7	0	
1.8MGT	1.80	4.000E-04	0.020	0.036	2.2	0.044	45.0%
FPGA 1.2V	1.20	2.000E-03	0.100	0.120	2.8	0.28	30.0%
0.9AVCC	0.90	8.000E-04	0.040	0.036	3.1	0.124	22.5%
1.2AVTT	1.20	2.800E-03	0.140	0.168	2.8	0.392	30.0%
0.85	0.85	4.000E-03	0.200	0.170	3.15	0.63	21.3%
1.8V	1.80	1.610E-02	0.805	1.449	2.2	1.771	45.0%
3.3V	3.30	1.160E-02	0.580	1.914	0.7	0.406	82.5%
Total				3.893		3.647	

BACKUP SLIDE: Circuit Performance Specifications: Power converter boards

- Voltage output: 3.3V to 1.2V ($\sim \pm 1\%$)
- Voltage input: 12V to 16V
- Output Power: 20W & 6W boards
- Voltage regulation: $>98\%$
- Output Voltage Ripple & Noise: $< 0.5\%$
- Operating environment: 35°C
- Efficiency: $\geq 70.0\%$
- Over-Voltage / over-current protection
- TID: 100kRad
- Magnetic tolerance: 2 Tesla field

Cooling:

- Mounts to heatsink or liquid cooling plate

Features:

- Remote output enable
- Status flag

Cost for procurement:

- Printed circuit boards + Bill of Material + Circuit Card Assembly:
\$1,000.00USD / assembly
- Assembly quantity: 5x complete circuit cards
- Equipment purchase: \$1K USD

BNL Responsibility:

- Engineering & design
- Printed circuit board layout
- Procure and assemble circuit cards
- Testing & evaluation
- Acceptance testing & qualification

Deliverables:

- Complete assembled board
- Testing + evaluation report