

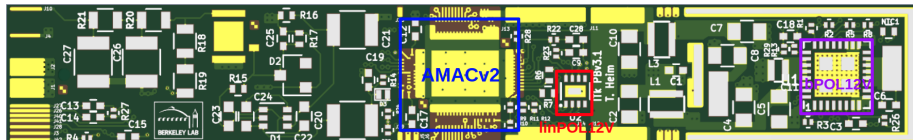
LINPOL12V qualification board

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LBL

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Introduction: powerboard powering scheme

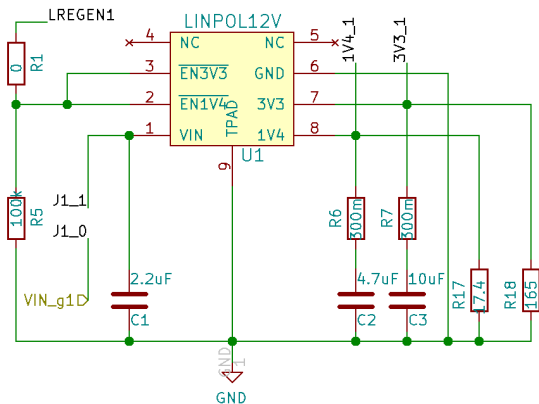


- bPOL12V (buck converter): supply LV (1.5V) to strip readout hybrids
- **linPOL12V** (linear regulator): supply voltage (1.4V) for AMAC
- linPOL12V spec load limit: 80mA
 - AMAC current is about 40mA; about 50mA at TID peak
 - Possibility to power AMAC by bPOL as backup (via a PMOS switch)
 - There are indications that linPOL output keeps rising with irradiation
 - If linPOL > 1.5V and PMOS switch is not completely OFF, the 1.5V from bPOL to hybrids will be affected... (see [Karol's talk](#) (pin 1234))
- This talk: design a PCB to test the stability and reliability of linPOL at > 80mA load with large statistics
 - If so, we can change the powerboard to power AMAC only from linPOL

High statistics linPOL qualification board

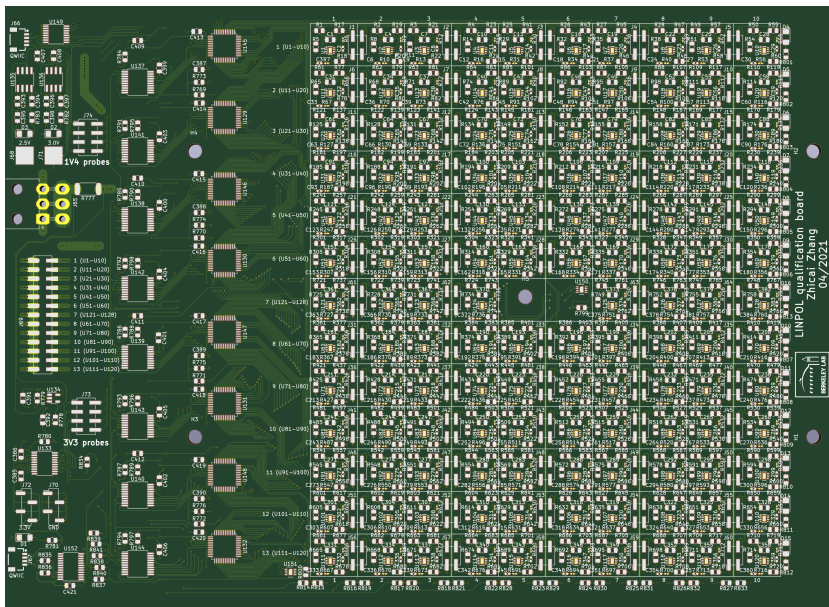
- Test 128 linPOLs per board
- linPOLs run with constant resistance loading (80mA, 100mA, etc.)
- Monitor the output of each linPOL with ADC
- Run them for a long time, with elevated temperature, irradiation, etc.
- Possibility to debug the output with scopes
- Possibility to turn on/off and isolate individual linPOLs

Schematic of a basic linPOL unit



- 1.4V and 3.3V output measured by 10 bit ADCs (AD799x)
- Three ways to control a linPOL:
 - A jumper at VIN for each linPOL (manual control)
 - A group of linPOLs (one row in a board) share one VIN power
 - A group of linPOLs (one column in a board) share one enable signal

The board



Status and plan

- Already placed the order to sunstone for the PCB manufacturing
- Will load about 4 boards and run them together (Qwiic daisy chained) in a [card rack](#)
- Still looking for cooling solutions for the board (about 1 W in a 1.6 cm^2 linPOL grid)