bwd ECAL testbeam SiPM board considerations for compatibility with COTS waveform readout plan

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- SiPM's to be connected common cathode OR as 16 isolated SiPM's
  - (32 pins of connectors seems OK to me, use 1.27mm connectors, 2× 2×(8 to 10) pins, ~13 mm wide should fit very nicely)
  - 16 isolated SiPM's gives maximum flexibility, e.g. to try series-connected readout if someone wishes to
  - If common cathode please use a plane in SiPM board, and many pins on connectors
- Must be SMT connector, at least on 2nd board (preamp board), due to space constraints / need to use other side of board
- suggest place connectors towards outer edges
  - We have to pick specific connector for 2nd board too, and see that placement is good for that board's mechanical constraints
- thermistor (0603, Vishay # NTCS0603E3103FHT), wire to two connector pins; can be on back side of SiPM board but front preferred
  - It is possible to omit the thermistor and SiPM temperature compensation… Recommend to have it though
- LED (0603 mounted on board?) if LED is needed
  - It also is fine to have LED on the second board, passing through hole/cutout in SiPM board, if preferred?

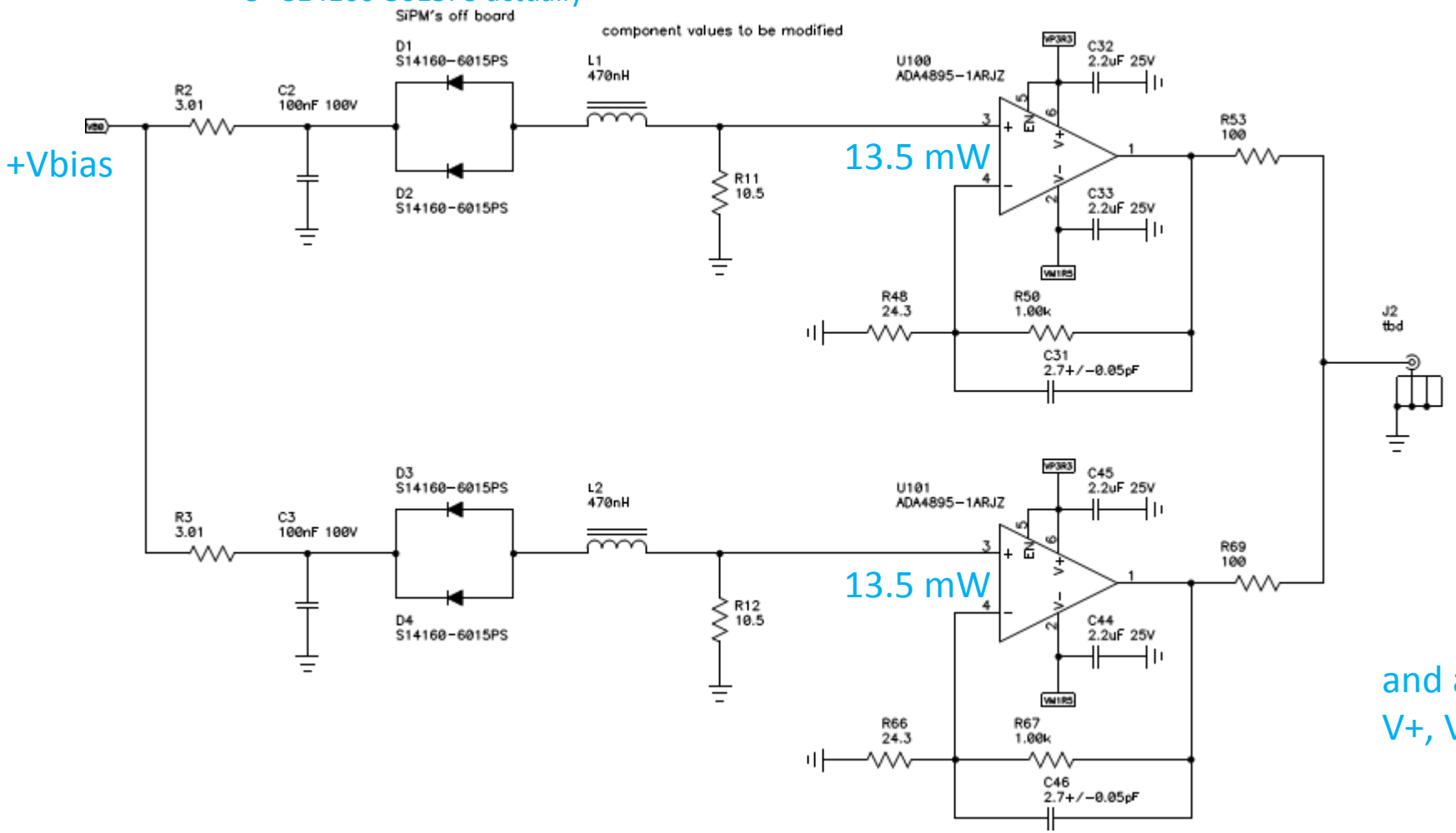
My suggestion on connectors: These, or something very similar

If connectors without alignment pins must be used (due to some mechanical conflict), then we probably have to make a fixture for soldering them. It's feasible I think.

2nd board circuit (roughly, and subject to change)

two-amplifier plan shown (faster pulse shape),
but one-amplifier plan might be fine

8× S14160-3015PS actually



some small 50 Ω coax connector

and a 6+ pin cable connector for:
V+, V-, GND, thermistor (2 pins), Vbias

the signal output from this should be compatible with other waveform ADC's, e.g. JLab fADC250

FOR REFERENCE ONLY

Fwd ECAL SiPM Board
aka “Adapter”

Connector: JAE # AX01R030VABB
mating on FEB # AX01F030VABB

- 4 towers, 2×2 of 6×6 mm^2 SiPM’s each
  Hamamatsu # S14160-6015PS
- frontend in groups of 2 SiPM’s for faster pulse (for DCR mitigation)
- serial number IC
  AD/Dallas # DS2411R
- thermistor (as in FCS)
  Vishay # NTCS0603E3103FHT
- LED pulser (similar to FCS)
  LED: Bivar # SM0603UV-400, same as in sPHENIX
- gluing alignment holes
  - also serve as broken board removal handle holes