

NPS PMT HV Divider – Status – 16 December 2021

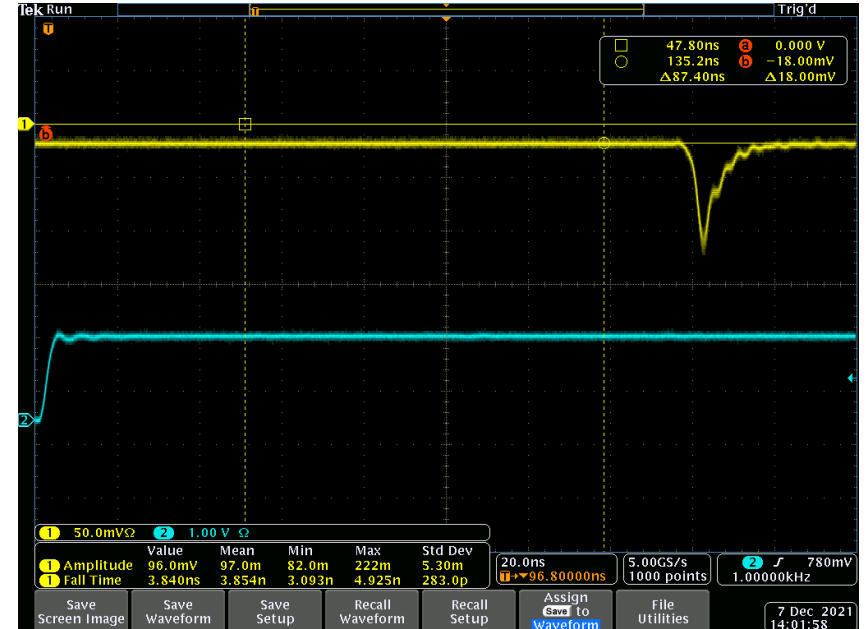
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HV = 605 V @ 405 μ A, Amplitude ~ 10% of Maximum



- Ver 2 PCB – 4 layer + regulators
- Un-shielded

❑ Noise: < 110 mVp-p

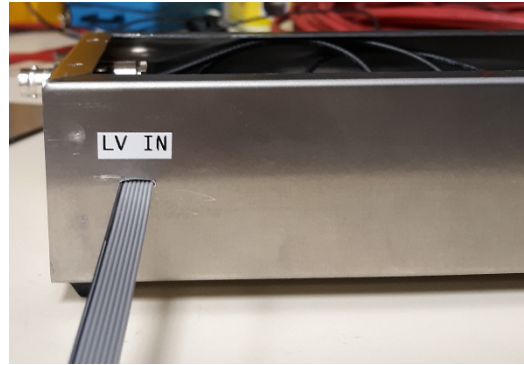


- Ver 2 PCB – 4 layer + regulators
- Shielded box

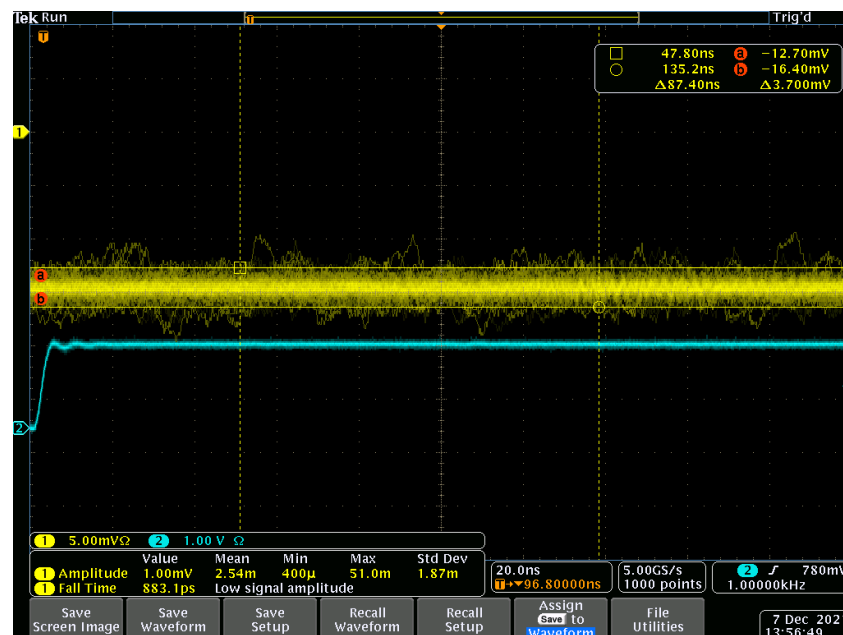
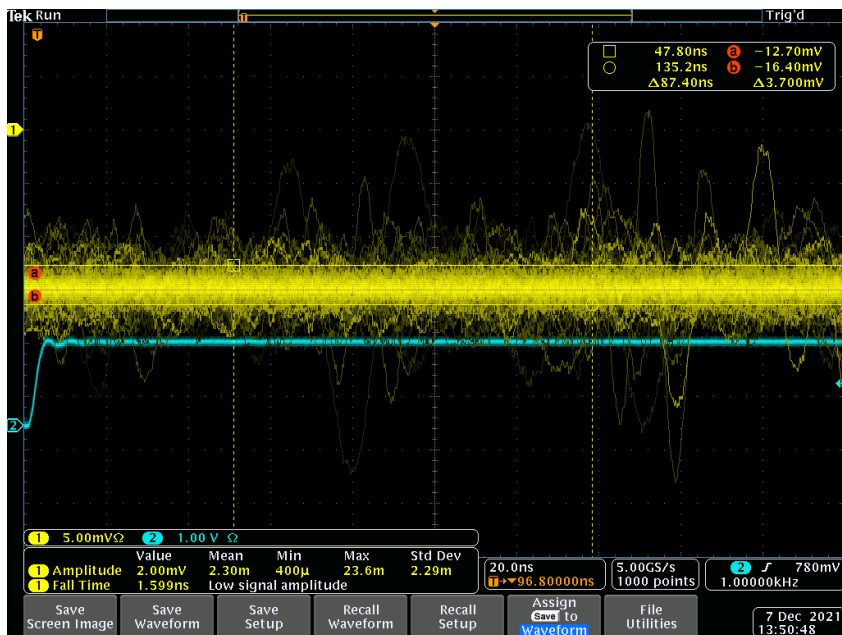
❑ Noise: < 5 mVp-p -- very low!

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- ❑ Test to assess detector shielding impact on baseline noise.



- ❑ Box is grounded from PCB through HV and signal connectors.
 - ❑ NPS detector HV is floating and should be better.
- ❑ Tested with and without extra GND cable to clean GND.



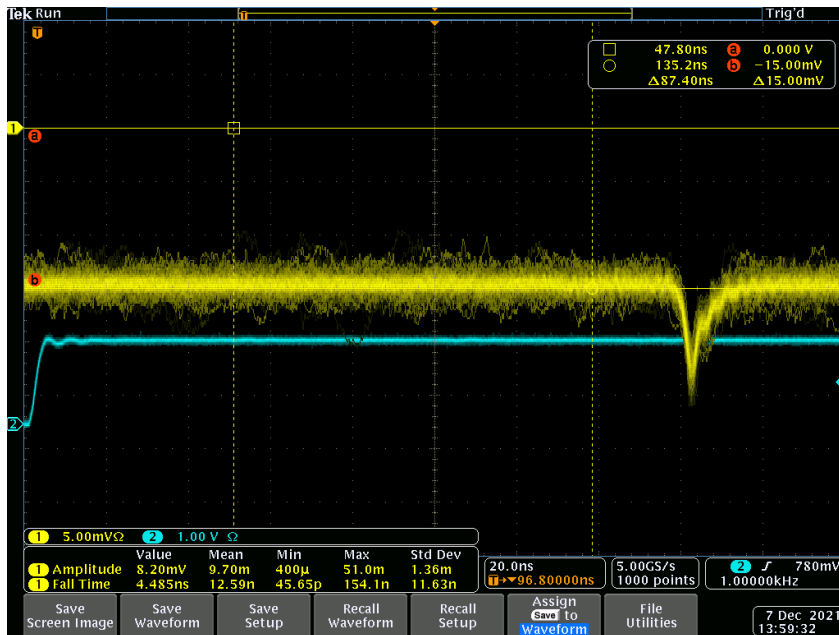
- Ver 2 PCB – 4 layer + regulators
- Shielded box via connectors
- Noise can be reduced by decreasing cable loop area

- Ver 2 PCB – 4 layer + regulators
- Shielded box with GND cable to clean GND

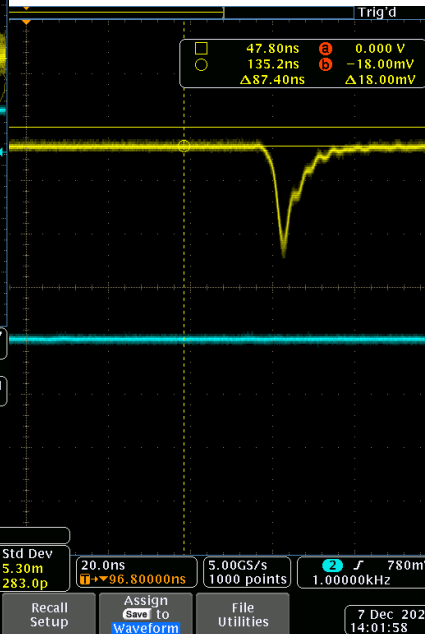
□ Noise is < 5 mVp-p

$10\text{ mV} = 1\% \sim 100\text{ MeV}$

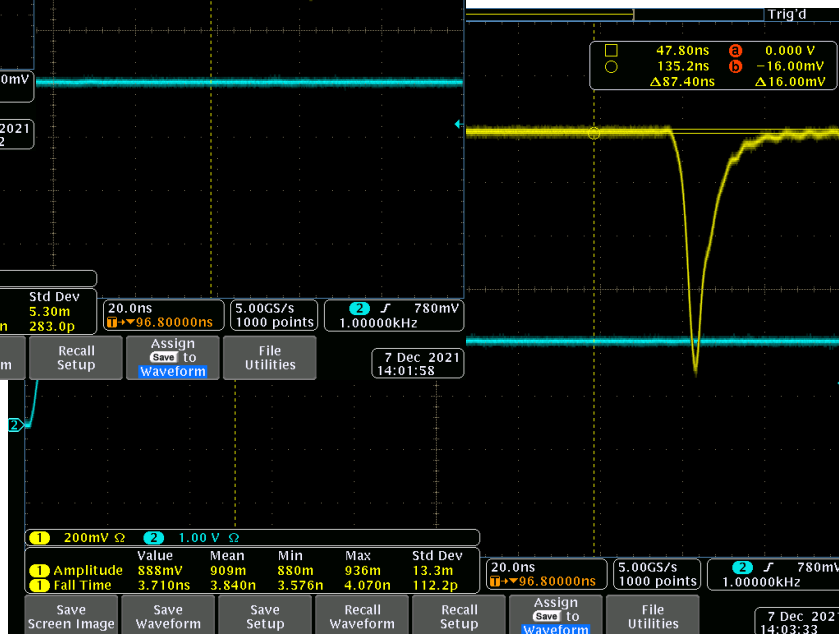
Note: pulse amplitude at % of full scale



$100\text{ mV} = 10\% \sim 1\text{ GeV}$



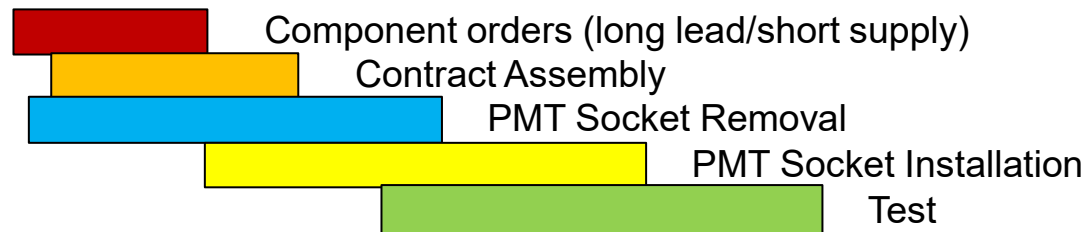
$900\text{ mV} = 90\% \sim 8\text{ GeV}$



- ❑ Tests with LED ($T_r \sim 800\text{ ps}$)
- ❑ Good shielding and grounding of the NPS will ensure good performance.

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- **Hybrid approach to manufacturing NPS dividers:**
 - **Turn-key (4 – 5 weeks) but ...**
 - **We procured components with long lead times and those in short supply: 2 connectors, transistors (4 weeks)**
 - **Total PCB assembly ~ 6 weeks**
- **Remove (from old PCBs) and install sockets: + 6 weeks**
- **Test: + 3 weeks**
 - **Total NPS Divider: 15 Weeks (late March – early April 2022)**
- **Procurements have been completed:**
 - ☐ **Ordered components (long lead/short supply).**
 - ☐ **Ordered LV cables.**
 - ☐ **PO issued for PCB assembly contract.**



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