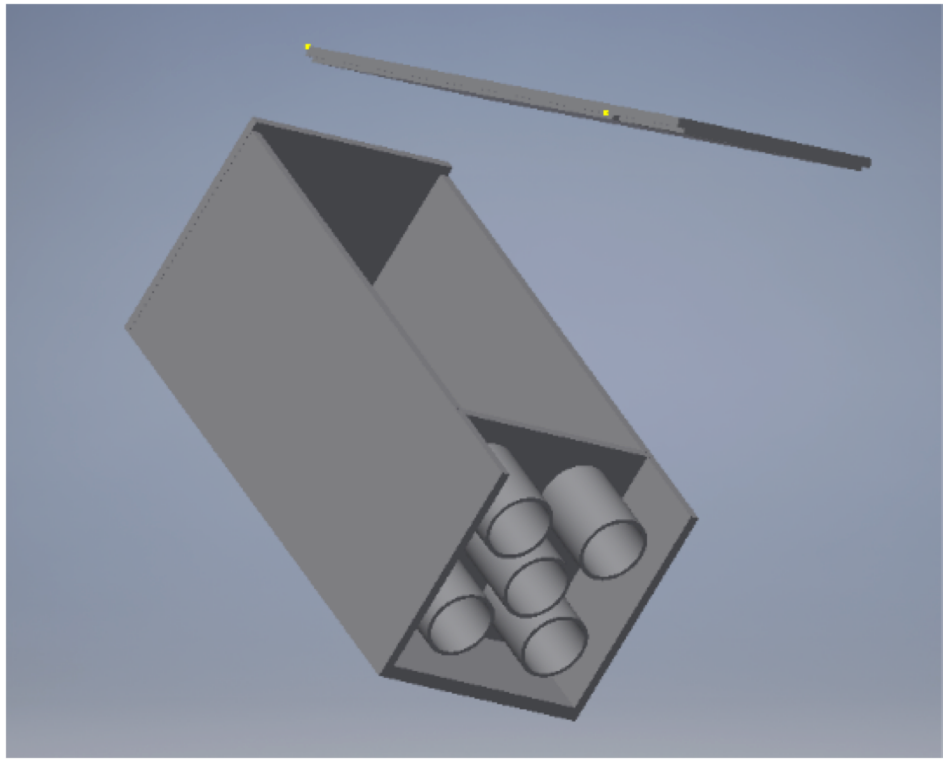
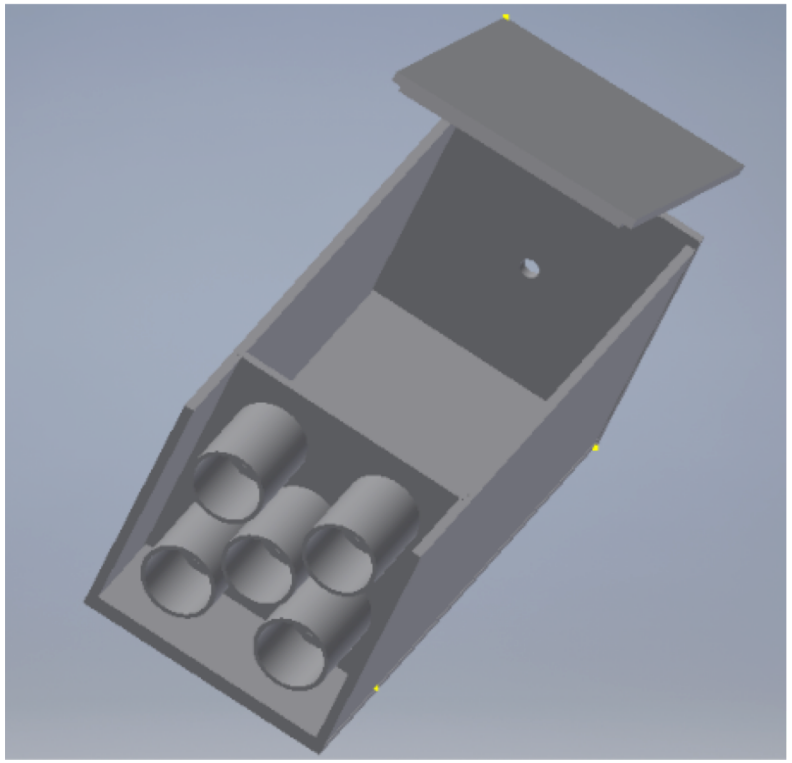
Multi PMT test system Construction

2018.06.12

남선호

Inventor Design



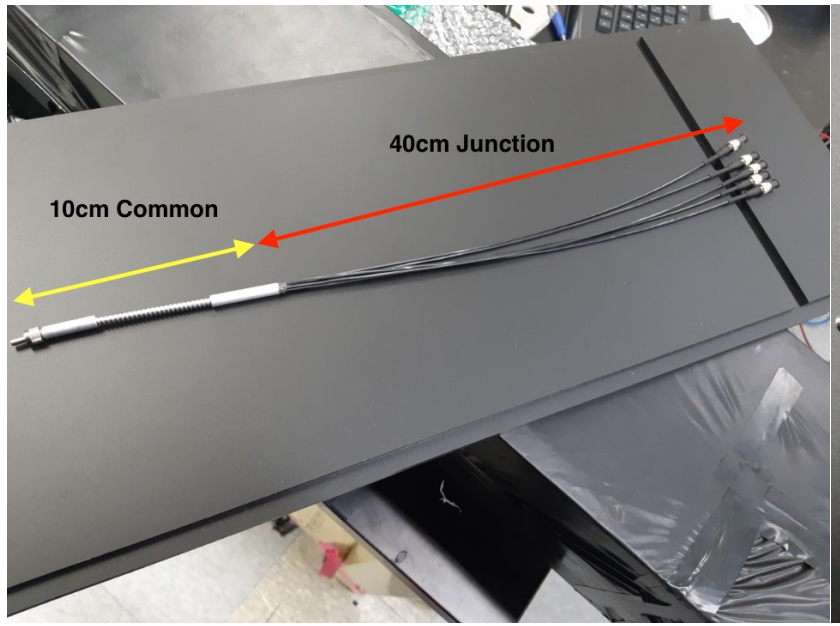


Decided design after last LAMPS meeting (5/2)

Dark Box Frame

Material : Black acrylic , Thickness : 10mm ~ 15mm ,
Inside wall : Matte treated

Optical fiber



1 to 5 Fiber Bundle

Fiber : FT400UMT-MMF, $\emptyset 400\mu m$ core

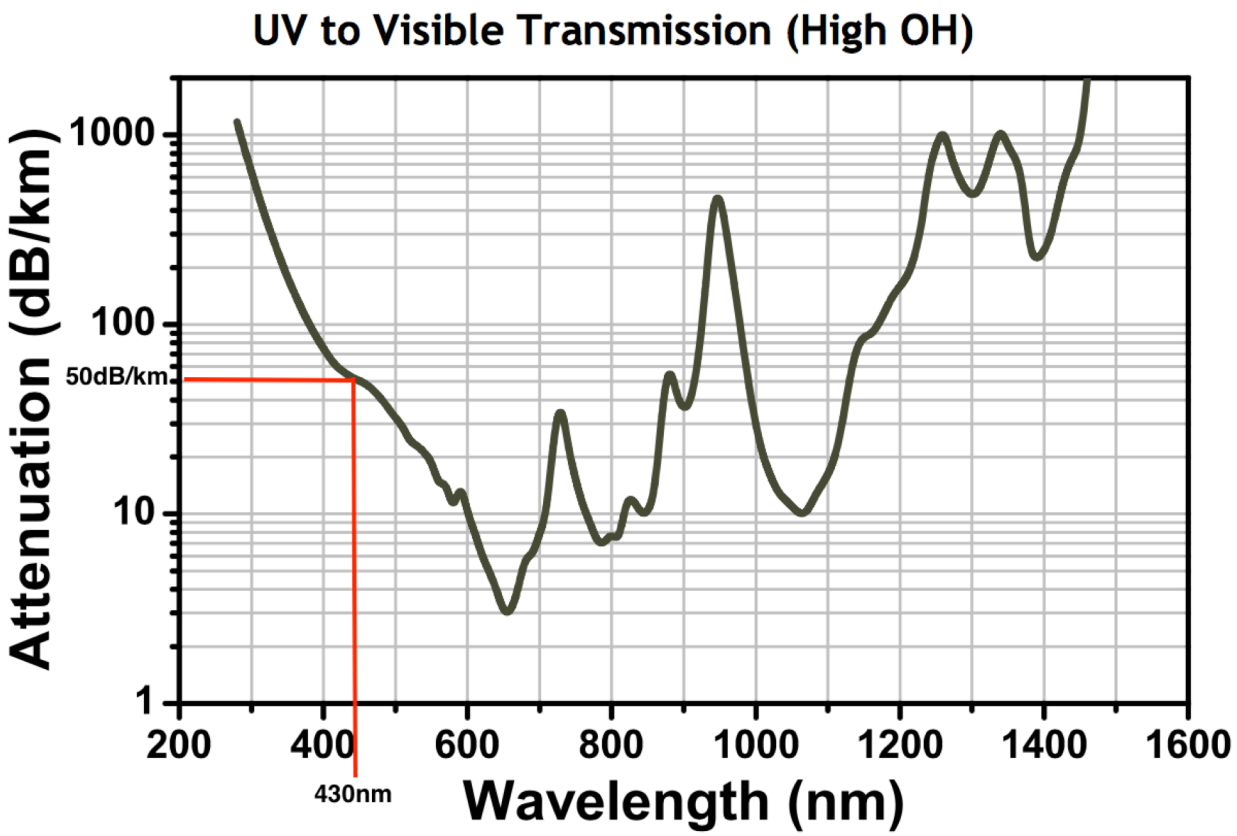
Common Length 10cm, Junction Length : 40cm

Jacket : common $\emptyset 5.0mm$ SUS Jacket (Spiral shape steel cover)

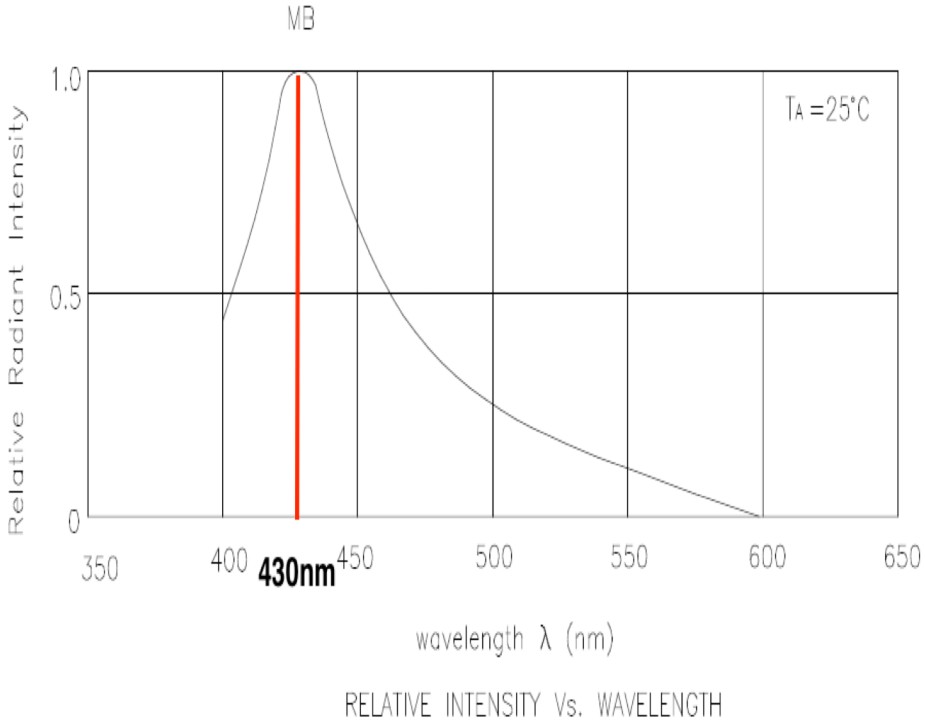
Junction $\emptyset 3.0mm$ *or* $\emptyset 2.0mm$ PVC Jacket

Fiber Specification

- Item # : **FT400UMT** , 0.39NA
- Wavelength Range : **300 - 1200 nm**
- Core diameter : 400 ± 8 μm
- Cladding diameter : 425 ± 10 μm
- Max Power Capability : Pulsed 4.0MW



Wavelength - Attenuation (from specific sheet)



LED wavelength spectrum

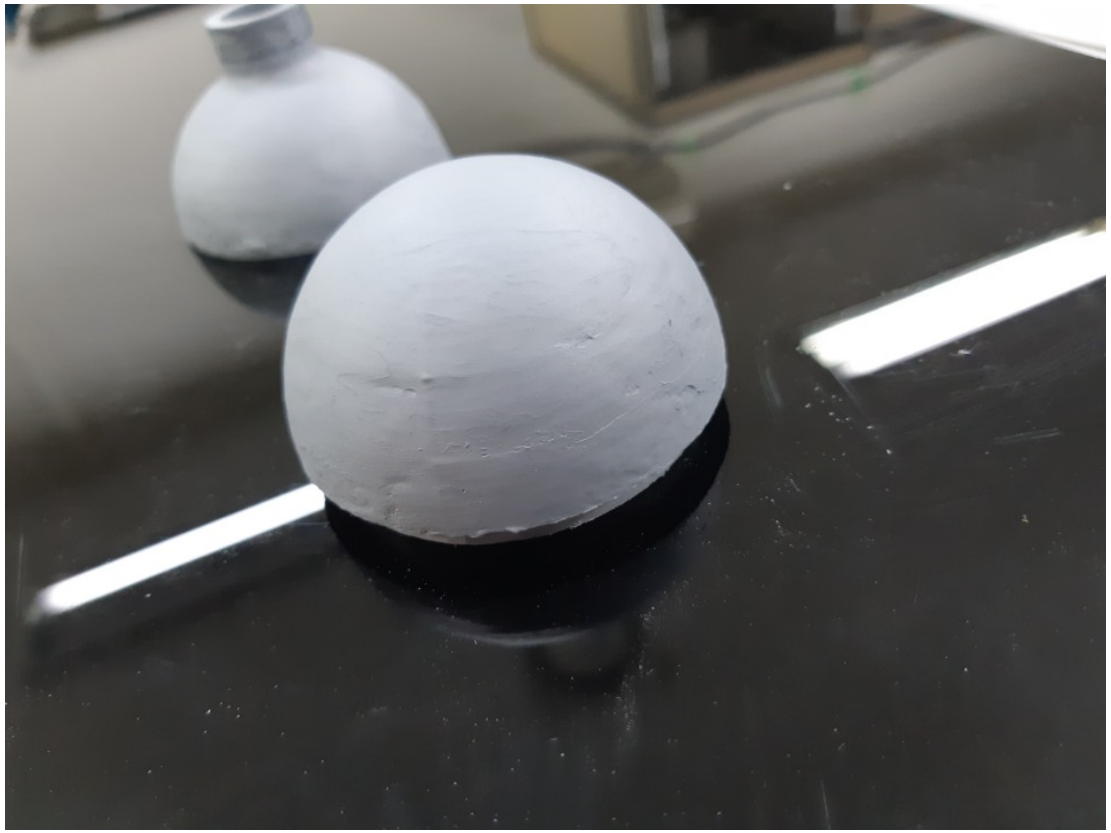
$$50\text{dB/km} = 0.025\text{dB/0.5m} \rightarrow \frac{P_f}{P_i} = 10^{-0.0025} = 0.994 \approx 1$$

Diffusion ball and LED

Diffusion ball was formed by 3D printing -> The Material has very good light transmission!!

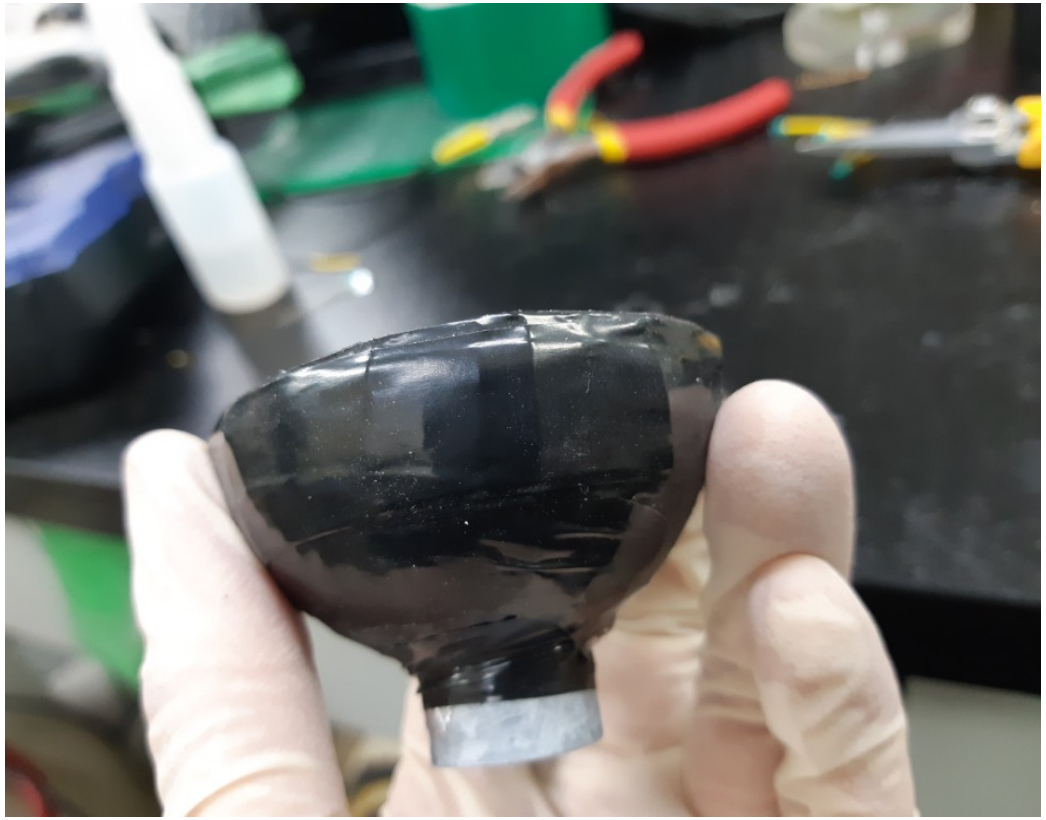
so I needed to do light shielding

First coated inner and outer surface using putty which include metal powder

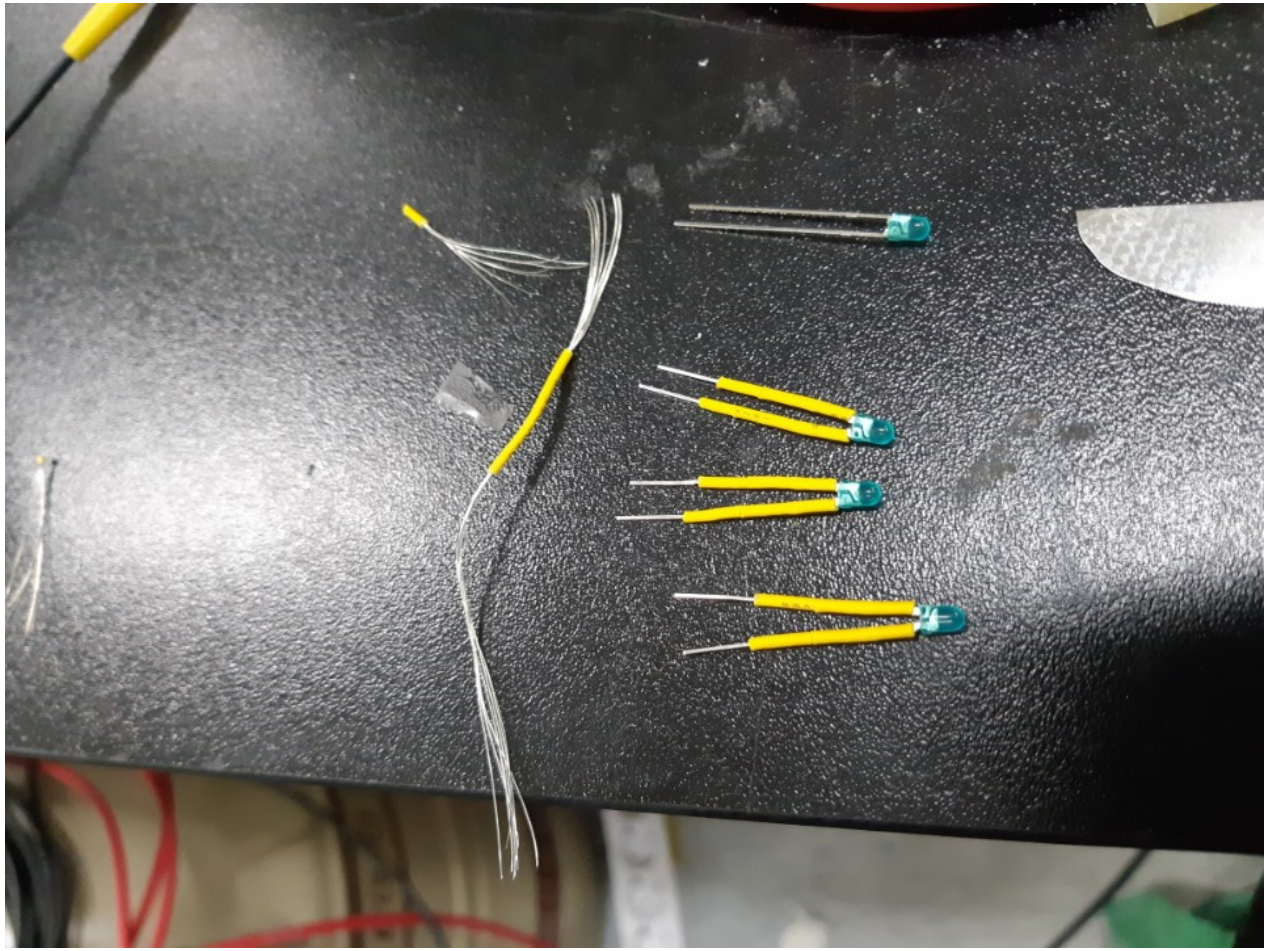


Next attached aluminum foil on outer surface using instant glue

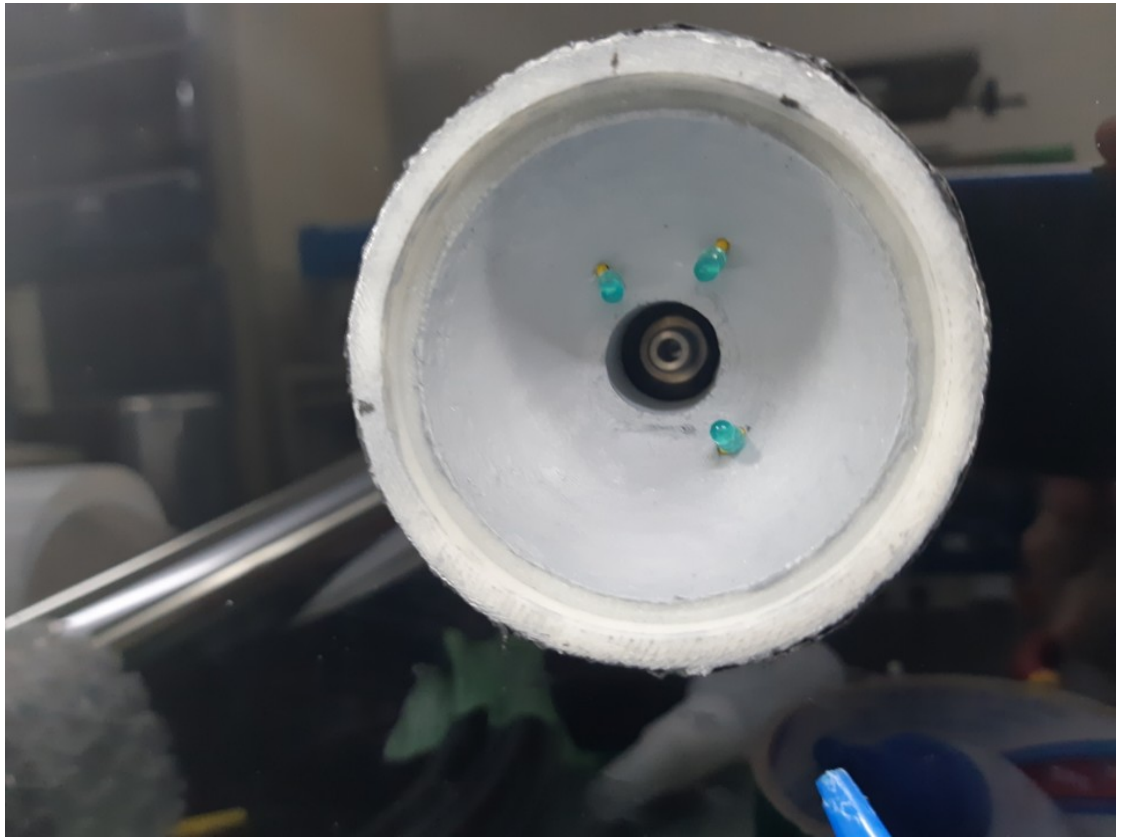
And than, cover black sheet and black tape on aluminum foil



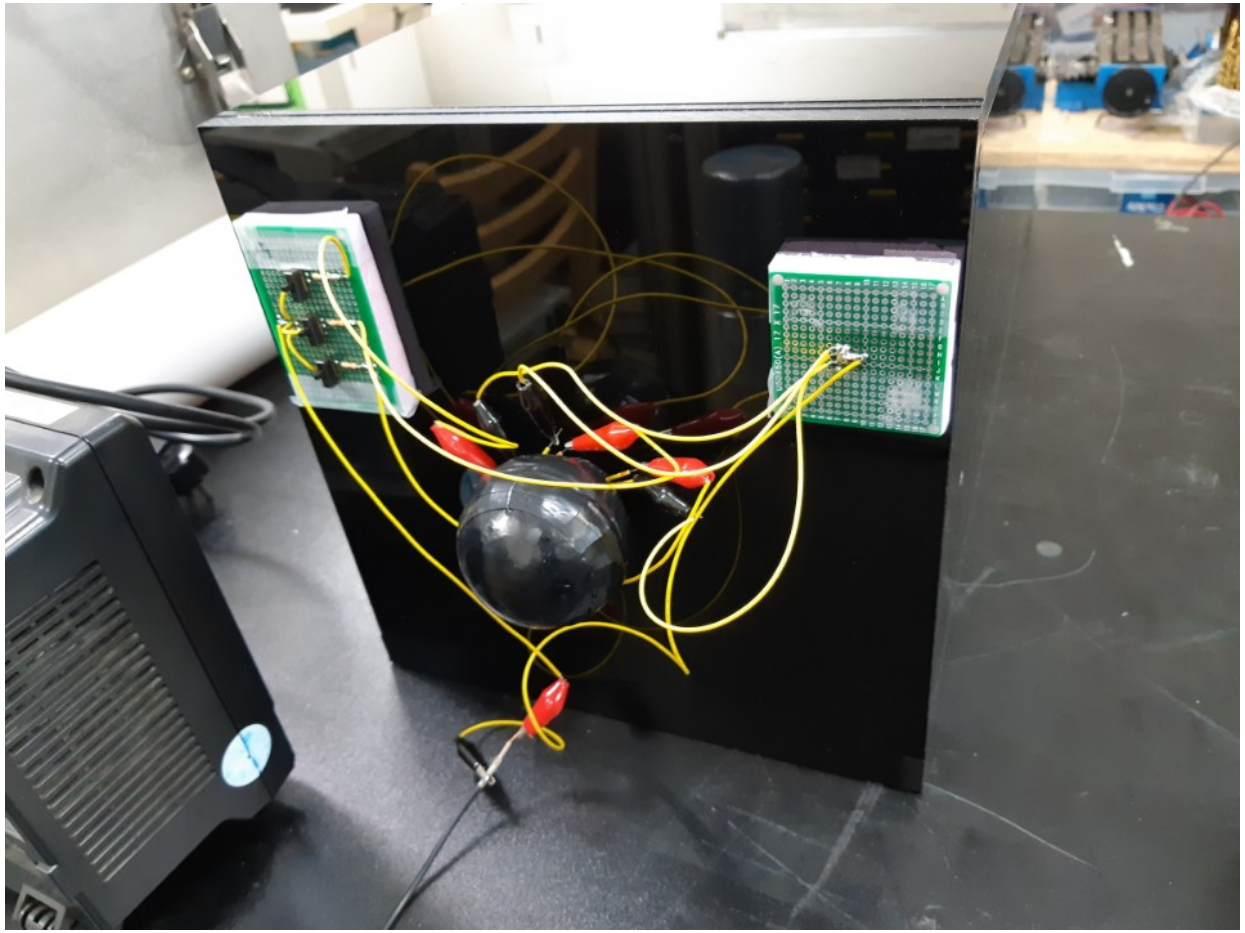
For avoid electrical short by metal surface, LED terminals covered by rubber (from electric wire)



Finally, drilled the LED terminals hole and coated reflection paint inside wall



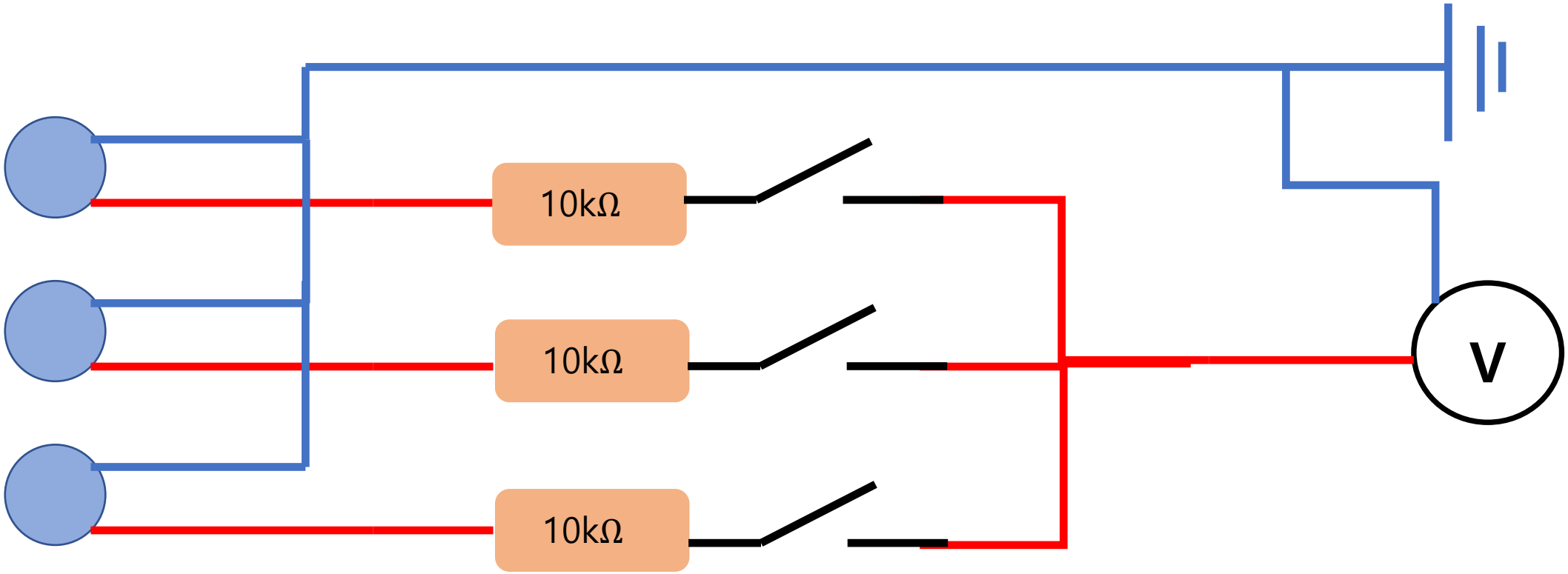
Result



Back

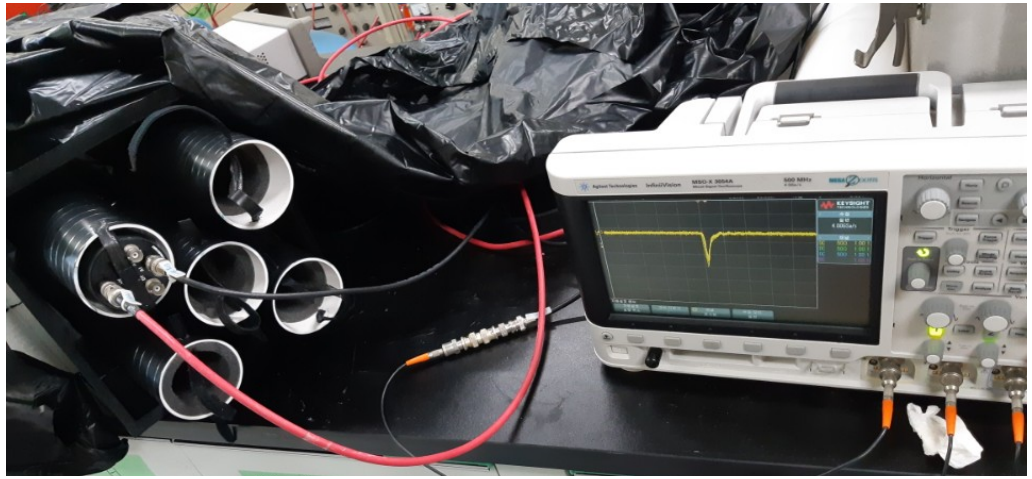
Front

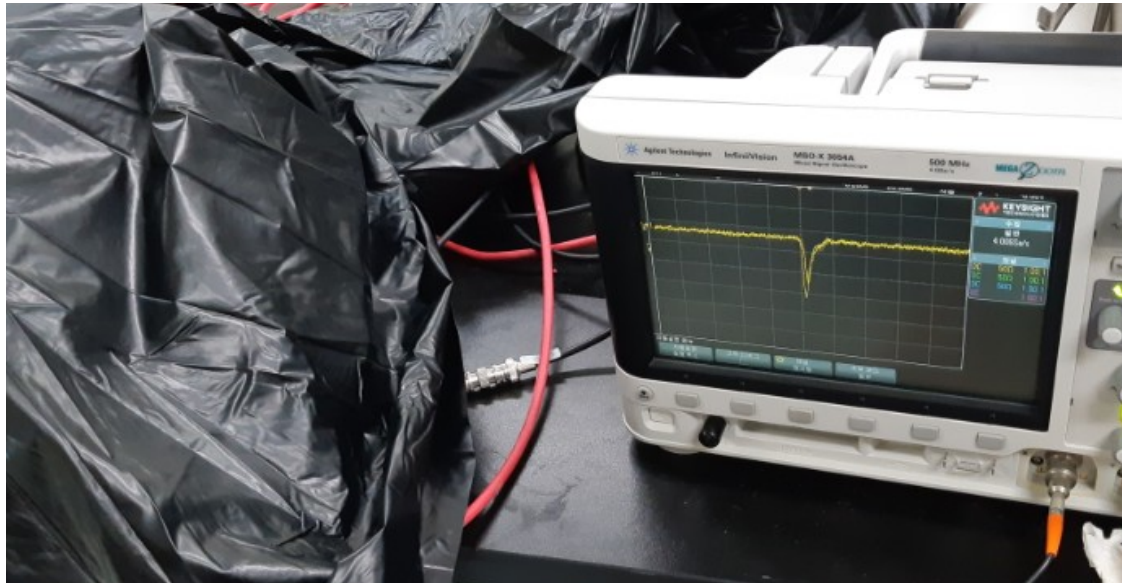
LED Control Circuit



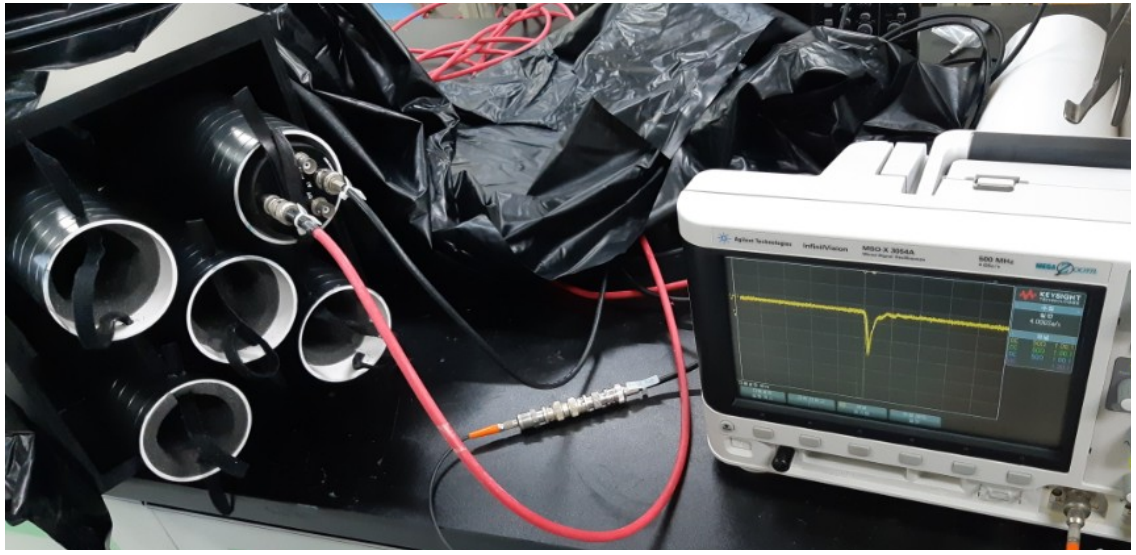
PMT Noise Check

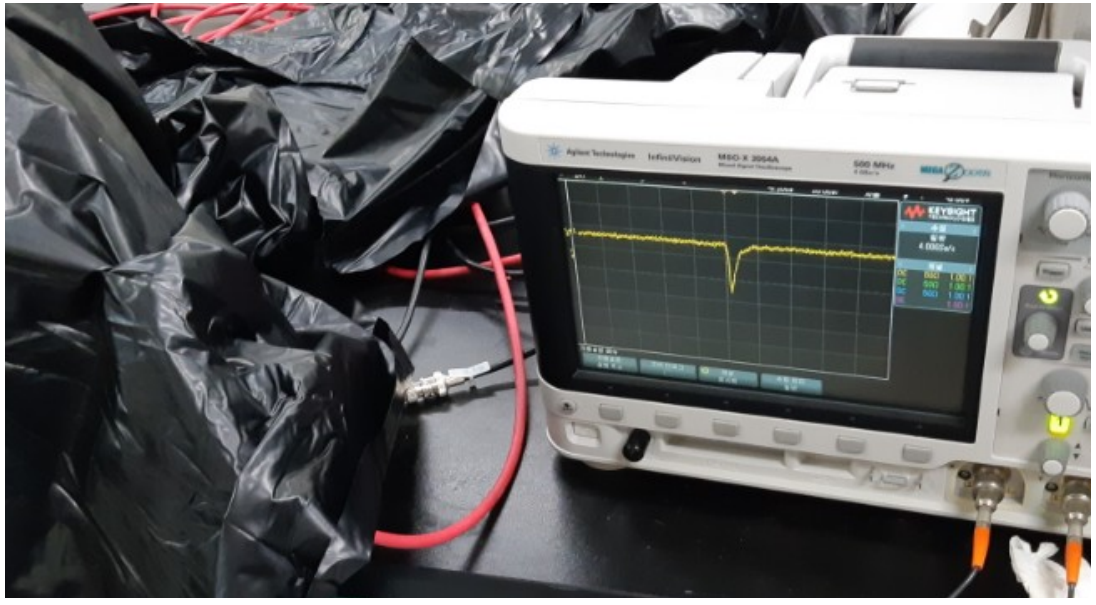
Hole 1

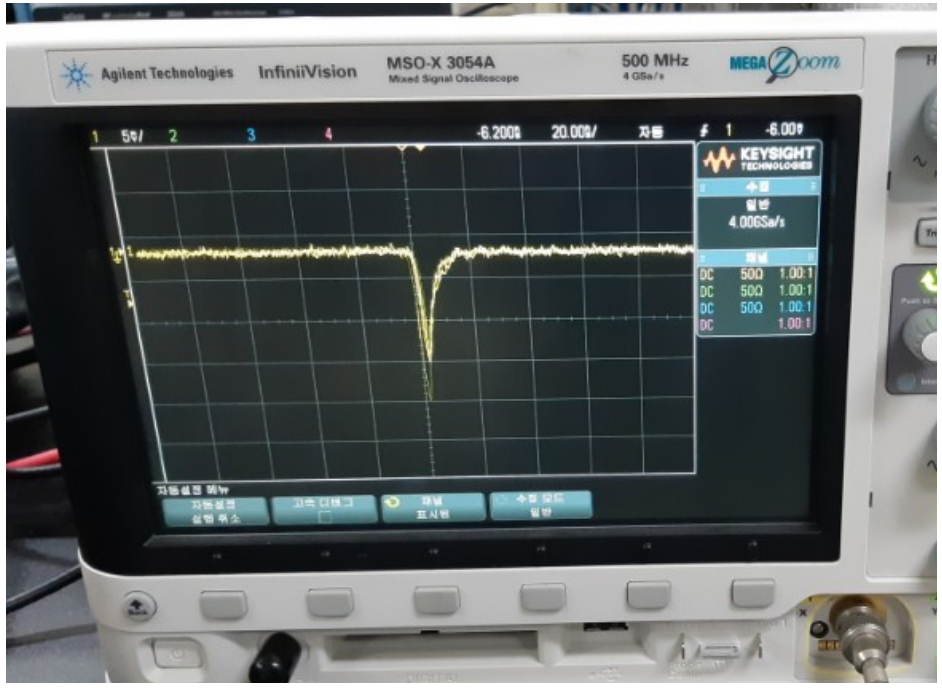




Hole 2



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MSO-X 3054A
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MEGA Zoom
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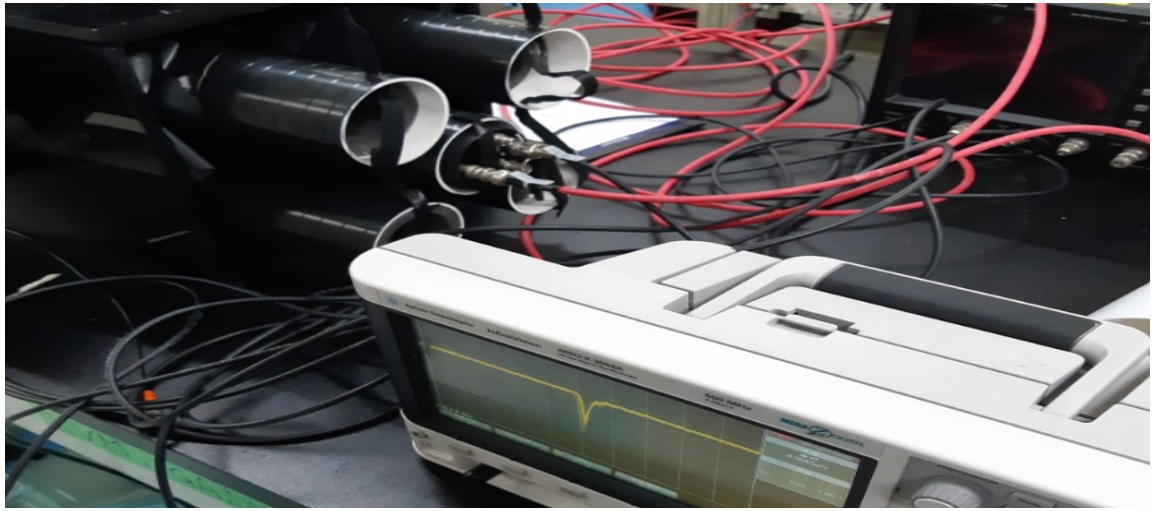
4.00GSa/s

Hole 3

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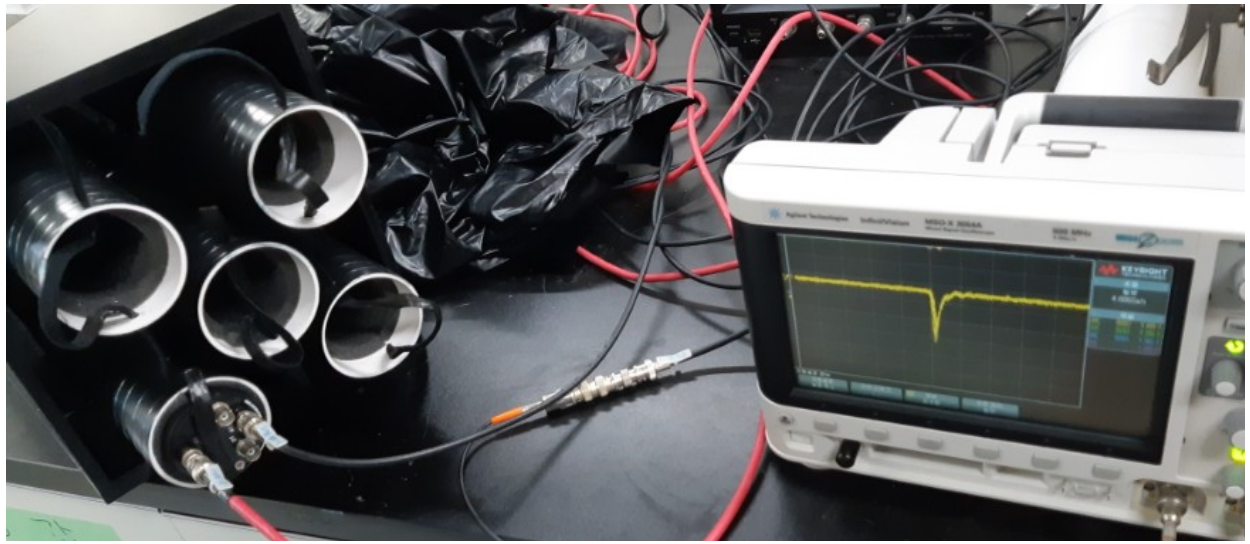
Hole 4

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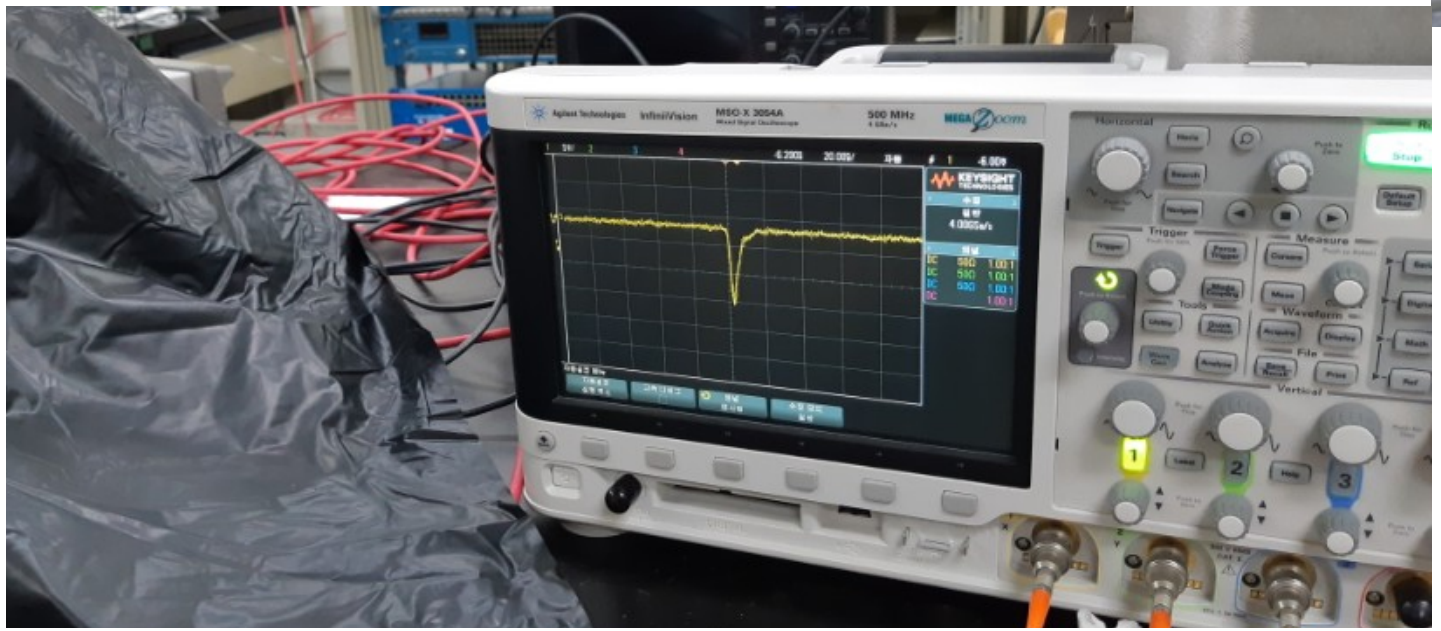
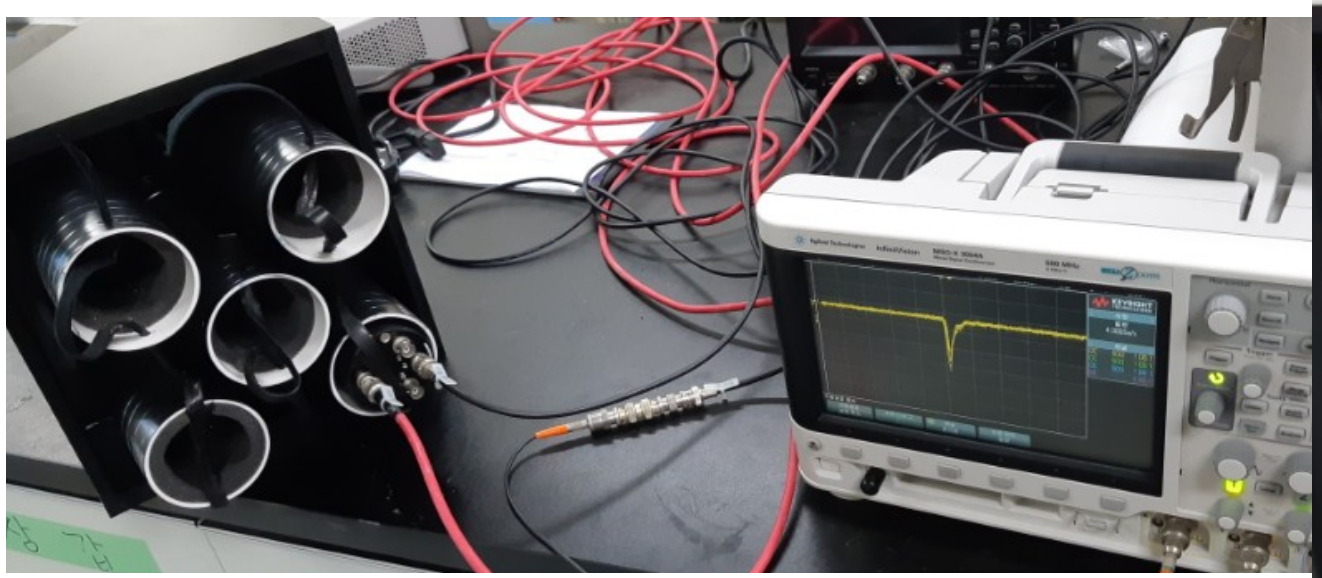


Hole 5

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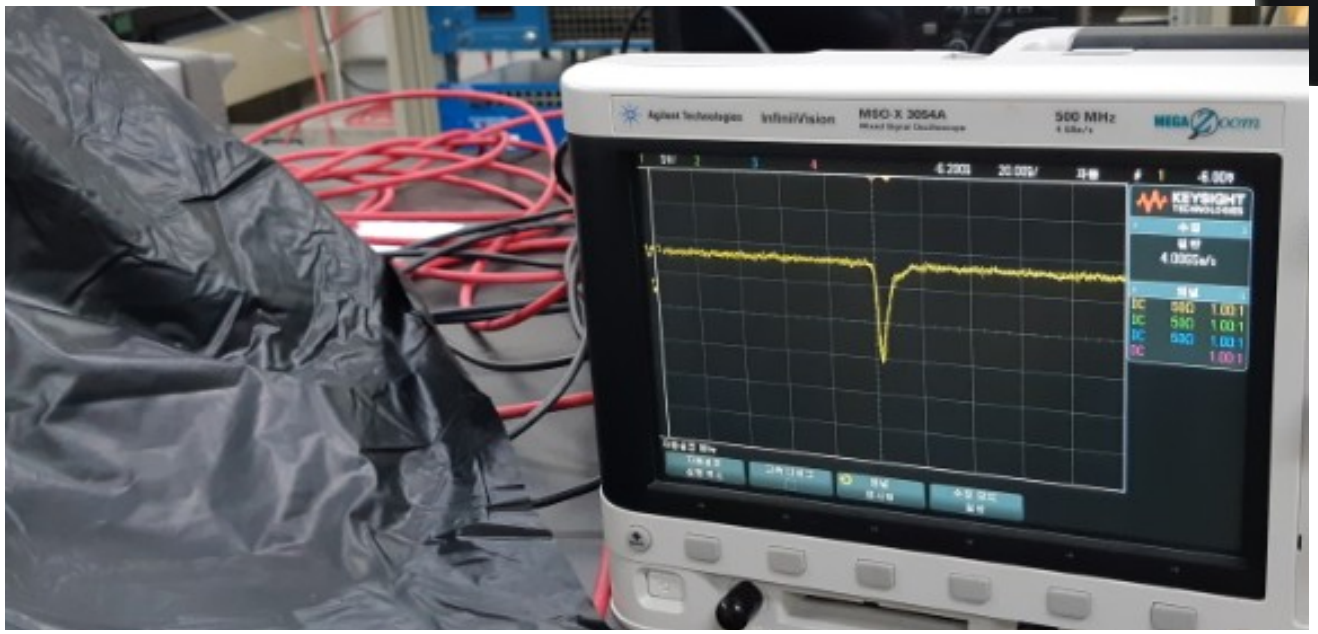
DC 1.00:1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