



PWO(MPPC) bench test at KU

Jahmin Jo
Korea University



PMT & MPPC



- PMT merits/demerits
 - response spectral range
relate to photocathod materials. ex) InGaS : 300 ~ 1700nm
 - good time resolution, low cost, weak for magnetism
- MPPC merits/demerits
 - strong for magnetism, very high sensitive for photon
 - bad time resolution, high cost, radiation damage,
response spectral range(ex) s13360 series 270 ~ 900 nm)

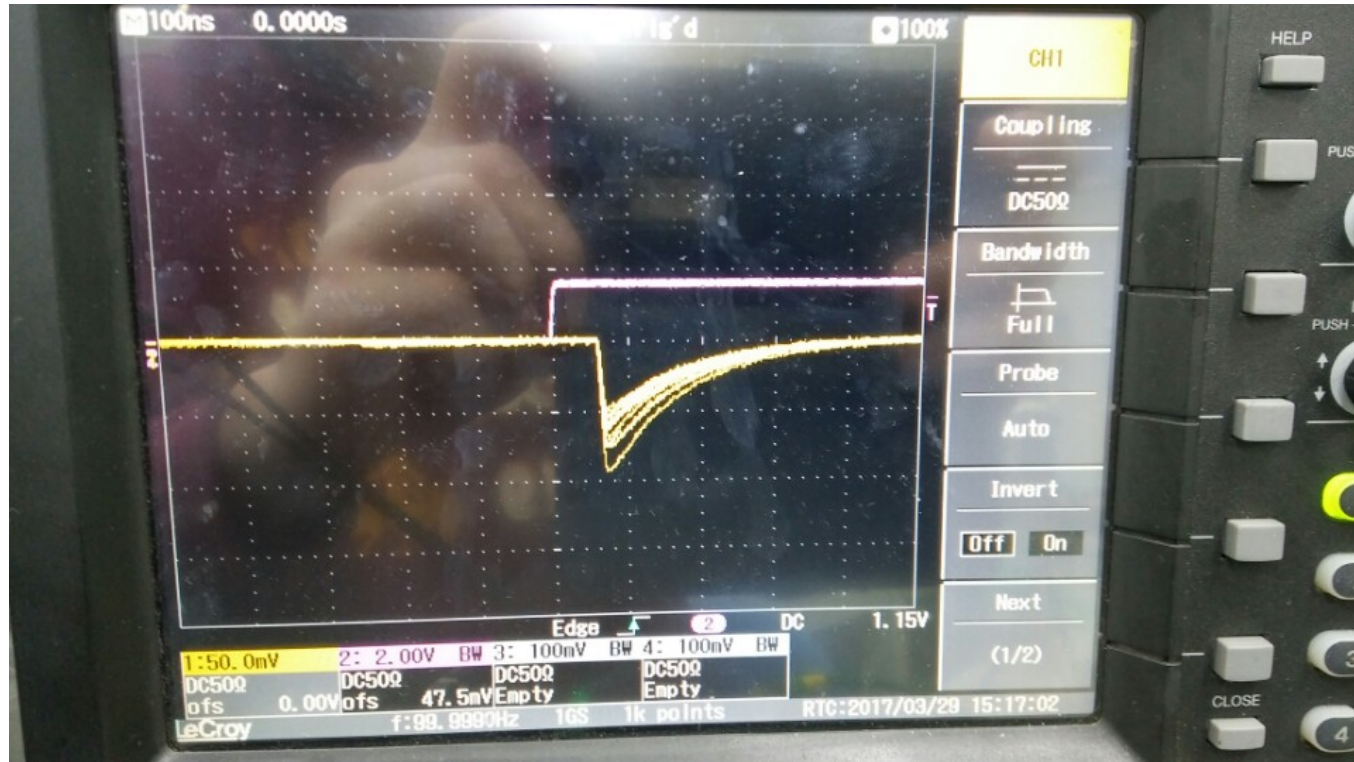


Condition



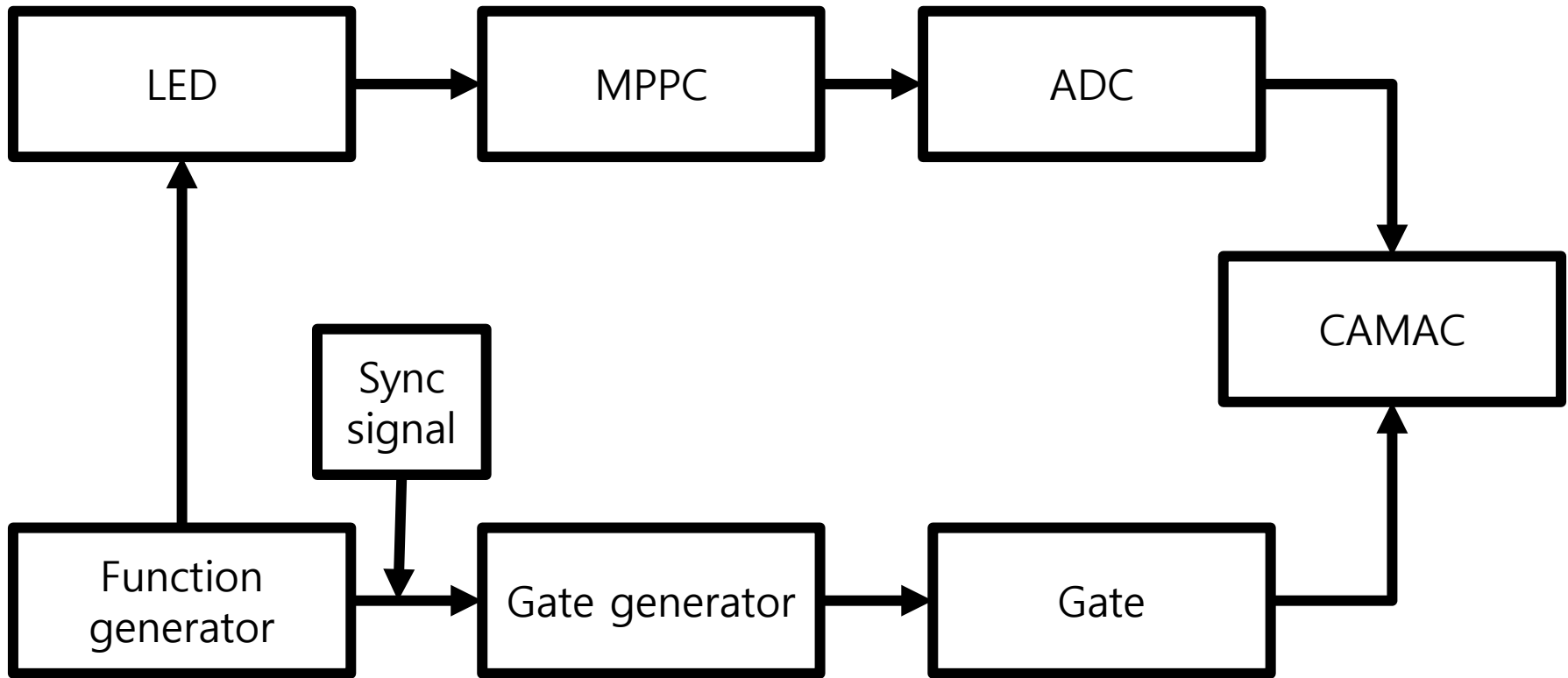
- MPPC(S13360-6050cs, serial #10505)
- Using Inverting amplifier board
- HV condition
 - $V_{op} = 56V$, $V_{amp} = \pm 5V$
- Function generator setting
 - frequency : 100Hz
 - amplitude : 1.71V
 - width : 20ns

Oscilloscope signal

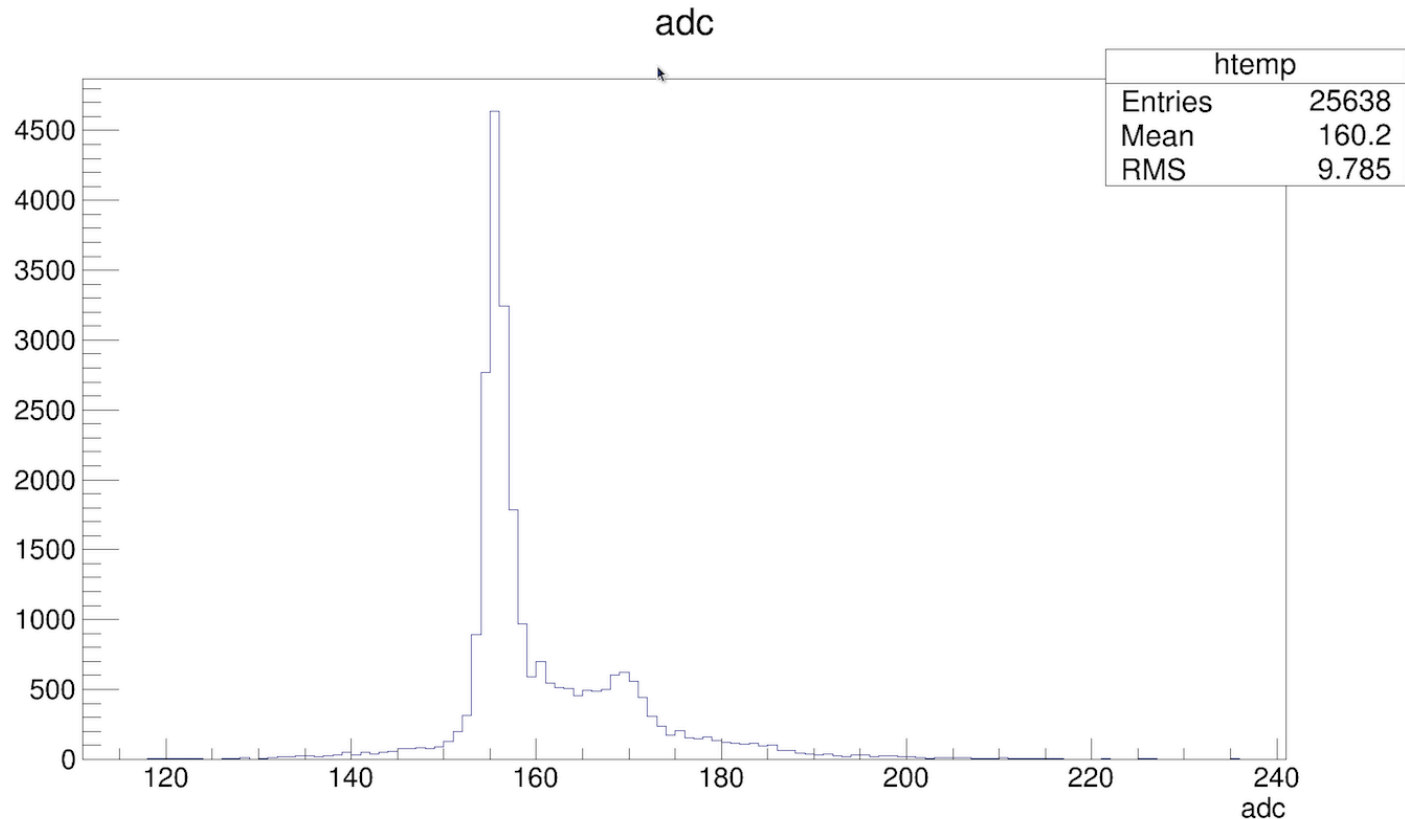


- Op Amp model : AD8000

Logic diagram

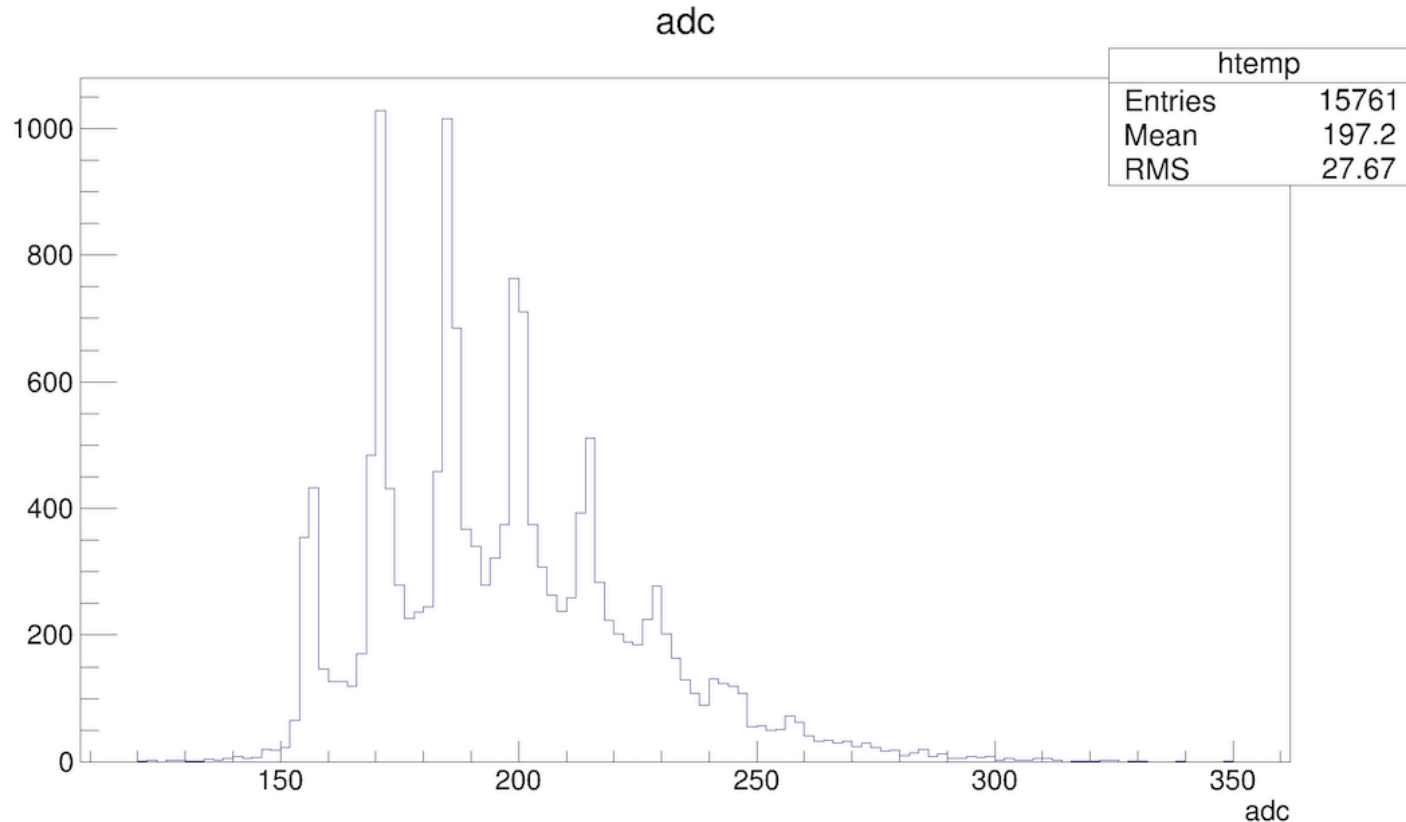


ADC



- No LED light (pedestal)

ADC



- Mean number of photon is 2



Future Plan



- Continue test experiment to use PWO crystal
- Change LED
- Check the amplification rate of Op amp



Back up



- PWO crystal properties

Melting point(k)	1396
Density (g/cm ³)	8.28
Radiation length(cm)	0.92
Cleavage plane	<101>
Wavelength of emission Max(nm)	440/530
Decay time (ns)	6/30
Light yield (Photons/Mev)	200
hygroscopic	no
Refractive index	2.16



Back up



- BGO crystal properties

Melting point(k)	1323
Density (g/cm ³)	7.13
Cleavage plane	no
Hardness (Mho)	5.00
Wavelength of emission Max(nm)	480
Primary decay time (ns)	300
Light output (Photons/MeV)	>8,000
hygroscopic	no
Refractive index	2.15

Back up

- Circuit diagram for inverting amplifier

