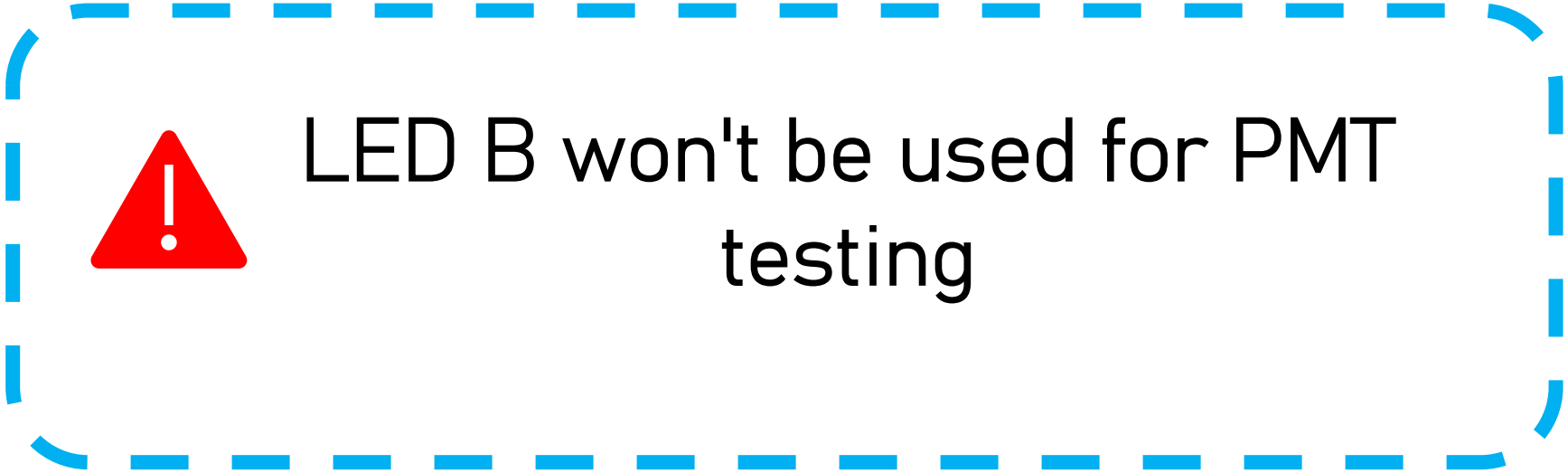
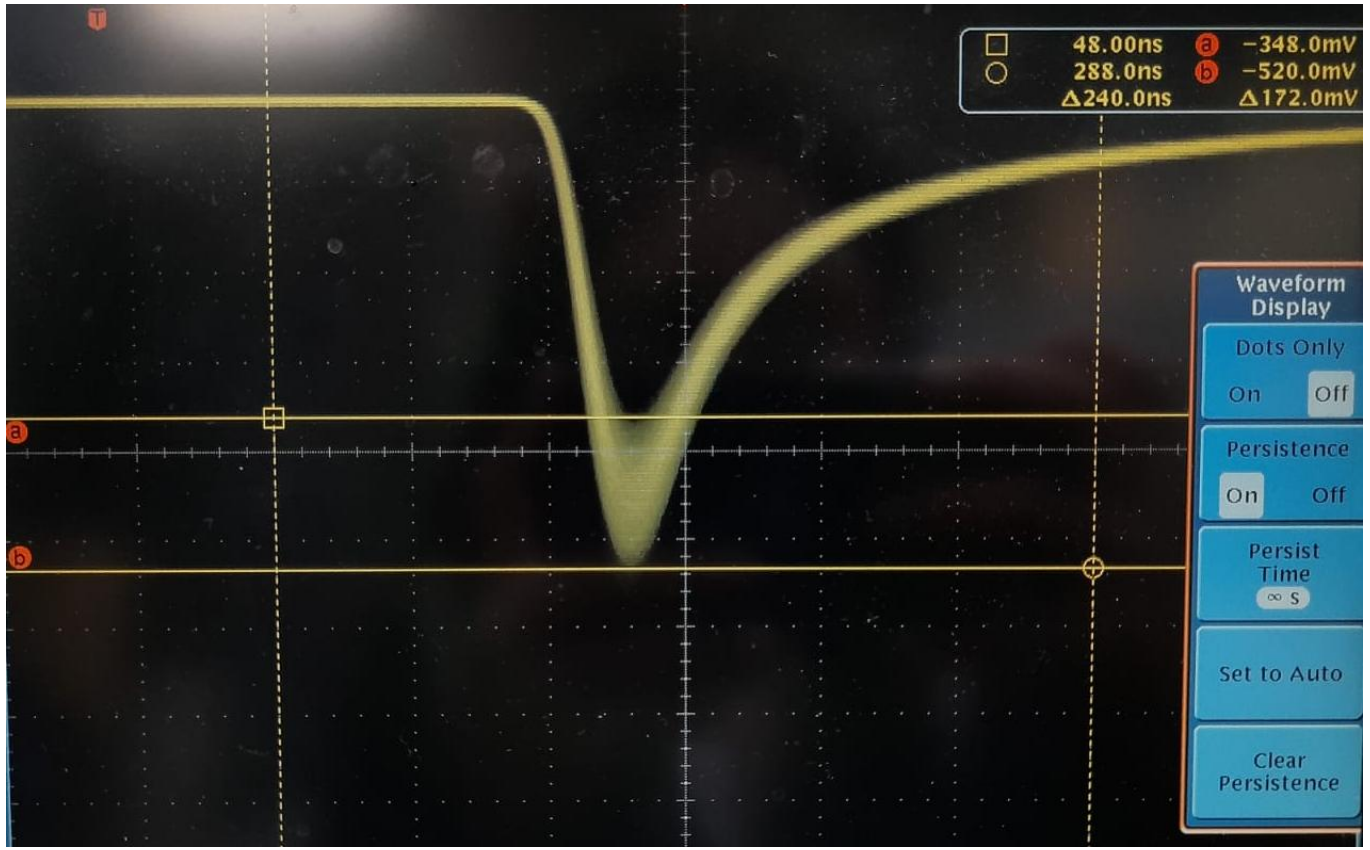

LED B won't be used for PMT testing

The PMT pulse fluctuated significantly while LED B was on.

- Pulse info:

  *Frequency: 1kHz
  *Amplitude: 5V
  *Pulse Width: 50 ns

- PMT HV= 800 V
- LED HV= 13V
- $\Delta 172mV$

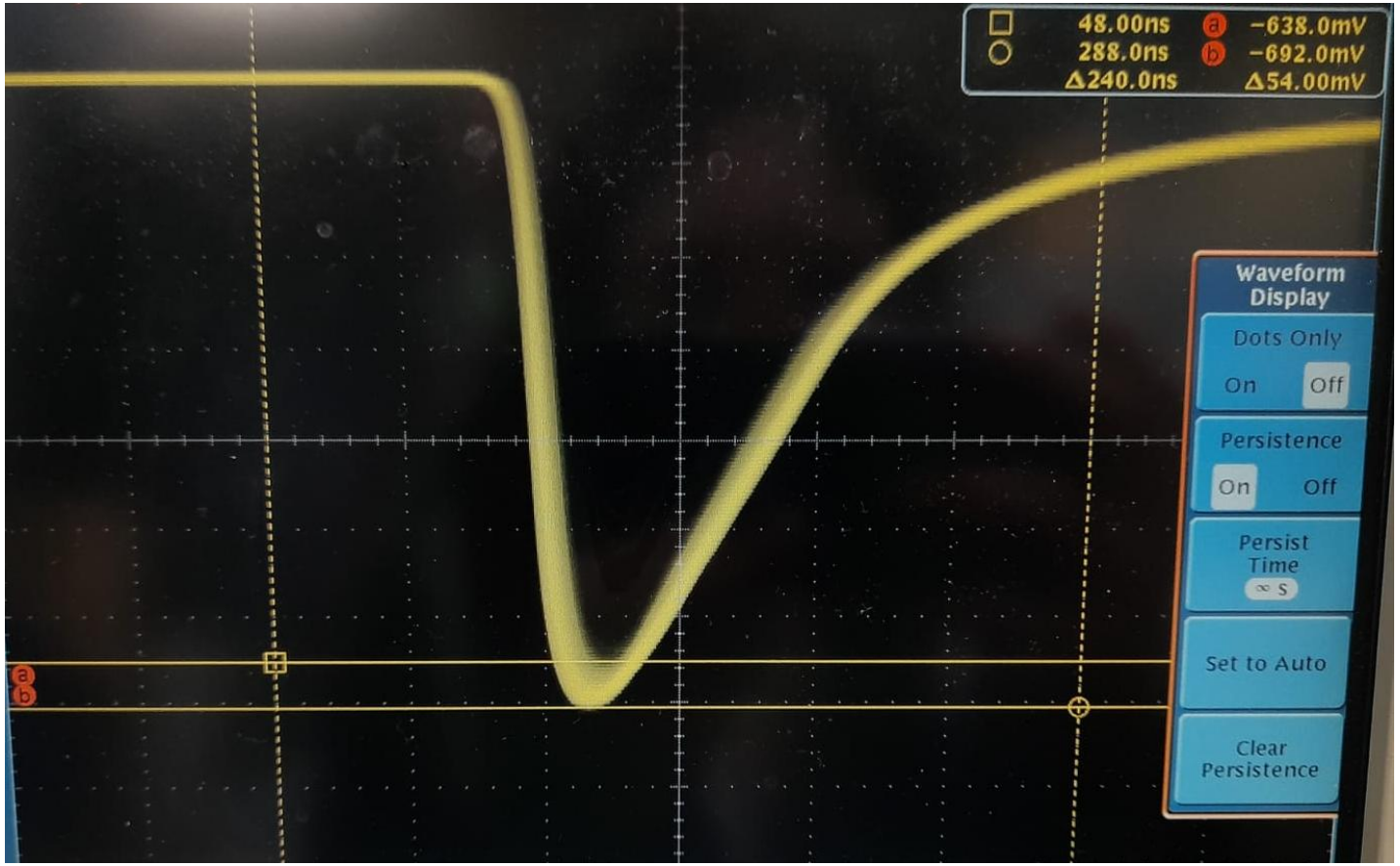


But if we change the frequency.

- Pulse info:

  *Frequency: 2kHz
  *Amplitude: 5V
  *Pulse Width: 50 ns

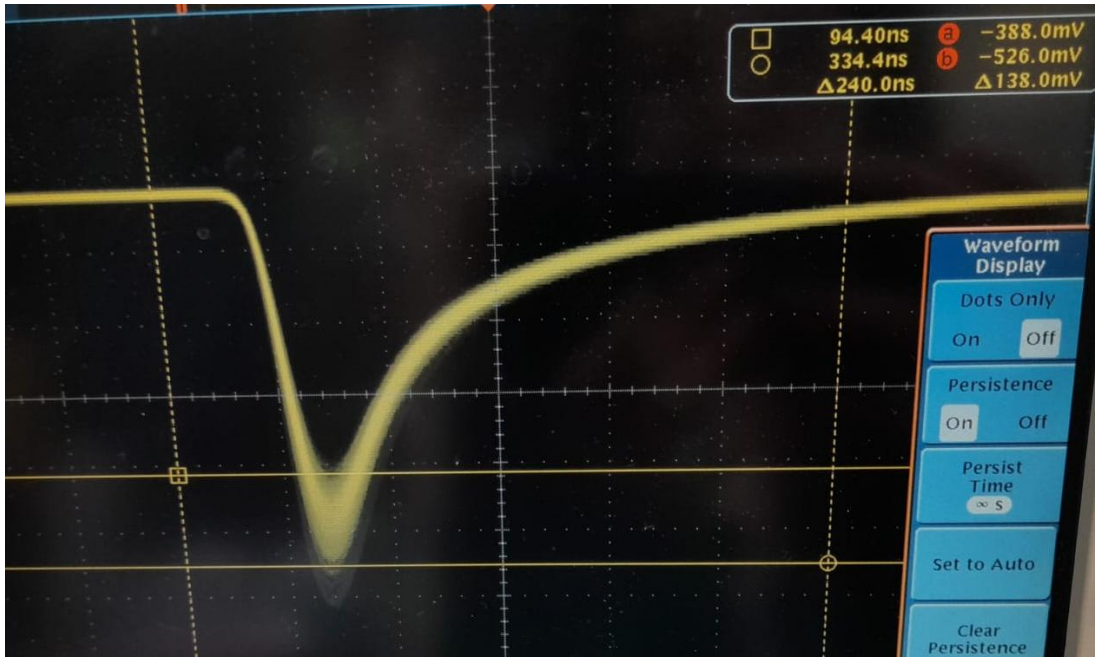
- PMT HV= 800 V
- LED HV= 13V
- $\Delta 54mV$



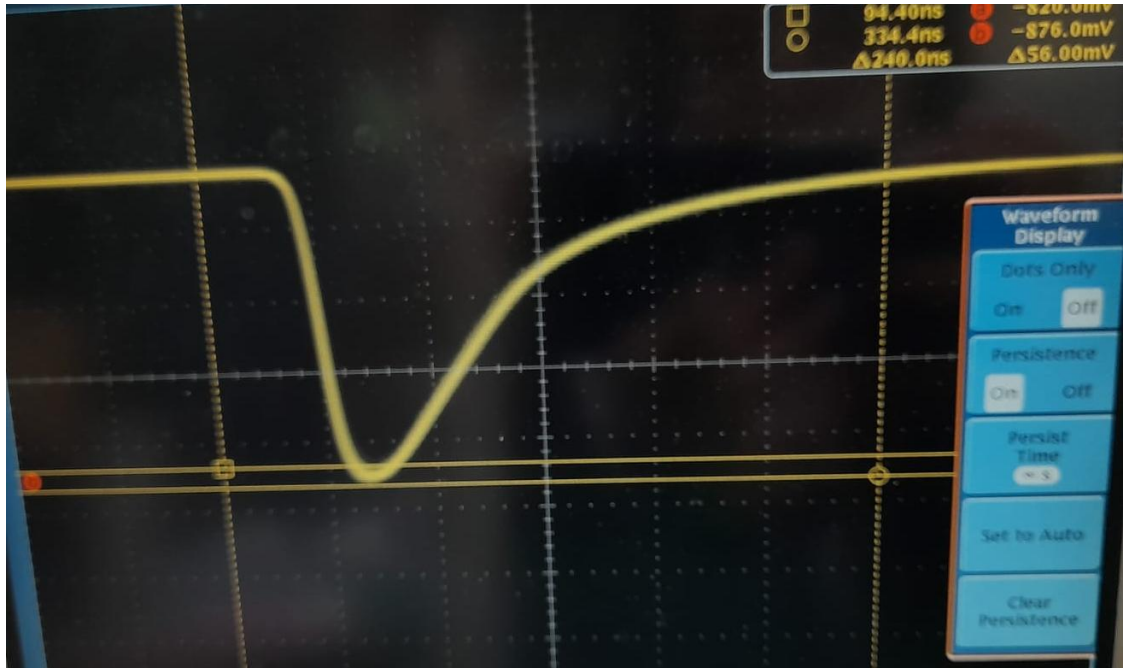
To sum up.

PMT HV Voltage (V)	There is no pulse below this frequency (kHz).	The pulse becomes distorted at this frequency (kHz).
9	4	4.2
11	2	2.2
13	0.9	1.2
15	0.6	0.8
17	0.4	0.6
19	0,2	0.4

Modifying the pulse width also has an impact.



- Pulse Width: 50 ns
- $\Delta 138mV$



- Pulse Width: 56 ns
- $\Delta 56mV$

To sum up.

PMT HV Voltage (V)	Pulse stabilizes at (ns)
9	116
11	78
13	56
15	48
17	40
19	34

To stabilize the pulse with the default pulse conditions we need.

- Pulse info:

  *Frequency: 1kHz
  *Amplitude: 5V
  *Pulse Width: 50 ns

- PMT HV= 800 V
- LED HV= 14V

LED A.

- Pulse info:

  *Frequency: 1kHz
  *Amplitude: 5V
  *Pulse Width: 50 ns

- PMT HV= 800 V
- LED HV= 10V

LED C.

- Pulse info:

  *Frequency: 1kHz
  *Amplitude: 5V
  *Pulse Width: 50 ns

- PMT HV= 800 V
- LED HV= 32V

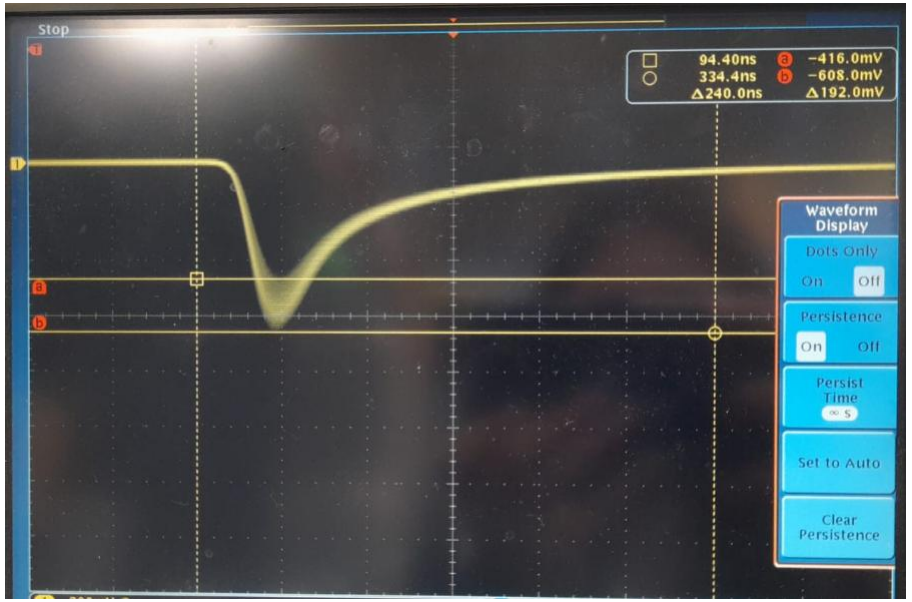
LED D.

- Pulse info:

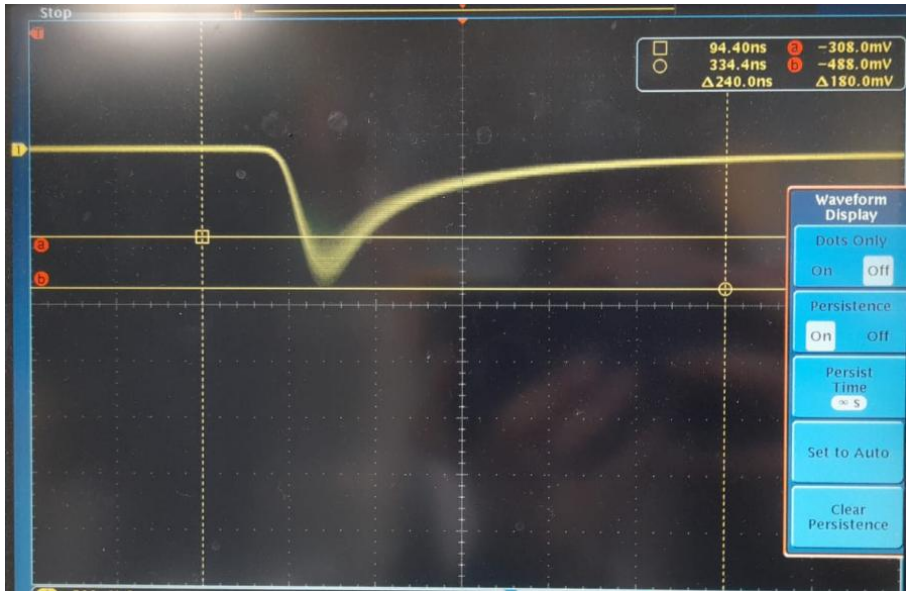
  *Frequency: 1kHz
  *Amplitude: 5V
  *Pulse Width: 50 ns

- PMT HV= 800 V
- LED HV= 7V

To check if this frequency-pulse width dependency is only present in LED B .

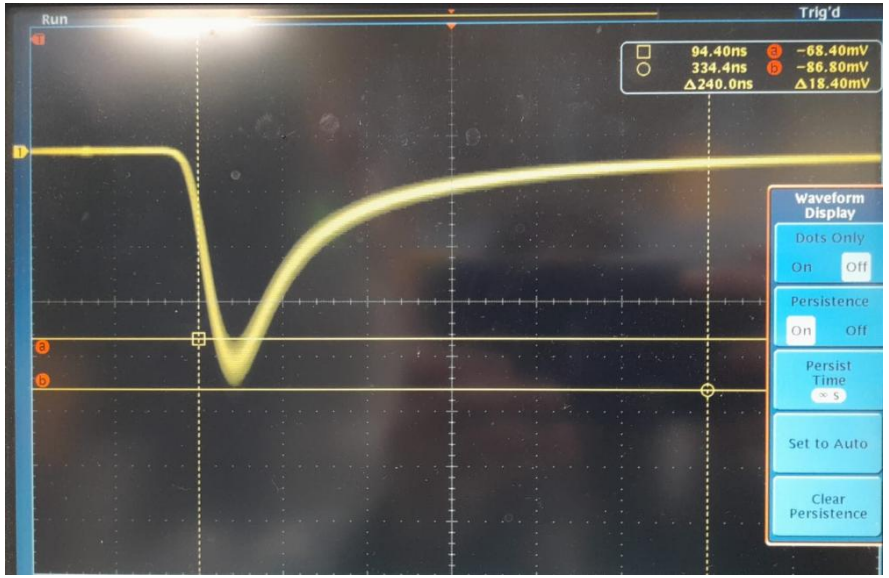


- Pulse Width: 32 ns
- Δ192 mV

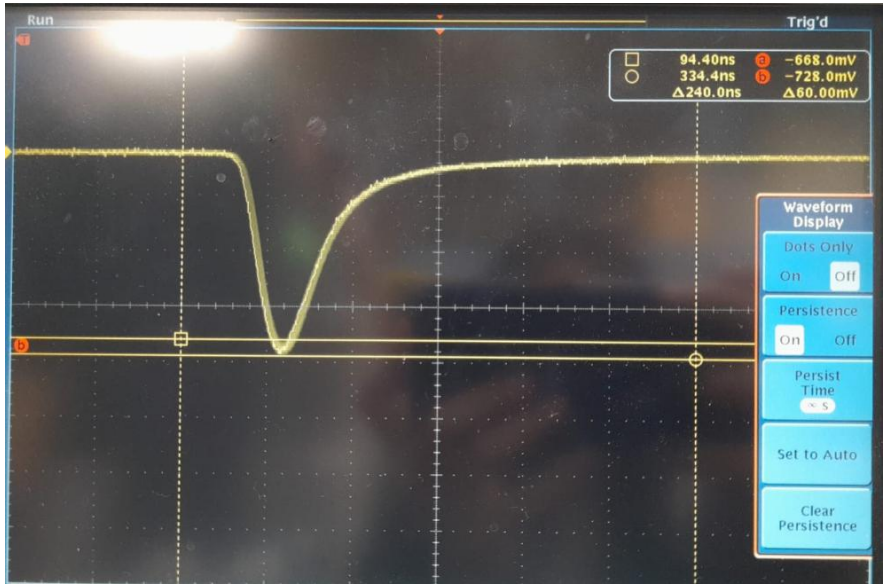


- Frequency: 0.3 kHz
- Δ180 mV

LED A .

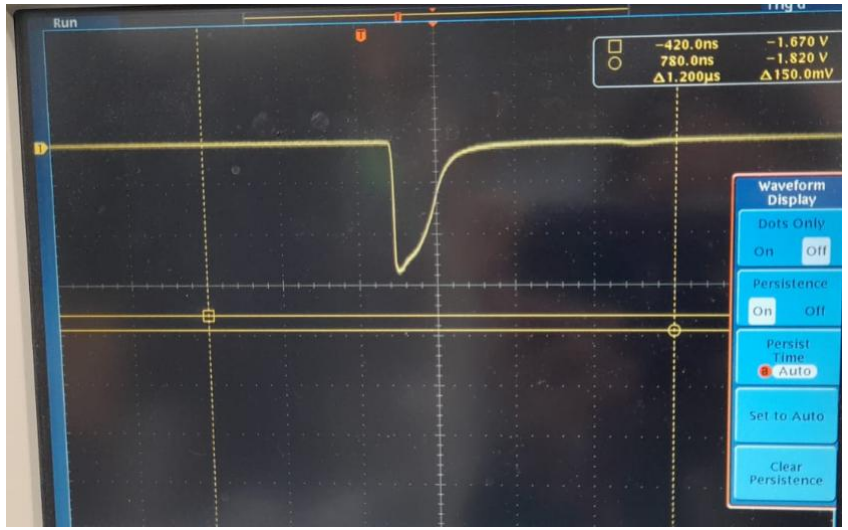


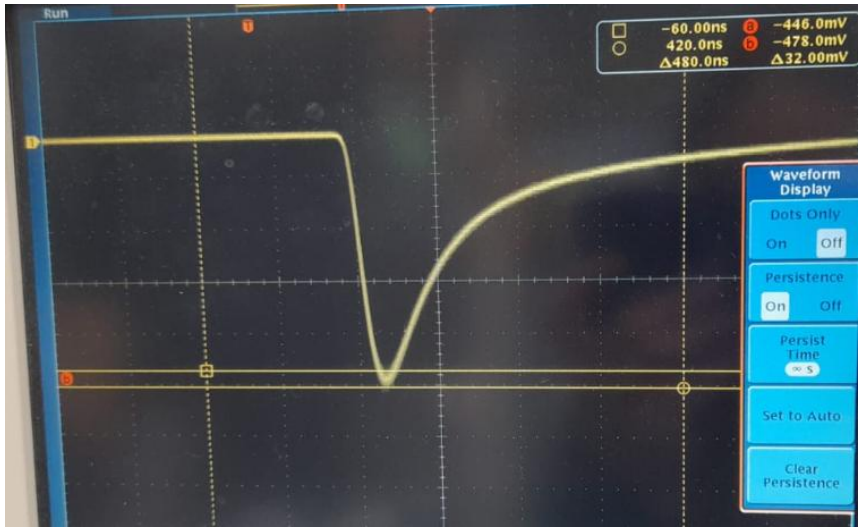
- Pulse Width: 10 ns
- Δ18.4 mV



- Frequency: 16 Hz
- Δ 60 mV

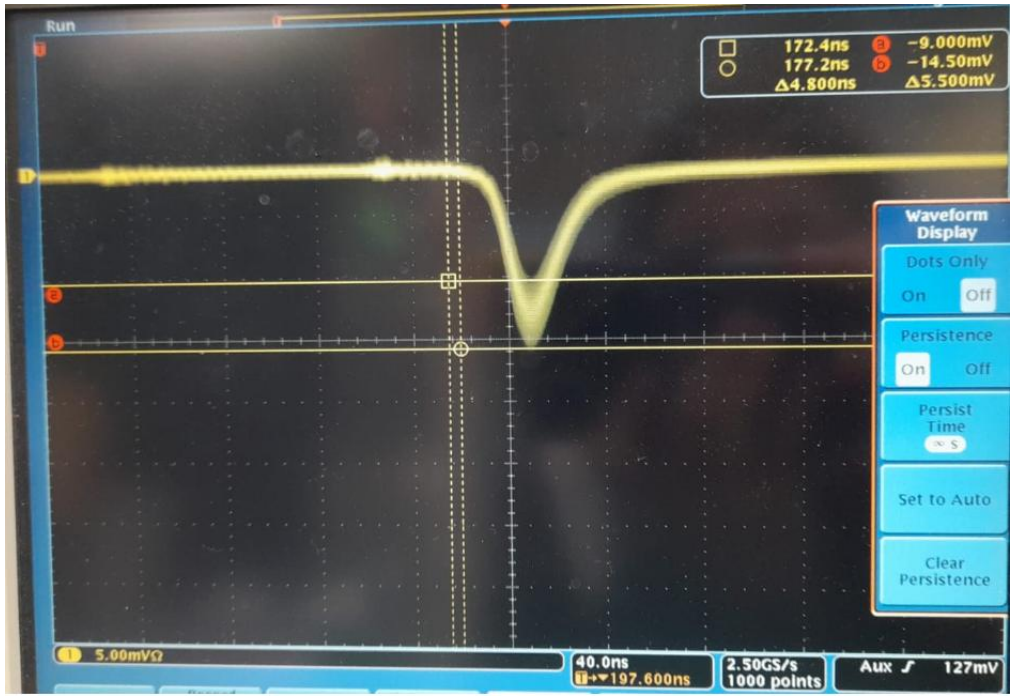
LED D .

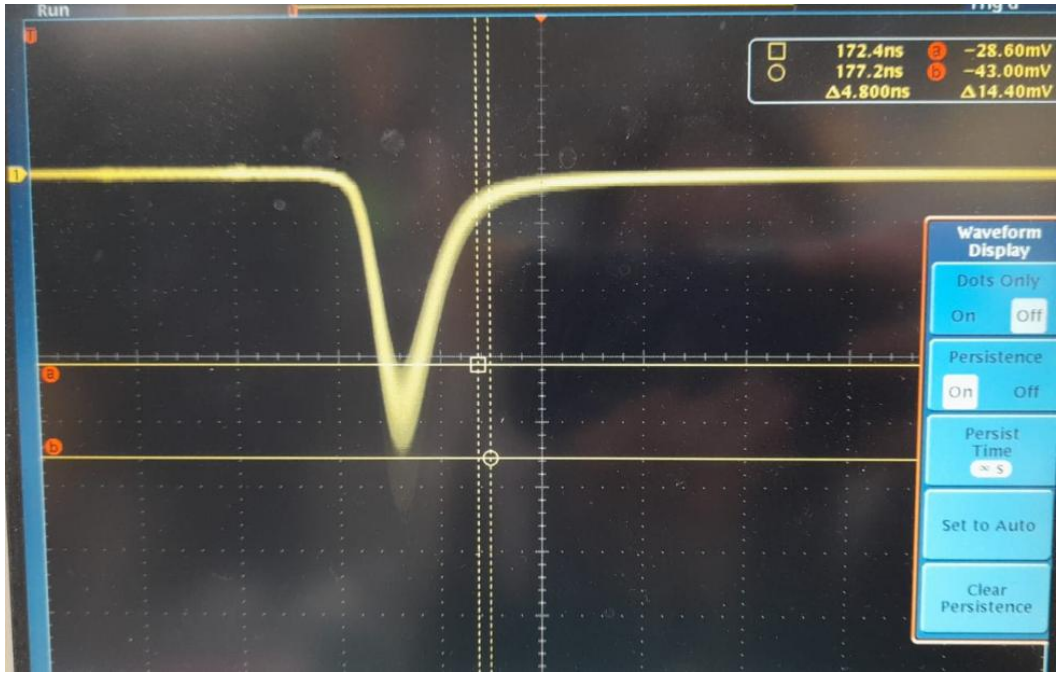




- Pulse Width: 3.4 ns
- Frequency: 15 Hz

LED C* .





- Pulse Width: 116 ns
- Δ 5.5 mV

- Frequency: 23 KHz
- Δ 14.4 mV