

Lab Exercise 2: Wave Propagation on Transmission Line

(Laboratory F1-116)

Task:

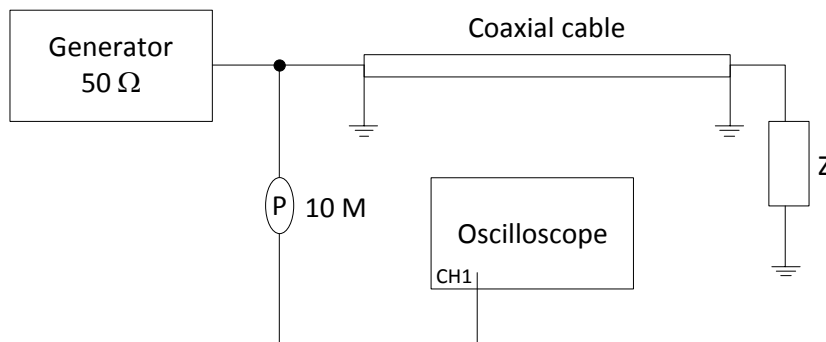
Observe voltage waveforms when they are reflected off various transmission line terminations.

- Determine the wave impedance of coaxial cable (model of transmission line) and the velocity of electromagnetic wave propagation.
- Record the voltage waveforms at the cable beginning for following cable terminations:
 - no-load
 - short circuit
 - resistance higher and lower than the wave impedance
 - resistance equal to the wave impedance
 - capacitance 10 nF
 - inductance 31 μ H

Used equipment:

| | |
|-----|---|
| G | function generator |
| OSC | digital oscilloscope |
| P | voltage probe 1:10 |
| C | coaxial cable |
| Z | terminating impedance (resistor, capacitor, inductor) |

Measurement circuit:



Recommended setup for measurement:

- The generator output impedance is set to 50 Ω .
- Generator output voltage is a square pulse signal with the amplitude 4 V and voltage offset +2 V.
- It is recommended to have the same time base of digital scope for all types of terminations \rightarrow 500 ns/div.