NS1 Oscilloscope Technical Datasheet

Vertical Specifications:

Channels	**1**
Bandwidth (+0.6dB, -3dB)*	**7.5MHz**
Vertical Ranges	**±10V, ±5V, ±2V, ±1V full scale**
Hardware Resolution	**8 bit**
DC Accuracy	**±4% of full scale**
Input Impedance	**1MΩ || 25pF**

*The frequency response is shaped in software using a 3 point FIR filter

Horizontal Specifications:

Maximum Sample Rate	**62.5MS/s**
Buffer Length	**16384 samples**
Timeing Accuracy	**±0.01%**
Clock Divisions	**1, 3, 5, 7, 9...**
Capture Mode	**Decimate**

Triggering

Modes	**Auto, Normal, Single**
Types	**Rising Edge, Falling Edge**
Resolution	**8 bit**

Sourcing a Probe and USB Cable

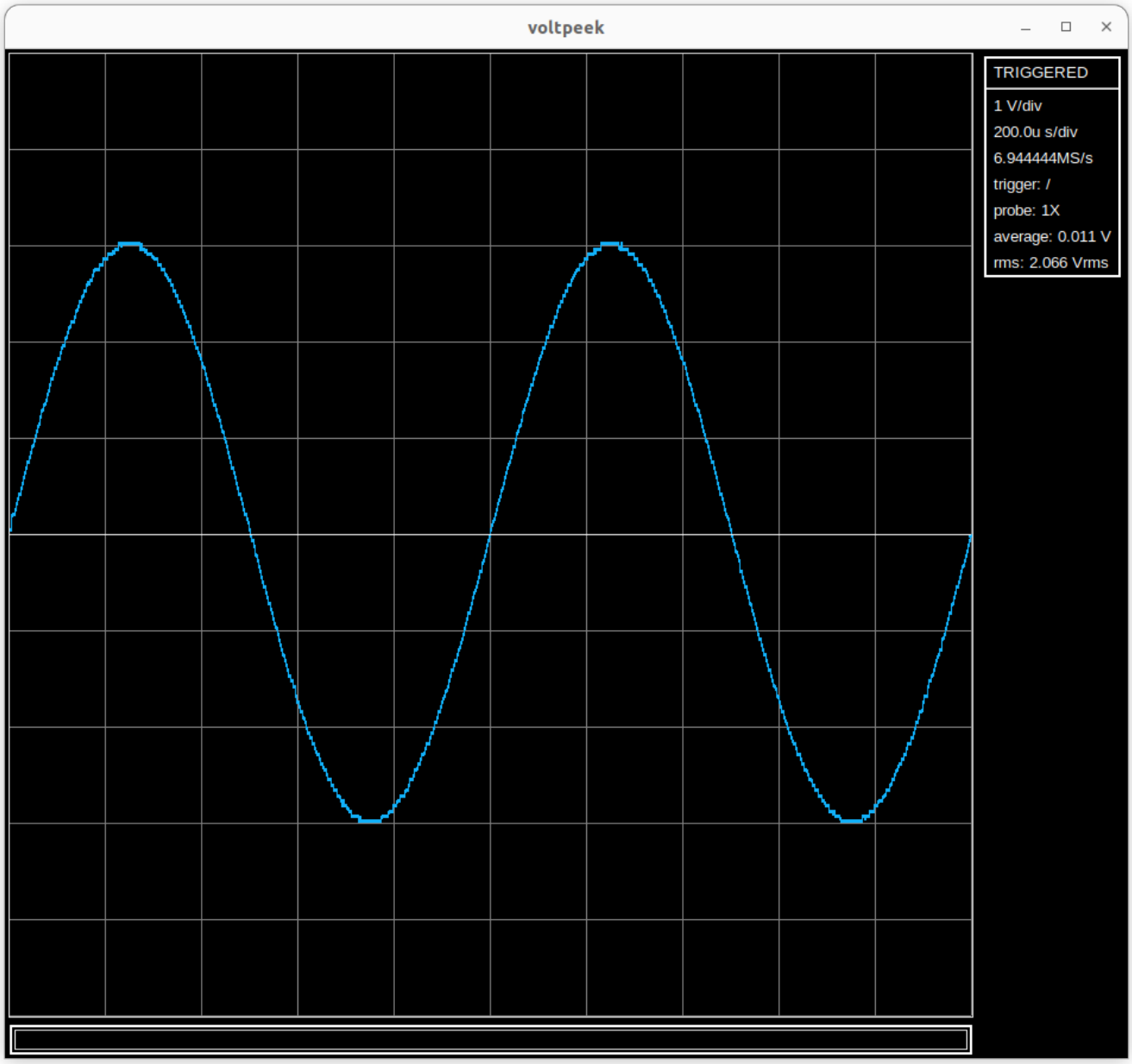
A probe and USB cable are not included with the NS1. Most micro USB cables will work. If a probe is used with a 10X division, make sure that the probes compensation capacitance goes high enough to compensate to the scopes input capacitance. For proper compensation, the time constant from the probes resistance and capacitance must equal the time constant from the scopes input resistance and capacitance.

Maximum Voltage

Make sure ±10V is not exceeded across input BNC connector. Probe division can be used to measure signals that exceed ±10V. It is the user's responsibility to make sure they are doing this correctly.

The NS1 is not isolated. That is, it shares a ground with whatever computer it is plugged into.

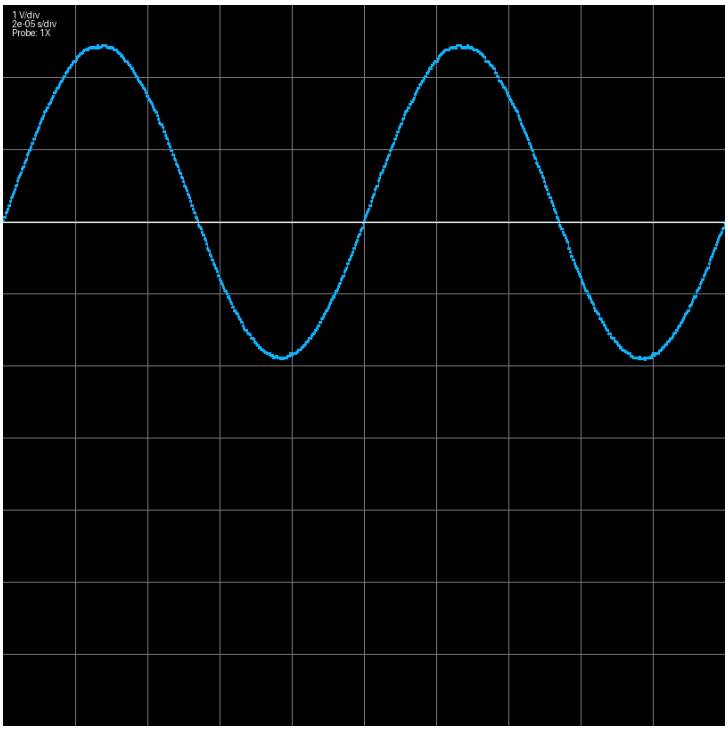
Voltpeek Software



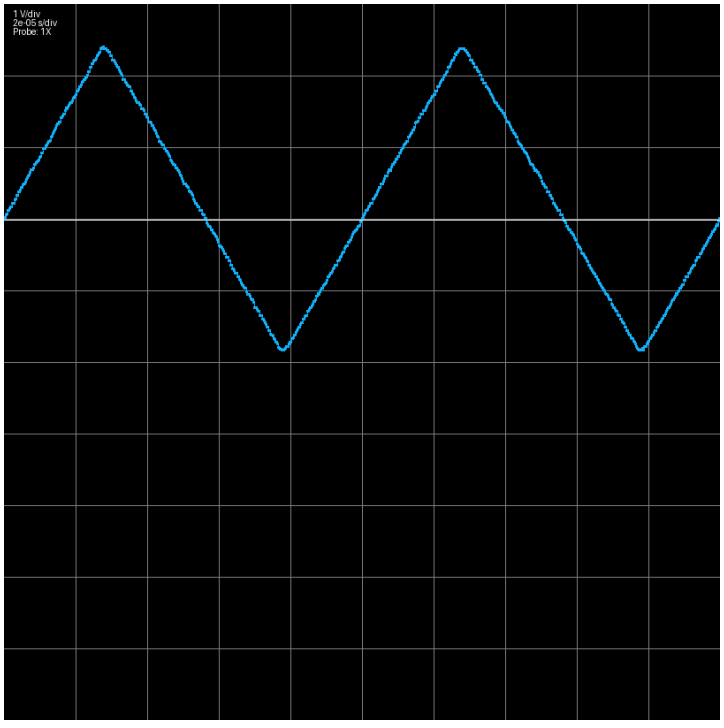
NS1 uses Voltpeek Software for waveform display and control. Voltpeek is fully command based. That is, the oscilloscope is controlled via commands and key input. Voltpeek is written in Python and is open source. Voltpeek can also be imported as a Python module to control the NS1 via scripting. See our getting started documentation for more information on using voltpeek. This can be found at: https://www.voltpeeklabs.io/

Example Waveforms Captured with NS1

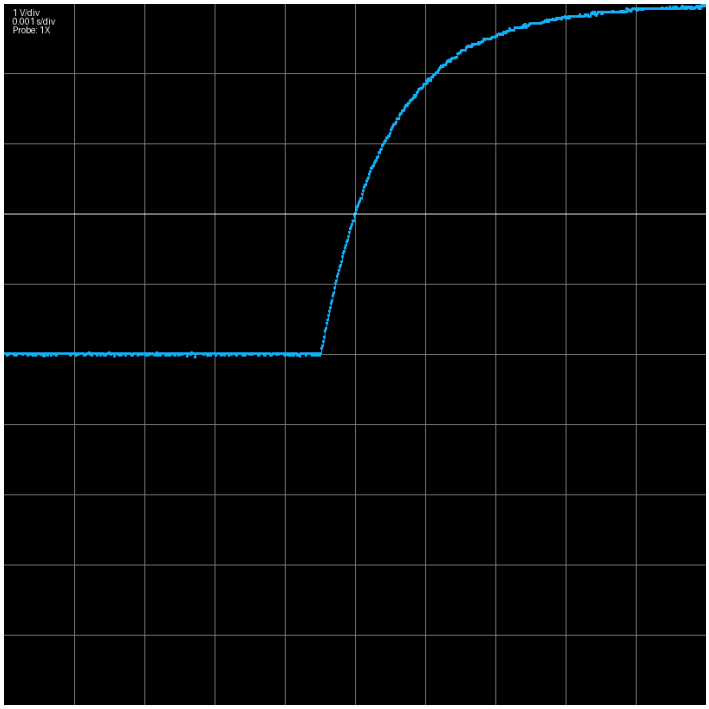
10kHz sine wave with DC bias:



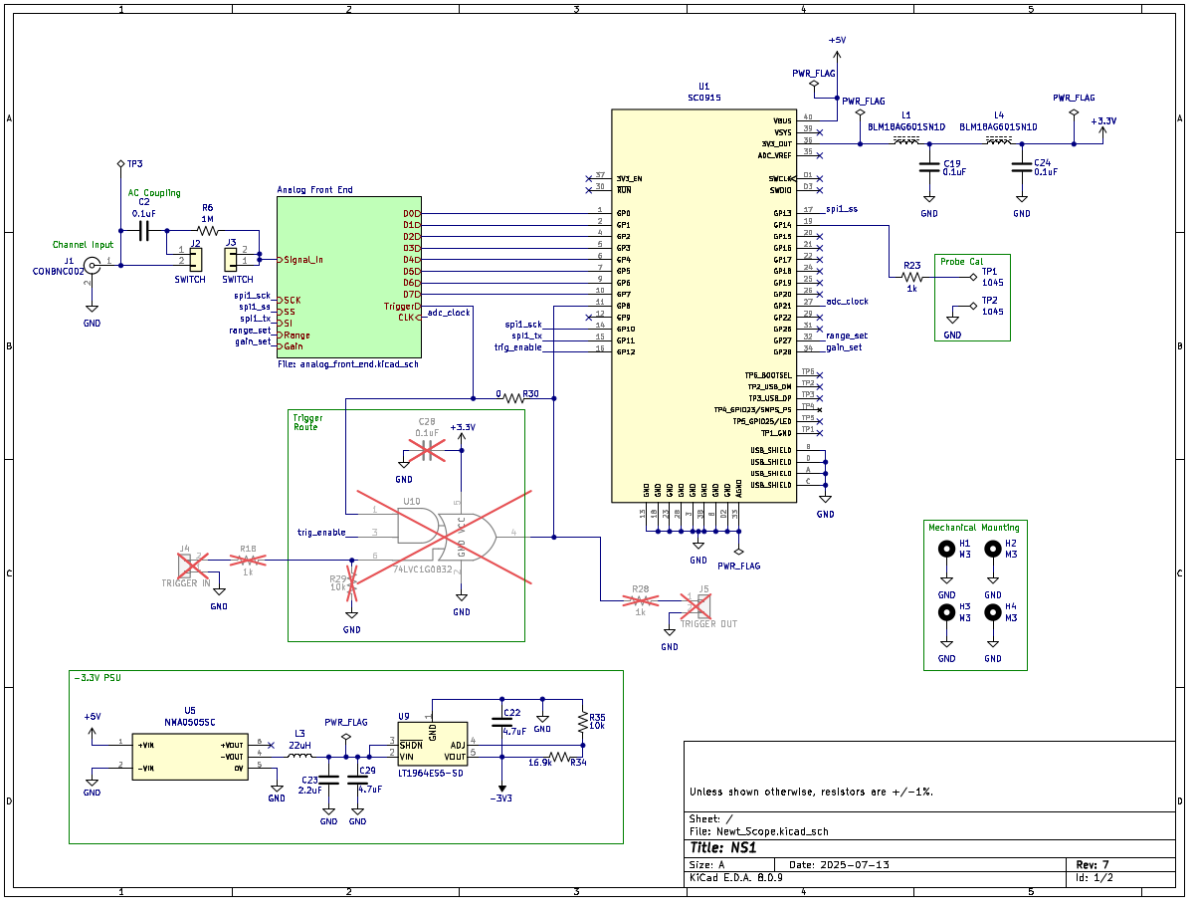
10kHz triangle wave with DC bias:

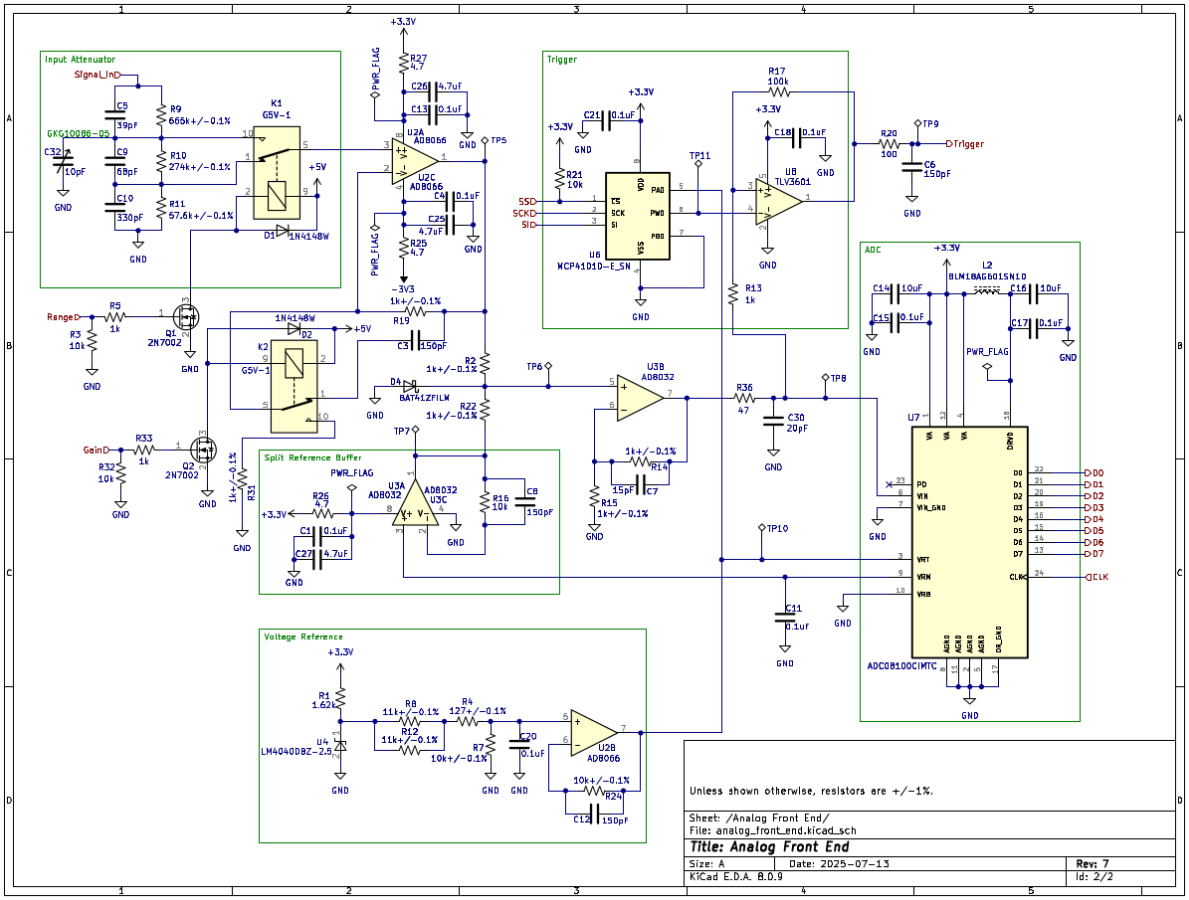


τ=1ms RC step response:

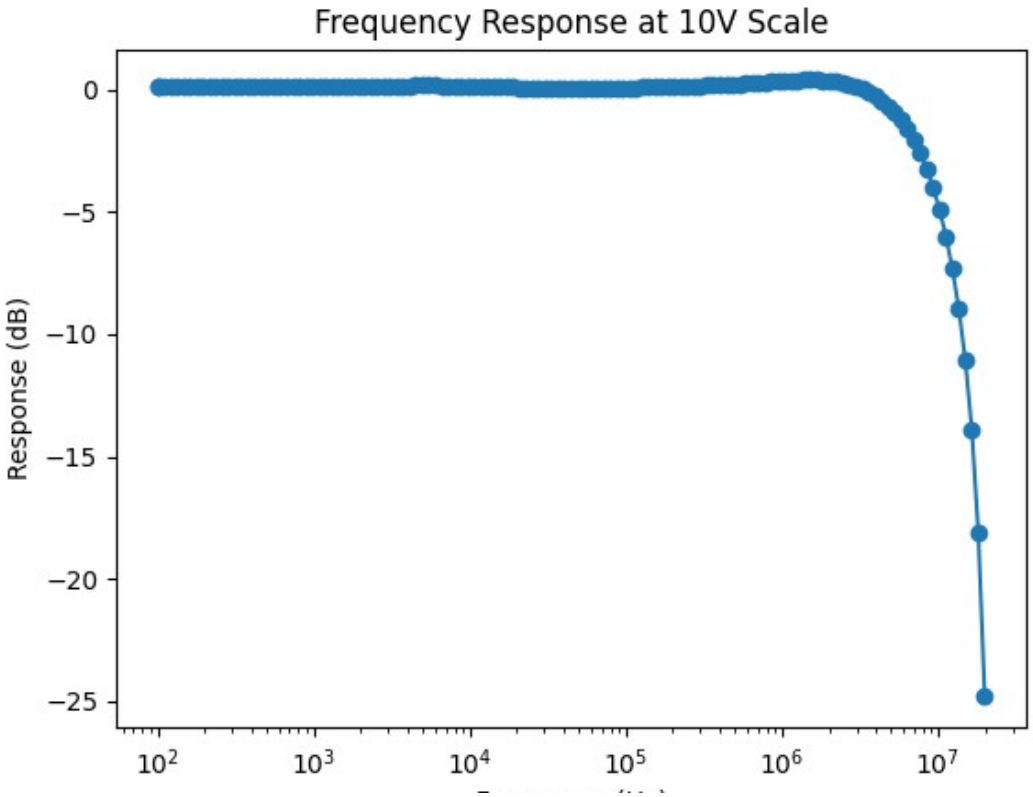


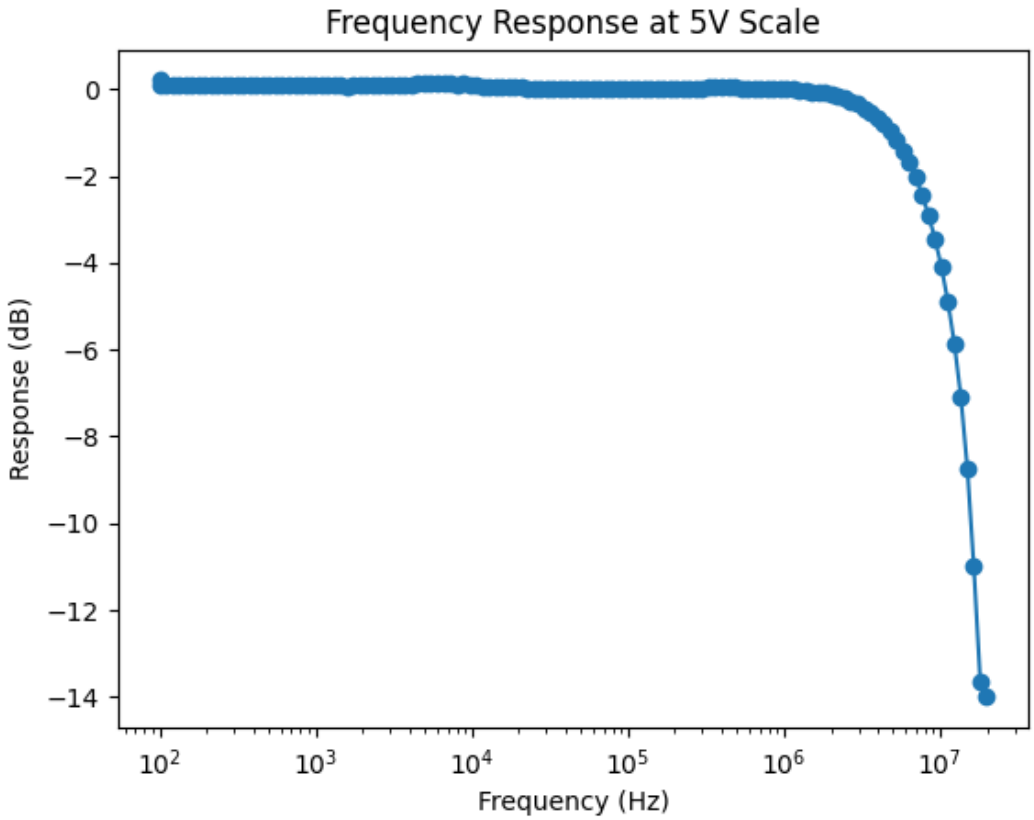
Schematic

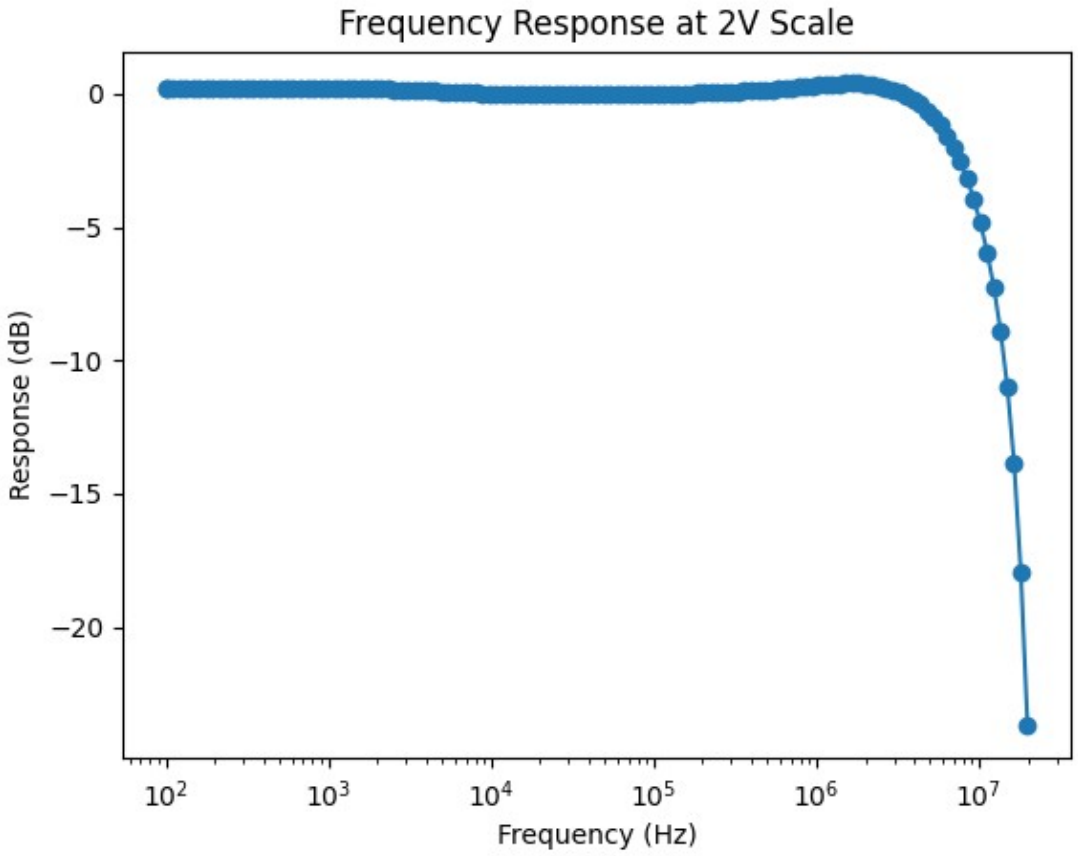

Analog Front End
Trigger Route
Probe Cal
Mechanical Mounting
-3.3V PSU
Unless shown otherwise, resistors are +/-1%.
Sheet: /
File: Newt_Scope.kicad_sch
Title: NS1
Size: A
Date: 2025-07-13
Rev: 7
KiCad E.D.A. 8.0.9
Id: 1/2

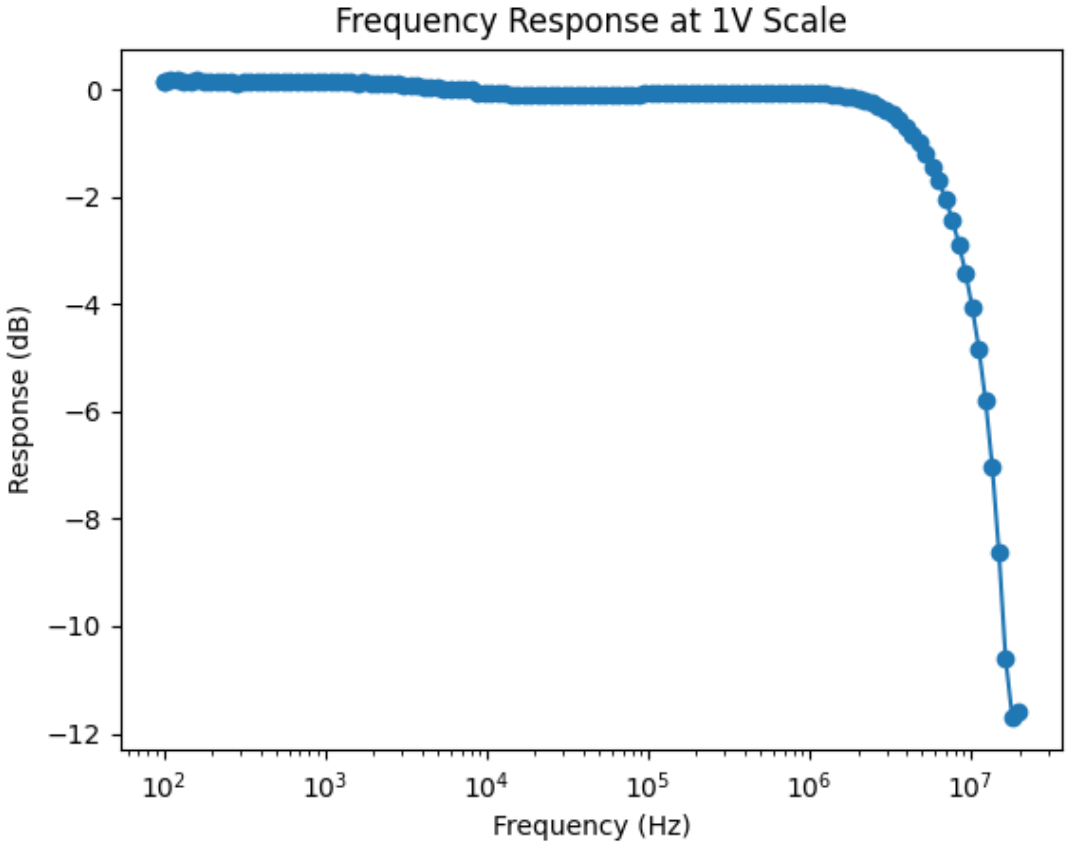

Input Attenuator
Split Reference Buffer
Trigger
ADC
Voltage Reference
Unless shown otherwise, resistors are +/-1%.
Sheet: /Analog Front End/
File: analog_front_end.kicad_sch
Title: Analog Front End
Size: A
Date: 2025-07-13
Rev: 7
KiCad E.D.A. 8.0.9
Id: 2/2

Example Frequency Response






Frequency Response at 2V Scale
Response (dB)
0
−5
−10
−15
−20
10^2
10^3
10^4
10^5
10^6
10^7
Frequency (Hz)


Frequency Response at 1V Scale
Response (dB)
0
−2
−4
−6
−8
−10
−12
10^2
10^3
10^4
10^5
10^6
10^7
Frequency (Hz)