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CS328A Noise

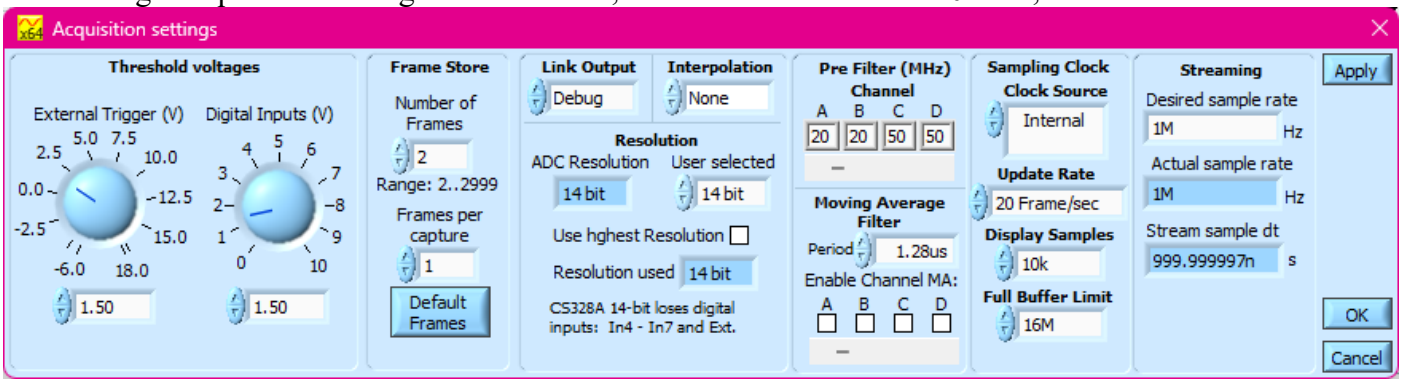
Summary

A user has requested the noise floor of a CS328A. He specified power density in V2/Hz. In this note, we show how that is achieved, and make some further measurements as well.

Setup

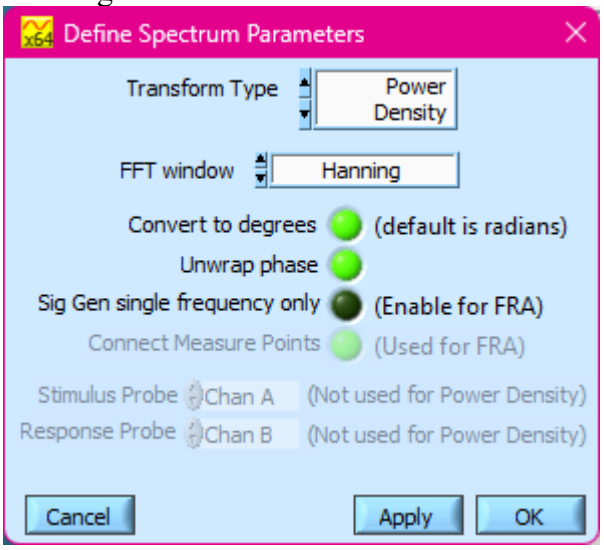
1. The CS328A was used with inputs Open, and no connection. This measures the thermal noise of the input divider correctly.

2. Use Settings Acquisition settings with 2 frames, and the Pre Filter set to 20 Mhz, resolution 14 bit.

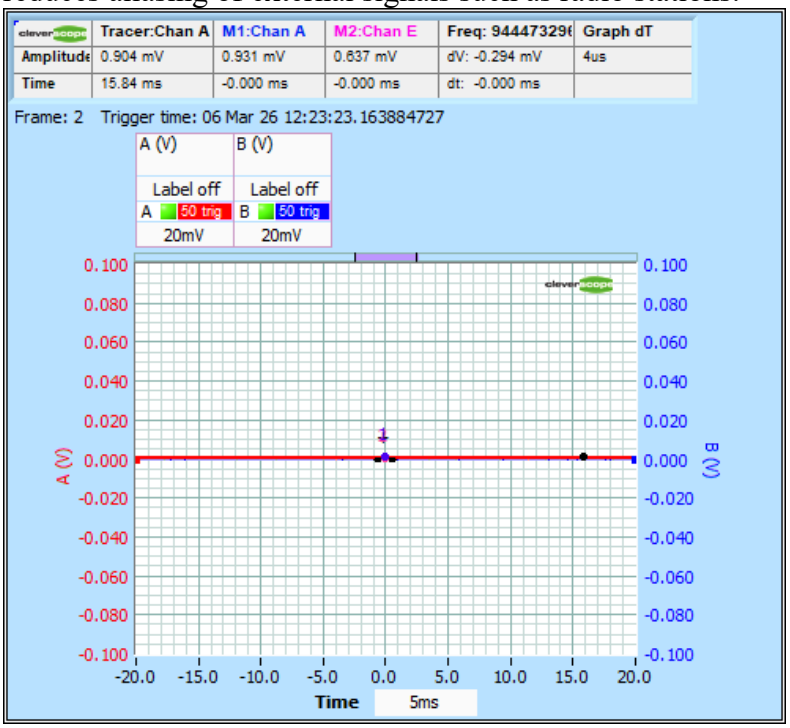


3. Ensure FRA is off in the FRA control panel.

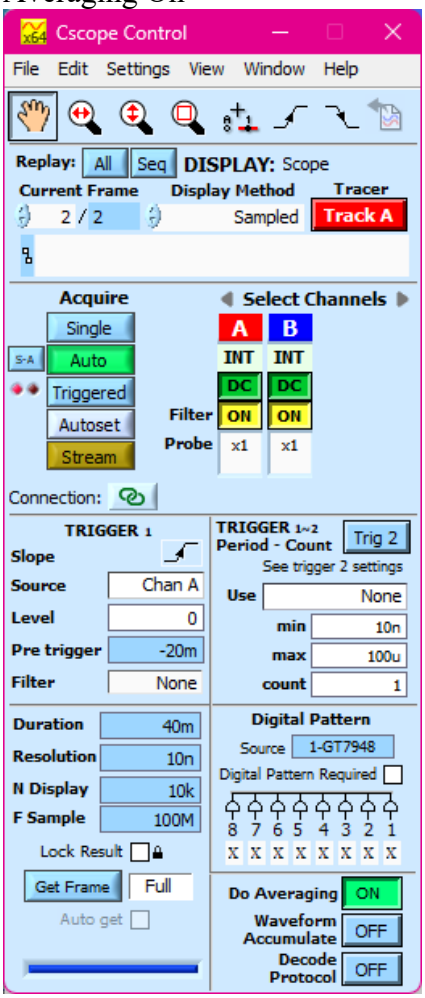
4. Using Settings/Spectrum Parameters, set the Transform Type to Power Density, and the FFT Window to Hanning.



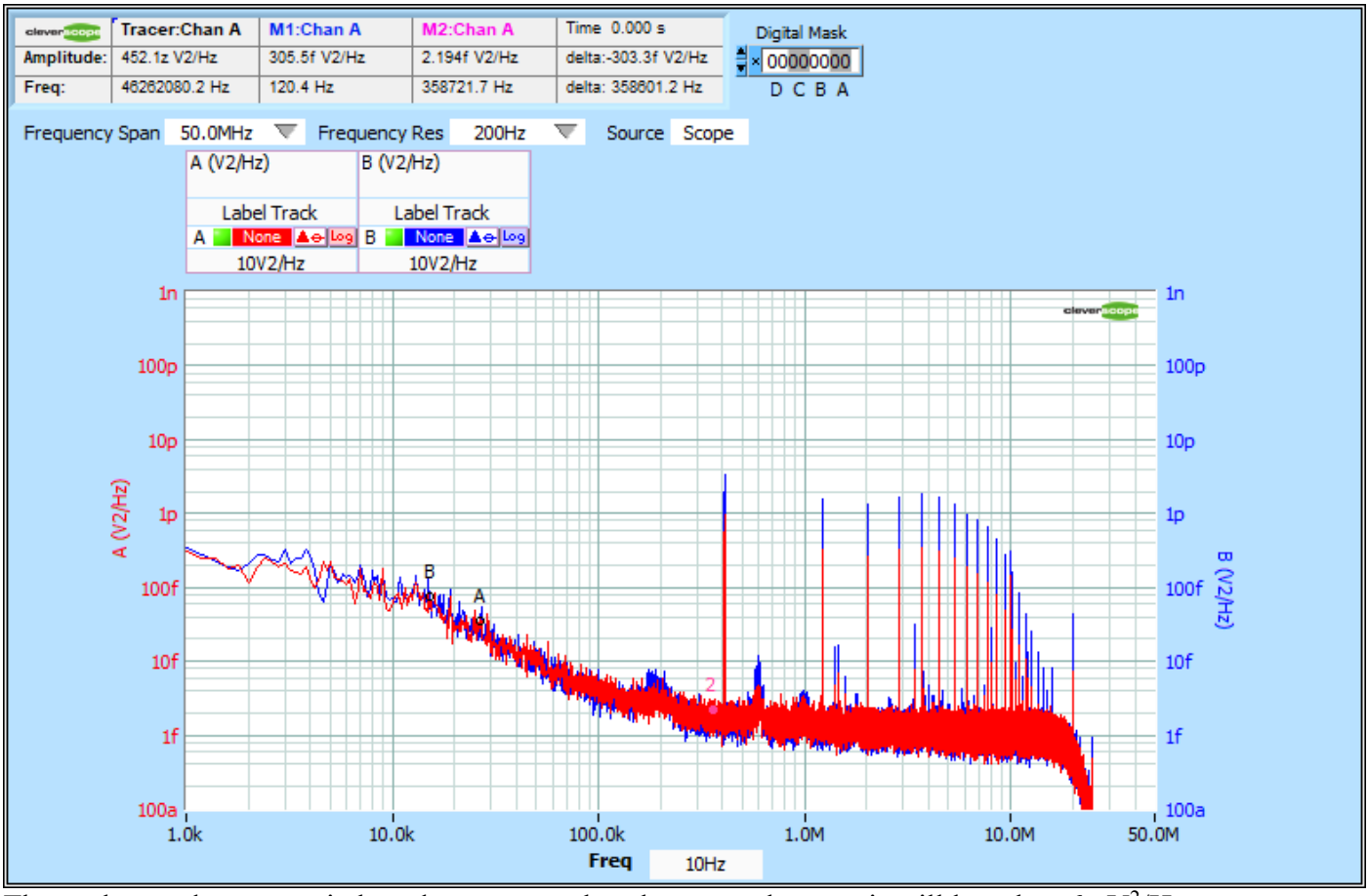
5. On the Scope Display, set the vertical axis to +/-100mV. This is a reasonable level for measuring the noise floor. Set the time axis to +/-20ms. This total period of 40m still results in a resolution of 10n, and reduces aliasing of external signals such as radio stations.



6. On the Cscope Control panel, turn on the filters for A and B to remove out of band interferers, and turn Averaging On

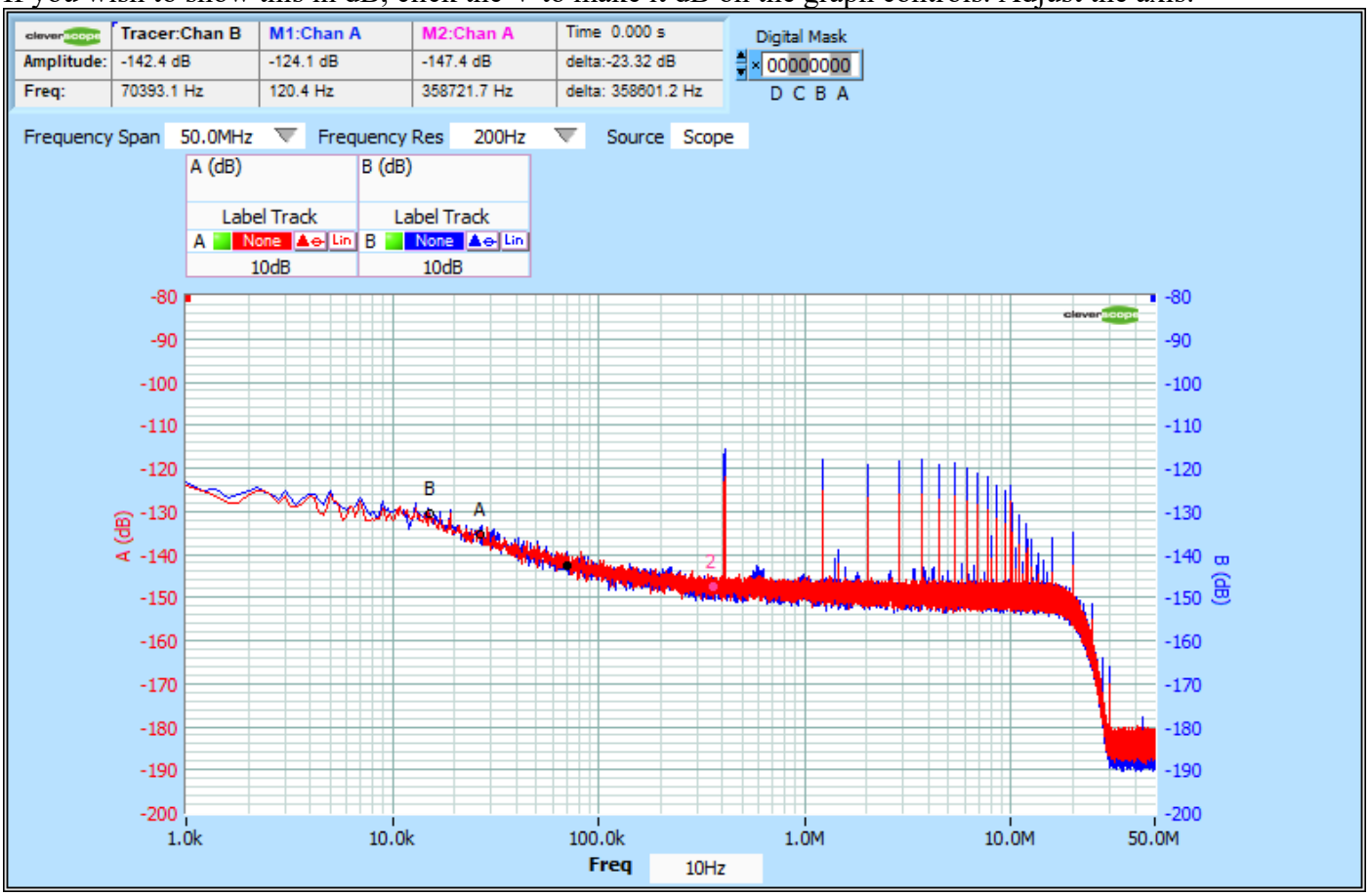


7. On the Spectrum Display, use Log Frequency axis, V display. Set Frequency Span to 50 MHz, and the Frequency resolution to 200 Hz. Overtype the amplitude axis top and bottom values to get the range you want.

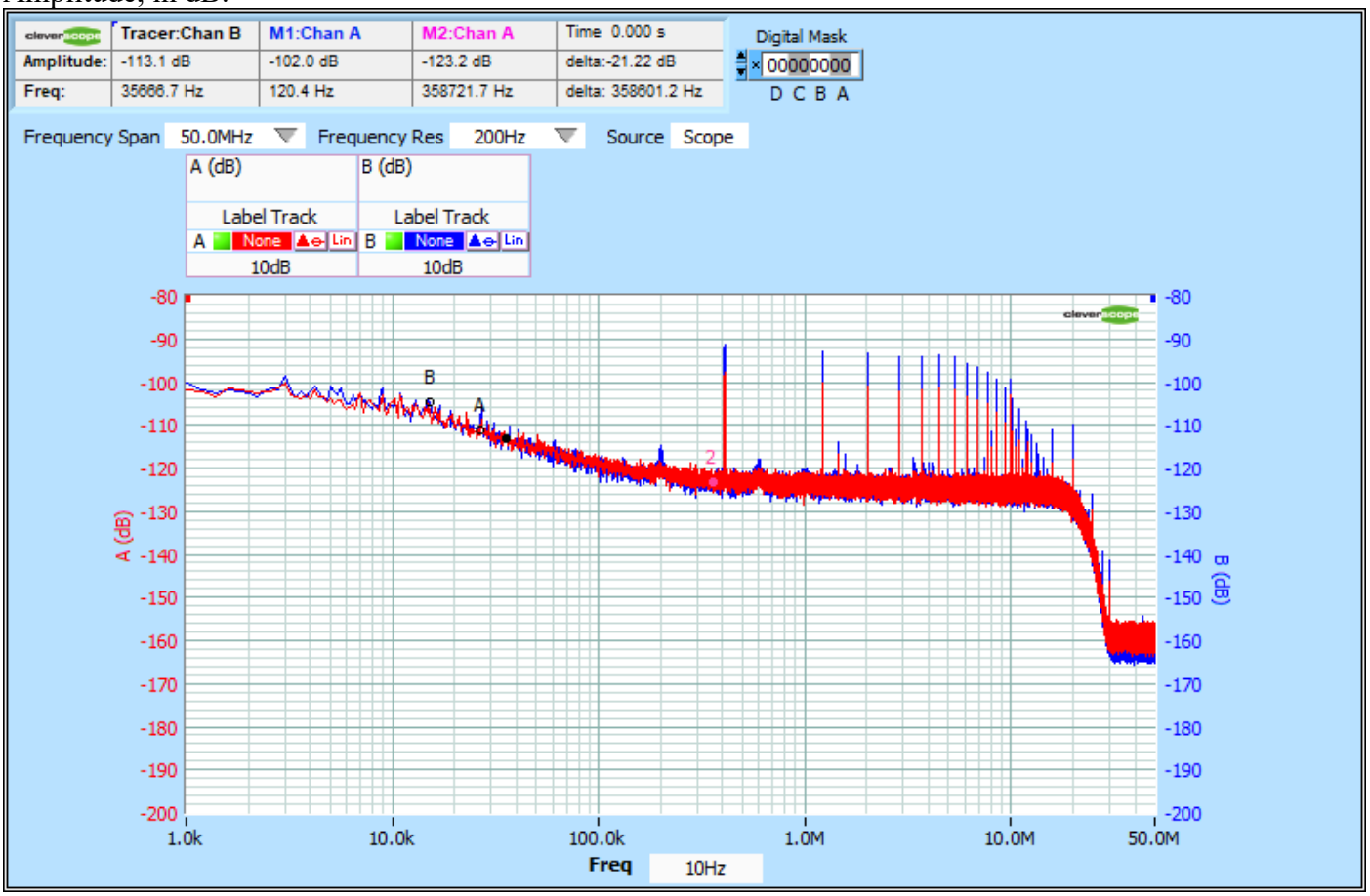


The peaks are due to a switchmode converter, but the spectral power is still less than 6 pV^2/Hz
Observe the typical 1/f noise characteristic, going to broadband around 200 kHz.

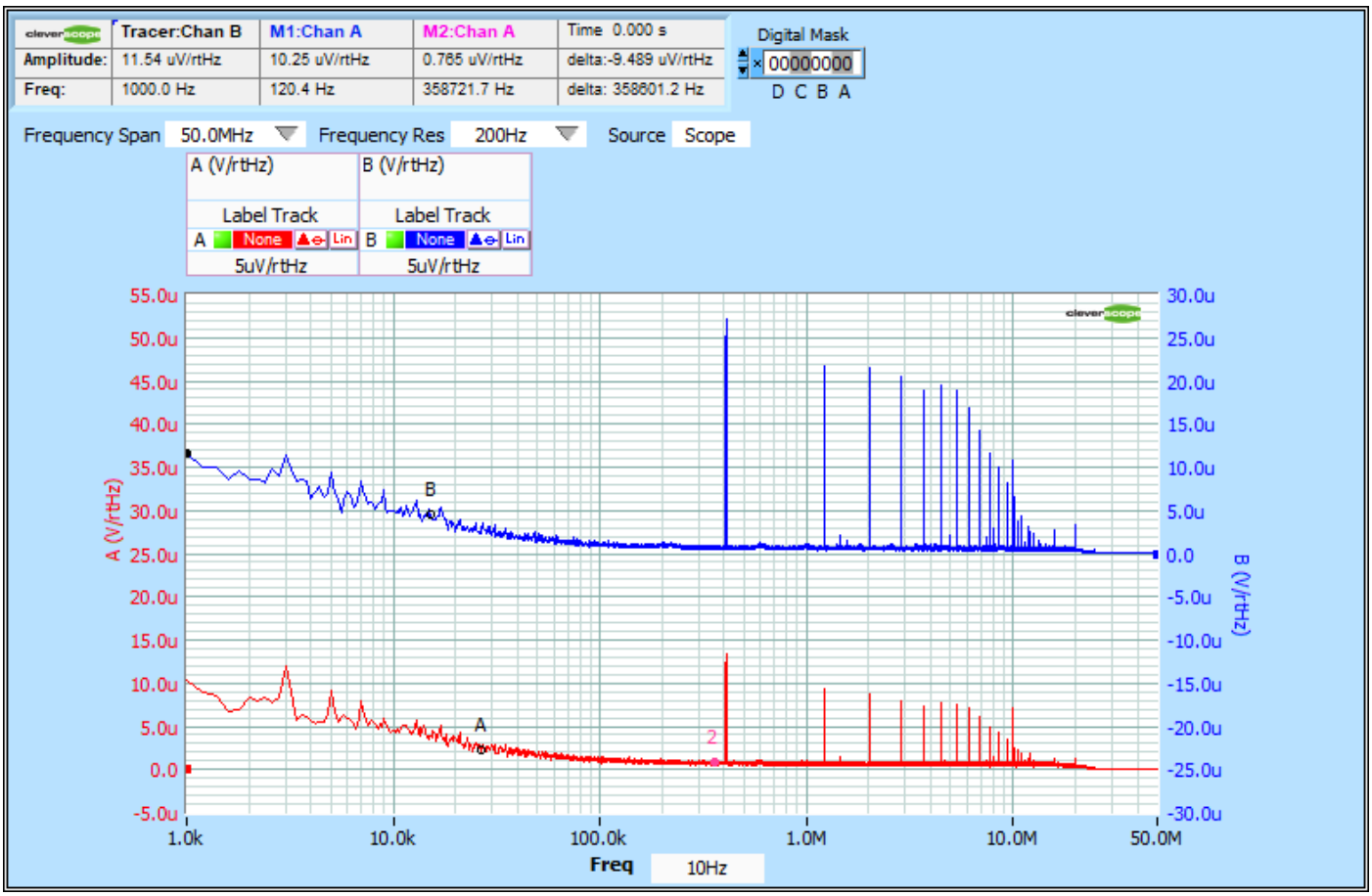
8. If you wish to show this in dB, click the V to make it dB on the graph controls. Adjust the axis:



9. If you wish to look at the RMS amplitude noise floor, change Settings/Spectrum Parameters to RMS Amplitude, in dB:



10. In Volts/rtHZ



Sorry about those peaks, I will check them out. But they are not large.