

OpAmp Noise Worksheets

The Excel workbook, OpAmpNoise.xls was created to allow the quick comparison of selected OpAmps over the frequency range of 0.01Hz to 1000Hz with respect to their internal noise. Data for the various devices was obtained by copying the manufacturers' graphs of typical voltage and current noise densities into a CAD program and then measuring the locations of the various points of interest from the graph.

Worksheets 'Plot Data' and 'OpAmps' are both protected from changes, so if data is to be added or modified, you must first select 'Tools' then 'Protection' and 'Unprotect Sheet'.

The noise charts are plotted as device input-referred voltage and current noise density, in voltage per $\sqrt{\text{Hz}}$ and current per $\sqrt{\text{Hz}}$. Since the source resistance will have a profound effect on the overall noise levels, plots are also provided which include the effects of that resistance. The source resistance value may be changed by entering its value in the 'Plot Data' worksheet, which can be done without unprotecting it. Since the dynamic range of the various OpAmps will be important in instrument design, a chart of device voltage noise relative to the nominal device clipping levels, expressed as dB, is also provided.

The default value of the source resistance, R_s , was selected as 52k, the resistance of the sensor circuit in one of our FBV seismometer designs. For sensors consisting of a coil and magnet, a much lower value of R_s would be used. After changing R_s the vertical scale of the various charts may no longer be appropriate and may need to be changed. Right click on the vertical axis to get a drop-down box where you can select 'Format Axis'. From there you can enter appropriate values for the Y axis 'Maximum' and 'Minimum'.