



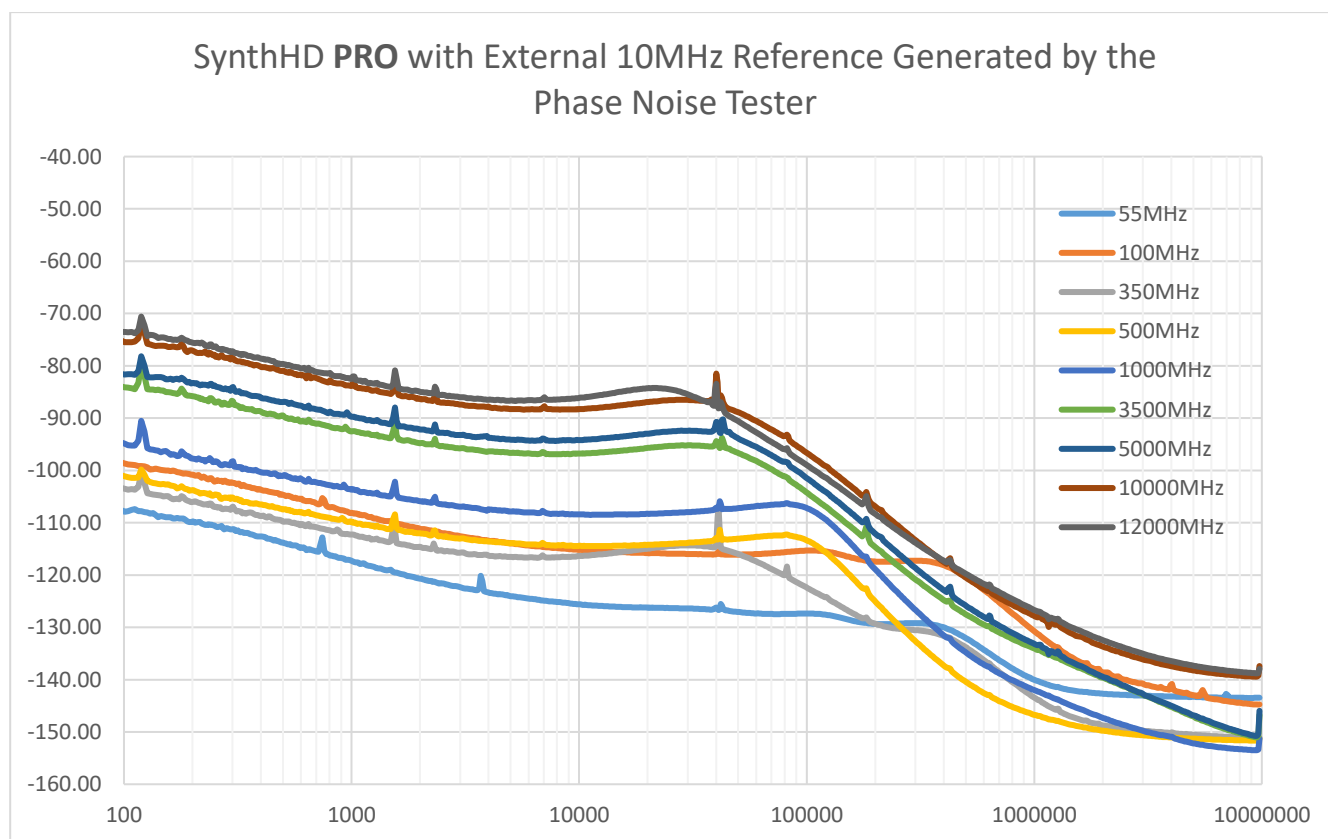
Windfreak Technologies, LLC.

Phase Noise Test Comparison for SynthHD and SynthHD PRO v1.4

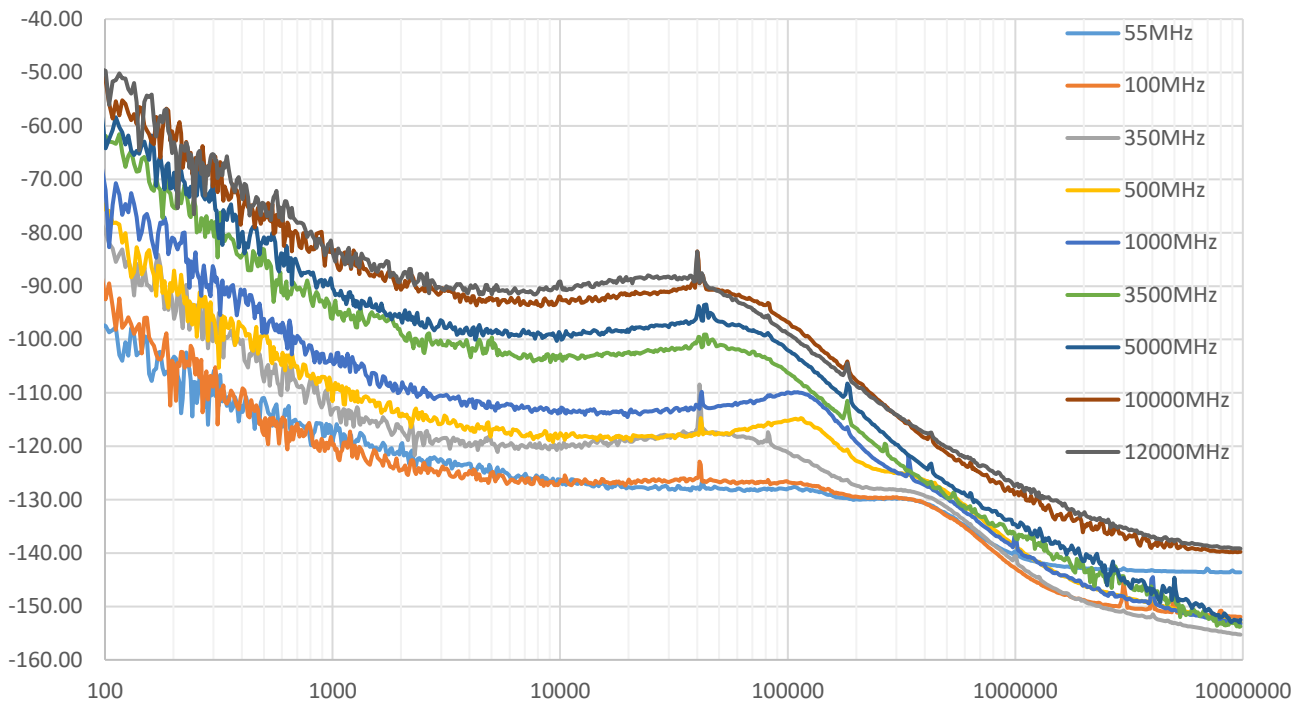
Phase noise inside the loop bandwidth is highly affected by the quality of the reference used to drive the PLL circuit. The SynthHD and SynthHD PRO both have the ability to use either a 27MHz or 10MHz internal TCXO reference, or to use an external reference from 10MHz to 100MHz. The phase noise tester is a Holzworth HA7062C and has a high quality 10MHz output that is used with the first plot below as it is the best case scenario. Using a higher frequency ovenized type low phase noise reference (OCXO) would likely generate better phase noise than below, especially at lower offset frequencies.

The SynthHD uses an older PLL chip (ADF5355) as compared to the SynthHD PRO which uses the ADF5356. The SynthHD PRO also uses a much better milled aluminum package which may help with the spurs. The SynthHD also has a lower cutoff frequency for its loop filter (15KHz) as compared to 60KHz with the SynthHD PRO. Otherwise, both products use the same PCB.

In all tests, “Feedback Mode is Fundamental” (available on the GUI Extras tab) is set for best phase noise performance at low frequencies. Although, not done in these tests, its also possible to adjust PLL Icp on the same tab to change the amplitude and frequency distribution of the noise since it effectively changes the cutoff frequency shape of the loop filter.



SynthHD PRO with Internal 27MHz Reference



SynthHD with Internal 27MHz Reference

