

SNP Advanced Technology Synthesizer Modules: Extremely Low Close-In Phase Noise Synthesizers

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The SNP line of standard product synthesizer modules from Giga-tronics features extremely low close-in phase noise over the 6-24 GHz frequency bands. These modules are well-suited for Instrumentation, EW, Radar and Datacom clock applications. Using permanent magnet YIG-tuned oscillators, these modules offer relatively fast tuning speed and low power consumption.

The heart of the synthesizer module is the Accumulative High Frequency Feedback (AHFF) Technology. This patented technology was developed by Giga-tronics engineers to overcome the limitations of fractional – N synthesizers. The AHFF technology achieves low N numbers and fine resolution in a single loop by making use of a high frequency reference source with a variable component to drive the PLL. Additionally, the PLL uses high frequency, fractional-frequency prescaling to allow the ratio for the reference frequency to the output frequency to be quite low compared to traditional PLL synthesis methods (see Figure 1).

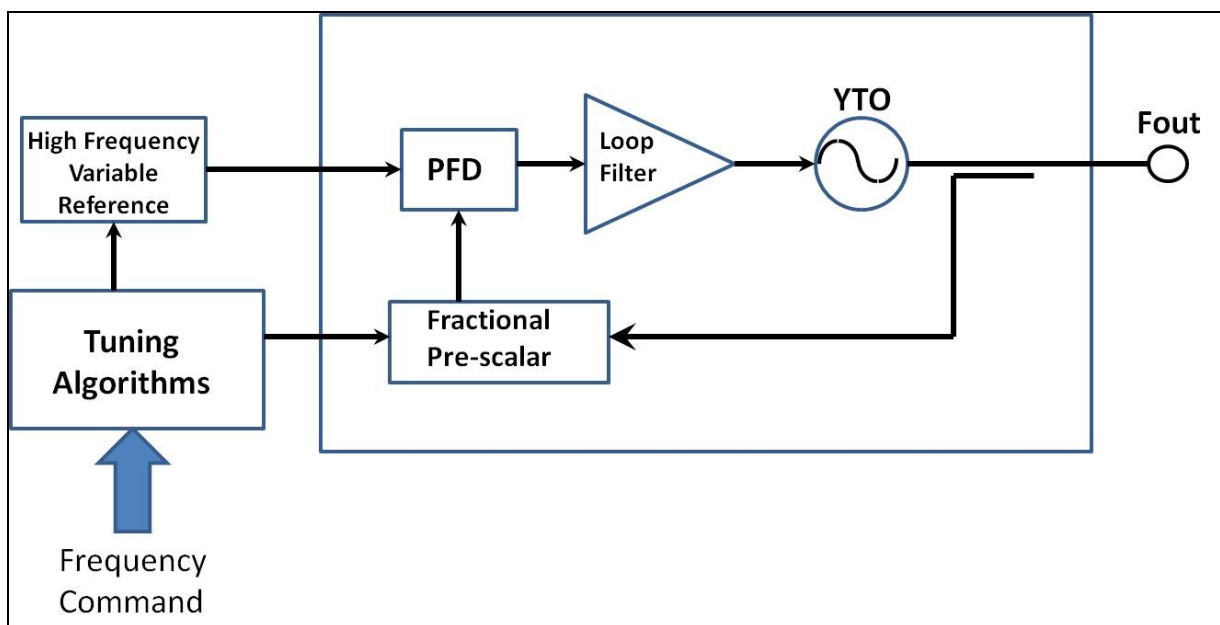


Figure 1: Accumulative High Frequency Feedback Block Diagram



The results of the AHFF technology can be seen in Figure 2a and 2b which compare the phase noise of a conventional single-loop PLL synthesizer, the SNY-0410-510-01 with the AHFF enabled SNP-1012-520-01. Note that below 40KHz offset, the AHFF technology allows for an improvement in phase noise of up to 30dB.

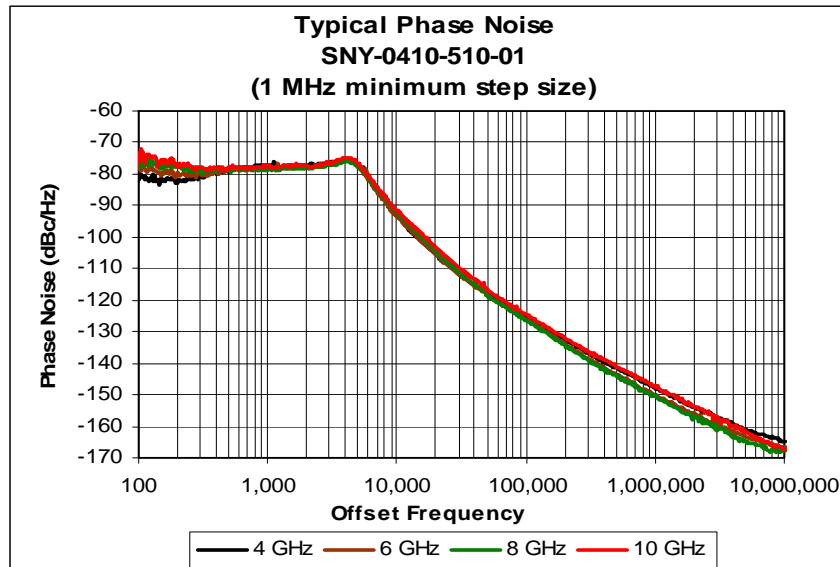


Figure 2a: Conventional (SNY) PLL Technology

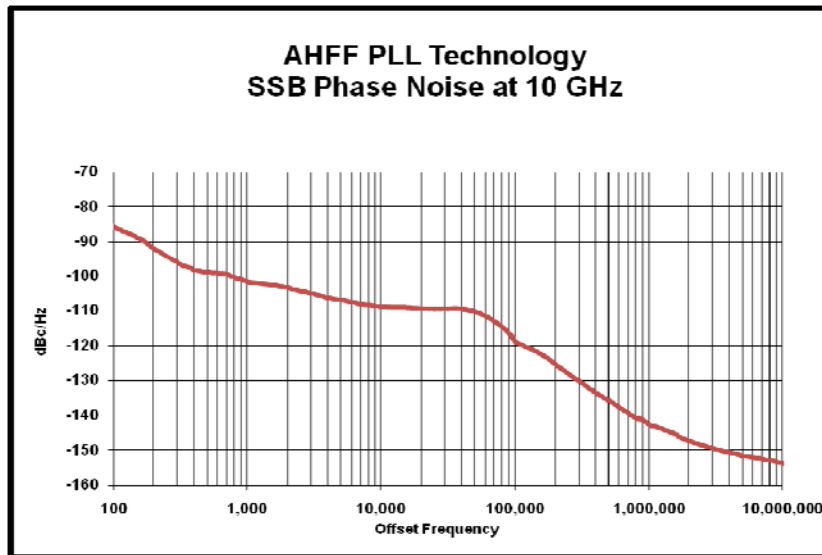


Figure 2b: AHFF (SNP-1012-520-02) PLL Technology



In addition to providing exceptional close-in phase noise, the SNP series of synthesizer modules includes an ALC to provide a constant output power across the specified frequency and temperature range. The module can be controlled by a 3-line serial protocol interface or via an optional USB Interface Card for easy PC control. The -01 version uses an internal reference while the -02 version provides for the use of an external 10 MHz reference. These synthesizer modules run from a single +15V supply. Delivery is from stock to 6 weeks.