The table below compares **Phase Noise** and **Noise Figure**, two fundamental parameters in RF and microwave system design. While both impact overall signal quality and system performance, they describe different aspects of noise behavior. Phase noise characterizes the short-term stability and spectral purity of a signal source, whereas noise figure quantifies how much additional noise a component, such as an amplifier, introduces relative to the thermal noise at its input. Understanding the distinctions between these parameters is critical for optimizing system sensitivity, dynamic range, and signal integrity across communication, radar, and electronic warfare applications.

Phase Noise	Noise Figure
Phase noise is measured in the frequency domain as a plot of the spectral density of noise sidebands relative to the carrier.	A single measurement in the frequency domain that describes how much an amplifier degrades the signal-to-noise ratio (SNR).
Phase noise refers to the random fluctuations in the phase of a signal, which cause the signal's energy to disperse around its nominal carrier frequency, producing sidebands in the frequency spectrum.	The amount of noise a component, such as an amplifier, adds to a signal relative to the thermal noise present at its input.
Seriously degrades signal fidelity, especially in radar platforms, by contributing to reciprocal mixing with noise figure. It can increase the bit error rate (BER), elevate sub-clutter visibility in forward-looking radar systems, and degrade overall system dynamic range.	Limits a receiver's sensitivity by raising the noise floor. A high noise figure means the receiver requires a stronger input signal to achieve a given signal-to-noise ratio (SNR).
A critical parameter for signal sources and frequency synthesizers where signal purity and integrity are essential.	A critical parameter for low-noise amplifiers (LNAs) in communication systems where input signal power is low and highly susceptible to additional noise.