

RF Design - Noise

Exercise 1: What is the noise figure of a 6 dB attenuator?

Exercise 2: What are the minimum possible values of T_e and F ?

Exercise 3: The datasheet for a low-noise amplifier (LNA) specifies a noise figure of 2 dB. What is the noise temperature T_e ?

Exercise 4: An LNA with a noise figure of 0.3 dB receives a signal with an SNR of 6 dB. What is the output SNR?

Exercise 5: A noise source with an ENR of 15 dB is connected to an LNA. The noise PSD at the output of the LNA is measured as -152 dBm/Hz and with the noise source on and -165.2 dBm/Hz with it off. Assuming the spectrum analyzer adds negligible noise and the “off” noise source temperature is 0 K, what are T_e and F ? Do not confuse mW and dBm.

Exercise 6: A What is the system noise figure of a receiver that consists of a 10 dB amplifier with 3 dB noise figure followed by a mixer with a 6 dB loss and an IF amplifier with a 20dB gain and a noise figure of 10 dB?