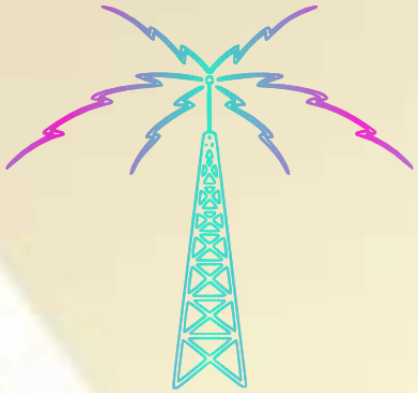
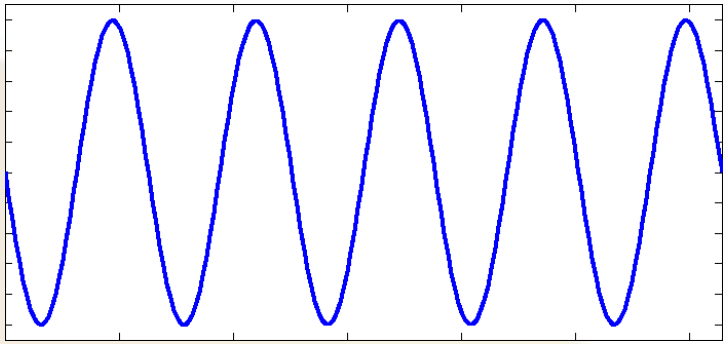


RF Components and Basic Concepts

1.12 - Power Amplifier (PA)

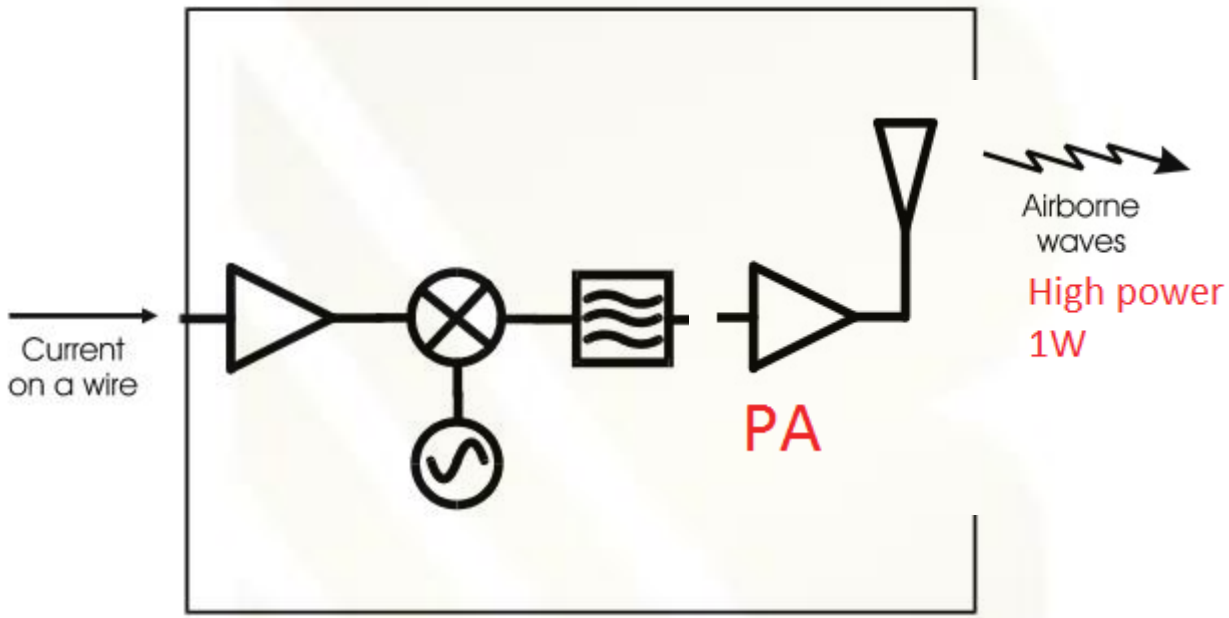
PA



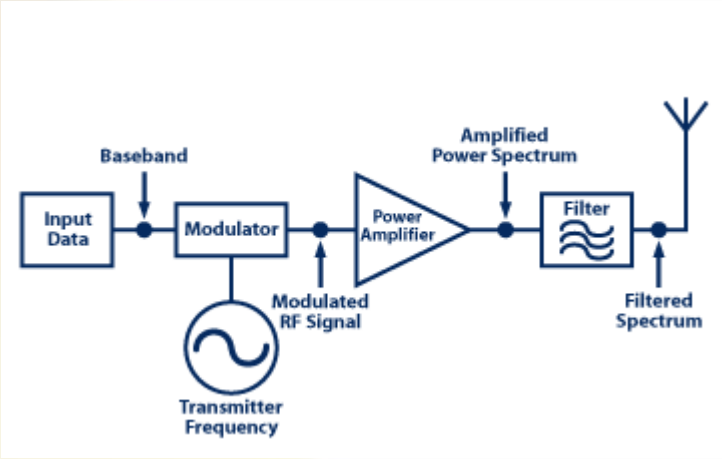
- A radio frequency amplifier, or RF amplifier, is a tuned amplifier that amplifies high-frequency signals used in radio communications.

- The frequency at which maximum gain occurs in an RF amplifier is made variable by changing the inductance or capacitance of the tuned circuit.
- An rf amplifier can tune over the desired range of input frequencies.
- Power gain of rf amplifiers is always limited at high radio frequencies.

Transmitter Block Diagram



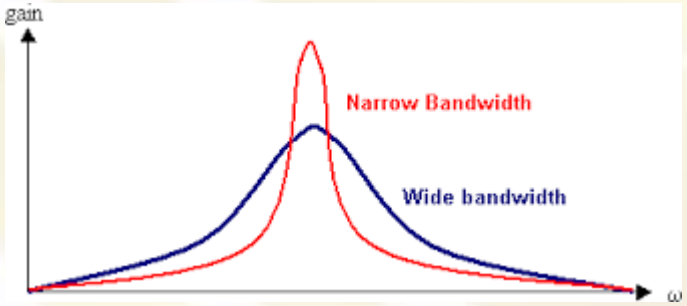
PA



Typically, RF power amplifiers drive the antenna of a transmitter.

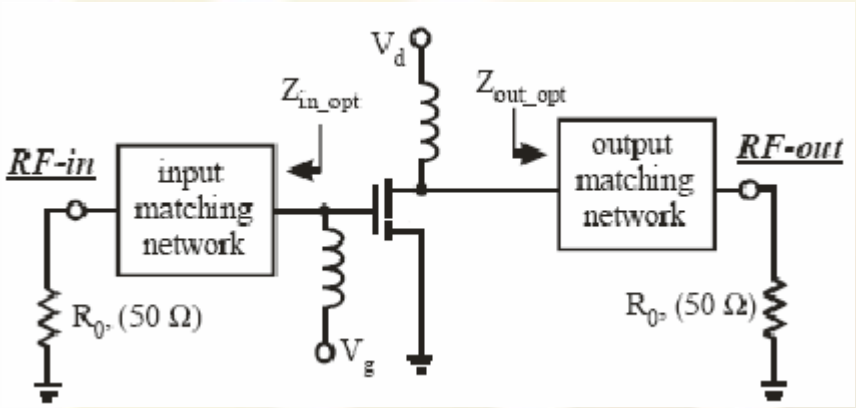
Design goals often include

- gain $\frac{Pout}{Pin}$
- Output power $Pout$
- bandwidth
- power efficiency $\frac{P\_delivered}{P\_dispated}$
- linearity
- input and output impedance matching
- heat dissipation.



PA Types

- Many modern RF amplifiers operate in different modes, called “classes”, to help achieve different design goals.
- Some classes are class A, AB, B, C, J, F, E.
- There is a Class D but those amplifiers can work only with low frequency signals.



PA IC Layout

Design and Simulation of a Ku-band MMIC Power Amplifier

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1st Chen Li
2nd Zheng-Liang Huang
3rd Wei Chen
4th Yongheng Shang
5th Fa-Xin Yu