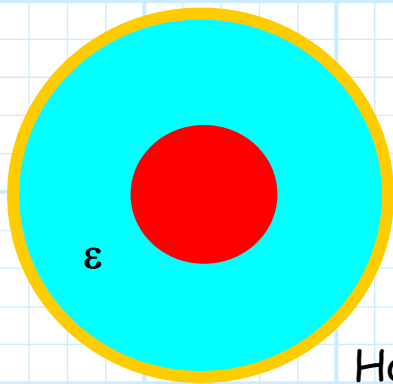


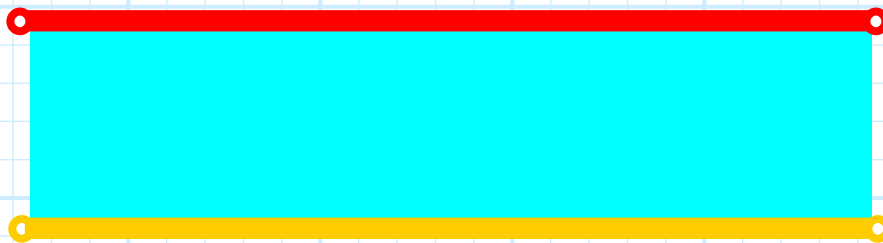
Printed Circuit Board Transmission Lines

Recall that a transmission line **must** consist of **two separate conductors**. Typically, the volume between these conductors is filled with a very low-loss **dielectric**.

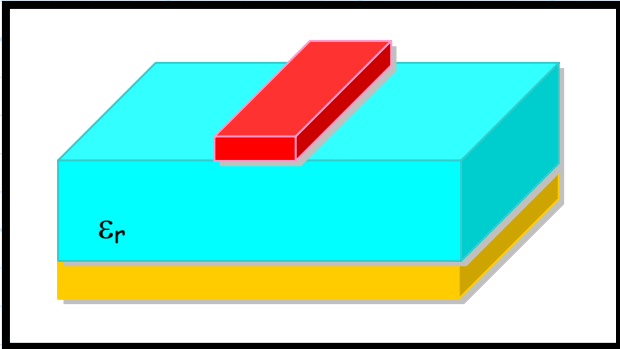


For example, a **coaxial** line has an inner conductor (**conductor #1**) and an outer conductor (**conductor #2**), with the cylindrical space between filled with dielectric.

However, we can likewise construct a transmission line using **printed circuit board** technology. The **substrate** of the circuit board is the dielectric that separates two conductors. The **first conductor** is typically a **narrow** etch that provides the **connection** between two components, while the **second conductor** is typically a **ground plane**.

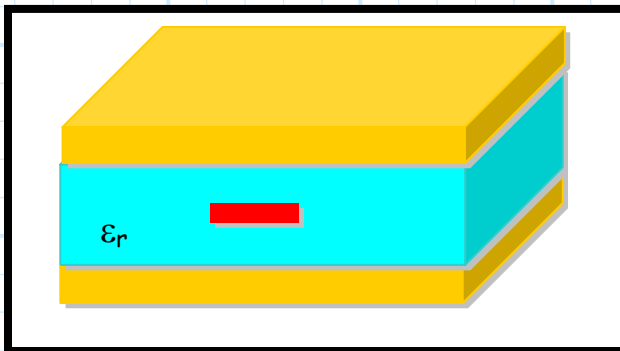


Below are some of the most popular types of printed circuit board transmission lines:



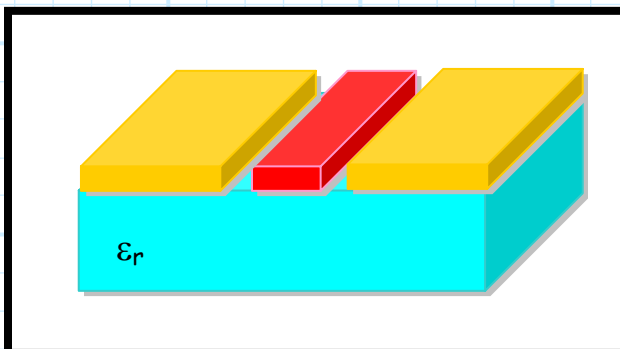
Microstrip

Probably most popular PCB transmission line. Easy fabrication and connection, yet is slightly dispersive, lossy, and difficult to analyze.



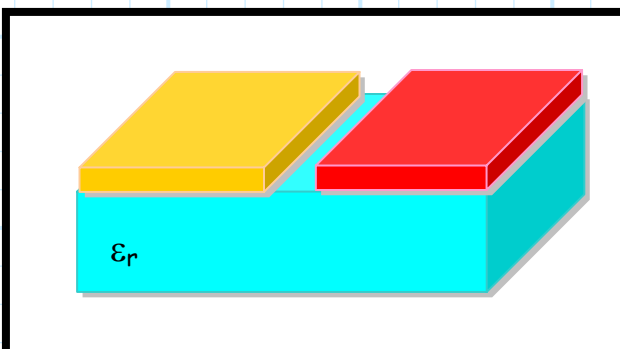
Stripline

Better than microstrip in that it is not dispersive, and is more easily analyzed. However, fabrication and connection is more difficult.



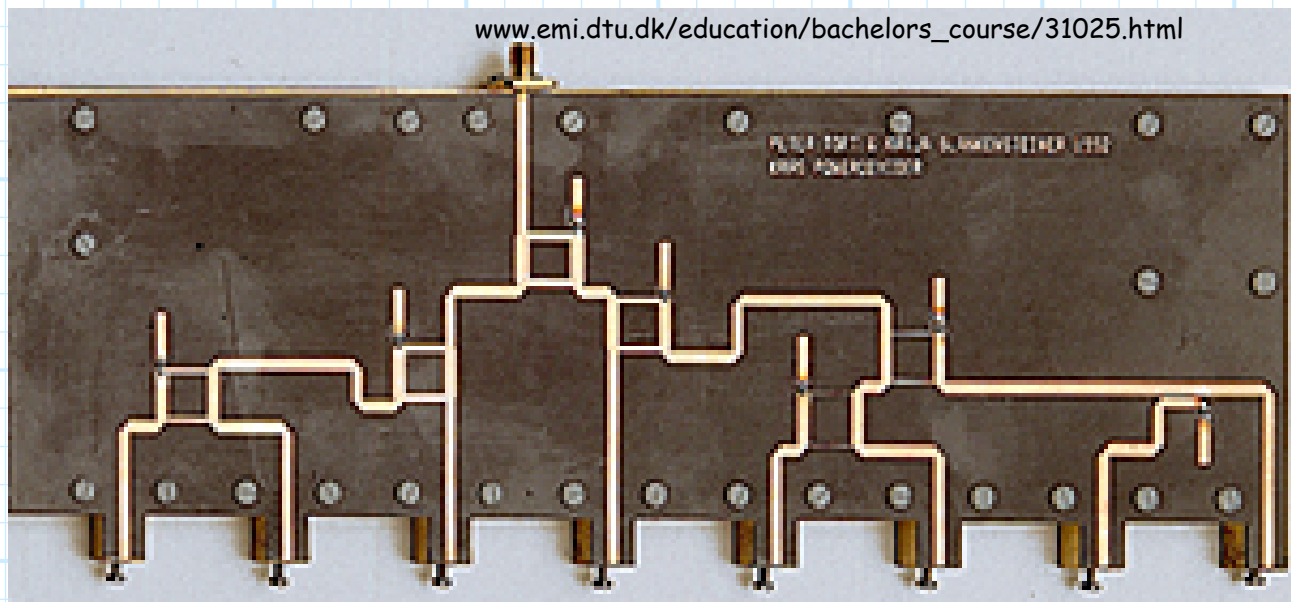
Coplanar Waveguide

The newest technology. Perhaps easiest to fabricate and connect components, as both ground and conductor are on one side of the board.

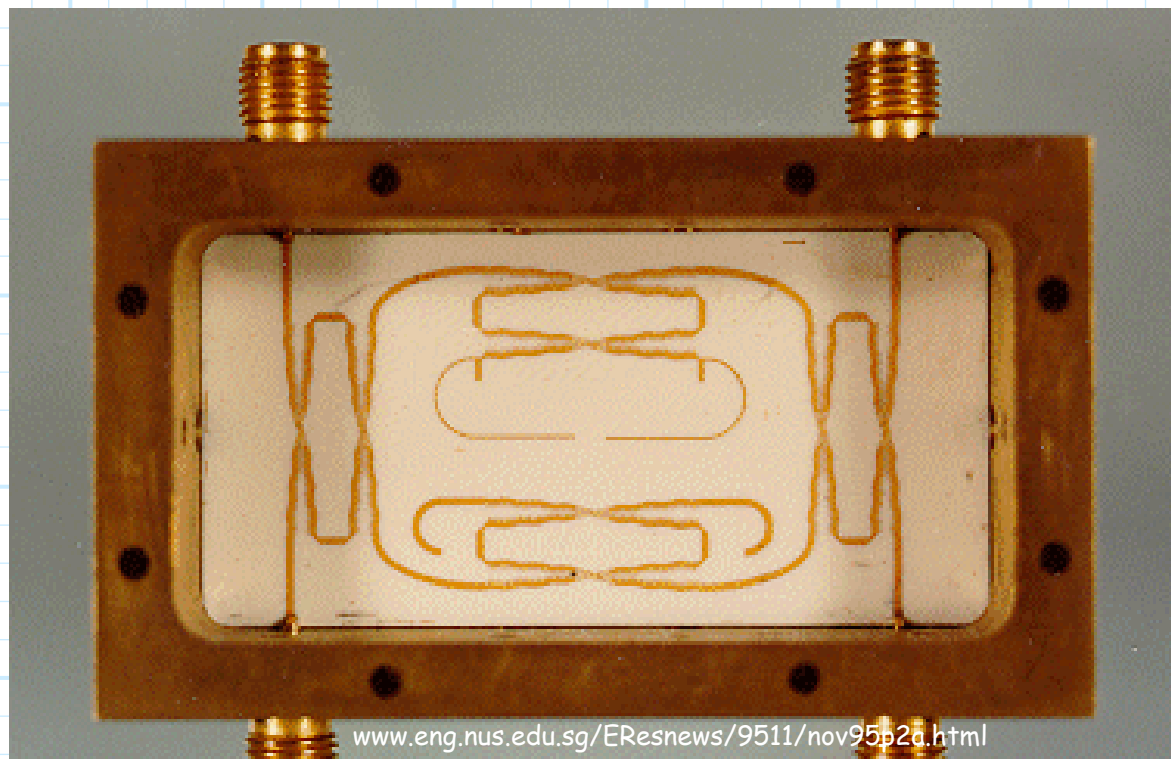


Slotline

Essentially, a dual wire transmission line. Best for "balanced" applications. Not used much.



An antenna array feed, constructed using **microstrip** transmission lines and circuits.



A wideband **microstrip** coupler.