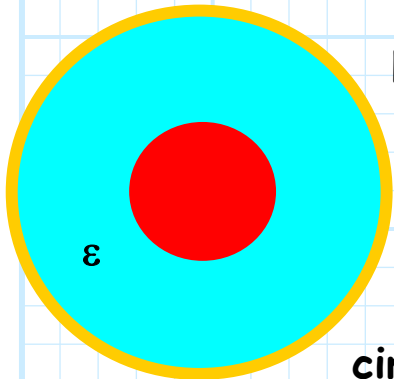


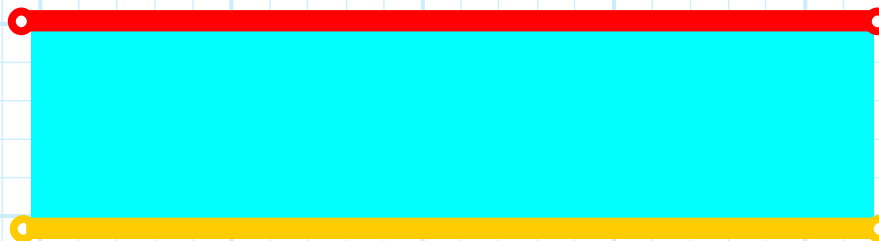
# Printed Circuit Board Transmission Lines

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**.

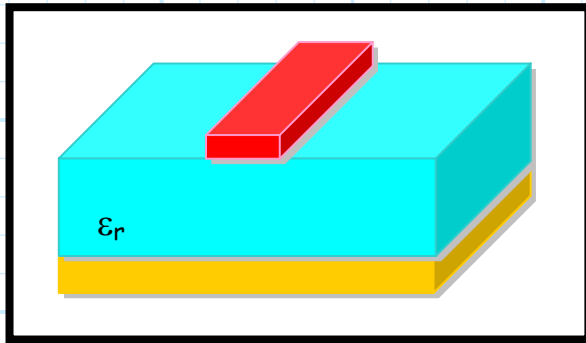


For example, a **coaxial** line has an inner conductor (**conductor #1**) and an outer conductor (**conductor #2**), with the cylindrical space between filled with dielectric.

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**.

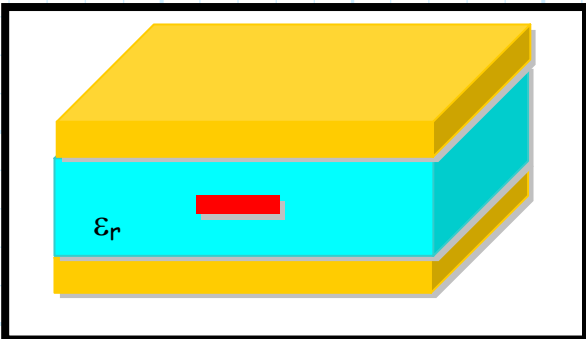


Below are some of the most popular types of printed circuit board transmission lines:



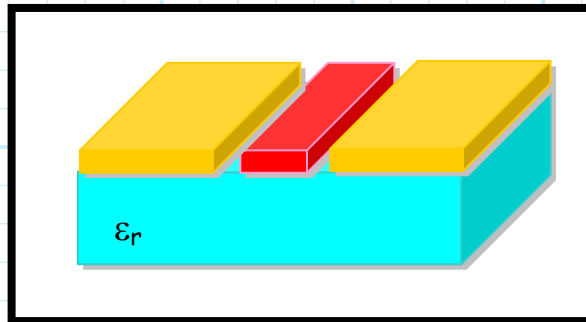
### Microstrip

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



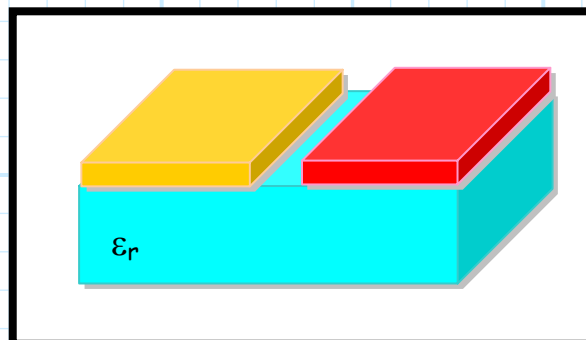
### Stripline

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



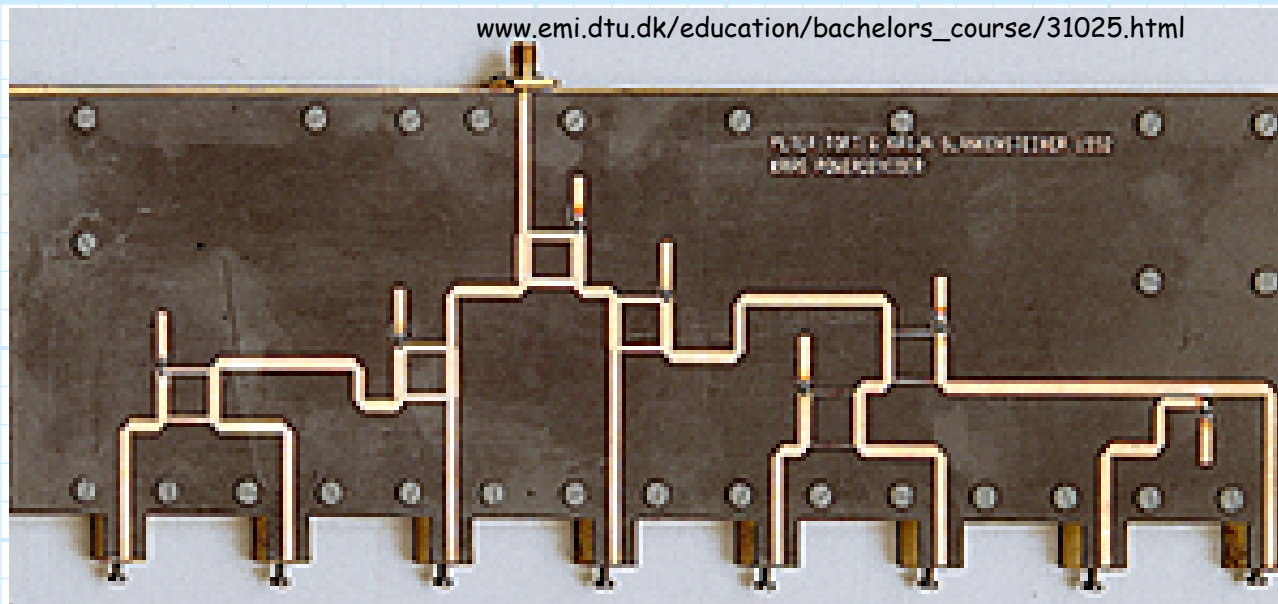
### Coplanar Waveguide

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

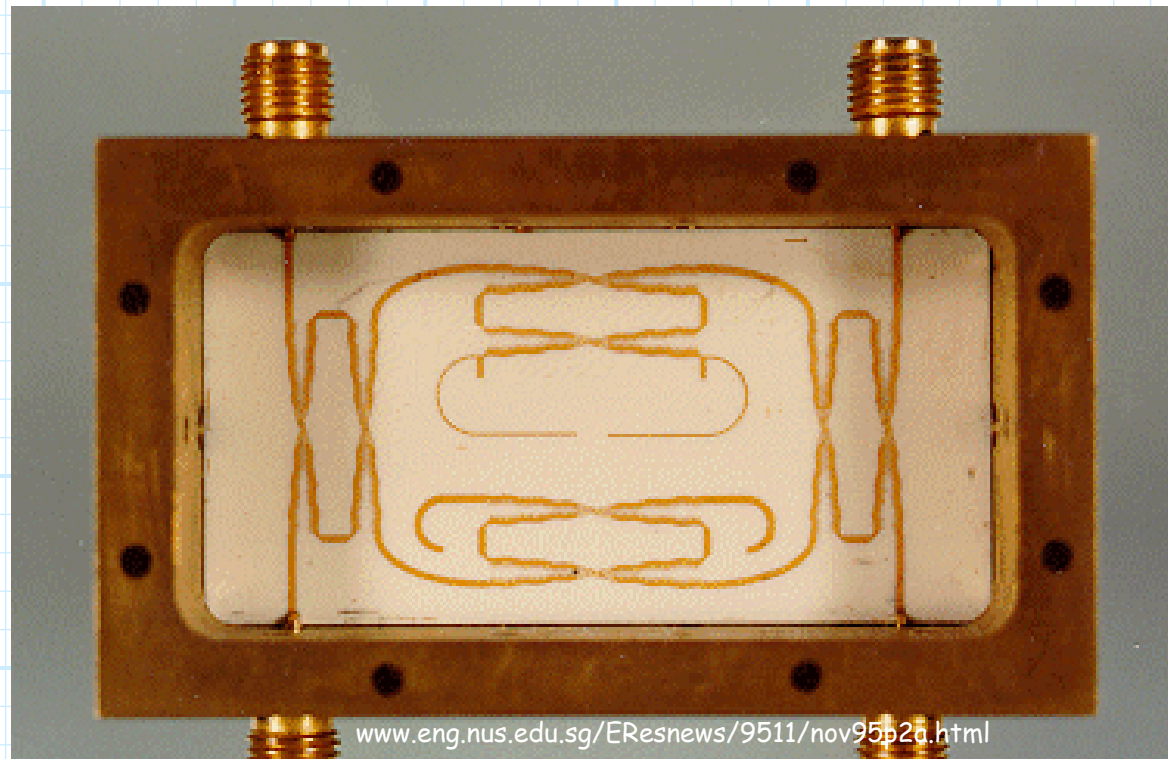


### Slotline

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.