

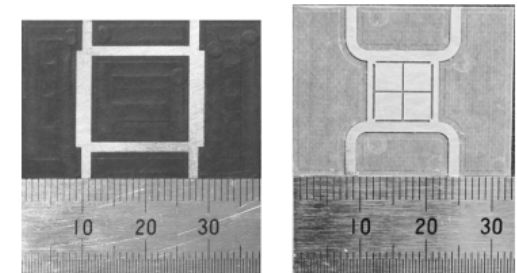
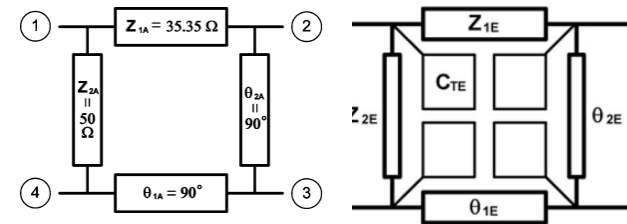
# Study of Compact Coupler and Power Divider

## Background

Couplers and power dividers are two widely used microwave devices. The conventional couplers and power dividers are mainly composed of quarter-wavelength transmission lines, and therefore, the size of the circuits are physically large at relative low frequency.

The reduction of the size associated with these transmission lines is essential in decreasing the size. Conventionally, there are two ways to reduce the size of transmission lines. The first one is achieved by using the folded line configuration but the resultant circuit area is still large. The other is accomplished by using lumped-element components. However, it needs precis lumped-element models.

The conventional quarter-wavelength transmission lines can be replaced with artificial lines. By derivation of the equivalent circuit, the artificial lines have the same performance at the operation frequency.



Source: R. Negra et. al. TMTT, Dec. 2008

## Tasks

- Select the structure to replace the conventional structure for compact couplers and power dividers
- Analysis the equivalent circuits and derive the equations
- Design, simulate, implement and measure the couplers and power dividers

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