

→ Wave Guides :-

A waveguide is a hollow metallic structure used to guide microwaves.

Main types:-

- Rectangular waveguide
- Circular waveguide.

Used in

- Radar
- Satellite communication.
- Microwave ovens.

→ Why Transmission Line fails at Microwave?

At microwave frequency

- Radiation loss increases.
- Dielectric loss increases.
- Power loss increases.

So we use hollow metallic waveguide which confine EM waves inside conducting walls.

→ Basic structure of Rectangular Waveguide.

A hollow metallic pipe of rectangular cross-section.

Dimensions:-

- width = a
- Height = b
- usually $a > b$

Wave propagates along
Z-direction