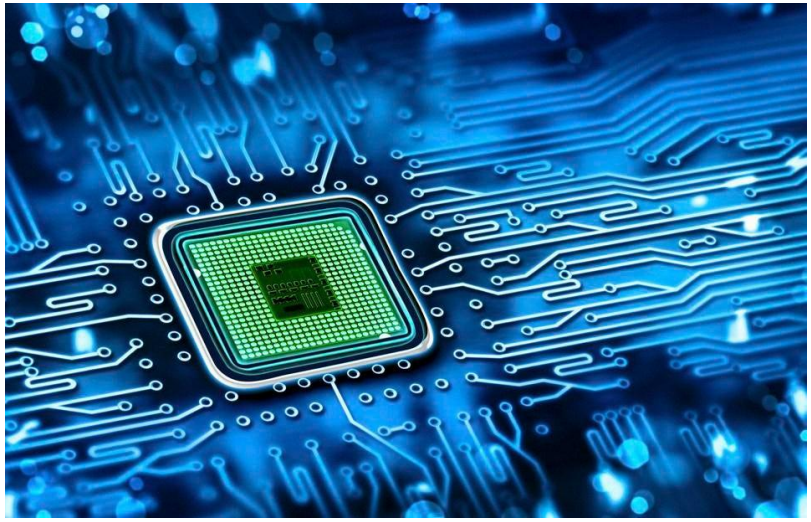
S-PARAMETER REPRESENTATION OF WAVEGUIDE CORNER BENDS



WAVEGUIDE CORNER BENDS

Waveguide bends are used to direct high frequency signals propagating through a waveguide in a specific direction. These bends allow the change in direction of a signal within a waveguide, with minimal loss, reflection and distortion of the electric and magnetic field

BEND: A bend is **a curve or a turn**. The word bend has several other senses as a verb and a noun. If you bend something that is straight, you are forcing it into a curve or an angle.

DEGREE OF BEND: The angle, expressed in number of degrees, to which the bend is formed (e.g., 45 degrees, 90 degrees, 180 degrees). Also called DOB.

WAVEGUIDE CORNER BENDS

A bend (in a road) is a mild deviation from the straight (less than 90 degrees). A corner (in a road) is 90 degrees or less, either turning left or right.

CORNER: the point where converging lines, edges, or sides meet

A bend in a waveguide is a 90 degree turn that distorts either the magnetic or electric field; an E-bend (also known as an “easy” bend) will distort the electric field ,while the H-bend (also known as a “hard” bend) distorts the magnetic field

WAVEGUIDE CORNER BENDS

Waveguide is normally rigid, except for flexible waveguide, and therefore it is often necessary to direct the waveguide in a particular direction. Using waveguide bends and twists it is possible to arrange the waveguide into the positions required.

Types of waveguide bend

There are several ways in which waveguide bends can be accomplished. They may be used according to the applications and the requirements.

- Waveguide E bend
- Waveguide H bend
- Waveguide sharp E bend
- Waveguide sharp H bend

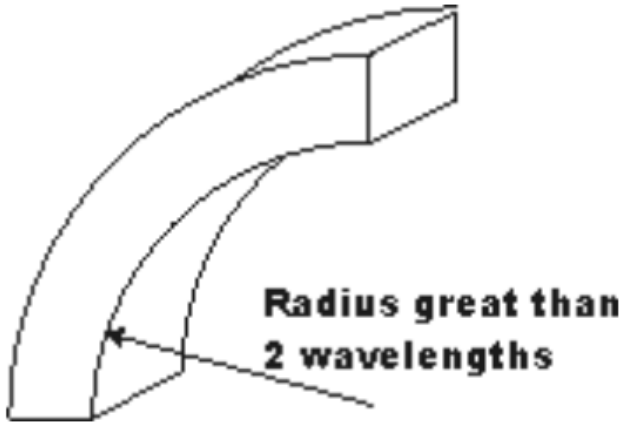
WAVEGUIDE CORNER BENDS

- Each type of bend is achieved in a way that enables the signal to propagate correctly and with the minimum of disruption to the fields and hence to the overall signal.
- Ideally the waveguide should be bent very gradually, but this is normally not viable and therefore specific waveguide bends are used.
- Most proprietary waveguide bends are common angles - 90° waveguide bends are the most common by far.

WAVEGUIDE CORNER BENDS

Waveguide E bend

This form of waveguide bend is called an E bend because it distorts or changes the electric field to enable the waveguide to be bent in the required direction.



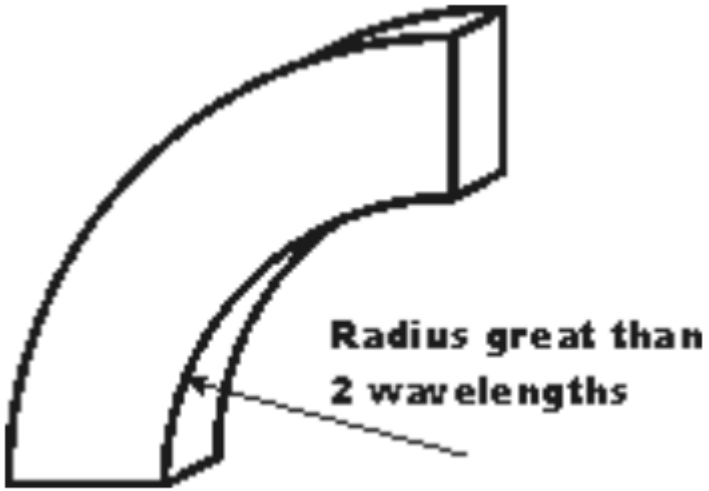
Waveguide E bend

To prevent reflections this waveguide bend must have a radius greater than two wavelengths.

WAVEGUIDE CORNER BENDS

Waveguide H bend

This form of waveguide bend is very similar to the E bend, except that it distorts the H or magnetic field. It creates the bend around the thinner side of the waveguide



Waveguide H bend

As with the E bend, this form of waveguide bend must also have a radius greater than 2 wavelengths to prevent undue reflections and disturbance of the field.

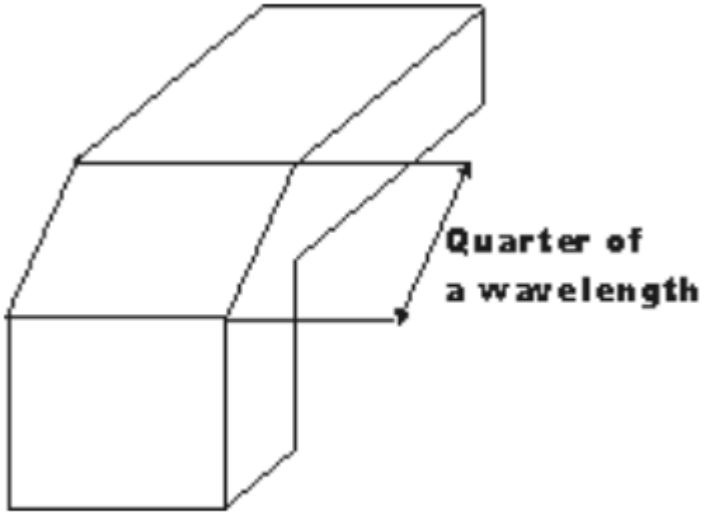
WAVEGUIDE CORNER BENDS

Waveguide sharp E bend

➢In some circumstances a much shorter or sharper bend may be required. This can be accomplished in a slightly different manner. The techniques is to use a 45° bend in the waveguide.

➢Effectively the signal is reflected, and using a 45° surface the reflections occur in such a way that the fields are left undisturbed, although the phase is inverted and in some applications this may need accounting for or correcting.

WAVEGUIDE CORNER BENDS

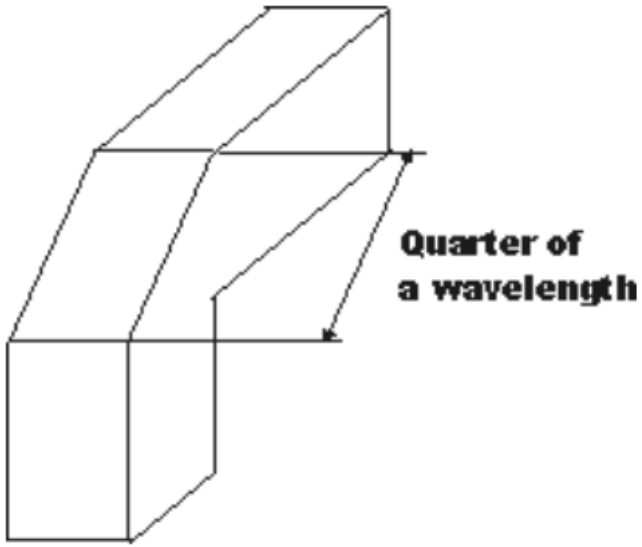


Waveguide sharp E bend

WAVEGUIDE CORNER BENDS

Waveguide sharp H bend

This for of waveguide bend is the same as the sharp E bend, except that the waveguide bend affects the H field rather than the E field.



Waveguide sharp H bend

Thank you