SNS COLLEGE OF TECHNOLOGY

Coimbatore-35
An Autonomous Institution

Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A+' Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

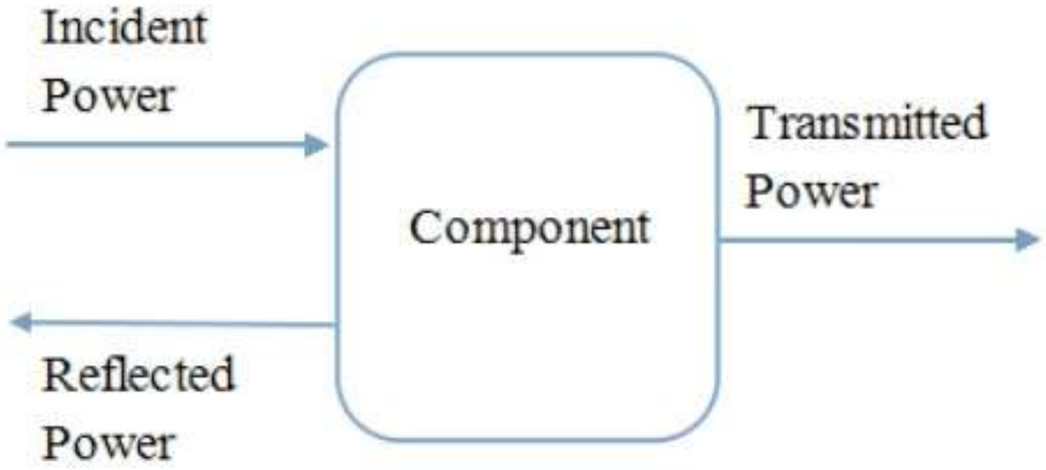
MICROWAVE ENGINEERING

IV YEAR/ VII SEMESTER

UNIT 3 – MICROWAVE MEASUREMENTS

TOPIC– INSERTION LOSS

INSERTION LOSS/ RETURN LOSS



$$\text{Insertion Loss} = \frac{\text{Incident Power}}{\text{Transmitted Power}}$$

$$\text{Return Loss} = \frac{\text{Incident Power}}{\text{Reflected Power}}$$

INCIDENT AND TRANSMITTED POWER

Microwave power is sent down a transmission line from the left and it reaches the component. This power is the *incident power*.

When it reaches the component, a portion is reflected back down the transmission line where it came from and never enters the component.

Rest of the power gets into the component. There some of it gets absorbed and the remainder passes through the component into the transmission line on the other side.

The power that actually comes out of the component is called the *transmitted power*, it is less than the incident power for two reasons: (1) some of the power gets reflected. (2) some of the power gets absorbed inside the component.

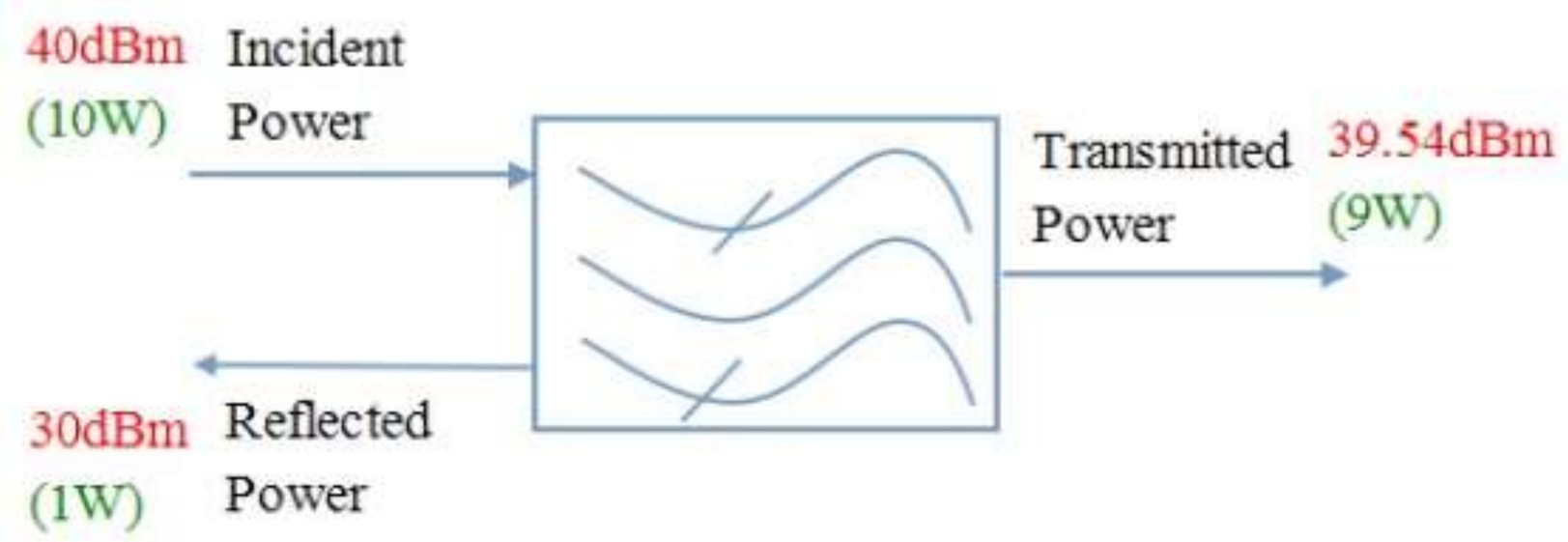
INSERTION LOSS/RETURN LOSS

The ratio of incident power to transmitted power, in dB terminology, is the insertion loss. The ratio of incident power to the reflected power, in dB terminology, is the return loss.

Insertion Loss = 10 * Log (Incident power (W) / Transmitted power (W))
OR **= Incident Power(dBm) – Transmitted Power(dBm)**

Return Loss = 10 * Log (Incident(W) / Reflected power(W))
OR **= Incident power (dBm) – Reflected power (dBm)**

INSERTION LOSS/RETURN LOSS-EXAMPLE



- Insertion Loss = 40dBm – 39.54dBm = 0.46dB
- Return Loss = 40dBm – 30dBm = 10dB

THANK YOU