

FERRITE DEVICE

- Non-metallic materials
- Resistivity 10^{14} times \rightarrow metals
- Dielectric constant 10-15
- Relative permeability of 1000
- Magnetic property similar to ferrous metals
- $\text{MeO} \cdot \text{Fe}_2\text{O}_3$

- Strong magnetic property
- High resistivity used up to 100 GHz
- Non reciprocating property

Ferrite devices

- Gyration
- Isolator
- Circulator

GYRATOR

- Two port device
- Phase difference of 180°
- Circular wave guide
- Circular ferrite rod supported by poly foam
- Tapered at both ends
- Surrounded by permanent Magnet

ISOLATOR

- Two port device
- Variable load
- 45 degree twist(anti clock wise) 45 degree (clockwise) faraday rotation
- Resistive card
- Absorb wave whose plane of polarization is parallel to the plane

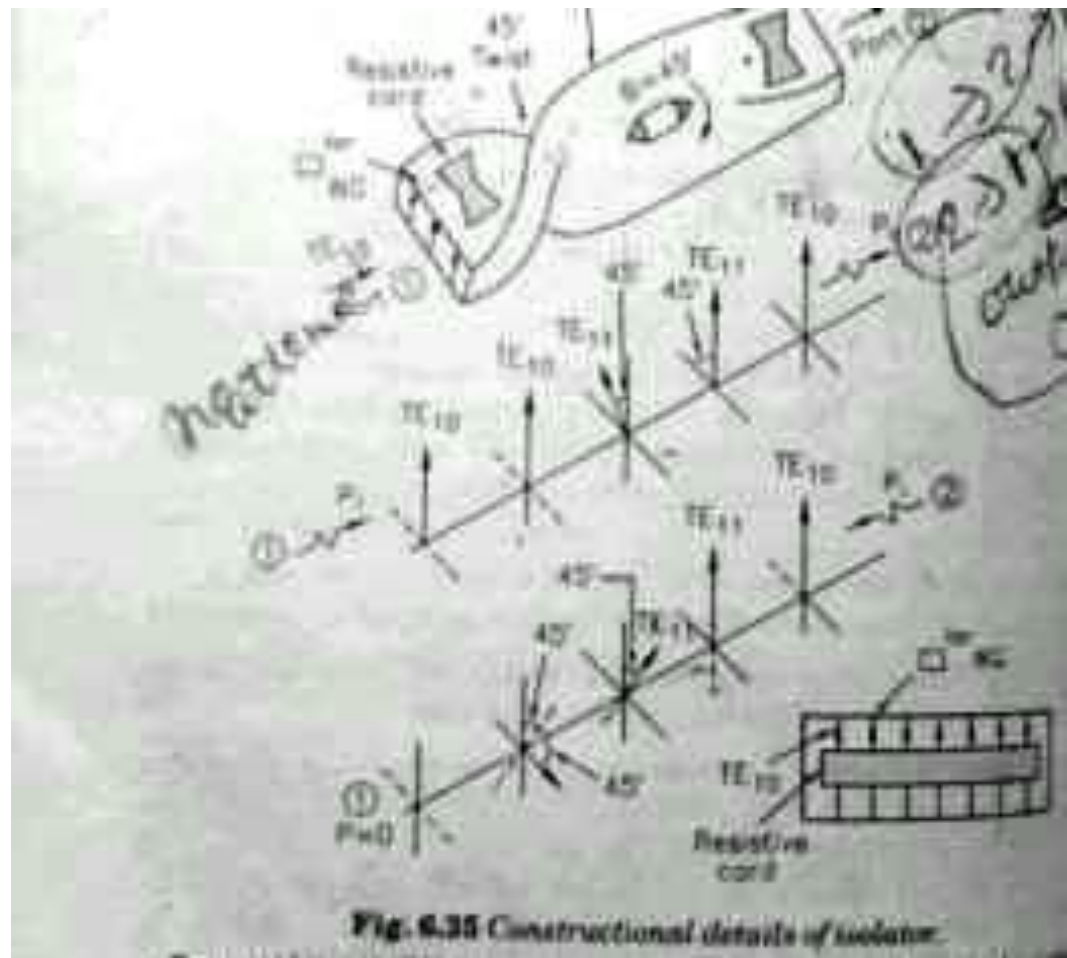
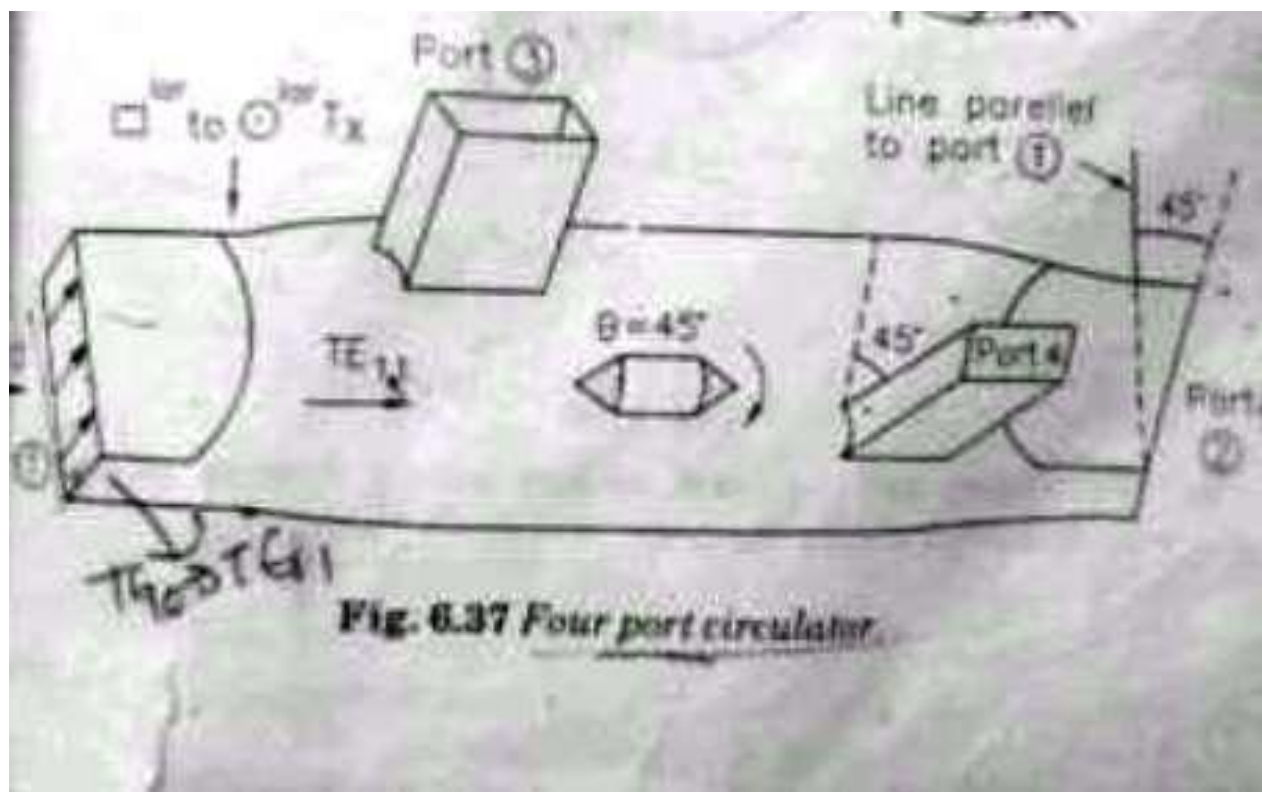


Fig. 6.35 Constructional details of isolator.

Circulator

- Four port device
- Clock wise direction
- Applications in Parametric amplifier, tunnel diode ,duplexer



Application of circulator

- Duplexer
- Low power device

Phase Shifter

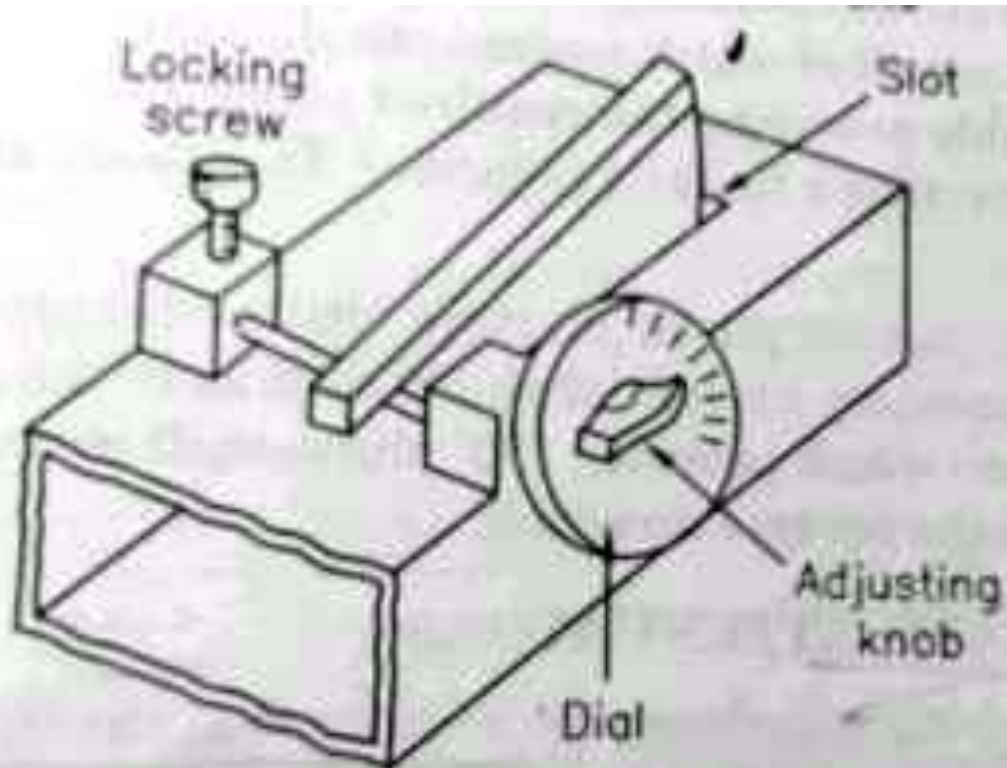
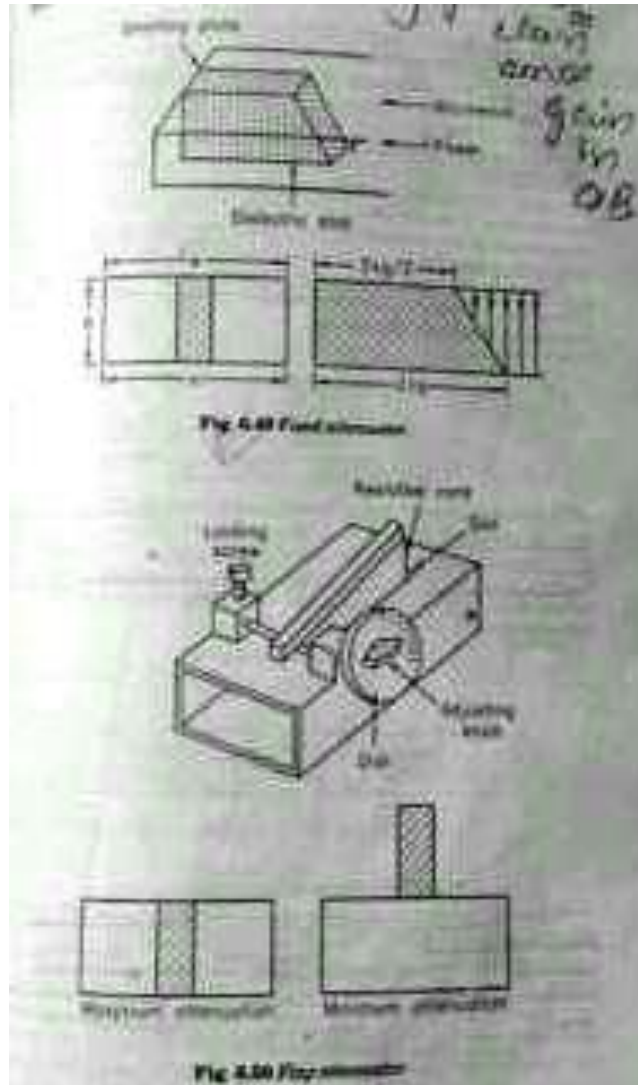
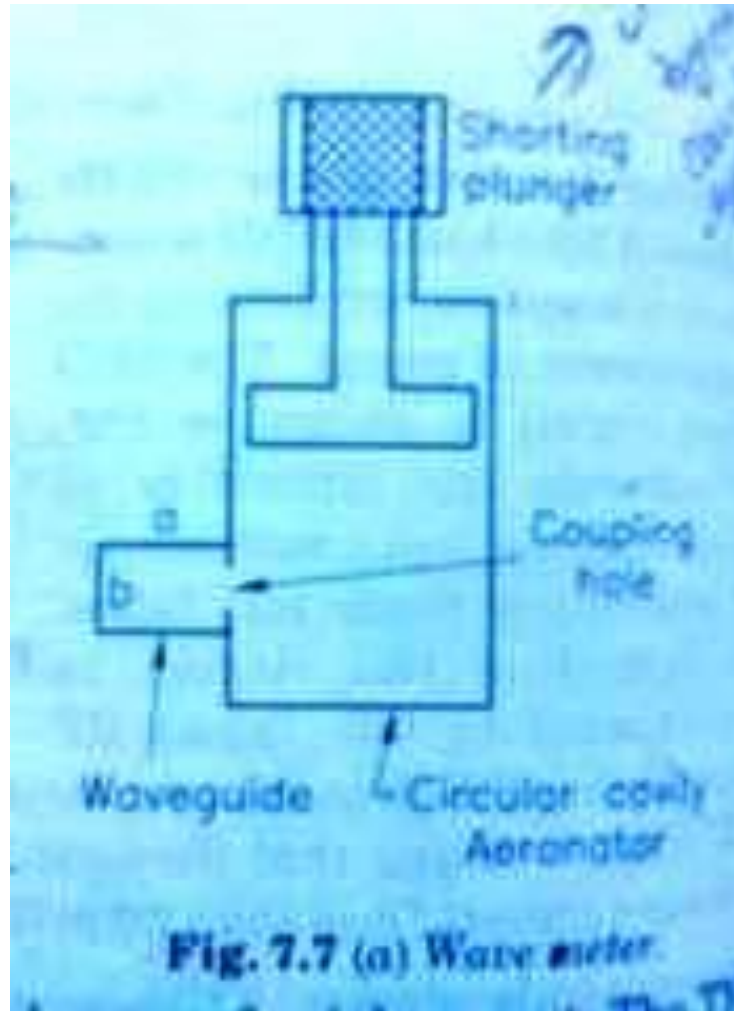


Fig. 6.47 Dielectric vane (variable) phase shifter.

Attenuators



Wave Meter



given by

$$f_0 = \frac{v}{2} \sqrt{\left(\frac{m}{a}\right)^2 + \left(\frac{n}{b}\right)^2 + \left(\frac{p}{d}\right)^2}$$

They should have high effective Q 's for good accuracy

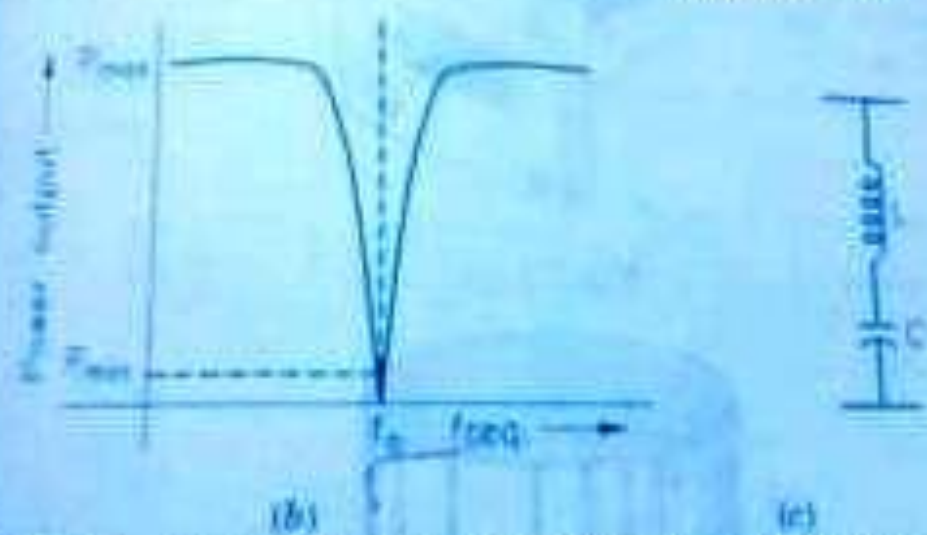


Fig 7.7 Absorption cavity (b) Characteristics, and (c) Analog equivalent

Waveguide Terminators

