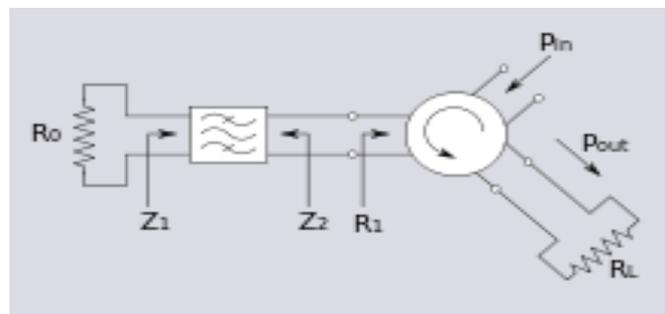


A *reflection amplifier* is a type of microwave amplifier circuit utilizing **negative resistance** diodes such as **tunnel diodes** and **Gunn diodes**. Negative resistance diodes can amplify signals, and often perform better at microwave frequencies than two-port devices. However since the diode is a one-port (two terminal) device, a nonreciprocal component is needed to separate the outgoing amplified signal from the incoming input signal. By using a 3-port circulator with the signal input connected to one port, the biased diode connected to a second, and the output load connected to the third, the output and input can be uncoupled.



Microwave diode reflection amplifier using a circulator

Microwave Transistors and Tunnel Diodes

Microwave solid-state devices are becoming increasingly important at microwave frequencies. These devices can be divided into four groups:

First group:

- Microwave bipolar junction transistor (BJT)
- Hetero junction bipolar transistor (HBT)
- Tunnel diode.

Second group:

- Microwave field effect transistor (FETs)
- Metal – semiconductor field effect transistor

