

ABSTRACT

In telecommunication networks UMTS/3G-WCDMA there are still certain areas that get a weak signal from the BTS both outdoor and indoor conditions, so it certainly can cause disruption and inconvenience to the customers. This can be caused by many things, among others: environmental factors that cause multipath and many obstacle, BTS transmit power limited, a considerable distance so that its signal is weaker when it comes to receivers, and others. Basically repeater consists of two types of passive and active repeaters, the difference is only in the active repeater requires a ration otherwise passive repeater does not need ration. Active repeaters that have been created consisting of several blocks, of which part is Receiver, Transmitter, Power Amplifiers, Coaxial Cables.

In this final project is is designed and realized active repeaters separately, namely the manufacture of the power amplifier and the antenna manufacture, then do union between the antenna and the amplifier power to make an active repeater. For the manufacture of the power amplifier is designed and realized with specifications that can operate at a frequency downlink, ie from 2.110 to 2.117 GHz. When given the power amplifier input power of 0 dBm then penguar capable of producing power at 10 dBm output power or otherwise has strengthened by 10 dB. Dalam power amplifier design used the Advanced Design System 2011 software (ADS 2011) to simulate the power amplifier circuit. Active components used are MMIC (Monolithic Microwave Integrated Circuit) type GALI-74 +. For the antenna is designed and realized Microstrip Patch Antenna Array 1x2 rectangle (two elements).

Tests carried out by measuring repeaters separately and as a whole. Separately, namely the antenna and repeater. For microstrip antenna array antenna using 2x1 rectangular patch obtained a gain of 1.15 dB for each antenna. Then to obtain the power amplifier gain of 15.79 dB. And to strengthen the overall repeater gain of 10.59 dB obtained.

Keywords: Active Repeater, Power Amplifiers, UMTS