ABSTRACT

Power amplifier has an important role to support the Infrastructure of communication system which is as a signal amplifier. Traveling Wave Tube Amplifier (TWTA) is sort of power amplifier that is used in satellite communication system. The limitations power in satellite communication system make TWTA is operated at the point near of saturation to assure the power irradiate maximum. On Saturation, TWTA works at the nonlinear work point which inflicts conversion of AM/AM and AM/PM, where nonlinear effects can cause signal distortion significantly and could influence a performance of system. Hence, it need a linearization technique in order to make the TWTA can reach the linearity.

One of the technique which can be used to make TWTA reaches the linearity is called adaptive digital predistortion in baseband mode technique. this dissertation discusses about the influence of predistortion on the system performance which used digital modulation. Here, the consideration of predistortion influence are based on the change of 16-QAM and 16-PSK modulation type, and the change of IBO (Input Back-off).

Based on the simulation results obtained that the performance of systems with predistortion approach linear channel than the system without predistorsi, At Eb / No 16 dB, for 16-QAM modulation without predistorsi BER value only reached 10^{-1}, wheres with predistortion BER reaches 6.10^{-2}. Similarly, when using 16-PSK modulation the system without predistortion BER value 4.10^{-0} wheres with predistortion BER reaches 2.10^{-2}.

Keyword : *Traveling Wave Tube Amplifier* (TWTA), AM – AM, AM – PM, *nonlinear Linearization*, IBO(*Input Back-off*), BER, Eb/No