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Orthogonal frequency-division multiplexing (OFDM) is an attractive transmission technique for high-bit-rate communication systems. The required transmit power needed for overcoming transmission loss between transmitter and receiver was generated by using HPA (both, the solid state high power amplifier (SSPA) and Travelling Wave Tube Amplifier (TWTA)). The HPA should be linear, however, in reality all the HPAs have nonlinear input-output characteristics which generate nonlinear distortion with respect to the signals envelope fluctuations . This thesis discussed the performance of HPA in PSD, PER and PAPR for both two types of HPA. In the light of the above, was done by the : Design Matlab®/Simulink Model for OFDM transceivers schemes under modulation 64 QAM in AWGN channels with and without HPA. When signal passing through the HPA of the transmitter side , the information signal is subject to various distortions named spectrum broadening effects ,PAPR due to number of sub-carrier which effects BER and constellation wrapping .The effect was reduced by increased the input power back-off. Another technique named companding(μ -law) was used to compress the signal to reduce the effect of PAPR and reducing depend on parameter μ