

ABSTRACT

Nowadays Development of communication requires high data rate and high bandwidth efficiency. Orthogonal Frequency Division Multiplexing Access (OFDMA) is a multicarrier technique that has high efficiency, the advantages of OFDMA is good against frequency selective fading, and not sensitive to delay the signal that has been widely applied in broadband communication technologies, such as Mobile WiMAX. However, OFDMA also has the disadvantage in term of Peak to Average Power Ratio (PAPR). The high value of PAPR will reduce the efficiency of the power amplifier in the system, so that requires a good amplifier. The low peak-to-average power ratio (PAPR) systems have been motivated LTE to adopt single carrier frequency division multiple access (SC-FDMA) as the uplink multiple access scheme to obtain a low PAPR value. In previous studies by Renu Rani and the other, PAPR reduction with a combination of clipping and pulse shaping and reduction of PAPR obtained by 4,9dB.

The technique proposed in this thesis is a combination of clipping and pulse shaping using filters Root Raised Cosine (RRC) with different number of subcarriers and the roll off factor. The main principle of the clipping technique is cutting the signal that entering the amplifier by limiting the amplitude of the input signals clipping with a value (threshold). While the pulse shaping filter is a process of convolution with the filter coefficients depend on a roll off factor.

Reduction PAPR obtained by proposed technique with 1024 subcarrier and 0,6 rolloff factor is 3,4dB. The result of PAPR performance by SC-FDMA system with Clipping and Pulse Shaping Technique was improved PAPR by 0,142dB using 256 subcarrier and 0,1 roll off factor. But in exchange, the value E_b/N_0 to get BER 10^{-4} is increase by 2,8dB.

Keywords: LTE, SC-FDMA, OFDMA, RRC, clipping, pulse shaping filter, subcarrier mapping