

ABSTRACT

Currently, the technology of multicarrier system used by the 4th generation of digital communications system is based on Orthogonal Frequency Division Multiplexing (OFDM). On one hand, this system produces multicarrier signal that is robust in mitigating the destructive effect of frequency – selective fading by dividing a wideband into many small/tiny frequency bands to get a flat fading response. In addition, they are also inherited the orthogonality characteristic that not only protects the system from Inter Symbol Interference (ISI) but by utilizing certain amount of overhead called cyclic prefix also can reduce the impact of Inter Carrier Interference (ICI).

On the other hand, OFDM systems have downsides in emitting a high out of band (OOB) signal and high peak to average power ratio (PAPR). These characteristics are very harmful and so do not suitable in low power and higher data rate environment in the next generation communication systems.

This thesis exploring a system and the impact of filters in reducing the OOB, PAPR and signal received performance by utilizing many types of pulse (which is rectangular pulse in OFDM systems). This system is the more general model of frequency division multiplexing, the GFDM (generalized frequency division multiplexing), will not take the advantage of signal's orthogonality. Otherwise, it will use a type of pulse that has more effective characteristic in both time and frequency domain (time-frequency localization – TFL) to improve the system performance. Three types of filter will be exercised in this simulation i.e. raised cosine, root raised cosine, and Gaussian filter.