ABSTRACT

In 3G system such as CDMA2000 and WCDMA, a handset can transmit multiple channel at different power level to accomodate high data rate. Commonly, if the number of active channel is bigger then the peak-to-average power ratio is increased. High peak-to-average power ratio may saturate the power amplifier, causing higher interference in the adjacent channels and a reduction of system capacity. To minimize this, the amplifier must be designed with larger back-off, which in turn reduces amplifier efficiency and reduces battery life, one of the critical characteristics of the mobile phone.

Modulation scheme used in 2G such as GMSK (Gaussian Minimum Shift Keying) and OQPSK (Offset Quadrature Phase Shift Keying) can minimize peak-to-average power ratio for single channel. But both of them can not be used in 3G system which can transmit multichannel at the same time.

HPSK (Hybrid Phase Shift Keying) also known as OCQPSK (Orthogonal Complex Quadrature Phase Shift Keying) is a variation of complex scrambling that eliminates zero-crossing for every second chip point by using a specific orthogonal code to spread the different channels and a Walsh Rotator. It is expected by using HPSK can reduce peak-to-average power ratio of transmit signal so that the battery life of handset can be maximized.

The simulation results show that system with HPSK have better performance than system without HPSK. It can be seen from BER versus Eb/No graph that system with HPSK give 8.4 dB gains compares with system without HPSK. The simulation results show that system with HPSK have PAPR maximum at 3.5, smaller than system without HPSK which has PAPR maximum at 6. Furthermore, from the CCDF curve it can be seen that HPSK can reduce consumption of power amplifier 9.42 dB less than system without HPSK.