**Comparison between single band and concurrent multi-band linear power amplifiers**

ABSTRACT

Currently the fourth generation of wireless communication system has been commercially implemented. Among many techniques of the fourth generation, carrier aggregation is one of the main techniques to enhance the speed of data transmission. At the physically layer of wireless communication, the design of power amplifiers should also follow the pace which supporting concurrent multi-band signals.

In this thesis, quantitative comparison between parallel single-band PAs and concurrent multi-band PA has shown in the aspects of area, drain efficiency and linearity. Methods of calculating drain efficiency is derived for concurrent multi-band signal of different frequency ratios. Linearity issues has been addressed based on the concepts of harmonic distortion and intermodulation distortion.

Final results of the drain efficiency map versus 2-D frequency ratio is plotted in figures for class A, B and C. Based on the theory of Volterra series, all of the frequency ratios, which contains harmonics or intermodulation products of other bands, are able to be excluded, and marked on the efficiency map