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Performance Analysis of Adjacent Channel Leakage power Ratio depending on RF Components for Multiband Base Station

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Abstract

Future mobile communication systems demanded a carrier aggregation (CA) techniques and a multi-input multi-output (MIMO) transmission system to increase data traffic[1]-[3]. A high linear multiband low-noise amplifier (LNA) is a key component to realize the future systems. This paper analyzes the relationship between the Adjacent Channel Leakage power Ration (ACLR) and performances of the LNA and band pass-filter in an RF front-end. To achieve -30dBc ACLR, for instance, low linear LNA requires -55 dB out of band suppression BPF to achieve the same ACLR. These results provided a design guidance of the receiver on the mobile base station for system designers.

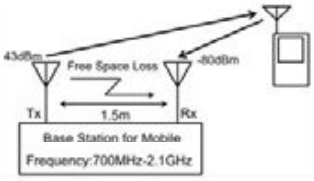


Fig. I System model

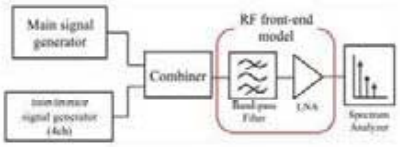
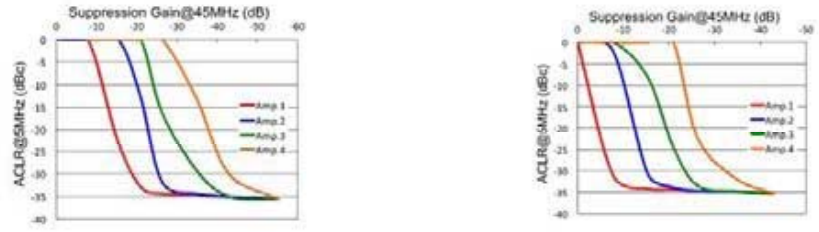


Fig. II Block diagram of Simulation



(a) 700 MHz (b) 2.1 GHz

Fig. III ACLR versus filter performance

Reference

1) R. Ratasuk, D. Tolli, A. Ghosh, "Carrier Aggregation in LTE-Advanced," 2010 IEEE 71st Vehicular Technology Conference, pp. 1-5, May 2010.
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3) P.L. Tsai, K.C.J Lin, W.T. Chen, "Downlink radio resource allocation with Carrier aggregation in MIMO LTE-advanced systems," 2014 IEEE Int. Conf. on Communications (ICC), pp. 10-14, Jun. 2014.