

Abstract: Analysis of Power Consumption for the Minimum Energy per Bit in Wireless System

Heung-Gyoon Ryu and Do-Hoon Kim

*Department of Electronic Engineering, Chungbuk National University, Korea
ecomm@cbu.ac.kr, neon86@nate.com*

Abstract

Wireless Communication and mobile computing devices basically work by battery power. It is very important to calculate and apply the power consumption and furthermore to develop nice feasible techniques for reducing the power consumption of wireless communication devices. RF and analog parts in the mm-wave and EHF frequency domain typically consume more energy compared to the digital parts. So, to design the wireless battery-driven system more power efficiently, we have to investigate the system level energy model for the RF front-end of a wireless transceiver. Also, the effects of the signal bandwidth, PAR, data rate, modulation level, transmission distance, specific attenuation of frequency band, and the signal center frequency on the RF front-end energy consumption and system capacity are considered. Eventually, we analyze the relationship between energy per bit and the data rate with the variation of the system bandwidth so that we can find the minimum energy per bit in the several Gbps data rate.

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