Peak-to-average power ratio in the circuit design of a 20mhz bandwidth of a wireless lan ieee 802.11n

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Abstrak

An important aspect of the Wireless Local Area Network's (WLAN) physical layer design is its Peak-to-Average Power Ratio (PAPR) that has an important role in the power amplifier's linearity and efficiency. This paper analyses the PAPR of IEEE 802.11n standard which has some different packet formats for backward compatibility. PAPR calculation is limited to the Legacy and High Throughput (HT) formats of a 20MHz bandwidth. Calculation results show that a high probability for the maximum PAPR exists in the signal field rather than in the preamble or data fields. Furthermore, the maximum PAPR for the signal field of a Legacy format 802.11n is 29.3dB that appears when the data rate is 6Mbps and data length is 3846 octet. However, the maximum PAPR for the high throughput (HT) format is 35.6dB that is related to a data rate of 6.5Mbps and a data length of 32768 octets. Moreover, the PAPR of the HT-format is 3dB higher than the Legacy format for CCDF 10-2.