Abstract

A two-dimensional (2D) orthogonal frequency division multiplexing (OFDM) system with peak-to-average power ratio (PAPR), a multicarrier system, is an important part of wireless communications engineering. Since these signals divide the bandwidth into other sub channels, so the OFDM signals accomplish high data rates. Although, high peak-to-average power ratio (PAPR) of the transmit signal is a major problem of multicarrier transmission such as orthogonal frequency division multiplexing (OFDM). To make fewer the PAPR values, there are many techniques that have been introduced, including selected mapping and amplitude clipping. The method that produces the least bit-error rate (BER) performance, its method is amplitude clipping and filtering which is the simplest method. And from the other side, SLM although it presents a computational complexity, it is considered the most suitable and distortion less. In this research, a new technique is proposed based on two-dimensional discrete Fourier transform (2D–DFT). In this paper we present a new method that reduces the computational complexities and distortion less compared to the SLM method. The M-PSK mapping types show
from theoretical analysis that the PAPR can be reduced to something like 0.0 dB, as proven
mathematically and by computer simulations.

References

1. Ahmed, M.S., Boussakta, S., Sharif, B.S. and Tsimenidis, C.C. (2011), 'OFDM Based on
Low Complexity Transform to Increase Multipath Resilience and Reduce PAPR', Signal
power ratio of multicarrier modulation by selected mapping', Electronics Letters, 32, 2056-2057.
233-237 vol.231.
sequence set of SLM OFDM scheme for a crest factor reduction', Signal Processing, IEEE
Transactions on, 54, 1931-1935.
Correlation Constraint', Information Theory, IEEE Transactions on, 54, 3330-3339.
multicarrier signal and aperiodic autocorrelation of the generating sequence', Communications
8. Hussain, I.M. and Tasadduq, I.A. (2008), 'PAPR Analysis in OFDM Signals Based on
WiCOM '08. 4th International Conference on, pp. 1-4.
signal in multiple signal representation', in Advanced Communication Technology, 2008. ICACT
2008. 10th International Conference on, pp. 832-834.
Communications Letters, IEEE, 7, 49-51.
OFDM signals with applications to code design', Information Theory, IEEE Transactions on, 52,
992-1006.
12. Litsyn, S. and Yudin, A. (2005), 'Discrete and continuous maxima in multicarrier
13. Muller, S.H. and Huber, J.B. (1997), 'OFDM with reduced peak-to-average power ratio
by optimum combination of partial transmit sequences', Electronics Letters, 33, 368-369.
with low peak-to-average power ratios', Information Theory, IEEE Transactions on, 46,
Science/Engineering/Math.
the PAPR of the MC-CDMA system without complexity', in Communications (APCC), 2011 17th
Asia-Pacific Conference on, pp. 688-691.


Index Terms

Computer Science

Signal Processing

Keywords

2D-DFT; CCDF; Orthogonal frequency division multiplexing modulation; PAPR reduction, SLM technique, complexity.