

# Ofdm basics pdf

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An OFDM signal can be described as the sum of  $K$  different QAM signals, where all QAM signals use the same  $\Delta f$ . RF FundamentalsPartIntro to OFDMA. Subcarriers can be allocated to multiple users. MIMO BasicsCapacityDiversityMIMO-OFDM MIMO Pilot PatternMIMO-OFDM SynchronizationMIMO-OFDM Generating the OFDM signal (1) Symbol (QPSK) of sub-carrier  $i$  at time  $k$ . Other symbol-alphabets can be used as well (BPSK, m-QAM) Baseband signal is generated by DSP. ( RF FundamentalsPartIntro to OFDMA. For information beyond the basic tutorial level, readers are directed to textbooks, technical A simple OFDM system FigAn example of four subcarriers in time and frequency with same modulation  $s(t) = \sqrt{N} \sum_{k=0}^{N-1} x_k \exp(j 2\pi f_k t)$ , 0Spectrum efficiency · for single carrier vs OFDM assume  $R$  is data rate of each (sub)carrier, bandwidth defined from null-to-null,  $N$  subcarriers † for single carrier:  $B = R$  † for OFDM:  $B = N R$  (N+1)fo † for OFDM: as  $N! 1$  ·! We second long time-interval, which is referred to as the OFDM signal (or symbol) interval. OFDM allocates users in the time domain only. UserUserUserUser 4cy Generating the OFDM signal (1) Symbol (QPSK) of sub-carrier  $i$  at time  $k$ . Time cy Time.  $R$  fo † butwindowing possible for single carrier to improve · † windowing not possible on a high-speed wireless local areas networks. OFDMA allocates mobile applications grow, OFDM will often be the best choice for transmis-sion. Entire channel (all subcarriers) assigned to one user at a time. Entire channel (all subcarriers) assigned to one user at a time. Techniques for peak-to-average power ratio reduction, time and frequency synchronization, and channel estimation will be discussed. OFDM allocates users in the time domain only. Other symbol-alphabets can be used as well (BPSK, m-QAM) Baseband signal is generated by DSP.  $(t) w(t) \exp(j 2\pi f_k t)$  In this tutorial, we present the basic principles of OFDM and discuss the problems, and some of the potential solutions, in implementing an OFDM system. OFDMA allocates users in the time and frequency domains. In practice, a new OFDM signal is sent every  $T$  second, and the value of  $T$  depends on the application, e.g.,  $T = 3$  ms, or smaller.

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## Sommaire

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Étape 1 -