

TD INF567

LTE Peak Data Rate

Version: 11 Mar. 2020

1 Introduction

In this TD we give an estimation of LTE downlink peak data rate by counting the available resources in a radio frame and removing resources dedicated to control signalling.

2 Peak data rate estimation

Question 1 *What is the largest signal bandwidth in LTE? What is the corresponding number of Resource Blocks (RB)?*

Question 2 *We assume a normal prefix. How many OFDM symbols are there per slot? Per radio frame? Deduce the number of Resource Elements (RE) per radio frame.*

Question 3 *What is the minimum number of REs used by PDCCH, PCFICH and PHICH?*

Question 4 *How many REs are used by SSS, PSS and PBCH?*

Question 5 *Give an estimation of the protocol overhead due to Reference Signals (RS) for a 4 antenna transmission.*

Question 6 *What is the denser modulation in LTE? What is the maximum number of MIMO parallel flows? What is the duration of a radio frame? Deduce the raw peak data rate?*

Question 7 *We assume a coding rate of $3/4$. Deduce the peak data rate in DL.*

Question 8 *Discuss the validity of the preceding result.*