

ABSTRACT

Long Range (LoRa) technology has advantages in the use of Internet of Things communication, due to the minimum power usage caused by the configuration of Spreading factor, adaptive data rate and the absence of continuous signaling from end devices and base stations. This technology uses the working frequency in the band 8 frequency band used together with 4th generation Long Term Evolution (LTE) technology, 3rd generation Universal Mobile Telecommunication Service (UMTS), and the 2nd generation Global System for Mobile Communications (GSM)

This study analyzes and provides the results of an analysis of the impact of LoRa interference on cellular networks in band 8 which is already above previously it was held and had permission to use frequency regulated by KOMINFO. LoRa network deployment in Indonesia uses the frequency 902-928 MHz. an interference scenario was performed using Monte Carlo modeling with the Spectrum Engineering Advance Monte Carlo Analysis Tools (SEAMCAT) tool.

That the LoRa interference simulation has been carried out on the LTE, UMTS system, and GSM. Co-channel deployment conditions are not possible because LTE, UMTS and GSM performance have decreased. The condition of cellular performance in LTE, UMTS and GSM has increased after being added guard band between LoRa communication with LTE, UMTS and GSM cellular. From the simulation results that have been carried out in the proposed minimum guard band of 3 MHz between cellular communication with LoRa for those close to uplink communication cellular and cellular downlink, guard band is expected to prevent the decline in cellular communication performance in real conditions in the field.

Keywords: *Internet of Things, Probability of Interference, Bitrate Loss, LTE, UMTS, GSM.*