

ABSTRACT

Internet of Things(IoT) has many variants, one of them is Long Range(LoRa) that uses Chirp Spread Spectrum(CSS) to communicate. CSS modulation is development of Frequency Shift Keying(FSK) and could implement the Phase Shift Keying(PSK). The usage of higher level of PSK can improve the data rate because of exploiting bit in symbol transmission. In this research CSS modulation will implement PSK modulation. The PSK modulation that will be used in this research is Binary Phase Shift Keying(BPSK) and Quadrature Phase Shift Keying(QPSK). The purpose is to know the performance of CSS BPSK and CSS QPSK in terms of bit error rate(BER) and data rate. The Scenario of test in this research has variation of data sent and Spreading Factor(SF). The data will be sent is 1 byte, 2 byte, 128 byte, 256 byte. For the SF is 7, 10, 12. The result of this research shows that CSS FSK and CSS BPSK has the highest data rate 4kbit/s and the lowest is 128bit/s. Data rate of CSS QPSK has the highest data rate 8kbit/s and the lowest is 256bit/s. The highest and lowest data rate of CSS FSK and CSS BPSK compared to CSS QPSK has the difference of 4kbit/s and 128bit/s. The cause of the difference is in CSS QPSK 1 symbol contains 2 bit while in CSS FSK and CSS BPSK 1 symbol only contains 1 bit. The average of simulation BER of CSS FSK, CSS BPSK, and CSS QPSK are 0.086309524, 0.025399344, and 0.035217285.

Keyword: *Chirp Spread Spectrum, Binary Phase Shift Keying, Quadrature Phase Shift Keying, Data Rate, Bit Error Rate*

