

ABSTRACT

Ultra Wideband (UWB) is a wireless application technology that has operation frequency within 3.1 GHz – 10.6 GHz and its transmission bandwidth is more than 500 MHz. UWB can be applied in indoor environment with very good performance because the benefit of UWB is providing very high data transmission rate with low transmission power.

In other side, using Orthogonal Frequency Division Multiplexing (OFDM) technique that is very popular in wireless communication with high data-rate that could change frequency selective fading channel into flat fading channel.

To get bandwidth efficiency and durability towards narrowband interference, then multiband OFDM UWB approaching technique can be used. Multiband OFDM UWB divides UWB frequency spectrum into 13 subbands, each subband has bandwidth operation about 528 MHz according to minimum bandwidth that had been decided by FCC. Though indoor channel model named Saleh-Valenzuela is one kind of channel model that has suitable for UWB communication according to IEEE 802.15.3a and Saleh-Valenzuela has 4 channel model (SV1, SV2, SV3, and SV4).

Reed-Solomon (RS) codes is using Forward Error Correction (FEC) technique that can fix and repair burst error. FEC is used for correcting error that established because of noise in indoor communication transmission process. Turbo codes is error correction codes can make small probability of error with low power.

Simulation results show for all Saleh-Valenzuela channel model, SV1 has the best performance from other three channel model in multiband OFDM UWB system with each Reed-Solomon codes and Turbo codes. It can be proven in multiband OFDM UWB simulation for SV1 with the BER 10^{-3} target, Turbo codes $g=[1\ 0\ 1;1\ 1\ 1]$ is resulting gain as much as 3.5 dB and RS(63,43,6) is resulting gain as much as 2.1 dB.

Key Word : Ultra Wideband (UWB), Multiband OFDM, Reed-Solomon codes, Turbo codes, SNR, BER