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Empirical measurement for path loss characteristics at multiple frequency bands from 2.2 to 14.6 GHz in chamber room

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Abstract

Free space path loss (FSPL) is the loss of electromagnetic signal strength. This loss is caused by the line-of-sight path through free space. Even in a line of sight (LoS) indoor single layer, as the distance increases, the path loss in the 1 GHz frequency band also exceeds the free space path loss. This is because the first Fresnel zone is shielded by the floor and ceiling. To improve the measurement results, a fully covered anechoic chamber is used in this empirical measurement. The measurement is based on multiple frequency bands from 2.23201 GHz to 14.685 GHz. This article details how to achieve it. Measurements are made to establish the correlation between the power transmit value and the frequency value. This movement involves the establishment of microwave link transmissions. Use a signal generator to control the transmit power and use a vector network analyzer in the electromagnetic compatibility (EMC) room to measure the received power level. Appropriate analysis that determines the correlation. The logarithm function developed based on the empirical experiment conducted, the result suggested the formulation of $LFS = a - b \ln(x + c)$. These findings enable people to understand the required FSPL value as the power transmission and frequency change during each measurement © This is an open access article under the CC BY-SA license

Author Keywords

Emc chamber; Fspl; Microwave link; Receiver; Transmitter

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