

Suphachoke Weerachawanasak 2014: A Performance Study of Data Broadcasting over Light Emitting Diode Illumination. Master of Engineering (Electrical Engineering), Major Field: Electrical Engineering, Department of Electrical Engineering. Thesis Advisor: Assistant Professor Wachira Chongburee, Ph.D. 79 pages.

This research proposes a method to evaluate the performance of light emitting diode for both illumination and data communication in an office room. The evaluation adopts the uniformity and delay spread as the indicator for illumination performance and data broadcasting performance respectively. The research scope is to compare the performances of using a single light source, 2-light transmitter, 4-light transmitter, 8-light transmitter and 9-light transmitter. The sources are mounted on the ceiling and the optical receiver is placed on a desk with 0.85 meters of height. The reflection calculation takes into account the reflection of wall only. The results show that light from reflection and multiple light sources yield better illuminance performance but poor communication performance. The 4-light transmitter is found to be the best performance because it provides the illuminance and uniformity that meet standard meanwhile maintains the least root mean square delay spread.

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