

**VISIBLE LIGHT COMMUNICATION (VLC) SYSTEM FOR AUDIO
TRANSMISSION**

FINAL PROJECT

Has been submitted in partial fulfillment of the requirements for the
degree of Bachelor in Engineering (*Sarjana Teknik*)

UNIVERSITAS BRAWIJAYA



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APPROVAL SHEET

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“Dedicated with love my lovely mom, Mrs. Siti Khuzaimah, my dearest dad, Mr. Suyudi, My brother, Ahmad Ajibun Novi and Muhammad Sigit Wahyudin...

...to my teachers, lecturers, especially Dr. Sholeh and Dr. Maisara...

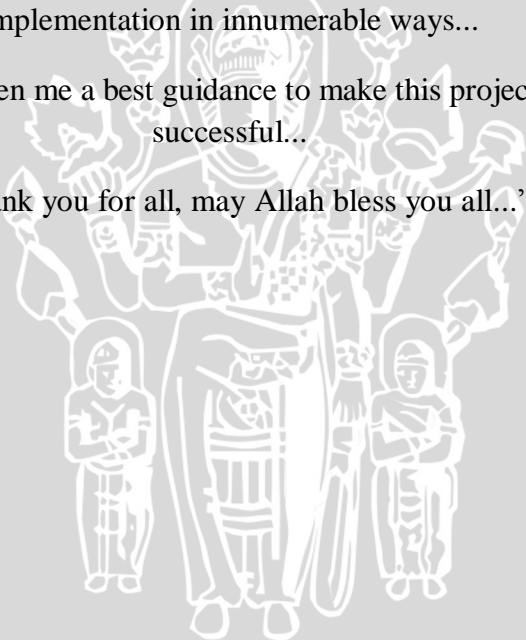
...all my friends, assistant of Telecommunication Laboratory, INVERTER 2011, students of Telecommunication engineering UB 2011, BEB UTHM family and all my seniors...

...special dedication to student mobility, Rezki, Mirza, Surya, Nurrotul, Asai and Akira....

...for their love, attention, endurance, determination and encouragement this project implementation in innumerable ways...

...Thank you for given me a best guidance to make this project become more successful...

...Thank you for all, may Allah bless you all...”

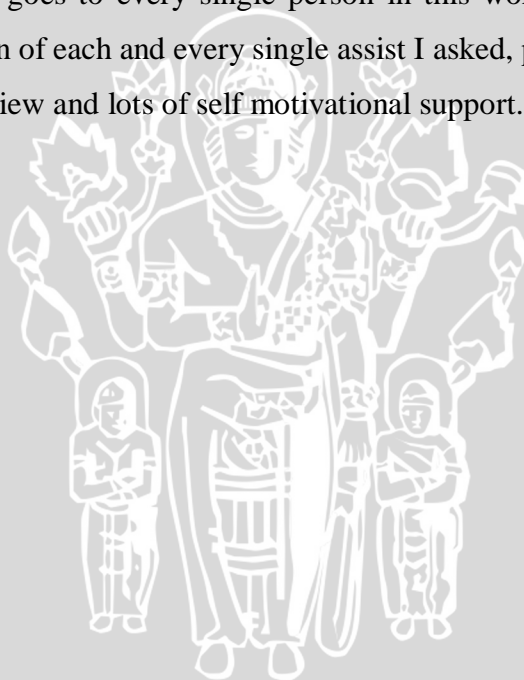


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ABSTRACT

Limited radio frequency spectrum (or bandwidth) is one of the major issues in wireless communication. Visible light communication (VLC) should be considered as the medium for wireless transmission because it has a few advantages over other standard wireless transmissions. The advantages of VLC are low power consumption and can avoid interference occurs. The visible light spectrum have 10,000 times larger than the entire radio frequency spectrum which ranges from 428 THz to 750 THz. In this project the performance of visible light communication have been tested on the variation of distance between transmitter and receiver. Besides that the influence of the additional amplifier at the transmitter and receiver on the VLC system are also been characterized. Based on the results and analysis the implementation of the amplifier circuit at the transmitter and receiver helps to improve the signal quality of the audio signal in the VLC system. However the amplifier also increased the noise in this system. Moreover, the distance between transmitter and receiver can influence the system performance too. The longer the distance means that the signal strength and voltage which has been received by the receiver decreased and cause the optical power loss in the system. As a conclusion this audio transmission in the VLC system are working properly and have been successfully demonstrated. However the maximum of distance between transmitter and receiver is limited to 20 cm. We believe this VLC technology has many potential to be explore and implemented in the next generation access network, in-home network, and transportation network.

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LIST OF ABBREVIATIONS

VLC	-	Visible Light Communication
IC	-	Integrated Circuit
cm	-	Centimeter
Km	-	Kilometer
m	-	Meter
nm	-	Nanometer
OOK	-	On-Off Keying
RF	-	Radio Frequency
THz	-	Tera Hertz
GHz	-	Giga Hertz
MHz	-	Mega Hertz
GND	-	Ground
QAM	-	Quadrature Amplitude Modulation
PSK	-	Phase Shift Keying
PC	-	Personal Computer
LED	-	Light Emitting Diode
MPEG	-	Moving Picture Experts Group

LIST OF APPENDIX

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APPENDIX B	Vishay BPW41N Photodiode Datasheet
APPENDIX C	LM386 Amplifier Datasheet

