SEMICONDUCTOR OPTICAL AMPLIFIER (SOA) FOR PHOTONIC SIGNAL PROCESSING

LATTY SHAZANA BT ISMAIL

SCHOOL OF MICROELECTRONIC ENGINEERING
UNIVERSITI MALAYSIA PERLIS
2011

ACKNOWLEDGEMENT

First of all, I would like to show my gratitude and prayer to Allah S.W.T for awarded me a good health during my final year project period. Without their blessing this project would not be success.

I would like to extend my sincere gratitude to my final year project supervisor Dr Mohamad Halim B Abd. Wahid, for his guidance towards the progress of this thesis. Throughout him has been patiently monitoring my progress and guided me in making the right direction and offering encouragement. Obviously the progress I had now will be uncertain without his assistance.

Most of all, I am very grateful to those who involve directly or indirectly to this final year project and thanks you for willing to spend time with me and giving me a lot of priceless suggestion and knowledge.

Last but not least, special thanks for my parents and friends for their unfulfilling encouragement support they have given me over the years.

APPROVAL AND DECLARATION SHEET

This report titled "Semiconductor optical amplifier (SOA) for photonic signal processing" is prepared and submitted by Latty Shazana Bt Ismail (081030299) and has been found satisfactory in term of scope, quality and presentation as partial fulfillment of the requirement for Bachelor of Engineering (Electronic Engineering) University Malaysia Perlis, (UniMAP).

Checked and Approved by

_____

(Dr Mohamad Halim B Abd Wahid)

Project Supervisor

School of Electronic Engineering

University Malaysia Perlis

May 2011

Semiconductor optical amplifier (SOA) for photonic signal processing.

ABSTRAK

Projek ini memaparkan ciri-ciri penguat optik semikonduktor dalam pemprosesan isyarat fotonik. Data- data yang berdasarkan ciri-ciri yang dianalisis adalah untuk aplikasi yang berpotensi dalam sistem fotonik seperti pensuisan dan penjana isyarat. Dengan menggunakan perisian Optisystem, ciri-ciri SOA dimodelkan dan mensimulasikan dengan memvariasikan parameter yang digunakan dalam SOA seperti arus , gandaan kuasa dan suhu. Kajian ini dapat membantu dalam merancang dan merekacipta aplikasi fotonik. Prestasi litar akan dapat dipertingkatkan dengan menggunakan parameter yang betul dan tepat dalam litar yang direkacipta. Dengan mengeksplorasi ciri-ciri SOA,ianya akan membantu perancang untuk memahami lebih lanjut tentang perilaku litar yang mereka perlukan untuk merekacipta litar menggunakan peranti SOA.

SEMICONDUCTOR OPTICAL AMPLIFIER (SOA) FOR PHOTONIC SIGNAL PROCESSING.

ABSTRACT

This project presents the characteristic of semiconductor optical amplifier in photonic signal processing. The characterization data is analyzed for potential application in photonic systems such as switching and signal generators. Using Optisystem, the characteristic is modeled and simulated by varying the parameter used in SOA such as current, gain and temperature. This characterization model will help in designing the application in photonic. Performance wise will be enhanced by employing correct parameters in the design. By exploring the properties, it will help the designer to understand more on the behavior of the circuit that they need to design using this SOA device.

TABLE OF CONTENTS

CHAPTER 3 METHDODOLOGY & RESULTS

CHAPTER 4: RESULTS & DISCUSSION (SOA CHARACTERIZATION)

CHAPTER 5: RESULTS & DISCUSSION (CSRZ GENERATION)

CHAPTER 6: CONCLUSION

LIST OF FIGURES

LIST OF TABLES

Table **Page**