Gunn Diode Oscillator Minutes

David Headland

2003-11-18 10:00

Attendance

- Fourth year students
  - DP Headland
  - AJ Nelms
  - RE Irwin
  - R Wan
  - JM Higginbotham
  - MP Gaskill

Approvals

- The minutes from the previous meeting were approved.

H Barth paper

- The origin of the maths used on the paper is explained.
- We need to find out why $\lambda_g(f_0) = 3\lambda_g(2f_0)$.
- Citation checks report that this is the start of work into second harmonic power combining oscillators.
- This paper is a good start for the project.

Resonant discs

- If anyone comes across information on resonant discs and their design, let RE Irwin know.
- Formulae describing the disc diameter and thickness are not known, although both parameters affect the resonant frequency of the system containing the disc.

Single diode oscillator design

- Three people is probably more than required.
- A thesis for X-band combining was presented.
- An X-band power combining paper was presented.
- Mathematics for calculating f_{cutoff} were demonstrated.
- A paper showing example dimensions was presented.
- JM Higginbotham will leave the design team and assist RE Irwin with resonant disc design and HFSS simulation.

Testing

- Thursday morning is now not good for Keith Williams.
- DP Headland will email him to arrange a new time.
- Modules for testing are present in the lab.
- All items removed from the lab must be signed out and back in again.

Fields in a waveguide

- Electric and magnetic fields inside a waveguide were drawn by R Sloan.
- The HFSS simulation session for RE Irwin and JM Higginbotham will be organised on Thursday.

Report task split

- Main body deadline moved forwards by one week to 8 December 2003.
- We should ask R Sloan and WS Truscott to check the report before final printing and submission.
- The task assignment was discussed and modified.
- The tasks required to complete the interim report have been assigned as follows:

Executive summary

RE Irwin	Executive summary.

Introduction

AJ Nelms	Aims and objectives.
RE Irwin	Reasons for the project.
MP Gaskill	Sections: Building.
JM Higginbotham	Sections: Simulation.
DP Headland	Sections: Testing.
R Wan	Sections: Research.
All	Basic summary overview paragraph for each chapter. Each section written should have a summary paragraph for this section.
JM Higginbotham	Existing devices.
RE Irwin	Team introduction.

Main Body

R Wan	1: Overview of Gunn diodes.
MP Gaskill	2: Health and Safety.
JM Higginbotham	3: Simulations.
AJ Nelms	4: GaAs vs InP.
RE Irwin	5: Waveguide/Planar circuits.
AJ Nelms	6: Biasing
RE Irwin	7: Harmonic operation.
DP Headland	8: Power combining and injection locking.
JM Higginbotham	9: Thermal requirements.
DP Headland	10: Commercial device testing results and findings.
AJ Nelms	11: Test plan.
MP Gaskill	12: Building a single device oscillator.
JM Higginbotham	13: Conclusion and summary.
Collation only	Appendices: Design requirements, risk assessments, relevant literature.

Summary

DP Headland	Progress against the time plan.
All	Proposed changes to time plan - should be reported as needed by each sub-team.
All	Describe progress of each section and describe any problems observed.

Additional sections

All	Provided references and cite where appropriate.
AJN, DPH	Tests made and findings - raw results.
RW, MPG	Circuits, drawings, etc.
RE Irwin	Block diagram.

CD Appendix

DP Headland	Project plan.
DP Headland	Meeting minutes.
MP Gaskill	Financial accounts.
DP Headland	Presentation slides.

Proposed actions

DP Headland	Provide the format for BibTEX references.
All	Read appendix D in the project guidelines before starting to write report sections.
MP Gaskill	Update the report task split and mail a copy to the group list.
All	Check the documentation task assignment for possible problems for Thursday.
DP Headland	Mail Keith Williams to re-arrange the tutorial for microwave test equipment.
All	Consider appropriate risks for out-of-hours working.

Next meeting

Time Thursday 20 November 2003, 14:00.

Place D floor coffee room.

Meeting adjourned, 11:40.