Gunn Diode Oscillator Minutes

David Headland

2003-10-21 09:00

Attendance

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

Apologies

- RE Irwin

Time plan

- It was decided that a task checklist should be created to be kept updated at UMIST.
- The results from the practical testing of commercial Gunn diode oscillators should be used to help with designing a single Gunn diode oscillator.

Group identity

- Gunn-a-lator was suggested.
  - Combination of the words “Gunn” and “oscillator”.
  - Designed to be catch and grab interest.
  - A corresponding logo was provided.
- The deadline was suggestions was set to Thursday, at which point all suggestions can be presented and a vote taken to choose the name and logo to be adopted.

Research so far

- JM Higginbotham will find various examples of microwave oscillator circuits to discuss at the next meeting with the group members, R Sloan and WS Truscott.
- Waveguide and planar circuit length tuning methods were discussed.
- Power supply parameters were discussed.
  - Variable output between around 5–8 V would be required.
  - Multiple individual variable outputs may be required.
  - The possibility of building or buying was discussed.
  - The facilities of specialised off-the-shelf Gunn diode power supplies are not currently known.
- Data sheets of the Gunn diodes e2v provide are hard to find.
- Previous experiments have shown than the diodes need forward biasing by around 6–8 V.
- Actual biasing requirements have been discovered by trial and error to compensate for slight differences in the diode design and manufacturing processes.
- Synchronisation through phase locked loops and injection locking was discussed.
- Wilkinson power combiners have been used in the past.

Miscellaneous

- A provisional risk assessment for working with microwaves has been drawn up.
- Remote access to IEEE Xplore was discussed.
- The lab session organised by R Sloan will start in E16 at 10:00 this morning.

Proposed actions

All	Continue research into the subjects assigned at the end of last meeting. Summarise any research, including pros, cons and reasoning. Copies should be made available to the rest of the group.	
	JM Higginbotham	Waveguide circuits..
	DP Headland	Phase locked loops and injection locking.
	RE Irwin	Waveguides and microstrips.
	MP Gaskill	Power supplies.
	R Wan	Diode biasing.
	AJ Nelms	GaAs vs. InP.
DP Headland	Update time plan to link commercial testing and the single diode oscillator design.	
All	Provide suggestions for a name, logo and mascot for the team.	

Next meeting

Time	Thursday, 23 October, 14:00
Place	D-floor coffee room

Meeting adjourned, 09:45.