Gunn Diode Oscillator Minutes

David Headland

2003-11-27 14:00

Attendance

- Fourth year students
  - DP Headland
  - RE Irwin
  - R Wan
  - JM Higginbotham
  - MP Gaskill
- UMIST Staff
  - R Sloan [Until 15:50]
  - WS Truscott [From 16:00]

Apologies

- AJ Nelms

Approvals

- The minutes from the previous meeting were approved.

Interim report

- A web site section was suggested in the report handbook.
  - DP Headland will write this section.
  - PHP source can be included as an appendix.
- Block diagrams were discussed.
  - The type is not important.
  - They should provide a simplified view of the project.
  - Project guidelines are not set in stone.
  - If the diagrams suggested don't fit, don't use them.
  - We could use circuit equivalents as block diagrams.
  - They should convey concepts without any great detail.
- Marks will be lost for repetition or contradiction.
- Avoid excessive use of "I" or "we".
- Be consistent with tense.
  - Proposed work should be written in the future tense.
  - Current work can be written in the continuous present tense.
  - Completed work could be written passively.
  - If the passive voice is too complicated, use of "I" or "we" is allowed.
- Referencing was discussed.
  - The Harvard referencing style was clarified.

Manufacture

- Drawings have been submitted to the workshop.
- The work cannot be done immediately.
- January 2004 was set as a provisional target date.

- Some work has already started.
- It is suggested that for time reasons drawings are sent to the supervisors for them to suggest changes to reduce machining time.
- MP Gaskill has some machining experience.
- It was suggested that the waveguide height is reduced to reduce second harmonic modes.

Out of hours working

- Changes were suggested to the risk assessment.
- The new assessment should be printed for supervisor approval.

Testing

- Power measurements were discussed:
  - Waveguide to air transfer is about 90% efficient.
  - Assume 100% efficiency.
  - The aperture size can be calculated.
  - Gain can then be calculated.
  - A book was lent to DP Headland to help with this.
- Spectrum analysis:
  - It was suggested that we look for the fundamental frequency emitted from the waveguide.

Transmission lines

- Z is impedance.
- $Z = R + jX$ (R is resistance, X is reactance).
- Y is admittance.

- $Y = G + jB$ (G is conductance, B is susceptance).
- Transmission lines can be used to transform impedances.

Project specifications

- RE Irwin has mailed Nigel Priestley.
- A copy of the reply has been sent to the mailing list.
- The target frequency has been defined as 82–92 GHz.
- 87 GHz should be used in calculations.
- TBC: Terahertz bayonet connector.

Attenuators

- R Sloan's comments:
  - Need to be ordered from Flann.
  - Rotary vein attenuators would be the best choice, but are expensive.
  - We should organise quotes and present them to the supervisors.
- WS Truscott's comments:
  - We cannot afford attenuators.
  - We should try to arrange to borrow them from e2v.

Project meal

- Nawaab has been contacted.
- Booking will be necessary for groups of over 15 people.
- It has been integrated into the MMD Christmas party.
- Price is £10/head.
- Drinks are extra.

Proposed actions

All	Continue work on the interim report.
JM Higginbotham	Create a block diagram from the simulation.
DP Headland	Locate the diode in e2v's aluminium oscillator.
R Wan	Finish design drawings.
DP Headland	Update the report task split.
MP Gaskill	Create a block diagram for the fabrication process.
RE Irwin	Contact T York regarding the report format.

Next meeting

Time	Tuesday 2 December 2003, 10:00.
Place	D floor coffee room.

Meeting adjourned, 16:55.