Gunn Diode Oscillator Minutes

David Headland

2003-11-25 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.

Bias choke operation

- Equivalent circuits have been found.
- Work should be started on the values by Thursday.
- More research was undertaken.
- Comparisons with transmission lines have been made.
- Waveguide impedance is normally measured rather than calculated.
- May want a transmission lines section in the report.

Waveguide design

- Design finished.
- Drawings have been created.
- Design team will go to the workshop and discuss fabrication.
- The bias choke hole can be drilled later to any size.
- The heating problem was discussed.
  - Water cooling should be used to cool the waveguide.
  - De-ionised water should be used to avoid corrosion.
  - A risk assessment for water cooling needs to be drawn up.
- Alignment holes were discussed for attachment to other devices.
- Dimensions for the holes are in the Flann catalogue.

Interim report

- After section 5, add a new section:
  - Title: "Radial line transformers".
  - Author: JM Higginbotham.
  - Length: approximately 3 pages.
- A glossary should be added as an appendix.
- Everyone should provide relevant entries for the glossary.
- The content of the report sections was discussed.
- R Wan will now be the author for the progress against the time plan section.
- We should check with the supervisors about what sort of block diagrams to include in the report.

Waveguide machining

- Machining facilities for the waveguide were discussed.
- It's unlikely that a waveguide could be manufactured before December.
- January or February is probably the earliest target.

Out of hours working

- Put the security phone number on the risk assessment.
- Point out that there is an internal phone in A19b.

Power supply

- An emitter follower stage was suggested for oscillations at DC.
- It was suggested that switched mode supplies are not used.
- It would be good to have a stop voltage set on the PSU.
- The is a possibility of using microprocessors to control multiple outputs on the power supply.
- Uses for the microprocessor should be considered.

Formal presentation

- Week 14 is available for full-time project work.
- Changes can be made to the presentation during this time.
- Some time should be used for rehearsals.
- Major changes and additions should be made in advance.

Device testing

- Tests to be performed were discussed.
  - Frequency vs. bias voltage.
  - Power output.
  - Phase noise.
- The function of a vector network analyser should be established.
- Further tests should be conducted to draw a full hysteresis loop for a Gunn diode.

Proposed actions

AJN, DPH	Continue testing the current oscillators.
All	Continue work on the interim report.
JM Higginbotham	Read the microwave bible.
RE Irwin	Contact the Narwab restaurant.
MPG, JMH, RW	Discuss fabrication with Roy Moody.
RE Irwin	Mail e2v with request for more Gunn diodes and power supply queries.
DP Headland	Modify and print the out-of-hours working risk assessment.

Next meeting

Time	Thursday 27 November 2003, 14:00.
Place	D floor coffee room.

Meeting adjourned, 11:11.