

# Gunn Diode Oscillator Minutes

David Headland

2004-02-12 10:00

## Attendance

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

## Approvals

- The minutes from the previous meeting were approved.

## Waveguide manufacture

- MP Gaskill called P Norton last Friday as requested.
- P Norton had not spoken to N Priestley at that point.
- It was suggested that we not bother with water cooling.
- A standard heatsink from RS was suggested for cooling.

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- The position of the diode within the waveguide can alter useable RF power by  $\pm 10$  mW.
  - P Norton called MP Gaskill back on Wednesday.
  - They don't think our design will work because of backshort problems.
  - Suggestions were made for improvement:
    - Split the backshort away from the main waveguide.
    - Make up about four backshorts to test them.
    - Use circular backshorts.
  - Drawings are being produced to be sent to e2v tomorrow.
  - Shims could be used for adjusting the waveguide length.
  - 0.5 mm was suggested as a good shim thickness.
  - We will ask e2v to make the shims along with the waveguide.
  - Tolerances have been changed to 0.02 instead of the BS 0.05.
  - We could build the waveguide in section to test with 2, 3 and 4 diodes.
  - A single section could also be built for the final design.

## **Elected positions**

- A vote was taken on whether to change any of the elected positions.
- It was unanimously decided that they should remain as they are:

Manager: RE Irwin.

Auditor: MP Gaskill.

Secretary: DP Headland.

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## Power supply

- Power supply issues were discussed.
- We may not need to individually bias each diode, but we will not know until tests have been performed.
- Required features were discussed:
  - A maximum voltage limiter. This can be constant across all outputs.
  - Current limitation is not required.
  - Small would be preferable.
  - Digital control would be nice for smooth adjustments, but not required.

## Time planning

- Points to consider were listed.
- A time plan check should be added to all future agendas before the “any other business” section.
- The manager is responsible for checking status with the plan.
- A new time plan was developed for this semester.

## Simulation

- JM Higginbotham has been progressing.
- New waveguide dimensions were discussed for simulation.
- All members were invited for a demonstration if required.
- It was suggested that at some point in the future, we present our findings and methods internally to help give an understanding of the “big picture” to the whole group.

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## Proposed actions

MP Gaskill	Complete waveguide drawings and send to e2v and JM Higginbotham.
RE Irwin	Chase up the supervisors for feedback.
JM Higginbotham	Ask R Sloan to clarify waveguide dimensions.
RE Irwin	Measure e2v's power combining waveguide oscillator.
R Wan	Check MP Gaskill's calculations on the waveguide drawings.
RE Irwin	Look into re-claiming cash for the report binding (£8.08).
JM Higginbotham	Continue working on the simulation with R Sloan where required.
DP Headland	Research hot electron injection.
R Wan	Look into voltage references set digitally.
AJ Nelms	Research power supply circuits.

## Next meeting

Time Thursday 19 February 2004, 10:00.

Place D floor coffee room.

Meeting adjourned, 12:18.