# Gunn Diode Oscillator Minutes

David Headland

2003-09-30 09:00

## Attendance

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

## Project assignment

The project members met initially and were provided with a copy of the project title.

## Assignment of roles

The following positions have been provisionally appointed within the project team:

Manager RE Irwin

Auditor MP Gaskill

Secretary DP Headland

## Summary of discussions

- Description of the project: to produce a power source using Gunn diodes. They are known to be efficient for frequencies less than 10 GHz, but as frequency increases heat becomes a major problem. Parallel usage is a possibility, but positioning is not trivial.
- Types of resonant circuit with inductance and capacitance
  - Wave guide circuits.
  - Planar microstrip circuits. These will be preferential for mass production due to lower manufacturing costs.
- Suggestion of starting at lower frequencies, to get a working model, then scaling the model to work at higher frequencies.
- Information on the industrial collaborator: Nigel Priestley, e2v Technologies, Lincoln. A site visit will be made during reading week, by which time a good background in the subject is required.
- Major project areas:
  - Heat and heat dissipation.
  - EM fields, modelling and simulation.
  - Power supply, as each diode may require different voltages, which optimum values varying for different power outputs. Sequential starting may be advantages with multiple diodes.

## Objectives

DP Headland Create two mailing lists, one for the project students only, and one for the students, project directors and industrial collaborator.

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| All | Read journal articles from the list below, along with any other relevant material. Summarise important findings and report back to the group at the next meeting | |
| | AJ Nelms | IEEE Transactions on Microwave Theory and Techniques, v38, n1, January 1990, pp 86-7. |
| | R Wan | Semiconductor Science and Technology, v14, n5, May 1999, pp 19-20. |
| | RE Irwin | Journal of Applied Physics, v39, n8, 15 April 2003, pp 4836-42. |
| | DP Headland | IEEE Transactions on Microwave Theory and Techniques, v48, n4, pt2, April 2000, pp 626-31. |
| | MP Gaskill | Solid-State Electronics, v36, n11, November 1993, pp 1547-55. |
| | JM Higginbotham | IEEE Transactions on Microwave Theory and Techniques, v39, n6, June 1991, pp 1000-9. |

## Next meeting

Time Thursday, 2 October 2003, 14:00

Place D-floor coffee room

Meeting adjourned, 11:50.