Staff Name: Shane Todd

Lab/Prog/Dept: NanoE/GaN

HOD: Patrick Lo

Appraisal Period: Jan to Dec 2012

Project/Assignment Name	RO for this Project	Expected End Date of Project	% time spent on Project
GaN-on-Si MOCVD growth	Patrick Lo	30-Dec-12	20
GaN-on-Si HEMT process development	Patrick Lo	30-Aug-12	20
GaN-on-Si device modelling and PDK	Patrick Lo	30-Jun-13	20
Rolls Royce GaN feasiblity study	Patrick Lo	30-Jul-12	20
Huawei Characterization project	Patrick Lo	30-Jul-12	20

Key Deliverables (descriptive only) for 2012	Progress on Deliverables
- Complete installation of GaN-on-Si MOCVD system - Complete GaN-on-Si MOCVD growth on 200 mm substrates - Develop CMOS compatible GaN-on-Si HEMT	- working with facilities hook-up contractor and Veeco to complete MOCVD installation - will start growth experiments in Aug 12
- Develop process for CMOS compatible GaN HEMT devices	- Process development underway, completed GaN etching, and different shortloops for module development
- Characterize active and passive devices fabricated from NTU - Develop device models from characterization data - Implement device models into process design kit (PDK) - Design millimeter wave power amplifier circuit using PDK	- currently characterizing NTU devices
- submit paper which studies technical and market feasiblity of using GaN transistors in power electronic applications - Complete circuit simulations of power inverters which compare tje performance of GaN transistor power switches versus Si and SiC transistor power switches	- feasiblity paper submitted to Rolls Royce - first iterations of thermal and circuit simulations complete - first iteration of thermal cooling design complete
- Complete DC characterization measurements of MOSFET transistors - Complete RF measurements and models of Balun devices - Complete load pull measurements of cascode circuit	- Characterization of MOSFET transistors mostly complete - measurements of balun devices mostly complete need to take 2-port measurements and create models - load pull measurements not started yet

Prestigious Journals (1st Author) Published	Prestigious Journals (1st Author) Accepted	Prestigious Conference (1st Author) Published	Prestigious Conference (1st Author) Accepted	Local Conference (1st Author) Published	Local Conference (1st Author) Accepted
1	1	1	1	1	1
1	1	1	1	1	1

IP (1st Inventor) Disclosed	IP (1st Inventor) Filed	No of PhD Student Attachments
1	1	1
1	1	1