

Visit to Veeco Laboratory in Somerset, New Jersey, USA for Training on Veeco k465i and Fabrication of 200 mm GaN-on-Si Demo Wafers

Work Project Proposal:

From 02 Jan 12 to 13 Jan 12, Shane Todd will visit the Veeco facility in Somerset, New Jersey, USA to complete training on the Veeco k465i MOCVD tool while also aiding Veeco process engineers to grow approximately 45 demo wafers with specific epitaxial layers provided by IME on 200 mm wafers. Veeco's top growth engineers are based in Somerset, so this will be an opportunity to get the best tool training possible, while learning know-how techniques through direct observation of the growth runs of GaN on 200 mm silicon. Veeco has also stated that they will not directly transfer the best known method recipes to our tool, rather we will copy the recipe details first hand during our visit to Somerset. The first week will be a combination of classroom and laboratory training, with some process runs thrown in also. The second week will be completely dedicated to process runs of the demo wafers. Shane will be allowed to aid in tool operation under Veeco supervision so that best know-how transfer is achieved.

Ensuring the demo wafers are fabricated correctly is essential because we will use these wafers in the first device integrations of the GaN-on-Si power electronics program.

Objectives:

- 1) Receive training on Veeco k465i system GaN-on-Si
- 2) Receive detailed recipes for GaN-on-Si HEMT and LED structures (in-person training is the method that Veeco has specified for best known method recipe transfer)
- 3) Ensure that ~45x200 mm demo wafers with epitaxial growth layers are grown and delivered properly to IME

Benefits:

- 1) Hands on training from Veeco's top MOCVD growth experts
- 2) Face-to-face contact with Veeco technical staff, establish relationship with engineers who will help us in collaboration between IME and Veeco
- 3) Ensure that the demo wafers are grown with the exact specifications that we want
- 4) Ensure that time is properly utilized so that all of the demo wafers are grown as promised
- 5) Get first hand know-how from working with MOCVD engineers and observing how they process wafers through the tool

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From 02 Jan 12 to 13 Jan 12, Shane Todd will visit the Veeco facility in Somerset, New Jersey, USA to complete training on the Veeco k465i MOCVD tool while also aiding Veeco process engineers to grow approximately 50 demo wafers with specific epitaxial layers provided by IME on 200 mm wafers. Veeco's top growth engineers are based in Somerset, so this will be an opportunity to get the best tool training possible, while learning know-how techniques through direct observation of the growth runs of GaN on 200 mm silicon. Veeco has also stated that they will not directly transfer the best known method recipes to our tool, rather we will copy the recipe details first hand during our visit to Somerset. The first week will be a combination of classroom and laboratory training, with some process runs thrown in also. The second week will be completely dedicated to process runs of the demo wafers. Shane will be allowed to aid in tool operation under Veeco supervision so that best know-how transfer is achieved.

Ensuring the demo wafers are fabricated correctly is essential because we will use these wafers in the first device integrations of the GaN-on-Si power electronics program. Having these GaN-on-Si wafers before the MOCVD tool is installed will give us probably a three-six month head start on process development for GaN-on-Si transistors.

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- 1) Receive training on Veeco k465i system GaN-on-Si
- 2) Receive detailed recipes for GaN-on-Si HEMT and LED structures (in-person training is the method that Veeco has specified for best known method recipe transfer)
- 3) Ensure that ~50x200 mm demo wafers with epitaxial growth layers are grown and delivered properly to IME

Benefits:

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- 2) Face-to-face contact with Veeco technical staff, establish relationship with engineers who will help us in collaboration between IME and Veeco
- 3) Ensure that the demo wafers are grown with the exact specifications that we want
- 4) Ensure that time is properly utilized so that all of the demo wafers are grown as promised
- 5) Get first hand know-how from working with MOCVD engineers and observing how they process wafers through the tool