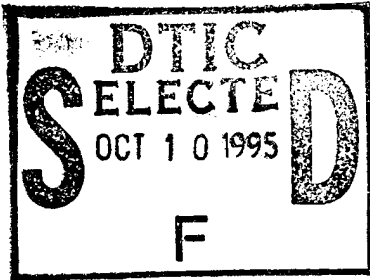


**Complementary 2-D MESFET for  
Low Power Electronics**



**Interim Report # 6**

**Air Force SBIR Phase I  
Contract Number: F33615-95-C-1679**

**September 28, 1995**

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**Complementary 2-D MESFET for Low Power Electronics  
(AirForce SBIR Contract F33615-95-C-1679)**

**Phase I Interim Report #6**

As detailed in the Phase I proposal, the project has four major tasks. These are 1) assessment of the p-channel 2-D MESFET device fabrication, 2) development of a p-channel 2-D MESFET model and implementation of the model into AIM-SPICE, 3) circuit simulations of complementary 2-D MESFET circuits using AIM-SPICE and comparison with conventional circuits, and, 4) analysis of manufacturability and technology insertion issues. This report summarizes progress in each task area through 28 SEP 95.

**Task 1: Assessment of p-Channel Device Fabrication**

The assessment of the p-channel 2-D MESFET device fabrication is underway. A heterostructure wafer was obtained from an MBE vendor and device fabrication is now getting under way using an ADT maskset used previously for n-channel devices. A second wafer has been obtained from Vitesse Semiconductor Corporation and will be used for diagnostic purposes (contacts to p-type GaAs). Device data will be presented in the next report.

**Task 2: Development of p-Channel 2-D MESFET Model**

The p-channel 2-D MESFET model has been implemented into AIM-Spice for simulation of p-channel 2-D MESFET *I-V* characteristics as well as complementary 2-D MESFET logic circuits (see previous reports). Once device data is available, the model parameters will be updated to better predict p-channel characteristics.

**Task 3: Complementary 2-D MESFET Circuit Simulations**

Preliminary circuit simulations of complementary 2-D MESFET circuits have been performed (see last report) and more extensive simulations will be conducted using the model revised as per the data to be obtained in the coming weeks.

**Task 4: Manufacturability and Technology Insertion Issues**

This task will be summarized in the Final Report.

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