AIR UNIVERSITY	**Department of Electrical and Computer Engineering**
	Subject: Linear Integrated Circuit Design
	LAB # 3 Device characteristics of an PMOS.

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Objective: To observe various graphs of PMOS transistor

LAB ASSESSMENT:

Attributes	Excellent (5)	Good (4)	Average (3)	Satisfactory (2)	Unsatisfactory (1)
Ability to Conduct Experiment					
Ability to assimilate the results					
Effective use of lab equipment and follows the lab safety rules					

Total Marks: 15 Obtained Marks : _____

LAB REPORT ASSESSMENT:

Attributes	Excellent (5)	Good (4)	Average (3)	Satisfactory (2)	Unsatisfactory (1)
Data presentation					
Experimental results					
Conclusion					

Total Marks: 15 Obtained Marks: _____

Date: _____ Signature: _____

Title:

- Device characteristics of an PMOS.

Equipment:

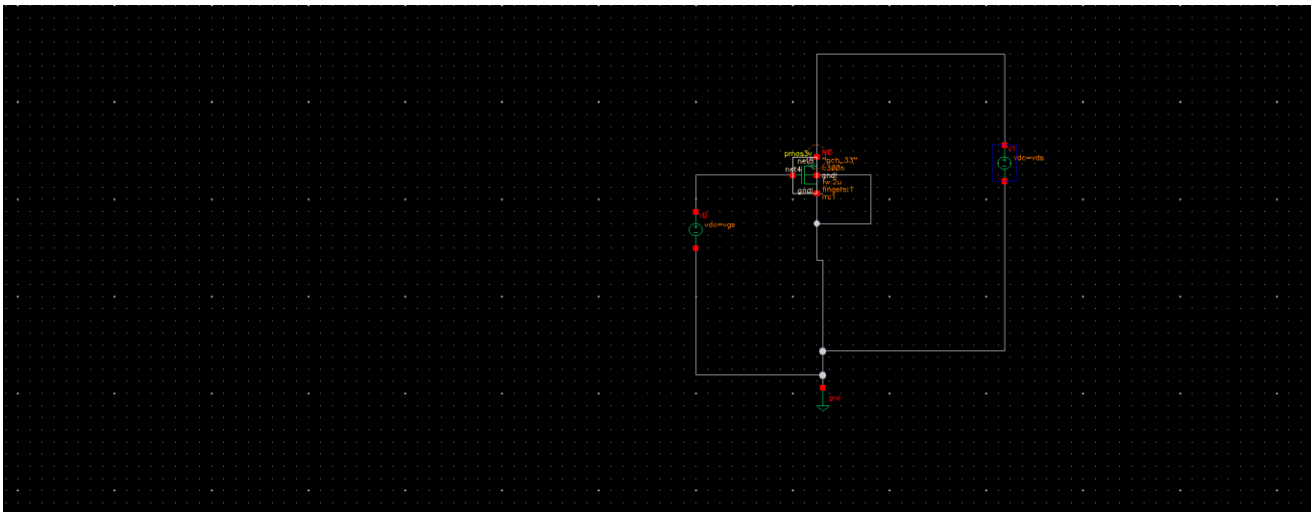
- Personal Computer
- VMware software
- Cadence Virtuoso

Introduction

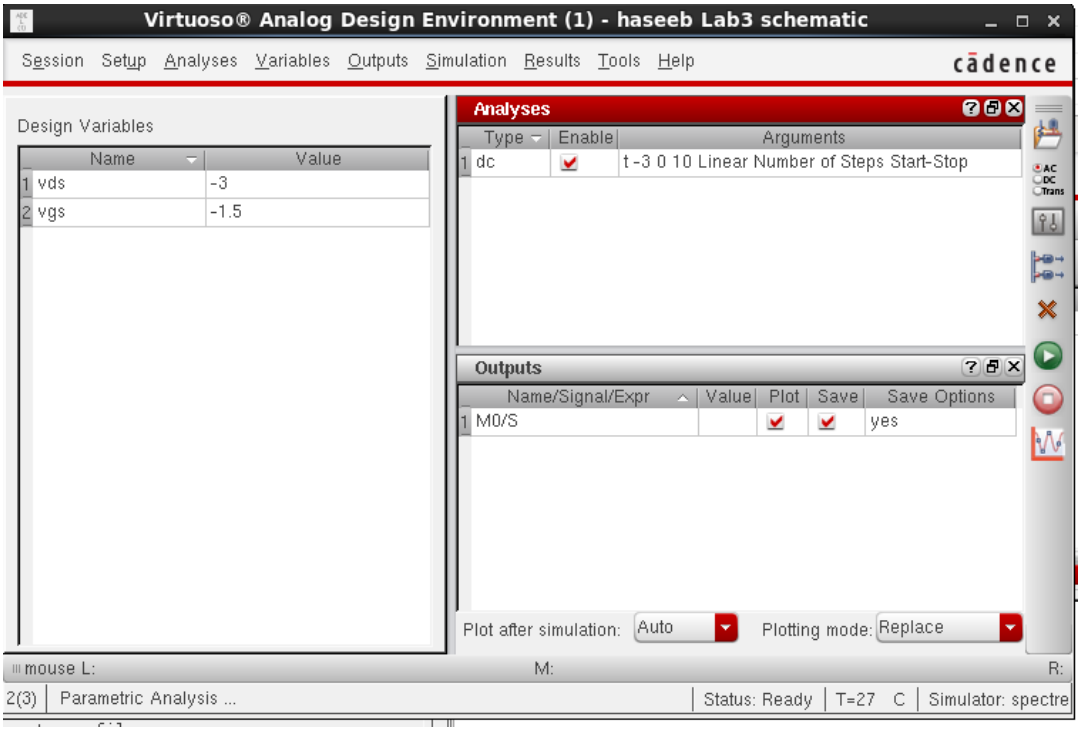
In this lab we will study about the characteristics of an PMOS transistor by obtaining various graphs between various variables and observe the region of operations.

Lab Task

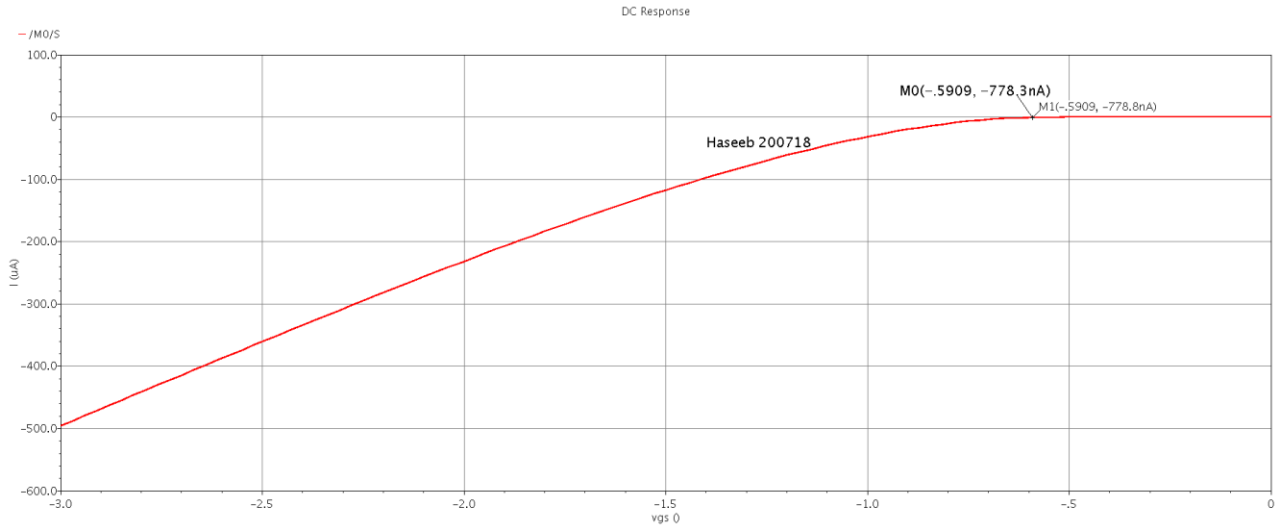
Below is the circuit which is designed on Cadence virtuoso to observe Pmos characteristics:



Click Ade L and select the following settings

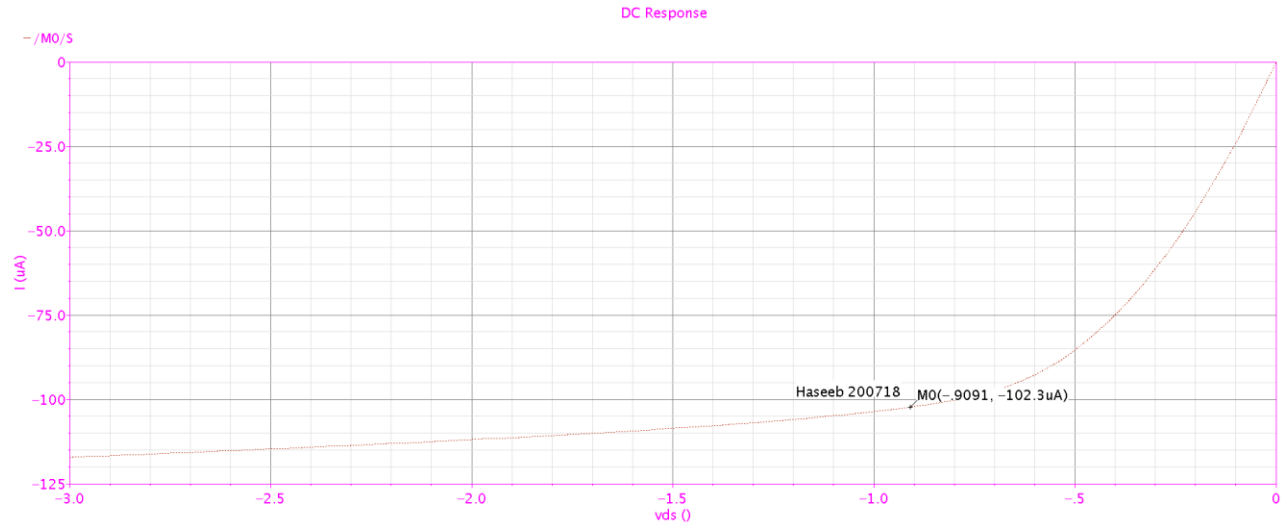


Click on run to get the following graph:



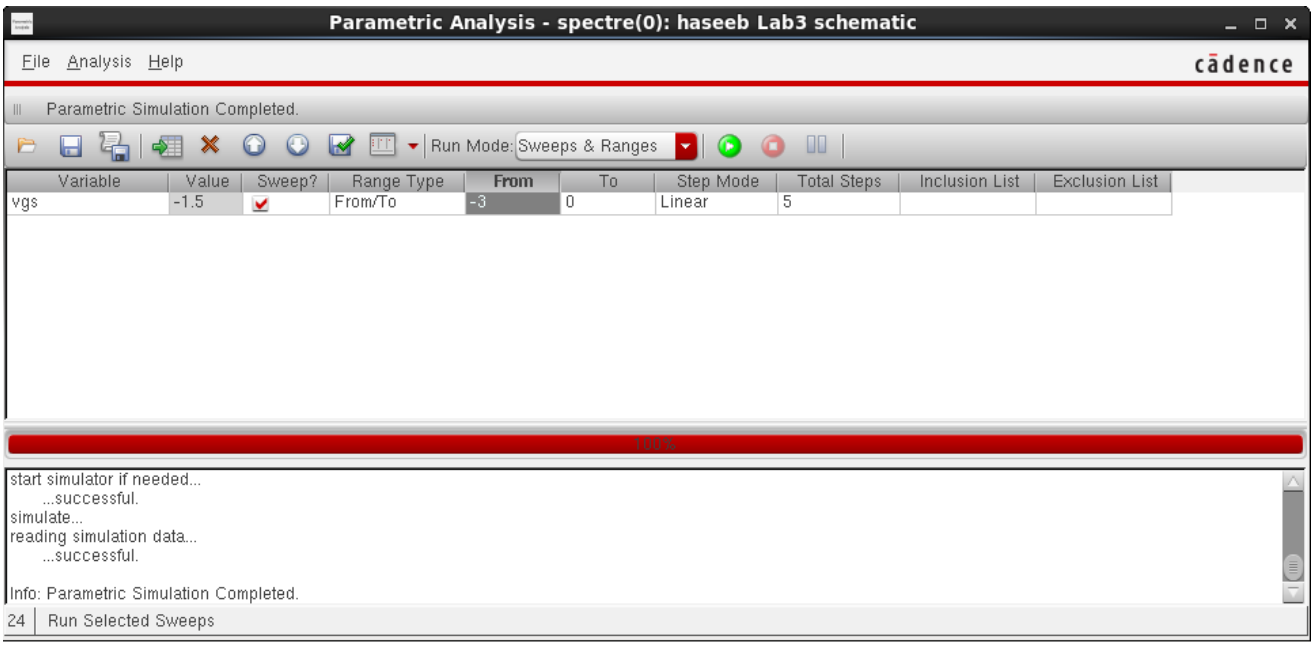
Graph Explanation: The labelled point on this graph is the threshold voltage VTH. The variable on x-axis is vgs and after its absolute value reaches VTH the transister goes into saturation mode and before that it remains in cutoff mode.

Now we will plot the drain current with the drain to source voltage. For this change the design variable to vds in the analysis window and then click on Run.

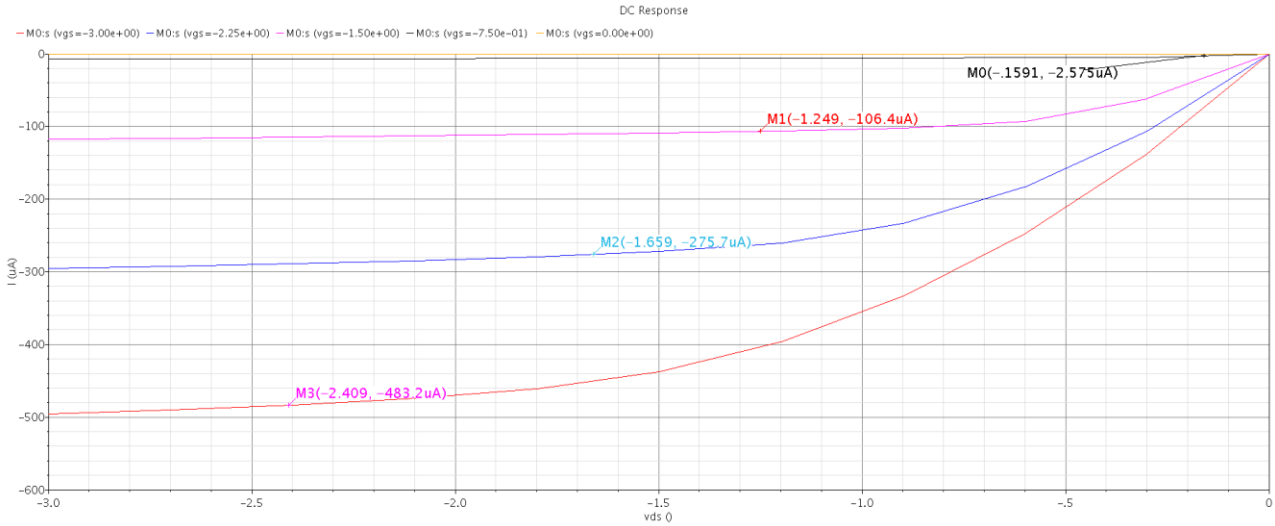


Graph Explanation: The labeled point is the subtraction of threshold voltage from the vgs voltage(1.5v).In the graph the transistor before this point is in triode mode and after this point it is in saturation mode.

Now go to Parametric Analaysis under tools and set the following settings:

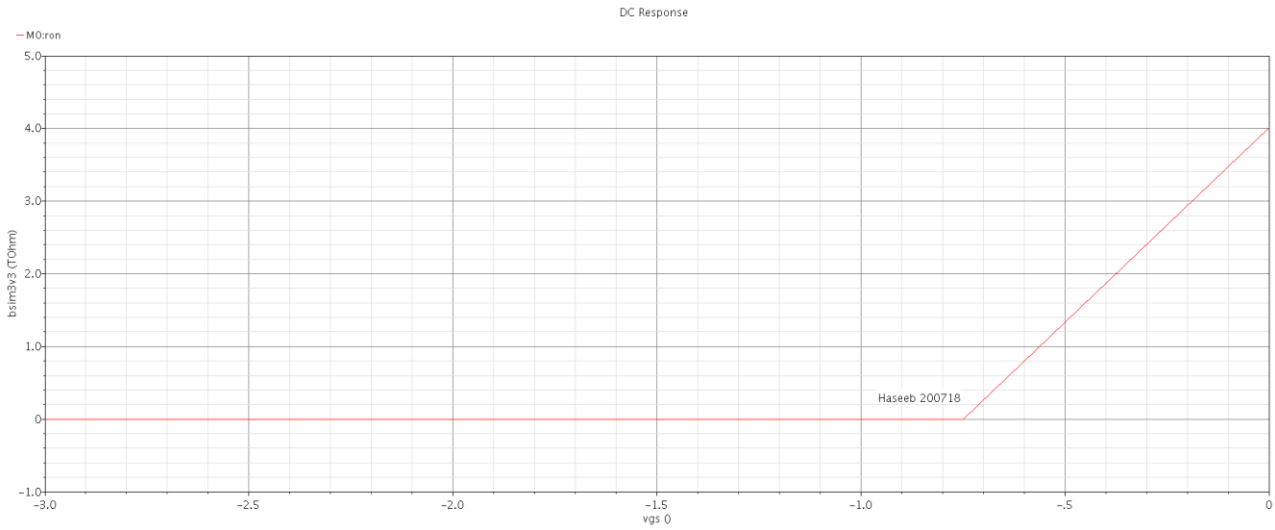


The following graph is obtained:



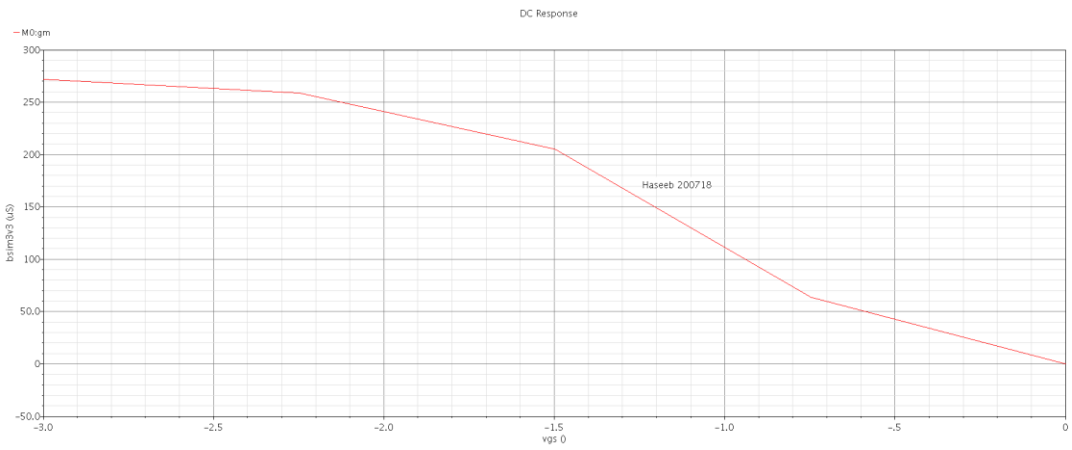
Graph Explanation: In parametric analysis we give a range of gate to source voltages Vgs from -3 to 0 volts.We will again subtract the threshold voltage Vth from all these different vgs voltages to get the points on the graph.

On the same analysis window go to dcopt-info and select Ron:



Graph Explanation: When the graph reaches the straight line is enters in Deep triode region which is achieved when Vds becomes less the 2 times overdrive voltage.(|Vds|<<2|Vov|)

Now we will plot the graph with gm on y axis and Vgs on X axis:



Graph Explanation: Gm = Slope of current

CONCLUSION

In this lab we studied different graphs related to Pmos characteristics.We also Plotted graphs against current of |Vds| and |Vgs| and then calculated points and labeled them which determine the different regions of the mode of operation of the transistor.