Full-Custom Layout

Professor : J.-F. Li

TA : C.–H. Wu

Environment Setting



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Create Library



Create Library (cont.)

After enter the library name



Create Library (cont.)



Create Cell_View



Create Cell_View (cont.)

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Environment

• Introduction of the option environment



Environment (cont.)



Environment (cont.)

• Options->Display



Inverter Layout

• Practice goal:

- Understand the layout option environment
- Accomplish a inverter circuit layout
- Content:
 - Virtuoso Layout Editor
 - Inverter Layout implement
 - Calibre
 - DRC
 - LVS



• 先畫出 PMOS and NMOS



• 將兩個MOS的drain端用metal連接



• 在MOS的source端分別加上vdd和gnd的DIFF層



• 呼叫tech. file內部原有的cell來使用

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● 加上PIMP、NIMP和NWELL層



• 在vdd、gnd和輸入輸出點打上label



• 打上label後的結果



• Inverter layout的完成圖



• Calibre DRC驗證(1)

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• Calibre DRC驗證(2): CM35P5_4M.23a.2



• Calibre DRC驗證(3)



• Calibre DRC驗證(4)

當error發生,點選message可 highlight layout之錯誤處



 Calibre LVS (Layout versus schematic) 驗證(1): cali035pMM5V_2P4M.lvs



• Calibre LVS驗證(2)



• 用於LVS驗證的spice檔 (schematic轉出)



• Calibre LVS驗證(3)



• Calibre LVS驗證(4)

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• Calibre LVS驗證(5)



• Run PEX (1): 轉出post-simulation的spice檔



• Run PEX (2)

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• Run PEX (3)

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Nand2 Layout

• Practice goal:

- Learn layout technologies
- Accomplish a nand2 logic circuit layout
- Content:
 - Layout Editor
 - Instance cell
 - Nand2 Layout implement



Nand2 Layout (1/8)

▶ 先畫出 PMOS and NMOS



Nand2 Layout (2/8)

• 將MOS的gate端相連接





Nand2 Layout (3/8)

• 將並聯的MOS相連接(學習並聯的技巧)



Nand2 Layout (4/8)

• 在MOS的source端分別加上vdd和gnd的DIFF層



Nand2 Layout (5/8)

● 加上PIMP、NIMP層



Nand2 Layout (6/8)

• Instance已畫好的layout使用



Nand2 Layout (7/8)

• 利用Ctrl+f、Shift+f來切換symbol的圖示



Nand2 Layout (8/8)

• 將個別電路的vdd、gnd相連接



Schematic

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• 將已完成的cell存成cell_view,供日後呼叫



將schematic轉出spice檔



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