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Taipei

2016 7.14

跨界整合 翻轉設計

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# Layout流程新思維：設計規範的制定與套用

Mika Ho/ Graser

14 / July / 2016

# Topic

- OrCAD ® Capture-Allegro® Flow
- Constraint Setting from OrCAD Capture
  - 透過SigXplorer來取得合理的Constraint數值
- GraserWARE – CM Import
  - Constraint Manager in v17.2
  - Flow of CM Import
  - CM Prepare
  - CM Import

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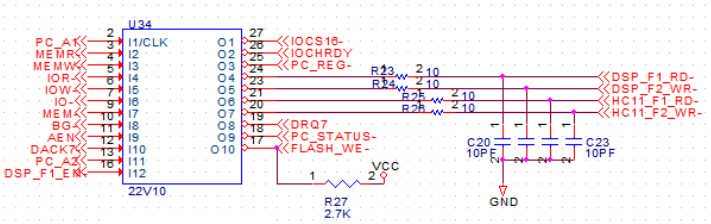
# OrCAD Capture-Allegro Flow

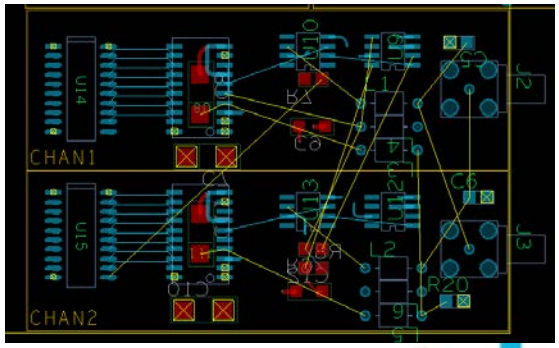
# OrCAD Capture-Allegro Flow

- 設計概念透過OrCAD® Capture將電路圖完成之後，能夠透過PCB，尤其能在設計端繪製線路圖的轉Netlist將連線關係導入Allegro ® 當下對設計定義相關的設計規範(Set Properties)，對於提升Layout的正確性及效率是很有幫助的。




Capture

Netlist
(With Properties)




Allegro

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# OrCAD Capture-Allegro Flow

- 使用OrCAD® Capture定義設計規範，在透過Netlist轉入Allegro® 後即能在Constraint Manager中看到相關的設定，Layout人員也因此能迅速開始佈線工作，節省了設定Properties並且能夠提高設定時的正確性。

| | | PROPAGATION_DELAY |
|---|---|---|
| 1 | VD0 | R19.2:U3.2:8000 mil:8500 mil:VD0.T.1:C16.1:8000 mil:8500 mil:VD0.T.1:R19.2:8000 mil:8500 mil:VD0.T.1:U1.J4:8000 mil:8500 mil:VD0.T.1:U14.2:8000 mil:8500 mil:VD0.T.1:U15.2:8000 |
| 2 | VD1 | VD1.T.1:C20.1:8000 mil:8500 mil:VD1.T.1:R18.2:8000 mil:8500 mil:VD1.T.1:U1.J5:8000 mil:8500 mil:VD1.T.1:U14.3:8000 mil:8500 mil:VD1.T.1:U15.3:8000 mil:8500 mil:VD1.T.1:U3.3:800 |
| 3 | VD2 | VD2.T.1:C15.1:8000 mil:8500 mil:VD2.T.1:R17.2:8000 mil:8500 mil:VD2.T.1:U1.J6:8000 mil:8500 mil:VD2.T.1:U14.4:8000 mil:8500 mil:VD2.T.1:U15.4:8000 mil:8500 mil:VD2.T.1:U3.4:800 |
| 4 | VD3 | VD3.T.1:C19.1:8000 mil:8500 mil:VD3.T.1:R15.2:8000 mil:8500 mil:VD3.T.1:U1.J7:8000 mil:8500 mil:VD3.T.1:U14.5:8000 mil:8500 mil:VD3.T.1:U15.5:8000 mil:8500 mil:VD3.T.1:U3.5:800 |
| 5 | VD4 | VD4.T.1:C14.1:8000 mil:8500 mil:VD4.T.1:R16.2:8000 mil:8500 mil:VD4.T.1:U1.H7:8000 mil:8500 mil:VD4.T.1:U14.6:8000 mil:8500 mil:VD4.T.1:U15.6:8000 mil:8500 mil:VD4.T.1:U3.6:800 |
| 6 | VD5 | VD5.T.1:C18.1:8000 mil:8500 mil:VD5.T.1:R14.2:8000 mil:8500 mil:VD5.T.1:U1.H6:8000 mil:8500 mil:VD5.T.1:U14.7:8000 mil:8500 mil:VD5.T.1:U15.7:8000 mil:8500 mil:VD5.T.1:U3.7:800 |
| 7 | VD6 | VD6.T.1:C13.1:8000 mil:8500 mil:VD6.T.1:R12.2:8000 mil:8500 mil:VD6.T.1:U1.H5:8000 mil:8500 mil:VD6.T.1:U14.8:8000 mil:8500 mil:VD6.T.1:U15.8:8000 mil:8500 mil:VD6.T.1:U3.8:800 |
| 8 | VD7 | VD7.T.1:C17.1:8000 mil:8500 mil:VD7.T.1:R13.2:8000 mil:8500 mil:VD7.T.1:U1.H4:8000 mil:8500 mil:VD7.T.1:U14.9:8000 mil:8500 mil:VD7.T.1:U15.9:8000 mil:8500 mil:VD7.T.1:U3.9:800 |

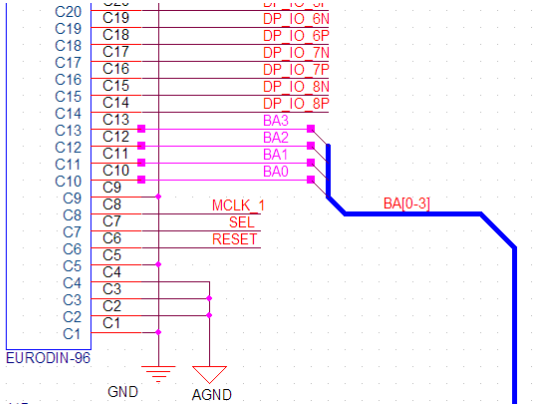
(In Capture)

(In Allegro CM)

| Type | Objects | Referenced Electrical CSet | Prop Delay | | | Prop Delay | | |
|---|---|---|---|---|---|---|---|---|
| | | | Min ns | Actual | Margin | Max ns | Actual | Margin |
| * | * | * | * | * | * | * | * | * |
| XNet | ⊟ VD0 | | | | -7608 MIL | | | 5977 MIL |
| PPr | R19.2:U3.2 | | 8000.00 MIL | 1636 MIL | -6364 MIL | 8500.00 MIL | 1636 MIL | 6864 MIL |
| PPr | VD0.T.1:C16.1 | | 8000.00 MIL | 2203 MIL | -5797 MIL | 8500.00 MIL | 2203 MIL | 6297 MIL |
| PPr | VD0.T.1:R19.2 | | 8000.00 MIL | 2028 MIL | -5972 MIL | 8500.00 MIL | 2028 MIL | 6472 MIL |
| PPr | VD0.T.1:U1.J4 | | 8000.00 MIL | 2523 MIL | -5477 MIL | 8500.00 MIL | 2523 MIL | 5977 MIL |
| PPr | VD0.T.1:U3.2 | | 8000.00 MIL | 392 MIL | -7608 MIL | 8500.00 MIL | 392 MIL | 8108 MIL |
| PPr | VD0.T.1:U14.2 | | 8000.00 MIL | 802 MIL | -7198 MIL | 8500.00 MIL | 802 MIL | 7698 MIL |
| PPr | VD0.T.1:U15.2 | | 8000.00 MIL | 1577 MIL | -6423 MIL | 8500.00 MIL | 1577 MIL | 6923 MIL |
| XNet | ⊟ VD1 | | | | -7558 MIL | | | 5977 MIL |
| PPr | VD1.T.1:C20.1 | | 8000.00 MIL | 2403 MIL | -5597 MIL | 8500.00 MIL | 2403 MIL | 6097 MIL |
| PPr | VD1.T.1:R18.2 | | 8000.00 MIL | 1878 MIL | -6122 MIL | 8500.00 MIL | 1878 MIL | 6622 MIL |
| PPr | VD1.T.1:U1.J5 | | 8000.00 MIL | 2523 MIL | -5477 MIL | 8500.00 MIL | 2523 MIL | 5977 MIL |
| PPr | VD1.T.1:U3.3 | | 8000.00 MIL | 442 MIL | -7558 MIL | 8500.00 MIL | 442 MIL | 8058 MIL |
| PPr | VD1.T.1:U14.3 | | 8000.00 MIL | 802 MIL | -7198 MIL | 8500.00 MIL | 802 MIL | 7698 MIL |
| PPr | VD1.T.1:U15.3 | | 8000.00 MIL | 1577 MIL | -6423 MIL | 8500.00 MIL | 1577 MIL | 6923 MIL |
| XNet | ⊟ VD2 | | | | -7508 MIL | | | 5897 MIL |
| PPr | VD2.T.1:C15.1 | | 8000.00 MIL | 2603 MIL | -5397 MIL | 8500.00 MIL | 2603 MIL | 5897 MIL |
| PPr | VD2.T.1:R17.2 | | 8000.00 MIL | 2153 MIL | -5847 MIL | 8500.00 MIL | 2153 MIL | 6347 MIL |
| PPr | VD2.T.1:U1.J6 | | 8000.00 MIL | 2523 MIL | -5477 MIL | 8500.00 MIL | 2523 MIL | 5977 MIL |
| PPr | VD2.T.1:U3.4 | | 8000.00 MIL | 492 MIL | -7508 MIL | 8500.00 MIL | 492 MIL | 8008 MIL |
| PPr | VD2.T.1:U14.4 | | 8000.00 MIL | 802 MIL | -7198 MIL | 8500.00 MIL | 802 MIL | 7698 MIL |
| PPr | VD2.T.1:U15.4 | | 8000.00 MIL | 1577 MIL | -6423 MIL | 8500.00 MIL | 1577 MIL | 6923 MIL |
| XNet | ⊞ VD3 | | | | -7458 MIL | | | 5697 MIL |
| XNet | ⊞ VD4 | | | | -7408 MIL | | | 5497 MIL |
| XNet | ⊞ VD5 | | | | -7333 MIL | | | 5272 MIL |
| XNet | ⊞ VD6 | | | | -7258 MIL | | | 5047 MIL |
| XNet | ⊞ VD7 | | | | -7183 MIL | | | 4822 MIL |

# OrCAD Capture-Allegro Flow

## OrCAD® Capture



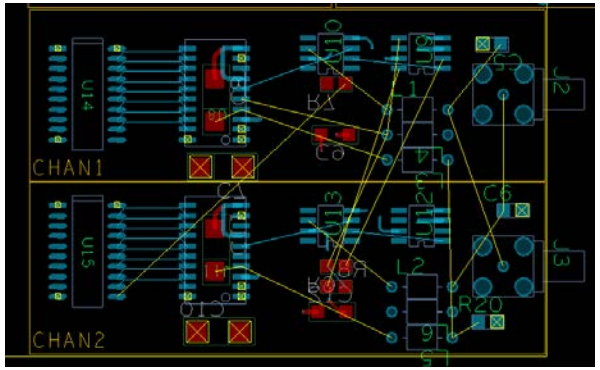

| | | RELATIVE_PROPAGATION_DELAY |
|---|---|---|
| 1 | BA0 | MATCH1:G:AD:AR:0:25.00 MIL |
| 2 | BA1 | MATCH1:G:AD:AR:0:25.00 MIL |
| 3 | BA2 | MATCH1:G:AD:AR:0:25.00 MIL |
| 4 | BA3 | MATCH1:G:AD:AR:0:25.00 MIL |

**Netlist**

**Properties**

**Back Annotate**

## Allegro®




| Type | Objects | Relative Delay | | | |
|---|---|---|---|---|---|
| | | Delta:Tolerance | Actual | Margin | +/- |
| | | mil | | | |
| * | * | * | * | * | * |
| Dsn | DfM_MakeCAP_Po | | | 125 MIL | |
| MGrp | MATCH1 (4) | 0.00 MIL:25.00 MIL | | 125 MIL | |
| Net | BA0 | 0.00 MIL:25.00 MIL | | | |
| Net | BA1 | 0.00 MIL:25.00 MIL | 50 MIL | 25 MIL | |
| Net | BA2 | 0.00 MIL:25.00 MIL | 100 MIL | 75 MIL | |
| Net | BA3 | 0.00 MIL:25.00 MIL | 150 MIL | 125 MIL | |

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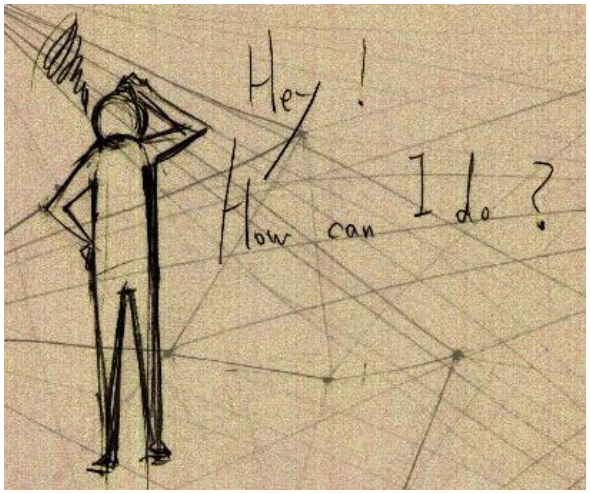
# OrCAD Capture-Allegro Flow

- Did you see that ???

| | | PROPAGATION_DELAY |
|---|---|---|
| 1 | VD0 | R19.2:U3.2:8000 mil:8500 mil:VD0.T.1:C16.1:8000 mil:8500 mil:VD0.T.1:R19.2:8000 mil:8500 mil:VD0.T.1:U1.J4:8000 mil:8500 mil:VD0.T.1:U14.2:8000 mil:8500 mil:VD0.T.1:U15.2:8000 |
| 2 | VD1 | VD1.T.1:C20.1:8000 mil:8500 mil:VD1.T.1:R18.2:8000 mil:8500 mil:VD1.T.1:U1.J5:8000 mil:8500 mil:VD1.T.1:U14.3:8000 mil:8500 mil:VD1.T.1:U15.3:8000 mil:8500 mil:VD1.T.1:U3.3:800 |
| 3 | VD2 | VD2.T.1:C15.1:8000 mil:8500 mil:VD2.T.1:R17.2:8000 mil:8500 mil:VD2.T.1:U1.J6:8000 mil:8500 mil:VD2.T.1:U14.4:8000 mil:8500 mil:VD2.T.1:U15.4:8000 mil:8500 mil:VD2.T.1:U3.4:800 |
| 4 | VD3 | VD3.T.1:C19.1:8000 mil:8500 mil:VD3.T.1:R15.2:8000 mil:8500 mil:VD3.T.1:U1.J7:8000 mil:8500 mil:VD3.T.1:U14.5:8000 mil:8500 mil:VD3.T.1:U15.5:8000 mil:8500 mil:VD3.T.1:U3.5:800 |
| 5 | VD4 | VD4.T.1:C14.1:8000 mil:8500 mil:VD4.T.1:R16.2:8000 mil:8500 mil:VD4.T.1:U1.H7:8000 mil:8500 mil:VD4.T.1:U14.6:8000 mil:8500 mil:VD4.T.1:U15.6:8000 mil:8500 mil:VD4.T.1:U3.6:800 |
| 6 | VD5 | VD5.T.1:C18.1:8000 mil:8500 mil:VD5.T.1:R14.2:8000 mil:8500 mil:VD5.T.1:U1.H6:8000 mil:8500 mil:VD5.T.1:U14.7:8000 mil:8500 mil:VD5.T.1:U15.7:8000 mil:8500 mil:VD5.T.1:U3.7:800 |
| 7 | VD6 | VD6.T.1:C13.1:8000 mil:8500 mil:VD6.T.1:R12.2:8000 mil:8500 mil:VD6.T.1:U1.H5:8000 mil:8500 mil:VD6.T.1:U14.8:8000 mil:8500 mil:VD6.T.1:U15.8:8000 mil:8500 mil:VD6.T.1:U3.8:800 |
| 8 | VD7 | VD7.T.1:C17.1:8000 mil:8500 mil:VD7.T.1:R13.2:8000 mil:8500 mil:VD7.T.1:U1.H4:8000 mil:8500 mil:VD7.T.1:U14.9:8000 mil:8500 mil:VD7.T.1:U15.9:8000 mil:8500 mil:VD7.T.1:U3.9:800 |

| Type | Objects | Relative Delay | | | |
|---|---|---|---|---|---|
| | | Delta:Tolerance | Actual | Margin | +/- |
| | | mil | | | |
| * | * | * | * | * | * |
| Dsn | DfM_MakeCAP_Po | | | 125 MIL | |
| MGrp | MATCH1 (4) | 0.00 MIL:25.00 MIL | | 125 MIL | |
| Net | BA0 | 0.00 MIL:25.00 MIL | | | |
| Net | BA1 | 0.00 MIL:25.00 MIL | 50 MIL | 25 MIL | |
| Net | BA2 | 0.00 MIL:25.00 MIL | 100 MIL | 75 MIL | |
| Net | BA3 | 0.00 MIL:25.00 MIL | 150 MIL | 125 MIL | |



# OrCAD Capture-Allegro Flow

- Electrical Constraint – Setting from OrCAD® Capture
- Physical & Spacing Constraint – CM Import

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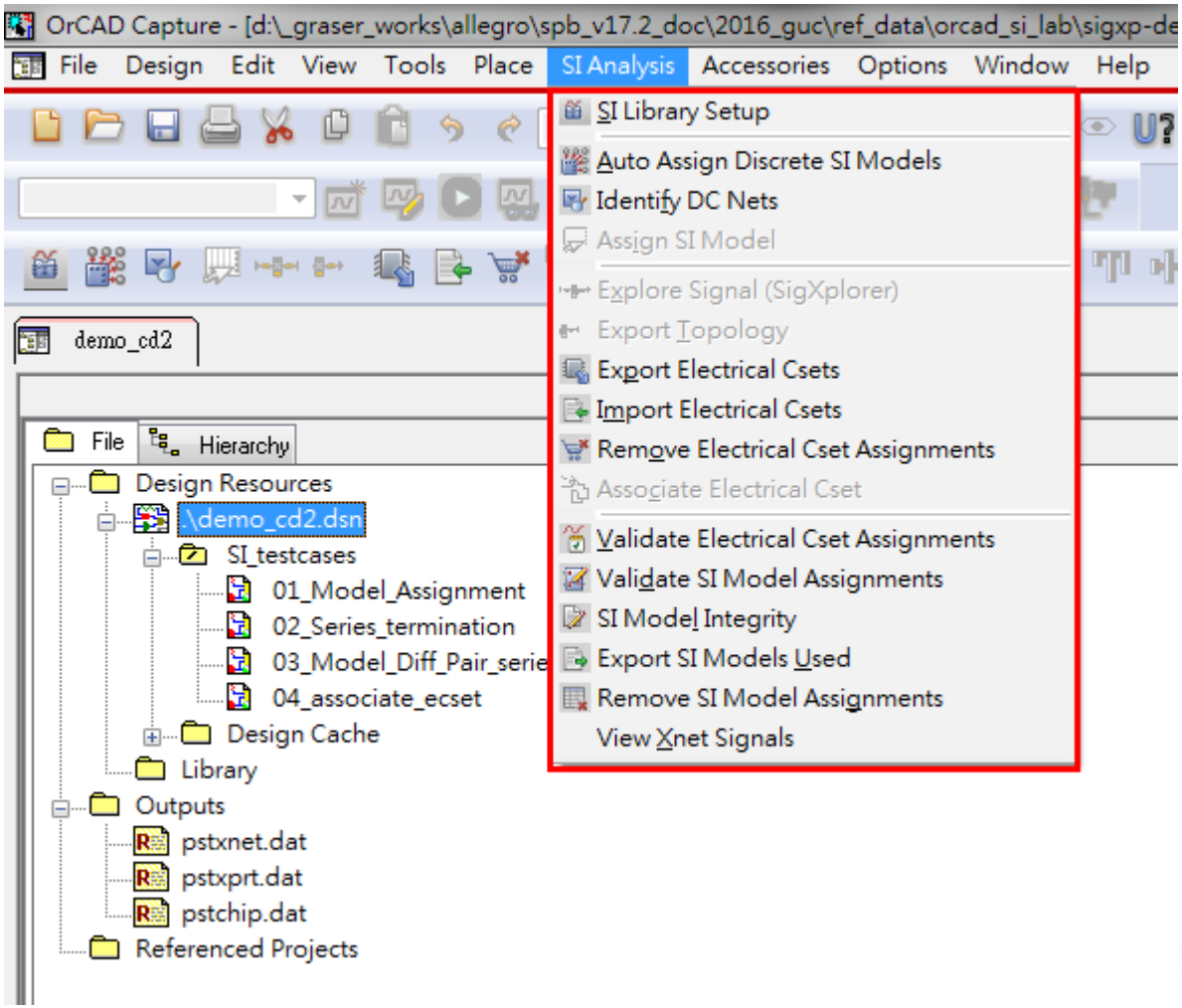
# Constraint Setting from OrCAD Capture

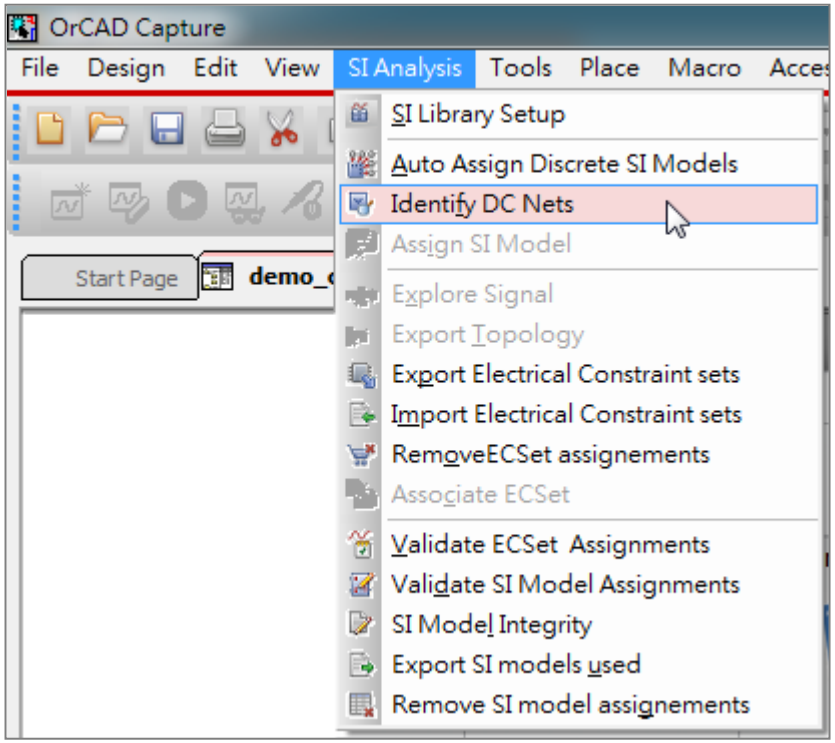
# Constraint setting from OrCAD Capture

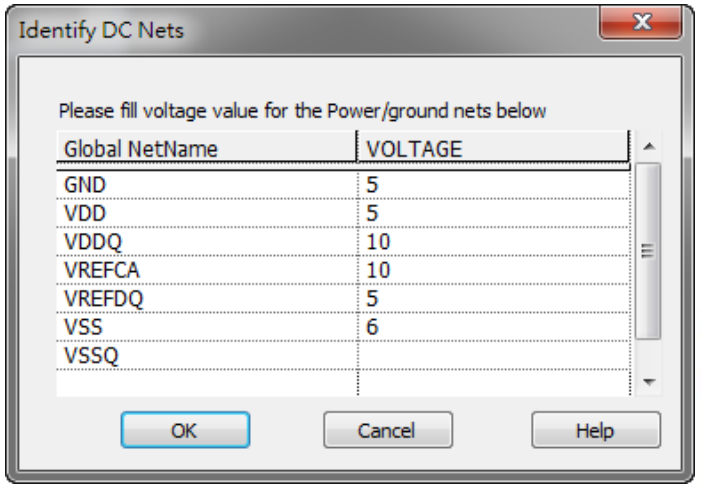
- 透過 SigXplorer 來取得合理的 Constraint 數值



# Constraint setting from OrCAD Capture

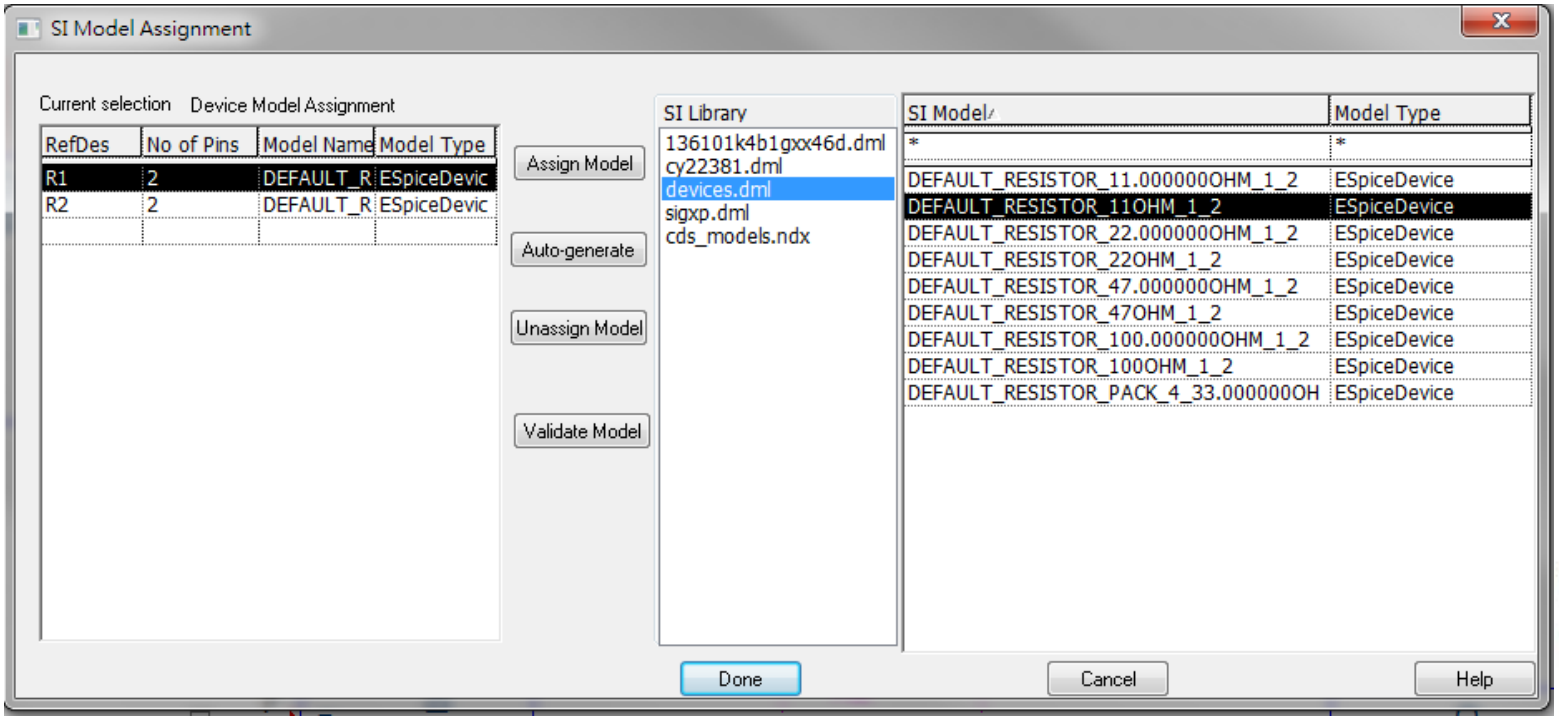
- 透過 SigXplorer 來取得合理的 Constraint 數值
  - DC Net Power Value Assignment



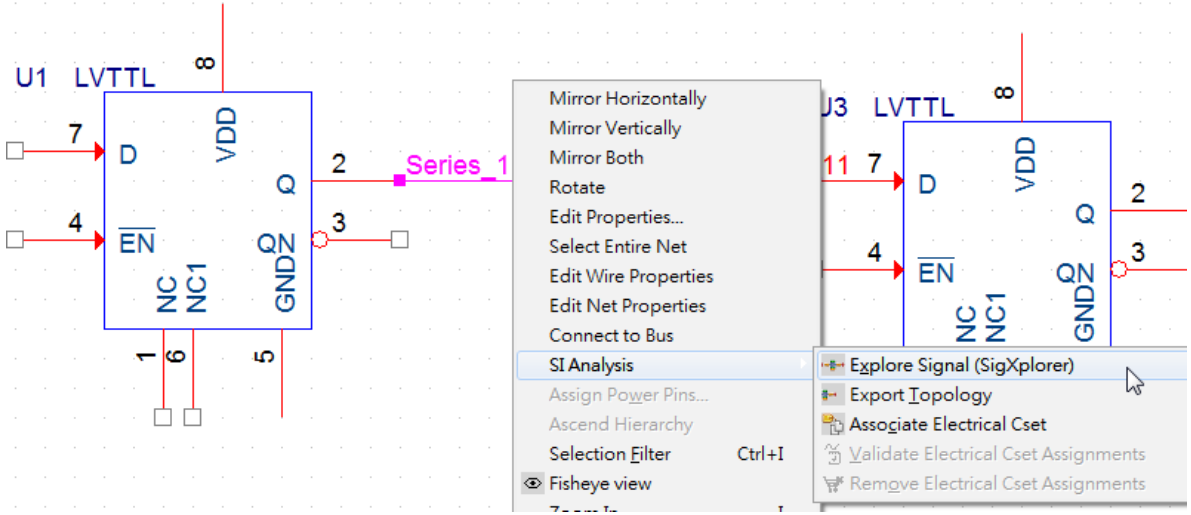
# Constraint setting from OrCAD Capture

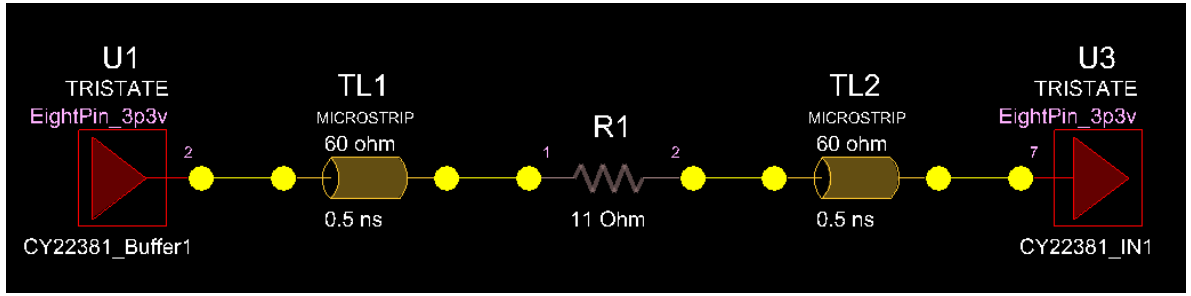
- 透過 SigXplorer 來取得合理的 Constraint 數值
  - Model assignment (若設計中有Xnet架構需設定)



# Constraint setting from OrCAD Capture

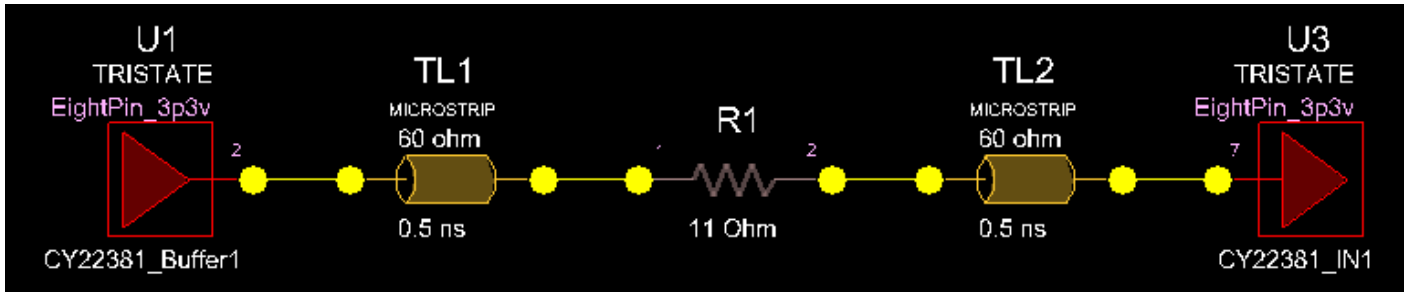
- 透過 SigXplorer 來取得合理的 Constraint 數值
  - 點選要分析的 Net 後，透過右鍵選單的 SI Analysis 功能來將 Net 拓樸結構抽取出來。

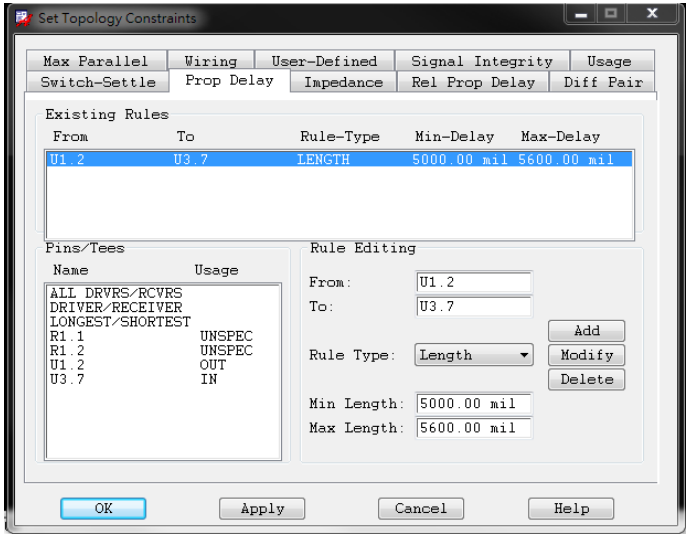


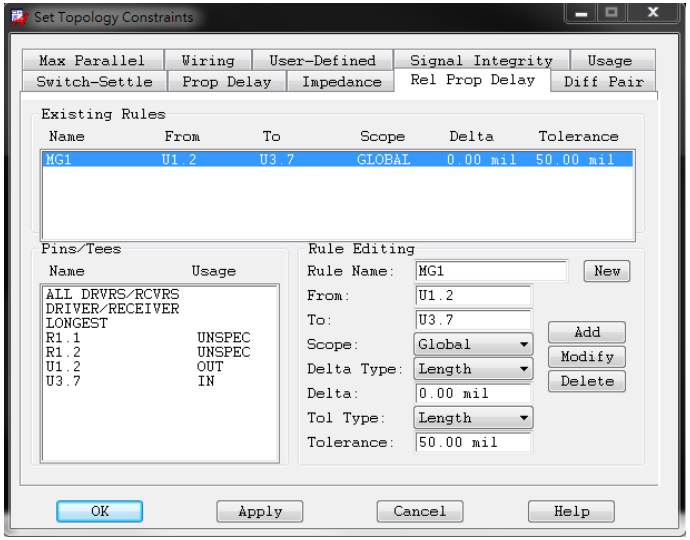



# Constraint setting from OrCAD Capture

- 透過 SigXplorer 來取得合理的 Constraint 數值
  - 透過調整 Net schedule 的拓樸架構後再進行 Electrical Constraint 設定。

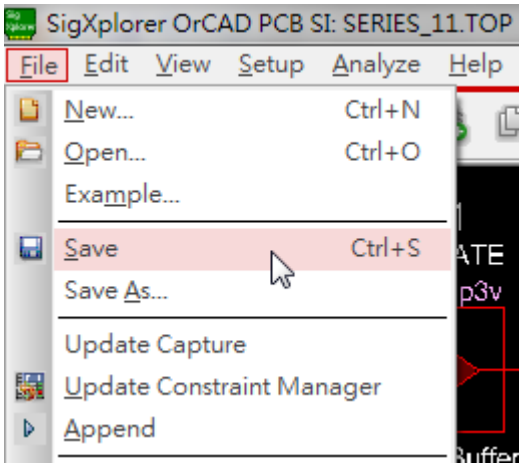


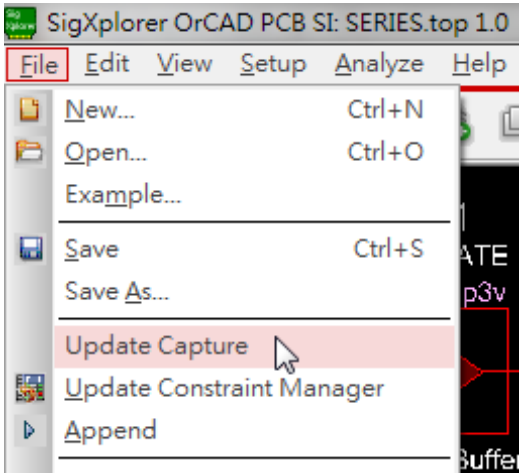



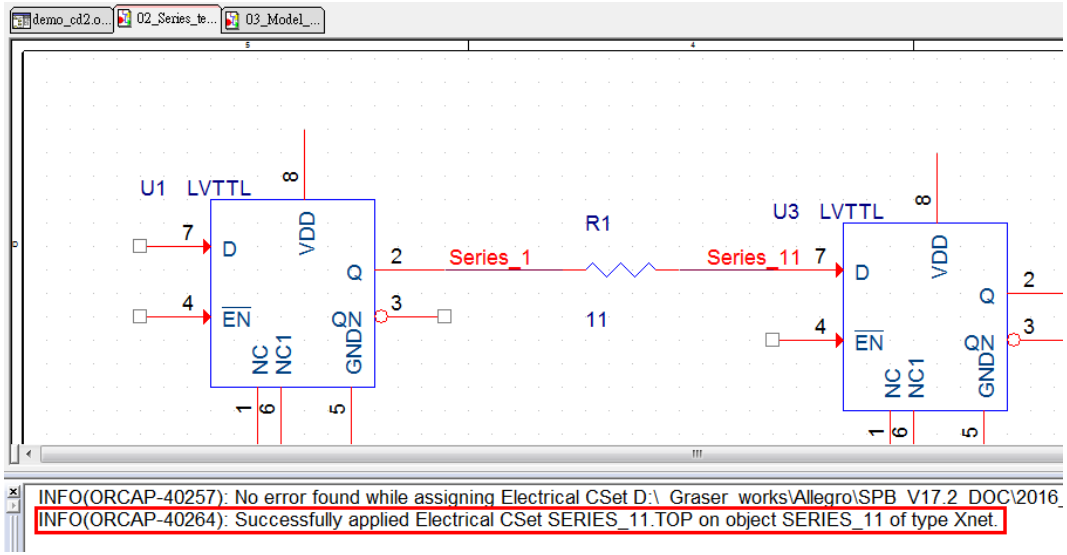



# Constraint setting from OrCAD Capture

- 透過 SigXplorer 來取得合理的 Constraint 數值
  - Save ECSet & Update to OrCAD® Capture

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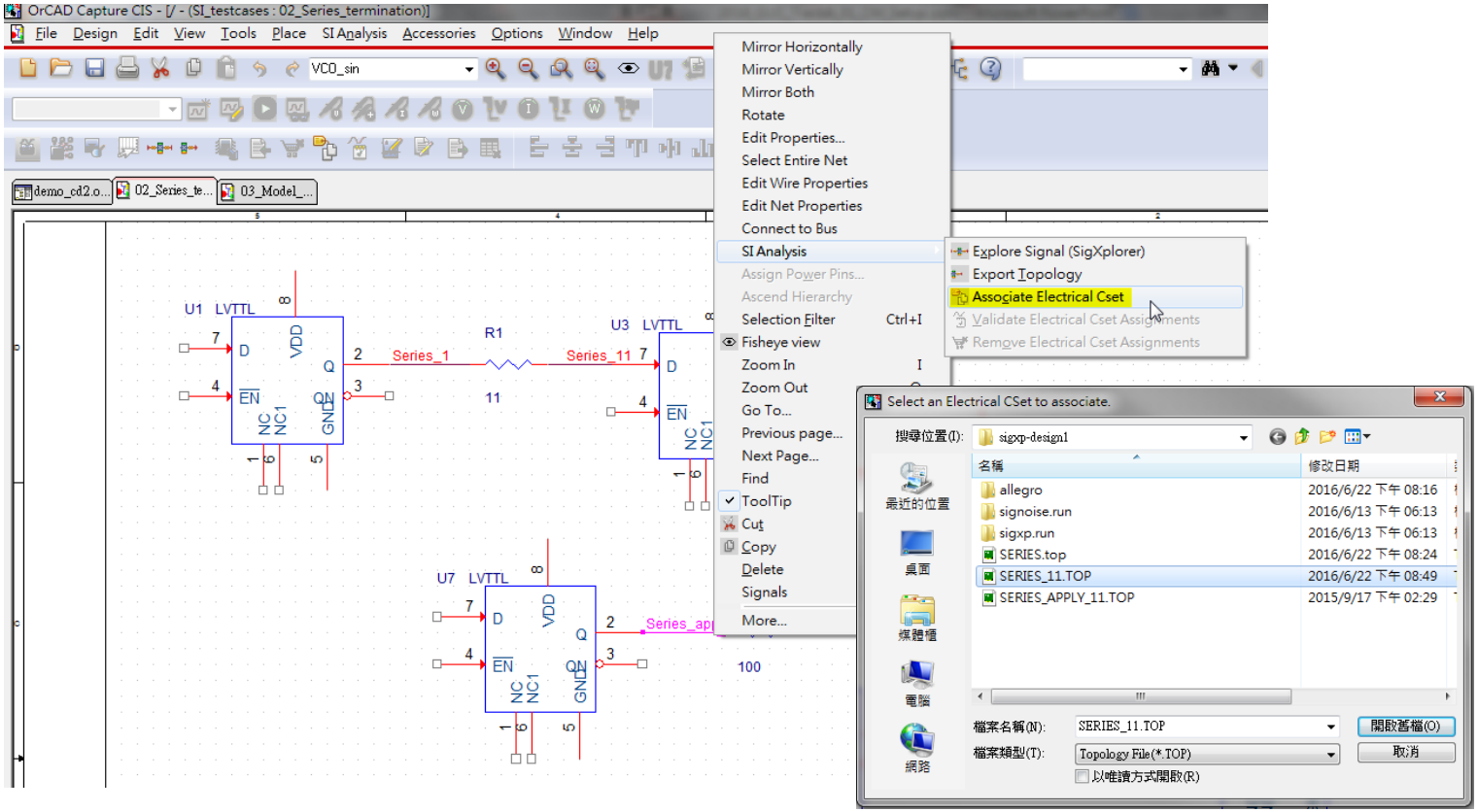
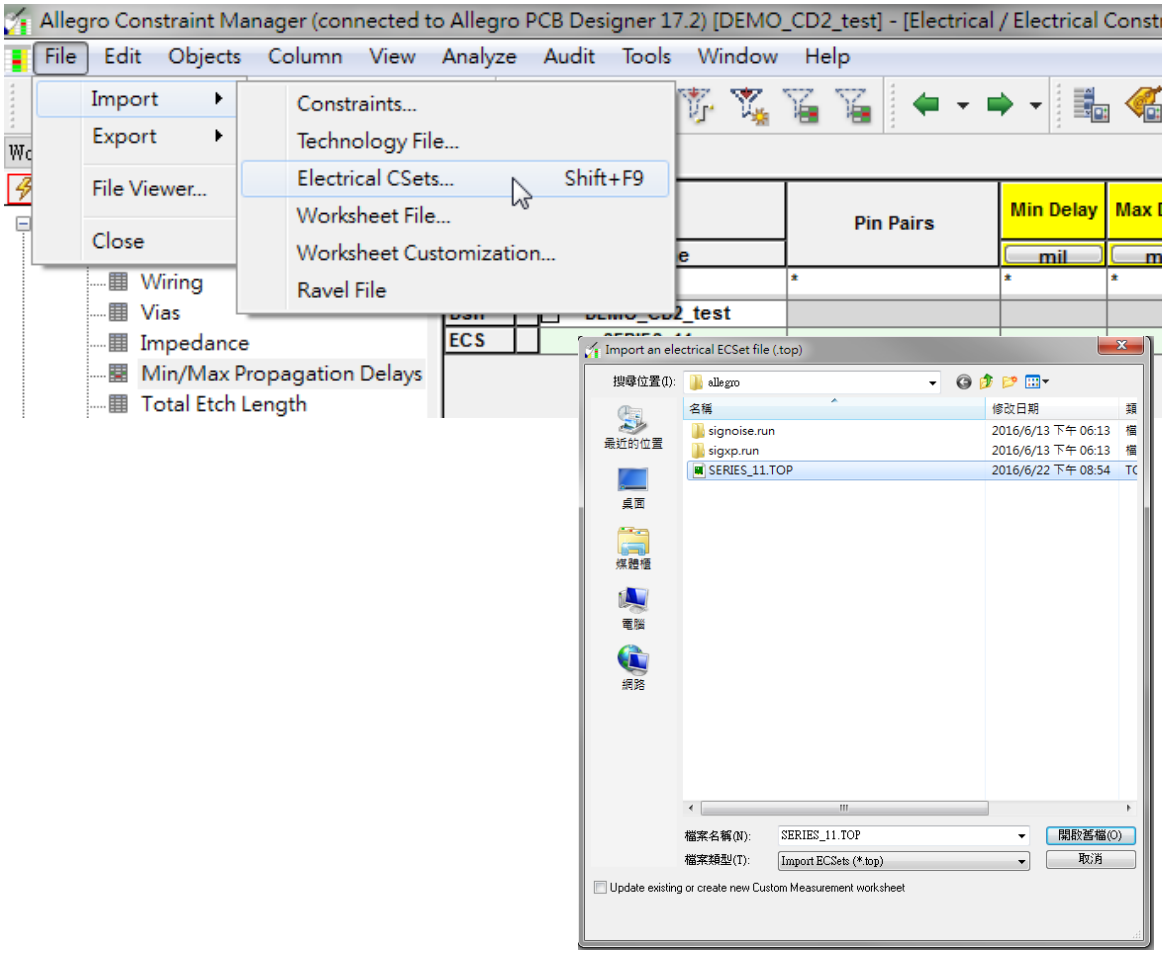
# Constraint setting from OrCAD Capture

- 透過 SigXplorer 來取得合理的 Constraint 數值
  - 可將 ECSet 再套用到其他相同拓樸架構的訊號上



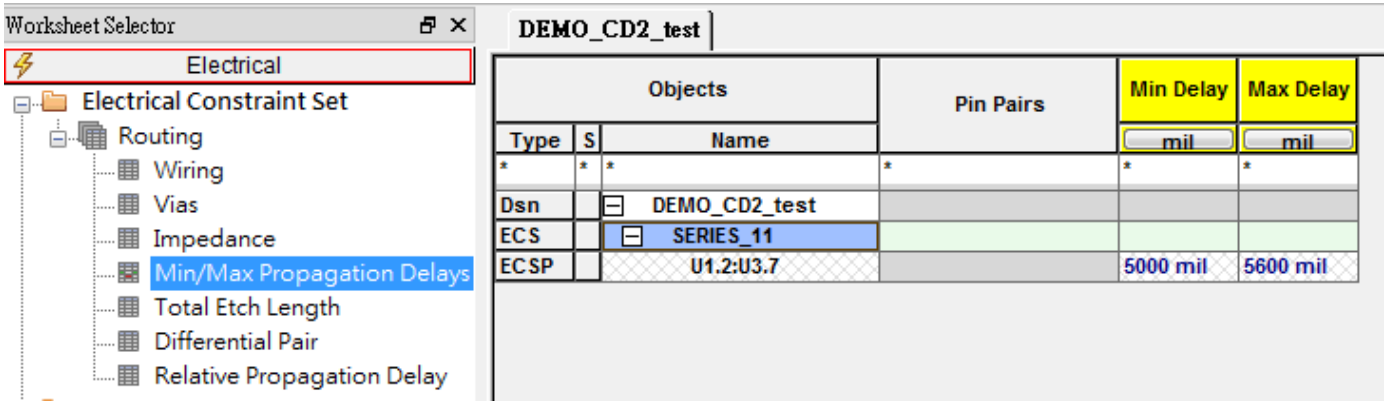
# Constraint setting from OrCAD Capture

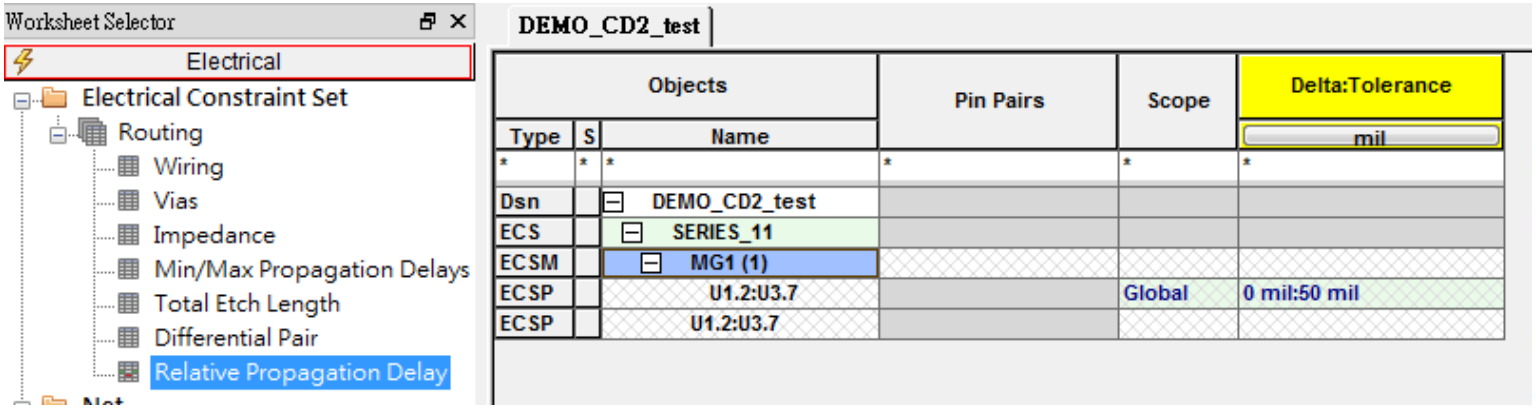
- 透過 SigXplorer 來取得合理的 Constraint 數值
  - ECSet import to Allegro CM



# Constraint setting from OrCAD Capture

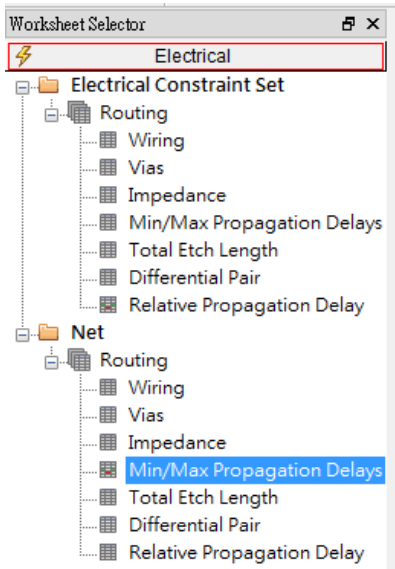
- 透過 SigXplorer 來取得合理的 Constraint 數值
  - ECSet import to Allegro CM



# Constraint setting from OrCAD Capture

- 透過 SigXplorer 來取得合理的 Constraint 數值
  - ECSet import to Allegro CM

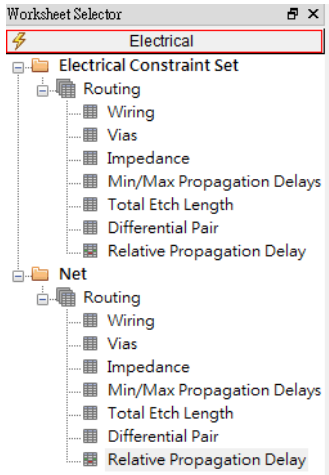



DEMO_CD2_test

| Objects | | | Referenced Electrical CSet | Pin Pairs | Prop Delay | | | Prop Delay | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Type | S | Name | | | Min mil | Actual | Margin | Max mil | Actual | Margin |
| * | * | * | * | * | * | * | * | * | * | * |
| Dsn | | DEMO_CD2_test | | | | | | | | |
| OTyp | | Diff Pairs | | | | | | | | |
| OTyp | | XNets/Nets | | | | | | | | |
| XNet | | ADDRESS_0 | | | | | | | | |
| XNet | | ADDRESS_1 | | | | | | | | |
| XNet | | ADDRESS_2 | | | | | | | | |
| XNet | | ADDRESS_3 | | | | | | | | |
| XNet | | ADDRESS_4 | | | | | | | | |
| XNet | | ADDRESS_5 | | | | | | | | |
| XNet | | ADDRESS_6 | | | | | | | | |
| XNet | | ADDRESS_7 | | | | | | | | |
| XNet | | ADDRESS_8 | | | | | | | | |
| XNet | | ADDRESS_9 | | | | | | | | |
| XNet | | ADDRESS_10 | | | | | | | | |
| XNet | | ADDRESS_11 | | | | | | | | |
| XNet | | ADDRESS_12 | | | | | | | | |
| XNet | | ADDRESS_13 | | | | | | | | |
| XNet | | DATA_0 | | | | | | | | |
| XNet | | DATA_1 | | | | | | | | |
| XNet | | DATA_2 | | | | | | | | |
| XNet | | SERIES_APPLY_11 | SERIES_11 | | | | | | | |
| PPr | | U7.2:U8.7 | | | 5000 mil | | | 5600 mil | | |
| XNet | | SERIES_BE_APPLY_11 | | | | | | | | |
| Net | | SERIES_2 | | | | | | | | |
| XNet | | SERIES_11 | SERIES_11 | | | | | | | |
| PPr | | U1.2:U3.7 | | | 5000 mil | | | 5600 mil | | |
| Net | | VDDQ | | | | | | | | |

# Constraint setting from OrCAD Capture

- 透過SigXplorer來取得合理的Constraint數值
  - ECSet import to Allegro CM




DEMO_CD2_test

| Objects | | | Referenced Electrical CSet | Pin Pairs | Scope | Relative Delay | | | | Length | Delay |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Delta:Tolerance | Actual | Margin | +/- | | |
| Type | S | Name | | | | mil | | | | mil | ns |
| * | * | * | * | * | * | * | * | * | * | * | * |
| Dsn | | DEMO_CD2_test | | | | | | | | | |
| OTyp | | Match Groups | | | | | | | | | |
| MGrp | | MG1 (2) | | | | | | | | | |
| PPr | | U7.2:U8.7 [SERIES_A | | | Global | 0 mil:50 mil | | | | | |
| PPr | | U1.2:U3.7 [SERIES_1 | | | Global | 0 mil:50 mil | | | | | |
| OTyp | | Diff Pairs | | | | | | | | | |
| OTyp | | XNets/Nets | | | | | | | | | |
| XNet | | ADDRESS_0 | | | | | | | | | |
| XNet | | ADDRESS_1 | | | | | | | | | |
| XNet | | ADDRESS_2 | | | | | | | | | |
| XNet | | ADDRESS_3 | | | | | | | | | |
| XNet | | ADDRESS_4 | | | | | | | | | |
| XNet | | ADDRESS_5 | | | | | | | | | |
| XNet | | ADDRESS_6 | | | | | | | | | |
| XNet | | ADDRESS_7 | | | | | | | | | |
| XNet | | ADDRESS_8 | | | | | | | | | |
| XNet | | ADDRESS_9 | | | | | | | | | |
| XNet | | ADDRESS_10 | | | | | | | | | |
| XNet | | ADDRESS_11 | | | | | | | | | |
| XNet | | ADDRESS_12 | | | | | | | | | |
| XNet | | ADDRESS_13 | | | | | | | | | |
| XNet | | DATA_0 | | | | | | | | | |
| XNet | | DATA_1 | | | | | | | | | |
| XNet | | DATA_2 | | | | | | | | | |
| XNet | | SERIES_APPLY_11 | SERIES_11 | | | | | | | | |
| PPr | | U7.2:U8.7 | | | | | | | | | |
| XNet | | SERIES_BE_APPLY_11 | | | | | | | | | |
| Net | | SERIES_2 | | | | | | | | | |
| XNet | | SERIES_11 | SERIES_11 | | | | | | | | |
| PPr | | U1.2:U3.7 | | | | | | | | | |
| Net | | VDDQ | | | | | | | | | |

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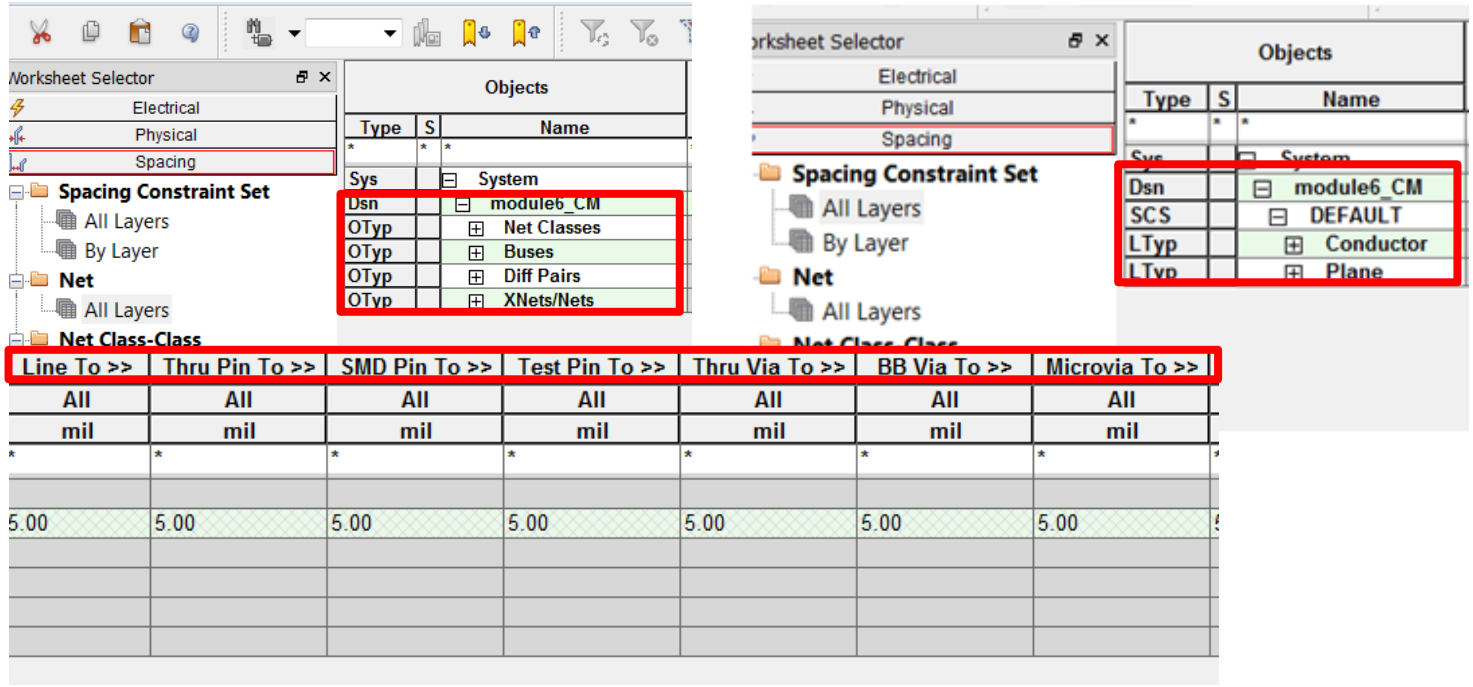
# GraserWARE - CM Import

# GraserWARE - CM Import

- Constraint Manager in v17.2
  - Date Compression
    - By Design Type
    - By Layer Type
    - Super Attribute - ALL

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# GraserWARE - CM Import

- Constraint Manager in v17.2
  - Super Attribute - ALL

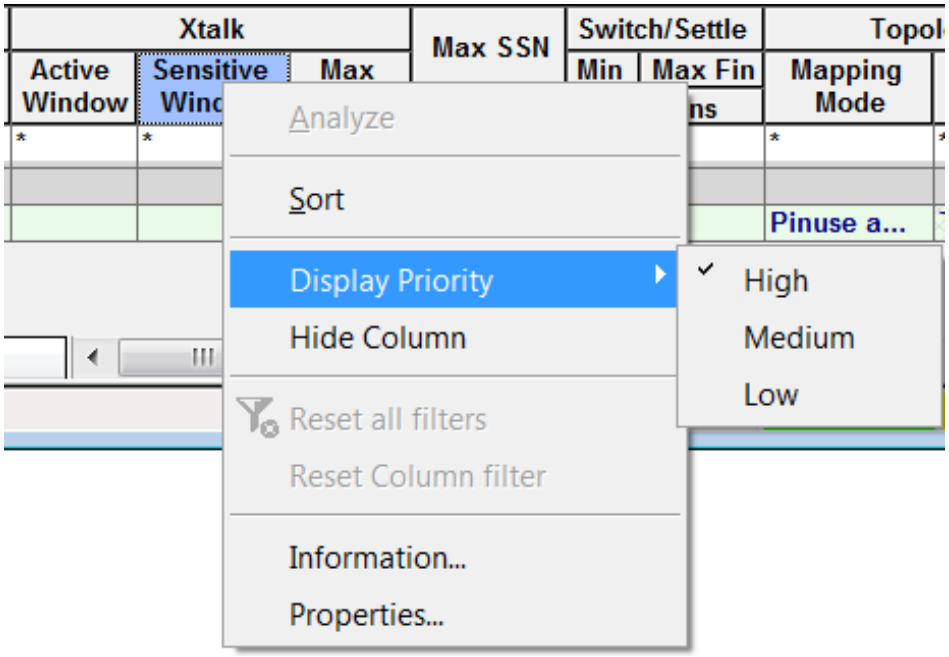
| Objects | | | Referenced Spacing CSet | Line To >> |
|---|---|---|---|---|
| Type | S | Name | | All |
| | | | | mil |
| * | * | * | * | * |
| Sys | | System | | |
| Dsn | | module6_CM | DEFAULT | 5.00 |
| SCS | | DEFAULT | | 5.00 |
| LTyp | | Conductor | | 5.00 |
| LTyp | | Plane | | 5.00 |
| SCS | | 12MIL | | 12.00 |

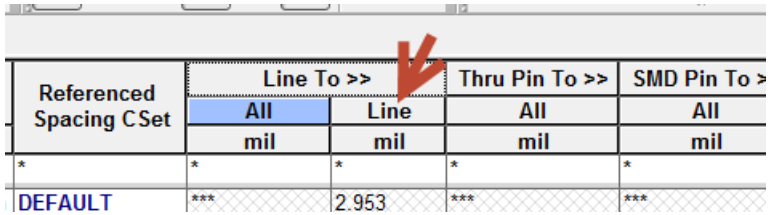
Set here
Apply Range

| Objects | | | Referenced Spacing CSet | Line To << | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Type | S | Name | | All | Line | Thru Pin | SMD Pin | Test Pin | Thru Via | BB Via | Test Via | Microvia | Shape | Bond Finger | Hole |
| | | | | mil | mil | mil | mil | mil | mil | mil | mil | mil | mil | mil | mil |
| * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| Sys | | System | | | | | | | | | | | | | |
| Dsn | | module6_CM | DEFAULT | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 |
| SCS | | DEFAULT | | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 |
| LTyp | | Conductor | | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 |
| LTyp | | Plane | | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 |
| SCS | | 12MIL | | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| LTyp | | Conductor | | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| LTyp | | Plane | | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |

# GraserWARE - CM Import

- Constraint Manager in v17.2
  - Show Less/More – Column Display Priority




Line to Line as High Priority

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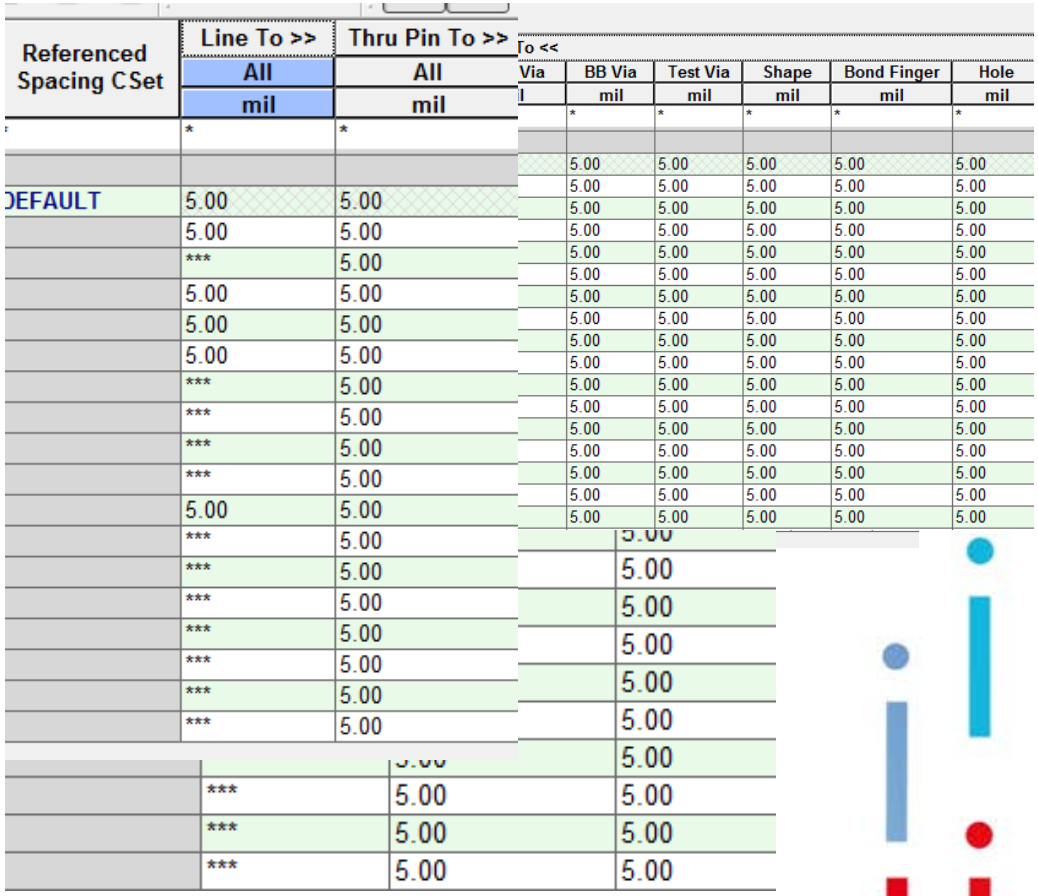
# GraserWARE - CM Import

- Constraint Manager in v17.2
  - Display Priority Example
    - Lower Bondfinger Priority

- Hover over Bondfinger then RMB – Display Priority
- Select “Low”
- Double Click Line to >>
- Column expands, Bond Finger is Hidden
- Double Click >> again and Bond Finger Appears
- Double Click << to reset to default settings

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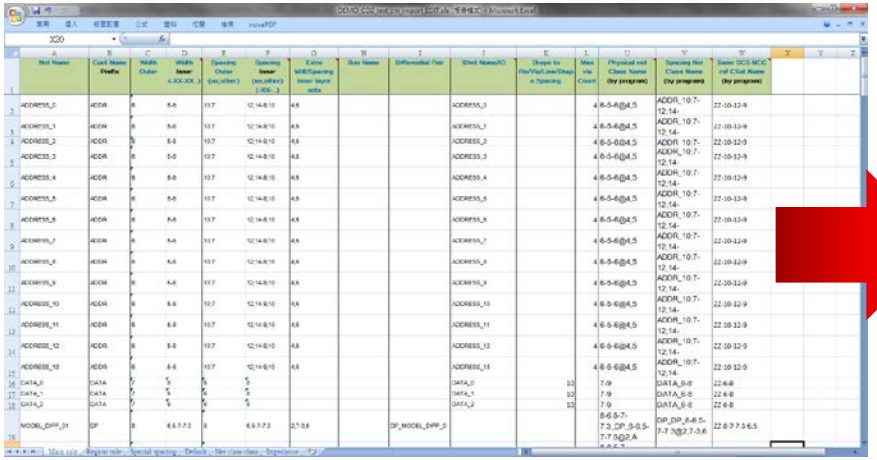
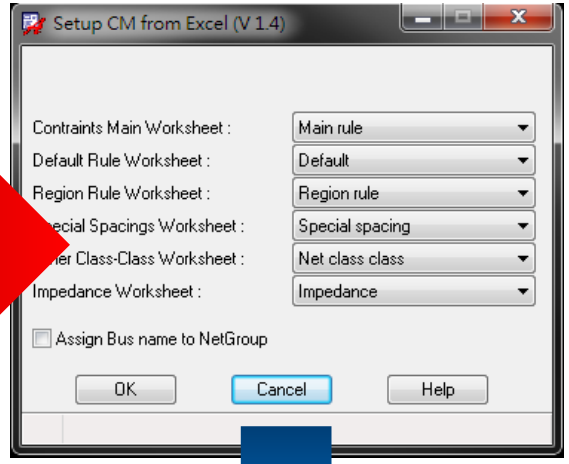
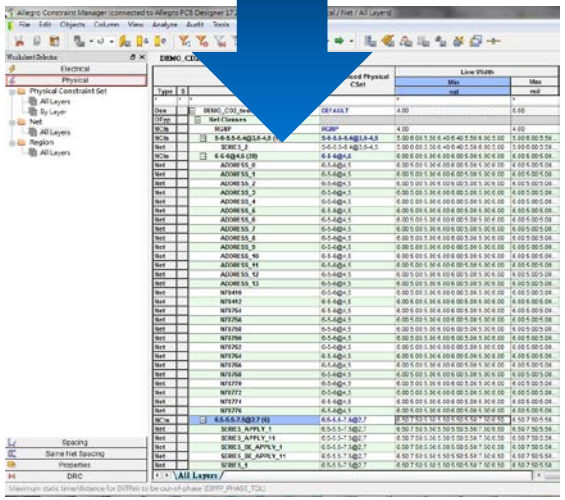
# GraserWARE - CM Import

- Flow of CM Import





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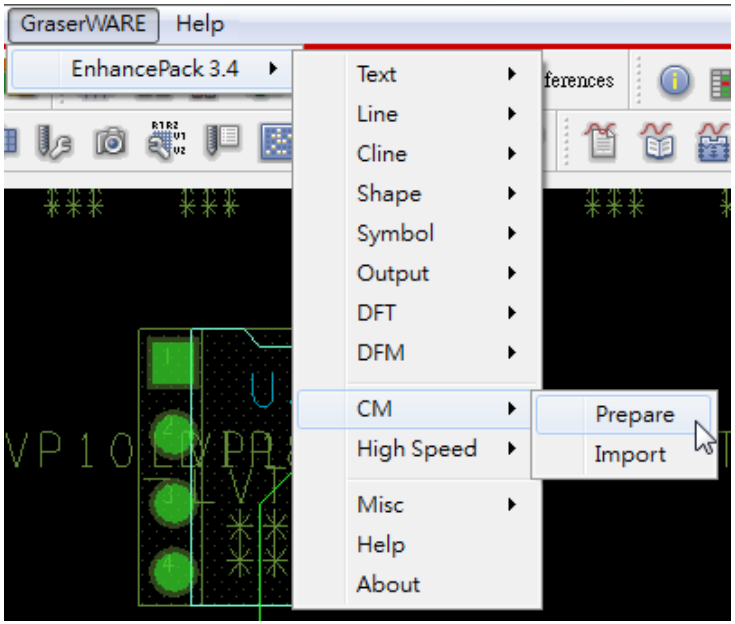
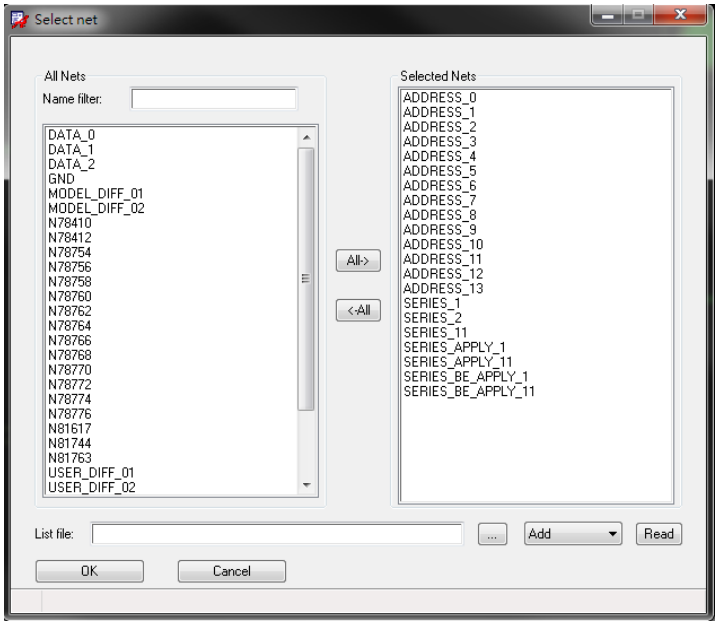
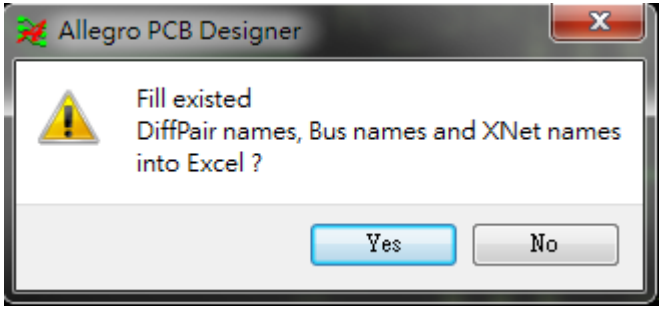
# GraserWARE - CM Import

- CM Prepare
  - 產生出新的空白設定表格



# GraserWARE - CM Import

- CM Prepare
  - 產生出新的空白設定表格

| | A | B | C | D | E | F | G | H | I | J | K | L | U | V | W |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Net Name | Cset Name Prefix | Width Outer | Width Inner (-XX-XX..) | Spacing Outer (us;other) | Spacing Inner (us;other) (-XX-..) | Extra Wdt/Spacing Inner layer sets | Bus Name | Differential Pair | XNet Name/ID | Shape to Pin/Via/Line/Shape Spacing | Max via Count | Physical net Class Name (by program) | Spacing Net Class Name (by program) | Same SCS NCC ref CSet Name (by program) |
| 2 | ADDRESS_0 | | | | | | | | | ADDRESS_0 | | | | | |
| 3 | ADDRESS_1 | | | | | | | | | ADDRESS_1 | | | | | |
| 4 | ADDRESS_2 | | | | | | | | | ADDRESS_2 | | | | | |
| 5 | ADDRESS_3 | | | | | | | | | ADDRESS_3 | | | | | |
| 6 | ADDRESS_4 | | | | | | | | | ADDRESS_4 | | | | | |
| 7 | ADDRESS_5 | | | | | | | | | ADDRESS_5 | | | | | |
| 8 | ADDRESS_6 | | | | | | | | | ADDRESS_6 | | | | | |
| 9 | ADDRESS_7 | | | | | | | | | ADDRESS_7 | | | | | |
| 10 | ADDRESS_8 | | | | | | | | | ADDRESS_8 | | | | | |
| 11 | ADDRESS_9 | | | | | | | | | ADDRESS_9 | | | | | |
| 12 | ADDRESS_10 | | | | | | | | | ADDRESS_10 | | | | | |
| 13 | ADDRESS_11 | | | | | | | | | ADDRESS_11 | | | | | |
| 14 | ADDRESS_12 | | | | | | | | | ADDRESS_12 | | | | | |
| 15 | ADDRESS_13 | | | | | | | | | ADDRESS_13 | | | | | |
| 16 | DATA_0 | | | | | | | | | DATA_0 | | | | | |
| 17 | DATA_1 | | | | | | | | | DATA_1 | | | | | |
| 18 | DATA_2 | | | | | | | | | DATA_2 | | | | | |
| 19 | MODEL_DIFF_01 | | | | | | | | DP_MODEL_DIFF_0 | | | | | | |
| 20 | MODEL_DIFF_02 | | | | | | | | DP_MODEL_DIFF_0 | | | | | | |
| 21 | N78410 | | | | | | | | | ADDRESS_0 | | | | | |
| 22 | N78412 | | | | | | | | | ADDRESS_1 | | | | | |
| 23 | N78754 | | | | | | | | | ADDRESS_2 | | | | | |
| 24 | N78756 | | | | | | | | | ADDRESS_13 | | | | | |
| 25 | N78758 | | | | | | | | | ADDRESS_10 | | | | | |
| 26 | N78760 | | | | | | | | | ADDRESS_7 | | | | | |
| 27 | N78762 | | | | | | | | | ADDRESS_4 | | | | | |
| 28 | N78764 | | | | | | | | | ADDRESS_12 | | | | | |
| 29 | N78766 | | | | | | | | | ADDRESS_9 | | | | | |
| 30 | N78768 | | | | | | | | | ADDRESS_6 | | | | | |
| 31 | N78770 | | | | | | | | | ADDRESS_3 | | | | | |
| 32 | N78772 | | | | | | | | | ADDRESS_11 | | | | | |
| 33 | N78774 | | | | | | | | | ADDRESS_8 | | | | | |
| 34 | N78776 | | | | | | | | | ADDRESS_5 | | | | | |

Main rule / Region rule / Special spacing / Default / Net class class / Impedance

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# GraserWARE - CM Import

- CM Prepare
  - 填入設計規範之設定值

| Net Name | Cset Name Prefix | Width Outer | Width Inner (-XX-XX..) | Spacing Outer (us;other) | Spacing Inner (us;other) (-XX-..) | Extra Wdt/Spacing Inner layer sets | Bus Name | Differential Pair | XNet Name/ID | Shape to Pin/Via/Line/Shape Spacing | Max via Count |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ADDRESS_0 | ADDR | 6 | 5-6 | 10;7 | 12;14-9;10 | 4,5 | | | ADDRESS_0 | | 4 |
| ADDRESS_1 | ADDR | 6 | 5-6 | 10;7 | 12;14-9;10 | 4,5 | | | ADDRESS_1 | | 4 |
| ADDRESS_2 | ADDR | 6 | 5-6 | 10;7 | 12;14-9;10 | 4,5 | | | ADDRESS_2 | | 4 |
| ADDRESS_3 | ADDR | 6 | 5-6 | 10;7 | 12;14-9;10 | 4,5 | | | ADDRESS_3 | | 4 |
| ADDRESS_4 | ADDR | 6 | 5-6 | 10;7 | 12;14-9;10 | 4,5 | | | ADDRESS_4 | | 4 |
| ADDRESS_5 | ADDR | 6 | 5-6 | 10;7 | 12;14-9;10 | 4,5 | | | ADDRESS_5 | | 4 |
| ADDRESS_6 | ADDR | 6 | 5-6 | 10;7 | 12;14-9;10 | 4,5 | | | ADDRESS_6 | | 4 |
| ADDRESS_7 | ADDR | 6 | 5-6 | 10;7 | 12;14-9;10 | 4,5 | | | ADDRESS_7 | | 4 |
| ADDRESS_8 | ADDR | 6 | 5-6 | 10;7 | 12;14-9;10 | 4,5 | | | ADDRESS_8 | | 4 |
| ADDRESS_9 | ADDR | 6 | 5-6 | 10;7 | 12;14-9;10 | 4,5 | | | ADDRESS_9 | | 4 |
| ADDRESS_10 | ADDR | 6 | 5-6 | 10;7 | 12;14-9;10 | 4,5 | | | ADDRESS_10 | | 4 |
| ADDRESS_11 | ADDR | 6 | 5-6 | 10;7 | 12;14-9;10 | 4,5 | | | ADDRESS_11 | | 4 |
| ADDRESS_12 | ADDR | 6 | 5-6 | 10;7 | 12;14-9;10 | 4,5 | | | ADDRESS_12 | | 4 |
| ADDRESS_13 | ADDR | 6 | 5-6 | 10;7 | 12;14-9;10 | 4,5 | | | ADDRESS_13 | | 4 |
| DATA_0 | DATA | 7 | 9 | 6 | 8 | | | | DATA_0 | 10 | |
| DATA_1 | DATA | 7 | 9 | 6 | 8 | | | | DATA_1 | 10 | |
| DATA_2 | DATA | 7 | 9 | 6 | 8 | | | | DATA_2 | 10 | |
| MODEL_DIFF_01 | DP | 8 | 6.5-7-7.3 | 8 | 6.5-7-7.3 | 2,7-3,6 | | DP_MODEL_DIFF_0 | | | |
| MODEL_DIFF_02 | DP | 8 | 6.5-7-7.3 | 8 | 6.5-7-7.3 | 2,7-3,6 | | DP_MODEL_DIFF_0 | | | |
| N78410 | ADDR | 6 | 5-6 | 10;7 | 12;14-9;10 | 4,5 | | | ADDRESS_0 | | 4 |
| N78412 | ADDR | 6 | 5-6 | 10;7 | 12;14-9;10 | 4,5 | | | ADDRESS_1 | | 4 |
| N78754 | ADDR | 6 | 5-6 | 10;7 | 12;14-9;10 | 4,5 | | | ADDRESS_2 | | 4 |
| N78756 | ADDR | 6 | 5-6 | 10;7 | 12;14-9;10 | 4,5 | | | ADDRESS_13 | | 4 |
| N78758 | ADDR | 6 | 5-6 | 10;7 | 12;14-9;10 | 4,5 | | | ADDRESS_10 | | 4 |
| N78760 | ADDR | 6 | 5-6 | 10;7 | 12;14-9;10 | 4,5 | | | ADDRESS_7 | | 4 |
| N78762 | ADDR | 6 | 5-6 | 10;7 | 12;14-9;10 | 4,5 | | | ADDRESS_4 | | 4 |
| N78764 | ADDR | 6 | 5-6 | 10;7 | 12;14-9;10 | 4,5 | | | ADDRESS_12 | | 4 |
| N78766 | ADDR | 6 | 5-6 | 10;7 | 12;14-9;10 | 4,5 | | | ADDRESS_9 | | 4 |

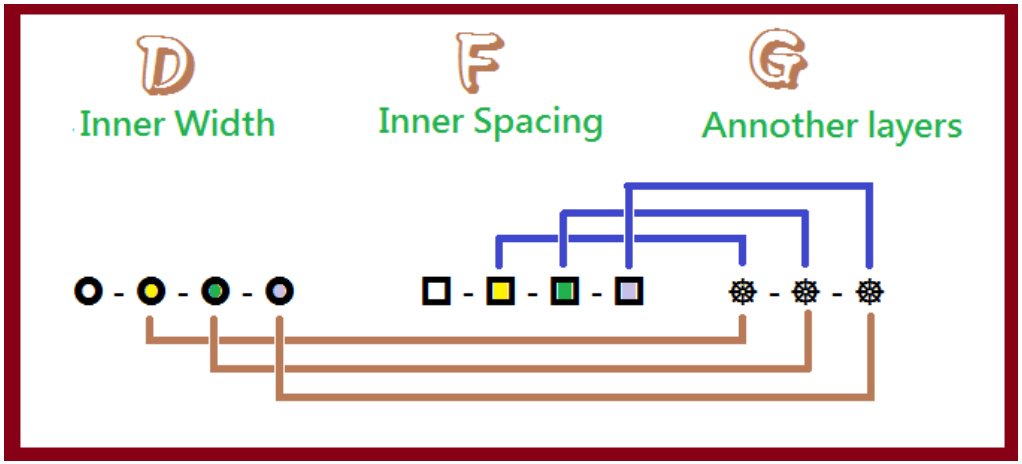
# GraserWARE - CM Import

- CM Prepare
  - 填入設計規範之設定值

| Net Name | Cset Name Prefix | Width Outer | Width Inner (-XX-XX..) | Spacing Outer (us;other) | Spacing Inner (us;other) (-XX-..) | Extra Wdt/Spacing Inner layer sets | Bus Name | Differential Pair | XNet Name/ID | Shape to Pin/Via/Line/Shape Spacing | Max via Count |
|---|---|---|---|---|---|---|---|---|---|---|---|
| N78754 | ADDR | 6 | 5-6 | 10;7 | 12;14-9;10 | 4,5 | | | ADDRESS_2 | | 4 |
| N78756 | ADDR | 6 | 5-6 | 10;7 | 12;14-9;10 | 4,5 | | | ADDRESS_13 | | 4 |
| N78758 | ADDR | 6 | 5-6 | 10;7 | 12;14-9;10 | 4,5 | | | ADDRESS_10 | | 4 |
| N78760 | ADDR | 6 | 5-6 | 10;7 | 12;14-9;10 | 4,5 | | | ADDRESS_7 | | 4 |
| N78762 | ADDR | 6 | 5-6 | 10;7 | 12;14-9;10 | 4,5 | | | ADDRESS_4 | | 4 |
| N78764 | ADDR | 6 | 5-6 | 10;7 | 12;14-9;10 | 4,5 | | | ADDRESS_12 | | 4 |
| N78766 | ADDR | 6 | 5-6 | 10;7 | 12;14-9;10 | 4,5 | | | ADDRESS_9 | | 4 |
| N78768 | ADDR | 6 | 5-6 | 10;7 | 12;14-9;10 | 4,5 | | | ADDRESS_6 | | 4 |
| N78770 | ADDR | 6 | 5-6 | 10;7 | 12;14-9;10 | 4,5 | | | ADDRESS_3 | | 4 |
| N78772 | ADDR | 6 | 5-6 | 10;7 | 12;14-9;10 | 4,5 | | | ADDRESS_11 | | 4 |
| N78774 | ADDR | 6 | 5-6 | 10;7 | 12;14-9;10 | 4,5 | | | ADDRESS_8 | | 4 |
| N78776 | ADDR | 6 | 5-6 | 10;7 | 12;14-9;10 | 4,5 | | | ADDRESS_5 | | 4 |
| N81617 | DATA | 7 | 9 | 6 | 8 | | | | DATA_0 | 10 | |
| N81744 | DATA | 7 | 9 | 6 | 8 | | | | DATA_1 | 10 | |
| N81763 | DATA | 7 | 9 | 6 | 8 | | | | DATA_2 | 10 | |
| SERIES_1 | 90OHM | | | | | | | | SERIES_11 | | |
| SERIES_2 | 120OHM | | | | | | | | | | |
| SERIES_11 | 90OHM | | | | | | | | SERIES_11 | | |
| SERIES_APPLY_1 | 90OHM | | | | | | | | SERIES_APPLY_11 | | |
| SERIES_APPLY_11 | 90OHM | | | | | | | | SERIES_APPLY_11 | | |
| SERIES_BE_APPLY_1 | 90OHM | | | | | | | | SERIES_BE_APPLY_11 | | |
| SERIES_BE_APPLY_11 | 90OHM | | | | | | | | SERIES_BE_APPLY_11 | | |
| USER_DIFF_01 | DP | 8 | 6.5-7-7.3 | 8 | 6.5-7-7.3 | 2,7-3,6 | | DP1 | | | |
| USER_DIFF_02 | DP | 8 | 6.5-7-7.3 | 8 | 6.5-7-7.3 | 2,7-3,6 | | DP1 | | | |
| *END* | | | | | | | | | | | |

# GraserWARE - CM Import

- CM Prepare
  - 針對內、外層的線寬及線距設定。




| D | E | F | G |
|---|---|---|---|
| Width Inner (-XX-XX..) | Spacing Outer (us;other) | Spacing Inner (us;other) (-XX-..) | Extra Wdt/Spacing Inner layer sets |
| 6.5-7-7.3 | 8 | 6.5-7-7.3 | 2,7-3,6 |
| 5-6 | 10;7 | 12;14-9;10 | 4,5 |

# GraserWARE - CM Import

- CM Prepare
  - Default rule 設定

| Default spacing / physical rules | | | | |
|---|---|---|---|---|
| | Spacing | | | Physical |
| Pin to Pin (outer-inner) | 5 | | Min line width (outer-inner) | 4 |
| Line to Pin (outer-inner) | 5 | | Max line width (outer-inner) | 0 |
| Line to Line (outer-inner) | 5 | | Min neck width (outer-inner) | 4 |
| Via to Pin (outer-inner) | 5 | | Max neck length | 0 |
| Via to Via (outer-inner) | 5 | | DiffPair primary gap (outer-inner) | 4 |
| Via to Line (outer-inner) | 5 | | DiffPair neck gap | 4 |
| Shape to Pin (outer-inner) | 5 | | DiffPair min_space | 3.9 |
| Shape to Via (outer-inner) | 5 | | DiffPair uncoupled_length | 100 |
| Shape to Line (outer-inner) | 5 | | DiffPair (+)Tolerance | 0.1 |
| Shape to Shape (outer-inner) | 5 | | DiffPair (-)Tolerance | 0.1 |
| Hole to xxx (outer-inner) | 8 | | Vias (VIA1, VIA2, ..) | via |
| | | | Allow Pad-Pad Connect | ALL_ALLOWED |

# GraserWARE - CM Import

- CM Prepare
  - Region rule設定

| Region rules | Physical | | | | | | Spacing | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Region Name | Min line width (out-in) | Max line width (out-in) | Min neck width (out-in) | Max neck length | DiffPair primary gap (out-in) | DiffPair neck gap (out-in) | Pin to Pin (out-in) | Line to Pin (out-in) | Line to Line (out-in) | Via to Pin (out-in) | Via to Via (out-in) | Via to Line (out-in) | Shape to Pin (out-in) | Shape to Via (out-in) | Shape to Line (out-in) | Shape to Shape (out-in) |
| BGA | 3.5 | 5 | 3.5 | 1000 | 4 | 3.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 8 | 8 | 8 | 10 |
| VIP_AREA | 4-4.2 | 4.5-5 | 3-3.5 | 1200 | 4.5-4 | 4-3.5 | 3-3.2 | 3-3.2 | 3-3.2 | 3-3.2 | 3-3.2 | 3-3.2 | 6 | 6 | 6 | 8 |
| MIN_SPACING_AREA | 3 | 4 | 3 | 800 | 4 | 3 | 4-3.5 | 4-3.5 | 4-3.5 | 4-3.5 | 4-3.5 | 4-3.5 | 5-4.5 | 5-4.5 | 5-4.5 | 6-7 |
| RGNS | | | | | | | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| RGNP | 4 | 4 | 4 | 4 | 4 | 4 | | | | | | | | | | |

# GraserWARE - CM Import

- CM Prepare
  - Spacing 在不同層及不同物件間之設定

| Special spacing rules | | | | | | | |
|---|---|---|---|---|---|---|---|
| Prefix | Layer | Line to Pin | Line to Via | Shape to Pin | Shape to Via | Shape to Line | Shape to Shape |
| DATA | 2,7 | | | 8 | 8 | | 12 |
| DATA | 3,6 | | 12.5 | | | | 12.5 |
| DATA | 4,5 | | | | | | 11.5 |
| DP | 3,6 | 4 | 4.5 | 6 | 6 | 7 | 10 |

  - Net Class to Class Spacing 設定

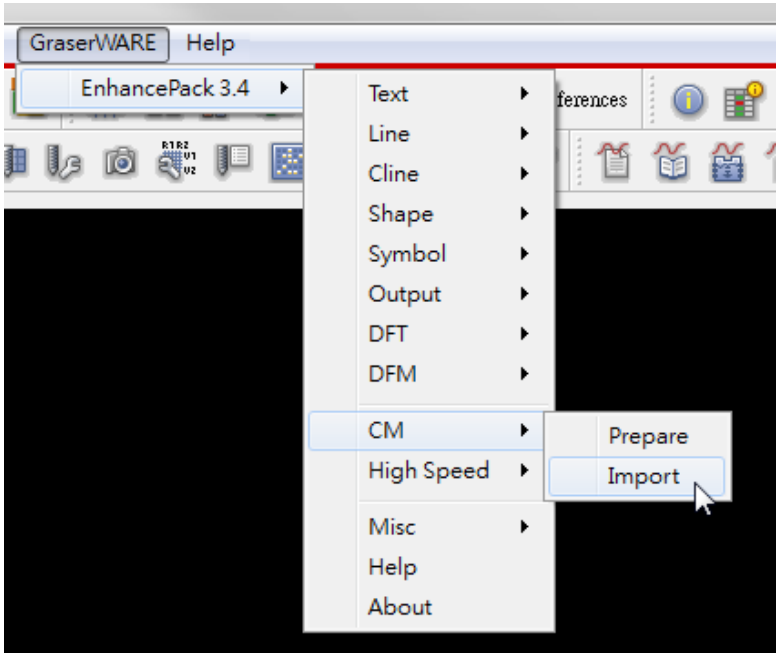
| Cset Name Prefix1 | Cset Name Prefix2 | Spacing Outer | Spacing Inner (-XX-..) | Extra Spacing Inner layer sets (XX-XX-..) | | | | | NCC ref CSet Name (by program) |
|---|---|---|---|---|---|---|---|---|---|
| ADDR | DATA | 12 | 15 | | | | | | |
| DATA | DP | 15 | 20 | | | | | | |

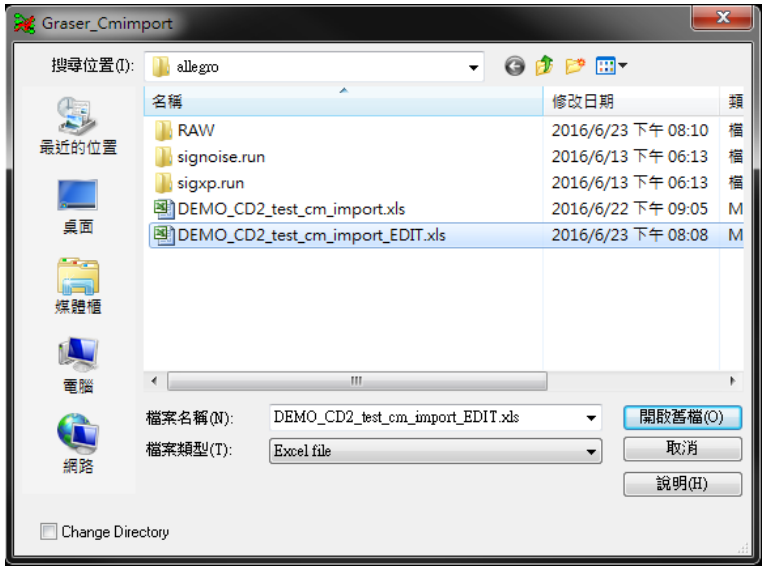
  - Design rule 以 Impedance 方式定義

| Impedance | Notes | Width Outer | Width Inner (-XX-XX..) | Spacing Outer (us;other) | Spacing Inner (us;other) (-XX-..) | Extra Wdt/Spacing Inner layer sets |
|---|---|---|---|---|---|---|
| 90OHM | | 6.5 | 5.5-7.5 | 4.5;4.8 | 5;5.3-7;6.5 | 2,7 |
| 120OHM | | 5 | 6-5.5-6.4 | 5 | 5-6-7 | 3,6-4,5 |

# GraserWARE - CM Import

- CM Import
  - 將設定好Excel檔案讀入

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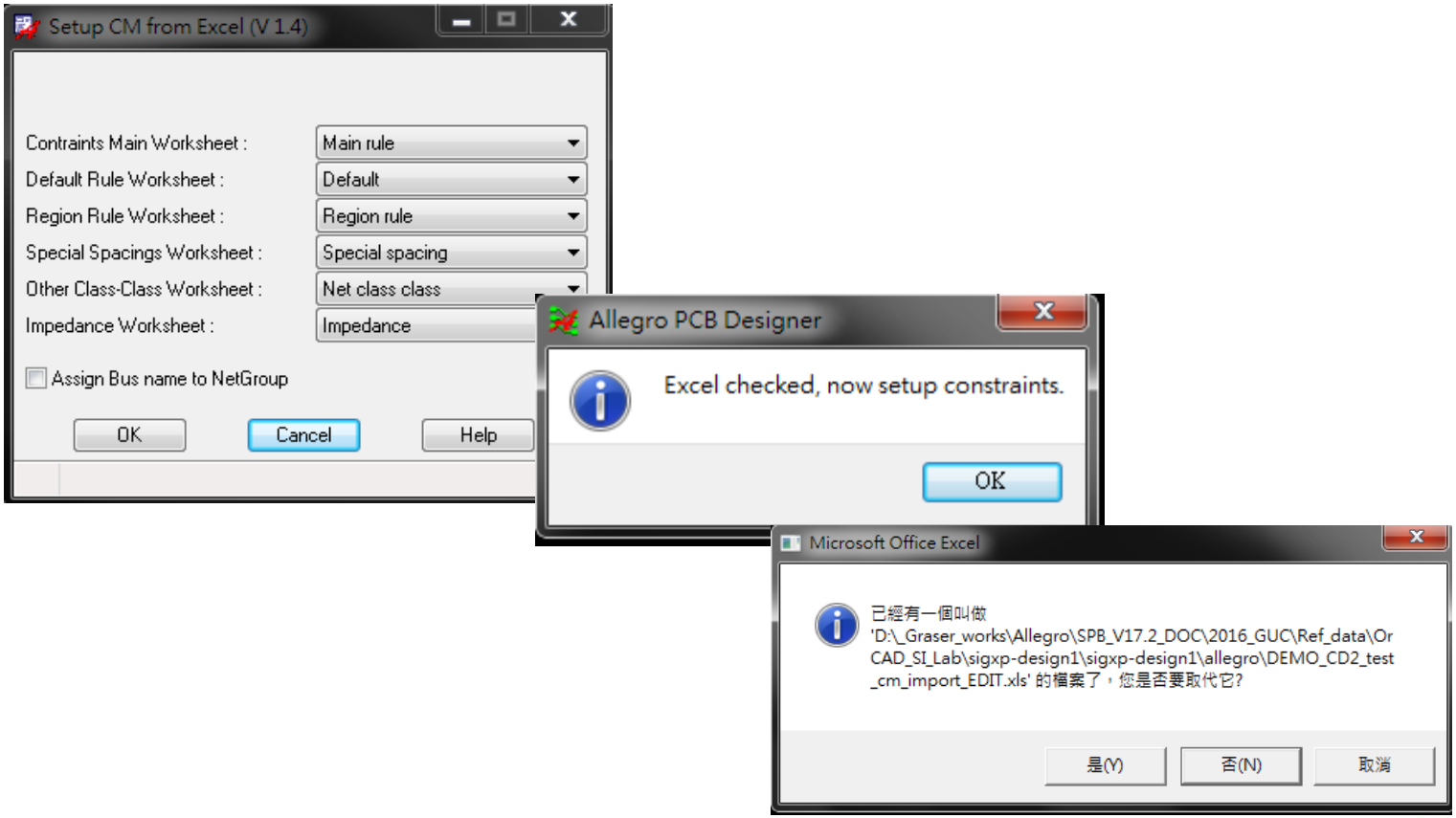
# GraserWARE - CM Import

- CM Import
  - 進行前對 Excel 內容設定的正確性檢查

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# GraserWARE - CM Import

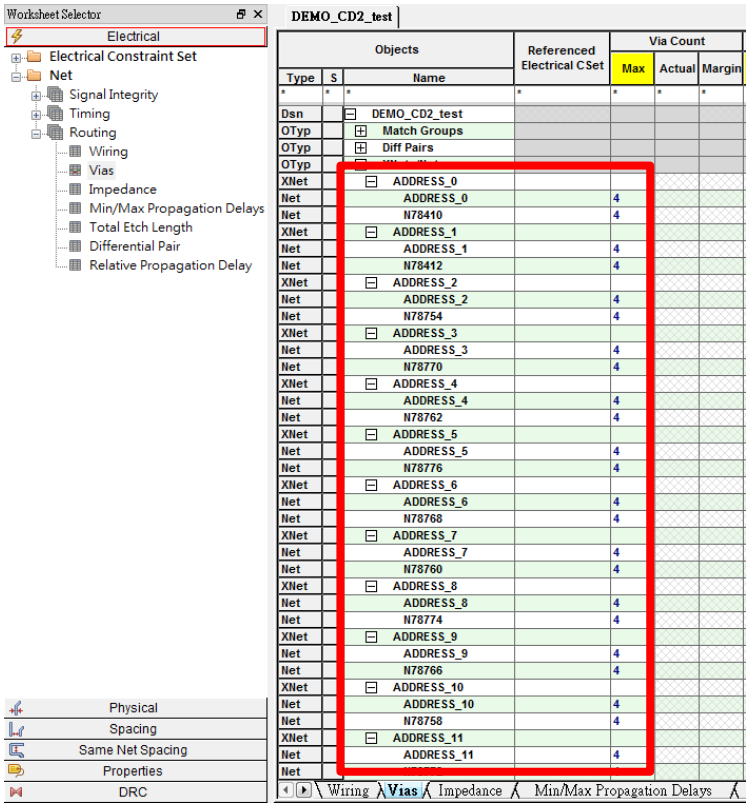
- CM Import
  - 順利 Update CM 之後，會將相關 Constraint Set 資訊倒回 Excel 表格

| Net Name | Cset Name Prefix | Width Outer | Width Inner (-XX-XX..) | Spacing Outer (us;other) | Spacing Inner (us;other) (-XX-..) | Extra Wdt/Spacing Inner layer sets | Bus Name | Differential Pair | XNet Name/ID | Shape to Pin/Via/Line/Shape Spacing | Max via Coun | Physical net Class Name (by program) | Spacing Net Class Name (by program) | Same SCS NCC ref CSet Name (by program) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| N78766 | ADDR | 6 | 5-6 | 10;7 | 12;14-9;10 | 4,5 | | | ADDRESS_9 | | 4 | 6-5-6@4,5 | ADDR_10;7-12;14-9;10@4,5 | ZZ-10-12-9 |
| N78768 | ADDR | 6 | 5-6 | 10;7 | 12;14-9;10 | 4,5 | | | ADDRESS_6 | | 4 | 6-5-6@4,5 | ADDR_10;7-12;14-9;10@4,5 | ZZ-10-12-9 |
| N78770 | ADDR | 6 | 5-6 | 10;7 | 12;14-9;10 | 4,5 | | | ADDRESS_3 | | 4 | 6-5-6@4,5 | ADDR_10;7-12;14-9;10@4,5 | ZZ-10-12-9 |
| N78772 | ADDR | 6 | 5-6 | 10;7 | 12;14-9;10 | 4,5 | | | ADDRESS_11 | | 4 | 6-5-6@4,5 | ADDR_10;7-12;14-9;10@4,5 | ZZ-10-12-9 |
| N78774 | ADDR | 6 | 5-6 | 10;7 | 12;14-9;10 | 4,5 | | | ADDRESS_8 | | 4 | 6-5-6@4,5 | ADDR_10;7-12;14-9;10@4,5 | ZZ-10-12-9 |
| N78776 | ADDR | 6 | 5-6 | 10;7 | 12;14-9;10 | 4,5 | | | ADDRESS_5 | | 4 | 6-5-6@4,5 | ADDR_10;7-12;14-9;10@4,5 | ZZ-10-12-9 |
| N81617 | DATA | 7 | 9 | 6 | 8 | | | | DATA_0 | 10 | | 7-9 | DATA_6-8 | ZZ-6-8 |
| N81744 | DATA | 7 | 9 | 6 | 8 | | | | DATA_1 | 10 | | 7-9 | DATA_6-8 | ZZ-6-8 |
| N81763 | DATA | 7 | 9 | 6 | 8 | | | | DATA_2 | 10 | | 7-9 | DATA_6-8 | ZZ-6-8 |
| SERIES_1 | 90OHM | | | | | | | | SERIES_11 | | | 6.5-5.5-7.5@2,7 | 90OHM | ZZ-4.5-7-5 |
| SERIES_2 | 120OHM | | | | | | | | | | | 5-6-5.5-6.4@3,6-4,5 | 120OHM | ZZ-5-6-7 |
| SERIES_11 | 90OHM | | | | | | | | SERIES_11 | | | 6.5-5.5-7.5@2,7 | 90OHM | ZZ-4.5-7-5 |
| SERIES_APPLY_ | 90OHM | | | | | | | | SERIES_APPLY_1 | | | 6.5-5.5-7.5@2,7 | 90OHM | ZZ-4.5-7-5 |
| SERIES_APPLY_ | 90OHM | | | | | | | | SERIES_APPLY_1 | | | 6.5-5.5-7.5@2,7 | 90OHM | ZZ-4.5-7-5 |
| SERIES_BE_APPLY_1 | 90OHM | | | | | | | | SERIES_BE_APPLY_11 | | | 6.5-5.5-7.5@2,7 | 90OHM | ZZ-4.5-7-5 |
| SERIES_BE_APPLY_11 | 90OHM | | | | | | | | SERIES_BE_APPLY_11 | | | 6.5-5.5-7.5@2,7 | 90OHM | ZZ-4.5-7-5 |
| USER_DIFF_01 | DP | 8 | 6.5-7-7.3 | 8 | 6.5-7-7.3 | 2,7-3,6 | | DP1 | | | | 8-6.5-7-7.3_DP_8-6.5-7-7.3@2,A | DP_DP_8-6.5-7-7.3@2,7-3,6 | ZZ-8-7-7.3-6.5 |
| USER_DIFF_02 | DP | 8 | 6.5-7-7.3 | 8 | 6.5-7-7.3 | 2,7-3,6 | | DP1 | | | | 8-6.5-7-7.3_DP_8-6.5-7-7.3@2,A | DP_DP_8-6.5-7-7.3@2,7-3,6 | ZZ-8-7-7.3-6.5 |

# GraserWARE - CM Import

- CM Import
  - Max via count

| Net Name | Cset Name Prefix | Width Outer | Width Inner (-XX-XX..) | Spacing Outer (us;other) | Spacing Inner (us;other) (-XX-..) | Extra Wdt/Spacing Inner layer sets | Bus Name | Differential Pair | XNet Name/ID | Shape to Pin/Via/Line/Shape Spacing | Max via Count | Physical net Class Name (by program) | Spacing Net Class Name (by program) | Same SCS NCC ref CSet Name (by program) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ADDRESS_0 | ADDR | 6 | 5-6 | 10;7 | 12;14-9;10 | 4,5 | | | ADDRESS_0 | | 4 | 6-5-6@4,5 | ADDR_10;7-12;14-9;10@4,5 | ZZ-10-12-9 |



# GraserWARE - CM Import

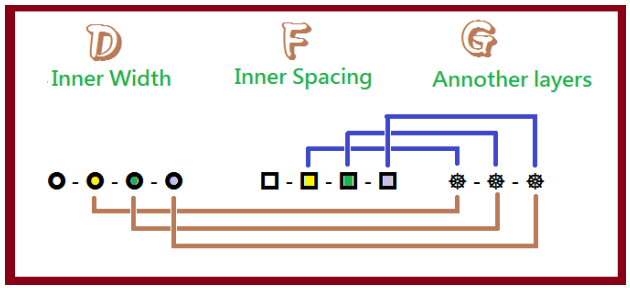
- CM Import
  - Physical

| Net Name | Cset Name Prefix | Width Outer | Width Inner (-XX-XX..) | Spacing Outer (us;other) | Spacing Inner (us;other) (-XX-..) | Extra Wdt/Spacing Inner layer sets | Bus Name | Differential Pair | XNet Name/ID | Shape to Pin/Via/Line/Shape Spacing | Max via Count | Physical net Class Name (by program) | Spacing Net Class Name (by program) | Same SCS NCC ref CSet Name (by program) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SERIES_2 | 120OHM | | | | | | | | | | | 5-6-5.5-6.4@3,6-4,5 | 120OHM | ZZ-5-6-7 |

| Impedance | Notes | Width Outer | Width Inner (-XX-XX..) | Spacing Outer (us;other) | Spacing Inner (us;other) (-XX-..) | Extra Wdt/Spacing Inner layer sets |
|---|---|---|---|---|---|---|
| 120OHM | | 5 | 6-5.5-6.4 | 5 | 5-6-7 | 3,6-4,5 |

| Objects | | | Referenced Physical CSet | Line Width |
|---|---|---|---|---|
| Type | S | Name | | Min |
| | | | | mil |
| Dsn | | DEMO_CD2_test | DEFAULT | 4.00 |
| OTyp | | Net Classes | | |
| NCls | | RGNP | RGNP | 4.00 |
| NCls | | 5-6-5.5-6.4@3,6-4,5 (1) | 5-6-5.5-6.4@3,6-4,5 | 5.00:6.00:5.50:6.40:6.40:5.50:6.00:5.00 |
| Net | | SERIES_2 | 5-6-5.5-6.4@3,6-4,5 | 5.00:6.00:5.50:6.40:6.40:5.50:6.00:5.00 |
| NCls | | 6.5-6.5-7.5@2,7 (6) | 6.5-5.5-7.5@2,7 | 6.50:7.50:5.50:5.50:5.50:5.50:7.50:6.50 |
| Net | | SERIES_APPLY_1 | 6.5-5.5-7.5@2,7 | 6.50:7.50:5.50:5.50:5.50:5.50:7.50:6.50 |
| Net | | SERIES_APPLY_11 | 6.5-5.5-7.5@2,7 | 6.50:7.50:5.50:5.50:5.50:5.50:7.50:6.50 |
| Net | | SERIES_BE_APPLY_1 | 6.5-5.5-7.5@2,7 | 6.50:7.50:5.50:5.50:5.50:5.50:7.50:6.50 |
| Net | | SERIES_BE_APPLY_11 | 6.5-5.5-7.5@2,7 | 6.50:7.50:5.50:5.50:5.50:5.50:7.50:6.50 |
| Net | | SERIES_1 | 6.5-5.5-7.5@2,7 | 6.50:7.50:5.50:5.50:5.50:5.50:7.50:6.50 |
| Net | | SERIES_11 | 6.5-5.5-7.5@2,7 | 6.50:7.50:5.50:5.50:5.50:5.50:7.50:6.50 |
| NCls | | 7-9 (6) | 7-9 | 7.00:9.00:9.00:9.00:9.00:9.00:9.00:7.00 |
| Net | | DATA_0 | 7-9 | 7.00:9.00:9.00:9.00:9.00:9.00:9.00:7.00 |
| Net | | DATA_1 | 7-9 | 7.00:9.00:9.00:9.00:9.00:9.00:9.00:7.00 |
| Net | | DATA_2 | 7-9 | 7.00:9.00:9.00:9.00:9.00:9.00:9.00:7.00 |
| Net | | N81617 | 7-9 | 7.00:9.00:9.00:9.00:9.00:9.00:9.00:7.00 |
| Net | | N81744 | 7-9 | 7.00:9.00:9.00:9.00:9.00:9.00:9.00:7.00 |
| Net | | N81763 | 7-9 | 7.00:9.00:9.00:9.00:9.00:9.00:9.00:7.00 |
| NCls | | 8-6.5-7-7.3_DP_8-6.5-7-7.3@2,A (4) | 8-6.5-7-7.3_DP_8-6.... | 8.00:7.00:7.30:6.50:6.50:7.30:7.00:8.00 |
| Net | | MODEL_DIFF_01 | 8-6.5-7-7.3_DP_8-6.5-... | 8.00:7.00:7.30:6.50:6.50:7.30:7.00:8.00 |
| Net | | MODEL_DIFF_02 | 8-6.5-7-7.3_DP_8-6.5-... | 8.00:7.00:7.30:6.50:6.50:7.30:7.00:8.00 |
| Net | | USER_DIFF_01 | 8-6.5-7-7.3_DP_8-6.5-... | 8.00:7.00:7.30:6.50:6.50:7.30:7.00:8.00 |
| Net | | USER_DIFF_02 | 8-6.5-7-7.3_DP_8-6.5-... | 8.00:7.00:7.30:6.50:6.50:7.30:7.00:8.00 |
| OTyp | | Diff Pairs | | |
| OTyp | | XNets/Nets | | |

- Line width
- Outer/Inner
- By Impedance

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# GraserWARE - CM Import

- CM Import
  - Physical Region

| Region rules | Physical | | | | | | Spacing | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Region Name | Min line width (out-in) | Max line width (out-in) | Min neck width (out-in) | Max neck length | DiffPair primary gap (out-in) | DiffPair neck gap (out-in) | Pin to Pin (out-in) | Line to Pin (out-in) | Line to Line (out-in) | Via to Pin (out-in) | Via to Via (out-in) | Via to Line (out-in) | Shape to Pin (out-in) | Shape to Via (out-in) | Shape to Line (out-in) | Shape to Shape (out-in) |
| BGA | 3.5 | 5 | 3.5 | 1000 | 4 | 3.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 8 | 8 | 8 | 10 |
| VIP_AREA | 4-4.2 | 4.5-5 | 3-3.5 | 1200 | 4.5-4 | 4-3.5 | 3-3.2 | 3-3.2 | 3-3.2 | 3-3.2 | 3-3.2 | 3-3.2 | 6 | 6 | 6 | 8 |
| MIN_SPACING_AREA | 3 | 4 | 3 | 800 | 4 | 3 | 4-3.5 | 4-3.5 | 4-3.5 | 4-3.5 | 4-3.5 | 4-3.5 | 5-4.5 | 5-4.5 | 5-4.5 | 6-7 |
| RGNS | | | | | | | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| RGNP | 4 | 4 | 4 | 4 | 4 | 4 | | | | | | | | | | |

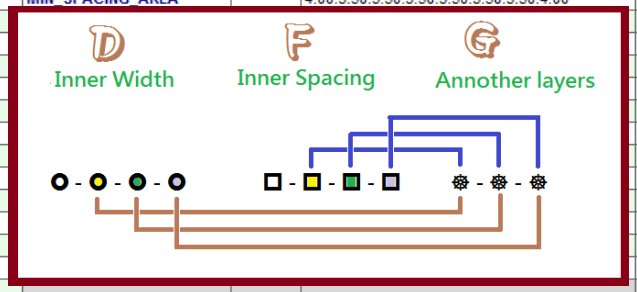
| Objects | | | Referenced Physical CSet | Line Width | | Neck | | Differential Pair | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Min | Max | Min Width | Max Length | Min Line Sp | Primary Gap | Neck Gap | (+)Toleranc | (-)Tolerance |
| Type | S | Name | | mil | mil | mil | mil | mil | mil | mil | mil | mil |
| * | * | * | * | * | * | * | * | * | * | * | * | * |
| Dsn | | DEMO_CD2_test | DEFAULT | 4.00 | 0.00 | 4.00 | 0.00 | 3.90 | 4.00 | 4.00 | 0.10 | 0.10 |
| Rgn | | BGA | BGA | 3.50 | 5.00 | 3.50 | 1000.00 | 3.90 | 4.00 | 3.50 | 0.10 | 0.10 |
| Rgn | | MIN_SPACING_AREA | MIN_SPACING_AREA | 3.00 | 4.00 | 3.00 | 800.00 | 3.90 | 4.00 | 3.00 | 0.10 | 0.10 |
| Rgn | | RGNP | RGNP | 4.00 | 4.00 | 4.00 | 4.00 | 3.90 | 4.00 | 4.00 | 0.10 | 0.10 |
| Rgn | | RGNS | | | | | | | | | | |
| Rgn | | VIP_AREA | VIP_AREA | 4.00:4.20:4.20:4.20:4.20:4.20:4.20:4.00 | 4.50:5.00:5.00... | 3.00:3.50:3.... | 1200.00 | 3.90 | 4.50:4.00:4.... | 4.00:3.50:3.... | 0.10 | 0.10 |

# GraserWARE - CM Import

- CM Import
  - Spacing

| Net Name | Cset Name Prefix | Width Outer | Width Inner (-XX-XX..) | Spacing Outer (us;other) | Spacing Inner (us;other) (-XX-..) | Extra Wdt/Spacing Inner layer sets | Bus Name | Differential Pair | XNet Name/ID | Shape to Pin/Via/Line/Shape Spacing | Max via Count | Physical net Class Name (by program) | Spacing Net Class Name (by program) | Same SCS NCC ref CSet Name (by program) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DATA_2 | DATA | 7 | 9 | 6 | 8 | | | | DATA_2 | 10 | | 7-9 | DATA_6-8 | ZZ-6-8 |
| MODEL_DIFF_01 | DP | 8 | 6.5-7-7.3 | 8 | 6.5-7-7.3 | 2,7-3,6 | | DP_MODEL_DIFF_0 | | | | 8-6.5-7-7.3_DP_8-6.5-7-7.3@2,A | DP_DP_8-6.5-7-7.3@2,7-3,6 | ZZ-8-7-7.3-6.5 |
| MODEL_DIFF_02 | DP | 8 | 6.5-7-7.3 | 8 | 6.5-7-7.3 | 2,7-3,6 | | DP_MODEL_DIFF_0 | | | | 8-6.5-7-7.3_DP_8-6.5-7-7.3@2,A | DP_DP_8-6.5-7-7.3@2,7-3,6 | ZZ-8-7-7.3-6.5 |
| N78410 | ADDR | 6 | 5-6 | 10;7 | 12;14-9;10 | 4,5 | | | ADDRESS_0 | | 4 | 6-5-6@4,5 | ADDR_10;7-12;14-9;10@4,5 | ZZ-10-12-9 |

| Objects | | | Referenced Spacing CSet | Line To >> | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | All | Line | Thru Pin | SMD Pin | Test Pin | Thru Via | BB Via | Test Via | Shape | Hole |
| Type | S | Name | | mil | mil | mil | mil | mil | mil | mil | mil | mil | mil |
| * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| Dsn | | DEMO_CD2_test | DEFAULT | *** | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 8.00 |
| OTyp | | Net Classes | | | | | | | | | | | |
| NCls | | ADDR_10;7-12;14-9;10@4,5 (28) | ADDR_10;7-12;14-9;10@4,5 | *** | 7.00:14.00:14.00:10.00:10.00:14.00:14.00:7.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 8.00 |
| NCls | | BGA | BGA | *** | 4.50 | 4.50 | 4.50 | 4.50 | 4.50 | 4.50 | 4.50 | 8.00 | 8.00 |
| NCls | | DP_DP_8-6.5-7-7.3@2,7-3,6 (4) | DP_DP_8-6.5-7-7.3@2,7-3,6 | *** | 8.00:7.00:7.30:6.50:6.50:7.30:7.00:8.00 | 5.00:5. | | | | | | | |
| Net | | MODEL_DIFF_01 | DP_DP_8-6.5-7-7.3@2,7-3,6 | *** | 8.00:7.00:7.30:6.50:6.50:7.30:7.00:8.00 | 5.00:5. | | | | | | | |
| Net | | MODEL_DIFF_02 | DP_DP_8-6.5-7-7.3@2,7-3,6 | *** | 8.00:7.00:7.30:6.50:6.50:7.30:7.00:8.00 | 5.00:5. | | | | | | | |
| Net | | USER_DIFF_01 | DP_DP_8-6.5-7-7.3@2,7-3,6 | *** | 8.00:7.00:7.30:6.50:6.50:7.30:7.00:8.00 | 5.00:5. | | | | | | | |
| Net | | USER_DIFF_02 | DP_DP_8-6.5-7-7.3@2,7-3,6 | *** | 8.00:7.00:7.30:6.50:6.50:7.30:7.00:8.00 | 5.00:5. | | | | | | | |
| NCls | | MIN_SPACING_AREA | MIN_SPACING_AREA | *** | 4.00:3.50:3.50:3.50:3.50:3.50:3.50:4.00 | 4.00:3. | | | | | | | |
| NCls | | RGNP | | | | 5.00 | | | | | | | |
| NCls | | RGNS | | | | 4.00 | | | | | | | |
| NCls | | VIP_AREA | | | | 3.00:3. | | | | | | | |
| NCls | | 90OHM (6) | | | | 5.00 | | | | | | | |
| Net | | SERIES_APPLY_1 | | | | 5.00 | | | | | | | |
| Net | | SERIES_APPLY_11 | | | | 5.00 | | | | | | | |
| Net | | SERIES_BE_APPLY_1 | | | | 5.00 | | | | | | | |
| Net | | SERIES_BE_APPLY_11 | | | | 5.00 | | | | | | | |
| Net | | SERIES_1 | | | | 5.00 | | | | | | | |
| Net | | SERIES_11 | | | | 5.00 | | | | | | | |
| NCls | | 120OHM (1) | | | | 5.00 | | | | | | | |
| Net | | SERIES_2 | | | | 5.00 | | | | | | | |
| OTyp | | Diff Pairs | | | | | | | | | | | |
| OTyp | | XNets/Nets | | | | | | | | | | | |




- Line spacing
- Outer/Inner
- Other Inner
- Same/different Net Class
- Shape spacing
- Other spacing
- Same net spacing

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# GraserWARE - CM Import

- CM Import
  - Spacing (Class-Class)

| Net Name | Cset Name Prefix | Width Outer | Width Inner (-XX-XX..) | Spacing Outer (us;other) | Spacing Inner (us;other) (-XX-..) | Extra Wdt/Spacing Inner layer sets | Bus Name | Differential Pair | XNet Name/ID | Shape to Pin/Via/Line/Shape Spacing | Max via Count | Physical net Class Name (by program) | Spacing Net Class Name (by program) | Same SCS NCC ref CSet Name (by program) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| N78410 | ADDR | 6 | 5-6 | 10;7 | 12;14-9;10 | 4,5 | | | ADDRESS_0 | | 4 | 6-5-6@4,5 | ADDR_10;7-12;14-9;10@4,5 | ZZ-10-12-9 |

| Cset Name Prefix1 | Cset Name Prefix2 | Spacing Outer | Spacing Inner (-XX-..) | Extra Spacing Inner layer sets (XX-XX-..) | NCC ref CSet Name (by program) |
|---|---|---|---|---|---|
| ADDR | DATA | 12 | 15 | | ZZ-12-15 |
| DATA | DP | 15 | 20 | | ZZ-15-20 |

| Objects | | | Referenced Spacing CSet | Line To >> | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | All | Line | Thru Pin | SMD Pin | Test Pin | Thru Via | BB Via | Test Via | Shape | Hole |
| Type | S | Name | | mil | mil | mil | mil | mil | mil | mil | mil | mil | mil |
| * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| Dsn | | DEMO_CD2_test | DEFAULT | *** | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 8.00 |
| NCIs | | ADDR_10;7-12;14-9;10@4,5 (2) | ADDR_10;7-12;14-9;10@4,5 | *** | 7.00:14.00:14.00:10.00:10.00:14.00:14.00:7.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 8.00 |
| CCIs | | ADDR_10;7-12;14-9;10@4,5 | ZZ-10-12-9 | *** | 10.00:12.00:12.00:9.00:9.00:12.00:12.00:10.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 8.00 |
| CCIs | | DATA_6-8 | ZZ-12-15 | *** | 12.00:15.00:15.00:15.00:15.00:15.00:15.00:12.00 | 5.00 | 5.00 | 5.00 | 5.00:5.0... | 5.00:5.0... | 5.00:5.0... | 10.00 | 8.00 |
| NCIs | | BGA | BGA | *** | 4.50 | 4.50 | 4.50 | 4.50 | 4.50 | 4.50 | 4.50 | 8.00 | 8.00 |
| NCIs | | DATA_6-8 (3) | DATA_6-8 | *** | 6.00:8.00:8.00:8.00:8.00:8.00:8.00:6.00 | 5.00 | 5.00 | 5.00 | 5.00:5.0... | 5.00:5.0... | 5.00:5.0... | 10.00 | 8.00 |
| CCIs | | ADDR_10;7-12;14-9;10@4,5 | ZZ-12-15 | *** | 12.00:15.00:15.00:15.00:15.00:15.00:15.00:12.00 | 5.00 | 5.00 | 5.00 | 5.00:5.0... | 5.00:5.0... | 5.00:5.0... | 10.00 | 8.00 |
| CCIs | | DATA_6-8 | ZZ-6-8 | *** | 6.00:8.00:8.00:8.00:8.00:8.00:8.00:6.00 | 5.00 | 5.00 | 5.00 | 5.00:5.0... | 5.00:5.0... | 5.00:5.0... | 10.00 | 8.00 |
| CCIs | | DP_DP_8-6.5-7-7.3@2,7-3,6 | ZZ-15-20 | *** | 15.00:20.00:20.00:20.00:20.00:20.00:20.00:15.00 | 5.00 | 5.00 | 5.00 | 5.00:5.0... | 5.00:5.0... | 5.00:5.0... | 10.00 | 8.00 |
| NCIs | | DP_DP_8-6.5-7-7.3@2,7-3,6 (2) | DP_DP_8-6.5-7-7.3@2,7-3,6 | *** | 8.00:7.00:7.30:6.50:6.50:7.30:7.00:8.00 | 5.00:5.0... | 5.00:5.0... | 5.00:5.0... | 5.00:5.0... | 5.00:5.0... | 5.00:5.0... | 5.00:5.0... | 8.00 |
| CCIs | | DATA_6-8 | ZZ-15-20 | *** | 15.00:20.00:20.00:20.00:20.00:20.00:20.00:15.00 | 5.00 | 5.00 | 5.00 | 5.00:5.0... | 5.00:5.0... | 5.00:5.0... | 10.00 | 8.00 |

| Class Name | Rgns | Rgnp | Min_Spacing_Area | Dp_Dp_8-6.5-7-7.3@2,7-3,6 | Data_6-8 | Bga | Addr_10;7-12;14-9;10@4,5 | 90Ohm | 120Ohm |
|---|---|---|---|---|---|---|---|---|---|
| 120Ohm | | | | | | | | | Zz-5-6-7 |
| 90Ohm | | | | | | | | Zz-4.5-7-5 | |
| Addr_10;7-12;14-9;10@4,5 | | | | | Zz-12-15 | | Zz-10-12-9 | | |
| Bga | | | | | | | | | |
| Data_6-8 | | | | Zz-15-20 | Zz-6-8 | | | | |
| Dp_Dp_8-6.5-7-7.3@2,7-3,6 | | | | Zz-8-7-7.3-6.5 | | | | | |
| Min_Spacing_Area | | | | | | | | | |
| Rgnp | | | | | | | | | |
| Rgns | | | | | | | | | |
| Vip_Area | | | | | | | | | |

# GraserWARE - CM Import

- CM Import
  - Spacing Region

| Region rules | Physical | | | | | | Spacing | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Region Name | Min line width (out-in) | Max line width (out-in) | Min neck width (out-in) | Max neck length | DiffPair primary gap (out-in) | DiffPair neck gap (out-in) | Pin to Pin (out-in) | Line to Pin (out-in) | Line to Line (out-in) | Via to Pin (out-in) | Via to Via (out-in) | Via to Line (out-in) | Shape to Pin (out-in) | Shape to Via (out-in) | Shape to Line (out-in) | Shape to Shape (out-in) |
| BGA | 3.5 | 5 | 3.5 | 1000 | 4 | 3.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 8 | 8 | 8 | 10 |
| VIP_AREA | 4-4.2 | 4.5-5 | 3-3.5 | 1200 | 4.5-4 | 4-3.5 | 3-3.2 | 3-3.2 | 3-3.2 | 3-3.2 | 3-3.2 | 3-3.2 | 6 | 6 | 6 | 8 |
| MIN_SPACING_AREA | 3 | 4 | 3 | 800 | 4 | 3 | 4-3.5 | 4-3.5 | 4-3.5 | 4-3.5 | 4-3.5 | 4-3.5 | 5-4.5 | 5-4.5 | 5-4.5 | 6-7 |
| RGNS | | | | | | | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| RGNP | 4 | 4 | 4 | 4 | 4 | 4 | | | | | | | | | | |

| Objects | | | Referenced Spacing CSet | Line To >> | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | All | Line | Thru Pin | SMD Pin | Test Pin | Thru Via | BB Via | Test Via | Shape |
| Type | S | Name | | mil | mil | mil | mil | mil | mil | mil | mil | mil |
| * | * | * | * | * | * | * | * | * | * | * | * | * |
| Dsn | | ⊟ DEMO_CD2_test | DEFAULT | *** | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 |
| Rgn | | BGA | BGA | *** | 4.50 | 4.50 | 4.50 | 4.50 | 4.50 | 4.50 | 4.50 | 8.00 |
| Rgn | | MIN_SPACING_AREA | MIN_SPACING_AREA | *** | 4.00:3.50:3.50:3.50:3.50:3.50:3.50:4.00 | 4.00:3.5... | 4.00:3.5... | 4.00:3.5... | 4.00:3.5... | 4.00:3.5... | 4.00:3.5... | 5.00:4.50:4.... |
| Rgn | | RGNP | | | | | | | | | | |
| Rgn | | RGNS | RGNS | *** | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| Rgn | | VIP_AREA | VIP_AREA | *** | 3.00:3.20:3.20:3.20:3.20:3.20:3.20:3.00 | 3.00:3.2... | 3.00:3.2... | 3.00:3.2... | 3.00:3.2... | 3.00:3.2... | 3.00:3.2... | 6.00 |

# GraserWARE - CM Import

- CM Import
  - Same net spacing

| Objects | | | Referenced Same Net Spacing CSet | Enable DRC By-Layer | Line To >> | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | All | Line | Thru Pin | SMD Pin | Test Pin | Thru Via | BB Via | Test Via | Shape | Hole |
| Type | S | Name | | | mil | mil | mil | mil | mil | mil | mil | mil | mil | mil |
| * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| Dsn | | ⊟ DEMO_CD2_test | DEFAULT | TRUE | *** | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 8.00 |
| OTyp | | ⊟ Net Classes | | | | | | | | | | | | |
| NCls | | ⊞ ADDR_10;7-12;14-9;10@4,5 (28) | ADDR_10;7-12;14-9;10@4,5 | TRUE | *** | 10.00:12.00:12.00:9.00:9.00:12.00:12.00:10.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 8.00 |
| NCls | | BGA | BGA | TRUE | *** | 4.50 | 4.50 | 4.50 | 4.50 | 4.50 | 4.50 | 4.50 | 8.00 | 8.00 |
| NCls | | ⊟ DATA_6-8 (6) | DATA_6-8 | TRUE | *** | 6.00:8.00:8.00:8.00:8.00:8.00:8.00:6.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 10.00 | 8.00 |
| Net | | DATA_0 | DATA_6-8 | TRUE | *** | 6.00:8.00:8.00:8.00:8.00:8.00:8.00:6.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 10.00 | 8.00 |
| Net | | DATA_1 | DATA_6-8 | TRUE | *** | 6.00:8.00:8.00:8.00:8.00:8.00:8.00:6.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 10.00 | 8.00 |
| Net | | DATA_2 | DATA_6-8 | TRUE | *** | 6.00:8.00:8.00:8.00:8.00:8.00:8.00:6.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 10.00 | 8.00 |
| Net | | N81617 | DATA_6-8 | TRUE | *** | 6.00:8.00:8.00:8.00:8.00:8.00:8.00:6.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 10.00 | 8.00 |
| Net | | N81744 | DATA_6-8 | TRUE | *** | 6.00:8.00:8.00:8.00:8.00:8.00:8.00:6.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 10.00 | 8.00 |
| Net | | N81763 | DATA_6-8 | TRUE | *** | 6.00:8.00:8.00:8.00:8.00:8.00:8.00:6.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 10.00 | 8.00 |
| NCls | | ⊟ DP_DP_8-6.5-7-7.3@2,7-3,6 (4) | DP_DP_8-6.5-7-7.3@2,7-3,6 | TRUE | *** | 8.00:7.00:7.30:6.50:6.50:7.30:7.00:8.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 8.00 |
| Net | | MODEL_DIFF_01 | DP_DP_8-6.5-7-7.3@2,7-3,6 | TRUE | *** | 8.00:7.00:7.30:6.50:6.50:7.30:7.00:8.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 8.00 |
| Net | | MODEL_DIFF_02 | DP_DP_8-6.5-7-7.3@2,7-3,6 | TRUE | *** | 8.00:7.00:7.30:6.50:6.50:7.30:7.00:8.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 8.00 |
| Net | | USER_DIFF_01 | DP_DP_8-6.5-7-7.3@2,7-3,6 | TRUE | *** | 8.00:7.00:7.30:6.50:6.50:7.30:7.00:8.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 8.00 |
| Net | | USER_DIFF_02 | DP_DP_8-6.5-7-7.3@2,7-3,6 | TRUE | *** | 8.00:7.00:7.30:6.50:6.50:7.30:7.00:8.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 8.00 |
| NCls | | MIN_SPACING_AREA | MIN_SPACING_AREA | TRUE | *** | 4.00:3.50:3.50:3.50:3.50:3.50:3.50:4.00 | 4.00:3.5... | 4.00:3.5... | 4.00:3.5... | 4.00:3.5... | 4.00:3.5... | 4.00:3.5... | 5.00:4.5... | 8.00 |
| NCls | | RGNP | RGNP | TRUE | *** | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 8.00 |
| NCls | | RGNS | RGNS | TRUE | *** | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 8.00 |
| NCls | | VIP_AREA | VIP_AREA | TRUE | *** | 3.00:3.20:3.20:3.20:3.20:3.20:3.20:3.00 | 3.00:3.2... | 3.00:3.2... | 3.00:3.2... | 3.00:3.2... | 3.00:3.2... | 3.00:3.2... | 6.00 | 8.00 |
| NCls | | ⊟ 90OHM (6) | 90OHM | TRUE | *** | 4.50:7.00:5.00:5.00:5.00:5.00:7.00:4.50 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 8.00 |
| Net | | SERIES_APPLY_1 | 90OHM | TRUE | *** | 4.50:7.00:5.00:5.00:5.00:5.00:7.00:4.50 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 8.00 |
| Net | | SERIES_APPLY_11 | 90OHM | TRUE | *** | 4.50:7.00:5.00:5.00:5.00:5.00:7.00:4.50 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 8.00 |
| Net | | SERIES_BE_APPLY_1 | 90OHM | TRUE | *** | 4.50:7.00:5.00:5.00:5.00:5.00:7.00:4.50 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 8.00 |
| Net | | SERIES_BE_APPLY_11 | 90OHM | TRUE | *** | 4.50:7.00:5.00:5.00:5.00:5.00:7.00:4.50 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 8.00 |
| Net | | SERIES_1 | 90OHM | TRUE | *** | 4.50:7.00:5.00:5.00:5.00:5.00:7.00:4.50 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 8.00 |
| Net | | SERIES_11 | 90OHM | TRUE | *** | 4.50:7.00:5.00:5.00:5.00:5.00:7.00:4.50 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 8.00 |
| NCls | | ⊟ 120OHM (1) | 120OHM | TRUE | *** | 5.00:5.00:6.00:7.00:7.00:6.00:5.00:5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 8.00 |
| Net | | SERIES_2 | 120OHM | TRUE | *** | 5.00:5.00:6.00:7.00:7.00:6.00:5.00:5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 8.00 |
| OTyp | | ⊞ Diff Pairs | | | | | | | | | | | | |
| OTyp | | ⊞ XNets/Nets | | | | | | | | | | | | |

Graser User Conference Taipei

# Thank you, next
# 整合規劃與協同設計