PCB Design With HDL Designer

- **Motivation**
  - Time savings
  - Money savings
  - Simplicity

- **Approach**
  - Use single tool for PCB and FPGA design
  - More FPGA designs than PCB designers
    - Use HDL designer for schematic capture
PCB Design With HDL Designer
Design Process

PCB Design Process (Minimal):
- Schematic Capture
- Displaying Reference Designators and Component Information on Schematic
- Netlist Creation and Conversion
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Schematic Capture - Symbols

- Part Symbols
- HDL Symbol Editor
  - Part Name
  - Part Number
  - Package Type
  - Pin Name (or Port Name)
  - Pin Number
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Schematic Capture - Symbols
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Schematic Capture – Schematic Diagrams

- Schematic Diagrams

- HDL Block Diagram Editor

  - Part Information from Part Symbol
    - Pin Number
    - Package Type
    - Part Number

  - Connection Information
    - Nets
    - Reference Designators
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VHDL Coding

Issue – Where to include Pin Numbers in VHDL?

– Comments

  – Possible

  – VHDL Attributes

    – Good Approach but not displayed on Block Diagrams in HDL Designer

  – VHDL Generics

    – Chosen Approach but displays pin numbers as a block of text
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Netlist Conversion

∩ Issue – How can a PADS netlist be produced?
  ∩ Comments
  ∩ Possible
  ∩ VHDL Attributes
    ∩ Good Approach but not displayed on Block Diagrams in HDL Designer
  ∩ VHDL Generics
    ∩ Chosen Approach but displays pin numbers as a block of text

```vhdl
GENERIC (  
  pin_a0 : string := "1";  
  pin_o0 : string := "2";  
  pin_a1 : string := "3";  
  pkg_type : string := "dip14";  
  part_num : string := "part_ac04"  
);
```
Conclusion

- Approach can be used PCB design
  - Would like Vendor to study modifications to HDL Designer
    - Schematic Display
    - PCB netlist output options
    - Design Rule Checking
    - Part List Generation