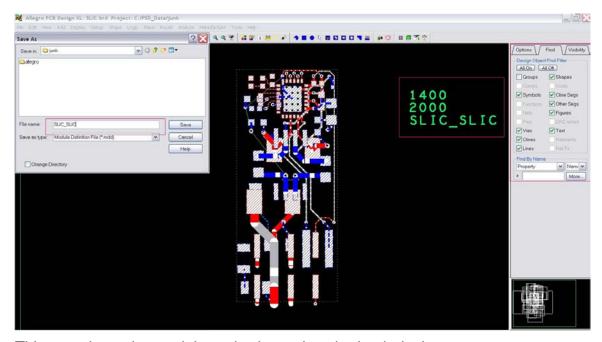# Hierarchical Design Example for Design Reuse Part2

6 The schematic design is now ready to be netlisted a layout created from the design. Create a netlist and a design, note; the new layout must have the same desired stackup as the final layout.

7 Once the layout is complete, a module is created from this layout. I find it useful to add text indicating the Module name and the origin of the module. It is helpful to use a large grid when creating the module, I prefer to use a 100 x 100 mil grid and chose an origin near a crital circuit component. In this case the SLIC package.

The module is created from the pull down menu Tools then Create Module. Then select the Design objects to be used in the Find Tab, all on is the normal default selection.
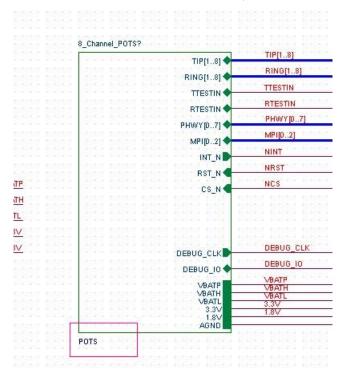
The File Name must be the Design Name, and then _ and the Root Schematic name, in this case the module name will be SLIC_SLIC.mdd.

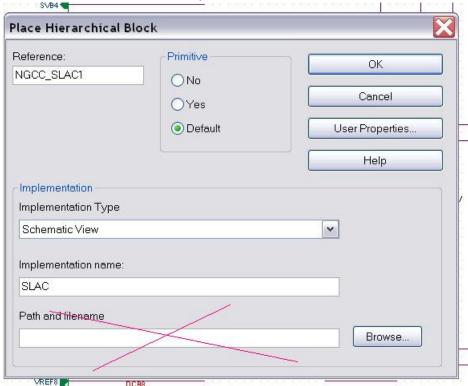This completes the module and schematic sub-circuit design.

8 To use this module and schematic sub-circuit design in a larger design, a new schematic must be created. In this case I will create an 8 channel POTS block consisting of an Octal SLAC and 8 SLIC's using the subcircuit just created.

This design will require three schematics, I chose Octal_POTS as the root, POTS and SLAC as the other 2 schematics. Note: The root schematic must contain a hierarchical block to the lower level schematics. The block name is that of the lower level schematic, here it is the POTS schematic.
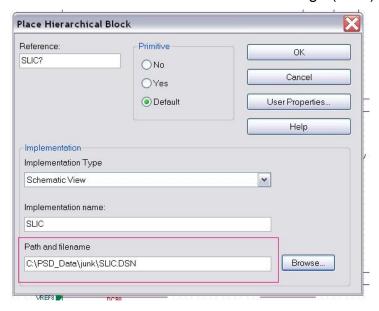

This block will contains 2 other hierarchical blocks, SLAC which is contained with in this design and the SLIC block which is not contained with in this design set.
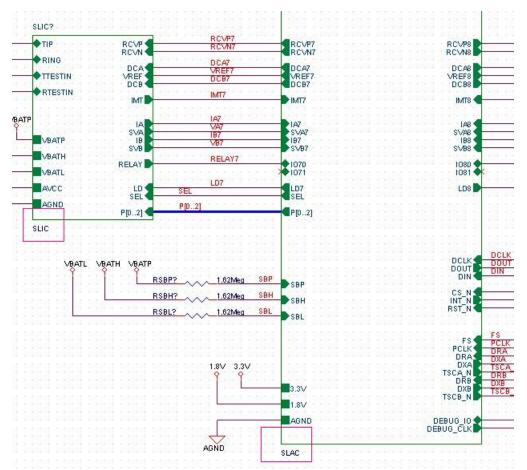
9 The hierarchical block is created by selecting the hierarchal block bottom, and then with the cursor in draw mode create a rectangle. A Place Hierarchical Block window will open and enter the Block Reference

(NGCC_SLAC1), Implementation Type (schematic view) and the Implementation name. The Implementation name is the name of the schematic that will be used, if the schematic is contained within the design no path and filename is required:

The Reuse Schematic hierachical block is created with the same method, however the Path and filename of the design (DSN) must be entered.
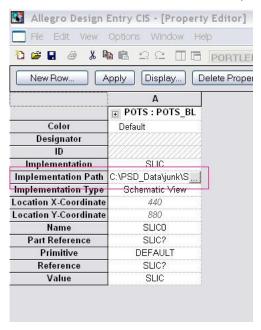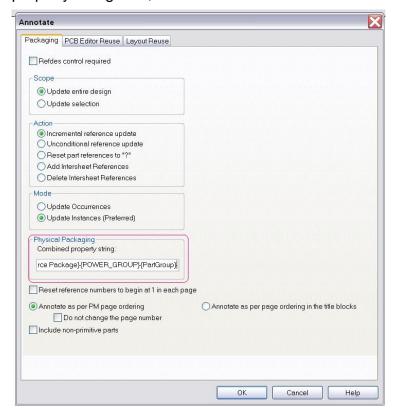

The SLIC block has an implementation path to the Reuse schematic that you previously designed. Note; The absolute path is shown in this design. It

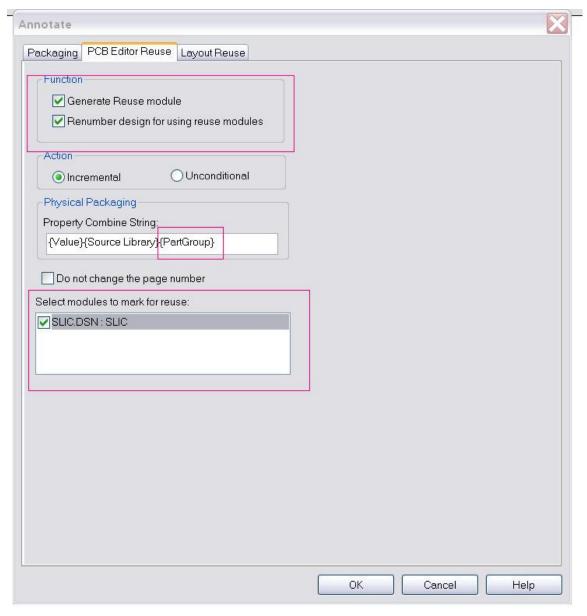maybe better to use a relative path, if the design is being given to someone else you will want to change this to a relative path. i.e. C:\PSD_Data\junk\SLIC.DSN will become SLIC.DSN where the SLIC.DSN file is in the same folder that the pots project folder is in.

10 The design is now ready for annotation. Use the annotation tool to annotate the design, make sure the {PartGroup} definition is in the Combined property string field, and annotate.
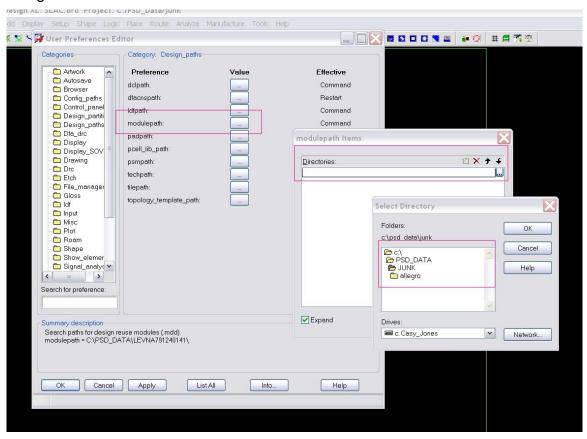
The design now must be annotated for PCB Reuse, open the Annotate window and chose the PCB Editor Reuse tab. Select both the "Generate Reuse module" and the "Renumber design for using reuse modules" check boxes.   Add the {PartGroup} indentifier in the Property Combined String field, and select the module in the Select modules to mark for reuse.

If you go to the SLIC page in the schematic design you will now see 8 instances of every part in the part properties, and the REUSE_ID field with have unique numbers for every instance. The design is now ready to enlist and open in Allegro.
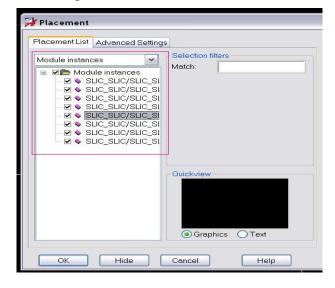
11 Allegro requires the user preferences of the design path set to the location of the MDD file (module), open the user Preferences under the setup toolbar

command. Set the modulepath variable point to the directory containing your design

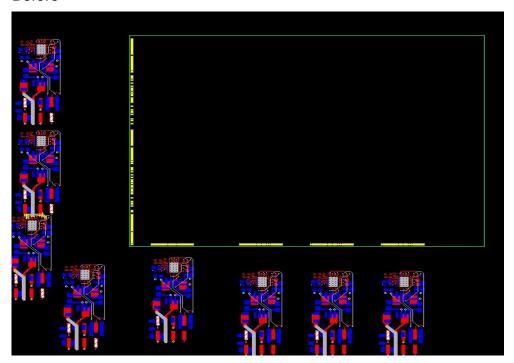Allegro is now ready to place the modules and components of the design.

12 From the toolbar select Place -> Manually and chose Module Instances under the placement list, and check off all the instances for placing them in the design.
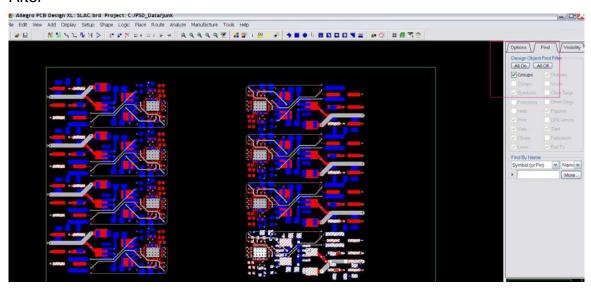
Note, it maybe helpful to have the grid setup to a large number like 100x100mil.

13 Moving and rotating the modules is preformed the same way as moving and rotating components, except that the selection must be by groups, not components. Here is a sample before and after of the design with the modules placed then moved.

Before

After

This placement took minutes, which would have been hours if placed without the use of modules. This design could be made into a module and used in a larger design. WPE