

OrCAD PCB Productivity Toolbox

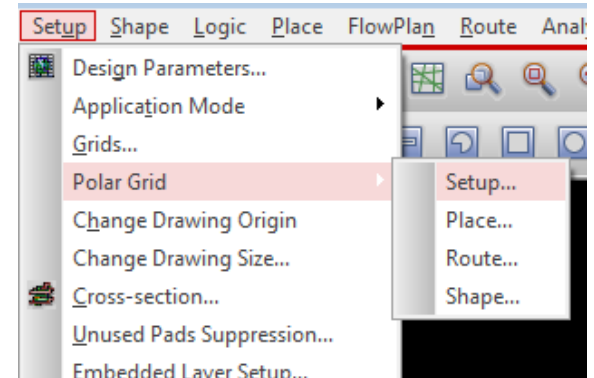
Официальный дистрибьютор в России – ООО «ПСБ СОФТ»

www.pcbsoft.ru

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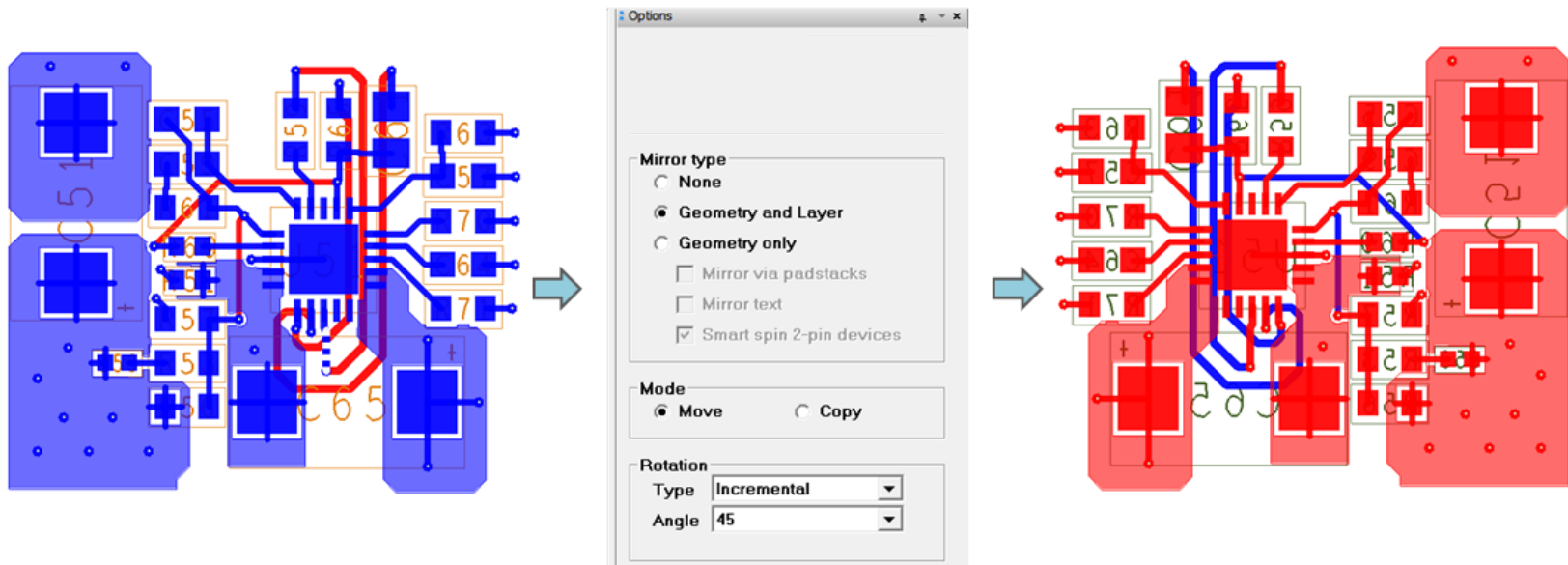
OrCAD PCB Productivity Toolbox

- Available for Professional and Standard PCB Editors focused on improving productivity
 - 18 powerful utilities designed to save time
- Seamlessly integrated within the OrCAD PCB Editors
 - Utilities integrated into the PCB Editor menus
- Complements and enhances existing out of the box capabilities
- Just one utility can justify the entire toolbox!



Advanced Mirror

- Enables mirror operations while moving or copying elements
 - Mirror across subclasses (*Geometry and Layer*)
 - Mirror on the same subclass (*Geometry only*)
- Including placement and routing
- Selection through window or single pick, dynamic preview
- Special handling for symbols, vias and text in *Geometry only* mode



Cross Copy

Easy way to copy objects from one class to another

- *Cross Copy* can move or copy objects to any destination layer for various purposes
- In contrast to *Create Detail*, objects are not destroyed (e.g. text will stay text!)
- Shape processing
 - Include/exclude voids
 - Fill or decompose with/out voids
 - Unfill shape
- Clines/lines processing
 - Can be converted to shape
 - Various endcap types
- Padstack processing (pins and vias)
 - Drawn as shape on destination layer
 - All visible layers are merged
 - Resulting pad shape can be voided by drill hole information
- Merging support
 - Selected data (find filter settings) is merged

The image shows a software dialog box titled "Cross Copy" with several sections for configuring the operation:

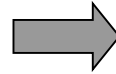
- General:**
 - Destination class/subclass: Board Geometry (dropdown)
 - Assembly_Notes (dropdown)
 - ☐ Delete original objects
- Shape options:**
 - Type: Filled Shape (dropdown)
 - Voids: Include (dropdown)
- Cline/line options:**
 - ☐ Convert to shape
 - Endcap: Round (dropdown)
- Pin/via options:**
 - Mode: Pads only (dropdown)
- Advanced:**
 - ☐ Merge all
 - ☐ Merge by net

At the bottom is a button labeled "Toggle Layers".

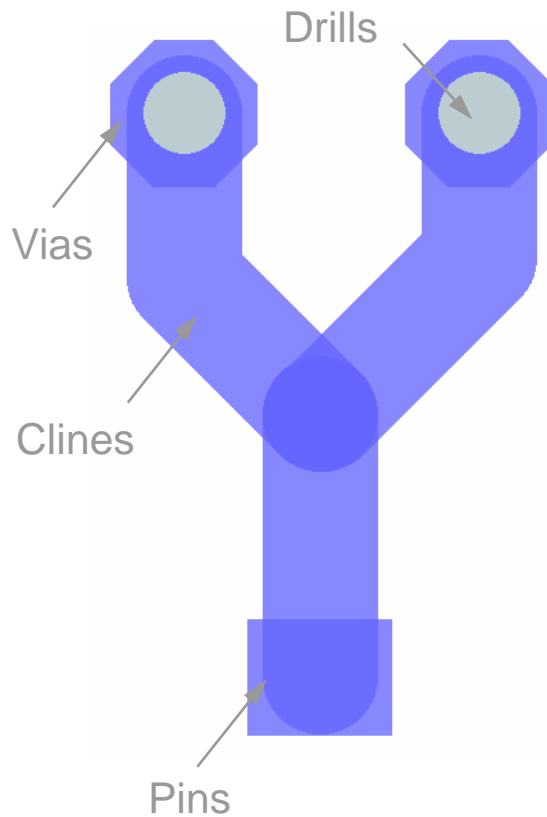
Cross Copy

Example: Merging data to soldermask shape

Selection



Result



General:

Destination class/subclass:

Board Geometry

Soldermask_Top

☐ Delete original objects

Shape options

Type: Filled Shape

Voids: Include

Cline/line options

☒ Convert to shape

Endcap: Round

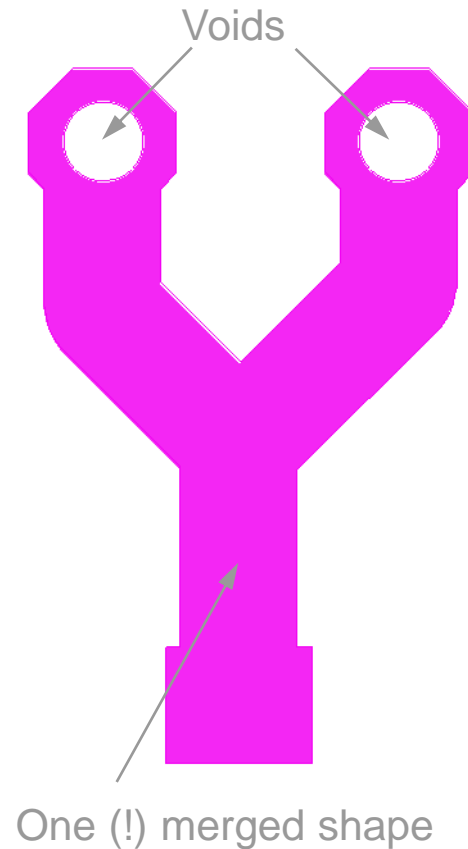
Pin/via options

Mode: Pads and Holes

Advanced

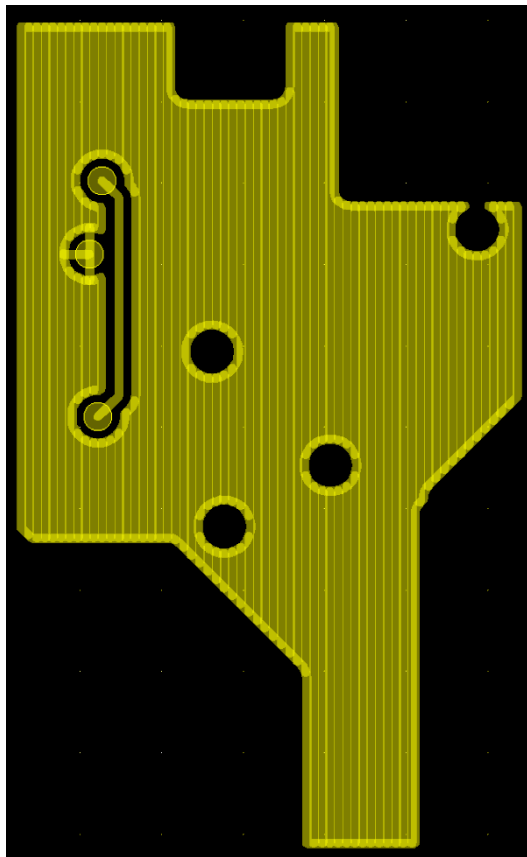
☒ Merge all

☐ Merge by net



Cross Copy

Example: Converting pseudo shapes (stroked lines) to “real” shapes



General:

Destination class/subclass:
Etch

☒ Top

☐ Delete original objects

Shape options

Type Filled Shape

Voids Include

Cline/line options

☒ Convert to shape

Endcap Round

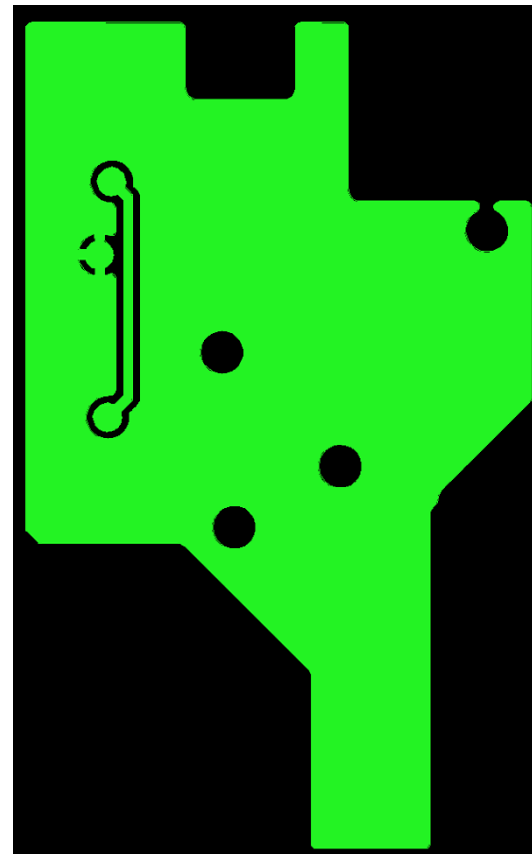
Pin/via options

Mode Pads only

Advanced

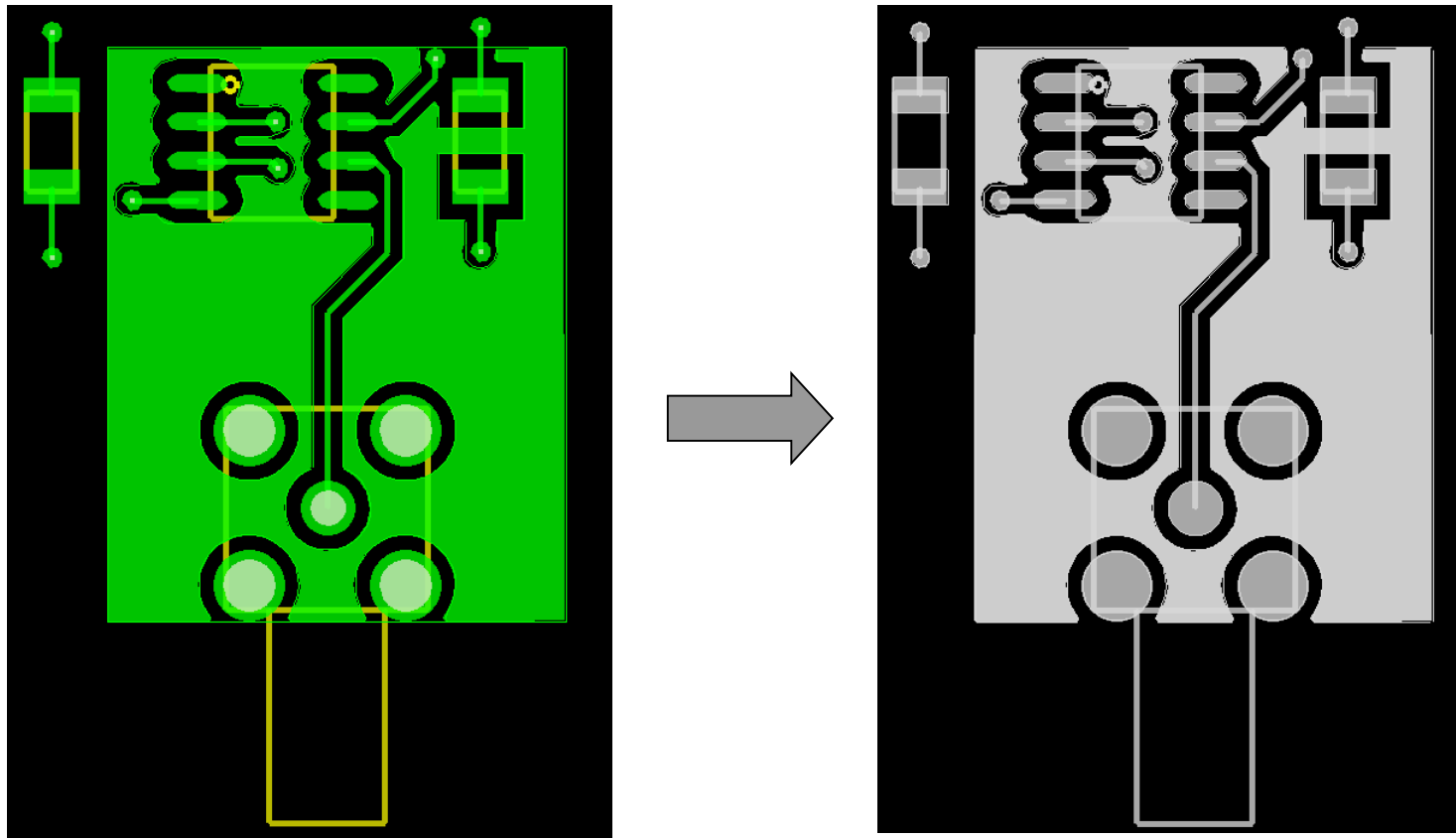
☒ Merge all

☐ Merge by net



Cross Copy

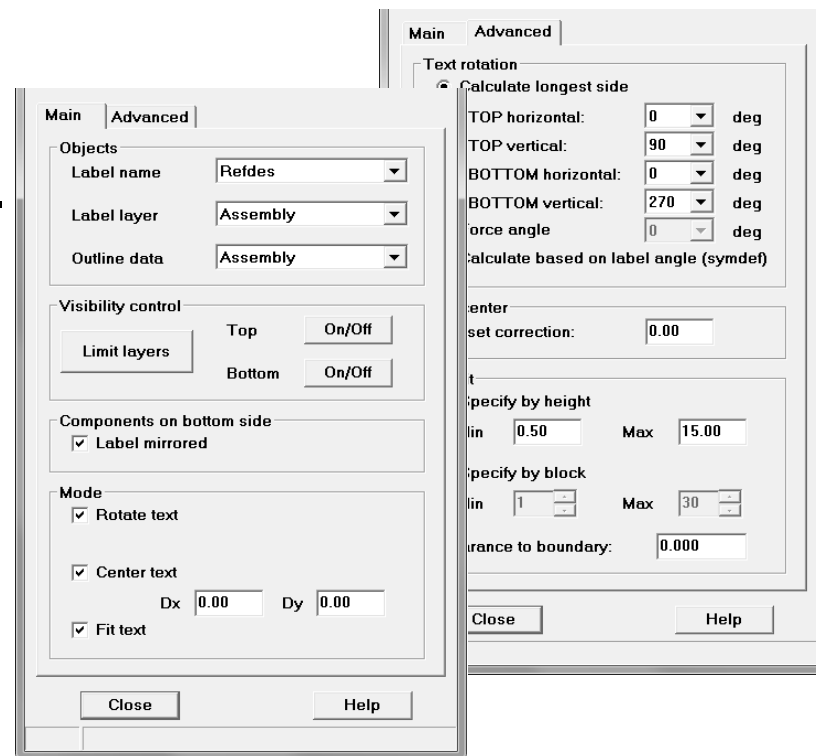
Example: Backup data on *Board Geometry/Assembly_Notes* for documentation purposes



Label Tune

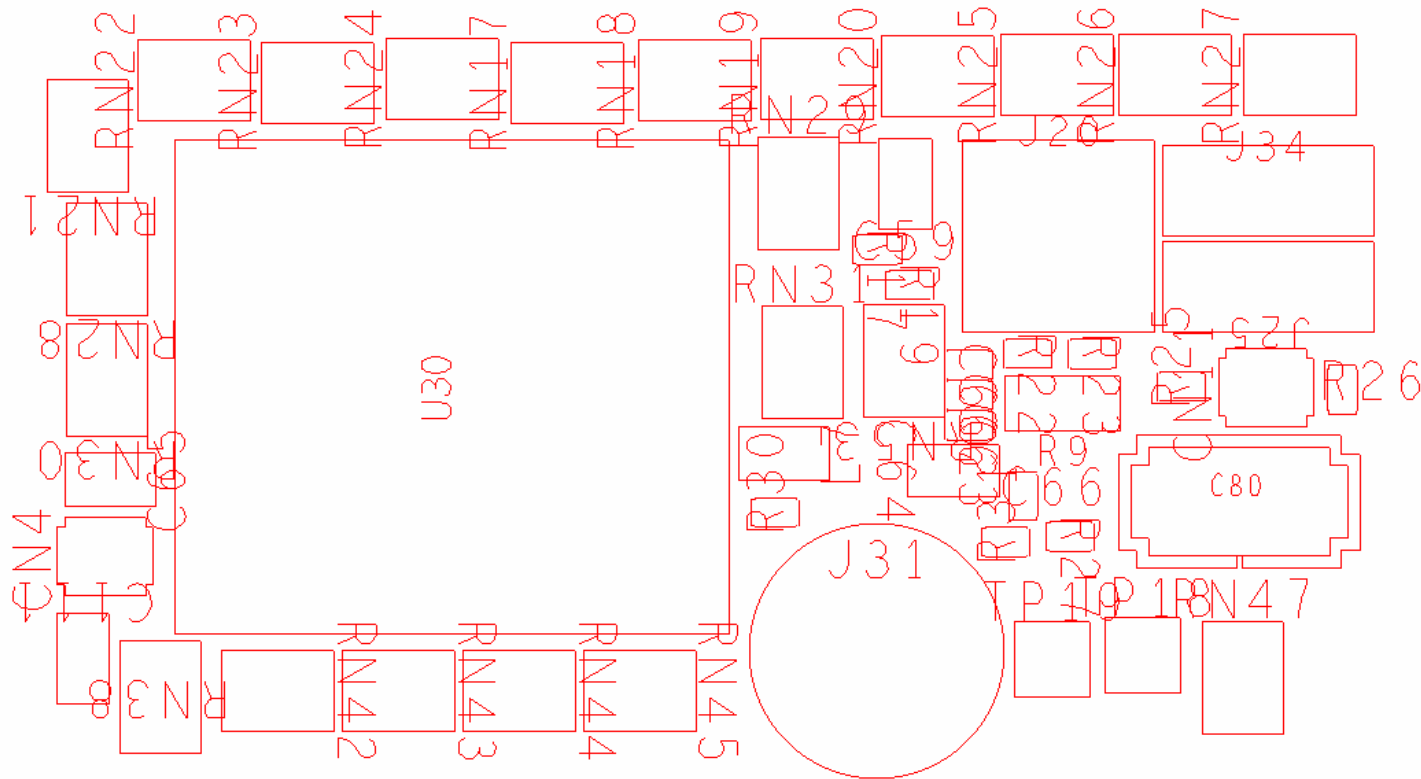
Adjust component labels automatically

- Improves readability
- Saves a lot of time when creating assembly drawings
- Features
 - Label can be chosen (e.g. Refdes, Value, Part Number..)
 - Automatic rotate, center, fit
 - Automatic mirroring
 - Visibility control
 - Various options
 - Max block size, max height
 - Boundary clearance



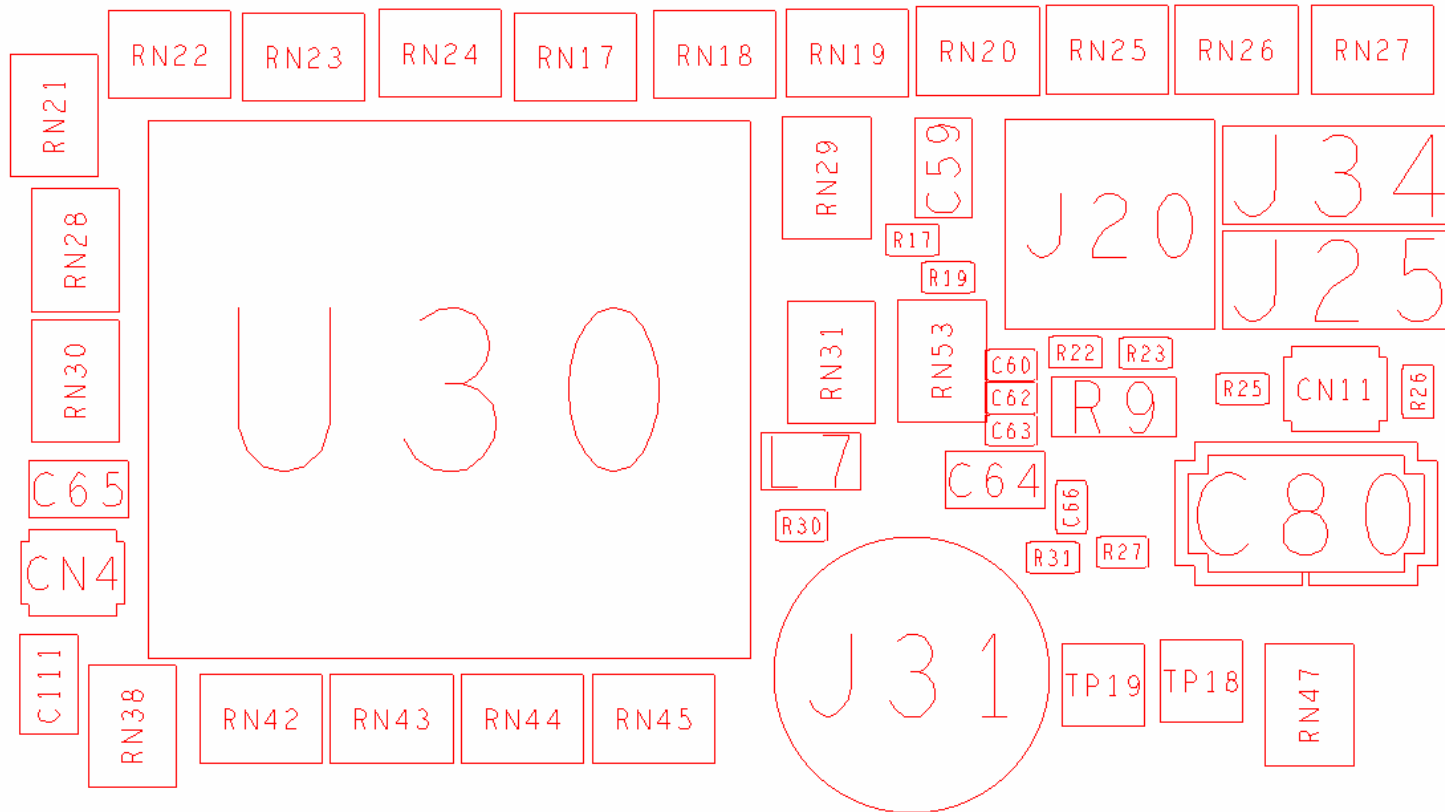
Label Tune

Typical situation during PCB layout



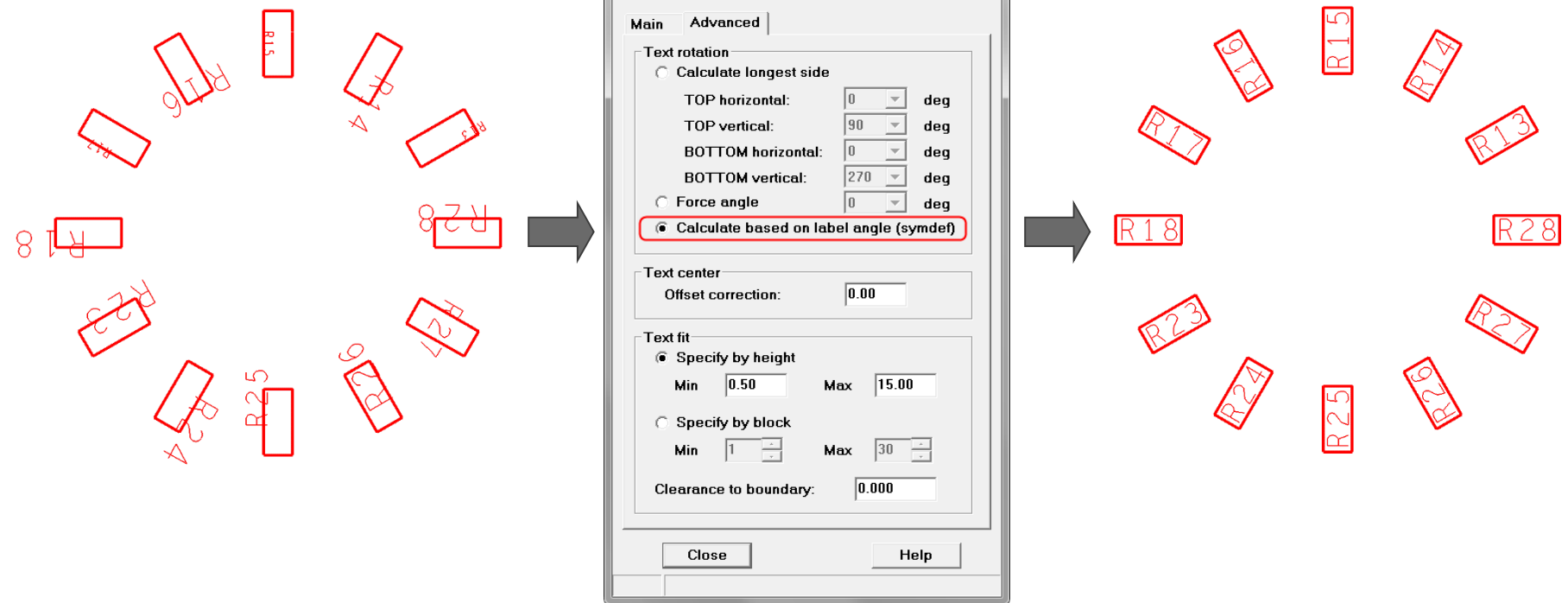
Label Tune

Result after running Label Tune



Label Tune

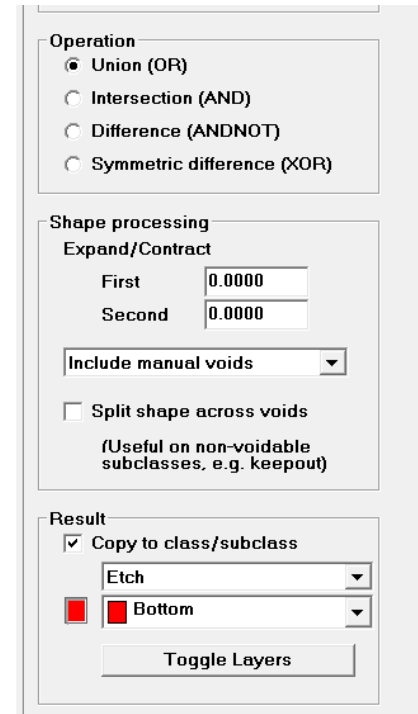
Another example



Shape Utilities – Boolean operations Features

- OR, AND, ANDNOT, XOR
- Supports shape–shape operations as well as shape–line and shape–text operations
- Shape attributes (shape type, fill style, net name etc.) are retained and applied to the resulting shape
- Ability to split shapes across voids
- Expand/contract capabilities
- Useful for general editing and basic RF-applications

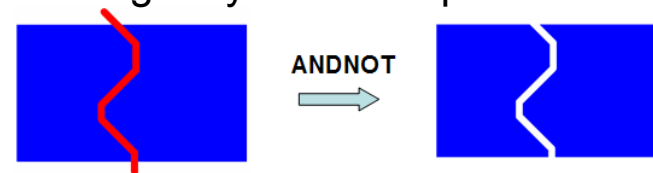
Basic operations



Etching negative texts into copper....

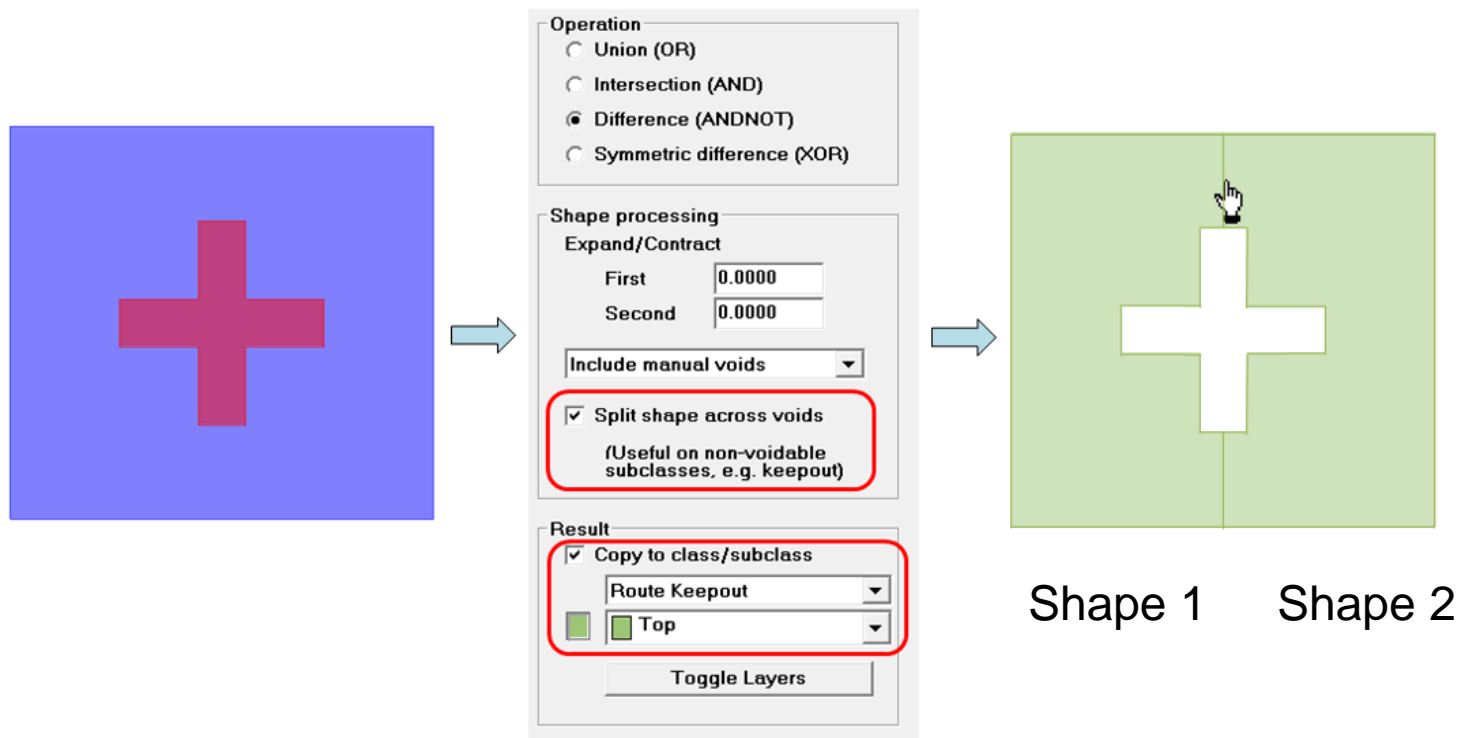


Cutting a dynamic shape....



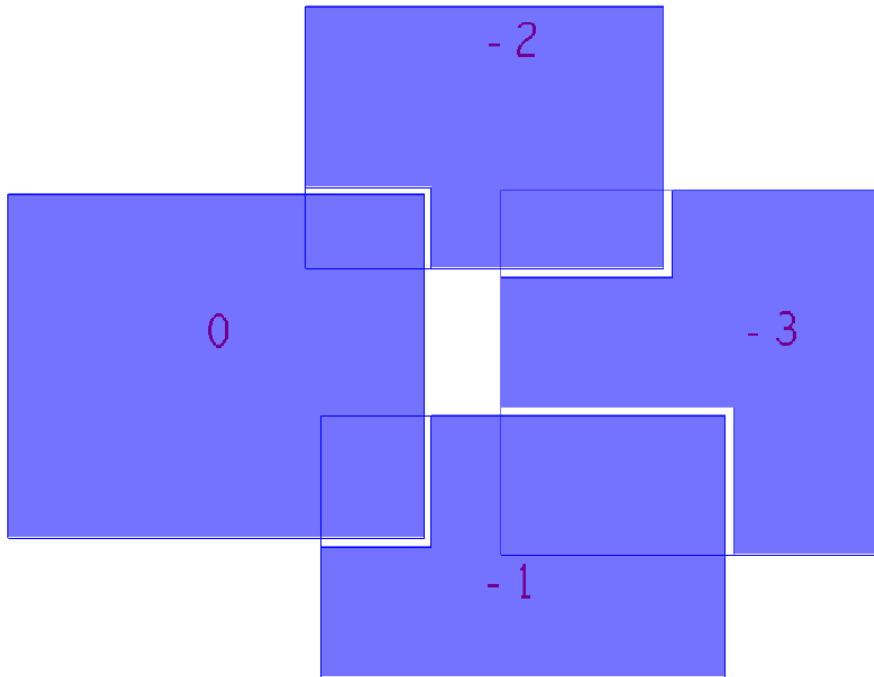
Shape Utilities – Boolean operations

- Let's you also split shapes across voids
- Useful when working on non-voidable layers such as KEEPOUT, NO_PROBE etc.



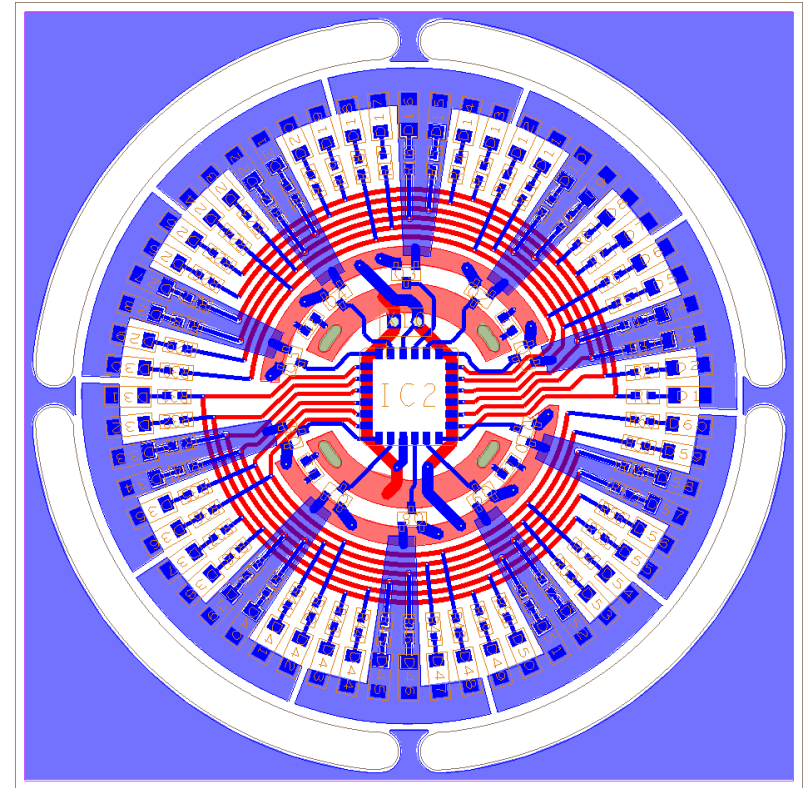
Shape Utilities – Advanced Priority Control

- Set priority values on overlapping shapes to control voiding
- Priority value is display
 - Can be raised or lowered



Polar Grid Utilities

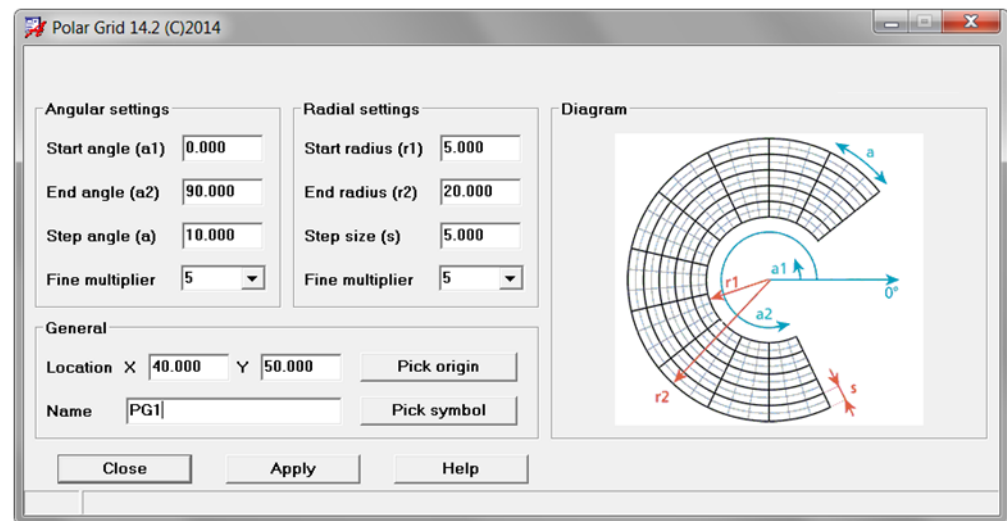
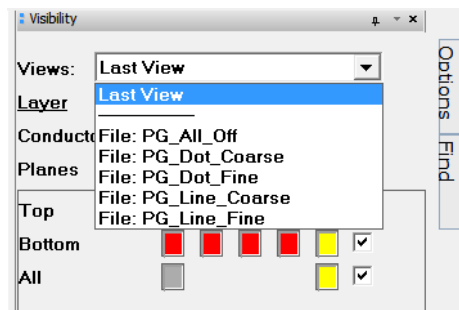
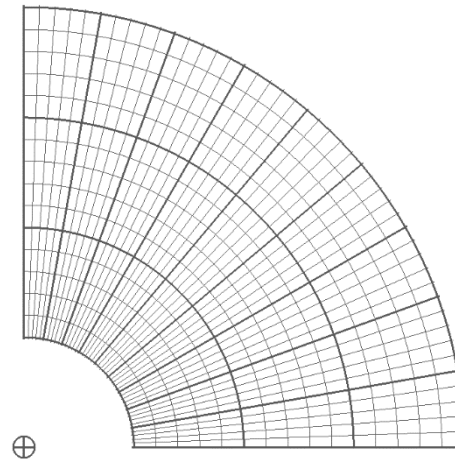
- Useful for boards where circular placement and routing is required.
- Providing a set of functions
 - Defining and editing a polar grid
 - Polar placement
 - Polar routing
 - Polar shape editing including voids
- Snap control
 - Coarse and fine grid
 - System grid
- Polar grid can be also used in conjunction with standard PCB Editor commands using *RMB - Snap pick to - Intersection*



Polar Grid Utilities

- **Polar Grid Setup**

- Define a new grid
- Edit an existing grid
- Fully parameterized
- Coarse and fine grid settings
- Line and dot style support
- Stored as format symbol in database
- Visibility control

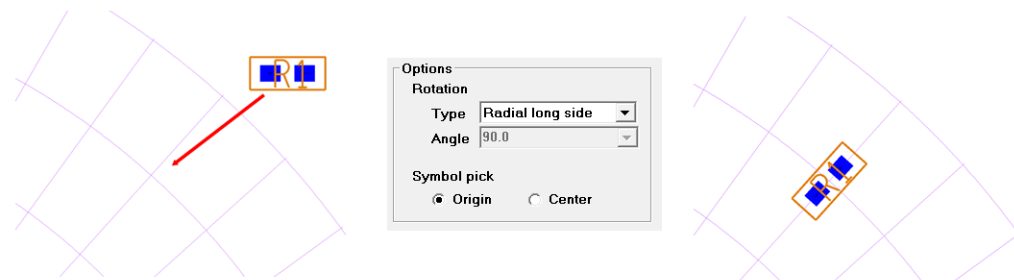


Polar Grid Utilities

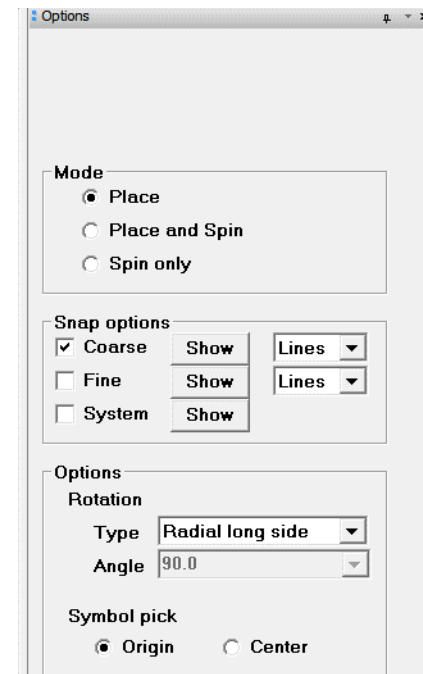
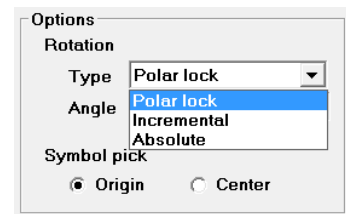
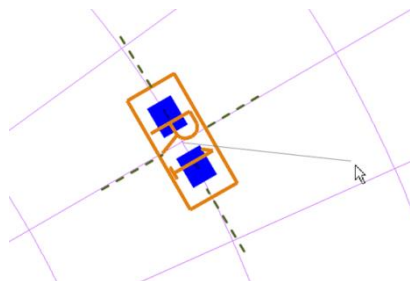
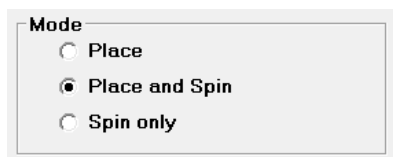
- **Polar placement**

- Special mode for placing component in circular or radial fashion
- Snap to fine or coarse grid
- Various alignment and rotation capabilities
- Spinning on polar grid basis (e.g. *Polar lock*)

Place mode



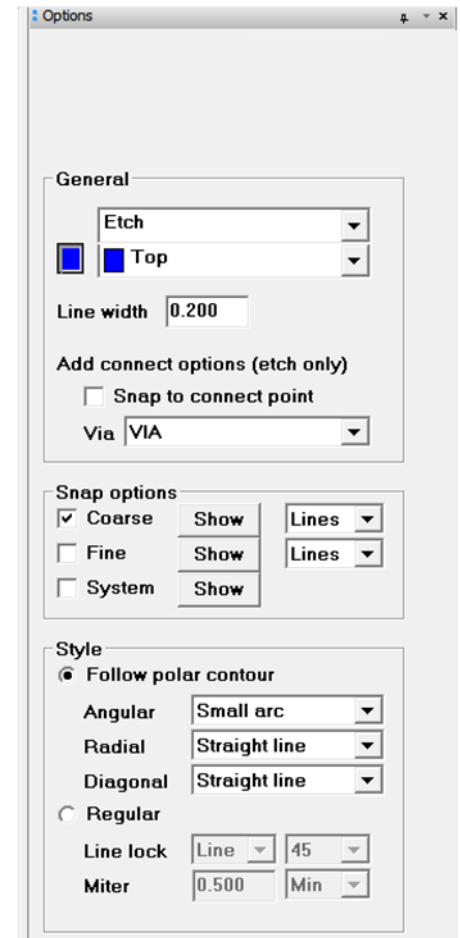
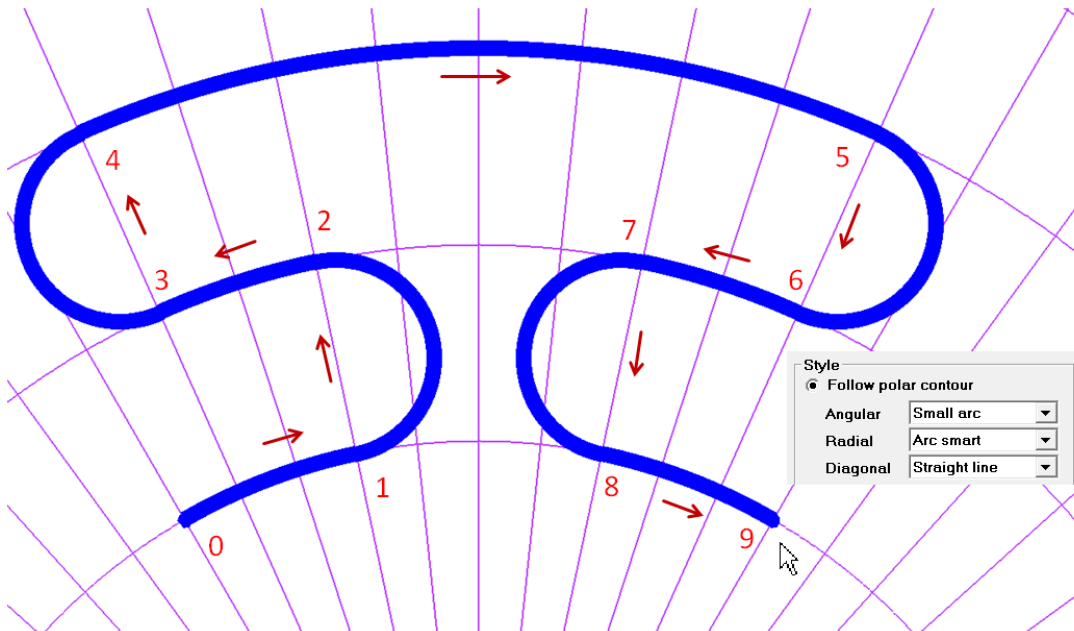
Place and Spin mode



Polar Grid Utilities

- **Polar routing**

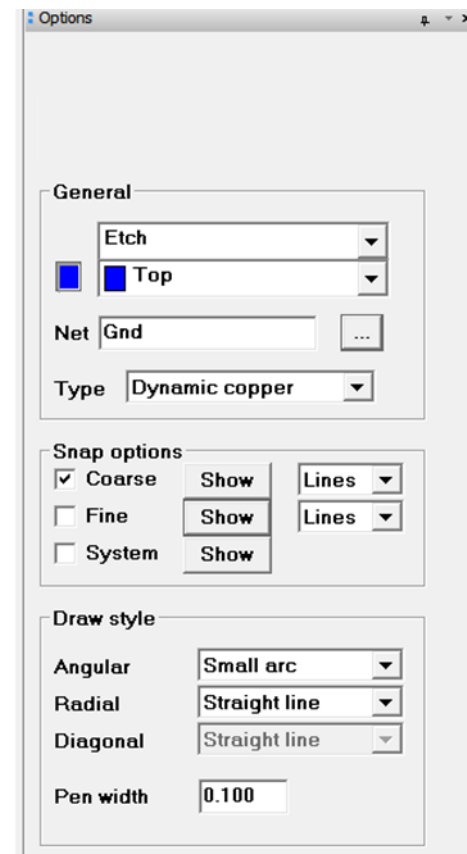
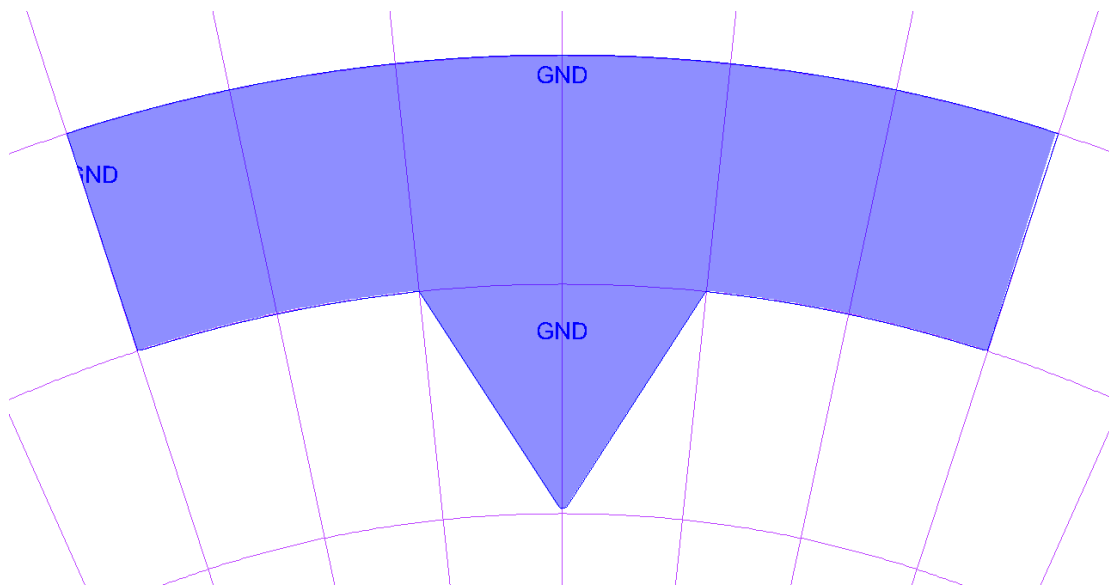
- Special mode for drafting or routing in a circular or radial fashion
- Snap to fine or coarse grid
- Ability to follow radial and angular contour
- Alternate path options (e.g. *Arc smart*)



Polar Grid Utilities

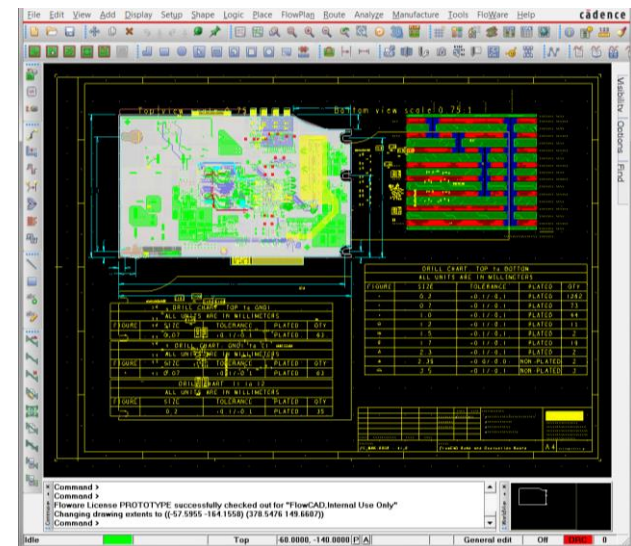
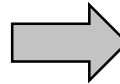
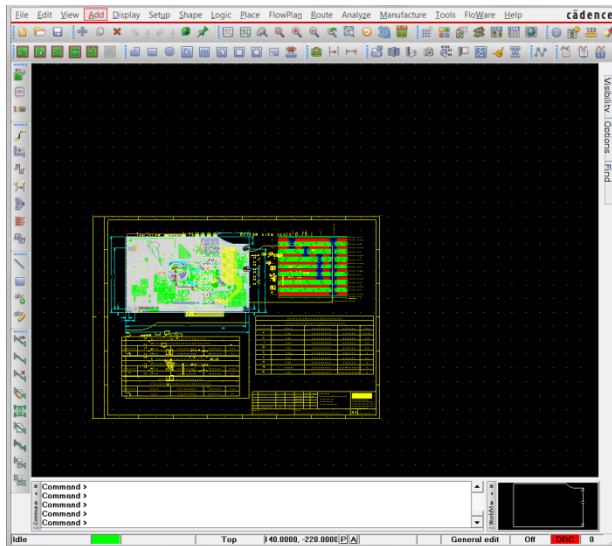
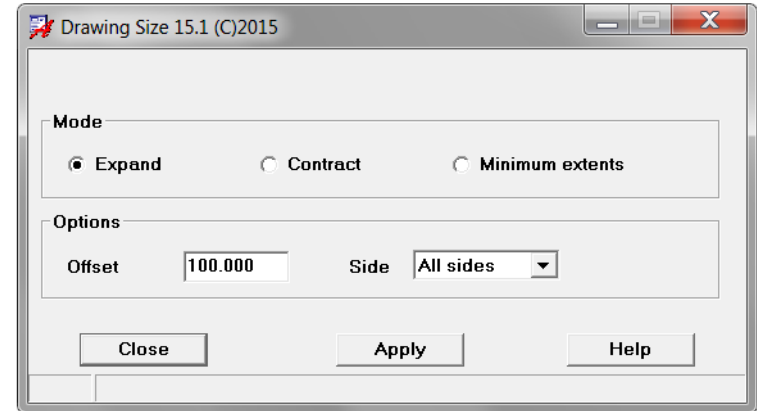
- **Polar shape and void editing**

- Special mode for creating shapes and voids in a polar grid
- Snap to fine or coarse grid
- Ability to follow radial and angular contour
- Alternate path options (e.g. *Arc smart*)



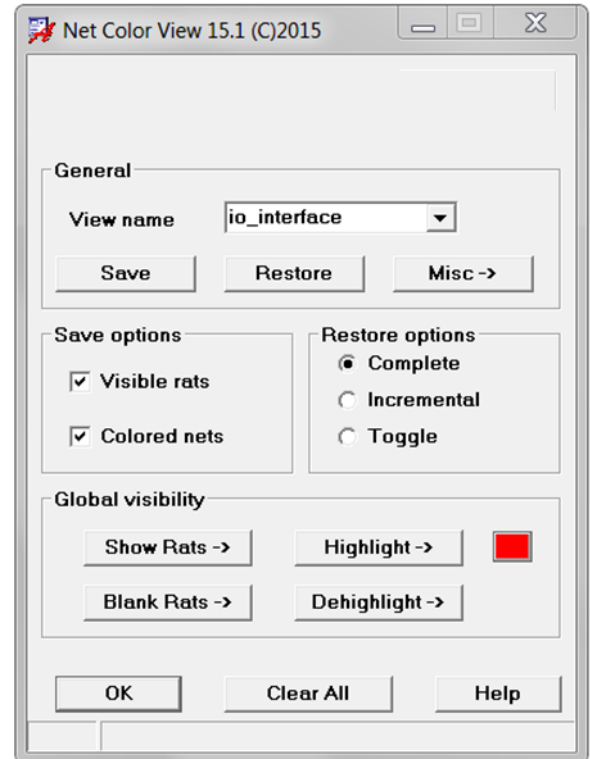
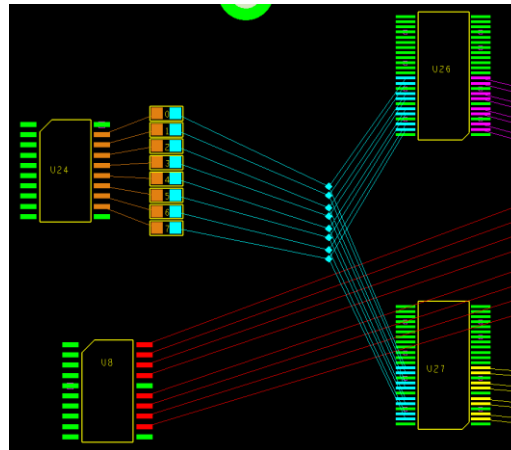
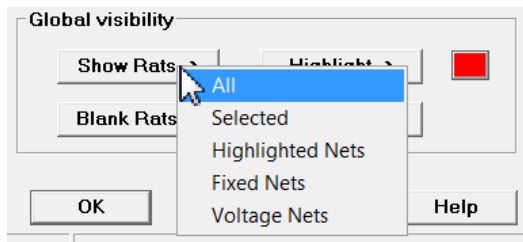
Change Drawing Size

- Let's you change the design extents in a quick and easy way.
- Useful if you want to reduce design extents to minimum values.
- Settings can be applied to all or individual sides.



Net Visibility Manager

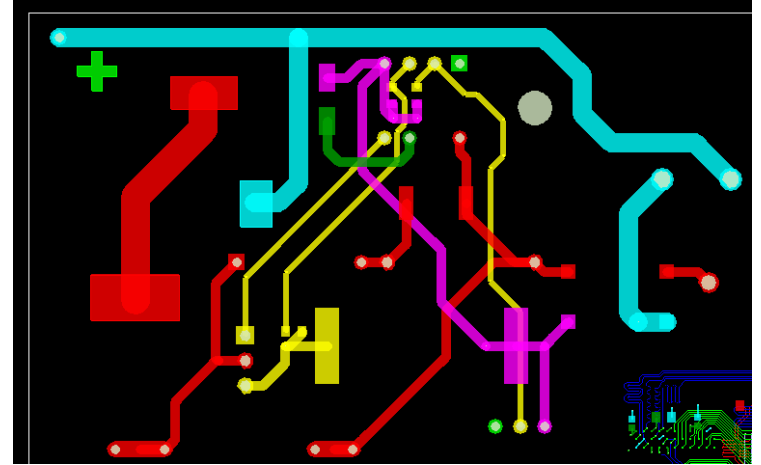
- Allows saving and restoring net color and rat visibility settings.
- Useful for floorplanning and route feasibility studies.
- Global visibility commands
 - Useful hands-on for configuring a view (display/blank rats and assign net colors)
 - Find By Name support
 - No need for jumping and travelling to standard commands from *PCB Editor*.



Class Color

Color spacing net classes for review and documentation

- Color chooser
- Legend support
- Settings stored in database
- Export/import settings



Legend

☒ Generate/Update legend Text block 5

CLASS	COLOR
HIGH VOLTAGE	Red
PE	Cyan
POWER	Green
SECONDARY	Magenta
SWITCH	Yellow

Class Color 1.00 (C)2012

Spacing Net Class	Color
1 HIGH VOLTAGE	Red
2 PE	Cyan
3 POWER	Green
4 SECONDARY	Magenta
5 SWITCH	Yellow

Legend

☐ Generate/Update legend Text block 5

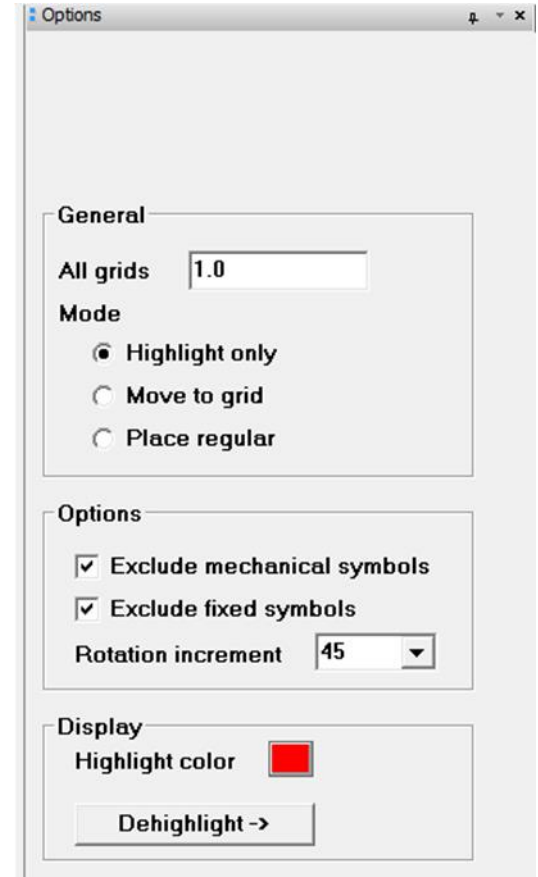
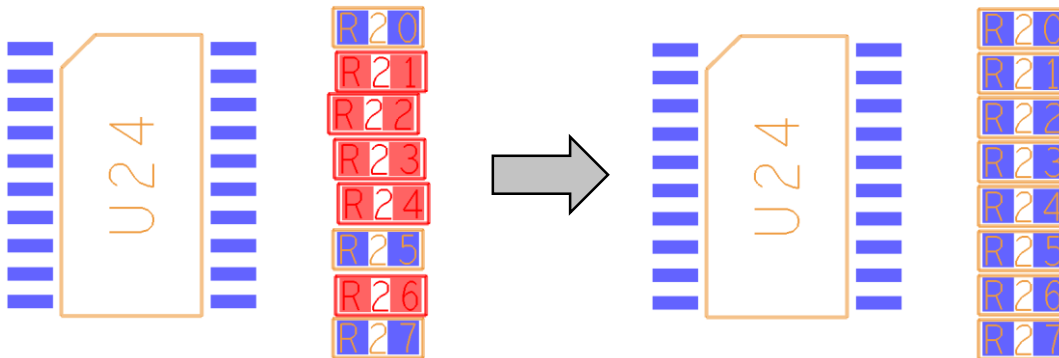
Configuration

Save to file Load from file

Close Apply Help

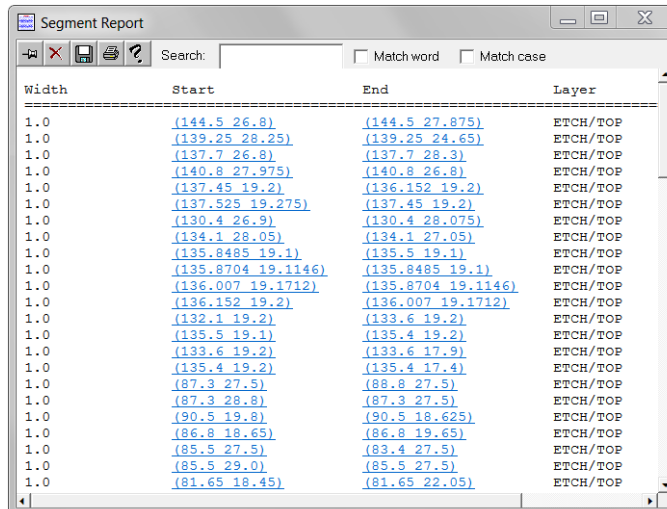
Push to Grid

- Placement application featuring Highlight off grid symbols
 - Option to move/push symbols to the nearest grid point.
 - Regular placement mode for standard placement operations
 - Single and multiple selected symbols
 - Including mirror and spin support



Change Width

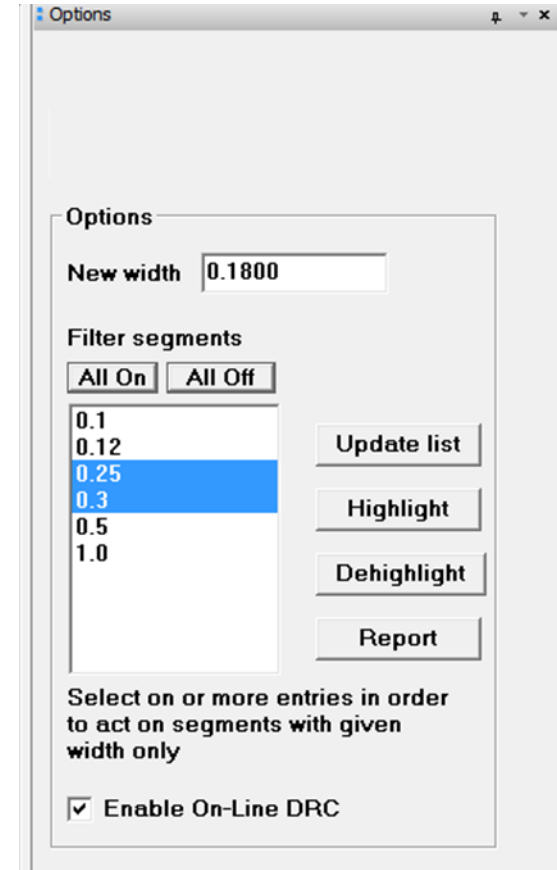
- Change the width of clines and clines segments.
- Supporting a filter mechanism in that the changes are only applied to segments matching a given width.
- Select by Pick, Window, Temp Group or Find By Name
- Highlight and report functionality including cross probing



Segment Report

Search: ☐ Match word ☐ Match case

Width	Start	End	Layer
1.0	(144.5 26.8)	(144.5 27.875)	ETCH/TOP
1.0	(139.25 28.25)	(139.25 24.65)	ETCH/TOP
1.0	(137.7 26.8)	(137.7 28.3)	ETCH/TOP
1.0	(140.8 27.975)	(140.8 26.8)	ETCH/TOP
1.0	(137.45 19.2)	(136.152 19.2)	ETCH/TOP
1.0	(137.525 19.275)	(137.45 19.2)	ETCH/TOP
1.0	(130.4 26.9)	(130.4 28.075)	ETCH/TOP
1.0	(134.1 28.05)	(134.1 27.05)	ETCH/TOP
1.0	(135.8485 19.1)	(135.5 19.1)	ETCH/TOP
1.0	(135.8704 19.1146)	(135.8485 19.1)	ETCH/TOP
1.0	(136.007 19.1712)	(135.8704 19.1146)	ETCH/TOP
1.0	(136.152 19.2)	(136.007 19.1712)	ETCH/TOP
1.0	(132.1 19.2)	(133.6 19.2)	ETCH/TOP
1.0	(135.5 19.1)	(135.4 19.2)	ETCH/TOP
1.0	(133.6 19.2)	(133.6 17.9)	ETCH/TOP
1.0	(135.4 19.2)	(135.4 17.4)	ETCH/TOP
1.0	(87.3 27.5)	(88.8 27.5)	ETCH/TOP
1.0	(87.3 28.8)	(87.3 27.5)	ETCH/TOP
1.0	(90.5 19.8)	(90.5 18.625)	ETCH/TOP
1.0	(86.8 18.65)	(86.8 19.65)	ETCH/TOP
1.0	(85.5 27.5)	(83.4 27.5)	ETCH/TOP
1.0	(85.5 29.0)	(85.5 27.5)	ETCH/TOP
1.0	(81.65 18.45)	(81.65 22.05)	ETCH/TOP



Options

New width

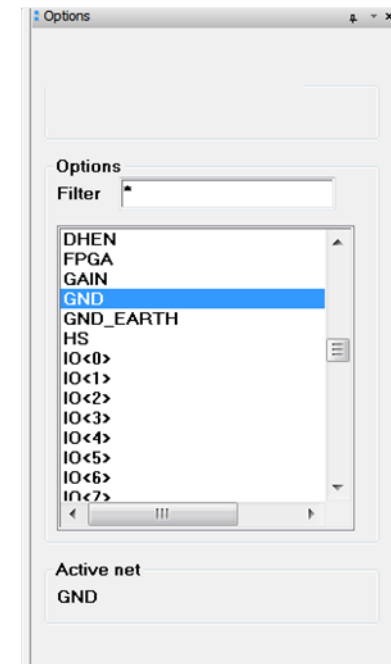
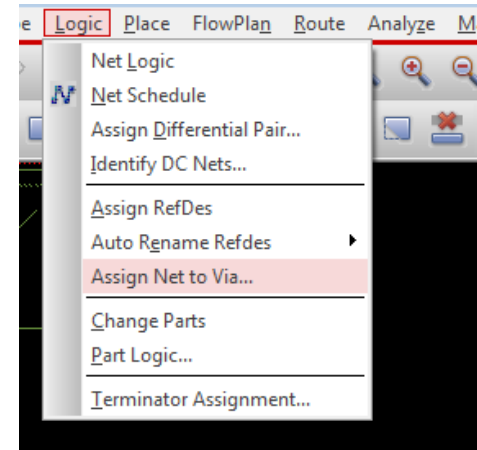
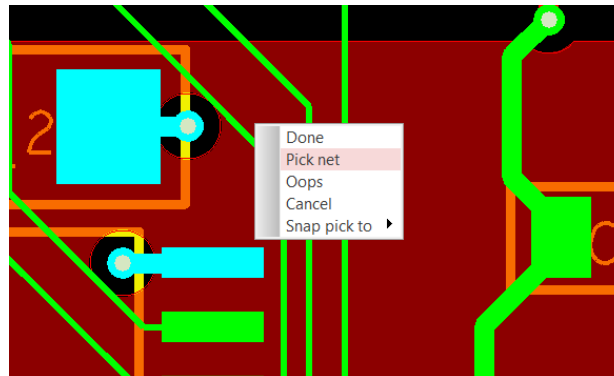
Filter segments

Select on or more entries in order to act on segments with given width only

☒ Enable On-Line DRC

Assign Net to Via

- Enables users to change the net on existing vias
- No need to delete and route new ones
- Use model
 - Select net from list (including wildcard support) or by context
 - RMB - Pick Net*
 - Click on one or more vias
 - Choose *RMB – Done* to confirm



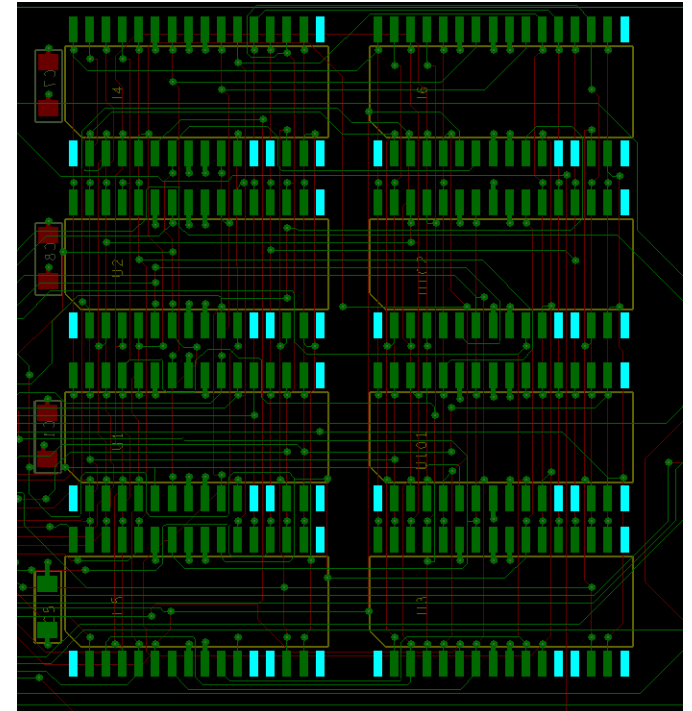
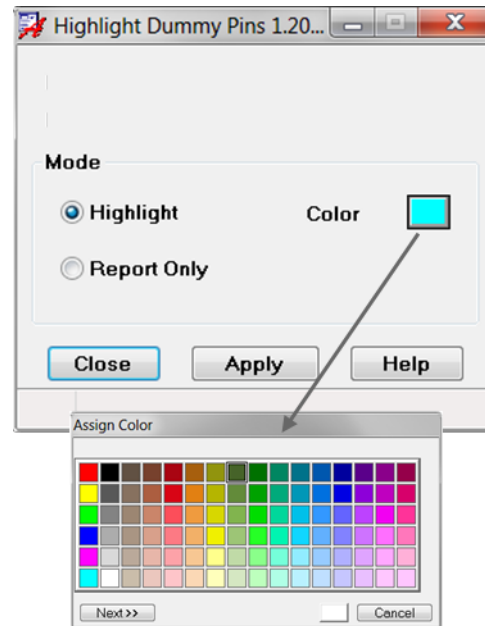
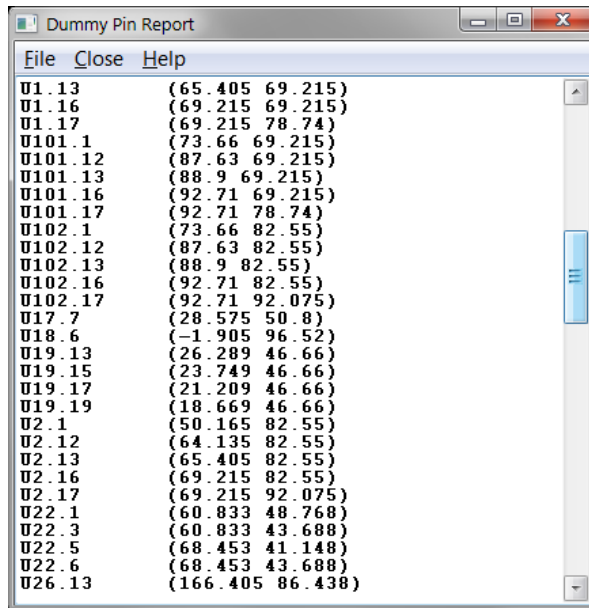
Assign Net to Via

- Example



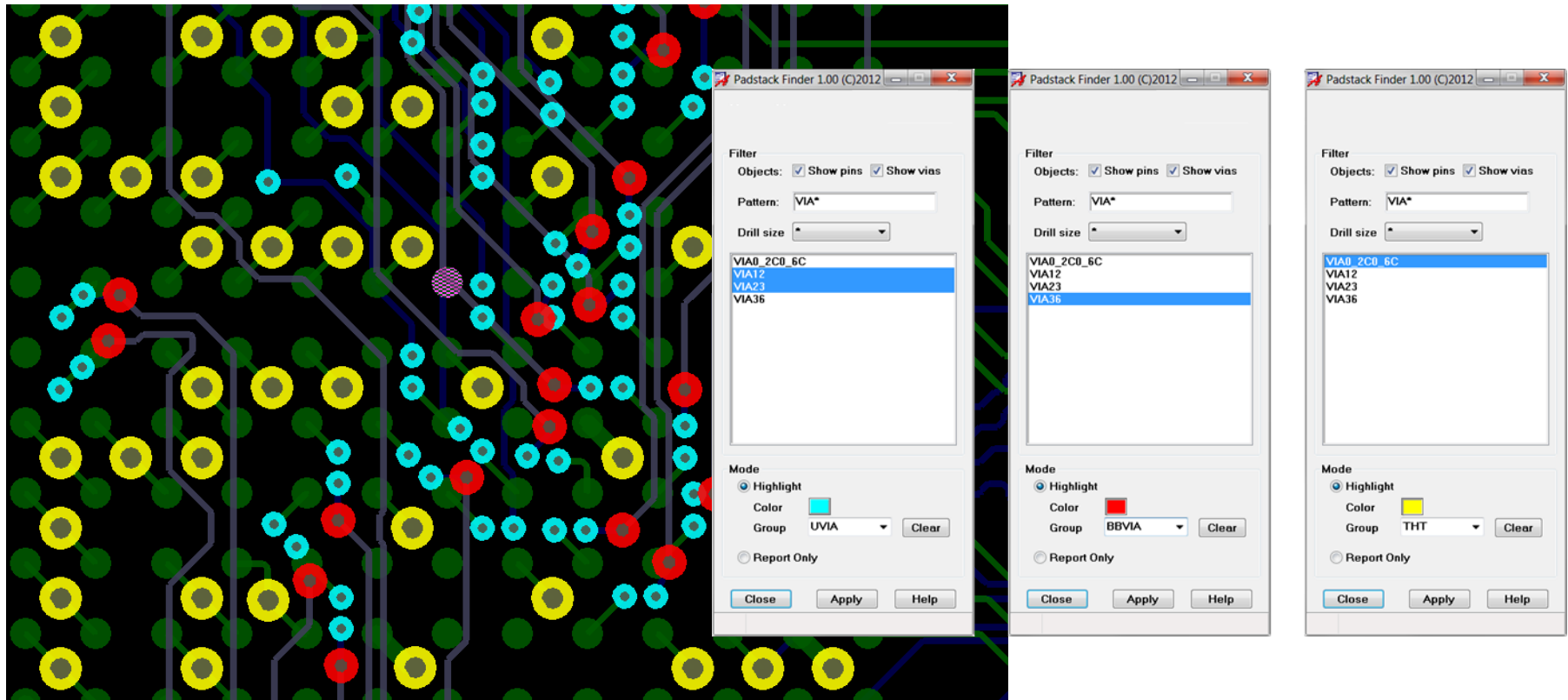
Highlight Dummy Pins

- Assigns a color to all pins in a design which are not connected to any net
- Including report and crossprobe functionality
- Useful for review purposes



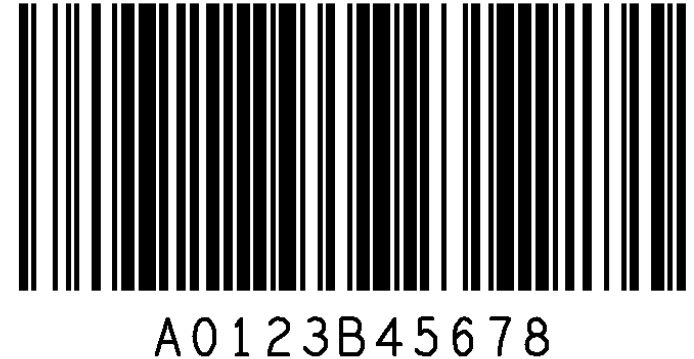
Padstack Finder

- Color by group
 - By specifying a group name individual groups can be colored



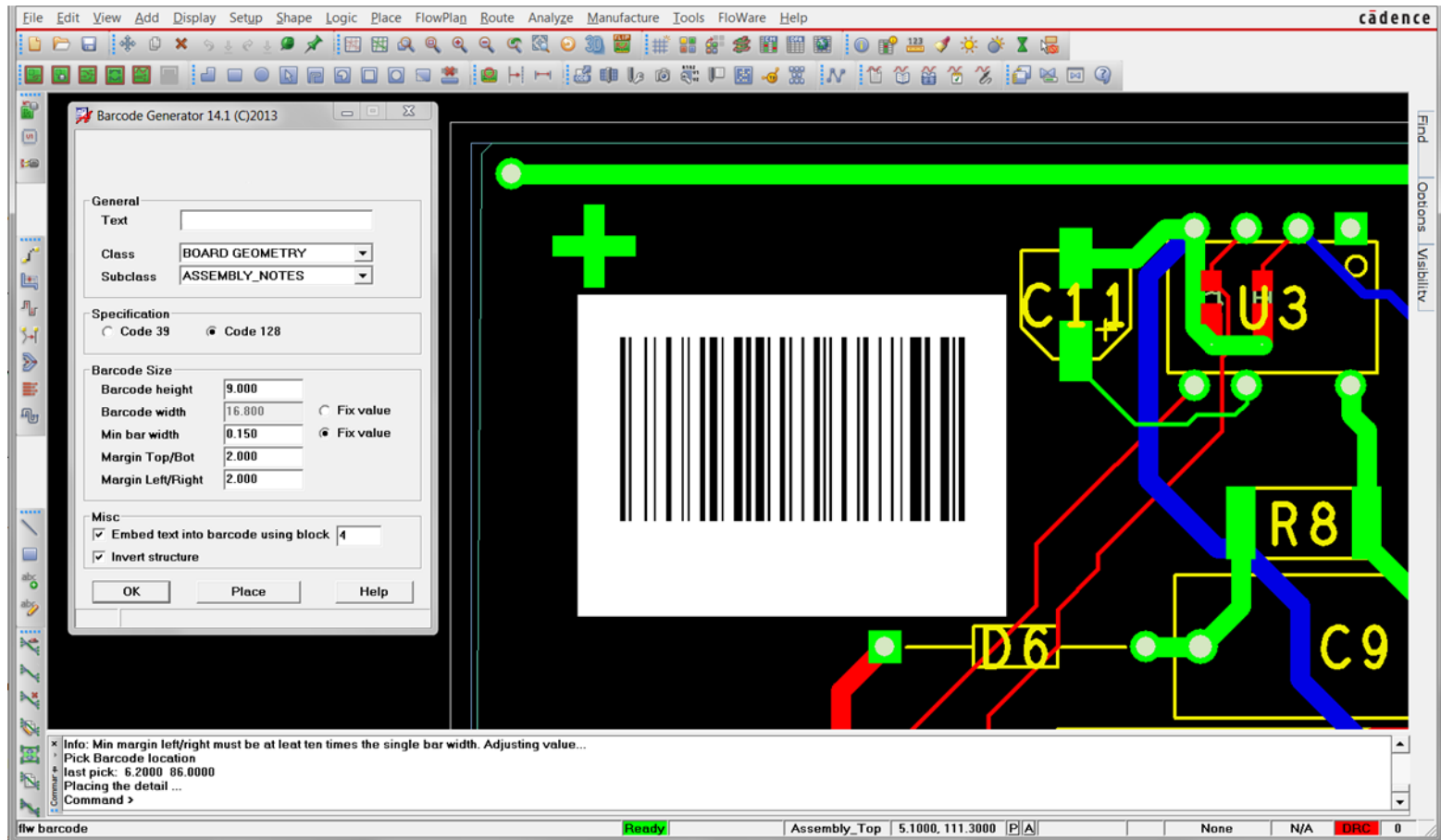
Barcode Generator

- Prints barcodes on a PCB layer as part of the manufacturing process
- Supporting definitions
Code 39, Code 128 and QR Code
- Adjustable parameters corresponding to selected code
- Additional drawing options (e.g. show text, inverted display)
- Dynamic preview during parameter change
- Parameter preset through configuration file



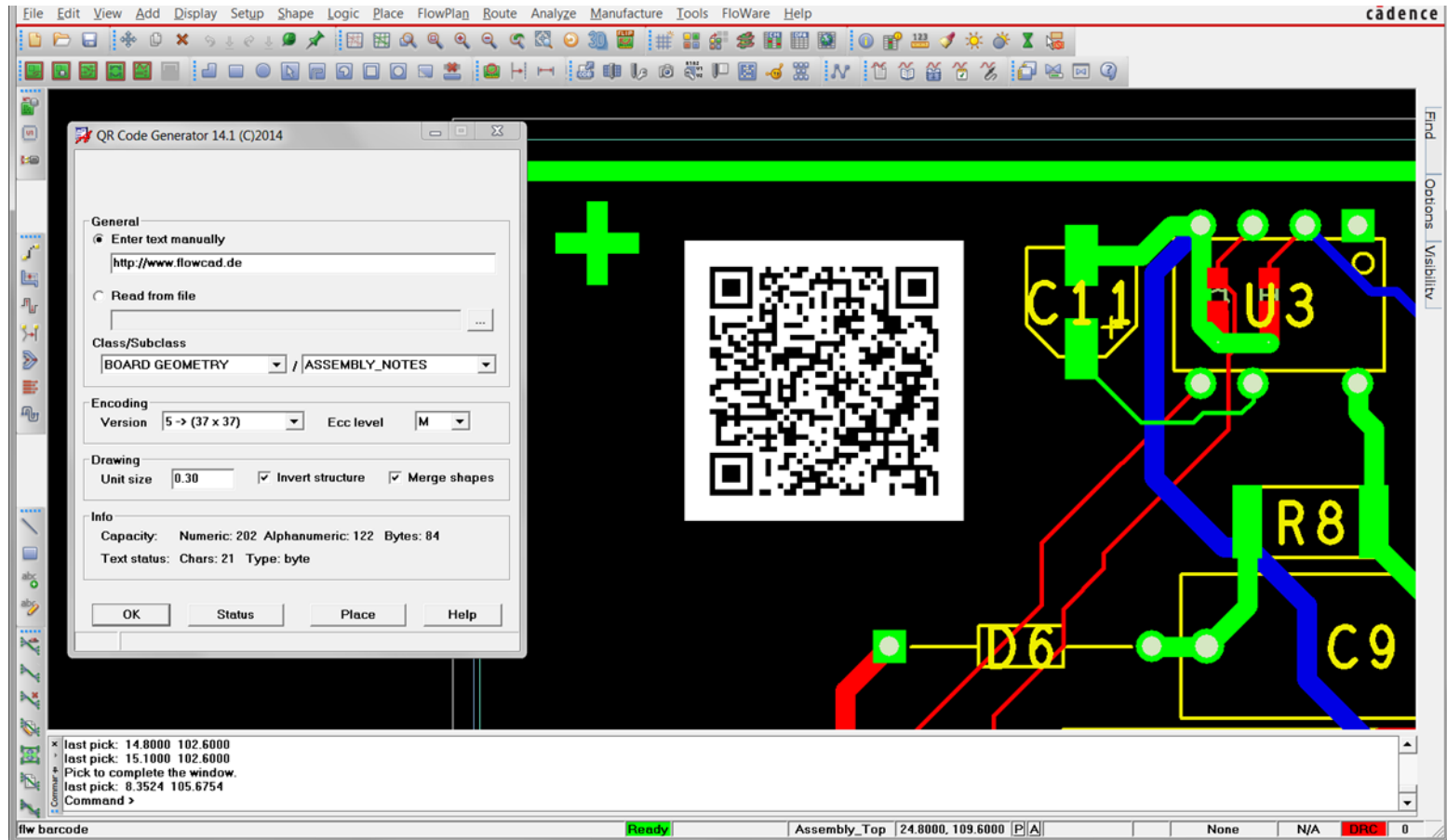
Barcode Generator

- Example: Code 128, show text, inverted display



Module: Barcode Generator

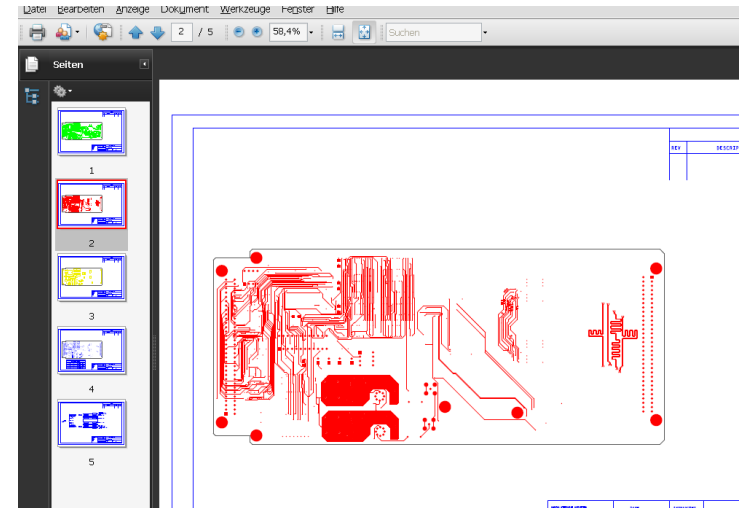
- Example: QR Code, inverted display



Batch Plot

Create PDF plots of the PCB

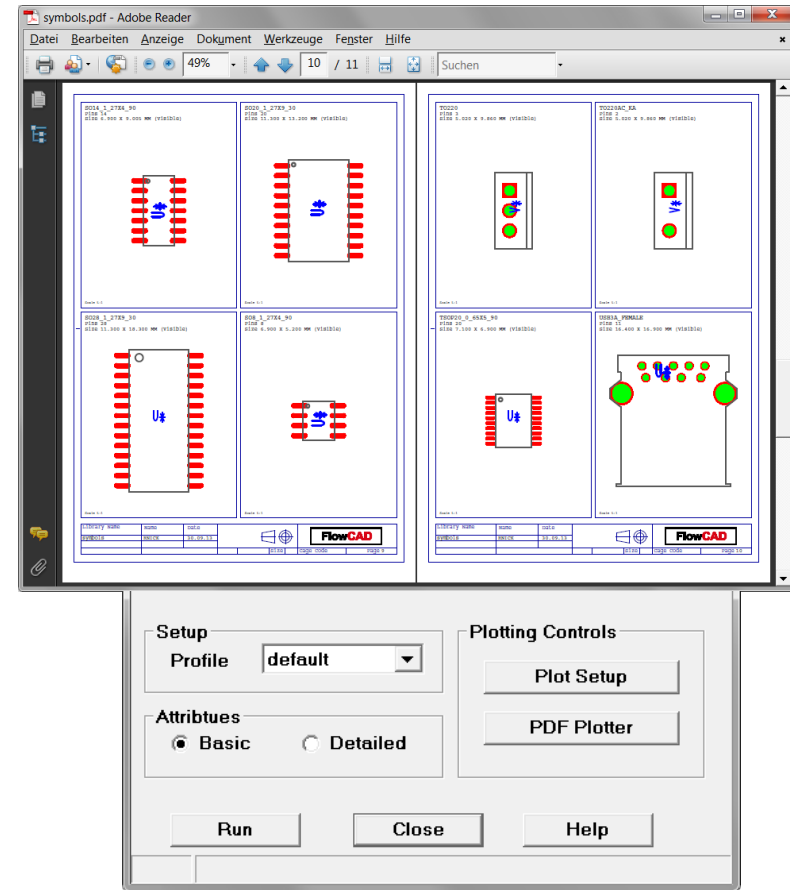
- Multipage or single page files
- Visibility control based on views
 - Color views as well as artwork views
- Group views (plotsets) into separate PDF files
 - Load and save configuration to disk
- Mirror a bottom view during plotting for better readability
- Integrates with Adobe Distiller, FreePDF XP and other Ghostscript based PDF writers



PCB Library Plot

Documentation of PCB footprints from library

- Includes representation of footprint graphics
- Graphics scaled into dedicated areas for better readability
- Additional attributes (size, pitch, padstacks used etc..) are automatically extracted and written to the document
- Frame templates are provided
- Customizable contents and drawing styles including drill holes
- One single PDF document for all footprints

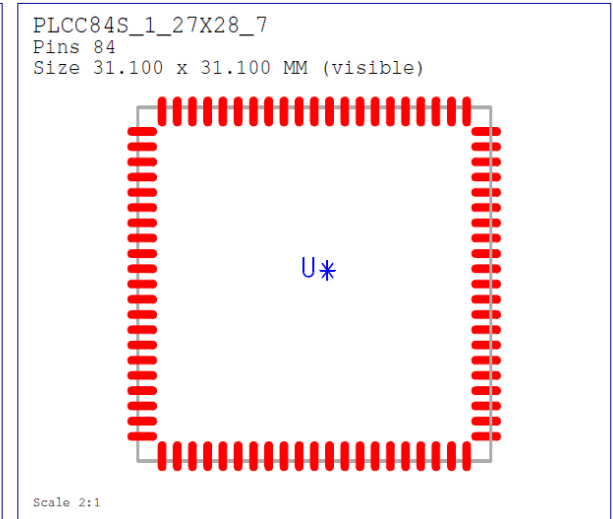
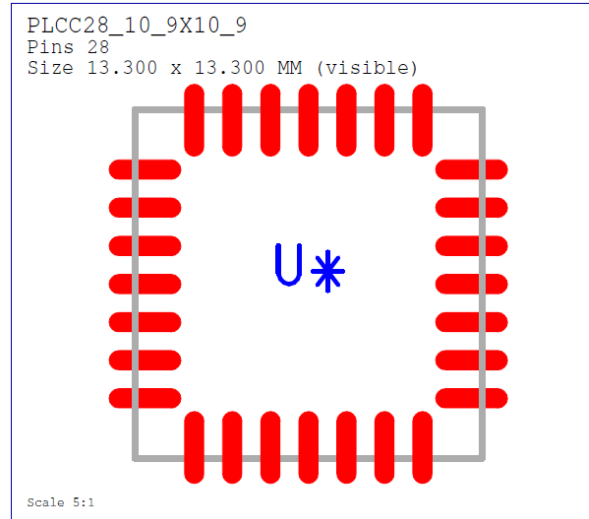


Module: PCB Library Plot

Default Mode

Basic information

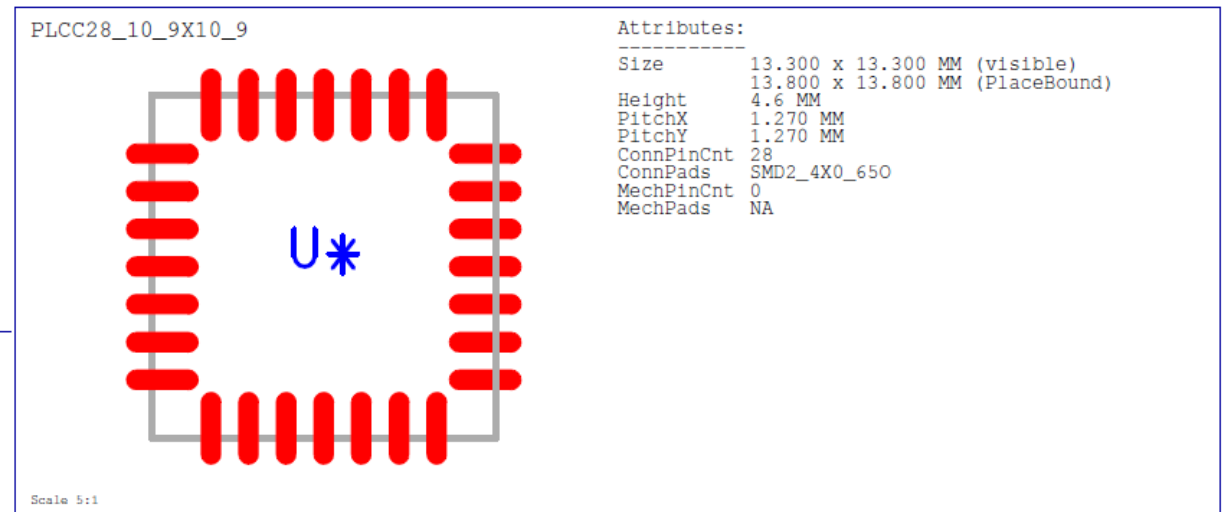
More footprints per page



Detailed Mode

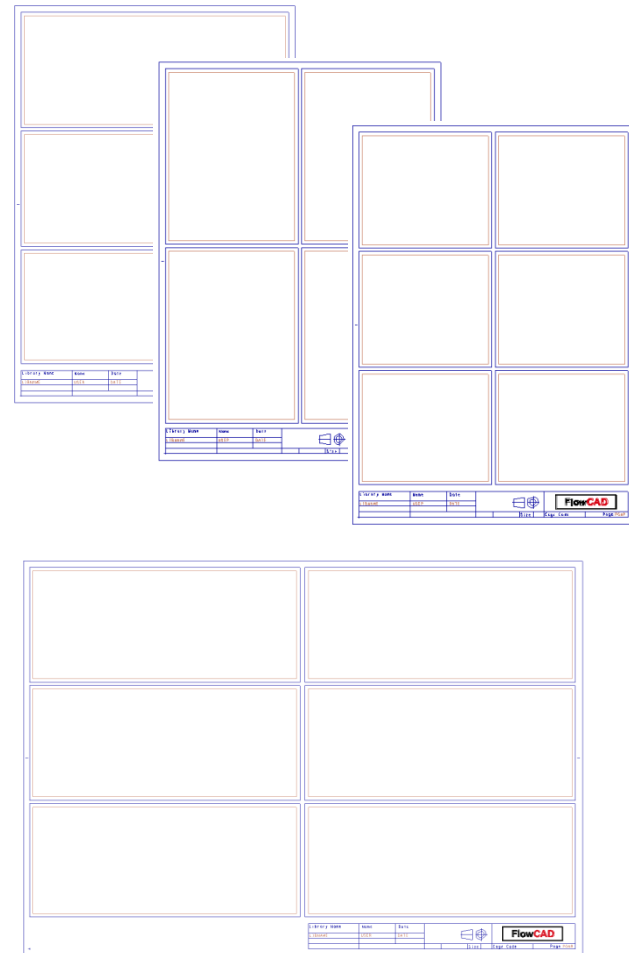
Additional information

Less footprints per page



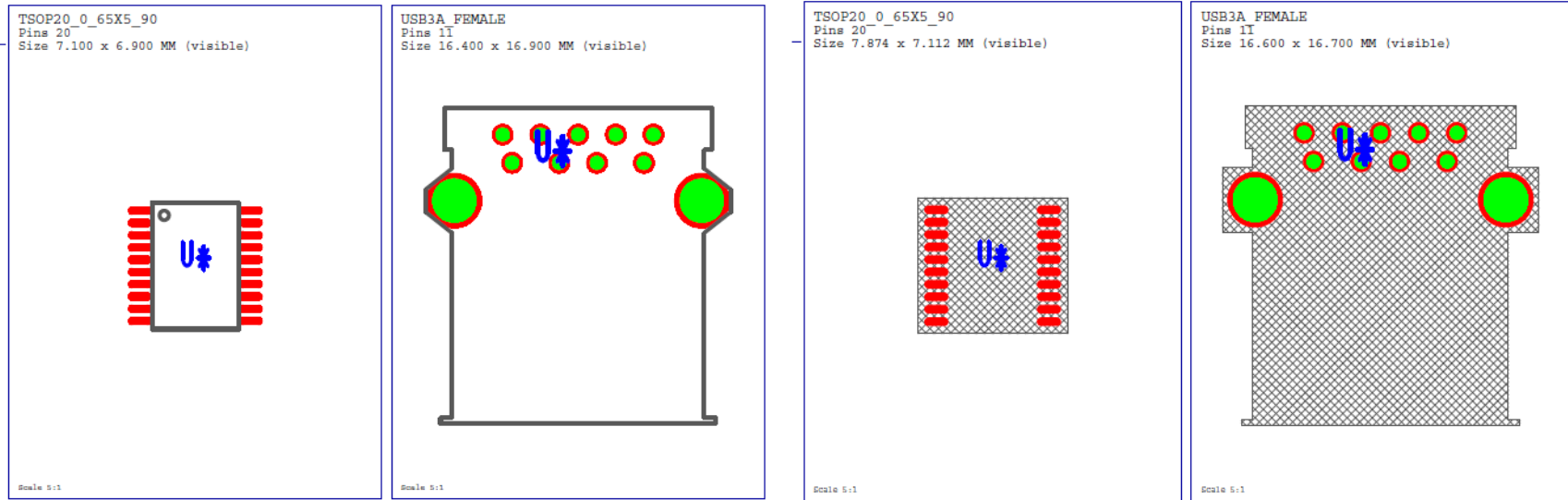
PCB Library Plot Templates

- Define the areas to be used for plotting which correlates to the number of footprints per page
- Metadata support for titleblocks (page number, date, user, library name)
- Default templates provided
- Customer can define his own templates



PCB Library Plot

Customizable content including drill holes and various drawing styles



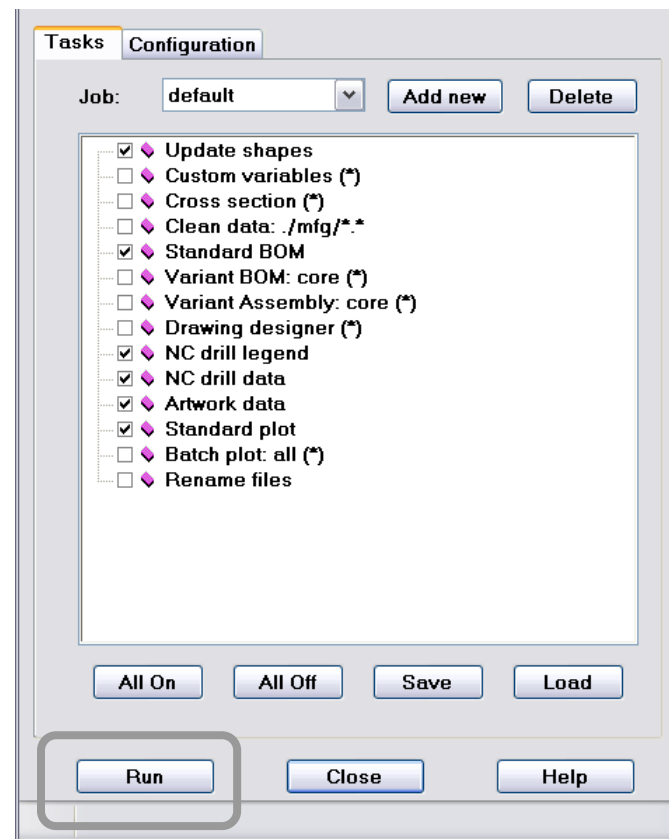
Assembly TOP including etch and drill holes

Placebound as hatch shape including etch and drill holes

Post Processing

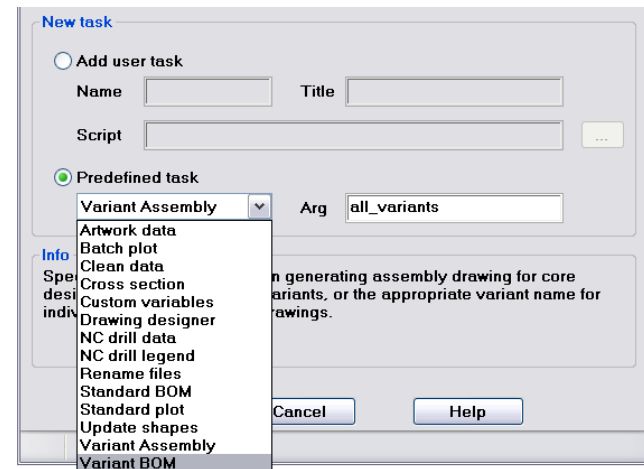
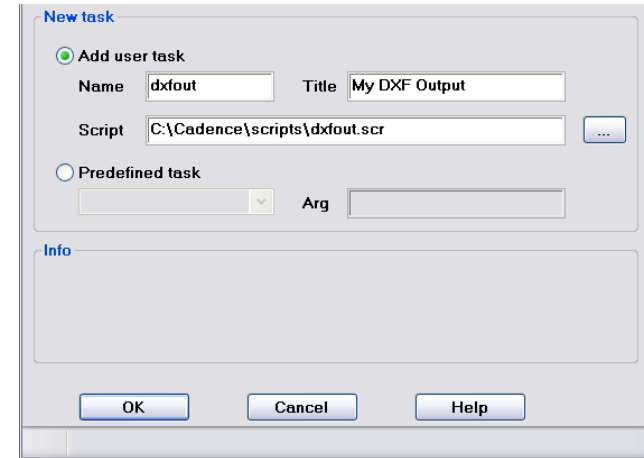
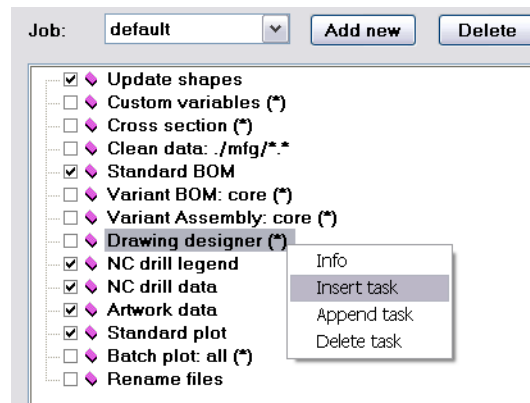
Generate manufacturing outputs in multiple formats quickly & easily

- Tasks can be enabled/disabled, added and removed individually
 - Standard functions from PCB Editor
 - Skill procedures
 - User defined scripts
- Jobs can be defined which contain a collection of tasks
- Configuration stored in database
- Import and Export capabilities for the purpose of standardization



Post Processing

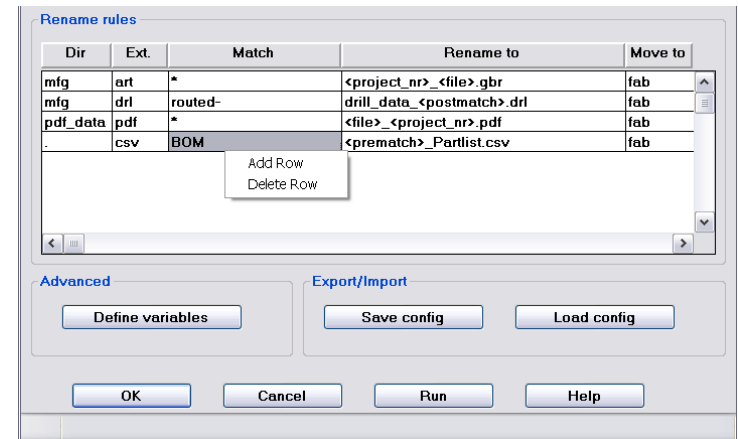
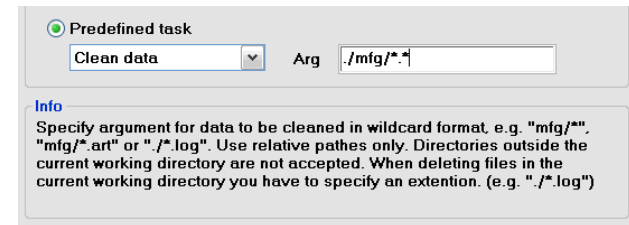
- Context menu provides task editing
 - Info
 - Tasks can be added (appended or inserted)
 - User tasks
 - Prededined tasks including arguments
 - Tasks can be removed if not needed at all



Post Processing

Additional built-in functions

- **Clean Data**
Performs file delete operations based on arguments provided including wildcards
- **Standard BOM**
Generates standard BOM in text and csv format
- **Standard Plot**
Plots all artwork film control records into one PDF file artwork.pdf
- **Rename Files**
Provides powerful automated file renaming mechanism (wildcards, variables and pattern tags) for PLM purposes

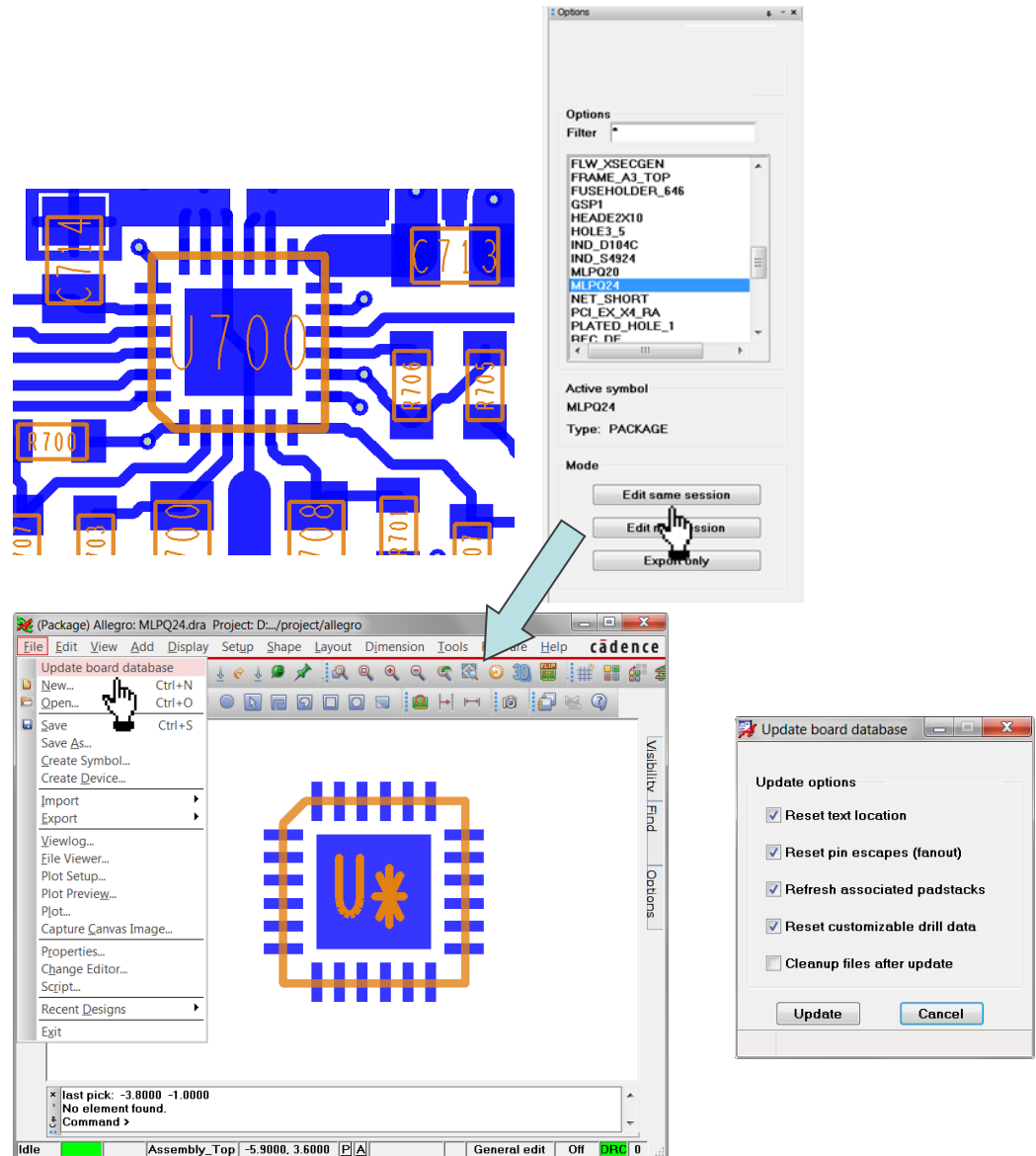


Quick Symbol Edit

- Opens symbol editor out of a layout database for viewing or editing purposes
- Three modes
 - Edit same session
 - Acts similar to Tools – Modify Design Padstack
 - Edit new session
 - Launches a new session and open the symbol dra file
 - Export only
 - Only exports symbol data (dra, psm, pad etc.) for the selected symbol to a specified directory

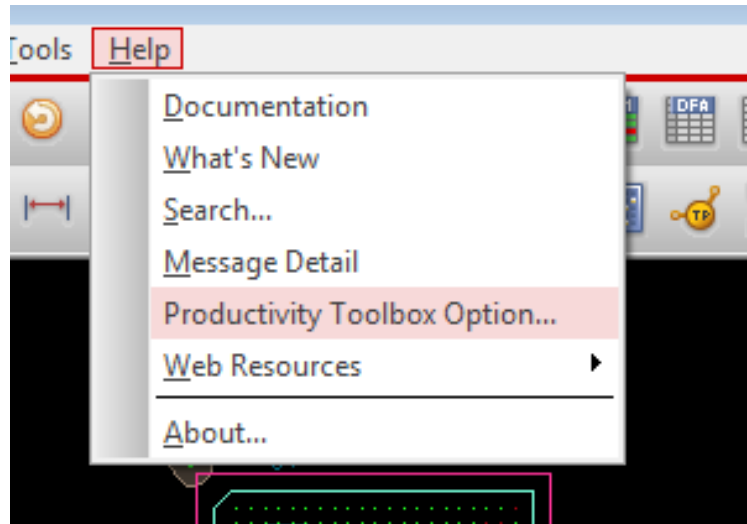
Quick Symbol Edit

- **Edit same session**
 - Seamless edit and update of a symbol definition in board context
 - Acts like Tools – Modify Design Padstack
 - Steps
 1. Launch *Quick Symbol Edit* in layout context
 2. Select a symbol
 3. Current database closes, symbol dra file will be opened
 4. Make your modifications
 5. Finally choose *File – Update board database*
 6. Specify update settings
 7. The layout database from which the command was launched opens again and the footprints will be updated.



Toolbox Documentation

- Help – Productivity Toolbox Option



OrCAD PCB Productivity Toolbox

- Boosts productivity for PCB Designers
- Seamlessly integrated within OrCAD PCB Editors
 - Commands added to PCB Editor menus
- Complements and enhances out of the box capabilities within OrCAD PCB Editors
- Just one utility can justify the entire toolbox!



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