# NAME

makeboxl - expand a cell linearly to boxes

# SYNOPSIS

**makeboxl** [-HNh] [-L] [-cL] [-d[N]] [-v] [-wXl,Xr,Yb,Yt] [-Ii] cell

# OPTIONS

**-H**        Perform a mixed linear/hierarchical expansion, i.e. expand only the sub-cells that are macros.

**-N**        Like option -H, but reads stream 'netterm' instead of 'term'.

**-h**        Pseudo hierarchical mode, all cell calls are preserved in the netlist.

**-L**        Expand only Local cells.

**-c**L      Select check level 'L' (positive integer value). The check level specifies the level of the lowest cell which is included in the expansion (default: all cells are included (maximum level)).
Level 0 means, only the bounding box and terminals of the top cell. Level 1 means, the primitives of the top cell and only the bounding boxes and terminals of the called cells.

**-d**[N]     Discretization, 'N' samples per lambda (default: 8).

**-v**        Verbose mode.

**-w**Xl,Xr,Yb,Yt
Select a partial expansion window. The window coordinates (integer values) must be specified as one argument (no blanks are allowed). Xl,Xr,Yb,Yt are respectively the left and right X-coordinates, and bottom and top Y-coordinates (default: the expansion window is the cell bounding box).

**-I**        Skip all fishbone images for Sea-of-Gates.

**-i**        No automatic image mode for Sea-of-Gates.

# DESCRIPTION

*Makeboxl* takes the internal database description of the cell and converts it to boxes.

Unless the option -H is used, *makeboxl* expands the cell *linearly*, i.e. the cell and all lower cells up to an user controlled limit to boxes. If an expansion window is specified, only the boxes in that window are expanded.

The cell argument is the cell name and must be the last argument. The current working directory must be the project directory. *Makeboxl* creates a special file "exp_dat", which contains the name of the cell which is expanded.

Option -N is a special hierarchical mode (for hierarchical 3D capacitance extraction): reads the stream 'netterm' instead of the stream 'term' for each subcell, generates a 'nettid' stream instead of a 'tid' stream, and generates 'n_LC_bxx' files instead of 't_LC_bxx' files. Use option -O to read also the stream 'netterm' for the cell itself. Use option -M to read also the stream '3Dbox'.

In the pseudo hierarchical mode (option -h) the layout is expanded but also cell calls are preserved in the netlist.

The circuit extractor space uses some new streams for back-annotation. Use option -b to discard the generation of the streams: tidpos, tidnam and anno_exp.

*Makeboxl* automatically detects the usage of Sea-of-Gates images. Be sure that the directory "seadif" exists. In this mode, makeboxl shall only use the highest level image(s) and skip all lower level images. Use option -I to skip all images. It works with the reserved instance name "IMAGE". This instance name may only be used for calls to image subcells and must be used for all this calls. If the image is on the first level, makeboxl shall try to merge the boxes of the image to reduce its output. Use option -i to put off the

image detection. In that case the images are expanded as all other subcells.

*Makeboxl* reads the file "is_macro" for macro status detection in hier_mode (-H). In this mode the subcells are not expanded, except the macro status is set. *Makeboxl* uses this file also for the list of allowed masks. Default, makeboxl shall expand all masks for all cells, except for devices which are not expanded (existence of file "devmod"). If a cell contains an "is_macro" file, and this file contains a list of masknames between '+' signs (i.e. "+in+ins+"), only these masks are expanded.
Note that new projects with xcontrol are not more using the files "is_macro" and "devmod". In that case, the cell status is controlled by the program *xcontrol*.

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**FILES**

NELSISPROJECT/.dmrc
(input file)

NELSISPROJECT/seadif/
(input directory, image mode detection)

NELSISPROJECT/layout/*cell*/annotations
(input file)

NELSISPROJECT/layout/*cell*/box
(input file)

NELSISPROJECT/layout/*cell*/3Dbox
(input file, -M)

NELSISPROJECT/layout/*cell*/mc
(input file)

NELSISPROJECT/layout/*cell*/nor
(input file)

NELSISPROJECT/layout/*cell*/term
(input file)

NELSISPROJECT/layout/*cell*/netterm
(input file, -N, -O)

NELSISPROJECT/layout/*cell*/info
(in/output file)

NELSISPROJECT/layout/*cell*/spec
(output file, flat_mode)

NELSISPROJECT/layout/*cell*/pseudo_hier
(output file, -h)

NELSISPROJECT/layout/*cell*/tid
(output file)

NELSISPROJECT/layout/*cell*/nettid
(output file, -N)

NELSISPROJECT/layout/*cell*/tidpos
(output file)

NELSISPROJECT/layout/*cell*/tidnam
(output file)

NELSISPROJECT/layout/*cell*/anno_exp
(output file)

```
NELSISPROJECT/layout/cell/LC_bxx
```
> (output files) LC=LayerCode

```
NELSISPROJECT/layout/cell/t_LC_bxx
```
> (output files)

```
NELSISPROJECT/layout/cell/n_LC_bxx
```
> (output files, -N)

```
NELSISPROJECT/layout/cell/LC_nxx
```
> (output files, no discr.)

```
NELSISPROJECT/exp_dat
```
> (output file)

**SEE ALSO**

device(1ICD), exp(1ICD), macro(1ICD), makegln(1ICD), makevln(1ICD), space(1ICD), xcontrol(1ICD).