NAME

Xspace - 3D layout to circuit extractor display program

SYNOPSIS

Xspace [space3d options] [-X] [X toolkit options] [cell]

OPTIONS

-S disp.*option*

Enable display *option* for usage.

-X Omit the menu bar and run *space3d* immediately. A cell name must be given on the command line.

TOOLKIT OPTIONS

-bg color

Set the background color to *color*.

-display host:screen

Tell X server which *host screen* must be used for graphical I/O. Default, the environment variable DISPLAY is used.

-fg color

Set the foreground color to *color*.

NOTICE

This manual page only gives a brief introduction to *Xspace*. It should in most cases be sufficient, however, for performing straight-forward extraction tasks. Other documentation is available, see below.

DESCRIPTION

Xspace is the graphical display tool of the *space3d(1ICD)* program. It is an X Window System based application.

Xspace is extremely useful to inspect 2D resistance meshes and 3D capacitance boundary-element meshes. But, *Xspace* can also be used to display in color the used *space3d* masks tile splitting and edges.

Xspace can also be started from the *helios(1ICD)* Space User Interface. When using this interface, you don't need to remember the options needed. You can easy fill in the Extraction and Display options Forms.

MENUS

Extract Menu

For all menu items see the *Xspace* User's Manual.

extract

Start *space3d* to do the extraction process (hotkey: 'e').

extract again

Show last extraction again (hotkey: 'a'). *Xspace* redisplays the display.out file.

save pp image

Don't clear the display after the prepass.

save ep image

Don't clear the display before a new extraction.

display clear

Clear the display (hotkey: 'c').

quit

Stop the program and exit (hotkey: 'q').

pause

Start/stop pause drawing display output (hotkey: 'p').

pause afterpp

Goto pause after each prepass is finished.

run free
No speed control anymore; the fastest drawing speed (hotkey: 'f'). Be aware that *Xspace* doesn't look for keyboard events anymore till the end of the extraction.

single step
Start single step mode (hotkey: 's'). Use the key or menu entry again to single step. Use hotkey 'e' or 'd' to go back to delayed (speed controlled) mode.

Database Menu
To select a layout cell for extraction. Maximum 34 cells in one Database menu.

Option Menu
To set extraction options. See the *Xspace* User's Manual.

Display Menu
To set display options. See also the *Xspace* User's Manual.

Speed Scrollbar
Click in the scrollbar to choice a display drawing speed or enable speed controlled mode again after single step.

HOTKEYS

There are many hotkeys. Some are already mentioned above in the Extract Menu. For all hotkeys, see the *Xspace* User's Manual.

Key: Left-arrow
Move picture a half window to the left.

Key: Right-arrow
Move picture a half window to the right.

Key: Down-arrow
Move picture a half window to the down-wards.

Key: Up-arrow
Move picture a half window to the up-wards.

Key: m Move picture; center around pointer position.

Key: b Zoom back to cell bounding box again.

Key: i Zoom in on current pointer position.

Key: I Zoom in on center of display window.

Key: o Zoom out on current pointer position.

Key: O Zoom out on center of display window.

Key: u Undo last zoom; back to previous view.

Key: x Zoom, use pointer position as lower left corner.

Key: y Zoom, use pointer position as upper right corner.

Key: . Display layout coordinates of pointer position. Note that coordinates are default displayed in internal units. That are database units multiplied by four.

Key: Ctrl-c
Abort extraction or extract again mode.

Key: Ctrl-l
Redraw display window, but don't use clear.

PARAMETERS

For all parameters see the *Xspace* User's Manual.

disp.coord_in_dbunits *on|off*

Use database units to display coordinate values (default: internal units).

disp.coord_in_microns *on|off*
Use micron meters to display coordinate values (default: internal units).

disp.draw_file *file*
Additional drawing commands may be specified in a file. For the command syntax see the User's Manual.

COLORS

The colors that are used by *Xspace* to display the different masks/conductors tiles, are specified in the colors section of the *space3d* element definition technology file. You can use color names as well as RGB values. The RGB values must start with a leading '@' sign. You can overrule a specific mask color setting with the **disp.color_**mask parameter. For example, to give mask 'metal2' the (hex) RGB value '44F', specify:

disp.color_metal2 @44F

EXAMPLES

To start the display program for the cell *latch* and using a local space parameter file, type:

% Xspace -P local.p latch

Note that the *space3d* extraction options can be set in the "Options" menu and the *Xspace* display options can be set in the "Display" menu. The extraction can be started by clicking "extract" in the "Extract" menu (or by using the 'e' hotkey).

% Xspace -P local.p -r3C latch

The above command does almost the same as the previous command, but the extraction options are already specified.

% Xspace -P local.p -r3C -X latch

The above command starts directly an extraction. The *Xspace* menu's cannot be used, thus the used display options must be specified in the parameter file (or else with a number of **-S** options on the command line).

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FILES

`NELSISPROJECT/display.out`
output file from *space3d*, read and displayed by *Xspace*.

`space.def.t`
default name of the *space3d* technology file, which was compiled by *tecc(1ICD)*.

SEE ALSO

A.J. van Genderen and N.P. van der Meijs, "Space 3D Capacitance Extraction User's Manual", Delft University of Technology, Delft, The Netherlands.

A.J. van Genderen, N.P. van der Meijs and T. Smedes, "Space Substrate Resistance Extraction User's Manual", Delft University of Technology, Delft, The Netherlands.

A.J. van Genderen and N.P. van der Meijs, "Xspace User's Manual", Delft University of Technology, Delft.

helios(1ICD), space(1ICD), space3d(1ICD), tecc(1ICD).