

Raikiri[®] (DRC/LVS)

[Abstract]

Raikiri is a EDA tool that run DRC(Design Rule Check) and LVS(Layout vs. Schematic) on integrated circuits.

[Benefits]

- Read and run de facto standard DRC/LVS rule files directly.
- Easy to use.
- Support Windows[®] and Linux(RedHat[®]8) platforms.

Getting started

- Insert USB dongle key that include DRC/LVS software. In this case, installation is not required.
- Second case, copy execution module to disk and run. In this case, setup procedure is easy.

Common Settings

The image shows a screenshot of the Raikiri software settings dialog box. The window title is "Raikiri (Apr. 2022)". The settings are organized into several sections, each with a text label and a corresponding input field or button:

- Configuration file:** A text input field for the configuration file path.
- Work directory:** A text input field with a "Browse..." button to the right.
- SPIICE(CDL) netlist(for LVS):** A text input field with a "Browse..." button to the right.
- GDS Layout Data:** A text input field with a "Browse..." button to the right.
- CDL top Cell Name:** A text input field.
- GDS top Cell Name:** A text input field.
- LVS Rule File:** A text input field with a "Browse..." button to the right.
- DRC Rule File:** A text input field with a "Browse..." button to the right.
- LVS Log File Name (Path is Work directory. Default is "lvs.lvs"):** A text input field.
- DRC Log File Name (Path is Work directory. Default is "drc.results"):** A text input field.

At the bottom of the dialog, there are two rows of buttons:

- Row 1: Load Config, Save Config, Run DRC, Run LVS, CDL net, GDS net
- Row 2: Run Log, LVS Log, DRC Log, Quit

Below the buttons is a large empty rectangular area labeled "Status monitor.".

Callouts with blue arrows point to the following elements:

- Configuration file (points to the Configuration File input field)
- Work directory (points to the Work directory input field)
- GDS data (points to the GDS Layout Data input field)
- Save configuration (points to the Save Config button)
- Read configuration (points to the Load Config button)
- Show run log (points to the Run Log button)
- Quit (points to the Quit button at the bottom right)

DRC Settings

The screenshot shows the Raikiri DRC Settings dialog box. It contains several input fields and buttons. Annotations with blue arrows point to specific elements:

- GDS data**: Points to the **GDS Layout Data** input field.
- Top structure**: Points to the **GDS top Cell Name** input field.
- DRC rule file**: Points to the **DRC Rule File** input field.
- DRC log file**: Points to the **DRC Log File Name** input field.
- Show DRC Log**: Points to the **DRC Log** button.
- Run DRC**: Points to the **Run DRC** button.

The dialog box includes the following fields and buttons:

- Configuration File:** [Empty text box]
- Work directory:** [Empty text box] **Browse...**
- SPICE(CDL) netlist(for LVS):** [Empty text box] **Browse...**
- GDS Layout Data:** [Empty text box] **Browse...**
- CDL top Cell Name:** [Empty text box]
- GDS top Cell Name:** [Empty text box]
- LVS Rule File:** [Empty text box] **Browse...**
- DRC Rule File:** [Empty text box] **Browse...**
- LVS Log File Name (Path is Work directory. Default is "lvs.lvs"):** [Empty text box]
- DRC Log File Name (Path is Work directory. Default is "drc.results"):** [Empty text box]
- Buttons:** Load Config, Save Config, Run DRC, Run LVS, CDL net, GDS net, Run Log, LVS Log, DRC Log, Quit

LVS Settings

Configuration File:

Work directory:
 Browse...

SPICE(CDL) netlist(for LVS):
 Browse...

GDS Layout Data:
 Browse...

CDL top Cell Name:

GDS top Cell Name:

LVS Rule File:
 Browse...

DRC Rule File:
 Browse...

LVS Log File Name (Path is Work directory. Default is "lvs.lvs"):

DRC Log File Name (Path is Work directory. Default is "drc.results"):

Load Config **Save Config** **Run DRC** **Run LVS** **CDL net** **GDS net**
Run Log **LVS Log** **DRC Log** **Quit**

CDL(SPICE)
data

LVS rule file

LVS log file

Show LVS log

Run LVS

Show CDL netlist
(flatten)

Show GDS netlist
(+device coordinate)

Run log

```
C:/Users/user/Documents/C/RKH/Work/rkLog.txt
GDS DataType number = 0
----- Obj Text -----
Label=XFAB_XH018_D_CELLS_JIHD_V_4_1, Layer=[N.A.], Net=[NULL], Attached=FALSE
Hier=0, Width=0, Mag=0.025000, Angle=0, X=100, Y=4780
-----
[Warning] GDS Layer number is not defined in rule.
[Action] Skipped GDS ---> Object conversion.
GDS Layer number = 230
GDS DataType number = 0
----- Obj Text -----
Label=DFRRJIHDX0 , Layer=[N.A.], Net=[NULL], Attached=FALSE
Hier=0, Width=0, Mag=0.200000, Angle=0, X=6720, Y=4280
-----
[Log] Divide Process start.
[Log] Delete enclosed start.
[Log] Merge Objects start.
[Log] Initialize Net start.
[Log] Pin Connect(1st) start.
[Log] Polygon Connect(1st) start.
[Log] Derive Layer process start.
----- File Include process start -----
Include FileName = C:/Users/user/Documents/C/RKH_20220519/Rule/./xh018.rul
----- File Include process finished -----
[Log] Update Net of GDS start.
[Log] Pin Connect(2nd) start.
[Log] Polygon Connect(2nd) start.
[Log] Derive Layer process start(Again).
[Log] Derive Layer process start(Again).
----- File Include process start -----
Include FileName = C:/Users/user/Documents/C/RKH_20220519/Rule/./xh018.rul
----- File Include process finished -----
[Log] Pin & Polygon Connect start(Again).
[Log] Derive Layer process start(Again).
[Log] Derive Layer process start(Again).
----- File Include process start -----
Include FileName = C:/Users/user/Documents/C/RKH_20220519/Rule/./xh018.rul
----- File Include process finished -----
[Log] Macro Process start.
----- File Include process start -----
Include FileName = C:/Users/user/Documents/C/RKH_20220519/Rule/./xh018.rul
----- File Include process finished -----

***** DRC Output Summary Begin *****
***** DRC Output Summary End *****

===== DRC Finished =====
```

To show this
Press [Run Log] button

In case DRC Summary
Section empty,
and DRC-OK.

DRC errors summary

```
C:/Users/user/Documents/C/RKH/Work/rkLog.txt
----- File Include process finished -----

***** DRC Output Summary Begin *****

S1IP : Minimum PIMP spacing/notch ... 0.44
Output Count = 4

S1M1 : Minimum MET1 spacing/notch ... 0.23
Output Count = 56

A1M1 : Minimum MET1 area ... 0.202
Output Count = 13

W1V1 : Fixed VIA1 size ... 0.26 x 0.26
Output Count = 714

S1V1 : Minimum VIA1 spacing ... 0.26
Output Count = 1

S3V1 : Minimum VIA1 stripe to VIA1 spacing ... 1.0
Output Count = 5986

E4M1V1 : Minimum MET1 enclosure of VIA1 stripe ... 0.07
Output Count = 1433

E7M2V1 : Minimum MET2 enclosure of VIA1 stripe ... 0.07
Output Count = 1152

S1M2 : Minimum MET2 spacing/notch ... 0.28
Output Count = 10

W1V2 : Fixed VIA2 size ... 0.26 x 0.26
Output Count = 518

S9V2 : Minimum VIA2 stripe to VIA2 spacing ... 1.0
Output Count = 3285

E8M2V2 : Minimum MET2 enclosure of VIA2 stripe ... 0.1
Output Count = 1036

***** DRC Output Summary End *****

===== DRC Finished =====
```

DRC Summary is written in "rk.log" file. To show this file, press [Show Run Log] button in main window.

Each error name and coordinates of each error is written in file. This file name is specified in [DRC Log File] text box in main window.

LVS log

```
C:/Users/user/Documents/C/RKH/Work/LVS.LVS
#####
LVS REPORT
#####
Execution Date/Time : May 23 12:38:39 2022

*****
COMPARISON RESULTS
*****

# # # # #
# # # CORRECT #
# # # # #
# # # # #
# # # # #

-----
*****
NET STATISTICS
*****

Number of      Number of      Unmatched      Unmatched
Source         Layout         Source         Layout
-----
544            544            0              0

-----
*****
DEVICE STATISTICS
*****

Number of      Number of      Unmatched      Unmatched      DEVICE
Source         Layout         Source         Layout
-----
52             52             0              0            C (M4)
575            575            0              0            M (XF)
601            601            0              0            MP (PD)
575            575            0              0            MN (ND)
```

Press [LVS Log] button
In main window.

In this case, LVS is OK.



Remarks

- Input GDS/CDL(SPICE) filename, rule filename, log filename, etc. are need to specify in main window.
- Rule file configurations that specified in main window will be ignored.
- GDS port name and CDL(SPICE) port name are need to match in LVS.
- Configurations and options are considered rarely needed may not support. Users can send enhancement request.

Contact

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