Usage Guide of Calibre on DRC check

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The guide shows the flow of DRC check with the tool – Calibre of Mentor Graphics. The design kits used in the guide is AMS kits. The method of DRC check is demonstrated with antenna error check under Cadence Virtuoso environment, and it can be applied to others of DRC check. The guide includes three sections: prepare date, setup of Calibre GUI mode and Calibre DRC.

Prepare Date

Before starting Calibre DRC, user has to export a GDS file of design layout. Below are the steps of exporting.

1. Type **ams_cds** to start Cadence in your project directory.
2. Select **File→Export→Stream…** from **CIW** window to export GDS file.
3. Fill in the **Library Name** (project library), the **Top Cell Name** (your design), and **Output File** in the **Virtuoso Stream Out** form as figure 1 shows. A '*.gds' file (TMP.gds for the example) is created in your project directory.
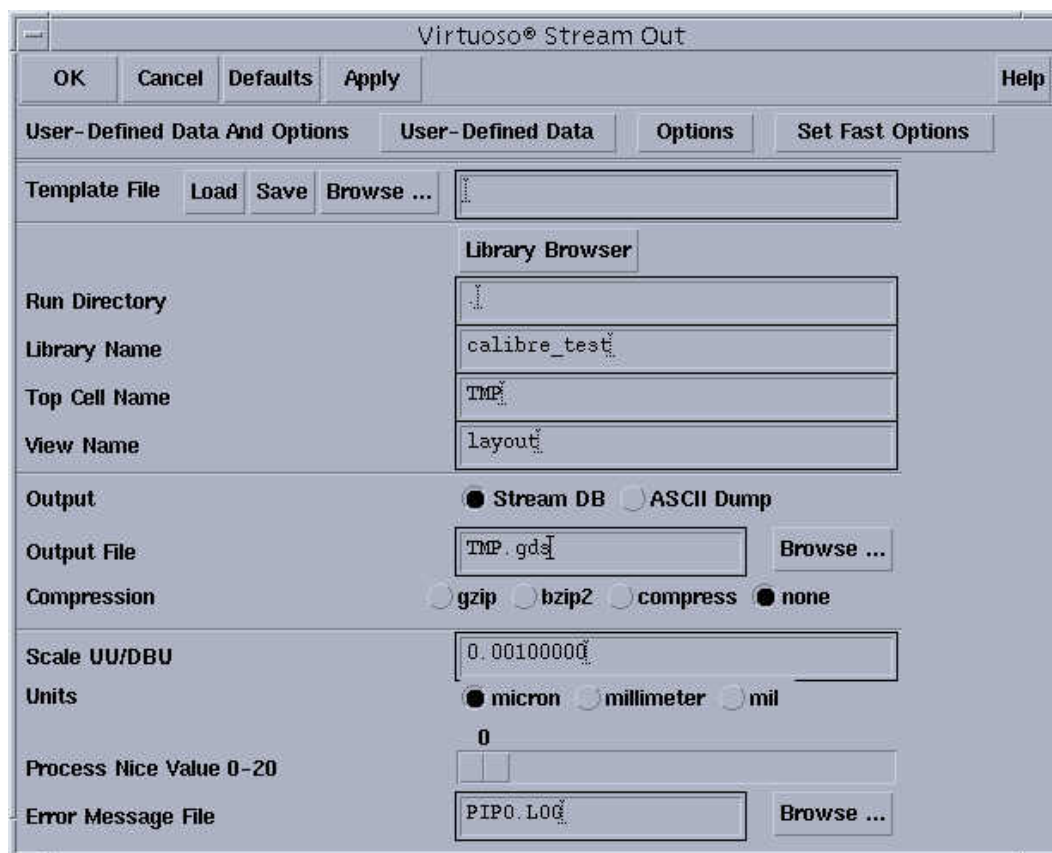

Fig 1. Export GDS layout.

Setup of Calibre GUI mode

Calibre GUI mode flow is working under Cadence Virtuoso environment and its environment setup is as follows.

1. Add '**setenv MGC_HOME <path-to-calibre-software>**' in your home '**.cshrc**' file. For example,

    setenv MGC_HOME /app22/mentor/calibre_2005_4_8.13/ss5_cal_2005.4_8.13

2. Add the following commands in your home '**.cshrc**' file to setup Calibre license.

    setenv LM_LICENSE_FILE 1717@hpap2-sv.cadcam.nus.edu.sg
    setenv MGLS_LICENSE_FILE 1717@hpap2-sv.cadcam.nus.edu.sg

3. Add the following command to the '**.cdsinit**' file in your project directory.

    load(strcat (getShellEnvVar("MGC_HOME") "/lib/calibre.skl"))

Calibre DRC

Calibre DRC verification procedures are as follows.

1. Type **ams_cds –mode lyp** to start Cadence in your project directory.
2. Open the layout view of your design top cell (example: TMP). There is a pull down menu for **Calibre** in **Virtuoso Layout Editing** window**,** as shown in figure 2.
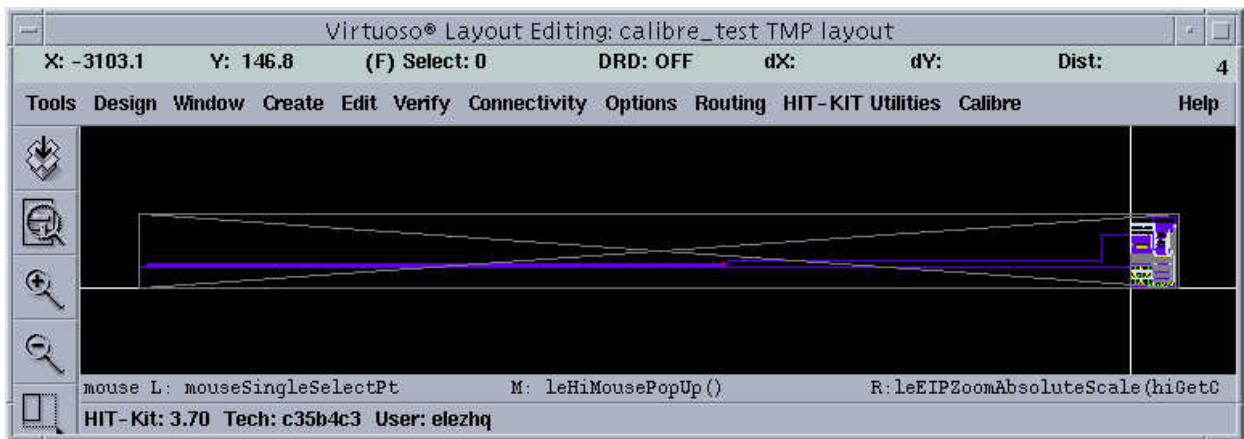

Fig 2. Menu for Calibre in Virtuoso Layout Editing window.

3. Click **Calibre→Run DRC** in **Virtuoso Layout Editing** window to invoke Calibre DRC graphic user interface, as shown in figure 3.
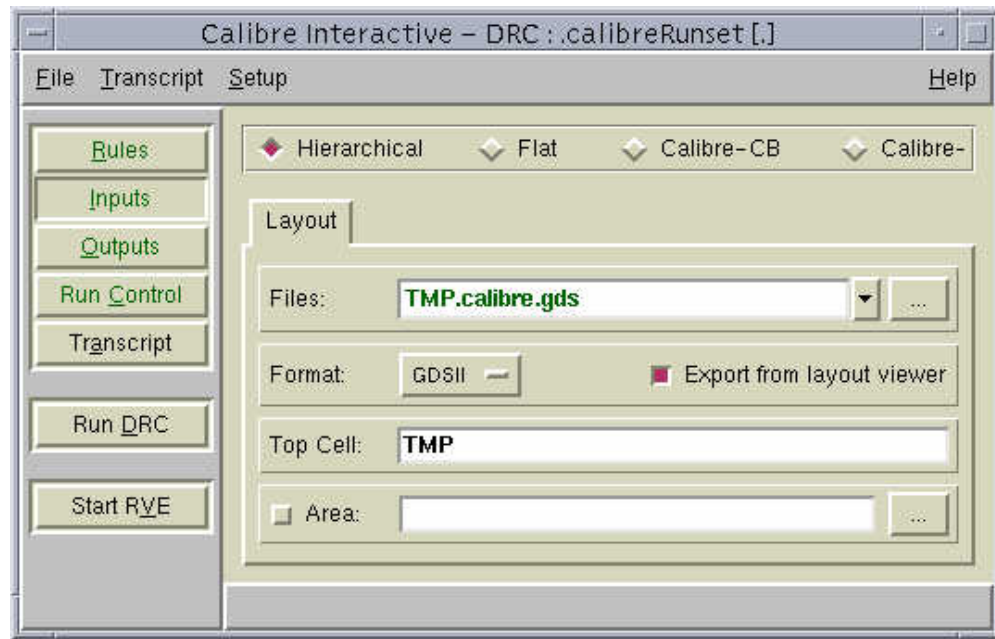
Fig 3. Calibre interactive – DRC window.

4. Select **Rules** in **Calibre interactive** window, and make sure it is pointed to the correct rule file (antenna rule file for the example), as shown in figure 4.
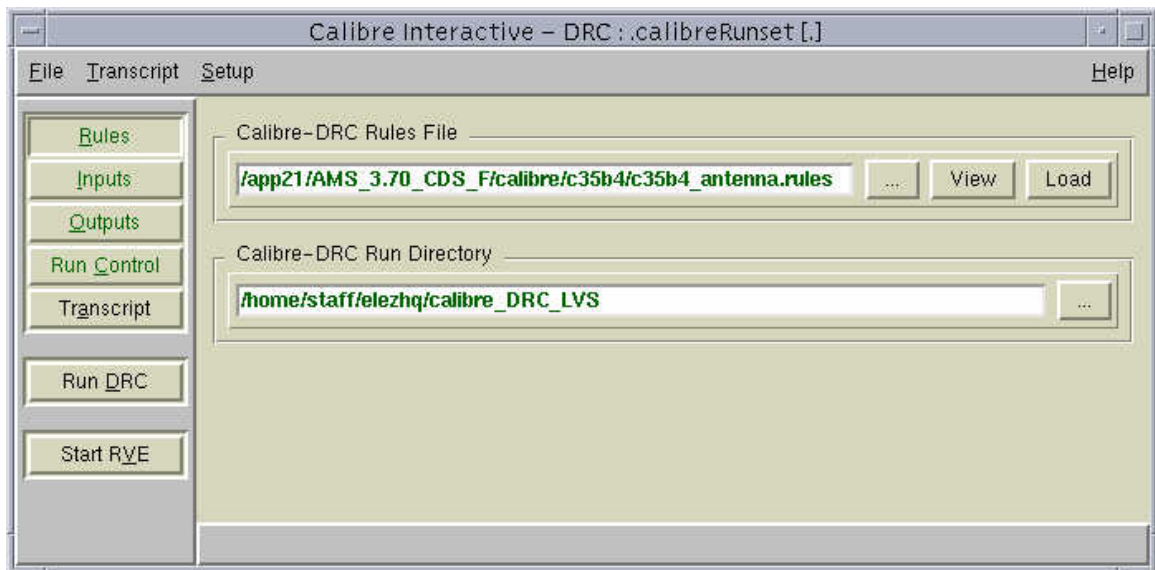

Fig 4. Setup Calibre-DRC rules file.

5. Select **Outputs** in **Calibre interactive** window, and change the output file names as you like or keep it unchanged. Example is shown in figure 5.
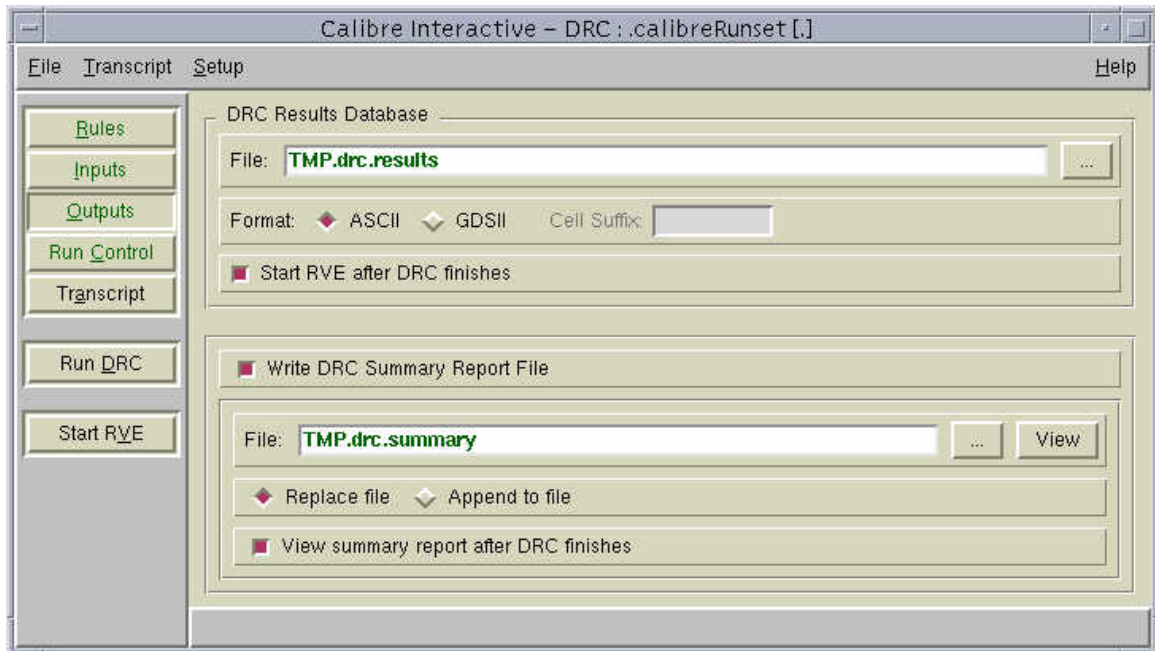
Fig 5. Setup the DRC results database.

6. Click **Run DRC** in **Calibre interactive** window. The DRC starts and DRC message appears in Calibre window while it is running. In the end, two windows appear: **Calibre – DRC RVE** window which shows the DRC results and DRC summary report window.
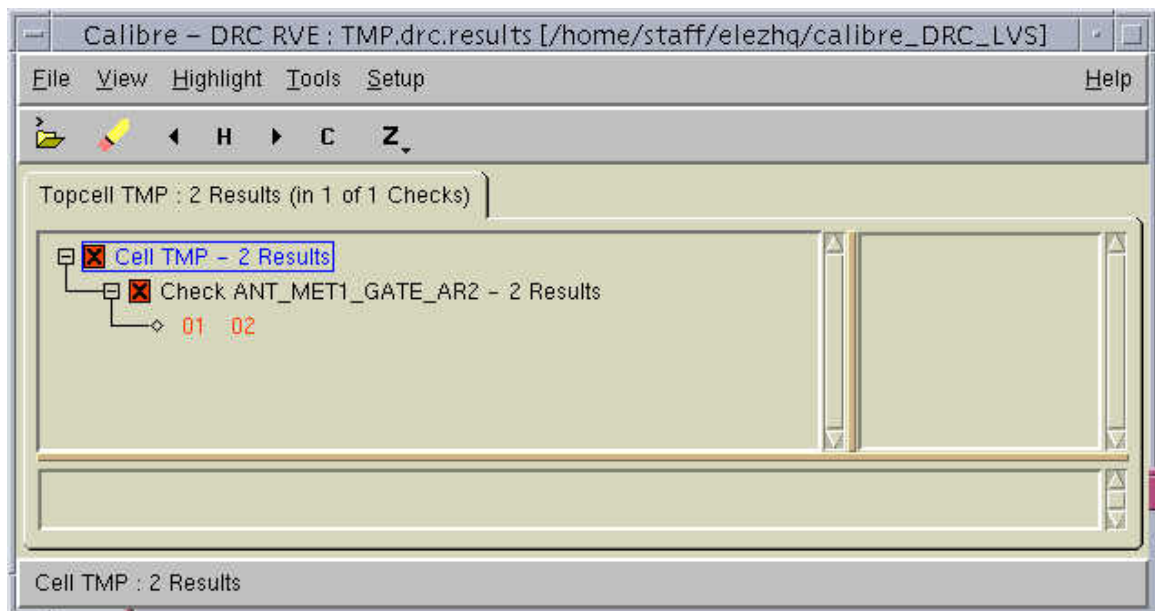

Fig 6. Calibre – DRC RVE window.

7. Highlight one of the errors in **Calibre – DRC RVE** window, for example 01. Observe the message appears in **Calibre - DRC RVE** window.
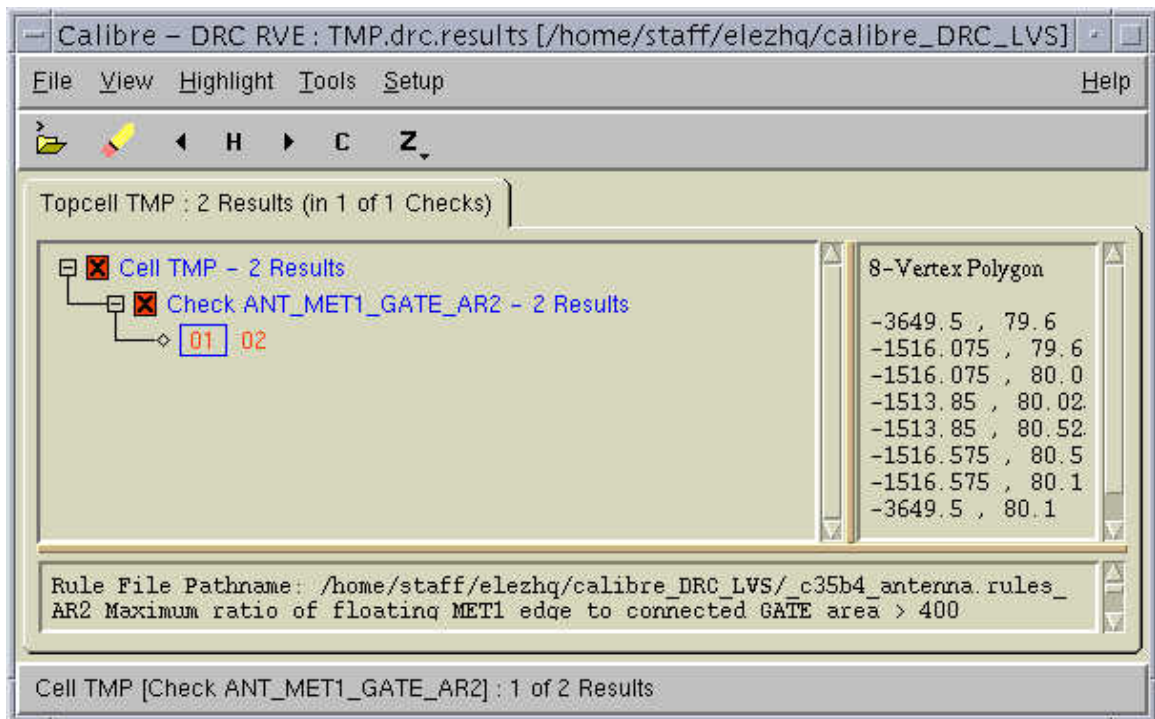
Fig 7. Highlight error in Calibre – DRC RVE window.

8. Click on **Highlight→Highlight Result→Current** in **Calibre - DRC RVE** window, and the errors will be highlighted in **Virtuoso Layout Editing** window as shown in figure 8.
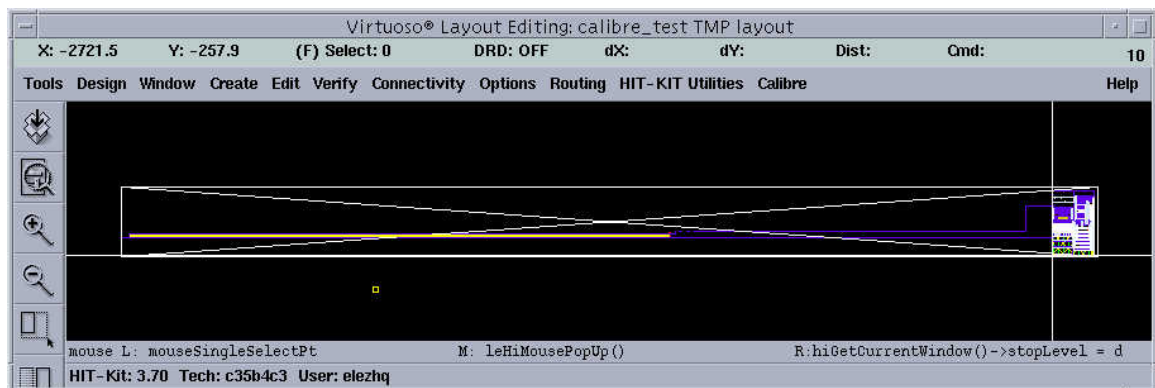

Fig 8. Errors highlighted in the layout window.

9. Click on **Highlight→Highlight Result→Next** to highlight next error in the layout window, and **Highlight→Highlight Result→Previous** to highlight previous error.

    User can start correct layout errors accordingly to Calibre DRC results and re-run Calibre DRC again until it is error free.

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