

TSMC 130nm PDK installation guide

26 August 2014

1. Packages to be installed

- From Sandro Bonachi, the 31 July 2014

Hi Laurent, for (1) I give you a list of the packages I installed. It depends also which tools you want to use...

T-000-CL-DR-002	1.8	TSMC WIRE BOND, FLIP CHIP AND INTERCONNECTION DESIGN RULE (C025-C015)	10/24/2012	
T-000-CL-DR-017	1.2	TSMC 0.13 UM ~ 55 NM WIRE BOND, EUTECTIC FLIP CHIP, LEAD FREE (LF) BUMP FLIP CHIP AND INTERCONNECTION DESIGN RULE	05/27/2014	1.3
T-000-CL-DR-017-C1	1.3A	TSMC 0.13 UM ~ 55 NM WIRE BOND, EUTECTIC FLIP CHIP, LEAD FREE (LF) BUMP FLIP CHIP AND INTERCONNECTION DRC (CALIBRE) COMMAND FILE	05/27/2014	
T-013-CM-SP-005	2.4	TSMC 0.13 UM MIXED SIGNAL 1P8M SALICIDE 1.2V/2.5V FSG IMD SPICE MODELS (CM013G)	05/08/2008	
T-013-LO-DR-001	2.5	TSMC 0.13 UM/0.11 UM CMOS LOGIC/MS/RF DESIGN RULE (CL013G/LV/LP, CM013G, CL011G/LV+, CM011G)	10/30/2013	
T-013-LO-DR-001-C1	2.5A	TSMC 0.13UM/0.11UM CMOS LOGIC/MS/RF DRC (CALIBRE) COMMAND FILE (CL013G/LV/LP, CM013G, CL011G/LV+, CM011G)	10/30/2013	
T-013-LO-DR-001-C2	2.4A	TSMC 0.13 UM/ 0.11 UM DUMMY OD/PO GENERATION UTILITY (CALIBRE) COMMAND FILE	11/02/2012	
T-013-LO-DR-001-C3	2.3A	TSMC 0.13UM/0.11UM DUMMY METAL (CALIBRE) GENERATION UTILITY	01/21/2010	
T-013-LO-DR-001-U1	2.5A	TSMC 0.13 UM/0.11 UM CMOS LOGIC/MS/RF DRC (ASSURA) COMMAND FILE (CL013G/LV/LP, CM013G, CL011G/LV+, CM011G)	12/30/2013	
T-013-LO-DR-001-U2	2.2A	TSMC 0.13UM DUMMY OD/PO GENERATION UTILITY (ASSURA) COMMAND FILE(3RD PARTY)	04/11/2007	
T-013-LO-DR-001-U3	2.2A	TSMC 0.13UM DUMMY METAL (ASSURA) GENERATION UTILITY COMMAND FILE (3RD PARTY)	04/11/2007	
T-013-LO-DR-001-V1	2.1A	TSMC 0.13UM LOGIC 1P8M SALICIDE 1.0V/2.5V,1.2V/2.5 V,1.0V/3.3V DRC (DIVA) COMMAND FILE	08/18/2004	
T-013-LO-LE-002	2.5A	TSMC 0.13 UM LAYOUT EDITOR (VIRTUOSO) TECHNOLOGY FILE	11/28/2013	
T-013-LO-LE-005	1.2	TSMC 0.13UM METAL SLOT(CALIBRE) INSERTION UTILITY	01/08/2002	
T-013-LO-LE-006	1.1	TSMC 0.13UM METAL SLOT(HERCULES)	01/08/2002	

INSERTION UTILITY

T-013-MM-SP-001	1.4	TSMC 0.13 UM MIXED SIGNAL 1P8M SALICIDE 1.2V/2.5V RF SPICE MODEL (CR013G)	05/20/2009
T-013-MM-SP-001-V1	1.4A	TSMC 0.13 UM MIXED SIGNAL 1P8M SALICIDE 1.2V/2.5V RF RC (ASSURA) TECH FILE	02/18/2014
T-013-MM-SP-001-X1	1.4A	TSMC 0.13 UM MIXED SIGNAL 1P8M SALICIDE 1.2V/2.5V RF RC (XCALIBRE) TECH.FILES	01/13/2014

- **The basic packages to be installed (Clermont - Summer 2014)**

t-013-mm-sp-001-k3_1_4c_20120216.zip and **t-013-mm-sp-001-k4_1_4c_3_20121226.zip**

- **The package required for ASSURA/QRC** (*From Sandro Bonachi, the 23 July 2014*)

For Assura/QRC to run you must download package:

T-013-MM-SP-001-V1 "TSMC 0.13 UM MIXED SIGNAL 1P8M SALICIDE 1.2V/2.5V RF RC (ASSURA) TECH FILE"

Version: 1.4A

Date: 02/18/2014

download filename is: t-013-mm-sp-001-v1_1_4a_20140218.zip

inside you find:

T-013-MM-SP-001-V1_v1.4a.tar.gz

inside you find:

RC_QRC_cr013g_1p7m_4x1n1u_mim5_5corners_1.4a.tar.gz

inside you find:

RC_QRC_cr013g_1p07m_4x1n1u_mim5_typical.tar.gz

(AND OTHER CORNERS)

inside you find:

RCXdspflNIT

RCXspiceINIT

cr013g_1p07m_4x1n1u_mim5_typical.ict

qrcTechFile

...

2. Installation of packages

- Packages **t-013-mm-sp-001-k3_1_4c_20120216**.

- Unzip and untar files (tar -vzxf).
- Run the script pdkInstall.pl: *perl pdkInstall.pl*
- Then select the following options (mail from Sandro)
 - o Our choice is:
 - o *** Select PROC : 0.13um MS/RF 1.2v/2.5v
 - o *** Select MIMCAP : 1.5fF_MIM
 - o *** Select METAL : 1p7m_4X1Z1U_CURDL
 - o You can download the documents for more info:
 - T013LODR001_2_5
 - T013CMSP005_2_4

- Package **t-013-mm-sp-001-k4_1_4c_3_20121226.zip**

- Unzip and untar files (tar -vzxf) inside the PDK directory.
- Run the script pdkPatchInstall.pl: *perl pdkPatchInstall.pl*

- Package **T-013-MM-SP-001-V1 "TSMC 0.13 UM MIXED SIGNAL 1P8M SALICIDE 1.2V/2.5V RF RC (ASSURA) TECH FILE"**

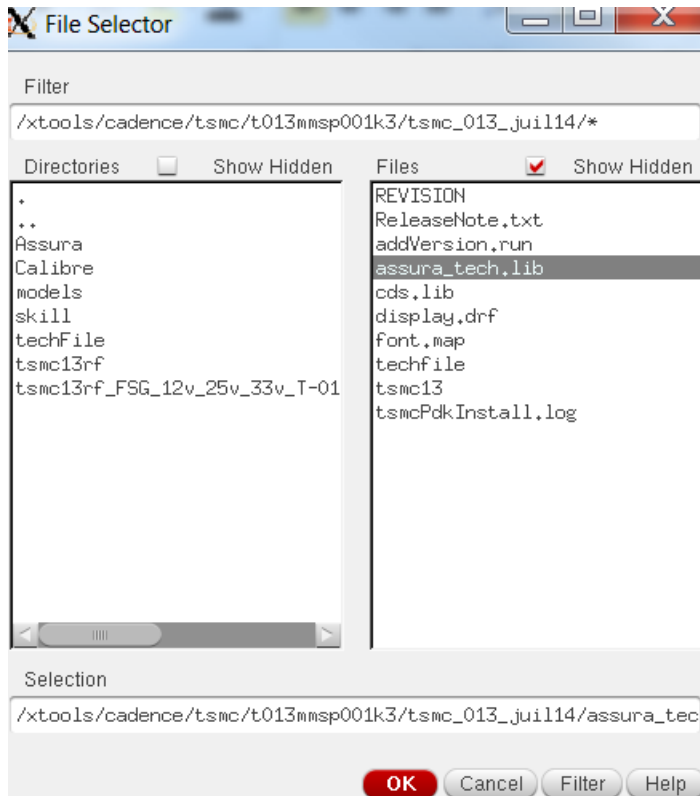
- All the tar.gz files have to be decompressed into a folder. We have called this folder 'qrc':
\$TSMC_DIR/Assura/lvs_rcx/qrc
- You will find below the list of the files in this folder.

```
-rwxr-xr-x+ 1 cdsmgr cdsmgr      1121 juil. 23 14:47 COPYRIGHT
-rwxr-xr-x+ 1 cdsmgr cdsmgr     24646 juil. 23 14:47 cr013g_1p05m_2x1n1u_mim3_cbest.ict
-rwxr-xr-x+ 1 cdsmgr cdsmgr     24018 juil. 23 14:47 cr013g_1p05m_2x1n1u_mim3_cworst.ict
-rwxr-xr-x+ 1 cdsmgr cdsmgr     24017 juil. 23 14:47 cr013g_1p05m_2x1n1u_mim3_rcbest.ict
-rwxr-xr-x+ 1 cdsmgr cdsmgr     24654 juil. 23 14:47 cr013g_1p05m_2x1n1u_mim3_rcworst.ict
-rwxr-xr-x+ 1 cdsmgr cdsmgr     22952 juil. 23 14:47 cr013g_1p05m_2x1n1u_mim3_typical.ict
-rwxr-xr-x+ 1 cdsmgr cdsmgr     28069 juil. 23 14:47 cr013g_1p06m_3x1n1u_mim4_cbest.ict
-rwxr-xr-x+ 1 cdsmgr cdsmgr     27408 juil. 23 14:47 cr013g_1p06m_3x1n1u_mim4_cworst.ict
-rwxr-xr-x+ 1 cdsmgr cdsmgr     27407 juil. 23 14:47 cr013g_1p06m_3x1n1u_mim4_rcbest.ict
-rwxr-xr-x+ 1 cdsmgr cdsmgr     28077 juil. 23 14:47 cr013g_1p06m_3x1n1u_mim4_rcworst.ict
-rwxr-xr-x+ 1 cdsmgr cdsmgr     26251 juil. 23 14:47 cr013g_1p06m_3x1n1u_mim4_typical.ict
-rwxr-xr-x+ 1 cdsmgr cdsmgr     31438 juil. 23 14:47 cr013g_1p07m_4x1n1u_mim5_cbest.ict
-rwxr-xr-x+ 1 cdsmgr cdsmgr     30803 juil. 23 14:47 cr013g_1p07m_4x1n1u_mim5_cworst.ict
-rwxr-xr-x+ 1 cdsmgr cdsmgr     30801 juil. 23 14:47 cr013g_1p07m_4x1n1u_mim5_rcbest.ict
-rwxr-xr-x+ 1 cdsmgr cdsmgr     31446 juil. 23 14:47 cr013g_1p07m_4x1n1u_mim5_rcworst.ict
-rwxr-xr-x+ 1 cdsmgr cdsmgr     29552 juil. 23 14:47 cr013g_1p07m_4x1n1u_mim5_typical.ict
-rwxr-xr-x+ 1 cdsmgr cdsmgr     34810 juil. 23 14:47 cr013g_1p08m_5x1n1u_mim6_cbest.ict
-rwxr-xr-x+ 1 cdsmgr cdsmgr     34197 juil. 23 14:47 cr013g_1p08m_5x1n1u_mim6_cworst.ict
-rwxr-xr-x+ 1 cdsmgr cdsmgr     34195 juil. 23 14:47 cr013g_1p08m_5x1n1u_mim6_rcbest.ict
-rwxr-xr-x+ 1 cdsmgr cdsmgr     34815 juil. 23 14:47 cr013g_1p08m_5x1n1u_mim6_rcworst.ict
-rwxr-xr-x+ 1 cdsmgr cdsmgr     32852 juil. 23 14:47 cr013g_1p08m_5x1n1u_mim6_typical.ict
-rwxr-xr-x+ 1 cdsmgr cdsmgr     451344 juil. 23 14:47 QAreport
-rwxr-xr-x+ 1 cdsmgr cdsmgr      12327 juil. 23 14:47 QAreport.cc
-rwxr-xr-x+ 1 cdsmgr cdsmgr 101470721 juil. 23 14:47 qrcTechFile
drwxr-xr-x+ 2 cdsmgr cdsmgr      4096 juil. 23 14:47 RCX
-rwxr-xr-x+ 1 cdsmgr cdsmgr     43373 juil. 23 14:47 RCXdspflINIT
-rwxr-xr-x+ 1 cdsmgr cdsmgr     43373 juil. 23 14:47 RCXspiceINIT
-rwxr-xr-x+ 1 cdsmgr cdsmgr      1731 juil. 23 14:47 README
-rwxr-xr-x+ 1 cdsmgr cdsmgr     35689 juil. 23 14:47 T013MMSP001V1_1_4A.pdf
drwxr-xr-x+ 2 cdsmgr cdsmgr      4096 juil. 23 14:47 TSMC_DOC_WM
```

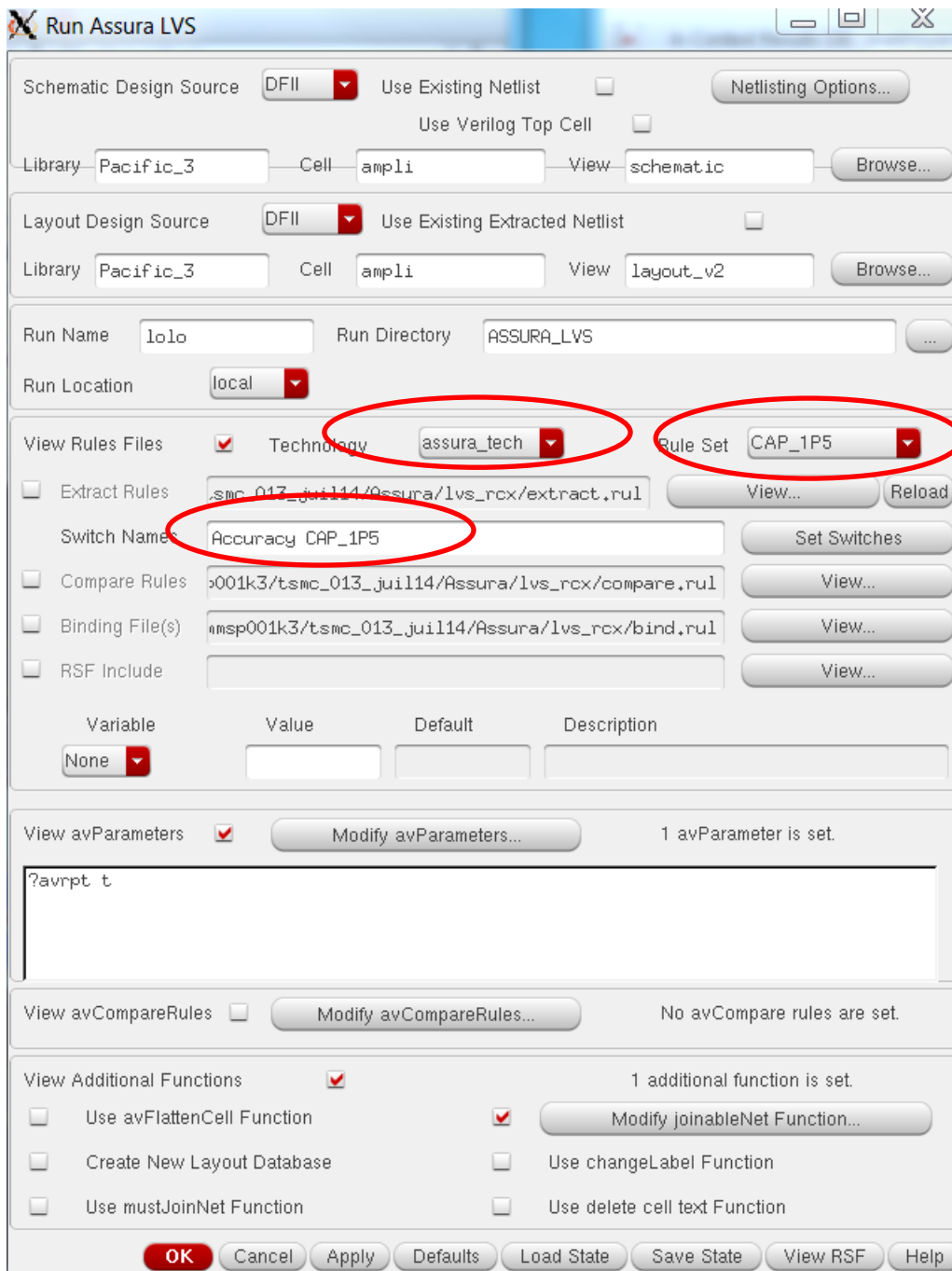
3. Assura LVS and QRC

- **Choice of the technology:**

Select the `assura_tech.lib` file from the menu Assura → Technology



- Parameters of the LVS and QRC forms:



4. Miscellaneous

- tsmc13rf_device_update**

As described in the ReleaseNote.txt, a useful utility is provided to user to transit the device form Normal device to Mismatch device or reverse.

Text extracted from the text file /xtools/cadence/tsmc/t013mmsp001k3/ReleaseNote.txt:

10.3 tsmc13rf_device_update(S_option S_libName S_cellName)

This utility is provided to user to transit the device form Normal device to Mismatch device or reverse.

> S_option: It's a key word that uses to decide which kind of device user want transition.

If the input is "nor", the device will transit to Normal device. If the input is "mis", the device will transit mismatch device. ("nor" or "mis")

> S_libName: The cell's library name.

> S_cellName: The cell that user want to transit.

```
tsmc13rf_device_update("mis" "Simu_Pacific_3_Richard" "dac_6bits")
```

Note: This utility not support hierarchy structure and it only transit schematic view.

Previously to run the tsmc13rf_device_update command, you have to load the context tsmc13rf.cxt

!!

```
loadContext "/xtools/cadence/tsmc/t013mmsp001k3/tsmc_013_juil14/skill/tsmc13rf.cxt"
```

I have tested it. It works on certain blocks and not on others!!!!

- **Commande tsmc13rf_VXL_update**

From José :

```
"After loading "tsmc13rf_vxl_patch.cxt", type this command in CIW if needed:tsmc13rf_VXL_update("tsmc13rf")"
```

What do they mean by load the *.cxt file? Where? From virtuoso? In the configuration script? I tried executing that command in the CIW but it doesn't recognize it. How did you go about this?

Le 28/07/2014 11:21, Laurent Royer a écrit :

Re-Hi José,

to load the context file "tsmc13rf_vxl_patch.cxt", you have to type this command in the CIW:

```
loadContext "your_PDK_installation_directory/skill/tsmc13rf_vxl_patch.cxt"
```

When I tried to run the tsmc_VXL_update command, I have an error:

```
*** Error in routine error:
```

```
Message: *Error* Warning: could not open tech.db. Exiting...
```

