KLayout Productivity Suite Documentation

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1 Introduction

1.1 About KLayout Productivity Suite

KLayout is an open source VLSI layout viewer and editor.

The *KLayout Productivity Suite* is a collection of plugins developed by the **Department for Integrated Circuits (ICD), Johannes Kepler University (JKU)** to enhance your layout design productivity.

The available plugins are listed in the table below.

Title	Description	Repository URL
Align Tool Plugin	Tool to align layout objects	https://github.com/iic-jku/klayout-align-tool
Automatic Backups	Create automatic backups of edited layouts	https://github.com/iic-jku/klayout-auto-backup
Layer Shortcuts Plugin	Shortcuts to quickly change layer visibility	https://github.com/iic-jku/klayout-layer-shortcuts

Title	Description	Repository URL
Library Manager Plugin	Library manager for hierarchical layouts	https://github.com/iic-jku/klayout-library-manager
Move Quickly Tool Plugin	Tool to quickly move layout objects	https://github.com/iic-jku/klayout-move-tool
Pin Tool Plugin	Efficient placement of pins	https://github.com/iic-jku/klayout-pin-tool
Plugin Utilities Library	Utility library used by various IIC KLayout plugins	https://github.com/iic-jku/klayout-plugin-utils

> **Tip**
>
> The *KLayout Productivity Suite* source code itself is made publicly available on GitHub and shared under the GPL-3.0 license (see links above in table above).
> The *KLayout Productivity Suite documentation* source code is made publicly available on GitHub (follow this link) and shared under the Apache-2.0 license.
> Please feel free to create issues and/or submit pull requests on GitHub to fix errors and omissions!
> The production of the tool and this document would be impossible without these (and many more) great open-source software products: `KLayout`, `Quarto`, `Python`, `ngspice`, `Numpy`, `Scipy`, `Matplotlib`, `Git`, `Docker`, `Ubuntu`, `Linux`…

1.2 Acknowledgements

TODO

1.3 Installation

Generally, the plugins can be installed using the KLayout Package Manager.

- `KLayoutProductivitySuite` acts as a meta-package that can be installed in KLayout's Package Manager. Once installed, it automatically pulls in all the plugins as `dependencies` through the `grain.xml`
- Alternatively, single plugins can be cherry-picked using the plugin title in the above table (without whitespace)

As for the dependencies, there are multiple options available.

1.3.1 Option 1: Using `IIC-OSIC-TOOLS` Docker Image

We provide a comprehensive, low entry barrier Docker image that comes pre-installed with most relevant open source ASIC tools, as well as the open PDKs. This is a pre-compiled Docker image which allows to do circuit design on a virtual machine on virtually any type of computing equipment (personal PC, Raspberry Pi, cloud server) on various operating systems (Windows, macOS, Linux).

For further information please look at the Docker Hub page and for detailed instructions at the IIC-OSIC-TOOLS GitHub page.

> **Linux**
>
> In this document, we assume that users have a basic knowledge of Linux and how to operate it using the terminal (shell). If you are not yet familiar with Linux (which is basically a must when doing integrated circuit design as many tools are only available on Linux), then please check out a Linux introductory course or tutorial online, there are many resources available.
> A summary of important Linux shell commands is provided in IIC-JKU Linux Cheatsheet.

1.3.2 Option 2: Standalone Installation

- KLayout layout tool:
  - get the latest pre-built package version
  - or follow the build instructions
- Skywater sky130A PDK:
  - optional
  - `pip3 install --upgrade ciel` (install PDK package manager)
  - `ciel ls-remote --pdk sky130A` (retrieve available PDK releases
    - for example `PRE-RELEASE 0c1df35fd535299ea1ef74d1e9e15dedaeb34c32 (2024.12.11)`)
  - `ciel enable --pdk sky130A 0c1df35fd535299ea1ef74d1e9e15dedaeb34c32` (install a PDK version)
  - PDK files now have been installed under `$HOME/.volare/sky130A`
- IHP SG13G2 PDK:
  - optional
  - `pip3 install --upgrade ciel` (install PDK package manager)
  - `ciel ls-remote --pdk ihp-sg13g2` (retrieve available PDK releases
    - for example `PRE-RELEASE cb7daaa8901016cf7c5d272dfa322c41f024931f (2025.07.18)`)
  - `ciel enable --pdk ihp-sg13g2 cb7daaa8901016cf7c5d272dfa322c41f024931f` (install a PDK version)
  - PDK files now have been installed under `$HOME/.volare/ihp-sg13g2`

2 Align Tool

TODO

3 Move Tool

TODO

4 Pin Tool

TODO

5 Layer Shortcuts Plugin

TODO

6 Library Manager

TODO

7 Automatic Backups

TODO