

Tips to Make PCells Using JavaScript

Introduction

JavaScript is one of the most popular script languages on the web and has many users. Expert supports JavaScript to make customized functions and PCells for users.

This application note shows several tips to make JavaScript PCells.

Benefit of JavaScript PCells

JavaScript PCells have some benefits compare to Lisa PCells:

1. **Easy to write** - JavaScript has more functions than Lisa
2. **Examples on the web** - JavaScript is a very popular script on the web where many examples and tutorials can be found
3. **Enhanced “callback” function** - Expert supports “callback” functions of PCells using JavaScript. This makes easy to manage parameters

Three Manuals for JavaScript

1. The reference manual of core JavaScript is in <https://developer.mozilla.org/en/javascript>
This is a complete reference for the JavaScript language.
2. Expert includes a JavaScript API reference available from menu Help>> JavaScript API reference
This manual has all relevant information for JavaScript API related layout editing.
3. The JavaScript and Lisa commands table is available in “Install_dir”/lib/expert/”version”/docs/Lisa_javascript_table.pdf

This manual can compare commands between Lisa and JavaScript. This can assist experienced users of Lisa.

Preparation to use JavaScript

At first, using JavaScript for Expert, select JavaScript as script engine from Expert menu.

Tools>>Script>>JS

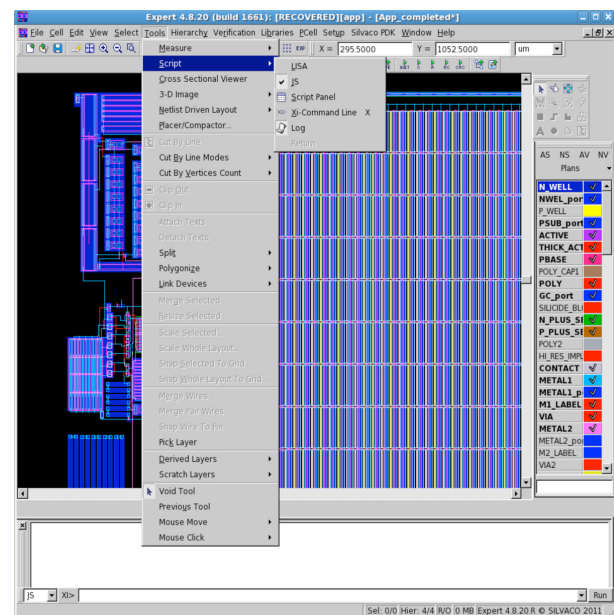


Figure 1. Setup JavaScript.

Check log window

The log window on Expert displays all the commands. You can examine JavaScript API commands in the log when you try to edit using the GUI. The log window is very helpful for checking the XI-command instantly.

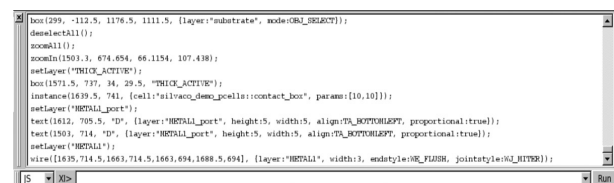


Figure 2. Log window.

Callback Function

Expert supports “callback” function of parameters of PCells using JavaScript only. This is not supported by Lisa.

Product Examples on the Silvaco website provide callback function examples in detail. Please see: <http://www.silvaco.com/examples/expert/section3/example4/index.html>

Compile PCells using external JS files

XI Script panel is a good editor for developing PCells. However, sometimes you may want Pcell scripts to manage as external files for revision control using tools such as CVS.

In this case, definePCell() function can compile a external PCell script file. **definePCell(“external file name”)** on XI-command line.



Figure 3. DefinePCell on XI-window.

Above Expert 4.8.17.R, some PCells can compile in a file using the definePCell() command. For example:

```
In “compile.js”
definePCell(“rnwell.js”);
definePCell(“rnpoly.js”);
definePCell(“rppoly.js”);
```

run(“compile.js”) on XI-window

JavaScript PCell Examples

You can download a free analog demo PDK which includes good PCell examples with callback from the Silvaco website.

<https://dynamic.silvaco.com/dynamicweb/silen/downloadFiles/nonProprietaryPDKs/13727-ppdk-silvaco-analog-demo-1-1-4-R.ssu>

Conclusion

It is easy to write JavaScript PCells for all users. JavaScript functions can easily be searched from the web because it is not a proprietary language.

In addition, you can download sample PCells to start up anytime you want.

JavaScript on Expert provides a strong environment not only for PCells, but also for layout customization by users.

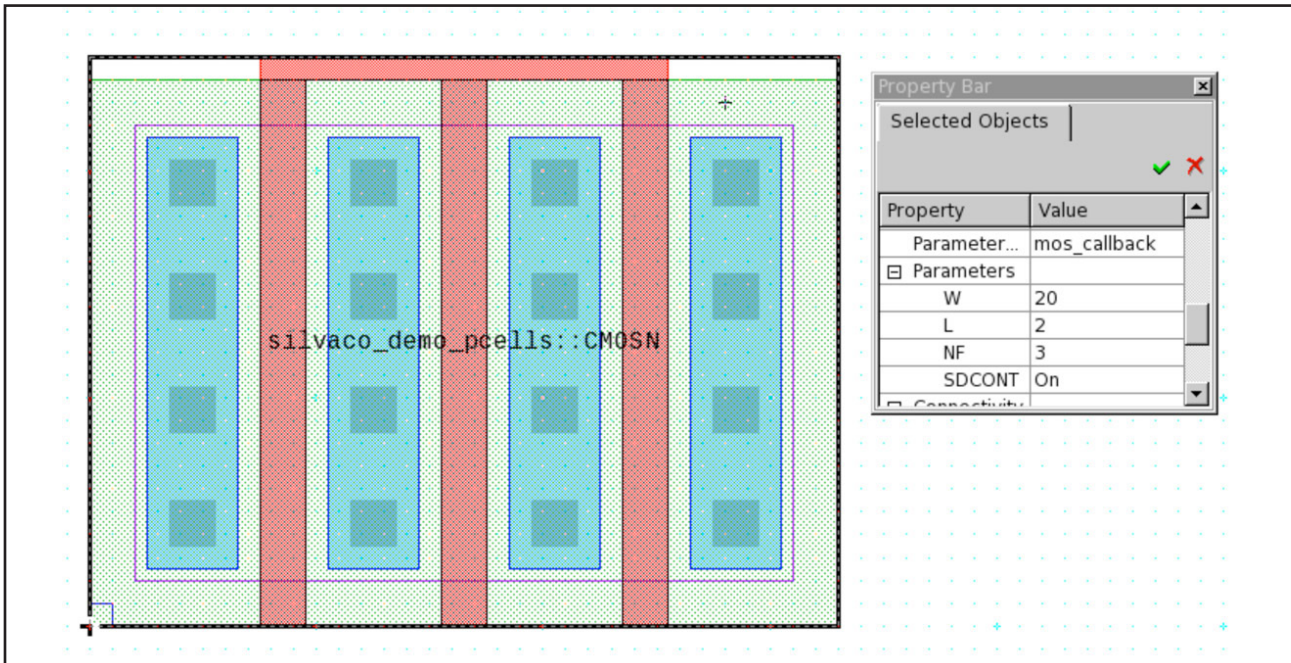


Figure4. Pcell Example in the demo PDK.