

# CORNERSTONE

## Quick reference design guidelines for MPW #21 – October 2020

[Sign-up deadline – Friday 20<sup>th</sup> November 2020](#)

[Mask submission deadline – Friday 18<sup>th</sup> December 2020](#)

File format = *.gdsII*.

Manufacturing grid size = 1 nm.

Design area = **11.47 x 4.9 mm<sup>2</sup>** or **5.5 x 4.9 mm<sup>2</sup>**.

Top cell name: 'Cell0\_*[Name of Institution]*'.

### 1. Terms & conditions and cost

All design submissions must agree with the terms and conditions:

[www.cornerstone.sotonfab.co.uk/terms-and-conditions](http://www.cornerstone.sotonfab.co.uk/terms-and-conditions)

Under no circumstances will we accept designs without agreement with the terms.

Therefore, we strongly recommend that the terms and conditions are pre-authorized by your institution prior to the mask submission date.

A purchase order (PO) must be uploaded at the same time as submitting your mask design in order to pay the access fee, detailed in Table 1 below. Purchase orders will not be accepted via email.

Table 1 – Access cost.

Design Area	Access Cost WITH Heaters*	Access Cost WITHOUT Heaters*
11.47 x 4.9 mm <sup>2</sup>	£11,650	£6,750
5.5 x 4.9 mm <sup>2</sup>	£8,000	£4,250

\*Quoted prices are exclusive of VAT, import duties, withholding taxes etc.

For information about setting up CORNERSTONE as a supplier to your institution, please contact [cornerstone@soton.ac.uk](mailto:cornerstone@soton.ac.uk).

Section 7 of the CORNERSTONE 21st Call - Design Rules.pdf document details the design submission process in detail.

### 2. Design rule changes from previous 340 nm SOI platform call (MPW #16)

The following changes have been made from the previous call on the 340 nm SOI platform:

1. The grating coupler layer will be patterned by e-beam lithography for this call to enable high efficiency (<1.5 dB) apodized grating couplers.
2. CORNERSTONE no longer offers a cleaving service for edge couplers. If you require edge couplers, please contact [cornerstone@soton.ac.uk](mailto:cornerstone@soton.ac.uk) to discuss your options.

### 3. Design rules summary

A summary of the design rules and GDS layer numbers can be found in Table 2 below.

Table 2 – Design rules summary.

Layer description	GDS number	Field	Min. feature size	Min. gap	Max. feature size	Target critical dimension
Silicon Etch 5 (195 nm ± 10 nm)	60	Dark	30 nm	30 nm	15 µm	33 nm
Silicon Etch 2 (340 nm to BOX)	3	Light	350 nm	200 nm	N/a	450 nm
	4	Dark	200 nm	350 nm		
	61	Light	10 µm	10 µm		
Heater Filaments	39	Light	2 µm	10 µm	N/a	2 µm
Heater Contact Pads	41	Light	2 µm	10 µm	N/a	2 µm
Cell Outline	99	N/a	N/a	N/a	N/a	N/a
Labels*	100	Dark	250 nm	250 nm	N/a	N/a

\*Features drawn in the Labels layer will be merged into Silicon Etch 2 by the CORNERSTONE team.

In order to help you ensure that you comply with the design rules, you can also download a design rule check (DRC) checklist from our website and if you have access to Tanner L-Edit software, a .tdb version of the template containing a DRC file that you can run to automatically find any design rule violations (note that the automatic DRC will not check all of the design rules, so it remains very important to read the design rules in detail).

#### 4. Minimum feature sizes, tolerances and other design rules

- Minimum feature sizes, minimum gaps, and maximum feature widths for each GDS layer are detailed in Table 2.
- The target critical dimension for each GDS layer is listed in Table 2. Note that other feature sizes may have a small dimensional bias.
- A minimum spacing between waveguides of at least 5 µm is recommended to avoid power coupling.
- An overlap of at least 200 nm between GDS layers is essential to account for the alignment tolerance between layers.
- All structures drawn in GDS layer 60 (Grating couplers) must overlap by at least 200 nm with GDS layer 3 (Waveguides).
- An overlap of at least 10 µm between GDS layer 39 (Heater Filaments) and GDS layer 41 (Heater Contact Pads) is recommended for optimal heater performance.
- Ensure all structures drawn in GDS layer 60 (Grating couplers) do not overlap with either GDS layer 39 (Heater Filaments) or GDS 41 (Heater Contact Pads).

#### 5. Technical support

For all queries, email [cornerstone@soton.ac.uk](mailto:cornerstone@soton.ac.uk).