

# **CORNERSTONE STANDARD COMPONENTS LIBRARY**

(On SOI Platforms)

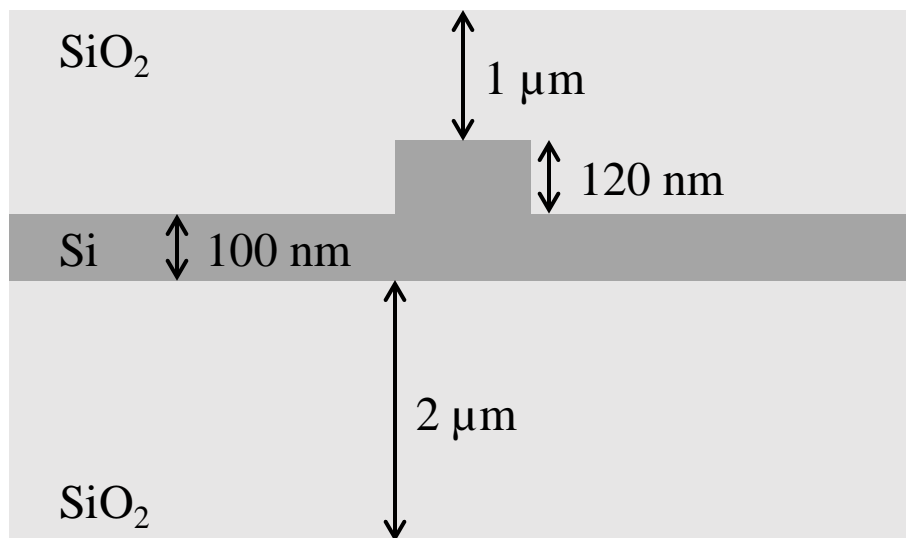


# Preface

In this document, we summarise the up-to-date designs and their measurement results of our CORNERSTONE standard components on SOI platforms, at the same time we are optimising the current designs, adding in new designs, and gathering more measurement results. Most of the dimensions are given in this document, whilst a few of them are not. Thus, please use this document together with our up-to-date GDS library which can be downloaded at <https://cornerstone.sotonfab.co.uk/mpw/live-calls>

CORNERSTONE provides an MPW service on three SOI platforms, 220 nm, 340 nm and 500 nm, based on which we provide our standard components. On the 220 nm and 340 nm platforms, we have two waveguide etching depths in addition to a grating etch and we provide standard components working at 1550 nm and 1310 nm. On the 500 nm platform, we have only one waveguide etching depth in addition to a grating etch and we provide standard components working at 1550 nm only. Currently, all of the components are based on TE mode.

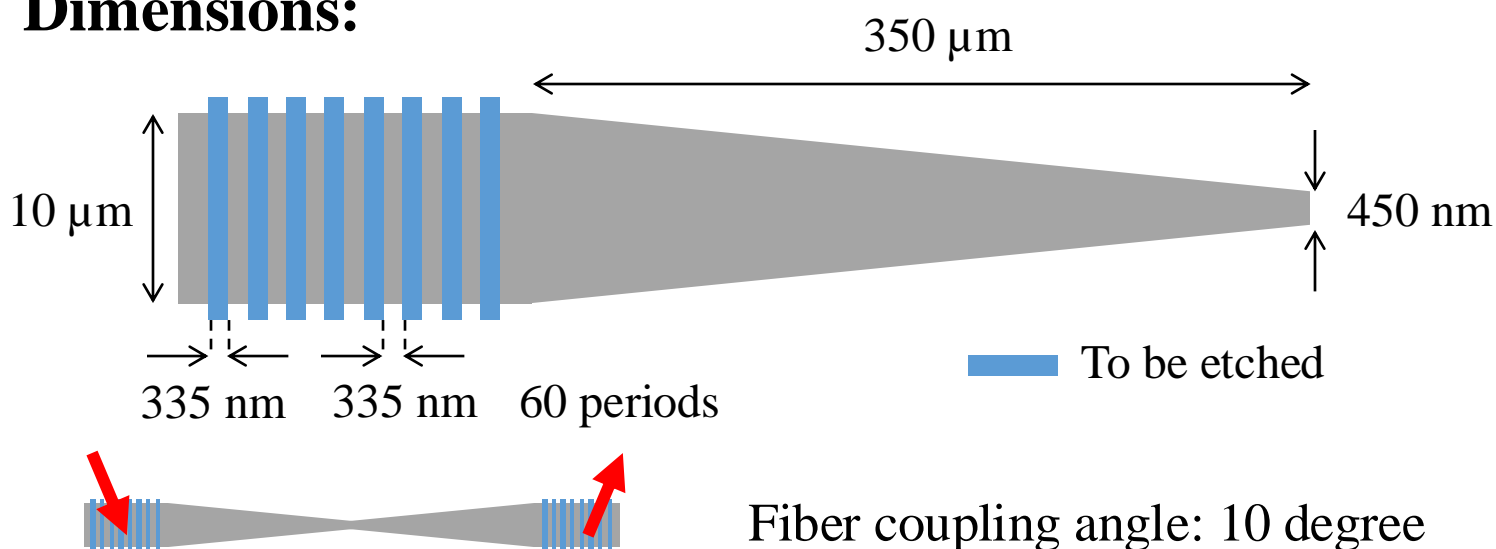
- Wavelength: 1550 nm
- Platform: 220 nm SOI
- **RIB**



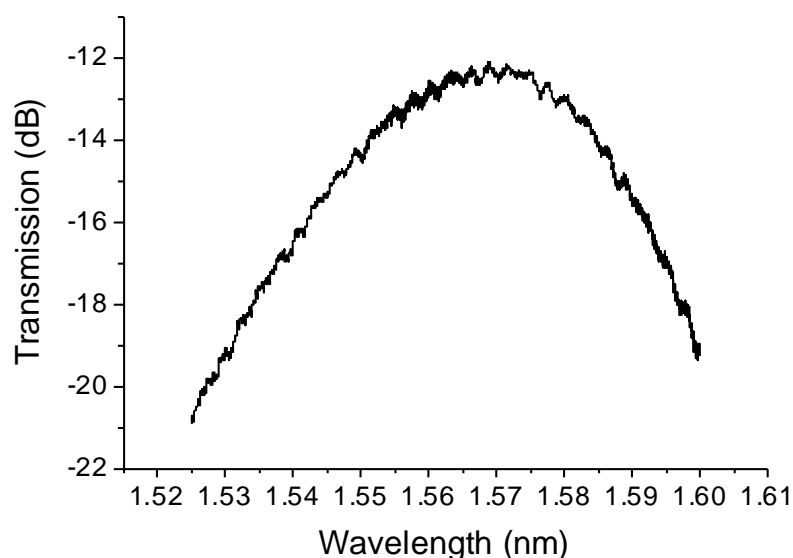
# SOI220nm\_1550nm\_TE\_RIB\_Grating\_Coupler

<b>Platform:</b>	220 nm SOI (2 $\mu\text{m}$ BOX layer)
<b>Wavelength:</b>	1550 nm
<b>Etching depth:</b>	120 nm
<b>Polarization:</b>	TE
<b>Cell name in GDS lib:</b>	SOI220nm_1550nm_TE_RIB_Grating_Coupler

## Dimensions:



## Measured transmission spectrum



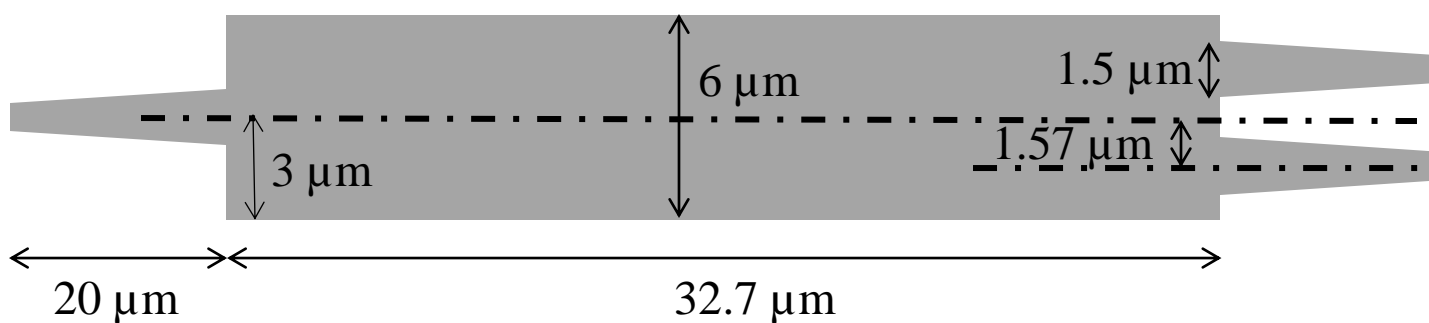
## Summarized performance:

- Coupling efficiency: 5.5-6.5 dB
- 1 dB bandwidth: > 35 nm
- Center wavelength: 1550-1580 nm

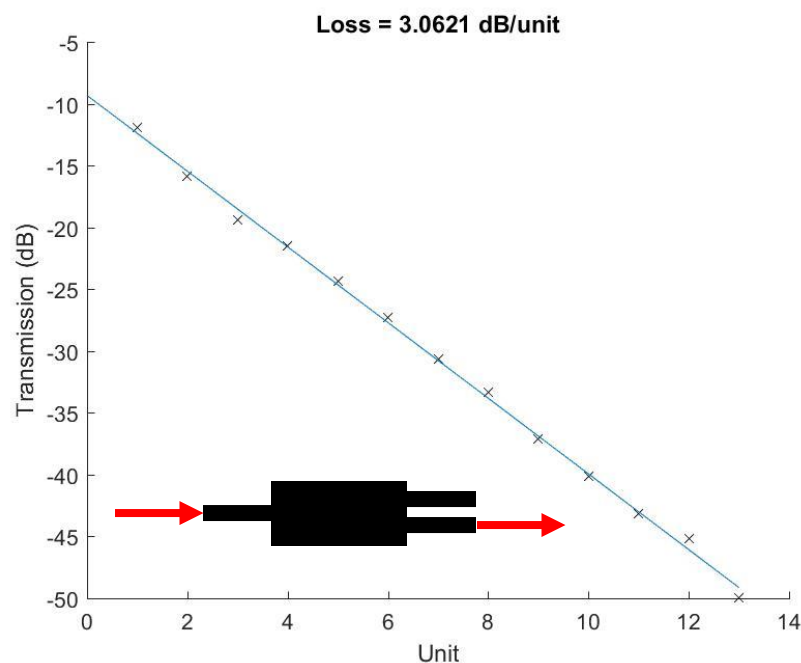
## SOI220nm\_1550nm\_TE\_RIB\_2x1\_MMI

<b>Platform:</b>	220 nm SOI (2 $\mu\text{m}$ BOX layer)
<b>Wavelength:</b>	1550 nm
<b>Etching depth:</b>	120 nm (Rib design)
<b>Polarization:</b>	TE
<b>Cell name in GDS lib:</b>	SOI220nm_1550nm_TE_RIB_2x1_MMI

### Dimensions:



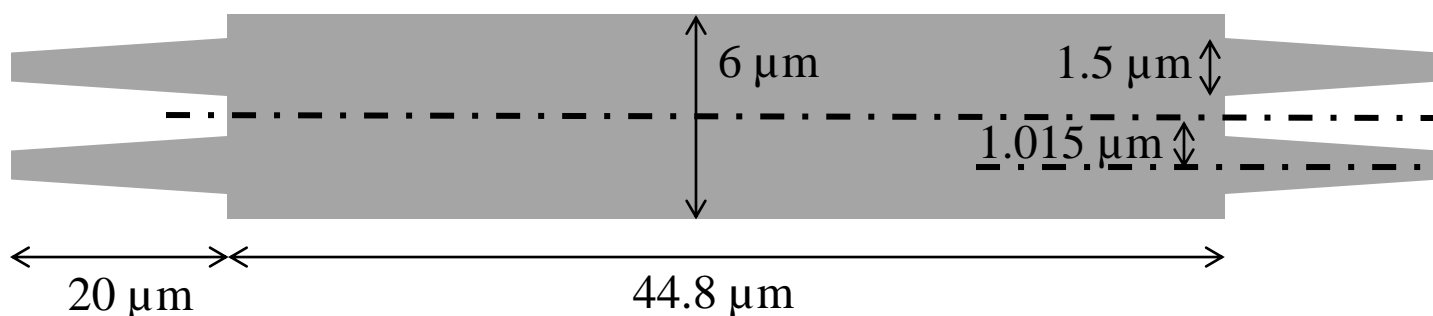
### Measurement results:



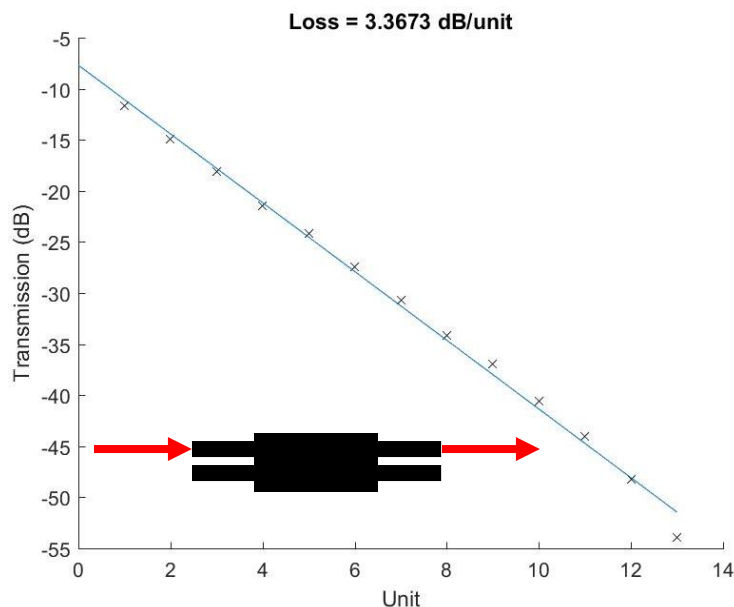
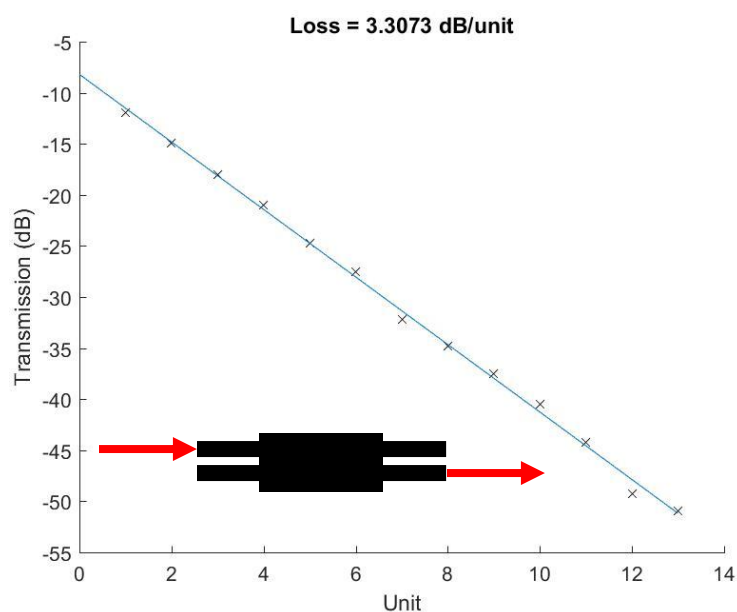
# SOI220nm\_1550nm\_TE\_RIB\_2x2\_MMI

<b>Platform:</b>	220 nm SOI (2 $\mu\text{m}$ BOX layer)
<b>Wavelength:</b>	1550 nm
<b>Etching depth:</b>	120 nm (Rib design)
<b>Polarization:</b>	TE
<b>Cell name in GDS lib:</b>	SOI220nm_1550nm_TE_RIB_2x2_MMI

## Dimensions:



## Measurement results:



# SOI220nm\_1550nm\_TE\_RIB\_90\_Degree\_Bend

<b>Platform:</b>	220 nm SOI (2 $\mu\text{m}$ BOX layer)
<b>Wavelength:</b>	1550 nm
<b>Etching depth:</b>	120 nm (Rib design)
<b>Polarization:</b>	TE
<b>Cell name in GDS lib:</b>	SOI220nm_1550nm_TE_RIB_90_Degree_Bend (Waveguide Width (W): 450 nm, Bend Radius (R): 25 $\mu\text{m}$ )

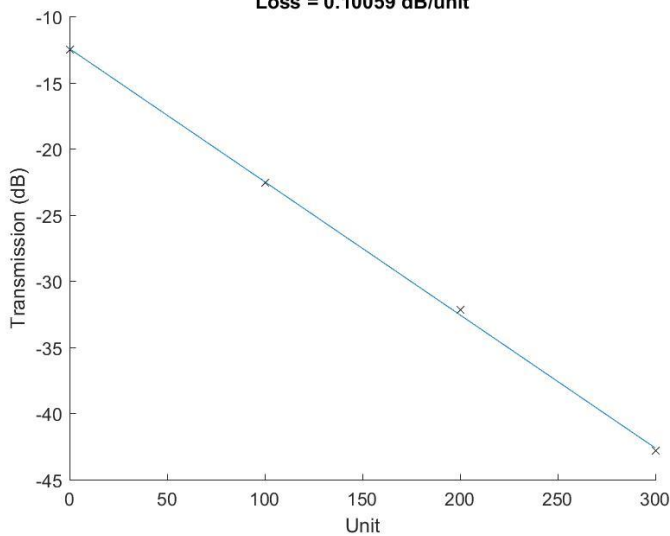
## Measurement results on varied dimensions:

(Unit: 90° bend)

**W: 450 nm**

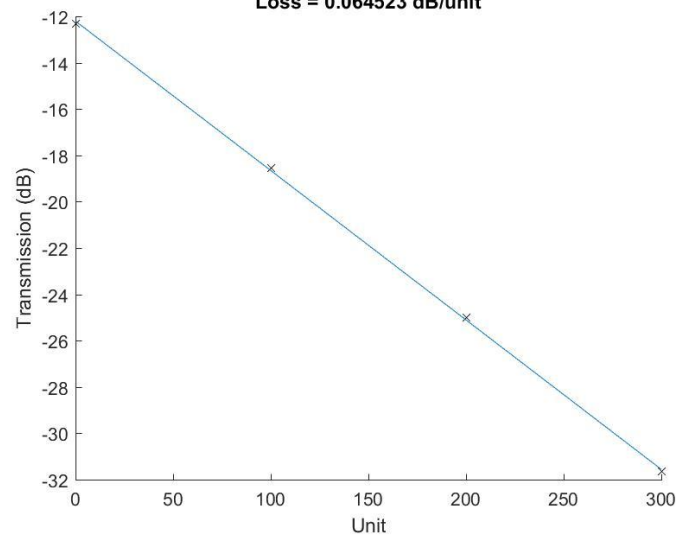
Loss = 0.10059 dB/unit

**R: 10  $\mu\text{m}$**



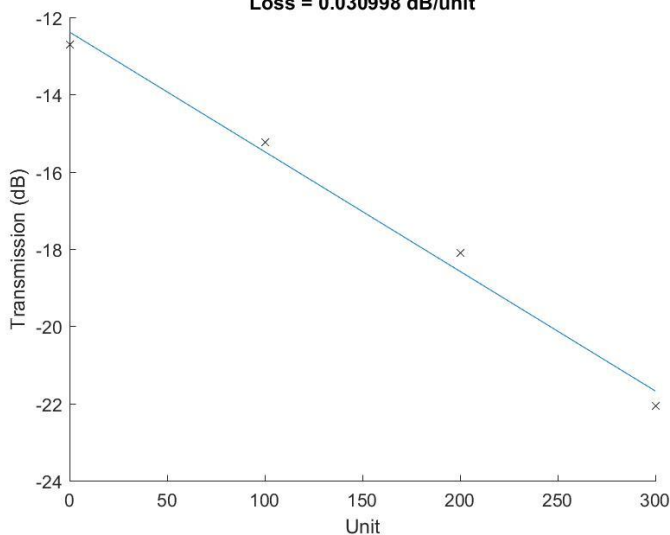
**W: 600 nm**

Loss = 0.064523 dB/unit

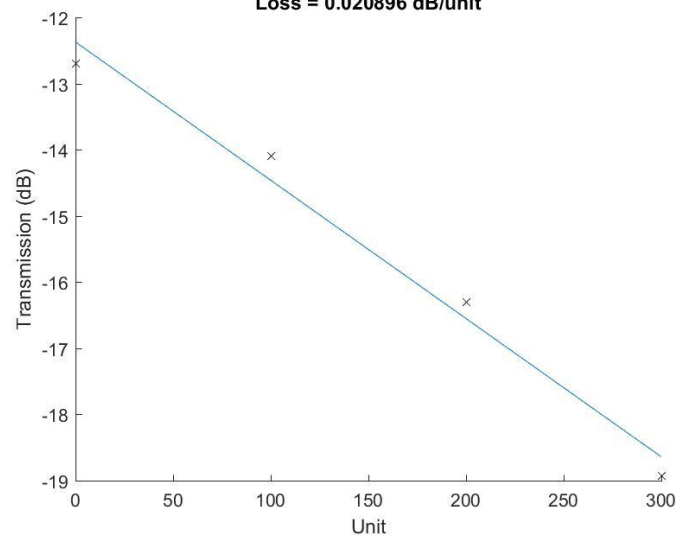


Loss = 0.030998 dB/unit

**R: 25  $\mu\text{m}$**



Loss = 0.020896 dB/unit



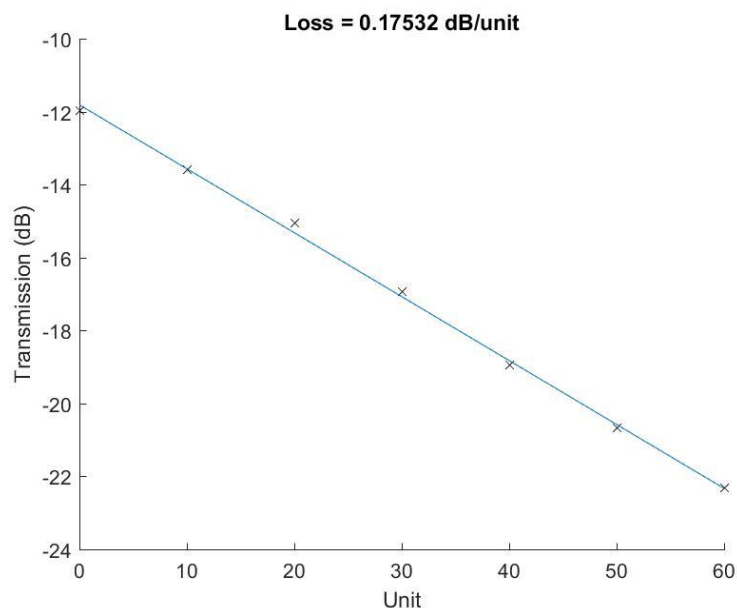
# SOI220nm\_1550nm\_TE\_RIB\_Waveguide\_Crossing

<b>Platform:</b>	220 nm SOI (2 um BOX layer)
<b>Wavelength:</b>	1550 nm
<b>Etching depth:</b>	120 nm (Rib design)
<b>Polarization:</b>	TE
<b>Cell name in GDS lib:</b>	SOI220nm_1550nm_TE_RIB_Waveguide_Crossing

**Dimensions:** See the drawing in GDS library

## Measurement results on different waveguide width (W):

**W: 400 nm**



**W: 450 nm**

