

# **CORNERSTONE STANDARD COMPONENTS LIBRARY**

(On 300 nm Si<sub>3</sub>N<sub>4</sub> Platform)





# Preface

In this document, we summarise the up-to-date designs and their measurement results of our CORNERSTONE standard components on SiN platforms, at the same time we are optimising the current designs, adding in new designs, and gathering more measurement results.

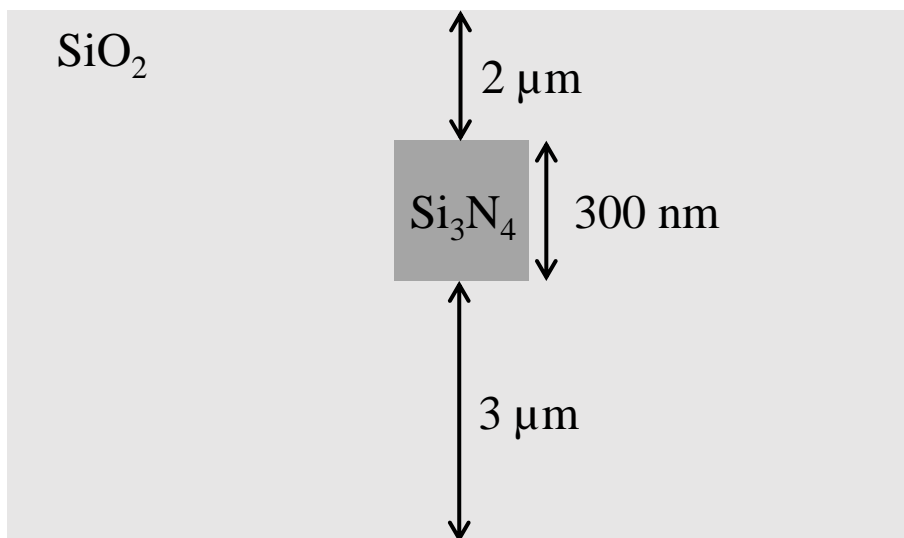
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- **Wavelength: 1550 nm**
- **Platform: 300 nm  $\text{Si}_3\text{N}_4$**

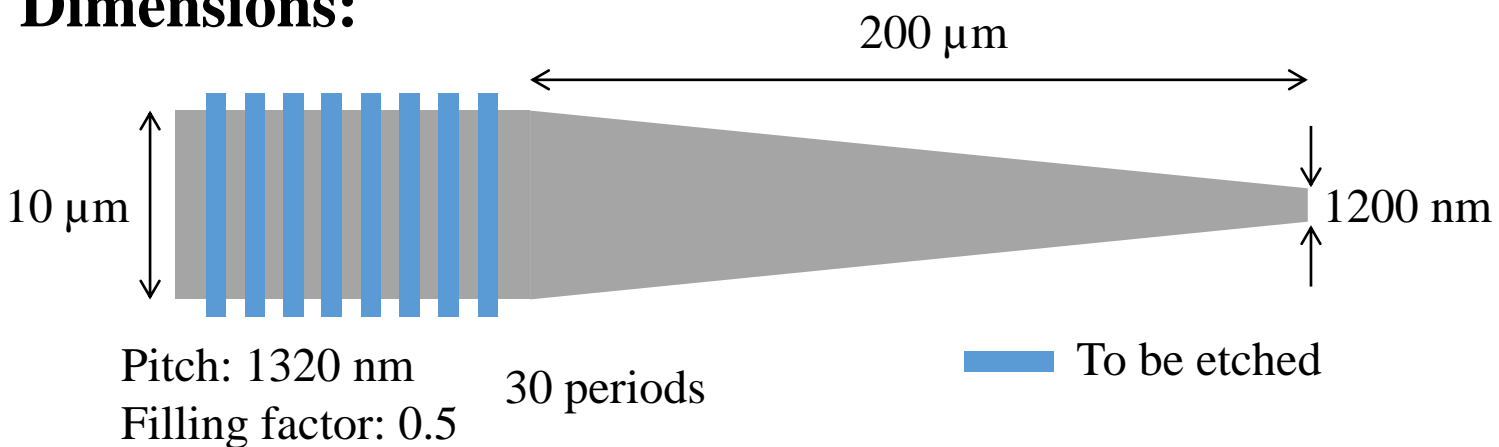
- Wavelength: 1550 nm
- Platform: 300 nm  $\text{Si}_3\text{N}_4$
- **STRIP**



# SiN300nm\_1550nm\_TE\_STRIP\_Grating\_Coupler

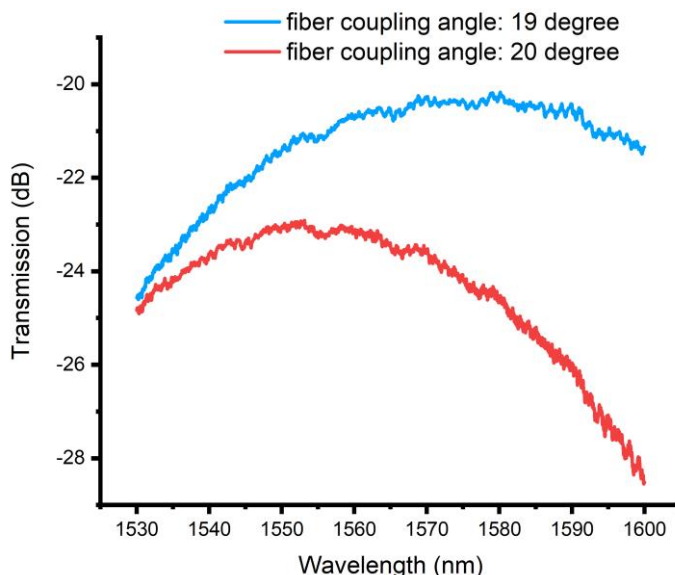
<b>Platform:</b>	300 nm Si <sub>3</sub> N <sub>4</sub>
<b>Wavelength:</b>	1550 nm
<b>Etching depth:</b>	300 nm
<b>Polarization:</b>	TE
<b>Cell name in GDS lib:</b>	SiN300nm_1550nm_TE_STRIP_Grating_Coupler

## Dimensions:

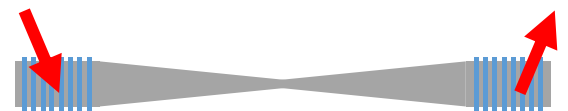


Fiber coupling angle: 19-20 degree

## Measured transmission spectrum



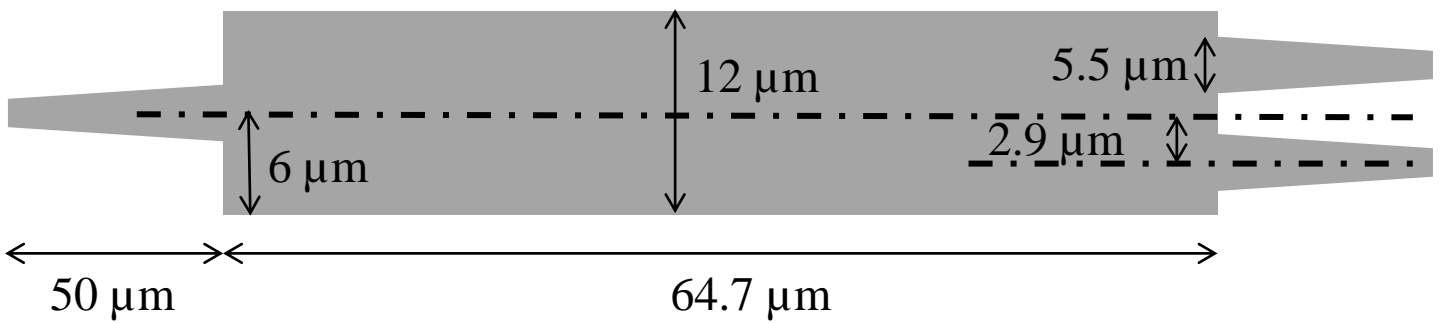
Transmission measured on a test structure as below, which includes two gratings.



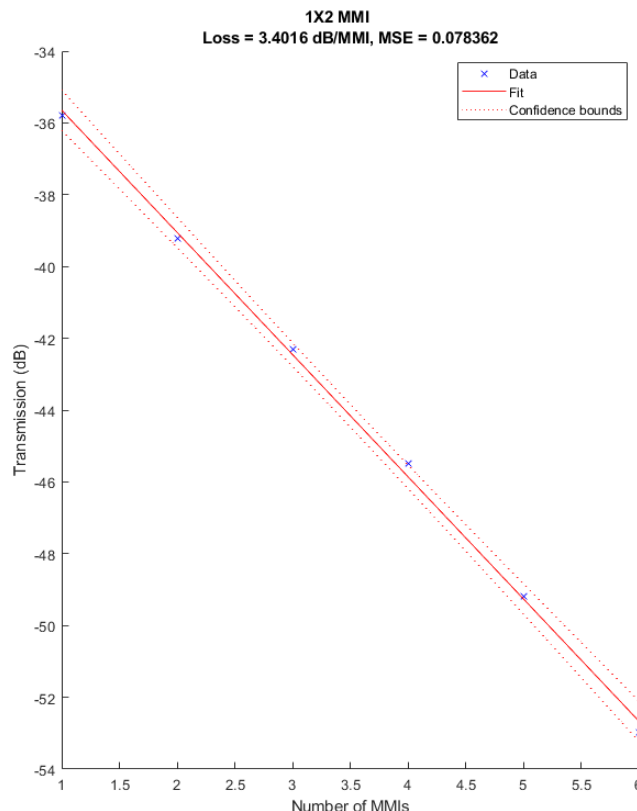
# SiN300nm\_1550nm\_TE\_STRIP\_2x1\_MMI

<b>Platform:</b>	300 nm Si <sub>3</sub> N <sub>4</sub>
<b>Wavelength:</b>	1550 nm
<b>Etching depth:</b>	300 nm
<b>Polarization:</b>	TE
<b>Cell name in GDS lib:</b>	SiN300nm_1550nm_TE_STRIP_2x1_MMI

## Dimensions:



## Measurement results:

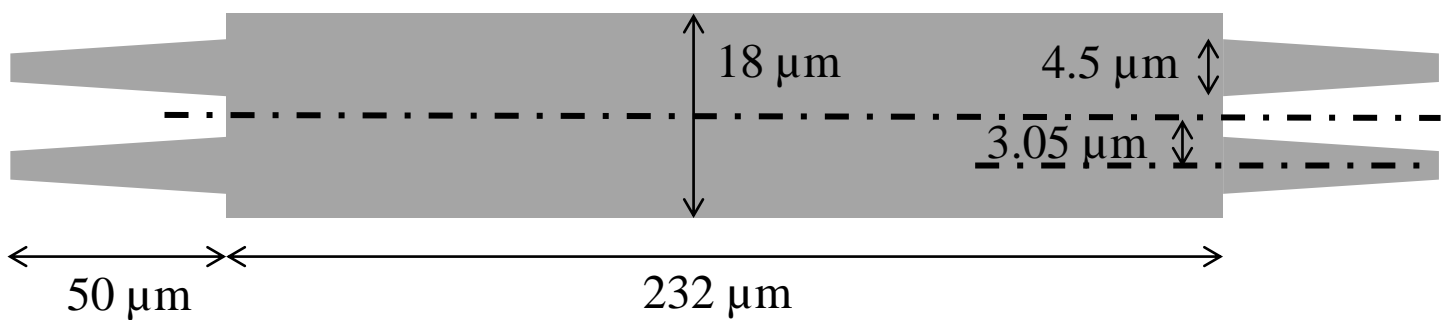


Transmission includes the measurement system loss, grating coupler loss and waveguide loss, as well as the measured device loss

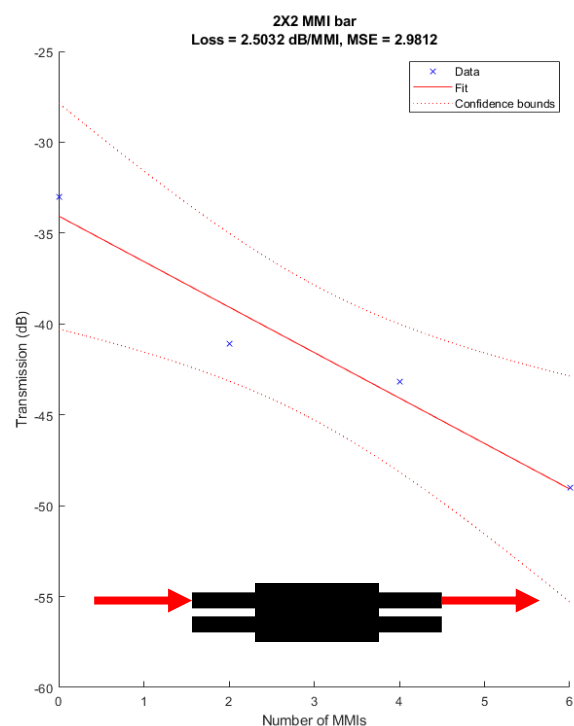
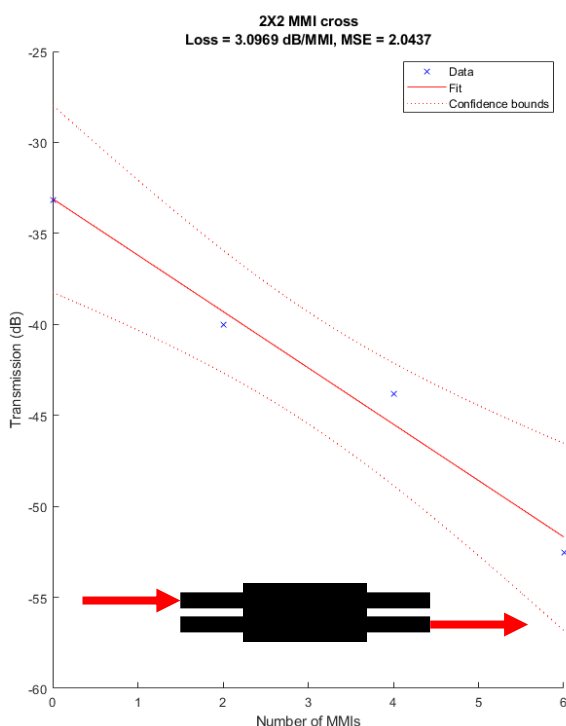
# SiN300nm\_1550nm\_TE\_STRIP\_2x2\_MMI

<b>Platform:</b>	300 nm Si <sub>3</sub> N <sub>4</sub>
<b>Wavelength:</b>	1550 nm
<b>Etching depth:</b>	300 nm
<b>Polarization:</b>	TE
<b>Cell name in GDS lib:</b>	SiN300nm_1550nm_TE_STRIP_2x2_MMI

## Dimensions:



## Measurement results:



Transmission includes the measurement system loss, grating coupler loss and waveguide loss, as well as the measured device loss



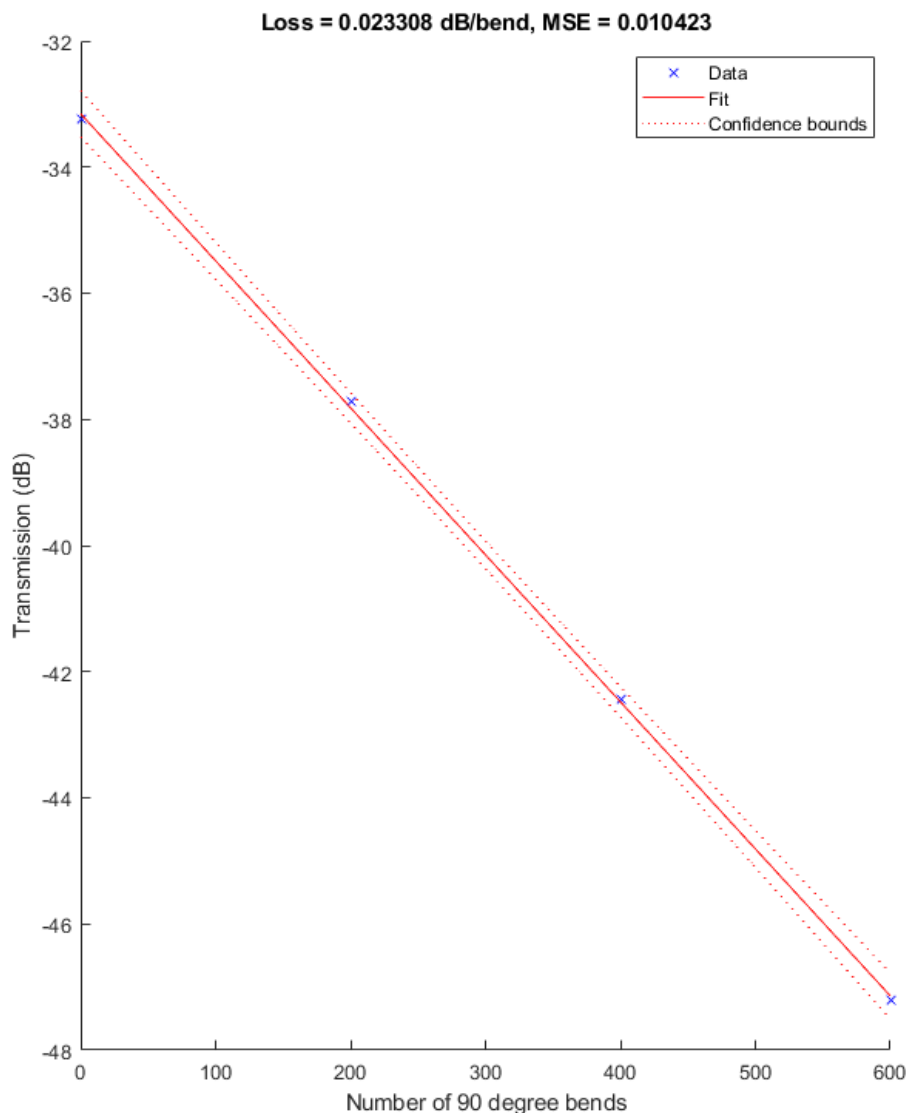
# SiN300nm\_1550nm\_TE\_STRIP\_90\_Degree\_Bend

<b>Platform:</b>	300 nm Si <sub>3</sub> N <sub>4</sub>
<b>Wavelength:</b>	1550 nm
<b>Etching depth:</b>	300 nm
<b>Polarization:</b>	TE
<b>Cell name in GDS lib:</b>	SiN300nm_1550nm_TE_STRIP_90_Degree_Bend

(Suggested bend radius: 80  $\mu$ m)

## Measurement results:

(per 90° bend)

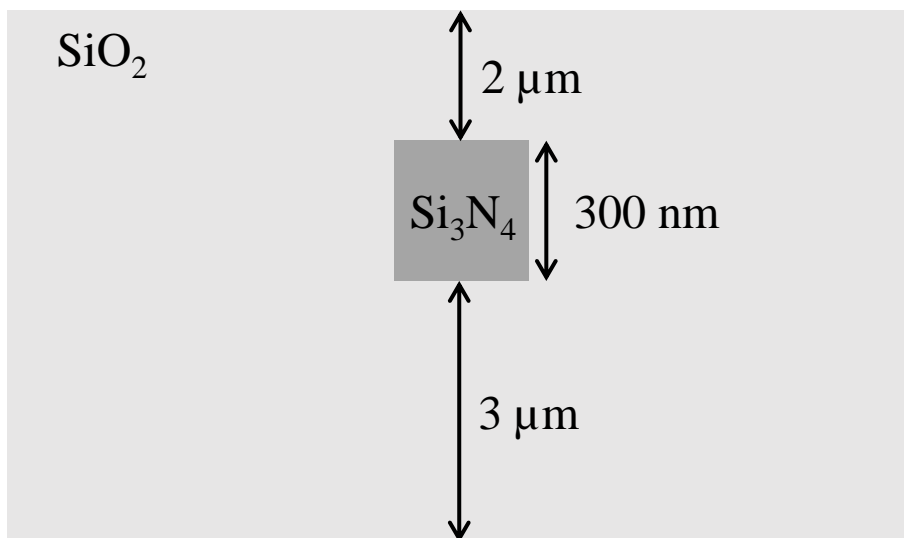


Transmission includes the measurement system loss, grating coupler loss and waveguide loss, as well as the measured device loss



- **Wavelength: 1310 nm**
- **Platform: 300 nm  $\text{Si}_3\text{N}_4$**

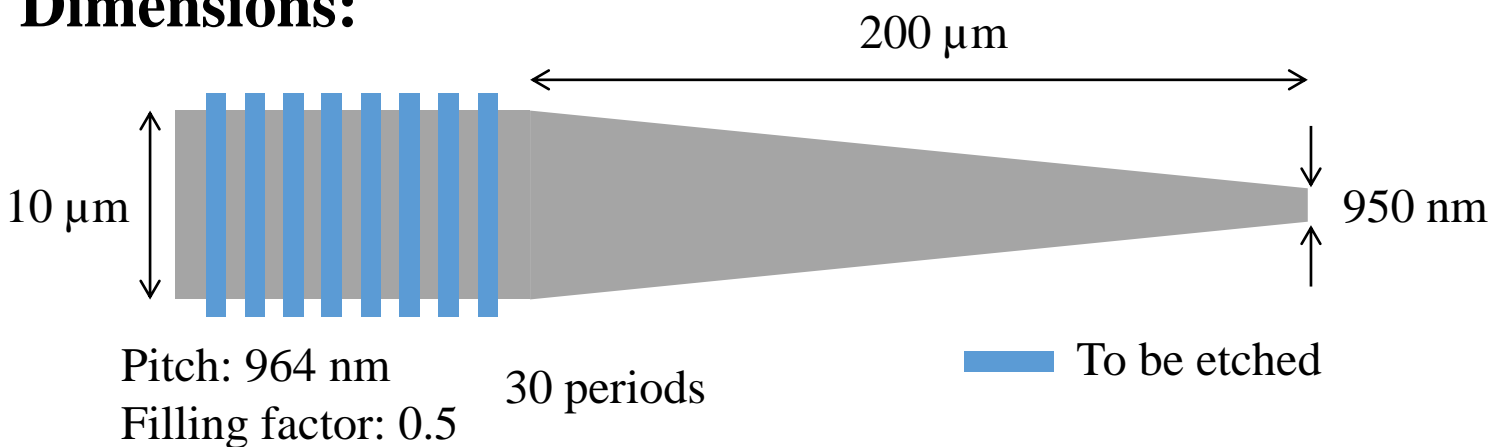
- Wavelength: 1310 nm
- Platform: 300 nm  $\text{Si}_3\text{N}_4$
- **STRIP**



# SiN300nm\_1310nm\_TE\_STRIP\_Grating\_Coupler

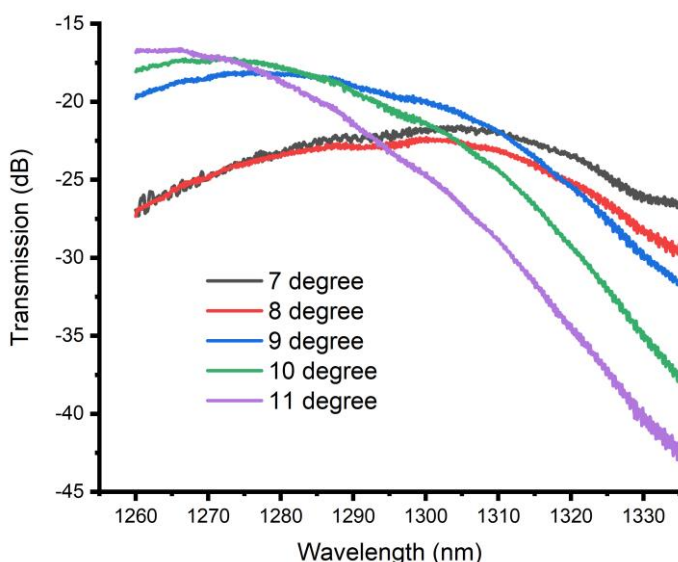
<b>Platform:</b>	300 nm Si <sub>3</sub> N <sub>4</sub>
<b>Wavelength:</b>	1310 nm
<b>Etching depth:</b>	300 nm
<b>Polarization:</b>	TE
<b>Cell name in GDS lib:</b>	SiN300nm_1310nm_TE_STRIP_Grating_Coupler

## Dimensions:



Fiber coupling angle: 7-11 degree

## Measured transmission spectrum



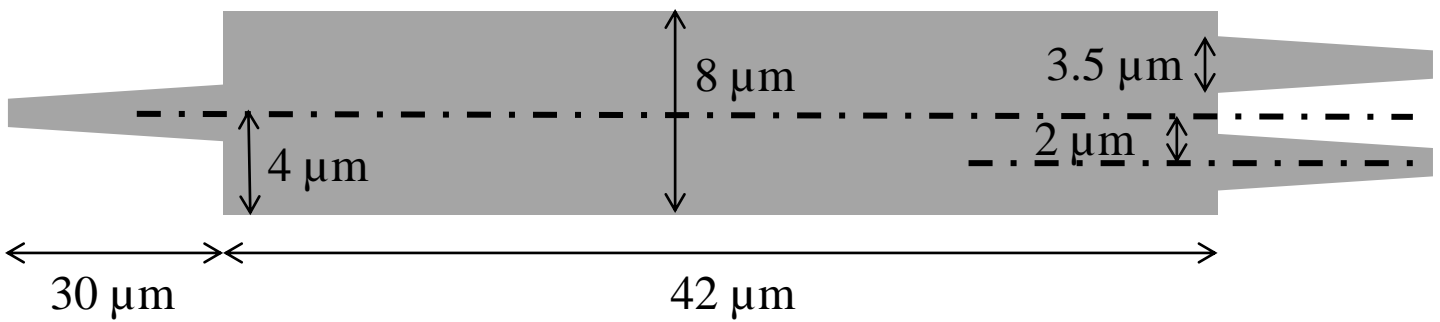
Transmission measured on a test structure as below, which includes two gratings.



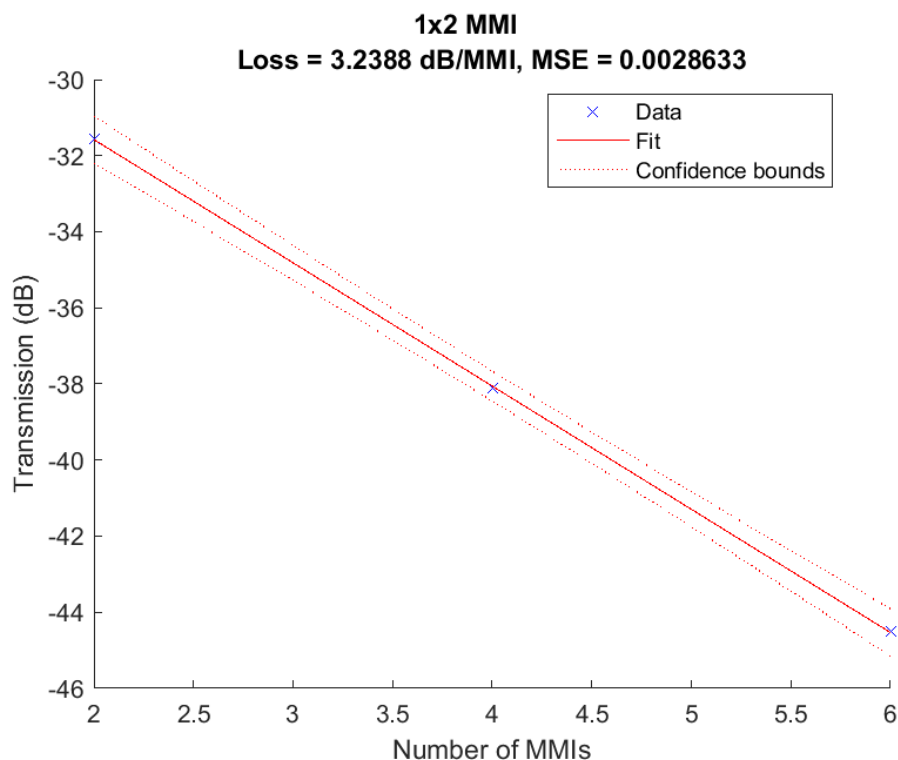
# SiN300nm\_1310nm\_TE\_STRIP\_2x1\_MMI

<b>Platform:</b>	300 nm Si <sub>3</sub> N <sub>4</sub>
<b>Wavelength:</b>	1310 nm
<b>Etching depth:</b>	300 nm
<b>Polarization:</b>	TE
<b>Cell name in GDS lib:</b>	SiN300nm_1310nm_TE_STRIP_2x1_MMI

## Dimensions:



## Measurement results:

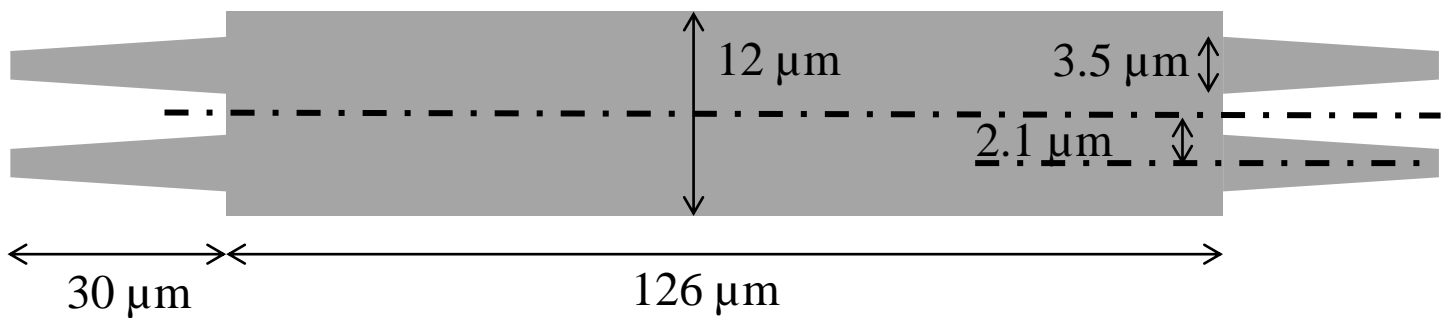


Transmission includes the measurement system loss, grating coupler loss and waveguide loss, as well as the measured device loss

# SiN300nm\_1310nm\_TE\_STRIP\_2x2\_MMI

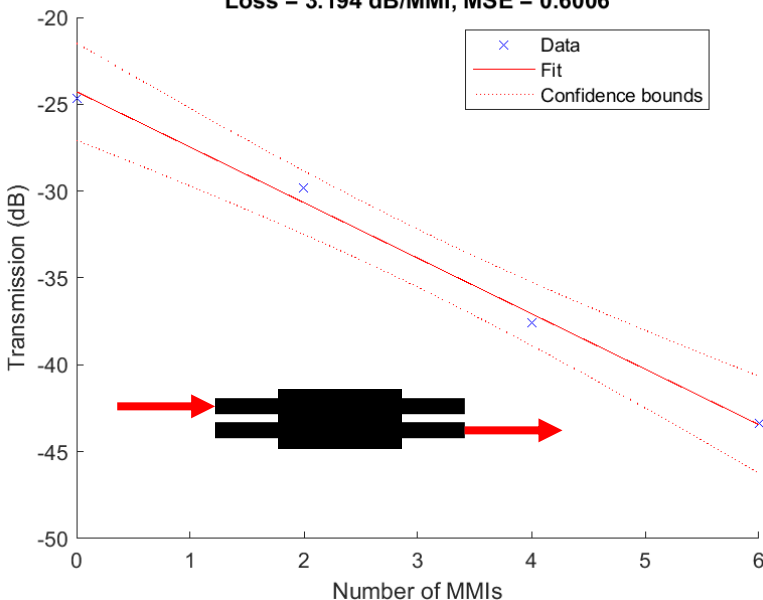
<b>Platform:</b>	300 nm Si <sub>3</sub> N <sub>4</sub>
<b>Wavelength:</b>	1310 nm
<b>Etching depth:</b>	300 nm
<b>Polarization:</b>	TE
<b>Cell name in GDS lib:</b>	SiN300nm_1310nm_TE_STRIP_2x2_MMI

## Dimensions:

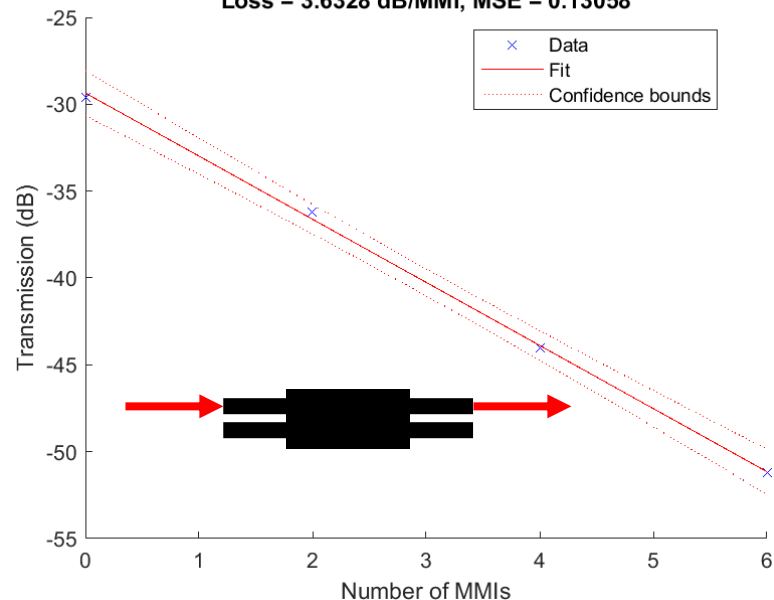


## Measurement results:

**2x2 MMI\_CROSS**  
Loss = 3.194 dB/MMI, MSE = 0.6006



**2x2 MMI\_BAR**  
Loss = 3.6328 dB/MMI, MSE = 0.13058



Transmission includes the measurement system loss, grating coupler loss and waveguide loss, as well as the measured device loss

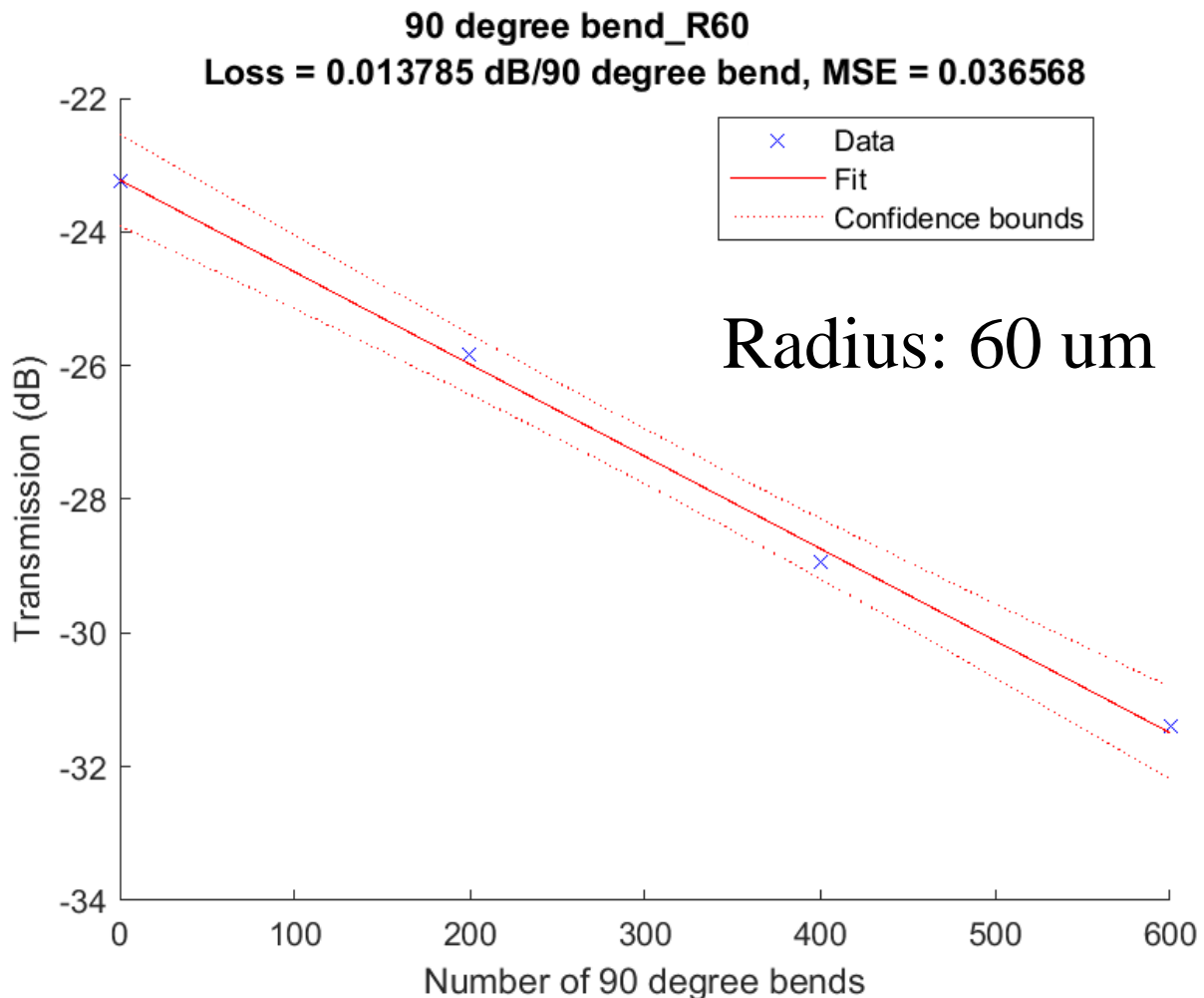
# SiN300nm\_1310nm\_TE\_STRIP\_90\_Degree\_Bend

<b>Platform:</b>	300 nm Si <sub>3</sub> N <sub>4</sub>
<b>Wavelength:</b>	1310 nm
<b>Etching depth:</b>	300 nm
<b>Polarization:</b>	TE
<b>Cell name in GDS lib:</b>	SiN300nm_1310nm_TE_STRIP_90_Degree_Bend

(Suggested bend radius: 60  $\mu$ m)

## Measurement results:

(per 90° bend)



Transmission includes the measurement system loss, grating coupler loss and waveguide loss, as well as the measured device loss