

## Grating Coupler - 1550 nm

Generated 7/9/2026, 10:46:18 AM · Provider: AI Copilot · qxphoton-engine/0.2.0 [gdsfactory+analytic-v2]

### Design Summary

This grating coupler is designed for fiber-to-chip coupling on a silicon nitride (SiN) platform, optimized to maximize efficiency at a 1550 nm operating wavelength. The analytic estimate predicts a transmission efficiency of 30.1%, equivalently an insertion loss of 5.217 dB (the same transmission expressed two ways), over a 40.0 nm bandwidth. The design uses a 29-period grating with a 1.1155  $\mu\text{m}$  period and 0.55 fill factor on a 1  $\mu\text{m}$  waveguide width, with a 100  $\mu\text{m}$  bend radius, occupying a footprint of 183.35  $\times$  13  $\mu\text{m}$ . It achieves a strong fabrication score of 99.0/100, indicating high manufacturability. These figures reflect analytic estimates rather than a full physical simulation.

### Specification

Component	Grating Coupler
Wavelength	1550 nm
Objective	Maximize Efficiency
Platform	Silicon Nitride (SiN)
Constraints	fiber-to-chip coupling
Parameters	n_periods=29, period_um=1.1155, fill_factor=0.55, wg_width_um=1, bend_radius_um=100

### Estimated Performance

Efficiency	30.1 %
Insertion Loss	5.22 dB
Bandwidth	40 nm
Fabrication Score	99 / 100

### Layout

Footprint	183.35 $\times$ 13 $\mu\text{m}$
Layers	3