

AT A GLANCE

PolyBoard enables the integration of low loss free-space sections into photonic integrated circuits via Micro-Optical Benches

Features

- Integrated free-space sections with < 1 dB on-chip losses
- Integration of bulk optical crystals (e.g. magneto optic materials, BBO, KTP, LiNbO₃, etc.)
- Chip-integrated free-space etalons

Applications

- Optical isolators
- Optical circulators
- Wavelength lockers
- Quantum technology

Micro-Optical Bench

PolyBoard's Micro-Optical Bench demonstrates the capability and flexibility of hybrid photonic integration. Using two GRIN-lenses, an on-chip free-space collimated beam section is created allowing for the low-loss insertion of bulk materials. These include Faraday rotators for optical isolators and circulators as well as nonlinear optical crystals for quantum technology applications.

Performance

- 20 dB isolation over 150 nm bandwidth
- 30 dB peak isolation
- <1.4 dB on-chip loss

References

- International R&D projects 3PEAT and UNIQORN (funded by EU commission)
- Innovative Regional Growth Core PolyPhotonics Berlin (funded by BMBF)

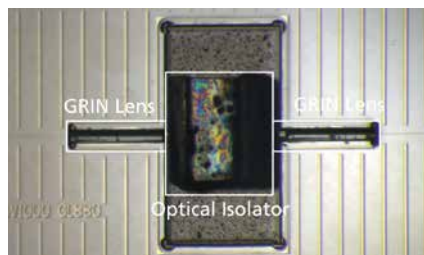
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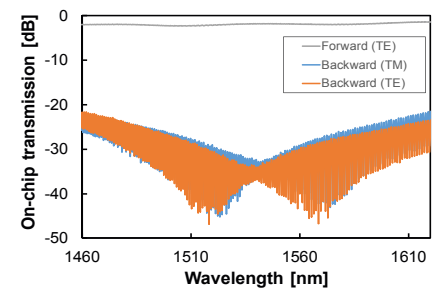
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Optical Isolator

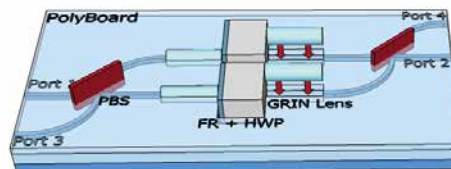


Integrated free-space isolator

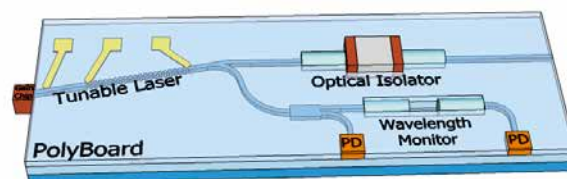


Spectrum of optical isolation

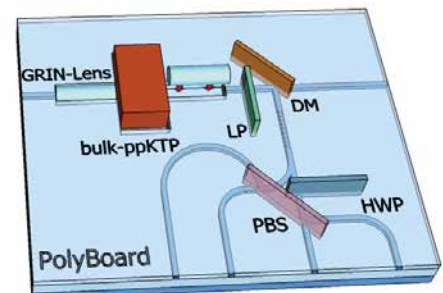
Further Applications



Optical circulator



Tunable laser with integrated isolator and wavelength locker



Entangled photon source