Low Loss Planar Optical Waveguide

Overview

Ultra-low loss optical planar waveguide technology is a critical research area driven by the need to improve energy effi-ciency and advance the power handling capability, performance, function and complexity of photonic integrated circuits and systems-on-chip. An increasing number of applications. To address the demand for low-cost, low-loss, and environmentally friendly optical power dividers in short-range visible light communication (VLC) systems, a low-loss 1 × 2 Y-branch optical splitter based on the integration of a planar optical waveguide (POW) and plastic optical fiber (POF) is. Based on subwavelength gratings, here, we show that it is possible to create broadband, multimode waveguides with very low propagation losses despite using a strongly absorbing material. We perform rigorous coupled-wave analysis and nite-difference time-domain simulations of integrated waveguides. Low-loss planar optical waveguides based on plasma deposited silicon oxycarbide Research ArticleVol. In addition, TriPleX waveguides are suitab e for operation at wavelengths from visible (<.

Article Content

Aug 24, 2025

Ultra-low-loss high-aspect-ratio Si N waveguides

K. Horikawa, I. Ogawa, T. Kitoh, and H. Ogawa, “Silica-based integrated planar lightwave true-time-delay network for microwave antenna applications,” in Proceedings of the Optical Fiber

Jul 29, 2025

Waveguide Loss

Surface Scattering Loss To quantitatively describe the optical loss, the exponential attenuation coefficient is generally used. In this case, the intensity (power per unit length) decays along the

Feb 13, 2026

Power loss at a step discontinuity in an asymmetrical ...

III: TM-polarized fieldsOptical and Quantum Electronics 18 (3): 239-246 Biehlig, W. 1986: Light propagation in a planar dielectric slab waveguide with step discontinuities.

Mar 05, 2026

Reducing Optical Loss in Photonic Tensor Core Links for Long-Range

Technical Solution: Corning specializes in ultra-low loss optical fibers and photonic components designed for long-range optical transmission systems. Their solutions include specialty optical fibers

Sep 05, 2025

Antiresonant reflecting optical waveguides in SiO

A new type of optical waveguide utilizing an antiresonant reflector is described. Implementation in the SiO 2 -Si system gave losses as low as 0.4 dB/cm for the TE mode. The TM

Nov 27, 2025

Low-loss optical waveguides made with a high-loss material

Planar waveguides with low loss that are fully compatible with existing photonic circuit fabrication techniques are missing.

Aug 08, 2025

Introduction to the Special Issue on Ultralow Loss Planar Waveguides ...

The fifteen papers in this special issue focus on ultra low loss planar waveguides and the applications. Ultra-low loss optical planar waveguide technology is a critical research area driven by

Apr 01, 2026

Design and Analysis of a Low-Loss 1 × 2 POF Splitter Based on

To address the demand for low-cost, low-loss, and environmentally friendly optical power dividers in short-range visible light communication (VLC) systems, a low-loss 1 × 2 Y-branch optical

Aug 19, 2025

Low losses Er3+-doped flexible planar waveguide: Toward an all-glass ...

In this paper an effective top-down route is developed to fabricate SiO 2 –HfO 2:Er 3+ planar waveguides with mechanical flexibility and low optical losses via RF-sputtering.

Apr 28, 2026

Classification-regression backpropagation neural network for efficient ...

With the rising demand for bandwidth and reliable data transmission, low-loss, wide-bandwidth, and fabrication-tolerant planar lightwave circuit (PLC) devices have emerged as a critical component for

Sep 15, 2025

Low loss, high contrast planar optical waveguides based on low-cost ...

Low loss, high contrast planar optical waveguides based on low-cost CMOS compatible LPCVD processing Willem Hoving1a, Rene Heidemanb, Douwe Geuzebroeka, Arne Leinseb, Edwin Kleina,

Dec 19, 2025

Low-loss planar optical waveguides based on plasma deposited

One of the insights of the ATR FTIR investigations presented in section two is that a low SiH4/CH4ratio is preferable, because Si-H bonds absorbing in the optical C band are less pronounced in this case.

Apr 24, 2026

From photonic integrated circuits to room-temperature quantum chips ...

The pursuit of room-temperature quantum photonic chips further intensifies requirements for low-loss routing, thermal stability, packaging tolerance and multi-material co-integration.

Apr 11, 2026

Ultra-low-loss silicon nitride photonic integrated circuits for highly ...

Achieving extremely low optical loss often requires a corresponding increase in the device footprint. This work explores a regime in integrated photonics in which optical loss at parity with the world-record

Aug 22, 2025

Low-loss waveguides written with a femtosecond laser for flexible ...

We describe a low-loss single-mode waveguide in planar light-wave circuit (PLC) glass doped with boron and phosphorus, which is more difficult to write than pure-silica glass. The written waveguide

Dec 06, 2025

Low-loss optical waveguides made with a high-loss material

Based on subwavelength gratings, here, we show that it is possible to create broadband, multimode waveguides with very low propagation losses despite using a strongly absorbing material.

Dec 12, 2025

Photonic integrated circuit

The range of devices required on a chip includes low loss interconnect waveguides, power splitters, optical amplifiers, optical modulators, filters, lasers and detectors. These devices require a variety of

Apr 03, 2026

Low-loss low thermo-optic coefficient Ta2O5 on crystal quartz planar ...

With the potential for very low loss and the ability to control the thermal response, this waveguide platform takes a key step toward creating thermally stable integrated resonators for on

Mar 29, 2026

Low-loss planar optical waveguides fabricated from polycarbonate

Low-loss slab waveguides with air as overcladding based on a high glass transition temperature (Tg) polycarbonate were fabricated through spin-coating. Optical absorption and thermo-optic coefficient

Dec 27, 2025

Introduction to the Special Issue on Ultralow Loss Planar Waveguides ...

Ultra Low Loss Planar Waveguides and Their Applications. Ultra-low loss optical planar waveguide technology is a critical research area driven by the need to improve energy effi-ciency and advance

Dec 17, 2025

Spiral Waveguides on Germanium-on-Silicon Nitride

Spiral waveguide sensors with a low bending loss on this platform enable compact sensors for mid-IR absorption spectroscopy.

Sep 19, 2025

Low loss, high contrast planar optical waveguides based

Abstract A new class of integrated optical waveguide structures ("TriPleX") is presented, based on low cost CMOS-compatible LPCVD processing

Oct 30, 2025

Silicon-organic hybrid (SOH) device concept. (a) Top view of an SOH...

Through the continuous efforts of researchers, the waveguide propagation loss with various integration methods has been greatly reduced, and the TFLN waveguide can even be as low as 0.04 dB cm −1 .

Nov 27, 2025

Low loss, high contrast planar optical waveguides based on low-cost ...

Low loss, high contrast planar optical waveguides based on low-cost CMOS compatible LPCVD processing

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Feb 10, 2026

Fabrication process of the multimode optical waveguides using...

The paper reports on the properties of UV-curable inorganic-organic hybrid polymer multimode optical channel waveguides fabricated by roll-to-plate (R2P) nanoimprinting. We measured transmission ...

Oct 04, 2025

Top 100 Optical Splitter Manufacturers in 2026 | ensun

Product Number: 307905 The optical splitter uses a planar light wave circuit (PLC) based on silica optical waveguide technology. It features small size, high reliability, wide operating wavelength range

May 26, 2026

Planar Waveguides – Buying Guide & Supplier List | RP Photonics

Planar waveguides are available in different material systems and fabrication technologies: Crystalline vs. glass: Crystalline waveguides (e.g., YAG, LiNbO 3) are often used for lasers and nonlinear

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