



FOCUSLIGHT
Never stop exploring

Photonics Solutions for

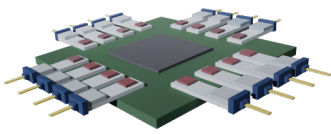
OPTICAL COMMUNICATIONS

Microlenses are at the heart of optical communication systems. They support efficient data transfer between key optical components. Micro-optics by Focuslight come with multiple benefits:

- Customization of optical and mechanical design features to address systems requirements at the maximum performance
- Various manufacturing platforms for cost-effective production
- Integration features for reliable and fast handling in production environment, such as recessed lenses, fiducials, v-grooves, prisms and glue pockets



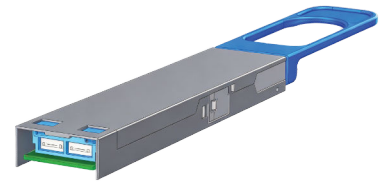
Co-Packaged Optics (CPO)



Focuslight offers advanced micro-optics solutions and v-groove arrays tailored for CPO applications as well as laser submounts for external lasers, helping customers achieve superior output performance and scalability that are crucial for dense optical interconnects.

External Laser Small Form Pluggable (ELSFP)

In ELSFP-based architectures, Focuslight provides specialized aspherical micro-lenses optimized for LD-to-fiber coupling, along with high-performance submount materials for laser integration and packaging, supporting efficient and reliable external laser modules for CPO applications.

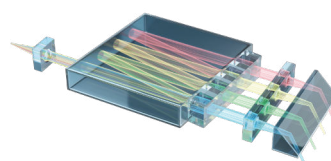
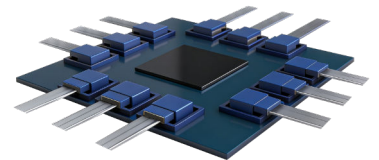


Scale-up Networks

Pairing with emerging 1060 nm VCSELs, microlenses and arrays enable efficient VCSEL-to-fiber coupling, precise beam control, and high-density integration. Focuslight provides Polymer-on-Glass (PoG) microlens array solutions and services of directly imprinting lenses on VCSEL wafers, supporting 800G, 1.6T, and future 3.2T AI architecture readiness.

Near Packaged Optics (NPO)

In NPO systems, optical signals must achieve efficient coupling and stable transmission within extremely limited space. Microlenses and microlens arrays enhance coupling between fibers and optical engines and reduce insertion loss and crosstalk, forming the foundation for reliable high-speed optical interconnects.



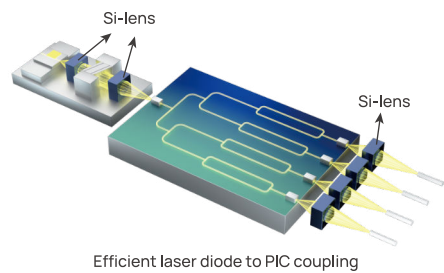
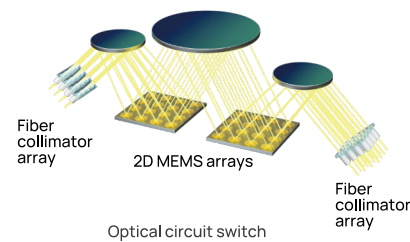
Single lenses and microlens arrays for light coupling in CWDM-based optical sub-assemblies

Optical Transceivers

Our products effectively couple light between laser diodes, detectors, and fibers within the optical transceivers. Micro-optics optimize data transmission and enable energy-efficient communication in high-speed networks.

WSS / OCS

With their precision and scalability, micro-optics are fundamental to next-generation wavelength-selective and optical-circuit switching (WSS / OCS), enabling smaller switch architectures and wider bandwidth through higher channel density.

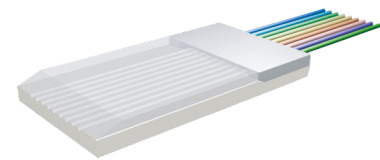


Photonic Integrated Circuits

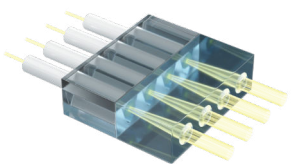
Micro-optics and laser sources in silicon and InP photonics are key components for 800G and 1.6T optical transceivers utilized in AI data centers. Our precise microlenses and microprisms as well as laser submounts enable low-loss coupling between laser diodes, PIC waveguides and optical fibers, enhancing the efficiency of data transfer.

Fiber Array Units (FAU)

Focuslight provides key optical components for FAUs, including engineered V-groove arrays and protective lids, ensuring precise fiber alignment and durability. With large-scale manufacturing and automated assembly capabilities, we support high-precision, high-density, and mass production required for reliable optical communication performance.



Fiber array unit with v-groove arrays, lid, and ribbon fiber



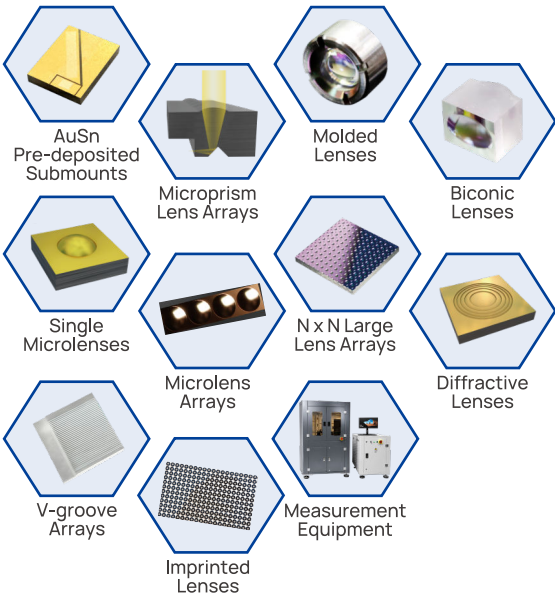
Microlens arrays for fiber collimation and extended beam connectors

Fiber Connectors

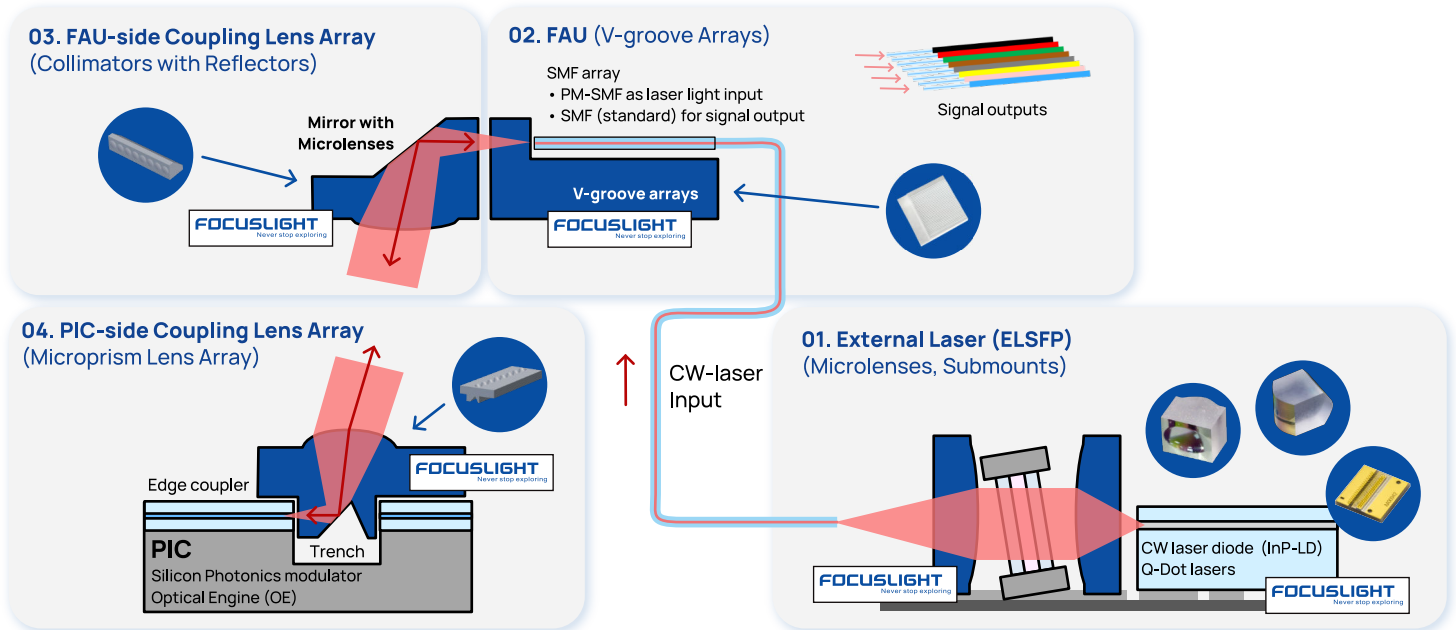
We design and manufacture microlens arrays to achieve optimal collimation and coupling of light from single and multimode fiber arrays, ensuring. Seamless and high-quality transmission of information.

Focuslight Product Portfolio in Optical Communications

Application Scenarios	Products / Services
Pluggable Optical Transceivers	Micro-lenses for CWDM and SiPho
Silicon Photonics (800G, 1.6T, ...)	Laser-to-PIC and PIC-to-fiber coupling micro-optics, submounts
Optical Circuit Switches	Large NxN microlens arrays for fiber arrays
Telecom and DCI photonics	Micro-optics for WSS (wavelength selective switches)
CPO – Fiber array unit (FAU)	Ultra-precise V-groove arrays for very high port counts
CPO – External lasers (ELSFP)	Special aspherical coupling optics, submounts
CPO – PIC	Special reflector with collimation optics
Optical Assembly & Packaging	Assembly & packaging service and equipment upon request
Optical in & Out (OIO)	Custom micro-optics

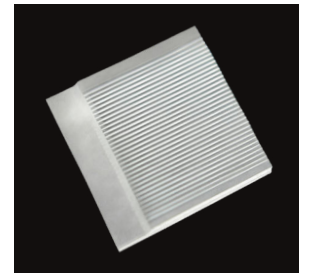


Focuslight – Powering Innovation Across NPO/CPO Sub-Ecosystems



Engineered V-Groove Arrays

Engineered V-Groove Arrays deliver precise fiber positioning for multi-channel photonic systems. The structures are processed across full wafers to secure consistent accuracy, achieving < 500 nm accumulative (first to last) spacing error possible, even for 48ch, 96ch and higher. Multiple groove shapes and pitches can be processed on the same array to support very flexible configurations. With wafer-level qualification and passive-alignment features, the product simplifies assembly and ensures reliable high-volume production.



Key Specifications	Standard Accuracy Version	High Accuracy Version
Ideal Positioning Accuracy (X/Y Directions, by means of inlaid fiber core mid-point)	X < 500 nm, Y < 750 nm	X < 250 nm, Y < 350 nm
Pitch (Spacing) Accuracy, Fiber-to-Fiber	< 500 nm	< 200nm
Accumulative Pitch (Spacing) Accuracy, First-to-Last	< 1000 nm	< 500 nm
Line Straightness	< 1500 nm	< 700 nm
Sidewall Verticality	90° ± 0.3°	90° ± 0.3°
V-Groove Angle	60° / 90° standard, or customizable	
Pitch (Spacing) Fiber to Fiber in X Direction	0.127 mm, 0.250 mm or customized; various pitches on the same product realizable	
Number of Channels	From 32, 48, 96, 128, or customized	
Surface Roughness (Ra)	< 0.2 µm	< 0.02 µm
Material Options	Borofloat 33, Fused Silica, S-TIH53, S-BSL7 (and equivalent such as N-BK7), Silicon and other non-toxic optical glasses on request	

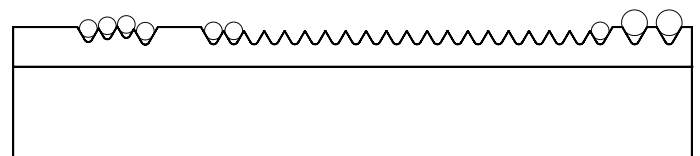
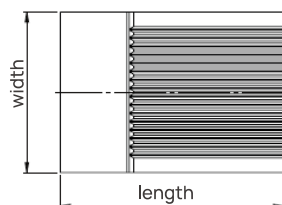
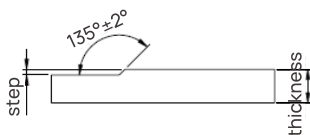


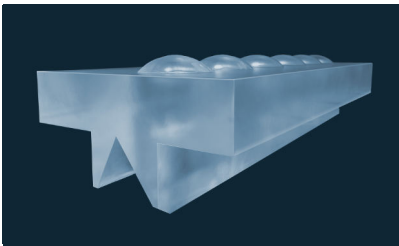
Illustration of complex design examples only.
Please contact us for technical support on your configuration.

Focuslight – Powering Innovation Across NPO/CPO Sub-Ecosystems

Microprism Lens Arrays

Microprism Lens Arrays combine lenses and prism structures into a single micro-optics component to reduce system complexity. Their monolithic design improves alignment accuracy, lowers optical loss, and minimizes material stress compared with traditional assembled optics.

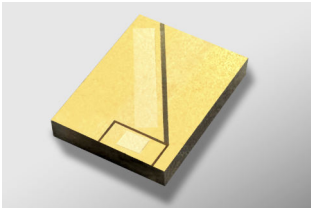
They support refocusing, collimation, and 90° beam-bending functions for PIC waveguides, laser diodes, and SMF/MMF coupling.



Key Specifications	
Materials	Silicon (IR) or fused silica (VIS/NIR)
Optical functions	Refocusing, collimation, 90° bent output
Compatible emitters	PIC waveguides, laser diodes, SMF/MMF
Compatible detectors	SMF/MMF, APD
Custom geometry	Sidewall angles, cavity depth/size

AuSn Pre-Deposited AlN Submounts

These advanced packaging submounts are becoming a critical enabler for next-generation optical communication architectures. Their excellent thermal management performance and highly reliable eutectic bonding interfaces deliver enhanced device stability, longer system lifetime, and scalable manufacturing capabilities.

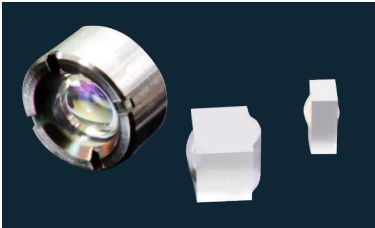


Key Specifications	
AlN Layer Thickness	0.33mm / 0.38mm / 0.45mm / 0.792mm available
Metal Layer	Au (Cu optional)
Solder Layer	AuSn
Thermal Conductivity	> 200 W/m-K

Precision Engineered Aspherical Lenses

These lenses are designed for external-laser (ELSFP) coupling in Co-Packaged Optics (CPO) systems, offering tight collimation and high coupling efficiency across both beam axes. Their monolithic structure increases robustness, reduces alignment steps, and raises overall reliability.

High-quality optical materials support up to 400 mW power without performance loss. With excellent polarization handling and simplified assembly, the lenses help lower system cost while supporting demanding optical-module designs.



Key Specifications	Standard Accuracy Version	High Accuracy Version
Center thickness tolerance	± 0.030 mm	± 0.010 mm
Outer diameter tolerance	± 0.015 mm	± 0.003 mm
Centration *	≤ 0.005 mm	≤ 0.003 mm
Surface tilt *	< 4 min	< 1.5 min
Radius error	± 1%	± 0.5%
Surface roughness (RMS)	< 5 nm	< 2 nm
Scratch/dig	40/20	20/10

* Each surface, relative to outer diameter.



www.focuslight.com

COMPANY INTRODUCTION

Founded in 2007 and headquartered in Xi'an, China, Focuslight Technologies Inc. is a fast-growing public company (Shanghai: 688167) that specializes in developing and manufacturing laser sources and materials, optical components, as well as photonics module and system solutions focusing on optical communication, consumer electronics, and pan-semiconductor applications. Focuslight has expanded its global footprint with manufacturing facilities and expert teams in China, Germany, Switzerland, Singapore, and Malaysia. With the relaunch of the Heptagon brand, the company extends its business to be a global photonics foundry by providing global photonics industry process development and manufacturing service.

Focuslight Technologies Inc.

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