

# Focuslight Corporate Overview

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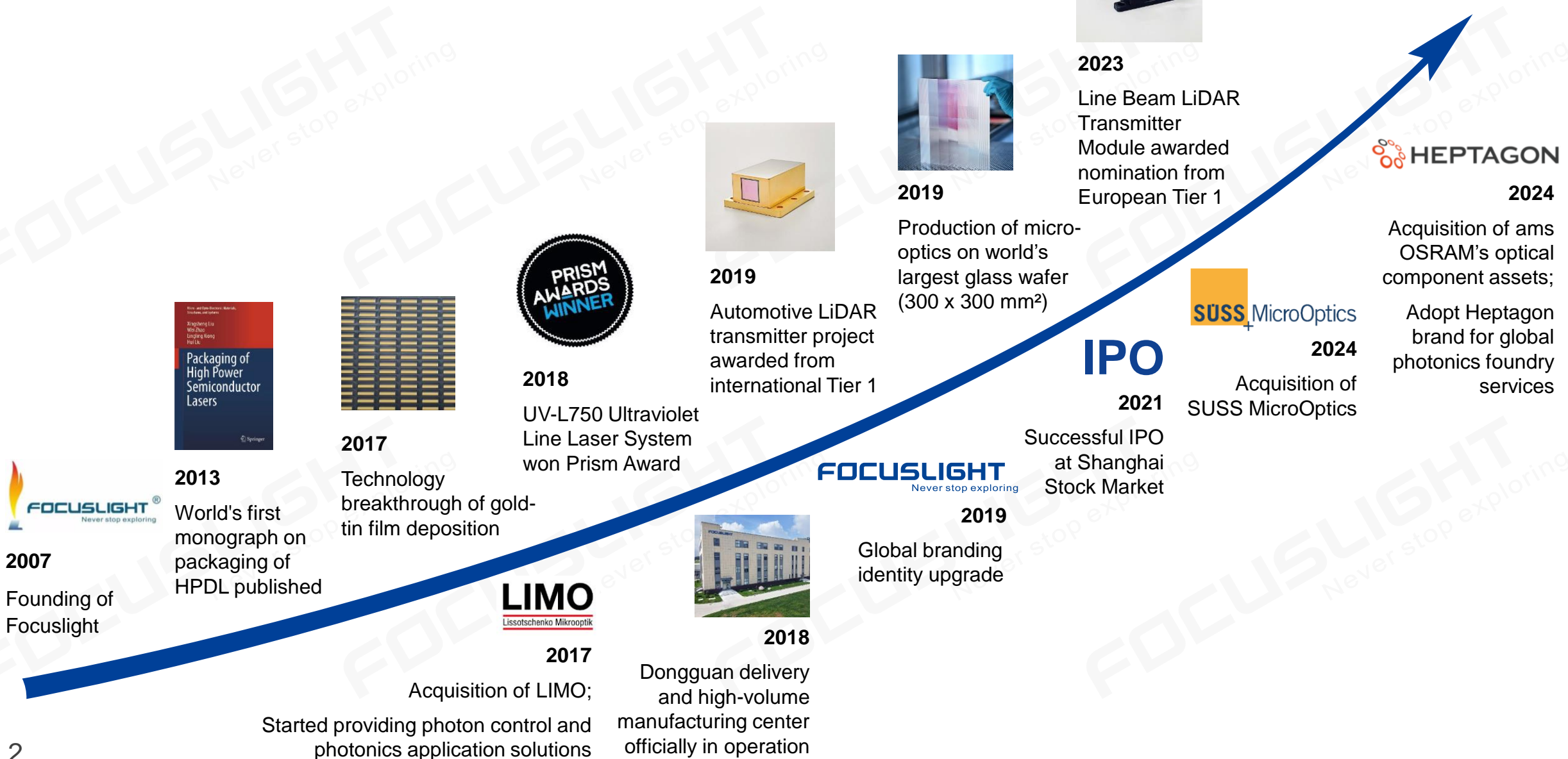
2024-09

# Focuslight Overview

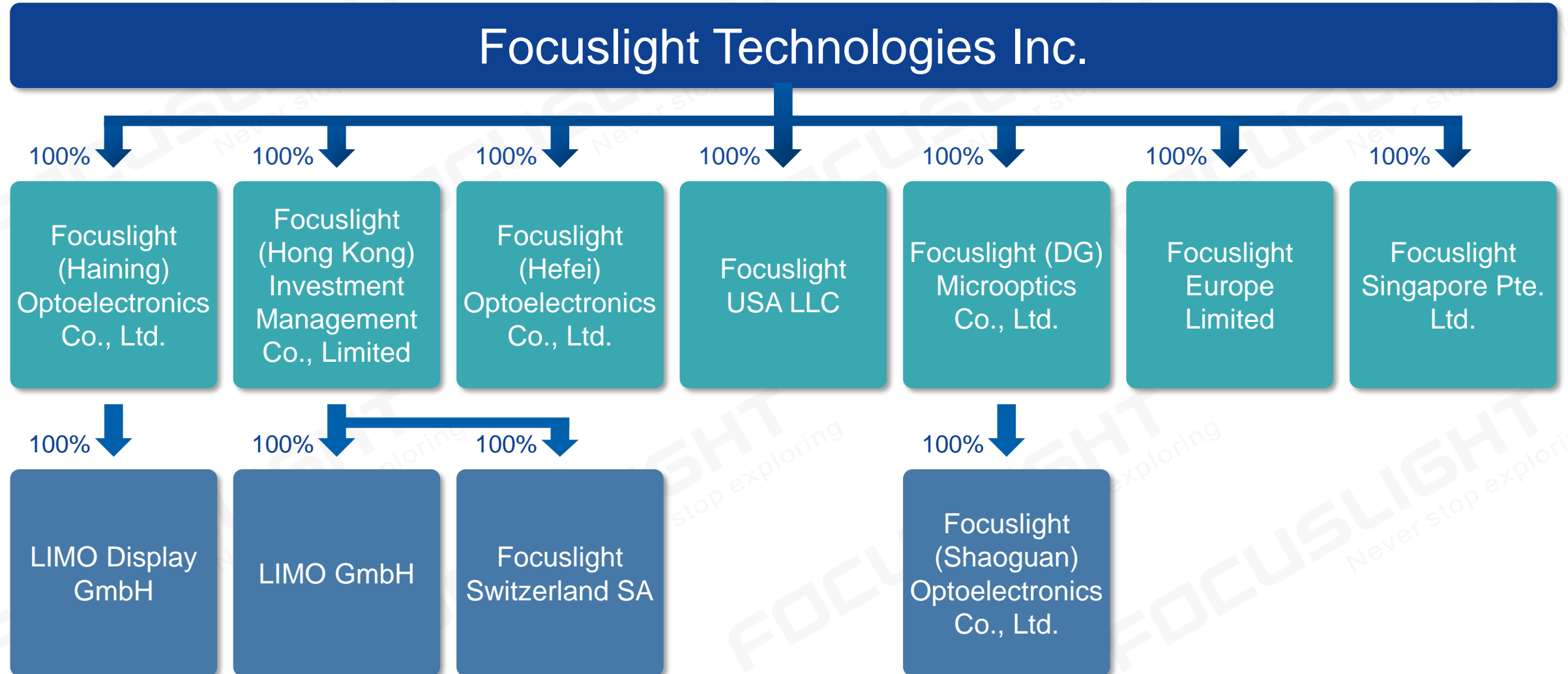
- Founded in 2007 by Dr. Victor X. Liu, headquartered in Xi'an, China.
- A fast-growing company that develops and manufactures:
  - **High-power diode laser components and materials** (Photon Generation)
  - **Laser optics components** (Photon Control)
  - **Photonics module and system solutions** (Application Solutions) focusing on optical communication, automotive, pan-semiconductor, and medical and health applications.
- A **global photonics foundry** offering process development and manufacturing services to the global photonics community.
- Publicly listed in the Shanghai Stock Exchange (Ticker Symbol: 688167).



# Milestones



# Focuslight Corporate and Subsidiaries



# Focuslight Global Operation System

Leverage the strengths and capabilities of each location to **cater to specific customer demands** and **optimize operational efficiency**.

Through centralized decision-making, integrated operations, and lean management, a **high-efficiency, low-cost global operation system** is established.



**Neuchâtel, Switzerland**  
Operation Center



**Dortmund, Germany**  
Operation Center



**Xi'an, China**  
Focuslight HQ, Operation Center



**Haining, China**  
**Hefei, China**  
Operation Center  
(being constructed)



**Silicon Valley, USA**  
Innovation Lab



**Zurich, Switzerland**  
R&D Office



**Ang Mo Kio (AMK), Singapore**  
Operation Center  
Business Center

**Other Southeast Asian regions**  
(to be decided)  
Photonics Foundry



**Shaoguan, China**  
Operation Center



**Dongguan, China**  
Operation Center

# Key Facts & Figures



Employees

>1,000



Yearly Revenue Proportion  
Invested into R&D

~16%



Last Year (2023)  
Revenue

**561M** RMB



Patents Valid  
Worldwide

>610



Facility Worldwide

>48,000m<sup>2</sup>

Clean Room Worldwide

>14,000m<sup>2</sup>



ISO 9001  
ISO 14001  
ISO 45001  
IATF 16949  
Certified

# Corporate Management Team



**Dr. Xingsheng Liu (Victor)**  
Chairman, CEO

Research and management experience in the US (Virginia Tech, Corning, Coherent, nLight)

100+ publications, 300+ patents, 30+ invited papers internationally

Committee Member of SPIE and IEEE, served or serving as chair or committee member of international conferences



**Dr. Chung-En Zah**  
CTO

30+ years of research experience in the US (Corning, Bellcore)

300+ publications, 50+ patents in optoelectronics and telecommunication

IEEE Fellow, OSA Fellow, 2x R&D 100 award winner

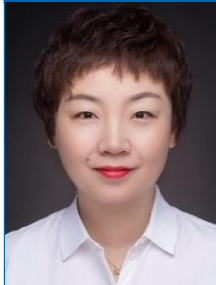


**Mr. Guowei Zhu (Gavin)**

Corporate VP of Quality, President of Automotive BU, Director of Corporate R&D

Over 20 years experience in international automotive companies

Rich plant P&L and operations management experience, familiar with IATF QMS and plant operations management by World Class Manufacturing (WCM) & Lean manufacturing



**Ms. Yiping Ye (Alison)**  
Board Director, CFO

Over 15 years management experience and multi-field business practices

In-depth understanding in LTC, IPD, intercultural cooperation and rich operational experience in market development, project operation and business management



**Mr. Ye Tian**

Board Director, Corporate VP of Global Sales, China Sales Director

Over 15 years' experience in market development, product marketing and sales, with certificate of CEIBS' Leadership Acceleration Program



**Dr. Reinhard Voelkel**  
Chief Strategy Officer

35+ years of professional experience in the field of micro-optics, with expertise in strategic leadership, business development, and innovation














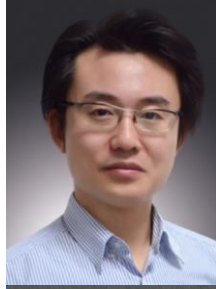





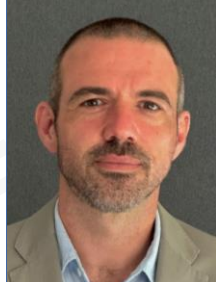









**Mr. Qichuan Yu**

Chief Product/Process Officer

Over 25 years of experience in wafer-level optics, optical sensor and camera packaging, SAW/BAW filter R&D, and NPD execution, with a strong focus on mastering, tooling, and wafer-level processes

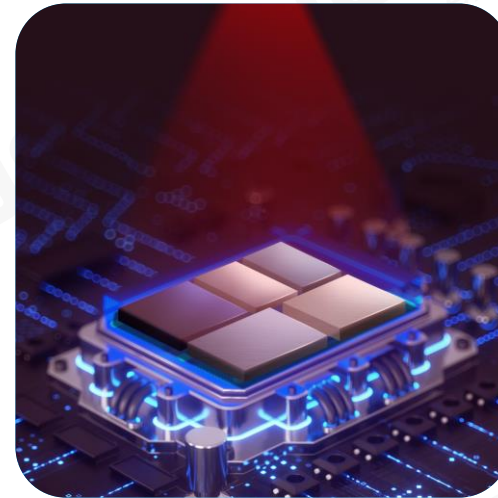
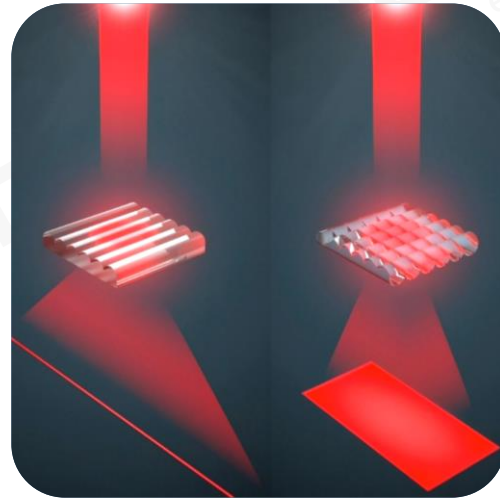
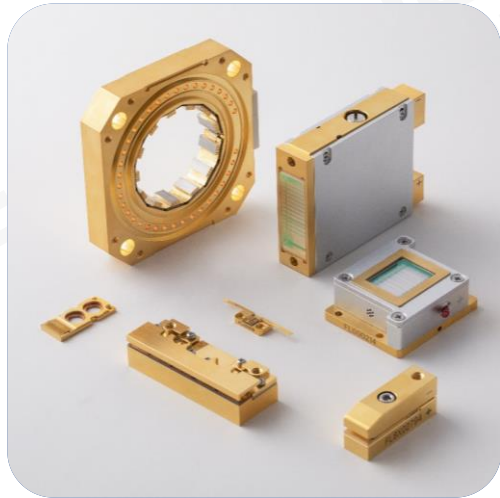


# Corporate Management Team

	<p><b>Ms. Xuefeng Zhang (Jennifer)</b> Board Secretary, Marketing Director</p> <p>14 years photonics industry international business experience</p> <p>In-depth understanding and rich experience in sales, marketing and business development</p> <p> </p>		<p><b>Mr. Jinchao Qu</b> President of Diode Laser BU, President of Medical &amp; Health BU</p> <p>Extensive years of product marketing and sales management experience</p> <p>Outstanding track record in previous roles as Asia Sales Director and Head of the Application Systems Special Task Force</p> <p> </p>
	<p><b>Mr. Dirk Walter Bogs</b> President of Laser Optics BU</p> <p>Over 25 years' experience in ultra-precision tooling, optic manufacturing, engineering &amp; project management, and operational management</p> <p>Very deep knowledge of technology development and optimization</p> <p> A Focuslight Company</p>		<p><b>Mr. Yong Tian (York)</b> VP of Laser Optics BU</p> <p>20+ years of operation &amp; R&amp;D management, very deep knowledge with organic optical materials and optical coating technology, published SCI articles and owns patented technologies</p> <p>Experienced in Lean Manufacturing &amp; Industry 4.0</p> <p> </p>
	<p><b>Mr. Yong Li (Leon)</b> VP of Automotive BU</p> <p>Outstanding leadership in previous roles: Overseas Sales Manager, Product Line Manager, and Head of the Automotive LiDAR Strategic Project</p> <p>Experienced in international cooperation and strategic planning</p> <p> </p>		<p><b>Mr. Ye Dai (Robert)</b> President of Pan-Semiconductor Solutions BU</p> <p>Excellent track record in worldwide sales &amp; product line management leadership roles</p> <p>20+ patents granted</p> <p> </p>
	<p><b>Dr. Tobias Senn</b> Vice President of Strategic Growth Division</p> <p>15+ years of experience in micro-optical component development for the consumer market. Expert in design for manufacturing and process development, with a strong focus on high-volume production and yield improvement</p> <p>    Helmholtz Zentrum Berlin</p>		<p><b>Mr. Hongyuan Liu (Tom)</b> President of Global Photonics Foundry BU</p> <p>20+ years in R&amp;D and operations management, specializing in optical imaging and non-imaging system design, WLO process &amp; integration, and optical component manufacturing. Proven track record in new product development and scaling high-volume production</p> <p>   </p>



# Products and Businesses



Photon  
Generation



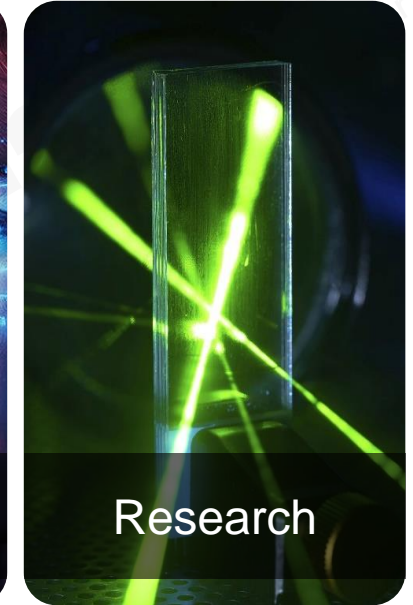
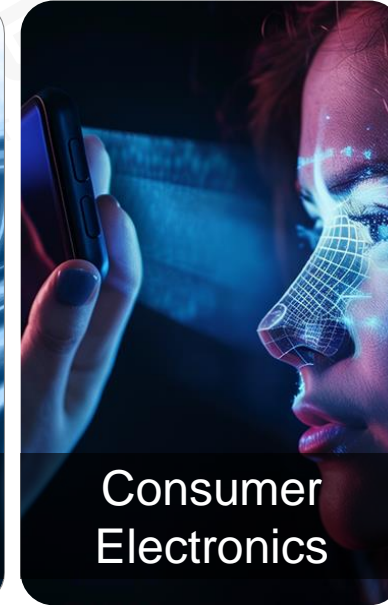
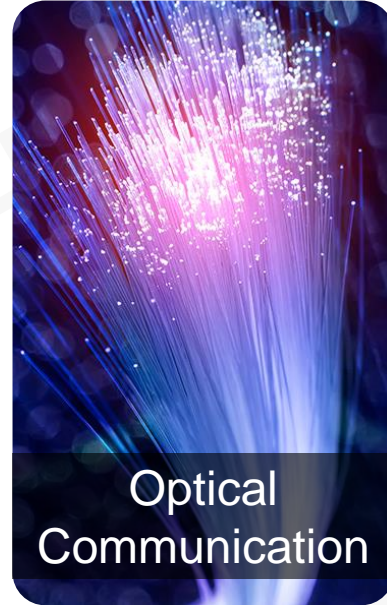
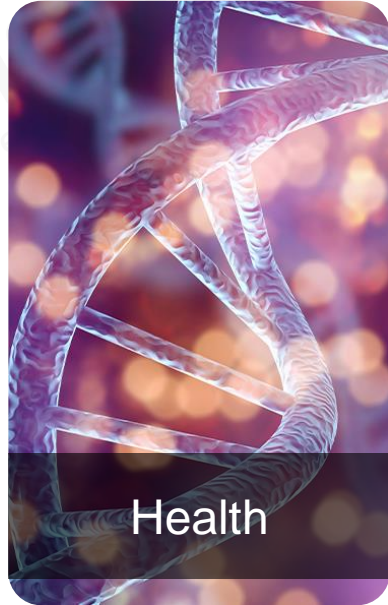
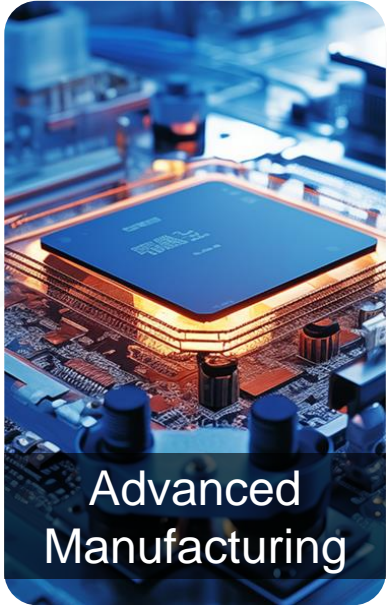
Photon  
Control



Photonics  
Application  
Solutions



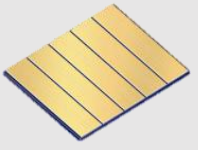


Global  
Photonics  
Foundry







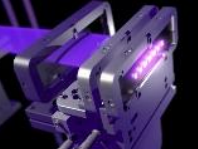

Be the global trusted photonics solution provider  
through innovation, manufacturing excellence and fast response




# Value Proposition



	<b>Chips</b> (Strategic collaboration with Suppliers)
	<b>Packaging Materials</b>
	<b>Optics Substrate</b>

	<b>Light Sources</b>
	<b>Optical Components</b>
	<b>Fiber Coupled Modules</b>

	<b>Laser Subsystems</b>
	<b>Optical Subsystems</b>
	<b>Integrated Modules</b>

	<b>Application Centers</b>
	<b>Technical Support</b>
	<b>Field Service Centers</b>

Industry Leader + Strong Financial Backing + Healthy Stable Company + Invest in the Future



## Do what we do best

Offer the best value

Optimize to the extreme

Achieve the best  
performance / quality-to-  
price ratio

## Commitment to Customers

- Lowest cost manufacturing for high volume products
- Willing to take technical risk, but need customer to commit market
- Willing to take investment risk in R&D and capital including M&A for customer on the condition of customer commitment of market share
- Collaboration transparency, fast response, IP protection and long-term partnership



## What we don't do

Take high market risk

Being greedy

Being too aggressive

Compete against customers

**Vision**

**FOCUSLIGHT**  
Never stop exploring

**To unlock the potential  
of photonics to  
enhance and enrich  
people's life**



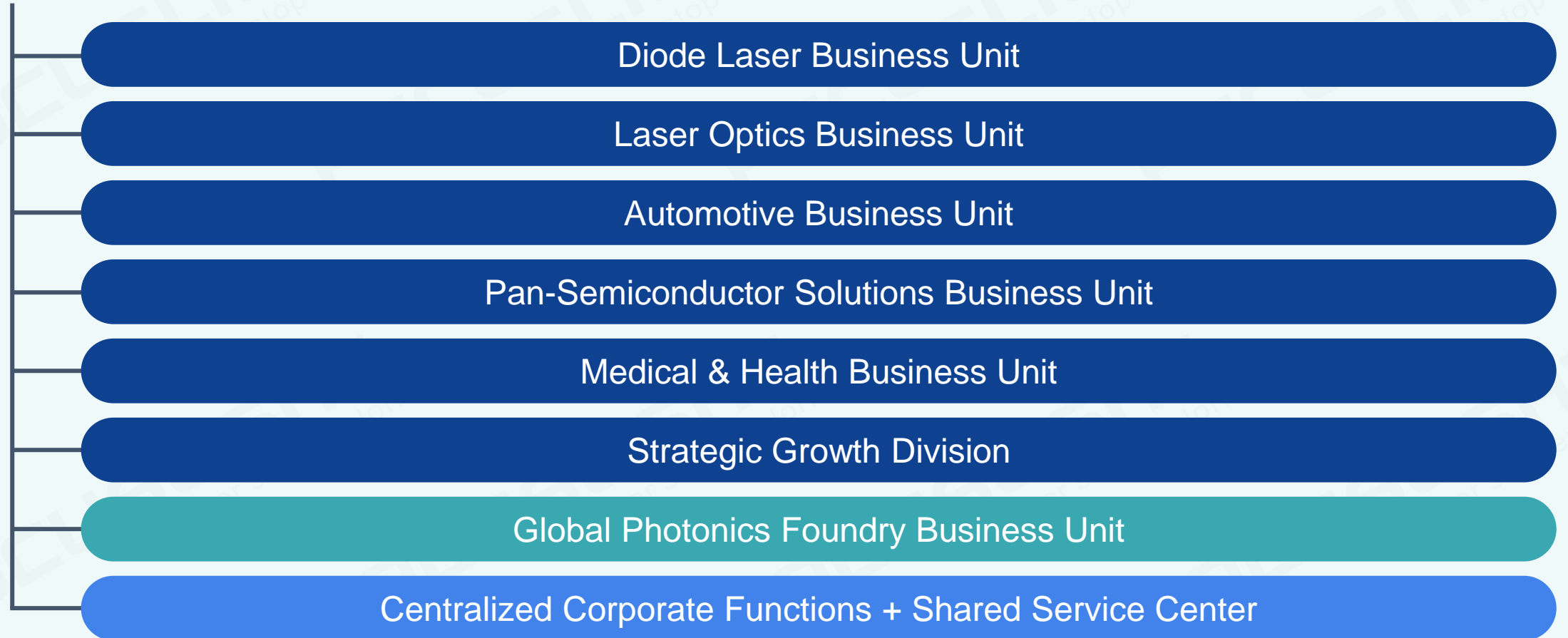
**FOCUSLIGHT**  
Never stop exploring

All Focuslight-designed products and business lines will be marketed globally under the Focuslight brand to streamline operations and create synergies.

 **HEPTAGON**  
A FOCUSLIGHT BRAND

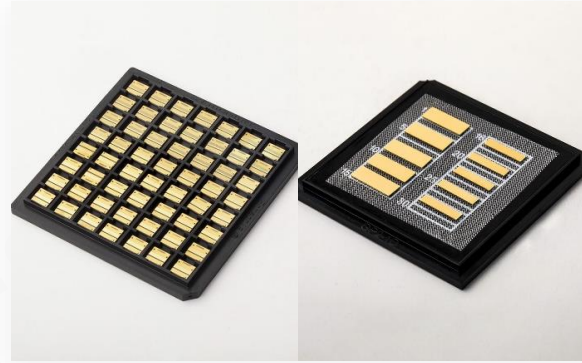
Foundry services that convert customers' ideas and designs into their own products and solutions will be marketed under the Heptagon brand.

## Focuslight Technologies



# Products - Diode Laser Components

Under Focuslight Brand



## Advanced Materials

- AuSn Pre-Deposited AlN Ceramic Submounts
- AuSn Pre-Deposited CuW Submounts
- Thin Film Metallization Service



## Active Devices

- Single Emitter Components
- Single Bar Components
- Micro-Channel Cooled Stacks
- Conduction Cooled Stacks
- Pumped Modules



## Fiber Coupled Modules & Passive Components

- Emitter-Based FCM
- Bar-Based FCM
- Patch Cords



## Professional Medical Application Components

- Laser Hair Removal Modules
- Medical Lasers

- Focuslight offers our customers a variety of products.
- Focuslight is committed to providing our customers with reliable, high-performance laser products and superior services



# Products - Laser Optics Components

Under Focuslight Brand

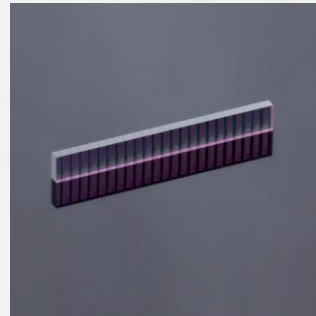
## Single Lenses and Linear Lens Arrays



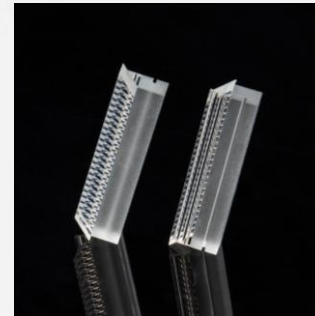
FAC



SAC



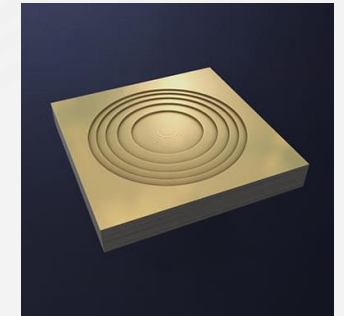
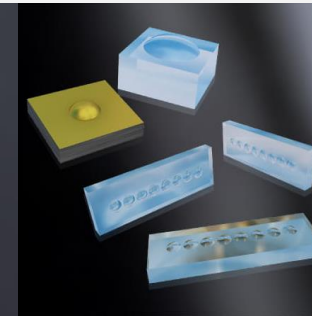
SAC array



BTS



Fiber coupler and collimator

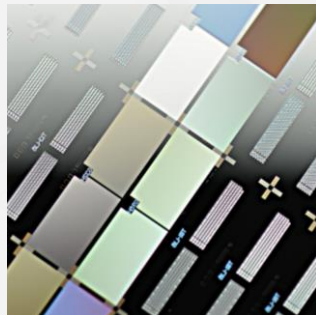


Collimating DOE

## Area Lens Arrays



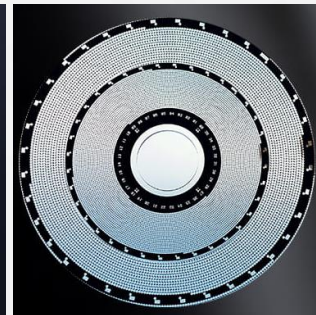
Homogenizer and  
diffuser



DOE beam splitter,  
dot or line generator

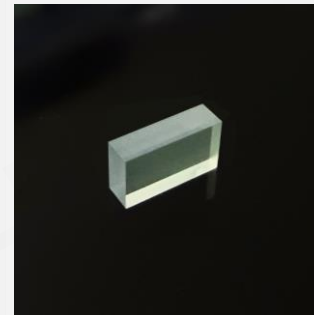


Shack-Hartmann  
array

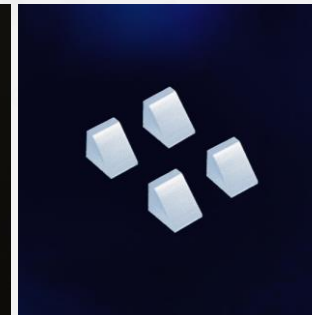


Pinhole array

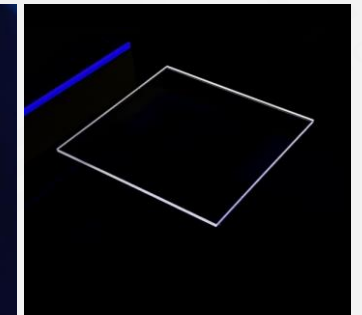
## Plano Optics and Coatings



Mirror



Prism



Window

# Products - Automotive Application Solutions

Under Focuslight Brand

## Flash LiDAR Transmitter Modules

**AL01** (Mass Production)



Auto-grade DPSSL Flash Tx

**AT02 / AT02 Pro**  
(Engineering Sample)



Auto-grade VCSEL modules for DMS (Driver Monitoring System)

**AX02 Pro** (Engineering Sample)



VCSEL Flash Tx 700W

## Line Beam LiDAR Transmitter Modules

**LE02 Pro**  
(Engineering Sample)



905nm 700W EEL Line Beam Tx

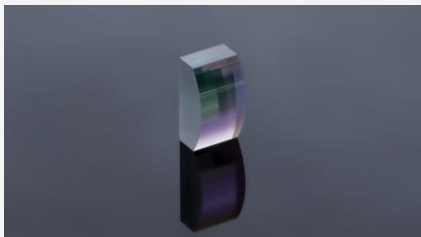
**LX02** (Engineering Sample)



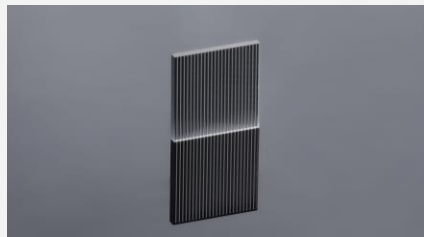
VCSEL Line Tx 1000W

## Optical Components and Assemblies for Automotive

EEL FAC Collimators



Auto-grade Diffusers and Homogenizers



Optics for Automotive Projected Lighting and Headlight



Customized Optical Assemblies



# Products - Pan-Semiconductor Application Solutions

Under Focuslight Brand

## Advanced Display Manufacturing Solutions



Solid-State Laser Lift-Off (LLO) System

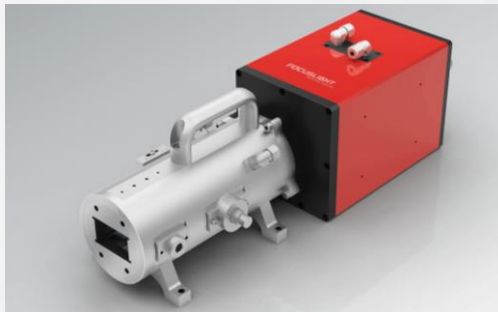


Solid-State Laser Annealing (SLA) System



Variable Beam Laser System  
(Mini and Micro LED Processing)

## IC Manufacturing Processing



IC Wafer Annealing System



Variable Beam Laser System  
(Advanced Chip Packaging)

## Industrial Solutions



IR Line System

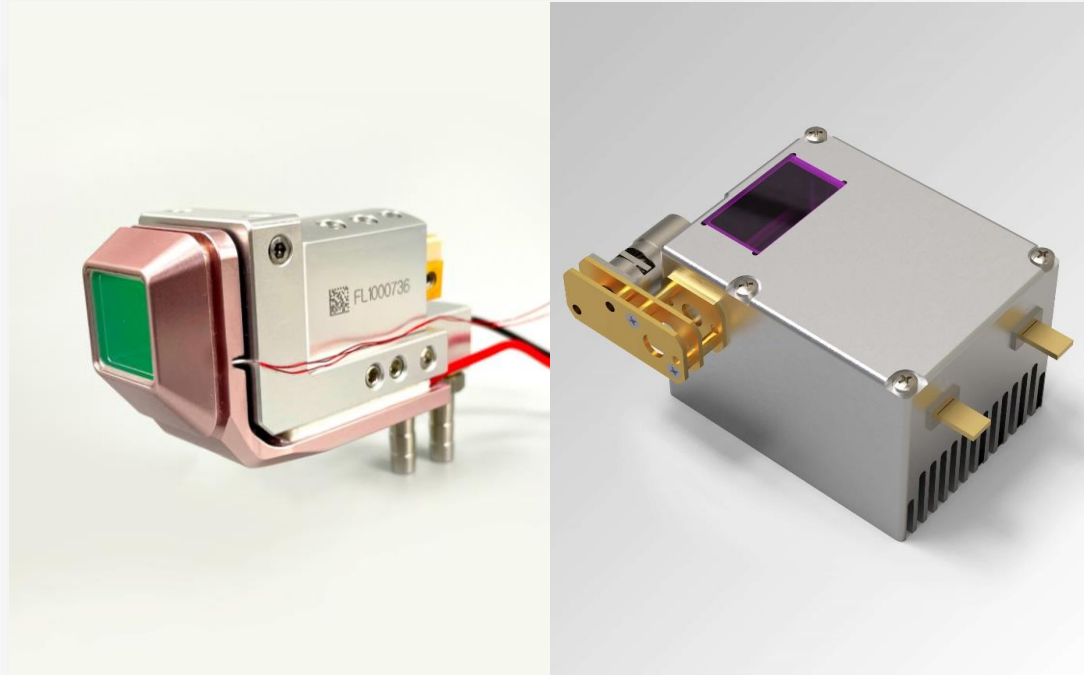


Industrial Laser Module

# Products - Medical and Health Application Solutions

Under Focuslight Brand

## Laser Hair Removal Modules



## Laser Skin Rejuvenation Module

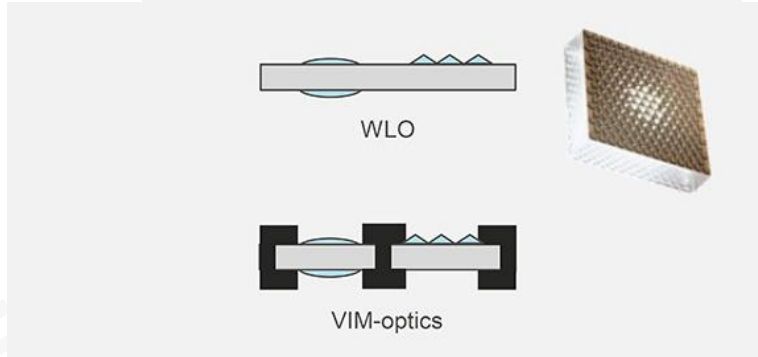


## Body Sculpting Module



# Global Photonics Foundry Services

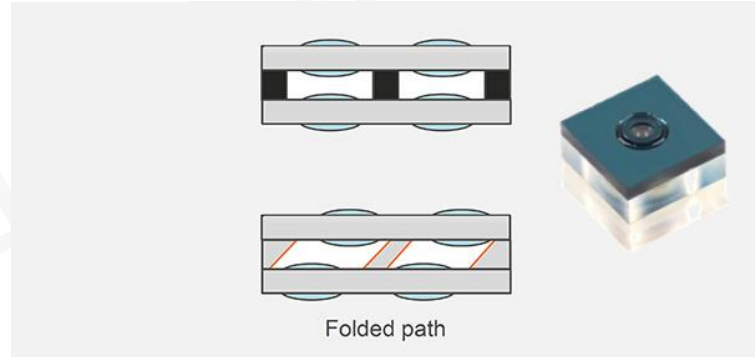
Under Heptagon Brand



## Wafer Level Optics

Imprinted optics from mm to nm scale

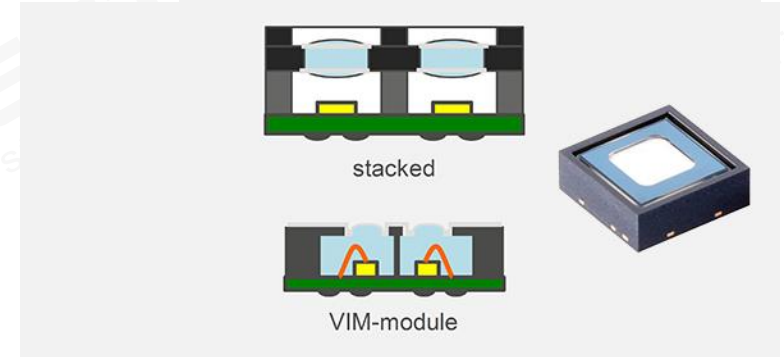
- Diffractive and refractive optics
- Micro lens arrays (MLAs)
- Diffusers



## Wafer Level Stacking

From imprinted optics from mm to nm scale

- Imaging lenses
- Projector lenses



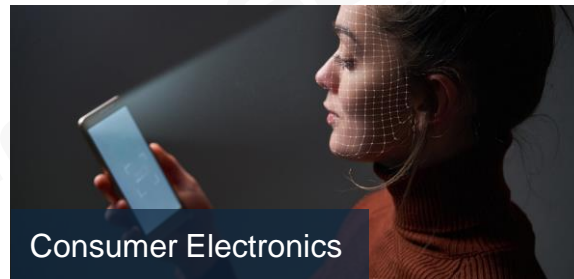
## Wafer Level Integration

From imprinted optics from mm to nm scale

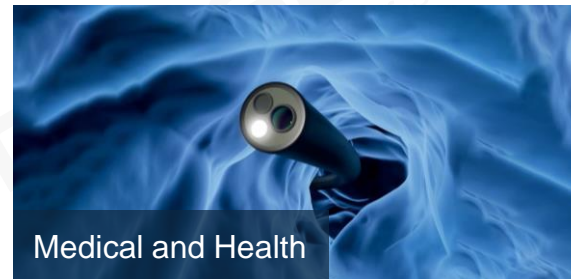
- Optical sensor and illumination modules



Automotive



Consumer Electronics



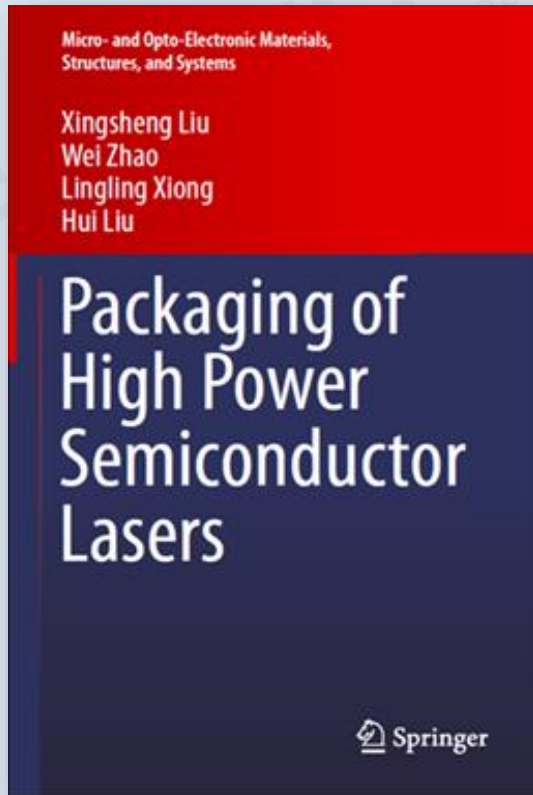
Medical and Health



Industrial

# Core Competence

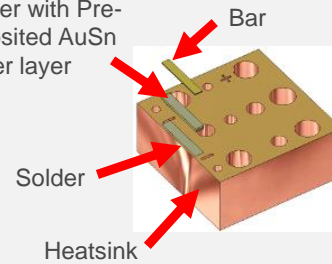
## Diode Laser



### Eutectic Bonding

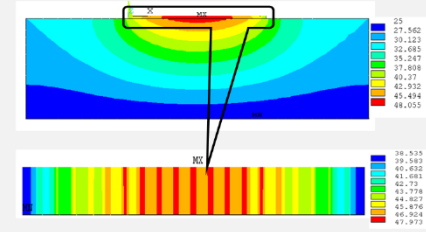
High Reliability

Carrier with Pre-deposited AuSn solder layer

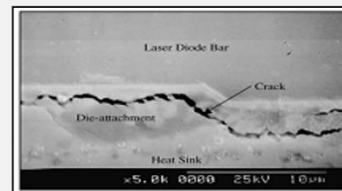


### Thermal Management

Finite Element Thermal Analysis and Design

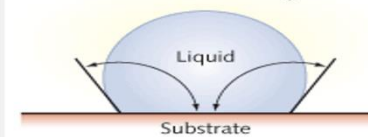


### Thermal Stress Control

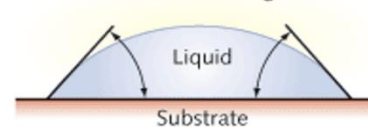


### Interface Materials and Surface Engineering

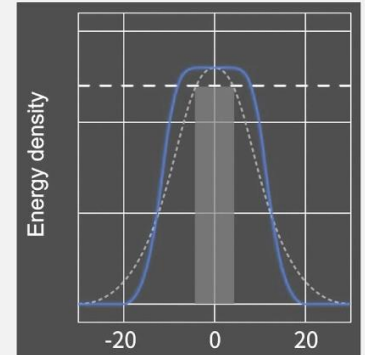
Solder nonwetting



Solder wetting



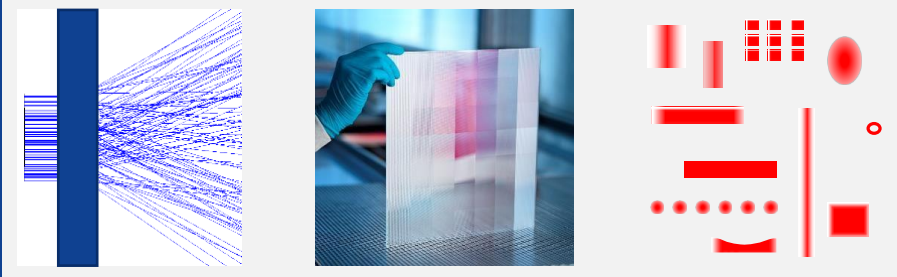
### Test, Analysis and Diagnosis



# Core Competence

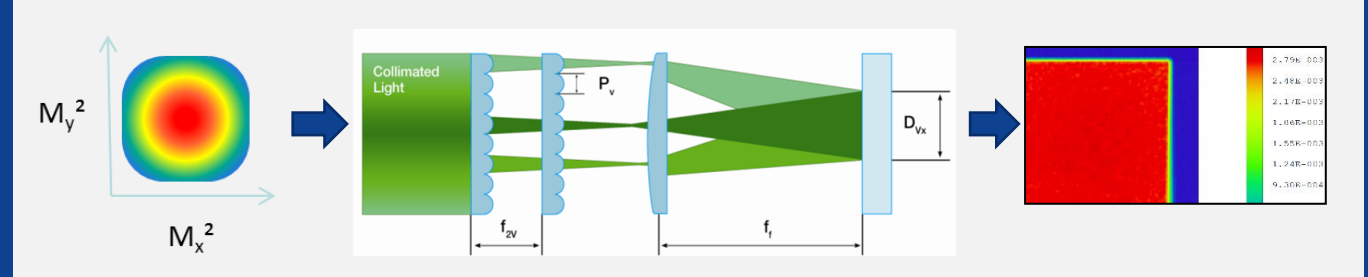
Beam Shaping – *The Right Photon at the Right Place and Time!*

## Micro Optics Design and Simulation



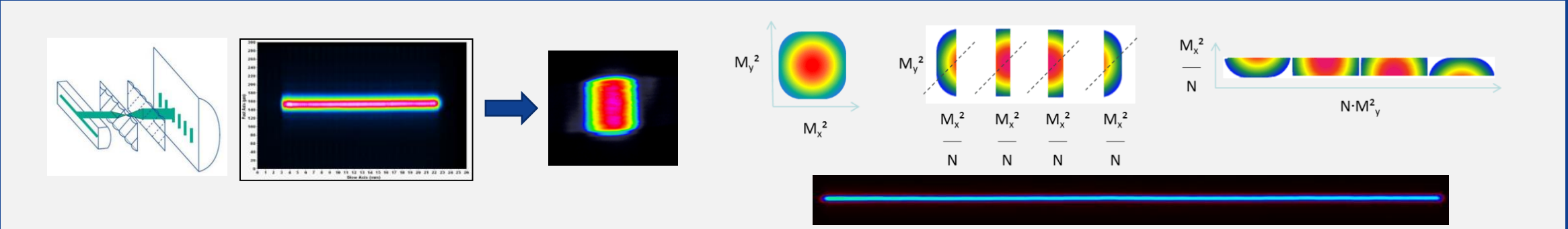
Acylindrical free-form micro-optics / arrays / diffusers /  
DOE splitters / beam shaping systems

## Homogenization



Uniform and homogeneous illumination in any desired shape

## Beam Transformation



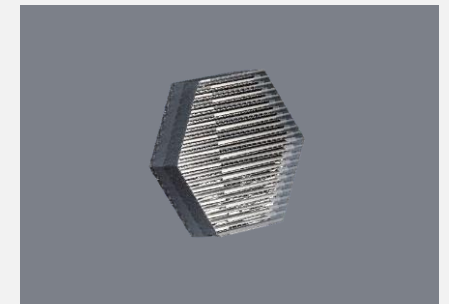
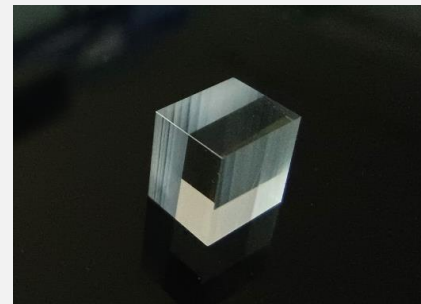
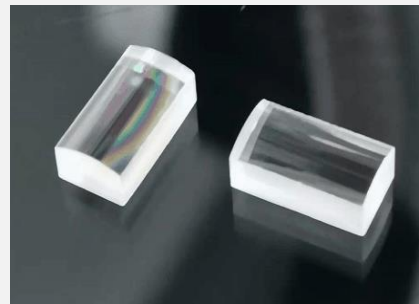
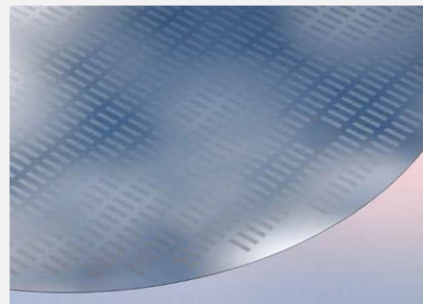
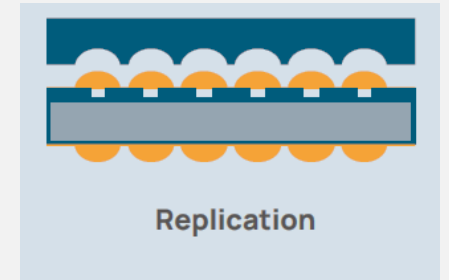
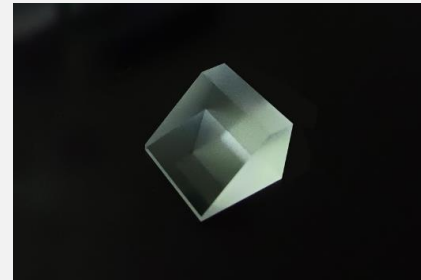
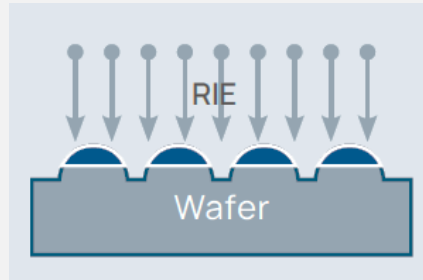
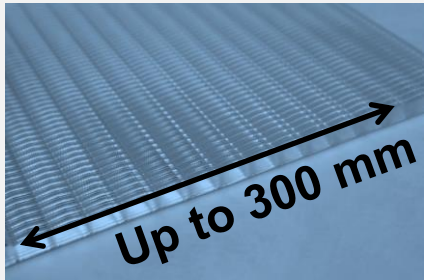
Asymmetrical → Symmetrical beam

Symmetrical beam → High density line beam

# Core Competence

Optics Manufacturing

Wafer Level Simultaneous Structuring	Wafer Level Photolithography-RIE (reactive ion etching)	Precision Glass Molding	Cold Processing	Imprint
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With inorganic materials:  
Glass, Fused Silica, Silicon, CaF<sub>2</sub>

With polymer on glass

**High LIDT Optical Coating:** Anti-reflection, high-reflection, beam splitter, band filter, and various customization (UV, VIS, IR)



# A Unified QM System in the Corporate Ensures Reliable and Premium Products

ISO9001 Certified Quality Management System (QMS)

ISO14001 Certified Environmental Management System (EMS)

IATF16949 Certified Automotive Quality Management System

ISO45001 Certified Occupational Health and Safety Management System

Failure Mode and Effect Analysis (FMEA)

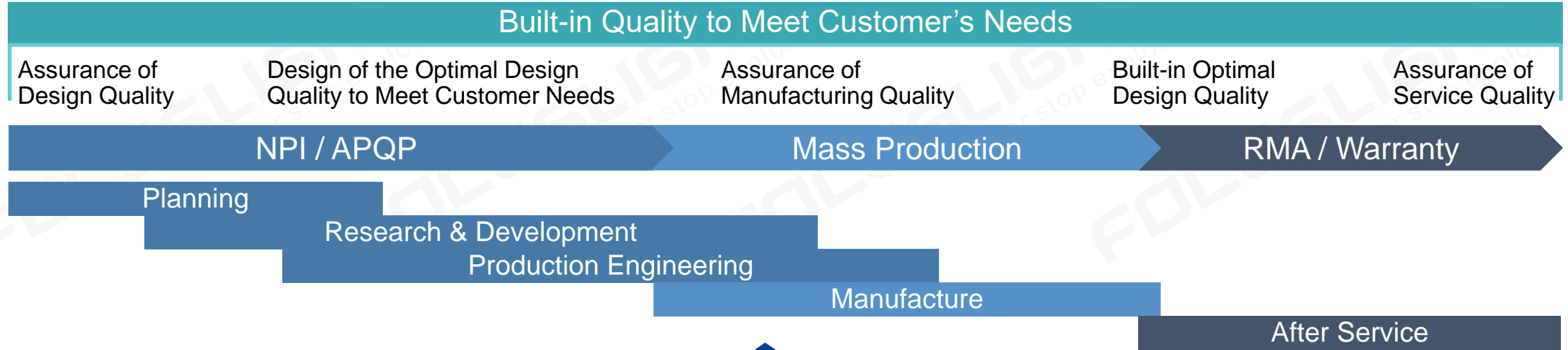
Statistical Process Control (SPC)

Production Traceability Database

Control Plan (CP)



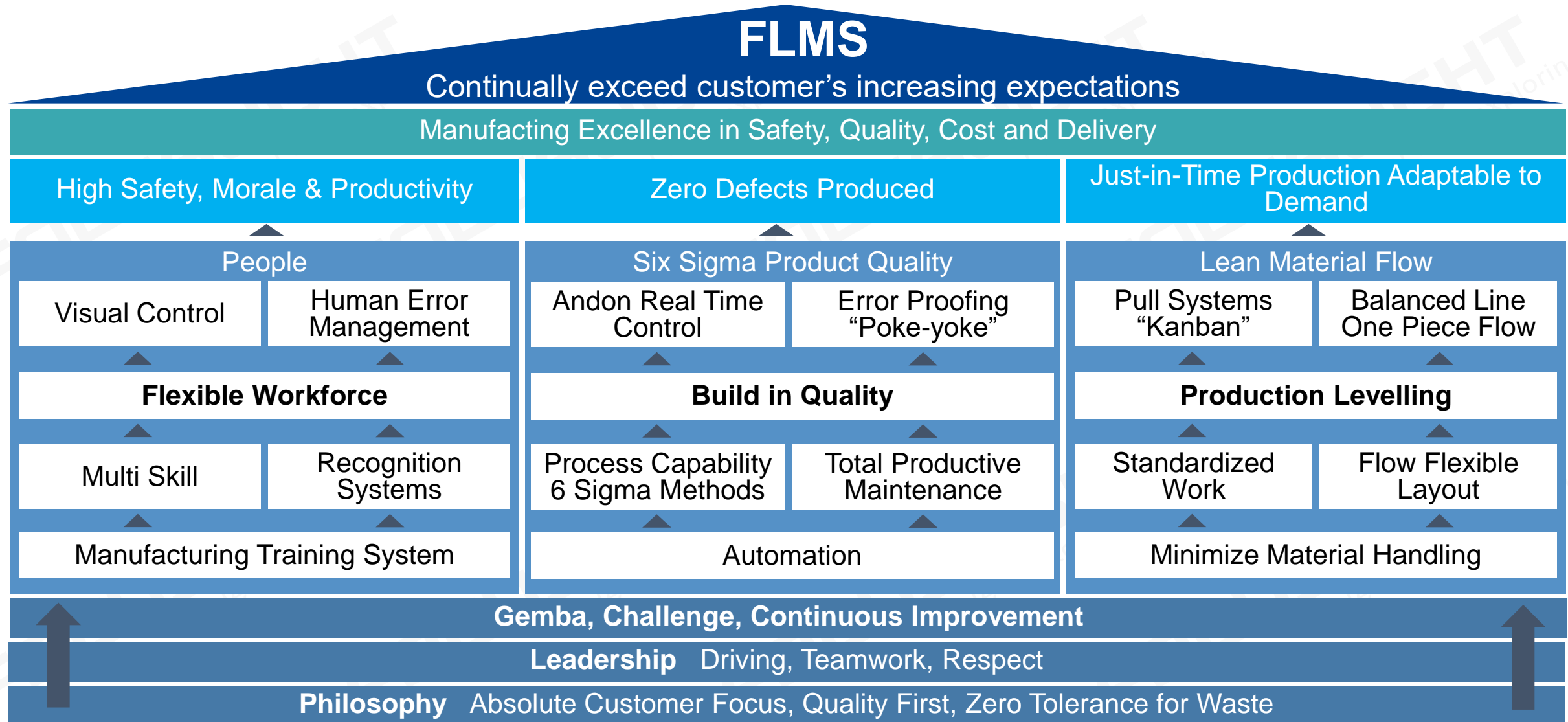
# Quality Assurance System



**Promotion of Consistent Quality Assurance Activities**

<b>Quality Control System of Design</b>	<b>Quality Control System of Manufacture</b>		<b>Quality Control Evaluation System</b>
<ul style="list-style-type: none"> <li>• QFD</li> <li>• Critical Characteristic, Special Characteristics</li> <li>• Tolerance Chain Design</li> <li>• FMEA, FTA</li> <li>• Design Validation</li> <li>• Design Review</li> </ul>	<ul style="list-style-type: none"> <li>• Parameter design</li> <li>• Process FMEA</li> <li>• Process Capability Study</li> <li>• Automatic Inspection,</li> <li>• Poka Yoke / Error Proof</li> <li>• Measurement System Analysis</li> </ul>	<ul style="list-style-type: none"> <li>• QA Network</li> <li>• Supplier Quality Management</li> <li>• Production Validation</li> <li>• Control Plan</li> <li>• QC Circles</li> <li>• Production Part Approval Process</li> </ul>	<ul style="list-style-type: none"> <li>• QC diagnosis</li> <li>• Quality assurance Meeting</li> <li>• Quality Auditing Improvement Meeting</li> </ul>

# Focuslight Manufacturing System (FLMS)



# Manufacturing Excellence

- Apply the **lean manufacturing practices** to all production lines, including automotive, diode laser and laser optics business
- **Absolute customer focus, zero tolerance of waste, and continuous improvement** philosophy
- **Significantly reduced** cycle time, improved manufacturing efficiency, and lowered RMA yield and manufacturing cost.
- Adopting **automation and advanced production management system**
- **SOP** of the first LiDAR transmitter project with an international automotive tier 1 customer
- IATF 16949 certified and VDA 6.3 audited



# Manufacturing Capacity

## Advanced Materials

10+ years high-volume manufacturing experiences + self-owned core technologies

DPC production



Etching production



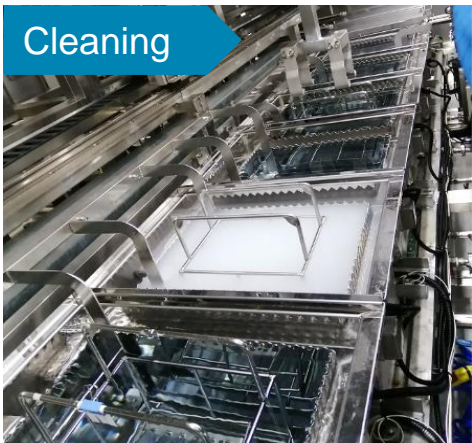
Au plating



Pattern production



Cleaning



AuSn deposition



Laser marking



Dicing



AOI inspection



Advanced Materials Manufacturing Capacity > 2M pcs / month

# Manufacturing Capacity

## Diode Laser Components

Packaging & Assembling



Optical Assembling



Testing & Measurement



Quality Inspection



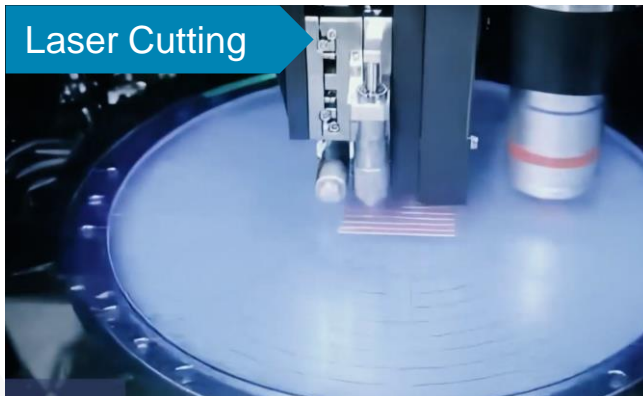
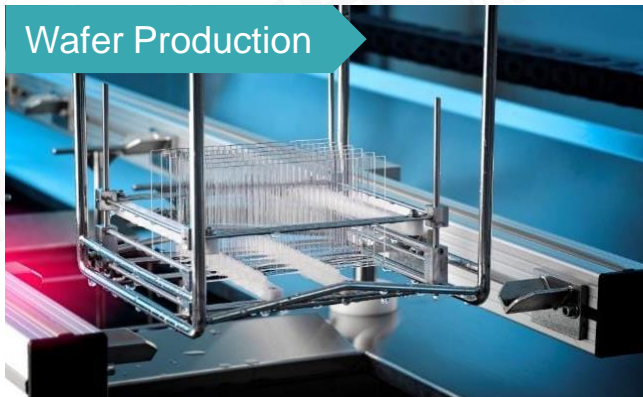
Burn-in & Lifetime Test



Diode Laser Manufacturing Capacity > 500K pcs / year  
Burn-in Capacity 600K pcs / year

# Manufacturing Capacity

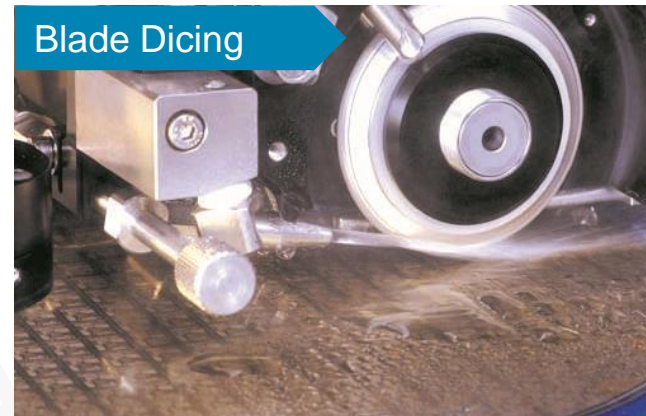
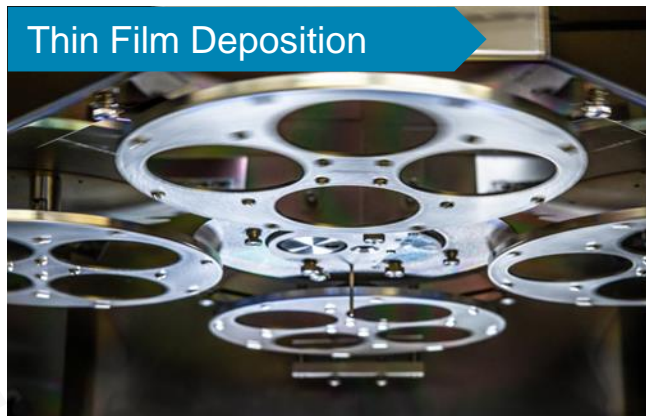
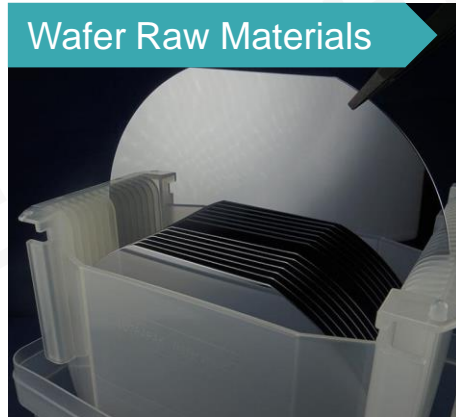
## Laser Optics Components: Wafer-Level Simultaneous Structuring Processing



Wafer-Level Simultaneous Structuring Processing:  
Manufacturing Capacity > 2K wafers / month or > 3.5M pcs lenses / month

# Manufacturing Capacity

## Laser Optics Components: Photolithography-Reactive-Ion-Etching Processing

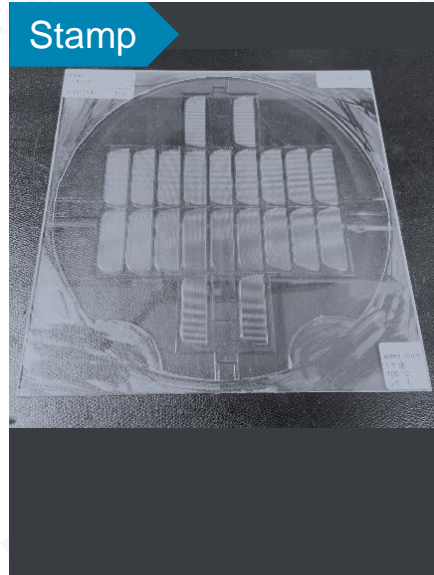
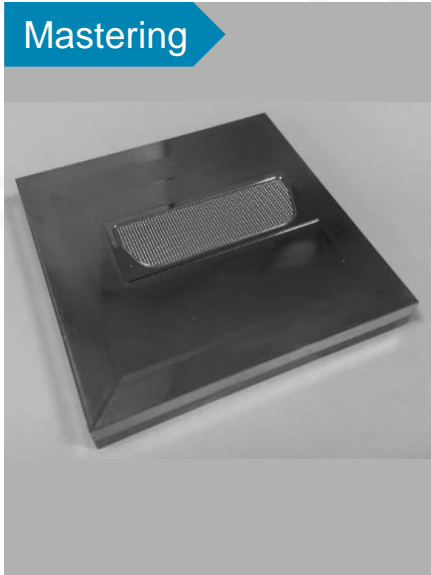


Photolithography-Reactive-Ion-Etching Processing:  
Manufacturing Capacity > 300 wafers / month



# Manufacturing Capacity

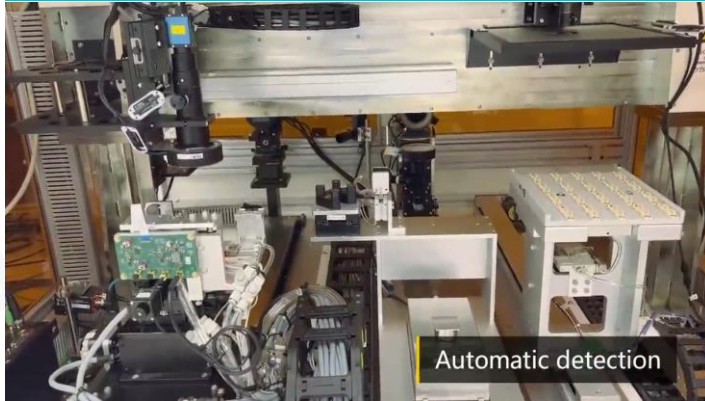
## Laser Optics Components: Imprinting Processing



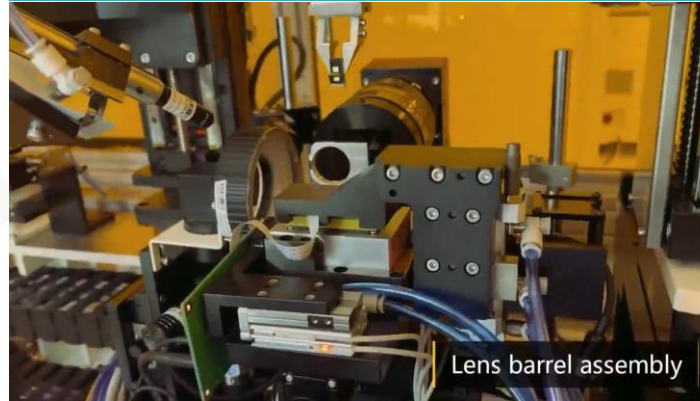
Imprinting Processing:  
Manufacturing Capacity > 15K wafers / year or > 30M pcs lenses / year

# Automation Powered Manufacturing Excellence

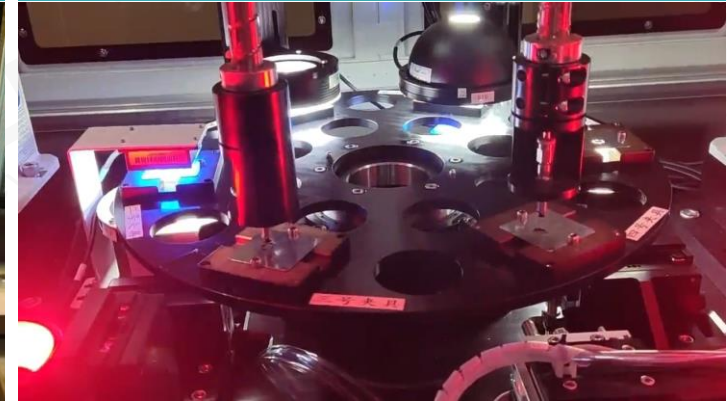
Automatic Optical Alignment



Automatic Assembly



Automated Optical Inspection



Laser Optics Production Line



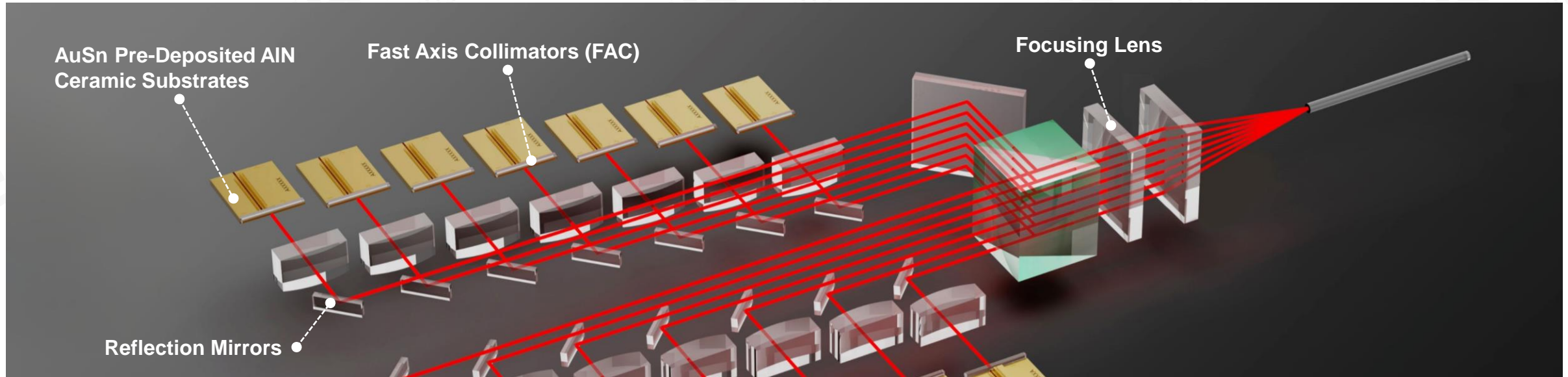
LiDAR Transmitter Production Line



Video Link: <https://www.focuslight.com/news-events/newslst/focuslight-autonotation-powered-manufacturing-excellence/>

# Typical Applications

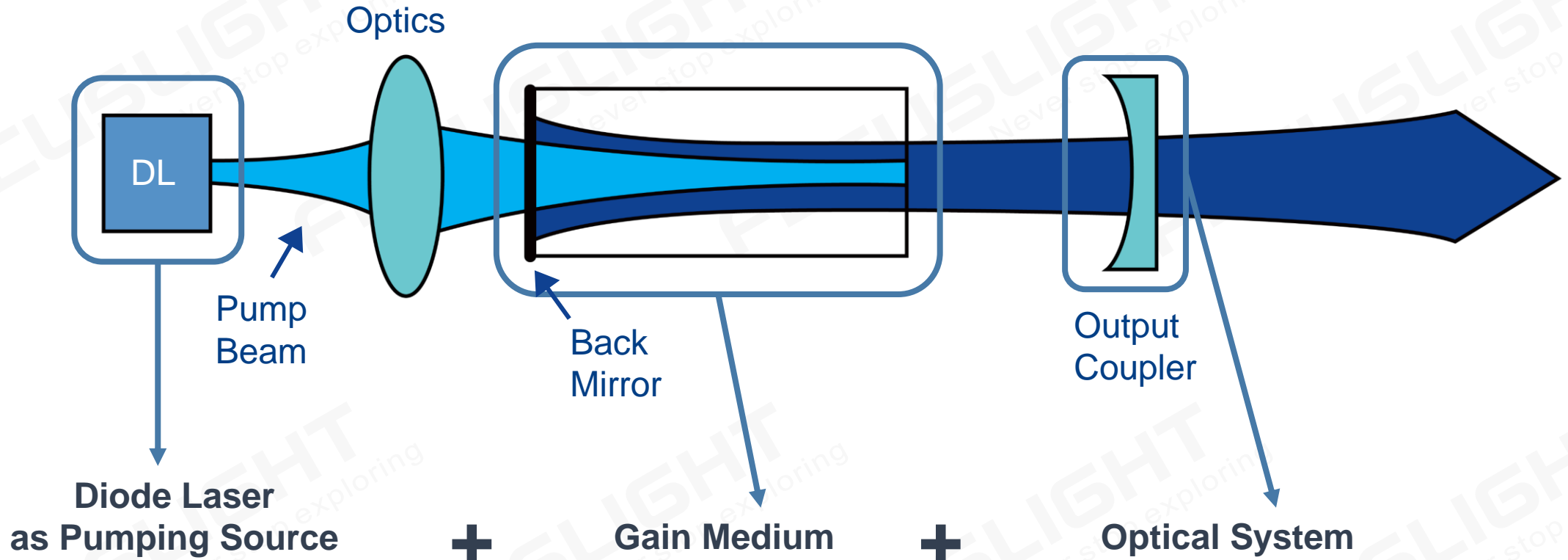
## Fiber Laser Pumping



- **AuSn pre-deposited ceramic substrates** – stable and reliable thanks to the high thermal conductivity and suitable thermal expansion coefficient;
- **Fast axis collimators (FAC)** – fundamental and efficient solutions for shaping the beam emitted by the pumping sources;
- **Reflection mirrors** – highly accurate and efficient in reflection, reducing optical signal losses;
- **Focusing lenses** – coupling the collimated laser beam precisely into the output fiber;

# Typical Applications

## Solid State Laser Pumping



Diode Laser:    ↓ Footprint    ↑ Reliability    ↑ Efficiency    ↓ Cost

# Typical Applications

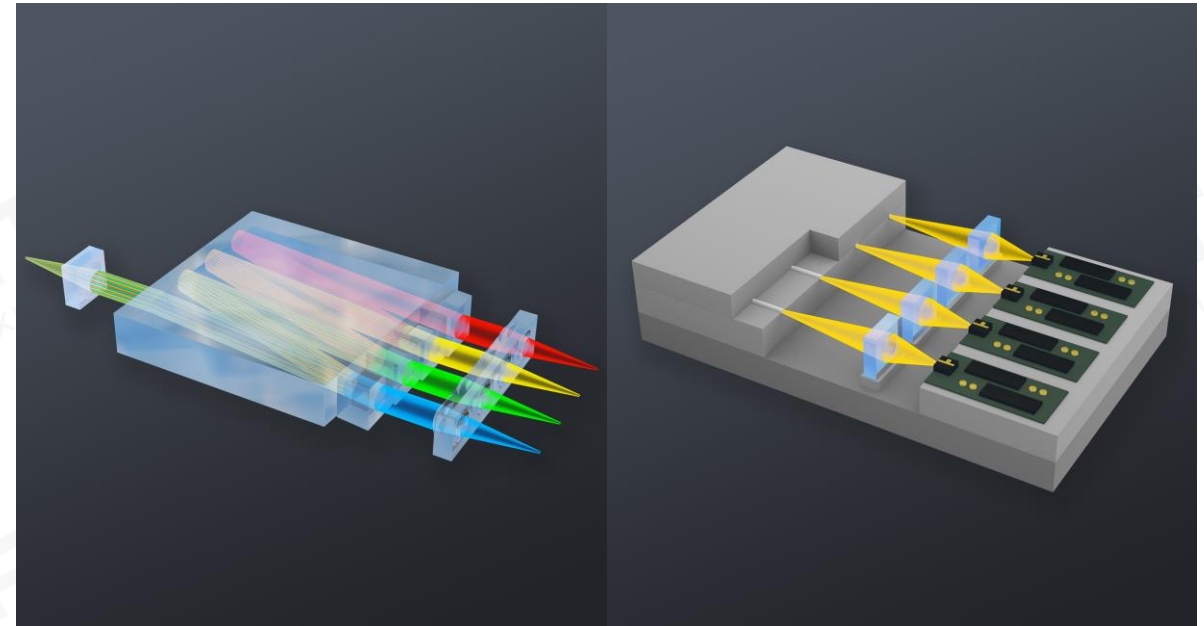
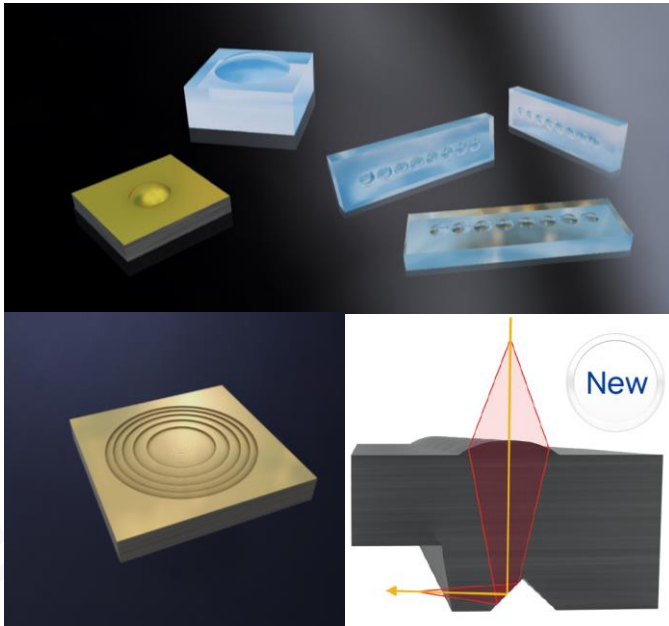
## Optical Communication

### Refractive Optics

- Focusing / collimating microlens
- Prism integrated MLA
- Microlens arrays
- Si refractive microlens arrays



- Transceiver (TROSAs, ROSAs, TOSAs \*)
- Fiber couplers for PICs
- Co-packaged optics
- Wavelength selective switches
- Extended beam connectors



\* TROSA = Transmit & Receive Optical Sub Assembly, ROSA = Receiver Optical Sub Assembly, TOSA = Transmitter Optical Sub Assembly

# Typical Applications

## Automotive Solutions



**Automotive LiDAR**



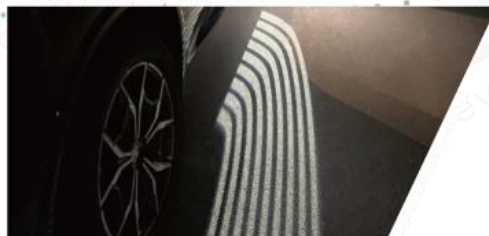
**Driver Monitoring System**



**Smart Headlight**



**AR HUD**



**Automotive Projected Lighting**



Optical Components



Laser Transmitter /  
Illumination Modules



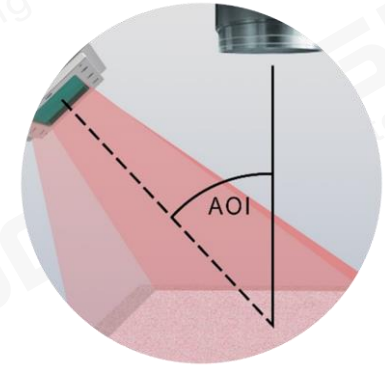
Contract Manufacturing  
Services



*Focuslight does not  
produce LiDAR /  
Lighting full system*

# Typical Applications

## Semiconductor



- Beam homogenization technology powers the illumination system – key optical component in **pan-semiconductor systems**
- > 15 years supply to the major manufacturer of semiconductor lithography tools

- Laser system solutions with high power density and different beam profiles, designed for various **laser-based wafer annealing processes** including IGBT backside annealing and SiC annealing

- Based on 976nm diode laser with adjustable beam output and >95% homogenization in energy distribution
- Ideal for **advanced chip packaging processes**, e.g. laser-assisted bonding

- Off-axis beam shaping technology powers laser surface treatment as well as surface inspection
- Typically used in **solar cell industry**

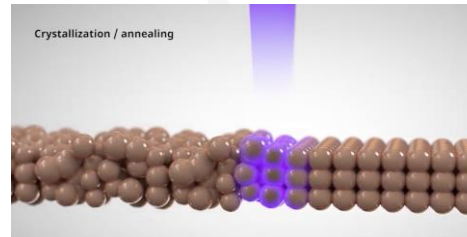
# Typical Applications

## Display

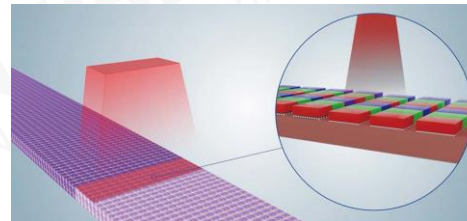


### Solid-State Laser Lift-Off (LLO) for Flexible Displays

- Several tens of beam shapers (plasma display pixel structuring)
- Several green 100 mm line beam systems (laser lift-off)
- > 600 mm UV line beam production system (laser lift-off)



### Next-gen LTPS Solid-state Laser Annealing Process



### Mini and Micro LED Processing

- Laser Mass Transfer and Laser Mass Soldering
- Laser Chip Repair



# Typical Applications

## Medical and Health



Hair Removal



Body Sculpting



Skin Rejuvenation



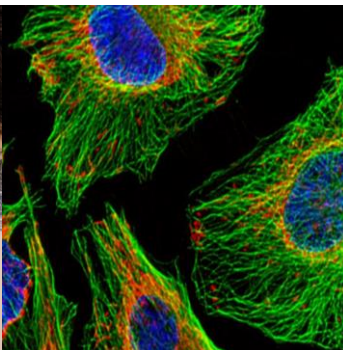
Ophthalmology



3D Interoral  
Scanning



Dermatology



Confocal  
Microscopy



Endoscopy



Sensing



Laser Surgery



Optical Components;  
Laser Components



Optical Solutions;  
Laser+Optics Assembly;  
Application Handpiece

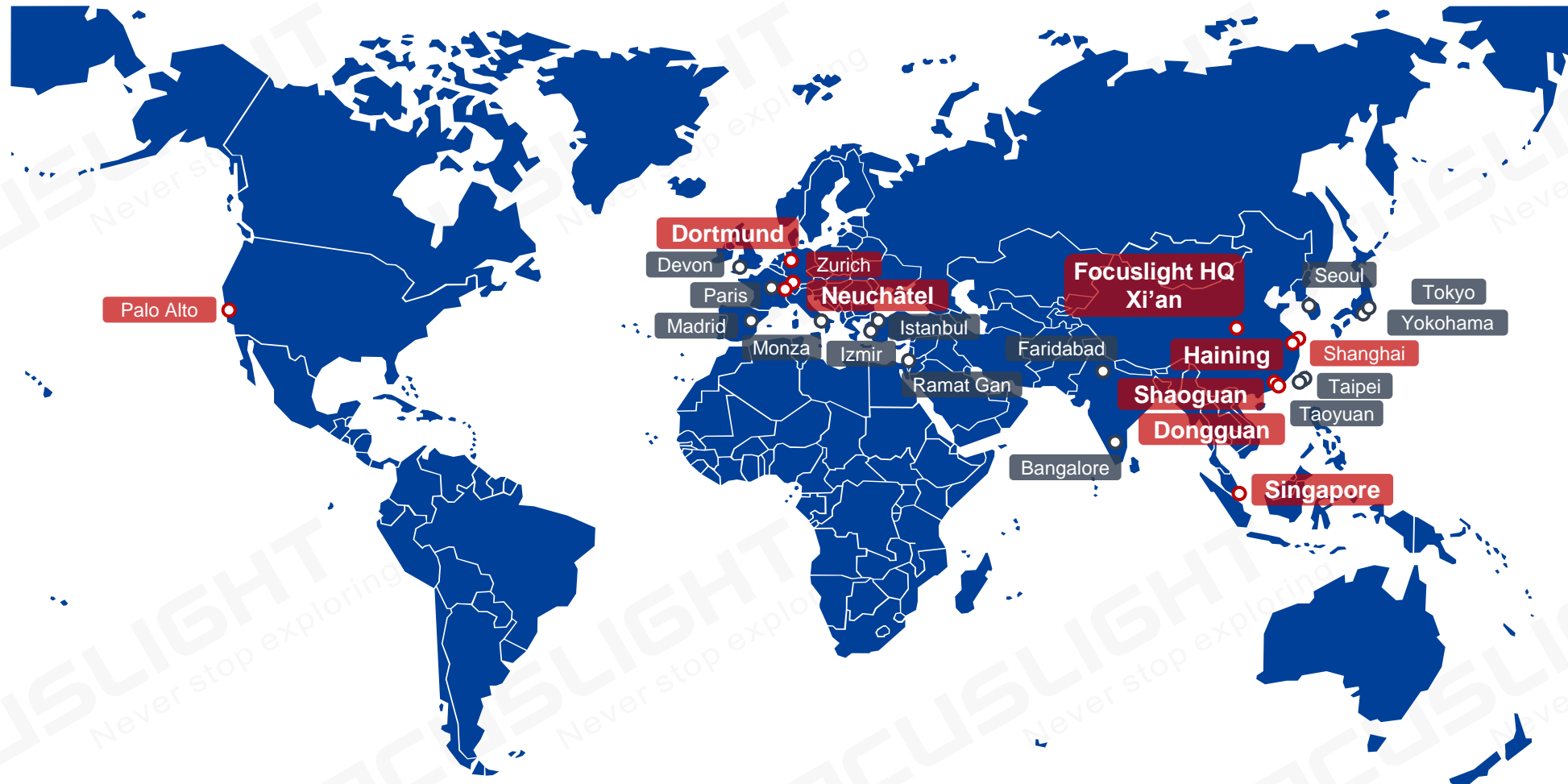


Contract Manufacturing  
Services



*Focuslight does not  
produce medical or  
health equipment*

# Sales Network



- Worldwide established distributors
- Direct sales offices in China, Switzerland and US
- Manufacturing site in Xi'an, Dortmund, Dongguan, Haining, Shaoguan, Neuchâtel, and Singapore

## Your committed and reliable long-term partner in photonics components and solutions



Diode laser light source leader and beam shaping expert with strong IP position



One-stop source from active devices to passive optics, from components to modules to application subassemblies



Global photonics foundry that convert customers' ideas and designs into their own products and solutions



Total solution, versatile customization service and field service provider



Strong RDE capability, high volume production capacity and low-cost manufacturing



Financially healthy and strong financial backing from investors for long term growth

# THANK YOU



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