FOCUSLIGHT

Never stop exploring

Focuslight BeamRazor™ LE02
Line Laser Transmitter for Beam Steering LiDAR

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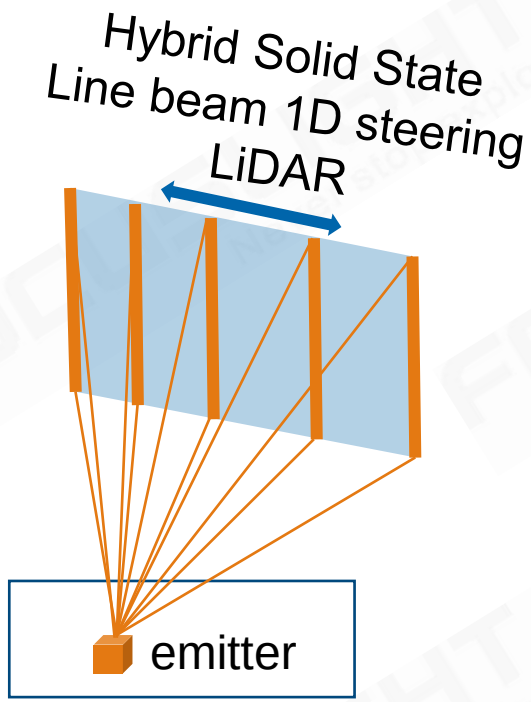
Focuslight Technologies Inc.
2021.3.30

Focuslight LiDAR Line Laser Transmitter

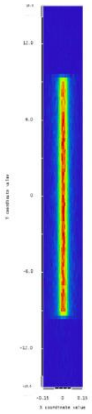


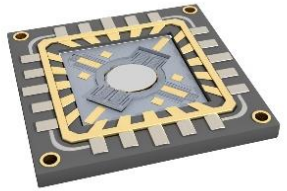
LiDAR-Tx L – Laser Tx Module for Line Steering

LiDAR-Tx OA – Optical Component & Assemblies

Innovative Line Beam Steering Approach, combined with SPAD/SiPM detector, would be the ideal couple for hybrid beam steering LiDAR:

One single laser line beam + Rotating mirror or 1D MEMS + SPAD / SiPM linear array





Focuslight's Line Laser Transmitter for LiDAR

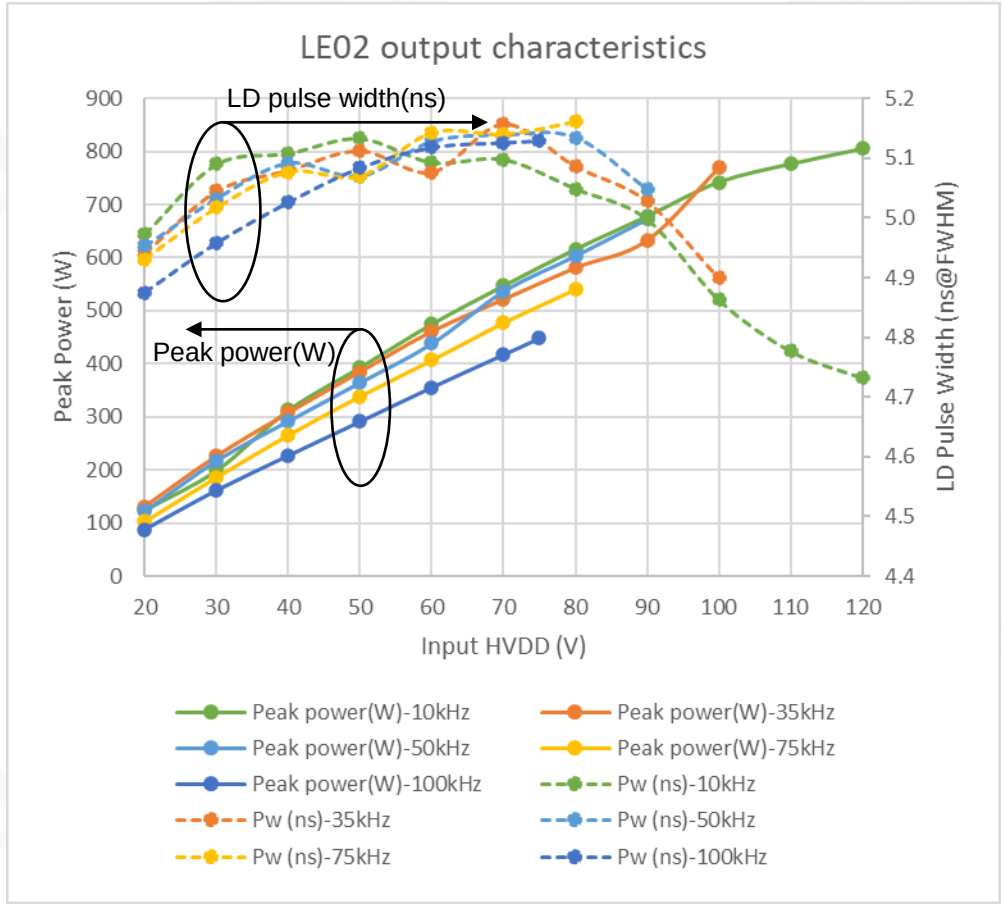
- Minimum moving parts
- Supporting various line densities: 16 lines – 64 lines - 128 lines – 300 lines
- Suitable for 1D MEMS or Steering Mirror

BeamRazor™ Series

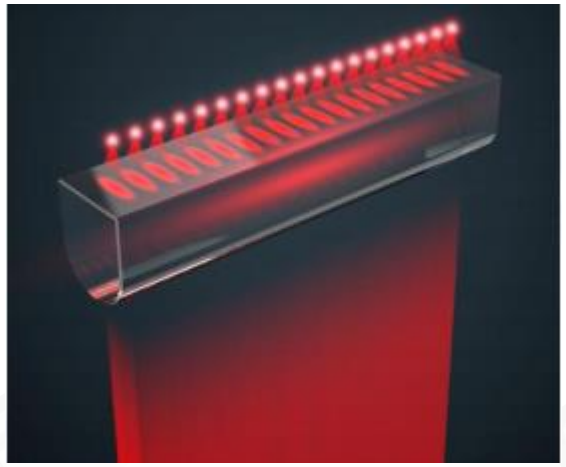
BeamRazor ™ LE02
LiDAR Tx Line Module

BeamRazor™ LE02 Line Laser Transmitter	
Dimensions	55*38*14mm
Laser diode	Support 905nm 8-ch LD bar
Peak power	> 700W@10kHz~50kHz (input HVDD=100V)
LD pulse width	~5ns
Divergence in fast axis@FW 1/e2	<0.12deg@FW 1/e2
Divergence in slow axis@FWHM	Diffuser: 20deg / 25deg; Homogenizer: 11deg / 25deg
Sample available	Available from 2021 Q1

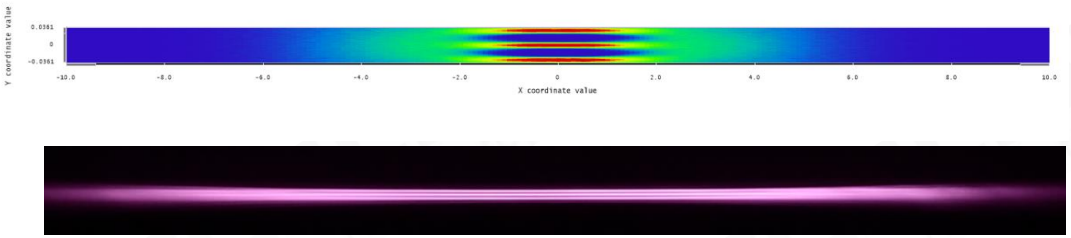
* Auto-grade design is possible according to customers' demands



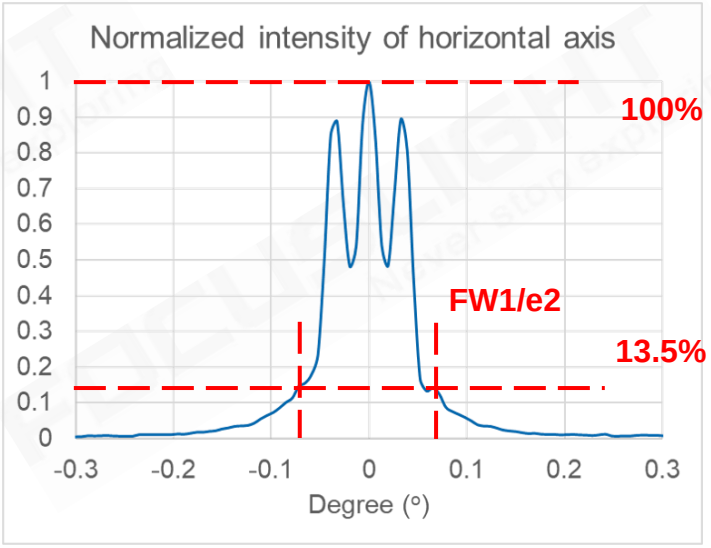
Line Laser Generation – Horizontal Direction



Fast Axis Collimators (FAC)



Simulation and Real test after FAC collimation (far field)

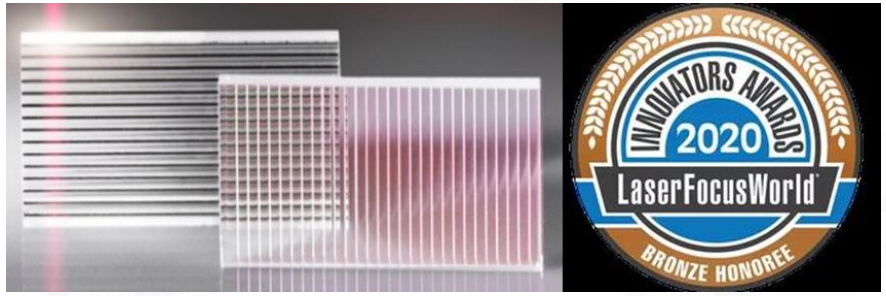


FA lens configuration	Effective focal length EFL	FA divergence (FW 1/e2)
FAC1500	1.5mm	0.44deg
FAC3000	3.0mm	0.22deg
FAC7700	7.7mm	0.12deg
Customized	…	<0.1deg

Unique collimation technique:

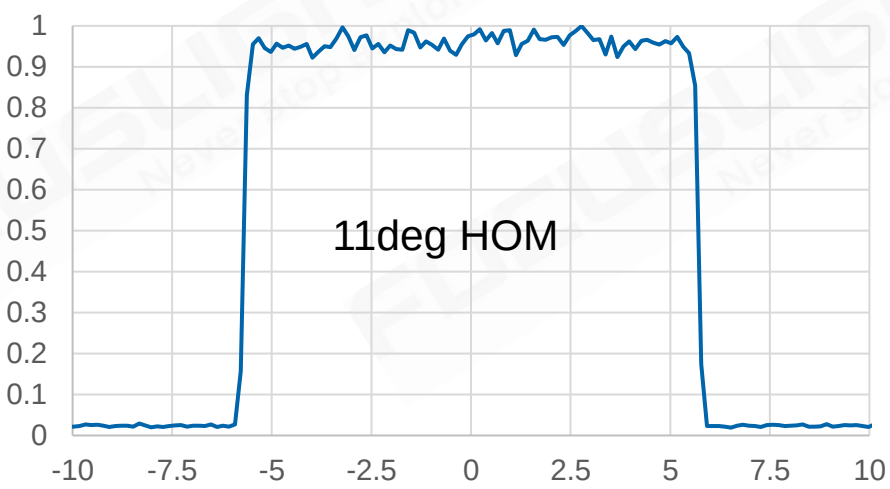
- Very small divergence in fast axis (horizontal direction)
- Automotive-grade operating temperature (-40℃ - 105℃)

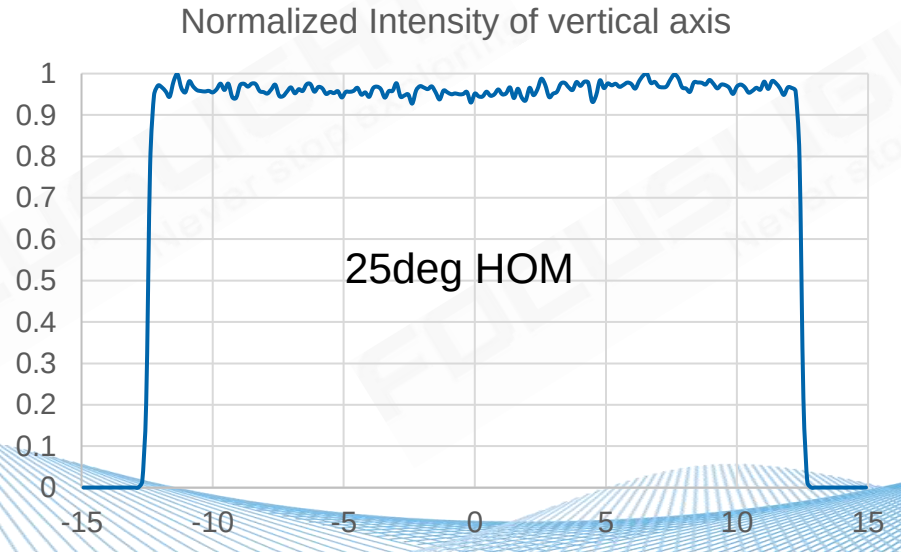
Line Laser Generation – Vertical Direction



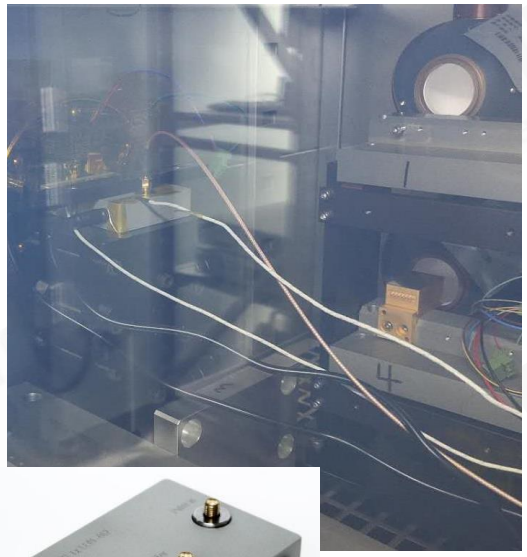
Diffuser & Homogenizer
(Innovators Awards of Laser Focus Word)

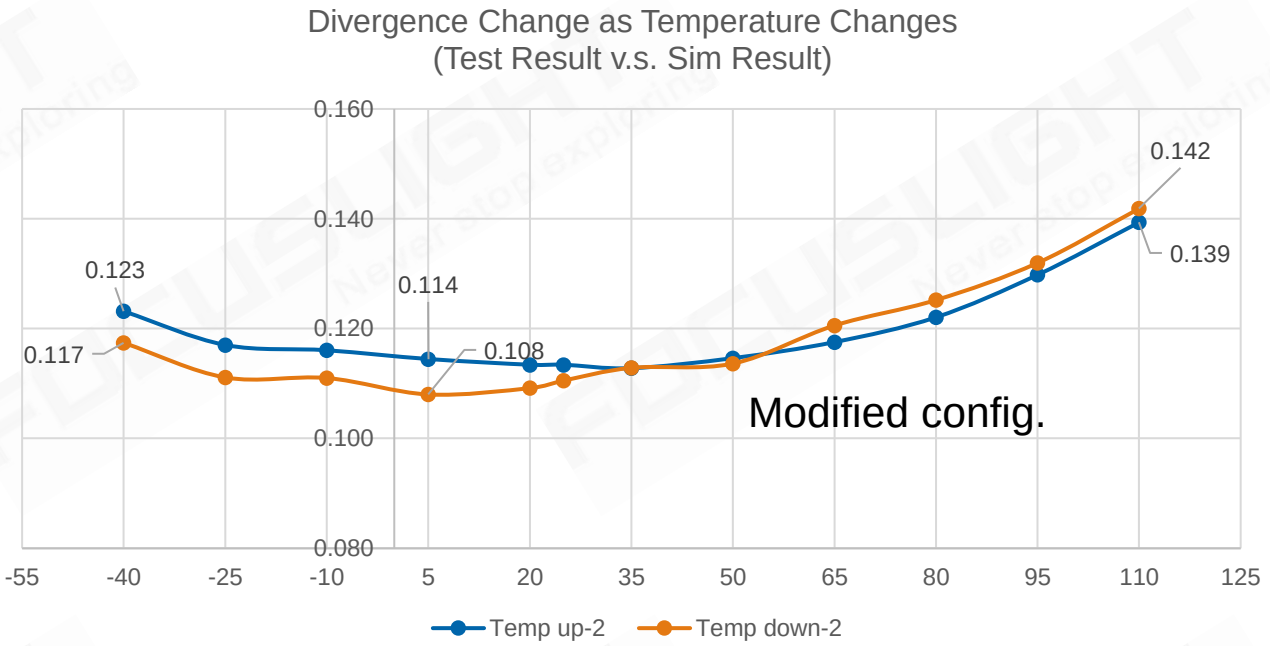
- High uniformity (>90%)
- Large FOV design (<160º)
- No hot spot (No energy concentration)
- Auto-grade operating temperature (-40℃ - 105℃)
- Ultra-low stray light (<0.1%)
- Customized vertical profile is possible

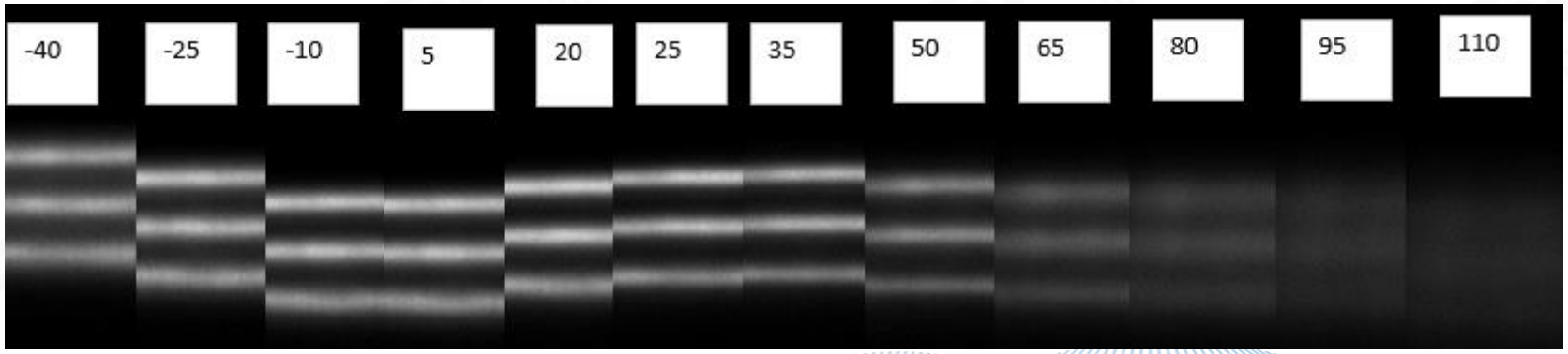




Wide Temperature Operation Challenge







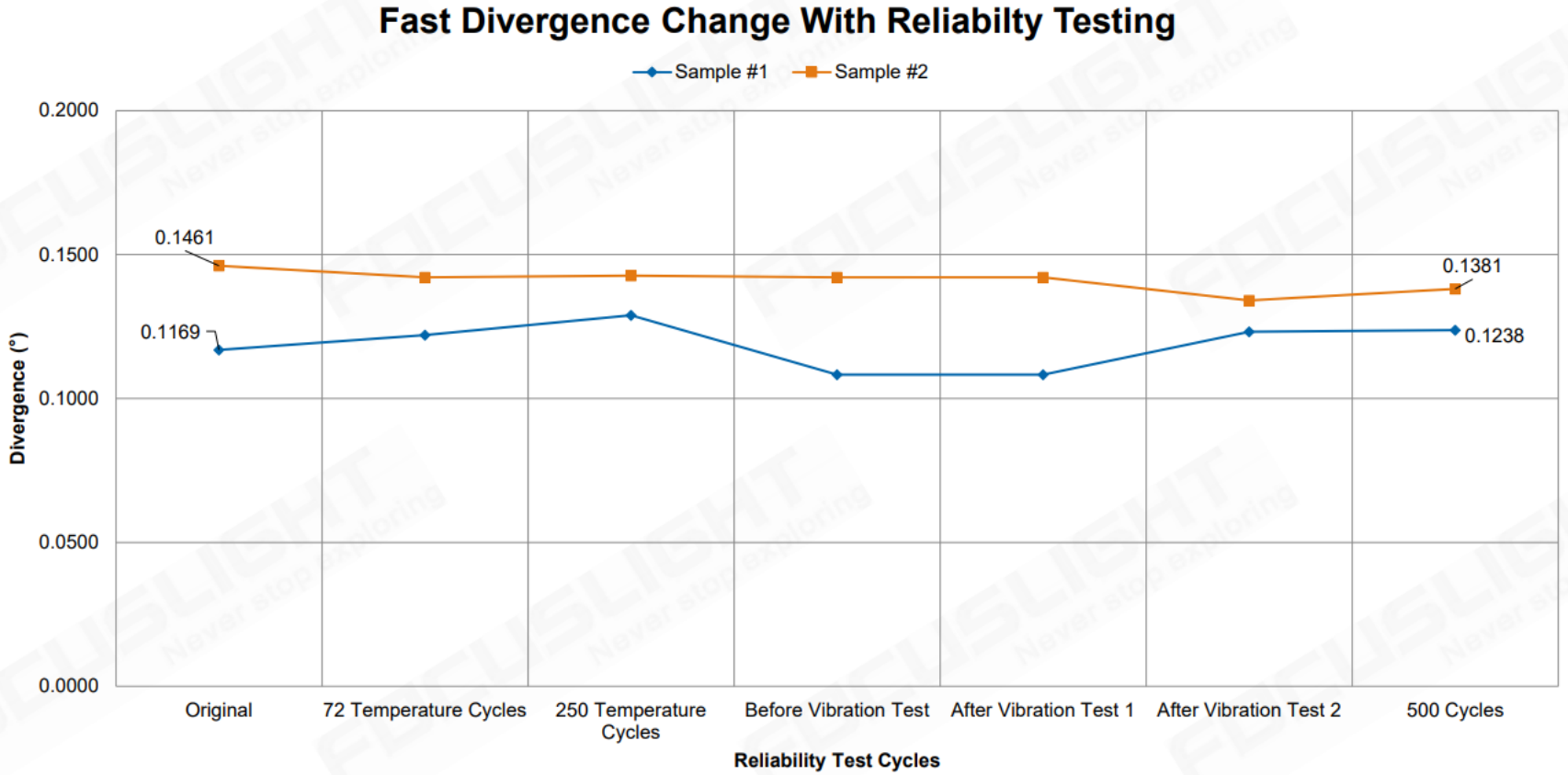
Beam profile change at different temperature

Wide temperature operation optimization:

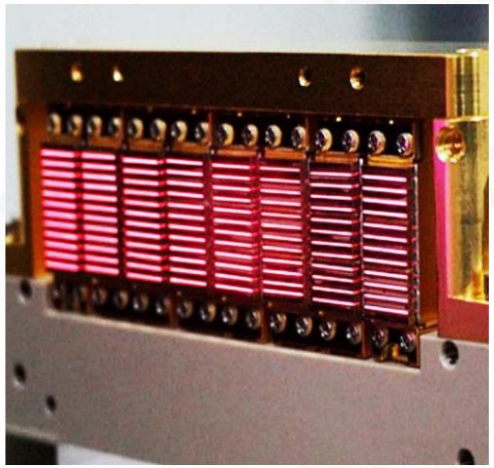
- Smart material selection and structure design
- Optimized optical design and improved process

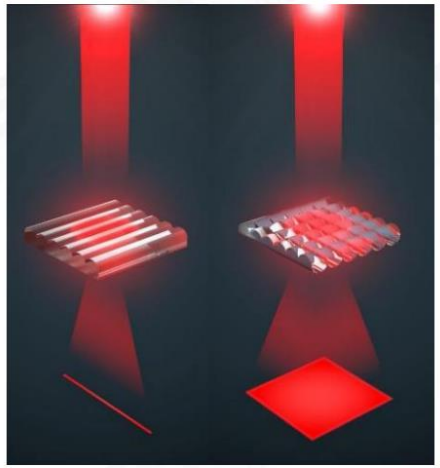
Reliability test

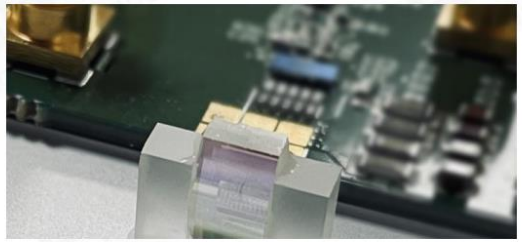
- Temperature cycles
- Vibration test

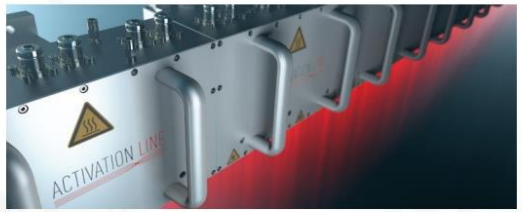


Focuslight Overview









Photon Generation + **Photon Control** + **Photonics Application Solutions**

Focuslight Overview- Automotive BU

AL01 (Mass Production)

Developed for a top Tier-1
(Auto grade DPSS 1064nm)

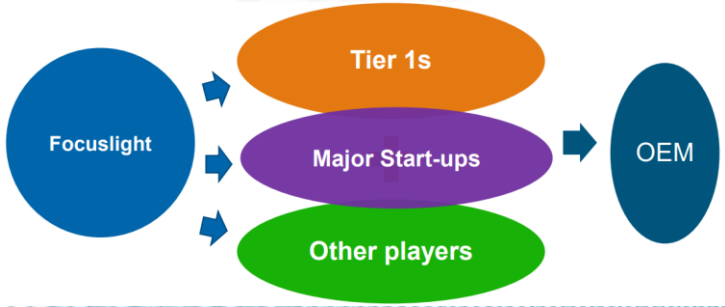
Mass production line of 3D flash LiDAR laser module in Focuslight

Quality Management System
IATF16949

Highlights of Automotive BU

- The world's first full solid-state 3D flash LiDAR Laser module AL01 (in mass production for a Global Tiers-1)
- ACE-Q102 verification
- IATF 16949 certificate

✓ Optical component
✓ LiDAR transmitter
✓ Assembling service
✗ LiDAR system



THANK YOU

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LIMO
A Focuslight Company