



Quarterly Financial Results Briefing 3rd Quarter of FY2021

QD Laser, Inc.
February 2022

Mission

**With the power of the semiconductor laser,
“I can’t” becomes “I can”.**

Contents

01 Financial Results for FY2021-Q3

02 Semiconductor Laser Devices

03 Laser Retinal Projection

04 Further Growth Upside Expected

05 ESG Initiatives

What was once thought to be impossible is now a reality; we have become the only company in the world to successfully mass produce Quantum Dot LASERs.

Our laser technology will enable dramatic improvements in our ability to process information, support visually impaired people, prevent eye diseases, and enhance vision, continually pushing the boundaries of human possibility.

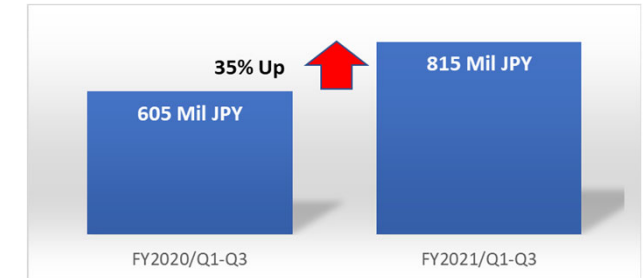
01

Financial Results for FY2021-Q3

Financial Results Highlights for FY2021-Q3 vs FY2020-Q3

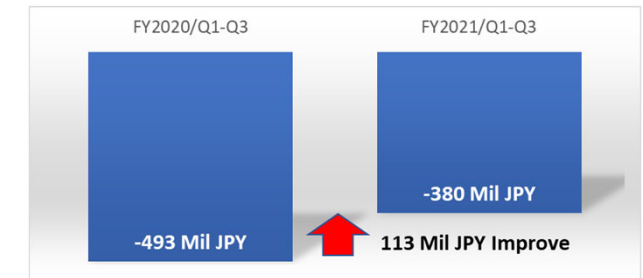
➤ 35% Sales Growth

Orders increased for the laser device business in DFB lasers for high-precision processing, compact visible lasers for biosensors, high-power lasers for sensors, and NRE (Non-Recurring Engineering). The laser eyewear (LEW) business also increased due to sales to financial institutions.



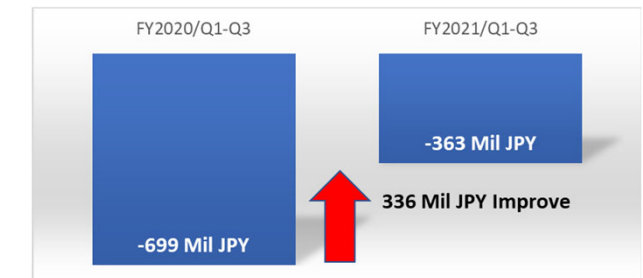
➤ 113 Million JPY Operating Loss Improved

Operating loss improved due to increased sales and a reduction in depreciation and development costs. Laser device (LD) business achieved the operating profit in cumulative three quarters of the year for the first time since the establishment.



➤ 336 Million JPY Quarterly Net Loss Improved

The same period of the previous year recorded an impairment loss on fixed assets of 161 million yen in the laser eyewear business, and net loss improved in the current year.



Financial Result Highlights for FY2021-Q3 vs FY2020-Q3

Sales Growth and Operating Loss Improved

35% sales growth driven by both businesses. LD business achieved the first operating profit in three quarters of the year since the establishment. The operating loss improved by 113 million JPY.

Performance Summary

(Million JPY)	FY2021 Q1-Q3	FY2020 Q1-Q3	YOY
Sales	815	605	+35% (+ 209)
(LD)	776	571	+36%
(LEW)	38	33	+14%
Operating Profit or Loss (△)	△380	△493	+113
(LD)	27	△15	+42
(LEW)	△194	△309	+115
Ordinary Loss (△)	△378	△537	+158
Quarterly Net Loss (△)	△363	△699	+336

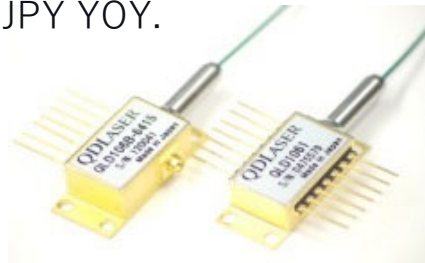
Sales by Product Group

(Million JPY)	FY2021 Q1-Q3	FY2020 Q1-Q3	YOY
DFB Laser	251	190	+32%
Compact Visible Laser	127	74	+72%
High-Power Laser	211	146	+45%
Quantum Dot Laser	83	97	-14%
NRE	102	58	+76%
Others	0	4	-100%
LD Total	776	571	+36%
LEW Total	38	33	+15%
Grand Total	815	605	+35%

^{*1} DFB Lasers for Precision Machining and Measurement : Sales in FY2021-Q3

251 million JPY sales, increased by 32% YOY.

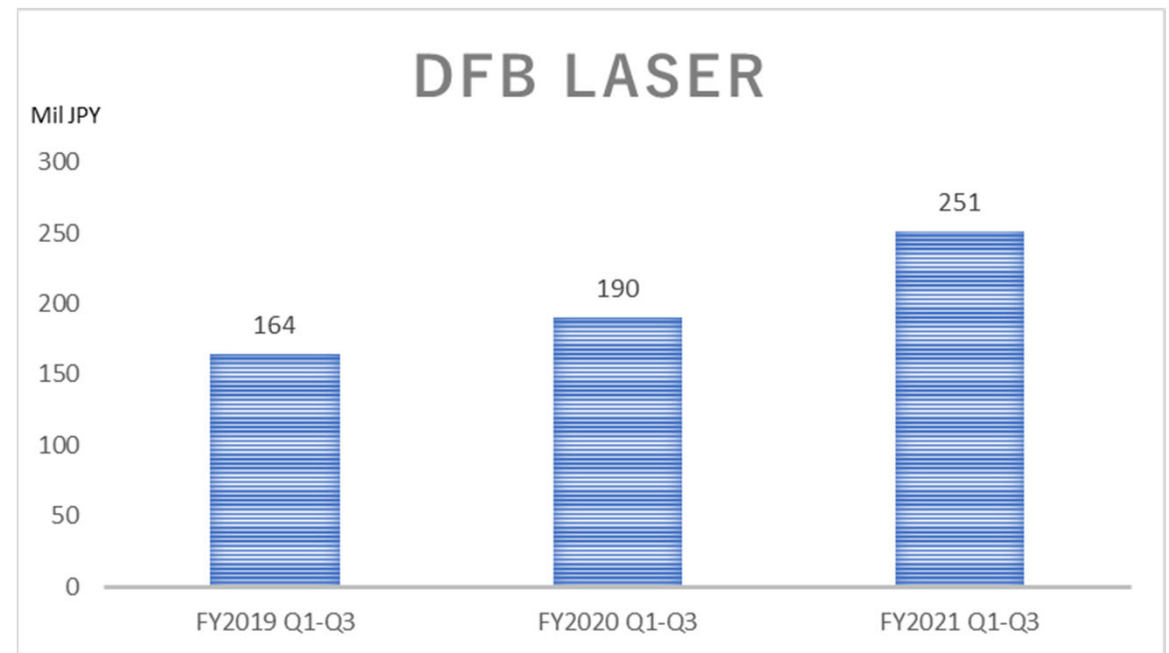
- North America: Sales increased by 255% YOY with the mass production of new equipment for precision machining started and solid orders for existing products.
- Europe: Sales of light sources for inspection equipment in the semiconductor wafer process increased by 33% YOY.
- Asia: Sales of light sources for LiDAR increased by 10 million JPY YOY.
- Europe: Sales of light sources for geomagnetic observation increased by 6.32 million JPY YOY.



DFB lasers

Left : for 15 ps pulsed operation

Right : for 50 ps pulsed, ns pulsed, and CW operations

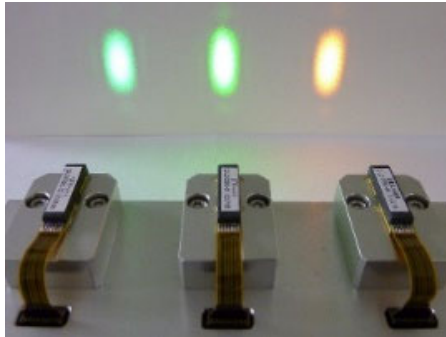


Cumulative sales of Q1 to Q3 in
FY2019, 2020 and 2021

Compact Visible Lasers : Sales in FY2021-Q3

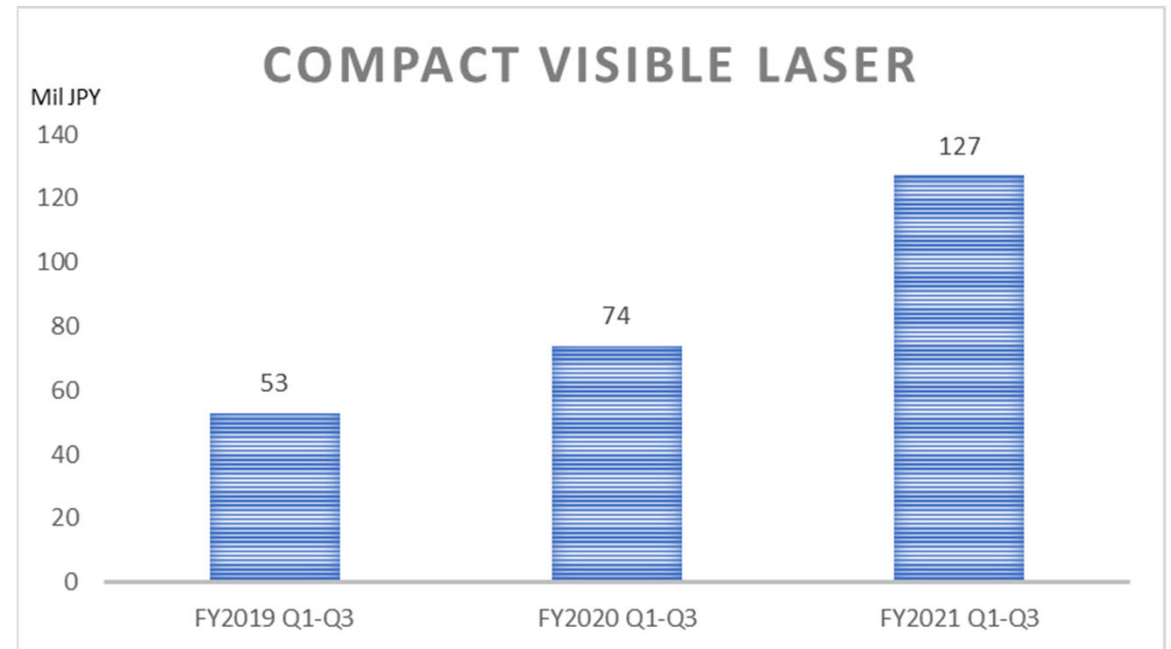
127 million JPY sales, increased by 72% YOY.

- China: Sales increased by 79% YOY with the mass production of a new application (cell sorter*1) started in the biomedical equipment manufacturer.
- Europe: Orders from a biomedical STED*2 microscope manufacturer resumed with sales of 1.45 million JPY and a forecast of 100pcs in 2022-2023 received. Note: the manufacturer has consumed most of the stock of 300 units shipped in 2019.



Compact visible lasers

Left: green, middle: yellow-green, and right: orange.



Cumulative sales of Q1 to Q3 in
FY2019, 2020 and 2021

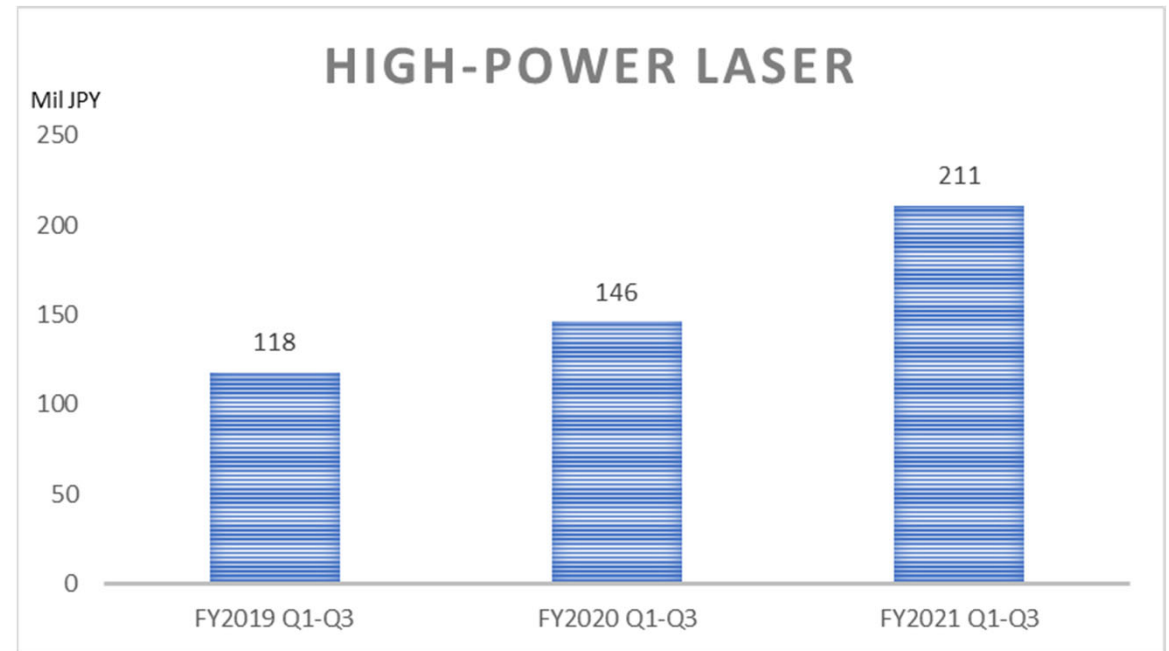
High-Power Lasers : Sales in FY2021-Q3

211 million JPY sales, increased by 45% YOY.

- China: Increased sales of light sources for sensors and projectors by 15% YOY due to stable orders.
- Europe: Increased sales of light sources for baggage management sensors by 70% YOY.
- Europe: Increased sales of light sources for factory communications by 551% YOY.
- North America: Increased sales of light sources for machine visions by 78% YOY.
- Japan: Increased sales of light sources for particle counter at semiconductor factories by 932% YOY.
- Japan: Increased sales of light sources for machine vision by 7.2 million JPY YOY.



High-power lasers
TO package



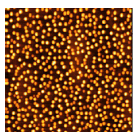
Cumulative sales of Q1 to Q3 in
FY2019, 2020 and 2021

Quantum Dot Lasers^{*1} : Sales in FY2021-Q3

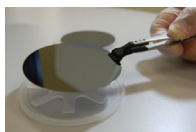
83 million JPY sales, decreased by 14% YOY.

QDLaser is working on quantum-dot lasers for silicon photonics with nine customers in Japan, the US, and Europe.

- Japan: Continuous orders on LiDAR development project for autonomous driving with the sales increased by 64% YOY.
- Japan: Completed the development of highly efficient chips for the optical connector and chip-to-chip communication customer. With the excellent test results from the customer, the chip is to move on to mass production in 2023.
- North America: Shipped to three customers working on LiDAR and optical connector/chip-to-chip communication in Q1-Q3 and scheduled to receive repeat orders from one customer in Q4. The first order is scheduled for a new customer in Q4.
- North America: First order received from a new customer for optical connector/ chip-to-chip communication and scheduled to receive the second order in Q4.
- Europe: First order is planned from a new customer for optical connector/ chip-to-chip communication in Q4 or later.



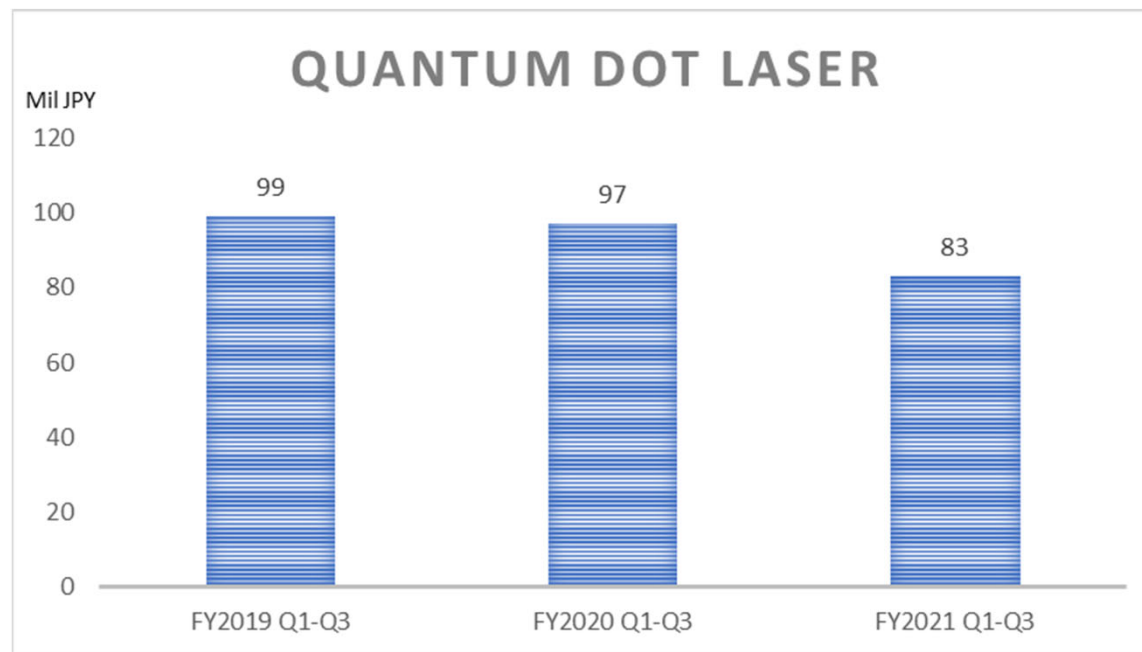
Quantum dot



Quantum dot wafer



Quantum dot laser chip



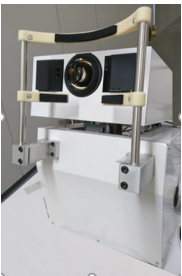
Cumulative sales of Q1 to Q3 in
FY2019, 2020 and 2021

NRE : Sales in FY2021-Q3

102 million JPY sales, increased by 76% YOY.

• Received the development consignment from medical, eyeglass, and university hospital-related customers with NRE (Non-Recurring Engineering) fee to realize the prototypes for
✓ Laser scanning fundus photography ※1
✓ Refractive power measurement ※2 ✓ Handy-type visual field testing※3
based on the laser retinal projection technology.
For 3Q, the basic specifications of the refractive power measuring device are delivered.

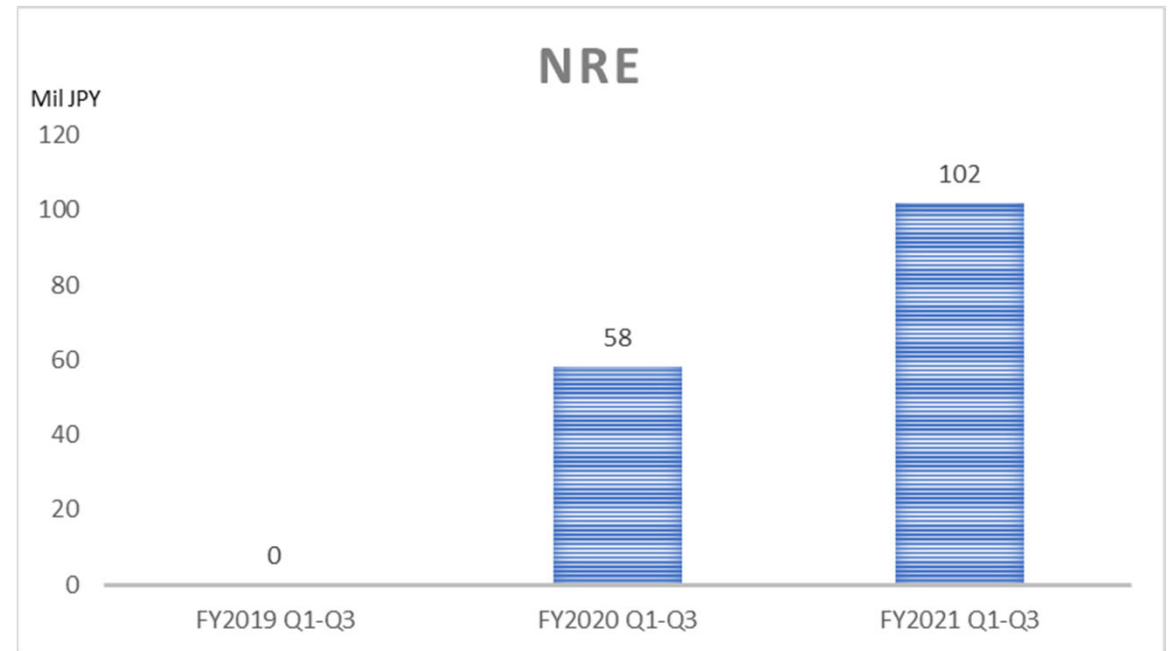
Fundus
photography



Refractive power
measurement



Handy-type
visual field testing



Cumulative sales of Q1 to Q3 in
FY2019, 2020 and 2021



※ 1 A prototype for laser scanning fundus photography enables fundus image acquisition at low cost and easy operability.

※ 2 A prototype for refractive power measurement allows you to subjectively and objectively inspect the refractive power of your eyes.

※ 3 A handheld device that directly projects a point image onto the retina according to an algorithm and measures the field of view and sensitivity.

Laser Eyewear (LEW) : Sales in FY2021-Q3

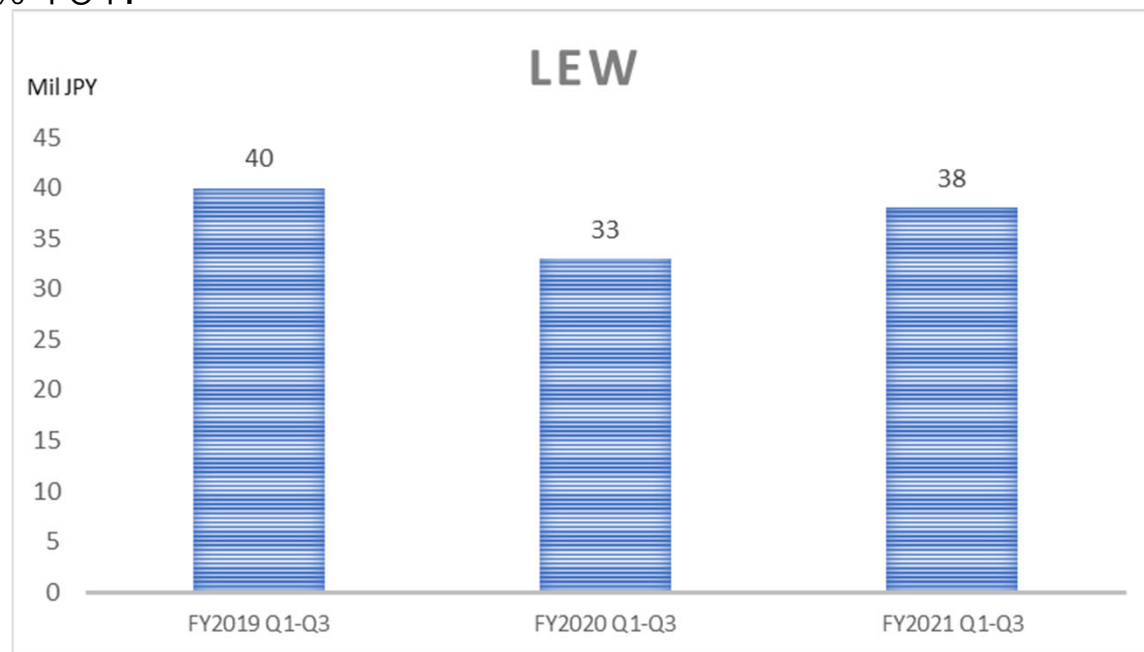
38 million JPY sales, increased by 15% YOY.

■ RETISSA Medical

- Eleven domestic medical institutions now introducing the device to patients
- Promotion by Santen Pharmaceutical and Seed to 471 hospitals on corneal diseases.
- 15 units sold to hospitals and patients.

■ RETISSA Display II

- Accessory camera launched on the EC site on August 31st.
- Video:<https://youtu.be/RSSeiCLq7v8>
- Local Municipality Subsidy with 90% benefit registered in 3 cities in Tokyo. Plan to expand to many cities nationwide
- 37th CSUN Assistive Technology Conference on March 14th to 18th @ Anaheim in USA
Joint exhibition with a digital camera maker



Cumulative sales of Q1 to Q3 in
FY2019, 2020 and 2021



RETISSA Display II



RD2CAM



RETISSAメディカル

Revision of Annual Forecast

Annual forecast is revised on February 10, 2022.

Revision of Annual Forecast

	Sales	Operating Loss	Ordinary Loss	Net Loss	Net Loss per Share
	Mil JPY	Mil JPY	Mil JPY	Mil JPY	JPY
Previous announcement forecast (A)	1,260	△533	△505	△508	△14.71
Revised forecast (B)	1,097	△549	△516	△502	△14.34
Increase / decrease amount (B-A)	△163	△16	△11	+6	
Increase / decrease ratio (%)	△12.9	△3.1	△2.3	+1.2	
Previous year result	895	△654	△707	△879	△32.94

Preventing measures of the worldwide spread of COVID-19 still restricts people's movement, exhibitions, and interviews with low vision people, interfering with the sales and promotion of laser eyewear.

Although we achieved our sales target in the first half, we revised our annual forecast considering that the COVID-19 impact remains during the current fiscal year. While sales decreased by 163 million yen, the decrease in operating income is limited to 16 million yen owing to reduced expenses in selling, general and administrative expenses, including suspension of overseas business trips. Ordinary income will decrease by 11 million yen due to increased foreign exchange gain. In addition, net income will increase by 6 million yen due to reduced restoration costs and extraordinary income.

Regarding the future, although the outlook is uncertain, there are signs of recovery in demand in overseas markets. With an expected recovery in demand in mind at the end of the spread of COVID-19, we continue activities to promote our products.

We are to enroll new three products as low vision aids and optometry in the fiscal year of 2022. Low vision aids include Retissa Super Capture for retinopathy to be demonstrated together with a digital camera maker and Retissa Handy to be introduced to public space like libraries, museums, and hospitals, so on.

Progress against Full-Year Forecast

74% progress against the full-year earnings forecast.

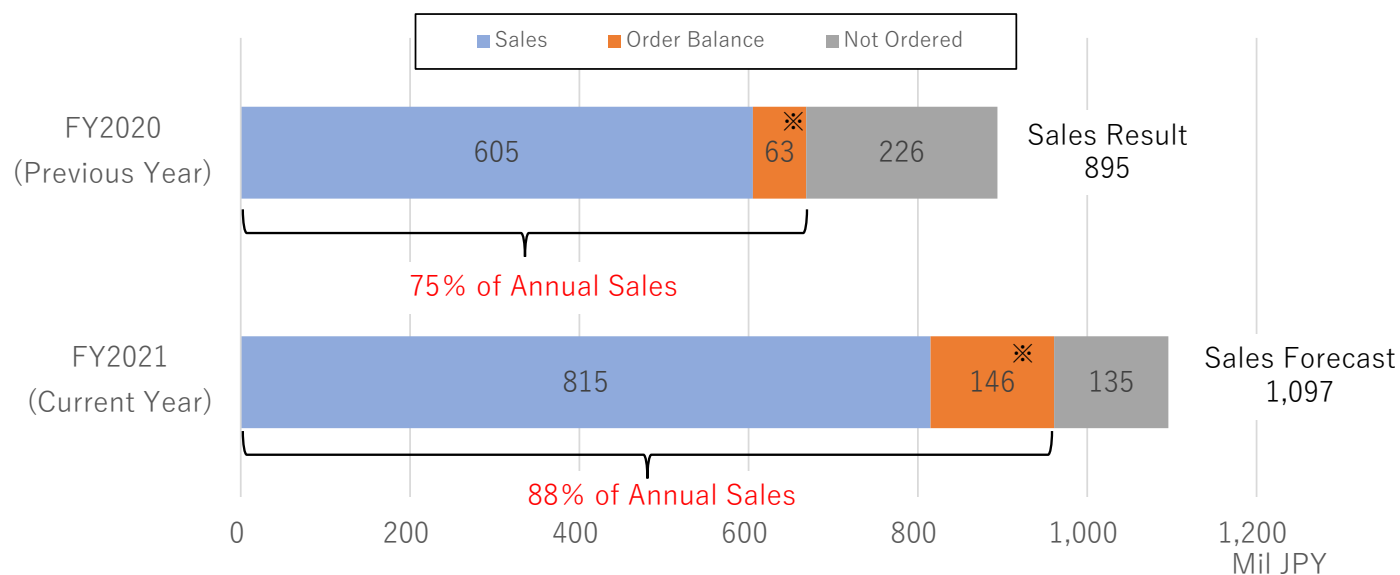
Progress against Forecast

(Million JPY)	FY2021 Forecast	FY2020 Result	YOY	FY2021 Q1-Q3 Result	Progress Rate
Sales	1,097	895	+23% (+201)	815	74%
(LD)	1,003	841	+19%	776	77%
(LEW)	93	54	+73%	38	41%
Operating Profit or Loss (△)	△549	△654	+105	△380	-
(LD)	37	7	+29	27	-
(LEW)	△304	△434	+129	△194	-
Ordinary Loss (△)	△516	△707	+191	△378	-
(Quarterly) Net Loss (△)	△502	△879	+377	△363	-

Order Progress Status

As of the end of the third quarter, sales + order balance (planned to sell for the current fiscal year) was 88% of the annual forecast sales, a significant increase from the previous year's 75%.

Sales and Order Balance against the Annual Sales Forecast



Issuance of Stock Acquisition Rights

Issued the 14th and 15th stock acquisition rights on December 13, 2021

		14th Stock Acquisition Rights	15th Stock Acquisition Rights
Issuing method		Third-party allotment to SBI SECURITIES CO., LTD. (With strike price adjustment clause)	Third-party allotment to SBI SECURITIES CO., LTD. (Fixed strike price)
Outline of Issuance	Exercisable period	December 14, 2021 to December 13, 2023	
	Estimated finance amount	3,167 million yen	1,858 million yen
	Number of stock acquisition rights	33,000 units	12,800 units
	Number of issued shares	3,300,000 shares	1,280,000 shares
	*Diluting rate	9.4%	3.6%
Strike Price	Initial strike price	956 yen	1,450 yen
	Strike price revision	Amount equivalent to 90% of the closing price on the trading day before the effective date of each exercise request	After June 13, 2022, the amount can be adjusted to 90% of the closing price on the previous trading day by a resolution of the Board of Directors. (Up to once every 6 months)
	Maximum strike price	—	—
	Minimum strike price	670 yen	1,450 yen If the strike price is revised by a resolution of the Board of Directors, the lower limit is 670 yen.
Others	Ancillary provisions	Exercise suspension clause (Specify a period that cannot be exercised at our discretion)	
	Acquisition clause	•All remaining stock acquisition rights can be acquired at our discretion •Acquired all stock acquisition rights remaining on the last day of the exercisable period	
	Transfer restrictions	The transfer of stock acquisition rights requires the approval of the Board of Directors	

Issuance of Stock Acquisition Rights

Our business situation and purpose of financing

Laser Devices Division



◆ The semiconductor laser industry market, to which the laser devices division belongs, is steadily expanding to meet the growing global needs in optical communication/ interconnects, displays, biosensors, smartphone face recognition, Lidar for autonomous driving, precision processing, and the like. To meet that demand and maintain sustainable business growth, we need to secure production capacity to respond to market expansion, improve quantum dot technology, and improve product reliability.

Laser Eyewear Division



◆ The laser eyewear business division's retinal imaging laser display technology is a new technology, not commercialized so far besides QD Laser. Developing new businesses and services based on retinal imaging technology is indispensable through strategic investment in license procurement of peripheral technologies and capital and business alliances to expand this unique business domain.

The purpose of this equity finance is to improve corporate value further through twofold investment. One is expanding the business foundation to increase production capacity and shorten development lead time in our laser devices business. The other is employing M & A of high-tech companies, capital and business alliances, and expansion of personnel leading to existing business growth and new business creation.

The investment using the funds obtained from this financing will be carried out over the medium to long term, resulting in future corporate value improvement. Thus, the funds are not for temporary working capital but the investment leading to long-term growth. We have judged to raise capital funds stably and continuously, rather than borrowings obliged to repay.

Issuance of Stock Acquisition Rights

Details of fund usage

Use of funds	Purpose
①Production Capacity Increment	The laser device business operates in various steadily growing markets such as precision processing, bio-inspection equipment, sensors, and communications. We have provided silicon photonics vendors with quantum dot lasers with excellent high-temperature operation characteristics for use in data centers, 5G base stations, and the like, where high-temperature operation is indispensable. A wider range of applications is expected in quantum dot lasers for silicon photonics, such as LiDAR for autonomous driving and chip-to-chip communication in electronic devices. We also provide compact visible lasers using our unique packaging technology to the bio-inspection equipment market, including flow cytometers and the like. We expect a further increase in demand as they contribute to the miniaturization and higher functionality of the equipment. Reinforcing production capacity to meet these increasing demands will scale our business and our business performance.
②Labor Costs	For our business to achieve continuous development, it is essential not only to develop technology-based new products but to acquire and educate human resources responsible for developing new markets. We have been recruiting human resources through introduction companies and web media. We will continue to secure human resources who resonate with our vision to support sustainable growth.
③Advertising Expenses	The smart glasses industry, to which our laser eyewear business belongs, is receiving increasing attention as seen in the increasing publication in newspapers, magazines, and web media, and its market continues to expand. We will actively promote our products by exhibiting at exhibitions, utilizing web media, and raising awareness to gain market share. We will establish a solid position in the smart glasses market and differentiate ourselves from our competitors.
④M & A, Capital and Business Alliance Investment	It is possible to complement and strengthen our business by implementing M & A and capital and business alliances with other companies in the same industry. The synergies help us expand our laser device business and laser eyewear business and improve corporate value by integrating our technologies and know-how, including crystal growth, device design, package design, optical design, and retinal imaging.

Issuance of Stock Acquisition Rights

FAQ

No	Question	Answer
1	What are stock acquisition rights?	Stock acquisition right is the right to receive the shares of the issuing company(QD Laser) through its execution. When SBI Securities, to which the stock acquisition rights are to be allotted, exercises the rights, QD Laser will receive payment of money equivalent to the exercise price. This means delivering QD Laser's common stock to SBI Securities for fundraising.
2	What is the outline of fundraising?	• QD Laser raises funds by allocating the Stock Acquisition Rights to SBI Securities and SBI Securities' exercising the Stock Acquisition Rights. The exercise price will be adjusted to the amount equivalent to 90% of the closing price of QD Laser's common stock on the trading day immediately before the exercise request for the 14th stock acquisition rights, rounded up to the nearest yen. The exercise price of the 15th stock acquisition rights remains at 1,450 yen without QD Laser's board resolutions to amend the exercise price. • A minimum exercise price is set for the Stock Acquisition Rights. The Stock Acquisition Rights will not be exercised at an exercise price lower than the minimum exercise price.
3	What is the reason or merit for choosing stock acquisition rights?	(1) The exercise price of the 14th stock acquisition rights will be adjusted to the amount equivalent to 90% of the closing price of QD Laser's common stock on the trading day immediately preceding the exercise request for the 14th stock acquisition rights, rounded up to the nearest yen. Since there is no maximum exercise price, QD Laser can enjoy the merit that the amount raised will increase when the stock price rises. (2) The exercise price of the 15th stock acquisition rights is fixed at 1450 yen without QD Laser's board resolutions to amend the exercise price. QD Laser intends to raise funds at a higher stock price level than the present. (3) It is possible to prevent a large amount of dilution from occurring at one time by setting a period of suspension of the exercise. (4) If funding is no longer required, QD Laser can acquire remaining stock acquisition rights.
4	Why did you choose stock acquisition rights over public offering or bank borrowing?	QD Laser chose this financing method as a result of the comparative examination with other financing methods: This method has the merit of 1) preventing immediate dilution compared to the public offering with a considerable preparation period, 2) maintaining financial soundness and flexibility of fund raising compared to borrowing, and 3) controlling the dilution to some extent by adopting the suspension clause.

Issuance of Stock Acquisition Rights

FAQ

No	Question	Answer
5	What are the disadvantages?	(1) This method will take a certain period to complete the exercise, depending on the activity by the allottee. (2) The actual procurement amount may be lower than the initially planned amount in the following cases: Regarding the 14th stock acquisition rights, the fall of the stock price accordingly reduces the payment price at the time of the exercise. Regarding the 15th stock acquisition rights, a resolution of QD Laser Board might lower the exercise price. (3) There is a possibility that the exercise will not proceed to prevent fundraise, such as when the stock price remains below the minimum exercise price.
6	How much is the planned procurement amount?	• QD Laser expects the total estimated amount of proceeds after deducting issuance costs to be 5,006 million yen. • Note that this amount is based on the assumption that SBI Securities exercise all the stock acquisition rights at the initial exercise price. The amount increases or decreases depending on the progress of exercise and the revision of the exercise price.
7	How significant is the dilution?	• The number of common shares, which is the purpose of the Stock Acquisition Rights, is fixed at 4,580,000 shares and causes the dilution of 13.14% of the total number of issued shares as of September 30th, 2021.
8	Is there any impact on the business results for this term?	• The influence of this funding on QD Laser's business results for the fiscal year ending March 2022 will be minor.
9	Will stock lending and short selling be carried out?	• SBI Securities, the allottee, has confirmed that it only sells QD Laser's shares acquired by exercising the Stock Acquisition Rights and never borrow QD Laser's shares for short selling.
10	Will you continue to raise funds like this?	• The purpose of this fundraising is to use the funds described in the background of the issuance of the Stock Acquisition Rights. QD Laser will respond to future demand for funds promptly based on corporate value.

02

Semiconductor Laser Devices

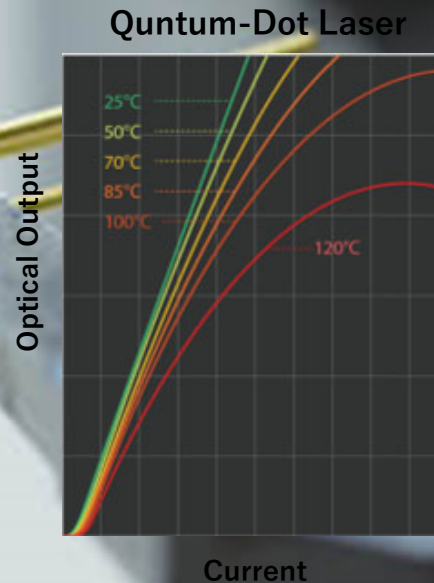
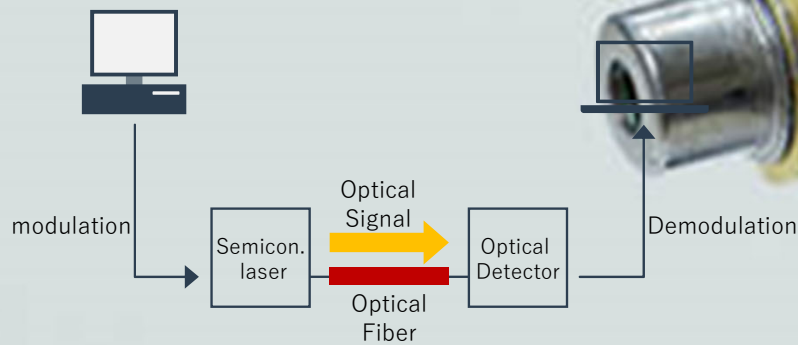
Solid Earnings Base and High Growth Potential
under Global Laser Market Expansion

Origin of semiconductor laser device business

Development and sales of "semiconductor lasers for optical communication" under strict specification requirements

Engineers in the R&D of optical communication devices gathered from many companies and started to put quantum dot lasers to practical use in the optical communication area. After their successful commercialization, we developed various products like compact visible lasers, DFB lasers, and quantum-dot lasers for silicon photonics.

Optical Communication@1300, 1550 nm



Requirements

High Speed

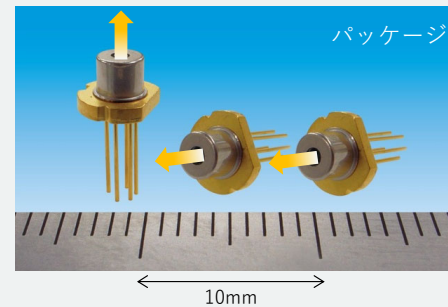
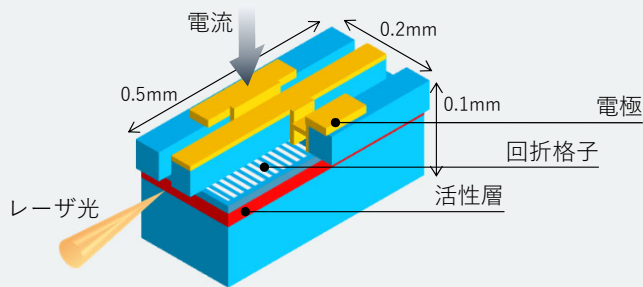
High and
Wide
Temperature

High
Reliability

Mass
Production

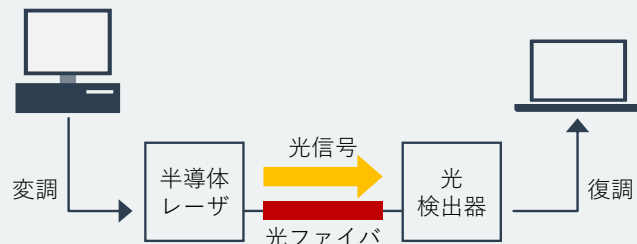
What is a Semiconductor Laser?

A tiny device to provide laser light by injecting an electric current through a semiconductor.

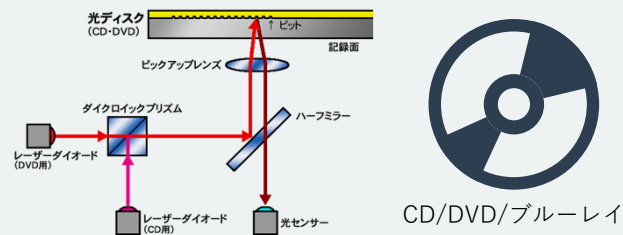


Optical communication and optical recording have significantly contributed to the global information and communication infrastructure.

Optical Communication@1300, 1550 nm



Optical Recording@660nm、450nm



Expected Role of QD Laser, Inc.

Semiconductor Laser History and Our Position in the 3rd Phase

1st phase

Proposals of Scientific Principles and Invention of Laser (1960s)

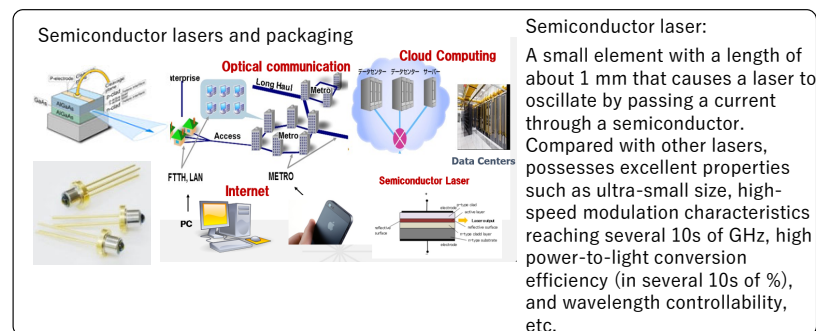
Laser

A technology used in recording, communication, processing and sensing.

Applied in various industries such as medicine, home appliances, automobiles, manufacturing and entertainment.

2nd phase

Invention of Semiconductor Lasers, Building out Optical Communication and the Internet (1995~)

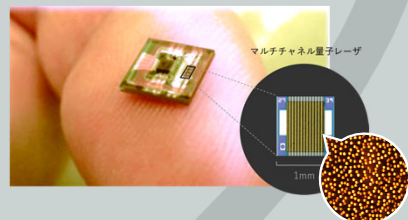


3rd phase

Accelerating the Integration of Humans and Information (2020s~)

Nanotechnology of QD laser to generate and control laser light

Image of quantum dots taken by an atomic force microscope and a quantum dot laser equipped on fingertip-sized silicon chip as 100Gbps optical transceiver



Quantum Dot Laser:

A semiconductor laser adopting a quantum dot structure which has a semiconductor nano-sized microcrystal in its active layer. Compared with existing semiconductor lasers, these lasers are superior in temperature stability, temperature resistance, and low noise.

Fields where our lasers are applied (being Developed or Commercialized)

- 5G base station
- Supercomputer
- Visual Aid
- Smart Glass
- Optical Interconnect
- Facial recognition
- Fundus photography
- Micromachining
- In-Vehicle communication
- LiDAR for autonomous cars
- Biophotonics

New Era for Semiconductor Lasers

We are developing products for all applications shown below and have launched a part of them

- Optical interconnect (Processors are connected by laser light)

⇒ Increase signal processing speed
(x100 to 1000)



- Display ⇒ AR/VR/XR

Smart Glasses

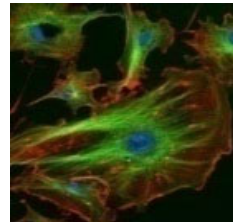


Head-up display



- Sensor ⇒ Precise detection of human and material
(shape, position, velocity)

Biomedical



Motion recognition



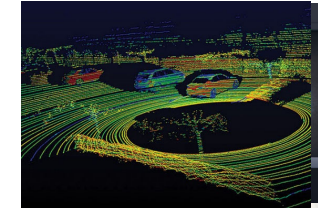
Face recognition



Fundus, Sight, Field of view



LiDAR
(Automotive, Robotics, Drone)



- Micromachining
⇒ Highly functional/high precision device manufacturing



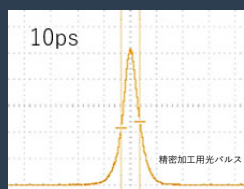
Our Core Technologies and Competitive Advantages

Material Creation, Design, and Control

Cutting Edge Semiconductor Laser Technology with Several Unique Features

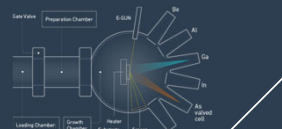
Laser Design

A technology to design lasers suitable for each use.
World's fastest (10ps)^{*3} semiconductor laser
 for precision material processing
 utilizing optical communication technology,



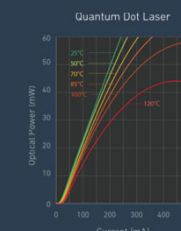
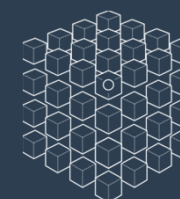
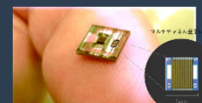
Semiconductor Crystal Growth

Technology to grow
 each atomic layer of semiconductor crystals
 on a semiconductor substrate



Quantum Dot

Succeeded in the mass production of
 quantum dot lasers with **world's highest operating temperature**^{*1}
 and developed **world's smallest silicon-based optical transceiver**^{*2}



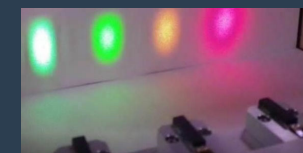
Small Module

A technology to make DFB lasers ultra compact.
 Our yellow/orange laser modules led us
 to become one of the finalists at the Prism Awards 2014.



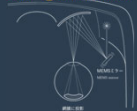
Diffraction Grating

Technology to form periodic refractive index change inside the laser
 enabling arbitrary wavelength control.
World's first^{*5} commercialization of yellow/orange semiconductor laser



VISIRIUM Technology

A technology to project
 images directly on the retina
 through ultra small laser projectors.
World's First Commercialization^{*4}



*1: "Extremely high temperature (220° C) continuous-wave operation of 1300-nm-range quantum-dot lasers",
 Published in 2011 Conference on Lasers and Electro-Optics Europe and 12th European

*2: Developed the world's smallest 5mm square ultra-high-speed, low-power-consumption optical transceiver – Achieved the world's best, 25Gbps / ch transmission

*3: 2017 PRISM Award in Industrial Lasers - QD Laser (2nd Feb 2017)
 Prism Awards honour photonic innovations at Photonics West 2019

*4: Japan/U.S. PATENT JP5362301/US8896911

*5:

Semiconductor Laser Devices Our Competitive Advantages / Barriers to Entry

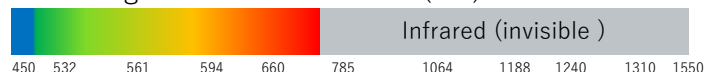
Laser Device

Business Model

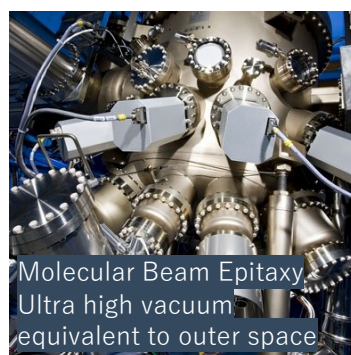
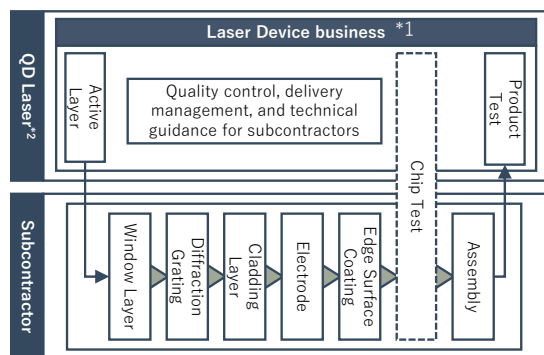
- **The only fabless company in the semiconductor laser industry**
 - Flexible manufacturing scale of several units to tens of millions units
 - Made fixed costs into variable costs
 - Mass production and diverse product offering lead to beyond breakeven point

- **Any wavelengths of lasers**

Wavelengths of lasers we offer (nm)

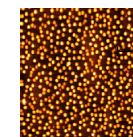


- **High level of freedom in creating new business, fields and products**



Core Competence : Quantum Dot Lasers

- **Atomic-level precision epitaxy technology (proprietary)**
 - Growth control by 0.1 second
 - Extracted the best recipes from over 100,000 recipes
 - The only one to succeed in mass production of quantum dot lasers, thanks to over 20 years of accumulated technology



100 nm

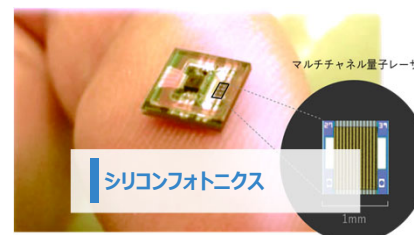
image of quantum dot by
atomic force microscope

- **Capable of operating in harsh environments of over 100°C and under high density packaging**

- Optoelectronic integrated circuit
- In-vehicle devices

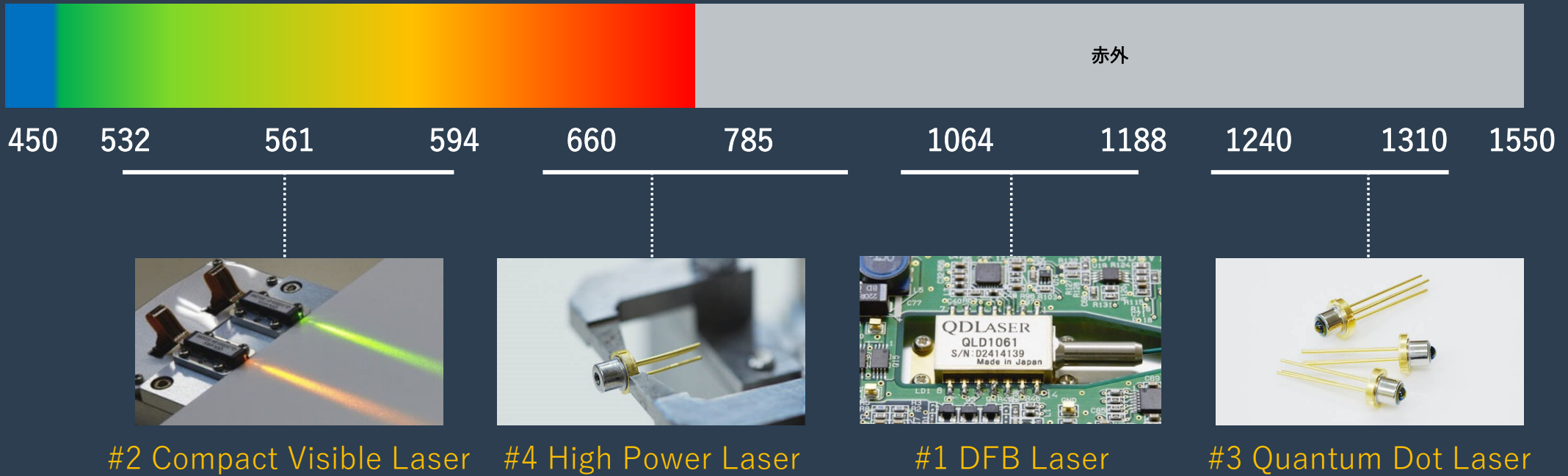
- **New potential market created by quantum dot lasers**

- Chip-to-chip optical interconnect
- LiDAR
- Quantum cryptography



Variations on semiconductor lasers developed and sold by QD Laser.

We provide a wide range of semiconductor lasers with wavelengths suitable for each application.

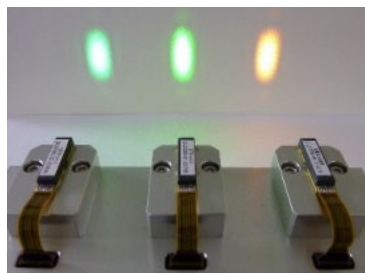


Launch of Palm-Sized Multi-color Compact Laser Light Source for Biomedical Equipment

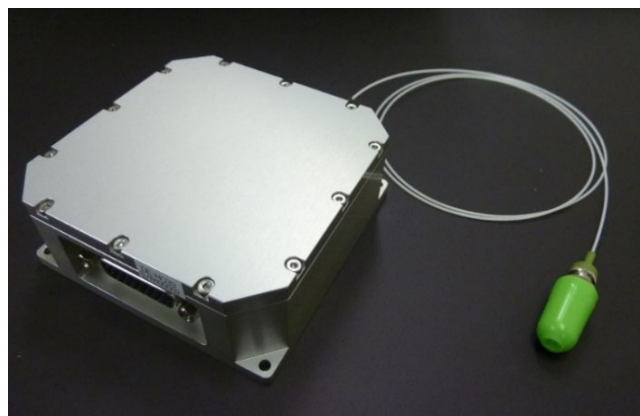
High value-added solution for biomedical equipment *1

- This light source provides manufacturers with all laser wavelengths required for any biomedical equipment in one **palm-sized compact** module *2 with stable output power and plug-and-play operation.
- This product enables manufacturers to miniaturize their equipment and shorten the development and production period as a new solution.
- Under testing by equipment manufactures.
- QD Laser aims for an industry share of *3 20% in light sources for biomedical equipment in five years.

Compact Visible Lasers



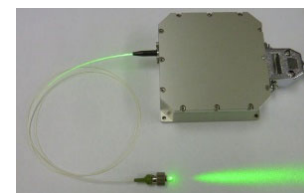
Integrated
into



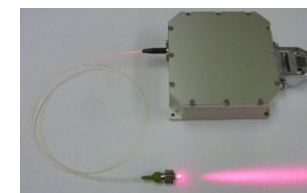
Palm-Sized Multi-color Compact Laser Light Source (80 x 80 x t30mm)



488nm



561nm



660nm



785nm

*1: Biomedical equipment is flow cytometers, ophthalmic examination equipment, fluorescence microscopes, and the like.

*2: The total volume of the driver integrated light sources is less than 50% of other company's products.

*3: Estimated annual accessible market size is 12,500 units. (8,000 out of 16,000 units for flow cytometer based on the "Global Flow Cytometer Market 2020-2024", and 4,500 units for an ophthalmic medical device)

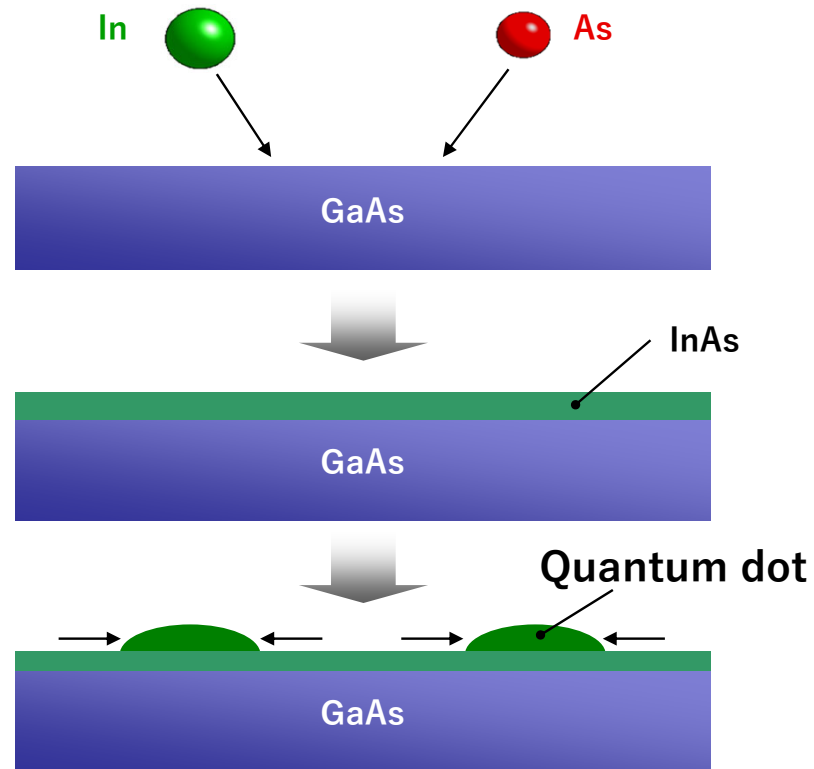
QDLaser's World Only-One Mass-Production Technology of Quantum Dot Lasers

- Introduction of mass-production MBE (Molecular Beam Epitaxy) system
- Control of temperature, indium source supply, and arsenic pressure at each second.
- Material recipe and know-hows for optimum growth conditions with several-tens-of-years experience (secret internal techniques which are intentionally not patented)

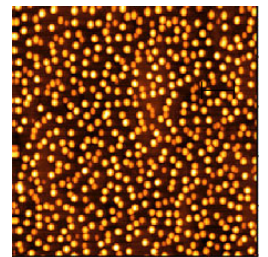
Mass production MBE system



Growth sequence of quantum dots (illustration of side view)



Atomic force microscope (top view) of quantum dots



100 nm

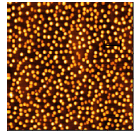
Tangible Silicon Photonics Market as Electronic / Optical Integrated Circuit Technology Platform

Customizing quantum dot lasers for Japan/US silicon photonics vendors.
Starting mass production in 2021.

Development and production

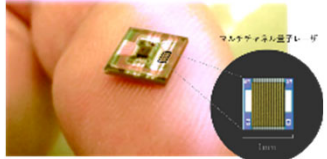
- 2010**
World's first mass production of quantum dot laser for optical communication
- 2012**
Started development of quantum dot laser for silicon photonics
- 2017**
Established mass production system of quantum dot lasers for silicon photonics (supplied to AIO core)
- 2019**
Our products installed in the "Ultra-thin connector integrated active optical module (I-PEX EOM)" developed by I-PEX
- 2021**
Working on joint development with silicon photonics vendors around the world. Starting mass production for chip-to-chip optical interconnect and Lidar during FY2021 to FY2023.

Quantum Dots



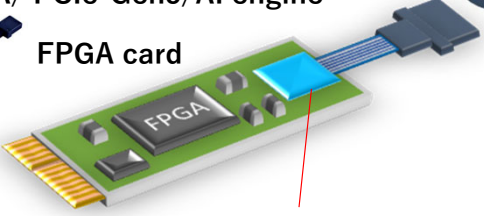
100 nm

100Gbps optical transceiver with quantum dot lasers as light sources

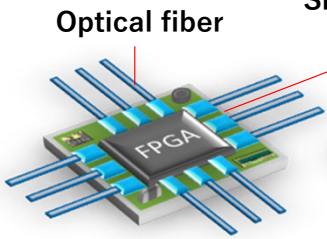


Optical Connector(EOM^{*1},CPO^{*2}) :
8K-SHTV/ FA/ PCIe-Gen5/AI engine

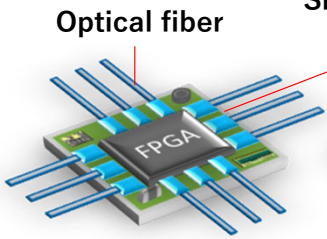
FPGA card



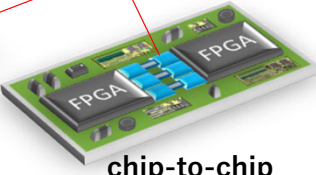
Silicon Photonics Chip



Optical fiber



chip-to-chip interconnects



Increased data and power consumption to be solved by Silicon Photonics

Problem

Increasing demand for global data in turn creates a global issue of increasing power consumption

World total amount of data is estimated to multiply 5 times^{*3} within 7 years

Year	World total amount of data
CY18	33ZB
CY25E	175ZB

World IT-related power consumption is estimated to multiply almost 35 times^{*4} within 15 years

Year	World IT-related power consumption
CY16	1,170TWh
CY30E	42,300TWh

Solution

Silicon photonics with quantum dot lasers mounted on silicon chips enable dramatic improvement in semiconductor performance^{*5}

Power consumption reduction

90%

Footprint

1/100

Processing speed

100x

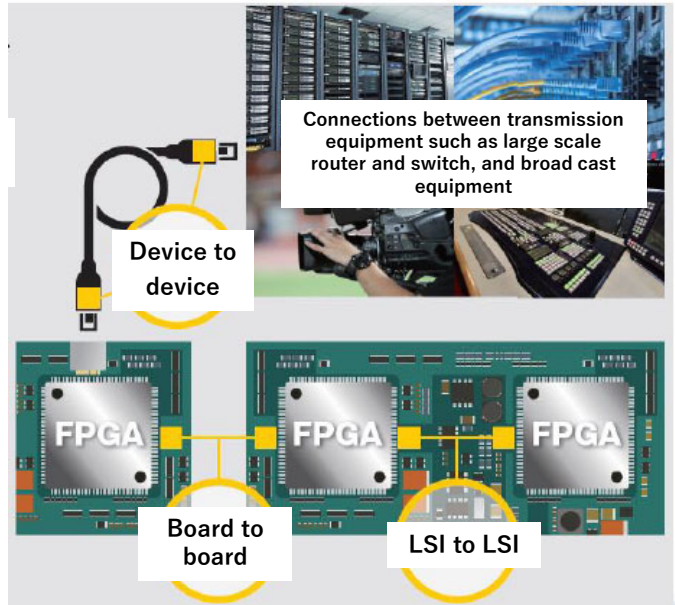
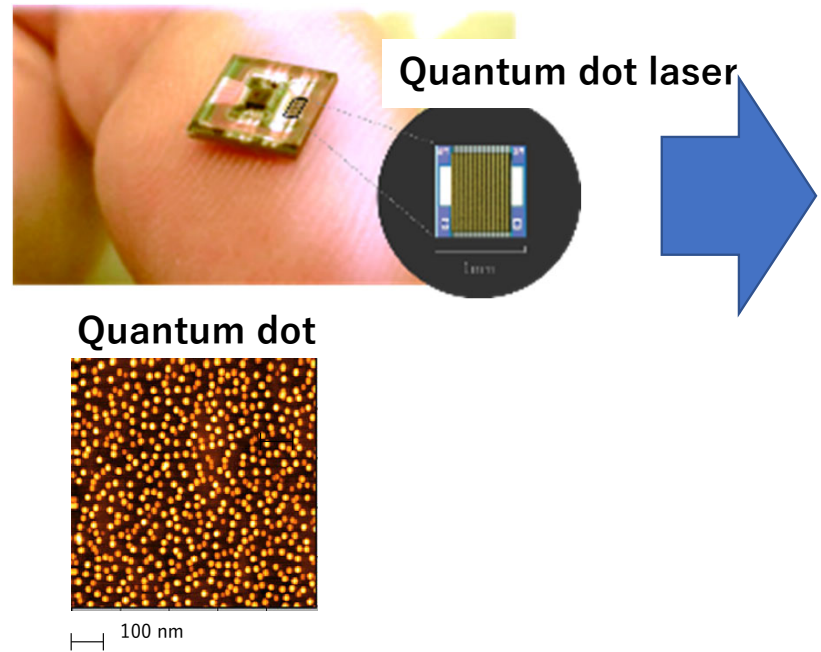
Huge information processing application that requires high-temperature operation

Application	Temperature
Date Centers	80°C
5G base stations	105°C
Automatic Driving/LiDAR	105°C

Silicon Photonics Becoming Tangible
for optical communications between computer chips and Lidars

- Joint developments in progress with nine customers in Japan, North America, and Europe.
- AIO Core Co., Ltd. has started sample shipment.

100Gb/s Silicon photonics chips with
QD Laser's quantum dot lasers



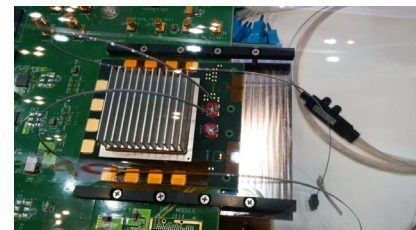
Courtesy of AIO Core Co., Ltd.
Note: Yellow squares show 100Gb/s transceiver Silicon chip

Applied modules
(Sample shipment)

IPEX: LIGHTPASS™



Demonstration by AIO Core



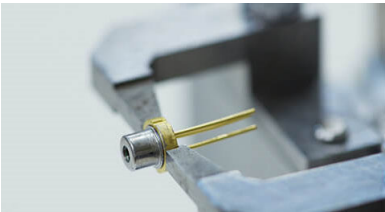
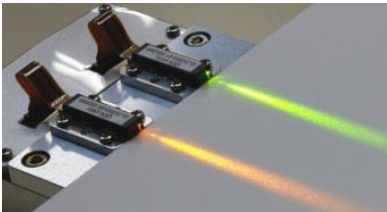
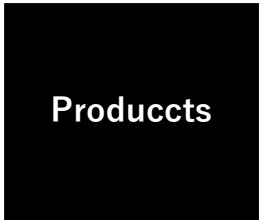
Our major laser device products, wavelengths, features, and uses

Compact visible lasers

High power laser

DFB laser

Quantum dot laser

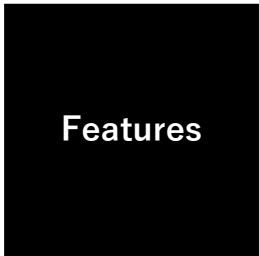


532, 561,594 nm

640-970nm

1030, 1053, 1064, 1080, 1120, 1180nm
1020-1120nm provided 1nm by 1nm

1,200-1330nm

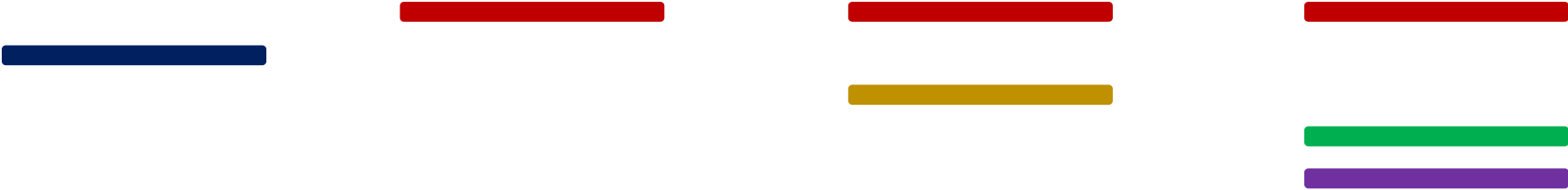
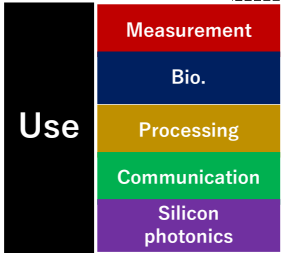


- Miniature size, low power consumption, stability, short pulse generation, and high-speed modulation, etc.
- World's first current injection yellow-green and orange lasers

- High power Fabry Perot laser
- Providing products and solutions according to applications.
- Supports various wavelengths, small quantities, and custom production.

- Precise control of wavelength with stable operation under continuous, nanosecond, and picosecond modes.
- High beam quality, small size, lightweight, high electricity-light conversion efficiency, and long life compared to existing solid-state lasers.
- Extensive product lineup that meets the various needs of customers.

- Quantum dots are used for the active layer (light-emitting part) of semiconductor lasers.
- Excellent temperature stability, high-temperature resistance, and low noise performance compared to existing semiconductor lasers.



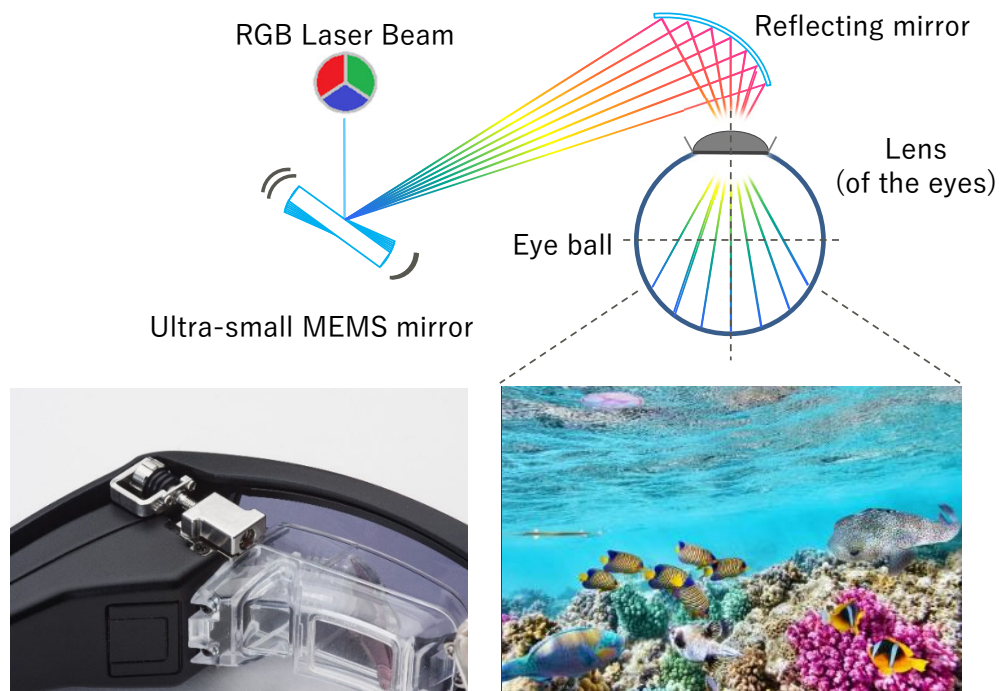
03

Laser Retinal Projection

World's First Commercialization of Laser Retinal Projection Eyewear

VISIRIUM TECHNOLOGY®

Unique Laser Technology bringing Innovation to Vision

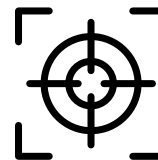


Direct Image Projection onto Retina



Visual experience independent of the condition of your cornea or lens

You can recognize an image clearly even with myopia, hyperopia, astigmatism, or ametropia.



Free focus

The focus of both the landscape you see with the naked eye and the image projected by our glasses can be superimposed on the retina. This is a unique feature not found in other AR glasses.



Enables vision even in the periphery of the retina*1

Since the image is in focus even over a wide area of the retina, we expect that it can also be effective for patients with retinopathy.

*1: At major airline company and National University Corporation Tsukuba University of Technology, a systematic demonstration study is currently underway.

Three Areas based on Retinal Projection Technology

Transforms
“hard to see”
to “visible”

Low Vision Aid

Sales started

Extend the healthy
lifespan of your vision

Vision Health Care

Business Development

The power of
“vision” broadens
your world

augmented vision

Strengthening Alliance

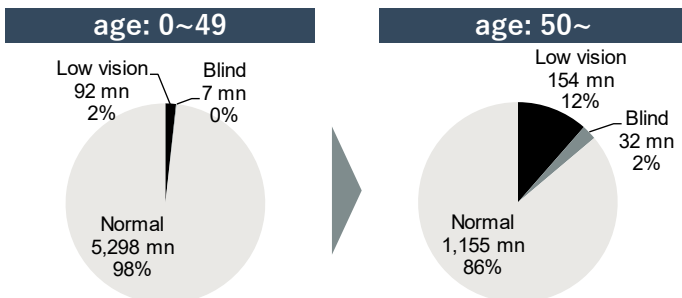
World's First Laser Retinal Projection Eyewear In the Low Vision Aid Space where Innovation has been Minimal, Laser Technology makes a Breakthrough

250mn people

with Low Vision Globally*¹

Currently they use magnifying glasses, video magnifiers, and telescopes daily. These tools are limited in use, have operational, issues and are not suitable for all users.

Here, we will make a breakthrough with our laser retinal projection technology.



GLOBAL DATA ON VISUAL IMPAIRMENTS 2010, WHO

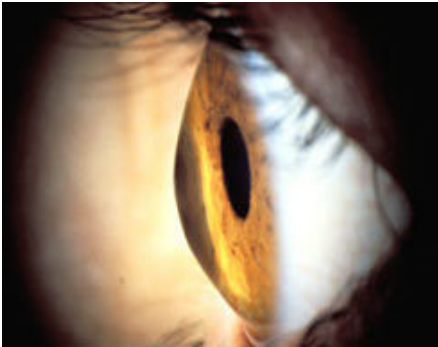


“Papa, you have grown old, I can see the wrinkles on your forehead.”*²



Completed Clinical Study in Japan and EU

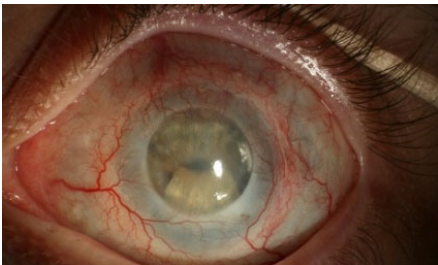
JAPAN



Irregular astigmatism

- Improved distance vision and reading speed of 15 subjects verified.
- Domestic medical device manufacturing and marketing approval @ January 28, 2020

Europe



Corneal clouding

- Improved distance vision and reading speed of 20 subjects verified.
- Long-term safety confirmed after one year of home use.
- Clinical trial completed @ June 2021.

RETISSA® series product development status

Medical device model sales started.

Sales increase in both consumer and medical models

RETISSA® Display II consumer use



Corrected vision: 0.8

- Refractive power: 0.8 corrected vision without eyeglasses in the power range of -11D*¹ (high myopia) to +6D (medium high hyperopia) *²

Sales strategy of this term

- New frame to improve wearing alignment and stability
- Accessory camera connected to the frame for enhanced functionality
- Proposals of use cases for companies
- Overseas sales, including US, China, and South Korea.

RETISSA® Medical Approved to market as a Medical Device in Japan



Controlled medical device (Controlled medical devices requiring special maintenance)*³

- Used to correct vision in patients whose vision is impaired by unjustified astigmatism (patients who are unable to achieve adequate vision using existing eyeglasses or contact lenses)
- Expected to (1) correct visual acuity, (2) improve reading speed, and (3) improve reading acuity

Sales strategy of this term

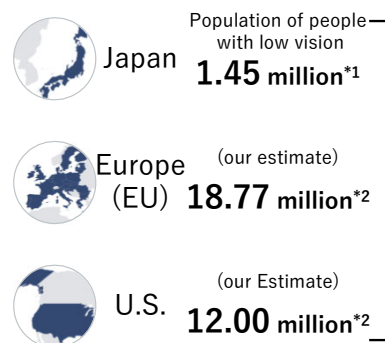
- Sales collaboration with Santen Pharmaceutical and Seed. • Efforts to reduce the burden on purchasers: Healthcare subsidy, medical insurance, tax deduction, etc.

Low Vision Aids: Total Addressable Market (※Anterior eye disease patients only :
Ametropia and corneal opacity)

JPY 900 bn (USD 8.6 bn) Market in Japan, U.S. and Europe

Plan to Expand into Other Countries like China further behind in Ophthalmic Technologies

Low Vision Market

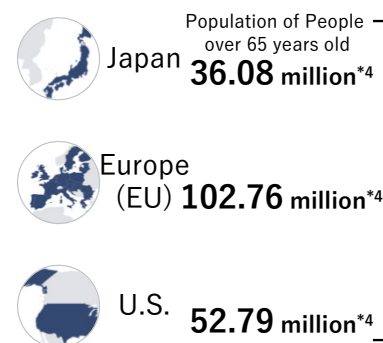


Estimated percentage of applicability (our estimate)*3 $\times$ **11%** $\times$ Product Price per Unit (our assumption)*6 **JPY 200k (USD 1.9k)**

Total market size of advanced countries (Our estimate)

JPY 708.7 bn
(USD 6.7 bn)

Senior Citizens Market



Estimated percentage of applicability (our estimate)*5 $\times$ **1%** $\times$ Product Price per Unit (our assumption)*6 **JPY 100k (USD 950)**

Total market size of advanced countries (our estimate)

JPY 191.7 bn
(USD 1.8 bn)

JPY 900 bn (USD 8.6 bn)

*1: Japan Ophthalmologists Association "Social costs of visual impairment in Japan"

*2: Calculated by multiplying the ratio of persons with low vision sourced from WHO "Visual Impairment and Blindness 2010" by the current population in each region (Europe: Eurostat "Population on 1 January", U.S.: United States Census Bureau "Annual Estimates of the Resident Population for the United States")

*3: According to the survey by Santen Pharmaceuticals, the number of keratoconus patients in Japan is estimated to be 60,000 to 120,000; also, as the data on p.39 shows that the prevalence per 100,000 people of keratoconus is almost the same as that of corneal opacity, it is assumed that the number of corneal opacity patients in Japan is similar to that of keratoconus patients. Assuming the number of patients suffering from each of these diseases to be an intermediate value of 80,000, the total is calculated to be 160,000; then, we apply the estimated percentage of applicability of 11%, calculated by dividing 160,000 by the population of persons with low vision (1,450,000), to each country's population of low vision persons. This percentage only takes into account anterior eye diseases; therefore, if our product is also effective for patients with retinal disease, the estimated percentage of applicability is expected to increase.

*4: Assuming that all the elderly aged 65 and over use near-sighted, presbyopic or bifocal glasses, we can estimate that each country's population aged 65 and over can be the potential population of persons with gap vision (Japan: Statistics Bureau of Japan "Population Estimates May 2020", EU: Eurostat "Population on 1 January by broad age group and sex", U.S.: United States Census Bureau "Population by Age and Sex: 2019").

*5: Due to the products' similarity in characteristics to hearing aids (used by the elderly on a daily basis, wearable equipment, sold at glasses stores, etc.), the hearing aid market is used as a reference to estimate the percentage of applicability. Given that the number of hearing aids shipped in Japan in 2017 numbered 562,747 (Japan Hearing Instruments Manufacturers Association "2018 Shipment Volume of Hearing Aids"), this number divided by the number of elderly people in Japan will give us an estimate that 1.7% of the elderly purchased a hearing aid, which we then adjust conservatively to assume an estimated percentage of applicability of 1.0% which can then be applied to each country's population of gap vision persons.

*6: Expected price per unit after the mass production is realized.

Sales and Manufacturing Strategies

01

Through partnership with major manufacturers such as MinebeaMitsumi and Audio Technica, achieved fabless manufacturing.
New high-performance and low-cost product under development.

02

Through media exposure / participating in large-scale exhibitions / donations to schools for blind children / trial sessions and interviews, raise awareness

03

Develop close cooperation with major players in each field

Zoff

Co-development of products

- Make efforts to revamp the eyeglass prescription process
- Co-develop and commercialize eyeglass-type vision assistive gear and next-generation eyeglasses (smart eyeglasses)

KAGA FEI

Distribution of RETISSA® Series

- Develop RETISSA® Series business globally to visual assistance device market and xR (VR, MR, AR) related device market
- With cumulative sales target of 100K units, recognize as a powerful supporter

Santen

Support Sales of Medical Device (RETISSA® Medical)

- First support sales domestically of RETISSA® Medical

04

Form Partnerships with Several Other Sales Partners

- RETISSA® Display (Consumer Use) : Glasses store, Distributor, E-Commerce, Partner
- RETISSA® Medical (medical Use) : Distributor, Partner

Cumulative sales record as of December 2021
Over 800 units*1

Product Development of Retissa Display Series

RETISSA Display II + RD2CAM (Accessory Camera)

- Free Focus/High Resolution/Full Color

RETISSA Display III FY2022-2023

- Under the collaborative development with a domestic electronic device manufacture
- Flat mirror with FOV of 40 degrees/Built-in camera
- Low cost design for a target price of US \$ 1000 under mass production
- Pocket-sized controller

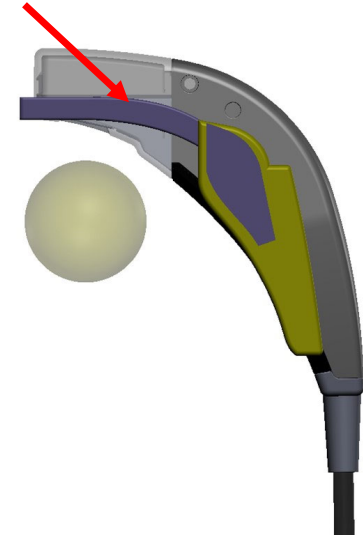
RETISSA Display IV as a smartglass FY2024-2025

- Eye tracking system under development

RD2CAM
(Accessory Camera)



Flat mirror

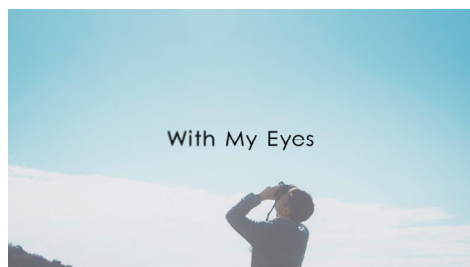


New Low Vision Aids: Retissa Super Capture

Ultra-Wide-Angle Viewfinders give “Vision” to Patients with Retinopathy

Best means to support visual function of 200 million people with retinopathy worldwide

- With My Eyes # 1, # 2, # 3



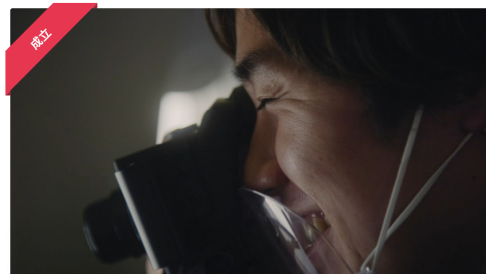
<https://www.youtube.com/watch?v=p5blfs94Oys>
https://www.youtube.com/watch?v=ZM52dax_5yc

- Crowdfunding Completed

世界初、レーザ視覚支援機器を盲学校に届けたい！



菅原 亮



支援期間
5,252,000 円 目標金額 5,000,000 円

支援者 募集終了日
211人 2022年2月12日

フォロー中

プロジェクトは成立しました！

シェア ツイート LINEで送る 印刷で書く

- 37th CSUN Assistive Technology Conference
March 14th to 18th @ Anaheim in USA
Joint exhibition with a digital camera maker
Presentation at an academic conference



RETISSA
Super Capture



Last year booth

Low Vision Aid sales channels and measures to expand the market

Subsidy for daily living equipment/ Introduction based on administrative budget Alliance with accessibility companies: Mirairo House, digital camera maker

■ RETISSA Display II + RD2CAM

- 90% benefits decided in 3 cities in Tokyo
- Start applying for benefits through a sales registration company in each city
- Installment in rehabilitation centers
- Japanese Red Cross Hospital experience meeting
- Start promotion with Mirairo House



<https://www.youtube.com/watch?v=24ln8a-Z004>

Ms. Ikoma, who appears, took the piano tuner's national exam, wearing the RETISSA Display II/RD2CAM.

■ RETISSA Handy (to be commercialized in 2022)

- Started introduction to libraries in Tokyo
- Under consideration for test introduction in museums/theaters
- Deliberation of its introduction to meet the Reading Barrier-Free Law * 1 at the Kanagawa Prefectural and Tokyo Assembly



■ RETISSA Super Capture (to be commercialized in 2022)

- Successful crowdfunding: <https://readyfor.jp/projects/80268>
- Joint exhibition at US exhibition CSUN * 2 with a digital camera maker
- WME#3 will be released.

1. **Reading Barrier-Free Law:** A law promulgated and enforced on June 28, 2019, to enable all people with or without disabilities to benefit from reading characters and print culture.

* 2 CSUN: The 37th "CSUN Assistive Technology Conference" to be held at the Marriott Hotel in Anaheim, California, USA, on March 14-18, 2020. More than 3,000 people participate in the conference from all over the world working on "accessibility" and those who are visually or hearing impaired.



IEC (International Electrotechnical Commission) officially published an international standard that defines how to evaluate the overall image quality of scanning retinal projection devices

QD Laser Co., Ltd. is the only company to have commercialized the laser scanning retinal projection product globally. On June 20th, the IEC [Note 1] officially issued the international standard on scanning retinal projection devices. This document covers a general image quality evaluation method, including the free focus characteristics. As a result, the performance of our products to provide "clear images that do not depend on eyesight" has come to be evaluated objectively and quantitatively. With this standardization, QDLaser expects the guarantee of product quality and the elimination of inferior products in the market, accelerating the worldwide spread of our products and forming a healthy industry and market.

International Standard

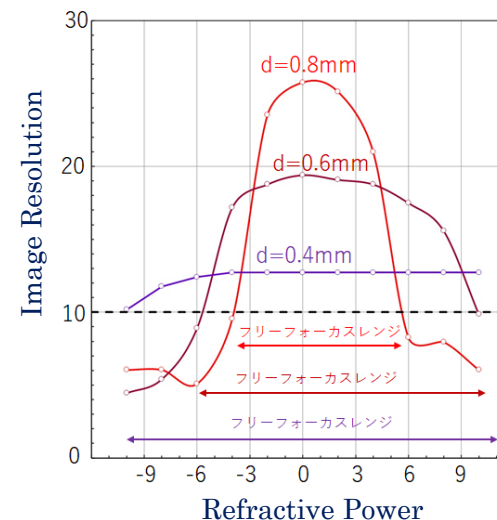
IEC 62906-5-5:2022

- Laser displays – Part 5-5
- Optical measuring methods of raster-scanning retina direct projection laser displays
- <https://webstore.iec.ch/publication/60142>

Note 1: IEC is an abbreviation for International Electrotechnical Commission.

Note 2: Free focus means that the visibility of the image projected by the scanning retinal projection device does not depend on the refractive power of the eyeball or the focus position. The performance of free focus changes depending on the beam diameter and divergence angle of the laser incident on the eyeball.

Free Focus Range Evaluation



The refractive power of the eyeball determines the resolution of the retinal projection image with the diameter of the parallel laser beam as a parameter. This international standard states that the range of refractive power of the eyeball to provide free focus is determined according to the diameter. When commercializing a scanning retinal projection device, it is required to specify the range of refractive power to provide free focus.

04

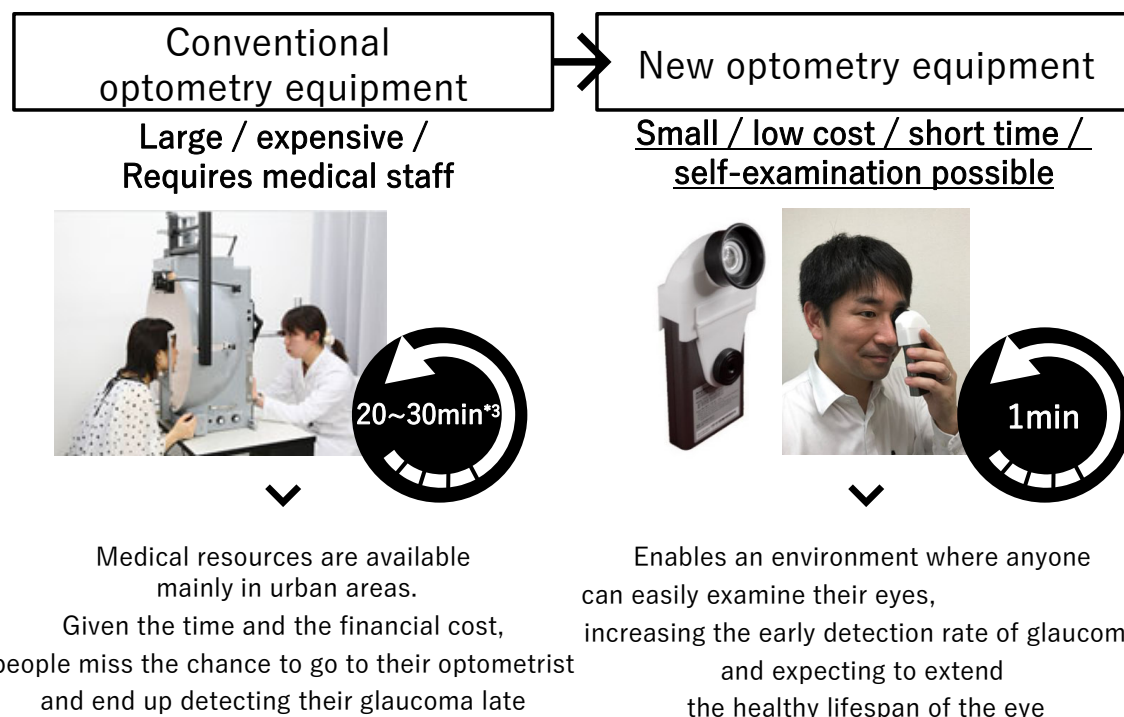
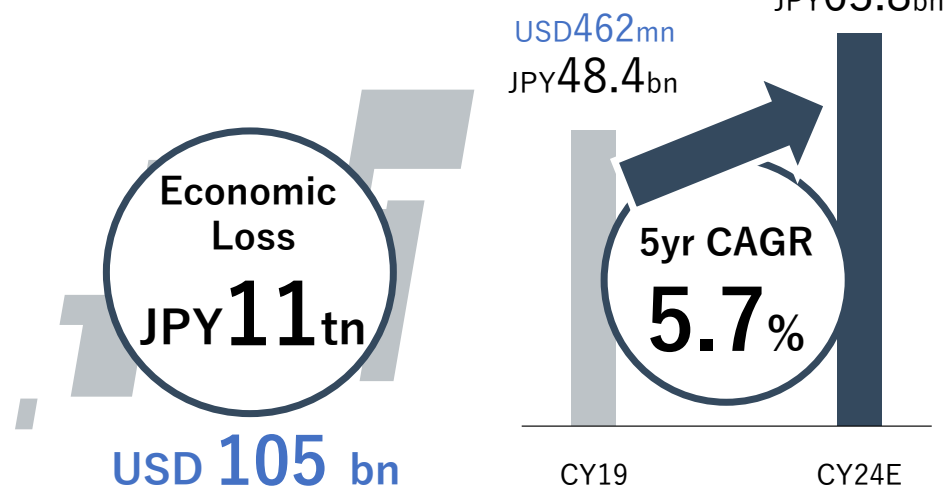
Further Growth Upside Expected

Large Growth Potential in Optometry Market

Utilizing Laser Retinal Projection Technology, Developed New Optometry Prototypes and Working with Partners to Launch in FY2022-2023

Estimated economic loss in Japan
due to visual impairment*1

Fundus photography equipment
market size*2



*1: Japan Ophthalmologists Association (2009) "Economic Cost of Visual Impairment in Japan" and "Prevalence of Visual Impairment in the Adult Japanese Population by Cause and Severity and Future Projections"
Economic cost = Direct health costs + Other financial costs + monetary converted number of loss of well-being from visual impairment (measured in disability-adjusted life years (DALYs))
*2: TechNavio (2020) "Global Ophthalmic Diagnostic Devices MARKET 2020-2024" Converted at an exchange rate of JPY/USD = 110 yen
*3: The approximate measurement time of the Goldmann perimeter and Humphrey perimeter, which are typical perimeters in conventional perimeter measurement.

A new group of optometry devices that utilize laser retinal projection technology

■ Eye & Brain Diseases

- Cataract (47%)
- Glaucoma (3.6%)
- Retinopathy (55%)
- Brain tumor (10 to 15 patients per 100,000)

Note:% is the average appearance rate of the entire population. The older the person, the more it increases.

■ Cognitive Function Degradation

- Aging
- Dementia
- Fatigue, Stress
- Alcohol

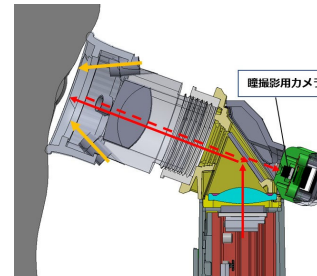
■ Cardiovascular Diseases

- Disease
- Diabetes
- Stroke
- Heart attack

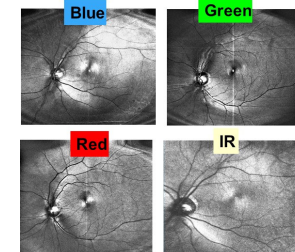
1st generation: Simple perimeter to be commercialized in FY2022, screening eye diseases in 1 minute.



2nd generation: Eye track perimeter with a camera to measure fixation stability and dynamic response to various visual stimuli. Software medical equipment.



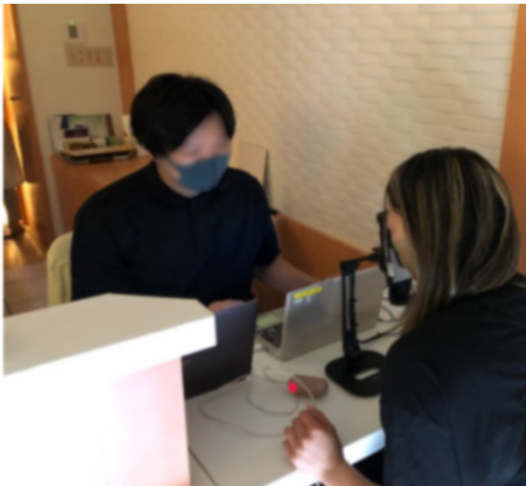
3rd generation: Ultra-compact fundus photography device. Hardware medical equipment.



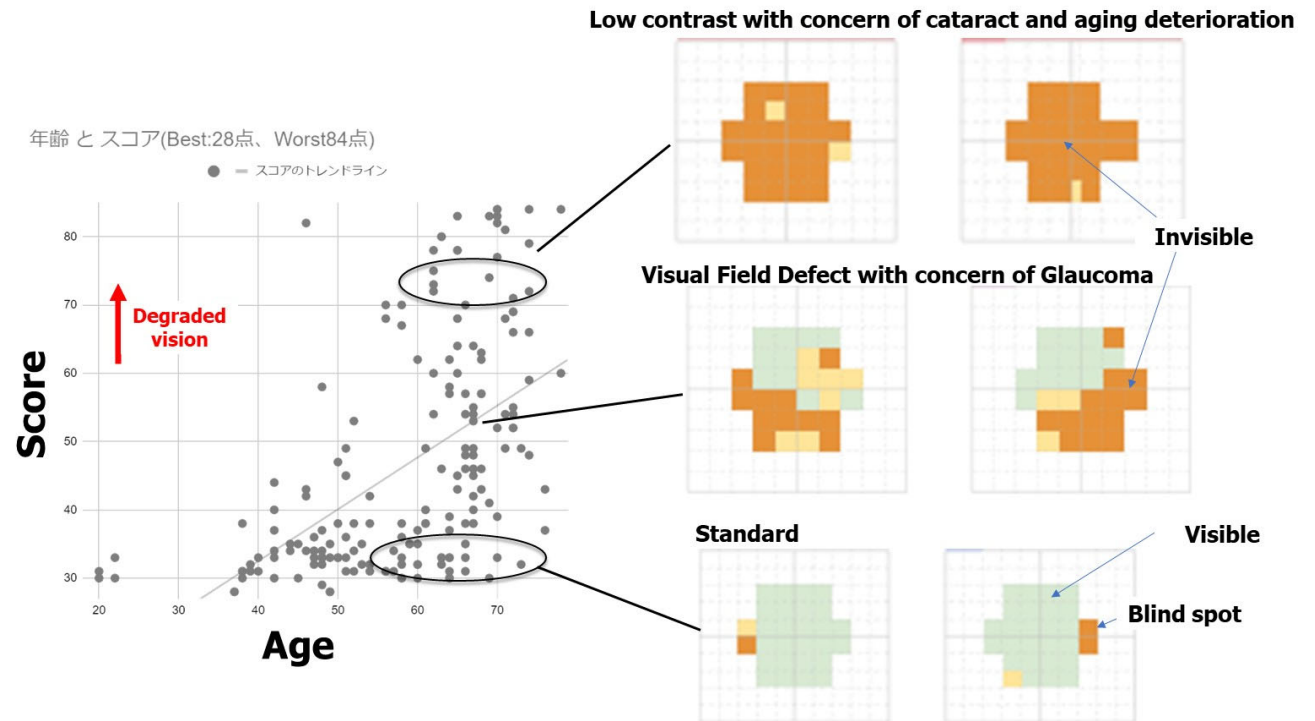
Results of the visual field test of 97 drivers of a taxi company

- We found a significant decrease in visual sensing ability with aging.
- A definitive diagnosis was made by an ophthalmologist as cataract for low contrast and glaucoma for visual field defect.
- The screening for eye diseases and the health check, including cognitive function, has become possible.
- We started studying with the taxi company about applying this device and system to health management of employees for accident prevention and employment maintenance.

Optometry diagnosis

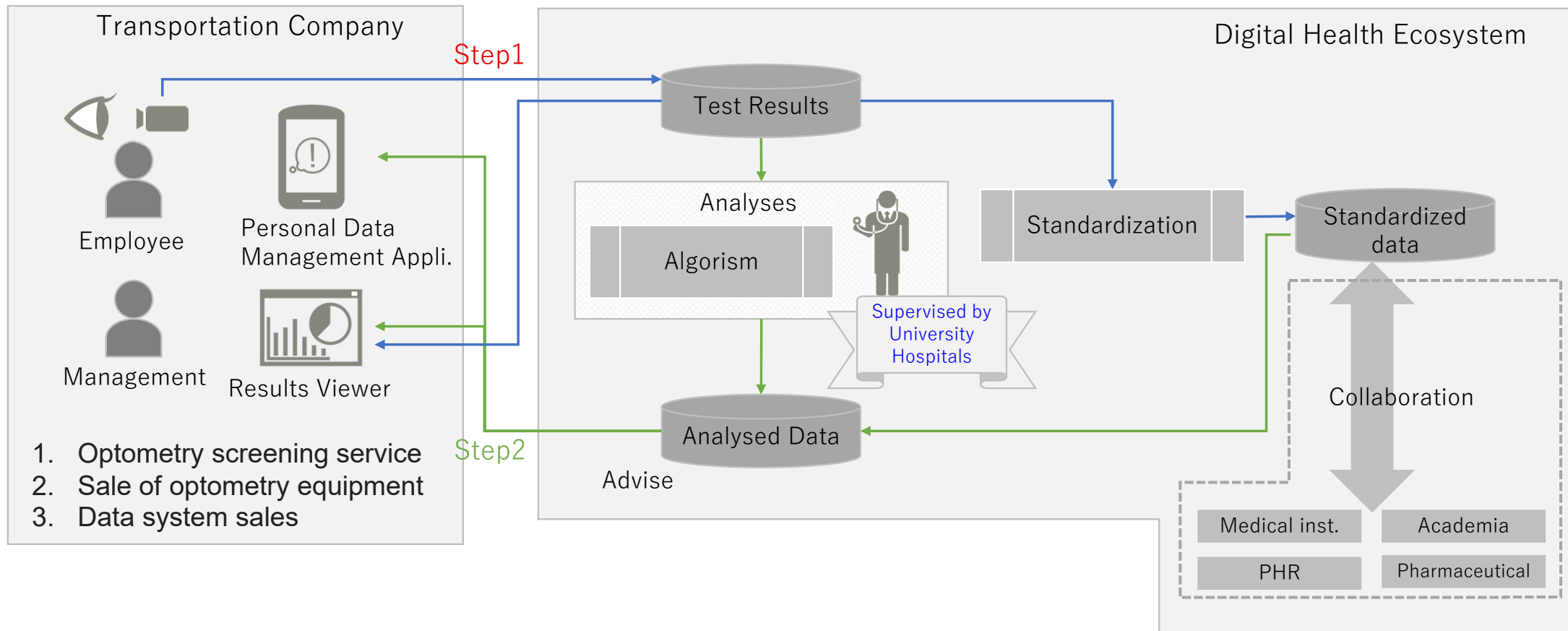


QDLaser is conducting medical research for people based on the Ministry of Health, Labor, and Welfare guidelines.



Service System Image

Starting introduction to companies with commercial drivers



Expected Growth Potential in Mid-Long Term

01 Through R&D of various laser technologies and stable profits from laser device business, strengthen business base for dramatic future growth.



02 Establish mass production and sales channels of consumer / medical eyewear
Make laser eyewear business the growth driver in the short to medium term



Target cumulative sales of 100,000 units and annual production of 50,000 units at FY2025.

Sales expansion in domestic and overseas markets

Starting low-cost mass production of RDIII later in FY 2022 or early in FY2023

IPO

Present



03

In the mid to long term, in addition to the laser eyewear business, plan to expand sales of optometers and silicon photonics.



Quantum dot lasers for silicon photonics are being developed with nine companies in Japan, the United States, and Europe. Mass production is to start in FY 2022-23 in order.



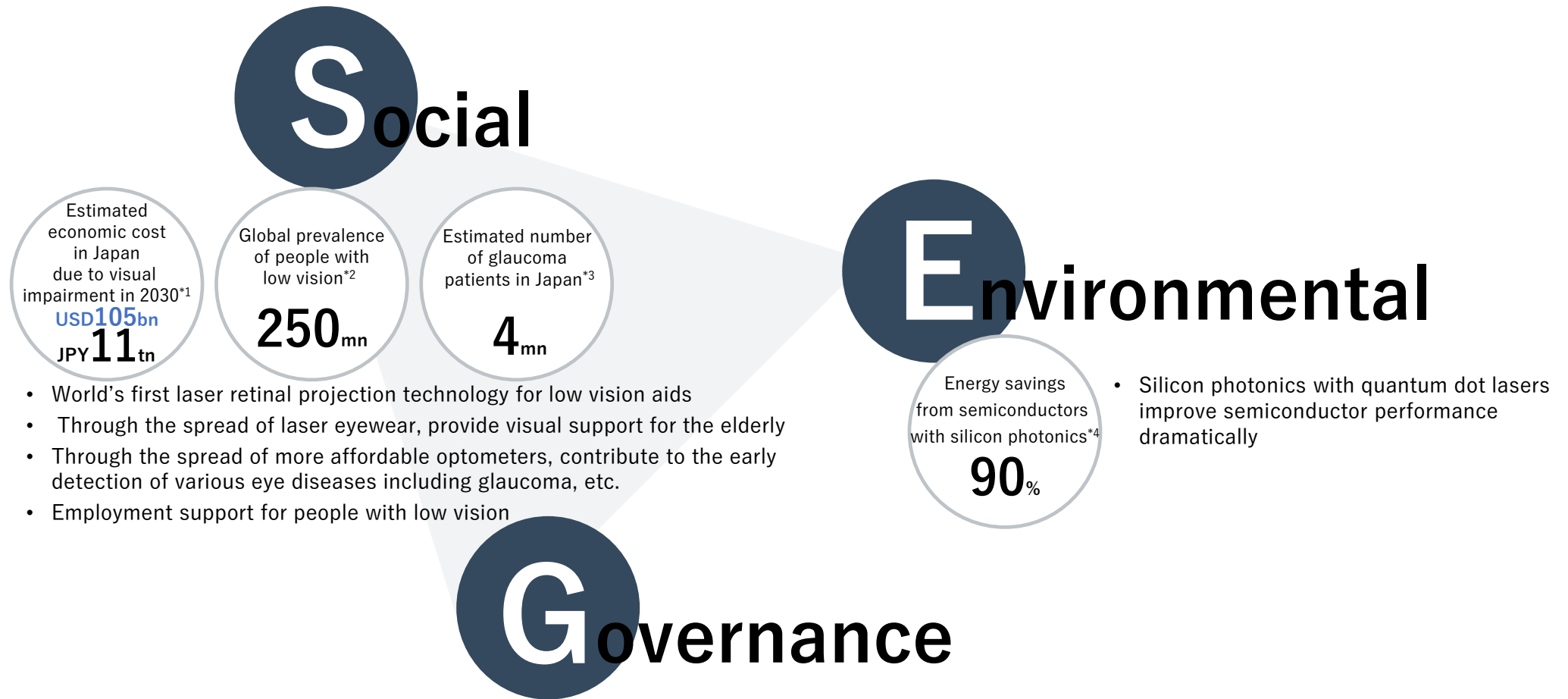
Trial operation of "optometry screening service" in FY2022 and full-scale delivery in FY2023. The compact optometry machine under is to be launched in FY2022.

Future

05

ESG Initiatives

Business Development from an ESG Perspective



*1: Japan Ophthalmologists Association "Economic Cost of Visual Impairment in Japan" and "Prevalence of Visual Impairment in the Adult Japanese Population by Cause and Severity and Future Projections"

Economic cost = Direct health costs + Other financial costs + monetary converted number of loss of well-being from visual impairment (measured in disability-adjusted life years (DALYs))

*2: WHO "GLOBAL DATA ON VISUAL IMPAIRMENTS 2010"

*3: Santen Pharmaceutical "Annual Report 2017"

*4: Target numbers in "Development of Technologies for Super Energy-Efficient Optical Electronics Implementation Systems" Promoted by METI, The Institute of Electronics, Information and Communication Engineers "Opt-Electronics Packaging Technology for Silicon Photonics"

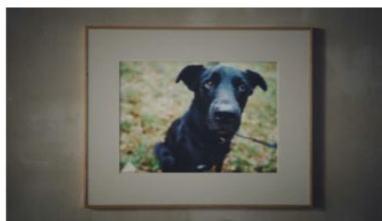
With My Eyes project

#1 Photographs by low vision people.

<https://www.youtube.com/watch?v=p5blfs94Oys>

#2 Let's go and see the invisible world.

https://www.youtube.com/watch?v=ZM52dax_5yc



Company Profile

Spin-off Venture from Fujitsu

Tier 1 Medical Companies such as Nikon/Santen joined as Shareholders

Company Name	QD Laser, Inc.
Foundation	April 24, 2006
Fiscal year-ended	March 31
Representative	Mitsuru Sugawara, President and CEO
Location	Headquarter: 1-1 Minamiwatarida-cho, Kawasaki-ku, Kawasaki-shi, Kanagawa
Number of Persons*1	60
Business	Planning, design, development, production and sales of semiconductor laser and its application products
Licenses	• Class II Marketing License for Medical Devices • Registration of medical equipment manufacturer • ISO 9001 • EN ISO 13485

**Science and Technology
Award from the Minister
of MEXT**

**Prime Minister's Honorary
Award for Achievement in
Industry-Academia-
Governmental Collaboration**



- Graduated from The University of Tokyo; Doctor of Engineering
- 1984: Graduated with a master's degree in Physical Engineering from the Department of Applied Physics, School of Engineering, University of Tokyo; joined Fujitsu Laboratory Ltd.
- 1995: Assumed the role of Senior Researcher at Optical Semiconductor Device Laboratory, Fujitsu Laboratory Ltd.; obtained degree in Eng. from The University of Tokyo
- 2004: Assumed the role of non-tenured professor at the Institute of Industrial Science, University of Tokyo
- 2005: Assumed the role of Deputy Head of Nanotechnology Research Center, Fujitsu Laboratory Ltd.
- 2006: Launched QD Laser Inc.; assumed the role of President and CEO

*1: As of December 31, 2021. Including 1 employee and officer, 13 dispatched employees.

Laser Retinal Projection: Diseases and Applicable Rate

Parts of Eye		Major diseases	# of patients per 100k people*1	Total per eye part*1	Possible Efficacy*2	Estimated applicability %*3	Future Outlook	
Anterior eye	Cornea	Corneal angiogenesis	4,000	4,104	◎	Effective on astigmatism and moderate opacity	50%	• May not be applicable in cases of severe opacity • Focused on obtaining the approvals to marketing medical devices by targeting diseases for which high efficacy can be expected. • Plan to expand the scope of application with RDII and RDIII on page 25 and the wide-angle viewfinder on page 27.
		Keratoconus	54					
		Corneal opacity	50					
	Crystalline lens	Cataract	47,800	52,900	◎	Effective on near/far-sightedness, astigmatism, opacity, etc. and as the technology does not depend on the function of the crystalline lens	40%	
		Aphakia	5,100					
		Phacocoele	<50					
	Uvea	Uveitis	714	714	△	Effective on astigmatism developed as a complication	10%	
		Choroidal neovascularization	<50					
Vitreum	Vitreous opacity	NA	-	○	Effective on low to moderate opacity	20%		
Retina	Epiretinal membrane	28,900	55,614	○	Enlargement and black and white inversion features are effective on macular diseases	30%	• Adaptable to central scotoma by changing the projection position and increasing magnification • Adaptable to tunnel vision through wide-angle imaging • May not be applicable in cases with severe symptoms	
	Lattice degeneration of retina	10,600			Some efficacy is seen in cases where anterior eye disease is also present AE camera feature is exceptionally effective on photophobia, night blindness, etc.			
	Hypertensive retinopathy	9,100						
	Age-related maculopathy	3,900						
	Diabetic retinopathy	3,114						
	Retinitis pigmentosa	<50						
Optic nerve	Glaucoma	3,550	3,865	△	Image downsizing feature is effective on tunnel vision	10%	• May not be applicable in cases with severe symptoms	
	Optic nerve head drusen	200						
	Optic neuritis	115						
Other	High myopia	3,000	3,000	◎	Exceptionally effective	50%	• Can improve by processing images taken by camera	
	Color amblyopia, color blindness	2,500	2,500	○	-	20%		

*1: These numbers were calculated by research company Lampe & Company in a report we commissioned with reference to scholarly papers published by governments and research institutions from each country. Figures for "# of patients per 100k people" and "Total per eye part" reflect the general research conducted across several jurisdictions and are not necessarily indicative of the number of potential cases in the markets in which we currently operate.

*2: Based on our assumptions

*3: Evaluated the "expected efficacy" using a scale: ◎ = 40-50%, ○ = 20-30% and △ = 5-10%.

Terminology

Semiconductor laser	A compact device with an approximate length of 1mm that causes laser oscillation by passing an electric current to a semiconductor. In comparison with a solid-state laser or gas laser, more micro-miniature in size; higher speed modulation characteristics up to 10GHz; higher photoelectric conversion efficiency achieving several tens of percent and better controllability of wavelength, among other things. Became widely used in the 1980s as a light source for communication systems and optical recording media, such as CDs and DVDs, etc.
Quantum dot laser (QDL)	A semiconductor laser using a quantum-dot structure comprising nanocrystalline semiconductors in its active layer. QD Laser is the only firm in the world to mass-produce QDLs for optical communications and silicon photonics. In comparison to existing semiconductor lasers, it is superior in temperature stability, high-temperature endurance and low-noise properties.
DFB laser	Distributed Feedback Laser: QD Laser's DFB laser is equipped with a diffraction grating which enables laser oscillation at a single wavelength. It is suitable for applications where the light output needs to be concentrated into a narrow wavelength range, such as the seed light of a fiber laser.
Silicon photonics	A technology which integrates an optical circuit with a silicon electronic circuit that has signal processing and memory functions, thus enabling a breakthrough in the processing capacity limitation of the conventional electronic circuit system (achieving 100 times faster processing speed and lower power consumption) and high-capacity data transmission between LSI chips (10Tb/s).
VISIRIUM technology	A technology that projects images onto the retina using precise optical systems, creating different colors flexibly from the three primary laser light colors - red, green and blue.
Diffraction grating technology	A technology that freely and precisely controls the wavelength of semiconductor lasers to fit into various applications by forming periodic irregularities inside the laser.
Ultrashort pulse	A laser with a very short pulse width (duration). It is used for microfabrication and other processes as it can prevent shape distortion due to thermal effects.
Retinal projection	To project images onto the retina
Simple perimeter	A device to assess the visual field of human eyes
CE marking	A certification mark that indicates conformity with standards required to be met by products exported to the EU. The CE mark is granted when a product meets standards in all EU member states.
Flow cytometer	A device capable of measuring certain properties of cells. By irradiating a cell suspension in a tube with a laser beam, it can measure the number and size of a large volume of cells over a short period of time using fluorescence and scattered light parameters. It is used in various fields including molecular biology, pathology, immunology, plant biology and marine biology.
LiDAR	LiDAR (Light Detection and Ranging) is a technology which irradiates an object and uses a light sensor to detect the reflection to measure the distance. It is expected to be used in autonomous driving systems in the future.
Heads-up Display	A technology that projects information and images onto various surfaces, such as glass, within the field of view. It is expected one day to project necessary information for drivers onto the windshield and the like.

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- The materials and information provided in this presentation include forward-looking statements.
- These statements are based on expectations, forecasts and risk assumptions as of this presentation's publishing, and contain uncertainties that could lead to results that are substantially different from these statements.
- These risks and uncertainties are present in any transaction, and are applicable to general industry and market conditions as well as general domestic and international economic conditions, including fluctuations in interest rates and currency exchange rates.
- Note that QD Laser does not bear any duty to update or revise forward-looking statements provided in this document, even if new information comes to light or future events occur.