

IR Presentation 2023



May 2024
OE Solutions IR

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Company overview



About OE Solutions

Overview

Name	OE Solutions, Co., Ltd	Date of Established	Aug.7, 2003
Number of Employees	331 (Korea: 333 / USA: 15 / Japan: 4)	Date of Listing	Feb.27, 2014(KOSDAQ code : 138080)
Product	Optical Transceiver & Laser Chip	Homepage	www.oesolutions.com
Locations	Head Quarter : Gwangju, South Korea / US : Ridgefield Park, NJ, USA / JAPAN : Tokyo Japan		

(As of December 31, 2023)

Locations



- Hilversum, Netherlands**
- Europe Headquarter
 - Europe Sales
 - Smart and system R&D

- Gwangju, Korea**
- Global Headquarter
 - Manufacturing
 - R&D

- Seoul (Anyang), Korea**
- Korea Sales
 - R&D

- Seoul (Suwon), Korea**
- Korea Sales
 - Engineering Support

- Tokyo, Japan**
- Japan Sales
 - Engineering Support

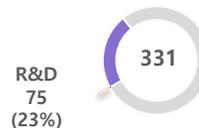
- Ridgefield Park, NJ, USA**
- US Headquarter
 - US (East Coast) Sales
 - Engineering Support

- Irvine, CA, USA**
- R&D

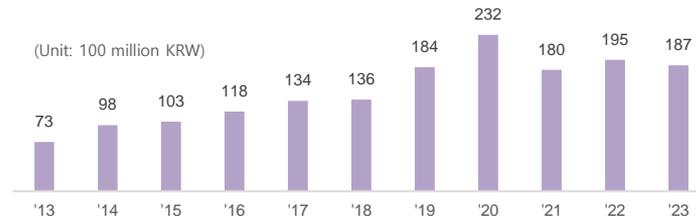
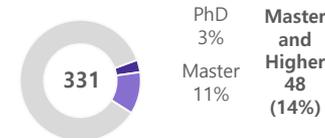
- Santa Babara, CA, USA**
- R&D

R&D Engineer & Cost

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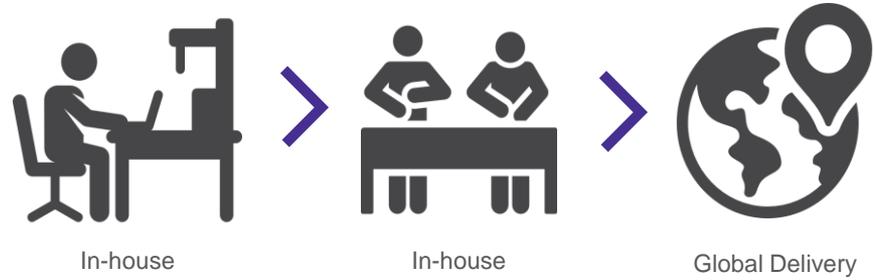


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OE Solutions – Global Supplier of Transceivers

Leading Supplier of High-Reliability Optical Components for Challenging Deployment Environments

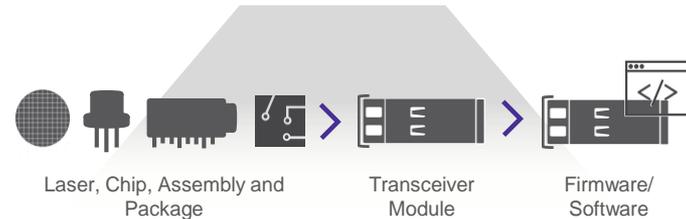


In-house Design

In-house Manufacturing

Global Delivery

- ❑ Leading supplier of optical components and Transceiver since 2003
- ❑ Founded by a team of Bell Labs and Samsung veterans
- ❑ Traded on KOSDAQ since 2014
- ❑ Key supplier to tier-1 MSO and Wireless OEMs
- ❑ Serving global customer in over 50 countries
- ❑ Leading supplier of BIDI and I-Temp Optics
- ❑ Leading supplier of Smart SFPs (co-developed with AimValley)
- ❑ Vertically integrated production from Chip to Transceiver
- ❑ In-house production in Gwangju, South Korea factory
- ❑ R&D sites in Korea, USA and the Netherlands

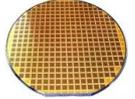


Laser, Chip, Assembly and Package

Transceiver Module

Firmware/ Software

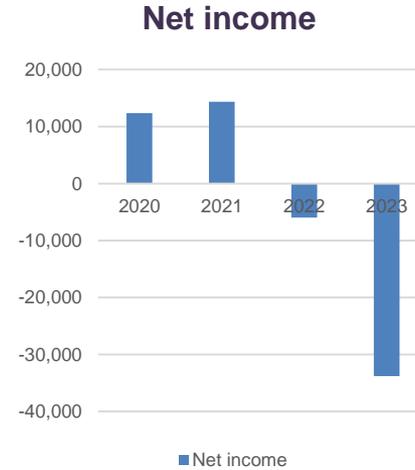
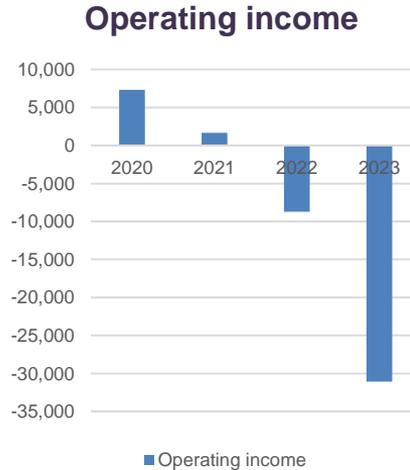
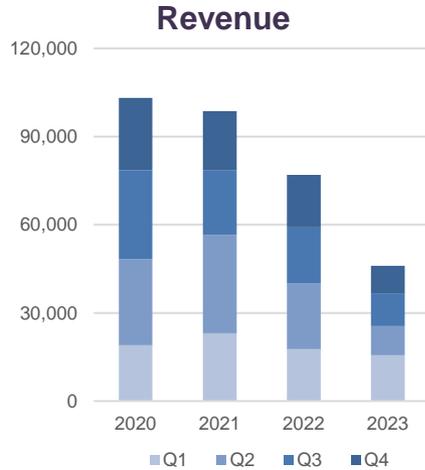
Vertical Integration

 Manufacturing Process		 Manufacturing Technology		
Chip		DML, EML, PIC (up to 50Gbps)	Epitaxy / Fabrication / Wafer Characterization	
Assembly		TO/ XMD (Cooled/ Uncooled)	Die Bonding, Wire Bonding, Seam Sealing, Burn-in, DC/AC Test	
Package		OSA (TOSA/ ROSA/ BOSA)	Laser welding, Epoxy bonding, DC/AC Test	
Circuit / Module		Transceiver (up to 400Gbps)	Auto Soldering / Auto Tuning / Test	
Firmware / Software		Sub-system (Network Migration & Self-Monitoring Technology)	Co-developed with AimValley, a networking technology expert in Netherlands	
Production		Own manufacturing, assembly & testing facility	Low cost, flexible production	

2023 Result review



2023 Revenue **46B KRW**, Operating income **-31.1B KRW(-67.6%)**, Net income **-38.8B KRW(-73.5%)**



※ 연결 기준

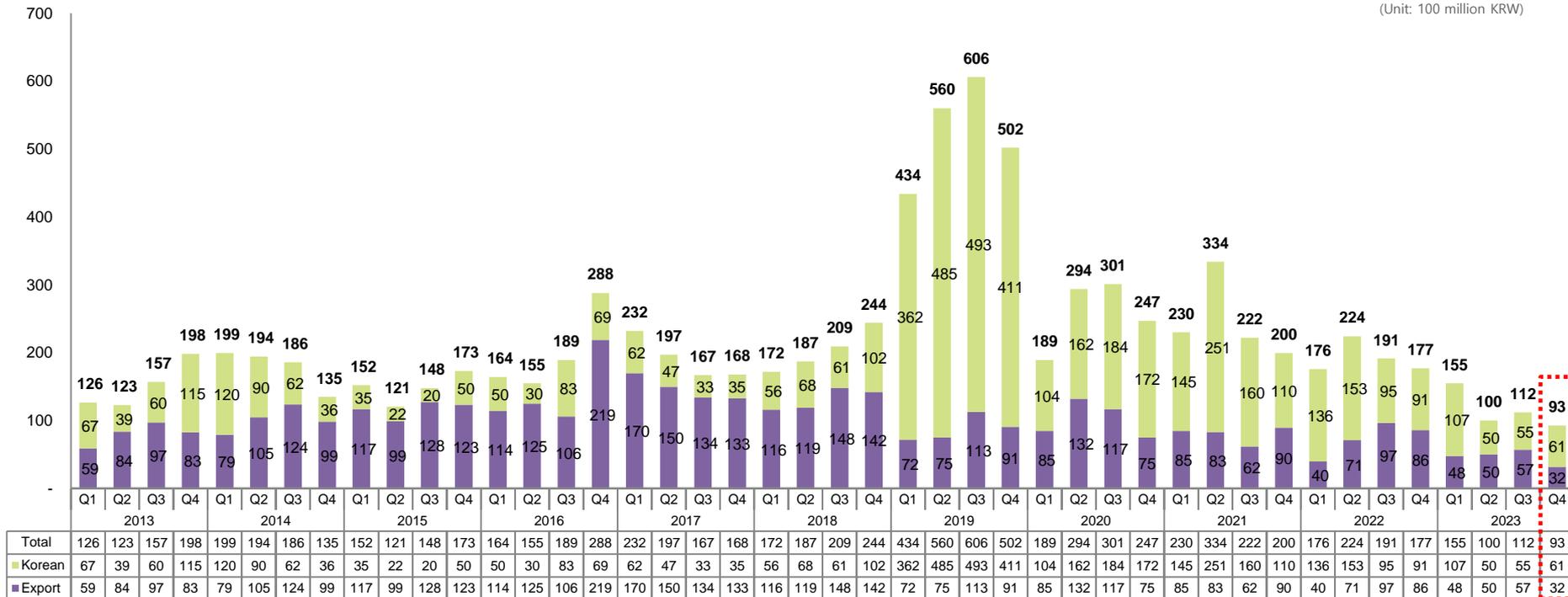
(단위: 백만원)

	2020	2021	2022	2023
• Revenue	103,178	98,681	76,954	46,003
• Operating income	7,333	1,655	-8,705	-31,081
• Operating margin	7.1%	1.7%	-11.3%	-67.6%
• Net income	12,352	14,372	-5,977	-33,817
• Net profit margin	12.0%	14.6%	-7.8%	-73.5%

Quarterly Revenue trends

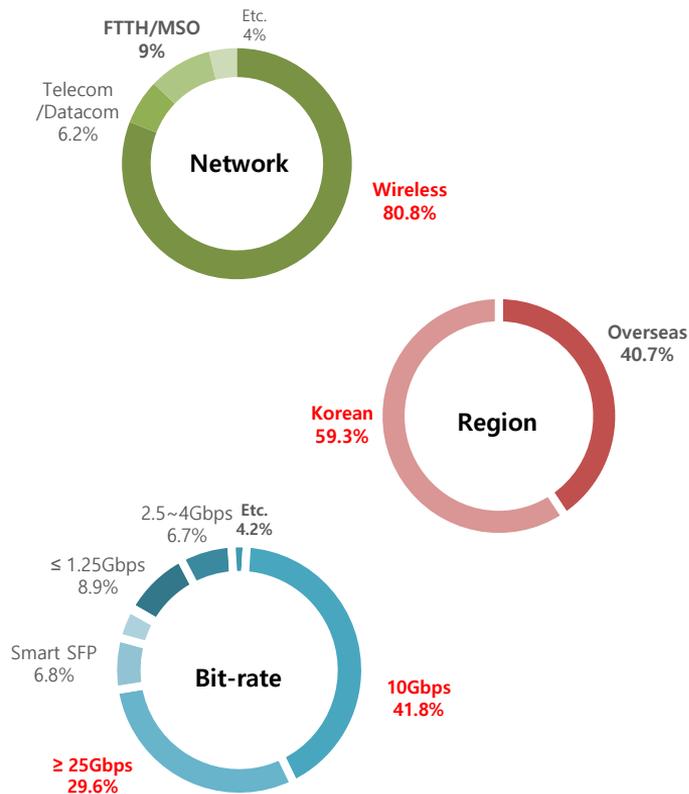
Anticipating a performance turnaround due to increased sales of High bit-rate products in 2H 2024

(Unit: 100 million KRW)



※ Based on separate standard

Sales details



(Unit: 100 million KRW)

	2022	2023	YoY (%)
Network			
• Wireless	551	372	-33%
• Telecom/Datacom	62	29	-53%
• FTTH/MSO	138	41	-70%
• etc.	19	18	-5%
Region			
• Korean	475	273	-43%
• Overseas	294	187	-37%
Overseas ratio	38%	41%	
Bit-rate			
• ≤1.25Gbps	63	41	-35%
• 2.5~4Gbps	70	31	-56%
• 5~6Gbps	27	9	-65%
• 10Gbps	354	192	-46%
• ≥25Gbps	189	136	-28%
• Smart SFP	46	31	-32%
• Component / Chip	19	18	-5%
• etc.	0.8	1	-
Total	770	460	-40%

※ Based on separate standard

OE Solutions Vision & Strategy



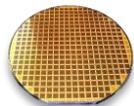
Vision

Connecting the world with customers through innovative solutions using OptoElectronic(OE) technology

Strategy

Laser Chip → Transceiver Vertical integration

Optical Component



- 10G / 25G / 50G / 100G will start using in-house laser chip
- 5G, 6G Wireless / Data center / LiDAR
- Through In-house capability 1)Cost competitive 2)Supply and demand stabilization
- Road map
 - Wireless : 10G / 25G / 50G EML, Tunable Chip
 - Data center : 50G EML
100G EML PAM4 : With joint ETRI
 - LiDAR : High power laser (Narrow linewidth)

Transceiver



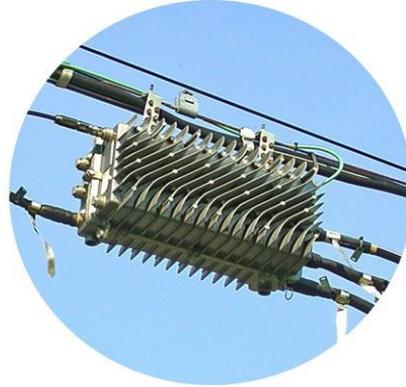
- Global 5G Wireless Transceiver All line-up
- Transceiver profitability and competitive advantage through in-house technology
- High bit-rate Transceiver development to launch a variety of Network Target products (Data center, Telecom, FTTH)
- Road map
 - 50Gbps / 100Gbps / 400Gbps PAM4 for wireless and Data Center interconnector
 - 10Gbps / 25Gbps Tunable Transceiver for WDM
 - Digital Coherent Transceiver for 100Gbps / 200Gbps / 400Gbps

Market and Applications which OE Solutions Transceiver serves



Wireless Fronthaul

- Support of all CPRI and Ethernet rates up to 25Gbps
- Standard, Extended and Industrial temperature ranges
- BIDI and WDM variants



Fixed Broadband

- Broad range of types including WDM
- Temperature ranges beyond IT
- High link budget variants



Transport & Interconnect

- Broad portfolio of TDM, CWDM and DWDM transceivers
- Non-standard wavelengths
- Standard, Extended and Industrial temperature ranges - and beyond
- BIDI and BIDI-CWDM variants



Network Enhancements

- Network migration, TDMoP/CES pseudo wire
- Service assurance including Level 2 and 3 OAM
- Network timing - SyncE over copper
- Smart management solutions

Optical Transceivers for Every Network

Metro Access

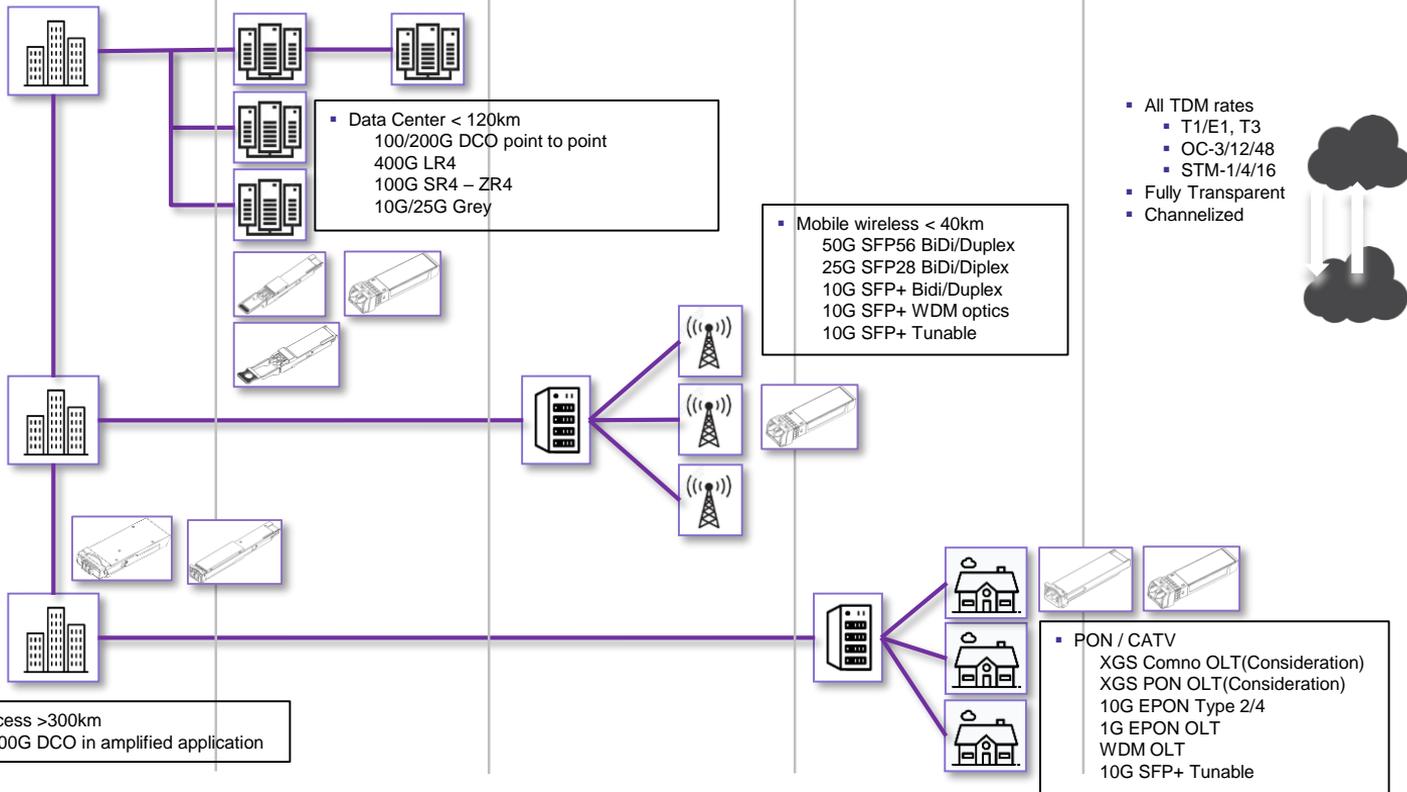
Data Center

Mobile Wireless

PON / CATV

Network Migration

Service Assurance



- Data Center < 120km
 - 100/200G DCO point to point
 - 400G LR4
 - 100G SR4 – ZR4
 - 10G/25G Grey

- Mobile wireless < 40km
 - 50G SFP56 BiDi/Duplex
 - 25G SFP28 BiDi/Duplex
 - 10G SFP+ BiDi/Duplex
 - 10G SFP+ WDM optics
 - 10G SFP+ Tunable

- All TDM rates
 - T1/E1, T3
 - OC-3/12/48
 - STM-1/4/16
- Fully Transparent
- Channelized



- Packet Network Probes
 - L2/ Ethernet
 - L3/ IP



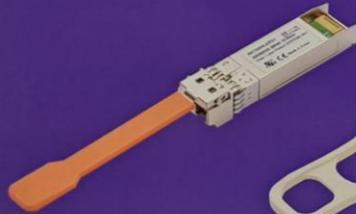
- Metro Access >300km
 - 100/200G DCO in amplified application

- PON / CATV
 - XGS Comno OLT(Consideration)
 - XGS PON OLT(Consideration)
 - 10G EPON Type 2/4
 - 1G EPON OLT
 - WDM OLT
 - 10G SFP+ Tunable

Strong in Wireless(5G, 6G) market, recently expanding the serving markets to Telecom and Data Center applications

Optical Transceivers for Next-Generation Networks

50G SFP56 BIDI
BR40/40km IT



100G QSFP28
ZR4/80km ST



100G QSFP28
DCO 120km IT



100G QSFP-DD
DCO 120km IT



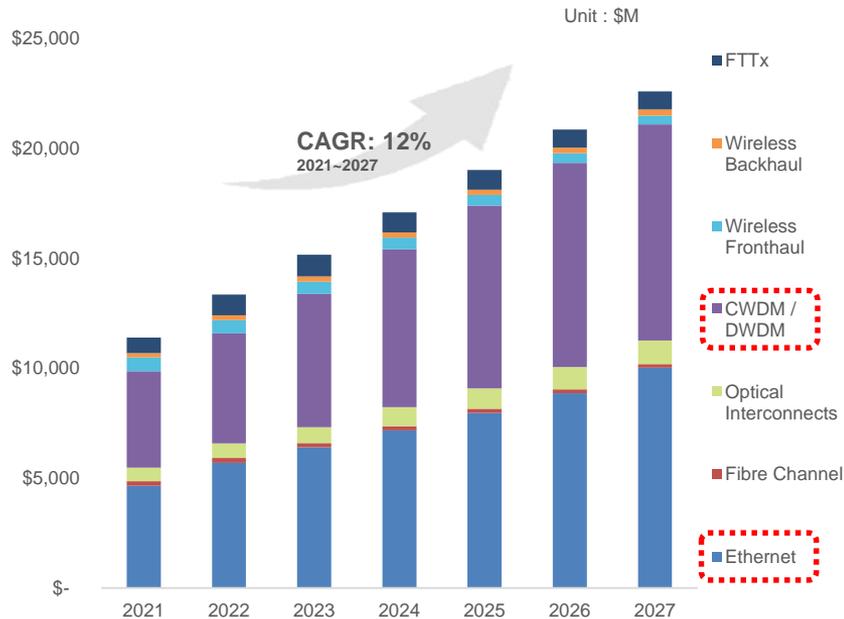
100/200G CFP2
DCO EDFA 120km IT



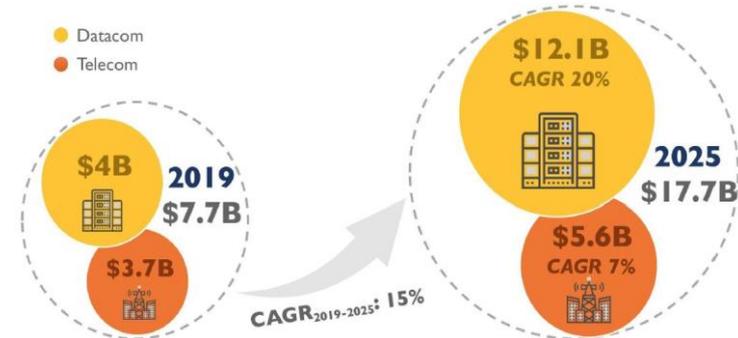
OE SOLUTIONS

Demand for Transceivers continues to increase to infrastructure investments that require data connectivity

Transceiver Market Forecast



Source : LightCounting, 2022



Source : Yole Developpement, 2020

Market and Applications which OE Solutions Laser Chip serves

Strong in telecom market, recently expanding the serving markets to LiDAR, Laser Sensors, and Data Center applications



Communications
LD & OSA

- 10G EML 1577nm
- 10G EML WDM(80km)
- 25G/50G O Band EML
- Tunable PIC Laser / ITLA



AI/DC High speed Laser

- 25G EML LWDM
- 50G EML CWDM4
- 100G EML O-Band



Next generation
AI/DC Laser

- 1310nm HP Laser for ELSFP
- CWDM HP Laser for ELSFP
- 1310nm HP Laser for SiPH
- CWDM4 HP Laser for SiPH

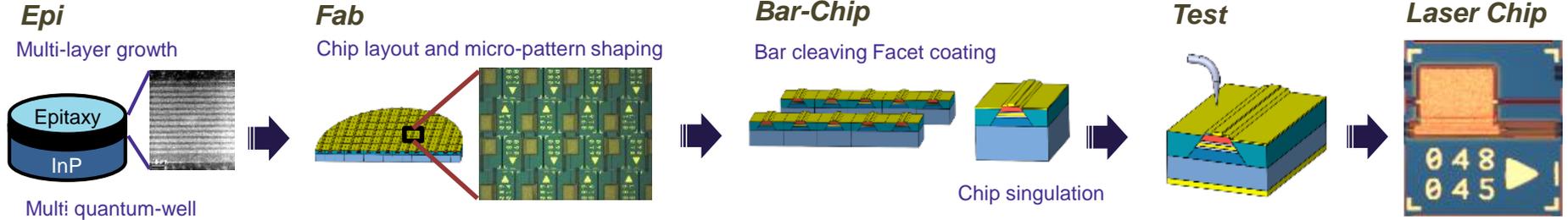


HP Laser for LiDAR

- 1550nm HP Laser(100mW)
- 1550nm HP Laser(200mW)
- Gain Chip(SOA) 1430/1550nm

Core Components and Process

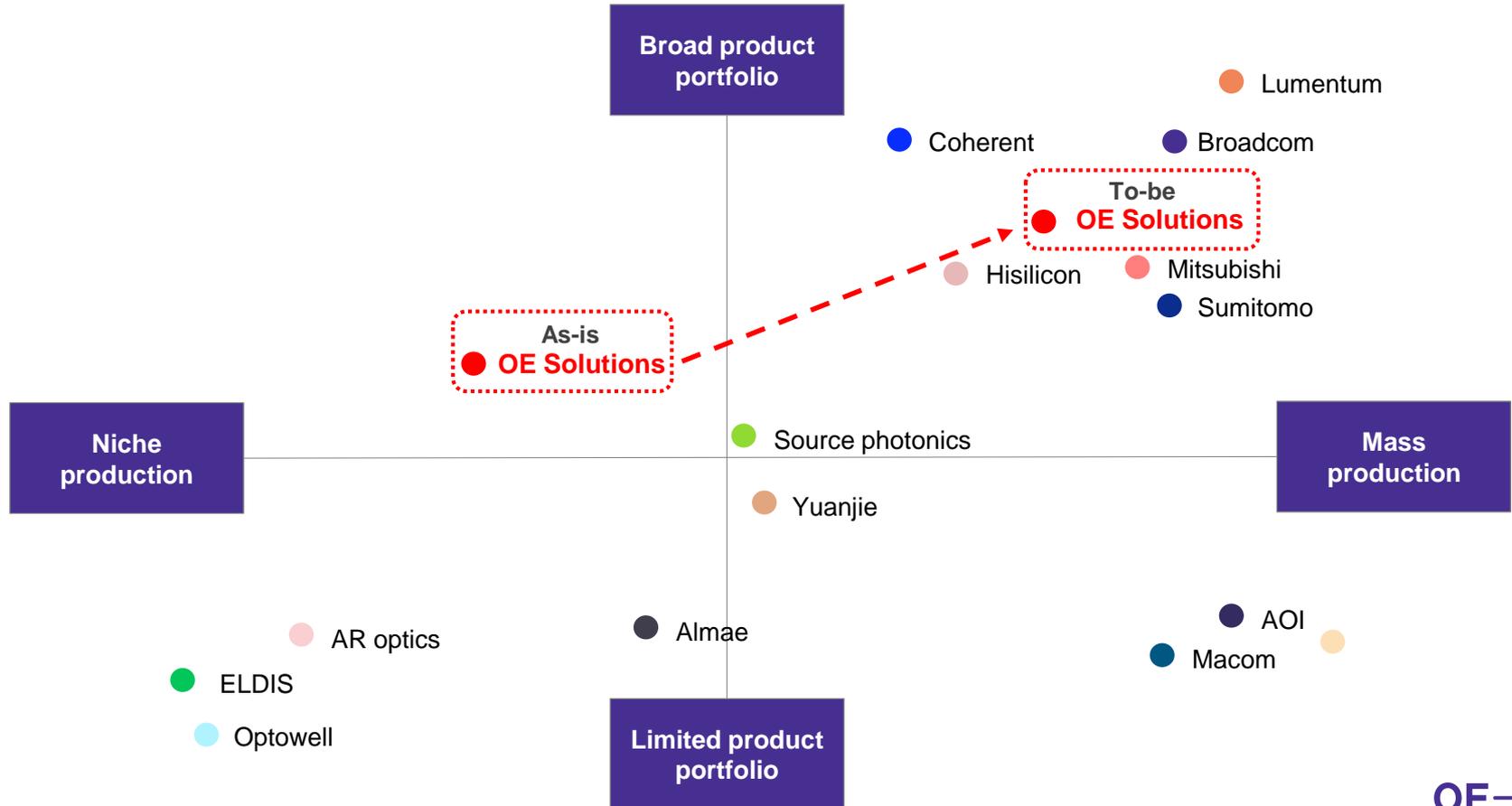
Laser Chip Process



Laser Chip Product



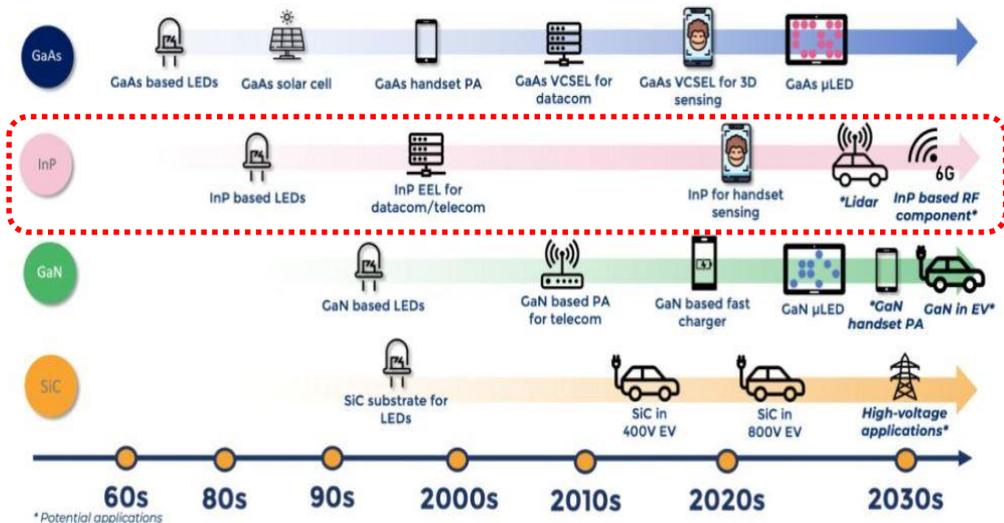
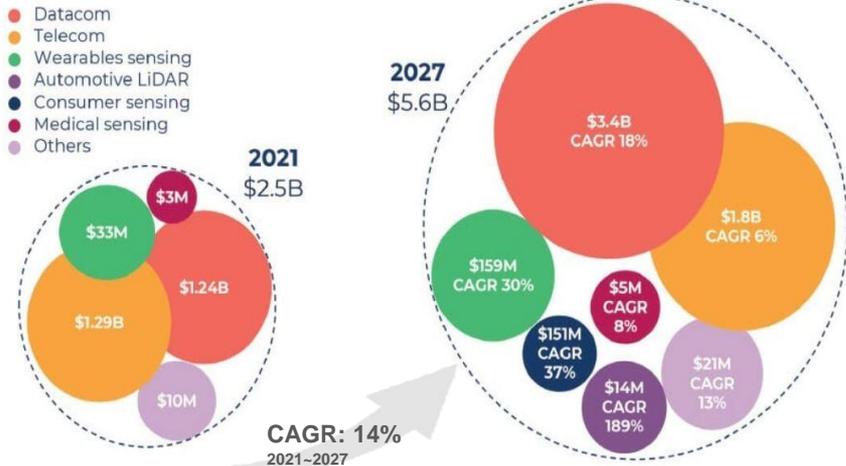
OE Solutions Laser Chip Position



The InP photonics device market has the potential for expansion into various business sectors

InP photonics device Market

Source : Yole Developpement, 2022



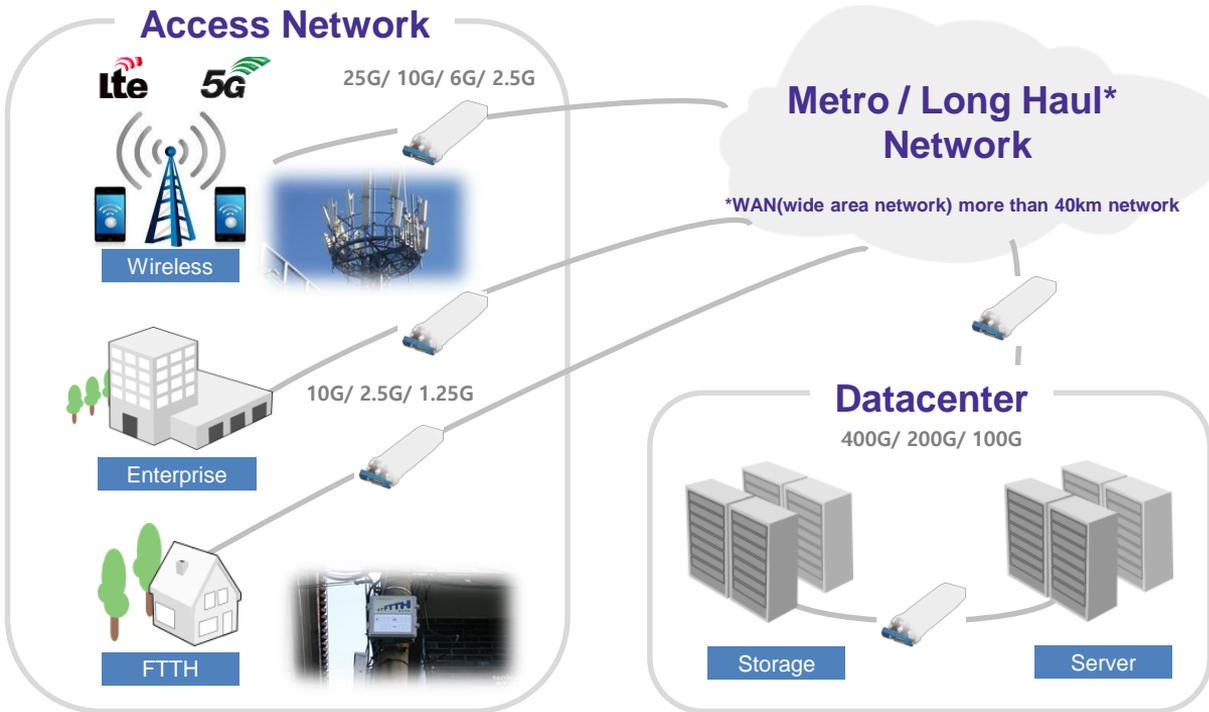
Appendix

- Product Application
- Customers
- Financials statement



The use of Transceiver in the Network

Transceiver required for network connections



Supplier to The World's Leading Network Equipment Manufacturers

NOKIA

ADTRAN



infinera

ciena

SAMSUNG

JUNIPER
NETWORKS

FUJITSU



NEC



harmonic



Consolidated financial statements

Statement of financial position

(Unit : million KRW)

	2020	2021	2022	2023
Current assets	129,808	106,938	99,267	74,833
Non-current assets	65,377	94,901	88,652	77,136
Total assets	195,184	201,839	187,920	151,969
Current liabilities	45,749	40,745	38,921	39,477
Non-current liabilities	2,455	1,794	1,344	1,069
Total liabilities	48,204	42,539	40,264	40,546
Capital	5,312	5,312	5,312	5,312
Paid-in capital in excess of par value	52,002	52,002	52,002	52,002
Retained earnings	87,511	99,665	90,861	54,593
Total equity	146,981	159,300	147,656	111,423

Income statement

(Unit : million KRW)

	2020	2021	2022	2023
Revenue	103,178	98,681	76,954	46,003
Cost of sales	62,686	62,416	52,818	46,752
Gross profit	40,492	36,265	24,136	-750
Selling general administrative expenses	33,159	34,610	32,841	30,331
Operating income	7,333	1,655	-8,705	-31,081
Profit before tax	6,699	11,967	-6,453	-29,457
Net income	12,352	14,372	-5,977	-33,817

Thank you.

OE — *
SOLUTIONS

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