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INVESTOR RELATIONS 2024



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and a

The Future of Al Computing

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Openedges Technology at a Glance







Prologue

OPENEDGES Technology's Business Areas





OPENEDGES Technology's Business Areas ①

Proloaue

Semiconductor IP is a ready-made solution requiring high-level technologies that enable faster development of SoC (System on Chip) such as AI semiconductors, reduce costs, and mitigate the risk of failure risks in development that can cost \$100 million



time

income generation

⁷Running royalty

income generation



OPENEDGES Technology's Business Areas (2)





01

Structural Development of System Semiconductor Market

01. Growth of AI Semiconductor & IP Market02. Roles of Semiconductor IP Design Company





Chapter 01, Structural Development of System Semiconductor Market

01 | Growth of Global System Semiconductor Market

Contrary to memory semiconductors, system semiconductors are continuing their steady growth





X Source: WSTS, Nov 2023 (Excluding Optoelectronics, Discrete Semiconductors and sensors)



Global Semiconductor IP market forecast





Chapter 01. Structural Development of System Semiconductor Market

03 | Roles of Semiconductor IP Design Companies

Semiconductor IP companies aim to develop and supply function blocks as needed by Fabless and Design House in a proactive manner.



Reasons for IP oligopoly Higher demand for proven IPs

proven IPs are in high demand due to the rising entry barriers

Requires highly proficient technical personnel Requires R&D investments for at least 3 years

% Note 1) (Outsourced) Semiconductor Assembly and Test: Semiconductor package assembly and test company that is responsible for performing post-processing after wafer process Note 2) Design House market does not have a reliable market size data as it is in its initial formation stage.



02

OPENEDGES Technology, as Korea's most renowned Al semiconductor IP design company

- 01. The Overview of OPENEDGES's Core Competitiveness
- 02. A Global Team of Professionals
- 03. Industry's Highest Technological Competitiveness
- 04. Verified Global Track Records
- 05. Business Partnership with Global Enterprises





Chapter 02, OPENEDGES Technology, as Korea's most renowned AI semiconductor IP design company

01 | The Overview of OPENEDGES' Core Competitiveness





Chapter 02. OPENEDGES Technology, as Korea's most renowned AI semiconductor IP design company

02 | A Global Team of Professionals – Global Presence





Chapter 02. OPENEDGES Technology, as Korea's most renowned AI semiconductor IP design company

02 | A Global Team of Professionals

Leadership of industry-leading experts with over 20 years of experience from Samsung Electronics/SK Hynix, and more.





Chapter 02, OPENEDGES Technology, as Korea's most renowned AI semiconductor IP design company

03 | Industry's Highest Technological Competitiveness ①

Al semiconductors are characterized as 'Data Intensive Computing' → Most optimize NPU and memory systems in edge Al with limited resources OPENEDGES is the only global leading Al semiconductor IP platform provider





Chapter 02, OPENEDGES Technology, as Korea's most renowned AI semiconductor IP design company

03 | Industry's Highest Technological Competitiveness ②

Leading the market through the development of cutting-edge technology

Division	IP	Description	Development status	Remark
		ENLIGHT [™] -Light (0.25 ~ 2 TOPS)	Now	Lightweight IoT applications (Keyword recognition, security camera application)
Al Platform IP Solution	ENLIGHT™	ENLIGHT [™] -Classic (2 ~ 16 TOPS)	Now	Intermediate IoT applications (ADAS)
for Edge Computing	(Neural Processing Unit)	ENLIGHT [™] -Pro (16 ~ 250 TOPS)	Now (Released in Apr. '24)	Automotive high-performance applications (Level 3 or higher self-driving vehicle application)
		ENLIGHT™ - Hyper (250 ~ 1000 TOPS)	In the future	Automotive high-performance applications (Level 4 or higher self-driving vehicle application)
		DDR4/3, LPDDR4X/4/3	Now	
		LPDDR5X/5/4X/4	Now	Current Mainstream Technology
	OMC™	НВМЗ	Now	Server and ultra-high-performance products
	(DDR Memory	DDR5	Now	Current Mainstream Technology
	Controller)	GDDR6	Now	High-performance AI product
		GDDR7	In the future	Next-generation High-performance AI product
		LPDDR6	In the process	Next-generation Mainstream Technology
		LPDDR4X/4	Now	TSMC 22nm Nodes
		LPDDR5X/5/4X/4	Now	TSMC 16nm Nodes
Total Momory		LPDDR5X/5/4X/4	Now	TSMC 12nm Nodes
System		GDDR6	Now	TSMC 12nm Nodes
Solution IP		LPDDR5X/5/4X/4	Now	TSMC 6/7nm Nodes
(ORBIT™)		НВМЗ	Now	TSMC 6/7nm Nodes
	ОРНҮ™	DDR5	Near future(~'25)	TSMC 5nm Nodes
	(DDR PHY)	LPDDR6	In the future	TSMC 4nm(or less) Nodes
		LPDDR3, DDR4/3	Now	Samsung 28nm Nodes
		LPDDR4X/4, LPDDR5/4X/4	Now	Samsung 14nm Nodes
		LPDDR5/4X/4	Now	Samsung 8nm Nodes
		LPDDR5X/5/4X/4	Now	Samsung 5nm Nodes
		LPDDR6	Near future(~'25)	Samsung 4nm Nodes
		GDDR7	In the future	-
	OIC™	OIC™	Now	Non-Cache-Coherent NoC
	(On-Chip-Interconnect)	OIC TM -AI	In the process	Cache-Coherent NoC



Chapter 02. OPENEDGES Technology, as Korea's most renowned AI semiconductor IP design company

03 | Industry's Highest Technological Competitiveness ③ Concentrate on areas that major global competitors cannot cover & expand M/S





Chapter 02, OPENEDGES Technology, as Korea's most renowned AI semiconductor IP design company

03 | Industry's Highest Technological Competitiveness ④

Maximize first-mover advantage of AI semiconductor integrated IP solutions

예상 출시 일정		20	21	20	22	20	23	20	24	2025	
에 경 물	~1 2 3	1H	2H	1H	2H	1H	2H	1H	2H	1H	2Н
ENLIC Neural Proc	GHT TM cessing Unit	NPU v1.0 [Performance] L 0.25~2 TOPS Sec	[TagetPoduct ight-weightIoTapp products(keywo recognition, secu cameraapplicati urity Camera	NPU v2.0	[lageti me] Mediumorhig application (autonomous applic iver Support :	Poclut] herlevelofioT nproducts drivingauxiliary ation) System	efomance] Hight 16~250 produc TOPS ofauto W	NPU v3.0 AutomousDiving (TagetPocket) performanceapplic tsforvehides(Appli promousdrivingvel ithLevel3orhigher Fully Au	ation cation nicles 1 tonomous Dr	NPU4.0 Lutanonus Divin (I mce] High-per 000 productsfor 5 application vehidesu iving	ingetProduct] formanceapplication vehicles(Multi-Dieversion of autonomous driving with Level 4 or higher)
ΟΙΟΤΜ	Non-Cache Coherent NOC	OIC v.1.X						- OIC v.2.0 -			
On-Chip Interconnect	Cache Coherent NOC										
OM Memory (C™ Controller	GDDR6	LP5X/5 /4X/4		НВМ3	DDR5				LP6	►
ОРНҮ™	SAMSUNG		LP4/4X/5 (14nm)				LP5X/5/4X (5nm)			LP6 (4nm)	►
DDR PHY	tsmc			LP4/4X/5 GDDR6 (12nm)	LP4/4X/5 (22nm)	HBM3 LP4X/5/5X (6/7nm)		LP5X/5/4X (12/16nm)		DDR5 (5nm)	
OUC Controller Die to Die (Chiplet Controller)									UCle v1.1 Controller (AXI streaming)		(UCle v1.1 Controller (Full spec.)
OPHY TM PHY Die to Die (Chiplet)	SAMSUNG										OPHY-D2D (5/8nm)
	tsmc										OPHY-D2D (6nm)



03 Industry's Highest Technological Competitiveness (5)

Leading the next generation of high value-added semiconductor technology expected to grow rapidly





Chapter 02. OPENEDGES Technology, as Korea's most renowned AI semiconductor IP design company

04 | Verified Global Track Records

Expanding global track record as value recognized as the essential solution in various industries





Chapter 02. OPENEDGES Technology, as Korea's most renowned AI semiconductor IP design company

05 | Business Partnership with Global Enterprises

Securing stable IP demands + Proactive response to advanced technologies and market trends





03

'24 2Q Business Performance

01. Sales Revenue02. Operating Profit(Loss)03. Contract Status





Chapter 03. '24 2Q Business Performance

01 | Sales Revenue

'24 2Q sales recorded KRW 4 billion due to new contracts, etc., increase compared to the 1Q24(63.1%, QoQ), 2Q23(42.5%, YoY)







(Unit: KRW 1 million)

Chapter 03. '24 2Q Business Performance

02 | Operating Profit(Loss)

Recorded a loss of 5.7 billion won, improved the deficit compared to1Q24 R&D expenses were managed at 8~9 billion won without much change.

Operating Profit(Loss)



Operating Profit Analysis
Sales increase reduces deficit compared to 1Q24, & deficit is expected to continue to decrease due to new contracts
Most of the R&D expenses are for developing new IP, are being managed stably at around KRW 8 to 9 billion per quarter without burdening large one-off costs.

Currently, discussions are underway to acquire multiple licenses, and sales growth and profitability improvement are expected to continue.



Chapter 03, '24 2Q Business Performance

03 | Contract Status

Contract value Increase QoQ due to the high-performance IP contracts. It will continue to grow due to closing of contracts under negotiation in 2H24.

Contract Status

(Unit: USD 1 million)

□ '24.2Q: 4 new license contracts, worth \$5.3M

- The average price per contract is \$1.3M,
- Winning a high-performance/high-price IP contracts

□ '24.1H: 7 cumulative license contracts, worth \$7.4M

- Cumulative contract value increase 68% compared to 1H23(\$4.4M)
- ASP per contract was \$1.1M, increased from \$0.7M in 1H23.

Contract status												
(Unit: case/\$M)	ʻ24.2Q (3M)	′24.1H (6M)	′23.1H (6M)	FY2023	FY2022							
Numbers	4	7	6	12	13							
Sum of Contract va lue	\$5.3M	\$7.4M	\$4.4M	\$15.5M	\$7.5M							
Average pri ce per Cont ract	\$1.3M	\$1.1M	\$0.7M	\$1.3M	\$0.6M							

Performance Analysis and outlook

'24 2Q Results

□ Signing high-performance/high-price IP contract

• Winning high-performance SoC projects considering Samsung 5nm, etc.

$\hfill\square$ Delay in completion of customization design project

• Negotiation on customized IPs that support the latest DRAMs such as HBM3 and DDR5 took longer than expected

Outlook for the second half of 2024

Expect high growth in normal license sales and improve profitability

- Securing large orders from Tier-1 customers in 2H of 2024
- Improving sales and profitability with high-performance IPcentered IP order contracts

$\hfill\square$ Expand due to demand for next-generation and customization

- In addition to CXL, expanding collaboration to reduce the performance gap between AI semiconductors and DRAM, such as PIM and Chiplet
- In addition to normal licenses, we plan to respond quickly to customization IP licenses with global top-tier companies



Growth Strategy

- 01. Growth Plan
- 02. Strengthen existing IP competitiveness
- 03. Expand detailed IP portfolio
- 04. Why Expanded IP Portfolio?
- 05. How to Succeed?
- 06. Competitor IP Product Portfolio Status







Expanding Portfolio with AI Semiconductor IP Solution

Multi-Die/Chip

On-die



Chapter 04, Growth Strategy

02 | Strengthen existing IP competitiveness



+ Cache Coherence Network-on-Chip IP in development

* IP responsible for maintaining data consistency in the cache memory within the SoC, a technology required when designing high-performance AI semiconductors based on multi-core

* Considering establishment of a subsidiary in Vietnam or Eastern Europe





Chapter 04, Growth Strategy

04 Why Expanded IP Portfolio? ① Rapid growth of the Wired Interface IP market

Wired Interface IP sector is growing the fastest due to increasing data demand for AI computing



* Resources: IPnest (As of May, '24)



Chapter 04. Growth Strategy

04 Why Expanded IP Portfolio? 2 Responding to demand for customized AI semiconductor chips (ASIC)

Al semiconductor market paradigm shift from SoC to ASIC \rightarrow Increased need for cooperation with semiconductor IP companies



Factors in demand for ASIC

Need for complex neural network response capable of complex natural language processing such as LLM/SLM



Design optimization from a whole chip perspective is needed to support data intensive computing





Chapter 04. Growth Strategy



01

Openedges has already secured industry-leading human resources and commercialization reference

02

Commercialization Reference

Commercialization experience in not only the first NPU IP in Korea, but also high-performance Memory Controller and DDR PHY IP, which are a pillar of the Wired Interface field. Industry-leadin Experts

Manpower required to expand the Wired Interface Portfolio.

Synergy with existing IPs

03

With the acquisition of advanced analog manpower, it is expected that there will be synergy in the development of DDR PHY IPs.



Chapter 04. Growth Strategy06Comparing Competitor IP Portfolios

By commercializing each IP in the Wired Interface IP field sequentially, Openedges will build up the Total AI Platform IP Solution optimized with ENLIGHT NPU by 2030.

Global Top 5 IP Companies vs. Openedges

	IPs	Openedges	arm	Synopsys	Cadence	Alphawave Semi	Imagination Technologies	
	CPU (Central P	Processing Unit)	-	•		-	-	•
Processor	cessor GPU, ISP (Imag	je Signal Processor)	-	•	- RISC-V	-	-	•
IP	DSP (Digital Si	gnal Processor)	-	-	•	•	-	-
	NPU (Neural Pi	rocessing Unit)	•	0	0	0	-	•
		DDR Cont'r/PHY	•	-	•	•	-	-
		HBM Cont'r/PHY	•	-	•	•		-
		UCle Cont'r/PHY	*	-	•	•	•	-
		PCIe Cont'r/PHY	*	-	•	•	•	-
	Wired Interface IP	CXL Cont'r/PHY	*	-	•	•	•	-
		Ethernet	-	-	•	•	•	-
	interface ii	USB	*	-	•	•	-	-
Physical		SATA(Serial ATA)	-	-	•	•	-	-
IP		HDMI	-	-	•	•	-	-
		Display Port	-	-	•	۲	-	-
		MIPI	*	-	•	•	-	-
	Memory Comp	ilers (Others)	-	-	•	-	-	-
	Standard Cell &	& I/O	-	•	•	-	-	-
	Memory Comp	ilers (SRAM)	-	•	•	-	-	-
	Analog & Mixe	d Signal	-	-	•	•	-	-
	Wireless Interf	face IP	-	-	•	-	-	-
0.1	Miscellaneous	IP	-	-	•	•	-	-
Other Digital IP	System IP (CC	NoC, NCC NoC etc.)	•	•	0	0	-	-
Digital IP	Security IP		-	•	•	-	-	-

* O: We judge the company to be a non-major competitor with little history of competition in the market (focused on low-end)

★: Candidates for Openedges ★: yr 2025 / ★: yr 2026 / ★: yr2027~



The D2D (UCle) market is expected to grow rapidly in the future due to the increase in demand for chiplet development, although the market size in 2022 is small and difficult to distinguish from Ethernet.



[Appendix] Financial Statements(Consolidated)

Statement of Financial Position

Statement			(Unit: Kl	RW 1 million)
	2Q24	2023	2022	2021
Current Assets	22,449	29,843	44,304	29,020
Non-current Assets	11,216	14,849	9,552	7,077
Total Assets	33,664	44,692	53,855	36,097
Current Liabilities	18,662	19,750	18,318	9,171
Non-current Liabilities	4,972	4,371	3,288	6,374
Total Liabilities	23,634	24,121	21,606	15,545
Capital	2,184	2,146	2,116	1,653
Capital Surplus	100,573	98,259	96,376	58,927
Other Capital	3,552	3,577	2,026	3,007
Retained earnings	∆96,279	∆83,412	∆68,269	∆43,035
Total Equity	10,031	20,571	32,249	20,553

Income Stater	nents		(Unit: I	KRW 1 million)
	2Q24	1Q24	Change	Change(%)
Sales Revenue	4,050	2,484	1,566	63%
Operating Expenses	9,784	9,589	195	2%
R&D Cost	7,816	7,543	273	4%
Selling General & Admin. Expense	1,968	2,046	∆78	∆4%
Operating Profit	∆5,733	∆7,106	1,373	N/A
Financial Income	285	380	∆95	∆25%
Financial Expenses	347	416	∆69	∆17%
Other Income	35	37	∆2	∆5%
Other Costs	1	-	1	N/A
Profit before Income Tax Expense	∆ 5,762	∆7,106	1,344	N/A
Income Tax Expense	-	-	-	N/A
NetIncome	∆5,762	∆7,106	1,344	N/A



[Appendix] Financial Summary

Financial Summary

(Unit: KRW 1 Million)

Consolidated	2019	2020	2021	1Q22	2Q22	3Q22	4Q22	2022	1Q23	2Q23	3Q23	4Q23	2023	1Q24	2Q24
--------------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------

Revenue	1,238	1,089	5,186	3,033	3,975	1,577	1,426	10,012	1,059	2,842	1,885	13,809	19,595	2,484	4,050
License fee	990	660	4,342	2,798	3,619	1,175	1,001	8,593	555	2,370	1,261	10,666	14,852	1,627	3,103
Maintenance	249	423	808	230	350	392	415	1,387	487	454	604	762	2,308	716	764
Royalty		6	35	5	7	10	10	32	17	18	20	17	71	2	18
Others												2,363	2,363	138	166

Cost and Expense	4,422	8,896	16,241	5,792	7,293	7,844	14,344	35,273	8,801	8,422	9,311	8,924	35,458	9,589	9,784
R&D Cost	2,347	6,623	10,654	3,937	5,361	6,063	12,349	27,710	7,052	6,546	7,146	6,439	27,184	7,543	7,816
Selling General & Admin Expense	2,075	2,273	5,587	1,855	1,932	1,782	1,995	7,563	1,749	1,876	2,165	2,485	8,275	2,046	1,968
Operating Income	∆3,183	∆7,807	∆11,055	∆2,759	∆3,317	∆6,267	∆12,918	∆25,261	∆7,742	∆5,581	∆7,426	4,885	∆15,8 <mark>6</mark> 4	∆7,106	∆5,733
Net Profit before Corporate Tax Costs	∆8,487	∆18,729	∆14,524	∆2,906	∆3,398	∆6,181	∆12,362	∆24,846	∆7,634	∆5,559	∆7,317	6,000	∆14,510	∆7,106	∆5,762
Net Income	∆8,487	∆18,729	∆14,608	∆2,906	∆3,398	∆6,178	∆12,745	∆25,227	∆7,631	∆5,557	∆7,310	5,642	∆14,856	∆7,106	∆5,762

X Numbers are based on consolidated financial statements.



[Appendix] Shareholders

Sean Lee(CEO, 17.38%) & related parties own more than 30% (30.65%)

* Co-founders, Executives etc.

Shareholder Status ('24.6.30.)



Name	Туре	# of shares	%
Sean Lee(CEO)	Common	3,796,314	17.38%
Related Parties	Common	2,899,543	13.27%
YUE FENG INVESTMENT HOLDING LIMITED	Common	425,000	1.95%
NPS (National Pension Service)	Common	281,706	1.29%
ESOP	Common	30,980	0.14%
Others	Common	14,239,308	65.19%
Total		21,842,757	100.00%

* Date: '24.6.30.

** Reference: '24.7.22, Stonebridge and Atinum each acquired 1,474,853 shares of convertible preferred stock by issuing new stocks allocation to the third-parties.