TOREX SEMICONDUCTOR | 6616

Sponsored Research
July 25, 2023

Sessa Investment Research

New LT targets extended to FY29/3

Total capex of ¥12.6bn to boost capacity for sales up 1.5x

SUMMARY

- Since 1H FY24/3 corresponds with the bottom of the current reset cycle, initial guidance for net sales is -9.3% YoY. In addition to ongoing high electricity rates, depreciation expense is set to increase +51.1% YoY, and initial guidance for OP is -62.3% YoY. On a cash flow basis, implied EBITDA is forecast to decline -29.1% YoY. It is worth noting that the forex assumption is USD 130, versus the current 144.

- 1) Fabless TOREX will invest ¥1.8bn in an overseas foundry's fab to secure dedicated 8-inch capacity necessary for the development of new high-performance power device products, 2) it is investing ¥4.4bn in an existing line to expand dedicated capacity for TOREX at Phenitec's Kagoshima Fab, including expanding clean room floor space, 3) it is investing ¥2.0bn in other capex at the Okayama No. 1 Fab and Kagoshima Fab to meet demand in a brisk semiconductor market, and additionally it is deploying ¥4.4bn capex for plant maintenance, etc. This represents total capex of ¥12.6bn to boost capacity for sales to increase 1.5x.

- Just based on new MTP targets for FY26/3, OP is set to grow from the depressed base in FY24/3 by 2-year CAGR of +91.5% (up 3.67x in 2 years). While admittedly the implied OPM of 14.86% is a challenging level, SIR believes current valuations are extremely compelling. Note that the SOX Index peaked at the end of Dec-2021, and then bottomed in Oct-2022, now recovered to 90% of the previous peak. This tends to align with the current WSTS model depicted on the upper left-hand chart on P18, i.e., bottoming roughly a year before the next up cycle is confirmed.

● **3 Simultaneous Megatrends: 5G/IoT, EV/ADAS/connected cars, power devices**

Source: excerpt from 2023 company product catalog.

Full Report

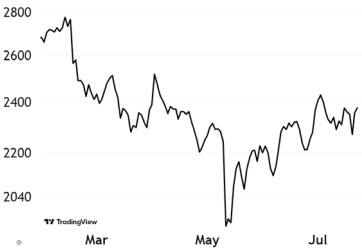
TOREX

Focus Points:

Power management IC specialist with attractive growth profile from new applications driven by 5G/IoT, EV/ADAS and highly energy efficient next-gen power devices.

Key Indicators	
Share price (7/25)	2,376
YH (23/2/10)	2,843
YL (23/5/15)	1,912
10YH (21/11/30)	3,960
10YL (14/5/20)	725.8
Shrs out. (mn shrs)	11.554
Mkt cap (¥ bn)	27.360
EV (¥ bn)	25.353
Equity ratio (3/31)	66.4%
24.3 P/E (CE)	24.8x
24.3 EV/EBITDA (CE)	6.4x
23.3 ROE (act)	9.2%
23.3 P/B (act)	1.06x
24.3 DY (CE)	2.36%

6M daily share price trend



Chris Schreiber CFA
Company Specialist
research@sessapartners.co.jp

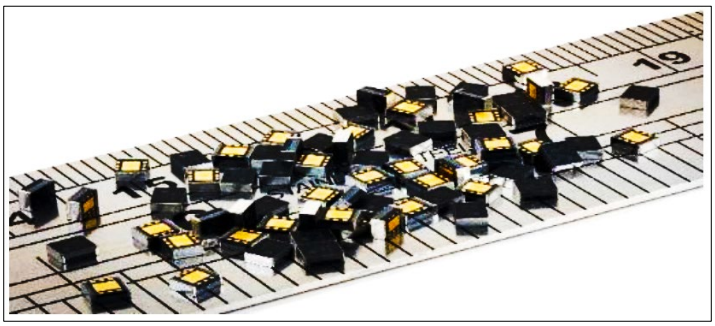
TOREX Semiconductor Consolidated Financial Summary

[J-GAAP]	FY13/3	FY14/3	FY15/3	FY16/3	FY17/3	FY18/3	FY19/3	FY20/3	FY21/3	FY22/3	FY23/3	FY24/3
JPY mn, %	act	act	act	act	act	act	act	act	act	act	act	init CE
Net sales	**8,600**	**9,391**	**9,972**	**10,621**	**21,560**	**23,997**	**23,897**	**21,501**	**23,713**	**30,864**	**31,957**	**29,000**
YoY	**(6.1)**	**9.2**	**6.2**	**6.5**	**103.0**	**11.3**	**(0.4)**	**(10.0)**	**10.3**	**30.2**	**3.5**	**(9.3)**
• TOREX (parent)	—	—	—	—	10,181	10,168	10,104	9,663	9,605	14,124	14,694	
• Phenitec contribution	—	—	—	—	11,378	13,828	13,792	11,837	14,107	16,740	17,262	
Gross profit	3,218	4,337	4,822	5,063	5,900	7,177	6,494	5,452	5,959	9,474	10,021	
SG&A expenses	2,651	2,922	3,472	3,923	4,649	4,964	4,943	4,774	4,750	5,577	6,045	
Depreciation, GW amort.	432	468	410	442	1,219	934	1,085	1,312	1,208	1,311	1,646	2,487
EBITDA	999	1,882	1,760	1,582	2,470	3,146	2,636	1,990	2,417	5,209	5,622	3,987
Operating profit	**567**	**1,414**	**1,350**	**1,140**	**1,251**	**2,212**	**1,551**	**678**	**1,209**	**3,898**	**3,976**	**1,500**
YoY	**1,282.9**	**149.4**	**(4.5)**	**(15.6)**	**9.7**	**76.8**	**(29.9)**	**(56.3)**	**78.3**	**222.4**	**2.0**	**(62.3)**
OPM %	**6.6%**	**15.1%**	**13.5%**	**10.7%**	**5.8%**	**9.2%**	**6.5%**	**3.2%**	**5.1%**	**12.6%**	**12.4%**	**5.2%**
• TOREX (parent)	—	—	—	—	680	633	646	453	516	1,789	2,567	
• TOREX (parent) OPM %	—	—	—	—	6.7%	6.2%	6.4%	4.7%	5.4%	12.7%	17.5%	
• Phenitec contribution	—	—	—	—	571	1,579	904	225	693	2,108	1,409	
• Phenitec contrib. OPM %	—	—	—	—	5.0%	11.4%	6.6%	1.9%	4.9%	12.6%	8.2%	
Ordinary profit	**445**	**1,339**	**1,679**	**971**	**906**	**1,998**	**1,820**	**676**	**1,206**	**4,125**	**3,981**	**1,500**
Extraordinary Gain	—	—	—	190	2,561	34	8	32	27	396	—	
Extraordinary Loss	227	15	—	137	31	62	23	117	62	107	993	
Profit before income taxes	217	1,324	1,679	1,024	3,435	1,971	1,805	592	1,171	4,414	2,988	
Total income taxes	25	(35)	428	442	331	561	484	174	238	1,257	809	
Profit ATOP	**192**	**1,357**	**1,248**	**580**	**2,931**	**902**	**1,049**	**418**	**934**	**3,157**	**2,180**	**1,050**
Attributed to minority int.	1	1	3	1	174	507	272	0	—	—	—	
Profit	193	1,359	1,251	581	3,105	1,410	1,321	417	934	3,157	2,180	1,050
Total assets	10,567	10,801	13,171	12,973	25,210	27,995	28,386	27,847	31,512	34,770	37,049	
• Current assets	9,057	9,410	10,753	10,818	19,166	21,669	19,907	18,846	22,422	24,880	24,715	
• Non-current assets	1,510	1,390	2,418	2,155	6,043	6,326	8,479	9,001	9,091	9,890	12,334	
Net IBD (net cash)	(3,059)	(4,385)	(6,576)	(6,904)	(3,846)	(7,376)	(6,266)	(4,532)	(4,350)	(4,382)	(690)	
• Cash/deposits, ST inv.	5,508	5,647	6,702	6,917	10,069	12,435	10,982	9,281	11,737	10,220	8,573	
• Int. bearing debt	2,449	1,262	126	13	6,223	5,059	4,716	4,749	7,387	5,838	7,883	
Total liabilities	4,160	2,896	2,282	2,044	9,612	8,910	8,748	9,175	11,722	12,041	12,455	
• Current liabilities	3,581	2,413	1,887	1,622	6,306	6,857	6,211	6,943	7,679	8,977	7,382	
• Non-current liabilities	579	483	395	421	3,306	2,053	2,537	2,232	4,043	3,064	5,073	
Total net assets	6,406	7,905	10,889	10,929	15,598	19,085	19,638	18,672	19,790	22,729	24,594	
• Total shareholders' eqty	6,375	7,869	10,844	10,886	11,433	14,503	19,594	18,672	19,790	22,729	24,594	
• Non-controlling interest	31	36	45	43	4,165	4,582	44	—	—	—	—	
ROE (%)	3.1	19.1	13.3	5.3	26.3	7.0	6.2	2.2	4.9	14.8	9.2	
ROIC (%)	6.3	16.1	9.1	6.4	5.6	7.2	4.4	2.1	3.8	9.5	10.4	
FY-end employees	309	329	342	343	981	982	1,017	1,016	1,016	1,034	1,063	
Capital expenditures	276	266	586	602	988	1,149	3,323	1,497	1,179	1,916	4,850	5,917
Forex rate	¥82.3	¥99.7	¥109.8	¥120.1	¥108.9	¥110.8	¥110.7	¥109.1	¥106.2	¥112.9	¥134.9	¥130.0

Source: compiled by SIR from Annual Securities Reports (YUHO financial statements) and IR results briefing materials.

Powerfully small.

"Micro DC/DC" XCL Series
Ultra small DC/DC converters that integrate a coil and a control IC. Simultaneously achieve **space-saving, high efficiency, low noise, high heat dissipation, and low cost**.



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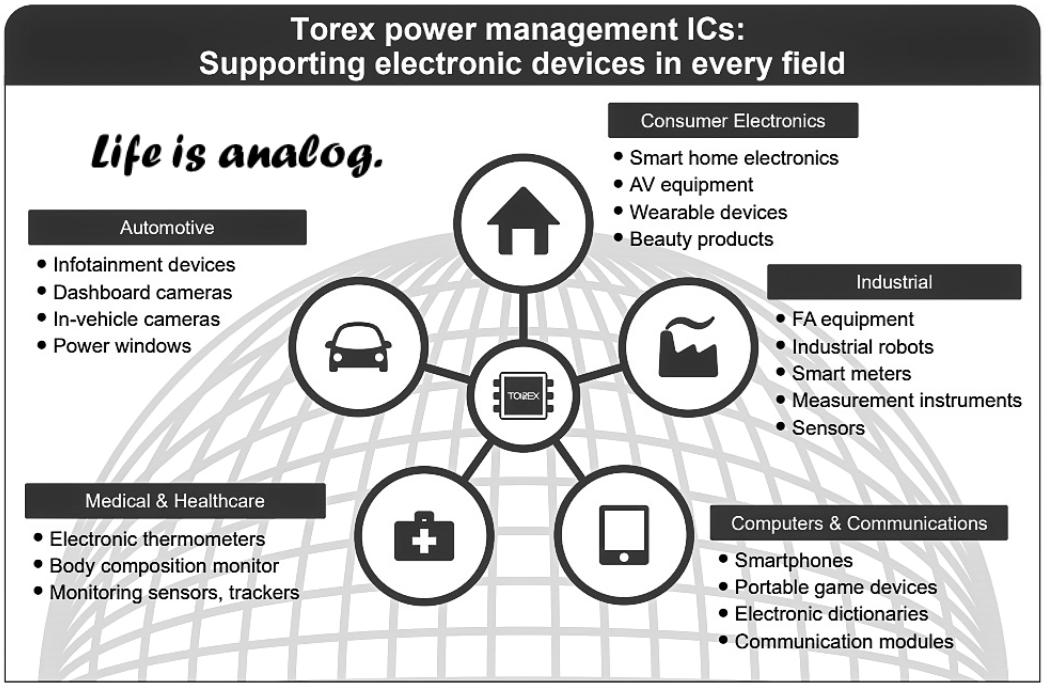
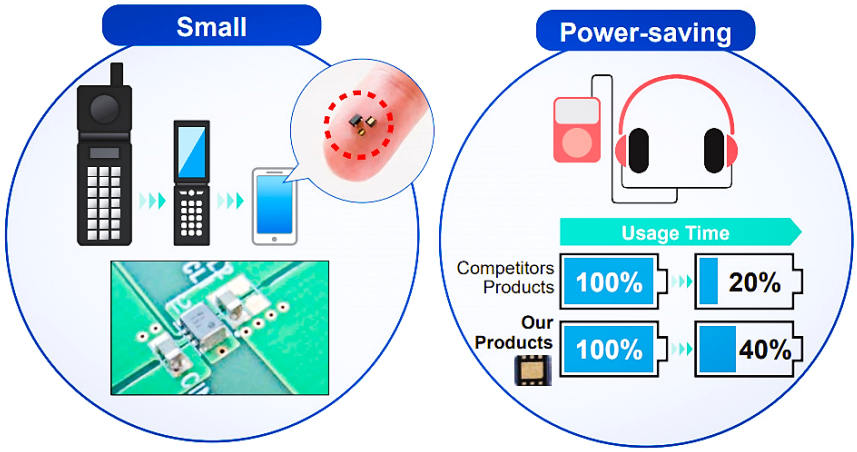




Source: excerpt from 2023 Company product catalog.

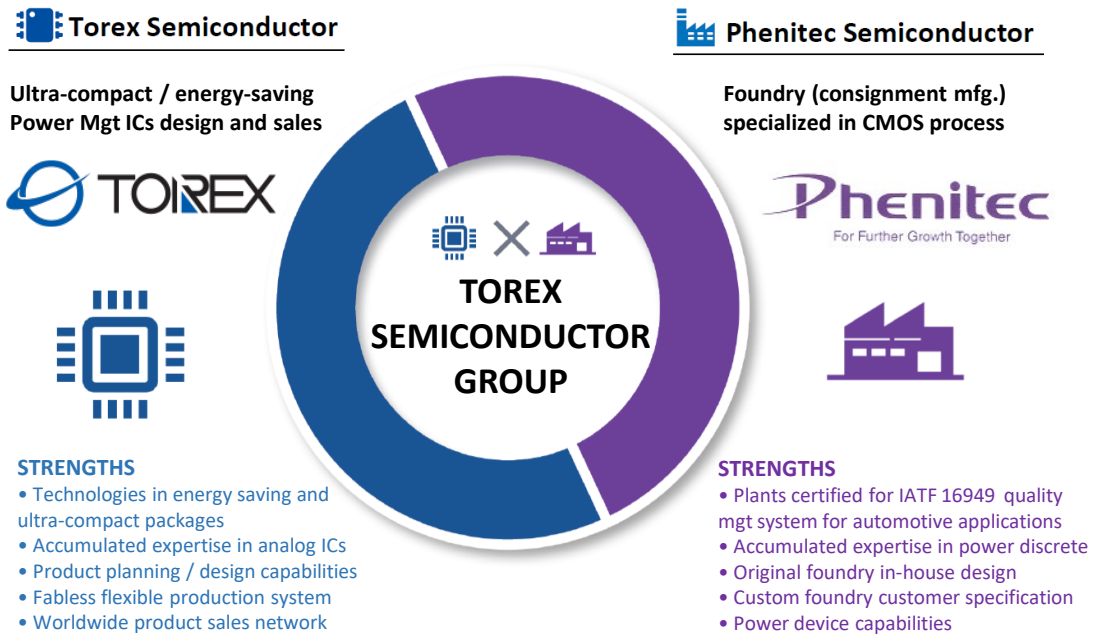
Part 1
COMPANY OVERVIEW

Torex Semiconductor Group Overview

The Torex Group has a unique business model, where the parent Torex has a fabless business model specializing in the design and sales of analog ICs, specifically power management ICs, which are required in all microcontroller units (MCUs)/modules, performing functions such as stable voltage supply, overcurrent protection, and high-efficiency voltage conversion. Voltage transmitted from dry cell or automotive batteries has subtle fluctuations due to decreases in stored electrical energy and changes in the environment such as temperature and electromagnetic noise. If voltage is left unregulated, it may lead to malfunction of electronic equipment, and therefore power management ICs are indispensable for all types of electronic components and products. The medium-term demand outlook is bright with growth in the number of IoT-connected devices accelerating, 5G infrastructure ramping up globally, diffusion of electric vehicles (EVs) entering a new growth phase, and technology advances in connected cars and ADAS (Advanced Driver-Assistance Systems).

Subsidiary Phenitec offers a unique foundry service in Japan using CMOS process technology for discrete and power semiconductors. Its comprehensive front-end wafer processing services include: 1) consignment manufacturing of custom products to customer specifications, 2) production of in-house developed original products, and 3) various partial micromachining of silicon wafers such as laser trimming, test & probe, back surface processing and dicing. By providing foundry solutions to meet customer needs, Phenitec is achieving low-cost, high-quality products. As the table on the next page shows, Phenitec was founded in October 1968 as Shinko Electric Co., Ltd., celebrating its 50TH anniversary in October 2018. It began manufacturing discrete devices in the late 1970s and early 1980s, with a commitment to Total Productive Maintenance (TPM) activities and emphasis on continually raising quality standards.

Torex Semiconductor Group Business Models by Entity



Source: company IR materials

Phenitec

PHENITEC SEMICONDUCTOR Corp. Corporate History

Date	Event / Milestone
1968/10	Shinko Electric Co., Ltd. established in Ibara, Okayama Pref.
1976/3	Diode device manufacturing commenced
1983/12	Zener diode device manufacturing commenced
1984/9	Transistor device manufacturing commenced
1988/5	Total Productive Maintenance (TPM) activities commenced
1989/5	EPI (epitaxial wafer) Plant completed
1990/8	Daiichi (No.1) Plant Fab-1 completed, power MOS, CMOS production commenced
1990/9	Received the PM Business Excellence award
1990/10	Bipolar IC manufacturing commenced
1997/8	Obtained ISO 9002 certification, JQA-1829
1998/10	Company name changed to Phenitec Semiconductor co., Ltd.
1998/11	QS 9000: obtained 1998 certification
1999/10	Obtained VDA6 certification (German version of QS 9000)
1999/12	Daiichi (No.1) Plant Fab-2 completed
2001/8	Mass production commenced on 6-inch line
2002/4	Obtained ISO 14001 certification
2002/8	Kyoto Design Center established
2003/11	Upgrade to ISO 9001 certification
2003/12	Daiichi (No.1) Plant Fab-3 completed
2004/5	ISO/TS 16949: obtained 2002 certification
2015/10	Acquired Kagoshima Plant from Yamaha Corp., commenced production
2016/4	Concluded a capital alliance with Torex Semiconductor, becoming a subsidiary
2017/4	ISO 14001: obtained 2015 certification
2018/4	Increased capital to JPY 1.6 billion, Torex stake raised to 69.1%
2018/8	Daiichi (No.1) Plant Fab-4 completed
2018/9	IATF 16949: obtained 2016 certification (Head Office Plant, Daiichi Plant)
2018/11	ISO 9001: obtained 2015 certification
2020/3	ISO 45001: obtained 2018 certification
2020/11	IATF16949 ： obtained 2016 certification (Kagoshima Fab)

Source: Phenitec website

October 2018
50TH Anniversary

Torex Semiconductor Group Corporate History

The history of the company began in October 1989 when the former Torex Semiconductor Co., Ltd. was established as a company responsible for sales of the foundry business of Shinko Electric Co., Ltd. (currently PHENITEC SEMICONDUCTOR Corp.). In order to expand the company's business scale, it was necessary to develop core business other than foundry sales, so the company focused on the field of analog power supply ICs, an under-covered area by major semiconductor manufacturers. The decision to focus on analog power management ICs was due to expectations that the development of final applications that run on batteries would accelerate in the future, and for such products, multiple analog power management ICs would be required to control battery power management.

XC61AN Series
High Precision Low Power Consumption Voltage Detector

In 1992 the company launched the XC61AN series voltage detector offering extremely precise detection and low power consumption. The XC61AN series was introduced for use on a portable cassette player with nickel-hydrogen rechargeable batteries. At the time, the ability to accurately detect the minimum 0.8V needed to run the player was a highly requested feature, and meeting this requirement made much longer play time possible.

TOREX SEMICONDUCTOR LTD. Corporate History

Date	Event / Milestone
1995/3	Established as a subsidiary of Shinko Electric Co., Ltd. (currently PHENITEC SEMICONDUCTOR Corp.) in Ibara, Okayama Pref. Established head office in Echujima, Koto-ku, Tokyo
1996/11	Established TOREX SEMICONDUCTOR (S) PTE LTD in Singapore (81%) as the first overseas base
1997/3	Established Torex Device Co., Ltd.
2000/6	Established TOREX SEMICONDUCTOR DEVICE (HONG KONG) LTD (currently ISM ASIA LIMITED)
2000/9	Established TOREX USA Corp.
2001/3	Established TOREX SEMICONDUCTOR EUROPE LIMITED
2002/5	Made TOREX SEMICONDUCTOR (S) PTE LTD a wholly owned subsidiary
2002/8	Head office moved to Nihonbashi Kayabacho, Chuo-ku, Tokyo
2002/10	Established Kansai branch office in Ibaraki, Osaka
2003/3	Obtained ISO 14001 certification (head office)
2003/5	Established Shanghai office
2004/4	Opened Sapporo Technology Center in Sapporo, Hokkaido
2004/6	Reorganized Shanghai office, and estab. TOREX SEMICONDUCTOR DEVICE (Shanghai) CO., LTD.
2005/12	Established Taiwan office. Opened Kanto West Sales Office in Tachikawa, Tokyo
2006/3	Kansai branch office moved to Yodogawa-ku, Osaka
2006/10	Absorbed through merger Torex Device Co., Ltd. As a result of this merger, Device Engineering Co., Ltd. became a wholly owned subsidiary
2007/2	Established TOREX (HONG KONG) LIMITED
2007/3	TOREX SEMICONDUCTOR DEVICE (HONG KONG) LTD (currently ISM ASIA LIMITED) shares sold
2007/4	The Taiwan office was reorganized, and established TOREX SEMICONDUCTOR TAIWAN LTD. Established TOS Device Co., Ltd.
2008/8	Obtained ISO 9001 certification (head office and all Japan bases)
2008/9	Opened Tokyo Technical Center in Chuo-ku, Tokyo
2009/4	Acquired 10% share capital of VIETNAM SEIBI SEMICONDUCTOR CO., LTD. (currently TOREX VIETNAM SEMICONDUCTOR CO., LTD)
2009/11	Acquired 80% share capital of VIETNAM SEIBI SEMICONDUCTOR CO., LTD. (currently TOREX VIETNAM SEMICONDUCTOR CO., LTD), making it a subsidiary
2010/5	Increased capital of VIETNAM SEIBI SEMICONDUCTOR CO., LTD (currently TOREX VIETNAM SEMICONDUCTOR CO., LTD), raising stake to 92.5%
2010/9	Kanto West Sales Office consolidated into the head office
2012/7	Merged Device Engineering Co., Ltd. and TOS Device Co., Ltd., with Device Engineering Co., Ltd. as the surviving entity. Head office moved to Shinkawa, Chuo-ku, Tokyo
2014/4	Listed on the TSE JASDAQ Standard Market
2014/9	Increased capital of VIETNAM SEIBI SEMICONDUCTOR CO., LTD (currently TOREX VIETNAM SEMICONDUCTOR CO., LTD), raising stake to 93.8%
2015/3	Absorbed through merger Device Engineering Co., Ltd.
2015/4	Increased capital of TOREX USA Corp., raising stake to 100.0% VIETNAM SEIBI SEMICONDUCTOR CO., LTD. company name changed to TOREX VIETNAM SEMICONDUCTOR CO., LTD.
2015/10	Listing designation moved from JASDAQ to the TSE Second Section
2016/4	Capital alliance with PHENITEC SEMICONDUCTOR Corp., made a subsid (51.0% of voting rights) Opened TOREX USA Corp. R&D Center in California, USA
2016/5	Opened Kansai Technology Center in Suita, Osaka
2017/6	Established Nagoya Sales Office
2018/3	Listing designation moved from the TSE Second Section to the TSE First Section
2019/2	Made PHENITEC SEMICONDUCTOR Corp. a wholly owned subsidiary
2019/8	Made TOREX VIETNAM SEMICONDUCTOR CO., LTD. a wholly owned subsidiary
2019/9	Capital Alliance with Cirel Systems Pvt Ltd. Registered as a remote support department of IATF 16949 certified factory PHENITEC SEMICONDUCTOR Corp. (Kansai Technology Center)
2020/6	Capital Alliance with Novel Crystal Technology, Inc.
2020/12	Registered as a remote support department of IATF 16949 (Head Office added)
2022/4	Transition to Tokyo Stock Exchange New Prime Market
2023/3	TOREX VIETNAM SEMICONDUCTOR CO., LTD certified IATF16949. Sapporo Technical Center is certified and registered as a remote support department.

Source: YUHO financial statements, Torex website.

March 2020
25TH Anniversary

However, after that, product development did not progress as planned, and due to overlapping with the semiconductor recession, a large amount of debt was accumulated, and the former Torex Semiconductor Co., Ltd. was closed down through special liquidation. The current Torex Semiconductor Co., Ltd. was established in March 1995 by taking over the business related to analog power management IC design and sales. Just 1½ years later, the company established its first overseas base in Singapore in November 1996. Ignoring the fact that the market for battery-powered ultra-compact and low-energy consumption power ICs was still small in scale with few market entrants and concerns about being premature, this marked the first step toward developing the Group's global reach today. In 1997, in order to reduce noise for pager wireless communications devices, Torex proposed a counter-intuitive internal oscillation circuit which intentionally sacrificed some efficiency, culminating in launching the XC6373/XC6383 Series of DC/DC converters.

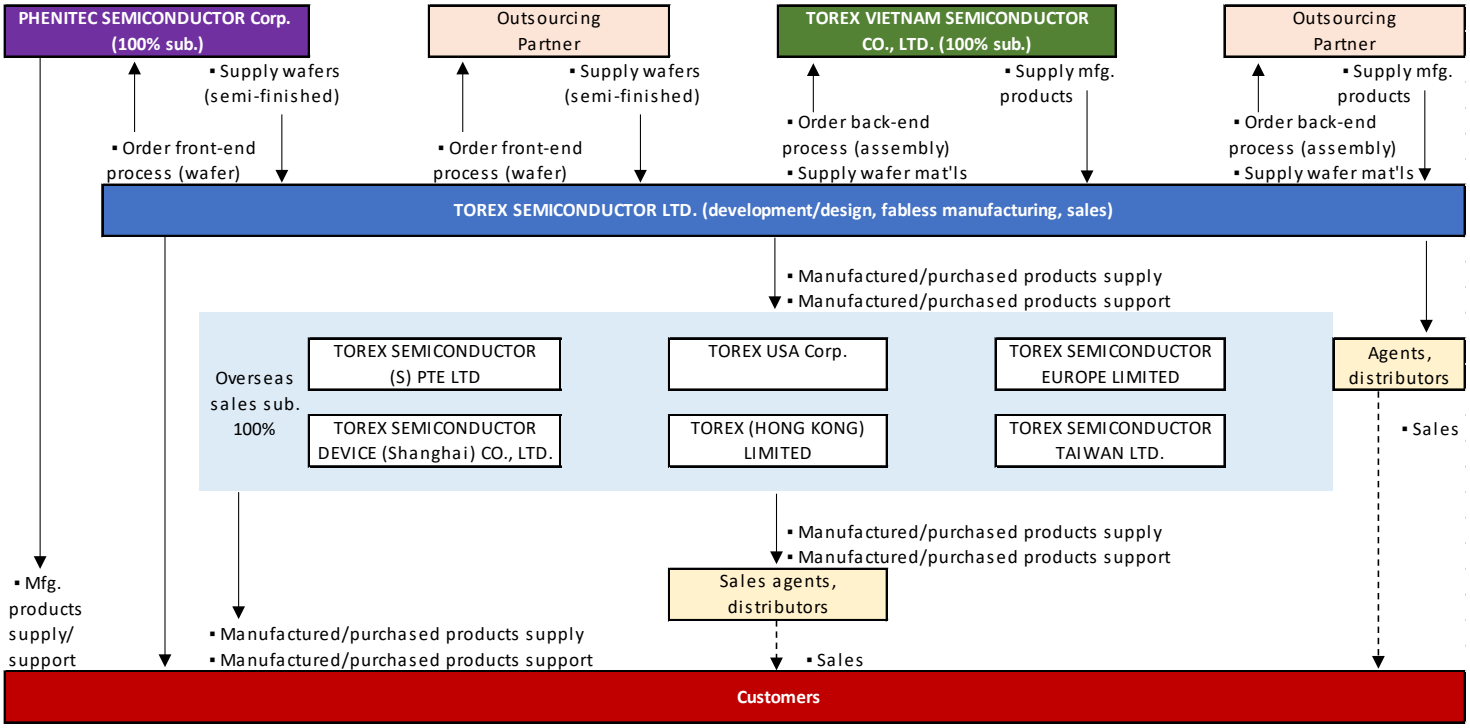
TOREX VIETNAM SEMICONDUCTOR CO., LTD.

Over the next 4 years the company established bases in Irvine, California in the US, (and later established a development center in San Jose, near Silicon Valley), and in Leicestershire, UK in Europe. Over the following 5 years during the mid-2000s, the company established bases in Shanghai, Taiwan and Hong Kong. Then in April 2009, the company acquired a 10% stake in VIETNAM SEIBI SEMICONDUCTOR CO., LTD. (currently TOREX VIETNAM SEMI-CONDUCTOR CO., LTD), raising its stake to 80% in November 2009, making it a subsidiary. With the increase of mobile devices, many companies began entering the compact power management IC industry. In order to differentiate itself from competitors, Torex began its push toward 'ultra-compact', developing a unique technology known as USP (ultra-small packages). Torex secured its own factory in Vietnam as a USP production base for back-end package assembly.

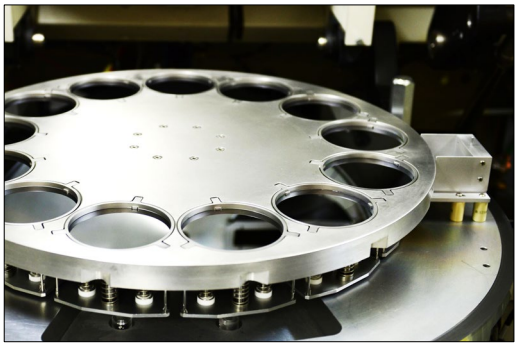
At the time of the IPO listing its shares on the TSE JASDAQ standard Market in April 2014, PHENITEC SEMICONDUCTOR Corp.. was the largest shareholder with a 19.2% stake. The company successfully moved its listing designation to the TSE Second Section 1½ years later in October 2015, moving up to the TSE First Section in March 2018. The company concluded a capital alliance with PHENITEC SEMICONDUCTOR in April 2016, acquiring a 51.0% stake, making it a subsidiary. Through a capital increase in April 2018, Torex raised its stake in Phenitec to 69.1%. Then in February 2019, the company raised its stake to 100%, making Phenitec a wholly owned subsidiary.

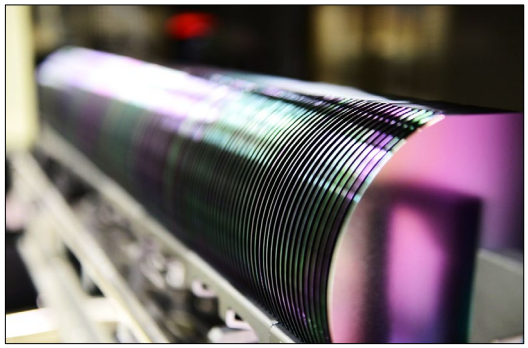
Some may question the meaning of fabless while also having foundry business which comes with high fixed costs, however, management ultimately decided to make the acquisition based on emphasizing stable supply of products to customers. At the time of acquisition, the company had decided to focus on target applications of industrial equipment and automotive, and automotive customers in particular paid close attention to stable supply capability. Also, there is a tendency of external third-party foundries to be reluctant to accept the time-consuming hassle from small-lot trial production for proprietary products. The Group having its own foundry business not only resolves these issues, but since Phenitec has its own customer base, it also does not rely on Torex for orders, and it can maintain stable business operations on its own. Even now Torex accounts for only a small portion of Phenitec sales. The business combination with Phenitec was a watershed milestone in the Group's corporate history. The exhibit on the top of the following page shows an organization chart for the 9 principal companies in the TOREX SEMICONDUCTOR Group.

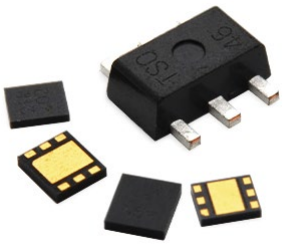
TOREX SEMICONDUCTOR Group Organization Chart



Source: compiled by SIR from YUHO financial statements







PHENITEC SEMICONDUCTOR Okayama Fab No. 1 (Daiichi Fab)

PHENITEC SEMICONDUCTOR Kagoshima Fab

PHENITEC SEMICONDUCTOR Okayama Fab No. 2 (Head Office Fab)

Phenitec

Overview of Current Production Capacity at Phenitec's 3 Main Facilities:

Okayama Fab No. 1 (Daiichi Fab)
- 5-inch 22,000 wafers/month
- 6-inch 27,000 wafers/month
- Total 30,000 wafers/month

Okayama Fab No. 2 (Head Office Fab)
- 5-inch 14,000 wafers/month

Kagoshima Fab
- 6-inch 19,000 wafers/month

This shows the current production capacity, not the capacity at full production. Also, the integration of the Okayama Fab No. 2 into the Fab No. 1 has been resumed, so the production capacity of Fab No. 2 will be reduced going forward. In addition, the Kagoshima Fab is investing in equipment to increase its production capacity to 20,000 6-inch wafers/month, which is underway in FY24/3.

Overview of Foundry Business

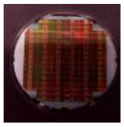
3 key considerations for the acquisition of Phenitec
① Automotive customers in particular place high priority on stable supply capability. The graphic on the right highlights control of quality and delivery.
② Many industrial customers ask for small-lot trial production of custom designs (outside foundries discourage)
③ Phenitec has its own customer base, not reliant on Torex. Its largest customer IXYS Corp. (US) accounted for 10.8% of total FY3/21 Group sales.

Summary of Phenitec's comprehensive foundry solutions services

Type	Original products foundry	Custom products foundry	Silicon micromachining
Products • Services	MOSFET IGBT Bipolar Transistor Diodes TVS SiC Devices (under development)	MOSFET Bipolar Transistors JFET Diodes IGBT Laser diode Bipolar IC CMOS IC MEMS (acceleration sensors) TVS	Laser trimming Wafer Test & Probe Back surface processing Dicing
Features	Many types		Also cover partial machining
	Handle small-lot orders		

Many customers become long-term users

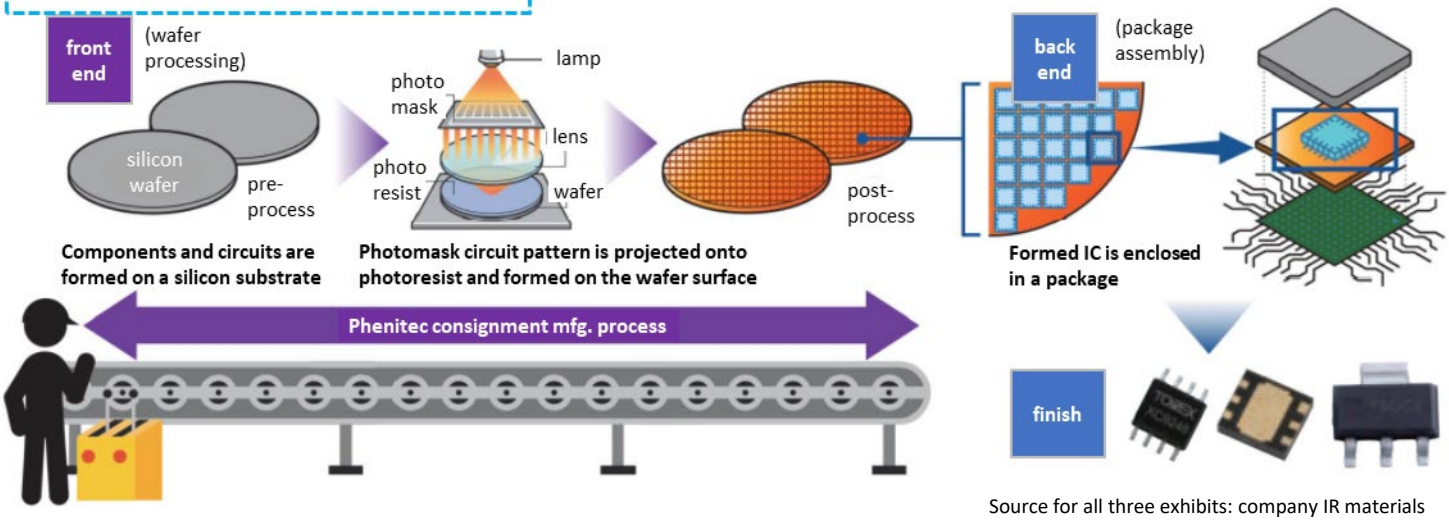
Merits / demerits of owning a Group foundry

	Overview	Choice	Quality	Cost		Delivery	
			Mfg tech/ quality	COS	Investment	Delivery date	New process time required
front end	 Form circuits on silicon substrate	Own	○	△	×	○	×
		Fabless	△	○	○	△	○

Aiming to be a company which can ensure stable long-term supply of high value-added products

★ **Phenitec is the sole provider of foundry service in Japan focused on discrete and CMOS process**

Semiconductor manufacturing process



Source for all three exhibits: company IR materials

Integration Effect
- Continue long-term stable product supply system
- Raise production efficiency by migrating from 5-inch to 6-inch wafers (raise 6-inch ratio from 24% → 64%)
- Optimize efficiencies with the right equipment and the right layout
- Reduce manufacturing cost through energy-saving plant structure
- Continue to raise quality standards for automotive and industrial equipment applications
- New Fab 4 has precious metal (gold, platinum) processing capability as in the Head Office Fab

Head Office Fab
- Use small diameter (4-inches and below) facilities for development of next-generation power devices
- Utilization at small volume mass production

Okayama Plant Integration Project getting back on track

In order to raise operational efficiency, the company began work on the project to integrate the two fabs in FY18/3. The original schedule targeted mass production equipment relocated and migration to mass production with customer certification by FY22/3, however, in addition to certification delays due to COVID-19, the explosion in global demand stretched capacity utilization to the limits, effectively putting the plan on hold. The Company is now back on track to complete the integration in FY24/3.

Source: excerpt from IR results briefing materials.

Kagoshima Fab Overview and Update

Start-up and development of the Kagoshima Plant acquired from Yamaha in Oct-2015 is basically on schedule. At the time of acquisition, the plant started out with zero backlogs since the Company only took over the facilities and employees, however since then the Company has steadily won new orders, and the plant has begun turning profitable on a single month basis, but has yet to realize profitability on a full-term basis. On May 8, 2023, the Company announced an impairment loss of ¥793mn related to the Kagoshima Fab, attributed to the change in product mix since acquisition.

Mass production products
- Power MOSFET
- CMOS
- IGBT
- TVS
- MEMS

Ramping up development of next-generation SiC power devices toward mass production, and starting to mass produce SiC SBDs.

In addition to being able to handle Group focus automotive applications, the Kagoshima Fab serves a key function in business contingency planning (BCP), since it employs similar process equipment used at the Fab No. 1 (Daiichi Fab) in Okayama, and could take up a portion of the slack in the event of power outage or other production disruption. ISO/TS 16949 from 2009, a technical specification for automotive sector quality management systems, has become one of the most widely used international standards in the global automotive supply chain. ISO/TS 16949, is evolving with the publication of a new global industry standard by the International Automotive Task Force (IATF). On October 3, 2016, IATF 16949: 2016 was published by the IATF, defining the requirements of a Quality Management System for organizations in the automotive industry. The company obtained IATF 16949 certification at the Kagoshima Plant in 2020.

Focus on promoting GX

TOREX Group 5Y MTP 2021 – 2025

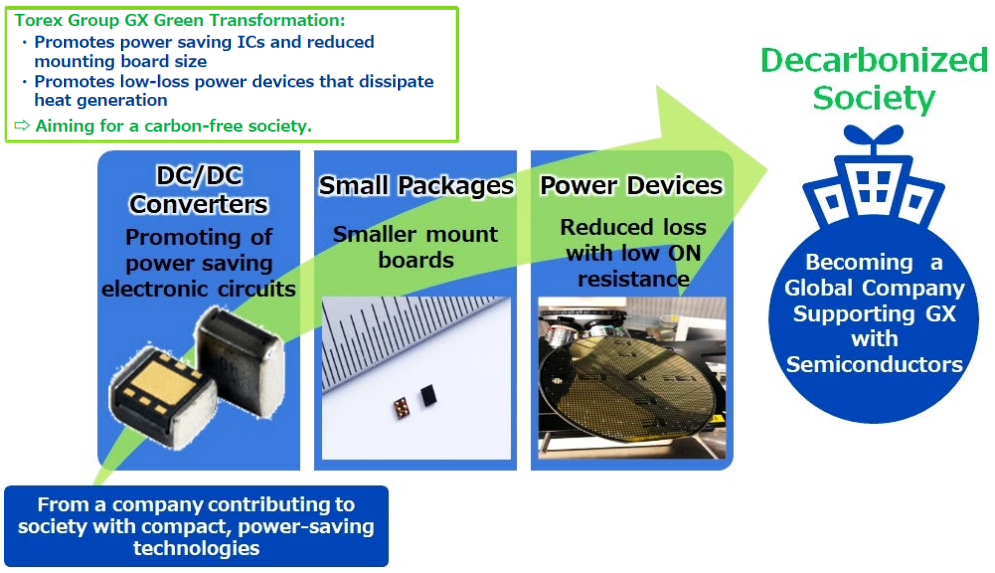
[FY3/22 – FY3/26]

The MTP announced February 15, 2021 promotes **'GX green transformation'** through promoting power-saving circuits, reducing mounting board area and promoting low power-loss devices that suppress heat generation. (Details of new extended LT targets though FY29/3 announced May 18, 2023, are examined in Part 3)

Parent Torex will continue to focus on developing high value-added power management ICs, including further share expansion of inductor built-in micro DC/DC converters, products specialized for 5G/IoT, solutions for solid-state and semi solid-state batteries, ultra-compact large-capacity packages, etc.

Initiatives for Phenitec include development of silicon-based power devices and compound semiconductors at Kagoshima, and thorough measures for manufacturing cost reduction, following completion of the Daiichi Plant integration project at Okayama.

2020 Energy Conservation Grand Prize
Product & Business Model Category



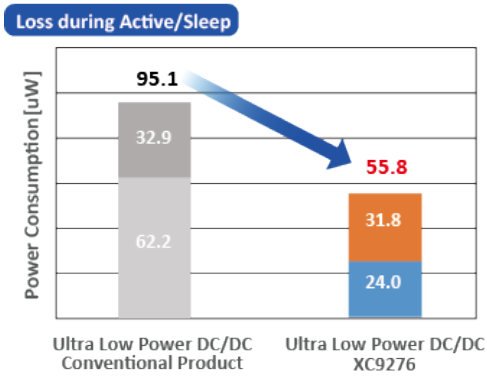
Contributing to the realization of a net zero carbon-neutral society through:

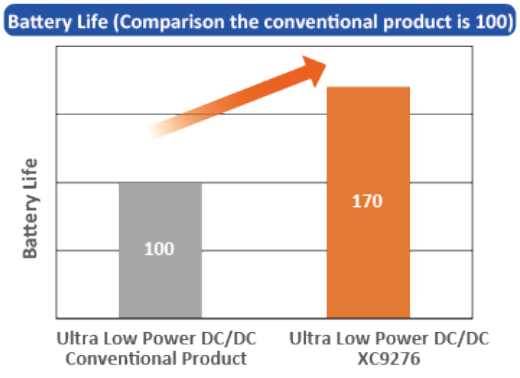
❶ Development of highly efficient, energy-saving power mgt. IC products

The step-down DC/DC converter XC9276 Series was awarded the 2020 Energy Conservation Grand Prize in the Product & Business Model category, by the Energy Conservation Center of Japan. By using the newly developed VSET function for switching the 2-value output voltage, the XC9276 series reduces power consumption by 41.3% and increases battery life by 1.7 times compared with traditional products.

Reduced Power Consumption
41.3%

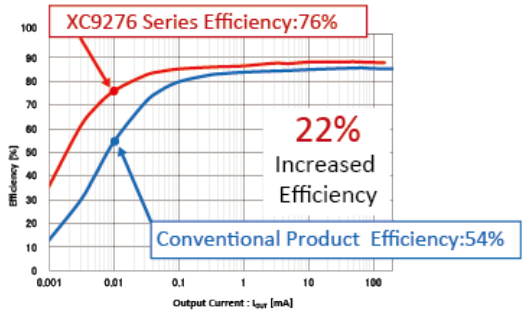
Battery Life
170%





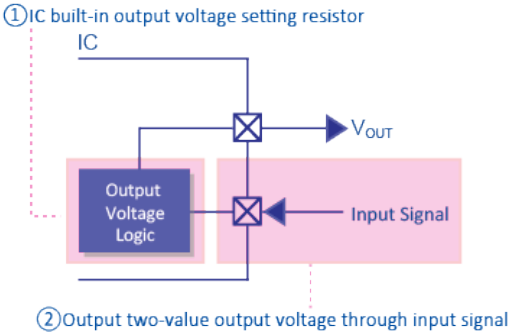
■Technology of ultra-low power

Stop the internal circuit of the IC according to the control status of the IC.Realize ultra-low current consumption.



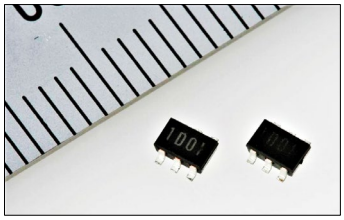
■Technology of switching between two-value output voltage

Only input signal without external parts, Achieves a function that can switch between binary output voltages.

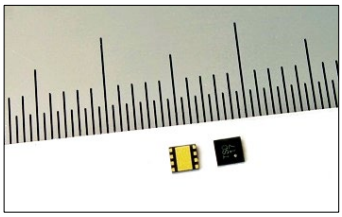


Source: company website.

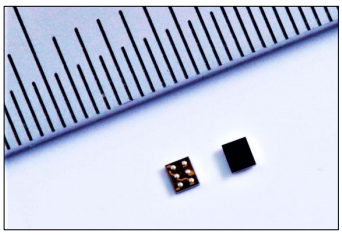
SOT package
(small-outline transistor)



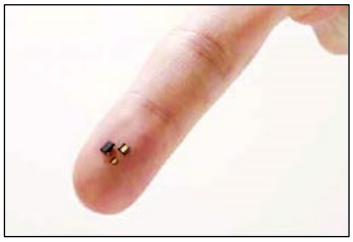
USP package
(ultra-small package)

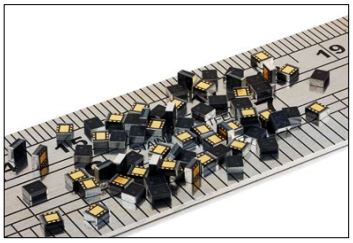


WLP package
(wafer-level package)



Powerfully small.





"Micro DC/DC" XCL Series
Ultra small DC/DC converters that integrate a coil and a control IC. Simultaneously achieve **space-saving, high efficiency, low noise, high heat dissipation, and low cost**.

❷ Resource conservation with PKG miniaturization and space-saving design

The XC9276 series is expected to be deployed in products such as **small IoT devices and wearable devices** that are small and need to be driven for a long time.

■ Technology of reduce mounting area

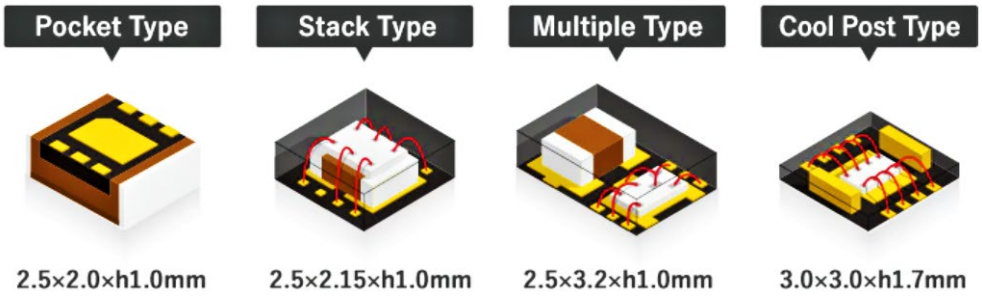
The installation area is reduced by reducing the coil inductance value and the IC package area.

High-growth focus product: Inductor Built-in Micro DC/DC converters

The Micro DC/DC XCL Series is ultra small DC/DC converters that integrate a coil and a control IC using Torex's unique technology, which realize devices that **simultaneously achieve space-saving, high efficiency, low noise, high heat dissipation, and low cost**.

Wireless and GPS functions are being added to a wide variety of devices, and radio-frequency interference and noise have become key concerns in electrical circuit design. Torex's Micro DC/DC XCL Series is optimized to achieve a lower noise than with a discrete DC/DC converter configuration. Improving power conversion efficiency is a key point in miniaturizing a power circuit. When semiconductor and electronic components are made smaller, the resistance component increases, and the loss appears as heat generation. The Micro DC/DC XCL Series reduces the loss of efficiency that accompanies miniaturization.

Different package types emphasize the required properties of 1) low EMI noise, 2) small, low-cost, 3) high efficiency/heat dissipation for large current, and 4) high heat dissipation and low noise for high withstand voltages.



The XCL303/XCL304 series targets high-speed optical transceivers for 5G applications, and it is the first inductor built-in Micro DC/DC converter product on the market to handle negative output voltage.

❸ Reduced power loss with low ON resistance* through development and sales promotion of next-generation silicon carbide (SiC) and gallium oxide (β-Ga_2O_3) power devices

***ON Resistance:** The resistance value between the Drain and Source of a MOSFET during operation (ON) is called the ON Resistance $R_{DS(on)}$. The smaller the value, the lower the power loss.

4 Main Electronics Application Groups:

- **INDUSTRIAL**
- **AUTOMOTIVE**
- **CONSUMER ELECTRONICS**
- **COMMUNICATIONS (ICT)**

INDUSTRIAL and AUTOMOTIVE are growth applications, while the weights of CONSUMER ELECTRONICS and COMMUNICATIONS (ICT) have been gradually shrinking.

For 2021 and 2022, INDUSTRIAL was 41% and 40%, respectively, and AUTOMOTIVE was 21% and 25%, respectively, both clearly continuing to rise.

The US-China Trade War put pressure on INDUSTRIAL in 2019, followed by severe pressure on AUTOMOTIVE in 2020 due to production cuts as a result of the pandemic and global chip shortages, coinciding with a rebound in CONSUMER ELECTRONICS due to special demand from the shift to working at home.

For FY22/3 and FY23/3, INDUSTRIAL was 35% and 39% respectively, and AUTOMOTIVE was 12% and 13%, respectively, also rising again post-pandemic.

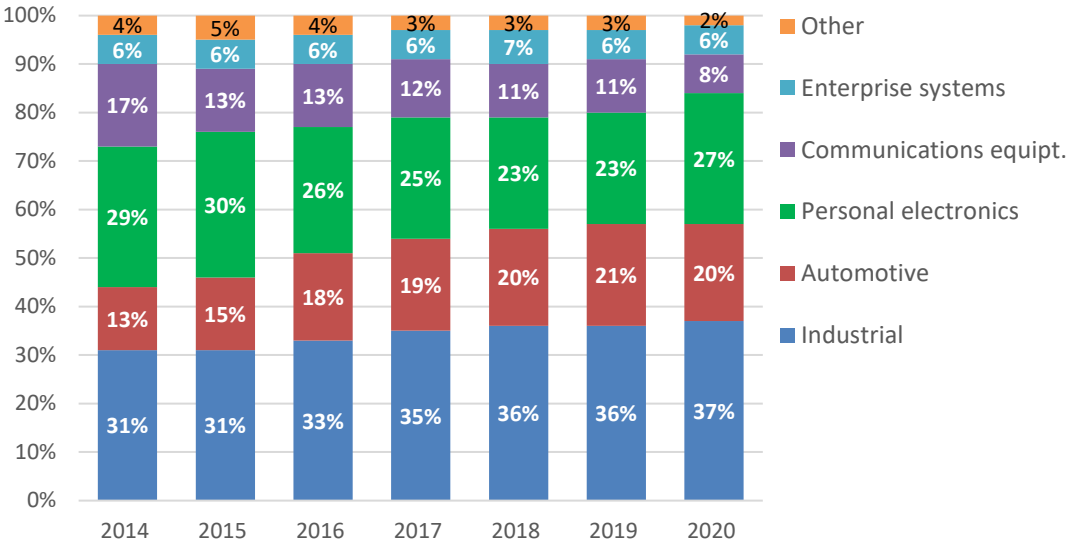
★ Applications are key to understanding and monitoring demand trends

Lastly before moving on to Part 2, it is worthwhile to highlight the importance of understanding end market application categories. The 4 main applications shown on the left comprise a standard classification system for the global electronic components supply chain overall, not just analog ICs and power management ICs. It is an intelligent and efficient way to organize the vast billions of electronic components by end market applications as part of understanding and monitoring demand trends for final products.

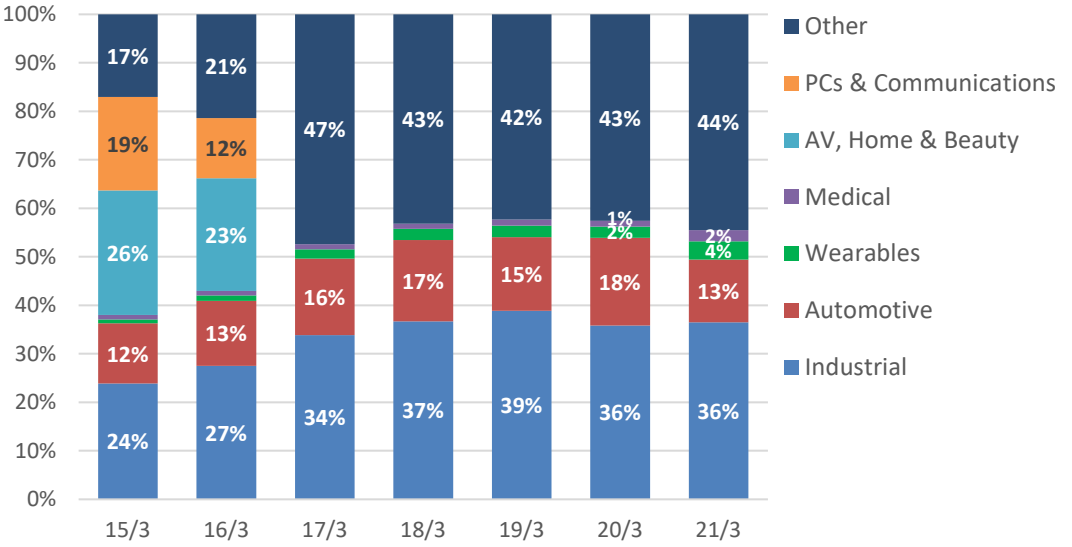
Question: Is it valid to compare a specialist niche player like Torex to the global no.1 analog supplier TI, which had 2022 Analog segment revenue of $15.4bn?

The answer is yes, because semiconductors are a global industry, subject to the same demand trends across the global market. The graph below shows the trend of revenue breakdown for TI by applications. The 4 main applications shown to the left accounted for 92% in 2020. The key takeaway from this graph is that out of the 4, **the weights of industrial and automotive are rising**.

Texas Instruments End Market (Application) Revenue Mix

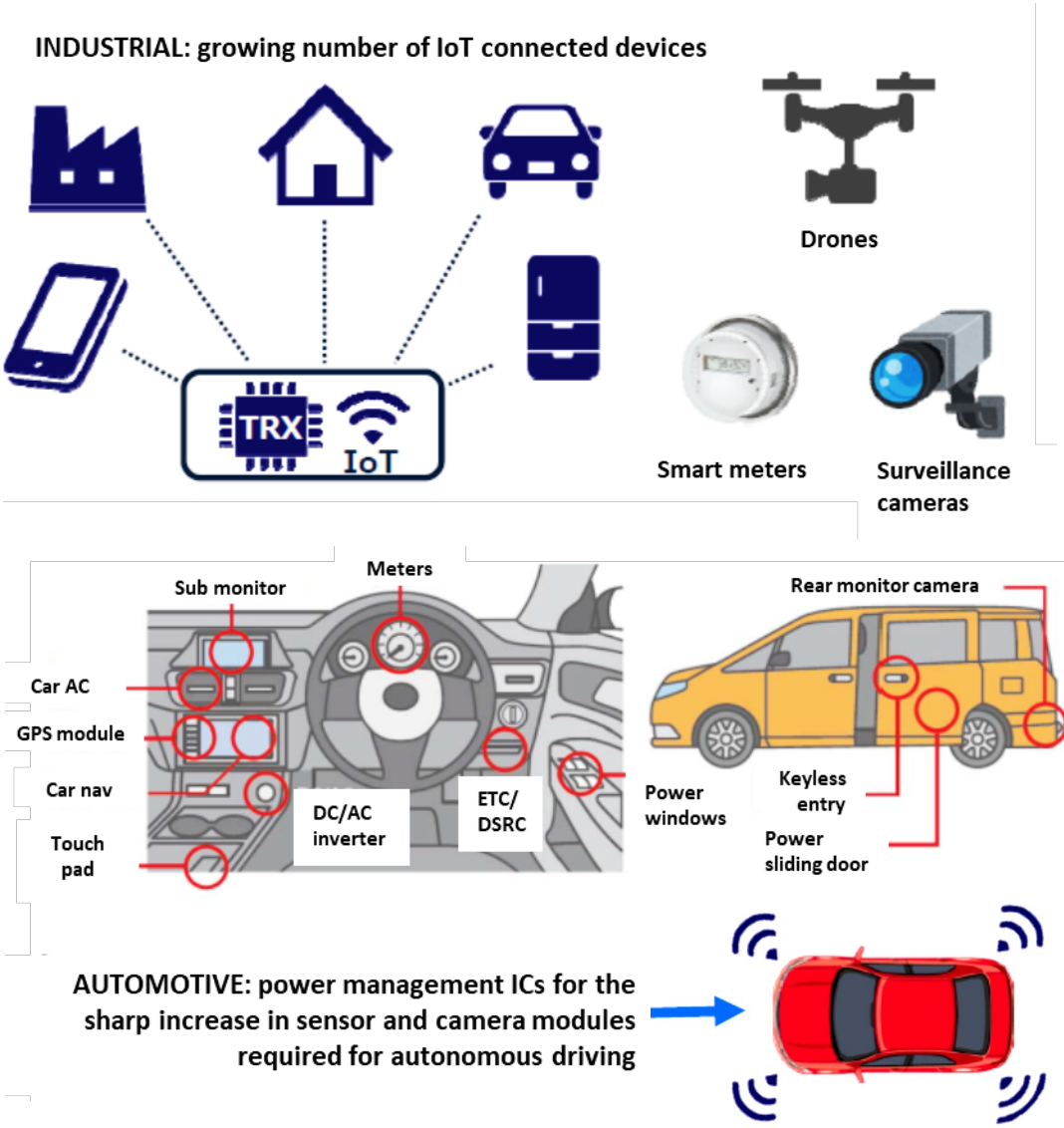


Torex Semiconductor Parent End Market (Application) Revenue Mix



Source: compiled by Sessa Partners from respective company data.

TOREX Power Management IC Applications Brief Summary



Power Management IC Applications

INDUSTRIAL

Industrial robots / POS registers / POS terminals / Industrial measuring instruments / Smart meters / Security equipment

AUTOMOTIVE

Car navigation systems / Car audio systems / Power windows / Power seats / In-vehicle ETC systems / Dashboard cameras / Rear-view monitor cameras / Drive recorders

MEDICAL & HEALTHCARE

Electronic thermometers / Scales / Blood pressure monitors / ECGs / Blood glucose monitors / Monitoring equipment

WEARABLES

Smartwatches / Smartglasses / Smart cards / Wearable cameras / Wearable devices

CONSUMER ELECTRONICS

LCD TVs / Beauty care products / Consumer game consoles / Home appliances / Home theaters / LED lighting

COMPUTERS & COMMUNICATIONS

Smartphones / PC peripherals / IC recorders / Digital cameras / Laptops / Electronic dictionaries / E-readers / Portable game devices

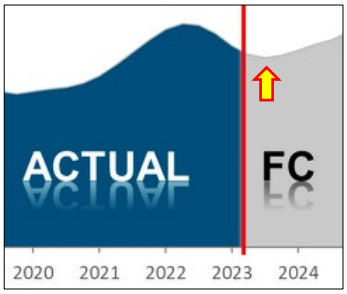
Source: compiled by SIR from IR results briefing materials

TOREX

Phenitec

Part 2 MARKET ENVIRONMENT AND GROWTH DRIVERS

Current WSTS model sees a bottom in WW billings in the 2Q or 3Q of 2023, followed by double-digit growth in 2024.



Source: WSTS press release

WSTS forecasts robust growth of the global semiconductor market in 2024 of +11.8%

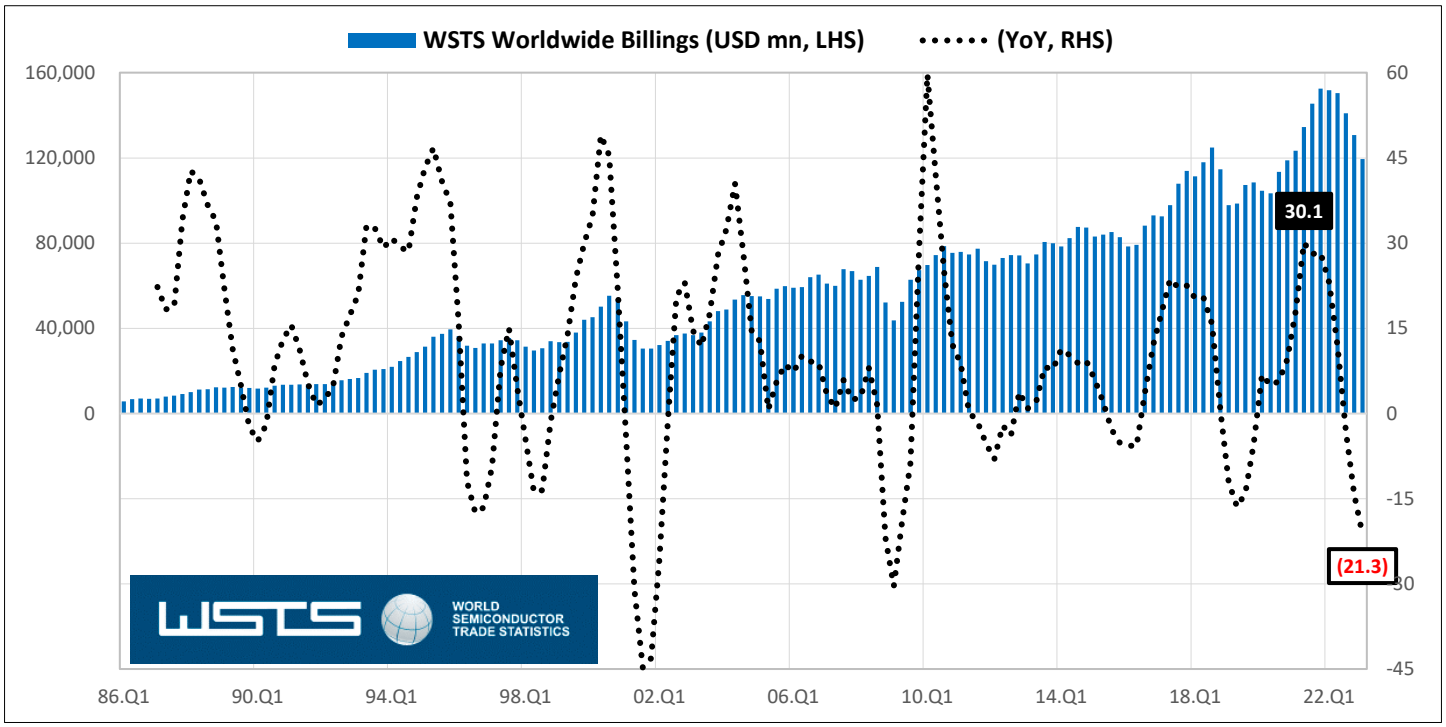
While 2023 is forecast to decline -10.3%, the first decline in 4 years since 2019, mainly due to memory from the slump in high-end smartphones, and adjustment in PCs and consumer electronics post-COVID, automotive applications are benefitting from the global ramp in EVs, and discrete power devices in particular are benefitting from brisk demand for renewable energy applications. The global semiconductor market is expected to surge +11.8% in 2024 assuming a global recovery after high inflation, and strong rebound in memory, with virtually all product categories set to post solid gains.

WSTS Spring 2023 Worldwide Semiconductor Forecast: 2023 -10.1%, 2024 +11.8%

USD mn (upper tier)	2018	2019	2020	2021	2022	2023	2023	2024
YoY (lower tier)	act	act	act	act	act	Nov-22	May-23	May-23
Discrete Semiconductors	**24,102**	**23,881**	**23,804**	**30,337**	**33,993**	**35,060**	**35,904**	**38,192**
Optoelectronics	38,032	41,561	40,397	43,404	43,908	45,381	45,949	45,881
Sensors	13,356	13,511	14,962	19,149	21,782	23,086	20,410	21,575
Integrated Circuits	393,288	333,354	361,226	463,002	474,402	453,041	412,832	470,349
● Analog	**58,785**	**53,939**	**55,658**	**74,105**	**88,983**	**90,952**	**83,907**	**88,902**
● Micro	67,233	66,440	69,678	80,221	79,073	75,273	71,470	75,855
● Logic	109,303	106,535	118,408	154,837	176,578	175,191	173,413	185,266
● Memory	157,967	106,440	117,482	153,838	129,767	111,624	84,041	120,326
Total Products	**468,778**	**412,307**	**440,389**	**555,893**	**574,084**	**556,568**	**515,095**	**575,997**
Discrete Semiconductors	**11.3**	**(0.9)**	**(0.3)**	**27.4**	**12.0**	**2.8**	**5.6**	**6.4**
Optoelectronics	9.2	9.3	(2.8)	7.4	1.2	3.7	4.6	(0.1)
Sensors	6.2	1.2	10.7	28.0	13.7	3.7	(6.3)	5.7
Integrated Circuits	14.6	(15.2)	8.4	28.2	2.5	(5.6)	(13.0)	13.9
● Analog	**10.8**	**(8.2)**	**3.2**	**33.1**	**20.1**	**1.6**	**(5.7)**	**6.0**
● Micro	5.2	(1.2)	4.9	15.1	(1.4)	(4.5)	(9.6)	6.1
● Logic	6.9	(2.5)	11.1	30.8	14.0	(1.2)	(1.8)	6.8
● Memory	27.4	(32.6)	10.4	30.9	(15.6)	(17.0)	(35.2)	43.2
Total Products	**13.7**	**(12.0)**	**6.8**	**26.2**	**3.3**	**(4.1)**	**(10.3)**	**11.8**

Source: compiled by SIR from World Semiconductor Trade Statistics (WSTS) press release archive.

Quarterly Trend of WSTS Worldwide Semiconductor Billings: Bottom around 2Q or 3Q 2023?



Source: compiled by SIR from WSTS Worldwide Semiconductor Quarterly Historical Billings Report.

Five Key Data Series Helpful in Monitoring the Phase of the Business Cycle for TOREX SEMICONDUCTOR

CY QTR	WW Billings (USD mn)	YoY	TXN Analog Rev (USD mn)	YoY	Torex (parent) Sales (JPY mn)	YoY	Torex + Phenitec Sales (JPY mn)	YoY	Japan exports to China (JPY bn)	YoY
13.Q1	70,449	0.9	1,648	(2.3)					2,713	(5.7)
Q2	74,645	2.1	1,745	(3.1)					3,124	4.4
Q3	80,552	8.2	1,931	4.8					3,284	12.2
Q4	79,938	7.7	1,869	12.0					3,505	29.3
14.Q1	78,445	11.3	1,837	11.5					3,093	14.0
Q2	82,322	10.3	1,995	14.3	2,287				3,240	3.7
Q3	87,699	8.9	2,149	11.3	2,478				3,402	3.6
Q4	87,377	9.3	2,123	13.6	2,618				3,647	4.1
15.Q1	83,108	5.9	2,035	10.8	2,588				3,131	1.3
Q2	83,977	2.0	2,049	2.7	2,613	14.2			3,340	3.1
Q3	85,232	(2.8)	2,182	1.5	2,718	9.7			3,354	(1.4)
Q4	82,851	(5.2)	2,073	(2.4)	2,549	(2.7)			3,398	(6.8)
16.Q1	78,463	(5.6)	1,879	(7.7)	2,742	5.9			2,910	(7.1)
Q2	79,151	(5.7)	2,044	(0.2)	2,701	3.4	5,227		2,981	(10.8)
Q3	88,294	3.6	2,323	6.5	2,384	(12.3)	5,087		2,992	(10.8)
Q4	93,024	12.3	2,290	10.5	2,493	(2.2)	5,473		3,479	2.4
17.Q1	92,521	17.9	2,256	20.1	2,603	(5.1)	5,773		3,383	16.3
Q2	97,886	23.7	2,411	18.0	2,474	(8.4)	5,714	9.3	3,552	19.2
Q3	107,857	22.2	2,698	16.1	2,581	8.3	6,095	19.8	3,714	24.1
Q4	113,956	22.5	2,535	10.7	2,549	2.2	6,036	10.3	4,241	21.9
18.Q1	111,307	20.3	2,566	13.7	2,564	(1.5)	6,152	6.6	3,679	8.8
Q2	117,939	20.5	2,690	11.6	2,476	0.1	6,203	8.6	3,975	11.9
Q3	124,874	15.8	2,907	7.7	2,727	5.7	6,266	2.8	3,982	7.2
Q4	114,658	0.6	2,638	4.1	2,432	(4.6)	6,074	0.6	4,262	0.5
19.Q1	97,852	(12.1)	2,518	(1.9)	2,469	(3.7)	5,353	(13.0)	3,403	(7.5)
Q2	98,570	(16.4)	2,534	(5.8)	2,202	(11.1)	4,797	(22.7)	3,628	(8.7)
Q3	107,372	(14.0)	2,674	(8.0)	2,649	(2.9)	5,534	(11.7)	3,606	(9.4)
Q4	108,513	(5.4)	2,497	(5.3)	2,563	5.4	5,599	(7.8)	4,046	(5.1)
20.Q1	104,560	6.9	2,460	(2.3)	2,249	(8.9)	5,571	4.1	3,224	(5.3)
Q2	103,423	4.9	2,434	(3.9)	2,170	(1.5)	5,858	22.1	3,552	(2.1)
Q3	113,526	5.7	2,865	7.1	2,220	(16.2)	5,551	0.3	3,932	9.1
Q4	118,880	9.6	3,127	25.2	2,351	(8.3)	5,762	2.9	4,374	8.1
21.Q1	123,343	18.0	3,280	33.3	2,864	27.3	6,542	17.4	4,041	25.4
Q2	134,550	30.1	3,464	42.3	3,002	38.3	7,014	19.7	4,563	28.4
Q3	145,439	28.1	3,548	23.8	3,575	61.0	7,970	43.6	4,481	13.9
Q4	152,560	28.3	3,758	20.2	3,820	62.5	7,937	37.8	4,899	12.0
22.Q1	151,749	23.0	3,816	16.3	3,727	30.1	7,944	21.4	4,326	7.0
Q2	150,504	11.9	3,992	15.2	4,028	34.2	8,594	22.5	4,583	0.4
Q3	141,014	(3.0)	3,993	12.5	4,119	15.2	8,791	10.3	5,126	14.4
Q4	130,817	(14.3)	3,558	(5.3)	3,469	(9.2)	7,699	(3.0)	4,970	1.4
23.Q1	119,496	(21.3)	3,289	(13.8)	3,078	(17.4)	6,873	(13.5)	3,836	(11.3)

Source: compiled by SIR from the following data sources and links below.

- WSTS Worldwide Semiconductor Quarterly Historical Billings Report: Historical Billings Report (wsts.org)
- Texas Instruments Segment Revenue & Operating Profit: Q1 2013-Q1 2023 and 2013-2022: https://investor.ti.com/financial-information/financial-data-non-gaap-reconciliations
- Trade Statistics of Japan, Customs and Tariff Bureau, Ministry of Finance: https://www.customs.go.jp/toukei/shinbun/happyou.htm
- Historical time series data can be downloaded in Excel csv files from e-Stat (select 'Asia' to find China figures): https://www.e-stat.go.jp/stat-search/files?page=1&layout=datalist&toukei=00350300&tstat=000001013137&cycle=1&tclass1=000001013254&tclass2val=0
- TOREX data by entity is disclosed in quarterly IR results briefing presentations: https://ir.torex.co.jp/ja/library/presentation.html

Correlation Parameters for Selected Data Series Pairs

Data series pairs	r	r^2
TXN analog revenue to WW billings	0.972	0.945
TXN analog revenue to Japan exports to China	**0.900**	**0.811**
TOREX Group sales to TXN analog rev	**0.924**	**0.855**
TOREX Group sales to Japan exports to China	**0.829**	**0.687**
TOREX parent sales to TXN analog rev	0.804	0.647
TOREX parent sales to Japan exports to China	0.703	0.494

Source: calculated by SIR.

Statistically significant r values → generally over 0.7

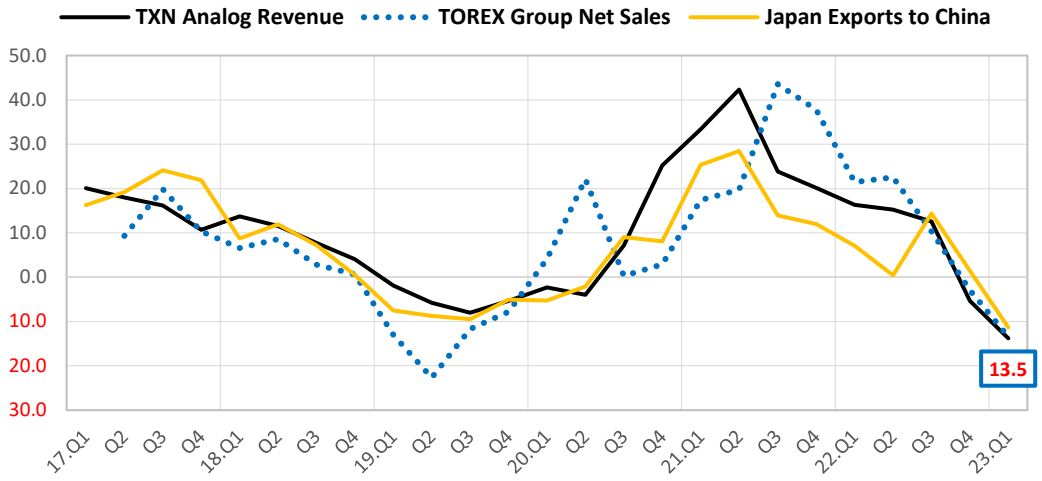
Correlation coefficient (r): measures the strength and direction of the linear relationship between two variables. **Coefficient of determination (r^2):** measures the goodness of fit of a linear regression model (variance of one variable explained by the other).

Japan exports to China have been a reliable proxy for the general health of the global electronics supply chain, likely a function in SIR's view of Japan's ongoing leadership in critical electronic components and advanced materials.

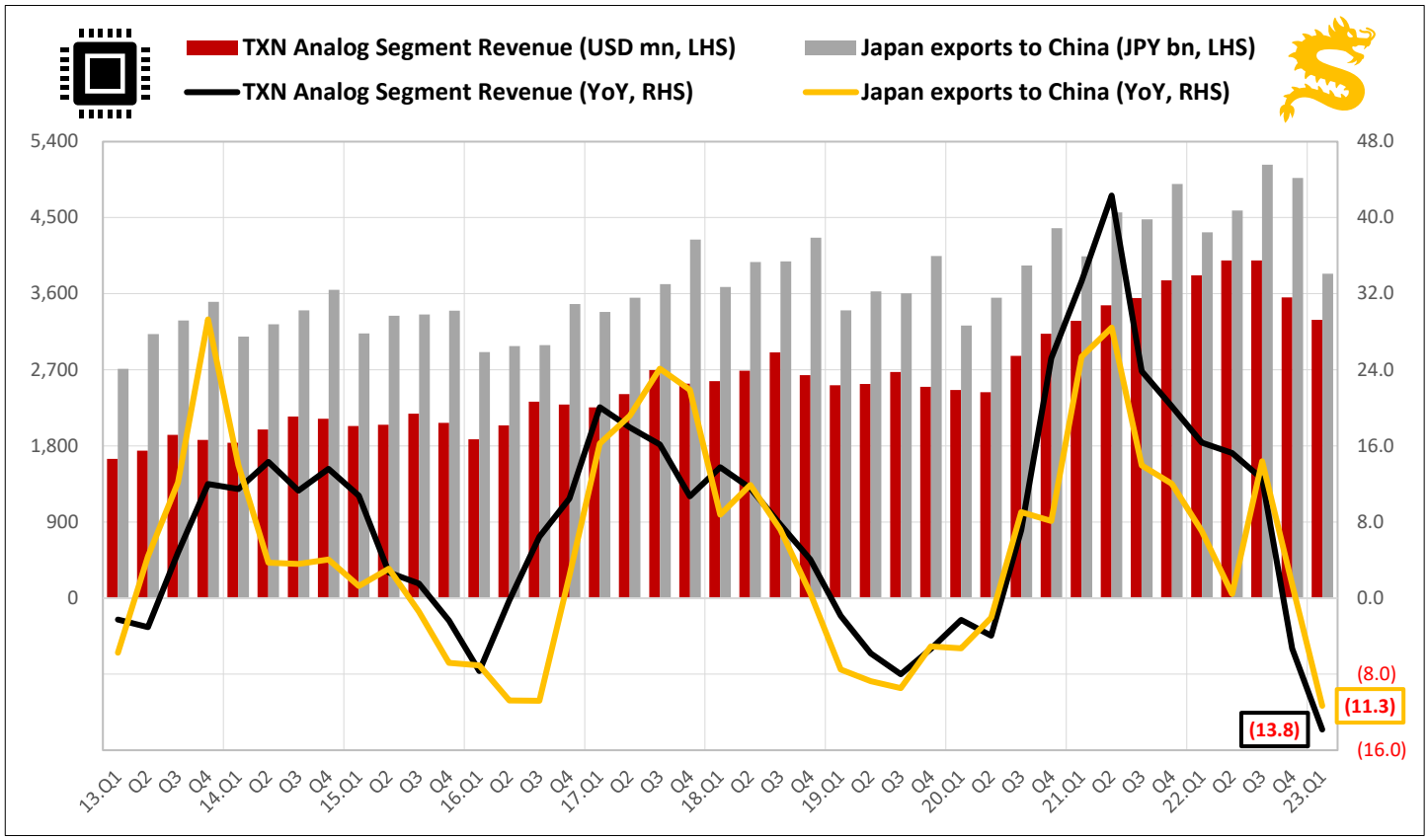
As shown in the bottom left-hand table on the previous page, TXN analog revenue to Japan exports to China has a correlation coefficient (r) of 0.900 and TOREX Group sales to TXN analog revenue has an r value of 0.924.

Two reliable checkpoints are readily available and extremely useful

In SIR's search for indicators to help in monitoring the phase of the business cycle for TOREX Semiconductor, we observed and identified two reliable checkpoints: 1) Texas Instruments Analog segment revenue, and Japan exports to China. Since TI reports quarterly earnings results roughly 3 weeks ahead of TOREX, TI's results have been helpful in flagging potential for positive or negative surprises on multiple occasions. In addition, MOF Trade Statistics are published monthly, with a one-month lag, so they can be monitored regularly. In our experience, it is best to confirm the quarterly figure, which tends to diminish volatility on a month-to-month basis. In any event, the graphs below illustrate the high correlation of these two extremely useful checkpoints.

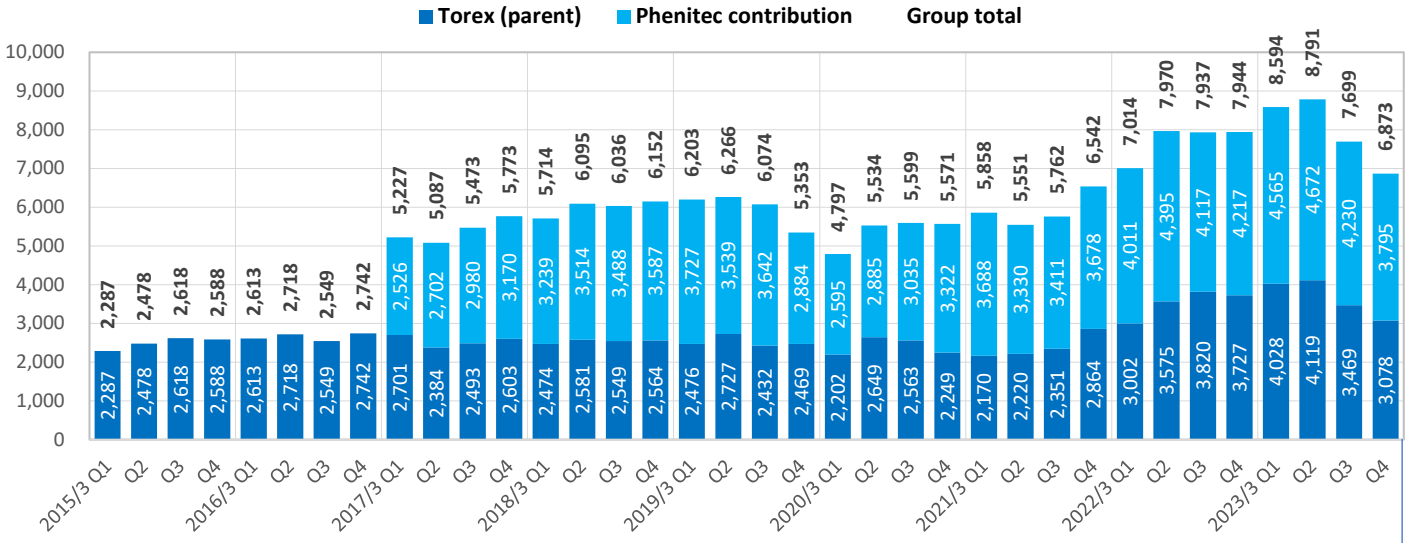


Quarterly Trend of Texas Instruments Analog Segment Revenue and Japan Exports to China

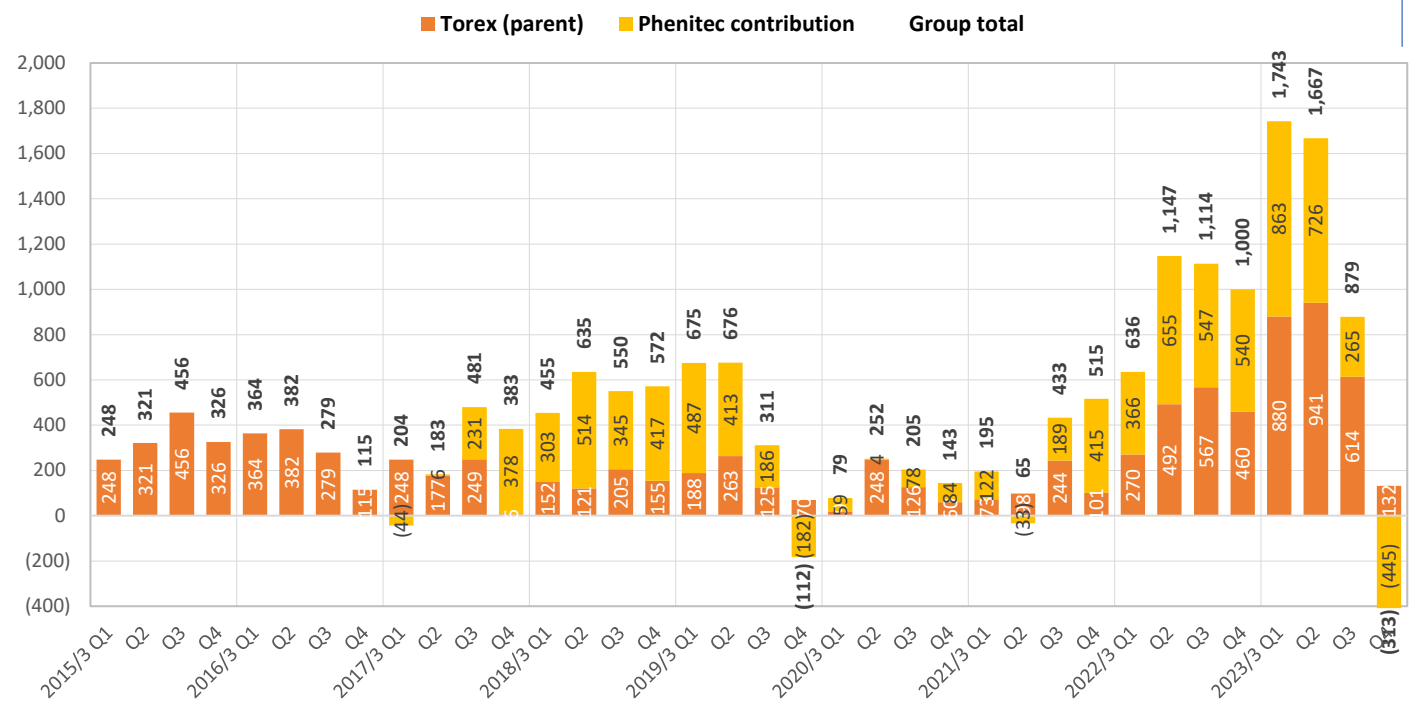


Source: compiled by SIR from Texas Instruments Segment Revenue & Operating Profit archives and MOF trade statistics.

TOREX Group Quarterly Trend of Consolidated Net Sales by Entity (JPY million)



TOREX Group Quarterly Trend of Consolidated Operating Profit/Loss by Entity (JPY million)



Monthly Trend of the Yen-Dollar Rate

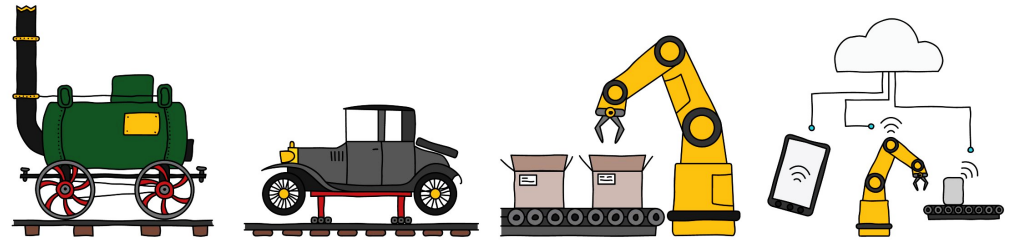
Simultaneous demand growth drivers include:

1. 5G global rollout, IoT connected devices
2. EV global model ramp, connected cars, ADAS
3. Surging demand for highly energy efficient next-gen power devices

Japan's vision for Realizing Society 5.0 is incorporating innovations from the 4th industrial revolution (IoT, big data, artificial intelligence (AI), robots, the sharing economy, etc.) into every sector and daily life, aiming to create super-smart social infrastructure and services, toward resolving the challenges of aging society, climate change, among others.

One example provided is progressing from people accessing car navigation data to find the correct route, to the use of sensors, big data and AI to enable autonomous driving.

Three global megatrends expanding simultaneously



Industry 1.0

The Industrial Revolution begins. Mechanization of manufacturing with the introduction of steam and water power

Industry 2.0

Mass production assembly lines using electrical power

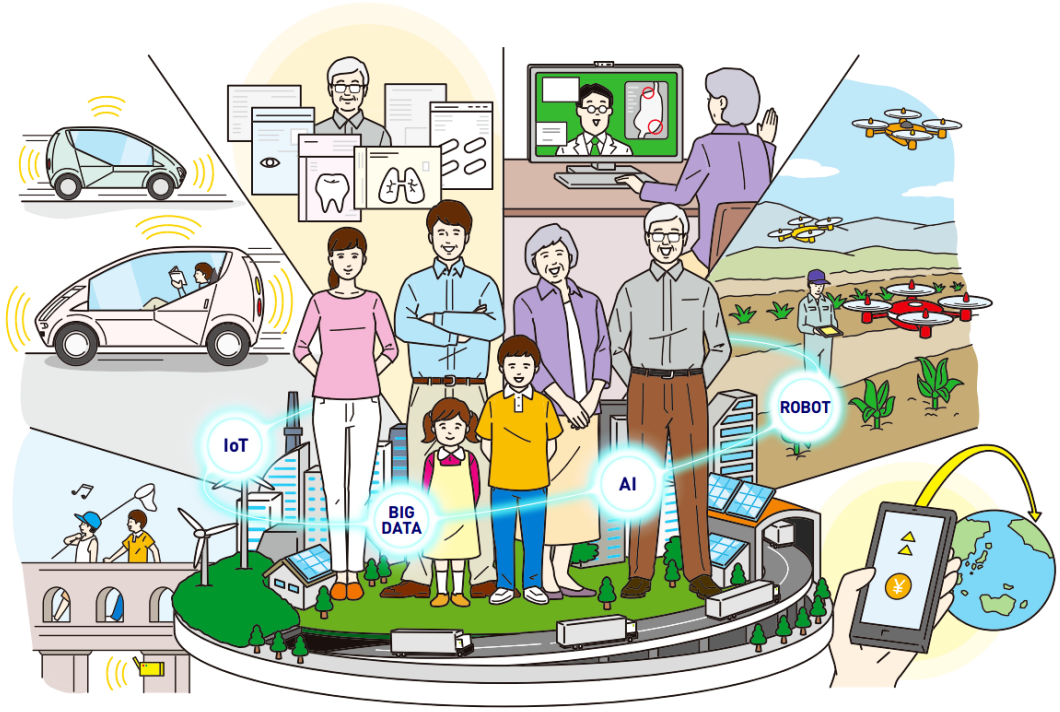
Industry 3.0

Automated production using electronics, programmable logic controllers (PLC), IT systems and robotics

Industry 4.0

The 'Smart Factory.' Autonomous decision making of cyber physical systems using machine learning and Big Data analysis. Interoperability through IoT and cloud technology.

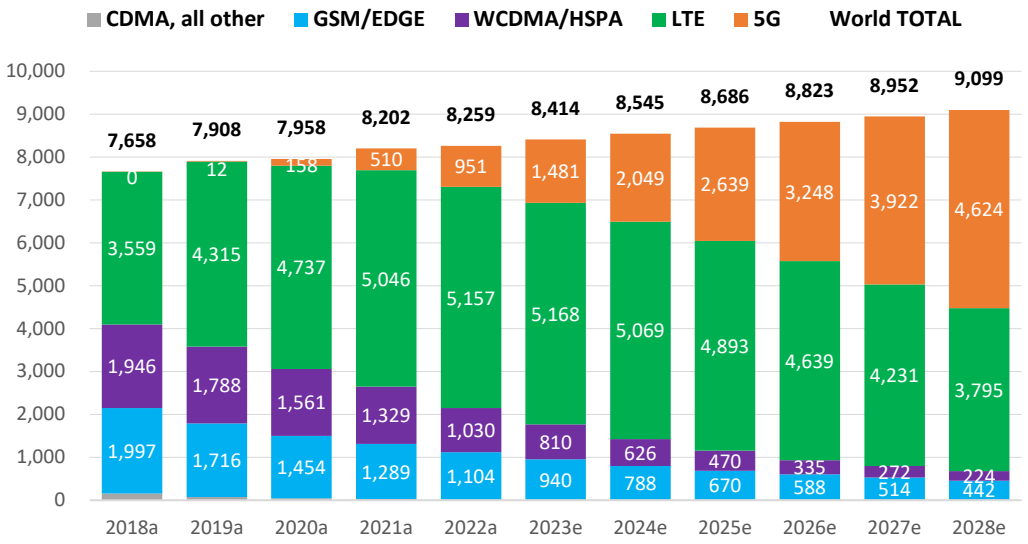
Japan's Vision of Society 5.0 – Super Smart Infrastructure & Services

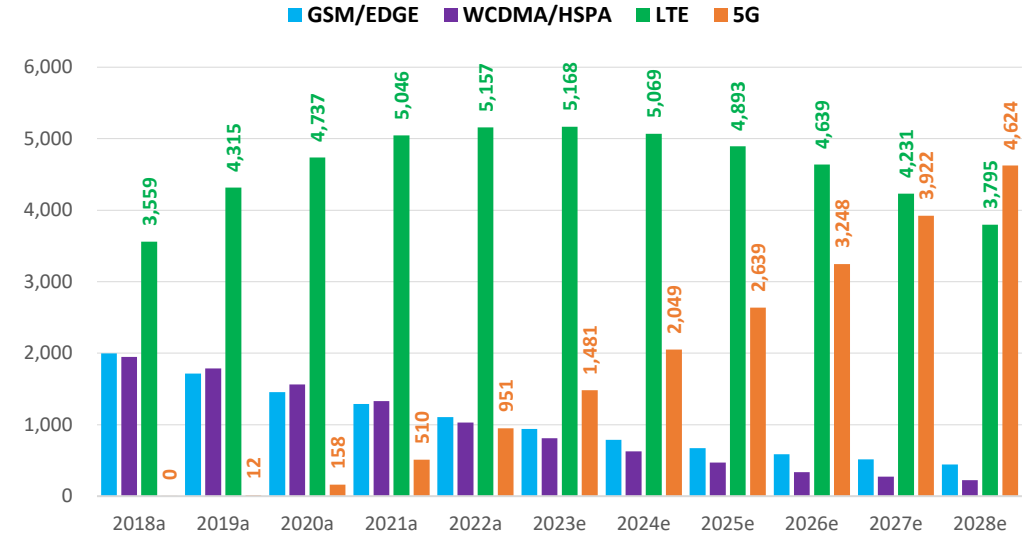


Source: excerpt from "Realizing Society 5.0," Cabinet Office, the Government of Japan.

By the end of 2028, Ericsson forecasts 4.6 billion 5G subscriptions globally, accounting for more than 50 percent of all mobile subscriptions. 5G will become the dominant mobile access technology by subscriptions in 2028. Subscriptions for 4G continue to increase, growing by 59 million during Q1 2023 to 5.2 billion. 4G subscriptions are projected to start declining from this year to around 3.8 billion by the end of 2028 as subscribers migrate to 5G.
6Y CAGR for 5G is +30.2%.

Ericsson Mobility Report June 2023 – Mobile Subscriptions by Technology (million)

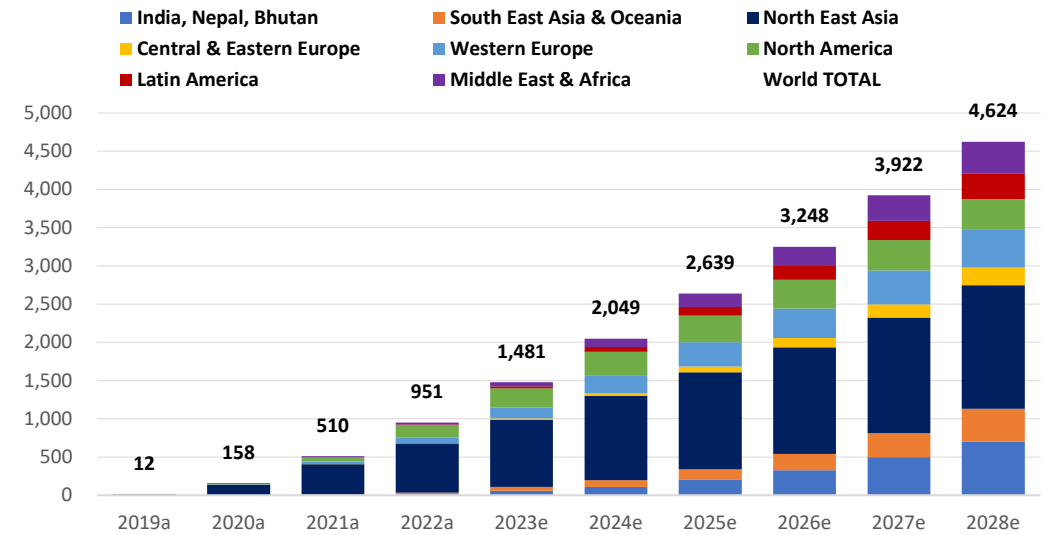




By technology	6Y CAGR
GSM/EDGE	(14.2)
WCDMA/HSPA	(22.4)
LTE	(5.0)
5G	**30.2**
World TOTAL	1.6

By region	6Y CAGR
India, Nepal, Bhutan	103.0
SE Asia & Oceania	60.3
Northeast Asia	16.6
Central & Eastern Europe	90.5
Western Europe	38.7
North America	16.0
Latin America	89.6
Middle East & Africa	59.7
5G World TOTAL	**30.2**

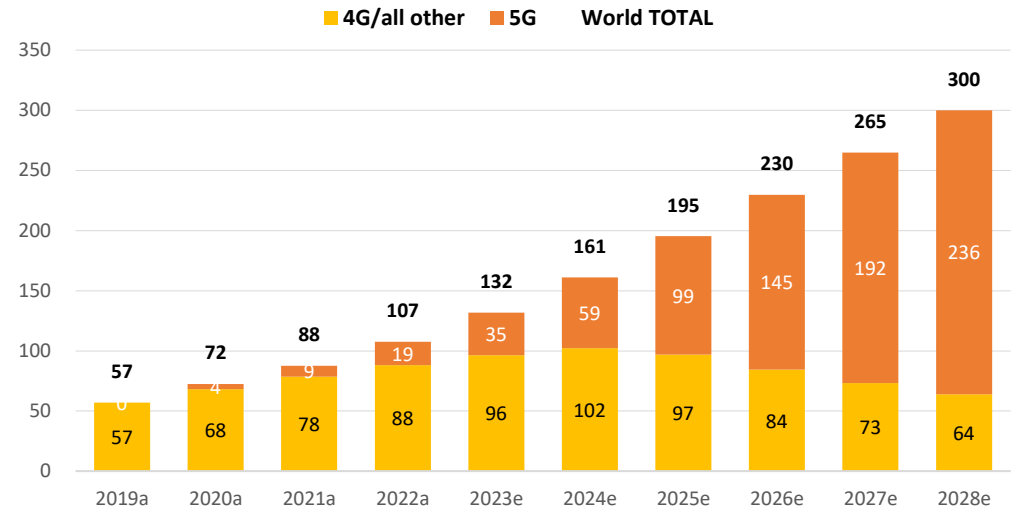
5G Mobile Subscriptions by Region (million)



Source: compiled by SIR from Ericsson Mobility Visualizer database and Ericsson Mobility Report June 2023.
https://www.ericsson.com/en/reports-and-papers/mobility-report

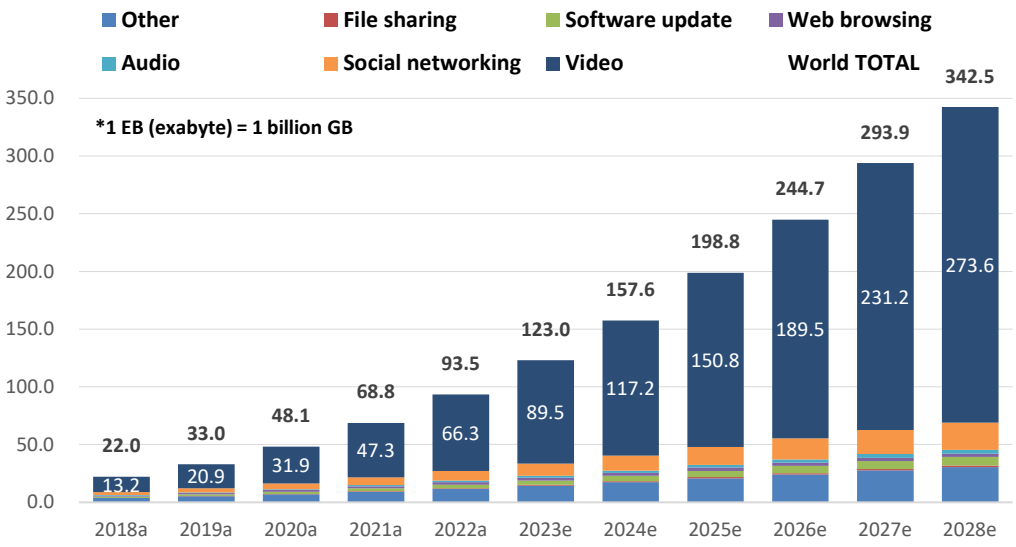
FWA is defined as a connection that provides broadband access through a mobile network enabled customer premises equipment (CPE). This includes indoor (desktop and window) and outdoor (rooftop and wall mounted). It does not include portable battery-based Wi-Fi routers or dongles. Societal impact is larger than the number of FWA connections, as it brings connectivity to three to five people. World TOTAL 6Y CAGR is +18.7% (5G +51.8%).

Fixed Wireless Access (FWA) connections (million)



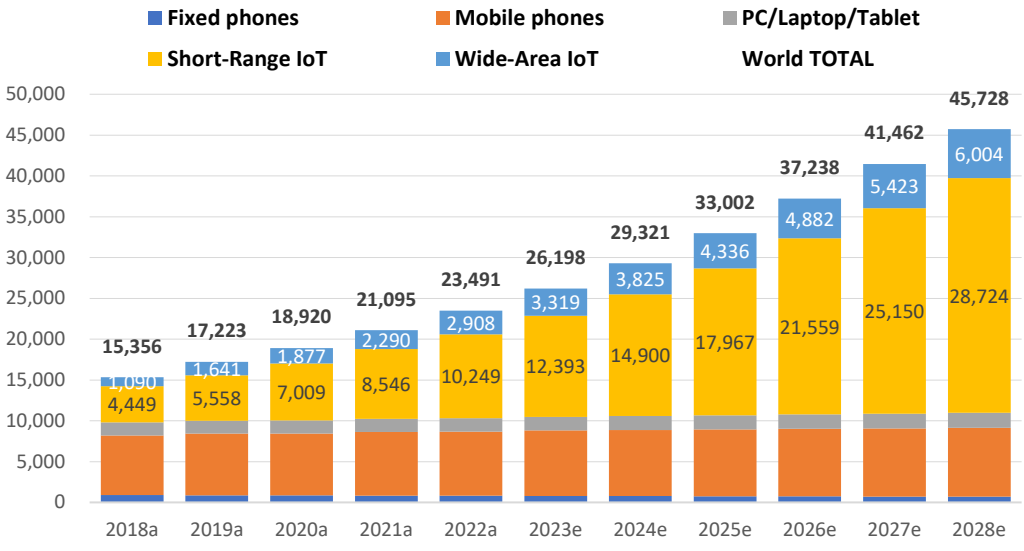
Total global mobile data traffic - excluding traffic generated by FWA - reached 93 EB per month at the end of 2022 (when FWA is included, total traffic reached around 118 EB per month), and projected 6Y CAGR is +24.2%, largely driven by video +26.7%. Currently, video traffic is estimated to account for 71 percent of all mobile data traffic, a share that is forecast to increase to 80 percent in 2028.

Mobile data traffic by application category (EB*/month)



IoT connected devices include connected cars, machines, meters, sensors, point-of-sale terminals, consumer electronics and wearables, etc. The wide-area segment consists of devices using cellular connections, as well as unlicensed low-power technologies. World TOTAL 6Y CAGR is +11.7%, driven by Short-Range IoT +18.7% and Wide-Area IoT +12.8%.

IoT connected devices (million)

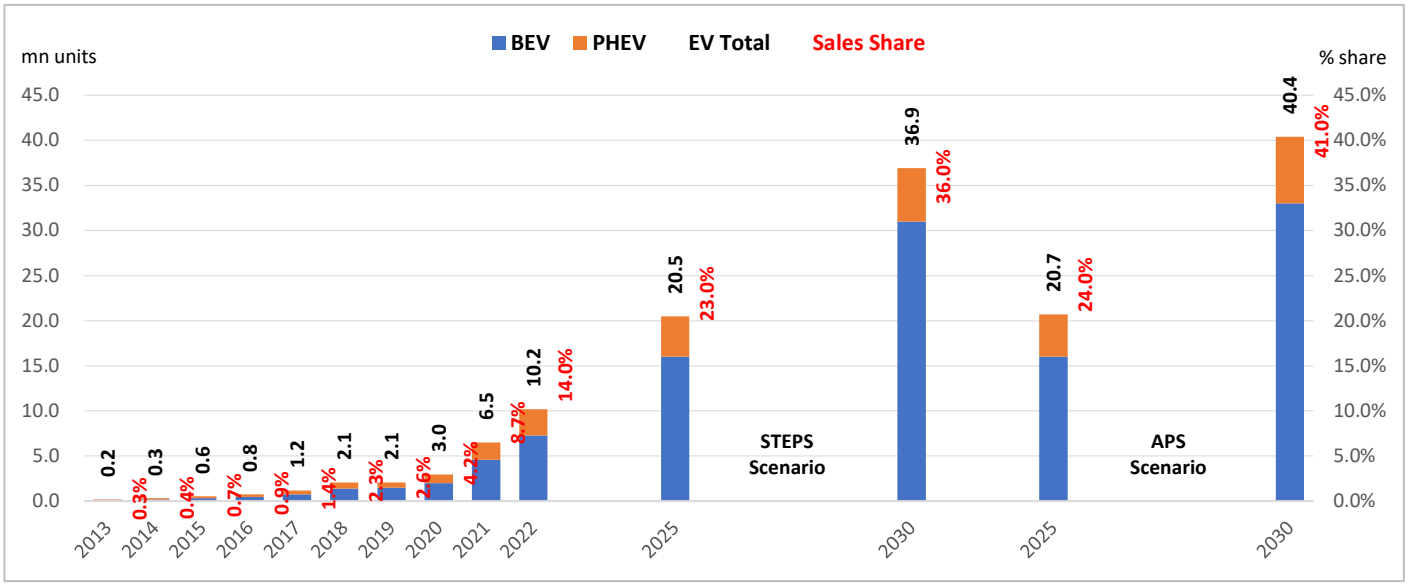


Key takeaways from IEA's "Global EV Outlook 2023" – exponential growth phase

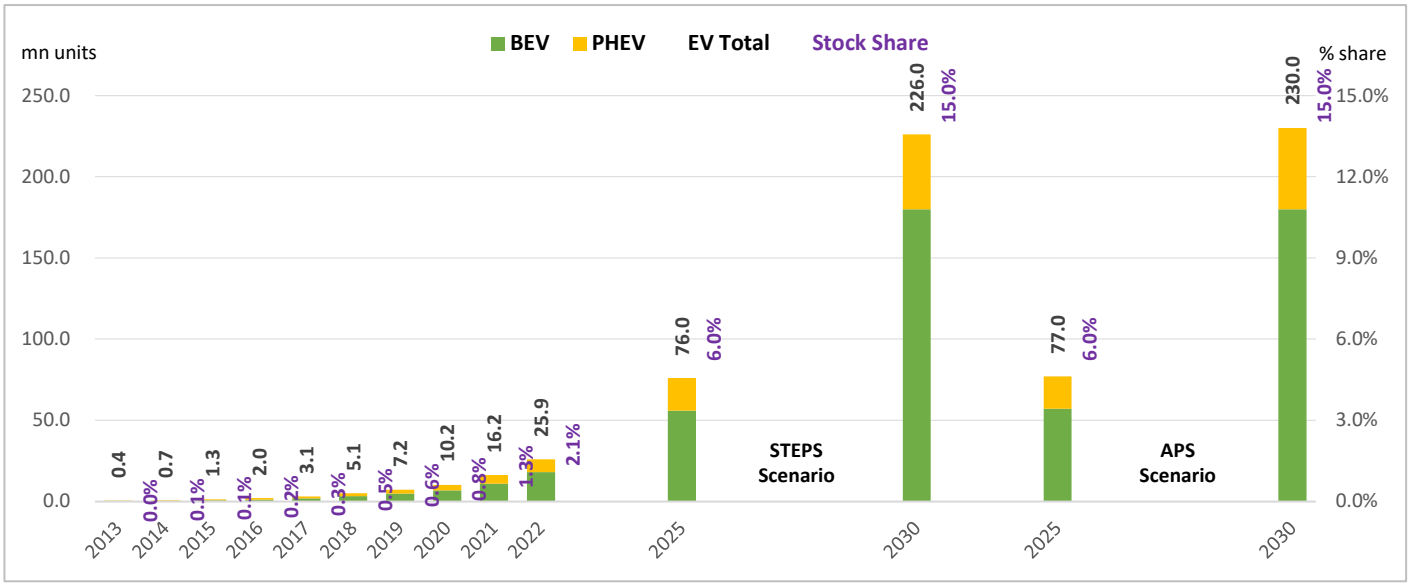
The International Energy Agency's flagship annual report "Global EV Outlook 2023, Catching up with climate ambitions" published on April 26, 2023, highlights a banner year in 2022 for EV sales globally, rising +57% YoY to 10.2mn units, and accounting for 14% of all new cars sold. Global spending on EVs exceeded USD 425bn in 2022, +50% YoY, with only 10% attributed to government incentives, alluding to the fact that consumers have a growing number of more affordable model choices. The number of available models reached 500 in 2022, more than double 2018.

As a result of new climate initiatives passed in the EU and US, IEA revised up its Stated Policies Scenario (STEPS) for the 2030 share of sales from less than 25% in the previous outlook to over 35%. Over 2.3mn EVs were sold in 1Q 2023, +25% YoY, and IEA forecasts 2023 sales to reach 14.0mn, +35% YoY, accelerating in the 2H.

EV sales, cars, World, 2013 – 2030 (million vehicles); STEPS Scenario revised up on par with APS



EV stock, cars, World, 2013 – 2030 (million vehicles, % share RHS)

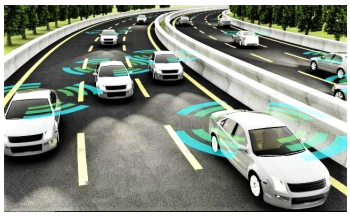


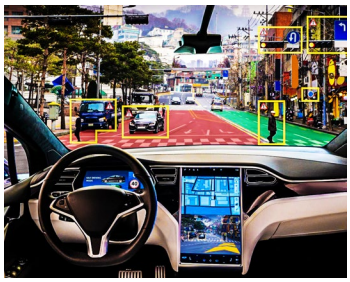
Source: compiled by SIR using EIA Global EV Data Explorer. https://www.iea.org/data-and-statistics/data-tools/global-ev-data-explorer

Full LCD display rear view mirror-type drive recorder (DR)

Source: MAXWIN

Power management IC demand in sensor and camera modules





Integration of internal vehicle data is accelerating the shift to 'Connected Cars'
Through bidirectional wireless communication, internal vehicle data, as well as external information on other vehicles on the road, road infrastructure, and maps can be exchanged between vehicles and applications in real time. Connected cars are not only connected to the internet, but also to various other devices with which they exchange information. Connected Cars represent one of the four major areas of development shaping the future of the global automotive sector, which are collectively known as "CASE" (Connected, Autonomous, Shared, and Electric). **Telematics** refers to systems that connect cars with the external environment. Applications related to connected cars include, ETC systems, VICS Center (Vehicle Information and Communication System) traffic control and congestion information system, GPS-based car navigation systems, vehicle to vehicle relative position sensor systems, infotainment related information distribution on nearby shops, restaurants, gas stations, etc.

Advanced Driver Assistance Systems (ADAS) on the road to fully autonomous driving
ADAS uses automated technology, such as sensors and cameras, to detect nearby obstacles or driver errors, and respond accordingly. Most road crashes occur due to human error. ADAS systems allow for the replacement of human perception, judgment, and operation through a combination of multiple technologies. Perception can be broadly divided into location awareness and external environment awareness. The key to autonomous driving, however, is to combine data obtained from various sensors to allow for accurate awareness of the external environment and to make appropriate driving decisions based on this data-based awareness.

According to a 2021 research report from Canalys, approximately 33 percent of new vehicles sold in the United States, Europe, Japan, and China had ADAS features, but only 10% of the 1.05 billion registered cars in use worldwide had ADAS systems. The firm also forecast that 50% of all automobiles in use by the year 2030 would be ADAS-enabled, implying a huge growth opportunity.

ADAS Level 5 is fully autonomous driving

- SiC SBD
- SiC MOSFET
- GaN HEMT

Next-gen highly energy efficient SiC and GaN Power Devices

Relative to conventional silicon-based semiconductors, wide-bandgap SiC and GaN-based compound semiconductors contribute to drastic reductions in system size and power consumption in a variety of applications, due to lower ON resistance and high-speed, low switching loss. High heat resistance makes them attractive for automotive applications.

Expected Applications

- Renewable energy wind/solar inverters
- EV traction motor inverters
- EV onboard chargers
- xEV quick charging stations
- Industrial equipment inverters, UPS
- Power conditioners, HEMS
- Data center server power supplies
- USB Power Delivery, etc.

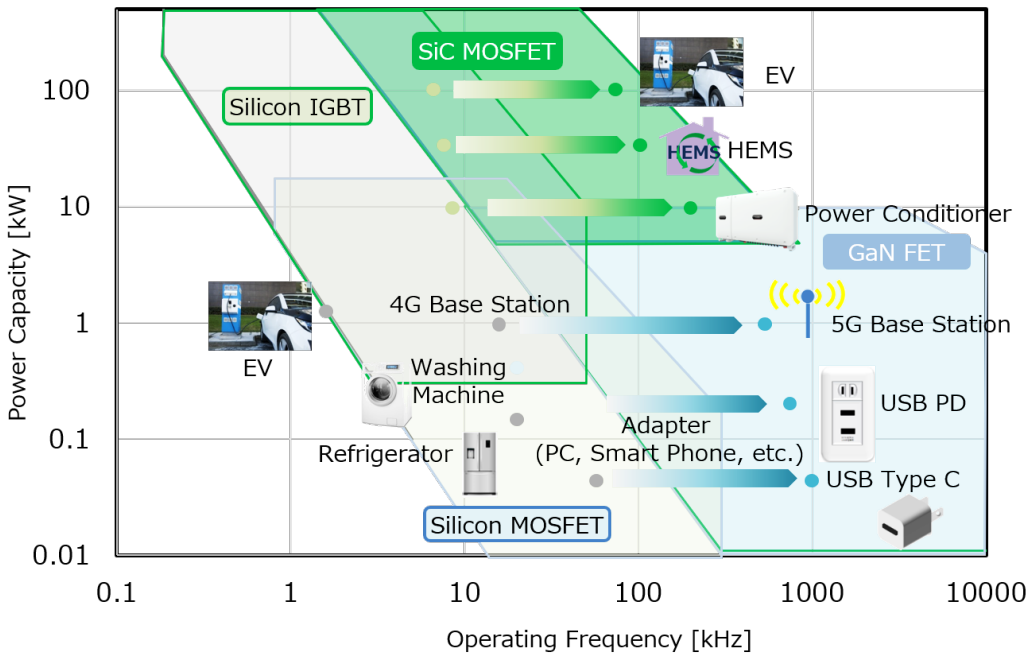
Characteristics of Silicon / SiC / GaN

Properties		Si	SiC	GaN
Bandgap	eV	1.1	3.3	3.4
Electron Mobility	cm^2/Vs	1350	700	1500
Breakdown Electrical Field	MV/cm	0.3	3.0	3.3
Figure of Merit	$\varepsilon\mu E_c^3$	1	440	1130

SiC /GaN Compared to Silicon:

High Breakdown Voltage Up to 10 Times Higher	High Heat Resistance Up to 1000℃
Compact Reduced Up to 1/1000	High Speed Up to 100 MHz

Application range of Silicon, SiC, GaN Device for Each Power Capacity and Operating Frequency



Source: Sanken Electric Co., Ltd. “Applications Where SiC and GaN Devices Are Expected To Be Used.”

Part 3
EARNINGS REVIEW AND EXTENDED LT TARGETS

New LT targets extended to FY29/3

Total capex of ¥12.6bn to boost capacity for sales up 1.5x

RESULTS SUMMARY

- For the fiscal year ended March 31, 2023, as can be seen in the table below, the TOREX Semiconductor Group posted record consolidated net sales (+3.5% YoY) and operating profit (+2.0% YoY), with OPM dipping slightly from 12.6% to 12.4%. TOREX the parent also posted record net sales (+4.0% YoY) and OP (+43.5% YoY), although 2H performance slowed due to abrupt global inventory consolidation (please see P21 for the quarterly trend of net sales and operating profit/loss by business entity). As a result of the 2H slowdown, full-term consolidated net sales posted a 3.2% shortfall to initial full-term guidance for 33,000mn (+6.9% YoY, and OP posted a 20.5% shortfall to initial guidance for ¥5,000mn (+28.3% YoY).

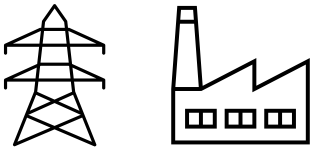
- While Phenitec contribution net sales (+3.1% YoY) also posted a record on a fiscal year basis since listing, Phenitec contribution OP plunged -33.2% YoY due to the soaring cost of electricity (see the explanation on the following two pages, set to continue in FY24/3) and other expenses, such as the decline in the 2H utilization rate and depreciation expense increasing (+25.5% YoY), including implementing overhauls that had been put off all at once. In addition, an impairment loss of ¥793mn was recorded related to the Kagoshima Fab, attributed to the change in product mix since acquisition from Yamaha in 2015.

- Since 1H FY24/3 corresponds with the bottom of the current reset cycle, initial guidance for net sales is -9.3% YoY. In addition to ongoing high electricity rates, depreciation expense is set to increase +51.1% YoY, and initial guidance for OP is -62.3% YoY. On a cash flow basis, implied EBITDA is forecast to decline -29.1% YoY. It is worth noting that the forex assumption is USD 130, versus the current 144.

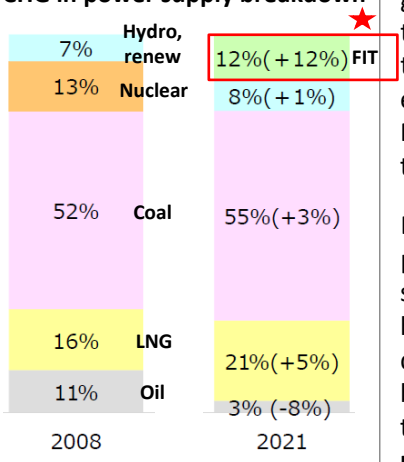
Torex Semiconductor Group FY23/3 Results and FY24/3 Initial Forecasts

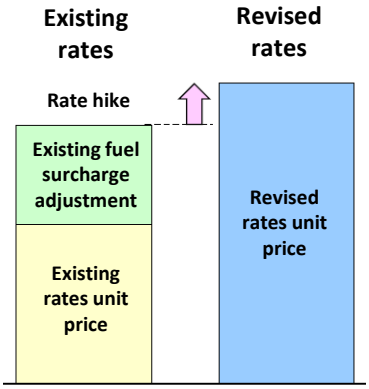
[J-GAAP]	FY13/3	FY14/3	FY15/3	FY16/3	FY17/3	FY18/3	FY19/3	FY20/3	FY21/3	FY22/3	FY23/3	FY24/3
JPY mn, %	act	act	act	act	act	act	act	act	act	act	act	init CE
Net sales	**8,600**	**9,391**	**9,972**	**10,621**	**21,560**	**23,997**	**23,897**	**21,501**	**23,713**	**30,864**	**31,957**	**29,000**
YoY	**(6.1)**	**9.2**	**6.2**	**6.5**	**103.0**	**11.3**	**(0.4)**	**(10.0)**	**10.3**	**30.2**	**3.5**	**(9.3)**
• TOREX (parent)	—	—	—	—	10,181	10,168	10,104	9,663	9,605	14,124	14,694	
• Phenitec contribution	—	—	—	—	11,378	13,828	13,792	11,837	14,107	16,740	17,262	
Gross profit	3,218	4,337	4,822	5,063	5,900	7,177	6,494	5,452	5,959	9,474	10,021	
SG&A expenses	2,651	2,922	3,472	3,923	4,649	4,964	4,943	4,774	4,750	5,577	6,045	
Depreciation, GW amort.	432	468	410	442	1,219	934	1,085	1,312	1,208	1,311	1,646	2,487
EBITDA	999	1,882	1,760	1,582	2,470	3,146	2,636	1,990	2,417	5,209	5,622	3,987
Operating profit	**567**	**1,414**	**1,350**	**1,140**	**1,251**	**2,212**	**1,551**	**678**	**1,209**	**3,898**	**3,976**	**1,500**
YoY	**1,282.9**	**149.4**	**(4.5)**	**(15.6)**	**9.7**	**76.8**	**(29.9)**	**(56.3)**	**78.3**	**222.4**	**2.0**	**(62.3)**
OPM %	**6.6%**	**15.1%**	**13.5%**	**10.7%**	**5.8%**	**9.2%**	**6.5%**	**3.2%**	**5.1%**	**12.6%**	**12.4%**	**5.2%**
• TOREX (parent)	—	—	—	—	680	633	646	453	516	1,789	2,567	
• TOREX (parent) OPM %	—	—	—	—	6.7%	6.2%	6.4%	4.7%	5.4%	12.7%	17.5%	
• Phenitec contribution	—	—	—	—	571	1,579	904	225	693	2,108	1,409	
• Phenitec contrib. OPM %	—	—	—	—	5.0%	11.4%	6.6%	1.9%	4.9%	12.6%	8.2%	
Ordinary profit	**445**	**1,339**	**1,679**	**971**	**906**	**1,998**	**1,820**	**676**	**1,206**	**4,125**	**3,981**	**1,500**
Extraordinary Gain	—	—	—	190	2,561	34	8	32	27	396	—	
Extraordinary Loss	227	15	—	137	31	62	23	117	62	107	993	
Profit before income taxes	217	1,324	1,679	1,024	3,435	1,971	1,805	592	1,171	4,414	2,988	
Total income taxes	25	(35)	428	442	331	561	484	174	238	1,257	809	
Profit ATOP	**192**	**1,357**	**1,248**	**580**	**2,931**	**902**	**1,049**	**418**	**934**	**3,157**	**2,180**	**1,050**
Attributed to minority int.	1	1	3	1	174	507	272	0	—	—	—	
Profit	193	1,359	1,251	581	3,105	1,410	1,321	417	934	3,157	2,180	1,050

Source: compiled by SIR from Annual Securities Reports (YUHO financial statements) and IR results briefing materials.



CHG in power supply breakdown





Source: excerpts from Chugoku Electric Power press release (Japanese only)
https://www.energia.co.jp/assets/2022/press/p22021028-5aUP.pdf

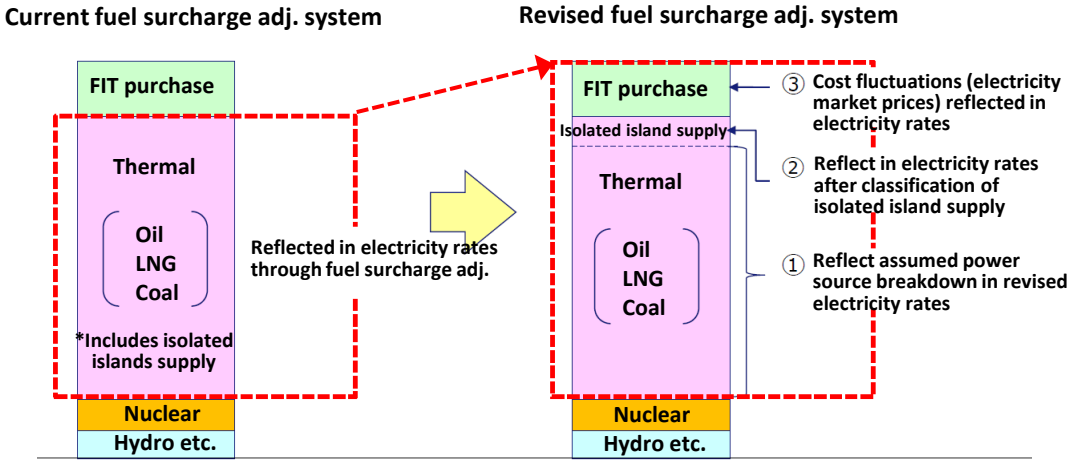
The BOJ's corporate goods price index (CGPI) in Dec-2022 rose +10.2%. Among the main commodity categories, electricity rose +52.3% YoY.

Despite oil prices having come down since peaking in June and the yen reversing from the low of 151 in October to 127 this January, there is a delay in conversion of the sliding fuel surcharge, and **Chugoku Electric Power has already announced rate hikes from April 1, 2023, so the negative impact is set to continue in FY24/3 for the time being.**

Surging electricity rates continuing in FY24/3

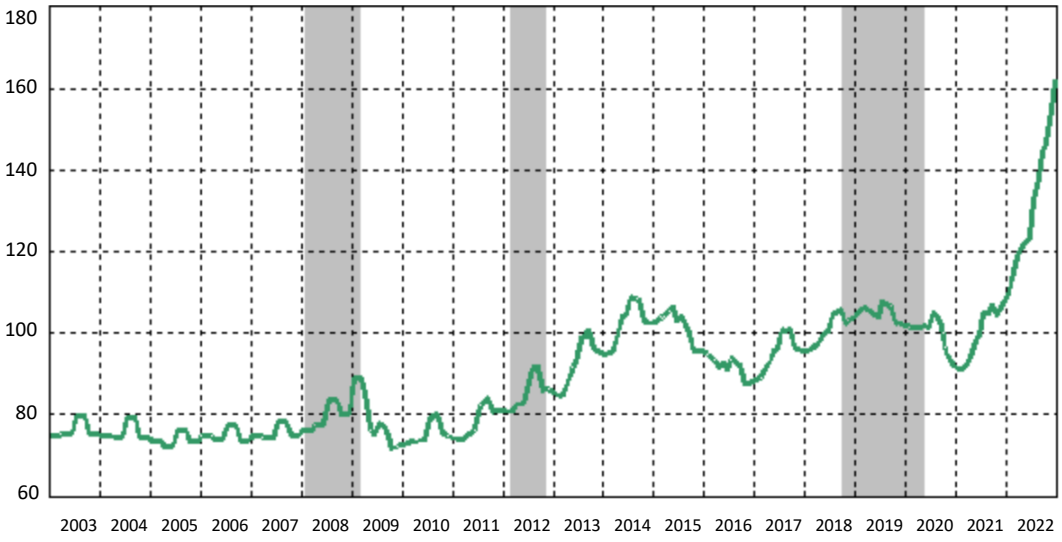
Phenitec's Okayama Fab No. 1 and Okayama Fab No. 2 are located in the Chugoku Region. Chugoku Electric Power (9504) announced new rate hikes from April 1, 2023. As can be seen from the graph at the bottom, electricity rates are surging. Despite the fact that global oil prices have retreated since peaking last June, and the yen has strengthened from the 151 low in October to 127 this January, electricity rates continue to rise (partly due to the time lag in the fuel surcharge adjustment), and since a new round of rate hikes took effect from April 1, the negative impact of surging electricity rates is set to continue in FY24/3 for the time being. Revised rates will include FIT purchase cost fluctuations under the revised surcharge adjustment system shown below on the right-hand side.

Background cited by Chugoku Electric Power: 1) **dire financial situation:** on top of prolonged nuclear power plant shutdowns and intensifying competition from deregulation, soaring fuel and electricity market prices are set to result in the largest net loss in its history, and the declining equity ratio could hinder ongoing stable supply of electric power due to difficulty in procuring necessary fuel, facilities renewal and repairs, 2) power supply breakdown has changed since FY2008 when rates were last revised, due to an increase in the amount of **electricity purchased under the FIT system and a decrease in nuclear power generation**.



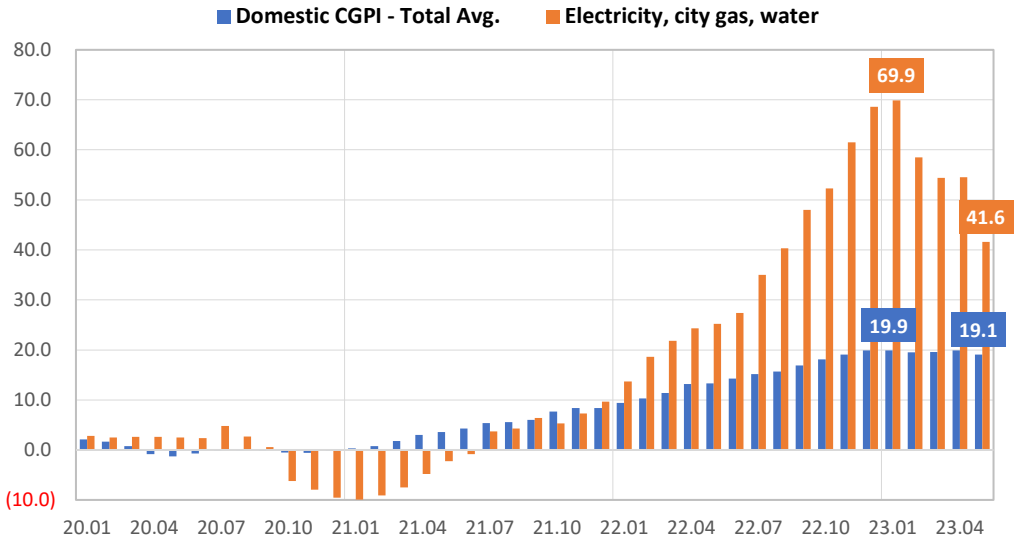
Source: excerpt from Chugoku Electric Power press release October 28, 2022.

BOJ Corporate Goods Price Index: Electricity (20-Year Trend)



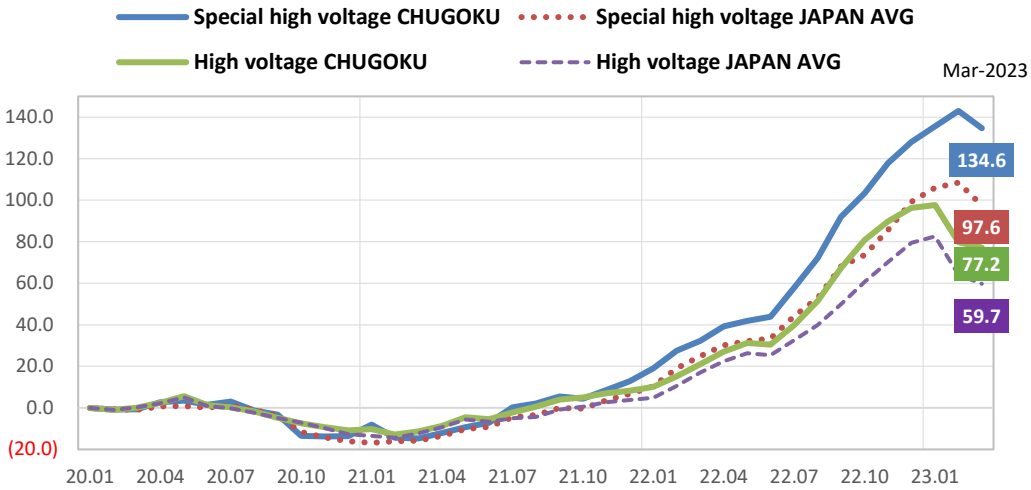
Source: compiled by SIR from BOJ CGPI Index time-series database (CY2020 = 100). Recession periods indicated in grey.

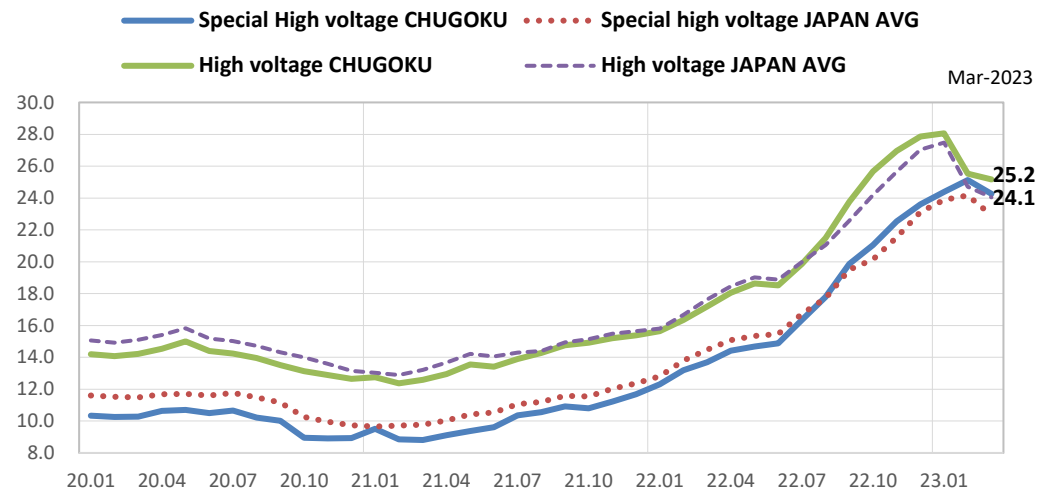
Update on the BOJ Corporate Goods Price Index and utilities costs (May-2023)



Source: compiled by SIR from monthly CPGI press releases of the Research and Statistics Department, Bank of Japan.
https://www.boj.or.jp/statistics/pi/cgpi_release/index.htm

Monthly trend of selected indices of electricity unit prices (upper) and yen/kWh (lower)





Source: compiled by SIR from EIC electricity market average sales price per unit data (through Mar-2023).
Site use requires free registration: https://pps-net.org/unit

EIC

in the wake of the deregulation of electricity and gas and advent of many new PPS (Power Producer and Supplier) operators, the Energy Information Center (EIC) is responsible for contributing to the promotion of energy businesses by providing information on the environment and energy, including various statistics and other energy-related information.

Note that **electricity unit prices in Chugoku are now higher than the nationwide average**, which is a function of the power supply breakdown for Chugoku Electric Power noted on the previous page.

Extended MTP targets to FY29/3

Total capex of ¥12.6bn to boost capacity for sales up 1.5x

CAPEX SUMMARY

Signed a long-term production contract agreement with an overseas foundry

Fabless TOREX will invest ¥1.8bn in the contractor's fab to secure dedicated 8-inch production capacity necessary for the development of new high-performance products, including medium- to high-breakdown voltage power device products. This line is scheduled to start mass production in Mar-2025.

Extending the production line for TOREX at Phenitec's Kagoshima Fab

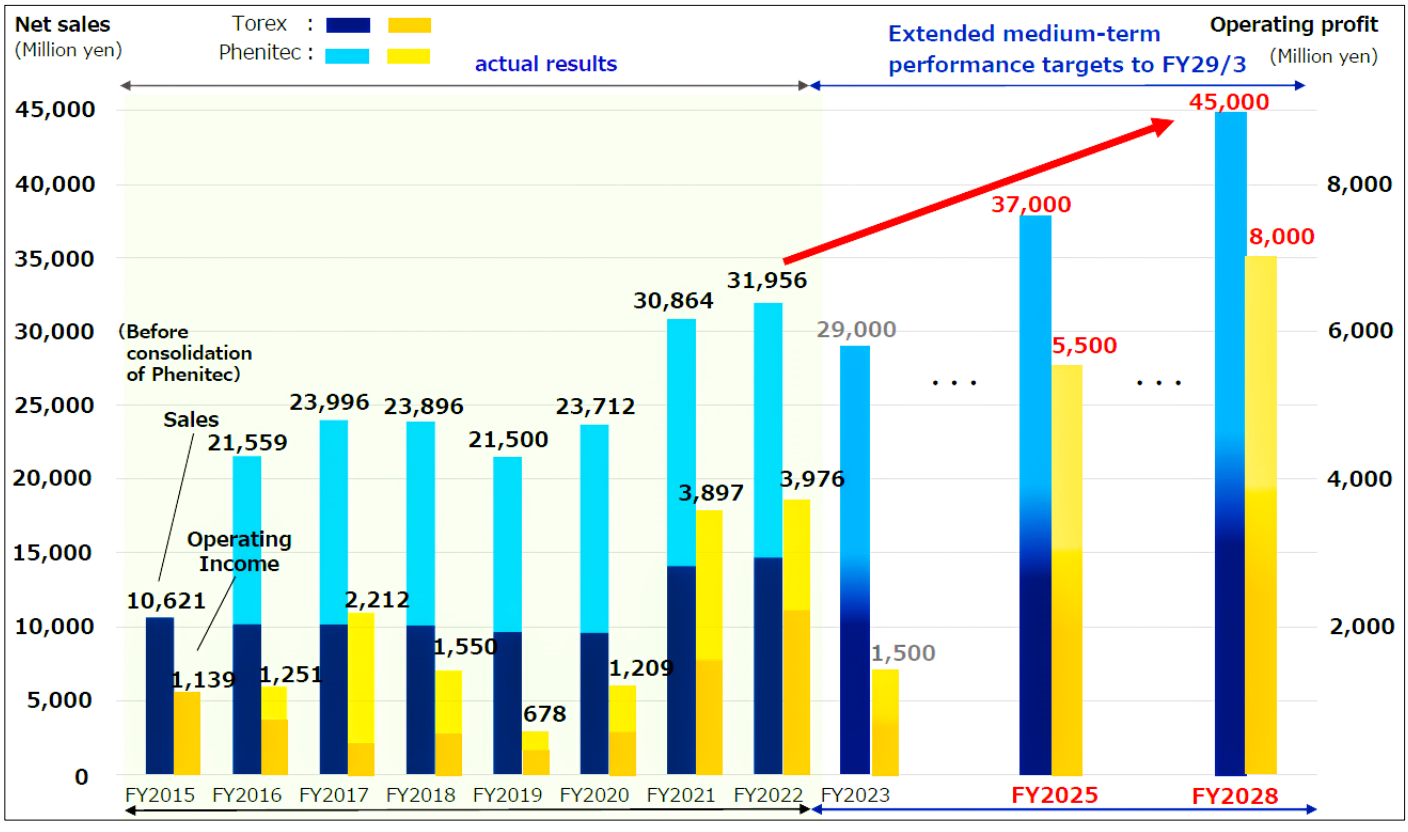
Investing ¥4.4bn in an existing line to expand dedicated capacity for TOREX. Expanding clean room floor space to expand capacity including for TOREX products.

Other capex to boost capacity at the Okayama Fab No. 1 and Kagoshima Fab

Investing ¥2.0bn to meet demand in a brisk semiconductor market. Additionally deploying ¥4.4bn capex for plant maintenance, etc. Total capex of ¥12.6bn to boost capacity for sales to increase 1.5x.

Just based on new MTP targets for FY26/3, OP is set to grow from the depressed base in FY24/3 by 2-year CAGR of +91.5% (up 3.67x). While admittedly the implied OPM of 14.86% is a challenging level, SIR believes current valuations are extremely compelling. Considering the semiconductor market is likely at the trough of the current reset cycle now, and share prices tend to discount roughly 1 year in advance, SIR believes TOREX Semiconductor is attractive at the current level.

Medium-term net sales and OP performance targets extended to FY29/3

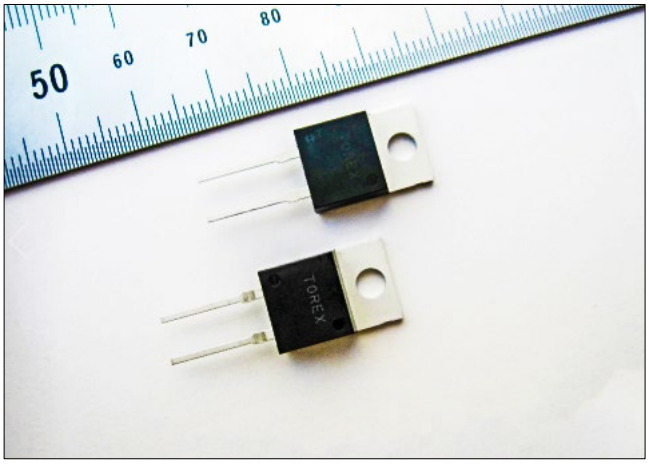


Source: excerpt from FY23/3 IR results briefing materials.

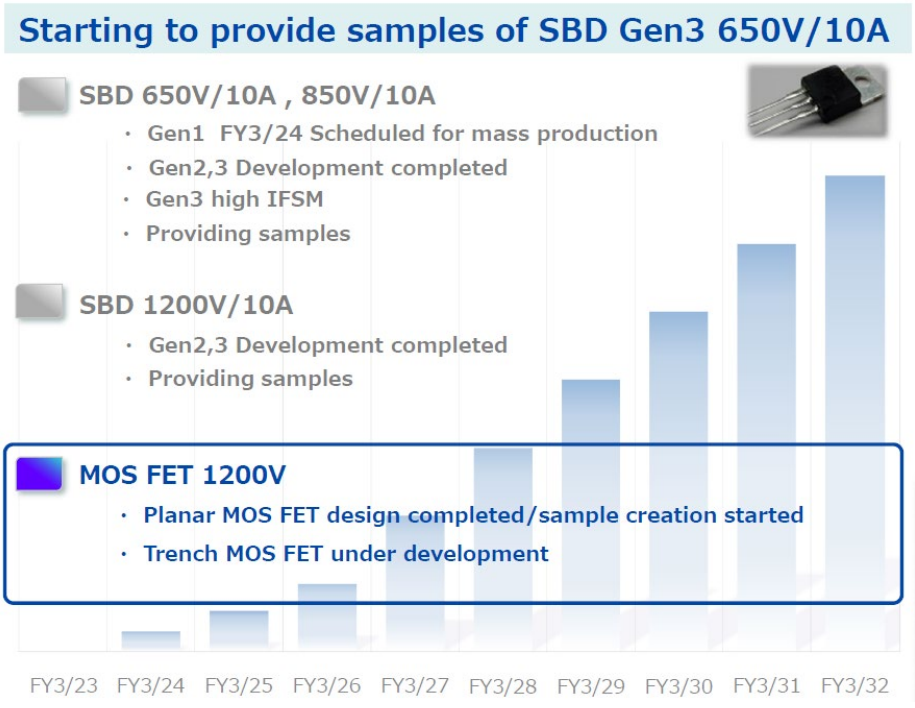
TOPICS: TOREX announces first next-gen power device product SiC SBD

On May 12, TOREX announced it has started providing samples of the 850V/10A Schottky barrier diode XBSC11A108CS using SiC (silicon carbide) as a new power semiconductor product that contributes to the reduction in power consumption and size of power supply systems such as air conditioners and EV chargers. This product is aimed at mass production in 2023. The 850V sample is for test marketing, and the Company plans to develop products with 650V~1200V that will be introduced to the market in turn.

According to the Company, it uses Sicoxs' direct bonded SiC (silicon carbide) substrate SiCkrest®, which 1) reduces cost for substrates, 2) enables process simplification and 3) shrinking of chip size, which in turn lead to being able to offer products at a competitive low price with high quality. This is a major new step for Torex entering the power device market, and the graphic below highlights the development schedule going forward.



▶Progress in SiC next-gen power device development going into FY24/3

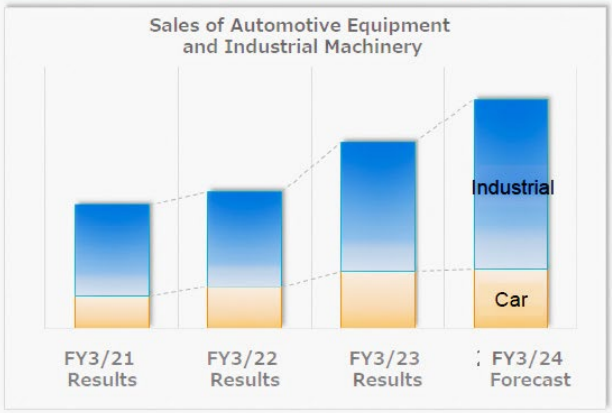


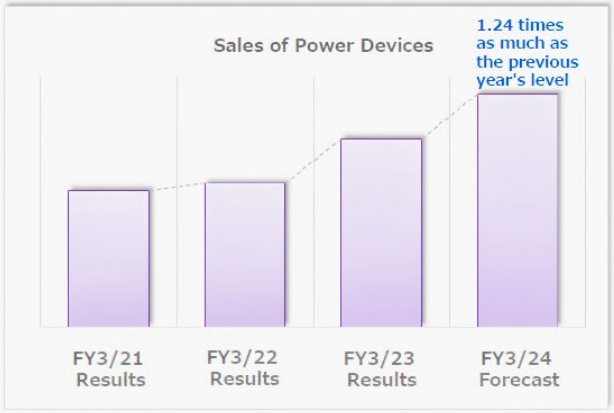
Phenitec

Strengthening the Development of Power Devices and Promoting Sales

Orders and new inquiries for Si power devices are strong.

Factors: Electrification of vehicles, strong demand for industrial devices, new energy, 5G, home appliances, etc.
Devices: IGBT, Power MOSFET, SBD





Developing process technology for compound semiconductor materials to meet demand for power semiconductors

Target materials: Silicon carbide (SiC), gallium oxide (Ga_2O_3), gallium nitride (GaN)

We aim to increase sales by developing power devices that will meet the needs of the market.

Strengthening the Development of Si Power Devices and Promoting Sales

Si power devices development plan

March 2023	March 2024	March 2025	March 2026

Aiming to increase sales by developing new power devices

Sales will increase

★ Low Vth Power MOSFET

- We will develop low-voltage-driven (1.5 V or less) products used in high-density mounting equipment such as medical and industrial uses.
- Products are being evaluated by customers.

★ Split Gate-Type MOSFET

- We will achieve extremely low on-resistance and high current density in a smaller package (contributing to longer battery life).
- A prototype is being evaluated.

★ Field-Stop Type IGBT

- We target our development at achieving cutting-edge performance from a field-stop (FS) IGBT with high input impedance, fast switching speed and low on-resistance even at high voltages.
- Samples are planned to be shipped in Q4 of the fiscal year ending March 2023.

★ High-performance Schottky barrier diode

- We will significantly improve the VF/IR trade-off by changing the device structure.
- We will be able to ensure a junction temperature of 150°C by curbing the leakage current.
- Samples are planned to be shipped in Q3 of the fiscal year ending March 2023.

Phenitec

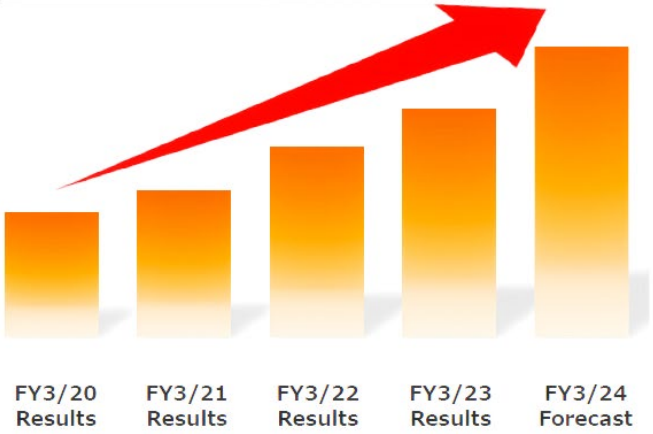
Current Status of Kagoshima Fab

Initiatives at Kagoshima Fab

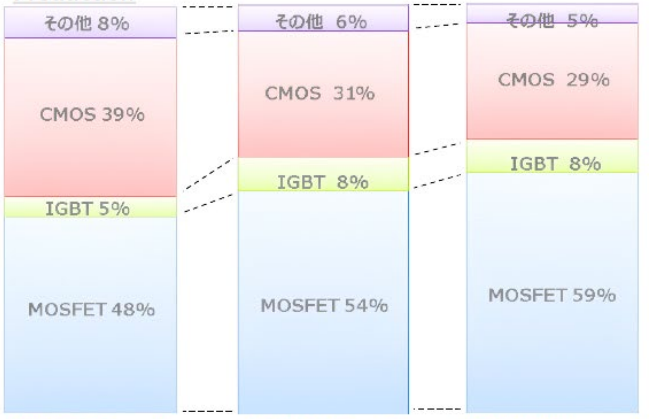
- ✓ Increasing production capacity to achieve business plan targets
- ✓ Ensuring a stable profit by reducing fixed operating expenses
- ✓ Establishing a welfare building (operations commencing in November) to improve the work environment

Working to establish a system for stable production of 20,000 wafers per month in FY3/23

Trends in sales at Kagoshima Fab



Main Mass Produced Products and Shares of Total Production



Increasing the capacity of Kagoshima Fab as one of the main fabrication plants of Torex

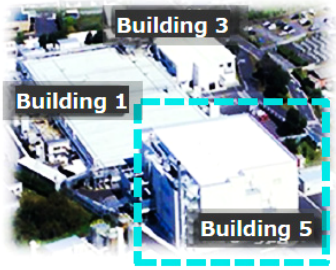
- Increase production capacity for CMOS power supply ICs
- Investment in other equipment to increase production 4.4 billion yen in total
- Plan a capital expenditure of 4.3 billion yen for Torex in the fiscal year ending March 2024
- Plan to start work to expand the clean room in May 2023 Completion scheduled in January 2024

2023/4/6 Ceremonial prayer for safety

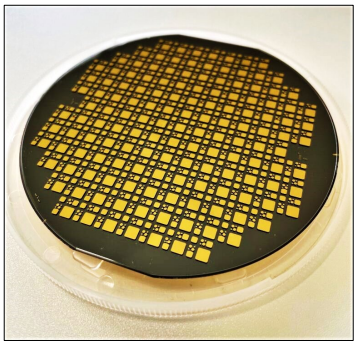
Change in production of Torex products

Achieve a stable supply of Torex products for the long term

Create a clean room on the third floor of Building 5 of Kagoshima Fab



NCT 4-inch beta-gallium oxide β-Ga_2O_3 epitaxial wafer



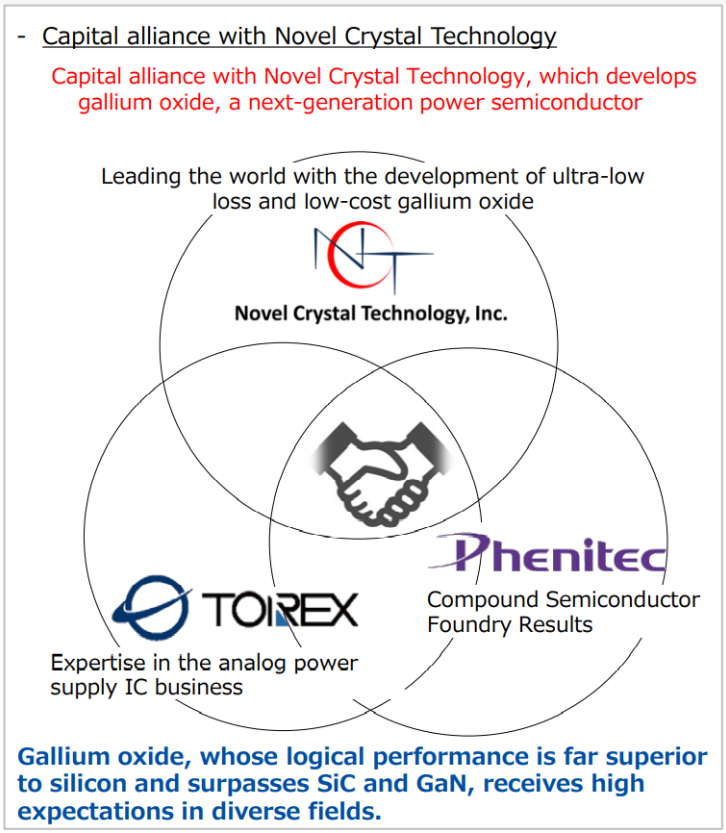
Source: Novel Crystal Technology June 16, 2021 press release.

Torex capital tie-up partner Novel Crystal Technology achieves world's first mass production of 100mm (4-inch) beta-gallium oxide (β-Ga_2O_3) epitaxial wafers, making it possible to mass produce next-generation power devices (June 16, 2021)

Previously Novel Crystal Technology had announced in April 2019 that it succeeded in developing high-quality 50mm (2-inch) beta-gallium oxide (β-Ga_2O_3) epitaxial wafers, and it has been manufacturing them and selling them since then, but they are limited to use for R&D since mass production is not economically viable with 2-inch wafers. Compared with silicon carbide (SiC) and gallium nitride (GaN), beta-gallium oxide (β-Ga_2O_3) has large band gap energy of 4.5eV (electron volts) which translates to lower loss of power, making it ideal for applications such as electric vehicles (EV) and other industrial equipment. In addition, beta-gallium oxide bulk single crystals are grown using the melt growth method, which is 100 times faster than the vapor growth method used for SiC and GaN. Finally, since beta-gallium oxide has a hardness similar to silicon, it can be processed (cutting and polishing) using existing equipment for silicon wafers (reducing the capex burden for customers).

NCT succeeded in demonstrating beta-gallium oxide low-loss Schottky barrier diodes (SBD) with a trench structure in September 2017, and it will continue to build mass production technology for trench-type SBDs on the 100mm line. The company plans to supply 150mm (6-inch) beta-gallium oxide (β-Ga_2O_3) epitaxial wafers in 2023.

Torex announced a capital tie-up with Novel Crystal Technology on June 30, 2020, as Group subsidiary Phenitec is also working on developing next-generation power devices, and the market for ultra low-loss and low-cost power devices is expected to grow rapidly over the next decade. NCT's β-Ga_2O_3 is summarized on the next 2 pages.



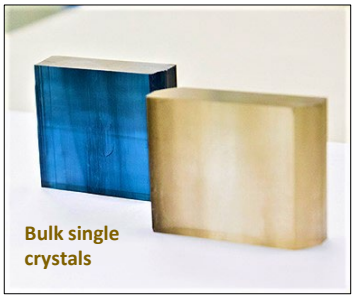
Source: excerpt from IR material "FY2021 – 2025 Mid-Term Management Plan," February 15, 2021.

Business Description
• Manufacture and sale of substrates with gallium oxide epitaxial film
• Manufacture and sale of single crystals and their applied products
• Manufacture and sale of semiconductors and their applied products

Head Office
2-3-1 Hirosedai, Sayama City, Saitama (41 employees 2020.6)

President and CEO
Akito Kuramata

Large band gap energy of 4.5eV (electron volts) means lower loss of power. Silicon is reaching its theoretical limit to lower ON resistance.



Bulk single crystals

NCT Shareholders:
• Tamura Corp. (6768): 38%
• Individual investors: 36%
• Corporate investors: 26%

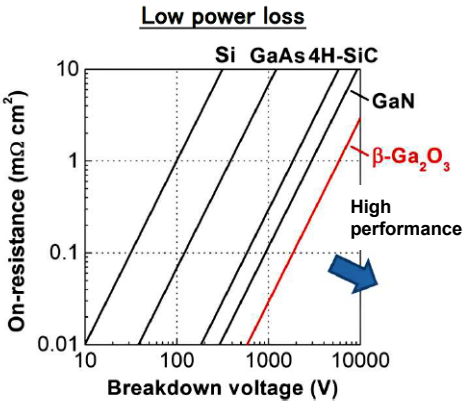
Corporate investors:
• AGC (5201)
• TDK (6762)
• Iwatani Venture Capital
• Satori Electric (7420)
• Shindengen Electric (6844)
• JX Nippon Mining & Metals
• Sojitz Machinery Corp.
• **Torex Semiconductor (6616)**
• Yaskawa Electric (6506)

Source: NEDO Project Review: Practical Development of Ampere-grade Gallium Oxide Power Device <July 2018 – May 2020>

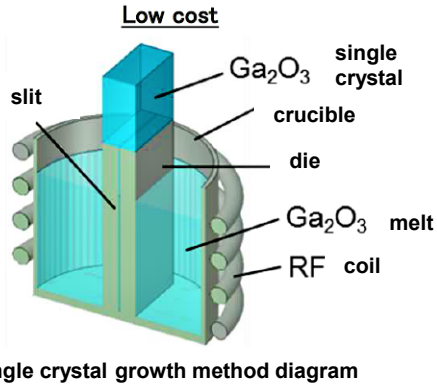
Summary of Novel Crystal Technology's next-generation power device material beta-gallium oxide (β-Ga_2O_3) epitaxial wafers and bulk single crystal growth technology
Established in June 2015, Novel Crystal Technology Inc. is a carve-out venture of Tamura Corporation (6768 TSE1) and a technology transfer venture of NICT (National Institute of Information and Communications Technology), and along with the Tokyo University of Agriculture and Technology, it is advancing research on beta-gallium oxide, a promising next generation power device material, aiming to IPO in 2023.

Novel Crystal Technology Inc. is developing and manufacturing β-Ga_2O_3 substrates and epitaxial wafers. It also leads the world in bulk single crystal growth technology, epitaxial film-forming techniques and power device fabrication technology. With the growing call for a carbon-free society, renewable energy development and efficient power usage are expected to build momentum. β-Ga_2O_3 power devices have promising applications in electric vehicles, robots and a host of other industrial equipment, contributing to sustainable society.

Features of β-Ga_2O_3: Promising Next-Generation Power Device Material
– Comparison with other wide band-gap semiconductor materials



High dielectric breakdown electric field (8 MV/cm)



Single crystal growth method diagram

High growth rate due to melt growth (30 mm/h)

The closer to the bottom-right corner, the greater the material's ability to realize a device that both saves energy and has a high breakdown voltage. Silicon is the material currently used for power devices, yet it is reaching its performance limits. Silicon carbide (SiC) and gallium nitride (GaN) have wider band gaps and greater theoretical values than Si, yet beta gallium oxide (β-Ga_2O_3) surpasses them both.

★Cost / performance advantages of beta-gallium oxide (β-Ga_2O_3)

❶ Difference in bulk crystal growth speed

With SiC and GaN, bulk single crystals are generally grown using the vapor growth method. However, the issues with this method are that only several hundred micrometers can be grown per hour, and high-quality crystals are difficult to produce. Meanwhile, beta gallium oxide (β-Ga_2O_3) is grown using the melt growth method. With a growth rate of several dozen millimeters per hour, this method is approximately 100 times faster than the vapor growth method, enabling the production of high-quality bulk single crystals. The speed at which the bulk single crystals can be grown translates to noticeably lower crystal growth costs.

Source: NCT company website

❷ Easy to process (cutting, polishing)

Because both SiC and GaN are extremely hard materials, the process of cutting out substrates from bulk single crystals and polishing them is time-consuming and labor intensive. Meanwhile, β-Ga_2O_3 has a hardness similar to silicon. This means it can be processed easily in the same facilities as silicon.

❸ Development of large-diameter substrates has progressed rapidly

With SiC, it took roughly 15 years to develop a 6-inch substrate (1997 – 2012). With β-Ga_2O_3, the same was achieved in just 5 years (2012 – 2017).

Summary of beta-gallium oxide (β-Ga_2O_3) characteristics:

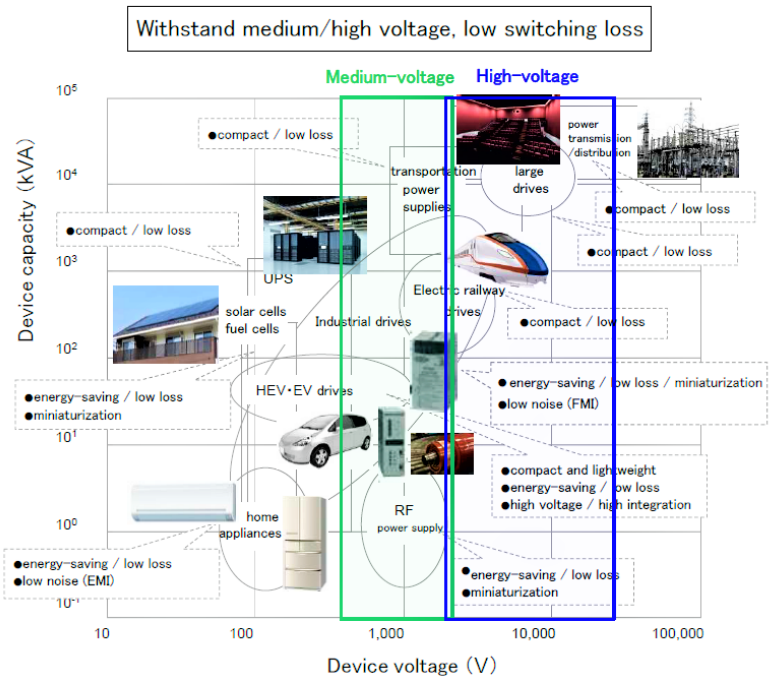
1) Energy saving / high breakdown voltage (ultra low-loss)
2) Bulk single crystals can be grown rapidly (100x faster than the vapor method)
3) The material is easy to process on existing equipment for silicon wafers
4) Large diameter substrates were achieved in a short time period

NEDO
New Energy and Industrial Technology Development Organization

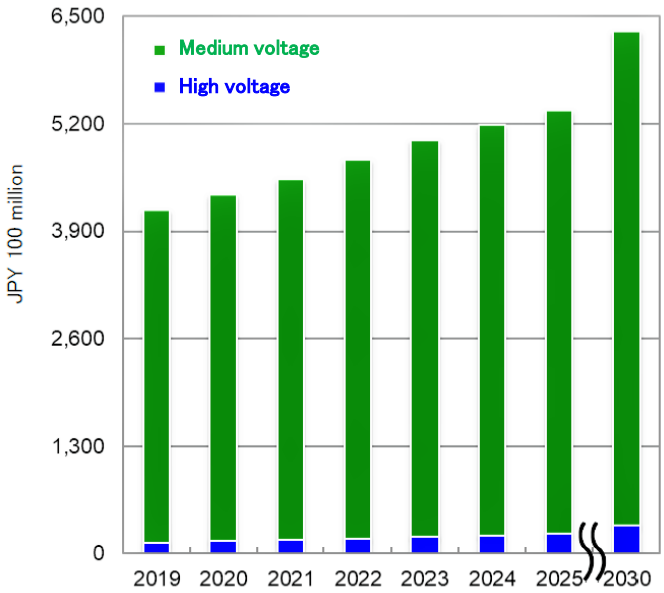
NEDO Project: Practical Development of Ampere-grade Gallium Oxide Power Device <July 2018 – May 2020>

- NCT (project co-leader): killer defect evaluation, epiwafer, polishing, diode proving
- Fujikoshi Machinery Corp. (project co-leader): Vertical Bridgman (VB) technique for growing beta gallium oxide crystals
- Saga University: killer defect evaluation
- Shinshu University: VB technique for growing beta gallium oxide crystals
- AGC (5201): polishing
- TDK (6762): killer defect evaluation, diode proving
- Cooperating companies: Tamura Corporation (6768), Nippon Sanso Holdings (4091)

Target Markets



Next-generation Power Device Market Forecast



Note: Forecast market size is calculated based on the current status and future outlook of the 2020 edition of Next-generation Power Device & Power Electronics-related Equipment Market (by Fuji Keizai Co., Ltd.)

Source: excerpt from NEDO Project Review: Practical Development of Ampere-grade Gallium Oxide Power Device <July 2018 – May 2020>

TOREX

Phenitec

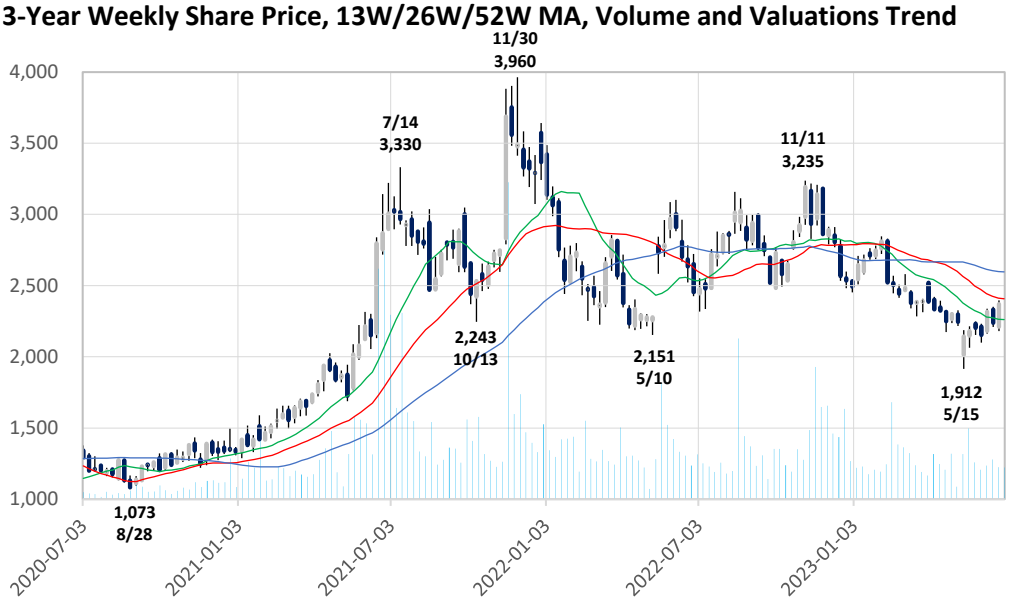
Part 4
SHARE PRICE INSIGHTS

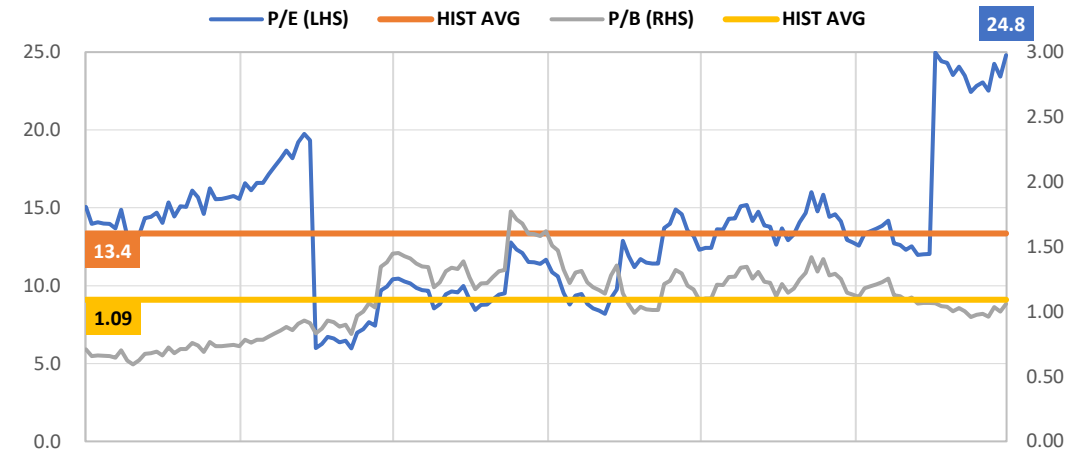
Performance and Valuations:
SESSA Smart Charts

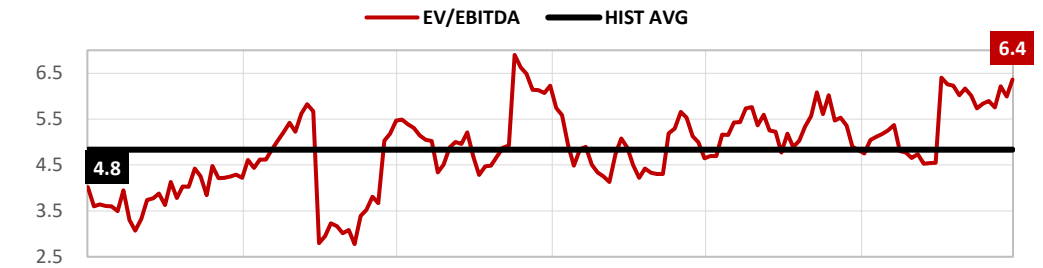
- ✓ **The current P/E of 24.8x and EV/EBITDA of 6.4x reflect depressed current term earnings.**
- ✓ **From experience, signals point strongly toward looking for a new entry point now on any weakness.**
- ✓ **Structural growth drivers for TOREX include 5G rollout/IoT device proliferation, EV/hybrid ramp, and demand for next-gen power devices to combat climate change.**

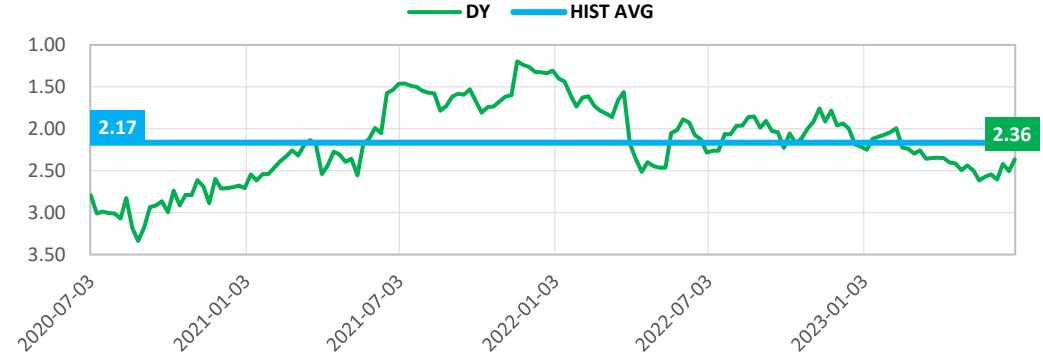
Analyst's view

3-Year Weekly Share Price, 13W/26W/52W MA, Volume and Valuations Trend







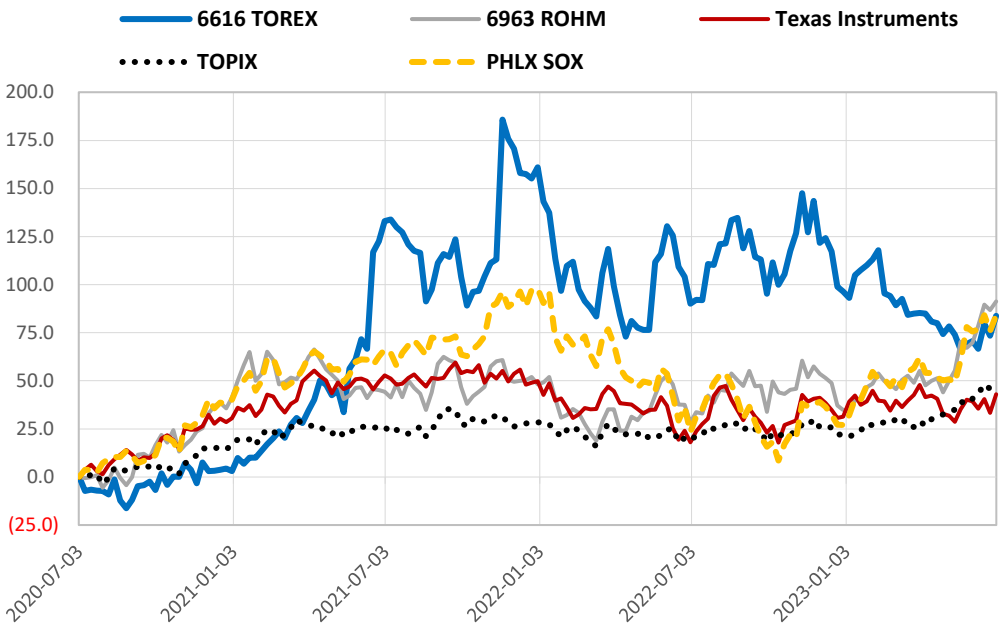


Source: compiled by SIR from SPEEDA historical earnings and price data. Valuations calculated based on CE.

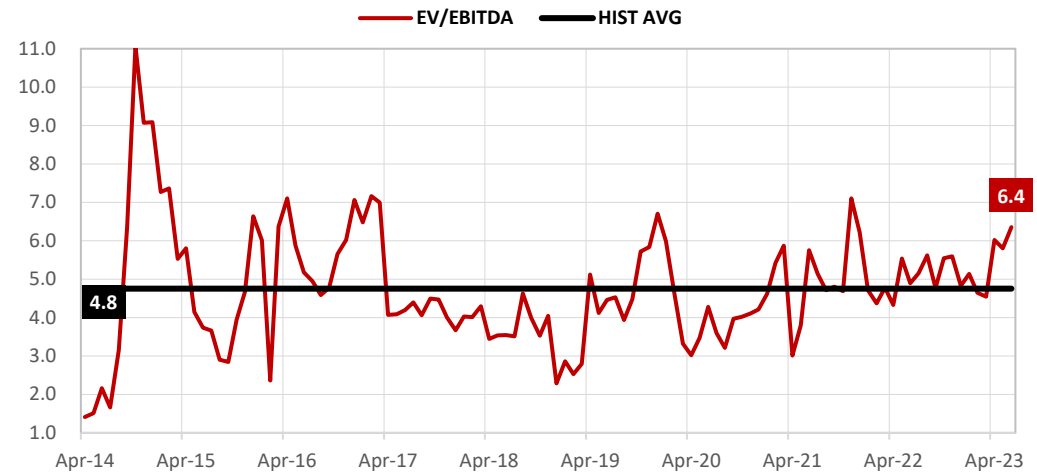
The PHLX Semiconductor Sector (SOX Index) is a Philadelphia Stock Exchange capitalization-weighted index composed of the 30 largest US companies primarily involved in the design, distribution, manufacture, and sale of semiconductors, created from December 1, 1993.

Note that the SOX Index peaked at the end of Dec-2021, and then bottomed in Oct-2022, now recovered to 90% of the previous peak. This tends to align with the current WSTS model depicted on the upper left-hand chart on P18, ie, bottoming roughly a year before the next up cycle is confirmed.

3-Year Weekly Relative Performance Chart



10-Year Monthly Share Price, 6M/12M/24M MA, Volume and Valuations Trend



Source: compiled by SIR from SPEEDA historical earnings and price data. Valuations calculated based on CE.

Major Shareholders (as of March 31, 2023)

Name or designation	Shares owned	% owned*
The Master Trust Bank of Japan, Ltd. (trust acct.)	872,300	7.87%
THE BANK OF NEW YORK 133652 (Standing proxy: Settlement Sales Division, Mizuho Bank, Ltd.)	764,900	6.90%
Tomoyuki Fujisaka	489,160	4.41%
The Chugoku Bank, Limited	472,190	4.26%
ARS Co., Ltd.	452,000	4.08%
PERSHING-DIV. OF DLJ SECS. CORP. (Standing proxy: Citibank, N.A. Tokyo Branch)	425,500	3.84%
Kibi Kogyo Co., Ltd	397,730	3.59%
Takanori Ozaki	321,500	2.90%
Koji Shibamiya	295,900	2.67%
The Custody Bank of Japan, Ltd. (trust acct.)	253,630	2.29%
Top 10 total*	**4,744,810**	**42.82%**
Shares with full voting rights (treasury stock, etc.)	473,000	4.09%
Shares with full voting rights (other)	11,073,800	95.84%
Fractional shares (less than 1 trading unit)	7,400	0.06%
Total number of shares issued and outstanding	11,554,200	100.00%

*Note: Ratio of shares held to total number of shares issued and outstanding (excluding treasury stock)

In the filing of Change Report for the Large Shareholding Report, which is available for public inspection as of December 7, 2022, Baillie Gifford & Co. and its joint holder, Baillie Gifford Overseas Ltd., are listed as holding the following shares as of November 18, 2022, but the Company is unable to confirm the number of shares actually held by them as of March 31, 2023, so they are not included in the above list of major shareholders.

Baillie Gifford & Co.	1,023,300 shares	(8.86%)
Baillie Gifford Overseas Ltd.	18,500 shares	(0.16%)
Total	1,041,800 shares	(9.02%)

Source: compiled by SIR from the Annual Securities Report (YUHO financial statements) for FY2023/3.

President Koji Shibamiya (born 1960-06-08)

President
Koji Shibamiya

Date	Career summary, positions and responsibilities at the Company
Apr-83	Joined Abe Photo Printing Co., Ltd. (currently Abeism Corporation)
Apr-86	Joined Nippon Precision Circuits Inc. (currently Seiko NPC Corporation)
Oct-87	Joined Ricoh Company, Lttd.
Apr-93	Joined Phenitec Semiconductor Corp.
Jul-99	Joined the Company
Jun-02	Director and General Manager of Sales Headquarters, the Company
Jun-09	Managing Director and General Manager of Sales Headquarters, the Company
Jun-14	Executive Director and General Manager of Business Headquarters, the Company
Jun-15	Representative Director, President, the Company
Jun-16	Representative Director, President and Executive Officer, the Company
Jun-20	Representative Director, President and Executive Officer, Manager of Domestic Sales Headquarters, the Company (current)

Source: compiled by SIR from the Notice of Convocation of the Ordinary General Meeting of Shareholders.

Dividend Policy, DOE and Payout Ratio

JPY mn, %	FY15/3 act	FY16/3 act	FY17/3 act	FY18/3 act	FY19/3 act	FY20/3 act	FY21/3 act	FY22/3 act	FY23/3 act	FY24/3 init CE
Shareholders' equity	10,527	10,797	11,172	14,429	19,671	19,053	19,634	22,335	24,100	24,500
Total dividends paid	291	340	305	341	425	438	396	485	621	621
DOE	2.7%	3.1%	2.7%	2.6%	2.5%	2.3%	2.0%	2.3%	2.6%	2.5%
Profit ATOP	1,248	580	2,931	902	1,049	418	934	3,157	2,180	1,050
Payout ratio	23.4%	58.6%	10.4%	34.2%	39.6%	105.2%	42.1%	15.2%	28.2%	58.7%

Note: compiled by SIR from Summary of Financial Results (TANSHIN financial statements).

Part 5
SUPPLEMENT

As reported consolidated financial statements from the FY2023/3 Annual Securities Report (YUHO):

- **Consolidated Balance Sheets**
- **Consolidated Statements of Income**
- **Consolidated Statements of Comprehensive Income**
- **Consolidated Statements of Cash Flows**

Another aerial view of Phenitec's Okayama Fab No. 1 (Daiichi Fab)

Consolidated Balance Sheets 1

(Thousands of yen)

	As of March 31, 2022	As of March 31, 2023
Assets		
Current assets		
Cash and deposits	10,219,751	8,572,536
Notes and accounts receivable - trade	5,916,777	5,332,969
Merchandise and finished goods	3,438,373	6,193,443
Work in process	2,818,287	2,199,331
Raw materials and supplies	1,940,970	1,641,954
Other	552,662	777,874
Allowance for doubtful accounts	(6,373)	(3,213)
Total current assets	24,880,449	24,714,896
Non-current assets		
Property, plant and equipment		
Buildings and structures, net	2,403,060	3,101,302
Machinery, equipment and vehicles, net	1,680,428	2,000,128
Tools, furniture and fixtures, net	343,332	399,281
Land	1,247,258	1,225,620
Leased assets, net	134,316	158,304
Construction in progress	804,861	2,316,849
Total property, plant and equipment	6,613,258	9,201,486
Intangible assets		
Software	752,856	530,708
Other	24,263	52,371
Total intangible assets	777,120	583,080
Investments and other assets		
Investment securities	1,056,742	937,875
Retirement benefit asset	463,063	442,377
Deferred tax assets	587,245	774,009
Other	421,453	426,670
Allowance for doubtful accounts	(29,015)	(31,656)
Total investments and other assets	2,499,489	2,549,276
Total non-current assets	9,889,868	12,333,842
Total assets	34,770,317	37,048,739

Consolidated Balance Sheets ❷

(Thousands of yen)

	As of March 31, 2022	As of March 31, 2023
Liabilities		
Current liabilities		
Notes and accounts payable - trade	1,720,227	1,200,122
Short-term borrowings	2,400,000	1,900,000
Current portion of long-term borrowings	950,000	1,470,496
Lease liabilities	38,216	52,857
Accounts payable - other	1,485,304	1,581,038
Income taxes payable	1,242,667	184,425
Contract liabilities	30,044	673
Provision for bonuses	571,792	589,493
Provision for bonuses for directors (and other officers)	45,000	24,070
Other	494,221	378,919
Total current liabilities	8,977,473	7,382,096
Non-current liabilities		
Bonds payable	—	100,000
Long-term borrowings	2,412,500	4,264,360
Lease liabilities	37,039	95,206
Long-term accounts payable - other	39,803	27,984
Retirement benefit liability	383,131	391,063
Provision for share awards	75,883	77,183
Asset retirement obligations	84,990	85,844
Deferred tax liabilities	1,033	1,703
Other	29,186	29,362
Total non-current liabilities	3,063,567	5,072,708
Total liabilities	12,041,040	12,454,805
Net assets		
Shareholders' equity		
Share capital	2,967,934	2,967,934
Capital surplus	8,299,941	8,388,605
Retained earnings	11,817,830	13,422,586
Treasury shares	(750,278)	(678,960)
Total shareholders' equity	22,335,428	24,100,165
Accumulated other comprehensive income		
Valuation difference on available-for-sale securities	(111,934)	(105,201)
Foreign currency translation adjustment	353,682	550,361
Remeasurements of defined benefit plans	152,101	48,608
Total accumulated other comprehensive income	393,849	493,768
Total net assets	22,729,277	24,593,934
Total liabilities and net assets	34,770,317	37,048,739

Consolidated Statements of Income

(Thousands of yen)

	Fiscal year ended March 31, 2022	Fiscal year ended March 31, 2023
Net sales	30,864,245	31,956,887
Cost of sales	21,389,757	21,935,691
Gross profit	9,474,487	10,021,195
Selling, general and administrative expenses	5,576,812	6,044,976
Operating profit	3,897,675	3,976,219
Non-operating income		
Interest and dividend income	19,045	32,252
Foreign exchange gains	185,333	—
Royalty gain	4,235	3,954
Rental income	40,256	42,202
Other	23,690	32,142
Total non-operating income	272,560	110,552
Non-operating expenses		
Interest expenses	34,900	66,885
Commission expenses	8,000	8,000
Foreign exchange losses	—	25,058
Other	2,761	5,528
Total non-operating expenses	45,662	105,473
Ordinary profit	4,124,574	3,981,298
Extraordinary income		
Gain on sale of non-current assets	372,176	—
Subsidy income	24,282	—
Total extraordinary income	396,458	—
Extraordinary losses		
Impairment losses	—	793,424
Loss on sale and retirement of non-current assets	22,969	54,095
Loss on valuation of investment securities	84,059	132,033
Loss on cancellation of insurance policies	—	10,180
Other	—	3,132
Total extraordinary losses	107,029	992,867
Profit before income taxes	4,414,003	2,988,430
Income taxes - current	1,361,383	952,443
Income taxes - deferred	(104,728)	(143,820)
Total income taxes	1,256,655	808,622
Profit	3,157,348	2,179,807
Profit attributable to owners of parent	3,157,348	2,179,807

Consolidated Statements of Comprehensive Income

(Thousands of yen)

	Fiscal year ended March 31, 2022	Fiscal year ended March 31, 2023
Profit	3,157,348	2,179,807
Other comprehensive income		
Valuation difference on available-for-sale securities	34,684	6,733
Foreign currency translation adjustment	239,748	196,679
Remeasurements of defined benefit plans, net of tax	(36,677)	(103,492)
Total other comprehensive income	237,755	99,919
Comprehensive income	3,395,103	2,279,727
Comprehensive income attributable to		
Comprehensive income attributable to owners of parent	3,395,103	2,279,727

Consolidated Statements of Cash Flows 1

(Thousands of yen)

	Fiscal year ended March 31, 2022	Fiscal year ended March 31, 2023
Cash flows from operating activities		
Profit before income taxes	4,414,003	2,988,430
Depreciation	1,311,300	1,645,952
Impairment losses	—	793,424
Loss (gain) on valuation of investment securities	84,059	132,033
Loss (gain) on sale and retirement of non-current assets	(349,207)	54,095
Loss (gain) on cancellation of insurance policies	—	10,180
Subsidy income	(24,282)	—
Increase (decrease) in allowance for doubtful accounts	(351)	(3,134)
Increase (decrease) in provision for bonuses	144,295	16,056
Increase (decrease) in provision for share awards	26,773	14,916
Decrease (increase) in retirement benefit asset	(141,090)	20,686
Increase (decrease) in retirement benefit liability	38,364	7,932
Interest and dividend income	(19,045)	(32,252)
Interest expenses	34,900	66,885
Foreign exchange losses (gains)	(353,513)	(250,476)
Decrease (increase) in trade receivables	(1,321,473)	686,243
Decrease (increase) in inventories	(2,508,431)	(1,778,503)
Increase (decrease) in trade payables	370,199	(524,624)
Increase (decrease) in long-term accounts payable - other	(28,675)	2,212
Other, net	421,189	(387,237)
Subtotal	2,099,016	3,462,825
Interest and dividends received	19,045	32,252
Interest paid	(34,309)	(60,205)
Income taxes refund (paid)	(339,838)	(2,150,086)
Subsidies received	14,282	10,000
Guarantee loss paid	(5,139)	—
Net cash provided by (used in) operating activities	1,753,056	1,294,785

Consolidated Statements of Cash Flows ②

(Thousands of yen)

	Fiscal year ended March 31, 2022	Fiscal year ended March 31, 2023
Cash flows from investing activities		
Net decrease (increase) in time deposits	(83)	(96)
Purchase of property, plant and equipment	(1,613,624)	(4,484,750)
Proceeds from sale of property, plant and equipment	359,091	13,510
Purchase of intangible assets	(198,497)	(130,416)
Purchase of investment securities	(124,294)	(3,983)
Proceeds from cancellation of insurance funds	—	68,975
Payments of leasehold and guarantee deposits	(3,038)	(1,442)
Proceeds from refund of leasehold and guarantee deposits	2,042	4,842
Other, net	(30,115)	(33,826)
Net cash provided by (used in) investing activities	(1,608,519)	(4,567,187)
Cash flows from financing activities		
Net increase (decrease) in short-term borrowings	(501,693)	(500,000)
Proceeds from long-term borrowings	—	3,779,360
Repayments of long-term borrowings	(1,030,000)	(1,228,276)
Proceeds from issuance of bonds	—	100,000
Purchase of treasury shares	(297)	(227)
Repayments of lease liabilities	(75,461)	(57,591)
Dividends paid	(440,962)	(575,047)
Other, net	(8,000)	(8,000)
Net cash provided by (used in) financing activities	(2,056,414)	1,510,217
Effect of exchange rate change on cash and cash equivalents	393,237	114,594
Net increase (decrease) in cash and cash equivalents	(1,518,639)	(1,647,589)
Cash and cash equivalents at beginning of period	11,681,709	10,163,070
Cash and cash equivalents at end of period	10,163,070	8,515,480

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Sessa Partners Inc.

#5a i-o Azabu, 2-8-14
Azabujyuban, Minato-ku, Tokyo
info@sessapartners.co.jp