

# TOREX SEMICONDUCTOR | 6616

Sponsored Research  
Sep. 2, 2022



## TOREX Group GX Green Transformation MTP initiatives in focus on passage of US Inflation Reduction Act

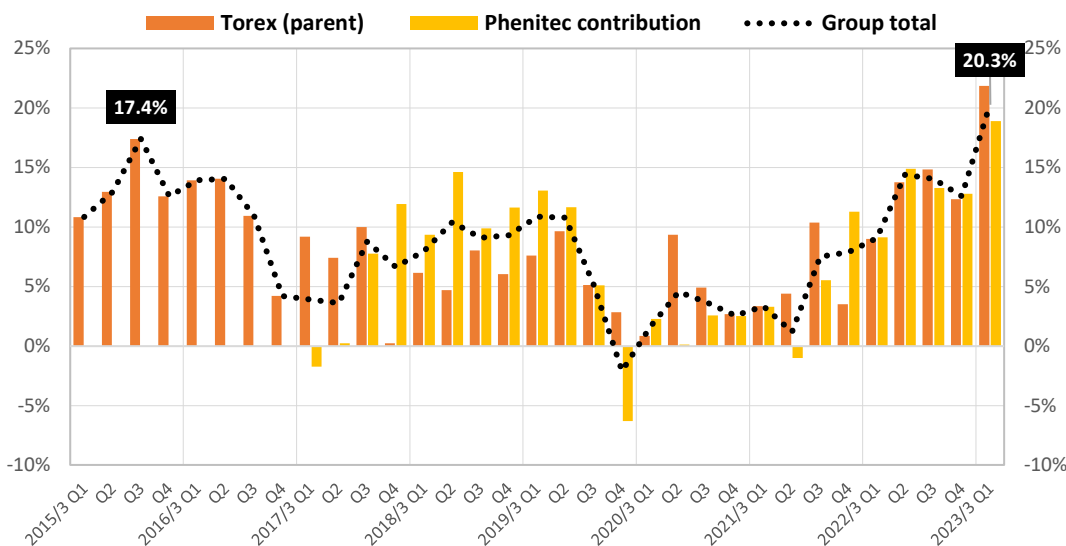
### SUMMARY

▶ As the orbit of the current semiconductor cycle begins to decay, the TOREX Group got off to a strong start in 1Q FY23/3, posting record consolidated net sales, OP and OPM, getting a nice boost from the weak yen with an overseas sales ratio of roughly 70% (sales denominated in FC). The graph below shows consolidated OPM topped 20% for the first time, and the graphs on P6 highlight record profits for both TOREX the parent and the Phenitec contribution. Further, initial guidance assumes a conservative forex rate of USD 120 (currently trading around 135), and the 1Q progress ratio for OP of 34.9% points to potentially significant upside to full-term profits. Jul-Sep 2Q orders will provide important clues on the 2H outlook.

▶ US President Joe Biden rejoined the Paris Agreement on his inauguration day in Jan-2021. Nevertheless, US GHG emissions grew by 6.2% in 2021, second only to China. On August 16, 2022, he signed into law the US Inflation Reduction Act, which includes \$360 billion (¥48.6 trillion) on spending to address climate change, the single largest investment on climate action in US history, which will likely have a profound impact on the international landscape. In its new 5-Year MTP 2021 – 2025 [FY22/3 – FY26/3], the TOREX Group is promoting its GX Green Transformation initiatives toward realization of a net zero carbon-neutral society through:

- ① development of highly efficient, energy-saving power management IC products,
- ② resource conservation with package miniaturization and space-saving design, and
- ③ reduced power loss with low ON resistance (the smaller the value, the lower the power loss) through development and sales promotion of next-generation silicon carbide (SiC) and gallium oxide ( $\beta$ -Ga<sub>2</sub>O<sub>3</sub>) power devices. The current P/E of 9.4x is trading on a 43% discount to historical average, with upside to initial guidance.

### TOREX SEMICONDUCTOR Group OPM tops 20% for the first time



Source: compiled by SIR from company TANSWIN financial statements and IR results briefing materials.

### 1Q Follow-up



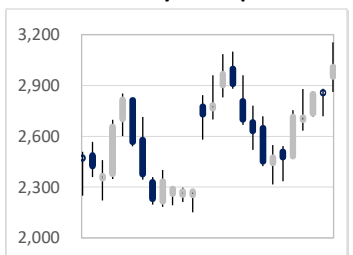
#### Focus Points:

Power management IC specialist with attractive growth profile from new applications driven by 5G, IoT-connected devices and the electrification of cars.

#### Key Indicators

Share price (8/31)	2,952
YH (22/1/4)	3,485
YL (22/5/10)	2,151
10YH (21/11/30)	3,960
10YL (14/5/20)	725.8
Shrs out. (mn shrs)	11.554
Mkt cap (¥ bn)	34.778
EV (¥ bn)	30.396
Equity ratio (6/30)	66.0%
23.3 P/E (CE)	9.4x
23.3 EV/EBITDA (CE)	4.4x
22.3 ROE (act)	14.9%
22.3 P/B (act)	1.37x
23.3 DY (CE)	1.86%

#### 6M weekly share price



Source: SPEEDA price data

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Company Specialist

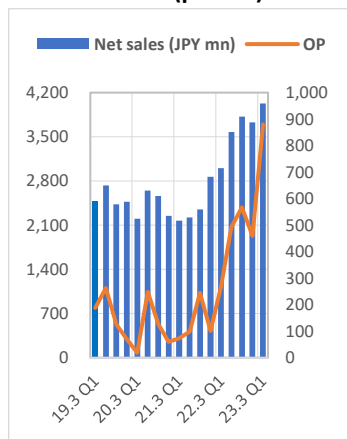
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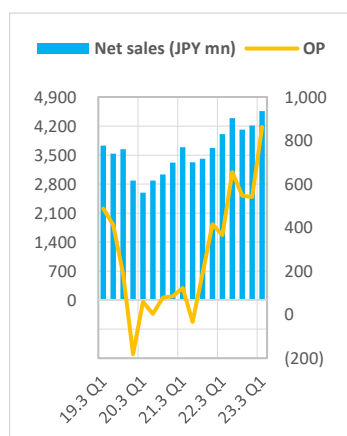
This report was prepared by Sessa Partners on behalf of TOREX SEMICONDUCTOR, LTD. Please refer to the legal disclaimer at the end for details.



TOREX (parent)



Phenitec contribution



Source: compiled by SIR from IR quarterly results briefing materials.

## Record profits boosted by the weak yen

### RESULTS SUMMARY

▶ TOREX SEMICONDUCTOR announced consolidated financial results for 1Q FY23/3 at 15:10 on Monday 8/15. Headline numbers for the 1Q ended June 30, 2022 were net sales +22.5% YoY, OP +174.1%, and profit attributable to owners of parent +159.6%. GPM improved from 27.7% → 36.9%, and OPM improved from 9.1% → 20.3%. 1Q progress ratios relative to full-term initial guidance were net sales 26.0% (versus 23.9% 8Y AVG) and OP 34.9% (versus 21.8% 8Y AVG), shown at the bottom of P3.

▶ By entity, TOREX the parent posted 34.2% growth in net sales and 225.9% growth in OP, the highest profits since listing, thanks to strong sales growth in Europe and the US, as well as the weak yen. Phenitec contribution net sales increased 13.8% YoY, and OP 135.8%, posting the highest profits since becoming a consolidated subsidiary, thanks to strength in industrial and automotive equipment, increased production as well as the weak yen. Please see the two tables on P7 for full details.

▶ Initial guidance for FY3/23 is net sales +6.9% YoY and OP +28.3%, with OPM improving further from 12.6% → 15.2%. Note that the full-term USD assumption is 120, versus 1Q actual 129. While the weak yen benefit is a key factor driving profits, high utilization rates and new capacity gradually coming online are also driving high profit growth.

▶ Sensitivity for a ¥1 annual fluctuation is: net sales roughly ¥140mn, and OP ¥115mn. Relative to the Company's assumption for 120, the USD is now trading near 135 (see graph on the bottom of P6. A rough calculation changing the assumption to 130 would boost OP from ¥5,000mn → ¥6,150mn (+23% versus initial CE).

### TOREX SEMICONDUCTOR FY23/3 1Q Consolidated Financial Results Summary

JPY mn, %	FY17/3	FY18/3	FY19/3	FY20/3	FY21/3	FY22/3	FY23/3	FY22/3	FY23/3
	act	act	act	act	act	act	init CE	1Q act	1Q act
<b>Net sales</b>	<b>21,560</b>	<b>23,997</b>	<b>23,897</b>	<b>21,501</b>	<b>23,713</b>	<b>30,864</b>	<b>33,000</b>	<b>7,014</b>	<b>8,594</b>
YoY	—	11.3	(0.4)	(10.0)	10.3	30.2	6.9	19.7	22.5
• Phenitec contrib.	11,378	13,828	13,792	11,837	14,107	16,740	—	4,011	4,565
YoY	—	21.5	(0.3)	(14.2)	19.2	18.7	—	8.8	13.8
• Torex parent	10,181	10,168	10,104	9,663	9,605	14,124	—	3,002	4,028
YoY	—	(0.1)	(0.6)	(4.4)	(0.6)	47.0	—	38.3	34.2
Gross profit	5,900	7,177	6,494	5,452	5,959	9,474	—	1,942	3,175
GPM	27.4%	29.9%	27.2%	25.4%	25.1%	30.7%	—	27.7%	36.9%
SG&A	4,649	4,964	4,943	4,774	4,750	5,577	—	1,306	1,432
Ratio to sales	21.6%	20.7%	20.7%	22.2%	20.0%	18.1%	—	18.6%	16.7%
<b>Operating profit</b>	<b>1,251</b>	<b>2,212</b>	<b>1,551</b>	<b>678</b>	<b>1,209</b>	<b>3,898</b>	<b>5,000</b>	<b>636</b>	<b>1,743</b>
YoY	—	76.8	(29.9)	(56.3)	78.3	222.3	28.3	225.3	174.1
OPM	5.8%	9.2%	6.5%	3.2%	5.1%	12.6%	15.2%	9.1%	20.3%
• Phenitec contrib.	571	1,579	904	225	693	2,108	—	366	863
YoY	—	176.5	(42.7)	(75.1)	208.0	204.2	—	200.0	135.8
OPM	5.0%	11.4%	6.6%	1.9%	4.9%	12.6%	—	9.1%	18.9%
• Torex parent	680	633	646	453	516	1,789	—	270	880
YoY	—	(6.9)	2.1	(29.9)	13.9	246.7	—	269.9	225.9
OPM	6.7%	6.2%	6.4%	4.7%	5.4%	12.7%	—	9.0%	21.8%
Yen-dollar rate	¥108.9	¥110.8	¥110.7	¥109.1	¥106.2	¥112.9	¥120.0	¥110.0	¥129.0
Capex	988	1,149	3,323	1,497	1,179	1,916	3,646	283	353
Depreciation	1,219	934	1,085	1,312	1,208	1,311	1,904	432	517

Source: compiled by SIR from TANSWIN financial statements and IR results briefing materials.

## TOREX SEMICONDUCTOR Consolidated Quarterly Earnings History Since Listing

JPY mn %	Quarterly cumulative		Progress ratios		Quarterly		YoY change		Margin OPM
	Net sales	OP	Net sales	OP	Net sales	OP	Net sales	OP	
2015/3 Q1	2,287	248	22.9%	18.4%	2,287	248	—	—	10.8%
Q2	4,766	569	47.8%	42.1%	2,478	321	—	—	13.0%
Q3	7,384	1,024	74.0%	75.9%	2,618	456	—	—	17.4%
Q4	9,972	1,350	100.0%	100.0%	2,588	326	—	—	12.6%
2016/3 Q1	2,613	364	24.6%	31.9%	2,613	364	14.2	46.8	13.9%
Q2	5,331	746	50.2%	65.4%	2,718	382	9.7	19.0	14.1%
Q3	7,880	1,024	74.2%	89.9%	2,549	279	(2.7)	(38.8)	10.9%
Q4	10,621	1,140	100.0%	100.0%	2,742	115	5.9	(64.6)	4.2%
2017/3 Q1	5,227	204	24.2%	16.3%	5,227	204	100.1	(43.9)	3.9%
Q2	10,314	387	47.8%	31.0%	5,087	183	87.1	(52.0)	3.6%
Q3	15,787	868	73.2%	69.4%	5,473	481	114.7	72.5	8.8%
Q4	21,560	1,251	100.0%	100.0%	5,773	383	110.5	231.8	6.6%
2018/3 Q1	5,714	455	23.8%	20.6%	5,714	455	9.3	123.1	8.0%
Q2	11,809	1,091	49.2%	49.3%	6,095	635	19.8	246.6	10.4%
Q3	17,845	1,640	74.4%	74.1%	6,036	550	10.3	14.3	9.1%
Q4	23,997	2,212	100.0%	100.0%	6,152	572	6.6	49.4	9.3%
2019/3 Q1	6,203	675	26.0%	43.5%	6,203	675	8.6	48.3	10.9%
Q2	12,470	1,351	52.2%	87.1%	6,266	676	2.8	6.5	10.8%
Q3	18,544	1,663	77.6%	107.2%	6,074	311	0.6	(43.4)	5.1%
Q4	23,897	1,551	100.0%	100.0%	5,353	(112)	(13.0)	TR	-2.1%
2020/3 Q1	4,797	79	22.3%	11.6%	4,797	79	(22.7)	(88.4)	1.6%
Q2	10,331	330	48.1%	48.7%	5,534	252	(11.7)	(62.8)	4.5%
Q3	15,930	535	74.1%	78.9%	5,599	205	(7.8)	(34.2)	3.7%
Q4	21,501	678	100.0%	100.0%	5,571	143	4.1	TB	2.6%
2021/3 Q1	5,858	195	24.7%	16.2%	5,858	195	22.1	148.9	3.3%
Q2	11,409	261	48.1%	21.6%	5,551	65	0.3	(74.1)	1.2%
Q3	17,171	694	72.4%	57.4%	5,762	433	2.9	111.6	7.5%
Q4	23,713	1,209	100.0%	100.0%	6,542	515	17.4	259.9	7.9%
2022/3 Q1	7,014	636	22.7%	16.3%	7,014	636	19.7	225.4	9.1%
Q2	14,983	1,783	48.5%	45.8%	7,970	1,147	43.6	17.6x	14.4%
Q3	22,921	2,897	74.3%	74.3%	7,937	1,114	37.8	157.2	14.0%
Q4	30,864	3,898	100.0%	100.0%	7,944	1,000	21.4	94.1	12.6%
<b>2023/3 Q1</b>	<b>8,594</b>	<b>1,743</b>	<b>26.0%</b>	<b>34.9%</b>	<b>8,594</b>	<b>1,743</b>	<b>22.5</b>	<b>174.1</b>	<b>20.3%</b>
Q2									
Q3									
Q4 CE	33,000	5,000	100.0%	100.0%			6.9	28.3	15.2%
8Y AVG Q1			23.9%	21.8%					
Q2			49.0%	48.9%					
Q3			74.3%	78.4%					
Q4			100.0%	100.0%					

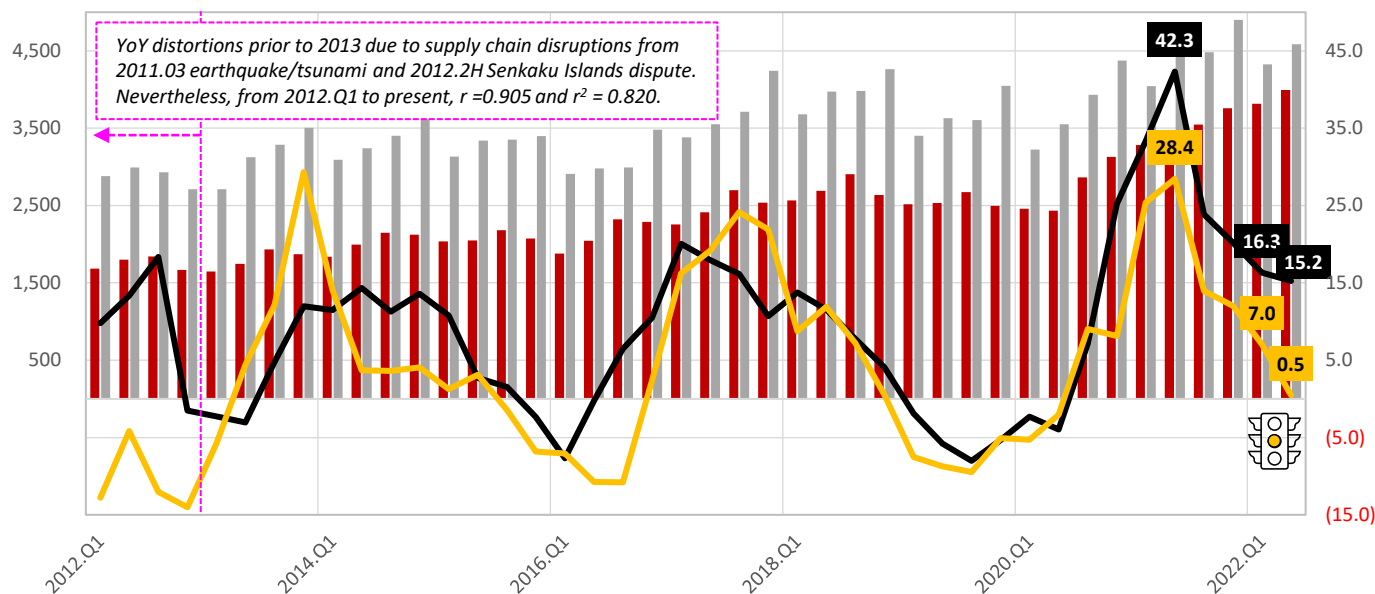
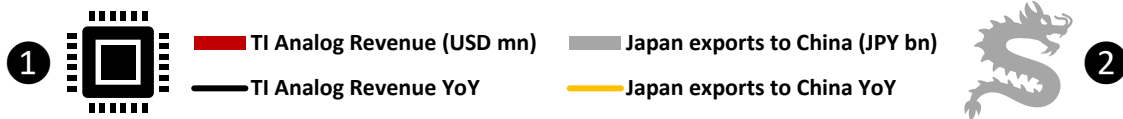
Source: compiled by SIR from company TANSHIN financial statements. Note: rounded to nearest million yen. TR = turn red, TB = turn black.



### ▶ Sharp increase in FY23/3 capex (+90% YoY) mainly targeting capacity increases at Phenitec's Kagoshima Plant

Initial guidance for FY3/23 is forecasting significant increases in both capex (+90% YoY) and depreciation (+45% YoY). Based on our follow-up interview, of the budgeted ¥2.5bn in capex for last term, roughly ¥0.5bn was delayed into this term due to the equipment delivery schedule. The majority of capex this term is for capacity increases at Phenitec's Kagoshima Plant, and a portion for work on the Okayama Daiichi (No. 1) Plant (adding a number of apparatus in shortage rather than large-scale investment). The Company is targeting a 5-10% capacity increase at the Kagoshima Plant. This entails raising current monthly wafer processing capacity of 18,000 – 19,000/month to a 'stable' 20,000 wafers/month. 'Stable' here refers to production yields across a range of different products.

Business environment and current phase in the cycle: the growth rate is slowing, but still growing



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

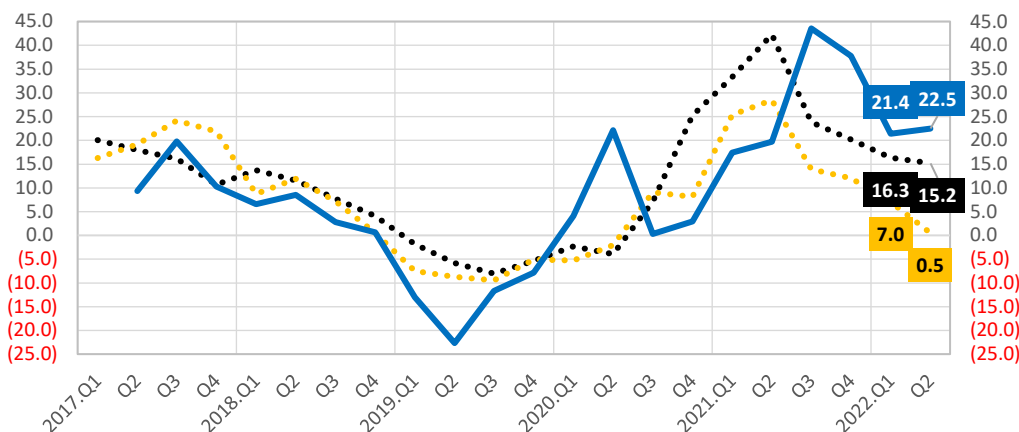
Robust Statistical Correlation

parameter	since 2012
correlation coefficient (r)	0.905
coefficient of determination ( $r^2$ )	0.820

Note: r measures the strength and direction of the linear relationship between two variables.  $r^2$  measures the goodness of fit of a linear regression model (variance of one variable explained by the other). Of course, correlation does not imply causation.

Source: compiled and calculated by SIR.

Small and nimble TOREX Group can outperform (underperform) from time to time



Source: compiled by SIR from MOF Trade Statistics, Texas Instruments IR data and TOREX financial statements.

Observations on where we are in the current cycle

As the current orbit begins to decay, we can make the following observations from our checklist of indicators. 1) The June forecast by the WSTS shown on the top of P5 in the product categories of discrete (Phenitec) and analog (TOREX) guides for low double-digit growth in 2022 after high double-digit growth in 2021, followed by low single-digit growth in 2023. 2) Our two favorite indicators shown in the graphs above show that while YoY sales growth peaked for TI in Apr-Jun 2021 and for Torex in Jul-Sep 2021, both maintained high double-digit growth in the most recent quarter. At the same time, Japan exports to China slowed to +0.5%, which requires monitoring going forward. 3) The Philadelphia Semiconductor Index (SOX), a capitalization-weighted index composed of the 30 largest U.S. companies primarily involved in the design, manufacture and sale of semiconductors shown on P9

## WSTS Semiconductor Market Forecast Spring 2022

USD bn, %	2018	YoY	2019	YoY	2020	YoY	2021	YoY	2022	YoY	2023	YoY
	act		act		act		act		Jun est		Jun est	
• Americas	103	16.4	79	(23.7)	95	21.3	121	27.4	149	22.6	156	4.4
• Europe	43	12.1	40	(7.3)	38	(5.8)	48	27.3	58	20.8	61	5.1
• Japan	40	9.2	36	(9.9)	36	1.3	44	19.8	49	12.6	52	4.8
• Asia Pacific	283	13.7	258	(8.8)	271	5.1	343	26.5	391	13.9	412	5.5
<b>TOTAL WORLD</b>	<b>469</b>	<b>13.7</b>	<b>412</b>	<b>(12.0)</b>	<b>440</b>	<b>6.8</b>	<b>556</b>	<b>26.2</b>	<b>646</b>	<b>16.3</b>	<b>680</b>	<b>5.1</b>
• Discrete	24	11.3	24	(0.9)	24	(0.3)	30	27.4	33	10.2	35	3.8
• Optoelectronics	38	9.2	42	9.3	40	(2.8)	43	7.4	44	0.3	45	3.7
• Sensors	13	6.2	14	1.2	15	10.7	19	28.0	22	15.7	23	3.6
• Integrated Circuits	393	14.6	333	(15.2)	361	8.4	463	28.2	547	18.2	577	5.4
Analog	59	10.8	54	(8.2)	56	3.2	74	33.1	88	19.2	93	5.7
Micro	67	5.2	66	(1.2)	70	4.9	80	15.1	89	11.4	94	5.3
Logic	109	6.9	107	(2.5)	118	11.1	155	30.8	187	20.8	201	7.3
Memory	158	27.4	106	(32.6)	117	10.4	154	30.9	183	18.7	189	3.4
<b>TOTAL PRODUCTS</b>	<b>469</b>	<b>13.7</b>	<b>412</b>	<b>(12.0)</b>	<b>440</b>	<b>6.8</b>	<b>556</b>	<b>26.2</b>	<b>646</b>	<b>16.3</b>	<b>680</b>	<b>5.1</b>

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

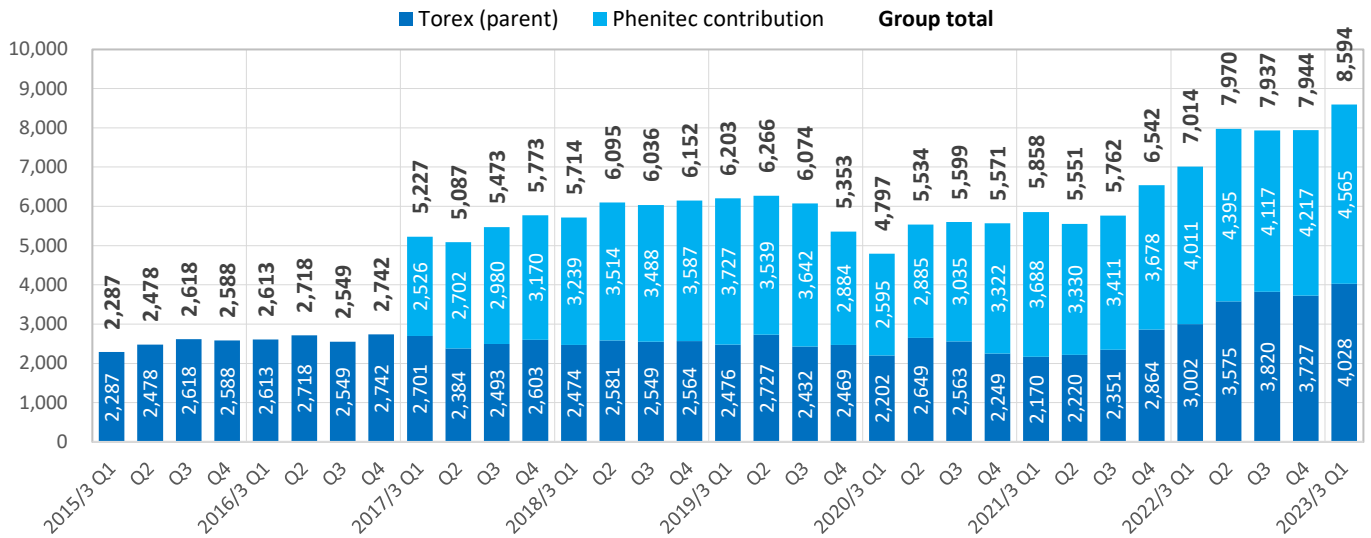
## TOREX SEMICONDUCTOR GROUP Quarterly Earnings History by Entity

JPY mn %	Net sales		Net sales YoY		OP		OP YoY		OPM	
	Torex parent	Phenitec contrib.	Torex parent	Phenitec contrib.	Torex parent	Phenitec contrib.	Torex parent	Phenitec contrib.	Torex parent	Phenitec contrib.
2015/3 Q1	2,287	—	—	—	248	—	—	—	10.8%	—
Q2	2,478	—	—	—	321	—	—	—	13.0%	—
Q3	2,618	—	—	—	456	—	—	—	17.4%	—
Q4	2,588	—	—	—	326	—	—	—	12.6%	—
2016/3 Q1	2,613	—	14.2	—	364	—	46.8	—	13.9%	—
Q2	2,718	—	9.7	—	382	—	19.0	—	14.1%	—
Q3	2,549	—	(2.7)	—	279	—	(38.8)	—	10.9%	—
Q4	2,742	—	5.9	—	115	—	(64.6)	—	4.2%	—
2017/3 Q1	2,701	2,526	3.4	—	248	(44)	(31.8)	—	9.2%	-1.7%
Q2	2,384	2,702	(12.3)	—	177	6	(53.7)	—	7.4%	0.2%
Q3	2,493	2,980	(2.2)	—	249	231	(10.6)	—	10.0%	7.8%
Q4	2,603	3,170	(5.1)	—	6	378	(94.8)	—	0.2%	11.9%
2018/3 Q1	2,474	3,239	(8.4)	28.2	152	303	(38.7)	TB	6.1%	9.4%
Q2	2,581	3,514	8.3	30.1	121	514	(31.6)	85.7x	4.7%	14.6%
Q3	2,549	3,488	2.2	17.0	205	345	(17.7)	49.4	8.0%	9.9%
Q4	2,564	3,587	(1.5)	13.2	155	417	25.8x	10.3	6.0%	11.6%
2019/3 Q1	2,476	3,727	0.1	15.1	188	487	23.7	60.7	7.6%	13.1%
Q2	2,727	3,539	5.7	0.7	263	413	117.4	(19.6)	9.6%	11.7%
Q3	2,432	3,642	(4.6)	4.4	125	186	(39.0)	(46.1)	5.1%	5.1%
Q4	2,469	2,884	(3.7)	(19.6)	70	(182)	(54.8)	TR	2.8%	-6.3%
2020/3 Q1	2,202	2,595	(11.1)	(30.4)	19	59	(89.9)	(87.9)	0.9%	2.3%
Q2	2,649	2,885	(2.9)	(18.5)	248	4	(5.7)	(99.0)	9.4%	0.1%
Q3	2,563	3,035	5.4	(16.7)	126	78	0.8	(58.1)	4.9%	2.6%
Q4	2,249	3,322	(8.9)	15.2	60	84	(14.3)	TB	2.7%	2.5%
2021/3 Q1	2,170	3,688	(1.5)	42.1	73	122	284.2	106.8	3.4%	3.3%
Q2	2,220	3,330	(16.2)	15.4	98	(33)	(60.5)	TR	4.4%	-1.0%
Q3	2,351	3,411	(8.3)	12.4	244	189	93.7	142.3	10.4%	5.5%
Q4	2,864	3,678	27.3	10.7	101	415	68.3	394.0	3.5%	11.3%
2022/3 Q1	3,002	4,011	38.3	8.8	270	366	269.9	200.0	9.0%	9.1%
Q2	3,575	4,395	61.0	32.0	492	655	402.0	TB	13.8%	14.9%
Q3	3,820	4,117	62.5	20.7	567	547	132.4	189.4	14.8%	13.3%
Q4	3,727	4,217	30.1	14.7	460	540	355.4	30.1	12.3%	12.8%
<b>2023/3 Q1</b>	<b>4,028</b>	<b>4,565</b>	<b>34.2</b>	<b>13.8</b>	<b>880</b>	<b>863</b>	<b>225.9</b>	<b>135.8</b>	<b>21.8%</b>	<b>18.9%</b>

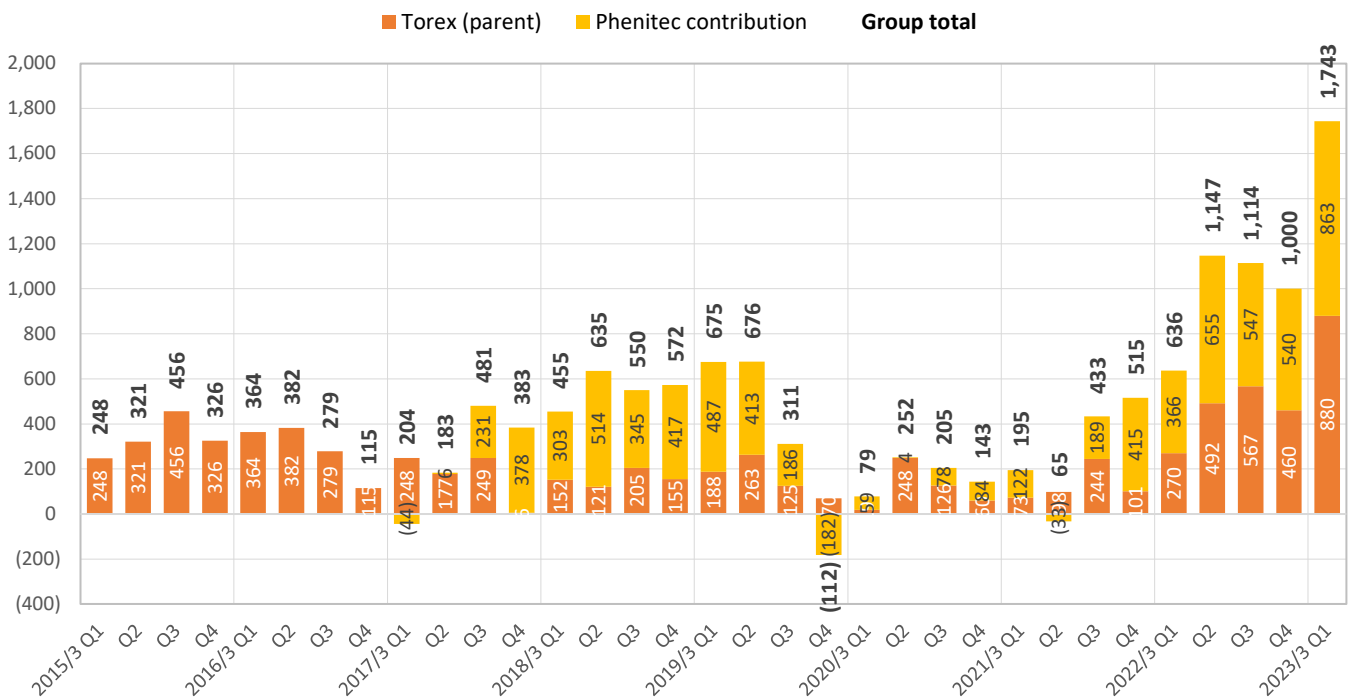
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**TOREX Group Quarterly Trend of Consolidated Net Sales by Entity (JPY million)**



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



**Monthly Trend of the Yen-Dollar Rate**



## Torex (parent) Sales Trend by Application and 'Design-in' based\* Region with YoY Heat Map

JPY mn, %	1Q 20/3	2Q 20/3	3Q 20/3	4Q 20/3	1Q 21/3	2Q 21/3	3Q 21/3	4Q 21/3	1Q 22/3	2Q 22/3	3Q 22/3	4Q 22/3	1Q 23/3
<b>by Application</b>													
<b>Torex sales</b>	<b>2,202</b>	<b>2,649</b>	<b>2,563</b>	<b>2,249</b>	<b>2,170</b>	<b>2,220</b>	<b>2,351</b>	<b>2,864</b>	<b>3,002</b>	<b>3,575</b>	<b>3,820</b>	<b>3,727</b>	<b>4,028</b>
• Industrial equipt.	784	912	933	834	872	763	805	1,064	1,033	1,238	1,262	1,352	1,610
• Automotive equipt.	350	615	457	327	241	249	352	398	400	423	464	466	510
• Medical equipt.	25	21	29	43	73	44	43	66	49	59	65	49	90
• Wearable equipt.	53	66	54	47	50	100	100	112	86	107	102	116	113
• Other	990	1,035	1,090	998	934	1,064	1,051	1,224	1,434	1,748	1,927	1,744	1,705
<b>YoY</b>													
<b>Torex sales</b>	<b>(11.1)</b>	<b>(2.9)</b>	<b>5.4</b>	<b>(8.9)</b>	<b>(1.5)</b>	<b>(16.2)</b>	<b>(8.3)</b>	<b>27.3</b>	<b>38.3</b>	<b>61.0</b>	<b>62.5</b>	<b>30.1</b>	<b>34.2</b>
• Industrial equipt.	(18.8)	(14.2)	(1.3)	(12.5)	11.2	(16.3)	(13.7)	27.6	18.5	62.3	56.8	27.1	55.9
• Automotive equipt.	(8.1)	60.2	26.2	(19.9)	(31.1)	(59.5)	(23.0)	21.7	66.0	69.9	31.8	17.1	27.5
• Medical equipt.	(30.6)	(19.2)	11.5	16.2	192.0	109.5	48.3	53.5	(32.9)	34.1	51.2	(25.8)	83.7
• Wearable equipt.	(25.4)	(10.8)	45.9	(16.1)	(5.7)	51.5	85.2	138.3	72.0	7.0	2.0	3.6	31.4
• Other	(3.1)	(12.3)	2.6	(1.7)	(5.7)	2.8	(3.6)	22.6	53.5	64.3	83.3	42.5	18.9
<b>by Region</b>													
<b>Torex D-in* sales</b>	<b>2,202</b>	<b>2,649</b>	<b>2,563</b>	<b>2,249</b>	<b>2,170</b>	<b>2,220</b>	<b>2,351</b>	<b>2,864</b>	<b>3,002</b>	<b>3,575</b>	<b>3,820</b>	<b>3,727</b>	<b>4,028</b>
• Japan	950	1,090	1,104	1,043	896	895	958	1,129	1,160	1,379	1,433	1,594	1,437
• Asia	724	1,001	980	700	781	849	876	1,105	1,197	1,444	1,469	1,197	1,432
• Europe	305	329	268	310	259	242	304	384	383	408	465	542	686
• North America	223	229	211	196	234	234	213	246	262	344	453	394	473
<b>YoY</b>													
<b>Torex D-in* sales</b>	<b>(11.1)</b>	<b>(2.9)</b>	<b>5.4</b>	<b>(8.9)</b>	<b>(1.5)</b>	<b>(16.2)</b>	<b>(8.3)</b>	<b>27.3</b>	<b>38.3</b>	<b>61.0</b>	<b>62.5</b>	<b>30.1</b>	<b>34.2</b>
• Japan	(12.5)	(6.0)	3.2	(4.0)	(5.7)	(17.9)	(13.2)	8.2	29.5	54.1	49.6	41.2	23.9
• Asia	(8.5)	11.7	19.8	(13.3)	7.9	(15.2)	(10.6)	57.9	53.3	70.1	67.7	8.3	19.6
• Europe	(11.6)	(18.2)	(11.8)	(18.2)	(15.1)	(26.4)	13.4	23.9	47.9	68.6	53.0	41.1	79.1
• North America	(12.2)	(15.2)	(12.1)	(0.5)	4.9	2.2	0.9	25.5	12.0	47.0	112.7	60.2	80.5

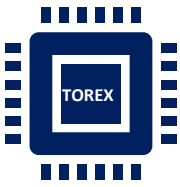
\*Note: Torex 'Design-in' based sales = regional sales adjusted on orders received basis.

## Phenitec\*\* Sales Trend by Application and Region with YoY Heat Map

JPY mn, %	1Q 20/3	2Q 20/3	3Q 20/3	4Q 20/3	1Q 21/3	2Q 21/3	3Q 21/3	4Q 21/3	1Q 22/3	2Q 22/3	3Q 22/3	4Q 22/3	1Q 23/3
<b>by Application</b>													
<b>Phenitec** sales</b>	<b>2,983</b>	<b>3,251</b>	<b>3,435</b>	<b>3,628</b>	<b>3,982</b>	<b>3,703</b>	<b>3,732</b>	<b>4,077</b>	<b>4,536</b>	<b>4,990</b>	<b>4,729</b>	<b>4,827</b>	<b>5,184</b>
• Industrial equipt.	408	412	493	696	911	630	588	653	676	793	756	757	846
• Automotive equipt.	876	921	892	915	838	738	869	942	1,044	1,228	1,090	1,126	1,256
• Medical equipt.	70	48	54	116	60	32	34	39	36	38	43	53	30
• Other	1,629	1,870	1,996	1,901	2,173	2,303	2,241	2,443	2,780	2,931	2,840	2,891	3,052
<b>YoY</b>													
<b>Phenitec** sales</b>	<b>(27.9)</b>	<b>(18.2)</b>	<b>(15.7)</b>	<b>11.0</b>	<b>33.5</b>	<b>13.9</b>	<b>8.6</b>	<b>12.4</b>	<b>13.9</b>	<b>34.8</b>	<b>26.7</b>	<b>18.4</b>	<b>14.3</b>
• Industrial equipt.	(46.2)	(41.6)	(55.2)	(0.3)	123.3	52.9	19.3	(6.2)	(25.8)	25.9	28.6	15.9	25.1
• Automotive equipt.	(3.5)	5.5	(3.4)	6.9	(4.3)	(19.9)	(2.6)	3.0	24.6	66.4	25.4	19.5	20.3
• Medical equipt.	(28.6)	(23.8)	(62.8)	38.1	(14.3)	(33.3)	(37.0)	(66.4)	(40.0)	18.8	26.5	35.9	(16.7)
• Other	(31.3)	(19.8)	4.7	16.6	33.4	23.2	12.3	28.5	27.9	27.3	26.7	18.3	9.8
<b>by Region</b>													
<b>Phenitec** sales</b>	<b>2,983</b>	<b>3,251</b>	<b>3,435</b>	<b>3,628</b>	<b>3,982</b>	<b>3,703</b>	<b>3,732</b>	<b>4,077</b>	<b>4,536</b>	<b>4,990</b>	<b>4,729</b>	<b>4,827</b>	<b>5,184</b>
• Japan	1,346	1,410	1,427	1,403	1,280	1,277	1,307	1,654	1,983	2,286	1,983	2,096	2,034
• Asia	495	661	803	805	914	869	1,088	1,193	1,118	1,084	1,275	1,269	1,568
• Europe	199	224	261	236	268	244	194	183	230	269	222	219	303
• North America	943	956	944	1,184	1,520	1,313	1,143	1,047	1,205	1,351	1,249	1,243	1,279
<b>YoY</b>													
<b>Phenitec** sales</b>	<b>(27.9)</b>	<b>(18.2)</b>	<b>(15.7)</b>	<b>11.0</b>	<b>33.5</b>	<b>13.9</b>	<b>8.6</b>	<b>12.4</b>	<b>13.9</b>	<b>34.8</b>	<b>26.7</b>	<b>18.4</b>	<b>14.3</b>
• Japan	(9.0)	3.5	5.2	5.3	(4.9)	(9.4)	(8.4)	17.9	54.9	79.0	51.7	26.7	2.6
• Asia	(51.4)	(38.2)	7.1	72.4	84.6	31.5	35.5	48.2	22.3	24.7	17.2	6.4	40.3
• Europe	0.5	23.1	27.9	15.1	34.7	8.9	(25.7)	(22.5)	(14.2)	10.2	14.4	19.7	31.7
• North America	(34.5)	(29.7)	(46.5)	(6.3)	61.2	37.3	21.1	(11.6)	(20.7)	2.9	9.3	18.7	6.1

\*\*Note: Phenitec sales include intra-company transactions with Torex.

Classifications subject to change.



Share Price, Valuations and Shareholder Rebates



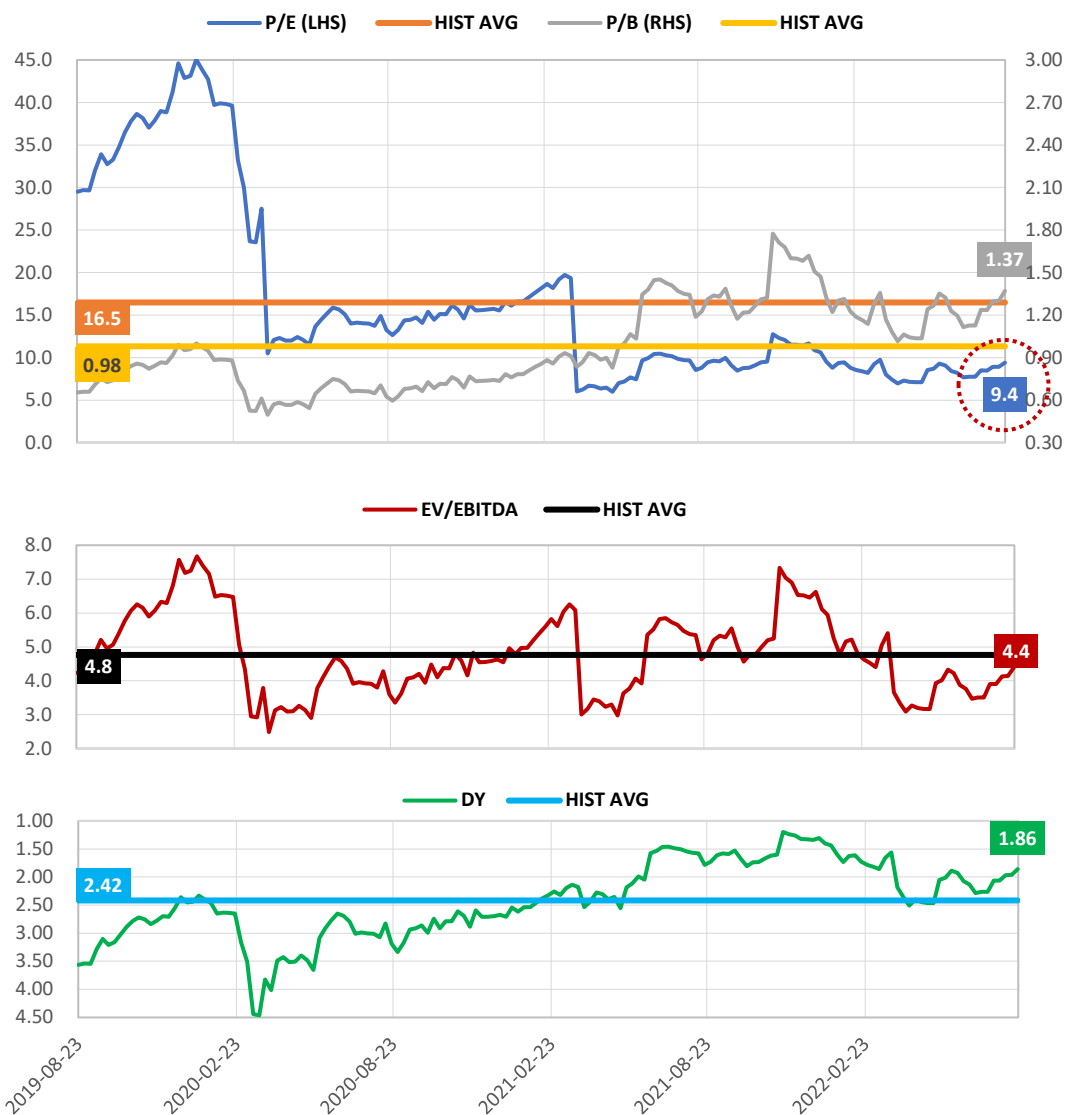
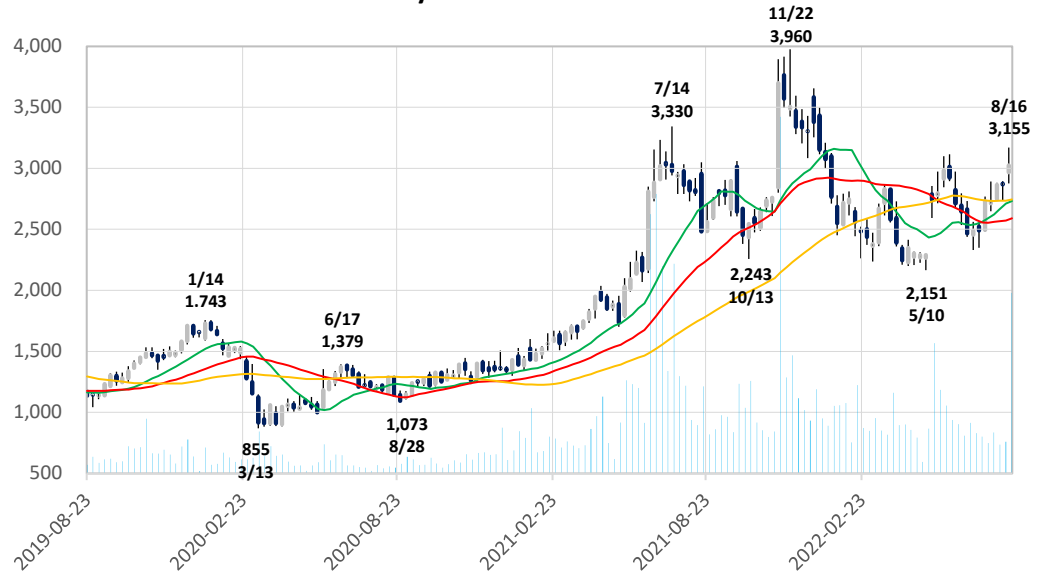
Performance and Valuations: SESSA Smart Charts

- ✓ The P/E of 9.4x is 43% below the historical avg. Considering potential upside to full-term guidance due to the conservative forex assumption of USD 120, this appears attractive. EV/EBITDA is 8% below the historical avg.
- ✓ Structural growth drivers for TOREX include 5G rollout/IoT device proliferation/DX shift, EV/hybrid ramp, and demand for next-gen power devices to combat climate change.



Analyst's view

Sessa Smart Charts: 3-Year Weekly Share Price and Valuations Trend

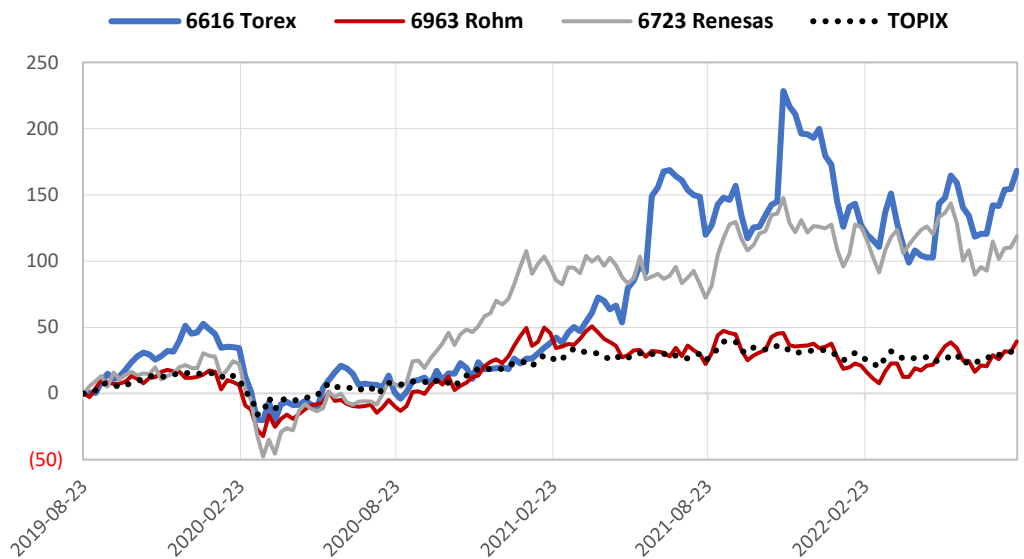


Source: compiled by SIR from SPEEDA historical earnings and price data. Valuations calculated based on CE.





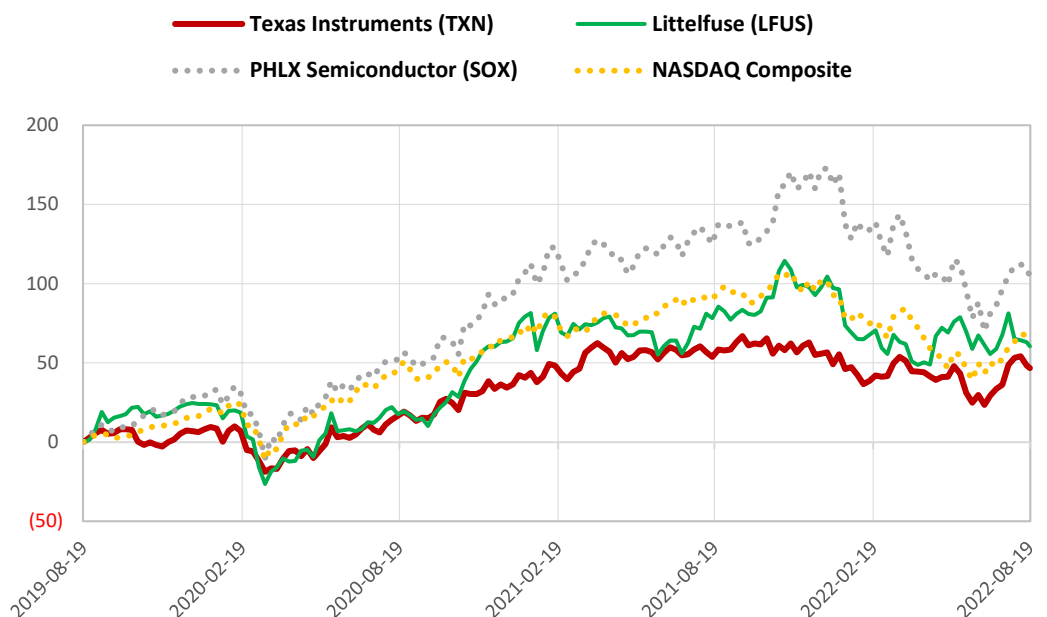
3-Year Weekly Relative Performance Trend



► Observations on where we are in the current cycle (continued from P4)

peaked at the end of Dec-2021, correcting sharply through the end of Jun-2022, subsequently rebounding over the last 6-7 weeks on signs of moderation in US inflation (energy and food prices, supply chain easing). 4) The valuation chart on P8 shows that TOREX is trading on a P/E of 9.4x, a 43% discount to its historical average, with potential upside to initial guidance based on the conservative forex rate assumption of 120. 5) While consensus macroeconomic forecasts expect some type of economic adjustment in 2023, which will have a negative impact on demand for general electronics, TOREX growth is being driven by structural drivers of 5G rollout/IoT device proliferation/DX shift, EV/hybrid ramp, and demand for next-generation energy-saving power devices to combat climate change.

3-Year Weekly Relative Performance Trend of Related US Semiconductor Stocks





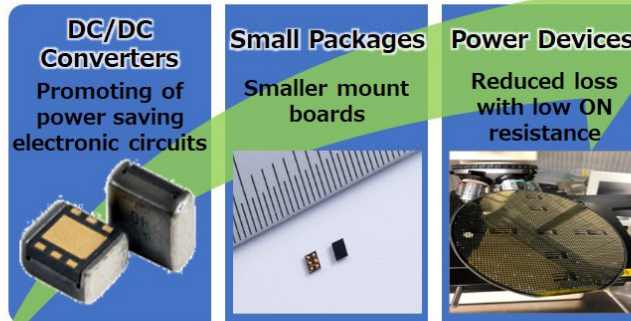
**New 5-Year MTP  
2021 – 2025  
[FY3/22 – FY3/26]**

The new MTP promotes 'GX green transformation' through promoting power-saving circuits, reducing mounting board area and promoting low power-loss devices that suppress heat generation.

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 Phenitex 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.

**Torex Group GX Green Transformation:**  
 · Promotes power saving ICs and reduced mounting board size  
 · Promotes low-loss power devices that dissipate heat generation  
 ⇨ Aiming for a carbon-free society.



From a company contributing to society with compact, power-saving technologies

**Decarbonized Society**

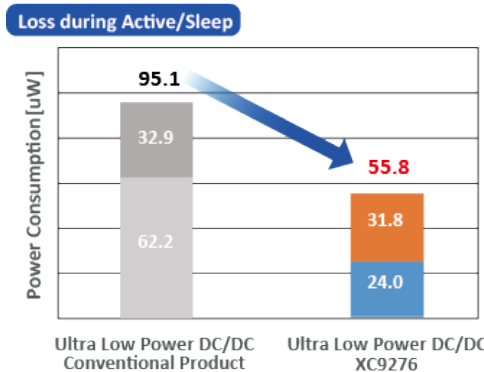


**Contributing to the realization of a net zero carbon-neutral society through:**

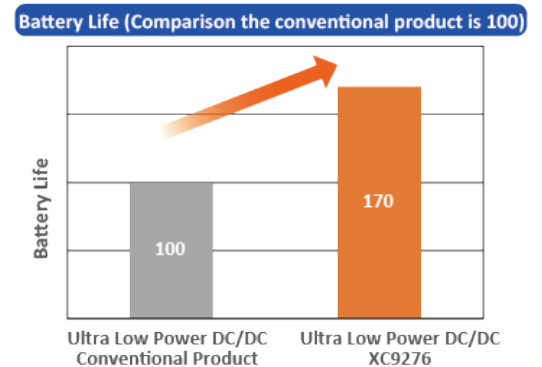
**① Development of highly efficient, energy-saving power mgt. IC products**

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%**

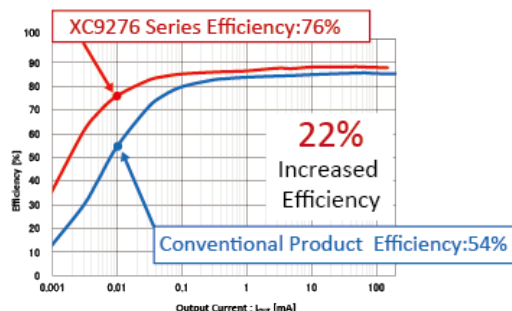


**Battery Life  
170%**



**Technology of ultra-low power**

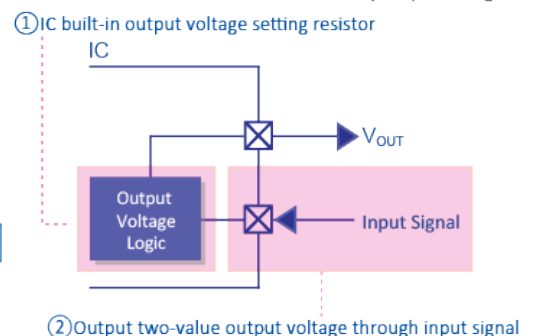
Stop the internal circuit of the IC according to the control status of the IC. Realize ultra-low current consumption.



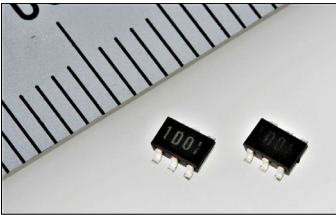
Source: company website.

**Technology of switching between two-value output voltage**

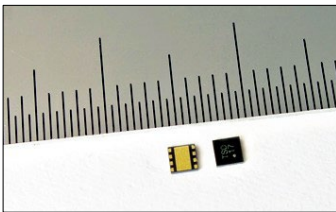
Only input signal without external parts, Achieves a function that can switch between binary output voltages.



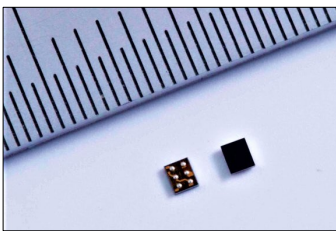
SOT package  
(small-outline transistor)



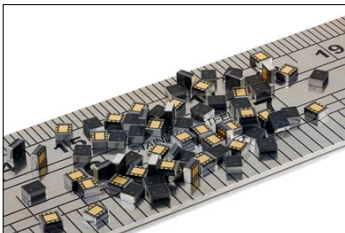
USP package  
(ultra-small package)



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.**

② 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.

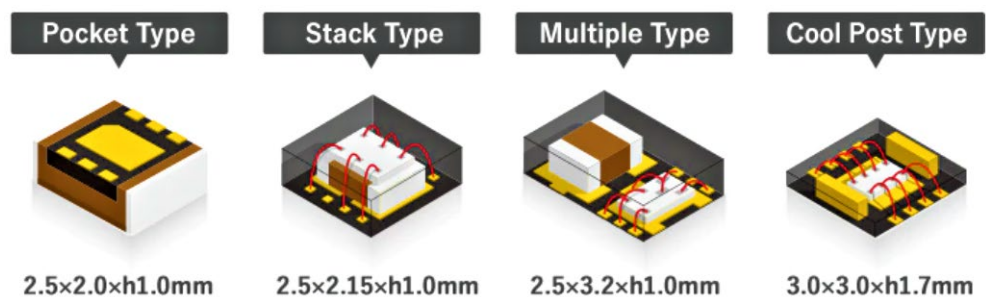


High-growth focus product: Inductor Built-in Micro DC/DC converters

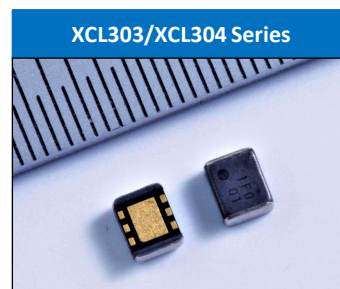
The Micro DC/DC XCL Series is ultra small DC/DC converters that integrate a coil and a control IC using Torex's unique technology, which realize devices that **simultaneously achieve space-saving, high efficiency, low noise, high heat dissipation, and low cost.**

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 below 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.



Source: company website.



③ Reduced power loss with low ON resistance\* through development and sales promotion of next-generation silicon carbide (SiC) and gallium oxide ( $\beta$ -Ga<sub>2</sub>O<sub>3</sub>) power devices

Phenitex schedule for advancing development of next-generation SiC power devices

Development of SiC devices at 6-inch Kagoshima Plant, start-up of process line, and mass production Development of price-competitive SiC SBDs (Schottky barrier diodes) in progress

→ SiC SBD Gen1 650V/10A Sample shipping now

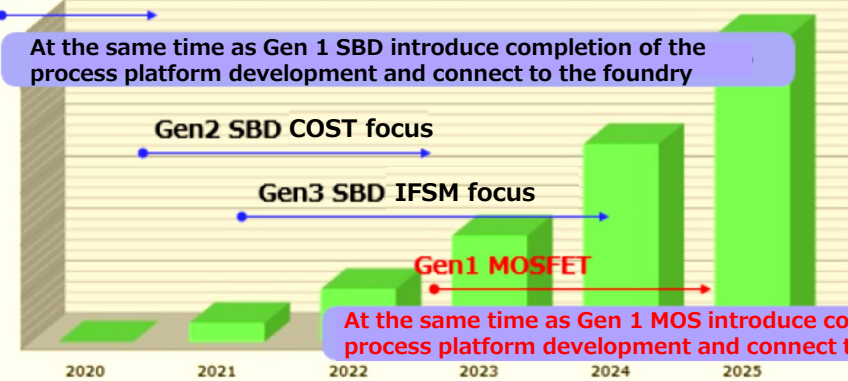
Participating as an Associate Member of Tsukuba Power Electronics Constellations (TPEC) promoted by the National Institute of Advanced Industrial Science and Technology (AIST) toward further cost reduction and R&D of SiC MOSFETs



2021	2022	2023	2024	2025
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Gen 2 sample shipments by end of FY3/22

Gen1 SBD

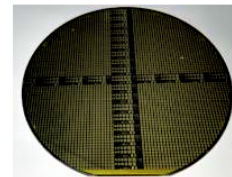


Uses high-concentration substrate

↓  
Process simplification  
Chip size shrink

- ✓ Low cost
- ✓ High quality

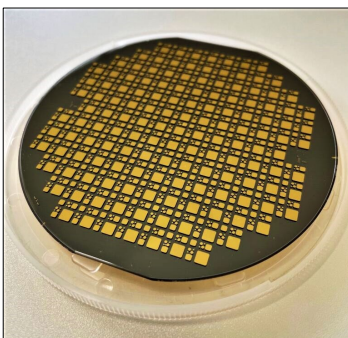
SiC devices produced in-house



In the future, we will make capital investment according to the progress of development and mass production of SiC-SBD and SiC-FET.

Source: excerpt from 4Q FY3/21 IR results briefing materials, May 24, 2021, updated with 3Q FY3/22 IR results briefing materials, February 14, 2022.

NCT 4-inch beta-gallium oxide  $\beta$ -Ga<sub>2</sub>O<sub>3</sub> 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 ( $\beta$ -Ga<sub>2</sub>O<sub>3</sub>) 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 ( $\beta$ -Ga<sub>2</sub>O<sub>3</sub>) 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 ( $\beta$ -Ga<sub>2</sub>O<sub>3</sub>) 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 ( $\beta$ -Ga<sub>2</sub>O<sub>3</sub>) epitaxial wafers in 2023.

\*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.

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