

# 6616 TOREX SEMICONDUCTOR

Sponsored Research  
June 17, 2020



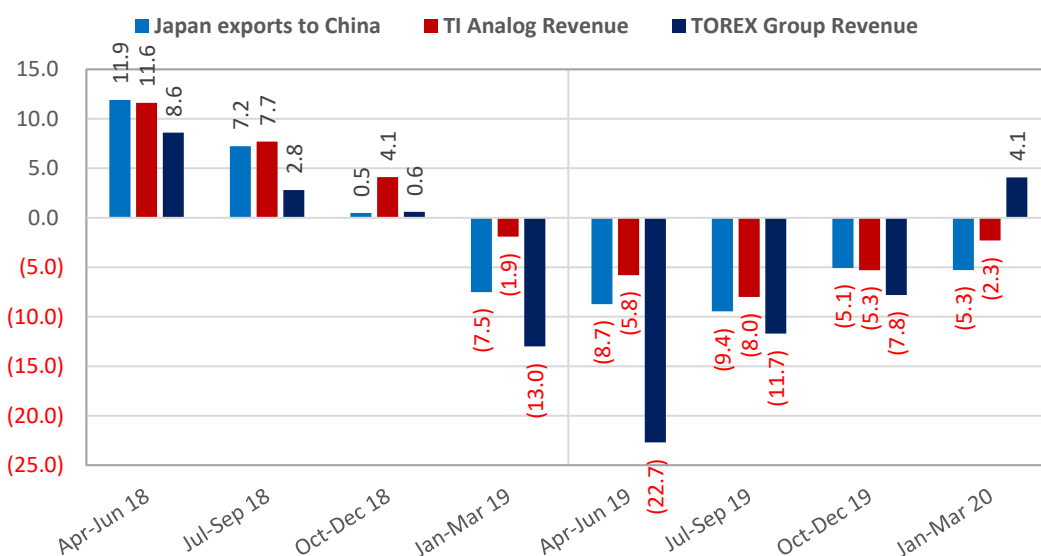
## Bucking the Trend

Phenittec delivers remarkable 4Q sales and OP growth

### SUMMARY

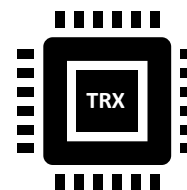
- Signs had pointed to some degree of shortfall on full-term results, but actual 4Q results showed underlying strength despite the difficult environment, bucking the trend with sales turning positive YoY (see graph below). Phenittec's steady recovery in Japan and China demand is encouraging, helping to improve operating rates.
- While there was a certain amount of cash burn last term, it is important to keep in mind that the company conducted a 5.2% share buyback, hiked the dividend, and paid down LT loans, all while advancing the large-scale capex project integrating the head office and Daiichi plants. Net cash still accounts for 25% of net assets, with a healthy equity ratio of 67.1%.
- The company skipped initial guidance, citing low visibility and lack of a reasonable basis to make forecasts due to uncertainties about the impact on orders due to coronavirus. However, as can be seen in the chart below, TOREX Group Revenue was the first to turn positive YoY in the 4Q, bucking the market trend.
- For the time being, it will be important to monitor supply chain inventory trends, and the potential risk to short-term earnings. However, the medium-term outlook for robust growth driven by new applications from the rollout of 5G, increase in IoT-connected devices and electrification of cars remains unchanged. The Kagoshima Plant is expected to turn profitable this term on a full-term basis.

### YoY Trend for Selected Demand Indicators: TOREX revenue turns positive in the 4Q



Note: the Analog segment for global no.1 Texas Instruments includes Power, Signal Chain and High Volume.  
Source: compiled by Sessa Partners from MOF Trade Statistics of Japan, respective company earnings releases.

## 4Q Follow-up



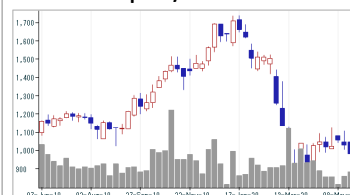
### Focus Points:

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 (6/2)	1,232
YH (20/1/14)	1,743
YL (20/3/13)	855
10YH (14/11/6)	3,187.5
10YL (14/5/20)	725.8
Mkt cap (¥ bn)	14.2
EV (¥ bn)	9.6
Net cash / mkt cap	32.5%
FY3/20 P/E (act)	32.4x
FY3/20 EV/EBITDA (act)	4.8x
FY3/20 P/B (act)	0.7x
FY3/20 DY (act)	3.25%

### Share price/vol 52 weeks



Source: SPEEDA

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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 SEMICONDUCTOR 5-Year Consolidated Earnings Trend

JPY mn, % J-GAAP	FY3/16 act	FY3/17 act	FY3/18 act	FY3/19 act	FY3/20 act	FY3/20 1H revised CE
Net sales	10,621	21,560	23,997	23,897	21,501	22,000
YoY	6.5	103.0	11.3	(0.4)	(10.0)	(7.9)
Gross profit	5,063	5,900	7,177	6,494	5,452	—
GPM	47.7%	27.4%	29.9%	27.2%	25.4%	—
SG&A expenses	3,923	4,649	4,964	4,943	4,774	—
Ratio to sales	36.9%	21.6%	20.7%	20.7%	22.2%	—
Depreciation	442	1,219	934	1,085	1,312	1,532
EBITDA	1,582	2,470	3,147	2,636	1,990	2,382
YoY	(9.9)	56.2	27.4	(16.2)	(24.5)	(9.6)
EBITDA margin	14.9%	11.5%	13.1%	11.0%	9.3%	10.8%
Operating profit	1,140	1,251	2,212	1,551	678	850
YoY	(15.6)	9.8	76.8	(29.9)	(56.3)	(45.2)
OPM	10.7%	5.8%	9.2%	6.5%	3.2%	3.9%
Ordinary profit	971	906	1,998	1,820	676	800
YoY	(42.2)	(6.7)	120.6	(8.9)	(62.9)	(56.0)
Profit ATOP	580	2,931	902	1,049	418	550
YoY	(53.5)	404.9	(69.2)	16.3	(60.2)	(47.6)
EPS (¥)	54.59	308.77	99.44	95.89	38.03	50.47
DPS (¥)	32.00	32.00	34.00	38.00	40.00	40.00
BPS (¥)	1,022.30	1,267.65	1,338.74	1,717.90	1,712.30	—
Overseas sales ratio	70.6%	71.9%	71.0%	71.8%	67.2%	—
Avg. forex rate (USD)	¥120.1	¥108.9	¥110.8	¥110.7	¥109.1	¥108.0
Capex	602	988	1,149	3,323	1,497	1,651
R&D	204	229	406	357	na	—
Cash and deposits	6,617	7,769	10,835	10,982	9,281	—
Interest bearing debt	3	6,094	4,980	4,671	4,649	—
ST loans	3	2,423	2,483	1,903	2,902	—
LT loans < 1Y	—	1,174	1,103	1,021	605	—
LT loans	—	2,496	1,394	1,748	1,143	—
Net cash (net debt)	6,613	1,675	5,855	6,311	4,632	—
Net assets	10,929	15,598	19,085	19,638	18,672	—
Non-controlling int.	43	4,165	4,582	44	—	—
Shr Eqty + Accum OCI	10,886	11,432	14,503	19,594	18,672	—
Total assets	12,973	25,210	27,995	28,386	27,847	—
Equity ratio (%)	83.9	45.3	51.8	69.0	67.1	—
ROE (%)	5.3	26.3	7.0	6.2	2.2	—
Amt dividends paid	340	305	341	425	438	—
Consol. payout (%)	58.6	10.7	34.2	39.6	105.2	—
DOE (%)	3.1	2.7	2.6	2.5	2.3	—

NOTE: by Japanese accounting convention, figures reported in thousand yen are truncated (cut off) when displayed in million yen, however YoY percentages and various financial ratios are calculated based on thousand yen. In order to preserve accuracy of YoY percentages and ratios, figures here are input in thousand yen and displayed rounded off to the nearest million yen. SOURCE: compiled by Sessa Partners from company TANSHIN financial statements.

As of 3Q results, the company needed 4Q sales growth of +13.4% to achieve revised guidance after challenging 1H results, a high hurdle given cumulative 9-months sales were -14.1% YoY. The bulk of FY3/20 headwinds can be attributed to the US-China trade war damaging global trade. Although actual full-term results posted slight shortfalls of roughly ¥500mn in sales and ¥170mn in OP, there was noteworthy improvement each quarter. 4Q results were surprisingly resilient, with Phenitec posting 4Q sales +15.2% YoY and +9.5% QoQ, and 4Q OP swinging from a loss of (¥182mn) last term to profit of ¥84mn, +7.7% QoQ. Considering target application industrial equipment sales declined -38.4% for the FY, this was no small achievement.

## TOREX SEMICONDUCTOR Quarterly Consolidated Earnings Trend

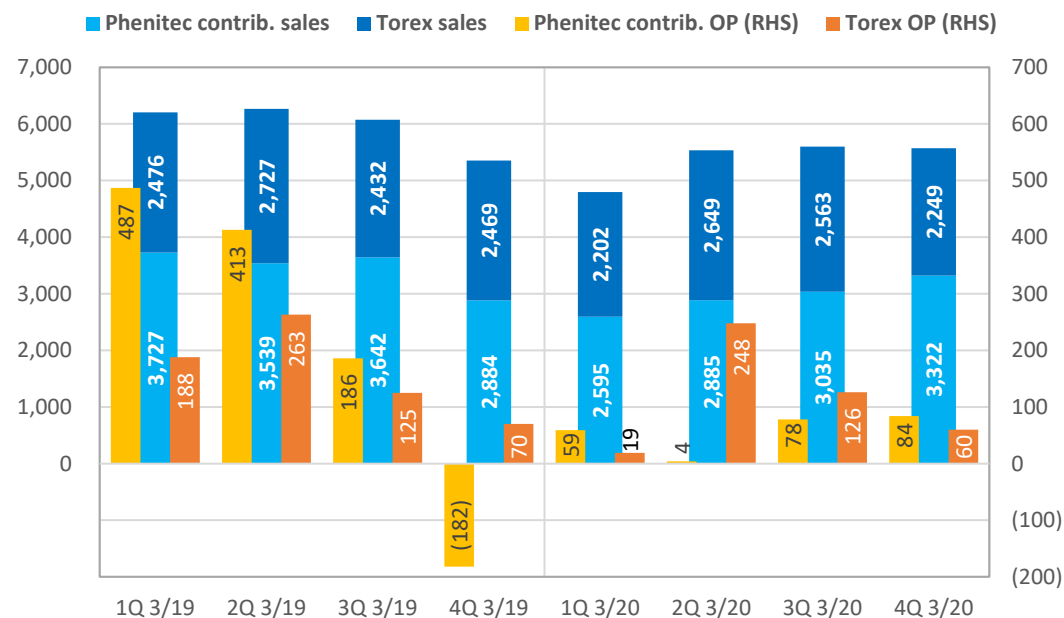
JPY mn, %	FY3/19 act	FY3/20 act	1Q 3/19 act	2Q 3/19 act	3Q 3/19 act	4Q 3/19 act	1Q 3/20 act	2Q 3/20 act	3Q 3/20 act	4Q 3/20 act
<b>Net sales</b>	<b>23,896</b>	<b>21,500</b>	<b>6,203</b>	<b>6,266</b>	<b>6,074</b>	<b>5,353</b>	<b>4,797</b>	<b>5,534</b>	<b>5,598</b>	<b>5,571</b>
YoY	(0.4)	(10.0)	8.6	2.8	0.6	(13.0)	(22.7)	(11.7)	(7.8)	4.1
• Phenitec contrib.	13,792	11,837	3,727	3,539	3,642	2,884	2,595	2,885	3,035	3,322
YoY	(0.3)	(14.2)	15.1	0.7	4.4	(19.6)	(30.4)	(18.5)	(16.7)	15.2
• Torex	10,104	9,663	2,476	2,727	2,432	2,469	2,202	2,649	2,563	2,249
YoY	(0.6)	(4.4)	0.1	5.7	(4.6)	(3.7)	(11.1)	(2.9)	5.4	(8.9)
Gross profit	6,493	5,451	1,921	1,892	1,530	1,151	1,269	1,422	1,446	1,315
GPM	27.2%	25.4%	31.0%	30.2%	25.2%	21.5%	26.5%	25.7%	25.8%	23.6%
SG&A	4,942	4,773	1,246	1,216	1,218	1,263	1,191	1,170	1,241	1,172
Ratio to sales	20.7%	22.2%	20.1%	19.4%	20.1%	23.6%	24.8%	21.1%	22.2%	21.0%
Depreciation	1,085	1,312	195	239	300	351	305	317	335	355
YoY	16.2	20.9	(11.8)	4.4	29.9	38.7	56.4	32.6	11.7	1.1
<b>EBITDA</b>	<b>2,635</b>	<b>1,990</b>	<b>870</b>	<b>915</b>	<b>612</b>	<b>239</b>	<b>384</b>	<b>568</b>	<b>540</b>	<b>498</b>
YoY	(16.2)	(24.5)	28.7	5.8	(21.5)	(71.0)	(55.9)	(37.9)	(11.8)	108.4
Ratio to sales	11.0%	9.3%	14.0%	14.6%	10.1%	4.5%	8.0%	10.3%	9.6%	8.9%
<b>Operating profit</b>	<b>1,550</b>	<b>678</b>	<b>675</b>	<b>676</b>	<b>311</b>	<b>(112)</b>	<b>78</b>	<b>252</b>	<b>204</b>	<b>144</b>
YoY	(29.9)	(56.3)	48.4	6.5	(43.5)	TR	(88.4)	(62.7)	(34.4)	TB
OPM	6.5%	3.2%	10.9%	10.8%	5.1%	-2.1%	1.6%	4.6%	3.6%	2.6%
• Phenitec contrib.	904	225	487	413	186	(182)	59	4	78	84
YoY	(42.7)	(75.1)	60.7	(19.6)	(46.1)	TR	(87.9)	(99.0)	(58.1)	TB
OPM	6.6%	1.9%	13.1%	11.7%	5.1%	-6.3%	2.3%	0.1%	2.6%	2.5%
• Torex	646	453	188	263	125	70	19	248	126	60
YoY	2.1	(29.9)	23.7	117.4	(39.0)	(54.8)	(89.9)	(5.7)	0.8	(14.3)
OPM	6.4%	4.7%	7.6%	9.6%	5.1%	2.8%	0.9%	9.4%	4.9%	2.7%
Ordinary profit	1,820	676	924	819	227	(150)	11	268	240	157
YoY	(8.9)	(62.9)	98.3	27.8	(62.5)	TR	(98.8)	(67.3)	5.7	TB
Profit ATOP	1,049	417	496	469	123	(39)	12	146	133	127
YoY	16.3	(60.2)	112.0	75.7	(58.0)	TR	(97.6)	(68.9)	8.1	TB

Source: compiled by Sessa Partners from company IR results briefing presentation materials.



With the exception of the 1Q, Torex OP achieved effectively similar levels as last term. After bottoming in the 1Q, Phenitec sales rose each quarter sequentially, turning positive YoY in the 4Q. Both saw firm demand in automotive equipment, but that was insufficient to offset declines in industrial equipt.

## Phenitec contribution 4Q 3/20 sales and OP both rose YoY and QoQ sequentially (¥ mn)

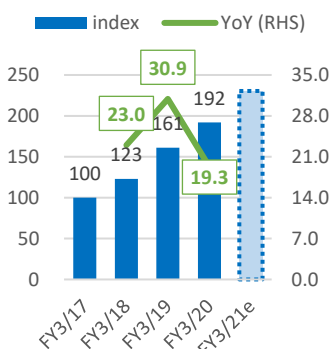


**Torex Sales Trend by Application and Design-in based\* Region**

JPY mn, %	FY3/19	FY3/20	1Q 3/19	2Q 3/19	3Q 3/19	4Q 3/19	1Q 3/20	2Q 3/20	3Q 3/20	4Q 3/20
<b>by Application</b>										
<b>Torex sales</b>	<b>10,104</b>	<b>9,663</b>	<b>2,476</b>	<b>2,727</b>	<b>2,432</b>	<b>2,469</b>	<b>2,202</b>	<b>2,649</b>	<b>2,563</b>	<b>2,249</b>
• Industrial equipt.	3,927	3,463	966	1,063	945	953	784	912	933	834
• Automotive equipt.	1,535	1,749	381	384	362	408	350	615	457	327
• Medical equipt.	125	118	36	26	26	37	25	21	29	43
• Wearable equipt.	238	220	71	74	37	56	53	66	54	47
• Other	4,279	4,113	1,022	1,180	1,062	1,015	990	1,035	1,090	998
<b>YoY</b>										
<b>Torex sales</b>	<b>(0.6)</b>	<b>(4.4)</b>	<b>0.1</b>	<b>5.7</b>	<b>(4.6)</b>	<b>(3.7)</b>	<b>(11.1)</b>	<b>(2.9)</b>	<b>5.4</b>	<b>(8.9)</b>
• Industrial equipt.	5.3	(11.8)	9.8	14.3	(0.1)	(2.0)	(18.8)	(14.2)	(1.3)	(12.5)
• Automotive equipt.	(10.1)	13.9	(3.5)	(3.3)	(18.1)	(13.9)	(8.1)	60.2	26.2	(19.9)
• Medical equipt.	15.7	(5.6)	80.0	(13.3)	(23.5)	54.2	(30.6)	(19.2)	11.5	16.2
• Wearable equipt.	2.1	(7.6)	10.9	19.4	(31.5)	5.7	(25.4)	(10.8)	45.9	(16.1)
• Other	(2.6)	(3.9)	788.7	(45.4)	(1.0)	(2.5)	(3.1)	(12.3)	2.6	(1.7)
<b>by Region</b>										
<b>Torex D-in* sales</b>	<b>10,104</b>	<b>9,663</b>	<b>2,476</b>	<b>2,727</b>	<b>2,432</b>	<b>2,469</b>	<b>2,202</b>	<b>2,649</b>	<b>2,563</b>	<b>2,249</b>
• Japan	4,401	4,187	1,086	1,159	1,070	1,086	950	1,090	1,104	1,043
• Asia	3,312	3,405	791	896	818	807	724	1,001	980	700
• Europe	1,430	1,212	345	402	304	379	305	329	268	310
• North America	961	859	254	270	240	197	223	229	211	196
<b>YoY</b>										
<b>Torex D-in* sales</b>	<b>(0.6)</b>	<b>(4.4)</b>	<b>0.1</b>	<b>5.7</b>	<b>(4.6)</b>	<b>(3.7)</b>	<b>(11.1)</b>	<b>(2.9)</b>	<b>5.4</b>	<b>(8.9)</b>
• Japan	2.4	(4.9)	8.8	6.5	0.4	(5.1)	(12.5)	(6.0)	3.2	(4.0)
• Asia	(0.5)	2.8	(0.3)	13.0	(8.7)	(4.7)	(8.5)	11.7	19.8	(13.3)
• Europe	(4.1)	(15.2)	(19.0)	0.5	(7.9)	13.1	(11.6)	(18.2)	(11.8)	(18.2)
• North America	(8.7)	(10.6)	(1.2)	(10.0)	(6.6)	(17.2)	(12.2)	(15.2)	(12.1)	(0.5)

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

**Inductor built-in micro DC/DC converters**



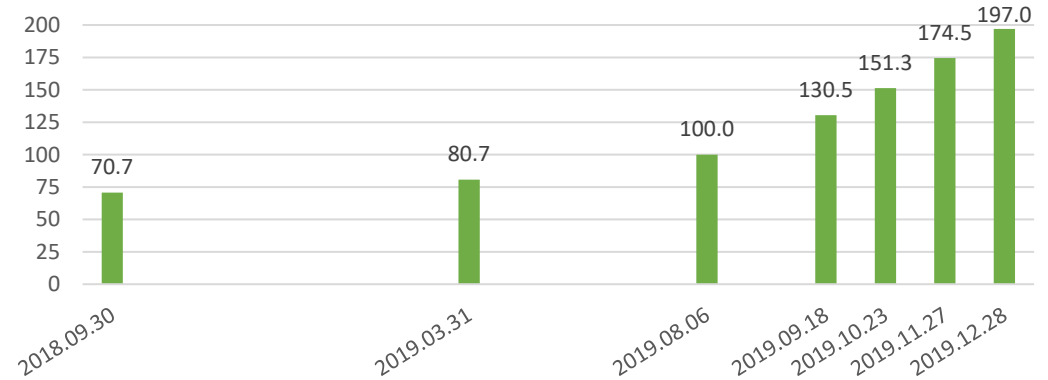
Note: indexed to FY3/17 = 100.

As can be seen in the table above, the main features for Torex sales by application in FY3/20 were industrial equipt. -11.8% and automotive equipt. +13.9%, with the decline in industrial outweighing the increase in automotive. Weakness in industrial was mainly seen in surveillance cameras, satellite communications and FA-related. Strength in automotive in the 2Q and 3Q was attributed to China's vertical ramp-up of ETC nationwide, and high growth in drive recorders in Japan. However, China's demand was essentially special demand associated with the government program, and orders apparently finished by the end of the year. In addition, drive recorder growth in Japan slowed to just 4.0% in the 4Q, likely only a temporary lull, but taking the momentum out of 4Q growth. In other areas, the company reports that wireless earphones and CMOS camera modules for PCs performed well, which can likely be inferred as special demand related to teleworking etc. under coronavirus. There is also strong demand in the medical field for medical products such as fingertip pulse oximeters that measure blood oxygen saturation levels.

**Inductor built-in micro DC/DC converter target markets / applications**

Personal Electronics	Industrial Equipment	Automotive Equipment	Medical Equipment
Wireless earphones	5G optical transceivers	Drive recorders	Blood pressure monitors
Wearables	Microcontroller boards	ETC onboard units	Blood sugar monitors
Beauty care products	Sensor modules	Car navigation	Fingertip pulse oximeters
Bluetooth, WiFi, GPS modules	Camera modules	AV main units	Healthcare equipment
	Home security	Camera and sensor modules	
	POS terminals	Keyless entry	
	IoT device modules	Power sliding doors	
		Sub displays	

China exceeds 2019 year-end target of 180mn ETC users nationwide (mn units)



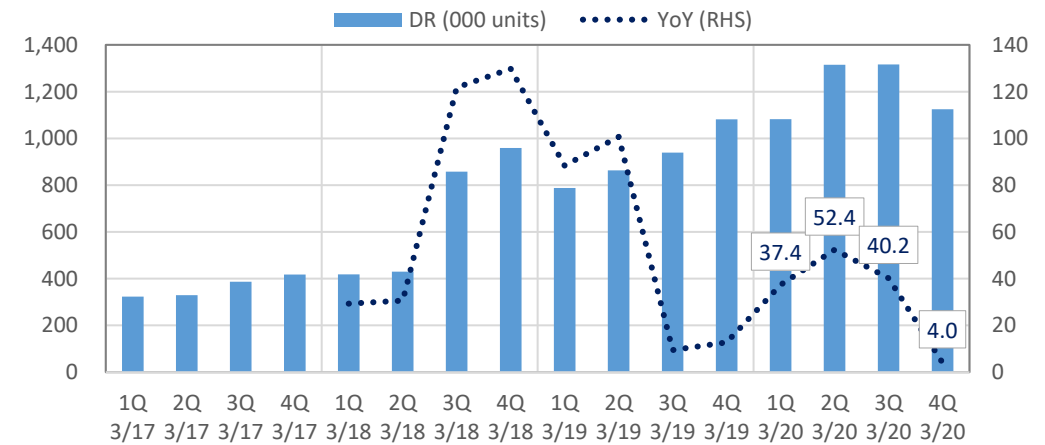
Source: China Daily (Xinhua News), China Ministry of Transport, Dept. of Road Transportation

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



Source: MAXWIN

Quarterly Trend of Drive Recorder (DR) Unit Shipments in Japan



Source: Japan Electronics and Information Technology Industries Association (JEITA)

Apple AirPods with charging case



Fingertip pulse oximeter for blood oxygen saturation level



Wireless earphones surpass smart watches in 2019 worldwide wearables shipments

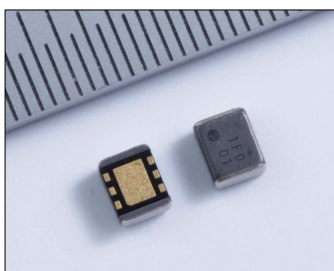
million units, %	CY2018 mn units	CY2018 mkt share	CY2019 mn units	CY2019 mkt share	YoY (%)
<b>Product</b>					
Earwear/Hearables	48.6	27.3%	170.5	50.7%	250.8
Wristband	50.5	28.4%	69.4	20.6%	37.4
Watch	75.3	42.3%	92.4	27.5%	22.7
Others	3.5	2.0%	4.2	1.2%	20.0
<b>TOTAL</b>	<b>178.0</b>	<b>100.0%</b>	<b>336.5</b>	<b>100.0%</b>	<b>89.0</b>
<b>Company</b>					
Apple	48.0	27.0%	106.5	31.6%	121.9
Xiaomi	23.3	13.1%	41.7	12.4%	79.0
Samsung	12.2	6.9%	30.9	9.2%	153.3
Huawei	11.2	6.3%	27.9	8.3%	149.1
Fitbit	13.8	7.8%	15.9	4.7%	15.2
Others	69.4	39.0%	113.5	33.7%	63.5
<b>TOTAL</b>	<b>178.0</b>	<b>100.0%</b>	<b>336.5</b>	<b>100.0%</b>	<b>89.0</b>

Source: IDC Worldwide Quarterly Wearable Device Tracker, March 2020

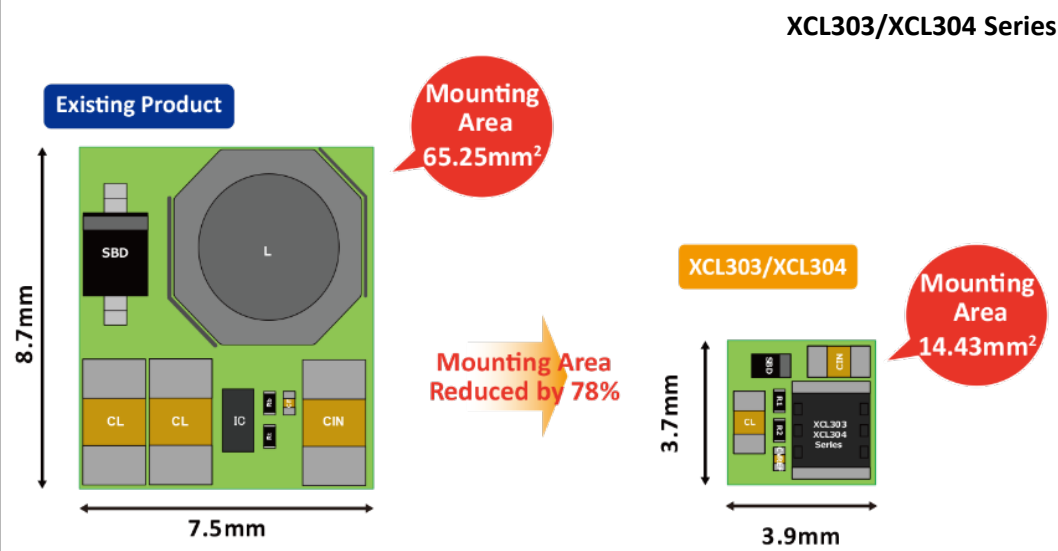
Demand for **fingertip pulse oximeters** has skyrocketed in the wake of COVID-19 as many patients arriving at hospitals often exhibit abnormally low oxygen levels.

One of the strengths of Torex and factors driving growth is aggressive new product development of inductor built-in micro DC/DC converters, which have the properties of 1) ultra-compact, 2) low power consumption, 3) high efficiency and 4) low EMI noise, and different package types emphasize the required property. The graph on P4 shows this category has been growing at +24.3% CAGR over the last 3 years. The table below that summarizes target applications and markets. The XCL303/XCL304 series below announced last November 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.

**XCL303/XCL304 Series**  
CL-2025-02 pkg (2.0 x 2.5 x 1.04mm)



Developed to meet demand for **optical transceivers** for high-speed communication such as 5G between data centers for expected new compact products.



**Phenittec\* Sales Trend by Application and Region**

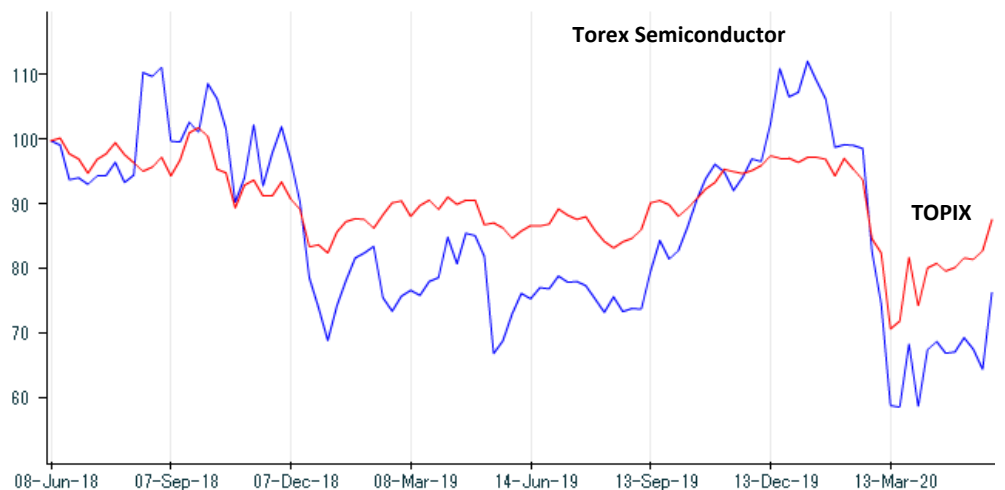
JPY mn, %	FY3/19	FY3/20	1Q 3/19	2Q 3/19	3Q 3/19	4Q 3/19	1Q 3/20	2Q 3/20	3Q 3/20	4Q 3/20
<b>by Application</b>										
<b>Phenittec* sales</b>	15,452	13,297	4,136	3,973	4,075	3,268	2,983	3,251	3,435	3,628
• Industrial eqipt.	3,262	2,009	759	705	1,100	698	408	412	493	696
• Automotive eqipt.	3,560	3,604	908	873	923	856	876	921	892	915
• Medical eqipt.	390	288	98	63	145	84	70	48	54	116
• Other	8,240	7,396	2,371	2,332	1,907	1,630	1,629	1,870	1,996	1,901
<b>YoY</b>										
<b>Phenittec* sales</b>	0.6	(13.9)	14.9	1.3	5.1	(17.6)	(27.9)	(18.2)	(15.7)	11.0
• Industrial eqipt.	(3.9)	(38.4)	(15.3)	(8.7)	29.4	(20.3)	(46.2)	(41.6)	(55.2)	(0.3)
• Automotive eqipt.	15.3	1.2	49.1	11.6	9.8	0.0	(3.5)	5.5	(3.4)	6.9
• Medical eqipt.	9.2	(26.2)	22.5	(52.6)	70.6	42.4	(28.6)	(23.8)	(62.8)	38.1
• Other	(3.3)	(10.2)	17.7	4.4	(9.3)	(25.0)	(31.3)	(19.8)	4.7	16.6
<b>by Region</b>										
<b>Phenittec* sales</b>	15,452	13,297	4,136	3,973	4,075	3,268	2,983	3,251	3,435	3,628
• Japan	5,529	5,586	1,479	1,362	1,356	1,332	1,346	1,410	1,427	1,403
• Asia	3,306	2,764	1,019	1,070	750	467	495	661	803	805
• Europe	789	920	198	182	204	205	199	224	261	236
• North America	5,828	4,027	1,440	1,359	1,765	1,264	943	956	944	1,184
<b>YoY</b>										
<b>Phenittec* sales</b>	0.6	(13.9)	14.9	1.3	5.1	(17.6)	(27.9)	(18.2)	(15.7)	11.0
• Japan	10.4	1.0	27.5	5.6	8.2	1.9	(9.0)	3.5	5.2	5.3
• Asia	(10.9)	(16.4)	25.0	17.8	(23.9)	(53.3)	(51.4)	(38.2)	7.1	72.4
• Europe	3.1	16.6	8.8	(20.9)	7.4	25.8	0.5	23.1	27.9	15.1
• North America	(0.9)	(30.9)	(0.1)	(9.0)	21.7	(15.5)	(34.5)	(29.7)	(46.5)	(6.3)

\*Note: Phenittec sales here include intra-company transactions with Torex. Classifications subject to change.

As can be seen in the table on the previous page, the main features for Phenitex sales by application in FY3/20 were industrial equipt. -38.4% and automotive equipt. +1.2%. The decline in orders from China and North America lowered operating rates, while increased depreciation from the major capex project of integrating the head office and Daiichi plants in Okayama. The good news from 4Q results was Phenitex contribution sales (after eliminations) rose +15.2% YoY and +9.5% sequentially QoQ. The table on the previous page highlights an apparent end to the 40%+ decline in industrial, and similar to Torex, strength in automotive for Japan customers.

Integration of the head office plant and Daiichi Plant will be completed this term. Since capex has already peaked, the outlook for depreciation this term is flattish, set to decline from next term onward. Benefits from the integration include: 1) raising production efficiency by migrating from 5-inch to 6-inch wafers (6-inch ratio 24% → 64%), 2) raising production efficiency with the right equipment and layout, 3) energy-saving cost reduction, and 4) obtaining quality standards required to expand industrial and automotive business. In addition, the Kagoshima Plant is expected to turn profitable this term on a full-term basis.

**Share Price and Relative Performance**



Source: SPEEDA

## APPENDIX

Reference data series on the following pages are readily available indicators to monitor monthly and quarterly conditions of the business environment. Both TI and Littelfuse which acquired Torex Group's major US client, IXYS Corp., report quarterly results 2 – 3 weeks ahead of TOREX SEMICONDUCTOR, which can provide some useful insight.

- ① MOF Trade Statistics of Japan: Exports by Destination Region
- ② MOF Trade Statistics of Japan: Exports to China by Sector
- ③ JEITA Domestic Consumer Electronic Shipments by Value
- ④ JEITA Selected Domestic Car AVC Equipment Shipments by Volume
- ⑤ Global No.1 Texas Instruments Analog Revenue Quarterly Trend



## MOF Trade Statistics of Japan: Exports by Destination Region

JPY bn, % YoY	Total Japan Exports	YoY	to P.R.C.	YoY	to U.S.A.	YoY	to ASEAN	YoY	to EU	YoY
2017.01	5,421	1.3	887	3.1	1,054	(6.6)	850	10.0	597	(5.6)
2017.02	6,347	11.3	1,197	28.2	1,223	0.4	930	10.5	701	3.3
2017.03	7,228	11.9	1,299	16.4	1,353	3.5	1,071	15.2	801	1.3
2017.04	6,330	7.5	1,188	14.7	1,233	2.7	941	6.7	718	2.2
2017.05	5,852	14.9	1,117	23.8	1,084	11.7	894	14.2	692	19.8
2017.06	6,608	9.7	1,248	19.5	1,304	7.1	957	7.5	726	9.6
2017.07	6,495	13.4	1,211	17.6	1,319	11.5	1,001	17.6	721	8.3
2017.08	6,278	18.1	1,219	25.8	1,183	21.8	991	22.0	672	13.7
2017.09	6,811	14.1	1,284	29.3	1,297	11.1	1,019	17.4	767	11.6
2017.10	6,693	14.0	1,354	26.0	1,282	7.1	1,025	19.5	753	15.8
2017.11	6,920	16.2	1,380	25.1	1,369	13.0	1,087	22.9	717	13.3
2017.12	7,304	9.4	1,507	15.9	1,412	3.1	1,105	10.0	792	11.4
2018.01	6,086	12.3	1,160	30.8	1,066	1.2	925	8.7	717	20.3
2018.02	6,463	1.8	1,080	(9.8)	1,277	4.4	995	7.0	781	11.5
2018.03	7,382	2.1	1,440	10.8	1,356	0.2	1,139	6.4	803	0.3
2018.04	6,822	7.8	1,316	10.8	1,286	4.3	1,013	7.6	819	14.1
2018.05	6,327	8.1	1,272	13.9	1,149	6.1	994	11.2	697	0.7
2018.06	7,054	6.7	1,386	11.1	1,293	(0.9)	1,085	13.4	794	9.3
2018.07	6,748	3.9	1,355	11.9	1,251	(5.2)	1,080	7.9	767	6.4
2018.08	6,688	6.5	1,365	12.0	1,245	5.2	1,037	4.7	719	7.0
2018.09	6,717	(1.4)	1,262	(1.7)	1,290	(0.6)	1,062	4.3	732	(4.5)
2018.10	7,243	8.2	1,476	9.0	1,430	11.6	1,114	8.7	811	7.7
2018.11	6,927	0.1	1,384	0.3	1,391	1.6	1,102	1.4	745	3.8
2018.12	7,022	(3.9)	1,402	(7.0)	1,435	1.6	1,088	(1.5)	823	3.9
2019.01	5,574	(8.4)	958	(17.4)	1,140	6.9	857	(7.3)	699	(2.6)
2019.02	6,385	(1.2)	1,140	5.6	1,303	2.0	936	(5.9)	801	2.5
2019.03	7,202	(2.4)	1,305	(9.4)	1,416	4.4	1,075	(5.6)	862	7.3
2019.04	6,664	(2.3)	1,233	(6.3)	1,415	10.0	1,018	0.5	798	(2.6)
2019.05	5,838	(7.7)	1,148	(9.7)	1,190	3.6	821	(17.4)	647	(7.1)
2019.06	6,585	(6.6)	1,246	(10.1)	1,356	4.9	1,012	(6.7)	740	(6.7)
2019.07	6,643	(1.5)	1,229	(9.3)	1,356	8.4	977	(9.5)	784	2.2
2019.08	6,139	(8.2)	1,200	(12.1)	1,190	(4.4)	934	(9.9)	709	(1.4)
2019.09	6,369	(5.2)	1,177	(6.7)	1,187	(7.9)	989	(6.9)	729	(0.5)
2019.10	6,576	(9.2)	1,322	(10.4)	1,268	(11.4)	990	(11.2)	743	(8.4)
2019.11	6,379	(7.9)	1,310	(5.4)	1,212	(12.9)	998	(9.4)	686	(8.0)
2019.12	6,576	(6.3)	1,413	0.8	1,221	(14.9)	971	(10.8)	757	(8.1)
2020.01	5,431	(2.6)	897	(6.4)	1,052	(7.7)	836	(2.5)	686	(1.8)
2020.02*	6,321	(1.0)	1,136	(0.4)	1,270	(2.6)	985	5.1	609	(7.7)
2020.03*	6,358	(11.7)	1,191	(8.7)	1,182	(16.5)	947	(11.9)	634	(11.1)
2020.04*	5,206	(21.9)	1,184	(4.0)	880	(37.8)	803	(21.1)	484	(28.0)
2020.05										
by QTR										
1Q 3/19	20,203	7.5	3,975	11.9	3,729	3.0	3,092	10.7	2,310	8.1
2Q 3/19	20,153	2.9	3,982	7.2	3,786	(0.4)	3,179	5.6	2,218	2.7
3Q 3/19	21,192	1.3	4,262	0.5	4,256	4.8	3,305	2.7	2,379	5.1
4Q 3/19	19,162	(3.9)	3,403	(7.5)	3,858	4.3	2,868	(6.2)	2,362	2.6
1Q 3/20	19,087	(5.5)	3,628	(8.7)	3,962	6.3	2,851	(7.8)	2,186	(5.4)
2Q 3/20	19,151	(5.0)	3,606	(9.4)	3,733	(1.4)	2,900	(8.8)	2,222	0.2
3Q 3/20	19,531	(7.8)	4,046	(5.1)	3,701	(13.0)	2,959	(10.5)	2,186	(8.1)
4Q 3/20*	18,111	(5.5)	3,223	(5.3)	3,504	(9.2)	2,767	(3.5)	1,929	(6.9)

Source: MOF Trade Statistics of Japan monthly press releases. \*Note: The UK exited the EU from Feb. 1, 2020, so YoY figures are adjusted accordingly.

## MOF Trade Statistics of Japan: Exports to China by Sector

JPY bn, % YoY	Total Exports to P.R.C.		General Machinery		of which SPEs		Electr. Equipmt.		of which ICs		Transport Equipmt.	
	YoY	YoY	YoY	YoY	YoY	YoY	YoY	YoY	YoY	YoY	YoY	
2017.01	887	3.1	168	10.1	—	—	205	(3.6)	53	1.9	82	18.5
2017.02	1,197	28.2	282	33.1	—	—	261	26.5	56	22.4	106	25.3
2017.03	1,299	16.4	297	14.1	—	—	282	16.4	58	8.1	118	13.0
2017.04	1,188	14.7	255	15.6	47	(0.5)	260	7.4	56	4.8	119	21.9
2017.05	1,117	23.8	252	40.1	50	54.3	229	14.1	55	16.5	104	9.3
2017.06	1,248	19.5	296	37.7	63	40.9	274	10.6	59	6.4	118	10.3
2017.07	1,211	17.6	265	18.6	45	(9.8)	279	15.8	61	7.4	117	9.6
2017.08	1,219	25.8	266	41.2	50	42.1	287	18.7	68	17.4	104	7.9
2017.09	1,284	29.3	264	44.6	59	105.1	316	22.4	73	21.6	119	15.8
2017.10	1,354	26.0	296	44.4	68	123.1	305	18.1	66	9.0	128	10.8
2017.11	1,380	25.1	309	40.1	73	69.0	326	26.2	68	18.1	138	6.0
2017.12	1,507	15.9	362	36.4	105	74.4	351	17.7	82	30.8	143	4.8
2018.01	1,160	30.8	273	62.7	70	44.0	261	27.4	59	11.7	103	25.4
2018.02	1,080	(9.8)	255	(9.6)	67	(2.2)	233	(11.0)	57	1.4	111	4.8
2018.03	1,440	10.8	393	32.0	100	72.4	300	6.6	68	17.3	126	7.1
2018.04	1,316	10.8	347	36.5	102	114.8	274	5.3	65	17.6	121	1.4
2018.05	1,272	13.9	329	30.5	95	90.7	259	12.8	60	9.3	111	6.9
2018.06	1,386	11.1	363	22.9	112	79.2	303	10.4	80	35.5	129	8.8
2018.07	1,355	11.9	338	27.8	105	135.1	295	5.8	72	16.6	137	10.1
2018.08	1,365	12.0	342	28.5	127	152.6	289	0.4	63	(7.3)	122	16.8
2018.09	1,262	(1.7)	296	12.1	89	50.8	270	(14.6)	52	(29.0)	139	16.8
2018.10	1,476	9.0	326	9.9	74	8.8	320	4.9	80	22.2	161	25.6
2018.11	1,384	0.3	307	(0.7)	69	(5.1)	297	(8.8)	74	7.8	145	5.6
2018.12	1,402	(7.0)	316	(12.7)	69	(34.3)	300	(14.8)	73	(10.7)	134	(6.4)
2019.01	958	(17.4)	201	(26.6)	53	(24.8)	206	(20.9)	60	1.8	97	(5.9)
2019.02	1,140	5.6	296	16.3	82	22.6	208	(10.8)	43	(24.5)	111	0.6
2019.03	1,305	(9.4)	338	(13.9)	84	(16.1)	260	(13.3)	53	(22.4)	126	(0.6)
2019.04	1,233	(6.3)	287	(17.3)	60	(41.0)	243	(11.3)	45	(31.0)	124	2.5
2019.05	1,148	(9.7)	273	(17.1)	69	(27.5)	229	(11.5)	59	(0.9)	117	5.7
2019.06	1,246	(10.1)	299	(17.7)	82	(27.1)	260	(14.2)	61	(24.0)	136	5.5
2019.07	1,229	(9.3)	278	(17.9)	72	(31.5)	254	(14.1)	55	(23.7)	131	(4.8)
2019.08	1,200	(12.1)	273	(20.2)	78	(38.7)	259	(10.2)	61	(2.6)	103	(15.3)
2019.09	1,177	(6.7)	243	(18.0)	67	(25.0)	264	(2.3)	67	27.9	125	(10.7)
2019.10	1,322	(10.4)	282	(13.4)	69	(6.2)	290	(9.6)	69	(13.6)	138	(14.4)
2019.11	1,310	(5.4)	288	(6.1)	75	7.7	278	(6.5)	61	(17.2)	153	5.4
2019.12	1,413	0.8	340	7.6	111	59.7	289	(3.4)	61	(17.1)	147	9.7
2020.01	897	(6.4)	194	(3.5)	54	2.7	195	(5.6)	54	(10.0)	102	5.8
2020.02	1,136	(0.4)	257	(13.3)	64	(22.1)	243	17.1	54	26.5	125	12.3
2020.03	1,191	(8.7)	288	(14.6)	73	(12.6)	256	(1.5)	62	17.4	113	(9.8)
2020.04	1,184	(4.0)	254	(11.6)	60	0.5	268	10.3	63	40.2	107	(13.7)
2020.05												
by QTR												
1Q 3/19	3,975	11.9	1,040	29.6	309	93.4	835	9.4	205	21.2	360	5.6
2Q 3/19	3,982	7.2	976	22.8	321	108.5	854	(3.3)	187	(7.9)	398	16.9
3Q 3/19	4,262	0.5	949	(1.9)	212	(13.8)	917	(6.7)	227	5.2	440	7.7
4Q 3/19	3,403	(7.5)	835	(9.3)	219	(7.8)	674	(15.1)	156	(15.3)	334	(1.8)
1Q 3/20	3,628	(8.7)	859	(17.4)	211	(31.8)	732	(12.4)	165	(19.4)	376	4.5
2Q 3/20	3,606	(9.4)	793	(18.7)	217	(32.6)	777	(9.0)	183	(2.2)	358	(10.0)
3Q 3/20	4,046	(5.1)	910	(4.1)	254	19.8	857	(6.6)	191	(15.9)	438	(0.5)
4Q 3/20	3,223	(5.3)	739	(11.5)	191	(12.5)	694	3.0	171	9.3	341	2.1

Source: MOF Trade Statistics of Japan monthly press releases.

## JEITA Domestic Consumer Electronic Shipments by Value

JPY bn, % YoY	Total		Video		Audio		Car AVC	
	Consumer Electronics	YoY	Eqipt.	YoY	Eqipt.	YoY	Eqipt.	YoY
2018.01	92	(3.6)	40	(5.8)	7	(8.5)	45	(0.8)
2018.02	109	1.0	50	4.9	6	(9.0)	53	(1.2)
2018.03	130	(2.9)	60	(5.3)	8	(19.8)	62	2.4
2018.04	98	(0.4)	45	(5.0)	7	(6.8)	46	5.7
2018.05	100	6.6	51	11.0	7	7.7	42	1.5
2018.06	121	7.4	66	18.9	7	0.8	48	(4.4)
2018.07	106	4.8	50	3.3	7	0.0	49	7.1
2018.08	92	(0.9)	43	(6.6)	6	10.5	43	3.8
2018.09	107	(5.9)	50	(7.6)	7	(11.5)	50	(3.4)
2018.10	106	(0.1)	49	0.0	7	(36.9)	51	7.9
2018.11	116	4.3	60	5.3	7	(3.5)	49	4.4
2018.12	145	2.9	89	1.1	9	5.4	47	6.0
2019.01	96	1.2	42	(2.0)	7	2.3	47	4.1
2019.02	107	(5.0)	47	(12.0)	6	9.5	53	0.5
2019.03	127	(4.9)	62	(3.4)	8	(5.2)	58	(6.6)
2019.04	96	(2.1)	42	(6.6)	8	10.0	47	0.5
2019.05	95	(5.6)	42	(17.9)	7	8.8	46	9.8
2019.06	116	(3.8)	60	(8.6)	7	(0.8)	49	2.4
2019.07	118	11.4	56	13.3	8	14.5	54	9.0
2019.08	109	18.5	58	33.4	7	2.6	45	5.7
2019.09	123	14.9	61	21.5	8	12.1	55	8.6
2019.10	100	(6.3)	45	(7.6)	8	18.1	47	(8.2)
2019.11	113	(2.6)	61	2.2	8	3.2	45	(9.3)
2019.12	135	(7.3)	84	(5.4)	9	(3.9)	42	(11.6)
2020.01	95	(0.9)	44	5.4	7	(1.6)	44	(6.4)
2020.02	96	(10.3)	41	(11.9)	6	(7.2)	48	(9.3)
2020.03	117	(8.4)	57	(7.4)	6	(19.5)	53	(8.1)
2020.04	82	(14.9)	38	(10.3)	5	(32.3)	39	(16.2)
2020.05								

Source: Japan Electronics and Information Technology Industries Association

## Japan DR Shipments

000 units, % YoY	Drive Recorders	YoY
1Q 3/17	323	
2Q 3/17	329	
3Q 3/17	387	
4Q 3/17	417	
1Q 3/18	418	29.3
2Q 3/18	430	30.6
3Q 3/18	858	121.8
4Q 3/18	959	129.8
1Q 3/19	788	88.4
2Q 3/19	863	100.7
3Q 3/19	939	9.5
4Q 3/19	1,081	12.8
1Q 3/20	1,082	37.4
2Q 3/20	1,315	52.4
3Q 3/20	1,317	40.2
4Q 3/20	1,125	4.0
<b>by FY</b>		
FY3/17	1,457	
FY3/18	2,665	83.0
FY3/19	3,672	37.8
FY3/20	4,839	31.8

Source: JEITA

## JEITA Selected Domestic Car AVC Equipment Shipments by Volume

000 units, % YoY	Car Navigation Systems	YoY	AV Main Units	YoY	ETC Onboard Units	YoY	ETC 2.0 (DSRC) Units	YoY
2018.01	466	1.5	177	(12.0)	269	8.9	59	(28.2)
2018.02	536	1.0	199	(9.6)	300	(0.9)	71	(15.9)
2018.03	633	2.1	223	(9.8)	347	(3.4)	85	(4.5)
2018.04	471	6.3	192	2.9	281	0.9	61	(2.8)
2018.05	426	2.5	173	(7.5)	257	(4.7)	51	5.6
2018.06	527	0.8	198	(9.2)	286	(8.6)	65	3.2
2018.07	512	8.5	207	(1.5)	285	(2.2)	61	5.9
2018.08	452	7.6	177	(0.3)	539	(4.3)	57	0.7
2018.09	573	8.2	185	(14.5)	279	(4.9)	73	2.1
2018.10	544	14.4	206	(4.9)	277	4.4	75	32.0
2018.11	510	6.8	212	1.5	279	2.6	72	21.5
2018.12	494	7.9	205	14.5	254	(4.7)	72	28.2
2019.01	479	2.8	210	18.6	259	(3.7)	68	14.1
2019.02	548	2.2	228	14.6	300	(0.1)	77	9.3
2019.03	610	(3.6)	234	4.6	344	(1.0)	99	17.5
2019.04	496	5.3	220	15.1	275	(2.3)	69	13.2
2019.05	490	14.8	213	23.4	267	3.7	60	18.3
2019.06	530	0.6	212	7.2	302	5.6	90	38.4
2019.07	539	5.2	257	24.1	290	1.9	105	70.6
2019.08	462	2.1	197	10.9	253	5.6	95	68.0
2019.09	563	(1.7)	240	29.9	304	9.0	98	34.6
2019.10	450	(17.3)	247	19.7	248	(10.4)	76	1.1
2019.11	456	(10.7)	234	10.7	244	(12.4)	76	5.5
2019.12	420	(4.3)	213	4.3	232	(8.4)	75	4.2
2020.01	451	(5.9)	239	14.2	207	(20.0)	91	34.6
2020.02	477	(12.9)	241	5.7	240	(20.0)	109	41.4
2020.03	549	(10.0)	274	17.4	272	(21.0)	102	2.2
2020.04	323	(34.8)	178	(19.5)	198	(27.9)	71	2.7
2020.05								

Source: Japan Electronics and Information Technology Industries Association

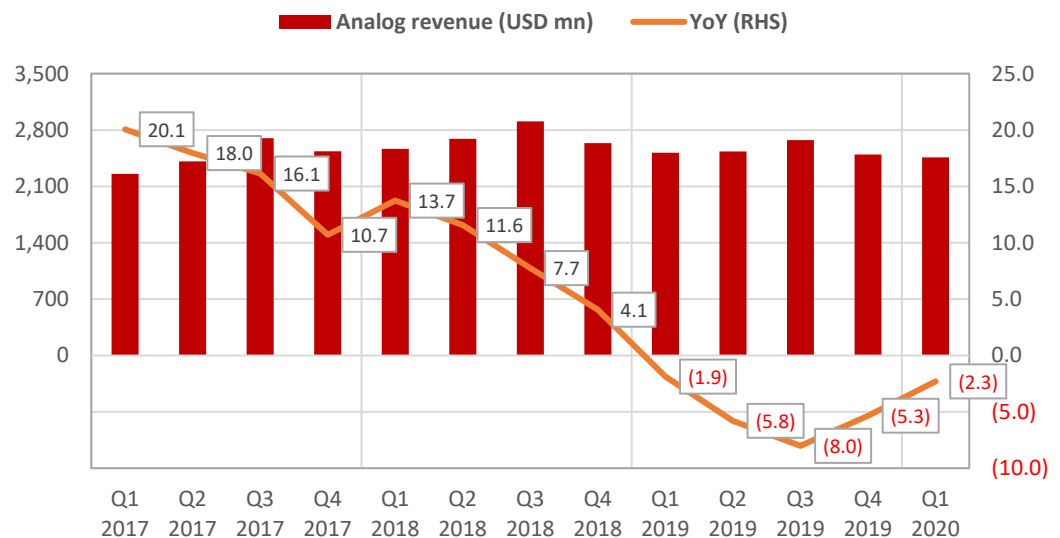
**Texas Instruments (NASDAQ: TXN) Consolidated Earnings Trend**

USD mn, %	FY12/17 act	YoY	FY12/18 act	YoY	FY12/19 act	YoY
<b>Total revenue</b>	<b>14,961</b>	<b>11.9</b>	<b>15,784</b>	<b>5.5</b>	<b>14,383</b>	<b>(8.9)</b>
▪ Analog (Power, Signal Chain and High Volume)	9,900	16.0	10,801	9.1	10,223	(5.4)
▪ Embedded Processing (Conn. Microcontrollers)	3,498	15.7	3,554	1.6	2,943	(17.2)
▪ Other (DLP, Calculators and Custom ASICs)	1,563	(13.7)	1,429	(8.6)	1,217	(14.8)
<b>Total OP</b>	<b>6,083</b>	<b>25.3</b>	<b>6,713</b>	<b>10.4</b>	<b>5,723</b>	<b>(14.7)</b>
▪ Analog	4,468	30.8	5,109	14.3	4,477	(12.4)
▪ Embedded Processing	1,143	39.9	1,205	5.4	907	(24.7)
▪ Other*	472	(24.1)	399	(15.5)	339	(15.0)
<b>OPM</b>	<b>40.7%</b>		<b>42.5%</b>		<b>39.8%</b>	
▪ Analog	45.1%		47.3%		43.8%	
▪ Embedded Processing	32.7%		33.9%		30.8%	
▪ Other	30.2%		27.9%		27.9%	

<b>Global revenue</b>	<b>14,961</b>	<b>11.9</b>	<b>15,784</b>	<b>5.5</b>	<b>14,383</b>	<b>(8.9)</b>
▪ US	1,901	13.0	2,288	20.4	1,827	(20.1)
▪ China	6,600	10.0	7,000	6.1	7,200	2.9
▪ Europe, ME, Africa	2,907	21.5	3,047	4.8	2,707	(11.2)
▪ Asia	2,224	9.9	2,240	0.7	1,450	(35.3)
▪ Japan	1,049	0.9	869	(17.2)	796	(8.4)
▪ Rest of World	280	21.2	340	21.4	403	18.5

Source: compiled by Sessa Partners from SPEEDA data. \*Note: As of January 1, 2017, royalties were moved from revenue to OI&E.

**Global No.1 Texas Instruments Analog Revenue Quarterly Trend**



Source: compiled by Sessa Partners from SPEEDA data.

## Littelfuse (NASDAQ: LFUS) Consolidated Earnings Trend

USD mn, %	FY12/17 act	YoY	FY12/18 act*	YoY	FY12/19 act	YoY
<b>Total revenue</b>	<b>1,222</b>	<b>15.7</b>	<b>1,718</b>	<b>40.6</b>	<b>1,504</b>	<b>(12.5)</b>
▪ Electronics	662	23.7	1,124	69.8	961	(14.5)
▪ Automotive	453	9.2	480	6.0	429	(10.6)
▪ Industrial	106	0.0	114	7.5	114	0.0
<b>Total OP</b>	<b>219</b>	<b>67.2</b>	<b>225</b>	<b>2.7</b>	<b>193</b>	<b>(14.2)</b>
▪ Electronics	156	33.3	241	54.5	146	(39.4)
▪ Automotive	63	5.0	55	(12.7)	47	(14.5)
▪ Industrial	10	150.0	17	70.0	22	29.4
(eliminations)	(10)		(89)		(22)	
<b>OPM</b>	<b>17.9%</b>		<b>13.1%</b>		<b>12.8%</b>	
▪ Electronics (before elim)	23.6%		21.4%		15.2%	
▪ Automotive (before elim)	13.9%		11.5%		11.0%	
▪ Industrial (before elim)	9.4%		14.9%		19.3%	
<b>Global revenue</b>	<b>1,222</b>	<b>15.7</b>	<b>1,718</b>	<b>40.6</b>	<b>1,504</b>	<b>(12.5)</b>
▪ US	383	7.3	512	33.7	440	(14.1)
▪ China	321	21.6	468	45.8	416	(11.1)
▪ Other countries	517	18.6	739	42.9	647	(12.4)

Source: compiled by Sessa Partners from SPEEDA data. \*Note: completed acquisition of IXYS Corp., the TOREX Group's large North American customer, on 2018.01.17

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