NOMURA | INSTINET

U.S. Semiconductors

EQUITY: AMERICAS SEMICONDUCTORS

Analog: Stability Amid Volatility

Initiating Coverage of ON (Buy), MCHP (Buy), CREE (Neutral); Assuming Coverage of ADI (Neutral)

- **The first half of 2018 has been volatile for semiconductors.** Regulatory impacts have recently shaken the semi sector. Broadcom's acquisition of QCOM was blocked by the U.S. government and China still has yet to approve the QCOM / NXPI transaction. Outside of regulatory policy, the upcoming iPhone refresh cycle has caused volatility among the Apple supply chain. Furthermore, investor concerns about peak cycle behavior and oversupply have been overhangs on memory and capital equipment companies. Apple supply chain and capital equipment comps are down 6.0% and 3.7% YTD (median) versus up 8.5% YTD for the SOX.
- **Amid volatility, Analog semi stocks have been surprisingly resilient.** Our comp group of Analog semiconductor stocks (ADI, CY, IFX, MCHP, MXIM, ON, SLAB, STM, and TXN) are up 10.7% YTD on average compared with +8.5% and +5.1% YTD for the SOX and S&P 500, respectively. We attribute this performance to 1) Analog's tendency for steadier business models versus other semi subsegments, 2) strong FCF generation and capital returns, and 3) strong demand in Auto/Industrial applications.
- **We expect Analog to outperform throughout the remainder of 2018. Our top pick in this report is ON Semiconductor. We are initiating on the shares with a Buy rating and $30 TP.** ON currently trades at a 35% discount to Analog (FY2 P/E), but we expect the multiple to expand. We believe that the company's exposure to Industrial/Auto is underappreciated (59% of revenues) and that solid execution in the integration of the integration of the FCS acquisition will help to enhance management's credibility. Furthermore, ON's 2020 target model will likely prove conservative, in our view. We expect a solid report and outlook from the company when it reports earnings on July 30. Our $30 TP is based on a multiple of 2.3x CY19E EV/Sales.
- **We initiate coverage of Microchip with a Buy rating and $110 TP,** based on a P/E of 16.7x our CY19E EPS (including-SBC). Microchip currently trades at a 22% discount to its comp group on FY2 P/E, but we believe MCHP's aggressive de-leveraging, share gains, and strong executional track record warrant the stock returning to its historical 5-year average premium of 2%.
- **We initiate on Cree with a Neutral rating and $44 TP.** We are positive on Cree's transition to a "power semi" company but believe the stock has already priced in tailwinds from SiC, the CEO's track record, and progress toward the target corp. model. Our $44 TP is based on a 50% weighting of our SOTP ($33) and EV/Sales vs. Op margin analysis ($55).
- **Last, we are assuming coverage of Analog Devices (ADI); maintaining Neutral and $100 TP.** We are bullish on ADI's exposure to Auto/Industrial but believe Consumer poses a headwind to revenue/EPS growth in FY19. We base our $100 TP on 17.4x our CY19E EPS.

Instinet, LLC, Equity Research

18 July 2018

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Americas Technology

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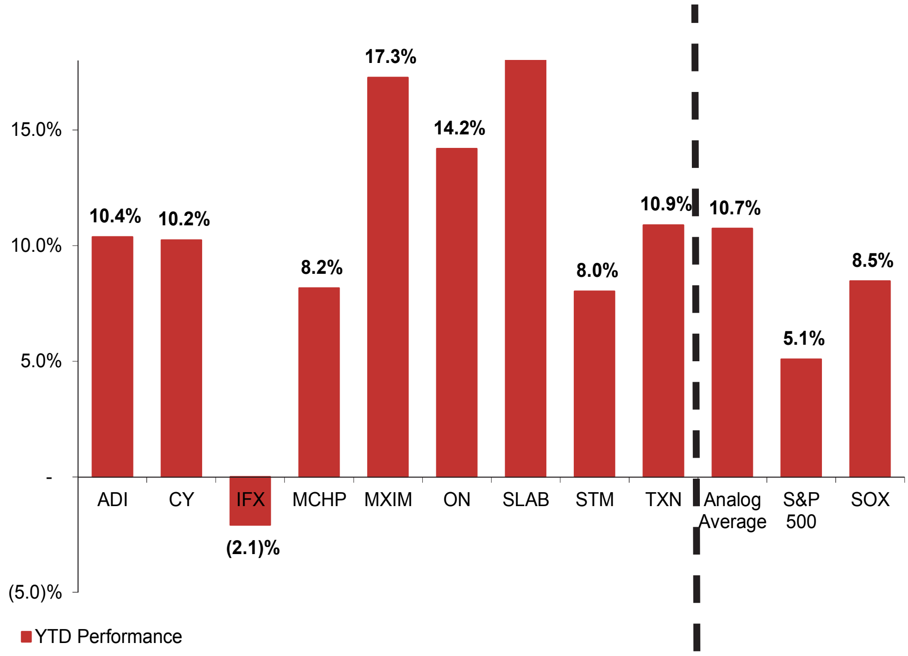
Executive Summary

The first half of 2018 has been volatile for semiconductors. Federal regulatory changes and strained geopolitical relationships with China have recently shaken the semi sector. Broadcom's acquisition of QCOM was blocked by the U.S. government, and China still has yet to approve the QCOM / NXPI transaction. Within the semi industry, we have seen higher volatility among the Apple supply chain for the upcoming iPhone refresh cycle and investor concerns about peak cycle behavior and oversupply affecting memory and capital equipment companies. Apple supply chain and capital equipment comps are down 6.0% and 3.7% YTD (median) versus up 8.5% YTD performance for the SOX.

Amid volatility, Analog semi stocks have been surprisingly resilient. Our comp group of Analog semiconductor stocks (ADI, CY, IFX, MCHP, MXIM, ON, SLAB, STM, and TXN) are up 10.7% YTD on average compared to up 8.5% and up 5.1% YTD for the SOX and S&P 500, respectively.

Fig. 1: YTD Performance for Analog Semi Stocks



Source: FactSet, Instinet research

Three main factors contribute to Analog's stability during this time of uncertainty:

1) Analog companies tend to have more reliable, steadier business models versus other semi subsegments. We analyzed the standard deviation in historical Q/Q revenue growth across the sector over the past five years and Analog had the lowest standard deviation (6.2%) compared with other semi subsegments (11.6% median), suggesting that Analog has higher revenue stability compared with other semi subsegments.

2) Revenue stability supports strong FCF generation and capital returns. Analog has a median 2018 FCF yield of 5.7%, second only to the Apple Supply Chain median of 6.0% and higher than Capital Equipment (5.3%), PC/Graphics (3.0%), and Comm / Networking (3.6%). We see a similar pattern for the median annualized dividend yield; Analog's annualized dividend yield (2.1%) was only below that of the Apple Supply Chain group (3.4%) and was above that of the other three subsegments.

3) Increasing content in Automotive and Industrial applications is driving healthy end-market demand. Gartner estimates Automotive will increase at a 10.7% CAGR (excluding memory) from 2017-2022 while Industrial will grow at a

10.4% CAGR. Both are over double the forecast semi industry CAGR of 5.1% (excluding memory) during the same period. The driving factor behind sustainable growth in both end markets has recently been, and will continue to be, content gains in applications rather than unit or GDP growth, in our view.

We expect the stability we saw in Analog YTD to remain throughout the remainder of 2018. Consensus currently models revenue growth for C3Q18 and C4Q18 to be slightly above seasonal for a comp group of Analog semiconductors (Analog Devices, Microchip, Maxim Integrated, NXP Semiconductors, ON Semiconductor, and Texas Instruments).

Our top pick among the Analog companies we initiate on is ON Semiconductor. We are initiating on the shares with a Buy rating and $30 target price. ON currently trades at a 35% discount to Analog (FY2 P/E) but we expect the multiple to expand. We believe that the company's exposure to Industrial/Auto is underappreciated (59% of revenues) and that solid execution in the integration of the integration of the FCS acquisition will help to enhance management's credibility. Furthermore, ON's 2020 target model will prove conservative, in our view. We expect a solid report and outlook from the company when it reports earnings on July 30. We initiate coverage with a $30 target price, based on a multiple of 2.3x CY19E EV/Sales. We arrived at this multiple using our proprietary EV/Sales versus Operating margin regression.

We also initiate coverage of Microchip with a Buy rating and $110 target price. While we understand Microchip is more levered than an "average" semiconductor company, we believe the company's aggressive deleveraging schedule, share gains, and management's excellent operational and executional track record in acquisition integrations does not warrant the current 22% discount to the comp group. We arrive at our $110 target price by applying a P/E multiple of 16.7x our CY19 EPS estimate of $6.54 (including SBC). This multiple is a 2% premium to the peer group average multiple of 16.4x, in line with Microchip's historical five-year average premium.

We also initiate on Cree with a Neutral rating and $44 target price. SiC and GaN should provide tailwinds to revenues, and we are positive on the company's overall transition from a "lighting" company to a "power semi" company, considering the CEO's (Gregg Lowe) multi-decade experience in Analog semiconductors. That said, with shares trading at $46.32, we believe they have already priced in the anticipated revenue and margin growth, Mr. Lowe's his track record, and execution toward the company's target financial model. As such, we remain on the sidelines for now and would look for lower-price opportunities to become more constructive on the shares. We arrive at our $44 target price by applying a 50% weight to our SOTP analysis ($33) and a 50% weight to our EV/Sales vs. Operating margin analysis ($55).

Last, we are assuming coverage of Analog Devices (ADI). We remain Neutral rated on the company with a $100 target price. We are bullish on ADI's exposure to Automotive/Industrial, but declines in Consumer pose as a headwind to revenue and EPS growth in FY19. As such, we believe shares remain fairly valued at current levels but would look for opportunities to become more constructive on the name. We base our $100 TP on 17.4x our CY19E EPS of $5.84, in line with ADI's peer group average multiple.

Analog Offers Stability in What Has Otherwise Been a Volatile Year

Federal regulatory changes, strained geopolitical relationships with China, and industry-specific shifts have recently shaken the semi sector

Semis have not escaped the volatile regulatory environment and news cycle. The Trump administration's corporate tax reform (passed in December 2017) was a mixed bag for semis. Those with onshore manufacturing operations and/or large offshore cash balances benefited from the lower tax rate and repatriation rate (Intel, Lam Research, Texas Instruments). Other companies, including Applied Materials and Micron, however, expect their tax rates to rise. Furthermore, the POTUS's unconventional use of Twitter for policy communications and continual changes to White House positioning has had surprising implications to semis. A prime example being Broadcom: It was widely thought that Broadcom announced its re-domiciliation to the United States in order to not only receive CFIUS approval for the acquisition of Brocade but to also clear the way for future U.S.-based acquisitions. Fast forward to March 2018, however, when President Trump announced on Twitter that the U.S. government would be blocking Broadcom's proposed acquisition of Qualcomm over national security concerns, a stark contrast to signals in prior months.

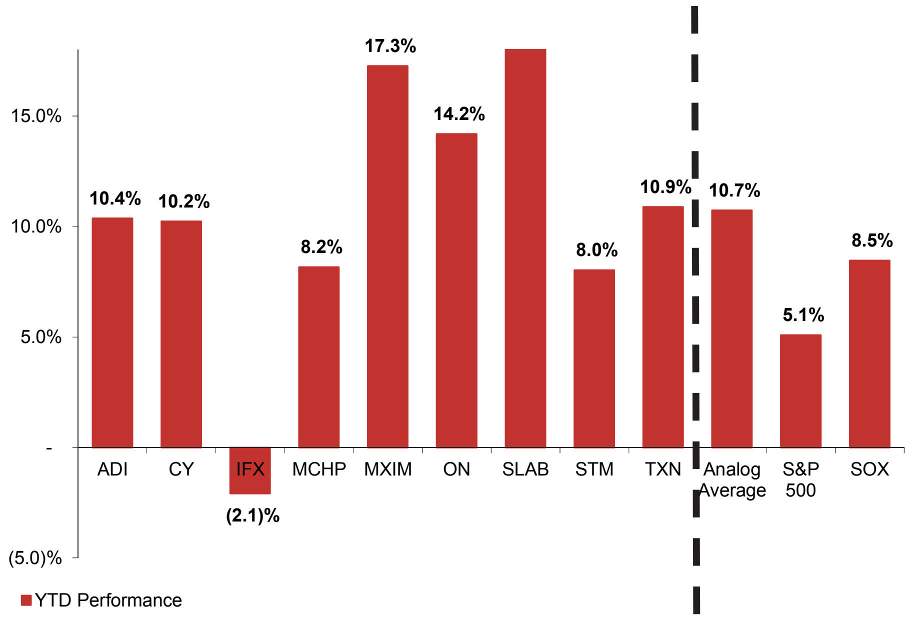
A strained geopolitical relationship with China hasn't helped, either. The Trump administration's stance on tariffs, particularly on Chinese imports, has sparked trade war concerns in an industry that exports meaningful quantities worth of products to China annually. Furthermore, the "Made in China 2025" objective threatens market share and exports at U.S. semi companies, particularly in connectivity, wireless components, and commoditized memory. The country's commitment to this plan has only heightened with recent tariff implementations. Furthermore, an article in *The Wall Street Journal* on July 11 mentioned that Chinese officials may delay license grants and M&A approval for U.S. companies in response to the new $200bn in tariffs announced on July 10. This rings particularly true for the NXPI/QCOM transaction—China remains the only jurisdiction left to approve Qualcomm's acquisition of NXPI, after the EU approved the deal in January 2018.

Volatility and investor concerns within the semiconductor industry itself have only compounded macroeconomic and regulatory impacts. While the Apple supply chain is known for its extreme seasonality and unpredictability, this cycle has seemed particularly hazardous for semi stocks. An anticipated strategy shift at Apple from above-$1,000 ASP OLED phones to lower-priced LCD phones resulted in Broadcom losing some share to Qorvo in the mid-/high-band socket market. In memory and semi capital equipment, investor concerns about peak cycle behavior and oversupply, particularly in display (OLED) and NAND/DRAM, have become overhangs on the shares. Apple supply chain and capital equipment comps have median YTD performance of -6.0% and -3.7%, respectively, compared with SOX performance of +8.5% YTD.

Analog offers stability amid environmental uncertainty

Amid volatility, Analog semi stocks have been surprisingly resilient. Our comp group of Analog semiconductor stocks (ADI, CY, IFX, MCHP, MXIM, ON, SLAB, STM, and TXN) are up 10.7% YTD on average compared with +8.5% and +5.1% YTD for the SOX and S&P 500, respectively.

Fig. 2: YTD Performance for Analog Semi Stocks

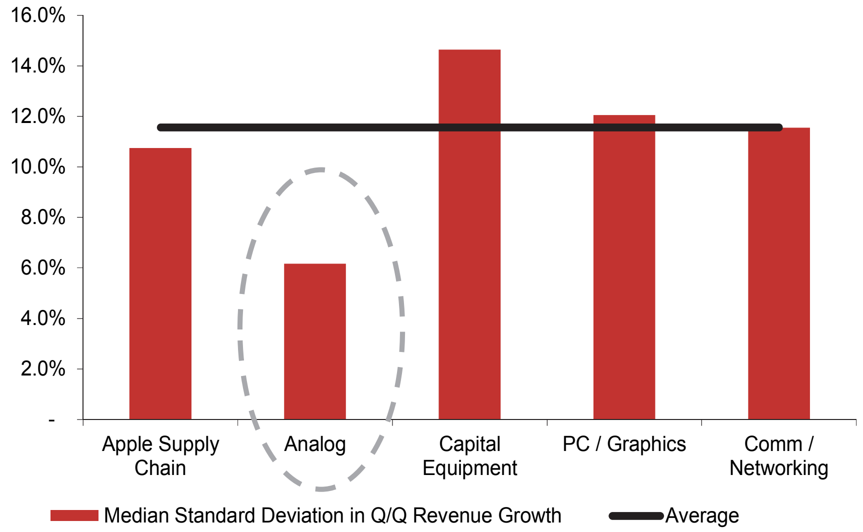


Source: FactSet, Instinet research

Three main factors contribute to Analog's stability during this time of uncertainty.

1) Analog companies tend to have more reliable, steady business models versus other semi subsegments. We analyzed the standard deviation in historical Q/Q revenue growth across the sector over the past five years and Analog had the lowest standard deviation of the group. This suggests that Analog has higher revenue stability compared with other semi subsegments, in our view**.** In our analysis, we calculated quarterly revenue growth from 1Q13 through 4Q17 for several semi subsegments including Analog, Apple Supply Chain, Capital Equipment, PC / Graphics, and Comm / Networking. Analog had the lowest standard deviation of the group at 6.2% and was well below the median of 11.6%.

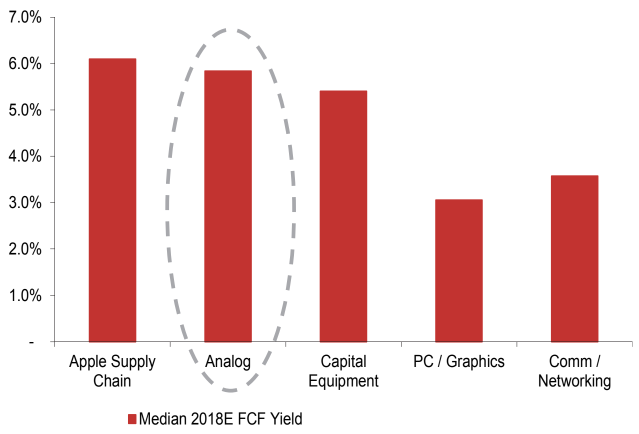
Fig. 3: Analog has the lowest median standard deviation in Q/Q revenue growth, 1Q2013 – 4Q2017



Source: Company data, FactSet, Instinet research

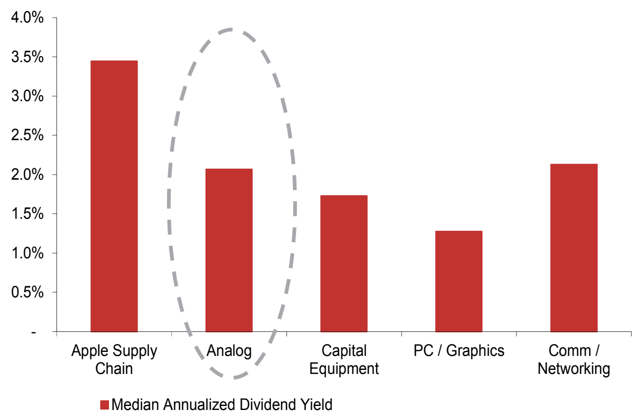
2) Revenue stability supports strong FCF generation and capital returns. Analog has a median 2018 FCF yield of 5.7%, second only to the Apple Supply Chain median of 6.0% and higher than Capital Equipment (5.3%), PC / Graphics (3.0%), and Comm / Networking (3.6%). We see a similar pattern for the median annualized dividend yield; Analog's annualized dividend yield (2.1%) was only below that of the Apple Supply Chain group (3.4%) and was above that of the other three subsegments. While Analog is below that of the Apple Supply Chain group for these two metrics, we believe the higher revenue stability that Analog offers can potentially be well worth the trade off in this environment.

Fig. 4: 2018E FCF Yield for Analog vs. Comp Groups



Source: Company data, FactSet, Instinet research

Fig. 5: Annualized Dividend Yield for Analog vs. Comp Groups



Source: FactSet, Instinet research

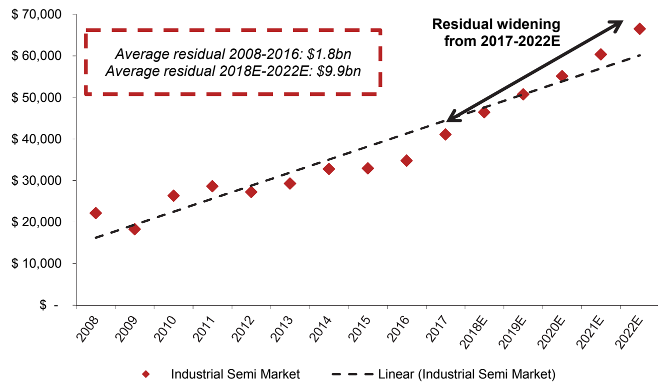
3) Increasing content in Automotive and Industrial applications is driving healthy end-market demand.

Automotive and Industrial have come front and center as two of the strongest forces behind semiconductor industry growth. In fact, both are expected to outgrow the industry as a whole over the next five years. Gartner estimates Automotive will increase at a 10.7% CAGR (excluding memory) from 2017-2022, while Industrial should grow at an estimated 10.4% CAGR. Both are over double the forecast semi industry

CAGR of 5.1% (excluding memory) during the same period. The driving factor behind sustainable growth in both end markets has recently been, and will continue to be, content gains in applications rather than unit or GDP growth, in our view.

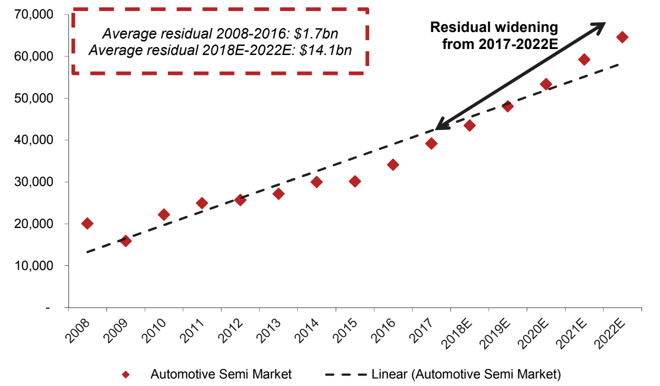
Investors may be concerned that Industrial growth is not sustainable, **but forecasts indicate otherwise.** Investors have voiced concerns about the recent above-average growth in the Industrial subsegment and that the segment will experience “mean reversion.” We created a line of best fit for aggregate Industrial semiconductor revenues and found that the average residual to this line from 2008 through 2016 was only $1.8bn. We would think of the residual as how much the actual growth of the subsegment varies from its average, predicted growth based on historical trends. The residual to the line of best fit increased to $2.6bn in 2017, however, and is forecast to rise to an average of $9.9bn in 2018 through 2022, *an $8bn increase over the prior average*. The widening of the residual indicates the Industrial semi segment is growing faster than its historical growth rate. We also point to our calculated CAGRs as evidence of this: from 2008 through 2016, we calculate Industrial semi grew at a 5.8% CAGR versus a forecast 11.4% CAGR from 2016 through 2022E. In fact, we have seen the same trend within the Automotive subsegment, which has traditionally been a “mean reverting” end market as well.

Fig. 6: Industrial Semi Residual Analysis
In $mn



Source: Gartner, Instinet estimates

Fig. 7: Automotive Semi Residual Analysis
In $mn



Source: Gartner, Instinet estimates

We expect the stability we saw in Analog YTD to persist throughout the remainder of 2018. Consensus currently models revenue growth for C3Q and C4Q to be slightly above seasonal in C2H18 for a comp group of Analog semiconductors. We calculated the delta between the implied consensus Q/Q revenue growth for C3Q18 / C4Q18 and the respective median five-year historical seasonality for a peer group consisting of Analog Devices, Microchip, Maxim Integrated, NXP Semiconductors, ON Semiconductor, and Texas Instruments. For C3Q18, we calculate the median delta was +0.2%, implying that consensus currently expects seasonal revenue growth to be above that of the five-year historical median seasonality for the group. This metric was +0.4% for C4Q18, also implying above-median revenue seasonality. Even excluding ADI (socket loss impacts at Apple) in both quarters and Microchip in 3Q (contributions from MSCC acquisition), we calculate the deltas to be +0.2% and +0.3% for C3Q and C4Q, respectively.

Fig. 8: Consensus Q/Q revenue growth versus five-year median historical seasonality

	Consensus Estimates		5-Yr Median Seasonality		Delta versus Median	
	3Q18E	4Q18E	3Q18E	4Q18E	3Q18E	4Q18E
ADI	2.4%	(2.4)%	12.7%	(5.2)%	(10.3)%	2.8%
MCHP	31.1%	(1.4)%	4.1%	(1.8)%	27.0%	0.3%
MXIM	(0.7)%	0.2%	(3.8)%	(1.7)%	3.1%	1.9%
NXPI*	4.4%	(0.2)%	5.1%	2.9%	(0.8)%	(3.1)%
ON	3.3%	(2.5)%	4.0%	(0.3)%	(0.7)%	(2.2)%
TXN*	7.4%	(6.5)%	6.5%	(7.0)%	1.0%	0.5%
				Median (inc. ADI, MCHP)	**0.2%**	**0.4%**
				Median (exc. ADI; exc. MCHP in 3Q)	**0.2%**	**0.3%**

*NXPI and TXN covered by Instinet's Romit Shah

Source: FactSet, Instinet research

NOMURA | INSTINET

ON Semiconductor Corporation

ON.OQ ON US

EQUITY: AMERICAS SEMICONDUCTORS

Initiating with a Buy Rating, $30 TP

Improving Credibility and Successful Execution to Drive Multiple Expansion

- **ON Semiconductor has outperformed it benchmarks this year, with shares up 14.1% YTD, well ahead of SOX (+8.5%) and the S&P 500 (+5.08%).** Shares currently trade at a 35% discount to its peer group on an FY2 P/E basis, but we expect the multiple to expand. We believe the company's exposure to Industrial and Automotive is underappreciated by investors and that the solid execution on the integration of the FCS acquisition should help to enhance management's credibility. The company's 2020 financial targets will likely also prove conservative. We are initiating with a Buy rating and $30 target price based on a multiple of 2.3x 2019E EV/Sales.
- **We estimate Automotive/Industrial will constitute 59% of ON's total sales in 2018, which bodes well for revenue growth.** Gartner estimates these end markets will grow at 10.7% / 10.4% CAGRs (ex-memory) from 2017 through 2022, almost double the rate of the overall semis (5.1%).
- **Fairchild acquisition: Not only has management's execution on the integration process been excellent, but the transaction has yielded surprise upside**. Unexpected revenue synergies developed as ON became a provider of low-, mid-, and high-voltage products and demand grew in Fairchild's SiC and server power management businesses.
- **Management likely ahead of schedule on its 2020 target model, which may be conservative.** We model ON achieving its 2020 revenue, opex, and FCF targets at least one year ahead of management's schedule. If we substitute management's market growth rate forecasts for Automotive/Industrial, all else equal, our 2019 and 2020 revenue growth rate estimates would rise to 5.3% and 5.4%, respectively, versus the 3.0% we currently model. This revenue growth would also be well above ON's target revenue CAGR of 3.0%.
- **We estimate 2018E revenue/EPS of $5.73bn/$1.80 vs. consensus of $5.73bn/$1.78** and 2019 revenue/EPS of $5.91bn/$1.98 vs. consensus of $5.93bn/$1.97.
- **We initiate coverage of ON Semiconductor with a Buy rating and a $30 TP.** Our $30 TP is based on a 2.3x EV/Sales multiple, based on our propriety regression of EV/Sales versus Operating margins for stocks across the semiconductor industry.

Year-end : Dec	2017		2018E			2019E	
EPS (US$)	Actual	Prev.	Curr.	Cons.	Prev.	Curr.	Cons.
1Q	0.27A	N/A	0.40A	0.40E	N/A	0.45E	0.44E
2Q	0.36A	N/A	0.45E	0.45E	N/A	0.47E	0.48E
3Q	0.44A	N/A	0.48E	0.48E	N/A	0.53E	0.54E
4Q	0.39A	N/A	0.48E	0.45E	N/A	0.53E	0.50E
Year	1.46A	N/A	1.80E	1.78E	N/A	1.98E	1.97E
P/E (x)	16.36	N/A	13.25	13.47	N/A	12.07	12.15

Source: Company data, FactSet, Instinet estimates

Key company data: See next page for company data and detailed price/index chart.

Instinet, LLC, Equity Research

18 July 2018

Rating Starts at	**Buy**
Target Price Starts at	USD 30.00
Closing price 17 July 2018	USD 23.91
Potential upside	+25.5%

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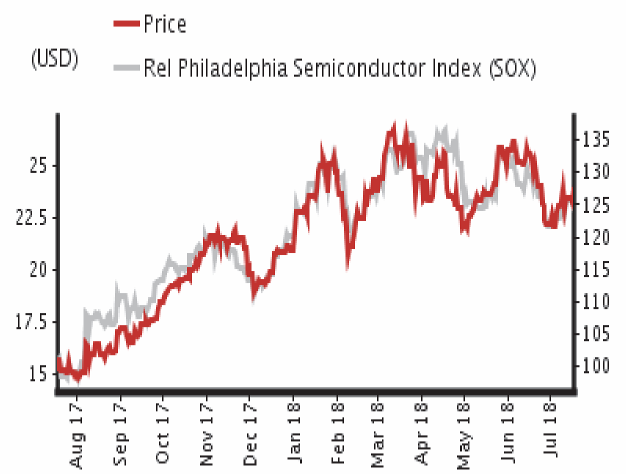
Key data on ON Semiconductor Corporation

Rating

Stock	Buy
Sector	Not rated

Relative performance chart



Source: Thomson Reuters, Instinet research

Performance as of 17 July 2018

(%)	1M	3M	12M
Absolute	-6.6	-7.1	59.3
Relative to Philadelphia Semiconductor Index (SOX)	-2.2	-7.2	35.7

Market data

Current Stock Price ($)	23.91
Market Cap ($mn)	10,223.0
52-week Low ($)	14.61
52-week High ($)	27.03
Shares Outstanding (mn)	427.56

Source: Thomson Reuters, Instinet research

Income Statement ($mn)

Year-end : Dec	2017A	2018E	2019E	2020E
Revenues	5,543	5,732	5,906	6,083
Gross Profit	1,991	2,184	2,304	2,430
Gross Margin	35.92	38.10	39.01	39.95
Operating Expenses	1,183	1,224	1,240	1,261
Operating Income	808	960	1,063	1,168
Other Inc./(Exp)	-114	-99	-87	-74
Pretax Income	695	861	977	1,094
Income Tax	68	78	117	131
Net Income (adj.)	625	779	856	959
EPS	1.46	1.80	1.98	2.22
Diluted Shares	427	432	432	432

Balance Sheet ($mn)

	2017A	2018E	2019E	2020E
Cash, Equivalents, & Investments	949	918	903	888
Accounts Receivable	702	709	715	739
Inventories	1,090	1,080	1,102	1,110
Other Current Assets	193	185	185	185
Total Current Assets	2,933	2,893	2,904	2,923
PP&E	2,279	2,436	2,546	2,625
Other Non-current Assets	438	442	442	442
Total Non-current Assets	4,262	4,396	4,505	4,585
Total Assets	7,195	7,289	7,410	7,508
Total Current Liabilities	1,409	1,937	1,212	1,217
Long-term Debt	2,704	1,499	1,539	716
Other Non-current Liabilities	282	282	282	282
Total Liabilities	4,394	3,719	3,033	2,215
Shareholders' Equity	2,801	3,570	4,377	5,292
Total Liabilities & Equity	7,195	7,289	7,410	7,508

Cash Flow Items ($mn)

	2017A	2018E	2019E	2020E
Cash from Operations	1,094	1,290	1,385	1,453
Cash from Investing	-365	-493	-472	-426
Cash from Financing	-811	-829	-928	-1,042
Depreciation	482	490	472	456
Capital Expenditures	-388	-487	-472	-426

Valuation

	2017A	2018E	2019E	2020E
Return on Equity	0.22	0.22	0.20	0.18
Debt to Capital	33.47	35.17	21.68	18.69
Debt to Assets	37.58	20.57	20.77	9.54
BVPS	6.50	8.21	10.08	12.20
Net Cash per Share	-4.69	-3.08	-1.47	0.40

Source: Company data, Instinet estimates

Executive Summary

ON Semiconductor has outperformed it benchmarks this year, with shares up 14.1% YTD, well ahead of SOX (+8.5%) and the S&P 500 (+5.08%). Shares currently trade at a 35% discount to the peer group on an FY2 P/E basis, but we expect the multiple to expand. We believe that the company's exposure to Industrial and Automotive is underappreciated by investors and that the solid execution on the integration of the FCS acquisition should help to enhance management's credibility. The company's 2020 financial targets will likely also prove conservative. We are initiating with a Buy rating and $30 target price based on a multiple of 2.3x 2019E EV/Sales.

We estimate Automotive and Industrial combined will constitute 59% of ON's total sales in 2018, which bodes well for revenue growth. Gartner estimates that these end markets will grow at a 10.7% and 10.4% CAGR (ex-memory), respectively, from 2017 through 2022. This is almost double the rate of the overall semi market (5.1% ex-memory). In Automotive, ON supplies solutions for multiple applications, including ADAS, LED lighting, Infotainment, and EV/Electrification applications. Notably, ON has just released a SiC-based product. In Industrial, Gartner estimates that ON is now the eighth-largest Industrial semi supplier, with 3.1% market share, up from #17, with 1.8% share in 2012.

Not only has management's execution on the integration process for the Fairchild acquisition been excellent, but the transaction has yielded surprise upside to revenue growth. When the deal closed, ON raised its cost synergies target from $150mn within 18 months of the deal close to $160mn. Furthermore, the company has noted additional, unexpected revenue synergies from the transaction in the form of 1) share gains as ON became a single provider of low-, mid-, and high-voltage products; and 2) greater demand and revenue generation from Fairchild's SiC and the server power management businesses, as well as some USB-C product lines.

ON is achieving several metrics in its target model, well ahead of 2020, due to solid execution in integrating Fairchild and better-than-anticipated revenue growth. Growth in the Industrial and Automotive markets has been well above the target CAGR, and Computing has declined less than expected due to strength in the server power management business. As such, we model 2018 revenues of $5.7bn, surpassing ON's 2020 target of $5.6bn. We now model ON achieving its 2020 target opex as a percentage of revenue of 21% in 2019, one year ahead of schedule, due to stronger revenues. Additionally, we forecast ON generating $913mn in FCF in 2019, also one year ahead of the initial plan.

ON's current long-term financial model could be conservative. ON guided to a revenue CAGR of 3.0% through 2020 at its 2017 Analyst Day. Applying the market growth rates of 11.5% / 10.8% for Automotive and 8.4% for Industrial in 2019/2020, all else equal, our 2019 and 2020 revenue growth rate estimates would rise to 5.3% and 5.4%, versus the 3.0% we currently model. This is also notably higher than the target model. We show our calculations in Figure 1.

Fig. 1: Incremental Revenue Growth from Auto/Industrial Market Growth Rates

	Instinet Current Model			Auto/Industrial Market Growth Rates		
	2018E	2019E	2020E	2018E	2019E	2020E
Segment						
Automotive	1,889	2,034	2,168	1,889	2,106	2,333
Y/Y growth	*12.6%*	*7.7%*	*6.6%*	12.6%	11.5%	10.8%
Computing	604	573	538	604	573	538
Y/Y growth	*10.7%*	*-5.2%*	*-6.1%*	10.7%	-5.2%	-6.1%
Consumer	737	699	660	737	699	660
Y/Y growth	*2.2%*	*-5.1%*	*-5.7%*	2.2%	-5.1%	-5.7%
Industrial/Medical	1,510	1,577	1,659	1,510	1,637	1,775
Y/Y growth	*9.1%*	*4.4%*	*5.2%*	9.1%	8.4%	8.4%
Communications	992	1,023	1,058	992	1,023	1,058
Y/Y growth	*-6.4%*	*3.1%*	*3.4%*	-6.4%	3.1%	3.4%
Total:	**$ 5,732**	**$ 5,906**	**$ 6,083**	**$ 5,732**	**$ 6,038**	**$ 6,363**
Y/Y growth		*3.0%*	*3.0%*		*5.3%*	*5.4%*
Delta					***$ 132***	***$ 281***
Incremental revenue growth					***2.3%***	***2.4%***
Upside to current estimates (%)					***2.2%***	***4.6%***

Source: Company data, Gartner, Instinet estimates

For 2018, we model revenue/EPS of $5.73bn/$1.80 versus consensus of $5.73bn/$1.78. For 2019, we estimate revenue/EPS of $5.91bn/$1.98 compared with consensus of $5.93bn/$1.97. We model 2Q18 revenue/EPS of $1.43bn/$0.45, which is in line with consensus and the company's guidance. All EPS estimates include SBC.

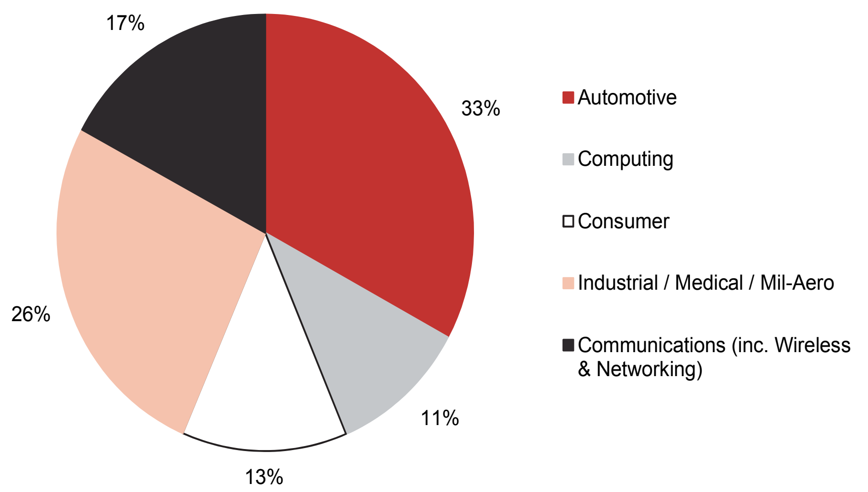
We initiate shares of ON Semiconductor with a Buy rating and $30 target price. Our $30 target price is based on 2.3x EV/Sales multiple, based on our propriety regression of EV/Sales versus Operating margins for stocks across the semiconductor industry. Using the line of best fit from this regression, our 2019 18.0% operating margin estimate implies an EV/Sales multiple of 2.3x. Our $5.91bn 2019E revenue estimate then implies an EV of $13.6bn, or a valuation of $30 per share. .

ON's Automotive and Industrial Exposure Bodes Well for Revenue Growth

Automotive and Industrial are two of the fastest growing subsegments within semiconductors. We estimate the Automotive semiconductor market will grow to $40.7bn in 2018, up from $36.5bn in 2017. Gartner models the Automotive semiconductor end market growing at a 10.7% CAGR from 2017 through 2022, well above the overall semi market CAGR of 5.1%. Industrial has a similar outlook; Gartner forecasts this end market growing at a 10.4% CAGR from 2017-2022. It estimates the Industrial market to have a total TAM of $37.0bn in 2017, growing to $40.2bn in 2018 and $60.9bn in 2022. We note all growth rates exclude memory.

We estimate Automotive and Industrial combined will comprise 59% of ON's total sales in 2018, leaving it meaningfully exposed to some of semi's fastest growing end markets. We model Automotive growing from 31% of revenues in 2017 to 33% in 2018 and Industrial remaining at 26% of revenues for both years. Management expects both segments will grow to 60% of total revenue by 2020, as noted during their Analyst Day in 2017. The increase of Automotive and Industrial as a percentage of revenues is due to several reasons we believe: 1) these segments are expected to outperform ON's total sales growth and 2) two of ON's other end markets, Computing and Consumer, are modeled to decline, in both nominal sales and as a percentage of revenue, for secular reasons.

Fig. 2: ON Semiconductor 2018E revenue break out



Source: Company data, Instinet estimates

Given the better margin profiles of these businesses, we expect the Automotive and Industrial expansion to serve as a tailwind for margins over the next several years. During their Analyst Day in March 2017, management noted that the positive product mix shift toward Industrial and Automotive should contribute 90bps of gross margin expansion from 2016 through 2020. Automotive and Industrial businesses across the industry typically have more accretive margins because of the lengthy design/sales cycles, capability to work in rugged environments (potential need for additional certifications), and long product lifecycles.

ON supplies solutions for ADAS, LED lighting, Infotainment, and EV/Electrification applications, among others, in the Automotive market, aligning them with the fastest growing subsegments. ON is the only semiconductor supplier that offers all 3 of the sensors needed for ADAS applications: Vision Control Module/Cameras, Radar, and LIDAR. Management has indicated the company has 70% share in ADAS image sensor applications; we believe this business is expected to grow at 20-25% per year over the next 5 years. Gartner forecasts Automotive LED lighting to grow at a 21.1% CAGR from 2017-2022—ON holds the #1 market share position in automotive lighting motion control and the #2 position in automotive LED power. ON also has strong market positions in stop/start technology and motor control.

ON offers multiple solutions for powertrain electrification—noteworthy, as EV penetration is still in its infancy. In our report "Charging Towards an Electric Future" from January 2018, we identified several areas in which ON supplied solutions, including Power MOSFETs, IGBTs, rectifiers, PFC components in the onboard chargers and switching devices in the auxiliary DC-DC converter module. Furthermore, and perhaps most important, ON has been sampling SiC diodes for EV applications and will begin production in 2H2018. We discuss the importance of SiC in a later section. And while EVs remain a minority in the automobile market (roughly 3.6mn units in 2017 vs. total annual units of 96.2mn), our colleagues at Nomura forecast alternative energy vehicles (including hybrids) to grow to 54.8mn units in 2030, implying a 23.3% CAGR. This should provide a meaningful tailwind for growth over the next several years: Cree, Inc. estimates the SiC market for EV applications to grow from global revenues of $7mn in 2017 to $2.4bn in 2022 and reach $15bn in 2032, assuming 30% EV penetration in autos. This implies a 67% CAGR from 2017 through 2032.

We believe management's 3-5% revenue growth guidance for Industrial in their 2020 model could be conservative; in fact, we estimate the Industrial segment could grow in the high-single digits. This growth would be driven by ON's exposure to increasing semi content in automation, cost saving/power management, and connectivity trends. ON Semiconductor has one of the broadest Industrial sensor product portfolios in the market, with leading market share in machine vision, scanning, specialty Industrial, medical, and IP Security. Gartner estimates that ON is now the eighth-largest Industrial semi supplier, with 3.1% market share, up from #17, with 1.8% share five years ago in 2012. The company has benefited from the migration toward higher degrees of factory automation, M2M quality control (inspection is done with camera and image sensors), and power management initiatives to reduce costs and/or energy consumption—we estimate 70% of all power generated is consumed by motors, so small increases in efficiency would yield meaningful cost/energy savings.

Fairchild Acquisition Driving Unexpected Upside

On November 18, 2015, ON entered into a definitive agreement to acquire Fairchild Semiconductor (FCS) for $20 per share. The total purchase price was $2.4bn. Management guided for the transaction to be immediately accretive to ON's non-GAAP EPS and FCF (excluding acquisition/restructuring charges) and annual cost synergies of $150mn within 18 months of the deal closing. Other parties became involved in the bidding process, but none were considered "superior offers." The acquisition of Fairchild Semiconductor was completed on September 19, 2016.

Management's execution on the integration process has been excellent. Within 18 months of the deal's close, ON management raised its cost synergies target from $150mn to $160mn. They also initiated cost savings targets of $200mn by year-end 2018 and $225mn by year-end 2019. As of May 2018, nearly all opex-related synergies had been completed, with mainly gross margin-related synergies remaining. These COGS synergies should be captured as the company continues to move its back-end production in-house. We expect to see the impact of this insourcing reflected in gross margins in 2018 and 2019. This is reflected in our model as we estimate gross margins of 38.1% in 2018 (+140bps Y/Y on 3.4% revenue growth) and 39.0% in 2019 (+90bps year over year on 3.0% revenue growth).

Even excluding the solid execution on integration, the FCS acquisition has yielded surprising upside to revenue growth. We point to two main drivers of the incremental revenue upside:

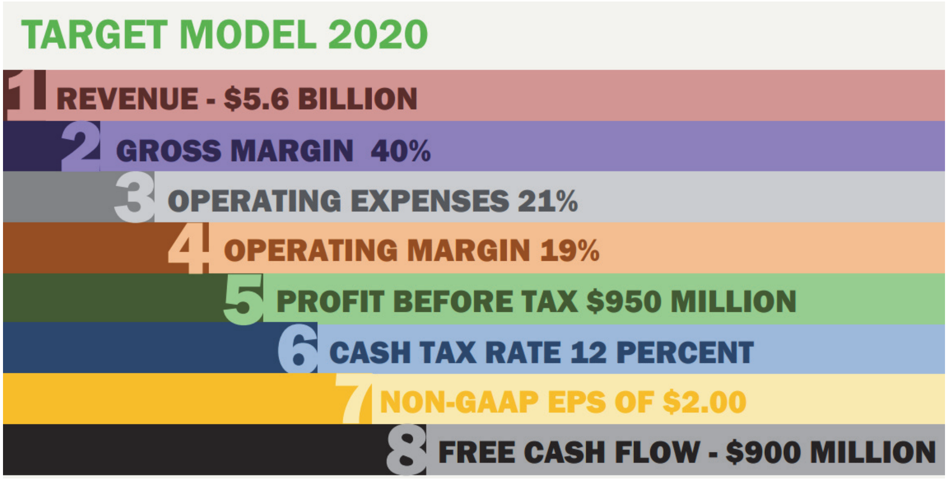
1) **Unexpected revenue synergies have driven incremental upside.** One of the main benefits of the FCS transaction was that it established ON as a provider of low-, mid-, and high-voltage products. ON then began to see customers shift some business away from another supplier, who we believe to be Infineon, as this supplier previously had a near-monopolistic position in the mid- to high-voltage space.

2) **Several business lines that ON acquired from FCS are seeing greater demand and stronger revenue generation than the company initially budgeted for.** These product lines include Fairchild's SiC business, some USB-C products, and server power management business. We believe that fundamental shifts in industry demand were mainly responsible for this upside; for example, SiC's value in EV applications was not yet well known. We expect SiC to become a major component in EVs as it drives higher power efficiency for a lower cost. Infineon estimates SiC can offer volume reductions of 50% to 80% and an approximate 5% gain in efficiency versus traditional Si in inverter applications for EVs. For the onboard charger (EVs), Cree estimates that SiC is 5x lighter, 3x smaller, and has 25% lower semiconductor losses compared with traditional silicon. The USB-C and server power management businesses have also contributed to better-than-expected revenue growth in Consumer and Compute. In fact, we model Compute up 11% Y/Y in 2018, well above the guided CAGR of (6%) – (4%), mainly due to the unexpected demand in server power management.

Recent Execution Signals Target Financial Model May Be Conservative

ON's 2020 target model issued in 2017 guided to 3.0% annual revenue growth, assuming an industry CAGR of 1.5-2%. At its Analyst Day in March 2017, ON issued a 2020 corporate target model of $5.6bn in revenues (implying 3.0% CAGR), gross margin of 40%, operating margin of 19%, non-GAAP EPS of $2.00, and FCF of $900mn. Segment revenue CAGR guidance was as follows: Automotive 7-9%, Industrials 3-5%, Communications 2-4%, Consumer (7%) – (5%), and Computing (6%) – (4%).

Fig. 3: ON Semiconductor Target Model from March 2017



Source: Company data (2017 Analyst Day), Instinet research

ON is achieving several metrics in its target model well ahead of 2020 due to solid execution in integrating Fairchild and unexpected revenue synergies/growth. Industrial and Automotive markets have been well above the target CAGR and Computing has declined less than expected due to strength in the server power management business. As such, we model 2018 revenues of $5.7bn, surpassing its target of $5.6bn by 2020. We now model ON achieving its target opex as a percentage of revenue of 21% in 2019, one year ahead of schedule, due to the stronger revenues. Additionally, we forecast ON generating $913mn in FCF in 2019, also one year ahead of the initial plan.

Considering forecast high-single/double-digit growth in Industrial and Automotive, we believe ON's target revenue CAGR of 3.0% may be conservative. In our analysis, we left our assumptions for Computing, Consumer, and Communications unchanged, but substituted revenue growth of 11.5% and 10.8% for Automotive and 8.4% for Industrial in 2019 and 2020, respectively. These market growth rates are in line with Gartner's forecasts in these end markets (excluding memory). We calculate that 2019 and 2020 revenue growth estimates would rise to 5.3% and 5.4% versus the 3.0% we currently model.

Fig. 4: Incremental Revenue Growth from Auto/Industrial Market Growth Rates

	Instinet Current Model			Auto/Industrial Market Growth Rates		
	2018E	2019E	2020E	2018E	2019E	2020E
Segment						
Automotive	1,889	2,034	2,168	1,889	2,106	2,333
Y/Y growth	*12.6%*	*7.7%*	*6.6%*	12.6%	11.5%	10.8%
Computing	604	573	538	604	573	538
Y/Y growth	*10.7%*	*-5.2%*	*-6.1%*	10.7%	-5.2%	-6.1%
Consumer	737	699	660	737	699	660
Y/Y growth	*2.2%*	*-5.1%*	*-5.7%*	2.2%	-5.1%	-5.7%
Industrial/Medical	1,510	1,577	1,659	1,510	1,637	1,775
Y/Y growth	*9.1%*	*4.4%*	*5.2%*	9.1%	8.4%	8.4%
Communications	992	1,023	1,058	992	1,023	1,058
Y/Y growth	*-6.4%*	*3.1%*	*3.4%*	-6.4%	3.1%	3.4%
Total:	**$ 5,732**	**$ 5,906**	**$ 6,083**	**$ 5,732**	**$ 6,038**	**$ 6,363**
Y/Y growth		*3.0%*	*3.0%*		*5.3%*	*5.4%*
Delta					***$ 132***	***$ 281***
Incremental revenue growth					***2.3%***	***2.4%***
Upside to current estimates (%)					***2.2%***	***4.6%***

Source: Company data, Gartner, Instinet estimates

Deleveraging and repurchases also drive upside in EPS. On their recent conference call, management discussed that they will be initiating a buyback in addition to paying down debt. We assume the company will primarily use the share repurchase program to offset dilution, with the remainder of FCF funneled into deleveraging. As such, we estimate an annualized share repurchase program of $205mn per year (assuming a 30-day average share price of $23.73) for 2019-2020. Assuming the remainder of FCF is used to repay debt, we estimate ON will deleverage by $716mn in 2018, $708mn in 2019, and $823mn in 2020. If we apply a 3.25% interest rate to their debt balance, we calculate that this deleveraging could reduce ON's interest expense to $74mn in 2020 vs. its prior corporate target of $100-110mn.

Financial Model

Our Estimates Are Broadly in Line with the Street

For 2Q18, we estimate revenue/EPS of $1.43bn/$0.45, which is in line with consensus and the company's guidance. We model gross margins of 38.0% for the quarter and an operating margin of 16.2%. Our tax rate is assumed to be 6.3%, which is implied from company guided tax expense of $13mn at the midpoint.

For 3Q18, we model revenue/EPS of $1.47bn/$0.48, also relatively in line with consensus estimates of $1.48bn/$0.48. We estimate gross and operating margins of 38.4% and 17.3%, respectively. We assume a 10% tax rate and flat share count to 2Q18.

For 2018, we model revenue/EPS of $5.73bn/$1.80 versus consensus of $5.73bn/$1.78. We note this surpasses the company's 2020 revenue target of $5.6bn. We assume gross margin of 38.1%, opex of $1.22bn, and operating margin of 16.8%. Our estimate for income expense declines Y/Y to $99mn due to the assumed deleveraging. Applying a 9.1% tax rate for the year and a flat share count to 2Q18, we calculate implied EPS of $1.80.

For 2019, we estimate revenue/EPS of $5.91bn/$1.98 compared with consensus of $5.93bn/$1.97. We also model the company achieving their corporate model of 39.0% gross margin, 21.0% opex as percent of sales, and 18.0% operating margin—one year ahead of their 2020 target. Because of deleveraging, we again calculate the annual interest expense declining year over year to $87mn and assume a 12.0% tax rate, in line with ON's target model. We further assume the share count remains flat to 2018. For 2020, we model revenue/EPS of $6.08bn/$2.22 versus consensus of $6.08bn/$2.19.

Fig. 5: Instinet Estimates vs. Consensus

	2Q18E		3Q18E		2018E		2019E		2020E	
(in $mn)	Instinet	Consensus	Instinet	Consensus	Instinet	Consensus	Instinet	Consensus	Instinet	Consensus
Sales	1,431	1,430	1,469	1,477	5,732	5,728	5,906	5,934	6,083	6,076
Seq growth	3.9%	3.8%	2.7%	3.3%	3.4%	3.3%	3.0%	3.6%	3.0%	2.4%
Gross margin	38.0%	38.0%	38.4%	38.5%	38.1%	38.1%	39.0%	38.8%	39.9%	40.1%
Operating margin	16.2%	16.2%	17.3%	17.4%	16.8%	16.5%	18.0%	17.6%	19.2%	18.6%
EPS (Non-GAAP)	$0.45	$0.45	$0.48	$0.48	$1.80	$1.78	$1.98	$1.97	$2.22	$2.19

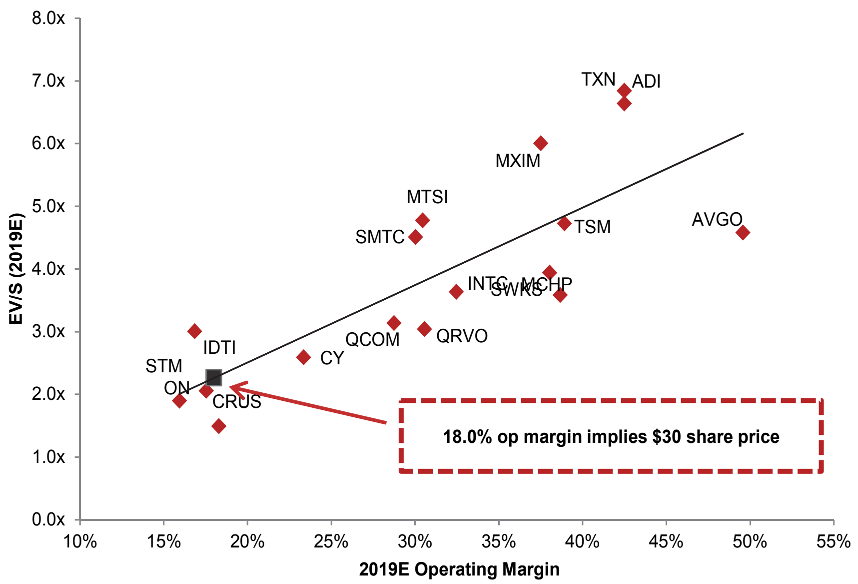
Source: Company data, FactSet, Instinet estimates

Valuation and Rating

EV/Sales vs. Operating Margin Regression Implies $30 per Share Valuation

We value ON Semiconductor at $30 per share based on our EV Sales vs. operating margin analysis. To arrive at this valuation, we performed a regression analysis of EV/2019E Sales against 2019 consensus operating margin forecasts for multiple companies within our space to create a linear regression formula. The correlation of this regression is 0.79. Using this formula, we calculate that our estimate for ON's operating margin of 18.0% in 2019 implies the shares should be trading at a 2.3x EV/2019 Sales multiple. We then calculate an implied EV of $13.6bn and using our 2019-end net debt balance of $636mn, we estimate an implied market cap of $12.9bn. Using the share count as of end-1Q18, we calculate an implied share price of $30.

Fig. 6: EV / 2019 Sales vs. Operating Margin Regression



Source: Company data, FactSet, Instinet estimates

P/E Analysis Reinforces Our $30 per Share Valuation

ON has traded at a 43% average discount to its peer group in the past 5 years. We analyzed the historical FY2 P/E over the past 5 years for ON, Texas Instruments, Microchip, Analog Devices, Infineon, STMicroelectronics, Maxim Integrated (not covered), Silicon Labs (not covered), and Xilinx . We calculated that over this time frame, ON traded at an average discount of 43% to this comp group. This discount was fueled by two main factors, in our view: 1) ON's missteps in integrating the SANYO acquisition in 2011 and 2) investor's perception that the company mainly offers only "commodity" products.

We believe that ON has addressed both of these issues and, as such, deserves a narrower discount relative to the comp group. ON has addressed both concerns with the solid execution in the FCS integration and by the fact that the majority of their product portfolio (>75%) consists of specialized products. While we acknowledge that the company may need to continue its solid execution and reestablish a track record in order to receive the full multiple, we believe the shares should at least receive some credit for the progress made. Shares currently trade at a 35% discount to the comp group, less than the 43% 5-yr average discount, but we believe the shares should trade closer to a 25% discount, based on the stock's multiple expansion over the TTM. ON's discount to the peer group has declined by 19.0% since July 2017. If we assume the discount continues to decline at this rate, we calculate the shares' discount will compress to only 25% within the NTM. We apply this discount to the comp group's current average FY2 P/E of 19.2x to arrive at a 14.4x multiple, which implies a $29 per share valuation assuming our 2019E EPS estimate (including SBC) of $1.98.

Fig. 7: ON Semiconductor Comp Group

	FY2 P/E
Texas Instruments*	19.2x
Microchip	13.0x
Analog Devices	16.6x
Infineon	21.3x
STMicroelectronics	15.3x
Maxim Integrated	21.2x
Silicon Laboratories	25.4x
Xilinx*	21.4x
Average	**19.2x**

*TXN and XLNX are covered by Romit Shah

Source: FactSet, Instinet estimates

Fig. 8: ON Semiconductor FY2 P/E Valuation

Assumed FY2 P/E Discount	25.0%
Comp group average FY2 P/E	19.2x
Implied ON FY2 P/E Multiple	**14.4x**
ON 2019E EPS (including SBC)	$1.98
Implied Share Price	**$ 29**

Source: FactSet, Instinet estimates

Initiating with a Buy Rating, $30 Target Price

We initiate shares of ON Semiconductor with a Buy rating and $30 target price. We are bullish on the shares considering the company's exposure to the fastest-growing sub-segments within the semi market (Automotive & Industrial), strong positioning within these markets, developing revenue synergies from the Fairchild acquisition, and potential upside in the company's target financial model. We initiate with a $30 target price based on a 2.3x EV/Sales multiple we derived from a propriety regression of EV/Sales versus Operating margins for stocks across the semiconductor industry.

Risks to Our Target Price

- Global or domestic economic conditions worsening, as semiconductors are exposed to overall global GDP and macro conditions. Semiconductors as an industry are generally exposed to the overall global GDP and cycle and macro conditions. A recession could affect ON's results.
- ON Semiconductor failing to adequately compete against its peers, as the semiconductor industry is highly competitive.

- Demand stagnation or declines in Automotive or Industrial could adversely impact revenue. Should these markets experience slower growth or weaker demand than expected, there could be risk to our target price.
- Geopolitical conditions could worsen, which may have a negative impact on ON’s revenues. ON sells its products both domestically and globally, including to China. Should geopolitical tensions between China and the U.S. worsen, there may be risk to our target price.
- ON sells its products globally, so any trade war or tariffs imposed by other countries against the U.S. could result in weakened product demand. A trade war or tariffs by countries outside of the U.S. could have an adverse impact on ON’s profitability.

Fig. 9: ON Segment Revenue Model

	2017				2018E				2019E				2017	2018E	2019E	2020E
($ in millions)	**Mar-17**	**Jun-17**	**Sep-17**	**Dec-17**	**Mar-18**	**Jun-18E**	**Sep-18E**	**Dec-18E**	**Mar-19E**	**Jun-19E**	**Sep-19E**	**Dec-19E**	**Dec-17**	**Dec-18**	**Dec-19**	**Dec-20**
REVENUE ANALYSIS																
GAAP Revenue - End Market																
Automotive	416	412	413	437	445	472	472	499	514	499	499	521	1,678	1,889	2,034	2,168
Computing	126	131	150	139	149	151	158	146	138	142	153	139	546	604	573	538
Consumer	170	185	191	175	182	182	191	183	165	173	185	177	721	737	699	660
Industrial / Medical / Mil-Aero	323	351	352	358	362	387	387	375	375	390	404	408	1,384	1,510	1,577	1,659
Communications (inc. Wireless & Networking)	247	260	285	269	240	240	261	251	236	250	275	262	1,060	992	1,023	1,058
Total	**$ 1,282**	**$ 1,338**	**$ 1,391**	**$ 1,378**	**$ 1,378**	**$ 1,431**	**$ 1,469**	**$ 1,454**	**$ 1,429**	**$ 1,454**	**$ 1,516**	**$ 1,508**	**$ 5,388**	**$ 5,732**	**$ 5,906**	**$ 6,083**
QoQ growth																
Automotive	12%	-1%	0%	6%	2%	6%	0%	6%	3%	-3%	0%	5%				
Computing	-3%	4%	15%	-8%	8%	1%	5%	-8%	-5%	3%	8%	-9%				
Consumer	-3%	9%	3%	-8%	3%	0%	5%	-4%	-10%	5%	7%	-4%				
Industrial / Medical / Mil-Aero	6%	9%	0%	1%	1%	7%	0%	-3%	0%	4%	4%	1%				
Communications (inc. Wireless & Networking)	-12%	5%	10%	-6%	-11%	0%	9%	-4%	-6%	6%	10%	-5%				
Total	2%	4%	4%	-1%	0%	4%	3%	-1%	-2%	2%	4%	-1%				
YoY growth																
Automotive	31%	30%	33%	18%	7%	15%	14%	14%	16%	6%	6%	4%	28%	13%	8%	7%
Computing	66%	49%	53%	6%	18%	15%	6%	5%	-7%	-6%	-3%	-4%	39%	11%	-5%	-6%
Consumer	88%	94%	59%	1%	7%	-2%	0%	4%	-9%	-5%	-3%	-3%	50%	2%	-5%	-6%
Industrial / Medical / Mil-Aero	67%	60%	50%	17%	12%	10%	10%	5%	4%	1%	4%	9%	45%	9%	4%	5%
Communications (inc. Wireless & Networking)	75%	63%	52%	-4%	-3%	-8%	-8%	-7%	-2%	4%	5%	4%	38%	-6%	3%	3%
Total	57%	52%	46%	9%	7%	7%	6%	6%	4%	2%	3%	4%	38%	6.4%	3.0%	3.0%
Percent of Total																
Automotive	32%	31%	30%	32%	32%	33%	32%	34%	36%	34%	33%	35%	31%	33%	34%	36%
Computing	10%	10%	11%	10%	11%	11%	11%	10%	10%	10%	10%	9%	10%	11%	10%	9%
Consumer	13%	14%	14%	13%	13%	13%	13%	13%	12%	12%	12%	12%	13%	13%	12%	11%
Industrial / Medical / Mil-Aero	25%	26%	25%	26%	26%	27%	26%	26%	26%	27%	27%	27%	26%	26%	27%	27%
Communications (inc. Wireless & Networking)	19%	19%	20%	19%	17%	17%	18%	17%	17%	17%	18%	17%	20%	17%	17%	17%
Total	100%	100%	100%	100%	83%	83%	82%	83%	83%	83%	82%	83%	100%	100%	100%	100%

Source: Company data, Instinet estimates

Fig. 10: ON Income Statement

Year End: December	2017				2018E				2019E				2017	2018E	2019E	2020E
($ in millions except per share data)	Mar-17	Jun-17	Sep-17	Dec-17	Mar-18	Jun-18E	Sep-18E	Dec-18E	Mar-19E	Jun-19E	Sep-19E	Dec-19E	Dec-17	Dec-18	Dec-19	Dec-20
INCOME STATEMENT																
Total Revenues	**$ 1,437**	**$ 1,338**	**$ 1,391**	**$ 1,378**	**$ 1,378**	**$ 1,431**	**$ 1,469**	**$ 1,454**	**$ 1,429**	**$ 1,454**	**$ 1,516**	**$ 1,508**	**$ 5,543**	**$ 5,732**	**$ 5,906**	**$ 6,083**
QoQ	13.9%	-6.9%	4.0%	-1.0%	0.0%	3.9%	2.7%	-1.0%	-1.8%	1.8%	4.2%	-0.5%				
YoY	75.8%	52.4%	46.3%	9.2%	-4.1%	6.9%	5.6%	5.6%	3.7%	1.6%	3.2%	3.7%	41.9%	3.4%	3.0%	3.0%
COGS	983	845	864	861	860	887	905	896	879	890	919	914	3,552	3,548	3,602	3,653
Gross profit	454	493	527	517	517	544	564	558	550	564	596	594	1,991	2,184	2,304	2,430
R&D	140	146	151	158	155	159	158	154	155	157	160	159	594	625	632	642
SMG&A	146	156	148	151	149	153	152	148	149	151	154	153	601	601	609	619
Amort. of acquisition-related intangible assets	29	29	37	29	27	27	27	27	27	27	27	27	124	110	110	110
Restructuring, impairment and other	5	8	11	10	0	3	0	0	0	0	0	0	34	3	-	-
Non-GAAP operating expenses	285	297	296	305	301	312	310	302	305	309	315	313	1,183	1,224	1,240	1,261
Operating income	169	197	231	212	217	232	255	257	245	255	282	281	808	960	1,063	1,168
Other income (expense), net	(36)	(26)	(28)	(24)	(26)	(25)	(24)	(23)	(23)	(22)	(21)	(21)	(114)	(99)	(87)	(74)
Pretax income	133	171	203	187	191	207	230	233	222	233	260	261	695	861	977	1,094
Income tax expense (benefit)	18	17	13	19	19	13	23	23	27	28	31	31	68	78	117	131
Net inc. attributable to noncontrolling interest	1	1	0	1	1	1	1	1	1	1	1	1	2	4	4	4
Net Income (GAAP)	$ 78	$ 94	$ 109	$ 530	$ 140	$ 146	$ 170	$ 172	$ 162	$ 172	$ 196	$ 197	$ 811	$ 627	$ 727	$ 833
Net Income (Non-GAAP)	**$ 114**	**$ 154**	**$ 189**	**$ 167**	$ 171	$ 193	$ 206	$ 209	$ 195	$ 204	$ 228	$ 228	**$ 625**	**$ 779**	**$ 856**	**$ 959**
EPS (GAAP)	$0.18	$0.22	$0.25	$1.22	$0.31	$0.33	$0.38	$0.39	$0.36	$0.39	$0.44	$0.44	$1.89	$1.41	$1.63	$1.87
EPS (Non-GAAP)	**$0.27**	**$0.36**	**$0.44**	**$0.39**	**$0.40**	**$0.45**	**$0.48**	**$0.48**	**$0.45**	**$0.47**	**$0.53**	**$0.53**	**$1.46**	**$1.80**	**$1.98**	**$2.22**
Diluted shares outstanding (Non-GAAP)	426	426	428	430	432	432	432	432	432	432	432	432	427	432	432	432
Percent of Sales																
Gross Margin (GAAP)	35.0%	36.8%	37.7%	37.3%	37.6%	38.0%	38.4%	38.4%	38.5%	38.8%	39.3%	39.4%	36.7%	38.1%	39.0%	39.9%
Gross Margin	31.6%	36.9%	37.9%	37.5%	37.6%	38.0%	38.4%	38.4%	38.5%	38.8%	39.3%	39.4%	35.9%	38.1%	39.0%	39.9%
R&D	9.7%	10.9%	10.8%	11.5%	11.3%	11.1%	10.7%	10.6%	10.9%	10.8%	10.6%	10.6%	10.7%	10.9%	10.7%	10.6%
SMG&A	10.2%	11.7%	10.6%	11.0%	10.8%	10.7%	10.3%	10.2%	10.5%	10.4%	10.2%	10.2%	10.8%	10.5%	10.3%	10.2%
Operating Margin	11.8%	14.7%	16.6%	15.4%	15.7%	16.2%	17.3%	17.7%	17.2%	17.6%	18.6%	18.7%	14.6%	16.8%	18.0%	19.2%
Pretax income margin	9.3%	12.8%	14.6%	13.6%	13.8%	14.5%	15.7%	16.0%	15.6%	16.0%	17.2%	17.3%	12.5%	15.0%	16.5%	18.0%
Tax Rate	13.8%	10.0%	6.6%	10.1%	10.0%	6.3%	10.0%	10.0%	12.0%	12.0%	12.0%	12.0%	9.8%	9.1%	12.0%	12.0%
Net Margin	8.0%	11.5%	13.6%	12.1%	12.4%	13.5%	14.1%	14.4%	13.6%	14.1%	15.1%	15.1%	11.3%	13.6%	14.5%	15.8%

Source: Company data, Instinet estimates

Fig. 11: ON Balance Sheet

Year End: December	2017				2018E				2019E				2017	2018E	2019E	2020E
($ in millions)	Mar-17	Jun-17	Sep-17	Dec-17	Mar-18	Jun-18E	Sep-18E	Dec-18E	Mar-19E	Jun-19E	Sep-19E	Dec-19E	Dec-17	Dec-18	Dec-19	Dec-20
BALANCE SHEET																
Assets																
Cash, Equiv, and ST Investments	729	872	901	949	925	923	920	918	913	910	906	903	949	918	903	888
Accounts Receivable	678	696	696	702	697	690	716	709	689	689	718	715	702	709	715	739
Inventories	1,011	1,002	1,029	1,090	1,160	1,089	1,091	1,080	1,059	1,073	1,108	1,102	1,090	1,080	1,102	1,110
Other current assets	191	194	190	193	185	185	185	185	185	185	185	185	193	185	185	185
Total Current Assets	2,609	2,764	2,815	2,933	2,967	2,887	2,912	2,893	2,846	2,857	2,918	2,904	2,933	2,893	2,904	2,923
PP&E, net	2,156	2,215	2,238	2,279	2,336	2,382	2,409	2,436	2,464	2,491	2,518	2,546	2,279	2,436	2,546	2,625
Goodwill	925	925	917	917	917	917	917	917	917	917	917	917	917	917	917	917
Intangible assets, net	731	709	663	628	601	601	601	601	601	601	601	601	628	601	601	601
Deferred tax assets	144	148	149	339	333	333	333	333	333	333	333	333	339	333	333	333
Other assets	73	73	80	99	109	109	109	109	109	109	109	109	99	109	109	109
Total Non-Current Assets	4,028	4,070	4,046	4,262	4,296	4,342	4,368	4,396	4,423	4,451	4,478	4,505	4,262	4,396	4,505	4,585
Total Assets	**$ 6,637**	**$ 6,834**	**$ 6,861**	**$ 7,195**	**$ 7,263**	**$ 7,229**	**$ 7,281**	**$ 7,289**	**$ 7,269**	**$ 7,308**	**$ 7,396**	**$ 7,410**	**$ 7,195**	**$ 7,289**	**$ 7,410**	**$ 7,508**
Liabilities																
Accounts payable	464	546	590	548	612	598	610	604	593	600	630	626	548	604	626	631
Accrued expenses	475	549	581	613	586	586	586	586	586	586	586	586	613	586	586	586
Current portion of long-term debt	273	268	259	248	747	747	747	747	-	-	-	-	248	747	-	-
Total Current Liabilities	1,212	1,363	1,429	1,409	1,945	1,931	1,943	1,937	1,178	1,186	1,216	1,212	1,409	1,937	1,212	1,217
Long Term Debt	2,987	2,872	2,684	2,704	2,084	1,870	1,699	1,499	2,059	1,897	1,739	1,539	2,704	1,499	1,539	716
Deferred tax liabilities	246	271	309	55	57	57	57	57	57	57	57	57	55	57	57	57
Other Long Term Liabilities	194	208	203	226	225	225	225	225	225	225	225	225	226	225	225	225
Total Non-Current Liabilities	3,427	3,352	3,197	2,985	2,367	2,152	1,981	1,782	2,342	2,179	2,021	1,821	2,985	1,782	1,821	998
Total Liabilities	**$ 4,639**	**$ 4,715**	**$ 4,626**	**$ 4,394**	**$ 4,312**	**$ 4,083**	**$ 3,924**	**$ 3,719**	**$ 3,520**	**$ 3,365**	**$ 3,236**	**$ 3,033**	**$ 4,394**	**$ 3,719**	**$ 3,033**	**$ 2,215**
Shareholders' Equity	**$ 1,976**	**$ 2,097**	**$ 2,212**	**$ 2,779**	**$ 2,928**	**$ 3,123**	**$ 3,333**	**$ 3,547**	**$ 3,726**	**$ 3,920**	**$ 4,137**	**$ 4,354**	**$ 2,779**	**$ 3,547**	**$ 4,354**	**$ 5,269**
Noncontrolling interest	**$ 22**	**$ 23**	**$ 23**	**$ 22**	**$ 23**	**$ 23**	**$ 23**	**$ 23**	**$ 23**	**$ 23**	**$ 23**	**$ 23**	**$ 22**	**$ 23**	**$ 23**	**$ 23**
Total Liabilities and Equity	**$ 6,637**	**$ 6,834**	**$ 6,861**	**$ 7,195**	**$ 7,263**	**$ 7,229**	**$ 7,281**	**$ 7,289**	**$ 7,269**	**$ 7,308**	**$ 7,396**	**$ 7,410**	**$ 7,195**	**$ 7,289**	**$ 7,410**	**$ 7,508**

Source: Company data, Instinet estimates

Fig. 12: ON Cash Flow Statement

Year End: December ($ in millions)	2017 Mar-17	Jun-17	Sep-17	Dec-17	2018E Mar-18	Jun-18E	Sep-18E	Dec-18E	2019E Mar-19E	Jun-19E	Sep-19E	Dec-19E	2017 Dec-17	2018E Dec-18	2019E Dec-19	2020E Dec-20
CASH FLOWS																
Cash flows from operations																
Net income	$ 79	$ 94	$ 109	$ 531	$ 141	$ 147	$ 170	$ 173	$ 163	$ 173	$ 197	$ 197	$ 813	$ 630	$ 731	$ 836
Depreciation & Amortization	114	117	128	123	120	122	125	124	114	116	121	121	482	490	472	456
Loss (gain) on sale or disposal of fixed assets	3	(1)	1	1	1	-	-	-	-	-	-	-	4	1	-	-
Gain on divestiture of business		-	(13)	-	-	-	-	-	-	-	-	-	(13)	-	-	-
Loss on debt refinancing and prepayment	26	-	7	14	-	-	-	-	-	-	-	-	47	-	-	-
Amortization of debt discount and issuance costs	5	4	4	4	3	3	3	3	3	3	3	3	16	13	13	13
Payments for term debt modification	(2)	-	-	(1)	-	-	-	-	-	-	-	-	(4)	-	-	-
Write-down of excess inventories	14	21	21	10	9	16	14	12	13	14	13	13	67	51	53	53
Share-based compensation expense	15	21	17	17	18	25	20	21	21	22	22	22	70	84	87	89
Non-cash interest on convertible notes	5	9	9	9	9	9	9	9	9	9	9	9	31	34	34	34
Non-cash asset impairment charges	-	-	6	1	-	-	-	-	-	-	-	-	7	-	-	-
Non-cash intangible asset impairment charges	4	2	2	5	-	-	-	-	-	-	-	-	13	-	-	-
Change in deferred taxes	36	21	39	(444)	8	-	-	-	-	-	-	-	(348)	8	-	-
Other	2	1	1	(0)	(1)	-	-	-	-	-	-	-	2	(1)	-	-
Changes in operating assets and liabilities	(92)	45	(1)	(45)	(81)	64	(16)	12	29	(6)	(35)	7	(93)	(22)	(5)	(28)
Cash flows from operations	**$ 209**	**$ 333**	**$ 328**	**$ 224**	**$ 227**	**$ 385**	**$ 325**	**$ 353**	**$ 353**	**$ 330**	**$ 330**	**$ 372**	**$ 1,094**	**$ 1,290**	**$ 1,385**	**$ 1,453**
Cash flows from investing activities																
Capital expenditures	(53)	(69)	(90)	(176)	(100)	(140)	(124)	(124)	(114)	(116)	(121)	(121)	(388)	(487)	(472)	(426)
Proceeds from sales of PP&E	0	2	0	12	6	-	-	-	-	-	-	-	14	6	-	-
Acquisitions, net of cash acquired	(1)	-	-	-	-	-	-	-	-	-	-	-	(1)	-	-	-
Net change in investments	(2)	-	-	-	-	-	-	-	-	-	-	-	(2)	-	-	-
Other investing cash flows	(0)	2	17	(7)	(12)	-	-	-	-	-	-	-	11	(12)	-	-
Cash flows from investing activities	**$ (55)**	**$ (66)**	**$ (73)**	**$ (171)**	**$ (106)**	**$ (140)**	**$ (124)**	**$ (124)**	**$ (114)**	**$ (116)**	**$ (121)**	**$ (121)**	**$ (365)**	**$ (493)**	**$ (472)**	**$ (426)**
Cash flows from financing																
Increase (decrease) in debt	(365)	(130)	(215)	(15)	(131)	(215)	(171)	(199)	(187)	(163)	(158)	(200)	(725)	(716)	(708)	(823)
Financing costs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Issuance of common stock under ESOP	6	5	0	12	-	4	4	5	3	4	4	4	24	14	16	17
Proceeds from exercise of stock options	8	2	2	7	4	4	4	5	4	4	4	4	18	16	16	16
Payments of tax witholding for restricted shares	(13)	(1)	(11)	(3)	(19)	(8)	(10)	(10)	(12)	(10)	(11)	(11)	(28)	(48)	(44)	(43)
Repurchase of common stock	(25)	-	-	-	-	(30)	(30)	(30)	(51)	(51)	(51)	(51)	(25)	(91)	(205)	(205)
Payment of dividends	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Payment of capital lease obligations	(5)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(9)	(4)	(4)	(4)
Payment of contingent consideration	-	-	-	(4)	-	-	-	-	-	-	-	-	(4)	-	-	-
Dividend to non-controlling interest shareholders	-	-	-	(2)	-	-	-	-	-	-	-	-	(2)	-	-	-
Other financing activities	(60)	-	-	-	-	-	-	-	-	-	-	-	(60)	-	-	-
Cash flows from financing	**$ (455)**	**$ (125)**	**$ (226)**	**$ (6)**	**$ (146.9)**	**$ (246)**	**$ (205)**	**$ (231)**	**$ (244)**	**$ (217)**	**$ (213)**	**$ (254)**	**$ (811)**	**$ (829)**	**$ (928)**	**$ (1,042)**
Exchange rate impact	2	(0)	0	(0)	2	0	0	0	0	0	0	0	2	2	-	-
Net Increase in Cash	**$ (299)**	**$ 143**	**$ 30**	**$ 48**	**$ (24)**	**$ (2)**	**$ (3)**	**$ (2)**	**$ (6)**	**$ (3)**	**$ (3)**	**$ (3)**	**$ (79)**	**$ (31)**	**$ (16)**	**$ (15)**
Cash, beginning of period	1,028	729	872	901	949	925	923	920	918	913	910	906	1,028	949	918	903
Cash, end of period	**$ 729**	**$ 872**	**$ 901**	**$ 949**	**$ 925**	**$ 923**	**$ 920**	**$ 918**	**$ 913**	**$ 910**	**$ 906**	**$ 903**	**$ 949**	**$ 918**	**$ 903**	**$ 888**
Free Cash Flow	**$ 156**	**$ 264**	**$ 238**	**$ 49**	**$ 127**	**$ 245**	**$ 201**	**$ 230**	**$ 238**	**$ 214**	**$ 209**	**$ 251**	**$ 707**	**$ 803**	**$ 913**	**$ 1,028**
Free Cash Flow per Share	$ 0.37	$ 0.62	$ 0.56	$ 0.11	$ 0.29	$ 0.57	$ 0.47	$ 0.53	$ 0.55	$ 0.50	$ 0.48	$ 0.58	$ 1.65	$ 1.86	$ 2.11	$ 2.38

Source: Company data, Instinet estimates

NOMURA | INSTINET

Microchip Technology Inc.

MCHP.OQ MCHP US

EQUITY: AMERICAS SEMICONDUCTORS

Initiating with a Buy Rating, $110 TP

Aggressive Deleveraging, Share Gains, and Execution Warrant a Higher Multiple

- **Microchip shares are up 8.16% YTD, ahead of the S&P 500 (+5.08%).** We expect Microchip to continue to outperform as the multiple expands from an aggressive de-leveraging schedule, share gains, and management's strong executional track record. However, shares still trade at a 22% discount to the average FY2 P/E multiple of its comp group comprising TXN, ADI, SLAB, MXIM, ON, and XLNX.
- **De-levering should improve MCHP's multiple and EPS.** MCHP's current 22% discount to peers is much steeper than its 5% average discount in the TTM prior to its MSCC acquisition. However, we estimate that MCHP could repay $1.63bn of debt in FY20 and $1.92bn in FY21, which we calculate would yield EPS accretion of 3% in FY20 and 6% in FY21.
- **We see Microchip as a cross between the "old" Broadcom and Texas Instruments.** Microchip is a high-quality analog franchise, like TXN, and has been active and successful in M&A, like AVGO. MCHP's strong management team is reminiscent of TXN's high-quality leadership, and "old" Broadcom's (i.e., pre CA acquisition) management team has had a stellar reputation in integrating acquired companies. We believe Microchip's management should receive a similar consideration.
- **Market share gains should drive above-industry organic growth.** Prior to the MSCC acquisition, management guided for long-term revenue growth of 7-9%, above a forecast of 5.1% (ex-memory) for the semi industry. Microchip has moved from the eighth-largest MCU supplier in 2003 to No. 3 in 2017. These share gains helped Microchip's MCU business outgrow the overall MCU market for six of the past seven years. While some of this growth is inorganic (acquisitions), we believe Microchip will continue to outperform the overall MCU market through market share gains.
- **We model FY19E revenue/EPS of $5.90bn/$6.45 vs. consensus of $5.89bn/$6.36.** For FY20, we estimate revenue/EPS of $6.54bn/$7.29 vs. consensus of $6.51bn/$7.30. Our model integrates the MSCC acquisition.
- **We initiate coverage of Microchip with a Buy rating and a $110 TP.** We arrive at our $110 TP by applying a P/E multiple of 16.7x to our CY19E EPS of $6.54 (including SBC). This multiple is a 2% premium to its peer group average of 16.4x, in line with MCHP's historical five-year average premium.

Instinet, LLC, Equity Research

18 July 2018

Rating Starts at	**Buy**
Target Price Starts at	USD 110.00
Closing price 17 July 2018	USD 95.05
Potential upside	+15.7%

Research analysts

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Year-end : Mar	2018		2019E			2020E	
EPS (US$)	Actual	Prev.	Curr.	Cons.	Prev.	Curr.	Cons.
1Q	1.31A	N/A	1.48E	1.48E	N/A	1.73E	1.76E
2Q	1.41A	N/A	1.66E	1.65E	N/A	1.84E	1.88E
3Q	1.36A	N/A	1.64E	1.63E	N/A	1.83E	1.84E
4Q	1.40A	N/A	1.67E	1.63E	N/A	1.89E	1.84E
Year	5.48A	N/A	6.45E	6.36E	N/A	7.29E	7.30E
P/E (x)	17.36	N/A	14.74	14.94	N/A	13.04	13.02

Source: Company data, FactSet, Instinet estimates

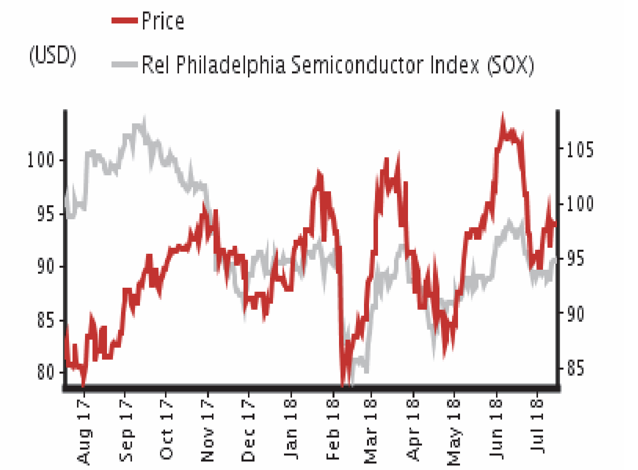
Key company data: See next page for company data and detailed price/index chart.

Key data on Microchip Technology Inc.

Rating

Stock	Buy
Sector	Not rated

Relative performance chart



Source: Thomson Reuters, Instinet research

Performance as of 17 July 2018

(%)	1M	3M	12M
Absolute	-6.8	6.7	17.3
Relative to Philadelphia Semiconductor Index (SOX)	-2.4	6.6	-6.3

Market data

Current Stock Price ($)	95.05
Market Cap ($mn)	22,378.4
52-week Low ($)	78.33
52-week High ($)	104.20
Shares Outstanding (mn)	235.44

Source: Thomson Reuters, Instinet research

Income Statement ($mn)

Year-end : Mar	2018A	2019E	2020E	2021E
Revenues	3,981	5,895	6,541	6,842
Gross Profit	2,434	3,641	4,064	4,277
Gross Margin	61.14	61.77	62.13	62.50
Operating Expenses	892	1,452	1,547	1,559
Operating Income	1,542	2,189	2,517	2,717
Other Inc./(Exp)	-58	-397	-439	-372
Pretax Income	1,484	1,792	2,078	2,346
Income Tax	129	166	197	223
Net Income (adj.)	1,356	1,626	1,880	2,123
EPS	5.48	6.45	7.29	8.03
Diluted Shares	247	252	258	265

Balance Sheet ($mn)

	2018A	2019E	2020E	2021E
Cash, Equivalents, & Investments	2,197	1,813	1,815	1,817
Accounts Receivable	564	894	945	976
Inventories	476	714	747	767
Other Current Assets	120	200	200	200
Total Current Assets	3,356	3,621	3,707	3,761
PP&E	768	1,558	1,708	1,858
Other Non-current Assets	172	326	326	326
Total Non-current Assets	4,901	14,583	13,988	13,360
Total Assets	8,257	18,204	17,696	17,121
Total Current Liabilities	2,017	958	988	1,005
Long-term Debt	1,758	11,556	9,929	8,013
Other Non-current Liabilities	1,202	1,400	1,400	1,400
Total Liabilities	4,977	13,915	12,317	10,418
Shareholders' Equity	3,280	4,290	5,379	6,703
Total Liabilities & Equity	8,257	18,204	17,696	17,121

Cash Flow Items ($mn)

	2018A	2019E	2020E	2021E
Cash from Operations	1,420	2,039	2,377	2,686
Cash from Investing	-1,012	-9,385	-374	-385
Cash from Financing	-415	8,123	-2,000	-2,299
Depreciation	616	873	968	1,013
Capital Expenditures	-207	-335	-374	-385

Valuation

	2018A	2019E	2020E	2021E
Return on Equity	0.08	0.24	0.24	0.22
Debt to Capital	38.08	18.26	15.51	13.04
Debt to Assets	21.30	63.48	56.11	46.80
BVPS	13.25	17.01	20.86	25.34
Net Cash per Share	-3.52	-38.64	-31.47	-23.42

Source: Company data, Instinet estimates

Executive Summary

We initiate coverage of Microchip Technology Inc. (MCHP) with a Buy rating and a $110 target price. Microchip shares are up 8.16% YTD, ahead of the S&P 500 (+5.08%). Strong financial results and execution, coupled with exposure to the Automotive and Industrial markets, have been the main drivers of the stock's performance, in our view. While Microchip is more levered than an "average" semiconductor company, we believe the company's market share gains, aggressive de-leveraging schedule, and management's excellent operational and executional track record in acquisition integrations do not warrant the shares' current 22% discount, on a FY2 P/E basis, to its peer group. The peer group comprises Texas Instruments (TXN), Analog Devices (ADI), Silicon Labs (SLAB, not covered), ON Semiconductor (ON), Maxim Integrated (MXIM, not covered), and Xilinx (XLNX).

De-levering should help Microchip expand its discounted multiple and EPS. We believe Microchip's valuation has been penalized for leverage related to acquisitions. Shares currently trade at a 22% discount to the average FY2 P/E multiple of its comp group, well below the 5% average discount in the trailing 12 months (TTM) before the Microsemi (MSCC) acquisition announcement in March 2018. We have seen this pattern before: In the TTM before the Atmel acquisition was announced in January 2016, Microchip traded at a 5% premium to its comp group; however, in the 12 months after the announcement, it traded, on average, in line with comps. In 2014 and 2015, Microchip traded at average *premiums* (versus the current discount) of 11% and 5%, respectively, on an FY2 P/E basis to a comp group consisting of Texas Instruments, Analog Devices, Silicon Labs, Maxim Integrated, ON Semiconductor, and Xilinx.

Strong free cash flow generation should allow Microchip to aggressively de-lever, which we calculate would be modestly accretive to EPS (3% and 6% in FY20 and FY21, respectively) and should help to expand the multiple. If we assume that MCHP does not pay down any debt, we estimate FY20 and FY21 EPS of $7.07 and $7.56. Due to strong FCF generation, however, we calculate Microchip could pay down in debt as much as $1.63bn in FY20 and $1.92bn in FY21. If we model debt repayments, our EPS estimates for those years are lifted to $7.29 and $8.03, respectively, resulting in EPS accretion of 3% in FY20 and 6% in FY21.

We see Microchip as a cross between the "old" Broadcom and Texas Instruments. Microchip is a high quality analog franchise, like Texas Instruments, but also has been active and successful in M&A, like Broadcom. Furthermore, Microchip's strong management team is reminiscent of TXN's high-quality leadership. Although the recent acquisition of CA Technologies was unpopular with investors, prior to this, Broadcom's management team has had a stellar reputation for successfully integrating acquired companies. We believe Microchip should receive a similar consideration.

Market share gains driving above-industry organic growth. Prior to the MSCC acquisition, management guided for long-term revenue growth of 7-9%, above Gartner's semi forecast of 5.1% (ex-memory). We expect the majority of this organic growth to be driven by market share gains. Microchip has steadily gained market share in the microcontroller unit (MCU) market over the past 15 years, going from the eighth-largest supplier in 2003 to No. 3 in 2017 with 14.1% share.

These market share gains have helped Microchip's MCU business outgrow the overall MCU market for six of the past seven years. We expect this trend to continue. Microchip's MCU business has outperformed the general MCU market by a median of 12.3% annually in the past six years. While some of this growth is inorganic (acquisitions), we believe Microchip could continue to outperform the overall MCU market through market share gains.

Fig. 1: MCHP MCU Business vs. MCU Market

	2010	2011	2012	2013	2014	2015	2016	2017
MCU	$ 14,905	$ 15,365	$ 14,665	$ 14,934	$ 15,845	$ 15,499	$ 16,146	$ 18,020
Y/Y		*3.1%*	*(4.6)%*	*1.8%*	*6.1%*	*(2.2)%*	*4.2%*	*11.6%*
MCHP	$ 977	$ 961	$ 997	$ 1,210	$ 1,378	$ 1,358	$ 1,980	$ 2,534
Y/Y		*(1.6)%*	*3.7%*	*21.4%*	*13.9%*	*(1.5)%*	*45.8%*	*28.0%*
Market Share		6.3%	6.8%	8.1%	8.7%	8.8%	12.3%	14.1%
Delta		**(4.7)%**	**8.3%**	**19.5%**	**7.8%**	**0.7%**	**41.6%**	**16.4%**

Source: Gartner, Instinet research

Automotive and Industrial exposure also contributing to organic growth. 17% of Microchip's revenue (post-Microsemi) is exposed to the Automotive segment and is focused on some of the fastest-growing areas, including ADAS, autonomous driving, and EV/electrification. We calculate that the Automotive semi market will grow at a 10.7% CAGR from 2017 through 2022 (excluding memory). 27% of Microchip's revenue is derived from the Industrial markets (post MSCC-acquisition), which Gartner estimates will grow at a 10.4% CAGR from 2017 through 2022 (excluding memory).

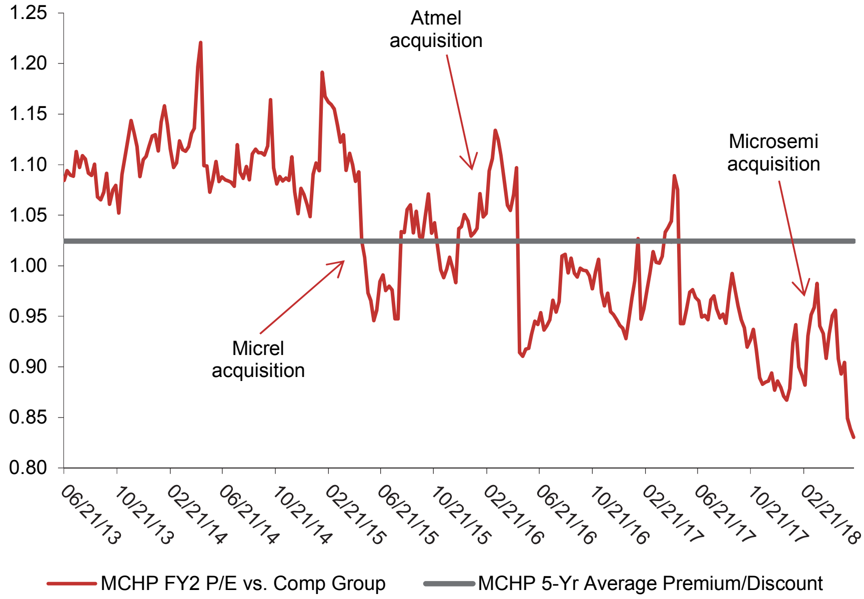
For FY19, we model revenue/EPS of $5.90bn/$6.45 versus consensus of $5.89bn/$6.36. For FY20, we model revenue/EPS of $6.54bn/$7.29 compared with consensus of $6.51bn/$7.30. The Microsemi acquisition has been fully integrated into our model, and this could account for some of, or the entire, difference between our estimates and consensus. We model F1Q19 revenue/EPS of $1.21bn/$1.48, matching consensus estimates.

We initiate coverage of Microchip with a Buy rating and a $110 target price. While Microchip is more levered than an "average" semiconductor company, we believe the company's anticipated market share gains, aggressive de-leveraging schedule, and management's excellent operational and executional track record in acquisition integration do not warrant the current 22% discount to the comp group. We arrive at our $110 target price by applying a P/E multiple of 16.7x to our CY19 EPS estimate of $6.54 including stock-based compensation (SBC). This multiple is a 2% premium to its peer group average multiple of 16.4x, in line with Microchip's historical five-year average premium.

Deleveraging Should Drive Multiple and EPS Expansion

Microchip's valuation has been penalized for leverage, we believe. MCHP shares currently trade at a 22% discount to the average FY2 P/E multiple of its comp group, well below the 5% average discount in the TTM prior to the MSCC acquisition announcement. Microchip expects its net leverage at the end of the June 2018 quarter to be 4.7x excluding 2037 convertible bonds. We believe that investors have penalized Microchip for this high leverage ratio relative to other analog companies by assigning the stock a lower multiple and, consequently, valuation. In 2014 and 2015, for example, Microchip traded at an average premium of 11% and 5%, respectively, on an FY2 P/E basis, to a comp group consisting of Texas Instruments, Analog Devices, Silicon Labs, Maxim Integrated, ON Semiconductor, and Xilinx. In the TTM before the announcement of the Atmel acquisition in January 2016, Microchip traded at a 5% premium to this group but, on average, traded in line with comps in the 12 months after the announcement. The shares currently trade at a 22% discount to the comp group versus a 5% average discount for the 12 months prior to the Microsemi acquisition announcement in March 2018.

Fig. 2: MCHP's FY2 P/E vs. Its Comp Group*



*Group consists of Texas Instruments, Analog Devices, Silicon Labs, Maxim Integrated, ON Semiconductor, and Xilinx.
Source: Company data, FactSet, Instinet research

Strong free cash flow generation should allow Microchip to de-lever aggressively. We calculate Microchip could pay down debt as much as $1.63bn in FY20 and $1.92bn in FY21. As such, the debt balances at the end of each fiscal year would be $9.93bn in FY20 and $8.01bn in FY21, down from our estimated $12.52bn at the close of the MSCC transaction in the June-18 quarter. We estimate the company generates $1.71bn and $2.00bn in FCF in FY19 and FY20, respectively.

We estimate this de-leveraging schedule will contribute $0.22 to EPS in FY20 and $0.47 in FY21. Furthermore, the lower leverage should help to expand the multiple, in our view. If we assume no debt repayments, we estimate FY20 and FY21 EPS of $7.07 and $7.56. Our Other Expense / (Income) increases in FY21 because of anticipated increases in market interest rates. If we model debt repayments, however, our EPS for those years are lifted to $7.29 and $8.03, respectively, implying EPS accretion of 3% in FY20 and 6% in FY21. We note that management has committed to using all net cash generation after paying capex, dividend, and tax payments to rapidly de-lever the company's balance sheet. Furthermore, as the company executes on its de-leveraging plans, we expect investors to reward the shares with a higher multiple that is closer to, or even in line with, Microchip's five-year historical 2% premium to its comp group.

Fig. 3: EPS Accretion Attributable to Debt Repayment

	No Debt Repayments		Debt Repayments	
(In $mn)	FY20E	FY21E	FY20E	FY21E
Total Debt (Year-end)	$ 12,518	$ 12,518	$ 9,929	$ 8,013
Other Expense / (Income)	$ 502	$ 509	$ 439	$ 372
EPS	$ 7.07	$ 7.56	$ 7.29	$ 8.03
Incremental EPS			*$ 0.22*	*$ 0.47*
Accretion			***3%***	***6%***

Source: Company data, FactSet, Instinet estimates

Microchip: A Cross Between the "Old" Broadcom and Texas Instruments

We see Microchip as a cross between the "old" Broadcom and Texas Instruments. Microchip is a high-quality analog franchise, like Texas Instruments, and has been active and successful in M&A, like Broadcom. Furthermore, Microchip's strong management team is reminiscent of both TXN's high-quality leadership and "old" AVGO's (pre-CA acquisition) stellar reputation for integrating acquired companies.

High-Quality Analog Franchise

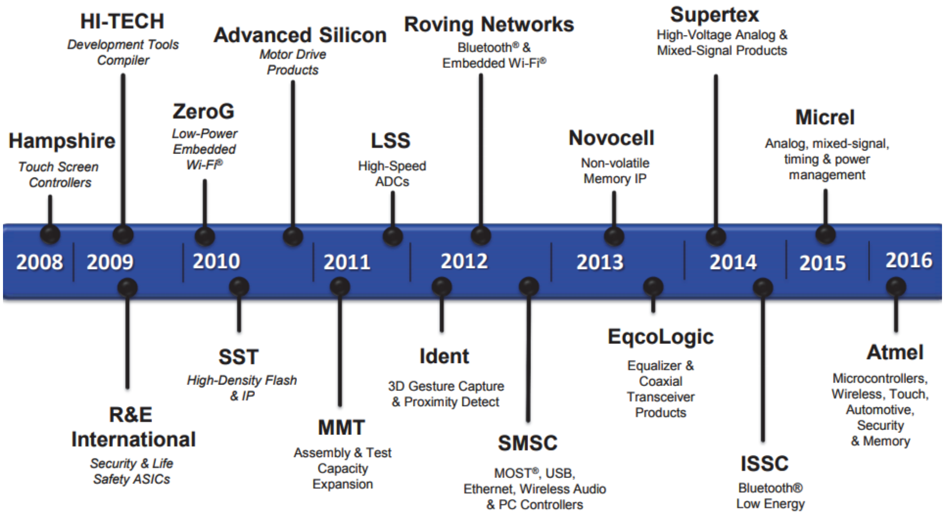
Microchip's product portfolio and customer base remind us of Texas Instruments' high quality analog franchise. Microchip has thousands of customers with no one end-customer (excluding distributors) comprising more than 10% of its revenue. Furthermore, the company has a catalog consisting of thousands of products that span multiple end-market applications including Automotive, Consumer, Industrial, and Communications. The lack of customer concentration and broad end-market exposure echoes Texas Instruments' business model. We note that their respective market strengths differ: we see Texas Instruments as the leader in the Analog market with 28.0% market share versus Microchip's 1.5% share (14th largest supplier). In the MCU market, however, Microchip has 14.1% share (3rd largest supplier) leading TXN's 9.5% share.

M&A Is a Meaningful Part of the Story

Microchip reminds us of a "lite" version of the "Old" Broadcom. As is the case for Broadcom, M&A has been a central part of Microchip's history and growth trajectory over the past 10 years. However, not all of Microchip's transactions have been as "transformative" as the deals Broadcom has executed or proposed (e.g., LSI, Broadcom classic, Qualcomm, and most recently, the acquisition of CA Technologies). Microchip has executed 17 acquisitions since 2008, closing two to three deals per year during most of that time frame, as shown in Fig. 4.

Prior to the CA acquisition, Broadcom's management team has had a stellar reputation among investors for successfully integrating acquired companies. We believe Microchip should receive a similar consideration. Microchip's management team has an excellent track record integrating prior acquisitions, which should give investors confidence that the Microsemi transaction will be no different**.** Of the 17 acquisitions that Microchip completed in the past 10 years, we have yet to find one that was poorly or not fully integrated into the company (as evidenced by a single enterprise management system). For the public-company acquisitions, we believe Microchip has met or exceeded all synergy targets. Management does have its work cut out for itself with Microsemi, as this company is much less streamlined (it currently runs on over 20 different enterprise management systems). We see Microchip management's experience and track record with prior transactions as an asset in handling the Microsemi transaction, and we believe the company will be successfully integrated in a timely manner.

Fig. 4: MCHP Acquisitions Since 2008



Source: Company data, Instinet research

Management Team Is an Asset

Similar to both TXN and AVGO (prior to its acquisition of CA), Microchip's management team has a strong reputation for operation and execution. From discussions with investors, we believe the management team at Microchip is very well respected from an operational and execution standpoint. Indeed, management has a solid track record, as displayed by the fact that the company has met or exceed all synergy targets for public acquisitions and has successfully integrated the prior 17 acquisitions. CEO Steve Sanghi and President and COO Ganesh Moorthy are highly involved in the operations of the businesses, which we think is crucial given the company's acquisitive culture.

Market Share Gains Driving Above-Industry Organic Growth

Prior to the Microsemi acquisition, Microchip guided to an organic long-term revenue CAGR of 7-9%, above the overall semi industry. This super-industry growth rate will be mostly attributed to market share gains, in our view. We compare this to overall semiconductor industry growth of 5.1% (ex-memory). Management has noted the majority of this revenue growth will be driven by market share gains, particularly in the Microcontroller and Analog businesses.

Microchip has steadily gained market share over the past 15 years. In 2003, Microchip was ranked No. 8 in MCU suppliers. It has steadily moved up through the ranks over time, growing to No. 6 in 2008, No. 4 in 2010, and No. 3 in 2016. Gartner estimates Microchip maintained the No. 3 spot in 2017 with 14.1% share. We believe these market share gains in MCU have been driven by a multitude of factors, including, but not limited to, inorganic growth (acquisitions), offering a suite of development and hardware tools that make it simple and easy for customers to design and switch between product lines, commitment to R&D spend and new product initiatives, a well-developed website with strong technical support for customers, and strong relationships with regional distributors. We also note that, particularly in Industrial, Microchip practices "customer driven" product obsolescence, which lowers risk and costs for customers.

These market share gains are not coming at the expense of one particular company, and we believe there is more room to grow. Instead, these share gains have been more broad-based across the market, in our view. This is important because it gives the company a higher ceiling for revenue gains versus the limits of taking share from only one company (dual supplier preferences, anti-competitive issues, etc.). Furthermore, Microchip has set its sights on expanding share in the Analog market;

Gartner estimates the company was only the 14th-largest supplier with 1.5% market share in 2017, which we believe gives Microchip a meaningful opportunity to expand. By contrast, Garter estimates the three largest suppliers, Texas Instruments, Analog Devices, and Maxim Integrated, have 28.0%, 19.3%, and 4.8% in Analog market share, respectively.

Microchip's MCU business has outgrown the overall MCU market for six of the past seven years. We expect this trend to continue. Microchip's MCU business has outperformed the general MCU market by a median of 12.3% annually in the past six years. In fact, the last time MCHP underperformed the overall MCU market was in 2011, when the total market grew 3.1% and MCHP's MCU business declined 1.6%. We acknowledge that some of this growth is inorganic (acquisitions); however, we believe Microchip could continue to outperform the overall MCU market through market share gains.

Fig. 5: MCHP MCU Business vs. MCU Market

	2010	2011	2012	2013	2014	2015	2016	2017
MCU	$ 14,905	$ 15,365	$ 14,665	$ 14,934	$ 15,845	$ 15,499	$ 16,146	$ 18,020
Y/Y		*3.1%*	*(4.6)%*	*1.8%*	*6.1%*	*(2.2)%*	*4.2%*	*11.6%*
MCHP	$ 977	$ 961	$ 997	$ 1,210	$ 1,378	$ 1,358	$ 1,980	$ 2,534
Y/Y		*(1.6)%*	*3.7%*	*21.4%*	*13.9%*	*(1.5)%*	*45.8%*	*28.0%*
Market Share		6.3%	6.8%	8.1%	8.7%	8.8%	12.3%	14.1%
Delta		**(4.7)%**	**8.3%**	**19.5%**	**7.8%**	**0.7%**	**41.6%**	**16.4%**

Source: Gartner, Instinet research

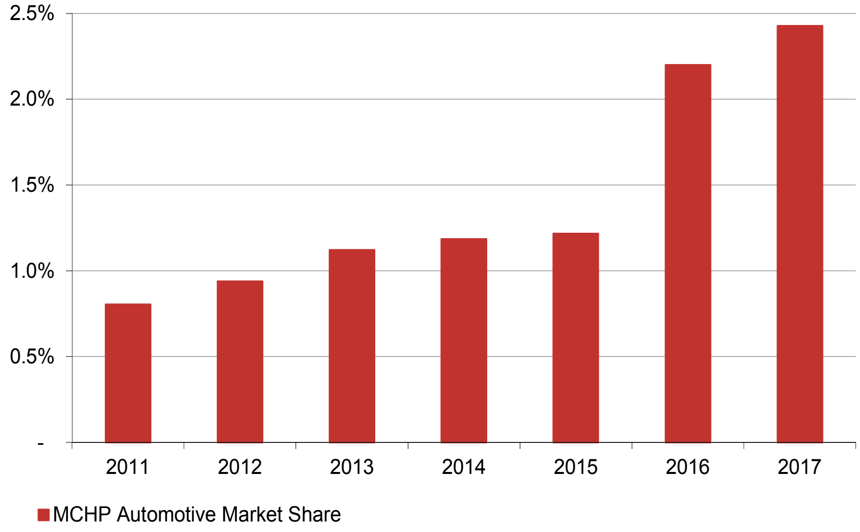
Automotive and Industrial Exposure Also Helping to Drive Organic Growth

Automotive: Content Gains from Electrification

Cars are becoming electrified. Gartner estimates that the Automotive semiconductor market was $36.5bn in 2017 and that it will increase to $40.7bn in 2018 (excluding memory), implying 11.5% Y/Y growth. Moreover, Gartner expects the Automotive market to grow to $55.5bn in 2021 and $60.7bn in 2022, implying that above-industry growth will continue for the next several years. Using these data, we calculate a CAGR (excluding memory) of 10.7% from 2017 to 2022, more than double the semi industry's 5.1% (ex-memory) over the same period.

17% of Microchip's revenue (post-Microsemi) is exposed to the Automotive segment and is focused on some of the fastest-growing areas. Gartner estimates Microchip was No. 10 in market share among Automotive semi suppliers in 2017 with 2.4% share. Among microcomponent suppliers (MCUs and MPUs), however, Gartner estimates Microchip was the sixth-largest supplier with 6.2% share. MCHP currently has leading market share in Capacitive Touch Screen Controllers and USB/Infotainment Connectivity, and is a leading supplier of in-vehicle networking and embedded control solutions. Specific ADAS applications in which Microchip participates, but is not limited to, include lane departure warning, automatic emergency braking, blind spot detection, parking sensor, autonomous parking, and pedestrian detection. Among electrification/EV applications, we found Microchip to be a prevalent supplier of MCUs and other components in powertrain and charging applications, including the battery management system (BMS), on-board chargers, inverter modules, auxiliary DC-DC converters, and power line communication (PLC) modules. Please see Charging Towards an Electric Future for further details. We expect Microchip will be able to sustain growth in this segment that is at least in line with that of the overall Automotive semi market.

Fig. 6: MCHP Market Share in Automotive Semiconductors (Including Memory)



Source: Gartner, Instinet research

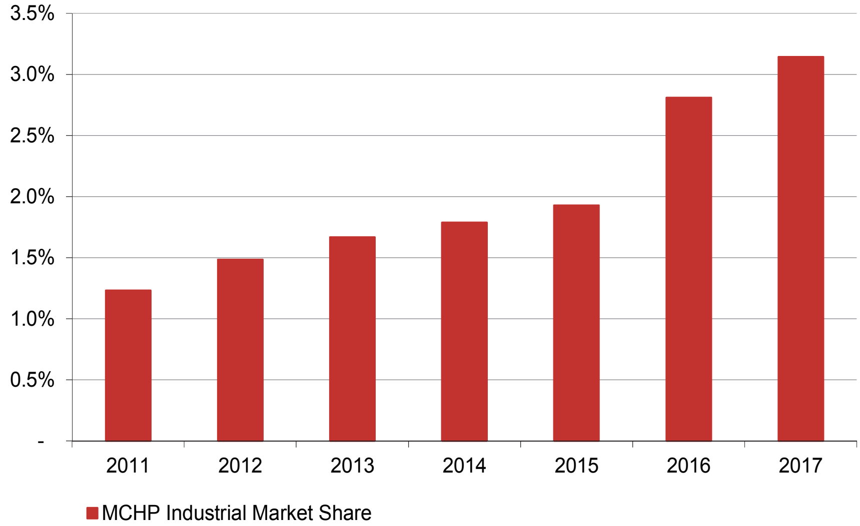
Microsemi acquisition gives MCHP access to SiC, one of the fastest-growing markets within Automotive. Silicon carbide (SiC) is still in its infancy but is already very important to EV-semi applications, as it provides higher power efficiency at a lower cost and size. Infineon estimates SiC can offer volume reductions of 50-80% and an approximate 5% gain in efficiency versus traditional Si inverter applications for EVs. For the on-board charger (EVs), Cree, Inc., a major provider of merchant SiC and power SiC components, estimates that SiC is 5x lighter, is 3x smaller, and has 25% lower semiconductor losses than traditional silicon. The acquisition of Microsemi now gives Microchip high-voltage SiC diodes and MOSFETs, which we believe will be used to target EV applications. Cree expects the SiC market for EV applications to grow from global revenues of $7mn in 2017 to $2.4bn in 2022 and $15bn in 2032, assuming 30% EV penetration in autos. This opens up Microchip to one of the fastest-growing segments within Automotive.

Industrial: Starting to See Similar Content Trends as Automotive

Gartner estimates the Industrial semiconductor market will grow at a 10.4% CAGR from 2017 through 2022. Gartner estimated the Industrial market to be $37.0bn in 2017, up from $31.9bn in 2016, excluding memory. This forecast growth is well above that of the general semiconductor industry over this period (5.1% ex-memory). While Industrial growth of 15.9% Y/Y in 2017 is expected to decline to 8.4% Y/Y in 2018 and in 2019, Gartner estimates growth will reaccelerate in 2020 and 2021 to 13.9% and 12.2%, respectively. Similar to Automotive, this pattern suggests Industrial growth has a long runway and should continue to be a tailwind to revenue growth in the semiconductor industry for many years.

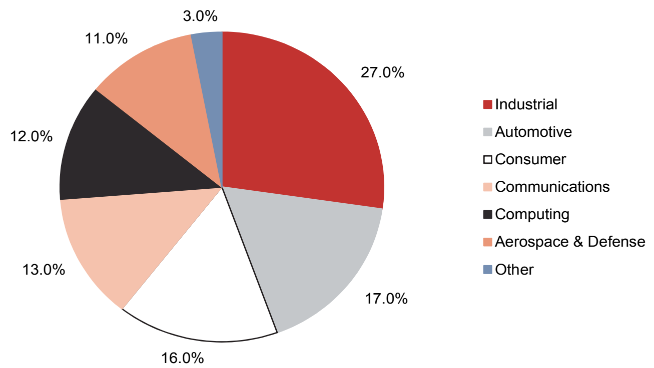
27% of Microchip's revenue is derived from the Industrial markets (post MSCC-acquisition). Gartner estimates Microchip was the seventh-largest semi supplier in the Industrial market with 3.1% share in 2017. The Industrial market is highly fragmented and the leading market share company, Texas Instruments, has only 11.0% share. Similar to Automotive, Industrial is highly attractive because of its long design-in cycles and long product life cycles. Microchip, in particular, has a competitive advantage because it practices "customer driven" end of life for its products; this lowers both costs and risks to the customer.

Fig. 7: MCHP Market Share in Industrial Semiconductors Market (Including Memory)



Source: Gartner, Instinet research

Fig. 8: Microchip Total Revenue End-Market Exposure (Including MSCC), 2017



Source: Company data, Instinet research

Financial Model

Impact of Microsemi. Prior to the acquisition of Microsemi, Microchip had the following long-term financial model: revenue growth of 7-9%, gross margin of 62.5%, operating expenses of 22.5% of revenues, and operating margin of 40.0%. After the acquisition, management raised its long-term corporate gross margin target to 63.0%, maintained its opex as a percentage of sales target at 22.5%, and raised its operating margin target to 40.5%.

De-leveraging is a key part of our financial model. We assume Microchip carries a debt balance of $12.5bn at the close of the June-18 quarter. Management has noted on prior conference calls that it plans to use all net cash generation after capex, tax, and dividend payments to de-lever the company balance sheet. For each quarter, we assume the company pays down debt in the amount of that quarter's FCF less payments for dividends. We calculate that Microchip pays down debt of $1.63bn in FY20 and $1.92bn in FY21. Because of this deleveraging, we also calculate that the Other Expense / (Income), which includes interest, declines from a quarterly rate of $115mn in the September-18 quarter to $110mn per quarter in FY20. For FY21, we estimate that average quarterly Other Expense / (Income) will decline to $93mn. It is important to note that roughly half of Microchip's debt balance is floating-rate debt and, consequently, we account for anticipated rises in the federal funds rate in our model.

Fig. 9: Estimated Debt Repayments and Other Expense / (Income)

(in $mn)	FY19E	FY20E	FY21E
Total Debt (Year-end)	$ 11,556	$ 9,929	$ 8,013
Average Quarterly Other Expense / (Income)	$ 99	$ 110	$ 93
Total Annual Other Expense / (Income)	$ 397	$ 439	$ 372

Source: Company data, FactSet, Instinet estimates

We fully incorporate the Microsemi acquisition into our financial model. We model F1Q19 in line with company guidance: revenues of $1.21bn (20.5% growth QoQ vs. guidance of 17-24% QoQ) and non-GAAP EPS of $1.48 versus guidance of $1.41-1.55. Our model matches consensus of $1.21bn/$1.48. For F2Q, we model revenue/EPS of $1.57bn/$1.66 versus consensus of $1.58bn/$1.65.

For FY19, we model revenue/EPS of $5.90bn/$6.45, which is in line with Microchip's guidance of 18% EPS growth. While our revenue estimate is relatively in line with consensus ($5.89bn), our EPS estimate is higher at $6.45 versus $6.36 consensus. The Microsemi acquisition has been fully integrated into our model, and this could account for some of, or the entire, difference. We model gross margin of 61.8% and operating margin of 37.1%.

For FY20, we model combined company revenues of $6.54bn, in line with consensus of $6.51bn. Our gross and operating margin estimates for the fiscal year are 62.1% and 38.5%, respectively. This compares with consensus gross and operating margin estimates of 46.3% and 38.9%, respectively. We estimate EPS of $7.29, slightly below consensus of $7.30.

Fig. 10: Instinet vs. Consensus Estimates

Year end:March	Jun-18E		Sep-18E		FY19E		FY20E		FY21E	
(in $mn except per share data)	Instinet	Consensus	Instinet	Consensus	Instinet	Consensus	Instinet	Consensus	Instinet	Consensus
Sales	1,208	1,208	1,572	1,584	5,895	5,894	6,541	6,513	6,842	6,837
Seq growth	20.5%	20.6%	30.1%	31.1%	48.1%	48.1%	11.0%	10.5%	4.6%	5.0%
Gross margin	61.7%	53.0%	61.7%	42.4%	61.8%	44.4%	62.1%	46.3%	62.5%	N/A
Operating margin	37.7%	38.0%	36.7%	37.3%	37.1%	37.4%	38.5%	38.9%	39.7%	38.7%
Pro Forma EPS	$1.48	$1.48	$1.66	$1.65	$6.45	$6.36	$7.29	$7.30	$8.03	$8.28

Source: Company data, FactSet, Instinet estimates

Valuation and Rating

Our EV/EBIT analysis yields a valuation of $112 per share. We calculate an average FY2 EV/EBIT of 15.8x for a comp group consisting of Texas Instruments, Analog Devices, Silicon Labs, Maxim Integrated, ON Semiconductor, and Xilinx. Using this average 15.8x multiple, we estimate an implied share price of $112 based on our CY19 EBIT estimate of $2.32bn (including SBC). Microchip has historically traded at a 4% discount to this peer group over the past five years on an EV/EBIT basis; however, based on our view of the company's strong outlook (particularly in Automotive and Industrial) and reputation for solid operation execution, we believe MCHP warrants a multiple in line with the group. Furthermore, we use Microchip's net debt as of CY19-end to account for the company's anticipated deleveraging.

Fig. 11: Comp Group FY2 EV/EBIT Multiple

	FY2 EV/EBIT
Texas Instruments*	15.7x
Analog Devices	15.1x
Silicon Labs	19.3x
Maxim Integrated	16.9x
ON Semiconductor	10.7x
Xilinx*	17.2x
Average	**15.8x**

*Texas Instruments and Xilinx covered by Romit Shah

Source: FactSet, Instinet research

Fig. 12: MCHP FY2 EV/EBIT Valuation

Implied MCHP EV/EBIT	15.8x
MCHP CY19E EBIT (inc. SBC)	$ 2,324
Implied MCHP enterprise value	$ 36,783
CY19E year-end net debt	8,546
Implied market cap	$ 28,237
Shares outstanding	252
Implied share price	**$ 112**

Source: Company data, FactSet, Instinet estimates

FY2 P/E analysis versus a comp group leads to a target valuation of $110 per share. We analyzed the historical five-year FY2 P/E for a comp group consisting of Texas Instruments, Analog Devices, Silicon Labs, Maxim Integrated, ON Semiconductor, and Xilinx. The data showed that, on average over the past five years, Microchip has traded at a 2% premium to the group on an FY2 P/E basis. Currently, however, the shares trade at a 22% discount to the group, owing to what we believe is a "leverage discount" by investors. If we assign the company's historical five-year average premium of 2% to the comp group's current multiple of 16.4x, we arrive at a valuation of approximately $110 per share based on our CY19 EPS estimate of $6.54 (including SBC).

Fig. 13: MCHP FY2 P/E Valuation

Comp group average FY2 P/E	16.4x
MCHP avg. 5-yr historical premium	2%
Implied MCHP CY19E P/E	**16.7x**
MCHP CY19E P/E (inc. SBC)	$ 6.54
Implied MCHP share price	**$ 110**

Source: Company data, FactSet, Instinet estimates

Initiating with a Buy Rating, $110 Target Price

We initiate coverage of Microchip Technology Inc. with a Buy rating and a $110 target price. While Microchip is more levered than an "average" semiconductor company, the current 22% discount to the comp group is unwarranted, in our view, based on the company's aggressive de-leveraging schedule, market share gains, and management's excellent operational and executional track record in acquisition integrations. We arrive at our $110 target price by applying a P/E multiple of 16.7x to our CY19 EPS estimate of $6.54 (including SBC). This multiple represents a 2% premium to the peer group average multiple of 16.4x and is in line with Microchip's historical five-year average premium of 2%.

Risks to Our Target Price

- Global or domestic economic conditions worsening, as semiconductors are exposed to overall global GDP and macro conditions. Semiconductors, as an industry, are generally exposed to the overall global GDP cycle and macro conditions. A recession could affect Microchip's results.
- Microchip failing to adequately compete against its peers, as the semiconductor industry is highly competitive. Microchip competes against other semiconductor

companies, including, but not limited to, Texas Instruments, NXP Semiconductors, Analog Devices, and Renesas. If Microchip's products or technology fall behind those of its competitors, we would expect Microchip to experience share loss, which could adversely affect revenues.

- Demand stagnation or decline in Automotive and Industrial could adversely impact revenue. Approximately 44% of Microchip's revenue (post MSCC-acquisition) will be derived from the Automotive and Industrial markets. Should these markets experience slower growth than expected or lower demand than anticipated, we would anticipate an adverse effect on Microchip's revenues.
- Geopolitcal conditions could worsen, which could have a negative effect on Microchip's revenue. The company sells its products into both regional and global distributors, some of which are located in China. Should geopolitical tensions between China and the United States worsen, Microchip's revenues may be adversely affected.
- If Microchip fails to successfully integrate the Microsemi acquisition, this may result in downside risk to our target price. Not successfully integrating the acquisition could cause morale and culture to suffer within the company as well as market share losses to competitors.

Fig. 14: MCHP Income Statement

Year End: March	Fiscal 2018				Fiscal 2019E				Fiscal 2020E				FY18	FY19E	FY20E	2017	2018E	2019E	2020E
($ in millions except per share data)	Jun-17	Sep-17	Dec-17	Mar-18	Jun-18E	Sep-18E	Dec-18E	Mar-19E	Jun-19E	Sep-19E	Dec-19E	Mar-20E	Mar-18	Mar-19E	Mar-20E	Dec-17	Dec-18	Dec-19	Dec-20
INCOME STATEMENT																			
Total Revenue	**$ 972**	**$ 1,012**	**$ 994**	**$ 1,002**	**$ 1,208**	**$ 1,572**	**$ 1,546**	**$ 1,569**	**$ 1,599**	**$ 1,647**	**$ 1,638**	**$ 1,658**	**3,981**	**5,895**	**$ 6,541**	**3,881**	**5,328**	**6,453**	**6,787**
QoQ	7.7%	4.1%	-1.8%	0.8%	20.5%	30.1%	-1.6%	1.5%	1.9%	3.0%	-0.6%	1.2%							
YoY	15.2%	15.8%	12.8%	11.0%	24.3%	55.3%	55.5%	56.6%	32.4%	4.8%	5.9%	5.6%	13.7%	48.1%	11.0%	22.5%	37.3%	21.1%	5.2%
COGS	385	394	384	384	463	602	591	598	608	622	622	626	1,547	2,254	2,477	1,531	2,040	2,449	2,549
Gross profit	587	618	611	618	745	970	955	971	991	1,025	1,015	1,032	2,434	3,641	4,064	2,350	3,288	4,003	4,238
R&D	120	123	121	123	165	225	220	223	223	223	220	220	487	833	888	481	733	890	888
SG&A	103	104	98	100	125	168	162	165	165	166	163	164	405	620	660	402	555	660	664
Other	-	-	(0)	0	-	-	-	-	-	-	-	-	0	-	-	(0)	0	-	-
Total opex	223	227	219	223	290	393	382	388	389	390	384	385	892	1,452	1,547	883	1,287	1,550	1,552
Operating income	364	391	392	396	456	577	573	584	603	635	632	647	1,542	2,189	2,517	1,468	2,001	2,453	2,685
Losses on equity method investments	0	0	0	0	-	-	-	-	-	-	-	-	0	-	-	0	0	-	-
Other Expenses / (Income)	15	12	19	12	51	115	116	115	114	112	109	104	57	397	439	64	294	450	391
Pretax income	350	379	373	383.3	405	462	457	468	489	524	523	543	1,484	1,792	2,078	1,404	1,707	2,003	2,295
Provision for Taxes (benefit)	31	34	32	32	34	44	43	44	46	50	50	52	129	166	197	122	154	190	218
GAAP Net Income	$ 171	$ 189	$ (251)	$ 147	$ 221	$ 262	$ 265	$ 274	$ 287	$ 321	$ 321	$ 338	$ 255	$ 1,022	$ 1,267	$ 246	$ 895	$ 1,204	$ 1,460
Pro forma Net Income	**$ 319**	**$ 344**	**$ 341**	**$ 351**	**$ 371**	**$ 419**	**$ 413**	**$ 424**	**$ 442**	**$ 474**	**$ 473**	**$ 491**	**$ 1,356**	**$ 1,626**	**$ 1,880**	**$ 1,281**	**$ 1,553**	**$ 1,813**	**$ 2,077**
Pro forma Net Income, Inc-SBC	$ 299	$ 323	$ 319	$ 330	$ 345	$ 385	$ 380	$ 390	$ 408	$ 439	$ 438	$ 456	$ 1,270	$ 1,500	$ 1,741	$ 1,197	$ 1,440	$ 1,676	$ 1,932
GAAP EPS	$ 0.70	$ 0.77	$ (1.07)	$ 0.58	$ 0.88	$ 1.04	$ 1.05	$ 1.08	$ 1.13	$ 1.25	$ 1.24	$ 1.30	$ 1.05	$ 4.06	$ 4.91	$ 1.02	$ 3.56	$ 4.70	$ 5.55
Pro Forma EPS	**$ 1.31**	**$ 1.41**	**$ 1.36**	**$ 1.40**	**$ 1.48**	**$ 1.66**	**$ 1.64**	**$ 1.67**	**$ 1.73**	**$ 1.84**	**$ 1.83**	**$ 1.89**	**$ 5.48**	**$ 6.45**	**$ 7.29**	**$ 5.24**	**$ 6.17**	**$ 7.08**	**$ 7.90**
Pro Forma EPS, Inc-SBC	$ 1.23	$ 1.32	$ 1.27	$ 1.31	$ 1.37	$ 1.53	$ 1.51	$ 1.54	$ 1.60	$ 1.71	$ 1.69	$ 1.75	$ 5.13	$ 5.95	$ 6.75	$ 4.90	$ 5.72	$ 6.54	$ 7.35
Shares Outstanding - Pro Forma	243	245	251	252	251	252	253	253	255	257	259	260	247	252	258	244	252	256	263
Percent of Sales																			
Gross Margin	60.4%	61.0%	61.4%	61.7%	61.7%	61.7%	61.8%	61.9%	62.0%	62.3%	62.0%	62.3%	61.1%	61.8%	62.1%	60.6%	61.7%	62.0%	62.4%
R&D	12.4%	12.2%	12.1%	12.3%	13.6%	14.3%	14.2%	14.2%	14.0%	13.6%	13.5%	13.3%	12.2%	14.1%	13.6%	12.4%	13.7%	13.8%	13.1%
SG&A	10.6%	10.3%	9.9%	10.0%	10.3%	10.7%	10.5%	10.5%	10.3%	10.1%	10.0%	9.9%	10.2%	10.5%	10.1%	10.3%	10.4%	10.2%	9.8%
Opex	22.9%	22.5%	22.0%	22.2%	24.0%	25.0%	24.7%	24.7%	24.3%	23.7%	23.4%	23.2%	22.4%	24.6%	23.7%	22.7%	24.2%	24.0%	22.9%
Operating Margin	37.5%	38.6%	39.4%	39.5%	37.7%	36.7%	37.1%	37.2%	37.7%	38.6%	38.6%	39.0%	38.7%	37.1%	38.5%	37.8%	37.6%	38.0%	39.6%
Pretax income margin	36.0%	37.4%	37.5%	38.2%	33.5%	29.4%	29.5%	29.8%	30.6%	31.8%	31.9%	32.7%	37.3%	30.4%	31.8%	36.2%	32.0%	31.0%	33.8%
Tax Rate	8.7%	9.1%	8.5%	8.4%	8.5%	9.5%	9.5%	9.5%	9.5%	9.5%	9.5%	9.5%	8.7%	9.3%	9.5%	8.7%	9.0%	9.5%	9.5%
Net Margin	32.8%	34.0%	34.3%	35.0%	30.7%	26.6%	26.7%	27.0%	27.7%	28.8%	28.9%	29.6%	34.1%	27.6%	28.7%	33.0%	29.2%	28.1%	30.6%

Source: Company data, Instinet estimates

Fig. 15: MCHP Balance Sheet

Year End: March ($ in millions)	Fiscal 2018 Jun-17	Sep-17	Dec-17	Mar-18	Fiscal 2019E Jun-18E	Sep-18E	Dec-18E	Mar-19E	Fiscal 2020E Jun-19E	Sep-19E	Dec-19E	Mar-20E	FY18 Mar-18	FY19E Mar-19E	FY20E Mar-20E	2017 Dec-17	2018E Dec-18	2019E Dec-19	2020E Dec-20
BALANCE SHEET																			
Assets																			
Total Cash and Short Term Investments	1,230	1,315	1,100	2,197	1,811	1,812	1,812	1,813	1,813	1,814	1,814	1,815	2,197	1,813	1,815	1,100	1,812	1,814	1,817
Accounts Receivable	529	545	553	564	847	896	881	894	911	938	933	945	564	894	945	553	881	933	967
Inventories	427	457	487	476	677	720	706	714	725	743	743	747	476	714	747	487	706	743	766
Other Current Assets	113	126	114	120	200	200	200	200	200	200	200	200	120	200	200	114	200	200	200
Total Current Assets	2,299	2,443	2,253	3,356	3,535	3,627	3,599	3,621	3,650	3,696	3,691	3,707	3,356	3,621	3,707	2,253	3,599	3,691	3,750
PP&E, Net	694	723	755	768	1,446	1,485	1,523	1,558	1,593	1,632	1,670	1,708	768	1,558	1,708	755	1,523	1,670	1,827
Goodwill	2,299	2,299	2,299	2,299	7,366	7,366	7,366	7,366	7,366	7,366	7,366	7,366	2,299	7,366	7,366	2,299	7,366	7,366	7,366
Intangible Assets, net	2,027	1,906	1,785	1,662	5,867	5,688	5,512	5,333	5,151	4,964	4,778	4,589	1,662	5,333	4,589	1,785	5,512	4,778	4,005
Long Term Investments	420	529	885	-	-	-	-	-	-	-	-	-	-	-	-	885	-	-	-
Other Assets	149	155	147	172	326	326	326	326	326	326	326	326	172	326	326	147	326	326	326
Total Non-Current Assets	5,589	5,612	5,870	4,901	15,004	14,864	14,726	14,583	14,436	14,288	14,139	13,988	4,901	14,583	13,988	5,870	14,726	14,139	13,524
Total Assets	**7,888**	**8,055**	**8,124**	**8,257**	**18,539**	**18,491**	**18,325**	**18,204**	**18,087**	**17,983**	**17,830**	**17,696**	**8,257**	**18,204**	**17,696**	**8,124**	**18,325**	**17,830**	**17,274**
Liabilities																			
Accounts Payable	416	404	421	374	666	629	618	625	635	650	650	654	374	625	654	421	618	650	670
Deferred Income to Distributors	309	324	336	334	334	334	334	334	334	334	334	334	334	334	334	336	334	334	334
Current Portion of Long-Term Debt	11	6	-	1,310	1,310	1,310	1,310	-	-	-	-	-	1,310	-	-	-	1,310	-	-
Total Current Liabilities	736	734	757	2,017	2,310	2,273	2,262	958	968	984	984	988	2,017	958	988	757	2,262	984	1,004
Long Term Debt	2,984	3,012	3,040	1,758	11,208	10,980	10,605	11,556	11,186	10,790	10,360	9,929	1,758	11,556	9,929	3,040	10,605	10,360	8,504
Long-term income tax payble	187	194	695	755	755	755	755	755	755	755	755	755	755	755	755	695	755	755	755
Long-term deferred tax liability	347	328	209	206	288	288	288	288	288	288	288	288							
Other Long-Term Liabilities	221	240	239	241	358	358	358	358	358	358	358	358	241	358	358	239	358	358	358
Total Non-Current Liabilities	3,739	3,775	4,182	2,960	12,608	12,380	12,005	12,956	12,586	12,190	11,760	11,329	2,960	12,956	11,329	4,182	12,005	11,760	9,904
Total Liabilities	**4,475**	**4,509**	**4,939**	**4,977**	**14,919**	**14,654**	**14,267**	**13,915**	**13,554**	**13,174**	**12,745**	**12,317**	**4,977**	**13,915**	**12,317**	**4,939**	**14,267**	**12,745**	**10,907**
Shareholders' Equity	**3,413**	**3,546**	**3,185**	**3,280**	**3,620**	**3,838**	**4,058**	**4,290**	**4,532**	**4,809**	**5,086**	**5,379**	**3,280**	**4,290**	**5,379**	**3,185**	**4,058**	**5,086**	**6,366**
Total Liabilities and Equity	**7,888**	**8,055**	**8,124**	**8,257**	**18,539**	**18,491**	**18,325**	**18,204**	**18,087**	**17,983**	**17,830**	**17,696**	**8,257**	**18,204**	**17,695.6**	**8,124**	**18,325**	**17,830**	**17,274**

Source: Company data, Instinet estimates

Fig. 16: MCHP Cash Flow Statement

Year End: March ($ in millions)	Fiscal 2018 Jun-17	Sep-17	Dec-17	Mar-18	Fiscal 2019E Jun-18E	Sep-18E	Dec-18E	Mar-19E	Fiscal 2020E Jun-19E	Sep-19E	Dec-19E	Mar-20E	FY18 Mar-18	FY19E Mar-19E	FY20E Mar-20E	2017 Dec-17	2018E Dec-18	2019E Dec-19	2020E Dec-20
CASH FLOWS																			
Cash Flows from Operations																			
Net income	$ 171	$ 189	$ (251)	$ 147	$ 221	$ 262	$ 265	$ 274	$ 287	$ 321	$ 321	$ 338	$ 255	$ 1,022	$ 1,267	$ 246	$ 895	$ 1,204	$ 1,460
Depreciation and amortization	152	153	155	157	179	233	229	232	237	244	242	245	616	873	968	587	797	955	1,005
Deferred income taxes	(22)	(25)	114	(16)	(21)	(21)	(19)	(19)	(20)	(20)	(20)	(20)	51	(81)	(80)	(7)	(78)	(79)	(80)
Share-based compensation	22	24	24	23	28	37	36	37	38	39	39	39	93	139	154	92	125	152	160
Amortization / loss on setttlement of debt	41	28	30	29	32	30	30	30	31	30	30	30	129	123	122	164	121	122	122
Loss (income) on equity investments	0	0	0	(6)	-	-	-	-	-	-	-	-	(6)	-	-	0	(6)	-	-
Other	(4)	(1)	(0)	21	-	-	-	-	-	-	-	-	16	-	-	(2)	21	-	-
																0	0	0	0
Changes in working capital:	(15)	(18)	292	5	90	(128)	16	(14)	(18)	(29)	5	(12)	265	(37)	(55)	302	(17)	(57)	(37)
Accounts receivable	(51)	(16)	(8)	(11)	(4)	(49)	15	(13)	(17)	(27)	5	(11)	(85)	(52)	(50)	(78)	(49)	(52)	(34)
Inventories	(10)	(30)	(30)	11	82	(43)	13	(7)	(12)	(18)	(0)	(4)	(59)	45	(33)	(67)	64	(37)	(22)
Deferred income to distributors	16	16	11	(2)	-	-	-	-	-	-	-	-				41	(2)	-	-
Other Current and Long-Term Assets		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Accounts Payable and Accrued Liabilities	36	(11)	16	(56)	12	(37)	(11)	7	10	16	0	3	(14)	(30)	29	48	(92)	32	19
Income tax (recoverable) / Payable	-	-	304	64	-	-	-	-	-	-	-	-	368	-	-	299	64	-	-
Other assets and liabilities	(7)	24	(1)	(2)	-	-	-	-	-	-	-	-	14	-	-	59	(2)	-	-
Cash Flows from Operations	**$ 345**	**$ 350**	**$ 365**	**$ 359**	**$ 529**	**$ 412**	**$ 558**	**$ 540**	**$ 554**	**$ 584**	**$ 618**	**$ 621**	**$ 1,420**	**$ 2,039**	**$ 2,377**	**$ 1,383**	**$ 1,859**	**$ 2,296**	**$ 2,629**
Cash Flows from Investing																			
Additions to PP&E	(22)	(60)	(66)	(58)	(62)	(93)	(91)	(89)	(90)	(95)	(94)	(95)	$ (207)	$ (335)	(374)	$ (171)	$ (304)	$ (369)	$ (390)
Acquisition	-	-	-	-	(10,350)	-	-	-	-	-	-	-	-	(10,350)	-	-	(10,350)	-	-
Net change in investments	(369)	(141)	(308)	3	1,300	-	-	-	-	-	-	-	(815)	1,300	-	(1,282)	1,303	-	-
Other investing cash flows	-	-	5	5	-	-	-	-	-	-	-	-	10	-	-	4	5	-	-
Cash Flows from Investing	**$ (391)**	**$ (201)**	**$ (370)**	**$ (50)**	**$ (9,112)**	**$ (93)**	**$ (91)**	**$ (89)**	**$ (90)**	**$ (95)**	**$ (94)**	**$ (95)**	**$ (1,012)**	**$ (9,385)**	**$ (374)**	**$ (1,449)**	**$ (9,346)**	**$ (369)**	**$ (390)**
Cash Flows from Financing																			
Debt Issuance / (Repayments)	-	(16)	(59)	0	9,450	(228)	(375)	(359)	(371)	(395)	(430)	(431)	(75)	8,488	(1,627)	415	8,847	(1,555)	(1,857)
Payment of cash dividends	(83)	(85)	(85)	(85)	(91)	(92)	(92)	(92)	(93)	(94)	(94)	(95)	(338)	(367)	(375)	(335)	(360)	(373)	(383)
Proceeds from sale of common stock	4	15	7	15	11	12	11	12	12	12	12	12	42	46	47	40	49	47	47
Tax pmts. for shares withheld for vested RSUs	(11)	(10)	(13)	(10)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(44)	(45)	(45)	(44)	(44)	(45)	(45)
Other	(0)	(0)	(0)	(0)	-	-	-	-	-	-	-	-	(1)	-	-	(1)	(0)	-	-
Cash Flows from Financing	**$ (89)**	**$ (96)**	**$ (150)**	**$ (80)**	**$ 9,358**	**$ (319)**	**$ (467)**	**$ (450)**	**$ (463)**	**$ (488)**	**$ (523)**	**$ (525)**	**$ (415)**	**$ 8,123**	**$ (2,000)**	**$ 75**	**$ 8,492**	**$ (1,925)**	**$ (2,238)**
Exchange rate impact	0	0	0	0	0	0	0	0	0	0	0	0	-	-	0	-	-	-	-
Net Increase in Cash	**$ (136)**	**$ 53**	**$ (154)**	**$ 229**	**$ 775**	**$ 1**	**$ (0)**	**$ 1**	**$ 0**	**$ 1**	**$ 1**	**$ 1**	**$ (7)**	**$ 777**	**$ 2**	**$ 8**	**$ 1,005**	**$ 3**	**$ 2**
Cash, beginning of period	$ 909	$ 773	$ 826	$ 672	$ 901	$ 1,677	$ 1,677	$ 1,677	$ 1,678	$ 1,679	$ 1,679	$ 1,680	$ 909	$ 901	$ 1,678	$ 664	$ 672	$ 1,677	$ 1,680
Cash, end of period	**$ 773**	**$ 826**	**$ 672**	**$ 901**	**$ 1,677**	**$ 1,677**	**$ 1,677**	**$ 1,678**	**$ 1,679**	**$ 1,679**	**$ 1,680**	**$ 1,681**	**$ 901**	**$ 1,678**	**$ 1,681**	**$ 672**	**$ 1,677**	**$ 1,680**	**$ 1,682**
Free Cash Flow	**$ 323**	**$ 290**	**$ 299**	**$ 301**	**$ 467**	**$ 319**	**$ 467**	**$ 451**	**$ 464**	**$ 489**	**$ 524**	**$ 526**	**$ 1,213**	**$ 1,705**	**$ 2,003**	**$ 1,211**	**$ 1,555**	**$ 1,927**	**$ 2,240**
Free Cash Flow per Share	$ 1.33	$ 1.19	$ 1.19	$ 1.20	$ 1.86	$ 1.27	$ 1.85	$ 1.78	$ 1.82	$ 1.90	$ 2.02	$ 2.02	$ 4.90	$ 6.76	$ 7.77	$ 4.96	$ 6.18	$ 7.53	$ 8.52

Source: Company data, Instinet estimates

NOMURA | INSTINET

Cree, Inc. CREE.OQ CREE US

EQUITY: AMERICAS SEMICONDUCTORS

Initiating with a Neutral Rating, $44 TP

Transitioning from lighting to power semi but execution appears priced into shares

- **Cree is transforming from a lighting company to a power semi company.** Cree's power semi business, Wolfspeed, is expected to grow from 15% of revenues in FY17 to 37% in FY22. This will likely provide an uplift to revenue growth and margins as Lighting / LED represent a smaller part of the overall business.
- **Gregg Lowe, the former CEO of Freescale Semiconductor, was selected as Cree's CEO in 2017.** Mr. Lowe's multi-decade semiconductor background will be a critical asset to Cree as it transitions to a power semi company. Furthermore, Mr. Lowe is highly regarded by investors, and we think he is a solid fit for Cree given his prior track record at FSL.
- **Cree (through Wolfspeed) has greater than 50% market share in the merchant SiC market as well as strong positions in both the power SiC (#1) and GaN product markets.** Mgmt. expects the SiC materials (raw wafers) TAM to grow from $56mn in CY17 to $1.2bn in CY22. Cree also forecasts the entire SiC power market will grow from $280mn in CY17 to $5.0bn in CY22, (assuming 30% penetration of EVs).
- **Although LED and Lighting have faced headwinds over the past several years, we believe Cree's FY22 target revenue and gross margin models are attainable.** Cree's revenue guidance for the LED business is in line with LED market CAGR estimates. Additionally, if we look at Lighting and LED comps, we believe the FY22 gross margin targets of 33.0% and 31.0%, respectively, are reasonable.
- **We estimate FY19E revenue/EPS of $1.68bn/$0.58 compared to consensus of $1.69bn/$0.60.** For FY20E, we estimate revenues/EPS of $1.85bn/$1.29, which is directly in line with consensus.
- **We initiate coverage of Cree with a Neutral rating and $44 target price.** While we are positive on the company's overall transition from a "lighting" company to a "power semi" company, shares are up 77.0% over the TTM, compared to 23.6% for the SOX and 14.25% for the S&P 500. We believe this indicates shares have already priced in successful execution towards the company's target model. We arrive at our $44 target price by applying a 50% weighting to our EV/Sales vs. Operating margin analysis ($55) and a 50% weighting to our sum-of-the-parts analysis ($33).

Year-end : Jun	2017		2018E			2019E	
EPS (US$)	Actual	Prev.	Curr.	Cons.	Prev.	Curr.	Cons.
1Q	0.15A	N/A	0.04A	0.04A	N/A	0.09E	0.10E
2Q	0.30A	N/A	-0.01A	0.01A	N/A	0.13E	0.15E
3Q	0.01A	N/A	0.04A	0.04A	N/A	0.14E	0.13E
4Q	0.04A	N/A	0.07E	0.08E	N/A	0.22E	0.20E
Year	0.50A	N/A	0.14E	0.16E	N/A	0.58E	0.60E
P/E (x)	91.93	N/A	324.05	292.11	N/A	79.59	77.04

Source: Company data, FactSet, Instinet estimates

Key company data: See next page for company data and detailed price/index chart.

Instinet, LLC, Equity Research

18 July 2018

Rating Starts at	Neutral
Target Price Starts at	USD 44.00
Closing price 17 July 2018	USD 46.32
Potential downside	-5%

Research analysts

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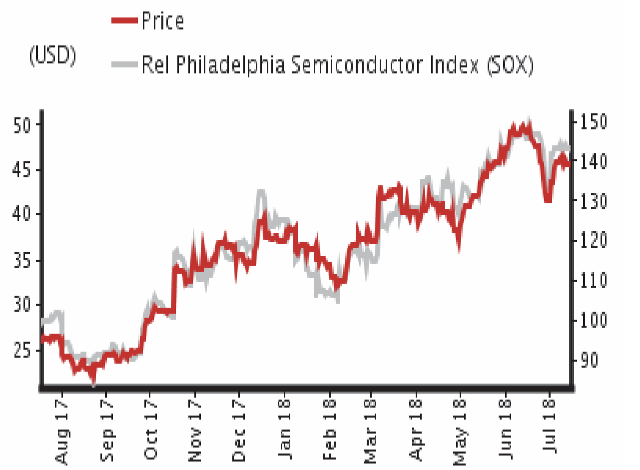
Key data on Cree, Inc.

Rating

Stock	Neutral
Sector	Not rated

Relative performance chart



Source: Thomson Reuters, Instinet research

Performance as of 17 July 2018

(%)	1M	3M	12M
Absolute	-5.8	13.3	77.0
Relative to Philadelphia Semiconductor Index (SOX)	-1.4	13.2	53.4

Market data

Current Stock Price ($)	46.32
Market Cap ($mn)	4,655.6
52-week Low ($)	20.50
52-week High ($)	50.67
Shares Outstanding (mn)	100.51

Source: Thomson Reuters, Instinet research

Income Statement ($mn)

Year-end : Jun	2017A	2018E	2019E	2020E
Revenues	1,473	1,484	1,677	1,848
Gross Profit	445	416	515	615
Gross Margin	30.21	28.06	30.69	33.28
Operating Expenses	389	404	437	446
Operating Income	56	13	78	169
Other Inc./(Exp)	4	3	-6	-6
Pretax Income	60	15	72	163
Income Tax	10	1	13	29
Net Income (adj.)	50	14	59	133
EPS	0.50	0.14	0.58	1.29
Diluted Shares	99	100	102	104

Balance Sheet ($mn)

	2017A	2018E	2019E	2020E
Cash, Equivalents, & Investments	611	406	423	540
Accounts Receivable	148	133	146	160
Inventories	284	312	330	346
Other Current Assets	57	55	55	55
Total Current Assets	1,101	905	953	1,101
PP&E	581	671	744	795
Other Non-current Assets	24	23	23	23
Total Non-current Assets	1,549	1,763	1,793	1,800
Total Assets	2,650	2,668	2,746	2,900
Total Current Liabilities	212	266	277	286
Long-term Debt	145	316	316	316
Other Non-current Liabilities	70	26	26	26
Total Liabilities	427	609	619	628
Shareholders' Equity	2,223	2,059	2,127	2,272
Total Liabilities & Equity	2,650	2,668	2,746	2,900

Cash Flow Items ($mn)

	2017A	2018E	2019E	2020E
Cash from Operations	216	173	137	221
Cash from Investing	-145	-455	-205	-189
Cash from Financing	-104	254	85	84
Depreciation	151	155	175	183
Capital Expenditures	-87	-190	-205	-189

Valuation

	2017A	2018E	2019E	2020E
Return on Equity	0.02	0.01	0.03	0.06
Debt to Capital	8.71	11.46	11.50	11.18
Debt to Assets	5.47	11.84	11.51	10.89
BVPS	22.56	20.57	20.87	21.87
Net Cash per Share	5.24	1.50	1.64	2.74

Source: Company data, Instinet estimates

Executive Summary

Cree is transforming from a lighting company to a power semi company. Cree's financial results have historically been dominated by their Lighting and LED segments while their power semi division, Wolfspeed, has represented the smallest product line. Management has guided that this relationship will reverse, however; Wolfspeed is expected to become the largest segment by FY22. We therefore model Wolfspeed growing from 15% of revenues in FY17 to an estimated 37% of revenues by FY22.

Gregg Lowe, the former CEO of Freescale Semiconductor, was selected as Cree's CEO in 2017. Mr. Lowe's multi-decade semiconductor background will be a critical asset to Cree as it transitions to a power semi company. We believe Mr. Lowe's prior experience in driving profitability at Freescale is a solid fit for a company that is targeting weighty profitability improvements. Mr. Lowe was formerly the CEO of Freescale Semiconductor from June 2012 until December 2015 when Freescale was acquired by NXP Semiconductors. Prior to that, Mr. Lowe served at Texas Instruments for 28 years, where he held several different roles.

Cree has perhaps one of the best positions in the SiC market. Cree has the leading market share in both merchant SiC wafers (>50%) and in power SiC productions (#1) through its Wolfspeed subsidiary. Management expects SiC materials (raw wafers) TAM to grow from $56mn in CY17 to $1.2bn in CY22, implying an 85% CAGR. Cree also forecasts the entire SiC power market will grow from $280mn in CY17 to $5.0bn in CY22, implying a 78% CAGR over the next five years (assuming 30% penetration of EVs). Silicon carbide (SiC) is a next-generation semiconductor material that offers superior energy efficiency and power density compared to standard silicon (Si), which still forms the basis of most power semiconductors. We see SiC-based components replacing traditional silicon, as it would enable OEMs to either increase driving range or reduce costs.

Cree is the #2 player in GaN power RF products, according to their Analyst Day presentation. The company estimates the GaN RF Device market was $384mn in CY17 and will grow at a 23% CAGR to $1.1bn in CY22. Management expects the non-RF GaN device market, which includes applications in Industrial, Military/Aeronautical, and Satellite communications, to grow at a 25% CAGR through CY22. We note that GaN products are manufactured on SiC wafers, of which Cree has >50% market share. GaN-based RF enables increased capacity and coverage in cellular basestations compared to traditional Si-based solutions.

Lighting and LED have faced headwinds over the past several years. A large driver of the difficult industry conditions in LED has been from industry oversupply. CREE's lighting business saw revenues triple from FY12 though FY15. Unfortunately, the segment grew far faster than Cree's infrastructure was ready to handle and the company started to experience production issues. Management has noted that they are starting to see some stabilization in the LED business and that, while early, there were some indications the recent Lighting restructuring was successful.

With that context, we believe Cree's FY22 target revenue and gross margin model for the Lighting and LED businesses is reasonable when considering overall market forecasts. LED FY22 target revenue of $793mn (compared to $594mn in FY18E) implies CREE's LED segment will grow at an 7.5% CAGR over the next four years. This is below Gartner's five-year estimated CAGR of 8.7%. Lighting FY22 target revenue of approximately $700mn (versus our estimate of $568mn in FY18) implies a 5.4% CAGR over the next four years. For gross margins targets, management issued LED gross margin estimates of 31.0% in FY22 (vs. 26.2% in FY18E) and gross margins of 33.0% in FY22 for Lighting (vs. 19.4% currently). While the differential between Cree's current margins and its target margins for both segments may seem like too much to overcome, we believe these targets are relatively reasonable when considering the margin profiles of comps.

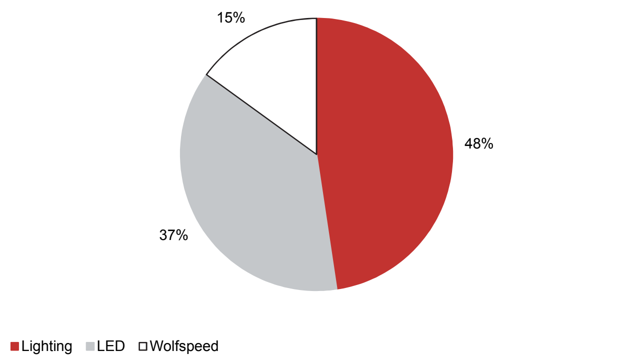
We estimate FY19E revenue/EPS of $1.68bn/$0.58 compared to consensus of $1.69bn/$0.60. For FY20E, we estimate revenues/EPS of $1.85bn/$1.29, which is directly in line with consensus. We model F4Q18 revenue / EPS estimates of $400mn/$0.07, slightly below consensus estimates of $401mn/$0.08. Our F1Q19 revenue/EPS estimates are $413mn/$0.09, again a touch below consensus of $416mn/$0.10.

We initiate coverage of Cree with a Neutral rating and $44 target price. SiC and GaN will clearly provide tailwinds to revenues, and we are positive on the company's overall transition from a "lighting" company to a "power semi" company. That said, at $46.32 per share, the stock is up 77.0% over the TTM, compared to 23.6% for the SOX and 14.25% for the S&P 500. As such, we believe shares have already priced in the anticipated revenue and margin growth, the CEO's credibility and track record and execution towards the company's target financial model. We elect to remain on the sidelines for now and would look for price setbacks to become more constructive on the shares. We arrive at our $44 target price by applying a 50% weighting to our EV/Sales vs. Operating margin analysis ($55) and a 50% weighting to our sum-of-the-parts analysis ($33).

Cree Is Transitioning to a Power Semi Company and the Right Person Is at the Helm

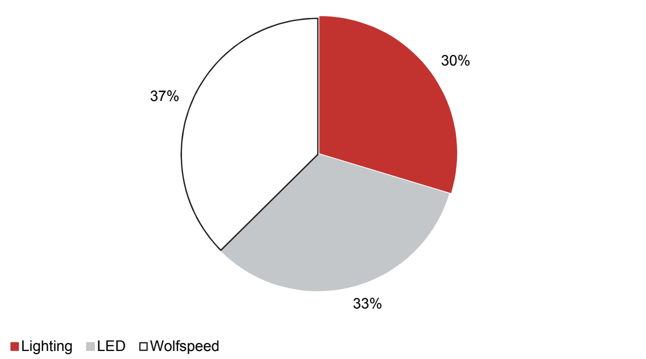
Cree is transforming from a lighting company to a power semi company. Cree's financial results have historically been dominated by their Lighting and LED product segments while their power semi division, Wolfspeed, has represented a minority of their revenue generation. Management has guided that this relationship will reverse, however; Wolfspeed is expected to become the largest segment by FY22, with the Lighting and LED segments trailing behind. We therefore model Wolfspeed growing from 15% of revenues in FY17 to an estimated 37% of revenues by FY22.

Fig. 1: FY17 Revenue segment breakdown



Source: Company data, Instinet estimates

Fig. 2: FY22E Revenue segment breakdown



Source: Company data, Instinet estimates

Gregg Lowe, the former CEO of Freescale Semiconductors, was selected as Cree's CEO in 2017. Mr. Lowe's semiconductor background, at both Texas Instruments and Freescale, will be a critical asset to Cree as it transitions to a power semi company. Prior to Cree, Mr. Lowe was the CEO of Freescale Semiconductor from June 2012 until December 2015 when Freescale was acquired by NXP Semiconductors. Prior to that, Mr. Lowe served at Texas Instruments for 28 years, where he held several different roles. Most notably, he held several roles within the Analog business line at Texas Instruments, most recently serving as the Senior Vice President and leader of this unit until his departure. We believe Lowe's multi-decade experience in the analog semiconductor business will be crucial in the company's transition to become more "semi-like" as Wolfspeed becomes a larger, and more important, driver of the overall business, in our view.

Mr. Lowe's accomplishments at Freescale bodes well for a company that aims to meaningfully boost profitability, in our view. Mr. Lowe was appointed CEO of Freescale in 2012 and the company grew from unprofitable to profitable during his tenure there. In FY11, the company reported a GAAP net loss of $410mn, but by the time Freescale was acquired in 2015, Freescale was generating GAAP net *income* of $251mn. Cree reported a FY17 GAAP net loss of $98mn in FY17, and we estimate Lighting and LED gross margins of 19.4% and 26.2% in FY18E, well below the target gross margins of 33% and 31%, respectively. We believe Mr. Lowe's experience in expanding profitability at FSL is a solid fit for Cree given the company's objectives to increase margins.

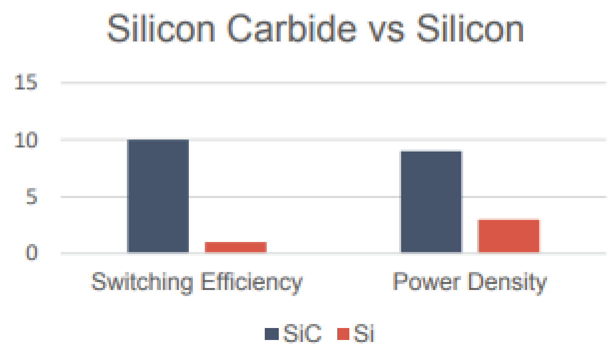
Mr. Lowe is highly regarded by investors. We believe that investors and the Street alike respect Mr. Lowe for his business acumen and strong operational background. This should, in our view, help to build investor confidence in the company's execution. We also believe that investors may perhaps underappreciate the focus Mr. Lowe has placed on Cree's morale and corporate culture. Furthermore, given that Mr. Lowe was at the helm when Freescale was sold to NXPI, some investors have questioned if he will follow a similar path with Cree in the future.

Cree Has Perhaps One of the Best SiC Positions in the Market

Silicon Carbide: Why Is It Important?

Silicon carbide (SiC) is a next-generation semiconductor material that offers superior energy efficiency and power density compared to standard silicon (Si), which still forms the basis of most power semiconductors. As a result of their unique thermal and electromagnetic properties, SiC components are particularly useful for such high-power applications as industrial equipment, air conditioners, X-ray generators, and, most notably, electric vehicle powertrains. In EV applications, we believe the advantages of SiC MOSFETs over Si-based MOSFETs and IGBTs will be most evident in the inverter module and on-board charger. Compared with Si-based components, SiC MOSFETs have 1) higher temperature tolerance, improving applicability in higher voltage environments, 2) reduced switching losses, and 3) low on-resistance, which in the inverter reduces the need for expensive cooling. These improvements in energy efficiency allow SiC components to be smaller than their Si counterparts, conserving valuable space and weight that can be allocated to other vehicle parts. Indeed, Infineon (not covered) estimates SiC can offer volume reduction of 50% to 80% and an approximate 5% gain in efficiency versus traditional Si in the inverter. For the on-board charger, Cree estimates that SiC is 5x lighter, 3x smaller and has 25% lower semiconductor losses compared to traditional Si.

Fig. 3: SiC versus Silicon



Source: Cree Analyst Day presentation

We see SiC-based components replacing traditional silicon, as it would enable OEMs to either increase driving range or reduce costs. Several automotive semiconductor suppliers have recognized that SiC allows for longer driving range as well as better energy efficiency in EVs, and, as a result, we believe SiC will gain market share in EV applications. Infineon has estimated that the penetration of SiC in the main inverter will reach 80% for large, luxury-tier BEVs and 20-30% for compact and mid-sized xEVs by 2035.

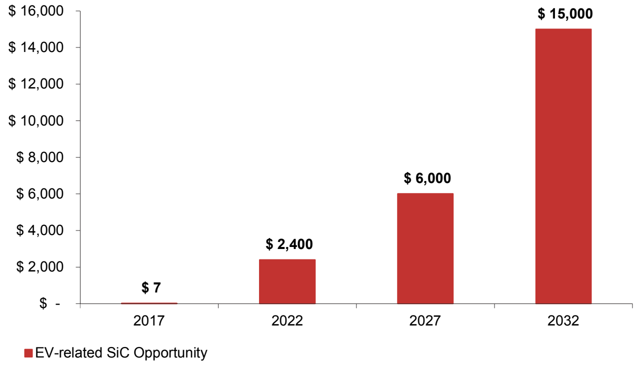
SiC Market Projections

Cree estimates the SiC market for EV applications to grow from global revenues of \$7mn in 2017 to \$2.4bn in 2022 and reach \$15bn in 2032, assuming 30% EV penetration in autos. This implies a 67% CAGR from 2017 through 2032. The company sees the biggest on-board vehicle opportunities for SiC to be the DC-DC converter, on-board charger, and, most importantly, the inverter. As noted in our report, "Charging Towards an Electric Future," the inverter is the most content-rich application within the EV. In this report, we estimate non-SiC IGBT module content of \$270-330 compared to total Inverter module content of \$320-400. The next most content-rich EV application is the on-board charger, according to our estimates, with content between \$100-125.

Cree also forecasts the entire SiC power market will grow from \$280mn in CY17 to \$5.0bn in CY22, implying a 78% CAGR over the next five years (assuming 30% penetration of EVs). SiC is expected to penetrate into other fast growing segments beyond EVs, including Solar and Fast Charging for EVs. Management forecasts SiC Fast Charging TAM of \$522mn in 2022 (versus \$2mn TAM in CY17) and Solar SiC TAM of \$2.1bn (vs. \$85mn in CY17).

Fig. 4: EV-related SiC TAM

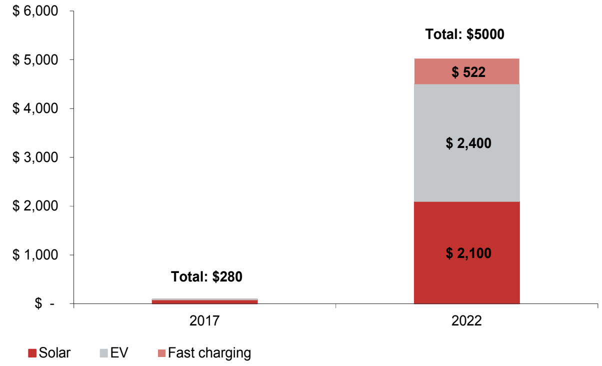
Units In $mn



Source: Company data, Cree analyst day

Fig. 5: SiC Power market growth

Units in $mn



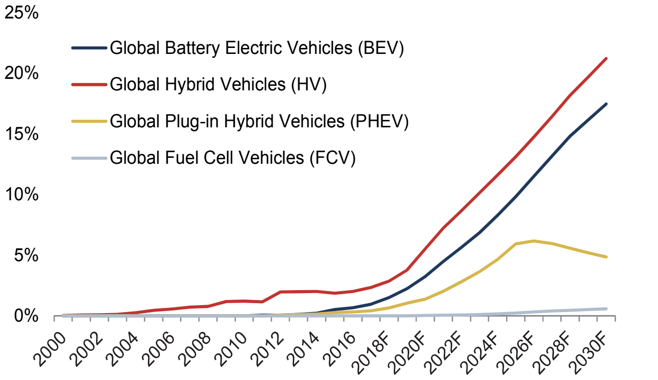
Source: Company data, Cree analyst day

But Aren't EVs Only a Small Portion of the Market? Not for Long…

We expect EVs will far outpace overall Automotive unit growth. Leveraging research from Nomura's automotive team, we forecast AEVs (Alternative Energy Vehicles) to grow at a 23.3% CAGR from 2017 to 2030, from 3.7% of deliveries (3.6mn units) in 2017 to 44.1% (54.8mn units) in 2030. Over the past five years, AEVs have grown at a 15.7% CAGR globally, from 1.7mn units in 2012 to 3.6mn units in 2017. This compares with the overall automotive market unit deliveries, which has grown at a 3.3% CAGR over the same time period. Please see pages 11-20 of our Tesla Initiation, Meet the Winner, for a more detailed explanation of regulatory and policy impacts on the adoption rate of EVs.

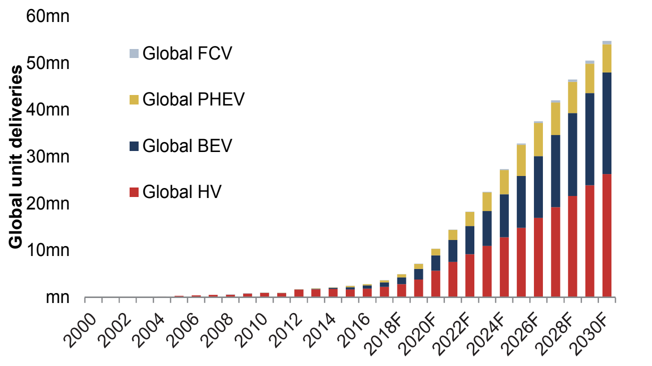
We classify AEVs into three separate categories: Hybrid Vehicles (HVs), Plug-In Hybrid Electric Vehicles (PHEVs), and Battery Electric Vehicles (BEVs). Of the AEV technologies, BEVs have grown the fastest at a 75.4% CAGR, albeit from a lower base of 56k in 2012 to 934k units globally in 2017. Globally, we estimate sales of BEVs will grow at a 27.4% CAGR, from 934k units in 2017 to 21.7mn units in 2030 and will represent 17.5% of the automotive market by that date. We forecast HVs and PHEVs will grow at a 20.8% and 23.1% CAGR, respectively, over the same time period. We note that all three categories of AEV have additional semiconductor content compared to a traditional internal combustion vehicle.

Fig. 6: Nomura Global AEV Penetration Forecasts



Source: Fourin, JAMA, Marklines, European Environment Agency, ICCT, Ward's Automotive, Autodata, Nomura estimates, Instinet research

Fig. 7: Nomura Global AEV Unit Forecasts



Source: Fourin, JAMA, Marklines, European Environment Agency, ICCT, Ward's Automotive, Autodata, Nomura estimates, Instinet research

Cree Has Strong, If Not Leading, Market Share in Both the SiC Materials and Power Businesses

Cree manufactures over 50% of merchant SiC wafers through their Wolfspeed business, making them the #1 supplier in the space. Management expects SiC materials TAM to grow from $56mn in CY17 to $1.2bn in CY22, implying a 85% CAGR. The SiC wafer market experienced tight supply constraints in 2017 and, as such, Cree is on track to double wafer capacity for SiC by the end of 2018. We believe that Cree's market leading position in merchant SiC remains relatively safe over the next several years for two main reasons: 1) Supply has been so tight that customers are not necessarily preoccupied with double sourcing just yet and 2) creating SiC wafers is a much more difficult and intensive process than manufacturing traditional Silicon wafers, which serves as a technical barrier to entry in the market. Other manufacturers of SiC wafers include II-IV (not covered) and Rohm (not covered).

In their SiC Power business line, Cree also holds the #1 market position. In this segment, they provide several packaged SiC ICs, such as SiC MOSFETs, diodes, power modules, and gate driver boards. Infineon, STMicroelectronics (not covered), Rohm, ON Semiconductor and Mitsubishi Electric (covered by Nomura's Masaya Yamasaki) are competitors that also offer SiC packaged components (usually diodes and MOSFETs). STM has noted that it holds a majority market share in SiC components for EV inverters and has secured a SiC-based design win with a major North American EV OEM. Mitsubishi Electric announced a prototype SiC inverter for EVs in March 2017, with commercialization expected in 2021. ON Semiconductor announced new SiC diodes specifically for automotive applications, which we believe to be mainly, or even solely, targeted for onboard EV applications. We believe Cree's market share in overall packaged SiC applications is lower than that of their merchant SiC business, but we expect both businesses should benefit as SiC penetration increases.

Cree's GaN Business Has Similar Positioning

GaN-based RF enables increased capacity and coverage in cellular basestations compared to traditional Si-based solutions. The rapid proliferation of wireless data, as users migrate more and more functionality to their smartphones, has been a critical issue that base station operators and service providers are trying to mitigate. When networks become too "crowded" with data, users will experience lower quality and slower network service. Current networks are already crowded and Cisco (covered by Instinet's Jeff Kvaal) is predicting cellular data will grow another 7x over the next five years. It is for these reasons why GaN is forecasted to become prevalent in base station RF applications in late-4G capacity expansions and 5G deployments: GaN-based antennas offer 2x the users per tower and 10x the data rate per user versus Si-based antennas.

Cree holds the #2 market share position in power RF products, according to their Analyst Day presentation. The company estimates the GaN RF Device market was $384mn in CY17 and will grow at a 23% CAGR to $1.1bn in CY22. Management expects the non-RF GaN device market, which includes applications in Industrial, Military/Aeronautical, and Satellite communications, to grow at a 25% CAGR through CY22. Cree's main competitors in this area include Qorvo and Sumitomo Electric. We note that GaN products are manufactured on SiC wafers, and we discuss Cree's #1 positioning in this market in the previous section.

Lighting and LED Still a Ways to Go but Target Model Is Not Unreasonable

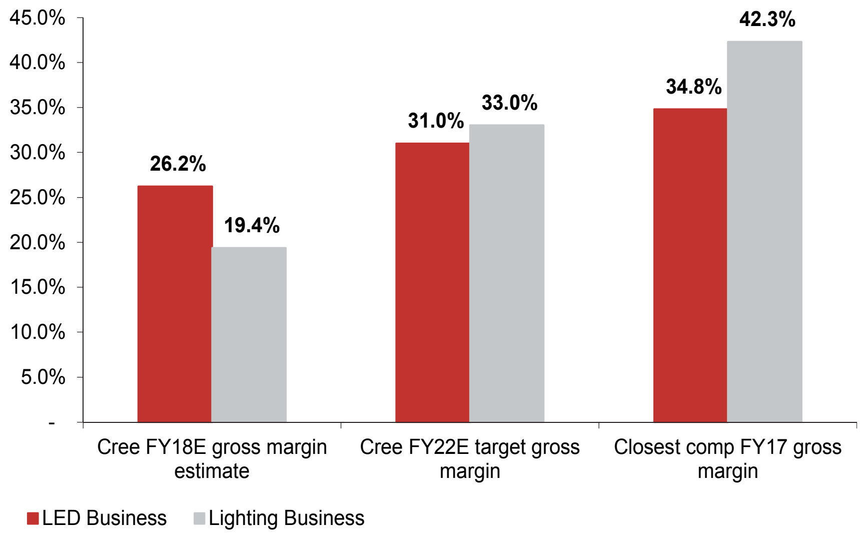
After a rough few years, LED may be stabilizing. Cree's LED business grew only 1% in FY16 and declined 10% in FY17. Prior to FY17, Cree's LED business was facing significant headwinds from industry oversupply. Cree also saw softness in FY17 as non-residential construction slowed, which generally is a meaningful driver for the segment. We believe growth prospects in FY18, however, are starting to turn; revenues for the first nine months of FY18 are up 8.3% Y/Y, and we model LED revenues will be up 7.9% Y/Y for the full year FY18. Management has noted in prior conference calls that the LED business is beginning to show signs of stabilization.

Cree's Lighting segment has also faced headwinds over the past several years, but recent results have shown some indication that the recent restructuring was successful. CREE's lighting business saw revenues triple from FY12 though FY15. Unfortunately, the segment grew far faster than Cree's infrastructure was ready to handle; therefore, the company started to experience production issues and a rise in field claims. Over the past twelve months, and especially under CEO Gregg Lowe's tenure, the Lighting business has undergone a restructuring. While it is still early, results have been positive thus far. Management has noted the company has released several new products using the new quality control procedures and that these products have been performing well in Cree's reliability lab and in the field. Management also noted they are starting to see declines in field claims.

Cree's FY22 target revenue model is reasonable, in our view, when considering overall market forecasts. LED FY22 target revenue of $793mn (compared to $594mn in FY18E) implies CREE's LED segment will grow at a 7.5% CAGR over the next four years. This is below Gartner's five-year estimated CAGR of 8.7% but well above the prior year's growth of (10%) Y/Y in FY17 and 1% Y/Y in FY16. Lighting FY22 target revenue of approximately $700mn (versus our estimate of $568mn in FY18) implies a 5.4% CAGR over the next four years. We believe recent trends in commercial spending may support growth in Lighting over the next several quarters, at least. Instinet's Michael Wood, who covers Americas Building Products, noted in a recent report that their proprietary Commercial Outlook Index reached a new cycle-high of 60.5 in April; the last time the COI was upward trending and hit 60.5 was in late 2003. While not a direct comparison, Cree's Lighting business is somewhat reliant on domestic commercial spending trends: over 90% of the Lighting business comes from commercial products, and we estimate roughly 85% of the business's revenues are generated from North America. Investors can read additional details on Michael Wood's Commercial Outlook Index in the report Commercial Tide Coming In.

Cree's segment gross margin targets for both LED and Lighting also seem attainable when compared to the current margin structures at peers. LED gross margins are modeled to be 26.2% in FY18 compared to Cree's FY22 target of 31.0%. Lighting gross margins in FY18 are estimated to be 19.4% versus the FY22 target of 33.0%. While the differential between Cree's current margins and its target margins for both segments may seem like too much to overcome, we believe these targets are relatively reasonable when considering the margin profiles of competitors. Osram (not covered), the most relevant comp for LED in our view, reported gross margins of 34.8% and 35.7% in their FY17 and FY18, respectively (versus Cree's target of 31.0%). In Lighting, we believe the closest comp is Acuity (not covered). Acuity reported gross margins of 42.3% and 43.7% in their FY17 and FY16, respectively, compared to Cree's FY22 Lighting gross margin target of 33.0%. Furthermore, recent product launches in Lighting are already earning gross margins in the low-30% range. We believe the gross margin targets for both businesses should be attainable as the company executes on operational improvements and experiences product mix shifts.

Fig. 8: Cree current and target gross margins compared to comps



Source: Company data, FactSet, Instinet estimates

Financial Model

We model our long-term estimates to be in line with Cree's target financial model. The company issued revenue/gross margin/operating margin guidance of $2.34bn/40.0%/20.0% during their Analyst Day in February 2017. Importantly, management expects Wolfspeed to grow from the smallest business segment currently to the largest, quadrupling in revenues. We show their revenue and gross margin guidance in Figure 9 below. As such, we model FY22 revenues of $2.33bn, gross margin of 40.0%, and operating margin of 20.0%. Our FY22 segment estimates can also be seen in Figure 10.

Fig. 9: FY17 results vs. Analyst Day FY22 guidance and Instinet estimates

(in $mn)	FY17 Results	Analyst Day FY22 Guidance	Instinet FY22 Estimates
Sales	**1,473**	**2,343**	**2,328**
Gross Margin	**30.2%**	**40.0%**	**40.0%**
Op. Margin	**3.8%**	**20.0%**	**20.0%**

Source: Company data, Instinet estimates

Fig. 10: Segment FY22 revenue guidance versus Instinet estimates

(in $mn)	FY17 Results	Analyst Day FY22 Guidance	Instinet FY22 Estimates
Lighting Products	**701**	**"Equal to FY17 in dollars"**	**691**
LED Products	**550**	**793**	**766**
Wolfspeed	**221**	**"Roughly quadruple FY17"**	**871**
Total	**1,473**	**2,343**	**2,328**

Source: Company data, Instinet estimates

We model F4Q18 revenue / EPS estimates of $400mn/$0.07, slightly below consensus estimates of $401mn/$0.08. We estimate gross margin of 29.7% and an operating margin of 2.3%. Our revenue estimates are as follows: Lighting - $143mn (Street: $143mn), LED - $153mn (Street: $153mn), and Wolfspeed - $104mn (Street: $105mn).

For F1Q19, we model revenues of $413mn, a touch below the consensus estimate of $416mn. We break out our segment revenue estimates as $145mn for Lighting, $158mn for LED, and $109mn for Wolfspeed. Our gross margin estimate is 30.2% for the quarter. We calculate our EPS estimate of $0.09 for F1Q, one penny below consensus of $0.10.

We model FY19E revenue/EPS of $1.68bn/$0.58 compared to consensus of $1.69bn/$0.60. Our gross and operating margin estimates for the fiscal year are 30.7% and 4.6%, respectively. For FY20E, we model revenues/EPS of $1.85bn/$1.29, which is directly in line with consensus. We anticipate meaningful margin expansion in FY20 and, as such, model gross margins of 33.3% and operating margins of 9.1% for the fiscal year.

Fig. 11: Instinet estimates versus consensus

Year end:Jun	Jun-18E		Sep-18E		FY18E		FY19E		FY20E	
(in $mn)	Instinet	Consensus	Instinet	Consensus	Instinet	Consensus	Instinet	Consensus	Instinet	Consensus
Sales	400	401	413	416	1,484	1,485	1,677	1,693	1,848	1,849
Seq. growth	12.4%	12.5%	3.2%	3.8%	0.8%	0.8%	13.0%	14.0%	10.2%	9.2%
Gross margin	29.7%	29.2%	30.2%	30.0%	28.1%	27.7%	30.7%	30.3%	33.3%	32.6%
Operating margin	2.3%	-5.7%	3.1%	-0.5%	0.9%	-22.5%	4.6%	0.1%	9.1%	5.5%
EPS	$0.07	$0.08	$0.09	$0.10	$0.14	$0.16	$0.58	$0.60	$1.29	$1.29

Source: Company data, FactSet, Instinet estimates

Valuation Implies Future Fundamental Tailwinds and Execution Already Priced In

A Sum-of-the-parts analysis implies a valuation of $33 per share. **While it may seem like the most logical valuation methodology at first, we note SOTP does not fully account for margin expansion**, **in our view.** In this analysis, we valued each segment of the business using a peer group EV / CY19 sales multiple. We note that instead of using CY19 sales for each segment, we used our discounted CY21 revenue estimates to account for the larger share we expect Wolfspeed will have in the long-term model. For all segments, we assume a WACC of 8.6% based on a market-risk premium of 6.9% and beta of 0.90. The comp groups for each segment and calculations for the implied EV of each segment is shown in Figure 12 and 13. We calculate an implied total EV of $3.2bn and valuation of $33 per share. We point out, however, that this analysis does not give Cree credit for the anticipated margin expansion throughout FY22.

Fig. 12: Segment comp groups

Lighting		FY2 EV/Sales
OSR-DE	Osram Licht AG	0.8x
AYI	Acuity Brands, Inc	1.4x
HUBB	Hubbell Inc.	1.7x
ETN	Eaton Corp.	1.8x
	Average:	**1.4x**

LED		
OSR-DE	Osram Licht AG	0.8x
2448-TW	Epistar Corp	1.4x
002745-CN	MLS Co.	0.6x
046890-KR	Seoul Semiconductor	0.9x
	Average:	**0.9x**

Wolfspeed		
ON	On Semiconductor	1.9x
IIVI	II-VI	2.3x
6963-JP	Rohm Co.	1.7x
MCHP	Microchip Technology Incorpor	4.3x
IFX-DE	Infineon Technologies AG	2.9x
STM-FR	STMicroelectronics	1.9x
MTSI	MACOM Technology	3.0x
QRVO	Qorvo Inc.	2.8x
	Average:	**2.4x**

Source: FactSet, company data

Fig. 13: Cree sum-of-the-parts valuation

Lighting	
Discounted CY21 Sales	$ 568
Peer Group EV / CY19 Sales	1.4x
Implied Lighting EV	**$ 804**

LED	
Discounted CY21 Sales	$ 629
Peer Group EV / CY19 Sales	0.9x
Implied LED EV	**$ 587**

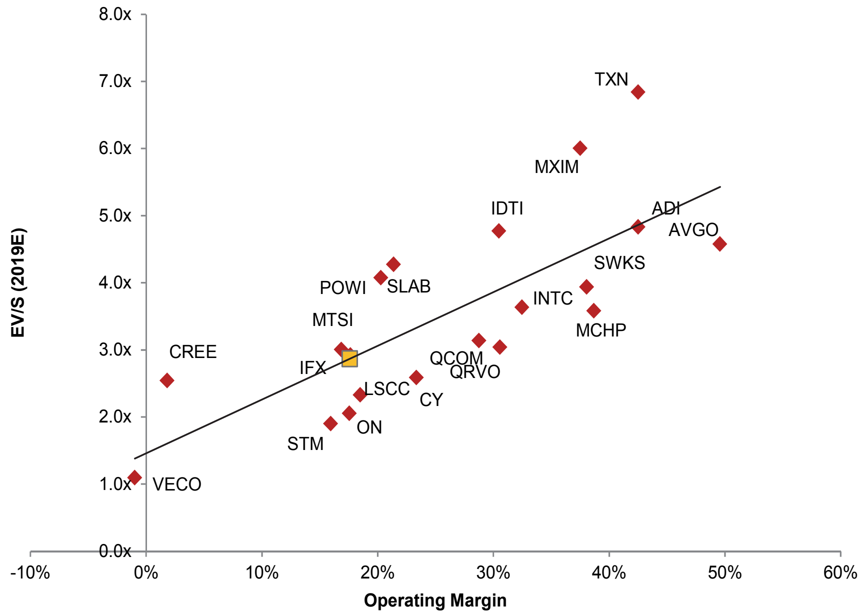
Wolfspeed	
Discounted CY21 Sales	$ 679
Peer Group EV / CY19 Sales	2.6x
Implied Wolfspeed EV	**$ 1,767**

Sum of the parts	
Total CREE Implied EV	$ 3,159
Less Debt	(316)
Plus Cash	462
Implied Market Share	$ 3,305
Weighted Shares Outstanding	100
Implied Share Price	**$ 33**

Source: FactSet, company data, Instinet estimates

Our EV/Sales vs. Operating Margin analysis yields a valuation of $55 per share. We regressed the EV / CY19 sales multiple for several stocks within the semi industry. Using this regression and our estimate for Cree's CY21 operating margin of 17.6%, we calculate a regressed EV/Sales multiple of 2.9x for Cree. To calculate the implied enterprise value, we used this multiple and our CY21 sales estimate of $2.21bn discounted back to CY19 using a WACC of 8.6%. Our model yields an implied valuation per share of $55. The correlation of the analysis is 0.76.

Fig. 14: EV/Sales versus Operating Margin regression



Source: Company data, FactSet, Instinet estimates

Rating and Target Price

We initiate coverage of Cree with a Neutral rating and $44 target price. SiC and GaN will clearly provide tailwinds to revenues and we are positive on the company's overall transition from a "Lighting" company to a "power semi" company. That said, at $46.32 per share, we believe shares have already priced in the anticipated revenue and margin growth, the credibility of Mr. Lowe and his track record, and execution towards the company's target financial model. We elect to remain on the sidelines for now and would look for lower-priced opportunities to become more constructive on the shares.

We arrive at our target price of $44 using a blend between our EV/Sales vs. Operating margin analysis ($55) and our sum-of-the-parts analysis ($33). We assign a weight to each valuation to account for 1) Cree's transition to a semi company and margin expansion (proxied by our EV/Sales vs. Operating Margin) and 2) account for the company's current structure as a Lighting/LED company (represented by SOTP analysis). In our model, we estimate Wolfspeed will account for 50% of gross profits in FY22 and Lighting/LED will account for the remaining 50%. As such, we assign a 50% weighting to our EV/Sales vs. Operating Margin valuation (Wolfspeed weighting) and a 50% weighting to our sum-of-the-parts valuation (LED/Lighting weighting). The blended average of the two valuations yields a target price of $44.

Fig. 15: CREE Target Price Calculation

Weighting	
Wolfspeed, % of FY22 gross profit	50.0%
Lighting & LED, % of FY22 gross profit	50.0%
Weighting assigned to S.O.T.P.	50.0%
Weighting assigned to EV/Sales vs. Op Margin	50.0%
Blended Valuation	
S.O.T.P. valuation per share	$ 33
Weighting	50.0%
EV/Sales vs. Op Margin valuation per share	$ 55
Weighting	50.0%
Blended Cree Target Price	**$ 44**

Source: Company data, FactSet, Instinet estimates

Risks to Our Target Price

- Higher or lower demand in raw SiC wafer markets would impact our target price. Cree, through its Wolfspeed subsidiary, has greater than 50% share in the raw SiC wafer market. If demand is greater than expected for raw SiC wafers, Cree's Wolfspeed business may perform better than expected and vice versa for lower-than-expected demand.
- Penetration rate of SiC and GaN power products could impact our target price. Cree has strong market share in both SiC and GaN power products, which are both considered relatively under-penetrated technologies in the semi power market. If adoption of SiC or GaN power products is faster than expected, Cree's financial results may be better than anticipated. If penetration of SiC or GaN products is slower than expected or fails to gain traction, we could see an adverse reaction in the share price.
- Demand in commercial lighting may impact Cree's Lighting business and impact our target price. Cree's Lighting business represented 48% of revenues in FY17. This business is largely exposed to commercial lighting demand. Should commercial lighting demand be better or worse than expected, there may be downside or upside risk to our target price.
- LED supply and demand conditions could impact Cree's LED business. If demand for LEDs is better or worse than expected, this may result in upside or downside to our target price, respectively. Furthermore, the LED industry recently underwent a duration of excess capacity; if other LED suppliers choose to continue to build capacity, this may also have a negative impact on Cree's LED business and result in downside risk to our target price.

Fig. 16: Cree Segment Summary

Year End: June	FY2018				FY2019				FY2020											
($ in millions)	Sep-17	Dec-17	Mar-18	Jun-18E	Sep-18E	Dec-18E	Mar-19E	Jun-19E	Sep-19E	Dec-19E	Mar-20E	Jun-20E	FY17	FY18E	FY19E	FY20E	CY17	CY18E	CY19E	CY20E
REVENUE ANALYSIS																				
Revenues																				
Lighting Products	150	145	131	143	145	147	139	151	154	154	143	154	701	568	582	605	603	565	597	619
LED Products	145	153	143	153	158	160	150	160	165	167	159	170	550	594	628	660	572	614	643	683
Wolfspeed	66	71	82	104	109	113	117	128	137	142	146	159	221	323	467	583	254	408	523	646
Total	**$ 360**	**$ 368**	**$ 356**	**$ 400**	**$ 413**	**$ 419**	**$ 407**	**$ 439**	**$ 455**	**$ 463**	**$ 447**	**$ 483**	**$ 1,473**	**$ 1,484**	**$ 1,677**	**$ 1,848**	**$ 1,429**	**$ 1,587**	**$ 1,763**	**$ 1,948**
% of Revenues																				
Lighting Products	42%	39%	37%	36%	35%	35%	34%	34%	34%	33%	32%	32%	48%	38%	35%	33%	42%	36%	34%	32%
LED Products	40%	42%	40%	38%	38%	38%	37%	37%	36%	36%	35%	35%	37%	40%	37%	36%	40%	39%	36%	35%
Wolfspeed	18%	19%	23%	26%	26%	27%	29%	29%	30%	31%	33%	33%	15%	22%	28%	32%	18%	26%	30%	33%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Q/Q Growth																				
Lighting Products	-3%	-3%	-10%	9%	2%	1%	-5%	8%	2%	0%	-7%	8%								
LED Products	1%	6%	-6%	7%	3%	1%	-6%	7%	3%	1%	-5%	7%								
Wolfspeed	9%	7%	16%	27%	5%	3%	4%	9%	7%	4%	3%	9%								
Total	0%	2%	-3%	12.4%	3%	2%	-3%	8%	4%	2%	-3%	8%								
Y/Y Growth																				
Lighting Products	-19%	-31%	-15%	-8%	-3%	2%	7%	6%	6%	5%	2%	2%	-21%	-19%	3%	4%	-23%	-6%	6%	4%
LED Products	5%	11%	9%	7%	9%	4%	5%	5%	5%	5%	6%	6%	-10%	8%	6%	5%	-2%	7%	5%	6%
Wolfspeed	33%	30%	46%	71%	65%	60%	43%	23%	25%	26%	24%	24%	90%	46%	45%	25%	54%	61%	28%	23%
Total	-3%	-8%	4%	11%	14%	14%	14%	10%	10%	10%	10%	10%	-9%	1%	13%	10%	-6%	11%	11%	10%
GROSS MARGIN ANALYSIS																				
Gross Profit (GAAP)*																				
Lighting Products Goss Profit	32	23	25	30	31	32	31	34	36	38	35	39	196	110	129	148	127	119	138	164
LED Products Gross Profit	39	39	38	40	42	43	40	43	45	46	43	47	152	156	167	182	147	163	173	193
Wolfspeed Gross Profit	32	34	39	48	51	53	55	60	66	69	71	79	103	154	219	285	121	192	249	324
Unallocated costs	(3)	(3)	(3)	-	-	-	-	-	-	-	-	-	(17)	(9)	-	-	(13)	(3)	-	-
Depreciation and amortization adjustment	-	-	-	-	-	-	-	-	-	-	-	-	(0)	-	-	-	(5)	-	-	-
Total	**$ 100**	**$ 93**	**$ 99**	**$ 119**	**$ 125**	**$ 128**	**$ 125**	**$ 137**	**$ 147**	**$ 153**	**$ 150**	**$ 166**	**$ 435**	**$ 411**	**$ 515**	**$ 615**	**$ 377**	**$ 470**	**$ 561**	**$ 681**
Gross Margin*																				
Lighting Products Goss Profit	21.3%	15.9%	19.1%	21.1%	21.6%	22.1%	22.1%	22.5%	23.5%	24.5%	24.5%	25.5%	28.0%	19.4%	22.1%	24.5%	21%	21%	23%	26%
LED Products Gross Profit	26.9%	25.3%	26.4%	26.4%	26.7%	26.7%	26.4%	26.7%	27.2%	27.7%	27.4%	27.9%	27.6%	26.2%	26.6%	27.5%	26%	27%	27%	28%
Wolfspeed Gross Profit	49.0%	48.4%	48.0%	46.5%	46.8%	47.0%	46.8%	47.3%	48.0%	48.5%	49.0%	50.0%	46.8%	47.8%	46.9%	48.9%	48%	47%	48%	50%
Total	27.8%	25.2%	27.8%	29.7%	30.2%	30.5%	30.8%	31.2%	32.2%	33.0%	33.5%	34.4%	29.5%	27.7%	30.7%	33.3%	26%	30%	32%	35%

*Historicals are GAAP; forecasts are non-GAAP

Source: Company data, Instinet estimates

Fig. 17: Cree Income Statement

Year End: June	FY2018				FY2019				FY2020				Jun-17	Jun-18	Jun-19	Jun-20				
($ in millions)	Sep-17	Dec-17	Mar-18	Jun-18E	Sep-18E	Dec-18E	Mar-19E	Jun-19E	Sep-19E	Dec-19E	Mar-20E	Jun-20E	FY17	FY18E	FY19E	FY20E	CY17	CY18E	CY19E	CY20E
INCOME STATEMENT																				
Total Revenue	**$ 360.4**	**$ 367.9**	**$ 356.0**	**$ 400.0**	**$ 412.6**	**$ 418.9**	**$ 406.5**	**$ 438.7**	**$ 455.5**	**$ 462.6**	**$ 447.0**	**$ 482.7**	**$ 1,473**	**$ 1,484**	**$ 1,677**	**$ 1,848**	**$ 1,429**	**$ 1,587**	**$ 1,763**	**$ 1,948**
QoQ	0%	2%	-3%	12%	3%	2%	-3%	8%	4%	2%	-3%	8%								
YoY	-3%	-8%	4%	11%	14%	14%	14%	10%	10%	10%	10%	10%	-9%	1%	13%	10%	-6%	11%	11%	10%
Cost of Goods Sold	258.3	273.4	255.0	281.0	288.0	291.0	281.4	301.8	308.9	309.9	297.2	316.6	1,028	1,068	1,162	1,233	1,043	1,115	1,202	1,267
Gross Profit	102.1	94.5	100.9	119.0	124.6	127.9	125.1	137.0	146.5	152.7	149.8	166.0	445	416	515	615	385	472	561	681
R&D	39.4	37.8	37.9	41.5	42.5	41.5	40.0	40.5	41.5	42.5	41.0	42.0	148	157	165	167	153	163	165	171
SG&A	57.1	59.9	63.2	68.4	69.4	68.4	66.9	67.4	68.9	70.4	68.9	70.9	250	249	272	279	238	269	274	286
Other	2.8	(0.6)	(3.8)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	(9)	(2)	0	0	(3)	(4)	0	0
Operating expenses	99.3	97.1	97.2	109.9	111.9	109.9	106.9	107.9	110.4	112.9	109.9	112.9	389	404	437	446	388	429	438	456
Operating income	2.8	(2.6)	3.7	9.1	12.7	18.0	18.2	29.1	36.1	39.8	39.9	53.1	56	13	78	169	(2)	43	123	225
Non-operating income (expense)	2.0	1.5	0.5	(1.5)	(1.5)	(1.5)	(1.5)	(1.5)	(1.5)	(1.5)	(1.5)	(1.5)	4	3	(6)	(6)	6	(4)	(6)	(6)
Pretax income	4.8	(1.1)	4.2	7.6	11.2	16.5	16.7	27.6	34.6	38.3	38.4	51.6	60	15	72	163	4	39	117	219
Income tax expense (benefit)	0.7	(0.5)	0.3	0.5	2.0	2.9	2.9	4.8	6.2	6.9	6.9	9.3	10	1	13	29	(4)	6	21	40
Minority Interest	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	0	0	0	0	0	0	0
GAAP Net income	$ (19.9)	$ 13.7	$ (240.6)	$ (36.0)	$ (23.3)	$ (19.2)	$ (18.5)	$ (10.2)	$ (5.0)	$ (2.1)	$ (1.6)	$ 8.4	$ (98)	$ (283)	$ (71)	$ (0)	$ (111)	$ (319)	$ (36)	$ 43
Non-GAAP Net Income	**$ 4.1**	**$ (0.7)**	**$ 3.8**	**$ 7.0**	**$ 9.2**	**$ 13.5**	**$ 13.8**	**$ 22.7**	**$ 28.3**	**$ 31.3**	**$ 31.4**	**$ 42.3**	**$ 50**	**$ 14**	**$ 59**	**$ 133**	**$ 8**	**$ 34**	**$ 96**	**$ 179**
GAAP EPS	($0.20)	$0.14	($2.40)	($0.36)	($0.23)	($0.19)	($0.18)	($0.10)	($0.05)	($0.02)	($0.02)	$0.08	($1.00)	($2.83)	($0.70)	($0.00)	($1.13)	($3.17)	($0.35)	$0.41
Non-GAAP EPS	**$0.04**	**($0.01)**	**$0.04**	**$0.07**	**$0.09**	**$0.13**	**$0.14**	**$0.22**	**$0.28**	**$0.30**	**$0.30**	**$0.41**	**$0.50**	**$0.14**	**$0.58**	**$1.29**	**$0.08**	**$0.33**	**$0.94**	**$1.71**
Diluted shares (GAAP)	98	101	100	101	101	101	102	102	103	103	104	104	99	100	102	104	98	101	103	105
Non-GAAP Diluted shares	98	101	100	101	101	101	102	102	103	103	104	104	99	100	102	104	98	101	103	105
Percent of Sales																				
Gross Margin	28.3%	25.7%	28.3%	29.7%	30.2%	30.5%	30.8%	31.2%	32.2%	33.0%	33.5%	34.4%	30.2%	28.1%	30.7%	33.3%	27.0%	29.8%	31.8%	35.0%
R&D	10.9%	10.3%	10.6%	10.4%	10.3%	9.9%	9.8%	9.2%	9.1%	9.2%	9.2%	8.7%	10.0%	10.5%	9.8%	9.0%	10.7%	10.3%	9.3%	8.8%
SG&A	15.8%	16.3%	17.8%	17.1%	16.8%	16.3%	16.5%	15.4%	15.1%	15.2%	15.4%	14.7%	17.0%	16.8%	16.2%	15.1%	16.6%	17.0%	15.5%	14.7%
Opex	27.5%	26.4%	27.3%	27.5%	27.1%	26.2%	26.3%	24.6%	24.2%	24.4%	24.6%	23.4%	26.4%	27.2%	26.0%	24.1%	27.1%	27.0%	24.8%	23.4%
Operating margin	0.8%	-0.7%	1.0%	2.3%	3.1%	4.3%	4.5%	6.6%	7.9%	8.6%	8.9%	11.0%	3.8%	0.9%	4.6%	9.1%	-0.2%	2.7%	7.0%	11.5%
Pretax Margin	1.3%	-0.3%	1.2%	1.9%	2.7%	3.9%	4.1%	6.3%	7.6%	8.3%	8.6%	10.7%	4.1%	1.0%	4.3%	8.8%	0.3%	2.5%	6.6%	11.2%
Effective Tax Rate	15.0%	42.2%	7.0%	7.0%	17.5%	17.5%	17.5%	17.5%	18.0%	18.0%	18.0%	18.0%	17.0%	7.0%	17.5%	18.0%	-95.2%	14.4%	17.8%	18.3%
Net Margin	1.1%	-0.2%	1.1%	1.7%	2.2%	3.2%	3.4%	5.2%	6.2%	6.8%	7.0%	8.8%	3.4%	1.0%	3.5%	7.2%	0.6%	2.1%	5.5%	9.2%

Source: Company data, Instinet estimates

Fig. 18: Cree Balance Sheet

Year End: June	FY2018				FY2019				FY2020											
($ in millions)	Sep-17	Dec-17	Mar-18	Jun-18E	Sep-18E	Dec-18E	Mar-19E	Jun-19E	Sep-19E	Dec-19E	Mar-20E	Jun-20E	FY17	FY18E	FY19E	FY20E	CY17	CY18E	CY19E	CY20E
BALANCE SHEET																				
ASSETS																				
Cash, Equiv, & ST Investments	$ 625	$ 650	$ 401	$ 406	$ 403	$ 409	$ 427	$ 423	$ 443	$ 474	$ 517	$ 540	$ 611	$ 406	$ 423	$ 540	$ 650	$ 409	$ 474	$ 650
Accounts Receivable	155	153	143	133	137	139	135	146	151	154	148	160	148	133	146	160	153	139	154	171
Inventories	278	273	310	312	315	318	307	330	338	339	325	346	284	312	330	346	273	318	339	358
Income tax receivable	8	3	8	8	8	8	8	8	8	8	8	8	8	8	8	8	3	8	8	8
Prepaid expenses	24	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
Other Current Assets	18	26	25	25	25	25	25	25	25	25	25	25	26	25	25	25	26	25	25	25
Total Current Assets	**$ 1,106**	**$ 1,128**	**$ 910**	**$ 905**	**$ 909**	**$ 921**	**$ 924**	**$ 953**	**$ 987**	**$ 1,021**	**$ 1,045**	**$ 1,101**	**$ 1,101**	**$ 905**	**$ 953**	**$ 1,101**	**$ 1,128**	**$ 921**	**$ 1,021**	**$ 1,234**
PP&E, Net	595	612	641	671	689	707	725	744	757	770	782	795	581	671	744	795	612	707	770	804
Goodwill	619	619	618	618	618	618	618	618	618	618	618	618	619	618	618	618	619	618	618	618
Intangible Assets	267	260	401	391	380	370	359	348	337	326	315	303	274	391	348	303	260	370	326	281
Other long-term investments	47	73	60	60	60	60	60	60	60	60	60	60	50	60	60	60	73	60	60	60
Deferred income taxes	11	10	11	11	11	11	11	11	11	11	11	11	12	11	11	11	10	11	11	11
Other assets	12	13	12	12	12	12	12	12	12	12	12	12	13	12	12	12	13	12	12	12
Total Non-Current Assets	**$ 1,552**	**$ 1,586**	**$ 1,743**	**$ 1,763**	**$ 1,770**	**$ 1,778**	**$ 1,785**	**$ 1,793**	**$ 1,795**	**$ 1,796**	**$ 1,798**	**$ 1,800**	**$ 1,549**	**$ 1,763**	**$ 1,793**	**$ 1,800**	**$ 1,586**	**$ 1,778**	**$ 1,796**	**$ 1,785**
Total Assets	**$ 2,658**	**$ 2,714**	**$ 2,653**	**$ 2,668**	**$ 2,679**	**$ 2,699**	**$ 2,710**	**$ 2,746**	**$ 2,782**	**$ 2,817**	**$ 2,843**	**$ 2,900**	**$ 2,650**	**$ 2,668**	**$ 2,746**	**$ 2,900**	**$ 2,714**	**$ 2,699**	**$ 2,817**	**$ 3,019**
LIABILITIES & EQUITY																				
Accounts payable	147	158	157	180	181	183	177	190	194	195	187	199	133	180	190	199	158	183	195	206
Accrued salaries and wages	40	47	51	51	51	51	51	51	51	51	51	51	42	51	51	51	47	51	51	51
Other current liabilities	43	41	36	36	36	36	36	36	36	36	36	36	37	36	36	36	41	36	36	36
Short-term debt	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-
Total Current Liabilities	**$ 229**	**$ 246**	**$ 243**	**$ 266**	**$ 268**	**$ 270**	**$ 264**	**$ 277**	**$ 281**	**$ 282**	**$ 274**	**$ 286**	**$ 212**	**$ 266**	**$ 277**	**$ 286**	**$ 246**	**$ 270**	**$ 282**	**$ 293**
Long Term Debt	141	124	316	316	316	316	316	316	316	316	316	316	145	316	316	316	124	316	316	316
Deferred income taxes	53	37	0	0	0	0	0	0	0	0	0	0	50	-	-	-	37	-	-	-
Other long-term liabilities	19	24	26	26	26	26	26	26	26	26	26	26	20	26	26	26	24	26	26	26
Long Term Liabilities	**$ 213**	**$ 186**	**$ 342**	**$ 342**	**$ 342**	**$ 342**	**$ 342**	**$ 342**	**$ 342**	**$ 342**	**$ 342**	**$ 342**	**$ 215**	**$ 342**	**$ 342**	**$ 342**	**$ 186**	**$ 342**	**$ 342**	**$ 342**
Total Liabilities	**$ 442**	**$ 431**	**$ 586**	**$ 609**	**$ 610**	**$ 612**	**$ 606**	**$ 619**	**$ 624**	**$ 624**	**$ 616**	**$ 628**	**$ 427**	**$ 609**	**$ 619**	**$ 628**	**$ 431**	**$ 612**	**$ 624**	**$ 635**
Total Equity	**$ 2,211**	**$ 2,278**	**$ 2,062**	**$ 2,054**	**$ 2,064**	**$ 2,082**	**$ 2,098**	**$ 2,122**	**$ 2,153**	**$ 2,188**	**$ 2,222**	**$ 2,267**	**$ 2,223**	**$ 2,054**	**$ 2,122**	**$ 2,267**	**$ 2,278**	**$ 2,082**	**$ 2,188**	**$ 2,379**
Minority Interest	**$ 5**	**$ 5**	**$ 5**	**$ 5**	**$ 5**	**$ 5**	**$ 5**	**$ 5**	**$ 5**	**$ 5**	**$ 5**	**$ 5**	**$ -**	**$ 5**	**$ 5**	**$ 5**	**$ 5**	**$ 5**	**$ 5**	**$ 5**
Total Liabilities and Equity	**$ 2,658**	**$ 2,714**	**$ 2,653**	**$ 2,668**	**$ 2,679**	**$ 2,699**	**$ 2,710**	**$ 2,746**	**$ 2,782**	**$ 2,817**	**$ 2,843**	**$ 2,900**	**$ 2,650**	**$ 2,668**	**$ 2,746**	**$ 2,900**	**$ 2,714**	**$ 2,699**	**$ 2,817**	**$ 3,019**

Source: Company data, Instinet estimates

Fig. 19: Cree Cash Flow Statement

Year End: June ($ in millions)	FY2018 Sep-17	Dec-17	Mar-18	Jun-18E	FY2019 Sep-18E	Dec-18E	Mar-19E	Jun-19E	FY2020 Sep-19E	Dec-19E	Mar-20E	Jun-20E
CASH FLOWS												
Cash Flows from Operations												
Net income	$ (19.9)	$ 13.8	$ (240.5)	$ (36.0)	$ (23.2)	$ (19.2)	$ (18.5)	$ (10.2)	$ (4.9)	$ (2.1)	$ (1.6)	$ 8.4
Depreciation & amortization	37.4	37.2	38.6	41.7	43.0	43.6	42.3	45.7	45.2	45.9	44.3	47.9
Stock-based compensation	10.1	12.0	11.2	11.0	12.4	12.7	12.1	12.9	13.6	13.8	13.3	14.4
Excess tax benefit from SBC arrangements	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Loss on disposal or impairment of long-lived as	2.8	4.3	1.7	2.5	2.8	2.8	2.5	2.7	2.7	2.7	2.6	2.7
Amortization of premium/discount on investme	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
(Gain) loss on equity investment	3.3	(24.7)	14.0	(3.7)	(2.8)	(4.3)	0.8	(2.5)	(2.2)	(2.1)	(1.5)	(2.1)
Foreign exchange gain on equity investment	(0.2)	(0.5)	(1.9)	(0.7)	(0.8)	(1.0)	(1.1)	(0.9)	(0.9)	(1.0)	(1.0)	(0.9)
Deferred income taxes	3.1	(14.9)	(38.1)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other	0.0	0.0	247.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Changes in working capital:	16.1	23.2	(14.1)	31.4	(5.3)	(3.5)	8.6	(20.1)	(8.9)	(2.8)	11.0	(20.8)
Accounts receivable	(6.0)	1.8	9.9	10.5	(4.2)	(2.1)	4.1	(10.7)	(5.6)	(2.4)	5.2	(11.8)
Inventories	7.0	4.4	(16.0)	(2.3)	(2.5)	(3.3)	10.6	(22.3)	(7.9)	(1.1)	13.8	(21.2)
Prepaid expenses and other assets	9.3	(4.3)	(3.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Accounts payable	6.4	11.5	(2.6)	23.2	1.4	1.9	(6.1)	12.8	4.6	0.6	(8.0)	12.2
Accrued salaries and wages and other liabilit	(0.6)	9.9	(2.5)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other assets and liabilities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cash Flows from Operations	**$ 54.1**	**$ 51.7**	**$ 19.6**	**$ 47.5**	**$ 27.4**	**$ 32.5**	**$ 48.1**	**$ 28.8**	**$ 45.8**	**$ 55.7**	**$ 68.5**	**$ 50.8**
Cash Flows from Investing												
Purchases of PP&E	(36.5)	(48.8)	(43.2)	(61.2)	(50.5)	(51.3)	(49.8)	(53.7)	(46.7)	(47.4)	(45.8)	(49.5)
Acquisitions / Purchases of patent and licensin	(2.5)	(2.5)	(430.1)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Net proceeds (purchases) of investments	4.3	(12.2)	177.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other	0.3	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cash Flows from Investing	**$ (34.3)**	**$ (63.4)**	**$ (296.1)**	**$ (61.2)**	**$ (50.5)**	**$ (51.3)**	**$ (49.8)**	**$ (53.7)**	**$ (46.7)**	**$ (47.4)**	**$ (45.8)**	**$ (49.5)**
Cash Flow from Financing												
Increase (decrease) in debt	(4.0)	(17.0)	192.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Proceeds from sales stock	0.1	46.4	15.7	17.4	19.9	24.9	19.5	20.4	21.2	21.5	20.6	20.9
Excess tax benefit from SBC arrangements	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Repurchase of common stock	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Payment of dividends	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Payment of acquisition-related contingent cons	(1.9)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other	4.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cash Flow from Financing	**$ (0.8)**	**$ 29.4**	**$ 207.7**	**$ 17.4**	**$ 19.9**	**$ 24.9**	**$ 19.5**	**$ 20.4**	**$ 21.2**	**$ 21.5**	**$ 20.6**	**$ 20.9**
Net Increase in Cash	**$ 19.5**	**$ 17.6**	**$ (68.5)**	**$ 4.0**	**$ (3.0)**	**$ 6.4**	**$ 18.1**	**$ (4.2)**	**$ 20.6**	**$ 30.1**	**$ 43.7**	**$ 22.5**
Cash at the beginning of the period	$ 132.6	$ 152.1	$ 169.7	$ 101.2	$ 105.3	$ 102.3	$ 108.7	$ 126.8	$ 122.6	$ 143.2	$ 173.3	$ 217.0
Cash at the end of the period	$ 152.1	$ 169.7	$ 101.2	$ 105.3	$ 102.3	$ 108.7	$ 126.8	$ 122.6	$ 143.2	$ 173.3	$ 217.0	$ 239.5
Free Cash Flow	**$ 17.7**	**$ 2.9**	**$ (23.6)**	**$ (13.7)**	**$ (23.2)**	**$ (18.8)**	**$ (1.7)**	**$ (24.9)**	**$ (0.9)**	**$ 8.3**	**$ 22.7**	**$ 1.3**
Free Cash Flow per share	$0.18	$0.03	($0.24)	($0.14)	($0.23)	($0.19)	($0.02)	($0.24)	($0.01)	$0.08	$0.22	$0.01

Year End: June ($ in millions)	FY17	FY18E	FY19E	FY20E	CY17	CY18E	CY19E	CY20E
CASH FLOWS								
Cash Flows from Operations								
Net income	$ (98)	$ (283)	$ (71)	$ (0)	$ (111)	$ (319)	$ (36)	$ 43
Depreciation & amortization	151	155	175	183	163	167	179	186
Stock-based compensation	48	44	50	55	43	47	52	58
Excess tax benefit from SBC arrangements	0	-	-	-	0	-	-	-
Loss on disposal or impairment of long-lived as	3	11	11	11	9	10	10	11
Amortization of premium/discount on investme	5	5	5	5	5	5	5	5
(Gain) loss on equity investment	(8)	(11)	(9)	(8)	(35)	3	(6)	(7)
Foreign exchange gain on equity investment	(3)	(3)	(4)	(4)	(3)	(4)	(4)	(4)
Deferred income taxes	75	(50)	-	-	63	(38)	-	-
Other	-	247	-	-	-	247	-	-
Changes in working capital:	43	57	(20)	(22)	68	9	(23)	(26)
Accounts receivable	17	16	(13)	(15)	(1)	14	(14)	(17)
Inventories	18	(7)	(17)	(16)	28	(24)	(21)	(19)
Prepaid expenses and other assets	17	2	-	-	20	(3)	-	-
Accounts payable	(5)	38	10	9	27	24	12	11
Accrued salaries and wages and other liabilit	(4)	7	-	-	(5)	(3)	-	-
Other assets and liabilities	-	-	-	-	-	-	-	-
Cash Flows from Operations	**$ 216**	**$ 173**	**$ 137**	**$ 221**	**$ 202**	**$ 127**	**$ 178**	**$ 266**
Cash Flows from Investing								
Purchases of PP&E	(87)	(190)	(205)	(189)	(137)	(206)	(198)	(174)
Acquisitions / Purchases of patent and licensin	(12)	(435)	-	-	(12)	(430)	-	-
Net proceeds (purchases) of investments	(47)	169	-	-	(31)	177	-	-
Other	1	1	-	-	2	0	-	-
Cash Flows from Investing	**$ (145)**	**$ (455)**	**$ (205)**	**$ (189)**	**$ (178)**	**$ (459)**	**$ (198)**	**$ (174)**
Cash Flow from Financing								
Increase (decrease) in debt	(15)	171	-	-	(46)	192	-	-
Proceeds from sales stock	18	80	85	84	56	78	83	84
Excess tax benefit from SBC arrangements	(0)	-	-	-	(0)	-	-	-
Repurchase of common stock	(104)	-	-	-	(6)	-	-	-
Payment of dividends	-	-	-	-	-	-	-	-
Payment of acquisition-related contingent cons	(3)	(2)	-	-	(2)	-	-	-
Other	-	5	-	-	5	-	-	-
Cash Flow from Financing	**$ (104)**	**$ 254**	**$ 85**	**$ 84**	**$ 8**	**$ 270**	**$ 83**	**$ 84**
Net Increase in Cash	**$ (34)**	**$ (27)**	**$ 17**	**$ 117**	**$ 33**	**$ (61)**	**$ 65**	**$ 176**
Cash at the beginning of the period	$ 166	$ 133	$ 105	$ 123	$ 137	$ 170	$ 109	$ 173
Cash at the end of the period	$ 133	$ 105	$ 123	$ 240	$ 170	$ 109	$ 173	$ 350
Free Cash Flow	**$ 129**	**$ (17)**	**$ (69)**	**$ 31**	**$ 65**	**$ (79)**	**$ (19)**	**$ 91**
Free Cash Flow per share	$1.31	($0.17)	($0.67)	$0.30	$0.66	($0.79)	($0.19)	$0.87

Source: Company data, Instinet estimates

NOMURA | INSTINET

Analog Devices, Inc. ADI.OQ ADI US

EQUITY: AMERICAS SEMICONDUCTORS

Assuming Coverage: Maintain Neutral

Bullish on Fundamentals in Automotive/Industrial, but Consumer Remains a Headwind

- **Automotive and Industrial combined will account for 67% of Analog Device's revenues in FY18E, giving the company a solid position in two of the semiconductor industry's fastest growing markets.** Gartner forecasts the Industrial market to grow at a 10.4% CAGR from 2017 through 2022 and for Automotive to grow at a 10.7% CAGR (both ex-memory). This is well above overall estimated semi market growth of 5.1% (ex-memory) over the same time period. Specific production lines within the Auto business have shown intermittent pockets of weakness, however, but any weakness has generally been short term and offset by strength in other applications—e.g., BMS solutions was weak in F2Q but was more than offset by strength in Infotainment and powertrain.
- **Consumer remains a headwind through FY19, in our view, and consensus has yet to account for this in their models.** Consensus currently models Consumer revenues down only 3.5% Y/Y ($803mn) in FY19—vs. our estimate of down 17% ($691mn)—as it fails to fully account for the continued effects from socket losses at a large portable consumer customer, which we believe is Apple. While we do expect the non-portable consumer business to grow Y/Y, we anticipate any such growth will be offset by declines in the portable consumer business. We model Consumer revenues down 21.0% Y/Y in FY18E and down 17% Y/Y in FY19E.
- **FY19 consensus EPS higher than our estimates, likely due to optimism in Consumer.** We model flat EPS growth Y/Y in FY19 ($5.82) vs. the Street at 1.4% Y/Y ($5.93). And we model revenue of $6.31bn in FY19 vs. consensus of $6.34bn. Our FY18E revenue and EPS estimates remain unchanged at $6.08bn/$5.82 vs. consensus of $6.10bn/$5.85.
- **We maintain our Neutral rating and $100 TP.** We are bullish on ADI's exposure to Automotive/Industrial, but declines in Consumer pose a headwind to revenue and EPS growth in FY19. As such, we believe shares remain fairly valued at current levels but would look for opportunities to become more constructive on the name. We believe shares should trade in line with ADI's comp group consisting of TXN, XLNX, MCHP, MXIM, and ON, which currently trade at an average FY2 P/E of 17.4x. We calculate our $100 TP using this 17.4x multiple and our CY19E EPS of $5.84.

With this note, coverage of ADI is assumed by Krysten Sciacca.

Year-end : Oct	2017		2018E			2019E	
EPS (US$)	Actual	Prev.	Curr.	Cons.	Prev.	Curr.	Cons.
1Q	0.94A	1.42A	1.42A	1.42E	1.39E	1.39E	1.37E
2Q	1.03A	1.45A	1.45A	1.45E	1.43E	1.43E	1.45E
3Q	1.26A	1.45E	1.45E	1.46E	1.52E	1.52E	1.52E
4Q	1.45A	1.50E	1.50E	1.52E	1.48E	1.48E	1.58E
Year	4.73A	5.82E	5.82E	5.85E	5.82E	5.82E	5.93E
P/E (x)	20.79	16.89	16.89	16.80	16.90	16.90	16.58

Source: Company data, FactSet, Instinet estimates

Key company data: See next page for company data and detailed price/index chart.

Instinet, LLC, Equity Research

18 July 2018

Rating Remains	Neutral
Target Price Remains	USD 100.00
Closing price 17 July 2018	USD 98.26
Potential upside	+1.8%

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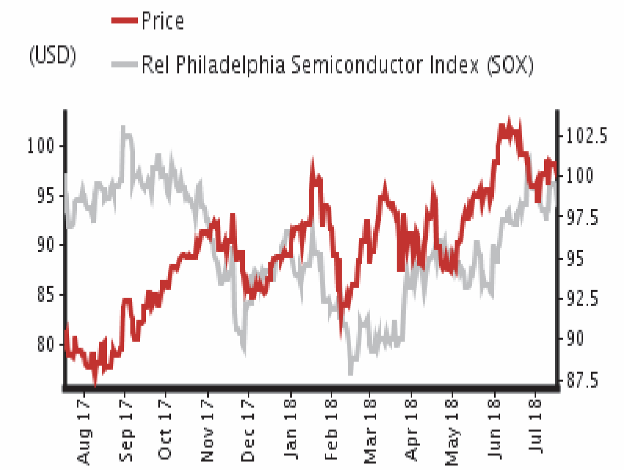
See Appendix A-1 for analyst certification, important disclosures and the status of non-US analysts.

Key data on Analog Devices, Inc.

Rating

Stock	Neutral
Sector	Not rated

Relative performance chart



Source: Thomson Reuters, Instinet research

Performance as of 17 July 2018

(%)	1M	3M	12M
Absolute	-3.2	3.2	21.2
Relative to Philadelphia Semiconductor Index (SOX)	1.2	3.2	-2.4

Market data

Current Stock Price ($)	98.26
Market Cap ($mn)	36,444.3
52-week Low ($)	76.41
52-week High ($)	103.59
Shares Outstanding (mn)	370.90

Source: Thomson Reuters, Instinet research

Income Statement ($mn)

Year-end : Oct	2017A	2018E	2019E	2020E
Revenues	5,193	6,079	6,310	6,598
Gross Profit	3,608	4,337	4,512	4,726
Gross Margin	69.49	71.33	71.50	71.63
Operating Expenses	1,652	1,851	1,799	1,837
Operating Income	1,957	2,485	2,713	2,889
Other Inc./(Exp)	-126	-163	-200	-200
Pretax Income	1,830	2,322	2,513	2,689
Income Tax	174	136	302	323
Net Income (adj.)	1,656	2,186	2,212	2,366
EPS	4.73	5.82	5.82	6.16
Diluted Shares	350	376	380	384

Balance Sheet ($mn)

	2017A	2018E	2019E	2020E
Cash, Equivalents, & Investments	1,048	1,581	2,970	4,500
Accounts Receivable	689	750	782	824
Inventories	551	506	528	556
Other Current Assets	64	71	71	71
Total Current Assets	2,351	2,908	4,350	5,952
PP&E	1,107	1,147	1,212	1,278
Other Non-current Assets	146	120	120	120
Total Non-current Assets	18,790	18,305	17,798	17,292
Total Assets	21,141	21,212	22,148	23,244
Total Current Liabilities	1,596	1,446	1,456	1,469
Long-term Debt	7,551	6,926	6,926	6,926
Other Non-current Liabilities	1,832	1,832	1,832	1,832
Total Liabilities	10,980	10,204	10,214	10,227
Shareholders' Equity	10,162	11,008	11,934	13,017
Total Liabilities & Equity	21,141	21,212	22,148	23,244

Cash Flow Items ($mn)

	2017A	2018E	2019E	2020E
Cash from Operations	1,167	2,332	2,309	2,470
Cash from Investing	-6,673	-292	-252	-264
Cash from Financing	5,629	-1,507	-667	-675
Depreciation	584	774	759	769
Capital Expenditures	-204	-239	-252	-264

Valuation

	2017A	2018E	2019E	2020E
Return on Equity	0.22	0.21	0.19	0.19
Debt to Capital	13.58	11.61	10.87	10.14
Debt to Assets	35.72	32.65	31.27	29.80
BVPS	28.99	29.30	31.38	33.87
Net Cash per Share	-19.41	-14.38	-10.55	-6.46

Source: Company data, Instinet estimates

Fig. 1: Segment Revenue Model

(in $mn)	Jan-17	Apr-17	Jul-17	Oct-17	Jan-18	Apr-18	Jul-18E	Oct-18E	Jan-19E	CY17	CY18E	CY19E	CY20E
Communications	$ 174	$ 212	$ 254	$ 272	$ 284	$ 288	$ 299	$ 302	$ 296	$ 986	$ 1,182	$ 1,241	$ 1,302
Consumer	270	211	252	313	239	198	178	213	189	1,026	795	676	687
Automotive	139	182	227	235	252	239	241	251	256	859	986	1,029	1,114
Industrial	401	543	700	720	744	788	789	773	781	2,593	3,119	3,396	3,541
Total Sales	$ 984	$ 1,148	$ 1,434	$ 1,541	$ 1,519	$ 1,513	$ 1,508	$ 1,540	$ 1,523	$ 5,464	$ 6,082	$ 6,342	$ 6,644

(% of Revenue)	Jan-17	Apr-17	Jul-17	Oct-17	Jan-18	Apr-18	Jul-18E	Oct-18E	Jan-19E	CY17	CY18E	CY19E	CY20E
Communications	18%	18%	18%	18%	19%	19%	20%	20%	19%	18%	19%	20%	20%
Consumer	27%	18%	18%	20%	16%	13%	12%	14%	12%	19%	13%	11%	10%
Automotive	14%	16%	16%	15%	17%	16%	16%	16%	17%	16%	16%	16%	17%
Industrial	41%	47%	49%	47%	49%	52%	52%	50%	51%	47%	51%	54%	53%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

(% QoQ)	Jan-17	Apr-17	Jul-17	Oct-17	Jan-18	Apr-18	Jul-18E	Oct-18E	Jan-19E
Communications	1%	22%	20%	7%	4%	1%	4%	1%	-2%
Consumer	-8%	-22%	19%	24%	-24%	-17%	-10%	20%	-11%
Automotive	-2%	31%	25%	3%	7%	-5%	1%	4%	2%
Industrial	1%	35%	29%	3%	3%	6%	0%	-2%	1%
Total	-2%	17%	25%	7%	-1%	0%	0%	2%	-1%

(% YoY)	Jan-17	Apr-17	Jul-17	Oct-17	Jan-18	Apr-18	Jul-18E	Oct-18E	Jan-19E	CY17	CY18E	CY19E	CY20E
Communications	4%	21%	46%	59%	63%	36%	18%	11%	4%	42%	20%	5%	5%
Consumer	115%	164%	36%	7%	-12%	-6%	-29%	-32%	-21%	31%	-23%	-15%	2%
Automotive	9%	32%	69%	66%	82%	31%	6%	7%	1%	56%	15%	4%	8%
Industrial	15%	41%	87%	82%	85%	45%	13%	7%	5%	68%	20%	9%	4%
Total Sales	28%	47%	65%	54%	54%	32%	5%	0%	0%	53%	11%	4%	5%

Note: Above chart reflects GAAP revenue

Source: Company data, FactSet, Instinet estimates

Fig. 2: ADI Income Statement

Year End: October		FY17				FY18E				FY19E										
($ in millions)	Jan-17	Apr-17	Jul-17	Oct-17	Jan-18	Apr-18	Jul-18E	Oct-18E	Jan-19E	Apr-19E	Jul-19E	Oct-19E	FY17	FY18E	FY19E	FY20E	CY17	CY18E	CY19E	CY20E
INCOME STATEMENT																				
Total Revenue	**$984**	**$1,209**	**$1,458**	**$1,541**	**$1,519**	**$1,513**	**$1,508**	**$1,540**	**$1,523**	**$1,558**	**$1,625**	**$1,605**	**$5,193**	**$6,079**	**$6,310**	**$6,598**	**$5,549**	**$6,082**	**$6,342**	**$6,644**
QoQ	-1.9%	22.8%	20.7%	5.7%	-1.5%	-0.4%	-0.3%	2.1%	-1.1%	2.3%	4.3%	-1.2%								
YoY	27.9%	55.2%	67.7%	53.6%	54.3%	25.2%	3.4%	-0.1%	0.3%	2.9%	7.7%	4.3%	51.8%	17.1%	3.8%	4.6%	55.7%	9.6%	4.3%	4.8%
		7.6%																		
COGS	334	371	431	449	440	434	430	439	438	444	459	458	1,585	1,743	1,798	1,872	1,655	1,741	1,805	1,885
Gross Profit	651	838	1,028	1,092	1,079	1,079	1,078	1,101	1,085	1,114	1,166	1,148	3,608	4,337	4,512	4,726	3,894	4,341	4,537	4,759
SG&A	123	191	184	186	177	172	172	173	171	175	181	181	683	694	707	725	719	690	712	727
R&D	184	235	276	274	289	289	289	289	287	291	297	297	969	1,157	1,172	1,192	1,038	1,156	1,177	1,194
Operating Expenses	307	380	437	435	446	442	442	443	438	446	458	458	1,559	1,772	1,799	1,837	1,758	1,766	1,809	1,841
Operating Income	344	457.7	591	657	633	637	637	658	647	668	708	690	1,957	2,485	2,713	2,889	2,242	2,574	2,728	2,918
Other Income (Expense)	(25.7)	(59.1)	(68.0)	(66.5)	(66.5)	(62.4)	(58.0)	(55.5)	(50.0)	(50.0)	(50.0)	(50.0)	(219)	(242)	(200)	(200)	(247)	(231)	(200)	(200)
Pretax Income	318	399	523	590	567	574	579	603	597	618	658	640	1,830	2,322	2,513	2,689	1,996	2,343	2,528	2,718
Income Tax Expense	26	42	54	53	35	30	35	36	72	74	79	77	174	136	302	323	180	160	303	326
Net Income	293	357	469	538	531	544	544	567	525	544	579	563	1,656	2,186	2,212	2,366	1,815	2,182	2,225	2,392
Stock Option Expense	17	22	33	32	38	39	36	38	35	36	39	38	104	151	148	158	118	149	148	160
% Dilution to EPS	5.3%	5.9%	6.5%	5.7%	6.7%	6.7%	6.7%	6.7%	6.7%	6.7%	6.7%	6.7%	5.8%	6.5%	6.3%	6.3%	4.5%	6.4%	6.3%	6.3%
GAAP Net Income	217	94	69	348	268	380	385	408	377	395	430	415	727	1,441	1,617	1,772	761	1,513	1,630	1,797
Shares Outstanding	313	346	371	372	374	375	376	378	379	380	381	382	350	376	380	384	361	377	381	385
Proforma EPS (Incl ESO)	**$0.94**	**$1.03**	**$1.26**	**$1.45**	**$1.42**	**$1.45**	**$1.45**	**$1.50**	**$1.39**	**$1.43**	**$1.52**	**$1.48**	**$4.73**	**$5.82**	**$5.82**	**$6.16**	**$5.03**	**$5.80**	**$5.84**	**$6.21**
YoY	67.0%	62.4%	53.8%	37.0%	51.8%	40.6%	14.5%	3.7%	-2.3%	-1.4%	5.2%	-1.6%	54.0%	23.1%	0.0%	5.9%	51.5%	15.1%	0.8%	6.4%
GAAP EPS	$0.69	$0.27	$0.18	$0.93	$0.72	$1.01	$1.02	$1.08	$0.99	$1.04	$1.13	$1.09	$2.08	$3.83	$4.25	$4.61	$2.10	$4.02	$4.28	$4.67
Percent of Sales																				
Gross Margin	66.1%	69.3%	70.5%	70.9%	71.0%	71.3%	71.5%	71.5%	71.3%	71.5%	71.8%	71.5%	69.5%	71.3%	71.5%	71.6%	70.2%	71.4%	71.5%	71.6%
SG&A	12.5%	15.8%	12.6%	12.1%	11.6%	11.4%	11.4%	11.2%	11.2%	11.2%	11.1%	11.3%	13.2%	11.4%	11.2%	11.0%	13.0%	11.3%	11.2%	10.9%
R&D	18.7%	19.5%	18.9%	17.8%	19.0%	19.1%	19.2%	18.8%	18.8%	18.7%	18.3%	18.5%	18.7%	19.0%	18.6%	18.1%	18.7%	19.0%	18.6%	18.0%
Operating Margin	35.0%	37.9%	40.5%	42.6%	41.7%	42.1%	42.2%	42.7%	42.5%	42.9%	43.6%	43.0%	37.7%	40.9%	43.0%	43.8%	40.4%	42.3%	43.0%	43.9%
Effective Tax Rate	8.0%	10.4%	10.4%	8.9%	6.2%	5.2%	6.0%	6.0%	12.0%	12.0%	12.0%	12.0%	9.5%	5.9%	12.0%	12.0%	9.0%	6.8%	12.0%	12.0%
Net Margin	29.7%	29.5%	32.1%	34.9%	35.0%	36.0%	36.1%	36.8%	34.5%	34.9%	35.6%	35.1%	31.9%	36.0%	35.0%	35.9%	32.7%	35.9%	35.1%	36.0%

Source: Company data, Instinet estimates

Fig. 3: ADI Balance Sheet

Year End: October	FY17				FY18E				FY19E											
($ in millions)	Jan-17	Apr-17	Jul-17	Oct-17	Jan-18	Apr-18	Jul-18E	Oct-18E	Jan-19E	Apr-19E	Jul-19E	Oct-19E	FY17	FY18E	FY19E	FY20E	CY17	CY18E	CY19E	CY20E
BALANCE SHEET																				
Assets																				
Cash & Cash Equivalents	$4,987	$5,698	$909	$1,048	$828	$807	$1,237	$1,581	$1,912	$2,239	$2,591	$2,970	$1,048	$1,581	$2,970	$4,500	$828	$1,912	$3,334	$4,915
Short-Term Investments	1,330	491	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
A/R	473	630	693	689	710	760	734	750	741	758	791	782	689	750	782	824	710	741	765	799
Inventories	366	648	520	551	560	551	496	506	505	512	530	528	551	506	528	556	560	505	516	540
Deferred Tax Assets	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Prepaid Expenses and Other	79	69	68	64	81	71	71	71	71	71	71	71	64	71	71	71	81	71	71	71
Total Current Assets	$7,234	$7,535	$2,189	$2,351	$2,178	$2,188	$2,538	$2,908	$3,230	$3,580	$3,982	$4,350	$2,351	$2,908	$4,350	$5,952	$2,178	$3,230	$4,686	$6,324
PPE, Net	$629	$1,089	$1,099	$1,107	$1,115	$1,115	$1,130	$1,147	$1,162	$1,178	$1,195	$1,212	$1,107	$1,147	$1,212	$1,278	$1,115	$1,162	$1,226	$1,293
Deferred comp plan investments	23	23	23	33	33	37	37	37	37	37	37	37	33	37	37	37	33	37	37	37
Other investments	49	56	60	25	65	27	27	27	27	27	27	27	25	27	27	27	65	27	27	27
Goodwill, net	1,677	12,270	12,242	12,217	12,224	12,258	12,258	12,258	12,258	12,258	12,258	12,258	12217	12258	12258	12258	12224	12258	12258	12258
Other intangible assets, net	530	5,588	5,441	5,319	5,182	5,066	4,923	4,780	4,637	4,494	4,351	4,208	5319	4780	4208	3637	5182	4637	4066	3494
Deferred tax assets	37	37	37	32	32	30	0	0	0	0	0	0	32	0	0	0	32	0	0	0
Other Assets	25	25	25	56	24	55	55	55	55	55	55	55	56	55	55	55	24	55	55	55
Total other assets	$2,970	$19,087	$18,926	$18,790	$18,676	$18,588	$18,431	$18,305	$18,177	$18,050	$17,925	$17,798	$18,790	$18,305	$17,798	$17,292	$18,676	$18,177	$17,669	$17,164
Total Assets	**$10,203**	**$26,623**	**$21,115**	**$21,141**	**$20,853**	**$20,776**	**$20,969**	**$21,212**	**$21,406**	**$21,630**	**$21,907**	**$22,148**	**$21,141**	**$21,212**	**$22,148**	**$23,244**	**$20,853**	**$21,406**	**$22,356**	**$23,488**
Liabilities																				
S/T & Current L/T Debt	$0	$4,321	$0	$300	$50	$56	$56	$56	$56	$56	$56	$56	$300	$56	$56	$56	$50	$56	$56	$56
Accounts Payable	157	190	228	237	223	213	222	227	216	220	237	236	237	227	236	249	223	216	221	231
Deferred Income on Shipment to Disti	357	378	450	474	530	566	566	566	566	566	566	566	474	566	566	566	530	566	566	566
Income Taxes Payable	0	0	0	0	49	105	105	105	105	105	105	105	0	105	105	105	49	105	105	105
Accrued Liabilities	298	560	423	586	385	493	493	493	493	493	493	493	586	493	493	493	385	493	493	493
Total Current Liabilities	$812	$5,449	$1,101	$1,596	$1,237	$1,433	$1,442	$1,446	$1,436	$1,439	$1,457	$1,456	$1,596	$1,446.2	$1,455.9	1,469	$1,237	$1,436	$1,441	1,451
Long-Term Debt	$3,805	$8,572	$8,199	$7,551	$7,385	$6,926	$6,926	$6,926	$6,926	$6,926	$6,926	$6,926	$7,551	$6,926	$6,926	$6,926	$7,385	$6,926	$6,926	$6,926
Deferred Compensation Plan Liability	23	23	23	23	39	37	37	37	37	37	37	37	23	37	37	37	39	37	37	37
Other Noncurrent Liabilities	257	180	139	135	863	851	851	851	851	851	851	851	135	851	851	851	863	851	851	851
Total Noncurrent Liabilities	$4,085	$11,207	$10,091	$9,383	$9,269	$8,758	$8,758	$8,758	$8,758	$8,758	$8,758	$8,758	$9,383	$8,758	$8,758	$8,758	$9,269	$8,758	$8,758	$8,758
Total Liabilities	**$4,897**	**$16,656**	**$11,192**	**$10,980**	**$10,505**	**$10,191**	**$10,200**	**$10,204**	**$10,194**	**$10,197**	**$10,215**	**$10,214**	**$10,980**	**$10,204**	**$10,214**	**$10,227**	**$10,505**	**$10,194**	**$10,199**	**$10,209**
Stockholders' Equity																				
Total Shareholders' Equity	$5,306	$9,967	$9,923	$10,162	$10,348	$10,585	$10,769	$11,008	$11,212	$11,432	$11,692	$11,934	$10,162	$11,008	$11,934	$13,017	$10,348	$11,212	$12,156	$13,279
Total Liabilities and S/E	**$ 10,203**	**$ 26,623**	**$ 21,115**	**$ 21,141**	**$ 20,853**	**$ 20,776**	**$ 20,969**	**$ 21,212**	**$ 21,406**	**$ 21,630**	**$ 21,907**	**$ 22,148**	**$ 21,141**	**$ 21,212**	**$ 22,148**	**$ 23,244**	**$ 20,853**	**$ 21,406**	**$ 22,356**	**$ 23,488**
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Source: Company data, Instinet estimates

Fig. 4: ADI Cash Flow Statement

Year End: October	FY17				FY18E				FY19E											
($ in millions)	Jan-17	Apr-17	Jul-17	Oct-17	Jan-18	Apr-18	Jul-18E	Oct-18E	Jan-19E	Apr-19E	Jul-19E	Oct-19E	FY17	FY18E	FY19E	FY20E	CY17	CY18E	CY19E	CY20E
CASH FLOWS																				
Cash Flows from Operations																				
Net Income	$217	$94	$69	$348	$268	$380	$385	$408	$377	$395	$430	$415	$727	$1,441	$1,617	$1,772	$761	$1,513	$1,630	$ 1,797
Adjustments to reconcile net income:																				
Stock-based compensation	17	22	33	32	38	39	36	38	35	36	39	38	104	151	148	158	118	149	148	160
Gain on sale of a product line	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Depreciation	34	49	55	56	56	57	45	45	46	46	47	48	195	203	187	198	209	196	189	199
Amortization	20	89	147	133	142	143	143	143	143	143	143	143	389	571	572	572	471	572	572	572
Deferred income taxes	(7)	(80)	99	(62)	(691)	(43)	(43)	(43)	(43)	(43)	(43)	(43)	(51)	(820)	(171)	(171)	(507)	(387)	(171)	(171)
Noncash portion of special charge	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other non-cash expense	13	132	153	50	7	3	0	0	0	0	0	0	348	10	0	0	344	6	0	0
Tax Benefit - option exercises	(8)	(18)	(4)	(12)	0	0	0	0	0	0	0	0	(42)	0	0	0	(36)	0	0	0
Changes in assets and liabilities	29	234	(916)	150	569	140	89	(21)	(1)	(21)	(32)	10	(503)	777	(44)	(58)	(143)	397	(35)	(51)
Cash Flows from Operations	**$314**	**$521**	**($364)**	**$696**	**$389**	**$718**	**$655**	**$570**	**$557**	**$557**	**$584**	**$611**	**$1,167**	**$2,332**	**$2,309**	**$2,470**	**$1,217**	**$2,445**	**$2,334**	**$2,506**
Cash Flows from Investing																				
Net ST Invstments	1,805	939	491	0	0	0	0	0	0	0	0	0	3,234	0	0	0	2,031	0	0	0
Payments for acquisitions	(1)	(9,686)	0	0	0	(52)	0	0	0	0	0	0	(9,687)	(52)	0	0	(9,687)	(52)	0	0
Additions to PPE	(28)	(47)	(64)	(65)	(63)	(54)	(60)	(62)	(61)	(62)	(65)	(64)	(204)	(239)	(252)	(264)	(227)	(237)	(254)	(266)
Proceeds from sale of other assets	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Decrease in other assets	(6)	(6)	(1)	(3)	(1)	0	0	0	0	0	0	0	(16)	(1)	0	0	(13)	(0)	0	0
Cash Flows from Investing	**$1,770**	**($8,801)**	**$426**	**($68)**	**($65)**	**($106)**	**($60)**	**($62)**	**($61)**	**($62)**	**($65)**	**($64)**	**($6,673)**	**($292)**	**($252)**	**($264)**	**($7,896)**	**($290)**	**($254)**	**($266)**
Cash Flow from Financing																				
Repayment of Debt	$0	$0	($4,700)	($350)	($420)	($1,200)	$0	$0	$0	$0	$0	$0	($5,050)	($1,620)	$0	$0	($5,330)	($1,340)	$0	$0
Repurchase of common stock	(3)	(24)	(9)	(11)	(8)	(22)	(12)	(13)	(14)	(15)	(14)	(14)	(47)	(55)	(57)	(57)	(50)	(59)	(57)	(57)
Proceeds from debt issuance	2,072	9,084	0	0	0	744	0	0	0	0	0	0	11,156	744	0	0	9,775	744	0	0
Proceeds from ESSP	34	53	18	28	38	28	28	30	31	29	30	30	133	124	120	119	136	119	119	119
Excess Tax Benefit - option exercises	8	18	4	12	0	0	0	0	0	0	0	0	42	0	0	0	36	0	0	0
Dividend to stockholders	(130)	(139)	(166)	(167)	(167)	(178)	(181)	(181)	(182)	(182)	(183)	(183)	(602)	(707)	(730)	(738)	(627)	(717)	(731)	(739)
Cash Flow from Financing	**$1,983**	**$8,989**	**($4,853)**	**($490)**	**($548)**	**($630.15)**	**($165)**	**($164)**	**($165)**	**($168)**	**($167)**	**($167)**	**$5,629**	**($1,507)**	**($667)**	**($675)**	**$3,942**	**($1,252)**	**($669)**	**($677)**
Effect of exchange rates	(1)	1	2	2	4	(3)	0	0	0	0	0	0	4	0	0	0	6	(2)	0	0
Net Increase in Cash	**$4,066**	**$710**	**($4,789)**	**$139**	**($220)**	**($21)**	**$430**	**$344**	**$332**	**$326**	**$352**	**$379**	**$127**	**$533**	**$1,389**	**$1,531**	**($2,731)**	**$901**	**$1,411**	**$1,564**
Cash at the beginning of the period	$921	$4,987	$5,698	$909	$1,048	$828	$807	$1,237	$1,581	$1,912	$2,239	$2,591	$921	$1,048	$1,581	$2,970	$3,673	$942	$1,843	$3,253
Cash at the end of the period	**$4,987**	**$5,698**	**$909**	**$1,048**	**$828**	**$807**	**$1,237**	**$1,581**	**$1,912**	**$2,239**	**$2,591**	**$2,970**	**$1,048**	**$1,581**	**$2,970**	**$4,500**	**$942**	**$1,843**	**$3,253**	**$4,818**
Free Cash Flow	**$286**	**$475**	**($428)**	**$631**	**$325**	**$665**	**$595**	**$508**	**$496**	**$495**	**$519**	**$546**	**$963**	**$2,093**	**$2,056**	**$2,206**	**$990**	**$2,207**	**$2,080**	**$2,241**
Free Cash Flow/Share	$0.91	$1.37	($1.15)	$1.69	$0.87	$1.77	$1.58	$1.35	$1.31	$1.30	$1.36	$1.43	$2.75	$5.57	$5.41	$5.74	$2.74	$5.86	$5.46	$5.82
EBITDA	**$398**	**$506**	**$646**	**$713**	**$690**	**$693**	**$681**	**$703**	**$693**	**$714**	**$755**	**$738**	**$2,151**	**$2,688**	**$2,900**	**$3,087**	**$2,452**	**$2,770**	**$2,917**	**$3,118**
Adjusted FCF/Share	$0.86	$1.31	($1.24)	$1.61	$0.77	$1.67	$1.49	$1.25	$1.22	$1.21	$1.26	$1.33	$2.45	$5.17	$5.02	$5.33	$2.42	$5.47	$5.07	$5.41
Net Debt/LTM EBITDA	(0.8)x	4.3x	3.7x	3.0x	2.6x	2.3x	2.1x	2.0x	1.8x	1.7x	1.5x	1.4x								
Dividends Per Share	$0.42	$0.45	$0.45	$0.45	$0.45	$0.48	$0.48	$0.48	$0.48	$0.48	$0.48	$0.48	$1.77	$1.89	$1.92	$1.92	$1.80	$1.92	$1.92	$1.92

Source: Company data, Instinet estimates

Appendix A-1

Analyst Certification

I, Krysten Sciacca, hereby certify (1) that the views expressed in this Research report accurately reflect my personal views about any or all of the subject securities or issuers referred to in this Research report, (2) no part of my compensation was, is or will be directly or indirectly related to the specific recommendations or views expressed in this Research report and (3) no part of my compensation is tied to any specific investment banking transactions performed by Nomura Securities International, Inc., Nomura International plc or any other Nomura Group company.

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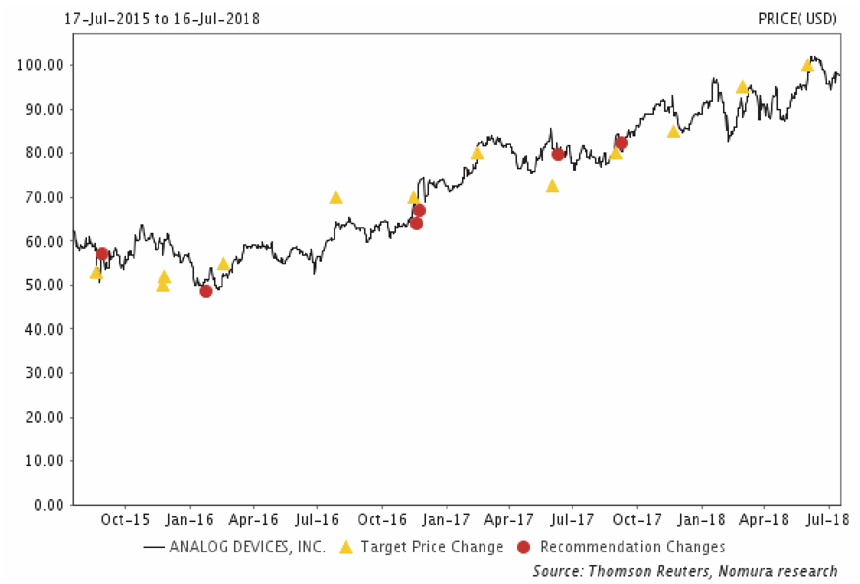
Materially mentioned issuers

Issuer	Ticker	Price	Price date	Stock rating	Sector rating	Disclosures
Analog Devices, Inc.	ADI US	USD 98.26	17-Jul-2018	Neutral	Not rated	A34
Cree, Inc.	CREE US	USD 46.32	17-Jul-2018	Neutral	Not rated	
Microchip Technology Inc.	MCHP US	USD 95.05	17-Jul-2018	Buy	Not rated	
ON Semiconductor Corporation	ON US	USD 23.91	17-Jul-2018	Buy	Not rated	

A34 As of 14th Nov 2016, the ratings and price targets depicted in the chart below have been assigned by Instinet, LLC. Previous ratings and price targets on this chart were published by another affiliate of the Nomura Group, including Nomura Securities International, Inc.

Analog Devices, Inc. (ADI US) **USD 98.26 (17-Jul-2018)** Neutral (Sector rating: Not rated)

Rating and target price chart (three year history)



Date	Rating	Target price	Closing price
31-May-18		100.00	97.18
01-Mar-18		95.00	88.31
22-Nov-17		85.00	88.65
31-Aug-17	Neutral		83.67
31-Aug-17		80.00	83.67
02-Jun-17	Reduce		80.91
02-Jun-17		72.50	80.91
15-Feb-17		80.00	81.60
15-Nov-16	Neutral		68.21
15-Nov-16		70.00	68.21
11-Nov-16	Not Rated		65.32
27-Jul-16		70.00	63.33
17-Feb-16		55.00	52.73
15-Jan-16	Neutral		49.82
25-Nov-15		52.00	60.25
23-Nov-15		50.00	56.80
19-Aug-15	Reduce		58.38
19-Aug-15		53.00	58.38

For explanation of ratings refer to the stock rating keys located after chart(s)

Valuation Methodology We base our $100 target price for Analog Devices (ADI) on 17.4x our CY19 EPS estimate, which is in line with ADI's peer group average multiple. We believe shares should trade in line with the comp group average multiple. The benchmark for this stock is the Philadelphia Semiconductor Index (SOX).

Risks that may impede the achievement of the target price Upside risks: 1) a large portion of both of ADI's businesses is tied to worldwide economic conditions. If demand is stronger than we expect, there could be upside to our target price. 2) Should ADI capitalize on incremental synergies beyond our expectations through the Linear acquisition, this could present upside risk. 3) Market share gains or an increase in ADI's content in Automobiles could cause upside to our target price. Downside risks: 1) ADI and indeed the semiconductor industry as a whole are highly levered to the global macro environment; should worldwide economic conditions deteriorate, there could be downside to our target price. 2) ADI is still integrating assets from the Linear Technology acquisition; should the integration not go as well as planned, there could be downside risk to our target price. 3) The semiconductor industry is a very competitive space; should ADI not be able to keep up with its peers, sales could potentially decline and there may be downside to our target price. 4) ADI is a global company and any trade wars and/or tariffs with any country, including China, could negatively affect revenues and operating results.

Cree, Inc. (CREE US) **USD 46.32 (17-Jul-2018)** Neutral (Sector rating: Not rated)

Chart Not Available

Valuation Methodology We arrive at our $44 target price on Cree, Inc. (CREE) by applying a 50% weighting to our EV/Sales vs. Operating margin analysis ($55) and a 50% weighting to our sum of the parts analysis ($33). The stock's benchmark is the Philadelphia Semiconductor Index (SOX).

Risks that may impede the achievement of the target price 1) Higher or lower demand in raw SiC wafer markets would pose upside/downside to our target price, respectively. 2) Higher or lower adoption rates of SiC and GaN power products would pose as upside/downside risk to our target price, respectively. 3) Higher / lower demand in commercial lighting would impact Cree's Lighting business and pose as upside/downside risk to our target price. 4) LED supply and demand conditions could impact Cree's LED business. If demand for LEDs is better or worse than expected, this may result in upside or downside to our target price, respectively. 5) Lower/higher excess inudstry capacity in the LED industry could have positive/negative impacts on pricing and pose as upside/downside risk to our target price.

Microchip Technology Inc. (MCHP US) **USD 95.05 (17-Jul-2018)** Buy (Sector rating: Not rated)

Chart Not Available

Valuation Methodology Our $110 target price for Microchip Technology Inc. (MCHP) is based on a multiple of 16.7x our CY19 EPS estimate (including SBC). This is a 2% premium to the stock's comp group average FY2 P/E, which is in line with the stock's five-yr historical average premium. The benchmark for this stock is the Philadelphia Semiconductor Index (SOX).

Risks that may impede the achievement of the target price 1) Worsening global or domestic economic conditions could have an adverse effect on MCHP's revenues as the semi industry is exposed to overall global and domestic GDP and macro conditions; 2) The semi industry is highly competitive and if Microchip fails to adequately compete against its peers, revenues may suffer and may present downside to our target price; 3) Worsening demand or slower-than-expected growth in Automotive and Industrial could adversely affect Microchip's revenues, which may introduce downside to our target price; 4) Worsening geopolitical conditions could have a negative impact on Microchip's business operations; 5) If Microchip fails to successfully integrate the Microsemi acquisition, this could cause morale and culture to suffer within the company as well as market share losses to competitors.

ON Semiconductor Corporation (ON US) **USD 23.91 (17-Jul-2018)** Buy (Sector rating: Not rated)

Chart Not Available

Valuation Methodology Our $30 target price for ON Semiconductor (ON) is based on a multiple of 2.3x 2019E EV/Sales. We derive this multiple from an EV/Sales vs. Operating Margin regression. The benchmark for the stock is the SOX Index.

Risks that may impede the achievement of the target price 1)Global or domestic economic conditions worsening, as semiconducutors are exposed to overall global GDP and macro conditions. Semiconductors, as an industry, are generally exposed to the overall global GDP and cycle and macro conditions. A recession could affect ON Semicondcutor's results. 2) ON Semiconductor failing to adequately compete against its peers as the semiconductor industry is highly competitive. 3) Demand stagnation or declines in Automotive or Industrial could adversely impact revenue. Should these markets experience slower growth or weaker demand than expected, there could be risk to our Target Price. 4)Geopolitcal conditions could worsen, which may have a negative impact on ON Semiconductors revenues. ON Semiconductor sells its products both domestically and globally, including China. Should geopolitical tensions between China and the US worsen, there may be risk to our Target Price.5) ON sells its products globally, so any trade war or tariffs imposed by other countries against the U.S. could result in downside to our target price.

Rating and target price changes

Issuer	Ticker	Old stock rating	New stock rating	Old target price	New target price
Cree, Inc.	CREE US	Not rated	Neutral	N/A	USD 44.00
Microchip Technology Inc.	MCHP US	Not rated	Buy	N/A	USD 110.00
ON Semiconductor Corporation	ON US	Not rated	Buy	N/A	USD 30.00

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