



**Company Description:**

Semtech Corporation designs, manufactures, and markets a wide array of analog and mixed signal semiconductors. This includes integrated circuits, discrete circuits and assembly products. These devices are used in computer, communications, industrial, military, and automotive applications.

**BUY**

Current Price:	\$38.10
Target Price:	\$47.10
Market Cap:	2.59B
Average Volume:	425.31K
D/E Ratio	0.37
ROIC/WACC	0.67
ROIC/WACC (Comp)	0.49



**Thesis:**

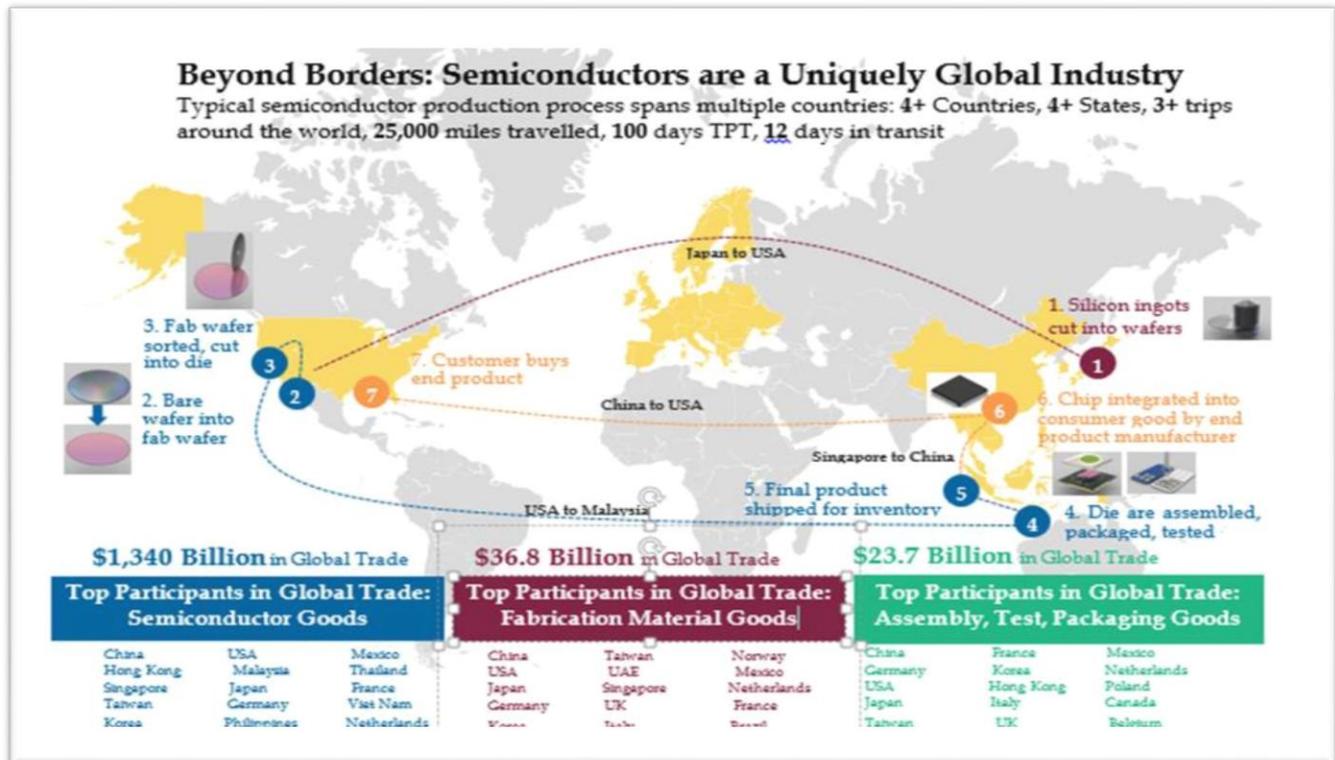
Semtech is well positioned within an industry experiencing rapid growth. Semtech has a major differentiator in its LoRa technology, which is expected to grow exponentially as the world becomes more connected than ever. The company has continued to make revenue additive acquisitions to reduce bottlenecks while maintaining debt levels consistent within the industry. These factors among others will lead to price growth in the future.

**Catalysts:**

- **Short Term(within the year):** Promising Q3, Comcast deal moving faster than expected
- **Mid Term(1-2 years):** LoRa Technology, Wireless and Sensing segment, Internet of Things
- **Long Term(3+):** Continued successful mergers and acquisition, Increased worldwide connectivity

## Industry Performance and Outlook:

Semiconductors are materials which connect to conductors and nonconductors/insulators. They are made from pure elements, typically silicon or germanium, another configuration includes compounds such as gallium arsenide. Through a process called doping, impurities are added in small amounts to pure semiconductors causing large changes in the material's conductivity. Semiconductors are used in the fabrication of electronic devices and are therefore an integral part of your everyday life. Semiconductors have made having smaller, more reliable, and faster mobile devices, computers, and medical equipment possible. The semiconductor value chain is made of seven essential steps with contributions from researchers, developers, manufacturers, assemblers, and suppliers all over the world.



The semiconductor industry is best represented in one entity as the iShares PHLX Semiconductor ETF with the ticker SOXX. This tradable entity has returned over 41% LTM compared with a 35% return in the technology sector and a 22% return in the S&P 500. This outperformance is driven by consistent quarter of quarter and then year over year growth within the industry. According to the Semiconductor Industry Association's monthly report, August sales of semiconductors reached \$35 billion. This represented a 4% month over month growth worldwide (9% U.S growth) and a 24% year over year growth internationally (39% U.S Growth). This industry will continue to grow as the world becomes more digitally connected in the coming years, with advancements in handheld technology and the emergence of smart cities.

## Internet of Things:

The internet of things is the network of physical devices, vehicles, and other items connected through electronics, software, sensors, actuators and network connectivity. This allows the objects in the network to be controlled remotely or sensed throughout the infrastructure of the network. This interconnectivity across the network improves efficiency through the enhanced communication within the network and the reduction of human error. The IoT will enable the creation of so-called cyber-physical systems. These systems are things

such as smart grids, virtual power plants, smart homes, driverless/intelligent cars, and smart cities. Semiconductors will play a vital role within the IoT's development. This is where through LoRa technology SMTC has a massive differentiator on the rest of the industry (See Below)

## Management:

Semtech's CEO is Mohan Maheswaran is SMTC's CEO and President. He started at this position in 2006 when he joined Semtech from Intersil Corporation who specialized in analog semiconductors. The CFO, Emeka Chukwu started with Semtech in late 2006, he also joined from Intersil. Jean-Paul Bardyn was named Chief Technical Officer in 2011 after being named the VP in R&D and the Advanced Communication and Sensing Business Unit. Bardyn began with the company in 2005 as the result of an acquisition. As you can see from the charts below the upper management has been with the company for an extended period of time and are being fairly well compensated.

Name	Title	Board	Age	Tenure	Start
1) Mohan R Maheswaran	President/CEO	✓	53 *	11.5	04/03/2006
2) Emeka N Chukwu	Exec VP/CFO		54 *	10.9	11/20/2006
3) Charles Butler Ammann	Exec VP/Secy/General Counsel		62 *	3.6	03/07/2014
4) Gary M Beauchamp	Exec VP/General Manager		57 *	3.7	02/26/2014
5) John Michael Wilson	Exec VP: Quality & Reliability		61 *	4.7	02/2013

Name	Title	Total Compensation
1) Mohan Maheswaran	President/CEO	4,826,485 (USD)
2) Emeka Chukwu	Exec VP/CFO	2,143,326 (USD)
3) James Kim	Senior VP:Worldwide Sa...	1,998,353 (USD)
4) Gary Beauchamp	Exec VP/General Manag...	1,648,876 (USD)
5) Charles Ammann	Exec VP/Secy/General ...	1,483,207 (USD)

## Business Description:

Semtech's analog and mixed signal semiconductors are used worldwide by manufacturers of computers, telecommunications, consumer, and industrial electronics. Some of the uses for Semtech's chips are power management, circuit protection, and transmission. These chips are used in a wide range of devices including: cell phones, base stations, laptops and desktop computers, network transmission equipment, and automated testing equipment. Semtech is broken into four segments; signal integrity, protection, wireless sensing and timing, and power and high reliability. The products of these segments are then sold into one of four markets, enterprise computing (data centers, laptops, other computer attachments), communications (carrier networks, modems, wireless LAN), high-end consumer (smartphones, tablets, digital TV), and industrial/other (IoT). Semtech does business worldwide with roughly 75 percent of revenues from Asia.

**Signal Integrity:** The signal integrity segment is the largest segment for SMTC, bringing in roughly 45% of total revenue. The signal integrity segment has seen 16 percent growth in the last year. This segment is responsible for making integrated circuits for broadcast and surveillance video, optical communications, and active cable transceivers.

**Protection:** The protection segment makes up 28 percent of SMTC's sales. This segment makes devices called transient voltage suppressors (TVS). These devices protect electronic systems from voltage spikes including electrostatic discharge and secondary lightning surges. SMTC in the Q2 earnings call reported a win with a major North American smartphone player in this space which will begin to show on Q3 reports.

According to the CEO, SMTC is the leader in the smartphone protection space and the market will begin to come to SMTC as technology becomes more advanced.

**Wireless Sensing and Timing:** This segment produces specialized radio frequency products used in industrial, medical, and communication applications as well as specialized sensing products in both industrial and consumer applications. This segment currently makes up 15 percent of SMTC’s total revenue. This is one of the most promising segments for SMTC in the near and long term as it incorporates SMTC’s LoRa project and is exposed to the IoT.



**Power and High Reliability:** The Power and High Reliability segment makes up 11 percent of total revenue. This segment produces devices that alter, regulate, and condition power within the electronic systems. \*Unfortunately, as is customary within the industry for reporting purposes SMTC does not report these segments separately on their 10-Q and 10-K reports. Therefor discerning margins for each segment is not possible.

### LoRa and Comcast:

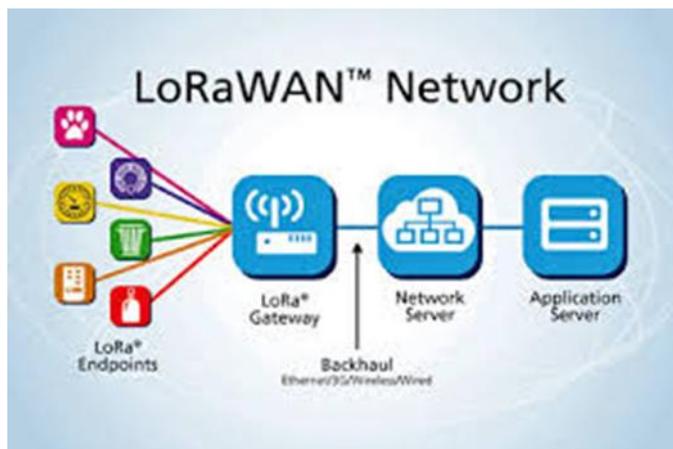
LoRa technology is one of the most promising areas in the semiconductor industry and Semtech owns the rights to this technology. From the SMTC website: “Semtech’s LoRa® RF technology is a low power, long range wireless platform that connects battery-operated mobile or portable devices to an internet of Things (IoT) or machine-to-machine (M2M) network infrastructure. The LoRa RF



Transceivers and Concentrators use minimal power while providing long range wireless connectivity making it an effective IoT solution for mobile network operators and device manufacturers.” Some of the applications for LoRa technology are asset tracking, energy management, fleet tracking, predictive medicine, cattle tracking, and many others. The company has formed a LoRa alliance that includes 500 plus members. This alliance is for the purpose of developing sensors, gateways, and networking using LoRa technology. Mr. Maheswaran believes that LoRa is set for aggressive growth, stating in the Q2 earnings report, “we want to get to \$40 million to \$50

million of revenue and next year \$80 million to \$100 million. And then, I think if we get to that point, we will see a path to potentially \$0.5 to \$1 billion of revenue for LoRa.”

In October 2016, SMTC issued a warrant to Comcast Cable Communications Management LLC to purchase up to 1,086,957 shares (1.5% of total shares outstanding). This was issued in according to the agreement for a trial by Comcast of LPWAN technology in the U.S. This trial is based on SMTC’s LoRa technology and is accounted for as equity and then cost as an offset to net sales over the



performance period. Comcast began with three cities and as of the Q2 earnings call, Comcast was adding 12 more cities to make a total of 15. Comcast is about six months ahead of schedule in the rollouts, which shows that LoRa has been successful so far. With the expansion of the IoT and as the world becomes more connected SMTC's leading position with LoRa will drive growth for years to come.

## Competition:

The semiconductor industry is highly competitive with both differentiation and margin management generally driving growth. SMTC does well in terms of differentiation of products but where they can improve is with margins. The chart below shows that while SMTC is consistent with the rest of the industry in terms of D/E and R&D Expense but there are areas for improvement. ADI is a very similar company however, roughly 13 times larger in market cap. Some of the operating efficiencies are due to size however, there will be some efficiencies that SMTC can incorporate. As the chart shows, Semtech has higher OPEX/Sales and CAPEX/Sales versus ADI, if SMTC brings its spending closer to ADI's spending it will increase margins and drive price growth. ADI has shown that it is possible and SMTC should be able to follow suit. Also, throughout the competition SMTC has the lowest short interest as a percentage of float, roughly 2.5x less than the median.

Name	Ticker	Mkt Cap	OPM LF	EBITDA to Net Sales:Q	P/S	R&D/Net Sales:Q	OpEx to Net SL:Q	APEX/Sales LF	SI % Eqty Flt
Median		2.53B	12.34%	18.71%	5.07	18.86%	41.40%	4.44%	2.43%
100) SEMTECH CORP	SMTC U	2.53B	12.34%	20.04%	4.38	17.91%	47.90%	9.00%	1.01%
101) ANALOG DEVICES INC	ADI US	32.60B	13.59%	27.71%	6.47	19.23%	39.88%	4.44%	2.41%
102) DIODES INC	DIOD US	1.64B	9.02%	17.35%	1.66	7.49%	25.10%	9.46%	1.93%
103) MACOM TECHNOLOGY SO	MTSI US	2.51B	3.42%	16.64%	3.32	19.91%	44.19%	4.22%	20.49%
104) MAXIM INTEGRATED PR	MXIM U	14.64B	32.16%	38.55%	6.37	18.86%	32.77%	2.49%	1.60%
105) MONOLITHIC POWER SY	MPWR U	4.74B	13.34%	17.37%	11.10	18.09%	41.40%	15.24%	3.92%
106) POWER INTEGRATIONS I	POWI U	2.19B	13.20%	18.71%	5.20	16.12%	36.49%	15.31%	3.68%
107) RAMBUS INC	RMBS U	1.50B	8.70%	23.25%	4.01	39.61%	68.26%	1.65%	5.70%

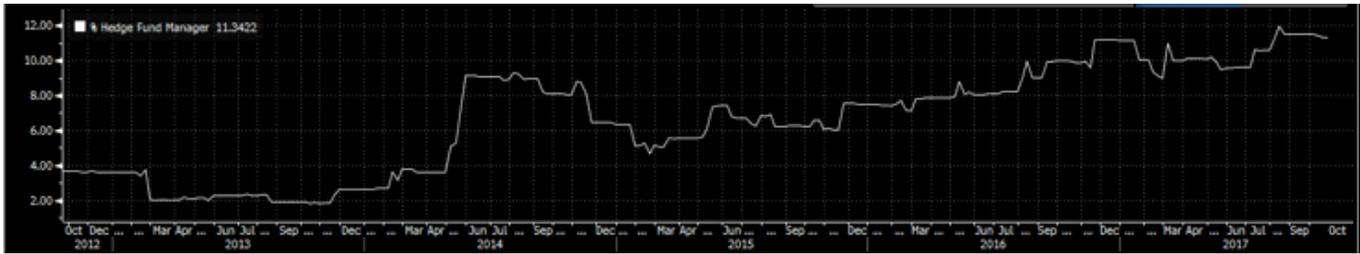
(Accounting Adjustments: Adjusted for Abnormal Items When Applicable)

10 Analyze List

## Ownership Summary:

Semtech has 92 percent institutional ownership, with 80.9 percent coming from investment advisors and 11.3 percent hedge fund ownership. The largest institutional owner is Fidelity with a 12% stake that they have been adding to recently but they do not look as if they will become an activist force. Hedge funds have been steadily adding Semtech from 2013 onward, increasing their ownership percentage from 2 percent to the 11.3 percent they are at now. There is also about one percent short interest therefore; the investors do see value in SMTC.

Ownership Type	10/15/17	Curr1
11) Investment Advisor	80.86	80.85
12) Hedge Fund Manager	11.34	11.34
13) Pension Fund	3.32	3.33
14) Insurance Company	1.12	1.12
15) Sovereign Wealth Fund	1.09	1.09
16) Individual	1.03	1.03
17) Bank	0.79	0.79
18) Government	0.25	0.25
19) Brokerage	0.11	0.11
20) Endowment	0.07	0.07
21) Private Equity	0.01	0.01



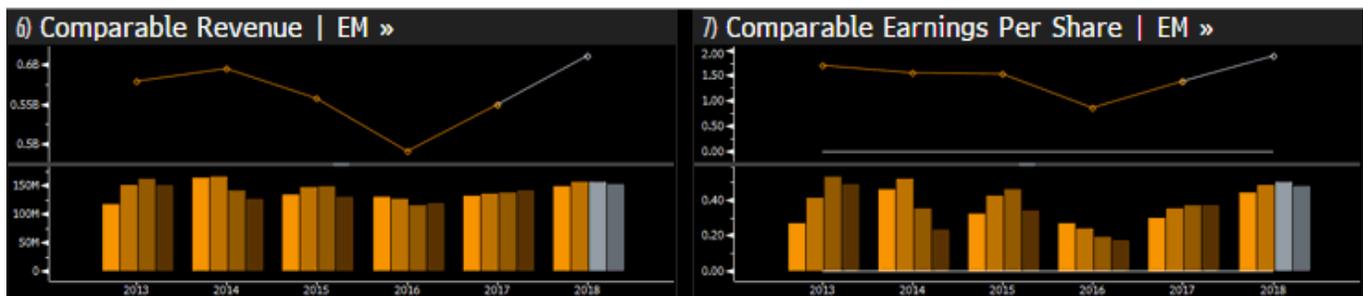
## Debt:

Semtech has a debt to equity ratio of 0.365, this compares to a debt to equity ratio of 0.3679 for similar companies. Semtech's debt amounts to \$400M in total with a term loan of \$150M and a credit revolving facilities for \$250M. Semtech used the entire term loan to pay its existing debt and the required transaction costs of the debt restructuring. Semtech has used \$97M of the revolving facility to finance various business moves such as capital expenditures, permitted acquisitions, permitted dividends, working capital and general corporate purposes. Both of the credit facilities were issued on November 15, 2016 as five-year notes that mature on November 12, 2021. The interest rates payable for Semtech on both facilities is 2.87%.

Name	Ticker	Mkt Cap	Debt/Equity LF	Debt/EBITDA LF
Median		2.41B	36.79%	1.86
100) SEMTECH CORP	SMTC US	2.54B	36.53%	1.70
101) ALPHA & OMEGA SEMIC	AOSL US	419.22M	0.57%	0.04
102) MAXIM INTEGRATED PR	MXIM US	14.11B	67.54%	1.73
103) RAMBUS INC	RMBS US	1.48B	29.35%	1.86
104) SILICON LABORATORIES	SLAB US	3.74B	36.79%	2.92
105) DIODES INC	DIOD US	1.61B	46.26%	2.60
106) ANALOG DEVICES INC	ADI US	32.65B	82.63%	5.81
107) MACOM TECHNOLOGY SO	MTSI US	2.41B	87.93%	8.85
108) LATTICE SEMICONDUCTO	LSCC US	708.32M	116.82%	6.94
109) MONOLITHIC POWER SY	MPWR US	4.71B	0.00%	0.00

## Earnings:

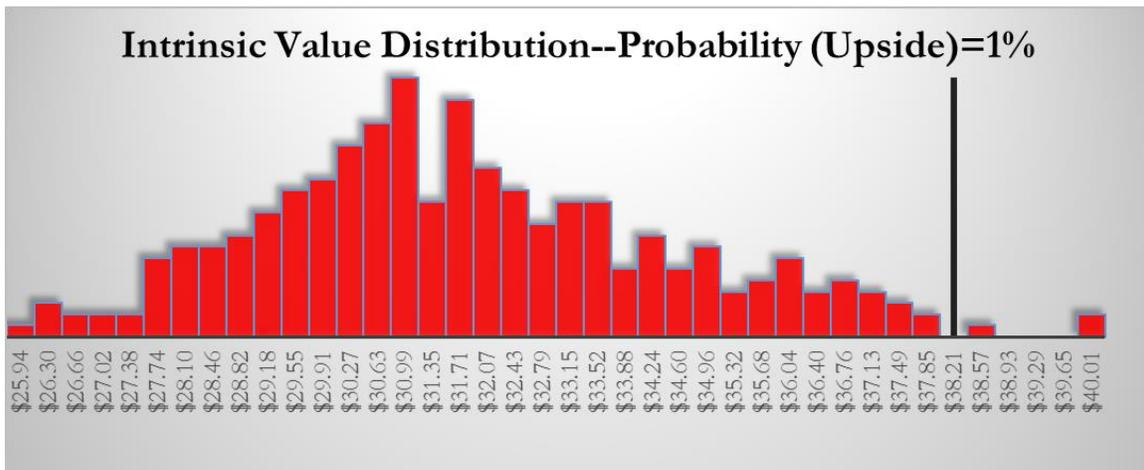
SMTC is expected to report earnings for Q3 on November 29, 2017. Semtech is estimating from \$152 to \$160 million in revenue with between \$0.18 and \$0.22 EPS. Q3 is usually stronger for smartphones and the Chinese market has been a little soft causing the CEO to give guidance flat to midpoint rather than slightly more aggressive. This weakness will be negated by strong growth in the wireless and sensing segment driven by the increasing usage in LoRa technology. The win within the protection segment in North America will also begin to show in Q3 results. This should lead to an earnings beat in Q3 when reported on November 29<sup>th</sup>.



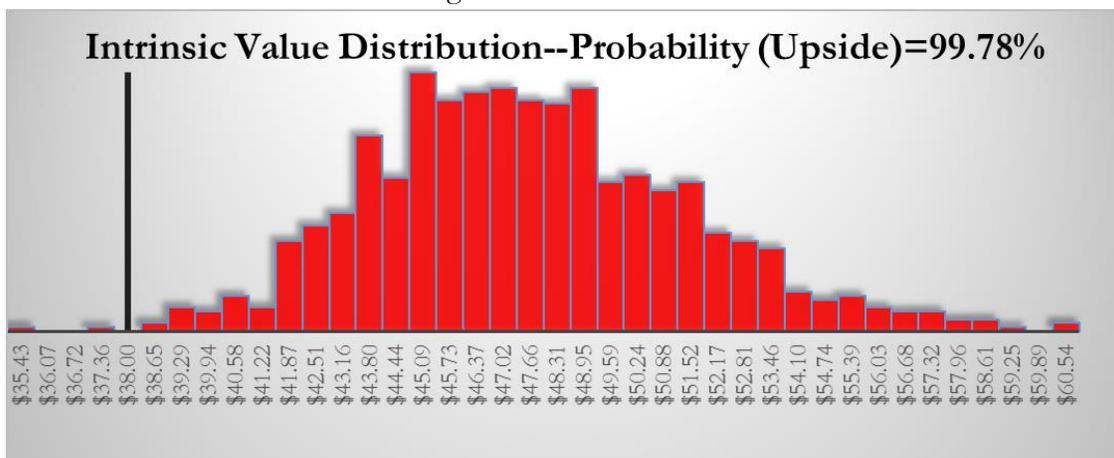
## Conclusion:

In conclusion, there are three major factors that will drive price growth for SMTC. First, there is the LoRa technology, which will grow rapidly as the globe becomes even more connected. This growth will be further amplified within the United States due to the deal with Comcast. Next comes the win in the smartphone industry with a major North American company. This protection win is significant because it shows that there is increasing demand for SMTC's advanced protection products. The third factor is the increasing connectivity of the world and the IoT. This will drive growth in the semiconductor industry as a whole, which will translate into growth for SMTC. Semtech's positioning within the industry will drive growth even further due to the differentiation in some of their marquee products. These growth factors will lead to one of three possible scenarios.

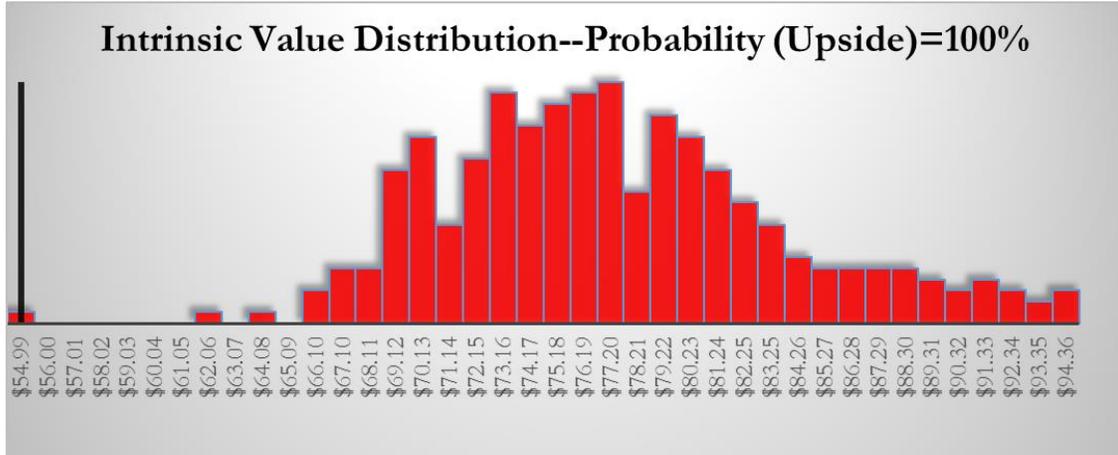
**Bear Case:** Taking everything from above into consideration there is the possibility that SMTC declines in price. For this to happen there would have to be less than expected growth with no margin improvement. Causes of this would be China's market staying softer for longer than expected, a hiccup in LoRa adoption, and unsuccessful acquisitions in removing bottlenecks. This would lead to a 1-year target price of \$31.23 and a loss of 18.5 %, I believe there is a 15% chance of this situation materializing.



**Realistic Case:** The more realistic case is based on continued growth with small year over year margin improvement. This case takes into account half of the projected year over year LoRa growth with steady growth across all segments. This assumes the Chinese market is as soft for as long as the CEO predicted in the Q2 earnings reports. Within this assumption, the protection segment sees a benefit from the newest acquisition but without others of the same type. This would lead to a 1-year price target of \$47.10 and a profit of 22.8 %. I believe there is a 75% chance of this occurring.



**Bull Case:** The most optimistic scenario includes better than expected growth and the ability to increase margins towards the levels of the larger competition. This growth includes SMTC reaching their LoRa growth expectations within the next five years. This is paired with an increase in large contracts from the protection segment. This is also taking into account a stronger Chinese market beginning in 2019. With this considered the bullish 1-year price target is \$76.19, which would lead to a double. I believe there is a 10% chance of this occurring.



\*Analyst estimates range from \$39-\$48 with the median at \$44

### Semtech Corporation (SMTC)

## CENTER FOR GLOBAL FINANCIAL STUDIES

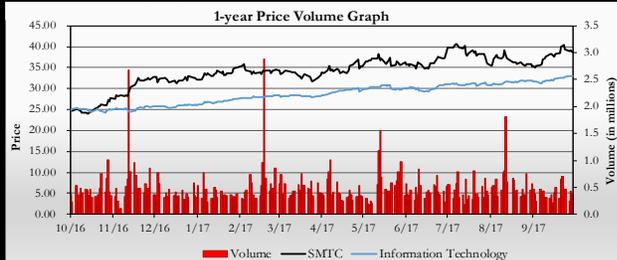
**BULLISH**

Analysis by John Graziano  
10/20/2017

Current Price: **\$38.55**  
Dividend Yield: **0.0%**

Intrinsic Value: **\$40.48**  
Target Price: **\$46.96**

Target 1 year Return: 21.82%  
Probability of Price Increase: 99.78%

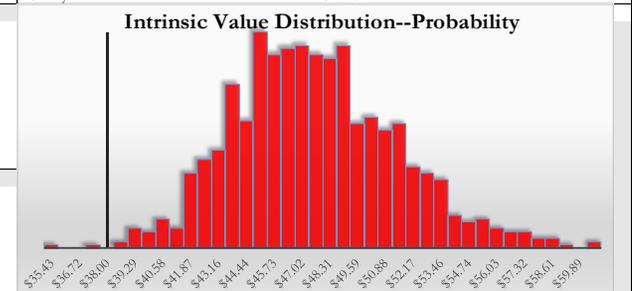


Description	
Semtech Corporation designs, develops, manufactures, and markets analog and mixed-signal semiconductor products.	
General Information	
Sector	Information Technology
Industry	Semiconductors and Semiconductor Equipment
Last Guidance	November 3, 2015
Next earnings date	November 30, 2017
Estimated Country Risk Premium	8.77%
Effective Tax rate	24%
Effective Operating Tax rate	23%

Market Data	
Market Capitalization	\$2,538.72
Daily volume (mil)	0.05
Shares outstanding (mil)	66.20
Diluted shares outstanding (mil)	66.96
% shares held by institutions	97%
% shares held by investments Managers	88%
% shares held by hedge funds	5%
% shares held by insiders	1.18%
Short interest	1.00%
Days to cover short interest	1.41
52 week high	\$41.15
52-week low	\$22.81
Volatility	31.45%

Past Earning Surprises		
Quarter ending	Revenue	EBITDA
7/31/2016	-0.43%	-32.88%
10/30/2016	-1.02%	-32.24%
1/29/2017	0.45%	-22.31%
4/30/2017	-2.24%	-29.88%
7/30/2017	-2.53%	-32.51%
Mean	-1.15%	-29.96%
Standard error	0.6%	2.0%

Peers	
Silicon Laboratories Inc.	
Monolithic Power Systems, Inc.	
Lattice Semiconductor Corporation	
Diodes Incorporated	
MACOM Technology Solutions Holdings, Inc.	
Alpha and Omega Semiconductor Limited	
Power Integrations, Inc.	
Rambus Inc.	



Management	
Maheswaran, Mohan	President, CEO & Director
Chukwu, Emeka	Executive VP & CFO
Ammann, Charles	Executive VP, General Counsel
Kim, James	Senior Vice President of Wor
Beauchamp, Gary	Executive VP & GM of Signal
Silberstein, Asaf	Senior Vice President of Wor

Profitability	
Return on Capital (GAAP)	13.2%
Operating Margin	13%
Revenue/Capital (GAAP)	1.05
ROE (GAAP)	10.4%
Net margin	11.0%
Revenue/Book Value (GAAP)	0.95

Invested Funds	
Cash/Capital	31.9%
NWC/Capital	5.2%
Operating Assets/Capital	23.1%
Goodwill/Capital	39.7%

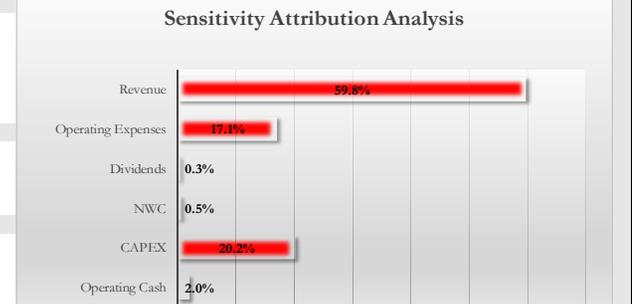
Capital Structure	
Total Debt/Market Capitalization	0.27
Cost of Existing Debt	4.0%
CGFS Rating (F-score, Z-score, and default Probability)	A
WACC	11.2%

Total compensations growth	
9.58% per annum over 6y	-0.2% per annum over 6y
9.53% per annum over 6y	-0.2% per annum over 6y
-10.81% per annum over 3y	1.45% per annum over 3y
8.66% per annum over 4y	4.28% per annum over 4y
-7.35% per annum over 5y	-4.09% per annum over 5y
N/M	N/M

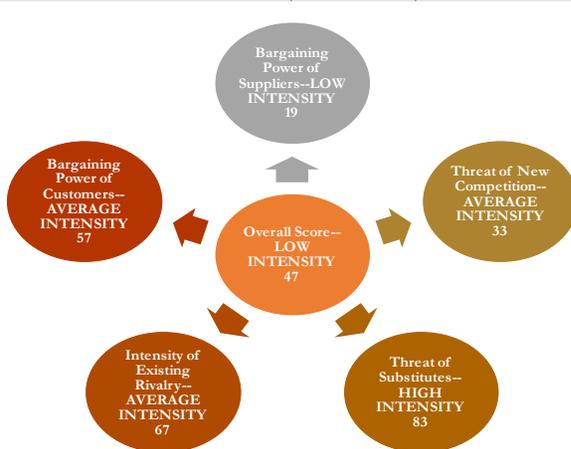
Peers' Median (LTM)	
SMTC (LTM)	SMTC (5 years historical average)
Return on Capital (GAAP)	11.38%
Operating Margin	12.66%
Revenue/Capital (GAAP)	0.90
ROE (GAAP)	5.9%
Net margin	6.1%
Revenue/Book Value (GAAP)	0.97

Invested Funds	
Cash/Capital	29.0%
NWC/Capital	6.9%
Operating Assets/Capital	26.2%
Goodwill/Capital	36.6%

Capital Structure	
Total Debt/Market Capitalization	0.32
Cost of Existing Debt	4.0%
CGFS Rating (F-score, Z-score, and default Probability)	BB
WACC	11.7%



Porter's 5 forces (scores are out of 100)



Period	Revenue Growth Forecast
Base Year	14%
7/30/2018	20%
7/30/2019	18%
7/30/2020	16%
7/30/2021	14%
7/30/2022	13%
7/30/2023	11%
7/30/2024	9%
7/30/2025	7%
7/30/2026	6%
7/30/2027	4%
Continuing Period	2%

Period	Return on Capital Forecast
Base Year	5.7%
7/30/2018	8.4%
7/30/2019	10.3%
7/30/2020	11.4%
7/30/2021	11.5%
7/30/2022	11.3%
7/30/2023	12.6%
7/30/2024	11.7%
7/30/2025	10.8%
7/30/2026	9.9%
7/30/2027	9.1%
Continuing Period	8.2%

Valuation	NOPAT Margin Forecast	Revenue to Capital Forecast
16.3%	16.3%	0.35
20.4%	20.4%	0.41
24.5%	24.5%	0.42
26.9%	26.9%	0.42
28.1%	28.1%	0.41
28.6%	28.6%	0.39
33.8%	33.8%	0.37
33.6%	33.6%	0.35
33.5%	33.5%	0.32
33.3%	33.3%	0.30
33.2%	33.2%	0.27
33.0%	33.0%	0.25

Valuation	WACC Forecast	Price per share Forecast
11.2%	11.2%	\$39.49
11.2%	11.2%	\$45.31
11.1%	11.1%	\$51.89
11.2%	11.2%	\$59.30
11.3%	11.3%	\$67.35
11.5%	11.5%	\$76.02
11.9%	11.9%	\$85.41
12.1%	12.1%	\$95.30
12.2%	12.2%	\$105.65
12.4%	12.4%	\$116.37
12.5%	12.5%	\$127.39
12.7%	12.7%	