



**January 13, 2017**

**CURRENT PRICE:** \$13.63  
**RATING:** HOLD  
**PRICE TARGET:** N/A  
**CURRENT YIELD:** 1.2%

**EPS Estimates**

	DEC 15A	DEC 16E
1Q	(\$0.11)	(\$0.07)A
2Q	\$0.15	\$0.10A
3Q	\$0.05	\$0.01A
4Q	\$0.08	\$0.01
	<b>\$0.22</b>	<b>\$0.05</b>

**Trading Data**

52-WEEK PRICE RANGE: **\$14.43-\$10.01**  
 SHARES OUTSTANDING: **27.4(M)**  
 MARKET CAP: **\$373.5(M)**  
 AVG. DAILY TRADING VOLUME: **0.90(M)**  
 S&P 500: **2,274**

**Valuation Data**

BOOK VALUE: **\$8.84**  
 PRICE TO BOOK: **1.5x**  
 DIVIDEND: **\$0.24**

**COHU, Inc. (NSDQ: COHU)**

*Positioning for 2017 & acquisition*

**Highlights**

- 3Q16 earnings of \$0.01/share vs. 3Q15's \$0.05/share
- Automotive & Industrial revenues rise to 66% of sales
- Purchased Kita Manufacturing
- COHU expects revenue ramp up in 2017
- Maintain HOLD rating

**Investment Thesis**

Use of integrated circuits throughout the world continues to accelerate as it finds its way into more products. A few decades integrated circuits were only associated with computers. However, their use has now spread into cellphones, automobiles, mobility items (i-Pads, Kindles, FitBit, etc.), communications, industrial robotics, solid state lighting (LED), and high speed memory. The current annual integrated circuit market is estimated to be \$11 billion with expectations of it growing to \$20 billion by 2020. One way for investors to invest in this growth area is through shares of COHU.

**Company Summary**

COHU is headquartered in the greater San Diego Metropolitan area (Poway CA) and has 1,600 employees. Formerly known as Cohu Electronics, the company changed its name to Cohu, Inc. in 1972 and was originally founded in 1947. The company develops, manufactures, sells, and services products used by the semiconductor industry to automate the testing of integrated circuits, wafer-level packages (WLPs) and light-emitting diodes (LEDs) found in many consumer products (i.e., cellphones, automobile sensors, computers, i-pads, automobile sensors, and other products). The company is comprised of four operating units: 1) Delta Design, 2) Rasco, 3) Ismeca, and 4) Integrated Test Solutions (ITS).

*For Important Disclosure information regarding the Firm's rating system, valuation methods and potential conflicts of interest, please refer to the last two pages of this report.*

100 Concourse Boulevard, Suite 101  
 Glen Allen, Virginia 23059

804.612.9700 ■ 800.612.1484  
 804.527.1104

[www.CapitolSecurities.com](http://www.CapitolSecurities.com)

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## COMPANY PRODUCTS

Cohu's products include semiconductor test handling and back-end finishing systems, micro-electronic mechanical systems (MEMS) test modules, thermal subsystems for burn-in and system level test of integrated circuits (ICs), and test contactors. COHU's products are used in the back-end of the semiconductor manufacturing process by global-semiconductor manufacturers and test subcontractors to automate the testing of ICs. This testing determines the quality of performance of the ICs prior to shipment to customers.

The company is comprised of four operating units: 1) Delta Design, 2) Rasco, 3) Ismeca, and 4) ITS.

Delta sells "pick & place" and "thermal sub-systems" used for burn-in and system level testing. This unit sells its Pyramid, Matrix, Eclipse, T-Core, and Linx products to semiconductor manufacturers and test subcontractors. The ICs tested with COHU's products go into the mobile markets (phones, tablets, etc.), computing, the automotive area, and high-performance memory.

Rasco was purchased by COHU in 2008 and sells "gravity feed", "test-in-strip", and "micro-electronic mechanical systems" (MEMS) test solutions. Test handles sold by this unit include Jupiter, Saturn, and Jaguar. ICs tested by these products are used in mobile products, "internet of things", and magnetic and pressure sensors used in automotive applications.

Ismeca, purchased in 2013 by COHU, sells "current-based test handling" and "back-end finishing equipment". This unit's products include NY20 and NX32 used for IC testing, LEDs, discrete devices, and sensors. ICs tested by these handlers are used in mobile products, "internet of things", solid state lighting, portable wearable items (e.g. Apple Watches & Fitbit wrist bands), and cyber security.

ITS provides high performance products for the test contactor markets was created in 2014 to drive growth in this sector. Growth of the test contactor market has made it vital for COHU to supply an integrated solution for power semiconductor testing in automotive, industrial, and LED markets. The company designs, manufactures, sells, and provides support for various lines of test contractor solutions. These are consumable electro-mechanical assemblies connecting the device under test, inside COHU's test handlers, and the automotive test equipment.

### COHU'S MANUFACTURING FACILITIES

- Poway, CA : 338,000 square feet (sold/leased back)
- Kolbermoor, Germany: 40,000 square feet (owned)
- Malacca, Malaysia: 50,000 square feet (leased)
- Calamba City, Laguna, Philippines: 51,000 square feet (leased)
- La Chaux-de-Fonds, Switzerland: 34,000 square feet (leased)
- Suzhou, China: 6,000 square feet (leased)



## SEMICONDUCTOR INDUSTRY'S USE OF COHU PRODUCTS:

Back-end testing includes the final test of an IC by manufacturers, or subcontractors, before end use in cellphones, computers, tablets, wearable internet products, solid state lighting products, automotive vehicles, and cybersecurity items. COHU provides test handling equipment to automate test the final test of ICs, reducing the likelihood of faulty product shipment by semiconductor manufacturers.

The problem for IC manufacturers is the more functions a chip is asked to perform, the more heat it generates which could potentially shut-down the IC and its ability to do its programmed tasks. COHU's thermal-control products controls/lowers the temperature of these multi-function chips during the testing process, solving the "heat problem", thus allowing the manufacturer to produce more ICs for sales to its customers. The more chips making it through the testing period is known as "increasing yield" and increases sales/profits for IC manufacturers.

## MANAGEMENT'S OPERATING GOALS

1) Increase market share in the ~\$940 million test handling market. COHU plans to leverage its leading "handler" market position, broad product portfolio, and thermal control technology to optimize test yield and increase its market share. 2) Expand total available market to ~\$2 billion with expansion into Wafer Level Package (WLP) probe and test contacting. 3) Continuously lowering product costs and expand COHU's gross margins by moving more of its manufacturing to Asia 4) Hit its 3-5 year financial targets of \$400 million in annual revenues, non-GAAP gross margins of 40%, and 17% adjusted EBITDA.

## REVENUE/PROFIT GROWTH OPPORTUNITIES:

COHU's success is directly tied to the semi-conductor industry and the proliferating use of integrated circuits/chips in various consumer products such as cell phones, i-pads, computing products, automobiles/vehicles, consumer products, and the growing connectivity of individuals into the internet. This provides three potential sources of revenue growth for COHU:

**GROWTH OF THE OVERALL SEMICONDUCTOR INDUSTRY.** In 2014 this industry grew 9.9% to \$336 billion, according to the Semiconductor Industry Association (SIA). COHU could piggy-back its own revenue growth with the semiconductor market as this sector grows into the future.

**COHU COULD EXPAND MARKET SHARE IN ITS CORE MARKETS.** Increasing its share in growing segments (mobility/automotive/LED), from optimizing test yields of ICs through new technologies, such as COHU's active thermal control/vision inspection.



EXPAND TOTAL AVAILABLBE MARKET TO ~\$2 BILLION FROM INCREASED SALES INTO TEST CONTACTING & WLP PROBE MARKETS. COHU introduced its new business unit, ITS, in 2014 to help increase revenues in the ~\$650 million test contactor market. The company's test handlers include test contactors which until recently only focused on selling the test handler. COHU's new strategy is to focus on selling both the handlers and test contactors and believes this could increase its market share of the test contractor market.

Additionally, 20% of semiconductors remain as WLPs and are not subject to traditional IC assembly and final test. These WLPs are only visually inspected and cannot be tested by traditional "test-handlers" and automated test equipment. However, COHU is developing products to test WLPs, and solve this issue, which potentially opens up an additional revenue stream in a market estimated at approximately ~\$250 million in size.

#### TRADING INFLUENCES ON COHU'S STOCK:

COHU's stock is very volatile, mirroring movements of semiconductor stocks. By modern day views, COHU would be viewed as a momentum, or growth stock, subject to potentially wide fluctuations in its share price. There are two things which tend to dictate the direction of COUH's share price movement. First, is the directional movement of semiconductor stocks. This occurs since COHU gets its orders from the semiconductor industry and as the anticipation of profits in this sector rises and falls, so do investor expectations regarding stocks in this sector. Thus both bullish and bearish Wall Street expectations associated with this sector drives the direction of trading in these stocks, as well as COHU's.

Second, is the amount of revenues generated on a quarterly basis. Being a small company, investors judge COHU's growth prospects upon increasing revenues on a quarter-to-quarter basis. Growing quarterly revenues, or new orders from COHU's customers, could be seen as positive and cause increased buying in its stock. Conversely, the opposite is true should revenues decline or customers delay/halt orders. Thus, management's forward guidance regarding expectations often times influences the direction of COHU's stock price movement.

#### RECENT DEVELOPMENTS

COHU recently completed its acquisition of Kita Manufacturing Co. LTD, a Japanese based company for \$15 million. Kita had 2016 revenues of \$17 million and designs, manufactures, and sells spring probe contacts used in final test contactors, probe cards, PCB test boards, and connectors sold to worldwide customers.



### 3Q16 EARNINGS CONFERENCE CALL TAKEAWAYS

During the 3Q16 conference call CEO Luis Muller stated COHU experienced a strong quarter for its turret handler business for tests and inspections of high performance mixed signal and radio frequency (RF) devices. Additionally, the company had a design win with a Korean test subcontractor, repeat orders from a recently added customer, and new orders for in-process strip testing of advanced memory.

The strongest segment was the automotive/industrial generating 66% of 3Q16 total system orders due to recent market share gains at one of its leading European customers. COHU currently supplies equipment to four of the top five automotive semiconductor companies and working towards landing the fifth company.

The amount of semiconductor content in vehicles continues to increase as midrange cars now contain approximately \$350 of semiconductor equipment per car and is expected to grow 7% per year through 2019 according to IC Insights. Semiconductors are used for infotainment, safety systems, body/networking, and power train chassis. COHU is primary supplier of handlers for testing power semiconductor devices used in automobiles. The company is developing a new simulated wafer level CSP prober for testing analog RF communication devices used in mobile, the internet of things, and automotive applications and enhanced its tri-temperature active thermal control products used in testing a new class of automotive processors.

The mobility and communications segment produced 25% of total system orders and experienced strong demand for COHU's turret handlers which perform electrical test/vision inspection of small package and wafer level semiconductor products. Several new orders materialized for the new 32-position turret platform increasing COHU's market share. A new wafer level CSP prober is being tested using multiple device types and could generate additional sales during 2017.

COHU stated several contactor evaluations are occurring at its leading handler customers and could generate sales during 4Q16 and produce revenue momentum in 2017.

Going forward the company believes its main growth opportunity will be in the digital market where COHU has a large installed base of pick and place handlers and customers are facing major challenges in the thermal control area potentially helped by an integrated handler contactor solution. Also, COHU is developing new technology to help customers with the rollout of the 5G platform which could increase demand for networking, smartphone, and ILT semiconductors.



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## Recent Earnings

Cohu reported 3Q16 GAAP earnings of \$0.01/share vs. \$0.05/share during 3Q15. The decline occurred as rising revenues were not enough to offset an increase in operating expenses. Net revenues rose 2.3% to \$69.3 million due to increased customer orders, mainly from the mobility and communication sectors for COHU's turret handlers. During 3Q16 66% of revenues came from automotive/industrial, 25% from mobility/computing, and 9% from solid-state lighting. Three of COHU's customers each accounted for more than 10% of the quarter's revenues with two in the automotive sector and the other in computing.

Expenses increased 4.6% to \$68.3 million due to higher cost of sales (\$46.04 million vs. \$44.72million), R&D expense (\$8.63 million vs. \$8.60 million), and SG&A (\$13.59 million vs. \$11.92 million). These expenses caused operating income to fall to \$996,000 from \$2.27 million. EBIT fell to \$1.07 million from \$2.28 million and income from continuing operations decreased to \$218,000 from \$1.34 million.

3Q16 non-GAAP earnings decreased to \$0.14/share from \$0.17/share during 3Q15. Operating income decreased to \$3.8 million from \$4.4 million. The GAAP to non-GAAP adjustments for 3Q16 include \$1.7 million of stock based compensation expense, \$1.8 million of purchased intangible amortization expense, and \$586,000 of restructuring expense.

## Our Thoughts

A decent report for COHU as the company's 3Q16 results came in-line with prior guidance provided by management. Per the prior guidance revenues came in higher than expected (\$69.3 million), gross margin was within guidance of 35.7% as were operating expenses of approximately \$19.6 million. GAAP earnings, when comparing 3Q16 and 3Q15, were \$0.01/share vs. \$0.05/share, and non-GAAP earnings were \$0.14/share vs. \$0.17/share.

Revenues from the automotive/industrial sectors, during 3Q16 increased to 66% from 50% of revenues, during 2Q16, as auto manufactures continue to put high technology components into vehicles for computing, internet, and entertainment purposes. This indicates 2017 revenue growth will be dependent upon continued growth of the auto sales. Overall, COHU is positioning itself for revenue growth during the next two years based on expanded use of its testing products from current and new customers

While we do not expect earnings growth when comparing 2016 to 2015, 2017 could generate increased profitability based on expanding sales. Given the recent volatility in this stock, we continue to rate COHU a HOLD and believe investors should wait for lower entry points before establishing positions.



## Risks

There are no guarantees COHU will be able to grow future earnings. Declining customer orders, increasing commodity prices, and rising operating costs could negatively affect the company's profits. Economic slowdowns, downturns in the semiconductor industry, and political change in Europe and Asia could have adverse effects on earnings. Currency fluctuations could influence earnings. New products from competitors, or changing industry trends/technology, are risks for COHU's ability to sell its products. Negative equity markets, rising interest rates, terrorist attacks, and failure to comply with the Sarbanes Oxley Act could cause a decline in COHU's share price. Given the relatively small amount of daily trading activity in COHU's stock, any increase in trading volume could significantly accelerate the volatility of its share price movement.

Steve Marascia  
Director of Research  
Capitol Securities Management  
804-612-9715  
[smarascia@capitolsecurities.com](mailto:smarascia@capitolsecurities.com)



# EQUITY RESEARCH

COHU, Inc.  
(dollars in figures, except for per share figures)

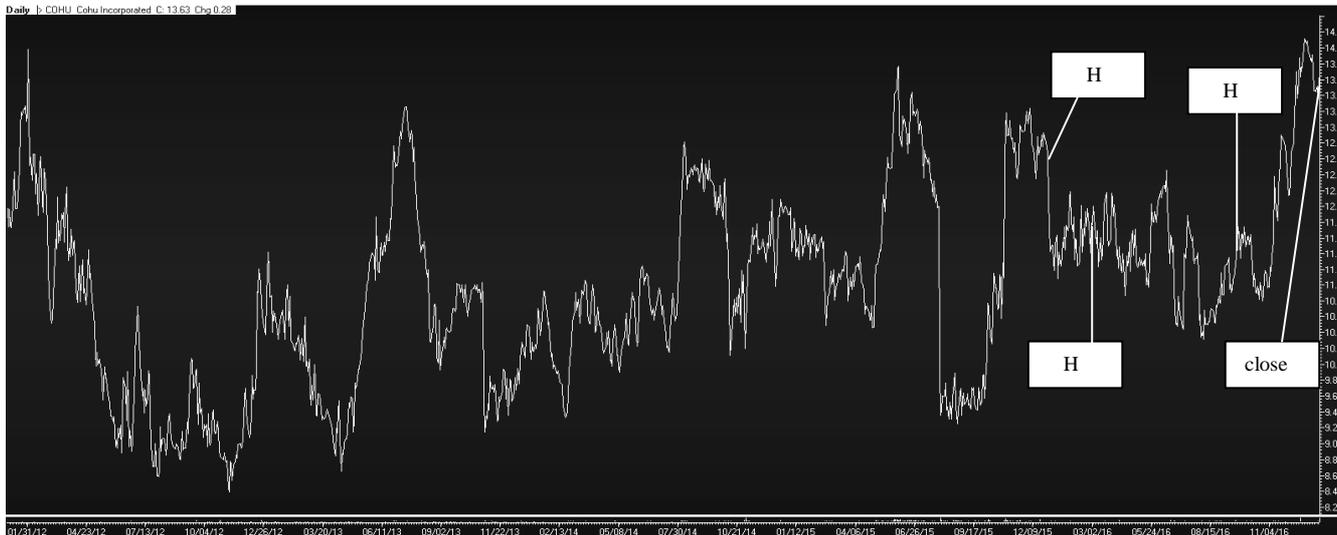
	1Q15	2Q15	3Q15	4Q15	FY15	1Q16	2Q16	3Q16	4Q16e	FY16e
Revenues	\$68,068	\$75,211	\$67,512	\$63,484	\$269,654	\$65,778	\$76,353	\$69,259	\$65,664	\$277,054
Cost of Sales	46,039	49,509	44,718	43,087	180,616	46,337	49,669	46,083	43,338	185,427
Research & Development	9,629	7,731	8,605	8,206	33,107	7,803	8,305	8,634	8,515	33,257
Selling, general, & Administrative	13,835	13,811	11,923	13,134	51,170	13,370	15,015	13,591	13,614	55,590
Impairment of goodwill/assets										
Gain on sale of facility				3,198	3,198					
Total costs/expenses	69,773	71,051	65,246	61,259	261,695	\$67,510	72,989	68,263	65,467	274,229
Gain/(loss) from Operations	-1,705	4,160	2,266	2,225	7,959	-1,732	3,364	996	197	2,825
Interest & other, net	6	4	9	25	44	43	59	71	83	256
Gain/(loss) from Cont. operations pre-tax	-1,699	4,164	2,275	2,250	8,003	-1,689	3,423	1,067	280	3,081
Income tax/benefit	1,041	277	940	40	2,211	222	761	849	98	1,930
Gain/(loss) from Cont. operations	-2,740	3,887	1,335	2,290	5,792	-1,911	2,662	218	172	1,141
Discontinued operations										
Income from dis. Ops pre-tax		-3,959	-222	-341	-5,536		-55	51	56	52
Income tax					6					
Income(loss) from discontinued ops		-3,959	-222	-341	-5,542		-55	51	56	52
Net Gain/(loss)	-2,740	-72	\$1,113	1,949	250	-1,911	2,607	269	228	1,193
Income from Discontinued Ops.	(\$0.11)	(\$0.15)	(\$0.01)	(\$0.01)	(\$0.21)		\$0.00	\$0.00	\$0.00	\$0.00
Diluted earnings per share (GAAP)	(\$0.11)	\$0.15	\$0.05	\$0.08	\$0.22	(\$0.07)	\$0.10	\$0.01	\$0.01	\$0.05
Non-GAAP earnings per share	\$0.03	\$0.27	\$0.17	\$0.09	\$0.58	\$0.06	\$0.22	\$0.14	\$0.12	\$0.54



# EQUITY RESEARCH

## Important Disclosures

Daily b COHU Cahu Incorporated C.13.63 Csp.0.28



12/31/15 \$12.07 initiate with HOLD rating

Ratings-

BUY: B

HOLD: H

SELL: S

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