



**December 31, 2015**

**CURRENT PRICE:** \$12.07  
**RATING:** HOLD  
**PRICE TARGET:** N/A  
**CURRENT YIELD:** 2.0%

**EPS Estimates**

	DEC 14A	DEC 15E
1Q	(\$0.13)	(\$0.11)A
2Q	\$0.09	\$0.15A
3Q	\$0.38	\$0.05A
4Q	\$0.05	\$0.03
	<b>\$0.39</b>	<b>\$0.12</b>

**Trading Data**

52-WEEK PRICE RANGE: \$13.84-\$9.14  
SHARES OUTSTANDING: 26.1(M)  
MARKET CAP: \$315.0(M)  
AVG. DAILY TRADING VOLUME: 0.11(M)  
S&P 500: 2,044

**Valuation Data**

BOOK VALUE: \$9.08  
PRICE TO BOOK: 1.33x  
DIVIDEND: \$0.24

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

*Initiating Coverage*

**Highlights**

- Offers growth opportunity in the semiconductor sector
- Developing new testing products for chip manufacturers
- Positive forward guidance from company
- COHU expects revenue ramp up in 2016 & 2017
- Initiating coverage with a 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 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.*



## 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 handlers 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 to approximately ~\$250 million in size. To this end, the company recently announced it achieved a major milestone in this strategy after receiving its first customer order for its WLP probe product.

#### 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.



# EQUITY RESEARCH

## Recent Earnings

COHU reported GAAP earnings of \$0.05/share vs. \$0.38/share during 3Q14. When comparing the two quarters, revenues declined to \$67.51 million from \$91.57 million, however both profits and revenues exceeded previous guidance. Operating expenses decreased 18% to \$65.27 million from \$79.57 million. Income from continuing operations decreased to \$1.34 million from \$10.01 million and loss from discontinued operations was -\$222,000 vs. -\$2.49 million. Net income totaled \$1.11 million vs. \$7.52 million. Non-GAAP earnings \$0.17/share vs. \$0.51/share.

Total operating expenses declined to \$67.51 million from \$79.57 million. The decrease was due to lower cost of sales (\$44.7 million vs. \$58.6 million) and SG&A expense (\$11.9 million vs. \$12.4 million). This decline was partly offset by higher R&D expense (\$8.60 million vs. \$8.59 million). Income from operations fell to \$2.27 million from \$12.01 million.

43% of total system orders were generated by the automotive sector due to strong demand for COHU's 'handler testing' products from the automotive sector as the industry moves towards the electrification of vehicles. The company's Saturn "gravity handler" won a key design with a Chinese customer allowing COHU to gain market share in the gravity segment. Additionally, several orders were received for MEMS test units for pressure and magnetic sensor used in newer autos.

29% of total system orders came from the consumer and mobility sector. The company received its first volume order from its "Eclipse" pick/place handlers which also uses COHU's thermal technology to control device temperature during tests. With this order COHU now has captured a second major mobile customer. The Turret-based test handler product received orders from a Korean company for test and inspections of RF devices. Additionally, 2 new customers placed orders for turret-based handlers allowing the potential for COHU to cross-sell pick/place systems. COHU got its first customer order for its wafer-level package testing product and will develop the product over the next few quarters for this customer. Management claims this was a major milestone towards achieving COHU's goal to expand its addressable market in WLP probe.

19% of total system orders were generated by the computing sector. COHU had orders for additional Pyramid (pick & place with active thermal control) handlers from demand tied to new device family launched by one of the company's key customers. This customer is testing data centers and traditional PC processors. A key US customer placed its first order for COHU's tri-temperature "T-Core" configuration of the "Eclipse" handler. This product is still in development but COHU claims it validates its roadmap for a next-generation active thermal solutions for a high-power dissipative server processor test.

9% of total system orders came from the solid-state lighting (SSL) sector. A large European customer increased production of SSL and placed multi-unit orders for COHU's turret handlers. Going forward, COHU believes their order stream could grow based upon capacity expansions created by increasing automotive applications for LEDs by big LED manufacturers. During 3Q15 large European customer qualified COHU's contacting solution for testing power management semiconductors with COHU's strip-handlers.



### 3Q15 CONFERENCE CALL TAKEAWAYS

Management expects COHU's revenue growth to come from the automotive, industrial, and the mobility markets. The mobility market could ramp-up and begin to accelerate in 4Q15 and into next year. The company anticipates new capacity additions in 4Q15 and 1H16 from increasing customer demand for its thermal products created by the launching of new smartphone and tablet models in 2016. COHU stated another revenue stream could appear sometime in 2016, followed by a ramp-up in 2017, from its product used by semiconductor manufacturers for singulated testing of WLPs.

COHU discussed the progress of moving its handler manufacturing to its Malaysian facility in order to reduce costs and increase production capacity. Management said 70% of its handler manufacturing will be done by this facility by 1/1/16 and expects the level to grow to 90% by 1/1/17.

### Our Thoughts

COHU offers a compelling way for small cap growth investors to get involved in the evolving semiconductor industry. Potentially, as integrated circuits become more and more common place in the products we use every day (automobiles, cellphones, computing, lighting, etc.), the semiconductor business could grow from \$11 billion to \$20 billion by 2020. Accordingly, as this market grows, so could COHU's revenues/profits as more of its products are bought by the semiconductor industry seeking to improve their own chip yield and profitability. We believe the company's revenues will begin to ramp up in 2016 and 2017 as more semi's purchase both its new and existing testing products in order to meet ever increasing amounts of chip production.

Given the volatility of COHU's stock (see chart) investors should await appropriate entry points before taking positions in this growth story. After hitting a recent low of \$9.27/share this past August, COHU's stock rallied over 40% and may be over extended at this time. Thus, we rate COHU a HOLD and recommend investors buy this stock at lower levels. Furthermore, forward revenue guidance provided by management is likely to create short-term buying/selling waves (volatility) based on either bullish, or bearish, guidance.



## 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.

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# EQUITY RESEARCH

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

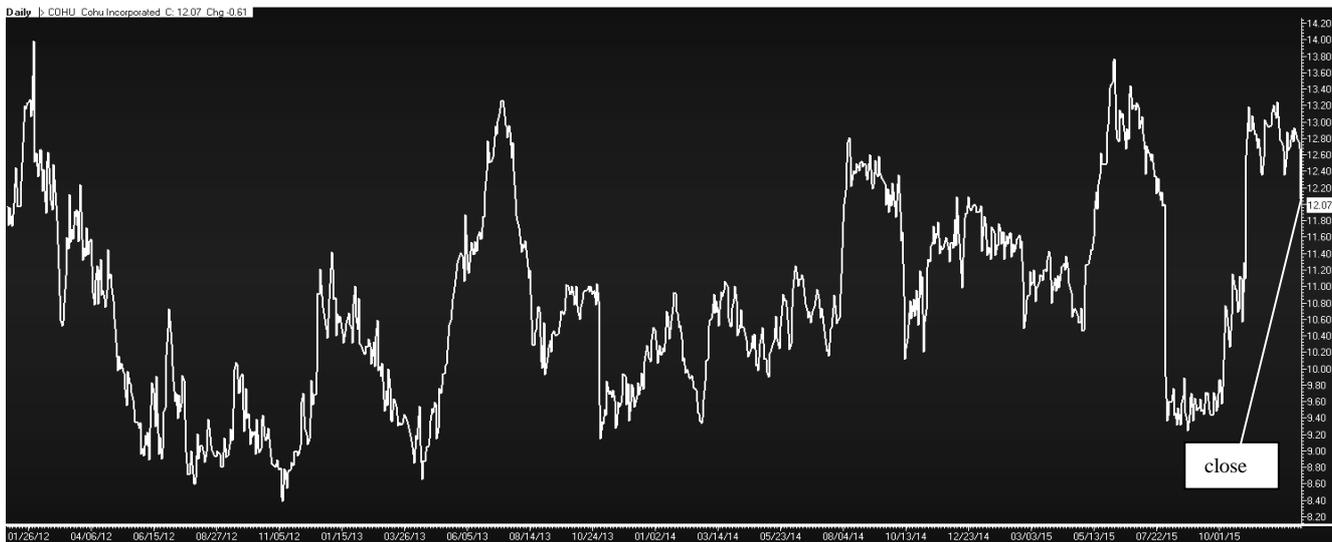
	1Q14	2Q14	3Q14	4Q14	FY14	1Q15	2Q15	3Q15	4Q15e	FY15e
Revenues	\$64,864	\$74,299	\$91,573	\$96,168	\$333,323	\$68,068	\$75,211	\$67,512	\$63,263	\$274,054
Cost of Sales	42,664	50,036	58,621	64,793	221,088	46,039	49,509	44,718	43,039	183,305
Research & Development	10,560	8,884	8,587	10,182	40,601	9,629	7,731	8,605	8,172	34,137
Selling, general, & Administrative	15,063	12,473	12,358	14,124	57,536	13,835	13,811	11,923	19,091	58,660
Impairment of goodwill/assets				5,000	5,000					
Total costs/expenses	68,287	71,051	79,566	94,099	324,225	69,773	71,051	65,246	62,130	268,200
Gain/(loss) from Operations	-3,423	2,906	12,007	2,069	9,098	-1,705	4,160	2,266	1,133	5,854
Interest & other, net	15	5	6	5	30	6	4	9	5	24
Gain/(loss) from Cont. operations pre-tax	-3,408	2,911	12,013	2,074	9,128	-1,699	4,164	2,275	1,138	5,878
Income tax/benefit	56	711	2,001	737	3,293	1,041	277	940	341	2,599
Gain/(loss) from Cont. operations	-3,352	2,200	10,012	1,337	5,835	-2,740	3,887	1,335	797	3,279
Discontinued operations										
Income from dis. Ops pre-tax	5	2,024	-2,598	301	4,192		-3,959	-222	-110	-4,291
Income tax		61	105	1,264	1,319					
Income from dis. Ops	5	1,963	-2,493	-963	2,873		-3,959	-222	-110	-4,291
Net Gain/(loss)	-3,347	4,163	7,519	374	8,708	-2,740	-72	\$1,113	687	-992
Income from Cont. Ops	(\$0.13)	\$0.09	\$0.38	\$0.05	\$0.22	(\$0.11)	\$0.15	\$0.05	\$0.03	\$0.12
Diluted earnings per share (GAAP)	(\$0.13)	\$0.16	\$0.29	\$0.01	\$0.33	(\$0.11)	\$0.00	\$0.04	\$0.03	(\$0.04)
Non-GAAP earnings per share	\$0.02	\$0.21	\$0.42	\$0.39	\$1.02	\$0.03	\$0.27	\$0.17		



# EQUITY RESEARCH

## Important Disclosures

Daily | COHU CoHu Incorporated | C: 12.07 | Chg: 0.61



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

Ratings-

BUY: B

HOLD: H

SELL: S

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