



**August 16, 2017**

**CURRENT PRICE:** \$18.02  
**RATING:** HOLD  
**PRICE TARGET:** N/A  
**CURRENT YIELD:** 1.3%

**EPS Estimates**

	DEC 16A	DEC 17E
1Q	(\$0.07)	\$0.24A
2Q	\$0.09	\$0.37A
3Q	\$0.01	\$0.32
4Q	\$0.08	\$0.33
	<b>\$0.12</b>	<b>\$1.26</b>

**Trading Data**

52-WEEK PRICE RANGE: **\$21.64-\$10.01**  
 SHARES OUTSTANDING: **28.73(M)**  
 MARKET CAP: **\$517.7(M)**  
 AVG. DAILY TRADING VOLUME: **0.27(M)**  
 S&P 500: **2,468**

**Valuation Data**

BOOK VALUE: **\$9.01**  
 PRICE TO BOOK: **2.0x**  
 DIVIDEND: **\$0.24**

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

*2Q17 Earnings Results*

**Highlights**

- 2Q17 earnings of \$0.37/share vs. 2Q16's \$0.10/share
- Momentum in auto, mobility, and "IoT"
- Demand ramp-up for COHU's products
- COHU provides positive 3Q17 guidance
- 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.*

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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 COHU'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.



## CONFERENCE CALL TAKEAWAYS

During the 2Q17 earnings conference call, COHU noted the 23% revenue growth, when compared to 2Q16, was above prior 2Q17 guidance of \$86 million. This was the company's largest quarterly revenue results since 2014 and was driven by continued momentum in the automotive, mobility, and "IoT" sectors. Orders, on a first time basis, hit a new record of over \$100 million with increased momentum for industrial and solid state lighting applications.

COHU's contactor business increased to over 10% of quarterly sales resulting from strong customer demand for a new RF solution and digital contactors coupled with Kita's spring probes. There was strong demand for turret temperature pick and place handlers for testing microcontroller devices related to the automotive, industrial, and consumer markets.

In the processor area, there was a strong ramp-up for COHU's Eclipse active thermal control handler at Asian test subcontractors related to a production launch of new mobile processors from a leading customer which outsources assembly/testing. Also, there were repeat orders for thermal subsystems used to test another customer's device and these will be in COHU's production volumes during 2H17. The company is making progress for new and existing customers with high power active thermal control configuration of the Eclipse handler testing server chips, graphics, and other high-end processors used in gaming and AI applications.

There was increased demand for turret handlers during 2Q17 resulting from a major LED customer using the product for testing/inspection of high power devices. COHU said sensor system orders were "strong" due to the market penetration of its products for testing MIMS used in automotive applications. Management expects further momentum in these areas going forward into 3Q17.

The growing power IC segment during the next few years could raise demand for COHU's gravity/handler products and some turret systems. Additionally, demand may grow based on further incorporation of automation and robotics by Corporate America.

Technological advances in functionality and product reliability needs in the automotive, internet of things (IoT), and mobility markets created the need for early detection of defects at a micrometer scale. To this end, COHU has developed a new product called, "Aquilae", designed to be a new vision inspection module for micro-crack detection on wafer level chip scale packages. Potentially, this offers COHU another avenue of revenues going forward as this product could broaden its application to larger semiconductors used in digital/mobile markets.

During 2Q17 COHU had a key design win at a leading European semiconductor manufacturer and received a secured strip test application with Kita probes at a large installed base of COHU handlers from Taiwanese customer. Additionally, COHU secured another win in the power sensors/LED markets from the above mentioned European semiconductor manufacturer, thus allowing annual sales to grow towards \$1 million.



# EQUITY RESEARCH

## Recent Earnings

COHU reported 2Q17 GAAP earnings of \$0.37/share vs. \$0.09/share during 2Q16. The improvement was due primarily to higher revenues driven by momentum in the automotive, mobility, and “internet of things” (IoT) markets. Revenues rose to \$93.9 million from \$76.4 million while costs and expenses increased to \$82.2 million from \$73.1 million allowing gross margins to increase to 39.6% from 35.0%. Systems orders were 57% of 2Q17 revenues with these being comprised of digital/mixed signal (28%), processors (24%), LED/Sensors (21%), analog/RF discrete (16%), power/management (10%), and others (1%).

Total expenses increased 15.2% to \$82.2 million due to a rise in cost of sales (\$56.7 million vs. \$49.6 million), R&D (\$9.5 million vs. \$8.5 million), and SG&A expense (\$16.0 million vs. \$15.2 million). The rise in cost of sales was due to increased orders and the R&D increase resulted from COHU’s continued product development needed for customer’s changing needs. The rise in revenues, which outpaced higher operating expenses, generated EBIT of \$11.6 million vs. \$3.2 million when comparing 2Q17 to 2Q16.

2Q17 non-GAAP earnings improved to \$0.48/share vs. \$0.23/share during 2Q16. Income from operations rose to \$13.8 million from \$6.2 million. The GAAP to non-GAAP adjustments include \$1.8 million of stock-based compensation expense, \$1 million of purchased intangible amortization expense, \$341,000 in restructuring costs, \$465,000 of cost related to the step-up in valuation of inventory obtained in the Kita acquisition, and \$56,000 in other acquisition related expenses.

## Our Thoughts

Revenue growth appears to be materializing at COHU following its 2Q17 earnings report. COHU reported 2Q17 GAAP earnings of \$0.37/share vs. \$0.09/share during 2Q16. The improvement was due primarily to higher revenues driven by momentum in the automotive, mobility, and “internet of things” (IoT) markets. Revenues rose to \$93.9 million from \$76.4 million while costs and expenses increased to \$82.2 million from \$73.1 million allowing gross margins to increase to 39.6% from 35.0%. 2Q17 non-GAAP earnings improved to \$0.48/share vs. \$0.23/share during 2Q16. Income from operations rose to \$13.8 million from \$6.2 million.

Management’s efforts to lower operating costs during the past few years created an improvement in margins coupled with growth in quarterly revenues. 2Q17’s revenue levels were the highest since 2014 and was driven by continued momentum in the automotive, mobility, and “IoT” sectors. Furthermore, COHU provided positive guidance for 3Q17 anticipating revenues of approximately \$94 million driven by momentum in the automotive and mobility markets, and gross margins could come in between 39%-41%. Going forward, management believes gross margins could hit 45% when annual revenues approach \$500 million. Given the recent volatility in the markets, and rich valuations, we recommend speculative investors seek lower points of entry for this stock. Our current rating on COHU is a HOLD.



## 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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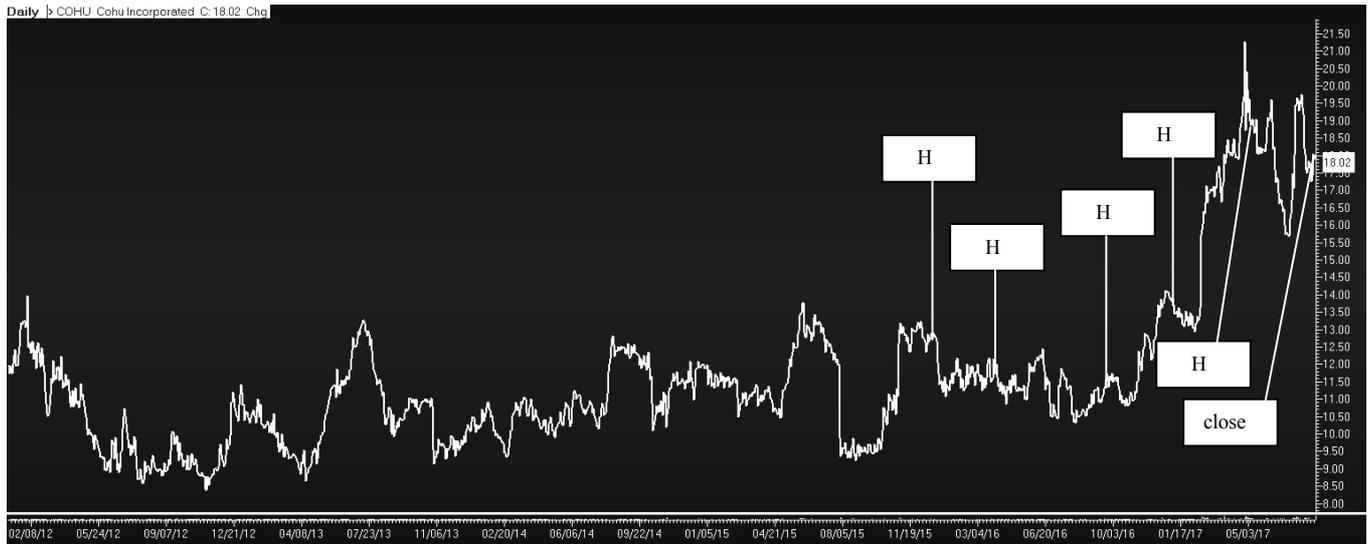
# EQUITY RESEARCH

## COHU, Inc.

(dollars in figures, except for per share figures)

	1Q16	2Q16	3Q16	4Q16	FY16	1Q17	2Q17	3Q17e	4Q17e	2017e
Revenues	\$65,778	\$76,353	\$69,259	\$70,694	\$282,084	\$81,097	\$93,866	\$93,856	\$88,185	\$357,004
Cost of Sales	46,337	49,669	46,083	45,167	187,256	48,841	56,736	57,252	52,029	214,858
Research & Development	7,803	8,305	8,634	10,143	34,481	9,776	9,466	9,576	9,903	38,721
Selling, general, & Administrative	13,370	15,015	13,591	12,232	54,332	14,460	16,020	15,858	14,788	61,126
Impairment of goodwill/assets										
Gain on sale of facility										
Total costs/expenses	\$67,510	72,989	68,263	67,642	276,419	73,077	82,222	82,868	76,720	314,887
Gain/(loss) from Operations	-1,732	3,364	996	3,052	5,665	8,020	11,644	11,170	11,465	42,299
Interest & other, net	43	59	71	169	342	101	142	115	118	476
Gain/(loss) from Cont. operations pre-tax	-1,689	3,423	1,067	3,221	6,007	8,121	11,786	11,285	11,347	42,539
Income tax/benefit	222	761	849	915	2,747	1,358	1,078	2,031	2,043	6,510
Gain/(loss) from Cont. operations	-1,911	2,662	218	2,306	3,260	6,763	10,708	9,254	9,304	36,029
Discontinued operations										
Income from dis. Ops pre-tax		-55	51	-217	-221		-278			-278
Income tax										
Income(loss) from discontinued ops		-55	51	-217	-221		-278			-278
Net Gain/(loss)	-1,911	2,607	269	2,089	3,039	6,763	10,430	9,254	9,304	35,751
Income from Discontinued Ops.		\$0.00	\$0.00	\$0.00	(\$0.01)	\$0.00	(\$0.01)	\$0.00	\$0.00	(\$0.01)
Diluted earnings per share (GAAP)	(\$0.07)	\$0.10	\$0.01	\$0.08	\$0.12	\$0.24	\$0.37	\$0.32	\$0.33	\$1.26
Non-GAAP earnings per share	\$0.06	\$0.22	\$0.14	\$0.24	\$0.68	\$0.35	\$0.48	\$0.41	\$0.37	\$1.46

## Important Disclosures



Ratings-  
BUY: B  
HOLD: H  
SELL: S

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