



Partners from RF to Light

February 6, 2018

MACOM and STMicroelectronics to Bring GaN on Silicon to Mainstream RF Markets and Applications

- | Combines manufacturing scale, supply security, and surge capacity from ST with MACOM's GaN on Silicon RF power products to address mainstream consumer, automotive, and wireless basestation programs
- | ST licenses MACOM's technology to supply GaN on Silicon RF power products
- | Anticipated breakthrough cost structure and power density of GaN on Silicon would enable 4G/LTE and massive MIMO 5G antennas

LOWELL, Mass. & GENEVA--(BUSINESS WIRE)-- MACOM Technology Solutions Holdings, Inc. (NASDAQ: MTSI) ("MACOM"), a leading supplier of high-performance RF, microwave, millimeterwave and lightwave semiconductor products, and STMicroelectronics (NYSE: STM), a global semiconductor leader serving customers across the spectrum of electronics applications, today announced an agreement to develop GaN (Gallium Nitride) on Silicon wafers to be manufactured by ST for MACOM's use across an array of RF applications. While expanding MACOM's source of supply, the agreement also grants to ST the right to manufacture and sell its own GaN on Silicon products in RF markets outside of mobile phone, wireless basestation and related commercial telecom infrastructure applications.

This press release features multimedia. View the full release here:
<http://www.businesswire.com/news/home/20180206006289/en/>



Through this agreement, MACOM expects to access increased Silicon wafer manufacturing capacity and improved cost structure that could displace incumbent Silicon LDMOS and accelerate the adoption of GaN on Silicon in mainstream markets. ST and MACOM have been working together for several years to bring GaN on Silicon production up in ST's CMOS wafer fab. As currently scheduled, sample production from ST is expected to begin in 2018.

"This agreement punctuates our long journey of leading the RF industry's conversion to GaN on Silicon technology. To date, MACOM has refined and proven the merits of GaN on Silicon using rather modest compound semiconductor factories, replicating and even exceeding the RF performance and reliability of expensive GaN on SiC alternative technology," said John Croteau, President and CEO, MACOM. "We expect this collaboration with ST to bring those GaN innovations to bear in a Silicon supply chain that can ultimately service the most demanding customers and applications."

"ST's scale and operational excellence in Silicon wafer manufacturing aims to unlock the potential to drive new RF power applications for MACOM and ST as it delivers the economic breakthroughs necessary to expand the market for GaN on Silicon," said Marco Monti, President of the Automotive and Discrete Product Group,

Through this agreement, MACOM expects to access increased Silicon wafer manufacturing capacity and improved cost structure that could displace incumbent Silicon LDMOS and accelerate the adoption of GaN on Silicon in mainstream markets. ST and MACOM have been working together for several years to bring GaN on Silicon production up in ST's CMOS wafer fab.

the potential to drive new RF power applications for MACOM and ST as it delivers the economic breakthroughs necessary to expand the market for GaN on Silicon," said Marco Monti, President of the Automotive and Discrete Product Group,



STMicroelectronics. "While expanding the opportunities for existing RF applications is appealing, we're even more excited about using GaN on Silicon in new RF Energy applications, especially in automotive applications, such as plasma ignition for more efficient combustion in conventional engines, and in RF lighting applications, for more efficient and longer-lasting lighting systems."

"Once the \$0.04/watt barrier for high power RF semiconductor devices is crossed, significant opportunities for the RF energy market may open up," said Eric Higham, Director Advanced Semiconductor Applications Service at Strategy Analytics. Higham continued, "Potential RF energy device shipments could be in the hundreds of millions for applications including commercial microwave cooking, automotive lighting and ignition, and plasma lighting, with sales reaching into the billions of dollars."

About MACOM

MACOM enables a better-connected and safer world by delivering breakthrough semiconductor technologies for optical, wireless and satellite networks that satisfy society's insatiable demand for information.

Today, MACOM powers the infrastructure that millions of lives and livelihoods depend on every minute to communicate, transact business, travel, stay informed and be entertained. Our technology increases the speed and coverage of the mobile Internet and enables fiber optic networks to carry previously unimaginable volumes of traffic to businesses, homes and datacenters.

Keeping us all safe, MACOM technology enables next-generation radars for air traffic control and weather forecasting, as well as mission success on the modern networked battlefield.

MACOM is the partner of choice to the world's leading communications infrastructure, aerospace and defense companies, helping solve their most complex challenges in areas including network capacity, signal coverage, energy efficiency and field reliability, through its best-in-class team and broad portfolio of RF, microwave, millimeterwave and lightwave semiconductor products.

MACOM is a pillar of the semiconductor industry, thriving for more than 60 years of daring to change the world for the better, through bold technological strokes that deliver true competitive advantage to customers and superior value to investors.

Headquartered in Lowell, Massachusetts, MACOM is certified to the ISO9001 international quality standard and ISO14001 environmental management standard. MACOM has design centers and sales offices throughout North America, Europe, Asia and Australia.

MACOM, M/A-COM, M/A-COM Technology Solutions, M/A-COM Tech, Partners in RF & Microwave and related logos are trademarks of MACOM. All other trademarks are the property of their respective owners. For more information about MACOM, please visit www.macom.com follow [@MACOMtweets](https://twitter.com/MACOMtweets) on Twitter, join MACOM on [LinkedIn](https://www.linkedin.com/company/macom/), or visit the MACOM [YouTube Channel](https://www.youtube.com/user/MACOM).

About STMicroelectronics

ST is a global leader in the semiconductor market serving customers across the spectrum of sense and power and automotive products and embedded processing solutions. From energy management and savings to trust and data security, from healthcare and wellness to smart consumer devices, in the home, car and office, at work and at play, ST is found everywhere microelectronics make a positive and innovative contribution to people's life. By getting more from technology to get more from life, ST stands for life.augmented. In 2016, the Company's net revenues were \$6.97 billion. Further information on ST can be found at www.st.com.

Special Note Regarding Forward-Looking Statements

This press release contains forward-looking statements. Forward-looking statements include, among others, statements concerning the anticipated development and manufacturing of GaN on Silicon wafers, the potential uses for such wafers, potential manufacturing, cost structure and power density benefits of GaN on Silicon, market adoption of GaN on Silicon and the pace of such adoption, opportunities within the RF energy market, and potential RF energy shipments and sales. Forward-looking statements include all statements that are not historical facts and generally may be identified by terms such as "anticipates," "believes," "could," "estimates," "expects," "intends," "may," "plans," "potential," "predicts," "projects," "seeks," "should," "will," "would" or similar expressions and the negatives of those terms.

These forward-looking statements reflect current views about future events and are subject to risks, uncertainties, assumptions and changes in circumstances that may cause those events or actual activities or results to differ materially from those expressed in any forward-looking statement. Neither MACOM nor ST can nor does guarantee future events, results, actions, levels of sales or other activity, performance or achievements. Readers are cautioned not to place undue reliance on these forward-looking statements. A number of important factors could cause actual results to differ materially

from those indicated by the forward-looking statements, including the potential that the parties are unable to timely deliver the quantities of products targeting applications at the right price point due to design challenges, manufacturing bottlenecks, supply shortages, yield issues or otherwise, the potential that the expected rollout fails to occur, occurs more slowly than the parties expect or does not result in the amount or type of anticipated new business, lower than expected demand in the RF market or other end markets or from OEM customers based on seasonal effects, regulatory action or inaction, technology shifts, standards changes, macro-economic weakness or otherwise, the potential for greater than expected pricing pressure and average selling price erosion based on attempts to win or maintain market share, competitive factors, technology shifts or otherwise, the potential inability to ramp GaN on Silicon products into volume production with acceptable manufacturing yields to satisfy customer demand in a timely fashion, the potential for inventory obsolescence and related write-offs, the potential loss of access to any in-licensed intellectual property or inability to license technology on reasonable terms, the impact of any claims of intellectual property infringement or misappropriation, failure to realize the expected economies of scale, lack of adoption or delayed adoption by customers and industries of GaN on Silicon, failures or delays in porting and qualifying GaN on Silicon process technology and achieving anticipated manufacturing economies of scale, lower than expected utilization and absorption in the manufacturing process, lack of success or slower than expected success in developing GaN on Silicon products under the collaboration, loss of key personnel, loss of business due to competitive factors, product or technology obsolescence, customer program shifts or otherwise, the potential for a shift in the mix of products sold in any period toward lower-margin products, the impact of supply shortages or other disruptions in supply chains, the impact of changes in export, environmental or other applicable laws, as well as those factors described in "Risk Factors" in MACOM's filings with the Securities and Exchange Commission ("SEC"), including its Annual Report on Form 10-K for the fiscal year ended September 29, 2017, as filed on November 15, 2017 or in ST's filings with the SEC, including its Annual Report on Form 20-F for the fiscal year ended December 31, 2016, as filed on March 3, 2017. Neither MACOM nor ST undertakes any obligation to publicly update or revise any forward-looking statement, whether as a result of new information, future events or otherwise.

View source version on [businesswire.com](http://www.businesswire.com/news/home/20180206006289/en/): <http://www.businesswire.com/news/home/20180206006289/en/>

MACOM

Ozzie Billimoria, 978-656-2896

Senior Marketing Communications Specialist

ozzie.billimoria@macom.com

or

STMicroelectronics

Michael Markowitz, +1-781-591-0354

Director, Technical Media Relations

michael.markowitz@st.com

Source: MACOM

News Provided by Acquire Media