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Resonant Releases Details of its Breakthrough XBAR Resonator Technology for 5G Mobile Devices

GOLETA, Calif., Oct. 23, 2018 (GLOBE NEWSWIRE) -- Resonant Inc. (NASDAQ: RESN), a leader in transforming the way radio frequency, or RF, front-ends are being designed and delivered for wireless devices, today released more details about its breakthrough resonator technology that holds the potential for a new class of high-performance RF filters for 5G devices.

The new discovery is important because resonators form the building blocks for RF filters and define much of the performance achievable in a filter. Resonant's XBAR is a new bulk acoustic wave (BAW) structure that can be produced in silicon using standard processes. Simulated utilizing the company's ISN platform, we believe XBAR outperforms best-in-class film bulk acoustic resonator (FBAR) devices in frequencies above 3 GHz. 5G wireless services for mobile devices are expected to operate in this higher frequency range to support high-bandwidth data applications. Today's filter technologies (surface acoustic wave (SAW), temperature compensated SAW (TC-SAW), BAW and FBAR) have operating limitations at frequencies higher than 3 GHz.

Key performance metrics demonstrated in initial XBAR resonators:

- Extremely large coupling coefficients, greater than 500 MHz at 5 GHz
    - Essential for the design of large bandwidth 5G filters
- High Q resonances, greater than 500, as high as 31 GHz

"5G technology holds the promise of brand new consumer and business services, but the requirements for filters to support high frequency, high power and high bandwidth are quite different from those of 4G. Performance of these new services will be hampered without the right filter technology that allows mobile devices to isolate the high-frequency signals," said Bob Hammond, Chief Technology Officer of Resonant. "With XBAR BAW resonators, we are on a path to providing an alternative filter technology that will facilitate high-performance services for mobile devices."

Developed with Infinite Synthesized Network®
Resonant developed the new resonator using its Infinite Synthesized Network® (ISN®) design technology, which today provides industry leading filter manufacturers and fabless companies with the ability to design complex filters, duplexers and quadplexers.

"Utilizing Resonant's ISN tool's accuracy for modeling acoustic wave structures allowed Resonant technologists to investigate alternatives to current mobile resonator structures and compare their performance," said George Holmes, Chief Executive Officer of Resonant. "It is through the continued development of our ISN roadmap that we have been able to complete the investigation and develop and patent the XBAR technology."

Resonant has measured the performance of XBAR resonators up to 38 GHz. The simulated performance accurately models the measured data, indicating that XBAR technology could be used to develop filters for devices used in 5G, both in the 3 to 6 GHz range as well as millimeter wave operating at 28 GHz and higher frequencies.

If successful, XBAR should provide for filter designs for 5G bands with better insertion loss, better rejection levels, higher power handling and wider passbands than currently available filters.

About Resonant Inc.
Resonant (NASDAQ: RESN) is transforming the market for RF front-ends (RFFE) by disrupting the RFFE supply chain through the delivery of solutions that leverage our Infinite Synthesized Network (ISN) software tools platform, capitalize on the breadth of our IP portfolio, and are delivered through our services offerings. In a market that is critically constrained by limited designers, tools and capacity, Resonant addresses these critical problems by providing customers with ever increasing design efficiency, reduced time to market and lower unit costs. Customers leverage Resonant's disruptive capabilities to design cutting edge filters and modules, while capitalizing on the added stability of a diverse supply chain through Resonant's fabless ecosystem-the first of its kind. Working with Resonant, customers enhance the connectivity of current mobile devices, while preparing for the demands of emerging 5G applications.

To learn more about Resonant, view the series of videos published on its website that explain Resonant's technologies and market positioning:

- Infinite Synthesized Networks, ISN Explained
- What is an RF Filter?
- RF Filter Innovation
- Transforming the Mobile Filter Supply Chain

For more information, please visit www.resonant.com.

Resonant uses its website (https://www.resonant.com) and LinkedIn page (https://www.linkedin.com/company/resonant-inc-/) as channels of distribution of information about its products, its planned financial and other announcements, its attendance at upcoming investor and industry conferences, and other matters. Such information may be deemed material information, and Resonant may use these channels to comply with its disclosure obligations under Regulation FD. Therefore, investors should monitor the company's website and its social media accounts in addition to following the company's press releases, SEC filings, public conference calls, and webcasts.

About Resonant's ISN® Technology
Resonant can create designs for difficult bands, modules and other complex RF Front End requirements that we believe have the potential to be manufactured for half the cost and developed in half the time of traditional approaches. ISN is a suite of proprietary mathematical methods, software design tools and network synthesis techniques that enable us to explore a much larger set of possible design solutions that regularly incorporate our proprietary technology. We then quickly deliver design simulations to our customers, which they manufacture or have manufactured by one of our foundry partners. These improved solutions still use Surface Acoustic Wave (SAW) or Temperature Compensated Surface

Acoustic Wave (TC-SAW) manufacturing methods and perform as well as those using higher cost manufacturing methods such as Bulk Acoustic Wave (BAW). Resonant's method delivers excellent predictability, enabling achievement of the desired product performance in roughly half as many turns through the fab. In addition, because Resonant's models are fundamental, integration with its foundry and fab customers is seamless because its models speak the "fab language" of basic material properties and dimensions.

Safe Harbor / Forward Looking Statements
This press release contains forward-looking statements, which include the following subjects, among others: the capabilities of our filter designs and ISN tools. Forward-looking statements are made as of the date of this document and are inherently subject to risks and uncertainties which could cause actual results to differ materially from those in the forward-looking statements, including, without limitation, the following: our limited operating history; our ability to complete designs that meet customer specifications; the ability of our customers (or their manufacturers) to fabricate our designs in commercial quantities; our customers' ability to sell products incorporating our designs to their OEM customers; changes in our expenditures and other uses of cash; the ability of our designs to significantly lower costs compared to other designs and solutions; the risk that the intense competition and rapid technological change in our industry renders our designs less useful or obsolete; our ability to find, recruit and retain the highly skilled personnel required for our design process in sufficient numbers to support our growth; our ability to manage growth; and general market, economic and business conditions. Additional factors that could cause actual results to differ materially from those anticipated by our forward-looking statements are under the captions "Risk Factors" and "Management's Discussion and Analysis of Financial Condition and Results of Operations" in our most recent Annual Report (Form 10-K) or Quarterly Report (Form 10-Q) filed with the Securities and Exchange Commission. Forward-looking statements are made as of the date of this release, and we expressly disclaim any obligation or undertaking to update forward-looking statements.

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