

# Resonant Releases New PMTx Extension For TC-SAW Filter Technologies

GOLETA, Calif., Nov. 09, 2020 (GLOBE NEWSWIRE) -- Resonant Inc. (NASDAQ: RESN), a leader in transforming the way radio frequency, or RF, front-ends are being designed and delivered for mobile handset and wireless devices, today announced the release of a new extension to its PMTx, Process Monitoring Tool, enabling PMTx to model and measure the fabrication processes of TC-SAW (Temperature-Compensated Surface Acoustic Wave)—both Thick SiO<sub>2</sub> and Bonded Wafer - filter technologies.

PMTx is an ISN® service that precisely monitors and improves the fabrication process of SAW—and now the more-complex and challenging-to-fabricate, TC-SAW—wafer technologies. A TC-SAW process is used to fabricate filters that are more stable over the expected device operating temperatures. Leveraging ISN, foundries can improve yields, increase profit margins and accelerate technology development. Leveraging electronic models to more efficiently monitor the fabrication process, PMTx provides a significant advantage over traditional imaging technologies which are significantly slower and more expensive, such as FIB-SEM and TEM. With PMTx customers enter their target dimensions and PMTx measures actual production dimensions against those targets, allowing customers to use the results to make adjustments in their processes.

“The new PMTx extensions are significant because they enable PMTx to monitor the fabrication processes of TC-SAW, including Bonded Wafer, which the market is rapidly moving toward from the SAW fabrication process that still dominates the market today,” said George B. Holmes, Chairman and CEO of Resonant. “Competition is fierce in this rapidly growing market, so any improvement in cost efficiency is important. Our fab customers have been increasingly asking for TC-SAW capabilities, and we believe we now have the potential for new evaluation licenses and/or customers. In fact, we expect at least one customer to sign an evaluation license for PMTx TC-SAW in the fourth quarter of 2020.”

## Advantages of PMTx over FIB-SEM

PMTx	FIB-SEM
<ul style="list-style-type: none"> <li>• Non-destructive method</li> <li>• Uses non-destructive electronic modeling, saving cost and time of wafers in fab</li> <li>• Takes minutes to sample full wafer</li> <li>• Characterizes the complete filter building block and provides trends across wafer</li> <li>• Enables foundry in-line benchmarking for critical processing parameters</li> </ul>	<ul style="list-style-type: none"> <li>• Destructive method</li> <li>• Uses energetic ion beams to physically cut the wafer, making it unusable after measurement</li> <li>• Takes hours to days, slowing fab recovery time</li> <li>• Extremely localized on wafer, hours to get a spot check only</li> <li>• Does not provide electrical performance and requires careful calibration</li> </ul>

## 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:

- [Resonant Corporate Video](#)
- [ISN and XBAR: Speeding the Transition to 5G](#)
- [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](http://www.resonant.com). Resonant uses its [website](#) and [LinkedIn page](#) 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<sup>®</sup> 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 less cost and less time than 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 software 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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