



 **RESONANT[®]**

RESONANT: STRATEGIC ALIGNMENT WITH 5G TRANSITION JANUARY 2020

20200106 Strategic Alignment with 5G Transition final

SAFE HARBOR STATEMENT

This document contains forward-looking statements. The words “believe,” “may,” “will,” “potentially,” “estimate,” “continue,” “anticipate,” “intend,” “could,” “would,” “project,” “plan,” “expect” and similar expressions that convey uncertainty of future events or outcomes are intended to identify forward-looking statements. Forward-looking statements may address the following subjects among others: the status of filter designs under development, the prospects for licensing filter designs upon completion of development, plans for other filter designs not currently in development, potential customers for our designs, the timing and amount of future royalty streams, the expected duration of our capital resources, our hiring plans, the impact of our designs on the mobile device market, and our business strategy. Forward-looking statements 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; the ability of our customers to sell products incorporating our designs to OEMs; our dependence on a small number of customers; the ability of our designs to significantly lower costs as 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 document, and we expressly disclaim any obligation or undertaking to update forward-looking statements.

We may refer to information regarding potential markets for products and other industry data. We believe that all such information has been obtained from reliable sources that are customarily relied upon by companies in our industry. However, we have not independently verified any such information.

HIGHLIGHTS

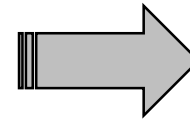
- In the following few slides we have outlined Resonant's high level strategy for 2020
 - Our plans to intersect and capitalize on the impending change to 5G
 - Our take on the implications created by major potential changes in the overall RF supply chain
 - Solutions already in play for 5G
 - Biggest segment of the market for the next several years in sub 3GHz, and our solutions for that market
 - Overview of the overall filter landscape, identifying the right partners will be the key to success

IMPACT OF 5G AND RESONANT STRATEGY ALIGNMENT

5G

- All about high data-rate (bandwidth)
- Most countries focusing on sub-6GHz spectrum
 - Large bandwidth (>600MHz)
 - High frequency (3.4GHz-5GHz)
- Gradual ramp in 5G capabilities over the next 5 years

GAP: Lack of Novel filter structures optimized for 5G



Resonant Strategy

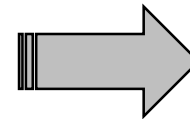
- Novel filter structures optimized for new requirements
 - IDT-membrane filters
 - XBAR for mobile sub-6GHz 5G spectrum
 - Teledyne Foundry for non-mobile
 - Constant innovation of new targeted filter structures

Analogous to Avago/FBAR when 3G transitioned to 4G

4G

- 4G is not going away
- Market will continue to grow
 - MIMO, NSA 5G
 - Increasing 4G content, even in “5G” phones
- New designs for lower cost and higher power

GAP: Stable, high volume supply chain eco-system



Resonant Strategy

- Develop filter fabless eco-system
 - Qualify independent foundries for FE &BE
 - Dependent on ISN designs
- Standard filter IP Library designs
 - Fast time-to-market
- Private label filters
- Continued innovation on filter structures, driving cost and time to market

2-prong strategy aligned with differing demands for 5G and 3G/4G

IMPLICATIONS OF AVGO ANNOUNCEMENT

Announcement:

- Re-categorized wireless business unit (FBAR and WLAN) as a Financial Asset from a Strategic Asset

Implication:

- Signals that wireless unit is for sale
- Drivers for sale: Increased competition, expiring patents, US-China trade war
 - Most likely acquirers : Apple, Skyworks, Qualcomm, Private Equity (PE)

Resonant Thoughts:

- Signals that FBAR filters are not applicable to new 5G spectrum
 - AVGO would not sell ahead of anticipated 5G growth
- Highlights fragility of filter supply chain
 - Limited number of vertically integrated suppliers
 - Restricting new market entrants

Validation of Resonant 5G (XBAR) and 3G/4G (Fabless) strategy

RESONANT SOLUTIONS FOR THE 5G MOBILE MARKET

SOLUTION:

XBAR

Resonant's proprietary resonator structure based on existing process technologies developed using ISN®

Filter IP Standard Library

Resonant's off-the-shelf RF filter design portfolio

VALUE PROPOSITION:

- ✓ Achieves bandwidth required for 5G
- ✓ Proprietary resonator structure
- ✓ Solution for 5G and WiFi coexistence

- ✓ Yields faster time to market

Target Customers:



RESONANT SOLUTION FOR THE 4G MOBILE MARKET

SOLUTION:

Foundry Program

Resonant's foundry partners available to support fabless customers

Custom filter designs

Resonant's service line to produce unique RF filter designs

Filter IP Standard Library

Resonant's off-the-shelf RF filter design portfolio

VALUE PROPOSITION:

- ✓ Opens markets to new entrants



- ✓ Low-cost, high-quality

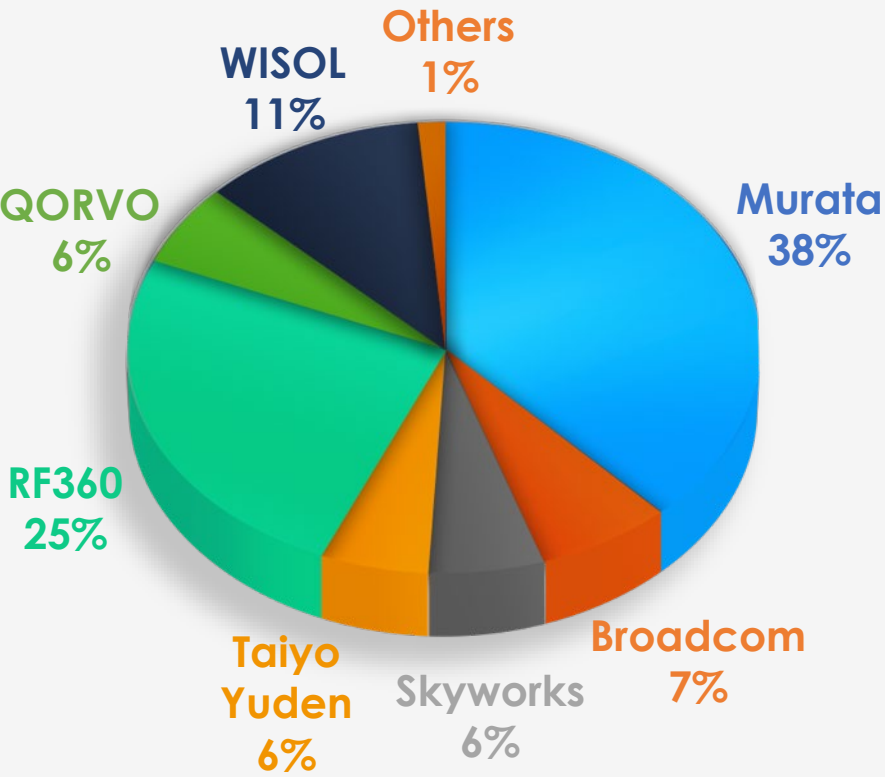
- ✓ Yields faster time to market

Target Customers:

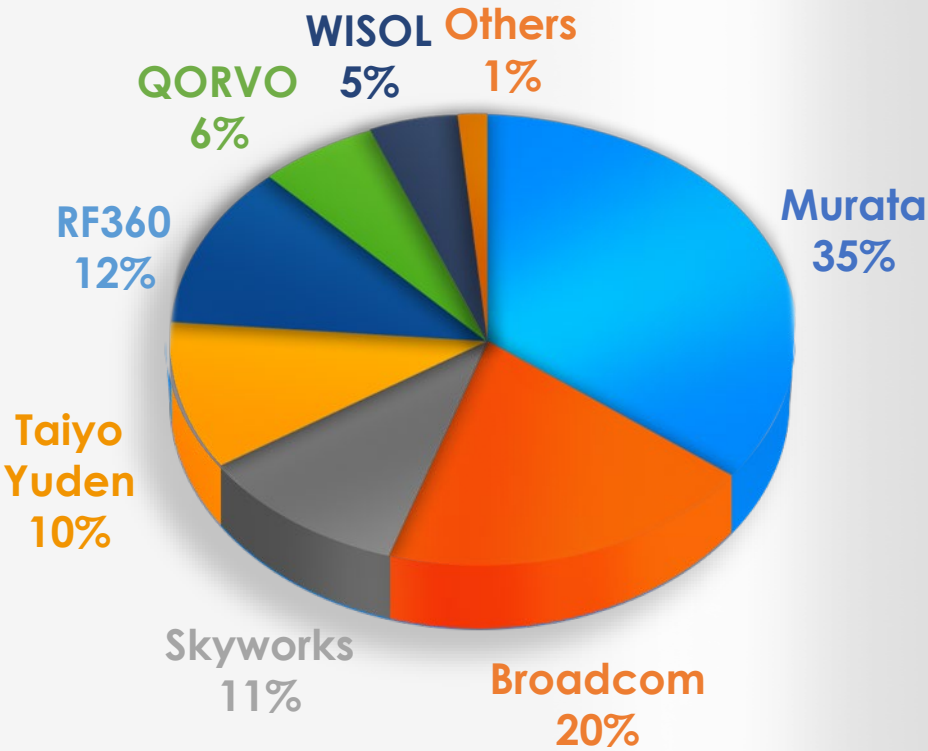


IMPLICATIONS OF PARTNERING WITH THE RIGHT COMPANY FOR XBAR DEAL

FILTERS

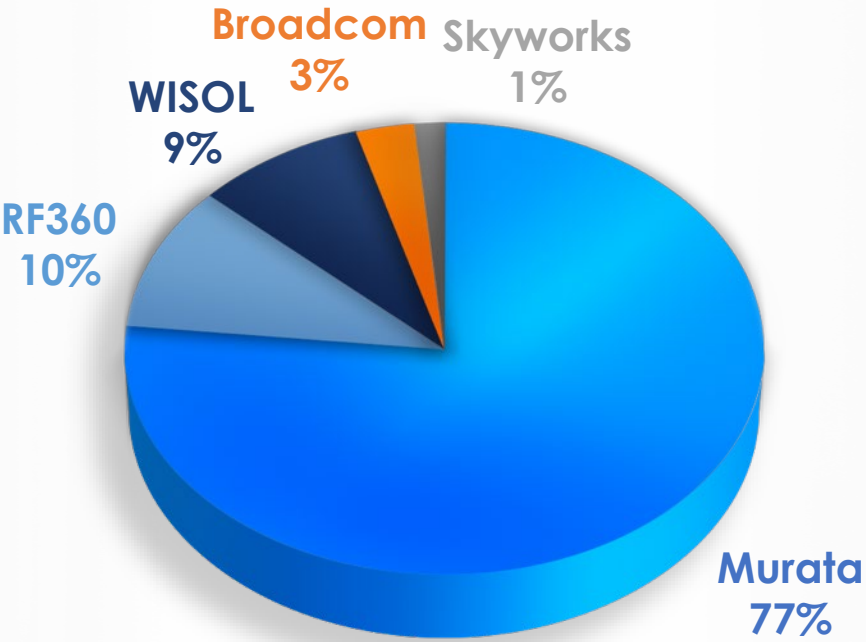


DUPLEXERS



FEMiDs

(Front-End Module with Integrated Duplexers)



5 COMPANIES MAKE UP 80% OF THE FILTER AND DUPLEXER MARKETS

Largest Filter Manufacturer Partners with Resonant for 5G Filters

MODULE GROWTH HAS BEEN SHIFTING DUE TO RECENT MACRO ECONOMIC EVENTS

Sources: Navian 2018