



INVESTOR RELATIONS PRESENTATION

OCTOBER 2019

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.

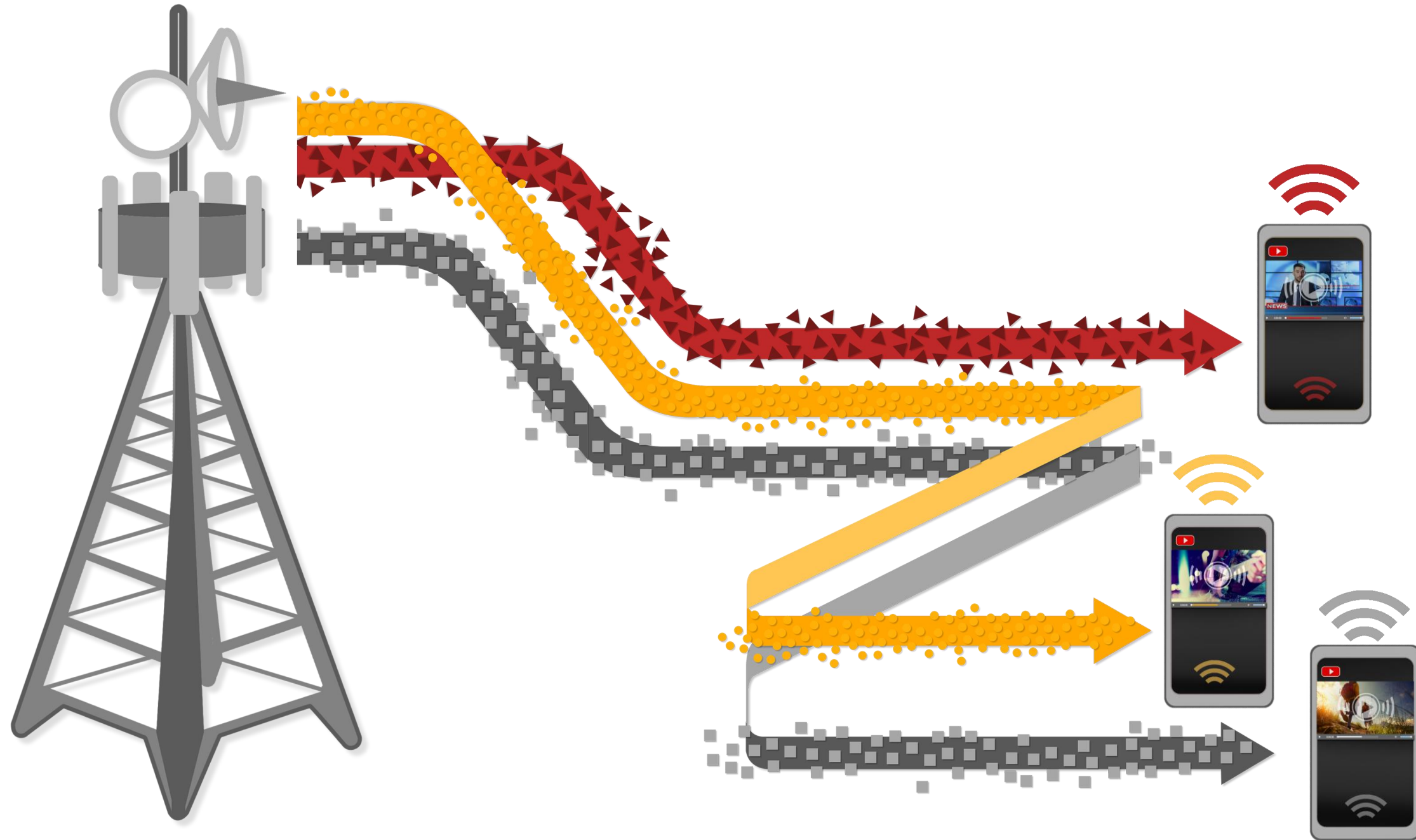
We may refer to information regarding potential markets for products and other industry data. We believe that all such information has been obtained from reliable sources that are customarily relied upon by companies in our industry. However, we have not independently verified any such information.

CORPORATE STORY: RESONANT OVERVIEW



View our full corporate video at <https://ir.resonant.com/videos>

NEXT GENERATION PHONES ARE DEPENDENT UPON INCREASING DEMAND FOR BANDWIDTH

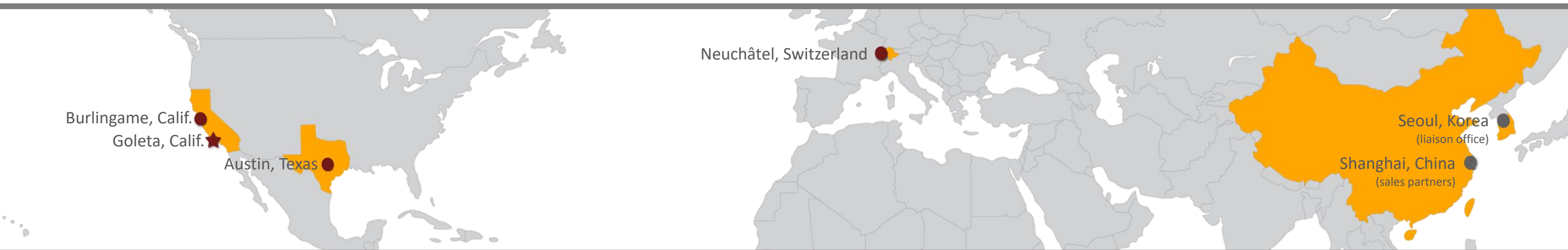


RF Front End (RFFE) Ensures Voice, Data and Video Calls Are Delivered Correctly
Resonant is transforming the way RFFEs are Designed and Delivered

SUMMARY OF COMPANY STATS

Corporate Overview

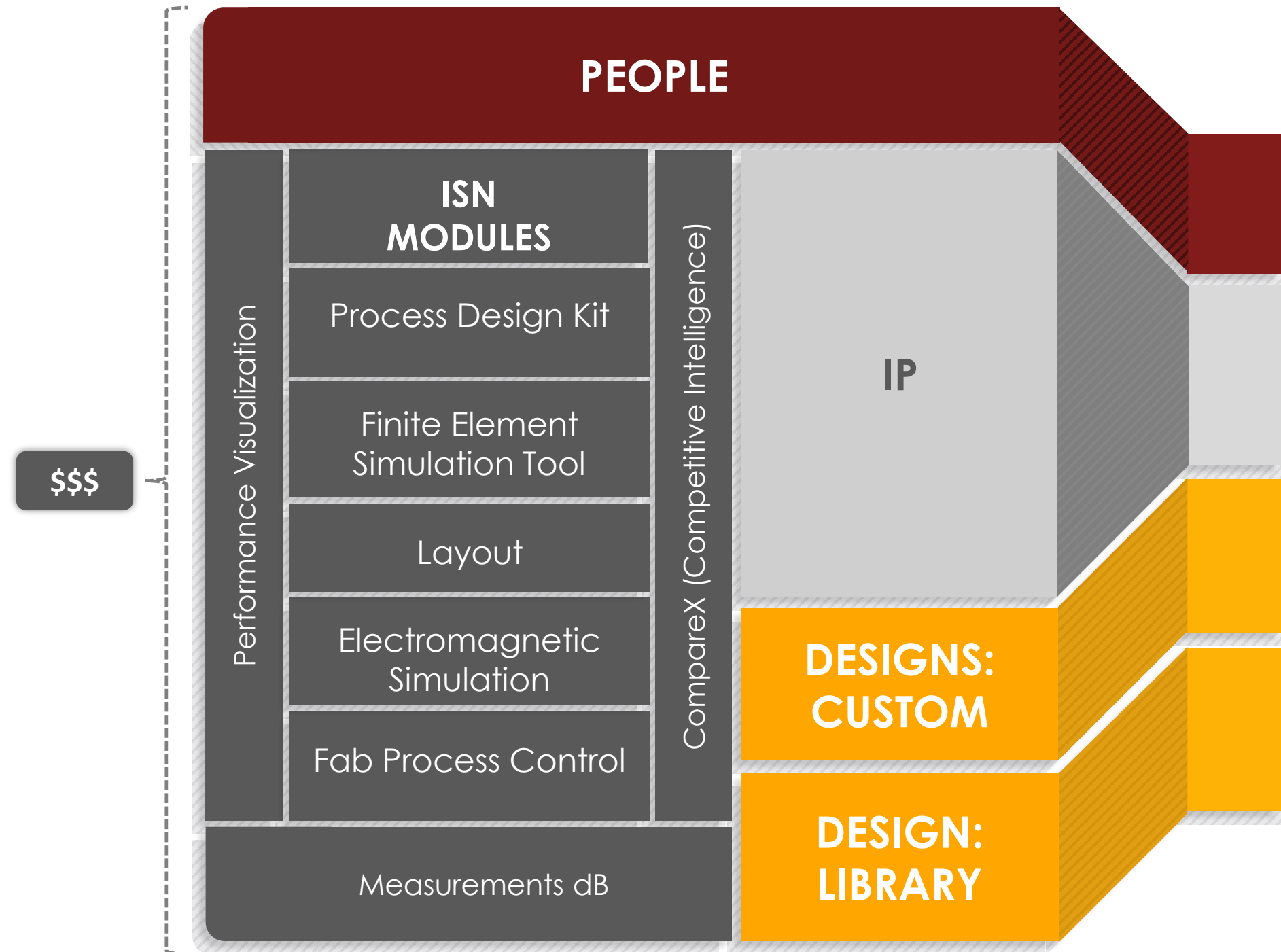
Founded:	May 2012	Business Model:	Licensing-Per Unit Royalty
IPO:	May 2014	Customers:	12 customers
Employees:	70+ employees	Foundry Partners:	7 partners
Cash, cash equivalents & investments¹:	\$10.5 M <i>as of June 30, 2019</i>	Market Validation:	80 devices contracted
		Patents:	>200 filed or issued



1. Excludes \$10 million private placement announced August 6, 2019

RESONANT IS THE ONLY PURE PLAY SOFTWARE & IP GROWTH OPPORTUNITY FOCUSED ON MOBILE FILTER MARKET

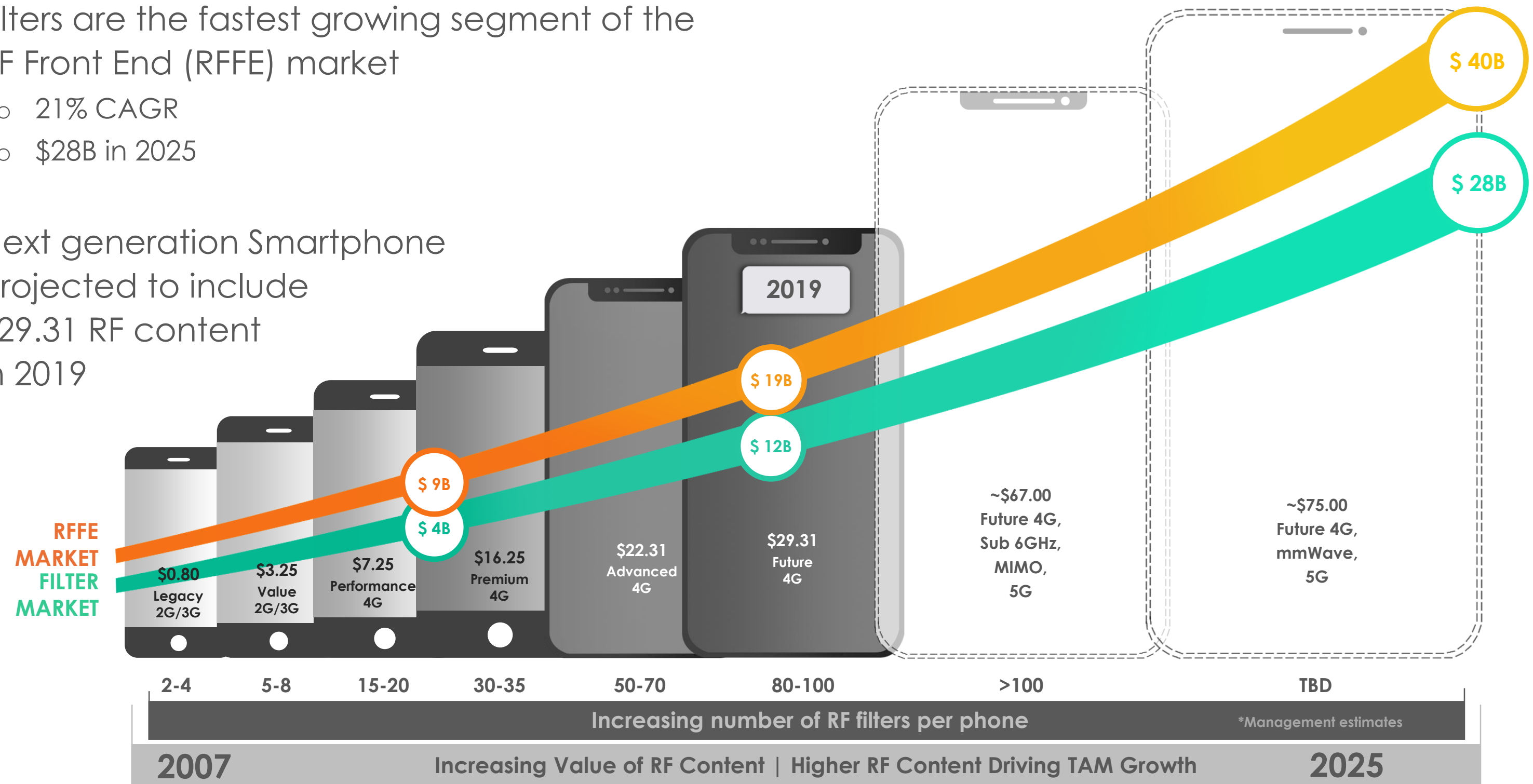
- **Filter market** is \$12B today **growing to \$28B** by 2025
 - Market will require **>3x number of filters**
 - **5G** is ramping
 - Filter companies are **constrained** by designer availability
- **Infinite Synthesized Networks® (ISN®) software** creates designs faster, better, and cheaper
 - Design efficiency is up to **5x greater** than other filter designers
 - Design turns **reduced** by up to **10x**
- **IP and Trade Secrets** creating core value
 - Latest development **targeting 5G**
- **Business model**
 - **Licensing** based on filter sales



Sources: Yole Developpement

RF FRONT END ENABLES MOBILE PHONE GROWTH

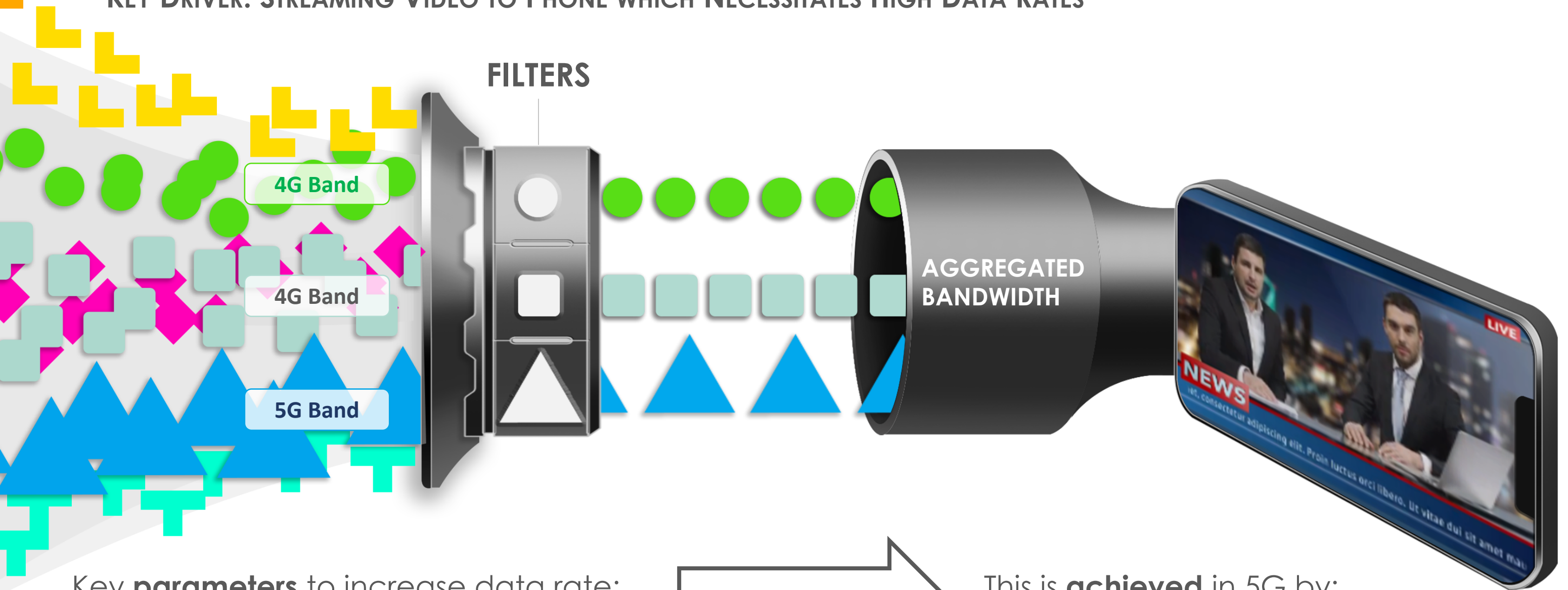
- Filters are the fastest growing segment of the RF Front End (RFFE) market
 - 21% CAGR
 - \$28B in 2025
- Next generation Smartphone projected to include \$29.31 RF content in 2019



Sources: Yole Developpement, Navian, Barclays, Management Estimates

5G: EXTREME MOBILE BROADBAND DRIVERS

KEY DRIVER: STREAMING VIDEO TO PHONE WHICH NECESSITATES HIGH DATA RATES



Key **parameters** to increase data rate:

1. Increase bandwidth
2. Increase number of channels
3. Improve SINR - Signal to (Interference + Noise) Ratio
 - a. By increasing transmit power at the user
 - b. By decreasing noise



This is **achieved** in 5G by:

1. More instantaneous bandwidth (n77, n79..) & aggregation of spectrum
2. More antennas (MIMO)
3. Densification of the network
4. Higher order modulation schemes

5G AND WIFI COEXISTENCE PROBLEM

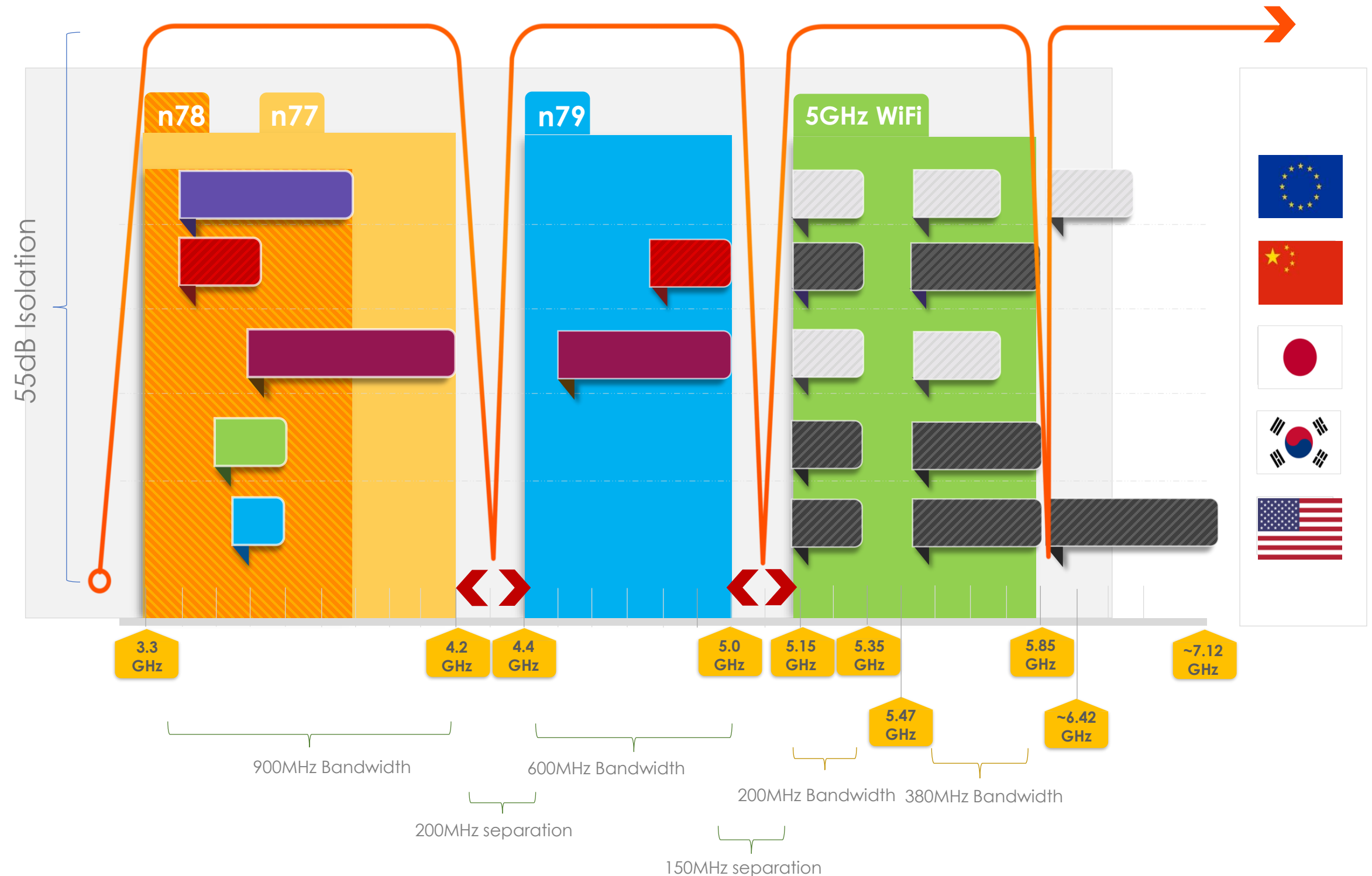
Problem:

- 5G (sub 6GHz) and 5GHz/6GHz WiFi need to operate together in 5G phones
- Massive potential interference problem

Requirements:

- Large bandwidths
- High isolation/rejection
- Low loss
- High Power
- Small and thin die size

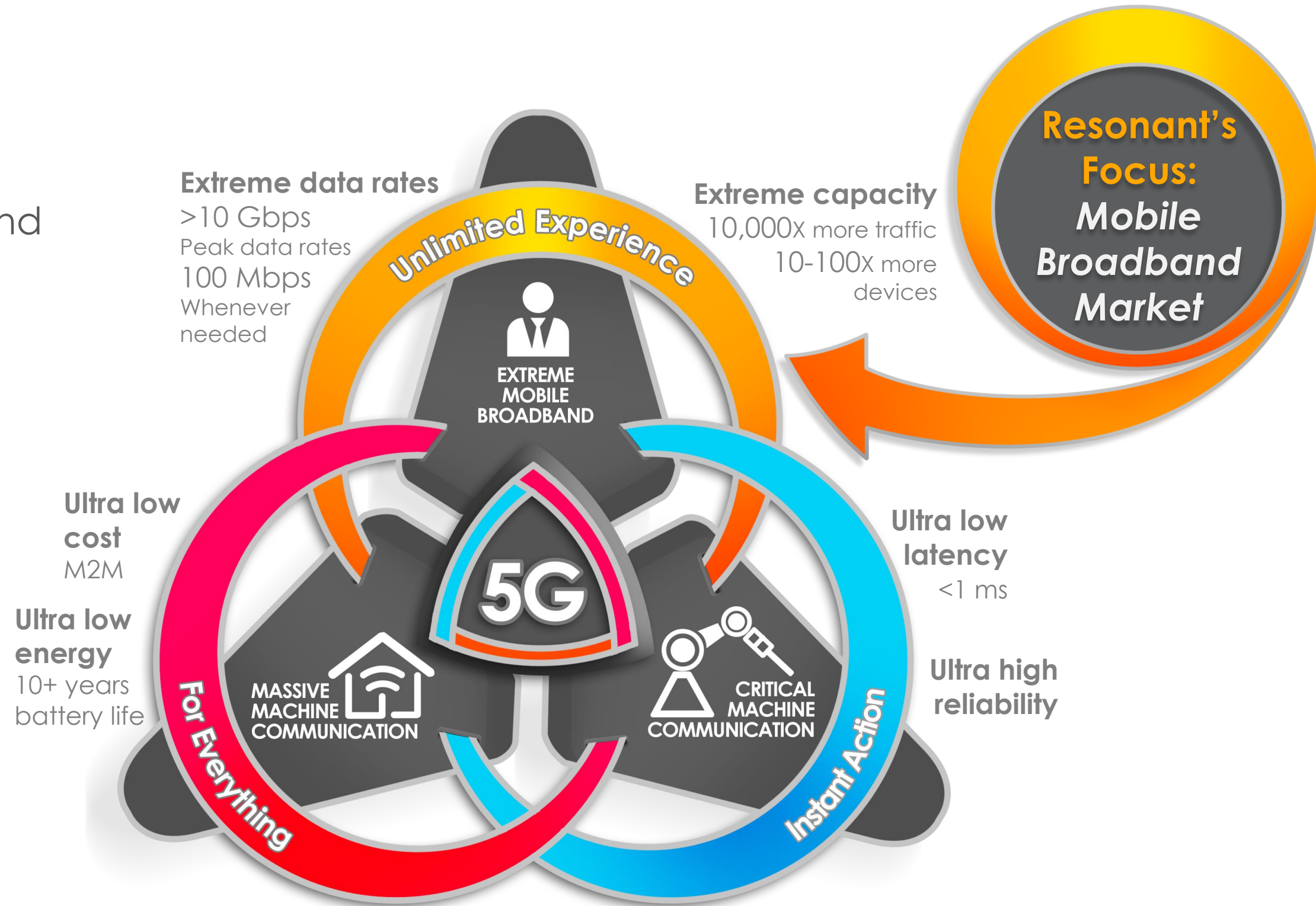
**Significantly different
from 4G**



5G: REQUIREMENTS FOR 5G USE CASES

3 Different Use Cases:

1. Extreme Mobile Broadband
 - a. HD Video
2. Massive MTM Comm.
 - a. IoT
3. Critical Machine Comm.
 - a. High reliability



Source: Nokia

5G's IMPACT ON THE RF FRONT END – DESIGN CAPACITY

Design capacity must increase by up to 8x by 2025 to maintain share

Design capacity constrains market¹

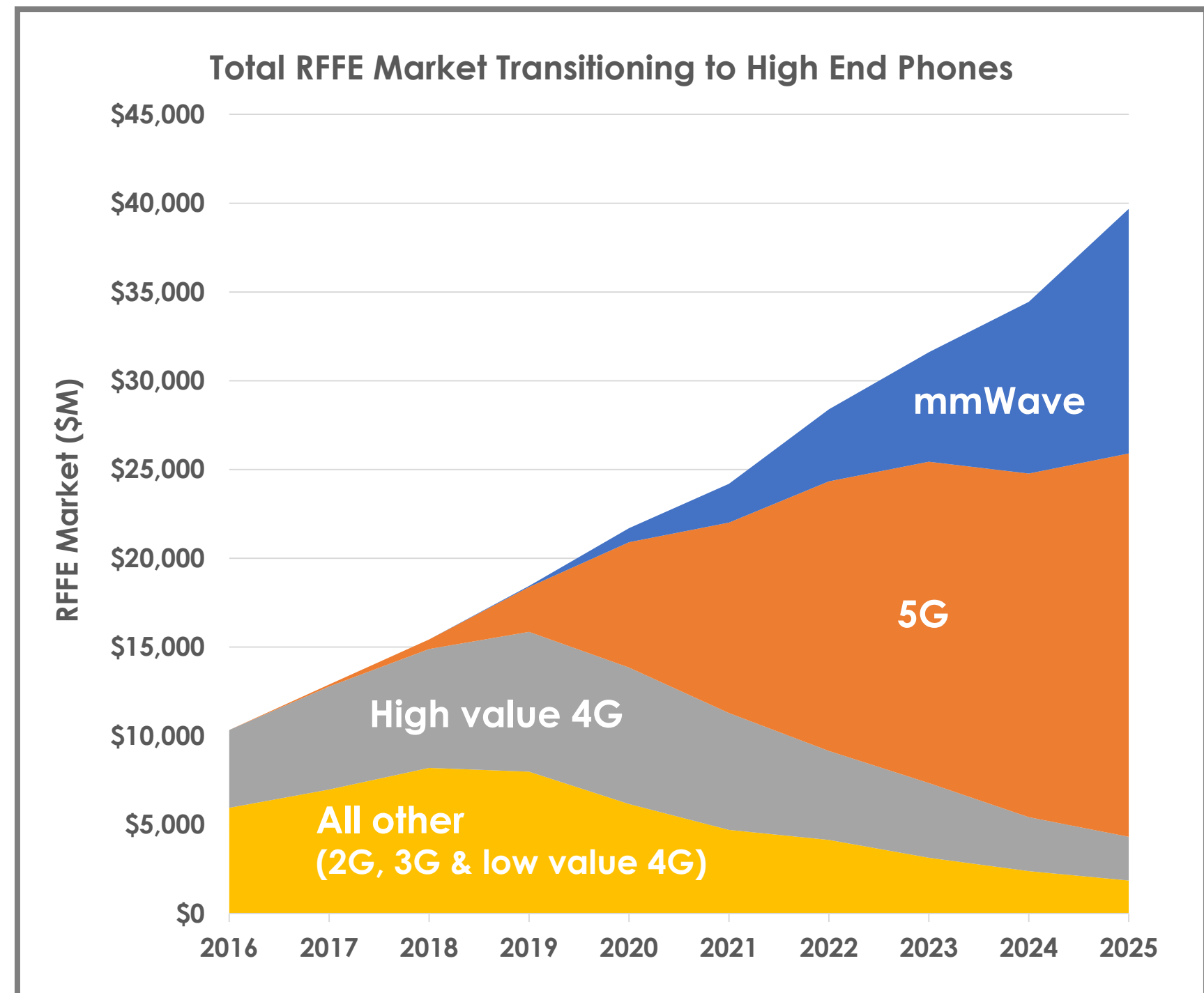
- Resonant is positioned to support entire RF spectrum with ISN platform; improving design efficiency by up to 5x

Legacy design methodology increases costs and slows development by utilizing fab turns to deliver designs

- Resonant's ISN platform enables fewer turns (up to 1-2) to deliver functional designs

High value 4G continues to be meaningful

- Resonant's Filter IP Standard Library of products enables new customer and suppliers to enter market



Sources: Yole Developpement, Management Estimates

1. Design capacity increase assumes for customer targeting current share in new phone market which has 3-4x greater filters per phone

ISN®: NEXT GENERATION DESIGN PLATFORM

RESONANT

FUNDAMENTAL | RIGOROUS | SCALABLE | DEFENDABLE

CURRENT FILTER DESIGN

UTILIZED BY MOST MANUFACTURERS

Image Design
Acoustic Wave Ladder

Modern Filter Theory

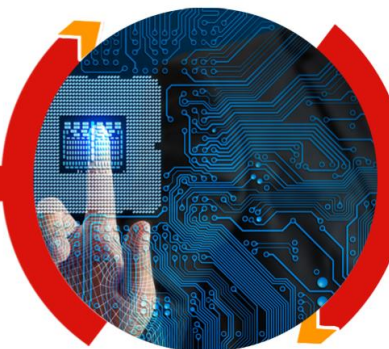
Coupling of Modes Model | COM
Empirical Optimization & Simulation

Aggregated Physical Properties
Velocity of Surface Waves
Reflectivity of Surface Waves

Acoustic Wave Network Synthesis

RF Circuit Models

Optimization



Fundamental Physical Models

Simulation

RF Circuits
Inductance | Voltage

RF Circuit Integration

Fundamental Physical Properties
Density | Dimensions

Fab Integration



1900s



1950s



2000s



Today

Current filter design process:

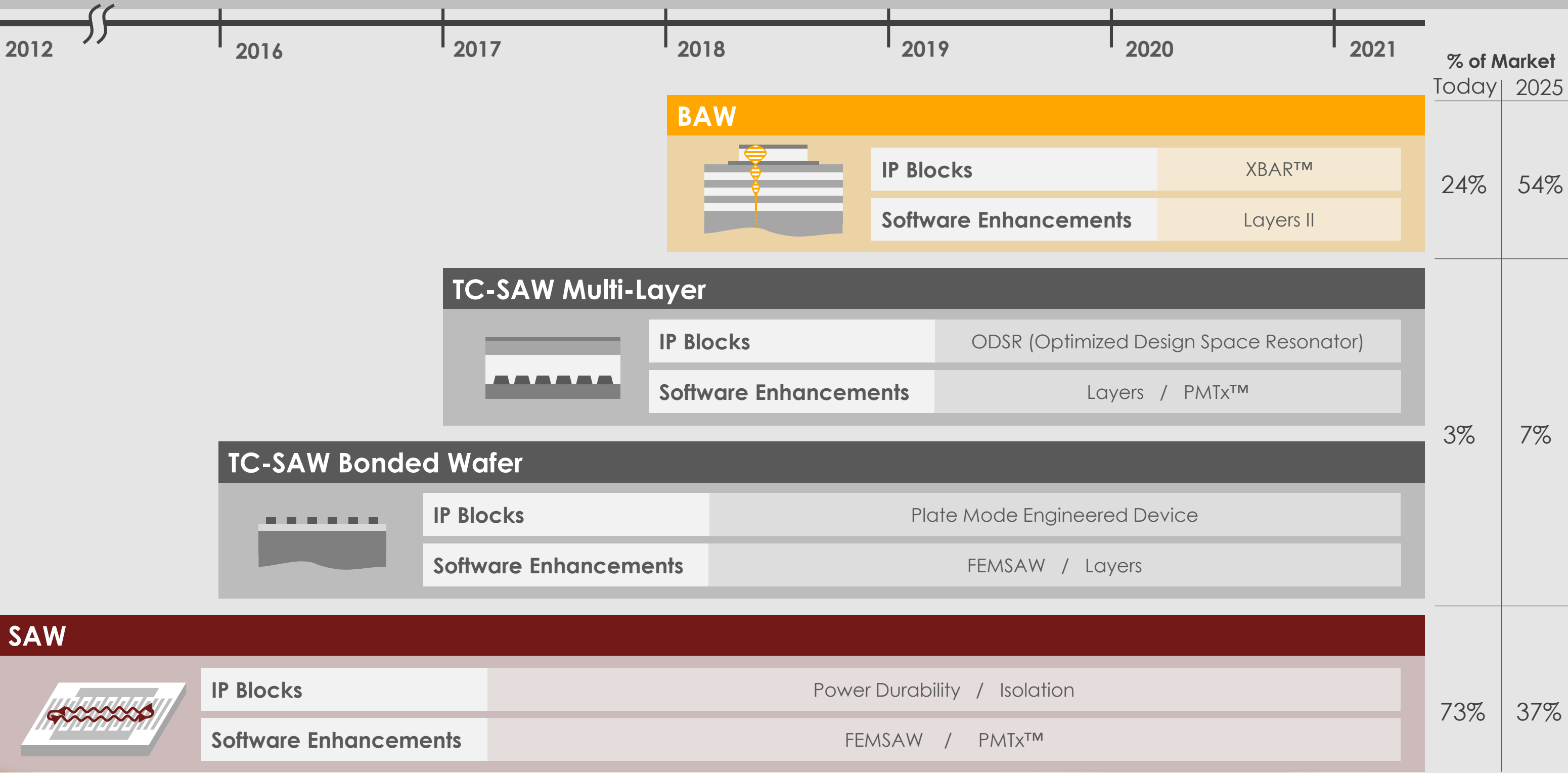
- Many iterations: long / expensive
- Limited design space: Bandwidth, power
- Limited to “captive” fab

ISN Value:

- Order of Magnitude Improvement in:
- Development time
 - Cost

ISN[®] IMPACTS DESIGN EFFICIENCIES FOR ALL FILTER TECHNOLOGIES

DEVELOPMENT OF FULLY INTEGRATED SAAS-BASED INFINITE SYNTHESIZED NETWORK

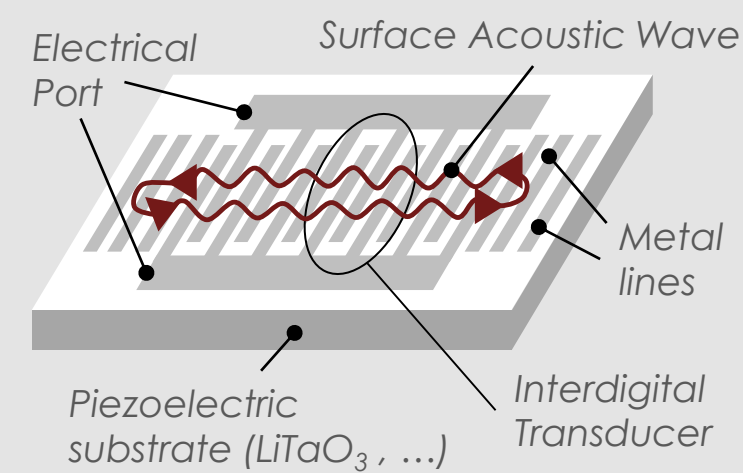


ACOUSTIC WAVE FILTER TECHNOLOGIES

SAW

Surface Acoustic Wave

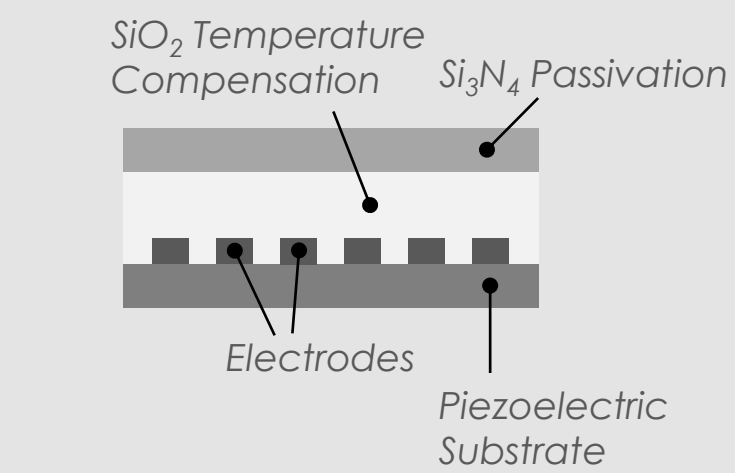
Acoustic wave propagates in a **lateral** direction



TC-SAW

Temperature-Compensated SAW

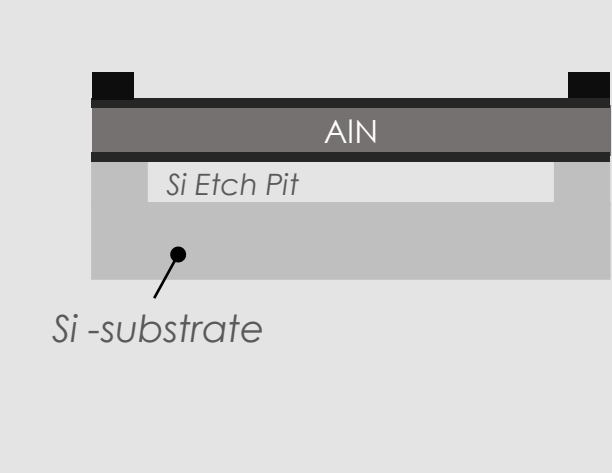
Acoustic wave propagates in a **lateral** direction



FBAR

Bulk Acoustic Wave

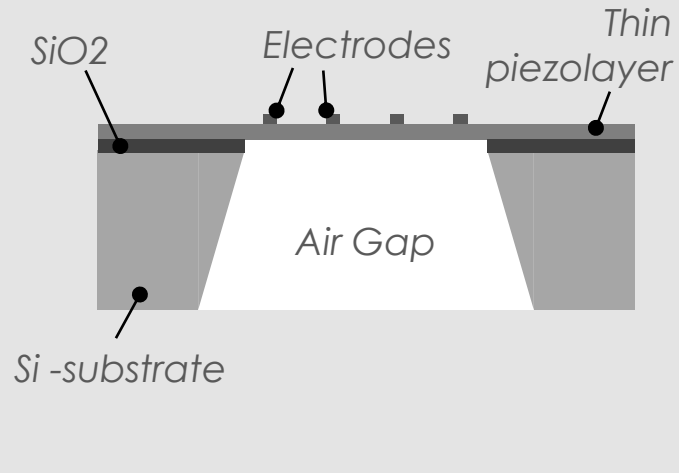
Acoustic wave propagates in a **vertical** direction



BAW – XBAR™

Bulk Acoustic Wave

Acoustic wave propagates in a **vertical** direction



APPLICATIONS

3G & 4G

4G

4G

4G & 5G

COST

Simple, low cost

Relatively low cost process

Complex, high cost process

Leverages standard industry process

PROCESS STEPS



PERFORMANCE

Best performance requires precise process control and improved design

Improves temperature stability

Low loss and high rejection

Best in class performance
Ultra-wideband

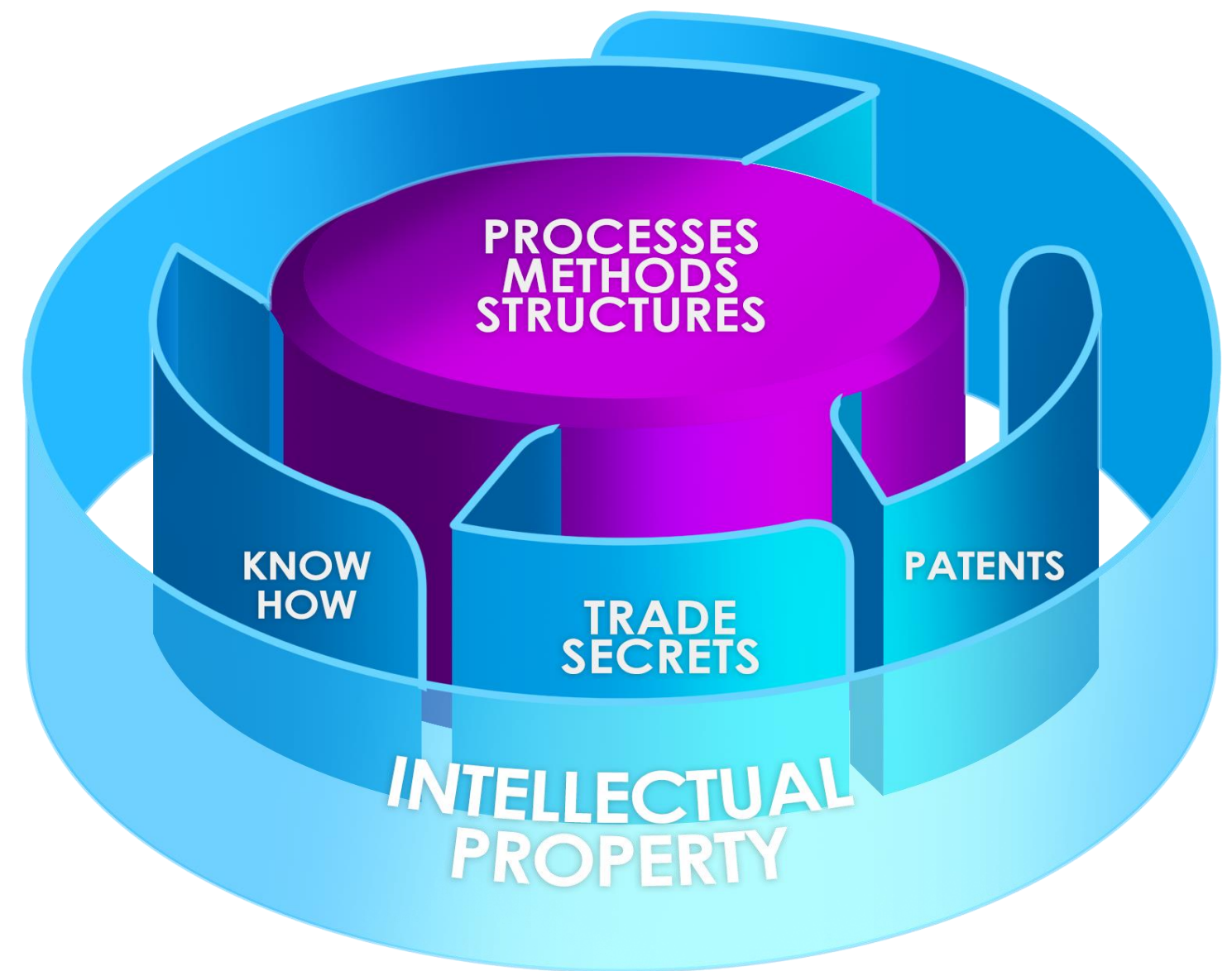
IP PORTFOLIO CONTINUES TO GROW

IP protection is important for Resonant

- Protects company's investment in innovation and technology from being copied
- Increases company's ability to acquire and keep customers and licensing partners
- Assures technology partners that the technological advantage we offer is durable and protected
- Increases company's enterprise value
- Creates assets for the company that can be used for strategic or defensive purposes

Resonant's IP Portfolio:

- >200 pending or issued patents
 - >40 patents targeting 5G
- Formal Trade Secret program
- Continually expanding the reach of our technology footprint



5G's IMPACT ON THE RF FRONT END – TECHNOLOGY

5G demands larger bandwidth that is only available at higher frequency

5G Requirements	XBAR
Large bandwidth <i>100's of MHz vs. 10's of MHz</i>	✓
High frequency (3GHz - 80GHz) <i>Only frequencies where large bandwidths are available</i>	✓
Power handling <i>High frequency = less propagation</i> <i>Overcome with higher power to increase coverage</i>	✓
High quality factor, Q, of resonator structure <i>Determines rejection and loss of the filter</i> <i>Particularly challenging at high frequency</i>	✓

What is XBAR?

- Proprietary resonator structure based on existing process technologies developed using ISN
 - IP/ XBAR based library products for 5G

Based upon simulation results
Initial measured verification in process

RESONANT IS TARGETING ENTIRE FILTER MARKET

Adv. Devt. and Filter
IP Standard Library

Phone OEMs

- Allows control of strategic filter supply



New entrants
requiring access to
filters

Fabless

- Shorter time to market
- Lower cost



Initial target
market

Vertically Integrated
Manufacturers

- Existing channel to market
- Shorter time to market



Carriers

- Provide context and application of new technologies



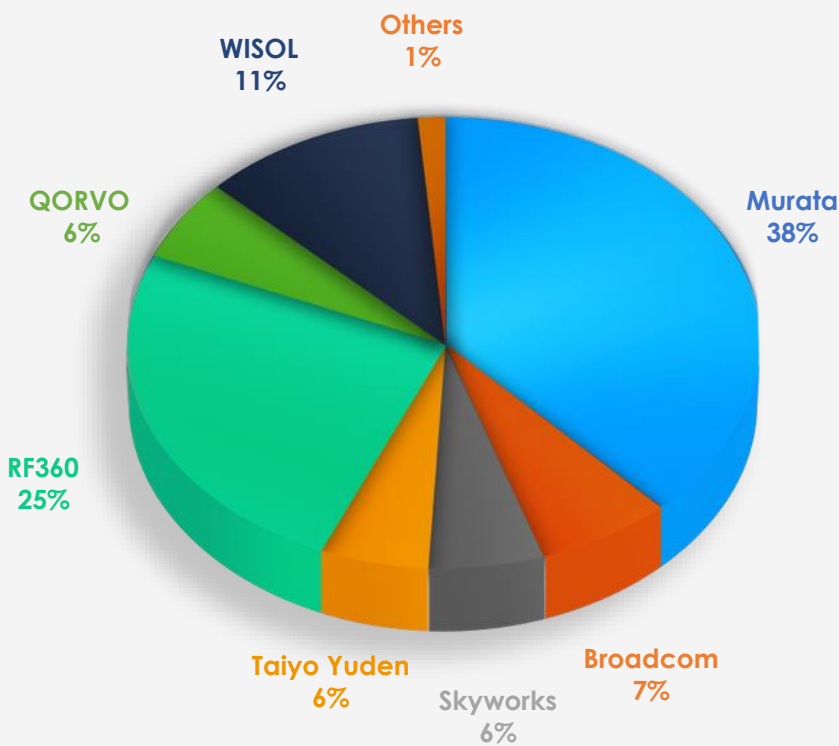
Foundry &
Packaging

- Opens markets to new entrants and creates competition

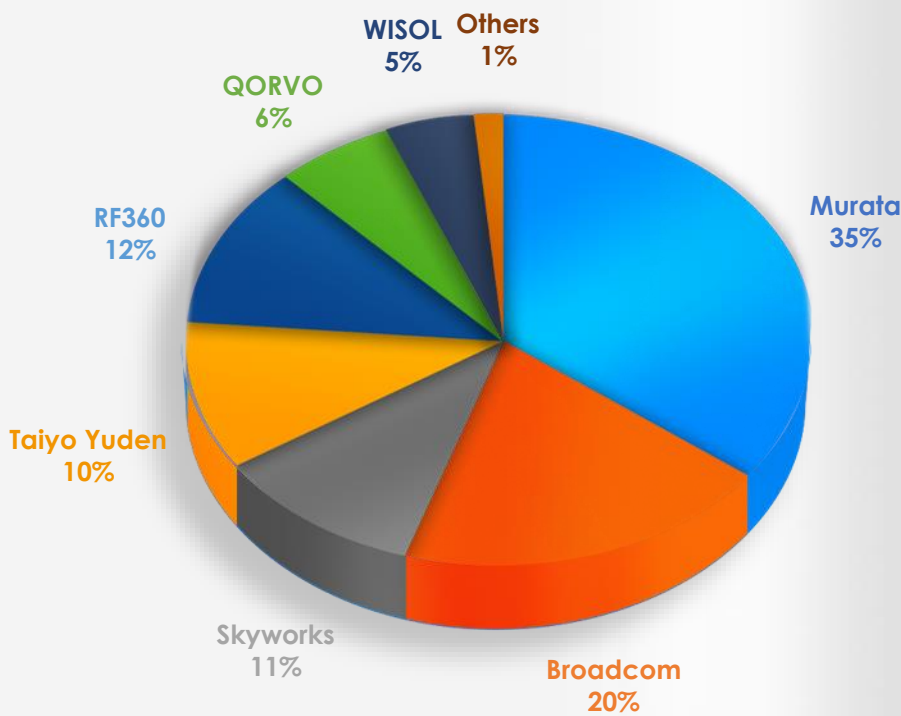


FOCUS ON THE LARGEST PLAYERS IN THE MARKET

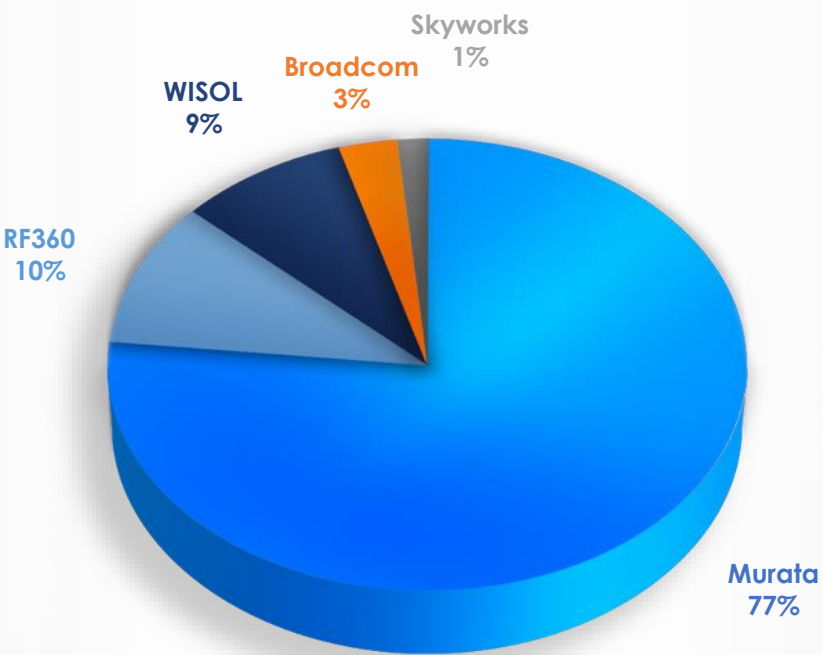
FILTER



DUPLEXER



FEMiD
(Front-End Module With Integrated Duplexers)

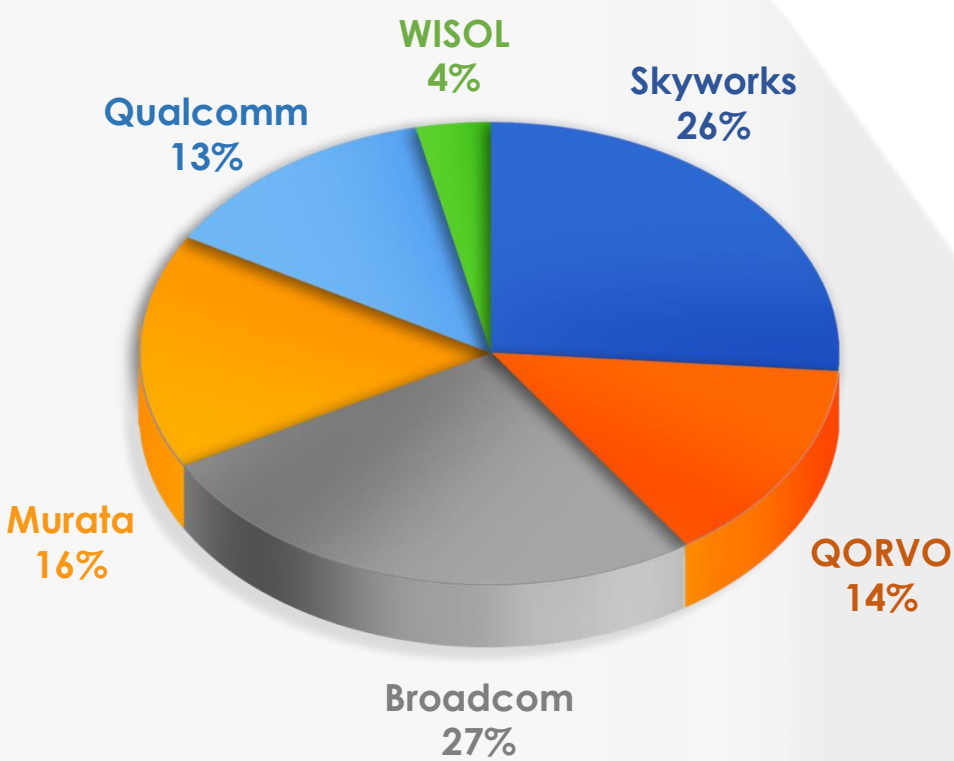


- 5 companies make up 80% of the filter and duplexer markets
- Module growth has been shifting due to a number of macro economic events that have happened in the past year

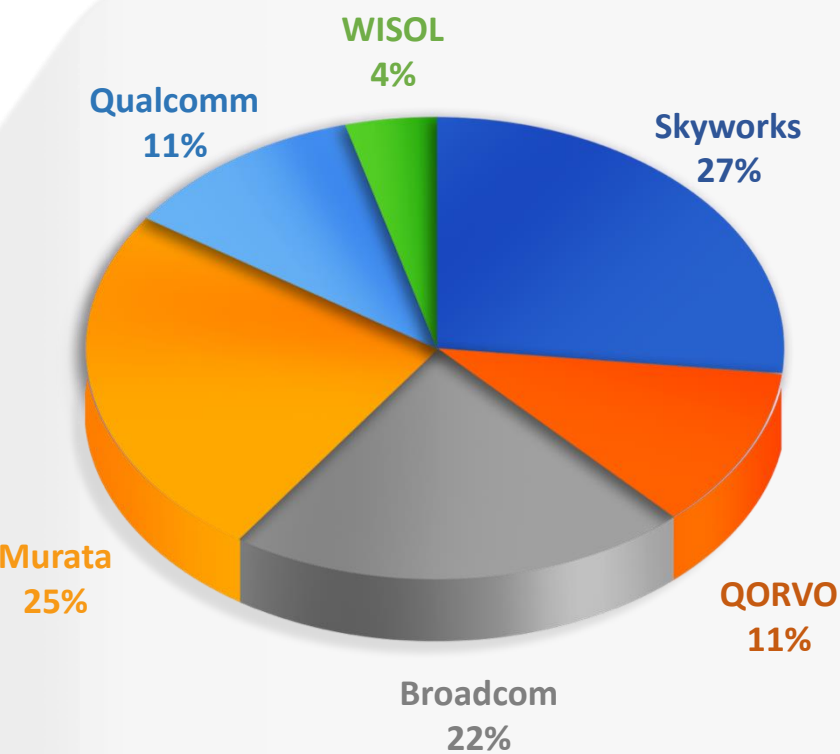
Sources: Navian 2018

MODULE MARKET SHARE

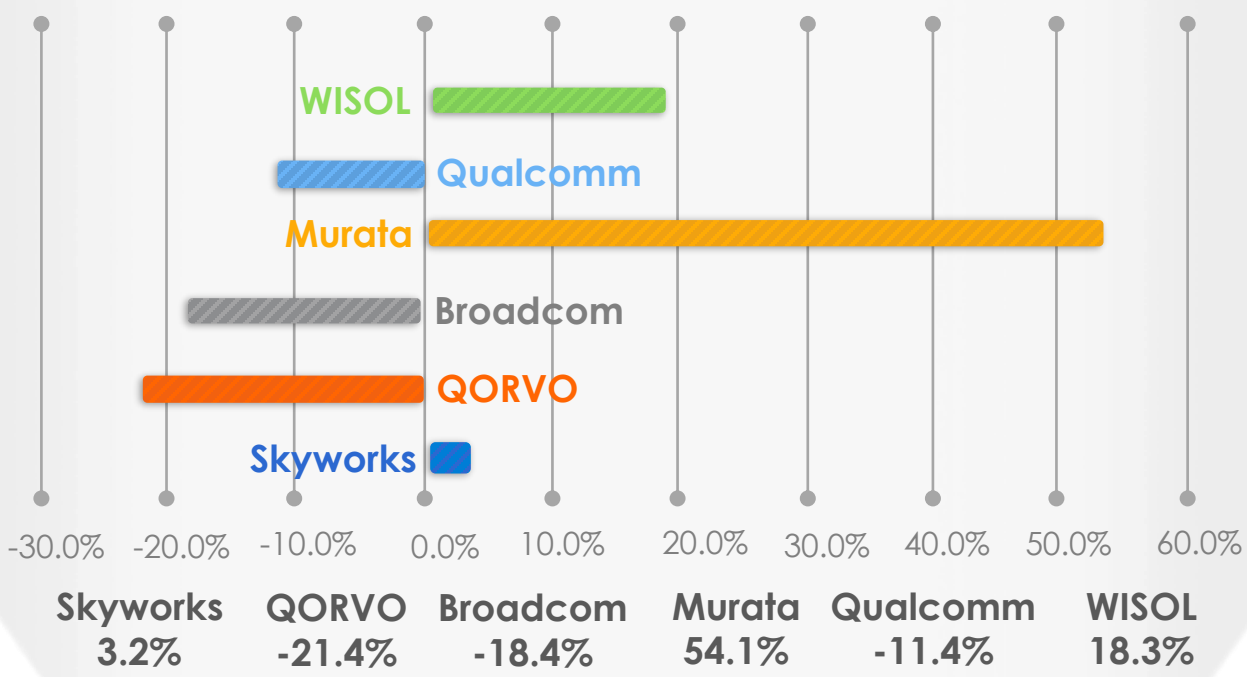
2018 MODULE MARKET SHARE (\$M)



2019 PROJECTED MODULE MARKET SHARE (\$M)

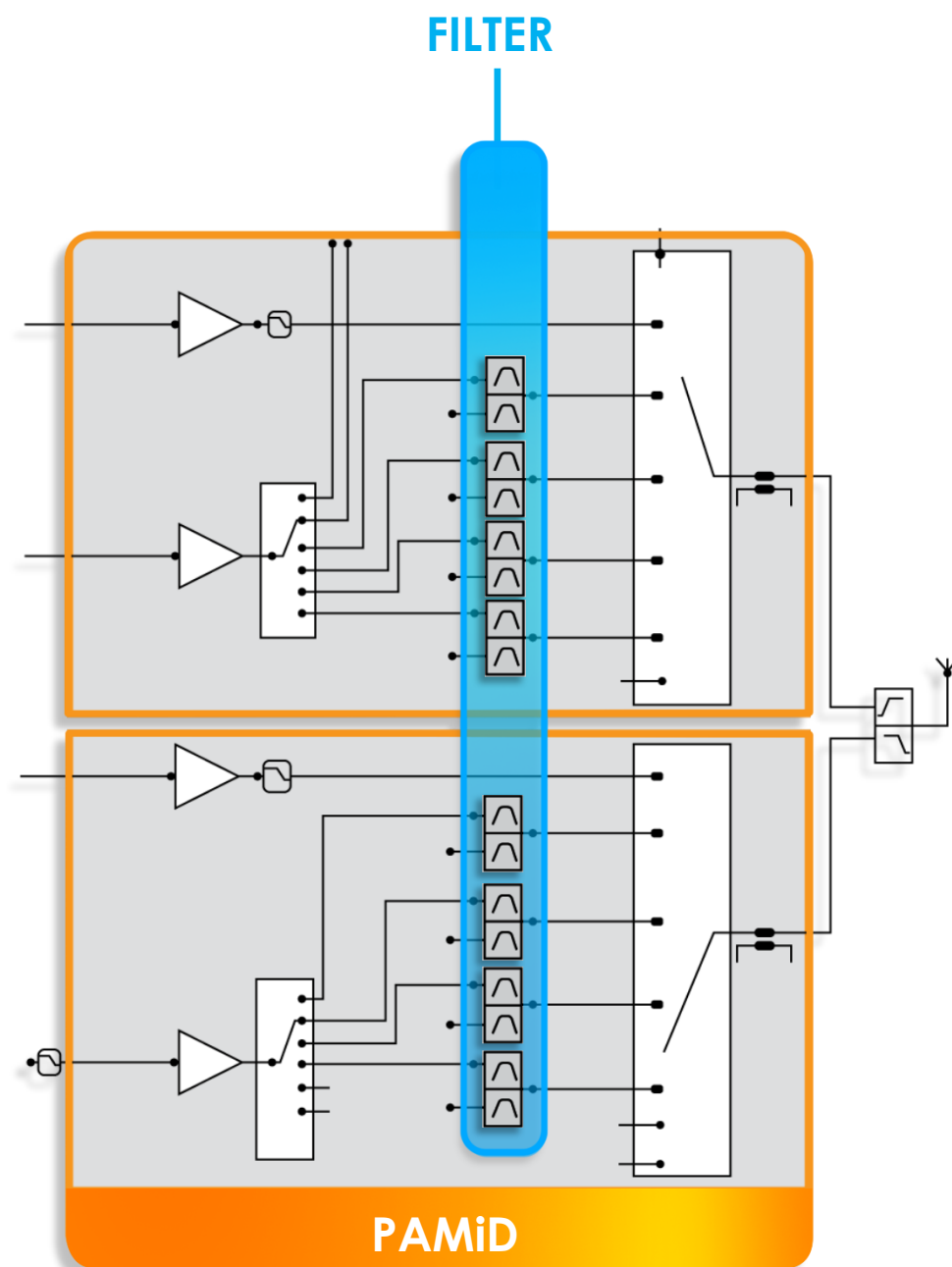


2019 – 2018 Module Growth



Sources: Navian 2018

TIER ONE PAMiD vs FEMiD SUPPLIERS



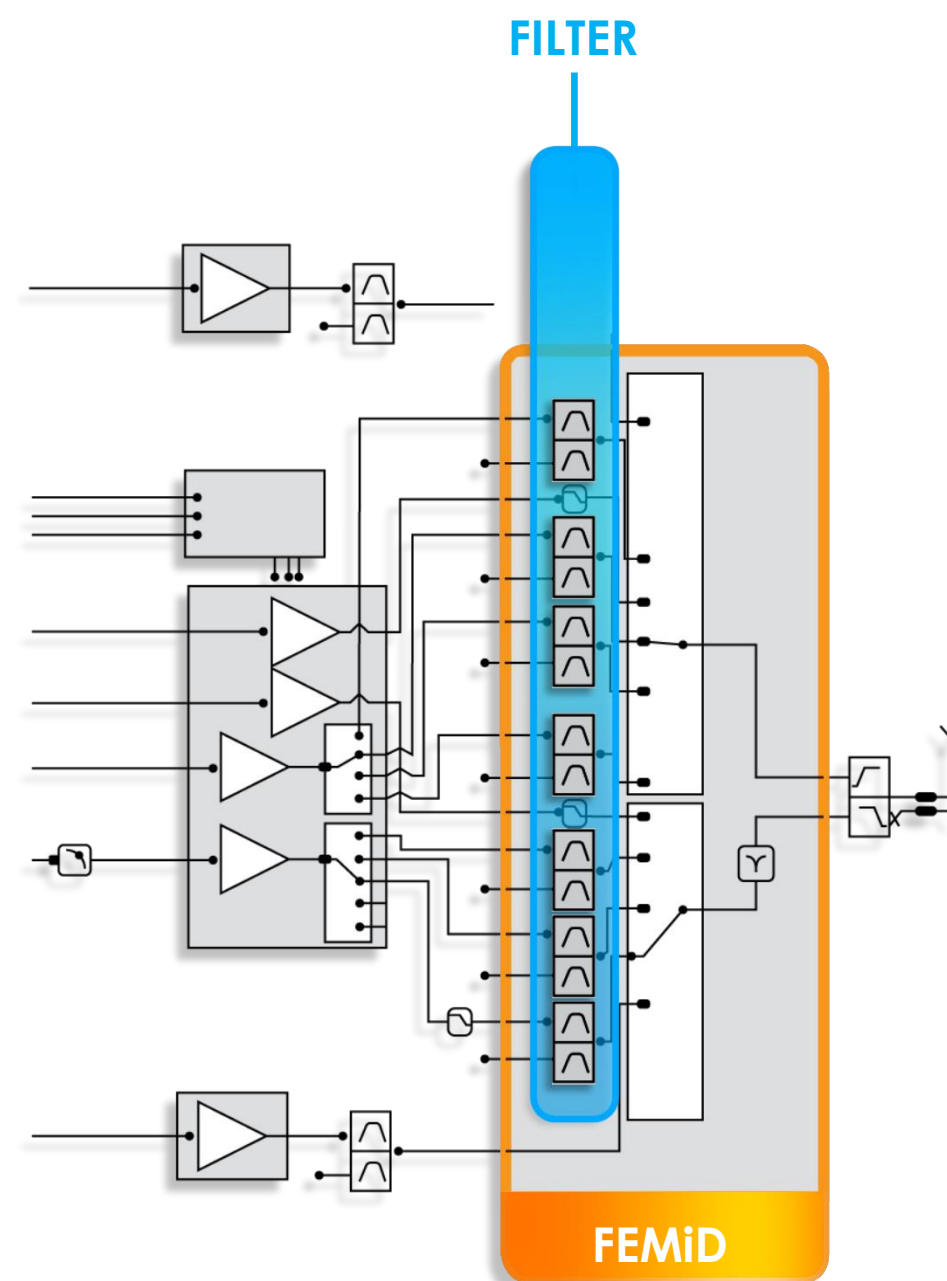
Power Amplifier Module in Duplexer

Tier One Suppliers:

- Broadcom, Skyworks, QORVO



RFFE architecture
change for China



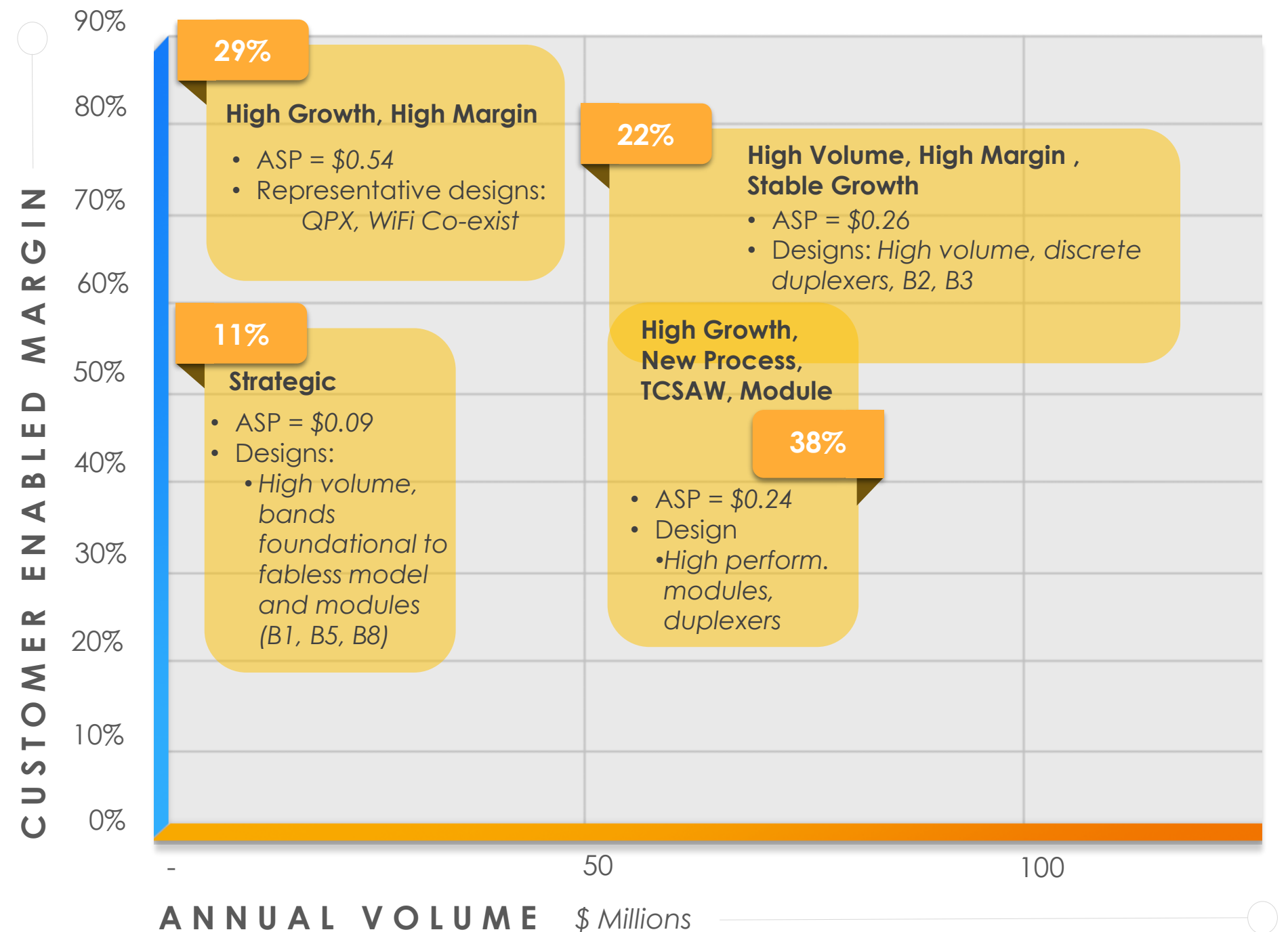
Front-End Module in Duplexer

Tier One Suppliers:

- Murata, RF360, Wisol

RESONANT IS TARGETING HIGH ASP & HIGH GROWTH SEGMENTS

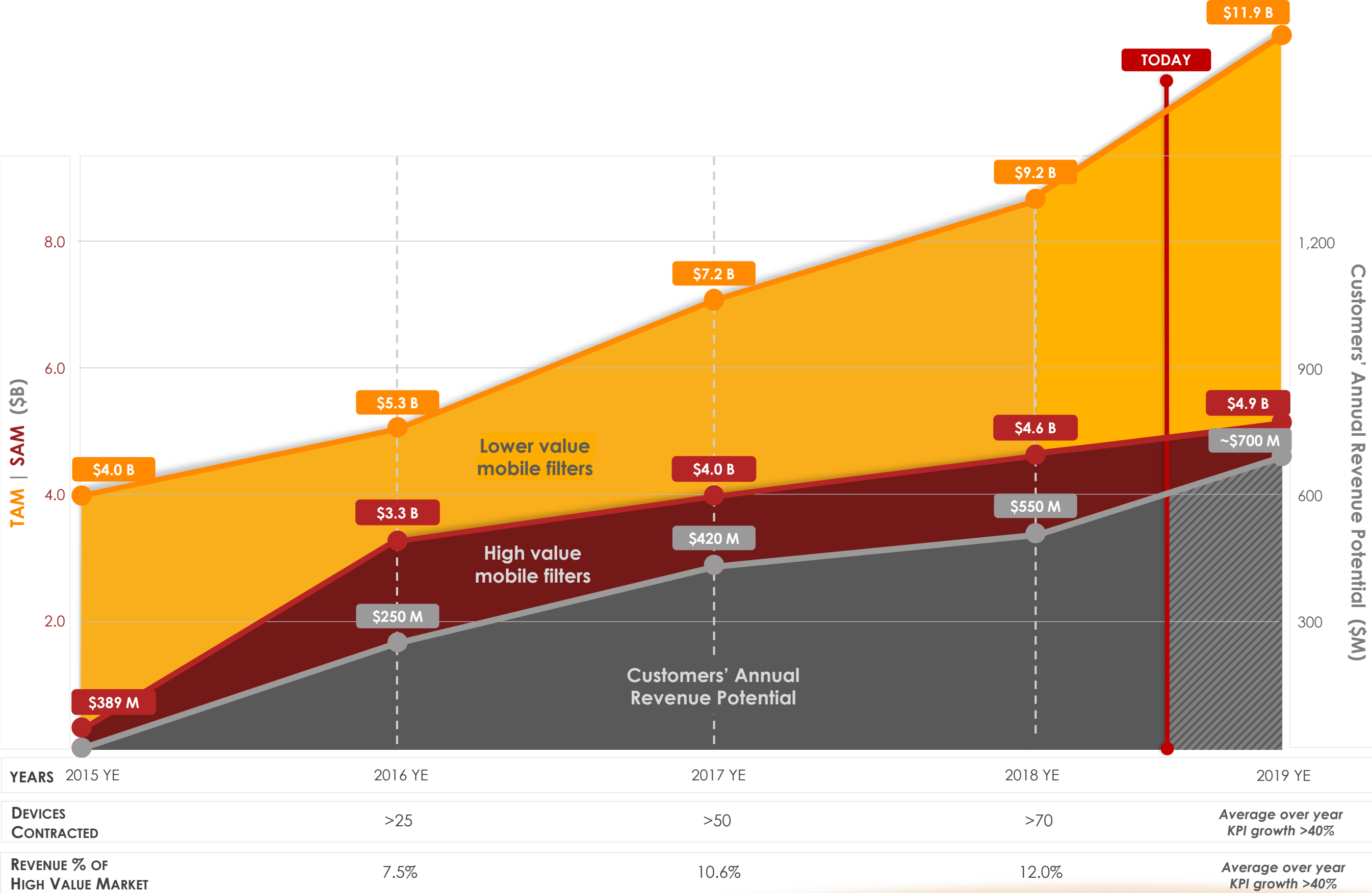
- **>20 designs accepted** by our customers
- **>10 products shipped** generating royalty revenue
- Contracted **royalty rates** generally in the range of 8% - 15%
- Targeting 30% - 70% success rate of contracted designs resulting in royalty
- Time from contract to customer acceptance varies based on technology, ranges between 6 and 18 months



% = % of current contracted devices

Sources: Yole Developpement, Navian

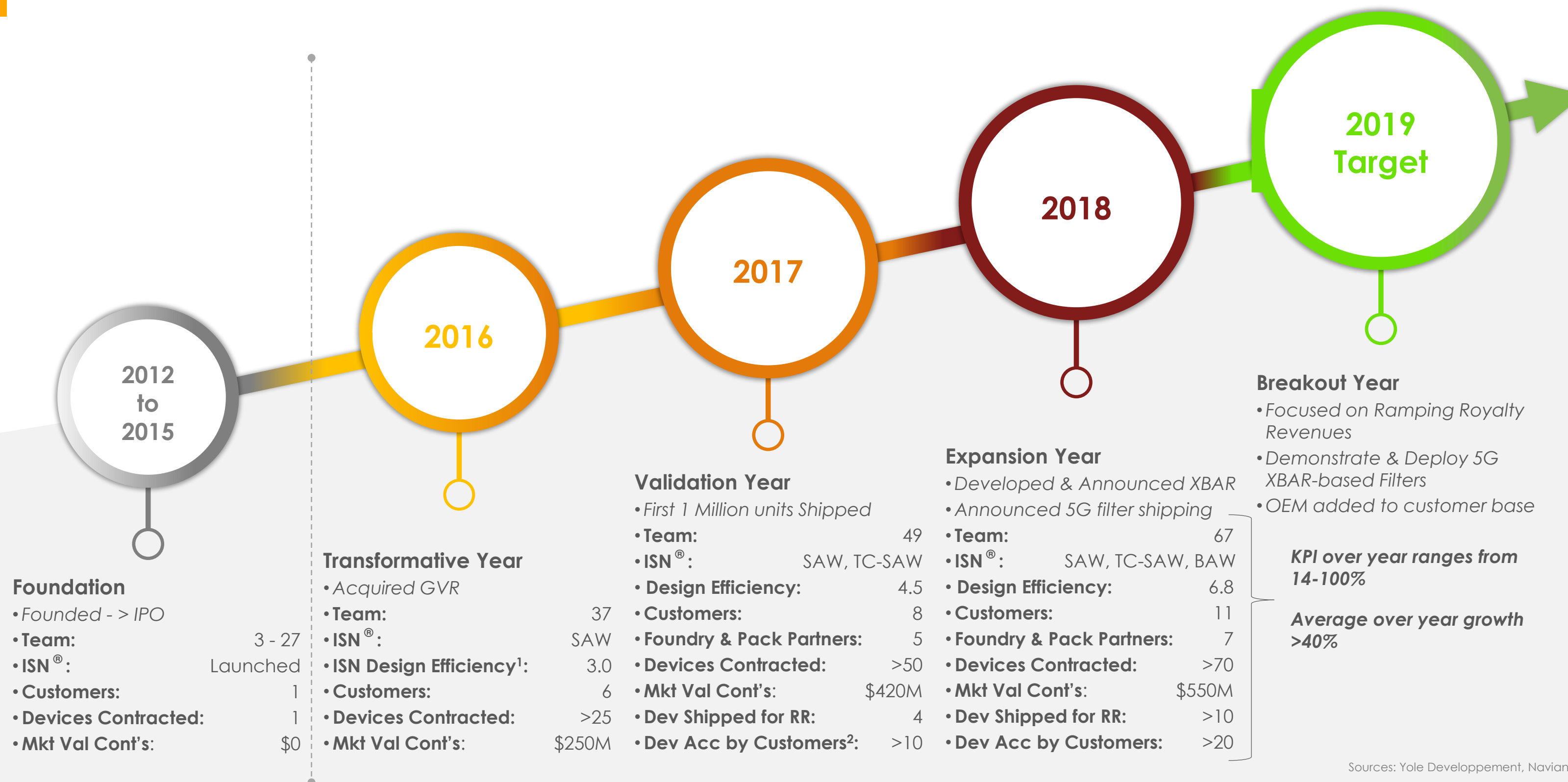
POTENTIAL CUSTOMER ANNUAL REVENUE ENABLED BY RESONANT



Customer Revenue Potential estimated using Navian published data, adjusted to reflect contracted customer data

Source: Navian and Yole Developpement

2019 BUILDS ON MOMENTUM



Sources: Yole Developpement, Navian

1. Design efficiency is the number ISN ready designs one designer can produce in a year. ISN ready designs use a qualified FAB process with industry competitive performance. A qualified FAB process includes confirmed performance with the FAB in the band
2. Device accepted by customer defined as customer has passed device handset testing

EXECUTIVE TEAM



George B. Holmes

Chairman
& CEO

30+ years leadership in
sales & marketing and
management



Marty McDermut

CFO

30+ years in financial and
accounting management;
CPA



Bob Hammond

CTO
& Co-founder

20+ years as Founder and
CTO of STI;
Physics Ph.D. Caltech



Neal Fenzi

Executive Vice
President of Engineering
& Co-Founder

20+ years in engineering,
operations and marketing
positions at STI; BSEE



INDEPENDENT BOARD MEMBERS

Michael Fox

Lead Independent Director

Financial expertise in capital markets, shareholder interests and strategy



J.P.Morgan

Rubén Caballero

Independent Director

Extensive expertise and leadership in R&D, prototyping, designing, integrating, testing, manufacturing and shipping millions of world class consumer electronics products and technologies



TROPICAN



Alan Howe

Independent Director

Operational, corporate finance, business devt. and leadership exp. Strategic in-depth knowledge of the wireless, telecom, high technology and software industries



COVAD

TELETRAC NAVMAN



Sprint

Jack Jacobs

Independent Director

Public company, corporate governance and leadership experience



BankersTrust

Josh Jacobs

Independent Director

Extensive experience commercializing technologies



kik

OmnicomMediaGroup

INVOKA

Jean Rankin

Independent Director

Governance, compliance, regulatory and licensing expertise within the semiconductor industry



Lucent Technologies



Bob Tirva

Independent Director

Extensive corporate and managerial finance experience in IT & services and semiconductor industries



INTERMEDIA

Dropbox



SUMMARY FINANCIAL INFORMATION

Jun 30, 2019		
		(\$ in M)
Cash, cash equivalents & investments ¹	\$	10.5
Other current assets		0.4
Long-term assets		7.1
Total assets	\$	18.0
Liabilities	\$	2.9
Operating lease liabilities		3.0
Stockholders' equity		12.1
Total liabilities and stockholders' equity	\$	18.0
Shares outstanding		28.2 M

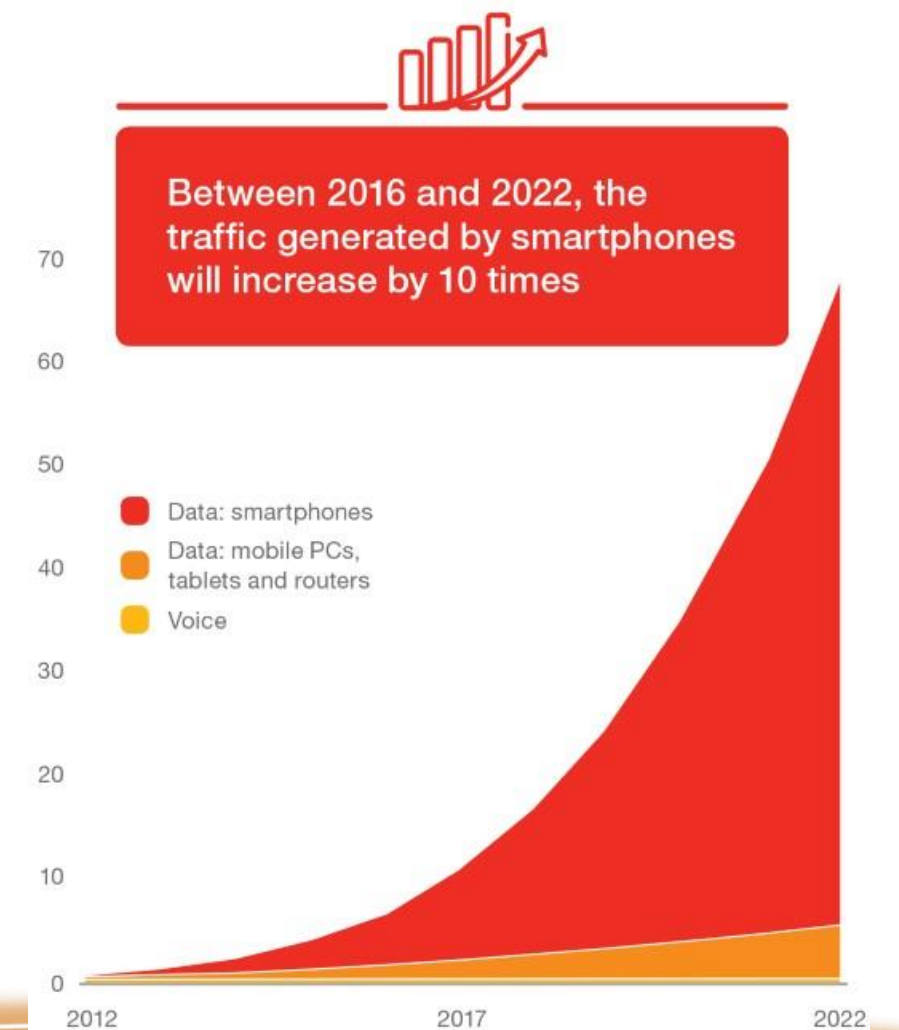
no debt

1. Excludes \$10 million private placement announced August 6, 2019

SUMMARY

- 2019 Momentum
 - Cash, cash equivalents & investments \$10.5M¹ (Jun 30, 2019)
 - More than 10 devices have shipped for royalty revenue; devices are in distribution and sampling to OEM's
 - Greater than 20 devices accepted by customers; acceptance criteria include handset testing
 - Complete ISN software suite: ISN supports SAW, TC-SAW & BAW with new cutting-edge IP focused on 5G – XBAR resonators
- Market continues to grow, 21% CAGR; RF front-end industry is undergoing dramatic increases in filter demand and complexity for bandwidth driven by:
 - Band Proliferation
 - Carrier Aggregation
 - 5G
- Resonant is a strategically positioned pure play equipped to take advantage of 5G
 - As the market continues to commoditize, working with Resonant and its industry-changing ISN platform will enable companies to maintain market share and remain competitive
 - Resonant's new BAW / XBAR technology for ultra-wide, instantaneous bandwidth has the potential to become the technology standard against which all others are measured

Global mobile traffic (ExaBytes per month)



1. Excludes \$10 million private placement announced August 6, 2019

