

# RichWave Company Profile

**Nov. 2015**



# Company Overview

- A leading & innovative wireless RF IC design company
- Founded : January 2004
- Capital : NT\$499 millions
- Employees : 160
- Products Evolution :

2005~2007



SiGe PA for 802.11b/g, Wireless Video-Sender

2008~2011



WiFi Switch, GaAs PA, FEM for 802.11N, FM, Wireless-Video Transceiver

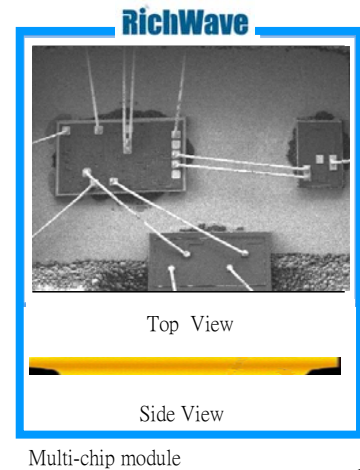
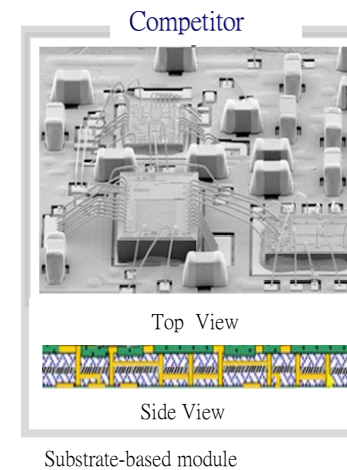
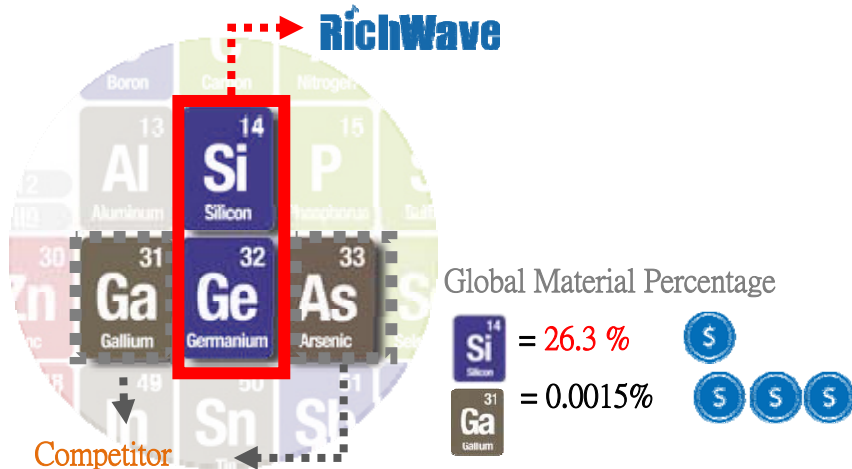
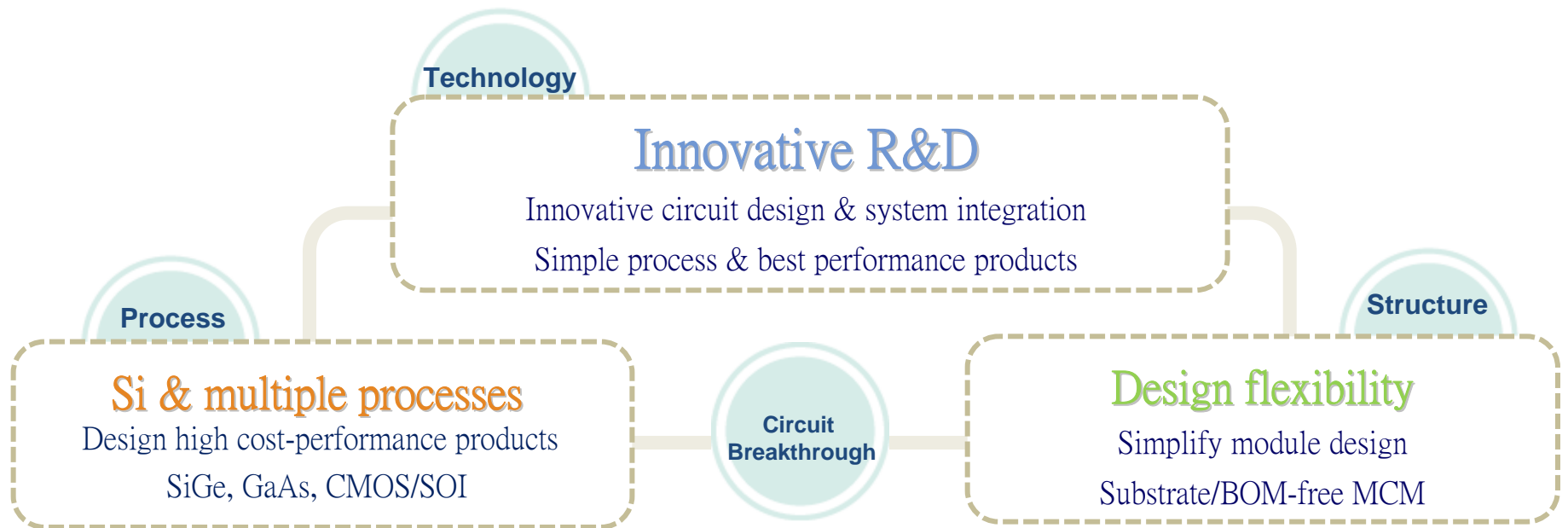
2012~2015



WiFi FEM, PA, Switch, LNA for 802.11ac, ASM in Cellular 3G/4G, Femto, Wireless-Surveillance Transceiver



# Differentiation & Innovation

















# RF is Key to Connectivity

- **Growing demand for information leads to huge growing demand for mobile & wireless data transfer over the various communication channels.**
- **In specific, RF plays the role of key components in WiFi & mobile.**



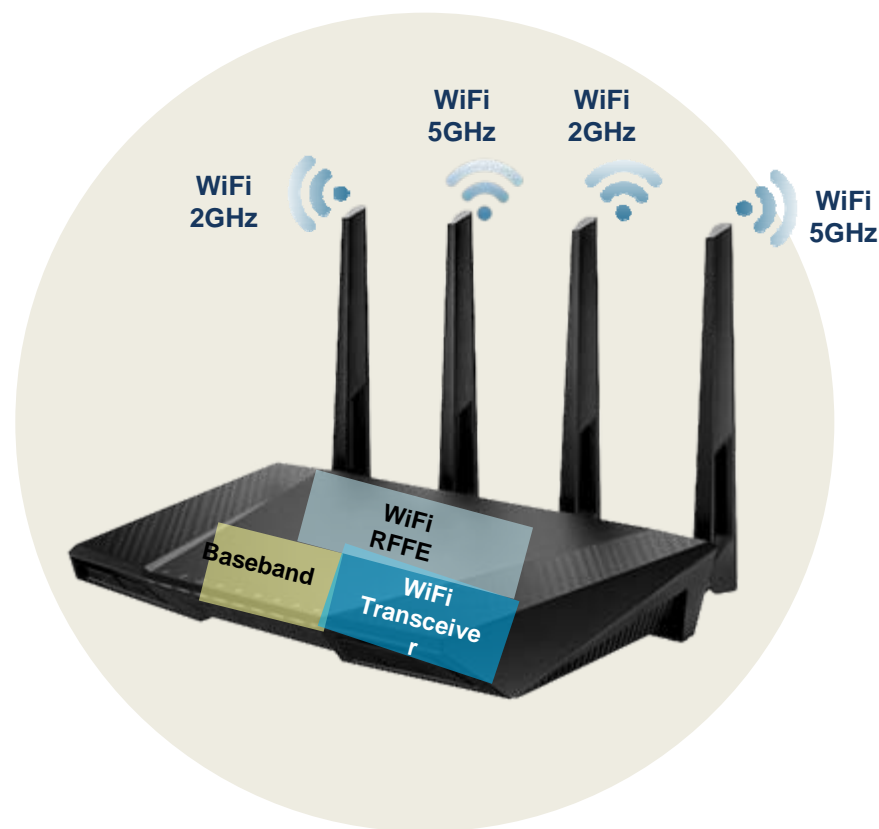
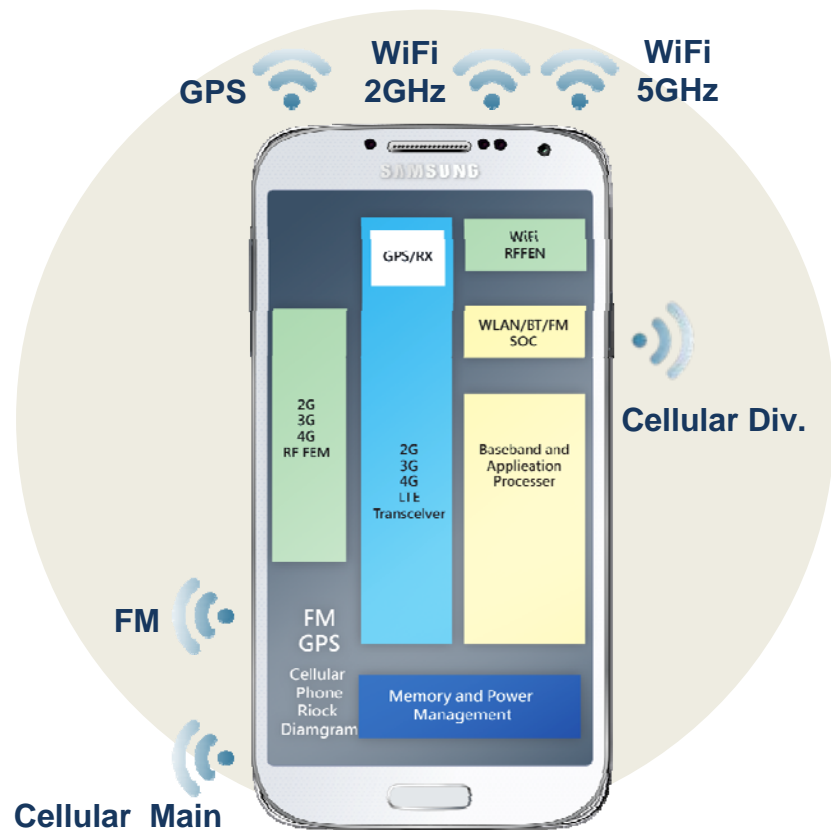
# Richwave RF is Everywhere

Richwave RF includes RFFE & RF transceiver, which covers WiFi, mobile & other IoT applications.

					
PA, LNA, SW, FEM					
ASM					
Video Transceiver & Broadcast					

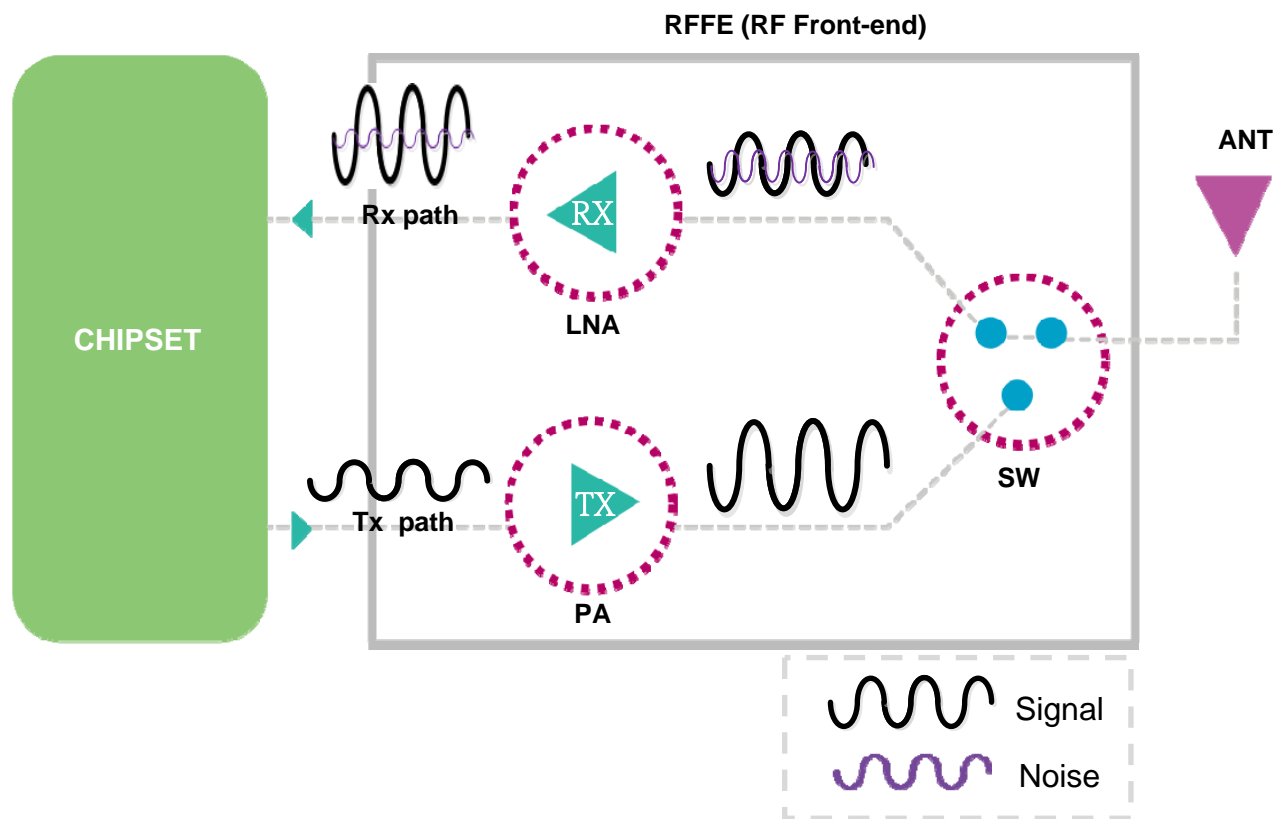
# RF Specifics in WiFi & Mobile

Multiple sets of RF components are needed, including RFFE, ASM, FM, GPS, etc.



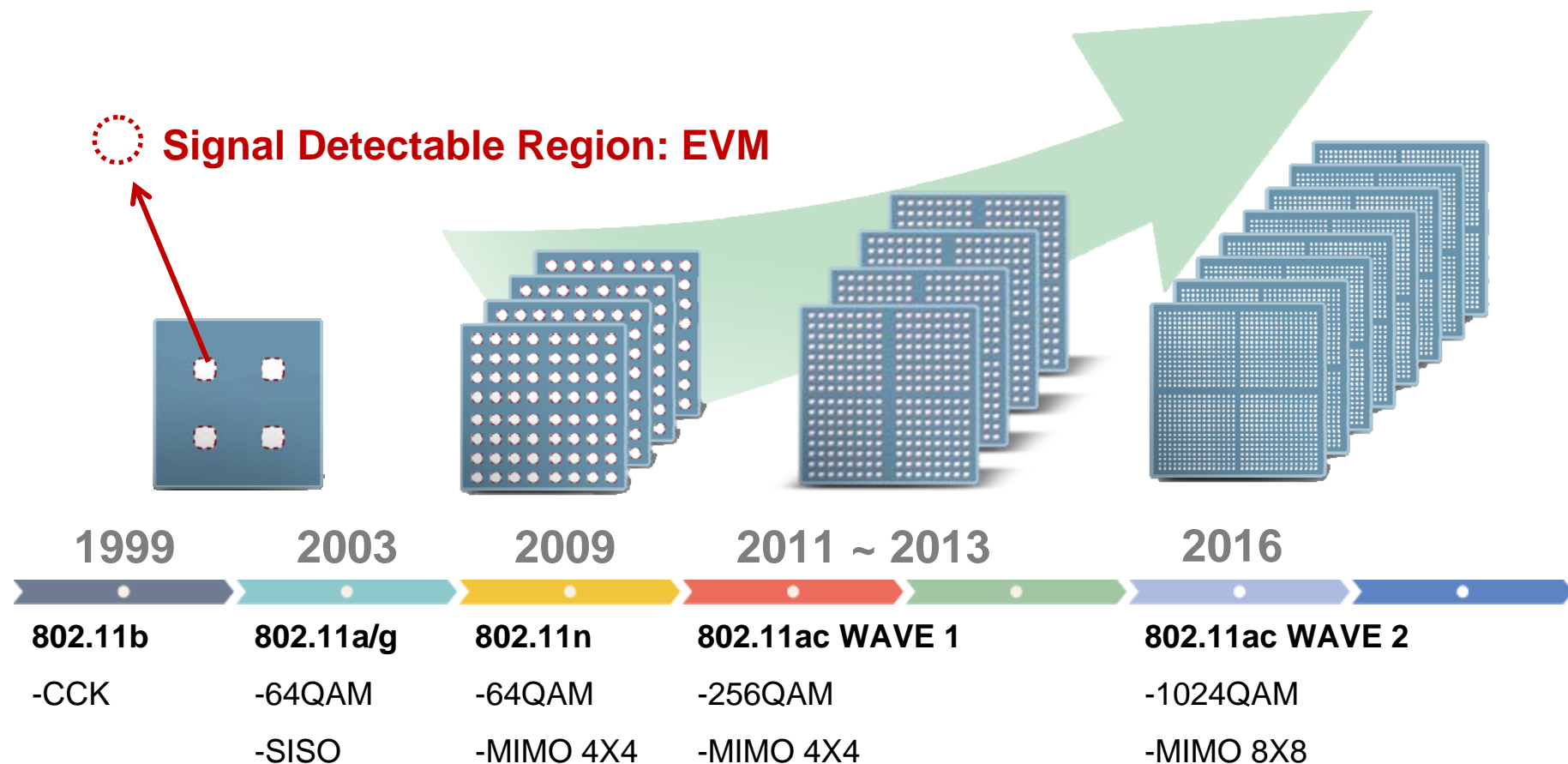


# WiFi RF Role & its Criticalness



# Surge Demand on Throughput

## - Driven the complexity in technology

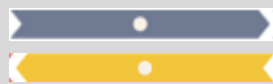




# Multiple Coverage Range Needed

- Affect Design Difficulty, Transmit and Receive

CONSUMER



ENTERPRISE



BACKHAUL



Requested Transmit Signal Strength (PA)



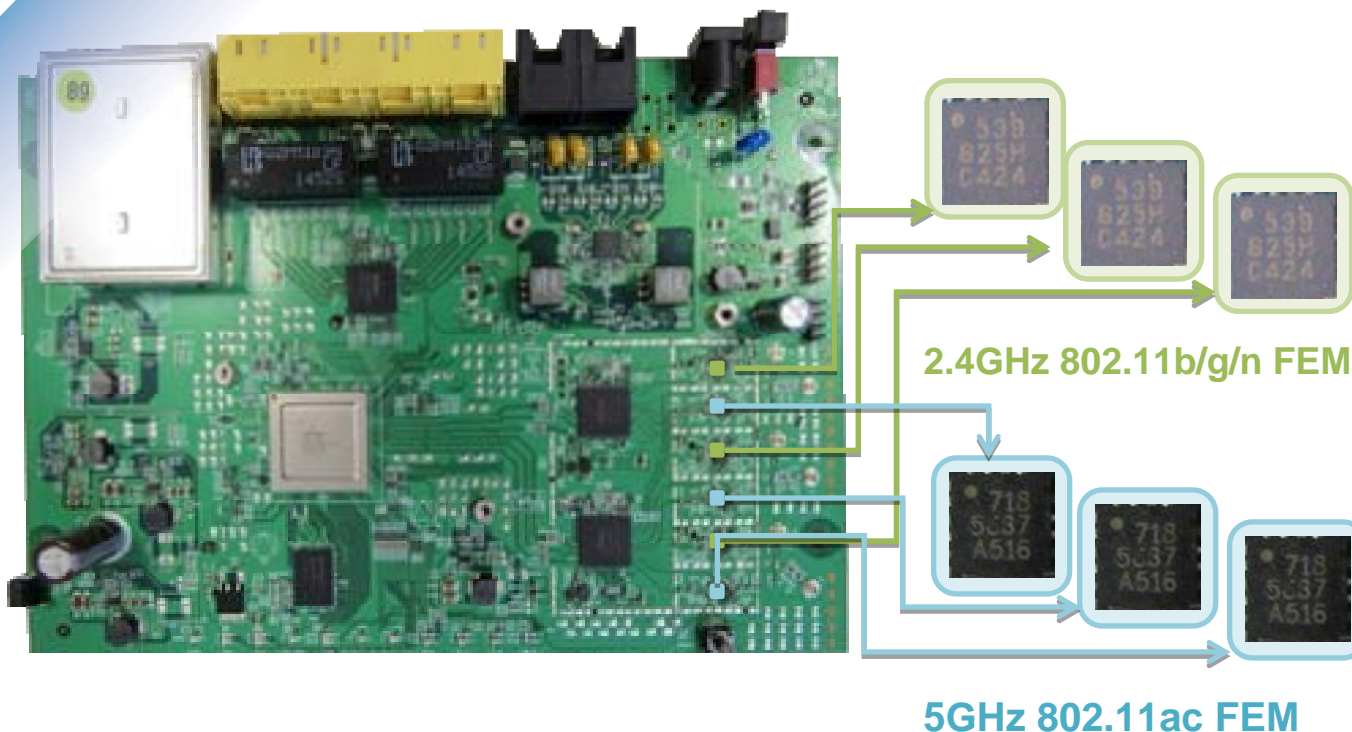
Requested Sensitivity on Receive Signal (LNA)



# A 3x3 WiFi Router Example



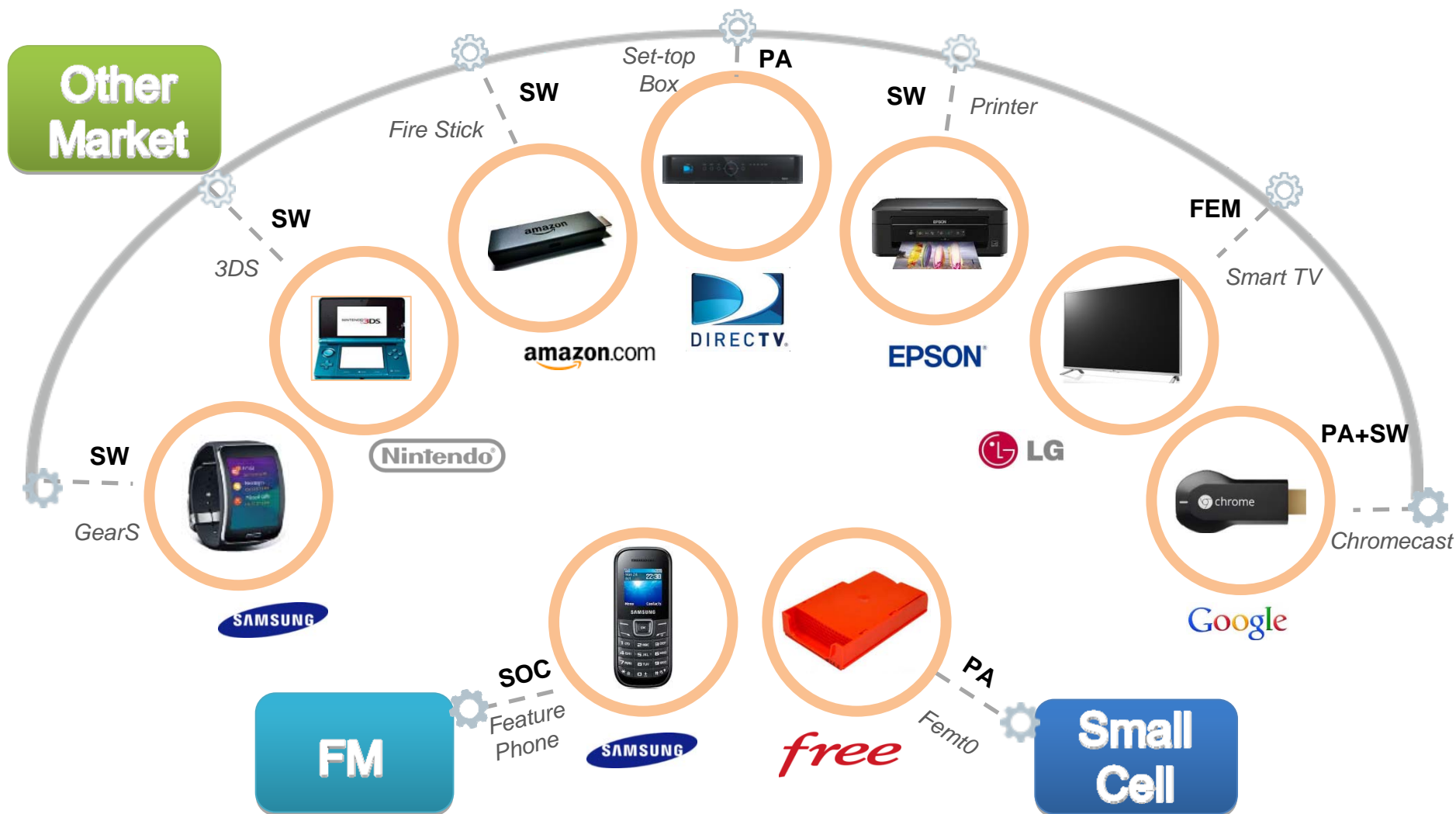
Total **6** sets of Richwave RF IC



# WiFi Applications with RichWave

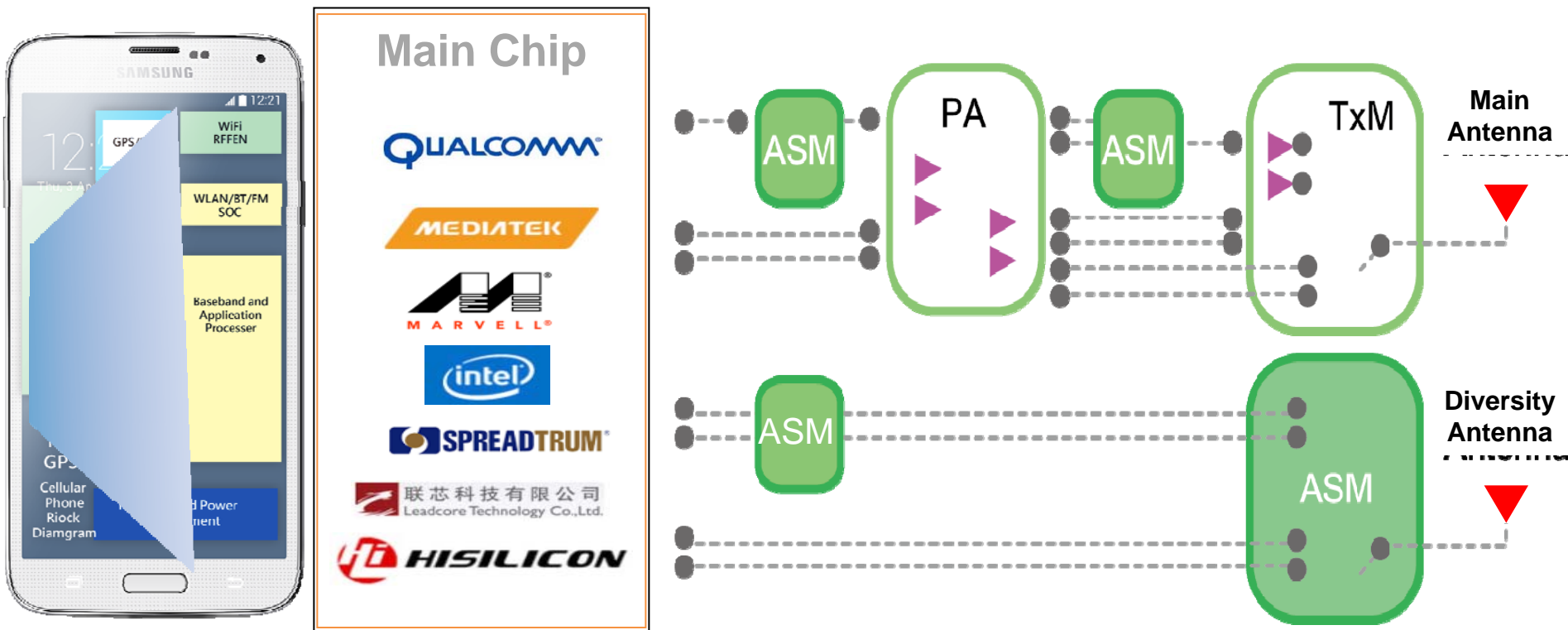


# WiFi Applications with RichWave



# Antenna Switch Module(ASM)

- Critical Part in Cellular Front End



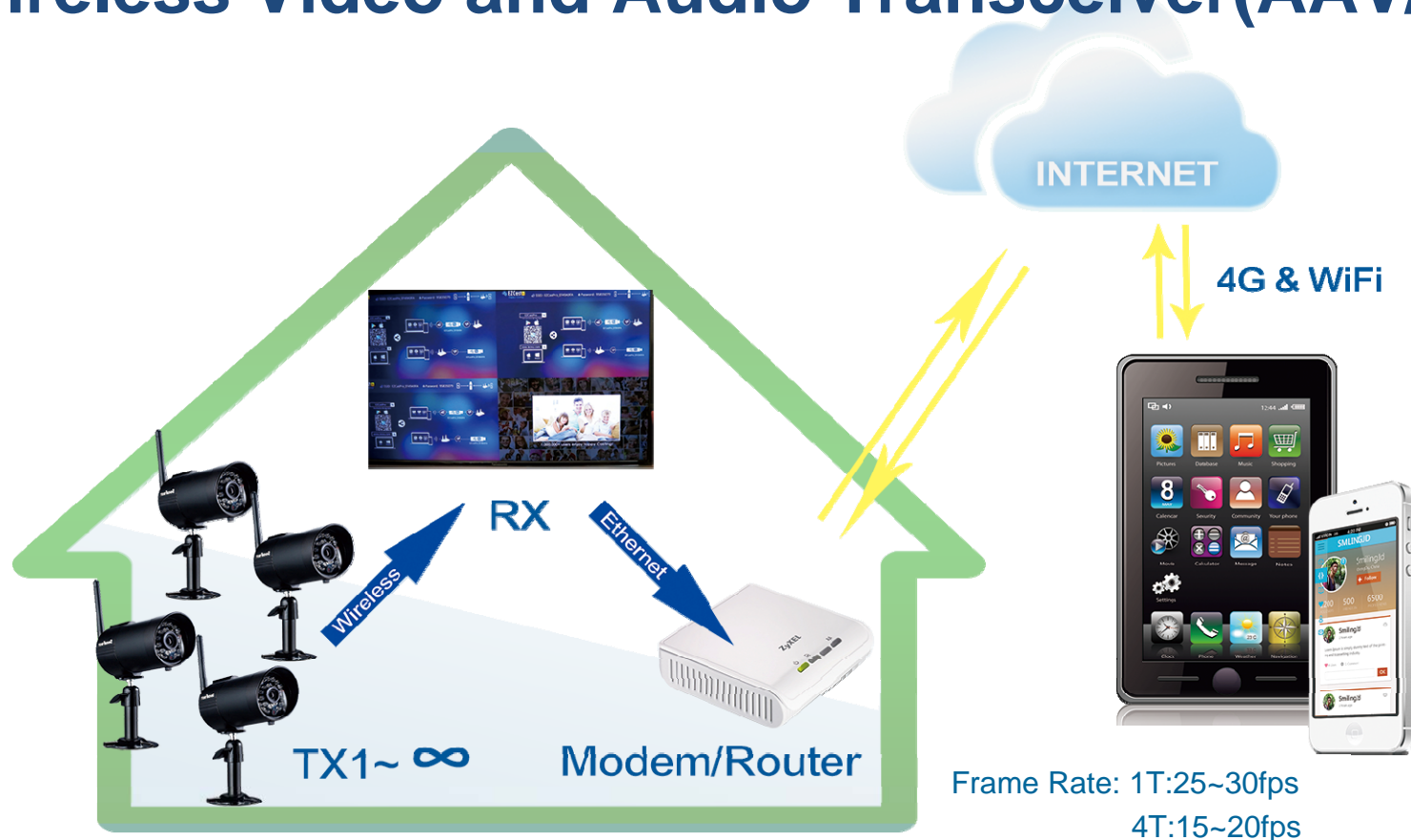
# ASM Applications with RichWave





# Smart Home Applications

## -Wireless Video and Audio Transceiver(AAV/DAV)



- Provided multiple instant remote control, independent recording, playback and push function with APP Developer Interface.
- Support smart home applications, such as automation and lighting control.

# Other Applications in IOT

## Wireless Parking Assist System



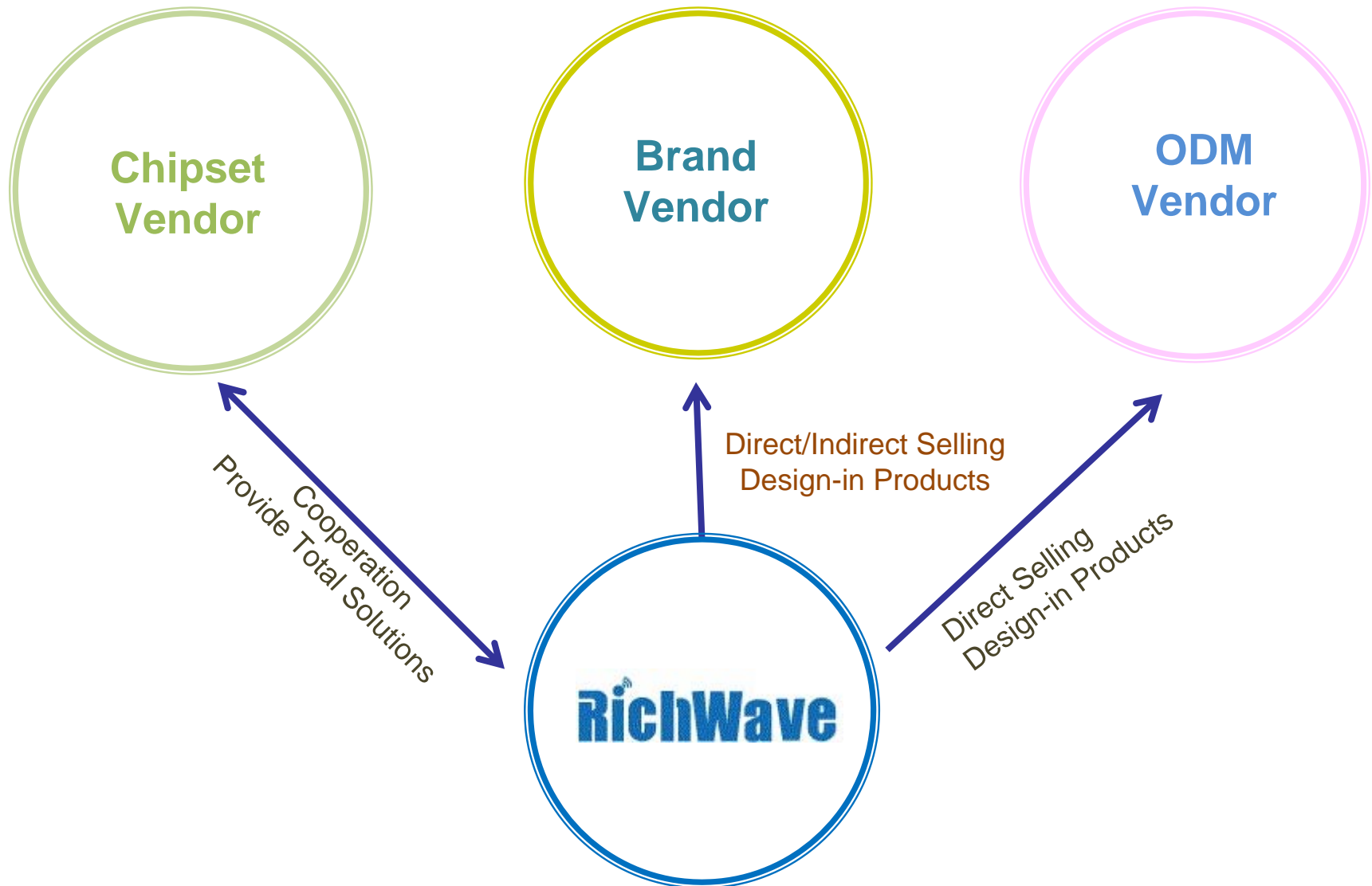
- Switchable between parking assist mode and event data recorder mode
- Support video resolution in NTSC/PA
- Turn on time less than 2 sec.
- Coverage range to 250m
- Frame rate 30fps and Transmission Delay 120ms

## Wireless Drone System



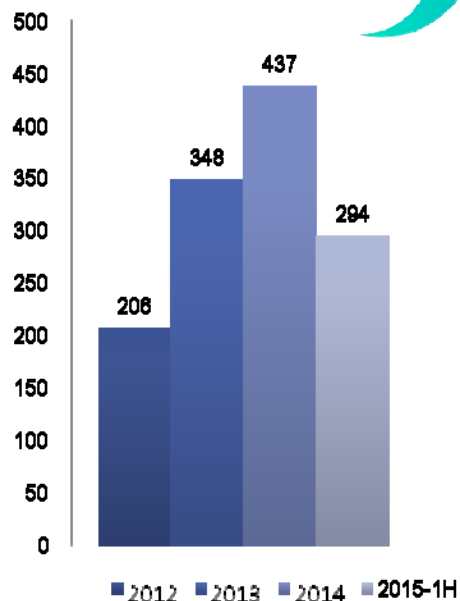
- Real time wireless audio transmission
- Integrated PA and LNA

# Sales Model with Clients



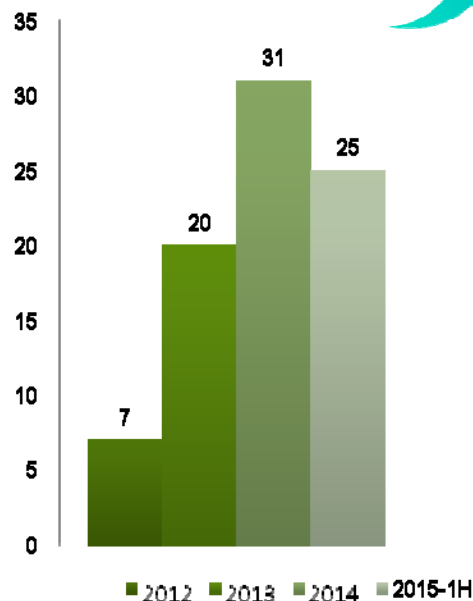
# Corporation Business Drivers

## ODM Design-in Number Growth



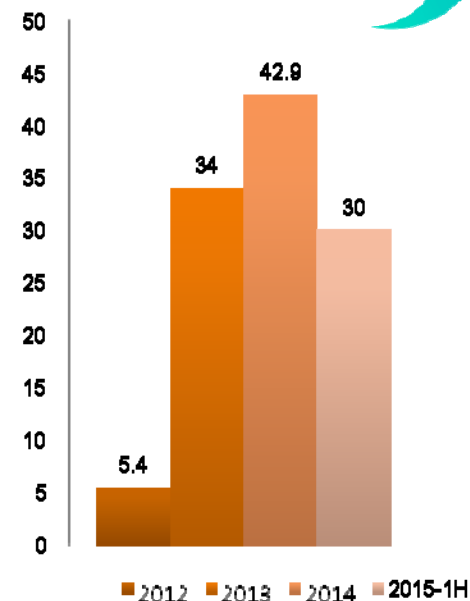
ODM-Design in Number

## OBM Design-in Number Growth



Brand-Design in Number

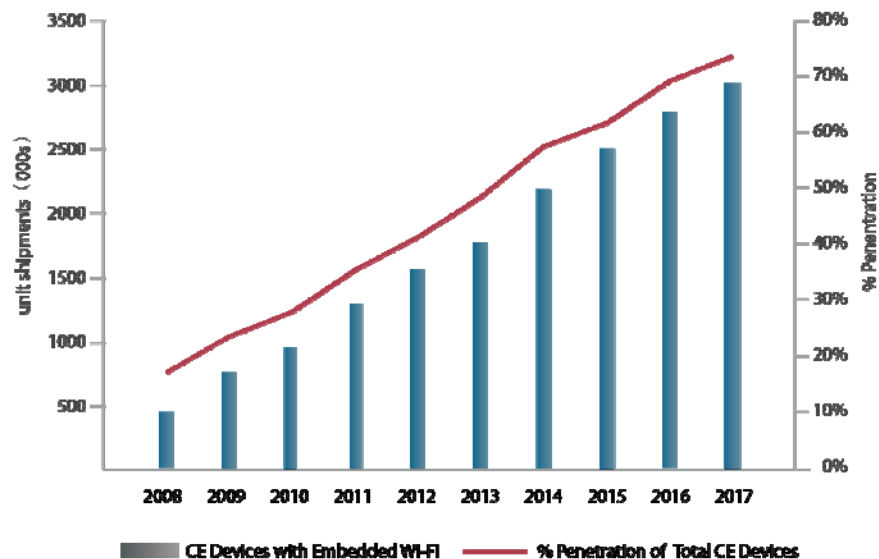
## FEM Parts Shipment Growth



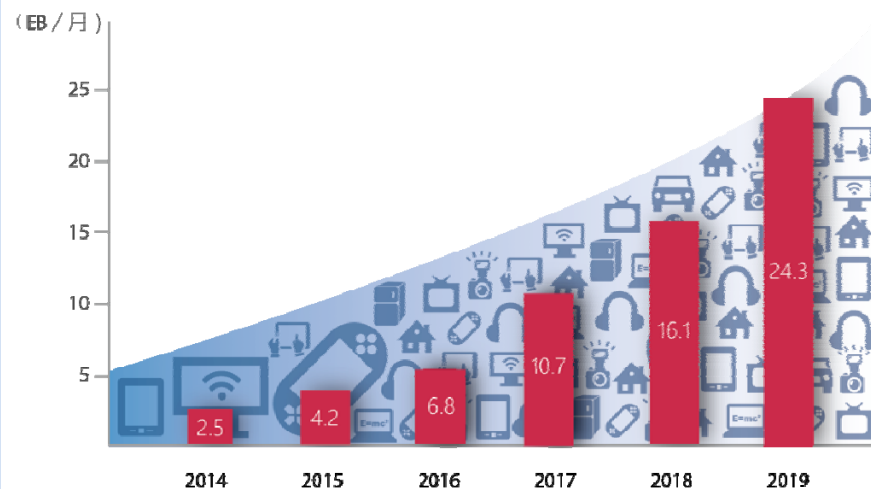
FEM Shipment in Quantity

# Macro Business Drivers

## WiFi Industry Growth



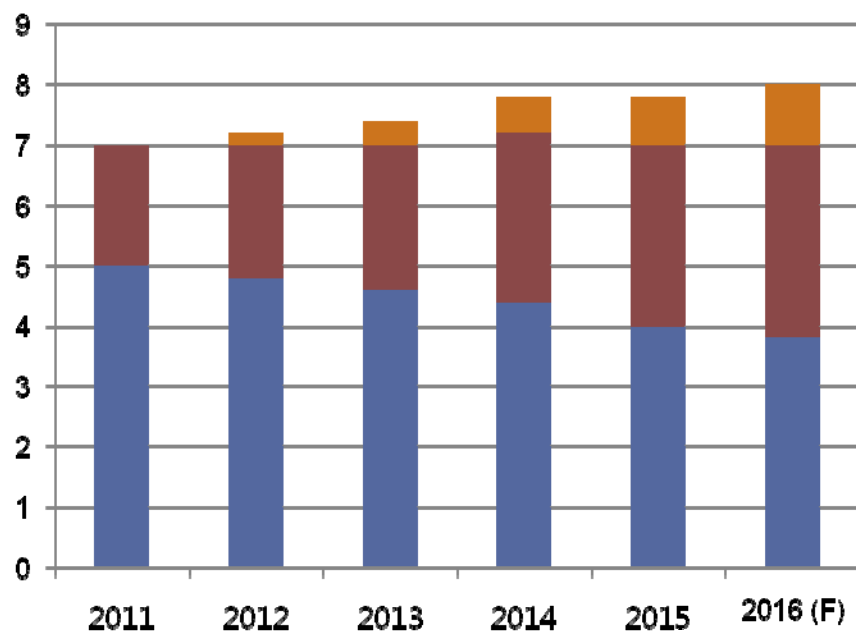
## Global Data Throughput and Application Growth



1 Exabyte (EB) =  $10^9$ GB

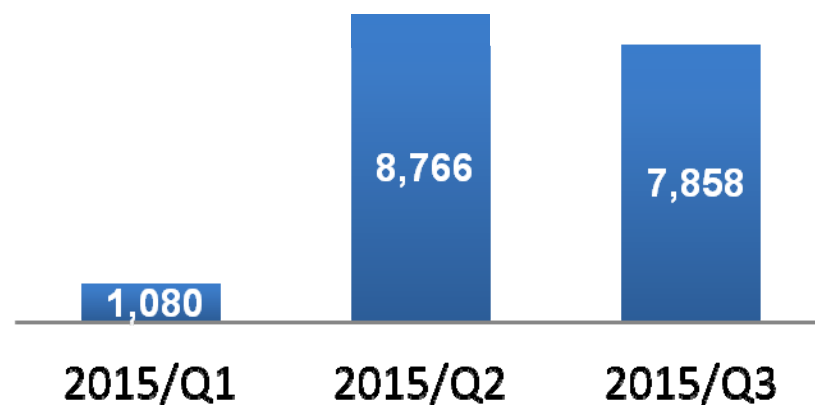
# New Market Business Drivers

## Global Handset Shipment Growth



## RichWave ASM Shipment in 2015

Total Shipment In Quarter (Kpcs)

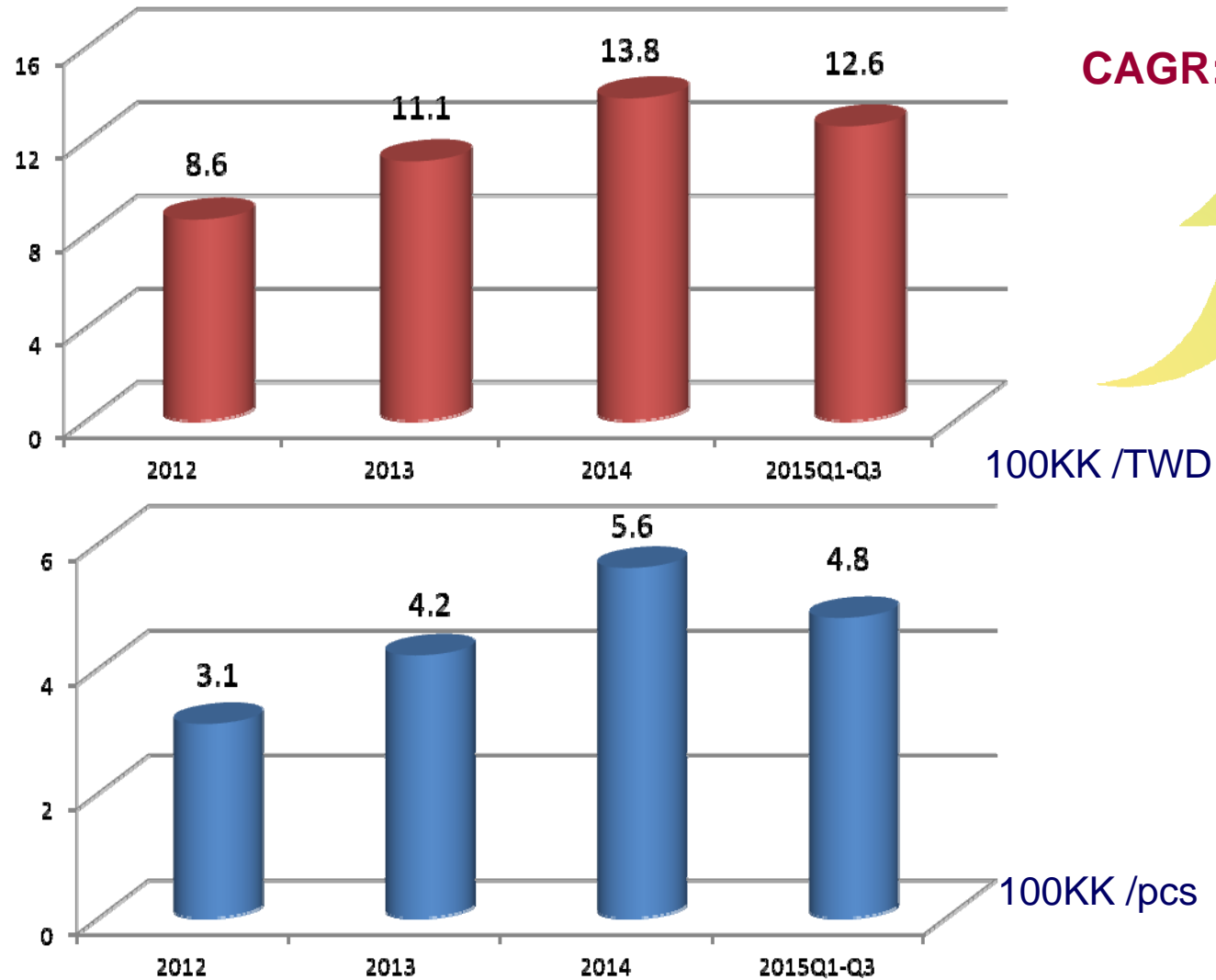




# Financial Overview



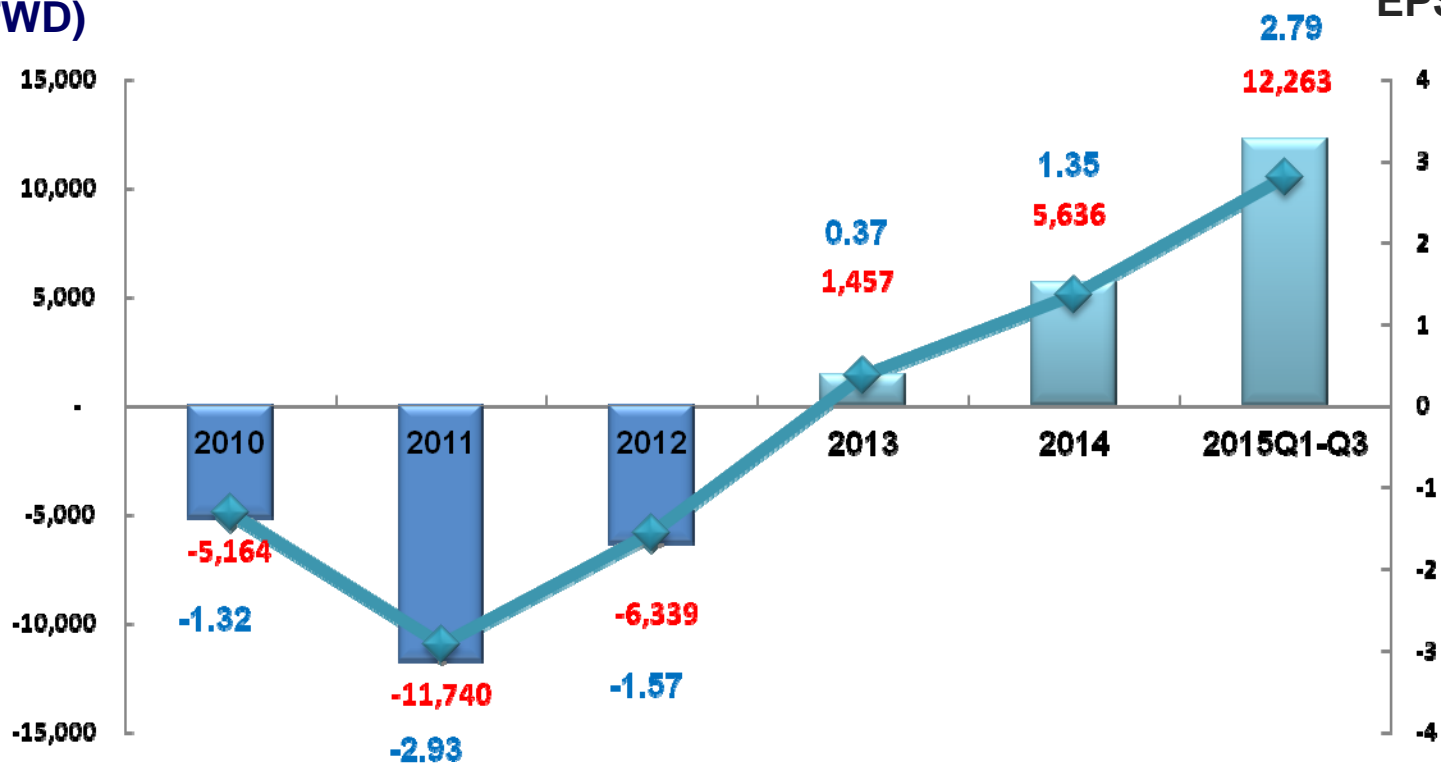
# Revenue and Shipment



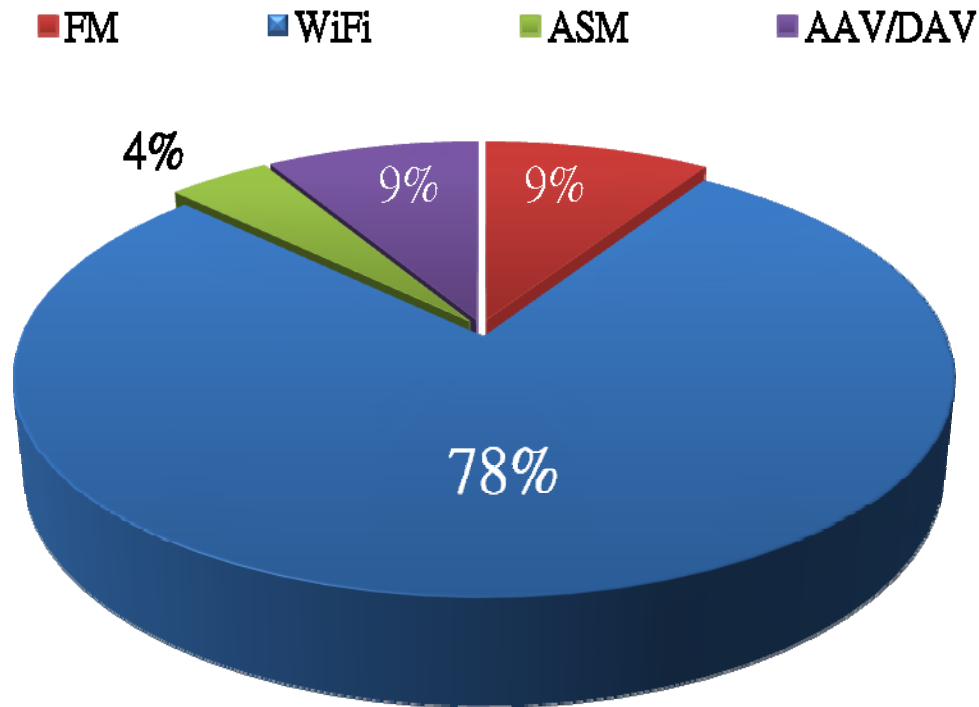
# Net Income and EPS

(10K TWD)

EPS : TWD

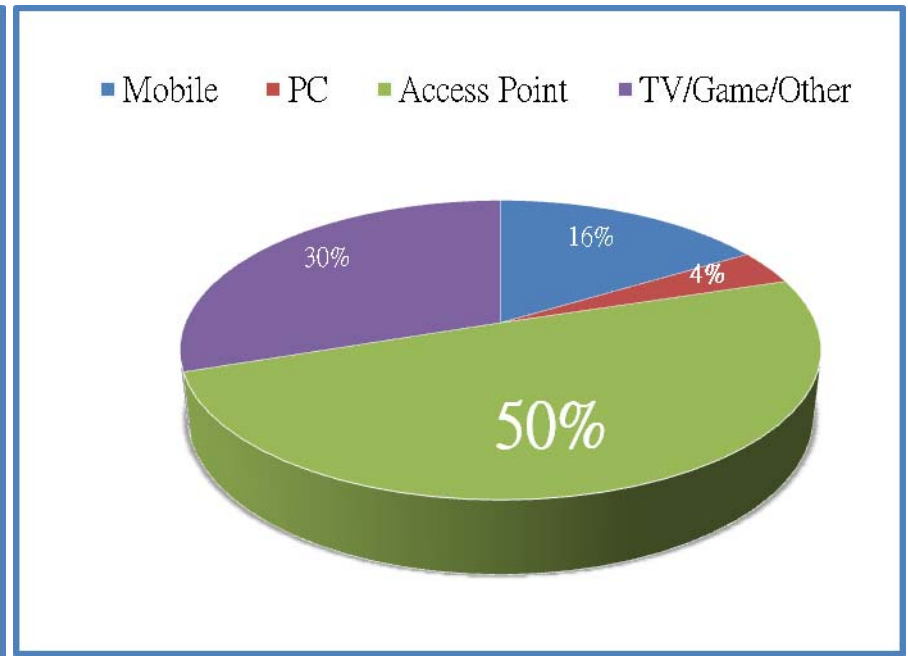
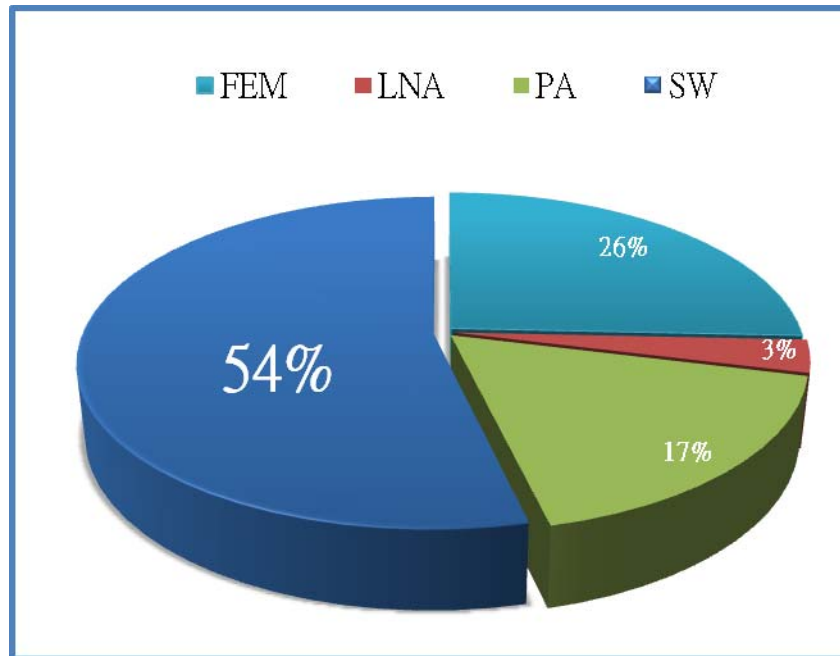


# Revenue by Product – 2015Q1-Q3



# WiFi Revenue by Product & Segment

## – 2015Q1-Q3



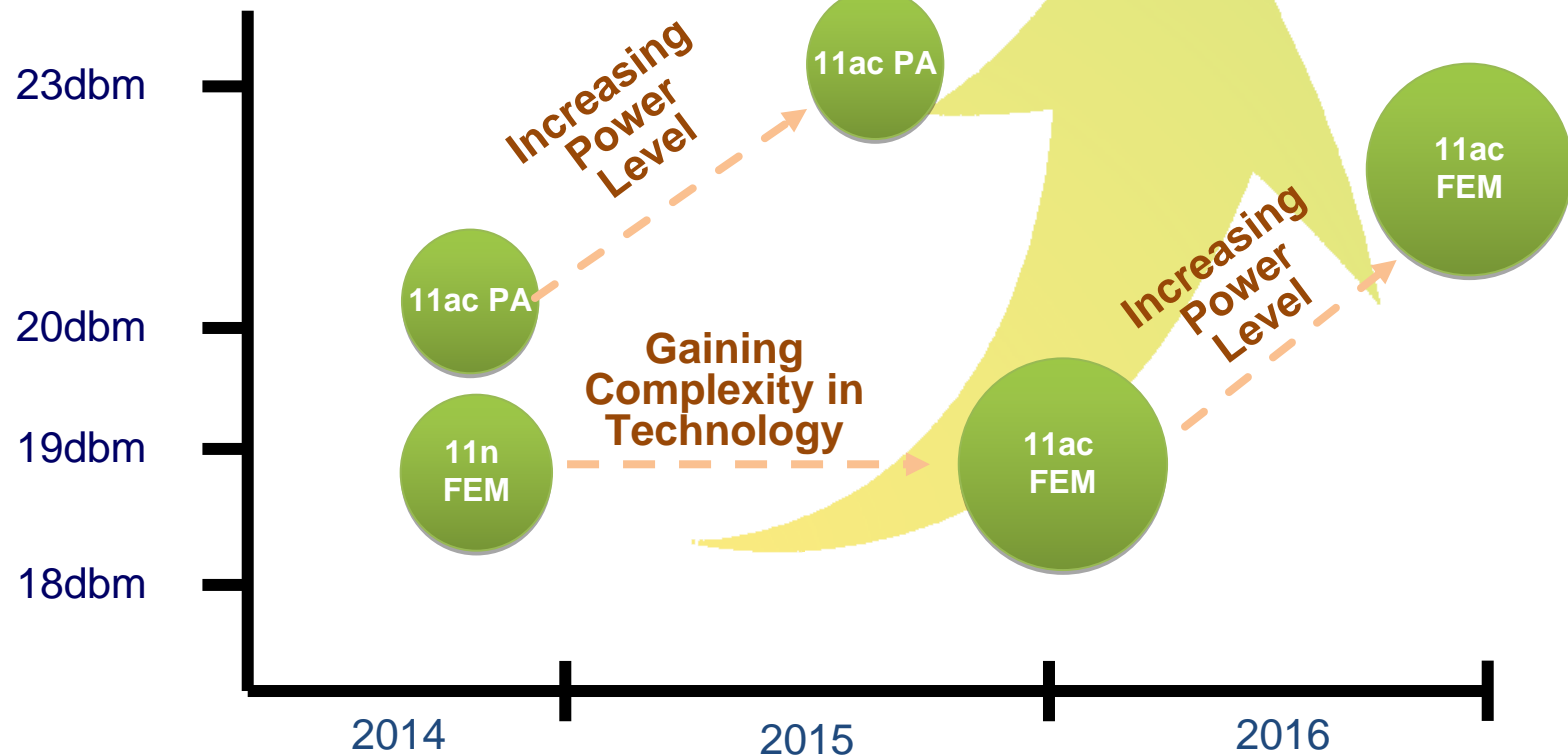
# Product Roadmap



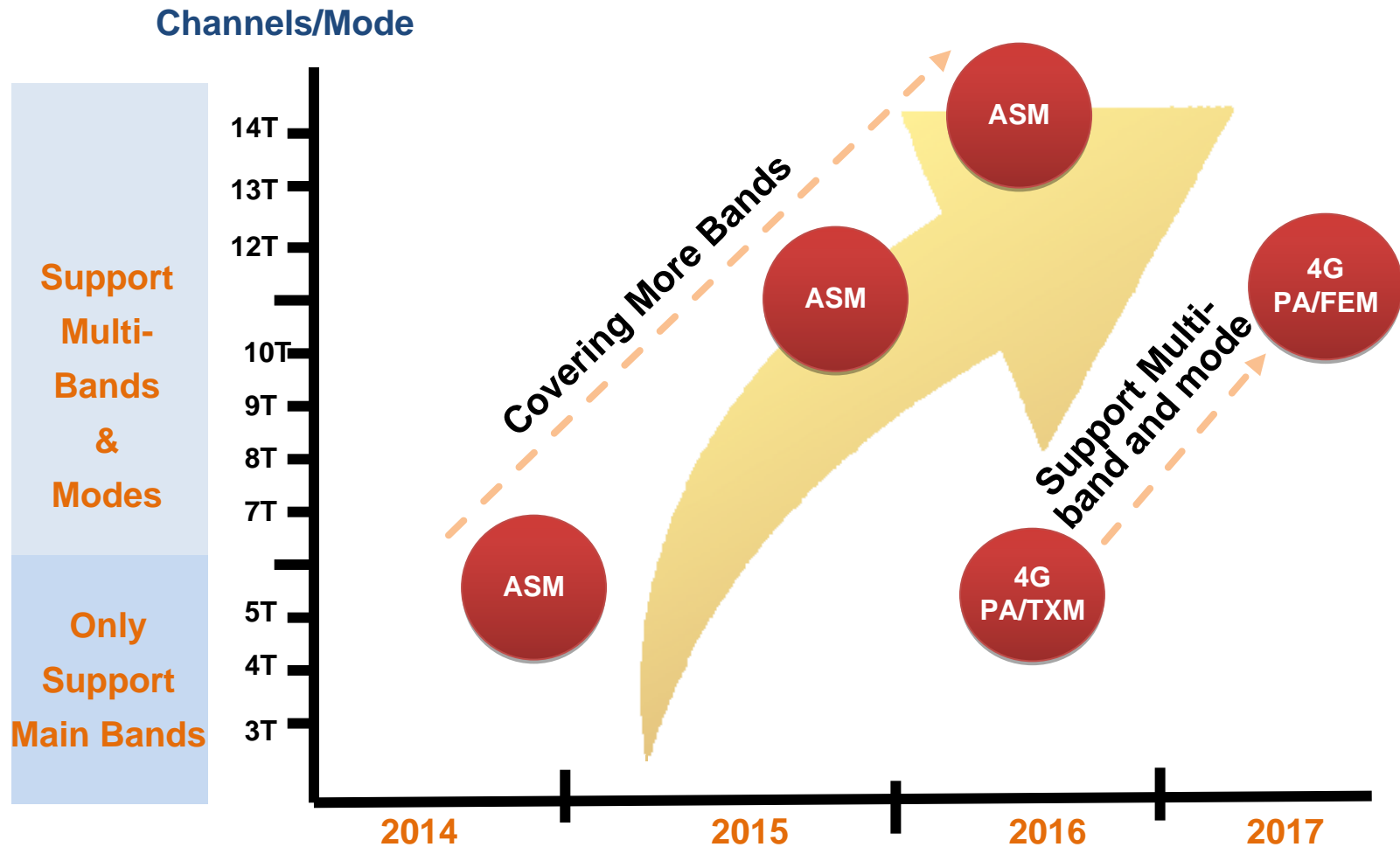


# WiFi Product Roadmap

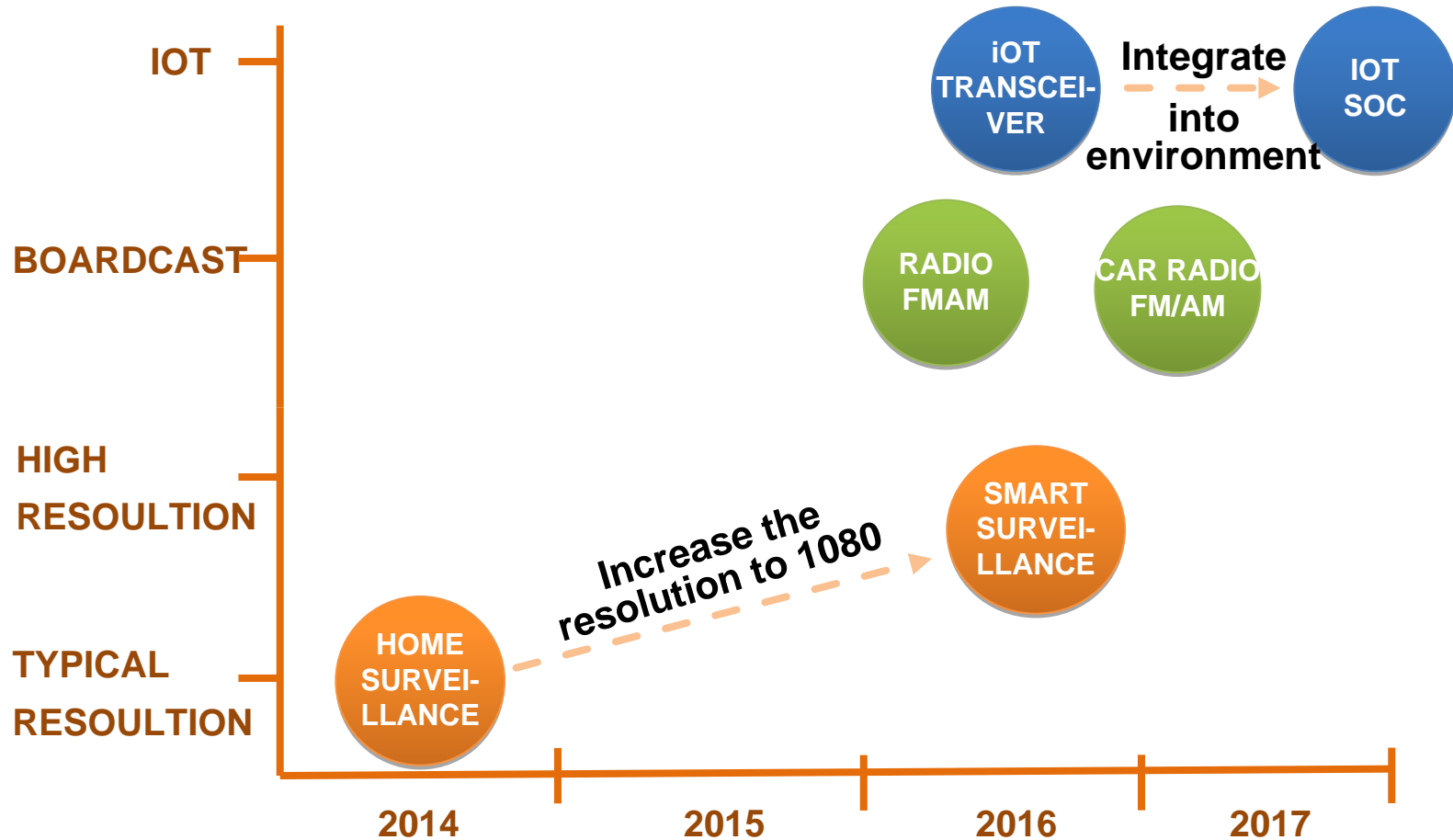
Output Power Level



# Cellular Product Roadmap



# Audio and Video Transceiver Product



**Thank You!**