

立積電子股份有限公司 投資人簡報

民國106年10月



立積電子公司簡介

COMPANY OVERVIEW

SHANGHAI
SHENZHEN
SUWON
TAIPEI
CHUPEI

LOS ANGELES



Founded
Jan. 2004



Listed in TSE
Nov. 2015

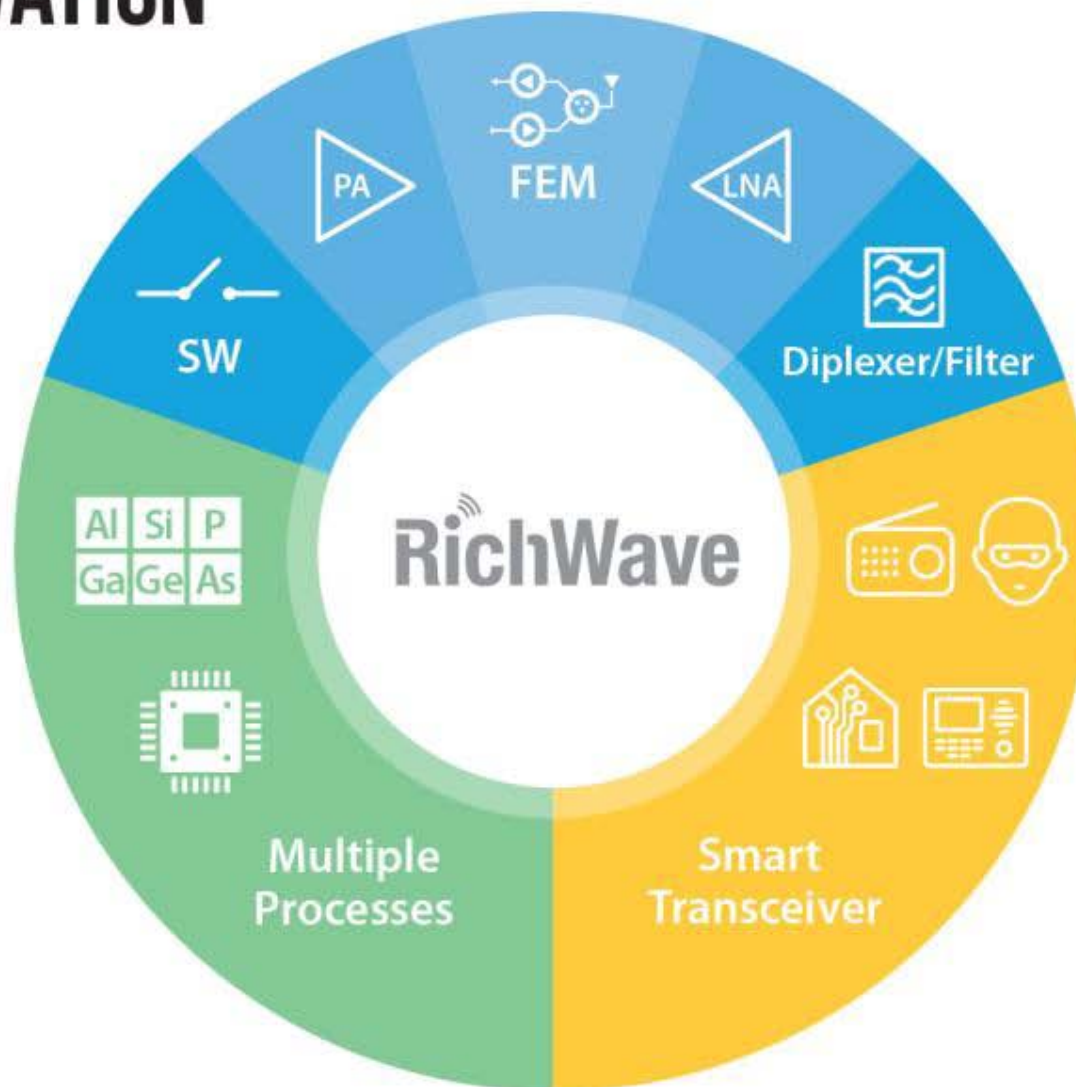


Customers
350



Products
270

DIFFERENTIATION & INNOVATION



WIFI



PA



LNA



SW



FEM

MOBILE



Lte™



PA



LNA



SW



SONY

ASUS

TCL

freebox

SYSTEM ON THE CHIP



FM Tuner

Transceiver

Transmitter

Receiver

AM Tuner

Video Processing



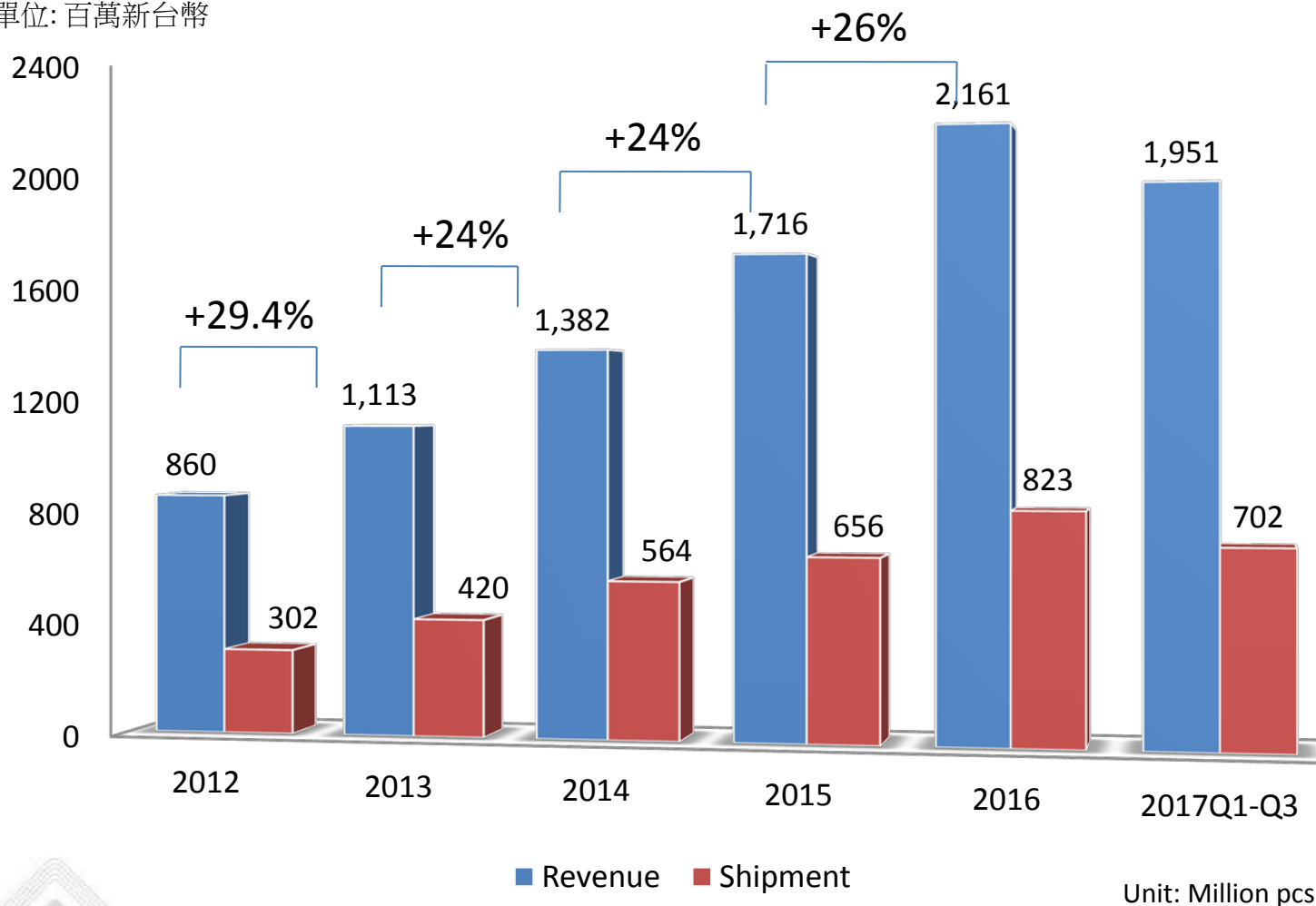
GOSCAM

FURRION

dji

歷年營收與出貨量

單位: 百萬新台幣

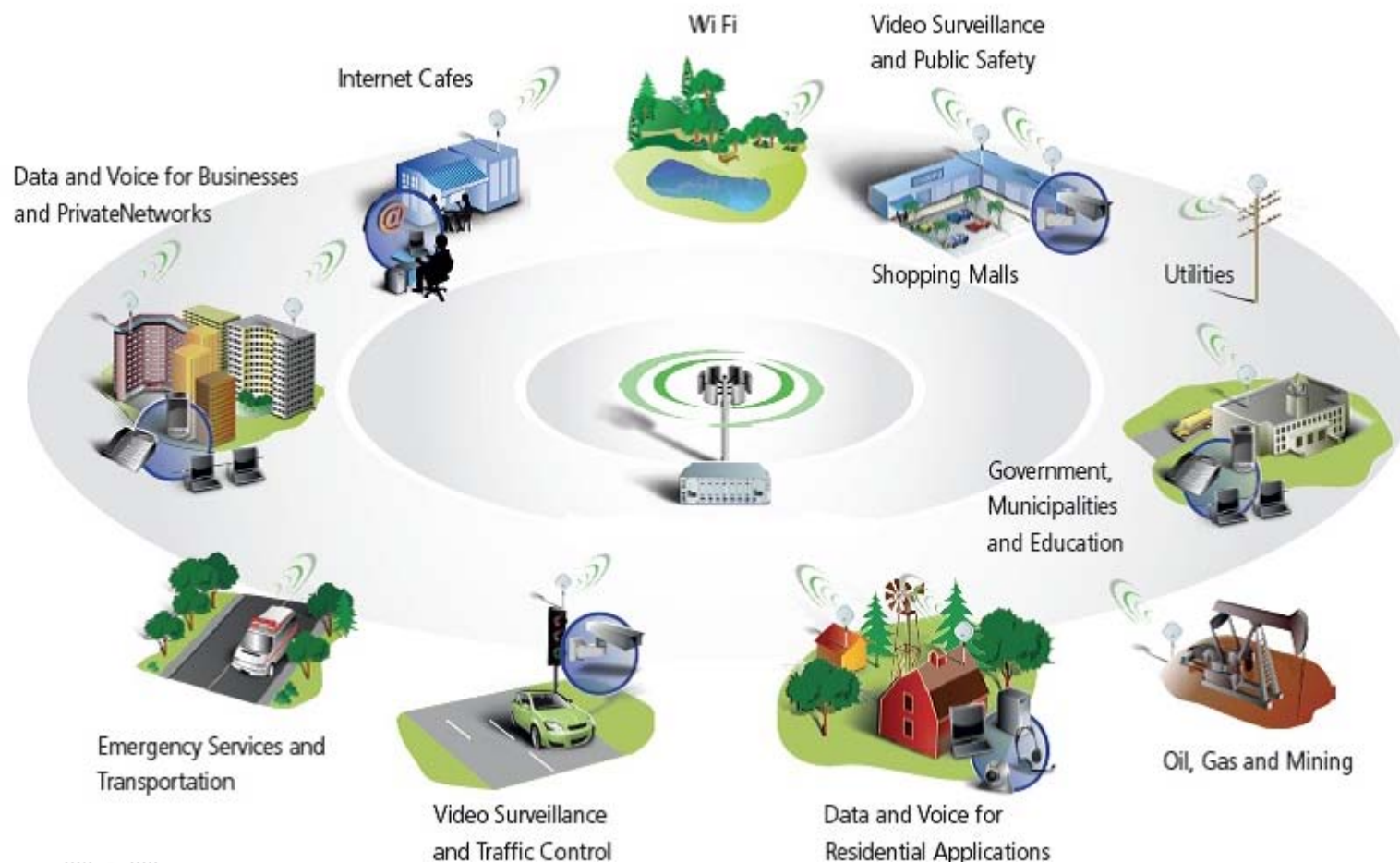


WiFi 無所不在



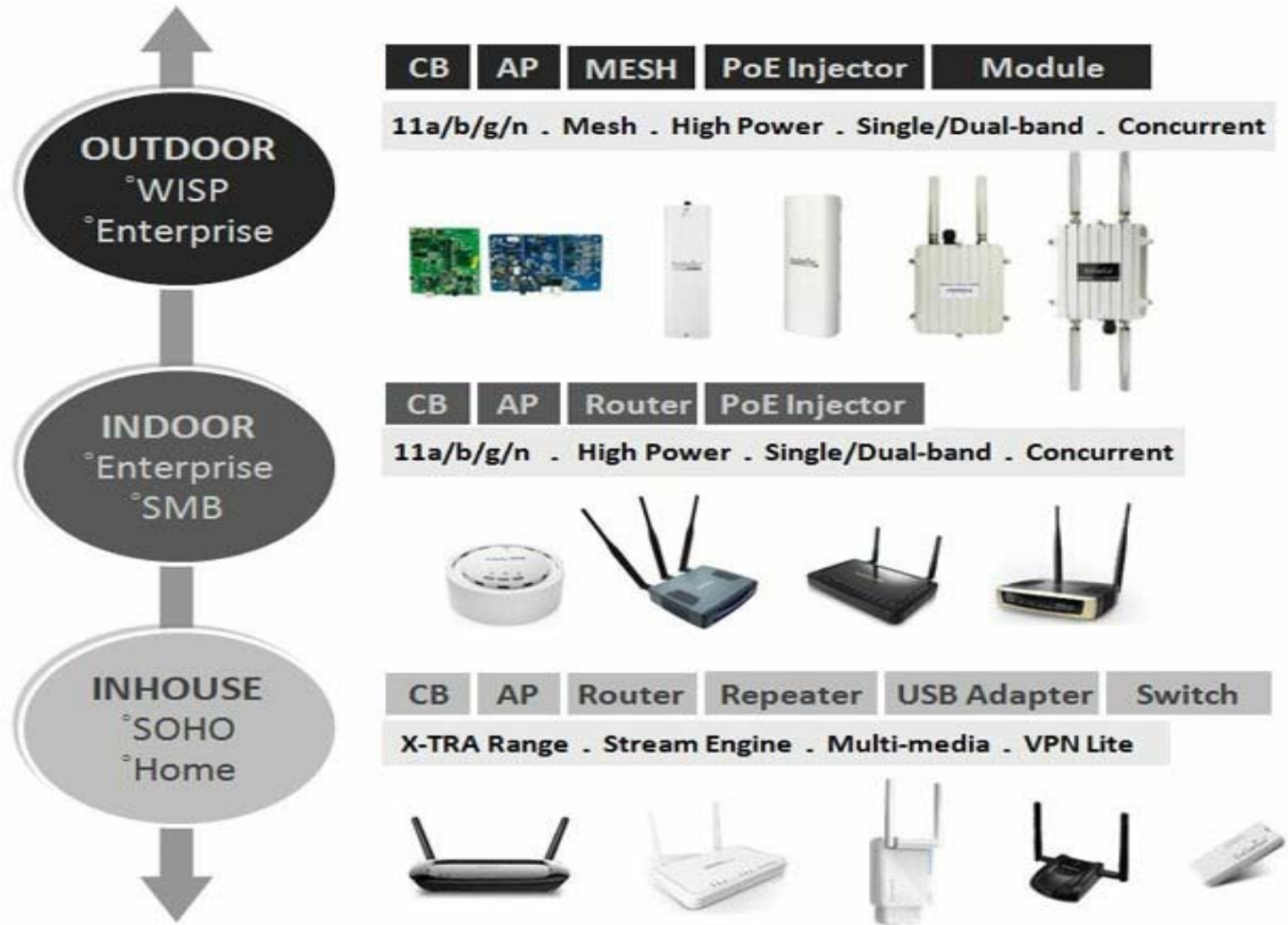
WiFi 連結物聯網

點對多點- 企業室內外的應用



Source: SIPSS-GLOBAL

產品範疇



Source: SIPSS-GLOBAL

AI 時代的WiFi

Router

Cable

Fiber

IP Cam

Automotive

Smarthome

Robotics

Gaming

IoT

Wireless Router Network Diagram



Source: www.Conceptdraw.com

內含WiFi的應用領域及廠商

Retail Router	• TP-Link, ASUS, Netgear, Belkin, Buffalo...
Enterprise Router	• Cisco, HP/Aruba, HUAWEI
IP Cam	• Hike-Vision, Netgear, Nest
STB/ OTT	• Roku, Technicolor, Xiaomi
Gaming	• Nintendo, SONY, Microsoft
Smart Speaker	• Amazon, Google, Harman, Xiaomi, Alibaba
Smart TV	• Samsung, LG, Xiaomi
Smart Phone	• ASUS, Samsung, LG, TCL, Xiaomi, Meizu
Automotive	• KOR/JPN module companies
AI/ Robotics	• ASUS- Zenbo, Softbank- Pepper, Anki- Cozmo
IoT	• Gemtek, Azureware, WNC, Fujitsu, Panasonic



立積所能涉足的市場

Segments	2017 (f)	2020 (f)	Growth (%)	Remarks
AP Router (DSL, Cable, PON)	350	400	14%	M units
STB/OTT	380	460	21%	M units, 2020
Smart Phone	1,517	1,697	11.91%	M units
Smart TV	104	114	9.6%	M units, 2018
Game Consoles	33,800	46,000	36%	US\$M
Smart Speaker	8.3	94	1075%	M units, US, 2016
IoT	20,000	30,000	50%	M units
Smart Home	65	320	392%	M units
Automotive (info..)	1,062	7,914	645%	US\$M, 2016
PC/Laptop/ Tablet	435	433	-0.5%	M units, 2016

Source: IDC, IHS, Accelerating Biz analysis, frost & Sullivan, Ovum, Statista, IDATE, Gartner, Voicebot.ai, Edison Research, Digital Market Outlook, ABI Research

Number of connected devices/things by technology worldwide from 2015 to 2021 (in millions)*

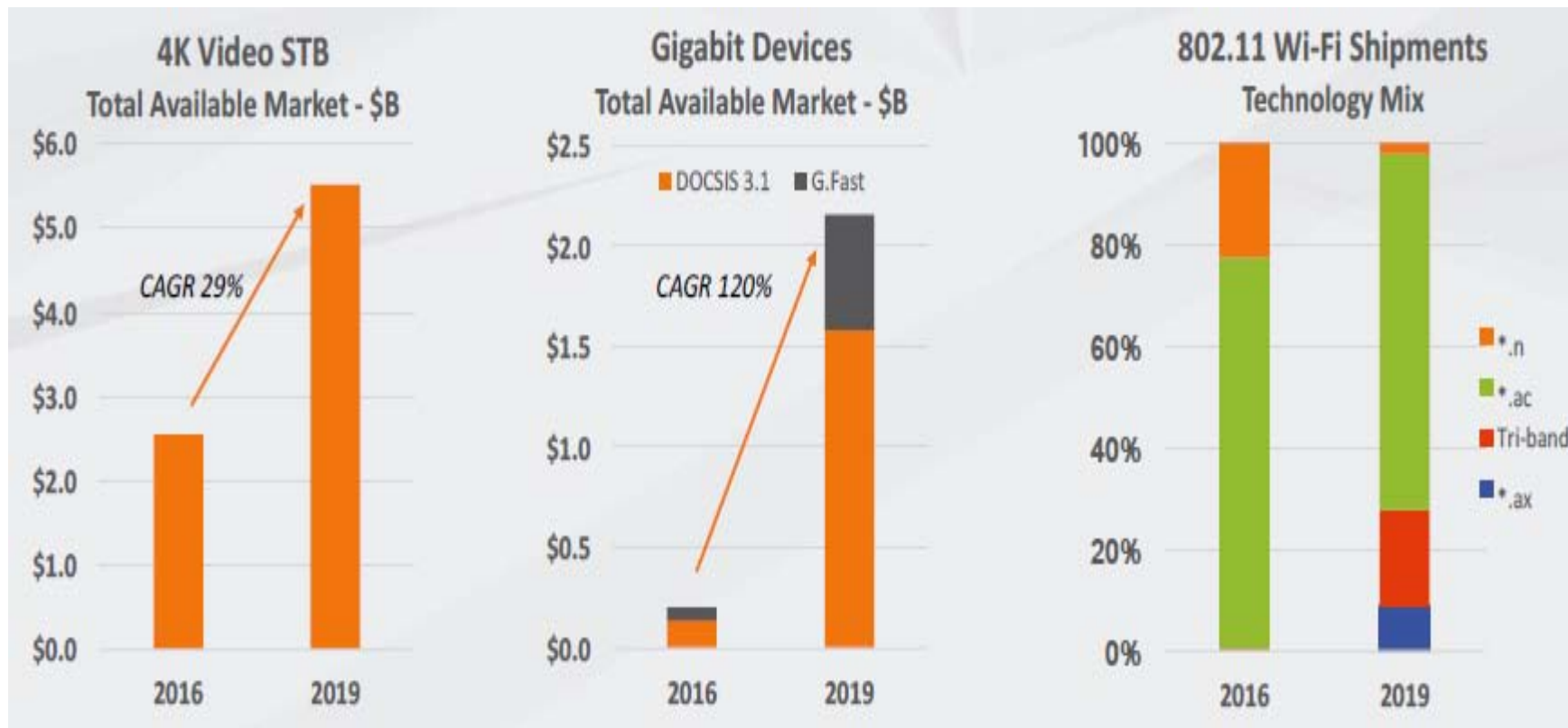


Source
Berg Insight
© Statista 2017

Additional Information:
Worldwide; Berg Insight; 2015 to 2016

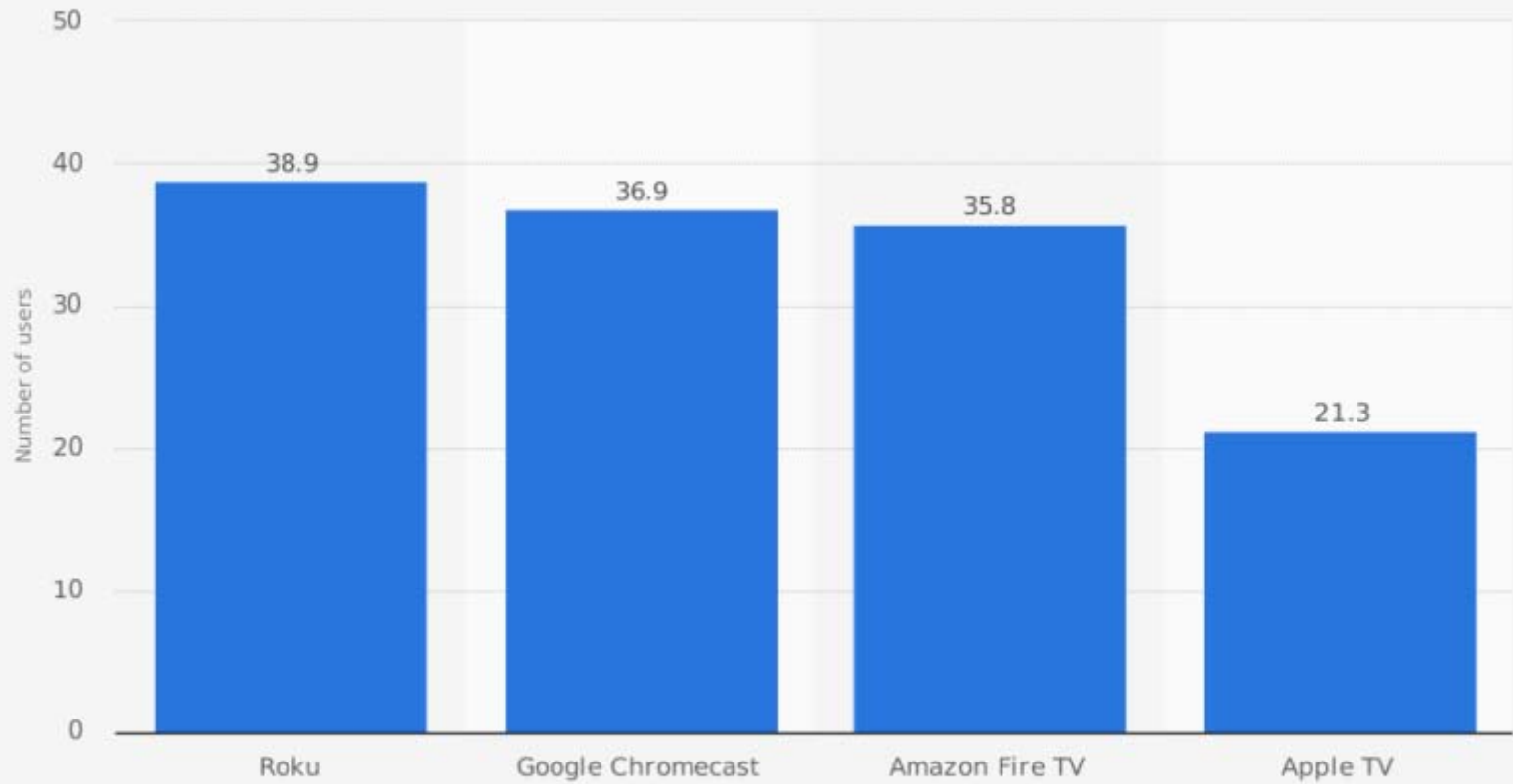
statista

Cable及STB 驅動WiFi 的採用



Source: ARRIS Investor Day 2017

Number of connected TV users in the United States as of July 2017, by brand

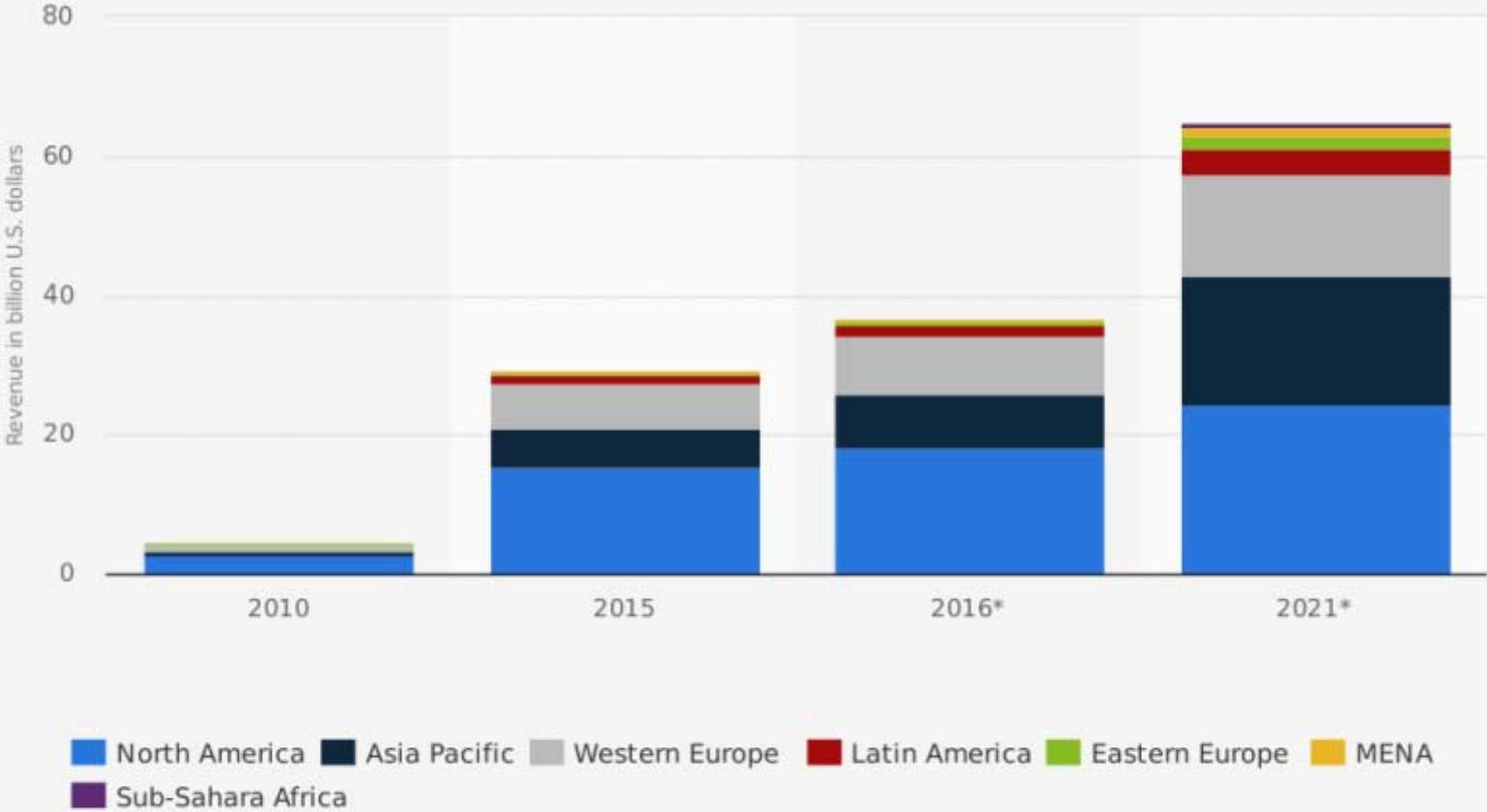


Source
eMarketer
© Statista 2017

Additional Information:
Worldwide; July 2017; based on individuals of any age who use the internet through each device at least once per month

statista

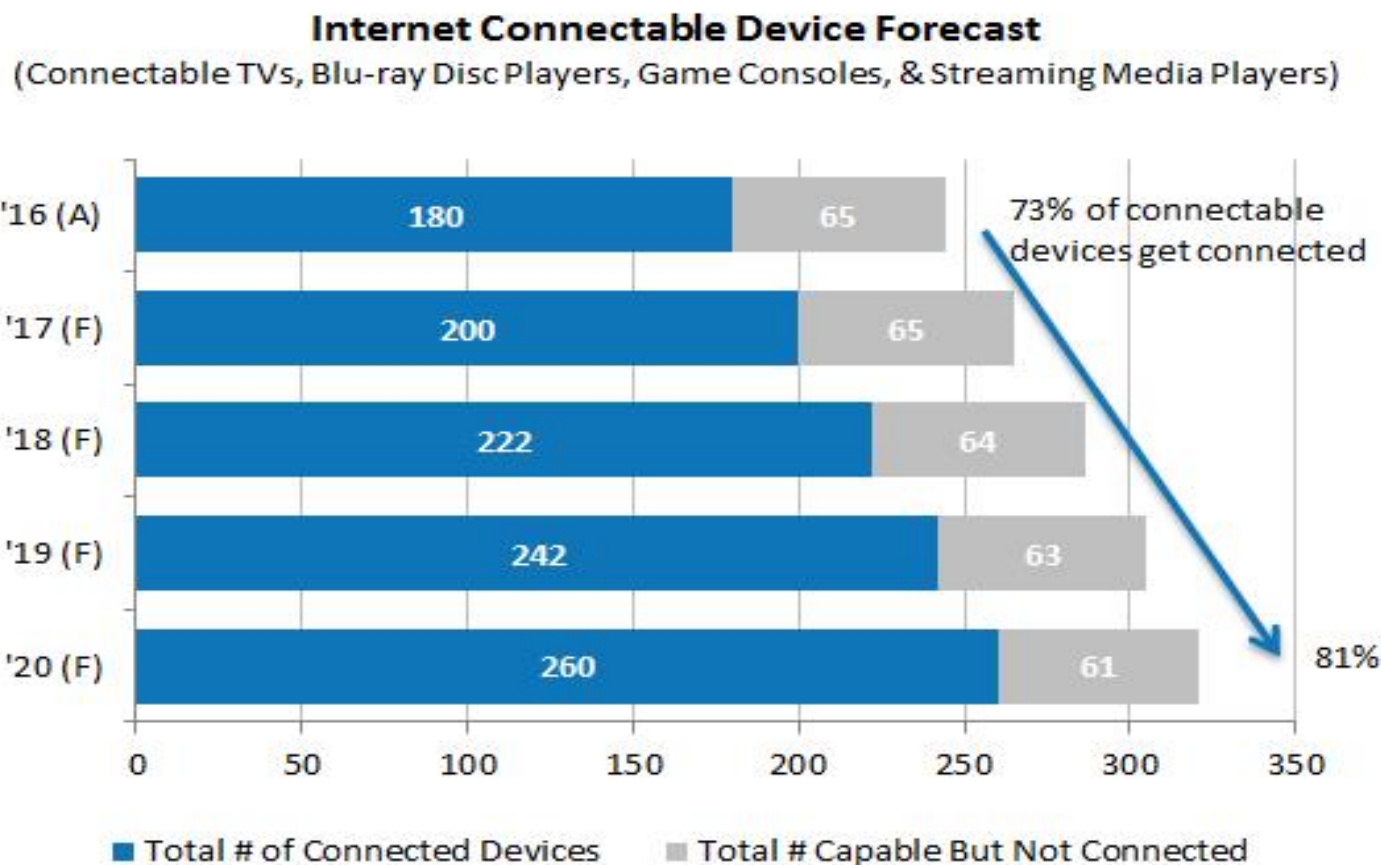
Over-the-top (OTT) TV and video revenue worldwide from 2010 to 2021, by region (in billion U.S. dollars)



Source
Digital TV Research
© Statista 2017

Additional Information:
2010 and 2015

客廳內的 WiFi 連結裝置快速增加

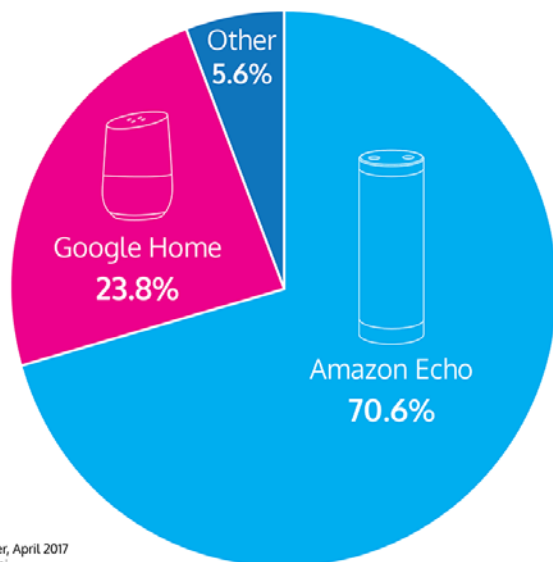


Base: U.S. Internet households

Source: The NPD Group/Connected Intelligence, TV-Connected Device Forecast
Includes a small percent of game consoles that are non-connectable

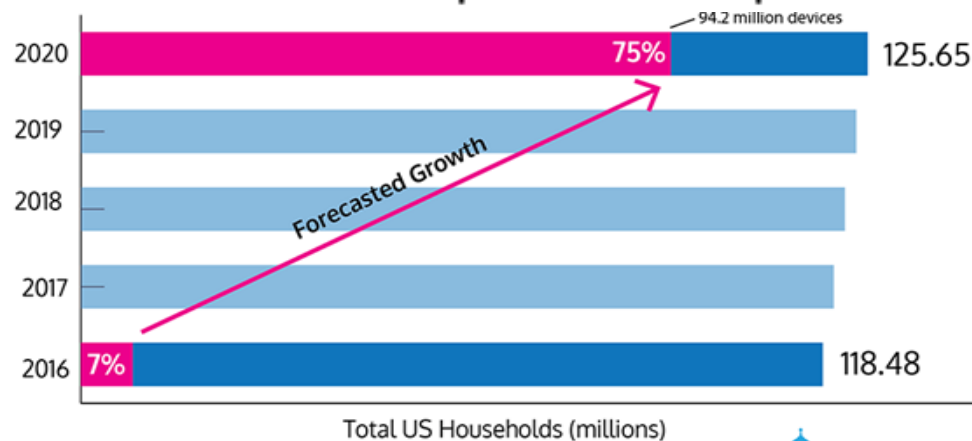
應用在智慧音箱的WiFi快速成長

US Voice-Enabled Speaker User Share by Player, 2017



Source: eMarketer, April 2017
Image: Voicebot.ai

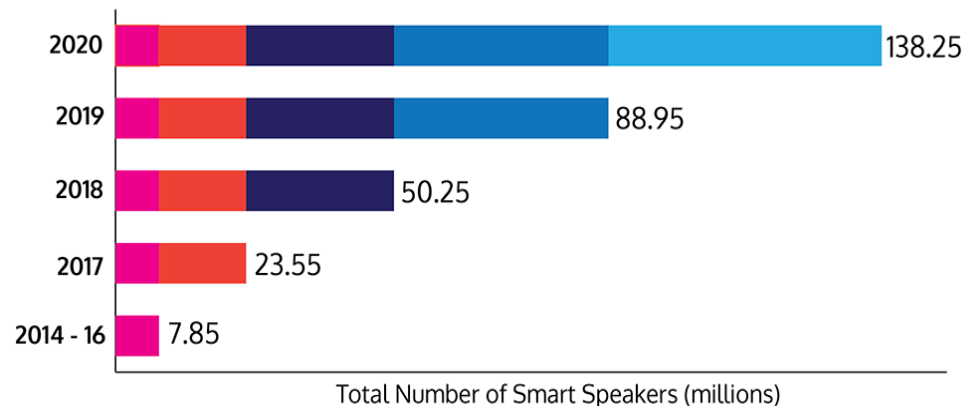
US Household Smart Speaker Ownership 2016-2020



Source: US Census, Gartner, Edison Research, Voicebot.ai



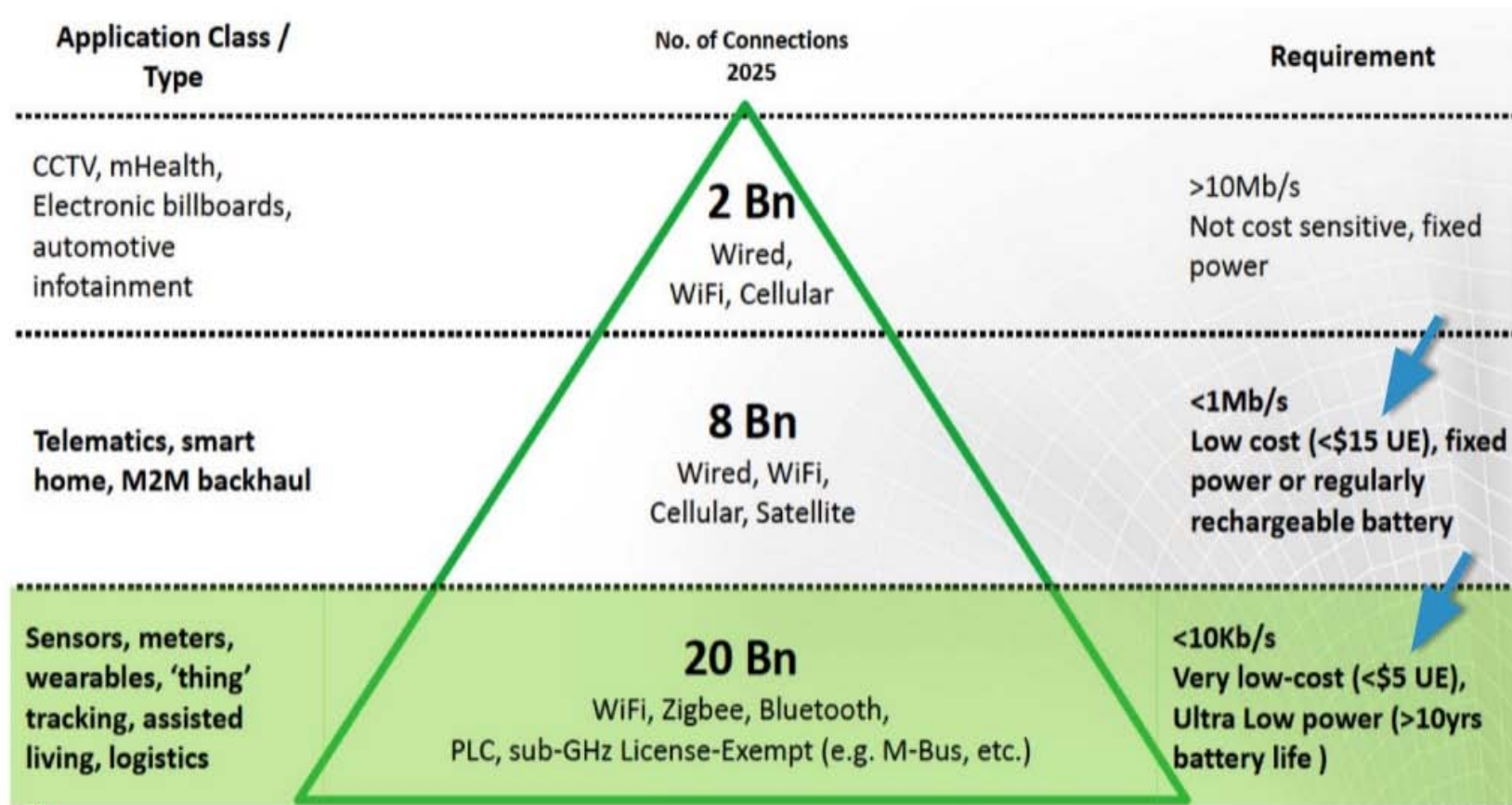
US Smart Speaker Installed Base - 2016 to 2020



Source: CIRP, VoiceLabs, Statista, Edison Research, Voicebot.ai



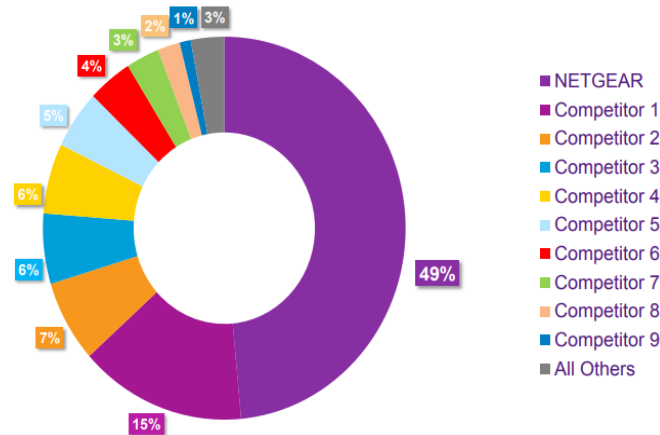
WiFi 應用無所不在



橫跨高階到低階的消費型WiFi 路由器

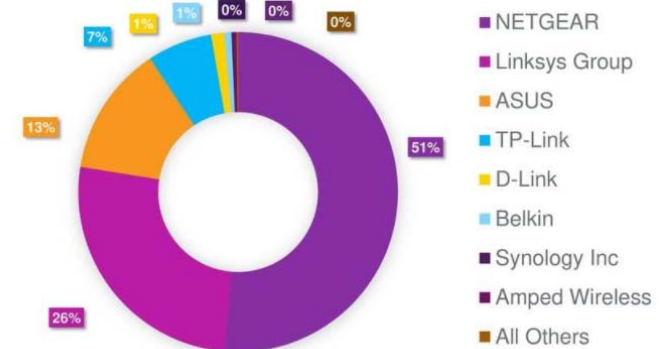
Consumer WiFi Market Share

Wireless Routers, Gateways, and Mesh Systems, US 2Q17

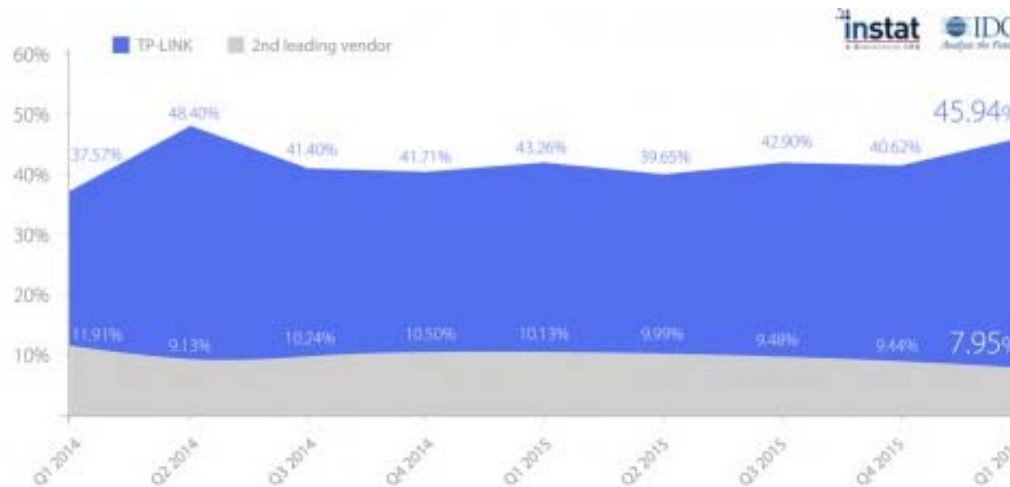


High End WiFi Router Market Share

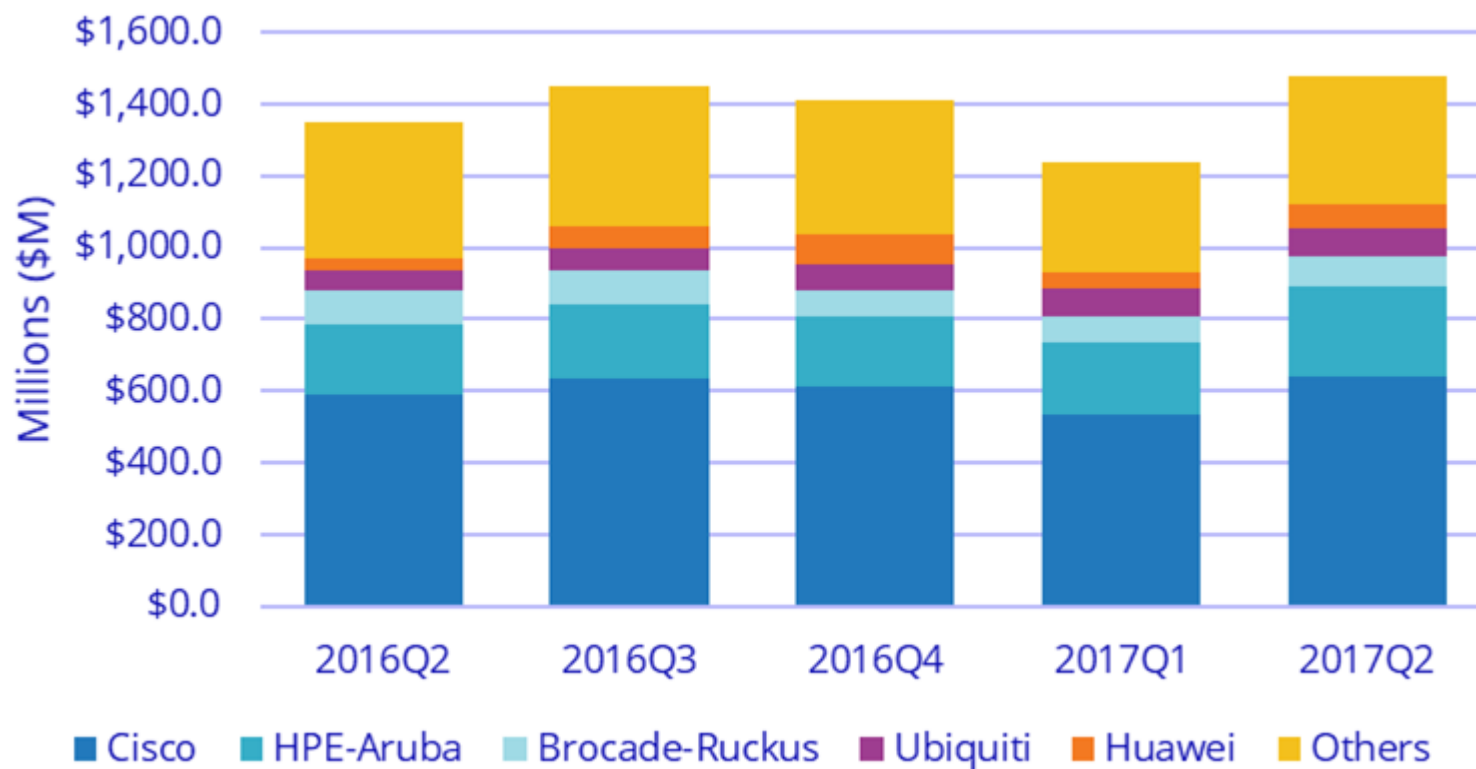
IPD, AC1800-AC5400, US 4Q16



Source: Netgear, 2017/08



企業型 WiFi 路由器是不同的

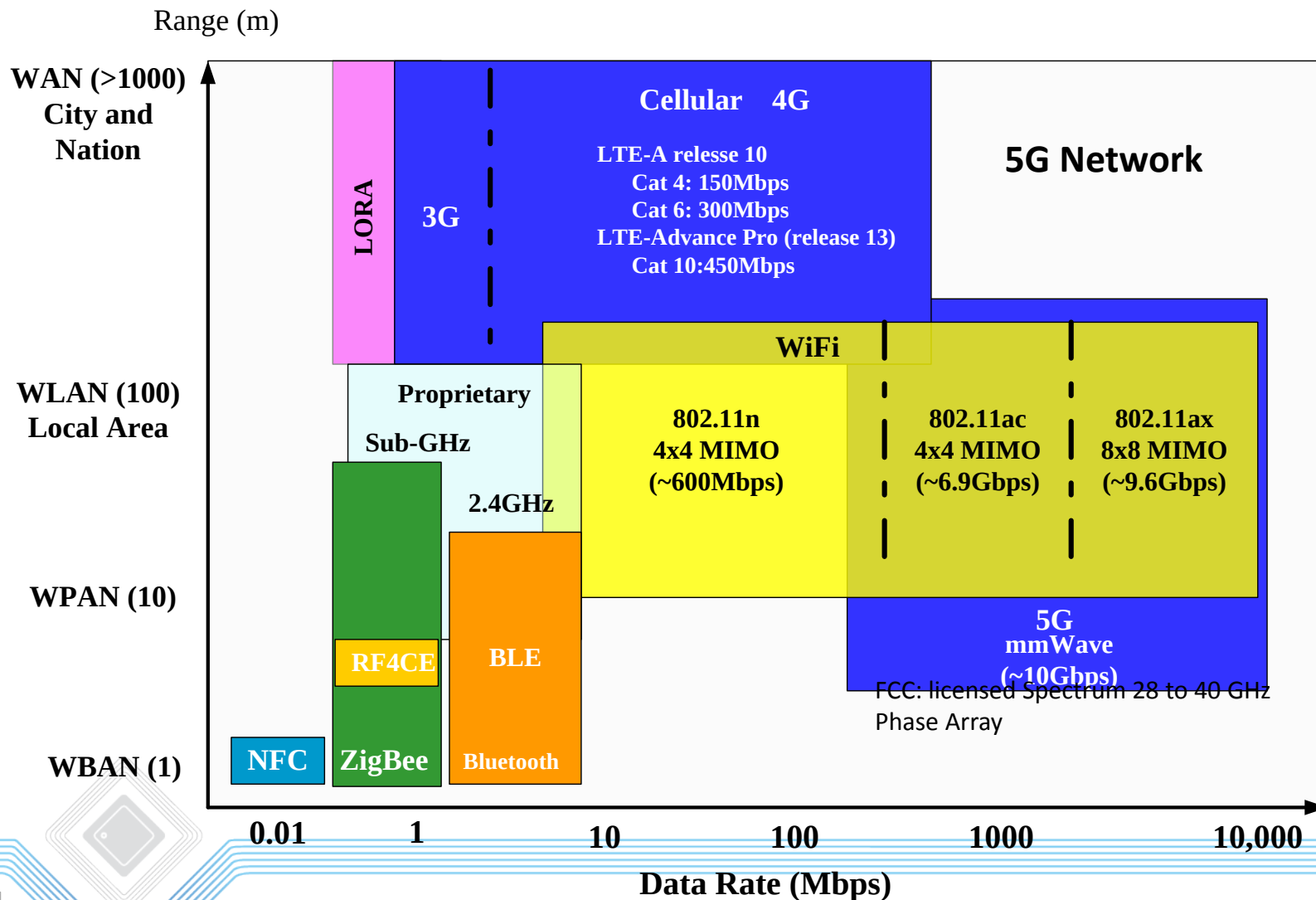


Source: IDC 2017



無線 RF 與多樣化的系統

未來WiFi, 4G, 5G 與 IOT 將相輔相成



下一代的 802.11ax 提供更快的傳輸速度

802.11ax promises:

- Up to 4X capacity increase
- Higher efficiency
- Improved coverage and performance

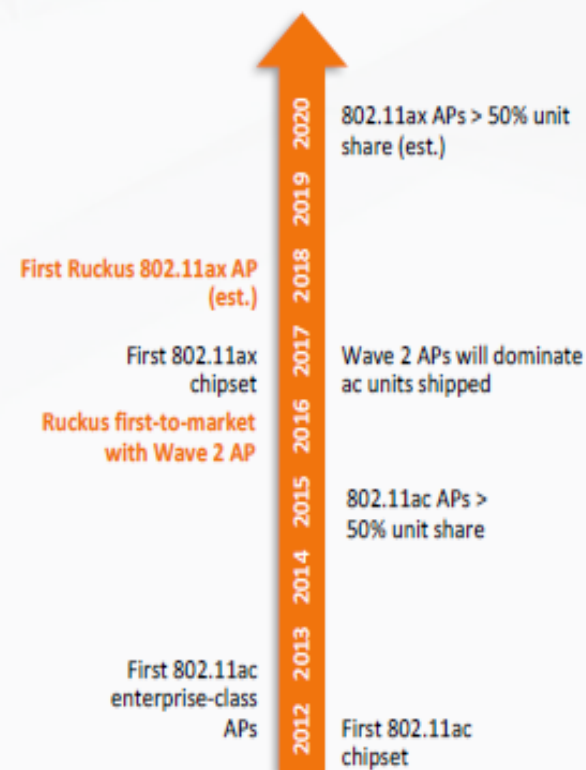
vs. 802.11ac Wave 2

11ax: simultaneously serves lots of devices per AP...



...and delivers optimal performance in dense environments with many APs

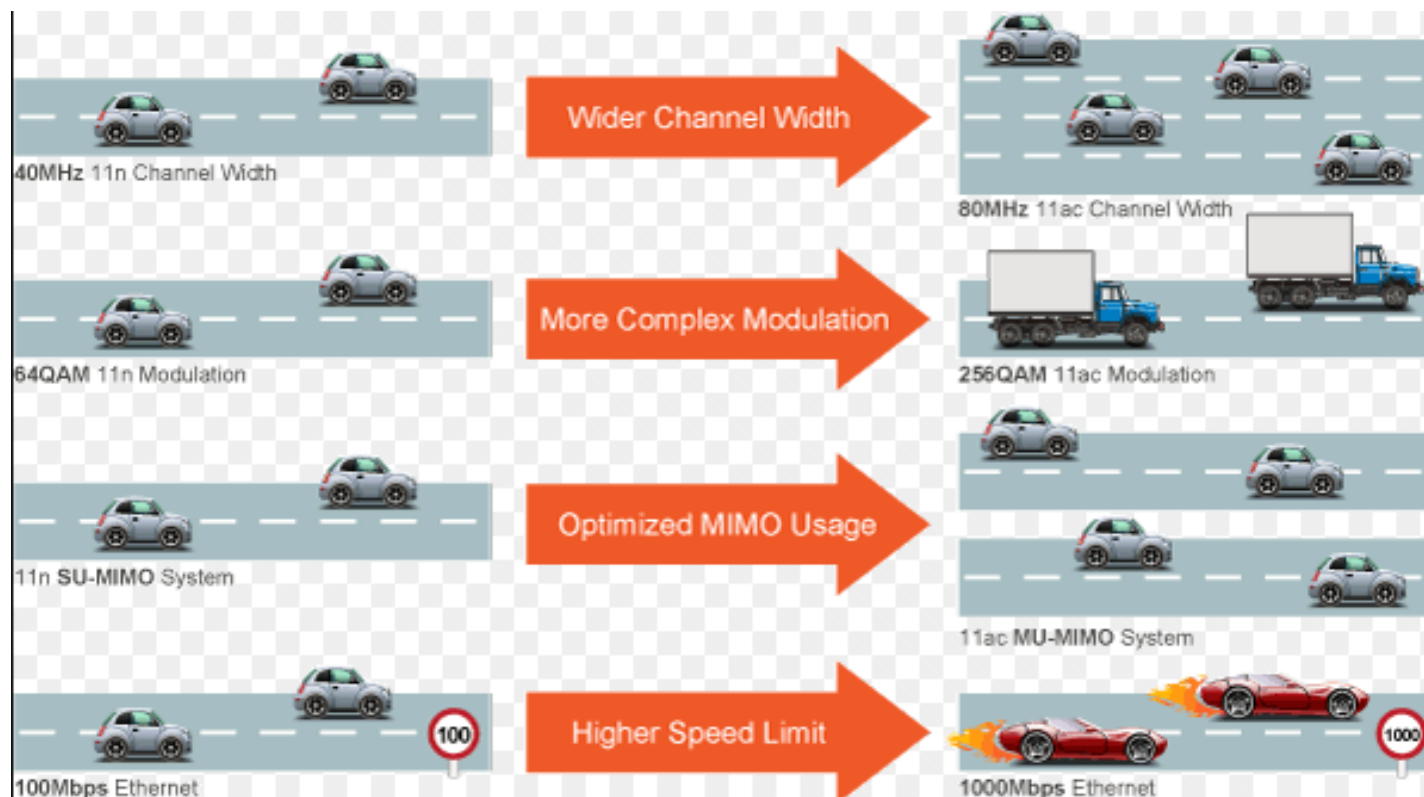
Enterprise AP Timeline



Source: ARRIS Investor Day 2017

WiFi 技術世代交替:

頻寬, 調變 & MIMO 數持續增加



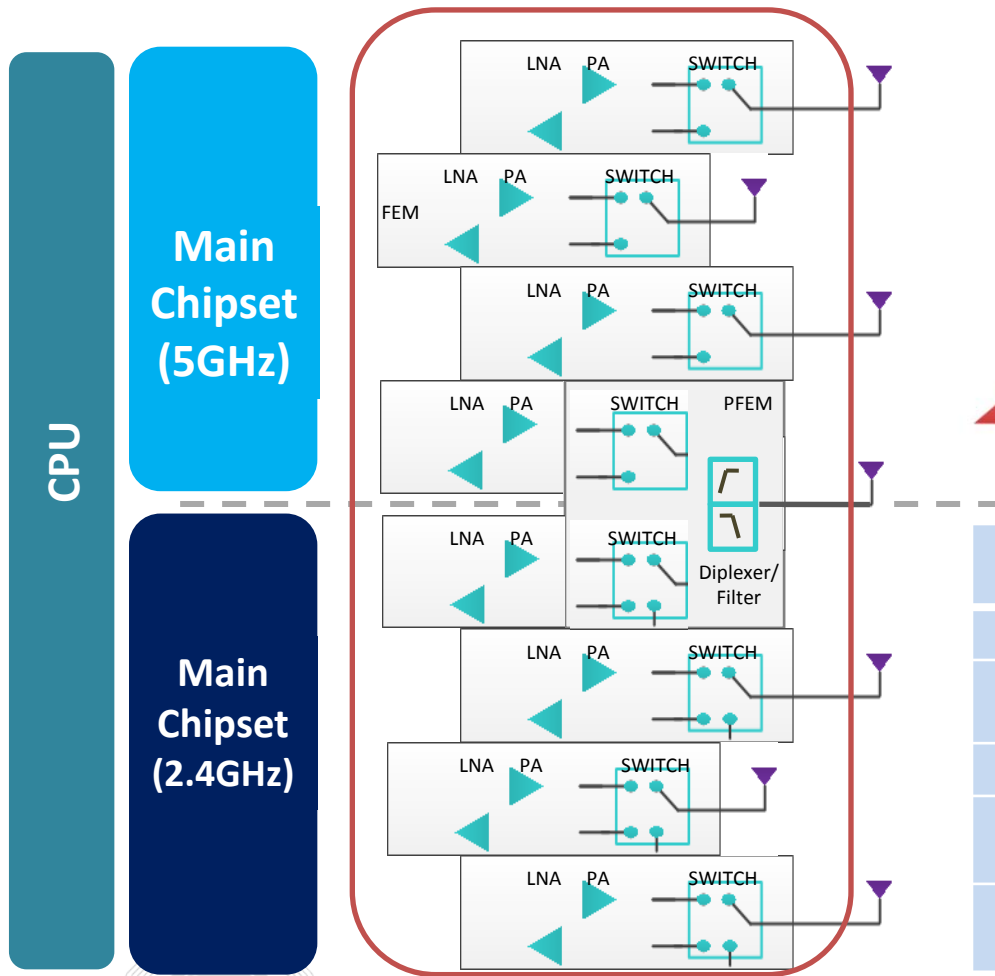
Go faster in wired & wireless

Take Advantage of 11ac to Optimize Data Link Speed

Source: Business System Connection

立積有完整的WiFi RFFE 解決方案

RFFE 的關鍵是效能: MU- MIMO 使RF Front End數目增加, PA 是傳輸距離, LNA 是接收靈敏度. RFFE 數量與 MIMO是成比例增加的

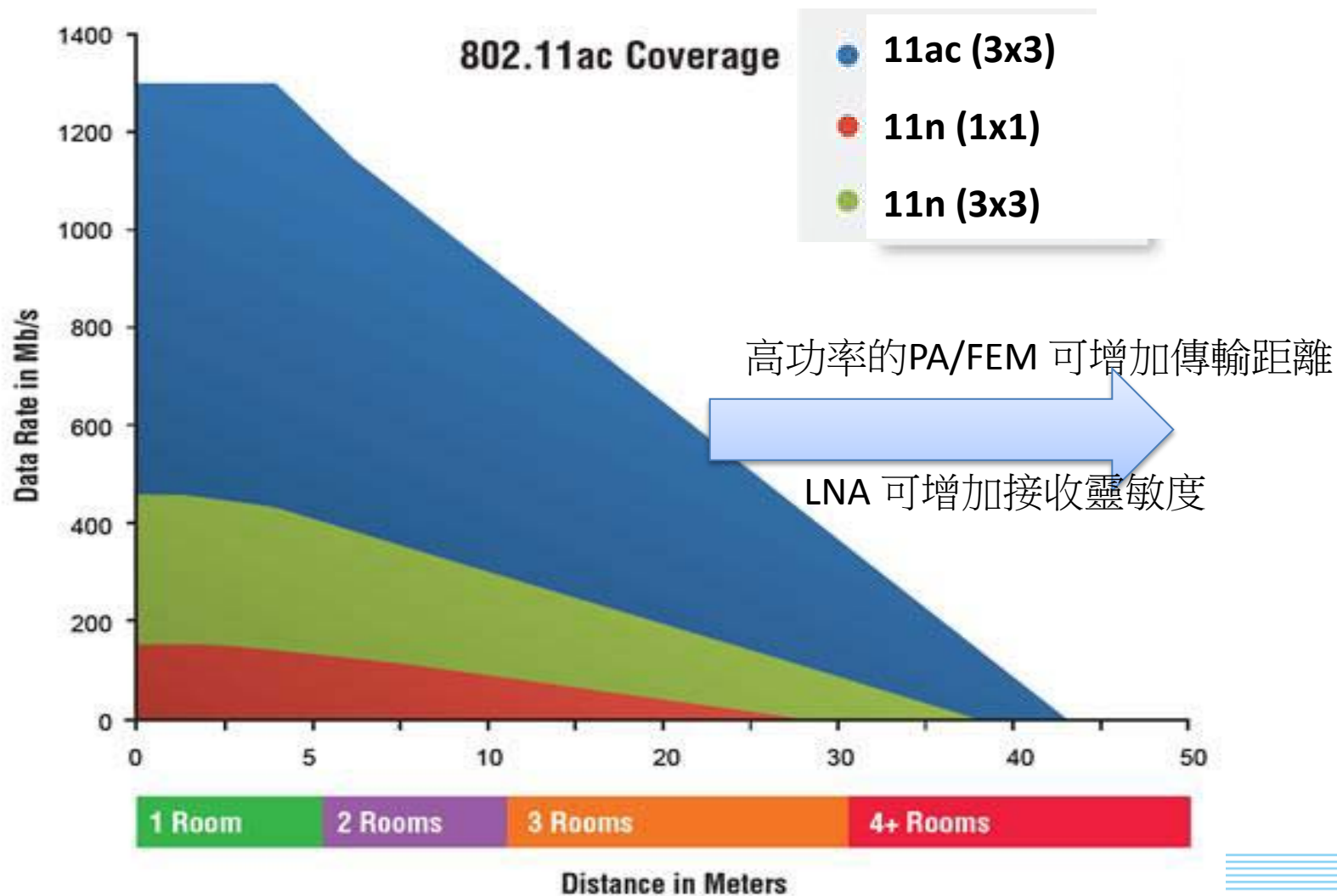


Source: D-Link

Antenna output	5GHz 11ac	5GHz 11n	2GHz 11ac	2GHz 11n
PA/LNA/SW	V	V	V	V
FEM (PA+LNA+SW)	V	V	V	V
FEM(LNA+SW)	V	V	V	V
Enterprise FEM (PA+LNA+SW)	V	V	V	V
Mobility FEM (PA+LNA+SW)	V	V	V	V

11ac 與未來WiFi 所涵蓋的距離

- 需要高功率的FEM/PA & LNA



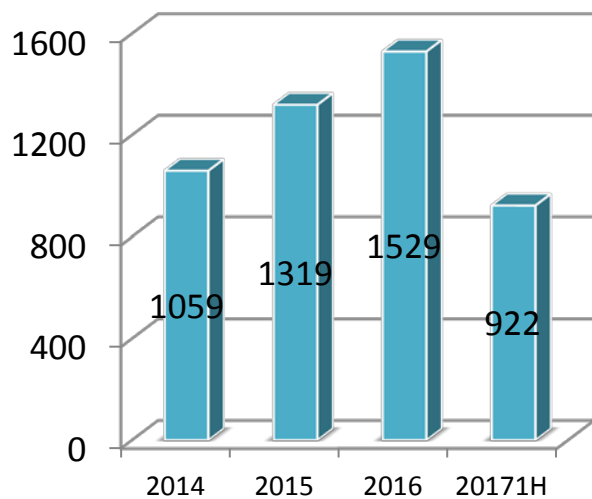


成長策略與優勢

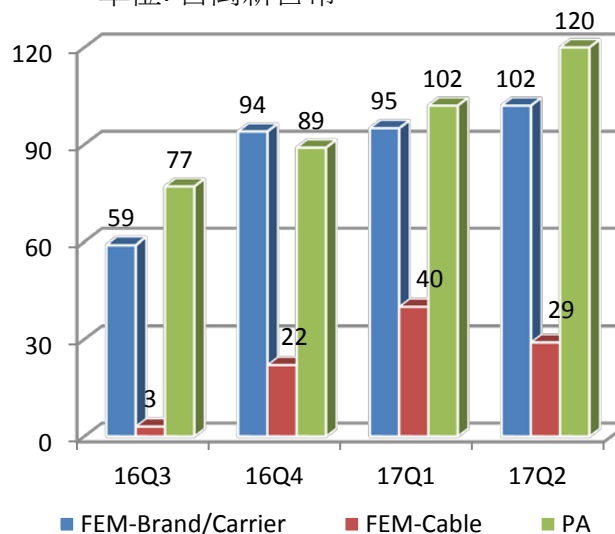
WiFi年成長超過30%

- 2017第二季 PA得益於802.11ac 零售路由器，季增17%，年增 66%。
- 2017第二季整體WiFi 季增11%，年增32%。
- 成長來自於11ac 市佔率提升、MIMO 2x2 and 3x3，以及更好的覆蓋率。

單位: 百萬新台幣



單位: 百萬新台幣



手機用的WiFi FEM 將開始起飛

- 11ac 2 in 1 FEM 已被全球主要品牌所採用。
- 11ac 3 in 1 FEM 將開始被全球主要品牌所採用，並於2018年貢獻營收。

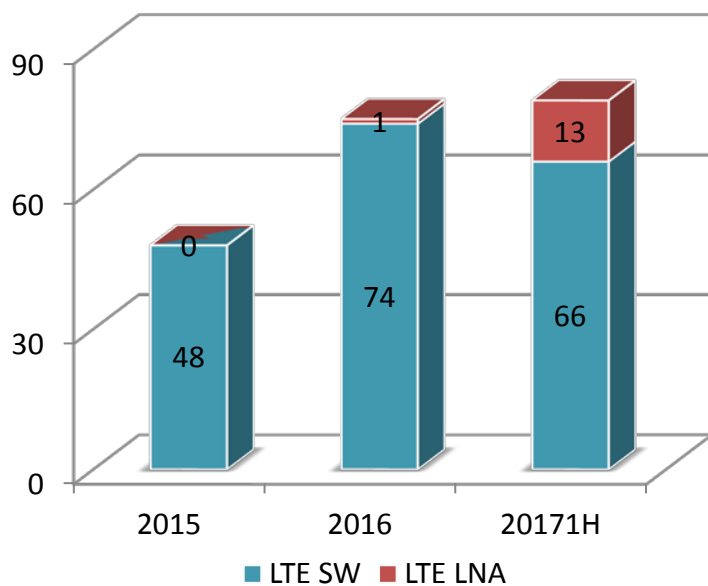
Vendor Rank	Vendor	Units	Unit Share	YoY
1	Samsung	233,900,226	22%	-2%
2	Apple	137,113,763	13%	-13%
3	Huawei	93,949,822	9%	26%
4	OPPO	68,208,679	7%	141%
5	vivo	52,565,708	5%	102%
6	LG Electronics	40,895,805	4%	-8%
7	Xiaomi	36,972,405	4%	-30%
8	ZTE	32,372,138	3%	-12%
9	TCL-Alcatel	22,807,700	2%	-6%
10	Gionee	21,477,873	2%	134%
11	Lenovo	21,082,932	2%	-35%
12	LeEco	16,479,983	2%	794%
13	Motorola	14,783,246	1%	-30%
14	Coolpad	13,620,170	1%	-40%
15	HTC	13,418,833	1%	-6%
	Others	222,451,069	22%	-13%
	Grand Total	1,042,100,352	100%	1%

Source: IDC: Top 15 Smart Phone Vendors in 2016-2017

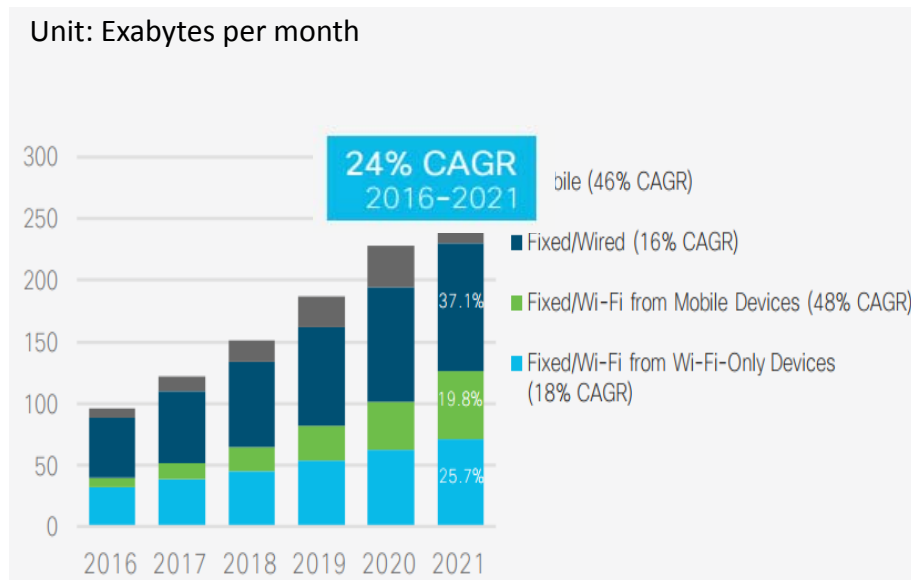
LTE 品牌客戶大有斬獲 成長 150~200%

- 2017 上半年 LTE SW/LNA 整體營收已超過2016 全年。
- LTE SW/LNA 的成長主要來自中國頂尖品牌。
- 2017 下半年將持續進攻全球品牌客戶。

單位: 百萬新台幣



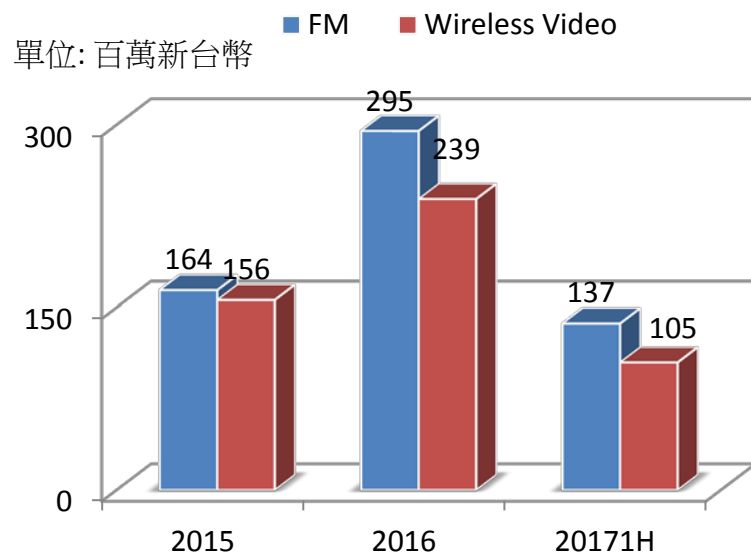
Unit: Exabytes per month



資料來源: Cisco VNI, 2017

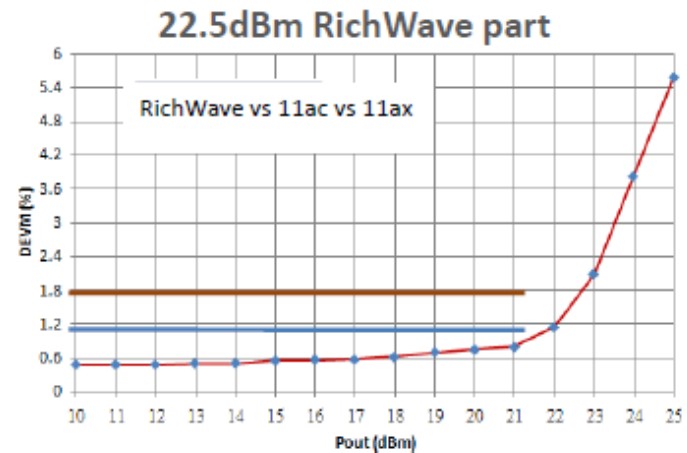
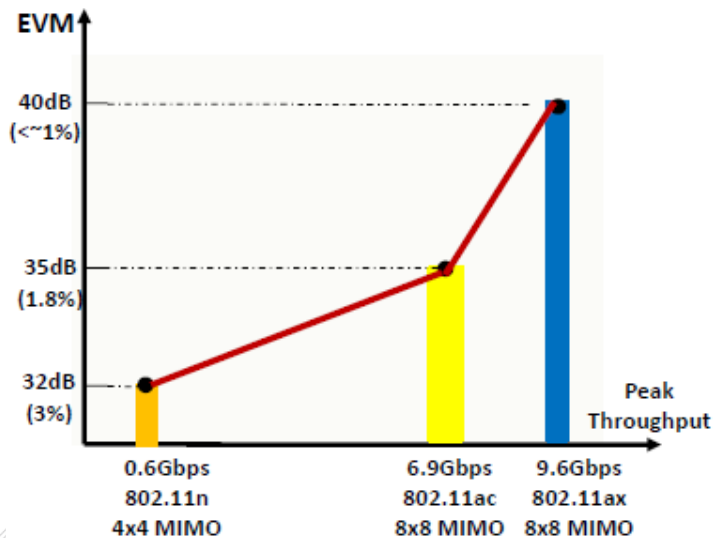
廣播晶片與無線影音

- 持續擴展廣播晶片與無線影音產品。
- FM 在韓國旗艦手機再下一城。
- 用自有技術開發，應用於智慧家庭、倒車後視、無人機... 的長距離無線HD 影音晶片持續出貨。



立積未來幾年的優勢

	產業趨勢	立積的優勢
WiFi	11AC => 11AX+ 1AC MIMO 2x2~4x4 In Router/Cable/STB/PON	優良的 EVM 技術 優良的 Noise 技術 完整的 FEM&PA+被動元件整合 簡潔的製程技術
智慧家居	智慧音箱與影音產品	優良的 EVM 技術 特殊FEM的靈活應用



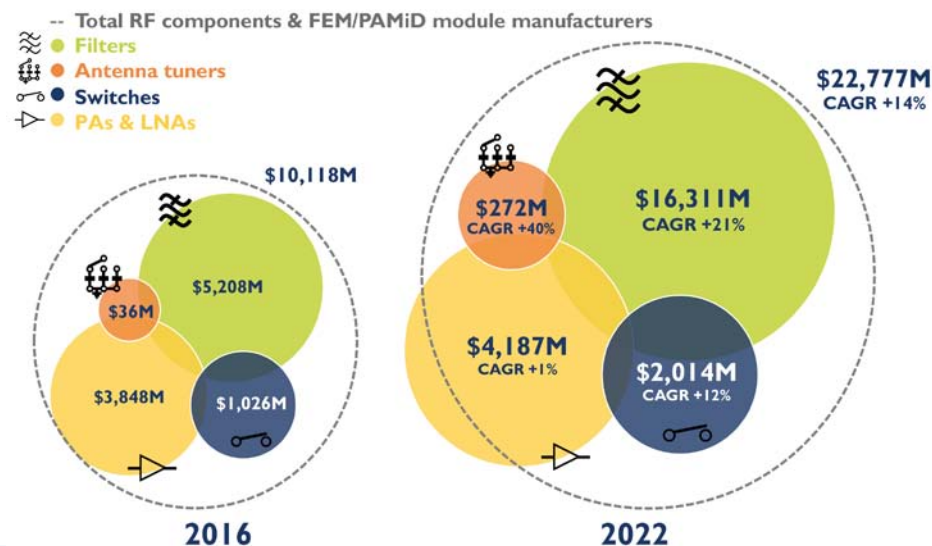
EVM floor and EVM win

立積未來幾年的優勢

	產業趨勢	立積的優勢
IOT	Multiple protocol	完整的 FEM&PA+被動元件整合 低功率技術
LTE	WiFi-Mob => 11AC CA 複雜度 & PAMid blended	小封裝/低功率 WiFi-Mob FEM 技術 完整的主動元件與整合
5G	Antenna/Active/Integrated EM- Lumped-concept obsolete	天線技術與天線/主動元件整合

這是一個在六年內會倍速成長的市場

**RF component and front end module ecosystem:
2016-2022 market outlook**



(Source: RF Front End Modules and Components for Cellphones 2017 report, March 2017, Yole Développement)

立積 WiFi 802.11ac 產品以效能取勝

輸出功率

H



Video Stream



Data Connected



Set-top box



Data Connected



IOT

L

	Parameter	立積	Ref.
5GHz FEM	Pout @1.8% EVM	22.5dBm	22.5dBm
	Pout @1.8% EVM	20dBm	19dBm
	Pout @1.8% EVM	16dBm	16dBm
2GHz FEM	Pout @3% EVM	27dBm	26dBm



RichWave