

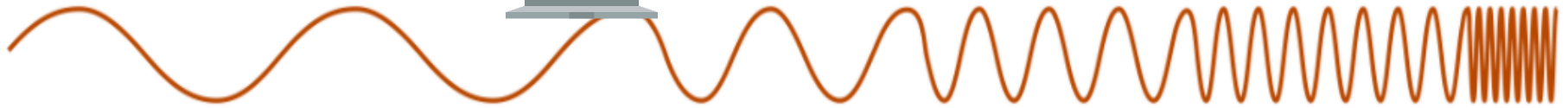
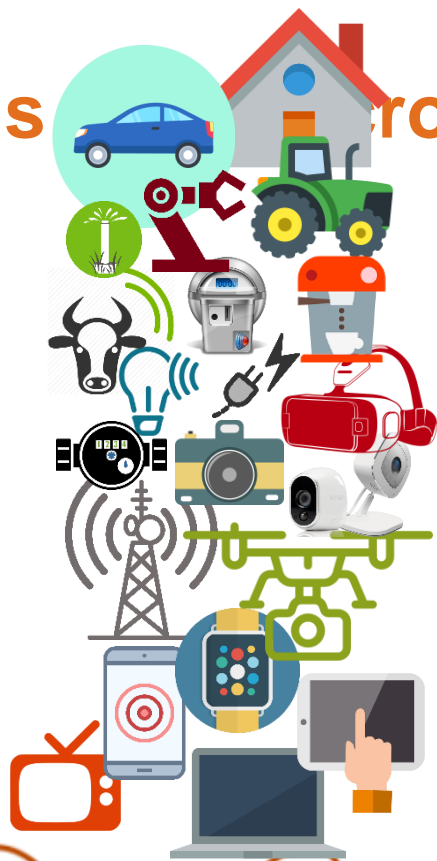


***Devices, Spectrum, and Emerging
Test Trends in the 5G Era***

High Level Trends for 2019



Spectrum is crowded



3 kHz

6 GHz

30 GHz

300 GHz

New Spectrum Opening

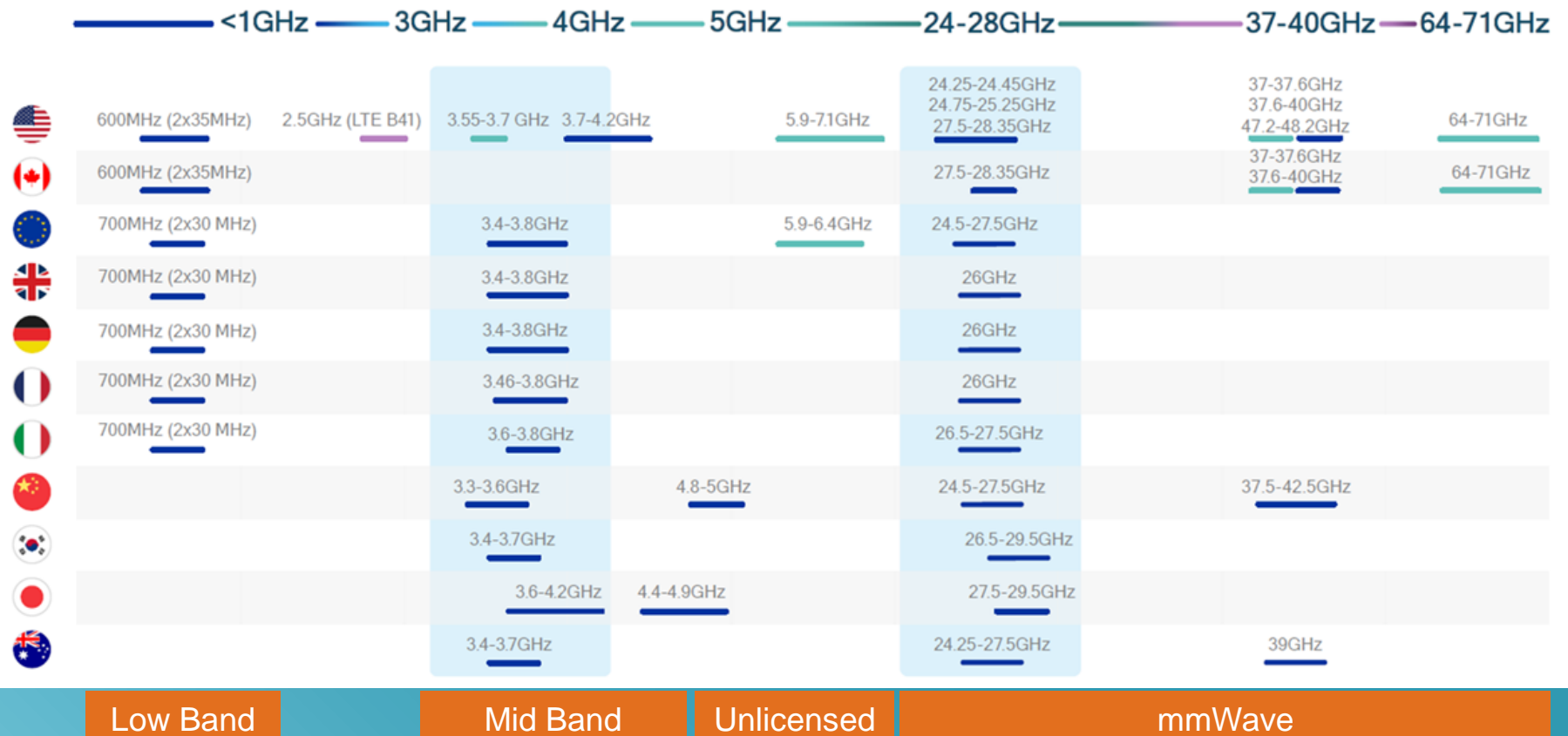
“6 GHz”
Unlicensed

mmWave

Electromagnetic Spectrum

5G Global Spectrum Exploration

Sub 6GHz (FR1) & mmWave (FR2)



Global 5G Deployments



FCC puts gigabit Wi-Fi on the roadmap by opening up new wireless spectrum



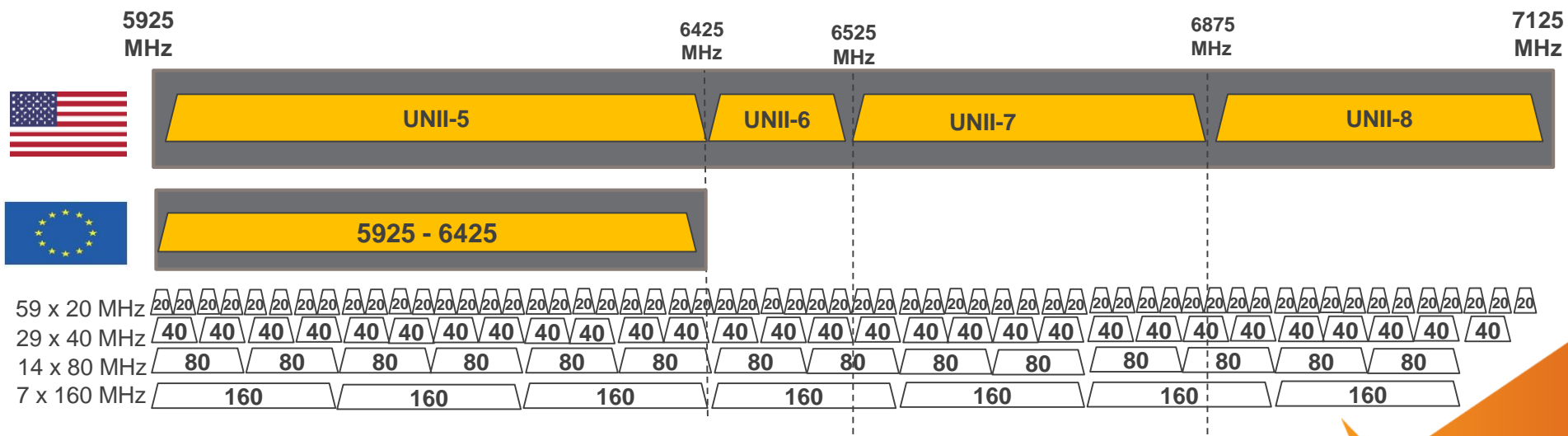
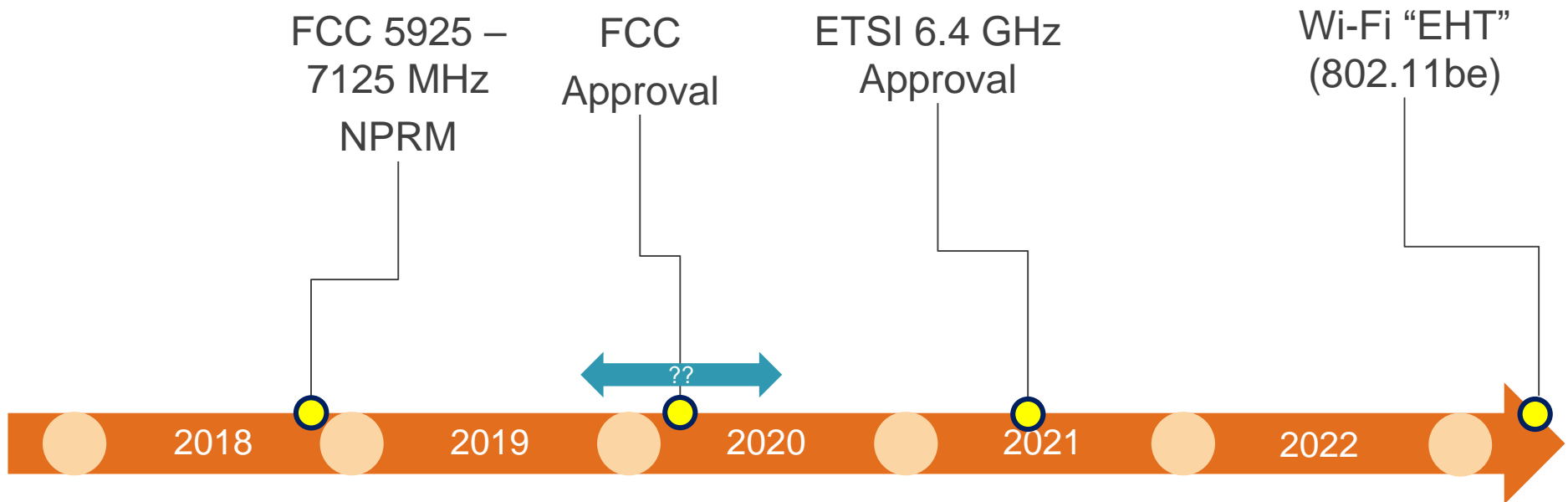
Devin Coldewey @techcrunch / 1 week ago

Comment



6 GHz Band enables global deployment of 160 MHz Wi-Fi Channels

WiFi Regulatory Roadmap



Wi-Fi 6 (802.11ax) Deployment



Huawei Unveils AirEngine as New Wi-Fi Brand and Announces Global Mass-Market Deployment of Its Wi-Fi 6 Products

English ▾

NEWS PROVIDED BY

[Huawei](#) →

19 Apr, 2019, 14:14 IST

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SHENZHEN, China, April 19, 2019 /PRNewswire/ -- At the Huawei Global Analyst Summit 2019, Huawei and Wi-Fi Alliance (WFA) held a media roundtable meeting with the theme of "Wi-Fi 6, Unlocking Business Value." At the media roundtable, Huawei announced AirEngine as its new Wi-Fi brand, which will be applied to its full series of enterprise-class Wi-Fi 6 products. Additionally, with global media and analysts present onsite, **Huawei highlighted that its Wi-Fi 6 products have been deployed on a large scale in five major regions worldwide.**



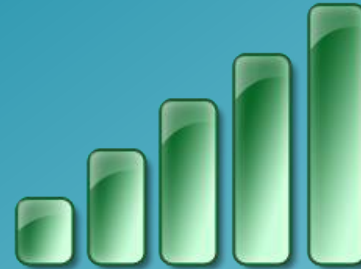
Wi-Fi 6 Certification Coming in Q3 2019



CERTIFIED

Verifying Key Specs for Wi-Fi

Range



Throughput



Battery Life

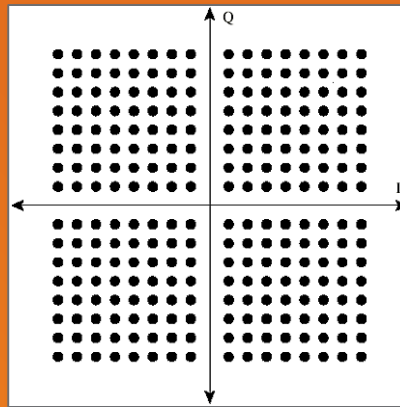


Previously, we cared about...

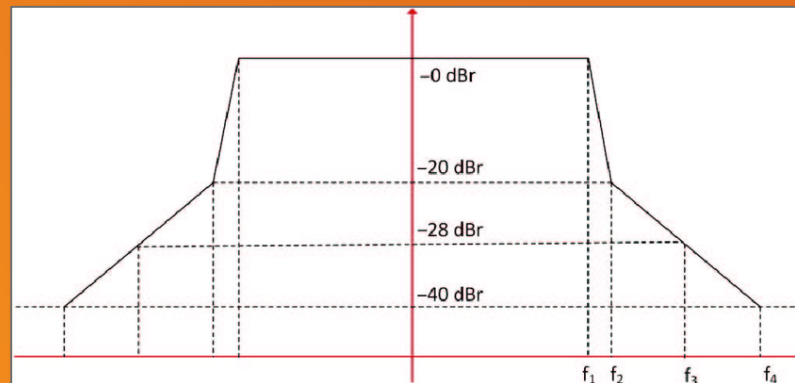
Power



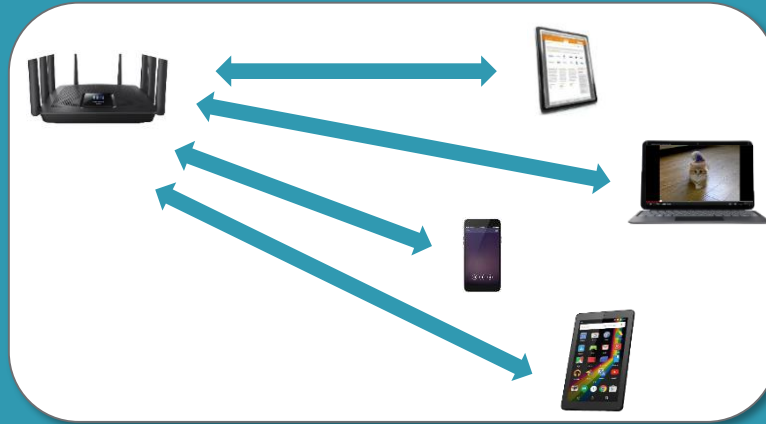
EVM



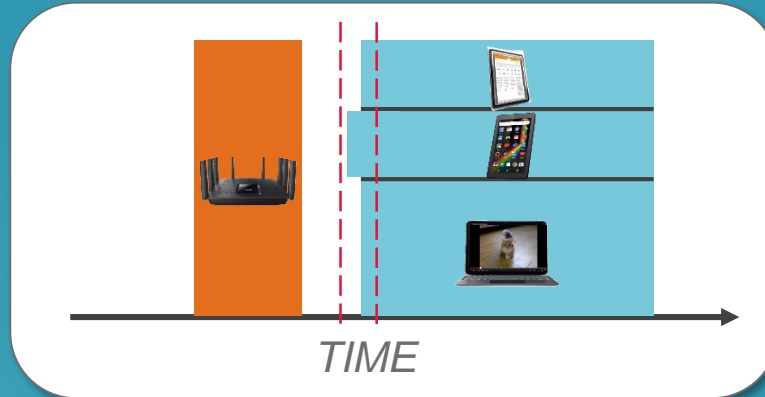
Mask



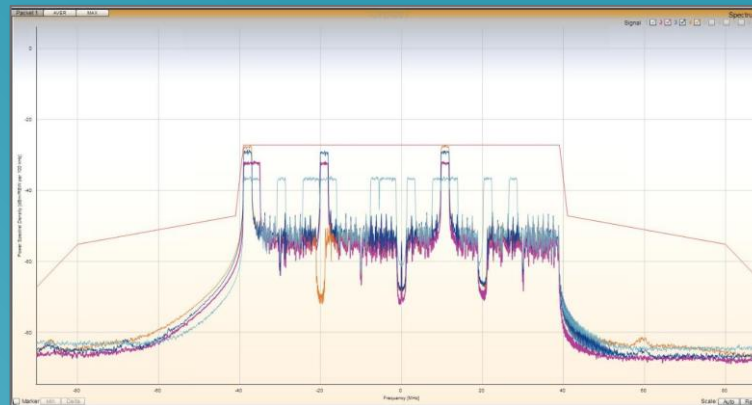
New Wi-Fi 6 Tests



Power Control



Timing



Multi-User

In 2019, Most Mobile 5G will be over Wi-Fi

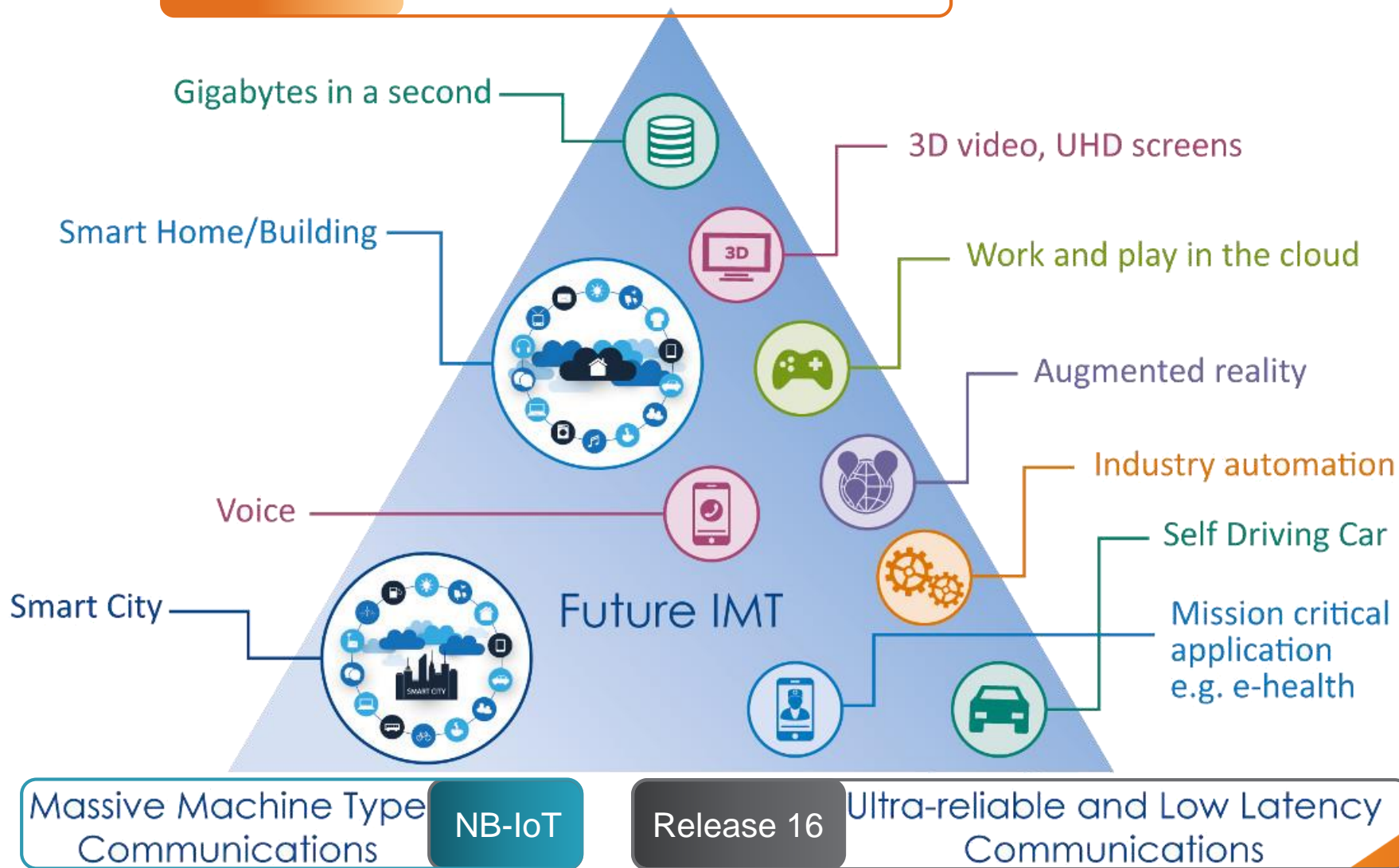


A “technology translator” for existing mobile devices

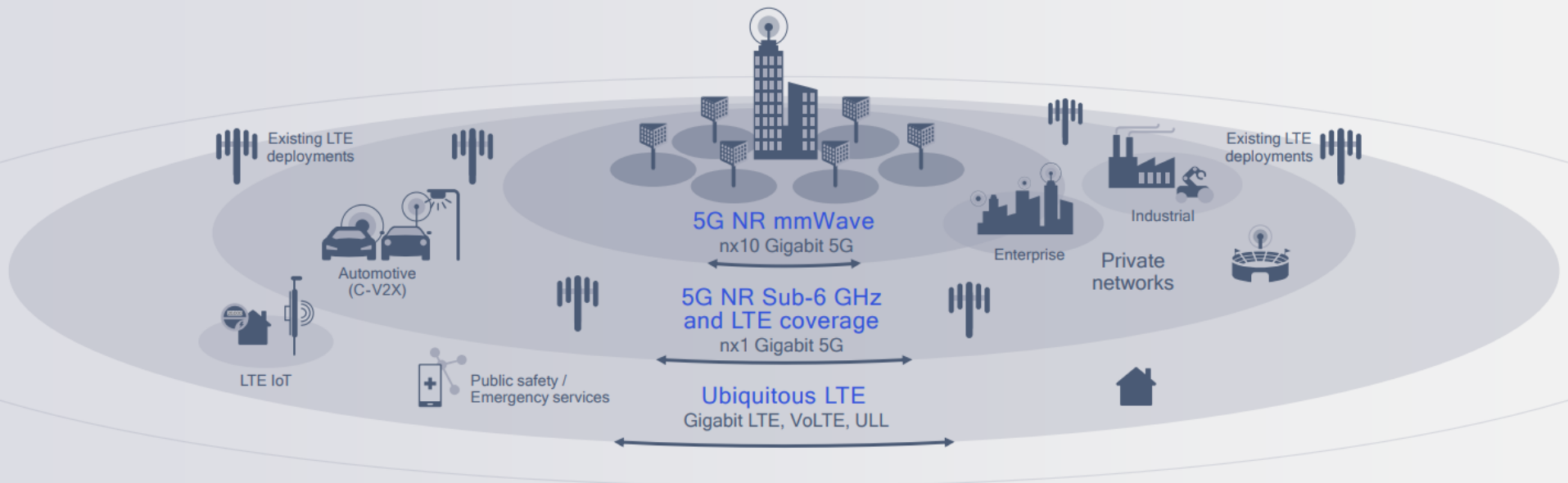
5G Use Case Revisited: eMMB, mMTC, URLLC

2019 Focus

Enhanced Mobile Broadband



It takes a range of different products in 5G



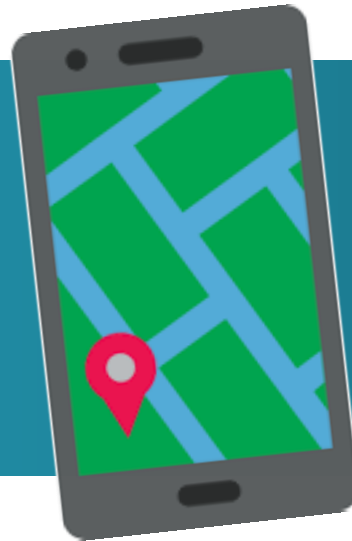
Let's explore some announced products...

5G Devices Spectrum Form Factor

Mobile Hotspot
"Pocket Router"



Handset
And Snap-on
dongles



Indoor and
Outdoor
CPE / FWT



Additional:

- 5G modules
- IoT Routers

As of April 2019: 26 Vendors have announced 5G devices
With a total of 48 announced devices

Mobile 5G Device Announcements

As of April 2018: 18
Smartphones available
or announced



Moto Z3 w/ 5G mod



LG V50 ThinQ 5G



ZTE Axon 10 Pro 5G



Samsung Galaxy S10 5G



Huawei Mate X



Xiaomi Mi Mix3 5G



OPPO Reno 5G



Samsung Galaxy Fold



Mobile Hotspot & CPE Device Announcements



Netgear Nighthawk
(mobile hotspot)



Huawei (mobile hotspot)

As of April 2019: 6 hotspots and 12 CPE devices have been announced



Inseego
(mobile hotspot)



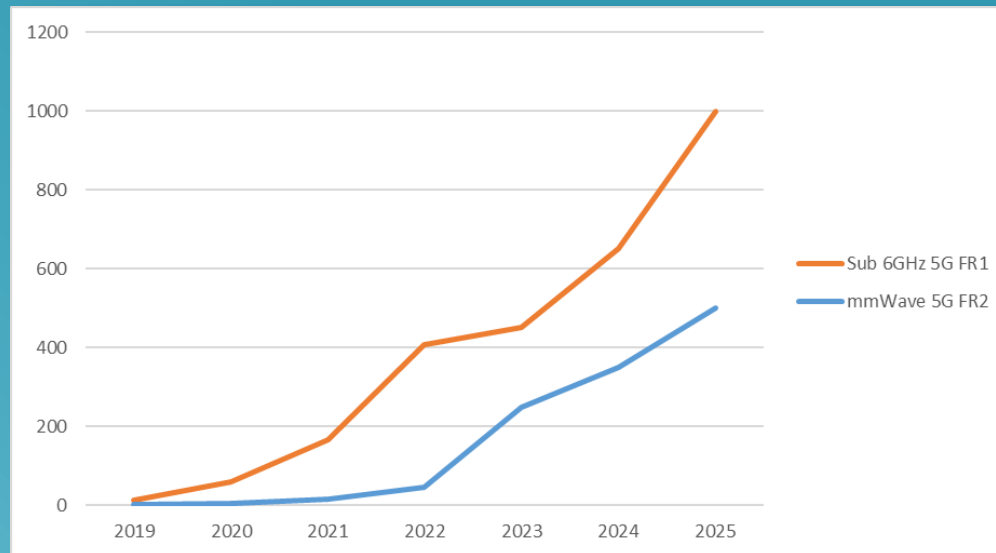
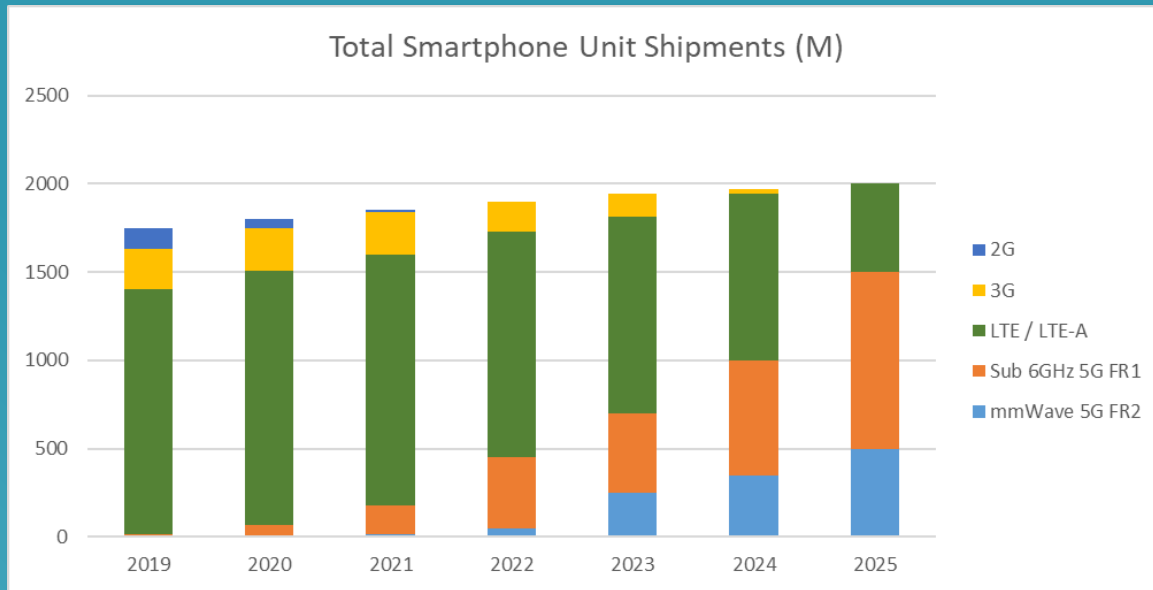
Samsung (CPE)



Huawei (CPE)

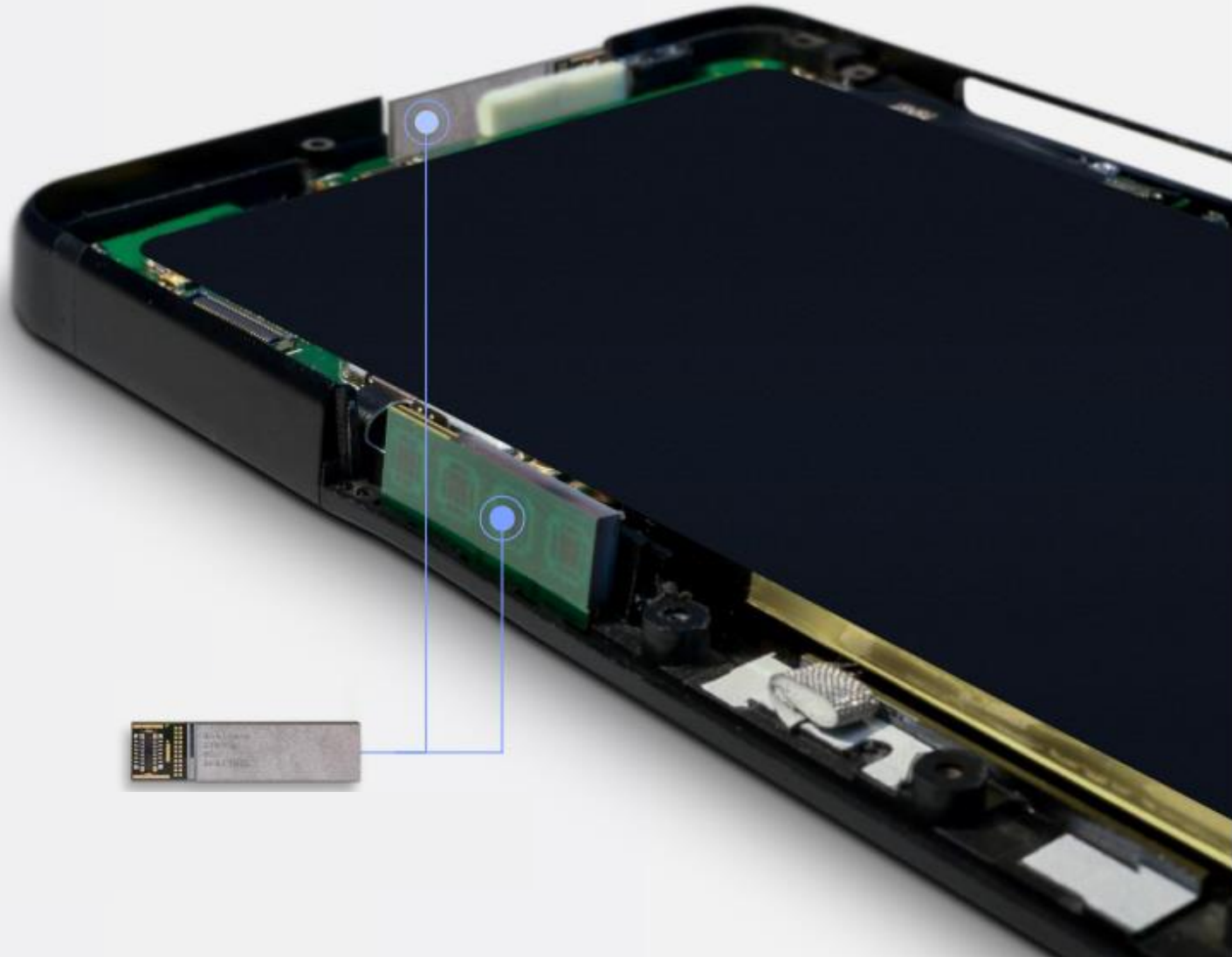


75% of Smartphones to be 5G-Enabled by 2025



Source: EE Times, April 2018

mmWave UE Form-Factor Test Challenges

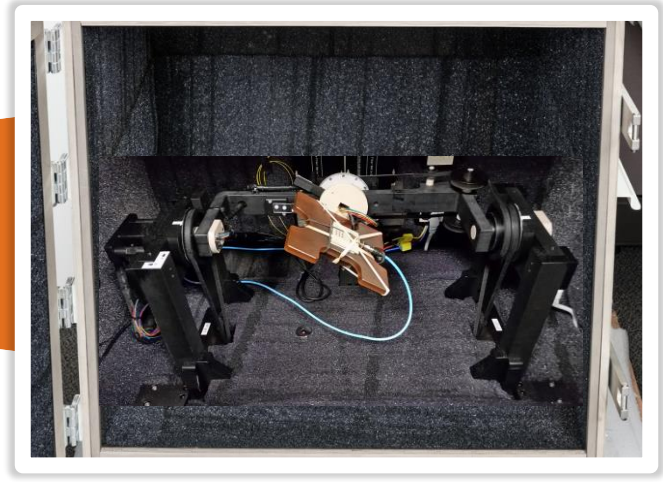


Source: Qualcomm 2018

LitePoint's Complete 5G mmWave Test Solution



**Compact mmWave OTA Test Chamber
for Design Validation Testing**



- Designed for 24" far field distance (~600 mm)
- 2-axis device positioner option
- UE and larger form-factor chambers available

So... What's New in 2019?



- Wi-Fi Alliance certifies Wi-Fi 6TM devices
 - Wi-Fi Alliance certifies Wi-Fi 6TM devices
 - Wi-Fi Alliance certifies Wi-Fi 6TM devices
- Wi-Fi 6**
CERTIFIED

