



TMYTEK

Company Profile 2020 Q3



TMYTEK

The background of the slide is a dark blue gradient with a circuit board pattern. On the right side, there are several white icons: a globe, a 5G signal icon, a bar chart, a smartphone, a Wi-Fi signal icon, a telephone handset, and an envelope. A white horizontal line with a dot at the end is located at the bottom left of the slide.

TMYTEK

TMYTEK specializes in the development of mmWave active and passive components and front-end transceiver systems and has successively received recognition from academic institutes and business partners around the world.



2014
Founded

US\$3.8M
Capitalization

A+ series
Closing H2 2020

48
Employees
(2020 Jul)



5G RU
O-RAN compliant mmWave
Radio Unit (RU) modules

5G XBeam
Novel Over-the-Air (OTA)
test solution

5G BBox
Best mmWave R&D tool



HQ
New Taipei, Taiwan

TMXLAB
New Taipei, Taiwan

R&D Center
Hsinchu, Taiwan



Founder & President

Su-Wei Chang



Ph.D candidate, UMass Amherst



Pacific Asia BD, Nicomatic, France
mmWave receiver engineer, ASIAA
Visiting engineer, Harvard-Smithsonian CfA



40s SCI papers · 500s cited



Antenna design, microwave components,
mmWave receiver design, MMIC design,
cryogenic electronics



Co-founder & VP

Ethan Lin



MS EE, NCTU



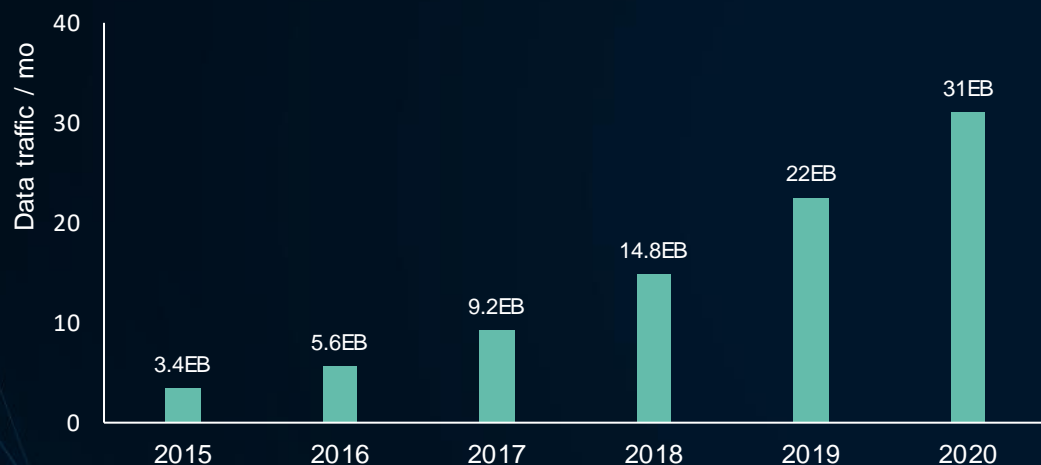
Founder & CEO, Scarlet Tech
Software chief engineer, HTC
Co-founder, Centrum Embedded Systems
IR Electronics Engineer, ASIAA



Embedded software, software engineering,
System architecture, digital marketing &
startup

5G NR adopts mmWave

Large spectrum resources in mmWave enhance mobile communication radically

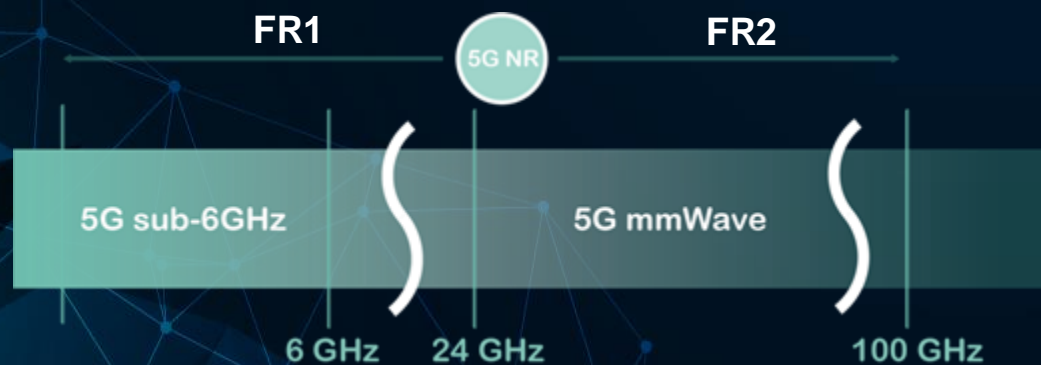


60x

Growth of traffic from 2013 to 2024

136B GB

Monthly traffic in 2024



100x

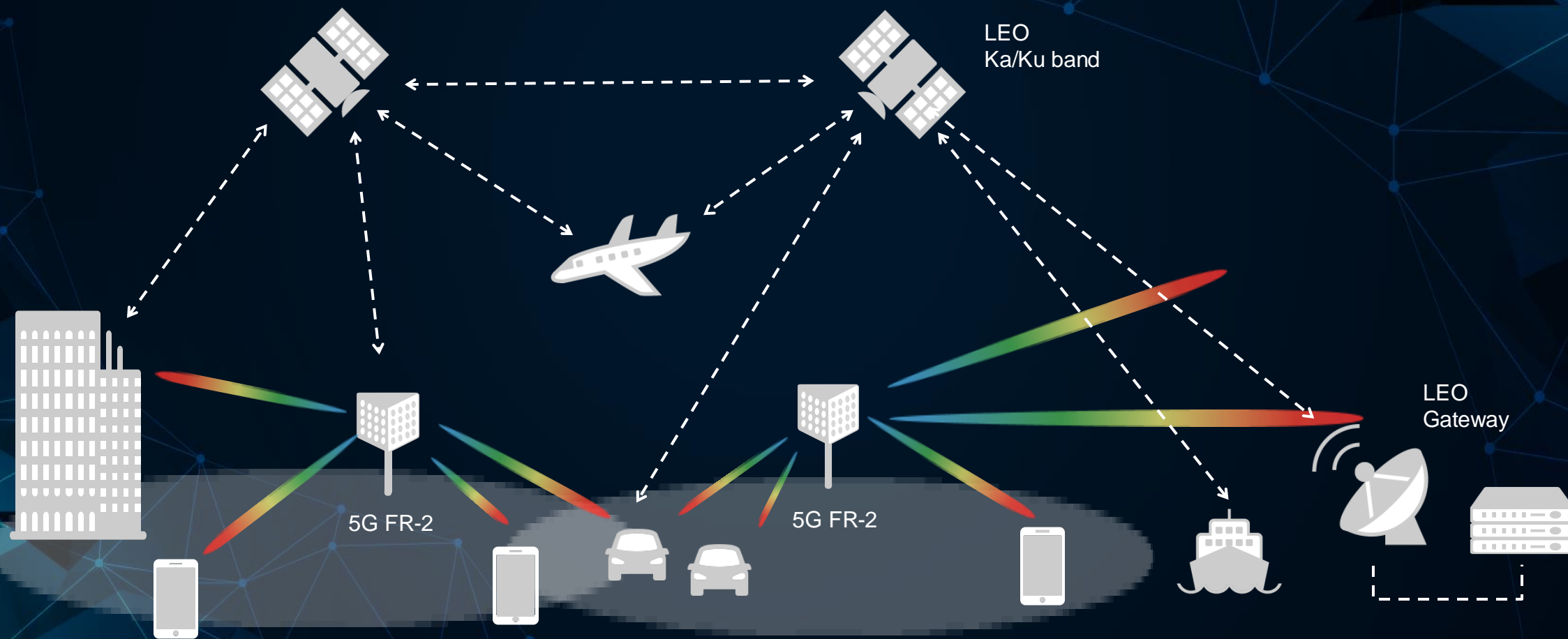
Peak speed

50yrs

5G~10G

mmWave for communication

RF hardware and beamforming algorithm are the solutions



4G Base station vs. 5G base station



4G Network

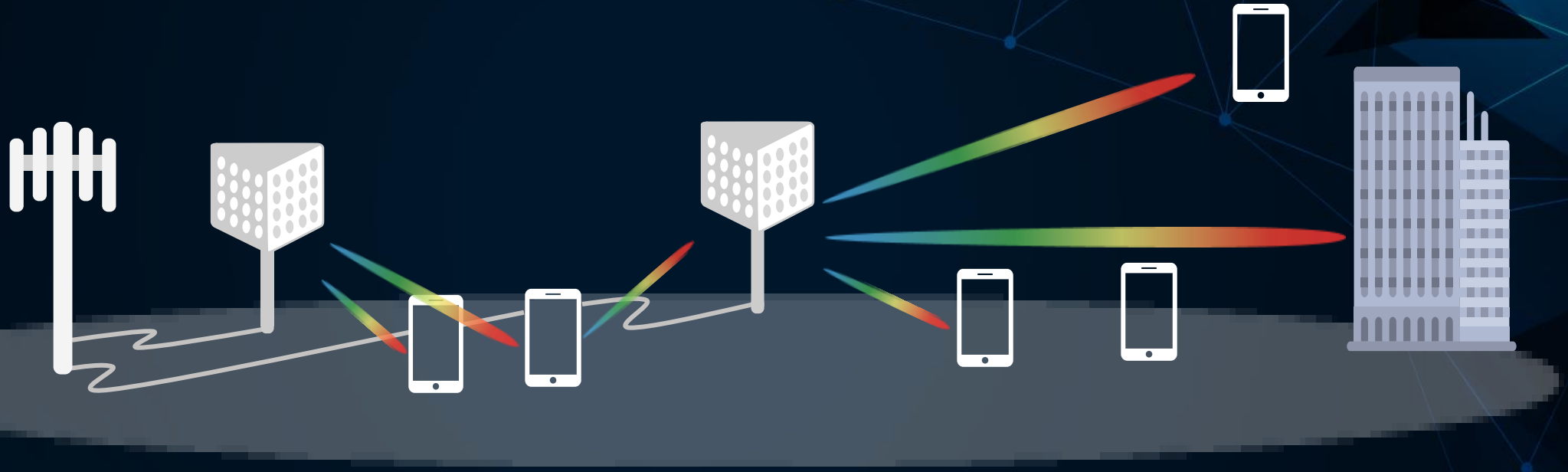


5G Network

Since 5G mmWave has higher transmission loss, the coverage is less than 4G LTE. For example, 4G macro cell can cover 2-40 km. For 5G mmWave, it requires many small cells to cover same area.

Beamforming is the key to 5G NR mmWave

Antenna array and beamforming technology are the solutions



Beam Tracking

Track and distinguish the beams coming from gNB

Beam Steering

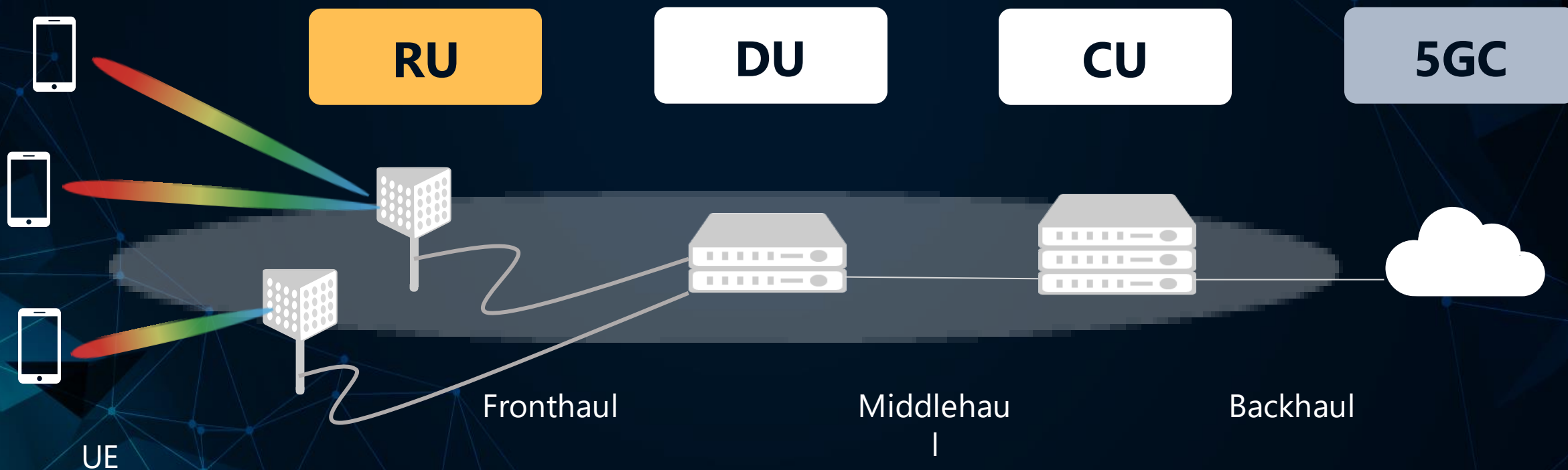
UE changes uplink beams to match the beams from gNB

Beam Switching

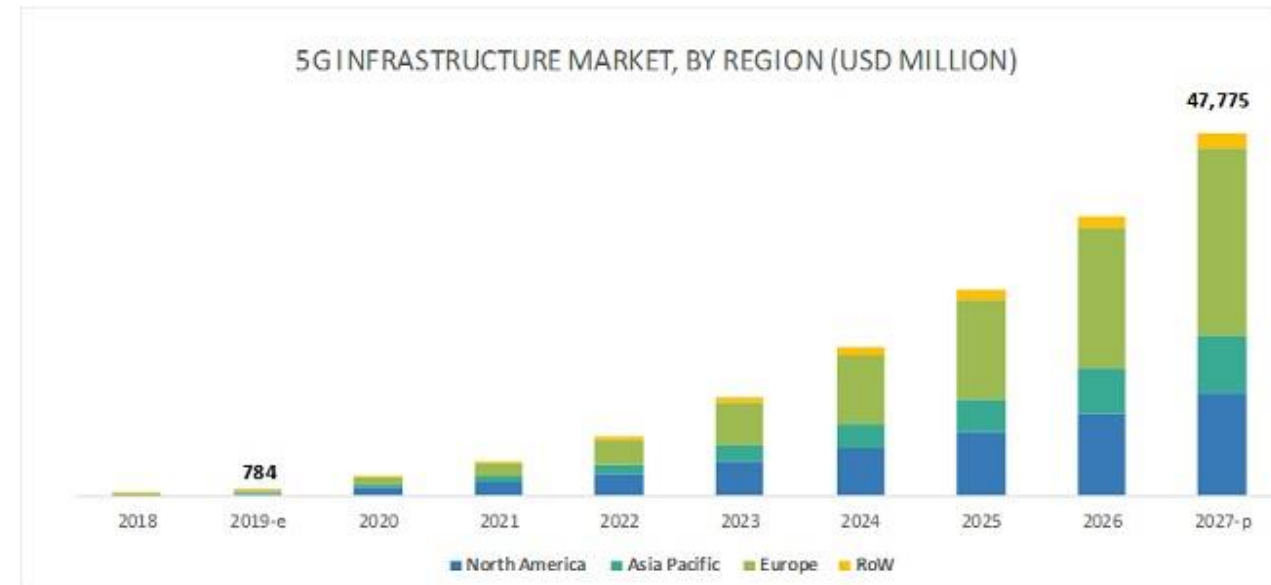
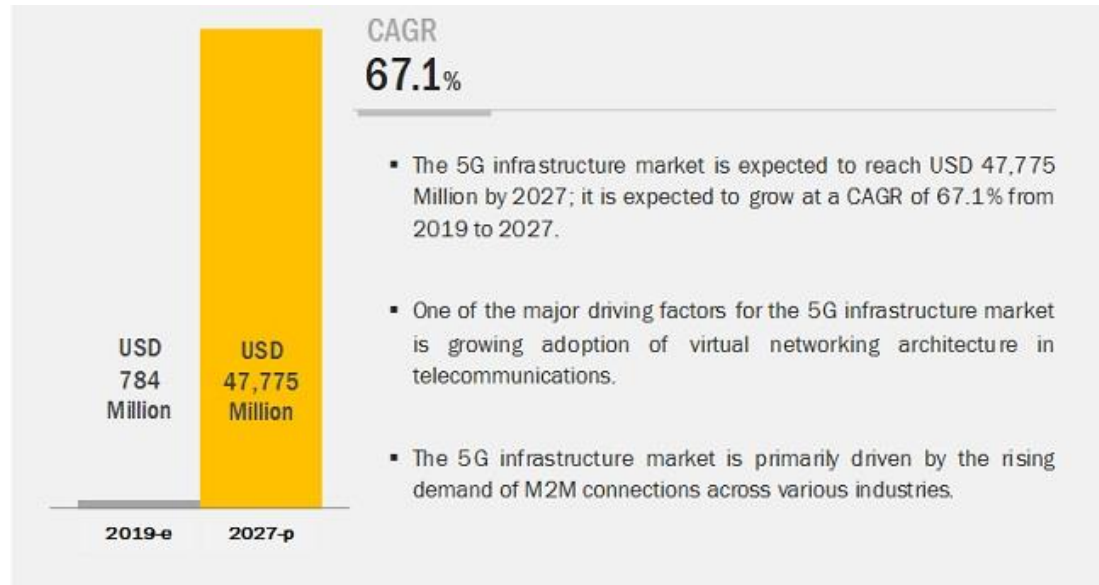
Switch between candidate beams to find the best signals

5G O-RAN

mmWave Array · Beamforming · Open Structure



5G base station Market



- Addressed market : Public network and Private network
- Motivation for 5G base station
 - 5G vRAN/ORAN : To save 30% cost and bring up the market growth
 - mmWave & transmitting power : The density of mmWave base station is 3-4X higher
 - More applications : Smart city, Commercial private 5G networks, Autonomous driving networks

Bottleneck in mmWave industry

Resolve major problems with advanced technology

Problem 1

**Absence of
R&D tool**

Solution 1

BBox

Built for antenna and
baseband /algorithm
developers

Problem 2

**Slow OTA
testing**

Solution 2

XBeam

Patented tech speeds up
the OTA by 20 times and
saves 80% cost

Problem 3

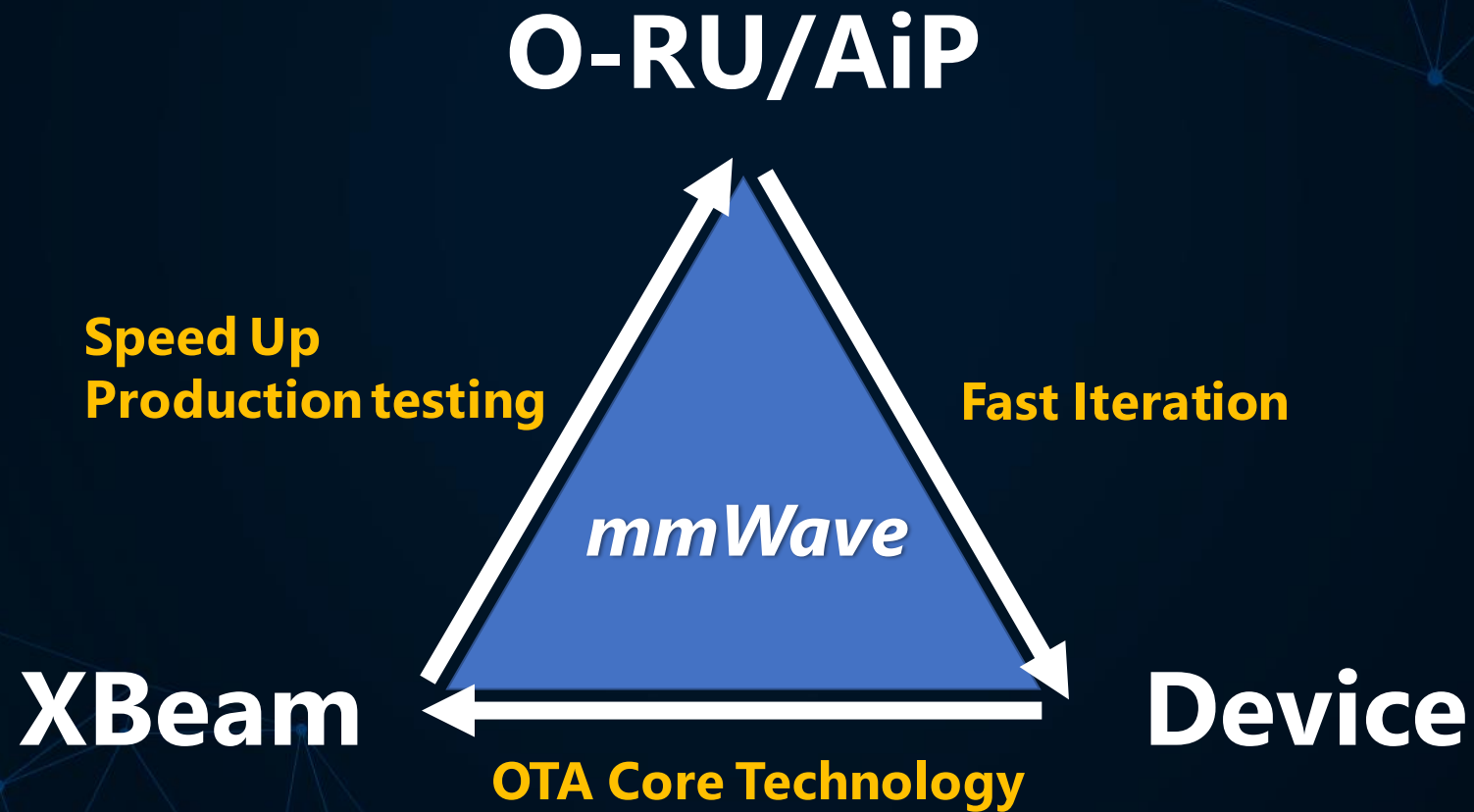
**Complex
RF FEM**

Solution 3

AiP

Excellent team build RF,
material, heat, software,
and more

The TMYTEK Flywheel and Business Model

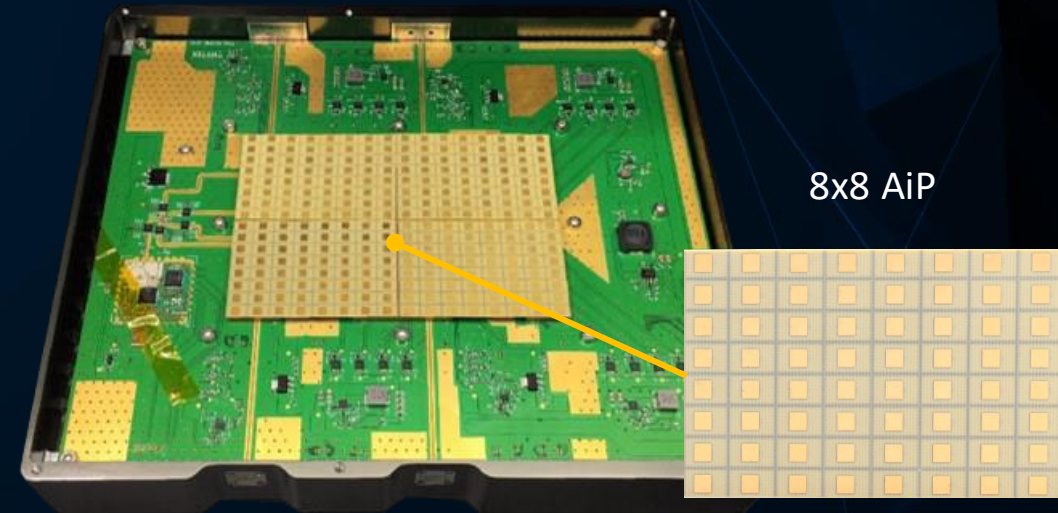
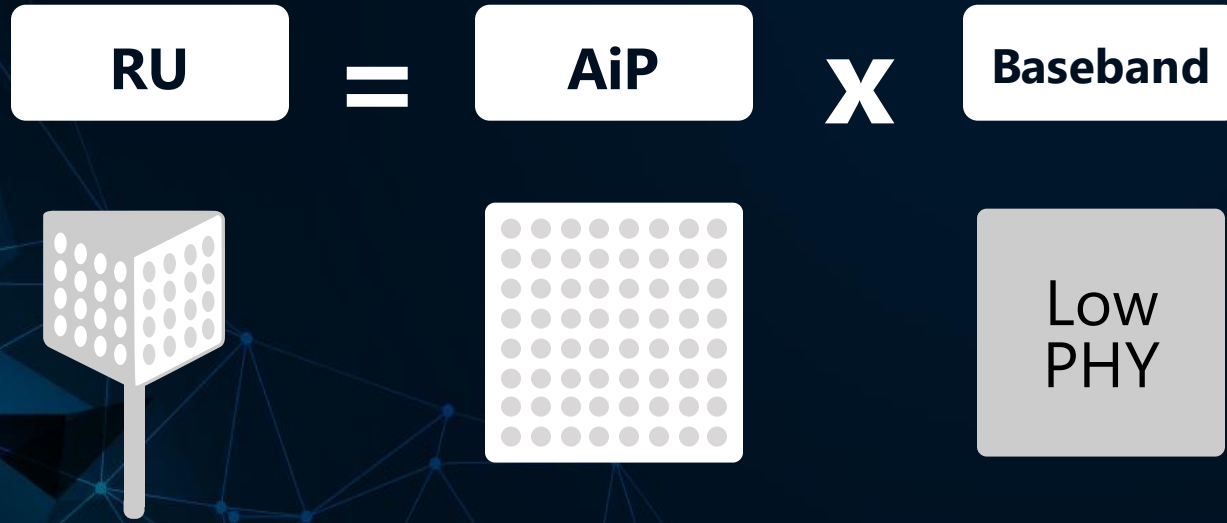


Antenna-in-Package (AiP)

TMYTEK's leading AiP technology is the key to Radio Unit (RU)

Awarded by Microwave Journal as the top 15 AiP company

Key partner of top Japanese LTCC manufactures



XBeam

Innovative OTA tool aiming at \$2B market

- 20 times faster than CATR
- 80% cost saving by using UD Box
- Seamlessly integrated with auto-testing handler
- 25 patents filed globally



MEDIATEK

Qualcomm



SPI

NGK
NTK

Gemtek

WNC

PEGATRON

Google



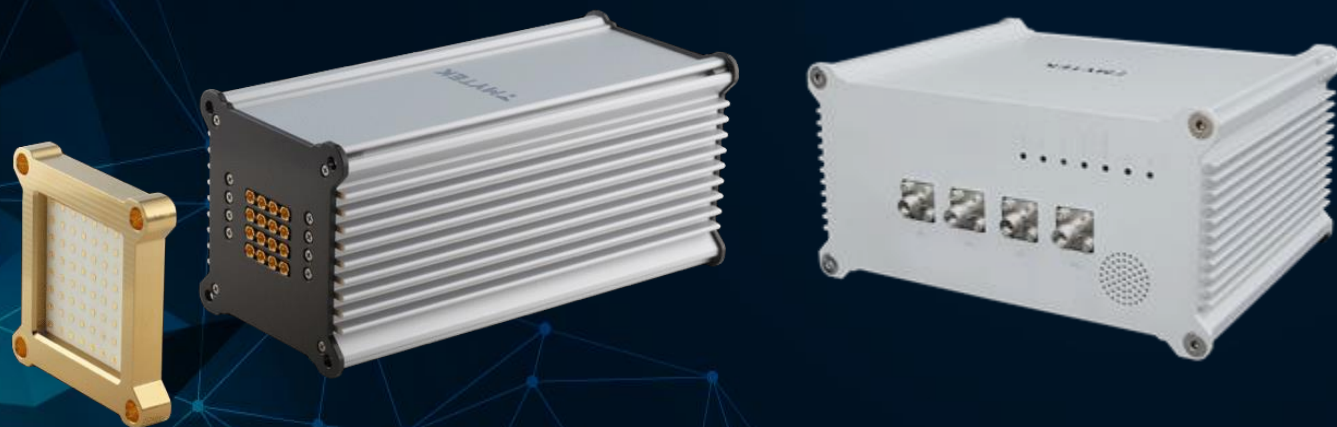
BBox & UD Box

Built for 5G NR mmWave R&D market

Antenna
Designer

System
Designer

Algorithm
Designer



CableLabs



Comcast

KDDI



中華電信
Chungwa Telecom



SoftBank

NC STATE
UNIVERSITY



NTT
docomo

Fraunhofer
Heinrich-Hertz-Institut

遠傳 FET



深圳大学
SHENZHEN UNIVERSITY



國立中正大學
National Chung Cheng University

arcadyan

TUM



清華大學
National Tsinghua University

5G Supply Chain



THANK YOU

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