NXP Wi-Fi/BT Introduction

Stephen Chen,
Sr. Business Development Manager

FEB 2021

SECURE CONNECTIONS
FOR A SMARTER WORLD

CONNECTING OUR WORLD

With one of the broadest portfolios of wireless technologies today, NXP is connecting our world.

Whether it’s connecting people with one another or connecting IoT devices to the cloud, our portfolio lets developers explore their most innovative ideas with confidence and trust.

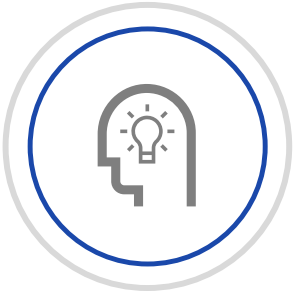
NXP is delivering complete solutions for powering smarter, more connected devices – making lives easier, safer, and more convenient.

MAJOR TECHNOLOGY VECTORS FOR ANY SMART DEVICE

SENSE

EVERYTHING
AWARE

THINK



EVERYTHING
SMART

CONNECT

EVERYTHING
CONNECTED

ACT

EVERYTHING
EFFICIENT

Uniquely positioned across all required building blocks

EVERYTHING **SAFE & SECURE**

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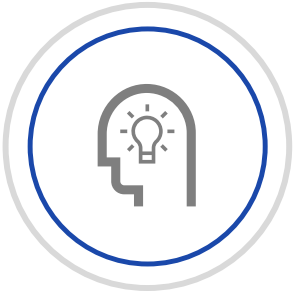

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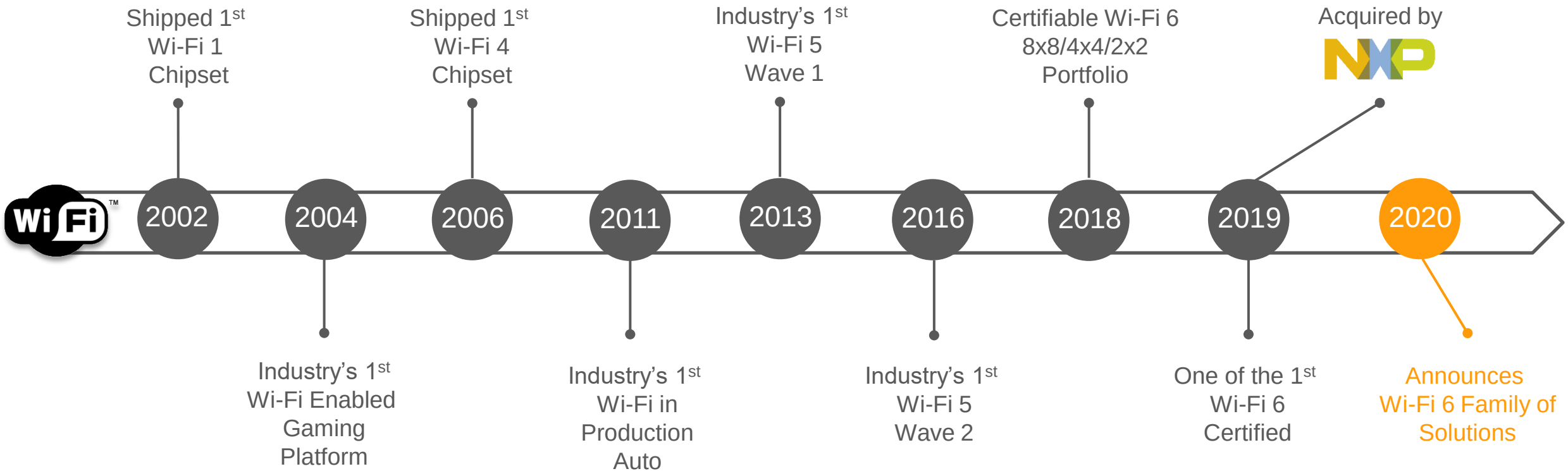
TWO DECADES OF Wi-Fi LEADERSHIP



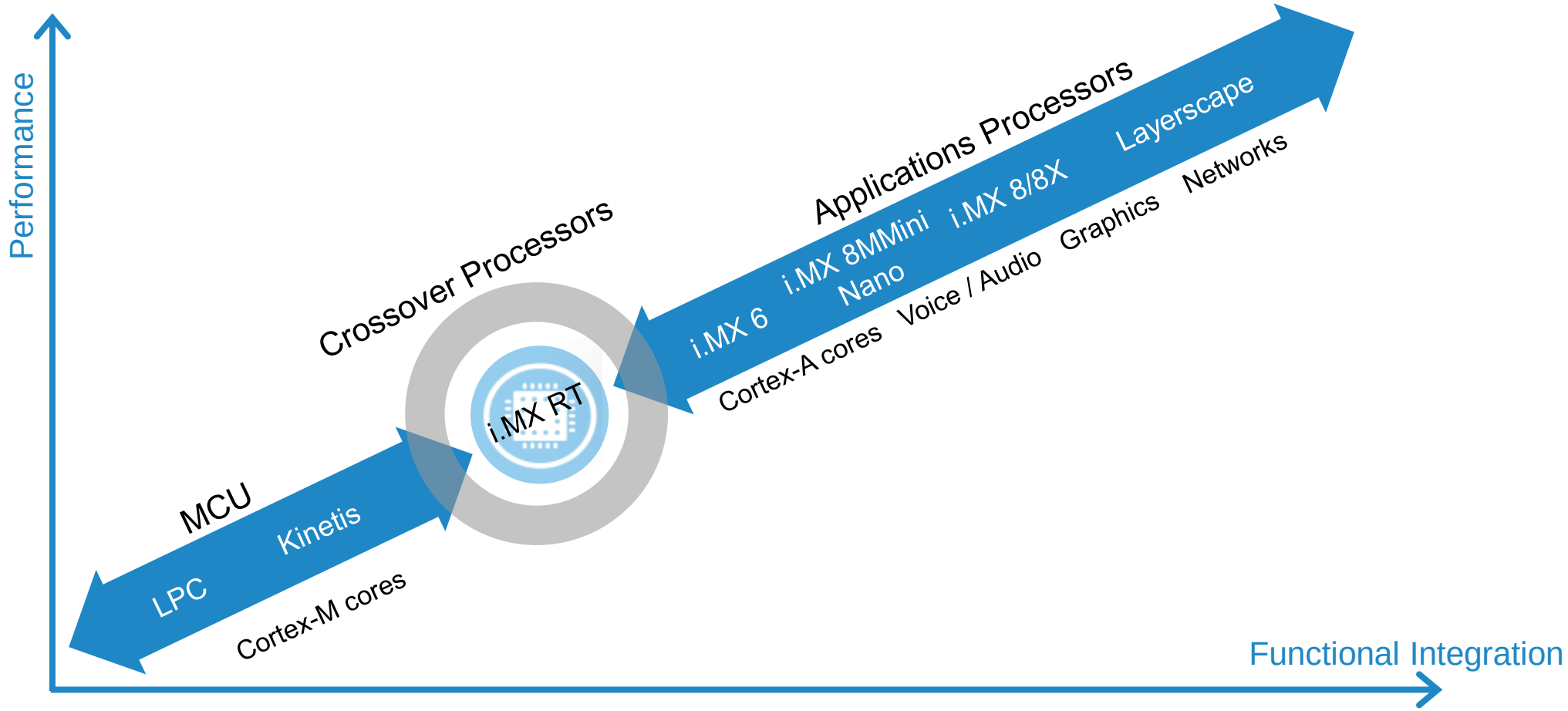
3,000
Wireless Patents

15+
Years Wireless Innovation

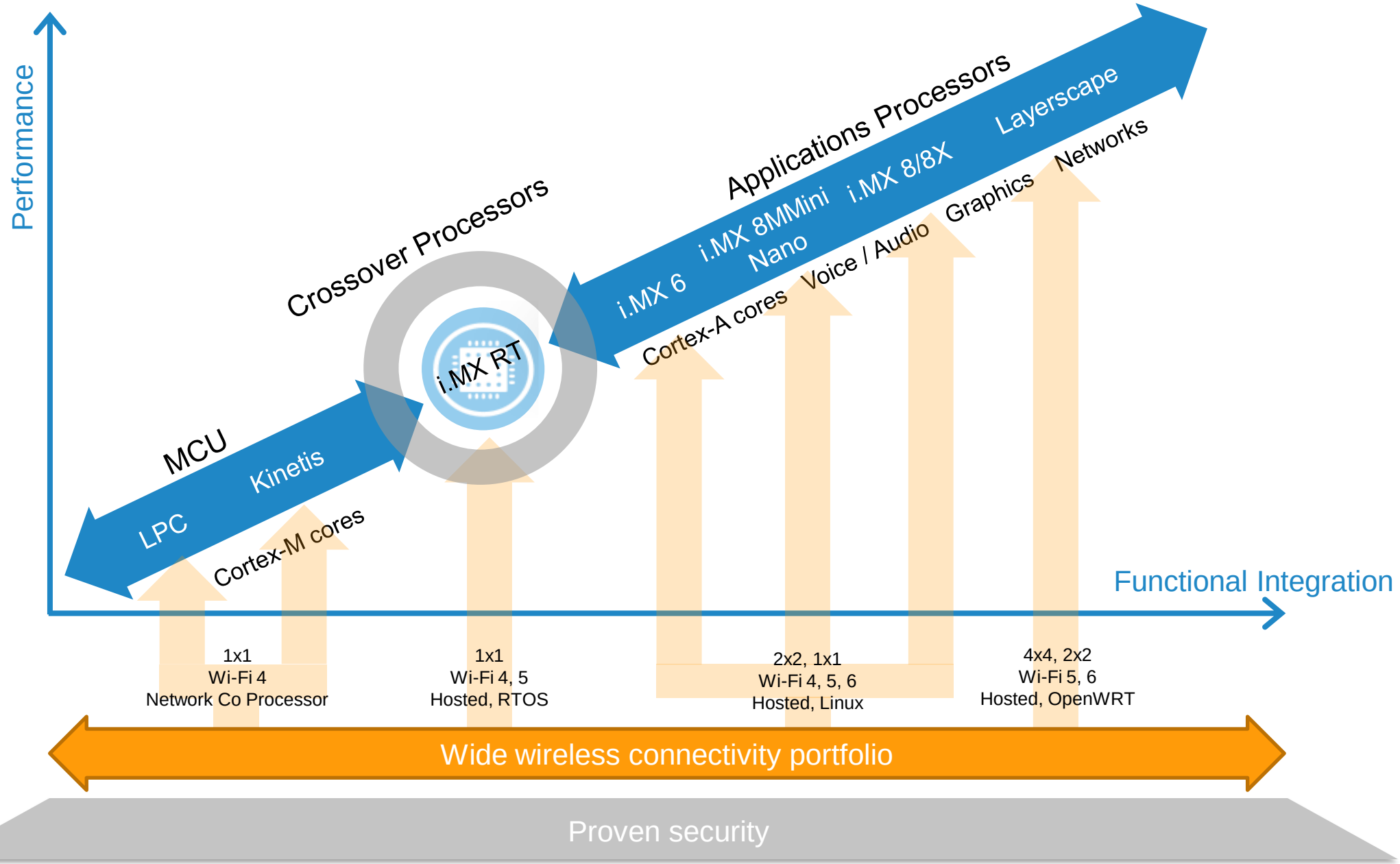
2+ Billion
Devices Shipped

10
Time Wi-Fi Alliance Winner
'Outstanding Leadership and Contribution'

INTEGRATING Wi-Fi INTO NXP'S SCALABLE EDGE COMPUTING CONTINUUM



INTEGRATING Wi-Fi INTO NXP'S SCALABLE EDGE COMPUTING CONTINUUM



KEY Wi-Fi TERMINOLOGY

Term	Definition
Wi-Fi Generation	
Hosted vs Host-less	
MIMO configuration (1x1, 2x2, 4x4)	
Single Band (SB), Dual Band (DB), Tri Band (TB)	
CDW (Concurrent Dual Wi-Fi)	

KEY Wi-Fi TERMINOLOGY

Term	Definition
Wi-Fi Generation	Wi-Fi 4 – 802.11n Wi-Fi 5 – 802.11ac Wi-Fi 6 – 802.11ax Wi-Fi 6E – 802.11ax + 6GHz
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MIMO configuration (1x1, 2x2, 4x4)	• Number of **input x output** [spatial] streams and antennas. – Ex. 2x2 represents 2 input streams and 2 output streams running on 2 antennas (Rx and Tx alternate) • OEMs will typically determine total bandwidth required and specify 1x1 or 2x2. – Ex: Wi-Fi 5 throughput is approximately 433Mb/s per stream. 1x1 = 433Mb/s, 2x2 = 866Mb/s.
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Single Band (SB), Dual Band (DB), Tri Band (TB)	• Single Band refers to a single radio that is designed to only support a specific single band (typically 2.4GHz **or** 5GHz) • Dual Band refers to a single radio that can be configured to support one of two bands (typically 2.4GHz **and** 5GHz) • Tri Band for NXP refers to a single chip supporting one of three bands (2.4 GHz, 5GHz, and **6GHz**)
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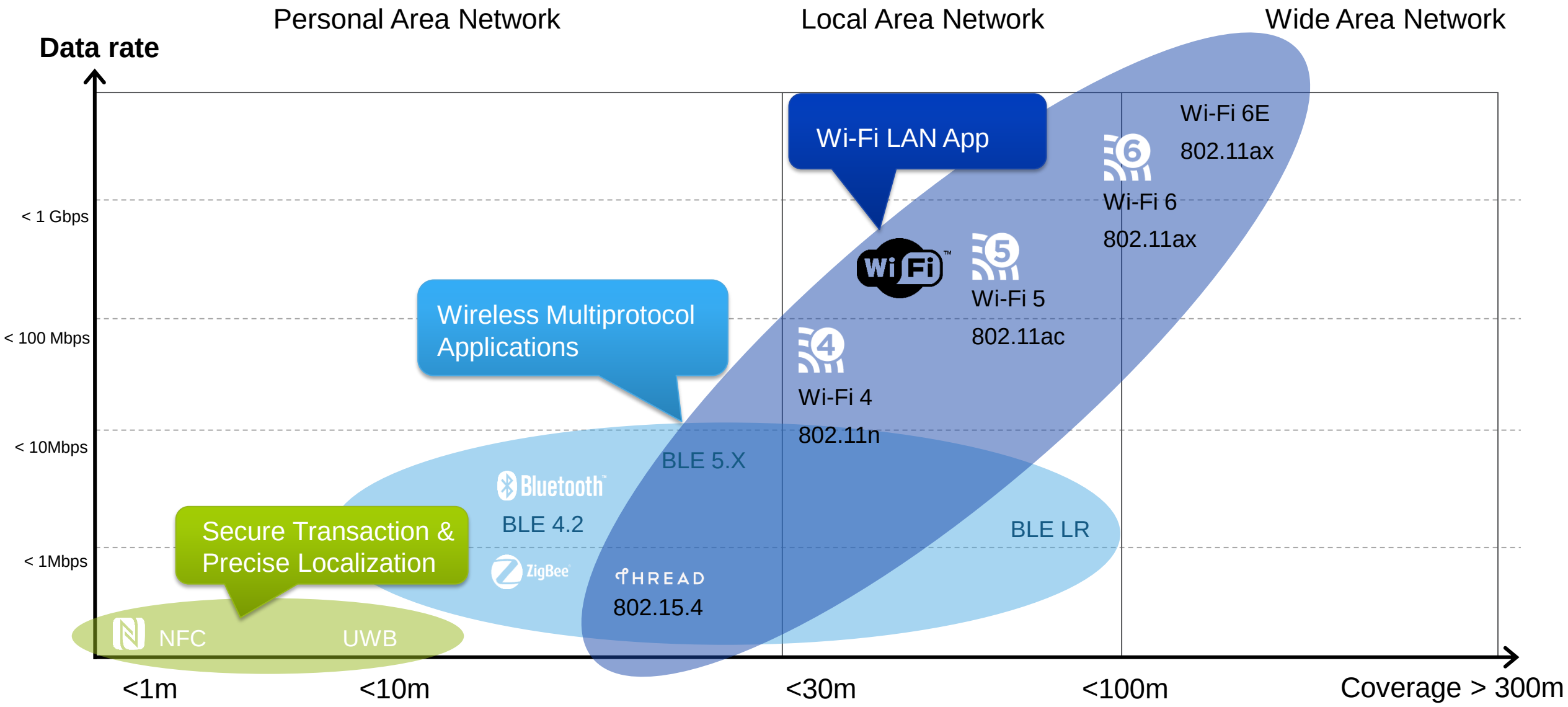
CDW (Concurrent Dual Wi-Fi)	• Feature to have 2 independent Wi-Fi systems on a single chip. Which include two independent MACs with ability to drive one of two **independent** radios (2.4GHz radio or 5(/6)GHz radio) – Ex: our current CDW solution, W9098, has 2 complete MAC, BB, RF to support simultaneous operation in both 5GHz and 2.4GHz bands (1—11ax, 1—11ac / 11n).

Technology Trends for IoT

SECURE CONNECTIONS
FOR A SMARTER WORLD

NXP WIRELESS CONNECTIVITY PORTFOLIO APPLICATIONS

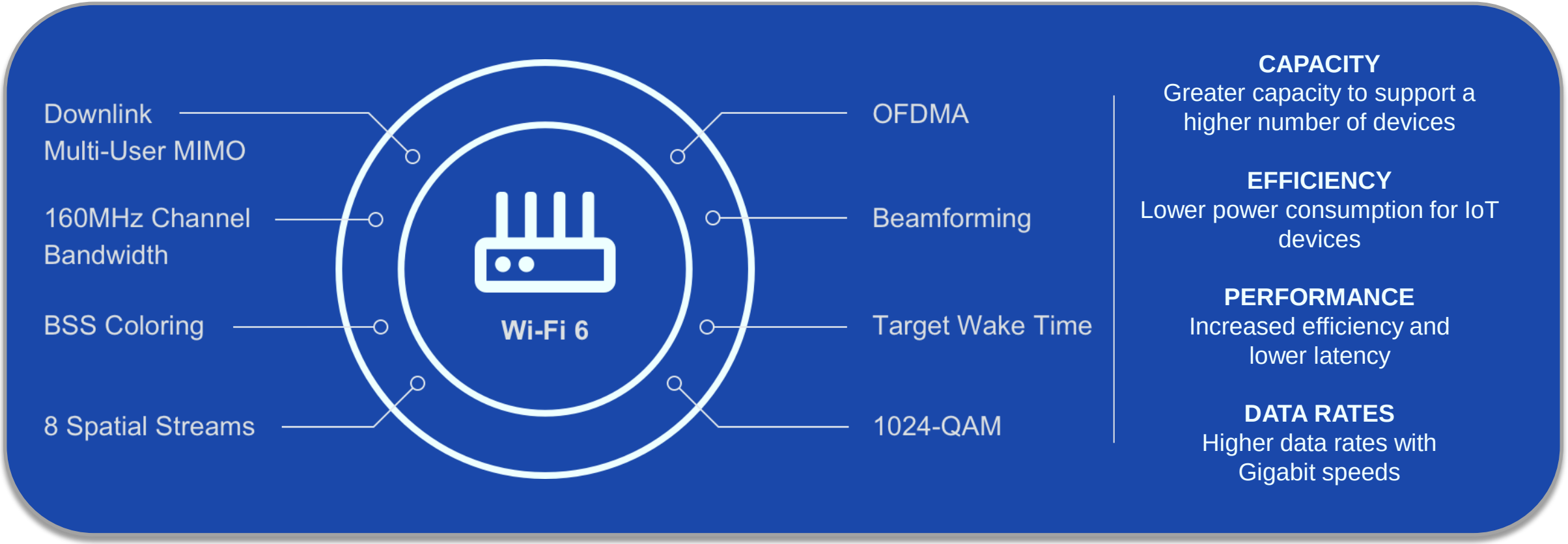


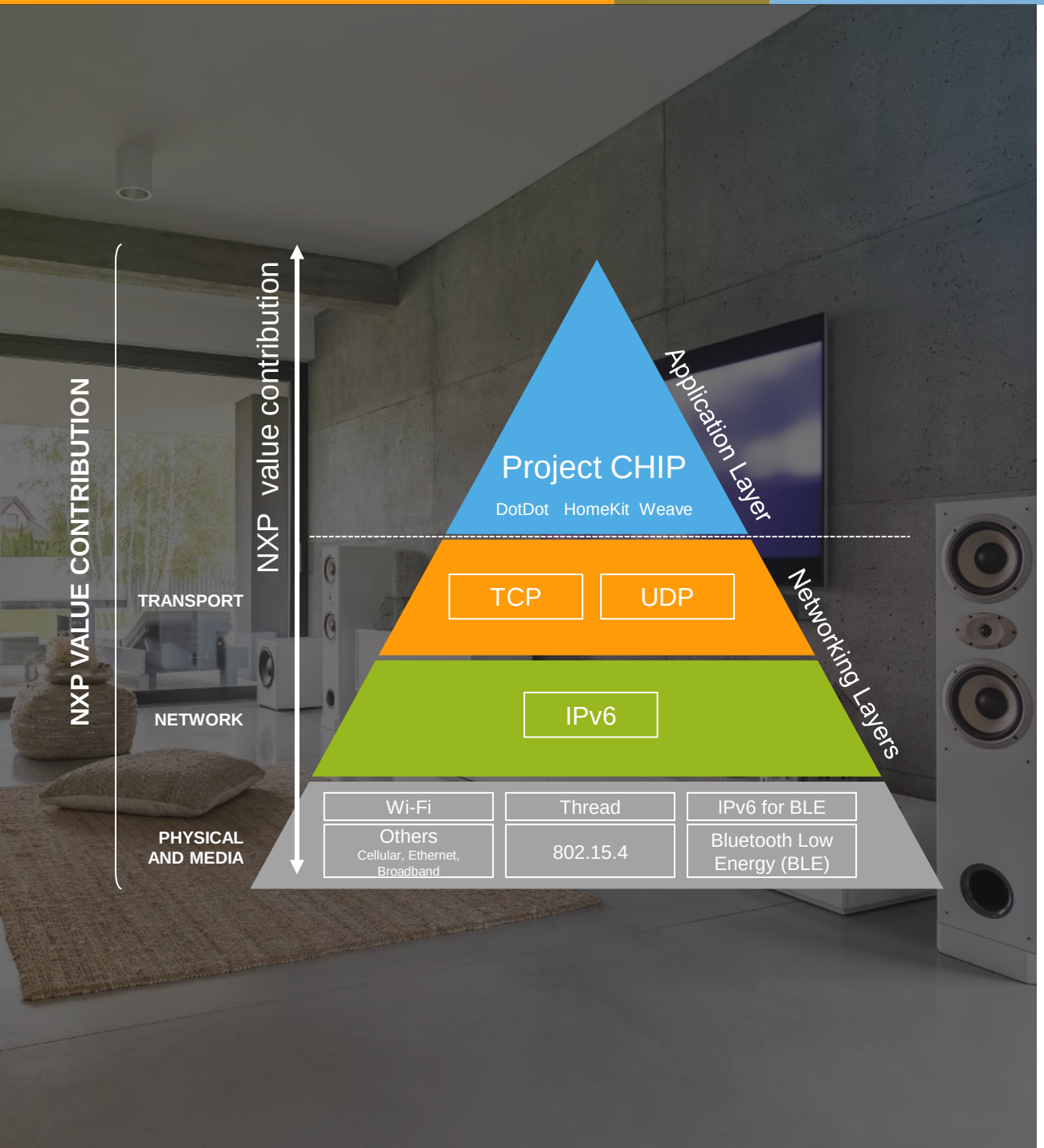
Wi-Fi OVERVIEW | PERFORMANCE

Wi-Fi Standards Capabilities		Wi-Fi 4	Wi-Fi 5	Wi-Fi 6 Wi-Fi 6E (6 GHz)
	Underlying Technology	**802.11n**	**802.11ac**	**802.11ax**
	Year Adopted	2009	2013 (Wave 1), 2016 (Wave 2)	2019
	Frequency Bands	2.4 GHz, 5 GHz	5 GHz	2.4 GHz, 5 GHz, 6 GHz (Wi-Fi 6E)
	Spatial Streams (NXP Current Product Support for Connected IoT Market)	1	1, 2	1, 2, 4
		Enabling trend to deliver customer required performance → w/ smaller devices and fewer antennas / spatial streams.		
	Channel Bandwidth (in MHz)	20, 40	20, 40, 80, 80+80, 160	20, 40, 80, 80+80, 160
	Theoretical Maximum Data Rate (NXP Current Product Support for Connected IoT Market)	72.2 Mbps (1x1, 20 MHz) 150.0 Mbps (1x1, 40 MHz)	--------- 200.0 Mbps (1x1, 40 MHz) 433.3 Mbps (1x1, 80 MHz) --------- 400.0 Mbps (2x2, 40 MHz) 866.7 Mbps (2x2, 80 MHz) 1733 Mbps (4x4, 80 MHz) ---------	143.4 Mbps (1x1, 20 MHz) 286.8 Mbps (1x1, 40 MHz) 600.5 Mbps (1x1, 80 MHz) 286.8 Mbps (2x2, 20 MHz) 573.5 Mbps (2x2, 40 MHz) 1201 Mbps (2x2, 80 MHz) 2402 Mbps (4x4, 80 MHz) 4804 Mbps (4x4, 160 MHz)
	Security	WPA2	WPA2	WPA3
	Highest Subcarrier Modulation	64-QAM	256-QAM	1024-QAM
	Range Extension Features			DCM, OFDMA
	Power Efficiency Features			TWT

Wi-Fi 6 DIFFERENCE IN IOT

Wi-Fi 6 delivers technical advancements over previous generations of Wi-Fi with several key features that enable significant increases in network capacity, power efficiency and performance.





PROJECT CONNECTED HOME OVER IP (CHIP)

GOALS OF CHIP PROJECT

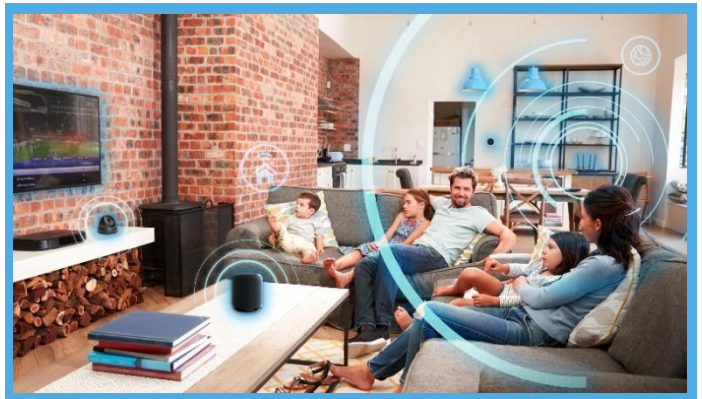
- Simplify development of IoT devices for manufacturers
- Increase compatibility of IoT devices for consumers
- Ensure security and privacy
- Create a truly smarter home (AIoT)
- Open-source approach for the development and implementation of a new, unified connectivity protocol

Source: https://www.connectedhomeip.com/

Products & Capabilities

SECURE CONNECTIONS
FOR A SMARTER WORLD

NXP INDUSTRIAL AND IOT APPLICATIONS

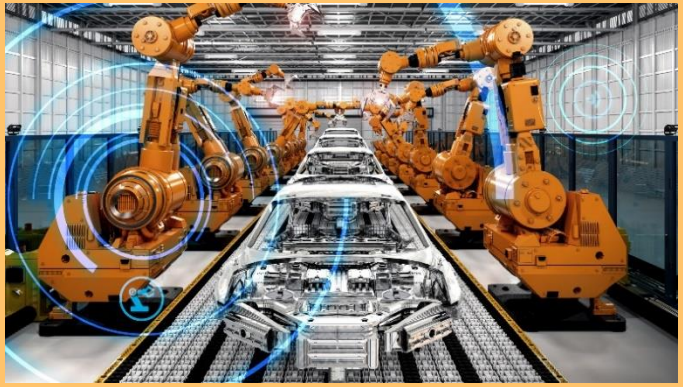


Smart Home

Web Cameras
Wireless Printers

Gaming Platforms

Voice Assistants



Automation

Asset Tracking
Safety

SMART HOME END DEVICES
PRODUCT REQUIREMENTS

Smart Home End Devices, Appliances

● → Common requirement ● → Select / Future requirement		Wi-Fi	Bluetooth	Interfaces	Host SoC	Power	Temperature	Other Features	Status
		Throughput **~ Low-Med** Range **~ Med-High**	**BLE** (Provisioning) **BLE Long Range** **BLE Mesh**	Wi-Fi: **SDIO** BT/BLE: **UART, SDIO**	**Low Cost** **Low Power** **RTOS, Linux**	Thermal Battery Operated **Standby/Sleep Modes**	**Industrial Range:** **-40℃ to +85℃**	Security: **WPA3** **[Project CHIP]**	
IW416	**1x1** **Dual-Band** **Wi-Fi 4**	20, 40 MHz	BT/BLE 5.1 BLE Long Range BLE Mesh	SDIO USB UART	i.MX RT Family FreeRTOS	Battery Operation IEEE Power Save	-40℃ to +85℃	WPA3 [Project CHIP] capable	**Production**
MW320	**1x1** **Single-Band** **Wi-Fi 4** **Integrated MCU**	20 MHz	None	UART (for Network Co Processor)	Integrated CM4F FreeRTOS LPC Family (for Network Co Processor)	Battery Operation IEEE Power Save	-40℃ to +85℃	WPA3	**Production**
W8987	**1x1** **Dual-Band** **Wi-Fi 5**	20,40,80 MHz 802.11s	BT/BLE 5.0 BLE Mesh	SDIO UART	i.MX RT Family FreeRTOS i.MX 6/7/8 Family Linux, Android	IEEE Power Save	-40℃ to +85℃	WPA3 GVA/AVS Enabled [Project CHIP] capable	**Production**
W8997	**2x2** **Dual-Band** **Wi-Fi 5**	20, 40, 80 MHz	BT/BLE 5.0 BLE Long Range BLE Mesh	PCIe SDIO USB UART	i.MX 6/7/8 Family Linux, Android	IEEE Power Save	-40℃ to +85℃	WPA3 GVA/AVS Enabled	**Production**

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W8987	**1x1 Dual-Band Wi-Fi 5**	20,40,80 MHz 802.11s	BT/BLE 5.0 BLE Mesh	SDIO UART	i.MX RT Family FreeRTOS i.MX 6/7/8 Family Linux, Android	IEEE Power Save	-40℃ to +85℃	WPA3 GVA/AVS Enabled [Project CHIP] capable	**Production**
W8997	**2x2 Dual-Band Wi-Fi 5**	20, 40, 80 MHz	BT/BLE 5.0 BLE Long Range BLE Mesh	PCIe SDIO USB UART	i.MX 6/7/8 Family Linux, Android	IEEE Power Save	-40℃ to +85℃	WPA3 GVA/AVS Enabled	**Production**

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AUDIO, VOICE & CONTROL
PRODUCT REQUIREMENTS

Smart Speakers, Smart Displays & Controllers, Multi-Channel Audio

		Wi-Fi	Bluetooth	Interfaces	Host SoC	Power	Temperature	Other Features	Status
● → Common requirement ● → Select or Future requirement		Throughput ~ **Low-Med** Range ~ **Med-High** **Synchronization**	**BLE (Provisioning)** **BLE Long Range** **BLE Mesh** **BT Classic** **BLE Audio**	Wi-Fi: **SDIO** BT/BLE: **UART, SDIO** 802.15.4: **SPI**	**Low Cost** **Low Power** **Video, Camera** **Linux, Android**	**Thermal** **Battery Operated** **Standby/Sleep Modes**	Temp Range: **0℃ to +70℃** **-40℃ to +85℃**	Security: **WPA3** **[Project CHIP]** **Voice Assist / Control**	
IW416	**1x1 Dual-Band Wi-Fi 4**	20, 40 MHz	BT/BLE 5.1 BLE Long Range BLE Mesh	SDIO USB UART	i.MX RT Family FreeRTOS i.MX 6/7/8 Family Linux, Android	Battery Operation IEEE Power Save	-40℃ to +85℃	WPA3 [Project CHIP] capable	**Production**
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W8997	**2x2 Dual-Band Wi-Fi 5**	20, 40, 80 MHz	BT/BLE 5.0 BLE Long Range BLE Mesh	PCIe SDIO USB UART	i.MX 6/7/8 Family Linux, Android	IEEE Power Save	-40℃ to +85℃	WPA3 GVA/AVS Enabled [Project CHIP] capable	**Production**
IW620	**2x2 Dual-Band Wi-Fi 6**	20, 40, 80 MHz	BT/BLE 5.1 BLE Long Range BLE Mesh BT Classic, LE Audio	PCIe SDIO USB UART	i.MX 6/7/8 Family Linux, Android	IEEE Power Save	-10℃ to +85℃	WPA3 GVA/AVS Enabled [Project CHIP] capable	**Production**

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NXP'S VALUE PROPOSITION FOR IOT

Broad Wireless Connectivity Portfolio

Wi-Fi 4/5/6, **Zigbee**, **Thread**, **Bluetooth** Classic and Low Energy, **NFC**, **UWB**
Multiprotocol and combo radios

Unified Development Environment

MCUXpresso SDKs, IDE, Config Tools
Wi-Fi Drivers **pre-integrated** into SDK/BSP for MCUs/MPUs, **maintained** by NXP

Flexible Architectures

Wireless MCUs, Hosted Solutions, Network Co-Processors
RTOS, Linux and Android across a wide compute platform
Chip-on-Board, partner Module or System-On-Module

Enabling Technologies

Commissioning (NFC, Bluetooth LE), **Locationing** (UWB, Bluetooth LE, Wi-Fi)
Security (Secure Element and/or embedded in MCU/MPU)
Ecosystems support (Project CHIP, Voice Assistant, Cloud Connectivity, etc.)

Customer Commitment

Total product **quality, longevity** for 10-15 years
Global Support & online Community for 10,000s of customers across thousands of applications
Continued **investment** in Wireless and IoT, leading **contributor** to connectivity standards

SECURE CONNECTIONS
FOR A SMARTER WORLD

Azurewave Technologies

A World-Leading DMSS of Wireless Connectivity Solution

Who We Are

AzureWave Technologies, Inc. is a world-leading provider of wireless connectivity and image processing solutions. Our ultra-small modules include WiFi, BT, GPS, MCU and others have extensively designed into PC, consumer electronic, industrial, IOT, embedded application systems, home appliances, automotive and more. The Company distributes its products to major overseas markets, including Asia, N. America, and Europe.

What We Provide

Applicable Solutions

From smart home, automotive, to mobile communication, we have adaptive one-stop road-mapping solutions for you.

Exceptional Modules

Ultra-small modules endowed with avant-grarde designing & automated processing for your integration into any devices.

Experienced Teams

Dedicated industrial experts accompanying you from the very beginning of conception to the end of delivering your product.

AzureWave

[Headquarter]

Taipei, Taiwan

[Found]

2005

[Manufacturing Center]

Shanghai, China

[Regional Offices]

San Jose , USA / Tokyo, Japan / Shanghai & Shenzhen, China

Core Business

Leading DMSS Solution Provider

Value

WLAN & WWAN Module

Camera & Image Processing Module

Innovation

AzureWave

Connecting Everything

Short range communication via wearable/mobile devices

Network center for home and office application

Enhanced coverage and Power Consumption for M2M application

AzureWave provides WPAN / WLAN/ WWAN connectivity solutions for various applications

AzureWave

Connecting Everything

WPAN Bluetooth

Short range communication via wearable/mobile devices

zigbee

Bluetooth 5.0

2x	4x	8x	+
speed	range	data	wireless coexistence

300M Range 24Mbps Speed

BT : BLE(Low Power)、EDR (High Data Rate)

BT 5.2 BLE Audio

WLAN Wi-Fi

Network center for home and office application

Wi-Fi 802.11ax

2020/Q4 802.11ax 5GHz

10.53 Gbps

2020/Q4 802.11ay 60GHz

20 Gbps

WWAN LPWA

Enhanced coverage and Power Consumption for M2M application

LTE

LTE-M Cat.0 — 1 Mbps — 7~900MHz

NB-IOT — 200kbps

LoRa — Available

SIGFOX — Available

Sub 1GHz

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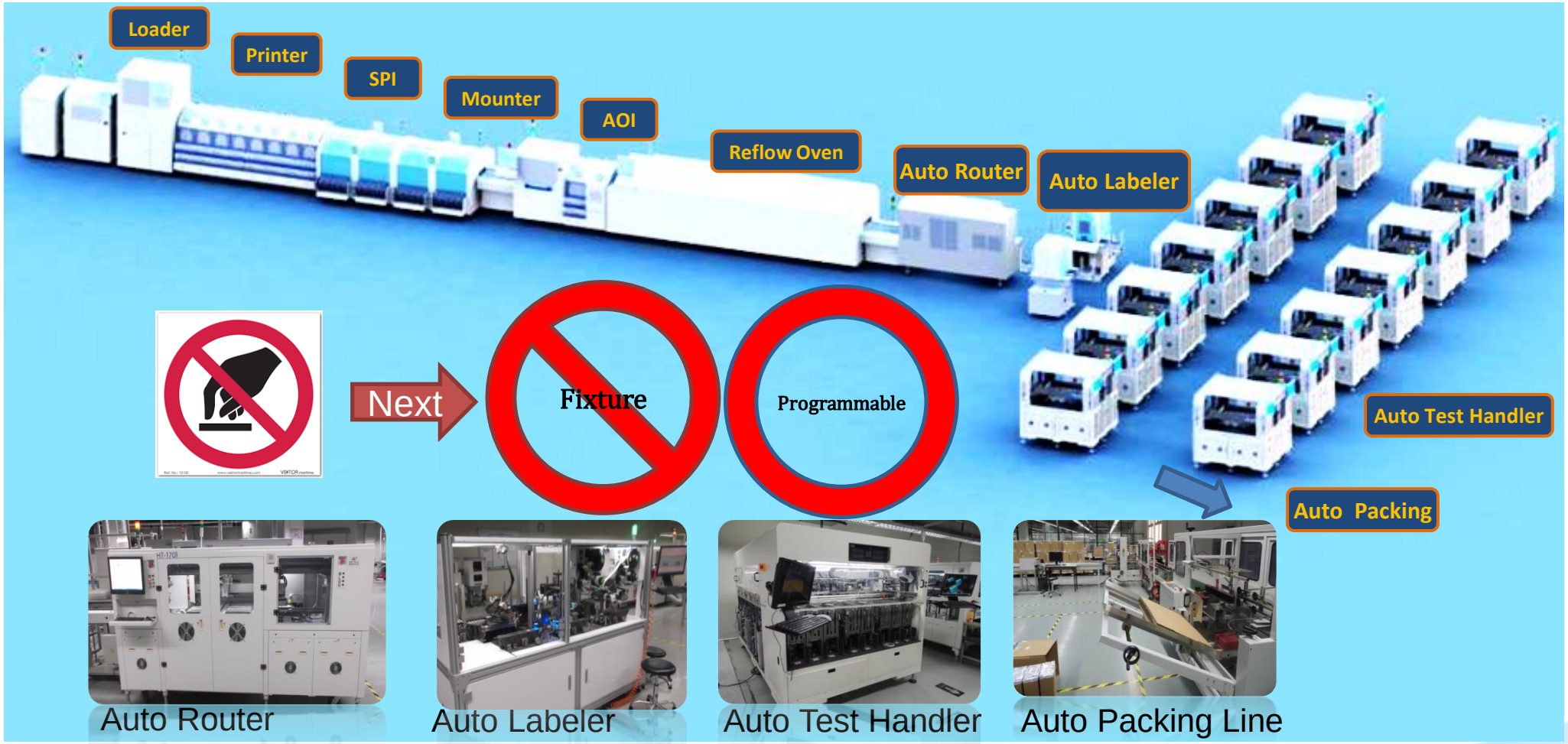
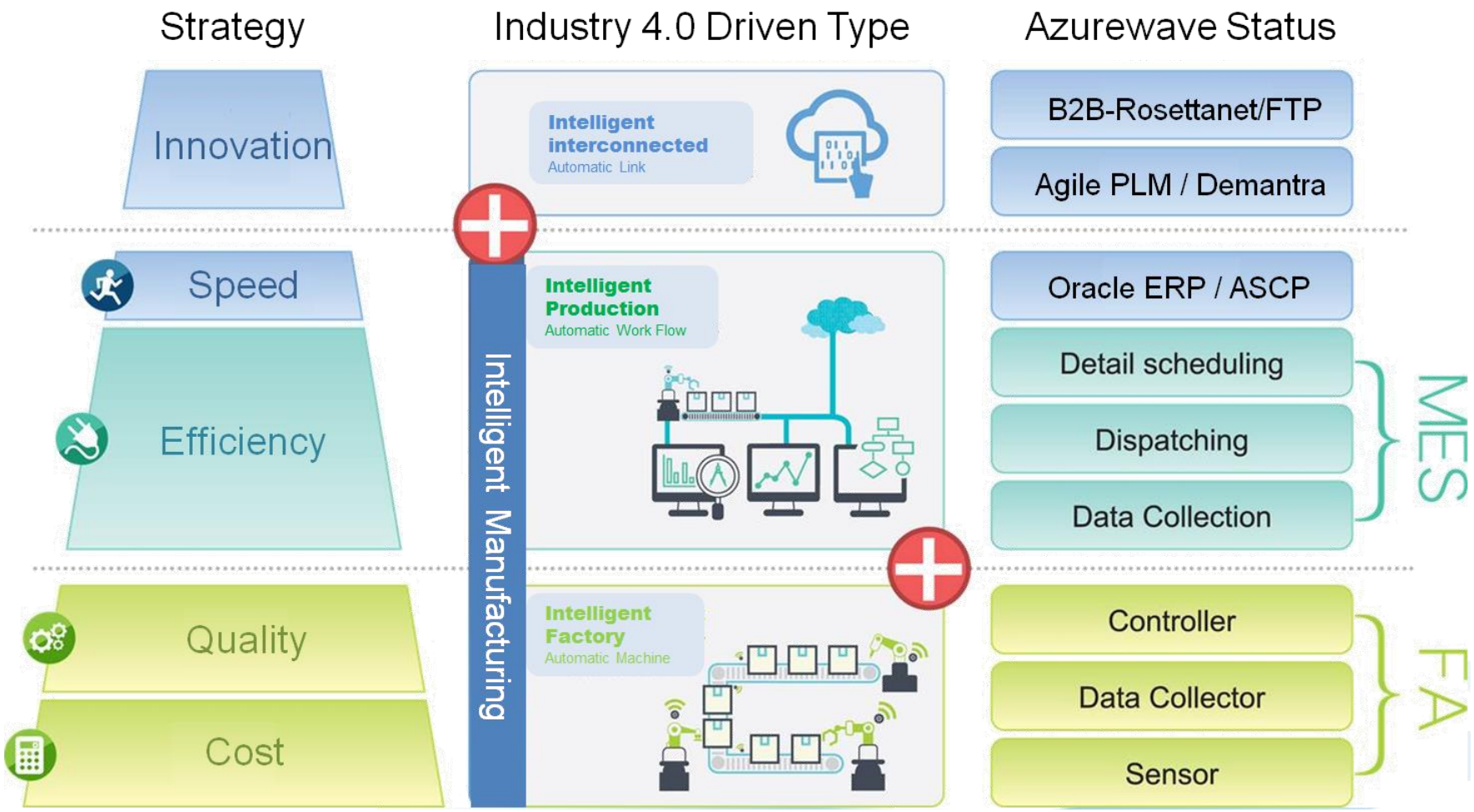
Automation Line - Hands free



Developed By Azurewave

AzureWave's Industry 4.0



IATF-16949 (Certificate No:0302512)

AzureWave Technologies (Shanghai) Inc.
No.1355, Jiaxin Highway, Malu Town, Jiading District,
Shanghai, P.R. China
Post Code: 201801

has established and applies
a Quality Management System for

Design and Manufacture of
Wireless Communication Products for Automobile
(with Product Design as per Chapter 8.3).

An audit was performed and has furnished proof
that the requirements according to

IATF 16949
First Edition 2016-10-01

are fulfilled.

Issue date: **2018-05-02**

Expiry date: **2021-05-01**

Certificate Registration No.: **12 111 55751 TMS**

IATF Certificate No.: **0302512**

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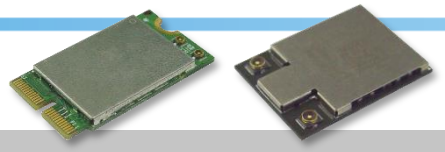
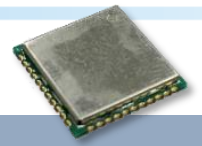
WiFi/BT Modules by Form Factors





M.2 Socket and Solder-down Module

Stamp LGA Module

SiP Module

M.2 2230

AW-CM276MA
88W8997
802.11ac Wave 2
BT5.0 (-30~85)
PCIe / SDIO / USB 2.0
Non-Windows

AW-XM455MA
IW610P
802.11**ax** + **BT5.1**
PCIe / UART
28*30*3.65 mm

AW-XM458MA
88W9098
802.11**ax** + **BT5.0**
CDW
PCIe / USB
28*30*3.65 mm

AW-XM455
IW620P (88W9097)
802.11**ax** + **BT5.1**
WAVE 2
PCIe/USB
20*18*2.85 mm

AW-XM458
88W9098
802.11**ax** + BT 5.X
Dual MAC (CDW)
PCIe / SDIO
20*18*2.85 mm

AW-CH397
88W8897
802.11a/b/g/n/ac
BT4.2
SDIO/UART/USB/PCIe
12.3*10*1.05mm

AW-CM358MA
88W8987 CSP
802.11ac + BT5.0
SDIO / UART
22* 30*2.45mm

AW-AM457MA-D
NXP IW416 QFN
802.11a/b/g/n + **BT5.1**
SDIO / UART
22*30*2.85mm
Dual Antenna

AW-AM510MA
NXP IW416 CSP
802.11a/b/g/n + **BT5.1**
SDIO / UART
22*30mm

AW-CM358SM
88W8987 CSP
802.11ac + **BT5.0**
SDIO / UART
12*12mm

AW-XM521
IW620S (88W9097)
802.11**ax** + **BT5.1**
SDIO / UART
20*18*2.85mm

M.2 1216

AW-NM191NF
88W8801
802.11b/g/n
SDIO/USB
(B1 is 0~70)
(B2 is -40~85)

AW-CM276NF
88W8997
802.11ac Wave 2
BT5.0
SDIO / UART / PCIe

AW-AM457-D
NXP IW416 QFN
802.11a/b/g/n + **BT5.1**
SDIO / **USB** / UART
15*15*2.5mm **(Dual)**
Support Cortex-M7

AW-AM510
NXP IW416 CSP
802.11a/b/g/n + **BT5.1**
SDIO / UART
12*12*2 mm
Support Cortex-M7

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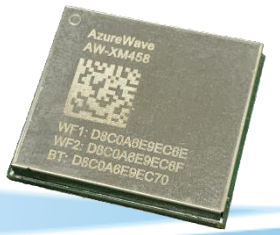
● 2x2ax ● 2x2ac ● 1x1ac ● 1x1n

802.11 AX solution

	AW-XM521	AW-XM455	AW-XM458	AW-XM458MA	AW-XM369
Main Chip	IW620S	IW620P	88W9098	88W9098	88Q9098
WLAN	802.11a/b/g/n/ac/ax	802.11a/b/g/n/ac/ax	802.11a/b/g/n/ac/ax	802.11a/b/g/n/ac/ax	802.11a/b/g/n/ac/ax
BT	BT5.1	BT5.1	BT5.0	BT5.0	BT5.0
Host Interface	WLAN: SDIO BT: UART	WLAN: PCIe BT: UART	WLAN: PCIe, SDIO BT: UART, SDIO	WLAN: PCIe, SDIO BT: UART, SDIO	WLAN: PCIe, SDIO BT: UART, SDIO
Dimension (mm)	20 x 18	20 x 18	28 x 30 (M.2 2230 E key)	28 x 30	20 x 18
Form factor	LGA Type	LGA Type	LGA Type	Connector Type	LGA Type
Operating Temp.	-10 ~ 85	-10 ~ 85	-30 ~ 85	-30 ~ 85	-40 ~ 105
Supported OS	Linux / Android	Linux / Android	Linux / Android	Linux / Android	Linux / Android
MP Scheudule	2021/Q2	2021/Q2	2021/Q1	2021/Q2	2021/Q2
Remark			Concurrent Dual Wi-Fi (CDW) with dual MAC	Concurrent Dual Wi-Fi (CDW) with dual MAC	AEC-Q100 compliant Concurrent Dual Wi-Fi (CDW) with dual MAC



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IoT Solution (Wi-Fi / BT + MCU)

Cotex-M4

AW-CU300 V2

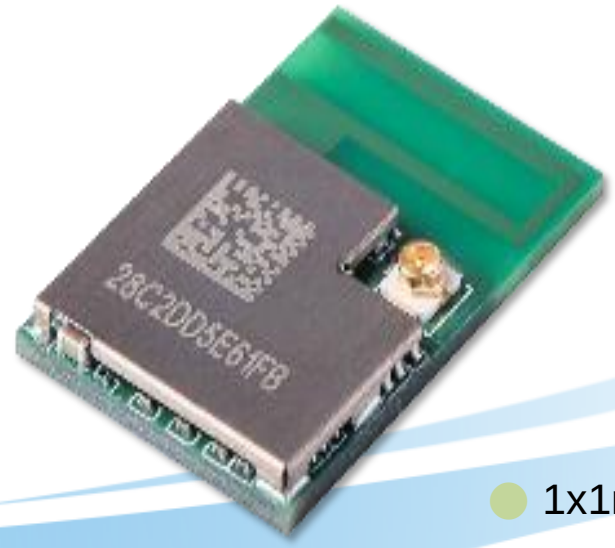
88MW320
802.11b/g/n
UART / SPI
23*15*2.35mm

AW-CU300A V2

88MW320
+On-board Flash 2M
802.11b/g/n
UART / SPI
28*15*2.35mm

AW-CU300A V3

88MW320
+On-board Flash 4M
802.11b/g/n
UART / SPI
28*15*2.35mm



1x1n

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WiFi/BT Modules Overview

	Model	Main chip	Form factor	Dimension (L x W x H mm)	WLAN Standard	BT Standard	Interface
802.11n	AW-NM191NF	88W8801	M.2 1216	12 x 16 x 1.95	11b/g/n	N/A	SDIO/USB
	AW-NM191MA	88W8801	M.2 2230	22 x 30 x 2.91	11b/g/n	N/A	SDIO
	AW-AM457-D	IW416 QFN	LGA	15 x 15 x 2.5	11a/b/g/n	BT5.1	SDIO+UART USB2.0+USB2.0
	AW-AM457MA-D	IW416 QFN	M.2 2230	22 x 30 x 2.85	11a/b/g/n	BT5.1	SDIO+UART
	AW-AM510	IW416 CSP	LGA	12 x 12 x 2	11a/b/g/n	BT5.1	SDIO+UART
	AW-AM510MA	IW416 CSP	M.2 2230	22 x 30	11a/b/g/n	BT5.1	SDIO+UART
802.11ac	AW-CM276NF	88W8997	M.2 1216	12 x 16 x 1.85	11a/b/g/n/ac	BT5.0	PCIe+USB SDIO+SDIO USB+USB PCIe+UART
	AW-CM276MA	88W8997	M.2 2230	22 x 30 x 2.85	11a/b/g/n/ac	BT5.0	PCIe+USB SDIO+SDIO PCIe+UART
	AW-CM358SM	88W8987	LGA	12 x 12 x 1.65	11a/b/g/n/ac	BT5.0	SDIO+UART
	AW-CM358MA	88W8987	M.2 2230	22 x 30 x 2.45	11a/b/g/n/ac	BT5.0	SDIO+UART
	AW-CH397 ***	88W8897	SiP	10 x 12.3 x 1	11a/b/g/n/ac 2x2	BT4.2	SDIO+UART
802.11ax	AW-XM369	88Q9098	LGA	20 x 18 x 2.85	11a/b/g/n/ac/ax 2x2	BT5.1	PCIe + UART SDIO + SDIO
	AW-XM458	88W9098	LGA	20 x 18 x 2.85	11a/b/g/n/ac/ax 2x2	BT5.1	PCIe + UART
	AW-XM458MA	88W9098	M.2 2230	**30 x 28** x 3.25	11a/b/g/n/ac/ax 2x2	BT5.1	PCIe + UART
	AW-XM455	IW620P	LGA	20 x 18 x 2.85	11a/b/g/n/ac/ax 2x2	BT5.1	PCIe + UART
	AW-XM455MA	IW620P	M.2 2230	**30 x 28** x 3.25	11a/b/g/n/ac/ax 2x2	BT5.1	PCIe + UART
	AW-XM521	IW620S	LGA	20 x 18 x 2.85	11a/b/g/n/ac/ax 2x2	BT5.1	SDIO + UART

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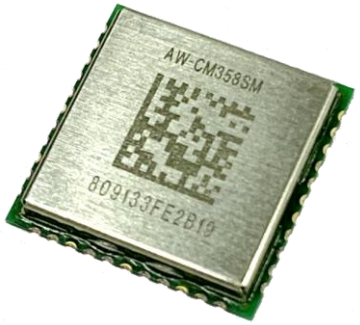
Very Popular Models



Model	AW-NM191NF	AW-CM358SM	AW-CM276NF	AW-XM458
Schedule	MP	MP	MP	Q1 2021
Chipset	88W8801	88W8987	88W8997	88W9098
Description	802.11 b/g/n	802.11 a/b/g/n/ac with BT5.0	802.11 a/b/g/n/ac with BT5.0	802.11 a/b/g/n/ac with BT5.0
Antenna	Dual, 1T x 1R	Single, 1T x 1R	Dual, 2T x 2R	Triple, 2T x 2R for Wi-Fi, 1T x 1T for BT
Form Factor	M.2 1216	Stamp LGA	M.2 1216	LGA Type
Size	12 x 16 x 1.95 mm	12 x 12 x 1.65 mm	12 x 16 x 1.85 mm	20 x 18 x 2.85 mm
Interface (WLAN/BT)	SDIO or USB	SDIO / UART	PCIe / UART, PCIe / USB SDIO / SDIO	PCIe / UART SDIO / SDIO
Certificate	CE, FCC, Japan	CE,FCC	CE, FCC, IC, NCC, AU, NZ, JP, India	CE , FCC , IC

AzureWave

Market Strategy

一. Platform

Focus NXP Platform:

LS系列： LS1043/1046/2080/208X/206X

I.MX系列： I.MX6 U

I.MX7 U

I.MX8

MX8M Plus

MX8M Mini、Nano

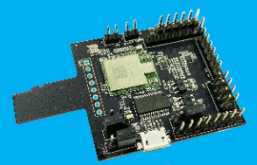
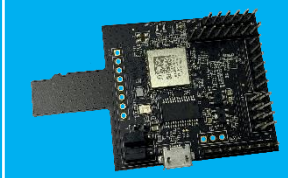
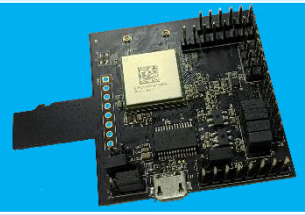
RT系列： RT600 audio

RT500 Wearable

RT1020/1052/1062 Industry

RT1070 Automotive

Module Form Factors

Model Name	AW-AM281SM	AW-NM191NF	AW-CM358SM	AW-CM276NF	AW-AM457-D	AW-AM510
Chipset	88W8977 eWLP	88W8801 QFN	88W8987 eWLP	88W8997 CSP	IW416 QFN	IW416 CSP
WLAN Standard	a/b/g/n + BT5.0	b/g/n	a/b/g/n/ac + BT5.0	a/b/g/n/ac + BT5.0	a/b/g/n + BT5.1	a/b/g/n + BT5.1
Antenna Stream	1T x 1R	1T x 1R (diversity)	1T x 1R	2T x 2R	1T x 1R	1T x 1R
Host Interface (WLAN + BT)	SDIO3.0 + SDIO3.0	USB or **SDIO**	**SDIO3.0 + UART** SDIO3.0 + SDIO3.0	**PCIe + UART** PCIe + USB **SDIO + SDIO**	**SDIO3.0 + UART** SDIO3.0 + SDIO3.0 USB2.0 + USB2.0	**SDIO3.0 + UART** SDIO3.0 + SDIO3.0
Form Factor	LGA	M.2 1216	Stamp LGA	M.2 1216	LGA	LGA
Size (mm)	12 x 12 x1.7	12 x 16 x 1.95	12 x 12 x 1.65	12 x 16 x 1.85	15 X 15 x 2.5	12 x 12 x 2
Certificate	FCC	CE, FCC, Japan	CE, FCC	CE, FCC, IC, NCC, AU, NZ, JP, India	Plan to apply CE, FCC, IC for AW-AM457-D	Plan to apply CE, FCC, IC
M.2 Board	AW-AM281MA	AW-NM191MA	AW-CM358MA	AW-CM276MA-PUR AW-CM276MA-SD	AW-AM457MA-D	AW-AM510MA
						TBD
uSD	AW-AM281-uSD	AW-NM191-uSD	AW-CM358-uSD	AW-CM276-uSD	AW-AM457-D-uSD	AW-AM510-uSD
				TBD		TBD

AzureWave

Module Advantages Delivered by Azurewave

RF Certification

- RF testing & regulatory delivery

Integration

- RF expertise empowers the processor & the platform
- Variety of interfaces adding flexibility for connection to applications

Miniaturization

- Ultra-small size with reduced z-height to fit into small devices and market niche

Time to Market

- Shorten development cycle by reducing R&D effort

Customization

- Everything from design, engineering to manufacturing

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AzureWave Technologies, Inc.

THANK YOU!

Inspired by wireless

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