QUECTEL

Build a smarter world

Quectel
5G & LTE-Advanced Module

Product Overview

Duty of confidentiality

The Receiving Party shall keep confidential all documentation and information provided by Quectel, except when the specific permission has been granted by Quectel. The Receiving Party shall not access or use Quectel's documentation and information for any purpose except as expressly provided herein. Furthermore, the Receiving Party shall not disclose any of the Quectel's documentation and information to any third party without the prior written consent by Quectel. For any noncompliance to the above requirements, unauthorized use, or other illegal or malicious use of the documentation and information, Quectel will reserve the right to take legal action.

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5G new capability

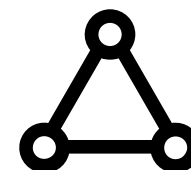| Ultra-high speed	Low latency	High reliability	Flexible deployment
Up to 10 times the maximum throughput of LTE	End-to-end latency as low as 1–5 ms in 5G network part	Error code rate as low as 0.001% brought by 5G URLLC features	Network slicing private network

URLLC: Ultra-Reliable Low Latency Communications

5G key technology

Ultra-high band width

6-100 GHz

FR2: mmWave
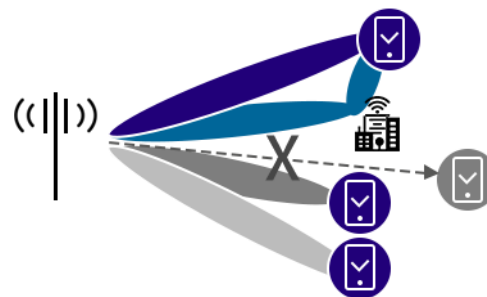**Bandwidth: 100–1000 MHz**

< 6 GHz

FR1: Sub-6 GHz
Bandwidth: 5–300 MHz

Frequency from 600 MHz to 40 GHz can be supported by 5G Network.

Higher spectrum efficiency
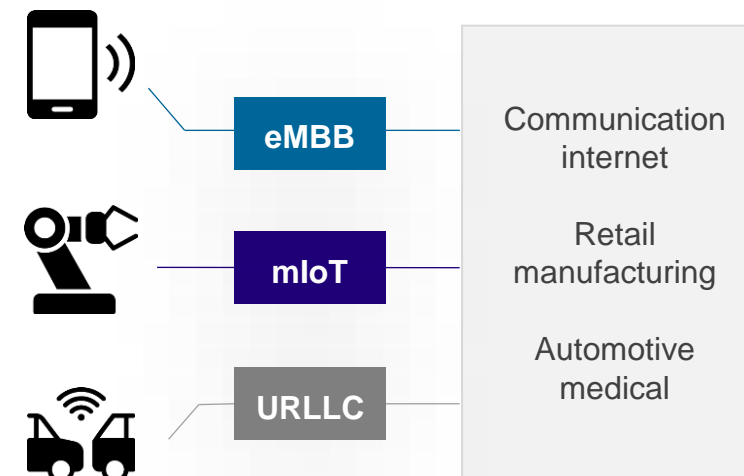
Multi-user massive MIMO

Single-user DL 4 × 4 MIMO / UL 2 × 2 MIMO

MIMO (Multi-In Multi-Out) technology applied to both base station and end device guarantees both enhanced throughput rate and network performance.

Network slicing

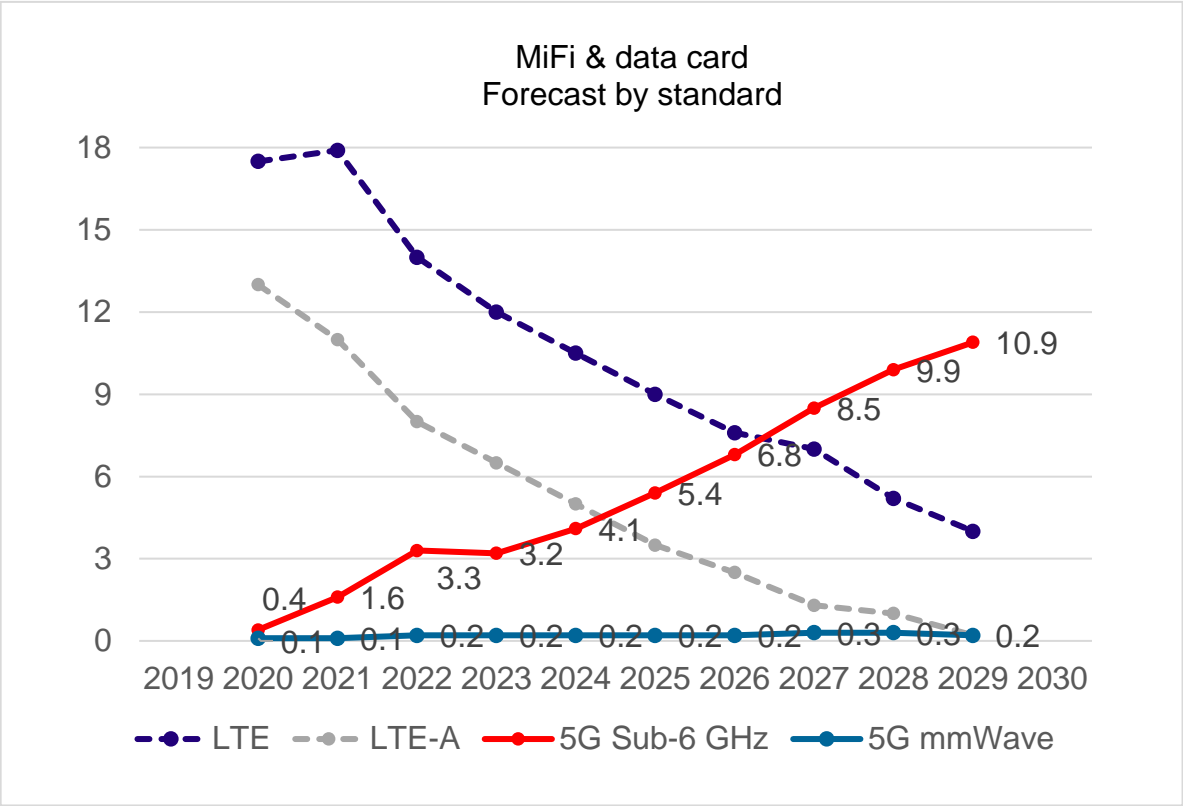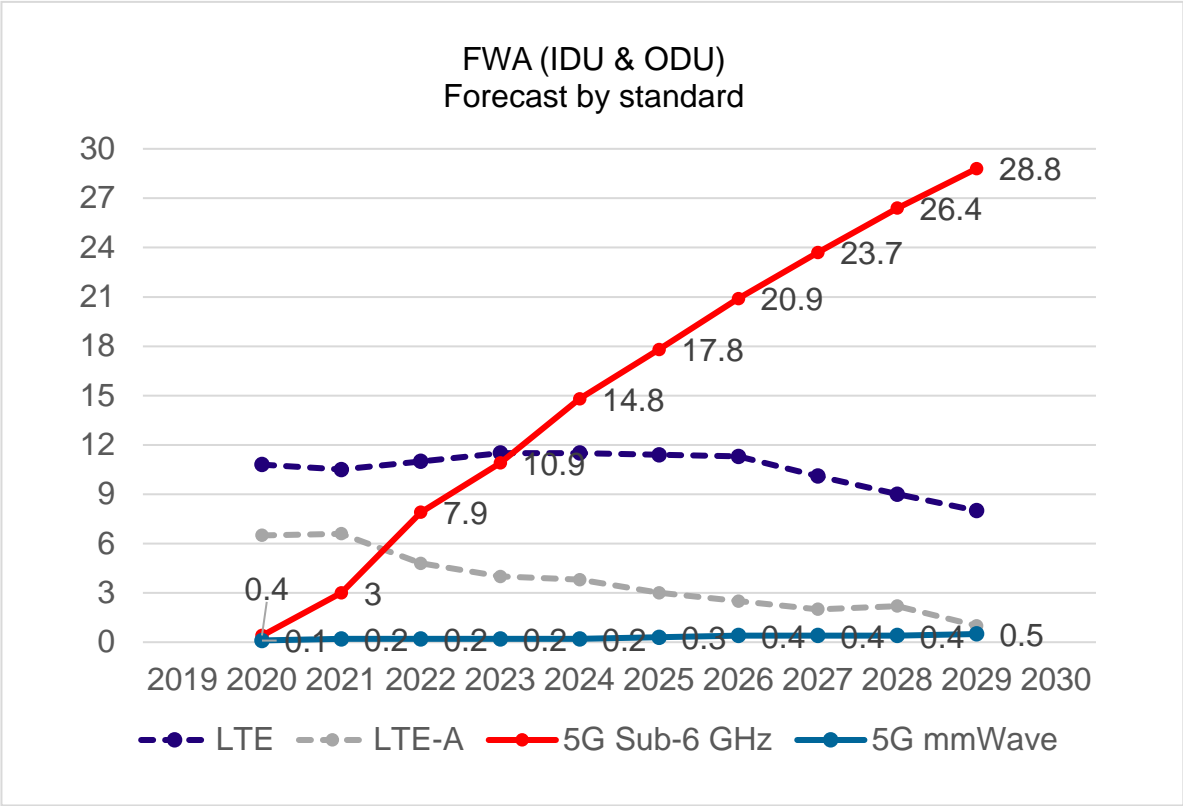**eMBB** — Communication internet

mIoT — Retail manufacturing

URLLC — Automotive medical

5G network slicing enables the building of end-to-end virtual networks tailored to various application requirements.

URLLC: Ultra-Reliable Low Latency Communications

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3GPP evolution

	Rel-15	Rel-16	Rel-17	Rel-18
Downlink capability	• NR CA (carrier aggregation) • Massive MIMO	• Massive MIMO enhancement • FR1 + FR2 NR-DC (NR-dual connectivity)	• mmWave spectrum expansion to 71 GHz • Further MIMO enhancement	• AI/ML for NR (Artificial intelligence/ machine learning) • NR coverage enhancements
Uplink capability	• UL MIMO (Multiple-input multiple-output) • UL 100 MHz bandwidth / carrier	• UL switch CA • Power class 1.5	• UL HARQ (Hybrid automatic repeat request)	• Coverage enhancement • CA enhancement • UL MIMO enhancement
IIOT feature	• Network slicing	• 5G LAN (Local area network) • NPN (Non-public network)	• RedCap UE (Reduced capability user equipment) • URLLC in the unlicensed spectrum	• Edge computing enhancement • Personal IoT networks • e-RedCap
Positioning & power saving	• OTDOA (Observed time difference of arrival) • C-DRX (Connected-mode discontinuous reception)	• Power saving based on WUS (Wake-up signal) • UAI (UE assistance information)	• Improved positioning for industrial automation	• Network energy savings enhancement • Narrowband positioning enhancement • 5G timing resiliency system

IIOT: Industrial Internet of Things

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5G carrier market is growing fast *(Source: TSR, 2023)*

FWA (IDU & ODU) Forecast by standard

MiFi & data card Forecast by standard

TAM (Total addressable market)	2024	2025	2024	2025
	5G Sub-6 (M units)		5G mmW (M units)	
5G FWA (IDU & ODU)	14.8	17.8	0.2	0.3
5G MiFi & data card	4.1	5.4	0.2	0.2

FWA: Fixed Wireless Access   IDU: Indoor Unit   ODU: Outdoor Unit

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Globally operator investments in FWA (LTE & 5G) *(Source: GSAcom)*

Number of operators investing in **LTE FWA** by subregion

- Central Asia, 5
- Eastern Asia, 8
- Southern Asia, 14
- Eastern Europe, 47
- Northern Europe, 44
- Southern Europe, 30
- Western Europe, 22
- Northern Africa, 15
- Sub-Saharan Africa, 93
- Middle East, 36
- Northern America, 59
- Latin America and the Caribbean, 56
- Western Asia, 9
- Oceania, 24
- South-Eastern Asia, 24
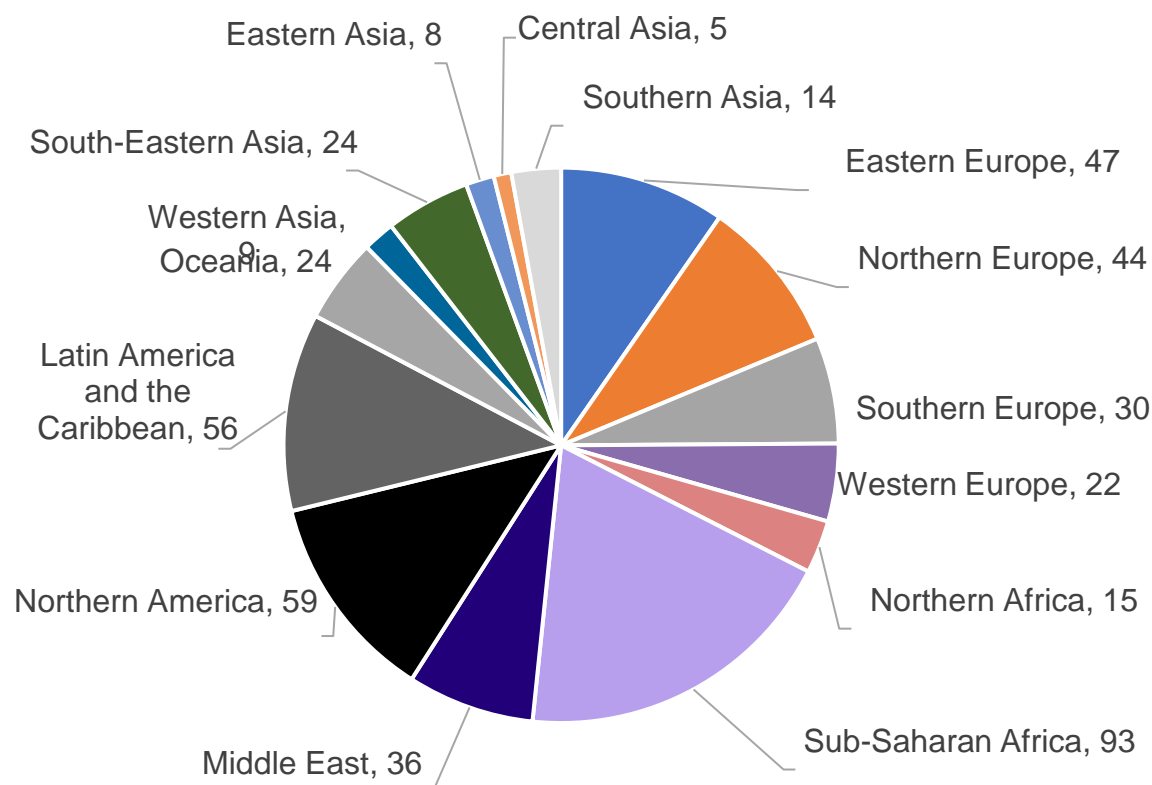
Number of operators investing in **5G FWA** by subregion

- Southern Asia, 3
- Eastern Asia, 9
- South-Eastern Asia, 6
- Oceania, 12
- Latin America and the Caribbean, 15
- Northern America, 11
- Middle East, 17
- Sub-Saharan Africa, 10
- Western Europe, 12
- Southern Europe, 11
- Northern Europe, 32
- Eastern Europe, 11

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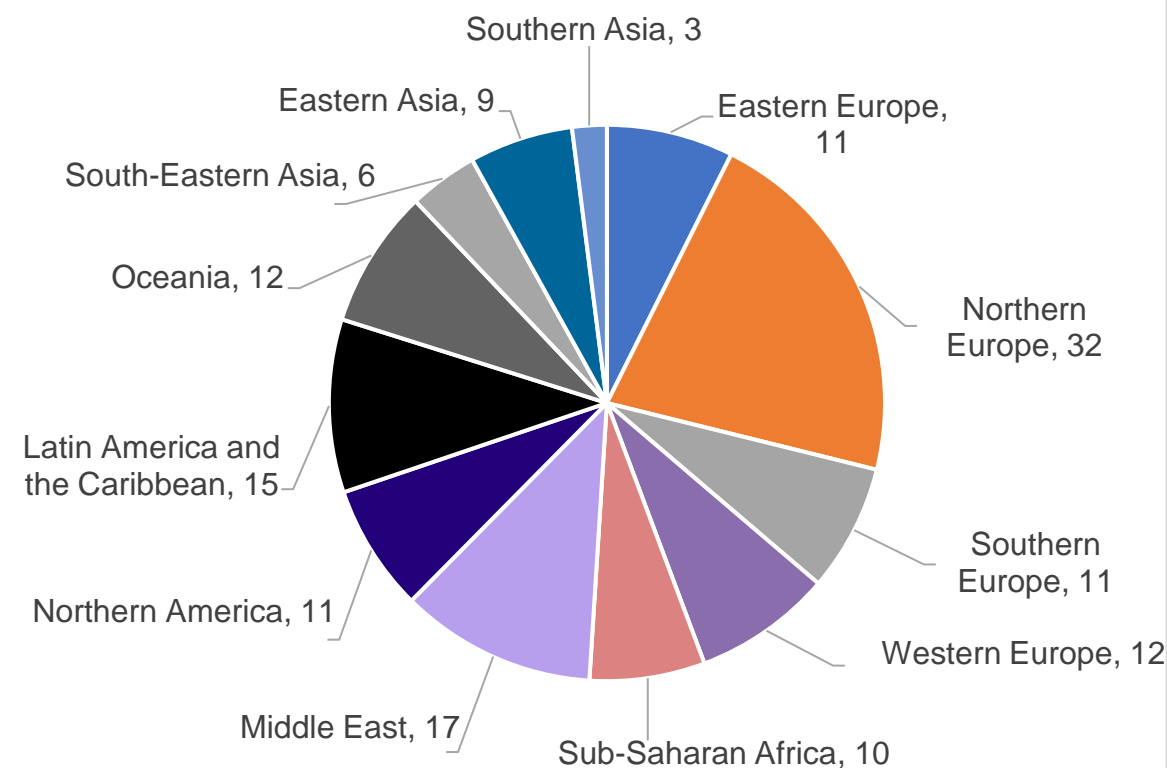
5G SA global status - *operator transitions to 5G SA core decline YoY in 2023*

(Source: Counterpoint, Dell'Oro, GSAcom, 5GObservatory)

55 operators have commercially implemented 5G SA
12 SA deployed in 2023

Cumulative 5G SA commercial deployments by region by 2023

- Middle East &Africa — 7
- Europe — 14
- Asia-Pacific — 21
- Caribbean & Latin America — 6
- North America — 7

5G Networks
519 operators in over 150 countries/territories are investing in 3GPP-compatible 5G services (mobile or fixed wireless access)

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Global 5G mmWave deployment and vendors

mmW 5G CPE market is small, mainly used for outdoor and hotspot areas;
mmW 5G accounts for only 1% of cellular CPE shipments.

📍 Deployed
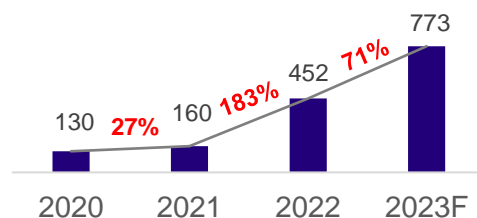📍 PoC

Evolution of 5G millimetre-wave capable shipments (millions)
Sample: 2021 FWA survey, 25 respondents,
2022 FWA survey, 26 respondents,
2023 FWA survey, 25 respondents

2020	2021	2022	2023F
130	160	452	773

27%   183%   71%

AT&T   T Mobile   verizon✓   uscellular

TIM   FASTWEB

SoftBank   docomo   KDDI   Rakuten Mobile

China unicom 中国联通

airtel   Jio   AIS

Singtel

OPTUS   nbn   Telstra

ODM: 英華達 Inventec Appliances   Gemtek   MEIG 美格   Foxconn 鸿海科技集团   WNC Wistron NeWeb Corp.   thinkstart   ASKEY

OEM: inseego   ATEL   COMPAL   Orbic   TCL   casa systems   NETGEAR   NOKIA   GENERAL MOBILE   sonim   D-Link   HUAWEI   ZTE   OPPO

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5G module overview

mmWave	**RG530F**	**RM530N**	• SDX62/SDX65 • Rel-16 • Up to 1000M NR BW		**RG651E**	**RM551E**	• SDX75 • Rel-17 • Up to 1000M NR BW • 4 × Cortex-A55	
Sub-6	**RG520N** **RG520F** **RG525F** **RM520N**		• SDX62/SDX65 • Rel-16 • Up to 300M NR BW		**RG650V** **RG650E** **RM550V**		• SDX72/SDX75 • Rel-17 • Up to 300M NR BW • 4 × Cortex-A55	
	RG500L **RG600L**		• T750 • Rel-15 • Up to 200M NR BW • 4 x Cortex-A55		**RG620T**		• T830 • Rel-16 • Up to 300M NR BW • 4 × Cortex-A55	
	RG500U **RG200U (Mini PCle)** **RM500U**		• UDX710 • Rel-15/16 • Up to 100M NR BW					
RedCap	**RG255C** **RG255C Mini PCle** **RG255C M.2** **RM255C**		• SDX35 • Rel-17 • 20M NR BW					

BW: Bandwidth   RedCap: Reduced Capability   Build a smarter world

5G module portfolio – part 1

	LGA		M.2
	46 × 53 mm		**30 × 52 mm**
SDX75	**RG650E** • NA [ES] (North America) • EU* (EMEA/ APAC[①]/ Brazil)	**RG651E** mmWave • EU** (EMEA/ APAC[①]/ Brazil) • NA* (North America)	**RM551E** mmWave • GL[ES] (Global)
SDX72	**RG650V** • EU (EMEA/ APAC[①]/ Brazil) • NA (North America)		**RM550V** • GL[ES] (Global)
	44 × 41 mm	**45 × 48 mm**	**30 × 52 mm**
SDX65	**RG520F** • EB (EMEA/ APAC[①]/ Brazil) • EU (EMEA/ APAC[①]/ Brazil) • NA (North America)	**RG525F** • NA (North America) **RG530F** mmWave • EU (EMEA/ APAC[①]/ Brazil) • NA (North America)	**RM520N** • GL (Global) • EU (EMEA/ APAC[①]/ Brazil)
	44 × 41 mm		
SDX62	**RG520N** • NA (North America) • EB (EMEA/ APAC[①]/ Brazil) • LA (LATAM excl. Brazil)	• EU (EMEA/ APAC[①]/ Brazil) • GT (TDD 3.5 GHz)	**RM530N** mmWave • GL (Global)
	29 × 32 mm	**Mini PCIe, 30 × 51 mm**	**30 × 42 mm**
SDX35	**RG255C** • GL (Global) • EU* (EMEA/ APAC[①]/ Brazil) • NA* (North America)	**RG255C Mini PCIe** • GL (Global)	**RG255C M.2** • GL[ES] (Global) **RM255C** • GL[ES] (Global)

* : Under development   **: Planning   ①: Excl. China/Japan   ES: Engineering Sample

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Version: 7.2 | Status: Released

RG650V & RG65xE series highlights

5G

3GPP Rel-17 compliant

- Enhanced massive MIMO
- Spectrum expansion

RG650V Series

RG65xE Series

Wi-Fi peripheral enhancement

- Wi-Fi 7 supported
- 2.4/5/6 GHz selectable
- Max. 4K QAM

SoC architecture

- SoC architecture based on module
- OpenWrt supported
- RDK-B supported
- 8RX supported

Abundant hardware interfaces

- 3 × PCIe
- 2 × USXGMII
- USB 3.1

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Version: 7.2 | Status: Released

RG650V & RG65xE series highlights

Support Quad core A55 subsystem

- CPU can support up to 2.2 GHz frequency.
- Hash rate significantly enhancement to hundreds GFLOPS (Giga Floating Point Operations Per Second).
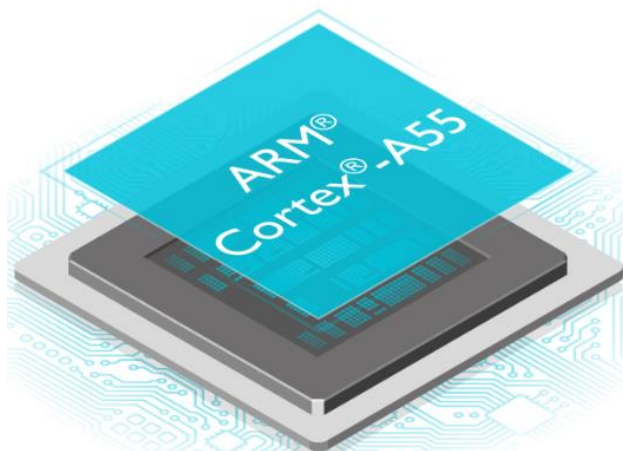
CPU Gflops
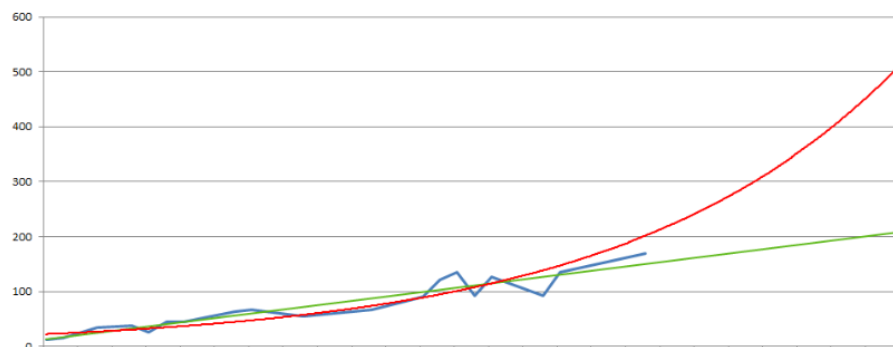
Support flexible software architecture

- Support OpenWRT or RDK-B, suitable for MBB region.
- Provide necessary SDK (Software development kit) and HDK (Hardware development kit) to customers.

	RDK broadband-broadband App platform
	WAN manager - service hub
	RDK OS
	HAL - Hardware abstraction layer
	SoC-drivers
	Linux-kernel

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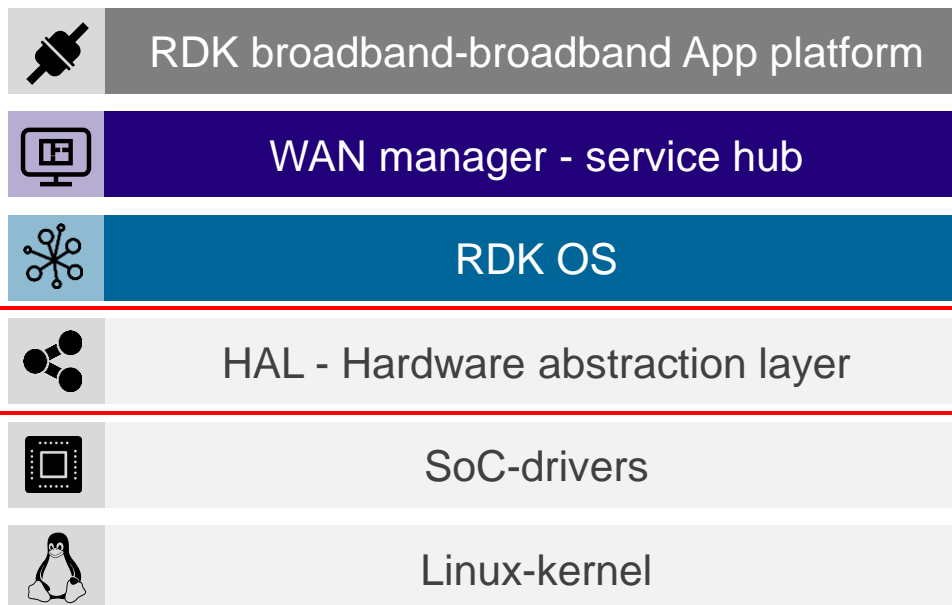
RG650V & RG65xE series highlights

Support max. 1024 QAM modulation

- Throughput can support max. to 7.7 Gbps downlink.
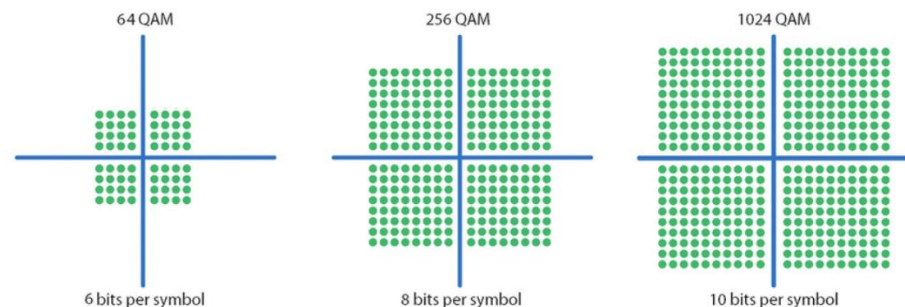
Co-work with Wi-Fi 7 chipsets

- Can co-work with Wi-Fi 7 chipsets, e.g. QFW71x4.
- Support easymesh R1/R2/R3/R4.

WiFi 7 CERTIFIED™

Support 8RX HORxD for downlink enhancement

- Support 8RX in key TDD bands.
- Significant enhancement for throughput & sensitivity.

8Rx vs 4Rx throughput comparison

	Near cell	Edge cell
8Rx	438.6	290.8
4Rx	405.3	243.9

Live N/w channel condition
■ 8Rx ■ 4Rx
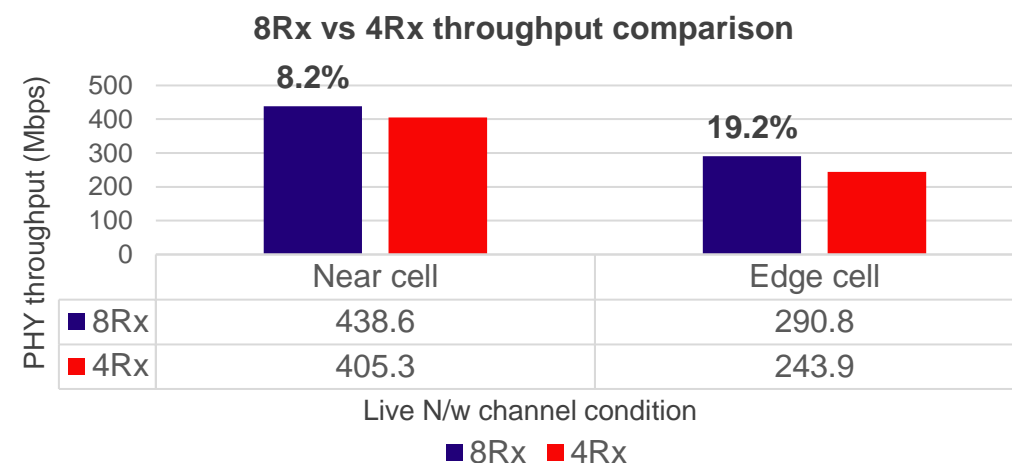
RG65xx module	Sensitivity (dBm)	
	4RX	8RX
n77	-94.2	-96.5
n78	-95.6	-97.7
n41	-93.4	-96.2

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RG650V/RG65xE series specifications

53.0 × 46.0 × 3.05 mm
5G Sub-6 GHz & mmWave LGA module

Variant		RG650V-EU	RG650E-EU	RG650V-NA	RG650E-NA	RG651E-NA
Region		EMEA/ APAC①/ Brazil		North America		
Platform		SDX72	SDX75	SDX72	SDX75	
5G NR	5G NR	3GPP Release 17 NSA/SA operation, Sub-6 GHz				3GPP Release 17 NSA/SA operation, Sub-6 GHz & mmWave
	NSA band	n1/ 3/ 5/ 7/ 8/ 20/ 26/ 28/ 38/ 40/ 41/ 71②/ 75/ 76/ 77/ 78		n2/ 5/ 7/ 12/ 13/ 14/ 25/ 26/ 29/ 30/ 38/ 41/ 48/ 66/ 70*/ 71/ 77/ 78		n2/ 5/ 7/ 12/ 13/ 14/ 25/ 26/ 29/ 30/ 38/ 41/ 48/ 66/ 70/ 71/ 77/ 78/ 257/ 258/ 260/ 261
	SA band	n1/ 3/ 5/ 7/ 8/ 20/ 26/ 28/ 38/ 40/ 41/ 71②/ 75/ 76/ 77/ 78		n2/ 5/ 7/ 12/ 13/ 14/ 25/ 26/ 29/ 30/ 38/ 41/ 48/ 66/ 70*/ 71/ 77/ 78		n2/ 5/ 7/ 12/ 13/ 14/ 25/ 26/ 29/ 30/ 38/ 41/ 48/ 66/ 70/ 71/ 77/ 78/ 257/ 258/ 260/ 261
	5G CA/BW	Up to 3 DL CA, 200 MHz NR BW	Up to 5 DL CA, 300 MHz NR BW	Up to 3 DL CA, 200 MHz NR BW	Up to 5 DL CA, 300 MHz NR BW	Sub-6: Up to 5 DL CA, 300 MHz NR BW mmWave: ≥ 8CC
	DL 4 × 4 MIMO	n1/ 3/ 5/ 7/ 8/ 20/ 26/ 28/ 38/ 40/ 41/ 71②/ 75/ 76/ 77/ 78		n2/ 5/ 7/ 12/ 13/ 14/ 25/ 26/ 29/ 30/ 38/ 41/ 48/ 66/ 70*/ 71/ 77/ 78		n2/ 5/ 7/ 12/ 13/ 14/ 25/ 26/ 29/ 30/ 38/ 41/ 48/ 66/ 70/ 71/ 77/ 78
	UL 2 × 2 MIMO	n1/ 3/ 5*/ 7/ 28*/ 38/ 40/ 41/ 77/ 78		n2/ 5/ 7/ 25/ 38/ 41/ 48/ 66/ 70*/ 71/ 77/ 78		n2/ 5/ 7/ 25/ 38/ 41/ 48/ 66/ 70*/ 71/ 77/ 78/ 257/ 258/ 260/ 261
LTE	LTE band	B1/ 3/ 5/ 7/ 8/ 20/ 28/ 32/ 38/ 40/ 41/ 42/ 43/ 71②		B2/ 4/ 5/ 7/ 12/ 13/ 14/ 17/ 25/ 26/ 29/ 30/ 38/ 41/ 42/ 43/ 48/ 66/ 71		
	DL 4 × 4 MIMO	B1/ 3/ 5/ 7/ 8/ 20/ 28/ 32/ 38/ 40/ 41/ 42/ 43/ 71②		B2/ 4/ 5/ 7/ 12/ 13/ 14/ 17/ 25/ 26/ 29/ 30/ 38/ 41/ 42/ 43/ 48/ 66/ 71		
UMTS	WCDMA band	B1/ 5/ 8		-	-	-
PCIe 3.0 interface		× 3				
USB 3.1 interface		× 1				
USXGMII interface		× 2				
Certification	Carrier	TBD	TBD	Verizon*/ T-Mobile*/ AT&T*	TBD	TBD
	Regulatory	CE/ RCM/ GCF*	TBD	GCF*/ PTCRB*/ FCC*/ IC*	TBD	TBD
Project stage		CS	Developing	CS	ES	Pre-ES

①: Excl. China/Japan   ②: Optional   *: Under development/ in progress

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Version: 7.2 | Status: Released

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RG650V/RG65xE series timeline (preliminary)

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	2023										2024										
Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.

RG650V-EU

Certification

Regulatory — CE/ RCM — Completed

GCF ●————————————————►

RG650V-NA

Certification

Carrier — Verizon ●————————————————————————————————►

T-Mobile ●——————————————————►

AT&T ●————————————————————————►

Regulatory — FCC/ IC ●——————————►

GCF/ PTCRB ●——————————————————►
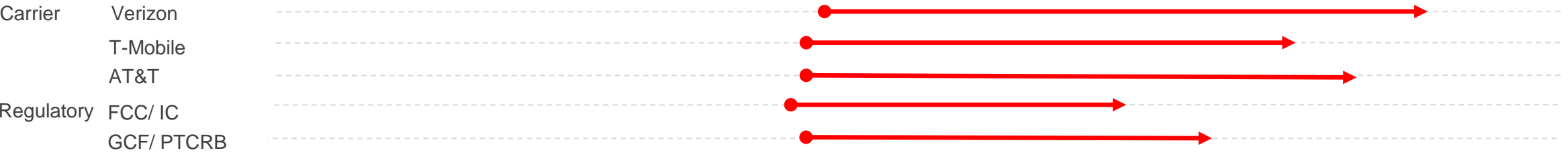
RG650E-EU

Project schedule

ES   CS

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Typical SoC router architecture (RG650x Series)

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ANT   ANT   ANT   …   ANT   ANT_GNSS

WLAN0   …   WLAN3

WLAN0   …   WLAN3

WLAN0   …   WLAN3

2.4 GHz Wi-Fi

5/ 6 GHz Wi-Fi

5/ 6 GHz Wi-Fi

PCIe

PCIe

PCIe

RG650x module

QUECTEL
RG650
XX   RG650EXX-XXX-XXXX
Q1-XXXXX
SN:XXXXXXXXXXXXXX
IMEI:XXXXXXXXXXXXXX

USXGMII   Ethernet PHY   1GE/ 2.5GE/ 10GE WAN/ LAN

USXGMII   Ethernet PHY   1GE/ 2.5GE/ 10GE WAN/ LAN

PCM
SPI   SLIC

(U)SIM   SIM slot (1.8/ 3.0 V)

(U)SIM   SIM slot (1.8 V and only external eSIM supported)
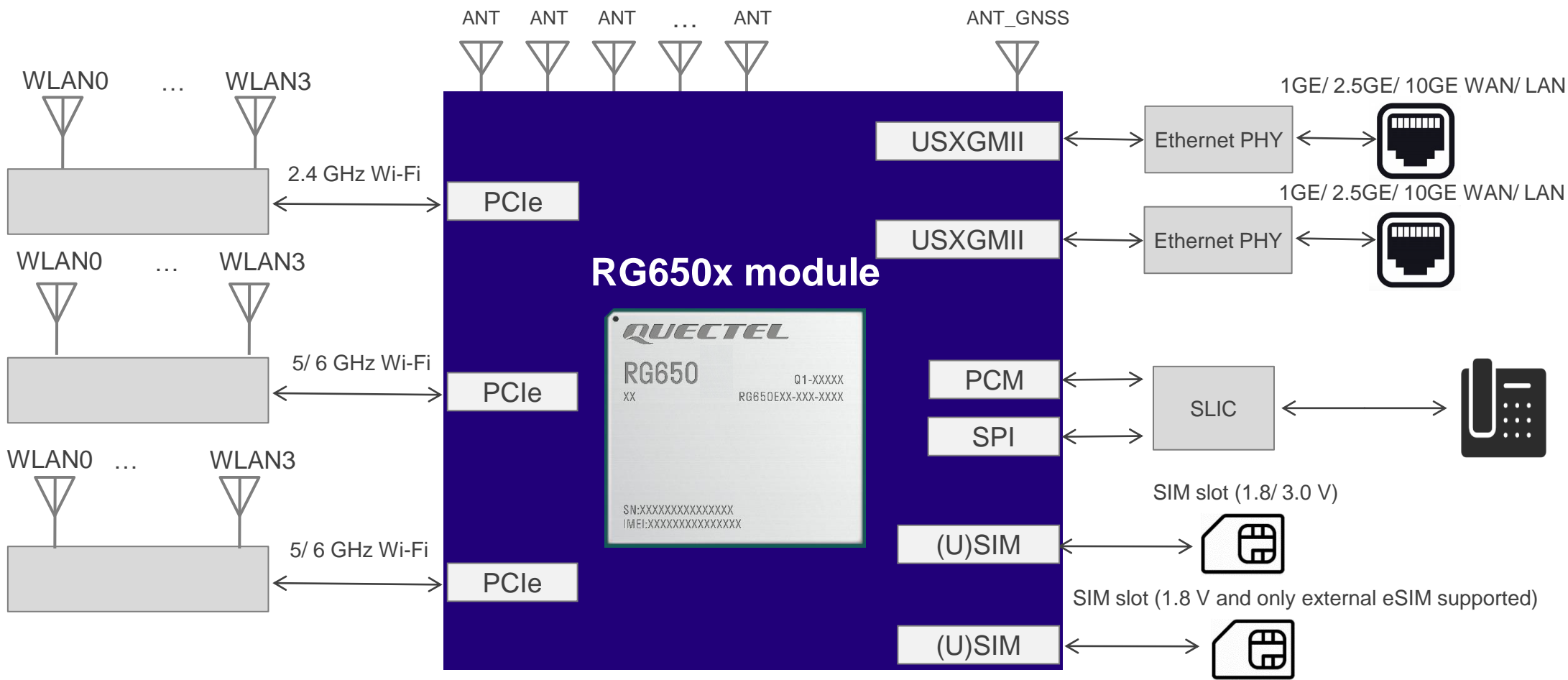
Typical indoor 5G CPE (Customer premise equipment) solution based on SDX72/SDX75 platform.

Wi-Fi 7	2.4/ 5/ 6 GHz + Bluetooth	QFW71x4/ WCN785x
Ethernet	Up to 10 Gbps	QEP8111/ QEP8121/ AQR113C etc.

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Flexible Wi-Fi architecture (RG650x series)
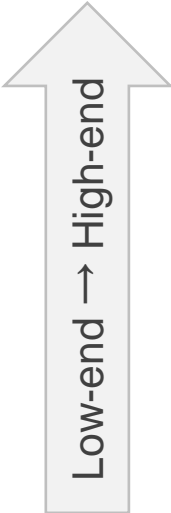
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Quectel 5G combinations	Architecture
RG650x modules + 3 × QFW71x4	4 × 4 MIMO 2.4 GHz + 4 × 4MIMO 5 GHz + 4 × 4 MIMO 6 GHz
RG650x modules + 2 × QFW71x4	4 × 4 MIMO 2.4 GHz + 2 × 2MIMO 5 GHz + 2 × 2 MIMO 6 GHz
	4 × 4 MIMO 2.4 GHz + 4 × 4 MIMO 5 GHz
RG650x modules + 1 × QFW71x4	2 × 2 MIMO 2.4 GHz + 2 × 2 MIMO 5 GHz
	4 × 4 MIMO 2.4 GHz or 4 × 4 MIMO 5 GHz

Low-end → High-end

WLAN0 ··· WLAN3

2.4 GHz Wi-Fi

PCIe

RG650x module base CPE

WLAN0 ··· WLAN3

5/ 6 GHz Wi-Fi

PCIe

QUECTEL
RG650x   QX-XXXXX
XX   RG650xXX-XXX-XXXXX

SN:XXXXXXXXXXXXXX
IMEI:XXXXXXXXXXXXXX

WLAN0 ··· WLAN3

5/ 6 GHz Wi-Fi

PCIe
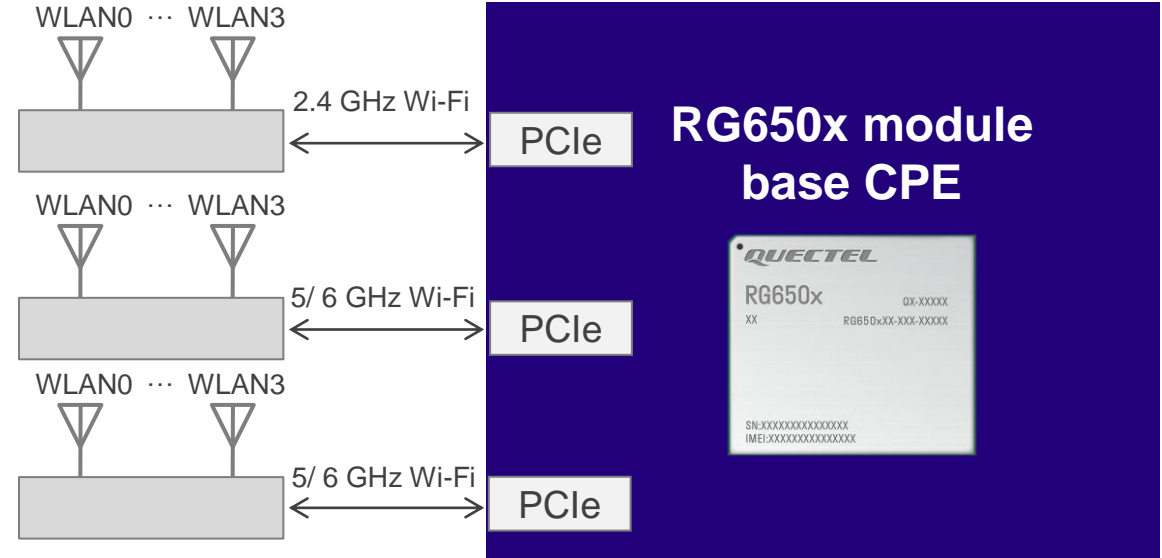
QFW71x4 Key Feature

- 4 × 4 Wi-Fi 7 radio
- 4×4/320 or dual 2×2/320
- 2 /5 /6 GHz selectable
- MLO, 320, Puncture, 4K-QAM
- OFDMA, MU-MIMO

MLO: Multi-Link Operation
QAM: Quadrature Amplitude Modulation
OFDMA: Orthogonal Frequency-Division Multiple Access
MU-MIMO: Multi-User Multiple-Input Multiple-Output

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Typical SoC ODU architecture (RG650x series)

ANT ANT ANT ... ANT ANT_GNSS

1GE/ 2.5GE/ 10GE WAN/ LAN

| USXGMII | ⟷ | Ethernet PHY | ⟷ |

1GE/ 2.5GE/ 10GE WAN/ LAN

| USXGMII | ⟷ | Ethernet PHY | ⟷ |

RG650x Module

ANT0

Wi-Fi/ BT for management

| BT UART |
| SPI |

QUECTEL

RG650

Q1-XXXXX
XX   RG650EXX-XXX-XXXX

SN:XXXXXXXXXXXXXXX
IMEI:XXXXXXXXXXXXXXX

SIM slot (1.8/ 3.0 V)

| (U)SIM | ⟷ |

SIM slot (1.8 V and only external eSIM supported)

| PCIe × 3 |

| (U)SIM | ⟷ |
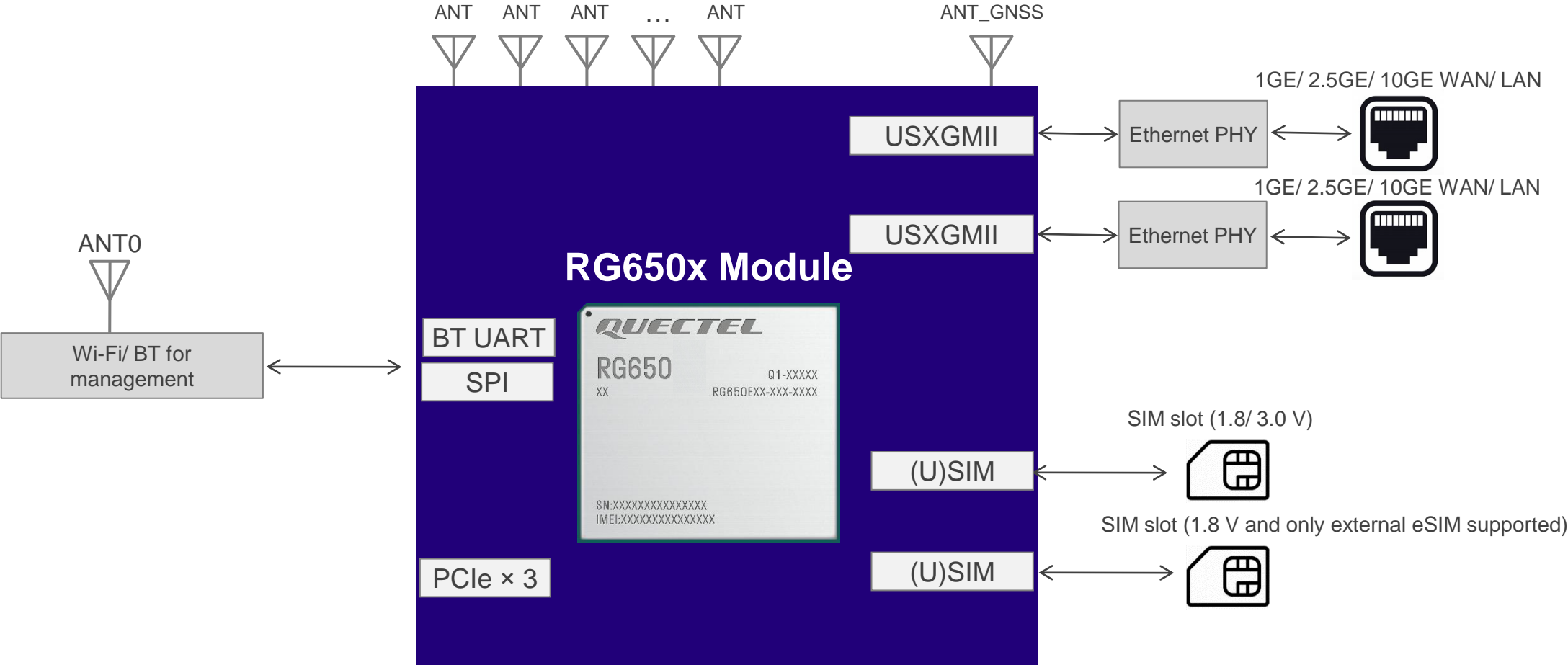
Typical 5G ODU (Outdoor unit) solution based on SDX72/ SDX75 platform.

| Wi-Fi/ BT | Wi-Fi/ BT for management | Based on SPI or UART extension |
| Ethernet | Up to 10 Gbps | QEP8111/ QEP8121/ AQR113C, etc. |

RM550V-GL/RM551E-GL specifications (preliminary)

30.0 × 52.0 × 2.3 mm
5G Sub-6 GHz & mmWave M.2 module

Variant		RM550V-GL	RM551E-GL
Region		Global	
Platform		SDX72	SDX75
5G NR	**5G NR**	3GPP Release 17 NSA/SA operation, Sub-6 GHz	3GPP Release 17 NSA/SA operation, Sub-6 GHz + mmWave
	NSA band	n1/ 2/ 3/ 5/ 7/ 8/ 12/ 13/ 14/ 18/ 20/ 25/ 26/ 28/ 29(Rx)/ 30/ 38/ 40/ 41/ 48/ 66/ 70/ 71/ 75/ 76/ 77/ 78/ 79	n1/ 2/ 3/ 5/ 7/ 8/ 12/ 13/ 14/ 18/ 20/ 25/ 26/ 28/ 29(Rx)/ 30/ 38/ 40/ 41/ 48/ 66/ 70/ 71/ 75/ 76/ 77/ 78/ 79/ 257/ 258/ 260/ 261
	SA band	n1/ 2/ 3/ 5/ 7/ 8/ 12/ 13/ 14/ 18/ 20/ 25/ 26/ 28/ 29(Rx)/ 30/ 38/ 40/ 41/ 48/ 66/ 70/ 71/ 75/ 76/ 77/ 78/ 79	n1/ 2/ 3/ 5/ 7/ 8/ 12/ 13/ 14/ 18/ 20/ 25/ 26/ 28/ 29(Rx)/ 30/ 38/ 40/ 41/ 48/ 66/ 70/ 71/ 75/ 76/ 77/ 78/ 79/ 257/ 258/ 260/ 261
	5G CA/BW	Up to 3 DL CA, 200 MHz NR BW	Sub-6: Up to 5 DL CA, 300 MHz NR BW mmWave: ≥ 8CC
	DL 4 × 4 MIMO	n1/ 2/ 3/ 7/ 25/ 30/ 38/ 40/ 41/ 48/ 66/ 77/ 78/ 79	
	UL 2 × 2 MIMO	n38/ 41/ 48/ 77/ 78/ 79	n38/ 41/ 48/ 77/ 78/ 79/ 257/ 258/ 260/ 261
LTE	**LTE category**	DL Cat 20/ UL Cat 18	
	LTE band	B1/ 2/ 3/ 4/ 5/ 7/ 8/ 12/ 13/ 14/ 17/ 18/ 19/ 20/ 25/ 26/ 28/ 29/ 30/ 32/ 34/ 38/ 39/ 40/ 41/ 42/ 43/ 48/ 66/ 71	
	DL 4 × 4 MIMO	B1/ 2/ 3/ 4/ 7/ 25/ 30/ 38/ 40/ 41/ 42/ 43/ 48/ 66	
UMTS	**WCDMA band**	B1/ 2/ 4/ 5/ 8/ 19	
Embedded GNSS		Optional	
PCIe 3.0 interface		Supported	
USB 3.1/ 2.0 interfaces		Supported	
eSIM		Supported / Built-in eSIM (optional)	
Certification	**Carrier**	TBD	
	Regulatory	TBD	
Project stage		ES	

This preliminary spec will have further updates

Version: 7.2 | Status: Released

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RM550V-GL/RM551E-GL timeline (preliminary)

					2024						2025		
Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.

RM550V-GL

Project schedule

ES1   ES2   CS

RM551E-GL

Project schedule

ES1   ES2

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Typical AP + module router architecture (RM55x series)

ANT0 ANT1 ANT2 ANT3

SIM slot

(U)SIM1

SIM slot

(U)SIM2

RM55x Module

QUECTEL
RM550V-GL   G1-XXXXX
XX   RM550VGLXX-XXX-XXXXX

SN:XXXXXXXXXXXXX
IMEI:XXXXXXXXXXXXXX

PCIe

USB

WLAN0 ··· WLAN3

AP

PCIe — Wi-Fi 1

WLAN0 ··· WLAN3

PCIe — Wi-Fi 2

PCIe

PCIe — XGMII — 1GE/ 2.5GE/ 10GE WAN/ LAN

USB — USB — XGMII — 1GE/ 2.5GE/ 10GE WAN/ LAN

AP	IPQ807x/IPQ5018/MT7621/…

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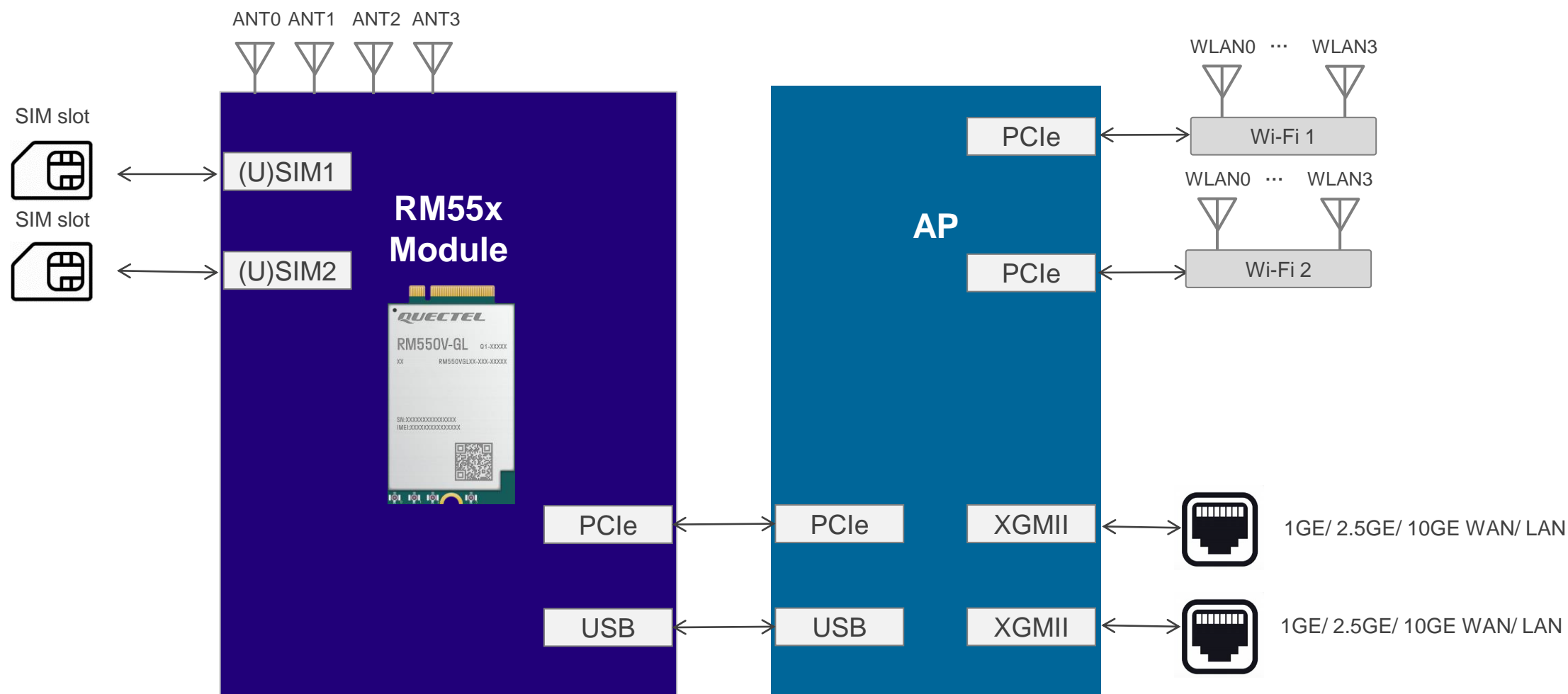
RG52xN/F & RM520N series highlights

QUECTEL

5G

3GPP Rel-16 compliant

- 5G NSA/SA, FDD/TDD supported
- Up to 300M NR BW
- Sub-6 CA up to DL 3CA / UL 2CA
- LTE Cat up to DL Cat 20/ UL Cat 18
- DL 8Rx supported [1]
- Embedded GNSS supported by All variants
- 5G LAN supported
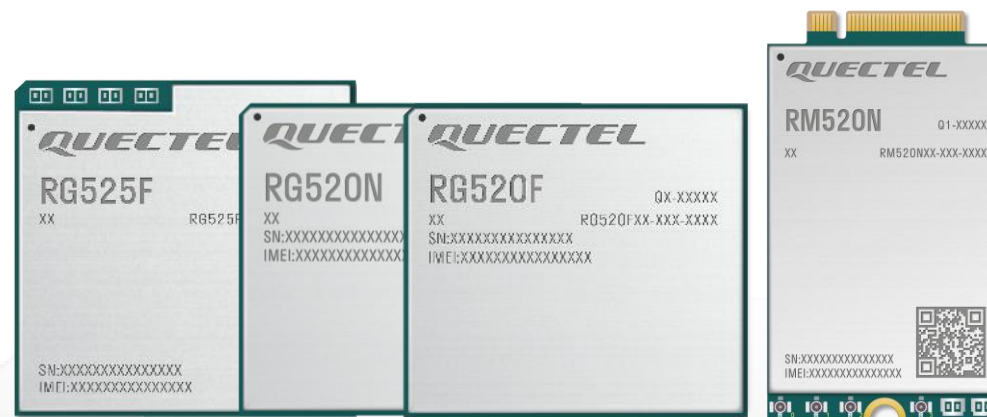
RG52xN/F & RM520N series

Global variants of M.2 module

- Global markets and bands covered
- Standard 30 × 52 M.2 form factor and pinout
- Completely compatible with Rel-15 5G M.2 module and LTE-Advanced M.2 modules

Regional variants of LGA module

- Abundant regional variants of LGA modules
- Cost effective
- Open solution supported for FWA applications

Abundant hardware interface & supported peripherals

- Dual SIM single stand-by
- PCIe Gen3
- USB 3.x/2.0

Convenient and guaranteed commercialization

- Global regulatory and carrier certified
- Total shipment volume reaches millions of pieces

[1]: 8Rx supported by RG525F-NA   FWA: Fixed Wireless Access

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RG520N/RG520F series specifications

44.0 × 41.0 × 2.75 mm
5G Sub-6 GHz LGA Module

Variant		RG520N-EU	RG520N-EB	RG520F-EU	RG520F-EB	RG520N-NA	RG520F-NA	RG520N-LA	RG520N-GT
Region		EMEA/ APAC① / Brazil				North America		LATAM (excl. Brazil)	Global TDD 3.5 GHz
Platform		SDX62		SDX65		SDX62	SDX65	SDX62	
5G NR	**5G NR**	3GPP Release 16 NSA/SA operation, Sub-6 GHz							
	NSA band	n1/ 3/ 5/ 7/ 8/ 20/ 28/ 38/ 40/ 41/ 75/ 76/ 77/ 78	n1/ 3/ 5/ 7/ 8/ 20/ 28/ 38/ 40/ 41/ 71/ 75/ 76/ 77/ 78	n1/ 3/ 5/ 7/ 8/ 20/ 28/ 38/ 40/ 41/ 75/ 76/ 77/ 78	n1/ 3/ 5/ 7/ 8/ 20/ 28/ 38/ 40/ 41/ 71/ 75/ 76/ 77/ 78	n2/ 5/ 7/ 12/ 13/ 14/ 25/ 26/ 29/ 30/ 38/ 41/ 48/ 66/ 70/ 71/ 77/ 78		n2/ 5/ 7/ 8/ 28/ 40/ 66/ 78	-
	SA band	n1/ 3/ 5/ 7/ 8/ 20/ 28/ 38/ 40/ 41/ 75/ 76/ 77/ 78	n1/ 3/ 5/ 7/ 8/ 20/ 28/ 38/ 40/ 41/ 71/ 75/ 76/ 77/ 78	n1/ 3/ 5/ 7/ 8/ 20/ 28/ 38/ 40/ 41/ 75/ 76/ 77/ 78	n1/ 3/ 5/ 7/ 8/ 20/ 28/ 38/ 40/ 41/ 71/ 75/ 76/ 77/ 78	n2/ 5/ 7/ 12/ 13/ 14/ 25/ 26/ 29/ 30/ 38/ 41/ 48/ 66/ 70/ 71/ 77/ 78		n2/ 5/ 7/ 8/ 28/ 40/ 66/ 78	n48/ 77/ 78
	Max. Sub-6 BW	120 MHz		200 MHz		120 MHz	200 MHz	120 MHz	
	Sub-6 CA	FDD + FDD, TDD + TDD, FDD + TDD DL 2CA/ UL 2CA		FDD + FDD, TDD + TDD, FDD + TDD DL 3CA/ UL 2CA		FDD + FDD, TDD + TDD, FDD + TDD DL 2CA/ UL 2CA	FDD + FDD, TDD + TDD, FDD + TDD DL 3CA/ UL 2CA	FDD + FDD, TDD + TDD, FDD + TDD DL 2CA/ UL 2CA	
	DL 4 × 4 MIMO	n1/ 3/ 5/ 7/ 8/ 20/ 28/ 40/ 41/ 75/ 76/ 77/ 78	n1/ 3/ 7/ 38/ 40/ 41/ 71③ / 77/ 78	n1/ 3/ 5/ 7/ 8/ 20/ 28/ 38/ 40/ 41/ 75/ 76/ 77/ 78	n1/ 3/ 7/ 38/ 40/ 41/ 71③ / 77/ 78	n2/ 5/ 7/ 12/ 13② / 14/ 25/ 26② / 29/ 30/ 38/ 41/ 48/ 66/ 70/ 71/ 77/ 78		n2/ 7/ 40/ 66/ 78	n48/ 77/ 78
	UL 2 × 2 MIMO	n38/ 40/ 41/ 77/ 78				n38/ 41/ 48/ 77/ 78		n78	n48/ 77/ 78
LTE	**LTE category**	DL Cat 19/ UL Cat 18		DL Cat 20/ UL Cat 18		DL Cat 19/ UL Cat 18	DL Cat 20/ UL Cat 18	DL Cat 19/ UL Cat 18	
	LTE band	B1/ 3/ 5/ 7/ 8/ 20/ 28/ 32/ 38/ 40/ 41/ 42/ 43	B1/ 3/ 5/ 7/ 8/ 20/ 28/ 32/ 38/ 40/ 41/ 42/ 43/ 71	B1/ 3/ 5/ 7/ 8/ 20/ 28/ 32/ 38/ 40/ 41/ 42/ 43	B1/ 3/ 5/ 7/ 8/ 20/ 28/ 32/ 38/ 40/ 41/ 42/ 43/ 71	B2/ 4/ 5/ 7/ 12(17)/ 13/ 14/ 25/ 26/ 29/ 30/ 38/ 41/ 42/ 43/ 46/ 48/ 66/ 71		B2/ 4/ 5/ 7/ 8/ 26/ 28/ 40/ 42/ 66	B42/ 43/ 48
	DL 4 × 4 MIMO	B1/ 3/ 5/ 7/ 8/ 20/ 28/ 32/ 38/ 40/ 41/ 42/ 43	B1/ 3/ 7/ 38/ 40/ 41/ 42/ 43/ 71③	B1/ 3/ 5/ 7/ 8/ 20/ 28/ 32/ 38/ 40/ 41/ 42/ 43	B1/ 3/ 7/ 8/ 38/ 40/ 41/ 42/ 43/ 71③	B2/ 4/ 5/ 7/ 12(17)/ 13/ 14/ 25/ 26/ 29/ 30/ 38/ 41/ 42/ 43/ 48/ 66/ 71		B2/ 4/ 7/ 40/ 42/ 66	B42/ 43/ 48
UMTS	**WCDMA band**	B1/ 5/ 8				-		B2 /4/ 5	-
Embedded GNSS		Optional							
PCIe 3.0 interface		Supported							
USB 3.1 interface		Supported							
RGMII interface		Not Supported							
Certification	**Carrier**	Telstra	TBD	TBD	TBD	Verizon*/ T-Mobile/ AT&T	TBD	TBD	TBD
	Regulatory	GCF/ CE/ RCM/ Anatel	CE/ RCM	CE/ RCM/ UKCA	CE/ RCM/ GCF*	GCF/ PTCRB/ FCC/ IC	FCC/ PTCRB	FCC**	CE
Project stage		CS	CS	CS	CS	CS	CS	CS	CS

①: Excl. China/Japan.   ②: Currently, support DL 2 × 2 MIMO only.   ③: Optional.   *: In progress.   **: Planning

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RG520N-NA timelines

2023										2024											
Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.

RG520N-NA

Certification

Carrier

AT&T .... Completed

T-Mobile .... Completed

Verizon ●————————————————————————▶

Regulatory

GCF/ PTCRB/ FCC/ IC .... Completed

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Version: 7.2 | Status: Released
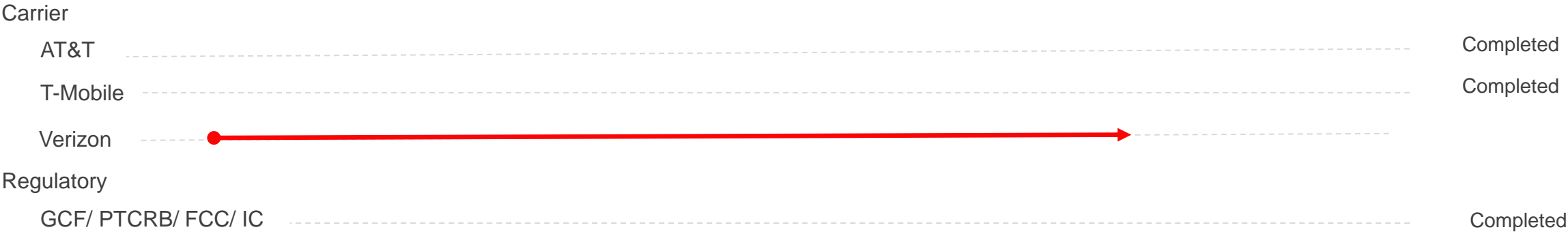
RG525F/RG530F series specifications

45.0 × 48.0 × 2.85 mm
5G Sub-6 GHz & mmWave LGA module

Variant		RG530F-EU	RG530F-NA	RG525F-NA
Region		EMEA/ APAC[①]/ Brazil	North America	
Platform		SDX65		
5G NR	**5G NR**	3GPP Release 16 NSA/SA operation, Sub-6 GHz, mmWave		3GPP Release 16 NSA/SA operation, Sub-6 GHz
	Sub-6 NSA band	n1/ 3/ 5/ 7/ 8/ 20/ 28/ 38/ 40/ 41/ 75/ 76/ 77/ 78	n2/ 5/ 7/ 12/ 13/ 14/ 25/ 26/ 29/ 30/ 38/ 41/ 48/ 66/ 70/ 71/ 77/ 78	
	Sub-6 SA band	n1/ 3/ 5/ 7/ 8/ 20/ 28/ 38/ 40/ 41/ 75/ 76/ 77/ 78	n2/ 5/ 7/ 12/ 13/ 14/ 25/ 26/ 29/ 30/ 38/ 41/ 48/ 66/ 70/ 71/ 77/ 78	
	Max. Sub-6 BW	200 MHz		
	Sub-6 CA	FDD + FDD, TDD + TDD, FDD + TDD DL 3CA/ UL 2CA		
	mmWave band	n257/ 258/ 260/ 261		-
	Max. mmWave BW	800 MHz		-
	DL 8Rx	-	-	n48/ 77/ 78
	DL 4 × 4 MIMO	n1/ 3/ 5/ 7/ 8/ 20/ 28/ 38/ 40/ 41/ 75/ 76/ 77/ 78	n2/ 5/ 7/ 12/ 13[②]/ 14/ 25/ 26[②]/ 29/ 30/ 38/ 41/ 48/ 66/ 70/ 71/ 77/ 78	
	UL 2 × 2 MIMO	n38/ 40/ 41/ 77/ 78	n38/ 41/ 48/ 77/ 78	
LTE	**LTE category**	DL Cat 20/ UL Cat18		
	LTE band	B1/ 3/ 5/ 7/ 8/ 20/ 28/ 32/ 38/ 40/ 41/ 42/ 43	B2/ 4/ 5/ 7/ 12(17)/ 13/ 14/ 25/ 26/ 29/ 30/ 38/ 41/ 42/ 43/ 46/ 48/ 66/ 71	
	DL 4 × 4 MIMO	B1/ 3/ 5/ 7/ 8/ 20/ 28/ 32/ 38/ 40/ 41/ 42/ 43	B2/ 4/ 5/ 7/ 12/ 13/ 14/ 17/ 25/ 26/ 29/ 30/ 38/ 41/ 42/ 43/ 48/ 66/ 71	
UMTS	**WCDMA band**	B1/ 5/ 8	-	
Embedded GNSS		Optional		
PCIe 3.0 interface		Supported		
USB 3.1 interface		Supported		
RGMII interface		-		
Certification	**Carrier**	Quectel will provide technical support for customer to certify RG530F based device directly.		Rogers
	Regulatory			IC/ PTCRB/ FCC
Project stage		CS	CS	CS

Back

①: Excl. China/Japan   ②: Only DL 2 × 2 MIMO supported   *: In progress   Build a smarter world

AP + module router architecture (RG52x/RG53x series)

ANT ANT ANT … ANT ANT_GNSS

WLAN0 … WLAN3

WLAN0 … WLAN3

SIM slot

(U)SIM1

RG52x/RG53x module

QUECTEL
RG5Xx
QX-XXXXX
XX   RG5XxXXX-XXX-XXXX
SN:XXXXXXXXXXXXXXX
IMEI:XXXXXXXXXXXXXXX

SIM slot

(U)SIM2

SD card

SDIO

AP

PCIe ↔ Wi-Fi 1

PCIe ↔ Wi-Fi 2

PCIe ↔ **PCIe** **XGMII** ↔ 1GE/ 2.5GE/ 10GE WAN/ LAN

SLIC ↔ **PCM/SPI** **USB** ↔ **USB** **XGMII** ↔ 1GE/ 2.5GE/ 10GE WAN/ LAN

AP	IPQ807x/IPQ5018/MT7621/…

Build a smarter world
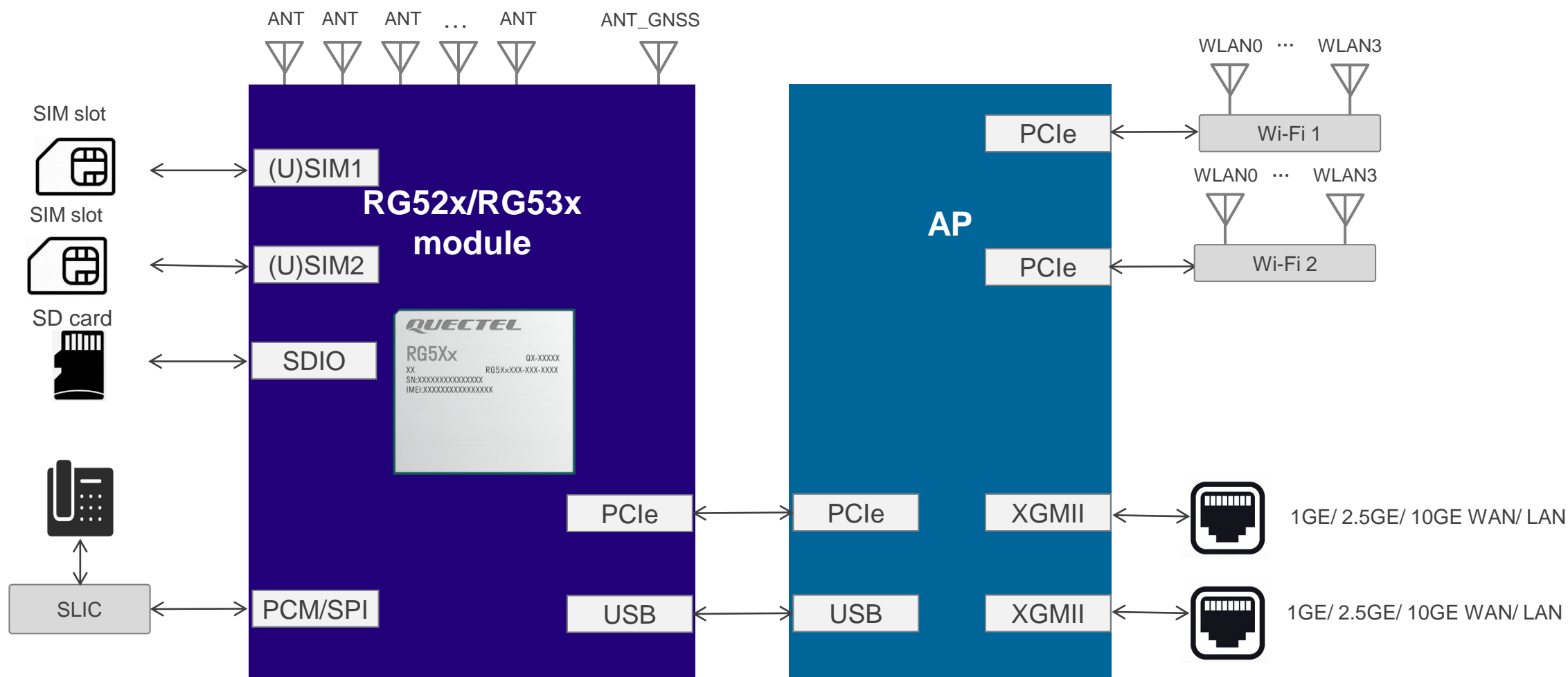
Typical SoC router architecture (RG52x/RG53x series)
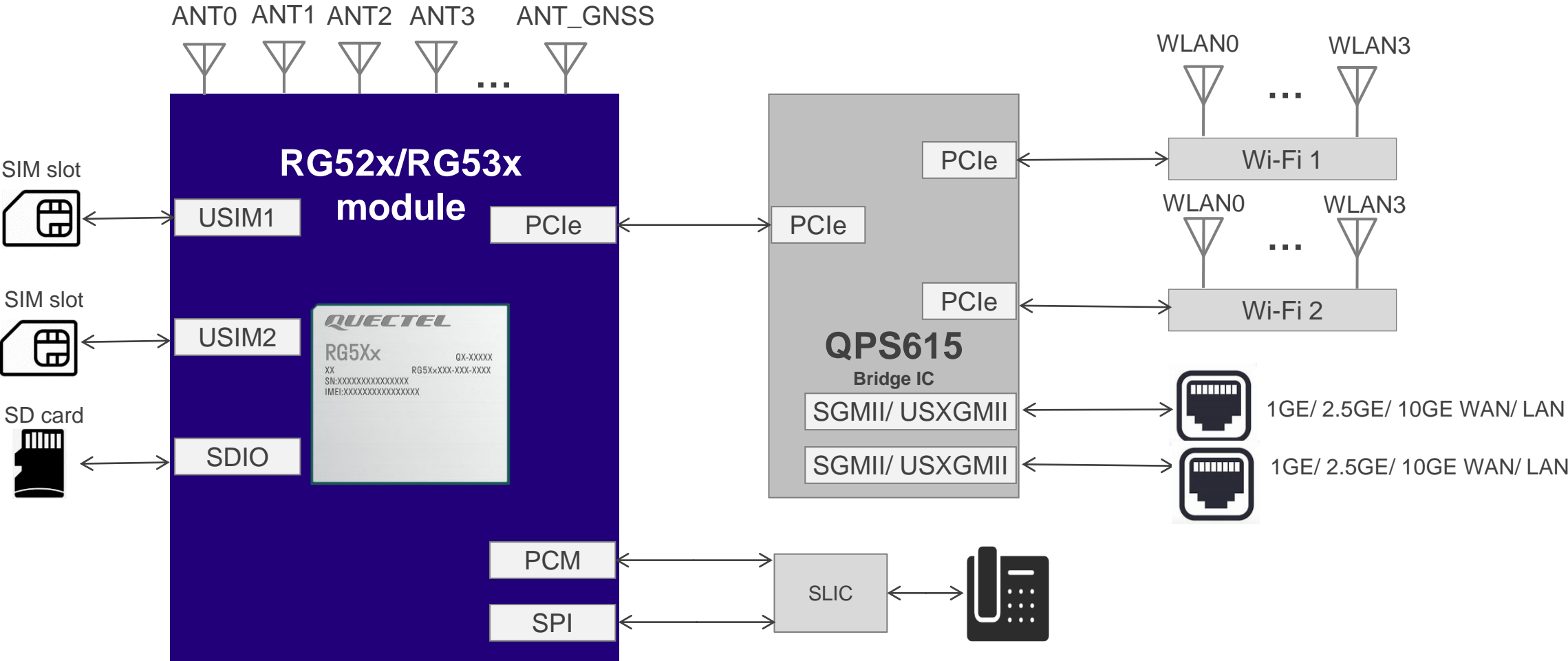
Wi-Fi 6E	2.4/ 5/ 6 GHz + Bluetooth	FC60E/ FC08E/ WCN6856 2 × 2	2.4G/ 5G	QFW6124 4 × 4
Wi-Fi 6	2.4G/ 5G + Bluetooth	FC64E/ FC06E/ QCA2064 2 × 2	2.4G/ 5G	QFW6114 4 × 4
Ethernet	Up to 10 Gbps	QCA8081/ RTL8125B/ RTL8367SC/ RTL8111x/ AQR113C, etc.		

Build a smarter world

Typical SoC MiFi architecture (RG52x/RG53x series)
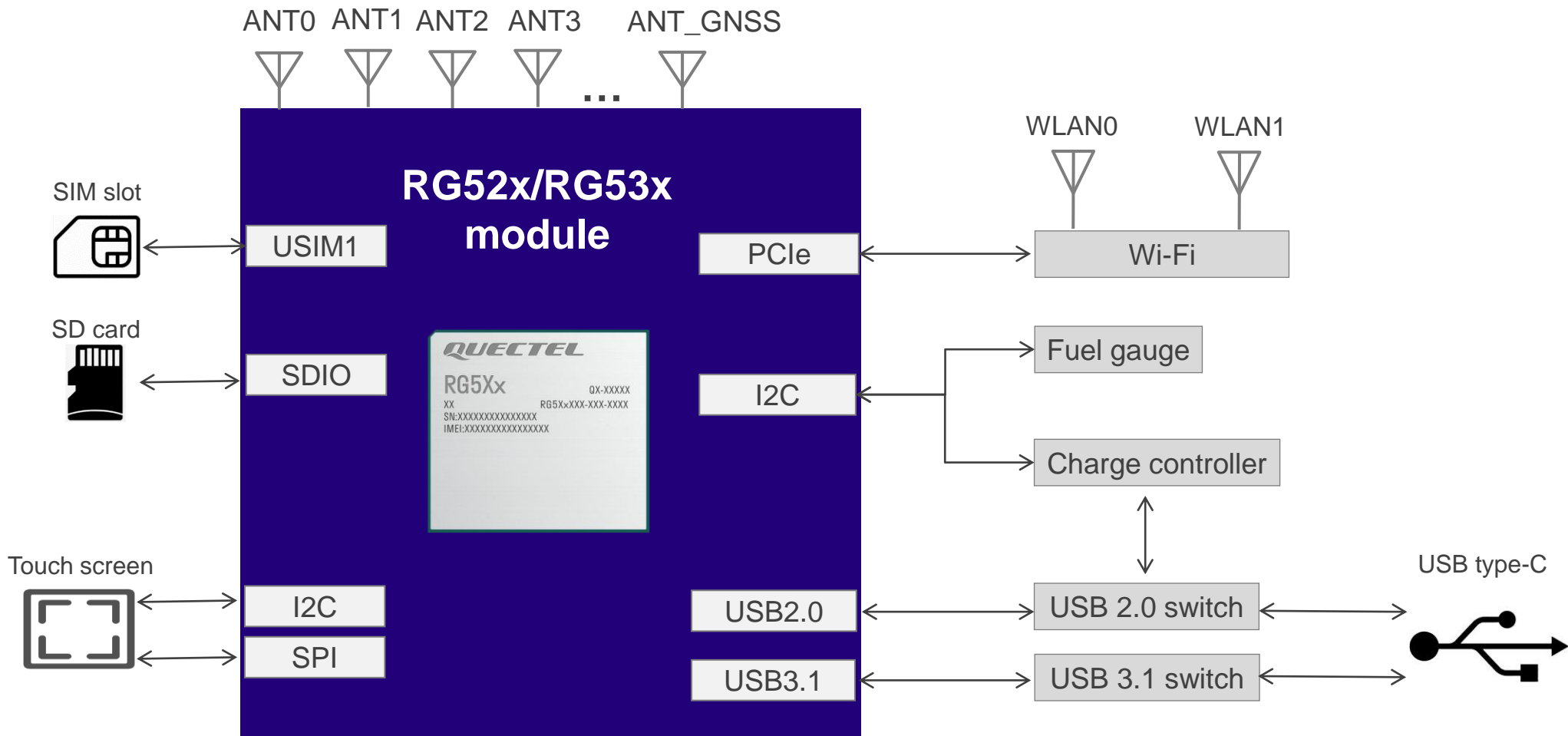
ANT0 ANT1 ANT2 ANT3   ANT_GNSS

...

WLAN0   WLAN1

RG52x/RG53x module

SIM slot → USIM1

SD card → SDIO

QUECTEL
RG5Xx   QX-XXXXX
XX   RG5XxXXX-XXX-XXXX
SN:XXXXXXXXXXXXXX
IMEI:XXXXXXXXXXXXXXXX

Touch screen → I2C
Touch screen → SPI

PCIe ↔ Wi-Fi

I2C ← Fuel gauge / Charge controller

USB2.0 ↔ USB 2.0 switch ↔ USB type-C

USB3.1 ↔ USB 3.1 switch ↔

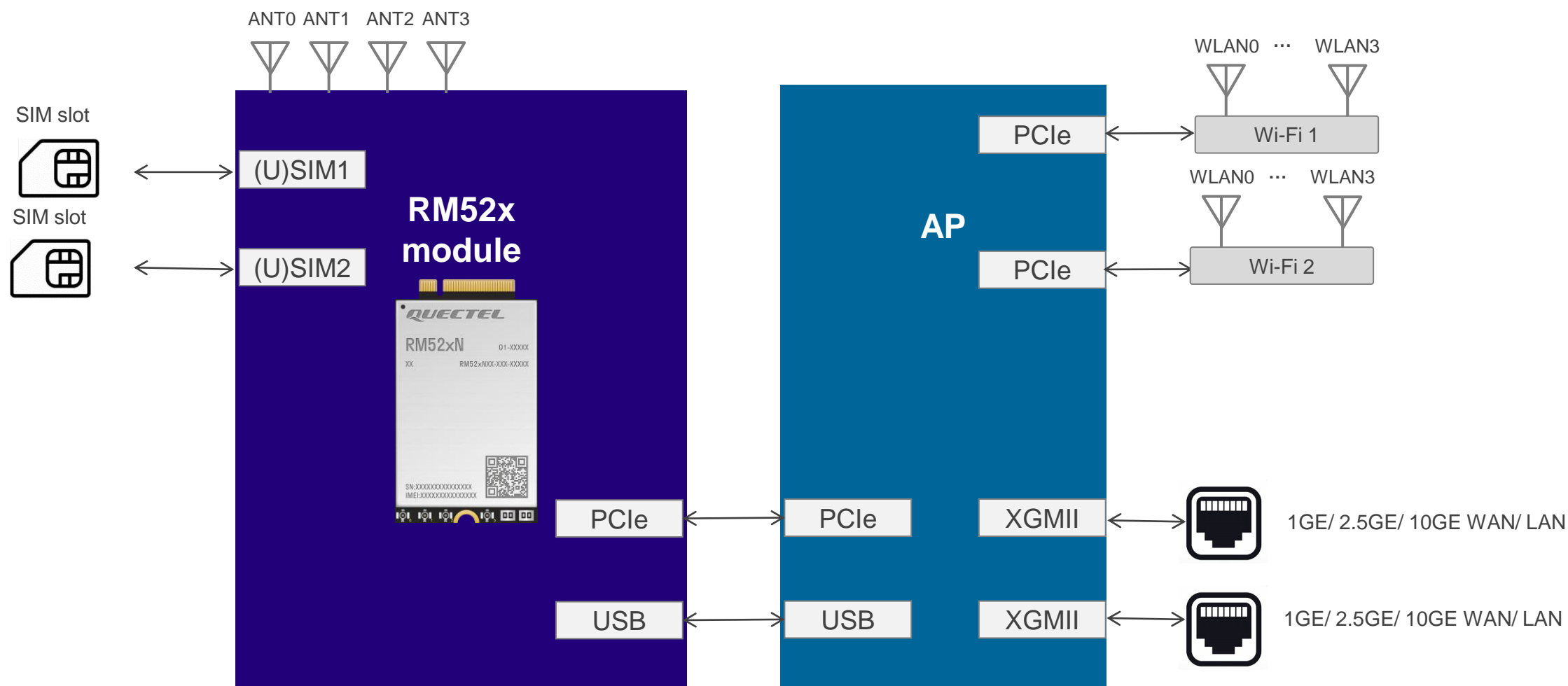| Wi-Fi 6E	2.4/ 5/ 6 GHz + Bluetooth	FC60E/ FC08E/ WCN6856 2 × 2	2.4G/ 5G	QFW6124 4 × 4
Wi-Fi 6	2.4G/ 5G + Bluetooth	FC64E/FC06E/QCA2064 2 × 2	2.4G/ 5G	QFW6114 4 × 4

Build a smarter world

RM520N/RM530N series specifications

30.0 × 52.0 × 2.3 mm
5G Sub-6 GHz & mmWave M.2 Module

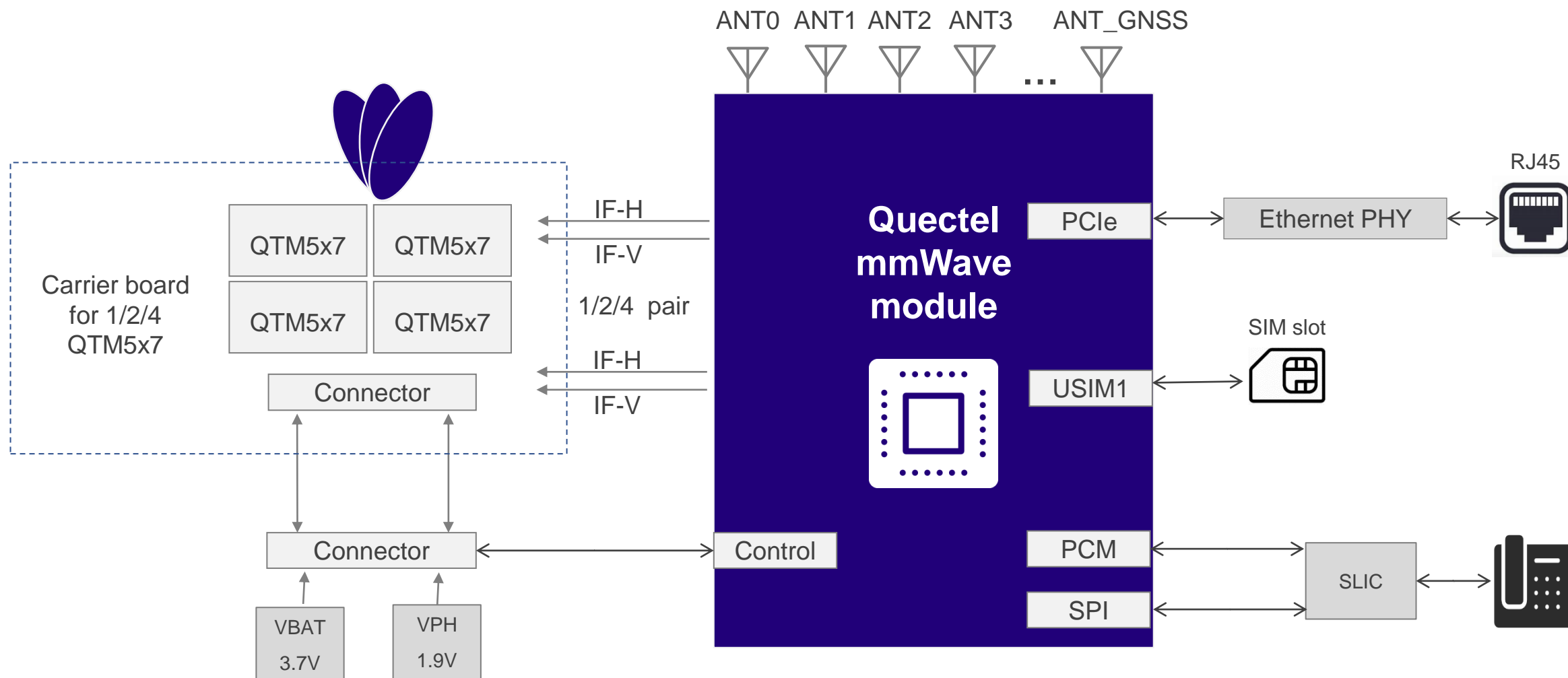| Variant		RM520N-GL	RM530N-GL	RM520N-EU
Region		Global[①]	Global	EMEA/ APAC[②]/ Brazil
Platform		SDX62		SDX62
5G NR	5G NR	3GPP Release 16 NSA/SA operation, Sub-6 GHz	3GPP Release 16 NSA/SA operation, Sub-6 GHz, mmWave	3GPP Release 16 NSA/SA operation, Sub-6 GHz
	Sub-6 NSA band	n1/ 2/ 3/ 5/ 7/ 8/ 12/ 13/ 14/ 18/ 20/ 25/ 26/ 28/ 29/ 30/ 38/ 40/ 41/ 48/ 66/ 70/ 71/ 75/ 76/ 77/ 78/ 79		n1/ 3/ 5/ 7/ 8/ 20/ 28/ 38/ 40/ 41/ 71/ 77/ 78/ 75/ 76
	Sub-6 SA band	n1/ 2/ 3/ 5/ 7/ 8/ 12/ 13/ 14/ 18/ 20/ 25/ 26/ 28/ 29/ 30/ 38/ 40/ 41/ 48/ 66/ 70/ 71/ 75/ 76/ 77/ 78/ 79		n1/ 3/ 5/ 7/ 8/ 20/ 28/ 38/ 40/ 41/ 71/ 77/ 78/ 75/ 76
	Max. Sub-6 BW	120 MHz		120 MHz
	Sub-6 CA	FDD + FDD, TDD + TDD, FDD + TDD DL 2CA/ UL 2CA		FDD + FDD, TDD + TDD, FDD + TDD DL 2CA/ UL 2CA
	mmWave band	-	n257/ 258/ 260/ 261	-
	Max. mmWave BW	-	400 MHz	-
	DL 4 × 4 MIMO	n1/ 2/ 3/ 7/ 25/ 30/ 38/ 40/ 41/ 48/ 66/ 70/ 77/ 78/ 79		n1/ 3/ 7/ 38/ 40/ 41/ 77/ 78
	UL 2 × 2 MIMO	n38/ 41/ 48/ 77/ 78/ 79	n38/ 41/ 48/ 77/ 78/ 79/ 257/ 258/ 260/ 261	n38/ 40/ 41/ 77/ 78
LTE	LTE category	DL Cat 19/ UL Cat 18		DL Cat 19/ UL Cat 18
	LTE band	B1/ 2/ 3/ 4/ 5/ 7/ 8/ 12/ 13/ 14/ 17/ 18/ 19/ 20/ 25/ 26/ 28/ 29/ 30/ 32/ 34/ 38/ 39/ 40/ 41/ 42/ 43/ 46(LAA)/ 48/ 66/ 71		B1/ 3/ 5/ 7/ 8/ 20/ 28/ 32/ 38/ 40/ 41/ 42/ 43/ 71
	DL 4 × 4 MIMO	B1/ 2/ 3/ 4/ 7/ 25/ 30/ 38/ 40/ 41/ 42/ 43/ 48/ 66		B1/ 3/ 7/ 38/ 40/ 41/ 42/ 43
UMTS	WCDMA band	B1/ 2/ 4/ 5/ 8/ 19		B1/ 5/ 8
Embedded GNSS		Optional		
PCIe 3.0 interface		Supported		
USB 3.1 interface		Supported		
eSIM		Supported / Built-in eSIM (optional)		
Certification	Carrier	T-Mobile[③]/ Verizon[③]/ SoftBank[④]/ AT&T/ LG U+/ NTT DOCOMO/ Deutsche Telekom/ Telefónica/ Telstra/ KDDI/ KT	Quectel will provide technical support for customer to certify RM530N-GL based device directly.	TBD
	Regulatory	GCF/ PTCRB/ CE/ Anatel/ CCC/ RCM/ IC/ FCC/ JATE/ TELEC/ KC/ NCC		CE/ RCM/ UKCA
Project stage		CS	CS	CS

①: Different regions support different software versions. Please contact PM/PDM for details   ②: Excl. China/Japan   ③ : LE1.3 MR is ongoing   ④ : PC only   *: In progress   **Build a smarter world**

Back

Typical AP + module router architecture (RM52x/RM53x series)

ANT0 ANT1 ANT2 ANT3

SIM slot

(U)SIM1

SIM slot

(U)SIM2

RM52x module

QUECTEL
RM52xN   Q1-XXXXX
XX   RM52xNXX-XXX-XXXXX
SN:XXXXXXXXXXXXX
IMEI:XXXXXXXXXXXXX

PCIe

USB

AP

WLAN0 ··· WLAN3

PCIe — Wi-Fi 1

WLAN0 ··· WLAN3

PCIe — Wi-Fi 2

PCIe

USB

PCIe — XGMII — 1GE/ 2.5GE/ 10GE WAN/ LAN

XGMII — 1GE/ 2.5GE/ 10GE WAN/ LAN

AP   IPQ807x/IPQ5018/MT7621/…

Build a smarter world

Typical high power mmWave application

Build a smarter world

Typical low power mmWave application

ANT0 ANT1 ANT2 ANT3   ANT_GNSS

WLAN0   WLAN1

SIM slot

SD card

Quectel mmWave Module

- USIM1
- SDIO
- Control
- I2C
- SPI

- PCIe → Wi-Fi
- IF-H
- IF-V
- VBAT 3.7V
- VPH 1.9V
- Connector → 1/2/4 QTM5x5
- Control
- I2C → Fuel gauge / Charge controller
- USB 2.0 → USB 2.0 switch
- USB 3.1 → USB 3.1 switch

1/2/4 QTM5x5

IF-H
IF-V
VBAT 3.7V
VPH 1.9V
Control

Connector

Touch screen

Fuel gauge

Charge controller

USB type-C

USB 2.0 switch

USB 3.1 switch

Build a smarter world

SDX35 module: RG255C series & RM255C-GL highlights

5G

3GPP Rel-17 5G RedCap

- 5G LAN
- Smaller size
- Cost effective
- Lower power consumption
- 5G URLLC supported
- Supplementary functions:
  GNSS, VoLTE, etc.

RG255C Series

RG255C-GL M.2   **RG255C Series Mini PCIe**

RM255C-GL

Convenient migration

- Compatible with Quectel LTE Cat 4 modules
- Compatible with Global LTE bands
- 1TX/2RX or 1TX/1RX
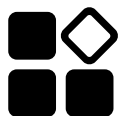
SoC architecture

- SoC architecture based on module
- OpenWrt supported
- Arm Cortex-A7 1.7 GHz

Abundant hardware interface

- PCIe 2.0 × 1
- SGMII × 1
- USB 2.0 × 1

Version: 7.2 | Status: Released

Build a smarter world

RG255C series & RM255C-GL specification

Rel-17 5G RedCap module

Variant		RG255C-GL	RG255C-GL Mini PCIe	RG255C-GL M.2	RG255C-NA	RG255C-EU	RM255C-GL
Region		Global			North America	EMEA/APAC[①]/Brazil	Global
Platform		SDX35					
Size (mm)		32.0 × 29.0 × 2.4	30.0 × 50.95 × 4.95	30.0 × 42.0 × 3.25	32.0 × 29.0 × 2.4	32.0 × 29.0 × 2.4	30.0 × 42.0 × 2.3
5G NR	**5G NR**	3GPP Release 17 RedCap SA operation, Sub-6 GHz					
	SA band	n1/ 2/ 3/ 5/ 7/ 8/ 12/ 13/ 14/ 18/ 20/ 25/ 26/ 28/ 30/ 38/ 40/ 41/ 48/ 66/ 70/ 71/ 77/ 78/ 79			n2/ 5/ 7/ 12/ 13/ 14/ 25/ 26/ 30/ 38/ 41/ 48/ 66/ 70/ 71/ 77/ 78	n1/ 3/ 5/ 7/ 8/ 20/ 28/ 38/ 40/ 41/ 77/ 78	n1/ 2/ 3/ 5/ 7/ 8/ 12/ 13/ 14/ 18/ 20/ 25/ 26/ 28/ 30/ 38/ 40/ 41/ 48/ 66/ 70/ 71/ 77/ 78
	Max. Sub-6 BW	20 MHz					
LTE	**LTE category**	Cat 4					
	LTE band	B1/ 2/ 3/ 4/ 5/ 7/ 8/ 12/ 13/ 14/ 17/ 18/ 19/ 20/ 25/ 26/ 28/ 30/ 34/ 38/ 39/ 40/ 41/ 42/ 43/ 48/ 66/ 70/ 71			B2/ 4/ 5/ 7/ 12/ 13/ 14/ 17/ 25/ 26/ 30/ 38/ 41/ 42/ 43/ 48/ 66/ 71	B1/ 3/ 5/ 7/ 8/ 20/ 28/ 38/ 40/ 41/ 42/ 43	B1/ 2/ 3/ 4/ 5/ 7/ 8/ 12/ 13/ 14/ 17/ 18/ 19/ 20/ 25/ 26/ 28/ 30/ 34/ 38/ 39/ 40/ 41/ 42/ 43/ 48/ 66/ 71
Embedded GNSS		Optional					
PCIe 2.0 interface		Supported	-	Supported	Supported	Supported	Supported
USB 2.0 interface		Supported					
SGMII interface		Supported	-	-	Supported	Supported	-
eSIM		Supported / Built-in eSIM (optional)					
Certification	**Carrier**	AT&T*/ Verizon*/ T-Mobile*	TBD	TBD	TBD	TBD	TBD
	Regulatory	CE*/ RCM* /FCC*/ IC*/ GCF*/ PTCRB*	CE*/ RCM* / FCC*/ IC*/	CE*/ RCM* /FCC*/ IC*/	FCC*/ IC*/ PTCRB*	CE*/ RCM*	TBD
Project stage		CS	CS	ES	Developing	Developing	ES

①: Excl. China/Japan   *: Under development/In progress

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Build a smarter world

RG255C-GL (M.2/ Mini PCIe) timeline (preliminary)

	2023								2024										
May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.

RG255C-GL

Certification

Regulatory

    CE/ RCM / FCC/ IC

    GCF/ PTCRB

RG255C-GL M.2

Project schedule

ES   CS

Certification

Regulatory

    CE/ RCM / FCC/ IC

RG255C-GL Mini PCIe

Certification

Regulatory

    CE/ RCM / FCC/ IC

Build a smarter world

RM255C-GL timeline (preliminary)

	2023						2024												2025			
Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.

RM255C-GL

Project schedule

ES1   ES2   ES3   ES4   CS

Build a smarter world

Typical AP + module router architecture (RG255C series)

ANT0 ANT1

ANT_GNSS

SIM slot

SIM slot

RG255C module

(U)SIM1

(U)SIM2

QUECTEL
RG255C   Q1-XXXXX
XX   RG255CXX-XXX-XXXXX

SN:XXXXXXXXXXXXXX
IMEI:XXXXXXXXXXXXXXX

WLAN0 ··· WLAN3

AP

PCIe

Wi-Fi

PCIe

PCIe

XGMII

1GE/ 2.5GE/ 10GE WAN/ LAN

SLIC

PCM/SPI

USB

USB

XGMII

1GE/ 2.5GE/ 10GE WAN/ LAN

AP	IPQ5018/MT7621/…

Build a smarter world

Typical SoC router architecture (RG255C series)

ANT0 ANT1

ANT_GNSS

WLAN0   WLAN1

Wi-Fi

PCIe

RG255C module

1GE WAN/ LAN

SGMII

SIM slot

(U)SIM1

QUECTEL

RG255C   Q1-XXXXX

XX   RG255CXX-XXX-XXXXX

PCM

SLIC

SIM slot

(U)SIM2

SN:XXXXXXXXXXXXXX
IMEI:XXXXXXXXXXXXXX

SPI

Typical SoC 5G CPE (Customer premise equipment) solution based on SDX35 platform.

Wi-Fi 5	2.4/ 5/ GHz + Bluetooth	QCA6174	2 × 2
Wi-Fi 6E	2.4/ 5/ 6 GHz + Bluetooth	WCN6856/ FC60E/ FC08E	2 × 2
Ethernet	Up to 1 Gbps	QEP8111/ RTL8211, etc.	

Build a smarter world

Version: 7.2 | Status: Released

5G module portfolio – part 2

Sub-6 GHz		
LGA, 53 × 44 mm		

	Sub-6 GHz	

T830

RG620T
- EU (EMEA/ APAC① / Brazil)
- NA (North America)

RG620T (carrier customized)
- EP (EMEA)
- VZ* (Verizon Customized)
- AT* (AT&T Customized)
- TM* (T-Mobile Customized)

LGA, 44 × 41 mm		LGA, 44 × 41 mm

T750

RG500L
- EU (EMEA/ APAC① / Brazil)
- NA (North America)
- LA (LATAM②)

RG500L (carrier customized)
- AR (India)
- JIO (India)

RG600L
- EU ES (EMEA/ APAC① / Brazil)

ES: Engineering Sample   *: Developing   ①: Excl. China/Japan   ②: Excl. Brazil

Build a smarter world

RG620T & RG500L & RG600L series highlights

5G features

- 3GPP Release16
- 5G Sub-6GHz
- 5G SA/NSA, FDD/TDD
- FR1 4CC 300 MHz
- DL/ UL: 7.01 Gbps/ 2.5 Gbps

RG500L Series **RG620T Series** **RG600L-EU**

System architecture

- SoC 5G chipset
- 4-nm process
- Quad-core Cortex-A55 (2.2 GHz)

Networki

- USXGMII × 2 (10 Gbps network interface)
- PCIe 4.0 × 1 + PCIe 3.0 × 2
- GNSS (BDS/ Galileo/ GLONASS/ GPS/ QZSS)
- USB 3.2
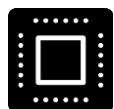
Module features

- 8RX
- 3TX
- HPUE, PC1.5
- 5G UltraSave/ network acceleration engine
- 5G modem integrated built-in CPUs/ CPE needless controller
- Applicable to CPE/ MiFi/ home gateway/ industrial gateway

Wi-Fi features

- Wi-Fi 6/ Wi-Fi 6E/ Wi-Fi 7 supported
- AX6000 – BE19000
- EasyMesh 4.0, WPA3 R3
- Wi-Fi Offload

Easy CPE development

- Customized DDR/flash & bands
- OpenWrt based on Linux
- Reference design for peripherals
- Schematics inspection
- Debugging for common drivers
- Wi-Fi or ethernet component supply

Version: 7.2 | Status: Released

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RG620T series specifications

53.0 × 44.0 × 2.95 mm
5G Sub-6 GHz LGA module

Variant		RG620T-NA	RG620T-EU
Region		North America	EMEA/ APAC[1]/ Brazil
Platform		T830	
5G NR	5G NR	3GPP Release 16 NSA/SA operation, Sub-6 GHz	
	Sub-6 NSA band	n2/ 5/ 7/ 12/ 13/ 14/ 25/ 26/ 29/ 30/ 38/ 41/ 48/ 66/ 70/ 71/ 77/ 78	n1/ 3/ 5 (71[2])/ 7/ 8/ 20/ 28/ 38/ 40/ 41/ 75/ 76/ 77/ 78
	Sub-6 SA band	n2/ 5/ 7/ 12/ 13/ 14/ 25/ 26/ 29/ 30/ 38/ 41/ 48/ 66/ 70/ 71/ 77/ 78	n1/ 3/ 5 (71[2])/ 7/ 8/ 20/ 28/ 38/ 40/ 41/ 75/ 76/ 77/ 78
	Max. Sub-6 BW	300 MHz	
	Sub-6 CA	FDD + FDD, TDD + TDD, FDD + TDD DL 4CA/ UL 2CA	FDD + FDD, TDD + TDD, FDD + TDD DL 4CA/ UL 2CA
	DL 4 × 4 MIMO	n2/ 5/ 7/ 12/ 13/ 14/ 25/ 26/ 30/ 38/ 41/ 48/ 66/ 70/ 71/ 77/ 78	n1/ 3/ 5 (71[2])/ 7/ 8/ 20/ 28/ 38/ 40/ 41/ 77/ 78
	UL 2 × 2 MIMO	n38/ 41/ 48/ 66/ 70/ 71/ 77/ 78	n38/ 40/ 41/ 77/ 78
	DL/UL Peak Rate	5G NR 7.01 Gbps/ 2.5 Gbps (@ DL 300 MHz, SA TDD 8:2)	5G NR 7.01 Gbps/ 2.5 Gbps (@ DL 300MHz, SA TDD 8:2)
	Power Class 1.5	n41/ 77/ 78	n41/ 77/ 78
LTE	LTE category	DL Cat 19/ UL Cat 18	
	LTE band	B2/ 4/ 5/ 7/ 12 (17)/ 13/ 14/ 25/ 26/ 29/ 30/ 38/ 41/ 42/ 43/ 46/ 48/ 66/ 70/ 71	B1/ 3/ 5 (71[2])/ 7/ 8/ 20/ 28/ 32/ 38/ 40/ 41/ 42/ 43 /46
	DL 4 × 4 MIMO	B2/ 4/ 5/ 7/ 12 (17)/ 13/ 14/ 25/ 26/ 30/ 38/ 41/ 42/ 43/ 48/ 66/ 70/ 71	B1/ 3/ 5 (71[2])/ 7/ 8/ 20/ 28/ 38/ 40/ 41/ 42/ 43
UMTS	WCDMA band	-	B1/ 5/ 8
Embedded GNSS		Supported (L1 + L5)	Supported (L1 + L5)[2]
PCIe 4.0 interface		Supported	
USB 3.2 interface		Supported	
USXGMII interface		Supported	
Certification	Carrier	T-Mobile*/ Verizon*/ AT&T*/ DISH*	Deutsche Telekom[3]/ British Telecom[3]/ Orange[3]/ Telstra*
	Regulatory	FCC/ IC/ GCF/ PTCRB	CE/ RCM/ GCF
Project stage		CS	CS

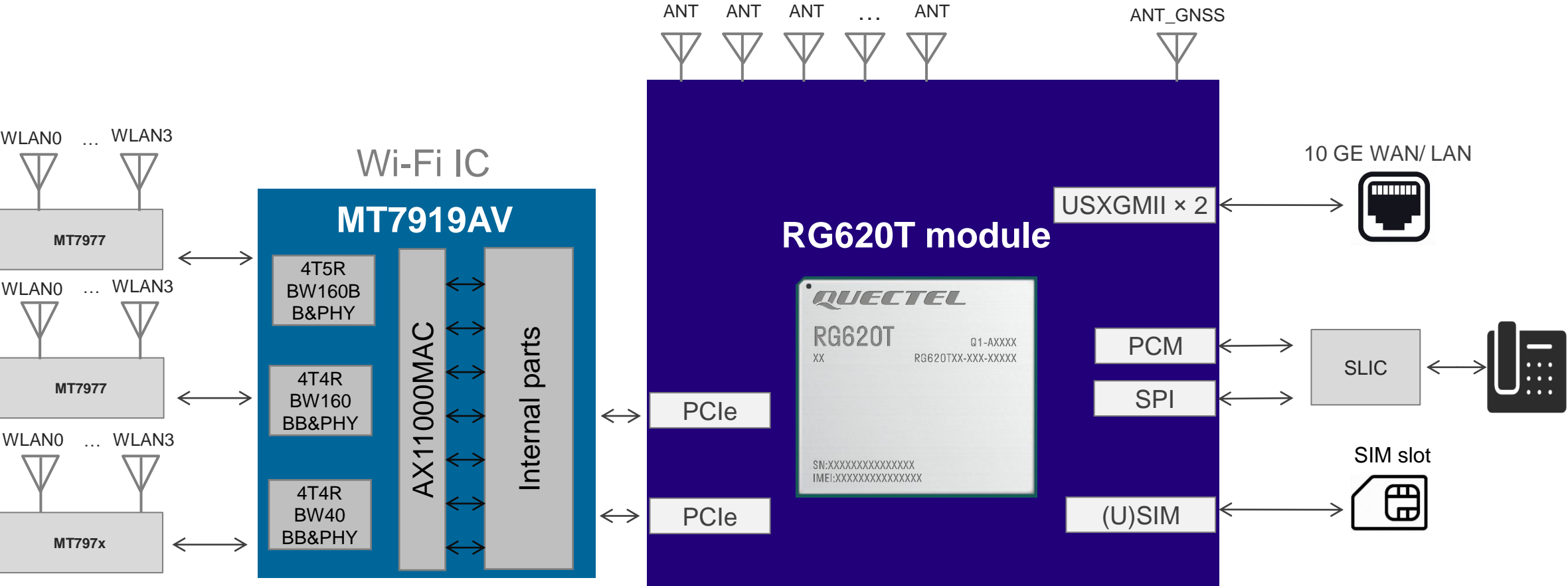①: Excl. China/Japan   ②: Optional   ③: TBD   *: In progress   RFP: Request for Proposal

Version: 7.2 | Status: Released

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RG620T-NA timeline

	2023							2024											
May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.

RG620T-NA

Certification

Carrier	AT&T	
	DISH	
	Verizon	
	T-Mobile	
Regulatory	FCC/ IC	Completed
	GCF	Completed
	PTCRB	Completed

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Typical SoC router architecture (RG620T series)

ANT ANT ANT ... ANT   ANT_GNSS

WLAN0 ... WLAN3

Wi-Fi IC

MT7919AV

MT7977

| 4T5R BW160B B&PHY |
| 4T4R BW160 BB&PHY |
| 4T4R BW40 BB&PHY |

AX11000MAC

Internal parts

WLAN0 ... WLAN3

MT7977

WLAN0 ... WLAN3

MT797x

RG620T module

QUECTEL
RG620T
XX   Q1-AXXXX
            RG620TXX-XXX-XXXXX
SN:XXXXXXXXXXXXXXX
IMEI:XXXXXXXXXXXXXXX

PCIe

PCIe

USXGMII × 2   10 GE WAN/ LAN

PCM

SPI   SLIC

SIM slot

(U)SIM

Typical SoC (System-on-chip) 5G router solution based on T830 platform, supporting 2.4 GHz 4 × 4 and 5 GHz/ 6 GHz, 160 MHz 4 × 4 Wi-Fi.

Wi-Fi	Wi-Fi 6E	Filogic 650 (MT7919AV)	2.4 GHz, 40 MHz 4 × 4 5 GHz or 6 GHz, 160 MHz 4 × 4	AX6000 or higher, dualband/triband Easy mesh
	Wi-Fi 7	Filogic 680 (MT7996AV)	2.4 GHz, 40 MHz 4 × 4 5 GHz or 6 GHz, 320 MHz 4 × 4	
Ethernet	Up to 10GE	Based on RFQ	WAN/LAN	1 Gbps/ 2.5 Gbps/ 10 Gbps

Typical SoC ODU architecture (RG620T series)

ANT   ANT   ANT   ANT   …   ANT_GNSS

RG620T module

| PCIe | | USXGMII × 2 | → 2.5 GE/ 10 GE LAN |

QUECTEL

RG620T   Q1-AXXXX
XX   RG620TXX-XXX-XXXXX

SN:XXXXXXXXXXXXXX
IMEI:XXXXXXXXXXXXXX

PCIe

SDIO
SPI

Wi-Fi for management

PCIe

(U)SIM

SIM slot
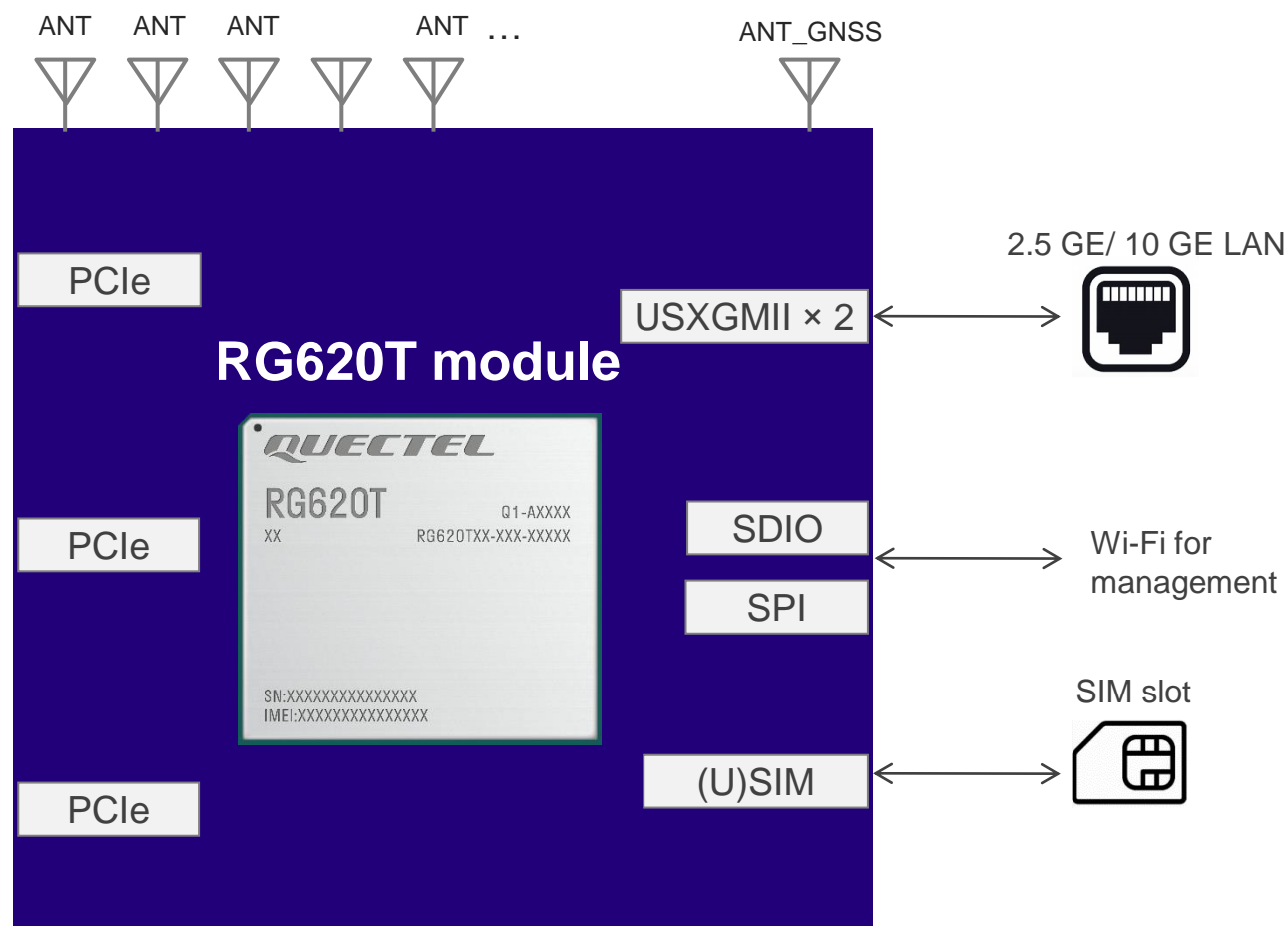
Typical SoC (System-on-Chip) 5G ODU solution based on T830 platform.

| **Ethernet** | Up to 10GE | Based on RFQ | WAN/ LAN | 1 Gbps/ 2.5 Gbps/ 10 Gbps |

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RG500L series specifications

44.0 × 41.0 × 2.75 mm
5G Sub-6 GHz LGA module

QUECTEL

Variant		RG500L-EU	RG500L-NA	RG500L-LA	RG500L-AR	RG500L-JIO
Region		EMEA/ APAC[①]/ Brazil	North America	LATAM (excl. Brazil)	India	India
Platform		T750				
5G NR	**5G NR**	3GPP Release 15 NSA/SA operation, Sub-6 GHz				
	NSA band	n1/ 3/ 5[②] (71[②])/ 7/ 8/ 20/ 28/ 38/ 40/ 41/ 77/ 78	n2/ 5/ 7/ 12/ 25/ 38/ 41/ 48/ 66/ 71/ 77/ 78	n2/ 5/ 7/ 28/ 66/ 78	n1/ 3/ 5/ 8/ 40/ 78	n78
	SA band	n1/ 3/ 5[②] (71[②])/ 7/ 8/ 20/ 28/ 38/ 40/ 41/ 77/ 78	n2/ 5/ 7/ 12/ 25/ 38/ 41/ 48/ 66/ 71/ 77/ 78	n2/ 5/ 7/ 28/ 66/ 78	n1/ 3/ 5/ 8/ 40/ 78	n78
	Max. Sub-6 BW	200 MHz				
	DL 4 × 4 MIMO	n1/ 3/ 7/ 38/ 40/ 41/ 77/ 78	n2/ 7/ 25/ 38/ 41/ 48/ 66/ 77/ 78	n2/ 7/ 66/ 78	n1/ 3/ 5/ 8/ 40/ 78	n78
	UL 2 × 2 MIMO	n40/ 41/ 77/ 78	n41/ 48/ 77/ 78	n78	n40/ 78	n78
LTE	**LTE category**	DL Cat 19/ UL Cat 18				
	LTE band	B1/ 3/ 5[②] (71[②])/ 7/ 8/ 20/ 28/ 32/ 38/ 40/ 41/ 42/ 43	B2/ 4/ 5/ 7/ 12/ 13/ 14/ 17/ 25/ 26/ 29/ 30/ 38/ 41/ 42/ 43/ 46/ 48/ 66/ 71	B2/ 4/ 5/ 7/ 8/ 28/ 42/ 43/ 66	B1/ 3/ 5/ 8/ 40	-
	DL 4 × 4 MIMO	B1/ 3/ 7/ 32[②]/ 38/ 40/ 41/ 42/ 43	B2/ 4/ 7/ 25/ 30/ 38/ 41/ 42/ 43/ 48/ 66	B2/ 4/ 7/ 42/ 43/ 66	B1/ 3/ 5/ 8/ 40	-
UMTS	**WCDMA band**	B1/ 5[②]/ 8	-	B2/ 4/ 5	-	-
Embedded GNSS		Supported (L1 + L5)[②]	Supported (L1 only)	-	-	-
PCIe 3.0 interface		Supported				
USB 3.0 interface		Supported				
SGMII interface		Supported				
Certification	**Carrier**	-	-	-	-	-
	Regulatory	GCF/ CE/ RCM	FCC/ IC	FCC	CE/ RCM	CE*/ GCF*
Project stage		CS	CS	CS	CS	CS

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①: Excl. China/Japan   ②: Optional

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Typical SoC router architecture (RG500L series)
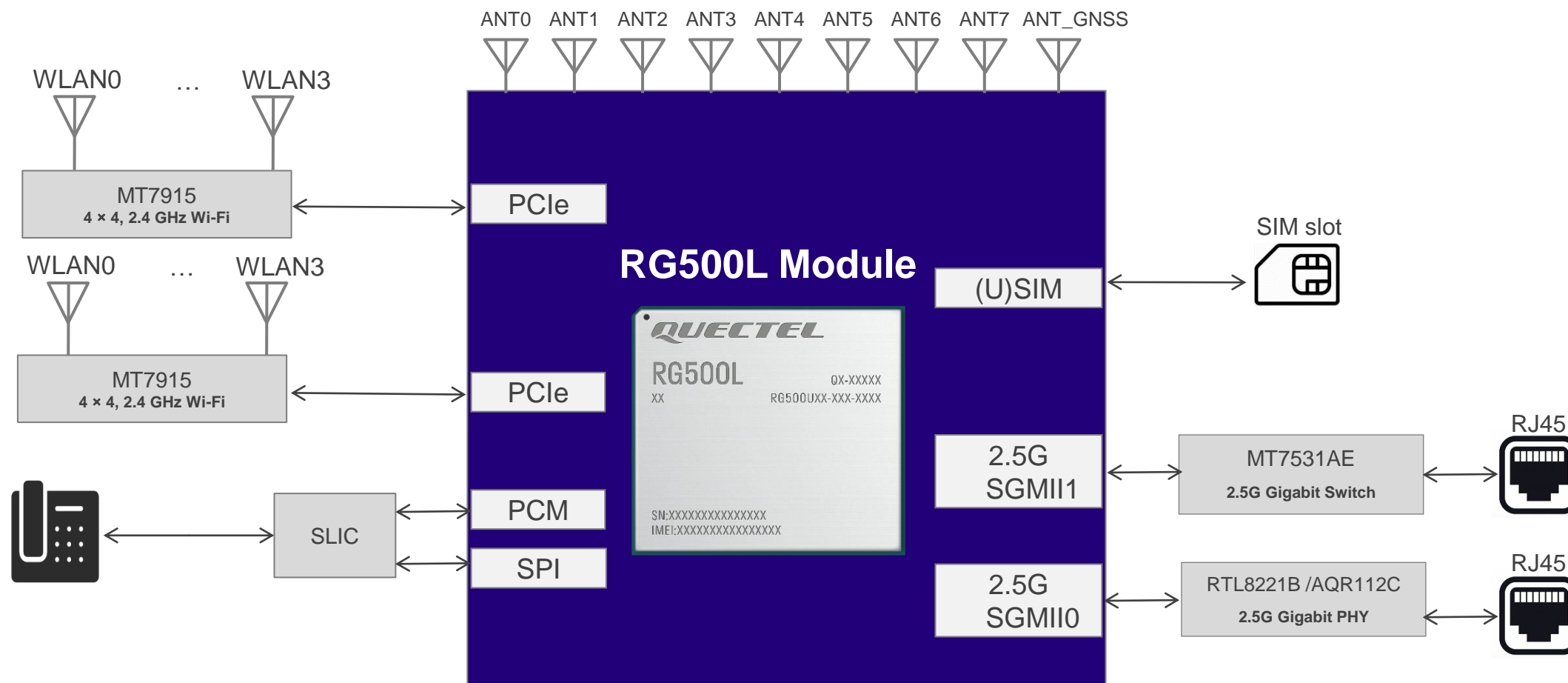
ANT0 ANT1 ANT2 ANT3 ANT4 ANT5 ANT6 ANT7 ANT_GNSS

WLAN0 … WLAN3

MT7915
4 × 4, 2.4 GHz Wi-Fi

WLAN0 … WLAN3

MT7915
4 × 4, 2.4 GHz Wi-Fi

RG500L Module

QUECTEL
RG500L
QX-XXXXX
XX   RG500UXX-XXX-XXXX
SN:XXXXXXXXXXXXXX
IMEI:XXXXXXXXXXXXXXX

PCIe

PCIe

SLIC

PCM

SPI

(U)SIM

SIM slot

2.5G SGMII1

MT7531AE
2.5G Gigabit Switch

RJ45

2.5G SGMII0

RTL8221B /AQR112C
2.5G Gigabit PHY

RJ45

Typical SoC (System-on-Chip) 5G router solution based on T750 platform, supporting 4 × 4, 2.4 GHz and 5 GHz Wi-Fi and dual Ethernet port.

Note:
1. 2.5G PHY is optional.
2. The devices included above are recommendation only and can be substituted as needed.

Build a smarter world

RG600L-EU specifications

Variant		RG600L-EU
Region		EMEA/ APAC[①]/ Brazil
Platform		T750
5G NR	5G NR	3GPP Release 15 NSA/SA operation, Sub-6 GHz
	NSA band	n1/ 3/ 5/ 7/ 8/ 20/ 28/ 38/ 40/ 41/ 71[②]/ 75[②]/ 76[②]/ 77/ 78
	SA band	n1/ 3/ 5/ 7/ 8/ 20/ 28/ 38/ 40/ 41/ 71[②]/ 75[②]/ 76[②]/ 77/ 78
	Max. Sub-6 BW	200 MHz
	DL 4 × 4 MIMO	n1/ 3/ 7/ 28/ 38/ 40/ 41/ 75[②]/ 76[②]/ 77/ 78
	UL 2 × 2 MIMO	n38/ 40/ 41/ 77/ 78
LTE	LTE category	DL Cat 19/ UL Cat 18
	LTE band	B1/ 3/ 5/ 7/ 8/ 20/ 28/ 32[②]/ 71[②]
	DL 4 × 4 MIMO	B1/ 3/ 7/ 28/ 32[②]
UMTS	WCDMA band	B1/ 5/ 8
Embedded GNSS		-
PCIe 3.0 interface		Supported
USB 3.1/ 3.0/ 2.0 interface		Supported
SGMII interface		Supported
Certification	Carrier	TBD
	Regulatory	GCF*/ CE*/ RCM*
Project stage		ES

①: Excl. China/Japan ②: Optional ES: Engineering Sample

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RG600L-EU timeline
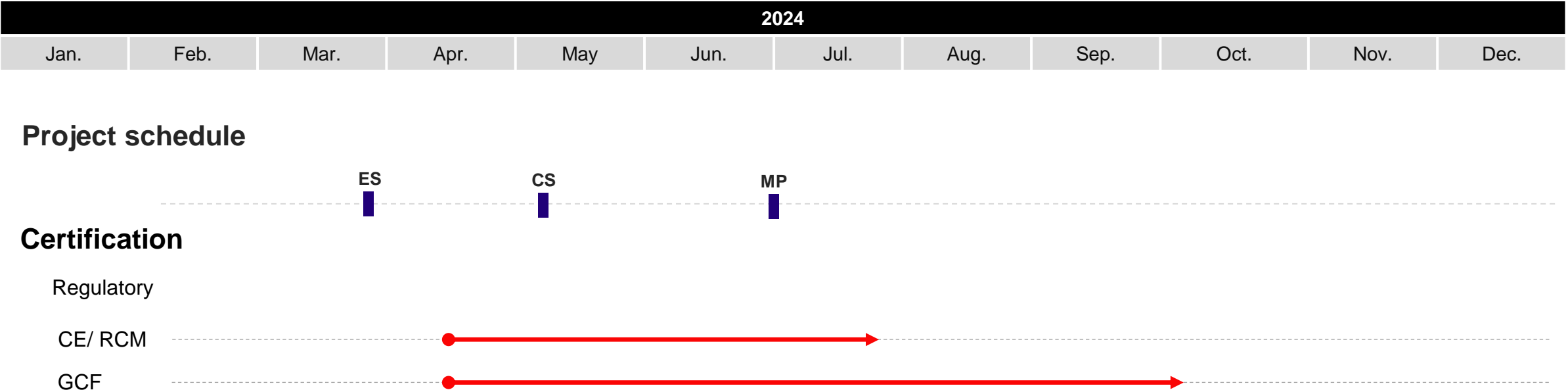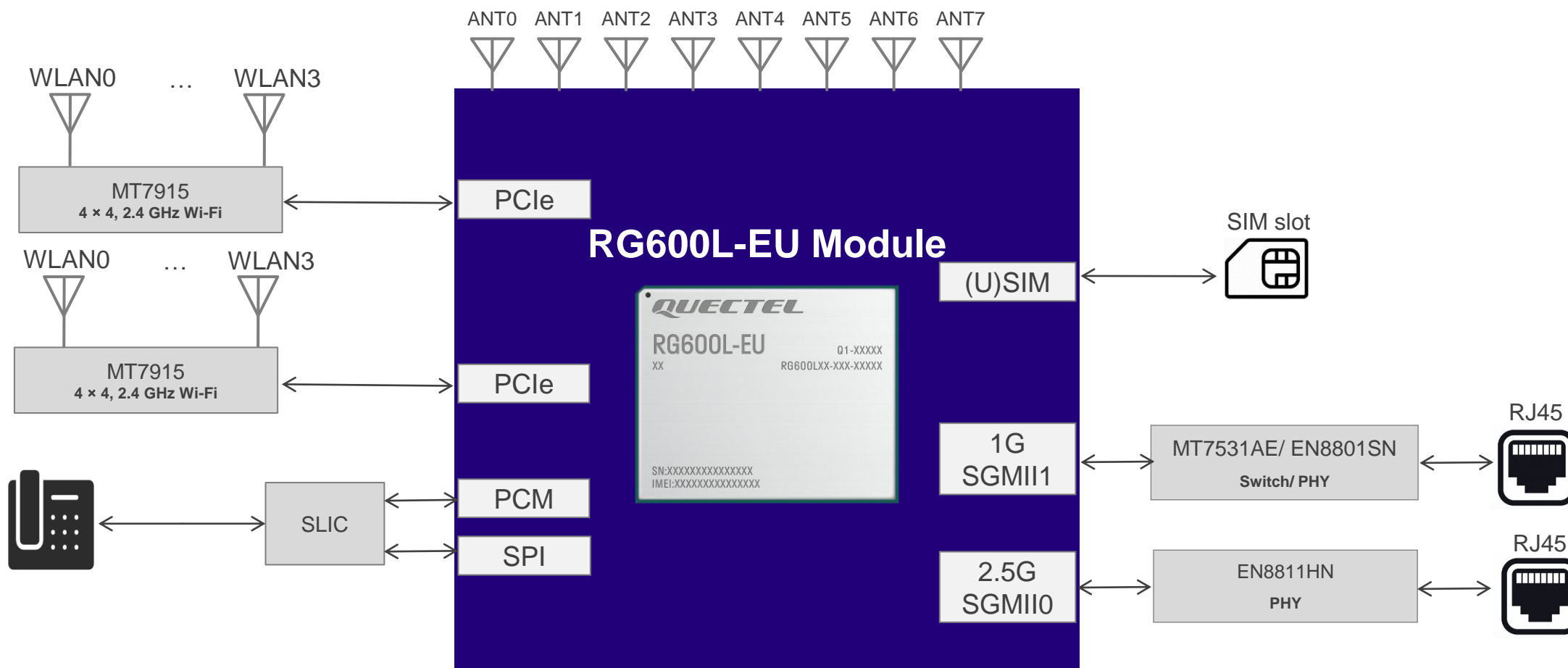
						2024						
Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.

Project schedule

ES   CS   MP

Certification

Regulatory

CE/ RCM

GCF

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Typical SoC router architecture (RG600L-EU)

ANT0 ANT1 ANT2 ANT3 ANT4 ANT5 ANT6 ANT7

WLAN0 … WLAN3

MT7915
4 × 4, 2.4 GHz Wi-Fi

WLAN0 … WLAN3

MT7915
4 × 4, 2.4 GHz Wi-Fi

RG600L-EU Module

QUECTEL

RG600L-EU   Q1-XXXXX
XX   RG600LXX-XXX-XXXXX

SN:XXXXXXXXXXXXXX
IMEI:XXXXXXXXXXXXXX

PCIe

PCIe

PCM

SPI

SLIC

(U)SIM

SIM slot

1G
SGMII1

MT7531AE/ EN8801SN

Switch/ PHY

RJ45

2.5G
SGMII0

EN8811HN

PHY

RJ45

Typical SoC (System-on-chip) 5G router solution based on T750 platform, supporting 4 × 4, 2.4 GHz, 5 GHz and 6 GHz Wi-Fi and dual Ethernet port.

Note:
1. 2.5G PHY is optional.
2. The devices included above are recommendation only and can be substituted as needed.

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5G module portfolio – part 3

LGA	M.2	Mini PCIe
44 × 41 mm	30 × 52 mm	30.7 × 50.95 mm

UDX710

RG500U
3GPP Rel 15/16[1]
• CN (EMEA/ APAC)
• EA (EMEA/ APAC/ LATAM)
• EB (EMEA/ APAC/ LATAM)
• LA (LATAM)

RM500U
3GPP Rel 15/16[1]
• CN (EMEA/ APAC)
• EA (EMEA/ APAC/ LATAM)
• CNV (EMEA/ APAC)

RG200U-CN Mini PCIe
3GPP Rel 15/16[1]
• CN (EMEA/ APAC)

30 × 41 mm

RG200U
3GPP Rel 15/16[1]
• CN (EMEA/ APAC)
• JO (INDIA)

①: Supported by partial ordering codes

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RG200U & RG500U & RM500U series highlights

5G

Unisoc UDX710 M1

- 3GPP Rel-15 compliant
- 5G NSA/SA, FDD/TDD supported
- Up to 100M NR BW

RG200U/RG500U series

RM500U series

Advanced IoT-dedicated 3GPP Rel-16[①]

- 5G LAN for wireless virtual network grouping
- URLLC for latency sensitive applications
- IRIG-B for high-accuracy time service
- More than 1000 vertical applications and customers

5G

Unisoc UDX710 M6

- 3GPP Rel-16[①] compliant
- 5G LAN/ IRIG-B/ URLLC

CPE

Affordable 5G CPE solution

- 3GPP Rel-15 for cost effective eMBB applications
- SA/NSA supported, up to 1 NR + 3 CC
- Open solution supported for FWA applications
- Quectel-only Unisoc 5G + Wi-Fi 6 (e.g., FC64E module) combo

Multiple variants available

- Cost effective and abundant variants
- RM500U-CN/ RM500U-EA/ RM500U-CNV
- RG500U-EA/ -CN/ -EB/ -LA
- RG200U-CN/ RG200U-CN Mini PCIe
- RG200U-JO

①: Supported by partial ordering codes only　　*: Under Development

RG500U /RG200U series (Mini PCIe) specifications

5G Sub-6 GHz LGA module

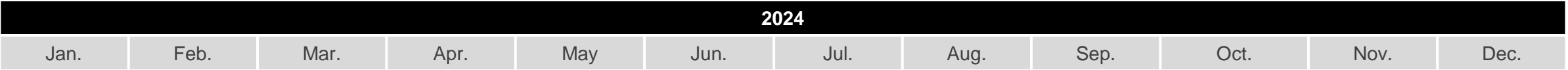| Variant		RG500U-CN	RG500U-EA	RG500U-EB	RG500U-LA	RG200U-JO	RG200U-CN	RG200U-CN Mini PCIe
Region		EMEA/ APAC	EMEA/ APAC/ LATAM		LATAM	India	EMEA/ APAC	
Platform		UDX710						
Dimensions (mm)		44.0 × 41.0 × 2.85				30.0 × 41.0 × 2.85		30.7 × 50.95 × 5.3
5G NR	**5G NR**	3GPP Release 15/16 NSA/SA operation, Sub-6 GHz						
	NSA band	n41/ 78/ 79	n1/ 3/ 7/ 38/ 40/ 41/ 77/ 78/ 79	n1/ 3/ 7/ 20/ 28/ 38/ 40/ 41/ 77/ 78	n2/ 5/ 7/ 28/ 40/ 66/ 78	-	n78/ 79[①]	
	SA band	n1/ 28/ 41/ 77/ 78/ 79	n1/ 3/ 5[①]/ 7/ 8/ 20/ 28/ 38/ 40/ 41/ 66[①]/ 71*/ 77/ 78/ 79[①]	n1/ 3/ 5 / 7/ 8/ 20/ 28/ 38/ 40/ 41/ 66/ 77/ 78	n2/ 5/ 7/ 8/ 28/ 38/ 40/ 66/ 71/ 78	n78	n1/ 3[①]/ 5/ 8/ 28/ 41/ 77/ 78/ 79[①]	
	Max. Sub-6 BW	100 MHz						
	DL 4 × 4 MIMO	n1/ 41/ 77/ 78/ 79	n1/ 3/ 7/ 38/ 40/ 41/ 77/ 78/ 79	n1/ 3/ 7/ 28/ 38/ 40/ 41/ 66/ 77/ 78	n2/ 7/ 28/ 38/ 40/ 66/ 78	n78	n1/ 41/ 77/ 78/ 79[①]	
	UL 2 × 2 MIMO	n41/ 77/ 78/ 79	n38/ 40/ 41/ 77/ 78/ 79	n38/ 40/ 41/ 77/ 78	n2/ 7/ 28/ 38/ 40/ 66/ 78	n78	n77/ 78/ 79[①]	
LTE	**LTE category**	DL Cat 12, UL Cat 13	DL Cat 12, UL Cat 13	DL Cat 12, UL Cat 13	DL Cat 12, UL Cat 13	-	DL Cat 12, UL Cat 13	
	LTE band	B1/ 2/ 3/ 5/ 7/ 8/ 20/ 28/ 34/ 38/ 39/ 40/ 41	B1/ 2/ 3/ 4/ 5/ 7/ 8/ 20/ 28A/ 28B/ 66/ 38/ 40/ 41/ 71*	B1/ 2/ 3/ 4/ 5/ 7/ 8/ 20/ 28/ 38/ 40/ 41/ 66	B2 / 4/ 5/ 7/ 8/ 26/ 28/38/ 40/ 66/ 71	-	B1/ 3/ 5/ 8/ 34/ 38/ 39/ 40/ 41	
	DL 2 × 2 MIMO	B1/ 2/ 3/ 5/ 7/ 8/ 20/ 28/ 34/ 38/ 39/ 40/ 41	B1/ 2/ 3/ 4/ 5/ 7/ 8/ 20/ 28A/ 28B/ 38/ 40/ 41/ 66	B1/ 2/ 3/ 4/ 5/ 7/ 8/ 20/ 28/ 38/ 40/ 41/ 66	B2/ 4/ 5/ 7/ 8/ 26/ 28/ 38/ 40/ 66/ 71	-	B1/ 3/ 5/ 8/ 34/ 38/ 39/ 40/ 41	
UMTS	**WCDMA band**	B1/ 2/ 5/ 8	B1/ 2/ 5/ 8	B1/ 2/ 5/ 8	B2/ 4/ 5	-	B1/ 8	
PCIe 2.0 interface		Supported	Supported	Supported	Supported	Supported	Supported	-
USB 2.0/3.0 interface		Supported	Supported	Supported	Supported	Supported	Supported	
RGMII interface[②]		-						
eSIM		Built-in eSIM (optional)						
Certification	**Carrier**	China Telecom/ China Mobile[③]/ China Unicom[③]	TBD	TBD	TBD	TBD	China Telecom/ China Mobile[③]/ China Unicom[③]	China Telecom/ China Mobile[③]/ China Unicom[③]
	Regulatory	SRRC/ NAL/ CCC	GCF/ CE/ RCM	CE/ RCM/ GCF*	FCC	GCF	NAL/ CCC/ SRRC	NAL/ CCC/ SRRC
Project stage		CS	CS	CS	CS	CS	CS	CS

①: Supported by partial ordering codes only ②: PCIe port can be converted to Gigabit Ethernet port (refer to solutions with Realtek RTL8111H); or 2.5 Gb Ethernet port (refer to solutions with Realtek RTL8125B)
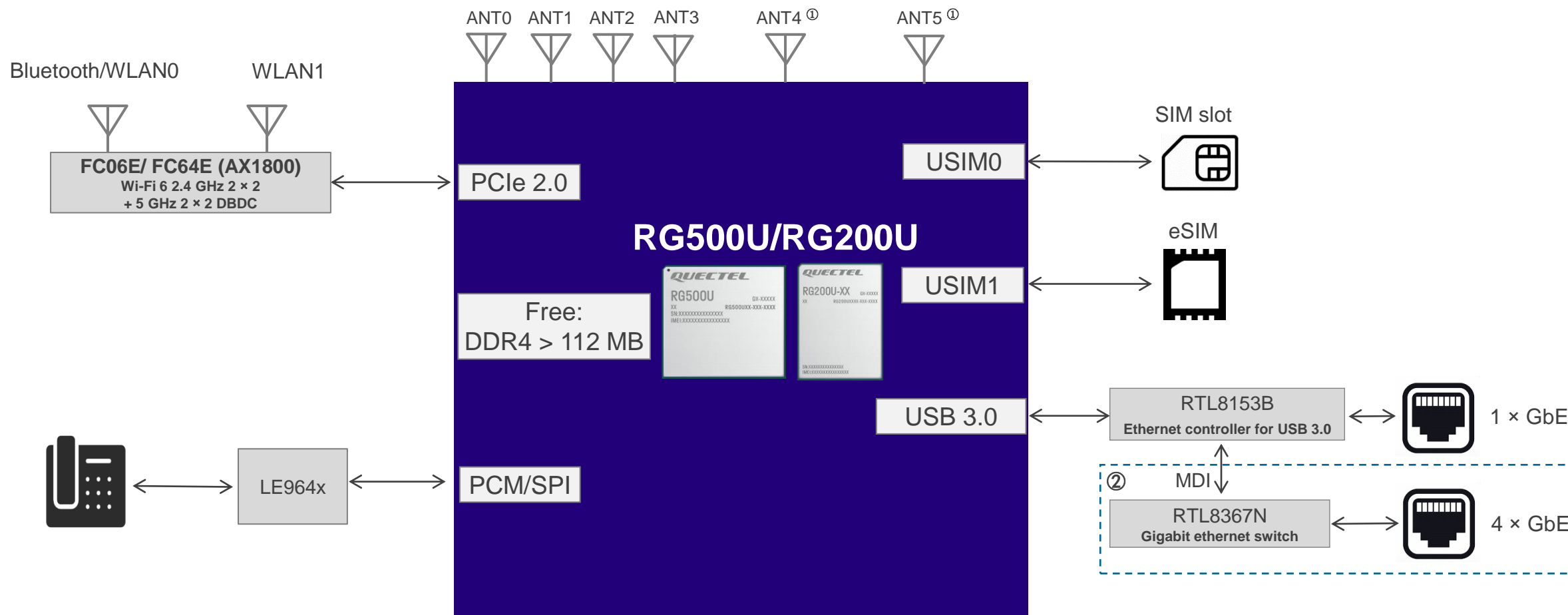③: TBD *:Under development/ planning/ in progress

Version: 7.2 | Status: Released

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RG500U-EB timeline

	2024										
Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.

Certification

Regulatory

CE/ RCM .... Completed

GCF

Build a smarter world

Typical SoC router architecture (RG500U/RG200U series)

Typical SoC (System-on-Chip) 5G router solution based on UDX710 platform.

NOTE:
1. ①: RG500U-CN, RG500U-EB, RG200U-CN and RG200U-JO support 4-antenna solution (ANT0–ANT3); RG500U-EA and RG500U-LA support 6-antenna solution (ANT0–ANT5).
2. ②: Optional 4 GE
3. The devices included above are recommendation only and can be substituted as needed.

GbE: Gigabit Ethernet
DBDC: Dual Band Dual Concurrent

Build a smarter world

RM500U series specifications

Variant		RM500U-CN	RM500U-EA	RM500U-CNV
Region		EMEA/ APAC	EMEA/ APAC/ Latin America	EMEA/ APAC
Platform		UDX710	UDX710	UDX710
Dimensions (mm)		30.0 × 52.0 × 2.3	30.0 × 52.0 × 3.75	30.0 × 52.0 × 2.3
5G NR	5G NR	3GPP Release15/ Release 16[1] NSA/ SA operation, Sub-6 GHz	3GPP Release 15 NSA/ SA operation, Sub-6 GHz	3GPP Release15/ Release 16[1] NSA/ SA operation, Sub-6 GHz
	Sub-6 NSA band	n41/ 78/ 79	n1/ 3/ 7/ 28/ 38/ 40/ 41/ 77/ 78	n41/ 78/ 79
	Sub-6 SA band	n1/ 28/ 41/ 77/ 78/ 79	n1/ 3/ 5/ 7/ 8/ 20/ 28/ 38/ 40/ 41/ 66/ 77/ 78	n1/ 3/ 5/ 8/ 28A/ 41 / 77/ 78/ 79
	Max. Sub-6 BW	100 MHz	100 MHz	100 MHz
	DL 4 × 4 MIMO	n1/ 41/ 77/ 78/ 79	n1/ 3/ 7/ 28 / 38/ 40/ 41/ 66/ 77/ 78	n1/ 28A/ 41/ 77/ 78/ 79
	UL 2 × 2 MIMO	n41/ 77/ 78/ 79	n38/ 40/ 41/ 77/ 78	n41/ 77/ 78/ 79
	DL 2 × 2 MIMO	n28	n5/ 8/ 20	n3/ 5/ 8
LTE	LTE category	DL Cat 12/ UL Cat 13	DL Cat 12/ UL Cat 13	DL Cat 12/ UL Cat 13
	LTE band	B1/ 2/ 3/ 5/ 7/ 8/ 20/ 28/ 34/ 38/ 39/ 40/ 41	B1/ 2/ 3/ 4/ 5/ 7/ 8/ 20/ 28/ 38/ 40/ 41/ 66	B1/ 3/ 5/ 8 /34/ 38/ 39/ 40/ 41
	DL 2 × 2 MIMO	B1/ 2/ 3/ 5/ 7/ 8/ 20/ 28/ 34/ 38/ 39/ 40/ 41	B1/ 2/ 3/ 4/ 5/ 7/ 8/ 20/ 28/ 38/ 40/ 41/ 66	B1/ 3/ 5/ 8/ 34/ 38/ 39/ 40/ 41
UMTS	WCDMA band	B1/ 2/ 5/ 8	B1/ 2/ 5/ 8	B1/ 5/ 8
PCIe 2.0 interface		Supported	Supported	Supported
USB 3.0 interface		Supported	Supported	Supported
USB 2.0 interface		Supported	Supported	Supported
eSIM		Supported/ Built-in eSIM (optional)	Supported/ Built-in eSIM (optional)	-
Certification	Carrier	China Telecom/ China Mobile[2]/ China Unicom[2]	TBD	China Telecom[2]/ China Mobile[2]/ China Unicom[2]
	Regulatory	SRRC/ NAL/ CCC/ CE/ RCM	CE/ RCM	SRRC/ NAL/ CCC
Project stage		CS	CS	CS

①: Optional band ②TBD: To Be Determined *: Under development/ planning/ in progress

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Version: 7.2 | Status: Released

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Contents

Version: 7.2 | Status: Released

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LTE-A key technology

1.2 Gbps	**Cat 18**
	DL 5CA
	DL 4 × 4 MIMO
600 Mbps	**Cat 12**
	DL 4CA
	UL 64QAM
	DL 256QAM
	DL 3CA
	LTE-A
	UL intra-band contiguous CA
300 Mbps	**Cat 6**
	DL 2CA

More spectrums aggregated

Multi-antenna technology

Higher order modulation

150 Mbps	**Cat 4**
	DL 64QAM
	LTE
100 Mbps	**Cat 3**
	DL 2 × 2 MIMO

Rel-8   **Rel-10**   **Rel-13**
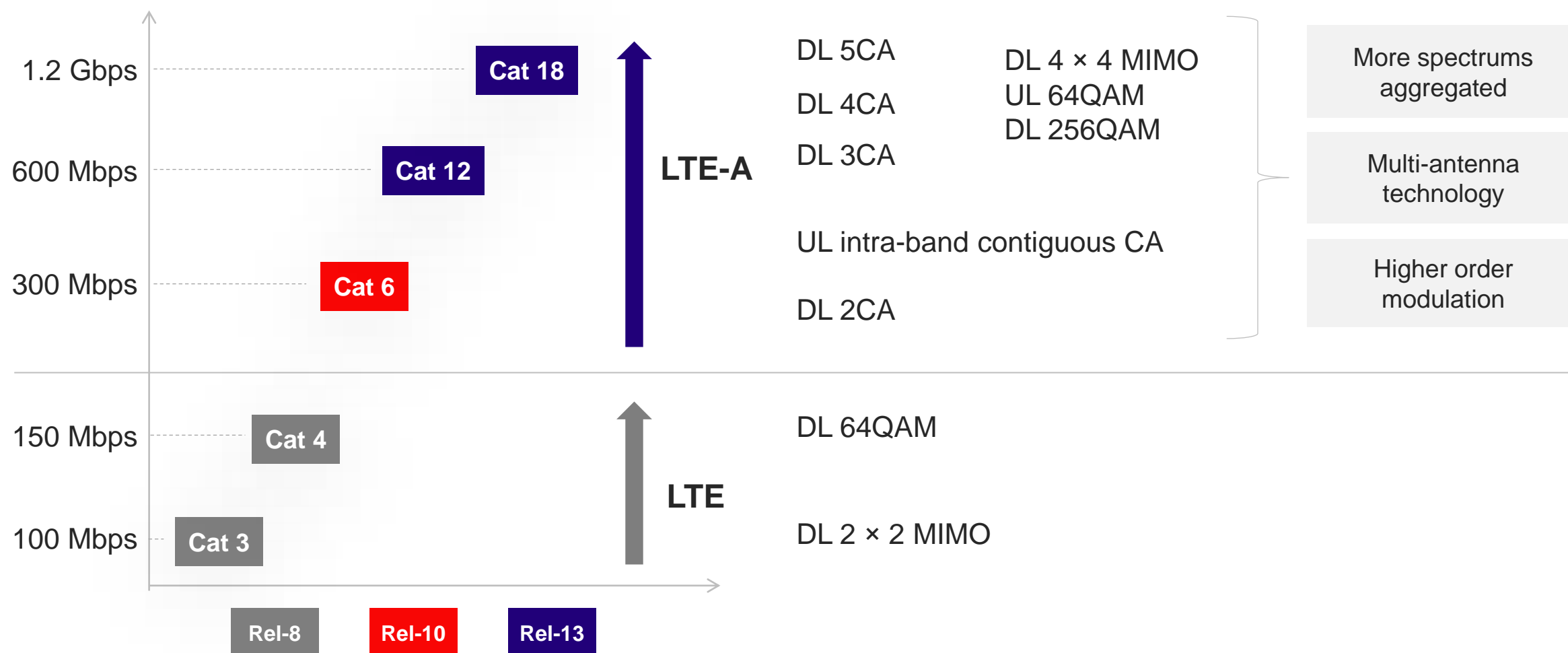
CA: Carrier Aggregation

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LTE-A module overview

Cat 16/ 18	**EM160R** • SDX24 • Rel-14	**EG18** • SDX20 • Rel-12
Cat 12	**EG120K** **EM120K** • SDX12 • Rel-12	**EG12** **EM12** • SDX20 • Rel-12
Cat 6	**EG060K** **EG065K** **EM060K** • SDX12 • Rel-12	**EG060W** • ASR1828 • Rel-10 • RGMII

NEW

NEW

NEW

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LTE-A module portfolio

	LTE-Advanced		
	LGA, 39.5 × 37 mm		M.2, 30 × 42 mm
Cat 12/ 16/18	**EG18** *(SDX20)* • EA (EMEA/ APAC[1] / Brazil) • NA (North America)		**EM160R** *(SDX24)* • GL (Global)
	EG12 *(SDX20)* • GT (TDD 3.5 GHz) • EA (EMEA/ APAC[1] / Brazil)		**EM12** *(SDX20)* • G (Global)
	EG120K *(SDX12)* • **NA (North America)** • **LA (LATAM excl. Brazil)** • **EA (EMEA/ APAC[1] / Brazil)** • JP (日本)		**EM120K** *(SDX12)* • GL (Global)
Cat 6	LGA, 39.5 × 37 mm	LGA, 31 × 28 mm	
	EG060K *(SDX12)* • **EA (EMEA/ APAC[1] / Brazil)** • **GT (TDD 3.5 GHz)** • **NA (North America)** • **LA (LATAM excl. Brazil)** • JP (Japan)	**EG065K** *(SDX12)* • EA (EMEA/ APAC[1]/ LATAM) • NA (North America)	**EM060K** *(SDX12)* • GL (Global) • NA (North America) • EA (EMEA/ APAC[1] / Brazil)
	LGA, 39.5 × 37 mm		
	EG060W *(ASR1828)* • EA (EMEA/ APAC[1]/ Brazil)		

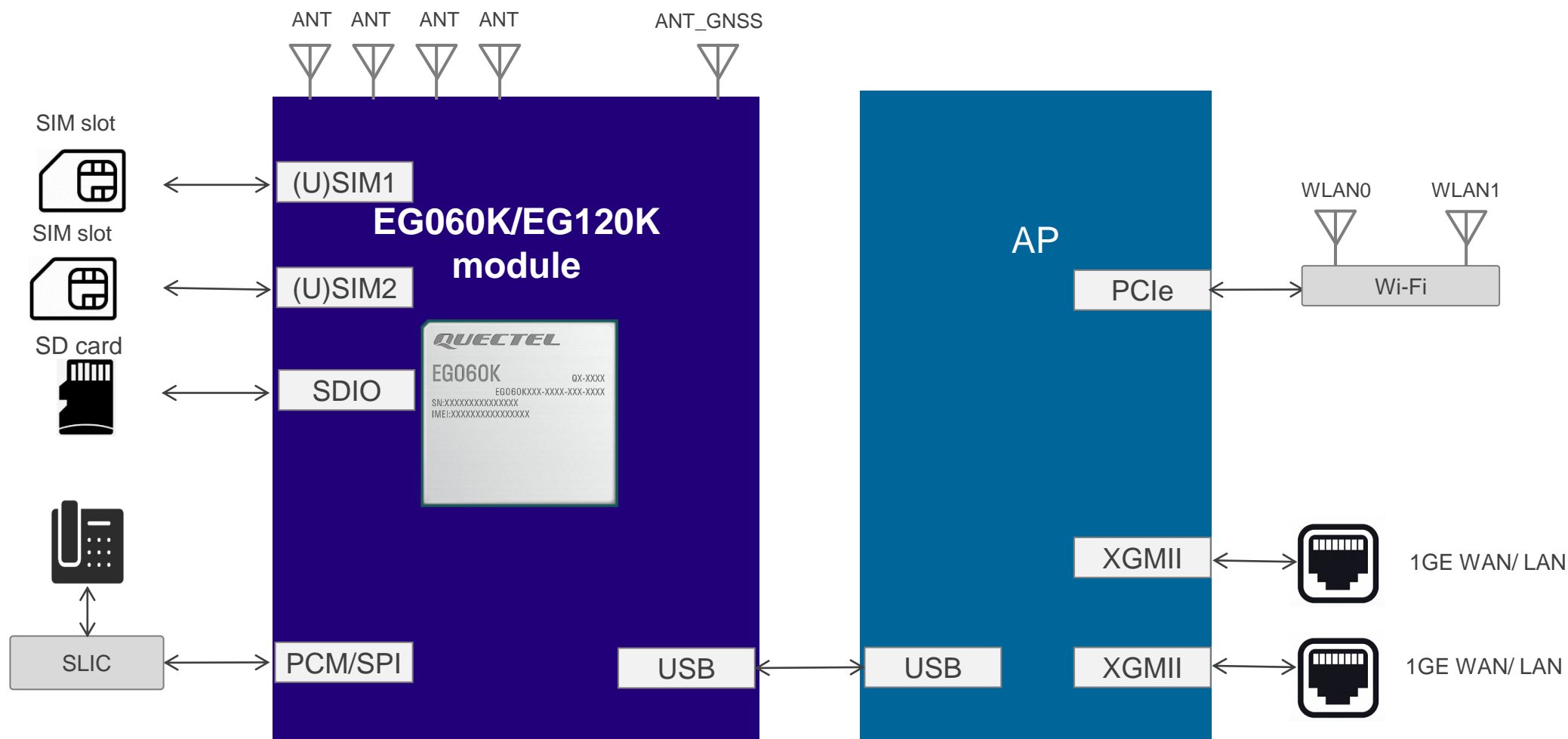[1]: Excl. China/Japan

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EG06xK/ EG060x series specifications

LTE Cat 6 LGA module
300M DL/ 50M UL

Variant		EG060K-EA	EG060K-NA	EG060K-LA	EG060K-JP	EG060K-GT	EG065K-NA	EG065K-EA	EG060W-EA
Region		EMEA/ APAC[①]/ Brazil	North America	LATAM (excl. Brazil)	Japan	Global TDD 3.5 GHz	North America	EMEA/ APAC[①]/ LATAM	EMEA/ APAC[①]/ Brazil
LTE category		6							6
Platform		SDX12							ASR1828
3GPP Release		Release 12							Release 10
Dimensions (mm)		39.5 × 37.0 × 2.8					31.0 × 28.0 × 2.4		39.5 × 37.0 × 3.05
LTE	**LTE-FDD Band**	B1/ 3/ 5/ 7 /8 / 20/ 28/ 32	B2/ 4/ 5/ 7/ 12/ 13/ 14/ 25/ 26/ 29/ 30/ 66/ 71	B2/ 4/ 5/ 7/ 8/ 25/ 28/ 66	B1/ 3/ 5/ 8/ 18/ 19/ 26/ 28[③]	-	B2/ 4/ 5/ 7/ 12/ 13/ 14/ 25/ 26/ 30/ 66	B1/ 2/ 3/ 4/ 5/ 7/ 8/ 20/ 28	B1/ 3/ 5/ 7/ 8/ 20/ 28/ 32[②]
	LTE-TDD Band	B38/ 40/ 41/ 42[②]/ 43[②]	B41/ 48	B42/ 43	B41	B40[②]/ 41[②]/ 42*/ 43*/ 48	-	B40	B38/ 40/ 41/ 42[②]/ 43[②]
	2CA	Intra-band and Inter-band					Intra-band and Inter-band		Intra-band and Inter-band
UMTS	**WCDMA band**	B1/ 3/ 5/ 8	-	B2/ 4/ 5/ 8	B1/ 3/ 5/ 6/ 8/ 9/ 19	-	-	B1*/ 2*/ 3*/ 4*/ 5*/ 8*	B1/ 5/ 8
Embedded GNSS		Optional					-		-
VoLTE (Voice over LTE)		Supported					-		Supported
USB 3.0/2.0 interface		Supported					Supported		Supported
Certification	**Carrier**	TBD	Verizon/ AT&T/ T-Mobile	TBD	TBD	TBD	AT&T/ Verizon/ Telus	British Telecom/ Telefónica/ Telstra	TBD
	Regulatory	CE/ RCM	GCF/ PTCRB/ FCC/ IC	TBD	TBD	FCC/ IC	GCF/ PTCRB/ FCC/ IC	GCF/ CE/ RCM/ Anatel/ JATE/ TELEC	CE/ RCM
Project stage		CS	CS	CS	CS	CS	CS	CS	CS

①: Excl. China/Japan   ②: Optional   ③: UL: 715–748 MHZ; DL: 770–803 MHz   *: Under development/ in progress

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Version: 7.2 | Status: Released

Typical AP + module router architecture (EG060K/EG120K series)

Version: 7.2 | Status: Released

Typical SoC MiFi architecture (EG060K/EG120K series)

Bluetooth&WLAN0   WLAN1

ANT0 ANT1 ANT2 ANT3

ANT_GNSS

QCA6174A-1
2 × 2 dual-band
802.11ac Wi-Fi/ Bluetooth 4.2

EG060K Module

QUECTEL

EG060K   QX-XXXX
                  EG060KXXX-XXXX-XXX-XXXX
SN:XXXXXXXXXXXXX
IMEI:XXXXXXXXXXXXXXX

PCIe 2.0 × 1 lane

USB2.0/3.0

USB 2.0/3.0

VBAT

VBUS

SMB1351
charger

I2C

USB2.0

CW2015CHBD
fuel gauging

BAT_THERM

USIM1

SIM slot

SPI

SPI interface

SDIO

SD card

PWRKEY/ RESET

Power key
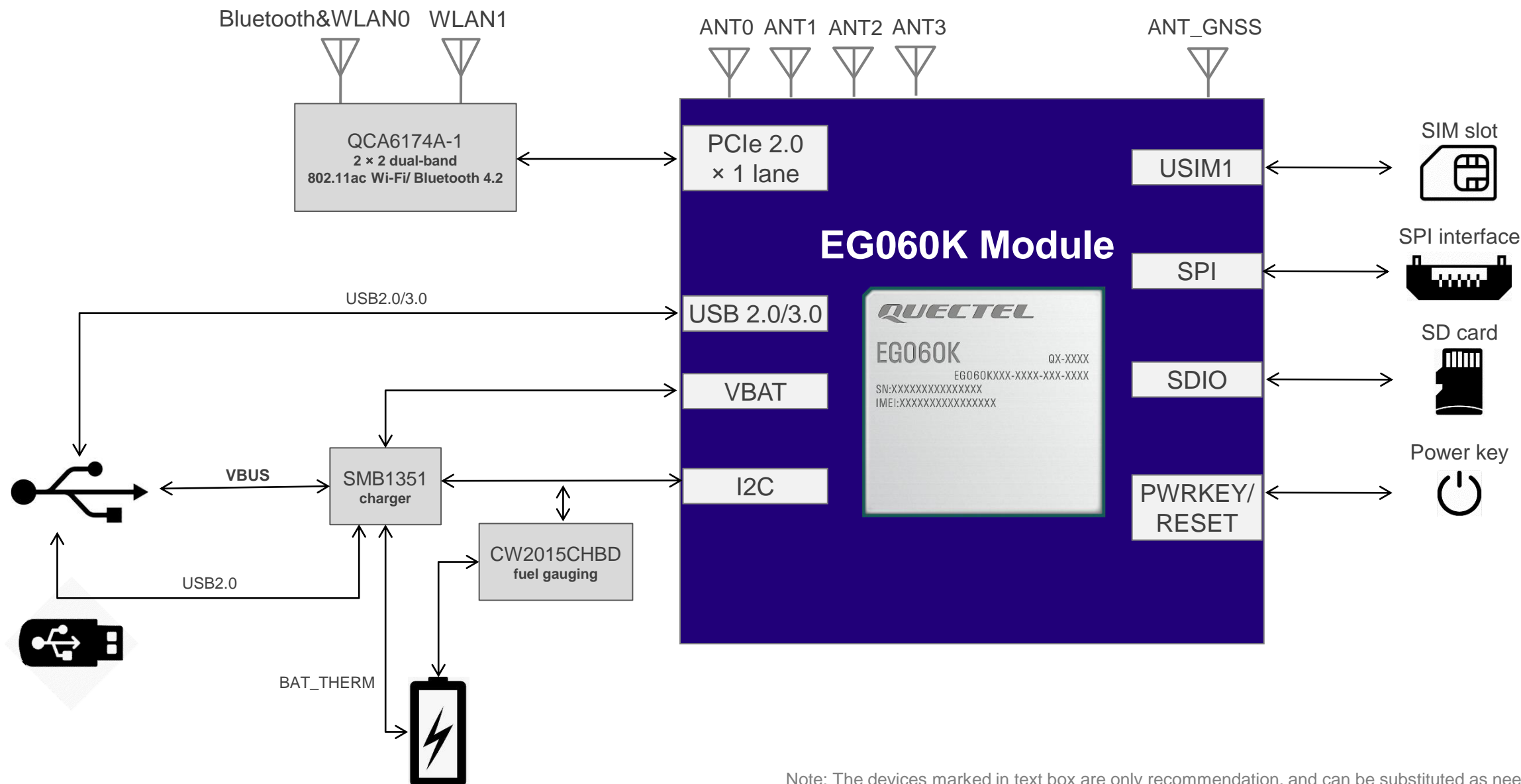
Note: The devices marked in text box are only recommendation, and can be substituted as needed.

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Typical SoC MiFi architecture (EG060W-EA)
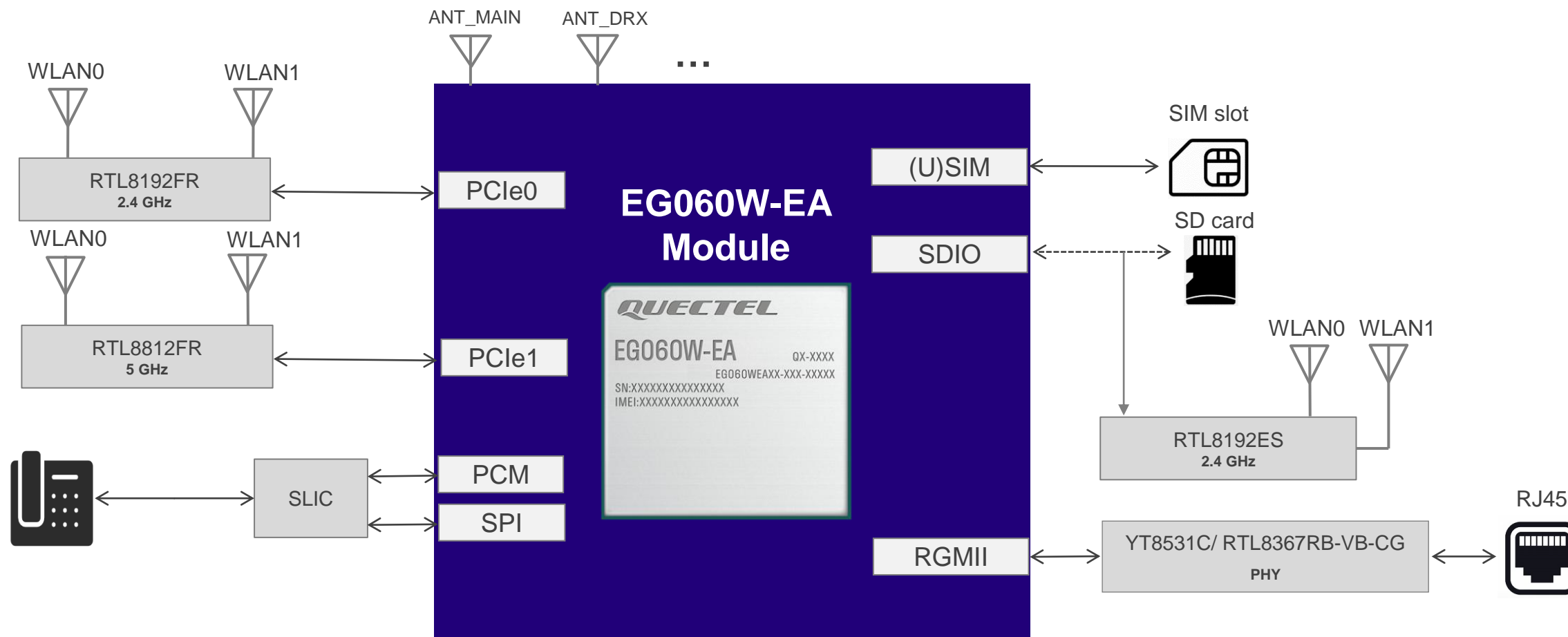
Note:
1. *: Under developing.
2. The devices marked in text box are only recommendation, and can be substituted as needed.

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EM060K series specifications

30.0 × 42.0 × 2.3 mm
LTE Cat 6 M.2 module，300M DL/ 50M UL

Variant		EM060K-GL	EM060K-NA	EM060K-EA
Region		Global	North America	EMEA/ APAC[①]/ Brazil
LTE category		6		
Platform		SDX12		
3GPP Release		Release 12		
LTE	LTE-FDD Band	B1/ 2/ 3/ 4/ 5/ 7/ 8/ 12/ 13/ 14/ 17[②]/ 18/ 19/ 20/ 25/ 26/ 28/ 29[③]/ 30/ 32[③]/ 66/ 71	B2/ 4/ 5/ 7/ 12/ 13/ 14/ 17/ 25/ 26/ 29/ 30/ 66/ 71	B1/ 3/ 5/ 7/ 8/ 20/ 28/ 32[③]/71[④]
	LTE-TDD Band	B34/ 38/ 39/ 40/ 41/ 42/ 43/ 46[③] (LAA)/ 48 (CBRS)	B41/ 42/ 43/ 48	B38/ 40/ 41
	DL 64QAM/ UL 16QAM	Supported		
	2CA	Intra-band and Inter-band		
UMTS	WCDMA band	B1/ 2/ 3/ 4/ 5/ 6/ 8/ 19	-	B1/ 3/ 5/ 8
Embedded GNSS		Optional		
eSIM		Optional		
USB 2.0/ 3.0 interface		Supported		
PCIe interface		Supported (RC Mode)*		
Certification	Carrier	Verizon/ AT&T/ T-Mobile/ NTT DOCOMO/ KDDI/ Vodafone/ British Telecom/ Orange/ Deutsche Telekom/ Swisscom/ Telstra/ Telefonica	Verizon/ AT&T/ T-Mobile	TBD
	Regulatory	GCF/ PTCRB/ NCC/ CE/ RCM/ FCC/ IC/ JATE/ TELEC/ Anatel	GCF/ PTCRB/ FCC/ IC	GCF/ PTCRB/ RCM
	Others	WHQL	TBD	TBD
Project stage		CS	CS	CS

①: Excl. China/Japan ②: B17 is supported through MFBI + B12 ③: LTE-FDD B29/ B32 and LTE-TDD B46 support Rx only and are only for secondary component carrier
④: Optional *: Under development/ in progress TBD: To Be Determined

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Version: 7.2 | Status: Released

EG120K/EG12/EG18 series specifications

Variant		EG120K-EA	EG120K-NA	EG120K-LA	EG120K-JP	EG12-GT	EG12-EA	EG18-EA	EG18-NA
Region		EMEA/ APAC①/ Brazil	North America	LATAM (excl. Brazil)	Japan	Global TDD 3.5 GHz	EMEA/ APAC①/ Brazil	EMEA/ APAC①/ Brazil	North America
LTE category		12						DL Cat 18/ UL Cat 13	
Platform		SDX12				SDX20		SDX20	
3GPP Release		Release 12				Release 12		Release 12	
Dimensions (mm)		39.5 × 37.0 × 2.8						39.5 × 37.0 × 2.8	
LTE	LTE-FDD Band	B1/ 3/ 5/ 7/ 8/ 20/ 28/ 32	B2/ 4/ 5/ 7/ 12/ 13/ 14/ 25/ 26/ 29/ 30/ 66/ 71	B2/ 4/ 5/ 7/ 8/ 25/ 28/ 66	B1/ 3/ 5/ 8/ 18/ 19/ 26/ 28③	-	B1/ 3/ 5/ 7/ 8/ 20/ 28	B1/ 3/ 5/ 7/ 8/ 20/ 28	B2/ 4/ 5/ 7/ 12/ 13/ 14/ 25/ 26/ 29/ 30/ 66/ 71
	LTE-TDD Band	B38/ 40/ 41/ 42② / 43②	B41/ 48	B42/ 43	B41	B42/ 43/ 48	B38/ 40/ 41	B38/ 40/ 41	B41
	CA	DL 3CA; UL 2CA						DL 5CA; UL 2CA	
	DL 256QAM	Supported							
	DL 4 × 4 MIMO	B1/ 3/ 7/ 38/ 40/ 41/ 42	B2/ 4/ 7/ 25/ 30/ 66/ 41/ 48	B2/ 4/ 7/ 66/ 42/ 43	B1/ 3/ 41	B42/ 48	B1/ 3/ 7	B1/ 3/ 7	B2/ 4/ 7/ 25/ 66
UMTS	WCDMA band	B1/ 3/ 5/ 8	-	-	B1/ 3 /5 /6 /8 / 9/ 19	-	B1/ 3/ 5/ 8	B1/ 3/ 5/ 8	B2/ 4/ 5
Embedded GNSS		Optional							
PCIe interface		Optional (RC Mode)				Optional (RC Mode)		Optional (RC Mode)	
RGMII interface		-				-		-	
USB 3.0 interface		Supported				Supported		Supported	
eSIM		Supported / Built-in eSIM (optional)				-		-	
Certification	Carrier	TBD	Verizon/ AT&T/ T-Mobile	TBD	TBD	-		Telstra	Verizon/ AT&T/ T-Mobile/ U.S. Cellular
	Regulatory	CE/ RCM	GCF/ PTCRB/ FCC/ IC	TBD	TBD	FCC	GCF/ CE/ RCM	GCF/ CE/ RCM	GCF/ PTCRB/ FCC/ IC
Project stage		CS	CS	CS	CS	CS	CS	CS	CS

①: Excl. China/Japan   ②: Optional   ③: UL: 715–748 MHZ; DL: 770–803 MHz   *: In progress

Version: 7.2 | Status: Released

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EM120K/EM12/EM160R series specifications

30.0 × 42.0 × 2.3 mm M.2 module
LTE Cat 12 : 600M DL/150M UL
LTE Cat 16: 1.0G DL/150M UL

Variant		EM120K-GL	EM12-G	EM160R-GL
Region		Global		
LTE category		12		DL Cat 16/ UL Cat 13
Platform		SDX12	SDX20	SDX24
3GPP Release		Release 12	Release 12	Release 14
LTE	LTE-FDD Band	B1/ 2/ 3/ 4/ 5/ 7/ 8/ 12/ 13/ 14/ 17/ 18/ 19/ 20/ 25/ 26/ 28/ 29/ 30/ 32/ 66/ 71	B1/ 2/ 3/ 4/ 5/ 7/ 8/ 9/ 12/ 13/ 14/ 17/ 18/ 19/ 20/ 21/ 25/ 26/ 28/ 29/ 30/ 32/ 66	B1/ 2/ 3/ 4/ 5/ 7/ 8/ 12/ 13/ 14/ 17/ 18/ 19/ 20/ 25/ 26/ 28/ 29/ 30/ 32/ 66
	LTE-TDD Band	B34/ 38/ 39/ 40/ 41/ 42/ 43/ 46(LAA)/ 48(CBRS)	B38/ 39/ 40/ 41	B38/ 39/ 40/ 41/ 42/ 43/ 46(LAA)/ 48(CBRS)
	DL 4 × 4 MIMO	-	-	B1/ 2/ 3/ 4/ 7/ 25/ 30/ 32/ 66/ 38/ 39/ 40/ 41
	DL 2CA	Intra-band and Inter-band		
	DL 3CA	Intra-band and Inter-band	Intra-band and Inter-band, Intra-band plus inter-band	Intra-band and Inter-band
	DL 256QAM /UL 64QAM	Supported		
	UL 2CA	Intra-band		
UMTS	WCDMA band	B1/ 2/ 3/ 4/ 5/ 6/ 8/ 19	B1/ 2/ 3/ 4/ 5/ 8/ 9/ 19	B1/ 2/ 3/ 4/ 5/ 6/ 8/ 19
Embedded GNSS		Optional	Optional	Optional
PCIe interface		Optional (RC Mode)*	Optional (RC Mode)	Supported
USB 2.0/3.0 interface		Supported	Supported	Supported
eSIM		Supported / Built-in eSIM (optional)	-	Supported / Built-in eSIM (optional)
Certification	Carrier	Verizon/ AT&T/ T-Mobile/ NTT DOCOMO/ KDDI/ Telstra/ Softbank[①]	Vodafone/ TIM/ Deutsche Telekom/ British Telecom/ Telefónica/ Verizon/ AT&T/ T-Mobile/ Sprint/ Rogers/ Telus/ NTT DOCOMO/ SoftBank[①]/ KDDI/ Telstra	Vodafone/ British Telecom/ Verizon/ AT&T/ T-Mobile/ Sprint/ China Mobile/ China Unicom/ NTT DOCOMO/ SoftBank[①]/ KDDI/ Rakuten/ Telstra*/ Swisscom
	Regulatory	GCF/ PTCRB/ CE/ RCM/ FCC/ IC/ NCC/ JATE/ TELEC	GCF/ CE/ FCC/ PTCRB/ IC/ Anatel/ CCC/ KC/ NCC/ JATE/ TELEC/ RCM/ ICASA/ UKCA	GCF/ CE/ FCC/ PTCRB/ IC/ Anatel/ IFETEL/ SRRC/ NAL/ CCC/ KC/ NCC/ JATE/ TELEC/ RCM/ ICASA
	Others	WHQL	WHQL	-
Project stage		CS	CS	CS

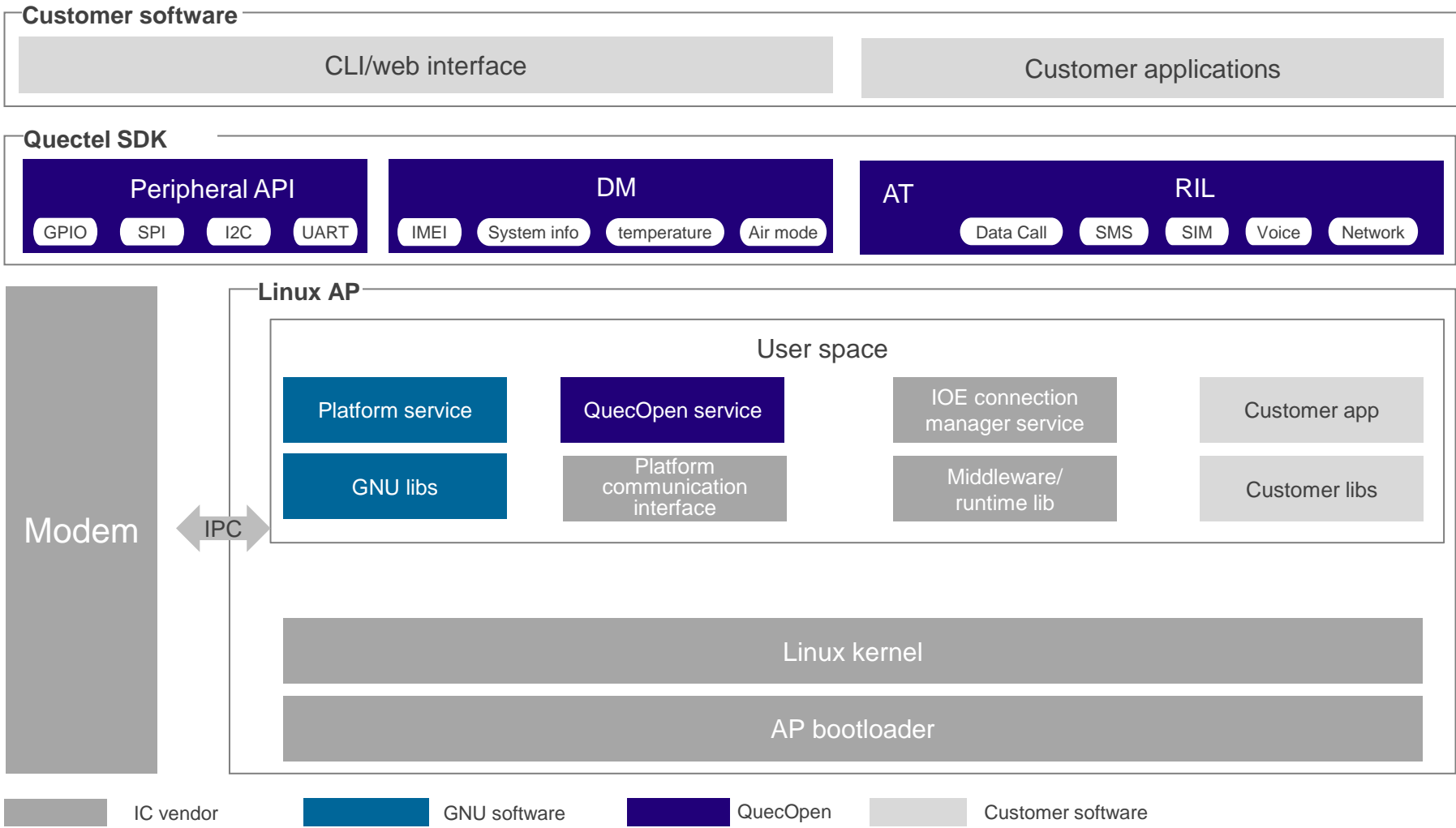①: Currently, SoftBank certification is only supported for PC applications   ②: TBD   *: Under development/ in progress

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QuecOpen® software framework

Customer software

CLI/web interface	Customer applications

Quectel SDK

Peripheral API	DM	AT	RIL
GPIO · SPI · I2C · UART	IMEI · System info · temperature · Air mode		Data Call · SMS · SIM · Voice · Network

Linux AP

User space

Platform service	QuecOpen service	IOE connection manager service	Customer app
GNU libs	Platform communication interface	Middleware/ runtime lib	Customer libs

Modem ←IPC→

Linux kernel

AP bootloader

■ IC vendor	■ GNU software	■ QuecOpen	■ Customer software

QuecOpen® function is optional
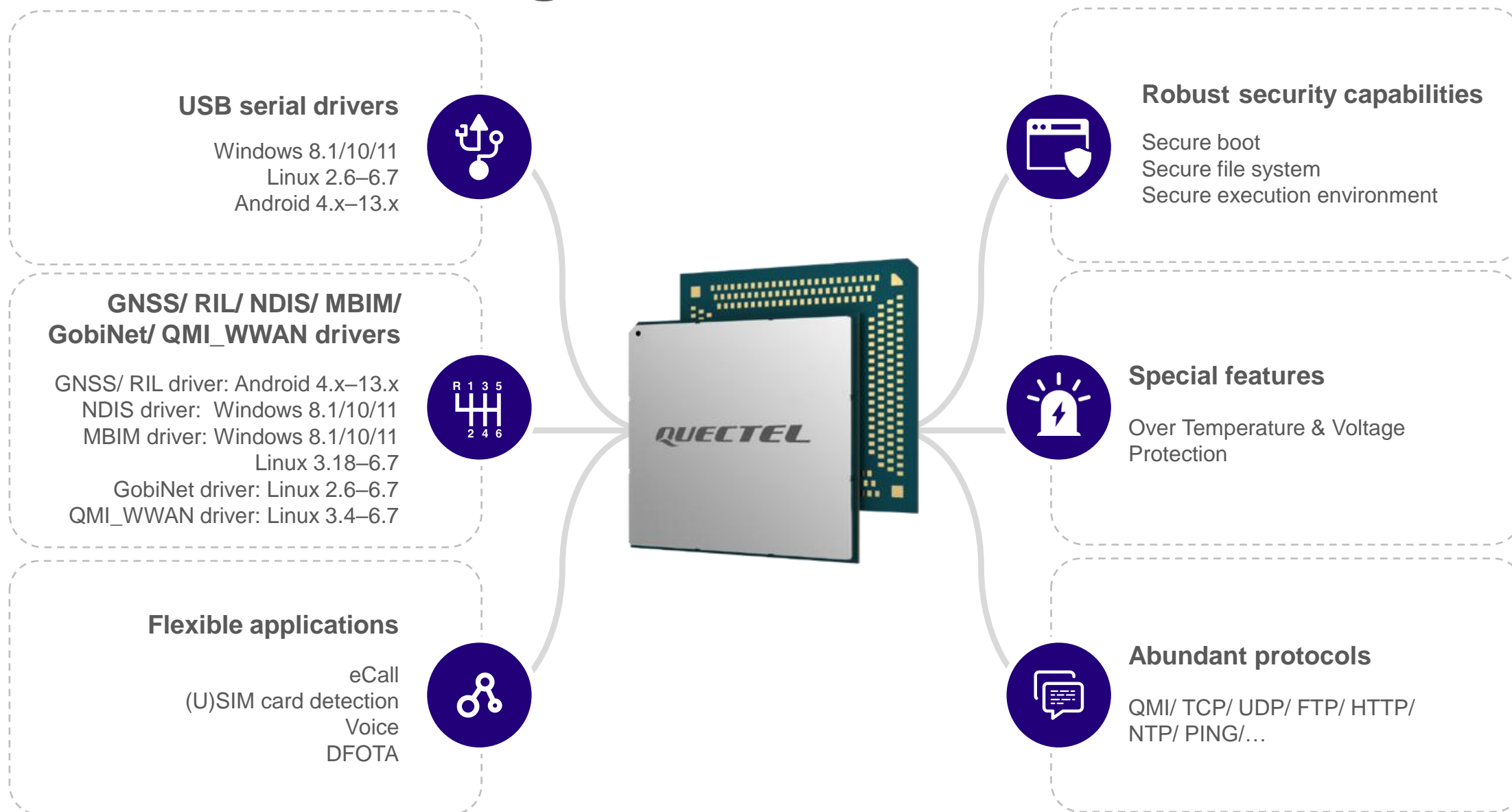
QuecOpen® is an open source embedded development platform based on Linux system, which is intended to simplify the design and development process for MBB/IoT applications.

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Software advantages

USB serial drivers

Windows 8.1/10/11
Linux 2.6–6.7
Android 4.x–13.x

GNSS/ RIL/ NDIS/ MBIM/ GobiNet/ QMI_WWAN drivers

GNSS/ RIL driver: Android 4.x–13.x
NDIS driver: Windows 8.1/10/11
MBIM driver: Windows 8.1/10/11
Linux 3.18–6.7
GobiNet driver: Linux 2.6–6.7
QMI_WWAN driver: Linux 3.4–6.7

Flexible applications

eCall
(U)SIM card detection
Voice
DFOTA

Robust security capabilities

Secure boot
Secure file system
Secure execution environment

Special features

Over Temperature & Voltage Protection

Abundant protocols

QMI/ TCP/ UDP/ FTP/ HTTP/ NTP/ PING/…
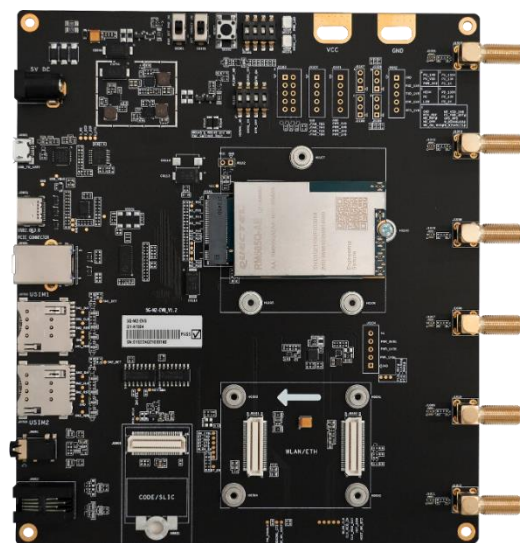
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Support package

EVB kits

5G EVB kit (for LGA)

Evaluation board with various peripherals adapt board

M.2 Module EVB kit

Evaluation board for M.2 series module debugging and testing

5G M.2 dongle EVB kit

Small-sized evaluation board with on-board antenna, for dongle application demo and test

mmWave EVB kit

Tuned mmWave evaluation board for mmWave performance testing

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Typical applications – fixed wireless access

Fixed wireless access

- Home gateway

- Industrial router

- CPE

- DTU

- Enterprise gateway

- Mobile hotspot

Typical applications – mobile broadband devices

Mobile broadband devices

- Consumer laptop

- Industrial tablet

- High-definition live broadcast

- AR/VR

- Drone

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Typical applications – industrial automation

Industrial automation

- Automated guided vehicle

- Remote control

- Smart grid

- Smart mine

- Robot

Thank you

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