



Quectel LPWA Module

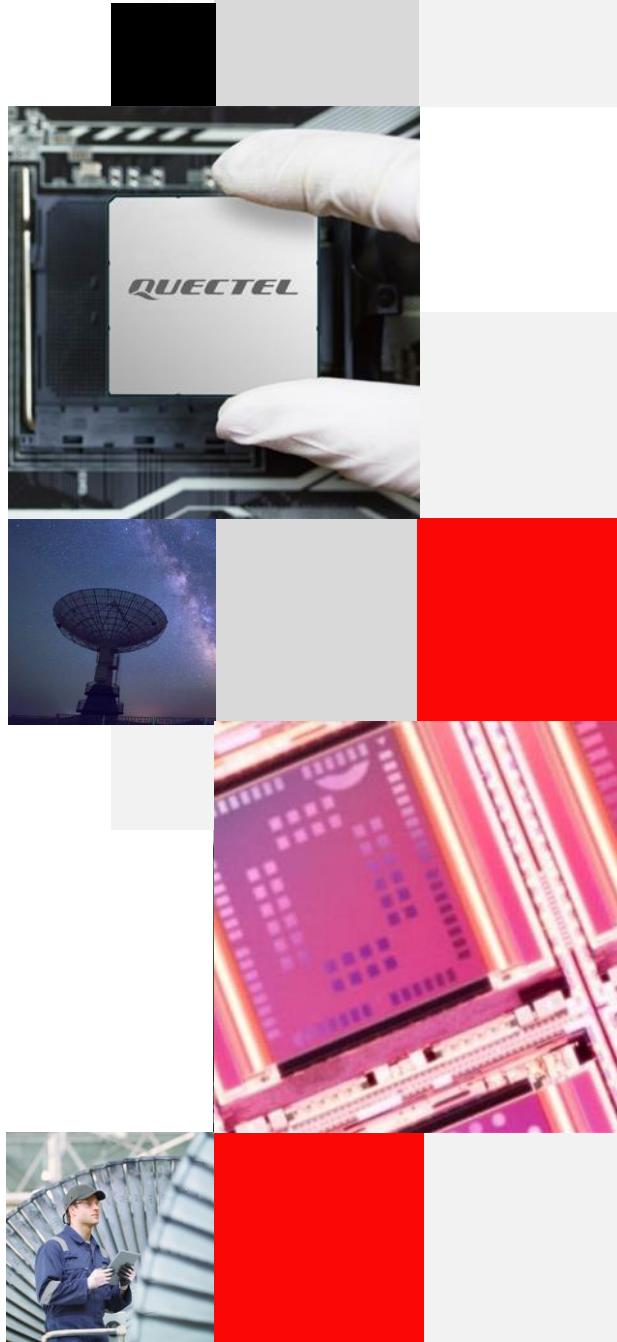
Product Overview

Build a Smarter World



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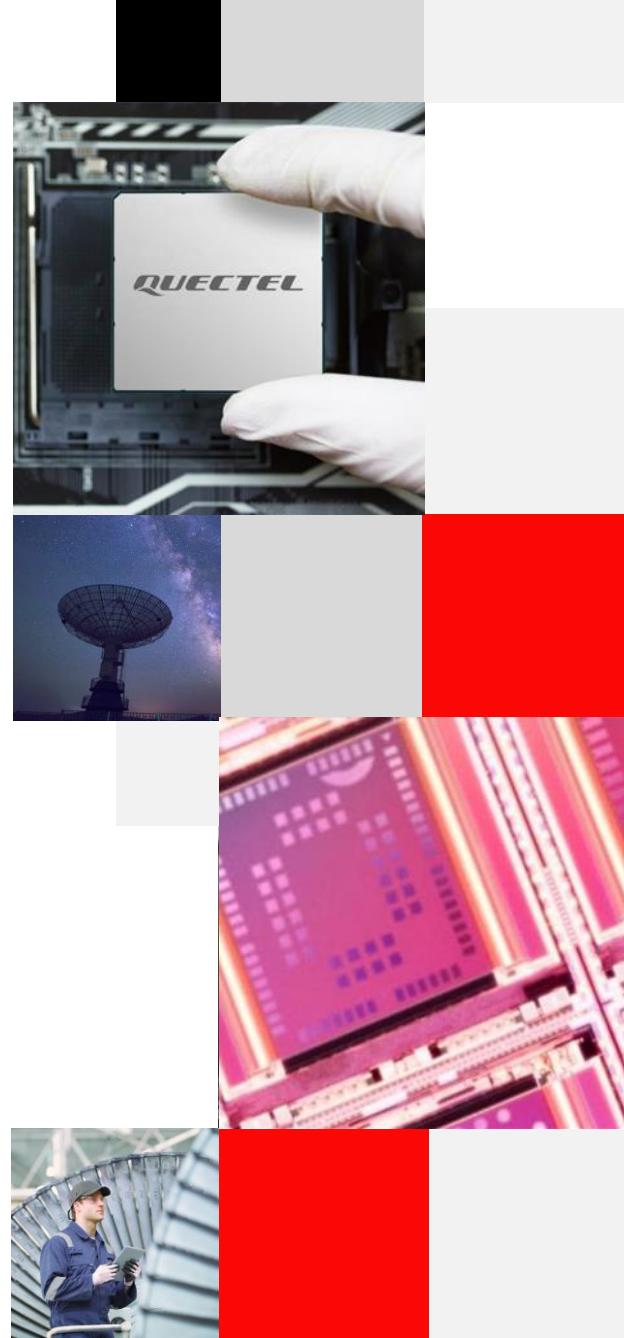
LPWA Technology

LPWA Modules Summary

Product Overview

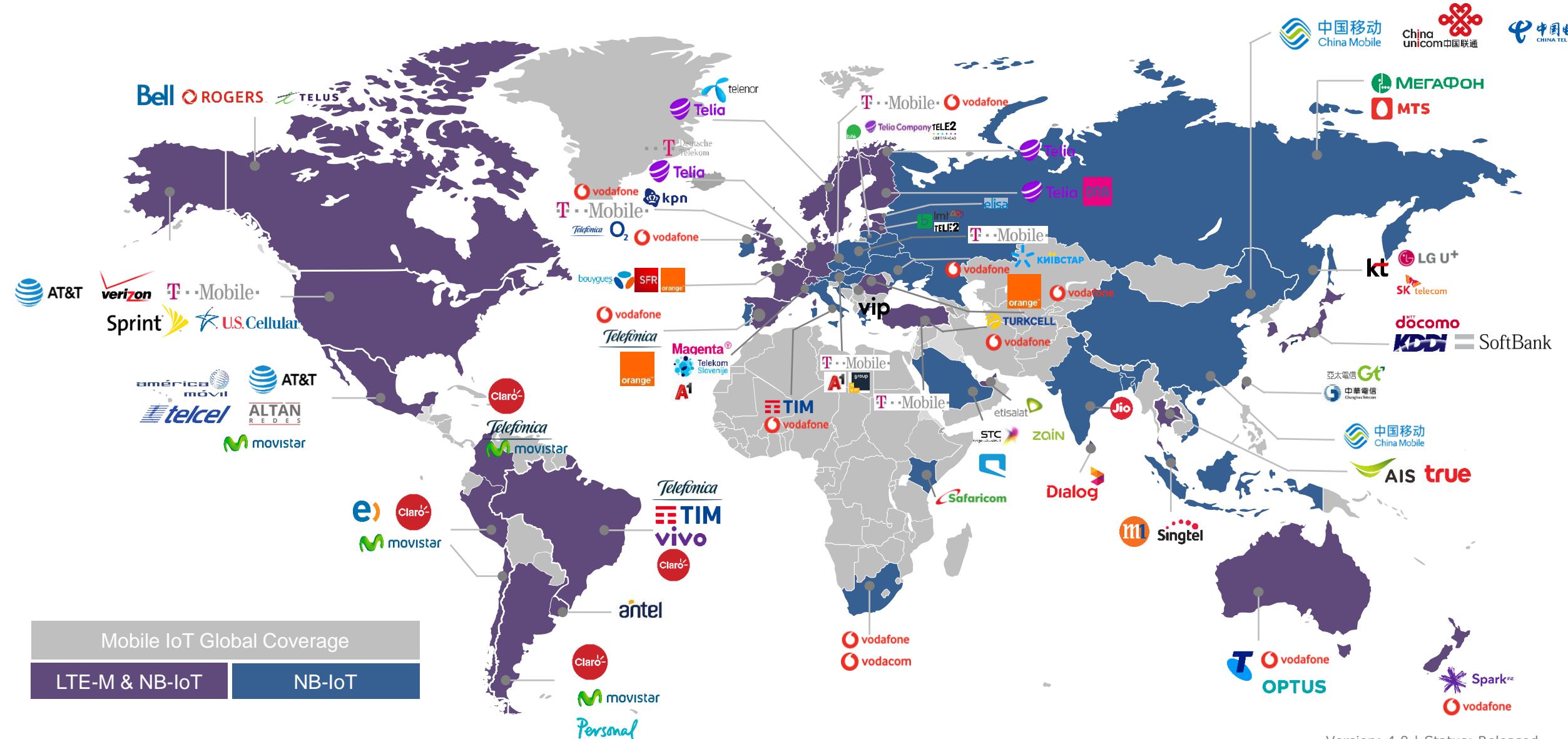
Applications

Build a Smarter World



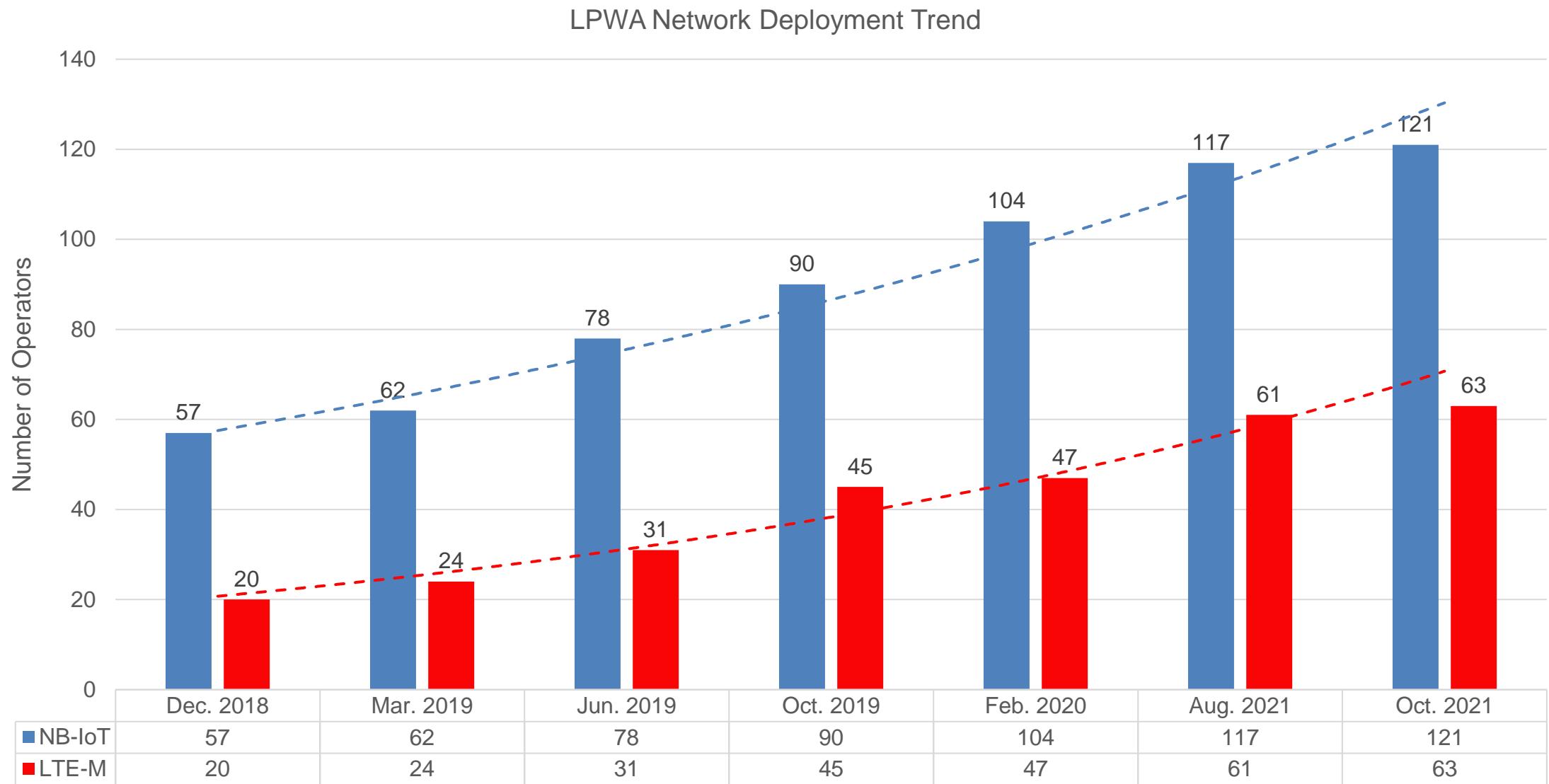
LPWA Network Deployment

(Based on GSMA Data up to October 15, 2021)



LPWA Network Deployment Trend

QUECTEL



NB-IoT Deployment (1)

(Based on GSMA Data up to October 15, 2021)



NB-IoT = 121

Country/Region	Operator	Bands	Country/Region	Operator	Bands	Country/Region	Operator	Bands
Argentina	Claro	4, 28	China	China Telecom	5	France	SFR	20
Argentina	MNO Personal	28	China	China Unicom	3, 8	Germany	Telefónica	8, 20
Argentina	Movistar	4, 28	China(Hong Kong)	3	8	Germany	Vodafone	20
Australia	Telstra	28	China(Hong Kong)	China Mobile	3	Germany	Deutsche Telekom	8, 20
Australia	Vodafone	8	China(Hong Kong)	SmarTone	8	Greece	Vodafone	20
Australia	Optus	28	China(Taiwan)	APTG	8	Greece	T-Mobile (Cosmote)	20
Austria	A1	20	China(Taiwan)	Chunghwa	8	Hungary	T-Mobile	20
Austria	T-Mobile (Magenta)	8	China(Taiwan)	FarEasTone	28	Hungary	Vodafone	20
Bangladesh	Grameenphone	3, 8 (TBC)	China(Taiwan)	Taiwan Mobile	28	India	Reliance Jio	3, 5
Belarus	A1	/	Colombia	Claro	5	Indonesia	Telkomsel	8
Belarus	Velcom	8	Colombia	Movistar	5	Indonesia	XL Axiata	8
Belgium	BASE (Telenet)	3, 20	Croatia	A1	20	Ireland	Vodafone	20
Belgium	Proximus	20	Croatia	T-Mobile (DT)	8, 20	Italy	Vodafone	20
Belgium	Orange	3,20	Czech	Vodafone	8, 20	Italy	Telecom Italia/TIM	20
Brazil	Claro	3, 28	Denmark	Telenor	20	Japan	SoftBank	1, 8
Brazil	Vivo	3, 28	Denmark	Telia	20, 8	Kazakstan	KCELL	/
Brazil	Telecom Italia/TIM	28	Denmark	TDC	20	Kenya	SafariCom	8
Canada	Rogers	4, 5, 12	Estonia	Telia	20	Latvia	Bite	20
Chile	Claro	28	Estonia	Elisa	20	Latvia	LMT	20
Chile	Movistar	28	Finland	Telia	20	Latvia	Tele2	20
Chile	Entel	28	Finland	DNA	20, 3	Lithuania	Bite	28
China	China Mobile	8	Finland	Elisa	20, 3	Lithuania	Telia	28

NB-IoT Deployment (2)

(Based on GSMA Data up to October 15, 2021)



NB-IoT = 121

Country/Region	Operator	Bands	Country/Region	Operator	Bands	Country/Region	Operator	Bands
Lithuania	Tele2	28	Saudi Arabia	STC	12	Turkey	Turkcell	1, 8, 20
Malaysia (6 Cities)	Maxis	3	Serbia	Vip Mobile (A1)	20	Turkey	Vodafone	8, 20
Malta	Vodafone	/	Singapore	M1	8	UAE	DU	20
Mexico	ALTAN	28	Singapore	StarHub	3, 8	UAE	Etisalat	20
Mexico	AT&T	5	Singapore	Singtel	8	Ukraine	Kyivstar	3
Mexico	Telcel	5	Slovakia	T-Mobile (Slovakia Telecom)	20	Ukraine	Vodafone	3
Netherlands	T-Mobile (DT)	20	Slovenia	A1	20	United Kingdom	Vodafone	20
Netherlands	Vodafone	20	Slovenia	Telekom Slovenije	20	Uruguay	Antel	3,28
New Zealand	Vodafone	28	South Africa	Vodafone	8	USA	AT&T	2, 4, 12
Norway	Telenor	8, 20	South Africa	Vodacom	3, 8, 28	USA	T-Mobile	2, 4, 12, 66, 71, 85
Norway	Telia	20	South Korea	KT	3	USA	Verizon	13
Peru	Claro	28	South Korea	LGU+	5			
Peru	Movistar	28	Spain	Telefónica	20			
Poland	T-Mobile (DT)	20	Spain	Vodafone	8, 20			
Portugal	Altice	20	Spain	Orange	20			
Portugal	Vodafone	8, 20	Sri Lanka	Dialog Axiata	3, 8			
Portugal	NOS	3,20	Sri Lanka	Mobitel	3,8			
Romania	Vodafone	20	Sweden	Telia	20			
Russia	MegaFon	20, 8, 3	Switzerland	Swisscom	20			
Russia	MTS	3	Thailand	AIS	8			
Saudi Arabia	Zain	3	Thailand	TRUE	8			
Saudi Arabia	Mobily	20	Thailand	DTAC	28			

LTE-M Deployment

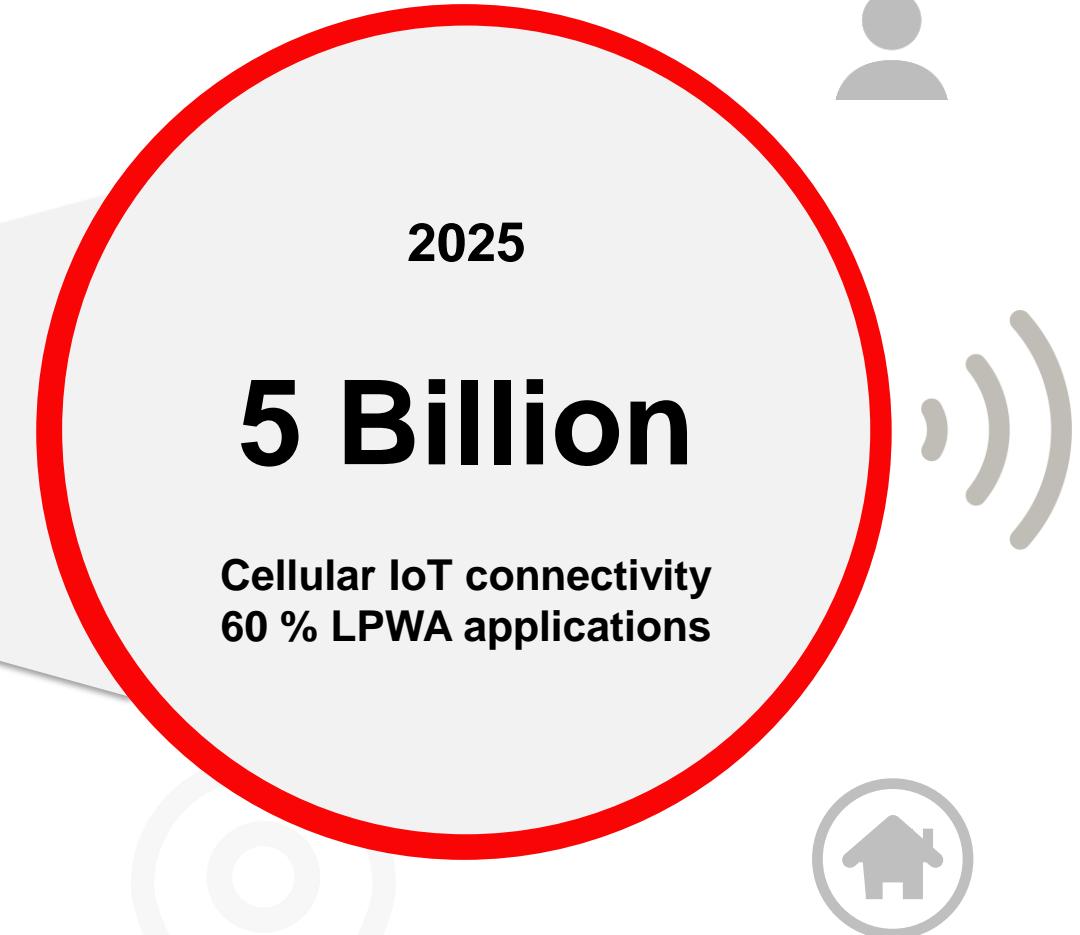
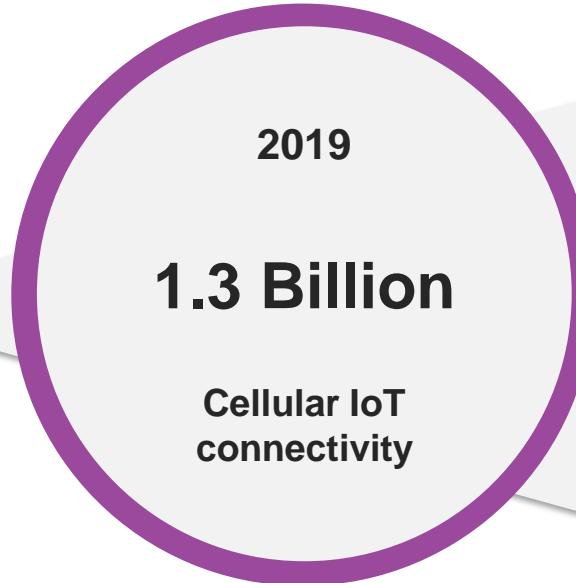
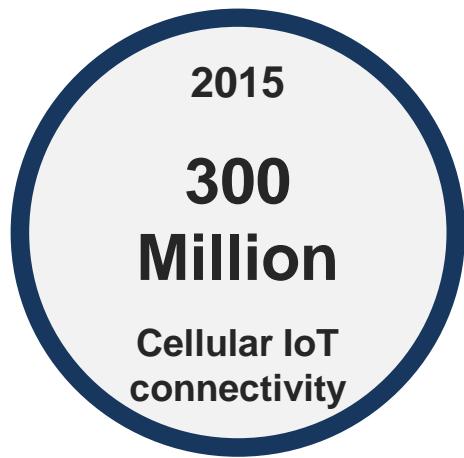
(Based on GSMA Data up to October 15, 2021)



LTE-M = 63

Country/Region	Operator	Bands	Country/Region	Operator	Bands	Country/Region	Operator	Bands
Argentina	Claro	28	Germany	Deutsche Telekom	8, 20	Singapore	SingTel	3, 8
Argentina	MNO Personal	28	Germany	Telefónica	20	South Korea	KT	3
Argentina	Movistar	4,28	Hungary	MVM Group	31	South Korea	LGU+	5
Argentina	Personal	4,28	Japan	KDDI	18, 26	South Korea	SKT	3, 5
Australia	Telstra	28	Japan	NTT DOCOMO	1, 19	Spain	Orange	3, 20
Belgium	Orange	20	Japan	SoftBank	1, 3, 8	Spain	Telefonia	20
Brazil	Claro	3, 28	Latvia	LMT	20	Sri Lanka	Dialog Axiata	8
Brazil	Vivo	3,28	Mexico	ALTAN	28	Sweden	Telenor	20
Canada	Bell	12	Mexico	América Móvil	4	Sweden	Telia	20
Canada	Rogers	4, 5, 12	Mexico	AT&T	4	Switzerland	Swisscom	20
Canada	Telus	2, 4, 5, 12	Mexico	Movistar	2	Thailand	AIS	3, 8
Chile	Claro	28	Mexico	Telcel	4	Turkey	Turkcell	20
China(Taiwan)	APTG	8	Netherlands	KPN	20	UAE	Etisalat	5
China(Taiwan)	Chunghwa	3	Netherlands	T-Mobile (DT)	8	UK	O2 Telefonica	20
Colombia	Claro	5	Netherlands	Vodafone	20	Uruguay	Antel	3, 28
Colombia	Movistar	4	New Zealand	Spark	28	US	USCC	2, 4, 5, 12
Colombia	Telefonica	2	New Zealand	Vodafone	28	USA	AT&T	2, 4, 12
Denmark	Telenor	20	Norway	Telenor	20	USA	Verizon	4, 13
Estonia	Elisa	/	Peru	Claro	28	USA	Sprint	25
Finland	DNA	20, 3	Peru	Entel	2, 28			
France	Bouygues Telecom	20	Peru	Movistar	4			
France	Orange	20, 3	Romania	Orange	3			

IoT Connectivity Forecast



LPWA Advantages



Note: VoLTE is supported on LTE Cat M1 only.

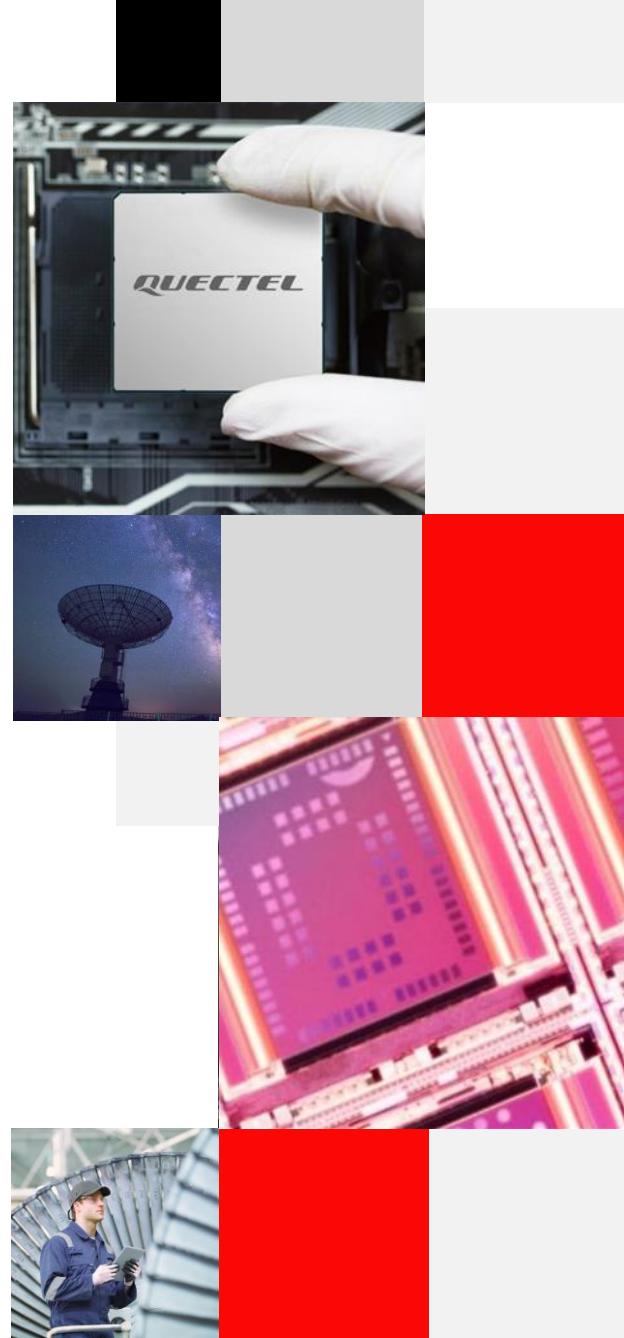


LPWA Technology

LPWA Modules Summary

Product Overview
Applications

Build a Smarter World



Narrow Band & Low Speed Modules Roadmap



LPWA

Qualcomm

Cat M, Cat NB, 2G
GNSS (Optional)

Sony

BG96



BG/BC9x Series

BG95 Series
-M1/ -M2/ -M3/ -M4/
-M5/ -M6/ -MF



BG95xA-GL

Qualcomm

NB-IoT

Unisoc

BC92



HiSilicon

BC95-G(EOL)



HiSilicon 5G NB-IoT Solutions

BC95-GV



MediaTek

BG/BC6xx Series

BG600L-M3



BG77x Series

BG77



BG770A-GL



BC660K-GL



BC65



BC68(EOL)



BC68-GV



BC66



BC66-NA



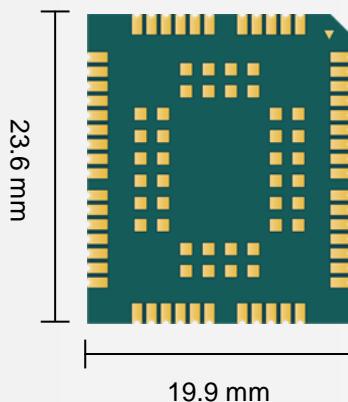
“9” Family Modules Compatibility



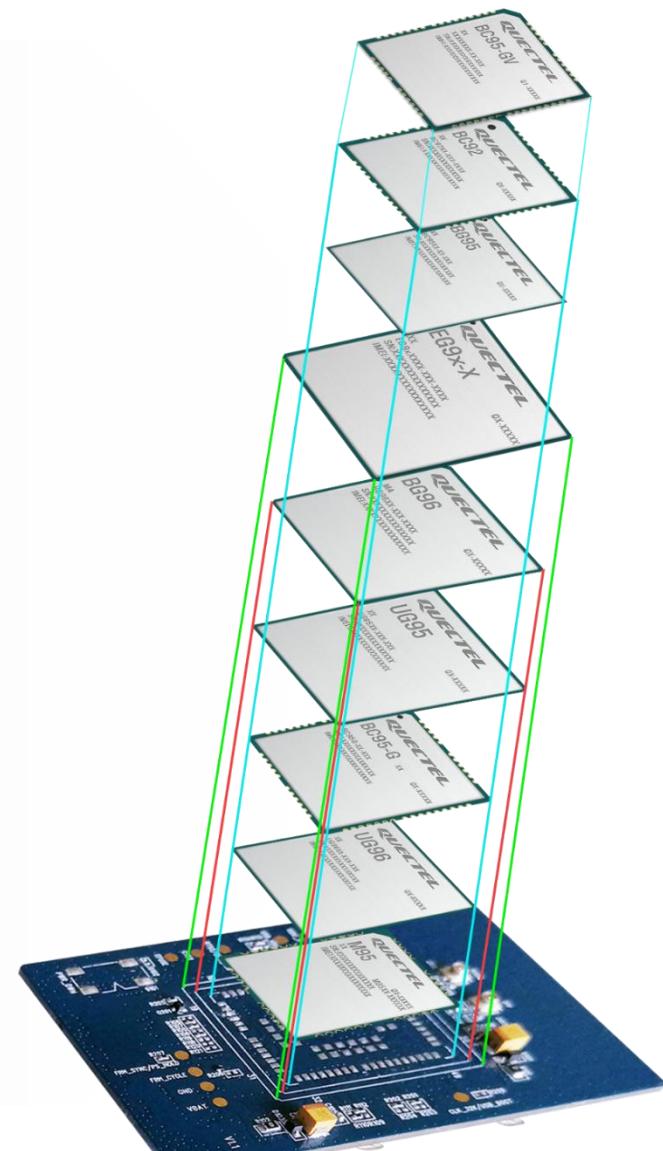
BG95xA-GL/BG95/BG96/BC95-GV/BC95-G/BC92 are compatible with the following Quectel 2G/3G/4G modules:

- GSM/GPRS module M95
- UMTS/HSPA modules UG96/UG95
- LTE Cat 4/Cat 1 module EG95/EG91

Quectel LPWA “9” family modules can share one single hardware footprint:



- NOTES:
1. The actual pin numbers of different modules that are compatible with each other may vary.
 2. BG96 is designed with larger outline size (26.5 mm x 22.5 mm) but with the same footprint size.
 3. The modules shown on this page is for illustration purpose only. The actual appearance of the modules may be different.
 4. In the figure on the right, EG9x-X refers to EG95 and EG91, BG95 refers to BG95 and BG950A-GL.



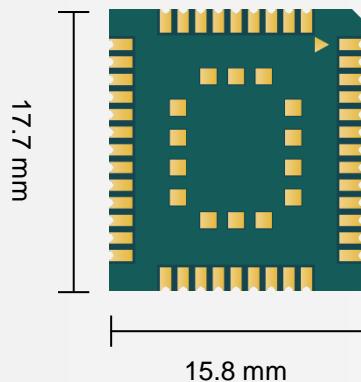
“6” Family Modules Compatibility

QUECTEL

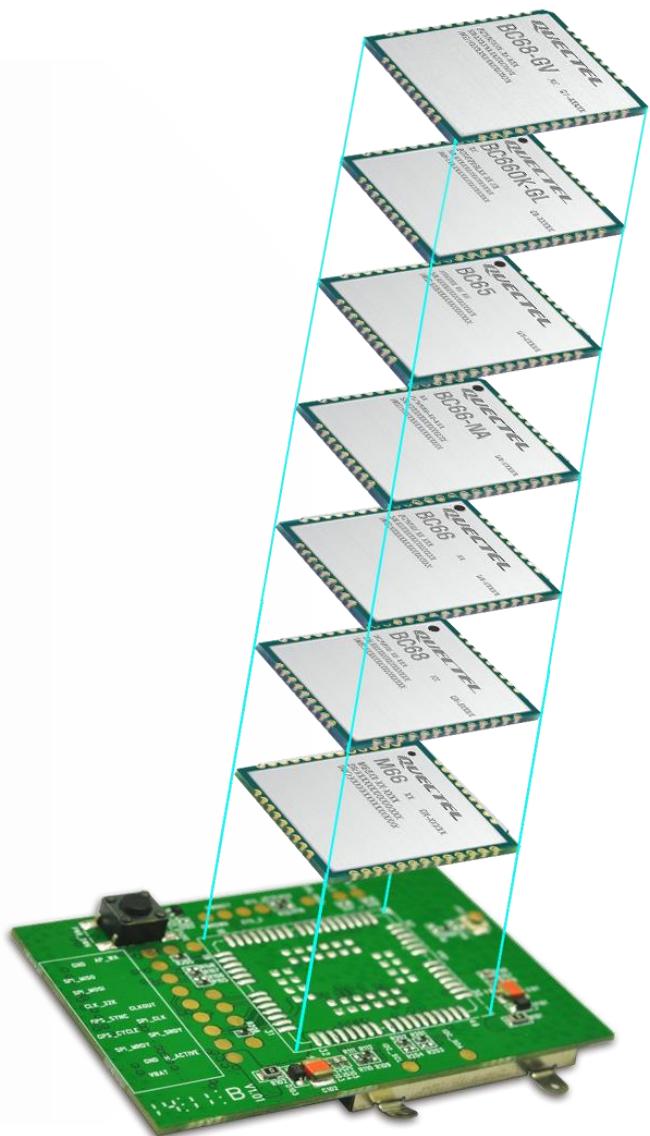
BC66/BC66-NA/BC68-GV/BC68/BC65/BC660K-GL are compatible with the following Quectel 2G module:

- #### ▪ Quectel GSM/GPRS M66 module

Quectel LPWA BC “6” family modules can share one single hardware footprint:



NOTES: 1. The actual pin numbers of different modules that are compatible with each other may vary.
2. The modules shown on this page is for illustration purpose only. The actual appearance of the modules may be different.



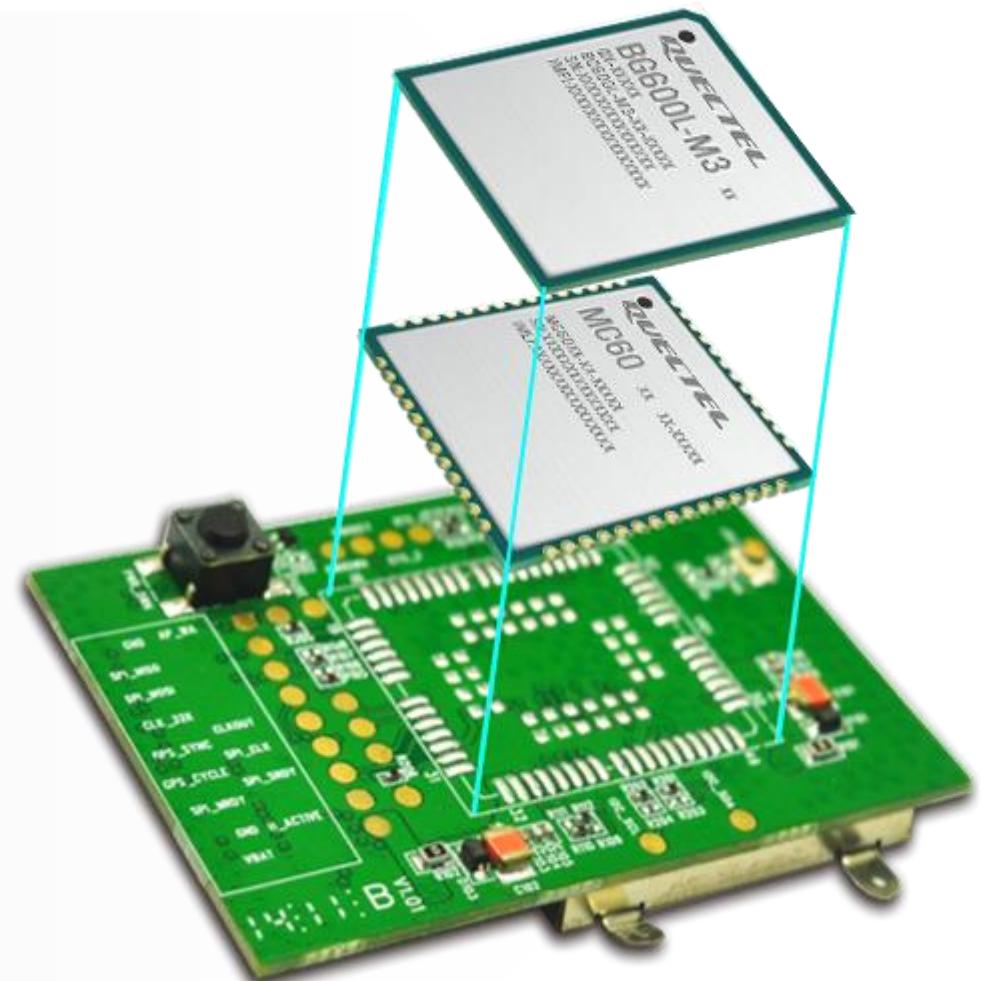
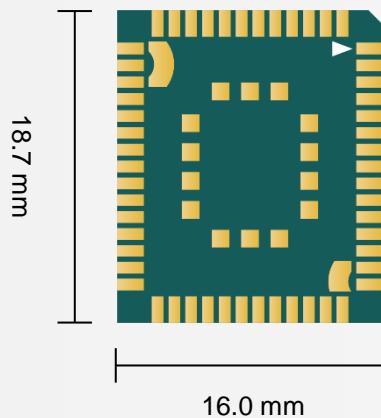
BG600L-M3 Compatibility



BG600L-M3 is compatible with

- Quectel GSM/GPRS/GNSS module MC60

BG600L-M3 and MC60 can share one single hardware footprint:



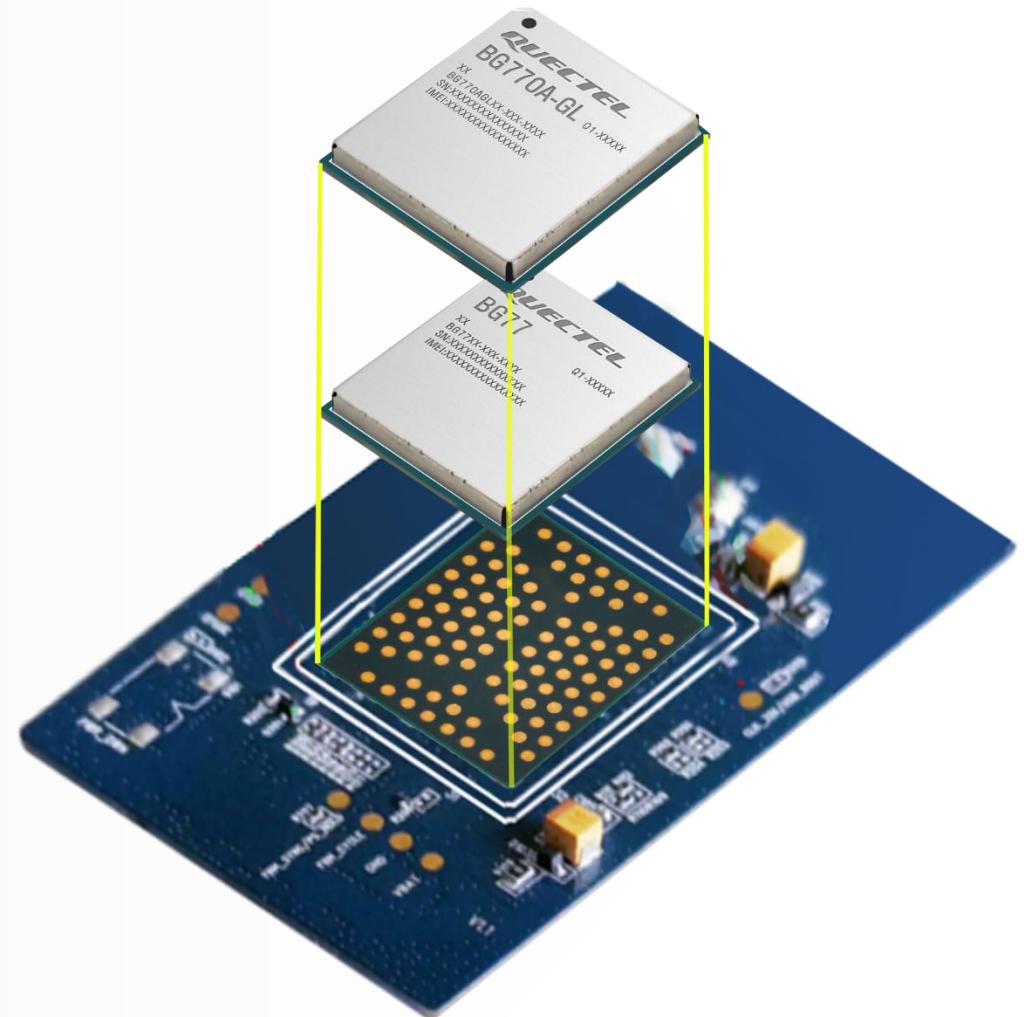
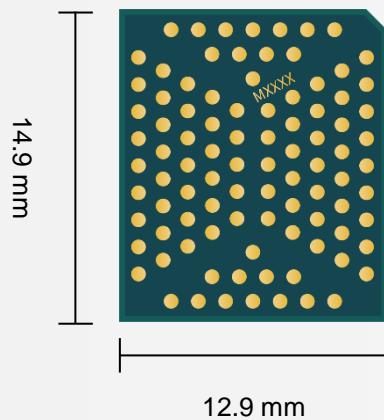
NOTES: 1. The actual pin numbers of different modules that are compatible with each other may vary.
2. The modules shown on this page is for illustration purpose only. The actual appearance of the modules may be different.

BG770A-GL Layout Compatibility



BG770A-GL is compatible with

- Quectel LPWA module BG77



The compatibility diagram shown above is for illustration purpose only.
The actual label design of the modules may be different.

Quectel LPWA Modules Summary (MP 1)



Module	BG96	BG95-M1/ -M2/ -M3/ -M4/ -M5/ -M6	BG77	BG600L-M3
Timeline	MP in Jan. 2018	BG95-M3: MP in Jan. 2020	MP in Feb, 2020	MP in Oct., 2020
Chipset	Qualcomm MDM9206	Qualcomm MDM9205	Qualcomm MDM9205	Qualcomm MDM9205
Mode	Cat M1/ Cat NB1/ EGPRS/ GNSS	Cat M1/ Cat NB2/ EGPRS/ GNSS	Cat M1/ Cat NB2/ GNSS	Cat M1/ Cat NB2/ EGPRS/ GNSS
LTE Band	1/2/3/4/5/8/12(17)/13/18/19/20/25 ^① /26*/28/39 (B39 for Cat M1 only)	1/2/3/4/5/8/12/13/18/19/20/25/26 ^② /27 ^② /28/31/66/71 ^③ /72/73/85	1/2/3/4/5/8/12/13/18/19/20/25/26 ^② /27 ^② /28/66/71 ^③ /85*	1/2/3/4/5/8/12/13/17/18/B19/20/25/26 ^② /27 ^② /28/66/71 ^③ /85
Compatibility	EG91/ UG95/ UG96/ BG95	BG96/ EG91/ UG95/ UG96/ M95	BG770A-GL	MC60
Highlight	<ul style="list-style-type: none"> Robust quality 30+ global certifications 	<ul style="list-style-type: none"> Low power consumption 1119 kbps UL (Cat M1) BG95-M1/-M2: 2.6–4.8 V BG95-M3/-M5/-M6: 3.3–4.3 V BG95-M4: 3.2–4.2 V VoLTE for Cat M1 CS voice for GSM eSIM/ SoftSIM/ nuSIM* 	<ul style="list-style-type: none"> Super compact size (14.9 × 12.9 × 1.7) mm 2.6–4.8 V power supply 	<ul style="list-style-type: none"> Compact size (18.7 × 16.0 × 2.1) mm VoLTE for Cat M1 CS voice for GSM 1119 kbps UL (Cat M1) 3.3–4.3 V power supply
Certification	Carrier: Vodafone/ Deutsche Telekom/ Telefónica/ Verizon/ AT&T/ T-Mobile/ Sprint/ U.S. Cellular/ Rogers/ Telus/ KT/ SKT/ LGU+/ NTT DOCOMO/ SoftBank/ KDDI/ Telstra Regulatory: GCF/ CE/ FCC/ PTCRB/ IC/ Anatel/ IFETEL/ CCC/ KC/ NCC/ JATE/ TELEC/ RCM/ NBTC/ IMDA	All major global carriers	All major global carriers	All major global carriers
Promotion Recommendations	<ul style="list-style-type: none"> Quality sensitive customers Asset tracking 	<ul style="list-style-type: none"> Quality sensitive customers Asset tracking 	<ul style="list-style-type: none"> Smart wearables Size-sensitive applications 	<ul style="list-style-type: none"> Quality sensitive customers Asset tracking

* means under development.

^① LTE B25 supported on BG96 with R1.2 hardware version.

^② Cat M1 bands only

^③ Cat NB2 bands only

Version: 4.0 | Status: Released

Quectel LPWA Modules Summary (MP 2)



Module	BC66	BC66-NA	BC660K-GL
Timeline	MP in Dec. 2018	MP in Oct. 2020	MP in May 2021
Chipset	MTK MT2625	MTK MT2625	Qualcomm QCX212
Mode	Cat NB1	Cat NB2	Cat NB2
LTE Band	1/2/3/4/5/8/12/13/17/18/19/20/25/28/66/26*	1/2/3/4/5/8/12/13/17/18/19/20/25/28/66/26*/71/85	1/2/3/4/5/8/12/13/17/18/19/20/25/28/66/70/85
Compatibility	M66/ BC68	M66/ BC68/ BC66	M66/ BC66/ BC68/ BC65
Highlight	<ul style="list-style-type: none"> • Cost efficiency • Small size • 2.1–3.63 V power supply • eSIM 	<ul style="list-style-type: none"> • Cost efficiency • Small size • 2.1–3.63 V power supply • eSIM 	<ul style="list-style-type: none"> • Battery voltage detection • QuecOpen® * • DFOTA
Certification	<p>Carrier: Vodafone/ Deutsche Telekom/ TIM/ Telefonica/ Altice-MEO/ AT&T/ T-Mobile/ SoftBank/ Telstra/ Verizon*/ LGU+*</p> <p>Regulatory: GCF/ CE/ PTCRB/ FCC/ IC/ KC/ NCC/ JATE/ TELEC/ RCM/ NBTC/ IMDA</p> <p>Others: ATEX</p>	<p>Carrier: Vodafone/ Deutsche Telekom/ T-Mobile/ Verizon*/ AT&T*/SoftBank*</p> <p>Regulatory: GCF/ CE/ PTCRB/ FCC/ IC/ KC/ JATE/ TELEC/ RCM/ NCC*/ NBTC*/ IMDA*/</p> <p>Others: ATEX*</p>	<p>Carrier: Vodafone*/ Deutsche Telekom/ Verizon*/ AT&T*/ KT*/ LGU+*/ Telstra*</p> <p>Regulatory: GCF*/ CE/ PTCRB*/ FCC/ IC/ Anatel*/ RCM/ IMDA/ KC</p>
Promotion Recommendations	<ul style="list-style-type: none"> • Smart metering/ smoke detector/ tracker • Cost-sensitive customers 	<ul style="list-style-type: none"> • Smart metering/ smoke detector/ tracker • Cost-sensitive customers 	<ul style="list-style-type: none"> • Smart metering/ smoke detector • Customers with high requirements on product maturity

* means under development/planning or ongoing

Quectel LPWA Modules Summary (MP 3)



Module	BC65	BC92
Timeline	MP in Jun. 2021	MP in Feb. 2020
Chipset	UNISOC RDA8908A	UNISOC RDA8909B
Mode	Cat NB2	Cat NB2/ GSM
LTE Band	1*/3/5/8/20/28	3/5/8/20/28
Compatibility	BC66/ BC68/ M66	BC95-G/ BG95/ M95
Highlight	<ul style="list-style-type: none"> • Low power design • DFOTA 	<ul style="list-style-type: none"> • Built-in ADC temperature detection* • Low power design • DFOTA
Certification	Carrier: Vodafone Regulatory: GCF/ CE/ RCM	Carrier: Vodafone/ MTN/ Vodacom Regulatory: GCF/ CE/ RCM/ ICASA
Promotion Recommendations	Smart wristband/ smart watch/ student card/ bike sharing/ tracker/ parking/ truck	<ul style="list-style-type: none"> • Smart wristband/ smart watch/ student card/ bike sharing/ tracker/ parking/ truck

* means under development/planning or ongoing

Quectel LPWA Modules Summary (MP 4)



Module	BC95-G(EOL)	BC68 (EOL)
Timeline	MP in Jun. 2018	MP in Jun. 2018
Chipset	HiSilicon Hi2115	HiSilicon Hi2115
Mode	Cat NB2	Cat NB2
LTE Band	B1/B3/B5/B8/B20/B28	B1/B3/B5/B8/B20/B28
Compatibility	M95	M66/ BC66
Highlight	<ul style="list-style-type: none"> • Good robustness • Proprietary DFOTA 	<ul style="list-style-type: none"> • Good robustness • Proprietary DFOTA
Certification	Carrier: Vodafone/ Deutsche Telekom/ Telefónica/ KT/ LGU+/ SoftBank/ Telstra/ Spark Regulatory: GCF/ CE/ Anatel/ KC/ NCC/ JATE/ TELEC/ RCM/ FAC/ NBTC/ IMDA Others: ATEX	Carrier: Vodafone/ Deutsche Telekom/ TIM/ Telefónica/ Altice-MEO/ SoftBank/ Telstra Regulatory: GCF/ CE/ NCC/ JATE/ TELEC/ RCM/ FAC/ IMDA Others: ATEX
Promotion Recommendations	<ul style="list-style-type: none"> • Smart metering/ smoke detector • Customers with high requirements on product maturity 	<ul style="list-style-type: none"> • Smart metering/ smoke detector • Customers with high requirements on product maturity

Quectel LPWA Modules Summary (Under Development 1)

Module	BG95-MF	BG770A-GL	BG950A-GL	BG951A-GL
Timeline	<ul style="list-style-type: none"> ES: Apr. 2020 CS: Nov. 2020 	<ul style="list-style-type: none"> ES: Jan. 2021 CS: Aug. 2021 	<ul style="list-style-type: none"> ES: Aug. 2021 CS: Oct. 2021 	<ul style="list-style-type: none"> ES: Sep. 2021 CS: Nov. 2021
Chipset	Qualcomm MDM9205	Sony ALT1250	Sony ALT1250	Sony ALT1250
Mode	Cat M1/ Cat NB2/ GNSS/ Wi-Fi	Cat M1/ Cat NB1/ Cat NB2*/ GNSS	Cat M1/ Cat NB1/ Cat NB2*/ GNSS	Cat M1/ Cat NB1/ Cat NB2*/ GNSS
LTE Band	1/2/3/4/5/8/12/13/18/19/20/25/26 ^① /27 ^① /28/66/71 ^② / 85	1/2/3/4/5/8/9*/10*/12/13/17 ^① /18/19/20/25/26 ^② /27 ^③ / 28/66	1/2/3/4/5/8/9*/10*/12/13/17 ^① /18/19/20/25/26 ^② /27 ^③ / 28/66	1/2/3/4/5/8/9*/10*/12/13/17 ^① /18/19/20/25/26 ^② /27 ^③ / 28/66
Compatibility	BG96/ EG91/ UG95/ UG96/ M95	BG77	BG95 series	BG95 series
Highlight	<ul style="list-style-type: none"> Low power consumption 1119 kbps UL (Cat M1) 3.3–4.3 V power supply VoLTE* for Cat M1 eSIM/ SoftSIM/ nuSIM* Wi-Fi positioning 	<ul style="list-style-type: none"> Super compact size (14.9 × 12.9 × 1.9) mm 2.2–4.35 V power supply iSIM* reserved for customization 	<ul style="list-style-type: none"> Low power consumption Global certification 	<ul style="list-style-type: none"> Low power consumption Global certification GNSS&LTE Concurrency
Certification*	Carrier: Vodafone*/ Verizon*/ AT&T* Regulatory: GCF*/ CE/ PTCRB*/ FCC/ IC/ RCM	All major global carriers	All major global carriers	All major global carriers
Promotion Recommendations	<ul style="list-style-type: none"> Quality sensitive customers Asset tracking 	<ul style="list-style-type: none"> Smart wearables Size-sensitive applications 	<ul style="list-style-type: none"> Asset tracking Satisfies low power consumption demands 	<ul style="list-style-type: none"> Asset tracking Telematics Applications

^① Cat M1 bands only

^② Cat NB2 bands only

^③ * means under development/planning or ongoing

Quectel LPWA Modules Summary (Under Development 2)



Module	BC95-GV^①	BC68-GV^①
Timeline	<ul style="list-style-type: none"> • ES: Nov. 2021 • CS: Dec. 2020 	<ul style="list-style-type: none"> • ES: Nov. 2021 • CS: Dec. 2020
Chipset	HiSilicon 5G NB-IoT Solution (CB0201)	HiSilicon 5G NB-IoT Solution (CB0201)
Mode	3GPP Rel-14, 3GPP Rel-15*, Cat NB2	3GPP Rel-14, 3GPP Rel-15*, Cat NB2
LTE Band	B1/B3/B5/B8/B20/B28/B18*/B26*	B1/B3/B5/B8/B20/B28/B18*/B26*
Compatibility	M95/ BC95-G	M66/ BC66/ BC68
Highlight	<ul style="list-style-type: none"> • Good robustness • Proprietary DFOTA • Integrated BLE 5.0* (AoA and mesh not supported) 	<ul style="list-style-type: none"> • Good robustness • Proprietary DFOTA • Integrated BLE 5.0* (AoA and mesh not supported)
Certification	<p>Carrier: Vodafone*/ Deutsche Telekom*/ Telefónica*/ KT*/ LGU+*/ SoftBank*/ Telstra*/ Spark*</p> <p>Regulatory: GCF*/ CE*/ Anatel*/ KC*/ NCC*/ JATE*/ TELEC*/ RCM*/ FAC*/ NBTC*/ IMDA*</p> <p>Others: ATEX*</p>	<p>Carrier: Vodafone*/ Deutsche Telekom*/ TIM*/ Telefónica*/ Altice-MEO*/ SoftBank*/ Telstra*</p> <p>Regulatory: GCF*/ CE*/ NCC*/ JATE*/ TELEC*/ RCM*/ FAC*/ IMDA*</p> <p>Others: ATEX*</p>
Promotion Recommendations	<ul style="list-style-type: none"> • Smart metering/ smoke detector • Customers with high requirements on product maturity 	<ul style="list-style-type: none"> • Smart metering/ smoke detector • Customers with high requirements on product maturity

“*” means under development/planning/ongoing.

^①Preliminary, specific hardware/software specifications to be determined.

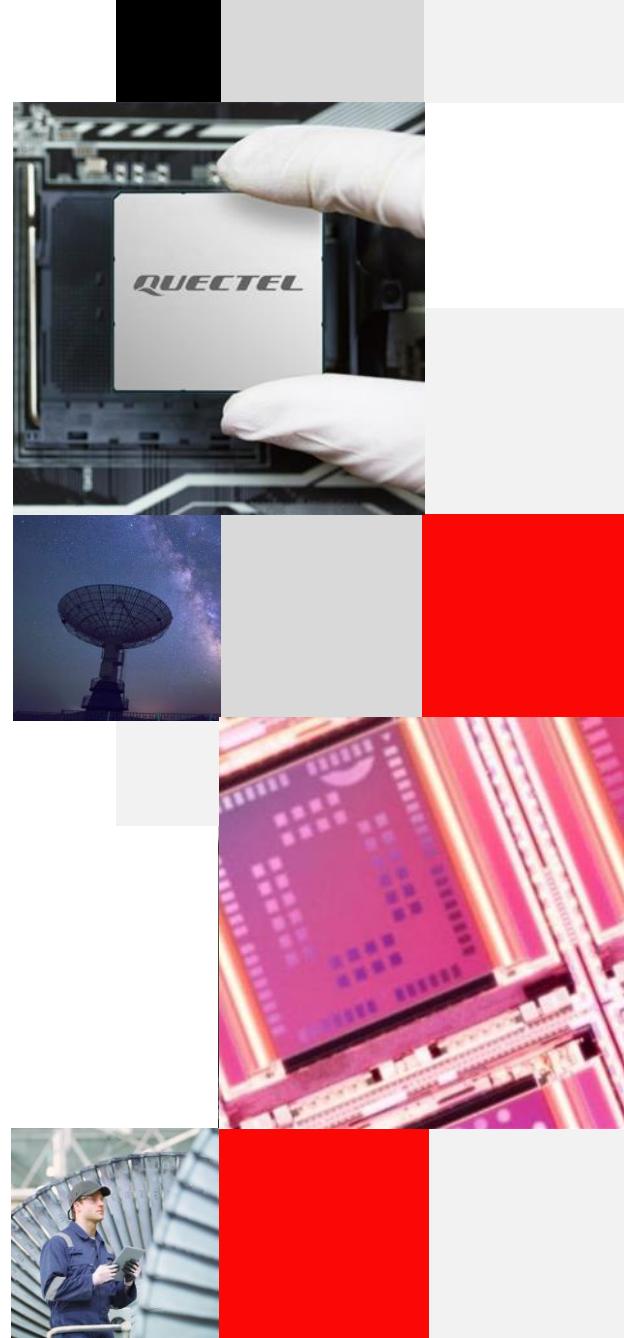


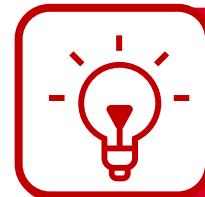
LPWA Technology LPWA Modules Summary

Product Overview

Applications

Build a Smarter World





Qualcomm Solution

LPWA Roadmap

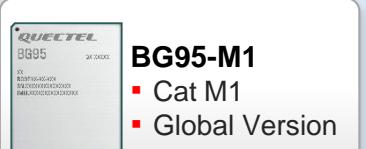


MDM9205



BG95-M3

- Cat M1/ NB2/ EGPRS
- Global Version



BG95-M1

- Cat M1
- Global Version



BG95-M4

- Cat M1/ NB2
- **B31/B72/B73 (450 MHz)**
- Global Version



BG95-MF

- Cat M1/ NB2
- **Wi-Fi Positioning**
- Global Version

BG95 Series are Pin-to-Pin Compatible with BG96



BG95-M2

- Cat M1/ NB2
- Global Version



BG95-M5

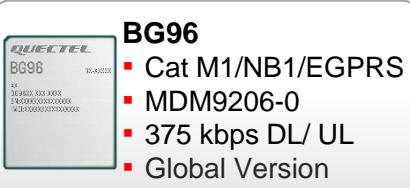
- Cat M1/ NB2/ EGPRS
- **Power Class 3**
- Global Version



BG95-M6

- Cat M1/ NB2
- **Power Class 3**
- Global Version

MDM9206



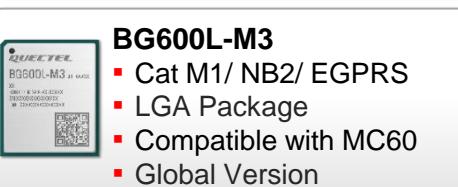
BG96

- Cat M1/NB1/EGPRS
- MDM9206-0
- 375 kbps DL/ UL
- Global Version



BG77

- Cat M1/ NB2
- **Super Compact Size**
- Global Version



BG600L-M3

- Cat M1/ NB2/ EGPRS
- LGA Package
- Compatible with MC60
- Global Version

QCX212



BC660K-GL

- Cat NB2
- 127 kbps DL/ 158.5 kbps UL
- Global Version

Earlier

2019

2020

2021

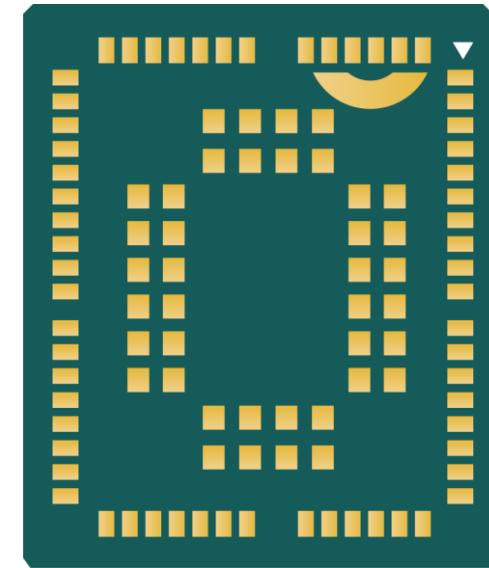
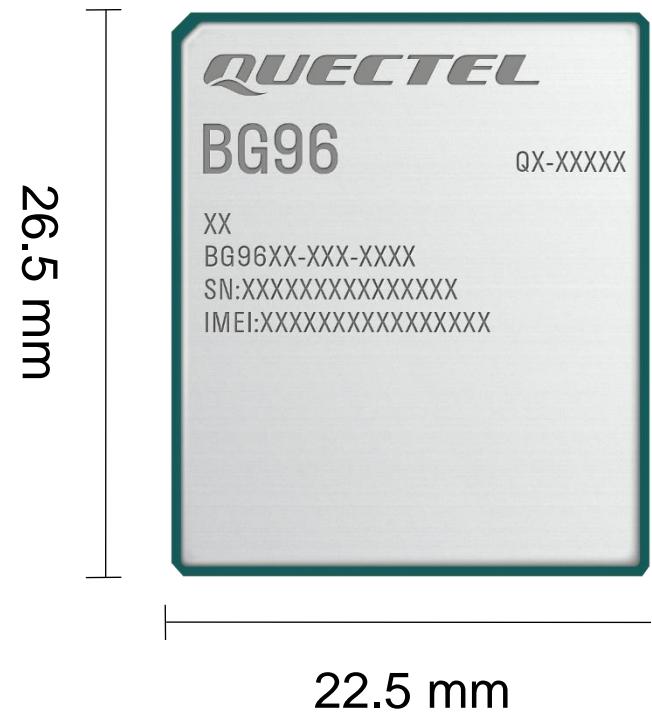
BG96/BG95/BG77/BG600L-M3/BC660K-GL Summary



Module	Models	Bands	Package	Dimensions (mm)	eSIM	Compatibility	Target Carrier Certification
BG96	BG96 (Cat M1/NB1/EGPRS)	Global	LGA	26.5 × 22.5 × 2.3	On-board	BG95/ BC95-G/ BC92/ EG9x/ UG9x/ M95	All major global carriers
BG95	BG95-M1 (Cat M1 Only) BG95-M2 (Cat M1/Cat NB2) BG95-M3 (Cat M1/Cat NB2/EGPRS) BG95-M4 (Cat M1/Cat NB2, 450 MHz Supported) BG95-MF (Cat M1/Cat NB2, Wi-Fi Positioning)	Global	LGA	23.6 × 19.9 × 2.2	Embedded/ On-board	BG96/ BC95-G/ BC92/ EG9x/ UG9x/ M95	All major global carriers/ depend on customers' requirements
	BG95-M5 (Cat M1/Cat NB2/EGPRS, Power Class 3) BG95-M6 (Cat M1/Cat NB2, Power Class 3)				On-board		
BG77	BG77 (Cat M1/Cat NB2)	Global	LGA	14.9 × 12.9 × 1.7	On-board	BG770A-GL	All major global carriers/ depend on customers' requirements
BG600L-M3	BG600L-M3 (Cat M1/Cat NB2/EGPRS)	Global	LGA	18.7 × 16.0 × 2.1	On-board	MC60	All major global carriers/ depend on customers' requirements
BC660K-GL	BC660K-GL (Cat NB2)	Global	LCC	17.7 × 15.8 × 2.0	Reserved	M66/ BC66/ BC66-NA/ BC65/ BC68	All major global carriers/ depend on customers' requirements

BG96 Mechanical Dimensions

Multi-Mode LPWA Module (MDM9206)



Length: 26.5 mm (± 0.15 mm)
Width: 22.5 mm (± 0.15 mm)
Height: 2.3 mm (± 0.2 mm)
Weight: Approx. 3.1 g

BG96 Highlights



Highlight	Description
Multi Modes	Cat M1/ Cat NB1/ EGPRS
Package	LGA / Mini PCIe
Global Bands	<ul style="list-style-type: none">Cat M1/NB1: B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25⁽¹⁾/B26*/B28/B39 (B39 for Cat M1 only)EGPRS: 850/900/1800/1900 MHz
Low Power Consumption	Approx. 10 µA in PSM mode
Mobility	Movable application (TX3.0)
Extended Power Supply Range	3.3–4.3 V, 3.8 V typ.
GNSS (Optional)	GPS, GLONASS, BeiDou/Compass, Galileo, QZSS
VoLTE	PCM digital audio interface
QuecOpen®	ARM A7 Processor, with 3 MB Flash and 3 MB RAM available for users
QuecLocator®*	Location based on base station cell information
Compatibility	Soldering footprint completely compatible with Quectel UG95/UG96/BC95

** means under development.

⁽¹⁾ LTE B25 supported on BG96 with R1.2 hardware version.

Version: 4.0 | Status: Released

Cat M1/Cat NB1/EGPRS



26.5 mm × 22.5 mm × 2.3 mm

Package: 102-pin LGA

Supply Voltage: 3.3–4.3 V, 3.8 V Typ.

Data Rate:

- LTE Cat M1: Max. 375 kbps (DL), Max. 375 kbps (UL) (Half Duplex)
- LTE Cat NB1: Max. 32 kbps (DL), Max. 70 kbps (UL)
- EGPRS: Max. 296 kbps (DL), Max. 236.8 kbps(UL)
- GPRS: Max. 107 kbps (DL), Max. 85.6 kbps (UL)

Protocols: PPP/TCP/UDP/SSL/TLS/FTP(S)/HTTP(S)/MQTT

Functions: Data/VoLTE/GNSS/DFOTA/NITZ/PING

Interfaces: (U)SIM/UART/USB/I2C/PCM/ADC/GPIO/Antenna

Power Consumption (Typical): 10 µA @PSM

BG96 Specifications 2



■ LPWA Cat M1/Cat NB1/EGPRS Module

26.5 mm × 22.5 mm × 2.3 mm
Cat M1: 375 kbps DL/375 kbps UL
Cat NB1: 32 kbps DL/70 kbps UL

Items	Description
Cat M1	LTE FDD: B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25 ^① /B26*/B28 LTE TDD: B39
Cat NB1	LTE FDD: B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25 ^① /B26*/B28
EGPRS	850/900/1800/1900 MHz
GNSS	Optional
Region	Global
Certification	Carrier: Vodafone/ Deutsche Telekom/ Telefónica/ Verizon/ AT&T/ T-Mobile/ Sprint/ U.S. Cellular/ Rogers/ Telus/ KT/ SKT/ LGU+/ NTT DOCOMO/ SoftBank/ KDDI/ Telstra Regulatory: GCF/ CE/ FCC/ PTCRB/ IC/ Anatel/ IFETEL/ CCC/ KC/ NCC/ JATE/ TELEC/ RCM/ NBTC/ IMDA

“*” means under development.

① LTE B25 supported on BG96 with R1.2 hardware version.

BG96 Power Consumption



Description	Conditions	Typ.	Unit
Power Saving Mode	PSM @ Real Network	10	µA
Sleep State^①	DRX = 1.28 s @ Paging Duration = 35 mA/25 ms	1.5	mA
	e-I-DRX = 40.96 s @ PTW = 2.3 mA/10 s	1.2	mA
Idle State^②	DRX = 1.28 s @ Paging Duration = 45 mA/16 ms	15	mA
	e-I-DRX = 40.96 s @ PTW = 16 mA/10 s	15	mA
Active State	23 dBm @ Instrument	205	mA
	10 dBm @ Instrument	140	mA
	0 dBm @ Instrument	128	mA
	Data Transfer @ Real Network	95	mA
	Voice @ Real Network	108	mA

^① Sleep state with UART connected and USB disconnected. The module can enter into sleep state through executing **AT+QSCLK=1** command via UART interface and then controlling the module's DTR pin. For details, please refer to [Quectel_BG96_Hardware_Design](#).

^② Idle state with UART connected and USB disconnected.

BG96 Main Interfaces



Interface	Description
(U)SIM	1.8 /3.0 V
UART	3 (UART1, UART2, UART3)
USB	1
I2C	1
ADC	2
GPIO	2 (I2C and UART3 can be re-configured as extra 4 GPIOs if they are not used)
PCM	1
Antenna Interface	2 (for Main Antenna and GNSS Antenna, respectively)
GNSS (Optional)	GPS, GLONASS, BeiDou/Compass, Galileo, QZSS

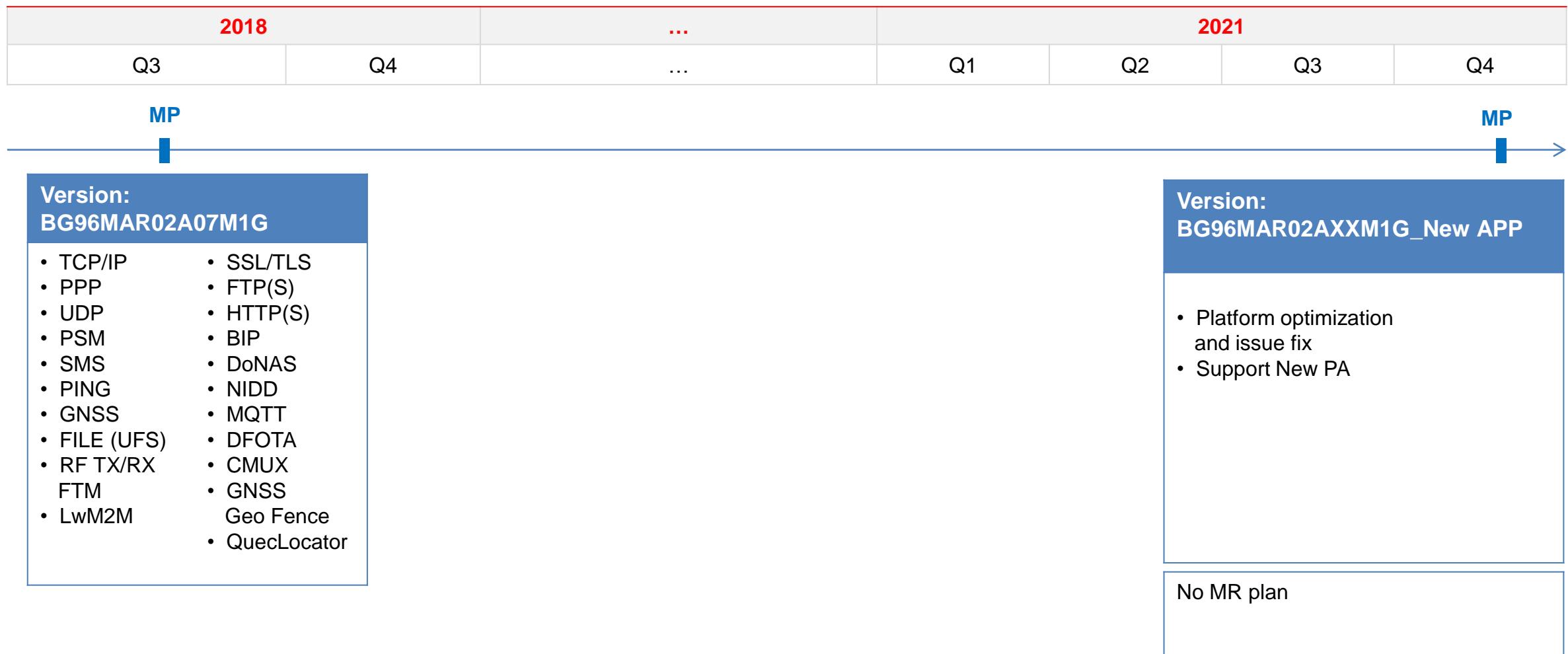
BG96 Main Functions



Function	Description
Protocols	PPP/ TCP/ UDP/ SSL/ TLS/ FTP(S)/ HTTP(S)/ MQTT
USB Serial Driver	Windows 7/8/8.1/10, Linux 2.6/3.x/4.1–4.15, Android 4.x/5.x/6.x/7.x/8.x/9.x
GNSS Driver	Android 4.x/5.x/6.x/7.x/8.x/9.x
RIL Driver	Android 4.x/5.x/6.x/7.x/8.x/9.x/10.x
NDIS Driver	Windows 7/8/8.1/10
GobiNet Driver	Linux 2.6–5.4
QMI_WWAN Driver	Linux 3.4–5.4
SMS	Point-to-point MO and MT; SMS Cell Broadcast; Text and PDU Mode
Voice	VoLTE (for Cat M1 only. Support Realtek ALC 5616 codec by default firmware)
DFOTA	Delta Firmware Upgrade Over-The-Air
LwM2M	Enabled

“” means under development*

BG96 (TX2.0, R02Axx) Development Schedule



The timeline will be adjusted according to the actual development status.

BG96 (TX2.0) Certifications



Project Stage

BG96 (TX2.0)

MP

Carrier Certification

Vodafone/ Deutsche Telekom/ Telefónica/ Verizon/ AT&T/ T-Mobile/ U.S. Cellular/
Rogers/ Telus/ SKT/ KDDI/ Telstra

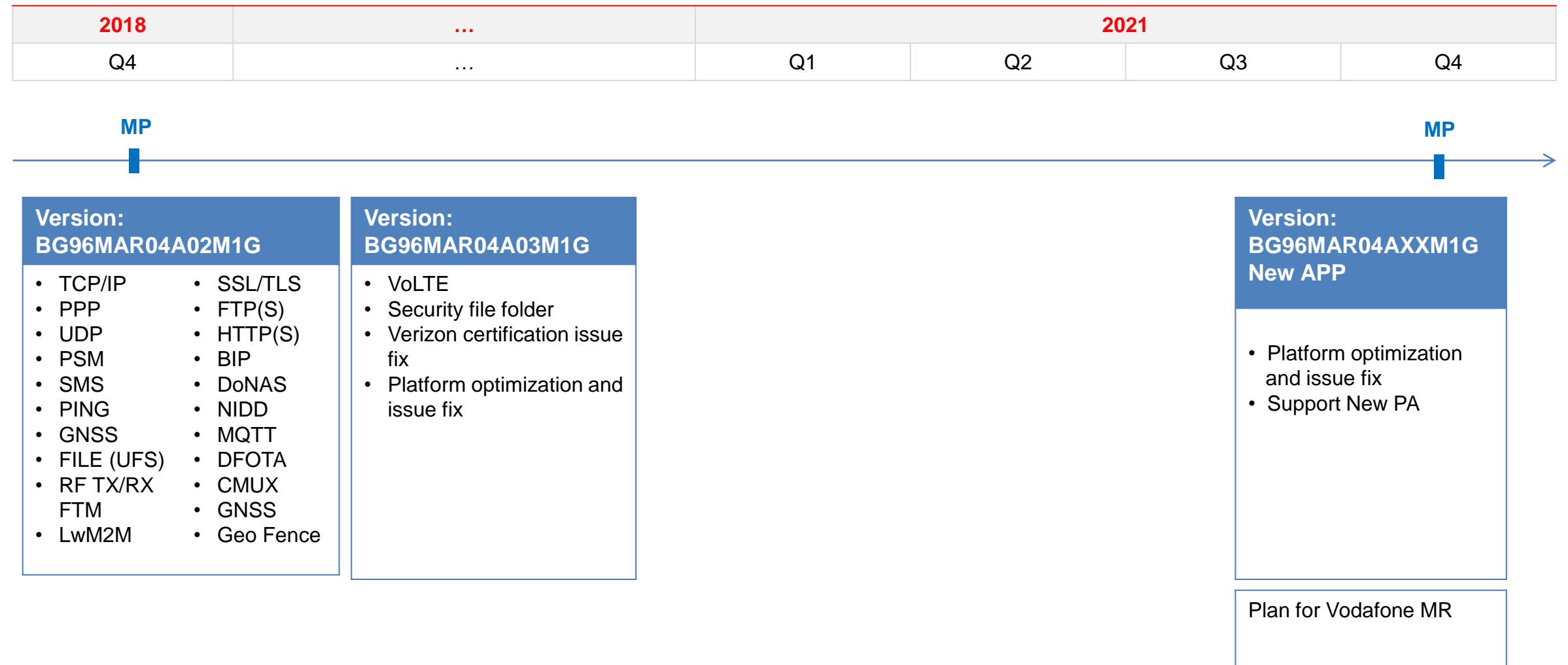


Regulatory Certification

GCF/ CE/ FCC/ PTCRB/ IC/ Anatel/ IFETEL/ CCC/ KC/ NCC/ JATE/ TELEC/ RCM/ NBTC/ IMDA



BG96 (TX3.0, R04Axx) Development Schedule (North America)



The timeline will be adjusted according to the actual development status.

Version: 4.0 | Status: Released

BG96 (TX3.0, R04Axx) Timeline (North America)



Project Stage

BG96 (TX3.0, R04Axx)

MP

Carrier Certification

Verizon/ AT&T/ T-Mobile/ Sprint/ Telus/ Telstra

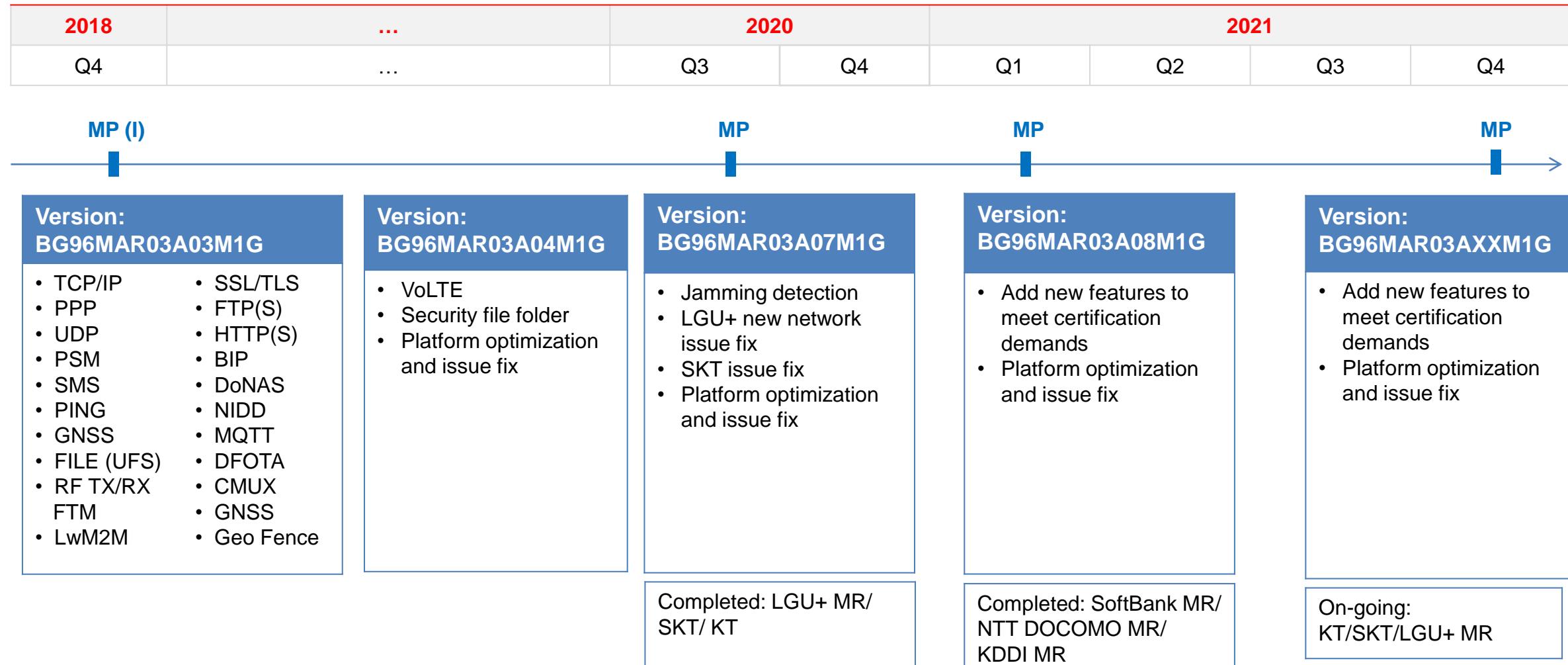


Regulatory Certification

GCF/ CE/ FCC/ PTCRB/ IC/ RCM



BG96 (TX3.0, R03Axx) Development Schedule (Other Regions)



The timeline will be adjusted according to the actual development status.

Version: 4.0 | Status: Released

Project Stage

BG96 (TX3.0, R03Axx)

MP

Carrier Certification

KT/ SKT/ LGU+/ NTT DOCOMO/ SoftBank/ KDDI/ Telstra



Regulatory Certification

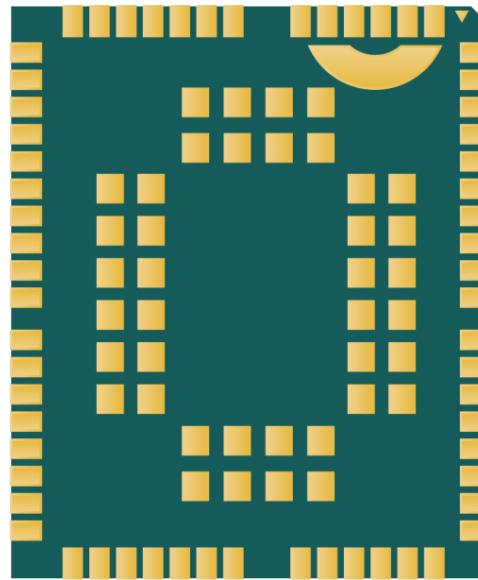
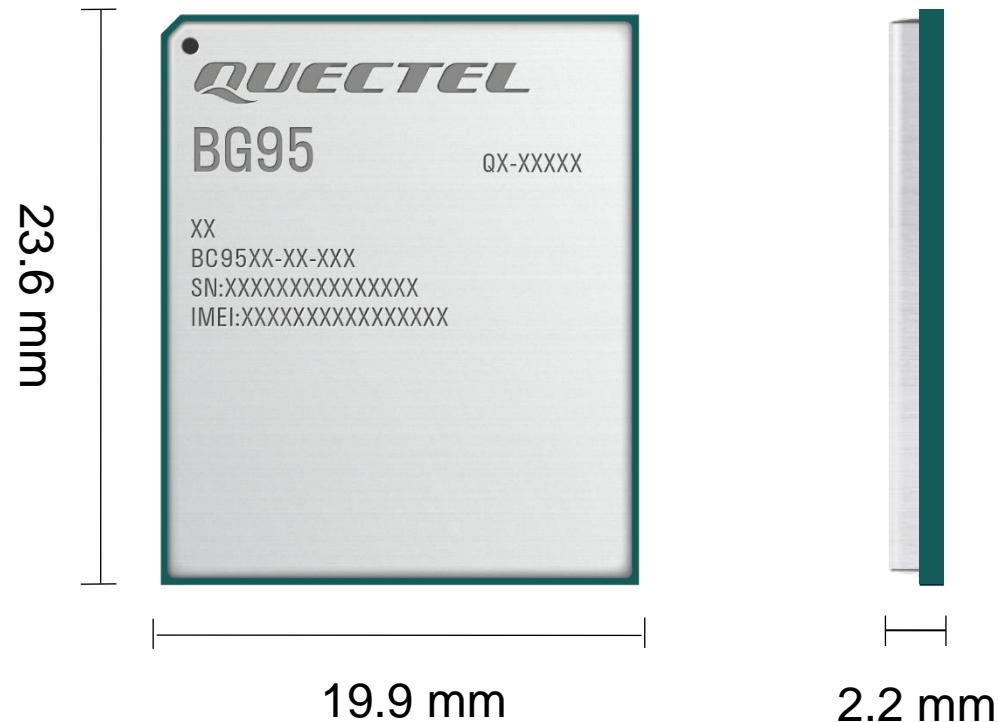
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BG95 Series Mechanical Dimensions



Multi-Mode LPWA Module (MDM9205)



Length: 23.6 mm (± 0.15 mm)
Width: 19.9 mm (± 0.15 mm)
Height: 2.2 mm (± 0.2 mm)
Weight: Approx. 2.15 g

BG95 Series Overview



Model	Mode	Bands	Certifications	Status
BG95-M1	Cat M1 Only	LTE-FDD: B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B26/B27/B28/B66/B85	All major global carriers	MP
BG95-M2	Cat M1/ Cat NB2	LTE-FDD: B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B26 ^① /B27 ^① /B28/B66/B71 ^② /B85	All major global carriers	MP
BG95-M3	Cat M1/ Cat NB2/ EGPRS	LTE-FDD: B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B26 ^① /B27 ^① /B28/B66/B71 ^② /B85 EGPRS: 850/900/1800/1900 MHz	All major global carriers	MP
BG95-M4	Cat M1/ Cat NB2 (450 MHz Supported)	LTE-FDD: B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B26 ^① /B27 ^① /B28/ B31^③ /B66/ B72^③ / B73^③ /B85	Major certifications in Europe and Latin America	MP
BG95-M5	Cat M1/ Cat NB2/ EGPRS (Power Class 3)	LTE-FDD: B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B26 ^① /B27 ^① /B28/B66/B71 ^② /B85 EGPRS: 850/900/1800/1900 MHz	All major global carriers	MP
BG95-M6	Cat M1/ Cat NB2 (Power Class 3)	LTE-FDD: B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B26 ^① /B27 ^① /B28/B66/B71 ^② /B85	All major global carriers	MP
BG95-MF	Cat M1/ Cat NB2 (Wi-Fi Positioning)	LTE-FDD: B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B26 ^① /B27 ^① /B28/B66/B71 ^② /B85 Wi-Fi (Positioning Only): 2.4 GHz	Based on market demand	CS

^① Cat M1 bands only ^② Cat NB2 Bands Only

^③LTE-FDD B31/B72/B73 for BG95-M4 supports Power Class 2 (26 dBm) and Power Class 3 (23 dBm).

* means under development

BG95 Series Highlights



Highlight	Description
Multi Modes	Cat M1/ Cat NB2/ EGPRS
Rich Product Variants	Support Power Class 3/ Power Class 5 (21 dBm)/ 450 MHz/ Wi-Fi Positioning/ Mini PCIe
Global Bands	<ul style="list-style-type: none"> LTE-FDD: B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B26^①/B27^①/B28/B31/B66/B71^②/B72/B73/B85 EGPRS: 850/900/1800/1900 MHz
Low Power Consumption	BG95-M3: Approx. 3.9 µA in PSM mode (USB and UART disconnected)
Mobility	Movable application with handover support (Cat M1 only)
PSM Wake-up	Support T3412 expiration and real-time hardware pin wake-up
Extended Power Supply Range ^③	<p>2.6–4.8 V, typ. 3.3 V (BG95-M1/-M2) 3.3–4.3 V, typ. 3.8 V (BG95-M3/-M5/-M6/-MF) 3.2–4.2 V, typ. 3.8 V (BG95-M4)</p>
GNSS	GPS, GLONASS, BeiDou, Galileo, QZSS
Voice	<ul style="list-style-type: none"> VoLTE for Cat M1 CS voice for GSM
QuecOpen®	Integrated ARM Cortex A7 processor supporting ThreadX
Security	Comprehensive set of hardware-based security features
Compatibility	Soldering footprint compatible with Quectel BG96/M95
Special Features	<ul style="list-style-type: none"> SIM service: eSIM/ SoftSIM/ nuSIM* Cloud service: AWS/ Azure QuecLocator® Jamming Detection Fast Shutdown

^① Cat M1 bands only

^② Cat NB2 Bands Only

^③ refer to the hardware design manual for more specific requirements on power supply voltage

LTE-FDD B31/B72/B73 for BG95-M4 supports Power Class 2 (26 dBm) and Power Class 3 (23 dBm).

* means under development

Cat M1/Cat NB2/EGPRS



Package: 102-pin LGA

Supply Voltage ^①: 2.6–4.8 V, typ. 3.3 V (BG95-M1/-M2)

3.3–4.3 V, typ. 3.8 V (BG95-M3/-M5/-M6/-MF)

3.2–4.2 V, typ. 3.8 V (BG95-M4)

Data Rate:

- LTE Cat M1: Max. 588 kbps (DL), Max. 1119 kbps (UL) (Half Duplex)
- LTE Cat NB2: Max. 127 kbps (DL), Max. 158.5 kbps (UL)
- EGPRS: Max. 296 kbps (DL), Max. 236.8 kbps(UL)
- GPRS: Max. 107 kbps (DL), Max. 85.6 kbps (UL)

Protocols: PPP/ TCP/ UDP/ SSL/ TLS/ FTP(S)/ HTTP(S)/ MQTT/ LwM2M/ CoAP/ IPv6

Functions: Data/ VoLTE/ GNSS/ DFOTA/ NITZ/ PING/ Jamming Detection/ Triangle Location

Interfaces: (U)SIM/ eSIM ^②/ UART/ USB/ I2C/ PCM/ ADC/ GPIO/ GRFC/ Antenna

Power Consumption (Typical): 3.9 µA @ PSM (USB and UART disconnected), BG95-M3

* means under development

① please refer to the hardware design manual for more specific requirements on power supply voltage.

② eSIM is reserved and not included by default.

BG95 Series Specifications 2



■ LTE Cat M1/Cat NB2/EGPRS Module

23.6 mm x 19.9 mm x 2.2 mm

Cat M1: 588 kbps DL/1119 kbps UL

Cat NB2: 127 kbps DL/158.5 kbps UL

Items		BG95-M1	BG95-M2	BG95-M3	BG95-M4	BG95-M5	BG95-M6	BG95-MF
Cat M1	LTE-FDD	B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B26/B27/B28/B66/B85	B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B26/B27/B28/B66/B85	B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B26/B27/B28/B66/B85	B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B27/B28/B31 ^① /B66/B72 ^① /B73 ^① /B85	B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B26/B27/B28/B66/B85	B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B26/B27/B28/B66/B85	B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B26/B27/B28/B66/B85
Cat NB2	LTE-FDD	-	B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B28/B66/B71/B85	B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B28/B66/B71/B85	B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B28/B31 ^① /B66/B72 ^① /B73 ^① /B85	B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B28/B66/B71/B85	B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B28/B66/B71/B85	B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B28/B66/B71/B85
EGPRS	-	-	850/900/1800/1900 MHz	-	-	850/900/1800/1900 MHz	-	-
Wi-Fi (For Positioning Only)	-	-	-	-	-	-	-	2.4 GHz
GNSS	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported
Certification	All major global carriers/ depend on customers' requirements	All major global carriers/ depend on customers' requirements	All major global carriers/ depend on customers' requirements	Major certifications in Europe and Latin America	All major global carriers/ depend on customers' requirements	All major global carriers/ depend on customers' requirements	Based on market demands	

* means under development

^① LTE-FDD B31/B72/B73 for BG95-M4 supports Power Class 2 (26 dBm) and Power Class 3 (23 dBm).

BG95-M3 Power Consumption



Description	Conditions	Typ.	Unit
Leakage	Power off mode	14.5 ^{NOTE}	µA
Power Saving Mode	PSM @ Real Network (USB and UART disconnected)	3.9	µA
Sleep State (Under Cat M1 network)	DRX = 1.28 s	1.89	mA
	e-I-DRX = 81.92 s @ PTW = 2.56 s, DRX = 1.28 s	0.63	mA
Sleep State (Under Cat NB1 network)	DRX = 1.28 s	1.49	mA
	e-I-DRX = 81.92 s @ PTW = 2.56 s, DRX = 1.28 s	0.67	mA
Active State (GNSS OFF) (Under Cat M1 network)	21 dBm @ Instrument	193	mA
	Data Transfer @ Real Network (TCP 200B)	48	mA
Active State (GNSS OFF) (Under Cat NB1 network)	21 dBm @ Instrument	154	mA
	Data Transfer @ Real Network (TCP 200B)	40	mA
Active State (GNSS ON, LTE OFF)	Searching (Cold start)	71	mA
	Tracking (Instrument, GPS only)	55	mA

NOTE: More internal power supplies are powered off and also the internal clock frequency is reduced in PSM, therefore the power consumption in PSM is much lower than that in power-off mode.

BG95 Series Main Interfaces



Interface	Description
(U)SIM	1 (Support 1.8 V only)
UART	3 (Main UART, Debug UART, GNSS UART)
USB 2.0	1
PCM	1 (For VoLTE only)
I2C	1 (For VoLTE only)
ADC	1
PWRKEY	1
GPIO	9
GRFC	2
Antenna Interface	2 (for Main Antenna and GNSS Antenna, respectively)

“” means under development*

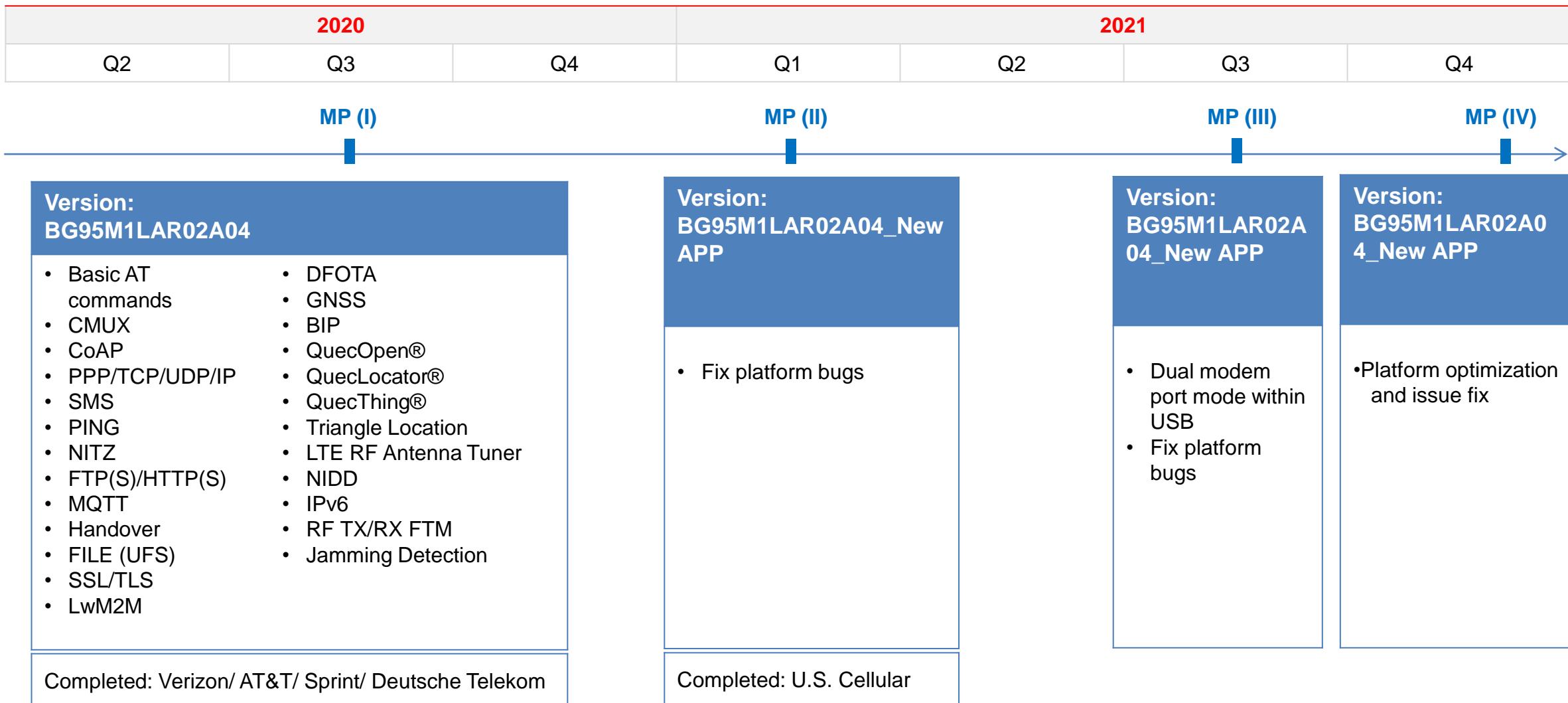
BG95 Series Main Functions



Function	Description
Protocols	PPP/ TCP/ UDP/ SSL/ TLS/ FTP(S)/ HTTP(S)/ MQTT/ LwM2M/ CoAP/ IPv6
USB Serial Driver	Windows 7/8/8.1/10, Linux 2.6–5.12, Android 4.x/5.x/6.x/7.x/8.x/9.x/10.x/11.x
GNSS/RIL Driver	Android 4.x/5.x/6.x/7.x/8.x/9.x/10.x/11.x
SMS	Point-to-point MO and MT; SMS Cell Broadcast; Text and PDU Mode
Voice	<ul style="list-style-type: none">• VoLTE for Cat M1• CS voice for GSM
DFOTA	Delta Firmware Upgrade Over-The-Air
LwM2M	Supported
GNSS	GPS, GLONASS, BeiDou, Galileo, QZSS
nuSIM*	Supported

“*” means under development

BG95-M1 Development Schedule (TX1.0, R02Axx)



BG95-M1 Timeline (TX1.0, R02Axx)



2020			2021			
Q2	Q3	Q4	Q1	Q2	Q3	Q4

Project Stage

BG95-M1



Carrier Certification

Deutsche Telekom/ Verizon/ AT&T/ Sprint/ U.S. Cellular



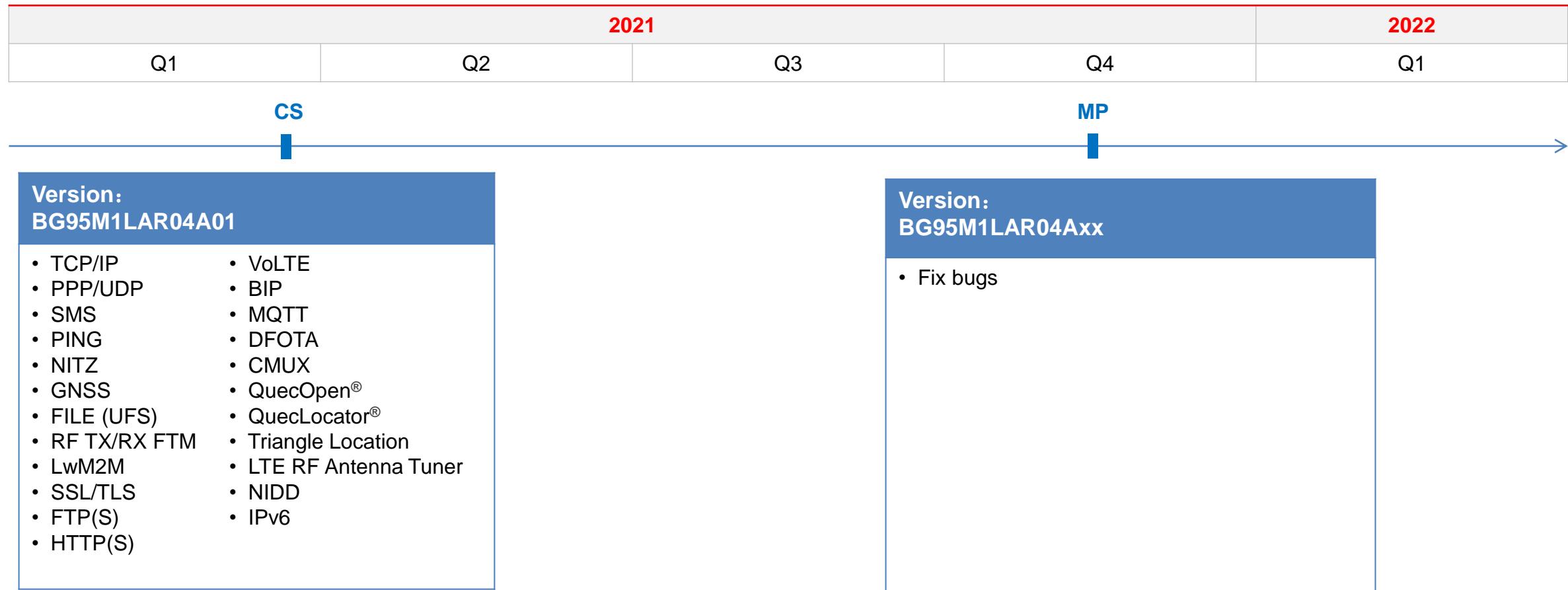
Regulatory Certification

GCF/ CE/ PTCRB/ FCC/ UKCA/ IC/ JATE/ TELEC/ RCM



back

BG95-M1 Development Schedule (TX2.0, R04Axx with VoLTE)



The timeline may be adjusted according to the actual development status.

BG95-M1 Timeline (TX2.0, R04Axx with VoLTE)



2021				2022	
Q1	Q2	Q3	Q4	Q1	

Project Schedule

CS

MP

CS: Commercial samples ready. Stable hardware design and quite stable software design. New software features can be added upon request.
MP: Hardware and software ready for mass production. For certification status, please refer to the certification schedule below.

Carrier Certification

Verizon/ AT&T

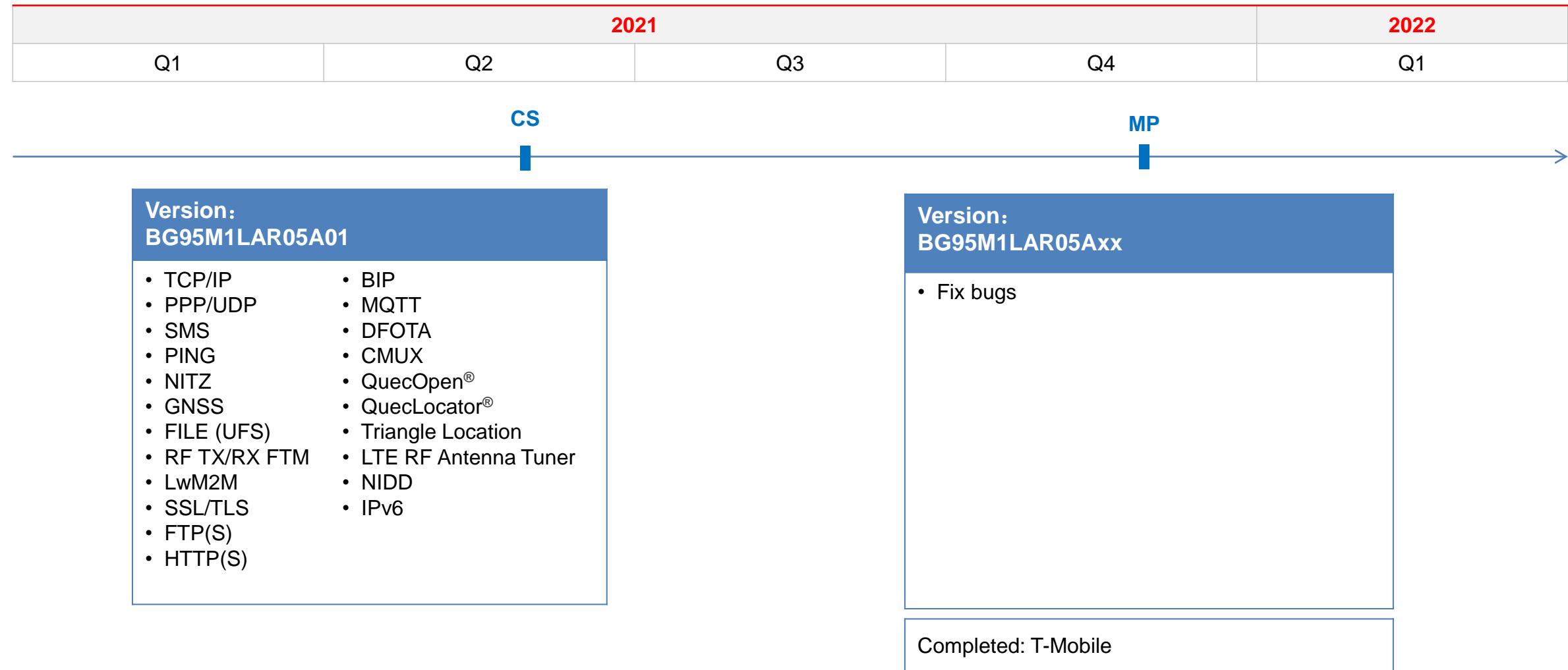
TBD

Regulatory Certification

GCF/ PTCRB

TBD

BG95-M1 Development Schedule (TX2.0, R05Axx Data Only)



The timeline may be adjusted according to the actual development status.

BG95-M1 Timeline (TX2.0, R05Axx Data Only)



2021				2022	
Q1	Q2	Q3	Q4	Q1	

Project Schedule



CS



MP

CS: Commercial samples ready. Stable hardware design and quite stable software design. New software features can be added upon request.
MP: Hardware and software ready for mass production. For certification status, please refer to the certification schedule below.

Carrier Certification

T-Mobile

Completed

Verizon/ AT&T

TBD

Regulatory Certification

GCF/ PTCRB

Completed

BG95-M2 Development Schedule (TX1.0, R02Axx)



2020		2021			
Q3	Q4	Q1	Q2	Q3	Q4
MP (I)		MP (II)		MP (III)	MP (IV)
Version: BG95M2LAR02A04 <ul style="list-style-type: none">• PPP/TCP/UDP/IP• Basic AT commands• SMS• PING• NITZ• FTP(S)/HTTP(S)• MQTT• Handover• FILE (UFS)• SSL/TLS• LwM2M• DFOTA• GNSS• BIP	<ul style="list-style-type: none">• CMUX• QuecOpen®• QuecLocator®• QuecThing®• Triangle Location• LTE RF Antenna Tuner• NIDD• IPv6• RF TX/RX FTM• Jamming Detection• CoAP	Version: BG95M2LAR02A04_New APP version <ul style="list-style-type: none">• Fix platform bugs		Version: BG95M2LAR02A04_New APP version <ul style="list-style-type: none">• Dual modem port mode within USB• Fix platform bugs	
Completed: Verizon/ AT&T/ Sprint/ Deutsche Telekom		Completed: Vodafone/ U.S. Cellular			

The timeline may be adjusted according to the actual development status.

BG95-M2 Timeline (TX1.0, R02Axx)



2020								2021										
May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.

Project Stage

BG95-M2 MP

Carrier Certification

Vodafone/ Deutsche Telekom/ Verizon/ AT&T/ T-Mobile^① / Sprint/ U.S. Cellular/ Telus

Completed

China Telecom/ China Mobile/ China Unicom/ Telefónica

TBD

Regulatory Certification

GCF/ CE/ PTCRB/ FCC/ UKCA/ IC/ Anatel/ IFETEL/ JATE/ TELEC/ RCM/ IMDA

Completed

ATEX



Start



Complete (Planned)

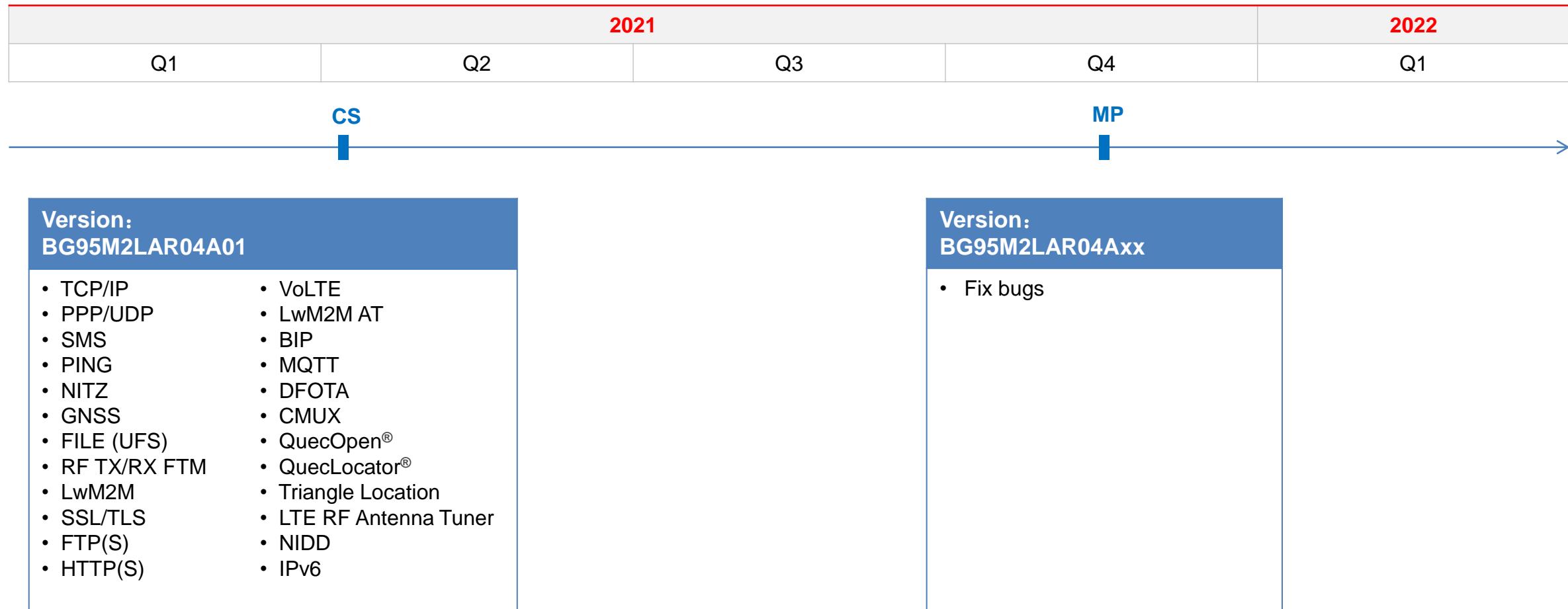
SRRC/ NAL/ CCC/ KC/ NCC/ NBTC

TBD

^① Conditional TA.

The timeline may be adjusted according to the maturity of Qualcomm baseline.
BG95-M2 will leverage some test results of BG95-M3.

BG95-M2 Development Schedule (TX2.0, R04Axx with VoLTE)



The timeline may be adjusted according to the actual development status.

BG95-M2 Timeline (TX2.0, R04Axx with VoLTE)



2021											
Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.

Project Schedule



CS: Commercial samples ready. Stable hardware design and quite stable software design. New software features can be added upon request.
MP: Hardware and software ready for mass production. For certification status, please refer to the certification schedule below.

Carrier Certification

AT&T

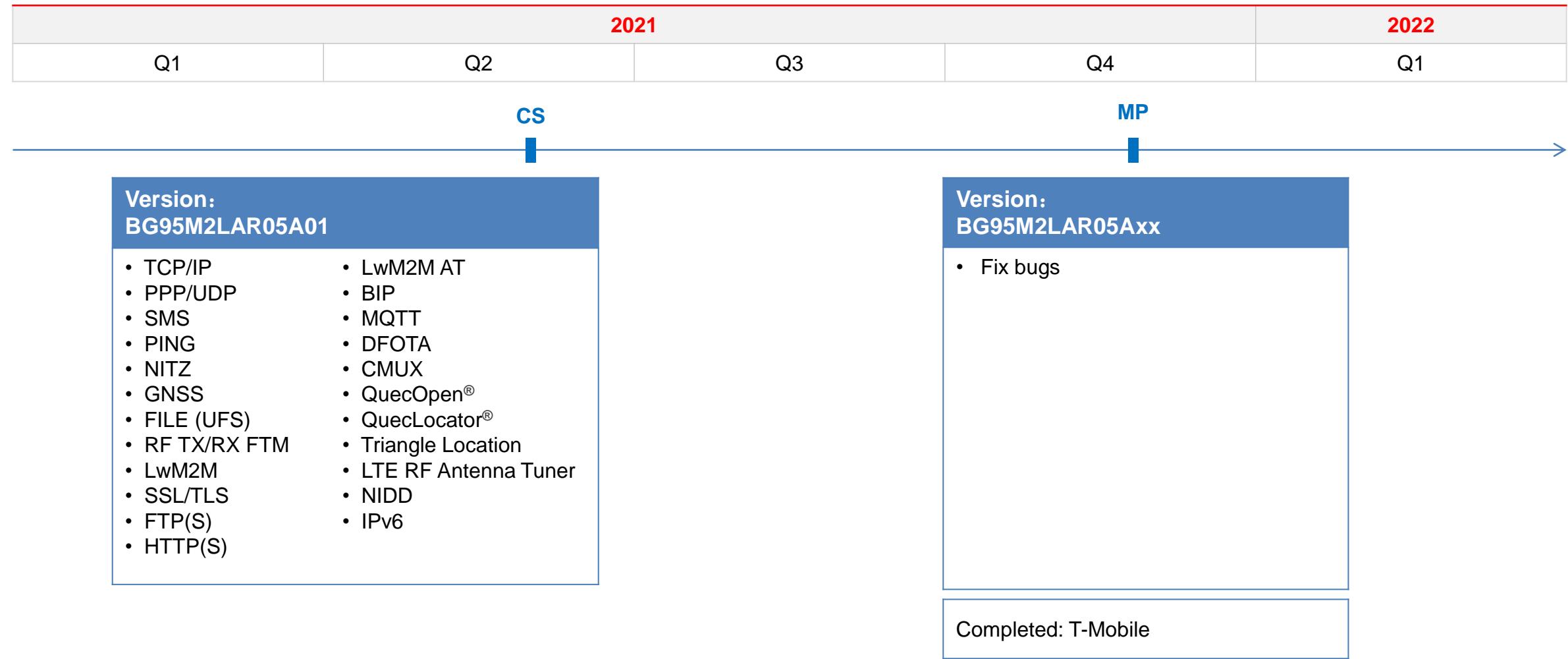
TBD

Regulatory Certification

GCF/PTCRB

TBD

BG95-M2 Development Schedule (TX2.0, R05Axx Data Only)



The timeline may be adjusted according to the actual development status.

BG95-M2 Timeline (TX2.0, R05Axx Data Only)



2021				2022
Q1	Q2	Q3	Q4	Q1

Project Schedule



CS



MP

CS: Commercial samples ready. Stable hardware design and quite stable software design. New software features can be added upon request.
MP: Hardware and software ready for mass production. For certification status, please refer to the certification schedule below.

Carrier Certification

T-Mobile

Completed

Version/ AT&T

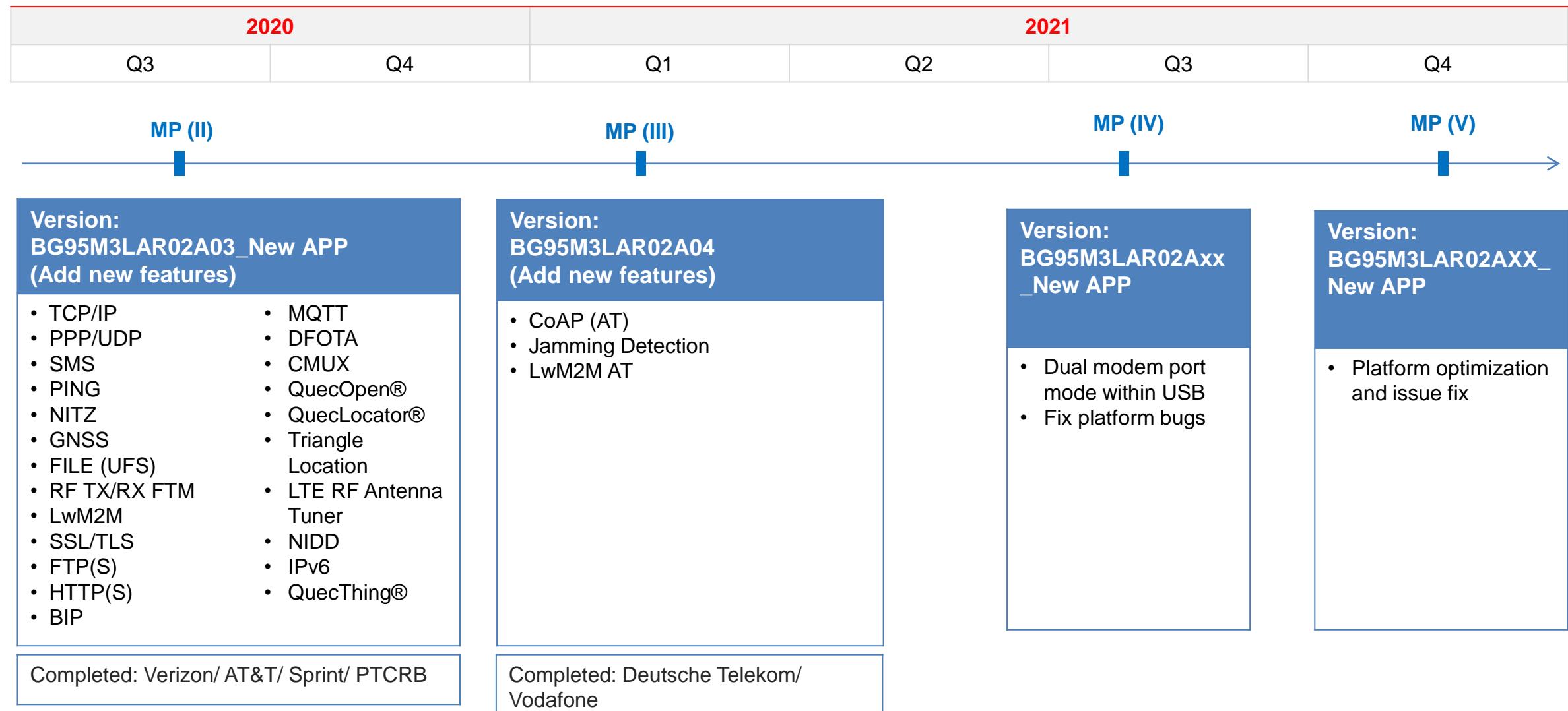
TBD

Regulatory Certification

GCF/ PTCRB

Completed

BG95-M3 Development Schedule (TX1.0, R02Axx)



The timeline may be adjusted according to the actual development status.

BG95-M3 Timeline (TX1.0, R02Axx)



2021											
Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.

Project Stage

BG95-M3

MP

Carrier Certification

Vodafone/ Deutsche Telekom/ Orange/ Verizon/ AT&T (FirstNet)/ T-Mobile/ Sprint/ U.S. Cellular/ Rogers/ Telus/ Telefónica/ Claro Completed

China Telecom/ China Mobile/ China Unicom

TBD

Regulatory/Other Certification

GCF/ CE/ FCC/ PTCRB/ IC/ Anatel/ IFETEL/ JATE/ TELEC/ RCM/ PEN/ CCC/ NCC

Completed

UKCA



Start

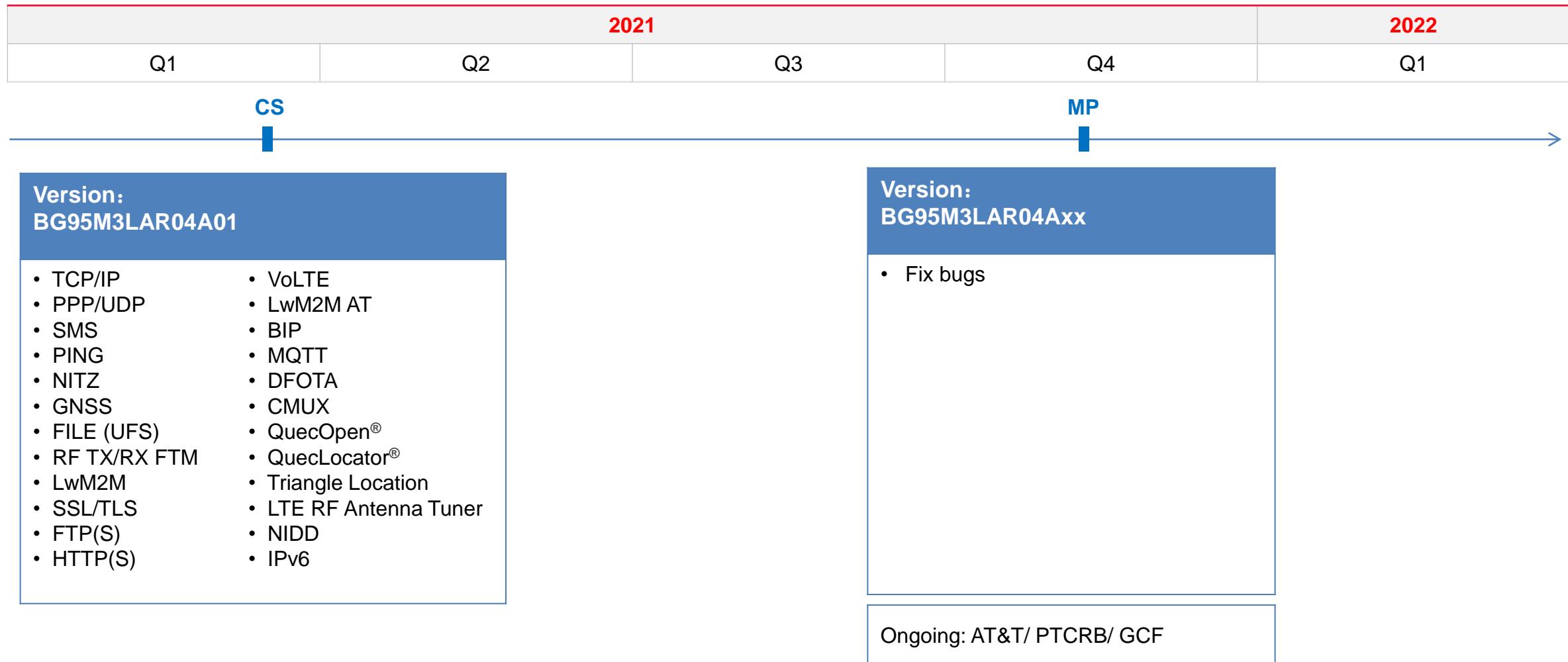
Complete (Planned)

SRRC/ NAL/ KC/ NBTC/ IMDA

TBD

The timeline may be adjusted according to the maturity of Qualcomm baseline.

BG95-M3 Development Schedule (TX2.0, R04Axx with VoLTE)



BG95-M3 Timeline (TX2.0, R04Axx with VoLTE)



2021				2022	
Q1	Q2	Q3	Q4	Q1	

Project Schedule

CS

MP

CS: Commercial samples ready. Stable hardware design and quite stable software design. New software features can be added upon request.
MP: Hardware and software ready for mass production. For certification status, please refer to the certification schedule below.

Carrier Certification

Verizon

Completed

AT&T

Start

Complete (Planned)

Regulatory Certification

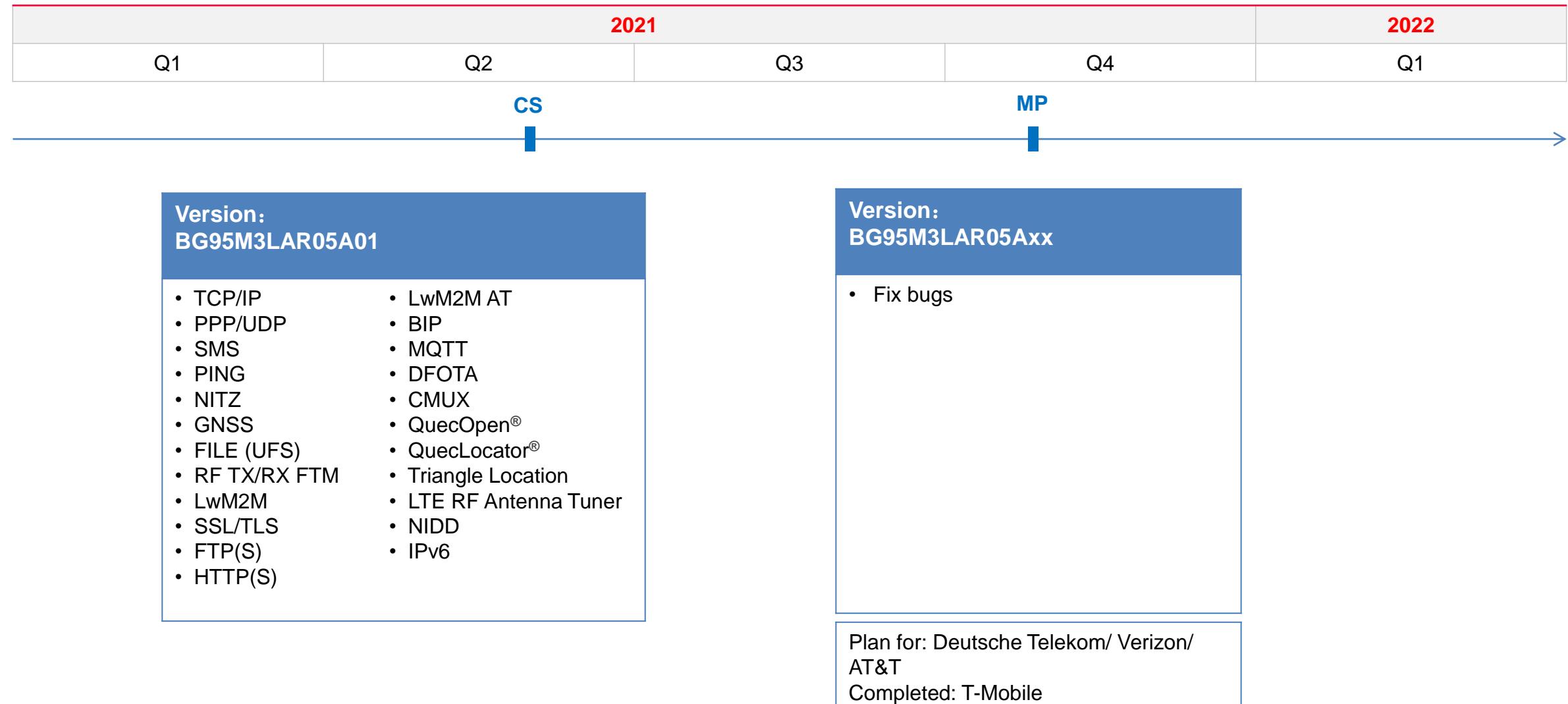
PTCRB



GCF



BG95-M3 Development Schedule (TX2.0, R05Axx Data Only)



The timeline may be adjusted according to the actual development status.

BG95-M3 Timeline (TX2.0, R05Axx Data Only)



2021					2022
Q1	Q2	Q3	Q4	Q1	

Project Schedule

CS

MP

CS: Commercial samples ready. Stable hardware design and quite stable software design. New software features can be added upon request.
MP: Hardware and software ready for mass production. For certification status, please refer to the certification schedule below.

Carrier Certification

T-Mobile

Completed

Deutsche Telekom

Start (Planned)

Verizon

Complete (Planned)

AT&T

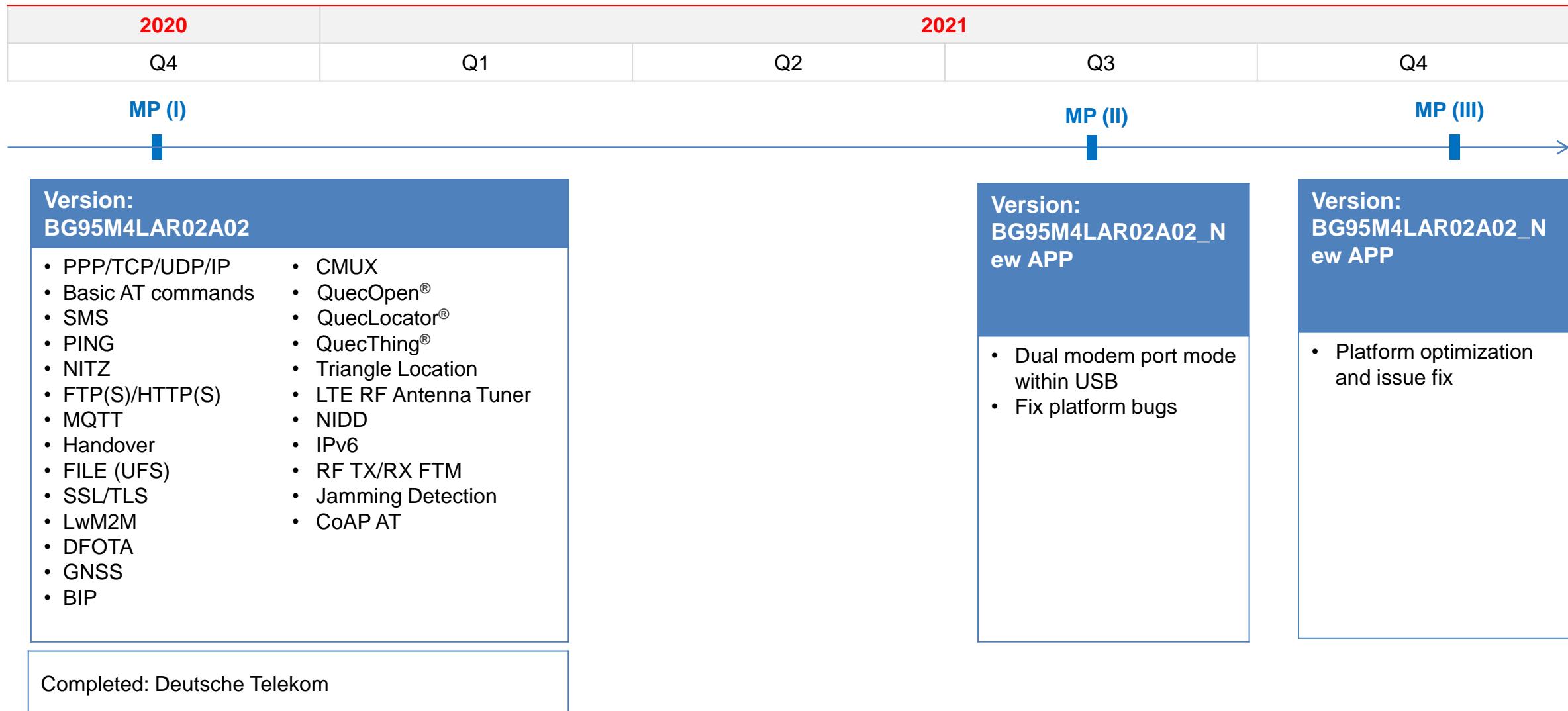


Regulatory Certification

GCF/ PTCRB

Completed

BG95-M4 Development Schedule (TX1.0, R02Axx)



Project Stage

BG95-M4



Carrier Certification

Deutsche Telekom



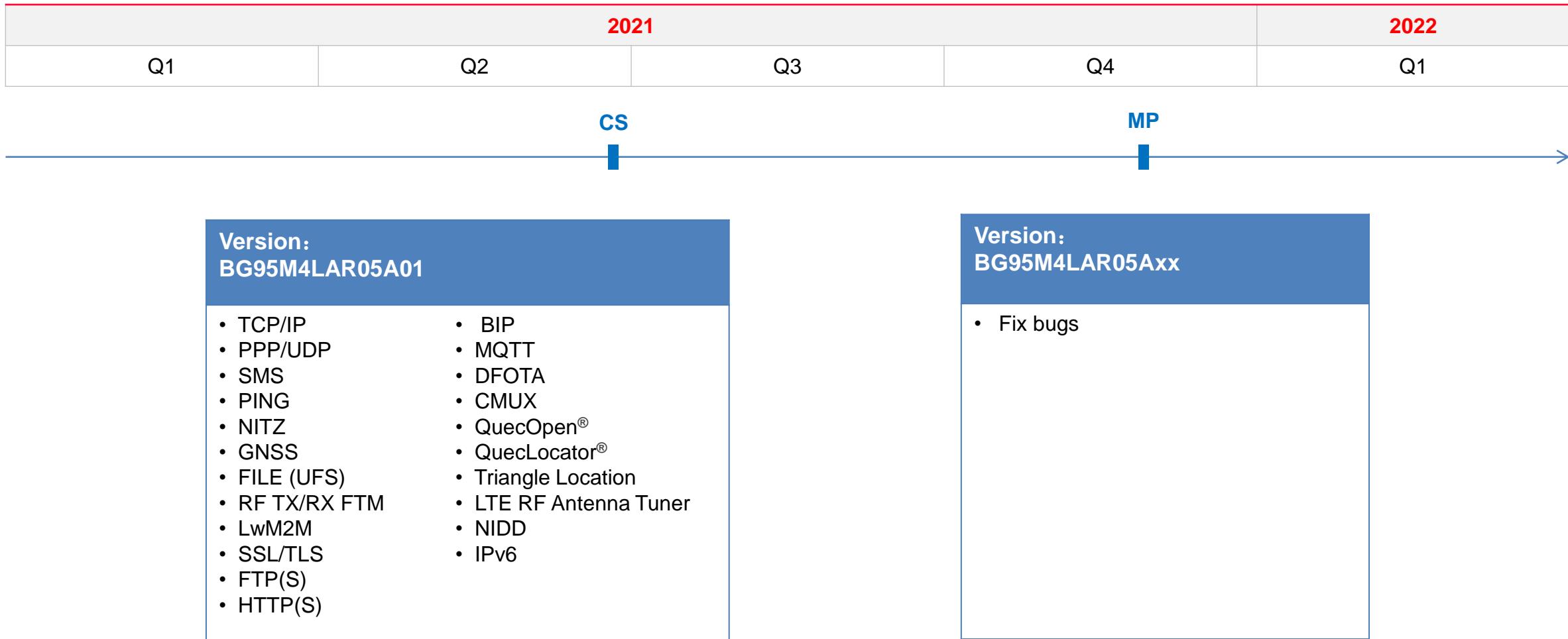
Regulatory Certification

GCF/ CE/ Anatel/ RCM



*The timeline may be adjusted according to the maturity of Qualcomm baseline.
BG95-M4 will leverage some test results of BG95-M3.*

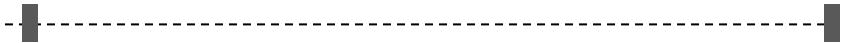
BG95-M4 Development Schedule (TX2.0, R05Axx Data Only, B31/B72/B73 PC2)



The timeline may be adjusted according to the actual development status.

2021					2022
Q1	Q2	Q3	Q4	Q1	

Project Schedule



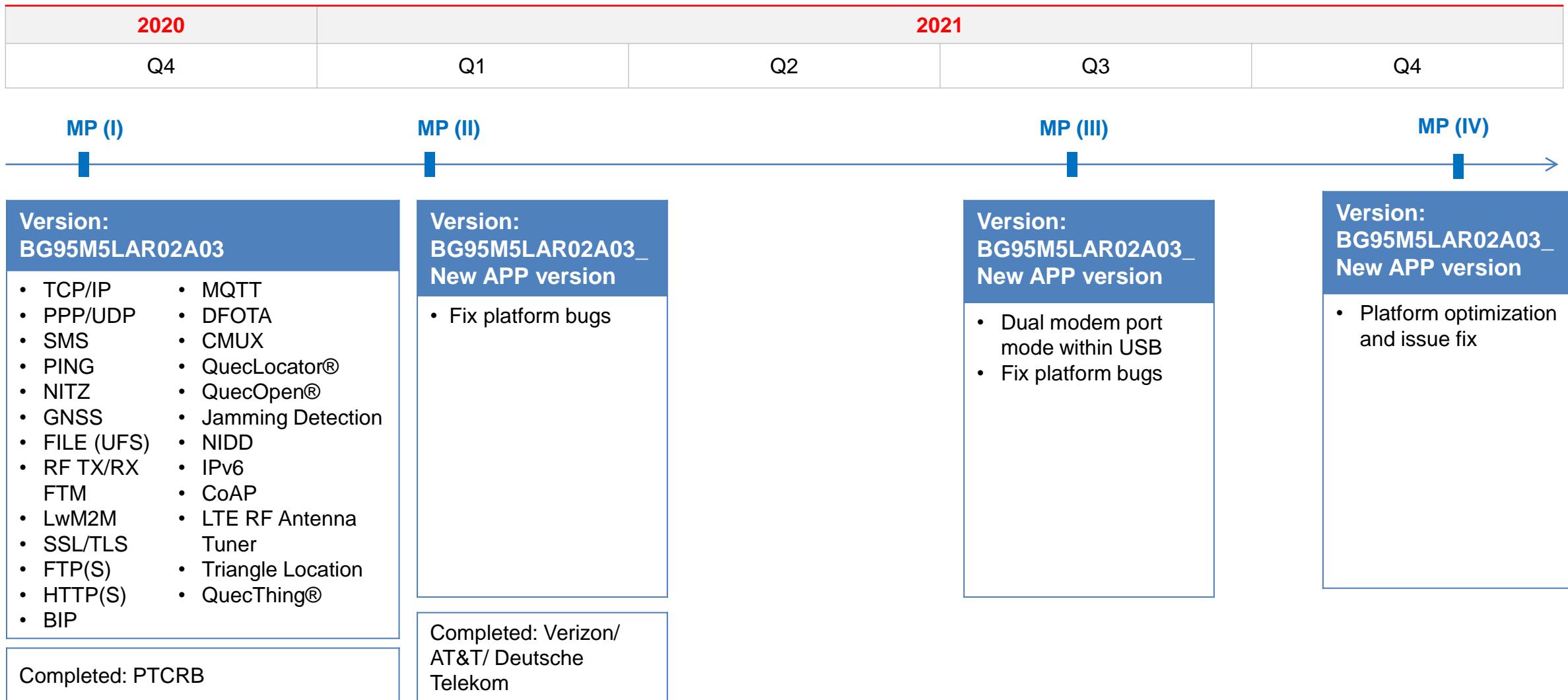
CS: Commercial samples ready. Stable hardware design and quite stable software design. New software features can be added upon request.
MP: Hardware and software ready for mass production. For certification status, please refer to the certification schedule below.

Regulatory Certification

CE



BG95-M5 Development Schedule (TX1.0, R02Axx)



The timeline may be adjusted according to the actual development status.

BG95-M5 Timeline (TX1.0, R02Axx)



2020		2021			
Q4	Q1	Q2	Q3	Q4	

Project Stage

BG95-M5



Carrier Certification

Vodafone/ Deutsche Telekom/ Verizon/ AT&T/ T-Mobile/ NTT DOCOMO/ KDDI/ Telstra

Completed

China Telecom/ China Mobile/ China Unicom/ KT/ SKT/ LGU+/ SoftBank

TBD

Regulatory Certification

GCF/ CE/ PTCRB/ FCC/ UKCA/ IC/ Anatel/ KC/ JATE/ TELEC/ RCM

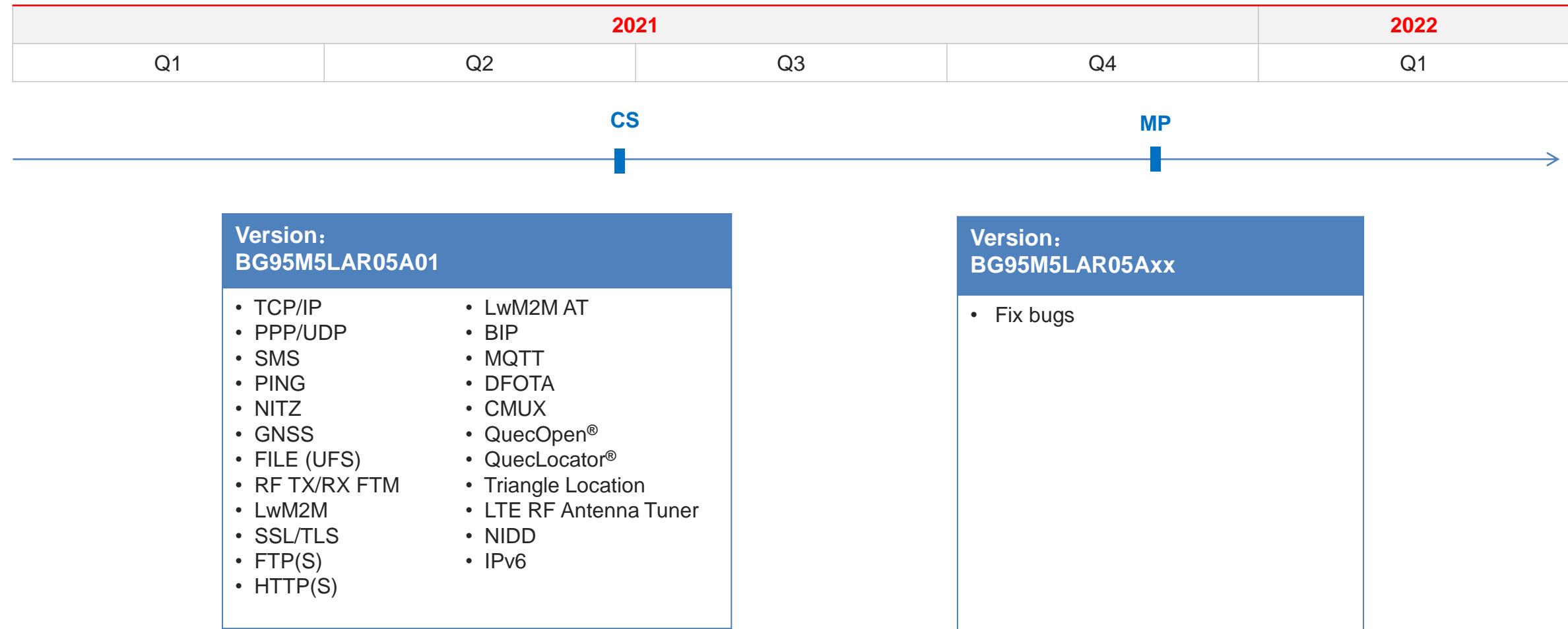
Completed

SRRC/ NAL/ CCC/ NCC/ NBTC/ IMDA

TBD

The timeline may be adjusted according to the maturity of Qualcomm baseline.
BG95-M5 will leverage some test results of BG95-M3. Version: 4.0 | Status: Released

BG95-M5 Development Schedule (TX2.0, R05Axx Data Only)



The timeline may be adjusted according to the actual development status.

BG95-M5 Timeline (TX2.0, R05Axx Data Only)



2021							2022					
Jun	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	

Project Schedule



CS



MP

CS: Commercial samples ready. Stable hardware design and quite stable software design. New software features can be added upon request.

MP: Hardware and software ready for mass production. For certification status, please refer to the certification schedule below.

Carrier Certification

Verizon/ AT&T

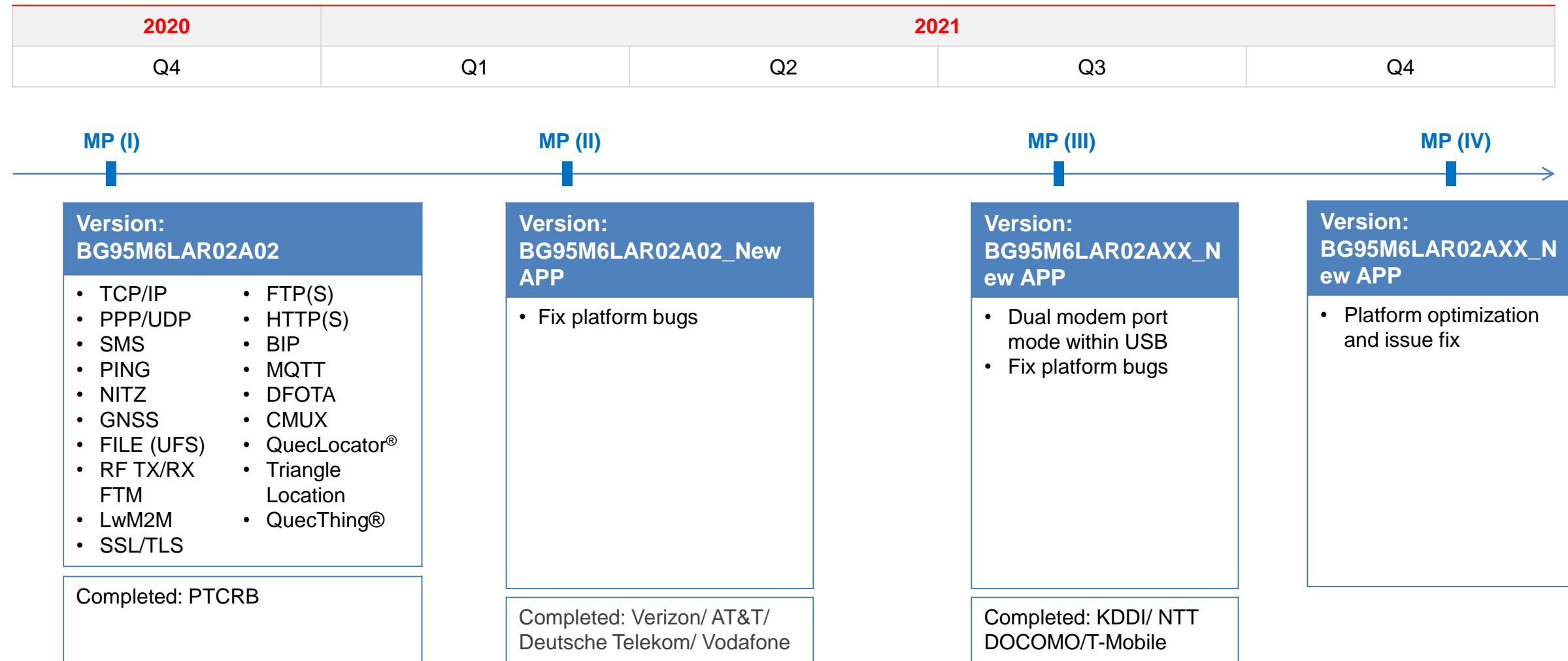
TBD

Regulatory Certification

GCF/ PTCRB

TBD

BG95-M6 Development Schedule (TX1.0, R02Axx)



The timeline may be adjusted according to the actual development status.

2021											
Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.

Project Schedule

BG95-M6

MP

Carrier Certification

Vodafone/ Deutsche Telekom/ Verizon/ AT&T / T-Mobile/ NTT DOCOMO/ KT/ SKT/ LGU+ / KDDI/ Telstra Completed

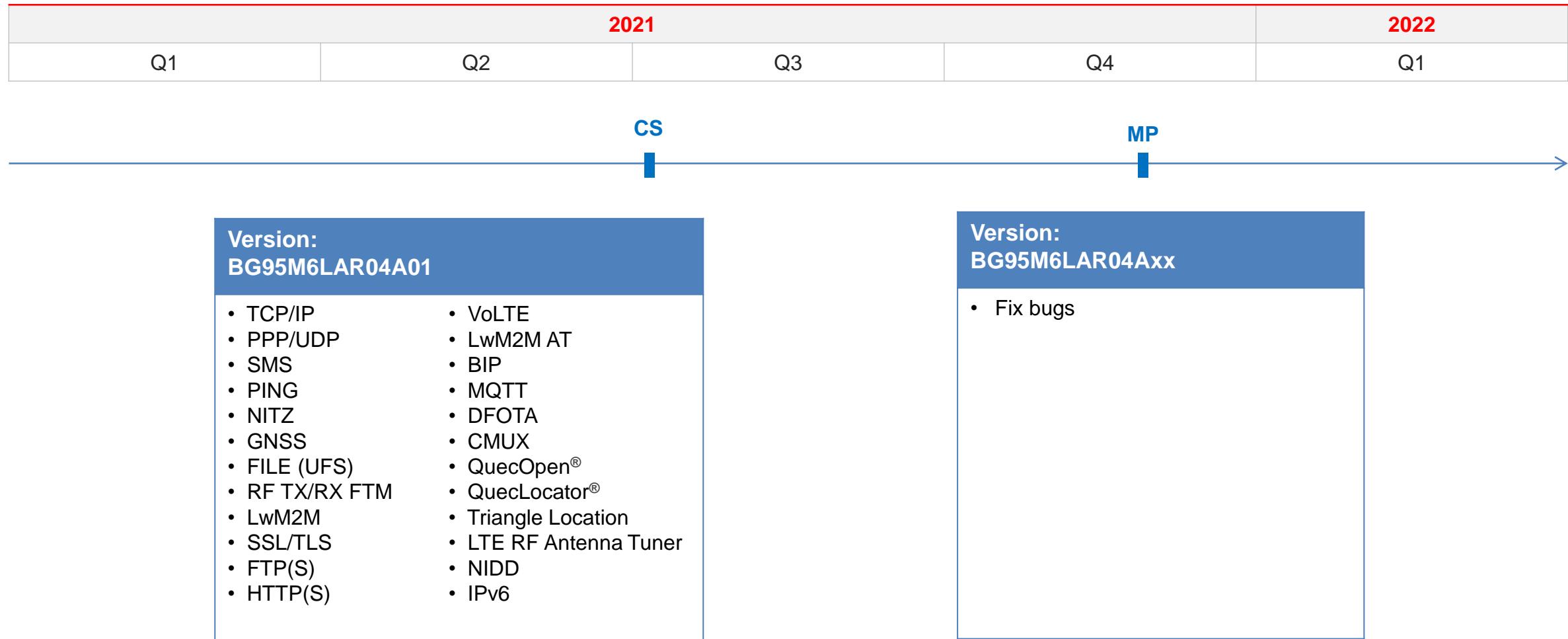
China Telecom/ China Mobile/ China Unicom/ SoftBank TBD

Regulatory Certification

GCF/ CE/ PTCRB/ FCC/ UKCA/ IC/ KC/ JATE/ TELEC/ RCM/ Anatel Completed

SRRC/ NAL/ CCC/ NCC/ NBTC/ IMDA TBD

BG95-M6 Development Schedule (TX2.0, R05Axx Data Only)



The timeline may be adjusted according to the actual development status.

BG95-M6 Timeline (TX2.0, R05Axx Data Only)



2021				2022	
Q1	Q2	Q3	Q4	Q1	

Project Schedule



CS



MP

CS: Commercial samples ready. Stable hardware design and quite stable software design. New software features can be added upon request.

MP: Hardware and software ready for mass production. For certification status, please refer to the certification schedule below.

Carrier Certification

Verizon/ AT&T

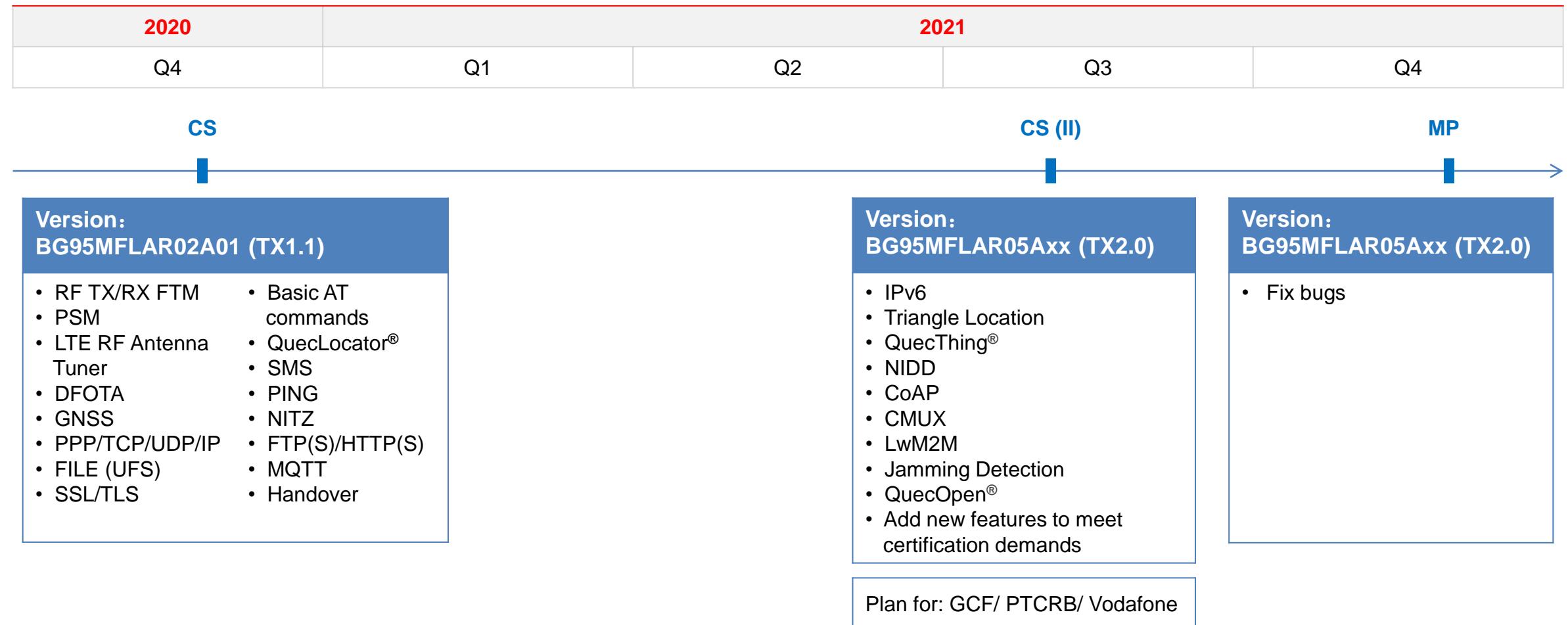
TBD

Regulatory Certification

GCF/ PTCRB

TBD

BG95-MF Development Schedule (TX2.0 Data Only)



The timeline may be adjusted according to the actual development status.

BG95-MF Timeline (TX2.0 Data Only)



2020		2021												2022											
Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.			

Project Schedule



CS: Commercial samples ready. Stable hardware design and quite stable software design. New software features can be added upon request.

MP: Hardware and software ready for mass production. For certification status, please refer to the certification schedule below.

Carrier Certification

Vodafone



Verizon/ AT&T

TBD

Regulatory Certification

CE/ FCC/ IC/ RCM

Completed

GCF/PTCRB

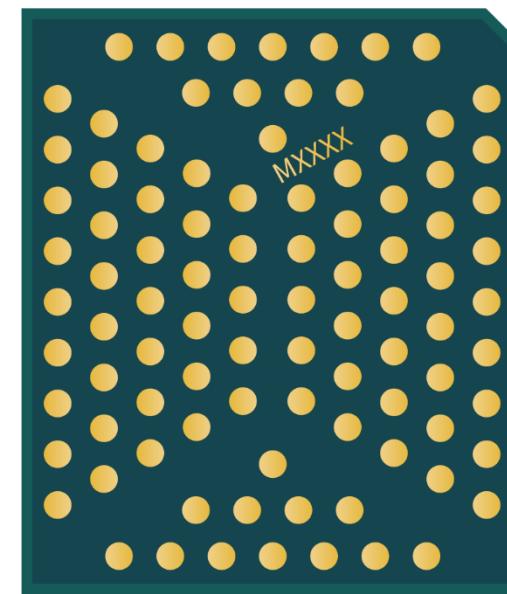


The timeline may be adjusted according to the maturity of Qualcomm baseline. BG95-MF will leverage some test results of BG95-M3.

BG77 Mechanical Dimensions



Ultra Compact LTE Cat M1/ Cat NB2 Module (MDM9205)



1.7 mm

12.9 mm

14.9 mm

Length: 14.9 mm (± 0.15 mm)
Width: 12.9 mm (± 0.15 mm)
Height: 1.7 mm (± 0.2 mm)
Weight: Approx. 0.73 g

BG77 Highlights



Highlight	Description
Super Compact Size	14.9 mm × 12.9 mm × 1.7 mm
Dual-Mode	LTE Cat M1/ Cat NB2
Power Class	Support Power Class 5 (21 dBm)
Global Bands	Cat M1: LTE FDD: B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B26/B27/B28/B66/B85* Cat NB2: LTE FDD: B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B28/B66/B71/B85*
Low Power Consumption	Approx. 3.2 µA in PSM mode (USB and UART disconnected)
Mobility	Movable application with handover support (Cat M1 only)
PSM Wake-up	Support T3412 expiration and real-time hardware pin wake-up
Extended Power Supply Range ^①	2.6–4.8 V, typ. 3.3 V
GNSS	GPS, GLONASS, BeiDou, Galileo, QZSS
Voice	VoLTE (For Cat M1 Only)
QuecOpen®	Integrated ARM Cortex A7 processor supporting ThreadX
Security	Comprehensive set of hardware-based security features
Special Features	<ul style="list-style-type: none">• SoftSIM• QuecLocator®• Jamming Detection• Fast Shutdown

* means under development

^①please refer to the hardware design manual for more specific requirements on power supply voltage

Cat M1/Cat NB2



14.9 mm × 12.9 mm × 1.7 mm

Super Compact Size: 14.9 mm × 12.9 mm × 1.7 mm

Package: 94-pin LGA

Supply Voltage ^①: 2.6–4.8 V, 3.3 V Typ.

Data Rate:

- LTE Cat M1: Max. 588 kbps (DL), Max. 1119 kbps (UL) (Half Duplex)
- LTE Cat NB2: Max. 127 kbps (DL), Max. 158.5 kbps (UL)

Protocols: PPP/ TCP/ UDP/ SSL/ TLS/ FTP(S)/ HTTP(S)/ MQTT/ LwM2M/ CoAP/ IPv6

Functions: Data/ VoLTE/ GNSS/ DFOTA/ NITZ/ PING/ Jamming Detection/ Triangle Location

Interfaces: (U)SIM/ UART/ USB/ I2C/ PCM/ ADC/ GPIO/ GRFC/ Antenna

Power Consumption (Typical): 3.2 µA @ PSM (USB and UART disconnected)

* means under development

① please refer to the hardware design manual for more specific requirements on power supply voltage.

BG77 Specifications 2



■ LTE Cat M1/Cat NB2 Module

14.9 mm × 12.9 mm × 1.7 mm
Cat M1: 588 kbps DL/1119 kbps UL
Cat NB2: 127 kbps DL/158.5 kbps UL

Items	BG77
Cat M1	LTE-FDD: B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B26/B27/B28/B66/B85*
Cat NB2	LTE-FDD: B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B28/B66/B71/B85*
GNSS	Supported
Certification	All major global carriers

“*” means under development

BG77 Power Consumption



Description	Conditions	Typ.	Unit
Leakage	Power off mode	13 ^{NOTE}	µA
Power Saving Mode	PSM @ Real Network (USB and UART disconnected)	3.2	µA
Sleep State (Under Cat M1 network)	DRX = 1.28 s	1.61	mA
	e-I-DRX = 81.92 s @ PTW = 2.56 s, DRX = 1.28 s	0.61	mA
Sleep State (Under Cat NB1 network)	DRX = 1.28 s	1.54	mA
	e-I-DRX = 81.92 s @ PTW = 2.56 s, DRX = 1.28 s	0.66	mA
Active State (GNSS OFF) (Under Cat M1 network)	21 dBm @ Instrument	228	mA
	Data Transfer @ Real Network (TCP 200B)	55	mA
Active State (GNSS OFF) (Under Cat NB1 network)	21 dBm @ Instrument	165	mA
	Data Transfer @ Real Network (TCP 200B)	45	mA
Active State (GNSS ON, LTE OFF)	Searching (Cold start)	77	mA
	Tracking (Instrument, GPS only)	62	mA

NOTE: More internal power supplies are powered off and also the internal clock frequency is reduced in PSM, therefore the power consumption in PSM is much lower than that in power-off mode.

BG77 Main Interfaces



Interface	Description
(U)SIM	1 (Support 1.8 V only)
UART	3 (Main UART, Debug UART, GNSS UART)
USB	1
PCM	1 (For VoLTE only)
I2C	1 (For VoLTE only)
RESET_N	1
ADC	2
GPIO	7
GRFC	2
Antenna Interface	2 (for Main Antenna and GNSS Antenna, respectively)

“*” means under development

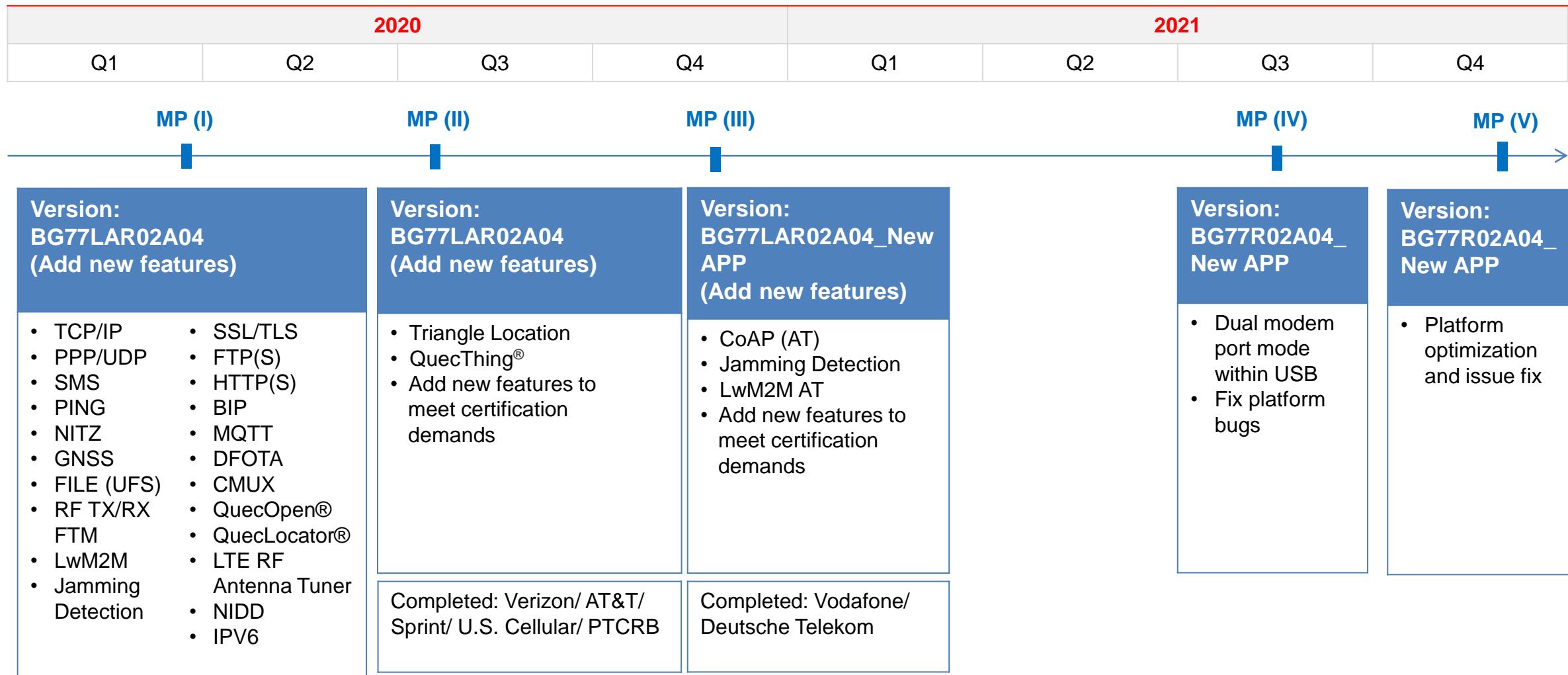
BG77 Main Functions



Function	Description
Protocols	PPP/ TCP/ UDP/ SSL/ TLS/ FTP(S)/ HTTP(S)/ MQTT/ LwM2M/ CoAP/ IPv6
USB Serial Driver	Windows 7/8/8.1/10, Linux 2.6–5.4, Android 4.x/5.x/6.x/7.x/8.x/9.x/10.x/11.x
GNSS/RIL Driver	Android 4.x/5.x/6.x/7.x/8.x/9.x/10.x/11.x
SMS	Point-to-point MO and MT; SMS Cell Broadcast; Text and PDU Mode
Voice	VoLTE (For Cat M1 Only)
DFOTA	Delta Firmware Upgrade Over-The-Air
LwM2M	Supported
GNSS	GPS, GLONASS, BeiDou, Galileo, QZSS

“*” means under development

BG77 Development Schedule (TX1.0, R02Axx)



The timeline may be adjusted according to the actual development status.

BG77 Timeline (TX1.0, R02Axx)



2021											
Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.

Project Stage

BG77 ↗ MP

Carrier Certification

Vodafone/ Deutsche Telekom/ Verizon/ AT&T/ T-Mobile^①/ Sprint/ U.S. Cellular Completed

China Mobile/ China Telecom/ China Unicom TBD

Regulatory Certification

GCF/ CE/ PTCRB/ FCC/ UKCA/ IC/ NCC/ JATE/ TELEC/ RCM Completed

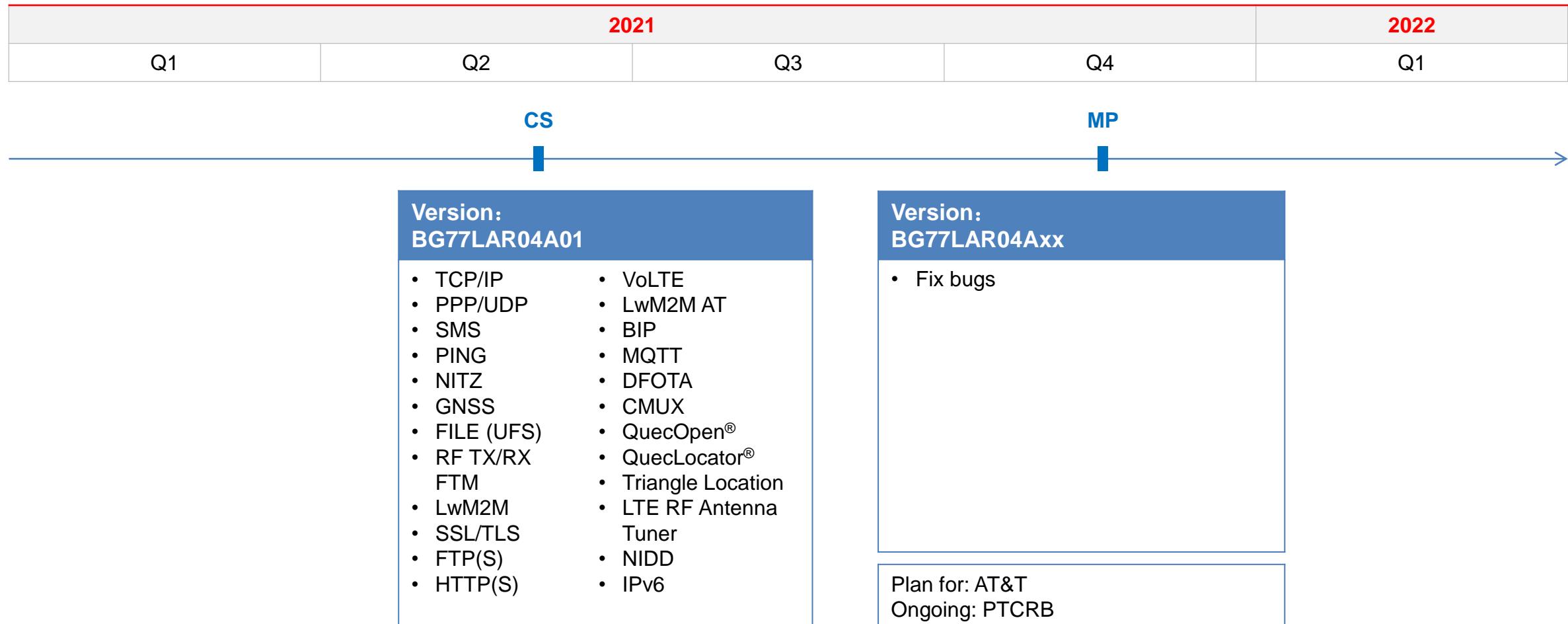
SRRC/ NAL/ CCC/ KC/ NBTC TBD

^① Conditional TA.

The timeline may be adjusted according to the maturity of Qualcomm baseline.
BG77 will leverage some test results of BG95-M3.

back

BG77 Development Schedule (TX2.0, R04Axx with VoLTE)



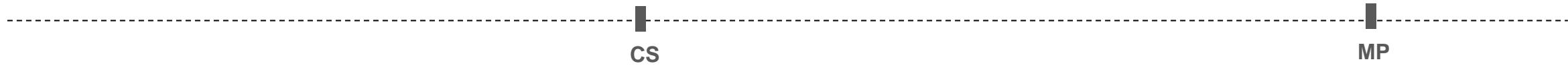
The timeline may be adjusted according to the actual development status.

BG77 Development Schedule (TX2.0, R04Axx with VoLTE)



2021											
Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.

Project Schedule



CS: Commercial samples ready. Stable hardware design and quite stable software design. New software features can be added upon request.
MP: Hardware and software ready for mass production. For certification status, please refer to the certification schedule below.

Carrier Certification

AT&T



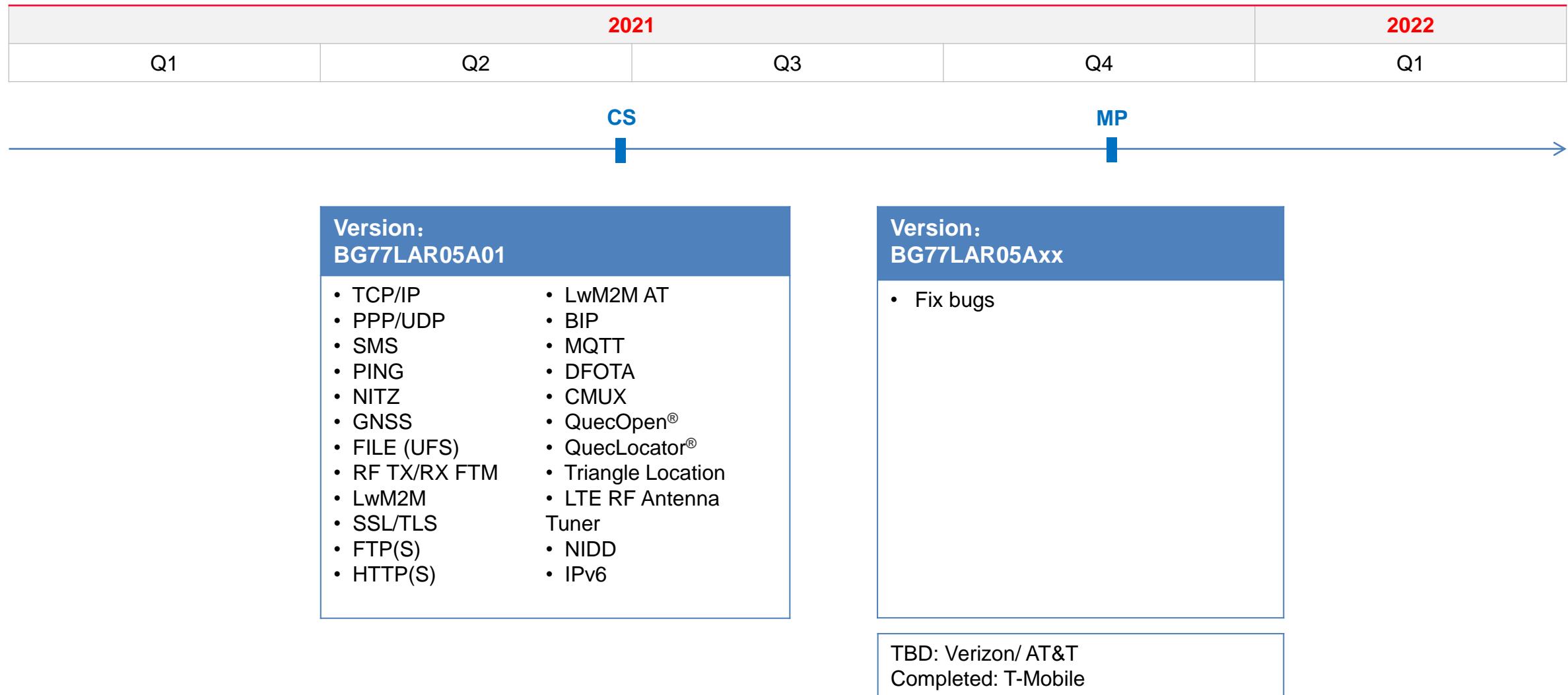
Start (planned) Complete (planned)

Regulatory Certification

PTCRB



BG77 Development Schedule (TX2.0, R05Axx Data Only)



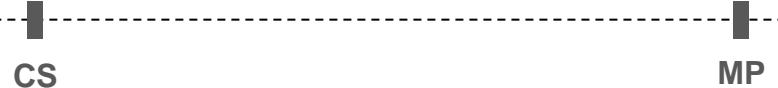
The timeline may be adjusted according to the actual development status.

BG77 Timeline (TX2.0, R05Axx Data Only)



2021					2022
Q1	Q2	Q3	Q4	Q1	

Project Schedule



CS: Commercial samples ready. Stable hardware design and quite stable software design. New software features can be added upon request.

MP: Hardware and software ready for mass production. For certification status, please refer to the certification schedule below.

Carrier Certification

T-Mobile **Completed**

Verizon/ AT&T **TBD**

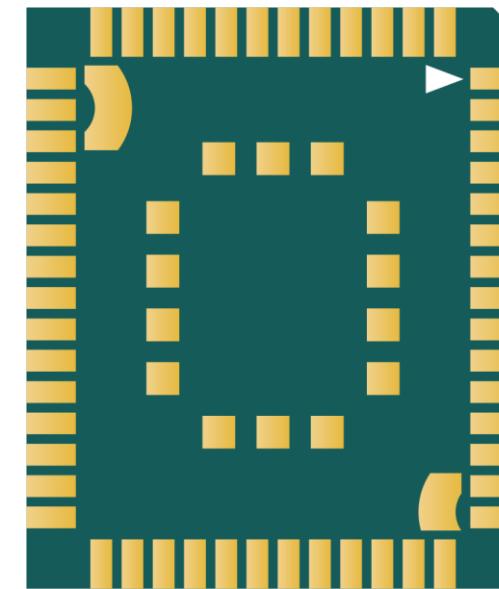
Regulatory Certification

PTCRB **Completed**

BG600L-M3 Mechanical Dimensions



Multi-Band LTE Cat M1/ Cat NB2 / EGPRS Module (MDM9205)



Length: 18.7 mm (\pm 0.15 mm)
Width: 16.0 mm (\pm 0.15 mm)
Height: 2.1 mm (\pm 0.2 mm)

BG600L-M3 Highlights



Highlight	Description
Multi Modes	Cat M1/ Cat NB2/ EGPRS
Global Bands	<ul style="list-style-type: none">LTE-FDD: B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B26^①/B27^①/B28/B66/B71^②/B85EGPRS: 850/900/1800/1900 MHz
Power Class	Support Power Class 5 (21 dBm)
Low Power Consumption	4.0 µA @ PSM (USB and UART disconnected)
Mobility	Movable application with handover support (Cat M1 only)
PSM Wake-up	Support T3412 expiration and real-time hardware pin wake-up
Extended Power Supply Range	3.3–4.3 V, typ. 3.8 V
GNSS	GPS, GLONASS, BeiDou, Galileo, QZSS
Voice	VoLTE (For Cat M1 Only), CS voice for GSM
QuecOpen®	Integrated ARM Cortex A7 processor supporting ThreadX
Security	Comprehensive set of hardware-based security features
Compatibility	Compatible with Quectel MC60
Special Features	<ul style="list-style-type: none">QuecLocator®Jamming DetectionFast Shutdown

Cat M1/Cat NB2/EGPRS



18.7 mm × 16.0 mm × 2.1 mm

Small Size: 18.7 mm × 16.0 mm × 2.1 mm

Package: 68-pin LGA

Supply Voltage: 3.3–4.3 V, 3.8 V Typ.

Data Rate:

- LTE Cat M1: Max. 588 kbps (DL), Max. 1119 kbps (UL) (Half Duplex)
- LTE Cat NB2: Max. 127 kbps (DL), Max. 158.5 kbps (UL)

Protocols: PPP/ TCP/ UDP/ SSL/ TLS/ FTP(S)/ HTTP(S)/ MQTT/ LwM2M/ CoAP/ IPv6/

Functions: Data/ VoLTE/ GNSS/ DFOTA/ NITZ/ PING/ Jamming Detection/ Triangle Location

Interfaces: (U)SIM/ UART/ USB/ I2C/ PCM/ ADC/ GPIO/ GRFC/ Antenna

Power Consumption (Typical): 4.0 µA @ PSM (USB and UART disconnected)

* means under development

BG600L-M3 Specifications 2



■ LTE Cat M1/Cat NB2/EGPRS Module

18.7 mm × 16.0 mm × 2.1 mm
Cat M1: 588 kbps DL/1119 kbps UL
Cat NB2: 127 kbps DL/158.5 kbps UL

Items	BG600L-M3
Cat M1	LTE-FDD: B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B26/B27/B28/B66/B85
Cat NB2	LTE-FDD: B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B28/B66/B71/B85
EGPRS	850/900/1800/1900 MHz
GNSS	Support
Certification	All major global carriers/ depend on customers' requirements

* means under development

BG600L-M3 Power Consumption



Description	Conditions	Typ.	Unit
Power Saving Mode	PSM @ Real Network (USB and UART disconnected)	4.0	µA
Sleep State (Under Cat M1 network)	DRX = 1.28 s	1.66	mA
	e-I-DRX = 81.92 s @ PTW = 2.56 s, DRX = 1.28 s	0.66	mA
Sleep State (Under Cat NB1 network)	DRX = 1.28 s	1.47	mA
	e-I-DRX = 81.92 s @ PTW = 2.56 s, DRX = 1.28 s	0.69	mA
Active State (GNSS OFF) (under Cat M1 network)	21 dBm @ Instrument	186	mA
	Data Transfer @ Real Network	59	mA
Active State (GNSS OFF) (under Cat NB1 network)	21 dBm @ Instrument	148	mA
	Data Transfer @ Real Network	47	mA
Active State (GNSS ON, LTE OFF)	Searching (Cold start)	66.31	mA
	Tracking (Instrument, GPS only)	20.8	mA

BG600L-M3 Main Interfaces



Interface	Description
USB	1
(U)SIM	1 (Support 1.8 V only)
UART	3 (Main UART, Debug UART, GNSS UART)
ADC	1
PWRKEY	1
NET_STATUS	1
Antenna Interface	2
GRFC	2
I2C	1 (For VoLTE only)
PCM	1 (For VoLTE only)
GPIO	6

* means under development

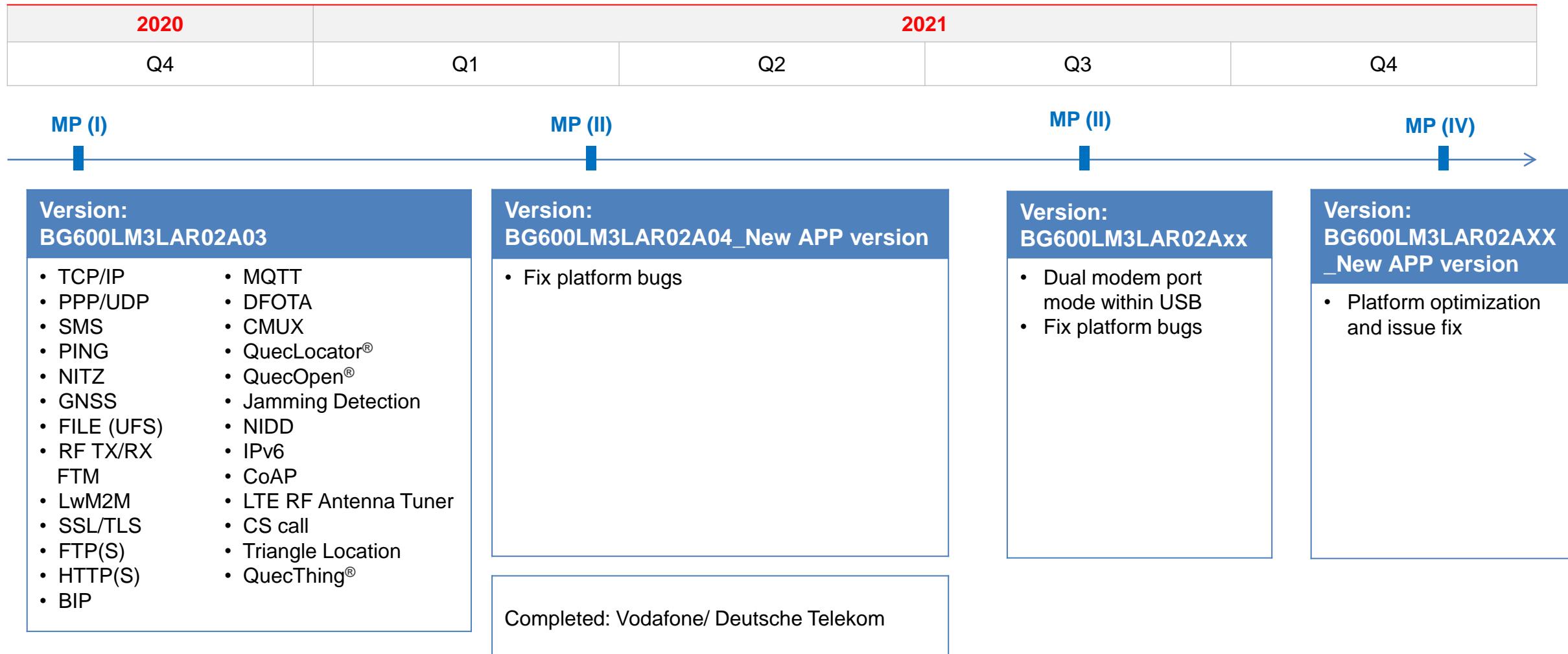
BG600L-M3 Main Functions



Function	Description
Protocols	PPP/ TCP/ UDP/ SSL/ TLS/ FTP(S)/ HTTP(S)/ MQTT/ LwM2M/ CoAP/ IPv6
USB Serial Driver	Windows 7/8/8.1/10, Linux 2.6–5.12, Android 4.x/5.x/6.x/7.x/8.x/9.x/10.x/11.x
GNSS/RIL Driver	Android 4.x/5.x/6.x/7.x/8.x/9.x/10.x/11.x
SMS	Point-to-point MO and MT; SMS Cell Broadcast; Text and PDU mode
Voice	<ul style="list-style-type: none">• VoLTE for Cat M1• CS Voice for GSM
DFOTA	Delta Firmware Upgrade Over-The-Air
LwM2M	Supported
GNSS	GPS/ GLONASS/ BeiDou/ Galileo/ QZSS

* means under development

BG600L-M3 Development Schedule (TX1.0, R02Axx)



The timeline may be adjusted according to the actual development status.

BG600L-M3 Timeline (TX1.0, R02Axx)



2021											
Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.

Project Stage

BG600L-M3 MP

Carrier Certification

Vodafone/ Deutsche Telekom Completed

Telefónica/ Sprint TBD

Regulatory Certification

GCF/ CE/ PTCRB/ FCC/ UKCA/ IC/ RCM/ Anatel Completed

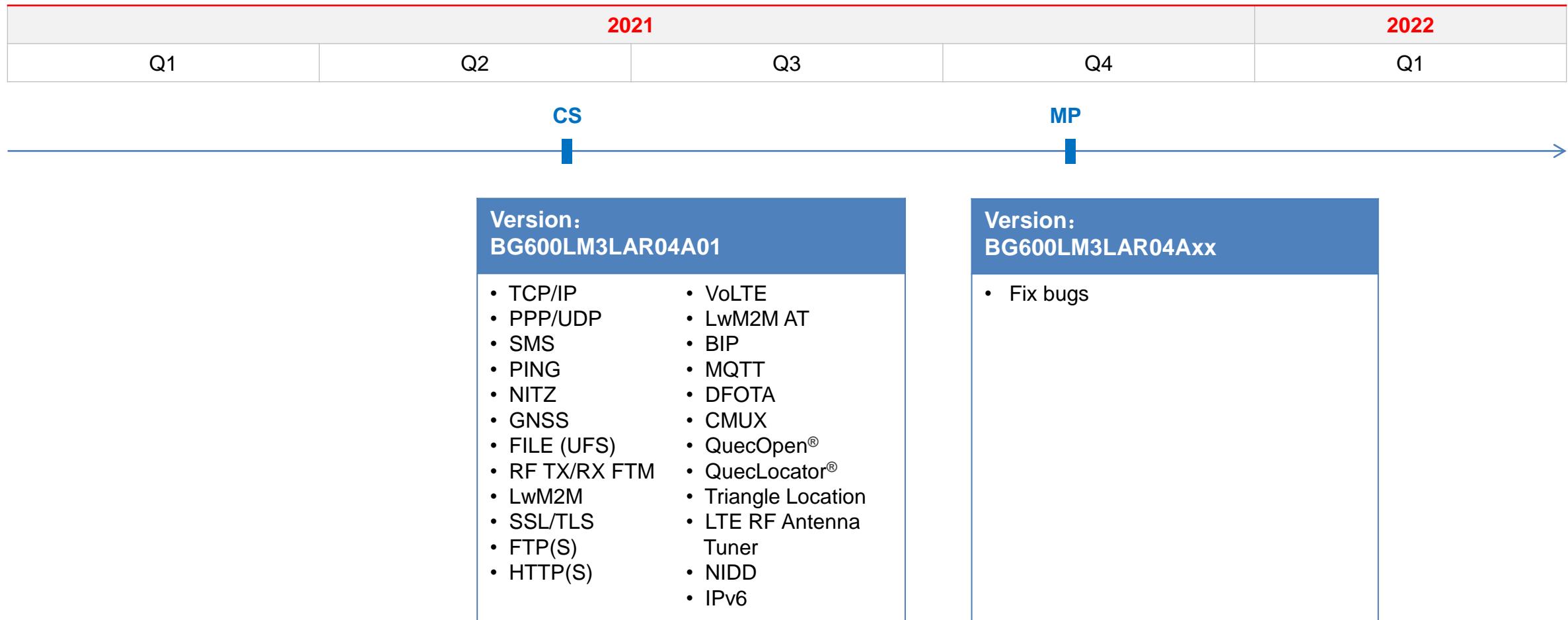
CCC TBD

[back](#)

The timeline may be adjusted according to the maturity of Qualcomm baseline.
BG600L-M3 will leverage some test results of BG95-M3.

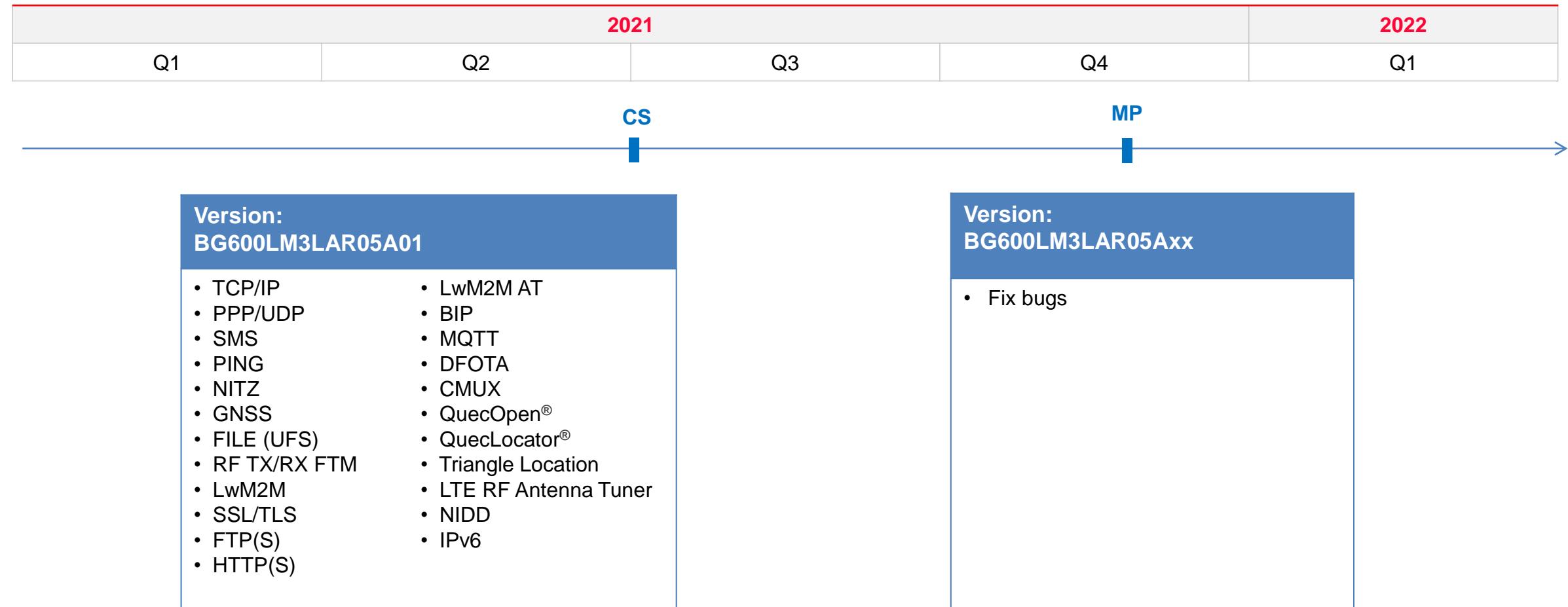
Version: 4.0 | Status: Released

BG600L-M3 Development Schedule (TX2.0, R04Axx with VoLTE)



The timeline may be adjusted according to the actual development status.

BG600L-M3 Development Schedule (TX2.0, R05Axx Data Only)



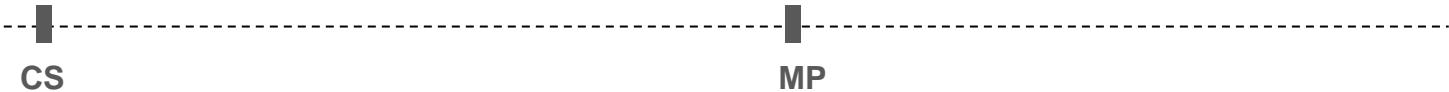
The timeline may be adjusted according to the actual development status.

BG600L-M3 Timeline (TX2.0, R05Axx Data Only)



2021				2022	
Q1	Q2	Q3	Q4	Q1	

Project Schedule



CS: Commercial samples ready. Stable hardware design and quite stable software design. New software features can be added upon request.

MP: Hardware and software ready for mass production. For certification status, please refer to the certification schedule below.

Carrier Certification

T-Mobile

Completed

Regulatory Certification

PTCRB

Completed

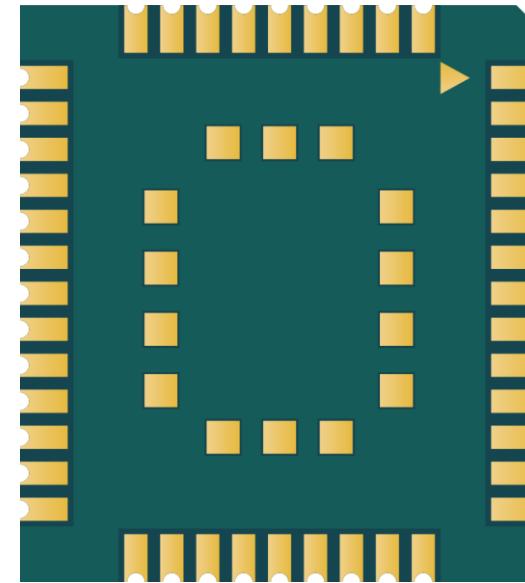
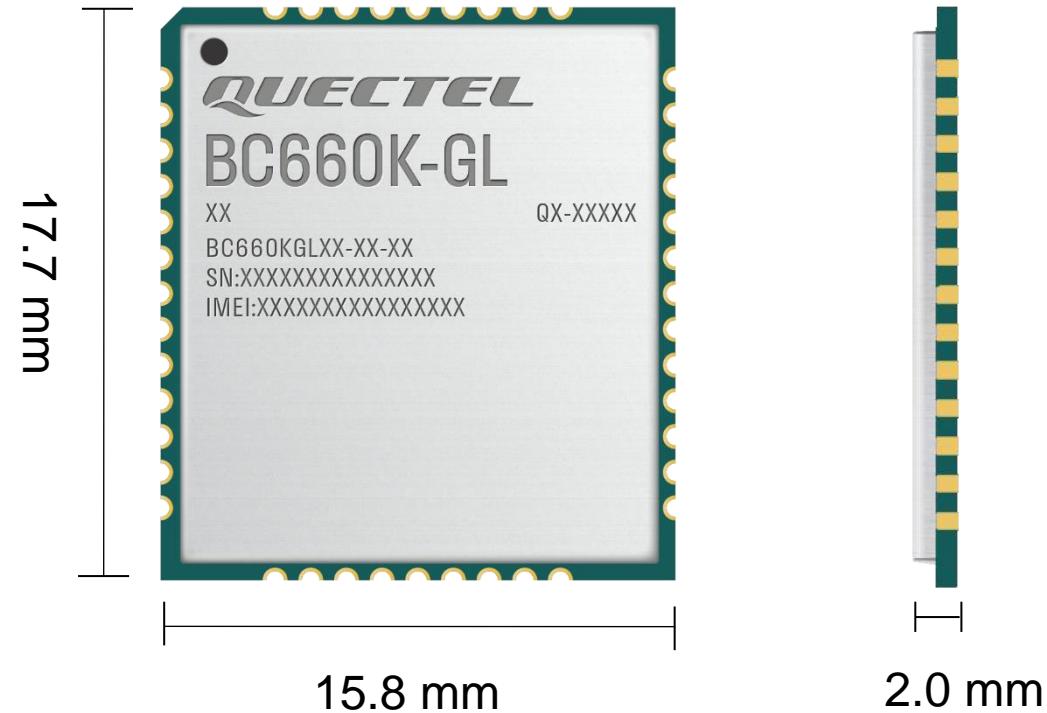
GCF

TBD

BC660K-GL Mechanical Dimensions



Multi-Band Cat NB2 Module (Qualcomm QCX212)



Length: 17.7 mm (± 0.15 mm)
Width: 15.8 mm (± 0.15 mm)
Height: 2.0 mm (± 0.2 mm)
Weight: Approx. 1.2 g

BC660K-GL Highlights



LTE Cat NB2

DL: Max. 127 kbps / UL: Max. 158.5 kbps

Highlights	Description
Global Bands	LTE Cat NB2: B1/B2/B3/B4/B5/B8/B12/B13/B17/B18/B19/B20/B25/B28/B66/B70/B85
Rich Hardware Interfaces	UART/RI/USIM/ADC/NETLIGHT*/PSM_EINT/BOOT/RESET_N/Antenna/GPIO/I2C* ^① /PWM* ^① /SPI* ^①
Abundant Protocols	UDP/TCP/PING/SNTP/LwM2M*/MQTT*/MQTTS*/SSL*/TLS*
eSIM ^②	eSIM reserved for customization
Power Supply	Supply voltage range: 2.2–4.3 V, typical 3.3 V Low voltage supply allows the battery to be powered by Lithium manganese/Lithium zinc cells.
Wakeup	<ul style="list-style-type: none">After the T3412 timer expires, the module will exit from Deep Sleep automatically.Send an AT command to the module (this AT command will be lost), pull down the MAIN_RXD, and, on a falling edge, the module will exit from Deep Sleep.Dedicated PSM_EINT interface(s) to wake up the module from Deep Sleep.
Power Consumption ^③	800 nA @ PSM 0.11 mA @ Idle (DRX = 2.56 s) 0.038 mA @ Idle (eDRX = 40.96 s, PTW = 10.24 s)
Advanced Features	<ul style="list-style-type: none">Battery voltage detection*QuecOpen®*DFOTA
Compatibility	Compatible with Quectel GSM/GPRS M66, NB-IoT BC66/BC66-NA, BC65 and BC68 modules, easy for migration and future upgrades.

* means under development.

① means supported only on QuecOpen® version.

② eSIM is reserved and not included by default.

③ sourced from the chipset spec.

BC660K-GL Main Interfaces



Interface	Description
USIM	1
UART	2 (for QuecOpen® version, × 3)
RI	1
PSM_EINT	1 (for QuecOpen® version, × 2)
ADC	1 (for QuecOpen® version, × 2)
RESET_N	1
BOOT	1
NETLIGHT*	1
GRFC*	2
Antenna	1
GPIO	4 (for QuecOpen® version, × 13)
I2C*	1 (for QuecOpen® version only)
PWM*	1 (for QuecOpen® version only)
SPI*	1 (for QuecOpen® version only)

BC660K-GL Main Functions



Function	Description
Protocols	UDP/TCP/PING/SNTP/LwM2M*/MQTT*/MQTTS*/SSL*/TLS*
SMS*	Text mode and PDU mode
DFOTA	Delta firmware upgrade over-the-air
eSIM	Supported ^①
QuecOpen® *	4 MB Nor flash (integrated) + 272 KB SRAM (integrated)

* means under development.

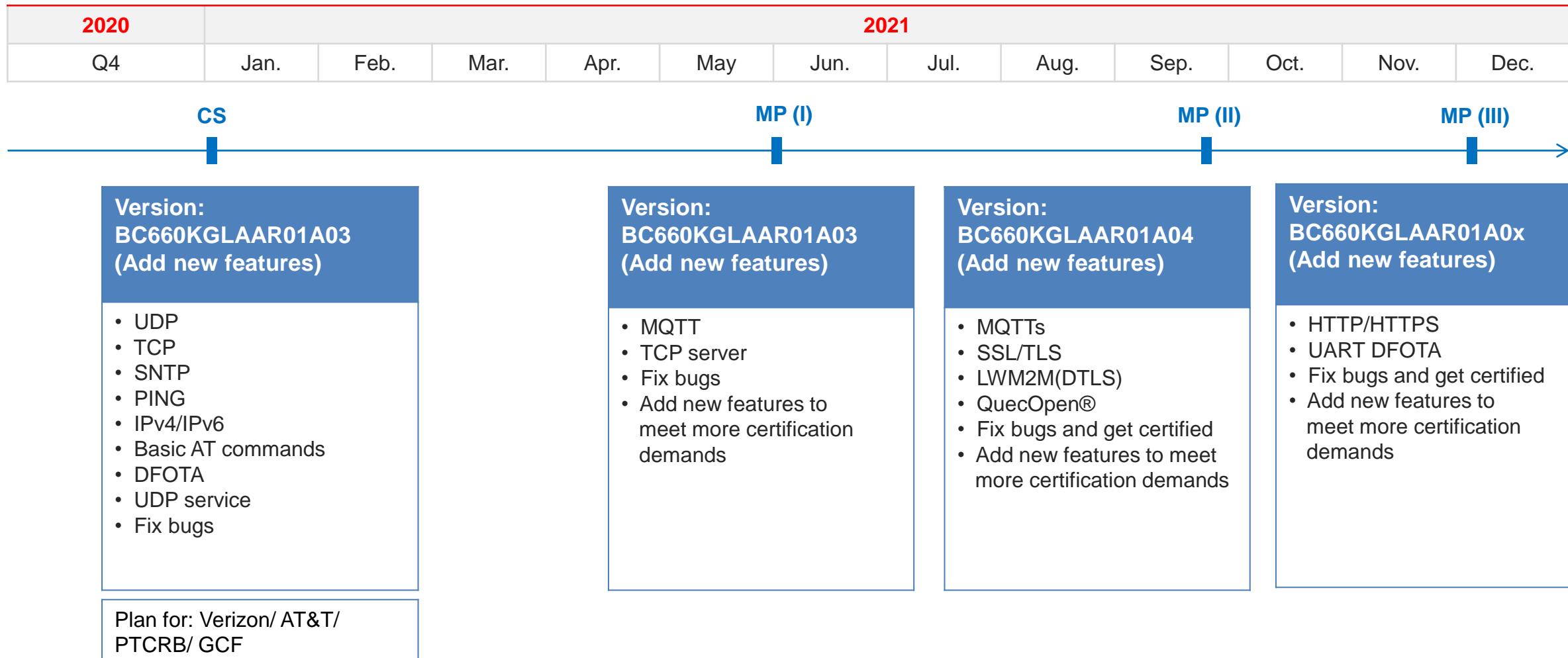
① eSIM is reserved and not included by default. If it is needed, a different OC will be provided.

BC660K-GL Power Consumption



Description	Conditions	Typ.	Unit
Deep Sleep	PSM	800	nA
Light Sleep	@ DRX = 1.28 s	220	µA
	@ DRX = 2.56 s	110	µA
	eDRX = 40.96 s, PTW = 10.24 s, ECL = 0	38	µA
Active State	@ Connected Tx 0 dBm	67	mA
	@ Connected Tx 23 dBm	330	mA

BC660K-GL Development Schedule



The timeline will be adjusted according to the actual development status.

BC660K-GL Timeline (1)



2020	2021												2022				
Q4	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May

Project Stage

BC600K-GL

MP

Carrier Certification

Deutsche Telekom

Completed

Vodafone

Start

Complete (Planned)

Verizon

AT&T

KT

LGU+

Telstra

The timeline may be adjusted according to the maturity of Qualcomm baseline.

Version: 4.0 | Status: Released

BC660K-GL Timeline (2)



2020	2021												2022		
Q4	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.

Project Stage

BC600K-GL MP

Regulatory Certification

CE/ FCC/ IC/ KC/ RCM/ IMDA

Completed

GCF/PTCRB

Start

Complete (Planned)

Anatel



Sony Solution

LPWA Modules (Sony Platform) Roadmap



ATL1250

SONY



BG770A-GL

- Cat M1/ NB1/ NB2*/ GNSS
- Low power consumption

*BG770A-GL Series are Pin-to-Pin
Compatible with BG77*

*BG95xA-GL Series are Pin-to-Pin
Compatible with BG95 Series*



BG95xA-GL

- Cat M1/ NB1/ NB2*/ GNSS
- Low power consumption
- LTE&GNSS Concurrency

2021

BG770A-GL & BG95xA-GL Overview



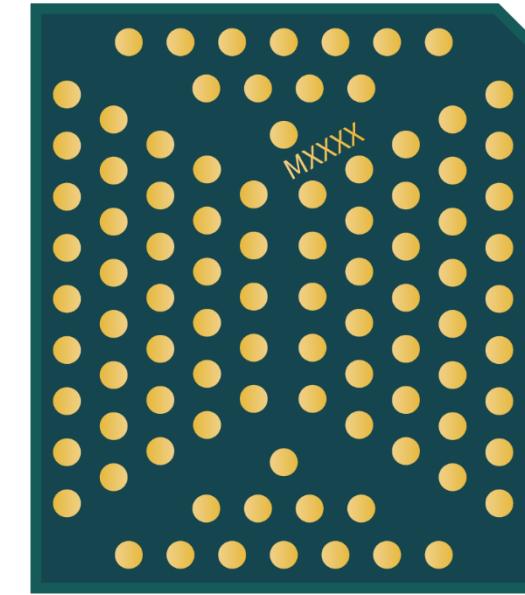
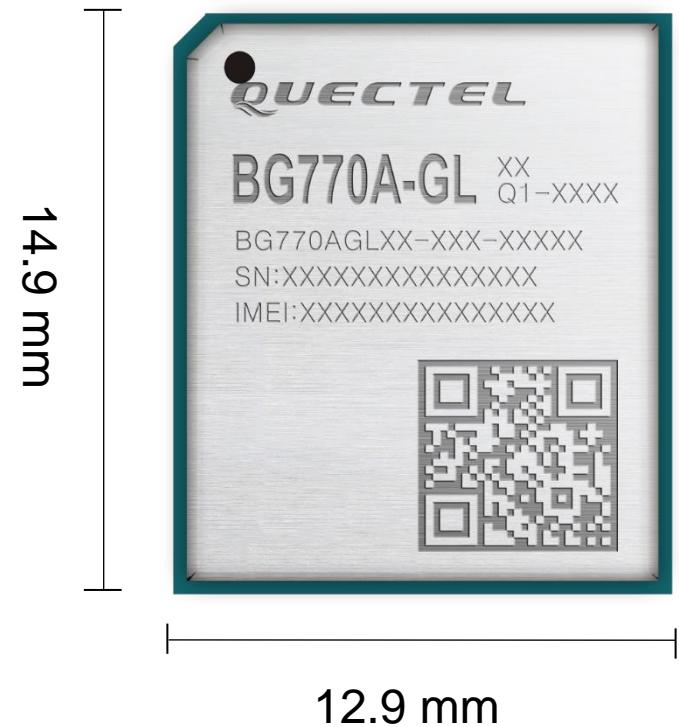
Module	Model	Features			Bands	Dimensions (mm)	Compatibility	Target Carrier Certifications	Status
		LTE&GNSS Concurrency	QuecOpen®	iSIM					
BG770A	BG770A-GL	-	-	-	Cat M1: LTE-FDD B1/B2/B3/B4/B5/B8/B9*/B10*/B12/B13/B18/B19/B20/B25/B26/B27/B28/B66 Cat NB1/ NB2*: LTE-FDD B1/B2/B3/B4/B5/B8/B12/B13/B17/B18/B19/B20/B25/B27*/B28/B66	14.9 × 12.9 × 1.9	BG77	All major global carriers, depending on customers' requirements	CS
BG95xA	BG950A-GL	-	-	-	Cat M1: LTE-FDD B1/B2/B3/B4/B5/B8/B9*/B10*/B12/B13/B18/B19/B20/B25/B26/B27/B28/B66 Cat NB1/ NB2*: LTE-FDD B1/B2/B3/B4/B5/B8/B9*/B10*/B12/B13/B17/B18/B19/B20/B25/B27*/B28/B66	23.6 × 19.9 × 2.2	BG95 Series/ BG96/ BC95-G/ BC92/ EG9x/ UG9x/ M95	All major global carriers, depending on customers' requirements	ES
	BG951A-GL	Supported	-	-					ES

* under development

BG770A-GL Mechanical Dimensions



Ultra Compact LTE Cat M1/ Cat NB1/ Cat NB2* Module (ALT1250)



Length: 14.9 mm (± 0.20 mm)
Width: 12.9 mm (± 0.20 mm)
Height: 1.9 mm (± 0.20 mm)

BG770A-GL Highlights



Highlights	Description
Super Compact Size	14.9 mm × 12.9 mm × 1.9 mm
Global Bands	Cat M1: LTE-FDD B1/B2/B3/B4/B5/B8/B9*/B10*/B12/B13/B18/B19/B20/B25/B26/B27/B28/B66 Cat NB1/ NB2*: LTE-FDD B1/B2/B3/B4/B5/B8/B12/B13/B17/B18/B19/B20/B25/B27*/B28/B66
Rich Hardware Interfaces	UART/ (U)SIM/ USB*/ PCM*/ I2C*/ ADC/ GPIO/ GRFC*/ NET_STATUS/ STATUS/ Antenna
Abundant Protocols	TCP/ PPP/ UDP/ SSL/ MQTT/ FTP(S)/ HTTP(S)/ LwM2M/ IPv4/ IPv6/ TLS/ DTLS/ PING/ CoAP/ NITZ
Power Supply	Supply voltage range: VBAT_BB: 2.2–4.35 V; VBAT_RF: 3.1–4.35 V; Typ. 3.3 V Low voltage supply allows the battery to be powered by Lithium manganese or Lithium zinc cells.
Wakeup	Hardware wakeup: Power Key
Ultra Low Power Consumption	<ul style="list-style-type: none">Power Saving Mode: 1.4 µASleep Mode (Modem Disabled): 45 µASleep Mode (ECL0): 1.1 mA @ DRX = 1.28 s (Cat M); 2.2 mA @ DRX = 1.28 s (NB-IoT) 0.06 mA @ eDRX Cycle = 40.96 s; PTW = 1.28 s; DRX = 1.28 s (Cat M) 0.16 mA @ eDRX Cycle = 40.96 s; PTW = 1.28 s; DRX = 1.28 s (NB-IoT)
Security*	ISE - hardware-based security features
Voice*	VoLTE (For Cat M1 Only)
GNSS	GPS, GLONASS
Advanced Features	<ul style="list-style-type: none">QuecLocatorDFOTA
Compatibility	Compatible with Quectel BG77

Cat M1/Cat NB1/Cat NB2*



14.9 mm × 12.9 mm × 1.9 mm

Super Compact Size: 14.9 mm × 12.9 mm × 1.9 mm

Package: 94-pin LGA

Supply Voltage: VBAT_BB: 2.2–4.35 V; VBAT_RF: 3.1–4.35 V; Typ. 3.3 V

Data Rate:

- LTE Cat M1: Max. 588 kbps (DL)/ 1119 kbps (UL)
- LTE Cat NB2: Max. 127 kbps (DL)/ 158 kbps (UL)

Protocols: TCP/ PPP/ UDP/ SSL/ MQTT/ FTP(S)/ HTTP(S)/ LwM2M/ IPv4/ IPv6/ TLS/ DTLS/ PING/ CoAP/ NITZ

Functions: Data Transfer/ GNSS/ DFOTA/ NITZ/ PING/ Jamming Detection/ Triangle Location

Interfaces: UART/ USB (FS Only)*/ (U)SIM/ I2C*/ PCM*/ ADC/ GPIO/ GRFC*/ NET_STATUS/ STATUS/ Antenna

Power Consumption (Typical): 1.4 µA @ PSM (USB and UART disconnected)

* Under development

BG770A-GL Specifications 2



■ LTE Cat M1/Cat NB1/Cat NB2* Module

14.9 mm x 12.9 mm x 1.9 mm
Cat M1: Max. 588 kbps (DL)/ 1119 kbps (UL)
Cat NB2: Max. 127 kbps (DL)/ 158 kbps (UL)

Items	BG770A-GL
Cat M1	LTE-FDD: B1/B2/B3/B4/B5/B8/B9*/B10*/B12/B13/B18/B19/B20/B25/B26/B27/B28/B66
Cat NB1/ NB2*	LTE-FDD: B1/B2/B3/B4/B5/B8/B12/B13/B17/B18/B19/B20/B25/B27*/B28/B66
GNSS	GPS, GLONASS
Certification*	All major global carriers

* Under development/Ongoing

BG770A-GL Power Consumption



Modes	Current Consumption	Notes
PSM	1.4 µA	
RF Disabled	45 µA	AT+CFUN=0 AT+QSCLK=2
Sleep Mode (Cat M; DRX = 1.28 s; ECL0)	1.1 mA	
Sleep Mode (NB-IoT; DRX = 1.28 s; ECL0)	2.2 mA	
Sleep Mode (Cat M; eDRX Cycle = 40.96 s; PTW = 1.28 s; DRX = 1.28 s)	0.06 mA	
Sleep Mode (NB-IoT; eDRX Cycle = 40.96 s; PTW = 1.28 s; DRX = 1.28 s)	0.16 mA	

BG770A-GL Main Interfaces



Interface	Description
(U)SIM	1 (Supports 1.8 V only)
UART	3
USB*	1 (FS only)
PCM*	1 (For VoLTE only)
I2C*	1 (For VoLTE only)
ADC	2
GPIO	7
GRFC*	2
NET_STATUS	1
STATUS	1
Antenna Interface	2 (For the main antenna and GNSS antenna, respectively)

* Under development

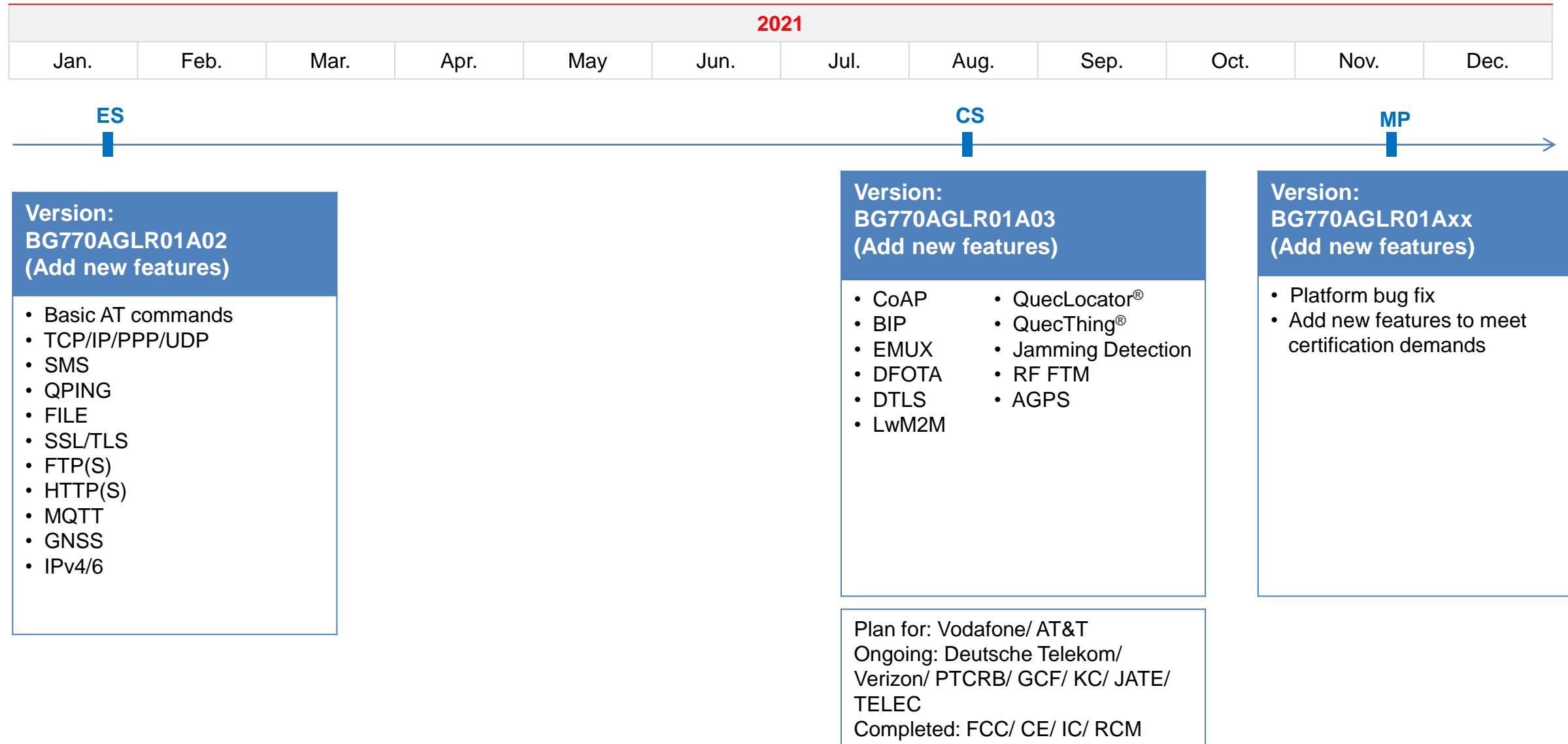
BG770A-GL Main Functions



Function	Description
Protocols	PPP/ TCP/ UDP/ SSL/ MQTT/ FTP(S)/ HTTP(S)/ LwM2M/ IPv4/ IPv6/ TLS/ DTLS/ PING/ CoAP/ NITZ
SMS	Point-to-point MO and MT; Text and PDU Mode
Voice*	VoLTE (For Cat M1 Only)
DFOTA	Delta Firmware Upgrade Over-The-Air
LwM2M	Supported
GNSS	GPS, GLONASS

* Under development

BG770A-GL Development Schedule

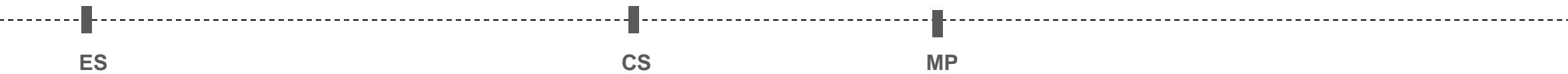


BG770A-GL Timeline (1)



2021												2022						
Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	

Project Schedule



ES: Engineering samples ready. Basic functions are available for customers' simple demo purpose.

CS: Commercial samples ready. Stable hardware design and quite stable software design. New software features can be added upon request.

MP: Hardware and software ready for mass production. For certification status, please refer to the certification schedule below.

Carrier Certification

Vodafone



Deutsche Telekom



Start (Planned)

Complete (Planned)

Verizon



AT&T



SKT



KDDI/ NTT DOCOMO

TBD

back

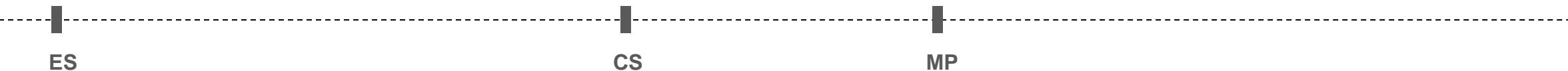
The timeline may be adjusted according to the maturity of chipset baseline and chipset certification progress.

BG770A-GL Timeline (2)



2021												2022						
Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	

Project Schedule



Regulatory Certification

CE/ FCC/ IC/ RCM

Completed

GCF

Start

Complete (Planned)

PTCRB

KC

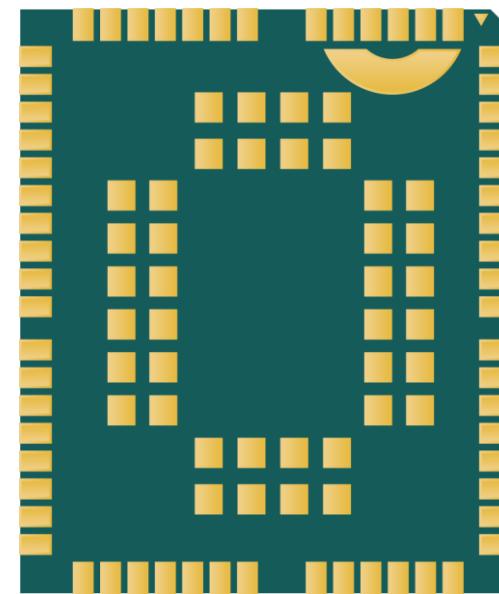
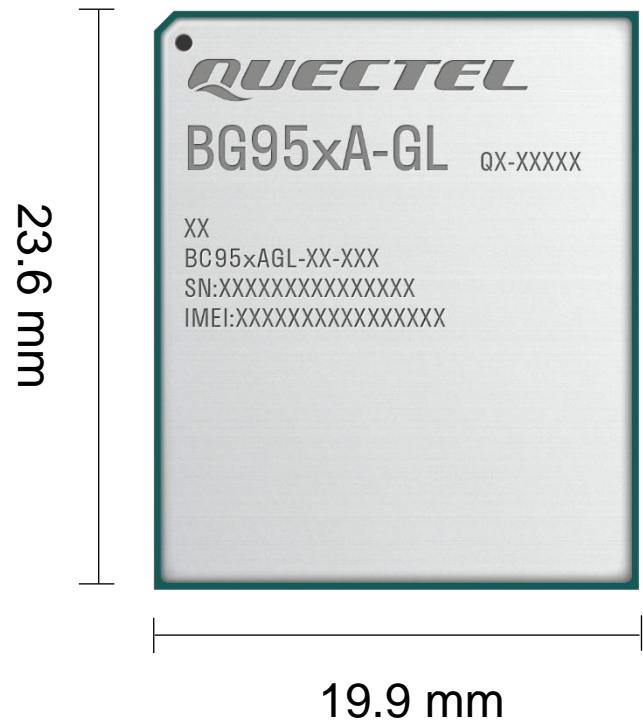
JATE/ TELEC

The timeline may be adjusted according to the maturity of chipset baseline and chipset certification progress.

BG95xA-GL Mechanical Dimensions



Multi-Mode Cat M1/ Cat NB 1/ Cat NB2* Module (ALT1250)



Length: 23.6 mm (± 0.15 mm)
Width: 19.9 mm (± 0.15 mm)
Height: 2.2 mm (± 0.2 mm)
Weight: Approx. 2.15 g

BG95xA-GL Series Highlights



Highlights	Description
Compatible Size	23.6 mm × 19.9 mm × 2.2 mm
Global Bands	Cat M1: LTE-FDD B1/B2/B3/B4/B5/B8/B9*/B10*/B12/B13/B18/B19/B20/B25/B26/B27/B28/B66 Cat NB1/ NB2*: LTE-FDD B1/B2/B3/B4/B5/B8/B9*/B10*/B12/B13/B17/B18/B19/B20/B25/B27*/B28/B66
Rich Hardware Interfaces	UART/ (U)SIM/ USB*/ PCM*/ I2C*/ ADC/ GPIO/ GRFC*/ NET_STATUS/ STATUS/ Antenna
Abundant Protocols	TCP/ PPP/ UDP/ SSL/ MQTT/ FTP(S)/ HTTP(S) /LwM2M/ IPv4/ IPv6/ TLS/ DTLS/ PING/ CoAP/ NITZ
Power Supply	Supply voltage range: 2.2–4.35 V, typical 3.3 V Low voltage supply allows the battery to be powered by Lithium manganese or Lithium zinc cells.
Wakeup	Hardware wakeup: Power Key
Ultra Low Power Consumption ^①	<ul style="list-style-type: none"> Power Saving Mode: 1.4 µA Sleep Mode (Modem Disabled): 45 µA Sleep Mode (ECL0): 1.1 mA @ DRX = 1.28 s (Cat M); 2.2 mA @ DRX = 1.28 s (NB-IoT) 0.06 mA @ eDRX Cycle = 40.96 s; PTW = 1.28 s; DRX = 1.28 s (Cat M) 0.16 mA @ eDRX Cycle = 40.96 s; PTW = 1.28 s; DRX = 1.28 s (NB-IoT)
Security*	ISE - hardware-based security features
Voice*	VoLTE (For Cat M1 Only)
GNSS	GPS, GLONASS, Galileo, Beidou, QZSS (<i>Only BG951A-GL supports Galileo, Beidou and QZSS as well as LTE&GNSS concurrency*</i>)
Advanced Features*	<ul style="list-style-type: none"> QuecLocator DFOTA
Compatibility	Compatible with Quectel BG95 series

Cat M1/Cat NB1/Cat NB2*



23.6 mm × 19.9 mm × 2.2 mm

Package: 102-pin LGA

Supply Voltage: 2.2–4.35 V, typ. 3.3 V

Data Rate:

- LTE Cat M1: Max. 588 kbps (DL)/ 1119 kbps (UL)
- LTE Cat NB1: Max. 27.2 kbps (DL)/62.5 kbps (UL)
- LTE Cat NB2: Max. 127 kbps (DL)/ 158 kbps (UL)

Protocols*: TCP/ PPP/ UDP/ SSL/ MQTT/ FTP(S)/ HTTP(S)/ LwM2M/ IPv4/ IPv6/ TLS/ DTLS/ PING/ CoAP/ NITZ

Functions: Data Transfer/ GNSS/ DFOTA/ NITZ/ PING/ Jamming Detection/ Triangle Location

Interfaces: UART/ USB* (FS Only)/ (U)SIM/ I2C*/ PCM*/ ADC/ GPIO/ GRFC*/ NET_STATUS/ STATUS/ Antenna

Power Consumption (Typical)^①: 1.4 µA @ PSM (USB and UART disconnected)

BG95xA-GL Specifications 2



23.6 mm x 19.9 mm x 2.2 mm

Cat M1: Max. 588 kbps (DL)/ 1119 kbps (UL)

Cat NB1: Max. 27.2 kbps (DL)/62.5 kbps (UL)

Cat NB2*: Max. 127 kbps (DL)/ 158 kbps (UL)

■ LTE Cat M1/Cat NB2 Module

Items	BG95xA-GL
Cat M1	LTE-FDD: B1/B2/B3/B4/B5/B8/B9*/B10*/B12/B13/B18/B19/B20/B25/B26/B27/B28/B66
Cat NB1/NB2*	LTE-FDD: B1/B2/B3/B4/B5/B8/B9*/B10*/B12/B13/B17/B18/B19/B20/B25/B27*/B28/B66
GNSS	GPS, GLONASS, Galileo, Beidou, QZSS (<i>only BG951A-GL supports Galileo, Beidou and QZSS as well as LTE&GNSS concurrency*</i>)
Certification (Planning)	All major global carriers

* Under development

BG95xA-GL Main Interfaces



Interface	Description
(U)SIM	1 (Supports 1.8 V only)
UART	3
USB*	1 (FS only)
PCM*	1 (For VoLTE only)
I2C*	1 (For VoLTE only)
ADC	2
GPIO	9
GRFC*	2
NET_STATUS	1
STATUS	1
Antenna Interface	2 (For the main antenna and GNSS antenna, respectively)

* Under development

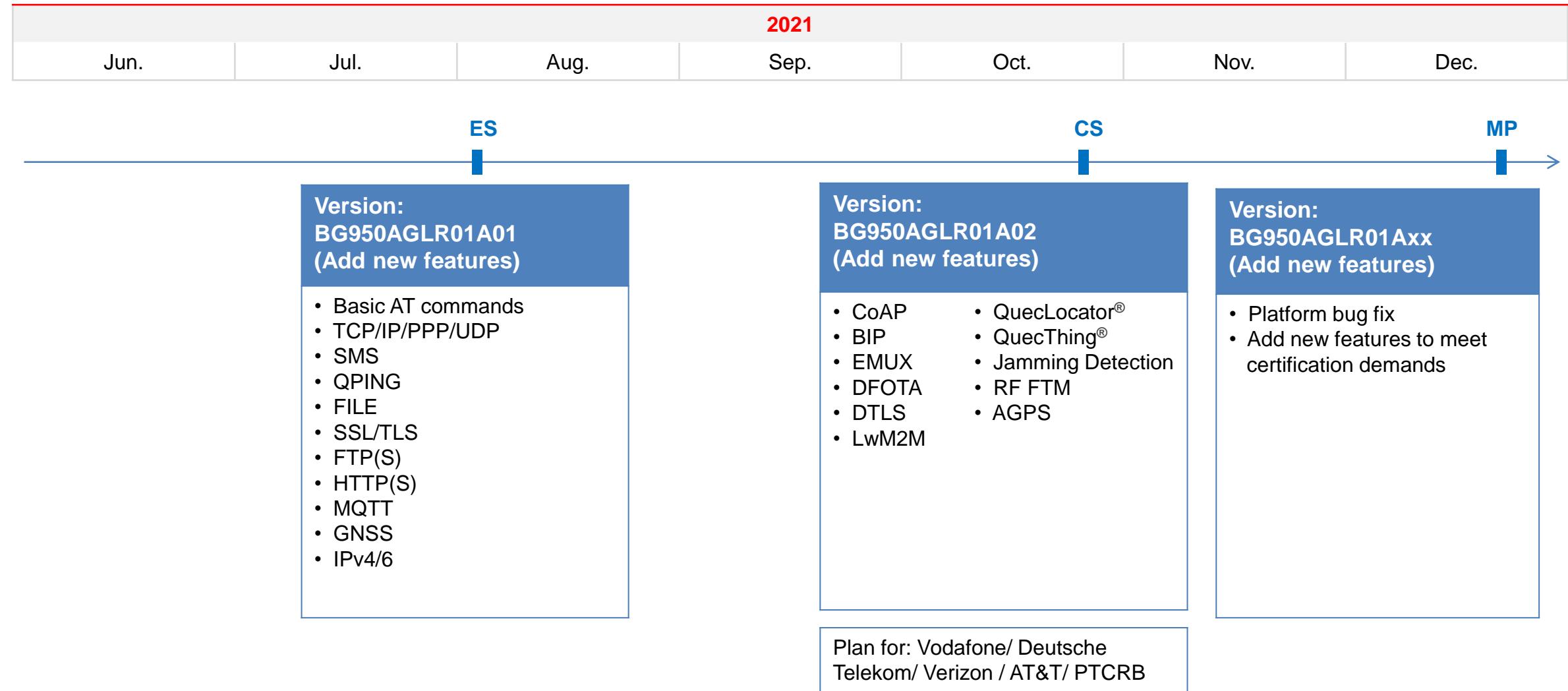
BG95xA-GL Main Functions



Function	Description
Protocols	PPP/ TCP/ UDP/ SSL/ MQTT/ FTP(S)/ HTTP(S)/ LwM2M/ IPv4/ IPv6/ TLS/ DTLS/ PING/ CoAP/ NITZ
SMS	Point-to-point MO and MT; Text and PDU mode
Voice*	VoLTE (for Cat M1 only)
DFOTA	Delta Firmware Upgrade Over-The-Air
LwM2M	Supported
GNSS	GPS, GLONASS, BeiDou, Galileo, QZSS (<i>only BG951A-GL supports BeiDou, Galileo and QZSS as well as LTE&GNSS concurrency[*]</i>)

* 表示正在开发中

BG950A-GL Development Schedule



BG950A-GL Timeline (1)



2021								2022						
May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	

Project Schedule



ES: Engineering samples ready. Basic functions are available for customers' simple demo purpose.

CS: Commercial samples ready. Stable hardware design and quite stable software design. New software features can be added upon request.

MP: Hardware and software ready for mass production. For certification status, please refer to the certification schedule.

Carrier Certification

Vodafone



Deutsche Telekom



Verizon



AT&T



Telefónica/ T-Mobile

TBD

back

The timeline may be adjusted according to the maturity of chipset baseline and chipset certification progress.

BG950A-GL Timeline (2)



2021								2022						
May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	

Project Schedule



Regulatory Certification

GCF

Start (Planned) Complete (Planned)

CE/FCC/IC/RCM



PTCRB



KC

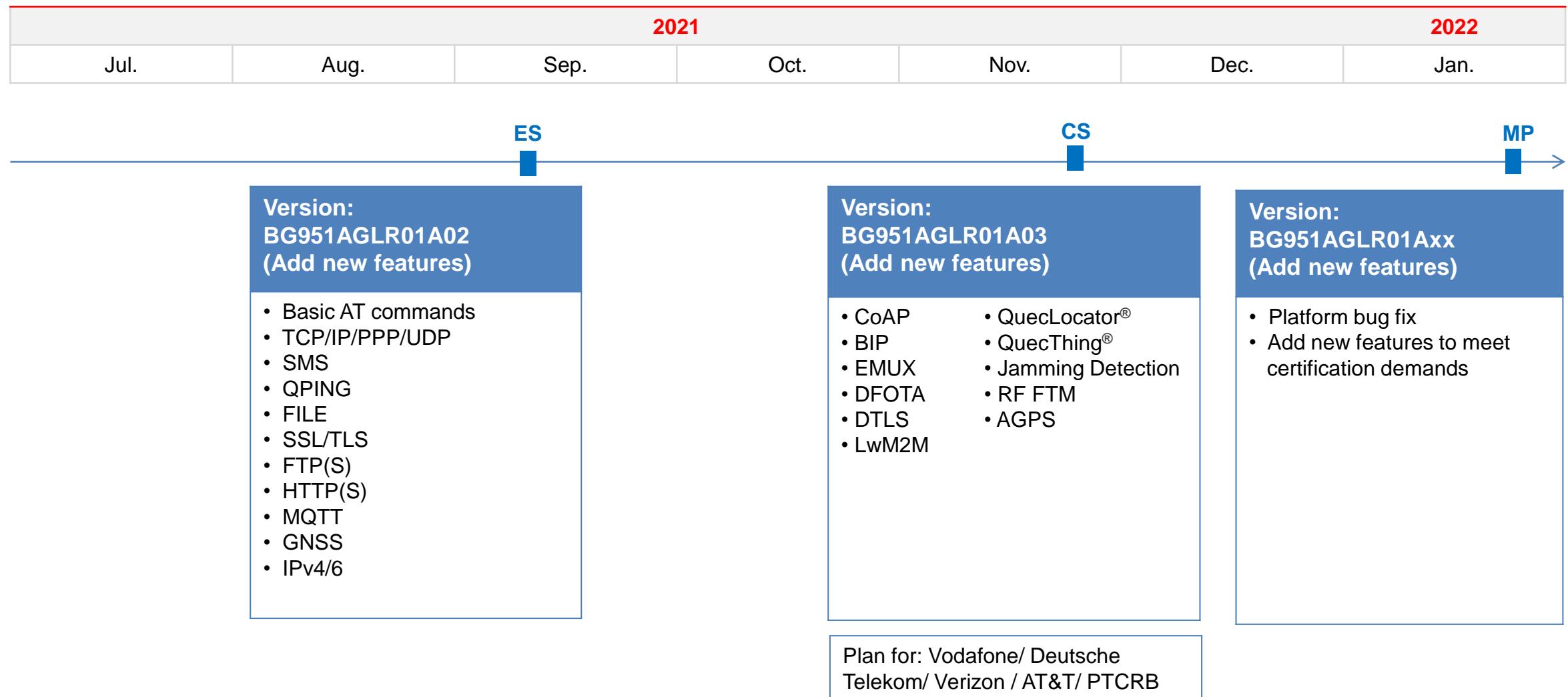


JATE/ TELEC



The timeline may be adjusted according to the maturity of chipset baseline and chipset certification progress.

BG951A-GL Development Schedule



BG951A-GL Timeline (1)



2021												2022				
May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.			

Project Schedule

ES

CS

MP

ES: Engineering samples ready. Basic functions are available for customers' simple demo purpose.

CS: Commercial samples ready. Stable hardware design and quite stable software design. New software features can be added upon request.

MP: Hardware and software ready for mass production. For certification status, please refer to the certification schedule.

Carrier Certification

Vodafone

Start (Planned)

Complete (Planned)

Deutsche Telekom

Start (Planned)

Verizon

Start (Planned)

AT&T

Start (Planned)

Telefónica/ T-Mobile

TBD

back

The timeline may be adjusted according to the maturity of chipset baseline and chipset certification progress.

BG951A-GL Timeline (2)



2021								2022						
May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	

Project Schedule

ES

CS

MP

Regulatory Certification

GCF

Start (Planned) Complete (Planned)

CE/FCC/IC/RCM



PTCRB



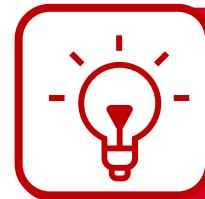
KC



JATE/ TELEC



The timeline may be adjusted according to the maturity of chipset baseline and chipset certification progress.



MTK Solution

NB-IoT Modules (MTK) Roadmap



MT2625



BC66

- Cat NB1
- 25.5 kbps DL/ 62.5 kbps UL
- Global Version



BC66-NA

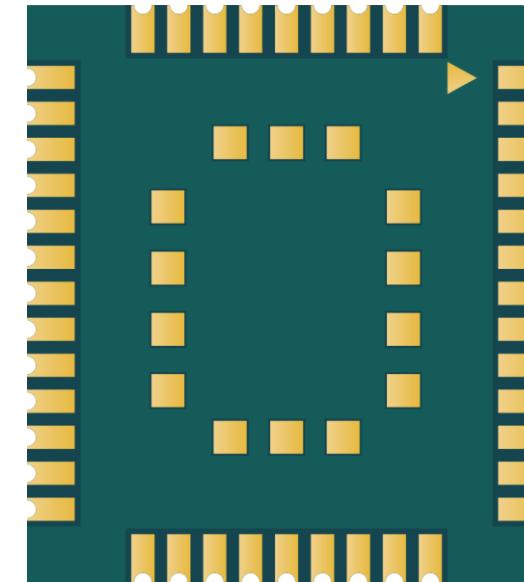
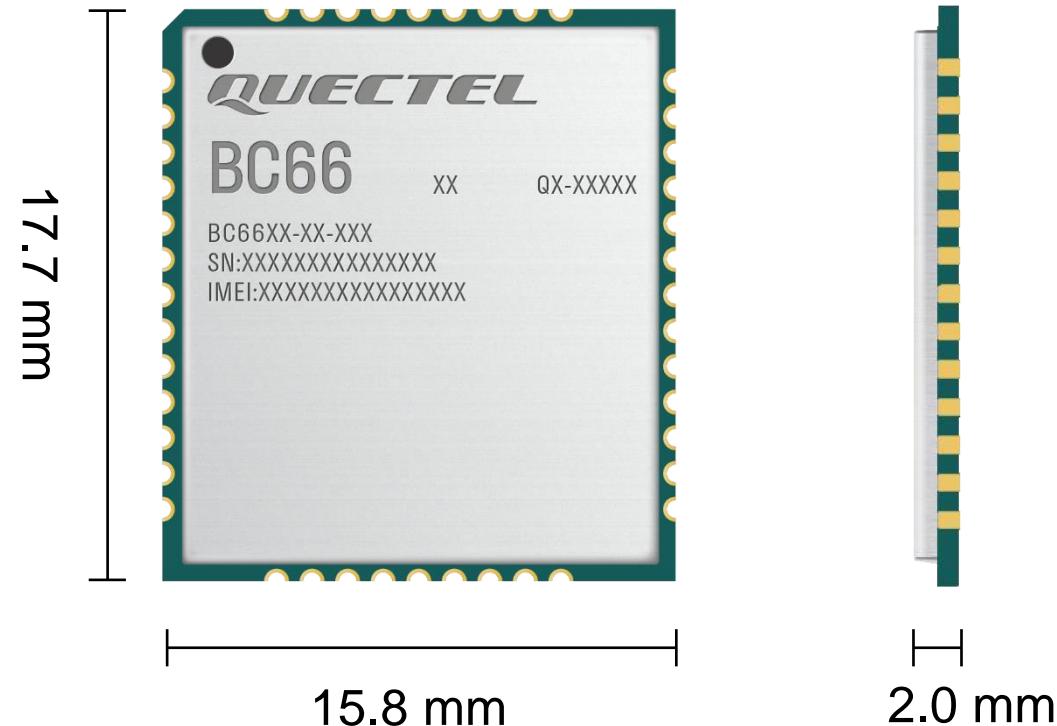
- Cat NB2
- 103 kbps DL/ 151 kbps UL
- B71/B85 Supported
- Global Version

2018

2019

BC66 Mechanical Dimensions

Multi-Band Cat NB1 Module (MTK MT2625)



Length: 17.7 mm (± 0.15 mm)
Width: 15.8 mm (± 0.15 mm)
Height: 2.0 mm (± 0.2 mm)
Weight: Approx. 1.2 g

BC66 Highlights



LTE Cat NB1

25.5 kbps DL/ 62.5 kbps UL

Highlight	Description
Global Bands	B1/B2/B3/B4/B5/B8/B12/B13/B17/B18/B19/B20/B25/B26*/B28/B66
Rich Hardware Interfaces	USB/ UART/ SPI ^① / I2S ^① / I2C ^① / USIM/ ADC/ NETLIGHT/ Antenna/ PSM_EINT/ PWRKEY/ RESET
Abundant Protocols	UDP/ TCP/ LwM2M/ MQTT/ SNTP/ TLS/ DTLS/ PPP*/ HTTP*/ HTTPS*/ CoAP*
Special Features	QuecOpen®, DFOTA, eSIM ^②
Low Power Consumption	3.5 µA (PSM), 0.24 mA (eDRX), 0.35 mA (DRX), 110 mA (Active, 23 dBm) <small>Average Value</small>
QuecLocator®*	Location based on base station cell information
Power Supply Feature	Low power supply voltage (2.1–3.63 V, typ. 3.3 V)
Wake-up Feature	Specialized PSM_EINT for module wake-up via external interrupt
Compatibility	Compatible with Quectel GSM module M66 and Quectel NB-IoT module BC68/ BC66-NA/ BC65

* means under development.

① means supported only on QuecOpen® version.

② eSIM is reserved and not included by default.

Version: 4.0 | Status: Released

BC66 Main Interfaces



Interface	Description
USB	1
USIM	1
UART	3 (Main/Debug/Auxiliary UART)
PSM_EINT	1 (wake up device via external interrupt)
ADC	1 (10 bits)
RESET	1
PWRKEY	1
NETLIGHT	1
Antenna	1
SPI	1 (for QuecOpen® version only)
I2C	1 (for QuecOpen® version only)
I2S	1 (for QuecOpen® version only)
GPIO	Configurable (for QuecOpen® version only)

BC66 Main Functions



Function	Description
Protocols	UDP/ TCP/ LwM2M/ MQTT/ SNTP/ TLS/ DTLS/ PPP*/ HTTP*/ HTTPS*/ CoAP*
DFOTA	Delta firmware upgrade over-the-air
eSIM	Supported ^①
QuecOpen®	<ul style="list-style-type: none">ROM: 200 KB for APP image binRAM: 400 KB (100 KB static memory and 300 KB dynamic memory)

* means under development.

① eSIM is reserved and not included by default. If needed, a different OC will be provided.

BC66 Development Schedule



2018	2019				2020				2021		
Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
MP (I) → MP (II) → MP (III) → MP (IV) → MP (V) → MP (VI)											
Version: BC66NBR01A06 <ul style="list-style-type: none"> • TCP/IP • UDP • LwM2M • MQTT • DFOTA • QuecOpen® 	Version: BC66NBR01A07 <ul style="list-style-type: none"> • Platform optimization and issue fix • Add T-Mobile LwM2M new request 	Version: BC66NBR01A10 <ul style="list-style-type: none"> • SSL/TLS • MQTTS • LwM2M optimization • Platform optimization and issue fix 	Version: BC66NBR02A02_SBK <ul style="list-style-type: none"> • SSL/TLS • Softbank customization requirements • Platform optimization and issue fix 	Version: BC66NBR03A0x <ul style="list-style-type: none"> • SMS • Platform optimization and issue fix 	Version: BC66NBR03A0x <ul style="list-style-type: none"> • Platform optimization and issue fix 						
Completed: Vodafone/ Deutsche Telekom/ PTCRB	Completed: T-Mobile	Completed: T-Mobile/ MR	Completed: SoftBank	Plan for: AT&T MR Ongoing: Verizon							

The timeline will be adjusted according to the actual development status.
BC66NBR01A10 and BC66NBR02A02_SBK cannot be upgraded to BC66NBR03A0x via DFOTA.

BC66 Timeline



2020												2021											
Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.			

Project Stage

BC66 MP

Carrier Certification

Vodafone/ Deutsche Telekom/ TIM/ Telefónica/ Altice-MEO/ AT&T/ T-Mobile/ SoftBank/ Telstra Completed

Verizon  Complete (Planned)

Start

LGU+ TBD

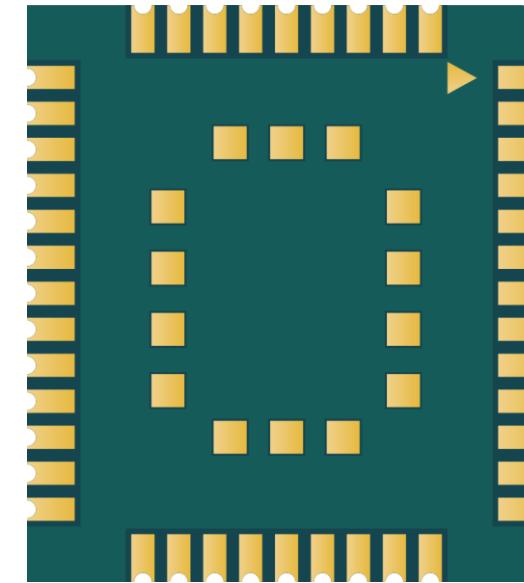
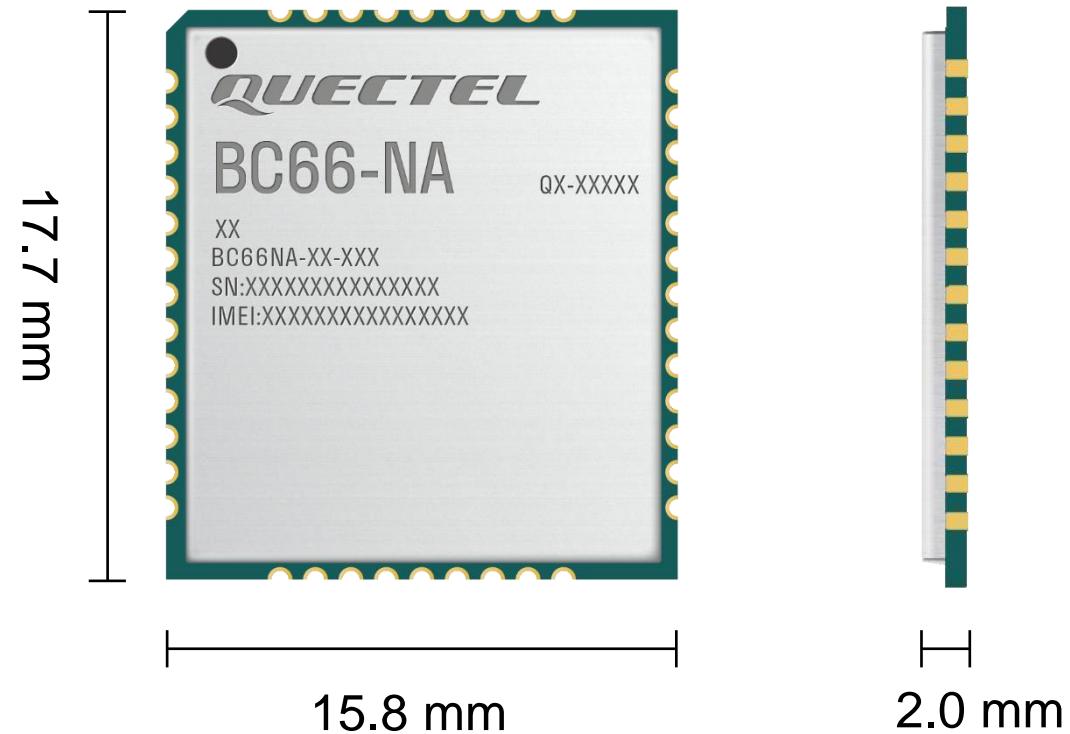
Regulatory/Other Certifications

GCF/ CE/ PTCRB/ FCC/ IC/ KC/ NCC/ JATE/ TELEC/ RCM/ NBTC/ IMDA/ ATEX Completed

BC66-NA Mechanical Dimensions



Multi-Band Cat NB2 Module (MTK MT2625)



Length: 17.7 mm (± 0.15 mm)
Width: 15.8 mm (± 0.15 mm)
Height: 2.0 mm (± 0.2 mm)
Weight: Approx. 1.2 g

BC66-NA Highlights



LTE Cat NB2

103 kbps DL/151 kbps UL

Highlight	Description
Global Bands	B1/B2/B3/B4/B5/B8/B12/B13/B17/B18/B19/B20/B25/B26*/B28/B66/B71/B85
Rich Hardware Interfaces	USB/ UART/ SPI ^① / I2S ^① / I2C ^① / USIM/ ADC/ NETLIGHT/ Antenna/ PSM_EINT/ PWRKEY/ RESET
Abundant Protocols	UDP/ TCP/ LwM2M/ MQTT/ SNTP/ TLS/ DTLS/ PPP*/ HTTP*/ HTTPS*/ CoAP*
Special Features	QuecOpen®, DFOTA, ECID*, OTDOA*, eSIM ^②
Low Power Consumption	3.5 µA (PSM), 0.13 mA (eDRX), 0.25 mA (DRX), 95 mA (Active, 23 dBm) ^{Average Value}
QuecLocator®*	Location based on base station cell information
Power Supply Feature	Low power supply voltage (2.1–3.63 V, typ. 3.3 V)
Wake-up Feature	Specialized PSM_EINT for module wake-up via external interrupt
Compatibility	Compatible with Quectel GSM module M66 and Quectel NB-IoT module BC68/ BC66/ BC65

* means under development.

① means supported only on QuecOpen® version.

② eSIM is reserved and not included by default.

BC66-NA Main Interfaces



Interface	Description
USB	1
USIM	1
UART	3 (Main/Debug/Auxiliary UART)
PSM_EINT	1 (wake up device via external interrupt)
ADC	1 (10 bits)
RESET	1
PWRKEY	1
NETLIGHT	1
Antenna	1
SPI	1 (for QuecOpen® version only)
I2C	1 (for QuecOpen® version only)
I2S	1 (for QuecOpen® version only)
GPIO	Configurable (for QuecOpen® version only)

BC66-NA Main Functions

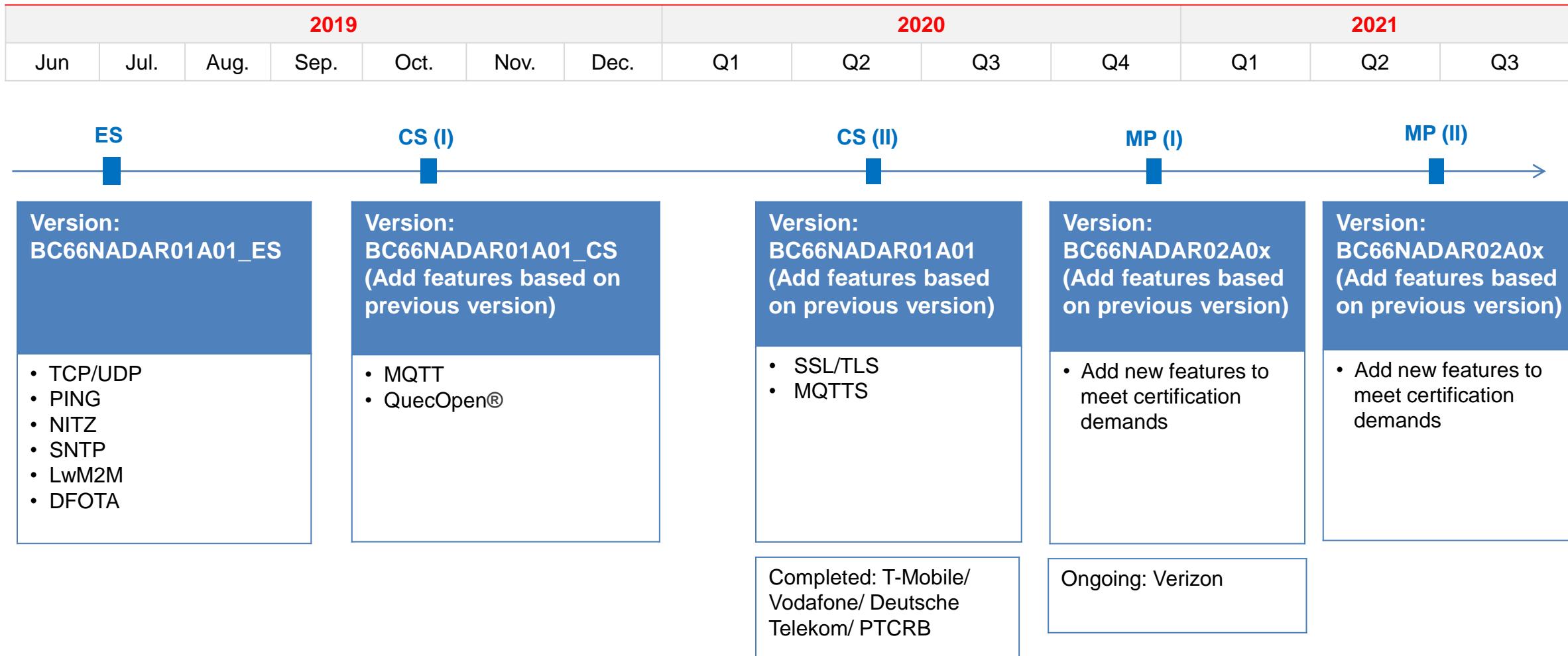


Function	Description
Protocols	UDP/ TCP/ LwM2M/ MQTT/ SNTP/ DTLS/ TLS/ PPP*/ CoAP*/ HTTP*/ HTTPS*
ECID*	Enhanced Cell ID
OTDOA*	Observed Time Difference of Arrival
DFOTA	Delta firmware upgrade over-the-air
eSIM	Supported ^①
QuecOpen®	<ul style="list-style-type: none">ROM: 200 KB for APP image binRAM: 400 KB (100 KB static memory and 300 KB dynamic memory)

* means under development.

① eSIM is reserved and not included by default. If needed, a different OC will be provided.

BC66-NA Development Schedule



The timeline may be adjusted according to the actual development status.
BC66NADAR01A01 cannot be upgraded to BC66NADAR02A0x via DFOTA.

BC66-NA Timeline



2020												2021											
Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.			

Project Stage

BC66-NA

Carrier Certification

Vodafone/ Deutsche Telekom/ T-Mobile

Completed

Verizon

Start

Complete (Planned)

AT&T/ SoftBank

TBD

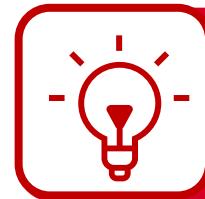
Regulatory/Other Certification

GCF/ CE/ PTCRB/ FCC/ IC/ KC/ JATE/ TELEC/ RCM

Completed

NCC/ NBTC/ IMDA/ ATEX

TBD



UNISOC Solution

NB-IoT Modules Roadmap



RDA8908A



BC65

- Cat NB2
- NB2: B1*/B3/B5/B8/B20/B28
- DL: Max. 127 kbps
- UL: Max. 158.5 kbps
- Global Version

RDA8909B



BC92

- Cat NB2/ GSM
- NB2: B3/B5/B8/B20/B28
- GSM: 850/900/1800/1900 MHz
- Global Version

xx/YY

Estimated Engineering Sample Date

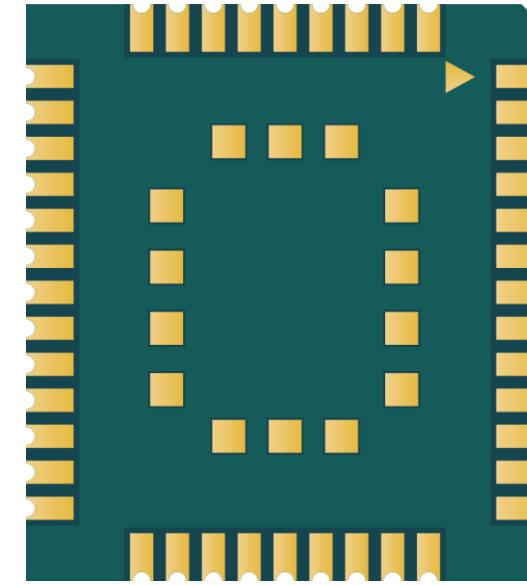
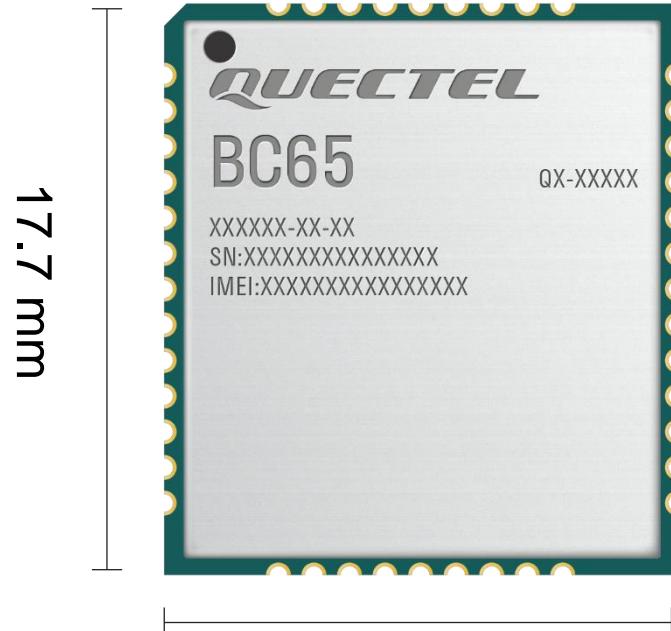
2020

2021

BC65 Mechanical Dimensions



Multi-Band LTE Cat NB2 Module (RDA8908A)



Length: 17.7 ± 0.15 mm
Width: 15.8 ± 0.15 mm
Height: 2.2 ± 0.2 mm
Weight: Approx. 1.2 g

BC65 Highlights

LTE Cat NB1 (Max.):
25.5 kbps (DL) / 62.5 kbps (UL)
LTE Cat NB2 (Max.):
127 kbps (DL) / 158.5 kbps (UL)



Highlight	Description
Global Bands	B1*/B3/B5/B8/B20/B28
Data Rate	<ul style="list-style-type: none">LTE Cat NB1 (Max.): 25.5 kbps (DL) / 62.5 kbps (UL)LTE Cat NB2 (Max.): 127 kbps (DL) / 158.5 kbps (UL)
Rich Hardware Interfaces	UART/(U)SIM/PSM_EINT/ADC/RESET/PWRKEY/RI/NETLIGHT/Antenna
Abundant Protocols	UDP/TCP/SNTP/MQTT/CoAP*/PPP/TLS/DTLS
eSIM Supported	eSIM [®] reserved to support customization
Power Supply Feature	Supply Voltage: 3.2–4.2 V, Typ. 3.8 V.
Wake-up Feature	Specialized PSM_EINT for module wake-up via external interrupt
Special Features	<ul style="list-style-type: none">Low power designDFOTA
Compatibility	Compatible with Quectel GSM module M66 and Quectel NB-IoT module BC66/BC68

* means under development.

① eSIM is reserved but not included by default.

BC65 Main Interfaces



Interface	Description
(U)SIM	1
UART	3 (Main/Debug/Auxiliary UART)
PSM_EINT	1 (wake up device via external interrupt)
ADC	1 (10 bits)
RESET	1
PWRKEY	1
RI	1
NETLIGHT	1
Antenna	1

BC65 Main Functions

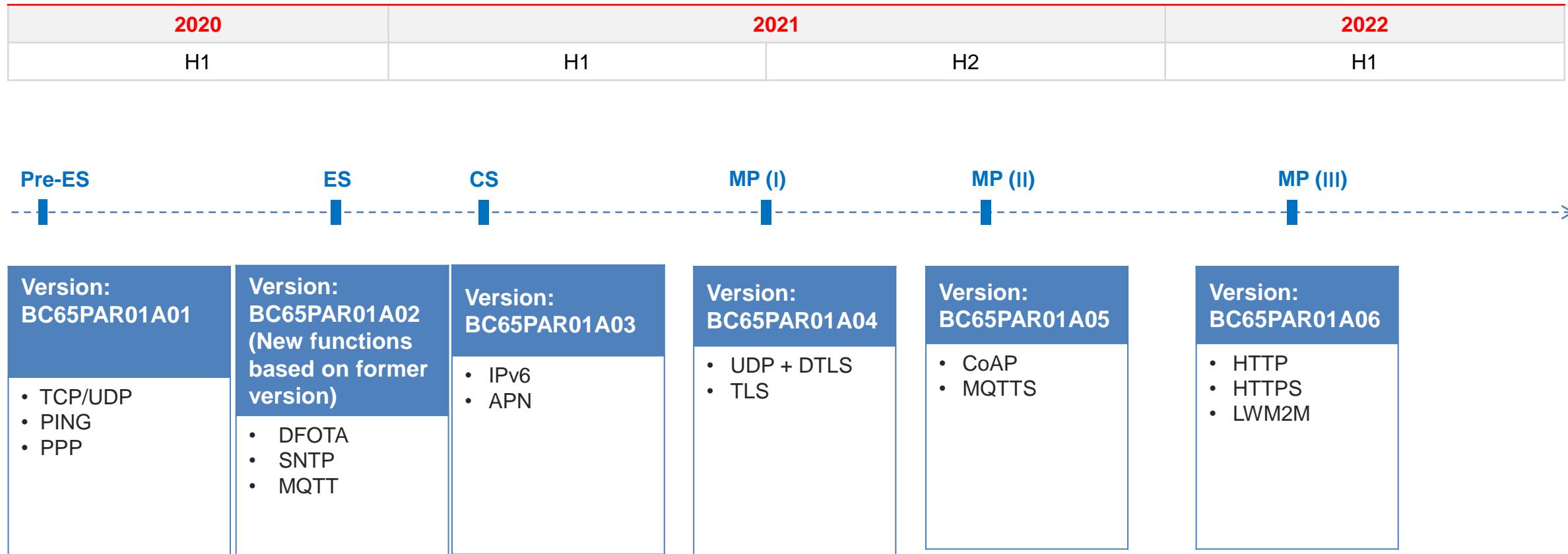


Function	Description
Protocols	UDP/TCP/SNTP/MQTT/CoAP*/PPP/TLS/DTLS
SMS*	Text and PDU mode
DFOTA	Delta Firmware Upgrade Over-The-Air
eSIM	Supported ⁽¹⁾
Power Supply	Range: 3.4–4.2 V Typical: 3.8 V

* means under development.

⁽¹⁾ eSIM is reserved but not included by default. If needed, a different OC will be provided.

BC65 Development Schedule



BC65 Timeline



Project Schedule

BC65

MP

MP: Hardware and software ready for mass production. For certification status, please refer to the "certification schedule".

Carrier Certification

Vodafone



Regulatory Certification

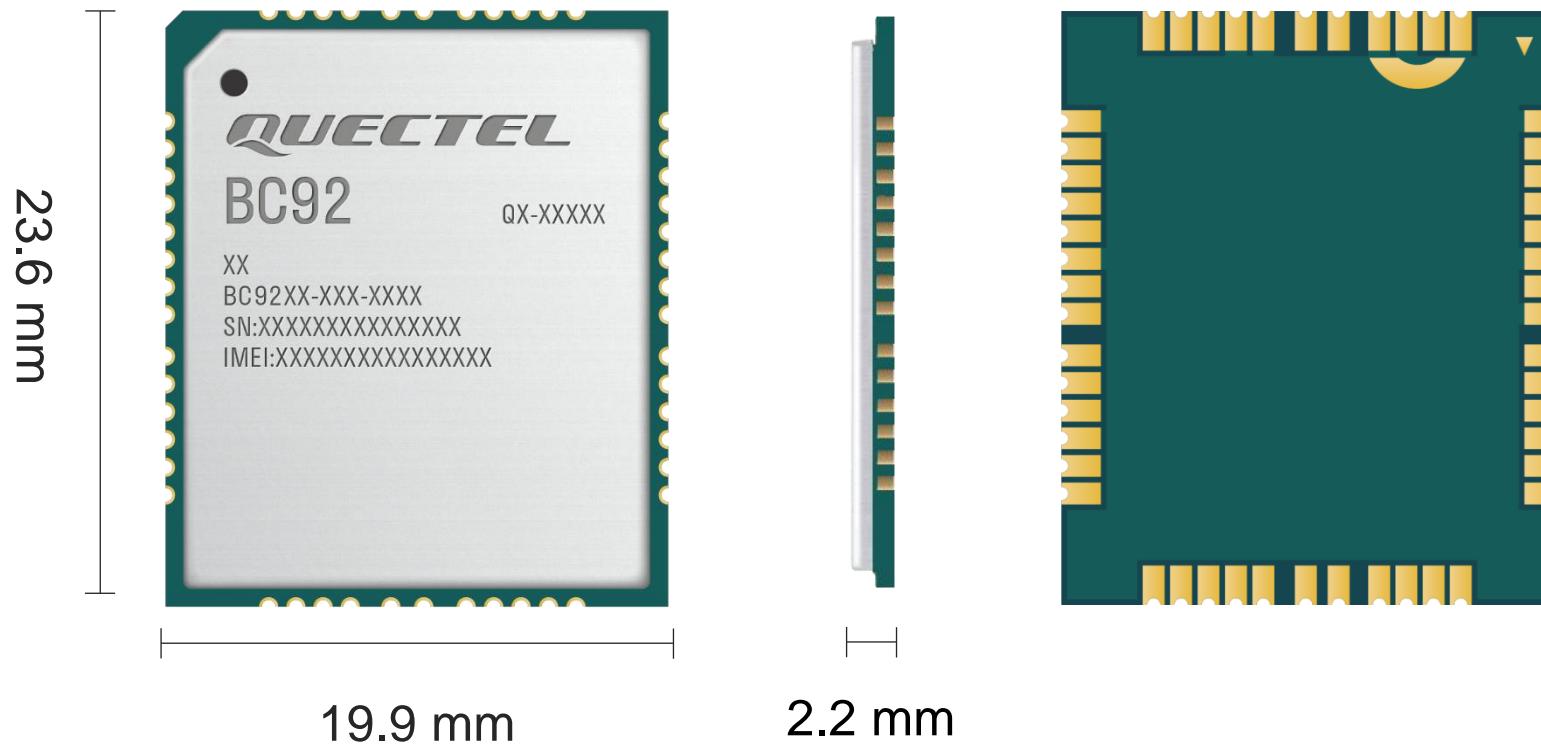
GCF/ CE/ RCM



BC92 Mechanical Dimensions



Multi-Band LTE Cat NB2 / GSM Module (RDA8909B)



Length: 23.6 mm (± 0.15 mm)

Width: 19.9 mm (± 0.15 mm)

Height: 2.2 mm (± 0.2 mm)

BC92 Highlights

LTE Cat NB2/GSM



LTE Cat NB1 (Max.): 25.5 kbps (DL) / 62.5 kbps (UL)

LTE Cat NB2 (Max.): 127 kbps (DL) / 158.5 kbps (UL)

GSM (Max.): 85.6 kbps (DL) / 85.6 kbps (UL)

Highlight	Description
Global Bands / Dual Mode	<ul style="list-style-type: none">LTE Cat NB2: B3/ B5/ B8/ B20/ B28GSM: 850/ 900/ 1800/ 1900 MHz
Data Rate	<ul style="list-style-type: none">LTE Cat NB1 (Max.): 25.5 kbps (DL) / 62.5 kbps (UL)LTE Cat NB2 (Max.): 127 kbps (DL) / 158.5 kbps (UL)GSM (Max.): 85.6 kbps (DL) / 85.6 kbps (UL)
Rich Hardware Interfaces	UART/(U)SIM/ADC/NETLIGHT/PSM_EINT/PWRKEY/RI/RESET/Antenna
Abundant Protocols	UDP/TCP/SNTP/PPP/MQTT/CoAP*/HTTP*/HTTPS*/FTP
Power Supply Feature	Supply Voltage: 3.4–4.2 V, typ. 3.8 V
Wake-up Feature	Specialized PSM_EINT for module wake-up via external interrupt
QuecLocator®	Location based on base station cell information
Special Features	<ul style="list-style-type: none">Built-in ADC temperature detection*Low power designDFOTA
Compatibility	Compatible with Quectel GSM module M95 and Quectel NB-IoT module BC95-G and Quectel LPWA BG95 module

* means under development.

BC92 Main Interfaces



Interface	Description
(U)SIM	2 [(U)SIM 1 supports NB-IoT/GSM, (U)SIM 2* only supports GSM]
UART	2 (Main, Debug)
PSM_EINT	1 (External Wake-up pin)
ADC	1 (10 bits)
RESET	1
PWRKEY	1
RI	1
NETLIGHT	1
Antenna	1

* means under development.

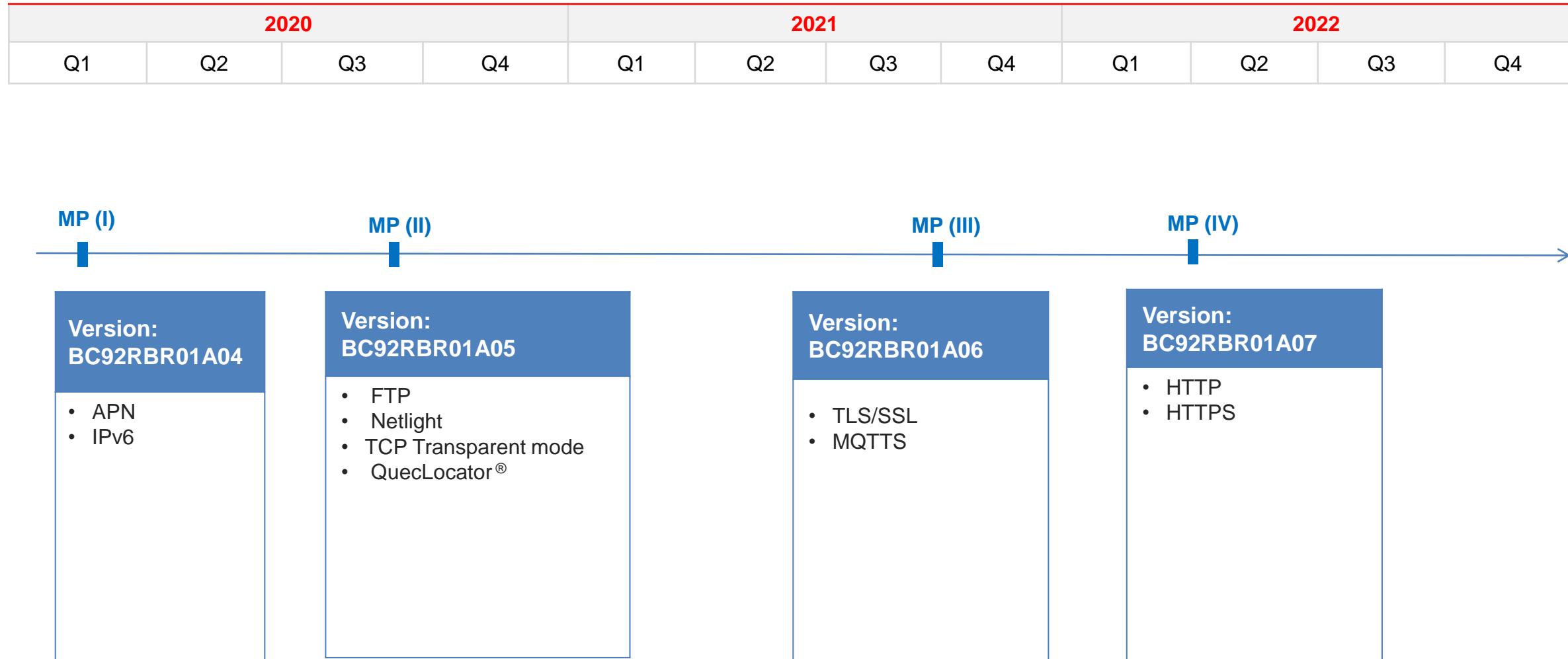
BC92 Main Functions



Function	Description
Protocols	UDP/TCP/SNTP/PPP/MQTT/CoAP*/HTTP*/HTTPS*/FTP
SMS*	Text and PDU mode
DFOTA	Delta Firmware Upgrade Over-The-Air
Power Supply	Range: 3.4–4.2 V Typical: 3.8 V

* means under development.

BC92 Development Schedule



Project Stage



Carrier Certification

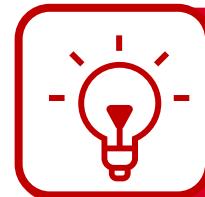
Vodafone/ Vodacom/ MTN



Regulatory Certification

CE/ RCM/ GCF/ ICASA





HiSilicon Solution

HiSilicon 5G NB-IoT Solution Roadmap



HiSilicon 5G NB-IoT Solution

Boudica V150



BC95-G

- Cat NB2 (NB-IoT)
- 125K DL/ 150K UL
- Global Version



BC68

- Cat NB2 (NB-IoT)
- 125K DL/ 150K UL
- Global Version



BC95-GV

- 3GPP Rel-14/Rel-15*
- Cat NB2 + BLE 5.0*
- Compatible with BC95-G



BC68-GV

- 3GPP Rel-14/Rel-15*
- Cat NB2 + BLE 5.0*
- Compatible with BC68

2017

2018

2019

2020

2021

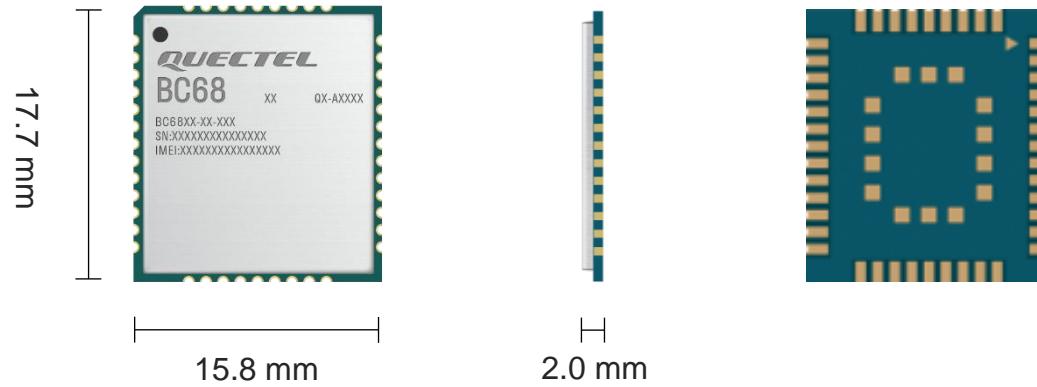
2022

BC68&BC68-GV Mechanical Dimensions

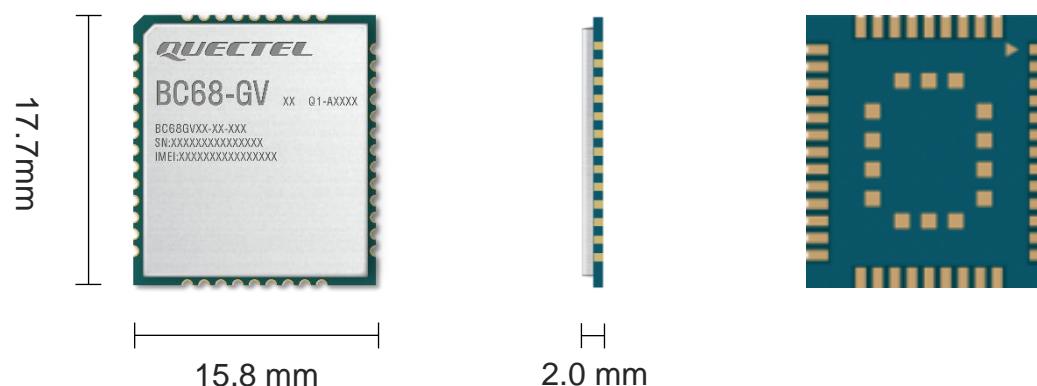


Multi-Band LTE Cat NB2 Module

BC68 (Boudica V150)



BC68-GV (HiSilicon 5G NB-IoT Solution)



17.7 mm × 15.8 mm × 2.0 mm

Length: 17.7 ± 0.15 mm

Width: 15.8 ± 0.15 mm

Height: 2.0 ± 0.2 mm

Weight: BC68 Approx. 1.1 ± 0.2 g

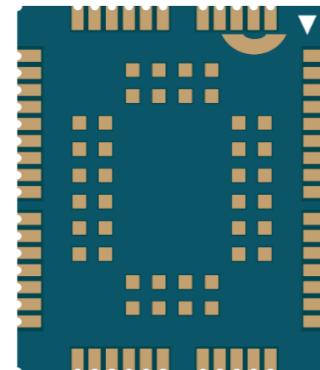
BC68-GV Approx. 1.0 ± 0.2 g

BC95-G&BC95-GV Mechanical Dimensions



Multi-Band LTE Cat NB2 Module

BC95-G (Boudica V150)



23.6 mm × 19.9 mm × 2.2 mm

Length: 23.6 ± 0.15 mm

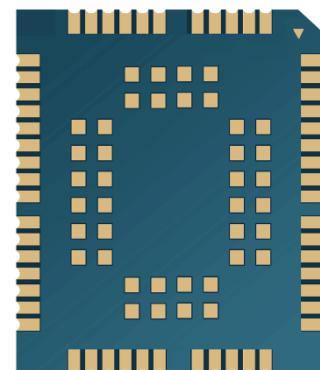
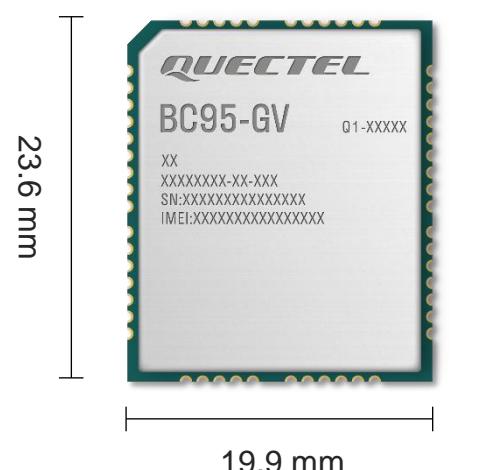
Width: 19.9 ± 0.15 mm

Height: 2.2 ± 0.2 mm

Weight: BC95-G Approx. 1.8 ± 0.2 g

BC95-GV Approx. 1.5 ± 0.2 g

BC95-GV (HiSilicon 5G NB-IoT Solution)



BC68&BC68-GV Specifications



Module	BC68 (EOL)	BC68-GV ①
Chipset	Boudica V150 (Hi2115)	HiSilicon 5G NB-IoT Solution (CB0201)
Category	3GPP Rel-14, Cat NB2	3GPP Rel-14, 3GPP Rel-15*, Cat NB2
Band	B1/B3/B5/B8/B20/B28 @ LTE-FDD	B1/B3/B5/B8/B20/B28/B18*/B26* @ LTE-FDD
Dimension	17.7 mm × 15.8 mm × 2.0 mm	17.7 mm × 15.8 mm × 2.0 mm
Data Rate	Single Tone	DL: 25.2 kbps; UL: 15.625 kbps
	Multi Tone	DL: 25.2 kbps; UL: 54 kbps
	Extended TBS/2 HARQ	DL: 125 kbps; UL: 150 kbps
Protocol	IPv4/ IPv6/ UDP/ CoAP/ LwM2M/ Non-IP/ DTLS/ TCP/ MQTT	IPv4*/ IPv6*/ UDP*/ TCP*/ Non-IP*/ CoAP*/ LwM2M*/ DTLS*/ MQTT*/ HTTP*/ DNS*/ TLS*/ MQTTS*
Supply Voltage	3.1–4.2 V, typ. 3.6 V	2.1–4.2 V, typ. 3.0/3.6 V
Power Consumption (Typical)	<ul style="list-style-type: none"> • 3 µA @ PSM • 0.5 mA @ Idle Mode, DRX = 2.56 s, ECL0 • 250 mA @ Tx, 23 dBm (B1/B3) • 220 mA @ Tx, 23 dBm (B5/B8/B20) • 280 mA @ Tx, 23 dBm (B28) • 130 mA @ Tx, 12 dBm (B1/B3/B5/B8/B20/B28) • 70 mA @ Tx, 0 dBm (B1/B3/B5/B8/B20/B28) • 60 mA @ Rx 	<ul style="list-style-type: none"> • 2 µA @ PSM • 0.23 mA @ Idle Mode, DRX = 2.56 s, ECL0 • 310 mA @ Tx, 23 dBm (B1/B3) • 210 mA @ Tx, 23 dBm (B5/B8/B20) • 210 mA @ Tx, 23 dBm (B28) • 75 mA @ Tx, 12 dBm (B1/B3/B5/B8/B20/B28) • 45 mA @ Tx, 0 dBm (B1/B3/B5/B8/B20/B28) • 23 mA @ Rx
Other Features	-	Integrated BLE 5.0* (AoA and mesh not supported)
Region	Global	Global
Certification	Carrier: Vodafone/ Deutsche Telekom/ TIM/ Telefónica/ Altice-MEO/ SoftBank/ Telstra Regulatory: GCF/ CE/ NCC/ JATE/ TELEC/ RCM/ FAC/ IMDA Others: ATEX	Carrier: Vodafone*/ Deutsche Telekom*/ TIM*/ Telefónica*/ Altice-MEO*/ SoftBank*/ Telstra* Regulatory: GCF*/ CE*/ NCC*/ JATE*/ TELEC*/ RCM*/ FAC*/ IMDA* Others: ATEX*

“*” means under development/planning/ongoing.

① Preliminary, specific hardware/software specifications to be determined.

BC95-G&BC95-GV Specifications



Module	BC95-G (EOL)	BC95-GV ^①
Chipset	Boudica V150 (Hi2115)	HiSilicon 5G NB-IoT Solution (CB0201)
Category	3GPP Rel-14, Cat NB2	3GPP Rel-14, 3GPP Rel-15*, Cat NB2
Band	B1/B3/B5/B8/B20/B28 @ LTE-FDD	B1/B3/B5/B8/B20/B28/B18*/B26* @ LTE-FDD
Dimension	23.6 mm × 19.9 mm × 2.2 mm	23.6 mm × 19.9 mm × 2.2 mm
Data Rate	Single Tone	DL: 25.2 kbps; UL: 15.625 kbps
	Multi Tone	DL: 25.2 kbps; UL: 54 kbps
	Extended TBS/2 HARQ	DL: 125 kbps; UL: 150 kbps
Protocol	IPv4/ IPv6/ UDP/ CoAP/ LwM2M/ Non-IP/ DTLS/ TCP/ MQTT	IPv4*/ IPv6*/ UDP*/ TCP*/ Non-IP*/ CoAP*/ LwM2M*/ DTLS*/ MQTT*/ HTTP*/ DNS*/ TLS*/ MQTTS*
Supply Voltage	3.1–4.2 V, typ. 3.6 V	2.1–4.2 V, typ. 3.0/3.6 V
Power Consumption (Typical)	<ul style="list-style-type: none"> • 3 µA @ PSM • 0.5 mA @ Idle Mode, DRX = 2.56 s, ECL0 • 250 mA @ Tx, 23 dBm (B1/B3) • 220 mA @ Tx, 23 dBm (B5/B8/B20) • 280 mA @ Tx, 23 dBm (B28) • 130 mA @ Tx, 12 dBm (B1/B3/B5/B8/B20/B28) • 70 mA @ Tx, 0 dBm (B1/B3/B5/B8/B20/B28) • 60 mA @ Rx 	<ul style="list-style-type: none"> • 2 µA @ PSM • 0.23 mA @ Idle Mode, DRX = 2.56 s, ECL0 • 310 mA @ Tx, 23 dBm (B1/B3) • 210 mA @ Tx, 23 dBm (B5/B8/B20) • 210 mA @ Tx, 23 dBm (B28) • 75 mA @ Tx, 12 dBm (B1/B3/B5/B8/B20/B28) • 45 mA @ Tx, 0 dBm (B1/B3/B5/B8/B20/B28) • 23 mA @ Rx
Other Features	-	Integrated BLE 5.0* (AoA and mesh not supported)
Region	Global	Global
Certification	Carrier: Vodafone/ Deutsche Telekom/ Telefónica/ KT/ LGU+/ SoftBank/ Telstra/ Spark Regulatory: GCF/ CE/ Anatel/ KC/ NCC/ JATE/ TELEC/ RCM/ FAC/ NBTC/ IMDA Others: ATEX	Carrier: Vodafone*/ Deutsche Telekom*/ Telefónica*/ KT*/ LGU+*/ SoftBank*/ Telstra*/ Spark* Regulatory: GCF*/ CE*/ Anatel*/ KC*/ NCC*/ JATE*/ TELEC*/ RCM*/ FAC*/ NBTC*/ IMDA* Others: ATEX*

“*” means under development/planning/ongoing.

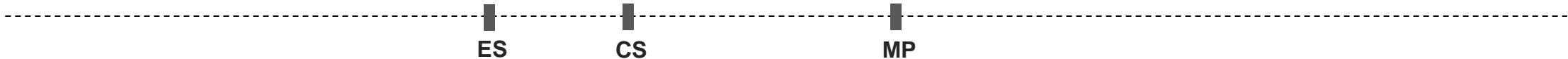
① Preliminary, specific hardware/software specifications to be determined.

BC68-GV Timeline



2021						2022					
Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.

Project Schedule



ES: Engineering samples ready. Basic functions are available for customers' simple demo purpose.

CS: Commercial samples ready. Stable hardware design and quite stable software design. New software features can be added upon request.

MP: Hardware and software ready for mass production. For certification status, please refer to the certification schedule below.

Carrier Certification

Vodafone/ Deutsche Telekom/ TIM/ Telefónica/ Altice-MEO/ SoftBank/ Telstra

TBD

Regulatory/Other Certification

GCF/ CE/ NCC/ JATE/ TELEC/ RCM/ FAC/ IMDA/ ATEX

TBD

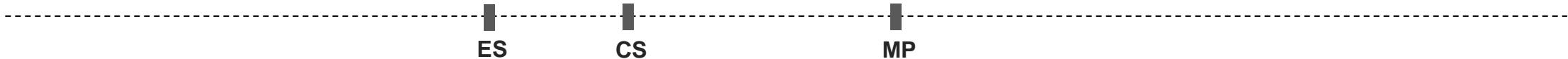
Note: Information in this page is preliminary.

BC95-GV Timeline



2021						2022					
Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.

Project Schedule



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Carrier Certification

Vodafone/ Deutsche Telekom/ Telefónica/ KT/ LGU+/ SoftBank/ Telstra/ Spark TBD

Regulatory/Other Certification

GCF/ CE/ Anatel/ KC/ NCC/ JATE/ TELEC/ RCM/ FAC/ NBTC/ IMDA/ ATEX TBD

Note: Information in this page is preliminary.

BC68-GV&BC95-GV New Features



3GPP Release	Feature	Description
Rel-15*	Wake-up signaling for IDLE mode	This feature allows eNB to send UE a 'wake-up signal' (WUS) to instruct the UE that it has to monitor NPDCCH for paging.
	Early data transmission	An idle mode UE is able to transmit data in Msg3 of the random access procedure without establishing RRC connections.
	Physical layer SR with SPS BSR	The eNB is able to configure by RRC periodic NPUSCH resources for the UE to send BSR.
	Quick release of RRC connection	This feature allows that, in case the UE is not polled, the UE can consider the receipt of the RRConnectionRelease message to be successfully acknowledged as soon as the UE has sent HARQ ACK.
	Relaxed monitoring for cell reselection enhancement	Greatly reduces RRM monitoring in cases where an NB-IoT UE is stationary, and UE battery life can be correspondingly extended.
	RLC UM support	This reduces the need to send RLC signaling over the air for IoT traffic which may be latency and/or loss tolerant, or recoverable by the application layer.
	Reduced system acquisition time	Compared to Rel-13 which supports up to 8 SIB1-NB repetitions, Rel-15 allows 16 repetitions.
	RRM measurement enhancement	Allows the UE to measure the RSRP through NSSS.
	NPRACH range enhancement	Allows unambiguous range determination up to 120 km.
	Power headroom reporting(PHR) enhancement	This feature improves the granularity of PHR transmitted in Msg3 to have 16 levels.
Rel-14	Access barring enhancement	This feature allows UEs to be barred on a per-coverage level basis.
	Mixed standalone operation	This feature allows configuration of SA anchor carriers with IB and GB non-anchor carriers, and of IB and GB anchor carriers with SA non-anchor carriers.
	Measurement Report on MSG5	Report RSRP/RSRQ in Msg5, which makes it easier for the network to know the coverage of the UE.
	CQI Report on MSG3	Report CQI in Msg3, which makes it easier for the eNB to choose the repetition of NPDSCH/NPDCCH.

** means under development.

BC68-GV&BC95-GV Enhanced Features



Feature	Description
Network	Cat NB2 + BLE 5.0*
Global Bands	B1/ B3/ B5/ B8/ B20/ B28/ B18*/ B26*
Low Power Consumption	PSM and eDRX features realize ultra-low power consumption and extended battery life; 2 µA @ PSM; 0.23 mA @ Idle Mode, DRX = 2.56 s, ECL0; Max. 210 mA @ Tx, 23 dBm; 23 mA @ Rx
Abundant Protocols*	IPv4/ IPv6/ UDP/ TCP/ Non-IP/ CoAP/ LwM2M/ DTLS/ MQTT/ HTTP/ DNS/ TLS/ MQTTS
Special Features	DFOTA; DFOTA Over BLE*; QuecOpen®*; eSIM ^①
Security	TEE Security; Digital Signature*
Compatibility	Compatible with various Quectel modules in packaging
Extensive Experience	Over 50 million shipments, five-hundred-customer foundation; Customers can deploy commercial products more quickly and stably. Millions of terminals have been functioning well with Quectel NB-IoT modules, and such applications include smart meters, trackers and smart NB-IoT white goods, etc.

“*” means under development.

^① eSIM is reserved but not included by default.

Project Stage

BC68  MP

Carrier Certification

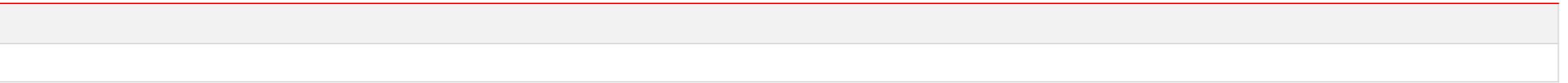
Vodafone/ Deutsche Telekom/ TIM/ Telefónica/ Altice-MEO/ SoftBank/ Telstra



Regulatory/Other Certification

GCF/ CE/ NCC/ JATE/ TELEC/ RCM/ FAC/ IMDA/ ATEX





Project Stage

BC95-G  MP

Carrier Certification

Vodafone/ Deutsche Telekom/ Telefónica/ KT/ LGU+/ SoftBank/ Telstra/ Spark



Regulatory/Other Certification

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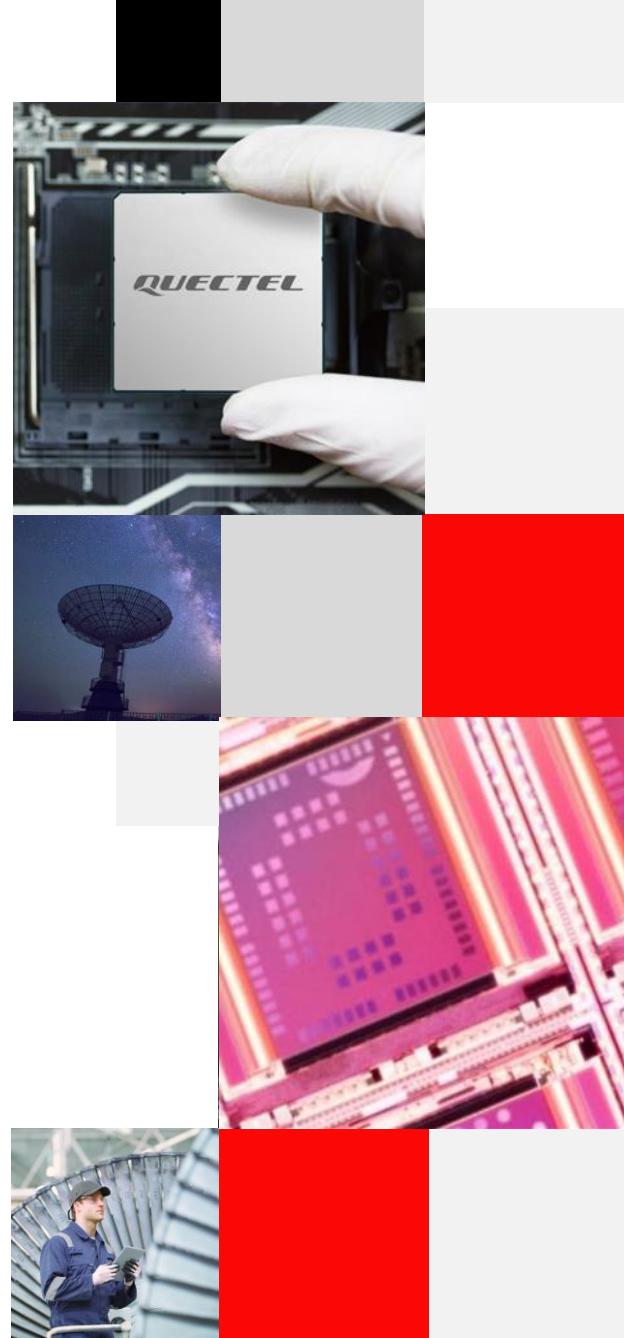
LPWA Technology

LPWA Modules Summary

Product Overview

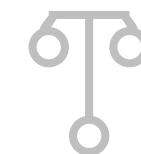
Applications

Build a Smarter World



LPWA Application Scenarios

QUECTEL



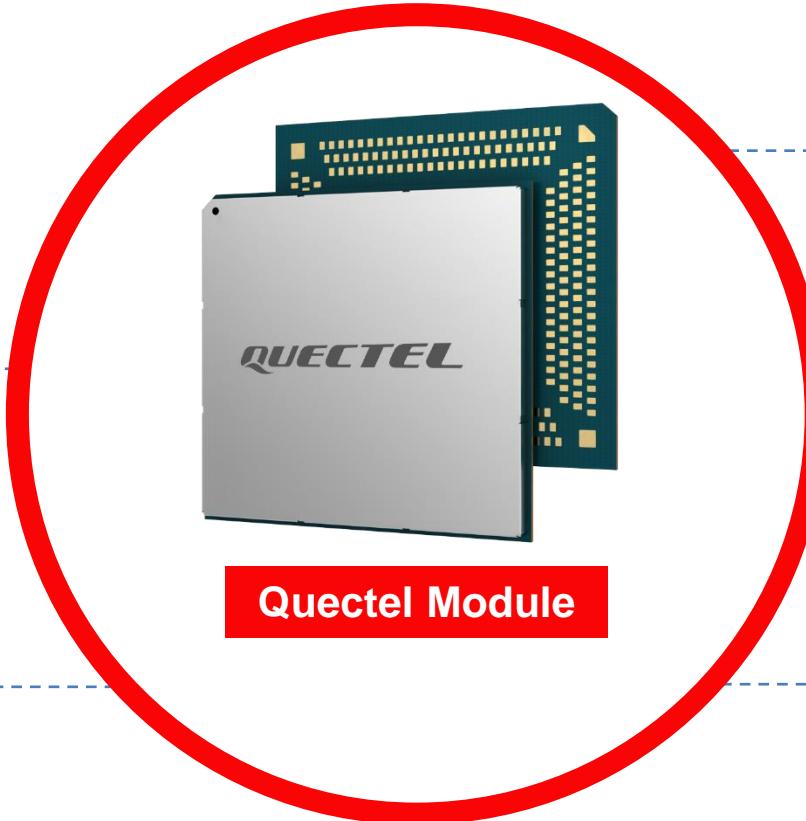
Public Utilities

- Water/Gas Metering
- Smart Parking
- Fire Hydrant
- Smoke Detector
- Street Lighting
- Smart Dustbin



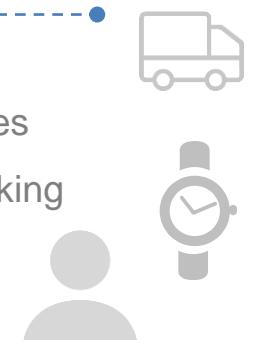
Industry & Agriculture

- Gas Detector
- Soil PH/Optical Sensor
- Machine Alarm
- Irrigation Controller



Smart Life

- Asset Tracking
- Wearable Devices
- Person/Pet Tracking



Smart Home

- Intelligent Door Lock
- Intelligent Control



Public Utilities – Smart Metering

QUECTEL

By 2024, there will be
1.9 billion
connected meters ^①



Domestic Meters

Wind Power Plant

Factory

Workplace

Nuclear Power Plant

Renewable Energy

Thermal Power Plant

Ecological Vehicle

Hydraulic Power Plant

Photoelectricity



Water Meter

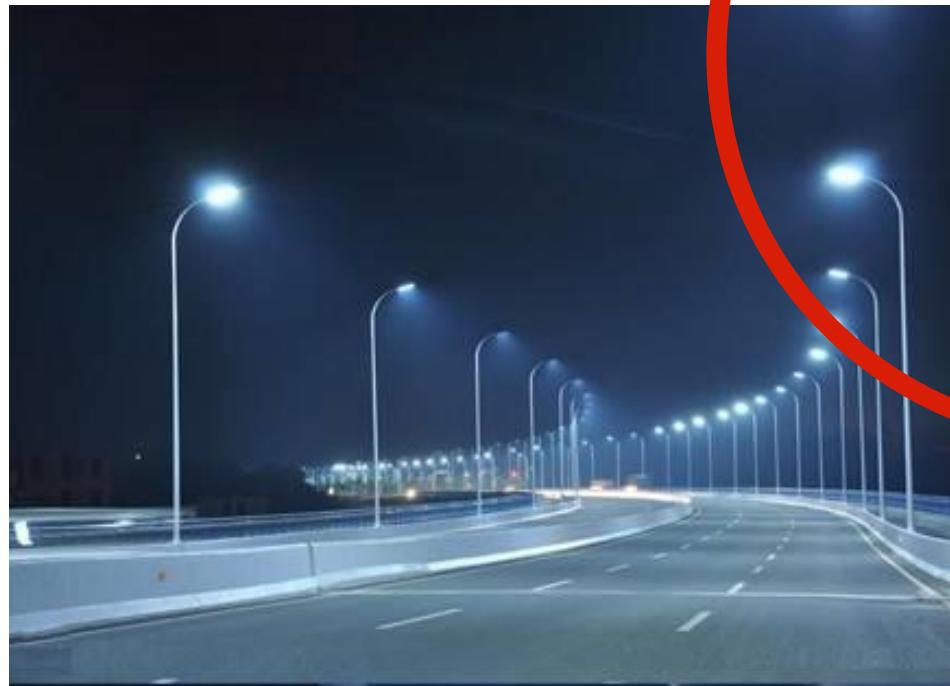


Electricity Meter



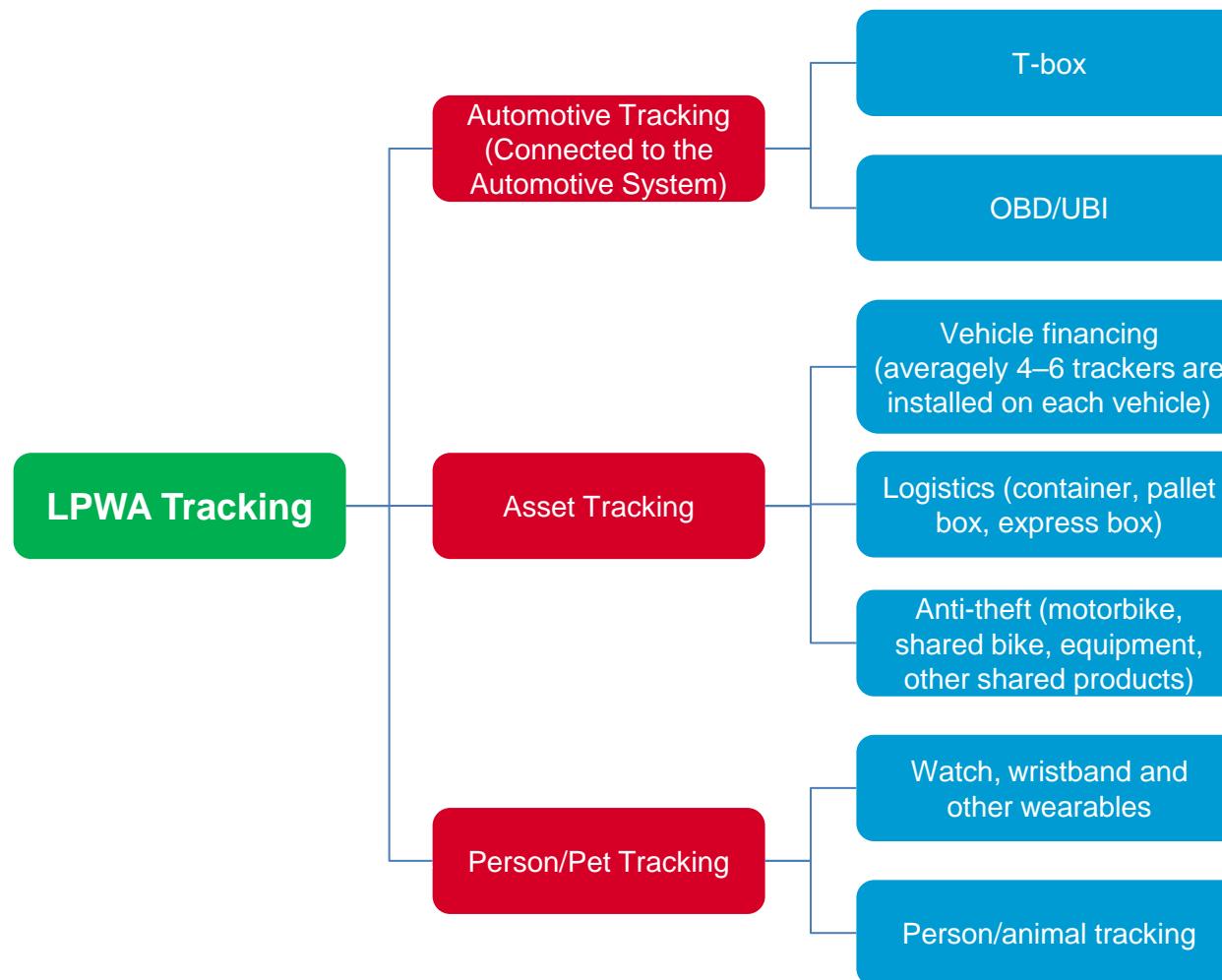
Public Utilities – Street Lighting

QUECTEL

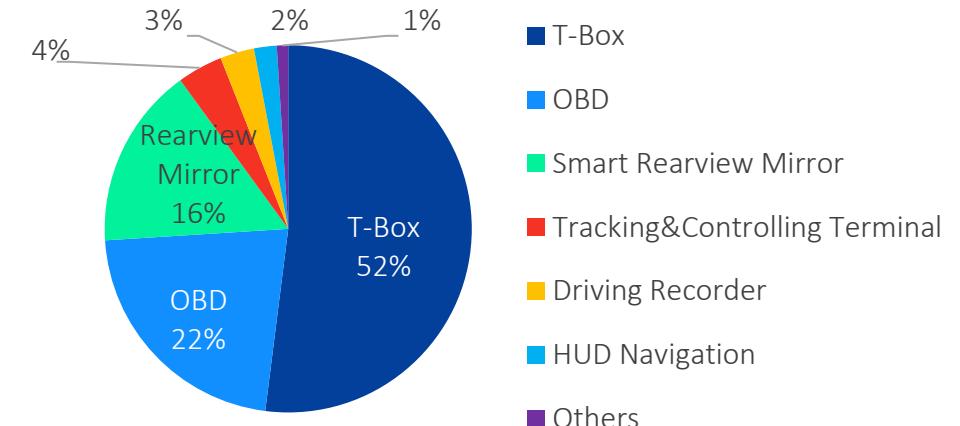


- Real time data feeds directly to the operation center
- Manual brightening of lighting when required
- Improved energy efficiency

Smart Life – LPWA Tracker



According to CAICT ^①, 10 million automotive wireless terminals were sold in 2018 in China:



Smart Home

Feature:

Non-inductive connection,
automation, machine learning

Trend:

Smarter, more convenient,
safer, more energy-efficient

Including:

White goods, black goods,
security, monitors, medical
treatment, healthcare,
wearables, wireless controllers,
etc.



Industry & Agriculture – Multi-gas Detector

QUECTEL



- Hazardous gas monitoring, including VOCs, combustibles and toxics, etc.
- Real-time gas concentration reading, location, alarm and status indication

Industry & Agriculture – Robotic Lawn Mower

QUECTEL



Smart Robotic Lawn Mower

(Based on Quectel LPWA module)



1 Wireless Communication Easy Operation with APP



Positioning technology, easy installation

2 Intelligent Cutting Smart Route



Smart algorithm

3 Wireless Charging High-efficiency Cutting



Self charging

4 Safe & Eco-friendly Low Noise and Power Consumption

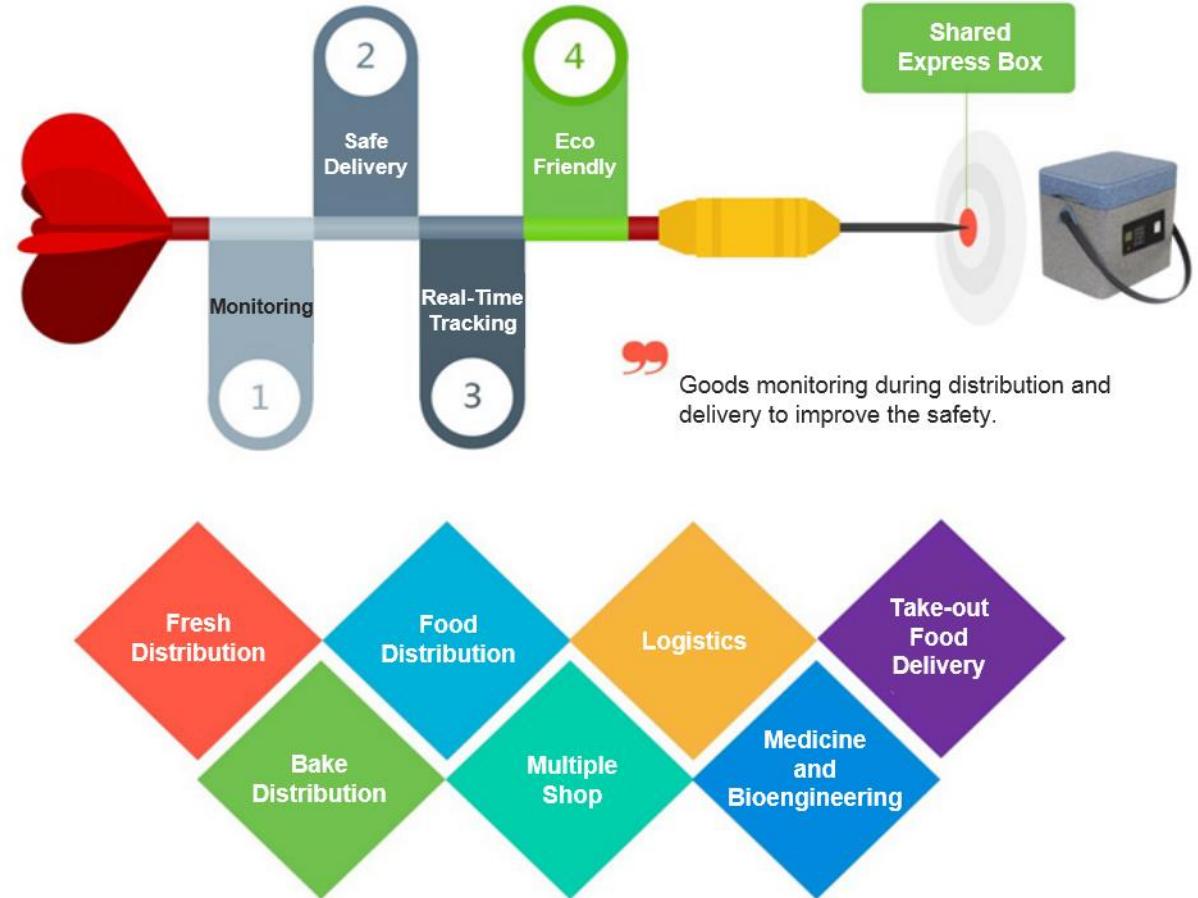


Lower noise

Smart Logistics – NB-IoT Shared Express Box



Smart IoT express box, featuring heat preservation, safe lock, real-time location, real-time temperature, integrates information technology and equipment IoT automation





The number one cellular module vendor in the world and a leading GNSS module supplier

- Unbeatable choice from the broadest module portfolio in the world
- The highest quality products for the best possible prices
- Superb support with the largest R&D team in the industry
- Continuous innovation – first to market with 5G, LPWA, CV2X, snapdragon
- A passionate, dedicated team of “Quectelers” ensure our customers always come first

Thank You

Build a Smarter World

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