



# Quectel BG96 LPWA Module

## Product Overview

December, 2019

# Technical Background

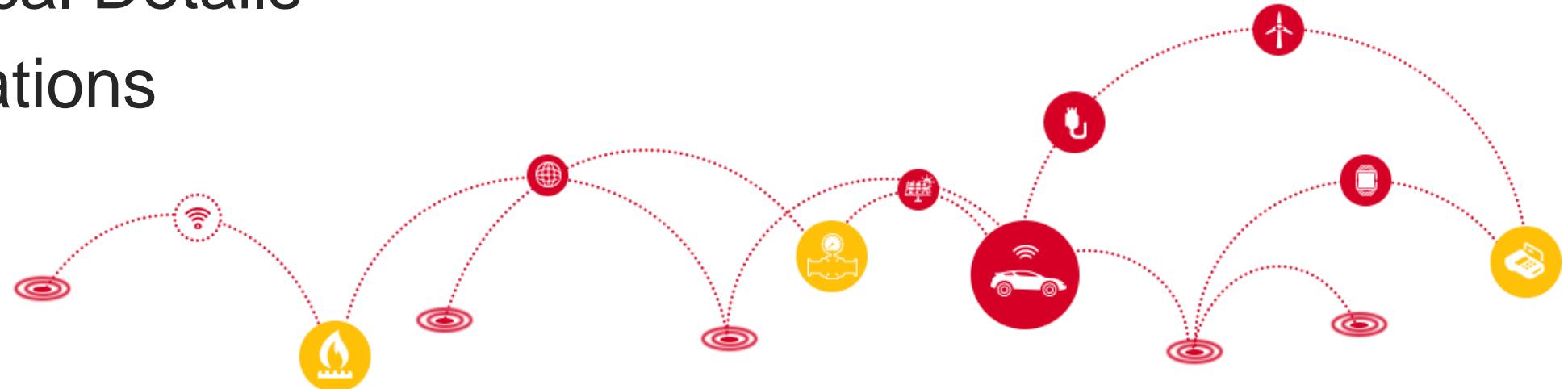
LPWA Roadmap

Highlights & Specifications

Development Timeline

Technical Details

Applications

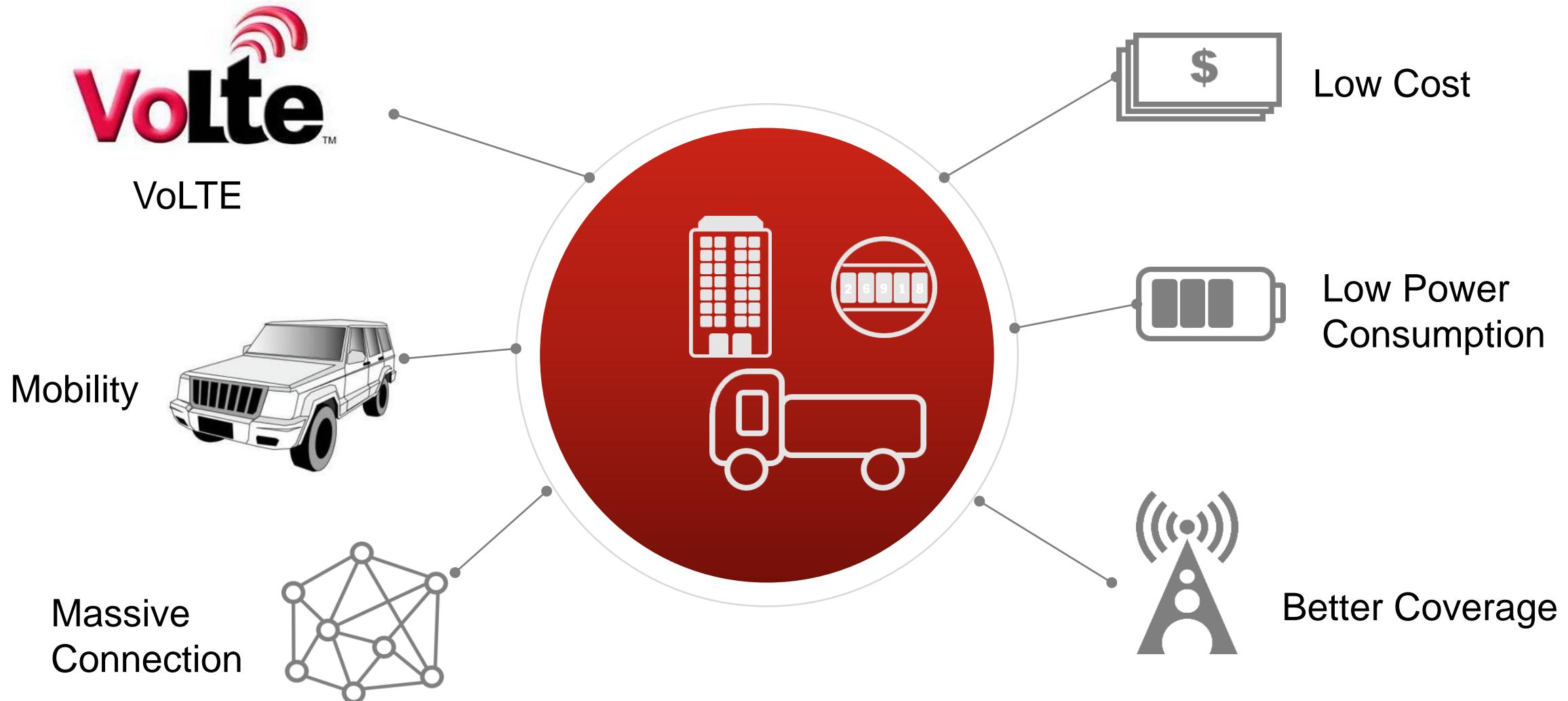


# LPWA Evolution

	Rel-8 Cat 4	Rel-11 Cat 1	Rel-13 Cat M1	Rel-13 Cat NB1
<b>Downlink Peak Rate</b>	150Mbps	10Mbps	1Mbps	<100Kbps
<b>Uplink Peak Rate</b>	50Mbps	5Mbps	1Mbps (Full Dup.)	<100Kbps
<b>Coverage MCL (Minimum Coupling Loss)</b>	140.7dB	140.7dB	155.7dB	164dB
<b>Battery Life (200 bytes/day)</b>	<1 year	<1 year	~10 years	~10 years
<b>Number of Antennas</b>	2	2	1	1
<b>UE Receive Bandwidth</b>	20MHz	20MHz	1.4MHz	200KHz
<b>UE Transmit Power</b>	23dBm	23dBm	23dBm	23dBm
<b>Standard Readiness</b>	Now	Now	Mar. 11, 2016	Jun. 9, 2017
<b>Network Readiness</b>	Now	Now	Q3 2017	Q3 2017

LPWA: Low Power Wide Area

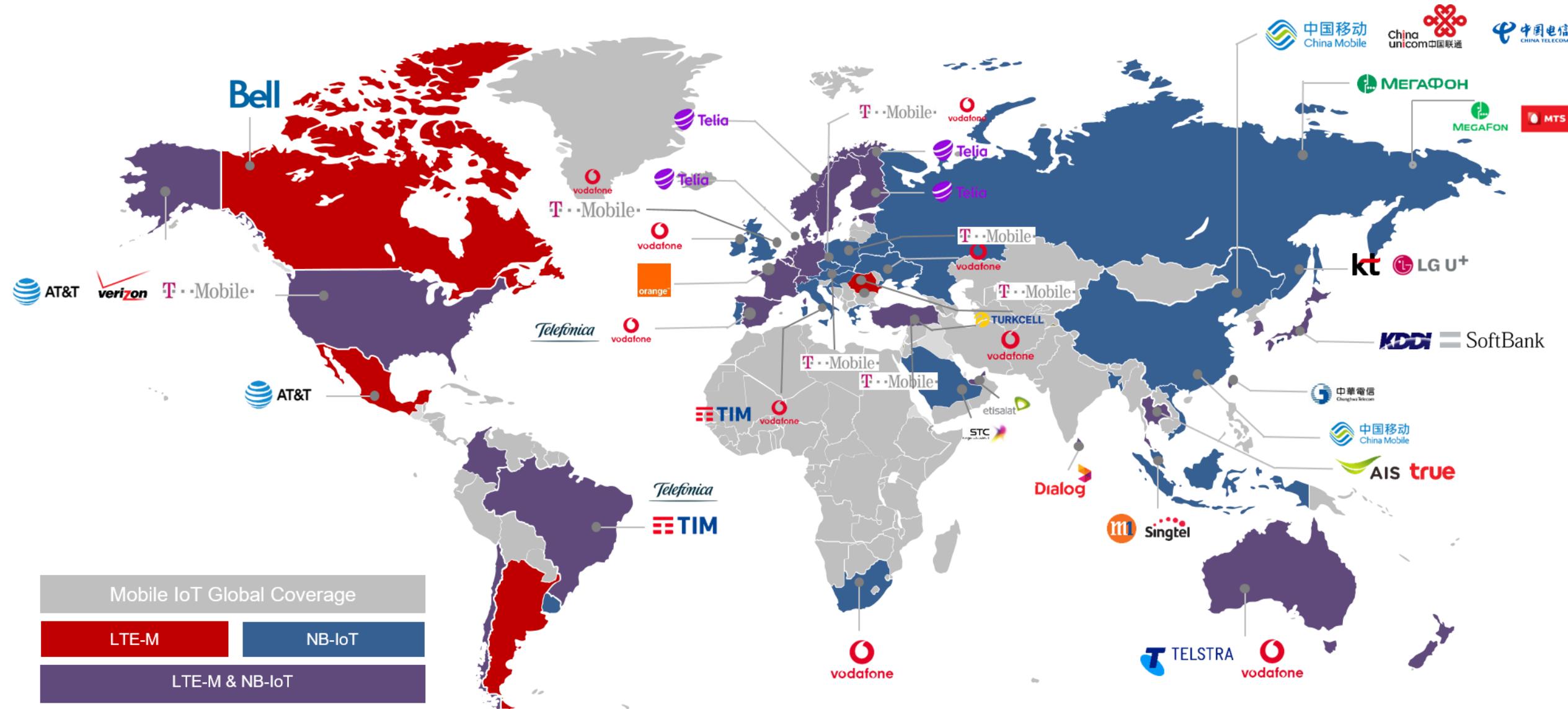
# eMTC Advantages



eMTC: Enhanced Machine Type Communication

# LPWA Network Deployment

(Based on GSMA Data up to Nov. 10, 2019)



# NB-IoT Global Coverage (1)

(Based on GSMA Data up to Nov. 10, 2019)



## NB-IoT = 90

Operator	Country/Region	Bands	Operator	Country/Region	Bands	Operator	Country/Region	Bands
3	Hong Kong, China	8	Elisa	Finland	20, 3	Orange	Belgium	20
A1	Austria	20	Elisa	Estonia	20	Proximus	Belgium	20
A1	Croatia	20	Etisalat	UAE	20	SFR	France	20
AIS	Thailand	8	Entel	Chile	28	Singtel	Singapore	8
APTG	Taiwan, China	8	FarEasTone	Taiwan, China	28	SmarTone	Hong Kong, China	8
Altice	Portugal	20	Grameenphone	Bangladesh	3, 8 (TBC)	SoftBank	Japan	1, 3, 8
Antel	Uruguay	28	KT	South Korea	3	StarHub	Singapore	8
AT&T	United States	2, 4, 12	Kyvistar	Ukraine	3	STC	Saudi Arabia	12
China Mobile	China	8	LGU+	South Korea	5	Swisscom	Switzerland	20
China Mobile	Hong Kong, China	3	M1	Singapore	3, 8	Taiwan Mobile	Taiwan, China	3, 28
China Telecom	China	5	Maxis	Malaysia (6 Cities)	3	TDC	Denmark	20
China Unicom	China	3, 8	Mobitel	Sri Lanka	8	Telecom Italia	Brazil (TIM Brazil)	3, 28
Chunghwa	Taiwan, China	8	MegaFon	Russia	20, 8, 3	Telecom Italia	Italy	20
Dialog Axiata	Sri Lanka	3, 8	Mobitel	Sri Lanka	3	Telefónica	Spain	20
DNA	Finland	20, 3	MTS	Russia	3	Telefónica	Brazil	3, 28
DU	UAE	20	NOS	Portugal	20	Telefónica	Germany	8, 20
DT	Australia	8	NTT Docomo	Japan	1, 19	Telefonica	Colombia	2

# NB-IoT Global Coverage (2)

(Based on GSMA Data up to Nov. 10, 2019)



## NB-IoT = 90

Operator	Country/Region	Bands	Operator	Country/Region	Bands	Operator	Country/Region	Bands
Telenor	Denmark	20	T-Mobile	US	2, 4, 12, 66, 71	Vodafone	Turkey	8, 20
Telenor	Norway	8, 20	Turkcell	Turkey	20	Vodafone	United Kingdom	20
Telia	Finland	20	Velcom	Belarus	8	Vodafone	Ukraine	3
Telia	Norway	20	Vodafone	Australia	8	Verizon	North America	13
Telia	Sweden	20	Vodafone	Czech Republic	8, 20	Viettel	Vietnam	/
Telia	Denmark	20, 8	Vodafone	Germany	20			
Telia	Estonia	20	Vodafone	Greece	20			
Telkomsel	Indonesia	8	Vodafone	Hungary	20			
Telstra	Australia	28	Vodafone	Ireland	20			
True	Thailand	8	Vodafone	Italy	20			
T-Mobile	Austria	8	Vodafone	Malta	/			
T-Mobile	Croatia	8, 20	Vodafone	New Zealand	28			
T-Mobile	Germany	8, 20	Vodafone	Portugal	20			
T-Mobile	Greece	20	Vodafone	Spain	8, 20			
T-Mobile	Poland	20	Vodafone	South Africa	8			
T-Mobile	Slovakia	20	Vodafone	South Africa	8			
T-Mobile	Netherlands	20	Vodafone	Netherlands	20			

# LTE-M Global Coverage

(Based on GSMA Data up to Nov. 10, 2019)



**LTE-M = 47**

Operator	Country/Region	Bands	Operator	Country/Region	Bands	Operator	Country/Region	Bands
AIS	Thailand	3, 8	KPN	Netherlands	20	Telefonica	Colombia	4
América Móvil	Mexico	4	LGU+	South Korea	5	Telia	Sweden	20
APTG	Taiwan, China	8, 28	NTT DOCOMO	Japan	1, 19	Telenor	Sweden	20
AT&T	Mexico	4, 5	Orange	Belgium	20	Telenor	Denmark	20
AT&T	US	2, 4, 12	Orange	France	20	Telenor	Norway	20
Bell	Canada	12	Orange	Romania	3, 7 (TBC)	Telstra	Australia	28
Chunghwa	Taiwan, China	3	Orange	Spain	20	Telus	Canada	2, 4, 5, 12
Claro	Brazil	3, 28	Rogers	Canada	4, 5, 12	Turkcell	Turkey	/
Claro	Colombia	2	SoftBank	Japan	1, 3, 8	USCC	US	2, 4, 5, 12
Claro	Chile	28	Spark	New Zealand	3, 28	VIVO	Brazil	3, 28
Claro	Argentina	28	Swisscom	Switzerland	20	Verizon	US	4, 13
Dialog Axiata	Sri Lanka	8	Sprint	US	25, 26	Vodafone	New Zealand	3, 28
DNA	Finland	20, 3	SKT	South Korea	3, 5	Vodafone	Netherlands	20
Elisa	Estonia	/	Singtel	Singapore	3			
Etisalat	UAE	5	Telefónica	Argentina	4, 28			
KDDI	Japan	18, 26	Telefónica	Brazil	3, 28			
KT	South Korea	/	Telefónica	Germany	20			

# Technical Background

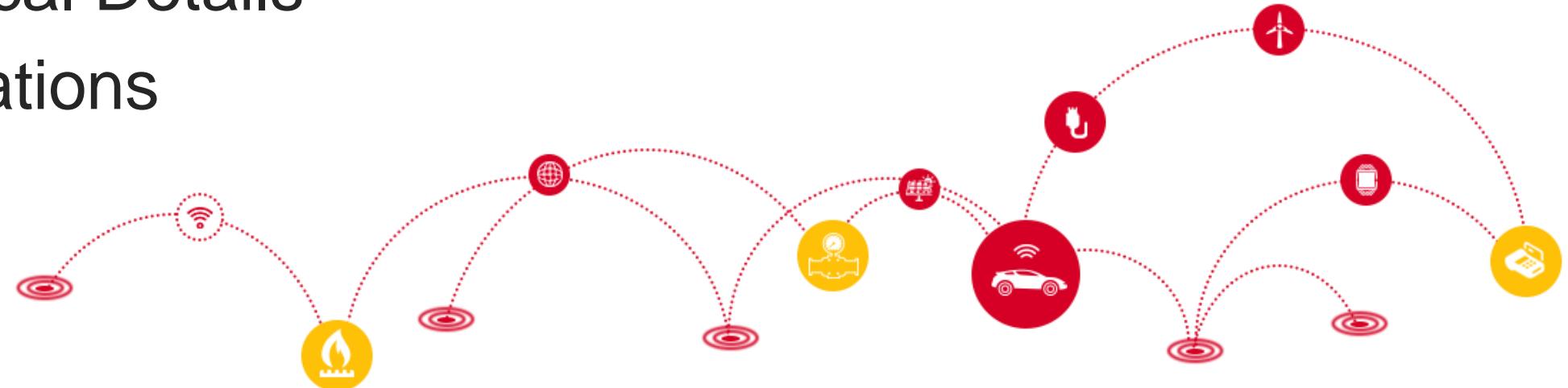
## LPWA Roadmap

Highlights & Specifications

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Applications



# LPWA Roadmap



**MDM9205**

**BG95 Series are Pin-to-Pin Compatible with BG96**



## BG95-M1

- Cat M1
- Global Version



## BG95-M2

- Cat M1/ NB2
- Global Version



## BG95-M3

- Cat M1/ NB2/ EGPRS
- Global Version



## BG95-N1

- Cat NB2
- Global Version



## BG95-M4

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



## BG95-M5

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



## BG95-MF

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



## BG77

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



## BG600L-M3

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



## BC69

- Cat M1/ NB2
- LCC Package
- Compatible With M66
- Global Version

**MDM9206**



## BG96

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

MM/YYYY Estimated Engineering Sample Dates

2017

2018

2019

Feb. 2020

Apr. 2020

May 2020

Technical Background

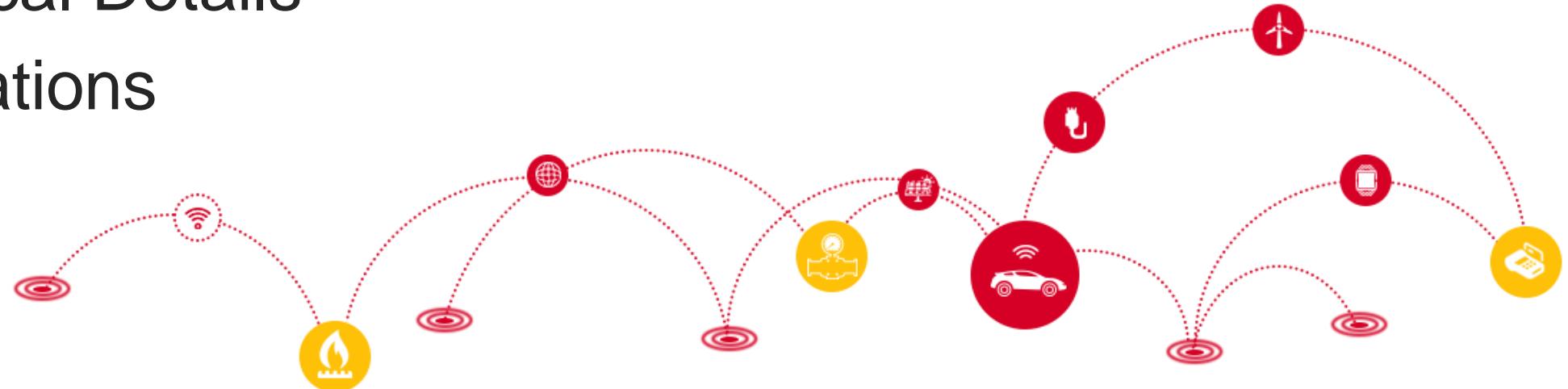
LPWA Roadmap

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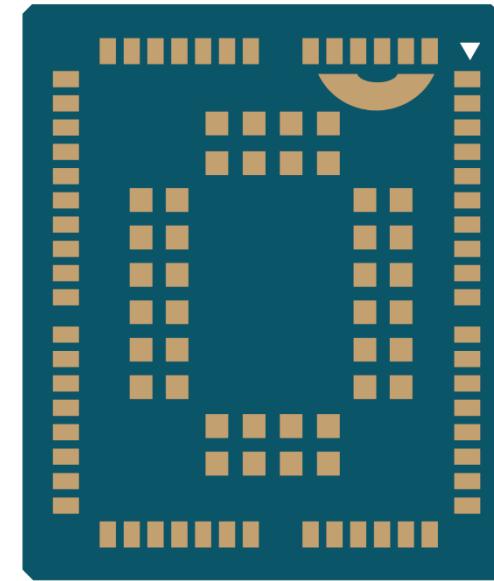
Technical Details

Applications



# BG96 Mechanical Dimensions

## Multi-Mode LPWA Module (MDM9206)



Length: 26.5mm ( $\pm 0.15\text{mm}$ )  
Width: 22.5mm ( $\pm 0.15\text{mm}$ )  
Height: 2.3mm ( $\pm 0.2\text{mm}$ )  
Weight: Approx. 3.1g

# BG96 Highlights

Highlight	Description
Multi Modes	Cat M1/ Cat NB1/ EGPRS
Global Bands	<ul style="list-style-type: none"><li><b>Cat M1/NB1:</b> B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25<sup>①</sup>/B26*/B28/B39 (B39 for Cat M1 only)</li><li><b>EGPRS:</b> 850/900/1800/1900MHz</li></ul>
Low Power Consumption	Approx. 10uA in PSM mode
Mobility	Movable application (TX3.0)
Extended Power Supply Range	3.3V~4.3V, 3.8V typ.
GNSS	GPS, GLONASS, BeiDou/Compass, Galileo, QZSS
VoLTE	PCM digital audio interface
QuecOpen®	ARM A7 Processor, with 3MB Flash and 3MB 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 will be supported on BG96 with R1.2 hardware version.

## Cat M1/Cat NB1/EGPRS



26.5mm × 22.5mm × 2.3mm

**Package:** 102-pin LGA

**Supply Voltage:** 3.3V~4.3V, 3.8V Typ.

**Data Rate:**

- LTE Cat M1: Max. 375kbps (DL), Max. 375kbps (UL) (Half Duplexer)
- LTE Cat NB1: Max. 32kbps (DL), Max. 70kbps (UL)
- EGPRS: Max. 296kbps (DL), Max. 236.8kbps(UL)
- GPRS: Max. 107kbps (DL), Max. 85.6kbps (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):** 10µA @PSM

# BG96 Specifications 2

## ■ LPWA Cat M1/Cat NB1/EGPRS Module



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

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

“\*” means under development.

<sup>①</sup> LTE B25 supported on BG96 with R1.2 hardware version.

# BG96 Power Consumption



Description	Conditions	Typ.	Max.	Unit
<b>Power Saving Mode</b>	PSM @ Real Network	10	-	µA
<b>Sleep State<sup>①</sup></b>	DRX=1.28s @ PagingDuration=35mA/25ms	1.5	78	mA
	e-I-DRX=40.96s @ PTW=2.3mA/10s	1.2	81	mA
<b>Idle State<sup>②</sup></b>	DRX=1.28s @ PagingDuration=45mA/16ms	15	77	mA
	e-I-DRX=40.96s @ PTW=16mA/10s	15	83	mA
<b>Active State</b>	23dBm @ Instrument	205	496	mA
	10dBm @ Instrument	140	278	mA
<b>Active State</b>	0dBm @ Instrument	128	225	mA
	Data Transfer @ Real Network	95	-	mA
	Voice @ Real Network	108	-	mA

<sup>①</sup> 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](#).

<sup>②</sup> Idle state with UART connected and USB disconnected.

# BG96 Main Interfaces



Interface	Description
(U)SIM	1.8V/3.0V
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
<b>Protocols</b>	PPP/ TCP/ UDP/ SSL/ TLS/ FTP(S)/ HTTP(S)/ MQTT
<b>USB Serial Driver</b>	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
<b>GNSS Driver</b>	Android 4.x/5.x/6.x/7.x/8.x/9.x
<b>RIL Driver</b>	Android 4.x/5.x/6.x/7.x/8.x/9.x
<b>NDIS Driver</b>	Windows 7/8/8.1/10
<b>GobiNet Driver</b>	Linux 2.6~5.4
<b>QMI_WWAN Driver</b>	Linux 3.4~5.4
<b>SMS</b>	Point-to-point MO and MT; SMS Cell Broadcast; Text and PDU Mode
<b>Voice</b>	VoLTE (for Cat M1 only. Support Realtek ALC 5616 codec by default firmware)
<b>DFOTA</b>	Delta Firmware Upgrade Over-The-Air
<b>LwM2M</b>	Enabled

*“\*” means under development*

# Technical Background

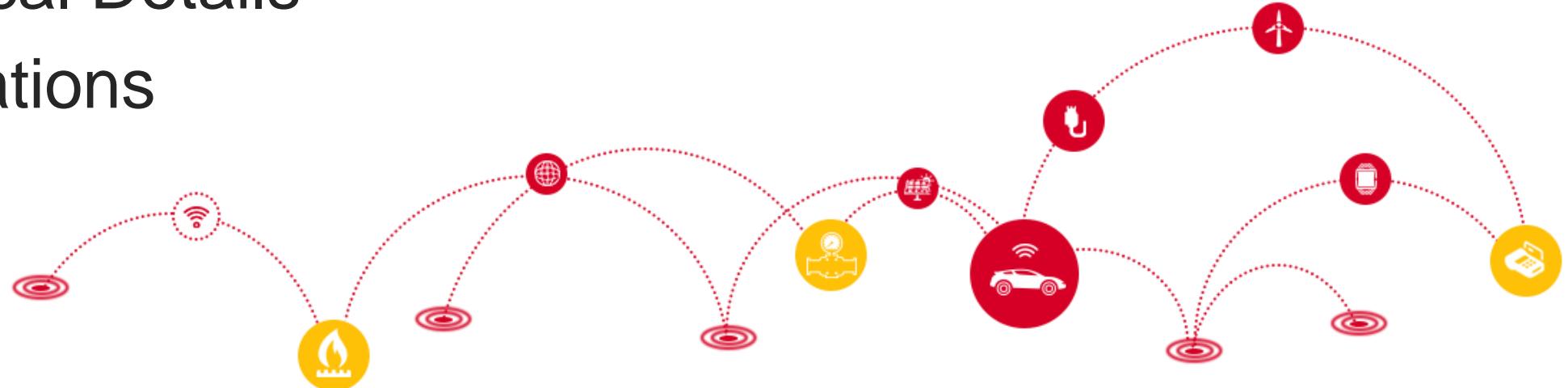
## LPWA Roadmap

### Highlights & Specifications

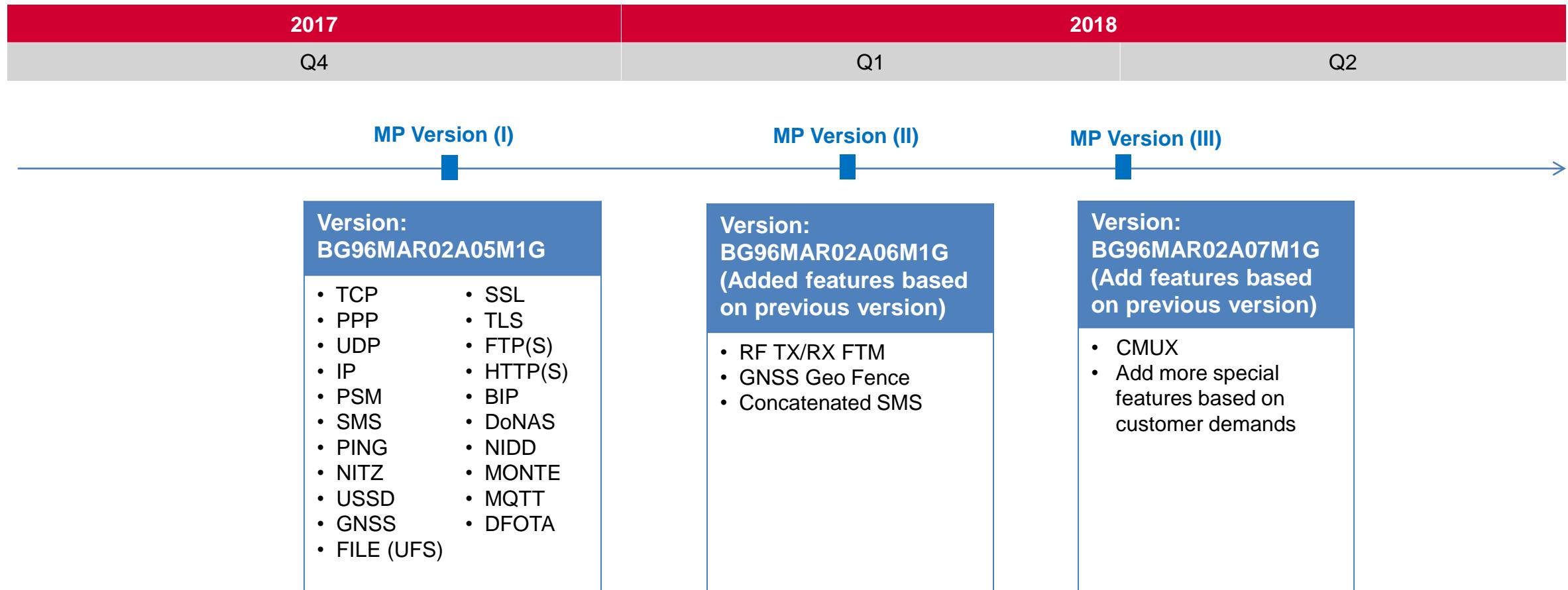
## **Development Timeline**

### Technical Details

### Applications



# BG96 (TX2.0) Development Schedule



# BG96 (TX2.0) Certifications



2018						2019			
Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.

## Project Stage

BG96 (TX2.0)

MP

## Carrier Certifications

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



## Regulatory Certifications

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



# BG96 Type Approvals (Verizon/GCF)



Verizon Wireless  
One Verizon Way  
Basking Ridge, NJ 07920

Nov 6, 2017

RE: Quectel Wireless Solutions Co., Ltd. BG96 Open Development Certification

Dear Loren Anderson:

Congratulations! On behalf of the Verizon Open Development team, we are pleased that you are participating in the Open Development Initiative. The Quectel Wireless Solutions Co., Ltd. BG96, under software version BG96MAR02ADSM1G and hardware version R1.1 has been approved, hereinafter the "Approved Device", through the Open Development certification process.

Open Development is centered on driving innovation and providing customers with flexibility in wireless solutions. Most importantly, Open Development is designed to encourage the development community to create new products and services in addition to what Verizon currently offers. Quectel Wireless Solutions Co., Ltd. can now market the Approved Device to operate on the nation's most reliable wireless data network. Our customers can now utilize these devices to support their business needs.

The Approved Device remains certified for the applicable category mentioned below provided it continues to satisfy the terms of the Certification Agreement between Verizon and Quectel Wireless Solutions Co., Ltd.. No less than ninety days prior to the expiration of the certification term, Quectel Wireless Solutions Co., Ltd. must submit the Approved Device for retesting and re-certification for the Approved Device to remain certified. The terms of validity for device certification are as follows:

\* 'LTE' capable device: Certification lasts five years from the date of this letter if each device complies with a Firmware Over The Air (FOTA) upgrade. Failure to comply with a FOTA upgrade grants each device conditional approval only until December 31, 2017.

\* 'Multimode' device: A multimode device that supports HD voice over LTE and complies with a FOTA upgrade will remain certified for five years from the date of this letter. Certification for a multimode device (LTE with CDMA) supporting CDMA Voice expires on December 31, 2019.

\* A 'CDMA only' (1xEVDO) device and its maintenance releases (MR) certifications expire December 31, 2019. Once the term expires, the device will receive no re-certification or (MR) certification. In addition effective July 1st, 2018, Verizon will no longer accept uploads or activations for any new CDMA-only MEID/ESN on our network, unless the devices are 4G LTE capable.

Thank you for choosing to have your devices certified via the Verizon Wireless® Open Development program.

Sincerely,

Behyar Khajehzadeh  
Director, Sales Operations  
Connected Solutions - IoT  
Verizon Wireless



## CERTIFICATE

The Global Certification Forum Ltd advises that  
**Quectel Wireless Solutions Co., Ltd.**

has successfully demonstrated compliance  
with the GCF certification requirements of GCF-CC and/or GCF-CC2

For  
**Quectel BG96**  
**Module**

On  
19-Oct-2018

GCF CC Version:	Status:	GCF Ref. Number:
3.70.1	Published	7479

This certificate has been issued by the Global Certification Forum in accordance with the requirements of the GCF PRDs. For the actual status of a device certification, please refer to the GCF web site.

The device manufacturer confirms that they are solely responsible for certifying the product and holds the GCF entirely harmless from any responsibility or liability associated with the product and/or the certification process. All GCF marks and/or certificates are provided "as is" with no representation and GCF expressly disclaims all warranties whatsoever whether express, implied statutory or otherwise. In no event shall GCF be liable for any direct, indirect, consequential or any damages whatsoever in any way connected with the use or performance of any GCF certified product whether based on contract, tort, negligence, strict liability or otherwise.

Global Certification Forum (GCF) Ltd  
www.globalcertificationforum.org Email: gcf@globalcertificationforum.org  
Registered Office: Suite 1, 3rd Floor, 11-12 St. James's Square, London SW1Y 4LB, UK.  
Company Number 6594830. VAT Number: GB 948 2259 92.

# BG96 Type Approvals (PTCRB/CE)



telefication bv  
The Netherlands  
Chamber of Commerce  
31565336  
[www.telefication.com](http://www.telefication.com)



## EU-type examination (Module B) certificate

No: 172141372/AA/00

In compliance with the procedure specified in RD\_061, Telefónica declares as designated Notified Body 0560 for the European Radio Equipment Directive, that the stated product, complies with the essential requirements, in accordance with Article 3 of Directive 2014/53/EU, as indicated under Annex 1 of this certificate, based on the applicable Technical Standards and Specifications, as listed under Annex 2 of this Certificate.

Product description: Quectel BG96  
Trademark: Quectel  
Type designation: BG96  
Hardware / Software version: R1.1 / BG96MAR02A05M1G  
Variants: -

This certificate is granted to manufacturer:  
Name: Quectel Wireless Solutions Co., Ltd.  
Address: 7th Floor, Hongye Building, No.1801 Hongmei Road, Xuhui  
District  
City: 200233 Shanghai  
Country: China

This certificate remains valid as long as the stated product stays in compliance with the essential requirements of the Radio Equipment Directive.

This certificate has THREE Annexes.

Zevenaar, 18 December 2017



Ramy Nabod  
Product Assessor



# BG96 Type Approvals (FCC/IC)



telefication bv  
The Netherlands  
Chamber of Commerce  
51565536  
www.telefication.com

**TCB**



## GRANT OF EQUIPMENT AUTHORIZATION

### Certification

Issued Under the Authority of the  
Federal Communications Commission  
By:

Telefication B.V.  
Edisonstraat 12a  
Zevenaar, NL-6902 PK  
Netherlands

Date of Grant: 09/12/2017

Application  
Dated: 09/07/2017

Quectel Wireless Solutions Company Limited  
7th Floor, Hongye Building,  
No.1801 Hongmei Road, Xuhui District  
Shanghai, 200233  
China

Attention: Johnny xiang

### NOT TRANSFERABLE

EQUIPMENT AUTHORIZATION is hereby issued to the named  
GRANTEE, and is VALID ONLY for the equipment identified hereon for  
use under the Commission's Rules and Regulations listed below.

FCC IDENTIFIER:

XMR201707BG96

Name of Grantee:

Quectel Wireless Solutions Company Limited

Equipment Class:

PCS Licensed Transmitter

Notes:

Quectel BG96

Modular Type:

Single Modular

Grant Notes

FCC Rule Parts

Frequency Range (MHz)

Output Watts

Frequency

Emission Tolerance

Designator

22H

824.2 - 848.8

0.624

0.04

PM

246KGXW

24E

1850.2 - 1909.8

0.582

0.019

PM

246KGXW

22H

824.2 - 848.8

0.188

0.032

PM

249KG7W

24E

1850.2 - 1909.8

0.174

0.019

PM

248KG7W

24E

1850.7 - 1909.3

0.925

0.004

PM

1M25G7D

24E

1850.7 - 1909.3

0.851

0.006

PM

1M15W7D

**TCB**

telefication bv  
The Netherlands  
Chamber of Commerce  
51565536  
www.telefication.com

## TECHNICAL ACCEPTANCE CERTIFICATE

## CERTIFICAT D'ACCEPTABILITÉ TECHNIQUE

CERTIFICATION No.  
No. DE CERTIFICATION

10224A-201709BG96

TELEFICATION No.  
No. DE TELEFICATION

172170569/AA/00

TEST SITE No.  
No. DE LABORATOIRE

8510A-1

ISSUED TO  
DÉLIVRÉ A

Quectel Wireless Solutions Co., Ltd.

TYPE OF EQUIPMENT  
GENRE DE MATÉRIEL

Cellular Mobile GSM (824-849 MHz)  
PCS MOBILE (1850-1910 MHz)  
Advanced Wireless Services (1710-1755 MHz and 2110-2155 MHz)  
Mobile Broadband Service (MBS) (698-756 and 777-787 MHz)

TRADE NAME AND MODEL  
MARQUE ET MODELE

Quectel / BG96

CERTIFIED TO  
CERTIFIÉ SELON LE

SPECIFICATION  
CAHIER DES CHARGES

RSS-102

ISSUE

5

RSS-130

EDITION

1

RSS-132

3

RSS-133

6

RSS-139

3

# BG96 Type Approvals (CCC/RCM)



## CERTIFICATE FOR CHINA COMPULSORY PRODUCT CERTIFICATION

CERTIFICATE NO.: 2018011606038032

### NAME AND ADDRESS OF THE APPLICANT

Quectel Wireless Solutions Co., Ltd.

7th Floor, Hongye Building, No.1801 Hongmei Road, Xuhui District, Shanghai 200233, China

### NAME AND ADDRESS OF THE MANUFACTURER

Quectel Wireless Solutions Co., Ltd.

7th Floor, Hongye Building, No.1801 Hongmei Road, Xuhui District, Shanghai 200233, China

### NAME AND ADDRESS OF THE FACTORY

Sintave Technology Co., Ltd

Building A Building B, Sintave Industrial Park, Lundai Road, Qisha Village, Shatian Town, Dongguan City, China

### PRODUCT NAME, MODEL AND SPECIFICATION

LTE Module

Quectel BG96 , Quectel BG36 (Powered by mainboard)

### THE STANDARDS AND TECHNICAL REQUIREMENTS FOR THE PRODUCTS

GB/T22450.1-2008;YD/T2583.14-2013;GB4943.1-2011

This is to certify that the above mentioned product(s) complies with the requirements of implementation rules for compulsory certification(REFNO.CNCA-C16-01:2014).

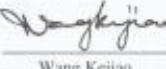
Valid from: Jan.08,2018

Valid until: Jan.08,2023

The validity of the certificate is subject to positive result of the regular follow up inspection by issuing certification body until the expiry date.

The certificate information is available through CNCA's website: [www.cnca.gov.cn](http://www.cnca.gov.cn)



President:   
Wang Kejian



CHINA QUALITY CERTIFICATION CENTRE

<http://www.cqc.com.cn>

Section 9, No. 188, Northuan Xlu, Beijing 100070 P. R. China

Tel: +86 10 63366666

Q 1881178

### Supplier's declaration of conformity



As required by the following Notices:

- > Radiocommunications (Compliance Labelling - Devices) Notice 2014 made under section 182 of the Radiocommunications Act 1992;
- > Radiocommunications Labelling (Electromagnetic Compatibility) Notice 2008 made under section 182 of the Radiocommunications Act 1992;
- > Radiocommunications (Compliance Labelling – Electromagnetic Radiation) Notice 2014 made under section 182 of the Radiocommunications Act 1992 and;
- > Telecommunications (Labelling Notice for Customer Equipment and Customer Cabling) Instrument 2015 made under section 407 of the Telecommunications Act 1997.

### Instructions for completion

- > Do not return this form to the ACMA. This completed form must be retained by the supplier as part of the documentation required for the compliance records and must be made available for inspection by the ACMA when requested.

### Supplier's details (manufacturer, importer or authorised agent)

Company Name (OR IDN/IRDN)

Alfacomm Wireless Pty Ltd
TRADING AS

ACN/ARBN 620383066
-----------------------

OR
New Zealand IRDN

Street Address (AUSTRALIAN OR NEW ZEALAND)

U13, 165-171 North Rocks Rd, North Rocks NSW 2151, Australia
POSTCODE2151

Phone: +61 452 624 491

### Product details and date of manufacture

Product description – brand name, type, current model, lot, batch or serial number (if available), software/firmware version (if applicable)

Product name: LTE Cat M1&Cat NB1&EGPRS Module

Brand name: Quectel

Model : BG96

Date of manufacture or importation of the original/modified item

# BG96 Type Approvals (AT&T)



## NOTICE OF NETWORK COMPATIBILITY

This Notice of Network Compatibility (this "Notice") is effective as of 2/16/2018 (the "Effective Date") and is issued by AT&T Mobility LLC on behalf of itself and its affiliates (collectively "AT&T") to Quectel BG96 ("Device Manufacturer") dated 2/16/2018.

This Notice applies only to the following product (the "Product"):

Module:

Manufacturer: Quectel

Model: BG96

Software: Revision: BG96MAR02A05M1G

Hardware: 1.1

Onboarding tool Device id: 109bwIXoIQ

Category: DOM

Release Type: IR

ODIS/DHIR Compliance Method (Only applicable to Devices; please choose one below):

Full DM ODIS/DHIR support as described in Device Management Implementation Guide (DMIG)

Dedicated TAC 86450803

Family TAC xxxxxxxx

Manual File Upload per DMIG (NOTE: This Notice of Network Compatibility letter is subject to revocation by AT&T if Quectel does not provide initial file upload of legacy devices as described in DMIG within 60 days of the issuance of this letter.)

Connection Mgr/ACM Version:

- Attachment A: Modem Manager Validation/ACM TA

This Notice only relates to the Product as specifically described herein and any variations from these component versions, no matter how slight, are not covered by this Notice.

- 4.8 Ability to make Emergency calls (for example to 911) as this is the responsibility of the manufacturer to test and meet the emergency location requirements

Manufacturer will not identify AT&T or its Affiliates in any advertising, sales material, press release, public disclosure or publicity without prior written authorization by AT&T.

Furthermore, AT&T does not make any representation or warranty, express or implied, to any person or entity, including, without limitation, any warranties regarding the performance, desirability, merchantability, suitability, originality, quality, fitness for a particular purpose or otherwise (irrespective of any previous course of dealings between the parties or custom or usage of trade), with respect to the Product. Device Manufacturer may not make any representation to any third party inconsistent with the terms of this Notice.

a. **Quectel General Indemnity Obligations.** Quectel, as Indemnifying Party, will defend, indemnify and hold harmless AT&T, and its Affiliates, directors, officers, and employees from and against any and all third-party claims, including but not limited to End User claims, causes of action, demands, liabilities, damages, losses, judgments, settlements, costs and expenses, including punitive damages, court costs, and reasonable attorneys' and expert witness' fees before and at trial and on appeal (collectively "Claims") related to or arising out of (i) the use of the Quectel BG96 ; (ii) services delivered by Quectel BG96 through information services or applications on the Quectel BG96; (iii) the battery in the Quectel BG96; or (iv) personal injury, death or property damage arising out of use of the Quectel BG96 or the information services and/or applications on or delivered by the Quectel BG96 ; except to the extent such Claim arises solely out of the use of the Service and not out of the use of the Quectel BG96 .

b. **Disclaimer of Warranties:** EXCEPT AS EXPRESSLY STATED IN THIS NOTICE, EACH PARTY DISCLAIMS ALL WARRANTIES, EITHER EXPRESSED OR IMPLIED, WITH RESPECT TO GOODS OR SERVICES HEREUNDER, INCLUDING, BUT NOT LIMITED TO, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. AT&T SUPPLIES A SERVICE, NOT GOODS. AT&T DOES NOT GUARANTEE COMPANY OR ANY END USER UNINTERRUPTED SERVICE.

AT&T IS NOT THE MANUFACTURER OF ANY Quectel EQUIPMENT AND MAKES NO WARRANTIES, EXPRESS OR IMPLIED, WITH RESPECT THERETO. **AT&T HAS NO RESPONSIBILITY OR LIABILITY FOR ANY BATTERY IN A Quectel BG96.** TO THE EXTENT AT&T PROVIDES ACCESS TO INFORMATION PROVIDED BY OTHER SOURCES, AT&T ACCEPTS NO LIABILITY FOR AND MAKES NO WARRANTIES, EXPRESS OR IMPLIED, WITH RESPECT TO THE CONTENT THEREOF. Quectel HAS NOT RELIED ON AND WILL NOT CLAIM THAT IT IS ENTITLED TO THE BENEFITS OF ANY REPRESENTATIONS, PROMISES, DESCRIPTION OF SERVICES OR OTHER STATEMENT NOT SPECIFICALLY SET FORTH IN THIS NOTICE.

# BG96 Type Approvals (IFETEL)



UNIDAD DE CONCESIONES Y SERVICIOS  
DIRECCIÓN GENERAL DE AUTORIZACIONES  
Y SERVICIOS  
IFT/223/UCS/DG-AUSE/ 6778 / 2017



"Año del Centenario de la Promulgación  
de la Constitución Política de los Estados Unidos Mexicanos"

Ciudad de México, a 13 de diciembre de 2017.

ASUNTO: Se otorga Certificado de Homologación  
Provisional

LIC. LUCY LOZANO PÉREZ  
REPRESENTANTE LEGAL DE  
JF INTERNACIONAL, S.A. DE C.V.  
Alcanfores No. 16  
Col. Jardines de San Mateo  
C.P. 53240, Naucalpan, Edo. de México

En atención a su escrito recibido el 28 de noviembre de 2017, con el que solicita el Certificado de Homologación Provisional del equipo módulo LTE, marca Quectel, modelo BG96 y en virtud de haber cumplido con los requisitos correspondientes, se hace de su conocimiento que el Instituto Federal de Telecomunicaciones emitió el Certificado Homologación número RTIQUBG17-2093, mismo que mediante el presente se entrega.

Lo anterior, con fundamento a lo previsto en el párrafo 15 del artículo 28 de la Constitución Política de los Estados Unidos Mexicanos y los artículos 3, fracción XXIV; 289, 290 de la Ley Federal de Telecomunicaciones y Radiodifusión publicada en el Diario Oficial de la Federación el 14 de julio de 2014 y 35 fracción X, del Estatuto Orgánico del Instituto Federal de Telecomunicaciones, publicado en el Diario Oficial de la Federación el 4 de septiembre de 2014.

ATENTAMENTE  
EL DIRECTOR GENERAL

GERARDO LÓPEZ MOCTEZUMA

UNIDAD DE CONCESIONES Y SERVICIOS  
DIRECCIÓN GENERAL DE AUTORIZACIONES  
Y SERVICIOS



"Año del Centenario de la Promulgación  
de la Constitución Política de los Estados Unidos Mexicanos"

## CERTIFICADO DE HOMOLOGACIÓN

Clase: PROVISIONAL

Número: RTIQUBG17-2093

Vigencia: 13 de diciembre de 2018

LIC. LUCY LOZANO PÉREZ  
REPRESENTANTE LEGAL DE  
JF INTERNACIONAL, S.A. DE C.V.  
Alcanfores No. 16  
Col. Jardines de San Mateo  
C.P. 53240, Naucalpan, Edo. de México

Fecha de emisión: 13 de diciembre de 2017	Oficio respuesta a solicitud: IFT/223/UCS/DG-AUSE/ 6778 / 2017
Equipo: Módulo LTE	
Marca: Quectel	Modelo: BG96
Perito(s) en Telecomunicaciones: Ing. Mario Olmos Cordero (614)	
CARACTERÍSTICAS TÉCNICAS	
Transmisor:	703-748 MHz, 824 a 849 MHz, 1850 a 1910 MHz, 1710 a 1755 MHz
Banda de frecuencias	s 0.3162 W (700 MHz), s 2 W (1900 MHz), s1 W (850/2100 MHz)
Potencia de salida	
Receptor:	758-803 MHz, 869 a 894 MHz, 1910 a 1980 MHz, 2110 a 2155 MHz
Banda de frecuencias	
GPS:	1575.42 (GPS/Galileo/QZSS) 1597.5~1605.8 (GLONASS) 1561.098 (BeiDou)
Frecuencias de operación	

Dictaminó: ARTURO CUBILLAS DOMÍNGUEZ	Revisó: El Director de Homologación ÁNGEL AGUILAR LÓPEZ	Autorizó: El Director General GERARDO LÓPEZ MOCTEZUMA
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# BG96 Type Approvals (JATE/TELEC)



## Type Certificate

Certified to	Quectel Wireless Solutions Co.,Ltd.
Type of Equipment	Leased line or Digital data transmission terminal equipment
Name of Equipment	BG96
Development Equipment Name	
Certified Number	D180034003
Certified Date	April 9, 2018
Remarks	No.18-0496

This is to certify that the above mentioned equipment has been approved technical conditions compliance design in accordance with the provisions of Article 56, Paragraph 1 of the Telecommunication Business Law.

April 9, 2018

DSP Research, Inc.



## Type Certificate

Certified to	Quectel Wireless Solutions Co.,Ltd.
Classification of specified radio equipment	Article 2-1-11-19-2 FD-LTE, Land mobile station(NB-IoT)
Type of emissions, frequency and antenna power	200K G1A,G1B,G1C,G1D,G1F,G1X,G7W 718.335~747.665MHz, 815.335~844.665MHz, 900.335~914.665MHz, 1710.335~1784.665MHz, 1920.335~1979.665MHz 0.2W
Model Name	BG96
Vendor Name	Quectel Wireless Solutions Co.,Ltd.
Certified Number	003-180062
Certified Date	April 9, 2018
Remark	No.18-0494 Refer to the attachment for "frequency details"

This is to certify that the above mentioned certification by type has been granted in accordance with the provisions of Article 38-24, Paragraph 1 of the Radio Law.

April 9, 2018

DSP Research, Inc.



# BG96 Type Approvals (IMDA)



AVNET ASIA PTE LTD  
151 LORONG CHUAN #06-03  
NEW TECH PARK  
SINGAPORE 556741

ATTN: LIM CHOON SHYAN  
(OTHERS)

Dear Sirs,

## EQUIPMENT REGISTRATION UNDER TELECOMMUNICATIONS (DEALERS) REGULATIONS

Registration Number: G3028-18

We acknowledge that the equipment listed below has been registered with the Info-communications Media Development Authority under regulation 20(6) of the Telecommunications (Dealers) Regulations (Cap 323, Rg 6) (the "Dealers Regulations") and approved for sale in Singapore.

### Equipment Description

Manufacturer	: QUECTEL WIRELESS SOLUTIONS CO., LTD.
Country of Origin/Import	: China
Technical Specification	: IMDA TS IOT
Type of Equipment	: Cat-M1 B3 Module
Brand/Trade Name	: Quectel
Model Name	: BG96
Frequency Range	(Tx) : 1710 - 1785 MHz (Rx) : 1805 - 1880 MHz
RF Power Output	: 23 dBm (LTE B3 Cat-M1)
Date of Registration	: 01 August 2018
Date of Expiry	: 31 July 2023

This is a computer generated printout. No signature is required.



AVNET ASIA PTE LTD  
151 LORONG CHUAN  
#06-03 NEW TECH PARK  
SINGAPORE 556741

ATTN: LIM CHOON SHYAN  
(ASSOCIATE DIRECTOR)

Dear Sirs,

## EQUIPMENT REGISTRATION UNDER TELECOMMUNICATIONS (DEALERS) REGULATIONS

Registration Number: G2102-18

We acknowledge that the equipment listed below has been registered with the Info-communications Media Development Authority under regulation 20(6) of the Telecommunications (Dealers) Regulations (Cap 323, Rg 6) (the "Dealers Regulations") and approved for sale in Singapore.

### Equipment Description

Manufacturer	: QUECTEL WIRELESS SOLUTIONS CO., LTD.
Country of Origin/Import	: CHINA
Technical Specification	: IMDA TS IOT
Type of Equipment	: NB-IoT Module
Brand/Trade Name	: Quectel
Model Name	: BG96
Frequency Range	(Tx) : 880 - 915 MHz 1710 - 1785 MHz (Rx) : 925 - 960 MHz 1805 - 1880 MHz
RF Power Output	: 23 dBm (LTE B8 NB-IoT) 23 dBm (LTE B3 NB-IoT)
Date of Registration	: 24 May 2018
Date of Expiry	: 30 April 2023

This is a computer generated printout. No signature is required.

# BG96 Type Approvals (Deutsche Telekom/SoftBank)



\*\*\*\*\*T...

To: Quectel Wireless Solutions Co., Ltd.  
Forward to: Brian Conrad, Sammy Zhu, Jean Hu  
From: Miguel Rodriguez, Andreas Utrap, Marco Leppich (Deutsche Telekom AG)  
Contact: E-Mail: [miguel.rodriguez@telekom.de](mailto:miguel.rodriguez@telekom.de), [andreas.utrap@telekom.de](mailto:andreas.utrap@telekom.de)  
Date: 10<sup>th</sup> July, 2018  
Subject: Limited Certification for Quectel BG96 Communication Module

Dear Quectel Team,  
Deutsche Telekom issues a limited certification for your BG96 communication module.

Concept Class	LPWA-enabled, Multi-Mode module (NB1, EGPRS)*
Deutsche Telekom (DT) Certification Date	10.07.2018
DT Responsible Entity / Contact	IDU-TIV / Miguel Rodriguez, Andreas Utrap
Certified Deutsche Telekom Affiliates**	AT, CZ, DE, NL, PL, SK
OEM Firmware Version	BG96MAR02A07M1G
OEM Hardware Version	R1.1

\* Although this chipset is LTE-M (Cat.M1) capable, Deutsche Telekom is not certifying this radio access technology yet.  
\*\* Please refer to the OEM Certification Report for Deutsche Telekom Affiliate Country Codes.

Detailed conditions for this limited certification are listed below. Until these topics are addressed, a full technical certification is not granted by Deutsche Telekom. For more details, please refer to the OEM Certification Report of this product.

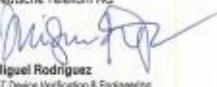
- Priority 1-High Chipset-specific issues must be addressed by the chipset supplier in the product's protocol stack.
- Priority 1-High OEM Module issues must be addressed by the OEM in this product.
- Feature support must be included for Early Release Assistance. The feature is available on the Qualcomm MDM9206 platform but no test procedure has been provided by Quectel as of the writing of this report.
- Feature support must be included for Non-IP Data Delivery feature. The feature is available on the Qualcomm MDM9206 platform but no test procedure has been provided by Quectel as of the writing of this report.

Until the criteria for a full technical certification are met, this product is only authorized for deployment in limited-scope pilot and demo activities for Deutsche Telekom IoT solutions.

Even after this product is granted a full technical certification, Deutsche Telekom will continue to restrict deployment of this product for Deutsche Telekom IoT projects having large volumes, as there is no support on this product for:

- No-harm to network / communication efficiency features (e.g. GSMA TS.24, due to application-side risks to Deutsche Telekom connectivity and service layer platforms).

Kind regards,  
Deutsche Telekom AG

  
Miguel Rodriguez  
IoT Device Verification & Engineering

  
Wayne Gilbert  
Terminal Integration & Validation (IDU-TIV)

Address: Deutsche Telekom AG  
Landgrabenweg 151, 53227 Bonn  
Contact: +49 228 181 0, E-Mail: [info@telekom.de](mailto:info@telekom.de)  
Supervisory Board: Prof. Dr. Ulrich Lohner (Chairman)  
Board of Directors: Thorsten Hörges (Chairman),  
Reinhard Daniels, Kai-Jen van Damme, Thomas Dannenfeldt, Srikanthan Gopalan, Dr. Christian P. Heik, Dr. Thomas Kremer, Claudia Neher  
Commercial register: Amtsgericht Bonn HRB 6794  
Registered office: Bonn  
VAT ID No.: DE 123473223  
WEFReg-Nr.: DE59478376

ソフトバンク株式会社  
デバイス技術本部 プロダクト企画統括部  
プロダクト開発1部プロジェクト4課  
村田 雄治  
2018年7月30日

## ネットワーク接続連絡書

拝啓 貴社益々ご清祥のこととお喜び申し上げます。平素は格別のご高配を賜り、厚く御礼申し上げます。

以下の端末の最終ソフトウェアにおいて、弊社での接続許可に関する審査が完了しましたので、審査結果を連絡致します。

【メーカー名】	Quectel Wireless Solutions Co., Ltd
【モデル名】	BG96
【FW Ver】	BG96MAR03A02M1G
【MBN File Ver】	MBN_Softbank_0x05814803
【最終結果】	許可

上記結果を以って、上記の内容での弊社商用ネットワークへの接続を許可致します。

### ■ご注意

・本接続許可是、上記の最終ソフトウェアでの弊社商用ネットワークへの接続を許可するものであるため、本接続許可に随時にソフトウェア変更が発生した場合には、改めて変更したソフトウェアでの接続許可が必要となります。

・本接続許可是、御社にて実施する接続試験項目の範囲内における接続を許可するものであり、当該端末が弊社ネットワークに影響を与えないことを保証するものではありません。このため、本接続許可後に弊社より接続禁止通知が発行された場合には、直ちにネットワークへの接続を中止して頂くこと、及び接続禁止の解除通知が発行されるまで、接続中止を継続して頂くことを、本接続許可に基づく接続条件と致します。

以上

# BG96 Type Approvals (Telefónica)



## Quectel BG96 Global Technical Testing Acceptance Letter

Addressed to: Quectel  
Manufacturer: Quectel  
Device Type: M2M-IoT Module  
Model: BG96  
Version: BG96MAR02A08M1G\_  
Remarks: Sep 12 2018 version

Madrid, 9<sup>th</sup> October 2018

To whom it may concern,

It is a pleasure to inform you that the **Quectel BG96** M2M-IoT Module has obtained this Global Technical Testing Acceptance letter from Telefónica under certain disclaimers (see Annex).

The tested version includes:

- Module version
  - Model: BG96
  - SW Version: BG96MAR02A08M1G (Sep 12th 2018)

This document validates the correct running of **Quectel BG96** within **Telefónica IoT/M2M platforms** in **Telefónica España** Mobile Communications Network and Infrastructure as a reference network, after tests executed by Dekra according to **IoT/M2M Module Certification** testing plan.

It is important to remark that Steering of Roaming / RAT Independent tests have been performed partially successful, so there are some pending bugs that should be solved in next future version of the module.

It is also important to remark that **Service Behaviour** tests have NOT been performed. Therefore, this document has no effect over **Service Behaviour** functionality or performance or any other functionality not tested. Device behaviour implementation is the responsibility of the final device/application.

The **IoT-M2M module** has been tested in a standalone configuration, so any other app/platform are not certified by Telefónica.

### Highlights of the test:

Communication features		
2G working frequency bands:	850/900/1800/1900 MHz	N/A
3G working frequency bands:	N/A	
IoT-NB working frequency bands:	B20	
LTE M working frequency bands:	B20 (only tested in laboratory environment)	
Tested network:	Spain	
M2M platform features		
M2M platform:	Movistar Kite Platform	
SIM card type:	Telefónica Spain UICC	
Electrical profile:	M02 / E05	
APNs:	m2mtelefonica.com m2mtefca.movistar.es	
Control Center:	Spain	
Commercial plan:	SB_TDIG_FACT_PILOTOCOMMERCIAL Subscription Group: DoB_TDg_Home_Y_Roaming	
Smart M2M account:	TGR_DeviceOnBoarding	



### Main tested block cases:

General test cases
Certificates and documents
RAT Independent
SIM USIM
Conformance 2G
Conformance NB-IoT
Conformance LTE-M
SAT/SAT
SMS
AT Commands
FOTA/FUMO
Satellite Positioning
Radio Testing (2 network configurations)
GPRS
NB-IoT
LTE M

### Pending bugs:

Khepera bug number	Severity	Description
82745	P2	Network Reselection - EF_HPLMN is based in hours instead of minutes
82694	P4	Retry schema after PDP context reject cause 34 is not based on minutes
85745	P4	DuT is not able to request a second PDP Context after network sends two Deactivate PDP Context Requests.

Note: P1 - Blocker, P2 - Major, P3 - Minor, P4 - Info message

(\*) Please see details in Annex.

Please transmit our congratulations to your team for the support and work during this project.

Best Regards,

Señor Castillo Paniagua

Telefónica España  
DSS Desarrollo de Servicios y Gran Público  
Dispositivos Móviles de Cliente

José Rubén García Muñoz

On behalf of:  
GTO- Telefónica Global Resources  
Desarrollo de Servicios, Ingeniería y Tecnología de Plataformas Globales  
Plataformas de Servicio IoT

# BG96 Type Approvals (Vodafone/Telus)

**QUECTEL**®  
Build a Smarter World



  
**vodafone**

**Vodafone Test Certificate**

This is to certify that Vodafone Group has tested the following stand-alone module (NB-IoT part only) and found it acceptable for use on all Vodafone and Partner networks

<b>MANUFACTURER</b>	: Quectel
<b>MODEL</b>	: BG96 (HW: R1.1, SW: BG96MAR02A07M1G)
<b>TECHNOLOGY</b>	: NB-IoT
<b>DATE</b>	: 24/09/2018

  
**Nicholas Dixon**  
on behalf of Stephen Packer  
Head of Platforms and Enablers (Vodafone Group Terminals)

This certificate is a statement that the module referred to above has been tested by Vodafone Group and is acceptable for use on all Vodafone and Partner networks. It is not a validation of the performance of the module other than in relation to acceptability on Vodafone networks at the time of testing. No warranty is given by Vodafone Group with regard to the module or its fitness for purpose. The use of this certificate and the Vodafone names are subject to the terms and conditions set out in the Vodafone Group Module Approval Services Agreement.

© 2017 Vodafone Group. VODAFONE and the Vodafone logo are trade marks of the Vodafone Group.

Document Reference Number: 0001

Date: May 15, 2018  
To: Roddick Sun, Certification Engineer  
7th Floor, Hongye Building,  
No.1801 Hongmei Road, Xuhui District, Shanghai, China, 200233

Dear Mr. Roddick Sun

I am pleased to inform you that the validation of BG96 module is complete.

The letter constitutes a notice from TELUS that the device, as specified below, has achieved basic technical compatibility with the TELUS wireless network and can therefore now be used in integrations that can be activated on our network.

<b>PTCRB Model</b>	<b>BG96</b>
<b>Module Name</b>	<b>BG96</b>
<b>Firmware Version</b>	<b>BG96MAR02A05M1G</b>
<b>Hardware Version</b>	<b>R1.1</b>
<b>SVN</b>	<b>05</b>

Device activated on the TELUS wireless network shall have the above mentioned configuration of the module.

TELUS assumes no liability for any devices activated on the TELUS wireless network using BG96 Module.

On behalf of TELUS Wireless Devices team, I would like to express our appreciation for all outstanding support and cooperation received from your team during the technical validation of this product.

We are looking forward towards our future cooperation.

Quectel Wireless Solutions Co., Ltd.  
7th Floor, Hongye Building,  
No.1801 Hongmei Road, Xuhui District,  
Shanghai, China, 200233

TELUS Communications Company  
200 Consilium Place, Suite 1600  
Scarborough, ON

M1H 3J3

Signed:



Printed: Roddick Sun  
Title: Certification Engineer  
Date: March 5, 2018

Printed: Jovan Mikarovski  
Title: Senior Design Specialist  
Date: March 5, 2018

Signed:



# BG96 Type Approvals (KDDI/NCC)



<https://open-dev.kddi.com/information?type=3>

IOT完了製品 | OPEN DEVICE DEVELOPER SITE

① IOT完了製品

スマートフォン タブレット バイブルー 用 SIMカード  
LTE Cat M1 & NB1

ホームページ機能のモジュールを使用した製品開発をご検討中のデベロッパー様へ、お貴重御見をお申しあげください。

BG96 Quectel Wireless Solutions Co., Ltd.

スペック

対応周波数: Cat M1/Cat NB1:  
■ LTE FDD:  
B1/B2/B3/B4/B5/B8/B20/B30/B31/B32  
LTE TDD: B39 (for Cat M1 Only)

カテゴリ: Cat M1/Cat NB1  
音声 / データのみ  
データ規格: SIMカード  
BG96 IoT Nano IC Card #2

商品概要  
BG96はシングルモードLTE Cat M1とNB-IoTの複合モジュールで、最大7.2Mbpsのアップリンクと最大371Mbpsのデータ率を備えます。LTE Cat M1/Cat NB1とEGPRSモジュールが統合されています。  
BG96は低消費電力設計であり、下部のQuectel ICモジュールとのピン互換性を備えており、  
- BG96/G95/LTEモジュール  
- BG96/G95/NB-IoTモジュール  
- BG96/G95/EGPRSモジュール  
- BG96/G95/Bluetoothモジュール  
24.5mm x 22.5mm x 2.5mmのコンパクトな尺寸で、GaNフォームファクタと高効率化により、BG96より多くのアプリケーションの設計を可能にし、低消費電力と高い耐久性の性能が特徴になります。  
また、柔軟なSIMカードにより多くのアプリケーションのために最適化された柔軟性が可能です。

お問い合わせ先  
会社名: Quectel Wireless Solutions Co., Ltd.  
連絡先: eric.jiang@quectel.com  
担当者名: eric Jiang

▲ページ上部へ戻る

TOPへ戻る

個人登録 | 会員登録 | 会員登録確認 | ログイン | ログアウト | ヘルプ

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お問い合わせ

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必維國際檢驗集團  
香港商立德國際商品試驗有限公司桃園分公司  
Bureau Veritas Consumer Products Services, (H.K.) Ltd.,  
Taoyuan Branch

## 電信終端設備審定證明

- 一、申請者：上海移遠通信技術股份有限公司  
(上海市徐匯區虹橋路1801號宏業大廈7樓 200233)  
二、製造廠商：上海移遠通信技術股份有限公司  
三、設備名稱：LTE Cat M1 & Cat NB1 & EGPRS Module  
四、廠牌：Quectel  
五、型號：BG96  
六、審定類別：無線電信終端類：LTE行動窄頻介面【PLMN11 (107年01月10日)】  
七、審定日期：107年 11 月 20 日  
八、審驗合格標識式樣：

CCAI18NB0040T1

- 說明：  
1. 經審驗合格之電信終端設備，逕審驗商應依審定證明中所核給之審驗合格標識，自製標識標貼並印鑄於設備本體適當位置，始得販賣。  
2. 審驗合格標識之使用權專屬取得審定證明之人。依電信終端設備審定證明第15項規定，持有人得經由網際網路申請同意他人於同廠牌同型號之電信終端設備後用審驗合格標識，並於次日起10天內，應檢具「電信終端設備審驗合格標識或符合性聲明標識並附用備查表」送本會備查。  
3. 取得審定證明之電信終端設備，有下列情形之一者，得撤銷或廢止審定證明：  
(1) 經發現原審定設備確有變更其廠牌、型號、設計或性能，而未重新申請審驗者。  
(2) 經確定原審定設備未依新修正技術規範公告所定實施期限及方式辦理審驗者。  
(3) 經發現申請審驗時所檢附之資料為偽造或虛偽不實者。  
(4) 經抽驗未能符合電信終端設備技術規範者。  
(5) 因代理權、專利權爭議、經法院判決訴訟確定或違反其他規定致不得販賣經審驗合格之電信終端設備。  
4. 輸入或販賣未經審驗合格之電信終端設備者，依電信法第67條規定新臺幣3萬元以30萬元以下罰鍰，並得沒入其設備。  
5. 本審定證明，係依電信法第44條第1項規定，由國家通訊傳播委員會委託辦理，本審定證明共計1頁，請頁分閱用無效。

備註：  
1. 本器材具備無線電信終端行動通信傳輸系統(LTE行動窄頻介面)，射頻規格如下：

工作頻率 (MHz)	傳導輸出功率 (dBm)	等效輻射功率 (dBm)	屬性
LTE Band 8: 885-915	23.96	24.79	NB IoT @ Sub-carrier spacing 15 kHz
LTE Band 28: 703-748	23.02	24.91	Cat-M1

2. 本產品電磁曝露量(MPE)標準值1mW/cm<sup>2</sup>，測試產品實測值為0.124mW/cm<sup>2</sup>，建議使用時至少距離人體20cm。

3. 本器材 IMEI 之TAC碼：86642503。

4. 本器材使用下列天線：

商標	型號	天線型式	天線增益 (dBi)	備註
上海聖丹納 電子科技股份 有限公司	SAA30968A	4G-LTE External	1.53 2.00 2.98 4.04	LTE Band 1 LTE Band 3 LTE Band 8 LTE Band 28

(以下空白)

型式認證號碼：CCAI18NB0040T1

# BG96 Type Approvals (KC)



9FC3-6AC3-EB68-3C20

방송통신기자재등의 적합인증서 Certificate of Broadcasting and Communication Equipments	
상호 또는 성명 Trade Name or Applicant	주식회사 엠티엠넷
기자재명칭(명칭) Equipment Name	LTE 이동통신용 무선설비의 기기(기타)
기본모델명 Basic Model Number	BG96
파생모델명 Sous Model Number	
인증번호 Certification No.	R-C-M2N-BG96
제조자/제조국가 Manufacturer/Country of Origin	Quectel Wireless Solutions Co., Ltd. / 중국
인증연월일 Date of Certification	2018-09-03
기타 Others	위 기자재는 「전파법」 제58조의2 제2항에 따라 인증되었음을 증명합니다. It is verified that foregoing equipment has been certificated under the Clause 2, Article 58-2 of Radio Waves Act.
2018년(Year) 09월(Month) 03일(Day)	
 국립전파연구원장 Director General of National Radio Research Agency	
※ 인증 받은 방송통신기자재는 반드시 "적합성평가표지"를 부착하여 유통하여야 합니다. 위반시 과태료 처분 및 인증이 취소될 수 있습니다.	

C46B-F2A7-CA08-A668

방송통신기자재등의 적합인증서 Certificate of Broadcasting and Communication Equipments	
상호 또는 성명 Trade Name or Applicant	Quectel Wireless Solutions Co., Ltd
기자재명칭(명칭) Equipment Name	LTE 이동통신용 무선설비의 기기(기타)
기본모델명 Basic Model Number	BG96
파생모델명 Sous Model Number	
인증번호 Certification No.	R-C-QUT-BG96
제조자/제조국가 Manufacturer/Country of Origin	Quectel Wireless Solutions Co., Ltd / 중국
인증연월일 Date of Certification	2018-10-19
기타 Others	위 기자재는 「전파법」 제58조의2 제2항에 따라 인증되었음을 증명합니다. It is verified that foregoing equipment has been certificated under the Clause 2, Article 58-2 of Radio Waves Act.
2018년(Year) 10월(Month) 19일(Day)	
 국립전파연구원장 Director General of National Radio Research Agency	
※ 인증 받은 방송통신기자재는 반드시 "적합성평가표지"를 부착하여 유통하여야 합니다. 위반시 과태료 처분 및 인증이 취소될 수 있습니다.	

# BG96 Type Approvals (SKT/US Cellular)



Certificate of Device Device 적합 인증서	
18-L-06	
	
Trade Name or Applicant 상호 또는 성명	엠티엠넷
Basic Model Number 기본모델명	BG96
Manufacturer/Country of Origin 제조자/제조국가	엠티엠넷
Type Identification 형식기호	2018-L-14 모뎀 내장형 Cat.M1
Date of Certification 인증연월일	2018-12-14

This is to certify that the above device is approved on SK telecom's reliability test requirement.  
위 단말은 SK telecom 내부 신뢰성 시험을 만족하여 인증되었음을 증명합니다.

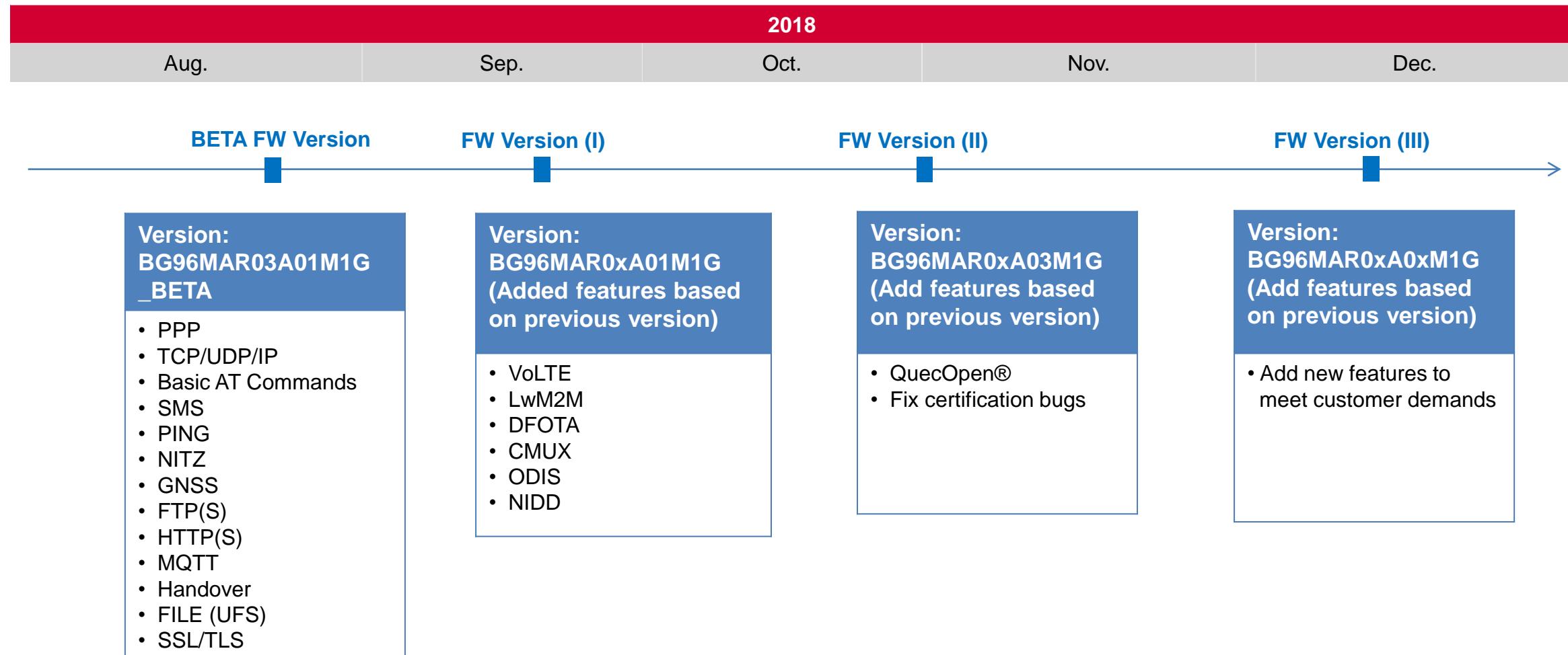
SK telecom



**Device Engineering**  
**HW / SW Conditional TA Approval**  
**Quectel BG96**  
**07/19/2019**

Software / Firmware: BG96MAR02A07M1G  
PRI: NA  
Hardware Version : R1.1  
Integrated Module: BG96  
Band Supported : LTE: 2,4,5,12

# BG96 (TX3.0) Development Schedule



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

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



2018			2019												2020	
Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	

## Project Stage

**BG96 (TX3.0, R04Axx)** MP

## Carrier Certification Schedule

T-Mobile/ Sprint      Completed

Verizon      Start Complete (Planned)

AT&T      TBD TBD

Bell      TBD TBD

## Regulatory Certifications

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

For approval tests listed above, BG96 is planned to be tested with new hardware version (R1.2, PCB V3.1) supporting Secure Boot feature.

# BG96 (TX3.0, R03Axx) Certifications (Other Regions)



2018					2019						
Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.

## Project Stage

**BG96 (TX3.0, R03Axx)**

MP

## Carrier Certification Schedule

LGU+/ NTT DOCOMO/ SoftBank/ KDDI/ Telstra



*For other regions, BG96's hardware design remains the same as before, and firmware can be upgraded from R02Axx to R03Axx according to application demands. Secure Boot feature is not supported.*

# Technical Background

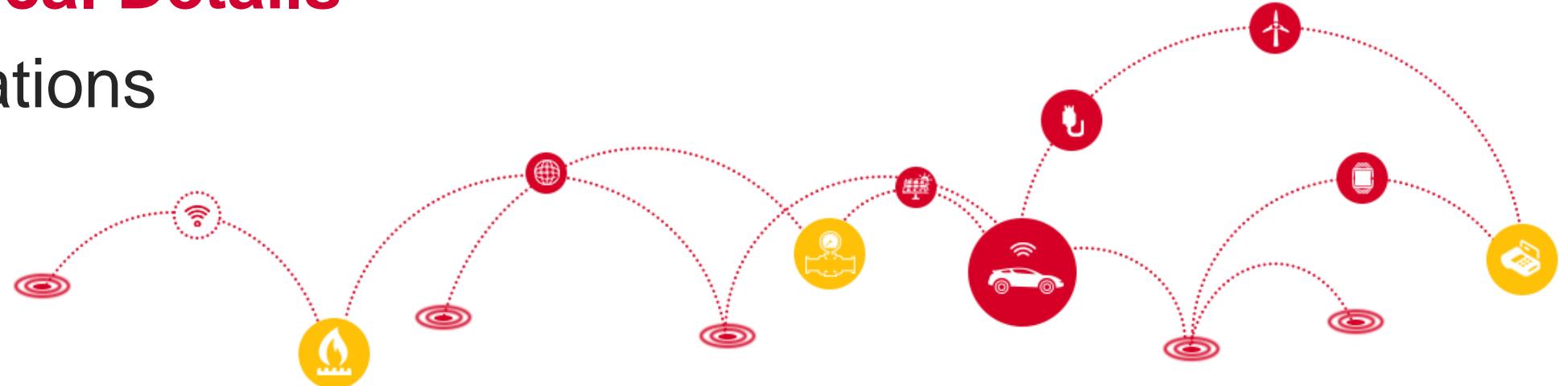
## LPWA Roadmap

### Highlights & Specifications

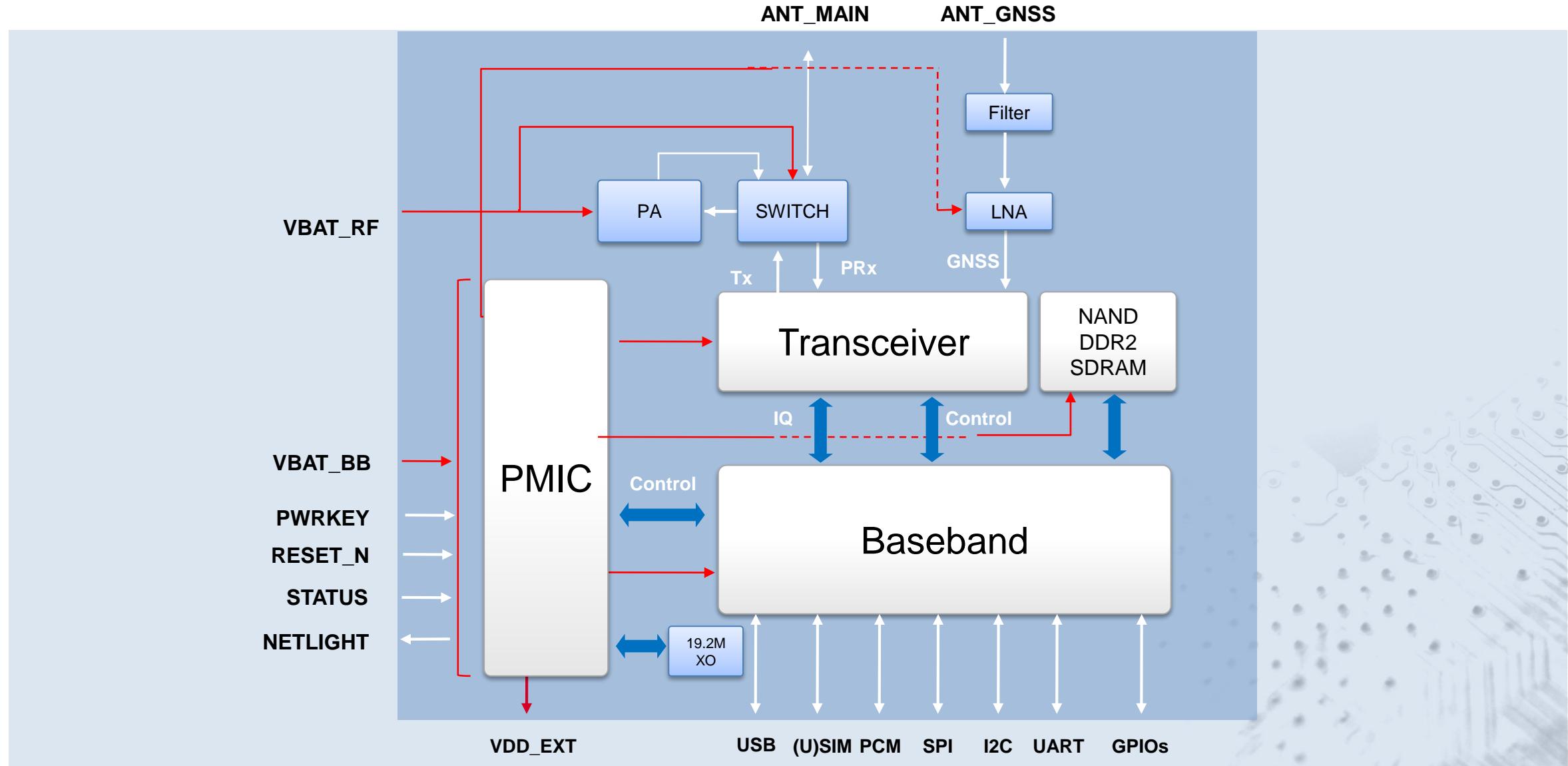
### Development Timeline

## Technical Details

### Applications



# Hardware Architecture

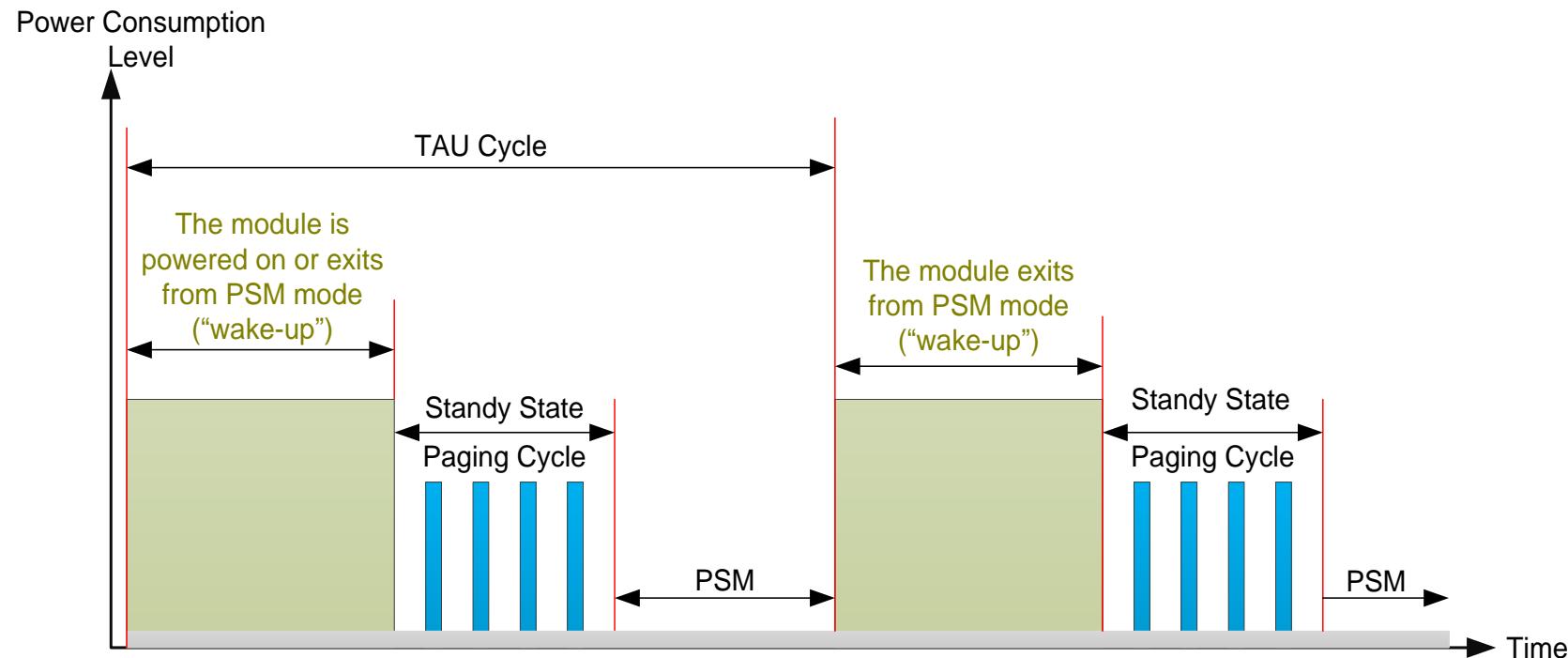


# Key Technologies 1 - PSM

Power Saving Mode (PSM) is similar to power-off, but the module remains registered on the network. When the module is woken up from PSM, there is no need to re-attach or re-establish PDN connection. When the module in PSM, it is not immediately reachable for mobile terminating services. PSM is therefore intended for applications that are expecting only infrequent mobile originating and terminating services and that can accept a corresponding latency in the mobile terminating communication.

When the module wants to use the PSM it shall request an Active Time value during every Attach and TAU/RAU procedures. If the network supports PSM and accepts that the module uses PSM, the network confirms usage of PSM by allocating an Active Time value to the module.

The following figure illustrates the power consumption cycle of BG96 module.

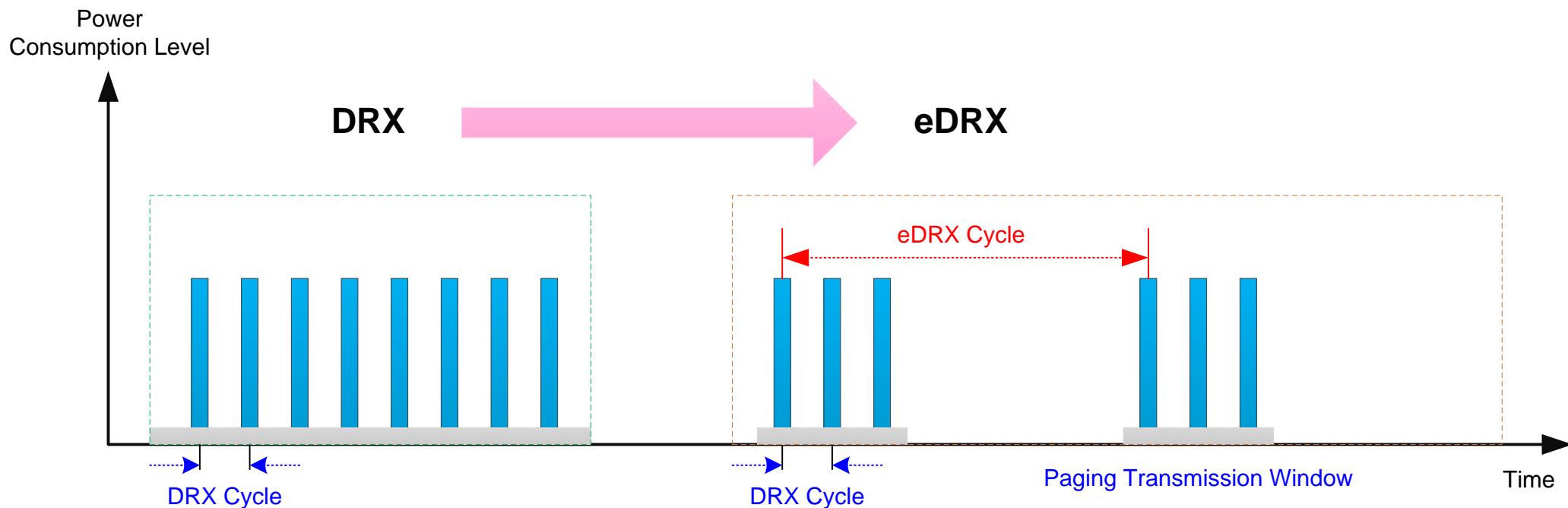


# Key Technologies 2 - e-I-DRX

The module (UE) and the network may negotiate over non-access stratum signaling the use of Extended Idle Mode DRX (e-I-DRX) for reducing its power consumption, while being available for mobile terminating data and/or network originated procedures within a certain delay dependent on the DRX cycle value.

Applications that want to use e-I-DRX need to consider specific handling of mobile terminating services or data transfers, and in particular they need to consider the delay tolerance of mobile terminated data.

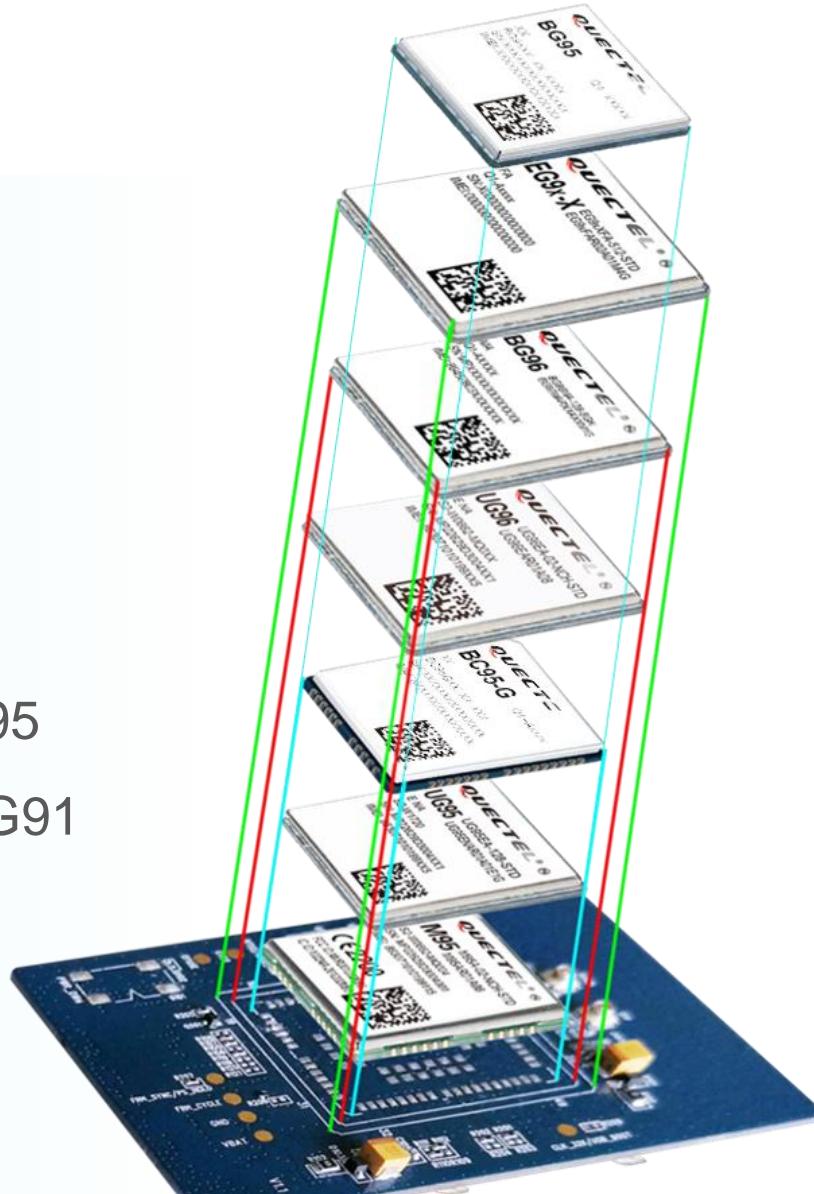
The following figure illustrates the DRX and e-I-DRX cycle of BG96 module.



# Layout Compatibility

BG96 is compatible with the following Quectel modules:

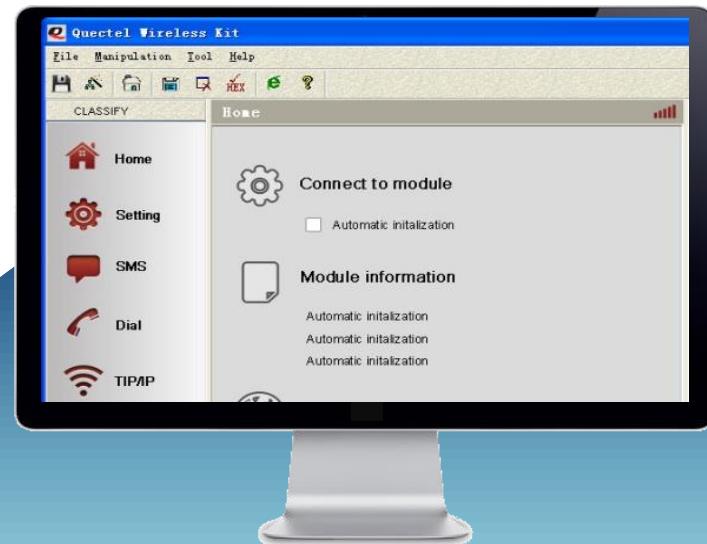
- GSM/GPRS module M95
- UMTS/HSPA modules UG96/UG95
- LTE Cat 4/Cat 1 module EG95/EG91
- LPWA module BC95-G/BG95



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

# Quick Start

## UMTS & LTE EVB Kit



Quectel offers a GUI tool named **QNavigator**. It can help customers quickly test Quectel module's functionality.



# Technical Background

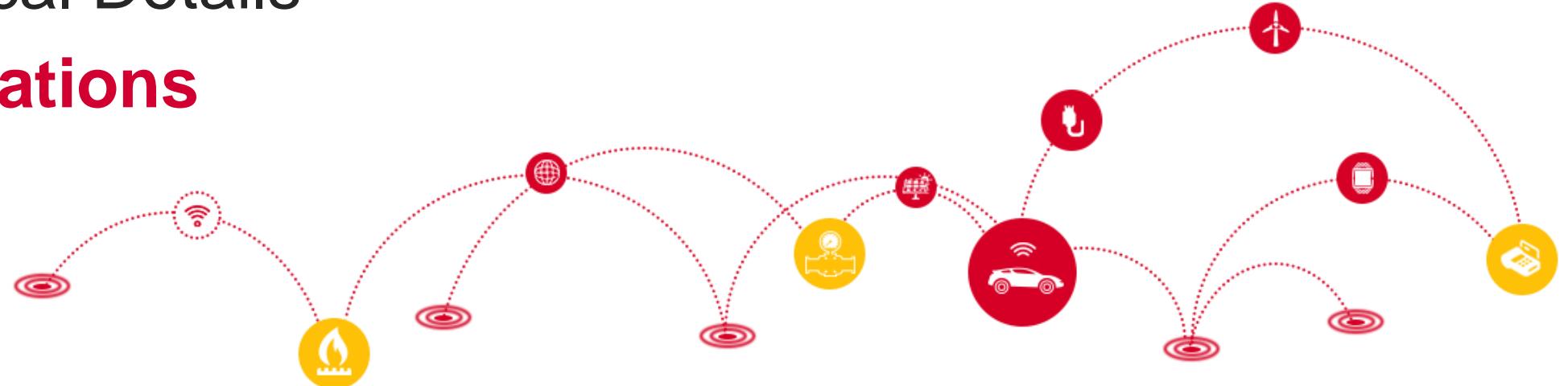
## LPWA Roadmap

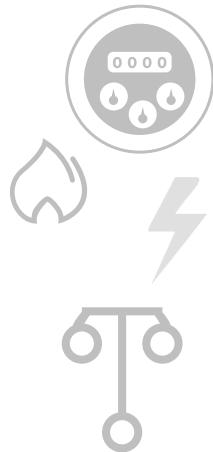
## Highlights & Specifications

## Development Timeline

## Technical Details

## Applications



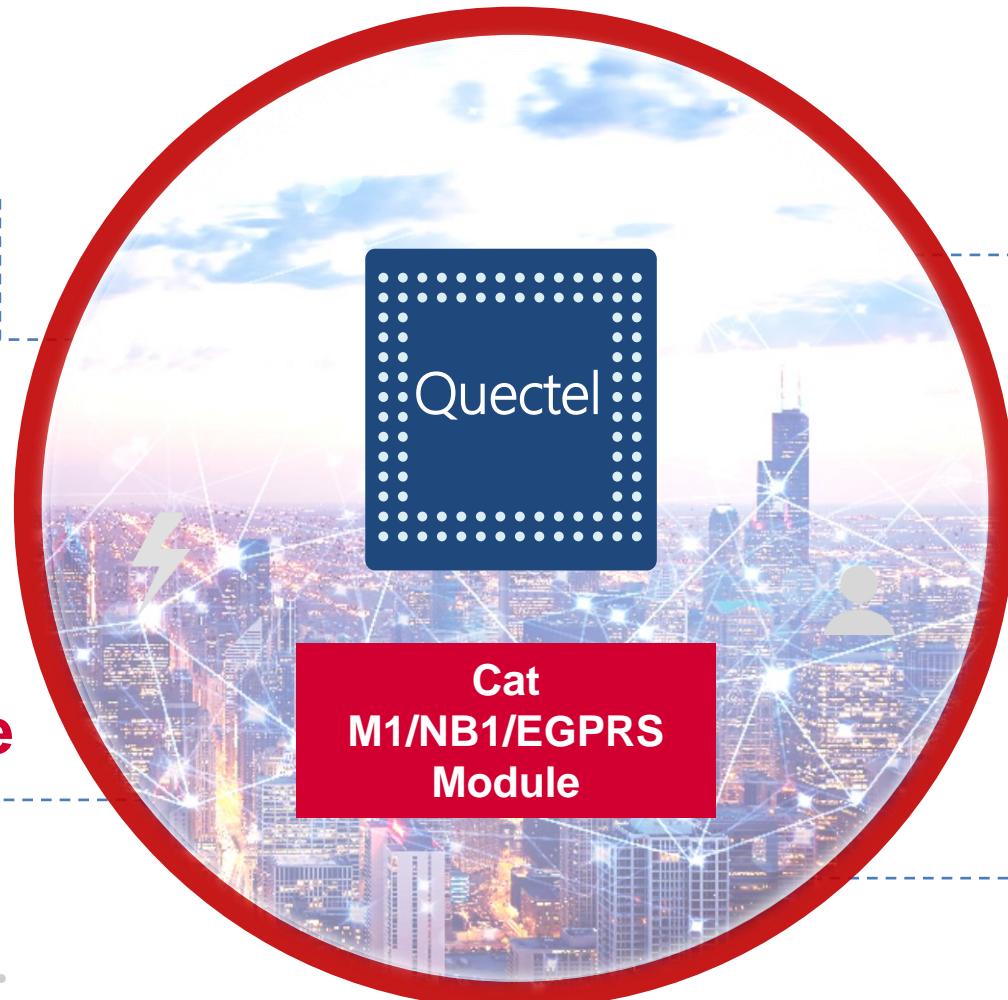


## Public Utilities

- Water/Gas Metering
- Parking
- Fire Hydrant
- Smoke Alarm
- Street Lighting
- Trash Bin

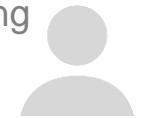
## Industry & Agriculture

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



## Personal Life

- Asset Tracking
- Electronics
- Person/Pet Tracking



## Smart Home

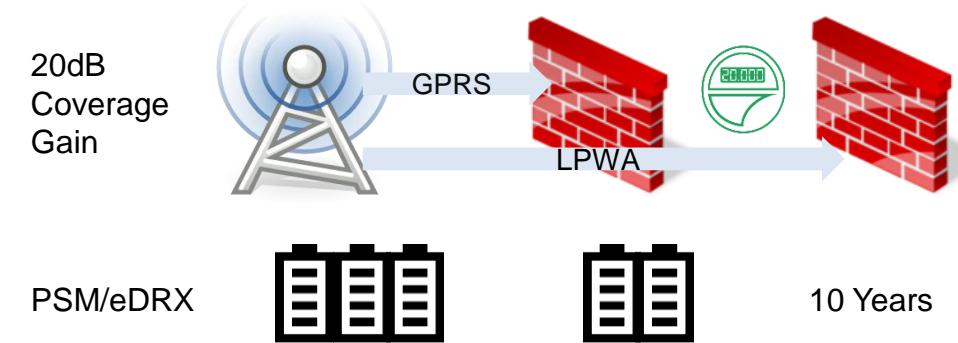
- Intelligent Door Lock
- Intelligent Control



# Smart Metering



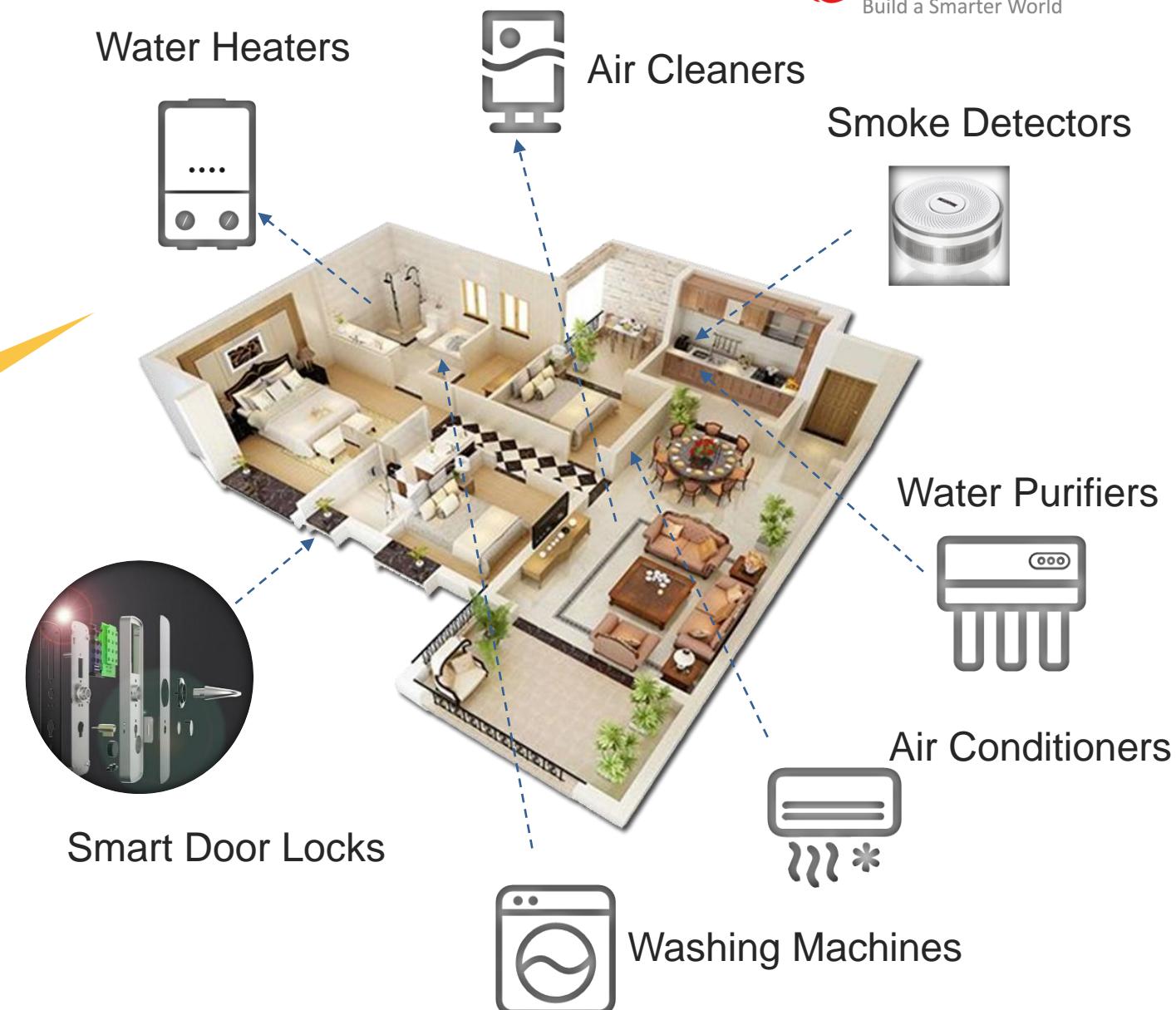
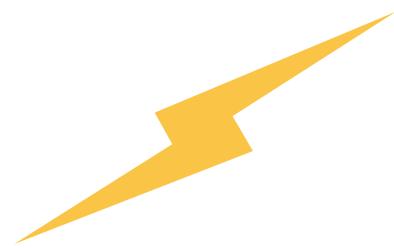
## Great Solution for Water Meters



- Battery driven
- Daily water data collection
- Automatic pipeline leakage, burst, blockage and temperature detection

# Smart Home

- NB-IoT smart locks
- Smart smoke detectors
- NB-IoT white goods
- Higher safety, more convenient
- Easy connection to NB-IoT platform

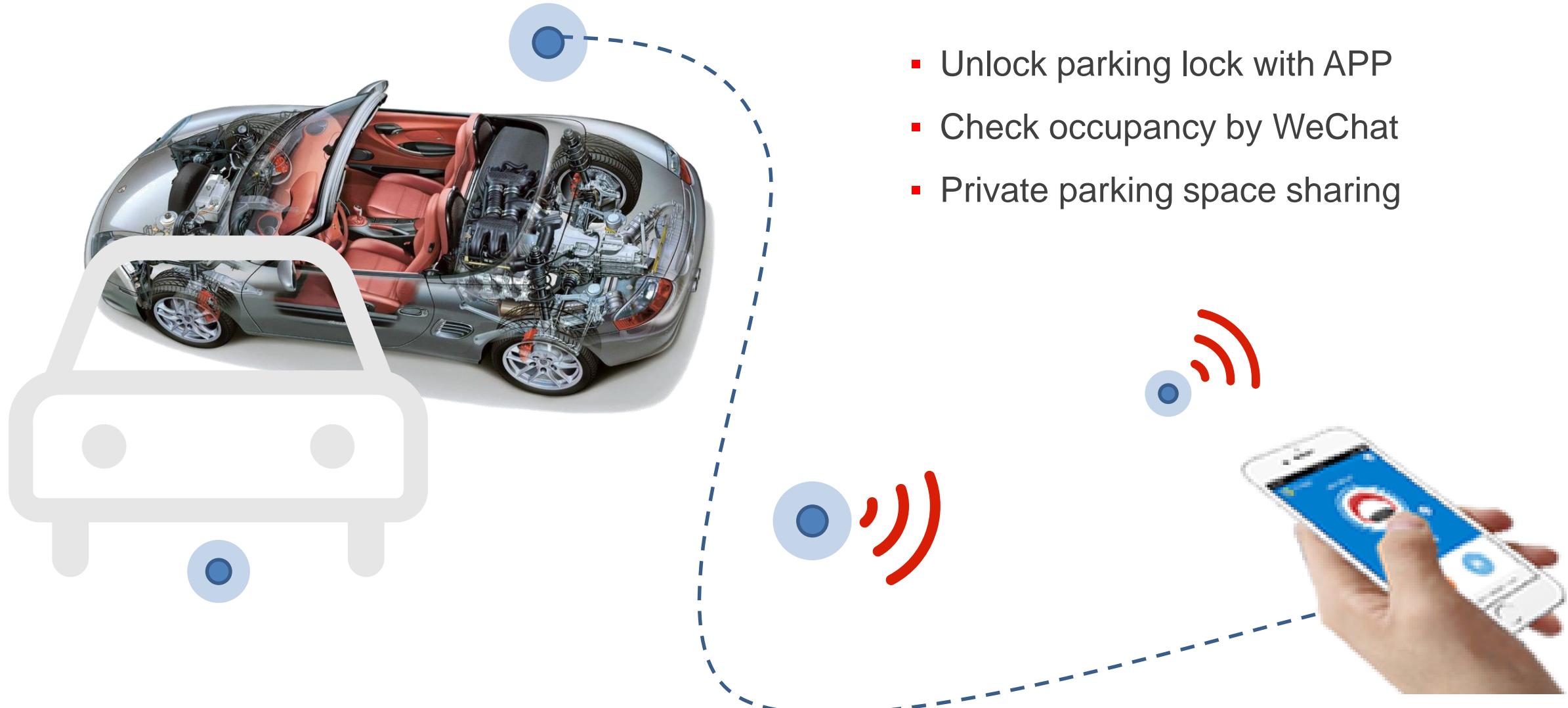


# Street Lighting



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

# Parking



# Bike Sharing



# Animal Testing



- Monitor health and safety of the cattle
- Improve milk yield and ensure in-time cow breeding

# Multi-gas Detector



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



# Thank you!

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Website: [www.quectel.com](http://www.quectel.com)

-  <https://www.linkedin.com/company/quectel-wireless-solutions>
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