



Quectel BC92 NB-IoT Module

Introduction

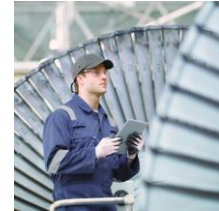
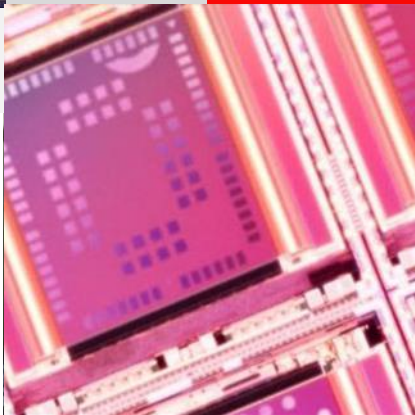
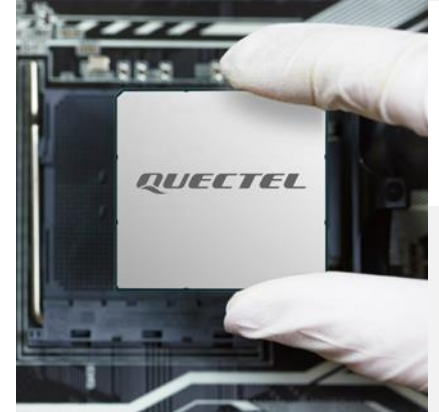
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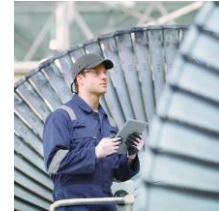
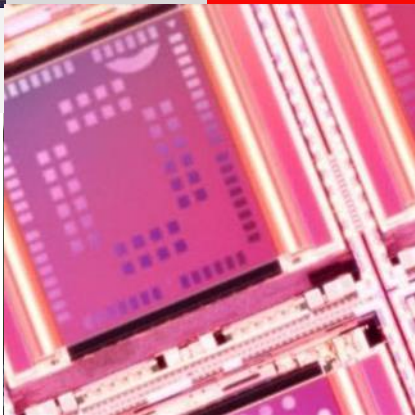
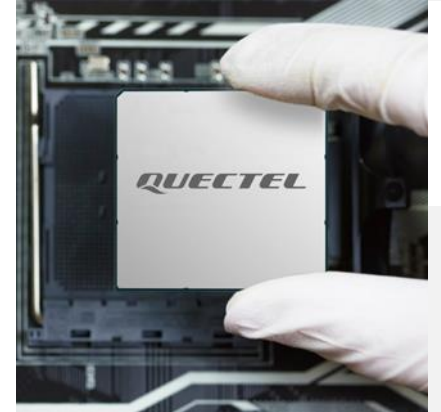
NB-IoT Technology

Product Overview

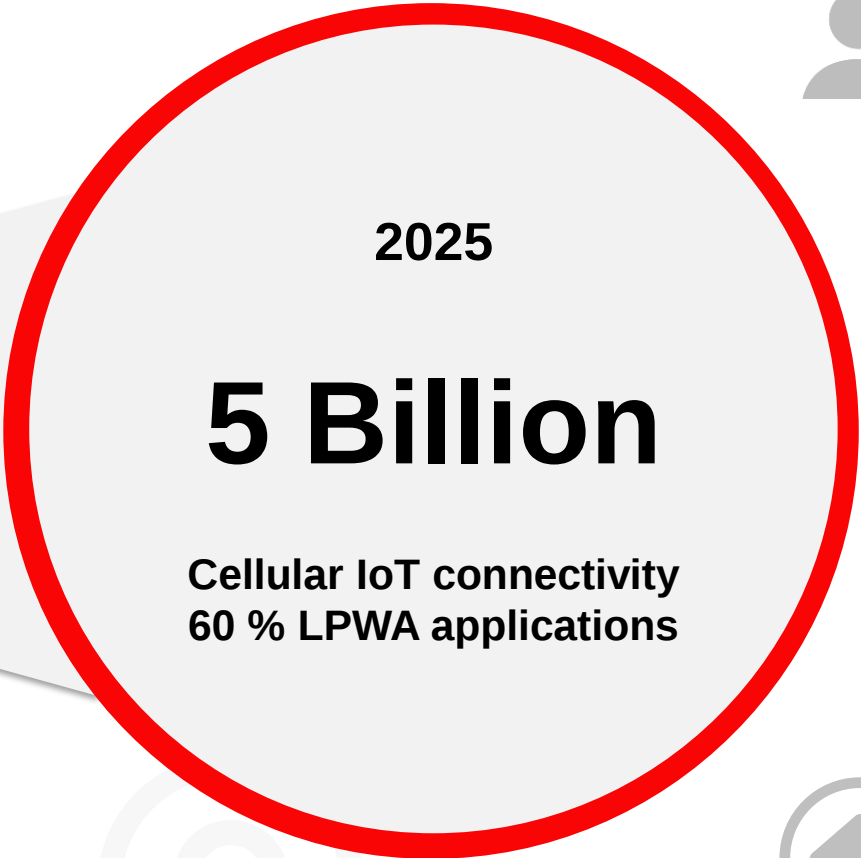
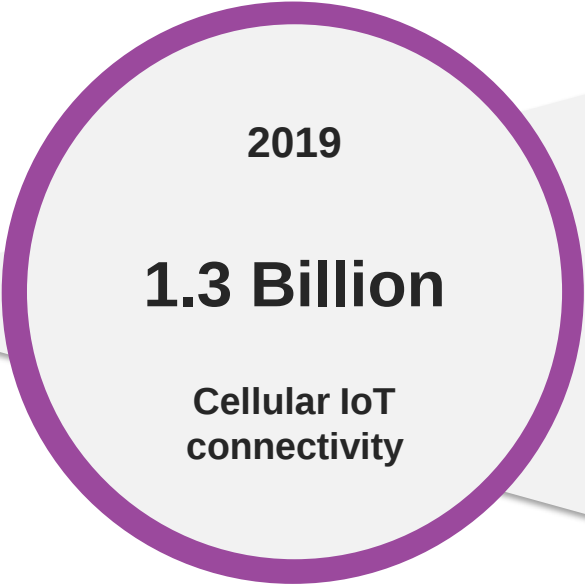
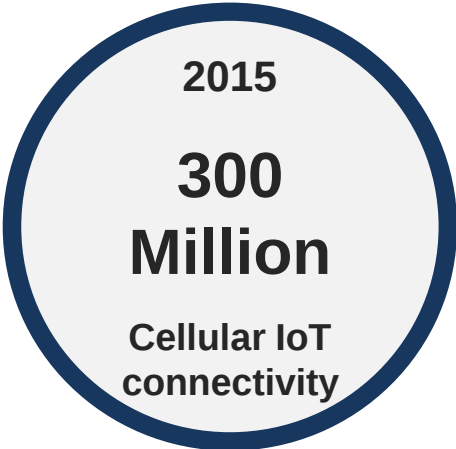
Technical Details

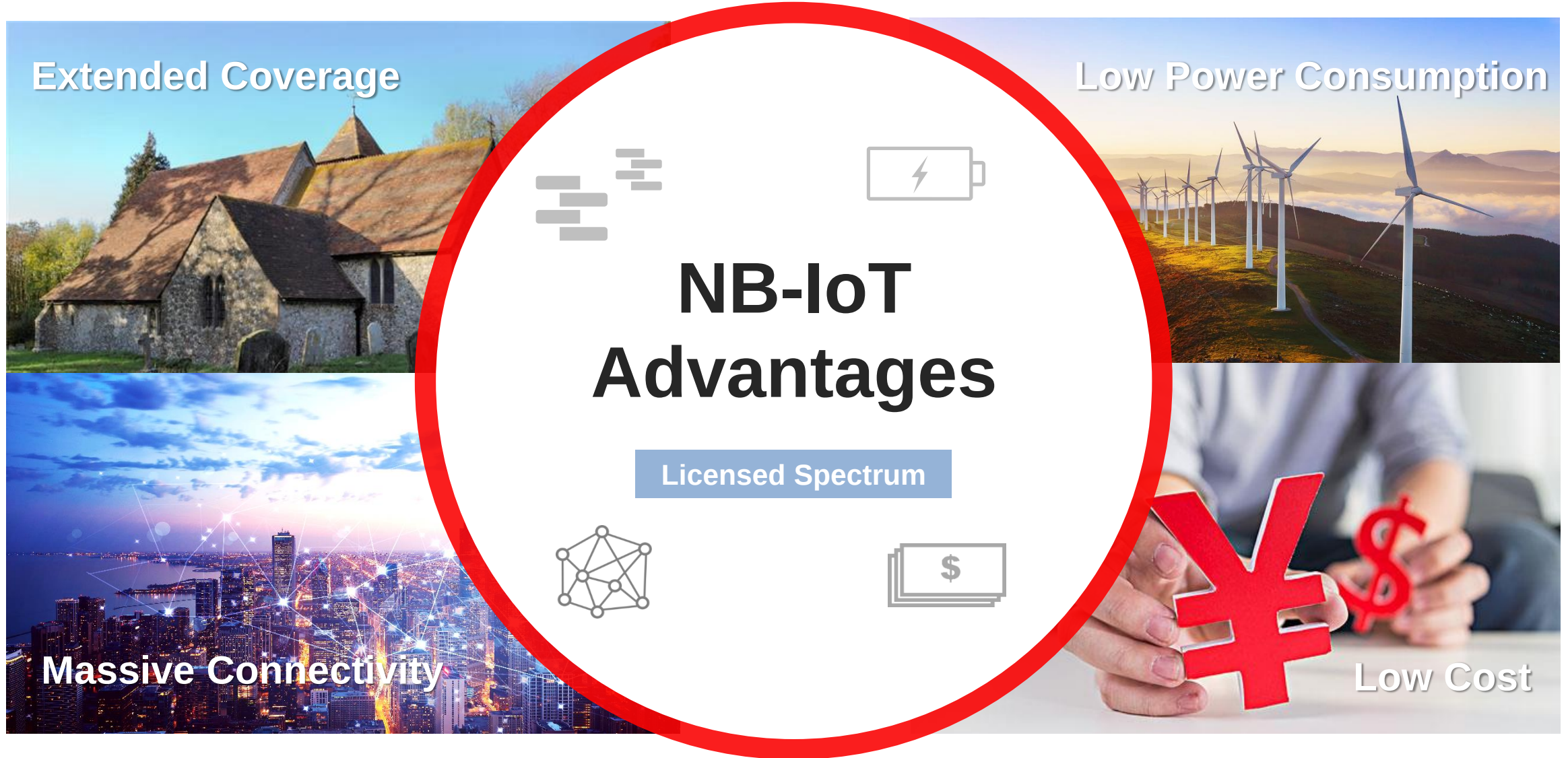
Applications

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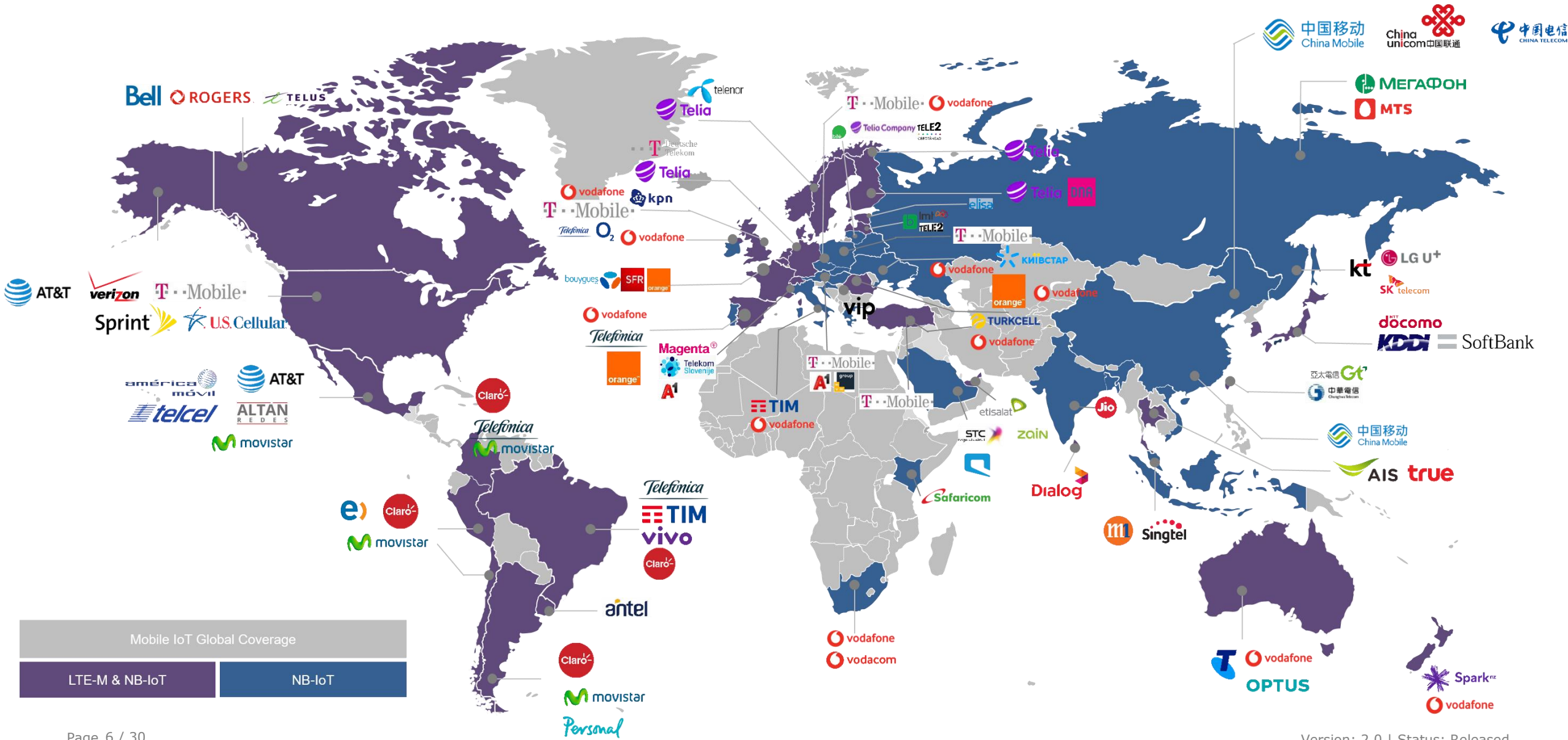


IoT Connectivity Forecast

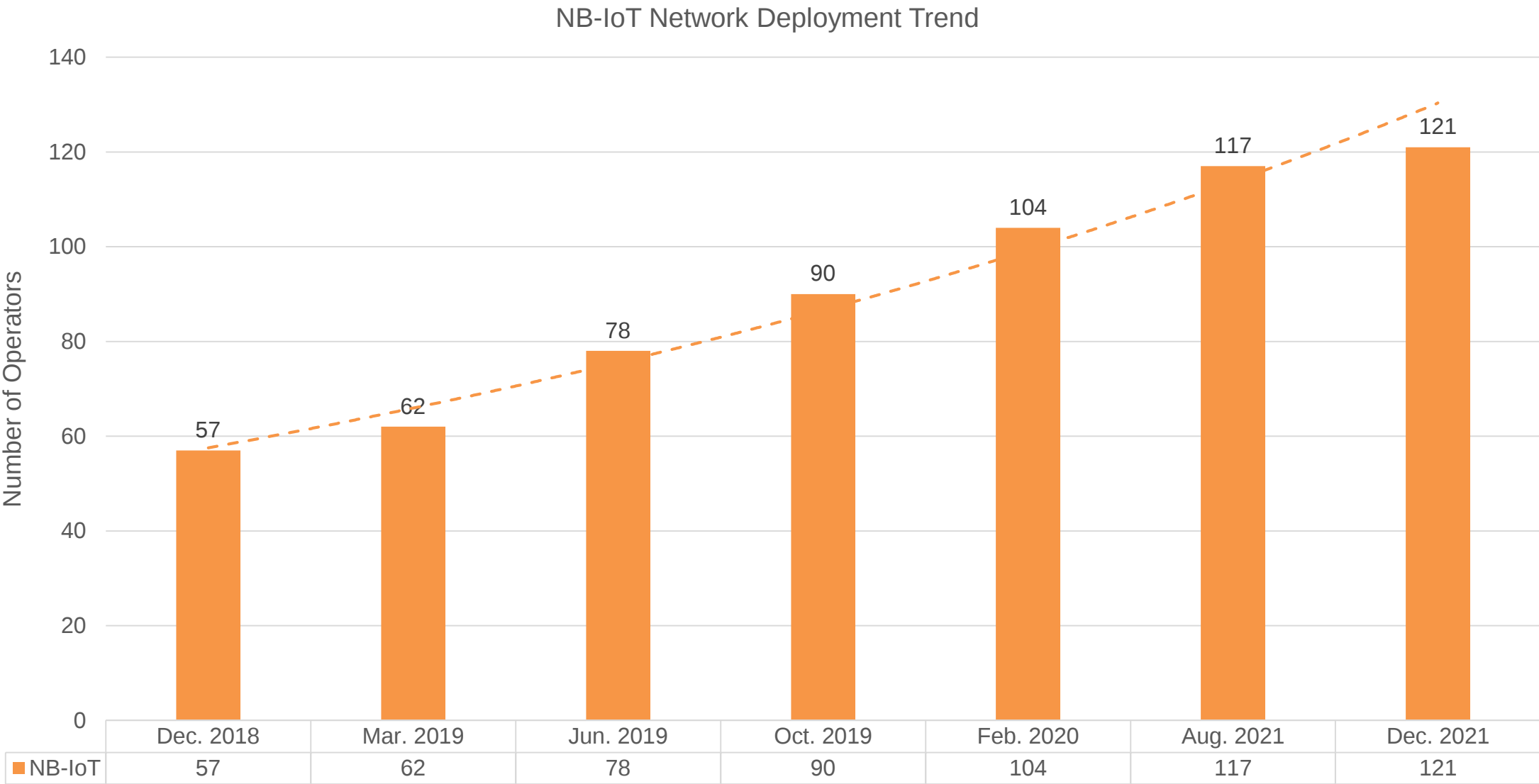




LPWA Network Deployment (Based on GSMA Data up to December 03, 2021)



NB-IoT Network Deployment Trend



NB-IoT Deployment (1) (Based on GSMA Data up to December 03, 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 December 03, 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, 8	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			



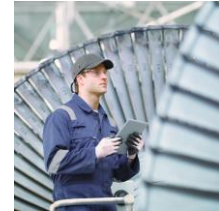
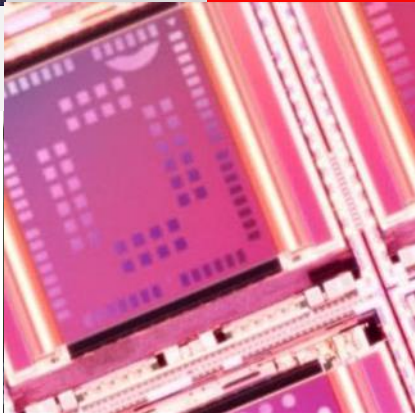
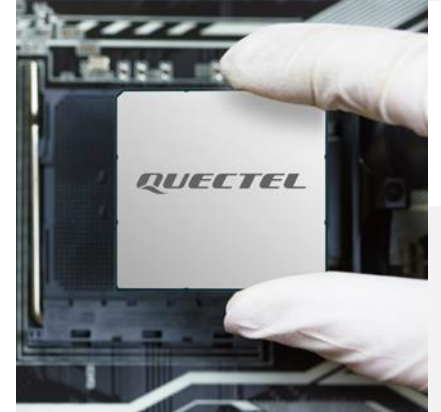
NB-IoT Technology

Product Overview

Technical Details

Applications

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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

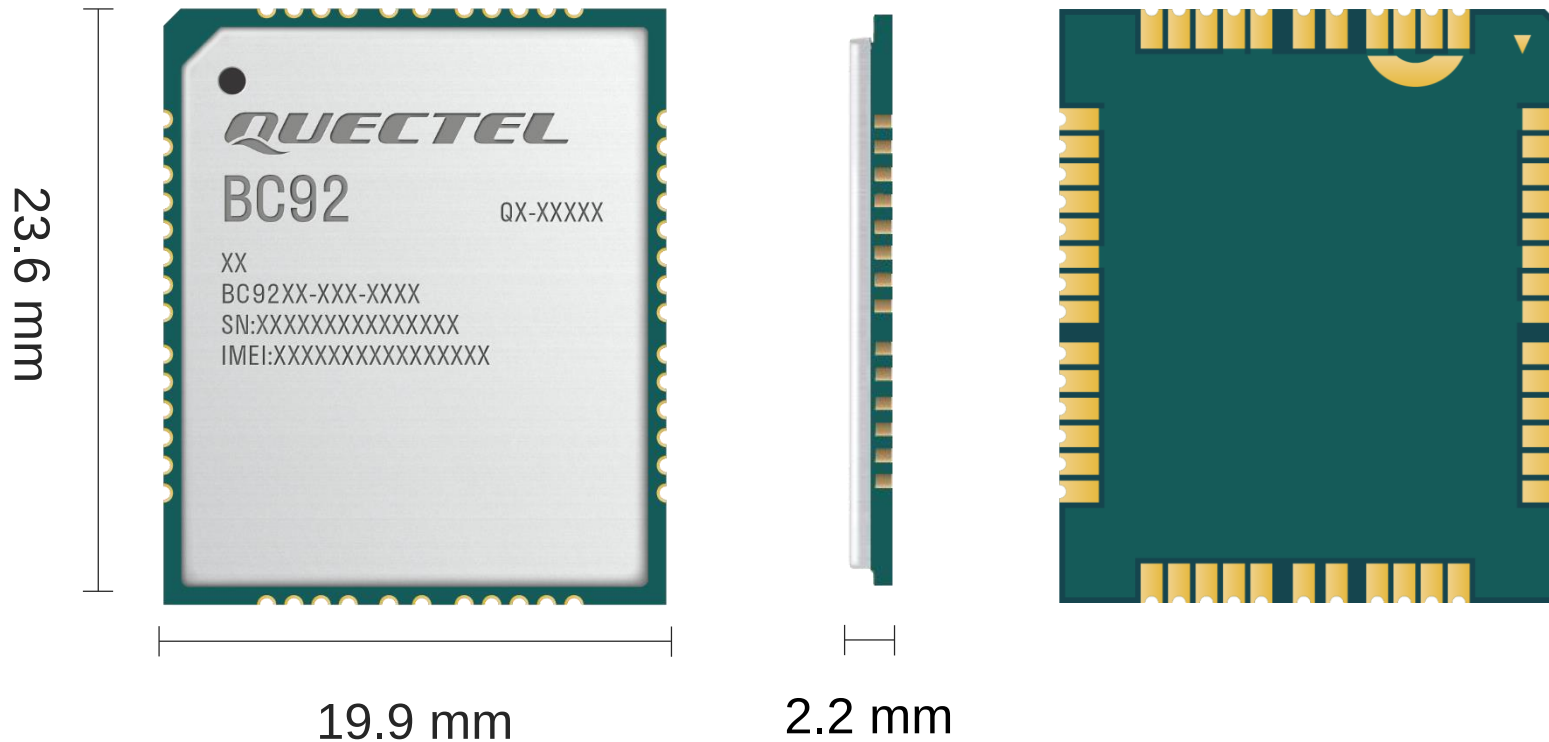
2020

2021

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	• LTE Cat NB2: B3/ B5/ B8/ B20/ B28 • GSM: 850/ 900/ 1800/ 1900 MHz
Data Rate	• 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
Special Features	• Built-in ADC temperature detection* • Low power design • DFOTA
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



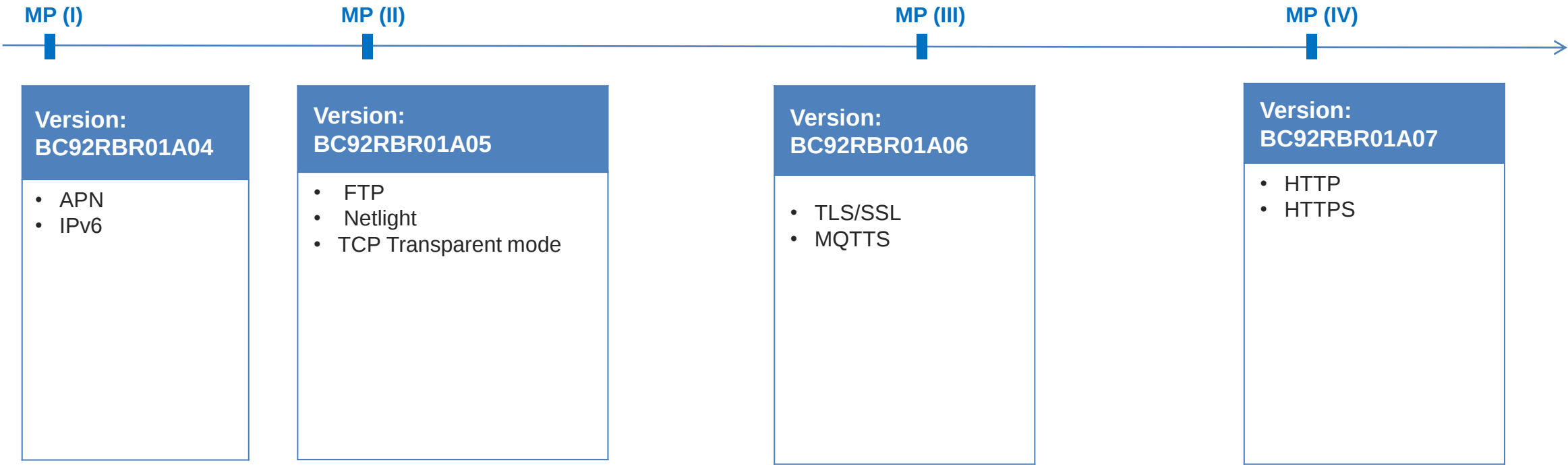
Function	Description
Protocols	UDP/TCP/SNTP/PPP/MQTT/CoAP*/HTTP*/HTTPS*/FTP
SMS*	Text and PDU mode
DFOTA	Delta Firmware Upgrade Over-The-Air
Power Supply	Range: 3.4–4.2 V Typical: 3.8 V

** means under development.*

BC92 Development Schedule



2020				2021				2022			
Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4



BC92 Certifications



Project Schedule

BC92

MP

Carrier Certification

Vodafone/ Vodacom/ MTN



Regulatory Certification

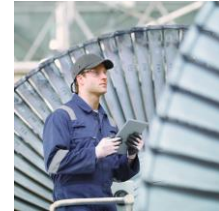
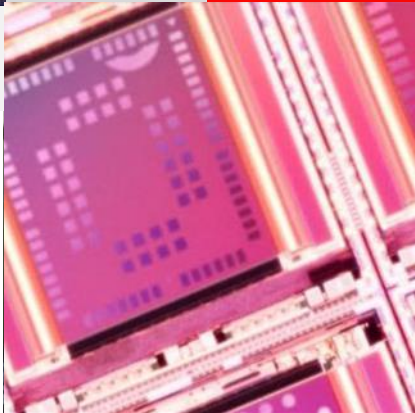
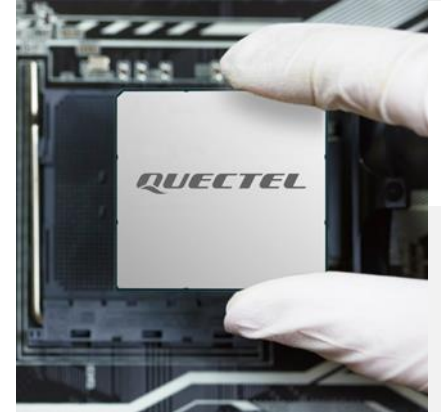
GCF/ CE/ Anatel/ RCM/ ICASA



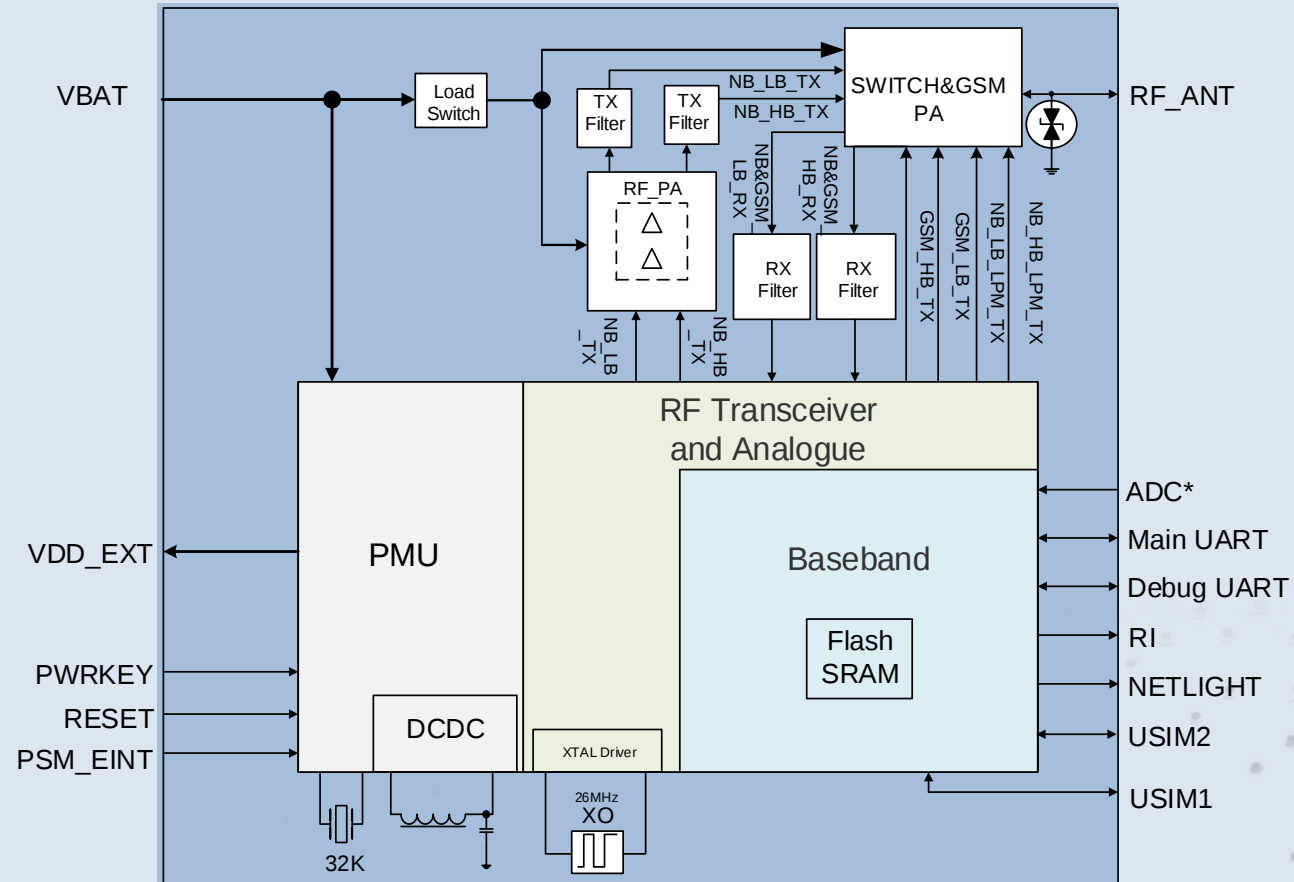


NB-IoT Technology Product Overview **Technical Details** Applications

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Hardware Diagram



* means under development.

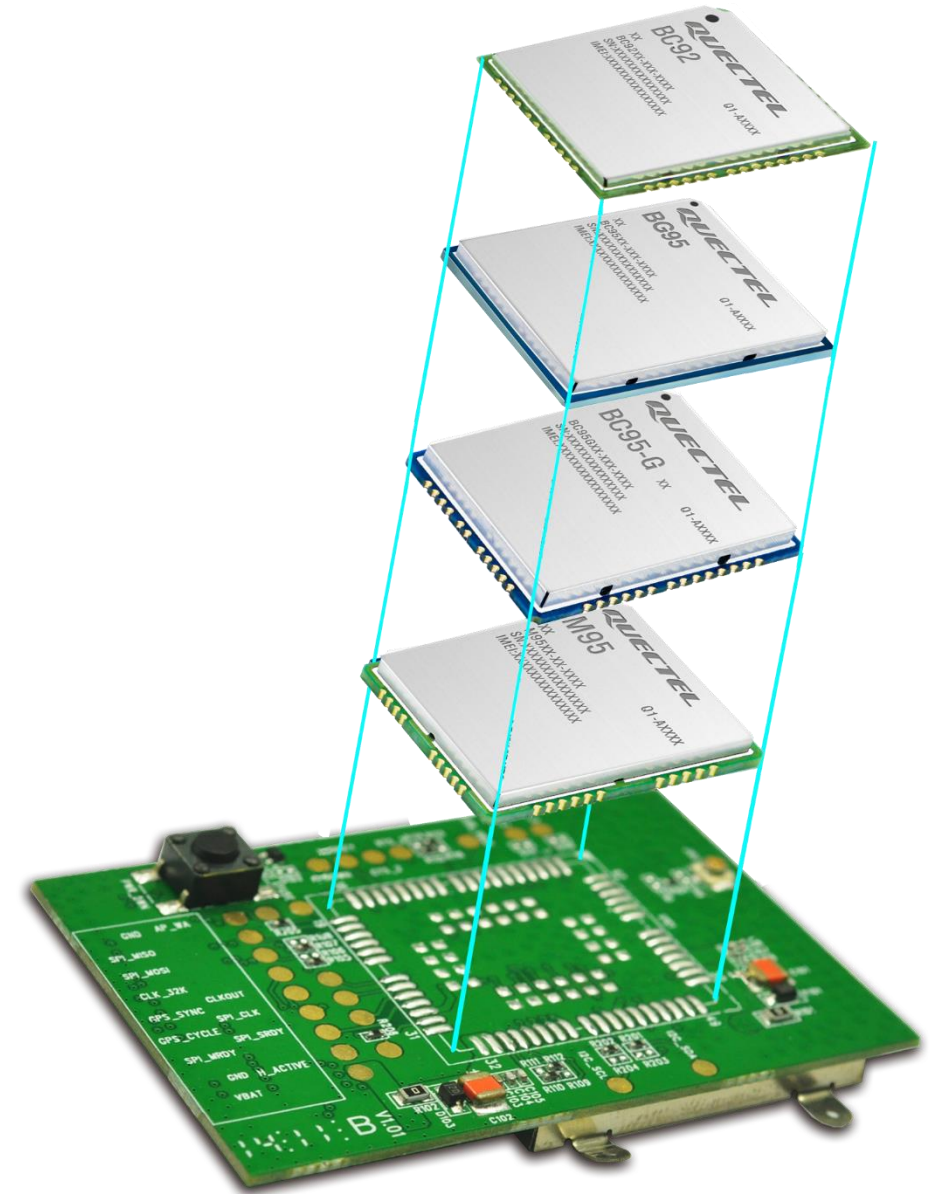
Layout Compatibility



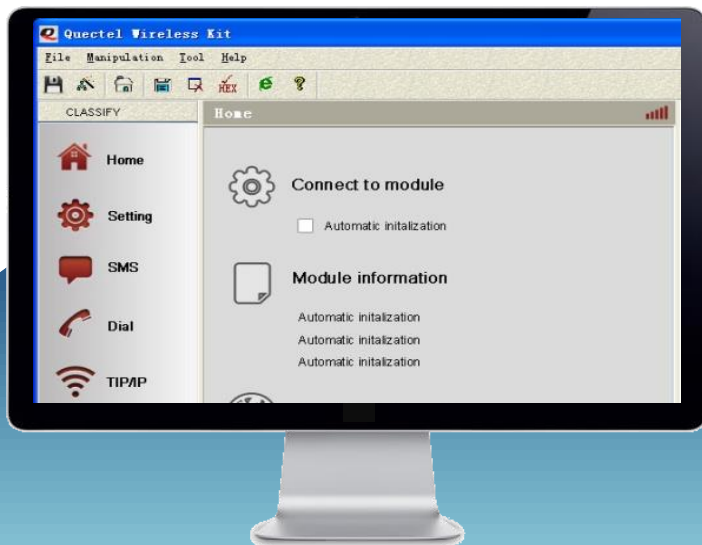
BC92 is compatible with

- Quectel NB-IoT BC95-G module
- Quectel LPWA BG95 module
- Quectel GSM/GPRS M95 module

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.



Quick Start



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

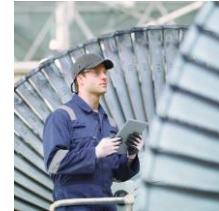
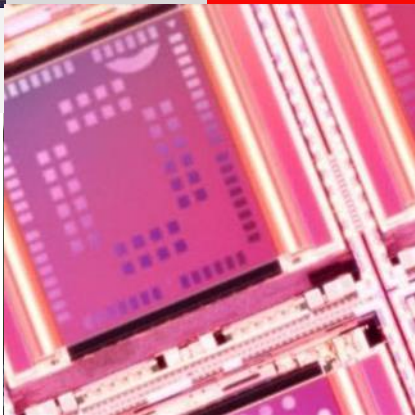
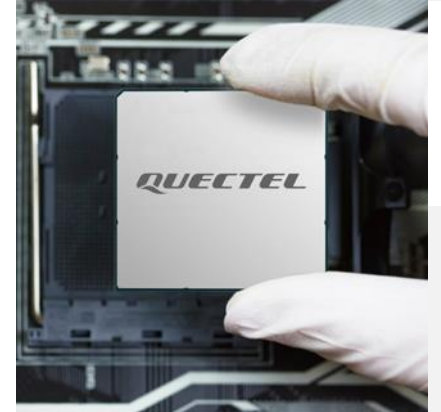
TE-B Kit





NB-IoT Technology Product Overview Technical Details **Applications**

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LPWA Application Scenarios



Public Utilities

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

Industry & Agriculture

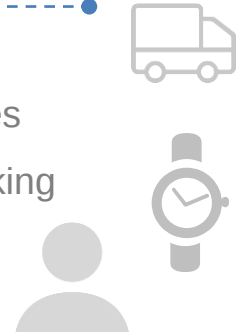
- Gas Detector
- Soil PH/Optical Sensor
- Machine Alarm
- Irrigation Controller



Quectel Module

Smart Life

- Asset Tracking
- Wearable Devices
- Person/Pet Tracking



Smart Home

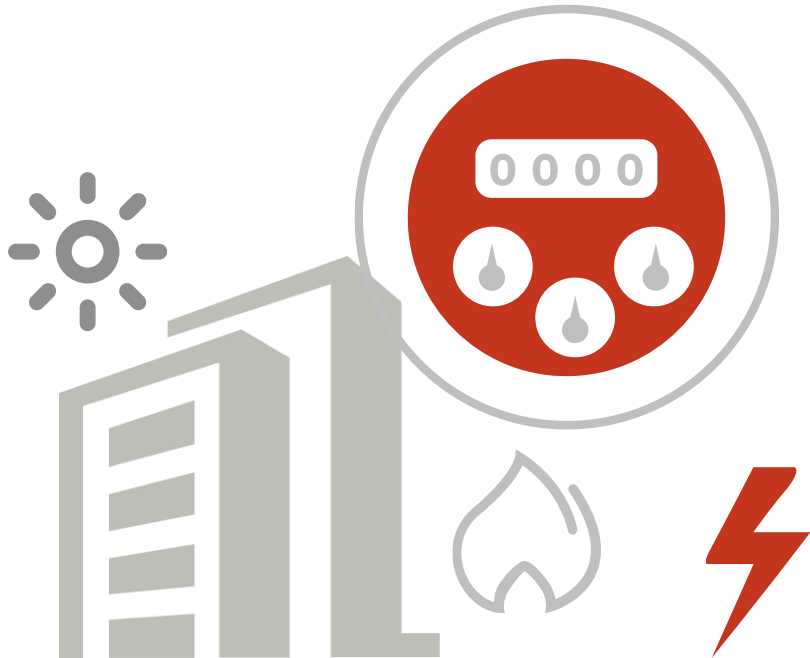
- Intelligent Door Lock
- Intelligent Control



Public Utilities – Smart Metering



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



Domestic Meters

Wind Power Plant

Factory

Workplace



Gas Meter



Water Meter



Heat Meter



Electricity Meter

Nuclear Power Plant

Thermal Power Plant

Hydraulic Power Plant

Renewable Energy

Ecological Vehicle

Photoelectricity

Public Utilities – Street Lighting

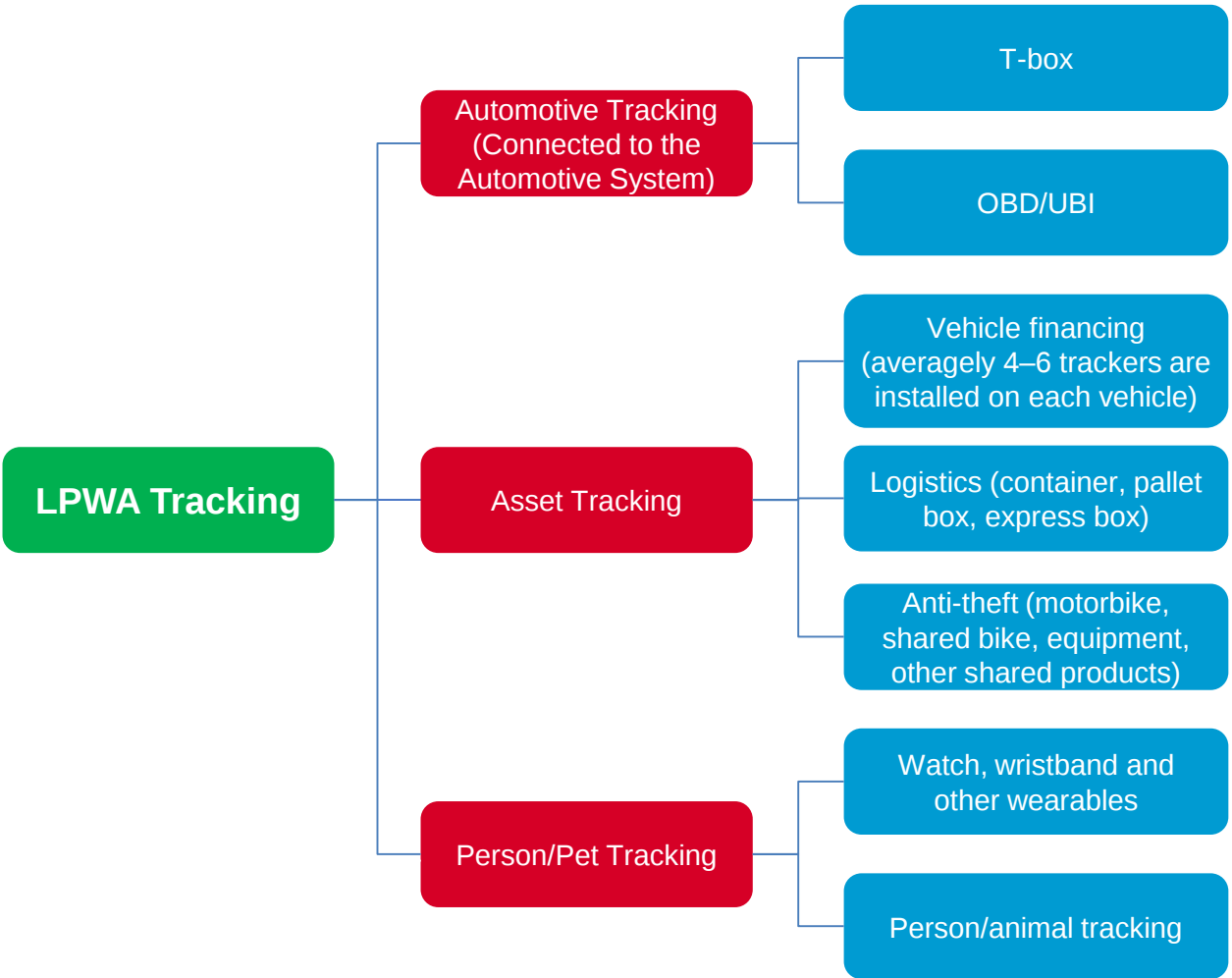
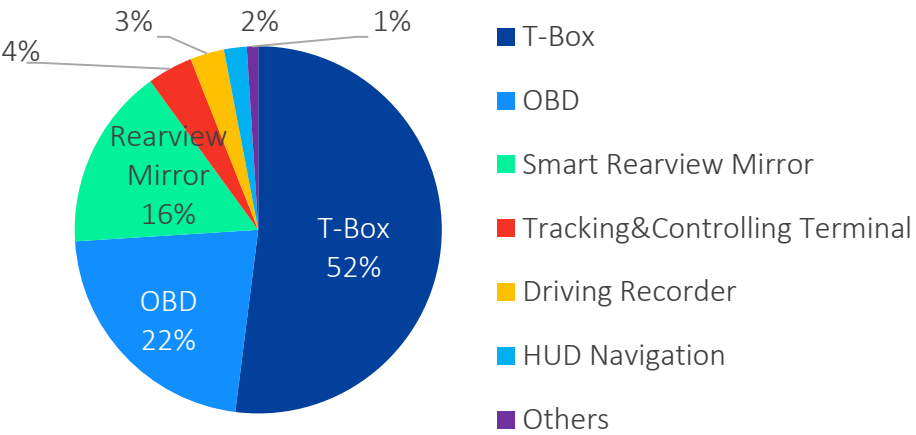


- Real time data feeds directly to the operation center
- Manual brightening of lighting when required
- Improved energy efficiency

Smart Life – LPWA Tracker



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



Smart Home

Feature:

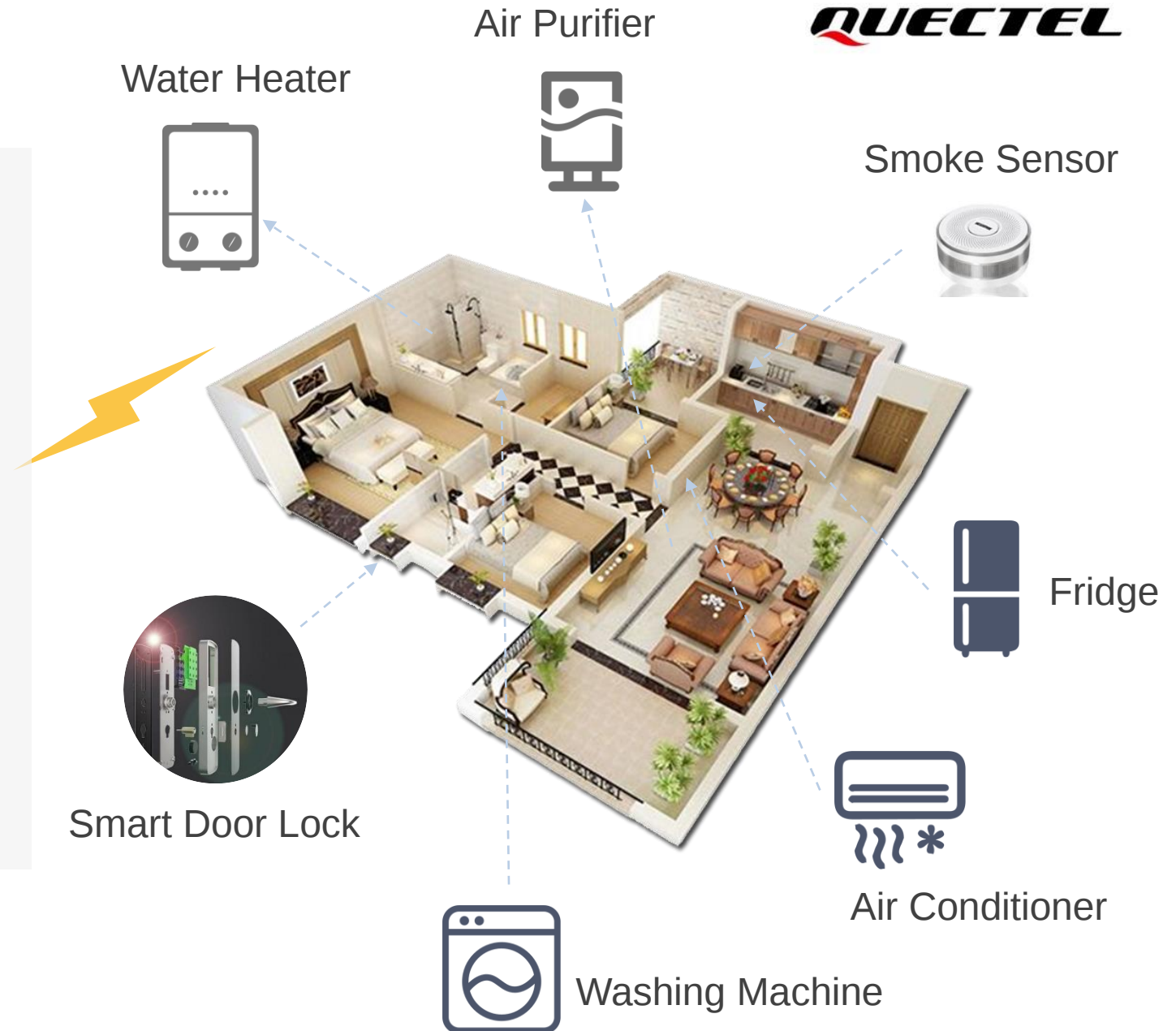
Non-inductive connection,
automation, machine learning

Trend:

Smarter, more convenient,
safer, more energy-efficient

Including:

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



Industry & Agriculture – Multi-gas Detector

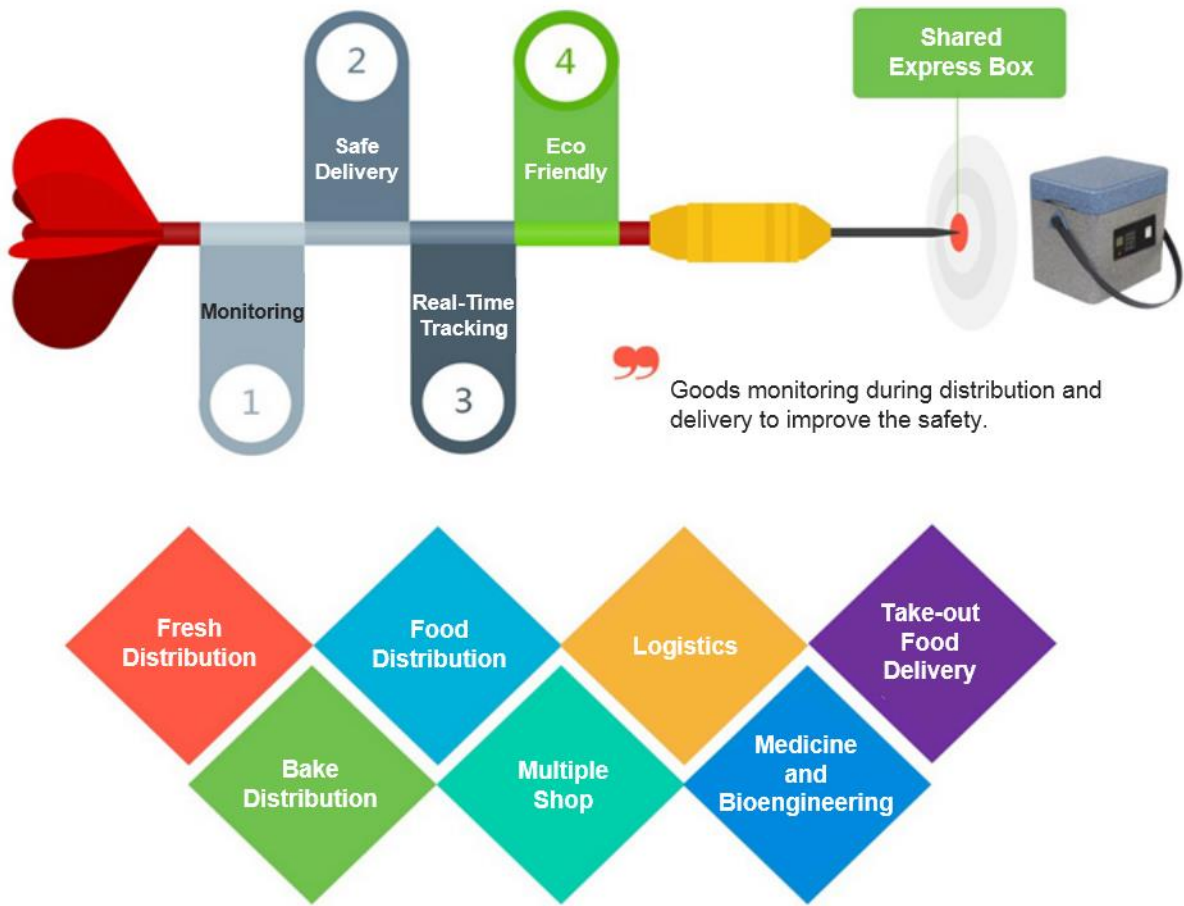


- Hazardous gas monitoring, including VOCs, combustibles and toxics, etc.
- Real-time gas concentration reading, location, alarm and status indication

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
- High quality range of off-the-shelf and customized antennas
- Superb support with the largest R&D team in the industry
- Continuous innovation in 5G, LPWA, Automotive, and Smart module technology
- A passionate, dedicated team of "Quectelers" ensures our customers always come first

Thank You

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