

Quectel Wireless Solutions

Company Overview

Onur Canitez, Regional Sales Director

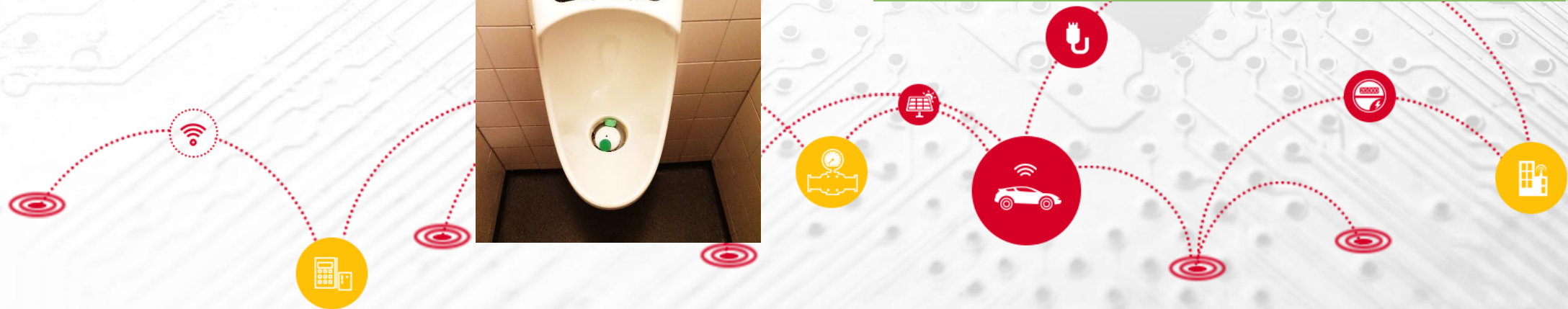
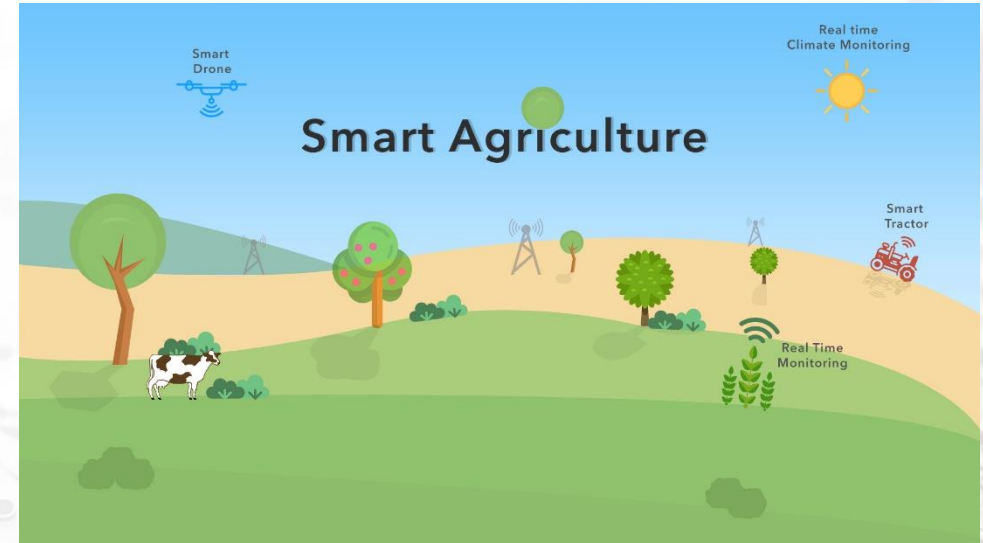
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Mehmet Cihangir, Field Application Engineer

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Oct., 2017

IoT ?



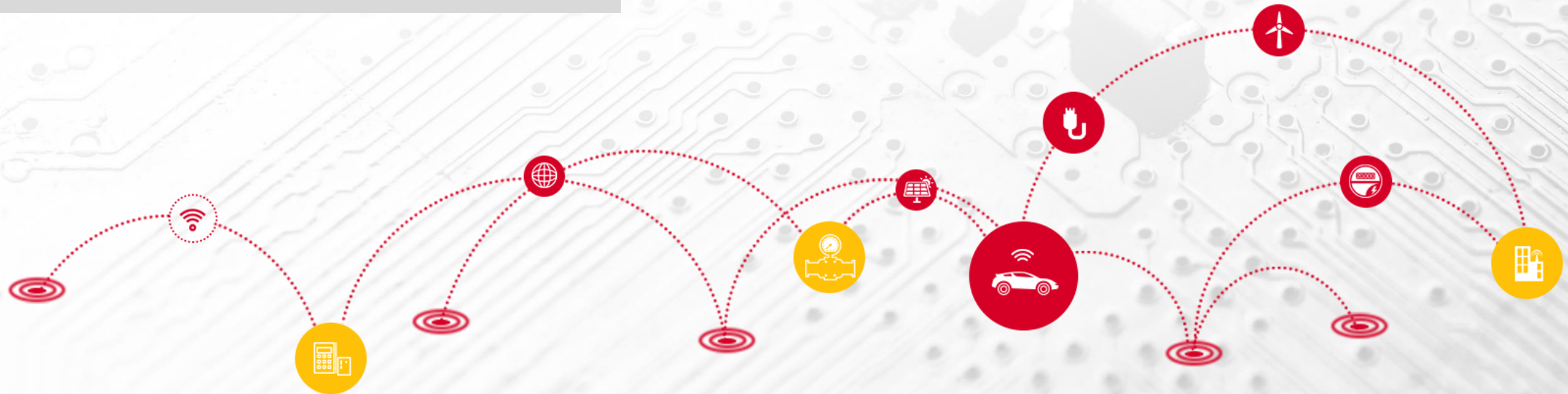
Quectel Overview

Product Portfolio

Technology

M2M Applications

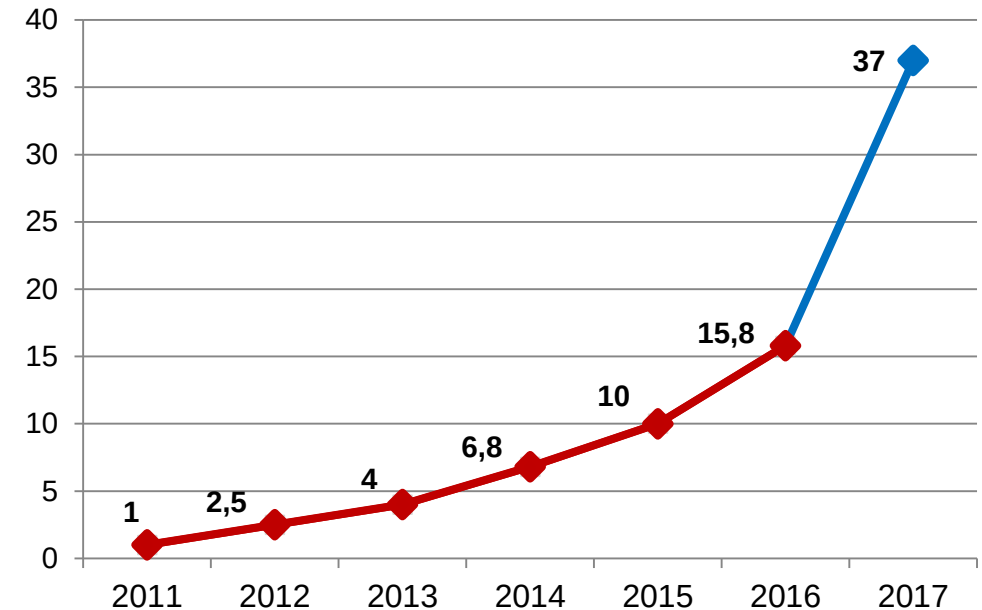
QUECTEL[®]
Build a Smarter World



About Quectel

- Founded in October, 2010
- HQ in Shanghai, China. 40+ Sales Offices, 2 R&D Centers, 70+ Distributors Worldwide
- 500+ employees
- Monthly production capacity over **5 Mpcs**
- More than 3000 customers worldwide

Shipment Growth (Mpcs)

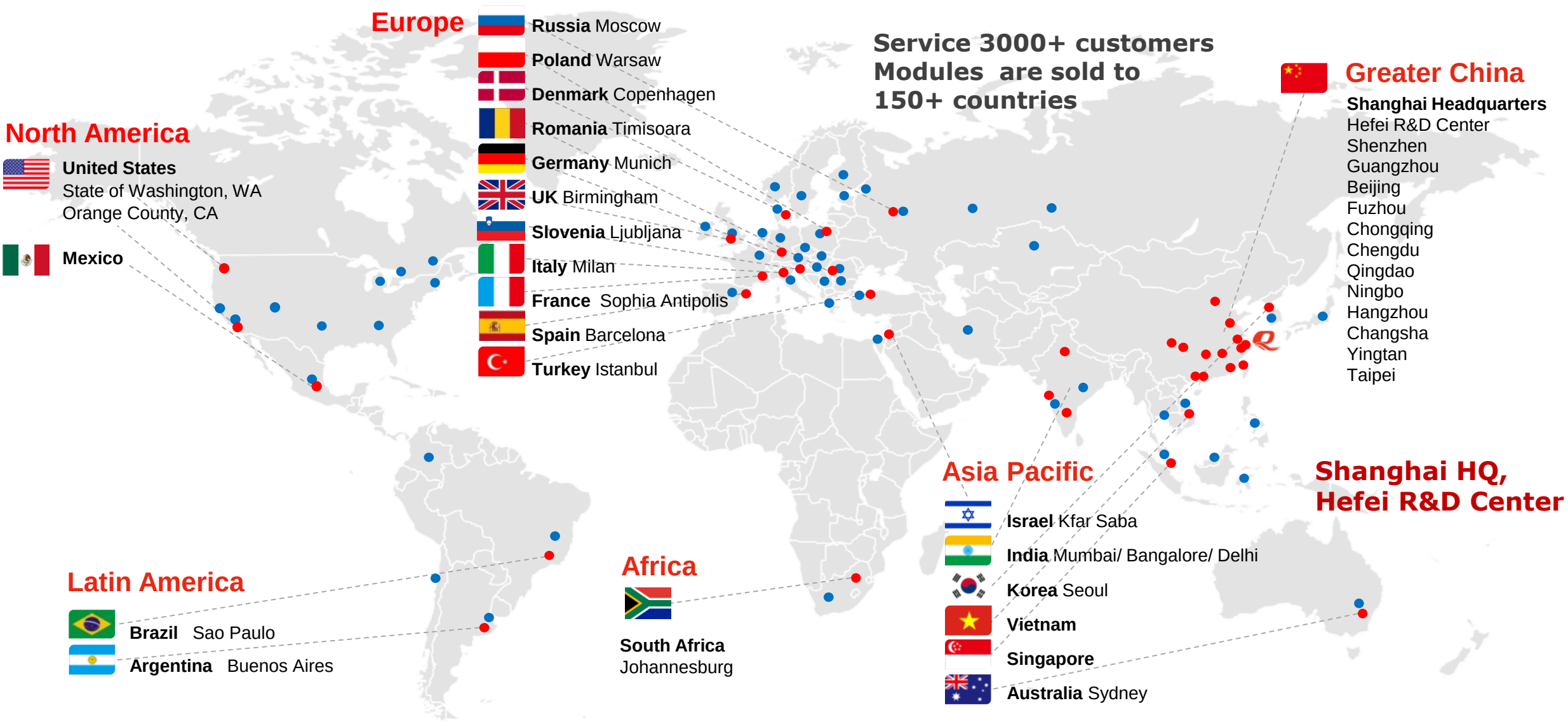


Global Presence



- 40+ sales offices
- 70+ distributors

Service 3000+ customers
Modules are sold to
150+ countries



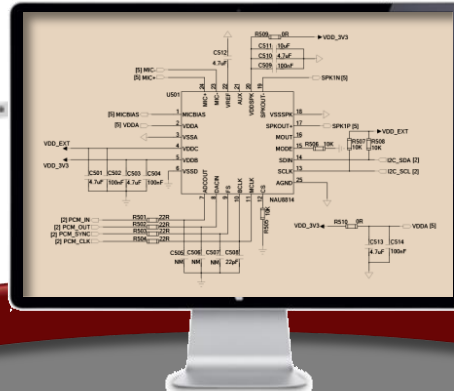
Technology Partners and Certifications



Quectel 360-degree support

1. Design Concept

- Analyze Customer's Demands
- Recommend a Right module for the Customer



2. Design In

- Recommend RF reference
- Check Schematic and Layout
- Offer software design support



3. Prototype

- Recommend Suppliers



4. RF/EMC TEST

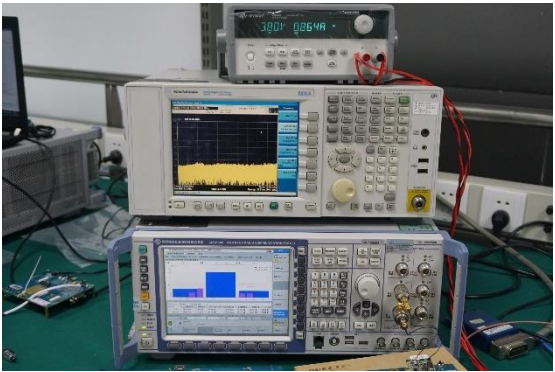
- Offer Laboratory

5. Mass Production

- One-year Free Repair and Maintenance
- After-sales Service



Test Environment

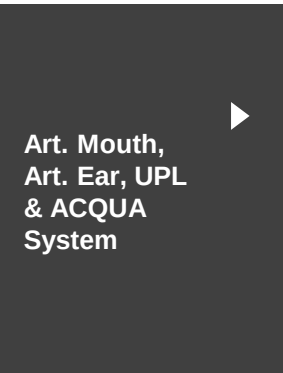


◀ CMW 500 & An....

Micro-drop Tester ▶



◀ Tumbling Barrel Tester



▶
Art. Mouth,
Art. Ear, UPL
& ACQUA
System



◀ Anechoic Chamber
for Audio

ESD Test System ▶



◀ OTA System

Thermal Shock Chamber ▶



◀ High / Low Temp. &
Humidity Chamber

Robot ▶



EMS Partners



Flextronics Suzhou, China



Serdia
Curitiba, Brazil



Qisda
Suzhou, China



Sintave
Dongguan, China

Quectel's modules are manufactured in the **ISO/TS16949**, **ISO14000** and **OHSAS18001** certified factories.

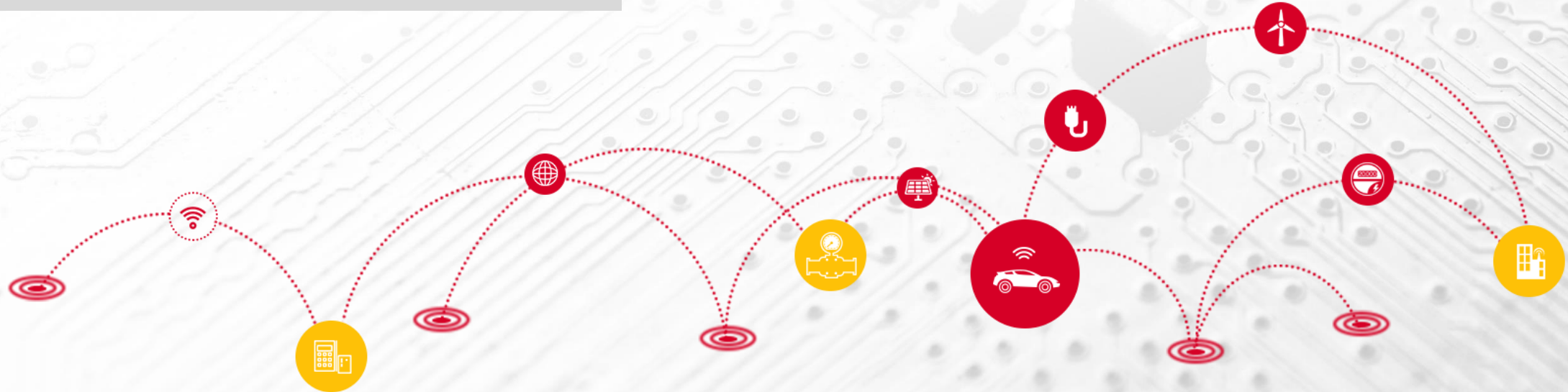
Quectel Overview

Product Portfolio

Technology

M2M Applications

QUECTEL[®]
Build a Smarter World



Quectel M2M Cellular Portfolio



LTE

2G-3G-4G-LPWA Migration

EG95/EG91

- Compatible with UG96
- Multi-mode LTE
- Cat.4, 150M DL/ 50M UL
- Cat.1, 10M DL/ 5M UL

BG96

- Cat.M1/ NB1/ EGPRS
- 375K DL/ 375K UL
- North America and Global Versions

BC95

- Cat.NB1 (NB-IoT)
- 100K DL
- B5/ -B8/ -B20/ -B28/ -G

UG95/UG96

- LGA Form Factor
- 7.2M/ 5.76M
- Global version (UG96)
- E/ -A (UG95)

M95

- LCC Form Factor
- (19.9×23.6×2.65)mm
- Quad-band

BC66

- Cat.NB1 (NB-IoT)
- 100K DL
- Global Versions

BC68

- Cat.NB1 (NB-IoT)
- 100K DL
- B5/ -B8/ -B20/ -B28/ -G

2G-LPWA Migration

M66

- LCC Form Factor
- (17.7×15.8×2.3)mm
- Bluetooth

Automotive

EG12 H1'18

- LGA Form Factor
- 3CA
- 600Mbps DL
- Cat.12

EG09 H1'18

- LGA Form Factor
- Cat.9
- 3CA
- 450Mbps DL

EG06 Q3'17

- LGA Form Factor
- LTE with CA
- Up to 4×2 MIMO DL
- Cat.6 300M DL/ 50M UL

AG35

- Automotive Grade
- Multi-mode LTE
- Cat.4, 150M DL/ 50M UL
- CE/ -E/ -C

EC25/ EC21

- Multi-mode LTE
- Cat.4, 150M DL/ 50M UL
- Cat.1, 10M DL/ 5M UL
- E/ -A/ -V/ -AU/ -AUT/ -AUV/ -KL/ -J

3G-4G Migration

UC20 HSPA+

- LCC Form Factor
- (32.0×29.0×2.5)mm
- 14.4M/ 5.76M
- E/ -A/ -G

MC60

- LCC Form Factor
- (18.7×15.8×2.3)mm
- GSM/ GPRS+GNSS

EP12 H2'18

- Mini PCIe Form Factor
- 3CA
- 600Mbps DL
- Cat.12

EP09 H2'18

- Mini PCIe Form Factor
- Cat.9
- 3CA
- 450Mbps DL

EP06 Q4'17

- Mini PCIe Form Factor
- LTE with CA
- Up to 4×2 MIMO DL
- Cat.6 300M DL/ 50M UL

EC25/ EC21

- Mini PCIe Form Factor
- Cat.4, 150M DL/ 50M UL
- Cat.1, 10M DL/ 5M UL
- E/ -A/ -V/ -AU/ -AUT/ -AUV/ -KL/ -J

UC20 Mini PCIe

- (51.0×30.0×4.9)mm
- 14.4M/ 5.76M
- E/ -A/ -G

EM06 Q3'17

- M.2 Form Factor
- LTE with CA
- Up to 4×2 MIMO DL
- Cat.6 300M DL/ 50M UL

EM05

- M.2 Form Factor
- LTE Cat.4
- Cat.4, 150M DL/ 50M UL
- CE/ -CML

SC60 Q3'17

- Smart Module
- Cat.6, 300M DL/ 50M UL
- 2GB RAM+16GB ROM
- CE/ -E/ -A/ -AU/ -W
- LCC Form Factor

SC20

- Smart Module
- Cat.4, 150M DL/ 50M UL
- CE/ -E/ -A/ -AU/ -J/ -W
- LCC Form Factor

Smart Modules



M10

- LCC Form Factor
- GSM/ GPRS+GNSS

M10

- LCC Form Factor
- GSM/ GPRS+GNSS

3G

2G

Smart Module Portfolio



SC20 Smart Module



Max.150Mbps (DL)/ Max.50Mbps (UL)

Dimensions: 40.5mm × 40.5mm × 2.8mm

Temperature Range: -40°C ~ +75°C

Interfaces: TP/ LCM/ Camera/ Audio/ USB/ UART/ USIM/ PCM/ ADC/ I2C/ SPI/ SDIO/ PWRKEY/ Antenna

Certifications: CE*/ FCC*/ CCC/ GCF*/ PTCRB*/ AT&T*/ Verizon*/ ACMA/ RCM*

SG30 Smart Module*



Q2'17



Q3'17

SG36 Smart Module
42.0mm × 45.5mm × 2.8mm

Max.150Mbps (DL)/ Max.50Mbps (UL)

Dimensions: 42.0 mm × 45.5mm × 2.8mm

Temperature Range: -40°C ~ +75°C

Interfaces: TP/ LCM/ Camera/ Audio/ USB/ UART/ USIM/ PCM/ ADC/ I2C/ SPI/ SDIO/ PWRKEY/ Antenna

Certifications: TBD

SC60 Smart Module*



Q3'17

Max.300Mbps (DL)/ Max.50Mbps (UL)

Dimensions: 44.0mm × 43.0mm × 2.9mm

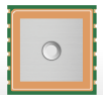
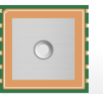
Temperature Range: -40°C ~ +75°C

Interfaces: TP/ LCM/ Camera/ Audio/ USB/ UART/ USIM/ PCM/ ADC/ I2C/ SPI/ SDIO/ PWRKEY/ Antenna

Certifications: TBD

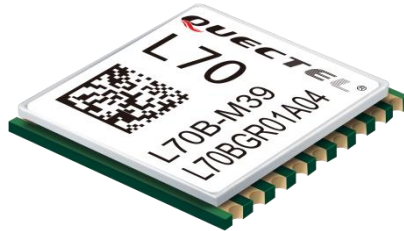


GNSS Module Roadmap

		Stand-alone Modules		Modules with Patch Antenna
GPS		L70 ▪ 18-pin LCC ▪ MT3339		L80 ▪ 12-pin LCC ▪ MT3339
		L70-R ▪ 18-pin LCC ▪ MT3337		L80-R ▪ 12-pin LCC ▪ MT3337
		L70-RL ▪ 18-pin LCC ▪ MT3337 ▪ Built-in LNA		
GNSS	L26 ▪ 24-pin LCC ▪ MT3333	L76 ▪ 18-pin LCC ▪ MT3333	L96 ▪ 31-Pin LCC ▪ MT3333 ▪ Built-in LNA ▪ Chip Antenna Integrated	
		L76B ▪ 18-pin LCC ▪ MT3333		L86 ▪ 12-pin LCC ▪ MT3333
		L76-L ▪ 18-pin LCC ▪ MT3333 ▪ Built-in LNA		
16.0mm × 12.2mm × 2.4 mm		10.1mm × 9.7mm × 2.5 mm		16.0mm × 16.0mm × 6.45 mm (L80) 18.4mm × 18.4mm × 6.45 mm (L86)

GPS Module Specifications

L70 GPS Module



10.1mm × 9.7mm × 2.5mm
MT3339

- 18 pins with LCC
- High Sensitivity: -165dBm
- Default baud rate: 9600bps
- Voltage: 2.8V to 4.3V, 3.3V typ.
- Low power consumption:
 - 12mA @Tracking mode
 - 18mA @Acquisition mode
 - 7uA @Backup mode
- AGPS function: EASY™ technology, EPO
- Multiple power saving modes (AlwaysLocate™/ Periodic mode/ Standby mode/ Backup mode)
- FLP mode: only 5mA in static receiving
- LOCUS, built-in logger solution
- Support SDK command

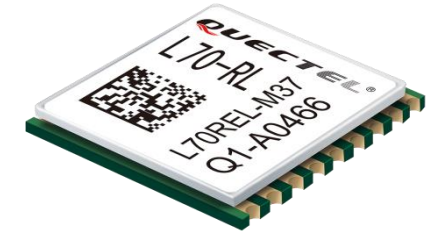
L70-R GPS Module



10.1mm × 9.7mm × 2.5mm
MT3337

- 18 pins with LCC
- High Sensitivity: -165dBm
- Default baud rate: 9600bps
- Voltage: 2.8V to 4.3V, 3.3V typ.
- Low power consumption:
 - 13mA @Tracking mode
 - 16mA @Acquisition mode
 - 8uA @Backup mode
- AGPS function: EASY™ technology, EPO
- Multiple power saving modes (Standby mode/ Backup mode)

L70-RL GPS Module



10.1mm × 9.7mm × 2.5mm
MT3337

- 18 pins with LCC
- High Sensitivity: -167dBm
- Default baud rate: 9600bps
- Voltage: 2.8V to 4.3V, 3.3V typ.
- Low power consumption:
 - 18mA @Tracking mode
 - 21mA @Acquisition mode
 - 8uA @Backup mode
- AGPS function: EASY™ technology, EPO
- Built-in LNA
- Multiple power saving modes (Standby mode/ Backup mode)

GNSS Module Specifications

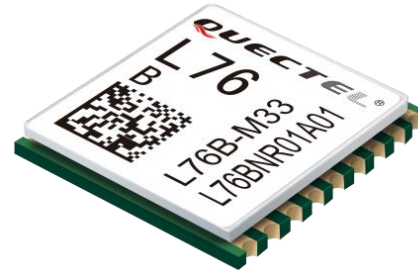
L76 GNSS Module



10.1mm × 9.7mm × 2.5mm
MT3333

- 18 pins with LCC
- GPS, GLONASS, Galileo and QZSS
- High Sensitivity: -165dBm
- Default baud rate: 9600bps
- Voltage: 2.8V to 4.3V, 3.3V typ.
- Low power consumption:
 - 18mA (GPS+GLONASS) @Tracking mode
 - 25mA (GPS+GLONASS) @Acquisition mode
 - 7uA @Backup mode
- AGPS function: EASY™ technology, EPO
- Multiple power saving modes (AlwaysLocate™/ Period mode/ Standby mode/ Backup mode)
- LOCUS, built-in logger solution
- Support SDK command

L76B GNSS Module



10.1mm × 9.7mm × 2.5mm
MT3333

- 18 pins with LCC
- GPS, **Beidou** and QZSS
- High Sensitivity: -165dBm
- Default baud rate: 9600bps
- Voltage: 2.8V to 4.3V, 3.3V typ.
- Low power consumption:
 - 18mA (GPS+BeiDou) @Tracking mode
 - 23mA (GPS+BeiDou) @Acquisition mode
 - 7uA @Backup mode
- AGPS function: EASY™ technology, EPO
- Multiple power saving modes (AlwaysLocate™/ Period mode/ Standby mode/ Backup mode)
- LOCUS, built-in logger solution

L76-L GNSS Module



10.1mm × 9.7mm × 2.5mm
MT3333

- 18 pins with LCC
- GPS, GLONASS, Galileo and QZSS
- High Sensitivity: -167dBm
- Default baud rate: 9600bps
- Voltage: 2.8V to 4.3V, 3.3V typ.
- Low power consumption:
 - 22mA (GPS+GLONASS) @Tracking mode
 - 29mA (GPS+GLONASS) @Acquisition mode
 - 7uA @Backup mode
- AGPS function: EASY™ technology, EPO
- Built-in LNA
- Multiple power saving modes (AlwaysLocate™/ Period mode/ Standby mode/ Backup mode)
- LOCUS, built-in logger solution
- Support SDK command

GNSS Module Specifications

L26 GNSS Modul



16.0mm x 12.2mm x 2.4mm
MT3333

- 24 pins with LCC
- GPS, GLONASS, Galileo and QZSS
- High Sensitivity: -167dBm
- Default baud rate: 9600bps
- Voltage: 2.8V to 4.3 V, 3.3V typ.
- Low power consumption:
 - 21mA (GPS+GLONASS) @Tracking mode
 - 29mA (GPS+GLONASS) @Acquisition mode
 - 7uA @Backup mode
- AGPS function: EASY™ technology, EPO
- Built-in LNA
- Multiple power saving modes (AlwaysLocate™/ Periodic mode/ Standby mode/ Backup mode)
- LOCUS, built-in logger solution
- Short-circuit protection and detection for active antenna
- Support SDK command

L96 GNSS Module

NEW

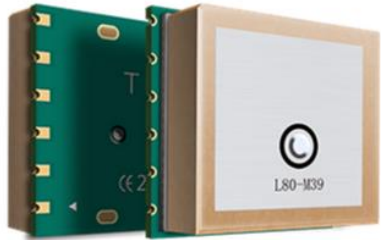


9.6mm x 14.0mm x 2.5 mm
MT3333

- Small compact size: 9.6 x 14.0 x 2.5 mm
- Multi-GNSS engine for GPS, GLONASS, GALILEO and QZSS
- Support EASY™, advanced AGPS technology without external memory
- Built-in LNA for better sensitivity
- Ultra low tracking power consumption
- AlwaysLocate™, an intelligent algorithm for power saving
- LOCUS, embedded logger function with no need for host and external flash
- Offer 99 acquisition/33 tracking channels and up to 210PRN channels
- Support DGPS, SBAS (WAAS/EGNOS/MSAS/GAGAN)
- Great anti-jamming performance due to multi-tone active interference canceller
- Balloon mode, for high altitude up to 80km
- PPS VS. NMEA can be used in time service
- Support SDK command developed by Quectel
- Support external antenna

GNSS Module (with Patch Antenna) Specifications

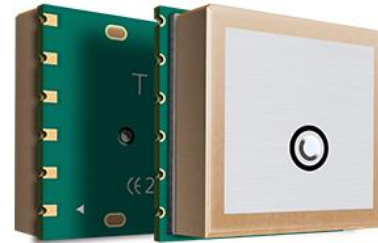
L80 GPS Module



16.0mm x 16.0mm x 6.45mm
MT3339

- 12 pins with LCC
- Patch Antenna (15.0mm x 15.0mm x 4.0mm) on the top of module
- High Sensitivity: -165dBm
- Default baud rate: 9600bps
- Voltage: 3V to 4.3V, 3.3V typ.
- Low power consumption
 - 20mA @Tracking mode
 - 25mA @Acquisition mode
 - 7uA @Backup mode
- Short-circuit protection and detection for active antenna
- Active antenna switching function
- Built-in LNA
- Large size of pins (Length=1.5mm; Width=1.0mm)
- AGPS function: EASY™ technology, EPO
- Multiple power saving modes (AlwaysLocate™/ Periodic mode/ Standby mode/ Backup mode)
- FLP mode: only 50% power consumption of normal mode
- LOCUS, built-in logger solution
- Support SDK command

L80-R GPS Module



16.0mm x 16.0mm x 6.45mm
MT3337

- 12 pins with LCC
- Patch Antenna (15.0mm x 15.0mm x 4.0mm) on the top of module
- High Sensitivity: -165dBm
- Default baud rate: 9600bps
- Voltage: 3V to 4.3V, 3.3V typ.
- Low power consumption
 - 20mA @Tracking mode
 - 25mA @Acquisition mode
 - 7uA @Backup mode
- Built-in LNA
- Large size of pins (Length=1.5mm; Width=1.0mm)
- AGPS function: EASY™ technology, EPO
- Multiple power saving modes (Standby mode/ Backup mode)

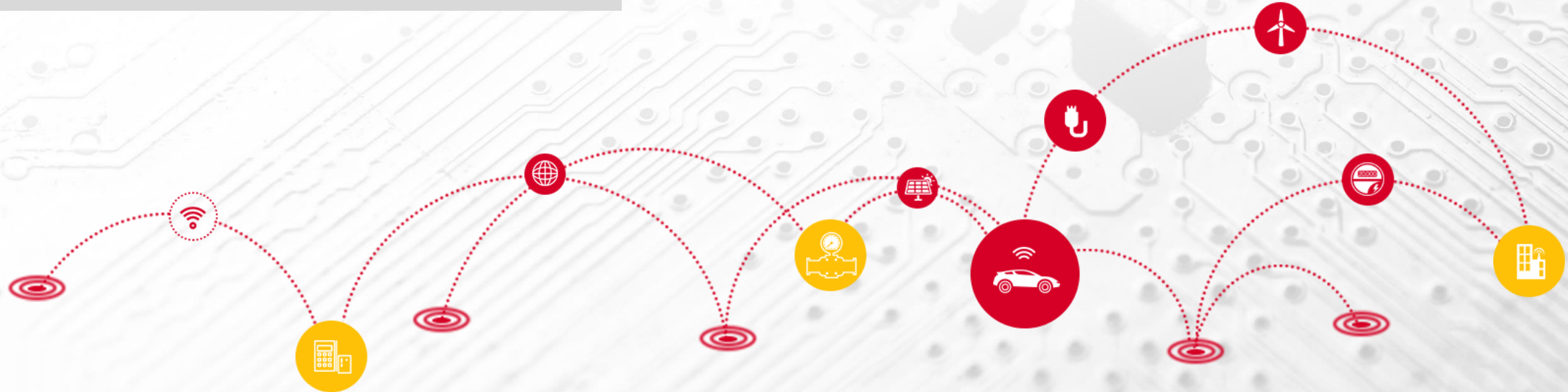
L86 GNSS Module



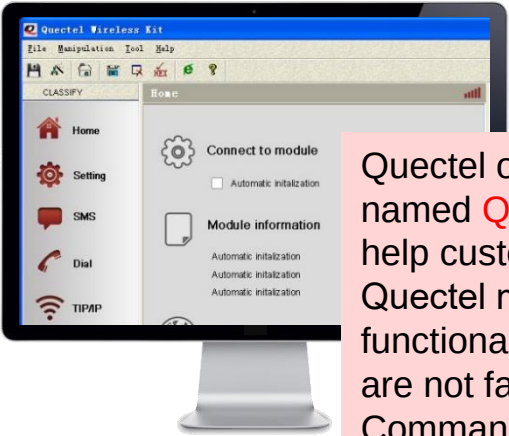
18.4mm x 18.4mm x 6.45mm
MT3333

- 12 pins with LCC
- Patch Antenna (18.4mm x 18.4mm x 4.0mm) on the top of module
- High Sensitivity: -167dBm
- Default baud rate: 9600bps
- Voltage: 3V to 4.3V, 3.3V typ.
- Low power consumption
 - 26mA (GLONASS+GPS) @Tracking mode
 - 30mA (GLONASS+GPS) @Acquisition mode
 - 7uA @Backup mode
- Short-circuit protection and detection for active antenna
- Active antenna switching function
- Built-in LNA
- Large size of pins (Length=1.5mm; Width=1.0mm)
- AGPS function: EASY™ technology, EPO
- Multiple power saving modes (AlwaysLocate™/ Periodic mode/ Standby mode/ Backup mode)
- LOCUS, built-in logger solution
- Support SDK command

Technology

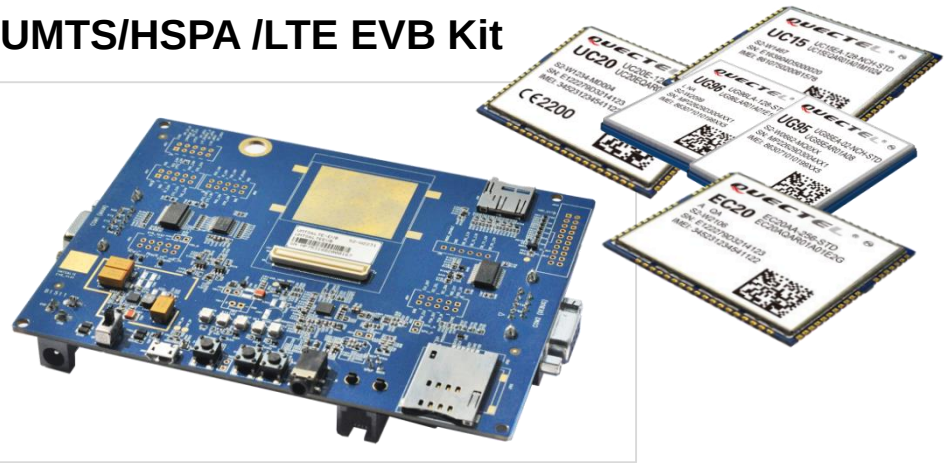


Easy to Evaluate – QNavigator and EVB Kit



Quectel offers a GUI tool named **QNavigator**. It can help customers quickly test Quectel module's functionality even if they are not familiar with AT Commands.

UMTS/HSPA /LTE EVB Kit



GSM/GPRS EVB Kit



UMTS/HSPA/LTE Mini PCIe Kit



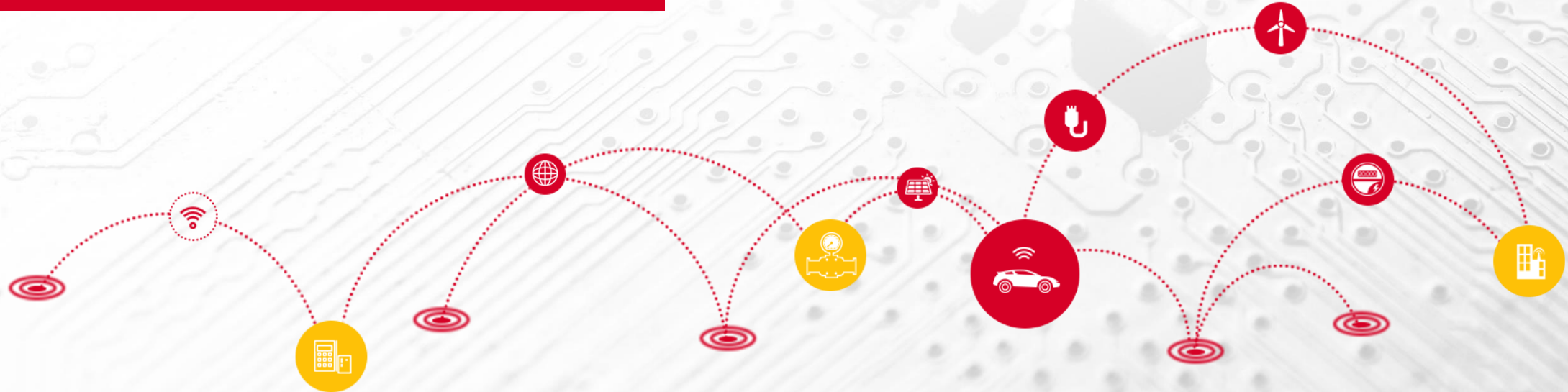
Quectel Overview

Product Portfolio

Technology

M2M Applications & NB-IoT

QUECTEL[®]
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LPWA Module Portfolio

BC95 LTE Cat.NB1



BC95-B8: 900MHz
BC95-B5: 850MHz
BC95-B20: 800MHz,
BC95-G: B1/B3/B5/B8/B20/B28 @LTE-FDD (TBD)

LCC package for robust soldering

Dimensions: 19.9mm × 23.6mm × 2.2mm

Temperature Range: -40°C ~ +85°C

Support embedded eSIM PCB footprint

Compatible with Quectel M95/UG96/UG95/EG91 modules

BC68 LTE Cat.NB1



B1@H-FDD: 2100MHz
B3@H-FDD: 1800MHz
B8@H-FDD: 900MHz
B5@H-FDD: 850MHz
B20@H-FDD: 800MHz
B28@H-FDD: 700MHz

LCC package for robust soldering

Dimensions: 17.7mm × 15.8mm × 2.3mm

Temperature Range: -40°C ~ +85°C

Compatible with Quectel M66/ module

BG96 LTE Cat.M1/NB1/EGPRS



Cat.M1: Max.375kbps (DL)/ Max. 375kbp (UL)
Cat.NB1: Max.32kbps (DL)/ Max. 70kbp (UL)

BG96-NA: B2/B4/B12/B13

BG96:

B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B26/B28
@LTE-FDD

B39 @LTE-TDD (B39 for Cat.M1 only)

850/900/1800/1900Mhz @GSM

LGA Form Factor

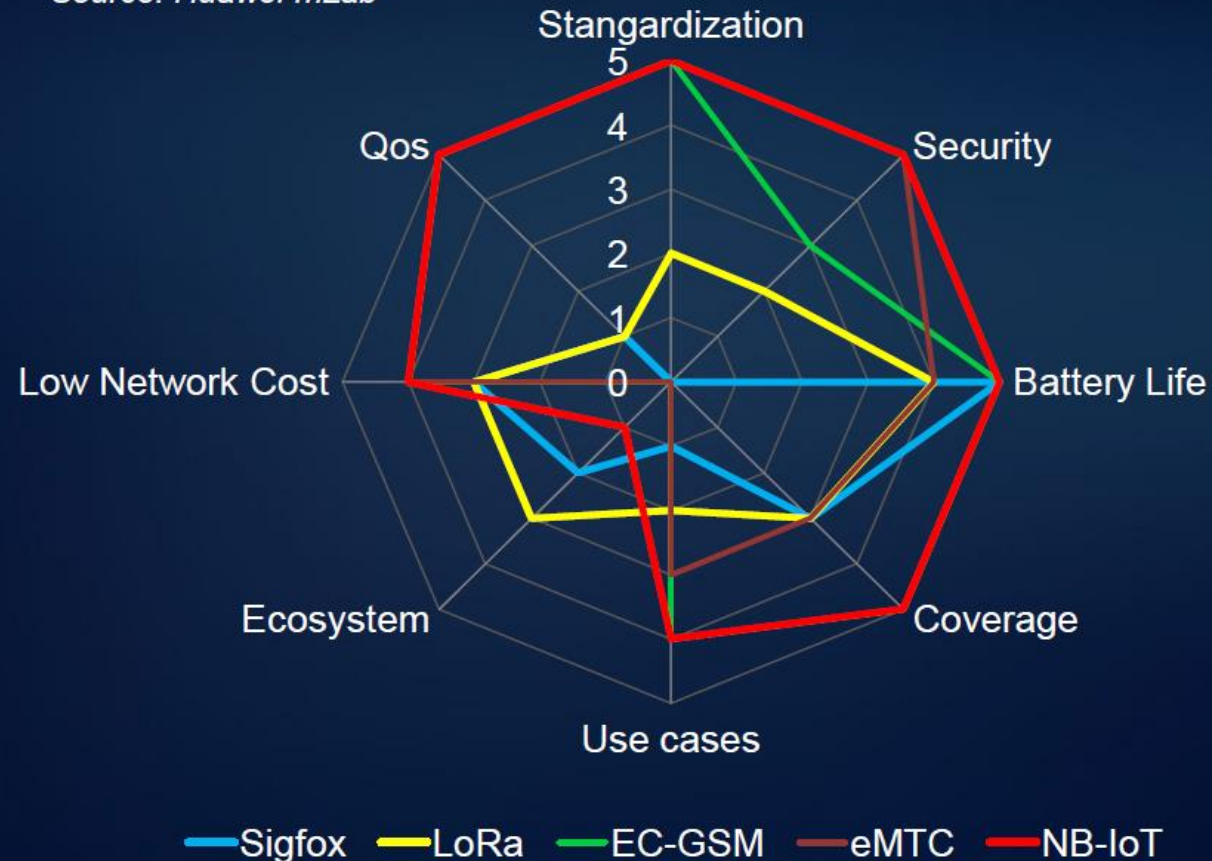
Dimensions: 22.5mm × 26.5mm × 2.3mm

Temperature Range: -40°C ~ +85°C

Compatible with Quectel
M95/UG95/UG96/BC95/EG91/EG95 module

Unlicensed IoT only for Limited Scenario

Source: Huawei mLab



LoRa:

- QoS not guaranteed (interference),
- Limitations in deep/wide coverage,
- Limited geographical area usage

Sigfox:

- QoS not guaranteed
- Proprietary technology,
- No encryption in air interface,
- Limitations in deep/wide coverage,
- Suggested for low end market only

NB-IoT Application Market

Industry & Agriculture

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

NB-IoT



Personal Life

- Asset Tracking
- Home appliance
- Person/Pet Tracking

Public Utilities

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

Metering & Home Appliances

Metering



- Remote meter readout
- Differential pricing policy
- Water quality monitoring
- Leak detection

NB-IoT



Home Appliances



Haier
Hisense

- Smart AC controlled by smart phone App
- AC remote monitoring

Sensor & Parking

Sensors for Industrial Applications



- Acceleration sensors
- Environmental sensors
- Pressure sensors
- Gyroscope monitoring

NB-IoT



Parking



- Unlock parking lock with App
- Check occupancy by WeChat
- Private parking space sharing

Street Lighting & Multi-gas Detector

Street Lighting



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

NB-IoT



Multi-gas Detector

Honeywell



- Monitors up to several threats, including VOCs, combustibles, toxics and oxygen.
- Real-time gas concentration reading, location, alarm and status indication

Smart Wristband & Smart Manhole Cover

Blood glucose meter

bioland



- Heart rate monitoring
- Smart reminding
- Sleep quality monitoring
- Pedometer

NB-IoT



Smart Manhole Cover



BaJoE

- Open/close status monitoring
- Waterproof
- Ultra low-power consumption
- Asset missing prevention

Smart Lock & Smart Hydrant

Smart Lock



- Remote management
- Password security
- Manpower saving

NB-IoT



Smart Hydrant



HOTHINK

- Status monitoring
- Damage prevention
- Waterproof

Tracker

Bicycle sharing



NB-IoT



Home Appliances



Tracker

Wearable



NB-IoT



Kids/Pet...



Interesting Use Cases



Target Applications



Telematics & Transport

- Automotive OEM
- Vehicle Tracking
- Container Tracking
- Ship Tracking
- Fleet Management
- OBD
- DVR
- Insurance Box



Energy

- Electricity Meter
- Gas Meter
- Water Meter
- Heat Meter
- Smart Grid
- Wind Turbines
- Solar Panel
- Charging Pile



Payment

- Wireless POS
- Cash Register
- ATM
- Vending Machine
- Top-up Machine



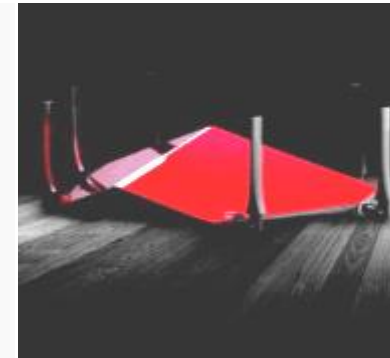
Security

- Alarm
- Camera
- Video Surveillance
- Intrusion Detection
- Smoke Detector
- Asset Protection



Smart City

- Street Lighting
- Traffic Light
- Elevator
- Digital Signage
- Advertisement Display
- LED Lighting
- Garbage Bin Monitoring
- Parking



Gateway

- DTU
- Consumer Router
- Industrial Router
- VOIP
- Server
- Wi-Fi Hotspot



Industry

- Industrial PDA
- Rugged Tablet PC
- Pipeline Management
- UAV
- Robot
- Flow Meter
- Refrigerator
- Industrial Control
- Industrial Monitoring



Life & Healthcare

- Personal Tracker
- Household Appliances
- Pet Tracker
- Wearables
- Elderly Monitoring
- Remote Medical Equipment
- Glucometer
- Blood Pressure Monitor
- Gambling Machine

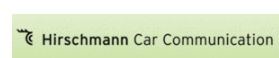


Agriculture & Environment

- Trail Camera
- Food Traceability
- Farm Machinery
- Irrigation
- Meteorological Station
- Wildlife Tracking
- Environment Monitoring
- Pollution Monitoring

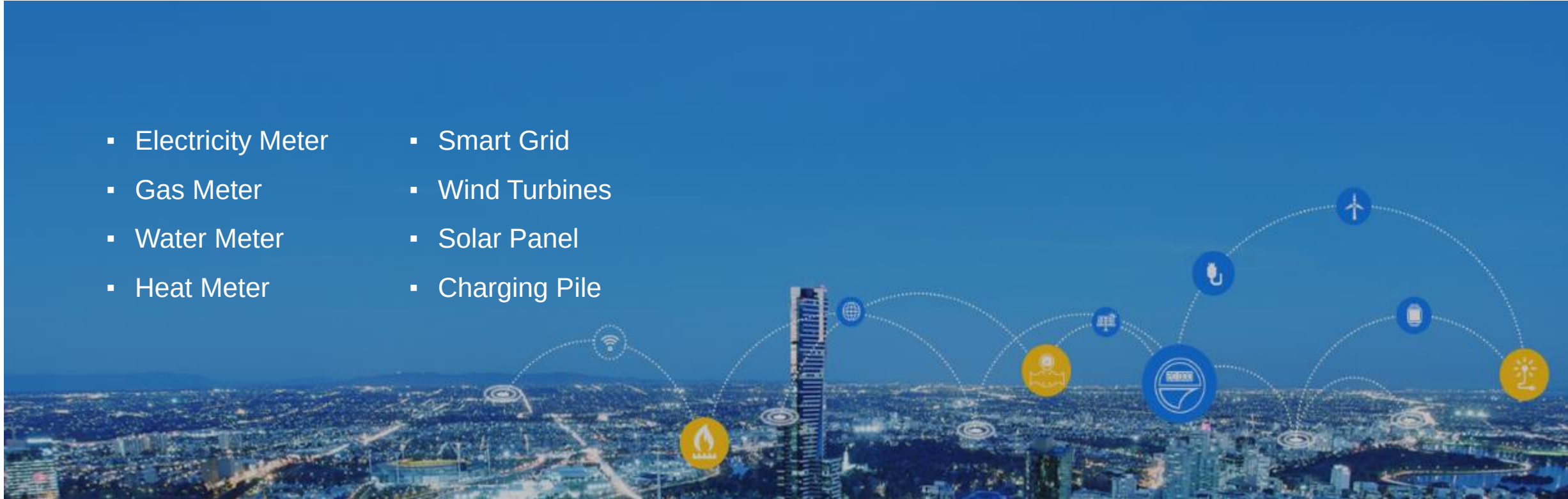
Telematics & Transport

- Automotive OEM
- Vehicle Tracking
- Container Tracking
- Ship Tracking
- Fleet Management
- OBD
- DVR
- Insurance Box



Energy

- Electricity Meter
- Gas Meter
- Water Meter
- Heat Meter
- Smart Grid
- Wind Turbines
- Solar Panel
- Charging Pile



BAYLAN

ltron

NARI
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NARI Technology Development Co., Ltd.

**SANXING
ELECTRIC**

**华立仪表
HOLLEY METERING**

ortem elektronik

**威胜集团
Wasion Group**

新联电子
股票代码: 002546

**DIEHL
Metering**

**许继电气
XJ ELECTRIC CO., LTD**

Payment



- Wireless POS
- Top-up Machine
- Cash Register
- ATM
- Vending Machine



Security

- Alarm
- Camera
- Video Surveillance
- Intrusion detection
- Smoke Detector
- Asset Protection



Honeywell

infobric

Silentron

THALES

AREVA
l'avenir pour énergie

eps

Tekelek
Tekelek Group
Excellence in monitoring and control

Smart City

- 
- Street Lighting
 - Traffic Light
 - Elevator
 - Digital Signage
 - Advertisement Display
 - LED Lighting
 - Garbage Bin Monitoring
 - Parking

Gateway

- DTU
- Consumer Router
- Industrial Router
- VOIP
- Server



Industry

- Industrial PDA
- Rugged Tablet PC
- Pipeline Management
- UAV
- Robot
- Flow Meter
- Refrigerator
- Industrial Control
- Industrial Monitoring

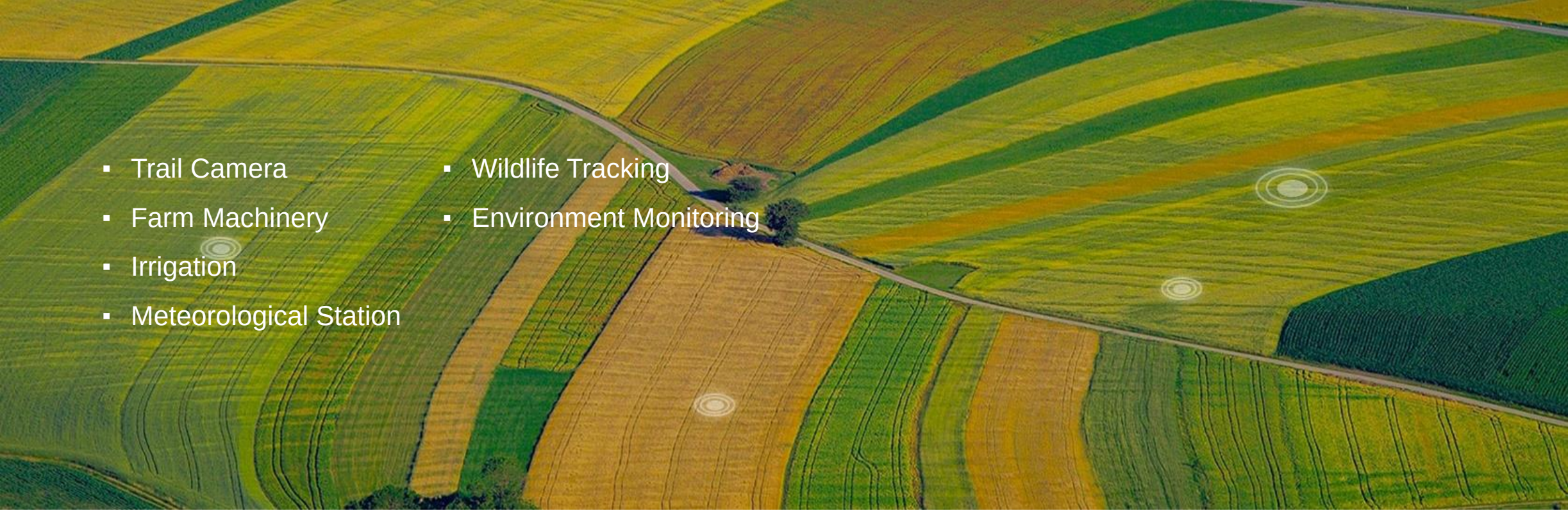


Life & Healthcare

- Personal Tracker
- Household Appliances
- Pet Tracker
- Wearables
- Elderly Monitoring
- Remote Medical Equipment
- Glucometer
- Blood Pressure Monitor



Agriculture & Environment

- 
- Trail Camera
 - Farm Machinery
 - Irrigation
 - Meteorological Station
 - Wildlife Tracking
 - Environment Monitoring

Q & A

Thank you!

BACKUP SLIDES



LTE Module Portfolio

EC20 LTE Module



EC20 Mini PCIe
51.0mm × 30.0mm × 4.9mm

Max.100Mbps (DL)/ Max.50Mbps (UL)

EC20-E: B1/3/5/7/8/20 @FDD-LTE, B1/5/8 @WCDMA
850/900/1800/1900MHz @GSM
EC20-A: B2/4/5/12/17 @FDD-LTE,
B2/4/5 @WCDMA, 850/1900MHz @GSM
EC20-C: B1/3/8 @FDD-LTE, B38/39/40/41 @TDD-LTE
B1/8 @WCDMA, B34/39 @TD-SCDMA,
900/1800 @GSM
EC20-CE: B1/3 @FDD-LTE, B38/39/40/41 @TDD-LTE
B1 @WCDMA, B34/39 @TD-SCDMA,
BC0 @CDMA2000 1X/EVDO, 900/1800 @GSM

Dimensions: 32.0mm × 29.0mm × 2.4mm;

Temperature Range: -40°C ~ +85°C

Certifications: CCC/ CE/ NAL/ SRRC/ DoC (for Russia) / KC/
SKT/ NCC/ ICASA/ GCF/ KT*/ FCC/ ANATEL

EC21 LTE Module



EC21 Mini PCIe
51.0mm × 30.0mm × 4.9mm

Max.10Mbps (DL)/ Max.5Mbps (UL)

EC21-E: B1/3/5/7/8/20 @FDD-LTE,
B1/5/8 @WCDMA, B3/B8@GSM
EC21-A: B2/4/12@FDD-LTE, B2/4/5@WCDMA
EC21-V: B4/13@FDD-LTE
EC21-AU: B1/2/3/4/5/7/8/28@FDD LTE, B40@TDD LTE
B1/2/5/8@WCDMA, B2/3/5/8@GSM
EC21-AUV¹: B1/3/5/8/28@FDD LTE, B1/5/8@WCDMA
EC21-AUT¹: B1/3/5/7/28@FDD LTE, B1/5@WCDMA
EC21-J: B1/3/8/18/19/26@FDD LTE
EC21-KL: B1/3/5/7/8@FDD-LTE
EC20-CEL¹: B1/3/5@FDD-LTE

Dimensions: 32.0mm × 29.0mm × 2.4mm;

Temperature Range: -40°C ~ +85°C

Certifications: CE/ FCC/ Vodafone*/ PTCRB/ GCF/ Verizon*/
AT&T*/ RCM/ Telstra/ JATE/ TELEC/ CCC/ SRRC*/ CTA*/ KC/
SKT*

EC25 LTE Module



EC25 Mini PCIe
51.0mm × 30.0mm × 4.9mm

Max.150Mbps (DL)/ Max.50Mbps (UL)

EC25-E: B1/3/5/7/8/20 @FDD-LTE,
B38/40/41 @TDD-LTE,
B1/5/8 @WCDMA, B3/B8@GSM
EC25 -A: B2/4/12@FDD-LTE, B2/4/5@WCDMA
EC25-V: B4/13@FDD-LTE
EC25-AU: B1/2/3/4/5/7/8/28@FDD LTE, B40 @TDD-LTE,
B1/2/5/8@WCDMA, B2/3/5/8@GSM
EC25-AUT: B1/3/5/7/28@FDD-LTE, B1/5@WCDMA
EC25-J: B1/3/8/18/19/26@FDD-LTE, B41 @TDD-LTE,
B1/6/8/19@WCDMA

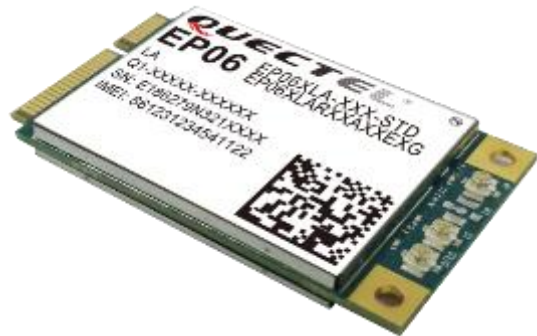
Dimensions: 32.0mm × 29.0mm × 2.4mm;

Temperature Range: -40°C ~ +85°C

Certifications: CE/ FCC/ PTCRB/ GCF/ Verizon/ AT&T/ RCM/
JATE/ TELEC/ KC/ SKT*

LTE-A Module Portfolio

EP06 LTE Module*



Q3'17

Max.300Mbps (DL)/ Max.50Mbps (UL)

EP06-E: B1/3/5/7/8/20/28/32 @FDD-LTE,
B38/40/41 @TDD-LTE, 2x CA @LTE, B1/3/5/8 @WCDMA
EP06-A: B2/4/5/7/12/13/17/25/26/29/30/66 @FDD-LTE,
B41 @TDD-LTE, 2x CA @LTE, B2/4/5 @WCDMA
EP06-LA: B2/3/4/5/7/8/20/28 @FDD-LTE, 2x CA @LTE,
B2/3/4/5/8 @WCDMA
EP06-APAC: B1/3/5/7/8/18/19/21/26 @FDD-LTE,
B38/39/40/41 @TDD-LTE, 2x CA @LTE,
B1/5/6/8/9/19 @WCDMA, B39 @TD-SCDMA

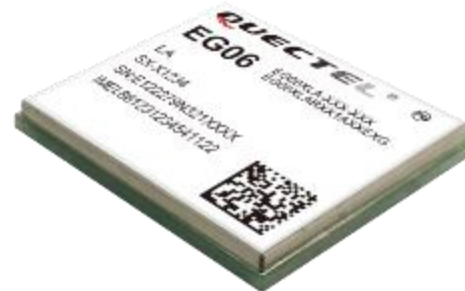
Dimensions: 30.0 mm x 51.0mm x 4.3mm

Mini PCIe Form Factor

Temperature Range: -40°C ~ +85°C

Certifications: TBD

EG06 LTE Module*



Q3'17

Max.300Mbps (DL)/ Max.50Mbps (UL)

EG06-E: B1/3/5/7/8/20/28/32 @FDD-LTE,
B38/40/41 @TDD-LTE, 2x CA @LTE, B1/3/5/8 @WCDMA
EG06-A: B2/4/5/7/12/13/17/25/26/29/30/66 @FDD-LTE,
B41 @TDD-LTE, 2x CA @LTE, B2/4/5 @WCDMA
EG06-LA: B2/3/4/5/7/8/20/28 @FDD-LTE, 2x CA @LTE,
B2/3/4/5/8 @WCDMA
EG06-APAC: B1/3/5/7/8/18/19/21/26 @FDD-LTE,
B38/39/40/41 @TDD-LTE, 2x CA @LTE,
B1/5/6/8/9/19 @WCDMA, B39 @TD-SCDMA
EG06-AUTL: B3/7/28 @FDD-LTE, 2x CA @LTE

Dimensions: 37.0mm x 39.5mm x 2.8mm

LGA Form Factor

Temperature Range: -40°C ~ +85°C

Certifications: TBD

EM06 LTE Module*



2H'17

Max.300Mbps (DL)/ Max.50Mbps (UL)

EM06-E: B1/3/5/7/8/20/28/32 @FDD-LTE,
B38/40/41 @TDD-LTE, 2x CA @LTE, B1/3/5/8 @WCDMA
EM06-A: B2/4/5/7/12/13/17/25/26/29/30/66 @FDD-LTE,
B41 @TDD-LTE, 2x CA @LTE, B2/4/5 @WCDMA
EM06-LA: B2/3/4/5/7/8/20/28 @FDD-LTE, 2x CA @LTE,
B2/3/4/5/8 @WCDMA
EM06-APAC: B1/3/5/7/8/18/19/21/26 @FDD-LTE,
B38/39/40/41 @TDD-LTE, 2x CA @LTE,
B1/5/6/8/9/19 @WCDMA, B39 @TD-SCDMA

Dimensions: 30.0mm x 42.0mm x 2.3mm ;

M.2 Form Factor

Temperature Range: -40°C ~ +85°C

Certifications: TBD

UMTS/HSPA+ Module Portfolio

UC20 UMTS/HSPA+



UC20 Mini PCIe
51.0mm × 30.0mm × 4.9mm

Max.14.4Mbps (DL)/ Max.5.76Mbps (UL)

UC20-E: 900/2100MHz @UMTS,
850/900/1800/1900MHz @GSM

UC20-A: 850/1900MHz @UMTS

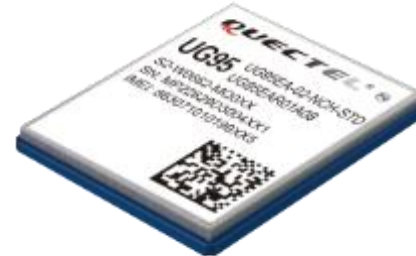
UC20-G: 800/850/900/1900/2100MHz @UMTS,
850/900/1800/1900MHz @GSM

Dimensions: 32.0mm × 29.0mm × 2.5mm

Temperature Range: -40°C ~ +85°C

Certifications: CE/ FCC/ IC/ KC/ NCC/ OFCA/ GCF/ PTCRB/
RCM/ SKT/ AT&T/ Rogers/ ANATEL/ Vodafone/ ICASA/
NBTC/ JATE/ TELEC/ SRRC / NAL/ DoC (for Russia)

UG95 UMTS/HSPA



Max.7.2Mbps (DL)/ Max.5.76Mbps (UL)

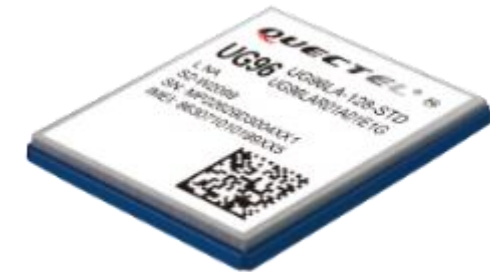
UG95-E: 900/2100MHz @UMTS, 900/1800MHz @GSM
UG95-A: 850/1900MHz @UMTS

Dimensions: 23.6mm × 19.9mm × 2.2mm

Temperature Range: -40°C ~ +85°C

Certifications: CE/ GCF/ FCC/ IC/ ICASA/ PTCRB/ AT&T/
Rogers/ DoC (for Russia)

UG96 UMTS/HSPA



Max.7.2Mbps (DL)/ Max.5.76Mbps (UL)

800/ 850/900/1900/2100MHz @UMTS
850/ 900/1800/1900MHz @GSM

Dimensions: 26.5mm × 22.5mm × 2.2mm

Temperature Range: -40°C ~ +85°C

Compatible with M95/UG95/BC95/BG96/EG91/EG95

Certifications: CE/ FCC/ GCF/ PTCRB/ ANATEL/ RCM/
IFETEL/ Movistar*/ ICASA/ DoC (for Russia)

GSM/GPRS Module Portfolio

M95 GSM/GPRS

MEDIATEK



Max. 85.6kbps (DL)/ Max. 85.6kbp (UL)

- PPP/ TCP/ UDP/ FTP/ HTTP/ SMTP/ PING/ MUX/ NITZ/ NTP/ SSL/ MMS (Sending)
- Dual SIM/ eCall/ Jamming Detection/ QuecFOTA/ DTMF/ MUX/ RIL/ QuecLocator
- Dimensions: 19.9mm × 23.6mm × 2.65mm
- Temperature Range: -40°C ~ +85°C
- Certifications: CE/ GCF/ Vodafone/ UCRF/ ATEX/ DoC/ FCC/ PTCRB/ IC/ Rogers/ Anatel/ NCC/ ICASA

M66 GSM/GPRS

MEDIATEK



Max. 85.6kbps (DL)/ Max. 85.6kbp (UL)

- PPP/ TCP/ UDP/ FTP/ HTTP/ SMTP/ PING/ CMUX/ NITZ/ NTP/ SSL/ MMS (Sending)
- eCall/ Jamming Detection/ QuecFOTA/ DTMF/ MUX/ RIL/ OpenCPU/ PCM/ QuecLocator
- Dimensions: 17.7mm × 15.8mm × 2.3mm
- Temperature Range: -40°C ~ +85°C
- Certifications: CE/ ANATEL/ ICASA/ DoC

MC60 GSM/GPRS/GNSS

MEDIATEK



Max. 85.6kbps (DL)/ Max. 85.6kbp (UL)

- TCP/ UDP/ FTP/ HTTP/ SMTP/ PPP/ MMS (Sending)/ NTP/ PING/ SSL
- EASY™/ LOCUST™/ AlwaysLocate™/ EPO™/ GLP/ AIC/ SDK/ QuecFastFix Online/ Dual SIM Single Standby/ OpenCPU
- Dimensions: 18.7mm × 16.0mm × 2.1mm
- Temperature Range: -40°C ~ +85°C
- Certifications: CE/ Anatel/ ICASA/ FCC

AG35 Automotive Module



Max.150Mbps (DL)/ Max.50Mbps (UL)

AG35-CE: B1/3/5/8 @FDD-LTE; B34/38/39/40/41 @TDD-LTE; B1/8 @WCDMA;
B34/39 @TD-SCDMA; BC0 @CDMA2000 1X/EVDO; 900/1800 @GSM

AG35-E: B1/3/7/8/20/28A @FDD-LTE; B1/3/8 @WCDMA; 900/1800 @GSM

AG35-C: B1/3/8 @FDD-LTE; B34/38/39/40/41 @TDD-LTE
B1/8 @WCDMA; B34/39 @TD-SCDMA; 900/1800 @GSM

Dimensions: 33.0mm × 37.5mm × 3.0mm;

Temperature Range: -40°C ~ +85°C

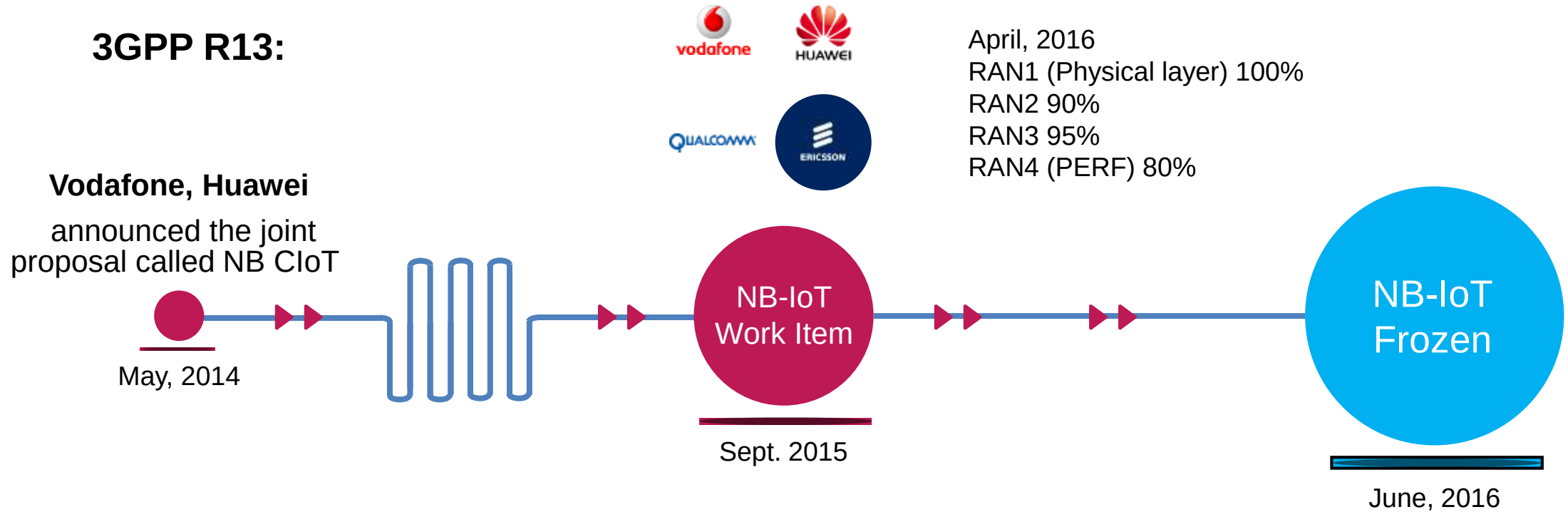
- **QUALCOMM** MDM9628 Chipset Solution dedicated for automotive application
- Ideal for automotive applications with IATF 16949 requirement
- Wide operation temperature range (-40° C to +85° C)
- Automotive quality processes (PPAP, 8D, DFMEA, PFMEA...)
- Excellent EMC/ESD protection ensures great robustness even in harsh environments
- Compact SMT form factor ideal for integration in slim and size-constrained automotive solutions
- Multi-constellation GNSS receiver available for applications requiring fast and accurate fixes in any environment



NB-IoT reference projects



NB-IoT Standardization Progress



R13 standardization of NB-IOT completed.

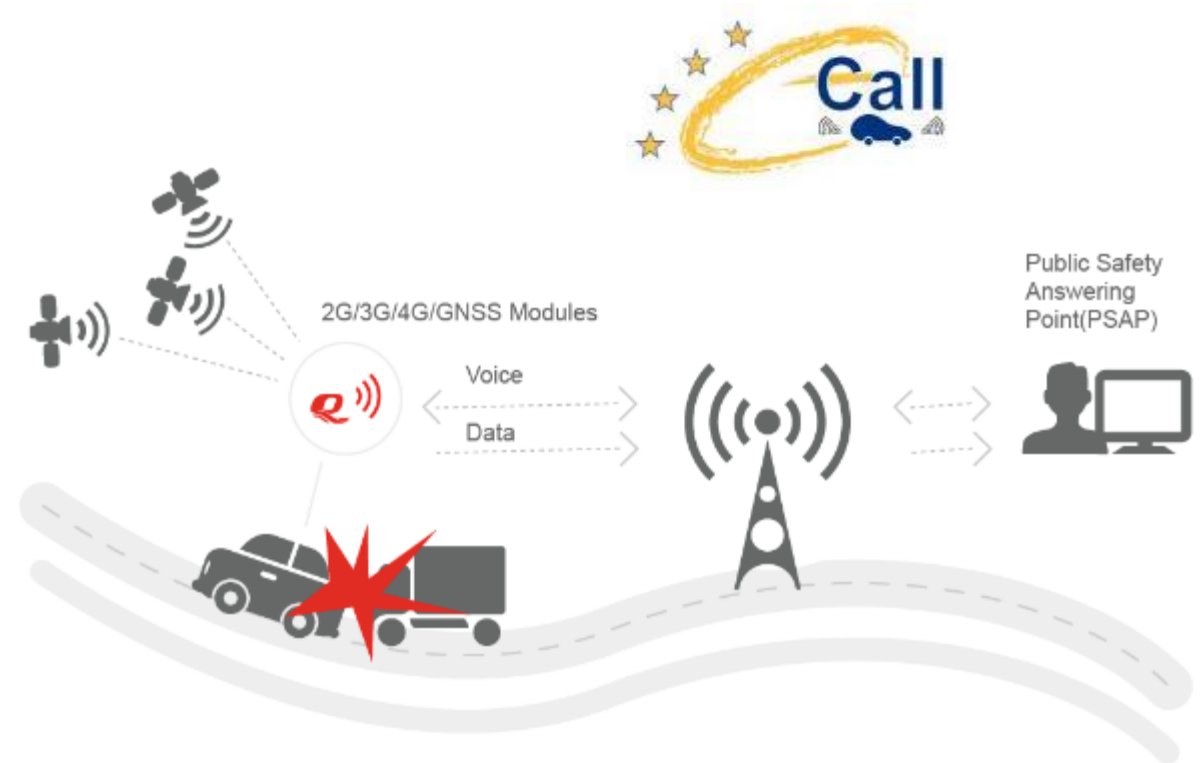
R14 standardization, including Location, Broadcast, R13 enhanced, is on its way.

Comparison with Other LPWA Technologies

	CAT.NB1	CAT.M1	EC-GSM	LoRa (Semtech)	UNB (Sigfox)	RMPA (Ingenu)
Spectrum	LTE & 2G Bands	LTE Bands	2G Bands	Unlicensed 433/868MHz	Unlicensed 902MHz	Unlicensed 2.4GHz
Modulation & Demodulation	pi/4 QPSK pi/2 BPSK	QPSK QAM	GMSK	Chirp Spread Spectrum	FSK	DSS D-BPSK
Data Rate	<200kbps	375kbps	70kbps	100kbps	100kbps	15kbps
Bandwidth	200KHz	1.08MHz	200KHz	125-500kHz	100KHz	1MHz
Transmit Power	23dBm	20dBm or 23dBm	23dBm or 33dBm	14dBm	14dBm	21dBm
Network	Mostly S/W Upgrad	S/W Upgrad	Mostly S/W Upgrad	Green Field	Green Field	Green Field
Terminal Price	~2G Price	~2G Price	=2G Price	~2G Price	~2G Price	>2G Price
Battery Life	>10 years	>10 years	>10 years	>10 years	>10 years	>10 years
Converge	164dB ~15km	163dB ~15km	164dB ~15km	157dB ~10km	16dB EU ~12km	175dB ~17km
Standard	3GPP	3GPP	3GPP	LoRa Alliance	Na	Na

eCall Function

A car will have an electronic safety system automatically calling emergency services in case of a serious accident. Even if the driver is unconscious, the system will inform rescue workers of the crash site's exact whereabouts, and the rescues will be on its way within minutes. The system is named as "**eCall**".



- *Quectel supports eCall in 2G/3G/4G/GNSS modules and has been working on eCall since late 2011.*
- *Quectel has enough development experience on eCall to support and assist customers with eCall application development.*