

# Quectel Wireless Solutions

Dedicated Supplier of M2M Wireless Modules



*Quectel*  
Products

*M2M*  
Applications

# Contents

|           |   |
|-----------|---|
| <b>3</b>  | <b>CEO of Quectel</b>                     |
| <b>4</b>  | <b>Company</b>                            |
| 4         | Company Overview                          |
| 6         | M2M – The Smart City’s Bedrock            |
| 8         | Concentration – The Road to Success       |
| 10        | Strong R&D Team – The Heart of Innovation |
| 12        | LTE – The Future of Technology Option     |
| <b>16</b> | <b>M2M Applications</b>                   |
| 18        | Telematics                                |
| 20        | Smart Metering                            |
| 22        | Mobile POS Terminal                       |
| 24        | Security                                  |
| 26        | Networking                                |
| 28        | mHealth                                   |
| <b>30</b> | <b>Products</b>                           |
| 32        | GSM/GPRS                                  |
| 44        | GSM/GPRS EVB Kits&QNavigator              |
| 46        | UMTS/HSPA(+)                              |
| 58        | UMTS/HSPA(+)<br>EVB Kits&QNavigator       |
| 60        | GNSS                                      |
| 74        | GNSS EVB Kits                             |
| <b>76</b> | <b>Technology</b>                         |
| <b>86</b> | <b>Quality</b>                            |
| <b>92</b> | <b>Partners</b>                           |
| <b>94</b> | <b>Contact Us</b>                         |



Patrick Qian - CEO of Quectel

Dear Readers,

I would like to sincerely thank you all for your constant supports to Quectel in 2013. We are very pleased to announce that we achieved a strong sales growth in 2013. This growth was largely fueled by a strong acceptance of our cellular and GNSS modules in the market. We look forward to continuing this momentum in 2014, and are excited for what the year will bring us.

In the past one year, we have further diversified our product portfolio. In WCDMA, we have added two new modules, UC20 and UC15, both of which are based on Qualcomm chipsets. These modules are now already in process of getting global certifications. We also added two new high performance GPS/Glonass modules L26 and L76, and a new GPS-with-patch-antenna module L80, which have enhanced our GNSS portfolio.

Our second R&D team in Hefei moved into a much bigger office for further expansion. As a part of our internationalization strategy, we have established more overseas offices, which includes France, Germany, India, Poland, Demark and South Africa. This will help to provide more localized support to our overseas customers.

Thanks to our strong distribution channels across the world and the continued trust from our esteemed customers, we have rapidly expanded our presence in key markets like Europe and North

America, while acquiring the No.1 spot in China in terms of market share, after 5 years of unprecedented growth. In 2014, we will continue to enrich our module portfolio by introducing an extremely compact WCDMA module series and LTE modules as well. We have built an overseas network of local sales and technical support offices, and we will continue to expand this network, not only to offer better local supports to our customers and partners worldwide, but also to show Quectel’s long term commitment in this industry.

We are proud and happy to be part of this ever-growing IoT industry. We are dedicated to making products that will play an important role in making this world more efficient and smart. We are here to listen, so that we can serve our customers better and build a more connected and beautiful world.

I offer my gratitude for your great supports during the past year and look forward to continuing our cooperations in coming years.



Patrick Qian  
CEO of Quectel

# Quectel Overview

## Dedicated Supplier of M2M Wireless Modules

As one of the leading providers of GSM/GPRS, UMTS/HSPA(+)/LTE, GNSS modules with many years of extensive experience, Quectel is always looking to be at the forefront of technology and maintaining customer's full satisfaction. A comprehensive product portfolio, strong R&D capability, matchless support services and global presence established our leadership position in the M2M marketplace.

Quectel offers high-performance cellular and GNSS modules based on the state-of-art technology. To completely satisfy customer's needs, Quectel not only provide a wide product range with numerous integrated features capable of meeting the most sophisticated requirements from all market segment, but also provide comprehensive technical support for developers in the development and testing phase. Additionally, timely help is available from Quectel's software and hardware team throughout customer's development via phone, email and face to face meetings when necessary, which significantly reduces customer's product development time and achieve short time to market.

On all aspects of Quality, Quectel ensures the quality of all modules meet customers' requirements perfectly. Small form factor, low power

consumption, ease of integration, long-term availability and suitability for the harsh environment are the key features for Quectel successful products.

Global presence is key to the way we serve our customers, with two R&D centers, 10+ local offices, 30+ senior sales managers and 40+ distributors strategically spread worldwide.

Helping customers to stay competitive in their business environment, Quectel provides customers with high quality and innovative wireless modules. Meanwhile, Quectel enhances its product portfolio to fulfill various applications in the M2M market. ●





# M2M – The Smart City's Bedrock

Boosted by technologies going mainstream, a better structured ecosystem and proven use cases in various verticals, M2M services indeed are set to play a key role in our increasingly connected and mobile world. M2M development brings inspiration for creating a smart city.

After nearly a decade of unfulfilled expectations, the M2M market is now quickly gaining momentum. Boosted by technologies going mainstream, a better structured ecosystem and proven use cases in various verticals, M2M services indeed are set to play a key role in our increasingly connected and mobile world. M2M development brings inspiration for creating a smart city. In these cities, individual areas are already becoming “smarter” – from smart grids via intelligently managed traffic to connected healthcare. The technical basis for the Smart City is M2M. At the heart of each M2M application is the M2M module. Facing to the dynamic and innovative M2M market and new trend of smart city, Quectel always actively respond to the challenge and changes with its broad and advanced product portfolio.

In future, many cities will rely on a smart grid based on connected electricity meters. People must install these so-called smart meters in their homes, where they coordinate feed-in and consumption. Quectel quad-band GSM/GPRS M95 module in LCC castellation packaging with the compact size of 19.9 × 23.6 × 2.65mm, ultra low power consumption and extended temperature range can be easily embedded into smart meters to transmit and send the real-time data for the user. Through these data, user can see the notice if demand exceeds the supply of electricity from renewable sources of energy.

Cities around the world face common transport challenges – from increasing congestion, safety concerns to ageing infrastructure. Intelligent Transportation System (ITS) is emerging to address many of today's traffic challenges. Transport is quickly evolving networks and M2M technologies are at the center of effective M2M and Telematics solutions. Quectel UMTS/HSPA+ UC20 module is widely used in In-car video surveillance for monitoring of the behavior, activities, or other changing information. Meanwhile, UC20 module supports eCall function. In case of emergency, the in-vehicle eCall system (IVS) automatically initiates an emergency call carrying both voice and data (including GPS location data) directly to the Public-safety Access Point. PSAP dispatches rescuers to provide timely assistance to the motorist involved in the collision. M2M modules extend the reach of intelligent wireless technology to ITS, which highly enhances passenger safety and security in its public transit system and improves the road safety.



**Doron Zhang**  
General Manager of Quectel



Smart cities are creating a very promising paradigm for providing advanced services to citizens. Healthcare is a growing market for wireless connectivity. Medical device with built-in M2M technology is a new way of supporting wellness and delivering and managing healthcare. This device is already allowing patients to undertake tasks traditionally carried out only by the physicians or under the direct care of the physicians. Patients can be monitored, diagnosed and even treated at home or on the move, without needing to see a clinician, spend time in a hospital or clinic, or wait long periods for test results. Integrating wireless technology into healthcare devices improves the lives of patients managing chronic health conditions and streamlines costs for their healthcare providers without sacrificing quality care. Quectel hopes working with healthcare platforms to help the next generation of healthcare innovators develop and integrate wireless connectivity into their solutions.

In addition, The Internet of Things (IoT) has really come of age. IoT is not only about technology, it is about the most fundamental aspects of how organizations operate and build robust new service models; leveraging the customer insights that the new wave of IoT-generated big data can bring to businesses. Quectel devotes all its efforts and time to develop EC21 and EC20 LTE modules. EC21 is single-mode LTE modules and EC20 is a multi-mode LTE module. They can meet demands for data rate and link reliability in modern wireless communication systems.

Smart cities are following the lead of connecting to the Internet to enable more all different areas that can benefit from connected technology, including healthcare, smart grid, retail, consumer electronics, etc, which will all continue to drive toward seamless communication. As an expert on cellular modules, Quectel will devote itself into all services segments of M2M industries to grasp the opportunities created by Smart Cities. ●

# Concentration

## The Road to Success

Quectel will continue to purely focus on M2M, pursuit our goals, deliver the high-quality products to meet our customers' demands and provide each customer with excellent and timely service and support.

>>

Quectel was founded in 2009. In the past four years, Quectel has established a comprehensive distribution system and has 40+ distributors, covering five continents and over 80 countries. Till now, Quectel has 10+ local offices and 30+ senior sales managers. Thanks to the joint efforts of our sales team and our partners, Quectel has served more than 2000 customers worldwide and sales achievements reached new record each year. Despite the adverse global economic conditions and the competition, Quectel sustained 50% sales growth rate.

M2M

It is our clear product strategy that contributes to our quick and sustainable growth in the main fields of M2M market. Our business in Automatics, Tracking, Smart Metering and Wireless POS Terminal have delivered stable and balanced growth. Quectel has been in the leading position in domestic market after 5 years running. We first launched Text-to-Speech functionality and positioning service in our GSM/GPRS module, which highly increased product integration and extended product portfolio. We have built the perfect service platform via cloud computing for our customers. A brand-new service model is formed based on the persistence and hardwork of our

dedicated R&D team. We have been concentrating our best efforts in setting the industry standards of Smart Metering, improving the standardization of this field.

For overseas market, Quectel continues its market expansion towards the developing countries and maintains the expansion of European market as the centerpiece of the market expansion policy. Backed by a high level of technical expertise and our diligent sales teams, Quectel has established its brand and reputation in the European market within 3 years. In



**John Wang**  
Vice General Manager  
of Quectel



addition, Quectel focuses more specially on Smart Metering and Automotive which have very strict quality requirements and in this way bring robust and rugged solutions to the market in a short time frames. Our wide customer base and high-quality products make us the best candidate for the supplier of the world leading meter manufacturers and automotive accessory enterprises.

Quectel will continue to purely focus on M2M, pursuit our goals and remain committed to innovation in our products and technology. In the future, M2M and IoT will definitely create more opportunities along with other new emerging technologies. Competition at vertical or horizontal level will become more and more intense in the whole industry chain. Quectel sales team will consistently not only keep the emphasis on marketing trends and technology development and also remain a sense of crisis. We will continue to deliver the high-quality, reliable and durable products to meet our customers' demands and provide each customer with excellent and timely service and support. ●



# Strong R&D Team The Heart of Innovation

LTE will usher in a new world of opportunities and challenges for every industry constituent. The great success of 3G modules made a solid foundation for the development of our LTE modules.

>>

More than 10 people, pioneers of wireless module industry, founded Quectel in 2009. We launched our first GSM/GPRS module M10 and GPS module L10 in the difficult times of early set-up. These two modules built Quectel's success in M2M field. Even today, many customers still use M10 series module in their products around the world.

In 2010, we began to expand our business towards global M2M market. Quectel was the first company to demonstrate Mediatek's GSM/GPRS chipset. Time has proved all. With high and stable quality, ultra low power consumption and rich functionalities, M10 series got success and built our reputation in the global market. Then, we released M72 module which was a GPRS module

dedicated for data transmission application. It has been widely used in M2M applications, like mobile POS terminal, cash register and smart metering.

In 2011, we increased our investments in R&D. Till 2014, Quectel has established two R&D centers in different cities of China with more than 100 R&D engineers. We launched OpenCPU technology in our GSM module, which enabled our customers to run embedded application in the module without the need of external MCU. We integrated Text-To-Speech and accurate DTMF generation functionalities into our module, which fully made our module suitable for transportation and security



**Willis Yang**  
Vice General Manager  
of Quectel



applications. Additionally, we also provided comprehensive technical support for developers in the development and testing phase. Timely help was available from Quectel's software and hardware team throughout customer's development via phone, email and face to face meetings when necessary, which significantly reduced customer's product development time and achieved short time to market.

In 2012, the improvement of chipset technology allowed wireless module to become smaller. Quectel designed the compact GSM/GPRS module M95 and GNSS module L70/L76 and GSM/GPRS M66. M66 was the smallest Quad-band GSM/GPRS module using LCC castellation packaging in the market. Its ultra-compact 17.7 × 15.8 × 2.3mm profile made M66 an perfect platform for size sensitive applications.

In 2013, Quectel had our professional R&D team, dedicated to develop 3G modules. We have launched two UMTS/HSPA(+) modules, which highly satisfied our customers based on its high-speed and high-reliable data transmission. LTE will usher in a new world of opportunities and challenges for every industry constituent. The great success of 3G modules made a solid foundation for the development of our LTE modules. In 2014, Quectel will devote all our efforts into developing our LTE modules and we are confident that we will win great success in LTE segment. ●



# LTE—The Future of Technology Option

Long Term Evolution (LTE) is a 4G wireless broadband technology developed by the Third Generation Partnership Project (3GPP), an industry trade group. 3GPP named the technology "Long Term Evolution" because it represents the next step (4G) in a progression from GSM, a 2G standard, to UMTS, the 3G technologies. LTE provides downlink peak data rate of at least 100Mbps and an uplink of at least 50Mbps, reduced latency, scalable bandwidth capacity, and backwards compatibility with UMTS/HSPA(+) and GSM/GPRS/EDGE.

Driving for the evolution of wireless broadband technology is the increasing expectations for speed, bandwidth and global access. The primary drive towards LTE for operators is the need for more capacity, performance management and improved efficiencies to lower delivery cost. LTE is the next step in the user experience. Specific M2M applications will be either created or enhanced to take advantage of the available bandwidth. Some new potential M2M applications include: vending machine monitoring with video commercial display, retail terminals displaying product demonstrations or live helpdesk, remote wireless surveillance cameras, telehealth terminals providing remote diagnosis and healthcare, facial recognition systems used in homeland security, and wireless router for in-car infotainment systems.

Although the different LTE frequencies and bands used in different countries will mean that only multi-band wireless terminals will be able to use LTE in all countries where it is supported, 499 operators in 143 countries are investing in LTE, while 244 commercially launched LTE networks in 92 countries (DEC,2013). LTE is the fastest developing mobile system technology ever.

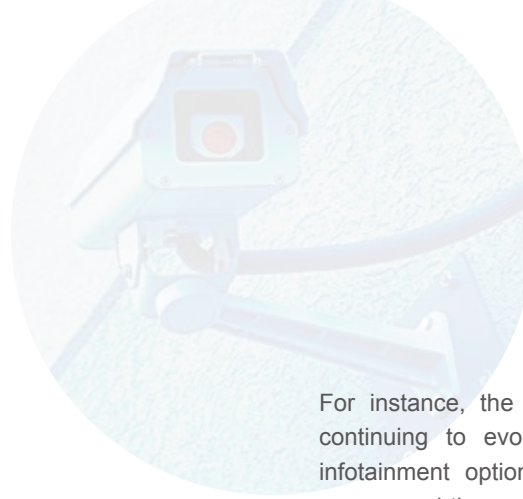
LTE is destined to be the future of all cellular networks and the last network standing as 2G and 3G networks are eventually phased out. Successful operators have generally shifted away from traditional voice & text packages to focus on data, and from unlimited data to data sharing, with simplified data packages. They already consider LTE as the natural choice for long term service applications.

In the early days of LTE, smartphone dominated the global LTE landscape. Along with the fast development of LTE network operators, more and more LTE terminals have come into our life, even though typical commercial M2M applications and IoT applications do not have restriction on the speed of data transmission.

For instance, the LTE connected car market is continuing to evolve, which offers a range of infotainment options. This service will let users access real-time news, weather and fuel prices. In addition, it will let drivers connect to Google Earth and Google Voice. Facebook and Twitter will support a text-to-speech function and a status function with prepared text modules for the system. Meanwhile, we have received the request from some of our Smart Meter customers for LTE technology and the request for long lifecycle of our modules and network available for up to 10 years as well. In addition to human-to-human applications, LTE also creates new opportunities for improved human-to-machine and machine-to-machine applications interactions and communications. Examples of high-bandwidth applications include mobile routers, remote surveillance system, facial recognition system, signal signage, vending, point-of-sales and telehealth terminals.

However, challenges in terms of cost, subscriber attraction, brand awareness and product management and innovations impede the development of LTE terminals, which is the inevitable phenomenon of the new technology in its early days. We believe that with the continuous improvement of multi-mode LTE/3G solution and complement of standalone LTE solution, LTE terminals will come into the market quickly.

4G LTE has become the fast growing standard in the history of telecommunication. Based on the advanced 4G LTE wireless baseband modems, Quectel's strategy is to design the LTE modules which give customers the ability to embed support for the latest mobile broadband technology in a variety of connected devices and give our customers an even faster mobile Internet experience with 4G LTE technology. ●



# Dedicated Supplier of M2M Wireless Modules

**2009**  
Founded in 2009

**2000+**  
Customers

**AT&T**

**30+**  
Senior Sales Managers

**GNSS**

**10+**  
Local Offices

**UMTS/HSPA(+)**

**180+**  
Employees

**GSM/GPRS**

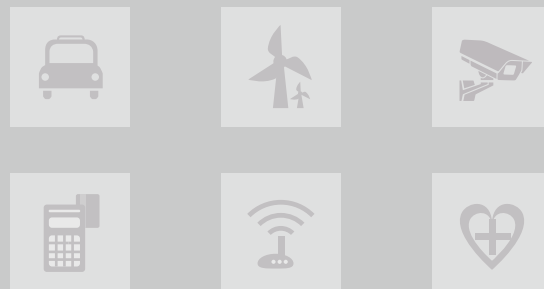
**80**  
Countries

**Vodafone**

**LTE**



# M2M Applications



>>

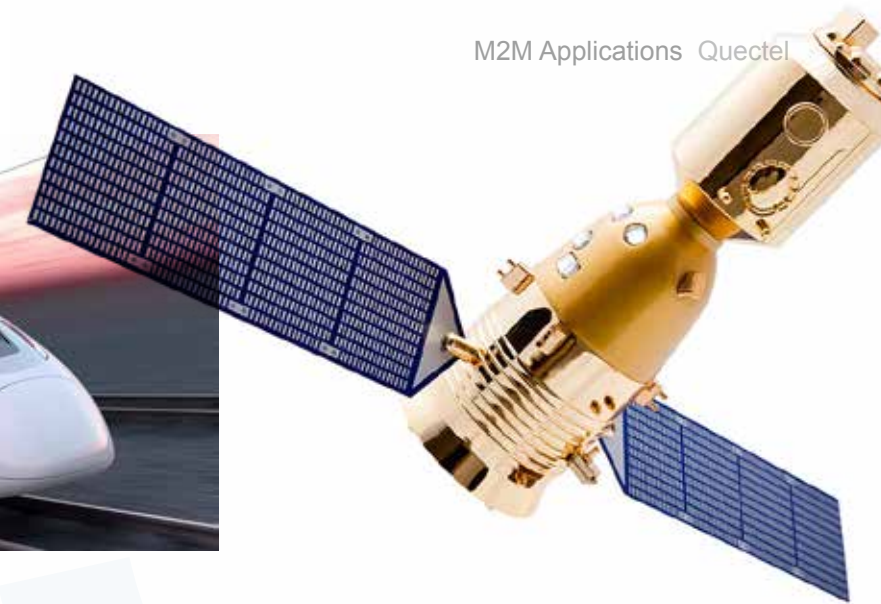
No matter what applications M2M technology is applied to, the core concept is the same, enabling real-time data communication between remote machines and central management applications to enhance the value of the remote device to its user. Within this basic structure of an M2M application, there are many wired and wireless communication options. But the real growth trend lies within embedded cellular M2M, which enables rapid and secure data transfer via GSM/GPRS, UMTS/HSPA(+) and LTE networks.

M2M technology is becoming smarter and more mobile. The exciting thing about M2M is that the possibilities are endless in terms of what new innovative devices and applications can be developed that leverage M2M technology. Just like it is very hard to imagine what it is going to be without cell phones only 25 years ago.

M2M technology has spread rapidly throughout a broad range of application areas in recent years, like more reliable data can be generated and transmitted faster, energy consumption can be reduced, logistics process can be managed more efficiently, and the safety of people and property is better ensured. But M2M applications such as automotive and transport are still the prominent application market for M2M modules; automated metering reading, security, remote payment system, fleet management, telemedicine, and the consumer market are the promising field.

M2M technology ushers in great and tremendous changes. And the era of "Internet of Things" has been a reality for sometime already, which leads to an ever greater acceptance of M2M technology. Some of the key factors driving the market for M2M solutions include growing range of successful applications, regulatory mandates, penetration of 3G technology, and launch of 4G technology. Therefore, developments in M2M applications have been highly sophisticated and advanced. The handling of M2M becomes increasingly easier and production cheaper.

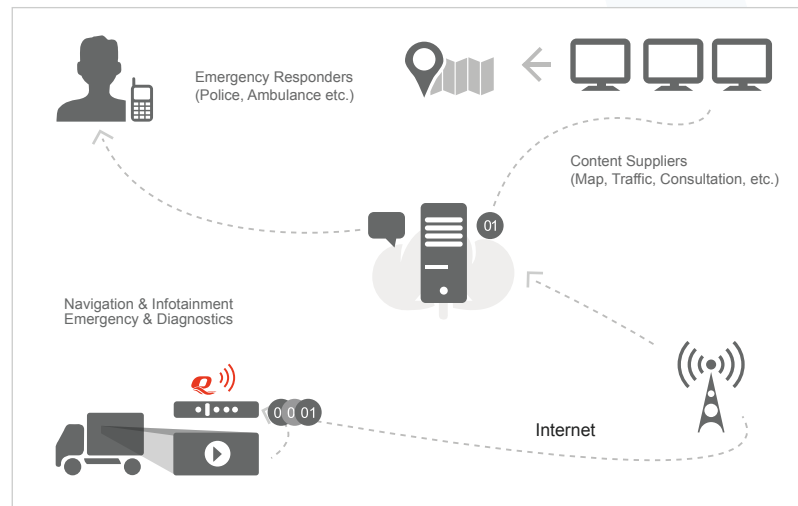
At present, M2M technology can cost-effectively deliver the speed and quality of service that end users require in an M2M application. That's why numerous industries, from healthcare to security to smart metering, are realizing the value of cellular and how it positively affects business models. ●



# Telematics

*Green, clean, cost effective and intelligent travel has become a new trend in this era.*

It has proven that M2M-enabled technology has the power to improve transportation systems in five significant areas: road safety, navigation, environmental impact, freight and logistics management and traffic management. In addition, telematics and infotainment will soon become standard in new vehicles.



The challenges facing Quectel are

- Rugged, high quality components
- Cost effective, high volume components for vehicle life span
- Tools and services to simplify integration and accelerate product development
- Real-time data collection and monitoring
- Reliable data transmission

Quectel Wireless Solutions takes these challenges and turns them into opportunities to develop GSM/GPRS, UMTS/HSPA(+) and GNSS modules for automotive applications

- Emergency call
- Navigation and driver assistance
- Infotainment
- Vehicle diagnostics
- Stolen vehicle tracking & recovery

## The advantages of Quectel modules

### High quality

Quectel modules that are used in automotive applications are subject to rigid mandatory tests and all modules are manufactured in the ISO/TS 16949 certified production sites. They all can meet stringent environmental & temperature requirements .

### Long durability

Ensure durability that lasts the lifetime of the vehicle with ruggedized designs that meet the industry's toughest quality and life span requirements.

### eCall function

Quectel M95 module is equipped with eCall emergency system, which can automatically contact the nearest Public Safety Answering Point (PSAP), transferring vital information such as time of accident, location of vehicle, vehicle description, Vehicle Identification Number, registered owner, etc. Emergency assistance can be dispatched immediately to shorten response time and save lives.

### Accurate and fast positioning

Advanced EASY technology and Location Based Service (LBS) respectively ensures Quectel GNSS and GSM/GPRS modules used in automotive applications accurate and fast positioning in the conditions of no GPS signal reception.

### Test to speech function

To meet the requirements on the Voice Navigation, Voice Operation and taking photos and video, Quectel launched its multifunctional driver with Test-to-Speech function and built-in camera. This driver dramatically simplifies the customer's application design and reduce the total cost of the ownership.

### SMD packaging

SMD packaging makes Quectel modules much a smaller compact size, which successfully reduces vibration induced by rough road.

### SSL function

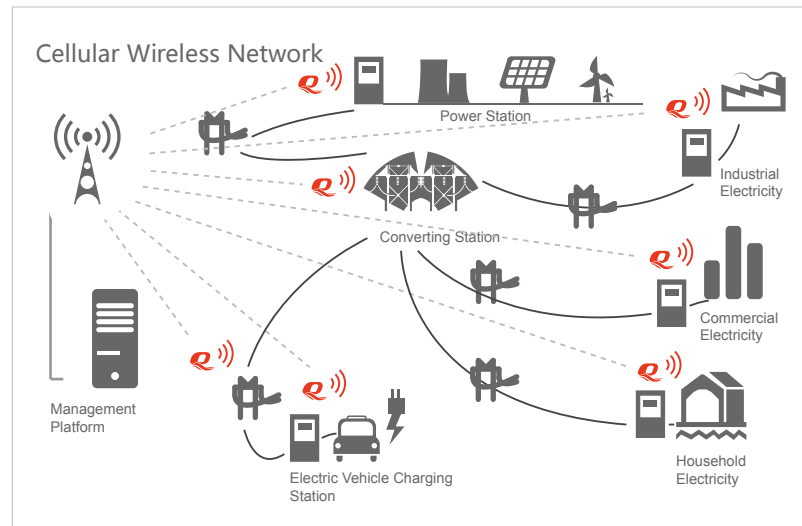
Quectel GSM/GPRS M95 and HMTS/HSPA+ UC20 support SSL protocol. SSL protocol provides a secure connection between a client and a server and can prevent data from being eavesdropped, tampered, or forged during the communication process.





# Smart Metering

*With the new energy economy trend of innovation and smart communication penetrating into M2M industry,*



Quectel wireless solutions designs the solution that integrates wireless communication technology with smart grid, which both meet the wireless communication needs and make the energy supply smart, secure, sustainable and reliable.

Cellular modules play an important role in the whole system of smart grid, which is the bridge between sensor and base station, as well as the environment of smart meter deployment is varied. So, cellular modules need to be solid and reliable year in and year out. Quectel modules address the requirements mentioned above through:

### Reliable data connection in hazard condition

Smart meters are equipped in the varied temperatures from the lowest -40°C to the highest +85°C, or in the area where there is big temperature difference between day and night. So, the high reliability of GSM/GPRS, UMTS/HSPA(+) and GNSS modules is of prime important. With the advanced product design standard, optimized software algorithm, and amounts of MTBF and RF testing, Quectel modules can performance well even in the areas of poor signal reception.

### Over-the-air updates and automated warning system

Over-the-air software patches and automated warning system have increased security for the field staff, who are no longer required to enter high voltage substation to read meters.

### Secure data transmission

Security mechanisms for data transmission have been taken to guarantee the data transmission secure in the cellular wireless network. Quectel modules ensure secure, mission-critical data performance with support for secure layer (SSL) and jamming detection, static IP addresses, a dedicated APN, secure SIM authentication and PIN code.

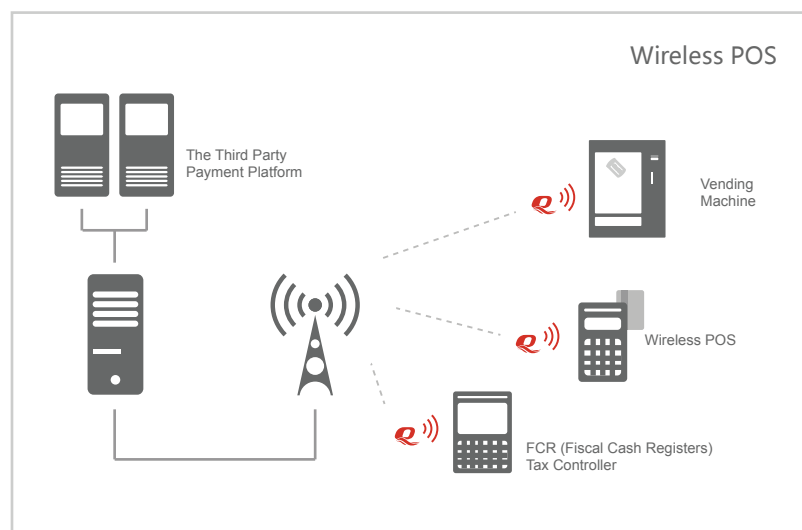
### Global network coverage

Quectel modules can get wireless connectivity anywhere a mobile phone works, with interfaces that support all major cellular networks.



# Mobile POS Terminal

*Wireless payment devices expand the ways in which customers can pay and free retailers from handling cumbersome cash.*



Mobile-enabled M2M commerce can even extend the boundaries of a retailer's physical store by allowing them to accept payments at mobile or temporary locations without a telephone line.

Based on the requirements on the wireless modules for wireless payment, Quectel modules are conducted amounts of testing and optimization work to ensure high reliability, high success rate of dialing, persistent network connections and remote FOTA upgrade. And with rugged

form factor, Quectel modules can withstand the hazard conditions and extremely high and low temperature. Quectel GSM/GPRS M95 module is perfectly suitable for wireless POS terminals thanks to its fast PPP connection. It is one of the smallest Quad-band GSM/GPRS modules in LCC castellation packaging with the compact size of 19.9 × 23.6 × 2.65mm. Compatible with Quectel UMTS/HSPA UG95, it provides an easy upgrade path from 2G to 3G.

### Advantages of Quectel modules for Wireless Payment

- High data transmission rate (up to 85.6kbp/s uplink)
- High sensitivity and acquisition: GSM850/EGSM900/DCS180/PCS1900 <-108.5dbm
- Reliable data transmission and fewer dropped calls
- Upgrade firmware remotely via QuecFOTA
- Pre-certified Quectel modules with major network operators guaranteed the connectivity and reduced time-to-market.

Quectel modules can ensure the wireless payment devices have the excellent features of simplicity, secure transactions, low cost, efficient remote monitoring, instantaneous payments and accurate responses.

### Secure transactions

With robust wireless signals and the greater bandwidth and faster data transfer rates offered by 2G/3G cellular technology, payment data can be transmitted securely and reliably.

### Reduced cost

Wireless networks lower the cost of installing electronic POS terminals since merchants avoid the expense and inconvenience of installing additional telephone lines at payment locations. Wireless also eliminates the down time spent waiting for extra lines to be installed.

### Instantaneous payments and accurate responses

Instantaneous payments give the highest customer satisfaction. Accurate responses show payment success or the reasons for failure. (no money for example).

### Simplicity

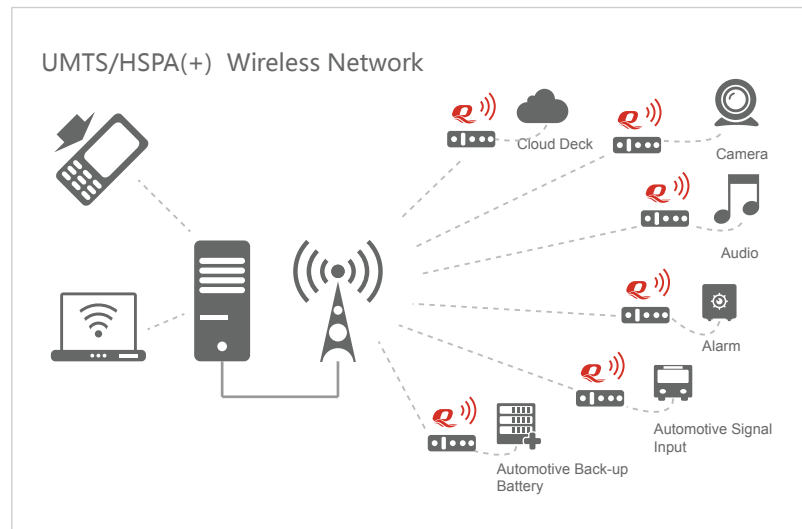
Best conversion rates from a single click-to-buy and no need to enter any further payment details.





# Security

*Increased concern over public and personal security is driving the market for security solutions.*



Traditional fixed line solutions are inconvenient, expensive and vulnerable to natural hazards and man-made disasters. Because of its rapid and flexible deployment, wireless communication is widely used in:

- Video surveillance: borders, buildings, streets
- Building security and controls: home, commercial/government building monitoring, access control, alarms

To address the demands of the application mentioned above, safety products need to have the following advantages

- Be able to monitor a large amount of scattered monitoring points.
- Cost-effective and scalable video streaming.
- Eliminated wires enable a more portable solution.
- Fast, secure and reliable high volume data transmission.

fully meet bandwidth requirements of peak video transmission. In addition, Quectel provides comprehensive hardware & software documentation, tools and 24/7 support to simplify customers' product development process and shorten time-to-market. With extended operating temperature, low power consumption and easy to integration, Quectel UC20 is characterized by secure and reliable data transmission even in harsh outdoors or mobile environment.

Quectel offers a broad product portfolio of GSM/GPRS and UMTS/HSPA+ modules. Based on Qualcomm chipsets, the featured UC20 UMTS/HSPA+ module delivers 5.76Mbps uplink data rate and 14.4Mbps downlink data rate, which



# Networking

*Cellular broadband networks provide advanced support for distributed operations and emerging industries that require flexible, reliable and secure internet access such as temporary internet installations, additional network bandwidth for kiosks, digital signage, and other Machine-to-Machine (M2M) applications.*

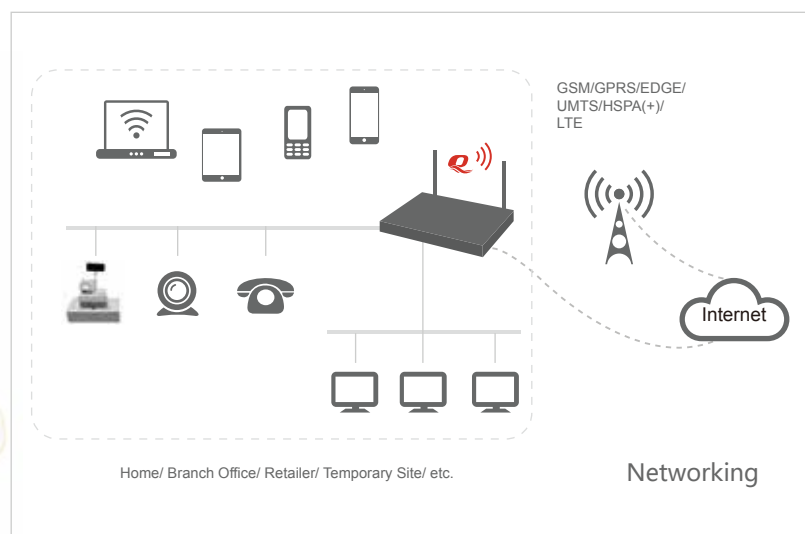
Some enterprises are also using secure high-speed wireless connections as backup or as a primary line to fixed line communications. The global 2G/3G/4G broadband coverage, the cellular network stability and maturity, together with the speeds offered by recent 3G broadband wireless implementations make cellular technologies the best complement to xDSL. LTE provides increased peak data rate, with at least 100Mbps downlink and 50Mbps uplink.

Quectel has launched a series of 3G modules and developing 4G modules based on the accelerating demand for the wireless broadband router. As a carrier of wireless data transmission, Quectel module can be embedded in the wireless network terminals. With extended temperature range, scalable bandwidth capacity and rugged small form factor, Quectel modules are able to fully meet the M2M industry standards and can performance well in hazard conditions.

Featuring the latest in 3G/4G technology, 3G/4G routers are designed to enable SOHO and office users to enjoy the freedom of secure, high-speed Internet connectivity at the home, office or while on the road. In electricity, finance, service industry and governmental institute and other commercial industries, wireless broadband router suitable for small scale industry can implement the fast deployment of wireless network.

### The advantages of Quectel modules

- Support the advanced network capacity and high-speed data rate 3G networks and the fastest 4G networks in all areas of the world.
- Secure communication protocols.
- Worldwide certifications and rich experiences of co-working with network carrier.



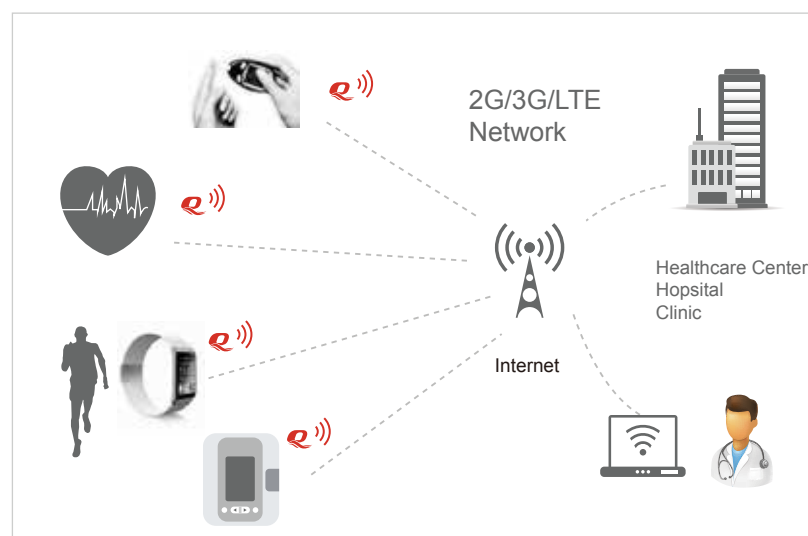




# mHealth

*Healthcare has become an exceptionally popular area of M2M deployment, especially in the face of rising expenditures on healthcare and the need for better efficiencies.*

Mobile health (mHealth) with the use of mobile phone technology (in combination with a web-based interface) create new mobile and internet-based services to support patients through their treatment journey irrespective of time and place, and result in an increase in convenience and efficiency of data collection, transfer, storage and analysis management of data as compared with paper-based system.



Depending on functional areas, M2M solutions applied in healthcare can be grouped into patient monitoring, organization of healthcare work and management of medication. The core of M2M-enabled mHealth solution is 3G/4G module, which enables the cellular transmission of data so that healthcare providers can provide remote care to patients. Particularly within environment of limited resources and beds, remote monitoring allows healthcare workers to better track patient conditions, medication regimen adherence and follow-up schedule.

The M2M-enabled mHealth solution collects data from many sensors and devices such as pedometers, electrocardiogram patch, sleep sensors, weight scales, blood glucose and blood pressure devices and provides a dashboard view of overall health status to authorised caregivers and the health system. Medication reminders and behavior-

al prompts are delivered to the touch screen on the Hub or to the user's mobile device to help with chronic disease management.

With Quectel M2M-enabled mHealth device, physician can remotely monitor a patient's health status and manage chronic conditions in real time no matter if the patient is at home, on the bus or anywhere. Quectel advanced SSL (Socket Secure Layer) function maintains strict requirements for security, safety, and patient-doctor confidentiality and privacy.

### The advantages of Quectel modules

- Small form factor and extended temperature range
- Reliable for seamless, always-on worldwide communication
- Secure data transmission over wireless networks utilizing Quectel SSL function

# Quectel Products



## Product Overview

Quectel provides top-quality innovative GSM/GPRS, UMTS/HSPA(+), GNSS modules that can be applied in wide range of applications including but not limited to automotive, smart metering, remote control and monitoring, tracking and tracing, sales/payment, security and mobile computing, etc.

Quectel's products are market-driven and all designed with industrial application in mind, so they are very robust on both hardware and software. All Quectel modules are characteristics of high sensitivity, low power consumption, extended operating temperature and many others. All Quectel modules comply with RoHS environmental regulations for compliance with legislative directives.

### GSM/GPRS Module Family



M10 GSM/GPRS



M66 GSM/GPRS



M72 GSM/GPRS



M85 GSM/GPRS



M95 GSM/GPRS

### UMTS/HSPA(+) Module Family



UC15 UMTS/HSDPA



UC15 Mini PCIe



UC20 UMTS/HSPA+



UC20 Mini PCIe



UG95 UMTS/HSPA

### GNSS Module Family



L20 GPS



L26 GNSS



L70 GPS



L70-R GPS



L76 GNSS



L80 GPS



# GSM/GPRS Family

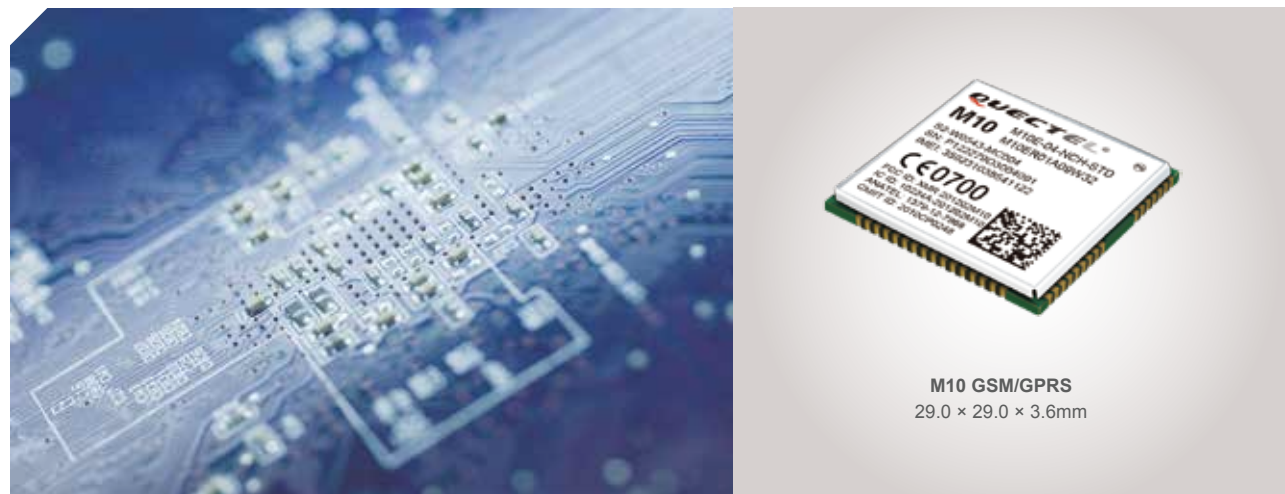
GSM/GPRS modules are based on open standards and meet the requirements of applicable international standards and legislation. Our leading edge products and services that cherish the environment and support sustainable development are the result of our own know-how and a perfect fit to the demands on the market. With compact size, low power consumption and extended temperature, our GSM/GPRS modules are used in a wide range of applications, such as automobile, VTS, smart metering, wireless POS, security and a multitude of embedded devices in many industries.



| Product                            | M10  | M66  | M72  | M85   | M95  |
|------------------------------------|--|--|--|---|--|
| Picture                            |  |  |  |   | <span style="border: 1px solid orange; border-radius: 5px; padding: 2px;">Recommended</span> |
| Packaging                          | 64-pin LCC Quad-band   | 44-pin LCC Dual-band                                       | 30-pin LCC Dual-band   | 83-pin LCC Quad-band  | 42-pin LCC Quad-band   |
| Dimensions                         | 29.0 × 29.0 × 3.6mm  | 15.8 × 17.7 × 2.3mm  | 27.5 × 24.0 × 2.7mm  | 24.5 × 25.3 × 2.6mm   | 19.9 × 23.6 × 2.65mm   |
| Frequency Range (MHz)              | 850/ 900/ 1800/ 1900   | 850/ 900/ 1800/ 1900                                       | 900/ 1800  | 850/ 900/ 1800/ 1900  | 850/ 900/ 1800/ 1900   |
| Weight (approx.)                   | 6.0 g  | 1.3 g  | 3.3 g  | 3.3 g   | 3.0 g  |
| Temperature Range                  | -40 °C to +85 °C   | -40 °C to +85 °C   | -40 °C to +85 °C   | -40 °C to +85 °C  | -40 °C to +85 °C   |
| <b>Data Transmission</b>           |  |  |  |   |  |
| GPRS Multi-slot Class              | 12, 1-12 configurable  | 12, 1-12 configurable                                      | 12, 1-12 configurable  | 12, 1-12 configurable   | 12, 1-12 configurable  |
| Data Rate (kbps)                   | 85.6 (DL & UL)   | 85.6 (DL & UL)   | 85.6 (DL & UL)   | 85.6 (DL & UL)  | 85.6 (DL & UL)   |
| SMS                                | •  | •  | •  | •   | •  |
| Protocols                          | TCP/ UDP/ PPP/ HTTP/ FTP/ SMTP/ PING/ NTP/ NITZ/ POP3/ MMS/ SSL  | TCP/ UDP/ PPP/ HTTP/ FTP/ SMTP/ PING/ NTP/ NITZ/ POP3/ MMS | TCP/ UDP/ PPP/ HTTP/ FTP/ SMTP/ PING/ NTP/ NITZ/ MMS Sending | TCP/ UDP/ PPP/ HTTP/ FTP/ SMTP/ PING/ NTP/ NITZ/ POP3/ MMS/ SSL | TCP/ UDP/ PPP/ HTTP/ FTP/ SMTP/ PING/ NTP/ NITZ/ MMS Sending/ SSL                            |
| <b>Specifications for Voice</b>    |  |  |  |   |  |
| Speech Codec Modes                 | HR/ FR/ EFR/ AMR   | HR/ FR/ EFR/ AMR   |  | HR/ FR/ EFR/ AMR  | HR/ FR/ EFR/ AMR   |
| Echo Arithmetic                    | Echo cancellation<br>Echo suppression<br>Noise reduction   | Echo cancellation<br>Echo suppression<br>Noise reduction   |  | Echo cancellation<br>Echo suppression<br>Noise reduction        | Echo cancellation<br>Echo suppression<br>Noise reduction                                     |
| <b>Interfaces</b>                  |  |  |  |   |  |
| SIM                                | 3V/ 1.8V   | 3V/ 1.8V   | 3V/ 1.8V   | 3V/ 1.8V  | 3V/ 1.8V   |
| Audio Analog                       | 2 inputs/ 2 outputs  | 1 input/ 2 outputs   |  | 2 inputs/ 3 outputs   | 2 inputs/ 2 outputs  |
| Audio Digital                      |  | •  |  | •   |  |
| RTC Backup                         | •  | •  | •  | •   | •  |
| UART                               | 3  | 3  | 2  | 3   | 2  |
| ADC                                | × 2, 10bit   | × 1, 10bit   |  | × 2, 10bit  |  |
| SD Card Interface                  | •  | •  |  | •   |  |
| GPIO                               | •  |  |  |   |  |
| Temperature Detection              |  |  |  | •   | •  |
| <b>Enhanced Features</b>           |  |  |  |   |  |
| eCall                              |  | •  |  | •   | •  |
| Jamming Detection                  | •  | •  | •  | •   | •  |
| DTMF                               | •  | •  | •  | •   | •  |
| Audio Playback/<br>Audio Recording | •  | •  |  | •   |  |
| Dual-SIM                           |  |  |  | •   | •  |
| QuecFOTA™                          | •  | •  | •  | •   | •  |
| QuecCell                           | •  | •  |  | •   | •  |
| QuecLocator                        | •  | •  | •  | •   | •  |
| QuecFile                           | •  | •  |  | •   |  |
| OpenCPU™                           | •  | •  |  | •   |  |
| RIL for Android & WinCE            | •  | •  | •  | •   | •  |
| MUX                                | •  | •  | •  | •   | •  |
| <b>Electrical Features</b>         |  |  |  |   |  |
| Power Supply                       | 3.3 ~ 4.6V   | 3.3 ~ 4.6V   | 3.3 ~ 4.6V   | 3.3 ~ 4.6V  | 3.3 ~ 4.6V   |
| Low Power Consumption              | 1.3mA @DRX=5<br>1.2mA @DRX=9   | 1.3mA @DRX=5<br>1.2mA @DRX=9                               | 1.3mA @DRX=5<br>1.2mA @DRX=9                                 | 1.3mA @DRX=5<br>1.2mA @DRX=9                                    | 1.3mA @DRX=5<br>1.2mA @DRX=9   |
| <b>Certifications</b>              |  |  |  |   |  |
| Certifications                     | CE/ GCF/ PTCRB<br>FCC/ IC/ ANATEL<br>Rogers/ NCC/ TELCEL<br>UCRF/ ICASA  | CE*  | CE/ GCF/ UCRF/<br>RCM  | GCF   | CE/ GCF/ Vodafone/<br>PTCRB/ FCC/ IC/<br>ANATEL/ Rogers/ RCM/<br>NCC/ TELCEL/<br>UCRF/ ICASA |
| <b>Recommended Applications</b>    |  |  |  |   |  |
| Recommended Applications           | Telematics, Smart Metering, Mobile POS Terminal, Gateway, Security, Tracking and Tracing, Remote Maintenance and Control, Mobile Computing, Healthcare, etc. |  |  |   |  |

# Quectel M10

## Quad-band GSM/GPRS Module



**M10 GSM/GPRS**  
29.0 × 29.0 × 3.6mm

### Product Description

The M10 is a complete Quad-band GSM/GPRS solution in an LCC castellation packaging which can be embedded in customer applications, offering the highest reliability and robustness.

Featuring an industry-standard interface and extremely low power consumption, the M10 delivers GSM/GPRS 850/900/1800/1900MHz performance for Voice, SMS, Data, and Fax in a small form factor. The M10 can fit into almost all the M2M applications, including VTS, Smart Metering, Wireless POS, Security, etc.

M10 supports an important remote upgrade technology which named QuecFOTA. With the unique Quectel protocol, the new firmware of M10 will be perfectly updated by MCU via UART, and this can greatly solve the worries for M2M applications.

As a part of Quectel's corporate policy of environmental protection, all products comply to the RoHS (Restriction of Hazardous Substances) directive of the European Union (EU Directive 2002/95/EG). ●

### Key Benefits

- Quad-band GSM/GPRS module with a size of 29.0 × 29.0 × 3.6mm
- LCC type suits for customer application
- Embedded powerful internet service protocols, multiple Sockets & IP addresses
- Based on mature and field-proven platform, backed up by our support service, from definition to design and production
- Certifications: CE/ GCF/ PTCRB/ FCC/ IC/ ANATEL/ Rogers/ NCC/ TELCEL/ UCRF/ ICASA

### General Features

|                             |  |
|-----------------------------|--|
| Quad-band                   | 850/ 900/ 1800/ 1900MHz  |
| GPRS Multi-slot Class       | 12, 1~12 configurable  |
| GPRS Mobile Station         | Class B  |
| Compliant to GSM Phase 2/2+ | Class 4<br>(2W @ 850/ 900MHz)<br>Class 1<br>(1W @ 1800/ 1900MHz) |
| Supply Voltage Range        | 3.3~4.6V 4.0V nominal  |
| Low Power Consumption       | 1.3mA @ DRX=5<br>1.2mA @ DRX=9                                   |
| Operation Temperature       | -40 °C to +85 °C   |
| Dimensions                  | 29.0 × 29.0 × 3.6mm  |
| Weight                      | Approx. 6.0g   |
| Mux Driver                  | GSM 07.10  |
| Control via AT Commands     | GSM 07.07 ,07.05 and other enhanced AT Commands                  |
| SIM Application Toolkit     |  |

### Specifications for Data

|                      |  |
|----------------------|--|
| GPRS Class 12        | Max. 85.6Kbps (uplink & downlink)        |
| PBCCH Support        |  |
| Coding Schemes       | CS 1, 2, 3, 4                            |
| USSD                 |  |
| Non Transparent Mode |  |
| Protocols            | PPP/ TCP/ UDP/ HTTP/ FTP/ MMS/ MUX/ SMTP |

### Specifications for SMS via GSM /GPRS

Point-to-point MO and MT  
SMS Cell Broadcast  
Text and PDU Mode

### Specifications for Voice

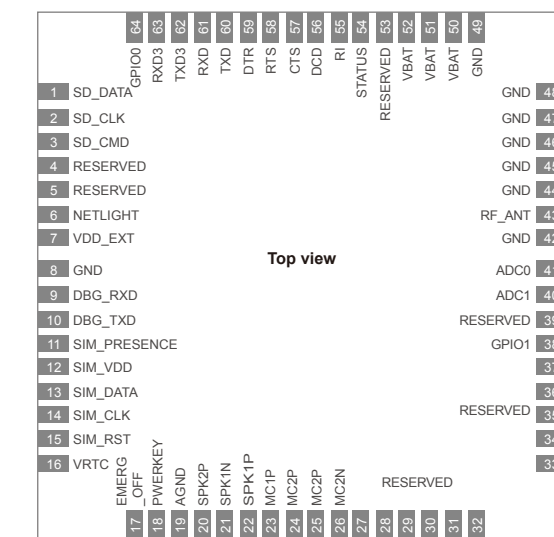
|                      |   |
|----------------------|---|
| Speech Codec Modes   | Half Rate (HR)<br>Full Rate (FR)<br>Enhanced Full Rate (EFR)<br>Adaptive Multi-Rate (AMR) |
| Echo Arithmetic      | Echo Cancellation<br>Echo Suppression<br>Noise Reduction                                  |
| Hands-free Operation |   |

### Interfaces

|                            |              |
|----------------------------|--------------|
| External SIM               | 3V/ 1.8V     |
| Analog Audio Interfaces    | Two Channels |
| RTC Backup                 |              |
| SD Card Interface          |              |
| Serial Port and Debug Port |              |
| Antenna Pad                |              |
| GPIOs                      |              |

### Certifications

|              |            |                 |             |             |        |
|--------------|------------|-----------------|-------------|-------------|--------|
| CE<br>Rogers | GCF<br>NCC | PTCRB<br>TELCEL | FCC<br>UCRF | IC<br>ICASA | ANATEL |
|--------------|------------|-----------------|-------------|-------------|--------|





# Quectel M66

## Quad-band GSM/GPRS Module



### Product Description

M66 is the smallest Quad-band GSM/GPRS module using LCC castellation packaging in the market. Based on the latest 2G chipset, it has the optimal performance in SMS & Data transmission and audio service even in harsh environment. Its ultra-compact 17.7 × 15.8 × 2.3mm profile makes M66 an perfect platform for size sensitive applications.

M66 adopts surface mounted technology, making it the ideal solution for durable and rugged designs. And its low profile and small size of LCC package ensure M66 easily embedded into the low-volume applications and ensure the reliable connectivity with the applications. This kind of package is ideally suited for large-scale manufacturing which has the strict requirements for cost and efficiency.

Its compact form factor, low power consumption and extended temperature make M66 the best choice for applications such as automotive, industrial PDA, personal tracking, wireless POS, smart metering, telematics and other M2M applications. ●

### Key Benefits

- The global tiniest Quad-Band LCC GSM/GPRS module
- Easier soldering process with LCC package
- Power consumption as low as 1.3mA
- Voice and Bluetooth supported
- QuecLocator and QuecFOTA™
- Embedded powerful Internet service protocols, multiple Sockets & IP addresses

### General Features

|                             |  |
|-----------------------------|--|
| Quad-band                   | 850/ 900/ 1800/ 1900MHz  |
| GPRS Multi-slot Class       | Class 12   |
| GPRS Mobile Station         | Class B  |
| Compliant to GSM Phase 2/2+ | Class 4<br>(2W @ 850/ 900MHz)<br>Class 1<br>(1W @ 1800/1900 MHz) |
| Supply Voltage Range        | 3.3~4.6V 4.0V nominal  |
| Low Power Consumption       | 1.3mA @ DRX=5<br>1.2mA @ DRX=9                                   |
| Operation Temperature       | -40 °C to +85 °C   |
| Dimensions                  | 17.7 × 15.8 × 2.3mm  |
| Weight                      | Approx. 1.5g   |
| Control via AT Commands     | GSM 07.07 ,07.05 and other enhanced AT Commands                  |

### Specifications for Data

|                      |  |
|----------------------|--|
| GPRS Class 12        | 85.6 Kbps (Downlink)<br>85.6 Kbps (Uplink) |
| PBCCH Support        |  |
| Coding Schemes       | CS 1, 2, 3, 4                              |
| USSD                 |  |
| Non Transparent Mode |  |
| Protocols            | PPP/ TCP/ UDP/ FTP/ MMS/ HTTP/ SMTP        |

### Specifications for SMS via GSM /GPRS

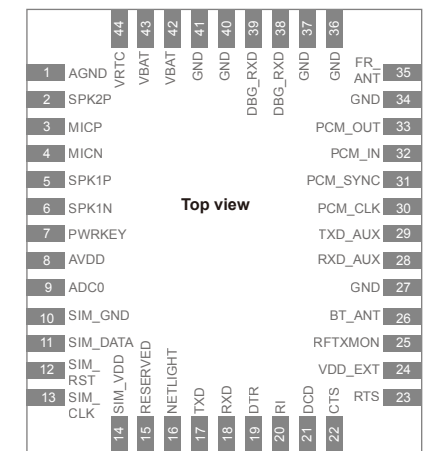
Point-to-point MO and MT  
SMS Cell Broadcast  
Text and PDU Mode

### Specifications for Voice

|                    |   |
|--------------------|---|
| Speech Codec Modes | Half Rate (HR)<br>Full Rate (FR)<br>Enhanced Full Rate (EFR)<br>Adaptive Multi-Rate (AMR) |
| Echo Arithmetic    | Echo Cancellation<br>Echo Suppression<br>Noise Reduction                                  |

### Interfaces

|                      |                                      |
|----------------------|--------------------------------------|
| SIM/ USIM            | Dual SIM 3V/ 1.8V                    |
| UART                 | 3 Interfaces                         |
| Analog Audio Channel | 2 output channels<br>1 input channel |
| Bluetooth            | ×1                                   |
| ADC                  | ×1                                   |
| PCM                  | ×1                                   |
| RTC                  | ×1                                   |
| Antenna Pad          | ×1                                   |



# Quectel M72

## Dual-band GSM/GPRS Module



### Product Description

M72 is a high-performance and cost-efficient Dual-band 900/1800 GSM/GPRS module based on the latest MTK chipset. Its slim and compact design are perfect fit for size-sensitive products.

M72 with LCC castellation package technology are surface mount package devices, which use metalized pads on the sides of the package. This kind of packaging makes it easily embedded in other applications and is ideally suitable for large-scale manufacturing which has the strict requirements for cost and efficiency.

By adopting the highly integrated chipset solution, M72 module contains built-in Baseband, RF, Memory and PMU functional units in its compact form factor. Combining the industrial standard interface with GPRS Class 12 enabling speeds up to 85.6 kbps for in both up and down link, M72 offers extremely fast data speeds and high reliability for SMS and data transmission even under rugged conditions.

Built-in unique Over-the-Air firmware update by means of QuecFOTA software allows M72 to update the firmware remotely.

With its compact profile, extended operating temperature and integrated TCP/IP stack, M72 is perfect platform for both industrial and household applications such as smart meter, wireless POS, automotive and security system. ●

### Key Benefits

- Dual-band GSM/GPRS module
- Compact form factor of 27.5 × 24.0 × 2.7mm
- LCC type for easy SMT production
- Embedded powerful Internet service protocols
- QuecFOTA™

### General Features

|                             |   |
|-----------------------------|---|
| Quad-band                   | 900/ 1800MHz  |
| GPRS Multi-slot Class       | 12, 1~12 configurable                                 |
| GPRS Mobile Station         | Class B   |
| Compliant to GSM Phase 2/2+ | Class 4<br>(2W @ 900MHz)<br>Class 1<br>(1W @ 1800MHz) |
| Supply Voltage Range        | 3.3~4.6V 4.0V nominal                                 |
| Low Power Consumption       | 1.3mA @ DRX=5<br>1.2mA @ DRX=9                        |
| Operation Temperature       | -40 °C to +85 °C                                      |
| Dimensions                  | 27.5 × 24.0 × 2.7mm                                   |
| Weight                      | Approx. 3.3g  |
| Control via AT Commands     | GSM 07.07 ,07.05 and other enhanced AT Commands       |

### Specifications for Data

|                      |                                     |
|----------------------|-------------------------------------|
| GPRS Class 12        | Max. 85.6Kbps (uplink & downlink)   |
| PBCCH Support        |                                     |
| Coding Schemes       | CS 1, 2, 3, 4                       |
| USSD                 |                                     |
| Non Transparent Mode |                                     |
| Protocols            | PPP/ TCP/ UDP/ HTTP/ FTP/ MUX/ SMTP |

### Specifications for SMS via GSM /GPRS

Point-to-point MO and MT  
SMS Cell Broadcast  
Text and PDU Mode

### Interfaces

|              |                            |
|--------------|----------------------------|
| External SIM | 3V/ 1.8V                   |
| RTC Backup   |                            |
| UART         | Serial Port and Debug Port |
| Antenna Pad  |                            |

### Enhanced Features

|                   |
|-------------------|
| Jamming Detection |
| QuecFOTA™         |
| DTMF Decoding     |

### Certifications

CE GCF UCRF RCM

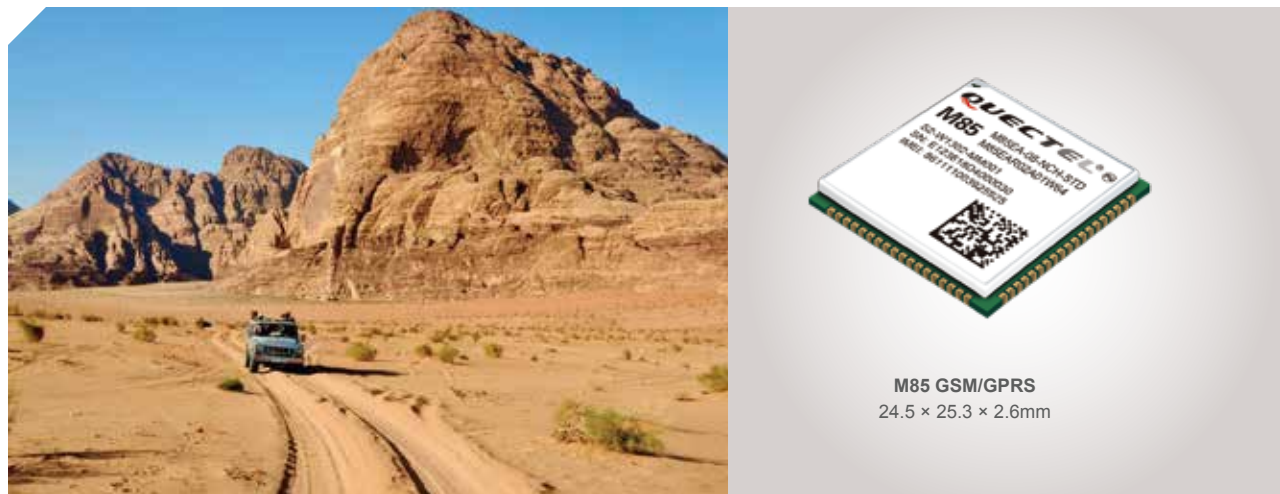
|                 |              |          |    |
|-----------------|--------------|----------|----|
| 1               | TXD          | GND      | 30 |
| 2               | RXD          | GND      | 29 |
| 3               | RTS          | RF_ANT   | 28 |
| 4               | CTS          | GND      | 27 |
| 5               | DTR          | GND      | 26 |
| 6               | RESERVED     | VBAT     | 25 |
| 7               | RESERVED     | VBAT     | 24 |
| <b>Top view</b> |              |          |    |
| 8               | SIM_GND      | RI       | 23 |
| 9               | SIM_PRESENCE | STATUS   | 22 |
| 10              | SIM_DATA     | NETLIGHT | 21 |
| 11              | SIM_VDD      | DCD      | 20 |
| 12              | SIM_CLK      | DBG_RXD  | 19 |
| 13              | SIM_RST      | DBG_TXD  | 18 |
| 14              | PWRKEY       | VRTC     | 17 |
| 15              | EMERG_OFF    | VDD_EXT  | 16 |





# Quectel M85

## Quad-band GSM/GPRS Module



M85 GSM/GPRS  
24.5 × 25.3 × 2.6mm

### Product Description

M85 is a powerful functional Quad-band GSM/GPRS module in LCC castellation packaging. It integrates advanced eCall/ Era-Glonass, UFS, recording and audio playing function into a compact form factor of 24.5 × 25.3 × 2.6mm, which fully meets developers' comprehensive requirements for large space storage and extends the functionality of the application at no additional cost.

M85 adopts surface mount technology, making it the ideal solution for durable and rugged designs, and reducing BOM cost and size on the customer's application. And its low profile and small size of LCC package ensures M85 easily embedded into the low-volume applications and ensures the reliable connectivity with the applications. This kind of package is ideally suited for large-scale manufacturing which has the strict requirements for cost and efficiency.

Built-in unique QuecFOTA™ technology allows M85 to update the firmware remotely. Additional features such as integrated TCP/IP protocol stack, serial multiplexer, enhance AT commands, jamming detection and antenna diagnosis guarantee reliable SMS, data, voice, multi-media transmission via GSM/GPRS network.

### Key Benefits

- Quad-band GSM/GPRS module with a size of 24.5 × 25.3 × 2.6mm
- LCC Package
- Embedded powerful Internet service protocols, multiple Sockets & IP addresses
- eCall
- SMTPS
- QuecFOTA™
- Dual SIM Single Standby
- Jamming Detection
- DTMF
- QuecLocator
- QuecCell

### General Features

|                             |   |
|-----------------------------|---|
| Quad-band                   | 850/ 900/ 1800/ 1900MHz   |
| GPRS Multi-slot Class       | 12, 1~12 configurable   |
| GPRS Mobile Station         | Class B   |
| Compliant to GSM Phase 2/2+ | Class 4<br>(2W @ 850/ 900MHz)<br>Class 1<br>(1W @ 1800/1900MHz) |
| Supply Voltage Range        | 3.3~4.6V 4.0V nominal   |
| Low Power Consumption       | 1.3mA @ DRX=5<br>1.2mA @ DRX=9                                  |
| Operation Temperature       | -40 °C to +85 °C  |
| Dimensions                  | 24.5 × 25.3 × 2.6mm   |
| Weight                      | Approx. 3.3g  |
| Control via AT Commands     | GSM 07.07 ,07.05 and other enhanced AT Commands                 |
| SIM Application Toolkit     |   |

### Specifications for Data

|                      |  |
|----------------------|--|
| GPRS Class 12        | Max. 85.6Kbps (uplink & downlink)                |
| PBCCH Support        |  |
| Coding Schemes       | CS 1, 2, 3, 4                                    |
| USSD                 |  |
| Non Transparent Mode |  |
| Protocols            | PPP/ TCP/ UDP/ FTP/ MMS/ HTTP/ SMTP/ SMPTS/ POP3 |
| Driver               | CMUX<br>RIL driver for Android, WinCE            |

### Specifications for SMS via GSM /GPRS

Point-to-point MO and MT  
SMS Cell Broadcast  
Text and PDU Mode

### Specifications for Voice

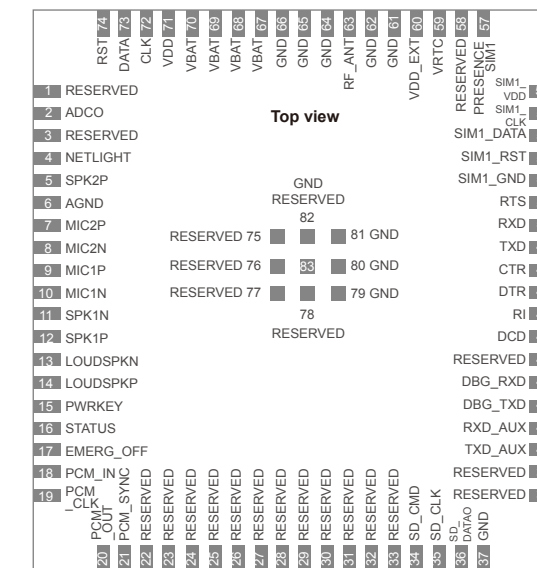
|                    |   |
|--------------------|---|
| Speech Codec Modes | Half Rate (HR)<br>Full Rate (FR)<br>Enhanced Full Rate (EFR)<br>Adaptive Multi-Rate (AMR) |
| Echo Arithmetic    | Echo Cancellation<br>Echo Suppression<br>Noise Reduction                                  |

### Interfaces

|                      |   |
|----------------------|---|
| SIM/ USIM            | Dual SIM 3V/ 1.8V   |
| ADC                  | 1 Input   |
| UART                 | 3 Interfaces  |
| Analog Audio Channel | 2 Inputs, 3 Outputs<br>Embedded Class-AB amplifier in one channel |
| SD Card interface    | Up to 32GB SD card supported                                      |
| RTC Backup           |   |
| PCM                  |   |
| Antenna Pad          |   |

### Certifications

GCF



# Quectel M95

## Quad-band GSM/GPRS Module



### Product Description

M95 is one of the smallest Quad-band GSM/GPRS modules in LCC castellation packaging with the compact size of 19.9 × 23.6 × 2.65mm, ultra low power consumption and extended temperature range.

With surface mount technology, the low profile and small size of LCC package make M95 easily embedded into the low-volume applications and ensure the reliable connectivity with the applications. This kind of package is ideally suited for large-scale manufacturing which has the strict requirements for cost and efficiency.

Built-in unique QuecFOTA™ technology allows M95 to update the firmware remotely. Additional features such as integrated TCP/IP protocol stack, serial multiplexer and enhanced AT commands guarantee fast and reliable transmission of data, voice, SMS via GSM/GPRS network and extend the functionality of the application without adding cost.

Its tiny size and ultra low power consumption make M95 a very cost effective and feature-rich platform that is quite suitable for a wide range of M2M applications such as VTS, Industry PDA, Personal Tracking, Wireless POS, Smart Metering and many other M2M applications. ●

### Key Benefits

- One of the smallest Quad-band GSM/ GPRS modules
- Easier soldering process with LCC package
- Embedded Class-AB amplifier
- Power consumption as low as 1.3mA
- Embedded powerful Internet service protocols, multiple Sockets & IP addresses
- eCall
- QuecFOTA™
- Jamming detection
- DTMF decoding

### General Features

|                             |  |
|-----------------------------|--|
| Quad-band                   | 850/ 900/ 1800/ 1900MHz  |
| GPRS Multi-slot Class       | 12, 1~12 configurable  |
| GPRS Mobile Station         | Class B  |
| Compliant to GSM Phase 2/2+ | Class 4<br>(2W @ 850/ 900MHz)<br>Class 1<br>(1W @ 1800/ 1900MHz) |
| Supply Voltage Range        | 3.3~4.6V 4.0V nominal  |
| Low Power Consumption       | 1.3mA @ DRX=5<br>1.2mA @ DRX=9                                   |
| Operation Temperature       | -40 °C to +85 °C   |
| Dimensions                  | 19.0 × 23.6 × 2.65mm   |
| Weight                      | Approx. 3.0g   |
| Control via AT Commands     | GSM 07.07 ,07.05 and other enhanced AT Commands                  |

### Specifications for Fax & Data

|                      |                                     |
|----------------------|-------------------------------------|
| GPRS Class 12        | Max. 85.6Kbps (uplink & downlink)   |
| PBCCH Support        |                                     |
| Coding Schemes       | CS 1, 2, 3, 4                       |
| USSD                 |                                     |
| Non Transparent Mode |                                     |
| Protocols            | PPP/ TCP/ UDP/ HTTP/ FTP/ MUX/ SMTP |

### Specifications for SMS via GSM /GPRS

Point-to-point MO and MT  
SMS Cell Broadcast  
Text and PDU Mode

### Specifications for Voice

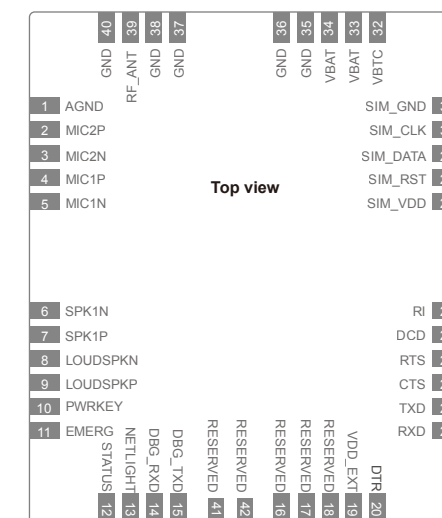
|                    |   |
|--------------------|---|
| Speech Codec Modes | Half Rate (HR)<br>Full Rate (FR)<br>Enhanced Full Rate (EFR)<br>Adaptive Multi-Rate (AMR) |
| Echo Arithmetic    | Echo Cancellation<br>Echo Suppression<br>Noise Reduction                                  |

### Interfaces

|                      |   |
|----------------------|---|
| SIM/ USIM            | 3V/ 1.8V  |
| UART                 | 2 Interfaces                                    |
| Analog Audio Channel | 2<br>Embedded Class-AB amplifier in one channel |
| RTC Backup           |   |
| Antenna Pad          |   |

### Certifications

|      |        |          |       |     |
|------|--------|----------|-------|-----|
| CE   | GCF    | Vodafone | PTCRB | FCC |
| IC   | ANATEL | Rogers   | RCM   | NCC |
| UCRF | ICASA  | TELCEL   |       |     |





## GSM/GPRS EVB Kits

### Product Description

Quectel provides fully functional, convenient and high performance EVB kits for customers to evaluate the performance of wireless modules. Integrated with friendly Human Machine Interaction, such as operation key, LEDs and debug testing points, user can quickly understand the characteristics and operational procedure of Quectel modules. Along with power supply adaptor, GSM antenna and USB to UART converter cable, Quectel wireless EVB kits allow user to conveniently evaluate the performance of Quectel wireless modules. Quectel also provides users with EVB schematics and layout reference design, which are worthy for users in designing their hardware.

### Features

- Easy to use
- Abundant functional interfaces
- Human Machine Interaction
- Visualization for module's working status via LEDs

### EVB Kit Includes

- One-page instruction
- Power supply adaptor
- USB to UART converter cable
- GSM antenna
- CD-ROM containing:
  - *Evaluation tools*
  - *USB-driver software*
  - *Documentation*



For detailed information, please refer to EVB\_User\_Guide.

## QNavigator

### Product Description

QNavigator Wireless Evaluation Software is an easy-use evaluation tool for evaluating, configuring and testing Quectel wireless modules. It provides a convenient way to configure Quectel wireless modules and save the configuration in the module flash. It can test SMS function, Voice call, TCP/UDP, PPP and Quectel's unique function QuecLocator. With the simple graphic user interface and built-in AT terminal, Qnavigator can show all the AT commands trace when user performs these functions, which dramatically decrease the learning curve of the AT commands sets. QNavigator supports the PC with running Windows XP, Windows 7, Windows 8 and Windows Vista.

### Features

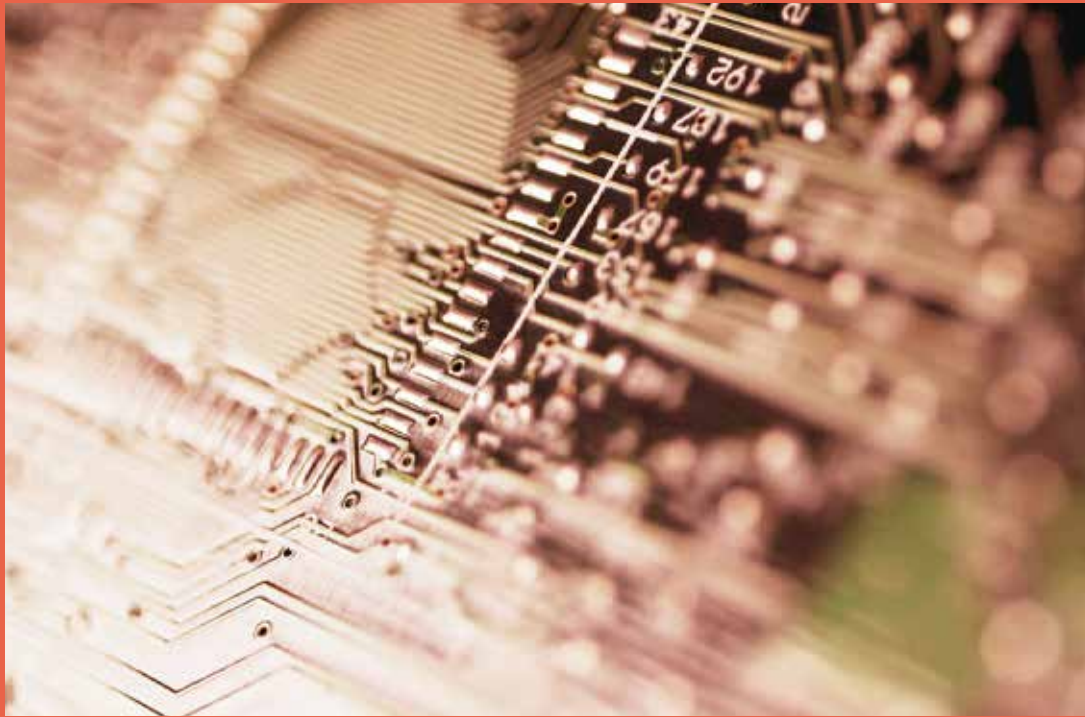
- Easy to configuration and use
- Easily access to main functionalities
- Learn AT commands through GUI interfaces
- Free of charge
- SMS management
- Voice Call management
- TCP/UDP management
- PPP management
- AT commands management
- GNSS demonstration
- QuecLocator demonstration
- AT commands testing






### QNavigator Includes

- Module connection management

# UMTS/HSPA(+) Family

Quectel enters the new level with UC15 and UC20, a series of 3G wireless modules. UC15 and UC20 feature fast HSPA connectivity, taking advantage of global 3G deployment while still leveraging backwards compatibility with GSM/GPRS and EDGE networks.



| Product                         | UC15   | UC15 Mini PCIe   | UC20   | UC20 Mini PCIe  | UG95  |
|---------------------------------|--|--|--|---|---|
| Picture                         |  <i>Recommended</i>   |                               |  <i>Recommended</i> |  |  |
| Packaging                       | 108-pin LCC  | 52-pin Mini PCIe   | 112-pin LCC  | 52-pin Mini PCIe  | 102-pin LGA   |
| Dimensions                      | 29.0 × 29.0 × 2.5mm  | 51.0 × 30.0 × 4.9mm  | 32.0 × 29.0 × 2.5mm  | 51.0 × 30.0 × 4.9mm   | 23.6 × 19.9 × 2.2mm   |
| 3G                              | UMTS/HSDPA   | UMTS/HSDPA   | UMTS/HSPA+   | UMTS/HSPA+  | UMTS/HSPA   |
| Frequency Bands (MHz)           | -E(for Europe)<br>900/2100@UMTS<br>900/1800@GSM<br>-A(for America)<br>850/1900@UMTS<br>850/900/1800/1900@GSM<br>-G(for Global)   | 900/2100@UMTS<br>900/1800@GSM  | 900/2100@UMTS<br>850/900/1800/1900@GSM   | 900/2100@UMTS<br>850/900/1800/1900@GSM  | 900/2100@UMTS<br>900/1800@GSM   |
| Weight (approx.)                | 4.3g   | 9.3g   | 4.9g   | 9.8g  | 2.5g  |
| Temperature Range               | -40 °C ~ +85 °C  | -40 °C ~ +80 °C  | -40 °C ~ +85 °C  | -40 °C ~ +80 °C   | -35 °C ~ +70 °C   |
| <b>Data Transmission</b>        |  |  |  |   |   |
| HSPA data rate (Mbps)           | 3.6 (DL)   | 3.6 (DL)   | 14.4 (DL)/ 5.76 (UL)   | 14.4 (DL)/ 5.76 (UL)  | 7.2 (DL)/ 5.76 (UL)   |
| UMTS data rate (Kbps)           | 384 (DL)/ 384 (UL)   | 384 (DL)/ 384 (UL)   | 384 (DL)/ 384 (UL)   | 384 (DL)/ 384 (UL)  | 384 (DL)/ 384 (UL)  |
| GPRS data rate (Kbps)           | 85.6 (DL)/ 85.6 (UL)   | 85.6 (DL)/ 85.6 (UL)   | 85.6 (DL)/ 85.6 (UL)   | 85.6 (DL)/ 85.6 (UL)  | 85.6 (DL)/ 85.6 (UL)  |
| EDGE data rate (Kbps)           | 236.8 (DL)   | 236.8 (DL)   | 236.8 (DL)/ 236.8 (UL)   | 236.8 (DL)/ 236.8 (UL)  | 236.8 (DL)  |
| SMS                             | •  | •  | •  | •   | •   |
| CSD                             | •  | •  | •  | •   | •   |
| Protocols                       | TCP/ UDP/ PPP/ MMS/ FTP/ SMTP/ SMTSP/ HTTP/ HTTPS/ PING/ SSL   | TCP/ UDP/ PPP/ MMS/ FTP/ SMTP/ SMTSP/ HTTP/ HTTPS/ PING/ SSL   | TCP/ UDP/ PPP/ MMS/ FTP/ SMTP/ SMTSP/ HTTP/ HTTPS/ PING/ SSL   | TCP/ UDP/ PPP/ MMS/ FTP/ SMTP/ SMTSP/ HTTP/ HTTPS/ PING/ SSL                        | TCP/ UDP/ PPP/ MMS/ FTP/ SMTP/ FTP/ SSL*  |
| <b>Interfaces</b>               |  |  |  |   |   |
| SIM                             | 1.8V/ 3V   | 1.8V/ 3V   | 1.8V/ 3V   | 1.8V/ 3V  | 1.8V/ 3V  |
| UART                            | 1  | 1  | 2  | 1   | 1   |
| USB                             | 2.0 HS   | 2.0 HS   | 2.0 HS   | 2.0 HS  | 2.0 HS  |
| Audio Analog                    | Optional <sup>1</sup>  | Optional <sup>1</sup>  |  |   |   |
| Audio Digital (PCM)             | Optional <sup>1</sup>  | Optional <sup>1</sup>  | Optional <sup>1</sup>  | Optional <sup>1</sup>   | Optional <sup>1</sup>   |
| RTC Backup                      |  |  | •  |   | •   |
| ADC                             | × 2, 12bits  |  | × 2, 15bits  |   |   |
| GPIO                            | •  |  | •  |   |   |
| Antenna                         | Pads for Primary   | Connector for Primary  | Pads for Primary, Rx-diversity and GNSS  | Connectors for Primary, SMT/ SMTSP/ HTTP/ HTTPS/ PING/ SSL                          | Pads for Primary  |
| SIM Card Holder                 |  |  |  | Optional for -E Version   |   |
| <b>Enhanced Features</b>        |  |  |  |   |   |
| eCall                           | •  | •  | •  | •   | ◦   |
| DTMF                            | •  | •  | •  | •   | ◦   |
| QuecFOTA™                       | •  | •  | •  | •   | ◦   |
| DeltaFOTA                       |  |  | •  | •   |   |
| Audio Playback/ Audio Recording |  |  | ◦  | ◦   |   |
| QuecLocator                     | ◦  | ◦  | •  | •   | ◦   |
| QuecFile                        | •  | •  | •  | •   | ◦   |
| RIL Driver                      | Windows CE6.0*, Android 2.3/4.0, Windows Mobile 6.1*/6.5*  | Windows CE6.0*, Android 2.3/4.0, Windows Mobile 6.1*/6.5*  | Windows CE6.0, Android 2.3/4.0/4.2   | Windows CE6.0, Android 2.3/4.0/4.2  | ◦   |
| NDIS                            |  |  | Windows XP/Vista/7/8, Linux 2.6/3.0  | Windows XP/Vista/7/8, Linux 2.6/3.0   |   |
| MUX                             | Linux 2.6 or later, Android 2.3 or later   | Linux 2.6 or later, Android 2.3 or later   | Linux 2.6/3.0, Android 2.3/4.0/4.2   | Linux 2.6/3.0, Android 2.3/4.0/4.2  | ◦   |
| USB Serial Driver               | Windows XP/Vista/7/8, Windows CE5.0/ 6.0/7.0, Windows Mobile 6.1*/6.5*, Linux 2.6 or later, Android 2.3 or later   | Windows XP/Vista/7/8, Windows CE5.0/ 6.0/7.0, Windows Mobile 6.1*/6.5*, Linux 2.6 or later, Android 2.3 or later | Windows XP/Vista/7/8, Windows CE5.0/6.0/7.0, Android 2.3/4.0/4.2, Linux 2.6/3.0                        | Windows XP/Vista/7/8, Windows CE5.0/6.0/7.0, Android 2.3/4.0/4.2, Linux 2.6/3.0     | Windows XP/Vista/7/8*, Linux 2.6/3.0, Android 2.3/4.0/4.2                           |
| SIM Detection                   | •  |  | •  |   | ◦   |
| GNSS                            |  |  | GPS/GLONASS  | GPS/GLONASS   |   |
| Firmware Update                 | via USB/ UART Interface  | via USB/ UART Interface  | via USB/ UART Interface  | via USB/ UART Interface   | via USB/ UART Interface   |
| <b>Electrical Features</b>      |  |  |  |   |   |
| Supply Voltage Range            | 3.3 ~ 4.3V   | 3.0~3.6V, typ. 3.3V  | 3.4 ~ 4.3V   | 3.0~3.6V, typ. 3.3V   | 3.3 ~ 4.3V  |
| Power Consumption               | 2.2mA@ GSM sleep, DRX=9<br>2.1mA@ UMTS sleep, DRX=9  | 3.5mA@ GSM sleep, DRX=9<br>3.3mA@ UMTS sleep, DRX=9  | 1.5mA@GSM sleep, DRX=9<br>1.4mA@UMTS sleep, DRX=9  | 3.1mA@GSM sleep, DRX=9<br>3.0mA@UMTS sleep, DRX=9                                   | 0.96mA@GSM sleep, DRX=9<br>1.15mA@UMTS sleep, DRX=9                                 |
| <b>Certifications</b>           |  |  |  |   |   |
| Certifications                  | CE/ GCF/ FCC/ PTCRB/ AT&T*   | CE/ FCC/ PTCRB/ GCF*   | CE/ FCC/ IC/ KC/ NCC/ OFCA/ GCF/ PTCRB/ RCM/ SKT*/ AT&T*/ Telstra/ ANATEL*/ Vodafone/ Rogers*          | CE/ FCC/ PTCRB/ GCF/ RCM  | CE*/GCF*/ FCC*/ PTCRB*/ AT&T*   |
| <b>Recommended Applications</b> |  |  |  |   |   |
| Recommended Applications        | Telematics, Smart Metering, Mobile POS Terminal, Gateway, Security, Tracking and Tracing, Remote Maintenance and Control, Networking, Mobile Computing, Healthcare, etc. |  |  |   |   |

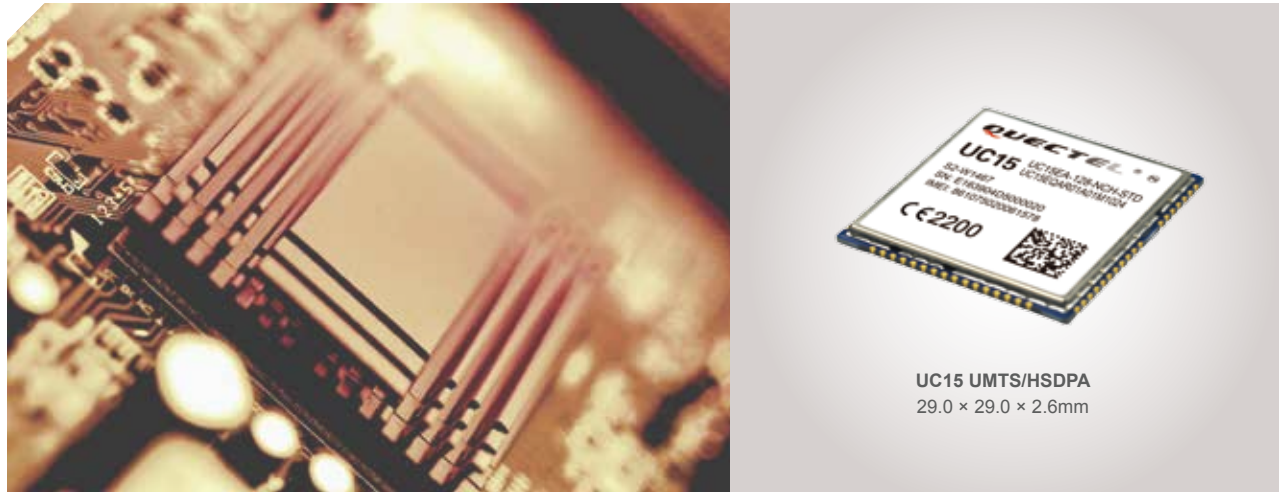
Note 1: Only supported in Telematics Version.

◦ & \* Under development



# Quectel UC15

## UMTS/HSDPA Module



### Product Description

UC15 is a cost effective UMTS/HSDPA module featuring a maximum data rate of 3.6Mbps downlink and 384Kbps uplink. Designed to be compatible with Quectel GSM/GPRS M10 module in the compact and unified form factor, it provides a flexible and scalable platform for migrating from GSM/GPRS/EDGE to UMTS/HSDPA. This enables integrators and developers to design their applications once and take advantage of true worldwide coverage and service flexibility afforded by the combination of the two most prevalent cellular technologies worldwide.

Its advanced LCC package allows fully automated manufacturing for high volume applications and copper-surfaced bottom design optimizes heat dissipation. The tiny profile in cost optimized SMT form factor and highly integration level enable integrators and developers to easily design their applications and truly benefit from the module's small size, low power consumption and mechanical intensity.

A rich set of Internet protocols, industry-standard interfaces (USB/UART/ADC/Status Indicator/PCM ) and abundant functionalities (USB drivers for Windows XP, Windows Vista, Windows 7, Windows 8, Windows CE, Linux, Android/eCall) extend the applicability of the module to a wide range of M2M applications such as automotive, metering, security, CPE and wireless POS. ●



### Key Benefits

- Worldwide UMTS/HSDPA and GSM/GPRS/EDGE coverage
- Minimal SMT form factor ideal for small end products with tight space
- High-quality data and image transmission even in hazard conditions and dark environment
- Fast time-to-market: Reference designs, evaluation tools and timely technical support minimize design-in time and development efforts
- Robust mounting and interfaces

### General Features

|                         |   |
|-------------------------|---|
| Frequency Bands         | UC15-E<br>900/ 2100MHz@UMTS<br>900/ 1800MHz@GSM<br>UC15-A<br>850/ 1900MHz@UMTS<br>850/ 900/ 1800/ 1900MHz@GSM |
| HSDPA                   | Release 5 (category 6)  |
| EDGE                    | Downlink only   |
| GPRS                    | Multi-slot Class 12   |
| UMTS                    | Release 99/5  |
| GSM                     | Release 99/4  |
| Supply Voltage Range    | 3.3V ~ 4.3V, 3.8V typ.  |
| Operation Temperature   | -40 °C ~ +85 °C   |
| Dimensions              | 29.0 × 29.0 × 2.5mm   |
| Weight                  | Approx. 4.3g  |
| Control via AT commands | 3GPP TS27.007, 27.005 and other enhanced AT Commands  |

### Specifications

|           |  |
|-----------|--|
| SMS       | Point-to-point MO and MT<br>SMS Cell Broadcast<br>Text and PDU Mode  |
| Data      | HSDPA Max.3.6Mbps<br>UMTS Max.384Kbps (DL)/Max.384Kbps (UL)<br>EDGE Max.236.Kbps (DL)<br>GPRS Max.85.6Kbps (DL)/Max.85.6Kbps (UL)<br>CSD 64 Kbps |
| Protocols | TCP/ UDP/ PPP/ MMS/ SMTP/ SMTPS/<br>HTTP/ HTTPS/ FTP/ PING/ SSL  |

### Special Features

|                 |            |   |
|-----------------|------------|---|
| Drivers         | USB Serial | Windows XP, Windows Vista, Windows7, Windows 8, Windows CE5.0/ 6.0/ 7.0, Windows Mobile 6.1*/6.5*, Linux 2.6 or later, Android 2.3 or later |
|                 | RIL        | Windows CE6.0, Windows Mobile 6.1/6.5, Android 2.3/4.0  |
|                 | MUX        | Linux 2.6 or later, Android 2.3 or later  |
| eCall           |            | Accident, Emergency Services  |
| Firmware Update |            | Firmware Update via USB and UART Interface  |
| QuecFile        |            | File System Access and Management   |
| QuecFOTA        |            |   |
| QuecLocator*    |            |   |



### Electrical Characteristics

|              |  |
|--------------|--|
| Output Power | Class 3 (24dBm +1/-3dB) for UMTS bands<br>Class 4 (33dBm ±2dB) for GSM 850/900<br>Class 1 (30dBm ±2dB) for GSM 1800/1900   |
| Consumption  | 65µA@Power off<br>2.2mA@ GSM sleep ,DRX=9<br>2.1mA@ UMTS sleep. DRX=9<br>240mA@GSM voice, max power<br>540mA@UMTS voice, max power<br>500mA@GPRS data, max power<br>520mA@UMTS data, max power<br>540mA@HSDPA, max power |
| Sensitivity  | -110dBm@UMTS Bands<br>-108.5dBm@GSM 900MHz<br>-108dBm@GSM 1800MHz  |

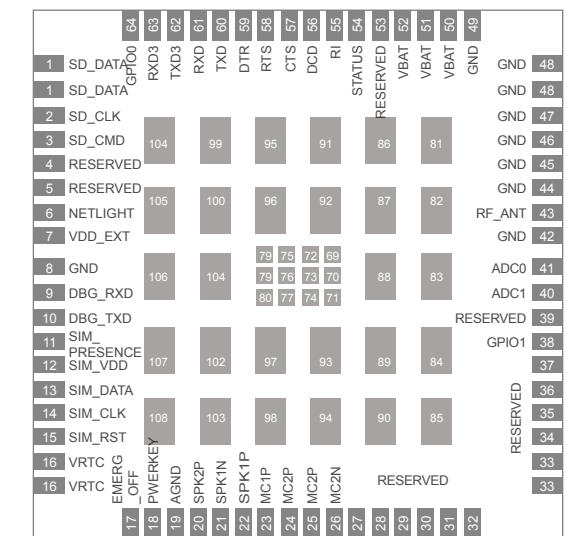
### Interfaces

|                |   |
|----------------|---|
| USB            | 2.0 High Speed                                |
| Audio Analog   | 2 Analog Input and Output Channels, optional  |
| Audio Digital* | Digital Audio through PCM Interface, optional |
| UART           | 1×Full Functions                              |
| USIM           | 1.8V/ 3V                                      |
| ADC            | × 2, 12bits                                   |
| NETLIGHT       |   |
| STATUS         | Indication for Power On and Off Status        |

### Certifications

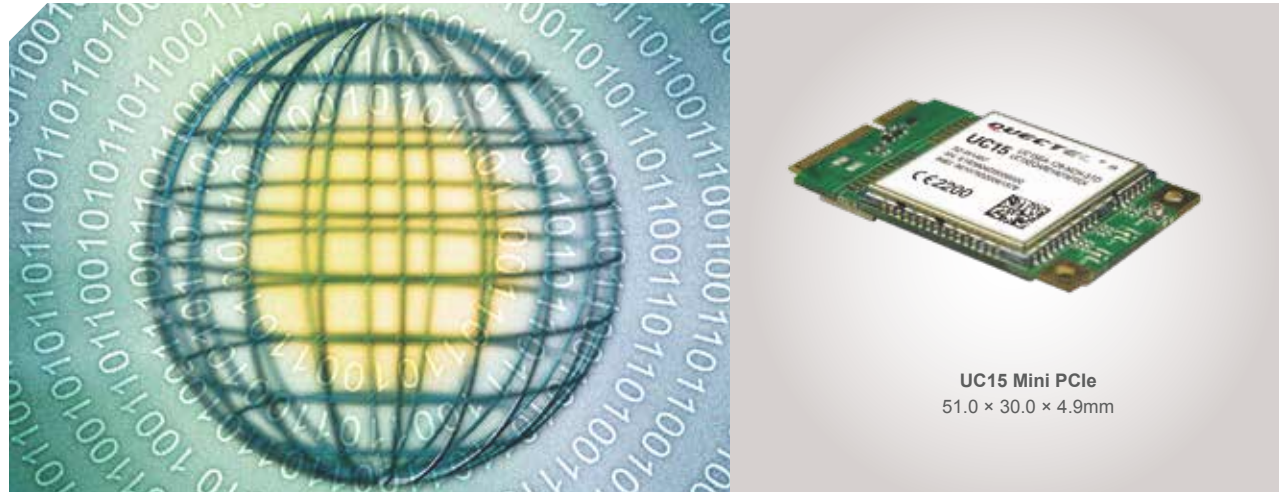
|    |      |       |     |       |
|----|------|-------|-----|-------|
| CE | GCF* | PTCRB | FCC | AT&T* |
|----|------|-------|-----|-------|

\* Under development



# Quectel UC15 Mini PCIe

## UMTS/HSDPA Module



### Product Description

UC15 Mini PCIe is the latest Quectel UMTS/HSDPA module featuring a maximum data rate of 3.6Mbps downlink and 384Kbps uplink. It is designed to provide customers with global network coverage on the connectivity of HSDPA/WCDMA, and it is also fully backward compatible with existing EDGE and GSM/GPRS networks through multi-band combination of dual-band WCDMA and quad-band GSM.

The tiny profile of 51.0 × 30.0 × 4.9mm in standard Mini PCIe form factor and highly integration level enable integrators and developers to easily design their applications and truly benefit from low power consumption and convenient Plug and Play Function.

With an extended temperature range from -40°C up to 80°C, UC15 Mini PCIe functions reliably in extreme environments for use outdoors or inside at sites that lack cooling and heating systems.

A rich set of Internet protocols, industry-standard interfaces (USB/UART/Analog Audio/LED\_WWAN) and abundant functions (USB drivers for Windows XP, Windows Vista, Windows 7, Windows 8, Windows CE, Linux, Android) extend the applicability of the module to a wide range of commercial and industrial M2M applications. ●

### Key Benefits

- Worldwide UMTS/HSDPA and GSM/GPRS/EDGE coverage
- Standard Mini PCIe form factor maximizes the convenience for customers to design and use
- High-quality data and image transmission even in hazard conditions and dark environment
- Fast time-to-market: Reference designs, evaluation tools and timely technical support minimize design-in time and development efforts
- Robust mounting and interfaces

### General Features

|                         |  |
|-------------------------|--|
| Frequency Bands         | UMTS/HSDPA:<br>900/2100MHz (UC15-E Mini PCIe)<br><br>GSM/GPRS/EDGE:<br>900/1800MHz |
| HSDPA                   | Release 5 (category 6)   |
| EDGE                    | Downlink only  |
| GPRS                    | Multi-slot Class 12  |
| UMTS                    | Release 99/5   |
| GSM                     | Release 99/4   |
| Supply Voltage Range    | 3.3V, typ  |
| Operation Temperature   | -40 °C ~ +80 °C  |
| Dimensions              | 51.0 × 30.0 × 4.9mm  |
| Weight                  | Approx. 9.3g   |
| Control via AT commands | 3GPP TS27.007, 27.005 and other enhanced AT Commands                               |

### Specifications

|           |  |
|-----------|--|
| SMS       | Point-to-point MO and MT<br>SMS Cell Broadcast<br>Text and PDU Mode  |
| Data      | HSDPA Max.3.6Mbps<br>UMTS Max.384Kbps (DL)/Max.384Kbps (UL)<br>GPRS Max.85.6Kbps (DL)/Max.85.6Kbps (UL)<br>CSD 64 Kbps |
| Protocols | TCP/ UDP/ PPP/ MMS/ SMTP/ SMTSP/ HTTP/ HTTPS/ FTP/ PING/ SSL   |

### Special Features

|                 |            |  |
|-----------------|------------|--|
| Drivers         | USB Serial | Windows XP, Windows Vista, Windows 7, Windows 8, Windows CE5.0/ 6.0/ 7.0, Windows Mobile 6.1*/6.5*, Linux 2.6 or later, Android 2.3 or later |
|                 | RIL        | Windows CE6.0, Windows Mobile 6.1/6.5, Android 2.3/4.0   |
|                 | MUX        | Linux 2.6 or later, Android 2.3 or later   |
| eCall           |            | Accident, Emergency Services   |
| Firmware Update |            | Firmware Update via USB and UART Interface   |
| QuecFile        |            | File System Access and Management  |
| QuecFOTA        |            |  |
| QuecLocator*    |            |  |

### Electrical Characteristics

|              |   |
|--------------|---|
| Output Power | Class 3 (24dBm +1/-3dB) for UMTS bands<br>Class 4 (33dBm ±2dB) for GSM 850/900<br>Class 1 (30dBm ±2dB) for GSM 1800/1900  |
| Consumption  | 3.5mA@ GSM sleep ,DRX=9<br>3.3mA@ UMTS sleep. DRX=9<br>70mA@Idle, USB active<br>320mA@GSM voice, max power<br>680mA@UMTS voice, max power<br>550mA@GPRS data, max power<br>690mA@HSDPA, max power |
| Sensitivity  | -110dBm@UMTS Bands<br>-108.5dBm@GSM 900MHz<br>-108dBm@GSM 1800MHz   |

### Interfaces

|                |  |
|----------------|--|
| USB            | 2.0 High Speed                                     |
| Audio Analog   | One Analog Input and one Output Channel (Optional) |
| Audio Digital* | PCM (Optional)                                     |
| UART           | 1×Full Functions                                   |
| USIM           | 1.8V/ 3V   |
| LED_WWAN#      | Network Status Indication                          |
| W_DISABLE#     | Disable RF Function                                |
| PERST#         | Reset Function                                     |
| Antenna        | 1×RF pad   |

### Certifications

CE FCC\* PTCRB GCF\*

\* Under development





# Quectel UC20

## UMTS/HSPA+ Module



UC20 UMTS/HSPA+  
32.0 × 29.0 × 2.6mm

### Product Description

UC20 is the latest Quectel UMTS/HSPA+ module offering a maximum data rate of 14.4Mbps downlink and 5.76Mbps uplink. UC20 is designed to provide customers with global network coverage on the connectivity of UMTS/HSPA+. It can also be fully backward compatible with existing EDGE and GSM/GPRS networks through multi-band combination of penta-band UMTS and quad-band GSM.

The tiny profile of 32.0 × 29.0 × 2.5mm in cost optimized SMT form factor and highly integration level enable integrators and developers to easily design their applications and truly benefit from the module's small size, low power consumption and mechanical intensity. Its advanced LCC package allows fully automated manufacturing for high-volume applications.

A rich set of Internet protocols, industry-standard interfaces (USB/UART/PCM/ADC/NETLIGHT/Rx-diversity) and abundant functions (USB drivers for Windows XP, Windows Vista, Windows 7, Windows 8, Windows CE, Linux, Android/eCall/GNSS) extend the applicability of the module to a wide range of M2M applications such as automotive, metering, tracking systems, security solutions, routers, wireless POS, mobile computing devices, PDA, and tablet PC.

### Key Benefits

- Worldwide UMTS/HSPA+ and GSM/GPRS/EDGE coverage
- Minimal SMT form factor ideal for small end products with tight space
- High-quality data and image transmission even in hazard conditions and dark environment
- Fast time-to-market: Reference designs, evaluation tools and timely technical support minimize design-in time and development efforts
- Equivalent noise-figure performance is achieved by primary and diversity receiving patches of WCDMA
- Robust mounting and interfaces

### General Features

|                         |   |
|-------------------------|---|
| Frequency Bands         | UC20-E<br>900/ 2100MHz@UMTS<br>850/ 900/ 1800/ 1900MHz@GSM<br>UC20-A<br>850/ 1900MHz @UMTS, 3G only<br>UC20-G<br>800/ 850/ 900/ 1900/ 2100MHz@UMTS<br>850/ 900/ 1800/ 1900MHz@GSM |
| HSPA+                   | Release 5/6 (UL category 6, DL category 10)   |
| EDGE                    | Multi-slot Class 12   |
| GPRS                    | Multi-slot Class 12   |
| UMTS                    | Release 99  |
| GSM                     | Release 99/4  |
| Supply Voltage Range    | 3.3V ~ 4.3V, 3.8V typ.  |
| Operation Temperature   | -40 °C ~ +85 °C   |
| Dimensions              | 32.0 × 29.0 × 2.5mm   |
| Weight                  | Approx. 4.9g  |
| Control via AT commands | 3GPP TS27.007, 27.005 and other enhanced AT Commands  |

### Specifications

|           |   |
|-----------|---|
| SMS       | Point-to-point MO and MT<br>SMS Cell Broadcast<br>Text and PDU Mode   |
| Data      | HSPA+ Max.14.4Mbps (DL)/Max.5.76Mbps (UL)<br>UMTS Max.384Kbps (DL)/Max.384Kbps (UL)<br>EDGE Max.236.8Kbps (DL)/Max.236.8Kbps (UL)<br>GPRS Max.85.6Kbps (DL)/Max.85.6Kbps (UL)<br>CSD 14.4Kbps |
| Protocols | TCP/ UDP/ PPP/ MMS/ SMTP/ SMTSP/ HTTP/ HTTPS/ FTP/ PING/ SSL  |

### Special Features

|                 |  |
|-----------------|--|
| Drivers         | USB Serial Windows XP/Vista, Windows 7/8, Windows CE5.0/6.0/7.0, Linux 2.6/3.0, Android 2.3/4.0/4.2<br>RIL Windows CE6.0, Android 2.3/4.0/4.2<br>NDIS Windows XP/Vista/ 7/ 8, Linux2.6/3.0<br>MUX Linux 2.6/3.0, Android 2.3/4.0/4.2 |
| eCall           | Accident, Emergency Services   |
| USIM Detection  | Hardware USIM Card Detection Design  |
| Firmware Update | Firmware Update via USB and UART Interface   |
| QuecFile        | File System Access and Management  |
| QuecLocator     |  |
| QuecFOTA        |  |
| Delta-FOTA      |  |
| GNSS            | GPS/GLONASS  |

### Electrical Characteristics

|                        |  |
|------------------------|--|
| Output Power           | Class 3 (24dBm +1/-3dB) for UMTS bands<br>Class E2 (27dBm ±3dB) for EDGE 850/900<br>Class E2 (26dBm +3/-4dB) for EDGE 1800/1900<br>Class 4 (33dBm ±2dB) for GSM 850/900<br>Class 1 (30dBm ±2dB) for GSM 1800/1900  |
| Consumption (GNSS Off) | 45µA@power off<br>1.5mA@GSM sleep, DRX=9<br>1.4mA@UMTS sleep, DRX=9<br>280mA@GSM voice, max power<br>450mA@UMTS voice, max power<br>550mA@GPRS data, max power<br>420mA@EDGE data, max power<br>520mA@UMTS data, max power<br>520mA@HSDPA, max power<br>500mA@HSUPA, max power |
| Sensitivity            | -110dBm@UMTS Bands<br>-108.5dBm@GSM 850/900MHz<br>-108dBm@GSM 1800/1900MHz   |

### GNSS Features

|                                 |   |
|---------------------------------|---|
| GNSS Receiver                   | Qualcomm gpsOne Gen8  |
| SBAS                            | WAAS, EGNOS, MSAS   |
| AGNSS                           | Support XTRA™ Technology  |
| Accuracy@Open Sky               | <1.5m CEP-50  |
| TTF@-130dBm with XTRA™, typ.    | Cold Start 22s<br>Warm Start 3s<br>Hot Start 2s                 |
| TTF@-130dBm without XTRA™, typ. | Cold Start 32s<br>Warm Start 29s<br>Hot Start 2.5s              |
| Sensitivity                     | Cold Start -147dBm<br>Reacquisition -159dBm<br>Tracking -161dBm |
| Power Saving Mode               | Support DPO Mode  |
| Dedicated GNSS AT Commands      |   |

### Interfaces

|            |   |
|------------|---|
| AUDIO      | Digital Audio through PCM Interface, Optional |
| USB        | 2.0 High Speed                                |
| UART       | 1×Full Function, 1×Debug                      |
| USIM       | 1.8V/3V                                       |
| NETLIGHT   | 1×NET_MODE, 1×NET_STATUS                      |
| ADC        | ×2, 15bits                                    |
| RTC Backup | Real Time Clock                               |
| SD         |   |
| RESET      |   |
| PWRKEY     |   |
| ANTENNA    | Pads for Primary, Rx-diversity and GNSS       |
| STATUS     | Indication for Power On and Off               |

### Certifications

CE FCC IC KC NCC OFCA GCF PTCRB RCM SKT\* AT&T\* Vodafone ANATEL\* Telstra\* Rogers\*

\* Under development



# Quectel UC20 Mini PCIe

UMTS/HSPA+ Module



**UC20 Mini PCIe**  
51.0 × 30.0 × 4.9mm

## Product Description

UC20 Mini PCIe is the latest Quectel UMTS/HSPA+ module featuring a maximum data rate of 14.4Mbps downlink and 5.76Mbps uplink. It is designed to provide customers with global network coverage on the connectivity of HSPA+/WCDMA, and it is also fully backward compatible with existing EDGE and GSM/GPRS networks through multi-band combination of dual-band WCDMA and quad-band GSM.

The tiny profile of 51.0 × 30.0 × 4.9mm in standard Mini PCIe form factor and highly integration level enable integrators and developers to easily design their applications and truly benefit from low power consumption and convenient Plug and Play Function.

With an extended temperature range from -40°C up to 80°C, UC20 Mini PCIe functions reliably in extreme environments for use outdoors or inside at sites that lack cooling and heating systems.

A rich set of Internet protocols, industry-standard interfaces (USB/UART/PCM/LED\_WWAN#/GNSS) and abundant functions (USB drivers for Windows XP, Windows Vista, Windows 7, Windows 8, Windows CE, Linux, Android) extend the applicability of the module to a wide range of commercial and industrial M2M applications. ●

## Key Benefits

- Worldwide UMTS/HSPA+ and GSM/GPRS/EDGE coverage
- Standard Mini PCIe form factor maximizes the convenience for customers to design and use
- High-quality data and image transmission even in hazard conditions and dark environment
- High sensitivity GNSS receiver
- Fast time-to-market: Reference designs, evaluation tools and timely technical support minimize design-in time and development efforts
- Robust mounting and interfaces

## General Features

|                         |  |
|-------------------------|--|
| Frequency Bands         | UC20-E Mini PCIe<br>900/2100MHz@UMTS<br>850/900/1800/1900MHz@GSM<br>UC20-A Mini PCIe<br>850/1900MHz @UMTS, 3G only |
| HSPA+                   | Release 5/6 (UL category 6, DL category 10)  |
| EDGE                    | Multi-slot Class 12  |
| GPRS                    | Multi-slot Class 12  |
| UMTS                    | Release 99   |
| GSM                     | Release 99/4   |
| Supply Voltage Range    | 3.0 ~ 3.6V, Typ. 3.3V  |
| Operation Temperature   | -40 °C ~ +80 °C  |
| Dimensions              | 51.0 × 30.0 × 4.9mm  |
| Weight                  | Approx. 9.8g   |
| Control via AT commands | 3GPP TS27.007, 27.005 and other enhanced AT Commands   |

## Specifications

|           |  |
|-----------|--|
| SMS       | Point-to-point MO and MT<br>SMS Cell Broadcast<br>Text and PDU Mode  |
| DATA      | HSPA+ Max.14.4Mbps (DL)/Max.5.76Mbps (UL)<br>UMTS Max.384Kbps (DL)/Max.384Kbps (UL)<br>EDGE Max.236.8Kbps (DL)/Max.236.8Kbps(UL)<br>GPRS Max.85.6Kbps (DL)/Max.85.6Kbps (UL)<br>CSD 14.4Kbps |
| Protocols | TCP/ UDP/ PPP/ MMS/ SMTP/ SMTPS/<br>HTTP/ HTTPS/ FTP/ PING/ SSL  |

## Special Features

|                 |            |  |
|-----------------|------------|--|
| Drivers         | USB Serial | Windows XP/Vista, Windows 7/8, Windows CE5.0/6.0/7.0, Linux 2.6/3.0, Android 2.3/4.0/4.2 |
|                 | RIL        | Windows CE6.0, Android 2.3/4.0/4.2   |
|                 | NDIS       | Windows XP/Vista/ 7/ 8, Linux2.6/3.0   |
|                 | MUX        | Linux 2.6/3.0, Android 2.3/4.0/4.2   |
| eCall           |            | Accident, Emergency Services   |
| Firmware Update |            | Firmware Update via USB Interface  |
| QuecFile        |            | File System Access and Management  |
| QuecLocator     |            |  |
| QuecFOTA        |            |  |
| Delta-FOTA      |            |  |
| GNSS            |            | GPS/GLONASS  |

## Electrical Characteristics

|                        |   |
|------------------------|---|
| Output Power           | Class 3 (24dBm +1/-3dB) for UMTS bands<br>Class E2 (27dBm ±3dB) for EDGE 850/900<br>Class E2 (26dBm +3/-4dB) for EDGE 1800/1900<br>Class 4 (33dBm ±2dB) for GSM 850/900<br>Class 1 (30dBm ±2dB) for GSM 1800/1900   |
| Consumption (GNSS Off) | 80µA@power off<br>3.1mA@GSM sleep, DRX=9<br>3.0mA@UMTS sleep, DRX=9<br>43.0mA@idle, USB active<br>348mA@GSM voice, max power<br>556mA@UMTS voice, max power<br>681mA@GPRS data, max power<br>570mA@EDGE data, max power<br>599mA@HSDPA, max power<br>598mA@HSUPA, max power |
| Sensitivity            | -110dBm@UMTS Bands<br>-108.5dBm@GSM 850/900MHz<br>-108dBm@GSM 1800/1900MHz  |

## GNSS Features

|                                  |   |
|----------------------------------|---|
| GNSS Receiver                    | Qualcomm gpsOne Gen8  |
| SBAS                             | WAAS, EGNOS, MSAS   |
| AGNSS                            | Support XTRA™ Technology  |
| Accuracy@Open Sky                | <1.5m CEP-50  |
| TTFF@-130dBm with XTRA™, typ.    | Cold Start 22s<br>Warm Start 3s<br>Hot Start 2s                 |
| TTFF@-130dBm without XTRA™, typ. | Cold Start 32s<br>Warm Start 29s<br>Hot Start 2.5s              |
| Sensitivity                      | Cold Start -147dBm<br>Reacquisition -159dBm<br>Tracking -161dBm |
| Power Saving Mode                | Support DPO Mode  |
| Dedicated GNSS AT Commands       |   |

## Interfaces

|             |   |
|-------------|---|
| AUDIO       | Digital Audio through PCM Interface(Optional) |
| USB         | 2.0 High Speed                                |
| UART        | 1×Seven-Line UART Interface                   |
| USIM        | 1.8V/3V                                       |
| LED_WWAN#   | Network Status                                |
| W_DISABLE#  | Close RF Channel                              |
| PERST#      | Reset Pin                                     |
| USIM Holder | Optional                                      |

## Certifications

|    |     |     |       |     |
|----|-----|-----|-------|-----|
| CE | FCC | GCF | PTCRB | RCM |
|----|-----|-----|-------|-----|

\* Under development





# Quectel UG95

## UMTS/HSPA Module



### Product Description

UG95 is an ultra-small UMTS/HSPA module based on the latest Intel® Wireless Communications Chipset. It features a maximum data rate of 7.2Mbps downlink and 5.76Mbps uplink. Designed to be pin to pin compatible with Quectel GSM/GPRS M95 module, it provides a flexible and scalable platform for migrating from GSM/GPRS/EDGE to UMTS/HSPA. This enables integrators and developers to design their applications once and take advantage of true worldwide coverage and service flexibility afforded by the combination of the two most prevalent cellular technologies worldwide.

The tiny profile of 19.9x23.6x2.2mm in cost optimized SMT form factor and highly integration level enable integrators and developers to easily design their applications and truly benefit from the module's small size, low power consumption and mechanical intensity. Its advanced LGA package allows fully automated manufacturing for high-volume applications.

A rich set of Internet protocols, industry-standard interfaces (USB/UART/I2C/Status Indicator/PCM) and abundant functionalities (USB drivers for Windows XP, Windows 7, Windows 8\*, Windows CE, Linux, Android/eCall) extend the applicability of the module to a wide range of M2M applications such as tablet PC, wireless POS, routers, telematics, mobile computing devices, security systems and metering.



### Key Benefits

- Worldwide UMTS/HSPA and GSM/GPRS/EDGE coverage
- Minimal SMT form factor ideal for smart terminal devices
- Easy drop-in migration from GSM/GPRS module
- Super slim and low profile in LGA package
- High-quality data and image transmission even in hazard conditions and dark environment
- Fast time-to-market: Reference designs, evaluation tools and timely technical support minimize design-in time and development efforts
- Robust mounting and interfaces

### General Features

|                         |  |
|-------------------------|--|
| Frequency Bands         | UG95-E<br>900/ 2100MHz@UMTS<br>900/ 1800MHz@GSM<br>UG95-A<br>850/ 1900MHz@UMTS 3G only |
| HSUPA                   | Release 7 (category 6)   |
| HSDPA                   | Release 7 (category 8)   |
| EDGE                    | Downlink only  |
| GPRS                    | Multi-slot Class 12  |
| UMTS                    | Release 99/7   |
| GSM                     | Release 99/4   |
| Supply Voltage Range    | 3.4V ~ 4.3V, 3.8V typ.   |
| Operation Temperature   | -35 °C ~ +70 °C  |
| Dimensions              | 19.9 × 23.6 × 2.2mm  |
| Weight                  | Approx. 2.5 g  |
| Control via AT commands | 3GPP TS27.007, 27.005 and other enhanced AT Commands                                   |

### Specifications

|           |   |
|-----------|---|
| SMS       | Point-to-point MO and MT<br>SMS Cell Broadcast<br>Text and PDU Mode   |
| Data      | HSDPA Max.5.76Mbps<br>HSDPA Max.7.2Mbps<br>UMTS Max.384Kbps (DL)/Max.384Kbps (UL)<br>EDGE Max.236.8Kbps (DL)<br>GPRS Max.85.6Kbps (DL)/Max.85.6Kbps (UL)<br>CSD 64 Kbps |
| Protocols | TCP/UDP/PPP/MMS*/SMTP*/FTP*/SSL*  |

### Special Features

|                 |            |  |
|-----------------|------------|--|
| Drivers         | USB Serial | Windows XP, Windows 7/8*, Linux2.6/3.0, Android2.3/4.0/4.2 |
| eCall*          |            | Accident, Emergency Services                               |
| Firmware Update |            | Firmware Update via USB and UART Interface                 |
| QuecFile*       |            | File System Access and Management                          |
| QuecFOTA*       |            |  |



### Electrical Characteristics

|              |  |
|--------------|--|
| Output Power | Class 3 (24dBm +1/-3dB) for UMTS bands<br>Class 4 (33dBm ±2dB) for GSM 850/900<br>Class 1 (30dBm ±2dB) for GSM 1800/1900   |
| Consumption  | 70µA@Power off<br>0.96mA@GSM sleep, DRX=9<br>1.15mA@UMTS sleep, DRX=9<br>212mA@GSM voice, max power<br>586mA@UMTS voice, max power<br>490mA@GPRS data, max power<br>524mA@HSDPA, max power<br>563mA@HSUPA, max power |
| Sensitivity  | -110dBm@UMTS 900/2100<br>-110.5dBm@UMTS 850/1900<br>-110.5dBm@DCS 1800<br>-109.5dBm@EGSM 900   |

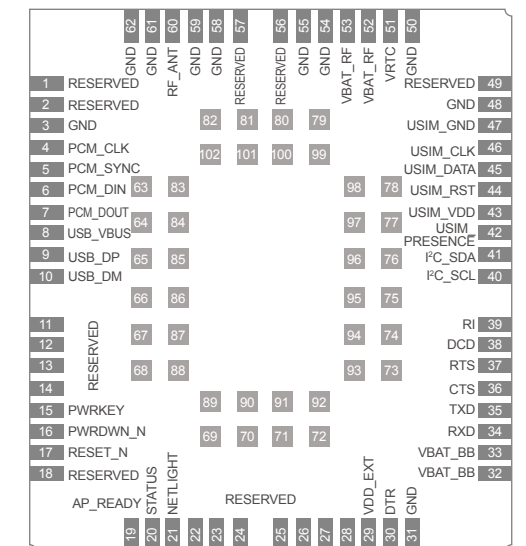
### Interfaces

|                  |  |
|------------------|--|
| USB              | 2.0 High Speed                                 |
| Audio Digital*   | Digital Audio through PCM Interface (optional) |
| UART             | 1×Full Functions                               |
| I <sup>2</sup> C |  |
| PCM              |  |
| USIM             | 1.8V/ 3V                                       |
| NETLIGHT         |  |
| STATUS           | Indication for Power On and Off Status         |

### Certifications

|     |      |        |      |       |
|-----|------|--------|------|-------|
| CE* | GCF* | PTCRB* | FCC* | AT&T* |
|-----|------|--------|------|-------|

\* Under development



## UMTS/HSPA(+) EVB Kits

### Product Description

Quectel provides fully functional, convenient and high performance EVB kits for customers to evaluate the performance of wireless modules. Integrated with friendly Human Machine Interaction, such as operation key, LEDs and debug testing points, user can quickly understand the characteristics and operational procedure of Quectel modules. Along with power supply adaptor, UMTS/GSM antenna and USB to UART converter cable, USB cable, Quectel wireless EVB kits allow user to conveniently evaluate the performance of Quectel wireless modules. Quectel also provides users with EVB schematics and layout reference design, which are worthy for users in designing their hardware.

### Features

- ☛ Easy to use
- ☛ Abundant functional interfaces
- ☛ Human Machine Interaction
- ☛ Visualization for module's working status via LEDs
- ☛ Documentations and tools packaged in one CD

### EVB Kit Includes

- ☛ One-page instruction
- ☛ Power supply adaptor
- ☛ USB to UART converter cable
- ☛ USB cable
- ☛ UMTS/GSM antenna
- ☛ GNSS antenna (optional)
- ☛ CD-ROM containing: *Evaluation tools/ USB-driver software Documentation*



For detailed information, please refer to EVB\_User\_Guide.

## QNavigator

### Product Description

QNavigator Wireless Evaluation Software is an easy-use evaluation tool for evaluating, configuring and testing Quectel wireless modules. It provides a convenient way to configure Quectel wireless modules and save the configuration in the module flash. It can test SMS function, Voice call, TCP/UDP, PPP and Quectel's unique function QuecLocator. With the simple graphic user interface and built-in AT terminal, QNavigator can show all the AT commands trace when user performs these functions, which dramatically decrease the learning curve of the AT commands sets. QNavigator supports the PC with running Windows XP, Windows 7, Windows 8 and Windows Vista.

### Features

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>☛ Easy to configuration and use</li> <li>☛ Easily access to main functionalities</li> <li>☛ Learn AT commands through GUI interfaces</li> <li>☛ Free of charge</li> </ul> | <ul style="list-style-type: none"> <li>☛ SMS management</li> <li>☛ Voice Call management</li> <li>☛ TCP/UDP management</li> <li>☛ PPP management</li> <li>☛ AT commands management</li> <li>☛ GNSS demonstration</li> <li>☛ QuecLocator demonstration</li> <li>☛ AT commands testing</li> </ul> |
|--|---|

### QNavigator Includes

- ☛ Module connection management



# GNSS Family

Quectel offers a broad portfolio of GPS and GNSS modules. Our modules enable people, vehicles and M2M devices to locate their exact position and communicate over mobile networks. Featuring tiny design, high precision and sensitivity, our GPS and GNSS modules are suitable for a wide range of M2M applications such as portable device, automotive, personal tracking, security and industrial PDA.



| Product                                     | Standalone Modules   |  |  |                                     |                                    | Antenna Module   |                                     |
|---|--|--|--|-------------------------------------|------------------------------------|--|-------------------------------------|
|   | L20  | L26  | L70                                    | L70-R                               | L76                                | L80  |                                     |
|   | Compatible   |  | Compatible                             |                                     |                                    |  |                                     |
| Picture                                     |  |  |  |                                     |                                    |  |                                     |
| GNSS  | GPS/ QZSS  | GLONASS/ GPS/ QZSS   | GPS/ QZSS                              | GPS/ QZSS                           | GLONASS/ GPS/ QZSS                 | GPS/ QZSS  |                                     |
| Packaging                                   | 24-pin LCC   | 24-pin LCC   | 18-pin LCC                             | 18-pin LCC                          | 18-pin LCC                         | 12-pin LCC   |                                     |
| Dimensions                                  | 16.0 × 12.2 × 2.4 mm   | 16.0 × 12.2 × 2.4 mm   | 10.1 × 9.7 × 2.5 mm                    | 10.1 × 9.7 × 2.5 mm                 | 10.1 × 9.7 × 2.5 mm                | 16.0 × 16.0 × 6.45 mm  |                                     |
| Weight (approx.)                            | 1.0 g  | 1.0 g  | 0.6 g                                  | 0.6 g                               | 0.6 g                              | 6.0 g  |                                     |
| Temperature Range                           | Operation  | -40 °C to +85 °C   | -40 °C to +85 °C                       | -40 °C to +85 °C                    | -40 °C to +85 °C                   | -40 °C to +85 °C   |                                     |
|   | Storage  | -45 °C to +125 °C  | -45 °C to +125 °C                      | -45 °C to +125 °C                   | -45 °C to +125 °C                  | -45 °C to +125 °C  |                                     |
| <b>General Features</b>                     |  |  |  |                                     |                                    |  |                                     |
| Chip Solution                               | SiRF IV  | MT3333   | MT3339                                 | MT3337                              | MT3333                             | MT3339   |                                     |
| L1 Band Receiver (C/A Code)                 | Channel Number   | 48 Track   | 33 Track/ 99 Acq.                      | 22 Track/ 66 Acq.                   | 22 Track/ 66 Acq.                  | 33 Track/ 99 Acq.  | 22 Track/ 66 Acq.                   |
|   | SBAS   | WAAS/ EGNOS  | WAAS/ EGNOS/ MSAS/ GAGAN               | WAAS/ EGNOS/ MSAS/ GAGAN            | WAAS/ EGNOS/ MSAS/ GAGAN           | WAAS/ EGNOS/ MSAS/ GAGAN   | WAAS/ EGNOS/ MSAS/ GAGAN            |
| Sensitivity                                 | Autonomous Acquisition   | -148dBm  | -148dBm                                | -148dBm                             | -148dBm                            | -148dBm  | -148dBm                             |
|   | Reacquisition  | -160dBm  | -160dBm                                | -160dBm                             | -160dBm                            | -160dBm  | -160dBm                             |
|   | Tracking   | -163dBm  | -167dBm                                | -165dBm                             | -165dBm                            | -165dBm  | -165dBm                             |
| TTFF (Time To First Fix)                    | Cold Start   | <35s, Autonomous<br>25s typ. With CGEE                           | <35s, Autonomous<br><15s, With EASY    | <35s, Autonomous<br><15s, With EASY | <35s<br><15s, With EASY            | <35s, Autonomous<br><15s, With EASY                              | <35s, Autonomous<br><15s, With EASY |
|   |  | Warm Start   | <35s, Autonomous<br>10s typ. With CGEE | <30s, Autonomous<br><5s, With EASY  | <30s, Autonomous<br><5s, With EASY | <30s<br><5s, With EASY   | <30s, Autonomous<br><5s, With EASY  |
|   | Hot Start  | <1s  | <1s                                    | <1s                                 | <1s                                | <1s  | <1s                                 |
| Position Accuracy (autonomous)              | <2.5m CEP  | <2.5m CEP  | <2.5m CEP                              | <2.5m CEP                           | <2.5m CEP                          | <2.5m CEP  |                                     |
| Velocity Accuracy (without aid)             | <0.01m/s   | <0.1m/s  | <0.1m/s                                | <0.1m/s                             | <0.1m/s                            | <0.1m/s  |                                     |
| Maximum Acceleration Accuracy (without aid) | <0.1 m/s <sup>2</sup>  | <0.1 m/s <sup>2</sup>  | <0.1 m/s <sup>2</sup>                  | <0.1 m/s <sup>2</sup>               | <0.1 m/s <sup>2</sup>              | <0.1 m/s <sup>2</sup>  |                                     |
| Timing Accuracy                             | <500ns   | <10ns  | <10ns                                  | <15ns                               | <10ns                              | <10ns  |                                     |
| Max Update Rate                             | 5Hz  | 10Hz   | 10Hz                                   | 5Hz                                 | 10Hz                               | 10Hz   |                                     |
| Baud Rate(default)                          | 4800bps  | 9600bps  | 9600bps                                | 9600bps                             | 9600bps                            | 9600bps  |                                     |
| Anti-jamming                                | •  | •  | •                                      | •                                   | •                                  | •  |                                     |
| <b>Electrical Data</b>                      |  |  |  |                                     |                                    |  |                                     |
| Power Supply                                | 2.0V to 3.6V   | 2.8V to 4.3V   | 2.8V to 4.3V                           | 2.8V to 4.3V                        | 2.8V to 4.3V                       | 3.0V to 4.3V   |                                     |
| I/O Voltage                                 | 2.0V to 3.6V   | 2.7V to 2.9V   | 2.7V to 2.9V                           | 2.7V to 2.9V                        | 2.7V to 2.9V                       | 2.7V to 2.9V   |                                     |
| Power Consumption                           | Acquisition  | 39mA   | 29mA (GPS+GLONASS)<br>26mA(GPS)        | 18mA                                | 16mA                               | 25mA (GPS+GLONASS)<br>21mA (GPS)                                 | 25mA                                |
|   | Tracking   | 36mA   | 21mA (GPS+GLONASS)<br>18mA (GPS)       | 12mA                                | 13mA                               | 18mA (GPS+GLONASS)<br>15mA (GPS)                                 | 20mA                                |
|   | Backup   | 33uA   | 7uA                                    | 7uA                                 | 8uA                                | 7uA  | 7uA                                 |
| <b>Interfaces</b>                           |  |  |  |                                     |                                    |  |                                     |
| UART  | •  | •  | •                                      | •                                   | •                                  | •  |                                     |
| IIC (NMEA)                                  |  |  |  |                                     |                                    |  |                                     |
| DR IIC                                      | •  |  |  |                                     |                                    |  |                                     |
| Reset                                       |  | •  | •                                      | •                                   | •                                  | •  |                                     |
| Time Pulse                                  | •  | •  | •                                      | •                                   | •                                  | •  |                                     |
| <b>Antenna</b>                              |  |  |  |                                     |                                    |  |                                     |
| Antenna Detection                           |  | Short circuit detection and protection<br>Open circuit detection |  |                                     |                                    | Short circuit detection and protection<br>Open circuit detection |                                     |
| Antenna Type                                | Active or passive  | Active or passive  | Active or passive                      | Active or passive                   | Active or passive                  | Embedded patch antenna or external active antenna                |                                     |
| Antenna Power                               | External or internal   | External or internal   | External or internal                   | External or internal                | External or internal               | Internal   |                                     |
| <b>Certifications</b>                       |  |  |  |                                     |                                    |  |                                     |
| Certifications                              | CE   | CE   | CE/ FCC                                |                                     | CE                                 | CE   |                                     |
| <b>Recommended Applications</b>             |  |  |  |                                     |                                    |  |                                     |
| Recommended Applications                    | Vehicle Tracking and Tracing, Pet Tracking, Asset Tracking, Connected PND, GIS Application, Security, Industrial PDA, Digital Camera, etc. |  |  |                                     |                                    |  |                                     |

# Quectel L20

## GPS Module



### Product Description

L20, a GPS receiver module, which is based on the latest SiRFstarIV ROM version 2.2, features extremely compact profile of 16.0 × 12.2 × 2.4mm and low current consumption of only 36mA during tracking. Highest sensitivity down to -163dBm for tracking satellites along with lowest Time-To-First-Fix fulfill the toughest requirements.

L20 supports aided-GPS function without the necessity of downloading data from server since it automatically captures ephemeris data from satellites locally and predicts ephemeris over 3 days without server assistance.

With embedded active jammer remover, L20 can track and remove up to 8CW (Carrier Wave) type signals up to 80dB-Hz signal level. This feature ensures fast and accurate navigation in hostile signal or high noise environment.

Its high sensitivity, lower power consumption and 48-PRN channels make L20 the best choice for portable device such as vehicle tracking, personal tracking, asset tracking, connected PND and security device.

### Key Benefits

- Hardware Baud Rate Configuration
- 5Hz Navigation Update Rate
- 1 SV Fast Time Setting
- High tracking sensitivity, -163dBm
- High acquisition sensitivity, -148dBm
- Power Saving Mode
- Self-Assisted CGEE function
- SBAS (WAAS, EGNOS and QZSS)
- Low power consumption  
Acquisition: 39mA@ -130dBm  
Tracking: 36mA@ -130dBm

### General Specifications

|                               |                        |   |
|-------------------------------|------------------------|---|
| L1 Band Receiver (1575.42MHz) | Channel Number         | 48 channels   |
|                               | C/A Code               | WAAS<br>EGNOSC<br>QZSS  |
|                               | SBAS                   |   |
| Horizontal Position Accuracy  | Autonomous             | <2.5m CEP   |
|                               | SBAS                   | <2.0m CEP   |
| Velocity Accuracy             | Without Aid            | < 0.01m/s   |
| Acceleration Accuracy         | Without Aid            | 0.1m/s <sup>2</sup>   |
| Timing Accuracy               |                        | <500ns  |
| Reacquisition Time            |                        | <1s   |
| TTFF (Time to First Fix)      | Cold Start             | <35s  |
|                               | Warm Start             | <35s  |
|                               | Warm Start with        | 10s typ.  |
|                               | Hot Start              | <1s   |
| Sensitivity                   | Autonomous Acquisition | -148dBm   |
|                               | Reacquisition          | -160dBm   |
|                               | Tracking               | -163dBm   |
| Max Update Rate               | Operation Temperature  | -40 °C to 85 °C   |
|                               | Storage Temperature    | -45 °C to 125 °C  |
| Environmental                 | Maximum Altitude       | Max.18288m  |
|                               | Maximum Velocity       | Max.514m/s  |
|                               | Maximum Acceleration   | 4G  |
| Dimensions                    |                        | 16.0 × 12.2 × 2.4 mm  |
| Weight                        |                        | Approx. 1.0g  |
| Active Jammer Remover         |                        | Removes in-band jammers up to 80 dB-Hz<br>Tracks up to 8 CW jammers |

### Interfaces

|             |   |
|-------------|---|
| One UART    | Adjustable: Baud rate configured by Hardware<br>Default: 4800 bps |
| Update rate | 1Hz (default), up to 5Hz  |
| I/O Voltage | 2.0V ~ 3.6V   |
| Protocols   | NMEA<br>OSP   |

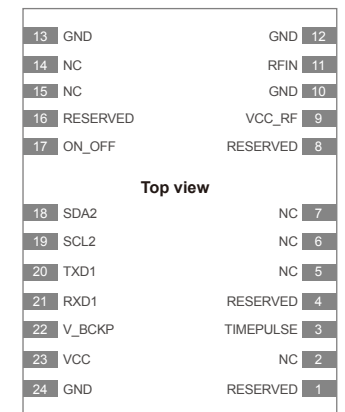
### Power Management

|                   |                             |
|-------------------|-----------------------------|
| Power Supply      | 2.0V ~ 3.6V                 |
| Power Acquisition | 39mA (passive antenna)      |
| Power Tracking    | 36mA (passive antenna)      |
| Power Saving      | ATP, PTF, (Note1)           |
| Antenna Type      | Passive or Active           |
| Antenna Power     | External or Internal VCC_RF |

### Certification

CE

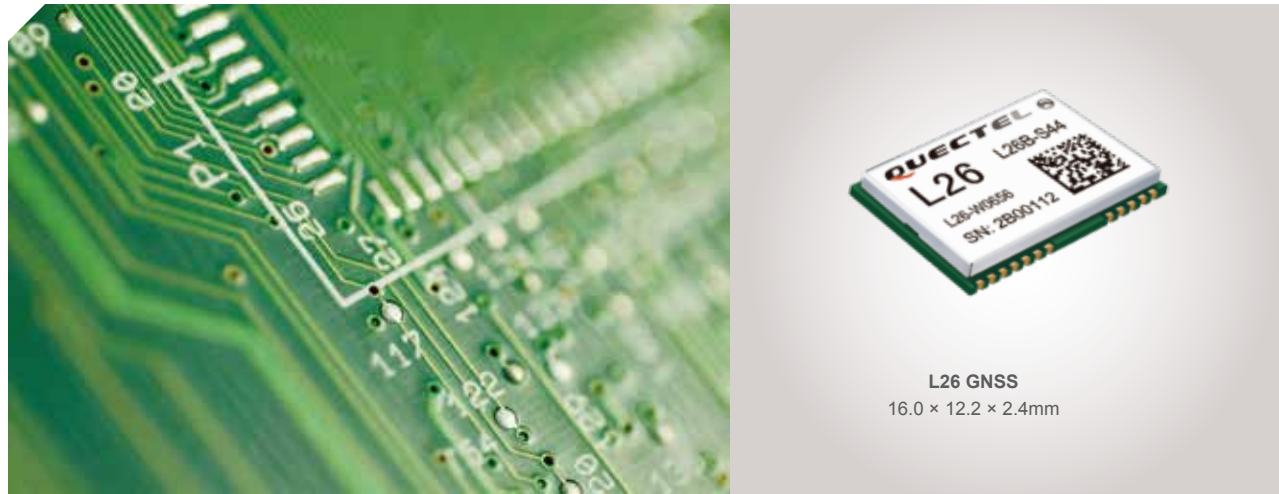
Note1: Both of ATP (Adaptive Trickle Power) and PTF (Push To Fix) are power saving modes of L20. For more details, please refer to L20 Hardware Design.





# Quectel L26

## GNSS Module



### Product Description

L26 is a single receiver module integrated with GLONASS and GPS system. It provides simultaneous GPS and Compass GLONASS open service L1 reception capability. With 33 tracking channels, 99 acquisition channels and 210 PRN channels, L26 can acquire and track any mix of GPS and GLONASS signals.

Compared with using GPS only, enabling both GPS and GLONASS generally doubles the number of visible satellites, reduces the time to first fix and increases positioning accuracy, especially when driving in rough urban environments.

Combining advanced AGPS called EASY™ (Embedded Assist System) with proven AlwaysLocate™ technology, L26 achieves the highest performance and fully meets the industrial standard. Additional feature of embedded logger function called LOCUS allows L26 to log position information to internal flash memory at default intervals of 15 seconds and provide typically more than 16 hours log capacity without adding cost.

L26 supports built-in short circuit protection for active antenna and an active antenna supervisor for short and open circuit detection.

Its super performance makes L26 ideal for automotive, industrial PDA, consumer and industry applications. Extremely low power consumption of L26 also makes it easier to be applied to power sensitive devices, especially portable applications.

### Key Benefits

- Multi-GNSS engine for GPS, GLONASS, and QZSS
- EASY™, advanced AGPS technology without the need of external memory
- Support short circuit protection and antenna detection
- Built-in LNA for better sensitivity
- Ultra low power consumption in tracking mode, 21mA
- Always Locate™, an intelligent algorithm for power saving
- LOCUS, innate logger solution with no need of host and external flash
- High sensitivity: -167dBm@Tracking, -148dBm@Acquisition
- 99 acquisition/33 tracking channels, up to 210PRN channels
- Support DGPS, SBAS (WAAS/EGNOS/MSAS/GAGAN)
- Anti-Jamming, Multi-tone Active Interference Canceller

### General Specifications

|                               |                        |   |
|-------------------------------|------------------------|---|
| L1 Band Receiver (1575.42MHz) | Channel Number         | 33 (Tracking)/<br>99 (Acquisition)<br>Up to 210 (PRN) |
|                               | C/A Code               |   |
|                               | SBAS                   | WAAS, EGNOS<br>MSAS, GAGAN                            |
| Horizontal Position Accuracy  | Autonomous             | <2.5m CEP   |
| Velocity Accuracy             | Without Aid            | < 0.1m/s  |
| Acceleration Accuracy         | Without Aid            | 0.1m/s <sup>2</sup>                                   |
| Timing Accuracy               |                        | <10ns   |
| Reacquisition Time            |                        | <1s   |
| TTFF@-130dBm with EASY™       | Cold Start             | <15s  |
|                               | Warm Start             | <5s   |
|                               | Hot Start              | <1s   |
| TTFF@-130dBm without EASY™    | Cold Start             | <35s  |
|                               | Warm Start             | <30s  |
|                               | Hot Start              | <1s   |
| Sensitivity                   | Autonomous Acquisition | -148dBm   |
|                               | Reacquisition          | -160dBm   |
|                               | Tracking               | -167dBm   |
| Max Update Rate               | Operation Temperature  | -40 C to 85 C   |
|                               | Storage Temperature    | -45 C to 125 C  |
| Environmental                 | Maximum Altitude       | Max.18000m  |
|                               | Maximum Velocity       | Max.515m/s  |
|                               | Maximum Acceleration   | 4G  |
| Dimensions                    | 16.0 × 12.2 × 2.4mm    |   |
| Weight                        | Approx. 1.0g           |   |

### Interfaces

|                   |  |
|-------------------|--|
| Serial Interfaces | UART: Adjustable 4800~115200 bps<br>Default: 9600bps |
| Update rate       | 1Hz (default), up to 10Hz                            |
| I/O Voltage       | 2.7V ~ 2.9V  |
| Protocols         | NMEA 0183<br>PMTK                                    |

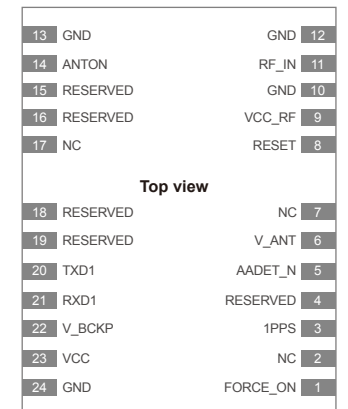
### Power Management

|                   |   |
|-------------------|---|
| Power Supply      | 2.8V ~ 4.3V   |
| Power Acquisition | 29mA (GPS+GLONASS)<br>26mA (GPS)  |
| Power Tracking    | 21mA (GPS+GLONASS)<br>18mA (GPS)  |
| Power Saving      | Typ.2.7mA @AlwaysLocate™(Note1)<br>7uA @Backup Mode<br>350uA @Standby Mode<br>Periodic Mode |
| Antenna Type      | Passive or Active   |
| Antenna Power     | External or Internal VCC_RF   |

### Certifications

CE

Note1: Measured in GPS+GLONASS system under outdoor static mode.



# Quectel L70

## GPS Module



### Product Description

L70, a SMD type module, brings the high performance of MTK positioning engine to the industrial applications with compact profile, ultra low power consumption and fast positioning capability.

Combining advanced AGPS called EASY™ (Embedded Assist System) and proven AlwaysLocate™ technology, L70 achieves the highest performance and fully meets the industrial standard. EASY™ technology ensures L70 can calculate and predict orbits automatically using the ephemeris data (up to 3 days) stored in internal flash memory, so L70 can fix position quickly even at indoor signal levels with low power consumption. With AlwaysLocate™ technology, L70 can adaptively adjust the on/off time to achieve balance between positioning accuracy and power consumption according to the environmental and motion conditions.

Additional feature of embedded logger function called LOCUS allows L70 to log position information to internal flash memory at default intervals of 15 seconds and provide typically more than 16 hours log capacity without adding cost.

With its tiny design, high precision and sensitivity, L70 is perfectly suitable for a broad range of M2M applications such as portable device, automotive, personal tracking, security and industrial PDA.

### Key Benefits

- Extremely compact size: 10.1 × 9.7 × 2.5mm
- EASY™, advanced AGPS technology without external memory
- Ultra low power consumption in tracking mode, 12mA
- AlwaysLocate™, an intelligent controller of periodic mode
- LOCUS, innate logger solution with no need of host and external flash
- High sensitivity -165dBm@Tracking, -148dBm@Acquisition
- 66 acquisition channels, 22 tracking channels
- Support QZSS
- Support DGPS, SBAS (WAAS/EGNOS/MSAS/GAGAN)
- Anti-Jamming, Multi-tone Active Interference Canceller

### General Specifications

|                               |                        |                                  |
|-------------------------------|------------------------|----------------------------------|
| L1 Band Receiver (1575.42MHz) | Channel Number         | 22 (Tracking) / 66 (Acquisition) |
|                               | C/A Code               |                                  |
|                               | SBAS                   | WAAS, EGNOS MSAS, GAGAN          |
| Horizontal Position Accuracy  | Autonomous             | <2.5m CEP                        |
| Velocity Accuracy             | Without Aid            | < 0.1m/s                         |
| Acceleration Accuracy         | Without Aid            | 0.1m/s <sup>2</sup>              |
| Timing Accuracy               | 1PPS out               | 10ns                             |
| Reacquisition Time            |                        | <1s                              |
| TTFF@-130dBm with EASY™       | Cold Start             | <15s                             |
|                               | Warm Start             | <5s                              |
|                               | Hot Start              | <1s                              |
| TTFF@-130dBm without EASY™    | Cold Start             | <35s                             |
|                               | Warm Start             | <30s                             |
|                               | Hot Start              | <1s                              |
| Sensitivity                   | Autonomous Acquisition | -148dBm                          |
|                               | Reacquisition          | -160dBm                          |
|                               | Tracking               | -165dBm                          |
| Environmental                 | Operation Temperature  | -40 °C to 85 °C                  |
|                               | Storage Temperature    | -45 °C to 125 °C                 |
| Dynamic Performance           | Maximum Altitude       | Max.18000m                       |
|                               | Maximum Velocity       | Max.515m/s                       |
|                               | Maximum Acceleration   | 4G                               |
| Dimensions                    | 10.1 × 9.7 × 2.5mm     |                                  |
| Weight                        | Approx. 0.6g           |                                  |

### Interfaces

|                   |  |
|-------------------|--|
| Serial Interfaces | UART: Adjustable 4800~115200 bps<br>Default: 9600bps |
| Update rate       | 1Hz (default), up to 10Hz                            |
| I/O Voltage       | 2.7V ~ 2.9V  |
| Protocols         | NMEA 0183<br>PMTK                                    |

### Power Management

|                   |  |
|-------------------|--|
| Power Supply      | 2.8V ~ 4.3V  |
| Power Acquisition | 18mA   |
| Power Tracking    | 12mA   |
| Power Saving      | Typ. 1.4mA @AlwaysLocate™(Note1)<br>7uA @Backup Mode<br>200uA @Standby Mode<br>Periodic Mode |
| Antenna Type      | Active or Passive  |
| Antenna Power     | External or Internal VCC_RF  |

### Certifications

CE FCC

Note1: Measured in GPS system under outdoor static mode.

|    |          |         |   |
|----|----------|---------|---|
| 10 | GND      | RESET   | 9 |
| 11 | RF_IN    | VCC     | 8 |
| 12 | GND      | NC      | 7 |
| 13 | ANTON    | V_BCKP  | 6 |
| 14 | VCC_RF   | STANDBY | 5 |
| 15 | NC       | 1PPS    | 4 |
| 16 | RESERVED | RXD1    | 3 |
| 17 | RESERVED | TXD1    | 2 |
| 18 | TIMER    | GND     | 1 |

**Top view**





# Quectel L70-R

## GPS Module



### Product Description

L70-R, a low cost ROM-based GPS module, brings the high performance of MTK positioning engine to the industrial applications with compact profile, ultra low power consumption and fast positioning capability.

With advanced AlwaysLocate™ technology, L70-R achieves the low consumption and fully meets the industrial standard. AlwaysLocate™ technology allows L70-R to adaptively adjust the on/off time to achieve balance between positioning accuracy and power consumption according to the environmental and motion conditions.

Additional feature of embedded logger function called LOCUS allows L70-R to log position information to internal NVRAM. Based on internal 8KB NVRAM, L70-R can record around 500 events of logging data without adding cost.

With its tiny design, high precision and sensitivity, L70-R is perfectly suitable for a broad range of M2M applications such as portable device, automotive, personal tracking, security and industrial PDA.

### Key Benefits

- Extremely compact size: 10.1 × 9.7 × 2.5mm
- Ultra low power consumption in tracking mode, 13mA
- AlwaysLocate™, an intelligent controller of periodic mode
- LOCUS, innate logger solution with no need of host and external flash
- High sensitivity -165dBm@Tracking, -148dBm@Acquisition
- 66 acquisition channels, 22 tracking channels
- Support QZSS
- Support DGPS, SBAS (WAAS/EGNOS/MSAS/GAGAN)
- Anti-Jamming, Multi-tone Active Interference Canceller

### General Specifications

|                               |                        |                                  |
|-------------------------------|------------------------|----------------------------------|
| L1 Band Receiver (1575.42MHz) | Channel Number         | 22 (Tracking) / 66 (Acquisition) |
|                               | C/A Code               |                                  |
|                               | SBAS                   | WAAS, EGNOS MSAS, GAGAN          |
| Horizontal Position Accuracy  | Autonomous             | <2.5m CEP                        |
| Velocity Accuracy             | Without Aid            | < 0.1m/s                         |
| Acceleration Accuracy         | Without Aid            | 0.1m/s <sup>2</sup>              |
| Timing Accuracy               | 1PPS out               | 15ns                             |
| Reacquisition Time            |                        | <1s                              |
| TTFF@-130dBm                  | Cold Start             | <35s                             |
|                               | Warm Start             | <30s                             |
|                               | Hot Start              | <1s                              |
| Sensitivity                   | Autonomous Acquisition | -148dBm                          |
|                               | Reacquisition          | -160dBm                          |
|                               | Tracking               | -165dBm                          |
| Environmental                 | Operation Temperature  | -40 C to 85 C                    |
|                               | Storage Temperature    | -45 C to 125 C                   |
| Dynamic Performance           | Maximum Altitude       | Max.18000m                       |
|                               | Maximum Velocity       | Max.515m/s                       |
|                               | Maximum Acceleration   | 4G                               |
| Dimensions                    | 10.1 × 9.7 × 2.5mm     |                                  |
| Weight                        | Approx. 0.6g           |                                  |

### Interfaces

|                   |  |  |
|-------------------|--|--|
| Serial Interfaces | UART: Adjustable 4800~115200 bps<br>Default: 9600bps |  |
| Update rate       | 1Hz (default), up to 5Hz                             |  |
| I/O Voltage       | 2.7V ~ 2.9V  |  |
| Protocols         | NMEA 0183<br>PMTK                                    |  |

### Power Management

|                   |  |
|-------------------|--|
| Power Supply      | 2.8V ~ 4.3V  |
| Power Acquisition | 16mA   |
| Power Tracking    | 13mA   |
| Power Saving      | Typ. 1.6mA @AlwaysLocate™(Note1)<br>8uA @Backup Mode<br>500uA @Standby Mode<br>Periodic Mode |
| Antenna Type      | Active or Passive  |
| Antenna Power     | External or Internal VCC_RF  |

Note1: Measured in GPS system under outdoor static mode.

|    |          |         |   |
|----|----------|---------|---|
| 10 | GND      | RESET   | 9 |
| 11 | RF_IN    | VCC     | 8 |
| 12 | GND      | NC      | 7 |
| 13 | ANTON    | V_BCKP  | 6 |
| 14 | VCC_RF   | STANDBY | 5 |
| 15 | NC       | 1PPS    | 4 |
| 16 | RESERVED | RXD1    | 3 |
| 17 | RESERVED | TXD1    | 2 |
| 18 | TIMER    | GND     | 1 |

**Top view**



# Quectel L76

## GNSS Module



### Product Description

L76, the smallest GNSS module, is a single receiver module integrated GLONASS with GPS system. It provides simultaneous GPS and Compass GLONASS open service L1 reception capability. With 33 tracking channels, 99 acquisition channels, and 210 PRN channels, L76 can acquire and track any mix of GPS and GLONASS signals.

Compared with using GPS only, enabling both GPS and GLONASS generally doubles the number of visible satellites, reduces the time to first fix and increases positioning accuracy, especially when driving in rough urban environments.

Combining advanced AGPS called EASY™ (Embedded Assist System) and proven AlwaysLocate™ technology, L76 achieves the highest performance and fully meets the industrial standard. Additional feature of embedded logger function called LOCUS allows L76 to log position information to internal flash memory at default intervals of 15 seconds and provide typically more than 16 hours log capacity without adding cost.

Its super performance makes L76 ideal for automotive, industrial PDA, consumer and industry applications. Extremely low power consumption makes it easier to be applied to power sensitive devices, especially portable applications. ●

### Key Benefits

- Extremely compact size, 10.1 × 9.7 × 2.5mm
- Multi-GNSS engine for GPS, GLONASS and QZSS
- EASY™, self-generated orbit prediction for instant positioning fix
- AGPS supports for fast TTFF
- Ultra low power consumption in tracking mode, 18mA
- Always Locate™, an intelligent algorithm for power saving
- LOCUS, innate logger solution with no need for host and external flash
- High sensitivity: -165dBm@Tracking, -148dBm@Acquisition
- 99 acquisition/33 tracking channels, up to 210PRN channels
- Support DGPS, SBAS (WAAS/EGNOS/MSAS/GAGAN)
- Anti-Jamming, Multi-tone Active Interference Cancellor

### General Specifications

|                               |                        |   |
|-------------------------------|------------------------|---|
| L1 Band Receiver (1575.42MHz) | Channel Number         | 33 (Tracking) / 99 (Acquisition) Up to 210(PRN) |
|                               | C/A Code               |   |
|                               | SBAS                   | WAAS, EGNOS MSAS, GAGAN                         |
| Horizontal Position Accuracy  | Autonomous             | <2.5m CEP                                       |
| Velocity Accuracy             | Without Aid            | < 0.1m/s  |
| Acceleration Accuracy         | Without Aid            | 0.1m/s <sup>2</sup>                             |
| Timing Accuracy               | 1PPS out               | 10ns  |
| Reacquisition Time            |                        | <1s   |
| TTFF@-130dBm with EASY™       | Cold Start             | <15s  |
|                               | Warm Start             | <5s   |
|                               | Hot Start              | <1s   |
| TTFF@-130dBm without EASY™    | Cold Start             | <35s  |
|                               | Warm Start             | <30s  |
|                               | Hot Start              | <1s   |
| Sensitivity                   | Autonomous Acquisition | -148dBm   |
|                               | Reacquisition          | -160dBm   |
|                               | Tracking               | -165dBm   |
| Environmental                 | Operation Temperature  | -40 C to 85 C                                   |
|                               | Storage Temperature    | -45 C to 125 C                                  |
| Dynamic Performance           | Maximum Altitude       | Max.18000m                                      |
|                               | Maximum Velocity       | Max.515m/s                                      |
|                               | Maximum Acceleration   | 4G  |
| Dimensions                    |                        | 10.1 × 9.7 × 2.5mm                              |
| Weight                        |                        | Approx. 0.6g                                    |

### Serial Interfaces

|                   |  |
|-------------------|--|
| Serial Interfaces | UART: Adjustable 4800~115200 bps<br>Default: 9600bps |
| Update rate       | 1Hz (default), up to 10Hz                            |
| I/O Voltage       | 2.7V ~ 2.9V  |
| Protocols         | NMEA 0183<br>PMTK                                    |

### Power Management

|                   |   |
|-------------------|---|
| Power Supply      | 2.8V ~ 4.3V   |
| Power Acquisition | 25mA (GPS+GLONASS)<br>21mA (GPS)  |
| Power Tracking    | 18mA (GPS+GLONASS)<br>15mA (GPS)  |
| Power Saving      | Typ.2.6mA @AlwaysLocate™(Note1)<br>7uA @Backup Mode<br>500uA @Standby Mode<br>Periodic Mode |
| Antenna Type      | Active or Passive   |
| Antenna Power     | External or Internal VCC_RF   |

### Certification

CE

\* Note1: Measured in GPS+GLONASS system under outdoor static mode.

|    |          |         |   |
|----|----------|---------|---|
| 10 | GND      | RESET   | 9 |
| 11 | RF_IN    | VCC     | 8 |
| 12 | GND      | NC      | 7 |
| 13 | ANTON    | V_BCKP  | 6 |
| 14 | VCC_RF   | STANDBY | 5 |
| 15 | NC       | 1PPS    | 4 |
| 16 | RESERVED | RXD1    | 3 |
| 17 | RESERVED | TXD1    | 2 |
| 18 | FORCE_ON | GND     | 1 |

**Top view**





# Quectel L80

Compact GPS Module/ Integrated with Patch Antenna



## Product Description

L80 is an ultra compact GPS POT (Patch on Top) module with an embedded 15.0 × 15.0 × 4.0mm patch antenna. This space-saving design makes L80 the perfect module for the miniature devices. Adopted by LCC package and integrated with patch antenna, L80 has exceptional performance both in acquisition and tracking.

Combining advanced AGPS called EASY™ (Embedded Assist System) and proven AlwaysLocate™ technology, L80 achieves the highest performance and fully meets the industrial standard. EASY™ technology ensures L80 can calculate and predict orbits automatically using the ephemeris data (up to 3 days) stored in internal flash memory, so L80 can fix position quickly even at indoor signal levels with low power consumption. With AlwaysLocate™ technology, L80 can adaptively adjust the on/off time to achieve balance between positioning accuracy and power consumption according to the environmental and motion conditions.

L80 supports automatic antenna switching function. It can achieve the switching between internal patch antenna and external active antenna. Moreover, it keeps positioning during the switching process.

With its tiny design, high precision and sensitivity, L80 is perfectly suitable for a broad range of M2M applications such as portable device, automotive, personal tracking, security and industrial PDA, especially suitable for special applications, like GPS mouse and OBD. ●



## Key Benefits

- Embedded patch antenna: 15.0 × 15.0 × 4.0mm
- Extremely compact size: 16.0 × 16.0 × 6.45mm
- Automatic antenna switching function
- Support short circuit protection and antenna detection
- Built-in LNA for better sensitivity
- EASY™, advanced AGPS technology without external memory
- Ultra low power consumption in tracking mode, 20mA,
- AlwaysLocate™, an intelligent controller of periodic mode
- LOCUS, innate logger solution with no need of host and external flash
- High sensitivity: -165dBm@Tracking, -148dBm@Acquisition
- 66 acquisition channels, 22 tracking channels
- Support DGPS, SBAS (WAAS/EGNOS/MSAS/GAGAN)
- Anti-Jamming, Multi-tone Active Interference Canceller

## General Specifications

|                               |                       |                        |
|-------------------------------|-----------------------|------------------------|
| L1 Band Receiver (1575.42MHz) | Channel Number        | 48 channels            |
|                               | C/A Code              |                        |
|                               | SBAS                  | WAAS, EGNOS MSAS,GAGAN |
| Horizontal Position Accuracy  | Autonomous            | <2.5m CEP              |
| Velocity Accuracy             | Without Aid           | < 0.1m/s               |
| Acceleration Accuracy         | Without Aid           | 0.1m/s <sup>2</sup>    |
| Timing Accuracy               | 1PPS out              | 10ns                   |
| Reacquisition Time            |                       | <1s                    |
| TTFF@-130dBm with EASY™       | Cold Start            | <15s                   |
|                               | Warm Start            | <5s                    |
|                               | Hot Start             | <1s                    |
| TTFF@-130dBm without EASY™    | Cold Start            | <35s                   |
|                               | Warm Start            | <30s                   |
|                               | Hot Start             | <1s                    |
| Sensitivity                   | Acquisition           | -148dBm                |
|                               | Reacquisition         | -160dBm                |
|                               | Tracking              | -165dBm                |
| Environmental                 | Operation Temperature | -40 C to 85 C          |
|                               | Storage Temperature   | -45 C to 125 C         |
| Dynamic Performance           | Maximum Altitude      | Max.18000m             |
|                               | Maximum Velocity      | Max.515m/s             |
|                               | Maximum Acceleration  | 4G                     |
| Dimensions                    | 16.0 × 16.0 × 6.45mm  |                        |
| Weight                        | Approx. 6.0g          |                        |

## Interfaces

|                   |  |
|-------------------|--|
| Serial Interfaces | UART: Adjustable 4800~115200 bps<br>Default: 9600bps |
| Update rate       | 1Hz (default), up to 10Hz                            |
| I/O Voltage       | 2.7V ~ 2.9V  |
| Protocols         | NMEA 0183<br>PMTK                                    |

## Power Management

|                   |   |
|-------------------|---|
| Power Supply      | 3.0V ~ 4.3V   |
| Power Acquisition | 25mA  |
| Power Tracking    | 20mA  |
| Power Saving      | 3mA @AlwaysLocate™(Note1)<br>7uA @Backup Mode<br>1mA @Standby Mode<br>Periodic Mode |

## Certification

CE

Note1: Measured in GPS system under outdoor static mode.

|    |         |        |   |
|----|---------|--------|---|
| 7  | TIMER   | 1PPS   | 6 |
| 8  | AADET_N | V_BCKP | 5 |
| 9  | NC      | VCC    | 4 |
| 10 | RESET   | GND    | 3 |
| 11 | EX_ANT  | TXD1   | 2 |
| 12 | GND     | RXD1   | 1 |

**Top view**



## GNSS EVB Kits

### Product Description

Quectel provides compact, fully functional and easy-use EVB kits for customers to evaluate the performance of GPS/GNSS modules. With the sophisticated design of PCB layout and RF signal trace, our EVB kits can ensure high positioning capability of GPS/GNSS modules. Micro-USB interface provides both power supply and high-speed data transfer. UART interface on the EVB kit also supports data transfer. It easily implements the shift between the two modes with just the push of Serial Point Alternative Switch. LEDs are designed to display the status of data transmission and positioning. In addition, some functional key such as STANDBY, FORCE\_ON, TIMER and RESET are equipped on EVB kit. With compact size and abundant interfaces, Quectel GPS/GNSS EVB kits completely meet the customers' demands and ideally suited for use in laboratories, Vehicles and outdoor locations.

### Features

- Compact size and easy to use
- Abundant functional interfaces
- Micro-USB interface both for power supply and data transfer
- Visualization for module's working status via LEDs
- External battery is available

### EVB Kit Includes

- One-page instruction
- Micro-USB cable
- CD-ROM containing:
  - Evaluation tools*
  - USB-driver software*
  - Documentation*



For detailed information, please refer to EVB\_User\_Guide.



# Quectel Technology

## Technology Overview

Quectel M2M's commitment is to lead the industry forward with continuous innovation that enable us to innovate against ourselves and work with our partners to continuously strive for better performance of our all products and innovate new products and technologies. Adhering to this philosophy and leveraging the strong R&D team, we created several unique technologies like QuecLocator, QuecCell, OpenCPU, eCall, QuecFile, DTMF and QuecFOTA to enhance the functionality of all our products and customer applications to achieve win-win situation.

**QuecLocator:** It is Quectel cellular positioning technology. Quectel provides a server with powerful database, which collects amounts of global base station information for fast positioning.

**QuecCell:** This function can scan the detailed information about the base station, lock the specified GSM frequency, and forbid the specified operator. With this feature, customer can choose the network they expect in the certain place.

**OpenCPU:** GSM/GPRS module acts as a main processor. Customer can design their applications conveniently based on it.

**RIL Driver(for Android or WinCE):** Radio Interface Layer (RIL) is a software layer which provides an interface between operating system (Android/WinCE) and radio hardware.

**QuecFile:** Module flash file system access function. QuecFile can expand the storage space of external MCU.

**Jamming Detection:** It allows Quectel module to detect GSM jamming signals. When jamming is detected, Quectel module sends a notification to MCU, reporting the presence of active jamming of the GSM mobile communication network.

**PING:** The PING command is used to test the ability of the source computer to reach a specified destination computer. It is a simple way to verify that a computer can communicate over the network with another computer or network device.

**eCall:** A European initiative to combine GSM and GPS for vehicle emergency service is eCall, a project by the European. Commission to provide rapid assistance to motorists involved in a collision anywhere in the European Union.

**QuecFOTA:** Firmware Over-the-Air. It enables mobile device manufacturers to remotely upgrade software. New software can be delivered over the air, eliminating the need for the user to bring the device to a service facility.

**Antenna Supervisor Function:** Quectel's GPS module L26 and L80 support Antenna Supervisor Function, which is designed to detect different external active antenna status including connection, open circuit and short circuit.

**UC20 GNSS:** UC20 includes a fully integrated global navigation satellite system solution that supports the latest generation gpsOne Gen8 of Qualcomm (GPS and GLONASS). It also supports Qualcomm gpsOneXTRA technology (one kind of A-GNSS), which will download XTRA file from the internet server to enhance the TTFF.

**DTMF Codec:** Dual-tone multi-frequency. Quectel provides an economical solution to embed the encoding/decoding DTMF in Quectel module. DTMF is used widely in the applications of security monitor, wireless communication, vehicle remote control, etc.

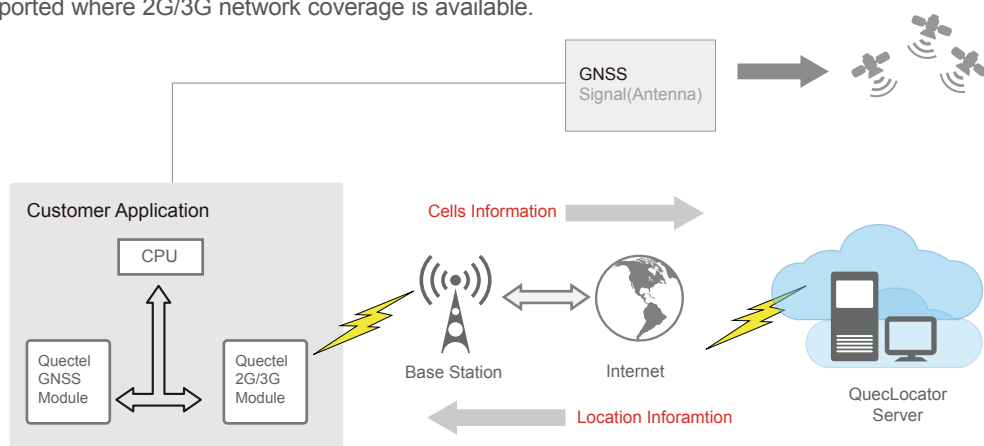
**Dual-SIM:** Dual SIM Single Standby. It can save customers' cost.

# QuecLocator

QuecLocator is Quectel’s cellular location technology.

Global Navigation Satellite System (GNSS) has been widely used because of its accurate and stable positioning capability. But it is not always possible in some challenging signal environments, such as when receiver works indoors, under the elevated bridge or GNSS signal is influenced by jamming.

At present, cellular networks are widely available, covering a large geographic area, which enables QuecLocator service to estimate the position on the basis of surrounding mobile network information easily. The service can be supported where 2G/3G network coverage is available.



Users can choose QuecLocator function when they need Location Base Service.

QuecLocator is an assisted positioning system beside GNSS. When devices are in some challenging signal environments, such as indoors or GNSS signal is not available, QuecLocator can provide position information in these situations.

QuecLocator also can be a cost down solution for some specific application. When an estimated position is enough, a GNSS module can be retrenched.

When using QuecLocator function, user only need to send one AT command. When Quectel 2G/3G module receives the AT command, it will send the cells information of base station to Quectel’s cloud server. The server will check its database to get the location information of the cellular base station and send it back to the devices.

Cellular location performance depends on the density of network cells. The more data the module can acquire from the database of the server, the more accurate the location information will be. Queclocator server offers a huge database including more than 27 million WCDMA base stations and over 13 million GSM base stations covering 238 countries. The devices with built-in Quectel 2G/3G modules can acquire location information easily around the world.

Quectel modules ensure our user stay safety via the following methods.

Cells Information and Location Information only carry location related data which ensure customer’s private information is secure.

Cells Information and Location Information have been encrypted.

# eCall

eCall is a European initiative intended to bring rapid assistance to motorists involved in a collision anywhere in the European Union. It combines cellular and GPS technology for emergency service. In case of emergency, the in-vehicle eCall system (IVS) automatically initiates an emergency call carrying both voice and data (including GPS location data) directly to the public safety access point to determine whether rescue services should be dispatched to the known position.

The EU is aiming to have a fully functional eCall service to be in place throughout the EU by 2015. The project is also supported by the European Automobile Manufacturers Association (ACEA). Some car makers such as BMW, PSA and Volvo Cars have already integrated eCall function into their products.

In Russia, a fully interoperable system called ERA-GLONASS is being deployed, with the aim to require an eCall terminal and a GPS/GLONASS receiver in new vehicles.

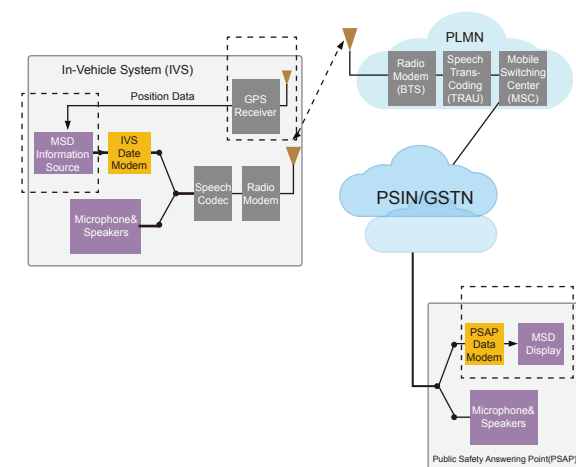


Quectel modules support eCall function. It is defined as a manually or automatically initiated emergency call from a vehicle, supplemented with a minimum set of emergency related data (MSD), as defined under the EU Commission Safety initiative. Quectel provides all-around support for eCall system

test. The module has the ability to act as In-vehicle System and also to simulate the Public Safety Answering Point. Thus, eCall testing can be easily performed by preparing two Quectel modules in the circumstance without access to a real PSAP.

After an emergency voice call has been (automatically or manually) established, the IVS modem receiver constantly monitors the incoming signal from the speech decoder output. When prompted by a request from the PSAP operator for MSD, the IVS connects the IVS data modem transmitter to the input of the speech coder and mutes any speech from the motorist for the duration of MSD transmission to prevent it from interfering with the eCall data transmission. Alternatively, it can be the IVS that may trigger the MSD transmission. In this case, the IVS asks the PSAP to request an MSD transmission.

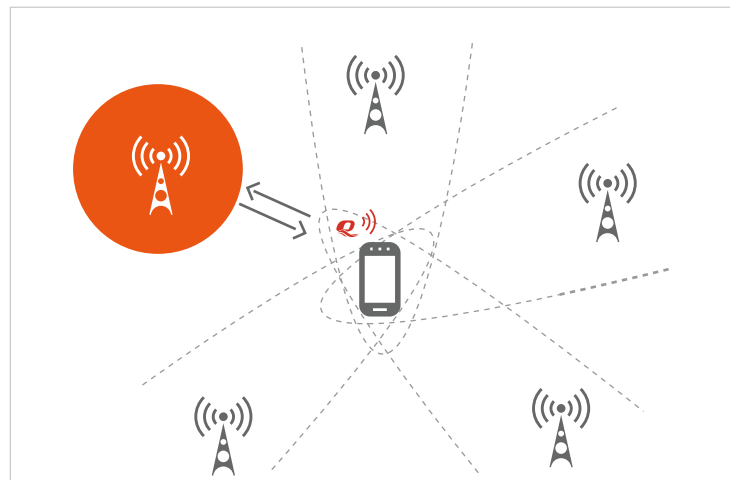
The first operation mode shall be referred to as the pull mode whereas the latter one is the push mode. Essentially, push mode is realized by a request from the IVS to the PSAP to pull the MSD.





# QuecCell

Since GSM network signal is weak in some places, the transfer of information across GSM/GPRS network and the GPRS transmission speed could be slow and GPRS connection drops frequently. QuecCell function can scan the detailed information about the base station, lock the specified GSM frequency, and forbid the specified operator. With this feature, customer can choose the network they expect in the certain place.



Quectel Wireless Solutions integrates scanning frequency technology named QuecScan and locking frequency technology named QuecLock into the module. QuecScan is used for scanning the information on every frequency point. QuecLock can lock the module into the specified frequency point.

- QuecLock function can stabilize the internet signal and accelerate internet connection.
- QuecScan and QuecLock can ensure reliable data transmission, which avoid changing base station in weak signal conditions and reduce power consumption.

Users can take advantages from QuecCell function of Quectel's GSM modules.

- No constraints on SIM card in executing QuecScan function.

# QuecFOTA

FOTA is an acronym for Firmware Over-the-Air. FOTA updating technology enables mobile device manufacturers to remotely update software. New software can be delivered over the air, eliminating the need for the user to bring the device to a service facility.

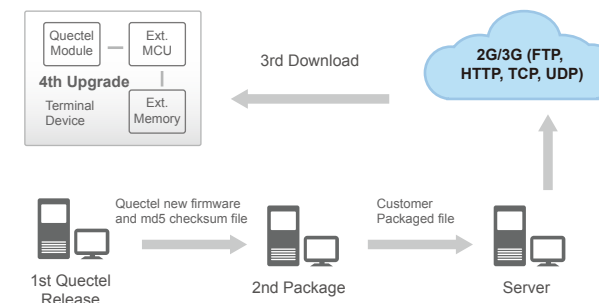
QuecFOTA improves the mobile terminal manufacturing experience and reduces support costs by remotely updating device firmware with new functionality and software improvements. QuecFOTA enables mobile phone manufacturers to create firmware updates for handsets and to deploy and install the updated firmware over the air.

The solution manages key elements of the firmware update process

- Identifies the essential changes from an existing version of firmware to a new, updated version.
- Easy and simple upgrade protocol. It is very easy to embed it in the customer's software.
- More flexible. The external MCU completes control over the entire upgrade process, including download speed control, firmware storage location and package encoding.
- Downloads and installs the new firmware update in the background while the device is fully operational.
- Manages different versions of updated firmware.

FOTA updating process consists of three stages

- Generating the update package. The initial stage includes generating a software updating package containing bug fixed or new features. It includes the differences between the version of existing firmware on device and the updated version of firmware.
- Delivery of the update package. Customer needs to put the delta package on their own network server (HTTP, FTP, TCP etc), and uses GSM/UMTS function provided by Quectel module to download the delta package from their network server into the device.
- Performing the update. For Quectel module, customer's device can use the specified AT commands to transfer delta package to Quectel module, and Quectel module will finish the validation and update process.



Advantages

- Suitable for various processors and Windows operation systems.
- Overcomes over-the-air (OTA) bandwidth and memory constraints.
- Upgrading is reliable, safe, clean and thorough.

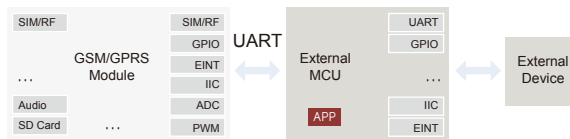
# OpenCPU™

Some of Quectel Modules open its internal source for users to develop their applications. This function is called OpenCPU™. Based on it, users can create innovative application and download it directly into Quectel module to run. In the OpenCPU solution, GSM/GPRS module acts as a main processor. So, GSM/GPRS module with OpenCPU solution will facilitate product design and accelerate the application development. And it also can save the cost of the product.

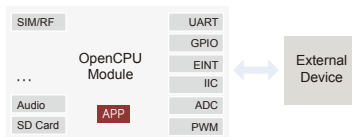
The core system of OpenCPU is released by Quectel, which includes the core binary file and library file. Quectel also provide Software interfaces to licensed embedded application developers. It includes audio API, FCM API, system API, Peripheral API, timer API, and debug API, standard C library API, and so on. Users can develop their applications with those API on Quectel's modules.

Compared with traditional solution, OpenCPU solution can make hardware design easier for the developer. The figure below shows the differences between them.

### Traditional Solution

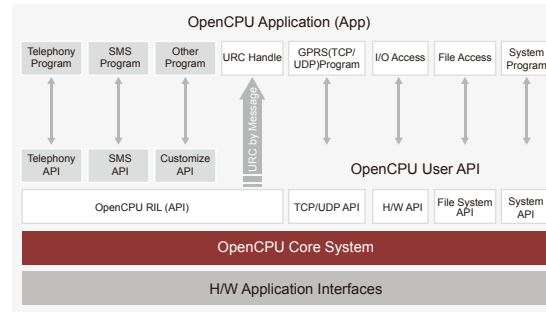


### OpenCPU Solution



System software of OpenCPU consists of 3 layers: Core system, User API and Application.

The following block diagram shows the software architecture of M85 OpenCPU.



Core System is a combination of hardware and system software of GSM/GPRS module. It has a built-in ARM processor, and has been built over Nucleus operating system, which has the characteristics of micro-kernel, real-time, multi-tasking and etc.

OpenCPU RIL, an open source layer, is embedded into User API layer. With OpenCPU RIL, developer can simply call API to send AT commands and get the response when API returns.

AT commands related to SMS and telephone are packed to the RIL APIs by default. Besides, developer can also easily add a new API to implement an AT Command according to the open source of RIL.

Quectel modules also support some enhanced features under OpenCPU. Such as Jamming Detection, TCP/IP protocols, eCall/Era-Glonass, QuecFOTA, QuecLocator, Audio Playback/ Audio Recording, QuecFile, POP3 and SMTP, etc. OpenCPU software also has steady flash protected mechanism.

Normally, Quectel provides a set of OpenCPU SDK for development.

- Compile environment.
- A set of header files defines all interface functions and OpenCPU parameters.
- Development guide and other related documents.
- Source codes for examples.
- Quectel Core System firmware, binary file.
- Download tool for image bin.

# Antenna Supervisor Function

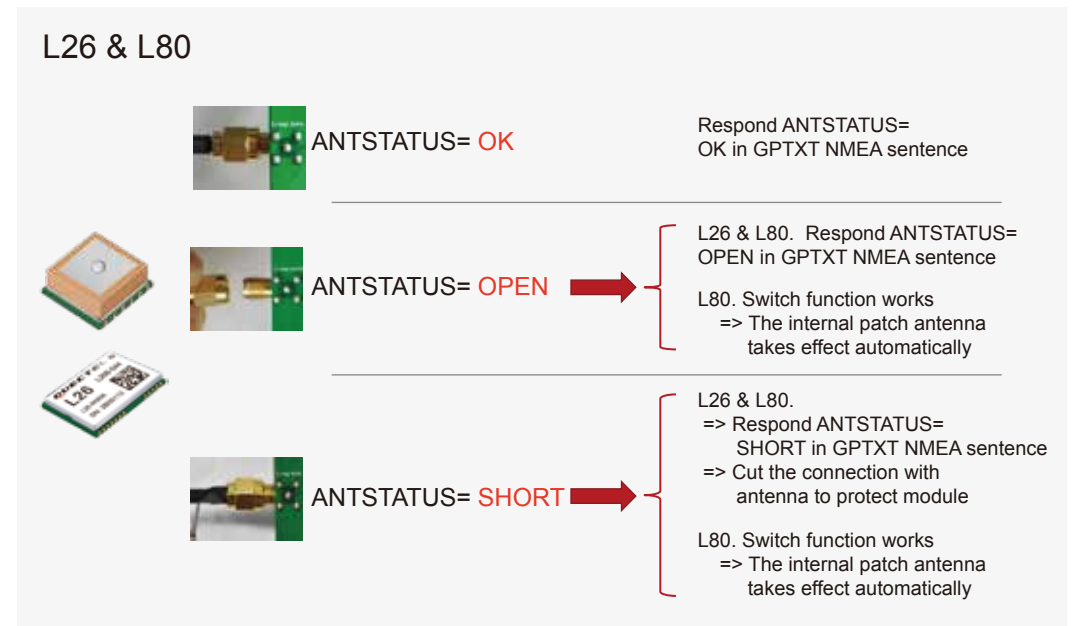
Quectel's GPS module L26 and L80 support Antenna Supervisor Function, which is designed to detect different external active antenna status including connection, open circuit and short circuit.

There are three statuses to indicate the external antenna.

- OPEN. External active antenna is not inserted.
- OK. External active antenna is inserted and worked normally.

• SHORT. External active antenna is inserted but short-circuited.

L80 also has internal antenna for backup. With Antenna Supervisor function, L80 can support automatic antenna switching function from external to internal antenna.



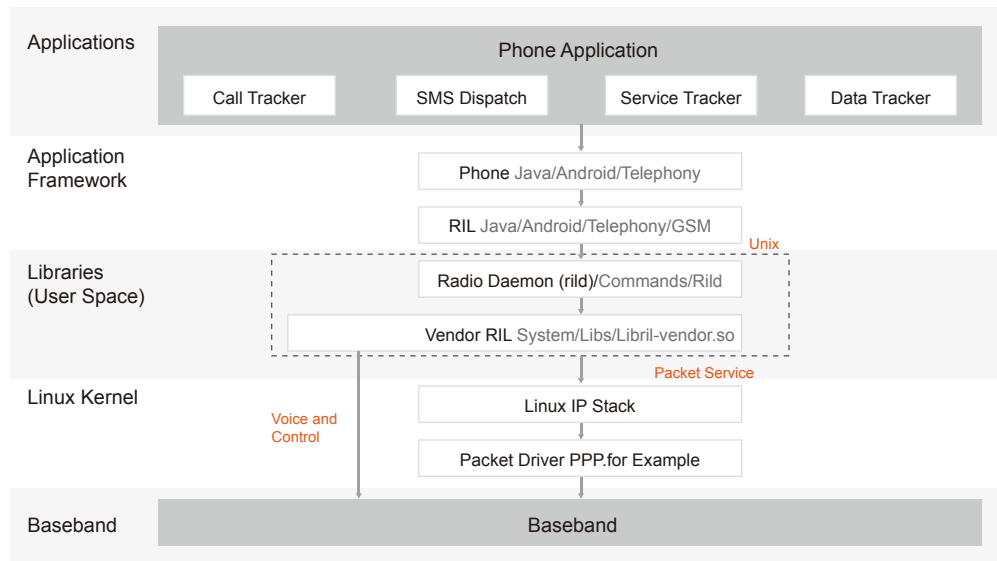


# RIL

Radio Interface Layer (RIL) is a software layer which provides an interface between operating system (Android/ WinCE) and radio hardware.

After user installed and configured the RIL driver successfully, SMS, voice call, data service functions can be used in the operating system.

Quectel 2G/3G module support RIL driver for Android and WinCE OS. The picture below is RIL driver structure for Android OS. And RIL driver for WinCE is similar with Android OS.



The RIL in Android locates between Kernel and Application Framework. It is divided into two parts, one is RILD and the other is Vendor RIL. RILD is responsible for the communication between Socket and Application Framework. Vendor RIL is responsible for communication with Radio via AT command channel and Packet data channel (PDCH). AT command channel is used for communicating with Radio directly and PDCH used for data service.

The RIL module is used to communicate with the vendor RILD. The Phone module directly provides phone function interfaces to application user who can call them to realize the phone functions.

RIL driver for WinCE system transforms the RIL request from application layer into AT commands, and then sends them to module. It needs to enable some system components under the options of kernel, before using RIL driver in customer's system board.

The software packet of Quectel modules provides USB driver and RIL driver for WinCE6.0 and provides the design guide for driver installation step by step. RIL driver can transform the RIL request from application layer into AT commands, and then send them to module after it is installed successfully.

# UC20 GNSS

UC20 includes a fully integrated global navigation satellite system solution that supports the latest generation gpsOne Gen8 of Qualcomm (GPS and GLONASS). It also supports Qualcomm gpsOneXTRA technology (one kind of A-GNSS), which will download XTRA file from the internet server to enhance the TTFF.

## GNSS

In the open sky, natural obstacles, such as trees, high buildings and etc. affect GPS modules to receive signals from satellites. The GNSS system can observe more satellites than single GPS system, which highly avoid the limitation of signal reception in the open sky.

Qualcomm's gpsOne Gen8 supports GNSS system which can observe more satellites. Therefore, enabling GLONASS and GPS system at the same time makes GNSS module saving times of acquisition, and get high accuracy and precision. It also reduces the values of PDOP and GDOP.

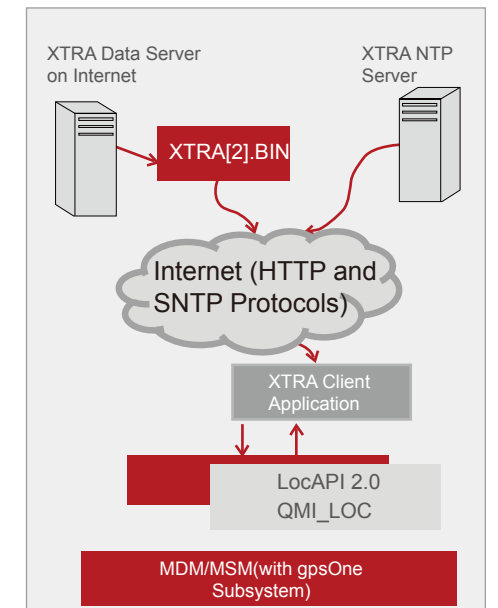
## gpsOne XTRA

Qualcomm's new gpsOne XTRA Assistance technology provides enhanced operation by enabling a user to download a small assistance data file through a brief Internet access session. This technology delivers more accurate positioning with greater sensitivity than otherwise possible with standalone GNSS receivers, especially in difficult areas such as indoors and in dense urban canyons.

XTRA file contains predicted GPS and GLONASS satellites coordinates and clock biases valid for up to 7days. It is the best if XTRA file is downloaded once every 1-2 days. And UC20 also supports SBAS (including WAAS, ENGOS and MSAS), which will improve fix accuracy.

## Dynamic Power Optimization

GNSS function normally has high power consumption. UC20 has power-saving solution named DPO (Dynamic Power Optimization), which attempts to turn off GNSS RF parts, reduces current consumption by 50% at most without impact on



TTFF and extends battery life, maximizes talk and standby time as well.

## NMEA

UC20 supports standard NMEA-0183 protocol, and outputs NMEA sentences with 1Hz via USB interface by default.

UC20 GNSS engine is high-performance and suitable for various applications which need lowest-cost and accurate positioning. Meanwhile, it can also support position tracking without network assistance, and GNSS capabilities when GSM/WCDMA is out of network coverage areas. UC20 GNSS can be applied in the following occasions: turn-by-turn navigation applications, asset tracking, buddy tracking, location-aware games, homing and fleet management.

# Quality



## Quality Assurance

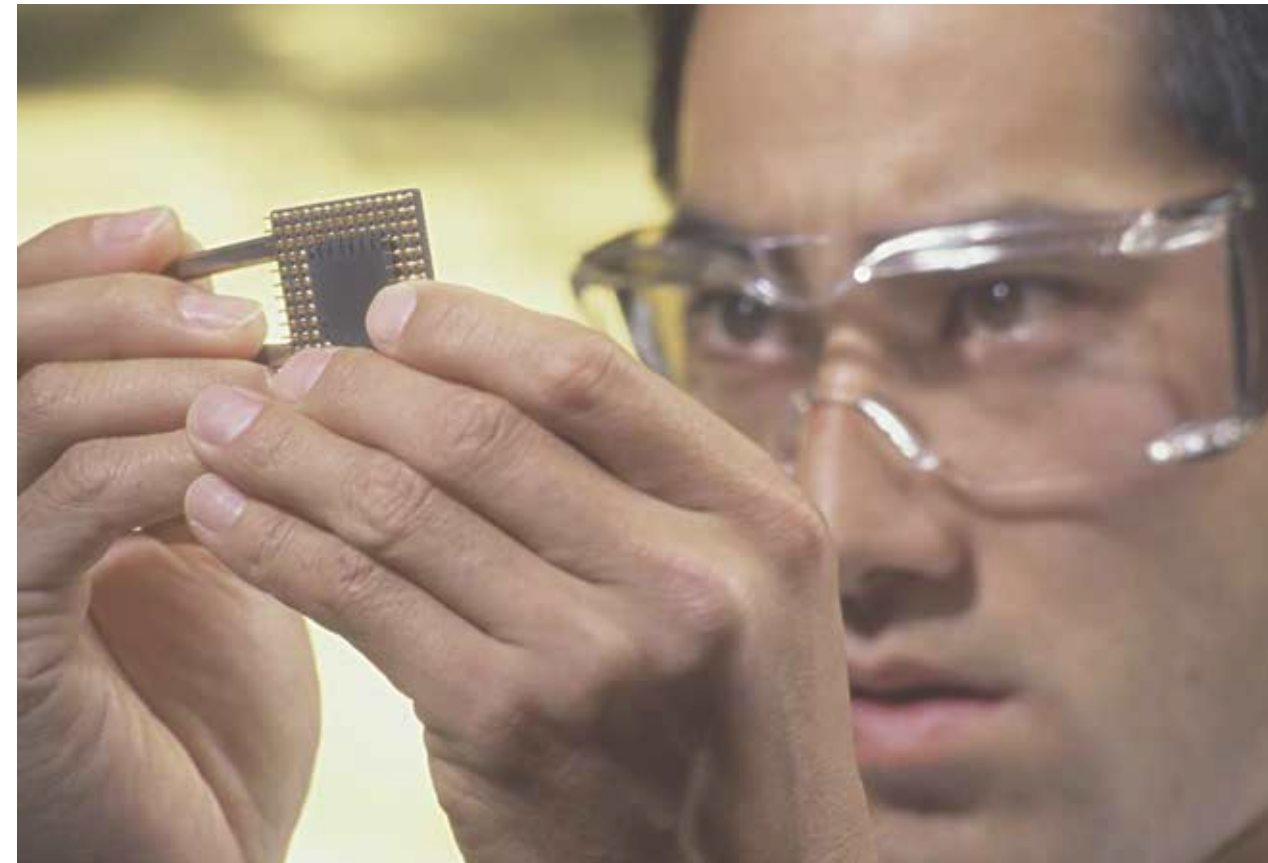
All Quectel modules conform to international quality standards.

Our quality system is certified according to the international quality standard ISO9001:2008 encompassing design, development, manufacture, sales and maintenance.

Quectel also extended its certification to the automobile in accordance with the quality standard ISO/TS16949:2002, which makes Quectel products suitable for all kinds of automotive applications.

Quectel is committed to be an environmental protector. All our contract manufacturers are ISO 14000 certified. All modules are qualified to meet regulatory requirements with respect to the use of hazardous substance.

Each Quectel module is inspected carefully during the whole manufacturing process. Inspection involves IQC/ PQC/ BT/ FT/ FCT/ QC/ QOC testing and packing inspection. Thanks to the comprehensive testing, Quectel is well known as the trusted supplier of GSM/GPRS, UMTS/HSPA(+)/LTE, and GNSS modules.





# Rigorous Hardware and Software Testing

Quectel modules need to go through substantive and rigorous hardware and software tests during the whole development process. Quectel puts each new module prototype through a rigorous testing process to ensure the reliability, integrity and compatibility of its design. Even after modules have reached mass production, Quectel continues to monitor module quality by randomly testing the reliability of some modules.

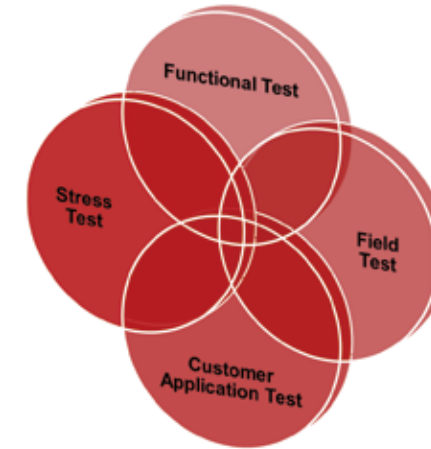
Hardware testing contains baseband test, RF test, EMC test, audio test and reliability test.

- Baseband test is to verify the circuit design and every component works properly.
- RF (Radio Frequency) performance is very essential part which is tested strictly and repetitiously.
- EMC, consisting of several tests, is tested to be compliant with relevant standards and laws.
- Quectel holds most advanced acoustic instruments to make excellent audio performance in both module and customer device.
- The purpose of reliability testing is to discover potential problems with the design and performance of modules as early as possible and, ultimately, provide confidence that the module meet its reliability requirements. Quectel reliability test mainly includes thermal shock testing, damp heat testing, random vibration testing, micro-drop testing, tumbling and MTBF.

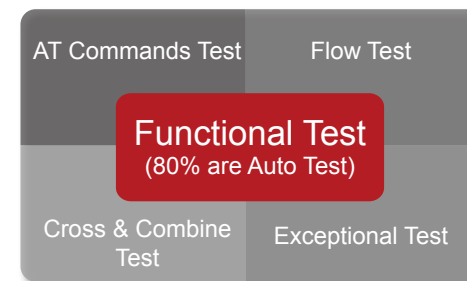
Quectel has professional test equipments to conduct the tests mentioned above.



Software testing includes functional test, stress test, field test and customer application test. Quectel also develops test tools and uses scripting language to realize these tests.



- Functional Test ensures that module has all the required functionality that is specified within its functional requirements. The chart below describes the main functional tests carried out on each module firmware.
- All Quectel modules must do Field Test in different places and on different networks in order to ensure the module performs well in different environments. Field Test contains static test and dynamic test.



- Both of static test and dynamic test contain basic functional test and stress test which are defined according to test experience. Static Test ensures the module works with kinds of SIM cards in different places and networks. Dynamic Test shall be carried out in moving environment such as in car, in subway, etc.
- Quectel modules are used in a wide range of M2M applications, such as automotive, smart metering, telematics, control & monitoring, tracking & tracing, payment, security, etc. To ensure the module can be flexibly used in different kinds of applications, we program an amount of scripts to simulate customer applications which named Customer APP Test.
- Quectel has a systematic standard on module Stress Test which covers Power ON/OFF, Voice call, Data call, SMS, PPP and TCP/UDP, etc. We program an amount of test scripts and develop testing tools to implement the stress test. Each module has to run all related stress-scripts continuously to ensure it works steadily.

# Certificates

Quectel modules have earned the approval of CE, GCF, FCC, IC, PTCRB, NCC, ANATEL, ROGERS, Vodafone, etc. And we will constantly certify our products worldwide. We can leverage our global experience to assist our customers in certifying their products.



# Packaging

Quectel modules are shipped in tape and reel forms and are hermetically sealed with desiccant and humidity indicator card.

The tape is packed in a vacuum-sealed bag which is ESD protected and comes with detailed care instructions about moisture sensitivity.



# Partners

## Suppliers



MediaTek Inc. is a fabless semiconductor company that provides system-on-chip solutions for wireless communications, HDTV, DVD and Blu-ray. Applications for MediaTek chips include smartphones and feature phones, tablets, digital televisions and other devices featuring wireless connectivity (GPS, Wi-Fi, Bluetooth and NFC), and ADSL equipment. Headquartered in Hsinchu, Taiwan, the company has 25 offices worldwide and is one of the top 25 semiconductor suppliers globally by sales volume.



Incorporated is an American global semiconductor company that designs and markets wireless telecommunications products and services. Headquartered in San Diego, CA, USA, the company has 157 worldwide locations.



CSR is a pioneering designer and developer of silicon and software for the consumer electronics market. It helps to transform the lives of motorists, photographers, music lovers, mobile phone users and other gadget-loving consumers. CSR is dedicated to finding simple solutions to complex problems. Using its track record working with leading brands can realize the potential of a wide range of devices to make peoples' lives and experiences easier, richer and more varied.



Intel Corporation is an American multinational semiconductor chip maker corporation headquartered in Santa Clara, California. Intel is one of the world's largest and highest valued semiconductor chip makers. It is the inventor of the x86 series of microprocessors, the processors found in most personal computers.

## Certification Bodies



Seven Layers IT Solutions has been designing, deploying and supporting data networks for the public and private sectors. We are experienced in implementing the latest high performance LAN and WANs, as well as designing advanced security solutions such as high-performance Firewalls, Intrusion Detection Systems and VPN's. Customers can take advantage of this expertise to ensure that their data networks deliver real benefits in any business environment.



MORLAB group is the authoritative lab engage in testing, examination, and certification service for electronic and telecommunication products.

## Network service provider



AT&T Inc. is an American multinational telecommunications corporation, headquartered at Whitacre Tower in downtown Dallas, Texas. AT&T is the largest provider of mobile telephone and the largest provider of fixed telephone in the United States, and also provides broadband subscription television services.



Vodafone Group plc is a British multinational telecommunications company headquartered in London and with its registered office in Newbury, Berkshire. Vodafone owns and operates networks in 21 countries and has partner networks in over 40 additional countries.



The Orange brand embodies the Group's values and commitment to bringing the digital universe to the largest possible number of people, creating a powerful and differentiating asset that unifies the image of the enterprise around the world.



Telefónica, S.A. is a Spanish broadband and telecommunications provider with operations in Europe, Asia, North America and South America. Operating globally, it is the sixth-largest mobile network provider in the world. The company started as a public telecommunications company. Its head office is in the Distrito Telefónica in Madrid.



T-Mobile USA, a subsidiary of Germany-based Deutsche Telekom, is one of the largest providers of wireless voice and data communications services in the US. The company's 33 million+ contract and prepaid consumer customers use its network domestically and are able to connect to the compatible network of its parent company when in Europe.



Rogers Communications is a diversified public Canadian communications and media company. It operates particularly in the field of wireless communications, cable television, telephone, and Internet connectivity with significant additional telecommunications and mass media assets.



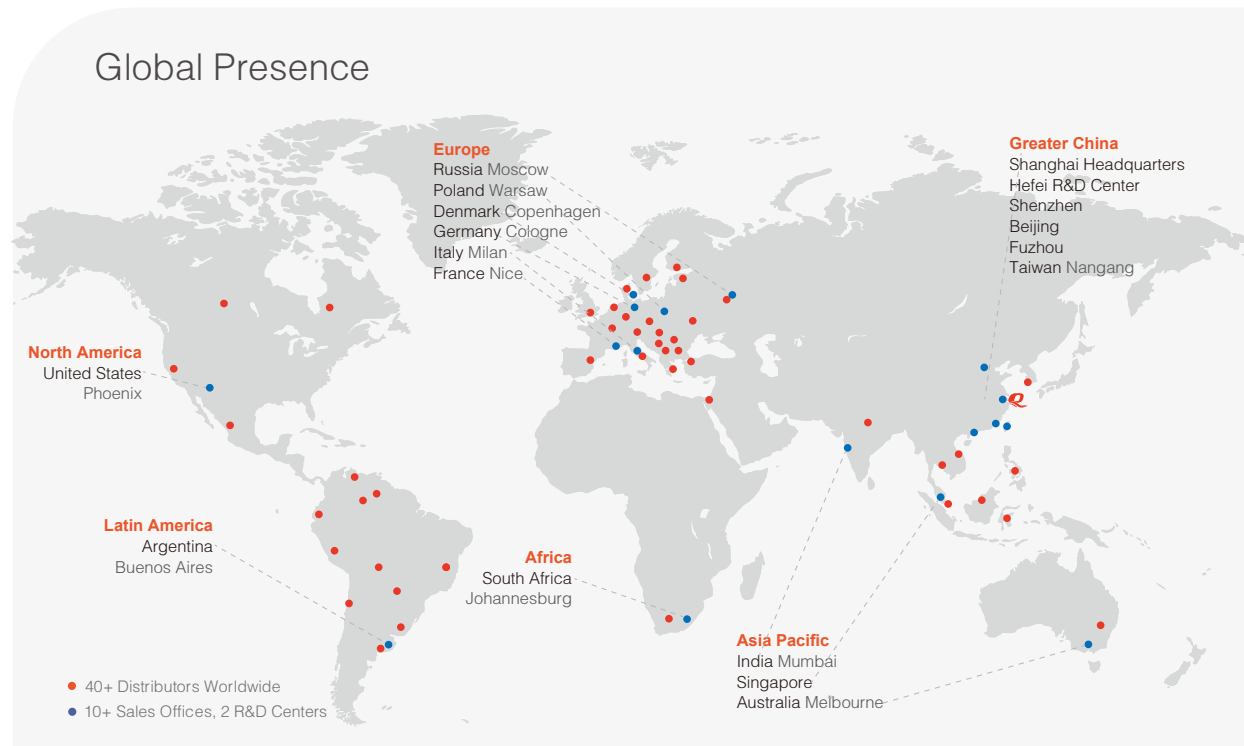
China Mobile Communications Corporation is a Chinese state-owned telecommunication company that provides mobile voice and multimedia services through its nationwide mobile telecommunications network. The company is the largest mobile telecommunications companies by market capitalization today.



China United Network Communications Group Co., Ltd. (Briefly named "China Unicom") was established on January 6, 2009 on the basis of the former China Unicom and China Netcom, which used to play the important roles on china's telecom market with their own advantages in different professional areas respectively. Such advantages will lend to the newly-built China Unicom an internal momentum for further growth.



# Contact Us



## Overseas

### Germany

Email: [europa@quectel.com](mailto:europa@quectel.com)

### Italy

Email: [italy@quectel.com](mailto:italy@quectel.com)

### France

Email: [france@quectel.com](mailto:france@quectel.com)

### Latin America

Email: [latinamerica@quectel.com](mailto:latinamerica@quectel.com)

### India

Email: [india@quectel.com](mailto:india@quectel.com)

### South Africa

Email: [southafrica@quectel.com](mailto:southafrica@quectel.com)

### Russia

Email: [russia@quectel.com](mailto:russia@quectel.com)

### Poland

Email: [poland@quectel.com](mailto:poland@quectel.com)

### Denmark

Email: [denmark@quectel.com](mailto:denmark@quectel.com)

### North America

Email: [northamerica@quectel.com](mailto:northamerica@quectel.com)

### South-East Asia

Email: [southeastasia@quectel.com](mailto:southeastasia@quectel.com)

## Greater China

### Shanghai

Email: [sales@quectel.com](mailto:sales@quectel.com)

### Shenzhen

Email: [shenzhen@quectel.com](mailto:shenzhen@quectel.com)

### Fuzhou

Email: [fuzhou@quectel.com](mailto:fuzhou@quectel.com)

### Beijing

Email: [beijing@quectel.com](mailto:beijing@quectel.com)

### Taiwan

Email: [taiwan@quectel.com](mailto:taiwan@quectel.com)

