
QUECTEL
Quectel
GSM Module
Product Overview
Build a Smarter World

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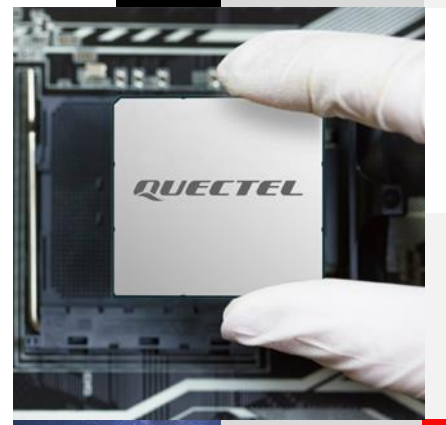
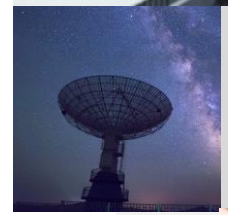
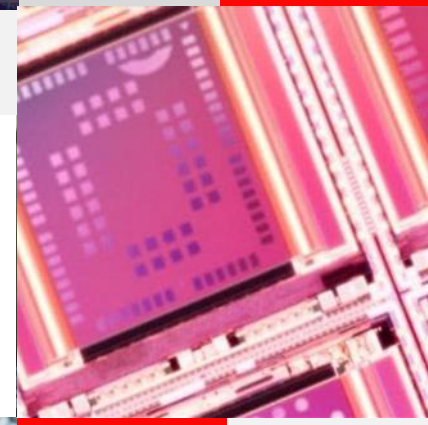
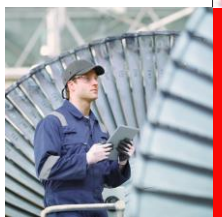








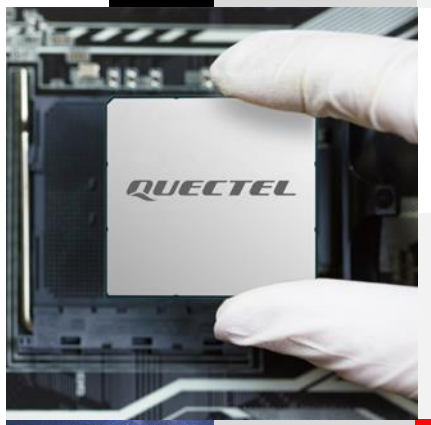
Roadmap

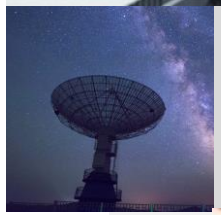
Specifications

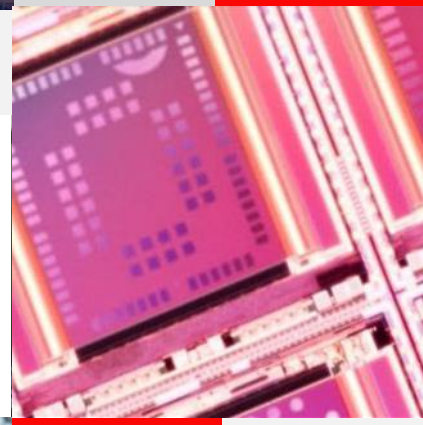
Technologies

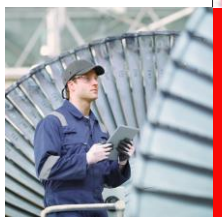
GSM Module Differences

Applications



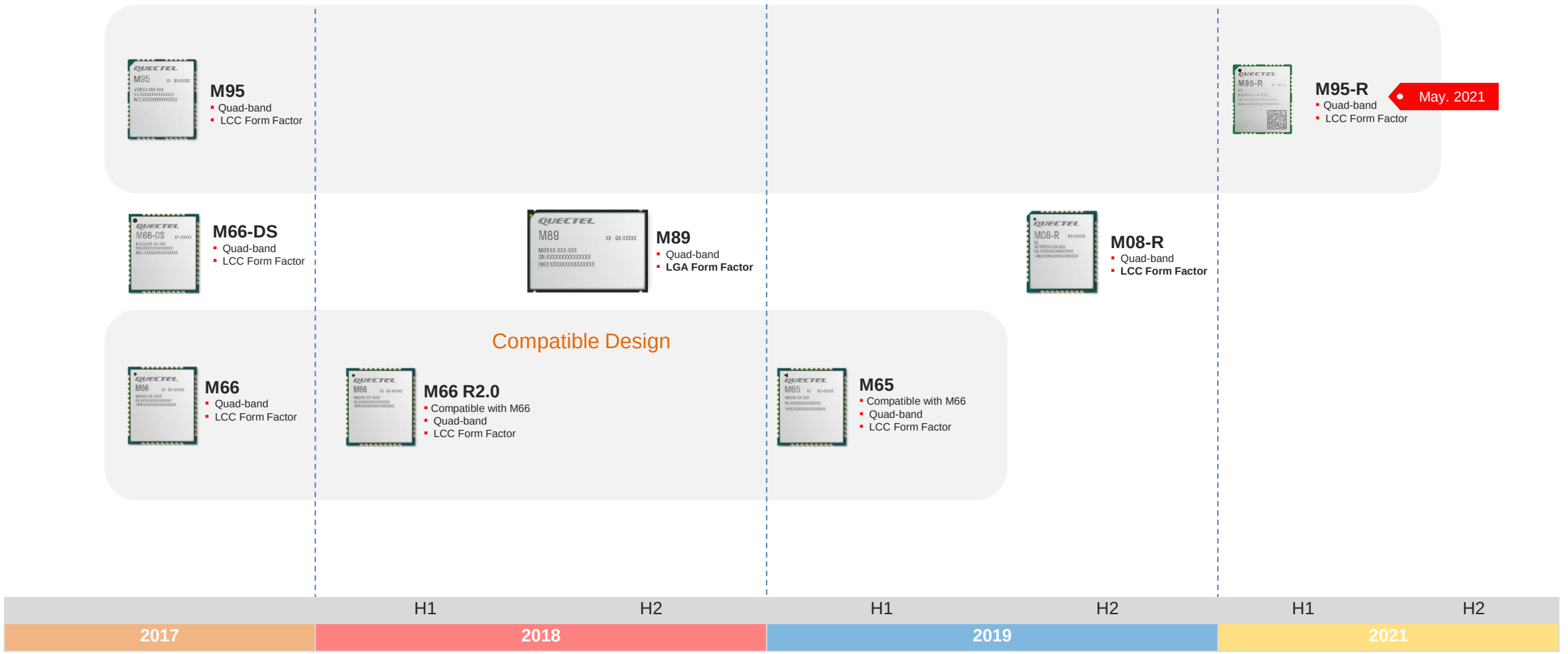






Build a Smarter World

GSM Modules Roadmap



GSM Roadmap

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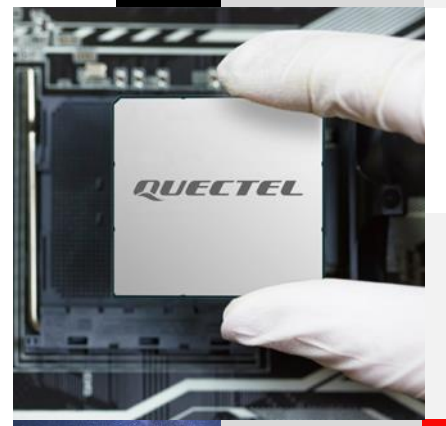
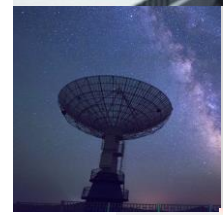
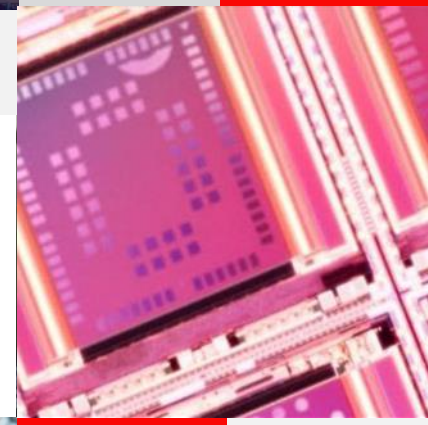
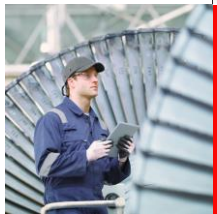
Build a Smarter World









M89 Specifications

18.8 mm × 26.7 mm × 2.3 mm
GPRS Multi-slot Class 12
85.6 kbps DL/85.6 kbps UL

Model	M89
Quad-Band	**850/900/1800/1900 MHz**
Supply Voltage	3.3–4.6 V, typ. 4.0 V
Consumption	3.0 mA @ DRX = 5 3.0 mA @ DRX = 9
SMS/Voice	●
Interfaces	(U)SIM/UART/Audio/RTC/GPIO/Antenna
Protocols	TCP/UDP/PPP/FTP/HTTP(S)/POP3/SMTP(S)/USSD/QNTP/QPING/SSL
Features	eCall DTMF Audio Play/Audio Recording QuecFOTA® QuecFile® CMUX SSL
Certification	**Regulatory:** CE/Anatel

● : Supported.

M08-R Specifications

17.6 mm × 15.7 mm × 2.4 mm
GPRS Multi-slot Class 12
85.6 kbps DL/85.6 kbps UL

Model	M08-R
Quad-Band	**850/900/1800/1900 MHz**
Supply Voltage	3.45–4.25 V, typ. 4.0 V
Consumption	1.3 mA① @ DRX = 5 1.2 mA① @ DRX = 9
SMS/Voice	●
Interfaces	(U)SIM/UART/RTC/Audio/GSM Antenna
Protocols	TCP/UDP/PPP/HTTP/NTP/PING/TTS/FTP/SSL/HTTPS/MQTT/IPv6*
Features	Audio Play/Audio Recording QuecCell® QuecFOTA® DFOTA QuecFile® CMUX QuecOpen® QuecLocator®
Certification	**Regulatory:** CE

● : Supported.
"" means under development.*
① means average value, for reference only.

M66/M66-DS/M66 R2.0/M65 Specifications

17.7 mm × 15.8 mm × 2.3 mm
GPRS Multi-slot Class 12
85.6 kbps DL/85.6 kbps UL

Model	M66	M66-DS	M66 R2.0	M65
Platform	MT6261D	MT6261D	MT6261M	RDA8955L
PA	RF7198 (M66) HS8298H (M66 R1.1)	RF7198	HS8298H	HS8225H
Quad-band	**850/900/1800/1900 MHz**	**850/900/1800/1900 MHz**	**850/900/1800/1900 MHz**	**850/900/1800/1900 MHz**
Supply Voltage	3.3–4.6 V, typ. 4.0 V	3.3–4.6 V, typ. 4.0 V	3.3–4.6 V, typ. 4.0 V	3.45–4.25 V, typ. 4.0 V
Consumption	1.3 mA @ DRX = 5 1.2 mA @ DRX = 9	1.3 mA @ DRX = 5 1.2 mA @ DRX = 9	1.3 mA @ DRX = 5 1.2 mA @ DRX = 9	1.2 mA @ DRX = 5 1.1 mA @ DRX = 9
SMS/Voice	SMS & Voice	SMS & Voice	SMS & Voice	SMS & Voice
Interfaces	(U)SIM/UART/PCM/RTC/ Audio/GSM & BT Antenna/SD	(U)SIM/UART/PCM/RTC/Audio/GSM & BT Antenna/SD/ADC	(U)SIM/UART/PCM/RTC/Audio/ GSM Antenna	(U)SIM/UART/RTC/Audio/ADC/ GSM Antenna
Protocols	TCP/UDP/PPP/FTP/HTTP/ SMTP/CMUX/SSL	TCP/UDP/PPP/FTP/HTTP/ SMTP/CMUX/SSL	TCP/UDP/PPP/FTP/HTTP(S)/ SMTP/CMUX/SSL/MQTT	TCP/UDP/PPP/HTTP/NTP/PING/ FTP/SSL/MQTT/HTTPS/IPv6
Features	eCall DTMF Audio Play/Audio Recording QuecFOTA® QuecCell® QuecFile® QuecOpen® BT 3.0 (SPP/HFP)	eCall DTMF Audio Play/Audio Recording QuecFOTA® QuecCell® QuecFile® QuecOpen® BT 3.0 (SPP/HFP) DSDS	eCall DTMF Audio Play/Audio Recording QuecFOTA® QuecCell® QuecFile® BT 3.0 (SPP/HFP)	DTMF* QuecOpen® Audio Play/Audio Recording QuecCell® QuecFOTA® QuecLocator® QuecFile® CMUX
Certification	**Carrier:** Vodafone/Deutsche Telekom **Regulatory:** GCF/CE/UCRF/FCC/Anatel/ FAC/ICASA **Others:** Bluetooth	**Carrier:** Deutsche Telekom **Regulatory:** CE	**Regulatory:** CE	**Regulatory:** CE/Anatel

"" means under development.*

M95/M95-R Specifications

23.6 mm × 19.9 mm × 2.65 mm
GPRS Multi-slot Class 12
85.6 kbps DL/85.6 kbps UL

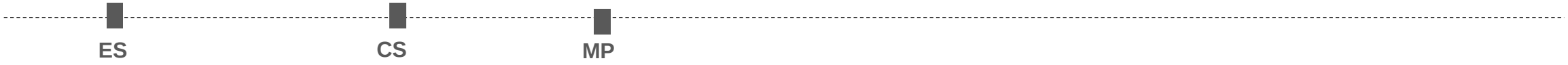
Model	M95	M95-R
Platform	MT6261M	RDA8955L
PA	RF7198 (M95) HS8298H (M95 R2.1)	HS8225H
Quad-band	**850/900/1800/1900 MHz**	**850/900/1800/1900 MHz**
Supply Voltage	3.3–4.6 V, typ. 4.0 V	3.45–4.25 V. typ. 4.0 V
Consumption	1.3 mA @ DRX = 5 1.2 mA @ DRX = 9	1.4 mA @ DRX = 5 1.3 mA @ DRX = 9
SMS/Voice	SMS & Voice	SMS & Voice
Interfaces	(U)SIM/UART/RTC/Antenna/Audio/PCM	(U)SIM/UART/RTC/Antenna/Audio/PCM
Protocols	PPP/TCP/UDP/FTP/HTTP/SMTP/CMUX/SSL/MQTT	PPP/TCP/UDP/FTP/HTTP/CMUX/SSL/MQTT
Features	eCall QuecFOTA® DTMF Dual SIM Audio Play/Audio Recording QuecCell®	QuecFOTA® DFOTA Audio Play/Audio Recording QuecCell®
Certification	**Carrier:** Vodafone/Telenor/Rogers **Regulatory:** GCF/CE/UCRF/FCC/PTCRB/IC/Anatel/NCC/RCM/ICASA **Others:** ATEX	**Regulatory:** CE*

"" means under development.*

M95-R Timeline

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

Project Schedule



ES: Engineering samples ready. Basic functions are available for customers' simple demo purpose.
CS: Commercial samples ready. Stable hardware design and quite stable software design. New software features can be added upon request.
MP: Hardware and software ready for mass production. For certification status, please refer to the "certification schedule".

Regulatory Certification

GSM Roadmap

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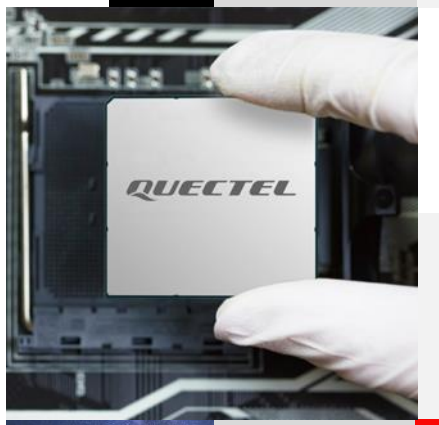
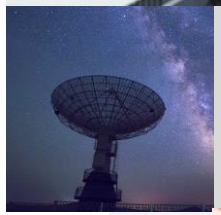
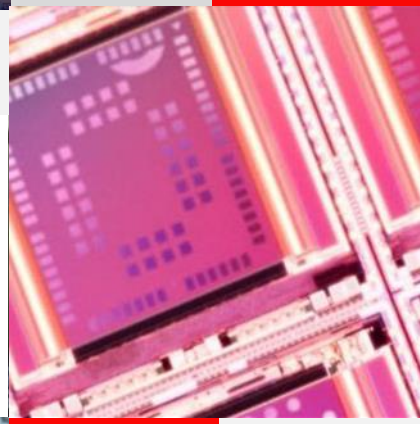
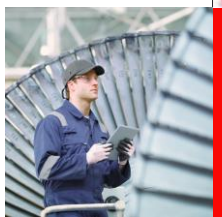


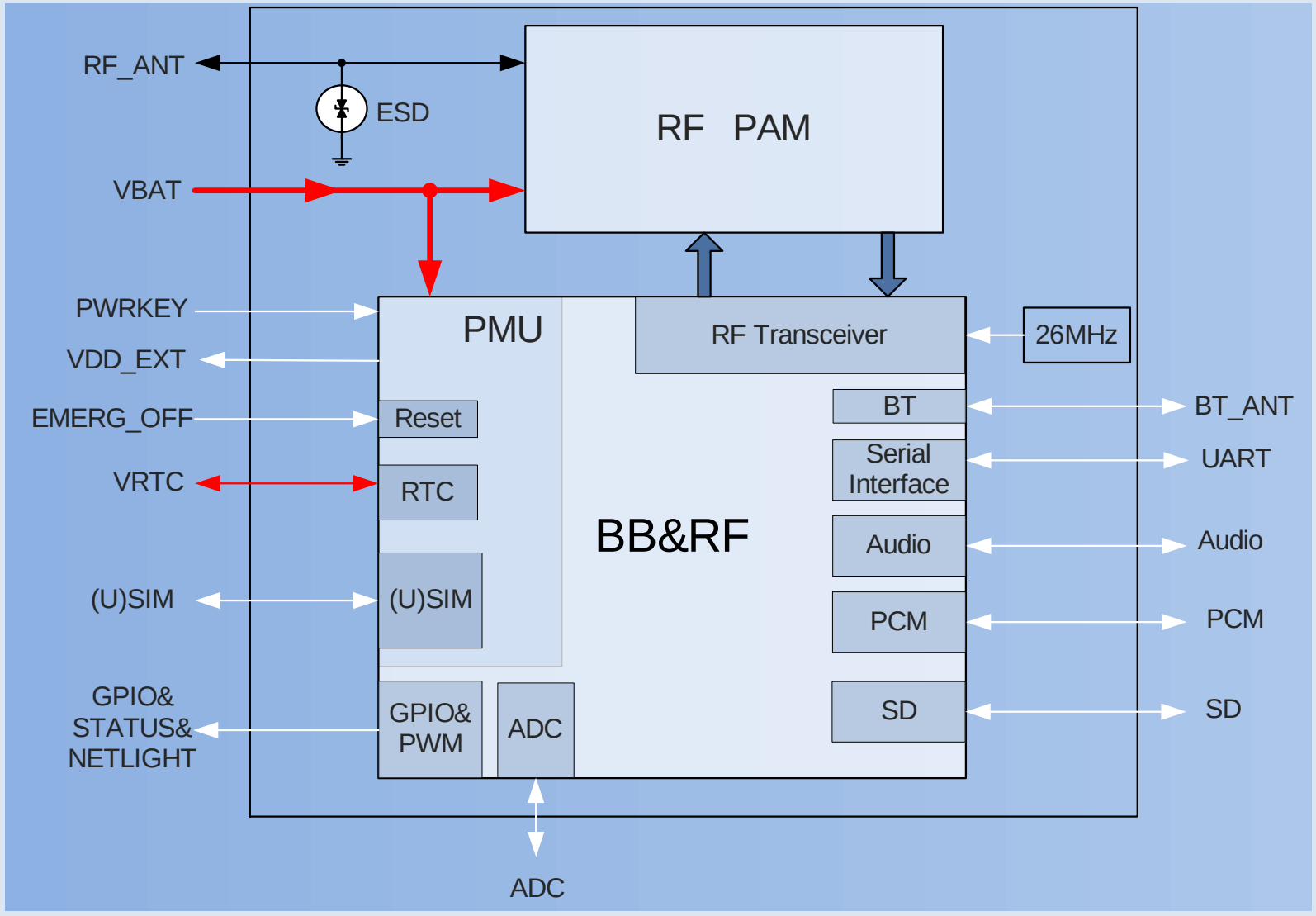






Build a Smarter World

Hardware Architecture



The block diagram is for reference only and varies among different modules.

Software Advantages

Enhanced Features

- QuecFOTA®
- QuecCell®
- QuecFile®
- QuecOpen® Optional
- Bluetooth Classic Optional
- DSDS Optional
- Audio Play/Audio Recording

Quality Guarantee

- Reliable network protocols
- Steady flash protection mechanism
- Superior audio algorithms
- High sensitivity

Abundant Protocols

- TCP/UDP
- PPP
- FTP
- NTP
- PING
- HTTP
- TTS
- SMTP
- MMS
- SSL
- MQTT

Flexible Applications

- eCall
- DTMF

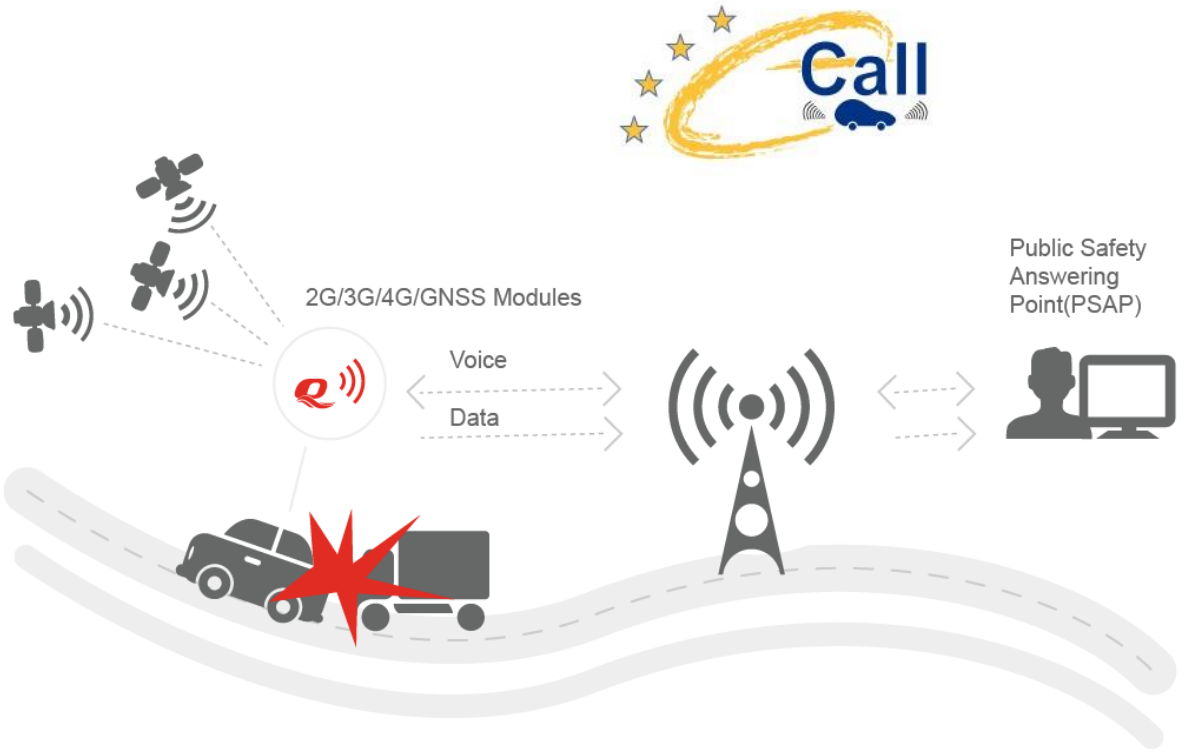
Enhanced AT Commands

- Standard V.25ter AT commands
- 3GPP TS 27.007 (GSM 07.07)
- 3GPP TS 27.005 (GSM 07.05 SMS)
- TCP/IP stack AT commands
- STK (SIM Application Toolkit)
- Quectel defined AT commands

NOTE: "Optional" means supported only on selected module models.

eCall

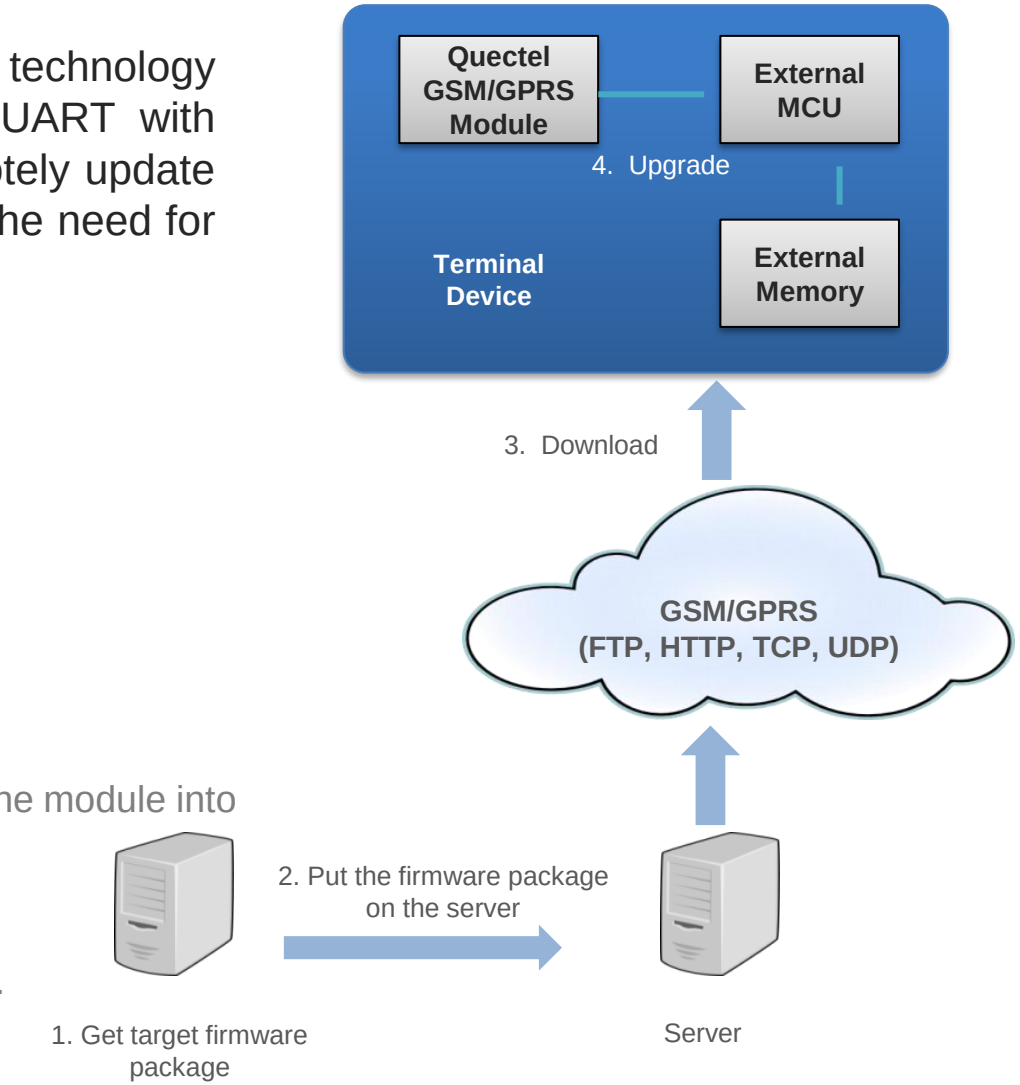
A car will have an electronic safety system automatically calling emergency services in case of a serious accident. Even if the driver is unconscious, the system will inform rescue workers of the crash site's exact whereabouts, and the rescues will be on its way within minutes. The system is named as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



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

QuecFOTA®

FOTA refers to Firmware Upgrade Over-The-Air. QuecFOTA® technology provides a solution to update module's firmware by MCU via UART with Quectel protocols. It enables mobile device manufacturers to remotely update firmware. The new firmware can be delivered over the air, without the need for users to bring the device to a service facility.



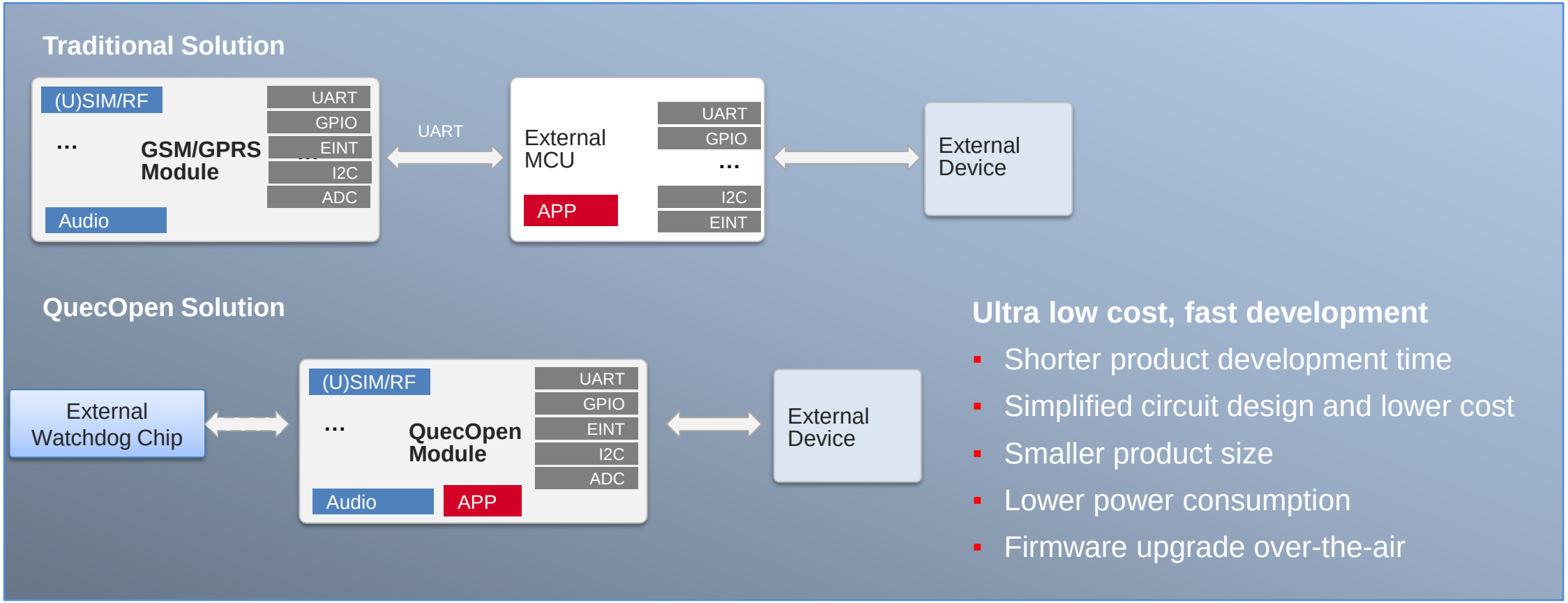
Firmware Upgrade Process via QuecFOTA®

- **Get target firmware package**
- **Put the firmware package on the server**
- **Download the firmware package**
- **QuecFOTA® synchronization**

  To update the firmware, the MCU must synchronize with module and put the module into command mode.
- **QuecFOTA® packet**

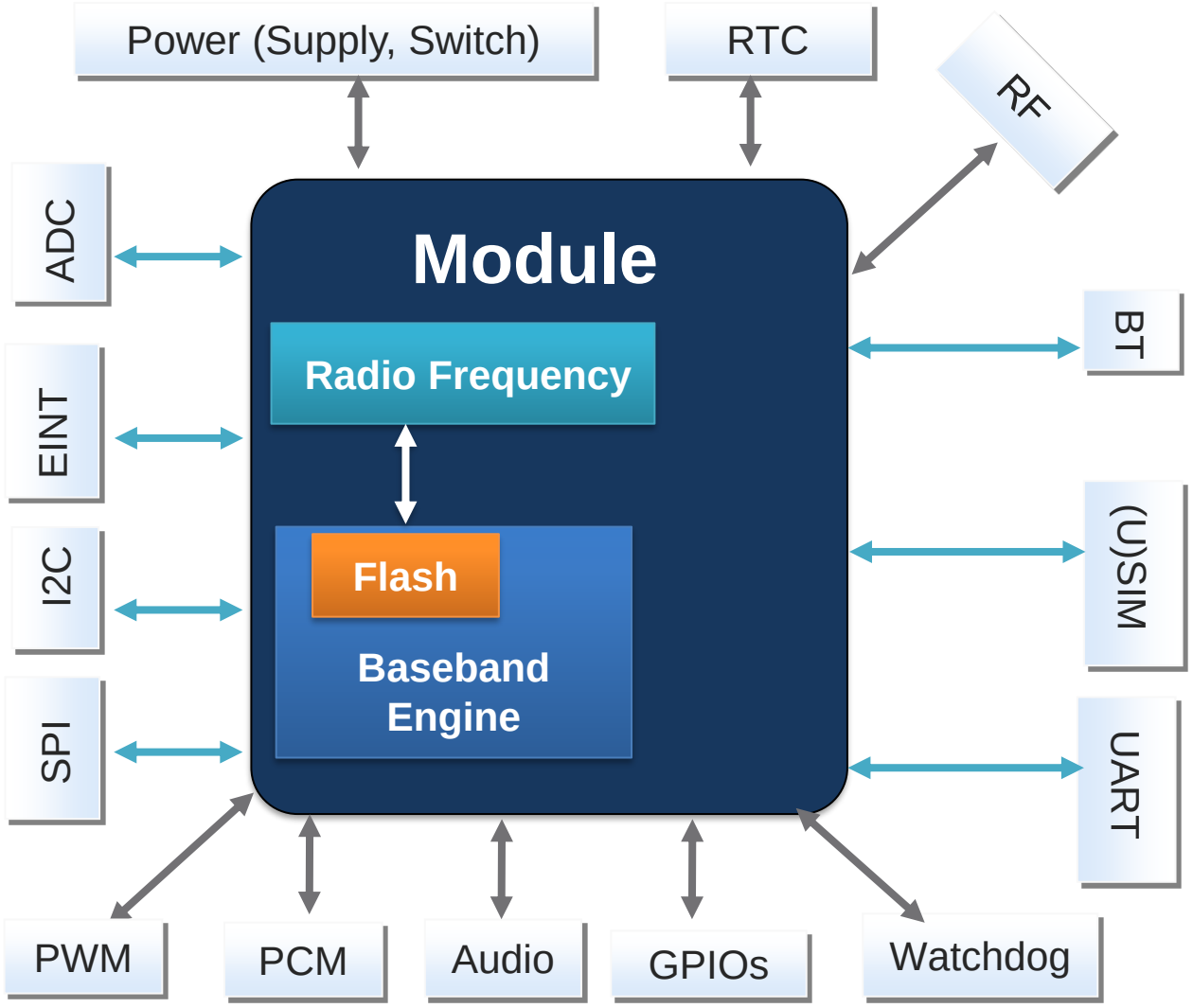
  Then MCU packets the new firmware and sends the packet to the module.

QuecOpen® Solution



QuecOpen® is an embedded development solution for M2M field. As compared with traditional solutions, QuecOpen® solution can make hardware design easier for developers. It enables customers to create innovative applications and then download them directly into Quectel GSM/GPRS modules to run.

QuecOpen® - Hardware Architecture



Hardware Architecture

- Power supply
- Power switch
- RTC
- UART
- ADC
- PCM
- Audio
- BT
- (U)SIM
- GPIOs
- PWM output
- EINT
- I2C
- SPI
- Watchdog
- RF

Bluetooth Function - Bluetooth 3.0 Profiles

Profile: SPP

Laptop or PC

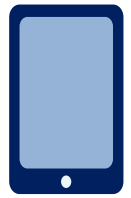
Series Data

Laptop or PC

Profile: HFP

Simple Headset

Hands-Free Unit installed in car



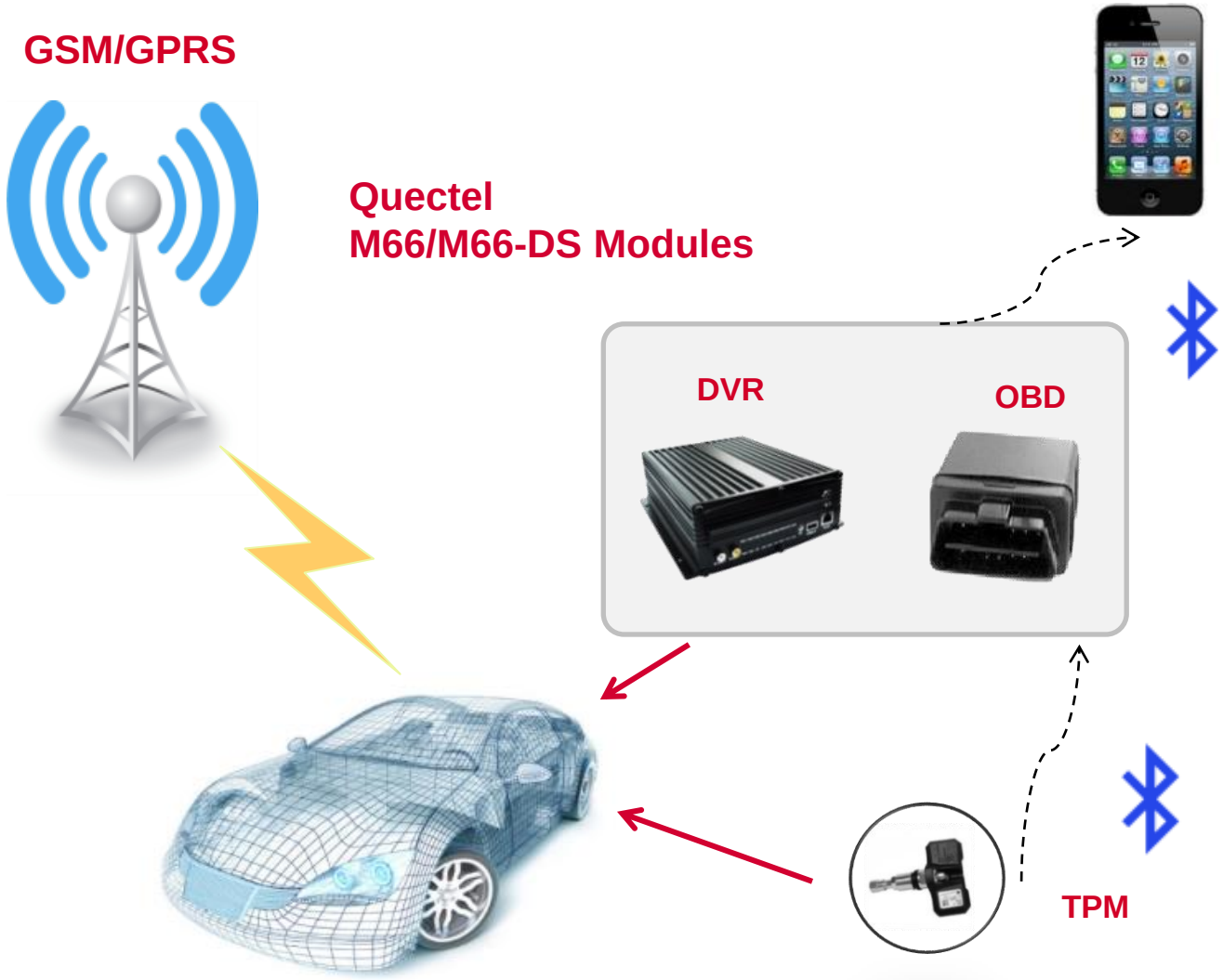
Mobile Phone

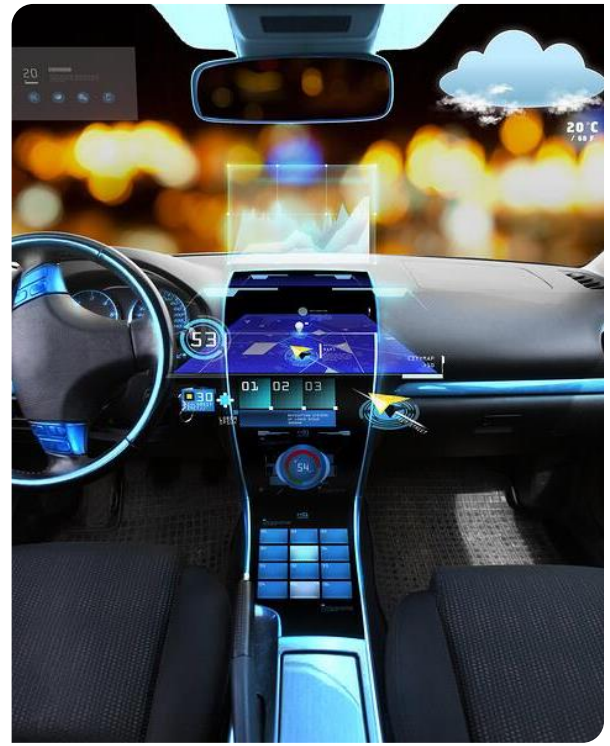
Cellular Connection

Quectel M66/M66-DS/M66 R2.0 Modules

NOTE: BT 3.0 is supported on Quectel M66/M66-DS/M66 R2.0 modules only and is optional on M66 R2.0 module.

Bluetooth Applications

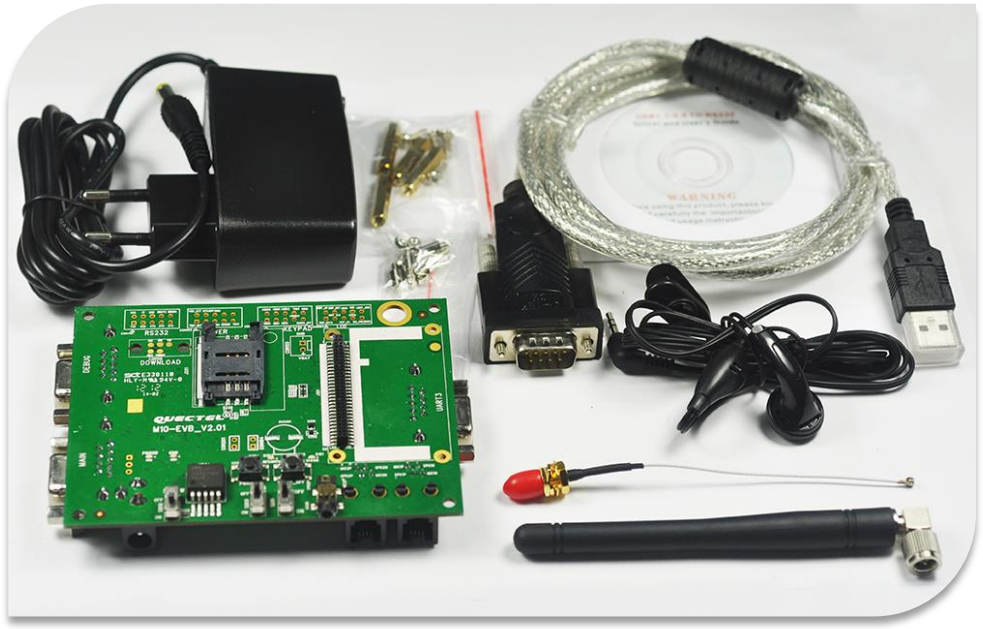




Application on Vehicles

NOTE: BT 3.0 is supported on Quectel M66/M66-DS/M66 R2.0 modules only and is optional on M66 R2.0 module.

Support Package (1)



Technical Materials Package

- Specification
- Hardware Design
- AT Commands Manual
- GSM EVB User Guide
- Reference Design
- Footprint&Part in PADS and Protel Formats

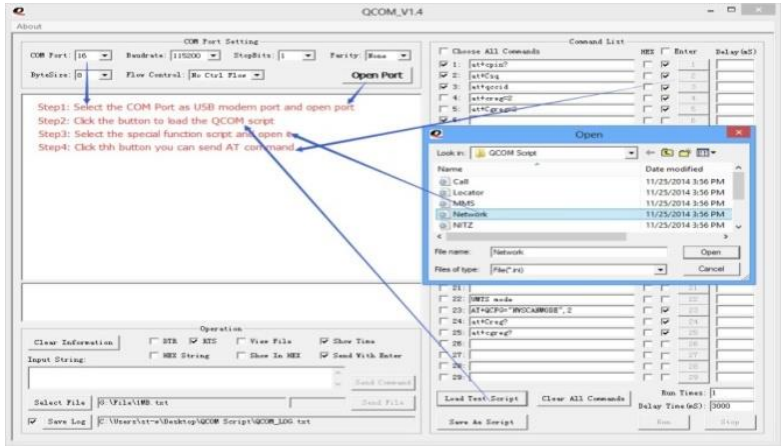
GSM-EVB Kit

- Accessories
  - GSM EVB
  - 5V DC Power Supply
  - GSM Antenna
  - USB Data Cable
  - USB-UART Converter Cable
  - RF Cable for GSM Antenna Connection
  - Disk
- Interfaces
  - RS-232 interfaces
  - Power supply
  - Antenna interface
  - Debug UART interface①
  - Handset interface
  - Earphone interface
- Features
  - Network status LED
  - Power key
  - Emergency off key

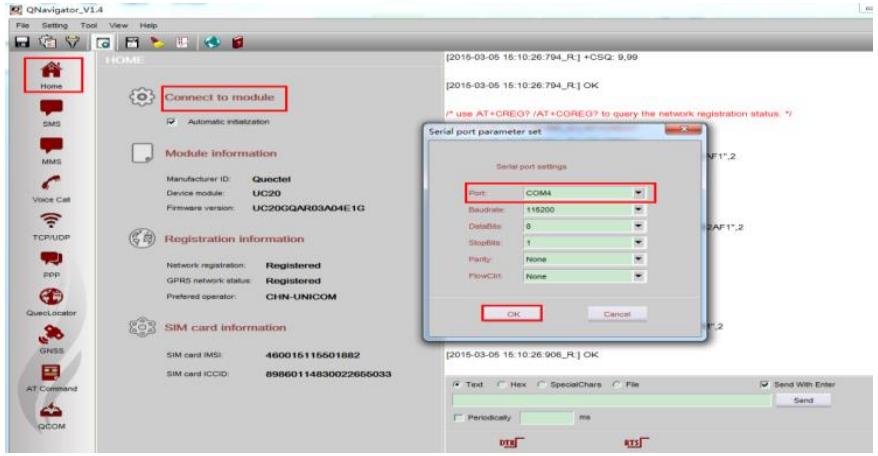
① The debug UART interface of M65 is on TE-A.

Support Package (2)

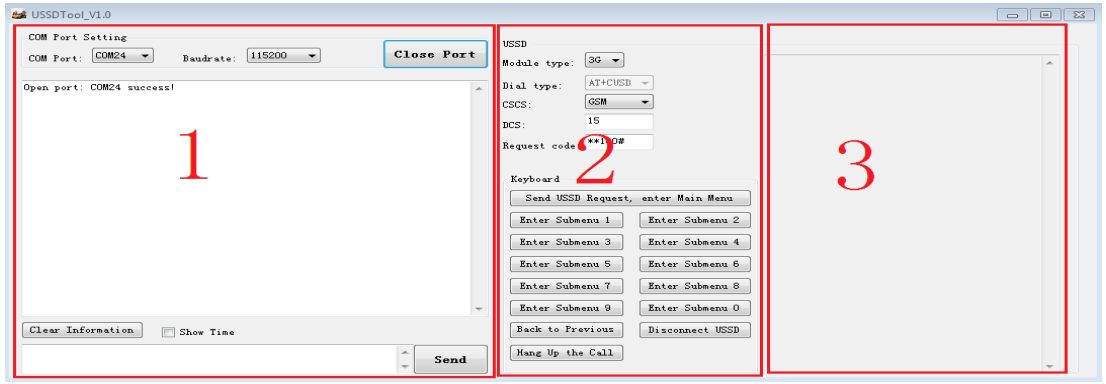
PC tool: QCOM/QNavigator/USSDTool - GSM Test Tool



QCOM

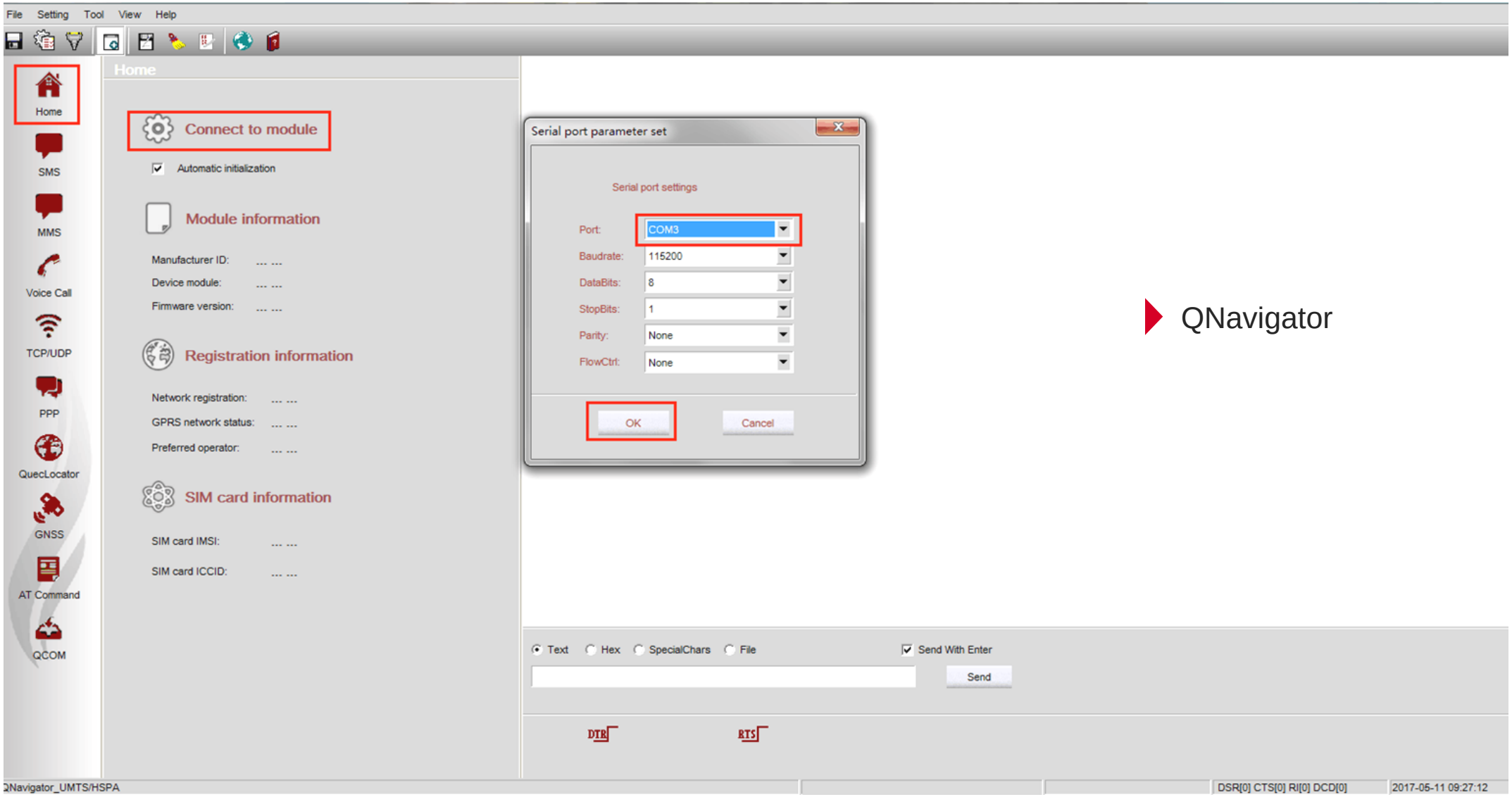


QNavigator



USSDTool

Support Package - QNavigator



- QNavigator

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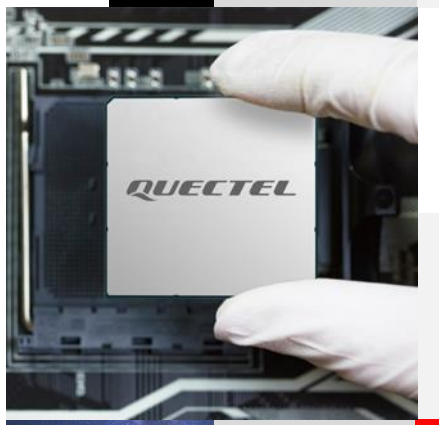
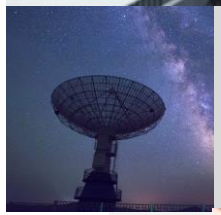
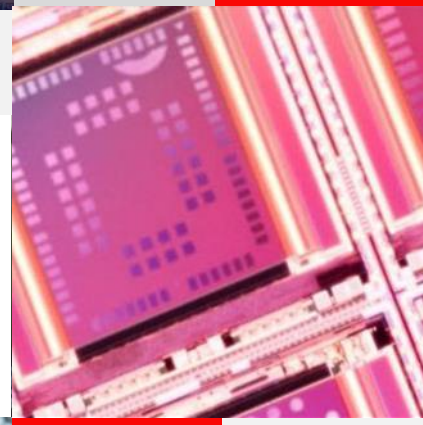
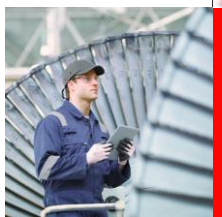








GSM Module Differences Table (1)

		M95	M95-R	M66	M65	M66 R2.0	M66-DS	M89
General Features	Band	850/900/1800/ 1900 MHz	850/900/1800/ 1900 MHz	850/900/1800/ 1900 MHz	850/900/1800/ 1900 MHz	850/900/1800/ 1900 MHz	850/900/1800/ 1900 MHz	850/900/1800/ 1900 MHz
	Flash Size (bit)	24 M	32 M	32 M	32 M	24 M	32 M	32 M
	Dimension	23.6 mm × 19.9 mm × 2.65 mm	23.6 mm × 19.9 mm × 2.65 mm	17.7 mm × 15.8 mm × 2.3 mm	17.7 mm × 15.8 mm × 2.3 mm	17.7 mm × 15.8 mm × 2.3 mm	17.7 mm × 15.8 mm × 2.3 mm	18.8 mm × 27.6 mm × 2.3 mm
Software Functions	SSL/MMS/ SMTP(S)	●	SSL/MMS	●	●	●	●	●
	Audio Recording	●	●	●	●	●	●	-
	Audio Play	●	●	●	●	●	●	●
	TTS	-	-	-	-	-	-	-
	QuecOpen®	-	-	●	●	-	●	-
	UFS	-	-	●	●	-	●	-
	Bluetooth Classic (SPP/HFP)	-	-	●	-	●	●	-

●: Supported.

GSM Module Differences Table (2)

		M95	M95-R	M66	M65	M66 R2.0	M66-DS	M89
Hardware Interfaces	External (U)SIM1	●	●	●	●	●	●	●
	External (U)SIM2	●	-	-	-	-	●	-
	Analog Audio	2	2	1 input, 2 output	1 input, 2 output	1 input, 2 output	1 input, 2 output	1 input, 1 output
	Digital Audio	● (Multiplexing Function)	● (Multiplexing Function)	●	-	●	●	-
	Main UART	●	●	●	●	●	●	●
	Debug UART	●	●	●	●	●	●	●
	Auxiliary UART	-	-	●	●	●	●	-
	SD Card	-	-	-	-	-	●	-
	Temperature Detection	●	-	-	-	-	●	-
	Internal SIM IC	● (Multiplexing Function)	-	-	-	-	-	-
	Bluetooth Classic	-	-	●	-	●	●	-
	I2C	-	-	● (For QuecOpen® Version Only)	● (For QuecOpen® Version Only, Multiplexing Function)	-	● (For QuecOpen® Version Only)	-
	SPI	-	-	● (For QuecOpen® Version Only)	-	-	● (For QuecOpen® Version Only)	-

●: Supported.
"Multiplexing Function" means the function is multiplexed from other interface pins.
"Compatible Function" means the function is not supported by default, but can be supported through hardware modification/upgrade.

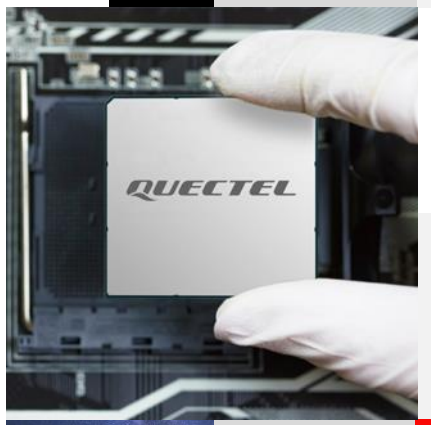
GSM Roadmap

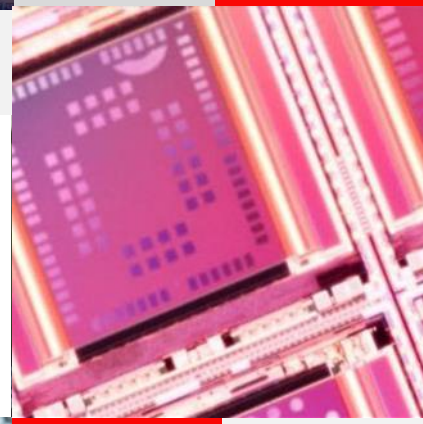
Specifications

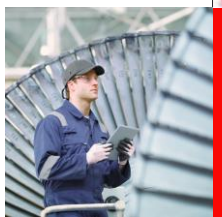
Technologies

GSM Module Differences

Applications







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Target Applications

Smart Metering
(Water/Gas/ Electricity)

Payment
(Wireless POS/ Cash Register)

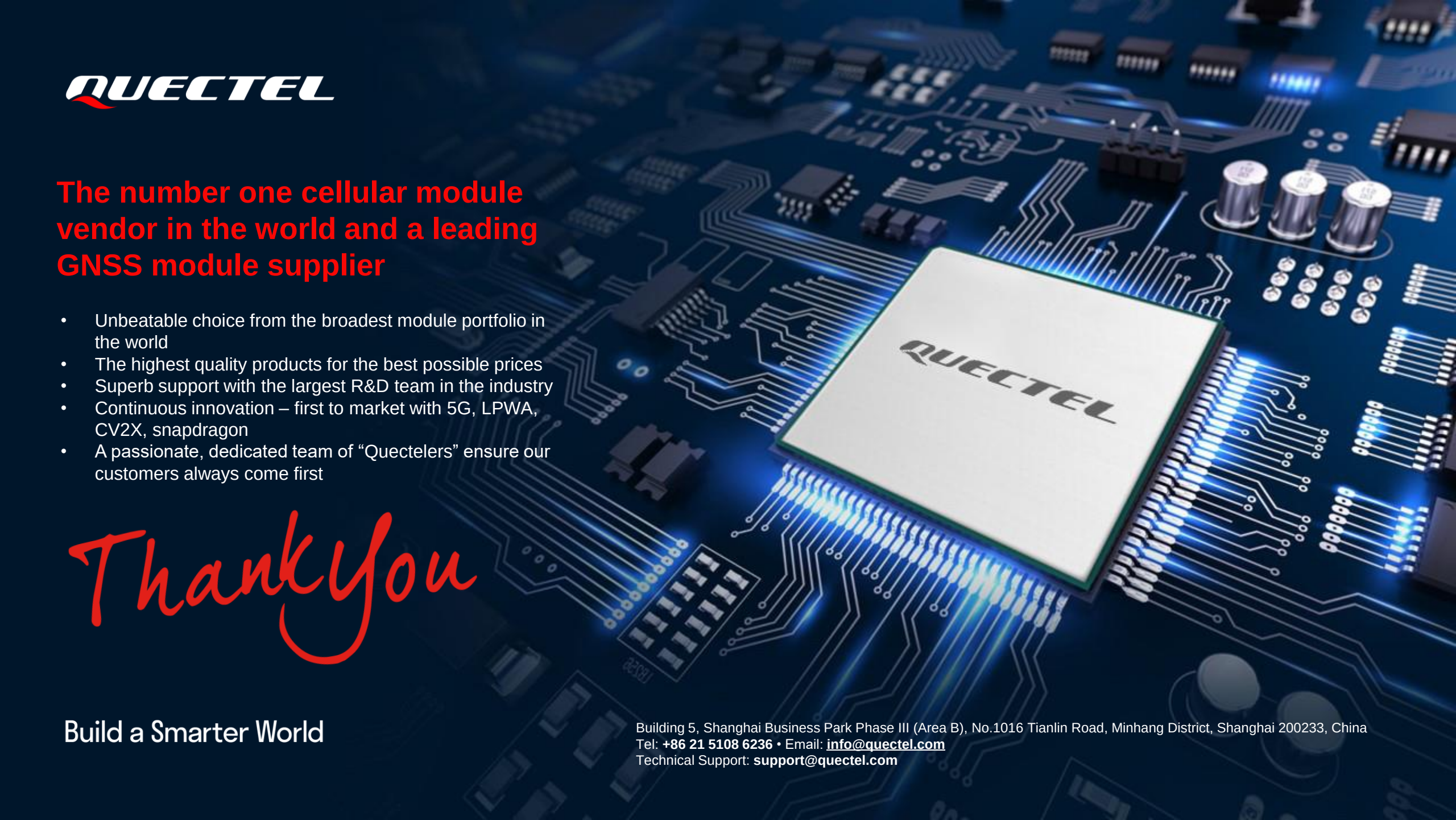
Personnel/ Pet Tracking

Industrial PDA

Security & Surveillance

Telematics

Transportation



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