

# *Global IoT solutions provider*

IoT modules and antenna catalogue



For more information contact us at  
[www.quectel.com](http://www.quectel.com)

# About Quectel Wireless Solutions

Quectel's passion for a smarter world drives us to accelerate IoT innovation. A highly customer-centric organization, we are a global IoT solutions provider backed by outstanding support and services. Our growing global team of 5,600 professionals sets the pace for innovation in cellular, GNSS, Wi-Fi and Bluetooth modules as well as antennas and services.

With regional offices and support across the globe, our international leadership is devoted to advancing IoT and helping build a smarter world.

For more information, please visit: [www.quectel.com](http://www.quectel.com), LinkedIn, Facebook, and X (formerly known as Twitter).

## An extensive IoT products and services portfolio, providing the full solution



### Cellular

- 5G
- 4G
- LPWA
- 3G/ 2G



### Automotive

- 5G/ 4G
- C-V2X
- GNSS
- Cockpit/ IVI
- Wi-Fi & Bluetooth



### Smart

- 5G
- 4G
- Edge compute



### Wi-Fi & Bluetooth

- Wi-Fi 7
- Wi-Fi 6E
- Wi-Fi 6
- Wi-Fi 5
- Wi-Fi 4
- BT 5.x
- Sub-G (LoRa/ HaLow)



### GNSS

- DR positioning
- RTK positioning
- Fusion positioning
- Timing
- Multiple frequency localization
- Single frequency localization
- Integrated antenna
- IMU



### Satellite

- 5G NTN
- Proprietary



### Antenna

- Embedded antenna
- External antenna
- Cable & accessories
- Automotive antenna
- mmWave antenna



### Services

- Antenna (consultation, design, evaluation and testing)
- Certification & testing
- RTK Correction Services

# Contents

---

<b>Quectel's IoT vertical framework</b>	<b>01</b>
<b>5G NR modules</b>	<b>02</b>
<b>5G RedCap modules</b>	<b>10</b>
<b>LTE-A modules</b>	<b>11</b>
<b>LTE modules</b>	<b>16</b>
<b>Smart modules</b>	<b>23</b>
<b>LPWA modules</b>	<b>32</b>
<b>Satellite modules</b>	<b>36</b>
<b>Automotive modules</b>	<b>37</b>
Automotive 5G modules	37
Automotive LTE-A modules	40
Automotive LTE modules	42
Automotive C-V2X modules	43
Automotive Wi-Fi & Bluetooth modules	44
<b>Wi-Fi &amp; Bluetooth modules</b>	<b>46</b>
RF Wi-Fi & Bluetooth modules	46
MCU Wi-Fi & Bluetooth modules	50
MCU Bluetooth modules	52
Sub-GHz modules	53
<b>GNSS modules</b>	<b>54</b>
<b>UMTS/HSPA(+) modules</b>	<b>63</b>
<b>GSM/GPRS modules</b>	<b>64</b>
<b>Antenna range</b>	<b>65</b>
5G antennas	65
Cellular (4G/3G/2G) antennas	66
GNSS antennas	68
Wi-Fi & Bluetooth antennas	70
Combo antennas	71
ISM antennas	71
Tuner	72
Cable assemblies	72

# Quectel's IoT vertical framework



## Intelligent transportation

IoV  
CVI  
Vehicle tracking  
Asset tracking  
Ship tracking  
Fleet management  
OBD  
DVR  
UBI auto insurance



## Smart energy

Electricity meters  
Gas meters  
Water meters  
Thermal meters  
Smart grid  
Wind generators  
Solar power generation  
Charging piles



## Payment

Wireless POS  
Cash registers  
ATM  
Vending machines  
Top-up machines



## Smart city

Street lighting  
Traffic lights  
Sharing economy  
Elevator monitoring  
Smart parking  
Parking meters  
Toll collection systems  
Digital indicators  
Advertising boards  
Smart bins  
LED landscape lighting controls



## Wireless gateways

DTUs  
Consumer routers  
Industrial routers  
VOIP  
Servers  
Wi-Fi hotspots



## Intelligent agriculture & environmental monitoring

Food traceability  
Farmland monitoring  
Farm management  
Meteorological stations  
Wildlife protection  
Farm irrigation  
Environmental monitoring



## Intelligent industry

Industrial PDAs/ scanners  
Industrial PCs  
Industrial computers  
Pipeline monitoring  
Robots  
Flow meters  
Industrial refrigeration  
Indoor air detection  
Water valves/ Pump controls








## Smart life & healthcare

Personal trackers  
Pet trackers  
Wearables  
Home automation  
Elderly monitoring  
Remote medical equipment  
Glucometers  
Blood pressure monitors  
Game machines  
Patient monitoring  
Mobile PCs



## Smart safety





Alarms  
Intrusion detectors  
Smoke detectors  
Gas detectors  
Motion sensors  
Asset protection

Product	RG650E*	RG651E*	RG650V	RM550V-GL*	RM551E-GL*	
						
Form factor	LGA	LGA	LGA	M.2	M.2	
Dimensions (mm)	46.0 × 53.0 × 3.05	46.0 × 53.0 × 3.05	46.0 × 53.0 × 3.05	52.0 × 30.0 × 2.3	52.0 × 30.0 × 2.3	
5G	Sub-6 GHz	Sub-6 GHz & mmWave	Sub-6 GHz	Sub-6 GHz	Sub-6 GHz & mmWave	
Frequency bands (MHz)	-EU (EMEA/ APAC/ Brazil)	5G NR: n1/3/5/7/8/20/26/28/38/40/41/67/75/76*/77/78; LTE-FDD: B1/3/5/7/8/20/28/32; LTE-TDD: B38/40/41/42/43; WCDMA: B1/5/8	/	5G NR: n1/3/5/7/8/20/26/28/38/40/41/71*/75/76*/77/78; LTE-FDD: B1/3/5/7/8/20/28/32/71; LTE-TDD: B38/40/41/42/43; WCDMA: B1/5/8	/	/
	-NA (North America)	5G NR: n2/5/7/12/13/14/25/26/29/30/38/41/48/66/70*/71/77/78; LTE-FDD: B2/4/5/7/12/13/17/14/25/26/29/30/66/71; LTE-TDD: B38/41/42/43/48	5G NR: n2/5/7/12/13/14/25/26/29/30/38/41/48/66/70/71/77/78/257/258/260/261; LTE-FDD: B2/4/5/7/12/13/17/14/25/26/29/30/66/71; LTE-TDD: B38/41/42/43/48	5G NR: n2/5/7/12/13*/14/25/26/29*/30/38/41/48*/66/70*/71/77/78; LTE-FDD: B2/4/5/7/12/13/17/14/25/26/29/30/66/71; LTE-TDD: B38/41/42/43/48	/	/
	-GL (Global)	/	/	/	5G NR: n1/2/3/5/7/8/12/13/14/18/20/25/26/28/29(Rx)/30/38/40/41/48/66/70/71/75/76/77/78/79/257/258/260/261; LTE-FDD: B1/2/3/4/5/7/8/12/13/14/17/18/19/20/25/26/28/29/30/32/66/71; LTE-TDD: B34/38/39/40/41/42/43/48; WCDMA: B1/2/4/5/8/19	5G NR: n1/2/3/5/7/8/12/13/14/18/20/25/26/28/29(Rx)/30/38/40/41/48/66/70/71/75/76/77/78/79/257/258/260/261; LTE-FDD: B1/2/3/4/5/7/8/12/13/14/17/18/19/20/25/26/28/29/30/32/66/71; LTE-TDD: B34/38/39/40/41/42/43/48; WCDMA: B1/2/4/5/8/19
Weight (approx.) g	17.3(RG650E-NA);17.8(RG650E-EU)	TBD	17.8	8.5	8.73	
Operating temperature	-30°C ~ +75°C	-30°C ~ +75°C	-30°C ~ +75°C	-30°C~+75°C	-30° C~+75° C	
Extended temperature	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	-40°C~+85°C	-40°C ~ +85°C	
Control via AT commands	3GPP TS27.007 and Quectel Enhanced AT Commands	3GPP TS27.007 and Quectel Enhanced AT Commands	3GPP TS27.007 and Quectel Enhanced AT Commands	3GPP TS27.007 and Quectel Enhanced AT Commands	3GPP TS27.007 and Quectel Enhanced AT Commands	
<b>Data transmission</b>						
5G	5G SA Sub-6: Max. 7.01 Gbps (DL)/ Max. 1.25 Gbps (UL); 5G NSA Sub-6: Max. 5.47 Gbps (DL)/ Max. 730 Mbps (UL)(RG650E-NA); 5G NSA Sub-6: Max. 5.47 Gbps (DL)/ Max. 733 Mbps (UL)(RG650E-EU)	5G SA Sub-6: Max. 7.01 Gbps (DL)/ Max. 1.25 Gbps (UL) 5G NSA Sub-6: Max. 5.47 Gbps (DL)/ Max. 730 Mbps (UL) 5G SA mmWave: Max. 9.41 Gbps (DL)/ Max. 3.66 Gbps (UL) 5G SA mmWave: Max. 8.61 Gbps (DL)/ Max. 3.54 Gbps (UL) 5G TDD + mmWave: Max. 10.95 Gbps (DL)/Max. 4.79 Gbps (UL) 5G FDD + mmWave: Max. 9.54 Gbps (DL)/Max. 3.79 Gbps (UL)	5G SA Sub-6: Max. 4.67 Gbps (DL)/ Max. 1.25 Gbps (UL); 5G NSA Sub-6: Max. 4.52 Gbps (DL)/ Max. 730 Mbps (UL)	5G SA Sub-6: Max. 4.67 Gbps (DL)/ Max. 1.25 Gbps (UL) 5G NSA Sub-6: Max. 4.52 Gbps (DL)/ Max. 730 Mbps (UL)	NSA Sub-6 GHz: Max. 5.47 Gbps (DL)/ Max. 730 Mbps (UL); SA Sub-6 GHz: Max. 7.01 Gbps (DL)/ Max. 1.25 Gbps (UL); NSA mmWave: Max. 9.41 Gbps (DL)/ 3.66 Gbps (UL)	
LTE	LTE-FDD: Max. 2.0 Gbps (DL)/ Max. 211 Mbps (UL)	LTE-FDD: Max. 2.0 Gbps (DL)/ Max. 200 Mbps (UL)	LTE-FDD: Max. 2.0 Gbps (DL)/ Max. 211 Mbps (UL)	LTE: Max. 2.0 Gbps (DL)/ Max. 211 Mbps (UL)	LTE: Max. 2.0 Gbps (DL)/ Max. 211 Mbps (UL)	
UMTS(Mbps)	WCDMA: Max. 42 (DL)/Max. 5.76 (UL)(RG650E-EU)	/	WCDMA: Max. 42 (DL)/Max. 5.76 (UL)(RG650V-EU)	WCDMA: Max. 42 Mbps(DL)/ Max. 5.76 Mbps (UL)	WCDMA: Max. 42 Mbps(DL)/ Max. 5.76 Mbps (UL)	
SMS	•	•	•	•	•	
Protocols	TCP/UDP/FTP/HTTP/HTTPS/PING/SMS	TCP/UDP/FTP/HTTP/HTTPS/PING/SMS	TCP/UDP/FTP/HTTP/HTTPS/PING/SMS	TCP/UDP/FTP/HTTP/HTTPS/PING/SMS	TCP/UDP/FTP/HTTP/HTTPS/PING/SMS	
<b>Interfaces</b>						
(U)SIM	1.8/ 3.0 V × 1; 1.8 V × 1 (eSIM external)	1.8/ 3.0 V × 1; 1.8 V × 1 (eSIM external)	1.8/ 3.0 V × 1; 1.8 V × 1 (eSIM external)	1.8/3.0 V × 2 (eSIM optional)	1.8/3.0 V × 2 (eSIM optional)	
UART	× 3 (RG650E-NA)	× 3	× 3	/	/	
USB	2.0/3.0/3.1	2.0/3.0/3.1	2.0/3.0/3.1	2.0/3.0/3.1	2.0/3.0/3.1	
PCIe	2-Lane × 2, 1-Lane × 1	2-Lane × 2, 1-Lane × 1	2-Lane × 2, 1-Lane × 1	1-Lane × 1	1-Lane × 1	
PCM	× 2	× 2	× 2	/	/	
I2C	× 2	× 2	× 2	/	/	
SPI	× 2	× 2	× 2	/	/	
GPIO	•	•	•	•	•	
ADC	• (RG650E-NA)	•	•	•	•	
SD card	/	/	/	/	/	
RESET_N	•	•	•	•	•	
Antenna	Sub-6 GHz: × 8; GNSS: × 1	Sub-6 GHz: × 8; GNSS: × 1; mmWave: × 8	Sub-6 GHz: × 8; GNSS: × 1	Sub-6 GHz: × 4; GNSS: × 2	Sub-6: × 4; GNSS: × 2; mmWave: × 3	
<b>Enhanced features</b>						
MIMO	Sub-6: DL 4 × 4, UL 2 × 2	Sub-6: DL 4 × 4, UL 2 × 2 mmWave: DL 2 × 2, UL 2 × 2	Sub-6: DL 4 × 4, UL 2 × 2	Sub-6: DL 4 × 4, UL 2 × 2	Sub-6: DL 4 × 4, UL 2 × 2	
Voice	Optional	Optional	Optional	Optional	Optional	
DTMF	Dual-tone Multi-frequency	Dual-tone Multi-frequency	Dual-tone Multi-frequency	Dual-tone Multi-frequency	Dual-tone Multi-frequency	
DFOTA	Delta Firmware over the Air	Delta Firmware over the Air	Delta Firmware over the Air	Delta Firmware over the Air	Delta Firmware over the Air	
GNSS	Optional	Optional	Optional	Optional	Optional	
(U)SIM card detection	•	•	•	•	•	
<b>Electrical features</b>						
Supply voltage range	3.3 V ~ 4.4 V, typ. 3.8 V	3.3 V ~ 4.4 V, typ. 3.8 V	3.3 V ~ 4.4 V, typ. 3.8 V	3.135 V ~ 4.4 V, typ. 3.7 V	3.135 V ~ 4.4 V, typ. 3.7 V	
Power consumption	TBD	TBD	0.22 mA @ Power off 2.7 mA @ Sleep	TBD	TBD	
<b>Software features</b>						
USB serial driver	Windows 8.1/10/11, Linux 2.6 ~ 6.7, Android 4.x ~ 13.x	Windows 8.1/10/11, Linux 2.6 ~ 6.7, Android 4.x ~ 13.x	Windows 8.1/10/11, Linux 2.6 ~ 6.7, Android 4.x ~ 13.x	Windows 8.1/10/11, Linux 2.6 ~ 6.7, Android 4.x ~ 13.x	Windows 8.1/10/11, Linux 2.6 ~ 6.7, Android 4.x ~ 13.x	
GNSS driver	Android 4.x ~ 13	Android 4.x ~ 13	Android 4.x ~ 13	Android 4.x ~ 13	Android 4.x ~ 13	
RIL driver	Android 4.x ~ 13	Android 4.x ~ 13	Android 4.x ~ 13	Android 4.x ~ 13	Android 4.x ~ 13	
NDIS driver*	Windows 8.1/10/11	Windows 8.1/10/11	Windows 8.1/10/11	Windows 8.1/10/11	Windows 8.1/10/11	
MBIM driver	Windows 8.1/10/11, Linux 3.18-6.7	Windows 8.1/10/11, Linux 3.18-6.7	Windows 8.1/10/11, Linux 3.18-6.7	Windows 8.1/10/11, Linux 3.18 ~ 6.7	Windows 8.1/10/11, Linux 3.18 ~ 6.7	
Gobinet driver*	Linux 2.6-6.7	Linux 2.6-6.7	Linux 2.6-6.7	Linux 2.6-6.7	Linux 2.6 ~ 6.7	
QMI_WWAN driver	Linux 3.4-6.7	Linux 3.4-6.7	Linux 3.4-6.7	Linux 3.4-6.7	Linux 3.4 ~ 6.7	
PCIe driver	Linux 3.10-6.7	Linux 3.10-6.7	Linux 3.10-6.7	Linux 3.10-6.7	Linux 3.10 ~ 6.7	
Certifications <sup>5</sup>	GCF/CE*/ RCM*/FCC*/IC*/PTCRB*/ Verizon*/AT&T*/T-Mobile*	Quectel will provide technical support for customer to certify RG651E-NA based device directly	CE/RCM/GCF/Verizon*/AT&T*/T-Mobile*/PTCRB/FCC/IC/Dish*	CE*/RCM*/PTCRB*/FCC*/IC*	Quectel will provide technical support for customer to certify RM551E-GL based device directly	
Recommended applications	Industrial routers, industrial PDAs, rugged tablet PCs and digital signage					

Note 1: Optional.  
Note 2: May depend on modules' variant.



\* Planning/ Under development/ In progress  
• Supported

# 5G NR modules

Product	RG520N	RG520F	RG525F	RG530F	
					
Form factor	LGA	LGA	LGA	LGA	
Dimensions (mm)	41.0 × 44.0 × 2.75	41.0 × 44.0 × 2.75	48.0 × 45.0 × 2.85	48.0 × 45.0 × 2.85	
5G	Sub-6 GHz	Sub-6 GHz	Sub-6 GHz	Sub-6 GHz & mmWave	
Frequency bands (MHz)	-EU(EMEA/ APAC / Brazil)	5G NR: n1/3/5/7/8/20/28/38/40/41/75/76/77/78; LTE-FDD: B1/3/5/7/8/20/28/32; LTE-TDD: B38/40/41/42/43; WCDMA: B1/5/8	5G NR: n1/3/5/7/8/20/28/38/40/41/75/76/77/78; LTE-FDD: B1/3/5/7/8/20/28/32; LTE-TDD: B38/40/41/42/43; WCDMA: B1/5/8	/	5G NR: n1/3/5/7/8/20/28/38/40/41/75/76/77/78/257/258/260/261; LTE-FDD: B1/3/5/7/8/20/28/32; LTE-TDD: B38/40/41/42/43; WCDMA: B1/5/8
	-EB(EMEA/ APAC / Brazil)	5G NR: n1/3/5/7/8/20/28/38/40/41/71/75/76/77/78; LTE-FDD: B1/3/5/7/8/20/28/32/71; LTE-TDD: B38/40/41/42/43/71; WCDMA: B1/5/8	5G NR: n1/3/5/7/8/20/28/38/40/41/71/75/76/77/78; LTE-FDD: B1/3/5/7/8/20/28/32/71; LTE-TDD: B38/40/41/42/43; WCDMA: B1/5/8	/	/
	-GT(Europe)	5G NR: n48/77/78; LTE-TDD: B42/43/48	/	/	/
	-NA (North America)	5G NR: n2/5/7/12/13/14/25/26/29/30/38/41/48/66/70/71/77/78; LTE-FDD: B2/4/5/7/12/13/14/17/25/26/29/30/66/71; LTE-TDD: B38/41/42/43/48; LAA: B46	5G NR: 2/5/7/12/13/14/25/26/29/30/38/41/48/66/70/71/77/78; LTE-FDD: B2/4/5/7/12/13/14/17/25/26/29/30/66/71; LTE-TDD: B38/41/42/43/48; LAA: B46	5G NR: n2/5/7/12/13/14/25/26/29/30/38/41/48/66/70/71/77/78; LTE-FDD: B2/4/5/7/12/13/14/17/25/26/29/30/66/71; LTE-TDD: B38/41/42/43/48; LAA: B46	5G NR: n2/5/7/12/13/14/25/26/29/30/38/41/48/66/70/71/77/78/257/258/260/261; LTE-FDD: B2/4/5/7/12/13/14/17/25/26/29/30/66/71; LTE-TDD: B38/41/42/43/48; LAA: B46
	-LA (Latin America)	5G NR: n2/5/7/8/28/40/66/78; LTE-FDD: B2/4/5/7/8/26/28/66; LTE-TDD: B40/42; WCDMA: B2/4/5	/	/	/
Weight (approx.) g	11	11	14.1	14.1	
Operating temperature	-30°C ~ +75°C	-30°C ~ +75°C	-30°C ~ +75°C	-30°C ~ +75°C	
Extended temperature	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	
Control via AT commands	3GPP TS27.007 and Quectel Enhanced AT Commands	3GPP TS27.007 and Quectel Enhanced AT Commands	3GPP TS27.007 and Quectel Enhanced AT Commands	3GPP TS27.007 and Quectel Enhanced AT Commands	
Data transmission <sup>1</sup>					
5G	5G SA Sub-6: Max. 2.4 Gbps (DL)/Max. 900 Mbps (UL); 5G NSA Sub-6: Max. 3.4 Gbps (DL)/Max. 550 Mbps (UL)	5G SA Sub-6: Max. 4.0 Gbps (DL)/Max. 900 Mbps (UL); 5G NSA Sub-6: Max. 4.0 Gbps (DL)/Max. 550 Mbps (UL)	5G SA Sub-6: Max. 4.0 Gbps (DL)/Max. 900 Mbps (UL); 5G NSA Sub-6: Max. 4.0 Gbps (DL)/Max. 550 Mbps (UL)	5G SA Sub-6: Max. 4.0 Gbps (DL)/ Max. 900 Mbps (UL); 5G NSA Sub-6: Max. 4.0 Gbps (DL)/ Max. 550 Mbps (UL); 5G NSA mmWave: Max. 8.8 Gbps (DL)/ Max. 2.6 Gbps (UL); 5G TDD+mmWave: Max. 8.0 Gbps(DL)/ Max. 3.4 Gbps (UL); 5G FDD+ mmWave: Max. 8.9 Gbps (DL)/ Max. 2.7 Gbps (UL)	
LTE	LTE-FDD: Max. 1.6 Gbps (DL)/ Max. 200 Mbps (UL)	LTE-FDD: Max. 2.0 Gbps (DL)/ Max. 200 Mbps (UL)	LTE-FDD: Max. 2.0 Gbps (DL)/ Max. 200 Mbps (UL)	LTE-FDD: Max. 2.0 Gbps (DL)/ Max. 200 Mbps (UL)	
UMTS	WCDMA: Max. 42 Mbps(DL)/Max. 5.76 Mbps(UL) (RG520N-EU/RG520N-EB/RG520N-LA)	WCDMA: Max. 42 Mbps(DL)/ Max. 5.76 Mbps(UL)(RG520F-EU)	/	WCDMA: Max. 42 Mbps(DL)/ Max. 5.76Mbps (UL)(RG530F-EU)	
SMS	•	•	•	•	
Protocols	TCP/UDP/FTP/HTTP/HTTPS/PING/SMS	TCP/UDP/FTP/HTTP/HTTPS/PING/SMS	TCP/UDP/FTP/HTTP/HTTPS/PING/SMS	TCP/UDP/FTP/HTTP/HTTPS/PING/SMS	
Interfaces					
(U)SIM	× 2, 1.8 V/2.95 V	× 2, 1.8 V/2.95 V	× 2, 1.8 V/ 2.95 V	× 2, 1.8 V/2.95 V	
UART	× 3	× 3	× 3	× 3	
USB	2.0/3.0/3.1	2.0/3.0/3.1	2.0/3.0/3.1	2.0/3.0/3.1	
PCIe	Gen3 × 2Lane	Gen3 × 2Lane	Gen3 × 2Lane	Gen3 × 2Lane	
PCM	•	•	•	•	
I2C	× 1	× 1	× 1	× 1	
SPI	•	•	•	•	
GPIO	•	•	•	•	
ADC	× 2	× 2	× 2	× 2	
SD card	•	•	•	•	
RESET_N	•	•	•	•	
Antenna	Cellular: 4, GNSS: × 1 (RG520N-EB/RG520N-NA/RG520N-GT/RG520N-LA); Cellular: 4 + 2 (optional), GNSS: × 1 (RG520N-EU)	Cellular: 4 + 2 (optional), GNSS: × 1 (RG520F-EU); Cellular: 4, GNSS: × 1 (RG520F-NA)	Cellular: sub6G: 8, GNSS: × 1	Cellular: sub6G × 4 + 2 (optional), mmWave × 8, GNSS: × 1 (RG530F-EU); Cellular: sub6G × 4, mmWave × 8, GNSS: × 1 (RG530F-NA)	
Enhanced features					
MIMO	Sub-6: DL 4 × 4, UL 2 × 2	Sub-6: DL 4 × 4, UL 2 × 2	Sub-6: DL 4 × 4, UL 2 × 2	Sub-6: DL 4 × 4, UL 2 × 2; mmWave: DL 2 × 2, UL 2 × 2	
Voice	Optional	Optional	Optional	Optional	
DTMF	Dual-tone Multi-frequency	Dual-tone Multi-frequency	Dual-tone Multi-frequency	Dual-tone Multi-frequency	
DFOTA	Delta Firmware over the Air	Delta Firmware over the Air	Delta Firmware over the Air	Delta Firmware over the Air	
GNSS	GPS/GLONASS/BDS/Galileo/QZSS	GPS/GLONASS/BDS/Galileo/QZSS	GPS/GLONASS/BDS/Galileo/QZSS	GPS/GLONASS/BDS/Galileo/QZSS	
(U)SIM card detection	•	•	•	•	
Electrical features					
Supply voltage range	3.3 V ~ 4.4 V, typ. 3.8 V	3.3 V ~ 4.4 V, typ. 3.8 V	3.3 V ~ 4.4 V, typ. 3.8 V	3.3 V ~ 4.4 V, typ. 3.8 V	
Power consumption	0.142 mA @ power off, 2.6 mA @ sleep (typ.) <sup>4</sup> (RG520N-EU/RG520N-EB/ RG520N-GT/RG520N-NA); TBD (RG520N-LA)	0.142 mA @ power off, 2.6 mA @ sleep (typ.) <sup>4</sup>	104 μA @ Power off, 5.78 mA @ Sleep, 43.31 mA @ USB 2.0, Idle, 63.74 mA @ USB 3.0, Idle (RG525F-NA)	110 μA @Power off, 3.96mA@Sleep, 33.5mA@USB2.0, Idle, 50.58mA@USB3.0, Idle	
Software features					
USB serial driver	Windows 8.1/10/11, Linux 2.6~6.7, Android 4.x ~ 13	Windows 8.1/10/11, Linux 2.6~6.7, Android 4.x ~ 13	Windows 8.1/10/11, Linux 2.6~6.7, Android 4.x ~ 13	Windows 8.1/10/11, Linux 2.6~6.7, Android 4.x ~ 13	
GNSS driver/ RIL driver	Android 4.x ~ 13	Android 4.x ~ 13	Android 4.x ~ 13	Android 4.x ~ 13	
NDIS driver	/	/	/	/	
MBIM driver*	Windows 8.1/10/11, Linux 3.18~6.7	Windows 8.1/10/11, Linux 3.18~6.7	Windows 8.1/10/11, Linux 3.18~6.7	Windows 8.1/10/11, Linux 3.18~6.7	
Gobinet driver	Linux 2.6~6.7	Linux 2.6~6.7	Linux 2.6~6.7	Linux 2.6~6.7	
QMI_WWAN driver	Linux 3.4~6.7	Linux 3.4~6.7	Linux 3.4~6.7	Linux 3.4~6.7	
PCIe driver	Windows 10/11, Linux 3.10~6.7	Windows 10/11, Linux 3.10~6.7	Windows 10/11, Linux 3.10~6.7	Windows 10/11, Linux 3.10~6.7	
Certifications <sup>4</sup>	Telstra/GCF/CE/RCM/Anatel/Verizon/T-Mobile/AT&T/PTCRB/FCC/IC	CE/RCM/UKCA/GCF/FCC/PTCRB	Rogers/GCF/PTCRB/FCC/IC/T-Mobile	Quectel will provide technical support for customer to certify RG530F based device directly	
Recommended applications	Industrial routers, industrial PDAs, rugged tablet PCs and digital signage				

Note 1: Excl. China/Japan.  
 Note 2: n48/77/78 support 8RX.  
 Note 3: means the data transmission is theoretical data rate and depends on network conditions.  
 Note 4: May depend on modules' variant.

\* Planning/ Under development/ In progress  
 • Supported

Product		RM520N	RM530N-GL
			
Form factor		M.2	M.2
Dimensions (mm)		52.0 × 30.0 × 2.3	52.0 × 30.0 × 2.3
5G		Sub-6 GHz	Sub-6 GHz/mmWave
Frequency bands (MHz)	-GL (Global)	5G NR: n1/2/3/5/7/8/12/13/14/18/20/25/26/28/29/30/38/40/41/48/66/70/71/75/76/77/78/79; LTE-FDD: B1/2/3/4/5/7/8/12/13/14/17/18/19/20/25/26/28/29/30/32/66/71; LTE-TDD: B34/38/39/40/41/42/43/48; LAA: B46; WCDMA: B1/2/4/5/8/19	5G NR: n1/2/3/5/7/8/12/13/14/18/20/25/26/28/29/30/38/40/41/48/66/70/71/75/76/77/78/79/257/258/260/261; LTE-FDD: B1/2/3/4/5/7/8/12/13/14/17/18/19/20/25/26/28/29/30/32/66/71; LTE-TDD: B34/38/39/40/41/42/43/48; LAA: B46; WCDMA: B1/2/4/5/8/19
	-EU (EMEA/ APAC/ Brazil)	5G NR: n1/3/5/7/8/20/28/38/40/41/71/75/76/77/78; LTE-FDD: B1/3/5/7/8/20/28/32/71; LTE-TDD: B38/40/41/42/43; WCDMA: B1/5/8	/
Weight (approx.) g		8.7	8.8
Operating temperature		-30°C ~ +75°C	-30°C ~ +75°C
Extended temperature		-40°C ~ +85°C	-40°C ~ +85°C
Control via AT commands		3GPP TS27.007 and Quectel Enhanced AT Commands	3GPP TS27.007 and Quectel Enhanced AT Commands
<b>Data transmission<sup>2</sup></b>			
5G		5G SA Sub-6: Max. 2.4 Gbps (DL)/Max. 900 Mbps (UL); 5G NSA Sub-6: Max. 3.4 Gbps (DL)/Max. 550 Mbps (UL)	5G SA Sub-6: Max. 2.4 Gbps (DL)/Max. 900 Mbps (UL); 5G NSA Sub-6: Max. 3.4 Gbps (DL)/Max. 550 Mbps (UL); 5G NSA mmWave: Max. 4.0 Gbps (DL)/Max. 1.4 Gbps (UL)
LTE		LTE-FDD: Max. 1.6 Gbps (DL)/Max. 200 Mbps (UL)	LTE-FDD: Max. 1.6 Gbps (DL)/Max. 200 Mbps (UL)
UMTS(Mbps)		WCDMA: Max. 42 (DL)/Max. 5.76 (UL)	WCDMA: Max. 42 (DL)/Max. 5.76 (UL)
SMS		•	•
Protocols		TCP/UDP/FTP/HTTP/HTTPS/PING/SMS	TCP/UDP/FTP/HTTP/HTTPS/PING/SMS
<b>Interfaces</b>			
(U)SIM		× 2	× 2
USB		2.0/3.0/3.1	2.0/3.0/3.1
PCIe		PCIe 3.0	PCIe 3.0
Antenna		Sub-6/GNSS × 4 (RM520N-CN/RM520N-GL); Sub-6/GNSS: 4+1 (optional) (RM520N-EU)	Sub-6/GNSS × 4, mmWave × 2
<b>Enhanced features</b>			
MIMO		Sub-6: DL 4 × 4, UL 2 × 2	Sub-6: DL 4 × 4, UL 2 × 2 mmWave: DL 2 × 2, UL 2 × 2
Voice		Optional <sup>3</sup>	Optional
DTMF		Dual-tone Multi-frequency	Dual-tone Multi-frequency
DFOTA		Delta Firmware over the Air	Delta Firmware over the Air
GNSS		GPS/GLONASS/BDS/Galileo/QZSS	GPS/GLONASS/BDS/Galileo/QZSS
(U)SIM card detection		•	•
<b>Electrical features</b>			
Supply voltage range		3.135 V ~ 4.4 V, typ. 3.7 V	3.135 V ~ 4.4 V, typ. 3.7 V
Power consumption		195 µA @ Power off; 4.7 mA @ Sleep; 40mA @ USB 2.0, Idle; 60 mA @ USB 3.0, Idle	173µA@Power off; 5.1mA@Sleep; 51mA@USB2.0, Idle; 69.4mA@USB3.0, Idle
<b>Software features</b>			
USB serial driver		Windows 8.1/10/11, Linux 2.6~6.7, Android 4.x ~ 13	Windows 8.1/10/11, Linux 2.6~6.7, Android 4.x ~ 13
GNSS driver		Android 4.x ~ 13	Android 4.x ~ 13
RIL driver		Android 4.x ~ 13	Android 4.x ~ 13
NDIS driver		Windows 8.1/10/11	Windows 8.1/10/11
MBIM driver		Windows 8.1/10/11, Linux 3.18~6.7	Windows 8.1/10/11, Linux 3.18~6.7
Gobinet driver		Linux 2.6~6.7	Linux 2.6~6.7
QMI_WWAN driver		Linux 3.4~6.7	Linux 3.4~6.7
PCIe driver		Windows 10/11, Linux 3.10~6.7	Windows 10/11, Linux 3.10~6.7
Certifications <sup>3</sup>		T-Mobile/Verizon/AT&T/NTT DOCOMO/Deutsche Telekom/Telefónica/Telstra/KT/GCF/PTCRB/CE/Anatel/CCC/RCM/IC/FCC/JATE/TELEC/KC/NCC/SRRC	Quectel will provide technical support for customer to certify RM530N-GL based device directly
Recommended applications		Industrial routers, industrial PDAs, rugged tablet PCs and digital signage	

Note 1: Excl. China/Japan.




Note 2: means the data transmission is theoretical data rate and depends on network conditions.

Note 3: May depend on modules' variant.

\* Planning/ Under development/ In progress

• Supported

# 5G NR modules

Product	RG500Q-EA/RG502Q-EA	RG500Q-EU/RG501Q-EU/RG502Q-EU	RG500Q-GT/RG502Q-GT
			
Form factor	LGA	LGA	LGA
Dimensions (mm)	41.0 × 44.0 × 2.75	41.0 × 44.0 × 2.75	41.0 × 44.0 × 2.75
5G	Sub-6 GHz	Sub-6 GHz	Sub-6 GHz
Frequency bands (MHz)	5G NR: n41/77/78/79/1/3/5/7/8/20/28/38/40; LTE-FDD: B1/3/5/7/8/18/19/20/26/28/32; LTE-TDD: B34/38/39/40/41/42/43; WCDMA: B1/3/5/6/8/19	5G NR: n1/3/5/7/8/20/28/38/40/41/77/78; LTE-FDD: B1/3/5/7/8/20/28/32; LTE-TDD: B38/40/41/42/43; WCDMA: B1/5/8	5G NR: n78; LTE-TDD: B42/43
Region	EMEA/ APAC	EMEA/APAC(exclude China)/Brazil	Global TDD Network
Weight (approx.) g	11	11	11
Operating temperature	-30°C ~ +75°C	-30°C ~ +75°C	-30°C ~ +75°C
Extended temperature	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C
Control via AT commands	3GPP TS27.007 and Quectel Enhanced AT Commands	3GPP TS27.007 and Quectel Enhanced AT Commands	3GPP TS27.007 and Quectel Enhanced AT Commands
<b>Data transmission<sup>1</sup></b>			
5G	5G SA Sub-6: Max. 2.1 Gbps (DL)/Max. 900 Mbps (UL) (RG500Q-EA); Max. 4.2 Gbps (DL)/Max. 900 Mbps (UL) (RG502Q-EA) 5G NSA Sub-6: Max. 2.5 Gbps (DL)/Max. 600/650 Mbps (UL) <sup>2</sup> (RG500Q-EA); Max. 5.0 Gbps (DL)/Max. 600/650 Mbps (UL) <sup>2</sup> (RG502Q-EA)	5G SA Sub-6: Max. 2.1 Gbps (DL)/Max. 900Mbps (UL) (RG500Q-EU/RG501Q-EU); Max. 4.2 Gbps (DL)/Max. 900Mbps (UL) (RG502Q-EU) 5G NSA Sub-6: Max. 2.5 Gbps (DL)/Max. 600/650 Mbps (UL) <sup>2</sup> (RG500Q-EU); Max. 3.3 Gbps (DL)/Max. 600/650 Mbps (UL) <sup>2</sup> (RG501Q-EU); Max. 5.0 Gbps (DL)/Max. 600/650 Mbps (UL) <sup>2</sup> (RG502Q-EU)	5G SA Sub-6: Max. 2.1 Gbps (DL)/Max. 900 Mbps (UL) (RG500Q-GT); Max. 4.2 Gbps (DL)/Max. 900 Mbps (UL) (RG502Q-GT)
LTE	LTE-FDD: Max. 1 Gbps (DL)/Max. 200 Mbps (UL) (RG500Q-EA); LTE-FDD: Max. 2 Gbps (DL)/Max. 200 Mbps (UL) (RG502Q-EA)	LTE-FDD: Max. 1 Gbps (DL)/Max. 200 Mbps (UL) (RG500Q-EU); LTE-FDD: Max. 2 Gbps (DL)/Max. 200 Mbps (UL) (RG501Q-EU/RG502Q-EU)	LTE-TDD: Max. 700 Mbps (DL)/Max. 116 Mbps (UL) (RG500Q-GT); LTE-TDD: Max. 1.2 Gbps (DL)/Max. 116 Mbps (UL) (RG502Q-GT)
UMTS(Mbps)	WCDMA: Max. 42 (DL)/Max. 5.76 (UL)	WCDMA: Max. 42 (DL)/Max. 5.76 (UL)	/
SMS	•	•	•
Protocols	TCP/UDP/FTP/HTTP/HTTPS/PING/SMS	TCP/UDP/FTP/HTTP/HTTPS/PING/SMS	TCP/UDP/FTP/HTTP/HTTPS/PING/SMS
<b>Interfaces</b>			
(U)SIM	× 2, 1.8 V/2.95 V	× 2, 1.8 V/2.95 V	× 2, 1.8 V/2.95 V
UART	× 3	× 3	× 3
USB	2.0/3.0/3.1	2.0/3.0/3.1	2.0/3.0/3.1
PCIe	PCIe Gen3 × 2 Lane	PCIe Gen3 × 2 Lane	PCIe Gen3 × 2 Lane
RGMI	•	•	•
PCM	•	•	•
I2C	× 1	× 1	× 1
SPI	•	•	•
GPIO	•	•	•
ADC	× 2	× 2	× 2
SD card	•	•	•
RESET_N	•	•	•
Antenna	Cellular: 6 + 2 (n79), GNSS: × 1	Cellular: 4+2(B32), GNSS: × 1	Cellular: 4
<b>Enhanced features</b>			
MIMO	4 × 4 DL	4 × 4 DL	4 × 4 DL
Voice	Optional	Optional	Optional
DTMF	Dual-tone Multi-frequency	Dual-tone Multi-frequency	Dual-tone Multi-frequency
DFOTA	Delta Firmware over the Air	Delta Firmware over the Air	Delta Firmware over the Air
GNSS	GPS/GLONASS/BDS/Galileo	GPS/GLONASS/BDS/Galileo	/
(U)SIM card detection	•	•	•
<b>Electrical features</b>			
Supply voltage range	3.3 V ~ 4.3 V, typ. 3.8 V	3.3 V ~ 4.3 V, typ. 3.8 V	3.3 V ~ 4.3 V, typ. 3.8 V
Power consumption	0.045 mA @ Power off 1.5 mA @ Sleep, Typ. 25 mA @ Idle	0.045 mA @ Power off 1.5 mA @ Sleep, Typ. 25 mA @ Idle	0.045 mA @ Power off 1.5 mA @ Sleep, Typ. 25 mA @ Idle
<b>Software features</b>			
USB serial driver	Windows 8.1/10/11, Linux 2.6-6.7, Android 4.x ~ 13	Windows 8.1/10/11, Linux 2.6-6.7, Android 4.x ~ 13	Windows 8.1/10/11, Linux 2.6-6.7, Android 4.x ~ 13
GNSS driver	Android 4.x ~ 13	Android 4.x ~ 13	Android 4.x ~ 13
RIL driver	Android 4.x ~ 13	Android 4.x ~ 13	Android 4.x ~ 13
NDIS driver	Windows 8.1/10/11	Windows 8.1/10/11	Windows 8.1/10/11
MBIM driver	Windows 8.1/10/11, Linux 3.18-6.7	Windows 8.1/10/11, Linux 3.18-6.7	Windows 8.1/10/11, Linux 3.18-6.7
Gobinet driver	Linux 2.6-6.7	Linux 2.6-6.7	Linux 2.6-6.7
QMI_WWAN driver	Linux 3.4-6.7	Linux 3.4-6.7	Linux 3.4-6.7
PCIe driver	Windows 10/11, Linux 3.10-6.7	Windows 10/11, Linux 3.10-6.7	Windows 10/11, Linux 3.10-6.7
Certifications <sup>3</sup>	China Telecom/China Mobile/China Unicom/KT/SKT/LGU+/CCC/SRRC/NAL/CE/RCM/KC/JATE/TELEC	CE/RCM/GCF	CE
Recommended applications	Industrial routers, industrial PDAs, rugged tablet PCs and digital signage		




Note 1: means the data transmission is theoretical data rate and depends on network condition.

Note 2: 600 Mbps is the typical value; while 650 Mbps is the theoretical data rate when the UL 256QAM of both LTE and 5G NR are enabled (LTE UL 256QAM in EN-DC is disabled by default and has not been deployed by operators, and it is not fully tested).

Note 3: May depend on modules' variant.

\* Planning/ Under development/  
In progress  
• Supported



Product	RM500Q-AE/RM502Q-AE/RM505Q-AE	RM500Q-GL	RM510Q-GL
			
Form factor	M.2	M.2	M.2
Dimensions (mm)	52.0 × 30.0 × 2.3	52.0 × 30.0 × 2.3	52.0 × 30.0 × 2.3
5G	Sub-6 GHz	Sub-6 GHz	Sub-6 GHz/ mmWave
Frequency bands (MHz)	5G NR: n1/2/3/5/7/8/12/20/25/28/38/40/41/48/66/71/77/78/79; LTE-FDD: B1/2/3/4/5/7/8/12(17)/13/14/18/19/20/25/26/28/29/30/32/66/71; LTE-TDD: B34/38/39/40/41/42/43/48; LAA: B46 <sup>2</sup> ; WCDMA: B1/2/3/4/5/6/8/19	5G NR: n1/2/3/5/7/8/12/20/25/28/38/40/41/48*/66/71/77/78/79; LTE-FDD: B1/2/3/4/5/7/8/12/13/14/17/18/19/20/25/26/28/29/30/32/66/71; LTE-TDD: B34/38/39/40/41/42/43/48; LAA: B46; WCDMA: B1/2/3/4/5/6/8/19;	5G NR: n1/2/3/5/7/8/12/20/25/28/38/40/41/48/66/71/77/78/79/257/258/260/261; LTE-FDD: B1/2/3/4/5/7/8/12(17)/13/14/18/19/20/25/26/28/29/30/32/66/71; LTE-TDD: B34/38/39/40/41/42/43/48; LAA: B46; WCDMA: B1/2/3/4/5/6/8/19
Region	Global (except for China)	Global (except for US)	Global
Weight (approx.) g	8.7	9	9.1
Operating temperature	-30°C ~ +70°C	-30°C ~ +75°C	-30°C ~ +70°C
Extended temperature	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C
Control via AT commands	3GPP TS27.007 and Quectel Enhanced AT Commands	3GPP TS27.007 and Quectel Enhanced AT Commands	3GPP TS27.007 and Quectel Enhanced AT Commands
<b>Data transmission<sup>1</sup></b>			
5G	5G SA Sub-6: Max. 2.1 Gbps (DL)/Max. 450 Mbps (UL) (RM500Q-AE/RM505Q-AE); Max. 4.2 Gbps (DL)/Max. 450 Mbps (UL) (RM502Q-AE) 5G NSA Sub-6: Max. 2.5 Gbps (DL)/Max. 650 Mbps (UL) (RM500Q-AE/RM505Q-AE); Max. 5 Gbps (DL)/Max. 650 Mbps (UL) (RM502Q-AE)	5G SA Sub-6: Max. 2.1 Gbps (DL)/Max. 900 Mbps (UL); 5G NSA Sub-6: Max. 2.5 Gbps (DL)/Max. 600/650 Mbps (UL) <sup>2</sup>	5G SA Sub-6: Max. 4.2 Gbps (DL)/Max. 450 Mbps (UL); 5G NSA Sub-6: Max. 5.0 Gbps (DL)/Max. 600/650 Mbps (UL) <sup>2</sup> ; 5G NSA mmWave: Max. 7.5 Gbps (DL)/Max. 2.9 Gbps (UL)
LTE	LTE-FDD: Max. 1 Gbps (DL)/Max. 200 Mbps (UL) (RM500Q-AE/RM505Q-AE); LTE-FDD: Max. 2 Gbps (DL)/Max. 200 Mbps (UL) (RM502Q-AE)	LTE-FDD: Max. 1 Gbps (DL)/Max. 200 Mbps (UL)	LTE-FDD: Max. 2 Gbps (DL)/Max. 200 Mbps (UL)
UMTS(Mbps)	WCDMA: Max. 42 (DL)/Max. 5.76 (UL)	WCDMA: Max. 42 (DL)/Max. 5.76 (UL)	WCDMA: Max. 42 (DL)/Max. 5.76 (UL)
SMS	•	•	•
Protocols	TCP/UDP/FTP/HTTP/HTTPS/PING/SMS	TCP/UDP/FTP/HTTP/HTTPS/PING/SMS	TCP/UDP/FTP/HTTP/HTTPS/PING/SMS
<b>Interfaces</b>			
(U)SIM	× 1, 1.8 V/3.0 V (RM500Q-AE/RM502Q-AE) × 2, 1.8 V/3.0 V (RM505Q-AE)	× 2, 1.8 V/3.0 V	× 1, 1.8 V/3.0 V
USB	2.0/3.0/3.1	2.0/3.0/3.1	2.0/3.0/3.1
PCIe	PCIe Gen3 × 1 Lane	PCIe Gen3 × 1 Lane	PCIe Gen3 × 1 Lane
PCM	× 1	× 1	× 1
GPIO	•	•	•
RESET_N	•	•	•
Antenna	Cellular: × 4, GNSS: × 1	Cellular: × 4, GNSS: × 1	Cellular: × 4, GNSS: × 1; mmWave IF *4 pairs
<b>Enhanced features</b>			
MIMO	DL: 4 × 4, UL: 2 × 2 (Only n41)	DL: 4 × 4, UL: 2 × 2	Sub-6: DL 4 × 4, UL 2 × 2 (Only n41); mmWave: DL 2 × 2, UL 2 × 2
Voice	Optional	Optional	Optional
DTMF	Dual-tone Multi-frequency	Dual-tone Multi-frequency	Dual-tone Multi-frequency
DFOTA	Delta Firmware over the Air	Delta Firmware over the Air	Delta Firmware over the Air
GNSS	GPS/ GLONASS/ BeiDou/ Galileo	GPS/ GLONASS/ BeiDou/ Galileo	GPS/ GLONASS/ BeiDou/ Galileo
(U)SIM card detection	•	•	•
<b>Electrical features</b>			
Supply voltage range	3.135 V ~ 4.4 V, typ. 3.7 V	3.135 V ~ 4.4 V, typ. 3.7 V	3.135 V ~ 4.4 V, typ. 3.7 V
Power consumption	82 µA @Power off 4.2 mA @Sleep, Typ. 32 mA, USB 2.0 @Idle 55 mA, USB 3.0 @Idle	70 µA @Power off 4.0 mA @Sleep, Typ. 32 mA, USB 2.0 @Idle 54 mA, USB 3.0 @Idle	82 µA @ Power off 5.11 mA @ Sleep 39 mA @ USB 2.0, Idle 54.5 mA @ USB 3.0, Idle
<b>Software features</b>			
USB serial driver	Windows 8.1/10/11, Linux 2.6~6.7, Android 4.x ~ 13	Windows 8.1/10/11, Linux 2.6~6.7, Android 4.x ~ 13	Windows 8.1/10/11, Linux 2.6~6.7, Android 4.x ~ 13
GNSS driver	Android 4.x ~ 13	Android 4.x ~ 13	Android 4.x ~ 13
RIL driver	Android 4.x ~ 13	Android 4.x ~ 13	Android 4.x ~ 13
NDIS driver	Windows 8.1/10/11	Windows 8.1/10/11	Windows 8.1/10/11
MBIM driver	Windows 8.1/10/11, Linux 3.18~6.7	Windows 8.1/10/11, Linux 3.18~6.7	Windows 8.1/10/11, Linux 3.18~6.7
Gobinet driver	Linux 2.6~6.7	Linux 2.6~6.7	Linux 2.6~6.7
QMI_WWAN driver	Linux 3.4~6.7	Linux 3.4~6.7	Linux 3.4~6.7
PCIe driver	Windows 10/11, Linux 3.10~6.7	Windows 10/11, Linux 3.10~6.7	Windows 10/11, Linux 3.10~6.7
Certifications <sup>4</sup>	Deutsche Telekom/Verizon/ AT&T-Mobile/Telus/Telstra/CE/RCM/GCF/PTCRB/FCC/IC/JATE/TELEC/NCC	China Telecom/China Mobile/China Unicom/Deutsche Telecom/KT/SKT/LGU+/CE/RCM/GCF/KC/CCC/SRRC/NAL	CE/RCM/GCF/PTCRB/FCC/IC/
Recommended applications	Industrial routers, industrial PDAs, rugged tablet PCs and digital signage		

Note 1: means the data transmission is theoretical data rate and depends on network conditions.




Note 2: 600 Mbps is the typical value; while 650 Mbps is the theoretical data rate when the UL 256QAM of both LTE and 5G NR are enabled. LTE UL 256QAM in EN-DC is disabled by default and has not been deployed by operators, and it is not fully tested.

Note 3: RM500Q-AE/RM505Q-AE only support 2 × 2 MIMO.

Note 4: May depend on modules' variant.


\* Planning/ Under development/  
In progress  
• Supported

# 5G NR modules

Product	RG500L	RG600L-EU	RG620T	
				
Form factor	LGA	LGA	LGA	
Dimensions (mm)	41.0 × 44.0 × 2.75	44.0 × 53.0 × 2.95	44.0 × 53.0 × 2.95	
5G	Sub-6 GHz	Sub-6 GHz	Sub-6 GHz	
Frequency bands (MHz)	-EU (EMEA/Oceania/Brazil)	RG600L-EUAA: 5G NR: n1/3/5/7/8/20/28/38/40/41/75/76/77/78; LTE-FDD: B1/3/5/7/8/20/28/32; LTE-TDD: B38/40/41/42/43; WCDMA: B1/5/8	RG600L-EUAA: 5G NR: n1/3/5/7/8/20/28/38/40/41/75/76/77/78; LTE-FDD: B1/3/5/7/8/20/28/32; LTE-TDD: B38/40/41/42/43; WCDMA: B1/5/8 RG600L-EUAB: 5G NR: n1/3/5/7/8/20/28/38/40/41/71/77/78; LTE FDD: B1/3/5/7/8/20/28/71; LTE TDD: B38/40/41/42/43; WCDMA: B1/5/8	5G NR: n1/3/5/7/8/20/28/38/40/41/71 (optional)/75/76/77/78/79 (optional); LTE-TDD: B38/40/41/42/43; LTE-FDD: B1/3/5/7/8/20/28/32/71 (optional); LAA: B46 (optional); WCDMA: B1/5/8
	-NA (North America)	5G NR: n2/5/7/12/25/38/41/48/66/71/77/78; LTE-FDD: B2/4/5/7/12/13/14/17/25/26/29/30/66/71; LTE-TDD: B38/41/42/43/48; LAA: B46	/	5G NR: n2/5/7/12/13/14/25/26/29/30/38/41/48/66/70/71/77/78; LTE-TDD: B38/41/42/43/48; LTE-FDD: B2/4/5/7/12/13/14/17/25/26/29/30/66/70/71; LAA: B46
	-AR (India)	5G: n1/3/5/8/40/78; LTE-FDD: B1/3/5/8; LTE-TDD: B40	/	/
	-JIO (India)	5G: n78	/	/
	Weight (approx.) g	13 (RG500L-EU/RG500L-NA/RG500L-AR); 10.91 (RG500L-JIO)	16.56	16.82
Operating temperature	-30°C ~ +70°C	-30°C ~ +70°C	-30°C ~ +70°C	
Extended temperature	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	
Control via AT commands	3GPP TS27.007 and Quectel Enhanced AT Commands	3GPP TS27.007 and Quectel Enhanced AT Commands	3GPP TS27.007 and Quectel Enhanced AT Commands	
Data transmission <sup>1</sup>				
5G	5G SA Sub-6: Max. 4.67 Gbps(DL)/Max. 1.25 Gbps(UL); 5G NSA Sub-6: Max. 4.67 Gbps(DL)/Max. 825 Mbps(UL) (RG500L-EU/RG500L-NA); 5G NSA Sub-6: Max. 3.75 Gbps (DL)/Max. 725 Mbps(UL) (RG500L-AR)	5G SA Sub-6: Max. 4.67 Gbps(DL)/Max. 1.25 Gbps(UL); 5G NSA Sub-6: Max. 4.67 Gbps(DL)/Max. 825 Mbps(UL)	5G SA Sub-6: Max. 7.01 Gbps(DL)/Max. 2.5 Gbps(UL); 5G NSA Sub-6: Max. 5.87 Gbps(DL)/Max. 1.46 Gbps(UL)	
LTE	LTE-FDD: Max. 1.6 Gbps(DL)/Max. 211 Mbps(UL) (RG500L-EU/RG500L-NA/RG500L-AR)	LTE-FDD: Max. 1.6 Gbps(DL)/Max. 211 Mbps(UL)	LTE-FDD: Max. 1.6 Gbps(DL)/Max. 211 Mbps(UL)	
UMTS(Mbps)	WCDMA: Max. 42 (DL)/Max. 5.76 (UL) (RG500L-EU/RG500L-NA)	WCDMA: Max. 42.2(DL)/Max. 11.5(UL)	WCDMA: Max. 42.2(DL)/Max. 11.5(UL) (RG620T-EU)	
SMS	•	•	•	
Protocols	HTTPS/TCP/UDP/FTP/HTTP/PING/FTPS/SSL/NTP	HTTPS/TCP/UDP/FTP/HTTP/PING/FTPS/SSL/NTP	HTTPS/TCP/UDP/FTP/HTTP/PING/FTPS/SSL/NTP	
Interfaces				
(U)SIM	× 2 (Dual SIM single standby)	× 2 (Dual SIM single standby)	× 2 (Dual SIM single standby)	
UART	× 3 (including 1 Bluetooth UART)	× 3 (including 1 Bluetooth UART)	× 3 (including 1 Bluetooth UART)	
USB	× 1 (USB 2.0/3.0)	× 1 (USB 2.0/3.0)	× 1 (USB 2.0/3.2)	
PCIe	PCIe 3 × 4 (RG500L-EU/RG500L-NA), PCIe 3 × 2 (RG500L-AR); PCIe 3 × 1 (RG500L-JIO)	PCIe 3 × 4	PCIe 4 × 1, PCIe 3 × 2	
I2S/GMII	/	/	× 2	
PCM	•	•	•	
I2C	× 1	× 4	× 4	
SPI	× 2 (RG500L-EU/RG500L-NA/RG500L-AR); × 1 (RG500L-JIO)	× 2	× 2	
GPIO	•	× 70 (Includes alternate function)	•	
ADC	× 3 (RG500L-EU/RG500L-NA/RG500L-AR); × 2 (RG500L-JIO)	× 3	× 7	
SD card	• (RG500L-NA/RG500L-JIO)	•	•	
RESET_N	•	•	•	
Antenna	Cellular: × 8, GNSS: × 1 (RG500L-EU/RG500L-NA); Cellular: × 8, (RG500L-AR); Cellular: × 4, (RG500L-JIO)	Cellular: × 8	Cellular: × 8, GNSS(optional): × 1 (RG620T-EU); Cellular: × 8, GNSS: × 1 (RG620T-NA);	
Enhanced features				
MIMO	DL: 4 × 4, UL: 2 × 2	DL: 4 × 4, UL: 2 × 2	DL: 4 × 4, UL: 2 × 2	
Voice	Optional (RG500L-EU/RG500L-NA/RG500L-AR); • (RG500L-JIO)	Optional	Optional	
DTMF	•	•	•	
FOTA	•	•	•	
GNSS	GPS/BDS/GLONASS/Galileo, L1 only (RG500L-NA); GPS/BDS/GLONASS/Galileo, L1 + L5 (RG500L-EU)	/	GPS/BDS/GLONASS/Galileo L1 + L5 (optional) (RG620T-EU); GPS/BDS/GLONASS/Galileo L1+L5 (RG620T-NA)	
(U)SIM card detection	•	•	•	
Electrical features				
Supply voltage range	3.3 V ~ 4.3 V, typ. 3.8 V	3.3 V ~ 4.3 V, typ. 3.8 V	3.3 V ~ 4.4 V, typ. 3.8 V	
Power consumption	80 μA @Power off 6.5 mA @Sleep 125 mA @Idle (USB active)	100 μA @Power off 6.5 mA @Sleep 125 mA @Idle (USB active)	135 μA @Power off 6 mA @Sleep 145 mA @Idle (USB active)	
Software features				
USB serial driver	Linux 3.18~6.5	Linux 3.18~6.5	Linux 3.18~6.5	
GNSS driver	/	/	/	
RIL driver	/	/	/	
RNDIS driver	/	/	/	
Certifications <sup>2</sup>	GCF/CE/RCM/FCC/IC	GCF/CE/RCM	CE/RCM/GCF/FCC/IC/PTCRB/AT&T	
Recommended applications	wireless routers, CPE, MiFi, industrial routers, home gateways, etc.		Industrial routers, CPE, home gateways, industrial PDAs, rugged tablet PCs and digital signage	

Note 1: means the data transmission is theoretical data rate and depends on network conditions.  
Note 2: May depend on modules' variant.

\* Planning/ Under development/ In progress  
• Supported

Product		RG500U
		
Form factor	LGA	
Dimensions (mm)	41.0 × 44.0 × 2.85	
5G	Sub-6 GHz	
Frequency bands (MHz)	-CN (EMEA/APAC)	5G NR: n1/28/41/77/78/79; LTE-FDD: B1/2/3/5/7/8/20/28; LTE-TDD: B34/38/39/40/41; WCDMA: B1/2/5/8
	-EA (EMEA/APAC/Latin America)	5G NR: n1/3/5/7/8/20/28/38/40/41/66/71*77/78; LTE-FDD: B1/2/3/4/5/7/8/20/28A/28B/66; LTE-TDD: B38/40/41; WCDMA: B1/2/5/8
	-EB (EMEA/APAC/Latin America)	5G NR: n1/3/5/7/8/20/28/38/40/41/66/77/78; LTE-FDD: B1/2/3/4/5/7/8/20/28/66; LTE-TDD: B38/40/41; WCDMA: B1/2/5/8
	-LA (Latin America)	5G NR: n2/5/7/8/28/38/40/66/71/78; LTE-FDD: B2/4/5/7/8/26/28/66/71; LTE-TDD: B38/40; WCDMA: B2/4/5
Weight (approx.) g	13(RG500U-CN/RG500U-EA); 12.5(RG500U-EB); 12.2(RG500U-LA)	
Operating temperature	-30° C ~ +75° C	
Extended temperature	-40° C ~ +85° C	
Control via AT commands	3GPP TS27.007 and Quectel Enhanced AT Commands	
<b>Data transmission<sup>2</sup></b>		
5G	5G SA Sub-6: Max. 2 Gbps (DL)/Max. 1 Gbps (UL); 5G NSA Sub-6: Max. 2.2 Gbps (DL)/Max. 575 Mbps (UL) (RG500U-CN); 5G NSA Sub-6: Max. 2.6 Gbps (DL)/Max. 650 Mbps (UL) (RG500U-EA/RG500U-EB/RG500U-LA);	
LTE (Mbps)	LTE-FDD: Max. 600 (DL)/Max. 150 (UL)	
UMTS (Mbps)	WCDMA: Max. 42.2 (DL)/Max. 11 (UL)	
SMS	•	
Protocols	TCP/UDP/PPP/FTP/HTTP/HTTPS/SSL/NTP	
<b>Interfaces</b>		
(U)SIM	× 2, 1.8 V/3.0 V	
USB	2.0/3.0	
PCIe	PCIe Gen2 × 1 Lane	
PCM	•	
GPIO	•	
RESET_N	•	
Antenna	× 4 (RG500U-CN/RG500U-EB); × 6 (RG500U-EA/RG500U-LA)	
<b>Enhanced features</b>		
MIMO	DL 4 × 4 MIMO: n1/41/77/78/79, UL 2 × 2 MIMO: n41/77/78/79, DL 2 × 2 MIMO: n28 & LTE (RG500U-CN); DL 4 × 4 MIMO: n1/3/7/38/40/41/77/78/79 <sup>1</sup> , UL 2 × 2 MIMO: n38/40/41/77/78/79 <sup>1</sup> , DL 2 × 2 MIMO: n5 <sup>1</sup> /8/20/28/66 <sup>1</sup> /71* & LTE (RG500U-EA); DL 4 × 4 MIMO: n1/3/7/28/38/40/41/66/77/78, UL 2 × 2 MIMO: n38/40/41/77/78, DL 2 × 2 MIMO: n5/8/20 & LTE (RG500U-EB); DL 4 × 4 MIMO: n2/7/28/38/40/66/78, UL 2 × 2 MIMO: n38/40/78, DL 2 × 2 MIMO: n5/8/71 & LTE (RG500U-LA);	
Voice	Optional	
DTMF	Dual-tone Multi-frequency	
DFOTA	Delta Firmware over the Air	
GNSS	/	
(U)SIM card detection	•	
<b>Electrical features</b>		
Supply voltage range	3.3 V ~ 4.3 V, typ. 3.8 V	
Power consumption	70 µA @ Power off; 3.5 mA @ Sleep; 68 mA @ USB 3.0, idle (RG500U-CN); 86 µA @ Power off; 4.4 mA @ Sleep; 56 mA @ USB 2.0, idle; 70 mA @ USB 3.0, idle (RG500U-EA); 88 µA @ Power off; 5.0 mA @ Sleep; 56 mA @ USB 2.0, idle; 70 mA @ USB 3.0, idle (RG500U-EB); 82 µA @ Power off; 5.0 mA @ Sleep; 60 mA @ USB 2.0, idle; 73 mA @ USB 3.0, idle (RG500U-LA)	
<b>Software features</b>		
USB serial driver	Windows 7*/8.1/10/11, Linux 2.6-6.5, Android 4.x-13.x	
GNSS driver	/	
RIL driver	Android 4.x-13.x	
RNDIS driver	Windows 7*/8.1/10/11, Linux 2.6-6.5	
MBIM driver	/	
ECM driver	Linux 2.6-6.5	
NCM driver	Linux 2.6-6.5	
PCIe driver	Linux 3.10-6.5	
Certifications <sup>3</sup>	China Telecom/China Mobile*/China Unicom*/CCC/SRRC/NAL/GCF/CE/RCM/FCC	
Recommended applications	wireless routers, CPE, industrial routers, home gateways, etc. (RG500U-CN/RG500U-EA); used in vertical industries such as smart energy, internet of Vehicles, industrial Internet, telemedicine, smart education, high-definition video, smart city, and home entertainment (RG500U-EB/RG500U-LA);	




Note 1: 0C optional.

Note 2: means the data transmission is theoretical data rate and depends on network conditions.

Note 3: May depend on modules' variant.

\* Planning/ Under development/ In progress  
• Supported

# 5G NR modules

Product	RM500U	RG200U-CN	RG200U-CN Mini PCIe
			
Form factor	M.2	LGA	Mini PCIe
Dimensions (mm)	52.0 × 30.0 × 2.3(RM500U-CNV); 52.0 × 30.0 × 3.75(RM500U-EA)	41.0 × 30.0 × 2.85	50.95 × 30.7 × 5.3
5G	Sub-6 GHz	Sub-6 GHz	Sub-6 GHz
Frequency bands (MHz)	-CN(EMEA/APAC)	5G NR: n1 <sup>1</sup> /3 <sup>1</sup> /5 <sup>1</sup> /8 <sup>1</sup> /28 <sup>1</sup> /41 <sup>1</sup> /77 <sup>1</sup> /78/79 <sup>1</sup> ; LTE-FDD: B1/3/5/8; LTE-TDD: B34/38/39/40/41; WCDMA: B1/8	5G NR: n1 <sup>1</sup> /3 <sup>1</sup> /5 <sup>1</sup> /8 <sup>1</sup> /28 <sup>1</sup> /41/77 <sup>1</sup> /78/79 <sup>1</sup> ; LTE-FDD: B1/3/5/8; LTE-TDD: B34/38/39/40/41; WCDMA: B1/8
	-EA(EMEA/APAC/Latin America)	5G NR: n1/3/5/7/8/20/28/38/40/41/66/77/78; LTE-FDD: B1/2/3/4/5/7/8/20/28/66; LTE-TDD: B38/40/41; WCDMA: B1/2/5/8	/
	-CNV(EMEA/APAC)	5G NR: n1/3/5/8/28A/41/77 <sup>1</sup> /78/79; LTE-FDD: B1/3/5/8; LTE-TDD: B34/38/39/40/41; WCDMA: B1/5 <sup>1</sup> /8	/
Weight (approx.) g	9.2(RM500U-EA); 8.8(RM500U-CNV)	8.2	13.4
Operating temperature	-30° C ~ +75° C	-30° C ~ +75° C	-30° C ~ +75° C
Extended temperature	-40° C ~ +85° C	-40° C ~ +85° C	-40° C ~ +85° C
Control via AT commands	3GPP TS27.007 and Quectel Enhanced AT Commands	3GPP TS27.007 and Quectel Enhanced AT Commands	3GPP TS27.007 and Quectel Enhanced AT Commands
<b>Data transmission<sup>2</sup></b>			
5G	5G SA Sub-6: Max. 2 Gbps (DL)/Max. 1 Gbps (UL); 5G NSA Sub-6: Max. 2.6Gbps(DL)/Max. 650Mbps (UL)(RM500U-EA); 5G NSA Sub-6: Max. 2.2 Gbps (DL)/Max. 575 Mbps (UL)(RM500U-CNV)	5G SA Sub-6: Max. 2 Gbps (DL)/Max. 1 Gbps (UL); 5G NSA Sub-6: Max. 2.2 Gbps (DL)/Max. 575 Mbps (UL)	5G SA Sub-6: Max. 2 Gbps (DL)/Max. 1 Gbps (UL); 5G NSA Sub-6: Max. 2.2 Gbps (DL)/Max. 575 Mbps (UL)
LTE(Mbps)	LTE-FDD: Max. 600 (DL)/Max. 150 (UL)	LTE-FDD: Max. 600 (DL)/Max. 150 (UL)	LTE-FDD: Max. 600 (DL)/Max. 150 (UL)
UMTS(Mbps)	WCDMA: Max. 42.2 (DL)/Max. 11 (UL)	WCDMA: Max. 42.2 (DL)/Max. 11 (UL)	WCDMA: Max. 42.2 (DL)/Max. 11 (UL)
SMS	•	•	•
Protocols	TCP/UDP/PPP/FTP/HTTP/HTTPS/FTPS/SSL/NTP	TCP/UDP/PPP/FTP/HTTP/HTTPS/FTPS/SSL/NTP	TCP/UDP/PPP/FTP/HTTP/HTTPS/FTPS/SSL/NTP
<b>Interfaces</b>			
(U)SIM	× 2, 1.8 V/3.0 V	× 2, 1.8 V/ 3.0 V	× 2, 1.8 V/ 3.0 V
USB	2.0/3.0	2.0/3.0	2.0/3.0
PCIe	PCIe Gen2 × 1 Lane	PCIe Gen2 × 1 Lane	/
PCM	•	•	•
GPIO	•	•	•
RESET_N	•	•	•
Antenna	× 4	× 4	× 4
<b>Enhanced features</b>			
MIMO	DL 4 × 4 MIMO: n1/3/7/28/66/38/40/41/77/78, UL 2 × 2 MIMO: n38/40/41/77/78, DL 2 × 2 MIMO: n5/8/20 & LTE (RM500U-EA); DL 4 × 4 MIMO: n1/28A/41/77/78/79, UL 2 × 2 MIMO: n41/77/78/79, DL 2 × 2 MIMO: n3/5/8(RM500U-CNV)	DL 4 × 4 MIMO: n1/41/77/78/79 <sup>1</sup> , UL 2 × 2 MIMO: n77/78/79 <sup>1</sup> , DL 2 × 2 MIMO: n3 <sup>1</sup> /5/8/28 & LTE	DL 4 × 4 MIMO: n1/41/77/78/79 <sup>1</sup> , UL 2 × 2 MIMO: n77/78/79 <sup>1</sup> , DL 2 × 2 MIMO: n3 <sup>1</sup> /5/8/28 & LTE
Voice	Optional	Optional	Optional
DTMF	Dual-tone Multi-frequency	Dual-tone Multi-frequency	/
DFOTA	Delta Firmware over the Air	Delta Firmware over the Air	Delta Firmware over the Air
GNSS	/	/	/
(U)SIM card detection	•	•	•
<b>Electrical features</b>			
Supply voltage range	3.3 V ~ 4.4 V, typ. 3.7 V	3.3 V ~ 4.3 V, typ. 3.8 V	3.3 V ~ 4.4 V, typ. 3.8 V
Power consumption	99 µA @ Power off; 4.8 mA @ Sleep; 62 mA @USB 2.0, idle; 75.5 mA @ USB 3.0, idle(RM500U-EA); 78 µA @ Power off; 5.1 mA @ Sleep; 57 mA @USB 2.0, idle; 71 mA @ USB 3.0, idle(RM500U-CNV)	80 µA @ Power off 3.3 mA @ Sleep, Typical 58.5 mA @ USB 2.0, idle 73.0mA @ USB 3.0, idle	3.5 mA @ Sleep, Typical 54 mA @ USB 2.0, idle 73 mA @ USB 3.0, idle
<b>Software features</b>			
USB serial driver	Windows 7*/8/8.1/10/11, Linux 2.6-6.5, Android 4.x-13.x	Windows 7*/8/8.1/10/11, Linux 2.6-6.5, Android 4.x-13.x	Windows 7*/8/8.1/10/11 Linux 2.6-6.5 Android 4.x-13.x
GNSS driver	/	/	/
RIL driver	Android 4.x-13.x	Android 4.x-13.x	Android 4.x-13.x
RNDIS driver	Windows 7*/8/8.1/10/11, Linux 2.6-6.5	Windows 7*/8/8.1/10/11, Linux 2.6-6.5	Windows 7*/8/8.1/10/11, Linux 2.6-6.5
MBIM driver	/	/	/
ECM driver	Linux 2.6-6.5	Linux 2.6-6.5	Linux 2.6-6.5
NCM driver	Linux 2.6-6.5	Linux 2.6-6.5	Linux 2.6-6.5
PCIe driver	Linux 3.10-6.5	Linux 3.10-6.5	Linux 3.10-6.5
Certifications <sup>3</sup>	China Telecom*/China Mobile*/China Unicom*/CCC/SRRC/NAL/CE/RCM	China Telecom/China Mobile*/China Unicom*/CCC/SRRC/NAL	China Telecom/China Mobile*/China Unicom*/CCC/SRRC/NAL
Recommended applications	wireless routers, CPE, industrial routers, home gateways, etc. (RM500U-CNV) industrial routers, home gateways, set-top boxes, industrial PDAs and digital labels (RM500U-EA)	wireless routers, CPE, industrial routers, home gateways, etc.	





Note 1: 0C optional.

Note 2: means the data transmission is theoretical data rate and depends on network conditions.

Note 3: May depend on modules' variant.

\* Planning/ Under development/ In progress  
• Supported



# 5G RedCap modules

Product	RG255C	RG255C M.2	RG255C Mini PCIe	RM255C-GL*
				
Form factor	LGA	M.2	Mini PCIe	M.2
Dimensions (mm)	29.0 × 32.0 × 2.4	30.0 × 42.0 × 3.25	30.0 × 50.95 × 4.95	42.0 × 30.0 × 2.3
5G	5G RedCap	5G RedCap	5G RedCap	5G RedCap
Frequency bands (MHz)	-NA*(North America)	/	/	/
	-EU*(EMEA/APAC <sup>1</sup> /Brazil)	/	/	/
	-CN(China)	/	/	/
	-GL(Global)	5G SA: n1/2/3/5/7/8/12/13/14/18/20/25/26/28/30/38/40/41/48/66/70/71/77/78/79; LTE-FDD: B1/2/3/4/5/7/8/12/13/14/17/18/19/20/25/26/28/30/66/70/71; LTE-TDD: B34/38/39/40/41/42/43/48	5G SA: n1/2/3/5/7/8/12/13/14/18/20/25/26/28/30/38/40/41/48/66/70/71/77/78/79; LTE-FDD: B1/2/3/4/5/7/8/12/13/14/17/18/19/20/25/26/28/30/66/71; LTE-TDD: B34/38/39/40/41/42/43/48	5G SA: n1/2/3/5/7/8/12/13/14/18/20/25/26/28/30/38/40/41/48/66/70/71/77/78/79; LTE-FDD: B1/2/3/4/5/7/8/12/13/14/17/18/19/20/25/26/28/30/66/71; LTE-TDD: B34/38/39/40/41/42/43/48
Weight (approx.) g	5.2	8.4	11	6.0
Operating temperature	-30°C ~ +75°C	-30°C ~ +75°C	-30°C ~ +75°C	-30°C ~ +75°C
Extended temperature	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C
Control via AT commands	3GPP TS27.007 and Quectel Enhanced AT Commands	3GPP TS27.007 and Quectel Enhanced AT Commands	3GPP TS27.007 and Quectel Enhanced AT Commands	3GPP TS27.007 and Quectel Enhanced AT Commands
<b>Data transmission</b>				
5G(Mbps)	Max. 223 (DL)/Max. 123 (UL)	Max. 223 (DL)/Max. 123 (UL)	Max. 223 (DL)/Max. 123 (UL)	Max. 223 (DL)/Max. 123 (UL)
LTE(Mbps)	Max. 195 (DL)/Max. 105 (UL)	Max. 195 (DL)/Max. 105 (UL)	Max. 195 (DL)/Max. 105 (UL)	Max. 195 (DL)/Max. 105 (UL)
UMTS(Mbps)	/	/	/	/
SMS	Support SGS, IMS and NAS SMS	Support SGS, IMS and NAS SMS	Support SGS, IMS and NAS SMS	Support SGS, IMS and NAS SMS
Protocols	TCP/UDP/SSL/TLS/FTP(S)/HTTP(S)/MQTT(S)/SMTP(S)/NTP/PING/NITZ/LwM2M protocols	TCP/UDP/SSL/TLS/FTP(S)/HTTP(S)/MQTT(S)/SMTP(S)/NTP/PING/NITZ/LwM2M protocols	TCP/UDP/SSL/TLS/FTP(S)/HTTP(S)/MQTT(S)/SMTP(S)/NTP/PING/NITZ/LwM2M protocols	TCP/UDP/SSL/TLS/FTP(S)/HTTP(S)/MQTT(S)/SMTP(S)/NTP/PING/NITZ/LwM2M protocols
<b>Interfaces</b>				
(U)SIM	× 2	× 2	× 2	× 2
UART	× 2	/	× 1	/
USB	2.0	2.0	2.0	2.0
PCIe	PCIe Gen2 × 1 Lane	PCIe Gen2 × 1 Lane	/	PCIe Gen2 × 1 Lane
PCM	•	•	•	•
GPIO	•	/	/	/
RESET_N	•	•	•	•
Antenna	Cellular × 2, GNSS × 1	Cellular × 2, GNSS × 1	Cellular × 2, GNSS × 1	Cellular × 2, GNSS × 1(Optional)
<b>Enhanced features</b>				
MIMO	/	/	/	/
Voice	Optional	Optional	Optional	Optional
DTMF	•	•	•	•
DFOTA	•	•	•	•
GNSS	GPS/GLONASS/BDS/Galileo/QZSS	GPS/GLONASS/BDS/Galileo/QZSS	GPS/GLONASS/BDS/Galileo/QZSS	GPS/GLONASS/BDS/Galileo/QZSS
(U)SIM card detection	•	•	•	•
<b>Electrical features</b>				
Supply voltage range	3.3 V ~ 4.3 V, typ. 3.8 V	3.135 V ~ 4.4 V, typ. 3.7 V	3.0 V ~ 3.6 V, typ. 3.3 V	3.135 V ~ 4.4 V, typ. 3.7 V
Power consumption	0.05 mA@Power off, 1.8 mA@ Sleep, Typical (RG255C-GL) TBD (RG255C-NA*/RG255C-EU*)	0.13 mA@Power off, 3 mA@ Sleep, Typical	4 mA@ Sleep, Typical	TBD
<b>Software features</b>				
USB serial driver	Windows 8.1/10/11, linux 2.6~6.7, Android 4.x~ 13	Windows 8.1/10/11, linux 2.6~6.7, Android 4.x~ 13	Windows 8.1/10/11, linux 2.6~6.7, Android 4.x~ 13	Windows 8.1/10/11, linux 2.6~6.7, Android 4.x~ 13
GNSS driver	Android 4.x~ 13	Android 4.x~ 13	Android 4.x~ 13	Android 4.x~ 13
RIL driver	Android 4.x~ 13	Android 4.x~ 13	Android 4.x~ 13	Android 4.x~ 13
NDIS driver	Windows 8.1/10/11	Windows 8.1/10/11	Windows 8.1/10/11	Windows 8.1/10/11
MBIM driver	Windows 8.1/10/11, Linux 3.18~6.7	Windows 8.1/10/11, Linux 3.18~6.7	Windows 8.1/10/11, Linux 3.18~6.7	Windows 8.1/10/11, Linux 3.18~6.7
Gobinet driver	Linux 2.6~ 6.7	Linux 2.6~ 6.7	Linux 2.6~ 6.7	Linux 2.6~ 6.7
QMI_WWAN driver	Linux 3.4~ 6.7	Linux 3.4~ 6.7	Linux 3.4~ 6.7	Linux 3.4~ 6.7
PCIe driver	Windows 10/11, Linux 3.10- 6.7	Windows 10/11, Linux 3.10- 6.7	Windows 10/11, Linux 3.10- 6.7	Windows 10/11, Linux 3.10- 6.7
Certifications <sup>2</sup>	FCC/IC/PTCRB/CE/RCM/GCF/Verizon*/AT&T*/T-Mobile*	CE/RCM/FCC/IC; (GCF/PTORB/Verizon*/AT&T*/T-Mobile* refer to RG255C-GL)	CE/RCM/FCC/IC; (GCF/PTORB/Verizon*/AT&T*/T-Mobile* refer to RG255C-GL)	FCC*/IC*/CE*/RCM*/GCF*/PTCRB*/AT&T*/Verizon*/T-Mobile*
Recommended applications		Industrial routers, industrial PDAs, rugged tablet PCs, wearable devices and digital signage		

Note 1: Excl. China/Japan.  
Note 2: May depend on modules' variant.

\* Planning/ Under development/ In progress  
• Supported

# LTE-A modules

Product	EG060K	EG065K	
			
Form factor	LGA	LGA	
Dimensions (mm)	37.0 × 39.5 × 2.8	28.0 × 31.0 × 2.4	
4G	LTE Cat 6	LTE Cat 6	
Frequency bands (MHz)	-E (EMEA/ Australia/ Brazil)	/	
	-EA (EMEA/ Australia/ Brazil)	LTE-FDD: B1/3/5/7/8/20/28/32 <sup>1</sup> ; LTE-TDD: B38/40/41/42(optional)/43(optional); Up to 2 × CA: B1+B1/3/5/7/8/20/28; B3+B3/5/7/8/20/28; B7+B5/7/8/20/28; B20+B32 <sup>1</sup> ; B38+B38; B40+B40; B41+B41 WCDMA: B1/3/5/8	LTE-FDD: B1/2/3/4/5/7/8/20/28; LTE-TDD: B40; WCDMA*: B1/2/3/4/5/8
	-NA(North America)	LTE-FDD: B2/4/5/7/12/13/14/25/26/29/30/66/71; LTE-TDD: B41/48	LTE-FDD: B2/4/5/7/12/13/14/25/26/30/66
	-GT(Global)	LTE-TDD: B40/41/42/43/48	/
	-JP(Japan)	LTE-FDD: B1/3/5/8/18/19/26/28; LTE-TDD: B41; WCDMA: B1/3/5/6/8/9/19	/
	-LA(Latin America)	LTE-FDD: B2/4/5/7/8/25/28/66; LTE-TDD: B42/B43; WCDMA: B2/B4/B5/B8	/
Weight (approx.) g	9.1	5.3	
Operating temperature	-30°C ~ +75°C	-30°C ~ +75°C	
Extended temperature	-40°C ~ +85°C	-40°C ~ +85°C	
Control via AT commands	3GPP TS27.007 and Quectel Enhanced AT Commands	3GPP TS27.007 and Quectel Enhanced AT Commands	
<b>Data transmission</b>			
LTE(Mbps)	LTE-FDD: Max. 300 (DL)/ Max. 50 (UL); LTE-TDD: Max. 226 (DL)/Max. 28 (UL)	LTE-FDD: Max. 300 (DL)/Max. 75 (UL)	
UMTS	DC-HSDPA: Max. 42 Mbps (DL)/ HSUPA: Max. 5.76 Mbps (UL) WCDMA: Max. 384 Kbps (DL/UL)	DC-HSDPA: Max. 42 Mbps (DL)/ HSUPA: Max. 5.76 Mbps (UL); WCDMA*: Max. 384 Kbps (DL/UL) (EG065K-EA)	
SMS	•	•	
Protocols	QMI/MBIM/NITZ/HTTP/HTTPS/FTP/LwM2M*/PING*	QMI/MBIM/NITZ/HTTP/HTTPS/FTP/LwM2M*/PING*	
<b>Interfaces</b>			
USB	2.0/3.0, Supports master* and Slave modes	2.0/3.0, Supports master* and Slave modes	
PCM	•	•	
I2S	× 1	× 1	
SPI	× 1	× 1	
SDIO	× 1	× 1	
RFFE	TBD	× 1	
GRFC	TBD	× 4	
I2C	× 1	× 1	
(U)SIM	× 2, 1.8 V/ 3.0 V	× 2, 1.8 V/ 3.0 V	
eSIM	Optional	/	
GPIO	× 3	× 5	
UART	× 3	× 2	
ADC	× 2	× 1	
RESET_N	•	× 1	
PCIe	Optional	Optional	
Antenna	Main, Diversity and GNSS	× 2(Main antenna); × 2(Diversity antennas)	
<b>Enhanced features</b>			
MIMO	2 × 2, 4 × 2, 4 × 4, DL	2 × 2, 4 × 2, DL	
eCall	Emergency services	Emergency services*	
Voice	Optional	Optional	
DTMF	Dual-tone Multi-frequency	Dual-tone Multi-frequency*	
DFOTA	Delta Firmware over the Air	Delta Firmware over the Air	
FOTA	•	/	
GNSS	GPS/GLONASS/BeiDou/Galileo/QZSS	/	
(U)SIM card detection	•	•	
<b>Electrical features</b>			
Supply voltage range	3.3 V ~ 4.4 V, typ. 3.8 V	3.3 V ~ 4.5 V, typ. 3.8 V	
Power consumption	20 µA @Power off 2.47 mA @LTE sleep(PF=128) 4.18 mA@LTE sleep(PF=64) 38.8 mA@Idle	26 µA @ Power off, 3.1 mA @ Sleep (PF = 128), 4.0 mA @ Sleep (PF = 64), 12.8 mA @ Idle (EG065K-NA); 26 µA @ Power off, 2.7 mA @ Sleep (PF = 128), 3.4 mA @ Sleep (PF = 64), 12.6 mA @ Idle (EG065K-EA)	
<b>Software features</b>			
USB serial driver	Windows 7*/8/8.1/10, WinCE 5.0/6.0/7.0*, Linux 2.6/3.x/4.1~4.14, Android 4.x/5.x/6.x/7.x/8.x	Windows 7*/8/8.1/10/11, Linux 2.6~5.18, Android 4.x~12.x	
RIL driver	Android 4.x/5.x/6.x/7.x/8.x	RIL driver*: Android 4.x~12.x	
NDIS driver	Windows 7*/8/8.1/10	Windows 7*/8/8.1/10/11	
RNDIS driver	/	/	
ECM driver	Linux 2.6 or later	ECM driver*: Linux 2.6~5.18	
Gobinet driver	Linux 2.6 or later	Linux 2.6~5.18	
QMI_WWAN driver	Linux 3.4 or later	Linux 3.4~5.18	
Certifications <sup>2</sup>	CE/RCM/Verizon/AT&T-Mobile/GCF/PTCRB/FCC/IC	British Telecom/Telefónica/Telstra/Deutsche Telekom/GCF/CE/RCM/Anatel/JATE/TELEC/KC/AT&T/Firstnet/Verizon/Telus/PTCRB/FCC/IC	
Recommended applications	Routers, home gateways, set-top boxes, PDAs, tablet PCs and digital signage		

Note 1: B32 is only for secondary component carrier.  
Note 2: May depend on modules' variant.




\* Planning/ Under development/ In progress  
• Supported

Product		EG060W-EA
		
Form factor		LGA
Dimensions (mm)		37.0 × 39.5 × 3.05
4G		LTE Cat 6
Frequency bands (MHz)	-EA (EMEA/APAC/Brazil)	LTE-FDD: B1/3/5/7/8/20/28/32; LTE-TDD: B38/40/41; 2 × CA: B1+B1/3/5/7/8/20/28; B3+B3/5/7/8/20/28; B7+B5/7/8/20/28; B20+B32; B38+B38; B40+B40; B41+B41; WCDMA: B1/5/8
Weight (approx.) g		8.2
Operating temperature		-20°C ~ +70°C
Extended temperature		-25°C ~ +75°C
Control via AT commands		3GPP TS27.007 and Quectel Enhanced AT Commands
Data transmission		
LTE(Mbps)		LTE-FDD: Max. 300(DL)/Max. 50(UL) LTE-TDD: Max. 220(DL)/Max. 30(UL)
UMTS		DC-HSDPA: Max. 42 Mbps(DL) HSUPA: Max. 5.76 Mbps (UL) WCDMA: Max. 384 Kbps(DL/UL)
SMS		•
Protocols		PPP/TCP/UDP/FTP/FTPS/HTTP/HTTPS/NTP/PING/SMTP/MMS/SMTPS/SSL
Interfaces		
USB		× 1
PCM		× 1
SPI		× 1
SDIO		× 1
I2C		× 1
(U)SIM		× 1
RGMII		× 1
UART		× 2
ADC		× 2
RESET_N		× 1
PCIe		× 2
Antenna		× 2
Enhanced features		
MIMO		•
eCall		•
Voice		•
DTMF		•
DFOTA		/
FOTA		•
GNSS		/
(U)SIM card detection		•
Electrical features		
Supply voltage range		3.3 V ~ 4.3 V, typ. 3.8 V
Power consumption		56 μA @ Power off; 5.42 mA @ Sleep; 58.63 mA @ Idle
Software features		
USB serial driver		Windows 7*/8.1/10/11, Linux 2.6~6.5, Android 4.x~13.x
RIL driver		Android 4.x~13.x
NDIS driver		/
RNDIS driver		Windows 7*/8.1/10/11, Linux 2.6~6.5
ECM driver		Linux 2.6~6.5
Gobinet driver		/
QMI_WWAN driver		/
Certifications		CE
Recommended applications		Routers, home gateways, set-top boxes, PDAs, tablet PCs and digital signage

Note 1: Excl. China/Japan.

\* Planning/ Under development/ In progress  
• Supported



# LTE-A modules

Product	EG12	EG120K	EG18
			
Form factor	LGA	LGA	LGA
Dimensions (mm)	37.0 × 39.5 × 2.8	37.0 × 39.5 × 2.8	37.0 × 39.5 × 2.8
4G	LTE Cat 12	LTE Cat 12	LTE Cat 18
Frequency bands (MHz)	-GT (Global)	LTE-TDD: B42/43/48 /	/
	-EA (EMEA/ Australia/ Brazil)	LTE-FDD: B1/3/5/7/8/20/28; LTE-TDD: B38/40/41; Up to 3 × CA: Intra-band and Inter-band; WCDMA: B1/3/5/8	LTE-FDD: B1/3/5/7/8/20/28/32(optional); LTE-TDD: B38/40/41/42(optional)/43(optional); Up to 3 × CA: Intra-band and Inter-band; WCDMA: B1/3/5/8
	-NA (North America)	/	-NA(North America) LTE-FDD: B2/4/5/7/12/13/14/25/26/29/30/66/71; LTE-TDD: B41/48
	-LA* (Latin America) (planning)	/	LTE-FDD: B2/4/5/7/8/25/28/66; LTE-TDD: B42/43; WCDMA: B2/4/5/8
	-JP(Japan)	/	LTE-FDD: B1/3/5/8/18/19/26/28; LTE-TDD: B41; WCDMA: B1/3/5/6/8/9/19
Weight (approx.) g	9	9.1	9
Operating temperature	-30°C ~ +75°C	-30°C ~ +75°C	-30°C ~ +75°C
Extended temperature	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C
Control via AT commands	3GPP TS27.007 and Quectel Enhanced AT Commands	3GPP TS27.007 and Quectel Enhanced AT Commands	3GPP TS27.007 and Quectel Enhanced AT Commands
<b>Data transmission</b>			
LTE	LTE-FDD: Max. 600 Mbps (DL)/Max. 150 Mbps(UL); LTE-TDD: Max. 430 Mbps (DL)/Max. 90 Mbps(UL)	LTE-FDD: Max. 600 Mbps (DL)/Max. 150 Mbps(UL); LTE-TDD: Max. 430 Mbps (DL)/Max. 90 Mbps (UL)	LTE-FDD: Max. 1.2 Gbps (DL)/Max. 150 Mbps (UL); LTE-TDD: Max. 573 Mbps (DL)/Max. 90 Mbps (UL)
UMTS	DC-HSDPA: Max. 42 Mbps (DL)/ HSUPA: Max. 11.2 Mbps (UL) WCDMA: Max. 384 Kbps (DL/UL)	DC-HSDPA: Max. 42 Mbps (DL)/ HSUPA: Max. 11.2 Mbps (UL) WCDMA: Max. 384 Kbps (DL/UL)	DC-HSDPA: Max. 42 Mbps (DL)/ HSUPA: Max. 11.2 Mbps (UL) WCDMA: Max. 384 Kbps (DL/UL)
SMS	•	•	•
Protocols	TCP/UDP/FTP/HTTP/HTTPS/PING/SMS	QMI/MBIM/NITZ/HTTP/HTTPS/FTP/LwM2M*/PING*	TCP/UDP/FTP/HTTP/HTTPS/PING/SMS
<b>Interfaces</b>			
USB	2.0/3.0, Slave mode	2.0/3.0, Supports master* and Slave modes	2.0/3.0, Slave mode
PCM	•	× 1	•
I2C	× 1	× 1	× 1
(U)SIM	× 2, 1.8 V/ 3.0 V	1.8 V/ 3.0 V	× 2, 1.8 V/ 3.0 V
eSIM	/	Optional	/
GPIO	× 2	× 3	× 2
UART	× 3	× 2	× 3
ADC	× 2	•	× 2
SPI	× 1 (optional)	× 1	× 1 (optional)
SD card	•	•	•
RESET_N	•	•	•
PCIe	Optional	Optional	Optional
RGMIII	/	/	/
Antenna	Main, Diversity and GNSS	Main, Diversity and GNSS	Main, Diversity and GNSS
<b>Enhanced features</b>			
MIMO	2 × 2, 4 × 2, 4 × 4, DL	2 × 2, 4 × 2, 4 × 4 DL	2 × 2, 4 × 2, 4 × 4 DL
eCall	•	Emergency services*	•
Voice	Optional	Optional	Optional
DTMF	Dual-tone Multi-frequency	Dual-tone Multi-frequency	Dual-tone Multi-frequency
DFOTA	Delta Firmware over the Air	Delta Firmware over the Air	Delta Firmware over the Air
GNSS	GPS/GLONASS/BeiDou/Galileo/QZSS	GPS/GLONASS/BeiDou/Galileo/QZSS	GPS/GLONASS/BeiDou/Galileo/QZSS
(U)SIM card detection	•	•	•
<b>Electrical features</b>			
Supply voltage range	3.3 V ~ 4.3 V, typ. 3.8 V	3.3 V ~ 4.3 V, typ. 3.8 V	3.3 V ~ 4.3 V, typ. 3.8 V
Power consumption	20 μA @Power off 1.83 mA @Sleep, Typ. 9.41 mA @Idle	20 μA @Power off 2.14 mA @LTE sleep(PF=128) 3.55 mA@LTE sleep(PF=64) 37.4 mA@Idle	20 μA @Power off 1.81 mA @Sleep, Typ. 9.38 mA @Idle
<b>Software features</b>			
USB serial driver	Windows 7*/8/8.1/10, Linux 2.6/3.x/4.x/5.x, Android 4.x/5.x/6.x/7.x/8.x/9.x	Windows 7*/8/8.1/10, WinCE 5.0/6.0/7.0*, Linux 2.6/3.x/4.1-4.14, Android 4.x/5.x/6.x/7.x/8.x	Windows 7*/8/8.1/10, Linux 2.6/3.x/4.x/5.x, Android 4.x/5.x/6.x/7.x/8.x/9.x
GNSS driver	/	/	/
RIL driver	Android 4.x/5.x/6.x/7.x/8.x/9.x	Android 4.x/5.x/6.x/7.x/8.x	Android 4.x/5.x/6.x/7.x/8.x/9.x
NDIS driver	Windows 7*/8/8.1/10	Windows 7*/8/8.1/10	Windows 7*/8/8.1/10
MBIM driver	/	Windows 7*/10, Linux 3.18-5.4	/
Gobinet driver	Linux 2.6/3.x/4.x/5.x	Linux 2.6/3.x/4.x/5.x	Linux 2.6/3.x/4.x/5.x
QMI_WWAN driver	Linux 3.x (3.4 or later)/4.x/5.x	Linux 3.x (3.4 or later)/4.x/5.x	Linux 3.x (3.4 or later)/4.x/5.x
PCIe driver	/	/	/
Certifications <sup>2</sup>	FCC/GCF/CE/RCM	CE/RCM/Verizon/AT&T-Mobile/GCF/PTCRB/FCC/IC	Telstra/GCF/CE/RCM/Verizon/AT&T-Mobile/PTCRB/FCC/IC/USCC
Recommended applications	Industrial routers, industrial PDAs, rugged tablet PCs and digital signage	Routers, home gateways, set-top boxes, PDAs, tablet PCs and digital signage	Industrial routers, industrial PDAs, rugged tablet PCs and digital signage

Note 1: LTE-FDD B17 is supported through MFBI+B12.  
Note 2: May depend on modules' variant.

\* Planning/ Under development/ In progress  
• Supported








Product	EM05	EM060K	
			
Form factor	M.2	M.2	
Dimensions (mm)	30.0 × 42.0 × 2.3	30.0 × 42.0 × 2.3	
4G	LTE Cat 4	LTE Cat 6	
Frequency bands (MHz)	-G/GL (Global)	-G(Global) LTE: B1/2/3/4/5/7/8/12/13/14/18/19/20/25/26/28/66/71/38/39/40/41; WCDMA: B1/2/4/5/6/8/19	-GL(Global) LTE-FDD: B1/2/3/4/5/7/8/12/13/14/17/18/19/20/25/26/28/29 <sup>2</sup> /30/32 <sup>1</sup> /66/71; LTE-TDD: B34/38/39/40/41/42/43/46 <sup>1</sup> (LAA)/48 (CBRS); Up to 2 × CA: B2+B2/5/12/13/29 <sup>3</sup> +B4+B4/5/12/13/29 <sup>3</sup> ; B5+B5/7/25/30/66; B7+B7/12/26; B12+B12/25/30/66; B13+B66; B25+B25/26; B30+B29; B66+B29/66; B41+B41; WCDMA: B1/2/3/4/5/6/8/19
	-E (EMEA/ Australia/New Zealand)	LTE-FDD: B1/3/7/8/20/28; LTE-TDD: B38/41; WCDMA: B1/8	/
	-EA (EMEA/ Australia/New Zealand)	/	LTE-FDD: B1/3/5/7/8/20/28/32/71 <sup>4</sup> ; LTE-TDD: B38/40/41/42/43 <sup>4</sup> ; WCDMA: B1/3/5/8
	-A (North America)	/	-NA (North America) LTE-FDD: B2/4/5/7/12/13/14/17/25/26/29/30/66/71; LTE-TDD: B41/42/43/48
	-J (Japan)	/	/
	-CN (China/Thailand/ India)	LTE-FDD: B1/3/5/8; LTE-TDD: B34/38/39/40/41; WCDMA: B1/5/8; EVDO/CDMA: BCO	/
Weight (approx.) g	6.0	6.2	
Operating temperature	-30°C ~ +70°C	-25°C ~ +75°C	
Extended temperature	-40°C ~ +85°C	-40°C ~ +85°C	
Control via AT commands	3GPP TS 27.005, 3GPP TS 27.007 and Quectel Enhanced AT Commands	3GPP TS27.007 and Quectel Enhanced AT Commands	
<b>Data transmission</b>			
LTE(Mbps)	LTE-FDD: Max. 150 (DL)/Max. 50 (UL); LTE-TDD: Max. 130 (DL)/Max. 30 (UL)	LTE-FDD: Max. 300 (DL)/Max. 50 (UL); LTE-TDD: Max. 226 (DL)/Max. 28 (UL)	
UMTS	DC-HSDPA: Max. 42 Mbps (DL)/ HSUPA: Max. 5.76 Mbps (UL) WCDMA: Max. 384 Kbps (DL/UL)	DC-HSDPA: Max. 42 Mbps (DL)/ HSUPA: Max. 5.76 Mbps (UL) WCDMA: Max. 384 Kbps (DL/UL)	
SMS	•	•	
CDMA2000	EVDO: Max. 3.1 Mbps (DL)/Max. 1.8 Mbps (UL) 1X Advanced: Max. 307.2 Kbps (DL)/Max. 307.2 Kbps (UL)	/	
Protocols	TCP/UDP/PPP/FTP/HTTP/NTP/PING/QMI/NITZ/SMTP/MMS/FTPS/SMTPS/SSL/FILE	QMI/MBIM/NITZ/HTTP/HTTPS/FTP/LwM2M*/PING*	
<b>Interfaces</b>			
USB	2.0 hi-speed	2.0/3.0*, Slave mode	
PCM	•	•	
I2C	× 1	× 1	
(U)SIM	1.8 V/ 3.0 V	× 2, 1.8 V/ 3.0 V	
eSIM	/	× 1/ built-in eSIM (optional)	
GPIO	× 1	MIPI interface	
RESET_N	•	•	
PCIe	/	Optional	
Antenna	Main, Diversity and GNSS	Main, Diversity and GNSS	
<b>Enhanced features</b>			
MIMO	DL MIMO, support Rx-diversity antenna	2 × 2, 4 × 2, DL	
eCall*	/	Emergency services	
Voice	• <sup>4</sup>	Optional	
DTMF	/	Dual-tone Multi-frequency	
DFOTA	•	Delta Firmware over the Air	
GNSS	Optional	GPS/ GLONASS/ BeiDou/ Galileo/ QZSS	
FOTA	/	/	
(U)SIM card detection	•	•	
<b>Electrical features</b>			
Supply voltage range	3.135 V ~ 4.4 V, typ. 3.3 V	3.135 V ~ 4.4 V, typ. 3.7 V	
Power consumption	5 μA @Power off/ 3.3 mA(PF=128) @LTE sleep/ 20 mA @Idle	0.07 μA@Power off; 1.80mA@Sleep, Typ.; 40 mA@Idle (EM060K-NA) 0.07 mA@Power off; 3.47 mA@Sleep, Typ.; 38 mA@Idle(EM060K-GL) 0.07 μA@Power off; 1.86mA@Sleep, Typ.; 38mA@Idle (EM060K-EA)	
<b>Software features</b>			
USB serial driver	Windows 7*/8/8.1/10, Linux 2.6-5.4, Android 4.x/5.x/6.x/7.x/8.x/9.x	Windows 7*/8/8.1/10, WinCE 5.0/6.0/7.0*, Linux 2.6/3.x/4.1-4.14, Android 4.x/5.x/6.x/7.x/8.x	
GNSS driver	Android 4.x/5.x/6.x/7.x/8.x/9.x	/	
RIL driver	Android 4.x/5.x/6.x/7.x/8.x/9.x	Android 4.x/5.x/6.x/7.x/8.x/9.x/10.x	
MBIM driver	Windows 8/8.1/10, Linux3.18-5.4	Windows 10	
NDIS driver	Windows 7*/8/8.1/10	Windows 7*/8/8.1/10	
Gobinet driver	Linux 2.6-5.4	Linux 2.6/3.x/4.x/5.x	
QMI_wwan driver	Linux 3.4-5.4	Linux 3.x (3.4 or later)/4.x/5.x	
Certifications <sup>5</sup>	CCC/SRRC/NAL/CE/GCF/PTCRB/FCC/RCM	Verizon/AT&T-Mobile/NTT DOCOMO/KDDI/Vodafone/British Telecom/Orange/Deutsche Telekom/Telstra/Telefónica/GCF/PTCRB/NCC/CE/RCM/FCC/IC/JATE/TELEC/Anatel	
Recommended applications	Consumer laptops, industrial laptops, industrial routers, industrial PDAs, rugged tablet PCs and digital signage.		

Note 1: B32 is only for secondary component carrier, B46 is only for secondary component carrier.  
 Note 2: B29 is only for secondary component carrier.  
 Note 3: means LTE-FDD B29 support receiving only, and is only for secondary component carrier in 2×CA.  
 Note 4: Optional.  
 Note 5: May depend on modules' variant.

\* Planning/ Under development/ In progress  
 • Supported

# LTE-A modules

Product	EM12-G	EM120K-GL	EM120R-GL	EM121R-GL	EM160R-GL
					
Form factor	M.2	M.2	M.2	M.2	M.2
Dimensions (mm)	42.0 × 30.0 × 2.3	42.0 × 30.0 × 2.3	42.0 × 30.0 × 2.3	42.0 × 30.0 × 2.3	42.0 × 30.0 × 2.3
4G	LTE Cat 12	LTE Cat 12	LTE Cat 12	LTE Cat 12	LTE Cat 16
Frequency bands (MHz)	-G/GL (Global) LTE-FDD: B1/2/3/4/5/7/8/9/12/13/14/17/18/19/20/21/25/26/28/29 <sup>1</sup> /30/32/66; LTE-TDD: B38/39/40/41; Up to 3 × CA: Intra-band and Inter-band, B1+3+5/7/8/19/20/28, B2+4+5, B2+4+13, B2+5+30, B2+12+30, etc; WCDMA: B1/2/3/4/5/8/9/19	LTE-FDD: B1/2/3/4/5/7/8/12/13/14/17/18/19/20/25/26/28/29 <sup>1</sup> /30/32 <sup>1</sup> /66/71; LTE-TDD: B38/39/40/41/42/43/46 <sup>3</sup> (LAA)/48 (CBRS); Up to 3 × CA: Intra-band and Inter-band; WCDMA: B1/2/3/4/5/6/8/19	LTE-FDD: B1/2/3/4/5/7/8/12/13/14/17/18/19/20/25/26/28/29 <sup>1</sup> /30/32 <sup>1</sup> /66; LTE-TDD: B38/39/40/41/42/43/46 <sup>3</sup> /48 (CBRS); Up to 3 × CA: Intra-band and Inter-band; WCDMA: B1/2/3/4/5/6/8/19	LTE-FDD: B1/2/3/4/5/7/8/12/13/14/17/18/19/20/25/26/28/29 <sup>1</sup> /30/32 <sup>1</sup> /66; LTE-TDD: B38/39/40/41/42/43/46 <sup>3</sup> /48 (CBRS); Up to 3 × CA: Intra-band and Inter-band; WCDMA: B1/2/3/4/5/6/8/19	LTE-FDD: B1/2/3/4/5/7/8/12/13/14/17/18/19/20/25/26/28/29 <sup>1</sup> /30/32 <sup>1</sup> /66; LTE-TDD: B38/39/40/41/42/43/46 <sup>3</sup> /48 (CBRS); Up to 5 × CA: Intra-band and Inter-band; WCDMA: B1/2/3/4/5/6/8/19
Weight (approx.) g	6.0	6.2	6.8	6.8	6.8
Operating temperature	-30°C ~ +70°C, -10°C ~ +65°C (Only for UL CA test)	-25°C ~ +75°C	-25°C ~ +75°C	-25°C ~ +75°C	-25°C ~ +75°C
Extended temperature	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C
Control via AT commands	3GPP TS27.007 and Quectel Enhanced AT Commands	3GPP TS27.007 and Quectel Enhanced AT Commands	3GPP TS27.007 and Quectel Enhanced AT Commands	3GPP TS27.007 and Quectel Enhanced AT Commands	3GPP TS27.007 and Quectel Enhanced AT Commands
Data transmission					
LTE	LTE-FDD: Max. 600 Mbps (DL)/ Max. 150 Mbps (UL); LTE-TDD: Max. 430 Mbps (DL)/ Max. 90 Mbps (UL)	LTE-FDD: Max. 600 Mbps (DL)/ Max. 150 Mbps (UL); LTE-TDD: Max. 408 Mbps (DL)/ Max. 90 Mbps (UL)	LTE-FDD: Max. 600 Mbps (DL)/ Max. 150 Mbps (UL); LTE-TDD: Max. 408 Mbps (DL)/ Max. 90 Mbps (UL)	LTE-FDD: Max. 600 Mbps (DL)/ Max. 150 Mbps (UL); LTE-TDD: Max. 408 Mbps (DL)/ Max. 90 Mbps (UL)	LTE-FDD: Max. 1.0 Gbps (DL)/ Max. 150 Mbps (UL); LTE-TDD: Max. 880 Mbps (DL)/ Max. 90 Mbps (UL)
UMTS	DC-HSDPA: Max. 42 Mbps (DL)/ HSUPA: Max. 5.76 Mbps (UL) WCDMA: Max. 384 Kbps (DL/UL)	DC-HSDPA: Max. 42 Mbps (DL)/ HSUPA: Max. 11.2 Mbps (UL) WCDMA: Max. 384 Kbps (DL/UL)	DC-HSDPA: Max. 42 Mbps (DL)/ HSUPA: Max. 11.2 Mbps (UL) WCDMA: Max. 384 Kbps (DL/UL)	DC-HSDPA: Max. 42 Mbps (DL)/ HSUPA: Max. 11.2 Mbps (UL) WCDMA: Max. 384 Kbps (DL/UL)	DC-HSDPA: Max. 42 Mbps (DL)/ HSUPA: Max. 11.2 Mbps (UL) WCDMA: Max. 384 Kbps (DL/UL)
SMS	•	•	•	•	•
Protocols	QMI/MBIM/NITZ/HTTP/HTTPS/FTP/LwM2M/PING	QMI/MBIM/NITZ/HTTP/HTTPS/FTP/LwM2M*/PING*	TCP/UDP/FTP/HTTP/HTTPS/PING/SMS	TCP/UDP/FTP/HTTP/HTTPS/PING/SMS	TCP/UDP/FTP/HTTP/HTTPS/PING/SMS
Interfaces					
USB	2.0/3.0, Slave mode	2.0/3.0, Slave mode	2.0/3.0, Slave mode	2.0/3.0, Slave mode	2.0/3.0, Slave mode
PCM	•	•	•	•	•
I2C	× 1	/	/	/	/
(U)SIM	× 2, 1.8 V/ 3.0 V	× 2, 1.8 V/ 3.0 V	× 2, 1.8 V/ 3.0 V	× 2, 1.8 V/ 3.0 V	× 2, 1.8 V/ 3.0 V
eSIM	external eSIM supported	× 1/ built-in eSIM (optional)	× 1/ built-in eSIM (optional)	× 1/ built-in eSIM (optional)	× 1/ built-in eSIM (optional)
GPIO	Optional	MIPI interface	MIPI interface	MIPI interface	MIPI interface
RESET_N	•	•	•	•	•
PCIe	Optional	Optional	PCIe Gen2 × 1 Lane	PCIe Gen2 × 1 Lane	PCIe Gen2 × 1 Lane
Antenna	Main, Diversity and GNSS	Main, Diversity and GNSS	Main, Diversity and GNSS	Main, Diversity and GNSS	Main, Diversity and GNSS, MIMO × 2
Enhanced features					
MIMO	4 × 2, 2 × 2, DL	2 × 2, 4 × 2 DL	2 × 2, 4 × 2 DL	2 × 2, 4 × 2 DL	2 × 2, 4 × 2, 4 × 4 DL
eCall*	Emergency services	Emergency services	Emergency services	Emergency services	Emergency services
Voice	Optional	Optional	Optional	Optional	Optional
DTMF	Dual-tone Multi-frequency	Dual-tone Multi-frequency	Dual-tone Multi-frequency	Dual-tone Multi-frequency	Dual-tone Multi-frequency
DFOTA	Delta Firmware over the Air	Delta Firmware over the Air	Delta Firmware over the Air	Delta Firmware over the Air	Delta Firmware over the Air
GNSS	GPS/GLONASS/BeiDou/Galileo/QZSS	GPS/GLONASS/BeiDou/Galileo/QZSS	GPS/GLONASS/BeiDou/Galileo/QZSS	GPS/GLONASS/BeiDou/Galileo/QZSS	GPS/GLONASS/BeiDou/Galileo/QZSS
(U)SIM card detection	•	•	•	•	•
Electrical features					
Supply voltage range	3.135 V ~ 4.4 V, typ. 3.7 V	3.135 V ~ 4.4 V, typ. 3.7 V	3.135 V ~ 4.4 V, typ. 3.7 V	3.135 V ~ 4.4 V, typ. 3.7 V	3.135 V ~ 4.4 V, typ. 3.7 V
Power consumption	56 µA@Power off 2.53 mA@Sleep(AT+CFUN=0, USB disconnected), 19.32 mA@Idle(PF=64, USB Active)	61 µA@Power off 2.58 mA@Sleep(AT+CFUN=0, USB Suspend) 17.35 mA@Idle(PF=64, USB Active)	USB mode 66 µA @ Power off 1.84 mA @ Sleep (AT+CFUN=0, USB Suspend) 24.48 mA @ Idle (PF = 64, USB Active); PCIE only mode 66 µA @ Power off 2.35 mA @ Sleep (AT+CFUN=0, Modem standby) 15.05 mA @ Idle (PF = 64, PCIE Active)	USB mode 66 µA @ Power off 1.84 mA @ Sleep (AT+CFUN=0, USB Suspend) 24.48 mA @ Idle (PF = 64, USB Active); PCIE only mode 66 µA @ Power off 2.35 mA @ Sleep (AT+CFUN=0, Modem standby) 15.05 mA @ Idle (PF = 64, PCIE Active)	USB mode 66 µA @ Power off 1.78 mA @ Sleep (AT+CFUN=0, USB Suspend) 24.75 mA @ Idle (PF = 64, USB Active); PCIE only mode 66 µA @ Power off 2.38 mA @ Sleep (AT+CFUN=0, Modem standby) 15.38 mA @ Idle (PF = 64, PCIE Active)
Software features					
USB serial driver	Windows: 7*/8/8.1/10/11 Linux: 2.6-5.x Android 4.x-12.x	Windows 7*/8/8.1/10, Linux 2.6/3.x/4.x/5.x, Android 4.x/5.x/6.x/7.x/8.x/9.x	Windows 7*/8/8.1/10, Linux 2.6/3.x/4.x/5.x, Android 4.x/5.x/6.x/7.x/8.x/9.x	Windows 7*/8/8.1/10, Linux 2.6/3.x/4.x/5.x, Android 4.x/5.x/6.x/7.x/8.x/9.x	Windows 7*/8/8.1/10, Linux 2.6/3.x/4.x/5.x, Android 4.x/5.x/6.x/7.x/8.x/9.x
RIL driver	Android 4.x-12.x	Android 4.x/5.x/6.x/7.x/8.x/9.x	Android 4.x/5.x/6.x/7.x/8.x/9.x	Android 4.x/5.x/6.x/7.x/8.x/9.x	Android 4.x/5.x/6.x/7.x/8.x/9.x
NDIS driver	Windows: 7*/8/8.1/10/11	Windows 7*/8/8.1/10	Windows 7*/8/8.1/10	Windows 7*/8/8.1/10	Windows 7*/8/8.1/10
Gobinet driver	Linux 2.6/3.x/4.x/5.x	Linux 2.6/3.x/4.x/5.x	Linux 2.6/3.x/4.x/5.x	Linux 2.6/3.x/4.x/5.x	Linux 2.6/3.x/4.x/5.x
QMI_wwan driver	Linux 3.x (3.4 or later)/4.x/5.x	Linux 3.x (3.4 or later)/4.x/5.x	Linux 3.x (3.4 or later)/4.x/5.x	Linux 3.x (3.4 or later)/4.x/5.x	Linux 3.x (3.4 or later)/4.x/5.x
PCIE driver	/	Linux 3.x/4.x/5.x	Linux 3.x/4.x/5.x	Linux 3.x/4.x/5.x	Linux 3.x/4.x/5.x
Certifications	Vodafone/TIM/Deutsche Telekom/ British Telecom/Telefonía/ Verizon/AT&T-Mobile/Sprint/ Rogers/Telus/Telstra/NTT DOCOMO/ SoftBank*/KDDI/CE/GCF/PTCRB/ FCC/IC/Anatel/RCM/KC/JATE/TELEC/ ICASA/NGC/WHQL	Verizon/AT&T-Mobile/Telstra/NTT DOCOMO/SoftBank/KDDI/CE/GCF/ PTCRB/FCC/IC/RCM/JATE/TELEC/NGC	Vodafone/Swisscom/British Telecom/Verizon/AT&T T-Mobile/ Sprint/Telstra/NTT DOCOMO/ SoftBank*/KDDI/China Mobile/China Unicom/CE/GCF/PTCRB/FCC/IC/ Anatel/IFETEL/RCM/KC/JATE/TELEC/ ICASA/NGC/CC/SSRC/NAL	Verizon/AT&T/CE/GCF/PTCRB/FCC/IC/ RCM	Vodafone/Swisscom/British Telecom/Verizon/AT&T T-Mobile/ Sprint/Telstra/NTT DOCOMO/ SoftBank*/KDDI/China Mobile/China Unicom/CE/GCF/PTCRB/FCC/IC/ Anatel/IFETEL/RCM/KC/JATE/TELEC/ ICASA/NGC/CC/SSRC/NAL
Recommended applications	Consumer laptops, industrial laptops, industrial routers, industrial PDAs, rugged tablet PCs and digital signage.				

Note 1: B32 is only for secondary component carrier.




Note 2: B29 is only for secondary component carrier.

Note 3: B46 is only for secondary component carrier.

Note 4: Currently, SoftBank certification is only supported for PC applications.

\* Planning/ Under development/ In progress



• Supported

Product	EC21/EC21 Mini PCIe	EC25/EC25 Mini PCIe	EC20-CE/EC20-CE Mini PCIe	
				
Form factor	LCC (EC21); Mini PCIe (EC21 Mini PCIe)	LCC (EC25); Mini PCIe (EC25 Mini PCIe)	LCC (EC20-CE); Mini PCIe (EC20-CE Mini PCIe)	
Dimensions (mm)	29.0 × 32.0 × 2.4 (EC21); 30.0 × 51.0 × 4.9 (EC21 Mini PCIe)	29.0 × 32.0 × 2.4 (EC25); 30.0 × 51.0 × 4.9 (EC25 Mini PCIe)	29.0 × 32.0 × 2.4 (EC20-CE); 30.0 × 51.0 × 4.9 (EC20-CE Mini PCIe)	
LTE category	LTE Cat 1	LTE Cat 4	LTE Cat 4	
Frequency bands(MHz)	-CE (China/India)	/	/	
	-E (EMEA/South Korea/Thailand/India)	(EMEA/Thailand/India) LTE-FDD: B1/3/5/7/8/20; WCDMA: B1/5/8; GSM: B3/8	(EMEA/South Korea/Thailand/India) LTE-FDD: B1/3/5/7/8/20; LTE-TDD: B38/40/41; WCDMA: B1/5/8; GSM: B3/8	/
	-EM (EMEA)	/	LTE-FDD: B1/3/5/7/8/20/28; LTE-TDD: B38/40/41; WCDMA: B1/5/8; GSM/EDGE: B3/8	/
	-EU (EMEA/Thailand)	LTE-FDD: B1/3/7/8/20/28A; WCDMA: B1/8; GSM: B3/8	LTE-FDD: B1/3/7/8/20/28A; LTE-TDD: B38/40/41; WCDMA: B1/8; GSM: B3/8	/
	-EUX (EMEA/Thailand)	LTE-FDD: B1/3/7/8/20/28A; WCDMA: B1/8; GSM: B3/8	LTE-FDD: B1/3/7/8/20/28A; LTE-TDD: B38/40/41; WCDMA: B1/8; GSM: B3/8	/
	-V (Verizon)	LTE-FDD: B4/13	LTE-FDD: B4/13	/
	-A (AT&T-Mobile/Canada)	LTE-FDD: B2/4/12; WCDMA: B2/4/5	LTE-FDD: B2/4/12; WCDMA: B2/4/5	/
	-ADL (AT&T-Mobile)	/	LTE-FDD: B2/4/12	/
	-AF (AT&T/Verizon/T-Mobile)	/	LTE-FDD: B2/4/5/12/13/14/66/71; WCDMA: B2/4/5	/
	-AFDL (AT&T/Verizon/T-Mobile)	/	LTE-FDD: B2/4/5/12/13/14/66/71	/
	-AFX (AT&T/Verizon)	/	LTE-FDD: B2/4/5/12/13/14/66/71; WCDMA: B2/4/5	/
	-AFXD (AT&T/Verizon/T-Mobile)	/	LTE-FDD: B2/4/5/12/13/14/66/71; WCDMA: B2/4/5	/
	-AU (Latin America/ANZ)	LTE-FDD: B1/2 <sup>1</sup> /3/4/5/7/8/28; LTE-TDD: B40; WCDMA: B1/2/5/8; GSM: B2/3/5/8	LTE-FDD: B1/2 <sup>1</sup> /3/4/5/7/8/28; LTE-TDD: B40; WCDMA: B1/2/5/8; GSM: B2/3/5/8	/
	-AUX (Latin America/ANZ)	LTE-FDD: B1/2 <sup>1</sup> /3/4/5/7/8/28; LTE-TDD: B40; WCDMA: B1/2/4/5/8; GSM: B2/3/5/8	LTE-FDD: B1/2 <sup>1</sup> /3/4/5/7/8/28; LTE-TDD: B40; WCDMA: B1/2/4/5/8; GSM: B2/3/5/8	/
-AUT (Australia) <sup>1</sup>	LTE-FDD: B1/3/5/7/28; WCDMA: B1/5	/	/	
-J (Japan)	LTE-FDD: B1/3/8/18/19/26	LTE-FDD: B1/3/8/18/19/26; LTE-TDD: B41; WCDMA: B1/6/8/19	/	
-KL (Korea)	LTE-FDD: B1/3/5/7/8	/	/	
-IN (India)	LTE-FDD: B1/3/5/8/40/41	/	/	
Weight (approx.) g	4.9 (EC21); 9.8 (EC21 Mini PCIe)	4.9 (EC25); 9.8 (EC25 Mini PCIe)	5.3 (EC20-CE); 10.6 (EC20-CE Mini PCIe)	
Operating temperature	-35°C ~ +75°C	-35°C ~ +75°C	-35°C ~ +75°C	
Extended temperature	-40°C ~ +85°C (EC21); -40°C ~ +80°C (EC21 Mini PCIe)	-40°C ~ +85°C (EC25); -40°C ~ +80°C (EC25 Mini PCIe)	-40°C ~ +85°C (EC20-CE); -40°C ~ +80°C (EC20-CE Mini PCIe)	
<b>Data transmission</b>				
LTE data rates (Mbps)	LTE-FDD: Max. 10 (DL) /Max. 5 (UL); LTE-TDD: Max. 8.96 (DL) /Max. 3.1 (UL)	LTE-FDD: Max. 150 (DL) /Max. 50 (UL); LTE-TDD: Max. 130 (DL) /Max. 30 (UL)	LTE-FDD: Max. 150 (DL) /Max. 50 (UL) LTE-TDD: Max. 130 (DL) /Max. 30 (UL)	
DC-HSPA+ data rates (Mbps)	Max. 42 (DL)/Max. 5.76 (UL)	Max. 42 (DL)/Max. 5.76 (UL)	Max. 42 (DL) / Max. 5.76 (UL)	
WCDMA data rates (Kbps)	Max. 384 (DL)/Max. 384 (UL)	Max. 384 (DL)/Max. 384 (UL)	Max. 384 (DL) / Max. 384 (UL)	
TD-SCDMA data rates (Mbps)	/	/	Max. 4.2 (DL) / Max. 2.2 (UL)	
EVDO data rates (Mbps)	/	/	Max. 3.1 (DL) / Max. 1.8 (UL)	
CDMA2000 data rates (Kbps)	/	/	Max. 307.2 (DL) / Max. 307.2 (UL)	
EDGE data rates (Kbps)	Max. 296 (DL)/Max. 236.8 (UL)	Max. 296 (DL)/Max. 236.8 (UL)	Max. 296 (DL) / Max. 236.8 (UL)	
GPRS data rates (Kbps)	Max. 107 (DL)/Max. 85.6 (UL)	Max. 107 (DL)/Max. 85.6 (UL)	Max. 107 (DL) / Max. 85.6 (UL)	
SMS	•	•	•	
CSD	•	•	•	
Protocols	TCP/UDP/PPP/FTP/HTTP/NTP/PING/QMI/HTTPS/SMP/MMS*/FTPS*/SMTPS/SSL	TCP/UDP/PPP/FTP/HTTP/NTP/PING/QMI/HTTPS/SMP/MMS*/FTPS*/SMTPS/SSL	TCP/UDP/PPP/FTP/HTTP/NTP/PING/QMI/NITZ/CMUX/HTTPS/SMP/MMS/FTPS/SMTPS/SSL/FILE	
<b>Interfaces</b>				
(U)SIM	× 1	× 1	× 1	
UART	× 2 (EC21); × 1 (EC21 Mini PCIe)	× 2 (EC25); × 1 (EC25 Mini PCIe)	× 2 (EC20-CE); × 1 (EC20-CE Mini PCIe)	
USB	× 1	× 1	× 1	
I2C	× 1	× 1	× 1 (EC20-CE); × 1 (EC20-CE Mini PCIe optional)	
Audio digital (PCM)	× 1	× 1	× 1 (optional)	
SDIO	× 2 (EC21 optional)	× 2 (EC25 optional)	× 2 (EC20-CE optional)	
ADC	× 2, 15bits (EC21)	× 2, 15bits (EC25)	× 2, 15bits (EC20-CE)	
SGMII	× 1 (EC21)	× 1 (EC25)	× 1 (EC20-CE)	
Antenna	× 1 Main, × 1 Rx-diversity, × 1 GNSS (optional)	× 1 Main, × 1 Rx-diversity, × 1 GNSS (optional)	× 1 Main, × 1 Rx-diversity (optional), × 1 GNSS (optional)	
<b>Enhanced features</b>				
GNSS	Optional	Optional	Optional	
Wi-Fi scan	/	/	/	
Bluetooth	/	/	/	
DTMF	•	•	•	
DFOTA	•	•	•	
QMI/ RmNet	•	•	•	
Audio playback/Audio recording	Optional	Optional	Optional	
QuecFile	•	•	• (EC20-CE)	
USB serial driver	Windows 7/8/8.1/10/11, Linux 2.6-6.7, Android 4.x-13.x	Windows 7/8/8.1/10/11, Linux 2.6-6.7, Android 4.x-13.x	Windows 7/8/8.1/10/11, Linux 2.6-6.7, Android 4.x-13.x	
GNSS driver	Android 4.x-13.x	Android 4.x-13.x	Android 4.x-13.x	
RIL driver	Android 4.x-13.x	Android 4.x-13.x	Android 4.x-13.x	
RNDSI driver	Windows 7/8/8.1/10/11, Linux 2.6-6.7	Windows 7/8/8.1/10/11, Linux 2.6-6.7	Windows 7/8/8.1/10/11, Linux 2.6-6.7	
ECM driver	Linux 2.6-6.7	Linux 2.6-6.7	Linux 2.6-6.7	
MBIM driver	Windows 7/8/8.1/10/11, Linux 3.18-6.7	Windows 7/8/8.1/10/11, Linux 3.18-6.7	Windows 7/8/8.1/10/11, Linux 3.18-6.7	
GobiNet driver	Linux 2.6-6.7	Linux 2.6-6.7	Linux 2.6-6.7	
QMI_ WWAN driver	Linux 3.4-6.7	Linux 3.4-6.7	Linux 3.4-6.7	
(U)SIM card detection	•	•	•	
Firmware update	Via USB/DFOTA	Via USB/DFOTA	Via USB/DFOTA	
<b>Electrical features</b>				
Supply voltage range	3.3 V ~ 4.3 V, typ. 3.8 V (EC21); 3.0 V ~ 3.6 V, typ. 3.3 V (EC21 Mini PCIe)	3.3 V ~ 4.3 V, typ. 3.8 V (EC25); 3.0 V ~ 3.6 V, typ. 3.3 V (EC25 Mini PCIe)	3.3 V ~ 4.3 V, typ. 3.8 V (EC20-CE); 3.0 V ~ 3.6 V, typ. 3.3 V (EC20-CE Mini PCIe)	
Power consumption	20 μA @Power off/ 3 mA @Sleep, Typ. / 22 mA @Idle (EC21); 3.5 mA @Sleep, Typ. / 34 mA @Idle (EC21 Mini PCIe)	20 μA @Power off/ 3 mA @Sleep, Typ. / 22 mA @Idle (EC25); 3.6 mA @Sleep, Typ. / 35 mA @Idle (EC25 Mini PCIe)	11 μA @Power off/ 1.5 mA @Sleep (PF=256), Typ. / 20 mA @Idle (EC20-CE); 4 mA @Sleep (PF=128), 3.7 mA @Sleep (PF=256), Typ. / 30 mA @Idle (EC20-CE Mini PCIe)	
Certifications <sup>3</sup>	Carrier Certification: Vodafone/Deutsche Telekom/ British Telecom/Verizon/AT&T-Mobile/U.S. Cellular/ Rogers/Telstra /Spark/NTT DOCOMO/KDDI/KT/SKT/LGU;; Regulatory Certification: CE/GCF/UKCA/RCM/CCC/FCC/PTC/RCB/IC/Anatel/JATE/TELEC; Others: WHQL	Carrier Certification: Vodafone/Deutsche Telekom/British Telecom/Orange/ Telefonica/KT/SKT/LGU+/Verizon/AT&T-Mobile/Rogers/Telus/U.S. Cellular/ Telstra/NTT DOCOMO/SoftBank/KDDI/ Bell*/Spark; Regulatory Certification: GCF/CE/UKCA/CCC/RCM/NBCT/ICASA/FCC/PTC/RCB/IC/ Anatel/JATE/TELEC; Others: WHQL	Regulatory Certification: NAL/SRRC/CCC (China)	
Recommended applications	Telematics, smart metering, mobile POS terminals, gateways, safety, tracking and tracing, remote maintenance and control, networking, mobile computing, healthcare, etc.			

Note 1: Inapplicable to Mini PCIe.  
 Note 2: Rx-diversity not supported.  
 Note 3: May depend on modules' variant.  
 Note 4: Data only.  
 GNSS antenna not supported on EC21-KL.  
 EC25-ADL/EC25-AFDL/EC25-AFXD/EC25-ADL Mini PCIe/EC25-AFDL Mini PCIe/EC25-AFXD Mini PCIe are requested for data only device.




\* Planning/ Under development/ In progress  
 • Supported

# LTE modules

Product	EG21-G/EG21-G Mini PCIe/EG21-GL/EG21-GL Mini PCIe	EG25-G/EG25-G Mini PCIe/EG25-GL/EG25-GL Mini PCIe
		
Form factor	LGA (EG21-G/GL); Mini PCIe (EG21-G Mini PCIe/EG21-GL Mini PCIe)	LGA (EG25-G/GL); Mini PCIe (EG25-G Mini PCIe/EG25-GL Mini PCIe)
Dimensions (mm)	29.0 × 32.0 × 2.4 (EG21-G/GL); 30.0 × 51.0 × 4.9 (EG21-G Mini PCIe/EG21-GL Mini PCIe)	29.0 × 32.0 × 2.4 (EG25-G/GL); 30.0 × 51.0 × 4.9 (EG25-G Mini PCIe/EG25-GL Mini PCIe)
LTE category	LTE Cat 1	LTE Cat 4
Frequency bands (MHz)	-G (Global) LTE-FDD: B1/2/3/4/5/7/8/12/13/18/19/20/25/26/28; LTE-TDD: B38/39/40/41; WCDMA: B1/2/4/5/6/8/19; GSM: B2/3/5/8 -GL (Global) LTE-FDD: B1/2/3/4/5/7/8/12/13/18/19/20/25/26/28/66; LTE-TDD: B34/38/39/40/41; WCDMA: B1/2/4/5/6/8/19; TD-SCDMA-GSM/EDGE: B2/3/5/8	LTE-FDD: B1/2/3/4/5/7/8/12/13/18/19/20/25/26/28; LTE-TDD: B38/39/40/41; WCDMA: B1/2/4/5/6/8/19; GSM: B2/3/5/8 LTE-FDD: B1/2/3/4/5/7/8/12/13/18/19/20/25/26/28/66; LTE-TDD: B34/38/39/40/41; WCDMA: B1/2/4/5/6/8/19; TD-SCDMA-GSM/EDGE: B2/3/5/8
Weight (approx.) g	4.9 (EG21-G/GL); 9.8 (EG21-G Mini PCIe/EG21-GL Mini PCIe)	4.9 (EG25-G/GL); 9.8 (EG25-G Mini PCIe/EG25-GL Mini PCIe)
Operating temperature	-35°C ~ +75°C	-35°C ~ +75°C
Extended temperature	-40°C ~ +85°C (EG21-G/GL); -40°C ~ +80°C (EG21-G Mini PCIe/EG21-GL Mini PCIe)	-40°C ~ +85°C (EG25-G/GL); -40°C ~ +80°C (EG25-G Mini PCIe/EG25-GL Mini PCIe)
<b>Data transmission</b>		
LTE data rates (Mbps)	LTE-FDD: Max. 10 (DL)/Max. 5 (UL); LTE-TDD: Max. 8.96 (DL)/Max. 3.1 (UL)	LTE-FDD: Max. 150 (DL)/Max. 50 (UL); LTE-TDD: Max. 130 (DL)/Max. 30 (UL)
DC-HSPA+ data rates (Mbps)	Max. 42 (DL)/Max. 5.76 (UL)	Max. 42 (DL)/Max. 5.76 (UL)
WCDMA data rates (Kbps)	Max. 384 (DL)/Max. 384 (UL)	Max. 384 (DL)/Max. 384 (UL)
EDGE data rates (Kbps)	Max. 296 (DL)/Max. 236.8 (UL)	Max. 296 (DL)/Max. 236.8 (UL)
GPRS data rates (Kbps)	Max. 107 (DL)/Max. 85.6 (UL)	Max. 107 (DL)/Max. 85.6 (UL)
SMS	•	•
Protocols	TCP/UDP/PPP/FTP/HTTP/NTP/PING/QMI/NITZ/CMUX/HTTPS/SMTP/MMS*/FTPS*/SMTPS/SSL/FILE	TCP/UDP/PPP/FTP/HTTP/NTP/PING/QMI/NITZ/CMUX/HTTPS/SMTP/MMS*/FTPS*/SMTPS/SSL/FILE
<b>Interfaces</b>		
(U)SIM	× 1	× 1
UART	× 2 (EG21-G/GL); × 1 (EG21-G Mini PCIe/EG21-GL Mini PCIe)	× 2 (EG25-G/GL); × 1 (EG25-G Mini PCIe/EG25-GL Mini PCIe)
USB	× 1	× 1
I2C	× 1 (EG21-G/GL); × 1 (EG21-G Mini PCIe/EG21-GL Mini PCIe optional)	× 1 (EG25-G/GL); × 1 (EG25-G Mini PCIe/EG25-GL Mini PCIe optional)
Audio digital (PCM)	× 1 (optional)	× 1 (optional)
SDIO	× 2 (EG21-G/GL optional)	× 2 (EG25-G/GL optional)
ADC	× 2, 15bits (EG21-G/GL)	× 2, 15bits (EG25-G/GL)
Antenna	× 1 Main, × 1 Rx-diversity, × 1 GNSS (optional)	× 1 Main, × 1 Rx-diversity, × 1 GNSS (optional)
<b>Enhanced features</b>		
GNSS	Optional	Optional
Wi-Fi scan	/	/
Bluetooth	/	/
DTMF	•	•
DFOTA	•	•
QMI/ RmNet	•	•
Audio playback/Audio recording	Optional	Optional
USB serial driver	Windows 7/8/8.1/10/11, Linux 2.6-6.7, Android 4.x-13.x	Windows 7/8/8.1/10/11, Linux 2.6-6.7, Android 4.x-13.x
GNSS driver	Android 4.x-13.x	Android 4.x-13.x
RIL driver	Android 4.x-13.x	Android 4.x-13.x
NDIS driver	Windows 7/8/8.1/10/11	Windows 7/8/8.1/10/11
MBIM driver	Windows 7/8/8.1/10/11, Linux 3.18-6.7	Windows 7/8/8.1/10/11, Linux 3.18-6.7
GobiNet driver	Linux 2.6-6.7	Linux 2.6-6.7
QMI_WWAN driver	Linux 3.4-6.7	Linux 3.4-6.7
(U)SIM card detection	•	•
(U)SIM card Connector	Optional (EG21-G Mini PCIe/EG21-GL Mini PCIe)	Optional (EG25-G Mini PCIe/EG25-GL Mini PCIe)
Firmware update	Via USB/DFOTA	Via USB/DFOTA
<b>Electrical features</b>		
Supply voltage range	3.3 V ~ 4.3 V, typ. 3.8 V (EG21-G/GL); 3.0 V ~ 3.6 V, typ. 3.3 V (EG21-G Mini PCIe/EG21-GL Mini PCIe)	3.3 V ~ 4.3 V, typ. 3.8 V (EG25-G/GL); 3.0 V ~ 3.6 V, typ. 3.3 V (EG25-G Mini PCIe/EG25-GL Mini PCIe)
Power consumption	13 µA@Power off/1.8 mA@Sleep, Typ. /22 mA@Idle (EG21-G); 12 µA@Power off/1.3 mA@Sleep, Typ. /15.4 mA@Idle (EG21-GL); 2.8 mA@Sleep, Typ. / 35 mA@Idle (EG21-G Mini PCIe); 2.3 mA@Sleep, Typ. / 22.4 mA@Idle (EG21-GL Mini PCIe)	15 µA@Power off/1.8 mA@Sleep, Typ. /22 mA@Idle (EG25-G); 7 µA@Power off/1.3 mA@Sleep, Typ. /15.7 mA@Idle (EG25-GL); 3.3 mA@Sleep, Typ. / 35 mA@Idle (EG25-G Mini PCIe); 2.4 mA@Sleep, Typ. / 22.3 mA@Idle (EG25-GL Mini PCIe)
Certifications <sup>1</sup>	Carrier Certification: Deutsche Telekom/Verizon/AT&T/Sprint/U.S.Cellular/T-Mobile/Telus; Regulatory Certification: GCF/CE/FCC/PTCRB/IC/Anatel/IFETEL/KC/NCC/JATE/TELEC/RCM/ICASA; Others: WHQL	Carrier Certification: Deutsche Telekom/Verizon/AT&T/T-Mobile/Sprint/U.S. Cellular/Telus/Rogers*; Regulatory Certification: GCF/CE/PTCRB/FCC/IC/Anatel/IFETEL/SRRC/NAL/CCC/KC/NCC/JATE/TELEC/RCM/NBTC/IMDA/ICASA; Others: WHQL
Recommended applications	Telematics, smart metering, mobile POS terminals, gateways, safety, tracking and tracing, remote maintenance and control, networking, mobile computing, healthcare, etc.	

Note 1: May depend on modules' variant.

\* Planning/ Under development/ In progress  
• Supported

Product	EG91	EG95	EG950A	
				
Form factor	LGA	LGA	LGA	
Dimensions (mm)	29.0 × 25.0 × 2.45	29.0 × 25.0 × 2.45	29.0 × 25.0 × 2.4	
LTE category	LTE Cat 1	LTE Cat 4	LTE Cat 4	
Frequency bands (MHz)	-E (Europe)	LTE-FDD: B1/3/7/8/20/28A; WCDMA: B1/8; GSM: B3/8	LTE-FDD: B1/3/7/8/20/28A; WCDMA: B1/8; GSM: B3/8	/
	-EX (Europe)	LTE-FDD: B1/3/7/8/20/28; WCDMA: B1/8; GSM: B3/8	LTE-FDD: B1/3/7/8/20/28; WCDMA: B1/8; GSM: B3/8	/
	-EL (Europe/Asia-Pacific)	/	/	LTE-FDD: B1/3/5/7/8/20/28; WCDMA: B1/5/8
	-NAXD (North America)	LTE-FDD: B2/4/5/12/13/25/26; WCDMA: B2/4/5	LTE-FDD: B2/4/5/12/13/25/26; WCDMA: B2/4/5	/
	-NAX (North America)	LTE-FDD: B2/4/5/12/13/25/26; WCDMA: B2/4/5	LTE-FDD: B2/4/5/12/13/25/26; WCDMA: B2/4/5	/
	-NA (North America)	LTE-FDD: B2/4/5/12/13; WCDMA: B2/4/5	LTE-FDD: B2/4/5/12/13; WCDMA: B2/4/5	/
	-VX (Verizon)	LTE-FDD: B4/13	/	/
	-AUX (Latin America/ANZ)	LTE-FDD: B1/2/3/4/5/7/8/28/66; WCDMA: B1/2/5/8; GSM: B2/3/5/8	LTE-FDD: B1/2/3/4/5/7/8/28/66; WCDMA: B1/2/5/8; GSM: B2/3/5/8	/
	-JP (Japan)	LTE-FDD: B1/3/8/18/19/26	LTE-FDD: B1/3/8/18/19/26; LTE-TDD: B41	/
	-LA (Latin America)	/	/	LTE-FDD: B1/2/3/4/5/7/8/28/66; WCDMA: B1/2/4/5/8
Weight (approx.) g	3.8	3.8	3.74	
Operating temperature	-35°C ~ +75°C	-35°C ~ +75°C	-35°C ~ +75°C	
Extended temperature	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	
<b>Data transmission</b>				
LTE data rates (Mbps)	Max. 10 (DL)/Max. 5 (UL)	Max. 150 (DL)/Max. 50 (UL)	Max. 150 (DL)/ Max. 50 (UL)	
DC-HSPA+ data rates (Mbps)	Max. 42 (DL)/Max. 5.76 (UL)	Max. 42 (DL)/Max. 5.76 (UL)	Max. 21 (DL)/ Max. 5.76 (UL)	
WCDMA data rates (Kbps)	Max. 384 (DL)/Max. 384 (UL)	Max. 384 (DL)/Max. 384 (UL)	Max. 384 (DL)/ Max. 384 (UL)	
EDGE data rates (Kbps)	Max. 296 (DL)/Max. 236.8 (UL)	Max. 296 (DL)/Max. 236.8 (UL)	/	
GPRS data rates (Kbps)	Max. 107(DL)/Max. 85.6 (UL)	Max. 107 (DL)/Max. 85.6 (UL)	/	
SMS	•	•	/	
Protocols	TCP/UDP/PPP/FTP/HTTP/NTP/PING/QMI/CMUX/HTTPS/SMT/PPS*/FTPS*/SMT/SSL/FILE	TCP/UDP/PPP/FTP/HTTP/NTP/PING/QMI/CMUX/HTTPS/SMT/PPS*/FTPS*/SMT/SSL/FILE	TCP/UDP/PPP/NTP/NITZ/FTP/HTTP/PING/CMUX/HTTPS/FTPS/SSL/FILE/MQTT/MMS/SMT/PPS*/SMT/SSL/FILE	
<b>Interfaces</b>				
(U)SIM	× 2	× 2	× 1	
UART	× 2	× 2	× 2	
USB	× 1	× 1	× 1	
I2C	× 1	× 1	× 1	
Audio digital (PCM)	× 1	× 1	× 1	
SPI	× 1	× 1	× 1	
RESET_N	× 1	× 1	× 1	
SDIO	/	/	× 1	
ADC	× 1	× 1	× 2	
Antenna	× 1 Main, × 1 Rx-diversity, × 1 GNSS (optional) <sup>1</sup>	× 1 Main, × 1 Rx-diversity, × 1 GNSS (optional) <sup>1</sup>	× 1 Main, × 1 Rx-diversity, × 1 GNSS (optional)	
<b>Enhanced features</b>				
GNSS <sup>1</sup>	Optional	Optional	Optional	
Wi-Fi scan	/	/	/	
Bluetooth	/	/	/	
EG91 (for North America)	•	•	/	
Digital audio/VoLTE	Optional	Optional	•	
DTMF	•	•	/	
DFOTA	•	•	•	
QMI/ RmNet	•	•	/	
Audio playback/Audio recording	Optional	Optional	•	
QuecFile	•	•	•	
USB serial driver	Windows 7/8/8.1/10/11, Linux 2.6~6.7, Android 4.x~13.x	Windows 7/8/8.1/10/11, Linux 2.6~6.7, Android 4.x~13.x	Windows 7/8/8.1/10/11, Linux 2.6~6.7, Android 4.x~13.x	
GNSS driver	Android 4.x~13.x	Android 4.x~13.x	Android 4.x~13.x	
RIL driver	Android 4.x~13.x	Android 4.x~13.x	Android 4.x~13.x	
NDIS driver	Windows 7/8/8.1/10/11	Windows 7/8/8.1/10/11	Windows 7/8/8.1/10/11	
MBIM driver	Windows 7/8/8.1/10/11, Linux 3.18~6.7	Windows 7/8/8.1/10/11, Linux 3.18~6.7	/	
GobiNet driver	Linux 2.6~6.7	Linux 2.6~6.7	/	
QMI_WWAN driver	Linux 3.4~6.7	Linux 3.4~6.7	/	
(U)SIM card detection	•	•	•	
Firmware update	Via USB/DFOTA	Via USB/DFOTA	Via USB/DFOTA	
<b>Electrical features</b>				
Supply voltage range	3.3 V ~ 4.3 V, typ. 3.8 V	3.3 V ~ 4.3 V, typ. 3.8 V	3.4 V ~ 4.5 V, typ. 3.8 V	
Power consumption	15 μA@Power off/2.6 mA@Sleep, Typ./21 mA@Idle	15 μA@Power off/2.6 mA@Sleep, Typ./21 mA@Idle	11 μA @Power off mode /1.1 mA @LTE sleep mode (PF=256), Typ /18 mA @ Idle mode	
Certifications <sup>2</sup>	Carrier Certification: Deutsche Telekom/Telstra <sup>3</sup> /Verizon/AT&T/T-Mobile/Sprint/Rogers/Telus/U.S. Cellular/NTT DOCOMO/KDDI/SoftBank*; Regulatory Certification: GCF/CE/UKCA/RCM/Anatel/NCC/PTCRB/FCC/IC/JATE/TELEC; Others: WHQL	Carrier certification: Deutsche Telekom/Telstra <sup>3</sup> /Verizon/AT&T/T-Mobile/Sprint/Rogers/Telus/U.S. Cellular/NTT DOCOMO/KDDI/SoftBank*; Regulatory certification: GCF/CE/UKCA/PTCRB/FCC/IC/JATE/TELEC; Others: WHQL	Regulatory: CE/RCM/UKCA	
Recommended applications	Telematics, smart metering, mobile POS terminals, gateways, safety, tracking and tracing, remote maintenance and control, networking, mobile computing, healthcare, etc.		Wildlife cameras	

Note 1: GNSS antenna not supported on EG91-E/EG95-E.

Note 2: May depend on modules' variant.



Note 3: EG91-AUX/EG95-AUX (Data Only).

EG91-AUX does not support Rx-diversity.

EG91-NAXD and EG95-NAXD are requested for data only device.



\* Planning/ Under development/ In progress  
• Supported

# LTE modules

Product	EG915Q/EG915Q-NA Mini PCIe	EG916Q	
			
Form factor	LGA(EG915Q); Mini PCIe(EG915Q-NA Mini PCIe)	LGA	
Dimensions (mm)	23.6 × 19.9 × 2.4(EG915Q); 51.0 × 30.0 × 4.9(EG915Q-NA Mini PCIe)	26.5 × 22.5 × 2.4	
LTE category	LTE Cat 1 bis	LTE Cat 1 bis	
Frequency bands (MHz)	-AF (North America)	LTE-FDD: B2/4/5/12/13/14/66/71	/
	-NA (North America)	LTE-FDD: B2/4/5/12/13/66	/
	-EU (Europe)	/	/
	-JP (Japan)	LTE-FDD: B1/3/8/18/19/26/28	/
	-GL (Global)	/	LTE-FDD: B1/2/3/4/5/7/8/12/13/18/19/20/25/26/28/66; LTE-TDD: B34/38/39/40/41
Weight (approx.) g	2.3 (EG915Q); 7.1(EG915Q-NA Mini PCIe)	2.6	
Operating temperature	-35°C ~ +75°C	-35°C ~ +75°C	
Extended temperature	-40°C ~ +85°C (EG915Q); -40°C ~ +80°C(EG915Q-NA Mini PCIe)	-40°C ~ +85°C	
<b>Data transmission</b>			
LTE data rates (Mbps)	Max. 10 (DL)/Max. 5 (UL)	Max. 10 (DL)/ Max. 5 (UL)	
DC-HSPA+ data rates (Mbps)	/	/	
WCDMA data rates (Kbps)	/	/	
EDGE data rates (Kbps)	/	/	
GPRS data rates (Kbps)	/	/	
SMS	•	•	
Protocols	TCP/UDP/NTP/NITZ/FTP/HTTP/PING/HTTPS/FTPS/SSL/MQTT/CMUX/PPP/FILE/MMS*/SMTP/SMTPS	TCP/UDP/NTP/NITZ/FTP/HTTP/PING/HTTPS/FTPS/SSL/MQTT/CMUX/ PPP/FILE/SMTP/SMTPS/MMS*	
<b>Interfaces</b>			
USIM	× 2 <sup>1</sup> (EG915Q); × 1(EG915Q-NA Mini PCIe)	× 2 <sup>1</sup> (1.8/ 3.0 V)	
UART	× 3 <sup>2</sup> (optional) (EG915Q); × 2(EG915Q-NA Mini PCIe)	× 4 <sup>3</sup> (optional)	
USB	× 1	× 1	
I2C	× 1	× 1	
Audio digital (PCM)	× 1	× 1	
SDIO	/	/	
ADC	× 2(EG915Q)	× 2	
Antenna	× 1 Main, × 1 GNSS (optional)	× 1 Main, × 1 GNSS (optional)	
<b>Enhanced features</b>			
GNSS	Optional	Optional	
Wi-Fi scan	•	•	
Bluetooth	/	/	
DTMF	/	/	
DFOTA	•	•	
QMI/ RmNet	/	/	
Audio playback/Audio recording	•	•	
QuecFile	•	•	
USB serial driver	Windows 7/8/8.1/10/11, Linux 2.6-6.7, Android 4.x-13.x	Windows 7/8/8.1/10/11, Linux 2.6-6.7, Android 4.x-13.x	
GNSS driver	Android 4.x-13.x	Android 4.x-13.x	
RIL driver	Android 4.x-13.x	Android 4.x-13.x	
RNDIS driver	Windows 7/8/8.1/10/11, Linux 2.6-6.7	Windows 7/8/8.1/10/11, Linux 2.6-6.7	
MBIM driver	/	/	
GobiNet driver	/	/	
QMI_WWAN driver	/	/	
(U)SIM card detection	•	•	
Firmware update	Via USB/DFOTA	Via USB/DFOTA	
<b>Electrical features</b>			
Supply voltage range	3.3 V ~ 4.3 V, typ. 3.8 V (EG915Q); 3.0~3.6 V, typ.3.3 V(EG915Q-NA Mini PCIe)	3.3 V ~ 4.3 V, typ. 3.8 V	
Power consumption	0.4 µA @ Power off mode / 54 µA @ Sleep mode (AT+CFUN = 0, USB disconnected) / 130 µA @ Sleep mode (AT+CFUN = 4, USB disconnected) / 4.55 mA @ Idle mode (PF = 64, USB disconnected) / 28.22 mA @ Idle mode (PF = 64, USB connected) (EG915Q); TBD(EG915Q-NA Mini PCIe)	0.4 µA @ Power off 45 µA @ Sleep Mode (AT+CFUN = 0, USB Disconnected) 0.125 mA @ Sleep Mode (AT+CFUN = 4, USB Disconnected) 0.68 mA @ Idle Mode (PF = 64, USB Disconnected) 25.8 mA @ Idle Mode (PF = 64, USB Connected)	
Certifications <sup>4</sup>	Carrier Certification: Verizon/AT&T-Mobile/Telus/NTT DOCOMO*/KDDI*/SoftBank*; Regulatory Certification: FCC/IC/GCF/PTCRB/JATE/TELEC; Others: WHQL	Carrier Certification: Verizon/AT&T-Mobile*; Regulatory Certification: CCC/CE/GCF/PTCRB/FCC/IC/RCM/KC/Anatel/JATE/TELEC; Others: WHQL	
Recommended applications	Asset management, commercial telematics, payment, RMAC (remote monitoring and control applications), safety and automation, smart metering and smart grid (EG915Q); IoT gateway, industrial PCs etc.(EG915Q-NA Mini PCIe)	Asset management, commercial telematics, payment, RMAC (Remote Monitoring and Control Applications), smart safety and automation, smart metering and smart grid	

Note 1: Both USIM1 and USIM2 interfaces support 1.8 V USIM cards only, when the USIM2 interface is enabled.  
 Note 2: The third GNSS serial port is optional.  
 Note 3: GNSS UART, GNSS Debug UART and GNSS antenna interfaces are optional.  
 Note 4: May depend on modules' variant.




\* Planning/ Under development/ In progress  
 • Supported

Product	EG800Q	EG800K
		
Form factor	LGA	LGA
Dimensions (mm)	17.7 × 15.8 × 2.4	17.7 × 15.8 × 2.4
LTE category	LTE Cat 1 bis	LTE Cat 1 bis
Frequency bands(MHz)	-CN (China/India)	/
	-NA (North America)	LTE-FDD: B2/4/5/12/13/66
	-EU (Europe)	LTE-FDD: B1/3/5/7/8/20/28
	-LA (Latin America)	/
Weight (approx.) g	2.0	1.37
Operating temperature	-35°C ~ +75°C	-35°C ~ +75°C
Extended temperature	-40°C ~ +85°C	-40°C ~ +85°C
<b>Data transmission</b>		
LTE data rates (Mbps)	Max. 10 (DL)/ Max. 5 (UL)	Max. 10 (DL)/Max. 5 (UL)
DC-HSPA+ data rates (Mbps)	/	/
WCDMA data rates (Kbps)	/	/
EDGE data rates (Kbps)	/	/
GPRS data rates (Kbps)	/	/
SMS	•	Optional (EG800K-CN)
Protocols	TCP/UDP/NTP/NITZ/FTP/HTTP/PING/HTTPS/FTPS/SSL/MQTT/CMUX/PPP/FILE/MMS*/SMTP/SMTS	TCP/UDP/PPP*/NTP/NITZ/FTP*/HTTP*/PING/HTTPS*/FTPS*/FILE*/SSL/MQTT
<b>Interfaces</b>		
USIM	× 1	× 1
UART	× 3 <sup>2</sup>	× 3 <sup>3</sup>
USB	× 1	× 1
I2C	× 1	× 1 <sup>4</sup>
Audio digital (PCM)	× 1	/
SDIO	/	/
ADC	× 2	× 2
Antenna	× 1 Main	× 1 Main, × 1 GNSS (optional)
<b>Enhanced features</b>		
GNSS	/	Optional
Wi-Fi scan	•	Optional
Bluetooth	/	/
DTMF	/	/
DFOTA	•	•
Audio playback/Audio recording	•	/
QuecFile	•	Optional
USB serial driver	Windows 7/8/8.1/10/11, Linux 2.6-6.7, Android 4.x-13.x	Windows 7/8/8.1/10/11, Linux 2.6-6.7, Android 4.x-13.x
GNSS driver	/	/
RIL driver	Android 4.x-13.x	Android 4.x-13.x
RNDIS driver	Windows 7/8/8.1/10/11, Linux 2.6-6.7	Windows 7/8/8.1/10/11, Linux 2.6-6.7
ECM driver	Linux 2.6-6.7	Linux 2.6-6.7
(U)SIM card detection	•	•
Firmware update	Via USB/DFOTA	Via USB/DFOTA
<b>Electrical features</b>		
Supply voltage range	3.3 V ~ 4.3 V, typ. 3.8 V	3.4 V ~ 4.3 V, typ. 3.8 V
Power consumption	50 µA @ Power off mode 0.06 mA @ Sleep mode (AT+CFUN=0, USB disconnected) 0.16 mA @ Sleep mode (AT+CFUN=4, USB disconnected) 4.50 mA @ Idle mode (PF=64, USB disconnected) 22.30 mA @ Idle mode (PF=64, USB connected)	6.15µA @ Power off mode /0.82mA @ LTE-FDD Sleep mode (PF = 128)/0.72mA @ LTE-FDD Sleep mode (PF = 256)/7.98mA @ LTE-TDD Idle mode(PF = 64 USB disconnected)/19.46mA @ LTE-TDD Idle mode(PF = 64 USB connected) (EG800K-CN); 7.47µA @ Power Off mode/0.64mA @ LTE-FDD Sleep mode(PF = 128)/0.56mA @ LTE-FDD Sleep mode(PF = 256)/7.82mA @ LTE-TDD Idle mode(PF = 64 USB disconnected)/19.66mA @ LTE-TDD Idle mode(PF = 64 USB connected) (EG800K-EU); 7.68 µA @ Power Off mode/0.73 mA @ LTE-FDD Sleep mode (PF = 128)/0.64 mA @ LTE-FDD Sleep mode(PF = 256)/7.43 mA @ LTE-FDD Idle mode(PF = 64, USB disconnected)/19 mA @ LTE-FDD Idle mode(PF = 64, USB connected) (EG800K-LA)
Certifications <sup>5</sup>	Carrier Certification: Verizon*/AT&T/T-Mobile/Deutsche Telekom/Spark; Regulatory Certification: GCF/PTCRB/FCC/IC/CE/UKCA/RCM/Anatel; Others: WHQL	Regulatory Certification: CCC/SRRC/NAL/CE/RCM/FCC/Anatel
Recommended applications	Asset management, commercial telematics, payment, RMAC (remote monitoring and control applications), safety and automation, smart metering and smart grid	Cloud trumpet, trackers, POS, data cards, smart safety, industrial PDA etc.

Note 1: The PPP, FTP, HTTP, HTTPS, FTPS and FILE protocols are optional.  
 Note 2: The third auxiliary serial port is under development.  
 Note 3: Indicates that only QuecOpen® supports the third auxiliary serial port.  
 Note 4: The QuecOpen® solution can support two I2C interfaces.  
 Note 5: May depend on modules' variant.

\* Planning/ Under development/ In progress  
 • Supported





# LTE modules

Product	EC200U/EC200U Mini PCIe	EC200A/EC200A Mini PCIe	EC200A-XXV1	
				
Form factor	LCC (EC200U); Mini PCIe-C (EC200U-CN Mini PCIe-C); Mini PCIe (EC200U-EU/-AU Mini PCIe)	LCC (EC200A); Mini PCIe (EC200A Mini PCIe); Mini PCIe-C (EC200A-CN Mini PCIe-C)	LCC	
Dimensions (mm)	28.0 × 31.0 × 2.4 (EC200U); 30.0 × 51.0 × 3.4 (EC200U-CN Mini PCIe-C); 30.0 × 51.0 × 4.9 (EC200U-EU/-AU Mini PCIe)	29.0 × 32.0 × 2.4 (EC200A); 30.0 × 51.0 × 4.9 (EC200A Mini PCIe); 30.0 × 51.0 × 3.5 (EC200A-CN Mini PCIe-C)	29.0 × 32.0 × 2.4	
LTE category	LTE Cat 1	LTE Cat 4	LTE Cat4	
Frequency bands (MHz)	-CN (China/India)	LTE-FDD: B1/3/5/8; LTE-TDD: B34/38/39/40/41; GSM: B3/8	LTE-FDD: B1/3/5/8; LTE-TDD: B34/38/39/40/41; WCDMA: B1/5/8; GSM: B3/8	LTE-FDD: B1/3/5/8; LTE-TDD: B34/38/39/40/41; WCDMA: B1/5/8; GSM: B3/8
	-EU (Europe/Asia-Pacific)	LTE-FDD: B1/3/5/7/8/20/28; LTE-TDD: B38/40/41; GSM: B2/3/5/8	LTE-FDD: B1/3/5/7/8/20/28; LTE-TDD: B38/40/41; WCDMA: B1/5/8; GSM: B3/8	LTE-FDD: B1/3/5/7/8/20/28; LTE-TDD: B38/40/41; WCDMA: B1/5/8; GSM: B3/8
	-EN (EMEA/APAC)	/	/	/
	-EL (Europe/Asia-Pacific)	/	LTE-FDD: B1/3/5/7/8/20/28; LTE-TDD: B38/40/41; WCDMA: B1/5/8	LTE-FDD: B1/3/5/7/8/20/28; LTE-TDD: B38/40/41; WCDMA: B1/5/8
	-AU (Australia/New Zealand/Latin America)	LTE-FDD: B1/2/3/4/5/7/8/28/66; LTE-TDD: B38/40/41; GSM: B2/3/5/8	LTE-FDD: B1/2/3/4/5/7/8/28/66; LTE-TDD: B40; WCDMA: B1/2/4/5/8; GSM: B2/3/5/8	/
Weight (approx.) g	4.1 (EC200U); 7.2 (EC200U-CN Mini PCIe-C); 9.25 (EC200U-EU/-AU Mini PCIe)	4.3 (EC200A); 9.7 (EC200A Mini PCIe); 8.5 (EC200A Mini PCIe-C)	4.2	
Operating temperature	-35°C ~ +75°C	-35°C ~ +75°C	-35°C ~ +75°C	
Extended temperature	-40°C ~ +85°C (EC200U); -40°C ~ +80°C (EC200U-CN Mini PCIe-C/EC200U-EU/-AU Mini PCIe)	-40°C ~ +85°C (EC200A); -40°C ~ +80°C (EC200A Mini PCIe/EC200A-CN Mini PCIe-C)	-40°C ~ +85°C	
<b>Data transmission</b>				
LTE data rates (Mbps)	Max. 10 (DL)/Max. 5 (UL) (EC200U); LTE-FDD: Max. 10 (DL)/Max. 5 (UL); LTE-TDD: Max. 8.96 (DL)/Max. 3.1 (UL) (EC200U-CN Mini PCIe-C, EC200U-EU/-AU Mini PCIe)	LTE-FDD: Max. 150 (DL)/Max. 50 (UL); LTE-TDD: Max. 130 (DL)/Max. 30 (UL)	LTE-FDD: Max. 150 (DL)/Max. 50 (UL); LTE-TDD: Max. 130 (DL)/Max. 30 (UL)	
DC-HSPA+ data rates (Mbps)	/	Max. 21 (DL)/Max. 5.76 (UL)	Max. 21 (DL)/Max. 5.76 (UL)	
WCDMA data rates (Kbps)	/	Max. 384 (DL)/Max. 384 (UL)	Max. 384 (DL)/Max. 384 (UL)	
EDGE data rates (Kbps)	/	Max. 236.8 (DL)/Max. 236.8 (UL)	Max. 236.8 (DL)/Max. 236.8 (UL)	
GPRS data rates (Kbps)	Max. 85.6 (DL)/Max. 85.6 (UL)	Max. 85.6 (DL)/Max. 85.6 (UL)	Max. 85.6 (DL)/Max. 85.6 (UL)	
SMS	•	•	*	
CSD	/	•	*	
Protocols	TCP/UDP/PPP/FTP/HTTP/NTP/PING/NITZ/CMUX/HTTPS/SMT/PPS/FTPS/SMT/SSL/FILE (EC200U); TCP/UDP/PPP/NITZ/PING/FILE/MQTT/NTP/HTTP/HTTPS/SSL/FTP/FTPS/CMUX/MMS (EC200U-CN Mini PCIe-C, EC200U-EU/-AU Mini PCIe)	TCP/UDP/PPP/NTP/NITZ/FTP/HTTP/PING/CMUX/HTTPS/FTPS/SSL/FILE/MQTT/MMS/SMT/PPS	TCP/UDP/PPP/NTP/NITZ/FTP/HTTP/PING/CMUX*/HTTPS/FTPS/SSL/FILE/MMS	
<b>Interfaces</b>				
(U)SIM	× 1	× 1	× 1	
UART	× 3 (EC200U); × 1 (EC200U-CN Mini PCIe-C, EC200U-EU/-AU Mini PCIe)	× 2 (EC200A); × 1 (EC200A Mini PCIe/EC200A-CN Mini PCIe-C)	× 2	
USB	× 1	× 1	× 1	
I2C	× 2 (EC200U); × 1 (EC200U-EU/-AU Mini PCIe)	× 1	× 1	
Audio digital (PCM)	× 1 (EC200U/EC200U-EU/-AU Mini PCIe)	× 1	/	
SDIO	× 1 <sup>1</sup>	× 2	× 2*	
ADC	× 3 (EC200U)	× 2, 12bits (EC200A)	× 2*	
Antenna	× 1 Main, × 1 GNSS (optional), × 1 Wi-Fi scan/ Bluetooth (optional) (EC200U) × 1 Main, × 1 GNSS (optional) (EC200U-CN Mini PCIe-C/ EC200U-EU/-AU Mini PCIe)	× 1 Main, × 1 Rx-diversity (optional), × 1 GNSS (optional)	× 1 Main, × 1 Rx-diversity	
<b>Enhanced features</b>				
GNSS	Optional	Optional	/	
Wi-Fi scan	Optional	/	/	
BlueTooth	Optional	/	/	
Digital audio	•	•	/	
VoLTE	•	•	/	
DTMF	•	•	/	
DFOTA	•	•	•	
Audio playback/Audio recording	•	•	/	
QuecFile	• (only support ufs)	•	•	
USB serial driver	Windows 7/8/8.1/10/11, Linux 2.6-6.7, Android 4.x-13.x	Windows 7/8/8.1/10/11, Linux 2.6-6.7, Android 4.x-13.x	Windows 8/8.1/10/11, Linux 2.6-6.7, Android 4.x-13.x	
GNSS driver	Android 4.x-13.x	Android 4.x-13.x	/	
RIL driver	Android 4.x-13.x	Android 4.x-13.x	Android 4.x-13.x	
RNDIS driver	Windows 7/8/8.1/10/11, Linux 2.6-6.7	Windows 7/8/8.1/10/11, Linux 2.6-6.7	Windows 8/8.1/10/11, Linux 2.6-6.7	
ECM driver	Linux 2.6-6.7	Linux 2.6-6.7	Linux 2.6-6.7	
(U)SIM card detection	•	•	•	
Firmware update	• (USB or DFOTA) (EC200U); Via USB/DFOTA (EC200U-CN Mini PCIe-C, EC200U-EU/-AU Mini PCIe)	Via USB/DFOTA	Via USB/DFOTA	
<b>Electrical features</b>				
Supply voltage range	3.3 V ~ 4.3 V, typ. 3.8 V (EC200U/EC200U-CN Mini PCIe-C); 3.0 V ~ 3.6 V, typ. 3.3 V (EC200U-EU/-AU Mini PCIe)	3.4 V ~ 4.5 V, typ. 3.8 V (EC200A/EC200A Mini PCIe-C); 3.0 V ~ 3.6 V, typ. 3.3 V (EC200A Mini PCIe)	3.4 V ~ 4.3 V, typ. 3.8 V	
Power consumption	30 µA @Power off mode/1.35 mA @LTE sleep mode (PF=256), Typ/13 mA @idle mode (EC200U) 4.13 mA @ LTE sleep (PF = 128)/3.94 mA @ LTE sleep (PF = 256)/29 mA @ Idle (PF = 64, USB connection)/18 mA @ Idle (PF = 64, USB disconnection) (EC200U-CN Mini PCIe-C); 4.54 mA @ LTE sleep (PF = 128)/4.31 mA @ LTE sleep (PF = 256)/37.17 mA @ Idle (PF = 64, USB connection)/22.40 mA @ Idle (PF = 64, USB disconnection) (EC200U-EU/-AU Mini PCIe)	11 µA @Power off mode/1.1 mA @LTE sleep mode (PF=256), Typ/18 mA @idle mode (EC200A); 19 µA @Power off mode, Typ/27.6 mA @LTE sleep mode (EC200A Mini PCIe); 1.59 mA @LTE sleep (PF=256)/28.6 mA @Idle (PF=64) (EC200A Mini PCIe-C)	8.05 µA @Power off mode/2.7 mA @LTE sleep mode (PF=128), Typ/2.4 mA @LTE sleep mode (PF=256), Typ/22.1 mA @idle mode	
Certifications <sup>2</sup>	Carrier Certification: KT; Regulatory Certification: CCC/SRRC/NAL/CE/RCM/KC/FCC/Anatel	Regulatory Certification: CCC/SRRC/NAL/CE/UKCA/RCM/KC/NCC/FCC/Anatel	Regulatory Certification: CCC/SRRC/NAL/CE/RCM	
Recommended applications	POS/POC/ETC, shared equipment, data cards, energy control and monitoring, safety and protection, industrial PDAs.	Automotive aftermarket, transportation, green energy, wireless payment, safety, smart cities, mobile gateways, smart industry, personal tracking, medical monitoring, agriculture and environmental monitoring.		

Note 1: Only QuecOpen® version support.  
Note 2: May depend on modules' variant.

\* Planning/ Under development/ In progress  
• Supported






Product	EG915U	EG912U	EG915N	EG912N
				
Form factor	LGA	LGA	LGA	LGA
Dimensions (mm)	23.6 × 19.9 × 2.4	29.0 × 25.0 × 2.4	23.6 × 19.9 × 2.4	29.0 × 25.0 × 2.4
LTE category	LTE Cat 1	LTE Cat 1	LTE Cat 1	LTE Cat 1
Frequency bands (MHz)	-CN (China/India)	LTE-FDD: B1/3/5/8; LTE-TDD: B34/38/39/40/41; GSM: B3/8	/	/
	-EU (Europe)	LTE-FDD: B1/3/5/7/8/20/28; GSM: B2/3/5/8	/	/
	-EN (Europe)	/	/	/
	-EAL (Europe/APAC/Latin)	/	LTE-FDD: B1/2/3/4/5/7/8/20/28/66; LTE-TDD: 38/40/41; GSM: B2/3/5/8	/
	-EA (Europe/Asia)	/	/	LTE-FDD: B1/3/7/8/20/28; GSM: B3/8
	-GL (Global)	/	LTE-FDD: B1/2/3/4/5/7/8/12/13/17/18/19/20/25/26/28/66; LTE-TDD: B34/38/39/40/41; GSM: B2/3/5/8	/
	-LA (Latin America)	LTE-FDD: B2/3/4/5/7/8/28/66; GSM: B2/3/5/8	/	LTE-FDD: B2/3/4/5/7/8/28/66; GSM: B2/3/5/8
Weight (approx.) g	2.48	3.67	2.46	3.5
Operating temperature	-35°C ~ +75°C	-35°C ~ +75°C	-35°C ~ +75°C	-35°C ~ +75°C
Extended temperature	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C
<b>Data transmission</b>				
LTE data rates (Mbps)	Max. 10 (DL)/Max. 5 (UL)	Max. 10 (DL)/Max. 5 (UL)	Max. 10 (DL)/Max. 5 (UL)	Max. 10 (DL)/Max. 5 (UL)
DC-HSPA+ data rates (Mbps)	/	/	/	/
WCDMA data rates (Kbps)	/	/	/	/
EDGE data rates (Kbps)	/	/	Max. 236.8 (DL)/Max. 236.8 (UL)	Max. 236.8 (DL)/Max. 236.8 (UL)
GPRS data rates (Kbps)	Max. 85.6 (DL)/Max. 85.6 (UL)	Max. 85.6 (DL)/Max. 85.6 (UL)	Max. 85.6 (DL)/Max. 85.6 (UL)	Max. 85.6 (DL)/Max. 85.6 (UL)
SMS	•	•	•	•
Protocols	TCP/UDP/PPP/FTP/HTTP/NTP/PING/NITZ/CMUX/HTTPS/SMP/MMS/FTPS/SMT/SSL/FILE	TCP/UDP/PPP/FTP/HTTP/NTP/PING/NITZ/CMUX/HTTPS/SMP/MMS/FTPS/SMT/SSL/FILE	TCP/UDP/PPP/NTP/NITZ/FTP/HTTP/PING/CMUX/HTTPS/FTPS/SSL/FILE/MQTT/MMS/SMT/SMP/SSL/FTP/SMT/PS/SMP	TCP/UDP/PPP/NITZ/PING/MQTT/NTP/HTTP/HTTPS/SSL/FTP/SMT/PS/SMP
<b>Interfaces</b>				
(U)SIM	× 2	× 2	× 2	× 2
UART	× 3	× 3	× 3	× 2
USB	× 1	× 1	× 1	× 1
I2C	× 1	× 1	× 1	× 1
Audio digital (PCM)	× 1	× 1	× 1	× 1
SDIO	× 1 <sup>1</sup>	× 1 <sup>1</sup>	/	/
ADC	× 2	× 2	× 2 (optional)	× 2
Antenna	× 1 Main, × 1 Wi-Fi scan/Bluetooth (optional)	× 1 Main, × 1 GNSS (optional), × 1 Wi-Fi scan/Bluetooth (optional)	× 1 Main, × 1 GNSS (optional)	× 1 Main
<b>Enhanced features</b>				
GNSS	/	Optional	Optional	/
Wi-Fi scan	Optional	Optional	•	•
BlueTooth	Optional	Optional	/	/
VoLTE	•	•	•	•
DTMF	•	•	•	•
DFOTA	•	•	•	•
Audio playback/Audio recording	•	•	•	•
QuecFile	• (only support ufs)	• (only support ufs)	•	•
USB serial driver	Windows 7/8/8.1/10/11, Linux 2.6-6.7, Android 4.x-13.x	Windows 7/8/8.1/10/11, Linux 2.6-6.7, Android 4.x-13.x	Windows 7/8/8.1/10/11, Linux 2.6-6.7, Android 4.x-13.x	Windows 7/8/8.1/10/11, Linux 2.6-6.7, Android 4.x-13.x
GNSS driver	Android 4.x-13.x	Android 4.x-13.x	Android 4.x-13.x	/
RIL driver	Android 4.x-13.x	Android 4.x-13.x	Android 4.x-13.x	Android 4.x-13.x
RNDIS driver	Windows 7/8/8.1/10/11, Linux 2.6-6.7	Windows 7/8/8.1/10/11, Linux 2.6-6.7	Windows 7/8/8.1/10/11, Linux 2.6-6.7	Windows 7/8/8.1/10/11, Linux 2.6-6.7
ECM driver	Linux 2.6-6.7	Linux 2.6-6.7	Linux 2.6-6.7	Linux 2.6-6.7
(U)SIM card detection	•	•	•	•
Firmware update	Via USB/DFOTA	Via USB/DFOTA	Via USB/DFOTA	Via USB/DFOTA
<b>Electrical features</b>				
Supply voltage range	3.3 V ~ 4.3 V, typ. 3.8V	3.3 V ~ 4.3 V, typ. 3.8 V	3.4 V ~ 4.5 V, typ. 3.8 V	3.3 V ~ 4.3 V, typ. 3.8 V
Power consumption	30 μA @ power off/1.3 mA @ sleep/13 mA @ idle	34 μA @ Power off 1.7 mA @ LTE sleep (PF = 128) 1.5 mA @ LTE sleep (PF = 256) 30 mA @ Idle (PF = 64, USB connected) 14 mA @ Idle (PF = 64, USB disconnected)	24 μA@Power off/1.4mA@Sleep, Typ./20.97 mA@idle	30 μA@Power off mode 1.28 mA@LTE sleep mode (PF = 128) 1.19 mA@LTE sleep mode (PF = 256) 20.65 mA @idle mode(PF = 64, USB Disconnect) 29.83 mA @ Idle mode(PF = 64, USB Active)
Certifications <sup>2</sup>	Regulatory Certification: GCF/CE/RCM/Anatel/UKCA/NCC/FCC	Regulatory Certification: CCC/SRRC/NAL/NCC/CE/FCC/IC/Anatel/RCM/KC/TELEC	Regulatory Certification: CE/RCM/UKCA/FCC/Anatel	Regulatory Certification: CE
Recommended applications	POS/POC/ETC, shared equipment, data cards, energy control and monitoring, safety and protection, industrial PDAs.		Telematics, smart metering, mobile POS terminals, gateways, safety, tracking and tracing, remote maintenance and control, networking, mobile computing, healthcare	POS/POC/ETC, shared equipment, data cards, energy control and monitoring, safety and protection, industrial PDAs.

Note 1: Only QuecOpen® version support.  
Note 2: May depend on modules' variant.

\* Planning/ Under development/ In progress  
• Supported

# Smart modules

Product	SC20 (Android)	SC20 (Linux)	SC200R
			
Form factor	LCC+LGA	LCC+LGA	LCC+LGA
Dimensions (mm)	40.5 × 40.5 × 2.8	40.5 × 40.5 × 2.8	40.5 × 40.5 × 2.8
LTE feature	LTE Cat 4; 3GPP E-UTRA Release 10 Compliant, Support DL MIMO 2 × 2	LTE Cat 4; 3GPP E-UTRA Release 10 Compliant, Support DL MIMO 2 × 2	LTE Cat 4; 3GPP E-UTRA Release 10 Compliant, Support DL MIMO 2 × 2
Frequency bands (MHz)	-CE/CEL (China)	-CE (China) LTE-FDD: B1/3/5/8; LTE-TDD: B38/39/40/41; WCDMA: B1/8; TD-SCDMA: B34/39; CDMA: B00; GSM: 900/1800MHz	-CE (China) LTE-FDD: B1/3/5/8; LTE-TDD: B38/39/40/41; WCDMA: B1/8; TD-SCDMA: B34/39; CDMA: B00; GSM: 900/1800MHz
	-E/EL/EM (EMEA/Korea/Thailand/India/Vietnam/Africa/Southeast Asia/Australia/South America)	-E (EMEA/Korea/Thailand/India/Vietnam) LTE-FDD: B1/3/5/7/8/20; LTE-TDD: B38/40/41; WCDMA: B1/5/8; GSM: 850/900/1800/1900MHz	-E (EMEA/Korea/Thailand/India/Vietnam) LTE-FDD: B1/3/5/7/8/20; LTE-TDD: B38/40/41; WCDMA: B1/5/8; GSM: 850/900/1800/1900MHz
	-A/AL/NA (North America)	-A (North America) LTE-FDD: B2/4/5/7/12/13/25/26; WCDMA: B1/2/4/5/8; GSM: 850/1900MHz	-AL (North America) LTE-FDD: B2/4/5/7/12/13/25/26; WCDMA: B1/2/4/5/8; GSM: 850/1900MHz
	-AU/AUL (ANZ/Brazil)	-AU (ANZ/Brazil) LTE-FDD: B1/3/5/7/8/28; LTE-TDD: B40; WCDMA: B1/2/5/8; GSM: 850/900/1800/1900MHz	-AUL (ANZ/Brazil) LTE-FDD: B1/3/5/7/8/28; LTE-TDD: B40; WCDMA: B1/2/5/8; GSM: 850/900/1800/1900MHz
	-J/JL/JP <sup>1</sup> (Japan)	-J (Japan) LTE-FDD: B1/3/8/18/19/26; LTE-TDD: B41; WCDMA: B1/6/8/19	-JL (Japan) LTE-FDD: B1/3/8/18/19/26; LTE-TDD: B41; WCDMA: B1/6/8/19
	-W/WL/WF* (Global)	-W (Wi-Fi) Only Wi-Fi & BT	-WL (Wi-Fi) Only Wi-Fi & BT
	-NA (North America)	-NA (North America) LTE-FDD: B2/4/5/7/12/13/14/17/25/26/66/71; LTE-TDD: B41; WCDMA: B2/4/5	-EM (EMEA/Africa/Southeast Asia/Australia/South America) LTE-FDD: B1/2/3/4/5/7/8/20/28; LTE-TDD: B38/40/41; WCDMA: B1/2/4/5/8; GSM: 850/900/1800/1900MHz
CPU	Qualcomm MSM8909 ARM Coretex 4 x A7@ 1.1GHz	Qualcomm MSM8909 ARM Coretex 4 x A7@ 1.1GHz	Qualcomm QCM2150 ARM Coretex 4 x A53@ 1.3GHz
NPU	/	/	/
GPU	Qualcomm® Adreno™ 304 Graphics Processing Unit (GPU), up to 409.6 MHz	Qualcomm® Adreno™ 304 Graphics Processing Unit (GPU), up to 409.6 MHz	Qualcomm® Adreno™ 308 Graphics Processing Unit (GPU) with 64-bit addressing, up to 485 MHz
Memory	1 GB LPDDR3 + 8 GB eMMC; 2 GB LPDDR3 + 16 GB eMMC	1GB LPDDR3 + 8GB eMMC	1 GB LPDDR3 + 8 GB eMMC; 2 GB LPDDR3 + 16 GB eMMC
Operating system	Android 7.1/8.1 in SC20-E/-A/-J/-AU/-W	Yocto Linux (Kernel 3.18) in SC20-EL/-AL/-JL/-AUL/-WL	Android 10
Supply voltage range	3.5 V ~ 4.2 V, typ. 3.8 V	3.5 V ~ 4.2 V, typ. 3.8 V	3.55 V ~ 4.2 V, typ. 3.8 V
Weight (approx.) g	9.8	9.8	10.2
Operating temperature	-35°C ~ +75°C	-35°C ~ +75°C	-35°C ~ +75°C
<b>Data transmission</b>			
LTE (Mbps)	LTE-FDD: Max. 150 (DL)/Max. 50 (UL) LTE-TDD: Max. 130 (DL)/Max. 30 (UL)	LTE-FDD: Max. 150 (DL)/Max. 50 (UL) LTE-TDD: Max. 130 (DL)/Max. 30 (UL)	LTE-FDD: Max. 150 (DL)/Max. 50 (UL) LTE-TDD: Max. 130 (DL)/Max. 30 (UL)
UMTS	DC-HSDPA: Max. 42 Mbps (DL); HSUPA: Max. 5.76 Mbps (UL); WCDMA: Max. 384 Kbps (DL/UL)	DC-HSDPA: Max. 42 Mbps (DL); HSUPA: Max. 5.76 Mbps (UL); WCDMA: Max. 384 Kbps (DL/UL)	DC-HSDPA: Max. 42 Mbps (DL); HSUPA: Max. 5.76 Mbps (UL); WCDMA: Max. 384 Kbps (DL/UL)
TD-SCDMA (Mbps)	Max. 4.2 (DL)/Max. 2.2 (UL)	Max. 4.2 (DL)/Max. 2.2 (UL)	/
CDMA2000	EVDO: Max. 3.1 Mbps (DL)/Max. 1.8 Mbps (UL); 1 × Advanced: Max. 307.2 Kbps (DL/UL)	EVDO: Max. 3.1 Mbps (DL)/Max. 1.8 Mbps (UL); 1 × Advanced: Max. 307.2 Kbps (DL/UL)	EVDO: Max. 3.1 Mbps (DL)/Max. 1.8 Mbps (UL); 1 × Advanced: Max. 307.2 Kbps (DL/UL)
GSM (Kbps)	EDGE: Max. 296 (DL)/Max. 236.8 (UL); GPRS: Max. 107 (DL)/Max. 85.6 (UL)	EDGE: Max. 296 (DL)/Max. 236.8 (UL); GPRS: Max. 107 (DL)/Max. 85.6 (UL)	EDGE: Max. 296 (DL)/Max. 236.8 (UL); GPRS: Max. 107 (DL)/Max. 85.6 (UL)
<b>Interfaces</b>			
LCM	4-lane MIPI_DSI, 1.5 Gbps/lane, HD (1280 × 720) @ 60 fps	4-lane MIPI_DSI, 1.5 Gbps/lane, HD (1280 × 720) @ 60 fps	4-lane MIPI_DSI, HD+ (1440 × 720) @ 60 fps; Wi-Fi display: 1080P @ 30 fps (UBWC)
Camera	2-lane rear camera and 1-lane front camera or 4-lane rear camera only; MIPI_CSI, 1.5 Gbps/ lane, up to 8 MP, Bayer/ YUV format	2-lane rear camera and 1-lane front camera or 4-lane rear camera only; MIPI_CSI, 1.5 Gbps/ lane, up to 8 MP, Bayer/ YUV format	2 groups of 4-lane MIPI_CSI, up to 2.1 Gbps/ lane, 2 × ISP; Support 2 or 3 cameras, up to 13 MP with dual ISP
Touch panel	Capacitive touchscreen, I2C controls	Capacitive touchscreen, I2C controls	Capacitive touch panel, I2C controls
Audio	Analog channels: Two inputs: MIC1, MIC2; Three outputs: speaker, earpiece, headphone	Analog channels: Two inputs: MIC1, MIC2; Three outputs: speaker, earpiece, headphone	Analog channels: 3 inputs: MIC1, MIC2, MIC3 (including one noise-canceling MIC); 3 outputs: speaker, earpiece, headphone
Video	Encode: 720P (H.264) @ 30 fps; WVGA (MPEG-4/VP8) @ 30 fps Decode: 1080P (H.264/ MPEG-4/ VP8/H.265/ DivX4/5/6) @ 30 fps; WVGA (H.263) @ 30 fps	Encode: 720P (H.264) @ 30 fps; WVGA (MPEG-4/VP8) @ 30 fps Decode: 1080P (H.264/ MPEG-4/ VP8/H.265/ DivX4/5/6) @ 30 fps; WVGA (H.263) @ 30 fps	Encode: 1080P (H.264) @ 30 fps; WVGA (MPEG-4/VP8) @ 30 fps Decode: 1080P (H.264/ MPEG-4/VP8/H.265/ DivX4/5/6) @ 30 fps; WVGA (H.263) @ 30 fps
USB	× 1, USB 2.0, supports USB OTG, High Speed 480 Mbps	× 1, USB 2.0, supports USB OTG, High Speed 480 Mbps	× 1, USB 2.0, supports USB OTG
I2C	Supported	Supported	Supported
(U)SIM	× 2, Support 1.8/ 3 V (U)SIM cards, with (U)SIM card detection function, DSDS supported	× 2, Support 1.8/ 3 V (U)SIM cards, with (U)SIM card detection function, DSDS supported	× 2, Support 1.8/ 2.95 V (U)SIM cards, with (U)SIM card detection function, DSDS supported
UART	× 2, Support up to 4 Mbps with hardware flow control	× 2, Support up to 4 Mbps with hardware flow control	× 3, Support 4Mbps, One of them supports Hardware Flow Control
SD card	× 1, SD 3.0, 4-bit SDIO	× 1, SD 3.0, 4-bit SDIO	× 1, SD 3.0, 4-bit SDIO
PWRKEY/ SPI/ ADC/ GPIO	Supported	Supported	Supported
PWM/ Motor driver	× 1	× 1	× 1
Antenna	× 4, Main/ Rx-diversity/ GNSS/ Wi-Fi & Bluetooth	× 4, Main/ Rx-diversity/ GNSS/ Wi-Fi & Bluetooth	4 Solder Pads for Main/Rx-diversity/ GNSS/Wi-Fi & BT antenna, Respectively
<b>Enhanced features</b>			
BT	Bluetooth 2.1 EDR/3.0 HS/4.2 LE; Support a maximum of 10 ACL/BEL/SCO links	Bluetooth 2.1 EDR/3.0 HS/4.2 LE; Support a maximum of 10 ACL/BEL/SCO links	Bluetooth 2.1 EDR/3.0 HS/4.2 LE; Support a maximum of 10 ACL/BEL/SCO links
Wi-Fi	2.4 & 5 GHz; 802.11a/b/g/n; 150 Mbps; STA/AP/P2P (SC20-CE only support 2.4GHz)	2.4 & 5 GHz; 802.11a/ b/ g/ n; 150 Mbps; STA/AP/P2P	2.4 & 5 GHz; 802.11a/b/g/n; 150 Mbps; STA/AP/ P2P
GNSS	GNSS <sup>2</sup> : GPS/BDS/GLONASS	GNSS <sup>2</sup> : GPS/BDS/GLONASS	GNSS <sup>2</sup> : GPS/BDS/GLONASS or GPS/BDS/Galileo
Charge function	Build-in Charge IC	Build-in Charge IC	Build-in Charge IC
Dual LCDs	Only support single LCD display	Only support single LCD display	Only support single LCD display
DSDS	Support dual SIM dual standby	Support dual SIM dual standby	Support dual SIM dual standby
Firmware upgrade	Firmware upgrade via USB or OTA	Firmware upgrade via USB or OTA	Firmware upgrade via USB or OTA
Certifications <sup>4</sup>	Carrier Certification: Verizon/AT&T-Mobile*/Rogers/Telus*/Telstra/NTT-DOCOMO/Softbank/KDDI; Regulatory Certification: CCC/SRRC/NAL/GCF/CE/KC/PTCRB/FCC/IC/Anatel/NCC/RCM/JATE/TELEC	Carrier Certification: Verizon/AT&T-Mobile*/Telus*/Telstra* Regulatory Certification: CCC*/SRRC*/NAL*/CE/GCF/RCM/PTCRB/FCC/IC/Anatel/NCC*/JATE/TELEC/Rogers/KC*	Carrier Certification: Telstra/Verizon/AT&T; Regulatory Certification: CCC/SRRC/GCF/CE/RCM/KC/PTCRB/FCC/IC/JATE*/TELEC*
Recommended applications	Smart POS, gateways, robots, wearables, safety, PDAs & tablets, vending machines, delivery lockers, telematics, mobile computing, video streaming and entertainment systems, etc.		

Note 1: TBD.


Note 2: GNSS is not supported on SC20-W/ -WL.

Note 3: GNSS is not supported on SC200R-WF.

Note 4: May depend on modules' variant.




SC20-E LTE-TDD B41 does not support full-frequency and the bandwidth of it is 2555-2655MHz.

\* Planning/ Under development/ In progress

Product	SG368Z	
		
Form factor	LGA	
Dimensions(mm)	46.0 × 42.0 × 3.15	
Frequency bands (MHz)	-WF(Global)	/
	-AP(Global)	/
CPU	RK3568, Quad-core ARM Cortex-A55 CPU @ 2.0 GHz	
NPU	1 Tops	
GPU	ARM Mali-G52	
Memory	Commercial grade: LP4/ LP4x,standard 2 GB + 32 GB (4 GB + 32 GB optional) Industrial grade: LP4/ LP4x,standard 2 GB + 16 GB (4 GB + 32 GB optional)	
Operating system	Linux (Kernel 4.19/ 5.10*)/ Android 13/ OpenWrt	
Supply voltage range	3.3 V ~ 3.5 V, typ. 3.4 V	
Weight (approx.) g	WF:13.1; AP:12.8	
Operating temperature	WF: Commercial grade: -10°C ~ +75°C, Industrial grade: -40°C ~ +85°C; AP: Commercial grade: -25°C ~ +75°C, Industrial grade: -40°C ~ +85°C	
<b>Data transmission</b>		
LTE (Mbps)	/	
UMTS	/	
TD-SCDMA	/	
CDMA2000	/	
GSM	/	
<b>Interfaces</b>		
LCM	1 × HDMI 2.0: Max.(4096 × 2160) @ 60 Hz 8-lane MIPI DSI 1.2: Max.(2048 × 1536) @ 60 Hz or 8-laneLVDS:Max.(1920 × 1080) @ 60 Hz 2 × 4-lane MIPI DSI 1.2: Max.(1920 × 1080) @ 60 Hz 4-lane eDP 1.3: Max.(2560 × 1600) @ 60 Hz 4-lane LVDS: Max.(1280 × 800) @ 60 Hz LCD RGB parallel display interface supports Max. 24 bits RGB*: Max.(1920 × 1080) @ 60 Hz	
Camera	1 × 4-lane MIPI CSI 8M or 2 × 2-lane, up to 2.5 Gbps/ lane Supports DVP* (BT.656/ 1120) analog camera	
Touch panel	Supported	
Audio	Loudspeaker, earpiece, analog microphones and digital audio	
Video	Encoding: 1080p @ 60 fps Decoding: 4K @ 60 fps H.264 AVC/ MVC Main10 Profile yuv400/ yuv420/ yuv422 @ L5.1, H.265 HEVC/ MVC Main10 Profile yuv420 @ L5.1, H.264/ AVC BP/ MP/ HP @ level4.2, H.265/ HEVC MP @ level4.1	
USB	× 4, compliant with USB 3.0/ 2.0 USB0: supports USB 2.0/ USB 3.0, supports USB HOST/ USB OTG USB1: supports USB 2.0/ USB 3.0, only supports USB HOST USB2: only supports USB 2.0, only supports USB HOST USB3: only supports USB 2.0, only supports USB HOST	
I2C	Max. × 5	
UART	Max. × 8 (SG368Z-WF); Max. × 10 (SG368Z-AP)	
SD card	× 1, SD 3.0	
PWRKEY	× 1	
SPI	Max. × 4, supports both master and slave modes	
ADC	× 5, general-purpose ADC interfaces	
GPIO	Max. × 107 (SG368Z-WF); Max. × 128 (SG368Z-AP)	
PWM	Max. × 14 (SG368Z-WF); Max. × 16 (SG368Z-AP)	
Motor driver	× 1	
Flashlight driver	3 high-current flash LED drivers, which support both flash and torch modes	
WLED Sink	/	
Antenna	× 1, Wi-Fi/ Bluetooth (SG368Z-WF)	
<b>Enhanced features</b>		
BT	Bluetooth 4.2(BR/ EDR + BLE)	
WLAN	2.4 & 5 GHz, Wi-Fi 5, 802.11a/b/g/n/ac	
GNSS	/	
Charge function	Supported	
Dual LCDs	Supported	
Firmware upgrade	Via USB	
Certifications	/	
Recommended applications	IoT gateway, smart commercial display, industrial device terminal, smart hospital, vehicle center console and automotive NVR, etc.	

\* Planning/ Under development/ In progress




# Smart modules

Product	SC200L	SC200E	SC206E	
				
Form factor	LCC+LGA	LCC+LGA	LCC+LGA	
Dimensions (mm)	40.5 × 40.5 × 2.85	40.5 × 40.5 × 2.85	40.5 × 40.5 × 2.85	
LTE feature	LTE Cat 4 3GPP E-UTRA Release 10 Compliant, Support DL MIMO 2 × 2 LTE-FDD: B1/3/5/8; LTE-TDD: B34/38/39/40/41; WCDMA: B1/8; GSM: 900/1800MHz	LTE Cat 4(SC200E-CE/EM/NA/JP/WF/GL) LTE-FDD: B1/3/5/8; LTE-TDD: B34/38/39/40/41(140M); WCDMA: B1/8; CDMA: BCC; GSM: 900/1800MHz	LTE Cat 4(SC206E-EM/NA)	
Frequency bands(MHz)	-CE (China)		/	
	-EU/EM (EMEA/Africa/South America/Korea/South Asia/Latin America/Australia/India/New Zealand/South Africa)	-EU (EMEA/South Africa/southeast Asia/India/Latin America) LTE-FDD: B1/3/5/7/8/20/28; LTE-TDD: B38/40/41; WCDMA: B1/5/8; GSM: 900/1800MHz	-EM(EMEA/ Korea/ South Asia/ Latin America/ India/ Australia/ New Zealand/ South Africa) LTE-FDD: B1/2/3/4/5/7/8/20/28(A+B); LTE-TDD: B38/40/41 (200M); WCDMA: B1/2/4/5/8; GSM: 850/900/1800/1900MHz	-EM(EMEA/ Korea/ South Asia/ Latin America/ India/ Australia/ New Zealand/ South Africa) LTE-FDD: B1/2/3/4/5/7/8/20/28(A+B); LTE-TDD: B38/40/41 (200M); WCDMA: B1/2/4/5/8; GSM: 850/900/1800/1900MHz
	-AU (ANZ/Brazil)	LTE-FDD: B1/2/3/4/5/7/8/28; LTE-TDD: B38 ; WCDMA: B1/2/4/5/8; GSM: 850/900/1800/1900 MHz	/	/
	-GL (Global)	/	LTE-FDD: B1/2/3/4/5/7/8/12/13/14/17/18/19/20/25/26/28/66/71; LTE-TDD: B34/38/39/40/41; WCDMA: B1/2/4/5/6/8/19; GSM: 850/900/1800/1900MHz	/
	-NA (North America)	/	LTE-FDD: B2/4/5/7/12/13/14/17/25/26/66/71; LTE-TDD: B41(200M)	LTE-FDD: B2/4/5/7/12/13/14/ 17/25/26/66/71; LTE-TDD: B41(200M)
	-JP (Japan)	/	LTE-FDD: B1/3/5/8/11/18/19/21/26/28; LTE-TDD: B41(200M); WCDMA: B1/6/8/19	/
	-WF(Global)	-WF(Wi-Fi) 2.4G & 5G Wi-Fi, 2.4G BT	-WF(Wi-Fi) 2.4G & 5G Wi-Fi, 2.4G BT	-WF(Wi-Fi) 2.4G & 5G Wi-Fi, 2.4G BT
CPU	Unisoc SL8541E ARM Coretex 4 x A53@ 1.4GHz	QCM2290, Quad-core ARM Cortex-A53 64-bit CPU @ 2.0 GHz	QCM2290, Quad-core ARM Cortex-A53 64-bit CPU @ 2.0 GHz	
NPU	/	/	/	
GPU	ARM Mali-T820 as 3D graphics accelerator, up to 680 MHz	Qualcomm® Adreno™ 702 Graphics Processing Unit (GPU) with 64-bit addressing	Qualcomm® Adreno™ 702 Graphics Processing Unit (GPU) with 64-bit addressing	
Memory	1 GB LPDDR3 + 8 GB eMMC; 2 GB LPDDR3 + 16 GB eMMC	32GB eMMC + 2GB LPDDR4X; 32GB eMMC + 3GB LPDDR4X	32GB eMMC + 2GB LPDDR4X	
Operating system	Android 10	Android 12/13*/14*	Yocto Linux (Kernel 5.4)*	
Supply voltage range	3.55 V ~ 4.2 V, typ. 3.8 V	3.55 V ~ 4.4 V, typ. 3.8 V	3.55 V ~ 4.4 V, typ. 3.8 V	
Weight (approx.) g	10	10.3	10.3	
Operating temperature	-30°C ~ +75°C	-35°C ~ +75°C	-35°C ~ +75°C	
<b>Data transmission</b>				
LTE (Mbps)	LTE-FDD: Max. 150 (DL)/ Max. 50 (UL) LTE-TDD: Max. 130 (DL)/ Max. 30 (UL)	Cat 4: LTE-FDD: Max. 150 (DL)/Max. 50 (UL) LTE-TDD: Max. 130 (DL)/Max. 30 (UL)	Cat 4: LTE-FDD: Max. 150 (DL)/Max. 50 (UL) LTE-TDD: Max. 130 (DL)/Max. 30 (UL)	
UMTS	DC-HSDPA: Max. 42 Mbps (DL); HSUPA: Max. 5.76 Mbps (UL) WCDMA: Max. 384 Kbps (DL/UL)	DC-HSDPA: Max. 42 Mbps (DL); DC-HSUPA: Max. 5.76 Mbps (UL) WCDMA: Max. 384 Kbps (DL/UL)	DC-HSDPA: Max. 42 Mbps (DL); DC-HSUPA: Max. 5.76 Mbps (UL) WCDMA: Max. 384 Kbps (DL/UL)	
CDMA2000	EVDO: Max. 3.1 Mbps (DL)/Max. 1.8 Mbps (UL) , 1X Advanced: Max. 307.2 Kbps (DL/UL)	EVDO: Max. 3.1 Mbps (DL)/Max. 1.8 Mbps (UL) 1X Advanced: Max. 307.2 Kbps (DL/UL)	EVDO: Max. 3.1 Mbps (DL)/Max. 1.8 Mbps (UL) 1X Advanced: Max. 307.2 Kbps (DL/UL)	
GSM(Kbps)	EDGE: Max. 296 (DL)/Max. 236.8 (UL) , GPRS: Max. 107 (DL)/Max. 85.6 (UL)	EDGE: Max. 296 (DL)/Max. 236.8 (UL) GPRS: Max. 107 (DL)/Max. 85.6 (UL)	EDGE: Max. 296 (DL)/Max. 236.8 (UL) GPRS: Max. 107 (DL)/Max. 85.6 (UL)	
<b>Interfaces</b>				
LCM	4-lane MIPI_DSI, HD+ (1440 × 720) @ 60 fps	1 group of 4-lane MIPI DSI, HD+ (1680 × 720) @ 60 fps	1 group of 4-lane MIPI DSI, HD+ (1680 × 720) @ 60 fps	
Camera	2 groups of MIPI_CSI (2-lane + 1-lane), up to 1.5 Gbps/lane 1 × ISP, 8 MP for rear camera (2-lane) and 2 MP for front camera (1-lane)	2 groups of 4-lane MIPI CSI, up to 2.5 Gbps/lane 2 or 3 cameras supported, up to 25 MP or 13 MP + 13 MP with dual ISP	2 groups of 4-lane MIPI CSI, up to 2.5 Gbps/lane 2 or 3 cameras supported, up to 25 MP or 13 MP + 13 MP with dual ISP	
Touch panel	Capacitive touch panel, I2C controls	Capacitive touch panel	Capacitive touch panel	
Audio	Analog channels: 3 inputs: MIC1, MIC2, MIC3 (including one noise-canceling MIC); 3 outputs: speaker, earpiece, headphone	3 analog inputs: MIC1, MIC2, MIC3 (including one noise-canceling MIC); 3 analog outputs: Line Out, earpiece, headphone	3 analog inputs: MIC1, MIC2, MIC3 (including one noise-canceling MIC); 3 analog outputs: Line Out, earpiece, headphone	
Video	Encoder: 1080P (H.264) @ 30 fps; WVGA (MPEG-4/VP8) @ 30 fps Decoder: 1080P (H.264/MPEG-4/VP8/H.265/DivX4/5/6) @ 30 fps; WVGA (H.263) @ 30 fps	Encoder: 1080P 8-bit H.264/H.265(HEVC) @ 30 fps Decoder: 1080P 8-bit H.264/H.265(HEVC)/VP9 @ 30 fps	Encoder: 1080P 8-bit H.264/H.265(HEVC) @ 30 fps; Decoder: 1080P 8-bit H.264/H.265(HEVC)/VP9 @ 30 fps	
USB	USB1 supports USB OTG, does not support USB hub; up to 480 Mbps; USB2 supports USB host mode and USB hub; up to 100 Mbps	× 1, compliant with USB 2.0/ 3.1, supports USB OTG, charge, etc.	× 1, compliant with USB 2.0/ 3.1, supports USB OTG, charge, etc.	
I2C	Supported	× 4	× 4	
(U)SIM	× 2, support 1.8/2.95 V (U)SIM cards, with (U)SIM card detection function, DSDS supported	× 2 (1.8V/2.95V)	× 2 (1.8V/2.95V)	
UART	× 2, up to 3.25 Mbps, UART0 supports hardware flow control	× 3, up to 4 Mbps, supports hardware flow control	× 3, up to 4 Mbps, supports hardware flow control	
SDIO	/	× 1 (3.0, 4-bit SDIO)	× 1 (3.0, 4-bit SDIO)	
SD card	× 1, SD 3.0, 4-bit SDIO	× 1, SD 3.0, 4-bit SDIO	× 1, SD 3.0, 4-bit SDIO	
PWRKEY	Supported	Pulled up internally to 1.1 V	Pulled up internally to 1.1 V	
SPI	Supported	× 1 (multiplexed)	× 1 (multiplexed)	
ADC	Supported	× 1, general-purpose ADC interface	× 1, general-purpose ADC interface	
GPIO	Supported	× 33	× 33	
PWM	× 1	× 1	× 1	
Motor driver	× 1	× 1	× 1	
Antenna	× 4, Main/Rx-diversity/GNSS/Wi-Fi & Bluetooth	× 4, Main/Rx-diversity/GNSS/Wi-Fi & Bluetooth antenna interface respectively (SC200E-WF: × 1, Wi-Fi & Bluetooth antenna interface)	× 4, Main/Rx-diversity/GNSS/Wi-Fi & Bluetooth antenna interface respectively (SC206E-WF: × 1, Wi-Fi & Bluetooth antenna interface)	
<b>Enhanced features</b>				
BT	Bluetooth 2.1 EDR/3.0 HS/4.2 LE/5.0 LE; Support a maximum of 10 ACL/EL/SCO links	2.1 EDR/3.0 HS/4.2 LE/5.0 LE	2.1 EDR/3.0 HS/4.2 LE/5.0 LE	
Wi-Fi	2.4 & 5 GHz, 802.11a/b/g/n/ac; 433 Mbps; STA/AP/P2P	2.4/5 GHz 802.11a/b/g/n/ac	2.4/5 GHz 802.11a/b/g/n/ac	
GNSS	GPS/GLONASS or GPS/BDS	GPS/BeiDou/GLONASS/Galileo/QZSS/SBAS	GPS/BeiDou/GLONASS/Galileo/QZSS/SBAS	
Charge function	Build-in Charge IC	Build-in Charge IC & Fuel Gauge Qualcomm Quick Charge technology	Build-in Charge IC & Fuel Gauge Qualcomm Quick charge technology	
Dual LCDs	Only support single LCD display	Only support single LCD display	Only support single LCD display	
DSDS	Support dual SIM dual standby	Support dual SIM dual standby	Support dual SIM dual standby	
Firmware upgrade	Firmware upgrade via USB or OTA	Firmware upgrade via USB and OTA	Firmware upgrade via USB and OTA	
Certifications <sup>1</sup>	CCC/SRRC*/NAL*/CE/GCF/RCM/Anatel	Verizon/AT&T-Mobile/KDDI*/CCC/SRRC/NAL/CE/UKCA/RCM/GCF/KC/Anatel/FCC/IC/PTCRB/JATE/TELEC/DCM/NB/C/NCC	Verizon/AT&T-Mobile/CE/UKCA/RCM/GCF/KC/Anatel/FCC/IC/PTCRB/JATE/TELEC	
Recommended applications	Smart POS, smart home gateways, smart robots, smart wearables, safety, PDAs & tablets, vending machines, delivery lockers, telematics, mobile computing, in-car video streaming and entertainment systems, etc.	Telematics, mobile POS terminals, gateways, safety, networking, mobile computing, etc.		

Note 1: May depend on modules' variant.

SC200L can't be promote to US, Canada, Australia, New Zealand, Japan or South Korea.

\* Planning/ Under development/ In progress

Product	SC600Y	SC680A	SC686A
			
Form factor	LCC+LGA	LCC+LGA	LCC+LGA
Dimensions (mm)	43.0 × 44.0 × 2.85	43.0 × 44.0 × 2.85	43.0 × 44.0 × 2.85
LTE feature	LTE Cat 6 3GPP E-UTRA Release 10 Compliant, Support DL MIMO 2 × 2	LTE Cat 6 3GPP E-UTRA Release 10 Compliant, Support DL MIMO 2 × 2	LTE Cat 6 3GPP E-UTRA Release 10 Compliant, Support DL MIMO 2 × 2
Frequency bands (MHz)	-EM ( EMEA/ India/ Korea/ South Asia/ Latin America/ Australia/ ANZ/ South Africa)	-EM ( EMEA/ India/ Korea/ South Asia/ Latin America/ Australia/ ANZ/ South Africa) LTE-FDD: B1/2/3/4/5/7/8/20/28; LTE-TDD: B38/39/40/41; WCDMA: B1/2/4/5/8; GSM: 850/900/1800/1900MHz	-EM ( EMEA/ India/ Korea/ South Asia/ Latin America/ Australia/ ANZ/ South Africa) LTE-FDD: B1/2/3/4/5/7/8/20/28; LTE-TDD: B38/40/41; WCDMA: B1/2/4/5/8; GSM: 850/900/1800/1900MHz
	-NA (North America)	LTE-FDD: B2/4/5/7/12/13/14/17/25/26/66/71; LTE-TDD: B41; WCDMA: B2/4/5	-NA (North America) LTE-FDD: B2/4/5/7/12/13/14/17/25/26/66/71; LTE-TDD: B41
	-JP (Japan)	LTE-FDD: B1/3/5/8/11/18/19/21/26/28; LTE-TDD: B41; WCDMA: B1/6/8/19	-JP <sup>1</sup> (Japan) LTE-FDD: B1/3/5/8/11/18/19/21/26/28; LTE-TDD: B41; WCDMA: B1/6/8/19
	-WF (Global)	Only Wi-Fi & BT	-WF (Global) Only Wi-Fi & BT
CPU	Qualcomm SDM450 ARM Coretex 8 x A53@ 1.8 GHz	Qualcomm QCM4290 ARM Coretex technology 4 x Kryo 260@ 2.0 GHz + 4 x Kryo 260@ 1.8 GHz	Qualcomm QCM4290 ARM Coretex technology 4 x Kryo 260@ 2.0 GHz + 4 x Kryo 260@ 1.8 GHz
NPU	/	1.1 TOPS	1.1 TOPS
GPU	Qualcomm® Adreno™ 506 graphics processing unit (GPU) with 64-bit addressing	Qualcomm® Kryo™ 610 graphics processing unit (GPU) at 950 MHz	Qualcomm® Kryo™ 610 graphics processing unit (GPU) at 950 MHz
Memory	2GB LPDDR3 + 16GB eMMC	64 GB UFS + 4 GB LPDDR4X (Default) 32 GB eMMC + 3 GB LPDDR4X (optional)	2GB LPDDR4X + 16GB eMMC
Operating system	Android 9/10	Android 12/13/14 <sup>1</sup>	Linux
Supply voltage range	3.55 V ~ 4.4 V, typ. 3.8 V	3.55 V ~ 4.4 V, typ. 3.8 V	3.55 V ~ 4.4 V, typ. 3.8 V
Weight (approx.) g	13.0	11.8	11.8
Operating temperature	-35°C ~ +75°C	-35°C ~ +75°C	-35°C ~ +75°C
<b>Data transmission</b>			
LTE (Mbps)	Cat 6: LTE-FDD: Max. 300 (DL)/Max. 50 (UL); LTE-TDD: Max. 265 (DL)/Max. 35 (UL) Cat 4: LTE-FDD: Max. 150 (DL)/Max. 50 (UL); LTE-TDD: Max. 130 (DL)/Max. 30 (UL)	Cat 6: LTE-FDD: Max. 300 (DL)/Max. 50 (UL); LTE-TDD: Max. 265 (DL)/Max. 35 (UL) Cat 4: LTE-FDD: Max. 150 (DL)/Max. 50 (UL); LTE-TDD: Max. 130 (DL)/Max. 30 (UL)	Cat 6: LTE-FDD: Max. 300 (DL)/Max. 50 (UL); LTE-TDD: Max. 265 (DL)/Max. 35 (UL) Cat 4: LTE-FDD: Max. 150 (DL)/Max. 50 (UL); LTE-TDD: Max. 130 (DL)/Max. 30 (UL)
UMTS	DC-HSDPA: Max. 42 Mbps (DL); DC-HSPA: Max. 11.2 Mbps (UL); WCDMA: Max. 384 Kbps (DL/UL)	DC-HSDPA: Max. 42 Mbps (DL); DC-HSPA: Max. 11.2 Mbps (UL); WCDMA: Max. 384 Kbps (DL/UL)	DC-HSDPA: Max. 42 Mbps (DL); DC-HSPA: Max. 11.2 Mbps (UL); WCDMA: Max. 384 Kbps (DL/UL)
GSM (Kbps)	EDGE: Max. 296 (DL)/Max. 236.8 (UL); GPRS: Max. 107 (DL)/Max. 85.6 (UL)	EDGE: Max. 296 (DL)/Max. 236.8 (UL); GPRS: Max. 107 (DL)/Max. 85.6 (UL)	EDGE: Max. 296 (DL)/Max. 236.8 (UL); GPRS: Max. 107 (DL)/Max. 85.6 (UL)
<b>Interfaces</b>			
LCM	2 x 4-lane MIPI_DSI; WUXGA (1920 × 1200) @ 60 fps for primary display and FHD (1920 × 1080) @ 60 fps for secondary display; Wi-Fi display: 1080P @ 30 fps (UBWC)	4-lane MIPI_DSI; DSI D-PHY 1.2; Split link supported; FHD+ (1080 × 2520) aspect ratio, up to 10 bpc; QSEED4, 4 L, Q-SYNC, SVI, CABL, and FOSS	4-lane MIPI_DSI; DSI D-PHY 1.2; Split link supported; FHD+ (1080 × 2520) aspect ratio, up to 10 bpc; QSEED4, 4 L, Q-SYNC, SVI, CABL, and FOSS
Camera	3 groups of 4-lane MIPI_CSI, up to 2.1 Gbps per lane. 2 × ISP; Support three cameras (4-lane + 4-lane + 4-lane) or four cameras (4-lane + 4-lane + 2-lane + 1-lane); Up to 21 MP with dual ISP	3 × ISP, (13 MP + 13 MP) or (25 MP + 5 MP) at 30 fps or (16 MP + 16 MP) @ 24 fps; 3 groups of 4-lane MIPI_CSI, up to 2.1 Gbps/ lane; Support 3 or 4 cameras, up to 25 MP with dual ISP	3 × ISP, (13 MP + 13 MP) or (25 MP + 5 MP) at 30 fps or (16 MP + 16 MP) @ 24 fps; 3 groups of 4-lane MIPI_CSI, up to 2.1 Gbps/ lane; Support 3 or 4 cameras, up to 25 MP with dual ISP
Touch panel	× 2, Capacitive touchscreen, I2C controls	Capacitive touch panel, I2C controls	Capacitive touch panel, I2C controls
Audio	Analog channels: Three inputs: MIC1, MIC2, MIC3 (including one noise-canceling MIC); Three outputs: speaker, earpiece, headphone	Analog channels: 3 inputs: MIC1, MIC2, MIC3 (including one noise-canceling MIC); 3 outputs: speaker, earpiece, headphone	Analog channels: 3 inputs: MIC1, MIC2, MIC3 (including one noise-canceling MIC); 3 outputs: speaker, earpiece, headphone
Video	Encode and Decode: Up to 1080P @ 60 fps High frame rate encoder; 720P @ 120 fps; 60 Mbps; Maximum 972000 macro block/s; 1080P @ 60 fps decode + 1080P @ 30 fps encode;	Encode: 1080p60 8 bit HEVC (H.265); 1080p60 8 bit H.264 Decode: 1080p60 8 bit HEVC (H.265), VP9; 1080p60 8 bit H.264	Encode: 1080p60 8 bit HEVC (H.265); 1080p60 8 bit H.264 Decode: 1080p60 8 bit HEVC (H.265), VP9; 1080p60 8 bit H.264
USB	× 1, USB 2.0/3.0 (Type-C), USB OTG + Charge	× 1, USB 2.0/3.1 (Type-C)	× 1, USB 2.0/3.1 (Type-C)
I2C	Supported	× 5	× 5
(U)SIM	× 2, Support 1.8/ 2.95 V (U)SIM cards, with (U)SIM card detection function, DSDS supported	× 2, Support 1.8/ 2.95 V (U)SIM cards, with (U)SIM card detection function, DSDS supported	× 2, Support 1.8/ 2.95 V (U)SIM cards, with (U)SIM card detection function, DSDS supported
UART	× 4, up to 4 Mbps, two of them support hardware flow control	× 4 (supports 115200 bps hardware flow control)	× 4 (supports 115200 bps hardware flow control)
SD card	SD 3.0, 4-bit SDIO	× 1, SD 3.0, 4-bit SDIO	× 1, SD 3.0, 4-bit SDIO
PWRKEY	Supported	Pulled up internally to 1.8 V	Pulled up internally to 1.8 V
SPI	Supported	× 3	× 3
ADC	Supported	× 2	× 2
GPIO	Supported	× 21	× 21
PWM	× 2	× 2	× 2
Motor driver	× 1	× 1	× 1
Flashlight driver	× 2	× 2	× 2
WLED Sink	× 4	× 4	× 4
Antenna	× 4, Main/Rx-diversity/GNSS/Wi-Fi & Bluetooth	× 4, Main/Rx-diversity/GNSS/Wi-Fi & Bluetooth	× 4, Main/Rx-diversity/GNSS/Wi-Fi & Bluetooth
<b>Enhanced features</b>			
BT	Bluetooth 2.1 EDR/3.0 HS/4.2 LE; Support a maximum of 10 ACL/BEL/SCO links	Bluetooth 2.1 EDR/3.0 HS/4.2 LE/5.1 LE	Bluetooth 2.1 EDR/3.0 HS/4.2 LE/5.1 LE
Wi-Fi	2.4 & 5 GHz, 802.11a/b/g/n/ac; 433 Mbps, STA/AP/P2P	2.4 & 5 GHz, 802.11a/b/g/n/ac/ax-ready	2.4 & 5 GHz, 802.11a/b/g/n/ac/ax-ready
GNSS	GNSS <sup>2</sup> : GPS/BDS/GLONASS or GPS/BDS/Galileo	GNSS <sup>3</sup> : GPS/BDS/GLONASS/Galileo/NavIC/QZSS/SBAS; L1	GNSS <sup>3</sup> : GPS/BDS/GLONASS/Galileo/NavIC/QZSS/SBAS; L1
Charge function	Build-in Charge IC & Fuel Gauge Qualcomm Quick Charge 3.0 technology	Build-in Charge IC & Fuel Gauge Qualcomm Quick Charge 3.0 technology	Build-in Charge IC & Fuel Gauge Qualcomm Quick Charge 3.0 technology
Dual LCDs	support independent display for 2 LCDs	only support single LCD display	only support single LCD display
DSDS	Support dual SIM dual standby	Support dual SIM dual standby	Support dual SIM dual standby
Firmware upgrade	Firmware upgrade via USB or OTA	Firmware upgrade via USB or OTA	Firmware upgrade via USB or OTA
Certifications <sup>4</sup>	Telstra/Verizon/AT&T-Mobile/NTT DOCOMO/KDDI/GCF/CE/RCM/Anatel/KC/NCC/PTCRB/FCC/IC/IFETEL/JATE/TELEC	Telstra*/Verizon/AT&T-Mobile/NTT DOCOMO/KDDI/CE/GCF/UKCA/RCM/KC/FCC/IC/PTCRB/IFETEL*/JATE/TELEC/NCC*	Verizon/AT&T-Mobile/CE/GCF/UKCA/RCM/KC/FCC/IC/PTCRB/JATE/TELEC
Recommended applications	Smart POS, smart home gateways, smart robots, smart wearables, safety, PDAs & tablets, vending machines, delivery lockers, telematics, mobile computing, in-car video streaming and entertainment systems, etc.		

Note 1: TBD.

Note 2: GNSS is not supported on SC600Y-WF.

Note 3: GNSS is not supported on SC680A-WF.

Note 4: May depend on modules' variant.

\* Planning/ Under development/ In progress

# Smart modules


Product	SG520B	SC200K	
			
Form factor	LGA	LCC+LGA	
Dimensions (mm)	42.5 × 56.5 × 2.95	40.5 × 40.5 × 2.85	
5G feature	3GPP Release 16, DL 4 × 4 MIMO, (SG520B-EM)UL 2 × 2 MIMO	/	
LTE feature	LTE Cat 15 3GPP Release 16, DL 4 × 4 MIMO(DL)	LTE Cat 4 3GPP E-UTRA Release 12 Compliant, Support DL MIMO 2 × 2	
Frequency bands (MHz)	-CE (China)	/	
	-CN (China/India)	5G SA/NSA: n1/3/5/8/28/41/78/79; LTE: B1/3/5/8/34/38/39/40/41; WCDMA: B1/5/8	/
	-EM (EMEA/Korea/South Africa/Latin America/Australia/India/New Zealand /India)	5G SA/NSA: n1/3/5/7/8/20/28/38/40/41/77/78/79; LTE: B1/2/3/4/5/7/8/12/17/18/19/20/26/28/32/34/38/39/40/41/42; WCDMA: B1/2/4/5/6/8/19; GSM/EDGE: B2/ 3/ 5/ 8	/
	-WF (Global)	/	only Wi-Fi & BT
CPU	QCM4490, octa-core 2 × A78 @ 2.4 GHz 6 × A55 @ 2 GHz	Unisoc UIS8581E ARM Coretex 4 × A55@ 1.6 GHz + 4 × A55@ 1.2GHz	
NPU	/	/	
GPU	Qualcomm® Adreno™ 613	PowerVR Fentale GE8322	
Memory	4 GB LPDDR4X + 64 GB UFS (Default)	2 GB LPDDR4X + 32 GB eMMC; 3 GB LPDDR4X + 32 GB eMMC; 4 GB LPDDR4X + 64 GB eMMC	
Operating system	Android 13/14/15/16 <sup>1</sup>	Android 10	
Supply voltage range	3.55 V ~ 4.4 V, typ. 4.0 V	3.55 V ~ 4.2 V, typ. 3.8 V	
Weight (approx.) g	17.4	10.5	
Operating temperature	-35°C ~ +75°C	-30°C ~ +75°C	
<b>Data transmission</b>			
5G	SG520B-CN: 5G SA: Max. 2.1 Gbps (DL)/Max. 450 Mbps (UL) 5G NSA: Max. 2.3 Gbps (DL)/Max. 550 Mbps (UL) SG520B-EM: 5G SA: Max. 2.1 Gbps (DL)/Max. 900 Mbps (UL) 5G NSA: Max. 2.5 Gbps (DL)/Max. 550 Mbps (UL)	/	
LTE	Max. 0.8 Gbps (DL)/Max. 200 Mbps (UL)	Cat 4: LTE FDD: Max. 150 Mbps (DL)/Max. 50 Mbps (UL) LTE TDD: Max. 130 Mbps (DL)/Max. 30 Mbps (UL)	
UMTS	DC-HSPA+: Max. 42 Mbps (DL)/Max. 5.7 Mbps (UL) WCDMA: Max. 384 kbps (DL)/Max. 384 kbps (UL)	DC-HSDPA: Max. 42 Mbps (DL) DC-HSPA: Max. 11.2 Mbps (DL) WCDMA: Max. 384 Kbps (DL)/Max. 384 Kbps (UL)	
GSM (Kbps)	EDGE: SG520B-EM: Max. 296 (DL)/Max. 236.8 (UL) GPRS: SG520B-EM: Max. 107 (DL)/Max. 85.6 (UL)	EDGE: Max. 296 (DL)/Max. 236.8 (UL) GPRS: Max. 107 (DL)/Max. 85.6 (UL)	
<b>Interfaces</b>			
LCM	FHD+ @ 60/ 90/ 120 Hz	4-lane MIPI_DSI, FHD+ (2160 × 1080) @ 60 fps	
Camera	3x MIPI CSI, 2x ISP: 25 MP @ 30 pfs, 16 + 16 MP @ 30 fps, 25 MP @ 30 fps ZSL, 64 MP NZSL	2 groups of 4-lane MIPI_CSI, Support 2 or 3 cameras, up to 16 MP with dual ISP	
Touch panel	Capacitive touch panel	Capacitive touch panel, I2C controls	
Audio	Needs external audio codec	Analog channels: 3 inputs: MIC1, MIC2, MIC3 (including one noise-canceling MIC); 3 outputs: speaker, earpiece, headphone	
Video	Encode: 1080p (H.264/ H.265) @ 60 fps Decode: 1080p (H.264/ H.265) @ 60 fps	Encode: 1080P (H.264) @ 30 fps; WVGA (MPEG-4/ VP8) @ 30 fps; Decode: 1080P (H.264/ MPEG-4/ VP8/ H.265/ DivX4/ 5/ 6) @ 30 fps; WVGA (H.263) @ 30 fps × 2, USB 2.0	
USB	Supports USB 3.1 Gen 1	USB1 supports USB OTG, does not support USB hub, up to 480 Mbps; USB2 only supports USB host mode, supports USB hub, up to 100 Mbps	
I2C	× 8	Supported	
(U)SIM	× 2 (1.8/ 2.95 V)	× 2, Support 1.8/ 2.95 V (U)SIM cards, with (U)SIM card detection function, DSDS supported	
UART	× 2	× 3, up to 3 Mbps, one of them supports hardware flow control	
SD card	× 1, SDIO 3.0, supports 4-bit SDIO	× 1, SD 3.0, 4-bit SDIO	
PWRKEY	1.8 V, pulled up internally	Supported	
SPI	× 1	Supported	
ADC	× 6, general-purpose ADC interfaces	Supported	
GPIO	× 56	Supported	
PWM	× 2	× 1	
Motor driver	× 1	/	
Flashlight driver	× 1	/	
Antenna	× 8 (cellular antenna × 5, Wi-Fi/ Bluetooth antenna × 1, Wi-Fi MIMO antenna × 1, GNSS antenna × 1)	× 4, Main/Rx-diversity/GNSS/Wi-Fi & Bluetooth	
<b>Enhanced features</b>			
BT	Bluetooth 5.2	Bluetooth 2.1 EDR/3.0 HS/4.2 LE/5.0 LE	
Wi-Fi	2.4 & 5 & 6 GHz 802.11a/b/g/n/ac/ax Supports DBS, 2 × 2 MU-MIMO	2.4 & 5 GHz, 802.11a/b/g/n/ac	
GNSS	GPS/GLONASS/BDS/Galileo/NavIC/QZSS/SBAS, L1	GPS/GLONASS or GPS/BDS	
Charge function	Build-in Charge IC & Fuel Gauge Qualcomm Quick Charge technology	Built-in charging function	
Dual LCDs	/	Only supports single LDC display	
DSDS	Supports dual card dual standby	Supports dual card dual standby	
Firmware upgrade	Firmware upgrade via USB or OTA	Firmware upgrade via USB or OTA	
Certifications <sup>2</sup>	CCC/SRRC/NAL/GCF*/CE*/RCM*/UKCA*	CCC/SRRC/NAL	
Recommended applications	Smart POS, smart home gateways, smart robots, smart wearables, safety, PDAs & tablets, vending machines, delivery lookers, telematics, mobile computing, in-car video streaming and entertainment systems, etc.		

Note 1: TBD.

Note 2: May depend on modules' variant.

SC200K can't be promote to US, Canada, Australia, New Zealand, Japan or South Korea .

\* Planning/ Under development/ In progress

Product	SC600T	SC606T	
			
Form factor	LCC+LGA	LCC+LGA	
Dimensions (mm)	43.0 × 44.0 × 2.85	43.0 × 44.0 × 2.85	
LTE feature	LTE Cat 6 3GPP E-UTRA Release 10 Compliant, Support DL MIMO 2 × 2	LTE Cat 6 3GPP E-UTRA Release 10 Compliant, Support DL MIMO 2 × 2	
Frequency bands (MHz)	-EM ( EMEA/ India/ Korea/ South Asia/ Latin America/ Australia/ ANZ/ South Africa)	LTE-FDD: B1/2/3/4/5/7/8/20/28; LTE-TDD: B38/39/40/41; WCDMA: B1/2/4/5/8; GSM: 850/900/1800/1900MHz	LTE-FDD: B1/2/3/4/5/7/8/20/28; LTE-TDD: B38/40/41; WCDMA: B1/2/4/5/8; GSM: 850/900/1800/1900MHz
	-NA (North America)	LTE-FDD: B2/4/5/7/12/13/14/17/25/26/66/71; LTE-TDD: B41; WCDMA: B2/4/5	LTE-FDD: B2/4/5/7/12/13/14/17/25/26/66/71; LTE-TDD: B41; WCDMA: B2/4/5
	-JP (Japan)	LTE-FDD: B1/3/5/8/11/18/19/21/26/28; LTE-TDD: B41; WCDMA: B1/6/8/19	/
	-WF (Global)	Only Wi-Fi & BT	Only Wi-Fi & BT
CPU	Qualcomm MSM8953 ARM Coretex 8 x A53@ 2.0 GHz	Qualcomm MSM8953 ARM Coretex 8 x A53@ 2.0 GHz	
NPU	/	/	
GPU	Qualcomm® Adreno™ 506 graphics processing unit (GPU) with 64-bit addressing	Qualcomm® Adreno™ 506 graphics processing unit (GPU) with 64-bit addressing	
Memory	2GB LPDDR3 + 16GB eMMC	2GB LPDDR3 + 16GB eMMC	
Operating system	Android 9/10	Yocto Linux (kernel 4.9)	
Supply voltage range	3.55 V ~ 4.4 V, typ. 3.8 V	3.55 V ~ 4.4 V, typ. 3.8 V	
Weight (approx.) g	13.0	13.0	
Operating temperature	-35°C ~ +75°C	-35°C ~ +75°C	
<b>Data transmission</b>			
LTE (Mbps)	Cat 6: LTE-FDD: Max. 300 (DL)/Max. 50 (UL); LTE-TDD: Max. 265 (DL)/Max. 35 (UL) Cat 4: LTE-FDD: Max. 150 (DL)/Max. 50 (UL); LTE-TDD: Max. 130 (DL)/Max. 30 (UL)	Cat 6: LTE-FDD: Max. 300 (DL)/Max. 50 (UL); LTE-TDD: Max. 265 (DL)/Max. 35 (UL) Cat 4: LTE-FDD: Max. 150 (DL)/Max. 50 (UL); LTE-TDD: Max. 130 (DL)/Max. 30 (UL)	
UMTS	DC-HSDPA: Max. 42 Mbps (DL); DC-HSUPA: Max. 11.2 Mbps (UL); WCDMA: Max. 384 Kbps (DL/UL)	DC-HSDPA: Max. 42 Mbps (DL); DC-HSUPA: Max. 11.2 Mbps (UL); WCDMA: Max. 384 Kbps (DL/UL)	
GSM(Kbps)	EDGE: Max. 296 (DL)/Max. 236.8 (UL); GPRS: Max. 107 (DL)/Max. 85.6 (UL)	EDGE: Max. 296 (DL)/Max. 236.8 (UL); GPRS: Max. 107 (DL)/Max. 85.6 (UL)	
<b>Interfaces</b>			
LCM	2 × 4-lane MIPI_DSI; WUXGA (1920 × 1200) @ 60 fps for primary display and FHD (1920 × 1080) @ 60 fps for secondary display; Wi-Fi display: 1080P @ 30 fps (UBWC)	2 × 4-lane MIPI_DSI; WUXGA (1920 × 1200) @ 60 fps for primary display and FHD (1920 × 1080) @ 60 fps for secondary display; Wi-Fi display: 1080P @ 30 fps (UBWC)	
Camera	3 groups of 4-lane MIPI_CSI, up to 2.1 Gbps per lane. 2 × ISP; Support three cameras (4-lane + 4-lane + 4-lane) or four cameras (4-lane + 4-lane + 2-lane + 1-lane); Up to 24 MP with dual ISP	3 groups of 4-lane MIPI_CSI, up to 2.1 Gbps per lane. 2 × ISP; Support three cameras (4-lane + 4-lane + 4-lane) or four cameras (4-lane + 4-lane + 2-lane + 1-lane); Up to 24 MP with dual ISP	
Touch panel	× 2, Capacitive touchscreen, I2C controls	× 2, Capacitive touchscreen, I2C controls	
Audio	Analog channels: Three inputs: MIC1, MIC2, MIC3 (including one noise-canceling MIC); Three outputs: speaker, earpiece, headphone	Analog channels: Three inputs: MIC1, MIC2, MIC3 (including one noise-canceling MIC); Three outputs: speaker, earpiece, headphone	
Video	Encode and Decode: Up to 4K @ 30 fps; High frame rate encode: 720P @ 120 fps; 60 Mbps; Maximum 972000 macro block/s; 1080P @ 60 fps Decode + 1080P @ 30 fps Encode	Encode and Decode: Up to 4K @ 30 fps; High frame rate encode: 720P @ 120 fps; 60 Mbps; Maximum 972000 macro block/s; 1080P @ 60 fps Decode + 1080P @ 30 fps Encode	
USB	× 1, USB 2.0/3.0 (Type-C), USB OTG + Charge	× 1, USB 2.0/3.0 (Type-C), USB OTG + Charge	
I2C	Supported	Supported	
(U)SIM	× 2, supports 1.8/ 2.95 V (U)SIM cards, with (U)SIM card detection function, DSDS supported	× 2, supports 1.8/ 2.95 V (U)SIM cards, with (U)SIM card detection function, DSDS supported	
UART	× 4, up to 4 Mbps, two of them support hardware flow control	× 4, up to 4 Mbps, two of them support hardware flow control	
SD card	SD 3.0, 4-bit SDIO	SD 3.0, 4-bit SDIO	
PWRKEY	Supported	Supported	
SPI	Supported	Supported	
ADC	Supported	Supported	
GPIO	Supported	Supported	
PWM	× 2	× 2	
Motor driver	× 1	/	
Flashlight driver	× 2	/	
WLED Sink	× 4	/	
Antenna	× 4, Main/Rx-diversity/GNSS/Wi-Fi & Bluetooth	× 4, Main/Rx-diversity/GNSS/Wi-Fi & Bluetooth	
<b>Enhanced features</b>			
BT	Bluetooth 2.1 EDR/ 3.0 HS/ 4.2 LE; Support a maximum of 10 ACL/ EL/ SCO links	Bluetooth 2.1 EDR/ 3.0 HS/ 4.2 LE; Support a maximum of 10 ACL/EL/SCO links	
Wi-Fi	2.4 & 5 GHz, 802.11 a/b/g/n/ac; 433 Mbps, STA/AP/P2P	2.4 & 5 GHz, 802.11 a/b/g/n/ac; 433 Mbps, STA/AP/P2P	
GNSS	GNSS <sup>1</sup> : GPS/BDS/GLONASS or GPS/BDS/Galileo	GNSS <sup>2</sup> : GPS/BDS/GLONASS or GPS/BDS/Galileo	
Charge function	Build-in Charge IC & Fuel Gauge Qualcomm Quick Charge 3.0 technology	/	
Dual LCDs	Supports independent display for 2 LCDs	Supports independent display for 2 LCDs	
DSDS	Supports dual SIM dual standby	Supports dual SIM dual standby	
Firmware upgrade	Firmware upgrade via USB or OTA	Firmware upgrade via USB or OTA	
Certifications <sup>3</sup>	Telstra/Verizon/AT&T-Mobile/NTT DOCOMO/KDDI/CE/RCM/GCF/Anatel/KC/NCC/PTCRB/FCC/IC/IFETEL/JATE/TELEC	Verizon/AT&T/CE/RCM/GCF/PTCRB/FCC/IC	
Recommended applications	Smart POS, smart home gateways, smart robots, smart wearables, safety, PDAs & tablets, vending machines, delivery lockers, telematics, mobile computing, in-car video streaming and entertainment systems, etc.		

Note 1: GNSS is not supported on SC600T-WF.  
Note 2: GNSS is not supported on SC606T-WF.  
Note 3: May depend on modules' variant.

\* Planning/ Under development/ In progress

# Smart modules

Product	SC666	SC668S	
			
Form factor	LCC+LGA	LCC+LGA	
Dimensions(mm)	43.0 × 44.0 × 2.85	43.0 × 44.0 × 2.85	
5G feature	/	/	
LTE feature	LTE Cat 6	LTE Cat 4	
Frequency bands(MHz)	-CE (China)	-CE(China) LTE-FDD: B1/3/5/8; LTE-TDD: B34/38/39/40/41 (120M); WCDMA: B1/8; TD-SCDMA: B34/39; CDMA: BCC; GSM: 900/1800MHz	-CE(China) LTE-FDD: B1/3/5/8; LTE-TDD: B34/38/39/40/41; WCDMA: B1/8; CDMA: BCC; GSM: 900/1800MHz
	-E/EM (EMEA/Europe/India/Korea/South Asia/Latin America/Australia/South Africa)	-E(Europe/India/Korea/South Asia/Latin America/Australia/South Africa) LTE-FDD: B1/2/3/4/5/7/8/20/28 (A+B); LTE-TDD: B38/39/40/41(200M); WCDMA: B1/2/4/5/8; GSM: 850/900/1800/1900MHz	-EM ( Europe/ India/ Korea/ South Asia/ Latin America/ Australia/ South Africa ) LTE-FDD: B1/2/3/4/5/7/8/20/28; LTE-TDD: B38/39/40/41(200M); WCDMA: B1/2/4/5/8; GSM: GSM850/EGSM900/DCS1800/PCS1900
	-A/NA (North America)	-A(North America) LTE-FDD: B2/4/5/7/12/13/14/17/25/26/66/71; LTE-TDD: B41(200M); WCDMA: B2/4/5	-NA ( North America ) LTE-FDD:B2/4/5/7/12/13/14/17/25/26/66/71; LTE-TDD: B41
	-J (Japan)	LTE-FDD: B1/3/5/8/11/18/19/21/26/28 (A+B); LTE-TDD: B41(120M); WCDMA: B1/6/8/19	/
	-MW/WF (Global)	-MW (Wi-Fi) only Wi-Fi & BT	-WF Only Wi-Fi/BT
CPU	Qualcomm® SDM660 ARM Cortex technology 4 × Kryo260 Gold@2.2 GHz + 4 × Kryo260 Silver@1.843 GHz	QCM6125 Kryo Gold: high-performance quad-core processor @ 2.0 GHz; Kryo Silver: low-power quad-core processor @ 1.8 GHz	
NPU	/	1.1 TOPS	
GPU	Qualcomm® Adreno 512 @ 650 MHz; OpenGL ES3.1 + AEP, DX12_FL12, Vulkan, OpenCL2.0 FP, RenderScript	Qualcomm high-performance Adreno™ 610 graphics engine	
Memory	3 GB LPDDR4X + 32 GB eMMC; 4 GB LPDDR4X + 64 GB eMMC	32GB eMMC+3GB LPDDR4X ; 64GB eMMC+4GB LPDDR4X; 128GB UFS+8GB LPDDR4X	
Operating system	Android 9/10	Android 10/11/13	
Supply voltage range	3.55 V ~ 4.4 V, typ. 4.0 V	3.55 V ~ 4.4 V, typ. 3.8 V	
Weight (approx.) g	12.0	12.0	
Operating temperature	-35°C ~ +75°C	-35°C ~ +75°C	
<b>Data transmission</b>			
5G	/	/	
LTE (Mbps)	Cat 6*: LTE-FDD: Max. 300 (DL)/Max. 50 (UL); LTE-TDD: Max. 265 (DL)/Max. 30 (UL) Cat 4: LTE-FDD: Max. 150 (DL)/Max. 50 (UL); LTE-TDD: Max. 130 (DL)/Max. 30 (UL)	Cat 4: LTE-FDD: Max. 150 (DL)/Max. 50 (UL); LTE-TDD: Max. 130 (DL)/Max. 30 (UL)	
UMTS	DC-HSDPA: Max. 42 Mbps (DL); DC-HSUPA: Max. 5.76 Mbps (UL); WCDMA: Max. 384 Kbps (DL/UL)	DC-HSDPA: Max. 42 Mbps (DL); DC-HSUPA: Max. 5.76 Mbps (UL); WCDMA: Max. 384 Kbps (DL/UL)	
TD-SCDMA(Mbps)	Max. 4.2 (DL)/Max. 2.2 (UL)	/	
CDMA2000	EVDO: Max. 3.1 Mbps (DL)/Max. 1.8 Mbps (UL); 1X Advanced: Max. 307.2 Kbps (DL/UL)	EVDO : Max. 3.1 Mbps (DL)/Max. 1.8 Mbps (UL) 1X Advanced: Max. 307.2 Kbps (DL/UL)	
GSM(Kbps)	EDGE: Max. 296 (DL)/Max. 236.8 (UL) ; GPRS: Max. 107 (DL)/Max. 85.6 (UL)	EDGE: Max. 296 (DL)/Max. 236.8 (UL); GPRS: Max. 107 (DL)/Max. 85.6 (UL)	
<b>Interfaces</b>			
LCM	2 × 4-lane MIPI DSI Default: MIPI_DSI (2560 × 1600 @ 60 fps) + DP over USB Type-C (4096 × 2160 @ 30 fps) ; Optional: MIPI_DSI0 (1920 × 1080 @ 60 fps) + MIPI_DSI1 (1920 × 1080 @ 60 fps) ; Wi-Fi display: 1080P @ 30 fps	4-lane MIPI DSI, supports up to 1920 × 1200 @ 60 fps or 1080 × 2520 @ 60 fps	
Camera	3 × 4-lane CSIs (4/ 4/ 4 or 4/ 4/ 2/ 1) D-PHY 1.2 @ 2.1 Gbps/ lane, or 3 × 3-lane C-PHY 1.0 at 17 Gbps (2.5 G symbols per trio per second); 2 × ISP: 16 MP (30 fps ZSL) @ 1 × ISP + 16 MP (30 fps ZSL) @ 1 × ISP; Max. 24 MP (30 fps ZSL) @ 2 × ISP	3 groups of 4-lane MIPI CSI, up to 2.1 Gbps per lane; Each group of 4-lane can be divided into (2-lane + 1-lane), supports up to 6 cameras, supports 2 concurrently working cameras; Dual-ISP, supports up to (16 MP + 16 MP) or up to 24 MP	
Touch panel	Capacitive touch panel, I2C controls	Capacitive touch panel	
Audio	Analog channels: 3 inputs: MIC1, MIC2, MIC3 (including one noise-canceling MIC); 3 outputs: speaker, earpiece, headphone	Analog audio: speakers, handsets, headphones, 3-way microphones	
Video	Decode: 4K @ 30 fps; H.264, VP8, VP9 and HEVC; Encode: 4K @ 30 fps; HEVC, H.264, VP8 and MPEG-4	Encode: 4K @ 30 fps; HEVC/ H.264/ VP8 Decode: 4K @ 30 fps; HEVC/ H.264/ VP8/ VP9 1080P @ 30 fps, MPEG-2	
USB	× 2; USB 3.1, supports DP over Type-C, compatible with USB 2.0; USB 2.0, only supports USB Host mode	× 1, supports USB 3.1 Type-C interface, compatible with USB 2.0	
I2C	Supported	× 2	
(U)SIM	× 2, supports 1.8/ 2.95 V (U)SIM cards, with (U)SIM card detection function, DSDS supported	× 2; supports 1.8/ 2.95 V (U)SIM cards; supports (U)SIM card hot swap detection and dual-SIM dual-standby	
UART	× 3, Up to 3 Mbps, one of them is used for debugging only	× 3 (Debug UART: 2-wire serial port, specialized for debugging use; UART03: 2-wire serial port; UART00: 4-wire serial port, supports RTS and CTS hardware flow control with maximum data rate of 4 Mbps)	
SD card	× 1, SD 3.0, 4-bit SDIO	× 1 (3.0, 4-bit SDIO)	
PWRKEY	Supported	Supported	
SPI	Supported	Supported	
ADC/ GPIO	Supported	Supported	
PWM	× 1	× 1	
Motor driver	/	/	
Flashlight driver	/	/	
Antenna	× 4, Main/Rx-diversity/GNSS/Wi-Fi & Bluetooth	× 4, Main, Rx-diversity, GNSS, Wi-Fi/Bluetooth antennas respectively (SC668S-WF: × 1, Wi-Fi/Bluetooth antenna)	
<b>Enhanced features</b>			
BT	Bluetooth 2.1 EDR/3.0 HS/4.2 LE/5.0 LE;	BT2.1+EDR/3.0/4.1 LE/4.2 BLE/5.0	
Wi-Fi	Wi-Fi <sup>1</sup> : 2.4 & 5 GHz, 802.11a/b/g/n/ac; 2 × MIMO Wi-Fi	2.4G/5G, 802.11a/b/g/n/ac	
GNSS	GNSS <sup>2</sup> : GPS/GLONASS/BDS/Galileo/QZSS/SBAS	GPS/GLONASS/BeiDou/Galileo/QZSS	
Charge function	Build-in Charge IC & Fuel Gauge Qualcomm Quick Charge technology	Need external third-party charging chips and meters	
Dual LCDs	Supports independent display for 2 LCDs	Supports dual screen display, 1920 × 1200 or 1080 × 2520 (MIPI screen) 1920 × 1080 (DP screen)	
DSDS	Supports dual SIM dual standby	Supports dual-SIM dual-standby	
Firmware upgrade	Firmware upgrade via USB or OTA	Firmware upgrade via USB or OTA	
Certifications <sup>3</sup>	Verizon/AT&T/CCC/SRRC/NAL/CE/GCF/UKCA/KC/NCC/RCM/PTCRB/FCC/IC/JATE/TELEC	Verizon*AT&T/TMO*/CCC/SRRC/NAL/CE/RCM/UKCA/GCF/KC/PTCRB/FCC/IC/JATE/TELEC	
Recommended applications	Smart POS, smart home gateways, smart robots, smart wearables, safety, PDAs & tablets, vending machines, delivery lockers, telematics, mobile computing, in-car video streaming and entertainment systems, etc.		

Note 1: 2 × MIMO Wi-Fi is not supported on SC666-CE.

Note 2: GNSS is not supported on SC666-MW.

Note 3: May depend on modules' variant.

\* Planning/ Under development/ In progress



Product	SC696S	SG560D	
			
Form factor	LCC+LGA	LGA	
Dimensions(mm)	43.0 × 44.0 × 2.85	42.5 × 56.5 × 2.95	
5G feature	/	3GPP Release 15, DL 4 × 4 MIMO/UL 2 × 2 MIMO	
LTE feature	LTE Cat 4	LTE Cat 15, 3GPP Release 15, DL MIMO 4 × 4	
Frequency bands(MHz)	-CE (China)	/	
	-EM (EMEA/Europe/India/Korea/South Asia/Latin America/Australia/South Africa)	-EM ( Europe/ India/ Korea/ South Asia/ Latin America/ Australia/ South Africa ) LTE-FDD: B1/2/3/4/5/7/8/20/28; LTE-TDD: B38/39/40/41 (200M); WCDMA: B1/2/4/5/8; GSM: GSM850/EGSM900/DCS1800/PCS1900	-EM (EMEA) 5G SA/NSA: n1/3/5/8/28/41/77/78/79; LTE: B1/2/3/4/5/7/8/12/17/18/19/20/26/28/32/34/38/39/40/41/42; WCDMA: B1/2/4/5/6/8/19; GSM: B2/3/5/8
	-NA (North America)	LTE-FDD:B2/4/5/7/12/13/14/17/25/26/66/71; LTE-TDD: B41	-NA <sup>1</sup> (North America) 5G SA/NSA: n2/5/7/12/13/14/25/26/29/30/38/41/48/66/70/71/77/78; LTE: B2/4/5/7/12/13/14/17/25/26/29/30/38/41/42/43/46/48/66/71
	-J (Japan)	/	/
	-WF (Global)	Only Wi-Fi/BT	-WF(Wi-Fi) only Wi-Fi & BT
CPU	QCM6125 Kryo Gold: high-performance quad-core processor @ 2.0 GHz; Kryo Silver: low-power quad-core processor @ 1.8 GHz	Qualcomm QCM6490 ARM Coretex technology 1 × Kryo670 Goldplus@ 2.7 GHz + 3 × Kryo670 Gold@ 2.4 GHz + 4 × Kryo670 Silver@ 1.9GHz	
NPU	1.1 TOPS	12 TOPS	
GPU	Qualcomm high-performance Adreno™ 610 graphics engine	Qualcomm® Adreno™ 643 @ 812 MHz	
Memory	16 GB eMMC + 2 GB LPDDR4X	4 GB LPDDR4X + 64 GB UFS	
Operating system	Linux	Android 12/13/14(TBD)/15(TBD)	
Supply voltage range	3.55 V ~ 4.4 V, typ. 3.8 V	3.55 V ~ 4.4 V, typ. 4.0 V	
Weight (approx.) g	12.0	17.5	
Operating temperature	-35°C ~ +75°C	-35°C ~ +75°C	
<b>Data transmission</b>			
5G	/	SG560D-CE: 5G SA: Max. 2.1 Gbps (DL)/Max. 450 Mbps (UL); 5G NSA: Max. 2.5 Gbps (DL)/Max. 550 Mbps (UL) SG560D-EM: 5G SA: Max. 2.1 Gbps (DL)/Max. 900 Mbps (UL); 5G NSA: Max. 2.5 Gbps (DL)/Max. 650 Mbps (UL)	
LTE	Cat 4; LTE-FDD: Max. 150 Mbps(DL)/Max. 50 Mbps (UL); LTE-TDD: Max. 130 Mbps(DL)/Max. 30 Mbps (UL)	Cat18: Max. 1.2 Gbps(DL)/Max. 200 Mbps(UL)	
UMTS	DC-HSDPA: Max. 42 Mbps (DL); DC-HSUPA: Max. 5.76 Mbps (UL); WCDMA: Max. 384 Kbps (DL/UL)	DC-HSPA+: Max. 42 Mbps (DL)/Max. 5.76 Mbps (UL); WCDMA: Max. 384 Kbps (DL)/Max. 384 Kbps(UL)	
TD-SCDMA	/	/	
CDMA2000	EVDO : Max. 3.1 Mbps (DL)/Max. 1.8 Mbps (UL) 1X Advanced: Max. 307.2 Kbps (DL/UL)	/	
GSM(Kbps)	EDGE: Max. 296 (DL)/Max. 236.8 (UL); GPRS: Max. 107 (DL)/Max. 85.6 (UL)	SG560D-EM: EDGE: Max. 296 (DL)/Max. 236.8 (UL); GPRS: Max. 107 (DL)/Max. 85.6 (UL)	
<b>Interfaces</b>			
LCM	4-lane MIPI DSI, supports up to 1920 × 1200 @ 60 fps or 1080 × 2520 @ 60 fps	1 × 4-lane MIPI_DSI, support up to 2.5 Gbps/ lane, 1200 × 2520 @ 144 fps; 1 × DP over Type C, support up to 4K (3840 × 2160) @ 60 fps; Support Wi-Fi Miracast 4K @ 60fps	
Camera	3 groups of 4-lane MIPI CSI, up to 2.1 Gbps per lane; Each group of 4-lane can be divided into (2-lane + 1-lane), supports up to 6 cameras, supports 2 concurrently working cameras; Dual-ISP, supports up to (16 MP + 16 MP) or up to 24 MP	4 × 4-lane MIPI_CSI, Supports up to 2.5 Gbps/ lane; 3 × ISP; 3 × 27 MP @ 24 fps; or 3 × 22MP @ 30 fps; or 36 MP + 27 MP @24 fps; or 36MP + 22MP @ 30 fps; or Max. 1×64 MP @ 30 fps	
Touch panel	Capacitive touch panel	Capacitive touchscreen, I2C controls	
Audio	Analog audio: speakers, handsets, headphones, 3-way microphones	Needs external audio codec	
Video	Encode: 4K @ 30 fps; HEVC/ H.264/ VP8 Decode: 4K @ 30 fps; HEVC/ H.264/ VP8/ VP9 1080P @ 30 fps, MPEG-2	Encode: 4K (H.264/ H.265) @ 30 fps Decode: 4K (H.264/ H.265/ VP9) @ 60 fps	
USB	× 1, supports USB 3.1 Type-C interface, compatible with USB 2.0	× 2, USB 3.1 Type-C with DisplayPort 1.4, compatible with USB 2.0; USB 2.0 Host	
I2C	× 2	Supported	
(U)SIM	× 2; supports 1.8/ 2.95 V (U)SIM cards; supports (U)SIM card hot swap detection and dual-SIM dual-standby	× 2, Support 1.8/ 2.95 V (U)SIM cards, with (U)SIM card detection function; Support DS2S	
UART	× 3 (Debug UART: 2-wire serial port, specialized for debugging use; UART03: 2-wire serial port; UART00: 4-wire serial port, supports RTS and CTS hardware flow control with maximum data rate of 4 Mbps)	× 3, supports 4 Mbps with Hardware Flow Control	
SD card	× 1 (3.0, 4-bit SDIO)	× 1, SD 3.0, 4-bit SDIO	
PWRKEY	Supported	Supported	
SPI	Supported	Supported	
ADC/ GPIO	Supported	Supported	
PWM	× 1	× 1	
Motor driver	/	× 1	
Flashlight driver	/	× 1	
Antenna	× 4, Main, Rx-diversity, GNSS, Wi-Fi/Bluetooth antennas respectively (SC696S-WF: × 1, Wi-Fi/Bluetooth antenna)	× 8 (Cellular antenna × 5, Wi-Fi/ Bluetooth antenna × 1, Wi-Fi MIMO antenna × 1, GNSS antenna × 1)	
<b>Enhanced features</b>			
BT	BT2.1+EDR/3.0/4.1 LE/4.2 BLE/5.0	Bluetooth 2.1 EDR/3.0 HS/4.2 LE/5.2 LE	
Wi-Fi	2.4G/5G, 802.11a/b/g/n/ac	2.4 & 5 & 6 GHz, 802.11a/b/g/n/ac/ax; Wi-Fi 6E, 2 × 2 MU-MIMO, DBS	
GNSS	GPS/GLONASS/BeiDou/Galileo/QZSS	GNSS <sup>2</sup> : GPS/GLONASS/BDS/NavIC/Galileo/QZSS/SBAS; L1 + L5	
Charge function	Need external third-party charging chips and meters	Build-in Charge IC & Fuel Gauge Qualcomm Quick Charge technology	
Dual LCDs	Supports dual screen display, 1920 × 1200 or 1080 × 2520 (MIPI screen) 1920 × 1080 (DP screen)	/	
DS2S	Supports dual-SIM dual-standby	Supports dual SIM dual standby	
Firmware upgrade	Firmware upgrade via USB or OTA	Firmware upgrade via USB or OTA	
Certifications <sup>3</sup>	Verizon®/AT&T/CE/RCM/GCF/FCC/IC/PTCRB	Verizon®/AT&T*/T-Mobile*/UKCA/CCC*/SRRC*/NAL*/CE/RCM/GCF*/PTCRB*/FCC/IC	
Recommended applications	Smart POS, smart home gateways, smart robots, smart wearables, safety, PDAs & tablets, vending machines, delivery lockers, telematics, mobile computing, in-car video streaming and entertainment systems, etc.		



Note 1: TBD.

Note 2: GNSS is not supported on SG560D-WF.





Note 3: May depend on modules' variant.

<sup>2</sup> Planning/ Under development/ In progress

# Smart modules

Product	SG865W	SG885G-WF
		
Form factor	LGA	/
Dimensions(mm)	46.0 × 42.0 × 2.95	49.0 × 51.0 × 4.25
Frequency bands (MHz)	-WF(Global)	-WF* (Wi-Fi) only Wi-Fi & BT
	-AP(Global)	/
CPU	Qualcomm QCS8250 ARM Cortex technology 1 × Kryo585 Goldprime@ 2.842 GHz + 3 × Kryo585 Gold@2.419 GHz + 4 × Kryo585 Silver@ 1.805GHz	Kryo™
NPU	NPU230, 11 TOPS	Dual eNPU V3, 48 TOPS
GPU	Adreno 650 at 587 MHz- 4K 60 fps UI or 2 × 2K 60 fps UI	Adreno™ 740
Memory	8 GB LPDDR5 + 64 GB UFS 2.1	8 GB LPDDR5X + 128 GB UFS 4.0 12 GB LPDDR5X + 256 GB UFS 4.0 16 GB LPDDR5X + 256 GB UFS 4.0 16 GB LPDDR5X + 512 GB UFS 4.0
Operating system	Android 10	Android 13*
Supply voltage range	3.55 V ~ 4.4 V, typ. 3.8 V	3.55 V ~ 4.4 V, typ. 3.8 V
Weight (approx.) g	TBD	18.6
Operating temperature	-35°C ~ +75°C	-30°C ~ +75°C
<b>Data transmission</b>		
LTE (Mbps)	/	/
UMTS	/	/
TD-SCDMA	/	/
CDMA2000	/	/
GSM	/	/
<b>Interfaces</b>		
LCM	2 × 4-lane MIPI DSI; 5040 × 2160 @ 60 fps with 8-lane MIPI; 2 × (2560 × 2560 @ 60 fps with 4-lane MIPI); 2 × 4K @ 60 fps over DP (MST mode); Wi-Fi display: 4K @ 60 fps	2 × 4-lane MIPI DSI
Camera	6 × 4-lane MIPI CSI; 2 × Full ISP + 2 × Lite ISP; 2 × Front-end input: 25 MP (4:3 aspect ratio) or 18 MP (16:9 aspect ratio); 2 × Front-end input: Mono/ YUV interface; Max. 64 MP @ 30 fps ZSL @ 2 × ISP	6 × 4-lane MIPI CSI
Touch panel	Capacitive-screen, I2C controls	Supported
Audio	Needs external audio codec	SWR, Digital microphone, MI2S interfaces, HIFI I2S
Video	Encode: 4K @ 120 fps; 8K @ 30 fps; Decode: 4K @ 240 fps; 8K @ 60 fps; H.264 High Profile, H.265 Main 10 Profile, VP8, HDR 10-bit video playback (HLG, HDR10), HDR 10-bit capture (HLG)	Encoder: 4K @ 120 fps; 8K @ 30 fps Decoder: 4K @ 240 fps; 8K @ 60 fps Native encode support for H.265 Main 10, H.265 Main, H.264 high formats Native decode support for H.265 Main 10, H.265 Main, H.264 High, and VP9 profile 2
USB	2 × USB 3.1, compatible w/DisplayPort × 2; USB 3.1, compatible with USB 2.0, one of them supports DisplayPort v1.4	× 1, both USB 3.1/ 2.0 are compliant
I2C	Supported	× 10
UART	× 3, Up to 3 Mbps, one of them is used for debugging only	× 1, debug UART
SD card	× 1, SD 3.0, 4-bit SDIO	× 1, SD 3.0
PWRKEY	Supported	× 1
SPI	Supported	× 5
ADC	Supported	× 2 General-purpose ADC interfaces
GPIO	Supported	Supported
PWM	/	Supported
Motor driver	× 1	× 1
Flashlight driver	3 high-current flash LED drivers, which support both flash and torch modes; Up to 1.5 A in total for FLASH_LED1/FLASH_LED2 in flash mode; Up to 0.75 A for FLASH_LED3 in flash mode	3 high-current flash LED drivers, which support both flash and torch modes
WLED Sink	/	/
Antenna	× 2 Wi-Fi/ Bluetooth and Wi-Fi MIMO antenna interfaces	× 2 Wi-Fi/ Bluetooth and Wi-Fi MIMO antenna interfaces
<b>Enhanced features</b>		
BT	Bluetooth 2.1 EDR/3.0 HS/4.2 LE/5.1 LE	Bluetooth 5.3 (BR/EDR + BLE)
WLAN	2.4 & 5 GHz, 2 × 2 MIMO, 802.11a/b/g/n/ac/ax, Wi-Fi 6, DBS	2.4 & 5 & 6GHz, Wi-Fi 7, 802.11a/b/g/n/ac/ax/be, 2 × 2 Wi-Fi MIMO
GNSS	NA, can be supported by using Quectel 4G/5G/GNSS modules	/
Charge function	Used for battery voltage detection, fuel gauge, battery temperature detection	Supported
Dual LCDs	support independent display for 2 LCDs	Supported*
Firmware upgrade	Firmware upgrade via USB or OTA	Via USB
Certifications	TBD	/
Recommended applications	Infotainment, live video, robotics, gaming, VR, 3D scanners, gym equipment, virtual coin mining diggers, ARM based computers and servers, etc.	

\* Planning/ Under development/ In progress

Product	BG96	BG95 Series <sup>1</sup>	BG95xA-GL Series	BG950S-GL
				
Form factor	LGA	LGA	LGA	LGA
Dimensions (mm)	26.5 × 22.5 × 2.3	23.6 × 19.9 × 2.2	23.6 × 19.9 × 2.2 (BG950A-GL/BG951A-GL/BG952A-GL/BG953A-GL/BG955A-GL)	23.6 × 19.9 × 2.2
RAT	LTE Cat M1/NB1/EGPRS	LTE Cat M1/Cat NB2/EGPRS	LTE Cat M1/Cat NB1/NB2; LTE Cat M1/NB1/NB2/GPRS (BG955A-GL)	Cat-M & NB IoT
Frequency bands (MHz)	LTE-FDD: B1/2/3/4/5/8/12/13/18/19/20/26*/28; EGPRS: 850/900/1800/1900MHz	LTE-FDD: B1/2/3/4/5/8/12/13/18/19/20/25/26 (Cat M1 Only)/27 (Cat M1 Only)/28/31/66/71 (Cat NB2 Only)/72/73/85/86* (Cat NB2 only)/87*/88*; EGPRS: 850/900/1800/1900MHz	LTE-FDD: B1/2/3/4/5/8/12/13/17 (Cat NB1/NB2 Only)/18/19/20/25/26 (Cat M1 Only)/27 (Cat M1 Only)/28/66 (BG950A-GL/BG951A-GL/BG952A-GL/BG953A-GL); LTE-FDD: B1/2/3/4/5/8/12/13/17 (Cat NB1/NB2 Only)/18/19/20/25/26 (Cat M1 Only)/27 (Cat M1 Only)/28/66; GPRS: 850/900/1800/1900MHz (BG955A-GL)	Cat M1: B1/2/3/4/5/8/12/13/18/19/20/25/26/27/28/66/71; Cat NB2: B1/2/3/4/5/8/12/13/17/18/19/20/25/26/28/66/71/85
Weight (approx.) g	3.1	2.15	2.15 (BG950A-GL/BG951A-GL/BG952A-GL/BG953A-GL); 2.05 (BG955A-GL)	2.31
Operating temperature	-35°C ~ +75°C	-35°C ~ +75°C	-35°C ~ +75°C	-35°C ~ +75°C
Extended temperature	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C
<b>Data transmission</b>				
LTE Cat M1 data rates (Kbps)	Max. 375 (DL), Max. 375 (UL)	Max. 588 (DL), Max. 1119 (UL)	Max. 588 (DL), Max. 1119 (UL)	Cat M1*: Max. 588 (DL), Max. 1119 (UL)
LTE Cat NB1 data rates (Kbps)	Max. 32 (DL), Max. 70 (UL)	Max. 32 (DL), Max. 70 (UL)	Max. 27.2 (DL), Max. 62.5 (UL)	Max. 27.2 (DL), Max. 62.5 (UL)
LTE Cat NB2 data rates (Kbps)	/	Max. 127 (DL), Max. 158.5 (UL)	Max. 127 (DL), Max. 158.5 (UL)	Cat NB2*: Max. 127 (DL), Max. 158 (UL)
EDGE data rates (Kbps)	Max. 296 (DL), Max. 236.8 (UL)	Max. 296 (DL), Max. 236.8 (UL)	/	/
GPRS data rates (Kbps)	Max. 107 (DL), Max. 85.6 (UL)	Max. 107 (DL), Max. 85.6 (UL)	Max. 85.6 (DL), Max. 42.8 (UL) (BG955A-GL)	/
SMS	•	Point-to-point MO and MT; Text and PDU mode; SMS cell broadcast	Point-to-point MO and MT; Text and PDU mode; SMS cell broadcast	Point-to-Point MO and MT; SMS cell broadcast; Text and PDU mode; SMS storage; ME by default
Protocols	PPP/TCP/UDP/SSL/TLS/FTP(S)/HTTP(S)/NITZ/PING/MQTT(S)/LwM2M/CoAP(S)/IPv6/DNS/NT/	PPP/TCP/UDP/SSL/TLS/FTP(S)/HTTP(S)/NITZ/PING/MQTT(S)/MQTT-SN/LwM2M/CoAP(S)/IPv6/DNS/NT/	PPP/TCP/UDP/SSL/TLS/FTP(S)/HTTP(S)/NITZ/PING/MQTT/LwM2M	TCP/PPP*/UDP/SSL*/MQTT/FTP(S)*/HTTP(S)/LwM2M*/IPv4/IPv6*/TLS*/DTLS*/PING*/CoAP/NITZ*
<b>Interfaces</b>				
(U)SIM	1.8 V / 3 V	1.8 V	1.8 V	× 1 (Supports 1.8 V only)
UART	× 3 (MAIN, DEBUG, NMEA)	× 3 (MAIN, DEBUG, NMEA)	× 3 (MAIN, DEBUG, GNSS) (BG950A-GL/BG951A-GL/BG953A-GL/BG955A-GL); × 2 (BG952A-GL)	× 2
USB	USB 2.0 × 1	USB 2.0 × 1	USB 2.0 × 1	/
I2C	I2C <sup>3</sup> × 1	I2C <sup>3</sup> × 1	I2C* × 2 (BG952A-GL)	/
ADC	ADC × 2	ADC × 1	ADC × 2	× 2
GPIO	GPIO × 2 (I2C and NMEA can be re-configured as GPIO)	GPIO <sup>4</sup> × 9	GPIO × 9 (BG950A-GL/BG951A-GL/BG953A-GL/BG955A-GL); GPIO Max. × 15 (BG952A-GL)	× 9
RESET	RESET × 1	RESET × 1	RESET × 1	× 1
PCM	PCM <sup>5</sup> × 1	PCM <sup>5</sup> × 1	/	/
Antenna	Primary, GNSS	Antenna <sup>5</sup> : 2 (for main antenna and GNSS antenna, respectively)	2 (for main antenna and GNSS antenna, respectively)	× 2 (Main Antenna: × 1; GNSS Antenna*: × 2)
<b>Enhanced features</b>				
QuecOpen <sup>6</sup>	Simplifies the Development of embedded applications	Simplifies the Development of embedded applications	Simplifies the Development of embedded applications (BG952A-GL)	/
iSIM	/	/	• (BG953A-GL)	/
DFOTA	•	•	•	•
GNSS/RIL driver	Android 4.x/5.x/6.x/7.x/8.x/9.x/10.x/11.x/12.x	Android 4.x/5.x/6.x/7.x/8.x/9.x/10.x/11.x/12.x	/	•
NDIS	Windows 7/8/8.1/10/11	/	/	•
USB serial driver	Windows 7/8/8.1/10/11, Linux 2.6 or later, Android 4.x/5.x/6.x/7.x/8.x/9.x/10.x/11.x/12.x	Windows 7/8/8.1/10/11, Linux 2.6-5.15, Android 4.x/5.x/6.x/7.x/8.x/9.x/10.x/11.x/12.x	/	/
SIM detection	•	•	•	•
GNSS	Optional	Optional	GPS, GLONASS (BG950A-GL/BG952A-GL/BG953A-GL/BG955A-GL); GPS/GLONASS/Galileo/Beidou/QZSS, LTE & GNSS concurrency (BG951A-GL);	•
Firmware update	via USB Interface	via USB Interface	via UART/USB*/DFOTA	•
<b>Electrical features</b>				
Supply voltage range	3.3 V ~ 4.3 V, typ. 3.8 V	typ. 3.8 V / typ. 3.3 V <sup>6</sup>	2.2 V ~ 4.35 V, typ. 3.3 V. (BG950A-GL/BG951A-GL/BG952A-GL/BG953A-GL); 3.3 V ~ 4.3 V, typ. 3.8 V (BG955A-GL)	VBAT_BB/ VBAT_RF: 2.2 V ~ 4.35 V, typ. 3.3 V
Power consumption	10 µA@PSM	3.9 µA@PSM <sup>7</sup>	1.5 µA@ PSM	Power Saving Mode: 1.35 µA; Sleep Mode @ GSCLK=2: Cat M1: 0.6 mA @ DRX = 1.28 s; 18 µA @ e-I-DRX = 40.96 s; PTW = 1.28 s; DRX = 1.28 s; 12 µA @ e-I-DRX = 81.92 s; PTW = 1.28 s; DRX = 1.28 s;
Max output power	Power class 3 23dBm @ LTE bands	Power class5 21dBm @ LTE bands / Power class 3 23dBm @ LTE bands <sup>8</sup> / Power class 2 26dBm @ LTE B31/72/73 of BG95-M4/Power class 2 26dBm @ LTE B31/72/73 and Power class 3 23dBm @ other LTE bands of BG95-M9	Power class 3 23dBm @ LTE bands	Power class 3 23dBm @ LTE bands
Certifications <sup>9</sup>	Vodafone/Deutsche Telekom/Telefónica/Verizon/AT&T-Mobile/U.S. Cellular/Rogers/Telus/Telstra/SKT/LGU+/NTT DOCOMO/SoftBank/KDDI/CE/GCF/PTCRB/FCC/IC/IFETEL/RCM/KC/JATE/TELEC/NBCT/IMDA/ICASA/NCC/CCC	Vodafone/Deutsche Telekom/Telefónica/Verizon/AT&T-Mobile/U.S. Cellular/Orange/Rogers/Telus/Telstra/KT/SKT/LGU+/NTT DOCOMO/SoftBank*/KDDI/CE/UKCA/GCF/PTCRB/FCC/IC/Anatel/IFETEL/RCM/KC/JATE/TELEC/NBCT*/IMDA/NCC/RoHS/ATEX/PEN/CCC	Vodafone /Deutsche Telekom/Verizon/AT&T-Mobile/Telus/Telstra/KT/SKT*/LGU+/NTT DOCOMO*/KDDI*/CE/GCF/PTCRB/FCC/IC/RCM/KC/JATE/TELEC	GC0*/CE/PTORB*/FCC/IC/RCM
Recommended applications	Gas detectors, soil PH testers, optical sensors, machinery alarm systems, irrigation controllers, elevators, asset tracking electronics, person/pet tracking, water/gas metering, smart parking systems, fire hydrants, smoke alarms, smart bins, street lighting			Tracker, metering, smart Health

Note 1: For different variants, please refer to the BG95 specification.

Note 2: BG95-M9 support B86/B87/B88.

Note 3: For Voice Call only.

Note 4: BG95-MF provides 7 GPIO Interfaces, please refer to HD for details.

Note 5: BG95-MF provides 3 antenna interfaces, please refer to HD for details.

Note 6: For the supply voltage of different variants, please refer to the BG95 Hardware Design document.

Note 7: For the power consumption of different variants, please refer to the BG95 Hardware Design document.

Note 8: For the max output power of different variant, please refer to BG95 Hardware Design document.




Note 9: May depend on modules' variant.

\* Planning/ Under development/

In progress

• Supported

# LPWA modules



Product	BG600L-M3	BG77	BG77xA-GL Series
			
Form factor	LGA	LGA	LGA
Dimensions (mm)	18.7 × 16.0 × 2.1	14.9 × 12.9 × 1.7	14.9 × 12.9 × 1.9
RAT	LTE Cat M1/Cat NB2/E6PRS	LTE Cat M1/Cat NB2	LTE Cat M1/Cat NB1/NB2
Frequency bands (MHz)	LTE-FDD: B1/2/3/4/5/8/12/13/18/19/20/25/26 (Cat M1 Only)/27 (Cat M1 Only)/28/66/71 (Cat NB2 Only)/85; E6PRS: 850/900/1800/1900MHz	LTE-FDD: B1/2/3/4/5/8/12/13/18/19/20/25/26 (Cat M1 Only)/27 (Cat M1 Only)/28/66/71 (Cat NB2 Only)/85*	LTE-FDD: B1/2/3/4/5/8/12/13/17 (Cat NB1/NB2 Only)/18/19/20/25/26 (Cat M1 Only)/27 (Cat M1 Only)/28/66
Weight (approx.) g	1.25	0.73	0.85
Operating temperature	-35°C ~ +75°C	-35°C ~ +75°C	-35°C ~ +75°C
Extended temperature	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C
<b>Data transmission</b>			
LTE Cat M1 data rates (Kbps)	Max. 588 (DL), Max. 1119 (UL)	Max. 588 (DL), Max. 1119 (UL)	Max. 588 (DL), Max. 1119 (UL)
LTE Cat NB1 data rates (Kbps)	Max. 32 (DL), Max. 70 (UL)	Max. 32 (DL), Max. 70 (UL)	Max. 27.2 (DL), Max. 62.5 (UL)
LTE Cat NB2 data rates (Kbps)	Max. 127 (DL), Max. 158.5 (UL)	Max. 127 (DL), Max. 158.5 (UL)	Max. 127 (DL), Max. 158.5 (UL)
EDGE data rates (Kbps)	Max. 296 (DL), Max. 236.8 (UL)	/	/
GPRS data rates (Kbps)	Max. 107 (DL), Max. 85.6 (UL)	/	/
SMS	Point-to-point M0 and MT; SMS cell broadcast; Text and PDU mode	Point-to-point M0 and MT; SMS cell broadcast; Text and PDU mode	Point-to-point M0 and MT; SMS cell broadcast; Text and PDU mode
Protocols	PPP/TCP/UDP/SSL/TLS/FTP(S)/HTTP(S)/NITZ/PING/MQTT(S)/MQTT-SN/LwM2M/CoAP(S)/IPv6/DNS/NTP	PPP/TCP/UDP/SSL/TLS/FTP(S)/HTTP(S)/NITZ/PING/MQTT(S)/MQTT-SN/LwM2M/CoAP(S)/IPv6/DNS/NTP	TCP/PPP/UDP/SSL/MQTT/FTP(S)/HTTP(S)/LwM2M/IPv4/IPv6/TLS/DTLS/CoAP/NITZ/Polta(BG770A-GL/BG772A-GL); PPP/TCP/UDP/SSL/TLS/FTP(S)/HTTP(S)/NITZ/PING/MQTT/LwM2M (BG773A-GL)
<b>Interfaces</b>			
(U)SIM	1.8 V	1.8 V	1.8 V
UART	× 3 (MAIN, DEBUG, NMEA)	× 3 (MAIN, DEBUG, NMEA)	× 3 (MAIN, DEBUG, AUX)(BG770A-GL); × 3 (MAIN, DEBUG, GNSS) (BG772A-GL/BG773A-GL)
USB	USB 2.0 × 1	USB 2.0 × 1	USB 2.0 × 1
I2C	I2C <sup>1</sup> × 1	I2C <sup>1</sup> × 1	I2C* × 2(BG772A-GL)
ADC	ADC × 1	ADC × 2	ADC × 2
GPIO	GPIO × 6	GPIO × 7	GPIO × 7(BG770A-GL/BG773A-GL); GPIO Max. × 15 (BG772A-GL)
RESET	RESET × 1	RESET × 1	RESET × 1
PCM	PCM <sup>1</sup> × 1	PCM <sup>1</sup> × 1	/
Antenna	2 (for main antenna and GNSS antenna, respectively)	2 (for main antenna and GNSS antenna, respectively)	2 (for main antenna and GNSS antenna, respectively)
<b>Enhanced features</b>			
QuecOpen <sup>®</sup>	Simplifies the development of embedded applications	Simplifies the development of embedded applications	Simplifies the development of embedded applications (BG772A-GL)
iSIM	/	/	•(BG773A-GL)
DFOTA	•	•	•
GNSS/RIL driver	Android 4.x/5.x/6.x/7.x/8.x/9.x/10.x/11.x/12.x	Android 4.x/5.x/6.x/7.x/8.x/9.x/10.x/11.x/12.x	/
USB serial driver	Windows 7/8/8.1/10/11, Linux 2.6~5.15, Android 4.x/5.x/6.x/7.x/8.x/9.x/10.x/11.x/12.x	Windows 7/8/9/10/11, Linux 2.6~5.15, Android 4.x/5.x/6.x/7.x/8.x/9.x/10.x/11.x/12.x	/
SIM detection	•	•	•
GNSS	Optional	Optional	GPS, GLONASS
RAI	/	/	/
Firmware update	via USB interface	via USB interface	via UART/USB <sup>1</sup> /DFOTA
<b>Electrical features</b>			
Supply voltage range	3.3 V ~ 4.3 V, typ. 3.8 V	2.6 V ~ 4.8 V, typ. 3.3 V <sup>2</sup>	VBAT_BB: 2.2 V ~ 4.35 V, typ. 3.3 V VBAT_RF: 3.1 V ~ 4.2 V, typ. 3.3 V
Power consumption	4.0 µA@PSM	3.44 µA@PSM	1.4 µA@PSM
Max output power	Power class 5 21dBm @ LTE bands	Power class 5 21dBm @ LTE bands	Power class 3 23dBm @ LTE bands
Certifications <sup>3</sup>	Vodafone/Deutsche Telekom/Telefónica*/Verizon*/AT&T*/T-Mobile/CE/UKCA/GCF/PTCRB/FCC/IC/Anatel/RCM/RoHS	Vodafone/Deutsche Telekom/Verizon/AT&T/T-Mobile/Telus/CE/UKCA/GCF/PTCRB/FCC/IC/RCM/KC*/JATE/TELEC/NBTC*/NCC/USCC/RoHS	Vodafone/Deutsche Telekom/Verizon/AT&T/T-Mobile/Orange/Telus/Telstra/KT/SKT/LGU+/NTT DOCOMO/Softbank*/KDDI/CE/GCF/PTCRB/FCC/IC/RCM/KC/JATE/TELEC/ICASA/RoHS
Recommended applications	Gas detectors, soil PH testers, optical sensors, machinery alarm systems, irrigation controllers, elevators, asset tracking electronics, person/pet tracking, water/gas metering, smart parking systems, fire hydrants, smoke alarms, smart bins, street lighting		

Note 1: For voice call only.

Note 2: please refer to the hardware design manual for more specific requirements on the minimum power supply voltage.





Note 3: May depend on modules' variant.

\* Planning/ Under development/ In progress  
• Supported

Product	BC660K-GL	BC950K-GL
		
Form factor	LCC	LCC
Dimensions (mm)	17.7 × 15.8 × 2.0	23.6 × 19.9 × 2.2
RAT	LTE Cat NB2	LTE Cat NB2
Frequency bands (MHz)	B1/2/3/4/5/8/12/13/17/18/19/20/25/28/66/70/85	B1/2/3/4/5/8/12/13/17/18/19/20/25/28/66/70/85
Weight (approx.) g	1.0±0.2	1.6±0.2
Operating temperature	-35°C ~ +75°C	-35°C ~ +75°C
Extended temperature	-40°C ~ +85°C	-40°C ~ +85°C
<b>Data transmission</b>		
LTE Cat NB1 data rates (Kbps)	Single-tone: 25.5(DL)/16.7(UL) Multi-tone: 127(DL)/158.5(UL)	Single-tone: 25.5(DL)/16.7(UL) Multi-tone: 127(DL)/158.5(UL)
LTE Cat NB2 data rates (Kbps)	Max. 127 (DL)/ 158.5 (UL)	Max. 127 (DL)/ 158.5 (UL)
GPRS data rates (Kbps)	/	/
SMS	Text mode	Text mode
Protocols	UDP/TCP/PING/LwM2M/SNTP/COAP/COAPS/HTTP/HTTPS/MQTT/MQTT/SSL/TLS	UDP/TCP/PING/LwM2M/SNTP/COAP/COAPS/HTTP/HTTPS/MQTT/MQTT/SSL/TLS
<b>Interfaces</b>		
(U)SIM	× 1 (1.8V/3.0V)	× 1 (1.8V/3.0V)
UART	UART × 2 (for QuecOpen® version, × 3)	× 2 (QuecOpen® version, × 3, only one port for debug)
I2C	× 1 (for QuecOpen® version only)	× 1 (for QuecOpen® only, multiplexed with other pins)
ADC	× 1 (for QuecOpen® version, × 2)	× 1 (QuecOpen® version, × 4)
GPIO	× 4 (for QuecOpen® version, × 16)	Configurable (for QuecOpen® only, multiplexed with other pins)
RESET(RESET_N)	× 1	× 1
SPI	× 1 (for QuecOpen® version only)	× 1 (for QuecOpen® version only, multiplexed with other pins)
PWM	× 1 (for QuecOpen® version only)	× 1 (for QuecOpen® version only, multiplexed with other pins)
RI	× 1	× 1
PSM_EINT	× 1 (for QuecOpen® version, × 2)	× 1 (for QuecOpen® version, × 5)
I2S	/	/
NETLIGHT	× 1	× 1
WAKEUP_OUT	/	/
Antenna	× 1	× 1
<b>Enhanced features</b>		
QuecOpen®	•	•
DFOTA	•	•
BLE 5.0	/	/
Firmware update	via UART/DFOTA	via UART/DFOTA
RAI	•	•
Location based services	/	/
eSIM*	Optional	Optional
<b>Electrical features</b>		
Supply voltage range	2.2 V ~ 4.3 V, typ. 3.3 V	2.2 V ~ 4.3 V, typ. 3.6 V
Power consumption	800 nA @ PSM	800 nA @ PSM
Certifications	Vodafone/Deutsche Telekom/Telefónica/Orange/Verizon/AT&T/T-Mobile/Telstra/Optus/Spark/KT/LGU+/CE/GCF/ATEX/PTCRB/FCC/IC/Anatel/RCM/KC/JATE/TELEC/NBTC/MDA/ICASA/NCC	Vodafone/Deutsche Telekom/Telefónica/Telstra*/KT*/LGU+*/CE/GCF/Anatel*/RCM/KC/NBTC*/IMDA*/ICASA*
Recommended Applications	Gas detectors, soil PH testers, optical sensors, machinery alarm systems, irrigation controllers, elevators, asset tracking, electronics, person/pet tracking, water/gas metering, smart parking systems, fire hydrants, smoke alarms, smart bins, street lighting	

\* Planning/ Under development/ In progress  
• Supported



# LPWA modules



Product	BC680Z-EU	BC65	BC92	BC95-GR
				
Form factor	LCC	LCC	LCC	LCC
Dimensions (mm)	17.7 × 15.8 × 2.2	17.7 × 15.8 × 2.2	23.6 × 19.9 × 2.2	23.6 × 19.9 × 2.2
RAT	3GPP Rel-14, Cat NB2	LTE Cat NB2	LTE Cat NB2/GSM	LTE Cat NB2
Frequency bands (MHz)	B3/5/8/20/28	LTE Cat NB2: B1*/3/5/8/20/28	LTE Cat NB2: B3/5/8/20/28; GSM: 850/900/1800/1900MHz	B3/5/8/20/28
Weight (approx.) g	1.12 ±0.2	1.2±0.2	1.8±0.1	1.6 ±0.2
Operating temperature	-35°C ~ +75°C	-25°C ~ +75°C	-25°C ~ +75°C	-25°C ~ +75°C
Extended temperature	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C
<b>Data transmission</b>				
LTE Cat NB1 data rates (Kbps)	/	Single-Tone: Max. 25.5 (DL)/16.7 (UL) Multi-Tone: Max. 25.5 (DL)/62.5 (UL)	Single-Tone: Max. 25.5 (DL)/16.7 (UL) Multi-Tone: Max. 25.5 (DL)/62.5 (UL)	Single-Tone: Max. 25.5 (DL)/16.7 (UL) Multi-Tone: Max. 25.5 (DL)/62.5 (UL)
LTE Cat NB2 data rates (Kbps)	Max. 126.5 (DL)/158.5 (UL)	Max. 127 (DL)/158.5 (UL)	Max. 127 (DL)/158.5 (UL)	Max. 127 (DL)/158.5 (UL)
GPRS data rates (Kbps)	/	/	GPRS Class 12: Max. 85.6 (DL)/85.6 (UL)	/
SMS	•	•	•	/
Protocols	UDP/TCP/LwM2M/SNTP/IPv4/IPv6/NITZ/PING	UDP/TCP/SNTP/MQTT/CoAP/PPP/TLS/DTLS/ CoAPS/HTTP/HTTPS	UDP/TCP/SNTP/PPP/MQTT/CoAP/HTTP/HTTPS/FTP/ CoAPS	UDP/TCP/SNTP/MQTT/CoAP*/PPP/TLS/DTLS/HTTP/ HTTPS/SMS/DFOTA
<b>Interfaces</b>				
(U)SIM	× 1	1.8 V/3.0 V	1.8 V/3.0 V	1.8 V/3.0 V
UART	× 2	× 3 (MAIN, DEBUG, AUX)	× 2 (MAIN, DEBUG)	× 3 (MAIN, DEBUG, AUX)
I2C	× 2(Open only)	/	/	/
ADC	× 1	× 1	× 1	× 1
GPIO	*(Open only)	/	/	/
RESET(RESET_N)	× 1	× 1	× 1	× 1
SPI	× 2(Open only)	/	/	/
PWM	× 1(Open only)	/	/	/
RI	RI*: × 1	× 1	× 1	× 1
PSM_EINT	× 1	× 1	× 1	× 1
I2S	/	/	/	/
NET_STATUS(NETLIGHT)	× 1*	/	/	× 1
WAKEUP_OUT	/	/	/	× 1
Antenna	× 2	× 1	× 1	× 1
<b>Enhanced features</b>				
QuecOpen*	•	/	/	*
DFOTA	•	•	•	•
BLE 5.0	/	/	/	/
Firmware update	via UART/DFOTA	via UART/DFOTA	via UART/DFOTA	•
RAI	•	•	•	•
Location based services	Supports GNSS	ECID, OTDOA	ECID, OTDOA	ECID, OTDOA
eSIM*	/	Optional	Optional	Optional
<b>Electrical features</b>				
Supply voltage range	2.2 V ~ 4.5 V	3.2 V ~ 4.2 V, typ. 3.8 V	3.4 V ~ 4.2 V, typ. 3.8 V	3.2 V ~ 4.2 V, typ. 3.6 V
Power consumption	2.8 µA @ PSM, 0.19 mA @ DRX in sleep mode, DRX = 2.56 s, ECL0, 0.11 mA @ eDRX in sleep mode, eDRX=10.24s, ECL0	4 µA @PSM	4 µA @PSM	3.8 µA @PSM 1.2 mA @ Idle, DRX = 2.56 s, ECL 0
Certifications <sup>1</sup>	Vodafone/Telefónica*/CE/GCF/Anatel*/RCM	Vodafone/Deutsche Telekom/Telefónica/CE/ GCF/RCM	Vodafone/Deutsche Telekom/Vodacom/CE/ GCF/Anatel*/RCM/ICASA/MTN	CE/RCM
Recommended applications	Gas detectors, soil PH testers, optical sensors, machinery alarm systems, irrigation controllers, elevators, asset tracking, electronics, person/pet tracking, water/gas metering, smart parking systems, fire hydrants, smoke alarms, smart bins, street lighting			

Note 1: May depend on modules' variant.

\* Planning/ Under development/ In progress  
• Supported

# Satellite modules


Product	CC200A-LB	CC660D-LS
		
Form factor	LCC + LGA	LCC + LGA
Dimensions (mm)	38.0 × 37.0 × 3.35	17.7 × 15.8 × 2.0
RAT	IDP	NTN
Frequency bands (MHz)	UL: 1626.5-1660.5 MHz; 1668-1675 MHz DL: 1518-1559 MHz	B255: UL: 1626.5-1660.5 MHz; DL: 1525-1559 MHz B256: UL: 1980-2010 MHz; DL: 2170-2200 MHz B23: UL: 2000-2020 MHz; DL: 2180-2200 MHz
Weight (approx.) g	9.4±0.2	1.2 ±0.2
Operating temperature	-35°C ~ +75°C	-35°C ~ +75°C
Extended temperature	-40°C ~ +85°C	-40°C ~ +85°C
<b>Data transmission</b>		
Satellite band	L-Band	L-Band (B255)/ S-Band (256/23)
GNSS	GPS L1/GLONASS L1/Galileo E1/BDS B1	/
Protocols	IDP	IPv4/UDP/NIDD/DNS
<b>Interfaces</b>		
(U)SIM	/	× 1
UART	× 2	× 3
USB	/	× 1
I2C	× 1*	/
ADC	× 2	× 1
GPIO	× 2	/
RESET(RESET_N)	× 1	× 1
RI	/	× 1*
PSM_EINT	/	× 1
NET_STATUS	× 1*	× 1*
WAKEUP_IN	× 1	/
Antenna	× 1	× 1
<b>Enhanced features</b>		
Firmware update	via UART/DFOTA*	via UART/DFOTA*
RAI	/	•
eSIM*	/	/
<b>Electrical features</b>		
Supply voltage range	Voltage range: 5.5 V ~ 6.5 V, typ. 6.0 V	2.2 V ~ 3.6 V, typ. 3.3 V
Power consumption	Satellite data reception: 162.6 mA Satellite data transmission: 1.69 A GNSS mode: 35.95 mA Deep Sleep mode: 190µA	3.4 µA @ Deep Sleep <sup>1</sup> 293 mA @ TX, 23 dBm (B255) 278 mA @ TX, 23 dBm (B256) 272 mA @ TX, 23 dBm (B23) 34 mA @ TX, 0 dBm (B255) 36 mA @ TX, 0 dBm (B256) 36 mA @ TX, 0 dBm (B23)
Certifications	Regulatory: CE/FCC/IC/RCM Satellite: Inmarsat Type Approval	Skylo/CE/FCC/IC/RCM
Recommended applications	Vehicle tracking, asset tracking, chassis tracking, container tracking, oil & gas pipeline monitoring, mining, smart grid, vessel connection, maritime buoys, heavy equipment monitoring, construction fleet management, smart agriculture, environmental monitoring	

Product	BG95-S5	BG770A-SN
		
Form factor	LGA	LGA
Dimensions (mm)	23.6 × 19.9 × 2.2	14.9 × 12.9 × 1.9
RAT	IoT-NTN/LTE Cat M1/Cat NB2/EGPRS	IoT-NTN/LTE Cat M1/Cat NB2
Frequency bands (MHz)	IoT-NTN: L-Band (B255)/ S-Band (B256/23); Cat M1: B1/2/3/4/5/8/12/13/18/19/20/25/26/27/28/66/85; Cat NB2: B1/2/3/4/5/8/12/13/18/19/20/25/28/66/71/85; EGPRS: GSM 850/EGSM 900/DCS 1800/PCS 1900	Cat M1: B1/2/3/4/5/8/12/13/18/19/20/25/26/27/28/66; Cat NB2: B1/2/3/4/5/8/12/13/17/18/19/20/25/28/66; IoT-NTN: L-Band(255)/S-Band (256/23)
Weight (approx.) g	2.15	0.8
Operating temperature	-35°C ~ +75°C	-35°C ~ +75°C
Extended temperature	-40°C ~ +85°C	-40°C ~ +85°C
<b>Data transmission</b>		
LTE Cat M1 data rate (Kbps)	Max. 588 (DL) / Max. 1119 (UL)	Cat M1: Max. 588 (DL), Max. 1119 (UL)
LTE Cat NB1 data rate (Kbps)	Max. 32 (DL) / Max. 70 (UL)	Max. 27.2 (DL), Max. 62.5 (UL)
LTE Cat NB2 data rate (Kbps)	Max. 127 (DL) / Max. 158.5 (UL)	Max. 127 (DL), Max. 158 (UL)
EDGE data rate (Kbps)	Max. 296 (DL) / Max. 236.8 (UL)	/
GPRS data rate (Kbps)	Max. 107 (DL) / Max. 85.6 (UL)	/
SMS	SMS <sup>2</sup> : Point-to-point MO and MT; Text and PDU mode; SMS cell broadcast	Point-to-point MO and MT; SMS Cell Broadcast; Text and PDU Mode
Protocols	PPP/TCP/UDP/SSL/FTP(S)/HTTP(S)/NITZ/NTP/PING/MQTT/LwM2M/CoAP/IPv6	PPP/TCP/UDP/SSL/FTP(S)/HTTP(S)/NITZ/PING/NIDD/MQTT/NTP/LwM2M/CoAP
<b>Interfaces</b>		
(U)SIM	× 1	•
UART	× 3	•
USB	× 1	•
I2C	× 1	/
GPIO	× 9	•
PCM	× 1	/
GRFC	× 2	•
Antenna	× 2	•
<b>Enhanced features</b>		
DFOTA	•	•
GNSS/RIL driver	•	•
USB serial driver	•	•
SIM detection	•	•
GNSS	•	•
RAI	•	•
Firmware update	•	•
<b>Electrical features</b>		
Supply voltage range	3.3 V ~ 4.3 V, typ. 3.8V	VBAT_BB: 2.2 V~4.35 V, typ. 3.3 V VBAT_RF: 3.1 V~4.2 V, typ. 3.3 V
Power consumption	Power consumption @PSM (µA) :4.4; Power consumption @ LTE Cat M (mA): Sleep Mode: 1.58 @ DRX = 1.28 s, 0.82 @ e-I-DRX = 81.92 s; Idle Mode: 13.78 @ DRX = 1.28 s, 13.28 @ e-I-DRX = 81.92 s; Active mode: 216 @ 23 dBm, GNSS off; Power consumption @ LTE Cat NB (mA): Sleep Mode: 1.56 @ DRX = 1.28 s, 0.83 @ e-I-DRX = 81.92 s; Idle Mode: 13.73 @ DRX = 1.28 s, 13.35 @ e-I-DRX = 81.92 s; Active mode: 189 @ 23 dBm, GNSS off; Power consumption @ IoT-NTN (mA): Sleep Mode: 2.19 @ DRX = 1.28 s, 0.9 @ e-I-DRX = 81.92 s; Idle Mode: 14.46 @ DRX = 1.28 s, 13.34 @ e-I-DRX = 81.92 s; Active mode: 54 @ 24 dBm, GNSS off	Power Saving Mode: 1.4 µA; Sleep Mode: Cat M1: 1.1 mA @ DRX = 1.28 s; 0.06 mA @ e-I-DRX = 40.96 s; PTW = 1.28 s; DRX = 1.28 s; 0.05 mA @ e-I-DRX = 81.92 s; PTW = 1.28 s; DRX = 1.28 s; Cat NB1: 2.2 mA @ DRX = 1.28 s; 0.16 mA @ e-I-DRX = 40.96 s; PTW = 2.56 s; DRX = 1.28 s; 0.12 mA @ e-I-DRX = 81.92 s; PTW = 2.56 s; DRX = 1.28 s
Max output power	Power class 3 23dBm	Power class 3 23dBm
Certifications	Skylo*/Verizon*/AT&T*/CE/GCF*/FCC/PTRCB*/IC/RCM	Skylo*/CE/PTRCB*/GCF*/FCC*
Recommended applications	Vehicle tracking, asset tracking, chassis tracking, container tracking, oil & gas pipeline monitoring, mining, smart grid, vessel connection, maritime buoys, heavy equipment monitoring, construction fleet management, smart agriculture, environmental monitoring	

Note 1: Reference data provided by the baseband chip platform.  
Note 2: SMS is not supported under IoT-NTN.

\* Planning/ Under development/ In progress  
• Supported

# Automotive 5G modules

Product		AG55xQ
		
Form factor	LGA	
Dimensions (mm)	54.5 × 53.0 × 3.45	
5G	Sub-6G	
4G	LTE Cat 19	
Frequency bands (MHz)	-CN (China)	5G-FDD: n1 <sup>1</sup> /3 <sup>1</sup> /28 <sup>1</sup> ; 5G-TDD: n41/78/79; LTE-FDD: B1/3/5/7/8; LTE-TDD: B34/38/39/40/41; WCDMA: B1/8; GSM: 900/1800 MHz; C-V2X: B47 (For AG550Q/AG553Q Series)
	-EU (EMEA/Australia, Korea/India/Southeast Asia/Latin America exl. Mexico)	5G-FDD: n1/3/8/20/28; 5G-TDD: n41/78; LTE-FDD: B1/2/3/4/5/7/8/20/28/32 <sup>2</sup> ; LTE-TDD: B38/40/41/42; WCDMA: B1/3/5/6/8; GSM: 900/1800/850/1900 MHz; C-V2X: B47 (For AG550Q/AG553Q Series)
	-NA (North America/Mexico)	5G-FDD: n2/5/25/66/71; 5G-TDD: n41/48/77/78; LTE-FDD: B2/4/5/7/12/13/14/17/25/26/28/29 <sup>3</sup> /30 <sup>3</sup> /66/71; LTE-TDD: B41/48; WCDMA: B2/4/5; GSM: 1900 MHz; C-V2X: B47 (For AG550Q/AG553Q Series)
	-ROW (Japan, Latin America)	/
	-JP* (Japan)	5G-FDD: n1/3; 5G-TDD: n77/78/79; LTE-FDD: B1/3/5/7/8/9/11/19/21/28; LTE-TDD: B41; WCDMA: B1/3/5/8/9/19; C-V2X: B47 (For AG550Q/AG553Q Series)
Weight (approx.) g	21	
Operating temperature	-40°C ~ +85°C (eCall: +95°C)	
<b>Data transmission</b>		
5G SA	Max. 2.0 Gbps (DL)/450 Mbps (UL)	
5G NSA	Max. 2.4 Gbps (DL)/550 Mbps (UL)	
LTE FDD data rates	Max. 1.6 Gbps (DL)/ Max. 200 Mbps (UL)	
LTE TDD data rates	Max. 1.4 Gbps (DL)/ Max. 120 Mbps (UL)	
DC-HSDPA/HSUPA data rates(Mbps)	Max. 42 (DL)/ Max. 5.76 (UL)	
WCDMA data rates (Kbps)	Max. 384 (DL)/ Max. 384 (UL)	
EDGE data rates (Kbps)	Max. 296 (DL)/ Max. 236.8 (UL)	
GPRS data rates (Kbps)	Max. 107 (DL)/ Max. 85.6 (UL)	
C-V2X data rates (Mbps)	Max. 48 (Tx)/ Max. 48(Rx)	
SMS	Point-to-point MO and MT; SMS cell broadcast; Text and PDU mode	
Protocols	TCP/UDP/PPP/PING/FTP(S)/HTTP(S)/SMTP/SSL/TLS/MMS/NTP/DTMF*/FILE/QMI	
<b>Interfaces</b>		
(U)SIM	× 2 (supports 1.8 V/ 3 V USIM/ SIM Cards)	
UART	× 3 (Main/Debug/BT UART)	
USB 2.0/3.1	× 1	
PCIe 3.0	× 1	
IIC	× 1	
IIS	× 1	
RGMII	× 1	
SDIO	× 1 (for eMMC)	
SPI	× 2	
Audio digital (PCM)	× 1	
ADC	× 2 (15-bit)	
GPIO	× 15 (For QuecOpen* version only)	
RESET_N	× 1 (Reset the module)	
Antenna	Main × 1; Diversity × 1; MIMO 3 × 1; MIMO 4 × 1; C-V2X × 2; GNSS × 1; DSDA × 2	
<b>Enhanced features</b>		
QuecOpen* (Open Linux)	•	
eCall	•	
DFOTA	•	
eSIM (eUICC)	Optional	
(U)SIM detection	•	
Temperature management	•	
GNSS	GPS/ GLONASS/ BeiDou/ Galileo /QZSS	
ESD/EMI protection	Realized through internal specific circuits and components (Electrostatic discharge conforms to ±12KV air discharge and ±8KV of contact discharge)	
Gigabit ethernet	Optional	
C-V2X TDD B47	Optional	
DSDA (Dual SIM dual activation)	Optional	
QDR 3.0 (External IMU required)	Optional	
RTK/PPE	Optional	
Multi-Frequency GNSS (L1/L5)	Optional	
UART interface for BT function	Optional	
<b>Advanced security features</b>		
TrustZone/ TPM*	•	
Secure boot	•	
SE-Linux	•	
<b>Software features</b>		
RIL driver	/	
GNSS driver	/	
USB ECM driver	Linux 2.6-5.12	
USB RNDIS driver	Windows 7/8/8.1/10, Linux 2.6-5.12	
USB GobiNet driver	Linux 2.6-5.12	
USB QMI_WWAN driver	Linux 3.4-5.12	
USB serial driver	Windows 7/8/8.1/10, Linux 2.6-5.12	
<b>Electrical features</b>		
Supply voltage range	VBAT_BB/VBAT_RF: 3.3 V ~ 4.3 V (typ. 3.8 V) ; VBAT_C-V2X: 4.75 V ~ 5.25 V (typ. 5.0 V)	
Power consumption	0.04 mA @Power off; 1.4 mA @Sleep(Typ); 25.0 mA @Idle	
Certifications <sup>3</sup>	CCC/SRRC/NAL/CE(AG551Q-EU)/RCM(AG551Q-EU)/GCF*/PTCRB*/FCC*/IC*/KCC*/JATE*/TELEC*/AT&T*	
Recommended applications	Automotive	

Note 1: n1/n3/n28 for AG55xQ-CN supports SA only.

Note 2: LTE-FDD B29/B30/B32 supports Rx only.

Note 3: May depend on modules' variant.

\* Planning/ Under development/ In progress  
• Supported




Product		AG57xQ
		
Form factor	LGA	
Dimensions (mm)	54.5 × 53.0 × 3.45	
5G	Sub-6G	
4G	LTE Cat 16	
Frequency bands (MHz)	-CN (China)	5G-FDD: n1/3/28A <sup>2</sup> ; 5G-TDD: n41/77/78/79 <sup>3</sup> ; LTE-FDD: B1/3/5/7/8; LTE-TDD: B34/38/39/40/41; WCDMA: B1/8; GSM: 900/1800MHz
	-EU (EMEA/Australia, Korea/India/Southeast Asia/Latin America excl. Mexico)	5G-FDD: n1/3/5 <sup>3</sup> or n71 <sup>3</sup> /8/20/28A; 5G-TDD: n38 <sup>2</sup> /40 <sup>2</sup> /41/78; LTE-FDD: B1/3/5 <sup>3</sup> or B71 <sup>3</sup> /7/8/20/28A/32 <sup>1</sup> ; LTE-TDD: B38/40/41/42 <sup>2</sup> ; WCDMA: B1/3/5 <sup>3</sup> /8; GSM: 900/1800MHz
	-NA (North America/Mexico)	5G-FDD: n2/5/12/25/66/71; 5G-TDD: n41/78; LTE-FDD: B2/4/5/7/12/13/14/17/25/26/29 <sup>1</sup> /30 <sup>1</sup> /66/71; LTE-TDD: N41; WCDMA: B41
	-ROW (Japan, Latin America)	5G-FDD: n1/3/28; 5G-TDD: n41/77/78/79 <sup>3</sup> ; LTE-FDD: B1/2/3/4/5/7/8/9/11 <sup>3</sup> /18/19/21/26/28; WCDMA: B1/3/5/6/7/8/9/19; GSM: 900/1800/850/1900MHz
	-JP* (Japan)	/
Weight (approx.) g	TBD	
Operating temperature	-40°C ~ +85°C (eCall: +95°C)	
<b>Data transmission</b>		
5G SA	2.0 Gbps (DL)/450 Mbps (UL)	
5G NSA	2.2 Gbps (DL)/550 Mbps (UL)	
LTE FDD data rates	800 Mbps (DL)/200 Mbps (UL)	
LTE TDD data rates	500 Mbps (DL)/120 Mbps (UL)	
DC-HSDPA/HSUPA data rates(Mbps)	42 Mbps/5.76 Mbps	
WCDMA data rates (Kbps)	384 kbps (DL)/384 kbps (UL)	
EDGE data rates (Kbps)	296 kbps (DL)/236.8 kbps (UL)	
GPRS data rates (Kbps)	107 kbps (DL)/85.6 kbps (UL)	
C-V2X data rates (Mbps)	48 Mbps (Tx)/48 Mbps (Rx)	
SMS	Point-to-point MO and MT, SMS cell broadcast, Text and PDU mode	
Protocols	TCP/UDP/PPP/PING/FTP(S)/HTTP(S)/SMTP/SSL/TLS/MMS/NTP/FILE/QMI	
<b>Interfaces</b>		
(U)SIM	×2	
UART	×3 (Main/Debug/BT UART)	
USB 2.0/3.1	×1	
PCIe 3.0	×1	
IIC	×1	
IIS	×1	
RGMI	×1	
SDIO	×1 (for eMMC/SD)	
SPI	×2	
Audio digital (PCM)	×1	
ADC	×2 (15-bit)	
GPIO	×15 (For QuecOpen® version only)	
RESET_N	×1 (Reset the module)	
Antenna	Main × 1; Diversity × 1; MIMO 3 × 1; MIMO 4 × 1; C-V2X × 2; GNSS × 1; DSDA × 2	
<b>Enhanced features</b>		
QuecOpen® (Open Linux)	•	
eCall	•	
DFOTA	•	
eSIM (eUICC)	Optional	
(U)SIM detection	•	
Temperature management	•	
GNSS	GPS/GLONASS/BeiDou/Galileo/QZSS	
ESD/EMI protection	Realized through internal specific circuits and components	
Gigabit ethernet	Optional	
C-V2X TDD B47	Optional	
DSDA (Dual SIM dual activation)	Optional	
QDR 3.0 (External IMU required)	Optional	
RTK/PPE	Optional	
Multi-Frequency GNSS (L1/L5)	Optional	
UART interface for BT function	Optional	
<b>Advanced security features</b>		
TrustZone/TPM*	•	
Secure boot	•	
SE-Linux	•	
<b>Software features</b>		
RIL driver	Android 4.x/5.x/6.x/7.x/8.x/9.x	
GNSS driver	Android 4.x/5.x/6.x/7.x/8.x/9.x	
USB ECM driver	Linux 2.6-5.0	
USB RNDIS driver	Windows 7/8/8.1/10, Linux 2.6-5.0	
USB GobiNet driver	Linux 2.6-5.0, Android 4.x/5.x/6.x/7.x/8.x/9.x	
USB QMI_WWAN driver	Linux 3.4-5.0, Android 4.x/5.x/6.x/7.x/8.x/9.x	
USB serial driver	Windows 7/8/8.1/10, Linux 2.6-5.0, Android 4.x/5.x/6.x/7.x/8.x/9.x	
<b>Electrical features</b>		
Supply voltage range	VBAT_BB/VBAT_RF: 3.3 V ~ 4.3 V (typ. 3.8 V) VBAT_C-V2X: 4.75 V ~ 5.25 V (typ. 5.0 V)	
Power consumption	TBD @Power off, TBD @Sleep, Typ., TBD @Idle	
Certifications <sup>4</sup>	CCC*/SRRC*/NAL*/CE*/GCF*/PTCRB*/FCC*/IC*/RCM*/KC*/JATE*/TELEC*/AT&T*	
Recommended applications	Automotive	

Note 1: LTE-FDD B29/B30/B32 supports Rx only.  
 Note 2: n28A supports Tx: 703-733 MHz, Rx:758-788 MHz.  
 Note 3: Optional.  
 Note 4: May depend on modules' variant.

\* Planning/ Under development/ In progress  
 • Supported

# Automotive 5G modules

Product	AG56xN	
		
Form factor	LGA	
Dimensions (mm)	45.0 × 46.9 × 3.25	
5G	Sub-6G	
4G	LTE Cat 18	
Frequency bands (MHz)	-CN (China)	5G-FDD: n1/3/5/8/28A <sup>1</sup> ; 5G-TDD: n41/77/78/79; LTE-FDD: B1/3/5/8; LTE-TDD: B34/38/39/40/41; WCDMA: B1/5/8; GSM: 900/1800MHz
	-EU (EMEA/ Korea/ Australia/ India/ Southeast Asia)	5G-FDD: n1/3/7/8/20/28A <sup>1</sup> ; 5G-TDD: n77/78; LTE-FDD: B1/3/5/7/8/20/28A <sup>1</sup> ; LTE-TDD: B38/40/41; WCDMA: B1/3/5/8; GSM: 850/900/1800MHz
	-NA (North America)	5G-FDD: n2/5/12/66; 5G-TDD: n77/78; LTE-FDD: B2/4/5/12/29 <sup>2</sup> /66
	-ROW (Japan/ Latin America/ Brazil/ Mexico/...)	5G-FDD: n28; 5G-TDD: n77/78/79; LTE-FDD: B1/3/19/21/28; WCDMA: B1/3
Weight (approx.) g	16	
Operating temperature	-40°C ~ +85°C (eCall: +95°C)	
<b>Data transmission</b>		
5G SA	Max. 4.0 Gbps (DL)/450 Mbps (UL)	
5G NSA	Max. 2.2 Gbps (DL)/480 Mbps (UL)	
LTE FDD data rates	Cat18: Max. 1.4 Gbps (DL) / Max. 200 Mbps (UL) Cat6: Max. 300 Mbps (DL) / Max. 50 Mbps (UL)	
LTE TDD data rates	Cat18: Max. 1.4 Gbps (DL) / Max. 200 Mbps (UL) Cat6: Max. 300 Mbps (DL) / Max. 50 Mbps (UL)	
DC-HSDPA/HSUPA data rates (Mbps)	Max. 42 (DL) / Max. 5.76 (UL)	
WCDMA data rates (Kbps)	Max. 384 (DL) / Max. 384 (UL)	
EDGE data rates (Kbps)	Max. 296 (DL) / Max. 236.8 (UL)	
GPRS data rates (Kbps)	Max. 107 (DL) / Max. 85.6 (UL)	
C-V2X data rates (Mbps)	/	
SMS	Point-to-point M0 and MT; SMS cell broadcast; Text and PDU mode	
Protocols	TCP/UDP/PPP/PING/FTP(S)/HTTP(S)/SMTP/SSL/TLS/MMS/NTP/DTMF*/FILE	
<b>Interfaces</b>		
(U)SIM	× 2	
UART	× 4	
USB 2.0/3.1	× 1	
PCIe 3.0	× 1	
IIC	× 2	
IIS	× 1	
RGMII	× 1	
SGMII	× 1	
SDIO	× 1	
SPI	× 3	
Audio digital (PCM)	× 1	
ADC	× 6	
GPIO	× 24	
RESET_N	× 1	
Antenna	Main × 1; Diversity × 1; MIMO 3 × 1; MIMO 4 × 1; GNSS × 1	
<b>Enhanced features</b>		
QuecOpen® (Open Linux)	•	
eCall	•	
Dual/ AB system*	•	
eSIM (eUICC)	•	
(U)SIM detection	•	
Temperature management	•	
GNSS	GPS/ GLONASS/ BeiDou/ Galileo	
ESD/ EMI protection	Realized through internal specific circuits and components (Electrostatic discharge conforms to ±12KV air discharge and ±8KV of contact discharge)	
Gigabit ethernet	Optional	
C-V2X TDD B47	/	
RTK/ ADR	Optional	
Multi-Frequency GNSS (L1/L5)	Optional	
UART interface for BT function	Optional	
<b>Advanced security features</b>		
TrustZone/ TPM*	•	
Secure boot	•	
SE-Linux	•	
<b>Software features</b>		
RIL driver	Android 4.x/ 5.x/ 6.x/ 7.x/ 8.x/ 9.x	
GNSS driver	Android 4.x/ 5.x/ 6.x/ 7.x/ 8.x/ 9.x	
RNDIS	Windows 7/8/8.1/10, Linux 2.6~5.0	
ECM	Linux 2.6~5.0	
Gobinet	Linux 2.6~5.0, Android 4.x/ 5.x/ 6.x/ 7.x/ 8.x/ 9.x	
QMI_WWAN driver	Linux 3.4~5.0, Android 4.x/5.x/6.x/7.x/8.x/9.x	
USB serial driver	Windows 7/8/8.1/10, Linux 2.6~5.0, Android 4.x/5.x/6.x/7.x/8.x/9.x	
<b>Electrical features</b>		
Supply voltage range	VBAT_BB/VBAT_RF: 3.3 V ~ 4.3 V (typ. 3.8 V)	
Power consumption	TBD @Power off TBD @Sleep, Typ. TBD @Idle	
Certifications <sup>3</sup>	CCC/SRRC/NAL/CE*/GCF*/RCM*/PTCRB*/FCC*/IC*/KC*/JATE*/TELEC*/AT&T*	
Recommended applications	Automotive	


Note 1: 5G FDD n28A supports Tx at 703-733 MHz and Rx at 758-788 MHz.

Note 2: LTE-FDD B29 supports Rx only.

Note 3: May depend on modules' variant.

\* Planning/ Under development/ In progress  
• Supported


# Automotive LTE-A modules

Product	AG52xR (x=0, 1, 5, 9)
	
Form factor	LGA
Dimensions (mm)	38.0 × 42.0 × 2.65
4.5G	-CN Cat 6; -EU/NA/JP Cat 12, Cat 16, Cat 9, Cat 6 as option
Frequency bands (MHz)	-CN(China)
	-EU(EMEA/ Korea/ Brazil/ India/ Australia)
	-NA(North America)
	-JP(Japan)
	-GL(Global)
Weight (approx.) g	9.23
Operating temperature	-40°C ~ +85°C (eCall: +95°C)
<b>Data transmission</b>	
LTE data rates (Mbps)	AG521R series/AG525R series: LTE Cat 12: LTE-FDD: Max. 600 (DL)/150 (UL), LTE-TDD: Max. 410 (DL)/90 (UL) LTE Cat 6: LTE-FDD: Max. 300 (DL)/50 (UL), LTE-TDD: Max. 226 (DL)/28 (UL) AG520R series: LTE Cat 12: LTE-FDD: Max. 600 (DL)/75 (UL), LTE-TDD: Max. 410 (DL)/45 (UL) LTE Cat 6: LTE-FDD: Max. 300 (DL)/50 (UL), LTE-TDD: Max. 226 (DL)/28 (UL)
DC-HSPA+ data rates (Mbps)	Max. 42 (DL)/Max. 5.76 (UL)
WCDMA data rates (Kbps)	Max. 384 (DL)/Max. 384 (UL)
TD-SCDMA data rates (Mbps)	/
EDGE data rates (Kbps)	Max. 296 (DL)/Max. 236.8 (UL)
GPRS data rates (Kbps)	Max. 107 (DL)/Max. 85.6 (UL)
C-V2X data rates (Mbps)	Max. 30 (Tx)/Max. 30(Rx)
SMS	Point-to-point MO and MT, SMS cell broadcast, Text and PDU mode
Protocols	TCP/UDP/PPP/PING/FTP(S)/HTTP(S)/SMTP/SSL/TLS/MMS/NTP/DTMF*/FILE/QMI
<b>Interfaces</b>	
(U)SIM	/
USIM	× 1 (default), × 2 (optional)
UART	3 × UARTs
USB	× 1
SDIO	× 1 (eMMC)
SPI	× 1
I2S/ PCM	× 1 I2S, × 1 PCM
I2C	× 1
RGMII	× 1
ADC	× 2
PCIe	× 1
GPIO	× 8 (Only Open)
JTAG/ QDSS	Yes
RESET	Yes
Antenna	5 (2 × 2 MIMO), Reserve for 7 antennas(4 × 4 MIMO) as option
<b>Enhanced features</b>	
QuecOpen™ (Open Linux)	•
PCIe for WLAN function	•
UART/ PCM for Bluetooth function	•
Gigabit ethernet	Optional
eCall	•
Multi-APN	•
Temperature management	•
DFOTA	•
eSIM (eUICC)	Optional
(U)SIM detection	•
QDR	Optional
PPE (RTK)	Optional
GNSS	GPS/GLONASS/BeiDou/Galileo/QZSS
ESD/EMI protection	Realized through internal specific circuits and components (Electrostatic discharge conforms to ±10KV air discharge and ±6KV of contact discharge)
C-V2X	Optional
QDR 3.0 (External IMU required)	Optional
Multi-Frequency GNSS (L1/L5)	Optional
<b>Advanced security features</b>	
TrustZone	TrustZone™/ TPM*: •
Secure boot	Secure Boot*: •
SE-Linux	•
Code/User data backup	•
<b>Software features</b>	
RNDIS driver	Windows 7/8/8.1/10, Linux 2.6-5.12
ECM driver/ GobiNet driver	Linux 2.6-5.12
QMI_WWAN driver	Linux 3.4-5.12
USB serial driver	Windows 7/8/8.1/10, Linux 2.6-5.12
<b>Electrical features</b>	
Supply voltage range	VBAT_BB/VBAT_RF: 3.3 V ~ 4.3 V (typ. 3.8 V) , VBAT_C-V2X: 4.75 V ~ 5.25 V (typ. 5.0 V)
Power consumption	0.021 mA@Power off/ 2.03 mA@LTE sleep, PF=128/1.61 mA @LTE sleep, PF=256; 15.9 mA@Idle, PF=64/27.2 mA@Idle, PF=64, USB Active
Certifications*	CCC/SRRC/NAL/CE/RCM/GCF/PTCRB/FCC/IC/UKCA/IFETEL/KC/NCC/JATE/TELEC/Verizon/AT&T-Mobile/Telus/KT/NTT DOCOMO/Telstra
Recommended applications	Automotive

Note 1: LTE-FDD B29, B30 and B32 support Rx only.  
 Note 2: LTE-FDD B30 is subject to carrier's deployment.  
 Note 3: May depend on modules' variant.

\* Planning/ Under development/ In progress  
 • Supported


# Automotive LTE-A modules

Product		AG519M
		
Form factor	LGA	
Dimensions (mm)	38.0 × 42.0 × 3.05	
4G	LTE Cat 6	
Frequency bands (MHz)	-CN (China/India)	LTE-FDD: B1/3/5/8; LTE-TDD: B34/38/39/40/41; WCDMA: B1/8; GSM: 900/1800MHz
	-EU (EMEA/ Korea/ Australia/Southeast Asia/ Brazil)	LTE-FDD: B1/3/5/7/8/20/28; LTE-TDD: B38/41; WCDMA: B1/5/8; GSM: 900/1800MHz
	-NA (North America/ Mexico/Latin America)	LTE-FDD: B2/4/5/7/12/13/17/28; WCDMA: B2/4/5; GSM: 850/1900MHz
	-JP (Japan)	LTE-FDD: B1/3/5/7/8/9/11/19/21/28; LTE-TDD: B41; WCDMA: B1/3/5/8/9/19
Weight (approx.) g	10	
Operating temperature	-40°C ~ +85°C (eCall: +95°C)	
<b>Data transmission</b>		
LTE FDD data rates (Mbps)	Max. 300 (DL)/ Max. 50 (UL)	
LTE TDD data rates (Mbps)	Max. 240 (DL)/ Max. 30 (UL)	
DC-HSDPA/HSUPA data rates (Mbps)	Max. 42 (DL)/ Max. 5.76 (UL)	
WCDMA data rates (Kbps)	Max. 384 (DL)/ Max. 384 (UL)	
EDGE data rates (Kbps)	Max. 236.8 (DL)/ Max. 236.8 (UL)	
GPRS data rates (Kbps)	Max. 85.6 (DL)/ Max. 85.6 (UL)	
SMS	Point-to-point MO and MT; SMS cell broadcast; Text and PDU mode	
Protocols	TCP/UDP/PPP/PING/FTP(S)/HTTP(S)/SMTP/SSL/TLS/MMS/NTP/DTMF*/FILE	
<b>Interfaces</b>		
(U)SIM	× 2	
UART	× 3	
USB 2.0/3.1	× 1	
PCIe/USB 3.0 (PCIe by default)	× 1	
IIC	× 2	
RGMI	× 1	
SDIO	× 1	
SPI	× 3	
ADC	× 3	
GPIO	× 15	
RESET_N	× 1	
Antenna	Main × 1; Diversity × 1; Wi-Fi/BT × 1; GNSS × 1	
<b>Enhanced features</b>		
QuecOpen® (Open Linux)	•	
eCall	•	
Dual/AB system*	•	
eSIM (eUICC)	•	
(U)SIM detection	•	
Temperature management	•	
GNSS	GPS/ GLONASS/ BeiDou/ Galileo	
ESD/EMI protection	Realized through internal specific circuits and components (Electrostatic discharge conforms to ±12KV air discharge and ±8KV of contact discharge)	
Gigabit ethernet	Optional	
RTK/ADR	Optional	
Multi-Frequency GNSS (L1/L5)	Optional	
UART interface for BT function	Optional	
<b>Advanced security features</b>		
TrustZone/ TPM*	•	
Secure boot	•	
SE-Linux	•	
<b>Software features</b>		
RIL driver	Android 4.x/ 5.x/ 6.x/ 7.x/ 8.x/ 9.x	
GNSS driver	Android 4.x/ 5.x/ 6.x/ 7.x/ 8.x/ 9.x	
RNDIS	Windows 7/8/8.1/10, Linux 2.6-5.0	
ECM	Linux 2.6-5.0	
Gobinet	Linux 2.6-5.0, Android 4.x/ 5.x/ 6.x/ 7.x/ 8.x/ 9.x	
QMI_WWAN driver	Linux 3.4-5.0, Android 4.x/5.x/6.x/7.x/8.x/9.x	
USB serial driver	Windows 7/8/8.1/10, Linux 2.6-5.0, Android 4.x/5.x/6.x/7.x/8.x/9.x	
<b>Electrical features</b>		
Supply voltage range	VBAT_BB/VBAT_RF: 3.8 V ~ 4.3 V (typ. 4.0 V)	
Power consumption	TBD @Power off TBD @Sleep, Typ. TBD @Idle	
Certifications <sup>1</sup>	CCC/SRRC/NAL/CE*/GCF*/PTCRB*/FCC*/IC*/RCM*/KC*/JATE*/TELEC*/AT&T*	
Recommended applications	Automotive	

Note 1: May depend on modules' variant.

\* Planning/ Under development/ In progress  
• Supported



# Automotive LTE modules


Product	AG35
	
Form factor	LGA
Dimensions (mm)	33.0 × 37.5 × 3.0
4G	LTE Cat 4
Frequency bands (MHz)	<ul style="list-style-type: none"> <li>- E (EMEA/Korea/Australia/India/Southeast Asia) LTE-FDD: B1/3/5/7/8/20/28; LTE-TDD: B38/40; WCDMA: B1/5/8; GSM: B3/8</li> <li>- CE (China/India) LTE-FDD: B1/3/5/8; LTE-TDD: B34/38/39/40/41; WCDMA: B1/8; TD-SCDMA: B34/39; CDMA2000 1X/EVDO(Optional); BC0; GSM: B3/8</li> <li>- NA (North America) LTE-FDD: B2/4/5/7/12(B17)/13; WCDMA: B2/4/5; GSM: B2/5</li> <li>- J (Japan) LTE-FDD: B1/3/5/8/9/19/21/28; LTE-TDD: B41; WCDMA: B1/3/5/6/8/19</li> <li>- LA (Latin America) LTE-FDD: B1/2/3/4/5/7/8/28; WCDMA: B1/2/3/4/5/8; GSM: B2/3/5/8</li> </ul>
Weight (approx.) g	8.1
Operating temperature	-35°C ~ +75°C
Extended temperature	-40°C ~ +85°C
<b>Data transmission</b>	
LTE data rates (Mbps)	LTE-FDD: Max. 150 (DL)/ Max. 50 (UL) ; LTE-TDD: Max. 130 (DL)/ Max. 30 (UL)
DC-HSPA+ data rates (Mbps)	Max. 42 (DL)/ Max. 5.76 (UL)
WCDMA data rates (Kbps)	Max. 384 (DL)/ Max. 384 (UL)
TD-SCDMA data rates (Mbps)	Max. 4.2 (DL)/ Max. 2.2 (UL)
EDGE data rates (Kbps)	Max. 296 (DL)/ Max. 236.8 (UL)
GPRS data rates (Kbps)	Max. 107 (DL)/ Max. 85.6 (UL)
SMS	Point-to-point MO/MT, SMS cell broadcast, Text and PDU mode
Protocols	TCP/UDP/PPP/PING/FTP(S)/HTTP(S)/SMTP/SSL/TLS/MMS/NTP/FILE/QMI
<b>Interfaces</b>	
(U)SIM	× 1 (Support 1.8 V/ 3 V USIM/ SIM Cards)
UART	× 3 (for main UART/ BT/ Debug functions)
HSIC	× 1
USB	USB 2.0 × 1 (with high speed up to 480Mbps)
IIC	× 2 (1 for PCM)
SGMII	× 1
SDIO	× 2 for Wi-Fi and eMMC
SPI	SPI > 1 (for QuecOpen® version only)
Audio digital (PCM)	× 1
ADC	× 3, 15bits
GPIO	GPIO > 15 (for QuecOpen® Version only)
Antenna	Main, Rx-diversity and GNSS
<b>Enhanced features</b>	
QuecOpen™ (Open Linux)	•
eCall	•
Era glonass	•
Multi-APN	•
Temperature management	•
DFOTA	Optional
Voice over USB (USB Audio)	•
QDR	Optional
PPE (RTK)	Optional (Support only in China)
GNSS	GPS/GLONASS/Beidou/Galileo/QZSS
<b>Advanced security features</b>	
TrustZone	•
Secure boot	•
Code/User data backup	•
<b>Software features</b>	
RIL driver/ GNSS driver	Android 4.x-9.x
RNDIS driver	Windows 7/8/8.1/10, Linux 2.6-5.4
ECM driver/ Gobinet driver	Linux 2.6-5.4
QMI_WWAN driver	Linux 3.4-5.4
USB serial driver	Windows 7/8/8.1/10, Linux 2.6-5.4, Android 4.x-9.x
<b>Electrical features</b>	
Supply voltage range	3.3 V ~ 4.3 V, typ. 3.8 V
Power consumption	20 µA @Power off/ 1.9 mA @LTE sleep, PF=128/1.6 mA @LTE sleep, PF=256/ 22 mA @Idle, Typ.
Certifications <sup>1</sup>	KT/STK/Verizon/AT&T/T-Mobile/Rogers/NITD DCCOM/LGU+*/GCF/CE/FCC/KC/RCM/CCC/SRRC/NAL/PTORB/IC/UATE/TELEC/Anatel
Recommended applications	Automotive

Note 1: May depend on modules' variant.

\* Planning/ Under development/ In progress  
• Supported





# Automotive C-V2X modules

Product	AG15	AG18
		
Form factor	LGA	LGA
Dimensions (mm)	28.0 × 32.0 × 2.85	28.0 × 32.0 × 2.85
C-V2X TDD	B47 for Global	B47
	B46D for Japan (optional)	B47
Frequency bands (MHz)	-(Global) /	B47
Weight (approx.) g	5.735	TBD
Operating temperature	-35°C ~ +75°C	-35°C ~ +75°C
<b>Data transmission</b>		
LTE data rates (Mbps)	C-V2X TDD: Max. 26 (TX)/Max. 26 (RX)	/
<b>Interfaces</b>		
UART	× 2	×2
USB	USB2.0/3.0×1	×1 (USB 3.0/ 2.0)
PCIe	× 1	×1
SPI	× 1	×1
I2C	× 2	×1
1PPS	× 1	×1
ADC	× 2	×2
GPIO	× 4	×4
Antenna	Main/Rx-diversity/GNSS antenna Interfaces	× 3 (C-V2X (× 2) and GNSS antenna Interfaces)
<b>Enhanced features</b>		
High security	•	*
Secure boot	•	•
SELinux*	•	*
ESD/EMI protection	•	/
QDR (optional)	/	•
PPE(RTK)(optional)	/	*
Temperature management	/	•
DFOTA	/	•
GNSS	•	•
Code/User data back up	/	•
Realized through internal specific circuits and components	•	/
<b>Software features</b>		
USB serial driver	/	•
Windows 7/8/8.1/10, Windows CE 5.0/6.0/7.0*	/	•
Linux 2.6/3.x/4.1~4.14	/	•
PCIe driver	•	TBD
Protocol	QMI (Qualcomm MSM Interface)	/
<b>Electrical features</b>		
Output power	Class 3 (23dBm±2dB) for C-V2X	Class 3 (23dBm±2dB) for C-V2X
Supply voltage	VBAT_BB: 3.3 V ~ 4.3 V, typ. 3.8 V VBAT_RF: 4.75 V ~ 5.25 V, typ. 5.0 V	VBAT_BB: 3.3 V ~ 4.3 V, typ. 3.8 V VBAT_RF: 4.75 V ~ 5.25 V, typ. 5.0 V
Power consumption	80 µA@PowerOff	TBD
Sensitivity	C-V2X TDD B47: -96dBm ; C-V2X TDD B46D: -96dBm	2RX: -97.5dBm SISO: TBD
Certifications	SRRC	SRRC*, CE*
Recommended applications	Automotive	V-BOX, T-BOX

Product	AG215S
	
Form factor	LGA
Dimensions (mm)	AG215S-CN/ -GL: 33.5 × 33.0 × 3.25 ; AG215S-GLR: 33.5 × 35.0 × 3.25
Weight (approx.) g	7.07
Operating temperature	-40°C ~ +85°C
Application processor module	Based on automotive grade application Processor for C-V2X and telematics
<b>Interfaces</b>	
SDIO	•
PCIe	PCIe Gen2*
USB	USB 3.0*1 and USB2.0*1
RGMI	RGMI up to 1 Gbps
UART	•
SPI	•
I2C	•
1PPS (Input)	•
ADC	•
<b>Enhanced features</b>	
Powerful cores	64-bit ARM Cortex-A53 Microprocessor Cores, 1.4 GHz Dual-Core Processor (Quad-Core Processor Optional), Optimized communication performance with Quectel AG520R/AG550Q/AG553Q, Dedicated AP for ITS stack and applications
Embedded ECDSA hardware engine	Supports NIST p-384, NIST p-256, Brainpool p-384, Brainpool p-256, SM2 256 bit Curves
Scalable ECDSA capability	Up to 2500TPS through embedded engine and CPU (based on NIST p-256 and SM2)
Hardware crypto engine embedded (optional)	Secret key generation and storage, digital signature and verification, Up to 2000TPS ECDSA capability (based on NIST p-256 and SM2)







\* Planning/ Under development/ In progress  
• Supported

# Automotive Wi-Fi & Bluetooth modules

	Automotive RF Wi-Fi & Bluetooth modules			
Product	AF20	AF50T	AF51Y	AF55C
				
Frequency bands	2.4 GHz/5 GHz	2.4 GHz/5 GHz	2.4 GHz/5 GHz	2.4 GHz/5 GHz
MIMO	/	2 × 2 + 2 × 2, Dual MAC, support DBS	2 × 2 + 1 × 1, Dual MAC	2 × 2
WLAN standard	IEEE 802.11a/b/g/n/ac	IEEE 802.11a/b/g/n/ac/ax	IEEE 802.11a/b/g/n/ac	IEEE 802.11a/b/g/n/ac/ax
BT standard	BT 5.0	BT 5.2	BT 5.2	BT 5.2
Form factor	LGA	LGA	LGA	LGA
Dimensions (mm)	17.2 × 15.2 × 2.26	19.5 × 21.5 × 2.3	19.5 × 21.5 × 2.5	19.5 × 21.5 × 2.85
Operating temperature	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C
Weight (approx.) g	1.26	2.1	2.32	2.7
<b>General features</b>				
Modulation mode	CCK/BPSK/QPSK/16QAM/64QAM/256QAM	CCK/BPSK/QPSK/16QAM/64QAM/256QAM/1024QAM	CCK/BPSK/QPSK/16QAM/64QAM/256QAM	CCK/BPSK/QPSK/16QAM/64QAM/256QAM/1024QAM
Encryption mode	WEP/TKIP/AES/WPA-PSK/WPA2-PSK	WPA3	WPA3	WPA3
AP (max access point)	16	32	32	16
Operator mode	AP/STA	AP/STA	AP/STA	AP/STA
<b>I/O interfaces</b>				
PCIe	/	× 1 (PCIe 2.0)	× 1 (PCIe 2.0)	PCIe Gen2
SDIO	× 1 (SDIO 3.0)	/	/	× 1 (optional)
UART	× 1	× 1	× 1	× 1
PCM	× 1	× 1	× 1	× 1
Wi-Fi antenna	/	× 1 (ANT_Wi-Fi1)	× 1 (ANT_Wi-Fi1)	× 1 (ANT_Wi-Fi1)
BT antenna	/	× 1 (ANT_BT) (optional)	× 1 (ANT_BT) (optional)	× 1 (ANT_BT) (optional)
Wi-Fi/BT antenna	× 1 (ANT_Wi-Fi1/BT)	× 1 (ANT_Wi-Fi0/BT)	× 1 (ANT_Wi-Fi0/BT)	× 1 (ANT_Wi-Fi0/BT)
<b>Electrical characteristics</b>				
Supply voltage range	Core supply voltage : 3.3 V; I/O supply voltage : 1.8 V	Core supply voltage : 0.95 V, 1.35 V, 1.95 V; I/O supply voltage : 1.8 V; RF supply voltage : 3.85 V	PA supply voltage: 2.2 V; I/O supply voltage: 1.8 V; Core supply voltage: 1.8 V	Core supply voltage: 3.3 V; I/O supply voltage: 1.8 V
<b>Physical rate (max.)</b>				
802.11a	Max. 54 Mbps	Max. 54 Mbps	Max. 54 Mbps	Max. 54 Mbps
802.11b	Max. 11 Mbps	Max. 11 Mbps	Max. 11 Mbps	Max. 11 Mbps
802.11g	Max. 54 Mbps	Max. 54 Mbps	Max. 54 Mbps	Max. 54 Mbps
802.11n	Max. 135 Mbps	Max. 600 Mbps	Max. 300 Mbps	Max. 600 Mbps
802.11ac	Max. 433 Mbps	Max. 866 Mbps	Max. 866 Mbps	Max. 866 Mbps
802.11ax	/	Max. 1774.5 Mbps	/	Max. 1.2 Gbps
BLE	Max. 1 Mbps	Max. 2 Mbps	Max. 2 Mbps	Max. 2 Mbps
Recommended applications	Automotive	Automotive	Automotive	Automotive





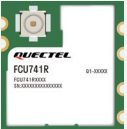

AF20 can work with Quectel AG35 module to provide Wi-Fi/BT function.  
AF50T/AF51Y can work with Quectel AG52xR and AG55xQ module to provide Wi-Fi/BT function.

# Automotive Wi-Fi & Bluetooth modules

Automotive RF Wi-Fi & Bluetooth modules						
Product	AH20C	AF31G	AF66T	AF67E	AF68E	AF61Y
						
Frequency bands	2.4 GHz	2.4 GHz/5 GHz	2.4 GHz/5 GHz	2.4 GHz/5 GHz	2.4 GHz/5 GHz/6 GHz	2.4 GHz/5 GHz
MIMO	/	2 × 2 MIMO	2 × 2 + 2 × 2, Dual MAC, support BDS	2 × 2 MIMO, dual MAC	2 × 2 + 2 × 2, Dual MAC, support BDS	2 × 2 + 1 × 1, Dual MAC
WLAN standard	/	IEEE 802.11 a/b/g/n/ac	IEEE 802.11 a/b/g/n/ac/ax	IEEE 802.11a/b/g/n/ac/ax	IEEE 802.11a/b/g/n/ac/ax	IEEE 802.11a/b/g/n/ac
BT standard	BT 5.2	BT 5.0	BT 5.2	BT 5.3	BT 5.3	BT 5.2
Form factor	LGA	LGA	LGA	LGA	LGA	LGA
Dimensions (mm)	13.0 × 13.0 × 2.45	23.0 × 23.0 × 3.0	23.0 × 23.0 × 3.0	23.0 × 23.0 × 3.0	23.0 × 23.0 × 3.0	23.0 × 23.0 × 3.0
Operating temperature	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C
Weight (approx.) g	0.71	3.11	3.36	TBD	TBD	3.58
<b>General features</b>						
Modulation mode	GFSK/π/4-DQPSK/8-DPSK/Gaussian	CCK/DSSS/OFDM/BPSK/QPSK/QAM	Wi-Fi: DSSS/CCK/OFDM/OFDMA/BPSK/QPSK/QAM, BT: GFSK/π/4 DQPSK/8DPSK	BPSK/QPSK/CCK/16QAM/64QAM/256QAM/1024QAM	CCK/BPSK/QPSK/16QAM/64QAM/256QAM/1024QAM/4096QAM	CCK/BPSK/QPSK/16QAM/64QAM/256QAM
Encryption mode	/	WPA 3	WPA 3	WPA3	WPA 3	WPA 3
AP (max access point)	/	10	32	32	32	32
Operator mode	/	AP/STA	AP/STA	AP/STA	AP/STA	AP/STA
<b>I/O interfaces</b>						
PCIe	/	× 1	× 1	× 1 (PCIe 2.0)	PCIe Gen3	× 1 (PCIe 2.0)
SDIO	/	/	/	/	/	/
UART	× 1	× 1	× 1	× 1	× 1	× 1
PCM	× 1	× 1	× 1	× 1	× 1	× 1
Wi-Fi antenna	/	× 1 (ANT_Wi-Fi1)	× 1 (ANT_Wi-Fi1)	× 1 (ANT_Wi-Fi1)	× 1 (ANT_Wi-Fi1)	× 1 (ANT_Wi-Fi1)
BT antenna	× 1 (ANT_BT)	/	× 1 (ANT_BT) (optional)	× 1 (ANT_BT) (optional)	× 1 (ANT_BT) (optional)	× 1 (ANT_BT) (optional)
Wi-Fi/BT antenna	/	× 1 (ANT_Wi-Fi0/BT)	× 1 (ANT_Wi-Fi0/BT)	× 1 (ANT_Wi-Fi0/BT)	× 1 (ANT_Wi-Fi0/BT)	× 1 (ANT_Wi-Fi0/BT)
<b>Electrical characteristics</b>						
Supply voltage range	Core supply voltage: 3.3 V; I/O supply voltage: 1.8 V	VDD_RF: 3.14 V ~ 3.46 V, typ. 3.3 V; VDD_IO: 1.71 V ~ 1.89 V, typ. 1.8 V	VDD_RF: 3.3 V ~ 4.25 V, typ. 3.85 V; VDD_CORE: 1.90 V, 1.35 V, 0.95 V; VDD_IO: 1.71 V ~ 1.89 V, typ. 1.8 V	VDD_PA_A: 3.14 V ~ 4.25 V, typ. 3.3 V VDD_PA_B: 1.71 V ~ 2.1 V, typ. 1.8 V VDD_CORE: 1.90 V, 1.35 V, 0.95 V VDD_IO: 1.71 V ~ 1.89 V, typ. 1.8 V	VDD_PA_A: 3.8 V; VDD_PA_B: 1.8 V; VDD_CORE: 1.90 V, 1.35 V, 0.95 V	PA supply voltage: 2.2V; I/O supply voltage: 1.8 V; Core supply voltage: 1.8 V
<b>Physical rate (max.)</b>						
802.11a	/	Max. 54 Mbps	Max. 54 Mbps	Max. 54 Mbps	Max. 54 Mbps	Max. 54 Mbps
802.11b	/	Max. 11 Mbps	Max. 11 Mbps	Max. 11 Mbps	Max. 11 Mbps	Max. 11 Mbps
802.11g	/	Max. 54 Mbps	Max. 54 Mbps	Max. 54 Mbps	Max. 54 Mbps	Max. 54 Mbps
802.11n	/	Max. 300 Mbps	Max. 300 Mbps	Max. 300 Mbps	Max. 600 Mbps	Max. 600 Mbps
802.11ac	/	Max. 866 Mbps	Max. 866 Mbps	Max. 866 Mbps	Max. 866 Mbps	Max. 866 Mbps
802.11ax	/	/	2G Max. 573.5 Mbps, 5G Max. 1200 Mbps	Max. 1440 Mbps	Max. 3.6 Gbps	/
BLE	Max. 1Mbps	Max. 1Mbps	Max. 2 Mbps	Max. 2 Mbps	Max. 2 Mbps	Max. 2 Mbps
Recommended applications	Automotive	Automotive	Automotive	Automotive	Automotive	Automotive












# RF Wi-Fi & Bluetooth modules

	Wi-Fi 4					
Product	FC30R	FC909A	FCS940R	FCS945R	FCU741R	FCU743R
						
Frequency bands	2.4 GHz	2.4 GHz	2.4 GHz	2.4 GHz/5 GHz	2.4 GHz/5 GHz	2.4 GHz/5 GHz
MIMO	1 × 1	1 × 1	1 × 1	1 × 1	1 × 1	1 × 1
WLAN standard	IEEE 802.11b/g/n	IEEE 802.11b/g/n	IEEE 802.11b/g/n	IEEE 802.11a/b/g/n	IEEE 802.11a/b/g/n	IEEE 802.11a/b/g/n
BT standard	/	BT 5.2	BT 5.0	BT 5.2	/	BT 5.2
Form factor	LCC	LCC	LCC	LCC	LCC	LCC
Dimensions (mm)	12.0 × 12.0 × 2.1	12.0 × 12.0 × 1.95	12.0 × 12.0 × 2.0	12.0 × 12.0 × 2.15	13.0 × 12.2 × 2.25	13.0 × 12.2 × 2.0
Operating temperature	-40°C ~ +85°C	-30°C ~ +85°C	0°C ~ +70°C or -20°C ~ +80°C	-20°C ~ +70°C (-40°C ~ +85°C Optional)	-20°C ~ +70°C	-20°C ~ +70°C
Weight (approx.) g	0.58	0.6	0.53	0.62	0.68	0.56
<b>General features</b>						
Modulation mode	BPSK/QPSK/CCK/16QAM/64QAM	DSSS/OFDM/DBPSK/DQPSK/CCK/BPSK/QPSK/16QAM/64QAM	OFDM/CCK/BPSK/QPSK/16QAM/64QAM	CCK/BPSK/QPSK/DQPSK/16QAM/64QAM	CCK/DBPSK/DQPSK/BPSK/QPSK/16QAM/64QAM	CCK/DBPSK/DQPSK/BPSK/QPSK/16QAM/64QAM
Encryption mode	WPA3	WPA3	WPA3	WPA3	WPA3	WPA3
<b>I/O interfaces</b>						
PCIe	/	/	/	/	/	/
SDIO	× 1 (SDIO 3.0)	× 1 (SDIO 2.0)	× 1 (SDIO 2.0)	× 1 (SDIO 2.0)	/	/
USB	/	/	/	/	× 1	× 1 (USB2.0)
SPI	/	/	/	/	/	/
UART	/	× 1	× 1	× 1	/	/
PCM	/	× 1	× 1	× 1	/	/
Wi-Fi antenna	× 1 (ANT_Wi-Fi1)	/	/	/	× 1 (ANT_Wi-Fi1)	/
BT antenna	/	/	/	× 1 (ANT_BT) (optional)	/	/
Wi-Fi/BT antenna	/	× 1 (ANT_Wi-Fi0/BT)	× 1 (ANT_Wi-Fi0/BT)	× 1 (ANT_Wi-Fi/BT)	/	× 1 (ANT_Wi-Fi0/BT)
<b>Electrical characteristics</b>						
Supply voltage range	VBAT: 3.0 V ~ 3.6 V, typ. 3.3 V; VDDIO: 1.75 V ~ 1.89 V, typ. 1.8 V	VBAT: 3.0 V ~ 4.8 V, typ. 3.3 V; VDDIO: 1.71 V ~ 3.63 V, typ. 1.8/3.3 V	VBAT: 3.0 V ~ 3.6 V, typ. 3.3 V; VDDIO: 1.62 V ~ 3.6 V, typ. 1.8/3.3 V	VBAT: 3.0 V ~ 3.6 V, typ. 3.3 V; VDD_IO: 1.62 V ~ 1.98 V, typ. 1.8 V, 3.0 V ~ 3.6 V, typ. 3.3 V	VBAT: 3.0 V ~ 3.6 V, typ. 3.3 V	VBAT: 3.0 V ~ 3.6 V, typ. 3.3 V
Power consumption	OFF State: 31 µA @ VDD3V3 power supply 1 µA @ VDD_SDIO power supply Idle (no connection): 60 mA @ VDD3V3 power supply 2 mA @ VDD_SDIO power supply	Max. current at Tx mode: 300 mA @ VBAT 0.7 mA @ VIO	Max. current at Tx mode: 364.6 mA @ VBAT 26.6 mA @ VDDIO	Max. current at Tx mode: 335 mA @ VBAT 0.3 mA @ VDD_IO	Max. current at Tx mode: 400 mA @ VBAT	Max. current consumption at 802.11b/g/a/n mode: 410.2 mA @ 3.3 V
<b>Physical rate (max.)</b>						
802.11a	/	/	/	Max. 54 Mbps	Max. 54 Mbps	Max. 54 Mbps
802.11b	Max. 11 Mbps	Max. 11 Mbps	Max. 11 Mbps	Max. 11 Mbps	Max. 11 Mbps	Max. 11 Mbps
802.11g	Max. 54 Mbps	Max. 54 Mbps	Max. 54 Mbps	Max. 54 Mbps	Max. 54 Mbps	Max. 54 Mbps
802.11n	Max. 150 Mbps	Max. 72 Mbps	Max. 150 Mbps	Max. 150 Mbps	Max. 150 Mbps	Max. 150 Mbps
802.11ac	/	/	/	/	/	/
802.11ax	/	/	/	/	/	/
Certifications	SRRG/CE/FCC/IC/RCM/KC*/JATE/TELEC	SRRG/CE/FCC/IC	SRRG/CE/FCC/IC/RCM/KC*/JATE*/TELEC*	SRRG/CE/FCC/IC/RCM/KC*/JATE*/TELEC*	SRRG/CE/FCC/IC/RCM/KC*/JATE/TELEC	SRRG/CE/FCC/IC/RCM/KC*/JATE*/TELEC*
Recommended applications	Telematics, smart metering, mobile POS terminals, gateways, safety, tracking and tracing, remote maintenance and control, networking, mobile computing, healthcare, etc.	OTT, smart speakers, projectors, POS, IPC	IPC, printers, POS, speakers, display etc.	Printers, POS, attendance machines, vacuum cleaners, smart speakers, digital signage, set-top boxes/IPTV, smart home control screens etc.	Printers, POS, attendance machines, vacuum cleaners, smart speakers, digital signage, set-top boxes/IPTV, smart home control screens etc.	Video transmission, printers, POS, attendance machines, vacuum cleaners, smart speakers, digital signage, set-top boxes/IPTV, smart home control screens, etc.

FC30R can work with Quectel EC20-CE/EC21/EC25/EC200A module to provide Wi-Fi/BT function.

\* Planning/ Under development/ In progress









# RF Wi-Fi & Bluetooth modules

	Wi-Fi 5								
Product	FC20	FC21	FC900E	FC905A	FC950R	FC906A	FC80A	FCS850R	FCS850R-B
									
Frequency bands	2.4 GHz/5 GHz	2.4 GHz/5 GHz	2.4 GHz/5 GHz	2.4 GHz/5 GHz	2.4 GHz/5 GHz	2.4 GHz/5 GHz	2.4 GHz+5 GHz	2.4 GHz/5 GHz	2.4 GHz/5 GHz
MIMO	1 × 1	1 × 1	1 × 1	1 × 1	1 × 1	1 × 1	2 × 2 or 1 × 1 + 1 × 1 in RSDB (Real Simultaneous Dual Band) mode	2 × 2	2 × 2
WLAN standard	IEEE 802.11a/b/g/n/ac	IEEE 802.11a/b/g/n/ac	IEEE 802.11a/b/g/n/ac	IEEE 802.11a/b/g/n/ac	IEEE 802.11a/b/g/n/ac	IEEE 802.11a/b/g/n/ac	IEEE 802.11a/b/g/n/ac	IEEE 802.11a/b/g/n/ac	IEEE 802.11a/b/g/n/ac
BT standard	BT 5.0	BT 5.0	BT 5.0	BT 5.0	BT 4.2	BT 5.4	BT 5.1	BT 5.0	BT 5.0
Form factor	LCC	LCC	LCC	LCC	LCC	LCC	LCC	LCC	LCC
Dimensions (mm)	16.6 × 13.0 × 2.05	16.6 × 13.0 × 2.05	12.0 × 12.0 × 2.05	12.0 × 12.0 × 1.55	12.0 × 12.0 × 2.35	12.0 × 12.0 × 1.55	15.0 × 13.0 × 2.2	15.0 × 13.0 × 2.3	15.0 × 13.0 × 2.3
Operating temperature	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	-30°C ~ +85°C	-20°C ~ +70°C (-40°C ~ +85°C Optional)	-20°C ~ +70°C	-40°C ~ +85°C	-20°C ~ +70°C	-20°C ~ +70°C
Weight (approx.) g	0.81	0.73	0.53	0.6	0.58	0.5	0.86	0.79	0.79
<b>General features</b>									
Modulation mode	DSSS/CCK/BPSK/QPSK/DBPSK/DQPSK/16QAM/64QAM/256QAM	DSSS/CCK/BPSK/QPSK/DBPSK/DQPSK/16QAM/64QAM/256QAM	BPSK/QPSK/CCK/16QAM/64QAM/256QAM	DSSS/CCK/BPSK/QPSK/DBPSK/DQPSK/16QAM/64QAM/256QAM	DBPSK/DQPSK/CCK/BPSK/QPSK/16QAM/64QAM/256QAM	DSSS/CCK/BPSK/QPSK/16QAM/64QAM/256QAM	BPSK/QPSK/CCK/16QAM/64QAM/256QAM	DBPSK/DQPSK/BPSK/QPSK/CCK/16QAM/64QAM/256QAM	DBPSK/DQPSK/BPSK/QPSK/CCK/16QAM/64QAM/256QAM
Encryption mode	WPA3	WPA3	WEP/TKIP/AES/WPA-PSK/WPA2-PSK	WPA3	WPA3	WPA3	WPA3	WPA3	WPA3
<b>I/O interfaces</b>									
PCIe	/	/	/	/	/	/	/	/	/
SDIO	× 1 (SDIO 3.0)	× 1 (SDIO 3.0)	× 1 (SDIO 3.0)	× 1 (SDIO 3.0)	× 1 (SDIO 3.0)	× 1 (SDIO 3.0) (optional)	× 1 (SDIO 3.0)	× 1 (SDIO 3.0)	× 1 (SDIO 3.0)
USB	/	/	/	/	/	× 1 (USB2.0) (optional)	/	/	/
SPI	/	/	/	/	/	/	/	/	/
UART	× 1	× 1	× 1	× 1	× 1	× 1 (optional)	× 1	× 1	× 1
PCM	× 1	× 1	× 1	× 1	× 1	× 1	× 1	× 1	× 1
Wi-Fi antenna	/	/	/	/	/	/	× 1 (ANT_Wi-Fi1) × 1 (ANT_Wi-Fi0)	× 1 (ANT_Wi-Fi1)	× 1 (ANT_Wi-Fi1) × 1 (ANT_Wi-Fi0)
BT antenna	/	/	/	/	/	/	/	/	× 1 (ANT_BT)
Wi-Fi/BT antenna	× 1 (ANT_Wi-Fi0/BT)	× 1 (ANT_Wi-Fi0/BT)	× 1 (ANT_Wi-Fi0/BT)	× 1 (ANT_Wi-Fi0/BT)	× 1 (ANT_Wi-Fi0/BT)	× 1 (ANT_Wi-Fi0/BT)	× 1 (ANT_Wi-Fi0/BT)	× 1 (ANT_Wi-Fi0/BT)	/
<b>Electrical characteristics</b>									
Supply voltage range	VBAT: 3.14 V ~ 3.46 V, typ. 3.3 V; VDDIO: 1.71 V ~ 3.46 V, typ. 1.8 V/3.3 V	VBAT: 3.14 V ~ 3.46 V, typ. 3.3 V; VDDIO: 1.71 V ~ 3.46 V, typ. 1.8 V/3.3 V	VBAT: 3.14 V ~ 3.46 V, typ. 3.3 V; VDDIO: 1.71 V ~ 3.46 V, typ. 1.8 V/3.3 V	VBAT: 3.13 V ~ 4.8 V, typ. 3.6 V; VDDIO: 1.71 V ~ 3.63 V, typ. 1.8 V/3.3 V	VBAT: 3.0 V ~ 3.6 V, typ. 3.3 V; VDDIO: 1.62 V ~ 3.6 V, typ. 1.8 V/3.3 V	VBAT: 3.2 V ~ 4.8 V, typ. 3.6 V; VDDIO: 1.62 V ~ 3.63 V, typ. 1.8 V/3.3 V	VBAT: 3.2 V ~ 4.5 V, typ. 3.3 V; VDDIO: 1.7 V ~ 3.6 V, typ. 1.8 V/3.3 V	VBAT: 3.1 V ~ 3.6 V, typ. 3.3 V; VDDIO: 1.7 V ~ 3.6 V, typ. 1.8 V/3.3 V	VBAT: 3.1 V ~ 3.6 V, typ. 3.3 V; VDDIO: 1.7 V ~ 3.6 V, typ. 1.8 V/3.3 V
Power consumption	OFF State (Wi-Fi is disabled): 2 µA @ 3.3 V WLAN power supply 554 µA @ 1.8 V I/O Pins power supply Idle (Wi-Fi is enabled without any device connected): 66 mA @ 3.3 V WLAN power supply 6.5 mA @ 1.8 V I/O Pins power supply	OFF State (Wi-Fi is disabled): 0 µA @ 3.3 V WLAN power supply 179 µA @ 1.8 V I/O Pins power supply Idle (Wi-Fi is enabled without any device connected): 31 mA @ 3.3 V WLAN power supply 2.8 mA @ 1.8 V I/O Pins power supply	Max. current at Tx mode: 404.7 mA @ VBAT 6.61 mA @ VIO	Max. current at Tx mode: 380 mA @ VBAT 0.7 mA @ VIO	Max. current at 802.11n/ac MIMO Tx mode: 375 mA @ 3.3 V 0.85 mA @ 1.8 V	Max. current at Tx mode: 315 mA @ VBAT 0.18 mA @ VIO	Max. current at Tx mode: 627 mA @ VBAT 0.7 mA @ VIO	Max. current at 802.11n/ac MIMO Tx mode: 389.83 mA @ 3.3 V 16.26 µA @ 1.8 V	Max. current at 802.11n/ac MIMO Tx mode: 389.83 mA @ 3.3 V 16.26 µA @ 1.8 V
<b>Physical rate (max.)</b>									
802.11a	Max. 54 Mbps	Max. 54 Mbps	Max. 54 Mbps	Max. 54 Mbps	Max. 54 Mbps	Max. 54 Mbps	Max. 54 Mbps	Max. 54 Mbps	Max. 54 Mbps
802.11b	Max. 11 Mbps	Max. 11 Mbps	Max. 11 Mbps	Max. 11 Mbps	Max. 11 Mbps	Max. 11 Mbps	Max. 11 Mbps	Max. 11 Mbps	Max. 11 Mbps
802.11g	Max. 54 Mbps	Max. 54 Mbps	Max. 54 Mbps	Max. 54 Mbps	Max. 54 Mbps	Max. 54 Mbps	Max. 54 Mbps	Max. 54 Mbps	Max. 54 Mbps
802.11n	Max. 150 Mbps	Max. 150 Mbps	Max. 150 Mbps	Max. 150 Mbps	Max. 150 Mbps	Max. 150 Mbps	Max. 300 Mbps	Max. 300 Mbps	Max. 300 Mbps
802.11ac	Max. 433 Mbps	Max. 433 Mbps	Max. 433 Mbps	Max. 433.3 Mbps	Max. 433.3 Mbps	Max. 433.3 Mbps	Max. 866 Mbps	Max. 866.7 Mbps	Max. 866.7 Mbps
802.11ax	/	/	/	/	/	/	/	/	/
Certifications	SRRC/CE/FCC/IC/Anatel/RCM/KC/JATE/TELEC	SRRC/CE/FCC/IC/RCM/JATE/TELEC	SRRC/CE/FCC/IC/RCM/UKCA	SRRC/CE/FCC/IC/JATE/TELEC	SRRC/CE/FCC/IC/RCM/KC*/JATE*/TELEC*	SRRC/CE/FCC/IC/RCM	SRRC/CE/FCC/IC/KC/JATE/TELEC	SRRC/CE/FCC/IC/RCM/KC*/TELEC*/JATE*	SRRC/CE/FCC/IC/RCM/KC*/TELEC*/JATE*
Recommended applications	Telematics, smart metering, mobile POS terminals, gateways, safety, tracking and tracing, remote maintenance and control, networking, mobile computing, healthcare, etc.		For industrial and commercial applications different needs, such as smart speakers, set-top boxes, POS machines etc.	Various commercial/ industrial applications e.g. POS machines and speaker boxes	POS, hoovers, printers etc.	Smart Home, industrial applications	Smart homes, industrial controls	Set-top boxes, smart speakers, digital signage, VR/AR, smart gateways, conference terminals, intelligent projectors, cloud computing etc.	

Note 1: Both SDIO and USB interfaces are optional and cannot be used simultaneously. Customers can choose according to actual needs and keep them unconnected if not used. When the USB interface is selected as the Bluetooth application interface, the UART and PCM interfaces also need to be unconnected. FC20 can work with Quectel EC20 R2.0/EC20-CE/EC21/EC25 modules to provide Wi-Fi/BT function. FC21 can work with Quectel EC20 R2.0/EC20-CE/EC21/EC25 modules to provide Wi-Fi/BT function.





\* Planning/ Under development/ In progress

# RF Wi-Fi & Bluetooth modules

	Wi-Fi 6							
Product	FC62E*/FC64E	FC06E	FCE863R	FCS866R	FGS060N	FGS061N	FCU865R	FCS962N-LP
								
Frequency bands	2.4 GHz/5 GHz (FC62E*); 2.4 GHz + 5 GHz (FC64E)	2.4 GHz + 5 GHz	2.4 GHz/5 GHz	2.4 GHz/5 GHz	2.4 GHz/5 GHz	2.4 GHz/5 GHz	2.4 GHz/5 GHz	2.4 GHz/5 GHz
MIMO	2 × 2 (FC64E support DBS, FC62E* not support DBS)	2 × 2 + 2 × 2	2 × 2	2 × 2	/	/	/	1 × 1
WLAN standard	IEEE 802.11a/b/g/n/ac/ax	IEEE 802.11a/b/g/n/ac/ax	IEEE 802.11a/b/g/n/ac/ax	IEEE 802.11a/b/g/n/ac/ax	IEEE 802.11a/b/g/n/ac/ax	IEEE 802.11a/b/g/n/ac/ax	IEEE 802.11a/b/g/n/ac/ax	IEEE 802.11a/b/g/n/ac/ax
BT standard	BT 5.2	BT 5.2	BT 5.2	BT 5.2	BT 5.2	BT 5.2	BT 5.3	BT 5.4
Form factor	LCC	LCC	LCC	LCC	LGA	LGA	LCC	LCC
Dimensions (mm)	18.0 × 19.9 × 2.1	25.5 × 22.0 × 2.25	15.0 × 13.0 × 2.2	15.0 × 13.0 × 2.0	14.0 × 13.0 × 2.0	14.0 × 13.0 × 2.0	15.0 × 13.0 × 2.0	12.0 × 12.0 × 1.55
Operating temperature	-30°C ~ +75°C	-30°C ~ +75°C	-20°C ~ +70°C (-40°C ~ +85°C Optional)	-20°C ~ +70°C	-40°C ~ +85°C	-40°C ~ +85°C	-20°C ~ +70°C	-40°C ~ +85°C
Weight (approx.) g	1.63	2.27	0.93	0.79	0.7	0.7	0.82	0.49
<b>General features</b>								
Modulation mode	DBPSK/DQPSK/CCK/BPSK/QPSK/QAM	DBPSK/DQPSK/CCK/BPSK/QPSK/QAM	DBPSK/DQPSK/CCK/BPSK/QPSK/16QAM/64QAM/256QAM/1024QAM/OFDMA/MU-MIMO	DBPSK/DQPSK/CCK/BPSK/QPSK/16QAM/64QAM/256QAM/1024QAM/OFDMA/MU-MIMO	DSSS/OFDM/DBPSK/DQPSK/CCK/BPSK/QPSK/16QAM/64QAM/256QAM/1024QAM	DSSS/OFDM/DBPSK/DQPSK/CCK/BPSK/QPSK/16QAM/64QAM/256QAM/1024QAM	DBPSK/DQPSK/CCK/BPSK/QPSK/16QAM/64QAM/256QAM/1024QAM/OFDMA	DSSS/CCK/BPSK/QPSK/DBPSK/DQPSK/16QAM/64QAM/256QAM/1024QAM
Encryption mode	WPA3	WPA3	WPA3	WPA3	WPA2/WPA3	WPA2/WPA3	WPA3	WPA3
<b>I/O interfaces</b>								
PCIe	× 1 (PCIe 3.0)	× 1 (PCIe 3.0)	× 1 (PCIe 1.1)	/	/	/	/	/
SDIO	/	/	/	× 1 (SDIO 3.0)	× 1 (SDIO 3.0)	× 1 (SDIO 3.0)	/	SDIO 3.0
USB	/	/	/	/	/	/	USB 2.0	/
SPI	/	/	/	/	× 1	/	/	/
UART	× 1	× 1	× 1	× 1	× 1	× 1	/	× 1
PCM	× 1	× 1	× 1	× 1	/	/	/	× 1
Wi-Fi antenna	× 1 (ANT_Wi-Fi1)	× 1 (ANT_Wi-Fi1) × 1 (ANT_Wi-Fi0)	× 1 (ANT_Wi-Fi0)	× 1 (ANT_Wi-Fi0)	/	/	/	/
BT antenna	/	× 1 (ANT_BT)	× 1 (ANT_BT) (Optional)	× 1 (ANT_BT) (Optional)	/	/	/	/
Wi-Fi/BT antenna	× 1 (ANT_Wi-Fi0/BT)	/	× 1 (ANT_Wi-Fi1/BT) (Optional)	× 1 (ANT_Wi-Fi1/BT) (Optional)	/	× 1 (ANT_Wi-Fi/BT)	× 1 (ANT_Wi-Fi0/BT)	× 1 (ANT_Wi-Fi0/BT)
Wi-Fi/BT/Thread antenna	/	/	/	/	× 1 (ANT_Wi-Fi/BT/Thread)	/	/	/
<b>Electrical characteristics</b>								
Supply voltage range	Core Supply Voltage: 0.95, 1.35, 1.95, 1.8, 2.2, 3.3 (Optional); I/O Supply Voltage: 1.8 V;	VDD_CORE_VL: 0.95 V; VDD_CORE_VM: 1.35 V; VDD_CORE_VH: 1.95 V; VDD_FEM: 5 V/ 3.3 V	VBAT: 3.1V ~ 3.6 V, typ. 3.3 V VDD_IO: 1.7 V ~ 3.6 V, typ. 1.8/3.3 V	VBAT: 3.0 V ~ 3.6 V, typ. 3.3 V VDDIO: 1.62 V ~ 3.6 V, typ. 1.8/3.3 V	VBAT_3V3: 3.14 V ~ 3.46 V, typ. 3.3 V; VBAT_1V8: 1.71 V ~ 1.89 V, typ. 1.8 V	VBAT_3V3: 3.14 V ~ 3.46 V, typ. 3.3 V; VBAT_1V8: 1.71 V ~ 1.89 V, typ. 1.8 V	VBAT: 3.0~3.6 V, typ. 3.3 V	VBAT: 3.2 V ~ 4.8 V, typ. 3.3 V VDD_IO: 1.62 V ~ 1.98 V, typ. 1.8 V
Power consumption	TBD	Max. current at non-signaling mode (DBS): 490 mA @ 0.95 V 320 mA @ 1.35 V 8 mA @ 1.8 V 151 mA @ 1.95 V 1350 mA @ 5 V	Max. current at 802.11n/ac/ax MIMO Tx mode: 406.92 mA @ 3.3 V 393.82 μA @ 1.8 V	Max. current at 802.11n/ac/ax MIMO Tx mode: 292.29 mA @ 3.3 V 62.74 μA @ 1.8 V	Max. current at Tx mode: 368 mA @ VBAT_3V3 300 mA @ VBAT_1V8	Max. current at Tx mode: 300 mA @ VBAT_3V3 400 mA @ VBAT_1V8	Max. current at 802.11a non-signaling Tx mode: 406.98 mA	Maximum current consumption in transmit mode: 350mA @VBAT 5mA @VDDIO
<b>Physical rate (max.)</b>								
802.11a	Max. 54 Mbps	Max. 54 Mbps	Max. 54 Mbps	Max. 54 Mbps	Max. 54 Mbps	Max. 54 Mbps	Max. 54 Mbps	Max. 54 Mbps
802.11b	Max. 11 Mbps	Max. 11 Mbps	Max. 11 Mbps	Max. 11 Mbps	Max. 11 Mbps	Max. 11 Mbps	Max. 11 Mbps	Max. 11 Mbps
802.11g	Max. 54 Mbps	Max. 54 Mbps	Max. 54 Mbps	Max. 54 Mbps	Max. 54 Mbps	Max. 54 Mbps	Max. 54 Mbps	Max. 54 Mbps
802.11n	Max. 600 Mbps	Max. 300 Mbps	Max. 300 Mbps	Max. 300 Mbps	Max. 150 Mbps	Max. 150 Mbps	Max. 150 Mbps	Max. 72.2 Mbps
802.11ac	Max. 866 Mbps	Max. 866 Mbps	Max. 867 Mbps	Max. 867 Mbps	Max. 433.3 Mbps	Max. 433.3 Mbps	Max. 433 Mbps	Max. 86.7 Mbps
802.11ax	Max. 1200 Mbps (FC62E*); Max. 1774.5 Mbps (FC64E)	Max. 1774.5 Mbps	Max. 1201Mbps	Max. 1201Mbps	Max. 600.4 Mbps	Max. 600.4 Mbps	Max. 600 Mbps	Max. 143.4 Mbps
802.11be	/	/	/	/	/	/	/	/
Certifications	FC62E*: SRRC*/CE*/FCC*/IC*/RCM*/KC*; FC64E: SRRC*/CE*/FCC*/IC*/RCM*/KC*/JATE/TELEC	SRRC*/CE*/FCC*/IC*/RCM*/KC*/JATE/TELEC	SRRC*/CE*/FCC*/IC*/RCM*/KC*/JATE*/TELEC	SRRC*/CE*/FCC*/IC*/RCM*/KC*/JATE*/TELEC*	CE/FCC*/IC*/RCM	CE/FCC*/IC*/RCM/SRRC	SRRC*/CE*/RCM*/FCC*/IC*/JATE*/TELEC*/KC*	SRRC*/CE*/FCC*/IC*/RCM*
Recommended applications	CPE, OTT, smart TVs	CPE, MiFi, OTT	Set-top boxes, smart speakers, digital signage, VR/AR, smart gateways, conference terminals, intelligent projectors, cloud computing etc		Smart home and industrial applications	Smart home and industrial applications	IPTV, NVR, projectors, traffic recorder	Network cameras, video doorbells, smart homes, smart glasses, smart door locks, smart speakers, smart lighting, and household appliances, etc.








\* Planning/ Under development/ In progress

# RF Wi-Fi & Bluetooth modules


	Wi-Fi 6E		Wi-Fi 7	
Product	FC65E*/FC66E	FC66E-B	FGE573Q	FGE576Q
				
Frequency bands	2.4 GHz/5 GHz/6 GHz (FC65E*) ; 2.4 GHz + 5 GHz/6GHz (FC66E)	2.4 GHz + 5 GHz/6GHz (FC66E-B)	2.4 GHz/5 GHz/6 GHz	2.4 GHz/5 GHz/6 GHz
MIMO	2 × 2 (FC66E support DBS, FC65E* not support DBS)	2 × 2 (FC66E-B support DBS)	2 × 2	2 × 2 (support DBS)
WLAN standard	IEEE 802.11a/b/g/n/ac/ax	IEEE 802.11a/b/g/n/ac/ax	IEEE 802.11a/b/g/n/ac/ax/be	IEEE 802.11a/b/g/n/ac/ax/be
BT standard	BT 5.2	BT 5.2	BT 5.3	BT 5.3
Form factor	LCC	LCC	LGA	LGA
Dimensions (mm)	18.0 × 19.9 × 2.1	18.0 × 19.9 × 2.1	16.0 × 20.0 × 1.8	16.0 × 20.0 × 1.8
Operating temperature	-30°C ~ +75°C	-30°C ~ +75°C	-20°C ~ +70°C	-20°C ~ +70°C
Weight (approx.) g	1.63	1.6	TBD	1.25
<b>General features</b>				
Modulation mode	DBPSK/DQPSK/CCK/BPSK/QPSK/QAM	DBPSK/DQPSK/CCK/BPSK/QPSK/QAM	DBPSK/DQPSK/CCK/BPSK/QPSK/QAM	DBPSK/DQPSK/CCK/BPSK/QPSK/QAM
Encryption mode	WPA3	WPA3	WPA3	WPA3
<b>I/O interfaces</b>				
PCIe	× 1 (PCIe 3.0)	× 1 (PCIe 3.0)	× 1 (for Wi-Fi)	× 1 (for Wi-Fi)
SDIO	/	/	/	/
USB	/	/	/	× 1 (for Bluetooth)
SPI	/	/	/	/
UART	× 1	× 1	× 1 (for Bluetooth)	× 1 (for Bluetooth)
PCM	× 1	× 1	× 1 (for Bluetooth)	× 1 (for Bluetooth)
Wi-Fi antenna	× 1 (ANT_Wi-Fi1)	× 1 (ANT_Wi-Fi1) × 1 (ANT_Wi-Fi0)	/	/
BT antenna	/	× 1 (ANT_BT)	/	/
Wi-Fi/BT antenna	× 1 (ANT_Wi-Fi0/BT)	/	× 1 (ANT_Wi-Fi1/BT) × 1 (ANT_Wi-Fi0/BT)	× 1 (ANT_Wi-Fi1/BT) × 1 (ANT_Wi-Fi0/BT)
Wi-Fi/BT/Thread antenna	/	/	/	/
<b>Electrical characteristics</b>				
Supply voltage range	Core Supply Voltage: 0.95, 1.35, 1.95, 1.8, 2.2, 3.3(Optional); I/O Supply Voltage: 1.8 V;	VDD_CORE_VL: 1.0 V; VDD_CORE_VM: 1.8 V; VDD_CORE_VH: 2.0 V; VDD_RF: 2.0 V; I/O Supply Voltage: 1.8V	VBAT: 3.0 V ~ 3.6 V, typ. 3.3 V	VBAT: 3.0 V ~ 3.6 V, typ. 3.3 V
Power consumption	TBD	TBD	Max. current at Tx mode: TBD @ VBAT	Max. current at Tx mode: TBD @ VBAT
<b>Physical rate (max.)</b>				
802.11a	Max. 54 Mbps	Max. 54 Mbps	Max. 54 Mbps	Max. 54 Mbps
802.11b	Max. 11 Mbps	Max. 11 Mbps	Max. 11 Mbps	Max. 11 Mbps
802.11g	Max. 54 Mbps	Max. 54 Mbps	Max. 54 Mbps	Max. 54 Mbps
802.11n	Max. 600 Mbps	Max. 600 Mbps	Max. 600 Mbps	Max. 600 Mbps
802.11ac	Max. 1732 Mbps	Max. 1732 Mbps	Max. 1732 Mbps	Max. 1732 Mbps
802.11ax	Max. 2400 Mbps (FC65E*); Max. 3000 Mbps (FC66E)	Max. 3000 Mbps	Max. 2400 Mbps	Max. 3000 Mbps
802.11be	/	/	Max. 2900 Mbps	Max. 3600 Mbps
Certifications	FC65E*: SRRC/CE/FCC/IC/RCM/KC; FC66E: SRRC/CE/FCC/IC/RCM/KC/JATE/TELEC	SRRC/CE/FCC/IC/RCM/KC/JATE/TELEC	SRRC*/CE*/FCC*/IC*/RCM*/KC*/TELEC*	SRRC*/CE*/FCC*/IC*/RCM*/KC*/TELEC*
Recommended applications	CPE, OTT, smart TVs	CPE, MiFi, OTT, smart TVs	Cloud gaming, 8K A/V streaming, AR/VR, industrial IoT and telemedicine	

\* Planning/ Under development/ In progress




# MCU Wi-Fi & Bluetooth modules

	Wi-Fi 4						
Product	FC41D	FCM100D	FCM740D	FLM040D	FLM140D	FLM240D	FLM340D
							
Microcontroller (MCU)	ARM968 (120 MHz)	ARM968 (120 MHz)	ARM968 (120 MHz)	ARM968 (120 MHz)	ARM968 (120 MHz)	ARM968 (120 MHz)	ARM968 (120 MHz)
ChipSet	BK7231M	BK7231M	BK7231M	BK7231M	BK7231M	BK7231M	BK7231M
Frequency bands	2.4 GHz	2.4 GHz	2.4 GHz	2.4 GHz	2.4 GHz	2.4 GHz	2.4 GHz
WLAN standard	IEEE 802.11 b/g/n	IEEE 802.11 b/g/n	IEEE 802.11 b/g/n	IEEE 802.11 b/g/n	IEEE 802.11 b/g/n	IEEE 802.11 b/g/n	IEEE 802.11 b/g/n
BT standard	BLE 5.2	BLE 5.2	BLE 5.2	BLE 5.2	BLE 5.2	BLE 5.2	BLE 5.2
Form factor	LCC	LCC	LCC+ DIP	DIP	DIP	DIP+LCC	DIP
Dimensions (mm)	20.0 × 18.0 × 2.6	24.0 × 16.0 × 2.6	20.3 × 15.8 × 2.7	15.0 × 16.8 × 1.85	17.91 × 14.99 × 2.8	17.3 × 15 × 2.8	12.7 × 8.5 × 2.6
Operating temperature	-40°C ~ +85°C	-40°C ~ +85°C/ -40°C ~ +105°C	-40°C ~ +105°C	-40°C ~ +105°C	-40°C ~ +85°C	-40°C ~ +105°C	-40°C ~ +105°C
Weight (approx.) g	1.51	1.55	1.06	0.55	0.83	0.85	0.32
<b>General features</b>							
RAM	256KB	256KB	256KB	256KB	256KB	256KB	256KB
PSRAM	/	/	/	/	/	/	/
Flash	2MB/ 4MB	2MB/ 4MB	2MB/ 4MB	2MB/ 4MB	2MB/ 4MB	2MB/ 4MB	2MB/ 4MB
Codec	/	/	/	/	/	/	/
Modulation mode	PSK/QPSK/CCK/16QAM/ 64QAM	PSK/QPSK/CCK/16QAM/ 64QAM	PSK/QPSK/CCK/16QAM/ 64QAM	PSK/QPSK/CCK/16QAM/ 64QAM	PSK/QPSK/CCK/16QAM/ 64QAM	PSK/QPSK/CCK/16QAM/ 64QAM	PSK/QPSK/CCK/16QAM/ 64QAM
Encryption mode	WPA-PSK/WPA2-PSK/ WPA3-SAE	WPA-PSK/WPA2-PSK/ WPA3-SAE	WPA-PSK/WPA2-PSK/ WPA3-SAE	WPA-PSK/WPA2-PSK/ WPA3-SAE	WPA-PSK/WPA2-PSK/ WPA3-SAE	WPA-PSK/WPA2-PSK/ WPA3-SAE	WPA-PSK/WPA2-PSK/ WPA3-SAE
Working mode	STA/AP	STA/AP	STA/AP	STA/AP	STA/AP	STA/AP	STA/AP
Protocols	TCP/UDP/MQTT/HTTP/HTTPS/ MQTTS	TCP/UDP/MQTT/HTTP/HTTPS/ MQTTS	TCP/UDP/MQTT/HTTP/HTTPS/ MQTTS	TCP/UDP/MQTT/HTTP/HTTPS/ MQTTS	TCP/UDP/MQTT/HTTP/HTTPS/ MQTTS	TCP/UDP/MQTT/HTTP/HTTPS/ MQTTS	TCP/UDP/MQTT/HTTP/HTTPS/ MQTTS
<b>I/O interfaces</b>							
GPIO	QuecOpen® support	QuecOpen® support	QuecOpen® support	QuecOpen® support	QuecOpen® support	QuecOpen® support	QuecOpen® support
UART	× 2	× 2	× 2	/	× 1	/	/
SDIO	/	/	/	/	/	/	/
SPI	QuecOpen® support	/	QuecOpen® support	/	/	/	/
USB	/	/	/	/	/	/	/
I2C	QuecOpen® support	QuecOpen® support	QuecOpen® support	/	/	/	/
I2S	/	/	/	/	/	/	/
ADC	QuecOpen® support	QuecOpen® support	QuecOpen® support	QuecOpen® support	QuecOpen® support	QuecOpen® support	QuecOpen® support
PWM	QuecOpen® support	QuecOpen® support	QuecOpen® support	QuecOpen® support	QuecOpen® support	QuecOpen® support	QuecOpen® support
DAC	/	/	/	/	/	/	/
PCM	/	/	/	/	/	/	/
Audio in	/	/	/	/	/	/	/
Audio out	/	/	/	/	/	/	/
LCD	/	/	/	/	/	/	/
EMAC	/	/	/	/	/	/	/
JTAG	/	/	/	/	/	/	/
SWD	/	/	/	/	/	/	/
Antenna	× 1 (RF coaxial connector, external antenna pin, PCB antenna) (optional)	× 1 (RF coaxial connector, external antenna pin, PCB antenna) (optional)	× 1 (RF coaxial connector, PCB antenna) (optional)	× 1 (Ceramic antenna)	× 1 (PCB antenna)	× 1 (RF coaxial connector, PCB antenna) (optional)	× 1 (external antenna pin)
<b>Electrical characteristics</b>							
Supply voltage range	VBAT: 3.0 V ~ 3.6 V, typ. 3.3 V	VBAT: 3.0 V ~ 3.6 V, typ. 3.3 V	VBAT: 3.0 V ~ 3.6 V, typ. 3.3 V	VBAT: 3.0 V ~ 3.6 V, typ. 3.3 V	VBAT: 3.0 V ~ 3.6 V, typ. 3.3 V	VBAT: 3.0 V ~ 3.6 V, typ. 3.3 V	VBAT: 3.0 V ~ 3.6 V, typ. 3.3 V
Power consumption	IDLE: 23.27 mA	IDLE: 23.27 mA	IDLE: 24.94 mA	IDLE: 24.21 mA	IDLE: 24.14 mA	IDLE: 24.14 mA	IDLE: 23.27 mA
Certification	SRRG/CE/FCC/IC/ANATEL/ RCM/KC/TELEC/BQB	SRRG/CE/FCC/IC/ANATEL/ RCM/TELEC	SRRG/CE/FCC/IC/RCM	SRRG/CE/FCC/IC/RCM/UKCA	SRRG/CE/FCC/IC/RCM/UKCA	SRRG/CE/FCC/IC/RCM	SRRG/CE/FCC/IC/RCM
Recommended applications	Smart home, industrial controls	Smart home, industrial controls	Smart home, industrial controls	Smart home, industrial controls	Smart home, industrial controls	Smart home, industrial controls	Smart home, industrial controls




# MCU Wi-Fi & Bluetooth modules

	Wi-Fi 6	
Product	FCM360W	FLM263D
		
Microcontroller (MCU)	RISC processor (240 MHz)	RISC-V (320 MHz)
ChipSet	ECR6600-A40D	BK7235
Frequency bands	2.4 GHz	2.4 GHz
WLAN standard	IEEE 802.11 b/g/n/ax	IEEE 802.11 b/g/n/ax
BT standard	BLE 5.1	BLE 5.2
Form factor	LCC	DIP
Dimensions (mm)	25.5 × 18.0 × 3.2	17.3 × 15 × 2.8
Operating temperature	-40°C ~ +85°C/-40°C ~ +105°C (optional)	-40°C ~ +105°C
Weight (approx.) g	1.65	0.85
<b>General features</b>		
RAM	512KB	512 KB
PSRAM	/	/
Flash	4MB/8MB	4MB
Codec	/	/
Modulation mode	PSK/QPSK/CCK/16QAM/64QAM	DSSS/CCK/BPSK/QPSK/16QAM/64QAM
Encryption mode	WPA-PSK/WPA2-PSK/WPA3-SAE	WPA-PSK/WPA2-PSK/WPA3-SAE
Working mode	STA/AP	STA/AP
Protocols	TCP/UDP/MQTT/HTTP/HTTPS/MQTTs	Wi-Fi: TCP/UDP/MQTT BLE: ATT/GATT/HID/HCI/SPP
<b>I/O interfaces</b>		
GPIO	QuecOpen® support	QuecOpen®support
UART	× 3	× 2
SDIO	/	/
SPI	QuecOpen® support	QuecOpen®support
USB	/	/
I2C	QuecOpen® support	QuecOpen®support
I2S	QuecOpen® support	QuecOpen®support
ADC	QuecOpen® support	QuecOpen®support
PWM	QuecOpen® support	QuecOpen®support
DAC	/	/
PCM	/	/
Audio in	/	/
Audio out	/	/
LCD	/	/
EMAC	/	/
JTAG	/	/
SWD	/	/
Antenna	× 1 (RF coaxial connector, external antenna pin, PCB antenna) (optional)	× 1 (RF coaxial connector, PCB antenna) (optional)
<b>Electrical characteristics</b>		
Supply voltage range	VBAT: 3.0 V ~ 3.6 V, typ. 3.3 V	VBAT: 3.0 V ~ 3.6 V, typ. 3.3 V
Power consumption	IDLE: 34.24 mA	IDLE: 23.02 mA
Certification	SRRC/CE/FCC/IC/RCM/UKCA	SRRC/CE/FCC/IC/RCM/UKCA
Recommended applications	Smart home, industrial controls	Smart home, industrial IoT

# MCU Bluetooth modules









Product	HCM111Z	HLM311Z	HCM010S
			
Microcontroller (MCU)	ARM Cortex-M3 (48 MHz)	ARM Cortex-M3 (up to 48 MHz)	ARM Cortex-M33 (80 MHz)
ChipSet	FR8016HA	FR8012HA0-J	EFR32BG21
Frequency bands	2.4 GHz	2.4 GHz	2.4 GHz
WLAN standard	/	/	/
BT standard	BLE 5.3	BLE 5.0	BLE 5.4
Form factor	LCC	DIP	LCC
Dimensions (mm)	15.0 × 12.0 × 2.25	18.0 × 10.16 × 8.5 (L-type); 24.78 × 10.0 × 5.0 (I-type)	20 × 15.6 × 2.35
Operating temperature	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +105°C
Weight (approx.) g	0.62	0.82 (L-type); 0.94 (I-type)	1.14
<b>General features</b>			
RAM	48KB	48 KB	64 KB
PSRAM	/	/	/
Flash	512 KB	512 KB	768 KB
Codec	/	/	/
Modulation mode	GFSK	GFSK	GFSK
Encryption mode	/	TRNG/AES128 ECB	AES128/256, SHA-1, SHA-2 (up to 256 bits), ECC (up to 256 bits), ECDSA (up to 256 bits), ECDH, J-Pak, TRNG, secure boot
Working mode	Server/Client/Server + Client	Server	Server/Client/Server + Client
Protocols	ATT/GATT/HCI/HID	BLE: ATT/GATT/HCI	ATT/GATT/HID/HCI
<b>I/O interfaces</b>			
GPIO	QuecOpen® support	/	QuecOpen® support
UART	×1	× 1	× 3
SDIO	/	/	/
SPI	QuecOpen® support	/	QuecOpen® support
USB	/	/	/
I2C	QuecOpen® support	/	QuecOpen® support
I2S	/	/	QuecOpen® support
ADC	QuecOpen® support	/	QuecOpen® support
PWM	QuecOpen® support	/	QuecOpen® support
DAC	/	/	/
PCM	/	/	/
Audio in	/	/	/
Audio out	/	/	/
LCD	/	/	/
EMAC	/	/	/
JTAG	/	/	QuecOpen® support
SWD	/	/	QuecOpen® support
Antenna	× 1 (RF coaxial connector, external antenna pin, PCB antenna) (Optional)	× 1 (PCB antenna)	× 1 (PCB antenna)
<b>Electrical characteristics</b>			
Supply voltage range	VBAT: 1.8 V ~ 4.3 V, typ. 3.3 V	VBAT: 1.8 V ~ 4.3 V, typ. 3.3 V	VBAT: 1.71 V ~ 3.8 V, typ. 3.3 V
Power consumption	IDLE: 5.487 mA	IDLE: 5.53 mA	IDLE: 6.443 mA
Certification	SRRC/CE/FCC/IC/RCM/KC/BQB	SRRC/CE/FCC/IC/RCM/BQB	SRRC/CE/FCC/IC/RCM
Recommended applications	Smart home, industrial control	Smart home, Industrial Control	Smart home, industrial controls

# Sub-GHz modules

	Wi-Fi HaLow	Sub-1 GHz	
Product	FGH100M*	KG100S	KG200Z
			
Processor or microcontroller *	/	ARM Cortex®-M33 (up to 80 MHz)	ARM Cortex-M4
ChipSet	MM6108	EFR32BG21*	STM32WLE5JCI6
Frequency bands	850-950 MHz	863M-928M & 2.4G	470-510 MHz, 862-928 MHz LoRa
Form factor	LGA	LGA	LGA
Dimensions (mm)	13.0 × 13.0 × 2.2	15.0 × 15.0 × 2.25	12.0 × 12.0 × 1.8
Operating temperature	-40°C~+85°C	-40°C ~ +85°C	-40°C ~ +85°C
Weight (approx.) g	0.72	0.94	0.56
<b>General features</b>			
RAM*	/	96KB	64 KB
PSRAM*	/	/	/
Flash*	/	1 MB	256 KB
Modulation mode	OFDM/BPSK/GPSK/16QAM/64QAM	FSK, GFSK, Sub-1 GHz CSS	LoRa/(G)FSK/(G)MSK/BPSK
Encryption mode	AES/SHA-256/SHA-384/SHA-512/WPA3	/	AES Hardware Encryption
<b>I/O interfaces</b>			
GPIO	/	Amazon Sidewalk SDK	QuecOpen® support
PCIe	/	/	/
SDIO	× 1 (SDIO2.0)	/	/
SPI	× 1	Amazon Sidewalk SDK	QuecOpen® support
UART	/	× 1	QuecOpen® support
USART	/	/	QuecOpen® support
USB	/	/	/
Jlink	/	× 1	× 1
I2C	/	Amazon Sidewalk SDK	QuecOpen® support
PCM	/	/	/
SWD	/	/	QuecOpen® support
JTAG	/	/	/
Antenna	1 × Wi-Fi antenna	× 2 (Sub-1 GHz CSS × 1 , BLE × 1)	× 1 (Sub-1 GHz CSS × 1)
<b>Electrical characteristics</b>			
Supply voltage range	VBAT: 3.0 V ~ 3.6 V, typ. 3.3 V; VDDIO: 1.8 V ~ 3.6 V, typ. 3.3 V	VBAT: 3.0 V ~ 3.6 V, typ. 3.3V	VBAT: 3.0 V ~ 3.6 V, typ. 3.3V
Power consumption	TBD	IDLE: 0.6mA	IDLE: 4.7µA
Certification	CE/FCC/IC	CE/FCC/IC/BQB	CE/FCC/IC/Anatel* /RCM
Recommended applications	IPC, industrial automation, mobile devices, POS, smart building, home automation	Smart homes, industrial controls	Smart homes, industrial controls

\* Planning/ Under development/ In progress





	DR and high precision GNSS								
Product	L26-ADR	L26-UDR	L26-DR(AA)	LC29H(BA)	LC29H(CA)	LC29H(DA)	LC29H(EA)	LC29H(BS)	
									
GNSS	GPS: L1 C/A GLONASS: L1 Galileo: E1 BDS: B11 QZSS: L1 C/A	GPS: L1 C/A GLONASS: L1 Galileo: E1 BDS: B11 QZSS: L1 C/A	GPS: L1 C/A; GLONASS: L1; Galileo: E1; BDS: B11; QZSS: L1 C/A	GPS/QZSS: L1 C/A, L5; GLONASS: L1; Galileo: E1, E5a; BDS: B11, B2a	GPS/QZSS: L1 C/A, L5; GLONASS: L1; Galileo: E1, E5a; BDS: B11, B2a	GPS/QZSS: L1 C/A, L5; GLONASS: L1; Galileo: E1, E5a; BDS: B11, B2a	GPS/QZSS: L1 C/A, L5; GLONASS: L1; Galileo: E1, E5a; BDS: B11, B2a	GPS/QZSS: L1 C/A, L5; GLONASS: L1; Galileo: E1, E5a; BDS: B11, B2a	
Form factor	LCC	LCC	LCC	LCC	LCC	LCC	LCC	LCC	
Dimensions (mm)	12.2 × 16.0 × 2.3	12.2 × 16.0 × 2.3	12.2 × 16.0 × 2.3	12.2 × 16.0 × 2.5	12.2 × 16.0 × 2.5	12.2 × 16.0 × 2.5	12.2 × 16.0 × 2.5	12.2 × 16.0 × 2.5	
Weight (approx.) g	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	
Operating temperature	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	
Storage temperature	-40°C ~ +90°C	-40°C ~ +90°C	-40°C ~ +90°C	-40°C ~ +90°C	-40°C ~ +90°C	-40°C ~ +90°C	-40°C ~ +90°C	-40°C ~ +90°C	
<b>General features</b>									
Working mode	4wheels-ADR	4wheels-UDR	PVT	DR+RTK	DR	1Hz RTK	10Hz RTK+Heading <sup>1</sup>	RTK base station	
Chip solution	Teseo III	Teseo III	Teseo III	AG3335A/T	AG3335A/T	AG3335A/T	AG3335AA/B	AG3335M	
L1 band receiver (C/A code) channel number	48 Track/2 Fast Acq	48 Track/2 Fast Acq	48 Track/2 Fast Acq	Tracking and acquisition total: 135	Tracking and acquisition total: 135	Tracking and acquisition total: 135	Tracking and acquisition total: 135	Tracking and acquisition total: 135	
L1 band receiver (C/A code) SBAS	WAAS/EGNOS/MSAS/GAGAN	WAAS/EGNOS/MSAS/GAGAN	WAAS/EGNOS/MSAS/GAGAN	WAAS/EGNOS/MSAS/GAGAN	WAAS/EGNOS/MSAS/GAGAN	WAAS/EGNOS/MSAS/GAGAN	Developing	/	
A-GNSS	Supported	Supported	Supported	Supported	Supported	Supported	Supported	/	
Sensitivity	Autonomous acquisition	-145 dBm	-145 dBm	-145 dBm	-147 dBm	-147 dBm	-147 dBm	-147 dBm	-147 dBm
	Reacquisition	-152 dBm	-152 dBm	-152 dBm	-157 dBm	-157 dBm	-157 dBm	-157 dBm	-157 dBm
	tracking	-162 dBm	-162 dBm	-162 dBm	-165 dBm	-165 dBm	-165 dBm	-165 dBm	-165 dBm
TTFF (time to first fix)	Cold start	32 s, Autonomous	32 s, Autonomous	32 s, Autonomous	26 s	26 s	26 s	26 s	/
	Warm start	25 s, Autonomous	25 s, Autonomous	27 s, Autonomous	16 s	16 s	16 s	16 s	/
	Hot start	2 s	2 s	2 s	1 s	1 s	1 s	1 s	/
Position accuracy (autonomous)	1.5 m CEP	1.5 m CEP	1.5 m CEP	Autonomous: 1 m	Autonomous: 1 m	Autonomous: 1 m	Autonomous: 1 m	/	
Position accuracy (RTK)	/	/	/	RTK: < 0.1 m + 1 ppm	/	RTK: 1 cm + 1 ppm	RTK: 1 cm + 1 ppm	/	
Velocity accuracy (without aid)	0.1m/s	0.1m/s	0.1m/s	0.03 m/s	0.03 m/s	0.03 m/s	0.03 m/s	/	
Convergence time (RTK)	/	/	/	RTK: < 10 s	/	RTK: < 10 s	RTK: < 10 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>	/	/	/	/	/	
Accuracy of 1PPS signal (RMS)	50 ns	50 ns	50 ns	20 ns	20 ns	20 ns	20 ns	20 ns	
Max update rate	10 Hz	10 Hz	10 Hz	GNSS: 1 Hz IMU: 100 Hz(MAX)	GNSS: 1 Hz IMU: 100 Hz(MAX)	GNSS: 1 Hz RTK: 1 Hz	GNSS: 1 Hz RTK: 1-10Hz	1 Hz	
Baud rate (default)	115200 bps	115200 bps	115200 bps	115200 bps	115200 bps	115200 bps	460800 bps	115200 bps	
Geo-fence	/	/	/	•	•	•	•	•	
Jamming detection	/	•	/	•	•	•	•	/	
Anti-jamming	/	/	/	/	/	/	/	/	
Built-in LNA	•	•	•	•	•	•	•	•	
<b>Electrical data</b>									
Power supply (VCC)	3.0 V ~ 3.6 V	3.0 V ~ 3.6 V	3.0 V ~ 3.6 V, typ. 3.3 V	3.1 V ~ 3.6 V	3.1 V ~ 3.6 V	3.1 V ~ 3.6 V	3.1 V ~ 3.6 V	3.1 V ~ 3.6 V	
I/O voltage	3.0 V ~ 3.6 V	3.0 V ~ 3.6 V	Same as VCC	2.8 V	2.8 V	2.8 V	2.8 V	2.8 V	
Power consumption (acquisition)	79 mA	84 mA	81 mA	32 mA	30 mA	30 mA	30 mA	24 mA	
Power consumption (tracking)	74 mA	81 mA	81 mA	32 mA	30 mA	30 mA	30 mA	24 mA	
Power consumption (backup)	8 μA	8 μA	8 μA	25 μA	25 μA	25 μA	25 μA	25 μA	
<b>Interfaces</b>									
UART	•	•	•	Adjustable: 9600-3000000 bps Default: 115200 bps	Adjustable: 9600-3000000 bps Default: 115200 bps	Adjustable: 9600-3000000 bps Default: 115200 bps	Adjustable: 9600-3000000 bps Default: 460800 bps	Adjustable: 9600-3000000 bps Default: 115200 bps	
I2C (NMEA)	/	/	/	•	•	•	/	•	
Reset	•	•	•	•	•	•	•	•	
Time pulse	•	•	•	•	•	•	•	•	
<b>Antenna</b>									
Short-circuit protection & open-circuit detection	•	•	•	/	/	/	/	/	
Antenna type	Active or passive	Active or passive	Active or passive	Active or passive	Active or passive	Active or passive	Active or passive	Active	
Antenna power	External or internal	External or internal	External or internal	External or internal	External or internal	External or internal	External or internal	External	
Certifications	CE	CE	CE	CE	CE	CE	CE	CE	
Recommended applications	Automotive tracking, OBD			Trackers, high-precision navigation, delivery robots					


Note 1: Heading function need 2pcs LC29H (EA) work together.

• Supported

# GNSS modules

		DR and high precision GNSS	
Product		LG290P	LG580P
			
GNSS		GPS: L1 C/A, L1C*, L5, L2C; GLO/NASS: L1, L2; Galileo: E1, E5a, E5b, E6; BDS: B1I, B1C, B2a, B2b, B2I, B3I; NavIC: L5; QZSS: L1 C/A, L1C*, L5, L2C; SBAS: L1	GPS: L1 C/A, L2C, L5 GLO/NASS: L1 Galileo: E1, E5a, E5b BDS: B1I, B1C, B2I, B2a, B2b QZSS: L1 C/A, L2C, L5 NavIC: L5 SBAS: L1
Form factor		LGA	LGA
Dimensions (mm)		12.2 × 16.0 × 2.6	21.0 × 16.0 × 2.6
Weight (approx.) g		0.9	1.4
Operating temperature		-40°C ~ +85°C	-40°C ~ +85°C
Storage temperature		-40°C ~ +90°C	-40°C ~ +90°C
<b>General features</b>			
Working mode		RTK	RTK+Heading
Chip solution		KT5030	KT5030
L1 band receiver (C/A code) channel number		Tracking 1040	Tracking 1040
L1 band receiver (C/A code) SBAS		WAAS/EGNOS/BDSBAS/MSAS/GAGAN/SDCM	WASS/EGNOS/BDSBAS/MSAS/GAGAN/SDCM
A-GNSS		*	*
Sensitivity	Autonomous acquisition	-145dBm	-145dBm
	Reacquisition	-155 dBm	-155 dBm
	tracking	-160 dBm	-160 dBm
TTFF (time to first fix)	Cold start	28 s	28 s
	Warm start	28 s	28 s
	Hot start	1.7 s	1.7 s
Position accuracy		Autonomous: 0.7 m CEP RTK: 0.8 cm + 1 ppm	Autonomous: 0.7 m CEP RTK: 0.8 cm + 1 ppm
Velocity accuracy (without aid)		0.03 m/s	0.03 m/s
Convergence time (RTK)		5 s	RTK: < 10 s
Maximum acceleration accuracy (without aid)		0.1 m/s <sup>2</sup>	0.1 m/s <sup>2</sup>
Accuracy of 1 PPS signal (RMS)		10ns	10 ns
Max update rate		10Hz (20Hz)	10 Hz (20 Hz*)
Baud rate (default)		460800 bps	460800 bps
Geo-fence		•	•
Jamming detection		*	*
Anti-jamming		*	*
Built-in LNA		•	•
<b>Electrical data</b>			
Power supply (VCC)		3.15 V ~ 3.45 V, typ. 3.3 V	3.0 V ~ 3.6 V, typ. 3.3 V
I/O voltage		3.3 V	3.3 V
Power consumption (acquisition)		99 mA	99 mA
Power consumption (tracking)		99 mA	99 mA
Power consumption (backup)		12 μA	12 μA
<b>Interfaces</b>			
UART		•	•
I2C (NMEA)		*	*
Reset		•	•
Time pulse		•	•
<b>Antenna</b>			
Short-circuit protection & open-circuit detection		•	\
Antenna type		Active	Active
Antenna power		External	External
Certifications		CE	CE*
Recommended applications		Intelligent robots, precision agriculture, surveying and mapping, automatic driving, etc.	

\* Planning/ Under development/ In progress  
• Supported

DR and high precision GNSS									
Product	LG69T(AA)	LG69T(AD)	LG69T(AB)*	LG69T(AM)	LG69T(AJ)	LG69T(AF)	LG69T(AI)	LG69T(AP)	LG69T(AR)
Compatible									
									
GNSS	GPS/QZSS: L1 C/A; L5 Galileo: E1; E5a BDS: B1; B2a	GPS/QZSS: L1 C/A; L5 Galileo: E1; E5a BDS: B1; B2a	GPS/QZSS: L1 C/A; L2C or L5 Galileo: E1; E5b or E5a BDS: B1; B2 or B2a GLONASS: L1 or L2	GPS/QZSS: L1 C/A; L5 Galileo: E1; E5a BDS: B1; B2a	GPS/QZSS: L1 C/A; L5 Galileo: E1; E5a BDS: B1; B2a	GPS: L1 C/A; L5 Galileo: E1; E5a BDS: B1; B2a QZSS: L1 C/A; L5	GPS/QZSS: L1 C/A; L2C or L5 Galileo: E1; E5b or E5a BDS: B1; B2 or B2a GLONASS: L1 or L2	GPS/QZSS: L1 C/A; L5 Galileo: E1; E5a BDS: B1; B2a	GPS/QZSS: L1 C/A; L5 Galileo: E1; E5a BDS: B1; B2a
Form factor	LGA	LGA	LGA	LGA	LGA	LGA	LGA	LGA	LGA
Dimensions (mm)	22.0 × 17.0 × 3.1	22.0 × 17.0 × 3.1	22.0 × 17.0 × 3.3	22.0 × 17.0 × 3.3	22.0 × 17.0 × 3.3	22.0 × 17.0 × 3.3	22.0 × 17.0 × 3.3	22.0 × 17.0 × 3.3	22.0 × 17.0 × 3.3
Weight (approx.) g	1.9	1.9	2.7	2.6	2.5	2.7	2.7	2.7	2.4
Operating temperature	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +105°C	-40°C ~ +85°C	-40°C ~ +105°C	-40°C ~ +105°C	-40°C ~ +105°C	-40°C ~ +85°C	-40°C ~ +105°C
Storage temperature	-40°C ~ +95°C	-40°C ~ +95°C	-40°C ~ +105°C	-40°C ~ +95°C	-40°C ~ +105°C	-40°C ~ +105°C	-40°C ~ +105°C	-40°C ~ +95°C	-40°C ~ +105°C
<b>General features</b>									
Working mode	Raw	PVT/Raw	Raw	RTK+Heading <sup>1</sup>	RAW	DR & IMU	RAW	DR+RTK+Heading <sup>1</sup>	Raw
Chip solution	TESEO V	TESEO V	TESEO APP	TESEO V	TESEO V	TESEO V	TESEO V	TESEO V	TESEO V
L1 band receiver (C/A code) channel number	80 Tracking channels, 4 Fast acquisition channels	80 Tracking channels, 4 Fast acquisition channels	80 Tracking channels, 4 Fast acquisition channels	80 Tracking channels, 4 Fast acquisition channels	80 Tracking channels, 4 Fast acquisition channels	80 Tracking channels, 4 Fast acquisition channels	80 Tracking channels, 4 Fast acquisition channels	80 Tracking channels, 4 Fast acquisition channels	80 Tracking channels, 4 Fast acquisition Channels
L1 band receiver (C/A code) SBAS	•	•	•	/	•	•	•	/	•
A-GNSS	•	•	/	•	•	•	•	•	•
Sensitivity	Autonomous acquisition	-145 dBm	-145 dBm	-144 dBm*	-145 dBm	-145 dBm	-145 dBm	-145 dBm	-145 dBm
	Reacquisition	-153 dBm	-153 dBm	-153 dBm*	-153 dBm	-153 dBm	-153 dBm	-153 dBm	-153 dBm
	Tracking	-160 dBm	-160 dBm	-159 dBm*	-160 dBm	-160 dBm	-160 dBm	-160 dBm	-160 dBm
TTFF (time to first fix)	Cold start	36 s	36 s	36 s*	36 s	36 s	36 s	36 s	36 s
	Warm start	30 s	30 s	30 s*	30 s	30 s	30 s	30 s	30 s
	Hot start	3 s	3 s	3 s*	3 s	3 s	3 s	3 s	3 s
Position accuracy (autonomous)	1.0 m CEP	1.0 m CEP	1.0 m CEP	1.0 m CEP	1.0 m CEP	1.0m CEP	1.0 m CEP	1.0 m CEP	1.0 m CEP
Position accuracy (RTK)	cm <sup>2</sup>	cm <sup>2</sup>	cm <sup>2</sup>	0.01 m+ppm CEP	cm <sup>2</sup>	/	cm <sup>2</sup>	0.01 m+ppm CEP	cm <sup>2</sup>
Velocity accuracy (without aid)	0.1 m/s	0.1 m/s	0.1 m/s	0.1 m/s	0.1 m/s	0.1m/s	0.1 m/s	0.1 m/s	0.1 m/s
Convergence time (RTK)	/	/	/	<10 s	/	/	/	<10 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>	0.1m/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>
Accuracy of 1PPS signal (RMS)	50 ns	50 ns	50 ns	50 ns	50 ns	50ns	50 ns	50 ns	50 ns
Max update rate	RAW: 10 Hz IMU: 100 Hz	RAW: 10 Hz PVT: 1 Hz	RAW: 10 Hz	PVT: 10 Hz	RAW: 10 Hz IMU: 100 Hz	PVT:10 Hz IMU: 100 Hz	RAW: 10 Hz	PVT: 10 Hz IMU raw data: 100 Hz	RAW: 10 Hz
Baud rate(default)	460800 bps	460800 bps	460800 bps	460800 bps	460800 bps	460800 bps	460800 bps	460800 bps	460800 bps
Geo-fence	/	/	/	•	/	•	/	•	/
Jamming detection	•	•	•	*	•	•	•	*	•
Built-in LNA	•	•	/	•	•	•	•	•	•
<b>Electrical data</b>									
Power supply (VCC)	3.0 V ~ 3.6 V	3.0 V ~ 3.6 V	3.0 V ~ 3.6 V	3.0 V ~ 3.6 V	3.0 V ~ 3.6 V	3.0 V ~ 3.6 V	3.0 V ~ 3.6 V	3.0 V ~ 3.6 V	3.0 V ~ 3.6 V
I/O voltage	3.0 V ~ 3.6 V	3.0 V ~ 3.6 V	3.0 V ~ 3.6 V	3.0 V ~ 3.6 V	3.0 V ~ 3.6 V	3.0 V ~ 3.6 V	3.0 V ~ 3.6 V	3.0 V ~ 3.6 V	3.0 V ~ 3.6 V
Power consumption (acquisition)	242 mA	235 mA	VCC: 55 mA, VCC_CORE: 230 mA	330 mA	245 mA	275 mA	295 mA	360 mA	245 mA
Power consumption (tracking)	237 mA	232 mA	VCC: 55 mA, VCC_CORE: 225 mA	335 mA	245 mA	274 mA	295 mA	360 mA	245 mA
Power consumption (backup)	55 μA	55 μA	55μA	55 μA	55 μA	55 μA	55 μA	55 μA	55 μA
<b>Interfaces</b>									
UART	•	•	•	•	•	•	•	•	•
Reset	•	•	•	•	•	•	•	•	•
Time pulse	•	•	•	•	•	•	•	•	•
<b>Antenna</b>									
Antenna type	Active	Active	Active	Active	Active	Active	Active	Active	Active
Antenna power	External or internal	External or internal	External or internal	External or internal	External or internal	External or internal	External or internal	External or internal	External or internal
Certifications	CE	CE	CE/ASIL-B	CE	/	CE	/	CE	/
Recommended applications	Automotive, high-precision navigation, delivery robots								





Note 1: Heading function need LG69T(AP) and LG69T(AM) work together.  
 Note 2: Depending on external precision positioning engine.

\* Planning/ Under development/ In progress  
 • Supported

# GNSS modules

GNSS positioning and orientation		
Product	LC02H(BA)	
		
GNSS	GPS/GLONASS/Galileo/BDS/QZSS	
Form factor	LCC	
Dimensions (mm)	24.0 × 22.0 × 2.55	
Weight (approx.) g	2.5	
Operating temperature	-40°C ~ +85°C	
Storage temperature	-40°C ~ +90°C	
<b>General features</b>		
Chip solution	AG3335M	
L1 band receiver (C/A code) channel number	75	
L1 band receiver (C/A code) SBAS	•*: WAAS/EGNOS/MSAS/GAGAN	
A-GNSS	Supported	
Sensitivity	Autonomous acquisition	-148 dBm
	Reacquisition	-160 dBm
	Tracking	-165 dBm
Orientation accuracy	Heading angle accuracy: 0.2°/m (1 m Baseline) Tilt angle accuracy: 0.3° Roll angle accuracy: 0.3°	
TTFF (time to first fix)	Cold start	28 s, Autonomous
	Warm start	22 s, Autonomous
	Hot start	1 s
Position accuracy (autonomous)	Horizontal: 1.5 m CEP Vertical: 3.5 m CEP	
Velocity accuracy (without aid)	/	
Maximum acceleration accuracy (without aid)	/	
Accuracy of 1PPS signal (RMS)	/	
Max update rate	1 Hz	
Baud rate(default)	115200 bps	
Geo-fence	•	
Jamming detection	•	
Anti-jamming	•	
Built-in LNA	•	
<b>Electrical data</b>		
Power supply (VCC)	3.1 V ~ 3.6 V, typ. 3.3 V	
I/O voltage	2.8 V	
Power consumption (acquisition)	83 mA	
Power consumption (tracking)	83 mA	
Power consumption (backup)	50 µA	
<b>Interfaces</b>		
UART	•	
I2C (NMEA)	*	
Reset	•	
Time pulse	•	
<b>Antenna</b>		
Short-circuit protection & open-circuit detection	/	
Antenna type	Active or passive	
Antenna power	Internal	
Certifications	CE*	
Recommended applications	Communication station antennas, precision agriculture, construction machinery attitude control, vehicle/ship positioning & orientation, etc.	









\* Planning/ Under development/ In progress  
• Supported

		Timing			
Product	L26-T	LC29T	LC98S	LC26G-T	
					
GNSS	GPS/Galileo/GLONASS/BDS/QZSS	GPS/Galileo/GLONASS/BDS/QZSS	GPS/BDS/GLONASS/Galileo/QZSS	GPS/GLONASS/Galileo/BDS/QZSS	
Form factor	LCC	LCC	LCC	LCC	
Dimensions (mm)	12.2 × 16.0 × 2.3	12.2 × 16.0 × 3.1	22.4 × 17.0 × 2.6	12.2 × 16.0 × 2.4	
Weight (approx.) g	0.9	1.1	1.68	0.85	
Operating temperature	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	
Storage temperature	-40°C ~ +90°C	-40°C ~ +90°C	-40°C ~ +90°C	-40°C ~ +90°C	
<b>General features</b>					
Working mode	Timing static mode	Timing static mode	Timing static mode	Timing static mode	
Chip solution	Teseo III	Teseo V	Teseo III	AG3352	
L1 band receiver (C/A code) channel number	48 Track/2 Fast Acq	80 Track/4 Fast Acq	48 Track/2 Fast Acq	47 Track	
L1 band receiver (C/A code) SBAS	WAAS/EGNOS/MSAS/GAGAN	WAAS/EGNOS/MSAS/GAGAN	WAAS/EGNOS/MSAS/GAGAN	WAAS/EGNOS/MSAS/GAGAN	
A-GNSS	Supported	Supported	Supported	Supported	
Sensitivity	Autonomous acquisition	-147 dBm	-145 dBm <sup>1</sup>	-146 dBm <sup>1</sup>	-148 dBm <sup>1</sup>
	Reacquisition	-153 dBm	-153 dBm <sup>1</sup>	-155 dBm <sup>1</sup>	-160 dBm <sup>1</sup>
	Tracking	-162 dBm	-161 dBm <sup>1</sup>	-161 dBm <sup>1</sup>	-165 dBm <sup>1</sup>
TTFF (time to first fix)	Cold start	32 s, Autonomous	35 s, Autonomous	29 s, Autonomous	28 s, Autonomous
	Warm start	30 s, Autonomous	24 s, Autonomous	28 s, Autonomous	25 s, Autonomous
	Hot start	2 s	2 s, Autonomous	2 s	1 s
Position accuracy (autonomous)	1.5 m CEP	1.5 m CEP	1.5 m CEP	1.5 m CEP	
1PPS timing accuracy (1σ)	< 13.6 (±6.8) ns	< 13.6 (±6.8) ns	< 13.6 (±6.8) ns	≤ 16(±8) ns	
Frequency reference	/	10 MHz	/	/	
Max update rate	5 Hz	10 Hz	10 Hz	1 Hz	
Baud rate (default)	9600/115200 bps	115200 bps	115200 bps	115200 bps	
Geo-fence	/	/	/	•	
Jamming detection	•	•	•	•	
Anti-jamming	/	/	/	•	
Built-in LNA	•	•	/	•	
<b>Electrical data</b>					
Power supply (VCC)	3.0 V ~ 3.6 V	3.0 V ~ 3.6 V	3.0 V ~ 3.6 V	1.75 V ~ 1.98 V, typ. 1.8 V	
I/O voltage	typ. 3.3 V	3.0 V ~ 3.6 V	3.0 V ~ 3.6 V	1.8 V	
Power consumption (acquisition)	80 mA (GPS+GLONASS+Galileo)	222 mA (GPS+BDS+GLONASS+Galileo+QZSS)	78 mA (GPS + GLONASS)	36 mA	
Power consumption (tracking)	73 mA (GPS+GLONASS+Galileo)	232 mA (GPS+BDS+GLONASS+Galileo+QZSS)	74 mA (GPS + GLONASS)	36 mA	
Power consumption (backup)	7 μA	55 μA	/	13 μA	
<b>Interfaces</b>					
UART	•	•	•	•	
I2C (NMEA)	/	*	*	•	
Reset	•	•	•	•	
Time pulse	•	•	•	•	
<b>Antenna</b>					
Short-circuit protection & open-circuit detection	•	•	•	•	
Antenna type	Active or passive	Active	Active or passive	Active or passive	
Antenna power	External or internal	External or internal	External or internal	Internal	
Certifications	CE	/	CE	CE	
Recommended applications	High-precision timing	High-precision timing for base stations		High-precision timing: financial services, power synchronization, communication base stations, railway dispatching	




Note 1: Demonstrated with a good external LNA.

\* Planning/ Under development/ In progress  
• Supported

# GNSS modules









		Standard precision GNSS - single band							
Product	LG77L(IC)	L76-L	LC760Z(00)	LC76G(AB)	LC76G(PA)	LC76G(PB)	LC26G(AB)	LC260Z(00)	
		Compatible							
									
GNSS	GPS/GLONASS/Galileo/BDS/QZSS	GPS/GLONASS/Galileo/BDS/QZSS	GPS/Galileo/GLONASS/QZSS	GPS/GLONASS/Galileo/BDS/QZSS	GPS/GLONASS/Galileo/BDS/QZSS	GPS/GLONASS/Galileo/BDS/QZSS	GPS/GLONASS/Galileo/BDS/QZSS	GPS/Galileo/BDS/QZSS/SBAS	
Form factor	LCC	LCC	LCC	LCC	LCC	LCC	LCC	LCC	
Dimensions (mm)	7.0 × 7.0 × 2.0	10.1 × 9.7 × 2.5	10.1 × 9.7 × 2.3	10.1 × 9.7 × 2.4	10.1 × 9.7 × 2.4	10.1 × 9.7 × 2.4	12.2 × 16.0 × 2.4	12.2 × 16.0 × 2.4	
Weight (approx.) g	0.2	0.6	0.5	0.5	0.6	0.6	0.5	1	
Operating temperature	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	
Storage temperature	-40°C ~ +90°C	-40°C ~ +90°C	-45°C ~ +90°C	-40°C ~ +90°C	-40°C ~ +90°C	-40°C ~ +90°C	-40°C ~ +90°C	-40°C ~ +90°C	
<b>General features</b>									
Working mode	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard	
Chip solution	MT3333	MT3333	HD8120	AG3352Q	AG3352Q	AG3352Q	AG3352Q	HD8120	
L1 band receiver (C/A code) channel number	33 Track/ 99 Acq	33 Track/ 99 Acq.	24 track / 64 Acq.	47 track	47 track	47 track	47 track	24 track / 64 Acq.	
L1 band receiver (C/A code) SBAS	WAAS/EGNOS/MSAS/GAGAN	WAAS/EGNOS/MSAS/GAGAN	Supported	Supported	Supported	Supported	Supported	Supported	
A-GNSS	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported	
Sensitivity	Autonomous acquisition	-146 dBm	-149 dBm	-149 dBm	-147 dBm	-147 dBm	-147 dBm	-147 dBm	-148 dBm
	Reacquisition	-156 dBm	-161 dBm	-158 dBm	-159 dBm	-159 dBm	-159 dBm	-159 dBm	-158 dBm
	Tracking	-163 dBm	-167 dBm	-160 dBm	-166 dBm	-166 dBm	-166 dBm	-166 dBm	-159 dBm
TTFF (time to first fix)	Cold start	25 s, Autonomous 17 s, with EASY™	32 s, Autonomous 15 s, with EASY™	28 s, Autonomous 15 s, with AGNSS	28s, Autonomous 15s, with EASY™ 5s, with EPO™	28 s, Autonomous 15 s, with EASY™ 5 s, with EPO™	28 s, Autonomous 15 s, with EASY™ 5 s, with EPO™	28 s, Autonomous 15 s, with AGNSS 5 s, with EPO™	28 s, Autonomous 15 s, with AGNSS 5 s, with EPO™
	Warm start	23 s, Autonomous 5 s, with EASY™	30 s, Autonomous 5 s, with EASY™	26 s, Autonomous 4 s, with AGNSS	25s, Autonomous 2s, with ESAY™	25 s, Autonomous 2 s, with ESAY™	25 s, Autonomous 2 s, with ESAY™	25 s, Autonomous 2 s, with ESAY™	26 s, Autonomous 4 s, with AGNSS
	Hot start	2 s	2 s	1 s	1 s	1 s	1 s	1 s	1 s
Position accuracy (autonomous)	2.5 m CEP	2.5 m CEP	2.0 m CEP	1.5 m CEP	1.5 m CEP	1.5 m CEP	1.5 m CEP	2 m CEP	
Velocity accuracy (without aid)	0.1 m/s	0.1 m/s	0.1 m/s	0.1 m/s	0.1 m/s	0.1 m/s	0.1 m/s	0.1 m/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>	0.1 m/s <sup>2</sup>	0.1 m/s <sup>2</sup>	
Accuracy of 1PPS signal (RMS)	35 ns	100 ns	30 ns	30 ns	30 ns	30 ns	35 ns	30 ns	
Max update rate	10 Hz	10 Hz	5 Hz	10 Hz	1 Hz	1 Hz	10 Hz	5 Hz	
Baud rate(default)	9600 bps	9600 bps	115200 bps	115200 bps	115200 bps	115200 bps	115200 bps	115200 bps	
Geo-fence	•	•	•	•	•	•	•	/	
Jamming detection	•	•	•	•	•	•	•	•	
Anti-jamming	•	•	•	•	•	•	•	/	
Built-in LNA	/	•	•	•	•	•	•	•	
<b>Electrical data</b>									
Power supply (VCC)	2.8 V ~ 4.3 V	2.8 V ~ 4.3 V	2.8 V ~ 3.6 V	2.55 V ~ 3.6 V	2.55 V ~ 3.6 V	1.75 V ~ 1.98 V	2.55 V ~ 3.6 V	2.8 V ~ 3.6 V, typ. 3.3 V	
I/O voltage	1.7 V ~ 1.9 V / 2.7 V ~ 2.9 V	2.7 V ~ 2.9 V	Same as VCC	2.55 V ~ 3.6 V	2.55 V ~ 3.6 V	1.75 V ~ 1.98 V	typ. 3.3 V	2.8 V ~ 3.6 V, typ. 3.3 V	
Power consumption (acquisition)	24 mA (GPS+GLONASS)	31 mA (GPS+GLONASS)	23 mA (GPS+Galileo+GLONASS)	36 mA(G3B)	10 mA(G3B)	15 mA(G3B)	36 mA(G3B)	20 mA(G2B)	
Power consumption (tracking)	23 mA (GPS+GLONASS)	31 mA (GPS+GLONASS)	22 mA (GPS+Galileo+GLONASS)	36 mA(G3B)	10 mA(G3B)	15 mA(G3B)	36 mA(G3B)	20 mA(G2B)	
Power consumption (backup)	6 μA	8 μA	13 μA	13 μA	13 μA	13 μA	15 μA	13 μA	
<b>Interfaces</b>									
UART	•	•	•	•	•	•	•	•	
I2C (NMEA)	•	•	•	•	•	•	•	•	
Reset	•	•	•	•	•	•	•	•	
Time pulse	•	•	•	•	•	•	•	•	
<b>Antenna</b>									
Short-circuit protection & open-circuit detection	•	/	•	/	/	/	•	•	
Antenna type	Active or passive	Active or passive	Active or passive	Active or passive	Active or passive	Active or passive	Active or passive	Active or passive	
Antenna power	External	External or internal	External or internal	External or internal	External or internal	External or internal	External or internal	External or internal	
Certifications	CE	CE	CE	CE	CE	CE	CE	/	
Recommended applications	Vehicle trackers, asset trackers, safety, industrial PDAs & PNDs, digital cameras							Fleet management, tracker, T-BOX, safety driving assistant	

• Supported

		Standard precision GNSS - dual band		
Product	LC79H(AL)	LC29H(AA)	LC29H(AI)	
				
GNSS	GPS/QZSS: L1 C/A, L5 GLONASS: L1 Galileo: E1, E5a BDS: B11, B2a	GPS/QZSS: L1 C/A, L5 GLONASS: L1 Galileo: E1, E5a BDS: B11, B2a	GPS/GLONASS/Galileo/BDS/QZSS/NavIC/SBAS	
Form factor	LCC	LCC	LCC	
Dimensions (mm)	10.1 × 9.7 × 2.4	12.2 × 16.0 × 2.5	12.2 × 16.0 × 2.5	
Weight (approx.) g	0.5	0.9	0.9	
Operating temperature	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	
Storage temperature	-40°C ~ +90°C	-40°C ~ +90°C	-40°C ~ +90°C	
<b>General features</b>				
working mode	Standard mode	Standard mode	Standard mode	
Chip solution	AG3335M	AG3335M	AG3335M	
L1 band receiver (C/A code) channel number	Tracking and acquisition total: 135	Tracking and acquisition total: 135	Tracking and acquisition total: 75	
L1 band receiver (C/A code) SBAS	WAAS, EGNOS, MSAS, GAGAN	WAAS, EGNOS, MSAS, GAGAN	WAAS, EGNOS, MSAS, GAGAN	
A-GNSS	Supported	Supported	Supported	
Sensitivity	Autonomous acquisition	-148 dBm	-147 dBm	-150 dBm
	Reacquisition	-159 dBm	-159 dBm	-160 dBm
	Tracking	-166 dBm	-165 dBm	-165 dBm
TTFF (time to first fix)	Cold start	26 s	26 s	29 s
	Warm start	18 s	16 s	24 s
	Hot start	1 s	1 s	1 s
Position accuracy (autonomous)	1.0 m CEP	1.0 m CEP	1.8 m CEP	
Velocity accuracy (without aid)	0.03 m/s	0.03 m/s	0.1 m/s	
Maximum acceleration accuracy (without aid)	/	/	/	
Accuracy of 1PPS signal (RMS)	20 ns	20 ns	80 ns	
Max update rate	PVT: 1 Hz	PVT: 1 Hz	PVT: 1 Hz	
Baud rate(default)	115200 bps	115200 bps	115200 bps	
Geo-fence	•	•	•	
Jamming detection	•	•	•	
Anti-jamming	/	/	/	
Built-in LNA	•	•	•	
<b>Electrical data</b>				
Power supply (VCC)	1.75 V ~ 1.98 V	3.1 V ~ 3.6 V	3.1 V ~ 3.6 V, typ. 3.3 V	
I/O voltage	2.8 V	2.8 V	Typ. 2.8 V	
Power consumption (acquisition)	33 mA	24 mA	16 mA	
Power consumption (tracking)	33 mA	24 mA	16 mA	
Power consumption (backup)	20 µA	25 µA	51 µA	
<b>Interfaces</b>				
UART	9600-921600 bps(Default:115200 bps)	9600-3000000 bps(Default:115200 bps)	•	
I2C (NMEA)	•	•	•	
Reset	•	•	•	
Time pulse	•	•	•	
<b>Antenna</b>				
Antenna type	Active or passive	Active or passive	Active or passive	
Antenna power	External or internal	External or internal	External or internal	
Certifications	CE	CE	CE	
Recommended applications	Shared mobility, delivery robots, GIS		Application areas include trackers, asset preservation, vehicle navigation, etc	

• Supported


# GNSS modules


	Integrated antenna								
Product	LC86L(C)	LC86G(AA)	LC86G(AB)	LC86G(LA)	LC86G(PA)	L86	L89 R2.0	L96	
	Compatible								
									
GNSS	GPS/GLONASS/Galileo/BDS/QZSS	GPS/BDS/Galileo	GPS/GLONASS/Galileo	GPS/GLONASS/BDS/Galileo/QZSS	GPS/GLONASS/Galileo/BDS/QZSS	GPS/GLONASS/BDS/Galileo/QZSS	GPS/GLONASS/BDS/Galileo/IRNSS/QZSS	GPS/GLONASS/BDS/Galileo/QZSS	
Form factor	LCC	LCC	LCC	LCC	LCC	LCC	LCC	LCC	
Dimensions (mm) <sup>1</sup>	16.0 × 16.0 × 6.95	16.0 × 16.0 × 6.95	16.0 × 16.0 × 6.95	18.4 × 18.4 × 6.95	16.0 × 16.0 × 6.95	18.4 × 18.4 × 6.45	26.4 × 18.4 × 6.8	14.0 × 9.6 × 2.0	
Weight (approx.) g	6	5.9	5.9	8	5.9	7.6	8.2	0.6	
Operating temperature	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	
Storage temperature	-40°C ~ +90°C	-40°C ~ +90°C	-40°C ~ +90°C	-40°C ~ +90°C	-40°C ~ +90°C	-40°C ~ +90°C	-40°C ~ +90°C	-40°C ~ +90°C	
<b>General features</b>									
Chip solution	MT3333	AG3352	AG3352	AG3352	AG3352	MT3333	AG3335	MT3333	
L1 band receiver (C/A code) channel number	33 Track/ 99 Acq	47 Track	47 Track	47 Track	47 Track	33 Track/ 99 Acq	33 Track/ 99 Acq	33 Track/ 99 Acq.	
L1 band receiver (C/A code) SBAS	WAAS/EGNOS/MSAS/GAGAN	WAAS/EGNOS/MSAS/GAGAN	Supported	WAAS/EGNOS/MSAS/GAGAN	Supported	WAAS/EGNOS/MSAS/GAGAN	WAAS/EGNOS/MSAS/GAGAN	WAAS/EGNOS/MSAS/GAGAN	
A-GNSS	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported	
Sensitivity	Autonomous acquisition	-148 dBm	-147 dBm	-147 dBm	-147 dBm	-147 dBm	-148 dBm	-148 dBm	
	Reacquisition	-162 dBm	-160 dBm	-160 dBm	-160 dBm	-160 dBm	-161 dBm	-160 dBm	
	Tracking	-166 dBm	-166 dBm	-166 dBm	-166 dBm	-166 dBm	-167 dBm	-165 dBm	
TTFF (time to first fix)	Cold start	35 s, Autonomous 15 s, with AGNSS	<30 s, Autonomous <12 s, with EASY™	<30 s, Autonomous <12 s, with EASY™	30 s, Autonomous 12 s, with EASY™	<30 s, Autonomous <12 s, with EASY™	35 s, Autonomous <15 s, with AGNSS	35 s, Autonomous 15 s, with EASY™	
	Warm start	30 s, Autonomous 5 s, with AGNSS	<28 s, Autonomous <2 s, with EASY™	<28 s, Autonomous <2 s, with EASY™	25 s, Autonomous 2 s, with EASY™	<28 s, Autonomous <2 s, with EASY™	30 s, Autonomous 5 s, with AGNSS	30 s, Autonomous 5 s, with EASY™	
	Hot start	2 s	<1 s	<1 s	<1 s	<1 s	1 s	<1 s	
Position accuracy(autonomous)	2.5 m CEP	1.5 m CEP	1.5 m CEP	1.5 m CEP	1.5 m CEP	2.5 m CEP	1.8 m CEP	2.5 m CEP	
Velocity accuracy(without aid)	0.1 m/s	0.1 m/s	0.1 m/s	0.1 m/s	0.1 m/s	0.1 m/s	0.03 m/s	0.1 m/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>	/	0.1 m/s <sup>2</sup>	
Accuracy of 1PPS signal (RMS)	100 ns	30 ns	30 ns	30 ns	30 ns	100 ns	100 ns	100 ns	
Max update rate	10 Hz	10 Hz	10 Hz	10 Hz	1 Hz	10 Hz	1 Hz	10 Hz	
Baud rate(default)	9600 bps	115200 bps	115200 bps	115200 bps	115200 bps	9600 bps	9600 bps	9600 bps	
Geo-fence	•	•	•	•	•	•	•	•	
Jamming detection	•	•	•	•	•	•	•	•	
Anti-jamming	•	•	•	•	•	•	/	•	
Built-in LNA	•	•	•	•	•	•	•	•	
<b>Electrical data</b>									
Power supply (VCC)	2.8 V ~ 4.3 V	2.55 V ~ 3.6 V	2.55 V ~ 3.6 V	2.55 V ~ 3.6 V	2.55 V ~ 3.6 V	2.8 V ~ 4.3 V	3.1 V ~ 4.3 V	2.8 V ~ 4.3 V	
I/O voltage	2.7 V ~ 2.9 V	2.55 V ~ 3.6 V	2.55 V ~ 3.6 V	2.55 V ~ 3.6 V	2.55 V ~ 3.6 V	2.7 V ~ 2.9 V	3.0 V	2.7 V ~ 2.9 V	
Power consumption (acquisition)	32 mA (GPS+GLONASS)	30 mA	33 mA	34 mA	11 mA	32 mA (GPS+GLONASS)	32 mA	25 mA	
Power consumption (tracking)	30 mA (GPS+GLONASS)	30 mA	33 mA	34 mA	11 mA	30 mA (GPS+GLONASS)	32 mA	20 mA	
Power consumption (backup)	7 μA	13 μA	13 μA	13 μA	13 μA	7 μA	51 μA	7 μA	
<b>Interfaces</b>									
UART	•	•	•	•	•	•	•	•	
I2C (NMEA)	/	/	/	/	/	/	•	•	
Reset	•	•	•	•	•	•	•	•	
Time pulse	•	•	•	•	•	•	•	•	
<b>Antenna</b>									
Short-circuit protection & open-circuit detection	•	•	•	•	•	•	•	/	
Antenna automatic switch	•	•	•	•	•	•	•	/	
Antenna type	Embedded patch antenna or external active antenna	Embedded patch antenna or external active antenna	Embedded patch antenna or external active antenna	Embedded patch antenna or external active antenna	Embedded patch antenna or external active antenna	Embedded patch antenna or external active antenna	Embedded patch antenna and chip antenna, external active antenna	Embedded chip antenna or external active antenna	
Antenna power	Internal	Internal	Internal	Internal	Internal	Internal	Internal	Internal	
Certifications	CE	CE	CE	CE	CE	CE	CE	CE	
Recommended applications	Vehicle or asset trackers, DVRs, connected PNDs & PDAs, safety, digital cameras, etc.						(Dedicated for India market) standard tracking		Asset tracking, digital cameras

Note 1: Please refer to the design document for footprint size.

• Supported




	IMU module
<b>Product</b>	LUA600A
	
Dimensions (mm)	25.0 × 25.0 × 12.5
Weight (approx.) g	11.3
Operating temperature	-40°C ~ +105°C
Storage temperature	-40°C ~ +105°C
<b>General features</b>	
Chip solution	SCHA634
Update rate	10-400 Hz; Default: 100 Hz
<b>Gyroscope specifications</b>	
Range	±300 °/s
Bias instability (Allan)	Typ. 1.8 °/h (X/Y axis), 1.4 °/h (Z axis) Max. 2.6 °/h (X/Y axis), 2.1 °/h (Z axis)
Angular random walk	Typ. 0.09 °/√h (X/Y axis), 0.1 °/√h (Z axis) Max. 0.13 °/√h (X/Y axis), 0.15 °/√h (Z axis)
Bias error over temperature (10 s smoothing, 1σ)	Typ. 0.01 °/s Max. 0.02 °/s
Scale factor error (@ 25°C)	Typ. 0.04 % Max. 0.15 %
Non-Linearity (@ 25°C)	Typ. 0.003 % FS Max. 0.01 % FS
Misalignment error	Typ. 0.004° Max. 0.01°
<b>Accelerometer specifications</b>	
Range	±6g
Bias instability (Allan)	Typ. 15 μg Max. 18 μg
Velocity random walk	Typ. 0.035 m/s/√h Max. 0.05 m/s/√h
Bias error over temperature (10 s smoothing, 1σ)	Typ. 0.05 mg (X/Y axis); 1 mg (Z axis) Max. 0.1 mg (X/Y axis); 2 mg (Z axis)
Scale factor error (@ 25°C)	Typ. 0.02% (X/Y axis); 0.03 % (Z axis) Max. 0.05% (X/Y axis); 0.12 % (Z axis)
Non-Linearity (@ 25°C, ±1g)	Typ. 0.008%FS (X/Y axis); 0.008 %FS (Z axis) Max. 0.02%FS (X/Y axis); 0.02 %FS (Z axis)
Misalignment Error	Typ. 0.002° (X/Y axis); 0.004 ° (Z axis) Max. 0.01° (X/Y axis); 0.017 ° (Z axis)
<b>Electrical features</b>	
Power supply (VCC)	3.0 V ~ 3.6 V, typ. 3.3 V
I/O voltage	Following VCC
Power consumption (@ 3.3 V)	75 mA
<b>Interfaces</b>	
UART	Baud rate: 115200-921600 bps; Default: 460800 bps
SPI	Max. clock frequency: 8 MHz
CAN	Max. Baud Rate (CAN): 1 Mbps Max. Baud Rate (CAN FD): 2 Mbps
Recommended applications	Automated driving, high-precision navigation, robotics and ect.

	Smart antenna		
Product	QLM29HBAA-GM	QLM29HCAA-GM	
			
GNSS	GPS/QZSS: L1 C/A, L5 GLONASS: L1 Galileo: E1, E5a BDS: B11, B2a	GPS/QZSS: L1 C/A, L5 GLONASS: L1 Galileo: E1, E5a BDS: B11, B2a	
Form factor	/	/	
Dimensions (mm)	72 × 57.6 × 22.3	72 × 57.6 × 22.3	
Weight (approx.) g	220	220	
Operating temperature	-40°C ~ +85°C	-40°C ~ +85°C	
Storage temperature	-40°C ~ +105°C	-40°C ~ +105°C	
<b>General features</b>			
Working mode	DR+RTK	DR	
Chip solution	AG3335A/T	AG3335A/T	
L1 band receiver (C/A code) channel number	Tracking and acquisition total: 135	Tracking and acquisition total: 135	
L1 band receiver (C/A code) SBAS	• (WAAS/EGNOS/MSAS/GAGAN)	• (WAAS/EGNOS/MSAS/GAGAN)	
A-GNSS	Supported	Supported	
Sensitivity	Autonomous acquisition	-147 dBm	-147 dBm
	Reacquisition	-157 dBm	-157 dBm
	Tracking	-165 dBm	-165 dBm
TTFF (time to first fix)	Cold start	26 s	26 s
	Warm start	16 s	16 s
	Hot start	1 s	1 s
Position accuracy (autonomous)	Autonomous: 1 m	Autonomous: 1 m	
Position accuracy (RTK)	RTK: < 0.1 m + 1 ppm	/	
Velocity accuracy (without aid)	0.03 m/s	0.03 m/s	
Convergence time (RTK)	RTK: < 10 s	/	
Maximum acceleration accuracy (without aid)	/	/	
Accuracy of 1PPS signal (RMS)	20 ns	20 ns	
Max update rate	GNSS: 1 Hz IMU: 100 Hz (MAX)	GNSS: 1 Hz IMU: 100 Hz (MAX)	
Baud rate (default)	115200 bps	115200 bps	
Geo-fence	•	•	
Jamming detection	•	•	
Anti-jamming	/	/	
Built-in LNA	•	•	
<b>Electrical data</b>			
Power supply (VCC)	3.3 V ~ 5.5 V, typ. 5 V	3.3 V ~ 5.5 V, typ. 5 V	
Power Consumption	39.8 mA	42 mA	
<b>Interfaces</b>			
RS232	115200 bps	115200 bps	
UART	/	/	
I2C (NMEA)	/	/	
<b>Antenna</b>			
Short-circuit protection & open-circuit detection	/	/	
Antenna type	Active	Active	
Antenna power	Internal	Internal	
Certifications	/	/	
Recommended applications	Car sharing, vehicle navigation		






• Supported

# UMTS/HSPA(+) modules

<b>Product</b>	UC200A-GL
	
Form factor	LCC
Dimensions (mm)	29.0 × 32.0 × 2.4
3G	UMTS/HSPA+
Frequency bands (MHz)	UMTS: B1/2/5/8; GSM: 850/900/1800/1900MHz
Region	Global
Weight (approx.) g	4.3
Operating temperature	-35°C ~ +75°C
Extended temperature	-40°C ~ +85°C
<b>Data transmission</b>	
HSPA data rates (Mbps)	Max. 21 (DL)/ Max. 5.76 (UL)
UMTS data rates (Kbps)	Max. 384 (DL/UL)
GPRS data rates (Kbps)	Max. 85.6 (DL/UL)
EDGE data rates (Kbps)	Max. 236.8 (DL/UL)
SMS	•
CSD	•
Protocols	TCP/UDP/PPP/NTP/NITZ/FTP/HTTP/PING/CMUX/HTTPS/SSL/FILE/MQTT/MMS/SMTP/SMTPTS
<b>Interfaces</b>	
SIM	1.8 V/ 3 V
UART	2
USB	2.0 hi-speed
Audio digital (PCM)	•
RTC backup	•
ADC	× 2, 12bits
Antenna	Pads for primary
<b>Enhanced features</b>	
DTMF	•
QuecFOTA®	•
DFOTA	•
RIL driver	Android 4.x~12.x
USB serial driver	Windows 7/8/8.1/10/11, Linux 2.6~5.15, Android 4.x~12.x
SIM detection	•
Firmware update	via USB/ DFOTA
<b>Electrical features</b>	
Supply voltage range	3.4 V ~ 4.5 V, typ. 3.8 V
Power consumption	17 μA @ Power Off 1 mA @ Sleep
Certifications	CE/FCC/Anatel/RCM
Recommended applications	Telematics, smart metering, mobile POS terminals, gateways, safety, tracking and tracing, remote maintenance and control, networking, mobile computing, healthcare, etc.

• Supported



# GSM/GPRS modules





Product	M66	M65	M95	M95-R	MC60/ MC60E
					
Form factor	LCC	LCC	LCC	LCC	LCC
Dimensions (mm)	17.7 × 15.8 × 2.3	17.7 × 15.8 × 2.3	23.6 × 19.9 × 2.65	23.6 × 19.9 × 2.65	18.7 × 16.0 × 2.1
Frequency range (MHz)	850/900/1800/1900	850/900/1800/1900	850/900/1800/1900	850/900/1800/1900	850/900/1800/1900
Weight (approx.) g	1.3	1.1	3.0	3.0	1.3
Operating temperature	-35°C ~ +75°C	-35°C ~ +75°C	-35°C ~ +75°C	-35°C ~ +75°C	-35°C ~ +75°C
Extended temperature	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +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/FTP/HTTP/SMTP/NITZ/PING/NTP/SSL/MQTT/HTTPS/SMTPS	TCP/UDP/PPP/FTP/HTTP/NITZ/PING/NTP/SSL/MQTT/HTTPS	TCP/UDP/PPP/FTP/HTTP/SMTP/NITZ/PING/NTP/SSL/MQTT	TCP/UDP/PPP/FTP/HTTP/NITZ/PING/NTP/SSL/MQTT	TCP/UDP/PPP/FTP/HTTP/NITZ/PING/NTP/SSL/HTTPS/MQTT
<b>Specifications for voice</b>					
Speech codec modes	HR/FR/EFR/AMR	HR/FR/EFR/AMR	HR/FR/EFR/AMR	HR/FR/EFR/AMR	HR/FR/EFR/AMR
Echo arithmetic	Echo cancellation Echo suppression Noise reduction	Echo cancellation Echo suppression Noise reduction	Echo cancellation Echo suppression Noise reduction	Echo cancellation Echo suppression Noise reduction	Echo cancellation Echo suppression Noise reduction
<b>Interfaces</b>					
SIM	1.8 V/3 V	1.8 V/3 V	1.8 V/3 V	1.8 V/3 V	1.8 V/3 V
Audio analog	1 input/2 outputs	1 input/2 outputs	2 inputs/ 2 outputs	2 inputs/ 2 outputs	1 input/ 2 outputs
Audio digital (PCM)	•	/	•	•	•
RTC backup	•	•	•	•	•
UART	3	3	2	2	4
ADC	× 1, 10bit	× 1, 10bit	/	/	× 1, 10bit
SD card interface	•	/	/	/	•
GPIO	/	/	/	/	•
Temperature detection	/	/	•	/	•
<b>Enhanced features</b>					
eCall	•	/	•	/	•
Jamming detection	•	/	•	/	•
DTMF	•	o	•	•	•
Audio playback/Audio recording	•	•	•	•	•
Dual-SIM	/	/	•	/	•
QuecFOTA®	•	DFOTA	•	•	•
QuecCell	•	•	•	•	•
QuecFile	•	•	/	/	•/o
QuecOpen®	•	•	/	/	•
MUX	•	•	•	•	•
Bluetooth	•	/	/	/	BT 3.0 (MC60) BT 3.0/ BT4.0 (MC60E)
GNSS	/	/	/	/	BEIDOU/GPS/GLONASS/Galileo/QZSS
<b>Electrical features</b>					
Power supply	3.3 V ~ 4.6V	3.45 V ~ 4.25 V	3.3 V ~ 4.6 V	3.45 V ~ 4.25 V	3.3 V ~ 4.6 V
Low power consumption	1.3mA @DRX=5 1.2mA @DRX=9	1.2mA @DRX=5 1.1mA @DRX=9	1.3mA @DRX=5 1.2mA @DRX=9	1.4mA @DRX=5 1.3mA @DRX=9	1.2mA @DRX=5 0.8mA @DRX=9
Certifications	Vodafone/Deutsche Telekom/CE/GCF/FCC/Anatel/ICASA/UCRF	CE/Anatel	Vodafone/CE/GCF/PTCRB/FCC/IC/Rogers/Anatel/RCM/ICASA/NCC/UCRF/Telenor	CE/Anatel	CE/GCF/FCC/Anatel/ICASA/UCRF
Recommended applications	Telematics, smart metering, mobile POS terminals, gateways, safety, tracking and tracing, remote maintenance and control, networking, mobile computing, healthcare, etc.				

o Under development  
• Supported

# 5G antennas

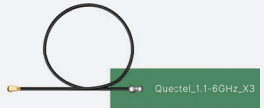

Product	YE0001BA	YECT004W1A	YECN009AA	YBY00A0KA	YECN001J1A	YECT005W1A
						
IP level	/	IP67	/	IP65	IP67, IP69K, IK10	/
Compliant	RoHS and REACH	RoHS and REACH	RoHS and REACH	RoHS	RoHS and REACH	RoHS
Frequency bands (MHz)	600-6000	600-6000	700-5000	700-5000	600-960, 1400-2690, 3300-6000	600-6000
Technology	5G	5G	5G	5G	5G	5G
Cable length (mm)	/	/	/	/	/	/
Connector type	SMA male	SMA male	SMA male	N male	SMA male	SMA male
Mounting type	Terminal	Terminal	Terminal	Terminal	Screw	Terminal
Dimensions (mm)	221 × 27.30 × 13.45	135 × 15.6 × 13	200 × 21 × 8	∅ 29 × 300	40.6 × 104	135 × 15.6 × 13
Matched Quectel modules	5G/4G/3G/2G/LPWA					

Product	YE0028AA	YXH001AA	YECT000WBA	YECN028AA	YECT028W1A
					
IP level	/	IP65	IP67, IP69K, IK10	IP66	IP66
Compliant	RoHS	RoHS	RoHS and REACH	RoHS and REACH	RoHS and REACH
Frequency bands (MHz)	700-2700, 3300-5000	700-960, 1710-2690, 3300-5000	600-960, 1400-2690, 3300-6000	410-470, 617-960, 1427-6000	600-960, 1710-2690, 3300-6000
Technology	5G	5G	5G	5G	5G
Cable length (mm)	1500	1000	/	/	/
Connector type	SMA male	SMA male	N type	SMA male	SMA male
Mounting type	Magnetic	Magnetic	Screw	Terminal	Terminal
Dimensions (mm)	234 × ∅ 60	285 × 45	40.6 × 104	225 × 54.5 × 13	225 × 54.5 × 13
Matched Quectel modules	5G/4G/3G/2G/LPWA				

Product	YPCS001AA	YPCS001AAEVB	YC0018CA	YC0018CAEVB
				
Frequency bands (MHz)	1427-5850	1427-5850	600-960, 1427-1707, 1710-2170, 2300-2700, 3300-5000, 5100-6000	600-960, 1427-1707, 1710-2170, 2300-2700, 3300-5000, 5100-6000
Technology	5G	5G	5G	5G
Cable length (mm)	/	/	/	/
Connector type	/	/	/	/
Mounting type	SMT	Screw	SMT	Screw
Dimensions (mm)	20 × 10 × 3	60 × 20 × 0.8	40 × 7 × 3	141 × 40.4 × 0.8
Matched Quectel modules	5G/4G/3G/2G/LPWA			







Product	YFCA011AA	YFCA010AA	YPCA006AA	YF0017FA	YF0017GA	YF0020EA
						
Frequency bands (MHz)	600-960, 1520-6000	410-470, 700-960, 1400-6000	410-470, 700-960, 1400-6000	1500-6000	1100-6000	600-6000
Technology	5G	5G	5G	5G	5G	5G
Cable length (mm)	150	101	101	201	201	202
Connector type	IPEX MHF 1	IPEX I	IPEX I	IPEX IV	IPEX IV	IPEX IV
Mounting type	Adhesive	Adhesive	Adhesive	Adhesive	Adhesive	Adhesive
Dimensions (mm)	120 × 47	138.8 × 16.2	150 × 16.2 × 0.6	49 × 13	49 × 13	90.3 × 15.3
Matched Quectel modules	5G/4G/3G/2G/LPWA					

The parameters shall be subject to the specification.

Product	YP0009NA	YP0009OA
		
Frequency bands (MHz)	1100-6000	600-6000
Technology	5G	5G
Cable length (mm)	203	202
Connector type	IPEX IV	IPEX IV
Mounting type	Adhesive	Adhesive
Dimensions (mm)	49 × 13 × 0.8	78.5 × 14.2 × 0.8
Matched Quectel modules	5G/4G/3G/2G/LPWA	

## Cellular (4G/3G/2G) antennas

Product	YC0002BA	YC0002BAEVB	YC0003BA	YC0003BAEVB
				
Frequency bands (MHz)	700-2690	700-2690	700-2690	700-2690
Technology	LTE (4G)	LTE (4G)	LTE (4G)	LTE (4G)
Cable length (mm)	/	/	/	/
Connector type	/	/	/	/
Mounting type	SMD	Screw	SMD	Screw
Dimensions (mm)	42 × 10 × 3	131 × 60 × 0.8	40 × 7 × 3	136.5 × 43 × 1
Matched Quectel modules	4G/3G/2G/LPWA			






Product	YC0017DA	YC0017DAEVB	YC0017EA	YC0017EA EVB	YPCP001AA	YPCP001AAEVB
						
Frequency bands (MHz)	698-960, 1710-2690, 3300-3800	698-960, 1710-2690, 3300-3800	698-960, 1710-2690, 3300-3800	698-960, 1710-2690, 3300-3800	600-960, 1710-2690	600-960, 1710-2690
Technology	LTE (4G)	LTE (4G)	LTE (4G)	LTE (4G)	LTE (4G)	LTE (4G)
Cable length (mm)	/	/	/	/	/	/
Connector type	/	/	/	/	/	/
Mounting type	SMD	/	SMD	/	SMD	/
Dimensions (mm)	25 × 7 × 3	140 × 36 × 0.8	25 × 7 × 3	140 × 36 × 0.8	36 × 9 × 3	110 × 45.5 × 0.8
Matched Quectel modules	4G/3G/2G/LPWA					





Product	YPCP003AA	YPCP003AAEVB	YPCP003BA	YMCP001AA	YMCP001AAEVBAA	YMCP001AAEVBBA	YMCP002AA	YMCP002AAEVB
								
Frequency bands (MHz)	698-960, 1695-2200, 2300-2700	698-960, 1695-2200, 2300-2700	698-960, 1695-2200, 2300-2700	698-960, 1710-2700	698-960, 1710-2700	698-960, 1710-2700	600-960, 1710-2690	600-960, 1710-2690
Technology	LTE (4G)	LTE (4G)	LTE (4G)	LTE (4G)	LTE (4G)	LTE (4G)	LTE (4G)	LTE (4G)
Cable length (mm)	/	/	/	/	/	/	/	/
Connector type	/	/	/	/	/	/	/	/
Mounting type	SMD	/	SMD	SMD	Screw	Screw	SMD	/
Dimensions (mm)	28 × 8 × 3	130 × 36	28 × 8 × 3	43.19 × 12.73 × 8.15	145 × 75	∅ 85	40 × 7.23 × 7.6	135 × 43
Matched Quectel modules	4G/3G/2G/LPWA							







The parameters shall be subject to the specification.

# Cellular (4G/3G/2G) antennas

Product	YF0022DA	YF0007KA	YFCA002HA	YF0006PA	YF0028AA
					
Frequency bands (MHz)	700-960, 1710-2170, 2300-2690	600-960, 1427.9-1495.9, 1710-2170, 2300-2700	700-2690	690-2700	698-960, 1700-2700
Technology	LTE (4G)	LTE (4G)	LTE (4G)	LTE (4G)	LTE (4G)
Cable length (mm)	74.5	74.5	86.5	90	150
Connector type	IPEX 1	IPEX 1	IPEX 1	IPEX 1	IPEX 1
Mounting type	Adhesive	Adhesive	Adhesive	Adhesive	Adhesive
Dimensions (mm)	40 × 15 × 0.8	50 × 25 × 0.8	30 × 20	50 × 25	94 × 21
Matched Quectel modules	4G/3G/2G/LPWA				

Product	YECT002AA	YECT003AA	YE0009AA	YPRO0A0AA	YCN001AA
					
IP level	/	/	/	IP66	IP66
Compliant	RoHS	RoHS	RoHS	RoHS	RoHS
Frequency bands (MHz)	600-2700	698-2700	824-2700	700-2700	700-960, 1560-1610, 1710-2700
Technology	LTE (4G)	LTE (4G)	LTE (4G)	LTE (4G)	LTE (4G)
Cable length (mm)	/	/	/	/	/
Connector type	SMA male	SMA male	SMA male	SMA male	SMA male
Mounting type	Terminal	Terminal	Terminal	Terminal	Terminal
Dimensions (mm)	196.2 × 16 × 13	113 × Ø 10	190 × 16	194.3 × 15.95	144 × Ø 13
Matched Quectel modules	4G/3G/2G/LPWA				









Product	YE0013CA	YECT007AA	YE0008BA	YECW000N1A
				
IP level	IP66	IP65	IP53	/
Compliant	RoHS	RoHS and REACH	RoHS and REACH	RoHS
Frequency bands (MHz)	698-2700	700-2690	700-960, 1710-2170	450-470, 700-960, 1710-2690
Technology	LTE (4G)	LTE (4G)	LTE (4G)	LTE (4G)
Cable length (mm)	/	/	/	2000
Connector type	SMA male	N-J	SMA male	SMA male
Mounting type	Terminal	Pole mount	Terminal	Screw
Dimensions (mm)	115.4 × Ø 10.2	Ø 20 × 300	53.5 × Ø 10.5	150 × 50 × 36.5
Matched Quectel modules	4G/3G/2G/LPWA			









Product	YE0010AA	YB0010AA	YE0012AA	YE0006AA	YE0021KA	YECT003W1A
						
IP level	IP66	IP66	IP53	IP65	IP65	IP65
Compliant	RoHS	RoHS	RoHS	RoHS	RoHS and REACH	RoHS and REACH
Frequency bands (MHz)	698-2700	698-2790	698-2700	700-960, 1710-2690	700-960, 1710-2700, 2300-2700	700-960, 1450-2690, 3300-3800
Technology	LTE (4G)	LTE (4G)	LTE (4G)	LTE (4G)	LTE (4G)	LTE (4G)
Cable length (mm)	1000	2000	250	1500	1500	/
Connector type	SMA male	SMA male	SMA male	SMA male	SMA male	SMA male
Mounting type	Adhesive	Magnetic	Adhesive	Magnetic	Magnetic	Terminal
Dimensions (mm)	152 × 18 × 5.9	Ø 84 × 81.5 × 15.5	116.5 × 21.7 × 5.6	318 × Ø 30	110 × Ø 30	12.4 × 50.8
Matched Quectel modules	4G/3G/2G/LPWA					










The parameters shall be subject to the specification.

# GNSS antennas

Product	YC0013AA	YC0013AAEVB	YPGS001AA	YPGS001AAEVB	YCGS010AA
					
Frequency bands (MHz)	1559-1606	1559-1606	1559-1609	1559-1609	1176.45-1278.75, 1575.42
Technology	GNSS L1 (passive)	GNSS L1 (passive)	GNSS L1 (passive)	GNSS L1 (passive)	GNSS L1 & L5 (passive)
Cable length (mm)	/	/	/	/	/
Connector type	/	/	/	/	/
Mounting type	SMD	/	SMD	/	SMD
Dimensions (mm)	3.2 x 1.2 x 0.6	90 x 50 x 1	7.0 x 5.8 x 0.8	80 x 35	5 x 3 x 0.5
Matched Quectel modules	GNSS L1 module series				GNSS L1/L5 module series








Product	YFGC010WWA	YFGC012WWA	YFGC012WWB	YFGC015WWA	YFGC015WWB	YFGC018WWA	YFGC020WWA	YFGC025WWA
								
Frequency bands (MHz)	1565-1586	1565-1586	1559-1586	1559-1606	1559-1606	1559-1606	1559-1606	1559-1606
Technology	GNSS L1	GNSS L1	GNSS L1	GNSS L1	GNSS L1	GNSS L1	GNSS L1	GNSS L1
Cable length (mm)	/	/	/	/	/	/	/	/
Connector type	/	/	/	/	/	/	/	/
Mounting type	Adhesive & soldering	Adhesive & soldering	Adhesive & soldering	Adhesive & soldering	Adhesive & soldering	Adhesive & soldering	Adhesive & soldering	Adhesive & soldering
Dimensions (mm)	10 x 10 x 4	12 x 12 x 4	12 x 12 x 4	15 x 15 x 4	15 x 15 x 4	18.4 x 18.4 x 4	20 x 20 x 4	25 x 25 x 2
Matched Quectel modules	GNSS L1 modules series							


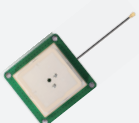
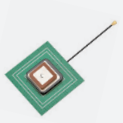



Product	YFGC025WWB	YFGC025WWC	YFGC025WWD	YPA00A0AA	YFGC035WWA	YFGC035WWB	YFGC035WWC	YFGC040WWA
								
Frequency bands (MHz)	1559-1606	1559-1606	1559-1606	Iridium (1616-1626.5)	1559-1606	1559-1606	1559-1606	1559-1606
Technology	GNSS L1	GNSS L1	GNSS L1	GNSS (passive)	GNSS L1	GNSS L1	GNSS L1	GNSS L1
Cable length (mm)	/	/	/	/	/	/	/	/
Connector type	/	/	/	/	/	/	/	/
Mounting type	Adhesive & soldering	Adhesive & soldering	Adhesive & soldering	Adhesive & soldering	Adhesive & soldering	Adhesive & soldering	Adhesive & soldering	Adhesive & soldering
Dimensions (mm)	25 x 25 x 2 (pin offset)	25 x 25 x 4	25 x 25 x 4 (pin offset)	25 x 25 x 4 (Ground plane: 90 x 140 x 0.8)	35 x 35 x 4	35 x 35 x 6	35 x 35 x 6	40 x 40 x 4
Matched Quectel modules	GNSS L1 modules series							







Product	YFGC009WWA	YFGC009WWB	YFGC009WWC	YFGC225WWA	YFGC233WWA	YFGC235WWA	YFGC238WWA	YFGC245WWA	YFGC245WWB
									
Frequency bands (MHz)	1559-1606	1559-1606	1559-1586	1565-1586, 1164-1189	1559-1606, 1164-1189	1559-1606, 1164-1189	1559-1606, 1164-1189	1559-1606, 1164-1189	1559-1606, 1164-1189
Technology	GNSS L1	GNSS L1	GNSS L1	GPS L1 & L5	GNSS L1 & L5	GNSS L1 & L5	GPS L1 & L5	GPS L1 & L5	GPS L1 & L5
Cable length (mm)	/	/	/	/	/	/	/	/	/
Connector type	/	/	/	/	/	/	/	/	/
Mounting type	SMD	SMD	SMD	Adhesive & soldering	Adhesive & soldering	Adhesive & soldering	Adhesive & soldering	Adhesive & soldering	Adhesive & soldering
Dimensions (mm)	15 x 15 x 4	18 x 18 x 4	25 x 25 x 4	25 x 25 x 4 + 18 x 18 x 4	33 x 33 x 4 + 25 x 25 x 4	35 x 35 x 6 + 28 x 28 x 4	38 x 38 x 6 + 28 x 28 x 4	45 x 45 x 6 + 40 x 40 x 4	45 x 45 x 8 + 40 x 40 x 4
Matched Quectel modules	GNSS L1 modules series				GNSS L1 & L5 modules series				

The parameters shall be subject to the specification.

# GNSS antennas

Product	YCGO004AA	YCGO005AA	YCGO006AA	YG0015AA	YCGO008AA	YCGO009AA	YCGO010AA
							
Frequency bands (MHz)	1575.45 ±1.5	1575–1602	1559–1586	1575.42–1602	1575.45 ±1.5	1575–1602	1559–1586
Technology	GNSS L1 (passive)	GNSS L1 (passive)	GNSS L1 (passive)	GNSS L1 (active)	GNSS L1 (active)	GNSS L1 (active)	GNSS L1 (active)
Cable length (mm)	50	50	50	55	55	95	50
Connector type	IPEX MHF I	IPEX MHF I	IPEX MHF I	IPEX MHF I	IPEX MHF I	IPEX MHF I	IPEX MHF I
Mounting type	Buckle	Buckle	Buckle	Buckle	Buckle	Buckle	Buckle
Dimensions (mm)	10 × 10 × 6.3	15 × 15 × 6.2	18 × 18 × 6.3	25 × 25 × 7.76	10 × 10 × 6.3	15 × 15 × 6.2	18 × 18 × 6.3
Matched Quectel modules	GNSS L1 module series						

Product	YCGA014AA	YBS00A1AA	YG0030AA	YFGA003AA	YFGA005AA	YFGA006AA
						
Frequency bands (MHz)	GPS L5: 1176.45; GPS L1: 1575.42; GLONASS L1: 1602	1164–1189, 1565–1606	1164–1189, 1565–1586	1559–1609	1560–1605	1160–1270, 1560–1605
Technology	GNSS L1 & L5 (active)	GNSS L1 & L5 (active)	GNSS L1 & L5 (passive)	GNSS L1 (passive)	GNSS L1 (passive)	GNSS L1 & L2 & L5 & L6 (passive)
Cable length (mm)	100	60	60	100	100.5	143
Connector type	IPEX MHF I	IPEX MHF I	IPEX MHF I	RFI	IPEX I	IPEX I
Mounting type	Buckle	Buckle	Buckle	Adhesive	Adhesive	Adhesive
Dimensions (mm)	18 × 18 × 4 + 25 × 25 × 4	58.7 × 58.7 × 14	18 × 18 × 4 + 25 × 25 × 4	39.45 × 13.25	61.15 × 11.24	74.5 × 24.5
Matched Quectel modules	GNSS L1/L5 module series			GNSS L1 module series		GNSS L1/L5 module series

Product	YEGB000Q1C	YEGB000Q1A	YEGB001Q1A	YEGN000Q1A	YEGN001Q1A	YETN001L1A
						
IP level	IP 67	IP 67	IP 67	IP 67	IP 67	IP67, IK09
Compliant	RoHS and REACH	RoHS and REACH	RoHS and REACH	RoHS and REACH	RoHS and REACH	RoHS and REACH
Frequency bands (MHz)	1565–1606	1164–1189, 1559–1606	1164–1189, 1559–1606	1164–1189, 1559–1606	1164–1189, 1559–1606	GNSS L1: 1559–1606; L-Band: TX: 1626.5–1660.5, 1668–1675; RX: 1518–1559
Technology	GNSS L1 & B1 & G1 (active)	GNSS L1 & L5 (active)	GNSS L1 & L5 (active)	GNSS	GNSS	Satellite L-Band, GNSS L1 Iridium antenna
Cable length (mm)	3000	3000	3000	3000	3000	524 ±24
Connector type	SMA male	SMA male	SMA male	SMA male	SMA male	SMA male
Mounting type	Magnetic and adhesive	Magnetic and adhesive	Magnetic and adhesive	Bracket	Bracket	Screw
Dimensions (mm)	46 × 36 × 15.8	60 × 56 × 22.6	55.2 × 48 × 20.5	62 × 56 × 23	55.2 × 48 × 20.5	106.15 × 87.21 × 26.5
Matched Quectel modules	GNSS L1 module series	GNSS L1/L5 module series			CC200A-LB and GNSS L1 module series	







Product	YEGT000W8A	YG0063AA	YEGT001BA	YEGT002BA
				
IP level	IP 67	IP65	IP53	IP53
Compliant	RoHS	RoHS	RoHS	RoHS and REACH
Frequency bands (MHz)	1164–1189, 1559–1606	GPS L1/L2/L5; BDS B1/B2/B3; GLONASS L1/L2; Galileo E1/E5a/E5b/E6; L-band	1561 ±5, 1575 ±5, 1602 ±5	1559–1606
Technology	Timing GNSS L1 & L5 (active)	GNSS full bands + L-band corrections (active)	GNSS L1 (passive)	GNSS L1 (passive)
Cable length (mm)	/	/	/	/
Connector type	TNC-K	TNC-K	SMA male	SMA male
Mounting type	Screw	Thread	Terminal	Terminal
Dimensions (mm)	∅ 65 × 45	∅ 165 × 68.8	53 × 16.4	53.5 × ∅10.5
Matched Quectel modules	Timing L1/L5 module series	/	All GNSS L1 modules	

The parameters shall be subject to the specification.



# Wi-Fi & Bluetooth antennas

Product	YC0009AA	YC0009AAEVB	YC0010AA	YC0010AAEVB	YXU00A0AA	YC0011AA	YFBC001WWA
							
Frequency bands (MHz)	2400-2500	2400-2500	2400-2500	2400-2500	2400-2500, 5150-7150	2400-2500, 5150-5850	2400-2500, 5150-5850, 5925-7125
Technology	Wi-Fi (Bluetooth)	Wi-Fi (Bluetooth)	Wi-Fi (Bluetooth)	Wi-Fi (Bluetooth)	Wi-Fi (Bluetooth)	Wi-Fi (Bluetooth)	Wi-Fi (Bluetooth)
Cable length (mm)	/	/	/	/	/	/	/
Connector type	/	/	/	/	/	/	/
Mounting type	SMD	/	SMD	/	SMD	SMT	SMD
Dimensions (mm)	3.2 x 1.6 x 0.5	90 x 50	5.2 x 2.0 x 1.2	90 x 50	8.0 x 6.6 x 1.6	5 x 2 x 1	1.6 x 0.8 x 0.4
Matched Quectel modules	FC30R				All Wi-Fi/BT modules		

Product	YF0011KA	YF0011SA	YF0023FA	YF0023GA	YF0023HA	YF0023IA
						
Frequency bands (MHz)	2400-2500, 5150-5850	2400-2500, 5150-5850	2400-2500, 4900-5850, 5925-7125	2400-2500, 4900-5850, 5925-7125	2400-2500, 4900-5850, 5925-7125	2400-2500, 4900-5850, 5925-7125
Technology	Wi-Fi 6 (Bluetooth)	Wi-Fi 6 (Bluetooth)	Wi-Fi 6E (Bluetooth)	Wi-Fi 6E (Bluetooth)	Wi-Fi 6E (Bluetooth)	Wi-Fi 6E (Bluetooth)
Cable length (mm)	50.5	100	100	100	100	100
Connector type	IPEX 1	IPEX MHF 4L	IPEX MHF I	IPEX MHF IV	IPEX MHF I	IPEX MHF IV
Mounting type	Adhesive	Adhesive	Adhesive & soldering	Adhesive & soldering	Adhesive & soldering	Adhesive & soldering
Dimensions (mm)	38.9 x 9	38.9 x 9	37.80 x 7.50	37.80 x 7.50	22.90 x 11.70	22.90 x 11.70
Matched Quectel modules	All Wi-Fi/BT modules (except Wi-Fi 6E)			All Wi-Fi/BT modules		




Product	YF0026AA	YF0026LA	YF0027AA	YF0027CA	YF0029AA	YF0029CA
						
Frequency bands (MHz)	2400-2500, 4900-5850, 5925-7125	2400-2500, 5150-5850, 5925-7125	2400-2500, 5150-5850, 5925-7125	2400-2500, 5150-5850, 5925-7125	2400-2500, 5150-5850, 5925-7125	2400-2500; 5150-5850; 5925-7125
Technology	Wi-Fi 6E (Bluetooth)	Wi-Fi 6E (Bluetooth)	Wi-Fi 6E (Bluetooth)	Wi-Fi 6E (Bluetooth)	Wi-Fi 6E (Bluetooth)	Wi-Fi 6E (Bluetooth)
Cable length (mm)	100	100	100	100	100	100
Connector type	IPEX MHF I	IPEX MHF IV	IPEX MHF I	IPEX MHF IV	IPEX MHF I	IPEX MHF IV
Mounting type	Adhesive	Adhesive & soldering	Adhesive	Adhesive	Adhesive	Adhesive
Dimensions (mm)	28.9 x 11	28.9 x 11	38 x 7	38 x 7	29.98 x 30.85	29.98 x 30.85
Matched Quectel modules	All Wi-Fi/BT modules					




Product	YE0031BA	YE0032BA	YEWNO01AA	YEWTO04AA	YEWNO18AA	YEWMO01AA
						
IP level	IP53	IP53	/	/	/	IP53
Compliant	RoHS and REACH	RoHS and REACH	RoHS	RoHS	RoHS	RoHS
Frequency bands (MHz)	2400-2500, 5150-5850	2400-2500, 5150-5850	2400-2500, 5150-5850	2400-2500, 5150-7150	2400-2500, 5150-5850, 5925-7125	2400-2500
Technology	Wi-Fi 6 (Bluetooth)	Wi-Fi 6 (Bluetooth)	Wi-Fi 6 (Bluetooth)	Wi-Fi 6E (Bluetooth)	Wi-Fi	Wi-Fi (Bluetooth)
Cable length (mm)	/	/	/	/	/	1500
Connector type	SMA male	SMA elbow male	RP-SMA male	SMA male	SMA male	SMA male
Mounting type	Terminal	Terminal	Terminal	Terminal	Terminal	Magnetic
Dimensions (mm)	53.5 x Ø 10.5	50 x 16.7 x 10.5	200 x Ø 13	109 x Ø 10	Ø13 x 201	Ø 30 x 77.4
Matched Quectel modules	All Wi-Fi/BT modules (except Wi-Fi 6E)			Wi-Fi 4/5/6/6E modules		FC30R

The parameters shall be subject to the specification.









# Combo antennas

Product	YEMN017AA	YEMN926J1A	YEMN016AA	YB0027AA	YEMA013AA
					
IP level	IP67, IP69K	IP67, IP69K	IP67, IP69K	IP67, IP69K	IP67, IP69K
Compliant	/	RoHS and REACH	/	/	/
Frequency bands (MHz)	LMH: 600-960, 1400-6000; MH: 1400-6000; GNSS: 1164-1189, 1559-1606	LMH: 600-960, 1400-6000; MH: 1400-6000; GNSS: 1164-1189, 1559-1606	LMH: 600-960, 1400-6000; MH: 1400-6000; GNSS: 1164-1189, 1565-1606	LMH: 600-960, 1400-6000; MH: 1400-6000; GNSS: 1164-1189, 1559-1606	LMH: 600-960, 1400-6000; MH: 1400-6000; GNSS: 1164-1189, 1559-1606
Technology	5G & GNSS	5G & GNSS	4 x 4 5G /4G MIMO + GPS L1 & L5	5G & GNSS	5G & GNSS
Cable length (mm)	300	300	300	300	300
Connector type	SMA male	SMA male	SMA	SMA male	SMA male
Mounting type	Screw	Screw	Screw	Screw	Adhesive
Dimensions (mm)	∅ 103.5 × 42.5	∅ 167 × 57	204.4 × 86.7 × 32	∅ 162 x56	264.6 × 161.2 × 30.6
Matched Quectel modules	All 5G/4G/3G/2G modules & GNSS L1 & L5 modules				

Product	YEMN302Q1A	YB0031AA	YEMA003AA	YEMA300QXA	YB0015AA	YEWN004AA
						
IP level	IP 67	IP66	IP66	IP67	IP66	IP66
Compliant	RoHS and REACH	RoHS	RoHS	RoHS and REACH	RoHS	RoHS
Frequency bands (MHz)	4G x 2: 700-960, 1710-2690; GNSS: 1565-1606	4G: 698-960, 1710-2690; GNSS: 1559-1592	4G MAIN: 700-960, 1710-2690; GNSS: 1575.42 ±5, 1561.098 ±5	4G: 700-960, 1700-2700; Wi-Fi: 2400-2500, 5150-5850; GNSS: 1559-1606	4G: 698-960, 1710-2690; Wi-Fi: 2400-2500; GNSS: 1556-1581	2400-2500, 5150-5850
Technology	LTE & GNSS	LTE & GNSS	LTE & GNSS	4G & Wi-Fi & GNSS	LTE/GPS & BD/Wi-Fi	Wi-Fi MIMO
Cable length (mm)	4G/4G DIV/GNSS: 1000	300	3000	1028 ±28	300	300
Connector type	SMA male	SMA male	4G: FAKRA D; GNSS: FAKRA C	SMA male & RP SMA male & SMA male	SMA male	SMA male
Mounting type	Screw	Adhesive	Adhesive	Adhesive	Screw	Screw
Dimensions (mm)	81.4 × 16.5	∅ 84 × 17.5	∅ 84 × 17.5	143.73 × 51.33 × 15	∅ 54 × 91	∅ 46 × 15
Matched Quectel modules	Combo	All 4G/3G/2G modules & GNSS L1 modules		All 4G/3G/2G modules & GNSS L1 modules & Wi-Fi 6/BT modules (except Wi-Fi 6E)	All Wi-Fi/BT modules (except Wi-Fi 6E)	






Product	YFCO002AA	YFWO01AA	YFMP200WWA
			
Frequency bands (MHz)	600-6000	2400-2500, 5150-7150	Wi-Fi: 2400-2500; GNSS: 1560-1580
Technology	4G & 5G	Wi-Fi/Bluetooth	Wi-Fi & GNSS
Cable length (mm)	150	100	/
Connector type	IPEX I	IPEX I	/
Mounting type	Adhesive	Adhesive	SMD
Dimensions (mm)	237 × 22	78.6 × 21.4	3.2 × 1.6 × 0.6
Matched Quectel modules	5G/4G/3G/2G/LPWA	All Wi-Fi/BT modules	Wi-Fi & GNSS 2-in-1

# ISM antennas

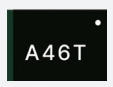
Product	YE0019AA	YEIM001AA	YEINO02AA	YFOA004AA	YFNF915F3AM	YFNF868F3AM	YCIS001AA	YFNP017WWA
								
IP level	/	/	/	/	/	/	/	/
Compliant	RoHS	RoHS and REACH	/	/	/	/	/	/
Frequency bands (MHz)	450-470	470-510	863-928	410-470	915	868	863-870	860-880, 900-930, 790-960
Technology	ISM	ISM	ISM	ISM	ISM	ISM	ISM	ISM
Cable length (mm)	/	2000	/	100	150	150	/	/
Connector type	SMA male	SMA male	SMA male	IPEX MHF 1	RF 1	RF 1	/	/
Mounting type	Terminal	Magnetic	Terminal	Adhesive	Adhesive	Adhesive	SMD	SMT
Dimensions (mm)	109 × ∅10	∅ 30 × 131	∅ 13 × 195	100 × 20	120.2 × 25	70 × 40	5.0 × 3.0 × 0.5	25 × 7 × 3

The parameters shall be subject to the specification.









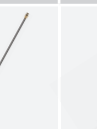
# ISM antennas




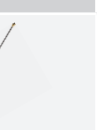

Product	YSIS001AA	YPCS002AA	YPCS002AAEVB	YPCS002BA	YPCS002BAEVB	YMCP003AA	YMCP003AAEVBAA	YMCP003AAEVBBA
								
Frequency bands (MHz)	433-435 (Compatible with B31 and B88)	791-960	791-960	791-960	791-960	790-960	790-960	790-960
Technology	ISM	ISM	ISM	ISM	ISM	ISM	ISM	ISM
Cable length (mm)	/	/	/	/	/	/	/	/
Connector type	/	/	/	/	/	/	/	/
Mounting type	SMD	SMD	/	SMD	/	SMD	/	/
Dimensions (mm)	29 × 7 × 7	20 × 11 × 1.6	115 × 35 × 0.8	20 × 11 × 1.6	115 × 35 × 0.8	40.99 × 6.68 × 3.99	120 × 45	∅ 80

# Tuner

Product	YSOS001AA
	
Frequency bands (MHz)	≥ 0.1 GHz
Technology	Antenna tuner
Cable length (mm)	/
Connector type	/
Mounting type	SMD
Dimensions (mm)	1.1 × 1.5
Matched Quectel modules	Consult with Quectel for module information

# Cable assemblies

Product	YM0003AA	YM0015AA	YM0003CA	YM0003AB	YM0013AA	YSAN025AA	YSAN026AA	YSAN027AA	YSAN028AA
									
Frequency bands (MHz)	DC-6000	DC-6000	DC-6000	DC-6000	DC-6000	DC-6000	DC-6000	DC-6000	DC-6000
Technology	Cable	Cable	Cable	Cable	Cable	Cable	Cable	Cable	Cable
Cable length (mm)	100	150	200	200	300	100/150/200/250/300	100/150/200/250/300	150/200/250/300	100/150/200/250/300
Connector type	SMA female to IPEX I	SMA female to IPEX I	SMA female to IPEX I	RP SMA female to IPEX I	SMA female to IPEX I	SMA female to IPEX I	RP SMA female to IPEX MHF I	SMA female to IPEX MHF 4L	RP SMA female to IPEX MHF 4L
Mounting type	Screw	Screw	Screw	Screw	Screw	Screw	Screw	Screw	Screw
Dimensions (mm)	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13

Product	YSAN027FA	YSAN028FA	YSAO001AA	YSAO002AA	YBY00A0IA
					
Frequency bands (MHz)	DC-6000	DC-6000	DC-6000	DC-6000	/
Technology	Cable	Cable	Cable	Cable	Bracket
Cable length (mm)	150/200/250/300	100/150/200/250/300	100	100	/
Connector type	SMA female to IPEX IV	RP SMA female to IPEX MHF 4L	IPEX MHF I	IPEX MHF I	/
Mounting type	Screw	Screw	Screw	Screw	/
Dimensions (mm)	1.13	1.13	1.13	1.13	80 × 60 × 86

The parameters shall be subject to the specification.

**Europe**

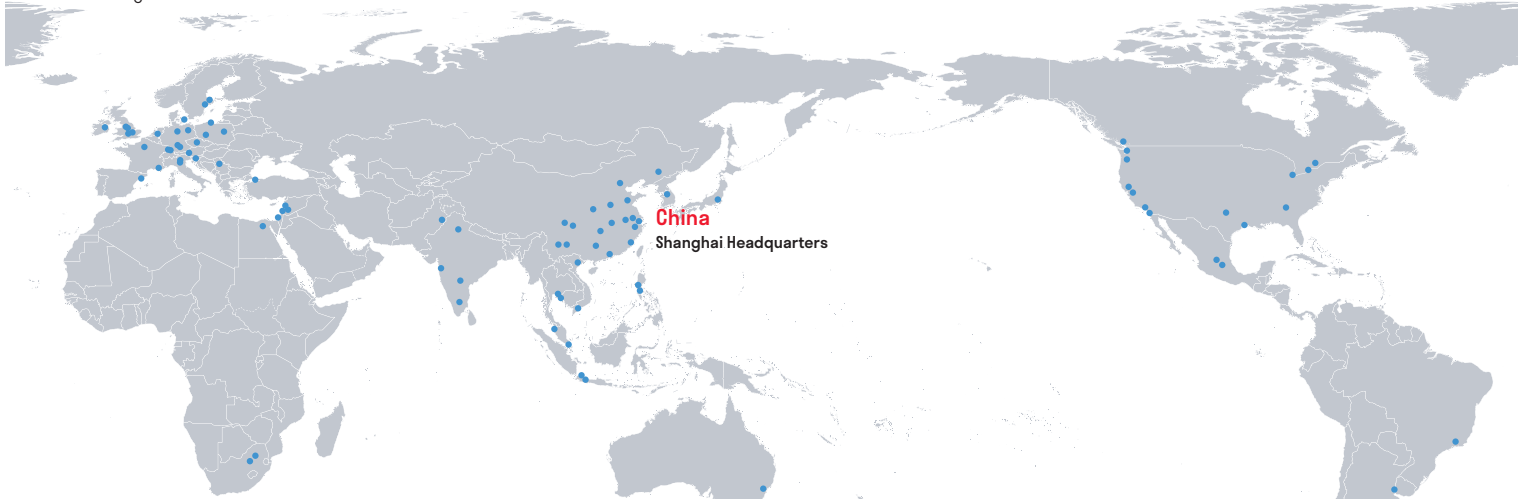
**Czech Republic:** Prague  
**Denmark:** Copenhagen  
**France:** Nice/Paris  
**Germany:** Augsburg/Berlin/Hannover/Munich  
**Ireland:** Navan  
**Italy:** Casatenovo/Milan  
**Poland:** Gdynia/Warsaw/Wroclaw  
**Serbia:** Belgrade

**Slovenia:** Ljubljana  
**Spain:** Barcelona  
**Sweden:** Sollentuna/Stockholm  
**Switzerland:** Zurich  
**The Netherlands:** Eindhoven  
**Turkey:** Istanbul  
**UK:** Birmingham/London/Manchester/Oxford

**North America**

**Canada:**  
 Mississauga/Toronto, ON  
 Vancouver, B.C

**United States:**  
 Alpharetta, GA  
 Chicago, IL  
 Houston/Round Rock/San Marcos, TX  
 Irvine/Orange County/San Diego/  
 Scotts Valley/Silicon Valley, CA  
 Point Roberts, WA



**Israel / Africa**

**Israel:** Tel Aviv  
**South Africa:** Gauteng/Johannesburg  
**Egypt:** Cairo

**Asia Pacific**

**Australia:** Melbourne/Sydney  
**India:** Bangalore/Delhi/Hyderabad/Mumbai  
**Indonesia:** Bandung/Jakarta  
**Japan:** Tokyo  
**Korea:** Seoul  
**Malaysia:** Penang

**Pakistan:** Lahore  
**Philippines:** Manila/Pasay City  
**Singapore**  
**Thailand:** Bangkok/Samutprakarn  
**Vietnam:** Hanoi/Ho Chi Minh City

**Latin America**

**Argentina:** Buenos Aires  
**Brazil:** Sao Paulo  
**Mexico:** Mexico City / Queretaro

50+ sales offices, 8 R&D centers globally  
 90+ distributors  
 Serving 7000+ customers  
 Modules are sold to 150+ countries and regions

**Overseas**

**Africa**  
 Email: africa-sales@quectel.com

**ANZ**  
 Email: anz-sales@quectel.com

**Benelux**  
 Email: benelux-sales@quectel.com

**Brazil**  
 Email: brazil-sales@quectel.com

**CIS**  
 Email: cis-sales@quectel.com

**DACH**  
 Email: dach-sales@quectel.com

**East-Europe**  
 Email: east-europe-sales@quectel.com

**France**  
 Email: france-sales@quectel.com

**Iberia**  
 Email: iberia-sales@quectel.com

**India**  
 Email: india-sales@quectel.com

**Israel**  
 Email: israel-sales@quectel.com

**Italy**  
 Email: italy-sales@quectel.com

**Japan**  
 Email: japan-sales@quectel.com

**Korea**  
 Email: korea-sales@quectel.com

**Latin America**  
 Email: latin-america-sales@quectel.com

**Middle East**  
 Email: middle-east-sales@quectel.com

**Nordic**  
 Email: nordic-sales@quectel.com

**North America**  
 Email: north-america-sales@quectel.com

**S.E.A**  
 Email: sea-sales@quectel.com

**South East Europe**  
 Email: see-sales@quectel.com

**Turkey**  
 Email: turkey-sales@quectel.com

**UK & Ireland**  
 Email: uk-sales@quectel.com

**Headquarters**

Building 5, Shanghai Business Park Phase III (Area B),  
 No.1016 Tianlin Road, Minhang District, Shanghai 200233, China  
 Tel: +86 21 5108 6236

**Hefei R&D Center**

Building 1-C, China Speech Valley Area A, 3335 Xiyu Road,  
 High-tech Zone, Hefei, Anhui 230088, China  
 Tel: +86 551 6586 9386

**Vancouver R&D Center**

1355-1 Commerce Pkwy Unit 100,  
 Richmond, BC Canada

**Shanghai R&D Center**

Building 13, Shanghai Business Park Phase III (Area B),  
 No.1016 Tianlin Road, Minhang District, Shanghai 200233, China  
 Tel: +86 21 5108 6236

**Foshan R&D Center**

Floor 9, Building 2, Sanshan Science and Technology Innovation Center, No. 12,  
 Gangkou Road, Sanshan New City, Guicheng Street, Nanhai District, Foshan,  
 Guangdong 528200, China  
 Tel: +86 757 6663 6236

**Belgrade R&D Center**

3rd Floor, Danube Business Center, Bulevar Mihaila Pupina 10L,  
 11070 New Belgrade, Serbia

**Guilin R&D Center**

Floor 4, Building 9, Guilin Electric Valley, Chaoyang Road,  
 Qixing District, Guilin, Guangxi 541004, China  
 Tel: +86 773 5886 236

**Wuhan R&D Center**

Floor 4-5, A2 Huaxiang Center, 776 Gaoxin Avenue, Donghu New Technology  
 Development Zone, Hongshan District, Wuhan City, Hubei 430074, China  
 Tel: +86 027 6552 9333

**Penang R&D Center**

1C-1-01 One Precinct, Lengkok Mayang Pasir, 11900 Bayan Lepas, Pulau  
 Pinang, Malaysia