



# THE DATASHEET OF LC79HALMD



# **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

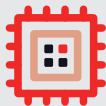
Quectel's passion for a smarter world drives us to accelerate IoT innovation. A highly customer-centric organization, we are a global IoT solutions provider backed by outstanding support and services. Our growing global team of 5,900 professionals sets the pace for innovation in cellular, GNSS, Wi-Fi 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  
Short Range

### Smart



5G  
4G  
Edge Compute

### Short Range



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



Cellular  
Short Range  
GNSS  
Automotive Antenna  
Customized Design and Service

### Services



Certification & Testing Services

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# 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  
Consumers 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  
UAV  
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*	RG650V*	RM550V-GL	
				
Form Factor	LGA	LGA	M.2	
Dimensions (mm)	46.0 × 53.0 × 3.05	46.0 × 53.0 × 3.05	52.0 × 30.0 × 2.3	
5G	Sub-6 GHz	Sub-6 GHz	Sub-6 GHz	
Frequency Bands (MHz)	-EU (EMEA/ APAC/ Brazil)	/	/	
	-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; LAA: B46 (Rx)	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; LAA: B46 (Rx)	/
	-GL (Global)	/	/	
Weight (approx.) g	17.3	TBD	TBD	
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	
Data Transmission				
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)	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)	
LTE	LTE-FDD: Max. 2.0 Gbps (DL)/Max. 211 Mbps (UL)	LTE-FDD: 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) (RG650V-EU)	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	
Interfaces				
(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 × 2 (eSIM optional)	
UART	× 3	× 3	/	
USB	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	1-Lane × 1	
PCM	× 2	× 2	/	
I2C	× 2	× 2	/	
SPI	× 2	× 2	/	
GPIO	•	•	•	
ADC	•	•	/	
SD Card	/	/	/	
RESET_N	•	•	•	
Antenna	Sub-6 GHz: × 8; GNSS: × 1	Sub-6 GHz: × 8; GNSS: × 1	Sub-6 & GNSS × 4	
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	
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	Optional	Optional	Optional	
(U)SIM Card Detection	•	•	•	
Electrical Features				
Supply Voltage Range	3.3-4.4 V, typ. 3.8 V	3.3-4.4 V, typ. 3.8 V	3.135-4.4 V, typ. 3.7 V	
Power Consumption	TBD	TBD	TBD	
Software Features				
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	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	NDIS Driver*: Windows 7/8/8.1/10/11	NDIS Driver*: Windows 7/8/8.1/10/11	NDIS Driver*: Windows 7/8/8.1/10/11	
MBIM Driver	Windows 8/8.1/10/11, Linux 3.18-6.5	Windows 8/8.1/10/11, Linux 3.18-6.5	Windows 8/8.1/10/11, Linux 3.18 ~ 6.5	
Gobinet Driver	Gobinet Driver*: Linux 2.6-6.5	Gobinet Driver*: Linux 2.6-6.5	Gobinet Driver*: Linux 2.6-6.5	
QMI_WWAN Driver	Linux 3.4-6.5	Linux 3.4-6.5	Linux 3.4-6.5	
PCIe Driver	Linux 3.10-6.5	Linux 3.10-6.5	Linux 3.10-6.5	
Certifications <sup>1</sup>	GCF*/PTCRB*/FCC*/IC*/ATT*/VR2*/TMO*	CE*/RCM*/GCF*/PTCRB*/FCC*/IC*/ATT*/VR2*/TMO*	FCC*/IC*/GCF*/PTCRB*	
Recommended Applications	Industrial routers, industrial PDAs, rugged tablet PCs and digital signage			

Note 1: May depend on modules' variant.

\* Under development  
• Supported

# 5G NR Modules

Product	RG520N	RG520F	RG525F	RG530F	
					
Form Factor	LGA	LGA	LGA	LGA	
Dimensions (mm)	41.0 x 44.0 x 2.75	41.0 x 44.0 x 2.75	48.0 x 45.0 x 2.85	48.0 x 45.0 x 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: n1/3/5/7/8/20/28/38/40/41/75/76/77/78/251/258/260/261; 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: 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; 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: n2/5/7/12/13/14/25/26/29/30/38/41/48/66/70/71/77/78/251/258/260/261; 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: B40/42/43; 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>3</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 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(Mbps)	WCDMA: Max. 42 (DL)/Max. 5.76 (UL) (RG520N-EU/RG520N-EB/RG520N-LA)	WCDMA: Max. 42 (DL)/Max. 5.76 (UL) (RG520F-EU)	/	WCDMA: Max. 42 (DL)/Max. 5.76 (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	3.3-4.4 V, typ. 3.8 V	3.3-4.4 V, typ. 3.8 V	3.3-4.4 V, typ. 3.8 V	3.3-4.4 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, 3.96 mA @ Sleep, 33.5 mA @ USB 2.0, Idle, 50.58 mA @ USB 3.0, Idle	
Software Features					
USB Serial Driver	Windows 7/8/8.1/10/11, Linux 2.6-6.3, Android 4.x ~ 13	Windows 7/8/8.1/10/11, Linux 2.6-6.3, Android 4.x ~ 13	Windows 7/8/8.1/10/11, Linux 2.6-6.3, Android 4.x ~ 13	Windows 7/8/8.1/10/11, Linux 2.6-6.3, 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 7/8/8.1/10/11	Windows 7/8/8.1/10/11	Windows 7/8/8.1/10/11	Windows 7/8/8.1/10/11	
MBIM Driver	Windows 8/8.1/10/11, Linux 3.18-6.3	Windows 8/8.1/10/11, Linux 3.18-6.3	Windows 8/8.1/10/11, Linux 3.18-6.3	Windows 8/8.1/10/11, Linux 3.18-6.3	
Gobinet Driver	Linux 2.6-6.3	Linux 2.6-6.3	Linux 2.6-6.3	Linux 2.6-6.3	
QMI_WWAN Driver	Linux 3.4-6.3	Linux 3.4-6.3	Linux 3.4-6.3	Linux 3.4-6.3	
PCIe Driver	Windows 10/11, Linux 3.10-6.3	Windows 10/11, Linux 3.10-6.3	Windows 10/11, Linux 3.10-6.3	Windows 10/11, Linux 3.10-6.3	
Certifications <sup>4</sup>	CE/RCM/FCC/IC/Anatel/GCF/PTCRB/Telstra/T-Mobile/AT&T	CE/RCM/UKCA/FCC/GCF/PTCRB	GCF/PTCRB/FCC/IC/Rogers	TBD	
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.

\* Under development

• Supported

Product		RM520N	RM530N-GL	RM521F-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/mmWave	Sub-6 GHz
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	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
	-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	8.8±0.1
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
Data Transmission <sup>2</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. 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)	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)
LTE		LTE-FDD: Max. 1.6 Gbps (DL)/Max. 200 Mbps (UL)	LTE-FDD: Max. 1.6 Gbps (DL)/Max. 200 Mbps (UL)	LTE-FDD: Max. 2.0 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
Interfaces				
(U)SIM		× 2	× 2	× 2
USB		2.0/3.0/3.1	2.0/3.0/3.1	2.0/3.0/3.1
PCIe		PCIe 3.0	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	Sub-6/GNSS: 4+1 (optional)
Enhanced Features				
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
Voice		Optional <sup>3</sup>	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		GPS/GLONASS/BDS/Galileo/QZSS	GPS/GLONASS/BDS/Galileo/QZSS	GPS/GLONASS/BDS/Galileo/QZSS
(U)SIM Card Detection		•	•	•
Electrical Features				
Supply Voltage Range		3.135~4.4 V, typ. 3.7 V	3.135~4.4 V, typ. 3.7 V	3.135~4.4 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	TBD
Software Features				
USB Serial Driver		Windows 7/8/8.1/10/11, Linux 2.6~6.3, Android 4.x ~ 13	Windows 7/8/8.1/10/11, Linux 2.6~6.3, Android 4.x ~ 13	Windows 7/8/8.1/10/11, Linux 2.6~6.3, 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 7/8/8.1/10/11	Windows 7/8/8.1/10/11	Windows 7/8/8.1/10/11
MBIM Driver		Windows 8/8.1/10/11, Linux 3.18~6.3	Windows 8/8.1/10/11, Linux 3.18~6.3	Windows 8/8.1/10/11, Linux 3.18~6.3
Gobinet Driver		Linux 2.6~6.3	Linux 2.6~6.3	Linux 2.6~6.3
QMI_WWAN Driver		Linux 3.4~6.3	Linux 3.4~6.3	Linux 3.4~6.3
PCIe Driver		Windows 10/11, Linux 3.10~6.3	Windows 10/11, Linux 3.10~6.3	Windows 10/11, Linux 3.10~6.3
Certifications <sup>3</sup>		T-Mobile/Verizon/AT&T/NTT DOCOMO/Deutsche Telekom/ Telstra/GCF/PTCRB/CE/Anatel/CCC/RCM/IC/FCC/JATE/TELEC/KC/ NCC/Telefónica/SRRC/KT	TBD	FCC*/IC*/GCF*/PTCRB*
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.

\* Under development  
• 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
Data Transmission <sup>1</sup>			
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
Interfaces			
(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
RGMII	•	•	•
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
Enhanced Features			
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	•	•	•
Electrical Features			
Supply Voltage Range	3.3~4.3 V, typ. 3.8 V	3.3~4.3 V, typ. 3.8 V	3.3~4.3 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
Software Features			
USB Serial Driver	Windows 7/8/8.1/10/11, Linux 2.6~6.3, Android 4.x ~ 13	Windows 7/8/8.1/10/11, Linux 2.6~6.3, Android 4.x ~ 13	Windows 7/8/8.1/10/11, Linux 2.6~6.3, 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 7/8/8.1/10/11	Windows 7/8/8.1/10/11	Windows 7/8/8.1/10/11
MBIM Driver	Windows 8/8.1/10/11, Linux 3.18~6.3	Windows 8/8.1/10/11, Linux 3.18~6.3	Windows 8/8.1/10/11, Linux 3.18~6.3
Gobinet Driver	Linux 2.6~6.3	Linux 2.6~6.3	Linux 2.6~6.3
QMI_WWAN Driver	Linux 3.4~6.3	Linux 3.4~6.3	Linux 3.4~6.3
PCIe Driver	Windows 10/11, Linux 3.10~6.3	Windows 10/11, Linux 3.10~6.3	Windows 10/11, Linux 3.10~6.3
Certifications <sup>3</sup>	China Telecom/China Mobile/China Unicom/KT/SKT/LGU+/CE/ SRRC/NAL/CCC/KC/JATE/TELEC/RCM	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.

\* Under development  
• 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
Data Transmission <sup>1</sup>			
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
Interfaces			
(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
Enhanced Features			
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	•	•	•
Electrical Features			
Supply Voltage Range	3.135~4.4 V, typ. 3.7 V	3.135~4.4 V, typ. 3.7 V	3.135~4.4 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
Software Features			
USB Serial Driver	Windows 7/8/8.1/10/11, Linux 2.6~6.3, Android 4.x ~ 13	Windows 7/8/8.1/10/11, Linux 2.6~6.3, Android 4.x ~ 13	Windows 7/8/8.1/10/11, Linux 2.6~6.3, 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 7/8/8.1/10/11	Windows 7/8/8.1/10/11	Windows 7/8/8.1/10/11
MBIM Driver	Windows 8/8.1/10/11, Linux 3.18~6.3	Windows 8/8.1/10/11, Linux 3.18~6.3	Windows 8/8.1/10/11, Linux 3.18~6.3
Gobinet Driver	Linux 2.6~6.3	Linux 2.6~6.3	Linux 2.6~6.3
QMI_WWAN Driver	Linux 3.4~6.3	Linux 3.4~6.3	Linux 3.4~6.3
PCIe Driver	Windows 10/11, Linux 3.10~6.3	Windows 10/11, Linux 3.10~6.3	Windows 10/11, Linux 3.10~6.3
Certifications <sup>4</sup>	GCF/CE/PTCRB/FCC/IC/NCC/JATE/TELEC/RCM/Deutsche Telecom/AT&T-Mobile/Verizon/Telus/Telstra	GCF/CE/SRRC/NAL/CCC/KC/RCM/Deutsche Telecom/China Telecom/China Mobile/China Unicom/KT/SKT/LGU+	FCC/IC/GCF/PTCRB/CE/RCM
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.

\* Under development



• Supported

# 5G NR Modules

Product	RG255C	RM255C-GL*
		
Form Factor	LGA	M.2
Dimensions (mm)	29.0 × 32.0 × 2.4	42.0 × 30.0 × 2.3
5G	5G RedCap	5G RedCap
Frequency Bands (MHz)	-NA(North America) 5G: n2/5/7/12/13/14/25/26/30/38/41/48/53*/66/70/71/77/78; LTE-FDD: B2/4/5/7/12/13/14/17/25/26/30/66/71; LTE-TDD: B38/41/42/43/48	/
	-EU(EMEA/APAC*/Brazil) 5G: n1/3/5/7/8/20/28/38/40/41/77/78; LTE-FDD: B1/3/5/7/8/20/28/71; LTE-TDD: B38/40/41/42/43	/
	-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: B1/2/3/4/5/7/8/12/13/14/17/18/19/20/25/26/28/30/66/71; 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	TBD
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
Data Transmission		
5G(Mbps)	Max. 220 (DL)/ 100 (UL)(RG255C-GL*); Max. 150 (DL)/ Max. 50 (UL)(RG255C-NA/RG255C-EU);	Max. 220 (DL)/ 100 (UL)
LTE(Mbps)	Max. 150 (DL)/ 50 (UL)	Max. 150 (DL)/ 50 (UL)
UMTS(Mbps)	/	/
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
Interfaces		
(U)SIM	× 2	× 2
USB	2.0	2.0
PCIe	PCIe Gen2 × 1 Lane	PCIe Gen2 × 1 Lane
PCM	•	•
GPIO	•	/
RESET_N	•	•
Antenna	Cellular × 2, GNSS × 1	Cellular × 2, GNSS × 1
Enhanced Features		
MIMO	/	/
Voice	Optional	Optional
DTMF	•	•
DFOTA	•	•
GNSS	GPS/GLONASS/BDS/Galileo/QZSS	GPS/GLONASS/BDS/Galileo/QZSS
(U)SIM Card Detection	•	•
Electrical Features		
Supply Voltage Range	3.3~4.3 V, typ. 3.8 V	3.135~4.4 V, typ. 3.7 V
Power Consumption	TBD	TBD
Software Features		
USB Serial Driver	Windows 7/8/8.1/10/11, linux 2.6~6.3, Android 4.x~ 13	Windows 7/8/8.1/10/11, linux 2.6~6.3, 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 7/8/8.1/10/11	Windows 7/8/8.1/10/11
MBIM Driver	Windows 8/8.1/10/11, Linux 3.18~6.3	Windows 8/8.1/10/11, Linux 3.18~6.3
Gobinet Driver	Linux 2.6~ 6.3	Linux 2.6~ 6.3
OMI WWAN Driver	Linux 3.4~ 6.3	Linux 3.4~ 6.3
PCIe Driver	Windows 10/11, Linux 3.10- 6.3	Windows 10/11, Linux 3.10- 6.3
Certifications	TBD	TBD
Recommended Applications	Industrial routers, industrial PDAs, rugged tablet PCs, wearable devices and digital signage	

Note 1: Excl. China/Japan.

\* Under development  
• Supported

Product	RG500L	RG620T	
			
Form Factor	LGA	LGA	
Dimensions (mm)	41.0 × 44.0 × 2.75	44.0 × 53.0 × 2.95	
5G	Sub-6 GHz	Sub-6 GHz	
Frequency Bands (Mhz)	-EU (EMEA/Oceania/Brazil)	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: n1/3/5/7/8/20/28/38/40/41/71 (Optional)/75/76/77/78; LTE-TDD: B38/40/41/42/43/46; LTE-FDD: B1/3/5/7/8/20/28/32/71 (Optional); LAA: B46; 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(17)/13/14/25/26/29/30/66/71; 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	/
Weight (approx.) g	13±0.3(RG500L-EU); TBD(RG500L-NA); 11.32(RG500L-AR)	16.82	
Operating Temperature	-30°C ~ +70°C	-30°C ~ +70°C	
Extended Temperature	-40°C ~ +85°C	-40°C ~ +85°C	
Control via AT Commands	3GPP Rel-15 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. 3.74 Gbps(DL)/Max. 1.46 Gbps (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. 7.01 Gbps(DL)/Max. 2.5 Gbps(UL); 5G NSA Sub-6: Max. 5.67 Gbps(DL)/Max. 1.46 Gbps(UL)	
LTE	LTE-FDD: Max. 1.6 Gbps(DL)/Max. 211 Mbps(UL) (RG500L-EU); LTE-FDD: Max. 1.4 Gbps(DL)/Max. 211 Mbps(UL) (RG500L-NA); LTE-FDD: Max. 1.6 Gbps (DL)/Max. 200 Mbps(UL) (RG500L-AR);	LTE-FDD: Max. 1.6 Gbps(DL)/Max. 211 Mbps(UL) LTE-TDD: 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) (RG620T-EU)	
SMS	•	•	
Protocols	HTTPS/TCP/UDP/FTP/HTTP/PING/FTPS/SSL/NTP	HTTPS/TCP/UDP/FTP/HTTP/PING/FTPS/SSL/NTP	
Interfaces			
(U)SIM	× 2, 1.8 V/ 3.0 V(RG500L-EU/RG500L-NA); × 2 (Dual SIM Single Standby) (RG500L-AR)	× 2	
UART	× 2 (RG500L-NA)	× 3	
USB	2.0/3.0(RG500L-EU); 2.0/3.0/3.1 <sup>2</sup> (RG500L-NA); 2.0/3.0/3.1 (RG500L-AR)	USB 3.2 × 1, USB 2.0 × 1	
PCIe	PCIe Gen3 × 1 Lane (RG500L-EU/RG500L-NA); PCIe 3 × 2 (RG500L-AR)	PCIe 4 × 1, PCIe 3 × 2	
UXSGMII	/	× 2	
PCM	•	× 2	
I2C	× 1	× 4	
SPI	× 2	× 2	
GPIO	•	•	
ADC	× 3	× 7	
SD Card	• (RG500L-NA)	•	
RESET_N	•	•	
Antenna	Main, Diversity and GNSS(RG500L-EU/RG500L-NA); Cellular: × 8 (RG500L-AR)	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	
Voice	Optional (RG500L-EU/RG500L-NA); Digital Audio and VoLTE/VoNR (Optional) (RG500L-AR)	Optional	
DTMF	Dual-tone Multi-frequency	Dual-tone Multi-frequency	
FOTA	Delta Firmware over the Air	Delta Firmware over the Air	
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	3.3~4.3 V, typ. 3.8 V	3.3~4.4 V, typ. 3.8 V	
Power Consumption	80 μA @Power off, 6.5 mA @Sleep, Typ. 125 mA @Idle (USB active) (RG500L-EU/RG500L-AR); 80 μA @Power off, 6.5 mA @Sleep, Typ. 122 mA @Idle (RG500L-NA)	135 μA @Power off 6 mA @Sleep 145 mA @Idle (USB active)	
Software Features			
USB Serial Driver	Windows 7/8/8.1/10, Linux 3.18~5.12, Android 4.x/5.x/6.x/7.x/8.x/9.x/10.x/11.x	Windows 7/8/8.1/10, Linux 3.18~5.12, Android 4.x/5.x/6.x/7.x/8.x/9.x/10.x/11.x	
GNSS Driver	Android 4.x/5.x/6.x/7.x/8.x/9.x/10.x/11.x (RG500L-EU/RG500L-NA)	Android 4.x/5.x/6.x/7.x/8.x/9.x/10.x/11.x	
RIL Driver	Android 4.x/5.x/6.x/7.x/8.x/9.x/10.x/11.x	Android 4.x/5.x/6.x/7.x/8.x/9.x/10.x/11.x	
RNDIS Driver	Drive-free	Drive-free	
Certifications <sup>3</sup>	GCF/CE/RCM/FCC/IC	CE/RCM/GCF*/FCC/IC/ PTCRB*	
Recommended Applications	Industrial routers, CPE, home gateways, industrial PDAs, rugged tablet PCs and digital signage	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: USB 3.1 only supports 5 Gbps.

Note 3: May depend on modules' variant.

\* Under development  
• Supported

# 5G NR Modules

Product	RG500U-CN	RG500U-EA	RG500U-EB	RG500U-LA	RG500U-EA M.2
					
Form Factor	LGA	LGA	LGA	LGA	M.2
Dimensions (mm)	41.0 × 44.0 × 2.85	41.0 × 44.0 × 2.85	41.0 × 44.0 × 2.85	41.0 × 44.0 × 2.85	52.0 × 52.0 × 3.6
5G	Sub-6 GHz	Sub-6 GHz	3GPP Release 15 NSA/SA operation, Sub-6 GHz	3GPP Release 15 NSA/SA operation, Sub-6 GHz	Sub-6 GHz
Frequency Bands (MHz)	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	5G NR: n1/3/5 <sup>2</sup> /7/8/20/28/38/40/41/ 66 <sup>1</sup> /71 <sup>1</sup> /77/78/79 <sup>2</sup> ; LTE-FDD: B1/2/3/4/5/7/8/20/28A/ 28B/66/71 <sup>1</sup> ; LTE-TDD: B38/40/41; WCDMA: B1/2/5/8	SA: n1/3/5/7/8/20/28/38/40/41/66/ 71 <sup>1</sup> /77/78; LTE-B1/2/3/4/5/7/8/20/28/38/40/41/ 66/71 <sup>1</sup> ; WCDMA: B1/2/5/8	SA: n2/5/7/8/28/38/40/66/71/78; LTE: B2/4/5/7/8/26/28/38/40/66/71; WCDMA: B2/4/5	5G NR: n1/3/5 <sup>2</sup> /7/8/20/28/38/40/41/ 66 <sup>1</sup> /71 <sup>1</sup> /77/78/79 <sup>2</sup> ; LTE-FDD: B1/2/3/4/5/7/8/20/28A/ 28B/66/71 <sup>1</sup> ; LTE-TDD: B38/40/41; WCDMA: B1/2/5/8
Region	EMEA/APAC	EMEA/APAC/Latin America	EMEA/APAC/Latin America	Latin America	EMEA/APAC/Latin America
Weight (approx.) g	13	13	12.5	12.2	19.9
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
Data Transmission <sup>3</sup>					
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)	5G SA Sub-6: Max. 2 Gbps (DL)/Max. 1 Gbps (UL); 5G NSA Sub-6: Max. 2.6 Gbps (DL)/Max. 650 Mbps (UL)	5G SA Sub-6: Max. 2Gbps (DL)/ Max. 1Gbps (UL); 5G NSA Sub-6: Max. 2.6Gbps (DL)/ Max. 650Mbps (UL)	5G SA Sub-6: Max. 2Gbps (DL)/ Max. 1Gbps (UL); 5G NSA Sub-6: Max. 2.6Gbps (DL)/ Max. 650Mbps (UL)	5G SA Sub-6: Max. 2 Gbps (DL)/Max. 1 Gbps (UL); 5G NSA Sub-6: Max. 2.6 Gbps (DL)/Max. 650 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)	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)	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	TCP/UDP/PPP/FTP/HTTP/HTTPS/FTPS/ SSL/NTP	TCP/UDP/PPP/FTP/HTTP/HTTPS/FTPS/SSL/ NTP
Interfaces					
(U)SIM	× 2, 1.8 V/ 3.0 V	× 2, 1.8 V/3.0 V	× 2, 1.8V/ 3.0V	× 2, 1.8V/ 3.0V	× 2, 1.8 V/3.0 V
USB	2.0/3.0	2.0/3.0	2.0/3.0	2.0/3.0	2.0/3.0
PCIe	PCIe Gen2 × 1 Lane	PCIe Gen2 × 1 Lane	PCIe Gen2 × 1 Lane	PCIe Gen2 × 1 Lane	PCIe Gen2 × 1 Lane
PCM	•	•	•	•	•
GPIO	•	•	•	•	•
RESET_N	•	•	•	•	•
Antenna	× 4	× 6	× 4	× 6	× 6
Enhanced Features					
MIMO	n41/77/78/79 UL 2 × 2, n1/41/77/78/79 DL 4 × 4, n28 & LTE DL 2 × 2	n38/40/41/77/78/79 UL 2 × 2, n1/3/7/38/40/41/77/78/79 DL 4 × 4, n5 <sup>2</sup> /8/20/28/66 <sup>1</sup> /71 <sup>1</sup> & LTE DL 2 × 2	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	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	n38/40/41/77/78/79 UL 2 × 2, n1/3/7/38/40/41/77/78/79 DL 4 × 4, n5 <sup>2</sup> /8/20/28/66 <sup>1</sup> /71 <sup>1</sup> & LTE DL 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	/	/	/	/	/
(U)SIM Card Detection	•	•	•	•	•
Electrical Features					
Supply Voltage Range	3.3-4.3 V, typ. 3.8 V	3.3-4.3 V, typ. 3.8 V	3.3-4.3 V, typ. 3.8 V	3.3-4.3 V, typ. 3.8 V	3.3-4.4 V, typ. 3.7 V
Power Consumption	70 µA @ Power off 3.5 mA @ Sleep 68 mA @ USB 3.0, idle	70 µA @ Power off 4.0 mA @ Sleep 55 mA @ USB 2.0, idle 68 mA @ USB 3.0, idle	88 µA @ Power off 5.0 mA @ Sleep 56 mA @ idle, USB 2.0 70 mA @ idle, USB 3.0	82 µA @ Power off 5.0 mA @ Sleep 60 mA @ idle, USB 2.0 73 mA @ idle, USB 3.0	160 µA @ Power off 4 mA @ Sleep 61 mA @ USB 2.0, idle 76 mA @ USB 3.0, idle
Software Features					
USB Serial Driver	Windows 7/8/10/11 Linux 2.6-6.5 Android 4.x-13.x	Windows 7/8/8.1/10/11, Linux 2.6-5.18, Android 4.x-12.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	Windows 7/8/8.1/10/11, Linux 2.6-5.18, Android 4.x-12.x
GNSS Driver	/	/	/	/	/
RIL Driver	Android 4.x-13.x	Android 4.x-12.x	Android 4.x-13.x	Android 4.x-13.x	Android 4.x-12.x
RNDIS Driver	Windows 7/8/8.1/10/11, Linux 2.6-6.5	Windows 7/8/8.1/10/11, Linux 2.6-5.18	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 2.6-5.18
MBIM Driver	/	/	/	/	/
ECM Driver	Linux 2.6- 6.5	Linux 2.6-5.18	Linux 2.6-6.5	Linux 2.6-6.5	Linux 2.6-5.18
NCM Driver	Linux 2.6- 6.5	Linux 2.6-5.18	Linux 2.6-6.5	Linux 2.6-6.5	Linux 2.6-5.18
PCIe Driver	Linux 3.10-6.5	Linux 3.10-5.18, Android 4.X-12.X	Linux 3.10-6.5	Linux 3.10-6.5	Linux 3.10-5.18, Android 4.X-12.X
Certifications	SRRG/NAL/CCC/China Telecom/China Mobile*/China Unicom*	CE/RCM/GCF	GCF*/CE*/RCM *	FCC*	CE/RCM/GCF*
Recommended Applications	5G wireless routers, OPE, industrial routers, home gateways, etc.		used in vertical industries such as smart energy, Internet of Vehicles, industrial Internet, telemedicine, smart education, high-definition video, smart city, and home entertainment		5G wireless routers, OPE, industrial routers, home gateways, etc.

Note 1: May depend on modules' variant.






Note 2: 0C optional.

Note 3: means the data transmission is theoretical data rate and depends on network conditions.

\* Under development

• Supported

# 5G NR Modules



Product	RM500U-CN	RM500U-EA	RM500U-CNV	RG200U-CN	RG200U-CN Mini PCIe
					
Form Factor	M.2	M.2	M.2	LGA	Mini PCIe
Dimensions (mm)	52.0 × 30.0 × 2.3	52.0 × 30.0 × 3.75	52.0 × 30.0 × 2.3	41.0 × 30.0 × 2.85	50.95 × 30.7 × 5.3
5G	Sub-6 GHz	Sub-6 GHz	Sub-6 GHz	Sub-6 GHz	Sub-6 GHz
Frequency Bands (MHz)	5G NR: n1/28/41/77/78/79; LTE-FDD: B1/2/3/5/7/8/20/28A/28B; LTE-TDD: B34/38/39/40/41; WCDMA: B1/2/5/8	5G NR: n1/3/5/7/8/20/28/38/40/41/ 77/78; LTE-FDD: B1/2/3/4/5/7/8/20/28/66; LTE-TDD: B38/40/41; WCDMA: B1/2/5/8	5G NR: n1/3/5/8/28A/41/77/78/79; LTE-FDD: B1/3/5/8; LTE-TDD: B34/38/39/40/41 WCDMA: B1/5/8	5G NR: n1/3/5/8/28/77/78/79; LTE-FDD: B1/3/5/8; LTE-TDD: B34/38/39/40/41; WCDMA: B1/8	5G NR: n1/3/5/8/28/77/78/79; LTE-FDD: B1/3/5/8; LTE-TDD: B34/38/39/40/41; WCDMA: B1/8
Region	EMEA/APAC	EMEA/APAC/Latin America	EMEA/ APAC	EMEA/APAC	EMEA/APAC
Weight (approx.) g	8.9	9.2	8.8	8.2	13.4
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
Data Transmission <sup>2</sup>					
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)	5G SA Sub-6: Max. 2Gbps (DL)/ Max. 1Gbps (UL); 5G NSA Sub-6: Max. 2.6Gbps(DL)/ Max. 650Mbps (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)	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)	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)	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	TCP/UDP/PPP/FTP/HTTP/HTTPS/FTPS/SSL/ NTP	TCP/UDP/PPP/FTP/HTTP/HTTPS/FTPS/SSL/ NTP
Interfaces					
(U)SIM	× 2, 1.8 V/3.0 V	× 2, 1.8V/ 3.0V	× 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	2.0/3.0	2.0/3.0
PCIe	PCIe Gen2 × 1 Lane	PCIe Gen2 × 1 Lane	PCIe Gen2 × 1 Lane	PCIe Gen2 × 1 Lane	/
PCM	•	•	•	•	•
GPIO	•	•	•	•	•
RESET_N	•	•	•	•	•
Antenna	× 4	× 4	× 4	× 4	× 4
Enhanced Features					
MIMO	n41/77/78/79 UL 2 × 2, n1/41/77/78/79 DL 4 × 4, n28 & LTE DL 2 × 2	n1/3/7/28/66/38/40/41/77/78 DL 4 × 4, n5/8/20 & LTE DL 2 × 2, n38/40/41/77/78 UL 2 × 2	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	n41/77/78/79 UL 2 × 2, n1/41/77/78/79 DL 4 × 4, n3/5/8/28 & LTE DL 2 × 2	n41/77/78/79 UL 2 × 2, n1/41/77/78/79 DL 4 × 4, n3/5/8/28 & LTE DL 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	/
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	/	/	/	/	/
(U)SIM Card Detection	•	•	•	•	•
Electrical Features					
Supply Voltage Range	3.3-4.4 V, typ. 3.7 V	3.3-4.4 V, typ. 3.7 V	3.3-4.4 V, typ. 3.7 V	3.3-4.3 V, typ. 3.8 V	3.3-4.3 V, typ. 3.8 V
Power Consumption	90 µA @ Power off 4.0 mA @ Sleep 55 mA @ USB 2.0, idle 70 mA @ USB 3.0, idle	99 µA @ Power off 4.8 mA @ Sleep 62 mA @ USB 2.0, idle 75.5 mA @ USB 3.0, idle	78 µA @ Power off 5.1 mA @ Sleep 57 mA @ USB 2.0, idle 71 mA @ USB 3.0, idle	60 µA @ Power off 3.0 mA @ Sleep 65 mA @ USB 3.0, idle	3.3 mA @ Sleep 68 mA @ USB 3.0, idle
Software Features					
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	Windows 7/8/8.1/10/11, Linux 2.6-5.18, Android 4.x-12.x	Windows 7/8/8.1/10/11, Linux 2.6-5.18, Android 4.x-12.x
GNSS Driver	/	/	/	/	/
RIL Driver	Android 4.x-13.x	Android 4.x-13.x	Android 4.x-13.x	Android 4.x ~ 12.x	Android 4.x ~ 12.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	Windows 7/8/8.1/10/11, Linux 2.6-5.18	Windows 7/8/8.1/10/11, Linux 2.6-5.18
MBIM Driver	/	/	/	/	/
ECM Driver	Linux 2.6-6.5	Linux 2.6-6.5	Linux 2.6-6.5	Linux 2.6- 5.18	Linux 2.6- 5.18
NCM Driver	Linux 2.6-6.5	Linux 2.6-6.5	Linux 2.6-6.5	Linux 2.6- 5.18	Linux 2.6- 5.18
PCIe Driver	Linux 3.10-6.5	Linux 3.10-6.5	Linux 3.10-6.5	Linux 3.10-5.18, Android 4.x-12.x	Linux 3.10-5.18, Android 4.x-12.x
Certifications	SRRC/NAL/CCC/CE/ROCM/China Telecom/China Mobile*/China Unicom*	CE/ROCM	SRRC/ NAL/ CCC	SRRC/NAL/CCC/China Telecom/China Mobile*/China Unicom*	SRRC/NAL/CCC/China Telecom/China Mobile*/China Unicom*
Recommended Applications	5G wireless routers, CPE, industrial routers, home gateways, etc	Industrial router, home gateway, Set-top boxes, industrial PDAs and digital Label etc	5G wireless routers, CPE, industrial routers, home gateways, etc	5G wireless routers, CPE, industrial routers, home gateways, etc	5G wireless routers, CPE, industrial routers, home gateways, etc

Note 1: May depend on modules' variant.

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

\* Under development  
• 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	
Data Transmission			
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*	
Interfaces			
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)	
Enhanced Features			
MIMO	2 × 2, 4 × 2, 4 × 4, DL	2 × 2, 4 × 2, DL	
eCall	Emergency Service	Emergency Service*	
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	•	•	
Electrical Features			
Supply Voltage Range	3.3~4.4 V, typ. 3.8 V	3.3~4.5 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)	
Software Features			
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/FCC/IC/PTCRB/GCF/AT&T/Verizon	GCF/PTCRB/FCC/IC/IFETEL*/Verizon/AT&T/Telus/CE/RCM/IMDA*/Anatel/British Telecom/Telefónica/ Telstra*/JATE*/TELEC*/SoftBank*	
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.





\* Under development  
• Supported

<b>Product</b>		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; 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	
<b>Data Transmission</b>		
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	
<b>Interfaces</b>		
USB	× 1	
PCM	× 1	
SPI	× 1	
SDIO	× 1	
I2C	× 1	
(U)SIM	× 1	
RGMI	× 1	
UART	× 2	
ADC	× 2	
RESET_N	× 1	
PCIe	× 2	
Antenna	× 2	
<b>Enhanced Features</b>		
MIMO	•	
eCall	•	
Voice	•	
DTMF	•	
DFOTA	/	
FOTA	•	
GNSS	/	
(U)SIM Card Detection	•	
<b>Electrical Features</b>		
Supply Voltage Range	3.3-4.3 V, typ. 3.8 V	
Power Consumption	56 μA @ Power off; 5.42 mA @ Sleep; 58.63 mA @ 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	
RIL Driver	Android 4.x-13.x	
NDIS Driver	/	
RNDIS Driver	Windows 7/8/8.1/10/11, 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.



\* Under development  
• Supported

# LTE-A Modules

Product	EG12	EG120K	EG512R-EA	EG18	
					
Form Factor	LGA	LGA	LGA	LGA	
Dimensions (mm)	37.0 × 39.5 × 2.8	37.0 × 39.5 × 2.8	38.0 × 42.0 × 2.65	37.0 × 39.5 × 2.8	
4G	LTE Cat 12	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	LTE-FDD: B1/3/5/7/8/20/28/32; LTE-TDD: B38/41/42/43; Up to 3×CA: Intra-band and Inter-band; WCDMA: B1/3/5/8	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
	-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	/	LTE-FDD: B2/4/5/7/12/13/14/17 <sup>1</sup> /25/26/29/30/ 66/71; LTE-TDD: B41; Up to 5 × CA: Intra-band and Inter-band; WCDMA Bands: B2/4/5
	-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	8.7	9	
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					
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. 600 Mbps (DL)/ Max. 75 Mbps (UL); LTE-TDD: Max. 310 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)	WCDMA: Max. 42 Mbps (DL)/ Max. 5.76 Mbps (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	TCP/UDP/FTP/HTTP/HTTPS/PING/SMS	
Interfaces					
USB	2.0/3.0, Slave Mode	2.0/3.0, Supports Master* and Slave Modes	2.0/3.0, Slave Mode	2.0/3.0, Slave Mode	
PCM	•	× 1	•	•	
I2C	× 1	× 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	× 2, 1.8 V/ 3.0 V	
eSIM	/	Optional	× 1 / built-in eSIM (optional)	/	
GPIO	× 2	× 3	•	× 2	
UART	× 3	× 2	•	× 3	
ADC	× 2	•	× 2	× 2	
SPI	× 1 (Optional)	× 1	•	× 1 (Optional)	
SD Card	•	•	•	•	
RESET_N	•	•	•	•	
PCIe	Optional	Optional	PCIe Gen2 × 1 Lane	Optional	
RGMI	/	/	•	/	
Antenna	Main, Diversity and GNSS	Main, Diversity and GNSS	Main, Diversity and GNSS	Main, Diversity and GNSS	
Enhanced Features					
MIMO	2 × 2, 4 × 2, 4 × 4, DL	2 × 2, 4 × 2, 4 × 4 DL	2 × 2, 4 × 2, 4 × 4 DL	2 × 2, 4 × 2, 4 × 4 DL	
eCall	•	Emergency Service*	/	•	
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/BeiDou/Galileo/QZSS	GPS/GLONASS/BeiDou/Galileo/QZSS	GPS/GLONASS/BeiDou/Galileo	GPS/GLONASS/BeiDou/Galileo/QZSS	
(U)SIM Card Detection	•	•	•	•	
Electrical Features					
Supply Voltage Range	3.3~4.3 V, typ. 3.8 V	3.3~4.3 V, typ. 3.8 V	3.3~4.3 V, typ. 3.8 V	3.3~4.3 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	50 μA @Power off 2.15 mA @LTE Sleep(PF=64) 8 mA @Idle	20 μA @Power off 1.81 mA @Sleep, Typ. 9.38 mA @Idle	
Software Features					
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 2.6~5.4, Android 4.x/5.x/6.x/7.x/8.x/9.x/10	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	/	/	Android 4.x/5.x/6.x/7.x/8.x/9.x/10	/	
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/10	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	Windows 7/8/8.1/10	
MBIM Driver	/	Windows 10, Linux 3.18~5.4	Windows 7/8/8.1/10, 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 2.6~5.4	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 3.4~5.4	Linux 3.x (3.4 or later)/4.x/5.x	
PCIe Driver	/	/	Windows 10, Linux 2.6~5.4, Android 4.x/5.x/6.x/7.x/8.x/9.x/10	/	
Certifications <sup>2</sup>	CE/RCM/FCC/GCF	CE/RCM/FCC/IC/PTCRB/GCF/AT&T/Verizon	GCF/CE/RCM/Telstra	CE/RCM/FCC/IC/GCF/PTCRB/AT&T/Verizon/ Telstra/USCC/T-Mobile	
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.






\* Under development  
• 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	/
	-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 Service
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		3.135~4.4 V, typ. 3.3 V	3.135~4.4 V, typ. 3.7 V
Power Consumption		5 μA @Power off/ 3.3 mA(PF=128) @LTE Sleep/ 20 mA @Idle	0.07μA@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)
<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>4</sup>		CCC/SRRC/NAL/CE/RCM/FCC/PTCRB/GCF	NCC/CE/RCM/FCC/IC/Verizon/ AT&T-Mobile/KDDI/NTT DOCOMO*/JATE/TELEC/GCF/PTCRB/ Telstra/on-going/DCM/Vodafone/British Telecom/Orange/Deutsche Telekom/Telefónica*/ SoftBank*
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: May depend on modules' variant.

\* Under development  
 • 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)	30.0 × 42.0 × 2.3	30.0 × 42.0 × 2.3	30.0 × 42.0 × 2.3	30.0 × 42.0 × 2.3	30.0 × 42.0 × 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: B1/2/3/4/5/6/8/19	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> /66/71; LTE-TDD: 34/38/39/40/41/42/43/46 <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 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	/	× 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 Service	Emergency Service	Emergency Service	Emergency Service	Emergency Service
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	3.135~4.4 V, typ. 3.7 V	3.135~4.4 V, typ. 3.7 V	3.135~4.4 V, typ. 3.7 V	3.135~4.4 V, typ. 3.7 V	3.135~4.4 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	CE/FCC/IC/CCC/RCM/ICASA/JETE/TELEC/GCF/PTCRB/Telstra/AT&T/Verizon/Telefonica/Vodafone/Deutsche Telekom/Docomo/British Telecom/UKCA/Anatel/KO/T-mobile/Sprint/Telus/Rogers/KDDI/TIM/WHGL/SoftBank*	Verizon/AT&T/T-Mobile/KDDI/NTT DOCOMO/JATE/TELEC/GCF/PTCRB/CE/RCM/FCC/IC/CCC/Telstra/on-going/SoftBank*	GCF/CE/PTCRB/FCC/IC/Anatel/IFETEL/SRRC/NAL/CCC/NCC/KC/JATE/TELEC/ROM/ICASA/Vodafone/British Telecom/Swisscom/Verizon/AT&T/T-Mobile/Sprint/China Mobile/China Unicom/NTT DOCOMO/SoftBank*/KDDI/Telstra	GCF/CE/PTCRB/FCC/IC/RCM/Verizon/AT&T	GCF/CE/PTCRB/FCC/IC/Anatel/IFETEL/SRRC/NAL/CCC/NCC/KC/JATE/TELEC/ROM/ICASA/Vodafone/British Telecom/Swisscom/Verizon/AT&T/T-Mobile/Sprint/China Mobile/China Unicom/NTT DOCOMO/SoftBank*/KDDI/Telstra*
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.

\* Under development

• 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-FDD: 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	/	/	
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)	
Data Transmission				
LTE data rate (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 rate (Mbps)	Max. 42 (DL) /Max. 5.76 (UL)	Max. 42 (DL) /Max. 5.76 (UL)	Max. 42 (DL) /Max. 5.76 (UL)	
WCDMA data rate (Kbps)	Max. 384 (DL) /Max. 384 (UL)	Max. 384 (DL) /Max. 384 (UL)	Max. 384 (DL) /Max. 384 (UL)	
TD-SCDMA data rate (Mbps)	/	/	Max. 4.2 (DL) /Max. 2.2 (UL)	
EVDO data rate (Mbps)	/	/	Max. 3.1 (DL) /Max. 1.8 (UL)	
CDMA2000 data rate (Kbps)	/	/	Max. 307.2 (DL) /Max. 307.2 (UL)	
EDGE data rate (Kbps)	Max. 296 (DL) /Max. 236.8 (UL)	Max. 296 (DL) /Max. 236.8 (UL)	Max. 296 (DL) /Max. 236.8 (UL)	
GPRS data rate (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	
Interfaces				
(U)SIM	1.8 V/ 3.0 V	1.8 V/ 3.0 V	1.8 V/ 3.0 V	
UART	× 2 (EC21); × 1 (EC21 Mini PCIe)	× 2 (EC25); × 1 (EC25 Mini PCIe)	× 2 (EC20-CE); × 1 (EC20-CE Mini PCIe)	
USB	USB 2.0 (Hi-Speed)	USB 2.0 (Hi-Speed)	USB 2.0 (Hi-Speed)	
IIC	•	•	• (EC20-CE); Optional (EC20-CE Mini PCIe)	
Audio Digital (PCM)	Optional	Optional	Optional	
SD	• (EC21)	• (EC25)	• (EC20-CE)	
ADC	× 2, 15bits (EC21)	× 2, 15bits (EC25)	× 2, 15bits (EC20-CE)	
SGMII	• (EC21)	• (EC25)	• (EC20-CE)	
GPIO	• (Only Supported on QuecOpen <sup>1</sup> )	• (Only Supported on QuecOpen <sup>1</sup> )	/	
Antenna	Pads for Primary, Rx-diversity and GNSS	Pads for Primary, Rx-diversity and GNSS	Pads for Primary, Rx-diversity and GNSS	
Enhanced Features				
GNSS	Optional	Optional	Optional	
WiFi-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, Linux 2.6-5.4, Android 4.x/5.x/6.x/7.x/9.x	Windows 7/8/8.1/10, Linux 2.6-5.4, Android 4.x/5.x/6.x/7.x/9.x	Windows 7/8/8.1/10, Linux 2.6-5.4, Android 4.x/5.x/6.x/7.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/9.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 8/8.1/10, Linux 3.8-5.4	Windows 8/8.1/10, Linux 3.8-5.4	Windows 8/8.1/10, Linux 3.8-5.4	
GobiNet Driver	Linux 2.6-5.4	Linux 2.6-5.4	Linux 2.6-5.4	
QMI_WWAN Driver	Linux 3.4-5.4	Linux 3.4-5.4	Linux 3.4-5.4	
(U)SIM Card Detection	•	•	•	
Firmware Update	Via USB/DFOTA	Via USB/DFOTA	Via USB/DFOTA	
Electrical Features				
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/Telefonía/Verizon/AT&T-Mobile/U.S. Cellular/ Rogers/SKT/KT/NTT DOCOMO/KDDI/Telstra/LGU-/ Spark; Regulatory Certification: GCF/CE/FCC/PTCRB/IC/Anatel/KC/ NCC/JATE/TELEC/RCM/UKCA; Others: WHQL	Carrier Certification: Vodafone/Deutsche Telekom/ British Telecom/Telefonía/ Bell/SKT/ LGU-/Telstra/KT/Spark; Regulatory Certification: GCF/CE/FCC/PTCRB/IC/Anatel/KC/ NCC/JATE/TELEC/RCM/ NBTC/ICASA/UKCA; Others: WHQL	Regulatory Certification: NAL/SRRG/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.

\* Under development




• Supported

# LTE Modules

Product	EG21-G/EG21-G Mini PCIe/EG21-GL	EG25-G/ EG25-G Mini PCIe/EG25-GL
		
Form Factor	LGA (EG21-G/GL); Mini PCIe (EG21-G Mini PCIe)	LGA (EG25-G/GL); Mini PCIe (EG25-G Mini PCIe)
Dimensions (mm)	29.0 × 32.0 × 2.4 (EG21-G/GL); 30.0 × 51.0 × 4.9 (EG21-G Mini PCIe)	29.0 × 32.0 × 2.4 (EG25-G/GL); 30.0 × 51.0 × 4.9 (EG25-G 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)	4.9 (EG25-G/GL); 9.8 (EG25-G 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)	-40°C ~ +85°C (EG25-G/GL); -40°C ~ +80°C (EG25-G Mini PCIe)
Data Transmission		
LTE data rate (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 rate (Mbps)	Max. 42 (DL)/Max. 5.76 (UL)	Max. 42 (DL)/Max. 5.76 (UL)
WCDMA data rate (Kbps)	Max. 384 (DL)/Max. 384 (UL)	Max. 384 (DL)/Max. 384 (UL)
EDGE data rate (Kbps)	Max. 296 (DL)/Max. 236.8 (UL)	Max. 296 (DL)/Max. 236.8 (UL)
GPRS data rate (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/SMT/PPS/MMS*/FTPS*/SMTPS/SSL/FILE	TCP/UDP/PPP/FTP/HTTP/NTP/PING/QMI/NITZ/CMUX/HTTPS/SMT/PPS/MMS*/FTPS*/SMTPS/SSL/FILE
Interfaces		
(U)SIM	1.8 V/ 3.0 V	1.8 V/ 3.0 V
UART	× 2 (EG21-G/GL); × 1 (EG21-G Mini PCIe)	× 2 (EG25-G/GL); × 1 (EG25-G Mini PCIe)
USB	USB 2.0 (Hi-Speed)	USB 2.0 (Hi-Speed)
IIC	•	•
Audio Digital (PCM)	Optional	Optional
SD	• (EG21-G/GL)	• (EG25-G/GL)
ADC	× 2, 15bits (EG21-G/GL)	× 2, 15bits (EG25-G/GL)
GPIO	• (Only Supported on QuecOpen™)	• (Only Supported on QuecOpen™)
Antenna	Pads for Primary, Rx-diversity and GNSS	Pads for Primary, Rx-diversity and GNSS
Enhanced Features		
GNSS	Optional	Optional
WiFi-Scan	/	/
Bluetooth	/	/
DTMF	•	•
DFOTA	•	•
QMI/ RmNet	•	•
Audio Playback/Audio Recording	Optional	Optional
USB Serial Driver	Windows 7/8/8.1/10, Linux 2.6-5.4, Android 4.x/5.x/6.x/7.x/9.x	Windows 7/8/8.1/10, Linux 2.6-5.4, Android 4.x/5.x/6.x/7.x/9.x
GNSS 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
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
NDIS Driver	Windows 7/8/8.1/10	Windows 7/8/8.1/10
MBIM Driver	Windows 8/8.1/10, Linux 3.8-5.4	Windows 8/8.1/10, Linux 3.8-5.4
GobiNet Driver	Linux 2.6-5.4	Linux 2.6-5.4
QMI_WWAN Driver	Linux 3.4-5.4	Linux 3.4-5.4
(U)SIM Card Detection	•	•
(U)SIM Card Connector	Optional (EG21-G Mini PCIe)	Optional (EG25-G Mini PCIe)
Firmware Update	Via USB/DFOTA	Via USB/DFOTA
Electrical Features		
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)	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)
Power Consumption	13 µA@Power off/1.7 mA@Sleep, Typ. /22 mA@Idle (EG21-G/GL)	13 µA@Power off/1.7 mA@Sleep, Typ. /22 mA@Idle (EG25-G/GL); 2.7 mA @Sleep, Typ. / 25 mA @Idle (EG25-G Mini PCIe)
Certifications <sup>1</sup>	Carrier Certification: Verizon/AT&T/Mobile/Deutsche Telekom/Sprint/U.S.Cellular/Telus; Regulatory Certification: CE/FCC/IC/RCM/PTCRB/GCF/Anatel/JATE/TELEC/NCC/ICASA/IFETEL/KC; Others: WHQL	Carrier Certification: Deutsche Telekom/Verizon/AT&T/Sprint/U.S. Cellular/Telus/T-Mobile/Rogers*; Regulatory Certification: SRRC/NAL/CCC/GCF/CE/FCC/PTCRB/IC/Anatel/IFETEL/KC/NCC/JATE/TELEC/RCM/NBCC/ICASA/IMDA; 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.

\* Under development  
• 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	
Data Transmission				
LTE data rate (Mbps)	Max. 10 (DL)/Max. 5 (UL)	Max. 150 (DL)/Max. 50 (UL)	Max. 150 (DL)/ Max. 50 (UL)	
DC-HSPA+ data rate (Mbps)	Max. 42 (DL)/Max. 5.76 (UL)	Max. 42 (DL)/Max. 5.76 (UL)	Max. 21 (DL)/ Max. 5.76 (UL)	
WCDMA data rate (Kbps)	Max. 384 (DL)/Max. 384 (UL)	Max. 384 (DL)/Max. 384 (UL)	Max. 384 (DL)/ Max. 384 (UL)	
EDGE data rate (Kbps)	Max. 296 (DL)/Max. 236.8 (UL)	Max. 296 (DL)/Max. 236.8 (UL)	/	
GPRS data rate (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/SMTP/MMS*/FTPS*/SMTPS/SSL/FILE	TCP/UDP/PPP/FTP/HTTP/NTP/PING/QMI/CMUX/HTTPS/SMTP/MMS*/FTPS*/SMTPS/SSL/FILE	TCP/UDP/PPP/NTP/NITZ/FTP/HTTP/PING/CMUX/HTTPS/FTPS/SSL/FILE/MQTT/MMS/SMTP/SMTPS	
Interfaces				
(U)SIM	1.8 V/ 3.0 V	1.8 V/ 3.0 V	× 1	
UART	× 2	× 2	× 2	
USB	USB 2.0 (Hi-Speed)	USB 2.0 (Hi-Speed)	USB 2.0 (Highspeed)	
IIC	•	•	•	
Audio Digital (PCM)	Optional	Optional	•	
SPI	•	•	•	
GPIO	• (Only Supported on QuecOpen <sup>1</sup> )	• (Only Supported on QuecOpen <sup>1</sup> )	•	
RESET_N	× 1	× 1	× 1	
SD	/	/	•	
ADC	× 1	× 1	× 1	
Antenna	Pads for Primary, Rx-diversity and GNSS <sup>1</sup>	Pads for Primary, Rx-diversity and GNSS <sup>1</sup>	Primary, Rx-diversity Antennas and GNSS	
Enhanced Features				
GNSS <sup>1</sup>	Optional	Optional	• (EG950A-EL); Optional(EG950A-LA)	
WiFi-Scan	/	/	/	
Bluetooth	/	/	/	
E911 (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, Linux 2.6-5.4, Android 4.x/5.x/6.x/7.x/9.x	Windows 7/8/8.1/10, Linux 2.6-5.4, Android 4.x/5.x/6.x/7.x/9.x	Windows 7/8/8.1/10/11, Linux 2.6-5.18, Android 4.x~12.x	
GNSS 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	Android 4.x~12.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	Android 4.x~12.x	
NDIS Driver	Windows 7/8/8.1/10	Windows 7/8/8.1/10	Windows 7/8/8.1/10/11, Linux 2.6-5.18, Android 4.x~12.x	
MBIM Driver	Windows 8/8.1/10, Linux 3.8-5.4	Windows 8/8.1/10, Linux 3.8-5.4	/	
GobiNet Driver	Linux 2.6-5.4	Linux 2.6-5.4	/	
QMI_WWAN Driver	Linux 3.4-5.4	Linux 3.4-5.4	/	
(U)SIM Card Detection	•	•	•	
Firmware Update	Via USB/DFOTA	Via USB/DFOTA	Via USB/DFOTA	
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	3.4-4.5 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/Verizon/AT&T/ U.S. Cellular/T-Mobile/Sprint/Rogers/Telus/Telstra/ <sup>3</sup> NTT DOCOMO/KDDI; Regulatory Certification: GCF/CE/FCC/PTCRB/IC/Anatel/NCCL/ RCM/UKCA/JATE/TELEC; Others: WHQL	Carrier Certification: Deutsche Telekom/Verizon/AT&T/ U.S. Cellular/T-Mobile/Rogers/Telus/Sprint/Telstra/ <sup>3</sup> NTT DOCOMO/KDDI; Regulatory Certification: GCF/CE/FCC/PTCRB/IC/UKCA/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.	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.



\* Under development  
• Supported

# LTE Modules

Product	EG800Q	EG915Q
		
Form Factor	LGA	LGA
Dimensions (mm)	17.7 × 15.8 × 2.4	23.6 × 19.9 × 2.4
LTE Category	LTE Cat 1 bis	LTE Cat 1 bis
Frequency Bands(MHz)	-NA (North America)	LTE-FDD: B2/4/5/12/13/66
	-EU (Europe)	LTE-FDD: B1/3/5/7/8/20/28
Weight (approx.) g	2.0	2.3
Operating Temperature	-35 °C ~ +75 °C	-35 °C ~ +75 °C
Extended Temperature	-40 °C ~ +85 °C	-40 °C ~ +85 °C
Data Transmission		
LTE data rate (Mbps)	Max. 10 (DL)/ Max. 5 (UL)	Max. 10 (DL)/Max. 5 (UL)
DC-HSPA+ data rate (Mbps)	/	/
WCDMA data rate (Kbps)	/	/
EDGE data rate (Kbps)	/	/
GPRS data rate (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/MMS*/SMTP/SMTPS
Interfaces		
(U)SIM	1.8 V/ 3.0 V	1.8 V/3.0 V
UART	× 3 (Main, Debug and Auxiliary UART*)	× 3(Main,Debug and GNSS UART(optional))
USB	USB2.0(High speed)	USB2.0(High speed)
IIC	× 1	× 1
Audio Digital (PCM)	× 1	× 1
SD	/	/
ADC	× 2	× 2
Antenna	Main Antenna	× 2(Main and GNSS Antenna(optional))
Enhanced Features		
GNSS	/	Optional
WiFi-Scan	•	•
BlueTooth	/	/
DTMF	/	/
DFOTA	•	•
QMI/ RmNet	/	/
Audio Playback/Audio Recording	•	•
QuecFile	•	•
USB Serial Driver	Windows 7/8/8.1/10/11, Linux 2.6-5.18, Android 4.x-13.x	Windows 7/8/8.1/10/11, Linux 2.6-5.18, Android 4.x-13.x
GNSS Driver	/	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 2.6-5.18	Windows 7/8/8.1/10/11; Linux 2.6-5.18
MBIM Driver	/	/
GobiNet Driver	/	/
QMI_WWAN Driver	/	/
(U)SIM Card Detection	•	•
Firmware Update	Via USB/DFOTA	Via USB/DFOTA
Electrical Features		
Supply Voltage Range	3.3-4.3 V, typ. 3.8 V	3.3-4.3 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)	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)
Certifications <sup>1</sup>	Carrier Certification: AT&T*/Verizon/T-Mobile*(upon request to start)/Deutsche Telekom; Regulatory Certification: CE/RCM/UKCA/FCC/IC/PTCRB*/GCF*; Others: WHQL	Carrier Certification: AT&T*/Verizon/T-Mobile*; Regulatory Certification: FCC/IC/PTCRB*/GCF*; Others: WHQL
Recommended Applications	Asset management, commercial telematics, payment, RMAC (remote monitoring and control applications), safety and automation, smart metering and smart grid	

Note 1: May depend on modules' variant.





\* Under development  
• Supported

Product	EC200U/EC200U Mini PCIe	EC200A/EC200A Mini PCIe	
			
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)	
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)	
LTE Category	LTE Cat 1	LTE Cat 4	
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
	-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
	-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
	-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)	
Operating Temperature	-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)	
Data Transmission			
LTE data rate (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)	
DC-HSPA+ data rate (Mbps)	/	Max. 21 (DL)/Max. 5.76 (UL)	
WCDMA data rate (Kbps)	/	Max. 384 (DL)/Max. 384 (UL)	
EDGE data rate (Kbps)	/	Max. 236.8 (DL)/Max. 236.8 (UL)	
GPRS data rate (Kbps)	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/SMTP/MMS/FTPS/SMTPS/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/SMTP/SMTPS	
Interfaces			
(U)SIM	1.8 V/ 3.0 V	1.8 V/ 3.0 V	
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)	
USB	USB 2.0 (Hi-Speed)	USB 2.0 (Hi-Speed)	
PCIe	/	/	
Audio Digital (PCM)	• (EC200U/EC200U-EU/-AU Mini PCIe)	Optional	
IIC	× 2 (EC200U); × 1 (EC200U-EU/-AU Mini PCIe)	•	
GPIO	• (Only Supported on QuecOpen®) (EC200U-CN Mini PCIe-C, EC200U-EU/-AU Mini PCIe)	•	
RESET_N	• (EC200U)	•	
SD	• (EC200U)	• (EC200A)	
ADC	• (EC200U)	× 2, 12bits (EC200A)	
Antenna	Pads for Primary, Rx-diversity	Pads for Primary, Rx-diversity	
Enhanced Features			
GNSS	Optional	Optional	
WiFi-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 2.6~5.18, Android 4.x~12.x	Windows 7/8/8.1/10, Linux 2.6~5.15, Android 4.x~12.x	
GNSS Driver	Android 4.x~12.x	/	
RIL Driver	Android 4.x~12.x	Android 4.x~12.x	
RNDIS Driver	Windows 7/8/8.1/10/11, Linux 2.6~5.18	Windows 7/8/8.1/10, Linux 2.6~5.15	
ECM Driver	Linux 2.6~5.18	Linux 2.6~5.15	
(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	
Electrical Features			
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)	
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)	
Certifications <sup>1</sup>	NAL/SRRC/CCC/CE/RCM/FCC/Anatel/KC/AT	CCC/SRRC/NAL/CE/RCM/UKCA/NCC/FCC/Anatel/KC	
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: May depend on modules' variant.





• Under development  
• Supported

# LTE Modules

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	/	/	
	-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	/
	-EN(Europe)	/	/	/	LTE-FDD: B1/3/5/7/8/20/28/31/72; GSM: B3/8
	-EA(Europe/Asia)	/	/	LTE-FDD: B1/3/7/8/20/28; GSM: B3/8	/
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	
Data Transmission					
LTE data rate (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 rate (Mbps)	/	/	/	/	
WCDMA data rate (Kbps)	/	/	/	/	
EDGE data rate (Kbps)	/	/	Max. 236.8 (DL)/Max. 236.8 (UL)	Max. 236.8 (DL)/Max. 236.8 (UL)	
GPRS data rate (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/SNTP/MMS/FTPS/SMTSP/SSL/FILE	TCP/UDP/PPP/FTP/HTTP/NTP/PING/NITZ/CMUX/HTTPS/SNTP/MMS/FTPS/SMTSP/SSL/FILE	TCP/UDP/PPP/NTP/NITZ/FTP/HTTP/PING/CMUX/HTTPS/FTPS/SSL/FILE/MQTT/MMS/SNTP/SMTSP	TCP/UDP/PPP/NITZ/PING/MQTT/NTP/HTTP/HTTPS/SSL/FTP/SMTSP/SNTP	
Interfaces					
(U)SIM	1.8V/ 3.0V	1.8 V/ 3.0 V	1.8 V/ 3.0 V	1.8 V/ 3.0 V	
UART	× 3	× 3	× 3 (main, debug and auxiliary*)	× 2	
USB	USB 2.0 (Hi-Speed)	USB 2.0 (Hi-Speed)	USB 2.0 (Hi-Speed)	USB 2.0 (Hi-Speed)	
IIC	× 1	× 1	•	× 1	
Audio Digital (PCM)	× 1	× 1	Optional	× 1	
GPIO	/	/	/	/	
ADC	× 2	× 2	/	× 2	
SD	*	*	/	/	
PWRKEY	•	•	•	•	
Antenna	Main Antenna, WiFi-Scan/Bluetooth Antenna (Optional)	Main Antenna, GNSS Antenna (Optional), WiFi-Scan/ Bluetooth Antenna (Optional)	Main Antenna and GNSS Antenna (Optional)	Main Antenna	
Enhanced Features					
GNSS	/	Optional	Optional	/	
WiFi-Scan	Optional	Optional	•	•	
BlueTooth	Optional	Optional	/	/	
VoLTE	•	•	/	•	
DTMF	•	•	•	•	
DFOTA	•	•	•	•	
Audio Playback/Audio Recording	•	•	Optional	•	
QueueFile	• (only support ufs)	• (only support ufs)	•	•	
USB Serial Driver	Windows 7/8/8.1/10/11, Linux 2.6~5.18, Android 4.x~12.x	Windows 7/8/8.1/10/11, Linux 2.6~5.18, Android 4.x~12.x	Windows 7/8/8.1/10, Linux 2.6~5.15, Android 4.x~12.x	Windows 7/8/8.1/10/11, Linux 2.6~5.18, Android 4.x~12.x	
GNSS Driver	/	Android 4.x~12.x	Android 4.x~12.x	/	
RIL Driver	Android 4.x~12.x	Android 4.x~12.x	Android 4.x~12.x	Android 4.x~12.x	
USB RNDIS Driver	Windows 7/8/8.1/10/11, Linux 2.6~5.18	Windows 7/8/8.1/10/11, Linux 2.6~5.18	Windows 7/8/8.1/10, Linux 2.6~5.15	Windows 7/8/8.1/10, Linux 2.6~5.12	
USB ECM Driver	Linux 2.6~5.18	Linux 2.6~5.18	Linux 2.6~5.15	Linux 2.6~5.12	
(U)SIM Card Detection	•	•	•	•	
Firmware Update	USB or DFOTA	USB or DFOTA	Via USB/DFOTA	USB or DFOTA	
Electrical Features					
Supply Voltage Range	3.3 V~4.3 V, typ. 3.8V	3.3 V~4.3 V, typ. 3.8 V	3.4~4.5 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>1</sup>	CE/RCM/GCF/Anatel/NCC/UKCA/FCC	SRRC/NAL/CCC/CE/FCC/Anatel/NCC/RCM/KC/PTCRB	CE/RCM/UKCA/FCC/Anatel	CE	
Recommended Applications	POS/PDC/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/PDC/ETC, shared equipment, data cards, energy control and monitoring, safety and protection, industrial PDAs.	

Note 1: May depend on modules' variant.  
EG915N-EA does not support GNSS.

\* Under development  
• Supported

Product	SC20 (Android)	SC20 (Linux)	SC20 (Linux, small memory)	SC200R	
					
Form Factor	LCC+LGA	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	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	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: BCC; GSM: 900/1800MHz	-CEL (China) LTE-FDD: B1/3/5/8; LTE-TDD: B38/39/40/41; 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/EL/EX/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	-EL (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	-EX(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	-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
	-A/AL/AX/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	-AX(North America) LTE-FDD: B2/4/5/7/12/13/25/26	-NA (North America) LTE-FDD: B2/4/5/7/12/13/14/17/25/26/66/71; LTE-TDD: B41; WCDMA: B2/4/5
	-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* (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	/	-JP* (Japan) LTE-FDD: B1/3/5/8/11/18/19/21/26/28; 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	/	-WF (Global) Only Wi-Fi & BT
	CPU	Qualcomm MSM8909 ARM Coretex 4 x A7@ 1.1GHz	Qualcomm MSM8909 ARM Coretex 4 x A7@ 1.1GHz	Qualcomm MSM8909 ARM Coretex 4x A7@ 1.1GHz	Qualcomm QCM2150 ARM Coretex 4 x A53@ 1.3GHz
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 304 Graphics Processing Unit (GPU), up to 409.6MHz	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	512MB NAND+ 512MB DDR2	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/-CE/-W	Yocto Linux (Kernel 3.18) in SC20-EL/-AL/-JL/-AUL/-WL	Yocto Linux(Kernel 3.18) in SC20-AX/-EX	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	3.5 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	9.8	10.2	
Operating Temperature	-35 °C ~ +75 °C	-35 °C ~ +75 °C	-35 °C to +75 °C	-35 °C ~ +75 °C	
Data Transmission					
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)	-AX: LTE-FDD: Max. 150 (DL)/Max. 50 (UL); LTE-TDD: Max. 130 (DL)/Max. 30 (UL) -EX: LTE-FDD: Max. 150 (DL)/Max. 50 (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)	-EX: 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) 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)/236.8 (UL); GPRS: Max. 107 (DL)/85.6 (UL)	EDGE: Max. 296 (DL)/236.8 (UL); GPRS: Max. 107 (DL)/85.6 (UL)	-EX: EDGE: 296 (DL)/236.8 (UL); GPRS: 107 (DL)/85.6 (UL)	EDGE: Max. 296 (DL)/236.8 (UL); GPRS: Max. 107 (DL)/85.6 (UL)	
Interfaces					
LCM	4-lane MIPI_DSI, 1.5 Gbps/lane, HD (1280 x 720) @ 60 fps	4-lane MIPI_DSI, 1.5 Gbps/lane, HD (1280 x 720) @ 60 fps	4-lane MIPI_DSI, up to 1.5 Gbps/ lane, HD (720P) @ 60 fps	4-lane MIPI_DSI, HD+ (1440 x 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	Uses MIPI_CSI, up to 1.5 Gbps/ lane, supports two cameras; 2-lane MIPI_CSI for rear camera, up to 8 MP; 1-lane MIPI_CSI for front camera, up to 2 MP	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	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: 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	Encoding: 720P (H.264) @ 30 fps; WVGA (MPEG-4/VP8) @ 30 fps Decoding: 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	Supports high speed mode, up to 480 Mbps; Supports USB 2.0 OTG, USB OTG + charge and USB to Ethernet functions	× 1, USB 2.0, supports USB OTG	
I2C	Supported	Supported	× 3	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, supports 1.8/ 3 V (U)SIM cards, (U)SIM card detection function and DSDS	× 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	× 2, UART1 supports hardware flow control, up to 4 Mbps	× 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	× 1, SD 3.0, 4-bit SDIO	
PWRKEY/ SPI/ ADC/ GPIO	Supported	Supported	Supported	Supported	
PWM/ Motor Driver	× 1	× 1	× 1	× 1	
Antenna	× 4, Main/ Rx-diversity/ GNSS/ Wi-Fi & Bluetooth	× 4, Main/ Rx-diversity/ GNSS/ Wi-Fi & Bluetooth	× 4, main antenna, Rx-diversity antenna, GNSS antenna and Wi-Fi/ Bluetooth antenna interface respectively	4 Solder Pads for Main/Rx-diversity/ GNSS/ Wi-Fi&BT Antenna, Respectively	
Enhanced Features					
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	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	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	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	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	Build-in Charge IC	
Dual LCDs	Only support single LCD Display	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	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	Firmware Upgrade via USB or OTA	
Certifications <sup>4</sup>	CE/GCF/RCM/FCC/IC/PTCRB/AT&T/Verizon/ Telstra/T-Mobile*/Telus*/JATE/TELEC/KDDI/ NTT-Docomo/CCC/SRRC/NAL/NCC/KC/Softbank/Anatel	CE/GCF/RCM/FCC/IC/PTCRB/AT&T/Verizon/ Telstra/T-Mobile*/Telus*/JATE/TELEC/CCC*/ SRRC*/NAL*/NCC*/KC*/Anatel	GCF/IC/CCC/PTCRB/AT&T/Verizon/CE/UKCA/ RCM	GCF/CE/RCM/FCC/PTCRB/AT&T/Verizon/Telstra/ IC/JATE*/TELEC*/CCC*/KC*/SRRC	
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




# 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 × 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	
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 10.0	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	
Data Transmission				
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) / 1.8 Mbps (UL) 1X Advanced: Max. 307.2 Kbps (DL/UL)	EVDO: Max. 3.1 Mbps (DL) / 1.8 Mbps (UL) 1X Advanced: Max. 307.2 Kbps (DL/UL)	
GSM(Kbps)	EDGE: Max. 296 (DL) / 236.8 (UL) , GPRS: Max. 107 (DL) / 85.6 (UL)	EDGE: Max. 296 (DL) / 236.8 (UL) GPRS: Max. 107 (DL) / 85.6 (UL)	EDGE: Max. 296 Kbps (DL) / 236.8 Kbps (UL) GPRS: Max. 107 Kbps (DL) / 85.6 Kbps (UL)	
Interfaces				
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/DivX/4/5/6) @ 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	× 2, USB 2.0 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 Supported	× 1, compliant with USB 2.0/ 3.1, supports USB OTG, charge, etc. × 4	× 1, compliant with USB 2.0/ 3.1, supports USB OTG, charge, etc. × 4	
I2C	× 2, support 1.8/2.95 V (U)SIM cards, with (U)SIM card detection function, DS2S supported	× 2 (1.8V/2.95V)	× 2 (1.8V/2.95V)	
(U)SIM	× 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	
UART	/	× 1 (3.0, 4-bit SDIO)	× 1 (3.0, 4-bit SDIO)	
SDIO	× 1, SD 3.0, 4-bit SDIO	× 1, SD 3.0, 4-bit SDIO	× 1, SD 3.0, 4-bit SDIO	
SD Card	Supported	Pulled up internally to 1.1 V	Pulled up internally to 1.1 V	
PWRKEY	Supported	× 1 (multiplexed)	× 1 (multiplexed)	
SPI	Supported	× 1, general-purpose ADC interface	× 1, general-purpose ADC interface	
ADC	Supported	× 33	× 33	
GPIO	Supported	× 1	× 1	
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)	
Enhanced Features				
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	
DS2S	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>	GCF/CE/Anatel/CCC/SRRC/NAL*	CCC/SRRC/NAL/CE/UKCA/RCM/GCF/KC/FCC/IC/PTCRB/AT&T/Verizon*/T-Mobile/JATE/TELEC/DCM/KDDI*/Anatel/NCC/NBTC	CE/UKCA/RCM/GCF/KC/FCC/IC/PTCRB*/AT&T*/Verizon*/T-Mobile*	
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

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 × A53@ 1.8GHz	Qualcomm QCM4290 ARM Coretex technology 4 × Kryo 260@ 2.0 GHz + 4 × Kryo 260@ 1.8GHz	Qualcomm QCM4290 ARM Coretex technology 4 × Kryo 260@ 2.0 GHz + 4 × Kryo 260@ 1.8GHz
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) 128 GB UFS + 8 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
Data Transmission			
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)/236.8 (UL); GPRS: Max. 107 (DL)/85.6 (UL)	EDGE: Max. 296 (DL)/236.8 (UL); GPRS: Max. 107 (DL)/85.6 (UL)	EDGE: Max. 296 (DL)/236.8 (UL); GPRS: Max. 107 (DL)/85.6 (UL)
Interfaces			
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)	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
Enhanced Features			
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 + L5	GNSS <sup>3</sup> : GPS/BDS/GLONASS/Galileo/NavIC/QZSS/SBAS; L1 + L5
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>	CE/RCM/GCF/NCC/Telstra/FCC/IC/PTCRB/AT&T/Verizon/ T-Mobile/JATE/TELEC/KDDI/NTT DOCOMO/IFETEL/Anatel/KC	CE/RCM/GCF/NCC* <sup>1</sup> /Telstra*/FCC/IC/PTCRB/AT&T/Verizon*/ T-Mobile/JATE/TELEC/KDDI*/NTT DOCOMO*/IFETEL*/ KC/UKCA	CE/RCM/GCF/FCC/IC/PTCRB/AT&T/Verizon*/T-Mobile*/JATE/ TELEC/KC/UKCA
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

# 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	
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 <sup>1</sup> /15 <sup>1</sup> /16 <sup>1</sup>	Android 10.0	
Supply Voltage Range	3.55-4.4 V, typ. 4.0 V	3.55 V~4.2 V, typ. 3.8 V	
Weight (approx.) g	TBD	10.5	
Operating Temperature	-35 °C ~ +75 °C	-30 °C ~ +75 °C	
Data Transmission			
5G	SG520B-CN: 5G SA: Max. 2.1 Gbps (DL)/Max. 450 Mbps (UL) 5G NSA: Max. 2.5 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-HSUPA: Max. 11.2 Mbps (DL) WCDMA: Max. 384 Kbps (DL)/ Max. 384 Kbps (UL)	
GSM (Kbps)	EDGE: SG520B-EM: Max. 296 kbps (DL)/Max. 236.8 kbps (UL) GPRS: SG520B-EM: Max. 107 kbps (DL)/Max. 85.6 kbps (UL)	EDGE: Max. 296 (DL) /Max. 236.8 (UL) GPRS: Max. 107 (DL) /Max. 85.6 (UL)	
Interfaces			
LCM	FHD+ @ 60/ 90/ 120 Hz	4-lane MIPI_DSI, FHD+ (2160 × 1080) @ 60 fps	
Camera	3× MIPI CSI, 2× ISP: 25 MP @ 30 fps, 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	
Enhanced Features			
BT	Bluetooth 5.2 2.4 & 5 & 6 GHz	Bluetooth 2.1 EDR/3.0 HS/4.2 LE/5.0 LE	
Wi-Fi	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 + L5	GPS/GLONASS or GPS/BDS	
Charge Function	Build-in Charge IC & Fuel Gauge Qualcomm Quick Charge technology	Built-in charging function	
Dual LCDs	/	only support single LDC display	
DSDS	Support dual card dual standby	Support 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*	SRRC/ NAL/ CCC	
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: May depend on modules' variant.

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

\* Planning/Under development

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 × A53@ 2.0 GHz	Qualcomm MSM8953 ARM Coretex 8 × A53@ 2.0 GHz	
GPU	Qualcomm <sup>®</sup> Adreno <sup>™</sup> 506 graphics processing unit (GPU) with 64-bit addressing	Qualcomm <sup>®</sup> Adreno <sup>™</sup> 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	
Data Transmission			
LTE (Mbps)	Cat 6: LTE-FDD: Max. 300 (DL)/Max. 50 (UL); LTE-TDD: Max. 285 (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. 285 (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)	
GSM(Kbps)	EDGE: Max. 296 (DL)/236.8 (UL); GPRS: Max. 107 (DL)/85.6 (UL)	EDGE: Max. 296 (DL)/236.8 (UL); GPRS: Max. 107 (DL)/85.6 (UL)	
Interfaces			
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, 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, 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	
Enhanced Features			
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, 802.11a/b/g/n/ac; 433 Mbps, STA/AP/P2P	2.4 & 5 GHz, 802.11a/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	support independent display for 2 LCDs	support independent display for 2 LCDs	
DSDS	Support Dual SIM Dual Standby	Support Dual SIM Dual Standby	
Firmware Upgrade	Firmware Upgrade via USB or OTA	Firmware Upgrade via USB or OTA	
Certifications <sup>3</sup>	CE/RCM/GCF/NCC/Telstra/FCC/IC/PTCRB/AT&T/Verizon/T-Mobile/JATE/TELEC/KDDI/NTT Docomo/IFETEL/Anatel/KC	CE/RCM/GCF/FCC/IC/PTCRB/AT&T/Verizon	
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

# 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: BCO; GSM: 900/1800MHz	-CE(China) LTE-FDD: B1/3/5/8; LTE-TDD: B34/38/39/40/41; WCDMA: B1/8; CDMA: BCO; 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 Coretex technology 4 x Kryo260 Gold@2.2 GHz + 4 x 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	
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 10.0/11.0/13.0	
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	
Data Transmission			
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-HSPA: Max. 5.76 Mbps (UL); WCDMA: Max. 384 Kbps (DL/UL)	DC-HSDPA: Max. 42 Mbps (DL); DC-HSPA: Max. 5.76 Mbps (UL); WCDMA: Max. 384 Kbps (DL/UL)	
TD-SCDMA	Max. 4.2 Mbps (DL)/2.2 Mbps (UL)	/	
CDMA2000	EVDO: Max. 3.1 Mbps (DL)/1.8 Mbps (UL); 1X Advanced: Max. 307.2 Kbps (DL/UL)	EVDO : Max. 3.1 Mbps (DL)/1.8 Mbps (UL) 1X Advanced: Max. 307.2 Kbps (DL/UL)	
GSM(Kbps)	EDGE: Max. 296 (DL)/236.8 (UL) ; GPRS: Max. 107 (DL)/85.6 (UL)	EDGE: Max. 296 (DL)/236.8 (UL); GPRS: Max. 107 (DL)/85.6 (UL)	
Interfaces			
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, H264, 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, Support 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)	
Enhanced Features			
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*: 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*: 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	support independent display for 2 LCDs	Supports dual screen display, 1920 × 1200 or 1080 × 2520 (MIPI screen) 1920 × 1080 (DP screen)	
DSDS	Support Dual SIM Dual Standby	Support Dual-SIM Dual-Standby	
Firmware Upgrade	Firmware Upgrade via USB or OTA	Firmware Upgrade via USB or OTA	
Certifications <sup>1</sup>	CE/GCF/FCC/PTCRB/NCC/AT&T/Verizon/RCM/IC/JATE/TELEC/CCC/SRRC/NAL/KC/UKCA	CCC/SRRC/NAL/CE/RCM/UKCA/FCC/IC/GCF/PTCRB/Verizon*/ATT*/TMO*/KC/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 × 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

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: n1/3/5/8/20/28/38/40/41/77/78/79; LTE: B1/2/3/4/5/7/8/12/17/18/19/20/26/28/32/34/38/39/40/41/42; WCDMA: B1/2/4/5/8/19; 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 x Kryo670 Goldplus@ 2.7 GHz + 3 x Kryo670 Gold@ 2.4 GHz + 4 x Kryo670 Silver@ 1.9GHz	
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	
Data Transmission			
5G	/	5G SA: 2.1 Gbps (DL)/900 Mbps (UL); 5G NSA: 2.5 Gbps (DL)/650 Mbps (UL)	
LTE (Mbps)	Cat 4: LTE-FDD: Max. 150 (DL)/Max. 50 (UL); LTE-TDD: Max. 130 (DL)/Max. 30 (UL)	Cat18: 1.2 (DL)/200 (UL)	
UMTS	DC-HSDPA: Max. 42 Mbps (DL); DC-HSPA: Max. 5.76 Mbps (UL); WCDMA: Max. 384 Kbps (DL/UL)	DC-HSPA+: 42 Mbps (DL)/5.76 Mbps (UL); WCDMA: 384 Kbps (DL)/384 Kbps(UL)	
TD-SCDMA	/	/	
CDMA2000	EVDO : Max. 3.1 Mbps (DL)/1.8 Mbps (UL) 1X Advanced: Max. 307.2 Kbps (DL/UL)	/	
GSM(Kbps)	EDGE: Max. 296 (DL)/236.8 (UL); GPRS: Max. 107 (DL)/85.6 (UL)	SG560D-EM: EDGE: 296 (DL)/236.8 (UL); GPRS: 107 (DL)/85.6 (UL)	
Interfaces			
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)	
Enhanced Features			
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	Support Dual-SIM Dual-Standby	Support Dual SIM Dual Standby	
Firmware Upgrade	Firmware Upgrade via USB or OTA	Firmware Upgrade via USB or OTA	
Certifications <sup>3</sup>	CE/RCM/FCC/IC*/PTCRB*/GCF*	CE/RCM/UKCA/GCF*/CCC*/SRRC*/NAL*/FCC/IC/PTCRB*/Verizon*/AT&T*/T-Mobile*	
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.

\* Planning/Under development

# Smart Modules

Product	SA800U	SG865W	SG885G-WF
			
Form Factor	B2B Connector	LGA	/
Dimensions(mm)	37.0 × 60.0 × 6.55	46.0 × 42.0 × 2.95	49.0 × 51.0 × 4.25
Frequency Bands (MHz)	-WF(Global) -AP(Global)	- WF* (Wi-Fi) only Wi-Fi & BT	/
CPU	Qualcomm SDA845 ARM Cortex technology 4 × Kryo385 Gold@2.649 GHz + 4 × Kryo385 Silver@1.766 GHz	Qualcomm QCS8250 ARM Cortex technology 1 × Kryo585 Goldprime@ 2.842 GHz + 3 × Kryo585 Gold@2.419 GHz + 4 × Kryo585 Silver@ 1.805GHz	Kryo™
GPU	Adreno 630 – 4K 60 fps UI or 2 × 2K 90 fps UI	Adreno 650 at 587 MHz– 4K 60 fps UI or 2 × 2K 60 fps UI	Adreno™ 740
Memory	4 GB LPDDR4X + 64 GB UFS; 8 GB LPDDR4X + 256 GB UFS	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 9/10	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	3.55-4.4 V, typ. 3.8 V
Weight (approx.) g	15.0	TBD	18.6
Operating Temperature	-35 °C ~ +75 °C	-35 °C ~ +75 °C	-30 °C ~ +75 °C
Data Transmission			
LTE (Mbps)	/	/	/
UMTS	/	/	/
TD-SCDMA	/	/	/
CDMA2000	/	/	/
GSM	/	/	/
Interfaces			
LCM	2 × 4-lane MIPI DSI; 3840 × 2400 @ 60 fps primary display; 4K @ 60 fps over DP; Wi-Fi display; 4K @ 30 fps	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	3 × 4-lane CSI with C-PHY/ D-PHY + 1 × 2-lane CSI with D-PHY ; 2 × ISP + 1 × Lite ISP; 16 MP (30 fps ZSL ) @ 1 × ISP + 16 MP (30 fps ZSL) @ 1 × ISP; Max. 32 MP (30 fps ZSL) @ 2 × ISP	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	Capacitive-screen, I2C controls	Supported
Audio	Needs external audio codec	Needs external audio codec	SWR, Digital Microphone, MI2S interfaces, HIFI I2S
Video	Decode: 4K @ 60 fps; H.264 High Profile, H.265 Main 10 Profile and VP9 Profile 2; Encode: 4K @ 60 fps; H.264 High Profile, H.265 Main 10 Profile; Encode: 4K @ 30 fps; VP8; Supports HDR 10-bit video playback (HLG, HDR10); Supports HDR 10-bit capture (HLG)	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 × 1 × USB 3.1, supports DP over Type-C; 1 × USB 3.1, only supports USB Host mode	2 × USB 3.1, compatible wdisplayPort × 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	Supported	× 10
UART	× 3, up to 3 Mbps, one of them is used for debugging only	× 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, 4-bit SDIO	× 1, SD 3.0
PWRKEY	Supported	Supported	× 1
SPI	Supported	Supported	× 5
ADC	Supported	Supported	× 2 General-purpose ADC interfaces
GPIO	Supported	Supported	Supported
PWM	× 2	/	Supported
Motor Driver	× 1	× 1	× 1
Flashlight Driver	× 3	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	not support	not support	/
Antenna	× 2 Wi-Fi/ Bluetooth and Wi-Fi MIMO antenna interfaces	× 2 Wi-Fi/ Bluetooth and Wi-Fi MIMO antenna interfaces	× 2 Wi-Fi/ Bluetooth and Wi-Fi MIMO antenna interfaces
Enhanced Features			
BT	Bluetooth 2.1 EDR/3.0 HS/4.2 LE/5.0 LE	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, DBS	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	NA, can be supported by using Quectel 4G/5G/GNSS modules	/
Charge Function	Build-in Charge IC & Fuel Gauge Qualcomm Quick Charge technology	Used for battery voltage detection, fuel gauge, battery temperature detection	Supported
Dual LCDs	support independent display for 2 LCDs	support independent display for 2 LCDs	Supported*
Firmware Upgrade	Firmware Upgrade via USB or OTA	Firmware Upgrade via USB or OTA	Via USB
Certifications	KC	TBD	/
Recommended Applications	Infotainment, live video, robotics, gaming, VR, unmanned aerial vehicle control, 3D scanners, gym equipment, virtual coin mining diggers, ARM based computers and servers, etc.		

\* Planning/Under development




Product	BG96	BG95 Series <sup>1</sup>	BG95xA-GL Series
			
Form Factor	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)
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)
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)
Weight (approx.) g	3.1	2.15	2.15 (BG950A-GL/BG951A-GL/BG952A-GL/BG953A-GL); 2.05 (BG955A-GL)
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
Data Transmission			
LTE Cat M1 data rate (Kbps)	Max. 375 (DL), Max. 375 (UL)	Max. 588 (DL), Max. 1119 (UL)	Max. 588 (DL), Max. 1119 (UL)
LTE Cat NB1 data rate (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 rate (Kbps)	/	Max. 127 (DL), Max. 158.5 (UL)	Max. 127 (DL), Max. 158.5 (UL)
EDGE data rate (Kbps)	Max. 296 (DL), Max. 236.8 (UL)	Max. 296 (DL), Max. 236.8 (UL)	/
GPRS data rate (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
Protocols	PPP/TCP/UDP/SSL/TLS/FTP(S)/HTTP(S)/NITZ/PING/MQTT(S)/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	PPP/TCP/UDP/SSL/TLS/FTP(S)/HTTP(S)/NITZ/ PING/MQTT/LwM2M
Interfaces			
(U)SIM	1.8 V/ 3 V	1.8 V	1.8 V
UART	× 3 (MAIN, DEBUG, NMEA)	× 3 (MAIN, DEBUG, NMEA)	× 3 (MAIN, DEBUG, GNSS)(BG950A-GL/BG951A-GL/BG953A-GL/BG955A-GL); × 2 (BG952A-GL)
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
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)
RESET	RESET × 1	RESET × 1	RESET × 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)
Enhanced Features			
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
Electrical Features			
Supply Voltage Range	3.3 ~ 4.3 V, typ. 3.8 V	typ. 3.8 V / typ. 3.3 V <sup>6</sup>	2.2-4.35 V, typ. 3.3 V . (BG950A-GL/BG951A-GL/BG952A-GL/BG953A-GL); 3.3-4.3 V, typ. 3.8 V (BG955A-GL)
Power Consumption	10 μA@PSM	3.9 μA@PSM <sup>7</sup>	1.5 μA@ PSM (BG950A-GL/BG951A-GL/BG952A-GL/BG955A-GL); TBD (BG953A-GL)
Max Output Power	Power Class 3 23dBm @ LTE Bands	Power Class5 21 dBm @ 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
Certifications <sup>9</sup>	Vodafone/Deutsche Telekom/Telefónica/ Verizon/AT&T/ T-Mobile/Telus/Rogers/ SKT/LGU+ /NTT DOCOMO/SoftBank/ KDDI/ Telstra/GCF/CE/FCC/PTCRB/IC/IFETEL/CCC/KC/ NCC/JATE/TELEC/RCM/NBTC/IMDA/ICASA/U.S. Cellular	Vodafone/Deutsche Telekom/Verizon/AT&T/T-Mobile/SKT/NTT DOCOMO/SoftBank*/KDDI/Telstra/CCC/GCF/CE/FCC/PTCRB/IC/ Anatel/KC/NCC/JATE/TELEC/RCM/NBTC*/IMDA/RoHS/ATEX/PEN/ KT/UKCA/LGU+ /Telefonica/U.S.Cellular/Telus/Orange/Rogers/IMDA/IFETEL	Vodafone /Deutsche Telekom/Verizon*/AT&T/T-Mobile*/SKT*/ LGU+*/NTT DOCOMO*/KDDI*/Telstra/GCF/CE/FCC/PTCRB/IC/KC/ JATE/TELEC/RCM/KT
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 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.

\* Under development  
 • 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
Data Transmission			
LTE Cat M1 data rate (Kbps)	Max. 588 (DL), Max. 1119 (UL)	Max. 588 (DL), Max. 1119 (UL)	Max. 588 (DL), Max. 1119 (UL)
LTE Cat NB1 data rate (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 rate (Kbps)	Max. 127 (DL), Max. 158.5 (UL)	Max. 127 (DL), Max. 158.5 (UL)	Max. 127 (DL), Max. 158.5 (UL)
EDGE data rate (Kbps)	Max. 296 (DL), Max. 236.8 (UL)	/	/
GPRS data rate (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/Polite(BG770A-GL/BG772A-GL); PPP/TCP/UDP/SSL/TLS/FTP(S)/HTTP(S)/NITZ/PING/MQTT/LwM2M(BG773A-GL)
Interfaces			
(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)
Enhanced Features			
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
Electrical Features			
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: 2.2~4.35 V, typ. 3.3 V VBAT_RF: 3.1~4.2 V, typ. 3.3 V
Power Consumption	4.0 μA@PSM	3.44 μA@PSM	1.4 μA@PSM (BG770A-GL/BG772A-GL); TBD (BG773A-GL)
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/CCC*/GCF/CE/FCC/RCM/PTCRB/IC/RoHS/Anatel/UKCA	Vodafone/Deutsche Telekom/Verizon/AT&T/T-Mobile/GCF/CE/FCC/PTCRB/IC/KC*/NCC/JATE/TELEC/RCM/NBIC*/Telus/USCC/RoHS/UKCA	FCC/CE/IC/RCM/KC/TELEC/JATE/Deutsche Telekom/SKT/Vodafone/PTCRB/GCF/AT&T/Verizon/RoHS/KT/LGU+/NTT/DOCOMO/KDDI/Telstra/ICASA/Softbank*/T-Mobile*/Orange
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.

\* Under development




• 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
Data Transmission		
LTE Cat NB1 data rate (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 rate (Kbps)	Max. 127 (DL)/ 158.5 (UL)	Max. 127 (DL)/ 158.5 (UL)
GPRS data rate (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
Interfaces		
(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	Primary	Primary
Enhanced Features		
QuecOpen®	•	•
DFOTA	•	•
BLE 5.0	/	/
Firmware Update	via UART/DFOTA	via UART/DFOTA
RAI	•	•
Location Based Service	/	/
eSIM*	Optional	Optional
Electrical Features		
Supply Voltage Range	2.2–4.3 V, typ. 3.3 V	2.2–4.3 V, typ. 3.6 V
Power Consumption	800 nA @ PSM <sup>1</sup>	800 nA @ PSM <sup>1</sup>
Certifications	GCF/CE/PTCRB/FCC/IC/Anatel/KC/RCM/IMDA/NBTC/ICASA/ATEX/JATE/TELEC/Vodafone/Deutsche Telekom/Verizon/AT&T/T-Mobile/KT/LGU+/Telefónica/Orange/Dptus/Telstra/Spark	GCF/CE/Anatel*/KC*/RCM/IMDA*/NBTC*/ICASA*/Vodafone*/Deutsche Telekom*/KT*/LGU+*/Telefónica*/Telstra*
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: Reference data provided by baseband chip.



\* Under development  
• Supported

# LPWA Modules

Product	BC65	BC92	BC95-GR
			
Form Factor	LCC	LCC	LCC
Dimensions (mm)	17.7 × 15.8 × 2.2	23.6 × 19.9 × 2.2	23.6 × 19.9 × 2.2
RAT	LTE Cat NB2	LTE Cat NB2/GSM	LTE Cat NB2
Frequency Bands (MHz)	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	1.2±0.2	1.8±0.1	1.6 ±0.2
Operating Temperature	-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
Data Transmission			
LTE Cat NB1 data rate (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 rate (Kbps)	Max. 127 (DL)/158.5 (UL)	Max. 127 (DL)/158.5 (UL)	Max. 127 (DL)/158.5 (UL)
GPRS data rate (Kbps)	/	GPRS Class 12: Max. 85.6 (DL)/85.6 (UL)	/
SMS	•	•	/
Protocols	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
Interfaces			
(U)SIM	1.8 V/3.0 V	1.8 V/3.0 V	1.8 V/3.0 V
UART	× 3 (MAIN, DEBUG, AUX)	× 2 (MAIN, DEBUG)	× 3 (MAIN, DEBUG, AUX)
I2C	/	/	/
ADC	× 1	× 1	× 1
GPIO	/	/	/
RESET(RESET_N)	× 1	× 1	× 1
SPI	/	/	/
PWM	/	/	/
RI	× 1	× 1	× 1
PSM_EINT	× 1	× 1	× 1
I2S	/	/	/
NETLIGHT	/	/	× 1
WAKEUP_OUT	/	/	× 1
Antenna	Primary	Primary	Primary
Enhanced Features			
QuecOpen*	/	/	*
DFOTA	•	•	•
BLE 5.0	/	/	/
Firmware Update	via UART/DFOTA	via UART/DFOTA	•
RAI	•	•	•
Location Based Service	ECID, OTDOA	ECID, OTDOA	ECID, OTDOA
eSIM*	Optional	Optional	Optional
Electrical Features			
Supply Voltage Range	3.2 V~4.2 V, typ. 3.8 V	3.4 V~4.2 V, typ. 3.8 V	3.2~4.2 V, typ. 3.6 V
Power Consumption	4 μA @PSM	4 μA @PSM	3.8 μA @PSM 1.2 mA @ Idle, DRX = 2.56 s, ECL 0
Certifications <sup>1</sup>	CE/RCM/GCF/Deutsche Telekom/Vodafone/Telefónica	CE/RCM/GCF/Vodafone/MTN/ICASA/Vodacom/Anatel/Deutsche Telekom	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.


\* Under development  
• Supported

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	Satellite	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
Data Transmission		
Satellite Band	L-Band	L-Band (B255)/ S-Band (256/23)
GNSS	GPS L1/ GLONASS L1/ Galileo E1/ BDS B1	/
SMS	/	/
Protocols	IDP	IPv4/UDP*/NIDD/SMP*/DNS*
Interfaces		
(U)SIM	/	× 1
UART	× 2	× 3 (QuecOpen® × 4)
I2C	× 1*	× 2(Only supported in QuecOpen® *solution)
ADC	× 2	× 1
GPIO	× 2	Configurable( Only supported in QuecOpen® *solution)
RESET(RESET_N)	× 1	× 1
SPI	/	× 1(Only supported in QuecOpen® *solution)
PWM	/	× 4(Only supported in QuecOpen® *solution)
RI	× 1*	× 1*
PSM_EINT	/	× 1
I2S	/	/
NET_STATUS	× 1*	× 1*
WAKEUP_IN	× 1	/
WAKEUP_OUT	/	/
Antenna	× 1	× 1
USB	/	× 1
Enhanced Features		
QuecOpen®	/	•
DFOTA	•	•
BLE 5.0	/	/
Firmware Update	via UART/DFOTA*	via UART/DFOTA*
RAI	/	•
Location Based Service	/	/
eSIM*	/	Optional
Electrical Features		
Supply Voltage Range	Voltage Range: 5.5V-6.5V Typical: 6.0V	2.2-3.6 V, typ. 3.3 V
Power Consumption	TBD	Typical: 3.4 μA @ Deep Sleep 338 mA @TX, 23 dBm (B255) 283 mA @TX, 23 dBm (B256) 275 mA @TX, 23 dBm (B23) 37 mA @TX, 0 dBm (B255) 37 mA @TX, 0 dBm (B256) 40 mA @TX, 0 dBm (B23)
Certifications	Regulatory:FCC*/ IC*/ CE*/ RCM* Satellite:Inmarsat Type Approval*	CE/RCM/FCC/IC/Skyle*
Recommended Applications	Vehicle Tracking, Asset Tracking, Chassis Tracking, Container Tracking, Oil & Gas Pipe Line Monitor, Mining, Smart Grid, Vessel Connection, Maritime Buoys, Heavy Equipment Monitor, Construction Fleet Management, Smart Agriculture, Environmental Monitor	


\* Under development  
• 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 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
Data Transmission		
LTE data rate (Mbps)	C-V2X TDD: Max. 26 (TX)/Max. 26 (RX)	/
Interfaces		
UART	× 2	×2
USB	USB2.0/3.0×1	×1 (USB 3.0/ 2.0)
PCIe	× 1	×1
SPI	× 2	×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)
Enhanced Features		
High Security	•	*
Secure Boot	•	•
SELinux*	•	*
ESD/EMI Protection	•	/
QDR (optional)	/	•
PPE(RTK)(optional)	/	*
Temperature Management	/	•
DFOTA	/	•
GNSS	•	•
Code/User Data Backup	/	•
Realized through Internal Specific Circuits and Components	•	/
Software Features		
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)	/
Electrical Features		
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: 3.3~4.3 V, typ. 3.8 V VBAT_RF: 4.75~5.25 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-boxes, T-boxes

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
Interfaces	
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	•
Enhanced Features	
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)


\* Under development  
• Supported

Product	AG35	
		
Form Factor	LGA	
Dimensions (mm)	33.0 × 37.5 × 3.0	
4G	LTE Cat 4	
Frequency Bands (MHz)	- 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
	- 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
	- NA (North America)	LTE-FDD: B2/4/5/7/12(B17)/13; WCDMA: B2/4/5; GSM: B2/5
	- J (Japan)	LTE-FDD: B1/3/5/8/9/19/21/28; LTE-TDD: B41; WCDMA: B1/3/5/6/8/19
	- 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
Weight (approx.) g	8.1	
Operating Temperature	-40°C ~ +85°C	
<b>Data Transmission</b>		
LTE data rate (Mbps)	LTE-FDD: Max. 150 (DL)/ Max. 50 (UL) ; LTE-TDD: Max. 130 (DL)/ Max. 30 (UL)	
DC-HSPA+ data rate (Mbps)	Max. 42 (DL)/ Max. 5.76 (UL)	
WCDMA data rate (Kbps)	Max. 384 (DL)/ Max. 384 (UL)	
TD-SCDMA data rate (Mbps)	Max. 4.2 (DL)/ Max. 2.2 (UL)	
EDGE data rate (Kbps)	Max. 296 (DL)/ Max. 236.8 (UL)	
GPRS data rate (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	•	
Voice over USB (USB Audio)	•	
QDR	Optional	
PPE (RTK)	Optional (Support only in China)	
GNSS	GPS/GLONASS/Beidou/Galileo/QZSS	
<b>Advanced Security Feature</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>	CCC/SRRC/NAL/GCF/CE/FC0/KC/RCM/Anatel/KT/STK*LGU+*/PTCRB/IC/AT&T/ Rogers/T-Mobile/Verizon/JATE/TELEC/NTT DOCOMO	
Recommended Applications	Automotive	

Note 1: May depend on modules' variant.

\* Under development  
• 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)	LTE: B1/3/5/7/8/34/38/39/40/41; UMTS: B1/8; CDMA(Optional): BCC; GSM: 1800MHz/900MHz
	-EU(EMEA/ Korea/ Brazil/ India/ Australia)	LTE: B1/3/5/7/8/20/28/32(DL)/38/40/41; UMTS: B1/3/5/8; GSM: 1800MHz/900MHz
	-NA(North America)	LTE-FDD: B2/4/5/7/12/13/14/25/26/29/30*/66/71
	-JP(Japan)	LTE-FDD: B1/3/5/8/9/11/18/19/21/28; LTE-TDD: B41; WCDMA: B1/3/5/8/9/19
	-GL(Global)	LTE-FDD: B1/2/3/4/5/7/8/9/11/12/13/18/19/20/21/25/26/28/29/30*1/32*/66/71; LTE-TDD: B34/38/39/40/41; WCDMA: B1/2/3/4/5/6/8/19; GSM: 850/900/1800/1900MHz
Weight (approx.) g	9.23	
Operating Temperature	-40°C ~ +85°C (eCall: +95°C)	
Data Transmission		
LTE data rate (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 rate (Mbps)	Max. 42 (DL)/Max. 5.76 (UL)	
WCDMA data rate (Kbps)	Max. 384 (DL)/Max. 384 (UL)	
TD-SCDMA data rate (Mbps)	/	
EDGE data rate (Kbps)	Max. 296 (DL)/Max. 236.8 (UL)	
GPRS data rate (Kbps)	Max. 107 (DL)/Max. 85.6 (UL)	
C-V2X data rate (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	
Interfaces		
(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	
Enhanced Features		
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	
Advanced Security Feature		
TrustZone	TrustZone™/TPM*: •	
Secure Boot	Secure Boot*: •	
SE-Linux	•	
Code/User Data Backup	•	
Software Features		
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	
Electrical Features		
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/FCC/IC/PTCRB/GCF/CE/RCM/Verizon/AT&T-Mobile/Telus/KT/NTT DOCOMO/Telstra/UKCA/IFETEL/KC/NCC/JATE/TELEC	
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.

\* Under development  
 • Supported

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: B2/4/5/7/12/13/17/28/29/30/66/71; 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 Rate (Mbps)	Max. 300 (DL)/ Max. 50 (UL)	
LTE TDD Data Rate (Mbps)	Max. 240 (DL)/ Max. 30 (UL)	
DC-HSDPA/HSUPA Data Rate (Mbps)	Max. 42 (DL)/ Max. 5.76 (UL)	
WCDMA Data Rate (Kbps)	Max. 384 (DL)/ Max. 384 (UL)	
EDGE Data Rate (Kbps)	Max. 236.8 (DL) / Max. 236.8 (UL)	
GPRS Data Rate (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	
RGMII	× 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 Feature</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>2</sup>	CCC/SRRC/NAL/FCC*/IC*/PTCRB*/GCF*/AT&T*/CE*/KC*/JATE*/TELEC*/RCM*	
Recommended Applications	Automotive	

Note 1: LTE-FDD B29 and B30 support Rx only.  
Note 2: May depend on modules' variant.

\* Under development  
• 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 Rate	Max. 1.6 Gbps (DL) / Max. 200 Mbps (UL)	
LTE TDD Data Rate	Max. 1.4 Gbps (DL) / Max. 120 Mbps (UL)	
DC-HSDPA/HSUPA Data Rate(Mbps)	Max. 42 (DL) / Max. 5.76 (UL)	
WCDMA Data Rate (Kbps)	Max. 384 (DL) / Max. 384 (UL)	
EDGE Data Rate (Kbps)	Max. 296 (DL) / Max. 236.8 (UL)	
GPRS Data Rate (Kbps)	Max. 107 (DL) / Max. 85.6 (UL)	
C-V2X Data Rate (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 (Support 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 Feature</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/FCC*/IC*/PTCRB*/GCF*/AT&T*/CE(AG551Q-EU)/KC*/JATE*/TELEC*/RCM(AG551Q-EU)	
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.

\* Under development  
• 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 exl. Mexico)	5G-FDD: n1/3/5 <sup>3</sup> or n71 <sup>3</sup> /8/20/28A; 5G-TDD: n38 <sup>3</sup> /40 <sup>3</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>3</sup> /30 <sup>3</sup> /66/71; LTE-TDD: N41; WCDMA: B4
	-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 Rate	800 Mbps (DL)/200 Mbps (UL)	
LTE TDD Data Rate	500 Mbps (DL)/120 Mbps (UL)	
DC-HSDPA/HSUPA Data Rate(Mbps)	42 Mbps/5.76 Mbps	
WCDMA Data Rate (Kbps)	384 kbps (DL)/384 kbps (UL)	
EDGE Data Rate (Kbps)	296 kbps (DL)/236.8 kbps (UL)	
GPRS Data Rate (Kbps)	107 kbps (DL)/85.6 kbps (UL)	
C-V2X Data Rate (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 Feature</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: 3.3V-4.3V (typ. 3.8V) VBAT_C-V2X: 4.75V-5.25V (typ. 5.0V)	
Power Consumption	TBD @Power off, TBD @Sleep, Typ., TBD @Idle	
Certifications <sup>4</sup>	CCC*/SRRC*/NAL*/FCC*/IC*/PTCRB*/GCF*/AT&T*/CE*/KC*/JATE*/TELEC*/RCM*	
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.

# Automotive 5G Modules

Product	AG568N	
		
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: n1/3/28A <sup>1</sup> ; 5G-TDD: n41/78; LTE-FDD: B1/3/5/7/8; LTE-TDD: B34/38/39/40/41; WCDMA: B1/8; GSM: 900/1800MHz
	-EU (EMEA/ Korea/ Australia/ India/ Southeast Asia)	5G-FDD: n1/3/7/8/20/28; 5G-TDD: n77/78; LTE-FDD: B1/3/5/7/8/20/28/32 <sup>2</sup> ; LTE-TDD: B38/40; WCDMA: B1/3/5/8; GSM: 900/1800MHz
	-NA (North America)	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>3</sup> /30 <sup>4</sup> /66/71; LTE-TDD: B38/41/48; WCDMA: B2/4/5
	-ROW (Japan/ Latin America/ Brazil/ Mexico/...)	5G-FDD: n1/3/20/28; 5G-TDD: n41/77/78/79; LTE-FDD: B1/3/4/5/7/8/9/11 <sup>4</sup> /18/19/20/21/26/28; LTE-TDD: B38/40/41; WCDMA: B1/3/5/6/8/9/19; GSM: 900/1800/850/1900 MHz
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 Rate	Cat18: Max. 1.4 Gbps (DL) / Max. 200 Mbps (UL) Cat6: Max. 300 Mbps (DL) / Max. 50 Mbps (UL)	
LTE TDD Data Rate	Cat18: Max. 1.4 Gbps (DL) / Max. 200 Mbps (UL) Cat6: Max. 300 Mbps (DL) / Max. 50 Mbps (UL)	
DC-HSDPA/HSUPA Data Rate (Mbps)	Max. 42 (DL) / Max. 5.76 (UL)	
WCDMA Data Rate (Kbps)	Max. 384 (DL) / Max. 384 (UL)	
EDGE Data Rate (Kbps)	Max. 296 (DL) / Max. 236.8 (UL)	
GPRS Data Rate (Kbps)	Max. 107 (DL) / Max. 85.6 (UL)	
C-V2X Data Rate (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 Feature</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>4</sup>	CCC/SRRC/NAL/FCC*/IC*/PTCRB*/GCF*/AT&T*/CE*/KC*/JATE*/TELEC*/RCM*	
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, B30 and B32 support Rx only.

Note 3: Optional bands. Not supported by default.

Note 4: May depend on modules' variant.






\* Under development  
• Supported

Automotive RF Wi-Fi & Bluetooth Modules				
Product	AF20	AF50T	AF51Y	AF56C*
				
Band	2.4/5	2.4/5	2.4/5	2.4/5
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	21.5 × 23.5 × 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	3.11
<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
Antenna	1 (Wi-Fi & BT Antenna)	2 × Wi-Fi Ant with shared BT Ant, independent ant is optional	2 × Wi-Fi Ant with shared BT Ant, independent ant is optional	2 X Wi-Fi Ant with shared BT Ant, independent BT ant is optional
<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>Data Transmission</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





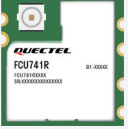
AF20 can work with Quectel AG35 module to provide Wi-Fi/BT function.  
 AF50T/AF51Y can work with Quectel AG52xR and AG55xQ module to provide Wi-Fi/BT function.  
 AF56C\* can work with Quectel AG56xN module to provide Wi-Fi/BT function.

\* Under development

# Wi-Fi & BT Modules

Automotive RF Wi-Fi & Bluetooth Modules					
Product	AH20C	AF31G	AF66T	AF68E*	AF61Y*
					
Band	2.4	2.4/5	2.4/5	2.4/5/6	2.4/5
MIMO	/	2 × 2 MIMO	2 × 2 + 2 × 2, Dual MAC, support BDS	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
BT Standard	BT 5.2	BT 5.0	BT 5.2	BT 5.3	BT5.2
Form Factor	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
Operating Temperature	-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	3.58
General Features					
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	CCK/BPSK/QPSK/16QAM/64QAM/256QAM/1024QAM/4096QAM	CCK/BPSK/QPSK/16QAM/64QAM/256QAM
Encryption Mode	/	WPA 3	WPA 3	WPA 3	WPA 3
AP (Max Access Point)	/	10	32	32	32
Operator Mode	/	AP/STA	AP/STA	AP/STA	AP/STA
I/O Interfaces					
PCIe	/	1	1	PCIe Gen3	1 (PCIe 2.0)
SDIO	/	/	/	/	/
UART	1	1	1	1	1
PCM	1	1	1	1	1
Antenna	1 BT Ant	2×Wi-Fi Ant with shared BT Ant, independent ant is optional	2×Wi-Fi Ant with shared BT Ant, independent ant is optional	2×Wi-Fi Ant with shared BT Ant, independent ant is optional	2×Wi-Fi Ant with shared BT Ant, independent ant is optional
Electrical Characteristics					
Supply Voltage Range	Core Supply Voltage: 3.3 V I/O Supply Voltage: 1.8 V	VDD_RF: 3.14–3.46 V, typ. 3.3 V VDD_IO: 1.71–1.89 V, typ. 1.8 V	VDD_RF: 3.3–4.25 V, typ. 3.85 V VDD_CORE: 1.90 V, 1.35 V, 0.95 V VDD_IO: 1.71–1.89 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
Data Transmission					
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. 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
802.11ax	/	/	2G Max. 573.5 Mbps, 5G Max. 1200 Mbps	Max. 3.6 Gbps	/
BLE	Max. 1Mbps	Max. 1Mbps	Max. 2 Mbps	Max. 2 Mbps	Max. 2 Mbps
Recommended Applications	Automotive	Automotive	Automotive	Automotive	Automotive









\* Under development

RF Wi-Fi & Bluetooth Modules (Wi-Fi 4)					
Product	FC30R	FC909A	FCS940R	FCS945R	FCU741R
					
Frequency Band	2.4GHz	2.4GHz	2.4GHz	2.4 GHz/5 GHz	2.4 GHz/5 GHz
MIMO	1 × 1	1 × 1	1 × 1	1 × 1	1 × 1
WLAN Standard	IEEE 802.11b/g/n	802.11b/g/n	IEEE 802.11b/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	/
Form Factor	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
Operating Temperature	-30° C ~ +85° C	-30° C ~ +85° C	-20° C ~ +80° C	-20° C ~ +70° C	-20° C ~ +70° C
Weight (approx.) g	0.58	0.6	0.53	0.62	0.68
General Features					
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
Encryption Mode	WPA3	WPA3	WPA3	WPA3	WPA3
I/O Interfaces					
PCIe	/	/	/	/	/
SDIO	1(SDIO 3.0)	1(SDIO 2.0)	1(SDIO 2.0)	1(SDIO 2.0)	/
USB	/	/	/	/	1
SPI	/	/	/	/	/
UART	/	1	1	1	/
PCM	/	1	1	1	/
Antenna	1 (Wi-Fi Antenna)	1 (Wi-Fi & BT Antenna)	1 (Wi-Fi & BT Antenna)	1 (Wi-Fi & BT Antenna) independent BT ant is optional*	1 (Wi-Fi Antenna)
Electrical Characteristics					
Supply Voltage Range	VBAT: 3.0 ~ 3.6 V, typ. 3.3 V VDDIO: 1.75 ~ 1.89 V, typ. 1.8 V	VBAT: 3.0~4.8 V, typ. 3.3 V VDDIO: 1.71~3.63 V, typ. 1.8/3.3 V	VBAT: 3.0~3.6 V, typ. 3.3 V VDDIO: 1.62~3.6 V, typ. 1.8/3.3 V	VBAT: 3.0~3.6 V, typ. 3.3 V; VDD_IO: 1.62~1.98 V, typ. 1.8 V, 3.0~3.6 V, typ. 3.3 V	VBAT: 3.0~3.6 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 10 mA @ VDD_IO	Max. current at Tx mode: 400 mA @ VBAT
Data Transmission					
802.11a	/	/	/	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. 150 Mbps	Max. 72 Mbps	Max. 150 Mbps	Max. 150 Mbps	Max. 150 Mbps
802.11ac	/	/	/	/	/
802.11ax	/	/	/	/	/
Certifications	CE/SRRC/RCM/JATE/TELEC/FCC*/KC*	SRRC/CE/FCC/IC	SRRC/FCC/CE/RCM/IC/KC*/JATE*/TELEC*	SRRC/CE/RCM/FCC/IC/KC*/JATE*/TELEC*	SRRC/CE/RCM/FCC/IC/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, Printer, POS, speaker, display, etc.	Printer, POS, Attendance machine, Vacuum cleaner, Smart speaker, Digital signage, Set-top box/IPTV, Smart home control screen, etc.	Printer, POS, Attendance machine, Vacuum cleaner, Smart speaker, Digital signage, Set-top box/IPTV, Smart home control screen, etc.

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




\* Under development

# Wi-Fi & BT Modules

RF Wi-Fi & Bluetooth Modules (Wi-Fi 5)								
Product	FC20	FC21	FC900E	FC905A	FCS950R	FC80A	FCS850R	FCS850R-B
								
Frequency Band	2.4GHz/5GHz	2.4GHz/5GHz	2.4GHz/5GHz	2.4GHz/5GHz	2.4 GHz/5 GHz	2.4GHz+5GHz	2.4 GHz/5 GHz	2.4 GHz/5 GHz
MIMO	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
BT Standard	BT 5.0	BT 5.0	BT 5.0	BT 5.0	BT 4.2	BT 5.1	BT 5.0	BT 5.0
Form Factor	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	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	-20°C ~ +70 °C	-20°C ~ +70 °C
Weight (approx.) g	0.81	0.73	0.53	0.6	0.58	0.86	0.79	0.79
General Features								
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	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
I/O Interfaces								
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)	1(SDIO 3.0)	1(SDIO 3.0)
USB	/	/	/	/	/	/	/	/
SPI	/	/	/	/	/	/	/	/
UART	1	1	1	1	1	1	1	1
PCM	1	1	1	1	1	1	1	1
Antenna	1 (Wi-Fi & BT Antenna)	1 (Wi-Fi & BT Antenna)	1 (Wi-Fi & BT Antenna)	1(Wi-Fi & BT Antenna)	1 × Wi-Fi Ant with shared BT Ant	2 × Wi-Fi Ant with shared BT Ant, independent BT ant is optional*	2(Wi-Fi & BT antenna, Bluetooth shares antenna with Wi-Fi)	2(Wi-Fi Antenna) 1(Independent BT antenna)
Electrical Characteristics								
Supply Voltage Range	VBAT: 3.14~3.46 V, typ. 3.3 V VDDIO: 1.71~3.46 V, typ. 1.8 V/3.3 V	VBAT: 3.14~3.46 V, typ. 3.3 V VDDIO: 1.71~3.46 V, typ. 1.8 V/3.3 V	VBAT: 3.14~3.46 V, typ. 3.3 V VDDIO: 1.71~3.46 V, typ. 1.8/3.3 V	VBAT: 3.13~4.8 V, typ. 3.6 V VDDIO: 1.71~3.63 V, typ. 1.8/3.3 V	VBAT: 3.0~3.6 V, typ. 3.3 V VDDIO: 1.62~3.6 V, typ. 1.8/3.3 V	VBAT: 3.2~4.5 V, typ. 3.3 V VDDIO: 1.7~3.6 V, typ. 1.8/3.3 V	VBAT: 3.1~3.6 V, typ. 3.3 V VDDIO: 1.7~3.6 V, typ. 1.8/3.3 V	VBAT: 3.1~3.6 V, typ. 3.3 V VDDIO: 1.7~3.6 V, typ. 1.8/3.3 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: 404.7mA @ 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: 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
Data Transmission								
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. 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. 866 Mbps	Max. 866.7Mbps	Max. 866.7Mbps
802.11ax	/	/	/	/	/	/	/	/
Certifications	SRRC/CE/FCC/JATE/TELEC/KC/IC/RCM/Anatel	SRRC/CE/FCC/JATE/TELEC/IC/RCM	SRRC/CE/FCC/IC/RCM/UKCA	SRRC/CE/FCC/IC/JATE/TELEC	SRRC/CE/RCM/FCC/IC/KC*/JATE*/TELEC*	SRRC/CE/FCC/IC/KC*/JATE/TELEC	SRRC/CE/RCM/FCC/IC/KC*/TELEC*/JATE*	SRRC/CE/RCM/FCC/IC/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 box, POS machine, etc.	Various commercial/ industrial applications e.g. POS machines and speaker boxes	POS, sweeper, printer, etc.	Smart homes, industrial control	Set-top box, Smart speaker, Digital signage, VR/AR, Smart Gateway, Conference terminal, Intelligent Projector, Cloud computer, etc.	Set-top box, Smart speaker, Digital signage, VR/AR, Smart Gateway, Conference terminal, Intelligent Projector, Cloud computer, etc.







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.

\* Under development

	RF Wi-Fi & Bluetooth Modules (Wi-Fi 6)		RF Wi-Fi & Bluetooth Modules (Wi-Fi 6E)
Product	FC62E*/FC64E	FC06E	FC65E*/FC66E
			
Frequency Band	2.4GHz/5GHz(FC62E*) ; 2.4GHz + 5GHz(FC64E)	2.4GHz + 5GHz	2.4GHz/5GHz/6GHz(FC65E*) ; 2.4GHz + 5GHz/6GHz(FC66E)
MIMO	2 × 2 (FC64E support DBS, FC62E* not support DBS )	2 × 2 + 2 × 2	2 × 2 (FC66E support DBS, FC65E* not 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
BT Standard	BT 5.2	BT 5.2	BT 5.2
Form Factor	LCC	LCC	LCC
Dimensions (mm)	18.0 × 19.9 × 2.1	25.5 × 22.0 × 2.25	18.0 × 19.9 × 2.1
Operating Temperature	-30°C ~ +75°C	-30°C ~ +75°C	-30°C ~ +75°C
Weight (approx.) g	1.63	2.27	1.63
General Features			
Modulation Mode	DBPSK/DQPSK/CCK/BPSK/QPSK/QAM	DBPSK/DQPSK/CCK/BPSK/QPSK/QAM	DBPSK/DQPSK/CCK/BPSK/QPSK/QAM
Encryption Mode	WPA3	WPA3	WPA3
I/O Interfaces			
PCIe	1 (PCIe 3.0)	1 (PCIe 3.0)	1 (PCIe 3.0)
SDIO	/	/	/
USB	/	/	/
SPI	/	/	/
UART	1	1	1
PCM	1	1	1
Antenna	2 × Wi-Fi Ant with shared BT Ant, independent BT ant is optional	2 × Wi-Fi Antenna, Stand-alone bluetooth antenna	2 × Wi-Fi Ant with shared BT Ant, independent BT ant is optional
Electrical Characteristics			
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	Core Supply Voltage: 0.95, 1.35, 1.95, 1.8, 2.2, 3.3(Optional) I/O Supply Voltage: 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	TBD
Data Transmission			
802.11a	Max. 54 Mbps	Max. 54 Mbps	Max. 54 Mbps
802.11b	Max. 11 Mbps	Max. 11 Mbps	Max. 11 Mbps
802.11g	Max. 54 Mbps	Max. 54 Mbps	Max. 54 Mbps
802.11n	Max. 600 Mbps	Max. 300 Mbps	Max. 600 Mbps
802.11ac	Max. 866 Mbps	Max. 866 Mbps	Max. 1732 Mbps
802.11ax	Max. 1200 Mbps(FC62E*) Max. 1774.5 Mbps(FC64E)	Max. 1774.5 Mbps	Max. 2400 Mbps(FC65E*) Max. 3000 Mbps(FC66E)
Certifications	FC62E*: SRRG*/CE*/FCC*/IC*/RCM*/KC*; FC64E: SRRG/CE/FCC/IC/KC/JATE/TELEC/RCM	SRRG/CE/FCC/IC/KC/RCM/UKCA	FC65E*: SRRG*/CE*/FCC*/IC*/RCM*/KC*; FC66E: SRRG/CE/FCC/IC/KC/JATE/TELEC/RCM
Recommended Applications	CPE, OTT, smart TVs	CPE, MIFI, OTT	CPE, OTT, smart TVs

\* Under development


# Wi-Fi & BT Modules

	MCU Wi-Fi & Bluetooth Modules (Wi-Fi 4)					
Product	FC41D	FCM100D	FLM040D	FLM140D	FLM240D	FLM340D
						
Microcontroller (MCU)	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
Frequency Band	2.4GHz	2.4GHz	2.4GHz	2.4GHz	2.4GHz	2.4GHz
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
BT Standard	BT 5.2	BT 5.2	BT 5.2	BT 5.2	BT 5.2	BT 5.2
Form Factor	LCC	LCC	DIP	DIP	DIP+LCC	DIP
Dimensions (mm)	20.0 × 18.0 × 2.6	24.0 × 16.0 × 2.6	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 ~ +85° C	-40° C ~ +105° C	-40° C ~ +105° C
Weight (approx.) g	1.51	1.55	0.55	0.83	0.85	0.32
<b>General Features</b>						
RAM	256KB	256KB	256KB	256KB	256KB	256KB
PSRAM	/	/	/	/	/	/
Flash	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
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
Working Mode	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
<b>I/O Interfaces</b>						
GPIO	QuecOpen® support	QuecOpen® support	QuecOpen® support	QuecOpen® support	QuecOpen® support	QuecOpen® support
UART	× 2	× 2	/	× 1	/	/
SDIO	/	/	/	/	/	/
SPI	QuecOpen® support	/	/	/	/	/
USB	/	/	/	/	/	/
I2C	QuecOpen® support	QuecOpen® support	/	/	/	/
I2S	/	/	/	/	/	/
ADC	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
DAC	/	/	/	/	/	/
PCM	/	/	/	/	/	/
Audio in	/	/	/	/	/	/
Audio out	/	/	/	/	/	/
LCD	/	/	/	/	/	/
EMAC	/	/	/	/	/	/
JTAG	/	/	/	/	/	/
SWD	/	/	/	/	/	/
Antenna	× 1 (External pin antenna, IPEX antenna interface, PCB antenna optional)	× 1 (External pin antenna, IPEX antenna interface, PCB antenna optional)	× 1 (Ceramic antenna)	× 1 (PCB antenna)	× 1 (IPEX antenna interface, PCB antenna optional)	× 1 (External pin antenna)
<b>Electrical Characteristics</b>						
Supply Voltage Range	VBAT: 3.0~ 3.6 V, Typical value: 3.3V	VBAT: 3.0~ 3.6 V, Typical value: 3.3V	VBAT: 3.0~ 3.6 V, Typical value: 3.3V	VBAT: 3.0~ 3.6 V, Typical value: 3.3V	VBAT: 3.0~ 3.6 V, Typical value: 3.3V	VBAT: 3.0~ 3.6 V, Typical value: 3.3V
Power Consumption	IDLE: 23.27mA	IDLE: 23.27mA	IDLE: 24.21mA	IDLE: 24.14mA	IDLE: 24.14mA	IDLE: 23.27mA
Certification	CE/FCC/IC/RCM/SRRC/KC/ ANATEL/TELEC/BQB	CE/FCC/IC/RCM/SRRC/ANATEL	CE/FCC/IC/RCM/SRRC/UKCA	CE/FCC/IC/RCM/SRRC/UKCA	CE/FCC/IC/RCM/SRRC	CE/FCC/IC/RCM/SRRC
Recommended Applications	Smart home, Industrial Control	Smart home, Industrial Control	Smart home, Industrial Control	Smart home, Industrial Control	Smart home, Industrial Control	Smart home, Industrial Control

\* Under development



MCU Wi-Fi & Bluetooth Modules (Wi-Fi 6)	
Product	FCM360W
	
Microcontroller (MCU)	RISC processor (240 MHz)
ChipSet	ECR6600-A40D
Frequency Band	2.4GHz
WLAN Standard	IEEE 802.11 b/g/n/ax
BT Standard	BT 5.1
Form Factor	LCC
Dimensions (mm)	25.5 × 18.0 × 3.2
Operating Temperature	-40° C ~ +85° C
Weight (approx.) g	1.65
<b>General Features</b>	
RAM	512KB
PSRAM	/
Flash	4MB/8MB
Codec	/
Modulation Mode	PSK/QPSK/CCK/16QAM/64QAM
Encryption Mode	WPA-PSK/WPA2-PSK/WPA3-SAE
Working Mode	STA/AP
Protocols	TCP/UDP/MQTT/HTTP/HTTPS/MQTTs
<b>I/O Interfaces</b>	
GPIO	QuecOpen® support
UART	x 3
SDIO	/
SPI	QuecOpen® support
USB	/
I2C	QuecOpen® support
I2S	QuecOpen® support
ADC	QuecOpen® support
PWM	QuecOpen® support
DAC	/
PCM	/
Audio in	/
Audio out	/
LCD	/
EMAC	/
JTAG	/
SWD	/
Antenna	× 1 (External pin antenna, IPEX antenna interface, PCB antenna optional)
<b>Electrical Characteristics</b>	
Supply Voltage Range	VBAT: 3.0- 3.6 V, Typical value: 3.3V
Power Consumption	IDLE: 34.24mA
Certification	CE/FCC/IC/RCM/UKCA/SRRC
Recommended Applications	Smart home, Industrial Control

# Wi-Fi & BT Modules

MCU Bluetooth Module	
Product	HCM010S
	
Microcontroller (MCU)	ARM Cortex-M33 (80 MHz)
ChipSet	EFR32BQ21
Frequency Band	2.4GHz
WLAN Standard	/
BT Standard	BLE 5.4
Form Factor	LCC
Dimensions (mm)	20 × 15.6 × 2.35
Operating Temperature	-40° C ~ +105° C
Weight (approx.) g	1.14
<b>General Features</b>	
RAM	64 KB
PSRAM	/
Flash	768 KB
Codec	/
Modulation Mode	GFSK
Encryption Mode	AES128/256, SHA-1, SHA-2 (up to 256 bits), ECC (up to 256 bits), ECDSA (up to 256 bits), ECCDH, J-Pak, TRNG, secure boot
Working Mode	Server/Client/Server + Client
Protocols	ATT, GATT, HID, HCI
<b>I/O Interfaces</b>	
GPIO	QuecOpen® support
UART	3
SDIO	/
SPI	QuecOpen® support
USB	/
I2C	QuecOpen® support
I2S	QuecOpen® support
ADC	QuecOpen® support
PWM	QuecOpen® support
DAC	/
PCM	/
Audio in	/
Audio out	/
LCD	/
EMAC	/
JTAG	QuecOpen® support
SWD	QuecOpen® support
Antenna	× 1 (PCB Antenna)
<b>Electrical Characteristics</b>	
Supply Voltage Range	VBAT: 1.71 ~3.8 V, Typ. 3.3 V
Power Consumption	TBD
Certification	SRRC*/CE*/RCM*/FCC*/IC*
Recommended Applications	Smart home, industrial control









\* Under development

# Sub-GHz Modules


	Wi-Fi HaLow	Sub-1 GHz
Product	FGH100M*	KG100S
		
Processor or Microcontroller *	/	ARM Cortex®-M33 (up to 80 MHz)
ChipSet	MM6108	EFR32BG21*
Frequency Band	850-950 MHz	863M-928M & 2.4G
Form Factor	LGA	LGA
Dimensions (mm)	13.0 × 13.0 × 2.2	15.0 × 15.0 × 2.25
Operating Temperature	-30°C~+85°C	-40°C ~ +85°C
Weight (approx.) g	0.72	0.94
<b>General Features</b>		
RAM*	/	96KB
PSRAM*	/	/
Flash*	/	1 MB
Modulation Mode	OFDM/BPSK/QPSK/16QAM/64QAM	FSK, GFSK, Sub-1 GHz CSS
Encryption Mode	AES/SHA-256/SHA-384/SHA-512/WPA3	/
<b>I/O Interfaces</b>		
GPIO	/	QuecOpen® support
PCIe	/	/
SDIO	1 (SDIO2.0)	/
SPI	1	QuecOpen® support
UART	/	1
USB	/	/
Jlink	/	1
I2C	/	QuecOpen® support
PCM	/	/
JTAG	/	/
Antenna	1 × Wi-Fi Antenna	× 2 (Sub-1 GHz CSS × 1, BLE × 1)
<b>Electrical Characteristics</b>		
Supply Voltage Range	VBAT: 3.0-3.6 V, typ. 3.3 V VDDIO: 1.8-3.6 V, typ. 3.3 V	VBAT: 3.0- 3.6 V, Typical value: 3.3V
Power Consumption	TBD	IDLE:0.6mA
Certification	CE*/FCC*/IC*	CE/FCC/IC/BQB
Recommended Applications	IPC, Industrial automation, mobile devices, POS, smart building, home automation	Smart home, Industrial Control

\* Under development

# GNSS Modules

		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: B1I QZSS: L1 C/A	GPS: L1 C/A GLONASS: L1 Galileo: E1 BDS: B1I QZSS: L1 C/A	GPS: L1 C/A; GLONASS: L1; Galileo: E1; BDS: B1I; QZSS: L1 C/A	GPS/QZSS: L1 C/A, L5; GLONASS: L1; Galileo: E1, E5a; BDS: B1I, B2a	GPS/QZSS: L1 C/A, L5; GLONASS: L1; Galileo: E1, E5a; BDS: B1I, B2a	GPS/QZSS: L1 C/A, L5; GLONASS: L1; Galileo: E1, E5a; BDS: B1I, B2a	GPS/QZSS: L1 C/A, L5; GLONASS: L1; Galileo: E1, E5a; BDS: B1I, B2a	GPS/QZSS: L1 C/A, L5; GLONASS: L1; Galileo: E1, E5a; BDS: B1I, 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	RTK base station
Chip Solution	Teseo III	Teseo III	Teseo III	AG3335A/T	AG3335A/T	AG3335A/T	AG3335A/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
	Reacquisition	-152 dBm	-152 dBm	-152 dBm	-157 dBm	-157 dBm	-157 dBm	-157 dBm
	Tracking	-162 dBm	-162 dBm	-162 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	/
	Warm Start	25 s, Autonomous	25 s, Autonomous	27 s, Autonomous	16 s	16 s	16 s	/
	Hot Start	2 s	2 s	2 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 RTK: 1 cm + 1 ppm	/
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/s²	0.1 m/s²	0.1 m/s²	/	/	/	/	/
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: 10 Hz RTK: 1~10 Hz	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	3.0 V to 3.6 V	3.0 V to 3.6 V	3.0 V~3.6 V, typ. 3.3 V	3.1 V to 3.6 V	3.1 V to 3.6 V	3.1 V to 3.6V	3.1 V to 3.6V	3.1 V to 3.6 V
I/O Voltage	3.0 V to 3.6 V	3.0 V to 3.6 V	Same as VCC	2.8 V	2.8 V	2.8 V	2.8 V	2.8 V
Power Consumption (Acquisition)	72 mA (GPS) 79 mA (GPS+GLONASS+Galileo)	84mA (GPS+GLONASS+Galileo)	81 mA	32 mA	30 mA	30 mA	30 mA	23 mA
Power Consumption (Tracking)	58 mA (GPS) 74 mA (GPS+GLONASS+Galileo)	81mA (GPS+GLONASS+Galileo)	81 mA	32 mA	30 mA	30 mA	30 mA	23 mA
Power Consumption (Backup/Low Power mode)	1.7 mA @ Standby Mode, 8 µA @ Backup Mode	1.7 mA @ Standby Mode, 8 µA @ Backup Mode	1.7 mA @ Standby Mode, 8 µA @ Backup Mode	22 µA	22 µA	22 µA	22 µA	22 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 (through VDD_RF)	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				


\* Under development  
• Supported

DR and High Precision GNSS										
Product	LG69T(AA)	LG69T(AD)	LG69T(AB)*	LG69T(AM)	LG69T(AJ)	LG69T(AI)	LG69T(AS)	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; B2l 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/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; L5 Galileo: E1; E5a BDS: B1; B2a	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 ~ +85 °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 ~ +95 °C	-40 °C ~ +95 °C	-40 °C ~ +105 °C	
General Features										
Working Mode	Raw	PVT/Raw	Raw	RTK+Heading <sup>1</sup>	RAW	RAW	Base station	DR+RTK+Heading <sup>1</sup>	Raw	
Chip Solution	TESE0 V	TESE0 V	TESE0 APP	TESE0 V	TESE0 V	TESE0 V	TESE0 V	TESE0 V	TESE0 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	-159 dBm	-160 dBm	
TTFF (Time To First Fix)	Cold Start	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	
	Hot Start	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	1.0 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	0.1 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>	0.1 m/s <sup>2</sup>	/	0.1 m/s <sup>2</sup>	0.1 m/s <sup>2</sup>	
Accuracy of 1 PPS Signal (RMS)	50 ns	50 ns	50 ns	50 ns	50 ns	50 ns	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	RAW: 10 Hz	RAW: 1 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	•	•	/	•	•	•	•	•	•	
Electrical Data										
Power Supply	3.0 V to 3.6 V	3.0 V to 3.6 V	3.0 V to 3.6 V	3.0 V to 3.6 V	3.0 V to 3.6 V	3.0 V to 3.6 V	3.0 V to 3.6 V	3.0 V to 3.6 V	3.0 V to 3.6 V	
I/O Voltage	3.0 V to 3.6 V	3.0 V to 3.6 V	3.0 V to 3.6 V	3.0 V to 3.6 V	3.0 V to 3.6 V	3.0 V to 3.6 V	3.0 V to 3.6 V	3.0 V to 3.6 V	3.0 V to 3.6 V	
Power Consumption (Acquisition)	242 mA	235 mA	VCC: 55 mA, VCC_CORE: 230 mA	330 mA	245 mA	295 mA	360 mA	360 mA	245 mA	
Power Consumption (Tracking)	237 mA	232 mA	VCC: 55 mA, VCC_CORE: 225 mA	335 mA	245 mA	295 mA	360 mA	360 mA	245 mA	
Power Consumption (Backup/Low power mode)	55 μA	55 μA	55 μA	55 μA	55 μA	55 μA	55 μA	55 μA	55 μA	
Interfaces										
UART	•	•	•	•	•	•	•	•	•	
Reset	•	•	•	•	•	•	•	•	•	
Time Pulse	•	•	•	•	•	•	•	•	•	
Antenna										
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.

\* Under development  
 • Supported

# GNSS Modules

GNSS Position 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 1 PPS 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	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/Low power mode)	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.	








\* Under development  
• 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 <sup>1</sup>	-146 dBm <sup>1</sup>	-148 dBm <sup>1</sup>	
	Reacquisition	-153 dBm	-153 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	1.1 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	3.0 V to 3.6 V	3.0 V to 3.6 V	3.0 V to 3.6 V	1.75~1.98 V, typ. 1.8 V	
I/O Voltage	typ. 3.3 V	3.0 V to 3.6 V	3.0 V to 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)	75 mA (GPS+GLONASS+Galileo)	232 mA (GPS+BDS+GLONASS+Galileo+QZSS)	74 mA (GPS + GLONASS)	36 mA	
Power Consumption (Backup/Low Power mode)	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.

• Under development  
• Supported

# GNSS Modules









		Standard Precision GNSS-Single Band					
Product	LG77L(IC)	L76-L	LC760Z	LC76G(AB)	LC76G(PA)	LC76G(PB)	LC26G(AB)
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
Form Factor	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
Weight (approx.) g	0.2	0.6	0.5	0.5	0.6	0.6	0.5
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
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
<b>General Features</b>							
Working Mode	Standard	Standard	Standard	Standard	Standard	Standard	Standard
Chip Solution	MT3333	MT3333	HD8120	AG3352Q	AG3352Q	AG3352Q	AG3352Q
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
L1 Band Receiver (C/A Code) SBAS	WAAS/EGNOS/MSAS/GAGAN	WAAS/EGNOS/MSAS/GAGAN	WAAS/EGNOS/MSAS/GAGAN/SDCM	Supported	Supported	Supported	Supported
A-GNSS	Supported	Supported	Supported	Supported	Supported	Supported	Supported
Sensitivity	Autonomous Acquisition	-146 dBm	-149 dBm	-147 dBm	-147 dBm	-147 dBm	-147 dBm
	Reacquisition	-156 dBm	-161 dBm	-158 dBm	-159 dBm	-159 dBm	-159 dBm
	Tracking	-163 dBm	-167 dBm	-160 dBm	-166 dBm	-166 dBm	-166 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 EP0™	28 s, Autonomous 15 s, with EASY™ 5 s, with EP0™	28 s, Autonomous 15 s, with EASY™ 5 s, with EP0™
	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™
	Hot Start	2 s	2 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
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
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)	35 ns	100 ns	30 ns	30 ns	30 ns	30 ns	35 ns
Max Update Rate	10 Hz	10 Hz	5 Hz	10 Hz	1 Hz	1 Hz	10 Hz
Baud Rate(default)	9600 bps	9600 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	2.8 V to 4.3 V	2.8 V to 4.3 V	2.8 V to 3.6 V	2.55 V to 3.6 V	2.55 V to 3.6 V	1.75 V to 1.98 V	2.55 V to 3.6 V
I/O Voltage	1.7 V to 1.9 V/ 2.7 V to 2.9 V	2.7 V to 2.9 V	Same as VCC	2.55 V to 3.6 V	2.55 V to 3.6 V	1.75 V to 1.98 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)
Power Consumption (Tracking)	23.0 mA (GPS+GLONASS)	31 mA (GPS+GLONASS)	22 mA (GPS+Galileo+GLONASS)	36 mA(G3B)	10 mA(G3B)	15 mA(G3B)	36 mA(G3B)
Power Consumption (Backup/Low power mode)	6 μA	8 μA	13 μA	13 μA	13 μA	13 μA	15 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
Antenna Power	External	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, etc.						

\* Under development  
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Standard Precision GNSS-Dual Band			
Product	LC79H(AL)	LC29H(AA)	
			
GNSS	GPS/QZSS: L1 C/A, L5 GLONASS: L1 Galileo: E1, E5a BDS: B1I, B2a	GPS/QZSS: L1 C/A, L5 GLONASS: L1 Galileo: E1, E5a BDS: B1I, B2a	
Form Factor	LCC	LCC	
Dimensions (mm)	10.1 × 9.7 × 2.4	12.2 × 16.0 × 2.5	
Weight (approx.) g	0.5	0.9	
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	standard mode	standard mode	
Chip Solution	AG3335M	AG3335M	
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	-148 dBm	-147 dBm
	Reacquisition	-159 dBm	-159 dBm
	Tracking	-166 dBm	-165 dBm
TTFF (Time To First Fix)	Cold Start	26 s	26 s
	Warm Start	18 s	16 s
	Hot Start	1 s	1 s
Position Accuracy (autonomous)	1.0 m CEP	1.0 m CEP	
Position Accuracy (RTK)	/	/	
Velocity Accuracy (without aid)	0.03 m/s	0.03 m/s	
Velocity Accuracy (RTK)	/	/	
Convergence Time (RTK)	/	/	
Maximum Acceleration Accuracy (without aid)	/	/	
Accuracy of 1PPS Signal (RMS)	20 ns	20 ns	
Max Update Rate	PVT: 1 Hz	PVT: 1 Hz	
Baud Rate(default)	115200 bps	115200 bps	
Geo-fence	•	•	
Jamming Detection	•	•	
Anti-jamming	/	/	
Built-in LNA	•	•	
<b>Electrical Data</b>			
Power Supply	1.75 to 1.98 V	3.1 to 3.6 V	
I/O Voltage	2.8 V	2.8 V	
Power Consumption (Acquisition)	33 mA	23 mA	
Power Consumption (Tracking)	33 mA	23 mA	
Power Consumption (Backup/Low power mode)	20 μA	22 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	
Antenna Power	External or internal	External or internal	
Certifications	CE	CE	
Recommended Applications	Shared mobility, delivery robots, GIS		


\* Under development  
• Supported

# GNSS Modules

Product	Integrated Antenna								
	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	
General Features									
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 1 PPS 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	•	•	•	•	•	•	•	•	
Electrical Data									
Power Supply	2.8 V to 4.3 V	2.55 V to 3.6 V	2.55 V to 3.6 V	2.55 V to 3.6 V	2.55 V to 3.6 V	2.8 V to 4.3 V	3.1 V to 4.3 V	2.8 V to 4.3 V	
I/O Voltage	2.7 V to 2.9 V	2.55 V to 3.6 V	2.55 V to 3.6 V	2.55 V to 3.6 V	2.55 V to 3.6 V	2.7 V to 2.9 V	3.0 V	2.7 V to 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 (GPS+GLONASS) 22 mA (GPS)	
Power Consumption (Tracking)	30 mA (GPS+GLONASS)	30 mA	33 mA	34 mA	11 mA	30 mA (GPS+GLONASS)	32 mA	20 mA (GPS+GLONASS) 20 mA (GPS)	
Power Consumption (Backup)	7 μA	13 μA	13 μA	13 μA	13 μA	7 μA	51 μA	7 μA	
Interfaces									
UART	•	•	•	•	•	•	•	•	
I2C (NMEA)	/	/	/	/	/	/	•	•	
Reset	•	•	•	•	•	•	•	•	
Time Pulse	•	•	•	•	•	•	•	•	
Antenna									
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.

\* Under development  
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IMU Module	
Product	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 (-40 °C to +105 °C)	0.05 °/s (X/Y axis); 0.03 °/s (Z axis)
Scale Factor Error	0.15 % (X/Y axis); 0.05 % (Z axis)
Non-Linearity	0.01 %FS
Misalignment Error	0.02°
<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 (-40 °C to +105 °C)	1.5 mg
Scale Factor Error	0.05%
Non-Linearity	0.02 % (±1g)
Misalignment Error	0.02°
<b>Electrical Data</b>	
Power Supply	3.0-3.6 V, typ. 3.3 V
I/O Voltage	Same as VCC
Power Consumption	75 mA @3.3V
<b>Interfaces</b>	
UART	Adjustable: 115200-921600 bps Default: 460800 bps
SPI	Up to 8 Mbps
CAN	Supported protocol: standard CAN (default) and CAN FD Up to 2 Mbps
Recommended Applications	Automated driving, high-precision navigation, robotics and ect.






\* Under development  
• Supported

# UMTS/HSPA(+) Modules

Product	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
Data Transmission	
HSPA data rate (Mbps)	Max. 21 (DL)/ Max. 5.76 (UL)
UMTS data rate (Kbps)	Max. 384 (DL/UL)
GPRS data rate (Kbps)	Max. 85.6 (DL/UL)
EDGE data rate (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
Interfaces	
SIM	1.8V/ 3V
UART	2
USB	2.0 Hi-Speed
Audio Digital (PCM)	•
RTC Backup	•
ADC	× 2, 12bits
Antenna	Pads for Primary
Enhanced Features	
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
Electrical Features	
Supply Voltage Range	3.4V~4.5V, typ. 3.8V
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.





\* Under development  
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# 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
Data Transmission					
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
Specifications for Voice					
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
Interfaces					
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	/	/	•	/	•
Enhanced Features					
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
Electrical Features					
Power Supply	3.3 ~ 4.6V	3.45 ~ 4.25V	3.3 ~ 4.6V	3.45 ~ 4.25V	3.3 ~ 4.6V
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	CE/Anatel/ICASA/GCF/UCRF/FCC/ Vodafone/Deutsche Telekom	CE/Anatel	CE/GCF/Vodafone/PTCRB/FCC/IC/ Anatel/Rogers/RCM/NCC/UCRF/ ICASA/Telenor	CE/Anatel	CE/FCC/Anatel/ICASA/GCF/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

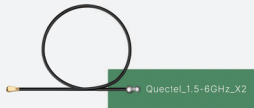
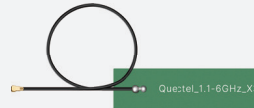
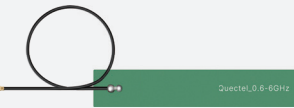
Product	YE0001BA	YE0003AA	YE0007AA	YECN009AA
				
Frequency Bands (MHz)	600-6000	699-5000	600-6000	700-5000
Technology	5G	5G	5G	5G
Cable Length (mm)	/	/	/	/
Connector Type	SMA Male	SMA Male	SMA Male	SMA Male
Mounting Type	Terminal	Terminal	Terminal	Terminal
Dimensions (mm)	221 × 27.30 × 13.45	190 × 16 × 5.6	152.4 × 21.79 × 14.49	200 × 21 × 8
Matched Quectel Modules	5G/4G/3G/2G/LPWA			

Product	YE0028AA	YXH001AA	YBY00A0KA
			
Frequency Bands (MHz)	700-2700, 3300-5000	700-960, 1710-2690, 3300-5000	700-5000
Technology	5G	5G	5G
Cable Length (mm)	1500	1000	/
Connector Type	SMA Male	SMA Male	N Male
Mounting Type	Magnetic	Magnetic	Terminal
Dimensions (mm)	234 × Φ 60	285 × 45	Φ 29 × 300
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	YFCA010AA	YFCA006AA	YF0017FA	YF0017GA	YF0020EA
					
Frequency Bands (MHz)	410-470; 700-960; 1400-6000	410-470; 700-960; 1400-6000	1500-6000	1100-6000	600-6000
Technology	5G	5G	5G	5G	5G
Cable Length (mm)	101	101	201	201	202
Connector Type	IPEX I	IPEX I	IPEX IV	IPEX IV	IPEX IV
Mounting Type	Adhesive	Adhesive	Adhesive	Adhesive	Adhesive
Dimensions (mm)	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	YP0009MA	YP0009NA	YP0009OA
			
Frequency Bands (MHz)	1500-6000	1100-6000	600-6000
Technology	5G	5G	5G
Cable Length (mm)	202	203	202
Connector Type	IPEX IV	IPEX IV	IPEX IV
Mounting Type	Adhesive	Adhesive	Adhesive
Dimensions (mm)	49 × 13 × 0.8	49 × 13 × 0.8	78.5 × 14.2 × 0.8
Matched Quectel Modules	5G/4G/3G/2G/LPWA		

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

Product	YC0001AA	YC0001CA	YC0001CAEVB	YC0002BA	YC0002BAEVB	YC0003BA	YC0003BAEVB
							
Frequency Bands (MHz)	698-960, 1710-2690	700-960, 1710-2700	700-960, 1710-2700	700-2690	700-2690	700-2690	700-2690
Technology	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	SMD	Screw
Dimensions (mm)	35.0 × 8.5 × 3.0	35 × 8.5 × 3	121.4 × 65	42 × 10 × 3	131 × 60 × 0.8	40 × 7 × 3	138.5 × 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	YCP003AA	YCP003AAEVB	YMP001AA	YMP001AAEVBAA	YMP001AAEVBBA	YMP002AA	YMP002AAEVB
							
Frequency Bands (MHz)	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)
Cable Length (mm)	/	/	/	/	/	/	/
Connector Type	/	/	/	/	/	/	/
Mounting Type	SMD	/	SMD	Screw	Screw	SMD	/
Dimensions (mm)	28 × 8 × 3	130 × 36	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	YPCA004AA	YFCA002HA	YF0006PA	YF0028AA
						
Frequency Bands (MHz)	700-960, 1710-2170, 2300-2690	600-960, 1427.9-1495.9, 1710-2170, 2300-2700	700-960, 1710-2690	700-2690	690-2700	698-960, 1700-2700
Technology	LTE (4G)	LTE (4G)	LTE (4G)	LTE (4G)	LTE (4G)	LTE (4G)
Cable Length (mm)	74.5	74.5	100	86.5	90	150
Connector Type	IPEX 1	IPEX 1	IPEX I	IPEX 1	IPEX I	IPEX I
Mounting Type	Adhesive	Adhesive	Adhesive	Adhesive	Adhesive	Adhesive
Dimensions (mm)	40 × 15 × 0.8	50 × 25 × 0.8	40 × 10 × 1	30 × 20	50 × 25	96 × 21
Matched Quectel Modules	4G/3G/2G/LPWA					








Product	YECT002AA	YECT003AA	YE0009AA	YPRO0A0AA	YCN001AA
					
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	YE0011BA	YECW000N1A
					
Frequency Bands (MHz)	698-2700	700-2690	700-960, 1710-2170	700-960, 1710-2170	450-470, 700-960, 1710-2690
Technology	LTE (4G)	LTE (4G)	LTE (4G)	LTE (4G)	LTE (4G)
Cable Length (mm)	/	/	/	/	2000
Connector Type	SMA Male	N-J	SMA Male	SMA Male	SMA Male
Mounting Type	Terminal	Pole Mount	Terminal	Terminal	Screw
Dimensions (mm)	115.4 × Ø 10.2	Ø 20 × 300	53.5 × Ø 10.5	50 × Ø 10.5 × 16.4	150 × 50 × 36.5
Matched Quectel Modules	4G/3G/2G/LPWA				



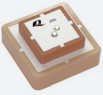
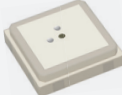


Product	YE0010AA	YB0010AA	YE0012AA	YE0006AA	YE0021KA	YE0029FA
						
Frequency Bands (MHz)	698-2700	698-2790	698-2700	700-960, 1710-2690	700-960, 1710-2700, 2300-2700	700-2700
Technology	LTE (4G)	LTE (4G)	LTE (4G)	LTE (4G)	LTE (4G)	LTE (4G)
Cable Length (mm)	1000	2000	250	1500	1500	1000
Connector Type	SMA Male	SMA Male	SMA Male	SMA Male	SMA Male	SMA Male
Mounting Type	Adhesive	Magnetic	Adhesive	Magnetic	Magnetic	Magnetic
Dimensions (mm)	152 × 18 × 5.9	Ø 84 × 81.5 × 15.5	116.5 × 21.7 × 5.6	318 × Ø 30	110 × Ø 30	88 × Ø 30
Matched Quectel Modules	4G/3G/2G/LPWA					

The parameters shall be subject to the Specification.

# GNSS Antennas

Product	YC0013AA	YC0013AAEVB	YPGS001AA	YPGS001AAEVB	YCGS005AA	YCGS006AA	YCGS010AA
							
Frequency Bands (MHz)	1559-1606	1559-1606	1559-1609	1559-1609	1575.42-1602 (±1.5)	1575.42-1602 (±1.5)	1176.45-1278.75, 1575.42
Technology	GNSS L1 (passive)	GNSS L1 (passive)	GNSS L1 (passive)	GNSS L1 (passive)	GNSS L1 & G1 (passive)	GNSS L1 & G1 (passive)	GNSS L1 & L5 (passive)
Cable Length (mm)	/	/	/	/	/	/	/
Connector Type	/	/	/	/	/	/	/
Mounting Type	SMD	/	SMD	/	SMD	SMD	SMD
Dimensions (mm)	3.2 × 1.2 × 0.6	90 × 50 × 1	7.0 × 5.8 × 0.8	80 × 35	18 × 18 × 4	25 × 25 × 4	5 × 3 × 0.5
Matched Quectel Modules	GNSS L1 module series						GNSS L1/L5 module series








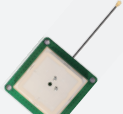
Product	YCGA001AA	YCGA002AA	YCGA003AA	YG0038AA	YG0043AA	YG0046AA
						
Frequency Bands (MHz)	1575.45 ± 1.5	1560-1602	1559-1605	1561, 1575	GPS L1: 1575.42; BD B1: 1561.098; GLONASS L1: 1602; GALILEO E1: 1575.42	1561 ± 2, 1575.42 ± 2
Technology	GNSS L1 (passive)	GNSS L1 (passive)	GNSS L1 (passive)	GNSS L1 (passive)	GNSS L1 (passive)	GNSS L1 (passive)
Cable Length (mm)	/	/	/	/	/	/
Connector Type	/	/	/	/	/	/
Mounting Type	Pin Mounting	Pin Mounting	Pin Mounting	Pin mounting	Pin Mounting	Pin Mounting
Dimensions (mm)	10 × 10 × 4	12 × 12 × 4	35 × 35 × 4	13 × 13 × 4	15 × 15 × 4	18 × 18 × 2
Matched Quectel Modules	GNSS L1 module series					

Product	YG0005AA	YG0062AA	YCGA012AA	YCGA013AA	YG0048AA	YPA00A0AA
						
Frequency Bands (MHz)	1600.4 ± 3, 1575.42 ± 3	1575.42 ± 3, 1602 ± 3	L5: 1166-1186, L1: 1559-1606	L5: 1166-1186, L1: 1559-1606	1164-1189, 1559-1606	Iridium (1616-1626.5)
Technology	GNSS L1 (passive)	GNSS L1 (passive)	GNSS L1 & L5 (passive)	GNSS L1 & L5 (passive)	GNSS L1 & L5 (passive)	GNSS (passive)
Cable Length (mm)	/	/	/	/	/	/
Connector Type	/	/	/	/	/	/
Mounting Type	Pin Mounting	Pin Mounting	Pin Mounting	Pin Mounting	Pin Mounting	Pin mounting
Dimensions (mm)	18.4 × 18.4 × 4	25 × 25 × 4	38 × 38 × 10 + 25 × 25 × 6	45 × 45 × 10.12	25 × 25 × 8.1 (25 × 25 × 4 + 18 × 18 × 4)	25 × 25 × 4 (Ground Plane: 90 × 140 × 0.8)
Matched Quectel Modules	GNSS L1 module series		GNSS L1/L5 module series			/





Product	YCGO004AA	YCGO005AA	YCGO006AA	YCGO007AA
				
Frequency Bands (MHz)	1575.45 ± 1.5	1575-1602	1559-1586	1575-1602
Technology	GNSS L1 (passive)	GNSS L1 (passive)	GNSS L1 (passive)	GNSS L1 (passive)
Cable Length (mm)	50	50	50	50
Connector Type	IPEX MHF I	IPEX MHF I	IPEX MHF I	IPEX MHF I
Mounting Type	Buckle	Buckle	Buckle	Buckle
Dimensions (mm)	10 × 10 × 6.3	15 × 15 × 6.2	18 × 18 × 6.3	25 × 25 × 6.3
Matched Quectel Modules	GNSS L1 module series			







The parameters shall be subject to the Specification.

# GNSS Antennas

Product	YG0015AA	YCGO008AA	YCGO009AA	YCGO010AA	YCGO011AA	YCGA014AA	YAT001BA	YBS00A1AA
								
Frequency Bands (MHz)	1575.42-1602	1575.45 ±1.5	1575-1602	1559-1586	1565-1606	GPS L5: 1176.45; GPS L1: 1575.42; GLONASS L1: 1602	1164-1189, 1565-1586	1164-1189, 1565-1606
Technology	GNSS L1 (active)	GNSS L1 (active)	GNSS L1 (active)	GNSS L1 (active)	GNSS L1 (active)	GNSS L1 & L5 (active)	GNSS L1 & L5 (active)	GNSS L1 & L5 (active)
Cable Length (mm)	55	55	95	50	50	100	40	60
Connector Type	IPEX MHF I	IPEX MHF I	IPEX MHF I	IPEX MHF I	IPEX MHF I	IPEX MHF I	RF I	IPEX MHF I
Mounting Type	Buckle	Buckle	Buckle	Buckle	Buckle	Buckle	Buckle	Buckle
Dimensions (mm)	25 × 25 × 7.76	10 × 10 × 6.3	15 × 15 × 6.2	18 × 18 × 6.3	25 × 25 × 6.3	18 × 18 × 4 + 25 × 25 × 4	25 × 25 × 2 & 18 × 18 × 2	58.7 × 58.7 × 14
Matched Quectel Modules	GNSS L1 module series					GNSS L1/L5 module series		


Product	YG0030AA	YCGO022AA	YFGA003AA	YFGA005AA	YFGA006AA	YFGA007AA
						
Frequency Bands (MHz)	1164-1189, 1565-1586	L1: 1559-1586, L5: 1164-1189	1559-1609	1560-1605	1160-1270, 1560-1605	1176.45; 1575.42
Technology	GNSS L1 & L5 (passive)	GNSS L1 & L5 (active)	GNSS L1 (Passive)	GNSS L1 (passive)	GNSS L1 & L2 & L5 & L6 (passive)	GNSS L1 & L2 & L5 & L6 (passive)
Cable Length (mm)	60	100	100	100.5	143	115
Connector Type	IPEX MHF I	IPEX MHF1	RFI	IPEX I	IPEX I	IPEX I
Mounting Type	Buckle	Buckle	Adhesive	Adhesive	Adhesive	Adhesive
Dimensions (mm)	18 × 18 × 4 + 25 × 4	25 × 25 × 4 + 38 × 38 × 6	39.45 × 13.25	61.15 × 11.24	74.5 × 24.5	43 × 24
Matched Quectel Modules	GNSS L1/L5 module series		GNSS L1 module series		GNSS L1/L5 module series	GNSS L1/L5 modules

Product	YG0035AA	YEGM007AA	YEGM007BA	YB0017AA
				
Frequency Bands (MHz)	B11: 1561 / L1: 1575	1560-1580	1565-1606	1164-1189, 1559-1606
Technology	GNSS L1 & B1 & G1 (active)	GNSS L1 & B1 (active)	GNSS L1 & G1 (active)	GNSS L1 & L5 (active)
Cable Length (mm)	3000	3000	3000	3000
Connector Type	SMA Male	SMA Male	SMA Male	SMA Male
Mounting Type	Magnetic	/	/	Magnetic
Dimensions (mm)	50.3 × 38.4 × 17.1	38.6 × 50.9 × 17	38.6 × 50.9 × 17	61.5 × 56.5 × 23
Matched Quectel Modules	GNSS L1 module series			GNSS L1/L5 module series

Product	YEGT000W8A	YG0063AA	YEGM011AA	YEGM011BA	YEGT001BA	YEGT002BA
						
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	1166-1227, 1559-1606	1166-1227, 1559-1606	1561 ±5, 1575 ±5, 1602 ±5	1559-1606
Technology	GNSS L1 & L5 (Active)	All GNSS bands + L-band Corrections (active)	GPS L1/L2/L5, BDS B1/B2, GLONASS G1 (active)	GPS L1/L2/L5, BDS B1/B2, GLONASS G1 (active)	GNSS L1 (passive)	GNSS L1 (passive)
Cable Length (mm)	/	/	4000	4000	/	/
Connector Type	TNC-K	TNC-K	Antenna: TNC Female Cable: SMA Male to TNC Male	Antenna: TNC Female Cable: SMA Male to TNC Male	SMA Male	SMA Male
Mounting Type	Screw	Thread	Thread and Magnet	Thread and Magnet	Terminal	Terminal
Dimensions (mm)	Ø 65 × 45	Ø 165 × 68.8	Ø 146.4 × 65	Ø 146.4 × 65	50 × 16.4	53.5 × Ø10.5
Matched Quectel Modules	Timing L1/L5 module series	/	GNSS L1/L2/L5 module series		All GNSS L1 modules	

The parameters shall be subject to the Specification.

# Wi-Fi & Bluetooth Antennas

Product	YC0009AA	YC0009AAEVB	YC0010AA	YC0010AAEVB	YCWS002AA	YXU00A0AA	YEW001AA
							
Frequency Bands (MHz)	2400-2500	2400-2500	2400-2500	2400-2500	2.4-2.5 GHz , 5.15-5.85 GHz, 5.925-7.125 GHz	2400-2500, 5150-7150	2400-2500
Technology	Wi-Fi (Bluetooth)	Wi-Fi (Bluetooth)	Wi-Fi (Bluetooth)	Wi-Fi (Bluetooth)	Wi-Fi 6E (Bluetooth)	Wi-Fi (Bluetooth)	Wi-Fi (Bluetooth)
Cable Length (mm)	/	/	/	/	/	/	1500
Connector Type	/	/	/	/	/	/	SMA Male
Mounting Type	SMD	/	SMD	/	SMD	SMD	Magnetic
Dimensions (mm)	3.2 x 1.6 x 0.5	90 x 50	5.2 x 2.0 x 1.2	90 x 50	3.2 x 1.6 x 0.5	8.0 x 6.6 x 1.6	Φ 30 x 77.4
Matched Quectel Modules	FC30R			All Wi-Fi/BT modules		FC30R	






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					




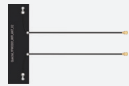
Product	YE0031BA	YE0032BA	YEW004AA	YEW001AA
				
Frequency Bands (MHz)	2400-2500, 5150-5850	2400-2500, 5150-5800	2400-2500, 5150-7150	2400-2500, 5150-5850
Technology	Wi-Fi 6 (Bluetooth)	Wi-Fi 6 (Bluetooth)	Wi-Fi 6E (Bluetooth)	Wi-Fi 6 (Bluetooth)
Cable Length (mm)	/	/	/	/
Connector Type	SMA Male	SMA Elbow Male	SMA Male	RP-SMA Male
Mounting Type	Terminal	Terminal	Terminal	Terminal
Dimensions (mm)	53.5 x Φ 10.5	50 x 16.7 x 10.5	109 x Φ 10	200 x Φ 13
Matched Quectel Modules	All Wi-Fi/BT modules (Except Wi-Fi 6E)		All Wi-Fi/BT modules	All Wi-Fi/BT modules (Except Wi-Fi 6E)

The parameters shall be subject to the Specification.








# Combo Antennas

Product	YEMN017AA	YB0008AA	YB0014AA	YW00A0AA	YB0027AA
					
Frequency Bands (MHz)	LMHs: 600-960, 1400-6000 MHs: 1400-6000 GNSS: 1164-1189, 1559-1606	4G × 2: 698-960, 1710-2690; GNSS: 1556-1581	4G × 2: 698-960, 1710-2690; GNSS: 1558-1581	4G: 700-960, 1710-2690; 4G DIV: 700-960, 1710-2690	5G LMH: 600-960, 1400-6000; 5G MH: 1400-6000; GNSS: 1164-1189, 1559-1606
Technology	5G & GNSS	Main LTE & DIV LTE & GNSS	Main LTE & DIV LTE & GNSS	LTE MIMO	5G Main & DIV & GNSS
Cable Length (mm)	300	300	3000	1500	300
Connector Type	SMA Male	SMA Male	SMA Male	SMA Male	SMA Male
Mounting Type	Screw	Adhesive	Screw	Screw	Screw
Dimensions (mm)	∅ 103.5 × 42.5	∅ 84 × 17.5	∅81 × 14.5	∅ 81 × 27.5	∅ 162 x56
Matched Quectel Modules	All 5G/4G/3G/2G modules & GNSS L1 & L5 modules	All 4G/3G/2G modules & GNSS L1 modules		All 4G/3G/2G modules	All 5G/4G/3G/2G modules & GNSS L1 & L5 modules

Product	YB0031AA	YEMA003AA	YFCO002AA	YCGS024AA	YCGS025AA
					
Frequency Bands (MHz)	4G: 698-960, 1710-2690; GNSS: 1559-1592	4G MAIN: 700-960, 1710-2690; GNSS: 1575.42 ±5, 1561.098 ±5	600-6000	1575.42, 2400-2500	1575.42, 2400-2500, 5150-5850
Technology	LTE & GNSS	LTE & GNSS	4G & 5G	GNSS & Wi-Fi	GNSS & Wi-Fi
Cable Length (mm)	300	3000	150	/	/
Connector Type	SMA Male	4G: FAKRA D; GNSS: FAKRA C	IPEX I	/	/
Mounting Type	Adhesive	Adhesive	Adhesive	SMD	SMD
Dimensions (mm)	∅ 84 × 17.5	∅ 84 × 17.5	237 × 22	3.2 × 1.6 × 0.5	3.2 × 1.6 × 0.5
Matched Quectel Modules	4G/3G/2G modules & GNSS L1 modules		5G/4G/3G/2G/LPWA	Wi-Fi module & GNSS L1	

Product	YB0015AA	YEMA004AA	YEWN004AA	YFWO001AA
				
Frequency Bands (MHz)	4G: 698-960, 1710-2690; Wi-Fi: 2400-2500; GNSS: 1556-1581	4G: 698-960, 1710-2690; Wi-Fi & Bluetooth: 2400-2500	2400-2500, 5150-5850	2400-2500, 5150-7150
Technology	LTE/GPS & BD/Wi-Fi	LTE & Wi-Fi	Wi-Fi MIMO	Wi-Fi/Bluetooth
Cable Length (mm)	300	900	300	100
Connector Type	SMA Male	SMA Male	SMA Male	IPEX I
Mounting Type	Screw	Screw	Screw	Adhesive
Dimensions (mm)	∅ 54 × 91	∅ 81 × 14.5	∅ 46 × 15	78.6 × 21.4
Matched Quectel Modules	4G/3G/2G modules & GNSS L1 modules & Wi-Fi, Bluetooth modules	All 4G/3G/2G modules & Wi-Fi modules	All Wi-Fi/BT modules (Except Wi-Fi 6E)	All Wi-Fi/BT modules

# ISM Antennas

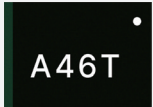
Product	YE0019AA	YEIM001AA	YEIN002AA	YFOA004AA	YCIS001AA	YCIS002AA	YCIS003AA
							
Frequency Bands (MHz)	450-470	465-475	863-928	410-470	863-870	863-870	902-928
Technology	ISM	ISM	ISM	ISM	ISM	ISM	ISM
Cable Length (mm)	/	2000	/	100	/	/	/
Connector Type	SMA Male	SMA Male	SMA Male	IPEX MHF 1	/	/	/
Mounting Type	Terminal	Magnetic	Terminal	Adhesive	SMD	SMD	SMD
Dimensions (mm)	109 × ∅10	∅ 30 × 131	∅ 13 × 195	100 × 20	5.0 × 3.0 × 0.5	10 × 3.2 × 0.5	10 × 3.2 × 0.5

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	NA	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	YSANO25AA	YSANO26AA	YSANO27AA	YSANO28AA
									
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 IV	RP SMA Female to IPEX IV
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	YSANO27FA	YSANO28FA	YM0004AA	YSAO001AA	YSAO002AA	YB00A0IA
						
Frequency Bands (MHz)	DC-6000	DC-6000	DC-6000	DC-6000	DC-6000	/
Technology	Cable	Cable	Cable	Cable	Cable	Bracket
Cable Length (mm)	150/200/250/300	100/150/200/250/300	100	100	100	/
Connector Type	SMA Female to IPEX IV	RP SMA Female to IPEX IV	SMA female to IPEX IV	FAKRA-D(Purple) to U.FL 1	FAKRA-C(Blue) to U.FL 1	/
Mounting Type	Screw	Screw	Screw	Screw	Screw	/
Dimensions (mm)	1.13	1.13	1.13	1.13	1.13	80 × 60 × 86

The parameters shall be subject to the Specification.

**Europe**

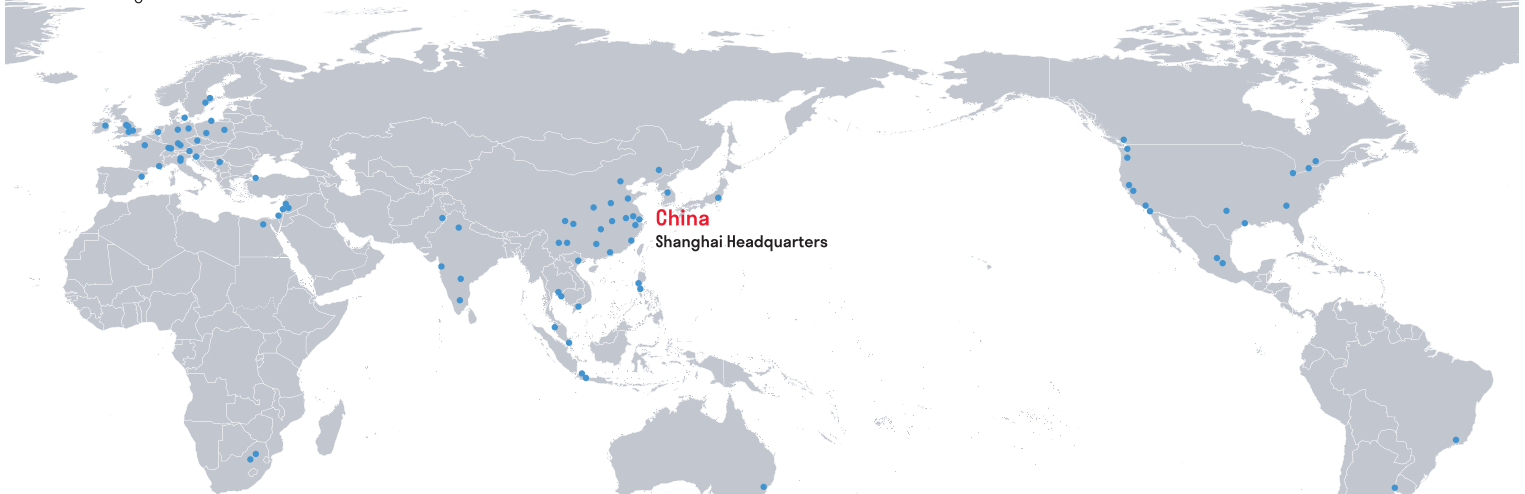
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**Serbia:** Belgrade

**Slovenia:** Ljubljana  
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**Singapore**  
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**Latin America**

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**Brazil:** Sao Paulo  
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 Modules are sold to 150+ countries and regions

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