

The background of the entire page is a deep space scene. A large, glowing blue arc representing the Earth's horizon curves across the middle. Overlaid on this is a complex network of blue lines and dots, resembling a global communication or IoT network. A bright sun or star is visible on the right side, creating a lens flare effect. The overall color palette is dominated by blues, blacks, and whites, with a touch of red from the logo and website URL.

Global IoT Solutions Provider

IoT Modules and Antenna Catalogue

For more information contact us at:

www.quectel.com



LTE

5G

LTE-M

NB-IoT

Wi-Fi

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 over 3,000 professionals sets the pace for innovation in cellular, GNSS and WiFi/BT modules, antennas and IoT connectivity. Listed on the Shanghai Stock Exchange (603236.SS), our international leadership is devoted to advancing IoT across the globe.

For more information visit: www.quectel.com or find us on Linked In, Twitter and Facebook.

GNSS

**UMTS/
HSPA(+)**

C-V2X

Antenna

LPWA

**GSM/
GPRS**

Contents

01	Quectel's IoT Vertical Framework
02	5G NR Module Family
07	LTE-A Module Family
11	LTE Module Family
16	Smart Module Family
23	LPWA Module Family
26	Automotive Module Family
28	Automotive LTE-A Module Family
30	Automotive 5G Module Family
33	Wi-Fi & BT Module Family
38	UMTS/HSPA(+) Module Family
39	GSM/GPRS Module Family
41	GNSS Module Family
46	Antenna Family
46	5G Antennas
47	Cellular (4G/3G/2G) Antennas
48	GNSS Antennas
50	Wi-Fi & Bluetooth Antennas
51	Combo Antennas
52	ISM Antennas
52	Cable Assemblies

Quectel's IoT Vertical Framework



Telematics and Transport

Automotive OEM
Vehicle Tracking
Asset Tracking
Ship Tracking
Fleet Management
OBD
Digital Video Recorders (DVR)
Special Purpose Vehicles (SPV)
Usage-Based Insurance (UBI)



Energy

Electricity Meters
Gas Meters
Water Meters
Heat Meters
Smart Grids
Wind Turbines
Solar Panels
Charging Piles



Payment

Wireless POS
Cash Registers
ATMs
Vending Machines
Top-up Machines



Safety

Alarms
Intrusion Detection
Smoke Detectors
Gas Detectors
Motion Sensors
Asset Protection



Smart Cities

Street Lighting
Traffic Lights
Sharing Economy
Smart Elevators
Smart Parking
Parking Meters
Toll Collection Systems
Digital Signage
Smart Bins
Outdoor LED Lighting



Gateways

DTUs
Consumer Routers
Industrial Routers
VOIP
Wi-Fi Hotspots



Industry

Industrial PDAs/ Scanners
Industrial PCs
Rugged Tablet PCs
Pipeline Monitoring
Robots
Flowmeters
Unmanned Aerial Vehicles (UAV)
Industrial Refrigerators
Indoor Air Monitoring
Water Valves/ Pump Controls



Life & Healthcare

Personal Trackers
Pet Trackers
Wearables
Home Automation
Elderly Monitoring
Remote Medical Equipment
Glucometers
Blood Pressure Monitors
Recreational Machines
Patient Monitoring Laptops



Agriculture & Environment

Food Traceability
Farmland Monitoring
Farm Machinery Management
Meteorological Stations
Wildlife Tracking
Irrigation
Environmental Monitoring

5G NR Module Family

Product	RG500Q-EA/RG502Q-EA	RG500Q-EU/RG501Q-EU/RG502Q-EU	RG500Q-GT/RG502Q-GT
			
Form Factor	LGA	LGA	LGA
Dimensions (mm)	44.0 × 41.0 × 2.75	44.0 × 41.0 × 2.75	44.0 × 41.0 × 2.75
5G	Sub-6 GHz	Sub-6 GHz	Sub-6 GHz
Frequency Bands (MHz)	5G NR: n41/n77/n78/n79/n1/n3/n5/n7/n8/n20/n28/n38/n40; LTE-FDD: B1/B3/B5/B7/B8/B18/B19/B20/B26/B28/B32; LTE-TDD: B34/B38/39/B40/B41/B42/B43; WCDMA: B1/B3/B5/B6/B8/B19	5G NR: n1/n3/n5/n7/n8/n20/n28/n38/n40/n41/n77/n78; LTE-FDD: B1/B3/B5/B7/B8/ B20/B28/B32; LTE-TDD: B38/B40/B41/B42/B43; WCDMA: B1/B5/B8	5G NR: n78; LTE-TDD: B42/B43
Region	EMEA/ APAC	EMEA/ Oceania/ Brazil	Europe
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 Transmission¹			
5G	5G SA Sub-6: Max. 2.1Gbps (DL)/Max. 900Mbps (UL) (RG500Q-EA) Max. 4.2Gbps (DL)/Max. 900Mbps (UL) (RG502Q-EA) 5G NSA Sub-6: Max. 2.5Gbps (DL)/Max. 600/650Mbps (UL) ² (RG500Q-EA) Max. 5.0Gbps (DL)/Max. 600/650Mbps (UL) ² (RG502Q-EA)	5G SA Sub-6: Max. 2.1Gbps (DL)/Max. 900Mbps (UL) (RG500Q-EU/RG501Q-EU) Max. 4.2Gbps (DL)/Max. 900Mbps (UL) (RG502Q-EU) 5G NSA Sub-6: Max. 2.5Gbps (DL)/Max. 600/650Mbps (UL) ² (RG500Q-EU) Max. 3.3Gbps (DL)/Max. 600/650Mbps (UL) ² (RG501Q-EU) Max. 5.0Gbps (DL)/Max. 600/650Mbps (UL) ² (RG502Q-EU)	5G SA Sub-6: Max. 2.1Gbps (DL)/Max. 900Mbps (UL) (RG500Q-GT) Max. 4.2Gbps (DL)/Max. 900Mbps (UL) (RG502Q-GT)
LTE	LTE-FDD: Max. 1Gbps (DL)/Max. 200Mbps (UL) (RG500Q-EA) LTE-FDD: Max. 2Gbps (DL)/Max. 200Mbps (UL) (RG502Q-EA)	LTE-FDD: Max. 1Gbps (DL)/Max. 200Mbps (UL) (RG500Q-EU) LTE-FDD: Max. 2Gbps (DL)/Max. 200Mbps (UL) (RG501Q-EU/RG502Q-EU)	LTE-TDD: Max. 700Mbps (DL)/Max. 116Mbps (UL) (RG500Q-GT) LTE-TDD: Max. 1.2Gbps (DL)/Max. 116Mbps (UL) (RG502Q-GT)
UMTS	WCDMA: Max. 42Mbps (DL)/Max. 5.76Mbps (UL)	WCDMA: Max. 42 Mbps (DL)/Max. 5.76Mbps (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, 1.8V/2.95V	× 2, 1.8V/2.95V	× 2, 1.8V/2.95V
UART	× 3	× 3	× 3
USB	2.0/3.0/3.1	2.0/3.0/3.1	2.0/3.0/3.1
PCIe	PCIe Gen3 × 2 Lane	PCIe Gen3 × 2 Lane	PCIe Gen3 × 2 Lane
RGMI	•	•	•
PCM	•	•	•
I2C	× 1	× 1	× 1
SPI	•	•	•
GPIO	•	•	•
ADC	× 2	× 2	× 2
SD Card	•	•	•
RESET_N	•	•	•
Antenna	Cellular: 6 + 2 (n79), GNSS: × 1	Cellular: 4+2(B32), GNSS: × 1	Cellular: 4
Enhanced Features			
MIMO	4 × 4 DL	4 × 4 DL	4 × 4 DL
Digital Audio	•	•	•
VoLTE	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	/
(U)SIM Card Detection	•	•	•
Electrical Features			
Supply Voltage Range	3.3V~4.3V, 3.8V Typ.	3.3V~4.3V, 3.8V Typ.	3.3V~4.3V, 3.8V Typ.
Power Consumption	0.033mA @ Power off 1.45mA @ Sleep, Typ. 20.1mA @ Idle	0.045mA @Power off 2.0mA @Sleep, Typ. 30mA @Idle	0.045mA @Power off 2.0mA @Sleep, Typ. 30mA @Idle
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	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	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
GNSS Driver	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/10	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/10	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/10
NDIS Driver	Windows 7/8/8.1/10	Windows 7/8/8.1/10	Windows 7/8/8.1/10
MBIM Driver	Windows 10, Linux 3.18~5.12	Windows 10, Linux 3.18~5.12	Windows 10, Linux 3.18~5.12
Gobinet Driver	Linux 3.18~5.12	Linux 3.18~5.12	Linux 3.18~5.12
QMI_WWAN Driver	Linux 3.18~5.12	Linux 3.18~5.12	Linux 3.18~5.12
PCIe Driver	Windows 10, Linux 3.18~5.12, Android 4.x/5.x/6.x/7.x/8.x/9.x/10	Windows 10, Linux 3.18~5.12, Android 4.x/5.x/6.x/7.x/8.x/9.x/10	Windows 10, Linux 3.18~5.12, Android 4.x/5.x/6.x/7.x/8.x/9.x/10
Certifications³	LGU+/Telstra*/China Telecom/China Mobile/China Unicom/ CE/SRRC/NAL/CCC/KC/RCM/JATE/TELEC/SKT/KT	CE/RCM/GCF	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 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

5G NR Module Family

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/n2/n3/n5/n7/n8/n12/n20/n25/n28/n38/n40/n41/n48/n66/n71/n77/n78/n79; LTE-FDD: B1/B2/B3/B4/B5/B7/B8/B12(B17)/B13/B14/B18/B19/B20/B25/B26/B28/B29/B30/B32/B66/B71; LTE-TDD: B34/B38/B39/B40/B41/B42/B43/B48; LAA: B46 ³ ; WCDMA: B1/B2/B3/B4/B5/B6/B8/B19	5G NR: n1/n2/n3/n5/n7/n8/n12/n20/n25/n28/n38/n40/n41/n48*/n66/n71/n77/n78/n79; LTE-FDD: B1/B2/B3/B4/B5/B7/B8/B12/B13/B14/B17/B18/B19/B20/B25/B26/B28/B29/B30/B32/B66/B71; LTE-TDD: B34/B38/39/B40/B41/B42/B43/B48; LAA: B46; WCDMA: B1/B2/B3/B4/B5/B6/B8/B19;	5G NR: n1/n2/n3/n5/n7/n8/n12/n20/n25/n28/n38/n40/n41/n48/n66/n71/n77/n78/n79/n257/n258/n260/n261; LTE-FDD: B1/B2/B3/B4/B5/B7/B8/B12(B17)/B13/B14/B18/B19/B20/B25/B26/B28/B29/B30/B32/B66/B71; LTE-TDD: B34/B38/39/B40/B41/B42/B43/B48; LAA: B46 WCDMA: B1/B2/B3/B4/B5/B6/B8/B19
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 Transmission¹			
5G	5G SA Sub-6: Max. 2.1Gbps (DL)/Max. 450Mbps (UL) (RM500Q-AE/RM505Q-AE) Max. 4.2Gbps (DL)/Max. 450Mbps (UL) (RM502Q-AE) 5G NSA Sub-6: Max. 2.5Gbps (DL)/Max. 650Mbps (UL) (RM500Q-AE/RM505Q-AE) Max. 5Gbps (DL)/Max. 650Mbps (UL) (RM502Q-AE)	5G SA Sub-6: Max. 2.1Gbps (DL)/Max. 900Mbps (UL) 5G NSA Sub-6: Max. 2.5Gbps (DL)/Max. 600/650Mbps (UL) ²	5G SA Sub-6: Max. 4.2Gbps (DL)/Max. 450Mbps (UL) 5G NSA Sub-6: Max. 5.0Gbps (DL)/Max. 600/650Mbps (UL) ² 5G NSA mmWave: Max. 7.5Gbps (DL)/Max. 2.9Gbps (UL)
LTE	LTE-FDD: Max. 1Gbps (DL)/Max. 200Mbps (UL) (RM500Q-AE/RM505Q-AE) LTE-FDD: Max. 2Gbps (DL)/Max. 200Mbps (UL) (RM502Q-AE)	LTE-FDD: Max. 1Gbps (DL)/Max. 200Mbps (UL)	LTE-FDD: Max. 2Gbps (DL)/Max. 200Mbps (UL)
UMTS	WCDMA: Max. 42Mbps (DL)/Max. 5.76Mbps (UL)	WCDMA: Max. 42Mbps (DL)/Max. 5.76Mbps (UL)	WCDMA: Max. 42Mbps (DL)/Max. 5.76Mbps (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, 1.8V/3.0V(RM500Q-AE/RM502Q-AE) × 2, 1.8V/3.0V(RM505Q-AE)	× 2, 1.8V/ 3.0V	× 1, 1.8V/ 3.0V
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	•
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
Digital Audio	•	•	•
VoLTE	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	3.135~4.4V 3.7V Typ.	3.135~4.4V, 3.7V Typ.	3.135~4.4V, 3.7V Typ.
Power Consumption	82μA @Power off 4.2mA @Sleep, Typ. 32mA, USB 2.0 @Idle 55mA, USB 3.0 @Idle	70μA @Power off 4.0mA @Sleep, Typ. 32mA, USB 2.0 @Idle 54mA, USB 3.0 @Idle	82 μA @ Power down 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, Linux 3.18~5.12, Android 4.x/5.x/6.x/7.x/8.x/9.x/10	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	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
GNSS Driver	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/10	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/10	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/10
NDIS Driver	Windows 7/8/8.1/10	Windows 7/8/8.1/10	Windows 7/8/8.1/10
MBIM Driver	Windows 10, Linux 3.18~5.12	Windows 10, Linux 3.18~5.12	Windows 10, Linux 3.18~5.12
Gobinet Driver	Linux 3.18~5.12	Linux 3.18~5.12	Linux 3.18~5.12
QMI_WWAN Driver	Linux 3.18~5.12	Linux 3.18~5.12	Linux 3.18~5.12
PCIe Driver	Windows 10, Linux 3.18~5.12, Android 4.x/5.x/6.x/7.x/8.x/9.x/10	Windows 10, Linux 3.18~5.12, Android 4.x/5.x/6.x/7.x/8.x/9.x/10	Windows 10, Linux 3.18~5.12, Android 4.x/5.x/6.x/7.x/8.x/9.x/10
Certifications⁴	CE/RCM/FCC/IC/GCF/PTCRB/JATE/TELEC/NCC/T-mobile/AT&T/Verizon*/Telstra/Deutsche Telecom/Telus*	CE/RCM/CCC/SRRC/NAL/KC/GCF/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

5G NR Module Family

Product	RG520N-EU	RG520N-NA	RG520F-EU	RG520F-NA	RG530F-EU	RG530F-NA
						
Form Factor	LGA	LGA	LGA	LGA	LGA	LGA
Dimensions (mm)	44.0 × 41.0 × 2.75	44.0 × 41.0 × 2.75	44.0 × 41.0 × 2.75	44.0 × 41.0 × 2.75	45.0 × 48.0 × 2.85	45.0 × 48.0 × 2.85
5G	Sub-6 GHz	Sub-6 GHz	Sub-6 GHz	Sub-6 GHz	Sub-6 GHz & mmWave	Sub-6 GHz & mmWave
Frequency Bands (MHz)	5G NR: n1/n3/n5/n7/n8/n20/ n28/n38/n40/n41/n75*/n76*/ n77/n78; LTE-FDD: B1/B3/B5/B7/B8/B20/ B28/B32; LTE-TDD: B38/B40/B41/B42/B43/ WCDMA: B1/B5/B8	5G NR: n2/n5/n7/n12/n13/n14/ n25/n26/n29/n30/n38/n41/ n48/n66/n70/n71/n77/n78; LTE-FDD: B2/B4/B5/B7/B12/B13/ B14/B17/B25/B26/B29/B30/ B66/B71; LTE-TDD: B38/B41/B42/B43/B48; LAA: B46	5G NR: n1/n3/n5/n7/n8/n20/ n28/n38/n40/n41/n75*/n76*/ n77/n78; LTE-FDD: B1/B3/B5/B7/B8/B20/ B28/B32; LTE-TDD: B38/B40/B41/B42/B43/ WCDMA: B1/B5/B8	5G NR: n2/n5/n7/n12/n13/n14/ n25/n26/n29/n30/n38/n41/ n48/n66/n70/n71/n77/n78; LTE-FDD: B2/B4/B5/B7/B12/B13/ B14/B17/B25/B26/B29/B30/ B66/B71; LTE-TDD: B38/B41/B42/B43/B48; LAA: B46	5G NR: n1/n3/n5/n7/n8/n20/ n28/n38/n40/n41/n75*/n76*/ n77/n78/n257/n258/n260/ n261; LTE-FDD: B1/B3/B5/B7/ B8/B20/B28/B32; LTE-TDD: B38/B40/B41/B42/B43/ WCDMA: B1/B5/B8	5G NR: n2/n5/n7/n12/n13/n14/ n25/n26/n29/n30/n38/n41/ n48/n66/n70/n71/n77/n78/ n257/n258/n260/n261; LTE-FDD: B2/B4/B5/B7/B12/B13/ B14/B17/B25/B26/B29/B30/ B66/B71; LTE-TDD: B38/B41/B42/B43/B48; LAA: B46
Region	EMEA/Oceania/Brazil	North America	EMEA/Oceania/Brazil	North America	EMEA/Oceania/Brazil	North America
Weight (approx.) g	TBD	TBD	TBD	TBD	TBD	TBD
Operating Temperature	-30°C ~ +75°C	-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	-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	3GPP TS27.007 and Quectel Enhanced AT Commands
Data Transmission ¹						
5G	5G SA Sub-6: Max. 2.4 Gbps (DL)/Max. 900 Mbps (UL) 5G NSA Sub-6: Max. 3.2 Gbps (DL)/Max. 550 Mbps (UL)	5G SA Sub-6: Max. 2.4 Gbps (DL)/Max. 900 Mbps (UL) 5G NSA Sub-6: Max. 3.2 Gbps (DL)/Max. 550 Mbps (UL)	5G SA Sub-6: Max. 4.0 Gbps (DL)/Max. 900 Mbps (UL) 5G NSA Sub-6: Max. 4.0 Gbps (DL)/Max. 550 Mbps (UL)	5G SA Sub-6: Max. 4.0 Gbps (DL)/Max. 900 Mbps (UL) 5G NSA Sub-6: Max. 4.0 Gbps (DL)/Max. 550 Mbps (UL)	5G SA Sub-6: Max. 4.0 Gbps (DL)/Max. 900 Mbps (UL); 5G NSA Sub-6: Max. 4.0 Gbps (DL)/Max. 550 Mbps (UL); 5G NSA mmWave: Max. 8.8 Gbps (DL)/Max. 2.6Gbps (UL); 5G TDD+ mmWave: Max. 8.0 Gbps (DL)/Max. 3.4Gbps (UL); 5G FDD+ mmWave: Max. 8.9 Gbps (DL)/Max. 2.7Gbps (UL)	5G SA Sub-6: Max. 4.0 Gbps (DL)/Max. 900 Mbps (UL); 5G NSA Sub-6: Max. 4.0 Gbps (DL)/Max. 550 Mbps (UL); 5G NSA mmWave: Max. 8.8 Gbps (DL)/Max. 2.6Gbps (UL); 5G TDD+ mmWave: Max. 8.0 Gbps (DL)/Max. 3.4Gbps (UL); 5G FDD+ mmWave: Max. 8.9 Gbps (DL)/Max. 2.7Gbps (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)	LTE-FDD: Max. 2.0 Gbps (DL)/ Max. 200 Mbps (UL)	LTE-FDD: Max. 2.0 Gbps (DL)/ Max. 200 Mbps (UL)	LTE-FDD: Max. 2.0 Gbps (DL)/ Max. 200 Mbps (UL)
UMTS	WCDMA: Max. 42 Mbps (DL)/ Max. 5.76 Mbps (UL)	/	WCDMA: Max. 42 Mbps (DL)/ Max. 5.76 Mbps (UL)	/	WCDMA: Max. 42 Mbps (DL)/ Max. 5.76 Mbps (UL)	/
SMS	•	•	•	•	•	•
Protocols	TCP/UDP/FTP/HTTP/HTTPS/PING/ SMS	TCP/UDP/FTP/HTTP/HTTPS/PING/ SMS	TCP/UDP/FTP/HTTP/HTTPS/PING/ SMS	TCP/UDP/FTP/HTTP/HTTPS/PING/ SMS	TCP/UDP/FTP/HTTP/HTTPS/PING/ SMS	TCP/UDP/FTP/HTTP/HTTPS/PING/ SMS
Interfaces						
(U)SIM	x2, 1.8/2.95 V	x2, 1.8/2.95 V	x2, 1.8/2.95 V	x2, 1.8/2.95 V	x2, 1.8/2.95 V	x2, 1.8/2.95 V
UART	x 3	x 3	x 3	x 3	x 3	x 3
USB	2.0/3.0/3.1	2.0/3.0/3.1	2.0/3.0/3.1	2.0/3.0/3.1	2.0/3.0/3.1	2.0/3.0/3.1
PCIe	Gen3 × 2Lane or Gen4 × 1Lane	Gen3 × 2Lane or Gen4 × 1Lane	Gen3 × 2Lane or Gen4 × 1Lane	Gen3 × 2Lane or Gen4 × 1Lane	Gen3 × 2Lane or Gen4 × 1Lane	Gen3 × 2Lane or Gen4 × 1Lane
PCM	•	•	•	•	•	•
I2C	x 1	x 1	x 1	x 1	x 1	x 1
SPI	•	•	•	•	•	•
GPIO	•	•	•	•	•	•
ADC	x 2	x 2	x 2	x 2	x 2	x 2
SD Card	•	•	•	•	•	•
RESET_N	•	•	•	•	•	•
Antenna	Cellular: 4 + 2 (optional), GNSS: x 1	Cellular: 4, GNSS: x 1	Cellular: 4 + 2 (optional), GNSS: x 1	Cellular: 4, GNSS: x 1	Cellular: sub6G x 8 + 2(optional), mmWave x 8; GNSS: x 1	Cellular: sub6G x 8, mmWave x 8; GNSS: x 1
Enhanced Features						
MIMO	DL 4 × 4, UL 2 × 2	DL 4 × 4, UL 2 × 2	DL 4 × 4, UL 2 × 2	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 mmWave: DL 2 × 2, UL 2 × 2
Digital Audio	•	•	•	•	•	•
VoLTE	Optional	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	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	Delta Firmware over the Air
GNSS	GPS/ GLONASS/ BeiDou/ Galileo	GPS/ GLONASS/ BeiDou/ Galileo	GPS/ GLONASS/ BeiDou/ Galileo	GPS/ GLONASS/ BeiDou/ Galileo	GPS/ GLONASS/ BeiDou/ Galileo	GPS/ GLONASS/ BeiDou/ Galileo
(U)SIM Card Detection	•	•	•	•	•	•
Electrical Features						
Supply Voltage Range	3.3~4.4V, 3.8V Typ.	3.3~4.4V, 3.8V Typ.	3.3~4.4V, 3.8V Typ.	3.3~4.4V, 3.8V Typ.	3.3~4.4 V, 3.8 V Typ.	3.3~4.4 V, 3.8 V Typ.
Power Consumption	TBD	TBD	TBD	TBD	TBD	TBD
Software Features						
USB Serial Driver	Windows 7/8/8.1/10, Linux 3.18~5.12, Android 4.x~11.x	Windows 7/8/8.1/10, Linux 3.18~5.12, Android 4.x~11.x	Windows 7/8/8.1/10, Linux 3.18~5.12, Android 4.x~11.x	Windows 7/8/8.1/10, Linux 3.18~5.12, Android 4.x~11.x	Windows 7/8/8.1/10, Linux 3.18~5.12, Android 4.x~11.x	Windows 7/8/8.1/10, Linux 3.18~5.12, Android 4.x~11.x
GNSS Driver	Android 4.x~11.x	Android 4.x~11.x	Android 4.x~11.x	Android 4.x~11.x	Android 4.x~11.x	Android 4.x~11.x
RIL Driver	Android 4.x~11.x	Android 4.x~11.x	Android 4.x~11.x	Android 4.x~11.x	Android 4.x~11.x	Android 4.x~11.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	Windows 7/8/8.1/10	Windows 7/8/8.1/10
MBIM Driver	Windows 10, Linux 3.18~5.12	Windows 10, Linux 3.18~5.12	Windows 10, Linux 3.18~5.12	Windows 10, Linux 3.18~5.12	Windows 10, Linux 3.18~5.12	Windows 10, Linux 3.18~5.12
Gobinet Driver	Linux 3.18~5.12	Linux 3.18~5.12	Linux 3.18~5.12	Linux 3.18~5.12	Linux 3.18~5.12	Linux 3.18~5.12
QMI_WWAN Driver	Linux 3.18~5.12	Linux 3.18~5.12	Linux 3.18~5.12	Linux 3.18~5.12	Linux 3.18~5.12	Linux 3.18~5.12
PCIe Driver	Windows 10, Linux 3.18~5.12, Android 4.x~11.x	Windows 10, Linux 3.18~5.12, Android 4.x~11.x	Windows 10, Linux 3.18~5.12, Android 4.x~11.x	Windows 10, Linux 3.18~5.12, Android 4.x~11.x	Windows 10, Linux 3.18~5.12, Android 4.x~11.x	Windows 10, Linux 3.18~5.12, Android 4.x~11.x
Certifications	CE*/RCM*	FCC*/IC*	GCF*/CE*/RCM*	GCF*/PTCRB*/FCC*/IC*	GCF*/CE*/RCM*	GCF*/PTCRB*/FCC*/IC*
Recommended Applications	Industrial Routers, Industrial PDAs, Rugged Tablet PCs and Digital Signage					

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

* Under development

5G NR Module Family

Product	RM520N-GL	RM530N-GL
		
Form Factor	M.2	M.2
Dimensions (mm)	52.0 × 30.0 × 2.3	52.0 × 30.0 × 2.3
5G	Sub-6 GHz	Sub-6 GHz/mmWave
Frequency Bands (MHz)	5G NR: n1/n2/n3/n5/n7/n8/n12/n13/n14/n18/n20/n25/n26/n28/n29/n30/n38/n40/n41/n48/n66/n70/n71/n75/n76/n77/n78/n79; LTE-FDD: B1/B2/B3/B4/B5/B7/B8/B12/B13/B14/B17/B18/B19/B20/B25/B26/B28/B29/B30/B32/B66/B71; LTE-TDD: B34/B38/B39/B40/B41/B42/B43/B48; LAA: B46; WCDMA: B1/B2/B4/B5/B8/B19	5G NR: n1/n2/n3/n5/n7/n8/n12/n13/n14/n18/n20/n25/n26/n28/n29/n30/n38/n40/n41/n48/n66/n70/n71/n75/n76/n77/n78/n79/n257/n258/n260/n261; LTE-FDD: B1/B2/B3/B4/B5/B7/B8/B12/B13/B14/B17/B18/B19/B20/B25/B26/B28/B29/B30/B32/B66/B71; LTE-TDD: B34/B38/B39/B40/B41/B42/B43/B48; LAA: B46; WCDMA: B1/B2/B4/B5/B8/B19
Region	Global	Global
Weight (approx.) g	TBD	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 Transmission¹		
5G	5G SA Sub-6: Max. 2.4Gbps (DL)/Max. 900Mbps (UL) 5G NSA Sub-6: Max. 2.8Gbps (DL)/Max. 550Mbps (UL)	5G SA Sub-6: Max. 2.4Gbps (DL)/Max. 900Mbps (UL) 5G NSA Sub-6: Max. 2.8Gbps (DL)/Max. 550Mbps (UL) 5G NSA mmWave: Max. 4.0Gbps (DL)/Max. 1.4Gbps (UL)
LTE	LTE-FDD: Max. 1.6Gbps (DL)/Max. 200Mbps (UL)	LTE-FDD: Max. 1.6Gbps (DL)/Max. 200Mbps (UL)
UMTS	WCDMA: Max. 42Mbps (DL)/Max. 5.76Mbps (UL)	WCDMA: Max. 42Mbps (DL)/Max. 5.76Mbps (UL)
SMS	•	•
Protocols	TCP/UDP/FTP/HTTP/HTTPS /PING/SMS	TCP/UDP/FTP/HTTP/HTTPS /PING/SMS
Interfaces		
(U)SIM	× 2	× 2
USB	2.0/3.0/3.1	2.0/3.0/3.1
PCIe	PCIe 4.0	PCIe 4.0
Antenna	Sub-6/GNSS × 4	Sub-6/GNSS × 4, mmWave × 2
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
Digital Audio	•	•
VoLTE	Optional	Optional
DTMF	Dual-tone Multi-frequency	Dual-tone Multi-frequency
DFOTA	Delta Firmware over the Air	Delta Firmware over the Air
GNSS	GPS/ GLONASS/ BeiDou/ Galileo	GPS/ GLONASS/ BeiDou/ Galileo
(U)SIM Card Detection	•	•
Electrical Features		
Supply Voltage Range	3.135~4.4V, 3.7V Typ.	3.135~4.4V, 3.7V Typ.
Power Consumption	TBD	TBD
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	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
GNSS Driver	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/10
RIL Driver	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/10
NDIS Driver	Windows 7/8/8.1/10	Windows 7/8/8.1/10
MBIM Driver	Windows 10, Linux 3.18~5.12	Windows 10, Linux 3.18~5.12
Gobinet Driver	Linux 3.18~5.12	Linux 3.18~5.12
QMI_WWAN Driver	Linux 3.18~5.12	Linux 3.18~5.12
PCIe Driver	Windows 10, Linux 3.18~5.12, Android 4.x/5.x/6.x/7.x/8.x/9.x/10	Windows 10, Linux 3.18~5.12, Android 4.x/5.x/6.x/7.x/8.x/9.x/10
Certifications	BCF*/CE*/PTCRB*/FCC*/IC*/JATE*/TELEC*/RCM*	BCF*/CE*/PTCRB*/FCC*/IC*/JATE*/TELEC*/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.

* Under development

5G NR Module Family

Product	RG500L-EU	RG500L-NA
		
Form Factor	LGA	LGA
Dimensions (mm)	44.0 × 41.0 × 2.75	44.0 × 41.0 × 2.75
5G	Sub-6 GHz	Sub-6 GHz
Frequency Bands (MHz)	5G NR: n1/n3/n5/n7/n8/n20/n28/n38/n40/n41/n77/n78; LTE-FDD: B1/B3/B5/B7/B8/B20/B28/B32; LTE-TDD: B38/B40/B41/B42/B43; WCDMA: B1/B5/B8	5G NR: n2/n5/n7/n12/n25/N38/n41/n48/n66/n71/n77/n78; LTE-FDD: B2/B4/B5/B7/B12(B17)/B13/B14/B25/B26/B29/B30/B66/B71; LTE-TDD: B38/B41/B42/B43/B48; LAA: B46
Region	EMEA/ Oceania/ Brazil	NA
Weight (approx.) g	13±0.3	TBD
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 Rel-15 and Quectel Enhanced AT Commands
Data Transmission¹		
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)	5G SA Sub-6: Max. 4.67 Gbps(DL)/Max. 2.5Gbps (UL) 5G NSA Sub-6: Max. 3.74 Gbps(DL)/Max. 1.46 Gbps (UL)
LTE	LTE-FDD: Max. 1.6 Gbps(DL)/Max. 211 Mbps(UL)	LTE-FDD: Max. 1.4 Gbps(DL)/Max. 211 Mbps(UL)
UMTS	WCDMA: Max. 42Mbps (DL)/Max. 5.76Mbps (UL)	WCDMA: Max. 42Mbps (DL)/Max. 5.76Mbps(UL)
SMS	•	•
Protocols	HTTPS/TCP/UDP/FTP/HTTP/PING/FTPS/SSL/NTP	TCP/UDP/PPP/FTP/HTTP/HTTPS/FTPS/SSL/NTP
Interfaces		
(U)SIM	× 2, 1.8V/ 3.0V	× 2, 1.8V/ 3.0V
UART	/	× 2
USB	2.0/3.0	2.0/3.0/3.1 ²
PCIe	PCIe Gen3 × 1 Lane	PCIe Gen3 × 1 Lane
PCM	•	•
I2C	× 1	× 1
SPI	/	•
GPIO	•	•
ADC	× 3	× 3
SD Card	/	•
RESET_N	•	•
Antenna	Main, Diversity and GNSS	Main, Diversity and GNSS
Enhanced Features		
MIMO	DL: 4 × 4, UL: 2 × 2	DL: 4 × 4, UL: 2 × 2
Digital Audio	•	•
VoLTE	Optional	Optional
DTMF	Dual-tone Multi-frequency	Dual-tone Multi-frequency
FOTA	Delta Firmware over the Air	Delta Firmware over the Air
GNSS	GPS/ GLONASS/ BeiDou/ Galileo	GPS/ GLONASS/ BeiDou/ Galileo
(U)SIM Card Detection	•	•
Electrical Features		
Supply Voltage Range	3.3~4.3V, 3.8V Typ.	3.3~4.3V, 3.8V Typ.
Power Consumption	80μA @Power off 6.5mA @Sleep, Typ. 125mA @Idle (USB active)	TBD @Power off TBD@Sleep, Typ. TBD @Idle
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	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
Certifications	CE/RCM/GCF*	GCF*/FCC*/IC*/PTCRB*
Recommended Applications	Industrial Routers, CPE, MiFi, Home Gateways	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: USB 3.1 only supports 5 Gbps.

* Under development

LTE-A Module Family

Product	EG06	EG060V-EA	EG060K	EG065K	
					
Form Factor	LGA	LGA	LGA	LGA	
Dimensions (mm)	39.5 × 37.0 × 2.8	39.5 × 37.0 × 3.05	39.5 × 37.0 × 2.8	31.0 × 28.0 × 2.4	
4G	LTE Cat 6	LTE Cat 6	LTE Cat 6	LTE Cat 6	
Frequency Bands (MHz)	-E (EMEA/ Australia/ Brazil)	/	/	/	
	-EA (EMEA/ Australia/ Brazil)	LTE-FDD: B1/B3/B5/B7/B8/B20/B28/B32 ¹ ; LTE-TDD: B38/B40/B41; Up to 2 × CA: B1+B1/B5/B8/B20/B28; B3+B3/B5/B7/B8/B20/B28; B7+B5/B7/B8/B20/B28; B20+B32; B38+B38; B40+B40; B41+B41; WCDMA: B1/B3/B5/B8	LTE-FDD: B1/B3/B5/B7/B8/B20/B28; LTE-TDD: B38/B40/B41; 2 × CA: B1+B1/B3/B5/B8/B20/B28; B3+B3/B5/B7/B8/B20/B28; B7+B5/B7/B8/B20/B28; B38+B38; B40+B40; B41+B41; WCDMA: B1/B5/B8	LTE-FDD: B1/B3/B5/B7/B8/B20/B28/B32 ¹ ; LTE-TDD: B38/B40/B41; Up to 2 × CA: B1+B1/B3/B5/B7/B8/B20/B28; B3+B3/B5/B7/B8/B20/B28; B7+B5/B7/B8/B20/B28; B28; B20+B32 ¹ ; B38+B38; B40+B40; B41+B41 WCDMA: B1/B3/B5/B8	LTE-FDD: B1/B2/B3/B4/B5/B7/B8/B20/B28; LTE-TDD: B40; WCDMA*: B1/B2/B3/B4/B5/B8
	-A /NA(North America)	-A(North America) LTE-FDD: B2/B4/B5/B7/B12/B13/B25/B26/B29 ² /B30/B66; Up to 2 × CA: B2+B2/B5/B12/B13/B29; B4+B4/B5/B12/B13/B29; B7+B5/B7/B12/B26; B25+B5/B12/B25/B26; B30+B5/B12/B29; B66+B5/B12/B13/B29/B66; WCDMA: B2/B4/B5	/	-NA(North America)(planning) LTE-FDD: B2/B4/B5/B7/B12/B13/B14/B25/B26/ B29/B30/B66/B71; LTE-TDD: B41/B48	-NA(North America) LTE-FDD: B2/B4/B5/B7/B12/B13/B14/B25/B26/ B30/B66
	-LA(Latin America) (planning)	/	/	LTE-FDD: B2/B4/B5/B7/B8/B28/B66; LTE-TDD: B42(Optional)/B43(Optional)	/
Weight (approx.) g	9.1	6.7	9.1	5.3	
Operating Temperature	-35°C ~ +75°C	-20°C ~ +55°C	-30°C ~ +75 °C	-30 °C ~ +75 °C	
Extended Temperature	-40°C ~ +85°C	-25°C ~ +60°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. 300Mbps (DL)/Max. 50Mbps (UL); LTE-TDD: Max. 226Mbps (DL)/Max. 28Mbps (UL)	LTE-FDD: Max. 300Mbps (DL)/Max. 50Mbps (UL); LTE-TDD: Max. 220Mbps (DL)/Max. 30Mbps (UL)	LTE-FDD: Max. 300Mbps (DL)/ Max. 50Mbps (UL); LTE-TDD: Max. 226Mbps (DL)/Max. 28Mbps (UL)	LTE-FDD: Max. 300Mbps (DL)/Max. 75Mbps (UL)	
UMTS	DC-HSDPA: Max. 42Mbps (DL)/ HSUPA: Max. 5.76Mbps (UL) WCDMA: Max. 384Kbps (DL)/Max. 384Kbps (UL)	DC-HSDPA*: Max. 42Mbps; HSUPA: Max. 5.76Mbps; WCDMA: Max. 384Kbps (DL)/Max. 384Kbps (UL)	DC-HSDPA: Max. 42Mbps (DL)/ HSUPA: Max. 5.76Mbps (UL) WCDMA: Max. 384Kbps (DL)/Max. 384Kbps (UL)	DC-HSDPA: Max. 42Mbps (DL)/HSUPA: Max. 5.76 Mbps (UL); WCDMA*: Max. 384Kbps (DL)/ Max. 384Kbps (UL) (EG065K-EA)	
SMS	•	•	•	•	
Protocols	TCP/UDP/FTP/HTTP/HTTPS/PING/SMS	TCP/PPP/FTP/HTTP/SMTP*/MMS*/POP3/SSL/ HTTPS/SMTPS*	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, Support Slave and Master* Modes	2.0/3.0, Supports Master* and Slave Modes	2.0/3.0, Supports Master* and Slave Modes	
PCM	•	•	•	•	
I2S	/	/	× 1	× 1	
SPI	× 2	/	× 1	× 1	
SDIO	/	/	× 1	× 1	
RFFE	/	/	TBD	× 1	
GRFC	/	/	TBD	× 4	
I2C	× 1	× 1	× 1	× 1	
(U)SIM	1.8V/ 3.0V	× 1, 1.8V/ 3.0V	× 2, 1.8V/ 3.0V	× 2, 1.8V/ 3.0V	
eSIM	/	/	Optional	/	
GPIO	× 2	× 2	× 3	× 5	
UART	× 3	× 2	× 3	× 2	
ADC	× 2	× 2	× 2	× 1	
RESET_N	•	•	•	× 1	
PCIe	Optional	Optional	Optional	Optional	
Antenna	× 3	Main, Diversity	Main, Diversity and GNSS	× 2(Main Antenna); × 2(Diversity Antennas)	
Enhanced Features					
MIMO	2 × 2, 4 × 2, DL	2 × 2, 4 × 2, DL	2 × 2, 4 × 2, DL	2 × 2, 4 × 2, DL	
eCall	Emergency Service*	Emergency Service	Emergency Service	Emergency Service*	
Digital Audio	•	•	•	Optional	
VoLTE	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	
FOTA	•	Firmware over the Air	•	/	
GNSS	GPS/GLONASS/BeiDou/Galileo/QZSS	/	GPS/GLONASS/BeiDou/Galileo/QZSS	/	
(U)SIM Card Detection	•	•	•	•	
Electrical Features					
Supply Voltage Range	3.3~4.3 V, 3.8V Typ.	3.3~4.3V 3.8V Typ.	3.3~4.4V 3.8V Typ.	3.3~4.5V, 3.8V Typ.	
Power Consumption	10µA @Power off; 1.5mA @LTE Sleep (PF=128); 1.5mA @LTE Sleep (PF=64); 18mA @Idle	10µA@Power off; 3.7mA@Sleep (PF=128); 5.0mA@Sleep (PF=64); 30mA@Idle	TBD@Power off; TBD@Sleep (PF=128); TBD@Sleep (PF=64); TBD@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, Linux 2.6/3.x/4.1~4.15, Android 4.x/5.x/6.x/7.x/8.x/9.x	Windows 7/8/8.1/10, Linux 2.6~5.9, Android 4.x~10.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 2.6~5.15, Android 4.x~12.x	
RIL Driver	Android 4.x/5.x/6.x/7.x/8.x/9.x	Android 4.x~10.x	Android 4.x/5.x/6.x/7.x/8.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	
RNDIS Driver	/	Windows 7/8/8.1/10; Linux 2.6~5.9	/	/	
ECM Driver	Linux 2.6/3.x/4.1~4.14	Linux 2.6~5.9	Linux 2.6 or later	Linux 2.6~5.15	
Gobinet Driver	Linux 2.6/3.x/4.x/5.x	/	Linux 2.6 or later	Linux 2.6~5.15	
QMI_WWAN Driver	Linux 3.x (3.4 or later)/4.1~4.15	/	Linux 3.4 or later	Linux 3.4~5.15	
Certifications ³	Deutsche Telekom/Telstra/GCF/CE/KC/RCM/ FCC/CCC/PTCRB/IC/AT&T/Verizon/USCC/British Telekom	CE/NCC/RCM	CE/RCM	GCF*/FCC*/IC*/PTCRB*/iFETEL*/AT&T(Firstnet)*/ Verizon*/Telus*/CE*/RCM*/IMDA*/ British Telecom*/Telefónica*/Telstra*	
Recommended Applications	Industrial Routers, Industrial PDAs, Rugged Tablet PCs and Digital Signage	Routers, MIFI, Home Gateways, Set-top box, PDAs, Tablet PCs and Digital Signage		Police Body Cameras, Routers (including Mifis), Home Gateways, Set-top Boxes, PDAs, 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: May depend on modules' variant.

* Under development

LTE-A Module Family

Product	EG12	EG120K	EG512R-EA	EG18
				
Form Factor	LGA	LGA	LGA	LGA
Dimensions (mm)	39.5 × 37.0 × 2.8	39.5 × 37.0 × 2.8	42.0 × 38.0 × 2.65	39.5 × 37.0 × 2.8
4G	LTE Cat 12	LTE Cat 12	LTE Cat 12	LTE Cat 18
Frequency Bands (MHz)	-GT (Global)	/	/	/
	-EA (EMEA/ Australia/ Brazil)	LTE-FDD: B1/B3/B5/B7/B8/B20/B28/ LTE-TDD: B38/B40/B41; Up to 3 × CA: Intra-band and Inter-band; WCDMA: B1/B3/B5/B8	LTE-FDD: B1/B3/B5/B7/B8/B20/B28/B32; LTE-TDD: B38/B41/B42/B43; Up to 3×CA: Intra-band and Inter-band; WCDMA: B1/B3/B5/B8	LTE-FDD: B1/B3/B5/B7/B8/B20/B28; LTE-TDD: B38/B40/B41; Up to 3 × CA: Intra-band and Inter-band; WCDMA: B1/B3/B5/B8
	-NA (North America)	/	/	LTE-FDD: B2/B4/B5/B7/B12/B13/B14/B17 ¹ /B25/ B26/B29/B30/B66/B71; LTE-TDD: B41; Up to 5 × CA: Intra-band and Inter-band; WCDMA Bands: B2/B4/B5
	-LA* (Latin America) (planning)	/	/	/
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. 600Mbps (DL)/Max. 150Mbps (UL) LTE-TDD: Max. 430Mbps (DL)/Max. 90Mbps (UL) DC-HSDPA: Max. 42Mbps (DL)/HSUPA: Max. 11.2Mbps (UL) WCDMA: Max. 384Kbps (DL)/Max. 384Kbps (UL)	LTE-FDD: Max. 600Mbps (DL)/Max. 150Mbps (UL) LTE-TDD: Max. 430Mbps (DL)/Max. 90Mbps (UL) DC-HSDPA: Max. 42Mbps (DL)/HSUPA: Max. 11.2Mbps (UL) WCDMA: Max. 384Kbps (DL)/Max. 384Kbps (UL)	LTE-FDD: Max. 600Mbps (DL)/Max. 75Mbps (UL) LTE-TDD: Max. 310Mbps (DL)/Max. 90Mbps (UL) DC-HSDPA: Max. 42Mbps (DL)/Max. 5.76Mbps (UL)	LTE-FDD: Max. 1.2Gbps (DL)/Max. 150Mbps (UL) LTE-TDD: Max. 573Mbps (DL)/Max. 90Mbps (UL) DC-HSDPA: Max. 42Mbps (DL)/HSUPA: Max. 11.2Mbps (UL) WCDMA: Max. 384Kbps (DL)/Max. 384Kbps (UL)
UMTS	•	•	•	•
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, 1.8V/ 3.0V	1.8V/ 3.0V	× 2, 1.8V/ 3.0V	× 2, 1.8V/ 3.0V
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*	/	•
Digital Audio	•	•	•	•
VoLTE	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, 3.8 V Typ.	3.3~4.3 V, 3.8V Typ.	3.3V~4.3V, 3.8V Typ.	3.3~4.3 V, 3.8 V Typ.
Power Consumption	20μA @Power off 1.83mA @Sleep, Typ. 9.41mA @Idle	TBD @Power off / TBD @LTE Sleep(PF=128) TBD@LTE Sleep(PF=64) TBD@Idle	50μA @Power off 2.15mA @LTE Sleep(PF=64) 8mA @Idle	20μA @Power off 1.81mA @Sleep, Typ. 9.38mA @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 ²	CE/RCM	CE/RCM	CE/RCM	CE/RCM/FCC/IC/GCF/PTCRB/AT&T*/Verizon*/Telstra/USCC*
Recommended Applications	Industrial Routers, Industrial PDAs, Rugged Tablet PCs and Digital Signage	Routers, MIFI, 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

LTE-A Module Family

Product	EM05	EM06	EM060K-GL	EP06
				
Form Factor	M.2	M.2	M.2	Mini PCIe
Dimensions (mm)	42.0 × 30.0 × 2.3	42.0 × 30.0 × 2.3	42.0 × 30.0 × 2.3	51.0 × 30.0 × 4.0
4G	LTE Cat 4	LTE Cat 6	LTE Cat 6	LTE Cat 6
Frequency Bands (MHz)	-G/GL (Global)	/	-GL (Global) LTE-FDD: B1/B2/B3/B4/B5/B7/B8/B12/B13/B14/ B17/B18/B19/B20/B25/B26/B28/B29/B30/ B32/B66/B71; LTE-TDD: B34/B38/B39/B40/ B41/B42/B43/B46 ¹ (LAA)/B48 (CBRS); Up to 2 × CA: B2+B2/B5/B12/B13/B29 ² ; B4+B4/ B5/B12/B13/B29 ² ; B5+B5/B7/B25/B30/B66; B7+B7/B12/B26; B12+B12/B25/B30/B66; B13+B66; B25+B25/B26; B30+B29; B66+B29/ B66; B41+B41; WCDMA: B1/B2/B4/B5/B6/B8/B19	/
	-E (EMEA/ Australia/New Zealand)	LTE-FDD: B1/B3/B7/B8/B20/B28/B32 ¹ ; LTE-TDD: B38/B40/B41; Up to 2 × CA: B1+B1/B5/B8/B20/B28; B3+B3/ B5/B7/B8/B20/B28; B7+B5/B7/B8/B20/B28; B20+B32 ¹ ; B38+B38; B40+B40; B41+B41; WCDMA: B1/B3/B5/B8	/	-E (EMEA/ Australia/Brazil) LTE-FDD: B1/B3/B5/B7/B8/B20/B28/B32 ¹ ; LTE-TDD: B38/B40/B41; Up to 2 × CA: B1+B1/B5/B8/B20/B28; B3+B3/ B5/B7/B8/B20/B28; B7+B5/B7/B8/B20/B28; B20+B32 ¹ ; B38+B38; B40+B40; B41+B41; WCDMA: B1/B3/B5/B8
	-A (North America)	LTE-FDD: B2/B4/B5/B7/B12/B13/B25/B26/B29 ² / B30/B66; LTE-TDD: B41; Up to 2 × CA: B2+B2/ B5/B12/B13/B29 ² ; B4+B4/B5/B12/B13/B29 ² ; B5+B5/B7/B25/B30/B66; B7+B7/B12/B26; B12+B12/B25/B30/B66; B13+B66; B25+B25/ B26; B30+B29; B66+B29/B66; B41+B41; WCDMA: B2/B4/B5	/	LTE-FDD: B2/B4/B5/B7/B12/B13/B25/B26/B29 ² / B30/B66; Up to 2 × CA: B2+B2/B5/B12/B13/ B29; B4+B4/B5/B12/B13/B29; B7+B5/B7/B12/ B26; B25+B5/B12/B25/B26; B30+B5/B12/B29; B66+B5/B12/B13/B29/B66; WCDMA: B2/B4/B5
	-J (Japan)	LTE-FDD: B1/B3/B8/B18/B19/B26/B28; LTE-TDD: B41; Up to 2 × CA: B1+B1/B8/B18/B19/B26/ B28; B3+B3/B8/B18/B19/B26/B28; B41+B41; WCDMA: B1/B3/B6/B8/B19	/	/
	-CE (China/Thailand/ India)	LTE-FDD: B1/B3/B5/B8; LTE-TDD: B38/B39/B40/ B41; WCDMA: B1/B8; EVDO/CDMA: BCO	/	/
Weight (approx.) g	6.0	6.5	TBD	10.1
Operating Temperature	-30°C ~ +70°C	-30°C ~ +70°C	-25°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
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	3GPP TS27.007 and Quectel Enhanced AT Commands	3GPP TS27.007 and Quectel Enhanced AT Commands
Data Transmission				
LTE	LTE-FDD: Max. 150Mbps (DL)/Max. 50Mbps (UL) LTE-TDD: Max. 130Mbps (DL)/Max. 30Mbps (UL)	LTE-FDD: Max. 300Mbps (DL)/Max. 50Mbps (UL) LTE-TDD: Max. 226Mbps (DL)/Max. 28Mbps (UL)	LTE-FDD: Max. 300Mbps (DL)/Max. 50Mbps (UL) LTE-TDD: Max. 226Mbps (DL)/Max. 28Mbps (UL)	LTE-FDD: Max. 300Mbps (DL)/Max. 50Mbps (UL); LTE-TDD: Max. 226Mbps (DL)/Max. 28Mbps (UL)
UMTS	DC-HSDPA: Max. 42Mbps (DL)/ HSUPA: Max. 5.76Mbps (UL) WCDMA: Max. 384Kbps (DL)/Max. 384Kbps (UL)	DC-HSDPA: Max. 42Mbps (DL)/ HSUPA: Max. 5.76Mbps (UL) WCDMA: Max. 384Kbps (DL)/Max. 384Kbps (UL)	DC-HSDPA: Max. 42Mbps (DL)/ HSUPA: Max. 5.76Mbps (UL) WCDMA: Max. 384Kbps (DL)/Max. 384Kbps (UL)	DC-HSDPA: Max. 42Mbps (DL)/ HSUPA: Max. 5.76Mbps (UL) WCDMA: Max. 384Kbps (DL)/Max. 384Kbps (UL)
SMS	•	•	•	•
CDMA2000	EVDO: Max. 3.1Mbps (DL)/Max. 1.8Mbps (UL) 1X Advanced: Max. 307.2Kbps (DL)/Max. 307.2Kbps (UL)	/	/	/
Protocols	TCP/UDP/PPP/FTP/HTTP/NTP/PING/QMI/NITZ/ SMTP/MMS/FTPS/SMTPS/SSL/FILE	TCP/UDP/FTP/HTTP/HTTPS/PING/SMS	QMI/MBIM/NITZ/HTTP/HTTPS/FTP/LwM2M [*] /PING [*]	TCP/UDP/FTP/HTTP/HTTPS/PING/SMS
Interfaces				
USB	2.0 Hi-Speed	2.0/3.0 [*] , Slave Mode	2.0/3.0 [*] , Slave Mode	2.0/3.0, Slave Mode
PCM	•	•	•	•
I2C	× 1	× 1	× 1	× 1
(U)SIM	1.8V/ 3.0V	× 2, 1.8V/ 3.0V	× 2, 1.8V/ 3.0V	× 2, 1.8V/ 3.0V
eSIM	/	/	× 1/ built-in eSIM (optional)	/
GPIO	× 1	× 11	MIPI interface	× 4
RESET_N	•	•	•	•
PCIe	/	Optional	Optional	/
Antenna	Main, Diversity and GNSS	Main, Diversity and GNSS	Main, Diversity and GNSS	× 3
Enhanced Features				
MIMO	DL MIMO, support Rx-diversity Antenna	2 × 2, 4 × 2, DL	2 × 2, 4 × 2, DL	2 × 2, 4 × 2, DL
eCall [*]	/	Emergency Service	Emergency Service	Emergency Service
Digital Audio	•	•	•	•
VoLTE	/	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	GPS/ GLONASS/ BeiDou/ Galileo/ QZSS	GPS/ GLONASS/ BeiDou/ Galileo/ QZSS	GPS/ GLONASS/ BeiDou/ Galileo/ QZSS
FOTA	/	•	/	•
(U)SIM Card Detection	•	•	•	•
Electrical Features				
Supply Voltage Range	3.135V~4.4V, 3.3V Typ.	3.135~4.4V, 3.7V Typ.	3.135~4.4V, 3.7V Typ.	3.1~4.4 V, 3.3 V Typ.
Power Consumption	5μA @Power off; 3.3mA(PF=128) @LTE Sleep; 20mA @Idle	50μA @Power off; 4.1mA @Sleep, Typ.; 22.1mA @Idle	TBD@Power off; TBD @Sleep, Typ.; TBD @Idle	3.3mA@Sleep, Typ.; 32.1mA @Idle
Software Features				
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, 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/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	/	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	Android 4.x/5.x/6.x/7.x/8.x/9.x/10.x	Android 4.x/5.x/6.x/7.x/8.x/9.x/10.x
MBIM Driver	Windows 8/8.1/10, Linux 3.18~5.4	Windows 8/8.1/10, Linux 3.18~5.4	Windows 10	Windows 8/8.1/10, Linux 3.18~5.4
NDIS Driver	Windows 7/8.1/10	Windows 7/8.1/10	Windows 7/8.1/10	Windows 7/8.1/10
Gobinet Driver	Linux 2.6~5.4	Linux 2.6~5.4	Linux 2.6/3.x/4.x/5.x	Linux 2.6~5.4
QMI_wwan Driver	Linux 3.4~5.4	Linux 3.4~5.4	Linux 3.x (3.4 or later)/4.x/5.x	Linux 3.4~5.4
Certifications [†]	CCC/SRRC/NAL/CE/RCM/FCC/PTCRB/GCF	GCF/CE/NCC/RCM/ICASA/FCC/PTCRB/IC/WHOL/ Verizon/AT&T/Telstra/Deutsche Telekom/ KDDI/UATE/TELEC/Sprint/KC	TBD	Telstra/Deutsche Telekom/GCF/CE/NCC/RCM/ FCC/IC/CCC/PTCRB/AT&T/Verizon/Telus/Sprint/ Rogers/Bell (TBD)/ICASA
Recommended Applications	Consumer Laptops, Industrial Laptops, Industrial Routers, Industrial PDAs, Rugged Tablet PCs and Digital Signage.			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 and B32 support receiving only, and are only for secondary component carrier in 2×CA.

Note 4: May depend on modules' variant.

^{*} Under development

LTE-A Module Family

Product	EM12-G	EM120K-GL	EM120R-GL	EM121R-GL	EM160R-GL
					
Form Factor	M.2	M.2	M.2	M.2	M.2
Dimensions (mm)	42.0 × 30.0 × 2.3	42.0 × 30.0 × 2.3	42.0 × 30.0 × 2.3	42.0 × 30.0 × 2.3	42.0 × 30.0 × 2.3
4G	LTE Cat 12	LTE Cat 12	LTE Cat 12	LTE Cat 12	LTE Cat 16
Frequency Bands (MHz)	-G/GL (Global) LTE-FDD: B1/B2/B3/B4/B5/B7/B8/B9/B12/B13/B14/B17/B18/B19/B20/B21/B25/B26/B28/B29 ¹ /B30/B32 ¹ /B66 LTE-TDD: B38/B39/B40/B41 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/B2/B3/B4/B5/B8/B9/B19	LTE-FDD: B1/B2/B3/B4/B5/B7/B8/B12/B13/B14/B17/B18/B19/B20/B25/B26/B28/B29 ¹ /B30/B32 ¹ /B66/B71 LTE-TDD: B34/B38/B39/B40/B41/B42/B43/B46 ² (LAA)/B48 (CBRS) Up to 3 × CA: Intra-band and Inter-band WCDMA: B1/B2/B3/B4/B5/B6/B8/B19	LTE-FDD: B1/B2/B3/B4/B5/B7/B8/B12/B13/B14/B17/B18/B19/B20/B25/B26/B28/B29 ¹ /B30/B32 ¹ /B66 LTE-TDD: B38/B39/B40/B41/B42/B43/B46 ² /B48 (CBRS) Up to 3 × CA: Intra-band and Inter-band WCDMA: B1/B2/B3/B4/B5/B6/B8/B19	LTE-FDD: B1/B2/B3/B4/B5/B7/B8/B12/B13/B14/B17/B18/B19/B20/B25/B26/B28/B29 ¹ /B30/B32 ¹ /B66 LTE-TDD: B38/B39/B40/B41/B42/B43/B46 ² /B48 (CBRS) Up to 3 × CA: Intra-band and Inter-band WCDMA: B1/B2/B3/B4/B5/B6/B8/B19	LTE-FDD: B1/B2/B3/B4/B5/B7/B8/B12/B13/B14/B17/B18/B19/B20/B25/B26/B28/B29 ¹ /B30/B32 ¹ /B66 LTE-TDD: B38/B39/B40/B41/B42/B43/B46 ² /B48 (CBRS) Up to 5 × CA: Intra-band and Inter-band WCDMA: B1/B2/B3/B4/B5/B6/B8/B19
Weight (approx.) g	6.0	TBD	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. 600Mbps (DL)/Max. 150Mbps (UL) LTE-TDD: Max. 408Mbps (DL)/Max. 90Mbps (UL)	LTE-FDD: Max. 600Mbps (DL)/Max. 150Mbps (UL) LTE-TDD: Max. 408Mbps (DL)/Max. 90Mbps (UL)	LTE-FDD: Max. 600Mbps (DL)/Max. 150Mbps (UL) LTE-TDD: Max. 408Mbps (DL)/Max. 90Mbps (UL)	LTE-FDD: Max. 600Mbps (DL)/Max. 150Mbps (UL) LTE-TDD: Max. 408Mbps (DL)/Max. 90Mbps (UL)	LTE-FDD: Max. 1.06bps (DL)/Max. 150Mbps (UL) LTE-TDD: Max. 880Mbps (DL)/Max. 90Mbps (UL)
UMTS	DC-HSPA: Max. 42Mbps (DL)/HSPA: Max. 11.2Mbps (UL) WCDMA: Max. 384Kbps (DL)/Max. 384Kbps (UL)	DC-HSPA: Max. 42Mbps (DL)/HSPA: Max. 11.2Mbps (UL) WCDMA: Max. 384Kbps (DL)/Max. 384Kbps (UL)	DC-HSPA: Max. 42Mbps (DL)/HSPA: Max. 11.2Mbps (UL) WCDMA: Max. 384Kbps (DL)/Max. 384Kbps (UL)	DC-HSPA: Max. 42Mbps (DL)/HSPA: Max. 11.2Mbps (UL) WCDMA: Max. 384Kbps (DL)/Max. 384Kbps (UL)	DC-HSPA: Max. 42Mbps (DL)/HSPA: Max. 11.2Mbps (UL) WCDMA: Max. 384Kbps (DL)/Max. 384Kbps (UL)
SMS	•	•	•	•	•
Protocols	TCP/UDP/FTP/HTTP/HTTPS /PING/SMS	QMI/MBIM/NITZ/HTTP/HTTPS/FTP/LwM2M ³ /PING ⁴	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, 1.8V/ 3.0V	× 2, 1.8V/ 3.0V	× 2, 1.8V/ 3.0V	× 2, 1.8V/ 3.0V	× 2, 1.8V/ 3.0V
eSIM	/	× 1/ built-in eSIM (optional)	× 1/ built-in eSIM (optional)	× 1/ built-in eSIM (optional)	× 1/ built-in eSIM (optional)
GPIO	× 11	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
Digital Audio	•	•	•	•	•
VoLTE	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	3.135~4.4V, 3.7V Typ.	3.135~4.4V 3.7V Typ.	3.135~4.4V 3.7V Typ.	3.135~4.4V 3.7V Typ.	3.135~4.4V, 3.7V Typ.
Power Consumption	56μA@Power down 2.53mA@Sleep(AT+CFUN=0, USB disconnected), 19.32mA@Idle(PF=64, USB Active)	USB Mode TBD @ Power down TBD @ Sleep (AT+CFUN=0, USB Suspend) TBD @ Idle (PF = 64, USB Active)	USB Mode 66 μA @ Power down 1.84 mA @ Sleep (AT+CFUN=0, USB Suspend) 24.48 mA @ Idle (PF = 64, USB Active) PCIe Only Mode 66 μA @ Power down 2.35 mA @ Sleep (AT+CFUN=0, Modem standby) 15.05 mA @ Idle (PF = 64, PCIe Active)	USB Mode 66 μA @ Power down 1.84 mA @ Sleep (AT+CFUN=0, USB Suspend) 24.48 mA @ Idle (PF = 64, USB Active) PCIe Only Mode 66 μA @ Power down 2.35 mA @ Sleep (AT+CFUN=0, Modem standby) 15.05 mA @ Idle (PF = 64, PCIe Active)	USB Mode 66 μA @ Power down 1.78 mA @ Sleep (AT+CFUN=0, USB Suspend) 24.75 mA @ Idle (PF = 64, USB Active) PCIe Only Mode 66 μA @ Power down 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, Linux 2.6/3.x/4.x/5.4, 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	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/5.x/6.x/7.x/8.x/9.x/10.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	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/NCC/RCM/ICASA/JETE/TELEC/GCF/PTCRB/Telstra/AT&T/Verizon/Telefonica/Vodafone/Deutsche Telekom/British Telecom/Docomo/WHQL	TBD	GCF/CE/PTCRB/FCC/IC/Anatel/IFETEL/SRRC/NAL/CCC/NCC/KC/JATE/TELEC/RCM/ICASA/Vodafone/British Telecom/Swisscom/Verizon/AT&T/T-Mobile/Sprint/China Mobile/China Unicom/NTT DOCOMO/SoftBank ³ /KDDI/Telstra ⁴	GCF/CE/PTCRB/FCC/IC/RCM/Verizon/AT&T	GCF/CE/PTCRB/FCC/IC/Anatel/IFETEL/SRRC/NAL/CCC/NCC/KC/JATE/TELEC/RCM/ICASA/Vodafone/British Telecom/Swisscom/Verizon/AT&T/T-Mobile/Sprint/China Mobile/China Unicom/NTT DOCOMO/SoftBank ³ /KDDI/Telstra ⁴
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.

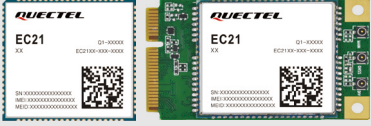
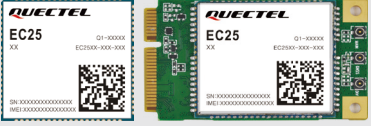
Note 2: B29 is only for secondary component carrier.

Note 3: B46 is only for secondary component carrier.

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

* Under development

LTE Module Family

Product	EC21/EC21 Mini PCIe	EC25/EC25 Mini PCIe	EC20 R2.1/EC20 R2.1 Mini PCIe
			
Form Factor	LCC (EC21), Mini PCIe (EC21 Mini PCIe)	LCC (EC25), Mini PCIe (EC25 Mini PCIe)	LCC (EC20 R2.1), Mini PCIe (EC20 R2.1 Mini PCIe)
Dimensions (mm)	32.0 × 29.0 × 2.4 (EC21) 51.0 × 30.0 × 4.9 (EC21 Mini PCIe)	32.0 × 29.0 × 2.4 (EC25) 51.0 × 30.0 × 4.9 (EC25 Mini PCIe)	32.0 × 29.0 × 2.4 (EC20 R2.1) 51.0 × 30.0 × 4.9 (EC20 R2.1 Mini PCIe)
LTE Category	LTE Cat 1	LTE Cat 4	LTE Cat 4
-CE (China/India)	/	/	
Frequency Bands (MHz)	-E (EMEA/South Korea/Thailand/India) (EMEA/Thailand/India) LTE-FDD: B1/B3/B5/B7/B8/B20 WCDMA: B1/B5/B8; GSM: B3/B8	(EMEA/South Korea/Thailand/India) LTE-FDD: B1/B3/B5/B7/B8/B20; LTE-TDD: B38/B40/B41 WCDMA: B1/B5/B8; GSM: B3/B8	/
	-EU (EMEA/Thailand) LTE-FDD: B1/B3/B7/B8/B20/B28A WCDMA: B1/B8; GSM: B3/B8	LTE-FDD: B1/B3/B7/B8/B20/B28A LTE-TDD: B38/B40/B41; WCDMA: B1/B8; GSM: B3/B8	/
	-EUX (EMEA/Thailand) LTE-FDD: B1/B3/B7/B8/B20/B28A WCDMA: B1/B8; GSM: B3/B8	LTE-FDD: B1/B3/B7/B8/B20/B28A LTE-TDD: B38/B40/B41; WCDMA: B1/B8; GSM: B3/B8	/
	-V (Verizon) LTE-FDD: B4/B13	LTE-FDD: B4/B13	/
	-A (AT&T/Mobile/Canada) LTE-FDD: B2/B4/B12; WCDMA: B2/B4/B5	LTE-FDD: B2/B4/B12; WCDMA: B2/B4/B5	/
	-AF(AT&T/Verizon/T-mobile)	LTE-FDD: B2/B4/B5/B12/B13/B14/B66/B71; WCDMA: B2/B4/B5	/
	-AFX (AT&T/Verizon)	LTE-FDD: B2/B4/B5/B12/B13/B14/B66/B71; WCDMA: B2/B4/B5	/
	-AFXD (AT&T/Verizon/T-mobile)	LTE-FDD: B2/B4/B5/B12/B13/B14/B66/B71; WCDMA: B2/B4/B5	/
	-MX (Mexico)	LTE-FDD: B2/B4/B5/B7/B28/B66; WCDMA: B2/B4/B5	/
	-AU (Latin America/ANZ) LTE-FDD: B1/B2*/B3/B4/B5/B7/B8/B28; LTE-FDD: B40; WCDMA: B1/B2/B5/B8; GSM: B2/B3/B5/B8	LTE-FDD: B1/B2*/B3/B4/B5/B7/B8/B28; LTE-TDD: B40; WCDMA: B1/B2/B5/B8; GSM: B2/B3/B5/B8	/
Weight (approx.) g	4.9 (EC21); 9.8 (EC21 Mini PCIe)	4.9 (EC25); 9.8 (EC25 Mini PCIe)	5.3 (EC20 R2.1); 10.6 (EC20 R2.1 Mini PCIe)
	-35°C ~ +75°C	-35°C ~ +75°C	-35°C ~ +75°C
	-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 R2.1); -40°C ~ +80°C (EC20 R2.1 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/SMTP/MMS*/FTPS*/SMTPS/SSL	TCP/UDP/PPP/FTP/HTTP/NTP/PING/QMI/HTTPS/SMTP/MMS*/FTPS*/SMTPS/SSL	TCP/UDP/PPP/FTP/HTTP/NTP/PING/QMI/NITZ/CMUX/HTTPS/SMTP/MMS/FTPS/SMTPS/SSL/FILE
Interfaces			
(U)SIM	1.8V/ 3.0V	1.8V/ 3.0V	1.8V/ 3.0V
UART	2 (EC21); 1 (EC21 Mini PCIe)	2 (EC25); 1 (EC25 Mini PCIe)	2 (EC20 R2.1); 1 (EC20 R2.1 Mini PCIe)
USB	USB 2.0 (Hi-Speed)	USB 2.0 (Hi-Speed)	USB 2.0 (Hi-Speed)
IIC	•	•	• (EC20 R2.1); Optional (EC20 R2.1 Mini PCIe)
Audio Digital (PCM)	Optional	Optional	• (EC20 R2.1); Optional (EC20 R2.1 Mini PCIe)
SD	• (EC21)	• (EC25)	• (EC20 R2.1)
ADC	× 2, 15bits (EC21)	× 2, 15bits (EC25)	× 2, 15bits (EC20 R2.1)
SGMII	• (EC21)	• (EC25)	• (EC20 R2.1)
GPIO	• (Only Supported on QuecOpen™)	• (Only Supported on QuecOpen™)	/
Antenna	Pads for Primary, Rx-diversity and GNSS	Pads for Primary, Rx-diversity and GNSS	Pads for Primary, Rx-diversity and GNSS
Enhanced Features			
DTMF	•	•	•
DFOTA	•	•	•
QMI/RmNet	•	•	•
Audio Playback/Audio Recording	Optional	Optional	Optional
QuecFile	•	•	• (EC20 R2.1)
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, Linux 2.6~5.4, Android 4.x/5.x/6.x/7.x/8.x/9.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
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/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	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	•	•	•
GNSS	Optional	Optional	Optional
Firmware Update	Via USB/DFOTA	Via USB/DFOTA	Via USB/DFOTA
Electrical Features			
Supply Voltage Range	3.3V~4.3V, 3.8V Typ. (EC21); 3.0V~3.6V, 3.3V Typ. (EC21 Mini PCIe)	3.3V~4.3V, 3.8V Typ. (EC25); 3.0V~3.6V, 3.3V Typ. (EC25 Mini PCIe)	3.3V~4.3 V, 3.8V Typ. (EC20 R2.1) 3.0V~3.6 V, 3.3V Typ. (EC20 R2.1 Mini PCIe)
Power Consumption	20µA @Power off/ 3mA @Sleep, Typ. / 22mA @Idle (EC21); 3.5mA @Sleep, Typ. / 34mA @Idle (EC21 Mini PCIe)	20µA @Power off/ 3mA @Sleep, Typ. / 22mA @Idle (EC25); 3.6mA @Sleep, Typ. / 35mA @Idle (EC25 Mini PCIe)	11µA @Power off/ 1.5mA @Sleep (PF=256), Typ. / 20mA @Idle (EC20 R2.1); 4mA @Sleep (PF=128), 3.7mA @Sleep (PF=256), Typ. / 30mA @Idle (EC20 R2.1 Mini PCIe)
Certifications ³	Carrier Certification: Vodafone/Deutsche Telekom/British Telecom/Telefónica/Verizon/AT&T/T-Mobile/U.S. Cellular/Rogers/SKT/KT/NTT DOCOMO/KDDI/Telstra/LGU+ Regulatory Certification: GCF/CE/FC/PTCRB/IC/Anatel/KC/NCC/JATE/TELEC/RCM/FAC Others: WHQL	Carrier Certification: Vodafone/Deutsche Telekom/ British Telecom/Telefónica/Verizon/AT&T/T-Mobile/U.S. Cellular/Rogers/Telus/NTT DOCOMO/SoftBank/KDDI/ Bell*/SKT/ LGU+ /Telstra/KT Regulatory Certification: GCF/CE/FC/PTCRB/IC/Anatel/KC/NCC/JATE/TELEC/RCM/FAC/NBCT/ICASA/IFETEL Others: WHQL	Regulatory Certification: NAL/SRRC/CCC (China)
Recommended Applications	Telematics, Smart Metering, Mobile POS Terminals, Gateways, Safety, Tracking and Tracing, Remote Maintenance and Control, Networking, Mobile Computing, Healthcare, etc.		

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

* Under development

LTE Module Family

Product		EG21-G/EG21-G Mini PCIe	EG25-G/ EG25-G Mini PCIe
			
Form Factor		LGA (EG21-G) Mini PCIe (EG21-G Mini PCIe)	LGA (EG25-G) Mini PCIe (EG25-G Mini PCIe)
Dimensions (mm)		32.0 × 29.0 × 2.4 (EG21-G) 51.0 × 30.0 × 4.9 (EG21-G Mini PCIe)	32.0 × 29.0 × 2.4 (EG25-G) 51.0 × 30.0 × 4.9 (EG25-G Mini PCIe)
LTE Category		LTE Cat 1	LTE Cat 4
Frequency Bands (MHz)	-G (Global)	LTE-FDD: B1/B2/B3/B4/B5/B7/B8/B12/B13/B18/B19/B20/B25/B26/B28 LTE-TDD: B38/B39/B40/B41 WCDMA: B1/B2/B4/B5/B6/B8/B19 GSM: B2/B3/B5/B8	LTE-FDD: B1/B2/B3/B4/B5/B7/B8/B12/B13/B18/B19/B20/B25/B26/B28 LTE-TDD: B38/B39/B40/B41 WCDMA: B1/B2/B4/B5/B6/B8/B19 GSM: B2/B3/B5/B8
Weight (approx.) g		4.9 (EG21-G), 9.8 (EG21-G Mini PCIe)	4.9 (EG25-G), 9.8 (EG25-G Mini PCIe)
Operating Temperature		-35°C ~ +75°C	-35°C ~ +75°C
Extended Temperature		-40°C ~ +85°C (EG21-G) -40°C ~ +80°C (EG21-G Mini PCIe)	-40°C ~ +85°C (EG25-G) -40°C ~ +80°C (EG25-G Mini PCIe)
Data Transmission			
LTE data rate (Mbps)		LTE-FDD: Max. 10Mbps (DL)/Max. 5Mbps (UL) LTE-TDD: Max. 8.96Mbps (DL)/Max. 3.1Mbps (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/SMTP/MMS*/FTPS*/SMTPS/SSL/FILE	TCP/UDP/PPP/FTP/HTTP/NTP/PING/QMI/NITZ/CMUX/HTTPS/SMTP/MMS*/FTPS*/SMTPS/SSL/FILE
Interfaces			
(U)SIM		1.8V/ 3.0V	1.8V/ 3.0V
UART		2 (EG21-G), 1 (EG21-G Mini PCIe)	2 (EG25-G), 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)	•(EG25-G)
ADC		× 2, 15bits (EG21-G)	× 2, 15bits (EG25-G)
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			
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)
GNSS		Optional	Optional
Firmware Update		Via USB/DFOTA	Via USB/DFOTA
Electrical Features			
Supply Voltage Range		3.3V~4.3 V, 3.8V Typ. (EG21-G) 3.0V~3.6 V, 3.3V Typ. (EG21-G Mini PCIe)	3.3V~4.3 V, 3.8V Typ. (EG25-G) 3.0V~3.6 V, 3.3V Typ. (EG25-G Mini PCIe)
Power Consumption		13μA@Power off, 1.7mA@Sleep, Typ., 22mA@Idle (EG21-G)	13μA@Power off, 1.7mA@Sleep, Typ., 22mA@Idle (EG25-G) 2.7mA @Sleep, Typ. / 25mA @Idle (EG25-G Mini PCIe)
Certifications		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: SRRG/NAL/CCC/GCF/CE/FCC/PTCRB/IC/Anatel/IFETEL/KC/NCC/JATE/TELEC/RCM/NBCT/ICASA/IMDA/FAC* Others: WHQL
Recommended Applications		Telematics, Smart Metering, Mobile POS Terminals, Gateways, Safety, Tracking and Tracing, Remote Maintenance and Control, Networking, Mobile Computing, Healthcare, etc.	

* Under development

LTE Module Family

Product	EG91	EG95
		
Form Factor	LGA	LGA
Dimensions (mm)	25.0 × 29.0 × 2.25	25.0 × 29.0 × 2.25
LTE Category	LTE Cat 1	LTE Cat 4
Frequency Bands (MHz)	-E (Europe)	LTE-FDD: B1/B3/B7/B8/B20/B28A; WCDMA: B1/B8; GSM: B3/B8
	-EX (Europe)	LTE-FDD: B1/B3/B7/B8/B20/B28 WCDMA: B1/B8; GSM: B3/B8
	-NAXD (North America)	LTE-FDD: B2/B4/B5/B12/B13/B25/B26; WCDMA: B2/B4/B5
	-NAX (North America)	LTE-FDD: B2/B4/B5/B12/B13/B25/B26; WCDMA: B2/B4/B5
	-NA (North America)	LTE-FDD: B2/B4/B5/B12/B13; WCDMA: B2/B4/B5
	-VX (Verizon)	LTE-FDD: B4/B13
	-AUX (Latin America/ANZ)	LTE-FDD: B1/B2/B3/B4/B5/B7/B8/B28/B66; WCDMA: B1/B2/B5/B8 GSM: B2/B3/B5/B8
Weight (approx.) g	3.8	3.8
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. 150 (DL)/Max. 50 (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/CMUX/HTTPS/SMTP/MMS*/FTPS*/SMTPS/SSL/FILE	TCP/UDP/PPP/FTP/HTTP/NTP/PING/QMI/CMUX/HTTPS/SMTP/MMS*/FTPS*/SMTPS/SSL/FILE
Interfaces		
(U)SIM	1.8V/ 3.0V	1.8V/ 3.0V
UART	2	2
USB	USB 2.0 (Hi-Speed)	USB 2.0 (Hi-Speed)
IIC	•	•
Audio Digital (PCM)	Optional	Optional
SPI	•	•
GPIO	• (Only Supported on QuecOpen [®])	• (Only Supported on QuecOpen [®])
Antenna	Pads for Primary, Rx-diversity and GNSS ¹	Pads for Primary, Rx-diversity and GNSS ¹
Enhanced Features		
EG11 (for North America)	•	•
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/8.x/9.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
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	•	•
GNSS ¹	Optional	Optional
Firmware Update	Via USB/DFOTA	Via USB/DFOTA
Electrical Features		
Supply Voltage Range	3.3V~4.3 V, 3.8V Typ.	3.3V~4.3 V, 3.8V Typ.
Power Consumption	15µA@Power off, 2.6mA@Sleep, Typ., 21mA@Idle	15µA@Power off, 2.6mA@Sleep, Typ., 21mA@Idle
Certifications²	Carrier Certification: Deutsche Telekom/Verizon/AT&T/U.S. Cellular/T-Mobile/Sprint/Rogers/Telus	Carrier Certification: Deutsche Telekom/Verizon/AT&T/U.S. Cellular/T-Mobile/Rogers/Telus/Sprint
	Regulatory Certification: GCF/CE/FCC/PTCRB/IC/Anatel/FAC/NCC/RCM Others: WHQL	Regulatory Certification: GCF/CE/FCC/PTCRB/IC/FAC Others: WHQL
Recommended Applications	Telematics, Smart Metering, Mobile POS Terminals, Gateways, Safety, Tracking and Tracing, Remote Maintenance and Control, Networking, Mobile Computing, Healthcare, etc.	

Note1: GNSS antenna not supported on EG91-E/EG95-E.

Note 2: May depend on modules' variant.

EG91-AUX does not support Rx-diversity.

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

* Under development

LTE Module Family

Product	EC200S	EC200A/EC200A Mini PCIe	EC200U/EC200U Mini PCIe
			
Form Factor	LCC	LCC (EC200A), Mini PCIe (EC200A Mini PCIe), Mini PCIe-C (EC200A-CN Mini PCIe-C)	LCC (EC200U), Mini PCIe-C (EC200U-CN Mini PCIe-C), Mini PCIe (EC200U-EU Mini PCIe)
Dimensions (mm)	32.0 × 29.0 × 2.4	32.0 × 29.0 × 2.4 (EC200A) 51.0 × 30.0 × 4.9 (EC200A Mini PCIe) 51.0 × 30.0 × 3.5 (EC200A-CN Mini PCIe-C)	31.0 × 28.0 × 2.4 (EC200U), 51.0 × 30.0 × 3.4 (EC200U-CN Mini PCIe-C), 51.0 × 30.0 × 4.9 (EC200U-EU Mini PCIe)
LTE Category	LTE Cat 1	LTE Cat 4	LTE Cat 1
Frequency Bands (MHz)	-CN (China/India)	/	LTE-FDD: B1/B3/B5/B8; LTE-TDD: B34/B38/B39/B40/B41; WCDMA: B1/B5/B8; GSM: B3/B8 (EC200U/EC200U-CN Mini PCIe-C)
	-EU (Europe/Asia-Pacific)	/	LTE-FDD: B1/B3/B5/B7/B8/B20/B28; LTE-TDD: B38/B40/B41; WCDMA: B1/B5/B8; GSM: B3/B8
	-EN (EMEA/APAC)	LTE-FDD: B1/B3/B5/B7/B8/B20/B28/B31/B72; GSM: B3/B8	/
	-AU (Australia/New Zealand/Latin America)	/	LTE-FDD: B1/B2/B3/B4/B5/B7/B8/B28/B66; LTE-TDD: B40; WCDMA: B1/B2/B4/B5/B8; GSM: B2/B3/B5/B8
Weight (approx.) g	4.3	4.3 (EC200A), 9.7 (EC200A Mini PCIe), 8.5 (EC200A Mini PCIe-C)	4.1 (EC200U), 5.16 (EC200U-CN Mini PCIe-C), 5.96 (EC200U-EU Mini PCIe)
Operating Temperature	-35°C ~ +75°C	-35°C ~ +75°C	-35°C ~ +75°C
Extended Temperature	-40°C ~ +85°C	-40°C ~ +85°C (EC200A), -40°C ~ +80°C (EC200A Mini PCIe/EC200A-CN Mini PCIe-C)	-40°C ~ +85°C (EC200U), -40°C ~ +80°C (EC200U-CN Mini PCIe-C/EC200U-EU Mini PCIe)
Data Transmission			
LTE data rate (Mbps)	LTE-FDD: Max. 10 (DL)/Max. 5 (UL) LTE-TDD: Max. 7.5 (DL)/Max. 1 (UL)	LTE-FDD: Max. 150 (DL)/Max. 50 (UL) LTE-TDD: Max. 130 (DL)/Max. 30 (UL)	Max. 10 (DL)/Max. 5 (UL) (EC200U), LTE-FDD: Max. 10Mbps (DL)/Max. 5Mbps (UL), LTE-TDD: Max. 8.96 (DL)/Max. 3.1 (UL) (EC200U-CN Mini PCIe-C/EC200U-EU Mini PCIe)
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)	Max. 236.8Kbps (DL)/Max. 236.8Kbps (UL)	/
GPRS data rate (Kbps)	Max. 85.6 (DL)/Max. 85.6 (UL)	Max. 85.6 Kbps (DL)/Max. 85.6 Kbps (UL)	Max. 85.6 (DL)/Max. 85.6 (UL)
SMS	•	•	•
CSD	/	*	/
Protocols	TCP/UDP/PPP/NTP/NITZ/FTP/HTTP/PING/CMUX/HTTPS/FTPS/SSL/FILE/MQTT/MMS/SMTP/SMTPS	TCP/UDP/PPP/NTP/NITZ/FTP/HTTP/PING/CMUX/HTTPS/FTPS/SSL/FILE/MQTT/MMS/SMTP/SMTPS	TCP/UDP/PPP/NITZ/PING/FILE/MQTT/NTP/HTTP/HTTPS/SSL/FTP/FTPS/CMUX/MMS
Interfaces			
(U)SIM	1.8V/ 3.0V	1.8V/ 3.0V	1.8V/ 3.0V
UART	× 2	2 (EC200A), 1 (EC200A Mini PCIe/EC200A-CN Mini PCIe-C)	3 (EC200U), 1 (EC200U-CN Mini PCIe-C/EC200U-EU Mini PCIe)
USB	2.0 Hi-Speed	USB 2.0 (Hi-Speed)	USB 2.0 (Hi-Speed)
PCIe	•	/	/
Audio Digital (PCM)	•	Optional	• (EC200U/EC200U-EU Mini PCIe)
I2C	× 1	•	2 (EC200U), 1 (EC200U-EU Mini PCIe)
GPIO	NA	•	• (Only Supported on QueoOpen®) (EC200U-CN Mini PCIe-C/EC200U-EU Mini PCIe)
RESET_N	•	•	• (EC200U)
SD	•	• (EC200A)	• (EC200U)
ADC	×2, 12bits	× 2, 12bits (EC200A)	• (EC200U)
Antenna	Main × 1	Pads for Primary, Rx-diversity	Main Antenna, GNSS Antenna, Wi-Fi Scan/Bluetooth Antenna (EC200U), Main and GNSS (EC200U-CN Mini PCIe-C/EC200U-EU Mini PCIe)
Enhanced Features			
Digital Audio	•	•	• (EC200U/EC200U-EU Mini PCIe)
VoLTE	•	•	• (EC200U)
DTMF	•	•	* (EC200U), • (EC200U-CN Mini PCIe-C/EC200U-EU Mini PCIe)
DFOTA	•	•	•
Audio Playback/Audio Recording	•	•	• (EC200U/EC200U-CN Mini PCIe-C)
QueoFile	•	•	•
GNSS	/	/	• (Optional) (EC200U), Optional (EC200U-CN Mini PCIe-C/EC200U-EU Mini PCIe)
USB Serial Driver	Windows 7/8/8.1/10, Linux 2.6-5.15, 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, Linux 2.6-5.15, Android 4.x-12.x
GNSS Driver	/	/	Android 4.x-11.x (EC200U)
RIL Driver	Android 4.x-12.x	Android 4.x-12.x	Android 4.x-12.x
RNDIS Driver	Windows 7/8/8.1/10, Linux 2.6-5.15	Windows 7/8/8.1/10, Linux 2.6-5.15	Windows 7/8/8.1/10, Linux 2.6-5.15
ECM Driver	Linux 2.6-5.15	Linux 2.6-5.15	Linux 2.6-5.15
(U)SIM Card Detection	•	•	•
Firmware Update	Via USB/DFOTA	Via USB/DFOTA	• (USB or FOTA) (EC200U), Via USB/DFOTA (EC200U-CN Mini PCIe-C/EC200U-EU Mini PCIe)
Electrical Features			
Supply Voltage Range	3.4V~4.5V, 3.8V Typ.	3.4V~4.5 V, 3.8V Typ. (EC200A); 3.4V~4.5 V, 3.8V Typ. (Mini PCIe-C); 3.0V~3.6 V, 3.3V Typ. (EC200A Mini PCIe)	3.3V~4.3 V, 3.8V Typ. (EC200U/EC200U-CN Mini PCIe-C) 3.0V~3.6 V, 3.3V Typ. (EC200U-EU Mini PCIe)
Power Consumption	20 μA @Power off Mode 1.1 mA @LTE Sleep Mode (PF = 128) 0.9 mA @LTE Sleep Mode (PF = 256) 16.5 mA @Idle Mode	11 μA @Power off Mode/ 1.1mA @LTE Sleep Mode (PF=256), Typ/ 18mA @Idle Mode (EC200A); 19 μA @Power off Mode, Typ/ 27.6mA @LTE Sleep Mode (EC200A Mini PCIe)	30 μA @Power off Mode/ 1.35mA @LTE Sleep Mode (PF=256), Typ/ 13mA @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 Mini PCIe)
Certifications ¹	CE/RCM	CCC/SRRC/NAL/CE/RCM/UKCA/NCC/FCC/Anatel*	NAL/SRRC/CCC/CE/RCM
Recommended Applications	Consumer Laptops, Industrial Laptops, Industrial Routers, Industrial PDAs, Rugged Tablet PCs and Digital Signage.	Vehicle rear installation and transportation, green energy, wireless payment, Safety, smart city, mobile gateway, smart industry, personal tracking, medical monitoring, agriculture and environmental monitoring.	POS/POC/ETC, Shared Equipment, Data Cards, Energy Control and Monitoring, Safety and Protection, Industrial PDAs.

Note 1: May depend on modules' variant.

* Under development

LTE Module Family

Product		EG915U	EG915N
			
Form Factor		LGA	LGA
Dimensions (mm)		23.6 × 19.9 × 2.4	23.6 × 19.9 × 2.4
LTE Category		LTE Cat 1	LTE Cat 4
Frequency Bands (MHz)	-CN (China/India)	LTE-FDD: B1/B3/B5/B8; LTE-TDD: B34/B38/B39/B40/B41; GSM: B3/B8	/
	-EU (Europe)	LTE-FDD: B1/B3/B5/B7/B8/B20/B28 GSM: B2/B3/B5/B8	LTE-FDD: B1/ B3/ B7/ B8/ B20 GSM: B3/ B8
	-LA (Latin America)	LTE-FDD: B2/B3/B4/B5/B7/B8/B28/B66 GSM: B2/B3/B5/B8	/
Weight (approx.) g		2.48	2.46
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)		/	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		•	•
Protocols		TCP/UDP/PPP/FTP/HTTP/NTP/PING/QMI/NITZ/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		1.8V/ 3.0V	1.8V/ 3.0V
UART		3	3(main, debug and auxiliary*)
USB		2.0 Hi-Speed	USB 2.0 (Hi-Speed)
I2C		1	•
Audio Digital (PCM)		•	Optional
GPIO		1	/
ADC		2	•
SD		*	/
PWRKEY		•	•
Antenna		Main Antenna, Wi-Fi Scan/Bluetooth Antenna	2 (Main Antenna and GNSS Antenna (Optional))
Enhanced Features			
VoLTE		•	/
DTMF		•	•
DFOTA		•	•
Wi-Fi Scan		•	•
Audio Playback/Audio Recording		•	Optional
QuecFile		•	•
GNSS		•(Optional)	Optional
USB Serial Driver		Windows 7/8/8.1/10, Linux 2.6-5.15, 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
USB RNDIS Driver		Windows 7/ 8/ 8.1/ 10, Linux 2.6-5.15	Windows 7/8/8.1/10, Linux 2.6-5.15
USB ECM Driver		Linux 2.6-5.15	Linux 2.6-5.15
(U)SIM Card Detection		•	•
Firmware Update		USB or FOTA	Via USB/DFOTA
Electrical Features			
Supply Voltage Range		3.3V-4.3 V, 3.8V Typ.	3.4-4.5 V, 3.8 V Typ.
Power Consumption		30 μA @ power off, 1.3 mA @ sleep, 13 mA @ idle	24μA@Power off, 1.4mA@Sleep, Typ., 20.97mA@Idle
Certifications ¹		CE*/RCM*/GCF*/Anatel*	CE*/RCM*/UKCA*
Recommended Applications		POS/POC/ETC, Shared Equipment, Data Cards, Energy Control and Monitoring, Safety and Protection, Industrial PDAs.	Telematics, Smart Metering, Mobile POS Terminal, Gateway, Safety, Tracking and Tracing, Remote Maintenance and Control, Networking, Mobile Computing, Healthcare, etc.

Note1: May depend on modules' variant.

* Under development

Smart Module Family

Product		SC20	SC20 Linux	SC200R
				
Form Factor		LCC+LGA	LCC+LGA	LCC+LGA
Dimensions (mm)		40.5 × 40.5 × 2.8	40.5 × 40.5 × 2.8	40.5 × 40.5 × 2.8
LTE Feature		LTE Cat 4 3GPP E-UTRA Release 10 Compliant, Support DL MIMO 2 × 2	LTE Cat 4 3GPP E-UTRA Release 10 Compliant, Support DL MIMO 2 × 2	LTE Cat 4 3GPP E-UTRA Release 10 Compliant, Support DL MIMO 2 × 2
Frequency Bands (MHz)	-CE/CEL (China)	-CE (China) LTE-FDD: B1/B3/B5/B8; LTE-TDD: B38/B39/B40/B41 WCDMA: B1/B8; TD-SCDMA: B34/B39; CDMA: BC0 GSM: 900/1800MHz	-CEL (China) LTE-FDD: B1/B3/B5/B8; LTE-TDD: B38/B39/B40/B41 WCDMA: B1/B8; TD-SCDMA: B34/B39; CDMA: BC0 GSM: 900/1800MHz	-CE (China) LTE-FDD: B1/B3/B5/B8; LTE-TDD: B34/B38/B39/B40/B41 WCDMA: B1/B8; CDMA: BC0; GSM: 900/1800MHz
	-E/EL/EM(EMEA/Korea/Thailand/India/Africa/Southeast Asia/Australia/South America)	-E (EMEA/Korea/Thailand/India) LTE-FDD: B1/B3/B5/B7/B8/B20; LTE-TDD: B38/B40/B41 WCDMA: B1/B5/B8; GSM: 850/900/1800/1900MHz	-EL (EMEA/Korea/Thailand/India) LTE-FDD: B2/B4/B5/B7/B8/B20; LTE-TDD: B38/B40 WCDMA: B1/B5/B8; GSM: 850/900/1800/1900MHz	-EM (EMEA/Africa/Southeast Asia/Australia/South America) LTE-FDD: B1/B2/B3/B4/B5/B7/B8/B20/B28 LTE-TDD: B38/B40/B41; WCDMA: B1/B2/B4/B5/B8 GSM: 850/900/1800/1900MHz
	-A/AL/NA(North America)	-A (North America) LTE-FDD: B2/B4/B5/B7/B12/B13/B25/B26 WCDMA: B1/B2/B4/B5/B8; GSM: 850/1900MHz	-AL (North America) LTE-FDD: B2/B4/B5/B7/B12/B13/B25/B26 WCDMA: B1/B2/B4/B5/B8; GSM: 850/1900MHz	-NA (North America) LTE-FDD: B2/B4/B5/B7/B12/B13/B14/B17/B25/B26/B66/B71 LTE-TDD: B41; WCDMA: B2/B4/B5
	-AU/AUL(ANZ/Brazil)	-AU (ANZ/Brazil) LTE-FDD: B1/B3/B5/B7/B8/B28; LTE-TDD: B40 WCDMA: B1/B2/B5/B8; GSM: 850/900/1800/1900MHz	-AUL (ANZ/Brazil) LTE-FDD: B1/B3/B5/B7/B8/B28; LTE-TDD: B40 WCDMA: B1/B2/B5/B8; GSM: 850/900/1800/1900MHz	/
	-J/JL/JPI (Japan)	-J (Japan) LTE-FDD: B1/B3/B8/B18/B19/B26; LTE-TDD: B41 WCDMA: B1/B6/B8/B19	-JL (Japan) LTE-FDD: B1/B3/B8/B18/B19/B26; LTE-TDD: B41 WCDMA: B1/B6/B8/B19	-JPI (Japan) LTE-FDD: B1/B3/B5/B8/B11/B18/B19/B21/B26/B28 LTE-TDD: B41; WCDMA: B1/B6/B8/B19
	-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		MSM8909, ARM Cortex-A7 microprocessor cores (quad-core) up to 1.1GHz	MSM8909, ARM Cortex-A7 microprocessor cores (quad-core) up to 1.1GHz	QCM2150, Quad-core ARM Cortex-A53 64-bit CPU @1.3GHz
GPU		Adreno™ 304	Adreno™ 304	Adreno™ 308
Memory		8GB eMMC+1GB LPDDR3; 16GB eMMC+2GB LPDDR3	8GB eMMC+1GB LPDDR3	8GB eMMC+1GB LPDDR3; 16GB eMMC+2GB LPDDR3
Operating System		Android 7.1/8.1 supported by SC20-E/-A/-J/-AU/-CE/-W	Yocto Linux (Kernel 3.18) supported only by SC20-EL/-AL/-JL/-AUL/-WL	Android 10
Supply Voltage Range		3.5V ~ 4.2V, 3.8V Typ.	3.5V ~ 4.2V, 3.8V Typ.	3.55V ~ 4.2V, 3.8V Typ.
Weight (approx.) g		9.8	9.8	10.2
Operating Temperature		-35 °C ~ +75 °C	-35 °C ~ +75 °C	-35 °C ~ +75 °C
Data Transmission				
LTE (Mbps)		LTE-FDD: Max. 150Mbps (DL)/ Max. 50Mbps (UL) LTE-TDD: Max. 130Mbps (DL)/ Max. 30Mbps (UL)	LTE-FDD: Max. 150Mbps (DL)/ Max. 50Mbps (UL) LTE-TDD: Max. 130Mbps (DL)/ Max. 30Mbps (UL)	LTE-FDD: Max. 150Mbps (DL)/ Max. 50Mbps (UL) LTE-TDD: Max. 130Mbps (DL)/ Max. 30Mbps (UL)
UMTS		DC-HSDPA: Max. 42Mbps (DL) HSUPA: Max. 5.76Mbps (UL) WCDMA: Max. 384Kbps (DL/UL)	DC-HSDPA: Max. 42Mbps (DL) HSUPA: Max. 5.76Mbps (UL) WCDMA: Max. 384Kbps (DL/UL)	DC-HSDPA: Max. 42Mbps (DL) HSUPA: Max. 5.76Mbps (UL) WCDMA: Max. 384Kbps (DL/UL)
TD-SCDMA		Max. 4.2Mbps (DL)/ Max. 2.2Mbps (UL)	Max. 4.2Mbps (DL)/ Max. 2.2Mbps (UL)	/
CDMA2000		EVDO: Max. 3.1Mbps (DL)/ Max. 1.8Mbps (UL) , 1X Advanced: Max. 307.2Kbps (DL/UL)	EVDO: Max. 3.1Mbps (DL)/ Max. 1.8Mbps (UL) , 1X Advanced: Max. 307.2Kbps (DL/UL)	EVDO: Max. 3.1Mbps (DL)/ Max. 1.8Mbps (UL) , 1X Advanced: Max. 307.2Kbps (DL/UL)
GSM		EDGE: Max. 296Kbps (DL)/ 236.8Kbps (UL) , GPRS: Max. 107Kbps (DL)/ 85.6Kbps (UL)	EDGE: Max. 296Kbps (DL)/ 236.8Kbps (UL) , GPRS: Max. 107Kbps (DL)/ 85.6Kbps (UL)	EDGE: Max. 296Kbps (DL)/ 236.8Kbps (UL) , GPRS: Max. 107Kbps (DL)/ 85.6Kbps (UL)
Interfaces				
LCM		4-lane MIPI_DSI, up to 1.5Gbps/lane HD (720P) @60fps	4-lane MIPI_DSI, up to 1.5Gbps/lane HD (720P) @60fps	4-lane MIPI_DS, HD+ (1440*720) @60fps
Camera		Use MIPI_CSI, up to 1.5Gbps/lane Support two Cameras: 2-lane MIPI_CSI for Rear Camera, up to 8MP 1-lane MIPI_CSI for Front Camera, up to 2MP	Use MIPI_CSI, up to 1.5Gbps/lane Support two Cameras: 2-lane MIPI_CSI for Rear Camera, up to 8MP 1-lane MIPI_CSI for Front Camera, up to 2MP	2 groups of 4-lane MIPI_CSI, up to 2.1Gbps per lane; Up to 13MP with dual ISP
Touch Panel		Capacitive Touch Panel	Capacitive Touch Panel	Capacitive Touch Panel
Audio		Analog channels: Two inputs: MIC1, MIC2; Three outputs: speaker, earpiece, headphone	Analog channels: Two inputs: MIC1, MIC2; Three outputs: speaker, earpiece, headphone	Analog channels: 3 inputs: MIC1, MIC2, MIC3 (including one noise-canceling MIC); 3 outputs: speaker, earpiece, headphone
Video		Encode: 30fps 720P (H.264), 30fps WVGA (MPEG-4/VP8) Decode: 30fps 1080P (H.264/MPEG-4/ VP8/H.265 DivX4/5/6), 30fps WVGA (H.263)	Encode: 30fps 720P (H.264), 30fps WVGA (MPEG-4/VP8) Decode: 30fps 1080P (H.264/MPEG-4/ VP8/H.265 DivX4/5/6), 30fps WVGA (H.263)	Video encoding: 1080p @30fps(H.264) Video decoding: 1080p @30fps(H.264, HEVC, and VP8) Video concurrency: 1080p @30fps decode+720p@30fps encode
USB		× 1, USB 2.0, supports USB OTG, High Speed 480 Mbps	× 1, USB 2.0, supports USB OTG, High Speed 480 Mbps	× 1, USB 2.0, supports USB OTG
I2C		× 3	× 3	× 4
(U)SIM		× 2 (1.8V/2.95V)	× 2 (1.8V/2.95V)	× 2 (1.8V/2.95V)
UART		× 2, Support 4Mbps with Hardware Flow Control	× 2, Support 4Mbps with Hardware Flow Control	× 3 Support 4Mbps, One of them supports Hardware Flow Control
SD Card		× 1 (3.0, 4-bit SDIO)	× 1 (3.0, 4-bit SDIO)	× 1 (3.0, 4-bit SDIO)
PWRKEY		1.8V, Pulled-up Internally	1.8V, Pulled-up Internally	1.8V, Pulled-up Internally
SPI		× 1	× 1	× 3 Can be multiplexed into UART/I2S/GPIO respectively
ADC		× 1, General purpose ADC interfaces	× 1, General purpose ADC interfaces	× 1 General purpose ADC interfaces
GPIO		× 25	× 25	× 35
PWM		× 1	× 1	× 1
Motor Driver		× 1	× 1	× 1
Antenna		4 Solder Pads for Main/Rx-diversity/ GNSS/Wi-Fi&BT Antenna, Respectively	4 Solder Pads for Main/Rx-diversity/ GNSS/Wi-Fi&BT Antenna, 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
WLAN		2.4G/5G, 802.11 a/b/g/n	2.4G/5G, 802.11 a/b/g/n	2.4G/5G, 802.11 a/b/g/n
GNSS		GPS/BDS/GLONASS or GPS/BDS/Galileo (not supported on SC20-W/-WL)	GPS/BDS/GLONASS or GPS/BDS/Galileo (not supported on SC20-W/-WL)	GPS/BDS/GLONASS or GPS/BDS/Galileo (not supported on SC200R-WF)
Charge Function		Build-in Charge IC	Build-in Charge IC	Build-in Charge IC
Dual LCD		Only support single LCD Display	Only support single LCD Display	Only support single LCD Display
DSDS		Support Dual SIM Dual Standby	Support Dual SIM Dual Standby	Support Dual SIM Dual Standby
Firmware Upgrade		Firmware Upgrade via USB or OTA	Firmware Upgrade via USB or OTA	Firmware Upgrade via USB or OTA
Certifications		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/CE/RCM/FCC/PTCRB/AT&T/Verizon/Telstra*/IC/JATE*/TELEC*/CCC
Recommended Applications		Smart POS, Smart Home Gateways, Smart Robots, Smart Wearables, Safety, PDAs & Tablets, Vending Machines, Delivery Lockers, Telematics, Mobile Computing, Police and Law Enforcement Equipment, In-car Video Streaming and Entertainment Systems, etc.		

Note1: TBD.
SC20-E LTE-TDD B41 does not support full-frequency and the bandwidth of it is 2555-2655MHz.

* Planning/Under development

Smart Module Family

Product		SC200L	SC200E
			
Form Factor		LCC+LGA	LCC+LGA
Dimensions (mm)		40.5 × 40.5 × 2.85	40.5 × 40.5 × 2.85mm
LTE Feature		LTE Cat 4 3GPP E-UTRA Release 10 Compliant, Support DL MIMO 2 × 2	LTE Cat 4(SC200E-CE/EM/NA)
Frequency Bands (MHz)	-CE (China)	LTE-FDD: B1/B3/B5/B8; LTE-TDD: B34/B38/B39/B40/B41 WCDMA: B1/B8; GSM: 900/1800MHz	-CE* (China) LTE-FDD: B1/B3/B5/B8; LTE-TDD: B34/B38/B39/B40/B41 (140M); WCDMA: B1/B8 CDMA: BCO; GSM: 900/1800MHz
	-EU/EM (EMEA/Africa/ South America/Korea/ South Asia/Latin America/Australia/India/ New Zealand/South Africa)	-EU (EMEA/Africa/Southeast Asia/South America) LTE-FDD: B1/B3/B5/B7/B8/B20/B28 LTE-TDD: B38/B40/B41; WCDMA: B1/B5/B8 GSM: 900/1800MHz	-EM* (EMEA/Korea/South Asia/Latin America/Australia/India/New Zealand/South Africa) LTE-FDD: B1/B2/B3/B4/B5/B7/B8/ B20/B28(A+B); LTE-TDD: B38/B40/B41 (200M) WCDMA: B1/B2/B4/B5/B8; GSM: 850/900/1800/1900MHz
	-AU (ANZ/Brazil)	LTE-FDD: B1/B2/B3/B4/B5/B7/B8/B28 LTE-TDD: B38; WCDMA: B1/B2/B4/B5/B8 GSM: 850/900/1800/1900 MHz	/
	-NA* (North America)	/	LTE-FDD: B2/B4/B5/B7/B12/B13/B14/ B17/B25/B26/B66/B71; LTE-TDD: B41 (200M)
	-JP ¹ (Japan)	/	LTE-FDD: B1/B3/B5/B8/B11/B18/B19/ B21/B26/B28(A+B); LTE-TDD: B41 (120M) WCDMA: B1/B6/B8/B19
	-WF (Global)	/	-WF* (Wi-Fi) 2.4G & 5G Wi-Fi, 2.4G BT
CPU		SL8541E, Quad-core ARM Cortex-A53 64-bit CPU @ 1.4 GHz	QCM2290, Quad-core ARM Cortex-A53 64-bit CPU @ 2.0 GHz
GPU		ARM mali820	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 (Default) 32GB eMMC + 3GB LPDDR4X (Optional)
Operating System		Android 10.0	Android 12/13*/14(TBD)
Supply Voltage Range		3.55V ~ 4.2V, 3.8V Typ.	3.5V ~ 4.4V, 3.8V Typ.
Weight (approx.) g		10	/
Operating Temperature		-30 °C ~ +75 °C	-35 °C ~ +75 °C
Data Transmission			
LTE (Mbps)		LTE-FDD: Max. 150Mbps (DL)/ Max. 50Mbps (UL) LTE-TDD: Max. 130Mbps (DL)/ Max. 30Mbps (UL)	Cat 4: LTE-FDD: Max. 150 (DL)/ Max. 50 (UL) LTE-TDD: Max. 130 (DL)/ Max. 30 (UL)
UMTS		DC-HSDPA: Max. 42Mbps (DL) HSUPA: Max. 5.76Mbps (UL) WCDMA: Max. 384Kbps (DL/UL)	DC-HSDPA: Max. 42Mbps (DL) DC-HSUPA: Max. 11.2Mbps (UL) WCDMA: Max. 384Kbps (DL/UL)
CDMA2000		EVDO: Max. 3.1Mbps (DL)/ Max. 1.8Mbps (UL) , 1X Advanced: Max. 307.2Kbps (DL/UL)	EVDO: Max. 3.1Mbps (DL)/ 1.8Mbps (UL) 1X Advanced: Max. 307.2Kbps (DL/UL)
GSM		EDGE: Max. 296Kbps (DL)/ 236.8Kbps (UL) , GPRS: Max. 107Kbps (DL)/ 85.6Kbps (UL)	EDGE: Max. 296Kbps (DL)/ 236.8Kbps (UL) GPRS: Max. 107Kbps (DL)/ 85.6Kbps (UL)
Interfaces			
LCM		4-lane MIPI_DSI, HD+ (1440 × 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 Support 2 or 3 cameras, up to 25 MP @ 30 fps with dual ISP
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 channels: 3 inputs: MIC1, MIC2, MIC3 (including one noise-canceling MIC); 3 outputs: Line Out, earpiece, headphone
Video		Encoder: 1080P (H.264) @ 30 fps; WVGA (MPEG-4/VP8) @ 30 fps Decoder: 1080P (H.264/MPEG-4/VP8/H.265/DivX4/5/6) @ 30 fps; WVGA (H.263) @ 30 fps	Encode: 30fps 1080P H.264/265 Decode: 30fps 1080P H.264/265
USB		× 2, USB 2.0 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	× 1, USB 2.0/3.1 (Type-C)
I2C		× 4	× 4
(U)SIM		× 2, support 1.8/2.95 V (U)SIM cards, with (U)SIM card detection function, DSDS supported	× 2 (1.8V/2.95V)
UART		× 2, up to 3.25 Mbps, UART0 supports hardware flow control	× 3, up to 4 Mbps, supports hardware flow control
SDIO		/	× 1 (3.0, 4-bit SDIO)
SD Card		× 1, SD 3.0, 4-bit SDIO	× 1
PWRKEY		Internally pulled up to VBAT	1.2V, Pulled-up Internally
SPI		× 1, multiplexed from GPIOs	× 1, multiplexed from GPIOs
ADC		× 1	× 1, general-purpose ADC interface
GPIO		× 25	× 33
PWM		× 1	× 1
Motor Driver		× 1	× 1
Antenna		× 4, Main/Rx-diversity/GNSS/Wi-Fi & Bluetooth antenna respectively	× 4, Main/Rx-diversity/GNSS/Wi-Fi & Bluetooth antenna interface respectively (SC200E-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/BEL/SCO links	Bluetooth 2.1 EDR/3.0 HS/4.2 LE/5.0 LE
WLAN		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/BDS/GLONASS/Galileo/QZSS/SBAS (not supported on SC200E-WF; SC200E-NA supports NavIC and L1 + L5)
Charge Function		Build-in Charge IC	Build-in Charge IC & Fuel Gauge Qualcomm Quick Charge technology
Dual LCD		Only support single LCD Display	Only support single LCD Display
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		GCf*/CE/Anatel*/CCC/SRRC*/NAL*	CCC/SRRC*/NAL*/CE*/UKCA*/RCM*/KC*/Anatel*/FCC*/IC*/PTCRB*/NCC*/NBTC*/JATE*/TELEC*/Telstra*/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, Police and Law Enforcement Equipment, In-car Video Streaming and Entertainment Systems, etc.	

Note 1: TBD.

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

* Planning/Under development

Smart Module Family

Product		SC600Y	SC680A
			
Form Factor		LCC+LGA	LCC+LGA
Dimensions (mm)		43.0 × 44 × 2.85	43.0 × 44 × 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/B2/B3/B4/B5/B7/B8/B20/B28; LTE-TDD: B38/B39/B40/B41; WCDMA: B1/B2/B4/B5/B8; GSM: 850/900/1800/1900MHz	LTE-FDD: B1/B2/B3/B4/B5/B7/B8/B20/B28; LTE-TDD: B38/B40/B41; WCDMA: B1/B2/B4/B5/B8; GSM: 850/900/1800/1900MHz
	-NA (North America)	LTE-FDD: B2/B4/B5/B7/B12/B13/B14/B17/B25/B26/B66/B71; LTE-TDD: B41; WCDMA: B2/B4/B5	LTE-FDD: B2/B4/B5/B7/B12/B13/B14/B17/B25/B26/B66/B71; LTE-TDD: B41
	-JP (Japan)	LTE-FDD: B1/B3/B5/B8/B11/B18/B19/B21/B26/B28; LTE-TDD: B41; WCDMA: B1/B6/B8/B19	-JP ¹ (Japan) LTE-FDD: B1/B3/B5/B8/B11/B18/B19/B21/B26/B28; LTE-TDD: B41; WCDMA: B1/B6/B8/B19
	-WF (Global)	Only Wi-Fi & BT	Only Wi-Fi & BT
CPU		SDM450 , Octa-core ARM Cortex-A53 64-bit CPU @1.8GHz	QCM4290, A customized 64-bit Arm v-8.0 compliant applications processor (Qualcomm® Kryo™ 260 CPU) Kryo Gold: quad high-performance cores 2.0 GHz Kryo Silver: quad low-power cores 1.8 GHz
GPU		Adreno™ 506 with 64-bit addressing	Qualcomm® Adreno™ GPU 610 at 950 MHz graphics processing unit (GPU) with 64-bit addressing
Memory		16 GB eMMC + 2 GB LPDDR3 (Default) 32 GB eMMC + 3 GB LPDDR3 (Optional)	64GB eMMC+4GB LPDDR4/32GB eMMC+3GB LPDDR4
Operating System		Android 9/10	Android 12/13*/14(TBD)
Supply Voltage Range		3.55V ~ 4.4V, 3.8V Typ.	3.55V ~ 4.4V, 3.8V Typ.
Weight (approx.) g		13.0	TBD
Operating Temperature		-35 °C ~ +75 °C	-35 °C ~ +75 °C
Data Transmission			
LTE (Mbps)		Cat 6: LTE-FDD: Max. 300Mbps (DL)/ Max. 50Mbps (UL) LTE-TDD: Max. 265Mbps (DL)/ Max. 35Mbps (UL) Cat 4: LTE-FDD: Max. 150Mbps (DL)/ Max. 50Mbps (UL) LTE-TDD: Max. 130Mbps (DL)/ Max. 30Mbps (UL)	Cat 6: LTE-FDD: Max. 300Mbps (DL)/ Max. 50Mbps (UL) LTE-TDD: Max. 265Mbps (DL)/ Max. 35Mbps (UL) Cat 4: LTE-FDD: Max. 150Mbps (DL)/ Max. 50Mbps (UL) LTE-TDD: Max. 130Mbps (DL)/ Max. 30Mbps (UL)
UMTS		DC-HSDPA: Max. 42Mbps (DL) DC-HSUPA: Max. 11.2Mbps (UL) WCDMA: Max. 384Kbps (DL/UL)	DC-HSDPA: Max. 42Mbps (DL) DC-HSUPA: Max. 11.2Mbps (UL) WCDMA: Max. 384Kbps (DL/UL)
GSM		EDGE: Max. 296Kbps (DL)/ 236.8Kbps (UL) GPRS: Max. 107Kbps (DL)/ 85.6Kbps (UL)	EDGE: Max. 296Kbps (DL)/ 236.8Kbps (UL) GPRS: Max. 107Kbps (DL)/ 85.6Kbps (UL)
Interfaces			
LCM		4-lane MIPI_DSI0 + 4-lane MIPI_DSI1 WUXGA (1920×1200) @60fps	4-lane MIPI_DSI for 2520 × 1080 @ 60 fps display
Camera		3 Groups of 4-lane MIPI_CSI, up to 2.1Gbps/lane, Support 3 or 4 Cameras, Up to 21MP with Dual ISPs	3 groups of 4-lane MIPI_CSI, up to 2.5 Gbps per lane Supports 3 or 4 cameras, up to 25 MP with dual ISPs
Touch Panel		Capacitive Touch Panel	Capacitive Touch Panel
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
Video		Video encoding and decoding: 1080P at 60fps Wi-Fi Video encoding and decoding: 1080P at 30fps	Video encoding and decoding: Support recording and playback of 1080p60 Wi-Fi Video encoding and decoding: 1080P at 30fps
USB		× 1, USB 2.0/3.0 (Type-C), USB OTG + Charge	× 1, USB 2.0/3.1 (Type-C)
I2C		× 5	× 5
(U)SIM		× 2 (1.8V/2.95V)	× 2 (1.8V/2.95V)
UART		×4, up to 4 Mbps, two of them support hardware flow control	× 3, up to 4 Mbps, one of them supports hardware flow control
SDIO		× 1 (3.0, 4-bit SDIO)	× 1 (3.0, 4-bit SDIO)
PWRKEY		1.8V, Pulled-up Internally	1.8V, Pulled-up Internally
SPI		× 2, Can be Multiplexed into UART and I2S Respectively, and I2S Supports Both Tx and Rx	× 1
ADC		× 2, General purpose ADC interfaces	× 2, General purpose ADC interfaces
GPIO		× 17	× 19
PWM		× 2	× 2
Motor Driver		× 1	× 1
Flashlight Driver		× 2	× 2
WLED Sink		× 4	× 4
Antenna		4 Solder Pads for Main/Rx-diversity/ GNSS/Wi-Fi&BT Antenna,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/5.1 LE
WLAN		2.4G/5G, 802.11 a/b/g/n/ac	2.4G/5G, 802.11 a/b/g/n/ac/ax ready
GNSS		GPS/BDS/GLONASS or GPS/BDS/Galileo (not supported on SC600Y-WF)	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
Dual LCD		Support Dual LCDs for Independent Display	Support Singal LCDs for Independent Display
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		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*/ Telstra*/ FCC*/ IC*/ PTCRB*/ AT&T*/ Verizon*/ T-Mobile*/ JATE*/ TELEC*/ KDDI */ NTT DOCOMO*/ IFETEL*/ Anatel*/KC*
Recommended Applications		Smart POS, Smart Home Gateways, Smart Robots, Smart Wearables, Safety, PDAs & Tablets, Vending Machines, Delivery Lockers, Telematics, Mobile Computing, Police and Law Enforcement Equipment, In-car Video Streaming and Entertainment Systems, etc.	

Note1: TBD.

* Planning/Under development

Smart Module Family

Product		SC200K	SC310K
			
Form Factor		LCC+LGA	LCC+LGA
Dimensions (mm)		40.5 × 40.5 × 2.85	44.3 × 64.6 × 3.1
LTE Feature		LTE Cat 4 3GPP E-UTRA Release 12 Compliant, Support DL MIMO 2 × 2	LTE Cat 4 3GPP E-UTRA Release 12 Compliant, Support DL MIMO 2 × 2
Frequency Bands(MHz)	-CE (China)	LTE-FDD: B1/B3/B5/B8; LTE-TDD: B34/B38/B39/B40/B41 WCDMA: B1/B8; GSM: 900/1800MHz	LTE-FDD: B1/B3/B5/B8; LTE-TDD: B34/B38/B39/B40/B41 WCDMA: B1/B8; GSM: 900/1800MHz
	-EM (Europe/Middle East/ Africa/South America/ Southeast Asia/India)	/	LTE-FDD: B1/B2/B3/B4/B5/B7/B8/B20/B28 LTE-TDD: B38/B40/B41(200M) WCDMA: B1/B2/B4/B5/B8 GSM: 850/900/1800/1900MHz
CPU		UNISOC UIS8581E,Octa-core 64-bit ARM Cortex-A55 processor	UNISOC UIS8581A,Octa-core 64-bit ARM Cortex-A55 processor
GPU		PowerVR Fentale GE8322 GPU and NEON multimedia processing engine	PowerVR Fentale GE8322 GPU and NEON multimedia processing engine
Memory		16GB eMMC+2GB LPDDR4X; 32GB eMMC+2GB LPDDR4X; 64GB eMMC+4GB LPDDR4X	32GB eMMC+2GB LPDDR4; 64GB eMMC+4GB LPDDR4; 128GB eMMC+4GB LPDDR4
Operating System		Android 10.0	Android 10.0
Supply Voltage Range		3.55V~4.2V, 3.8V Typ.	3.55V~4.2V, 3.8V Typ.
Weight (approx.) g		10.5	18.04
Operating Temperature		-30 °C ~ +75 °C	-20 °C ~ +75 °C
Data Transmission			
LTE (Mbps)		Cat 4: LTE FDD: Max. 150Mbps (DL)/ Max. 50Mbps (UL) LTE TDD: Max. 130Mbps (DL)/ Max. 30Mbps (UL)	Cat 4: LTE FDD: Max. 150Mbps (DL)/ Max. 50Mbps (UL) LTE TDD: Max. 130Mbps (DL)/ Max. 30Mbps (UL)
UMTS		DC-HSPA: Max. 42Mbps (DL) DC-HSUPA: Max. 11.2Mbps (DL) WCDMA: Max. 384Kbps (DL)/ Max. 384Kbps (UL)	DC-HSPA: Max. 42Mbps (DL)DC-HSUPA: Max. 11.2Mbps (DL) WCDMA: Max. 384Kbps (DL)/ Max. 384Kbps (UL)
GSM		EDGE: Max. 296Kbps (DL) /Max. 236.8Kbps (UL) GPRS: Max. 107Kbps (DL) /Max. 85.6Kbps (UL)	EDGE: Max. 296Kbps (DL) /Max. 236.8Kbps (UL) GPRS: Max. 107Kbps (DL) /Max. 85.6Kbps (UL)
Interfaces			
LCM		4-lane MIPI, HD+ (2160 × 1080) @ 60 fps	4-lane MIPI, HD+ (2160 × 1080) @ 60 fps
Camera		Supports 3 cameras (4-lane + 2-lane + 1-lane), up to 16 MP	Supports 2 cameras (4-lane MIPI), double YUV Camera; 5MP+5MP
Touch Panel		Capacitive touch panel	Capacitive touch panel
Audio		Analog channels: 3 inputs: MIC1, MIC2, MIC3 (including one noise-canceling MIC); 3 outputs: speaker, earpiece, headphone coding: 1080P (H.264) @ 30 fps; WVGA (MPEG-4/VP8) @ 30 fps	Analog channels: 2 inputs: MIC1, MIC2; 1 output: headphone coding: 1080P (H.264) @ 30 fps; WVGA (MPEG-4/VP8) @ 30 fps
Video		decoding: 1080P (H.264/MPEG-4/VP8/H.265/DivX4/5/6) @ 30 fps; WVGA (H.263) @ 30 fps × 2, USB 2.0	decoding: 1080P (H.264/MPEG-4/VP8/H.265/DivX4/5/6) @ 30 fps; WVGA (H.263) @ 30 fps × 2, USB 2.0
USB		USB1 supports USB OTG, does not support USB hub; USB2 only supports USB Host mode, supports USB hub	USB1 supports USB OTG, does not support USB hub; USB2 only supports USB Host mode, supports USB hub
I2C		× 4	× 4
(U)SIM		×2, supports 1.8/2.95 V (U)SIM cards	× 2, supports 1.8/2.95 V (U)SIM cards
UART		× 3, up to 3 Mbps, one of them supports hardware flow control	× 3, up to 3 Mbps, one of them is used for debugging only
SD Card		× 1, supports SD 3.0	× 1, supports SD 3.0
PWRKEY		Internally pulled up to VBAT	Internally pulled up to VBAT
SPI		× 2	× 2
ADC		× 1	× 1
GPIO		× 40	× 25
PWM		× 1	× 1
Antenna		× 4, Main, Rx-diversity, GNSS, Wi-Fi/BT antenna respectively	× 4, Main, Rx-diversity, GNSS, Wi-Fi/BT antenna respectively
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/5.0 LE
WLAN		2.4/5GHz, 802.11a/b/g/n/ac	2.4&5 GHz, 802.11a/b/g/n/ac
GNSS		GPS/GLONASS or GPS/BDS	GPS/GLONASS or GPS/BDS
Charge Function		Built-in charging function	/
Dual LCD		Support Dual LCDs for Independent Display	Only support single LCD 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		SRRC/ NAL/ CCC	SRRC*/ NAL*/ CCC/CE*/GCF*
Recommended Applications		Smart POS, Smart Home Gateways, Smart Robots, Smart Wearables, Safety, PDAs & Tablets, Vending Machines, Delivery Lockers, Telematics, Mobile Computing, Police and Law Enforcement Equipment, In-car Video Streaming and Entertainment Systems, etc.	

SC200K and SC310K can't be promote to US, Canada, Australia, New Zealand, Japan or South Korea .

* Planning/Under development

Smart Module Family

Product	SC600T	SC606T
		
Form Factor	LCC+LGA	LCC+LGA
Dimensions (mm)	43.0 × 44 × 2.85	43.0 × 44 × 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/B2/B3/B4/B5/B7/B8/B20/B28; LTE-TDD: B38/B39/B40/B41; WCDMA: B1/B2/B4/B5/B8; GSM: 850/900/1800/1900MHz
	-NA (North America)	LTE-FDD: B2/B4/B5/B7/B12/B13/B14/B17/B25/B26/B66/B71; LTE-TDD: B41; WCDMA: B2/B4/B5
	-JP (Japan)	LTE-FDD: B1/B3/B5/B8/B11/B18/B19/B21/B26/B28; LTE-TDD: B41; WCDMA: B1/B6/B8/B19
	-WF (Global)	Only Wi-Fi & BT
CPU	MSM8953, Octa-core ARM Cortex-A53 64-bit CPU @2.0GHz	MSM8953, Octa-core ARM Cortex-A53 64-bit CPU @2.0GHz
GPU	Adreno™ 506 with 64-bit addressing	Adreno™ 506 with 64-bit addressing
Memory	16 GB eMMC + 2 GB LPDDR3 (Default) 32 GB eMMC + 3 GB LPDDR3 (Optional)	16GB eMMC+2GB LPDDR3
Operating System	Android 9/10	Yocto Linux (kernel 4.9)
Supply Voltage Range	3.55V ~ 4.4V, 3.8V Typ.	3.55V ~ 4.4V, 3.8V Typ.
Weight (approx.) g	13.0	13
Operating Temperature	-35 °C ~ +75 °C	-35 °C ~ +75 °C
Data Transmission		
LTE (Mbps)	Cat 6: LTE-FDD: Max. 300Mbps (DL)/ Max. 50Mbps (UL) LTE-TDD: Max. 265Mbps (DL)/ Max. 35Mbps (UL) Cat 4: LTE-FDD: Max. 150Mbps (DL)/ Max. 50Mbps (UL) LTE-TDD: Max. 130Mbps (DL)/ Max. 30Mbps (UL)	Cat 6: LTE-FDD: Max. 300Mbps (DL)/ Max. 50Mbps (UL) LTE-TDD: Max. 265Mbps (DL)/ Max. 35Mbps (UL) Cat 4: LTE-FDD: Max. 150Mbps (DL)/ Max. 50Mbps (UL) LTE-TDD: Max. 130Mbps (DL)/ Max. 30Mbps (UL)
UMTS	DC-HSDPA: Max. 42Mbps (DL) DC-HSUPA: Max. 11.2Mbps (UL) WCDMA: Max. 384Kbps (DL/UL)	DC-HSDPA: Max. 42Mbps (DL) DC-HSUPA: Max. 11.2Mbps (UL) WCDMA: Max. 384Kbps (DL/UL)
GSM	EDGE: Max. 296Kbps (DL)/ 236.8Kbps (UL) GPRS: Max. 107Kbps (DL)/ 85.6Kbps (UL)	EDGE: Max. 296Kbps (DL)/ 236.8Kbps (UL) GPRS: Max. 107Kbps (DL)/ 85.6Kbps (UL)
Interfaces		
LCM	4-lane MIPI_DSI0 + 4-lane MIPI_DSI1 WUXGA (1920×1200) @60fps	4-lane MIPI_DSI0 + 4-lane MIPI_DSI1 WUXGA (1920×1200) @60fps
Camera	3 Groups of 4-lane MIPI_CSI, up to 2.1Gbps/lane, Support 3 or 4 Cameras, Up to 24MP with Dual ISPs	3 Groups of 4-lane MIPI_CSI, up to 2.1Gbps/lane, Support 3 or 4 Cameras, Up to 24MP with Dual ISPs
Touch Panel	Capacitive Touch Panel	Capacitive Touch Panel
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	Video encoding and decoding: Support recording and playback of 4k videos at 30fps Wi-Fi Video encoding and decoding: 1080P at 30fps	Video encoding and decoding: Support recording and playback of 4k videos at 30fps Wi-Fi Video encoding and decoding: 1080P at 30fps
USB	× 1, USB 2.0/3.0 (Type-C), USB OTG + Charge	× 1, USB 2.0/3.0 (Type-C), USB OTG + Charge
I2C	× 5	× 5
(U)SIM	× 2 (1.8V/2.95V)	× 2 (1.8V/2.95V)
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
SDIO	× 1 (3.0, 4-bit SDIO)	× 1 (3.0, 4-bit SDIO)
PWRKEY	1.8V, Pulled-up Internally	1.8V, Pulled-up Internally
SPI	× 2, Can be Multiplexed into UART and I2S Respectively, and I2S Supports Both Tx and Rx	× 2, Can be Multiplexed into UART and I2S Respectively, and I2S Supports Both Tx and Rx
ADC	× 2, General purpose ADC interfaces	× 1, General purpose ADC interfaces
GPIO	× 17	× 19
PWM	× 2	×2
Motor Driver	× 1	/
Flashlight Driver	× 2	/
WLED Sink	× 4	/
Antenna	4 Solder Pads for Main/Rx-diversity/ GNSS/Wi-Fi&BT Antenna, 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
WLAN	2.4G/5G, 802.11 a/b/g/n/ac	2.4G/5G, 802.11 a/b/g/n/ac
GNSS	GPS/BDS/GLONASS or GPS/BDS/Galileo (not supported on SC600T-WF)	GPS/BDS/GLONASS or GPS/BDS/Galileo (not supported on SC606T-WF)
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
Dual LCD	Support Dual LCDs for Independent Display	Support Dual LCDs for Independent Display
DSDS	Support Dual SIM Dual Standby	Support Dual SIM Dual Standby
Firmware Upgrade	Firmware Upgrade via USB or OTA CE/RCM/GCF/NCC/Telstra/FCC/IC/PTCRB/AT&T/Verizon/T-Mobile/JATE/TELEC/KDDI/NTT DOCOMO/ IFETEL/Anatel/KC	Firmware Upgrade via USB or OTA CE/RCM/GCF/FCC/IC/PTCRB/AT&T/Verizon
Certifications		
Recommended Applications		
	Smart POS, Smart Home Gateways, Smart Robots, Smart Wearables, Safety, PDAs & Tablets, Vending Machines, Delivery Lockers, Telematics, Mobile Computing, Police and Law Enforcement Equipment, In-car Video Streaming and Entertainment Systems, etc.	

Smart Module Family

Product	SC66	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 6	LTE Cat 15 3GPP Release 15, DL MIMO 4 × 4
Frequency Bands (MHz)	-CE/CN (China)	-CN* (China) 5G SA/NSA: n1/n28/n41/n78/n79; LTE: B1/B3/B5/B8/B34/B38/B39/B40/B41 WCDMA: B1/B5/B8
	-E/EU (EMEA/Europe/India/Korea/South Asia/Latin America/Australia/South Africa)	-EU* (EMEA) 5G SA/NSA: n1/n3/n5/n7/n8/n20/n28/n38/n40/n41/n77/n78; LTE: B1/B3/B5/B7/B8/B20/B28/B32/B38/B39/B40/B41/B42;WCDMA: B1/B5/B8; GSM/EDGE: 900/1800 MHz
	-A/NA (North America)	-NA (North America)(TBD)
	-J (Japan)	N/A
	-MW/WF (Global)	N/A
CPU	SDM660, Customized 64-bit ARM v8.0-compliant AP (Kryo260 CPU) Kryo Gold Quad high-performance cores targeting 2.2GHz, L2 - 1MB Kryo Silver Quad low-power cores targeting 1.843GHz, L2 - 1MB	QCM6490 6nm Kryo 6xx, 1xGoldP@2.7GHz, 3xGold@2.4GHz, 4xSilver@1.9GHz
GPU	Qualcomm® Adreno 512 at 650MHz	Adreno 642L @ 812 MHz
Memory	32GB eMMC + 3GB LPDDR4X (Default) 64GB eMMC + 4GB LPDDR4X (Optional)	4 GB LPDDR4X + 64 GB UFS
Operating System	Android 9/10	Android 12/13*/14*/15*
Supply Voltage Range	3.55V ~ 4.4V, 4V Typ.	3.55V ~ 4.4V, 4.0V Typ.
Weight (approx.) g	12.0	N/A
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 6*: LTE-FDD: Max. 300 (DL)/ Max. 50 (UL) LTE-TDD: Max. 265 (DL)/ Max. 30 (UL)	Cat 15: 800 (DL)/ 100 (UL)
	Cat 4: LTE-FDD: Max. 150 (DL)/ Max. 50 (UL) LTE-TDD: Max. 130 (DL)/ Max. 30 (UL)	
UMTS	DC-HSDPA: Max. 42Mbps (DL) DC-HSPA+: Max. 5.76Mbps (UL) WCDMA: Max. 384Kbps (DL/UL)	DC-HSPA+: 42Mbps (DL)/ 11.2Mbps (UL) WCDMA: 384Kbps (DL)/ 384Kbps(UL)
TD-SCDMA	Max. 4.2Mbps (DL)/2.2Mbps (UL)	/
CDMA2000	EVDO: Max. 3.1Mbps (DL)/ 1.8Mbps (UL) 1X Advanced: Max. 307.2Kbps (DL/UL)	/
GSM	EDGE: Max. 296Kbps (DL)/ 236.8Kbps (UL) GPRS: Max. 107Kbps (DL)/ 85.6Kbps (UL)	SG560D-EU: EDGE: 296Kbps (DL)/ 236.8Kbps (UL) GPRS: 107Kbps (DL)/85.6Kbps (UL)
Interfaces		
LCM	2560×1600 @60fps primary display + 4k@30fps over DP Dual MIPI DSI	FHD+ (1200 × 2520) 8L @ 144 Hz, 1 × DSI D-PHY (4-lane), DP 1.4 SST
Camera	4-lane MIPI_CSIx3, up to 2.1Gbps/Lane, Support 3 or 4 Cameras, Up to 24MP with Dual ISPs	3 × ISP: 22+22+22 MP @ 30 fps or 36+22 MP @ 30 fps or 64 MP @ 30 fps ZSL + 2 × IFE, 4K30 w/ MCTF, OIS, EIS and HDR10; CSI 4/4/4/4 or 2/1 DPHY1.2/CPHY1.2
Touch Panel	Capacitive Touch Panel	Capacitive touch panel
Audio	Analog channels: 3 inputs: MIC1, MIC2, MIC3 (including one noise-canceling MIC); 3 outputs: speaker, earpiece, headphone	Needs external audio codec
Video	Encoding: 4K (HEVC/H264/VP8)@30FPS Decoding: 4K (HEVC/H264/VP8/VP9)@30FPS	Video encode: 4K 30 fps for H.264/H.265 Video decode: 4K 60 fps for H.264/H.465/VP9
USB	× 2 1 × USB 3.1, supports DP over Type-C, compatible with USB 2.0 1 × USB 2.0, only supports USB Host mode	× 2 1 × USB 3.1 Type-C with DisplayPort 1.4, compatible with USB 2.0; 1 × USB 2.0 Host
I2C	× 5	× 5 (including 3 lanes used for cameras)
(U)SIM	× 2 (1.8V/2.95V)	× 2, supports 1.8/2.95 V (U)SIM cards, with (U)SIM card detection function, DSDS supported
UART	× 4, (one group Support 4Mbps with Hardware Flow Control)	× 3, supports 4 Mbps with Hardware Flow Control
SDIO	× 1 (3.0, 4-bit SDIO)	× 1 (3.0, 4-bit SDIO)
PWRKEY	1.8V, Pulled-up Internally	1.8V, pulled up internally
SPI	× 1, only support master mode	× 1
ADC	× 2, General purpose ADC interfaces	× 4, general-purpose ADC interfaces
GPIO	× 22	× 24
PWM	× 1	× 1
Motor Driver	/	× 1
Flashlight Driver	/	× 1
Antenna	Main antenna, Rx-diversity antenna, GNSS antenna, Wi-Fi/BT antenna and WIFI_MIMO antenna interfaces (SC66-CE and SC66-W do not support MIMO Wi-Fi)	× 7 (Cellular antenna × 4, Wi-Fi antenna × 2, GNSS antenna × 1)
Enhanced Features		
BT	Bluetooth 2.1 EDR/3.0 HS/4.2 LE/5.0 LE; 2 × 2 MIMO Wi-Fi (except SC66-CE)	Bluetooth 2.1 EDR/3.0 HS/4.2 LE/5.2 LE
WLAN	2.4 & 5 GHz, 802.11a/b/g/n/ac	2.4&5&6 GHz, 802.11a/b/g/n/ac/ax, Supports DBS, 2 × 2 MU-MIMO
GNSS	GPS/GLONASS/BDS/Galileo/QZSS/SBAS (not supported on SC66-MW)	GPS/GLONASS/BDS/NavIC/Galileo/QZSS/SBAS; L1 + L5
Charge Function	Build-in Charge IC & Fuel Gauge Qualcomm Quick Charge technology	Build-in Charge IC & Fuel Gauge Qualcomm Quick Charge technology
Dual LCD	Support Dual LCDs for Independent Display	/
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	CE/GCF/CCC/PTCRB/NCC/AT&T/Verizon/RCM/IC/JATE/TELEC/CCC/SRRC/NAL/KC/UKCA	CE*/GCF*/UKCA*/CCC*/SRRC*/NAL*
Recommended Applications	Smart POS, Smart Home Gateways, Smart Robots, Smart Wearables, Safety, PDAs & Tablets, Vending Machines, Delivery Lockers, Telematics, Mobile Computing, Police and Law Enforcement Equipment, In-car Video Streaming and Entertainment Systems, etc.	

* Planning/Under development

Smart Module Family

Product		SA800U	SG865W*
			
Form Factor		B2B Connector	LGA
Dimensions(mm)		60.0 × 37.0 × 6.55	46.0 × 42.0 × 2.95
Frequency Bands (MHz)	-WF(Global)	- WF (Wi-Fi) 2 x 2 Wi-Fi MIMO & BT	- WF (Wi-Fi) 2 x 2 Wi-Fi MIMO & BT
CPU		SDA845, Qualcomm® Kryo™ 385 64-bit Processor (Octa-core) CPU Quad high-performance Kryo cores at 2.649 GHz Quad low-power Kryo cores at 1.766 GHz	QCS8250, 64-bit application processors (Kryo 585) with 4 MB L3 cache: 1 × Kryo 585 Gold prime core Fmax at 2.842 GHz – with 512 KB L2 cache 3 × Kryo 585 Gold cores Fmax at 2.419 GHz – with 256 KB L2 cache per core 4 × Kryo 585 Silver cores Fmax at 1.805 GHz – with 128 KB L2 cache per core
GPU		Qualcomm® Adreno™ 630	Adreno 650 at 587 MHz– 4K 60 fps UI or 2 × 2K 60 fps UI
Memory		64GB UFS + 4GB LPDDR4X	64GB UFS + 8GB LPDDR5
Operating System		Android 10	Android 10
Supply Voltage Range		3.55V ~ 4.4V, 3.8V Typ.	3.55V ~ 4.4V, 3.8V Typ.
Weight (approx.) g		15.0	TBD
Operating Temperature		-35 °C ~ +75 °C	-35 °C ~ +75 °C
Data Transmission			
LTE (Mbps)		/	/
UMTS		/	/
TD-SCDMA		/	/
CDMA2000		/	/
GSM		/	/
Interfaces			
LCM		Supports 2 groups of 4-lane MIPI_DSI Dual independent display 3840 × 2440 @ 60 fps for primary display + 4K @60 fps over DP	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
Camera		3 groups of 4-lane + 1 group of 2-lane MIPI_CSI, up to 2.5 Gbps/lane 2 Full ISPs + 1 Lite ISP Supports 3 cameras of 16 MP + 16 MP + 2 MP working simultaneously Supports single camera of up to 32 MP	2 × Full ISP + 2 × Lite ISP 2 × Front-end input: 25 MP (4:3) or 18 MP (16:9 aspect ratio) 2 × Front-end input: mono/YUV Interface
Touch Panel		Capacitive Touch Panel	Capacitive Touch Panel
Audio		Needs external audio codec	Needs external audio codec
Video		4K @ 60 fps H.264/265 encoding + decoding Supports HDR	Video coding: 8K @ 30 fps Video decoding: 8K @ 60 fps
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 with USB 2.0, one of them supports DisplayPort v1.4
I2C		× 15	× 4
UART		× 13, Supports up to 4 Mbps and hardware flow control	× 4
SDIO		× 1(SD 3.0, 4-bit SDIO)	× 1, SD 3.0
PWRKEY		PWRKEY, VOL_UP, VOL_DOWN, HOME_KEY	Internally pulled up
SPI		× 15	× 4, only support master mode
ADC		× 2	× 4, general-purpose ADC interfaces
GPIO		× 109	× 16
PWM		× 2	/
Motor Driver		× 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
WLED Sink		not support	not support
Antenna		Wi-Fi/BT, Wi-Fi MIMO, BT*, FM*	Wi-Fi/BT, Wi-Fi MIMO, BT*, FM*
Enhanced Features			
BT		Bluetooth 2.1 EDR/3.0 HS/4.2 LE/5.0 LE; 2 × 2 MIMO Wi-Fi	Bluetooth 2.1 EDR/3.0 HS/4.2 LE/5.1 LE
WLAN		2.4 & 5 GHz, 802.11a/b/g/n/ac	2.4 & 5 GHz, 802.11a/b/g/n/ac/ax (Wi-Fi 6), 2 × 2 Wi-Fi MIMO
GNSS		/	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
Dual LCD		Support Dual LCDs for Independent Display	Support Dual LCDs for Independent Display
Firmware Upgrade		Firmware Upgrade via USB or OTA	Firmware Upgrade via USB or OTA
Certifications		KC	TBD
Recommended Applications		Infotainment, Live Video, Robotics, Gaming, VR, Unmanned Aerial Vehicle Control, 3D Scanner, Gym Equipment, Virtual Coin Mining Digger, ARM based computer and server, etc.	

* Under development

LPWA Module Family

Product	BG96	BG95 Series ¹	BG950A-GL	BG951A-GL
				
Form Factor	LGA	LGA	LGA	LGA
Dimensions (mm)	26.5 × 22.5 × 2.3	23.6 × 19.9 × 2.2	23.6 × 19.9 × 2.2	23.6 × 19.9 × 2.2
RAT	LTE Cat M1/ NB1/ EGPRS	LTE Cat M1/Cat NB2/EGPRS	LTE Cat M1/Cat NB1/NB2*	LTE Cat M1/Cat NB1/NB2*
Frequency Bands (MHz)	LTE-FDD: B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B26*/B28 EGPRS: 850/900/1800/1900MHz	LTE-FDD: B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B26(Cat M1 Only)/B27 (Cat M1 Only)/B28/B31/B66/B71 (Cat NB2 Only)/B72/B73/B85/B86* ² /Cat NB2 only/B87* ² /B88* ² ; EGPRS: 850/900/1800/1900MHz	LTE-FDD: B1/B2/B3/B4/B5/B8/B12/B13/B17(Cat NB1/N2* Only)/B18/B19/B20/B25/B26(Cat M1 Only)/B27 (Cat M1 Only)/B28/B66	LTE-FDD: B1/B2/B3/B4/B5/B8/B12/B13/B17(Cat NB1/N2* Only)/B18/B19/B20/B25/B26(Cat M1 Only)/B27 (Cat M1 Only)/B28/B66
Weight (approx.) g	3.1	2.15	2.15	2.15
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 Cat M1 data rate (Kbps)	Max. 375 (DL), Max. 375 (UL)	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)	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)	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	•	Point-to-point M0 and MT; Text and PDU Mode; SMS Cell Broadcast	Point-to-point M0 and MT; Text and PDU Mode; SMS Cell Broadcast	Point-to-point M0 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/NT/	PPP/TCP/UDP/SSL/TLS/FTP(S)/HTTP(S)/NITZ/PING/MQTT(S)/MQTT-SN/LwM2M/CoAP(S)/IPv6/DNS/NT/	PPP/TCP/UDP/SSL/TLS/FTP(S)/HTTP(S)/NITZ/PING/MQTT/LwM2M/Polite	PPP/TCP/UDP/SSL/TLS/FTP(S)/HTTP(S)/NITZ/PING/MQTT/LwM2M/Polite
Interfaces				
(U)SIM	1.8V/ 3V	1.8V	1.8V	1.8V
UART	× 3 (MAIN, DEBUG, NMEA)	× 3 (MAIN, DEBUG, NMEA)	× 3 (MAIN, DEBUG, GNSS)	× 3 (MAIN, DEBUG, GNSS)
USB	USB 2.0 × 1	USB 2.0 × 1	USB 2.0 × 1	USB 2.0 × 1
I2C	I2C ³ × 1	I2C ³ × 1	I2C* × 1	I2C* × 1
ADC	ADC × 2	ADC × 1	ADC × 2	ADC × 2
GPIO	GPIO × 2 (I2C and NMEA can be re-configured as GPIO)	GPIO ⁴ × 9	GPIO × 7	GPIO × 7
RESET	RESET × 1	RESET × 1	RESET × 1	RESET × 1
PCM	PCM ⁵ × 1	PCM ⁵ × 1	/	/
Antenna	Primary, GNSS	Antenna ⁵ : 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 [*]	Simplifies the Development of Embedded Applications	Simplifies the Development of Embedded Applications	QuecOpen [*] :Simplifies the Development of Embedded Applications	QuecOpen [*] :Simplifies the Development of Embedded Applications
DFOTA	•	•	•	•
GNSS/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/12.x	/	/
NDIS	Windows 7/8/8.1/10	/	/	/
USB Serial Driver	Windows 7/8/8.1/10, Linux 2.6 or later, Android 4.x/5.x/6.x/7.x/8.x/9.x/10.x/11.x	Windows 7/8/8.1/10, 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	GPS/GLONASS/Galileo/Beidou/QZSS LTE & GNSS concurrency
Firmware Update	via USB Interface	via USB Interface	via UART/USB*/DFOTA	via UART/USB*/DFOTA
Electrical Features				
Supply Voltage Range	3.3 ~ 4.3V, 3.8V Typ.	3.8V Typ. /3.3V Typ. ⁶	2.2~4.35 V, 3.3 V Typ.	2.2~4.35 V, 3.3 V Typ.
Power Consumption	10μA@ PSM	3.9μA@PSM ⁷	1.5μA@ PSM	1.5μA@ PSM
Max Output Power	Power Class 3 23dBm @ LTE Bands	Power Class5 21dBm @ LTE Bands / Power Class3 23dBm@ LTE Bands ⁸ / Power Class 2 26dBm@ LTE B31/72/73 of BG95-M4/Power Class 2 26dBm@LTE B31*/72*/73*/87*/88* and 23dBm@other LTE Bands of BG95-M9	Power Class 3 23dBm @ LTE Bands	Power Class 3 23dBm @ LTE Bands
Certifications	Vodafone/Deutsche Telekom/Telefónica/ Verizon/AT&T/T-Mobile/Sprint/Telus/Rogers/SKT/LGU+/NTT DOCOMO/SoftBank/KDDI/ Telstra/GCF/CE/FCC/PTCRB/IC/IFETEL/CCC/KC/ NCC/JATE/TELEC/RCM/NBCT/IMDA/ICASA/ U.S. Cellular	China Telecom*/China Mobile*/China Unicom*/Vodafone/Deutsche Telekom/ Verizon/AT&T/T-Mobile/Sprint/SKT/NTT DOCOMO/SoftBank*/KDDI/Telstra/SRRC*/NAL*/ CCC/GCF/CE/FCC/PTCRB/IC/Anatel/KC/NCC/ JATE/TELEC/RCM/NBCT*/IMDA/RoHS/ATEX/PEN/ KT/UCKA/LGU+/Telefónica/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	Vodafone* /Deutsche Telekom*/Verizon*/ AT&T*/T-Mobile*/SKT*/LGU+*/NTT DOCOMO*/ KDDI*/Telstra*/GCF*/CE/FCC/PTCRB*/IC/KC/ JATE/TELEC/RCM
	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			
Recommended Applications				

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. * Under development
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.

LPWA Module Family

Product	BG600L-M3	BG77	BG770A-GL	BG772A-GL
				
Form Factor	LGA	LGA	LGA	LGA
Dimensions (mm)	18.7 × 16.0 × 2.1	14.9 × 12.9 × 1.7	14.9 × 12.9 × 1.9	14.9 × 12.9 × 1.9
RAT	LTE Cat M1/Cat NB2/E6PRS	LTE Cat M1/Cat NB2	LTE Cat M1/Cat NB1/NB2*	LTE Cat M1/Cat NB1/NB2*
Frequency Bands (MHz)	LTE-FDD: B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B26(Cat M1 Only)/B27 (Cat M1 Only)/B28/B66/B71 (Cat NB2 Only)/B85 E6PRS: 850/900/1800/1900MHz	LTE-FDD: B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B26(Cat M1 Only)/B27 (Cat M1 Only)/B28/B66/B71 (Cat NB2 Only)/B85*	LTE-FDD: B1/B2/B3/B4/B5/B8/B12/B13/B17 (Cat NB1/NB2*Only)/B18/B19/B20/B25/B26 (Cat M1 Only)/B27 (Cat M1 Only)/B28/B66	LTE-FDD: B1/B2/B3/B4/B5/B8/B12/B13/B17(Cat NB1/NB2* Only)/B18/B19/B20/B25/B26(Cat M1 Only)/B27 (Cat M1 Only)/B28/B66
Weight (approx.) g	1.25	0.73	0.85	0.85
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 Cat M1 data rate (Kbps)	Max. 588 (DL), Max. 1119 (UL)	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)	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)	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 MO and MT; SMS Cell Broadcast; Text and PDU Mode	Point-to-point MO and MT; SMS Cell Broadcast; Text and PDU Mode	Point-to-point MO and MT; SMS Cell Broadcast; Text and PDU Mode	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)/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	TCP/PPP/UDP/SSL/MQTT/FTP(S) /HTTP(S) / LwM2M/IPv4/IPv6/TLS/DTLS/CoAP/NITZ/Polite
Interfaces				
(U)SIM	1.8V	1.8V	1.8V	1.8V
UART	× 3 (MAIN, DEBUG, NMEA)	× 3 (MAIN, DEBUG, NMEA)	× 3 (MAIN, DEBUG, AUX)	× 3 (1 main UART, 1 auxiliary UART, 1 debug UART)
USB	USB 2.0 × 1	USB 2.0 × 1	USB 2.0 × 1 (FS Only)	USB 2.0 × 1
I2C	I2C ¹ × 1	I2C ¹ × 1	I2C* × 1	I2C* × 2
ADC	ADC × 1	ADC × 2	ADC × 2	ADC × 2
GPIO	GPIO × 6	GPIO × 7	GPIO × 7	GPIO Max. x 15
RESET	RESET × 1	RESET × 1	RESET × 1	RESET × 1
PCM	PCM ¹ × 1	PCM ¹ × 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)	2 (for Main Antenna and GNSS Antenna, respectively)
Enhanced Features				
QuecoOpen [®]	Simplifies the Development of Embedded Applications	Simplifies the Development of Embedded Applications	/	QuecoOpen [™] :Simplifies the Development of Embedded Applications
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, 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 7/8/8.1/10, 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	GPS, GLONASS
RAI	/	/	/	/
Firmware Update	via USB Interface	via USB Interface	via UART/USB*/DFOTA	via UART/USB*/DFOTA
Electrical Features				
Supply Voltage Range	3.3V~4.3V, 3.8V Typ.	2.6V~4.8V, 3.3V Typ. ²	VBAT_BB: 2.2~4.35 V, Typ. 3.3 V VBAT_RF: 3.1~4.2 V, Typ. 3.3 V	2.2~4.35 V, 3.3 V Typ.
Power Consumption	4.0μA@PSM	3.44μA@PSM	1.4μA@PSM	1.4μA@ PSM
Max Output Power	Power Class 5 21dBm @ LTE Bands	Power Class 5 21dBm @ LTE Bands	Power Class 3 23dBm @ LTE Bands	Power Class 3 23dBm @ LTE Bands
Certifications	Vodafone/Deutsche Telekom/Telefónica*/Verizon*/AT&T*/T-Mobile/Sprint*/CCC*/GCF/CE/FCC/RCM/PTCRB/IC/RoHS/Anatel/UKCA	China Telecom*/China Mobile*/China Unicom*/Vodafone/Deutsche Telekom/Verizon*/AT&T*/T-Mobile/Sprint/SRRC*/NAL*/CCC*/GCF/CE/FCC/PTCRB/IC/KC*/NCC/JATE/TELEC/RCM/NBCT*/Telus/USCC/RoHS/UKCA	FCC/CE/IC/RCM/KC/TELEC/JATE/Deutsche Telekom/SKT*/Vodafone*/PTCRB/GCF/AT&T*/Verizon*/RoHS/SKT*/LGU+*/NTT DOCOMO*/KDDI*/Telstra*/ICASA	Vodafone*/Deutsche Telekom*/Verizon*/AT&T*/T-Mobile*/SKT*/LGU+*/NTT DOCOMO*/KDDI*/Telstra*/GCF*/CE/FCC/PTCRB*/IC/KC*/JATE/TELEC/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: For Voice Call only.

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

* Under development

LPWA Module Family

Product	BC66	BC66-NA	BC660K-GL	BC65	BC92	BC95-GV	BC68-GV
							
Form Factor	LCC	LCC	LCC	LCC	LCC	LCC	LCC
Dimensions (mm)	15.8 × 17.7 × 2.0	15.8 × 17.7 × 2.0	15.8 × 17.7 × 2.0	17.7 × 15.8 × 2.2	23.6 × 19.9 × 2.2	19.9 × 23.6 × 2.2	15.8 × 17.7 × 2.0
RAT	LTE Cat NB1	LTE Cat NB2	LTE Cat NB2	LTE Cat NB2	LTE Cat NB2/GSM	LTE Cat NB2	LTE Cat NB2
Frequency Bands (MHz)	LTE Cat NB1: B1/B2/B3/B4/B5/B8/B12/ B13/ B17/B18/B19/B20/ B25/B28/ B66/B26*	LTE Cat NB2: B1/B2/B3/B4/B5/B8/B12/ B13/B17/B18/B19/B20/ B25/B28/B66/B71/B85/ B26*	LTE Cat NB2: B1/B2/B3/B4/B5/B8/B12/ B13/B17/B18/B19/B20/ B25/B28/B66/B70/B85	LTE Cat NB2: B1*/B3/B5/B8/B20/B28	LTE Cat NB2: B3/B5/B8/B20/B28 GSM: 850/900/1800/1900MHz	B1 @H-FDD: 2100MHz; B3 @H-FDD: 1800MHz; B5 @H-FDD: 850MHz; B8 @H-FDD: 900MHz; B20 @H-FDD: 800MHz; B28 @H-FDD: 700MHz;	B1 @H-FDD: 2100MHz; B3 @H-FDD: 1800MHz; B5 @H-FDD: 850MHz; B8 @H-FDD: 900MHz; B20 @H-FDD: 800MHz; B28 @H-FDD: 700MHz;
Weight (approx.) g	1.2±0.2	1.2±0.2	1.0±0.2	1.2±0.2	1.8±0.1	1.5±0.2	1.0±0.2
Operating Temperature	-35°C ~ +75°C	-35°C ~ +75°C	-35°C ~ +75°C	-25°C ~ +75°C	-25°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	-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: 25.5 (DL)/ 62.5 (UL)	Single Tone: 25.5 (DL)/ 16.7 (UL) Multi-Tone: 25.5 (DL)/ 62.5 (UL)	Single-tone: 25.5 (DL) /16.7 (UL) Multi-Tone: 127 (DL) /158.5 (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)	Single Tone: 25.2 (DL) / 15.625 (UL) Multi-Tone: 25.2 (DL)/ 54 (UL)	Single Tone: 25.2 (DL)/ 15.625 (UL) Multi-Tone: 25.2 (DL)/ 54 (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)	Max. 127 (DL)/158.5 (UL)	Extended TBS/2 HARQ : 125 (DL)/150 (UL)	Extended TBS/2 HARQ : 125 (DL)/150 (UL)
GPRS data rate (Kbps)	/	/	/	/	GPRS Class 12: Max. 85.6 (DL)/85.6 (UL)	/	/
SMS	•	•	•	•	•	•	•
Protocols	UDP/TCP/LwM2M/MQTT/ SNTP/PPP/CoAP/TLS/ DTLS/ HTTP/HTTPS	UDP/TCP/LwM2M/MQTT/ SNTP/PPP*/CoAP*/TLS/ DTLS/HTTP*/HTTPS*	UDP/TCP/PING/LwM2M/ SNTP/MQTT/MQTS/SSL/TLS	UDP/TCP/SNTP/MQTT/CoAP*/ PPP/TLS/DTLS	UDP/TCP/SNTP/PPP/MQTT/ CoAP*/HTTP*/HTTPS*/FTP	IPv4/IPv6/UDP/TCP/ Non-IP/CoAP/LwM2M/ DTLS/MQTT/HTTP*/DNS/ TLS*/MQTT*	IPv4/IPv6/UDP/TCP/ Non-IP/CoAP/LwM2M/ DTLS/MQTT/HTTP*/DNS/ TLS*/MQTT*
Interfaces							
(U)SIM	1.8V	1.8V	1.8/3.0V	1.8V/3.0V	1.8V/3.0V	× 1 Supports 1.8V/ 3.0V	× 1 Supports 1.8V/ 3.0V
UART	× 3 (MAIN, DEBUG, AUX)	× 3 (MAIN, DEBUG, AUX)	UART × 2 (for QuecOpen* version, × 3)	× 3 (MAIN, DEBUG, AUX)	× 2 (MAIN, DEBUG)	× 2 (QuecOpen** Version: × 3)	× 2 (QuecOpen** Version: × 3)
I2C	× 1 (QuecOpen Version Only)	× 1 (QuecOpen Version Only)	× 1 (QuecOpen Version only)	/	/	Max. × 4 (QuecOpen** Version Only)	Max. × 3 (QuecOpen** Version Only)
ADC	× 1	× 1	ADC × 1 (for QuecOpen* version, × 2)	× 1	× 1	× 2 (QuecOpen** Version: × 4)	× 2 (QuecOpen** Version: × 3)
GPIO	Config (QuecOpen Version Only)	Config (QuecOpen Version Only)	GPIO × 4 (for QuecOpen* version, × 13)	/	/	Config (QuecOpen** Version Only)	Config (QuecOpen** Version Only)
RESET(RESET_N)	× 1	× 1	× 1	× 1	× 1	× 1	× 1
SPI	× 1 (QuecOpen Version Only)	× 1 (QuecOpen Version Only)	SPI × 1 (for QuecOpen* version only)	/	/	× 2 (QuecOpen** Version Only)	× 2 (QuecOpen** Version Only)
PWM	× 1 (QuecOpen Version Only)	× 1 (QuecOpen Version Only)	× 1 (QuecOpen Version Only)	/	/	× 2 (QuecOpen** Version Only)	× 2 (QuecOpen** Version Only)
RI	× 1	× 1	× 1	× 1	× 1	× 1	× 1
PSM_EINT	× 1	× 1	PSM_ENIT × 1 (for QuecOpen* version, × 2)	× 1	× 1	/	/
I2S	× 1 (QuecOpen Version Only)	× 1 (QuecOpen Version Only)	/	/	/	/	/
NETLIGHT	/	/	× 1	/	/	× 1	× 1
WAKEUP_OUT	/	/	/	/	/	× 1	× 1
Antenna	Primary	Primary	Primary	Primary	Primary	Pads for Primary	Pads for Primary
Enhanced Features							
QuecOpen*	•	•	•	/	/	•	•
DFOTA	•	•	•	•	•	•	•
BLE 5.0	/	/	/	/	/	•	•
Firmware Update	via UART/ DFOTA	via UART/ DFOTA	via UART/ DFOTA	via UART/ DFOTA	via UART/ DFOTA	via UART/DFOTA/DFOTA Over BLE	via UART/DFOTA/DFOTA Over BLE
RAI	•	•	•	•	•	•	•
Location Based Service	/	ECID* , OTDOA*	/	ECID, OTDOA	ECID, OTDOA	ECID, OTDOA	ECID, OTDOA
eSIM*	Optional	Optional	Optional	Optional	Optional	Optional	Optional
Electrical Features							
Supply Voltage Range	2.1V~3.63V, 3.3V Typ.	2.1V~3.63V, 3.3V Typ.	2.2~4.3 V, 3.3 V Typ.	3.2V~4.2V, 3.8V Typ.	3.4V~4.2V, 3.8V Typ.	2.1~4.2 V, typical 3.0/3.6 V	2.1~4.2 V, typical 3.0/3.6 V
Power Consumption	3.5µA@ PSM	3.6µA@ PSM	800 nA @ PSM	4µA @PSM	4µA @PSM	2 µA ¹ @ PSM 0.15 mA @ Idle Mode, DRX = 2.56 s, ECIO 320 mA @ Tx, 23 dBm (B1) 310 mA @ Tx, 23 dBm (B3) 220 mA @ Tx, 23 dBm (B5/ B8/B20/28) 50 mA @ Tx, 0 dBm (B1) 45 mA @ Tx, 0 dBm (B3) 35 mA @ Tx, 0 dBm (B5/ B8/B20/B28) 23 mA @ Rx	2 µA ¹ @ PSM 0.15 mA @ Idle Mode, DRX = 2.56 s, ECIO 310 mA @ Tx, 23 dBm (B1) 300 mA @ Tx, 23 dBm (B3) 250 mA @ Tx, 23 dBm (B5/ B8/B20/28) 50 mA @ Tx, 0 dBm (B1) 45 mA @ Tx, 0 dBm (B3) 35 mA @ Tx, 0 dBm (B5/ B8/B20/B28) 23 mA @ Rx
Certifications	NCC/IC/CE/RCM/GCF/FCC/ PTCRB/JATE/TELEC/KC/ NBTC/T-Mobile/Altice/ TIM(Telecom Italia)/ Vodafone/ATEX/IMDA/ AT&T/LGU+*/Softbank/ Telstra/Telefonica/ Deutsche Telekom/ Altice-MEO/Verizon	NCC/IC/CE/RCM/GCF/ FCC/PTCRB/JATE/TELEC/ KC/NBTC*/T-Mobile/ Vodafone/ATEX*/IMDA*/ AT&T/LGU+*/Softbank*/ Telstra*/Telefonica*/ Deutsche Telekom/ Verizon	CE/RCM/FCC/IC/PTCRB*/ GCF*/AT&T*/Verison*/DT/ Vodafone/KC/LGU+*/KT*/ ICASA/Anatel	CE/RCM/GCF/Deutsche Telekom/Vodafone	CE/RCM/GCF/Vodafone/ MTN/ICASA/Vodacom/ Anatel/FAC	CE*/GCF*/RCM*/NCC*/ JATE*/TELEC*/KC*/NBTC*/ Vodafone*/Global*/ Deutsche Telekom*/ Telstra*/Softbank*/KT*/ Telefónica*/LGU+*/ATEX*/ IMDA*/ANATEL*/FAC*	CE*/GCF*/RCM*/NCC*/ JATE*/TELEC*/IMDA* / Deutsche Telekom*/ Vodafone*/Telstra* / ATEX*/Softbank*/KC*/ Telefónica*/TIM*/ Altice-MEO*/FAC*
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 platform.

* Under development

Automotive Module Family

Product	AG15
	
Form Factor	LGA
Dimensions (mm)	32.0 × 28.0 × 2.85
C-V2X TDD	B47 for Global B46D for Japan (optional)
Weight (approx.) g	5.735
Operating Temperature	-40 °C ~ +85 °C
Data Transmission	
LTE data rate (Mbps)	C-V2X TDD: Max. 26 (TX)/Max. 26 (RX)
Protocols	QMI (Qualcomm MSM Interface)
Interfaces	
UART	× 2
USB	USB2.0/3.0×1
PCIe	× 2 (1 for PCM)
SPI	× 1
I2C	× 2 for Wi-Fi and eMMC
1PPS	× 1
ADC	× 2
GPIO	× 4
Antenna	Main, Rx-diversity and GNSS
Enhanced Features	
High Security	•
Secure Boot*	•
SELinux*	•
ESD/EMI Protection	•
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	•
Android 4.x/5.x/6.x/7.x/8.x	•
PCIe Driver	•
Protocol	QMI (Qualcomm MSM Interface)
Electrical Features	
Output Power	Class 3 (23dBm±2dB) for C-V2X
Supply Voltage	VBAT_BB: 3.3V~4.3V, 3.8V Typ. VBAT_RF: 4.75V~5.25V, 5.0V Typ.
Power Consumption	80μA@PowerOff
Sensitivity	C-V2X TDD B47: -96dBm C-V2X TDD B46D: -96dBm
Certifications	TBD
Recommended Applications	Automotive

Product	AG215S
	
Form Factor	LGA
Dimensions (mm)	33.5 × 33.0 × 3.25
Weight (approx.) g	7.07
Operating Temperature	-40 °C ~ +85 °C
Application Processor Module	Automotive Grade Application Processor for C-V2X and Telematics
Interfaces	
SDIO	•
PCIe	PCIe Gen2*
USB	USB 3.0*1 and USB2.0*1
RGMII	RGMII 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

Automotive Module Family

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/B3/B5/B7/B8/B20/B28; LTE-TDD: B38/B40; WCDMA: B1/B5/B8; GSM: B3/B8 -CE (China/India) LTE-FDD: B1/B3/B5/B8; LTE-TDD: B34/B38/B39/B40/B41; WCDMA: B1/B8 TD-SCDMA: B34/B39; CDMA2000 1X/EVDO(Optional): BC0; GSM: B3/B8 -NA (North America) LTE-FDD: B2/B4/B5/B7/B12(B17)/B13; WCDMA: B2/B4/B5; GSM: B2/B5 -J (Japan) LTE-FDD: B1/B3/B5/B8/B9/B19/B21/B28; LTE-TDD: B41; WCDMA: B1/B3/B5/B6/B8/B19 -LA (Latin America) LTE-FDD: B1/B2/B3/B4/B5/B7/B8/B28; WCDMA: B1/B2/B3/B4/B5/B8; GSM: B2/B3/B5/B8
Weight (approx.) g	8.1
Operating Temperature	-40°C ~ +85°C
Data Transmission	
LTE data rate	LTE-FDD: Max. 150Mbps (DL)/ Max. 50Mbps (UL) LTE-TDD: Max. 130Mbps (DL)/ Max. 30Mbps (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
Interfaces	
(U)SIM	× 1 (Support 1.8V/ 3V 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
Enhanced Features	
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
Advanced Security Feature	
TrustZone	•
Secure Boot	•
Code/User Data Backup	•
Software Features	
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
Electrical Features	
Supply Voltage Range	3.3V~4.3V, 3.8V Typ.
Power Consumption	20μA @Power off/ 1.9mA @LTE Sleep, PF=128/ 1.6mA @LTE Sleep, PF=256/ 22mA @Idle, Typ.
Certifications	CCC/SRRC/NAL/GCF/CE/FCC/KC/RCM/Anatel/KT/STK*/LGU+*/PTCRB/IC/AT&T/ Rogers/T-Mobile/Verizon/JATE/TELEC/NTT DOCOMO
Recommended Applications	Automotive

* Under development

Automotive LTE-A Module Family

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/B3/B5/B7/B8/B34/B38/B39/B40/B41; UMTS: B1/B8; CDMA(Optional): BC0; GSM: 1800MHz/900MHz
	-EU (EMEA/ Korea/ Brazil/ India/ Australia) LTE: B1/B3/B5/B7/B8/B20/B28/B32(DL)/B38/B40/B41; UMTS: B1/B3/B5/B8; GSM: 1800MHz/900MHz
	-NA (North America) LTE-FDD: B2/B4/B5/B7/B12/B13/B14/B25/B26/B29 ¹ /B30 ¹ /B66/B71
	-JP (Japan) LTE-FDD: B1/B3/B5/B8/B9/B11/B18/B19/B21/B28; LTE-TDD: B41; WCDMA: B1/B3/B5/B8/B9/B19
	-GL (Global) LTE-FDD: B1/B2/B3/B4/B5/B7/B8/B9/B11/B12/B13/B18/B19/B20/B21/B25/B26/B28/B29 ¹ /B30 ¹ /B32 ¹ /B66/B71; LTE-TDD: B34/B38/B39/B40/B41 ; WCDMA: B1/B2/B3/B4/B5/B6/B8/B19; GSM: 850/900/1800/1900MHz
Weight (approx.) g	9.23
Operating Temperature	-40°C ~ +85°C (eCall: +95°C)
Data Transmission	
LTE data rate	AG521R series/AG525R series LTE Cat 12: LTE-FDD: Max. 600Mbps (DL)/150Mbps (UL), LTE-TDD: Max. 410Mbps (DL)/90Mbps (UL) LTE Cat 6: LTE-FDD: Max. 300Mbps (DL)/50Mbps (UL), LTE-TDD: Max. 226Mbps (DL)/28Mbps (UL) AG520R series LTE Cat 12: LTE-FDD: Max. 600Mbps (DL)/75Mbps (UL), LTE-TDD: Max. 410Mbps (DL)/45Mbps (UL) LTE Cat 6: LTE-FDD: Max. 300Mbps (DL)/50Mbps (UL), LTE-TDD: Max. 226Mbps (DL)/28Mbps (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: 3.3V~4.3V (3.8V Typ.) , VBAT_C-V2X: 4.75V~5.25V (5.0V Typ.)
Power Consumption	0.021mA@Power off/ 2.03mA@LTE Sleep, PF=128/1.61mA @LTE Sleep, PF=256; 15.9mA@Idle, PF=64/27.2mA@Idle, PF=64, USB Active
Certifications	CCC/SRRC/NAL/FCC/IC/PTCRB/GCF/CE/RCM/Verizon/AT&T/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.

* Under development

Automotive LTE-A Module Family

Product		AG519M
		
Form Factor		LGA
Dimensions (mm)		42.0 × 38.0 × 3.05
4G		LTE Cat 6
Frequency Bands (MHz)	-CN (China/India)	LTE FDD: B1/B3/B5/B8; LTE TDD: B34/B38/B39/B40/B41 WCDMA: B1/B8; GSM: 900/1800MHz
	-EU (EMEA/ Korea/ Australia/Southeast Asia/ Brazil)	LTE FDD: B1/B3/B5/B7/B8/B20/B28; LTE TDD: B38/B41 WCDMA: B1/B5/B8; GSM: 900/1800MHz
	-NA (North America/ Mexico/Latin America)	LTE FDD: B2/B4/B5/B7/B12/B13/B17/ B28/B29/B30/B66/B71; WCDMA: B2/B4/B5;GSM: 850/1900MHz
	-JP (Japan)	LTE FDD: B1/B3/B5/B7/B8/B9/B11/B19/B21/B28; LTE TDD: B41 WCDMA: B1/B3/B5/B8/B9/B19
Weight (approx.) g		10
Operating Temperature		-40 °C ~ +85 °C (eCall: +95 °C)
Data Transmission		
LTE FDD Data Rate		Max. 300Mbps (DL)/ Max. 50Mbps (UL)
LTE TDD Data Rate		Max. 240Mbps (DL)/ Max. 30Mbps (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
Interfaces		
(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
Enhanced Features		
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
Advanced Security Feature		
TrustZone/ TPM*		•
Secure Boot		•
SE-Linux		•
Software Features		
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
Electrical Features		
Supply Voltage Range		VBAT_BB/VBAT_RF: 3.8V~4.3V (4.0V Typ.)
Power Consumption		TBD @Power off TBD @Sleep, Typ. TBD @Idle
Certifications		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.

* Under development

Automotive 5G Module Family

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 ¹ /n3 ¹ /n28 ¹ ; 5G-TDD: n41/n78/n79; LTE-FDD: B1/B3/B5/B7/B8; LTE-TDD: B34/B38/B39/B40/B41; WCDMA: B1/B8; 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/n3/n8/n20/n28; 5G-TDD: n41/n78; LTE-FDD: B1/B2/B3/B4/B5/B7/B8/B20/B28/B32 ² ; LTE-TDD: B38/B40/B41/B42; WCDMA: B1/B3/B5/B6/B8; GSM: 900/1800/850/1900 MHz; C-V2X: B47 (For AG550Q/AG553Q Series)
	-NA (North America/ Mexico)	5G-FDD: n2/n5/n25/n66/n71; 5G-TDD: n41/n48/n77/n78; LTE-FDD: B2/B4/B5/B7/B12/B13/B14/B17/B25/B26/B28/B29 ² /B30 ² /B66/B71; LTE-TDD: B41/B48; WCDMA: B2/B4/B5; GSM: 1900 MHz; C-V2X: B47 (For AG550Q/AG553Q Series)
	-JP* (Japan)	5G-FDD: n1/n3; 5G-TDD: n77/n78/n79; LTE-FDD: B1/B3/B5/B7/B8/B9/B11/B19/B21/B28; LTE-TDD: B41; WCDMA: B1/B3/B5/B8/B9/B19; C-V2X: B47 (For AG550Q/AG553Q Series)
Weight (approx.) g		21
Operating Temperature		-40°C ~ +85°C (eCall: +95°C)
Data Transmission		
5G SA		Max. 2.0Gbps (DL)/450Mbps (UL)
5G NSA		Max. 2.4Gbps (DL)/550Mbps (UL)
LTE FDD Data Rate		Max. 1.6Gbps (DL)/ Max. 200Mbps (UL)
LTE TDD Data Rate		Max. 1.4Gbps (DL)/ Max. 120Mbps (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
Interfaces		
(U)SIM		× 2 (Support 1.8V/ 3V 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
Enhanced Features		
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
Advanced Security Feature		
TrustZone/ TPM*		•
Secure Boot		•
SE-Linux		•
Software Features		
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
Electrical Features		
Supply Voltage Range		VBAT_BB/VBAT_RF: 3.3V~4.3V (3.8V Typ.) ; VBAT_C-V2X: 4.75V~5.25V (5.0V Typ.)
Power Consumption		0.04mA @Power off; 1.4mA @Sleep(Typ.); 25.0mA @Idle
Certifications		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.

* Under development

Automotive 5G Module Family

Product		AG57xQ
		
Form Factor		LGA
Dimensions (mm)		54.5 × 53.0 × 3.45
5G		Sub-6G
4G		LTE Cat 15
Frequency Bands (MHz)	-CN (China)	5G FDD: n1/n3/n28A ¹ ; 5G TDD: n41/n77/n78/n79 ² ; LTE FDD: B1/B3/B5/B7/B8; LTE TDD: B34/B38/B39/B40/B41; WCDMA: B1/B8; GSM: 900/1800MHz
	-EU (EMEA/Australia, Korea/India/ Southeast Asia/Latin America exl. Mexico)	5G FDD: n1/n3/n5 ³ or n71 ² /n8/n20/n28A; 5G TDD: n38 ² /n40 ² /n41/n78; LTE FDD: B1/B3/B5 ³ or B71 ² /B7/B8/B20/B28A/B32 ² ; LTE TDD: B38/B40/B41/B42 ² WCDMA: B1/B3/B5 ³ /B8; GSM: 900/1800MHz
	-NA (North America/ Mexico)	5G FDD: n2/n5/n12/n25/n66/n71; 5G TDD: n41/n78; LTE FDD: B2/B4/B5/B7/B12/B13/B14/B17/B25/B26/B29 ³ /B30 ³ /B66/B71; LTE TDD: N41; WCDMA: B41
	-ROW (Japan, Latin America)	5G FDD: n1/n3/n28; 5G TDD: n41/n77/n78/n79 ² ; LTE FDD: B1/B2/B3/B4/B5/B7/B8/B9/B11 ² /B18/B19/B21/B26/B28; WCDMA: B1/B3/B5/B6/B7/B8/B9/B19; GSM: 900/1800/850/1900MHz
Weight (approx.) g		TBD
Operating Temperature		-40 °C ~ +85 °C (eCall: +95 °C)
Data Transmission		
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
Interfaces		
(U)SIM		×2
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/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
Enhanced Features		
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
Advanced Security Feature		
TrustZone/ TPM*		•
Secure Boot		•
SE-Linux		•
Software Features		
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
Electrical Features		
Supply Voltage Range		VBAT_BB/VBAT_RF: 3.3V~4.3V (3.8V Typ.) VBAT_C-V2X: 4.75V~5.25V (5.0V Typ.)
Power Consumption		TBD @Power off, TBD @Sleep, Typ., TBD @Idle
Certifications		CCC*/SRRC*/NAL*/FCC*/IC*/PTCRB*/GCF*/AT&T*/CE*/KC*/JATE*/TELEC*/RCM*
Recommended Applications		Automotive

Note 1: n28A supports Tx: 703~733 MHz, Rx:758~788 MHz.

Note 2: Optional.

Note 3: LTE-FDD B29/B30/B32 supports Rx only.

* Under development

Automotive 5G Module Family

Product		AG568N	AG569N
			
Form Factor		LGA	LGA
Dimensions (mm)		45.0 × 46.9 × 3.25	54.5 × 53.0 × 3.65
5G		Sub-6G	Sub-6G
4G		LTE Cat 18	LTE Cat 18
Frequency Bands (MHz)	-CN (China)	5G FDD: n1/n3/n28A ¹ ; 5G TDD: n41/n78; LTE FDD: B1/B3/B5/B7/B8; LTE TDD: B34/B38/B39/B40/B41 WCDMA: B1/B8; GSM: 900/1800MHz	5G FDD: n1/n3/n28A ¹ ; 5G TDD: n41/n78; LTE FDD: B1/B3/B5/B7/B8; LTE TDD: B34/B38/B39/B40/B41; WCDMA: B1/B8; GSM: 900/1800MHz
	-EU (EMEA/ Korea/ Australia/ India/ Southeast Asia)	5G FDD: n1/n3/n8/n20/n28; 5G TDD: n41/n78; LTE FDD: B1/B3/B5/B7/B8/B20/B28/B32 ² ; LTE TDD: B38/B40/B41 WCDMA: B1/B3/B5/B8; GSM: 900/1800/850MHz	5G FDD: n1/n3/n8/n20/n28; 5G TDD: n41/n78; LTE FDD: B1/B3/B5/B7/B8/B20/B28/B32 ² ; LTE TDD: B38/B40/B41 WCDMA: B1/B3/B5/B8; GSM: 900/1800/850MHz
	-NA (North America)	5G FDD: n2/n5/n12/n25/n66/n71; 5G TDD: n41/n78; LTE FDD: B2/B4/B5/B7/B12/B13/B14/B17/B25/ B26/B29 ³ /B30 ³ /B66/B71; LTE TDD: B38/B41/B48; WCDMA: B2/B4/B5	5G FDD: n2/n5/n12/n25/n66/n71; 5G TDD: n41/n78; LTE FDD: B2/B4/B5/B7/B12/B13/B14/B17/B25/ B26/B29 ³ /B30 ³ /B66/B71; LTE TDD: B38/B41/B48; WCDMA: B2/B4/B5
	-ROW (Japan/ Latin America/ Brazil/ Mexico/...)	5G FDD: n1/n3/n20/n28; 5G TDD: n41/n77/n78/n79; LTE FDD: B1/B3/B4/B5/B7/B8/B9/B1 ¹ / B18/ B19/B20/B21/B26/B28; LTE TDD: B38/B40/B41 WCDMA: B1/B3/B5/B6/B8/B9/B19; GSM: 900/1800/850/1900 MHz	5G FDD: n1/n3/n20/n28; 5G TDD: n41/n77/n78/n79; LTE FDD: B1/B3/B4/B5/B7/B8/B9/B1 ¹ / B18/ B19/B20/B21/B26/B28; LTE TDD: B38/B40/B41 WCDMA: B1/B3/B5/B6/B8/B9/B19; GSM: 900/1800/850/1900 MHz
	Weight (approx.) g	16	22
Operating Temperature		-40 °C ~ +85 °C (eCall: +95 °C)	-40 °C ~ +85 °C (eCall: +95 °C)
Data Transmission			
5G SA		Max. 4.0Gbps (DL)/450Mbps (UL)	Max. 4.0Gbps (DL)/450Mbps (UL)
5G NSA		Max. 2.2Gbps (DL)/480Mbps (UL)	Max. 2.2Gbps (DL)/480Mbps (UL)
LTE FDD Data Rate		Cat18: Max. 1.4Gbps (DL)/ Max. 200Mbps (UL) Cat6:Max. 300Mbps (DL)/ Max. 50Mbps (UL)	Cat18: Max. 1.4Gbps (DL)/ Max. 200Mbps (UL) Cat6:Max. 300Mbps (DL)/ Max. 50Mbps (UL)
LTE TDD Data Rate		Cat18: Max. 1.4Gbps (DL)/ Max. 200Mbps (UL) Cat6:Max. 300Mbps (DL)/ Max. 50Mbps (UL)	Cat18: Max. 1.4Gbps (DL)/ Max. 200Mbps (UL) Cat6:Max. 300Mbps (DL)/ Max. 50Mbps (UL)
DC-HSDPA/HSUPA 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)
C-V2X Data Rate (Mbps)		/	TBD
SMS		Point-to-point MO and MT; SMS Cell Broadcast; Text and PDU Mode	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	TCP/UDP/PPP/PING/FTP(S)/HTTP(S)/SMTP/SSL/TLS/MMS/NTP/DTMF*/FILE
Interfaces			
(U)SIM		× 2	× 2
UART		× 4	× 3
USB 2.0/3.1		× 1	× 1
PCIe 3.0		× 1	× 1
IIC		× 2	× 2
IIS		× 1	× 1
RGMII		× 1	× 1
SGMII		× 1	× 1
SDIO		× 1	× 1
SPI		× 3	× 2
Audio Digital (PCM)		× 1	× 1
ADC		× 6	× 6
GPIO		× 24	× 21
RESET_N		× 1	× 1
Antenna		Main × 1; Diversity × 1; MIMO 3 × 1; MIMO 4 × 1; GNSS × 1	Main × 1; Diversity × 1; MIMO 3 × 1; MIMO 4 × 1; C-V2X × 2; GNSS × 1
Enhanced Features			
QuecoOpen® (Open Linux)		•	•
eCall		•	•
Dual/AB System*		•	•
eSIM (eUICC)		•	•
(U)SIM Detection		•	•
Temperature Management		•	•
GNSS		GPS/ GLONASS/ BeiDou/ Galileo	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)	Realized through Internal Specific Circuits and Components (Electrostatic Discharge Conforms to ±12KV air discharge and ±8KV of contact discharge)
Gigabit Ethernet		Optional	Optional
C-V2X TDD B47		/	•
RTK/ADR		Optional	Optional
Multi-Frequency GNSS (L1/L5)		Optional	Optional
UART Interface for BT Function		Optional	Optional
Advanced Security Feature			
TrustZone/ TPM*		•	•
Secure Boot		•	•
SE-Linux		•	•
Software Features			
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
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
RNDIS		Windows 7/8.1/10, Linux 2.6~5.0	Windows 7/8.1/10, Linux 2.6~5.0
ECM		Linux 2.6~5.0	Linux 2.6~5.0
Gobinet		Linux 2.6~5.0, Android 4.x/ 5.x/ 6.x/ 7.x/ 8.x/ 9.x	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	Linux 3.4~5.0, Android 4.x/5.x/6.x/7.x/8.x/9.x
USB Serial Driver		Windows 7/8.1/10, Linux 2.6~5.0, Android 4.x/5.x/6.x/7.x/8.x/9.x	Windows 7/8.1/10, Linux 2.6~5.0, Android 4.x/5.x/6.x/7.x/8.x/9.x
Electrical Features			
Supply Voltage Range		VBAT_BB/VBAT_RF: 3.3V~4.3V (3.8V Typ.)	VBAT_BB/VBAT_RF: 3.3V~4.3V (3.8V Typ.) VBAT_C-V2X: 4.75V~5.25V (5.0V Typ.)
Power Consumption		TBD @Power off TBD @Sleep, Typ. TBD @Idle	TBD @Power off TBD @Sleep, Typ. TBD @Idle
Certifications		CCC/SRRC/NAL/FCC*/IC*/PTCRB*/GCF*/AT&T*/CE*/KC*/JATE*/TELEC*/RCM*	CCC/SRRC/NAL/FCC*/IC*/PTCRB*/GCF*/AT&T*/CE*/KC*/JATE*/TELEC*/RCM*
Recommended Applications		Automotive	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.

* Under development

Wi-Fi & BT Module Family

	Automotive Wi-Fi & BT Modules				
Product	AF20	AF50T	AF51Y	AF56C*	AH20C*
					
Band	2.4/5	2.4/5	2.4/5	2.4/5	2.4
MIMO	/	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	BT 5.0
Form Factor	LGA	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	13 × 13 × 2.35
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	1.26	2.1	2.32	TBD	TBD
General Features					
Function	Wi-Fi 2.4GHz + 5GHz & BT 5.0	Wi-Fi 2.4GHz + 5GHz & BT 5.2	Wi-Fi 2.4GHz + 5GHz & BT 5.2	Wi-Fi 2.4GHz + 5GHz & BT 5.2	BT 5.0
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	GFSK/π/4-DQPSK/8-DPSK/Gaussian
Encryption Mode	WEP/TKIP/AES/WPA-PSK/WPA2-PSK	WPA3	WPA3	WPA3	/
AP (Max Access Point)	16	32	32	TBD	/
Operator Mode	AP/STA	AP/STA	AP/STA	AP/STA	/
I/O Interfaces					
PCIe	/	1 (PCIe 2.0)	1 (PCIe 2.0)	1	/
SDIO	1 (SDIO 3.0)	/	/	/	/
UART	1	1	1	1	1
PCM	1	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	1 BT Ant
Electrical Characteristics					
Supply Voltage Range	Core Supply Voltage : 3.3V; I/O Supply Voltage : 1.8V	Core Supply Voltage : 0.95V, 1.35V, 1.95V; I/O Supply Voltage : 1.8V; RF Supply Voltage : 3.85V	PA Supply Voltage: 2.2V I/O Supply Voltage: 1.8V Core Supply Voltage: 1.8V	Core Supply Voltage: 3.3V I/O Supply Voltage: 1.8V	Core Supply Voltage: 3.3V I/O Supply Voltage: 1.8V
Power Consumption	TBD	TBD	TBD	TBD	TBD
Data Transmission					
802.11a	Max. 54Mbps	Max. 54Mbps	Max. 54Mbps	Max. 54Mbps	/
802.11b	Max. 11Mbps	Max. 11Mbps	Max. 11Mbps	Max. 11Mbps	/
802.11g	Max. 54Mbps	Max. 54Mbps	Max. 54Mbps	Max. 54Mbps	/
802.11n	Max. 135Mbps	Max. 600Mbps	Max. 300Mbps	Max. 600Mbps	/
802.11ac	Max. 433Mbps	Max. 866Mbps	Max. 866Mbps	Max. 866Mbps	/
802.11ax	/	Max. 1774.5Mbps	/	Max. 1.2Gbps	/
BLE	Max. 1Mbps	Max. 2Mbps	Max. 2Mbps	Max. 2Mbps	Max. 2Mbps
Recommended Applications	Automotive	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 Module Family

	Non-Automotive Wi-Fi & BT Modules (Wi-Fi 4)		Non-Automotive Wi-Fi & BT Modules (Wi-Fi 5)	
Product	FC30R	FC20	FC21	FC80A
				
Band	2.4GHz	2.4GHz+5GHz	2.4GHz+5GHz	2.4GHz+5GHz
MIMO	1 × 1	1 × 1	1 × 1	2 × 2 or 1 × 1 + 1 × 1 in RSDB (Real Simultaneous Dual Band) mode
WLAN Standard	IEEE 802.11b/g/n	IEEE 802.11a/b/g/n/ac	IEEE 802.11a/b/g/n/ac	IEEE 802.11a/b/g/n/ac/ax
BT Standard	/	BT 5.0	BT 5.0	BT 5.0
Form Factor	LCC	LCC	LCC	LCC
Dimensions (mm)	12.0 × 12.0 × 2.1	16.6 × 13.0 × 2.05	16.6 × 13.0 × 2.05	15 × 13 × 2.2
Operating Temperature	-30° C ~ +85° C	-40° C ~ +85° C	-40° C ~ +85° C	-30° C ~ +75° C
Weight (approx.) g	0.58	0.81	0.73	0.86
General Features				
Function	Wi-Fi 2.4GHz	Wi-Fi 2.4GHz+5GHz & BT 5.0	Wi-Fi 2.4GHz + 5GHz & BT 5.0	Wi-Fi 2.4GHz + 5GHz + BT 5.0
Modulation Mode	BPSK/QPSK/CCK/16QAM/64QAM	CCK/BPSK/QPSK/16QAM/64QAM/ 256QAM	BPSK/QPSK/CCK/16QAM/64QAM/ 256QAM	BPSK/QPSK/CCK/16QAM/64QAM/ 256QAM
Encryption Mode	TKIP/AES/WPA-PSK/WPA2-PSK	WEP/TKIP/AES/WPA-PSK/WPA2-PSK	WEP/TKIP/AES/WPA-PSK/WPA2-PSK	WPA3
AP (Max Access Point)	16	16	16	TBD
Operator Mode	AP/STA	AP/STA	AP/STA	AP/STA
I/O Interfaces				
SDIO	1 (SDIO 3.0)	1 (SDIO 3.0)	1 (SDIO 3.0)	1
UART	/	1	1	1
PCM	/	1	1	1
Antenna	1 (Wi-Fi Antenna)	1 (Wi-Fi & BT Antenna)	1 (Wi-Fi & BT Antenna)	2 × Wi-Fi Ant. with shared BT Ant. independant BT ant is optional
Electrical Characteristics				
Supply Voltage Range	3.0 ~ 3.6V, 3.3V Typ. 1.75 ~ 1.89V, 1.8V Typ.	3.14 ~ 3.46V, 3.3V Typ. 1.71 ~ 3.46V, 1.8V/3.3V Typ.	3.14 ~ 3.46V, 3.3V Typ. 1.71 ~ 3.46V, 1.8V/3.3V Typ.	Power Supply Voltage: 3.2V-4.5V I/O Supply Voltage: 1.7V-3.6V, 1.8V/3.3V
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	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	TBD
Data Transmission				
802.11a	/	Max. 54Mbps	Max. 54Mbps	Max. 54Mbps
802.11b	Max. 11Mbps	Max. 11Mbps	Max. 11Mbps	Max. 11Mbps
802.11g	Max. 54Mbps	Max. 54Mbps	Max. 54Mbps	Max. 54Mbps
802.11n	Max. 150Mbps	Max. 150Mbps	Max. 150Mbps	Max. 300Mbps
802.11ac	/	Max. 433Mbps	Max. 433Mbps	Max. 866Mbps
802.11ax	/	/	/	/
BLE	/	Max. 2Mbps	Max. 2Mbps	Max. 2Mbps
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.		Smart Home, Industrial Controls

FC30R can work with Quectel EC20 R2.1/EC21/EC25 module to provide Wi-Fi/BT function.
 FC20 can work with Quectel EC20 R2.0/EC20 R2.1/EC21/EC25 modules to provide Wi-Fi/BT function.
 FC21 can work with Quectel EC20 R2.0/EC20 R2.1/EC21/EC25 modules to provide Wi-Fi/BT function.

* Under development

Wi-Fi & BT Module Family

	Non-Automotive Wi-Fi & BT Modules (Wi-Fi 6)	
Product	FG50V*	FC62E*/FC64E*
		
Band	2.4GHz + 5GHz	2.4GHz + 5GHz
MIMO	2 × 2(support DBS)	2 × 2 (FC64E support DBS, FC62E not support DBS)
WLAN Standard	IEEE 802.11a/b/g/n/ac/ax	IEEE 802.11a/b/g/n/ac/ax
BT Standard	BT 5.2	BT 5.2
Form Factor	LGA	LCC
Dimensions (mm)	19.5 × 21.5 × 2.1	18 × 19.9 × 2.1
Operating Temperature	-30°C ~ +85°C	-30°C ~ +85°C
Weight (approx.) g	2.3	1.63
General Features		
Function	Wi-Fi 2.4GHz + 5GHz & BT 5.2	Wi-Fi 2.4GHz + 5GHz & BT 5.2
Modulation Mode	BPSK/QPSK/CCK/16QAM/64QAM/256QAM/1024QAM	DBPSK/DQPSK/CCK/BPSK/QPSK/QAM
Encryption Mode	WPA3	WPA3
AP (Max Access Point)	32	32
Operator Mode	AP/STA	AP/STA
I/O Interfaces		
PCIe	1 (PCIe 3.0)	1 (PCIe 3.0)
UART	1	1
PCM	1	1
Antenna	2 × Wi-Fi Ant with shared BT Ant, independant BT ant is optional	2 × Wi-Fi Ant with shared BT Ant, independant BT ant is optional
Electrical Characteristics		
Supply Voltage Range	Core Supply Voltage : 0.95V, 1.35V, 1.95V; I/O Supply Voltage: 1.8V; RF Supply Voltage: 3.85V	Core Supply Voltage: 0.95, 1.35, 1.95, 1.8, 2.2, 3.3(Optional) I/O Supply Voltage: 1.8V;
Power Consumption	Max. current in 802.11ax DBSmode (transmitting in FTMmode): 517 mA @ 0.95 V 1116 mA @ 3.85 V 147 mA @ 1.95 V 276 mA @ 1.35 V 3 mA @ 1.8 V	TBD
Data Transmission		
802.11a	Max. 54Mbps	Max. 54Mbps
802.11b	Max. 11Mbps	Max. 11Mbps
802.11g	Max. 54Mbps	Max. 54Mbps
802.11n	Max. 600Mbps	Max. 600 Mbps
802.11ac	Max. 866Mbps	Max. 866 Mbps
802.11ax	Max. 1774.5Mbps	Max. 1174.5 Mbps
BLE	Max. 2Mbps	Max. 2Mbps
Recommended Applications	CPE, MIFI, OTT, Smart TV	

FG50V can work with Quectel RG500Q module to provide Wi-Fi/BT function.

* Under development

Wi-Fi & BT Module Family

	Non-Automotive Wi-Fi & BT Modules (Wi-Fi 6E)
Product	FC65E*/FC66E*
	
Band	2.4GHz + 5GHz + 6GHz
MIMO	2 × 2 (FC66E support DBS, FC65E not support DBS)
WLAN Standard	IEEE 802.11a/b/g/n/ac/ax
BT Standard	BT 5.2
Form Factor	LCC
Dimensions (mm)	18 × 19.9 × 2.1
Operating Temperature	-30°C ~ +85°C
Weight (approx.) g	1.63
General Features	
Function	Wi-Fi 2.4GHz + 5GHz + 6GHz & BT 5.2
Modulation Mode	DBPSK/DQPSK/CCK/BPSK/QPSK/QAM
Encryption Mode	WPA3
AP (Max Access Point)	32
Operator Mode	AP/STA
I/O Interfaces	
PCIe	1 (PCIe 3.0)
UART	1
PCM	1
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: 1.8V;
Power Consumption	TBD
Data Transmission	
802.11a	Max. 54Mbps
802.11b	Max. 11Mbps
802.11g	Max. 54Mbps
802.11n	Max. 600 Mbps
802.11ac	Max. 1732 Mbps
802.11ax	Max. 2400 Mbps
BLE	Max. 2Mbps
Recommended Applications	CPE, MIFI, OTT, Smart TV

* Under development

Wi-Fi & BT Module Family

	Standalone Wi-Fi & BT Modules	
Product	HC06U	FC41D
		
Band	2.4GHz	2.4GHz
MIMO	/	/
WLAN Standard	/	802.11b/g/n
BT Standard	BLE 5.0	BT 5.2
Form Factor	LCC	LCC
Dimensions (mm)	16.5 × 13.3 × 2.3	20 × 18 × 2.6
Operating Temperature	-40°C ~ +85°C	-40°C ~ +85°C
Weight (approx.) g	0.85	1.05
General Features		
Function	BT 5.0	Wi-Fi 2.4G+BT 5.2
Modulation Mode	/	BPSK/QPSK/CCK/16QAM/64QAM
Encryption Mode	SMP	WPA3
AP (Max Access Point)	/	TBD
Operator Mode	/	AP/STA
I/O Interfaces		
PCIe	/	/
UART	1	2
PCM	/	/
Antenna	× 1 (Built-in ceramic antenna, Built-out Pin antenna)	× 1 (Built-out Pin antenna, IPEX antenna, PCB antenna)
Electrical Characteristics		
Supply Voltage Range	I/O Supply Voltage: 3.3V Power Supply Voltage: 3.3V	Power Supply Voltage: 3.3V
Power Consumption	TBD	TBD
Data Transmission		
802.11a	/	/
802.11b	/	Max. 11Mbps
802.11g	/	Max. 54Mbps
802.11n	/	Max. 72Mbps
802.11ac	/	/
802.11ax	/	/
BLE	Max. 1Mbps	Max. 1Mbps
Recommended Applications	Low Power Data Transmission, Keyboards, Mouse, Remote Control, Sports & Leisure Equipment, Mobile Phone Accessories and Consumer Electronic Products	Smart Home, Industrial Controls

* Under development

UMTS/HSPA(+) Module Family

Product	UG96	UC200A-GL
		
Form Factor	LGA	LCC
Dimensions (mm)	22.5 × 26.5 × 2.2	32.0 × 29.0 × 2.4
3G	UMTS/HSPA	UMTS/HSPA+
Frequency Bands (MHz)	UMTS: B1/B2/B5/B6/B8; GSM: 850/900/1800/1900MHz	UMTS: B1/B2/B5/B8; GSM: 850/900/1800/1900MHz
Region	Global	Global
Weight (approx.) g	3.1	4.3
Operating Temperature	-35 °C ~ +75 °C	-35°C ~ +75°C
Extended Temperature	-40 °C ~ +85 °C	-40°C ~ +85°C
Data Transmission		
HSPA data rate (Mbps)	7.2 (DL)/ 5.76 (UL)	Max. 21 (DL)/ Max. 5.76 (UL)
UMTS data rate (Kbps)	384 (DL)/ 384 (UL)	Max. 384 (DL/UL)
GPRS data rate (Kbps)	85.6 (DL)/ 85.6 (UL)	Max. 85.6 (DL/UL)
EDGE data rate (Kbps)	296 (DL)/ 236.8 (UL)	Max. 236.8 (DL/UL)
SMS	•	•
CSD	•	•
Protocols	TCP/UDP/PPP/MMS/HTTP/HTTPS/SMTP/SMTPS/FTP/NTP/NITZ/PING/SSL	TCP/UDP/PPP/NTP/NITZ/FTP/HTTP/PING/CMUX/HTTPS/FTPS/SSL/FILE/MQTT/MMS/SMTP/SMTPS
Interfaces		
SIM	1.8V/ 3V	1.8V/ 3V
UART	1	2
USB	2.0 Hi-Speed	2.0 Hi-Speed
Audio Digital (PCM)	Optional ¹	•
RTC Backup	•	•
ADC	/	× 2, 12bits
Antenna	Pads for Primary	Pads for Primary
Enhanced Features		
DTMF	•	•
QuecFOTA [®]	/	•
DFOTA	•	•
RIL Driver	Android 4.x/5.x/6.x/7.x/8.x/9.x	Android 4.x/5.x/6.0/7.x/8.x/9.x
USB Serial Driver	Windows 7/8/8.1/10 Windows CE5.0/6.0/7.0* Linux 2.6/3.x/4.1~4.15 Android 4.x/5.x/6.x/7.x/8.x/9.x	Windows 7/8/8.1/10, Linux 2.6~5.12, Android 4.x~11.x
SIM Detection	•	•
Firmware Update	via USB/ UART Interface	via USB/ DFOTA
Electrical Features		
Supply Voltage Range	3.3~4.3V, 3.8V Typ.	3.4V~4.5V, 3.8V Typ.
Power Consumption	1.1mA@GSM sleep, DRX=9 1.7mA@UMTS sleep, DRX=9	17 µA @ Power Off 1 mA @ Sleep
Certifications	CE/ FCC/ GCF/ PTCRB/ Anatel/ RCM/ IFETEL/ Movistar/ ICASA/ JATE/ TELEC/ DoC ² / Telefonica / Deutsche Telekom/IC/RCM	CE/FCC/Anatel ¹ / RCM
Recommended Applications	Telematics, Smart Metering, Mobile POS Terminals, Gateways, Safety, Tracking and Tracing, Remote Maintenance and Control, Networking, Mobile Computing, Healthcare, etc.	

Note 1: Only supported in Telematics version.
Note 2: Only supported in Russia.

* Under development

GSM/GPRS Module Family

Product	M66	M66-DS	M65	M08-R	M89
					
Form Factor	LCC	LCC	LCC	LCC	LGA
Dimensions (mm)	15.8 × 17.7 × 2.3	15.8 × 17.7 × 2.3	15.8 × 17.7 × 2.3	15.7 × 17.6 × 2.4	18.8 × 27.6 × 2.3
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	1.3	1.1	1.18	2.15
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/HTTP/FTP/SMTP/PING/NTIP/NITZ/MMS Sending/SSL	TCP/UDP/PPP/HTTP/FTP/SMTP/PING/NTIP/NITZ/MMS Sending/SSL	TCP/UDP/PPP/HTTP/FTP/PING/NTP/NITZ/SSL/IPV6*	TCP/UDP/PPP/HTTP/NTP/PING/TTS/FTP/SSL/MQTT/HTTPS/IPV6*	TCP/UDP/PPP/HTTP/FTP/SMTP/PING/NTIP/NITZ/MMS Sending/SSL
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	1.8V/ 3V	1.8V/ 3V	1.8V/ 3V	1.8V/ 3V	1.8V/ 3V
Audio Analog	1 input/ 2 outputs	1 input/ 2 outputs	1 input/ 2 outputs	1 input/ 1 output	1 input/ 2 outputs
Audio Digital (PCM)	•	•	/	/	/
RTC Backup	•	•	•	•	•
UART	3	3	3	3	2
ADC	× 1, 10bit	× 1, 10bit	× 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	DFOTA	•
QuecCell	•	•	•	•	•
QuecFile	•	•	•	•	•
QuecOpen®	•	•	o	•	/
RIL for Android	•	•	•	•	•
MUX	•	•	•	•	• (Scan Only)
Bluetooth	•	•	/	/	/
Electrical Features					
Power Supply	3.3 ~ 4.6V	3.3 ~ 4.6V	3.45 ~ 4.25V	3.45 ~ 4.25V	3.3 ~ 4.6V
Low Power Consumption	1.3mA @DRX=5 1.2mA @DRX=9	1.3mA @DRX=5 1.2mA @DRX=9	1.2mA @DRX=5 1.1mA @DRX=9	1.3mA @DRX=5 1.2mA @DRX=9	2.8mA @DRX=5 2.7mA @DRX=9
Certifications	CE/ Anatel/ ICASA	CE	CE	CE	CE/ Anatel
Recommended Applications	Telematics, Smart Metering, Mobile POS Terminals, Gateways, Safety, Tracking and Tracing, Remote Maintenance and Control, Mobile Computing, Healthcare, etc.				

o & * Under development

GSM/GPRS Module Family

Product	M95	M95-R	MC60/ MC60E	MC90
				
Form Factor	LCC	LCC	LCC	LCC
Dimensions (mm)	19.9 × 23.6 × 2.65	19.9 × 23.6 × 2.65	16.0 × 18.7 × 2.1	15.0 × 25.6 × 2.3
Frequency Range (MHz)	850/ 900/ 1800/ 1900	850/ 900/ 1800/ 1900	850/ 900/ 1800/ 1900	850/ 900/ 1800/ 1900
Weight (approx.) g	3.0	3.0	1.3	1.4
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				
GPRS Multi-slot Class	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)
SMS	•	•	•	•
Protocols	TCP/UDP/PPP/MQTT/HTTP/FTP/SMTP/PING/NTP/NITZ/MMS Sending/SSL	TCP/UDP/PPP/MQTT/HTTP/FTP/PING/NTP/NITZ/SSL	TCP/UDP/PPP/HTTP/FTP/SSL/PING/NTP/NITZ/SMS/MQTT	TCP/UDP/PPP/HTTP/FTP/SSL/PING/NTP/NITZ/SMS/MQTT
Specifications for Voice				
Speech Codec Modes	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
Interfaces				
SIM	1.8V/ 3V	1.8V/ 3V	1.8V/ 3V	1.8V/ 3V
Audio Analog	2 inputs/ 2 outputs	2 inputs/ 2 outputs	1 input/ 2 outputs	1 input/ 2 outputs
Audio Digital (PCM)	•	•	•	•
RTC Backup	•	•	•	•
UART	2	2	4	4
ADC	/	/	× 1, 10bit	× 1, 10bit
SD Card Interface	/	/	•	/
GPIO	/	/	•	•
Temperature Detection	•	/	•	•
Enhanced Features				
eCall	•	/	•	•
Jamming Detection	•	/	•	•
DTMF	•	•	•	•
Audio Playback/ Audio Recording	•	•	•	•
Dual-SIM	•	/	•	•
QuecFOTA®	•	•	•	•
QuecCell	•	•	•	•
QuecFile	/	/	•/○	•
QuecOpen®	/	/	•	•
RIL for Android	•	•	•	•
MUX	•	•	•	•
Bluetooth	/	/	BT 3.0 (MC60) BT 3.0/ BT4.0 (MC60E)	/
Wi-Fi	/	/	/	• (only Scan)
GNSS	/	/	BEIDOU/ GPS/ GLONASS/Galileo/ QZSS	BEIDOU/ GPS/ GLONASS/Galileo/ QZSS
Electrical Features				
Power Supply	3.3 ~ 4.6V	3.45 ~ 4.25V	3.3 ~ 4.6V	3.3 ~ 4.3V
Low Power Consumption	1.3mA @DRX=5 1.2mA @DRX=9	1.4mA @DRX=5 1.3mA @DRX=9	1.2mA @DRX=5 0.8mA @DRX=9	1.2mA @DRX=5 0.8mA @DRX=9
Certifications	CE/ GCF/ Vodafone/ PTCRB/ FCC/ IC/ Anatel/ Rogers/ RCM/ NCC/ TELCEL/ UCRF/ ICASA	CE*	CE/ FCC/ Anatel/ ICASA/ GCF	CE
Recommended Applications	Telematics, Smart Metering, Mobile POS Terminals, Gateways, Safety, Tracking and Tracing, Remote Maintenance and Control, Mobile Computing, Healthcare, etc.			

○ & * Under development

GNSS Module Family

		Standalone Positioning/ Timing Modules					
Product		L26	L26-LB	L26-ADR	L26-UDR	L26-T	LC98S
		Compatible					
							
GNSS		GPS/ GLONASS/ Galileo/ BeiDou/QZSS	GPS/ GLONASS/BeiDou/ QZSS	GPS/ Galileo/ GLONASS/ BeiDou/ QZSS	GPS/ Galileo/ GLONASS/ BeiDou/ QZSS	GPS/ Galileo/ GLONASS/ BeiDou/ QZSS	GPS/ BeiDou/ GLONASS/ Galileo/ QZSS
Form Factor		LCC	LCC	LCC	LCC	LCC	LCC
Dimensions (mm)		16.0 × 12.2 × 2.4	16.0 × 12.2 × 2.3	16.0 × 12.2 × 2.3	16.0 × 12.2 × 2.3	16.0 × 12.2 × 2.3	22.4 × 17.0 × 2.6
Weight (approx.) g		1.0	1.0	0.9	0.9	0.9	1.68
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
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
General Features							
Working Mode		/	/	4wheels-ADR	4wheels-UDR	Timing Static Mode	Timing Static ModeW
Chip Solution		MT3333	AG3331	Teseo III	Teseo III	Teseo III	Teseo III
L1 Band Receiver (C/A Code) Channel Number		33 Track/ 99 Acq	33 Track/ 99 Acq	48 Track/2 Fast Acq	48 Track/2 Fast Acq	48 Track/2 Fast Acq	48 Track/2 Fast Acq
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
A-GNSS		Supported	Supported	Supported	Supported	Supported	Supported
Sensitivity	Autonomous Acquisition	-148dBm	-148dBm	-145dBm	-145dBm	-147dBm	-146dBm ¹
	Reacquisition	-160dBm	-160dBm	-152dBm	-152dBm	-154dBm	-155dBm ¹
	Tracking	-167dBm	-165dBm	-162dBm	-162dBm	-162dBm	-161dBm ¹
TTFF (Time To First Fix)	Cold Start	35s, Autonomous 15s, With EASY™	32s, Autonomous 15s, With EASY™	32s, Autonomous	32s, Autonomous	32s, Autonomous	29s, Autonomous
	Warm Start	30s, Autonomous 5s, With EASY™	28s, Autonomous 8s, With EASY™	25s, Autonomous	25s, Autonomous	25s, Autonomous	28s, Autonomous
	Hot Start	1s	1s	2s	2s	2s	2s
Position Accuracy(autonomous)		2.5m CEP	2.5m CEP	1.5m CEP	1.5m CEP	1.5m CEP	1.5m CEP
Velocity Accuracy(without aid)		0.1m/s	0.1m/s	0.1m/s	0.1m/s	0.1m/s	0.1m/s
Maximum Acceleration Accuracy (without aid)		0.1m/s²	0.1m/s²	0.1m/s²	0.1m/s²	0.1m/s²	0.1m/s²
Timing Accuracy (1σ)		<100ns	<100ns	<100ns	<100ns	<6.8ns	<6.8ns
Max Update Rate		10Hz	10Hz	1Hz	10Hz	10Hz	10Hz
Baud Rate (default)		9600bps	9600bps	115200bps	115200bps	9600bps	115200bps
Geo-fence		•	•	/	/	•	/
Jamming Detection		•	•	/	•	•	•
Anti-jamming		•	•	/	/	/	•
Built-in LNA		•	•	•	•	•	•
Electrical Data							
Power Supply		2.8V to 4.3V	2.8V to 4.3V	3.0V to 3.6V	3.0V to 3.6V	3.0V to 3.6V	3.0V to 3.6V
I/O Voltage		2.7V to 2.9V	2.7V to 2.9V	3.0V to 3.6V	3.0V to 3.6V	Typ. 3.3 V	3.0V to 3.6V
Power Consumption (Acquisition)		29mA (GPS+GLONASS) 26mA (GPS)	30.3mA@3.3V (GPS+GLONASS)	72mA (GPS) 79mA (GPS+GLONASS+Galileo)	84mA (GPS+GLONASS+Galileo)	71mA (GPS+GLONASS+Galileo)	78mA (GPS + GLONASS)
Power Consumption (Tracking)		21mA (GPS+GLONASS) 18mA (GPS)	28.0mA@3.3V (GPS+GLONASS)	58mA (GPS) 74mA (GPS+GLONASS+Galileo)	81mA (GPS+GLONASS+Galileo)	67mA (GPS+GLONASS+Galileo)	74mA (GPS + GLONASS)
Power Consumption (Backup/Low Power mode)		7μA	8μA	17μA	13μA	9μA	TBD
Interfaces							
UART		•	•	•	•	•	•
IIC (NMEA)		/	•	/	/	/	*
Reset		•	•	•	•	•	•
Time Pulse		•	•	•	•	•	•
Antenna							
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
Antenna Power		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
Recommended Applications		Vehicle Trackers, Asset Trackers, Industrial PDAs		Automotive Tracking , OBD		High Precision Timing	High Precision Timing for Base Stations

Note 1: Demonstrated with a good external LNA.

* Under development

GNSS Module Family

	Standalone Modules					
Product	LG77L(A)	LG77L(B) ¹	LG77L(C) ¹	L70-R ¹ /L70-RL ¹	L76 ¹ /L76B ¹ /L76-L ¹	L76-LB ¹
	Compatible			Compatible		
						
GNSS	GPS/ BeiDou/QZSS/GLONASS	GPS/ BeiDou/QZSS/GLONASS	GPS/GLONASS/Galileo/BeiDou/QZSS	GPS/ QZSS	GPS/GLONASS/Galileo/BeiDou/QZSS	GPS/BeiDou/QZSS/GLONASS
Form Factor	LCC	LCC	LCC	LCC	LCC	LCC
Dimensions (mm)	7.0 × 7.0 × 2.0	7.0 × 7.0 × 2.0	7.0 × 7.0 × 2.0	9.7 × 10.1 × 2.5	9.7 × 10.1 × 2.5	9.7 × 10.1 × 2.3
Weight (approx.) g	0.2	0.2	0.2	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
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
General Features						
Chip Solution	AG3331	AG3331	MT3333	MT3337	MT3333	AG3331
L1 Band Receiver (C/A Code) Channel Number	33 Track/ 99 Acq	33 Track/ 99 Acq	33 Track/ 99 Acq	22 Track/ 66 Acq.	33 Track/ 99 Acq.	33 Track/ 99 Acq.
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
A-GNSS	Supported	Supported	Supported	Supported	Supported	Supported
Sensitivity	Autonomous Acquisition	-147dBm	-147dBm	-148dBm (L70-R) -149dBm (L70-RL)	-148dBm (L76/ L76B) -149dBm (L76-L)	-149dBm
	Reacquisition	-156dBm	-156dBm	-160dBm (L70-R) -161dBm (L70-RL)	-160dBm (L76/ L76B) -161dBm (L76-L)	-161dBm
	Tracking	-158dBm	-158dBm	-165dBm (L70-R) -167dBm (L70-RL)	-165dBm (L76/ L76B) -167dBm (L76-L)	-167dBm
TTFF (Time To First Fix)	Cold Start	26s, Autonomous 14s, With EASY™	26s, Autonomous 14s, With EASY™	25s, Autonomous 17s, With EASY™	35s, Autonomous 15s, With EASY™	32s, Autonomous 15s, With EASY™
	Warm Start	24s, Autonomous 4s, With EASY™	24s, Autonomous 4s, With EASY™	23s, Autonomous 5s, With EASY™	30s, Autonomous 5s, With EASY™	28s, Autonomous 8s, With EASY™
	Hot Start	2s	2s	2s	1s	1s
Position Accuracy (autonomous)	2.5m CEP	2.5m CEP	2.5m CEP	2.5m CEP	2.5m CEP	2.5m CEP
Velocity Accuracy (without aid)	0.1m/s	0.1m/s	0.1m/s	0.1m/s	0.1m/s	0.1m/s
Maximum Acceleration Accuracy (without aid)	0.1m/s²	0.1m/s²	0.1m/s²	0.1m/s²	0.1m/s²	0.1m/s²
Timing Accuracy (1σ)	<100ns	<100ns	<100ns	<100ns	<100ns	<100ns
Max Update Rate	10Hz	10Hz	10Hz	5Hz (L70-R/ L70-RL)	10Hz	10Hz
Baud Rate(default)	9600bps	9600bps	9600bps	9600bps	9600bps	9600bps
Geo-fence	•	•	•	/	•	•
Jamming Detection	•	•	•	•	•	•
Anti-jamming	•	•	•	•	•	•
Built-in LNA	/	/	/	Supported by L70-RL	Supported by L76-L	/
Electrical Data						
Power Supply	2.8V to 4.3V	2.8V to 4.3V	2.8V to 4.3V	2.8V to 4.3V	2.8V to 4.3V	2.8V to 4.3V
I/O Voltage	1.7V to 1.9V/ 2.7V to 2.9V	1.7V to 1.9V/ 2.7V to 2.9V	1.7v to 1.9v/ 2.7v to 2.9v	2.7V to 2.9V	2.7V to 2.9V	2.7V to 2.9V L76LB(L): 1.7V to 1.9V
Power Consumption (Acquisition)	25mA (GPS+GLONASS)	25mA (GPS+GLONASS)	24mA (GPS+GLONASS)	16mA (L70-R) 21mA (L70-RL)	25mA (GPS+GLONASS)/ 21mA (GPS)(L76) 23mA (GPS+BeiDou) (L76B) 29mA (GPS+GLONASS)/ (L76-L) 18mA (GPS+GLONASS)/ 15mA (GPS) (L76) 18mA (GPS+BeiDou) (L76B) 22mA (GPS+GLONASS) (L76-L)	31mA (GPS+GLONASS)
Power Consumption (Tracking)	24mA(GPS+GLONASS)	24mA(GPS+GLONASS)	23.0mA (GPS+GLONASS)	13mA (L70-R) 18mA (L70-RL)		27mA (GPS+GLONASS)
Power Consumption (Backup/Low power mode)	6μA	6μA	6μA	8μA (L70-R/ L70-RL)	7μA	8μA
Interfaces						
UART	•	•	•	•	•	•
IIC (NMEA)	•	•	•	/	Supported by L76-L	•
Reset	•	•	•	•	•	•
Time Pulse	•	•	•	•	•	•
Antenna						
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
Antenna Power	External	External	External	External or internal	External or internal	External or internal
Certifications	CE	CE	CE	CE	CE	CE
Recommended Applications	Vehicle Trackers, Asset Trackers, Safety, Industrial PDAs or PNDs, Digital Cameras, etc.					

Note 1: Integrated RTC .

* Under development

GNSS Module Family

		Dual Band Precision Modules				
Product		LC79D(A)	LC79H(AL)*	LC29D(B)*	LC29D(C) ¹	LC29H(AA)/LC29H(BA)* /LC29H(CA)* /LC29H(DA)*
		Compatible		Compatible		
						
GNSS		GPS L1 L5 Galileo E1 E5 QZSS L1 L5 IRNSS L5 GLONASS L1 BeiDou B1	GPS L1 Galileo E1 QZSS L1 GPS L5 Galileo E5 QZSS L5 BeiDou B1 BeiDou B2a GLONASS L1	GPS L1 L5 Galileo E1 E5 QZSS L1 L5 IRNSS L5 GLONASS L1 BeiDou B1 B2a	GPS L1 L5 Galileo E1 E5 QZSS L1 L5 IRNSS L5 GLONASS L1 BeiDou B1	GPS L1 Galileo E1 QZSS L1 GPS L5 Galileo E5 QZSS L5 BeiDou B1 BeiDou B2a GLONASS: L1
Form Factor		LCC+LGA	LCC	LCC	LCC	LCC
Dimensions (mm)		9.7 × 10.1 × 2.4	10.1 × 9.7 × 2.4	16.0 × 12.2 × 2.4	16.0 × 12.2 × 2.4	16.0 × 12.2 × 2.5
Weight (approx.) g		0.42	0.28	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
Storage Temperature		-40 °C ~ +90 °C	-40 °C ~ +90 °C	-40 °C ~ +90 °C	-40 °C ~ +90 °C	-40 °C ~ +90 °C
General Features						
working mode		standard mode	standard mode	DR+RTK mode	2wheels-ADR mode	Standard(LC29H(AA)); DR+RTK mode(LC29H(BA)*); 2wheels-ADR mode(LC29H(CA)*); RTK only mode(LC29H(DA)*)
Chip Solution		BCM47755B1	AG3335M	BCM47765	BCM47755	AG3335M(LC29H(AA)) AG3335A/T(LC29H(BA)* /LC29H(CA)* /LC29H(DA)*)
L1 Band Receiver (C/A Code) Channel Number		32 channels	135 channels	48 channels	32 channels	72 channels
L1 Band Receiver (C/A Code) SBAS		Support (Only support GAGAN)*	WAAS, EGNOS, MSAS* and GAGAN	*	*	WAAS, EGNOS, MSAS, GAGAN
A-GNSS		Supported	Supported	Supported	Supported	Supported
Sensitivity	Autonomous Acquisition	-147dBm	-148 dBm	-148dBm	-148dBm	-147 dBm
	Reacquisition	-158dBm	-159 dBm	-157dBm	-157dBm	-159 dBm(LC29H(AA)), -162 dBm(LC29H(BA)* /LC29H(CA)* /LC29H(DA)*)
	Tracking	-163dBm	-166 dBm	-162dBm	-163dBm	-165 dBm
TTFF (Time To First Fix)	Cold Start	34s, Autonomous	26s, Autonomous 12s, With EASY™	34s, Autonomous	34s, Autonomous	32s, Autonomous(LC29H(AA)) TBD(LC29H(BA)* /LC29H(CA)* /LC29H(DA)*)
	Warm Start	30s, Autonomous	18s, Autonomous 2s, With EASY™	30s, Autonomous	30s, Autonomous	20s, Autonomous(LC29H(AA)) TBD(LC29H(BA)* /LC29H(CA)* /LC29H(DA)*)
	Hot Start	2s	1 s	2s	2s	1s(LC29H(AA)) TBD(LC29H(BA)* /LC29H(CA)* /LC29H(DA)*)
Position Accuracy (autonomous)		1.2m CEP	1.0m CEP	Autonomous: 1.0 m CEP	1.2m CEP	1.0m CEP
Position Accuracy (RTK)		/	0.1m/s	0.5m/s	/	/
Velocity Accuracy (without aid)		0.1m/s	0.1m/s	0.1m/s	0.1m/s	0.1m/s
Velocity Accuracy (RTK)		/	/	TBD	/	/
Convergence Time (RTK)		/	/	TBD	/	/
Maximum Acceleration Accuracy (without aid)		0.1m/s²	0.1m/s²	0.1m/s²	0.1m/s²	0.1m/s²
Timing Accuracy (1σ)		<34.9ns	<100ns	TBD	TBD	TBD
Max Update Rate		1Hz	10Hz	10Hz	10Hz	1Hz
Baud Rate(default)		115200bps	115200bps	115200bps	115200bps	115200bps
Geo-fence		•	•	*	*	•
Jamming Detection		/	•	/	/	/
Built-in LNA		•	•	•	•	•
Electrical Data						
Power Supply		1.7V to 1.9V	1.75-1.98V	2.7V to 3.6V	2.7V to 3.6V	3.1V to 3.6V
I/O Voltage		1.7V to 1.9V	1.75-1.98V	2.7V to 3.6V	2.7V to 3.6V	Typ. 2.8 V
Power Consumption (Acquisition)		47mA (GPS+BeiDou+GLONASS+Galileo+QZSS+ IRNSS)	33mA	50mA*	53mA	24mA(LC29H(AA)), 26mA(LC29H(BA)*), TBD(LC29H(CA)* /LC29H(DA)*)
Power Consumption (Tracking)		43mA (GPS+BeiDou+GLONASS+Galileo+QZSS+ IRNSS)	33mA	37mA*	39mA	24mA(LC29H(AA)), 26mA(LC29H(BA)*), TBD(LC29H(CA)* /LC29H(DA)*)
Power Consumption (Backup/Low power mode)			20μA			25 μA @ Backup Mode(LC29H(AA)/LC29H(BA)*), TBD(LC29H(CA)* /LC29H(DA)*)
Interfaces						
UART		•	•	•	•	•
IIC (NMEA)		/	•	/	/	•
Reset		•	•	•	*	/
Time Pulse		•	•	•	•	/
Antenna						
Antenna Type		Active or passive	Active or passive	Active or passive	Active or passive	Active or passive
Antenna Power		External or internal	External or internal	External or internal	External or internal	External or internal
Certifications		CE	CE*	CE*	CE	CE*
Recommended Applications		Shared Mobility, Delivery Robots, GIS				

Note 1: This module also supports SPI.

* Under development

GNSS Module Family

Automotive Dual Band Precision Modules				
Product	LG69T(AA)*	LG69T(AD)	LG69T(AB)*	LG69T(AM)*
Compatible				
				
GNSS	GPS/QZSS: L1 C/A; L5 Galileo: E1; E5a BeiDou: B1; B2a	GPS/QZSS: L1 C/A; L5 Galileo: E1; E5a BeiDou: B1; B2a	GPS/QZSS: L1 C/A; L2C Galileo: E1; E5b BeiDou: B1; B2I GLONASS: L1	GPS: L1 C/A; L5 Galileo: E1; E5a BeiDou: B1; B2a
Form Factor	LGA	LGA	LGA	LGA
Dimensions (mm)	22.0 × 17.0 × 3.15	22.0 × 17.0 × 3.15	22.0 × 17.0 × 3.3	22.0 × 17.0 × 3.3
Weight (approx.) g	1.9	1.9	1.9	1.9
Operating Temperature	-40 °C ~ +85 °C	-40 °C ~ +85 °C	-40 °C to +105 °C	-40 °C ~ +85 °C
Storage Temperature	-40 °C ~ +90 °C	-40 °C ~ +90 °C	-40 °C to +105 °C	-40 °C ~ +90 °C
General Features				
Working Mode	DR*/Raw	PVT/Raw	Raw	RTK*
Chip Solution	TESEO V	TESEO V	TESEO APP	TESEO V
L1 Band Receiver (C/A Code) Channel Number	80 Tracking Channels 4 Fast Acquisition Channels	80 Tracking Channels 4 Fast Acquisition Channels	80 Tracking Channels 4 Fast Acquisition Channels	80 Tracking Channels 4 Fast Acquisition Channels
L1 Band Receiver (C/A Code) SBAS	*	*	/	/
A-GNSS	*	*	/	/
Sensitivity	Autonomous Acquisition	-145dBm	-144dBm	-145dBm
	Reacquisition	-153dBm	-153dBm	-153dBm
	Tracking	-160dBm	-159dBm	-160dBm
TTFF (Time To First Fix)	Cold Start	36s	36s	36s
	Warm Start	30s	30s	30s
	Hot Start	3s	3s	3s
Position Accuracy (autonomous)	1.0m CEP	1.0m CEP	1.0m CEP	1.0m CEP
Position Accuracy (RTK)	/	/	/	0.1m+ppm CEP
Velocity Accuracy (without aid)	0.1m/s	0.1m/s	0.1m/s	0.1m/s
Convergence Time (RTK)	/	/	/	<10s
Maximum Acceleration Accuracy (without aid)	0.1m/s²	0.1m/s²	0.1m/s²	0.1m/s²
Timing Accuracy (1σ)	<100ns	<100ns	<100ns	<100ns
Max Update Rate	RAW: 10Hz; IMU: 100Hz; PVT: 1Hz	RAW: 10Hz; PVT: 1Hz	RAW: 10Hz	PVT: 10Hz
Baud Rate(default)	460800bps(raw); 115200bps(DR)	460800bps(raw); 115200bps(PVT)	460800bps	460800bps
Geo-fence	/	/	/	/
Jamming Detection	•	•	/	/
Built-in LNA	•	•	•	•
Electrical Data				
Power Supply	3.0V to 3.6V	3.0V to 3.6V	3.0V to 3.6V	3.0V to 3.6V
I/O Voltage	3.0V to 3.6V	3.0V to 3.6V	3.0V to 3.6V	3.0V to 3.6V
Power Consumption (Acquisition)	260 mA	222 mA	180mA@VCC 235mA@VCC_CORE	TBD
Power Consumption (Tracking)	253 mA	219 mA	180mA@VCC 235mA@VCC_CORE	TBD
Power Consumption (Backup/Low power mode)	55µA	55µA	110µA	TBD
Interfaces				
UART	•	•	•	•
Reset	•	•	•	•
Time Pulse	•	•	•	•
Antenna				
Antenna Type	Active	Active	Active	Active
Antenna Power	External or internal	External or internal	External or internal	External or internal
Certifications	CE*	CE*	CE*	CE*
Recommended Applications	Automotive, High Precision Navigation, Delivery Robots			

* Under development

GNSS Module Family

		Antenna Modules				
Product		L80/ L80-R	LC86L (A)	LC86L (C)	L86	L89 R2.0
		Compatible				
						
						
GNSS		GPS/QZSS	GLONASS/GPS/ BeiDou/QZSS	GPS/GLONASS/Galileo/BeiDou/QZSS	GPS/ GLONASS/BeiDou/Galileo/QZSS	GPS/ GLONASS/ BeiDou/ Galileo/IRNSS/QZSS
Form Factor		LCC	LCC	LCC	LCC	LCC
Dimensions (mm) ¹		16.0 × 16.0 × 6.45	16.0 × 16.0 × 6.95	16.0 × 16.0 × 6.95	18.4 × 18.4 × 6.45	18.4 × 26.4 × 6.8
Weight (approx.) g		6.0	6.0	6	7.6	8.2
Operating Temperature		-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
General Features						
Chip Solution		MT3339 (L80) MT3337 (L80-R)	AG3331	MT3333	MT3333	AG3335
L1 Band Receiver (C/A Code) Channel Number		22 Track/ 66 Acq	33 Track/ 99 Acq	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	WAAS/EGNOS/MSAS/GAGAN	WAAS/EGNOS/MSAS/GAGAN	WAAS/EGNOS/MSAS/GAGAN
A-GNSS		Supported	Supported	Supported	Supported	Supported
Sensitivity	Autonomous Acquisition	-148dBm	-148dBm	-148dBm	-149dBm	-148dBm
	Reacquisition	-160dBm	-161dBm	-162dBm	-161dBm	-160dBm
	Tracking	-165dBm	-166dBm	-166dBm	-167dBm	-165dBm
TTFF (Time To First Fix)	Cold Start	35s, Autonomous 15s, With EASY™	35s, Autonomous 15s, With EASY™	35s, Autonomous 15s, With EASY™	35s, Autonomous 15s, With EASY™	35s, Autonomous 15s, With EASY™
	Warm Start	30s, Autonomous 5s, With EASY™	30s, Autonomous 5s, With EASY™	30s, Autonomous 5s, With EASY™	30s, Autonomous 5s, With EASY™	30s, Autonomous 5s, With EASY™
	Hot Start	1s	2s	2s	1s	1s
Position Accuracy(autonomous)		2.5m CEP	2.5m CEP	2.5m CEP	2.5m CEP	1.8m CEP
Velocity Accuracy(without aid)		0.1m/s	0.1m/s	0.1m/s	0.1m/s	0.1m/s
Maximum Acceleration Accuracy (without aid)		0.1m/s²	0.1m/s²	0.1m/s²	0.1m/s²	0.1m/s²
Timing Accuracy (1σ)		<100ns	<100ns	<100ns	<100ns	<100ns
Max Update Rate		10Hz (L80) 5Hz (L80-R)	10Hz	10Hz	10Hz	1Hz
Baud Rate(default)		9600bps	9600bps	9600bps	9600bps	9600bps
Geo-fence		• (Supported by L80)	•	•	•	•
Jamming Detection		•	•	•	•	•
Anti-jamming		•	•	•	•	•
Built-in LNA		•	•	•	•	•
Electrical Data						
Power Supply		3.0V to 4.3V	2.8V to 4.3V	2.8V to 4.3V	3.0V to 4.3V	3.1V to 4.3V
I/O Voltage		2.7V to 2.9V	2.7V to 2.9V	2.7V to 2.9V	2.7V to 2.9V	3.0 V
Power Consumption (Acquisition)		25mA	32mA (GPS+GLONASS)	32mA (GPS+GLONASS)	30mA (GPS+GLONASS)	32mA
Power Consumption (Tracking)		20mA	31mA (GPS+GLONASS)	30mA (GPS+GLONASS)	26mA (GPS+GLONASS)	32mA
Power Consumption (Backup)		7μA	6μA	7μA	7μA	51μA
Interfaces						
UART		•	•	•	•	•
IIC (NMEA)		/	/	/	/	/
Reset		•	•	•	•	•
Time Pulse		•	•	•	•	•
Antenna						
Short-Circuit Protection & Open-Circuit Detection		Supported by L80	•	•	•	/
Antenna Automatic Switch		Supported by L80	•	•	•	/
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 and chip antenna, external active antenna
Antenna Power		Internal	Internal	Internal	Internal	External
Certifications		CE	CE	CE	CE	/
Recommended Applications		Vehicle or Asset Trackers, DVRs, Connected PNDs & PDAs, Safety, Digital Cameras, etc.				(Dedicated for India market) Standard Tracking

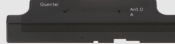
Note 1: Please refer to the design document for footprint size.

* Under development

5G Antennas

Product	YE0001BA	YE0003AA	YE0007AA	YE0025AA
				
Frequency Bands (MHz)	600-6000	699-5000	600-6000	698-960,1710-5000
Technology	5G	5G	5G	5G
Cable Length (mm)	n/a	n/a	n/a	n/a
Connector Type	SMA Male (center pin)	SMA Male (center pin)	SMA Male (center pin)	SMA Male (center pin)
Mounting Type	Terminal	Terminal	Terminal	Terminal
Dimensions (mm)	221 × 26.95 × 13.5	190 × Ø 16	152.4 × 21.79 × 14.49	199 × 22
Matched Quectel Modules	5G/4G/3G/2G/LPWA			

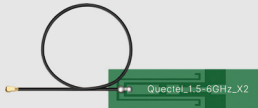
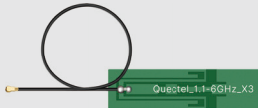
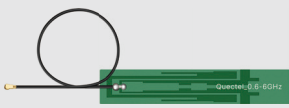
Product	YE0027AA	YE0028AA	YE0037AA	YXH001AA	YBY00A0KA
					
Frequency Bands (MHz)	699-5000	700-2700, 3300-5000	700-5000	700-960, 1710-2690, 3300-5000	700-960, 1710-2690, 3300-5000
Technology	5G	5G	5G	5G	5G
Cable Length (mm)	3000	1500	1000	1000	n/a
Connector Type	SMA Male (center pin)	SMA Male (center pin)	SMA Male (center pin)	SMA Male (center pin)	N-J (Male pin with internal thread)
Mounting Type	Magnetic	Magnetic	Magnetic	Magnetic	Terminal
Dimensions (mm)	221 × Ø 61	234 × Ø 60	88 × Ø 30	285 × 45	Ø 20 × 300
Matched Quectel Modules	5G/4G/3G/2G/LPWA				

Product	YF0002AA	YF0002BA	YF0002CA	YF0002DA
				
Frequency Bands (MHz)	700-960, 1710-2700, 3300-5000	1710-2700, 3300-5000	1710-2700, 3300-5000	700-960, 1710-2700, 3300-5000
Technology	5G	5G	5G	5G
Cable Length (mm)	n/a	n/a	n/a	n/a
Connector Type	Spring contact	Spring contact	Spring contact	Spring contact
Mounting Type	Screw	Screw	Screw	Screw
Dimensions (mm)	60.1 × 12.25 × 10.1	41.25 × 10.1 × 10.1	37.25 × 9.6 × 10.1	50.25 × 20.1 × 10.1
Matched Quectel Modules	5G/4G/3G/2G/LPWA			

Product	YF0017AA	YF0017BA	YF0020AA	YC0018AA	YC0018AAEVB
					
Frequency Bands (MHz)	1500-6000	1100-6000	600-6000	617-6000	617-6000
Technology	5G	5G	5G	5G	5G
Cable Length (mm)	193 ±3	193 ±3	184 ±3	n/a	n/a
Connector Type	IPEX IV	IPEX IV	IPEX IV	n/a	n/a
Mounting Type	Adhesive	Adhesive	Adhesive	SMD	n/a
Dimensions (mm)	49 × 13 × 0.13	49 × 13 × 0.13	90.15 × 15.2 × 0.13	42 × 7 × 3	140 × 40.4
Matched Quectel Modules	5G/4G/3G/2G/LPWA				

The parameters shall be subject to the Specification.

5G Antennas

Product	YP0009AA	YP0009BA	YP0009CA
			
Frequency Bands (MHz)	1500-6000	1100-6000	600-6000
Technology	5G	5G	5G
Cable Length (mm)	193 ±3	193 ±3	188 ±3
Connector Type	IPEX IV	IPEX IV	IPEX IV
Mounting Type	Adhesive	Adhesive	Adhesive
Dimensions (mm)	49 × 13 × 0.85	49 × 13 × 0.85	78.5 × 14.2 × 0.85
Matched Quectel Modules	5G/4G/3G/2G/LPWA		

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

Product	YC0001AA	YC0002AA	YC0003AA	YC0003AAEVB	YC0017BA	YC0017BAEVB
						
Frequency Bands (MHz)	698-960, 1710-2690	698-960, 1710-2690	698-2700	698-2700	698-3800	698-3800
Technology	LTE (4G)	LTE (4G)	LTE (4G)	LTE (4G)	LTE (4G)	LTE (4G)
Cable Length (mm)	n/a	n/a	n/a	n/a	n/a	n/a
Connector Type	n/a	n/a	n/a	n/a	n/a	n/a
Mounting Type	SMD	SMD	SMD	n/a	SMD	n/a
Dimensions (mm)	35.0 × 8.5 × 3.0	42 × 10 × 3	40 × 7 × 3	120 × 43	26 × 8 × 3	140 × 36
Matched Quectel Modules	4G/3G/2G/LPWA					

Product	YF0022AA	YF0007BA	YPCA004AA	YFCA002AA	YF0006DA	YF0028AA
						
Frequency Bands (MHz)	700-2690	600-960, 1427.9-1495.9, 1710-2170, 2300-2700	700-2690	700-2690	690-960, 1710-2170, 2300-2690	698-3000
Technology	LTE (4G)	LTE (4G)	LTE (4G)	LTE (4G)	LTE (4G)	LTE (4G)
Cable Length (mm)	75 ±3	75 ±3	100 ±3	75 ±3	75 ±3	150 ±2
Connector Type	RF1	RF1	IPEX I	RF1	IPEX I	IPEX I
Mounting Type	Adhesive	Adhesive	Adhesive	Adhesive	Adhesive	Adhesive
Dimensions (mm)	40 × 15 × 1.6	50 × 25 × 0.85	40 × 10 × 1	30 × 20 × 0.13	50 × 25 × 0.13	96 × 21 × 0.2
Matched Quectel Modules	4G/3G/2G/LPWA					

Product	YECT002AA	YECT003AA	YE0009AA	YPR00A0AA	YCN001AA
					
Frequency Bands (MHz)	700-960, 1710-2690	698-960, 1710-2700	824-2700	700-2700	700-2700
Technology	LTE (4G)	LTE (4G)	LTE (4G)	LTE (4G)	LTE (4G)
Cable Length (mm)	n/a	n/a	n/a	n/a	n/a
Connector Type	SMA Male (center pin)	SMA Male (center pin)	SMA Male (center pin)	SMA Male (center pin)	SMA Male (center pin)
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				

The parameters shall be subject to the Specification.

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

Product	YE0006AA	YE0010AA	YB0010AA	YB0016AA	YE0012AA	YE0021AA	YE0029AA
							
Frequency Bands (MHz)	700-2700	698-2700	698-960, 1710-2690	698-960, 1710-2700	824-960, 1710-2690	690-960, 1710-2690	700-2700
Technology	LTE (4G)	LTE (4G)	LTE (4G)	LTE (4G)	LTE (4G)	LTE (4G)	LTE (4G)
Cable Length (mm)	1500	1000 ±30	2000 ±30	3000 ±50	250 ±10	1500 ±30	3000 ±50
Connector Type	SMA Male (center pin)	SMA Male (center pin)	SMA Male	SMA Male (center pin)	SMA Male (center pin)	SMA Male (center pin)	SMA Male (center pin)
Mounting Type	Magnetic	Adhesive	Magnetic	Screw	Adhesive	Magnetic	Magnetic
Dimensions (mm)	318 × Φ 30	152 × 18 × 5.9	Φ 81.5 × 16	54 × 91	116.5 × 21.7 × 5.6	112 × 29.8	88 × Φ 30
Matched Quectel Modules	4G/3G/2G/LPWA						

Product	YDX001AA	YE0002AA	YE0013AA	YGL001AA
				
Frequency Bands (MHz)	824-2690	699-2700	700-2700	700-960, 1710-2690
Technology	LTE (4G)	LTE (4G)	LTE (4G)	LTE (4G)
Cable Length (mm)	n/a	n/a	n/a	n/a
Connector Type	SMA Male (center pin)	RP-SMA Male (center receptacle)	SMA Male (center pin)	SMA Male (center pin)
Mounting Type	Terminal	Terminal	Terminal	Terminal
Dimensions (mm)	208 × Φ 12	174.6 × 19.2	115.4 × 17.5 × Φ 10.2	196.2 × 16 × 13
Matched Quectel Modules	4G/3G/2G/LPWA			

Product	YE0008AA	YE0011AA	YKL001CA
			
Frequency Bands (MHz)	824-960, 1710-2170, 2500-2700	824-960, 1710-2170, 2500-2700	NB: 800-1000, 1700-1900
Technology	LTE (4G)	LTE (4G)	2G/3G/NB-IoT
Cable Length (mm)	n/a	n/a	310 ±10
Connector Type	SMA Male (center pin)	SMA Male (center pin)	SMA Male (center pin)
Mounting Type	Terminal	Terminal	Screw
Dimensions (mm)	52 × Φ 10	50 × Φ 10	50 × 48
Matched Quectel Modules	LPWA/3G/2G module series		

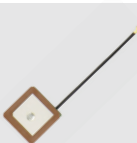
GNSS Antennas

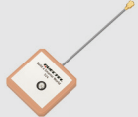
Product	YC0013AA	YC0013AAEVB	YC0008AA	YC0008AAEVB	YCGA001AA	YCGA002AA	YG0038AA
							
Frequency Bands (MHz)	1559-1606	1559-1606	1173, 1575	1173, 1575	1559-1606	1559-1606	1559-1606
Technology	GNSS	GNSS	GNSS L1 & L5 (passive)	GNSS L1 & L5 (passive)	GNSS L1	GNSS L1	GNSS L1
Cable Length (mm)	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Connector Type	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Mounting Type	SMD	n/a	SMD	n/a	Pin Mounting	Pin Mounting	Pin Mounting
Dimensions (mm)	3.2 × 1.6 × 0.6	90 × 50	30 × 5 × 5	80 × 36	10 × 10 × 4	12 × 12 × 4	13 × 13 × 4
Matched Quectel Modules	GNSS L1 module series		GNSS L1/L5 module series		GNSS L1 module series		

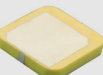
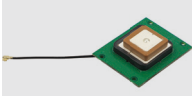
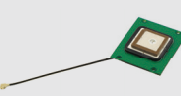
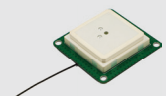
The parameters shall be subject to the Specification.

GNSS Antennas

Product	YG0043AA	YG0046AA	YG0005AA	YG0062AA	YG0048AA
					
Frequency Bands (MHz)	1559-1606	1559-1606	1559-1606	1559-1606	1176, 1575
Technology	GNSS L1	GNSS L1	GNSS L1	GNSS L1	GNSS L1 & L5
Cable Length (mm)	n/a	n/a	n/a	n/a	n/a
Connector Type	n/a	n/a	n/a	n/a	n/a
Mounting Type	Pin Mounting	Pin Mounting	Pin Mounting	Pin Mounting	Pin mounting
Dimensions (mm)	15 × 15 × 4	18 × 18 × 2	18 × 18 × 4	25 × 25 × 4	18 × 18 × 4 & 25 × 25 × 4
Matched Quectel Modules	GNSS L1 module series				GNSS L1/L5 module series

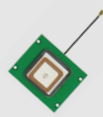
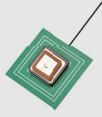
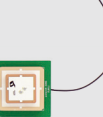
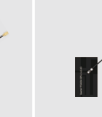
Product	YCGO004AA	YCGO005AA	YCGO006AA	YCGO007AA	YG0034AA	YG0021AA
						
Frequency Bands (MHz)	1559-1606	1559-1606	1559-1606	1559-1606	1559-1606	1560-1605
Technology	GNSS L1 (passive)	GNSS L1 (passive)	GNSS L1 (passive)	GNSS L1 (passive)	GNSS L1 (active)	GNSS L1 & B1 & G1 (active)
Cable Length (mm)	50±2	50±2	50±2	50±2	35±2	42 ±3
Connector Type	IPEX I	IPEX I	IPEX I	IPEX I	IPEX I	IPEX I
Mounting Type	Cable Mounting	Cable Mounting	Cable Mounting	Cable Mounting	Cable Mounting	Cable Mounting
Dimensions (mm)	10 × 10 × 6.5	15 × 15 × 6.5	18 × 18 × 6.5	25 × 25 × 6.5	13 × 13 × 6.8	18.4 × 18.4 × 8.86
Matched Quectel Modules	GNSS L1 module series					

Product	YG0032AA	YG0015AA	YCGO008AA	YCGO009AA	YCGO010AA	YCGO011AA
						
Frequency Bands (MHz)	Beidou: 1561 ±5; GPS: 1575 ±5	1559-1606	1559-1606	1559-1606	1559-1606	1559-1606
Technology	GNSS L1 & B1 & G1 (active)	GNSS L1 (active)	GNSS L1 (active)	GNSS L1 (active)	GNSS L1 (active)	GNSS L1 (active)
Cable Length (mm)	55	55 ±3	50±3	50±2	50±3	50±3
Connector Type	IPEX I	IPEX I	IPEX I	IPEX I	IPEX I	IPEX I
Mounting Type	Cable Mounting	Cable Mounting	Cable Mounting	Cable Mounting	Cable Mounting	Cable Mounting
Dimensions (mm)	18 × 18 × 6.6	25 × 25 × 8.25	10 × 10 × 6.5	15 × 15 × 6.5	18 × 18 × 6.5	25 × 25 × 6.5
Matched Quectel Modules	GNSS L1 module series					

Product	YCGS004AA	YCGS005AA	YCGS006AA	YAT001AA	YAT001BA	YBS00A1AA
						
Frequency Bands (MHz)	1560-1606	1560-1606	1560-1606	1176, 1575	1176, 1575	1176, 1575
Technology	GNSS L1 & G1	GNSS L1 & G1	GNSS L1 & G1	GNSS L1 & L5 (active)	GNSS L1 & L5 (active)	GNSS L1 & L5 (active)
Cable Length (mm)	n/a	n/a	n/a	n/a	n/a	n/a
Connector Type	n/a	n/a	n/a	n/a	n/a	n/a
Mounting Type	SMD	SMD	SMD	Cable Mounting	Cable Mounting	Cable Mounting
Dimensions (mm)	9 × 9 × 4	18 × 18 × 4	25 × 25 × 4	25 × 25 × 4 & 18 × 18 × 4	25 × 25 × 2 & 18 × 18 × 2	40 × 40 × 4 & 45 × 45 × 6
Matched Quectel Modules	GNSS L1 module series			GNSS L1/L5 module series		

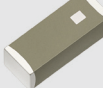
The parameters shall be subject to the Specification.

GNSS Antennas

Product	YAT001CA	YG0030AA	YCGO014AA	YFGA001AA	YFGA002AA	YFGA003AA	YFGA004AA
							
Frequency Bands (MHz)	1176, 1575	1176, 1575	L5: 1166–1186 L1: 1559–1606	1160–1270, 1560–1605	1559–1609	1559–1609	1160–1270, 1560–1605
Technology	GNSS L1 & L5 (active)	GNSS L1 & L5 (passive)	GNSS L1 & L5 (passive)	GNSS L1 & 2 & L5 & L6	GNSS L1	GNSS L1	GNSS L1 & 2 & L5 & L6
Cable Length (mm)	40 ±2	100 ±2	142	100	100	100	100
Connector Type	IPEX I	IPEX I	IPEX I	IPEX I	IPEX I	IPEX I	IPEX I
Mounting Type	Cable Mounting	Cable Mounting	Cable Mounting	Adhesive	Adhesive	Adhesive	Adhesive
Dimensions (mm)	25 × 25 × 2 & 18 × 18 × 4	52 × 52 × 9.9	50 × 50 × 19.0	74.56 × 24.5 × 0.25	61.15 × 11.24	39.45 × 13.25	43 × 24 × 0.12
Matched Quectel Modules	GNSS L1/L5 module series				GNSS L1 module series		GNSS L1/L5 modules

Product	YG0035AA	YLY001CA	YB0017AA	YG0028AA	YG0065AA	YEGT001AA	YEGT002AA	YG0063AA
								
Frequency Bands (MHz)	1561, 1575	1568 ±10	GPS L1/L5, BD B1/B2, GLONASS L1	1561–1602, 1166–1186	1575–1602	1559–1606	1559–1606	GPS L1/L2/L5; BDS B1/B2/B3; GLONASS L1/L2; Galileo E1/E5a/E5b/E6; L-band Corrections
Technology	GNSS L1 & B1 & G1 (active)	GNSS L1 & B1 & G1 (active)	GNSS L1 & L5 (active)	GNSS L1 & L5 (active)	GNSS L1 (active)	GNSS L1	GNSS L1	All GNSS bands + L-band Corrections
Cable Length (mm)	3000 ±20	2000	L = 3000	3000	3000	n/a	n/a	n/a
Connector Type	SMA Male (center pin)	SMA Male (center pin)	SMA Male (center pin)	SMA Male (center pin)	FAKRA Female (Code C)	SMA Male (center pin)	SMA Male (center pin)	TNC Female
Mounting Type	Magnetic	Magnetic	Magnetic	Magnetic	Magnetic	Terminal	Terminal	Screw
Dimensions (mm)	50.3 × 38.4 × 17.1	45.5 × 38 × 13.5	61.5 × 56.5 × 23	Φ 54 × 38	34.5 × 37.5 × 12.5	50 × Ø10	52 × Ø10	Φ 165 × 68
Matched Quectel Modules	GNSS L1 module series		GNSS L1/L5 module series		GNSS L1 modules	All GNSS L1 modules		All GNSS L1/L2/L5 modules

Wi-Fi & Bluetooth Antennas

Product	YC0009AA	YC0010AA	YEWM001AA
			
Frequency Bands (MHz)	2400–2500	2400–2500	2400–2500
Technology	Wi-Fi (Bluetooth)	Wi-Fi (Bluetooth)	Wi-Fi (Bluetooth)
Cable Length (mm)	n/a	n/a	1500
Connector Type	n/a	n/a	SMA Male (center pin)
Mounting Type	SMD	SMD	Magnetic
Dimensions (mm)	3.2 × 1.6 × 0.5	5.2 × 2.0 × 1.2	Φ 30 × 77.4
Matched Quectel Modules	FC30R		

The parameters shall be subject to the Specification.

Wi-Fi & Bluetooth Antennas

Product	YF0011AA	YF0026AA	YF0027AA	YF0029AA	YF0023AA	YF0023CA
						
Frequency Bands (MHz)	2400-2500, 5150-5850	2400-2500, 4900-5850, 5925-7125	2400-2500, 4900-5850, 5925-7125	2410-2490, 4920-5925	2400-2500, 5150-5850, 5925-7125	2400-2500, 5150-5850, 5925-7125
Technology	Wi-Fi (Bluetooth)	Wi-Fi (Bluetooth)	Wi-Fi (Bluetooth)	Wi-Fi (Bluetooth)	Wi-Fi (Bluetooth)	Wi-Fi (Bluetooth)
Cable Length (mm)	44 ±13	100 ±2	100 ±2	100 ±2	100±2	100±2
Connector Type	IPEX I (U.FL Generation I)	IPEX I (U.FL Generation I)	IPEX I (U.FL Generation I)	IPEX I (U.FL Generation I)	RF I Generation	RF I Generation
Mounting Type	Adhesive	Adhesive	Adhesive	Adhesive	Adhesive	Adhesive
Dimensions (mm)	38.9 × 9 × 0.12	28.9 × 11 × 0.2	42 × 7 × 0.2	30 × 30 × 0.25	22.90 × 11.70	37.80 × 7.50
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)	All Wi-Fi/BT modules	

Product	YE0031AA	YE0032AA	YE0038AA	YEW004AA	YEW001AA
					
Frequency Bands (MHz)	2.4-2.5 GHz, 5.15-5.85 GHz	2.4-2.5 GHz, 5.15-5.85 GHz	2400-2500, 5150-5850	2400-2500, 5150-7150	2400-2500, 5150-5850
Technology	Wi-Fi (Bluetooth)	Wi-Fi (Bluetooth)	Wi-Fi (Bluetooth)	Wi-Fi 6E (Bluetooth)	Wi-Fi (Bluetooth)
Cable Length (mm)	n/a	n/a	n/a	n/a	n/a
Connector Type	SMA Male (center pin)	SMA Male (center pin)	SMA Male (center pin)	SMA Male (center pin)	RP-SMA Male (Center Receptacle)
Mounting Type	Terminal	Terminal	Terminal	Terminal	Terminal
Dimensions (mm)	52 ±2	50 ±2	195 × 13	109 × Φ 10	200 × 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)

Combo Antennas

Product	YB0007AA	YB0008AA	YB0009AA	YB0014AA
				
Frequency Bands (MHz)	700-960, 1710-2690, 3300-5000	4G MAIN: 698-960, 1710-2690; GNSS: 1575.42 ±5, 1561.098 ±5; 4G DIV: 1710-2690	4G: 824-960, 1710-2690; GPS, BD: 1575.42 ±10, 1561 ±10	LTE Main & Div: 698-960, 1700-2700; GNSS: 1561-1571; 1602-1606
Technology	5G	Main LTE & DIV LTE & GNSS	LTE & GNSS	Main LTE & DIV LTE & GNSS
Cable Length (mm)	500	300	310	3000
Connector Type	SMA Male (center pin)	SMA Male (center pin)	SMA Male (center pin)	SMA Male (center pin)
Mounting Type	Screw	Adhesive	Screw	Screw
Dimensions (mm)	Φ 120 × 43	Φ 84 × 17.5	33 × 48	81 × 27.5
Matched Quectel Modules	All 5G modules (RM50xQ Series, RG50xQ Series) & All 4G/3G/2G modules & GNSS L1 modules	All 4G/3G/2G modules & GNSS L1 modules		

Product	YB0015AA	YK001AA	YB0032AA	YB0033AA	YB0022AA
					
Frequency Bands (MHz)	LTE: 698-960, 1700-2700; Wi-Fi, Bluetooth: 2400-2500; GNSS: 1561 ±5, 1575 ±5	Bluetooth: 2400-2500; 4G: 824-960; 1710-2690; GPS, BD: 1575.42 ±10, 1561 ±10	700-960, 1700-2700	LTE Main & Div: 700-960, 1700-2700; GNSS: 1559-1610 (active)	LTE Main & Div: 700-2700; Wi-Fi: 2400-5850; GNSS: 1561/1575.42/1602
Technology	LTE/GPS & BD/Wi-Fi	LTE/GPS & BD/Wi-Fi	Main LTE & DIV LTE	Main LTE & DIV LTE & GNSS	Main LTE & DIV LTE & GNSS & Wi-Fi1 & Wi-Fi2
Cable Length (mm)	300	310	2000	2000	1000
Connector Type	SMA Male (center pin)	SMA Male (center pin)	SMA Male (Center Pin)	SMA Male (Center Pin)	FME Female Connector
Mounting Type	Screw	Screw	Screw	Screw	Screw
Dimensions (mm)	54 × 91	33 × 48	Φ 120 × 43	Φ 120 × 43	Φ 120 × 43
Matched Quectel Modules	4G/3G/2G modules & GNSS L1 modules & Wi-Fi modules		All 4G/3G/2G modules	All 4G/3G/2G modules & GNSS L1 modules	4G/3G/2G modules & GNSS L1 modules & Wi-Fi, Bluetooth modules

The parameters shall be subject to the Specification.

Combo Antennas

Product	YB0031AA	YEMA003AA	YEMA004AA	YWL00A0AA	YB0026AA	YEWN004AA
						
Frequency Bands (MHz)	LTE: 698-960; 1710-2690; GNSS: 1575.42 ±5, 1561.098 ±5	LTE: 700-2700 1561/1575.42/1602	4G: 698-960, 1710-2690 Wi-Fi & Bluetooth: 2400-2500	698-960, 1710-2690	LTE: 700-2700; Wi-Fi: 2400-5850; GNSS: 1561/1575.42/1602	2400-2500, 5150-5850
Technology	LTE & GNSS	LTE & GNSS	LTE & Wi-Fi	Main LTE & DIV LTE	LTE & GNSS & Wi-Fi1 & Wi-Fi2	Wi-Fi MIMO
Cable Length (mm)	300	3000	900	1500	1000	300
Connector Type	SMA Male (center pin)	4G: FAKRA D GNSS: FAKRA C	SMA Male (Center Pin)	SMA Male (Center Pin)	GNSS: FAKRA_C, LTE: FAKRA_D, Wi-Fi 1: FAKRA_I, Wi-Fi 2: FAKRA_I	SMA Male (Center Pin)
Mounting Type	Adhesive	Adhesive	Screw	Screw	Screw	Screw
Dimensions (mm)	Φ 84 × 17.5	Φ 84 × 17.5	Φ 81 × 14.5	Φ 81 × 27.5	Φ 120 × 43	Φ 46 × 15
Matched Quectel Modules	All 4G/3G/2G modules & GNSS L1 modules		All 4G/3G/2G modules & Wi-Fi modules	All 4G/3G/2G modules	All 4G/3G/2G modules & GNSS L1 modules & Wi-Fi, Bluetooth modules	Wi-Fi modules

ISM Antennas

Product	YE0019AA	YE0039BA	YEIM001AA
			
Frequency Bands (MHz)	450-470	430-470, 790-960	465-475
Technology	ISM	ISM	ISM
Cable Length (mm)	/	75	2000
Connector Type	SMA Male (center pin)	SMA Male (center pin)	SMA Male (center pin)
Mounting Type	Terminal	Adhesive	Magnetic
Dimensions (mm)	109 × 10	117 × 21.81 × 5.47	Φ 30 × 131

Cable Assemblies

Product	YM0003AA	YM0015AA	YM0003CA	YM0003AB	YM0013AA
					
Frequency Bands (MHz)	0-6000	0-6000	0-6000	0-6000	0-6000
Technology	Cable	Cable	Cable	Cable	Cable
Cable Length (mm)	100	150	200	200	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
Mounting Type	Screw	Screw	Screw	Screw	Screw
Dimensions (mm)	100	150	200	200	300
Matched Quectel Modules	All modules (5G excluded)				

Product	YM0004AA	YM0005AA	YSAN001AA	YBY00A0HA	YBY00A0JA	YBY00A0IA
						
Frequency Bands (MHz)	0-6000	0-6000	0-6000	0-6000	0-6000	-
Technology	Cable	Cable	Cable	Cable	Cable	Bracket
Cable Length (mm)	100	150	300	200	250	-
Connector Type	SMA-female to IPEX IV	SMA-female to RF IV	SMA-female to RF IV	N-K-female to IPEX I	N-female to IPEX I	-
Mounting Type	Screw	Screw	Screw	Screw	Screw	-
Dimensions (mm)	100	150	300	200	250	-
Matched Quectel Modules	All 5G modules (RM50xQ Series, RG50xQ Series)			All modules (5G excluded)		All modules

The parameters shall be subject to the Specification.

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 90+ distributors
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 Modules are sold to 150+ countries and regions

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