

# **GLOBAL *IOT SOLUTIONS* PROVIDER**

## IoT Modules and Antenna Catalogue



LTE

LTE-M

5G

C-V2X

GNSS

LTE-A

Automotive

## 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 4,000 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](http://www.quectel.com) or find us on Linked In, Twitter and Facebook.

Wi-Fi

Smart

Antenna

NB-IoT

AloT

2G/3G

QuecCloud

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# Quectel's IoT Vertical Framework



## Intelligent Transportation

IoV  
CVI  
Vehicle Tracking  
Asset Tracking  
Ship Tracking  
Fleet Management  
OBD  
DVR  
UBI Auto Insurance



## Smart Energy

Electricity Meters  
Gas Meters  
Water Meters  
Thermal Meters  
Smart Grid  
Wind Generators  
Solar Power Generation  
Charging Piles



## Payment

Wireless POS  
Cash Registers  
ATM  
Vending Machines  
Top-up Machines



## Smart City

Street Lighting  
Traffic Lights  
Sharing Economy  
Elevator Monitoring  
Smart Parking  
Parking Meters  
Toll Collection Systems  
Digital Indicators  
Advertising Boards  
Smart Bins  
LED Landscape Lighting Controls



## Wireless Gateways

DTUs  
Consumers Routers  
Industrial Routers  
VOIP  
Servers  
Wi-Fi Hotspots



## Intelligent Agriculture & Environmental Monitoring

Food Traceability  
Farmland Monitoring  
Farm Management  
Meteorological Stations  
Wildlife Protection  
Farm Irrigation  
Environmental Monitoring



## Intelligent Industry

Industrial PDAs/ Scanners  
Industrial PCs  
Industrial Computers  
Pipeline Monitoring  
Robots  
Flowmeters  
UAV  
Industrial Refrigeration  
Indoor Air Detection  
Water Valves/ Pump Controls



## Smart Life & Healthcare




Personal Trackers  
Pet Trackers  
Wearables  
Home Automation  
Elderly Monitoring  
Remote Medical Equipment  
Glucometers  
Blood Pressure Meters  
Game Machines  
Patient Monitoring  
Mobile PCs



## Smart Safety

Alarms  
Intrusion Detectors  
Smoke Detectors  
Gas Detectors  
Motion Sensors  
Asset Protection

# 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: n41/77/78/79/11/3/5/7/8/20/28/38/40; LTE-FDD: B1/3/5/7/8/18/19/20/26/28/32; LTE-TDD: B34/38/39/40/41/42/43; WCDMA: B1/3/5/6/8/19	5G NR: n1/3/5/7/8/20/28/38/40/41/77/78; LTE-FDD: B1/3/5/7/8/20/28/32; LTE-TDD: B38/40/41/42/43; WCDMA: B1/5/8	5G NR: n78; LTE-TDD: B42/43
Region	EMEA/ APAC	EMEA/ 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 Transmission <sup>1</sup>			
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) <sup>2</sup> (RG500Q-EA); Max. 5.0Gbps (DL)/Max. 600/650Mbps (UL) <sup>2</sup> (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) <sup>2</sup> (RG500Q-EU); Max. 3.3Gbps (DL)/Max. 600/650Mbps (UL) <sup>2</sup> (RG501Q-EU); Max. 5.0Gbps (DL)/Max. 600/650Mbps (UL) <sup>2</sup> (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. 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	× 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	3.3~4.3V, typ. 3.8V	3.3~4.3V, typ. 3.8V	3.3~4.3V, typ. 3.8V
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
Certifications <sup>3</sup>	China Telecom/China Mobile/China Unicom/KT/SKT/LGU+/CE/ SRRC/NAL/CCC/KC/JATE/TELEC/RCM	CE/RCM/GCF	CE
Recommended Applications	Industrial Routers, Industrial PDAs, Rugged Tablet PCs and Digital Signage		




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

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

Note 3: May depend on modules' variant.

\* Under development

# 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)	30.0 × 52.0 × 2.3	30.0 × 52.0 × 2.3	30.0 × 52.0 × 2.3
5G	Sub-6 GHz	Sub-6 GHz	Sub-6 GHz/ mmWave
Frequency Bands (MHz)	5G NR: n1/2/3/5/7/8/12/20/25/28/38/40/41/48/66/71/77/78/79; LTE-FDD: B1/2/3/4/5/7/8/12(17)/13/14/18/19/20/25/26/28/29/30/32/66/71; LTE-TDD: B34/38/39/40/41/42/43/48; LAA: B46 <sup>3</sup> ; WCDMA: B1/2/3/4/5/6/8/19	5G NR: n1/2/3/5/7/8/12/20/25/28/38/40/41/48*/66/71/77/78/79; LTE-FDD: B1/2/3/4/5/7/8/12/13/14/17/18/19/20/25/26/28/29/30/32/66/71; LTE-TDD: B34/38/39/40/41/42/43/48; LAA: B46; WCDMA: B1/2/3/4/5/6/8/19;	5G NR: n1/2/3/5/7/8/12/20/25/28/38/40/41/48/66/71/77/78/79/257/258/260/261; LTE-FDD: B1/2/3/4/5/7/8/12(17)/13/14/18/19/20/25/26/28/29/30/32/66/71; LTE-TDD: B34/38/39/40/41/42/43/48; LAA: B46; WCDMA: B1/2/3/4/5/6/8/19
Region	Global (except for China)	Global (except for US)	Global
Weight (approx.) g	8.7	9	9.1
Operating Temperature	-30°C ~ +70°C	-30°C ~ +75°C	-30°C ~ +70°C
Extended Temperature	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C
Control via AT Commands	3GPP TS27.007 and Quectel Enhanced AT Commands	3GPP TS27.007 and Quectel Enhanced AT Commands	3GPP TS27.007 and Quectel Enhanced AT Commands
Data Transmission <sup>1</sup>			
5G	5G SA Sub-6: Max. 2.1Gbps (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) <sup>2</sup>	5G SA Sub-6: Max. 4.2Gbps (DL)/Max. 450Mbps (UL); 5G NSA Sub-6: Max. 5.0Gbps (DL)/Max. 600/650Mbps (UL) <sup>2</sup> ; 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, typ. 3.7V	3.135~4.4V, typ. 3.7V	3.135~4.4V, typ. 3.7V
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
Certifications <sup>4</sup>	GCF/CE/PTCRB/FCC/IC/NCC/JATE/TELEC/RCM/Deutsche Telekom/AT&T-Mobile/Verizon/Telus/Telstra	GCF/CE/PTCRB/FCC/IC/NCC/KC/RCM/Deutsche Telekom/China Telecom/China Mobile/China Unicom/KT/SKT/LGU+	FCC/IC/GCF/PTCRB/CE/RCM
Recommended Applications	Industrial Routers, Industrial PDAs, Rugged Tablet PCs and Digital Signage		

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





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

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

Note 4: May depend on modules' variant.

\* Under development

# 5G NR Module Family

Product	RG520N	RG520F	RG525F	RG530F	
					
Form Factor	LGA	LGA	LGA	LGA	
Dimensions (mm)	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 & mmWave	
Frequency Bands (MHz)	-EU (EMEA/ APAC <sup>1</sup> / Brazil)	5G NR: n1/3/5/7/8/20/28/38/40/41/75/76/77/78; LTE-FDD: B1/3/5/7/8/20/28/32; LTE-TDD: B38/40/41/42/43; WCDMA: B1/5/8	5G NR: n1/3/5/7/8/20/28/38/40/41/75/76/77/78; LTE-FDD: B1/3/5/7/8/20/28/32; LTE-TDD: B38/40/41/42/43; WCDMA: B1/5/8	/	5G NR: n1/3/5/7/8/20/28/38/40/41/75/76/77/78/257/258/260/261; LTE-FDD: B1/3/5/7/8/20/28/32; LTE-TDD: B38/40/41/42/43; WCDMA: B1/5/8
	-EB (EMEA/ APAC <sup>1</sup> / Brazil)	5G NR: n1/3/5/7/8/20/28/38/40/41/75/76/77/78; LTE-FDD: B1/3/5/7/8/20/28/32; LTE-TDD: B38/40/41/42/43; WCDMA: B1/5/8	/	/	/
	-GT (Europe)	5G NR: n78; LTE-TDD: B42/43	/	/	/
	-NA (North America)	5G NR: n2/5/7/12/13/14/25/26/29/30/38/41/48/66/70/71/77/78; LTE-FDD: B2/4/5/7/12/13/14/17/25/26/29/30/66/71; LTE-TDD: B38/41/42/43/48; LAA: B46	5G NR: n2/5/7/12/13/14/25/26/29/30/38/41/48/66/70/71/77/78; LTE-FDD: B2/4/5/7/12/13/14/17/25/26/29/30/66/71; LTE-TDD: B38/41/42/43/48; LAA: B46	5G NR: n2/5/7/12/13/14/25/26/29/30/38/41/48/66/70/71/77/78/257/258/260/261; LTE-FDD: B2/4/5/7/12/13/14/17/25/26/29/30/66/71; LTE-TDD: B38/41/42/43/48; LAA: B46	5G NR: n2/5/7/12/13/14/25/26/29/30/38/41/48/66/70/71/77/78/257/258/260/261; LTE-FDD: B2/4/5/7/12/13/14/17/25/26/29/30/66/71; LTE-TDD: B38/41/42/43/48; LAA: B46
Weight (approx.) g	11	TBD	TBD	TBD	
Operating Temperature	-30°C ~ +75°C	-30°C ~ +75°C	-30°C ~ +75°C	-30°C ~ +75°C	
Extended Temperature	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	
Control via AT Commands	3GPP TS27.007 and Quectel Enhanced AT Commands	3GPP TS27.007 and Quectel Enhanced AT Commands	3GPP TS27.007 and Quectel Enhanced AT Commands	3GPP TS27.007 and Quectel Enhanced AT Commands	
Data Transmission <sup>3</sup>					
5G	5G SA Sub-6: Max. 2.4 Gbps (DL)/Max. 900 Mbps (UL); 5G NSA Sub-6: Max. 3.4 Gbps (DL)/Max. 550 Mbps (UL)	5G SA Sub-6: Max. 4.0 Gbps (DL)/Max. 900 Mbps (UL); 5G NSA Sub-6: Max. 4.0 Gbps (DL)/Max. 550 Mbps (UL)	5G SA Sub-6: Max. 4.0 Gbps (DL)/Max. 900 Mbps (UL); 5G NSA Sub-6: Max. 4.0 Gbps (DL)/Max. 550 Mbps (UL)	5G SA Sub-6: Max. 4.0 Gbps (DL)/Max. 900 Mbps (UL); 5G NSA Sub-6: Max. 8.8 Gbps (DL)/Max. 2.6 Gbps (UL); 5G TDD+mmWave: Max. 8.0 Gbps (DL)/Max. 3.4 Gbps (UL); 5G FDD+ mmWave: Max. 8.9 Gbps (DL)/Max. 2.7 Gbps (UL)	
LTE	LTE-FDD: Max. 1.6 Gbps (DL)/Max. 200 Mbps (UL)	LTE-FDD: Max. 2.0 Gbps (DL)/Max. 200 Mbps (UL)	LTE-FDD: Max. 2.0 Gbps (DL)/Max. 200 Mbps (UL)	LTE-FDD: Max. 2.0 Gbps (DL)/Max. 200 Mbps (UL)	
UMTS	WCDMA: Max. 42 Mbps (DL)/Max. 5.76 Mbps (UL) (RG520N-EU/RG520N-EB)	WCDMA: Max. 42 Mbps (DL)/Max. 5.76 Mbps (UL) (RG520F-EU)	/	WCDMA: Max. 42 Mbps (DL)/Max. 5.76 Mbps (UL) (RG530F-EU)	
SMS	•	•	•	•	
Protocols	TCP/UDP/FTP/HTTP/HTTPS/PING/SMS	TCP/UDP/FTP/HTTP/HTTPS/PING/SMS	TCP/UDP/FTP/HTTP/HTTPS/PING/SMS	TCP/UDP/FTP/HTTP/HTTPS/PING/SMS	
Interfaces					
(U)SIM	× 2, 1.8/2.95 V	× 2, 1.8/2.95 V	× 2, 1.8V/ 2.95V	× 2, 1.8/2.95 V	
UART	× 3	× 3	× 3	× 3	
USB	2.0/3.0/3.1	2.0/3.0/3.1	2.0/3.0/3.1	2.0/3.0/3.1	
PCIe	Gen3 × 2Lane	Gen3 × 2Lane	Gen3 × 2Lane	Gen3 × 2Lane	
PCM	•	•	•	•	
I2C	× 1	× 1	× 1	× 1	
SPI	•	•	•	•	
GPIO	•	•	•	•	
ADC	× 2	× 2	× 2	× 2	
SD Card	•	•	•	•	
RESET_N	•	•	•	•	
Antenna	Cellular: 4, GNSS: × 1 (RG520N-EB/RG520N-NA/RG520N-GT); Cellular: 4 + 2 (optional), GNSS: × 1 (RG520N-EU)	Cellular: 4 + 2 (optional), GNSS: × 1 (RG520F-EU); Cellular: 4, GNSS: × 1 (RG520F-NA)	Cellular: sub6G: 8, GNSS: × 1	Cellular: sub6G × 4 + 2 (optional), mmWave × 8, GNSS: × 1 (RG530F-EU); Cellular: sub6G × 4, mmWave × 8, GNSS: × 1 (RG530F-NA)	
Enhanced Features					
MIMO	DL 4 × 4, UL 2 × 2	DL 4 × 4, UL 2 × 2	Sub-6: DL 4 × 4, UL 2 × 2	Sub-6: DL 4 × 4, UL 2 × 2; mmWave: DL 2 × 2, UL 2 × 2	
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/BDS/Galileo/QZSS	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, typ. 3.8V	3.3-4.4V, typ. 3.8V	3.3-4.4 V, typ. 3.8 V	3.3-4.4V, typ. 3.8V	
Power Consumption	0.142 mA @ power off, 2.6 mA @ sleep (typ.) <sup>3</sup>	TBD	TBD	TBD	
Software Features					
USB Serial Driver	Windows 7/8/8.1/10/11, Linux 2.6-5.18, Android 4.x-12.x	Windows 7/8/8.1/10, Linux 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-12.x	Android 4.x-11.x	Android 4.x-11.x	Android 4.x-11.x	
RIL Driver	Android 4.x-12.x	Android 4.x-11.x	Android 4.x-11.x	Android 4.x-11.x	
NDIS Driver	Windows 7/8/8.1/10/11	Windows 7/8/8.1/10	Windows 7/8/8.1/10	Windows 7/8/8.1/10	
MBIM Driver	Windows 10/11, Linux 3.18-5.18	Windows 10, Linux 3.18-5.12	Windows 10, Linux 3.18-5.12	Windows 10, Linux 3.18-5.12	
Gobinet Driver	Linux 2.6-5.18	Linux 3.18-5.12	Linux 3.18-5.12	Linux 3.18-5.12	
QMI_WWAN Driver	Linux 3.4-5.18	Linux 3.18-5.12	Linux 3.18-5.12	Linux 3.18-5.12	
PCIe Driver	Linux 3.10-5.18	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 <sup>4</sup>	CE/RCM/FCC/IC/Anatel*/GCF/PTCRB/Telstra*/T-Mobile*/AT&T*	TBD	GCF*/PTCRB*/FCC*/IC*	TBD	
Recommended Applications	Industrial Routers, Industrial PDAs, Rugged Tablet PCs and Digital Signage				

Note 1: Excl. China/Japan.



Note 2: n48/77/78 support 8RX.

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

Note 4: May depend on modules' variant.

\* Under development

# 5G NR Module Family

Product		RM520N	RM530N-GL
			
Form Factor		M.2	M.2
Dimensions (mm)		30.0 × 52.0 × 2.3	30.0 × 52.0 × 2.3
5G		Sub-6 GHz	Sub-6 GHz/mmWave
Frequency Bands (MHz)	-GL (Global)	5G NR: n1/2/3/5/7/8/12/13/14/18/20/25/26/28/29/30/38/40/41/48/66/70/71/75/76/77/78/79; LTE-FDD: B1/2/3/4/5/7/8/12/13/14/17/18/19/20/25/26/28/29/30/32/66/71; LTE-TDD: B34/38/39/40/41/42/43/48; LAA: B46; WCDMA: B1/2/4/5/8/19	5G NR: n1/2/3/5/7/8/12/13/14/18/20/25/26/28/29/30/38/40/41/48/66/70/71/75/76/77/78/79/257/258/260/261; LTE-FDD: B1/2/3/4/5/7/8/12/13/14/17/18/19/20/25/26/28/29/30/32/66/71; LTE-TDD: B34/38/39/40/41/42/43/48; LAA: B46; WCDMA: B1/2/4/5/8/19
	-EU/EMEA/ APAC <sup>1</sup> / Brazil)	5G NR: n1/3/5/7/8/20/28/38/40/41/71/75/76/77/78; LTE-FDD: B1/3/5/7/8/20/28/32/71; LTE-TDD: B38/40/41/42/43; WCDMA: B1/5/8	/
Weight (approx.) g		8.7	TBD
Operating Temperature		-30°C ~ +75°C	-30°C ~ +75°C
Extended Temperature		-40°C ~ +85°C	-40°C ~ +85°C
Control via AT Commands		3GPP TS27.007 and Quectel Enhanced AT Commands	3GPP TS27.007 and Quectel Enhanced AT Commands
Data Transmission <sup>2</sup>			
5G		5G SA Sub-6: Max. 2.4Gbps (DL)/Max. 900Mbps (UL); 5G NSA Sub-6: Max. 3.4Gbps (DL)/Max. 550Mbps (UL)	5G SA Sub-6: Max. 2.4Gbps (DL)/Max. 900Mbps (UL); 5G NSA Sub-6: Max. 3.4Gbps (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 3.0	PCIe 3.0
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		*(RM520N-EU)	•
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, typ. 3.7V	3.135~4.4V, typ. 3.7V
Power Consumption		TBD (RM520N-EU); 195 μA @ Power down; 4.7 mA @ Sleep; 41 mA @ USB 2.0, Idle; 60 mA @ USB 3.0, Idle (RM520N-GL)	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 <sup>3</sup>		T-Mobile/Verizon*/AT&T*/NTT DOCOMO*/Deutsche Telekom*/Telstra*/GCF/PTCRB/CE/Anatel/ CCC/RCM/IC/FCC/JATE*/TELEC*/KC*/NCC*	TBD
Recommended Applications		Industrial Routers, Industrial PDAs, Rugged Tablet PCs and Digital Signage	

Note 1: Excl. China/Japan.


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

Note 3: May depend on modules' variant.

\* Under development




# 5G NR Module Family

<b>Product</b>	<b>RG500U-EA</b>
	
Form Factor	LGA
Dimensions (mm)	44.0 × 41.0 × 2.85
5G	Sub-6 GHz
Frequency Bands (MHz)	5G NR: n1/3/7/8/20/28/38/40/41/77/78/79; LTE-FDD: B1/2/3/4/5/7/8/20/28A/28B/66; LTE-TDD: B38/40/41; WCDMA: B1/2/5/8
Region	EMEA/APAC/Latin America
Weight (approx.) g	13
Operating Temperature	-30°C ~ +75°C
Extended Temperature	-40°C ~ +85°C
Control via AT Commands	3GPP TS27.007 and Quectel Enhanced AT Commands
<b>Data Transmission<sup>1</sup></b>	
5G	5G SA Sub-6: Max. 2Gbps (DL)/Max. 1Gbps (UL); 5G NSA Sub-6: Max. 2.6Gbps (DL)/Max. 650Mbps (UL)
LTE(Mbps)	LTE-FDD: Max. 600 (DL)/Max. 150 (UL)
UMTS(Mbps)	WCDMA: Max. 42.2 (DL)/Max. 11 (UL)
SMS	•
Protocols	TCP/UDP/PPP/FTP/HTTP/HTTPS/FTPS/SSL/NTP
<b>Interfaces</b>	
(U)SIM	× 2, 1.8V/3.0V
USB	2.0/3.0
PCIe	PCIe Gen2 × 1 Lane
PCM	•
GPIO	•
RESET_N	•
Antenna	× 6
<b>Enhanced Features</b>	
MIMO	n1/n3/n7/n38/n40/n41/n77/n78/n79 DL 4 × 4 N8/N20/N28 & LTE DL 2 × 2
Digital Audio	•
VoLTE	Optional
DTMF	Dual-tone Multi-frequency
DFOTA	Delta Firmware over the Air
GNSS	/
(U)SIM Card Detection	•
<b>Electrical Features</b>	
Supply Voltage Range	3.3-4.3 V, typ. 3.8 V
Power Consumption	70 μA @ Power off 4.0 mA @ Sleep 55 mA @ USB 2.0, idle 68 mA @ USB 3.0, idle
<b>Software Features</b>	
USB Serial Driver	Windows 7/8/8.1/10/11, Linux 2.6-5.18, Android 4.x-12.x
GNSS Driver	/
RIL Driver	Android 4.x-12.x
RNDIS Driver	Windows 7/8/8.1/10/11, Linux 2.6-5.18
MBIM Driver	/
ECM Driver	Linux 2.6-5.18
NCM Driver	Linux 2.6-5.18
PCIe Driver	Linux 3.10-5.18, Android 4.X-12.X
Certifications	CE/RCM
Recommended Applications	5G Wireless Router, CPE, MiFi, Industrial Routers, Home Gateway, etc

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

\* Under development

# 5G NR Module Family

Product	RG500L
	
Form Factor	LGA
Dimensions (mm)	44.0 × 41.0 × 2.75
5G	Sub-6 GHz
Frequency Bands (MHz)	<p>-EU (EMEA/Oceania/Brazil) 5G NR: n1/3/5/7/8/20/28/38/40/41/77/78; LTE-FDD: B1/3/5/7/8/20/28/32; LTE-TDD: B38/40/41/42/43; WCDMA: B1/5/8</p> <p>-NA (North America) 5G NR: n2/5/7/12/25/38/41/48/66/71/77/78; LTE-FDD: B2/4/5/7/12(17)/13/14/25/26/29/30/66/71; LTE-TDD: B38/41/42/43/48; LAA: B46</p>
Weight (approx.) g	13±0.3(RG500L-EU); TBD(RG500L-NA)
Operating Temperature	-30°C ~ +70°C
Extended Temperature	-40°C ~ +85°C
Control via AT Commands	3GPP Rel-15 and Quectel Enhanced AT Commands
Data Transmission <sup>1</sup>	
5G	5G SA Sub-6: Max. 4.67 Gbps(DL)/Max. 1.25 Gbps (UL)(RG500L-EU); 5G SA Sub-6: Max. 4.67 Gbps(DL)/Max. 1.25Gbps (UL)(RG500L-NA); 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)(RG500L-EU); LTE-FDD: Max. 1.4 Gbps(DL)/Max. 211 Mbps(UL)(RG500L-NA)
UMTS	WCDMA: Max. 42Mbps (DL)/Max. 5.76Mbps (UL)
SMS	•
Protocols	HTTPS/TCP/UDP/FTP/HTTP/PING/FTPS/SSL/NTP(RG500L-EU); TCP/UDP/PPP/FTP/HTTP/HTTPS/FTPS/SSL/NTP (RG500L-NA)
Interfaces	
(U)SIM	× 2, 1.8V/ 3.0V
UART	× 2(RG500L-NA)
USB	2.0/3.0(RG500L-EU); 2.0/3.0/3.1 <sup>2</sup> (RG500L-NA)
PCIe	PCIe Gen3 × 1 Lane
PCM	•
I2C	× 1
SPI	•(RG500L-NA)
GPIO	•
ADC	× 3
SD Card	•(RG500L-NA)
RESET_N	•
Antenna	Main, Diversity and GNSS
Enhanced Features	
MIMO	DL: 4 × 4, UL: 2 × 2
Digital Audio	•
VoLTE	Optional
DTMF	Dual-tone Multi-frequency
FOTA	Delta Firmware over the Air
GNSS	GPS/BDS/GLONASS/Galileo, L1 only(RG500L-NA); GPS/BDS/GLONASS/Galileo, L1 + L5(RG500L-EU)
(U)SIM Card Detection	•
Electrical Features	
Supply Voltage Range	3.3~4.3V, typ. 3.8V
Power Consumption	80µA @Power off, 6.5mA @Sleep, Typ. ,125mA @Idle (USB active)(RG500L-EU); TBD @Power off, TBD@Sleep, Typ. , TBD @Idle (RG500L-NA)
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
GNSS Driver	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
Certifications <sup>3</sup>	GCF/CE/RCM
Recommended Applications	Industrial Routers, CPE, MiFi, Home Gateways, Industrial PDAs, Rugged Tablet PCs and Digital Signage





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

Note 2: USB 3.1 only supports 5 Gbps.

Note 3: May depend on modules' variant.

\* Under development





# 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: B1/3/5/7/8/20/28/32 <sup>1</sup> ; LTE-TDD: B38/40/41; Up to 2 × CA: B1+B1/5/8/20/28; B3+B3/5/7/8/20/28; B7+B5/7/8/20/28; B20+B32; B38+B38; B40+B40; B41+B41; WCDMA: B1/3/5/8	LTE-FDD: B1/3/5/7/8/20/28; LTE-TDD: B38/40/41; 2 × CA: B1+B1/3/5/8/20/28; B3+B3/5/7/8/20/28; B7+B5/7/8/20/28; B38+B38; B40+B40; B41+B41; WCDMA: B1/5/8	LTE-FDD: B1/3/5/7/8/20/28/32 <sup>1</sup> ; LTE-TDD: B38/40/41/42(Optional)/43(Optional); Up to 2 × CA: B1+B1/3/5/7/8/20/28; B3+B3/5/7/8/20/28; B7+B5/7/8/20/28; B20+B32; B38+B38; B40+B40; B41+B41 WCDMA: B1/3/5/8	LTE-FDD: B1/2/3/4/5/7/8/20/28; LTE-TDD: B40; WCDMA*: B1/2/3/4/5/8
	-A /NA(North America)	-A(North America) LTE-FDD: B2/4/5/7/12/13/25/26/29 <sup>2</sup> /30/66; Up to 2 × CA: B2+B2/5/12/13/29; B4+B4/5/12/13/29; B7+B5/7/12/26; B25+B5/12/25/26; B30+B5/12/23; B66+B5/12/13/29/66; WCDMA: B2/4/5	/	-NA(North America) LTE-FDD: B2/4/5/7/12/13/14/25/26/29/30/66/71; LTE-TDD: B41/48	-NA(North America) LTE-FDD: B2/4/5/7/12/13/14/25/26/30/66
	-GT(Global)	/	/	LTE-TDD: B40/41/42/43/48	/
	-LA(Latin America)	/	/	LTE-FDD: B2/4/5/7/8/28/66; LTE-TDD: B42(Optional)/B43(Optional); WCDMA: B2/B4/B5/B8	/
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(Mbps)	LTE-FDD: Max. 300 (DL)/Max. 50 (UL); LTE-TDD: Max. 226 (DL)/Max. 28 (UL)	LTE-FDD: Max. 300 (DL)/Max. 50 (UL); LTE-TDD: Max. 220 (DL)/Max. 30 (UL)	LTE-FDD: Max. 300 (DL)/ Max. 50 (UL); LTE-TDD: Max. 226 (DL)/Max. 28 (UL)	LTE-FDD: Max. 300 (DL)/Max. 75 (UL)	
UMTS	DC-HSDPA: Max. 42Mbps (DL)/ HSUPA: Max. 5.76Mbps (UL) WCDMA: Max. 384Kbps (DL/UL)	DC-HSDPA*: Max. 42Mbps; HSUPA: Max. 5.76Mbps; 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. 5.76 Mbps (UL); WCDMA*: Max. 384Kbps (DL/UL) (EG065K-EA)	
SMS	•	•	•	•	
Protocols	TCP/UDP/FTP/HTTP/HTTPS/PING/SMS	TCP/PPP/FTP/HTTP/SMTP*/MMS*/POP3/SSL/ HTTP/S/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, 4 × 4, 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, typ. 3.8V	3.3~4.3V typ. 3.8V	3.3~4.4V typ. 3.8V	3.3~4.5V, typ. 3.8V	
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; 3.7mA@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 7/8/8.1/10/11, Linux 2.6~5.18, 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	RIL Driver*: Android 4.x~12.x	
NDIS Driver	Windows 7/8/8.1/10	/	Windows 7/8/8.1/10	Windows 7/8/8.1/10/11	
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	ECM Driver*: Linux 2.6~5.18	
Gobinet Driver	Linux 2.6/3.x/4.x/5.x	/	Linux 2.6 or later	Linux 2.6~5.18	
QMI_wwan Driver	Linux 3.x (3.4 or later)/4.1~4.15	/	Linux 3.4 or later	Linux 3.4~5.18	
Certifications <sup>3</sup>	Deutsche Telekom/Telstra/GCF/CE/KC/RCM/ FCC/CCC/PTCRB/IC/AT&T/Verizon/USCC/British Telecom/FAC	CE/NCC/RCM	CE/RCM/FCC*/IC*	GCF/PTCRB/FCC/IC/IFETEL*/Verizon*/AT&T*/ Telus*/CE/RCM/MDA*/ Anatel*/ British Telecom*/Telefonica*/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)	LTE-TDD: B42/43/48	/	/
	-EA (EMEA/ Australia/ Brazil)	LTE-FDD: B1/3/5/7/8/20/28; LTE-TDD: B38/40/41; Up to 3 × CA: Intra-band and Inter-band; WCDMA: B1/3/5/8	LTE-FDD: B1/3/5/7/8/20/28/32 (Optional); LTE-TDD: B38/40/41/42 (Optional)/ 43 (Optional); Up to 3 × CA: Intra-band and Inter-band; WCDMA: B1/3/5/8	LTE-FDD: B1/3/5/7/8/20/28/32; LTE-TDD: B38/41/42/43; Up to 3×CA: Intra-band and Inter-band; WCDMA: B1/3/5/8
	-NA (North America)	/	-NA (North America) LTE-FDD: B2/4/5/7/12/13/14/17/25/26/29/30/ 66/71; LTE-TDD: B41/48	LTE-FDD: B2/4/5/7/8/12/13/14/17/25/26/29/30/ 66/71; LTE-TDD: B41; Up to 5 × CA: Intra-band and Inter-band; WCDMA Bands: B2/4/5
	-LA* (Latin America) (planning)	/	LTE-FDD: B2/4/5/7/8/28/66; LTE-TDD: B42 (Optional)/43 (Optional); WCDMA: B2/4/5/8	/
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)	LTE-FDD: Max. 600Mbps (DL)/Max. 150Mbps (UL); LTE-TDD: Max. 430Mbps (DL)/Max. 90Mbps (UL)	LTE-FDD: Max. 600Mbps (DL)/Max. 75Mbps (UL); LTE-TDD: Max. 310Mbps (DL)/Max. 90Mbps (UL)	LTE-FDD: Max. 1.2Gbps (DL)/Max. 150Mbps (UL); LTE-TDD: Max. 573Mbps (DL)/Max. 90Mbps (UL)
UMTS	DC-HSDPA: Max. 42Mbps (DL)/ HSUPA: Max. 11.2Mbps (UL) WCDMA: Max. 384Kbps (DL/UL)	DC-HSDPA: Max. 42Mbps (DL)/ HSUPA: Max. 11.2Mbps (UL) WCDMA: Max. 384Kbps (DL/UL)	WCDMA: Max. 42Mbps (DL)/Max. 5.76Mbps (UL)	DC-HSDPA: Max. 42Mbps (DL)/ HSUPA: Max. 11.2Mbps (UL) WCDMA: Max. 384Kbps (DL/UL)
SMS	•	•	•	•
Protocols	TCP/UDP/FTP/HTTP/HTTPS/PING/SMS	QMI/MBIM/NITZ/HTTP/HTTPS/FTP/LwM2M*/PING*	TCP/UDP/FTP/HTTP/HTTPS/PING/SMS	TCP/UDP/FTP/HTTP/HTTPS/PING/SMS
Interfaces				
USB	2.0/3.0, Slave Mode	2.0/3.0, Supports Master* and Slave Modes	2.0/3.0, Slave Mode	2.0/3.0, Slave Mode
PCM	•	× 1	•	•
I2C	× 1	× 1	× 1	× 1
(U)SIM	× 2, 1.8V/ 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
RGMII	/	/	•	/
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	3.3~4.3V, typ. 3.8V	3.3~4.3V, typ. 3.8V	3.3~4.3V, typ. 3.8V	3.3~4.3V, typ. 3.8V
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 <sup>2</sup>	CE/RCM/FCC/GCF	CE/RCM/FCC/IC	GCF/CE/RCM/Telstra	CE/RCM/FCC/IC/GCF/PTCRB/AT&T/Verizon/ Telstra/USCC/T-Mobile
Recommended Applications	Industrial Routers, Industrial PDAs, Rugged Tablet PCs and Digital Signage	Routers, 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	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: B1/2/3/4/5/7/8/12/13/14/17/18/19/20/25/26/28/66/71/38/39/40/41; LTE-TDD: B34/38/39/40/41/42/43/46 <sup>1</sup> (LAA)/48 (CBRS); Up to 2 × CA: B2+B2/5/12/13/29 <sup>2</sup> ; B4+B4/5/12/13/29 <sup>2</sup> ; B5+B5/7/25/30/66; B7+B7/12/26; B12+B12/25/30/66; B13+B66; B25+B25/26; B30+B29; B66+B29/66; B41+B41; WCDMA: B1/2/4/5/6/8/19	/	/
	-E (EMEA/ Australia/New Zealand)	LTE-FDD: B1/3/7/8/20/28; LTE-TDD: B38/41; WCDMA: B1/8	LTE-FDD: B1/3/5/7/8/20/28/32 <sup>1</sup> ; LTE-TDD: B38/40/41; Up to 2 × CA: B1+B1/5/8/20/28; B3+B3/5/7/8/20/28; B7+B5/7/8/20/28; B20+B32 <sup>2</sup> ; B38+B38; B40+B40; B41+B41; WCDMA: B1/3/5/8	/	-E (EMEA/ Australia/Brazil) LTE-FDD: B1/3/5/7/8/20/28/32 <sup>1</sup> ; LTE-TDD: B38/40/41; Up to 2 × CA: B1+B1/5/8/20/28; B3+B3/5/7/8/20/28; B7+B5/7/8/20/28; B20+B32 <sup>2</sup> ; B38+B38; B40+B40; B41+B41; WCDMA: B1/3/5/8
	-A (North America)	/	LTE-FDD: B2/4/5/7/12/13/25/26/29 <sup>2</sup> /30/66; LTE-TDD: B41; Up to 2 × CA: B2+B2/5/12/13/29 <sup>2</sup> ; B4+B4/5/12/13/29 <sup>2</sup> ; B5+B5/7/25/30/66; B7+B7/12/26; B12+B12/25/30/66; B13+B66; B25+B25/26; B30+B29; B66+B29/66; B41+B41; WCDMA: B2/4/5	-NA (North America) LTE-FDD: B2/4/5/7/12/13/14/17/25/26/29/30/66/71; LTE-TDD: B41/48	LTE-FDD: B2/4/5/7/12/13/25/26/29 <sup>2</sup> /30/66; Up to 2 × CA: B2+B2/5/12/13/29; B4+B4/5/12/13/29; B7+B5/7/12/26; B25+B5/12/25/26; B30+B5/12/29; B66+B5/12/13/29/66; WCDMA: B2/4/5
	-J (Japan)	/	LTE-FDD: B1/3/8/18/19/26/28; LTE-TDD: B41; Up to 2 × CA: B1+B1/8/18/19/26/28; B3+B3/8/18/19/26/28; B41+B41; WCDMA: B1/3/6/8/19	/	/
	-CE (China/Thailand/India)	LTE-FDD: B1/3/5/8; LTE-TDD: B38/39/40/41; WCDMA: B1/8; 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 TS 27.007 and Quectel Enhanced AT Commands	3GPP TS 27.007 and Quectel Enhanced AT Commands	3GPP TS 27.007 and Quectel Enhanced AT Commands	
Data Transmission					
LTE (Mbps)	LTE-FDD: Max. 150 (DL)/Max. 50 (UL); LTE-TDD: Max. 130 (DL)/Max. 30 (UL)	LTE-FDD: Max. 300 (DL)/Max. 50 (UL); LTE-TDD: Max. 226 (DL)/Max. 28 (UL)	LTE-FDD: Max. 300 (DL)/Max. 50 (UL); LTE-TDD: Max. 226 (DL)/Max. 28 (UL)	LTE-FDD: Max. 300 (DL)/Max. 50 (UL); LTE-TDD: Max. 226 (DL)/Max. 28 (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)	DC-HSDPA: Max. 42Mbps (DL)/ HSUPA: Max. 5.76Mbps (UL) WCDMA: Max. 384Kbps (DL/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	3.135~4.4V, typ. 3.3V	3.135~4.4V, typ. 3.7V	3.135~4.4V, typ. 3.7V	3.1~4.4 V, typ. 3.3 V.	
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 7/8/8.1/10	Windows 7/8/8.1/10	Windows 7/8/8.1/10	Windows 7/8/8.1/10	
Gobinet Driver	Linux 2.6~5.4	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 <sup>4</sup>	CCC/SRRC/NAL/CE/RCM/FCC/PTCRB/GCF	GCF/CE/NCC/RCM/ICASA/FCC/PTCRB/IC/WHLL/ Verizon/AT&T/Telstra/Deutsche Telekom/ KDDI/JATE/TELEC/Sprint/KC	NCC/CE/RCM/FCC/IC	Telstra/Deutsche Telekom/GCF/CE/NCC/RCM/ FCC/IC/CCC/PTCRB/AT&T/Verizon/Telus/Sprint/ Rogers/ICASA/FAC	
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	-G/GL (Global) LTE-FDD: B1/2/3/4/5/7/8/9/12/13/14/17/18/19/20/21/25/26/28/29 <sup>1</sup> /30/32/66; LTE-TDD: B38/39/40/41; Up to 3 × CA: Intra-band and Inter-band, B1+3+5/7/8/19/20/28, B2+4+5, B2+4+13, B2+5+30, B2+12+30, etc; WCDMA: B1/2/3/4/5/6/8/19	LTE-FDD: B1/2/3/4/5/7/8/12/13/14/17/18/19/20/25/26/28/29 <sup>1</sup> /30/32 <sup>1</sup> /66/71; LTE-TDD: B38/39/40/41/42/43/46 <sup>3</sup> (LAA)/48 (CBRS); Up to 3 × CA: Intra-band and Inter-band; WCDMA: B1/2/3/4/5/6/8/19	LTE-FDD: B1/2/3/4/5/7/8/12/13/14/17/18/19/20/25/26/28/29 <sup>1</sup> /30/32 <sup>1</sup> /66; LTE-TDD: B38/39/40/41/42/43/46 <sup>3</sup> (CBRS); Up to 3 × CA: Intra-band and Inter-band; WCDMA: B1/2/3/4/5/6/8/19	LTE-FDD: B1/2/3/4/5/7/8/12/13/14/17/18/19/20/25/26/28/29 <sup>1</sup> /30/32 <sup>1</sup> /66; LTE-TDD: B38/39/40/41/42/43/46 <sup>3</sup> (CBRS); Up to 3 × CA: Intra-band and Inter-band; WCDMA: B1/2/3/4/5/6/8/19	LTE-FDD: B1/2/3/4/5/7/8/12/13/14/17/18/19/20/25/26/28/29 <sup>1</sup> /30/32 <sup>1</sup> /66; LTE-TDD: B38/39/40/41/42/43/46 <sup>3</sup> (CBRS); Up to 5 × CA: Intra-band and Inter-band; WCDMA: B1/2/3/4/5/6/8/19
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. 430Mbps (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. 1.0Gbps (DL)/ Max. 150Mbps (UL); LTE-TDD: Max. 880Mbps (DL)/ Max. 90Mbps (UL)
UMTS	DC-HSDPA: Max. 42Mbps (DL)/ HSUPA: Max. 5.76Mbps (UL) WCDMA: Max. 384Kbps (DL/UL)	DC-HSDPA: Max. 42Mbps (DL)/ HSUPA: Max. 11.2Mbps (UL) WCDMA: Max. 384Kbps (DL/UL)	DC-HSDPA: Max. 42Mbps (DL)/ HSUPA: Max. 11.2Mbps (UL) WCDMA: Max. 384Kbps (DL/UL)	DC-HSDPA: Max. 42Mbps (DL)/ HSUPA: Max. 11.2Mbps (UL) WCDMA: Max. 384Kbps (DL/UL)	DC-HSDPA: Max. 42Mbps (DL)/ HSUPA: Max. 11.2Mbps (UL) WCDMA: Max. 384Kbps (DL/UL)
SMS	•	•	•	•	•
Protocols	QMI/MBIM/NITZ/HTTP/HTTPS/FTP/LwM2M/PING	QMI/MBIM/NITZ/HTTP/HTTPS/FTP/LwM2M*/PING*	TCP/UDP/FTP/HTTP/HTTPS/PING/SMS	TCP/UDP/FTP/HTTP/HTTPS/PING/SMS	TCP/UDP/FTP/HTTP/HTTPS/PING/SMS
Interfaces					
USB	2.0/3.0, Slave Mode	2.0/3.0, Slave Mode	2.0/3.0, Slave Mode	2.0/3.0, Slave Mode	2.0/3.0, Slave Mode
PCM	•	•	•	•	•
I2C	× 1	/	/	/	/
(U)SIM	× 2, 1.8V/ 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	Optional	MIPI interface	MIPI interface	MIPI interface	MIPI interface
RESET_N	•	•	•	•	•
PCIe	Optional	Optional	PCIe Gen2 × 1 Lane	PCIe Gen2 × 1 Lane	PCIe Gen2 × 1 Lane
Antenna	Main, Diversity and GNSS	Main, Diversity and GNSS	Main, Diversity and GNSS	Main, Diversity and GNSS	Main, Diversity and GNSS, MIMO × 2
Enhanced Features					
MIMO	4 × 2, 2 × 2, DL	2 × 2, 4 × 2 DL	2 × 2, 4 × 2 DL	2 × 2, 4 × 2 DL	2 × 2, 4 × 2, 4 × 4 DL
eCall*	Emergency Service	Emergency Service	Emergency Service	Emergency Service	Emergency Service
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, typ. 3.7V	3.135~4.4V, typ. 3.7V	3.135~4.4V, typ. 3.7V	3.135~4.4V, typ. 3.7V	3.135~4.4V, typ. 3.7V
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: 7/8/8.1/10/11 Linux: 2.6-5.X Android: 4.x-12.x	Windows 7/8/8.1/10, Linux 2.6/3.x/4.x/5.x, Android 4.x/5.x/6.x/7.x/8.x/9.x	Windows 7/8/8.1/10, Linux 2.6/3.x/4.x/5.x, Android 4.x/5.x/6.x/7.x/8.x/9.x	Windows 7/8/8.1/10, Linux 2.6/3.x/4.x/5.x, Android 4.x/5.x/6.x/7.x/8.x/9.x	Windows 7/8/8.1/10, Linux 2.6/3.x/4.x/5.x, Android 4.x/5.x/6.x/7.x/8.x/9.x
RIL Driver	Android: 4.x-12.x	Android 4.x/5.x/6.x/7.x/8.x/9.x	Android 4.x/5.x/6.x/7.x/8.x/9.x	Android 4.x/5.x/6.x/7.x/8.x/9.x	Android 4.x/5.x/6.x/7.x/8.x/9.x
NDIS Driver	Windows: 7/8/8.1/10/11	Windows 7/8/8.1/10	Windows 7/8/8.1/10	Windows 7/8/8.1/10	Windows 7/8/8.1/10
Gobinet Driver	Linux 2.6/3.x/4.x/5.x	Linux 2.6/3.x/4.x/5.x	Linux 2.6/3.x/4.x/5.x	Linux 2.6/3.x/4.x/5.x	Linux 2.6/3.x/4.x/5.x
QMI_WWAN Driver	Linux 3.x (3.4 or later)/4.x/5.x	Linux 3.x (3.4 or later)/4.x/5.x	Linux 3.x (3.4 or later)/4.x/5.x	Linux 3.x (3.4 or later)/4.x/5.x	Linux 3.x (3.4 or later)/4.x/5.x
PCIe Driver	/	Linux 3.x/4.x/5.x	Linux 3.x/4.x/5.x	Linux 3.x/4.x/5.x	Linux 3.x/4.x/5.x
Certifications	CE/FCC/IC/NCC/RCM/CAS/A/JETE/TELEC/GCF/PTCRB/Telstra/AT&T/Verizon/Telefónica/Vodafone/Deutsche Telekom/British Telecom/Docomo/UKCA/Anatel/KC/T-Mobile/Sprint/Telus/Rogers/KDDI/TIM/WHQL	CE/RCM/FCC/IC/NCC	GCF/CE/PTCRB/FCC/IC/Anatel/IFETEL/SRRC/NAL/CCC/NCC/KC/JATE/TELEC/RCM/CAS/A/Vodafone/British Telecom/Swisscom/Verizon/AT&T/T-Mobile/Sprint/China Mobile/China Unicom/NTT Docomo/SoftBank*/KDDI/Telstra*	GCF/CE/PTCRB/FCC/IC/RCM/Verizon/AT&T	GCF/CE/PTCRB/FCC/IC/Anatel/IFETEL/SRRC/NAL/CCC/NCC/KC/JATE/TELEC/RCM/CAS/A/Vodafone/British Telecom/Swisscom/Verizon/AT&T/T-Mobile/Sprint/China Mobile/China Unicom/NTT Docomo/SoftBank*/KDDI/Telstra*
Recommended Applications	Consumer Laptops, Industrial Laptops, Industrial Routers, Industrial PDAs, Rugged Tablet PCs and Digital Signage.				

Note 1: B32 is only for secondary component carrier.



Note 2: B29 is only for secondary component carrier.

Note 3: B46 is only for secondary component carrier.

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

\* Under development



# 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	
Frequency Bands (MHz)	-CE (China/India)	/	/	
	-E (EMEA/South Korea/Thailand/India)	(EMEA/Thailand/India) LTE-FDD: B1/3/5/7/8/20; WCDMA: B1/5/8; GSM: B3/8	(EMEA/South Korea/Thailand/India) LTE-FDD: B1/3/5/7/8/20; LTE-TDD: B38/40/41; WCDMA: B1/5/8; GSM: B3/8	/
	-EU (EMEA/Thailand)	LTE-FDD: B1/3/7/8/20/28A; WCDMA: B1/8; GSM: B3/8	LTE-FDD: B1/3/7/8/20/28A; LTE-TDD: B38/40/41; WCDMA: B1/8; GSM: B3/8	/
	-EUX (EMEA/Thailand)	LTE-FDD: B1/3/7/8/20/28A; WCDMA: B1/8; GSM: B3/8	LTE-FDD: B1/3/7/8/20/28A; LTE-TDD: B38/40/41; WCDMA: B1/8; GSM: B3/8	/
	-V (Verizon)	LTE-FDD: B4/13	LTE-FDD: B4/13	/
	-A (AT&T-Mobile/Canada)	LTE-FDD: B2/4/12; WCDMA: B2/4/5	LTE-FDD: B2/4/12; WCDMA: B2/4/5	/
	-ADL (AT&T-Mobile)	/	LTE-FDD: B2/4/12	/
	-AF (AT&T/Verizon/T-Mobile)	/	LTE-FDD: B2/4/5/12/13/14/66/71; WCDMA: B2/4/5	/
	-AFDL (AT&T/Verizon/T-Mobile)	/	LTE-FDD: B2/4/5/12/13/14/66/71	/
	-AFX (AT&T/Verizon)	/	LTE-FDD: B2/4/5/12/13/14/66/71; WCDMA: B2/4/5	/
	-AFXD (AT&T/Verizon/T-Mobile)	/	LTE-FDD: B2/4/5/12/13/14/66/71; WCDMA: B2/4/5	/
	-AU (Latin America/ANZ)	LTE-FDD: B1/2 <sup>3</sup> /3/4/5/7/8/28; LTE-FDD: B40; WCDMA: B1/2/5/8; GSM: B2/3/5/8	LTE-FDD: B1/2 <sup>3</sup> /3/4/5/7/8/28; LTE-TDD: B40; WCDMA: B1/2/5/8; GSM: B2/3/5/8	/
	-AUX (Latin America/ANZ)	LTE-FDD: B1/2 <sup>3</sup> /3/4/5/7/8/28; LTE-TDD: B40; WCDMA: B1/2/4/5/8; GSM: B2/3/5/8	LTE-FDD: B1/2 <sup>3</sup> /3/4/5/7/8/28; LTE-TDD: B40; WCDMA: B1/2/4/5/8; GSM: B2/3/5/8	/
	-AUT (Australia) <sup>1</sup>	LTE-FDD: B1/3/5/7/28; WCDMA: B1/5	/	/
-J (Japan)	LTE-FDD: B1/3/8/18/19/26	LTE-FDD: B1/3/8/18/19/26; LTE-TDD: B41; WCDMA: B1/6/8/19	/	
-KL (Korea)	LTE-FDD: B1/3/5/7/8	/	/	
Weight (approx.) g	4.9 (EC21); 9.8 (EC21 Mini PCIe)	4.9 (EC25); 9.8 (EC25 Mini PCIe)	5.3 (EC20 R2.1); 10.6 (EC20 R2.1 Mini PCIe)	
Operating Temperature	-35°C ~ +75°C	-35°C ~ +75°C	-35°C ~ +75°C	
Extended Temperature	-40°C ~ +85°C (EC21); -40°C ~ +80°C (EC21 Mini PCIe)	-40°C ~ +85°C (EC25); -40°C ~ +80°C (EC25 Mini PCIe)	-40°C ~ +85°C (EC20 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)	
EVD0 data rate (Mbps)	/	/	Max. 3.1 (DL) /Max. 1.8 (UL)	
CDMA2000 data rate (Kbps)	/	/	Max. 307.2 (DL) /Max. 307.2 (UL)	
EDGE data rate (Kbps)	Max. 296 (DL)/Max. 236.8 (UL)	Max. 296 (DL)/Max. 236.8 (UL)	Max. 296 (DL) /Max. 236.8 (UL)	
GPRS data rate (Kbps)	Max. 107 (DL)/Max. 85.6 (UL)	Max. 107 (DL)/Max. 85.6 (UL)	Max. 107 (DL) /Max. 85.6 (UL)	
SMS	•	•	•	
CSD	•	•	•	
Protocols	TCP/UDP/PPP/FTP/HTTP/NTP/PING/QMI/HTTPS/SMP/MMS*/FTPS*/SMTPS/SSL	TCP/UDP/PPP/FTP/HTTP/NTP/PING/QMI/HTTPS/SMP/MMS*/FTPS*/SMTPS/SSL	TCP/UDP/PPP/FTP/HTTP/NTP/PING/QMI/NITZ/CMUX/HTTPS/SMP/MMS/FTPS/SMTPS/SSL/FILE	
Interfaces				
(U)SIM	1.8V/ 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 <sup>1</sup> )	• (Only Supported on Quecopen <sup>1</sup> )	/	
Antenna	Pads for Primary, Rx-diversity and GNSS	Pads for Primary, Rx-diversity and GNSS	Pads for Primary, Rx-diversity and GNSS	
Enhanced Features				
GNSS	Optional	Optional	Optional	
WiFi-Scan	/	/	/	
Bluetooth	/	/	/	
DTMF	•	•	•	
DFOTA	•	•	•	
QMI/ RmNet	•	•	•	
Audio Playback/Audio Recording	Optional	Optional	Optional	
QuecFile	•	•	• (EC20 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/9.x	Windows 7/8/8.1/10, Linux 2.6-5.4, Android 4.x/5.x/6.x/7.x/9.x	Windows 7/8/8.1/10, Linux 2.6-5.4, Android 4.x/5.x/6.x/7.x/9.x	
GNSS Driver/ RIL Driver	Android 4.x/5.x/6.x/7.x/8.x/9.x	Android 4.x/5.x/6.x/7.x/8.x/9.x	Android 4.x/5.x/6.x/7.x/8.x/9.x	
NDIS Driver	Windows 7/8/8.1/10	Windows 7/8/8.1/10	Windows 7/8/8.1/10	
MBIM Driver	Windows 8/8.1/10, Linux 3.8-5.4	Windows 8/8.1/10, Linux 3.8-5.4	Windows 8/8.1/10, Linux 3.8-5.4	
GobiNet Driver	Linux 2.6-5.4	Linux 2.6-5.4	Linux 2.6-5.4	
QMI_WWAN Driver	Linux 3.4-5.4	Linux 3.4-5.4	Linux 3.4-5.4	
(U)SIM Card Detection	•	•	•	
Firmware Update	Via USB/DFOTA	Via USB/DFOTA	Via USB/DFOTA	
Electrical Features				
Supply Voltage Range	3.3V-4.3V, typ. 3.8V (EC21); 3.0V-3.6V, typ. 3.3V (EC21 Mini PCIe)	3.3V-4.3V, typ. 3.8V (EC25); 3.0V-3.6V, typ. 3.3V (EC25 Mini PCIe)	3.3V-4.3V, typ. 3.8V (EC20 R2.1); 3.0V-3.6V, typ. 3.3V (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 <sup>3</sup>	Carrier Certification: Vodafone/Deutsche Telekom/ British Telecom/Telefónica/Verizon/AT&T-Mobile/U.S. Cellular/ Rogers/SKT/KT/NTT DOCOMO/KDDI/Telstra/LGU-/ Spark; Regulatory Certification: GCF/CE/FCC/PTCRB/IC/Anatel/KC/ NCC/JATE/TELEC/RCM/FAC/UKCA; Others: WHQL	Carrier Certification: Vodafone/Deutsche Telekom/ British Telecom/Telefónica/ Verizon/AT&T-Mobile/U.S. Cellular/ Rogers/Telus/NTT DOCOMO/SoftBank/KDDI/ Bell/SKT/ LGU-/ Telstra/KT/Spark; Regulatory Certification: GCF/CE/FCC/PTCRB/IC/Anatel/KC/NCC/JATE/TELEC/RCM/FAC/NBTC/CASA/UKCA; Others: WHQL	Regulatory Certification: NAL/STRCC/CCC (China)	
Recommended Applications	Telematics, Smart Metering, Mobile POS Terminals, Gateways, Safety, Tracking and Tracing, Remote Maintenance and Control, Networking	Mobile Computing, Healthcare, etc.		

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

\* Under development



# 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: B1/2/3/4/5/7/8/12/13/18/19/20/25/26/28; LTE-TDD: B38/39/40/41; WCDMA: B1/2/4/5/6/8/19; GSM: B2/3/5/8	LTE-FDD: B1/2/3/4/5/7/8/12/13/18/19/20/25/26/28; LTE-TDD: B38/39/40/41; WCDMA: B1/2/4/5/6/8/19; GSM: B2/3/5/8
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)
<b>Data Transmission</b>			
LTE data rate (Mbps)		LTE-FDD: Max. 10 (DL)/Max. 5 (UL); LTE-TDD: Max. 8.96 (DL)/Max. 3.1 (UL)	LTE-FDD: Max. 150 (DL)/Max. 50 (UL); LTE-TDD: Max. 130 (DL)/Max. 30 (UL)
DC-HSPA+ data rate (Mbps)		Max. 42 (DL)/Max. 5.76 (UL)	Max. 42 (DL)/Max. 5.76 (UL)
WCDMA data rate (Kbps)		Max. 384 (DL)/Max. 384 (UL)	Max. 384 (DL)/Max. 384 (UL)
EDGE data rate (Kbps)		Max. 296 (DL)/Max. 236.8 (UL)	Max. 296 (DL)/Max. 236.8 (UL)
GPRS data rate (Kbps)		Max. 107 (DL)/Max. 85.6 (UL)	Max. 107 (DL)/Max. 85.6 (UL)
SMS		•	•
Protocols		TCP/UDP/PPP/FTP/HTTP/NTP/PING/QMI/NITZ/CMUX/HTTPS/SMTP/MMS*/FTPS*/SMTPS/SSL/FILE	TCP/UDP/PPP/FTP/HTTP/NTP/PING/QMI/NITZ/CMUX/HTTPS/SMTP/MMS*/FTPS*/SMTPS/SSL/FILE
<b>Interfaces</b>			
(U)SIM		1.8V/ 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 Quc0pen <sup>®</sup> )	• (Only Supported on Quc0pen <sup>®</sup> )
Antenna		Pads for Primary, Rx-diversity and GNSS	Pads for Primary, Rx-diversity and GNSS
<b>Enhanced Features</b>			
GNSS		Optional	Optional
WiFi-Scan		/	/
BlueTooth		/	/
DTMF		•	•
DFOTA		•	•
QMI/ RmNet		•	•
Audio Playback/Audio Recording		Optional	Optional
USB Serial Driver		Windows 7/8/8.1/10, Linux 2.6-5.4, Android 4.x/5.x/6.x/7.x/9.x	Windows 7/8/8.1/10, Linux 2.6-5.4, Android 4.x/5.x/6.x/7.x/9.x
GNSS Driver		Android 4.x/5.x/6.x/7.x/8.x/9.x	Android 4.x/5.x/6.x/7.x/8.x/9.x
RIL Driver		Android 4.x/5.x/6.x/7.x/8.x/9.x	Android 4.x/5.x/6.x/7.x/8.x/9.x
NDIS Driver		Windows 7/8/8.1/10	Windows 7/8/8.1/10
MBIM Driver		Windows 8/8.1/10, Linux 3.8-5.4	Windows 8/8.1/10, Linux 3.8-5.4
GobiNet Driver		Linux 2.6-5.4	Linux 2.6-5.4
QMI_WWAN Driver		Linux 3.4-5.4	Linux 3.4-5.4
(U)SIM Card Detection		•	•
(U)SIM Card Connector		Optional (EG21-G Mini PCIe)	Optional (EG25-G Mini PCIe)
Firmware Update		Via USB/DFOTA	Via USB/DFOTA
<b>Electrical Features</b>			
Supply Voltage Range		3.3V-4.3 V, typ. 3.8V (EG21-G); 3.0V-3.6 V, typ. 3.3V (EG21-G Mini PCIe)	3.3V-4.3 V, typ. 3.8V (EG25-G); 3.0V-3.6 V, typ. 3.3V (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/NBTC/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 × 2.45	25.0 × 29.0 × 2.45	
LTE Category	LTE Cat 1	LTE Cat 4	
Frequency Bands (MHz)	-E (Europe)	LTE-FDD: B1/3/7/8/20/28A; WCDMA: B1/8; GSM: B3/8	LTE-FDD: B1/3/7/8/20/28A; WCDMA: B1/8; GSM: B3/8
	-EX (Europe)	LTE-FDD: B1/3/7/8/20/28; WCDMA: B1/8; GSM: B3/8	LTE-FDD: B1/3/7/8/20/28; WCDMA: B1/8; GSM: B3/8
	-NAXD (North America)	LTE-FDD: B2/4/5/12/13/25/26; WCDMA: B2/4/5	LTE-FDD: B2/4/5/12/13/25/26; WCDMA: B2/4/5
	-NAX (North America)	LTE-FDD: B2/4/5/12/13/25/26; WCDMA: B2/4/5	LTE-FDD: B2/4/5/12/13/25/26; WCDMA: B2/4/5
	-NA (North America)	LTE-FDD: B2/4/5/12/13; WCDMA: B2/4/5	LTE-FDD: B2/4/5/12/13; WCDMA: B2/4/5
	-VX (Verizon)	LTE-FDD: B4/13	/
	-AUX (Latin America/ANZ)	LTE-FDD: B1/2/3/4/5/7/8/28/66; WCDMA: B1/2/5/8; GSM: B2/3/5/8	LTE-FDD: B1/2/3/4/5/7/8/28/66; WCDMA: B1/2/5/8; GSM: B2/3/5/8
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 <sup>®</sup> )	• (Only Supported on QuecOpen <sup>®</sup> )	
Antenna	Pads for Primary, Rx-diversity and GNSS <sup>1</sup>	Pads for Primary, Rx-diversity and GNSS <sup>1</sup>	
Enhanced Features			
GNSS <sup>1</sup>	Optional	Optional	
WiFi-Scan	/	/	
Bluetooth	/	/	
E911 (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/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	•	•	
Firmware Update	Via USB/DFOTA	Via USB/DFOTA	
Electrical Features			
Supply Voltage Range	3.3V-4.3 V, typ. 3.8V	3.3V-4.3 V, typ. 3.8V	
Power Consumption	15µA@Power off/2.6mA@Sleep, Typ./21mA@Idle	15µA@Power off/2.6mA@Sleep, Typ. /21mA@Idle	
Certifications <sup>2</sup>	Carrier Certification: Deutsche Telekom/Verizon/AT&T/U.S. Cellular/T-Mobile/Sprint/Rogers/Telus/Telstra*; Regulatory Certification: GCF/CE/FCC/PTCRB/IC/Anatel/FAC/NCC/RCM/UKCA; Others: WHQL	Carrier Certification: Deutsche Telekom/Verizon/AT&T/U.S. Cellular/T-Mobile/Rogers/Telus/Sprint/Telstra*; Regulatory Certification: GCF/CE/FCC/PTCRB/IC/FAC/UKCA; Others: WHQL	
Recommended Applications	Telematics, Smart Metering, Mobile POS Terminals, Gateways, Safety, Tracking and Tracing, Remote Maintenance and Control, Networking, Mobile Computing, Healthcare, etc.		

Note 1: 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	EC200U/EC200U Mini PCIe	EC200A/EC200A Mini PCIe	EC200S
			
Form Factor	LCC (EC200U); Mini PCIe-C (EC200U-CN Mini PCIe-C); Mini PCIe (EC200U-EU Mini PCIe)	LCC (EC200A); Mini PCIe (EC200A Mini PCIe); Mini PCIe-C (EC200A-CN Mini PCIe-C)	LCC
Dimensions (mm)	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)	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)	32.0 × 29.0 × 2.4
LTE Category	LTE Cat 1	LTE Cat 4	LTE Cat 1
Frequency Bands (MHz)	-CN (China/India)	LTE-FDD: B1/3/5/8; LTE-TDD: B34/38/39/40/41; GSM: B3/8 (EC200U/EC200U-CN Mini PCIe-C)	/
	-EU (Europe/Asia-Pacific)	LTE-FDD: B1/3/5/7/8/20/28; LTE-TDD: B38/40/41; GSM: B2/3/5/8 (EC200U/EC200U-EU Mini PCIe)	/
	-EN (EMEA/APAC)	/	/
	-AU (Australia/New Zealand/Latin America)	LTE-FDD: B1/2/3/4/5/7/8/28/66; LTE-TDD: B38/40/41; GSM: B2/3/5/8 (EC200U)	LTE-FDD: B1/2/3/4/5/7/8/28/66; LTE-TDD: B40; WCDMA: B1/2/4/5/8; GSM: B2/3/5/8
Weight (approx.) g	4.1 (EC200U); 5.16 (EC200U-CN Mini PCIe-C); 5.96 (EC200U-EU Mini PCIe)	4.3 (EC200A); 9.7 (EC200A Mini PCIe); 8.5 (EC200A Mini PCIe-C)	4.3
Operating Temperature	-35°C ~ +75°C	-35°C ~ +75°C	-35°C ~ +75°C
Extended Temperature	-40°C ~ +85°C (EC200U); -40°C ~ +80°C (EC200U-CN Mini PCIe-C/EC200U-EU Mini PCIe)	-40°C ~ +85°C (EC200A); -40°C ~ +80°C (EC200A Mini PCIe/EC200A-CN Mini PCIe-C)	-40°C ~ +85°C
Data Transmission			
LTE data rate (Mbps)	Max. 10 (DL)/Max. 5 (UL) (EC200U); LTE-FDD: Max. 10 (DL)/Max. 5 (UL); LTE-TDD: Max. 8.96 (DL)/Max. 3.1 (UL) (EC200U-CN Mini PCIe-C/EC200U-EU Mini PCIe)	LTE-FDD: Max. 150 (DL)/Max. 50 (UL); LTE-TDD: Max. 130 (DL)/Max. 30 (UL)	LTE-FDD: Max. 10 (DL)/Max. 5 (UL)
DC-HSPA+ data rate (Mbps)	/	Max. 21 (DL)/Max. 5.76 (UL)	/
WCDMA data rate (Kbps)	/	Max. 384 (DL)/Max. 384 (UL)	/
EDGE data rate (Kbps)	/	Max. 236.8 (DL)/Max. 236.8 (UL)	Max. 236.8 (DL)/Max. 236.8 (UL)
GPRS data rate (Kbps)	Max. 85.6 (DL)/Max. 85.6 (UL)	Max. 85.6 (DL)/Max. 85.6 (UL)	Max. 85.6 (DL)/Max. 85.6 (UL)
SMS	•	•	•
CSD	/	*	/
Protocols	TCP/UDP/PPP/NITZ/PING/FILE/MQTT/NTP/HTTP/HTTPS/SSL/FTP/FTPS/CMUX/MMS	TCP/UDP/PPP/NITZ/FTP/HTTP/PING/CMUX/HTTPS/FTPS/SSL/FILE/MQTT/MMS/SMTP/SMTPS	TCP/UDP/PPP/NITZ/FTP/HTTP/PING/CMUX/HTTPS/FTPS/SSL/FILE/MQTT/MMS/SMTP/SMTPS
Interfaces			
(U)SIM	1.8V/ 3.0V	1.8V/ 3.0V	1.8V/ 3.0V
UART	× 3 (EC200U); × 1 (EC200U-CN Mini PCIe-C/EC200U-EU Mini PCIe)	× 2 (EC200A); × 1 (EC200A Mini PCIe/EC200A-CN Mini PCIe-C)	× 2
USB	USB 2.0 (Hi-Speed)	USB 2.0 (Hi-Speed)	USB 2.0 (Hi-Speed)
PCIe	/	/	•
Audio Digital (PCM)	• (EC200U/EC200U-EU Mini PCIe)	Optional	•
IIC	× 2 (EC200U); × 1 (EC200U-EU Mini PCIe)	•	× 1
GPIO	• (Only Supported on QuecOpen®) (EC200U-CN Mini PCIe-C/EC200U-EU Mini PCIe)	•	NA
RESET_N	• (EC200U)	•	•
SD	• (EC200U)	• (EC200A)	•
ADC	• (EC200U)	× 2, 12bits (EC200A)	× 2, 12bits
Antenna	Main Antenna, GNSS Antenna, WiFi-Scan/Bluetooth Antenna (EC200U); Main and GNSS (EC200U-CN Mini PCIe-C/EC200U-EU Mini PCIe)	Pads for Primary, Rx-diversity	Main × 1
Enhanced Features			
GNSS	Optional	/	/
WiFi-Scan	Optional	/	/
BlueTooth	Optional	/	/
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 QuecFile	• (EC200U/EC200U-CN Mini PCIe-C)	•	•
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	• (USB or DFOTA) (EC200U); Via USB/DFOTA (EC200U-CN Mini PCIe-C/EC200U-EU Mini PCIe)	Via USB/DFOTA	Via USB/DFOTA
Electrical Features			
Supply Voltage Range	3.3V~4.3 V, typ. 3.8V (EC200U/EC200U-CN Mini PCIe-C); 3.0V~3.6 V, typ. 3.3V (EC200U-EU Mini PCIe)	3.4V~4.5 V, typ. 3.8V (EC200A); 3.4V~4.5 V, typ. 3.8V (EC200A Mini PCIe-C); 3.0V~3.6 V, typ. 3.3V (EC200A Mini PCIe)	3.4V~4.5V, typ. 3.8V
Power Consumption	30µA @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)/2.9 mA @ Idle (PF = 64, USB connection)/1.8 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)	11µA @Power off Mode/1.1mA @LTE Sleep Mode (PF=256), Typ/18mA @Idle Mode (EC200A); 19µA @Power off Mode, Typ/27.6mA @LTE Sleep Mode (EC200A Mini PCIe); 1.59mA @LTE sleep (PF=256)/28.6mA @Idle (PF=64) (EC200A Mini PCIe-C)	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
Certifications <sup>1</sup>	NAL/SRRC/CCC/CE/RCM/FCC/Anatel	CCC/SRRC/NAL/CE/RCM/UKCA/NCC/FCC/Anatel	CE/RCM
Recommended Applications	POS/PDC/ETC, Shared Equipment, Data Cards, Energy Control and Monitoring, Safety and Protection, Industrial PDAs.	Vehicle rear installation and transportation, green energy, wireless payment, Safety, smart city, mobile gateway, smart industry, personal tracking, medical monitoring, agriculture and environmental monitoring.	Consumer Laptops, Industrial Laptops, Industrial Routers, Industrial PDAs, Rugged Tablet PCs and Digital Signage.

Note 1: May depend on modules' variant.

\* Under development





# LTE Module Family

Product	EG915U	EG912U-GL	EG915N	EG912N	
					
Form Factor	LGA	LGA	LGA	LGA	
Dimensions (mm)	19.9 × 23.6 × 2.4	25.0 × 29.0 × 2.4	19.9 × 23.6 × 2.4	25.0 × 29.0 × 2.4	
LTE Category	LTE Cat 1	LTE Cat 1	LTE Cat 1	LTE Cat 1	
Frequency Bands (MHz)	-CN (China/India)	LTE-FDD: B1/3/5/8; LTE-TDD: B34/38/39/40/41; GSM: B3/8	/	/	
	-EU (Europe)	LTE-FDD: B1/3/5/7/8/20/28; GSM: B2/3/5/8	/	LTE-FDD: B1/3/7/8/20; GSM: B3/8	
	-GL(Global)	/	LTE-FDD: B1/2/3/4/5/7/8/12/13/17/18/19/20/25/26/28/66 LTE-TDD: B34/38/39/40/41 GSM: B2/3/5/8	/	/
	-LA (Latin America)	LTE-FDD: B2/3/4/5/7/8/28/66; GSM: B2/3/5/8	/	LTE-FDD: B2/3/4/5/7/8/28/66; GSM: B2/3/5/8	/
	-EN(Europe)	/	/	/	LTE-FDD: B1/3/5/7/8/20/28/31/72 GSM: B3/8
Weight (approx.) g	2.48	3.67	2.46	3.5	
Operating Temperature	-35°C ~ +75°C	-35°C ~ +75°C	-35°C ~ +75°C	-35°C ~ +75°C	
Extended Temperature	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	
Data Transmission					
LTE data rate (Mbps)	Max. 10 (DL)/Max. 5 (UL)	Max. 10 (DL)/Max. 5 (UL)	Max. 10 (DL)/Max. 5 (UL)	Max. 10 (DL)/Max. 5 (UL)	
DC-HSPA+ data rate (Mbps)	/	/	/	/	
WCDMA data rate (Kbps)	/	/	/	/	
EDGE data rate (Kbps)	/	/	Max. 236.8 (DL)/Max. 236.8 (UL)	Max. 236.8 (DL)/Max. 236.8 (UL)	
GPRS data rate (Kbps)	Max. 85.6 (DL)/Max. 85.6 (UL)	Max. 85.6 (DL)/Max. 85.6 (UL)	Max. 85.6 (DL)/Max. 85.6 (UL)	Max. 85.6 (DL)/Max. 85.6 (UL)	
SMS	•	•	•	•	
Protocols	TCP/UDP/PPP/FTP/HTTP/NTP/PING/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	TCP/UDP/PPP/NTP/NITZ/FTP/HTTP/PING/CMUX/HTTPS/FTPS/SSL/FILE/MQTT/MMS/SMTP/SMTPS	TCP/UDP/PPP/NITZ/PING/MQTT/NTP/HTTP/HTTPS/SSL/FTP/SMTPS/SMTP	
Interfaces					
(U)SIM	1.8V/ 3.0V	1.8V/ 3.0V	1.8V/ 3.0V	1.8V/ 3.0V	
UART	× 3	× 3	× 3 (main, debug and auxiliary*)	× 2	
USB	USB 2.0 (Hi-Speed)	USB 2.0 (Hi-Speed)	USB 2.0 (Hi-Speed)	USB 2.0 (Hi-Speed)	
IIC	× 1	× 1	•	× 1	
Audio Digital (PCM)	•	× 1	Optional	× 1	
GPIO	/	/	/	/	
ADC	× 2	× 2	/	× 2	
SD	*	*	/	/	
PWRKEY	•	•	•	•	
Antenna	Main Antenna, WiFi-Scan/Bluetooth Antenna	× 3 (Main Antenna, GNSS Antenna (Optional), WiFi-Scan/ Bluetooth Antenna)	× 2 (Main Antenna and GNSS Antenna (Optional))	Main Antenna	
Enhanced Features					
GNSS	/	Optional	•	/	
WiFi-Scan	Optional	•	•	Optional	
BlueTooth	Optional	•	/	/	
VoLTE	•	•	/	•	
DTMF	•	•	•	•	
DFOTA	•	•	•	•	
Audio Playback/Audio Recording	•	•	Optional	•	
QuecFile	•	•	•	•	
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/ 11, Linux 2.6-5.18, Android 4.x-12.x	Windows 7/8/8.1/10, Linux 2.6-5.15, Android 4.x-12.x	Windows 7/8/8.1/10/11, Linux 2.6-5.18, Android 4.x-12.x	
GNSS Driver	/	Android 4.x-12.x	Android 4.x-12.x	/	
RIL Driver	Android 4.x-12.x	Android 4.x-12.x	Android 4.x-12.x	Android 4.x-12.x	
USB RNDIS Driver	Windows 7/8/8.1/10, Linux 2.6-5.15	Windows 7/8/8.1/10/11, Linux 2.6-5.18	Windows 7/8/8.1/10, Linux 2.6-5.15	Windows 7/8/8.1/10, Linux 2.6-5.12	
USB ECM Driver	Linux 2.6-5.15	Linux 2.6-5.18	Linux 2.6-5.15	Linux 2.6-5.12	
(U)SIM Card Detection	•	•	•	•	
Firmware Update	USB or DFOTA	USB or DFOTA	Via USB/DFOTA	USB or DFOTA	
Electrical Features					
Supply Voltage Range	3.3V-4.3 V, typ. 3.8V	3.3 V-4.3 V, typ. 3.8 V	3.4-4.5 V, typ. 3.8 V	3.3 V-4.3 V, typ. 3.8 V	
Power Consumption	30 μA @ power off/1.3 mA @ sleep/13 mA @ idle	34μA@ Power off 1.7 mA @ LTE Sleep (PF = 128) 1.5 mA @ LTE Sleep (PF = 256) 30 mA @ Idle (PF = 64, USB Connected) 14 mA @ Idle (PF = 64, USB Disconnected)	24μA@Power off/1.4mA@Sleep, Typ./ 20.97mA@Idle	30μA@Power off Mode 1.28mA@LTE Sleep Mode (PF = 128) 1.19mA@LTE Sleep Mode (PF = 256) 20.65 mA @Idle Mode(PF = 64, USB Disconnect) 29.83 mA @ Idle Mode(PF = 64, USB Active)	
Certifications <sup>1</sup>	CE/ROHS/GCF/Anatel/NCC*	SRRC*/NAL*/CCC*/CE*/FCC*/Anatel*/NCC*/ROHS*	CE*/ROHS*/UKCA*	CE*	
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.	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

# Smart Module Family

Product	SC20 (Android)	SC20 (Linux)	SC20 (Linux, small memory)	SC200R	
					
Form Factor	LCC+LGA	LCC+LGA	LCC+LGA	LCC+LGA	
Dimensions (mm)	40.5 × 40.5 × 2.8	40.5 × 40.5 × 2.8	40.5 × 40.5 × 2.8	40.5 × 40.5 × 2.8	
LTE Feature	LTE Cat 4; 3GPP E-UTRA Release 10 Compliant, Support DL MIMO 2 × 2	LTE Cat 4; 3GPP E-UTRA Release 10 Compliant, Support DL MIMO 2 × 2	LTE Cat 4; 3GPP E-UTRA Release 10 Compliant, Support DL MIMO 2 × 2	LTE Cat 4; 3GPP E-UTRA Release 10 Compliant, Support DL MIMO 2 × 2	
Frequency Bands (MHz)	-CE/CEL (China)	-CEL (China) LTE-FDD: B1/3/5/8; LTE-TDD: B38/39/40/41; WCDMA: B1/8; TD-SCDMA: B34/39; CDMA: BCC; GSM: 900/1800MHz	-CEL (China) LTE-FDD: B1/3/5/8; LTE-TDD: B38/39/40/41; WCDMA: B1/8; TD-SCDMA: B34/39; CDMA: BCC; GSM: 900/1800MHz	/	-CE (China) LTE-FDD: B1/3/5/8; LTE-TDD: B34/38/39/40/41; WCDMA: B1/8; CDMA: BCC; GSM: 900/1800MHz
	-E/EL/EX/EM (EMEA/Korea/Thailand/India/Vietnam/Africa/Southeast Asia/Australia/South America)	-E (EMEA/Korea/Thailand/India/Vietnam) LTE-FDD: B1/3/5/7/8/20; LTE-TDD: B38/40/41; WCDMA: B1/5/8; GSM: 850/900/1800/1900MHz	-E (EMEA/Korea/Thailand/India/Vietnam) LTE-FDD: B1/3/5/7/8/20; LTE-TDD: B38/40/41; WCDMA: B1/5/8; GSM: 850/900/1800/1900MHz	-EX (EMEA/Korea/Thailand/India/Vietnam) LTE-FDD: B1/3/5/7/8/20; LTE-TDD: B38/40/41; WCDMA: B1/5/8; GSM: 850/900/1800/1900MHz	-EM (EMEA/Africa/Southeast Asia/Australia/South America) LTE-FDD: B1/2/3/4/5/7/8/20/28; LTE-TDD: B38/40/41; WCDMA: B1/2/4/5/8; GSM: 850/900/1800/1900MHz
	-A/AL/AX/NA (North America)	-A (North America) LTE-FDD: B2/4/5/7/12/13/25/26; WCDMA: B1/2/4/5/8; GSM: 850/1900MHz	-AL (North America) LTE-FDD: B2/4/5/7/12/13/25/26; WCDMA: B1/2/4/5/8; GSM: 850/1900MHz	-AX (North America) LTE-FDD: B2/4/5/7/12/13/25/26	-NA (North America) LTE-FDD: B2/4/5/7/12/13/14/17/25/26/66/71; LTE-TDD: B41; WCDMA: B2/4/5
	-AU/AUL (ANZ/Brazil)	-AU (ANZ/Brazil) LTE-FDD: B1/3/5/7/8/28; LTE-TDD: B40; WCDMA: B1/2/5/8; GSM: 850/900/1800/1900MHz	-AUL (ANZ/Brazil) LTE-FDD: B1/3/5/7/8/28; LTE-TDD: B40; WCDMA: B1/2/5/8; GSM: 850/900/1800/1900MHz	/	/
	-J/JL/JLP (Japan)	-J (Japan) LTE-FDD: B1/3/8/18/19/26; LTE-TDD: B41; WCDMA: B1/6/8/19	-JL (Japan) LTE-FDD: B1/3/8/18/19/26; LTE-TDD: B41; WCDMA: B1/6/8/19	/	-JP (Japan) LTE-FDD: B1/3/5/8/11/18/19/21/26/28; LTE-TDD: B41; WCDMA: B1/6/8/19
	-W/WL/WF* (Global)	-W (Wi-Fi) Only Wi-Fi & BT	-WL (Wi-Fi) Only Wi-Fi & BT	/	-WF (Global) Only Wi-Fi & BT
	CPU	Qualcomm MSM8909 ARM Coretex 4 x A7@ 1.1GHz	Qualcomm MSM8909 ARM Coretex 4 x A7@ 1.1GHz	Qualcomm MSM8909 ARM Coretex 4x A7@ 1.1GHz	Qualcomm OCM2150 ARM Coretex 4 x A53@ 1.3GHz
GPU	Qualcomm® Adreno™ 304 Graphics Processing Unit (GPU), up to 409.6 MHz	Qualcomm® Adreno™ 304 Graphics Processing Unit (GPU), up to 409.6 MHz	Qualcomm Adreno 304 Graphics Processing Unit (GPU), up to 409.6MHz	Qualcomm® Adreno™ 308 Graphics Processing Unit (GPU), up to 64-bit addressing, up to 485 MHz	
Memory	1 GB LPDDR3 + 8 GB eMMC; 2 GB LPDDR3 + 16 GB eMMC	1GB LPDDR3+ 8GB eMMC (only for SC20-AU/EL); 2GB LPDDR3+ 16GB eMMC (only for SC20-AL/EL)	512MB NAND+ 521MB DDR2	1 GB LPDDR3 + 8 GB eMMC; 2 GB LPDDR3 + 16 GB eMMC	
Operating System	Android 7.1 / 8.1 in SC20-E/-A/-J/-AU/-CE/-W	Yocto Linux (Kernel 3.18) in SC20-EL/-AL/-JL/-AUL/-WL	Yocto Linux (Kernel 3.18) in SC20-AX/-EX	Android 10	
Supply Voltage Range	3.5V ~ 4.2V, typ. 3.8V	3.5V ~ 4.2V, typ. 3.8V	3.5 ~ 4.2 V, typ. 3.8 V	3.55V ~ 4.2V, typ. 3.8V	
Weight (approx.) g	9.8	9.8	9.8	10.2	
Operating Temperature	-35 °C ~ +75 °C	-35 °C ~ +75 °C	-35 °C to +75 °C	-35 °C ~ +75 °C	
Data Transmission					
LTE (Mbps)	LTE-FDD: Max. 150 (DL)/Max. 50 (UL) LTE-TDD: Max. 130 (DL)/Max. 30 (UL)	LTE-FDD: Max. 150 (DL)/Max. 50 (UL) LTE-TDD: Max. 130 (DL)/Max. 30 (UL)	-AX: LTE-FDD: Max. 150 (DL)/50 (UL); LTE-TDD: Max. 130 (DL)/30 (UL) -EX: LTE-FDD: Max. 150 (DL)/50 (UL)	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); HSUPA: Max. 5.76Mbps (UL); WCDMA: Max. 384Kbps (DL/UL)	-EX: 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 (Mbps)	Max. 4.2 (DL)/Max. 2.2 (UL)	Max. 4.2 (DL)/Max. 2.2 (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 (Kbps)	EDGE: Max. 296 (DL)/236.8 (UL); GPRS: Max. 107 (DL)/85.6 (UL)	EDGE: Max. 296 (DL)/236.8 (UL); GPRS: Max. 107 (DL)/85.6 (UL)	-EX: EDGE: 296 (DL)/236.8 (UL); GPRS: 107 (DL)/85.6 (UL)	EDGE: Max. 296 (DL)/236.8 (UL); GPRS: Max. 107 (DL)/85.6 (UL)	
Interfaces					
LCM	4-lane MIPI_DSI, 1.5 Gbps/lane, HD (1280 x 720) @ 60 fps	4-lane MIPI_DSI, 1.5 Gbps/lane, HD (1280 x 720) @ 60 fps	4-lane MIPI_DSI, up to 1.5 Gbps/ lane, HD (720P) @ 60 fps	4-lane MIPI_DSI, HD+ (1440 x 720) @ 60 fps; Wi-Fi display: 1080P @ 30 fps (UBWC)	
Camera	2-lane rear camera and 1-lane front camera or 4-lane rear camera only; MIPI_CSI, 1.5 Gbps/ lane, up to 8 MP, Bayer/ YUV format	2-lane rear camera and 1-lane front camera or 4-lane rear camera only; MIPI_CSI, 1.5 Gbps/ lane, up to 8 MP, Bayer/ YUV format	Uses MIPI_CSI, up to 1.5 Gbps/ lane, supports two cameras: 2-lane MIPI_CSI for rear camera, up to 8 MP; 1-lane MIPI_CSI for front camera, up to 2 MP	2 groups of 4-lane MIPI_CSI, up to 2.1 Gbps/ lane, 2 × ISP; Support 2 or 3 cameras, up to 13 MP with dual ISP	
Touch Panel	Capacitive touchscreen, I2C controls	Capacitive touchscreen, I2C controls	Capacitive touch panel	Capacitive touch panel, I2C controls	
Audio	Analog channels: Two inputs: MIC1, MIC2; Three outputs: speaker, earpiece, headphone	Analog channels: Two inputs: MIC1, MIC2; Three outputs: speaker, earpiece, headphone	Analog channels: Two inputs: MIC1, MIC2; Three outputs: speaker, earpiece, headphone	Analog channels: 3 inputs: MIC1, MIC2, MIC3 (including one noise-canceling MIC); 3 outputs: speaker, earpiece, headphone	
Video	Encode: 720P (H.264) @ 30 fps; WVGA (MPEG-4/VP8) @ 30 fps Decode: 1080P (H.264/ MPEG-4/VP8/H.265/ DivX4/5/6) @ 30 fps; WVGA (H.263) @ 30 fps	Encode: 720P (H.264) @ 30 fps; WVGA (MPEG-4/VP8) @ 30 fps Decode: 1080P (H.264/ MPEG-4/VP8/H.265/ DivX4/5/6) @ 30 fps; WVGA (H.263) @ 30 fps	Encoding: 720P (H.264) @ 30 fps; WVGA (MPEG-4/VP8) @ 30 fps Decoding: 1080P (H.264/ MPEG-4/VP8/ H.265/DivX4/5/6) @ 30 fps; WVGA (H.263) @ 30 fps	Encode: 1080P (H.264) @ 30 fps; WVGA (MPEG-4/VP8) @ 30 fps Decode: 1080P (H.264/ MPEG-4/VP8/H.265/ DivX4/5/6) @ 30 fps; WVGA (H.263) @ 30 fps	
USB	× 1, USB 2.0, supports USB OTG, High Speed 480 Mbps	× 1, USB 2.0, supports USB OTG, High Speed 480 Mbps	Supports high speed mode, up to 480 Mbps; Supports USB 2.0 OTG, USB OTG + charge and USB to Ethernet functions	× 1, USB 2.0, supports USB OTG	
I2C	Supported	Supported	× 3	Supported	
(U)SIM	× 2, Support 1.8/ 3 V (U)SIM cards, with (U)SIM card detection function, DSDS supported	× 2, Support 1.8/ 3 V (U)SIM cards, with (U)SIM card detection function, DSDS supported	× 2, supports 1.8/ 3 V (U)SIM cards, (U)SIM card detection function and DSDS	× 2, Support 1.8/ 2.95 V (U)SIM cards, with (U) SIM card detection function, DSDS supported	
UART	× 2, Support up to 4 Mbps with hardware flow control	× 2, Support up to 4 Mbps with hardware flow control	× 2, UART1 supports hardware flow control, up to 4 Mbps	× 3, Support 4Mbps. One of them supports Hardware Flow Control	
SD Card	× 1, SD 3.0, 4-bit SDIO	× 1, SD 3.0, 4-bit SDIO	× 1, SD 3.0, 4-bit SDIO	× 1, SD 3.0, 4-bit SDIO	
PWRKEY/ SPI/ ADC/ GPIO	Supported	Supported	Supported	Supported	
PWM/ Motor Driver	× 1	× 1	× 1	× 1	
Antenna	× 4, Main/ Rx-diversity/ GNSS/ Wi-Fi & Bluetooth	× 4, Main/ Rx-diversity/ GNSS/ Wi-Fi & Bluetooth	× 4, main antenna, Rx-diversity antenna, GNSS antenna and Wi-Fi/ Bluetooth antenna interface respectively	4 Solder Pads for Main/Rx-diversity/ GNSS/ Wi-Fi&BT Antenna, Respectively	
Enhanced Features					
BT	Bluetooth 2.1 EDR/3.0 HS/4.2 LE; Support a maximum of 10 ACL/BEL/SCO links	Bluetooth 2.1 EDR/3.0 HS/4.2 LE; Support a maximum of 10 ACL/BEL/SCO links	Bluetooth 2.1 EDR/ 3.0 HS/ 4.2 LE; Support a maximum of 10 ACL/BEL/SCO links	Bluetooth 2.1 EDR/3.0 HS/4.2 LE; Support a maximum of 10 ACL/BEL/SCO links	
Wi-Fi	2.4 & 5 GHz; 802.11a/b/g/n; 150 Mbps; STA/AP/P2P	2.4 & 5 GHz; 802.11a/ b/ g/ n; 150 Mbps; STA/AP/P2P	2.4/ 5 GHz, 802.11a/b/g/n; 150 Mbps; STA/AP/P2P	2.4 & 5 GHz, 802.11a/b/g/n; 150 Mbps; STA/AP/ P2P	
GNSS	GNSS <sup>2</sup> : GPS/BDS/GLONASS	GNSS <sup>2</sup> : GPS/BDS/GLONASS	GPS/BDS/GLONASS	GNSS <sup>3</sup> : GPS/BDS/GLONASS or GPS/BDS/Galileo	
Charge Function	Build-in Charge IC	Build-in Charge IC	Build-in Charge IC	Build-in Charge IC	
Dual LCD	Only support single LCD Display	Only support single LCD Display	Only support single LCD Display	Only support single LCD Display	
DSDS	Support Dual SIM Dual Standby	Support Dual SIM Dual Standby	Support Dual SIM Dual Standby	Support Dual SIM Dual Standby	
Firmware Upgrade	Firmware Upgrade via USB or OTA	Firmware Upgrade via USB or OTA	Firmware Upgrade via USB or OTA	Firmware Upgrade via USB or OTA	
Certifications <sup>4</sup>	CE/GCF/RCM/FCC/IC/PTC/AT&T/Verizon/Telstra/T-Mobile/Telus/JATE/TELEC/KDDI/NTT-DOCOMO/CCC/SRRC/NAL/NCC/KC/SoftBank/Anatel	CE/GCF/RCM/FCC/IC/PTC/AT&T/Verizon/Telstra/T-Mobile/Telus/JATE/TELEC/CCC/SRRC/NAL/NCC/KC/Anatel	GCF/IC/FCC/PTC/AT&T/Verizon/CE/UKCA/RCM	GCF/CE/RCM/FCC/PTC/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.				

Note 1: TBD.

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

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

Note 4: May depend on modules' variant.

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

\* Planning/Under development




# Smart Module Family

Product	SC200L	SC200E	SC206E	
				
Form Factor	LCC+LGA	LCC+LGA	LCC+LGA	
Dimensions (mm)	40.5 × 40.5 × 2.85	40.5 × 40.5 × 2.85	40.5 × 40.5 × 2.85	
LTE Feature	LTE Cat 4 3GPP E-UTRA Release 10 Compliant, Support DL MIMO 2 × 2	LTE Cat 4(SC200E-CE/EM/NA/JP)	LTE Cat 4(SC200E-EM/NA)	
Frequency Bands(MHz)	-CE (China)	LTE-FDD: B1/3/5/8; LTE-TDD: B34/38/39/40/41; WCDMA: B1/8; GSM: 900/1800MHz	LTE-FDD: B1/3/5/8; LTE-TDD: B34/38/39/40/41(140M); WCDMA: B1/8; CDMA: BCC; GSM: 900/1800MHz	/
	-EU/EM (EMEA/Africa/South America/Korea/South Asia/Latin America/Australia/India/New Zealand/South Africa)	-EU (EMEA/South Africa/southeast Asia/India/Latin America) LTE-FDD: B1/3/5/7/8/20/28; LTE-TDD: B38/40/41; WCDMA: B1/5/8; GSM: 900/1800MHz	-EM(EMEA/ Korea/ South Asia/ Latin America/ India/ Australia/ New Zealand/ South Africa) LTE-FDD: B1/2/3/4/5/7/8/20/28(A+B); LTE-TDD: B38/40/41 (200M); WCDMA: B1/2/4/5/8; GSM: 850/900/1800/1900MHz	-EM(EMEA/ Korea/ South Asia/ Latin America/ India/ Australia/ New Zealand/ South Africa) LTE-FDD: B1/2/3/4/5/7/8/20/28(A+B); LTE-TDD: B38/40/41 (200M); WCDMA: B1/2/4/5/8; GSM: 850/900/1800/1900MHz
	-AU (ANZ/Brazil)	LTE-FDD: B1/2/3/4/5/7/8/28; LTE-TDD: B38 ; WCDMA: B1/2/4/5/8; GSM: 850/900/1800/1900 MHz	/	/
	-NA (North America)	/	LTE-FDD: B2/4/5/7/12/13/14/17/25/26/66/71; LTE-TDD: B41(200M)	LTE-FDD: B2/4/5/7/12/13/14/ 17/25/26/66/71; LTE-TDD: B41(200M)
	-JP (Japan)	/	LTE-FDD: B1/3/5/8/11/18/19/21/26/28; LTE-TDD: B41(200M); WCDMA: B1/6/8/19	/
	-WF(Global)	-WF(Wi-Fi) 2.4G & 5G Wi-Fi, 2.4G BT	-WF (Wi-Fi) 2.4G & 5G Wi-Fi, 2.4G BT	-WF (Wi-Fi) 2.4G & 5G Wi-Fi, 2.4G BT
	CPU	Unisoc SL8541E ARM Coretex 4 × A53@ 1.4GHz	QCM2290, Quad-core ARM Cortex-A53 64-bit CPU @ 2.0 GHz	QCM2290, Quad-core ARM Cortex-A53 64-bit CPU @ 2.0 GHz
GPU	ARM Mali-T820 as 3D graphics accelerator, up to 680 MHz	Qualcomm® Adreno™ 702 Graphics Processing Unit (GPU) with 64-bit addressing	Qualcomm® Adreno™ 702 Graphics Processing Unit (GPU) with 64-bit addressing	
Memory	1 GB LPDDR3 + 8 GB eMMC; 2 GB LPDDR3 + 16 GB eMMC	32GB eMMC + 2GB LPDDR4X; 32GB eMMC + 3GB LPDDR4X	32GB eMMC + 2GB LPDDR4X	
Operating System	Android 10.0	Android 12/13*/14*	Yocto Linux (Kernel 5.4)*	
Supply Voltage Range	3.55V ~ 4.2V, typ. 3.8V	3.55V ~ 4.4V, typ. 3.8V	3.55V ~ 4.4V, typ. 3.8V	
Weight (approx.) g	10	/	/	
Operating Temperature	-30 °C ~ +75 °C	-35 °C ~ +75 °C	-35 °C ~ +75 °C	
Data Transmission				
LTE (Mbps)	LTE-FDD: Max. 150 (DL) / Max. 50 (UL) LTE-TDD: Max. 130 (DL) / Max. 30 (UL)	Cat 4: LTE-FDD: Max. 150 (DL) / Max. 50 (UL) LTE-TDD: Max. 130 (DL) / Max. 30 (UL)	Cat 4: LTE-FDD: Max. 150 (DL) / Max. 50 (UL) LTE-TDD: Max. 130 (DL) / Max. 30 (UL)	
UMTS	DC-HSDPA: Max. 42Mbps (DL); HSUPA: Max. 5.76Mbps (UL) WCDMA: Max. 384Kbps (DL/UL)	DC-HSDPA: Max. 42Mbps (DL); DC-HSUPA: Max. 5.76Mbps (UL) WCDMA: Max. 384Kbps (DL/UL)	DC-HSDPA: Max. 42Mbps (DL); DC-HSUPA: Max. 5.76Mbps (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)	EVDO: Max. 3.1Mbps (DL) / 1.8Mbps (UL) 1X Advanced: Max. 307.2Kbps (DL/UL)	
GSM(Kbps)	EDGE: Max. 296 (DL) / 236.8 (UL) , GPRS: Max. 107 (DL) / 85.6 (UL)	EDGE: Max. 296 (DL) / 236.8 (UL) GPRS: Max. 107 (DL) / 85.6 (UL)	EDGE: Max. 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	1 group of 4-lane MIPI DSI, HD+ (1680 × 720) @ 60 fps	
Camera	2 groups of MIPI CSI (2-lane + 1-lane), up to 1.5 Gbps/lane 1 × ISP, 8 MP for rear camera (2-lane) and 2 MP for front camera (1-lane)	2 groups of 4-lane MIPI CSI, up to 2.5 Gbps/lane 2 or 3 cameras supported, up to 25 MP or 13 MP + 13 MP with dual ISP	2 groups of 4-lane MIPI CSI, up to 2.5 Gbps/lane 2 or 3 cameras supported, up to 25 MP or 13 MP + 13 MP with dual ISP	
Touch Panel	Capacitive touch panel, I2C controls	Capacitive Touch Panel	Capacitive Touch Panel	
Audio	Analog channels: 3 inputs: MIC1, MIC2, MIC3 (including one noise-canceling MIC); 3 outputs: speaker, earpiece, headphone	3 analog inputs: MIC1, MIC2, MIC3 (including one noise-canceling MIC); 3 analog outputs: Line Out, earpiece, headphone	3 analog inputs: MIC1, MIC2, MIC3 (including one noise-canceling MIC); 3 analog outputs: Line Out, earpiece, headphone	
Video	Encode: 1080P (H.264) @ 30 fps; WVGA (MPEG-4/VP8) @ 30 fps Decode: 1080P (H.264/MPEG-4/VP8/H.265/DivX4/5/6) @ 30 fps; WVGA (H.263) @ 30 fps × 2, USB 2.0	Encoder: 1080P 8-bit H.264/H.265(HEVC) @ 30 fps Decoder: 1080P 8-bit H.264/H.265(HEVC)/VP9 @ 30 fps	Encoder: 1080P 8-bit H.264/H.265(HEVC) @ 30 fps; Decoder: 1080P 8-bit H.264/H.265(HEVC)/VP9 @ 30 fps	
USB	USB1 supports USB OTG, does not support USB hub; up to 480 Mbps; USB2 supports USB Host mode and USB hub; up to 100 Mbps	× 1, compliant with USB 2.0/ 3.1, supports USB OTG, charge, etc.	× 1, compliant with USB 2.0/ 3.1, supports USB OTG, charge, etc.	
I2C	Supported	× 4	× 4	
(U)SIM	× 2, support 1.8/2.95 V (U)SIM cards, with (U)SIM card detection function, DSDS supported	× 2 (1.8V/2.95V)	× 2 (1.8V/2.95V)	
UART	× 2, up to 3.25 Mbps, UART0 supports hardware flow control	× 3, up to 4 Mbps, supports hardware flow control	× 3, up to 4 Mbps, supports hardware flow control	
SDIO	/	× 1 (3.0, 4-bit SDIO)	× 1 (3.0, 4-bit SDIO)	
SD Card	× 1, SD 3.0, 4-bit SDIO	× 1, SD 3.0, 4-bit SDIO	× 1, SD 3.0, 4-bit SDIO	
PWRKEY	Supported	Pulled up internally to 1.1 V	Pulled up internally to 1.1 V	
SPI	Supported	× 1 (multiplexed)	× 1 (multiplexed)	
ADC	Supported	× 1, general-purpose ADC interface	× 1, general-purpose ADC interface	
GPIO	Supported	× 33	× 33	
PWM	× 1	× 1	× 1	
Motor Driver	× 1	× 1	× 1	
Antenna	× 4, Main/Rx-diversity/GNSS/Wi-Fi & Bluetooth	× 4, Main/Rx-diversity/GNSS/Wi-Fi & Bluetooth antenna interface respectively (SC200E-WF: × 1, Wi-Fi & Bluetooth antenna interface)	× 4, Main/Rx-diversity/GNSS/Wi-Fi & Bluetooth antenna interface respectively (SC206E-WF: × 1, Wi-Fi & Bluetooth antenna interface)	
Enhanced Features				
BT	Bluetooth 2.1 EDR/3.0 HS/4.2 LE/5.0 LE; Support a maximum of 10 ACL/EL/SCO links	2.1 EDR/3.0 HS/4.2 LE/5.0 LE	2.1 EDR/3.0 HS/4.2 LE/5.0 LE	
Wi-Fi	2.4 & 5 GHz, 802.11 a/b/g/n/ac; 433 Mbps; STA/AP/P2P	2.4/5 GHz 802.11 a/b/g/n/ac	2.4/5 GHz 802.11 a/b/g/n/ac	
GNSS	GPS/GLONASS or GPS/BDS	GPS/BeiDou/GLONASS/Galileo/QZSS/SBAS	GPS/BeiDou/GLONASS/Galileo/QZSS/SBAS	
Charge Function	Build-in Charge IC	Build-in Charge IC & Fuel Gauge Qualcomm Quick Charge technology	Build-in Charge IC & Fuel Gauge Qualcomm Quick Charge technology	
Dual 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 and OTA	Firmware Upgrade via USB and OTA	
Certifications <sup>1</sup>	GCF/CE/Anatel/CCC/SRRC/NAL*	CCC/SRRC/NAL/CE/UKCA*/RCM/GCF*/KC*/FCC/IC/PTCRB*/AT&T*/Verizon*/T-Mobile*/JATE*/TELEC*/DCM*/KDDI*/Anatel*/NCC*/NBTC*	CE*/UKCA*/RCM*/GCF*/KC*/FCC*/IC*/PTCRB*/AT&T*/Verizon*/T-Mobile*	
Recommended Applications	Smart POS, Smart Home Gateways, Smart Robots, Smart Wearables, Safety, PDAs & Tablets, Vending Machines, Delivery Lockers, Telematics, Mobile Computing, Police and Law Enforcement Equipment, In-car Video Streaming and Entertainment Systems, etc.	Telematics, Mobile POS Terminal, Gateway, Safety, Networking, Mobile Computing, etc.		

Note 1: May depend on modules' variant.  
SC200L can't be promote to US, Canada, Australia, New Zealand, Japan or South Korea.

\* Planning/Under development

# Smart Module Family

Product	SC600Y	SC680A	SC686A
			
Form Factor	LCC+LGA	LCC+LGA	LCC+LGA
Dimensions (mm)	44.0 × 43.0 × 2.85	44.0 × 43.0 × 2.85	44.0 × 43.0 × 2.85
LTE Feature	LTE Cat 6 3GPP E-UTRA Release 10 Compliant, Support DL MIMO 2 × 2	LTE Cat 6 3GPP E-UTRA Release 10 Compliant, Support DL MIMO 2 × 2	LTE Cat 6 3GPP E-UTRA Release 10 Compliant, Support DL MIMO 2 × 2
Frequency Bands(MHz)	-EM ( EMEA/ India/ Korea/ South Asia/ Latin America/ Australia/ ANZ/ South Africa)	-EM* ( EMEA/ India/ Korea/ South Asia/ Latin America/ Australia/ ANZ/ South Africa)	-EM* ( EMEA/ India/ Korea/ South Asia/ Latin America/ Australia/ ANZ/ South Africa)
	-NA (North America)	-NA* (North America)	-NA* (North America)
	-JP (Japan)	-JP <sup>1</sup> (Japan)	-JP <sup>1</sup> (Japan)
	-WF (Global)	-WF* (Global) Only Wi-Fi & BT	-WF* (Global) Only Wi-Fi & BT
		LTE-FDD: B1/2/3/4/5/7/8/20/28; LTE-TDD: B38/39/40/41; WCDMA: B1/2/4/5/8; GSM: 850/900/1800/1900MHz	LTE-FDD: B1/2/3/4/5/7/8/20/28; LTE-TDD: B38/40/41; WCDMA: B1/2/4/5/8; GSM: 850/900/1800/1900MHz
CPU	Qualcomm SDM450 ARM Coretex 8 × A53@ 1.8GHz	Qualcomm QCM4290 ARM Coretex technology 4 × Kryo 260@ 2.0 GHz + 4 × Kryo 260@ 1.8GHz	Qualcomm QCM4290 ARM Coretex technology 4 × Kryo 260@ 2.0 GHz + 4 × Kryo 260@ 1.8GHz
GPU	Qualcomm® Adreno™ 506 graphics processing unit (GPU) with 64-bit addressing	Qualcomm® Kryo™ 610 graphics processing unit (GPU) at 950 MHz	Qualcomm® Kryo™ 610 graphics processing unit (GPU) at 950 MHz
Memory	2GB LPDDR3 + 16GB eMMC	4 GB LPDDR4X + 64 GB eMMC	4 GB LPDDR4X + 64 GB eMMC; 3 GB LPDDR4X + 32 GB eMMC
Operating System	Android 9/10	Android 12/ 13 <sup>1</sup> / 14 <sup>1</sup>	Linux
Supply Voltage Range	3.55V ~ 4.4V, typ. 3.8V	3.55V ~ 4.4V, typ. 3.8V	3.55V ~ 4.4V, typ. 3.8V
Weight (approx.) g	13.0	11.8	11.8
Operating Temperature	-35 °C ~ +75 °C	-35 °C ~ +75 °C	-35 °C ~ +75 °C
Data Transmission			
LTE (Mbps)	Cat 6: LTE-FDD: Max. 300 (DL)/Max. 50 (UL); LTE-TDD: Max. 265 (DL)/Max. 35 (UL) Cat 4: LTE-FDD: Max. 150 (DL)/Max. 50 (UL); LTE-TDD: Max. 130 (DL)/Max. 30 (UL)	Cat 6: LTE-FDD: Max. 300 (DL)/Max. 50 (UL); LTE-TDD: Max. 265 (DL)/Max. 35 (UL) Cat 4: LTE-FDD: Max. 150 (DL)/Max. 50 (UL); LTE-TDD: Max. 130 (DL)/Max. 30 (UL)	Cat 6: LTE-FDD: Max. 300 (DL)/Max. 50 (UL); LTE-TDD: Max. 265 (DL)/Max. 35 (UL) Cat 4: LTE-FDD: Max. 150 (DL)/Max. 50 (UL); LTE-TDD: Max. 130 (DL)/Max. 30 (UL)
UMTS	DC-HSDPA: Max. 42Mbps (DL); DC-HSPA: Max. 11.2Mbps (UL); WCDMA: Max. 384Kbps (DL/UL)	DC-HSDPA: Max. 42Mbps (DL); DC-HSPA: Max. 11.2Mbps (UL); WCDMA: Max. 384Kbps (DL/UL)	DC-HSDPA: Max. 42Mbps (DL); DC-HSPA: Max. 11.2Mbps (UL); WCDMA: Max. 384Kbps (DL/UL)
GSM(Kbps)	EDGE: Max. 296 (DL)/236.8 (UL); GPRS: Max. 107 (DL)/85.6 (UL)	EDGE: Max. 296 (DL)/236.8 (UL); GPRS: Max. 107 (DL)/85.6 (UL)	EDGE: Max. 296 (DL)/236.8 (UL); GPRS: Max. 107 (DL)/85.6 (UL)
Interfaces			
LCM	2 × 4-lane MIPI_DSI; WUXGA (1920 × 1200) @ 60 fps for primary display and FHD (1920 × 1080) @ 60 fps for secondary display; Wi-Fi display: 1080P @ 30 fps (UBWC)	4-lane MIPI_DSI; DSI D-PHY 1.2; Split link supported; FHD+ (1080 × 2520) aspect ratio, up to 10 bpc; QSEED4, 4 L, Q-SYNC, SVI, CABL, and FOSS	4-lane MIPI_DSI; DSI D-PHY 1.2; Split link supported; FHD+ (1080 × 2520) aspect ratio, up to 10 bpc; QSEED4, 4 L, Q-SYNC, SVI, CABL, and FOSS
Camera	3 groups of 4-lane MIPI_CSI, up to 2.1 Gbps per lane. 2 × ISP; Support three cameras (4-lane + 4-lane + 4-lane) or four cameras (4-lane + 4-lane + 2-lane + 1-lane); Up to 21 MP with dual ISP	3 × ISP, (13 MP + 13 MP) or (25 MP + 5 MP) at 30 fps or (16 MP + 16 MP) @ 24 fps; 3 groups of 4-lane MIPI_CSI, up to 2.1 Gbps/ lane; Support 3 or 4 cameras, up to 25 MP with dual ISP	3 × ISP, (13 MP + 13 MP) or (25 MP + 5 MP) at 30 fps or (16 MP + 16 MP) @ 24 fps; 3 groups of 4-lane MIPI_CSI, up to 2.1 Gbps/ lane; Support 3 or 4 cameras, up to 25 MP with dual ISP
Touch Panel	× 2, Capacitive touchscreen, I2C controls	Capacitive touch panel, I2C controls	Capacitive touch panel, I2C controls
Audio	Analog channels: Three inputs: MIC1, MIC2, MIC3 (including one noise-canceling MIC); Three outputs: speaker, earpiece, headphone	Analog channels: 3 inputs: MIC1, MIC2, MIC3 (including one noise-canceling MIC); 3 outputs: speaker, earpiece, headphone	Analog channels: 3 inputs: MIC1, MIC2, MIC3 (including one noise-canceling MIC); 3 outputs: speaker, earpiece, headphone
Video	Encode and Decode: Up to 1080P @ 60 fps High frame rate encoder; 720P @ 120 fps; 60 Mbps; Maximum 972000 macro blocks; 1080P @ 60 fps decode + 1080P @ 30 fps encode;	Encode: 1080p60 8 bit HEVC (H.265); 1080p60 8 bit H.264 Decode: 1080p60 8 bit HEVC (H.265), VP9; 1080p60 8 bit H.264	Encode: 1080p60 8 bit HEVC (H.265); 1080p60 8 bit H.264 Decode: 1080p60 8 bit HEVC (H.265), VP9; 1080p60 8 bit H.264
USB	× 1, USB 2.0/3.0 (Type-C), USB OTG + Charge	× 1, USB 2.0/3.1 (Type-C)	× 1, USB 2.0/3.1 (Type-C)
I2C	Supported	× 5	× 5
(U)SIM	× 2, Support 1.8/ 2.95 V (U)SIM cards, with (U)SIM card detection function, DSDS supported	× 2, Support 1.8/ 2.95 V (U)SIM cards, with (U)SIM card detection function, DSDS supported	× 2, Support 1.8/ 2.95 V (U)SIM cards, with (U)SIM card detection function, DSDS supported
UART	× 4, up to 4 Mbps, two of them support hardware flow control	× 3, up to 4 Mbps, one of them supports hardware flow control	× 3, up to 4 Mbps, one of them supports hardware flow control
SD Card	SD 3.0, 4-bit SDIO	× 1, SD 3.0, 4-bit SDIO	× 1, SD 3.0, 4-bit SDIO
PWRKEY	Supported	Pulled up internally to 1.8 V	Pulled up internally to 1.8 V
SPI	Supported	× 3	× 3
ADC	Supported	× 2	× 2
GPIO	Supported	× 21	× 21
PWM	× 2	× 2	× 2
Motor Driver	× 1	× 1	× 1
Flashlight Driver	× 2	× 2	× 2
WLED Sink	× 4	× 4	× 4
Antenna	× 4, Main/Rx-diversity/GNSS/Wi-Fi & Bluetooth	× 4, Main/Rx-diversity/GNSS/Wi-Fi & Bluetooth	× 4, Main/Rx-diversity/GNSS/Wi-Fi & Bluetooth
Enhanced Features			
BT	Bluetooth 2.1 EDR/3.0 HS/4.2 LE; Support a maximum of 10 ACL/BEL/SCO links	Bluetooth 2.1 EDR/3.0 HS/4.2 LE/5.1 LE	Bluetooth 2.1 EDR/3.0 HS/4.2 LE/5.1 LE
Wi-Fi	2.4 & 5 GHz, 802.11a/b/g/n/ac; 433 Mbps, STA/AP/P2P	2.4 & 5 GHz, 802.11a/b/g/n/ac/ax-ready	2.4 & 5 GHz, 802.11a/b/g/n/ac/ax-ready
GNSS	GNSS <sup>3</sup> : GPS/BDS/GLONASS or GPS/BDS/Galileo	GNSS <sup>3</sup> : GPS/BDS/GLONASS/Galileo/NavIC/QZSS/SBAS; L1 + L5	GNSS <sup>3</sup> : GPS/BDS/GLONASS/Galileo/NavIC/QZSS/SBAS; L1 + L5
Charge Function	Build-in Charge IC & Fuel Gauge Qualcomm Quick Charge 3.0 technology	Build-in Charge IC & Fuel Gauge Qualcomm Quick Charge 3.0 technology	Build-in Charge IC & Fuel Gauge Qualcomm Quick Charge 3.0 technology
Dual LCD	support independent display for 2 LCDs	only support single LCD display	only support single LCD display
DSDS	Support Dual SIM Dual Standby	Support Dual SIM Dual Standby	Support Dual SIM Dual Standby
Firmware Upgrade	Firmware Upgrade via USB or OTA	Firmware Upgrade via USB or OTA	Firmware Upgrade via USB or OTA
Certifications <sup>4</sup>	CE/RCM/GCF/NCC/Telstra/FCC/IC/PTCRB/AT&T/Verizon/T-Mobile/JATE/TELEC/KDDI/NTT DOCOMO/IFETEL/Anatel/KC	CE*/RCM*/GCF*/NCC*/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.		

Note 1: TBD.

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

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

Note 4: May depend on modules' variant.



\* Planning/Under development

Product		SC200K
		
Form Factor	LCC+LGA	
Dimensions (mm)	40.5 × 40.5 × 2.85	
LTE Feature	LTE Cat 4 3GPP E-UTRA Release 12 Compliant, Support DL MIMO 2 × 2	
Frequency Bands(MHz)	-CE (China)	LTE-FDD: B1/3/5/8; LTE-TDD: B34/38/39/40/41; WCDMA: B1/8; GSM: 900/1800MHz
	-WF(Global)	only Wi-Fi & BT
CPU	Unisoc UIS8581E ARM Cortex 4 x A55@ 1.6 GHz + 4 x A55@ 1.2GHz	
GPU	PowerVR Fentale GE8322	
Memory	2 GB LPDDR4X + 32 GB eMMC; 3 GB LPDDR4X + 32 GB eMMC; 4 GB LPDDR4X + 64 GB eMMC	
Operating System	Android 10.0	
Supply Voltage Range	3.55V~4.2V, typ. 3.8V	
Weight (approx.) g	10.5	
Operating Temperature	-30 °C ~ +75 °C	
Data Transmission		
LTE (Mbps)	Cat 4: LTE FDD: Max. 150 (DL) / Max. 50 (UL) LTE TDD: Max. 130 (DL) / Max. 30 (UL)	
UMTS	DC-HSPA: Max. 42Mbps (DL) DC-HSUPA: Max. 11.2Mbps (DL) WCDMA: Max. 384Kbps (DL) / Max. 384Kbps (UL)	
GSM(Kbps)	EDGE: Max. 296 (DL) /Max. 236.8 (UL) GPRS: Max. 107 (DL) /Max. 85.6 (UL)	
Interfaces		
LCM	4-lane MIPI_DSI, FHD+ (2160 × 1080) @ 60 fps	
Camera	2 groups of 4-lane MIPI_CSI, Support 2 or 3 cameras, up to 16 MP with dual ISP	
Touch Panel	Capacitive touch panel, I2C controls	
Audio	Analog channels: 3 inputs: MIC1, MIC2, MIC3 (including one noise-canceling MIC); 3 outputs: speaker, earpiece, headphone	
Video	Encode: 1080P (H.264) @ 30 fps; WVGA (MPEG-4/ VP8) @ 30 fps; Decode: 1080P (H.264/ MPEG-4/ VP8/ H.265/ DivX4/ 5/ 6) @ 30 fps; WVGA (H.263) @ 30 fps	
USB	× 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	
I2C	Supported	
(U)SIM	× 2, Support 1.8/ 2.95 V (U)SIM cards, with (U)SIM card detection function, DSDS supported	
UART	× 3, up to 3 Mbps, one of them supports hardware flow control	
SD Card	× 1, SD 3.0, 4-bit SDIO	
PWRKEY	Supported	
SPI	Supported	
ADC	Supported	
GPIO	Supported	
PWM	× 1	
Antenna	× 4, Main/Rx-diversity/GNSS/Wi-Fi & Bluetooth	
Enhanced Features		
BT	Bluetooth 2.1 EDR/3.0 HS/4.2 LE/5.0 LE	
Wi-Fi	2.4 & 5 GHz, 802.11 a/b/g/n/ac	
GNSS	GPS/GLONASS or GPS/BDS	
Charge Function	Built-in charging function	
Dual LCD	only support single LDC display	
DSDS	Support dual card dual standby	
Firmware Upgrade	Firmware Upgrade via USB or OTA	
Certifications <sup>1</sup>	SRRC/ NIAL/ 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.	

Note 1: May depend on modules' variant.  
SC200K 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)	44.0 × 43.0 × 2.85	44.0 × 43.0 × 2.85
LTE Feature	LTE Cat 6 3GPP E-UTRA Release 10 Compliant, Support DL MIMO 2 × 2	LTE Cat 6 3GPP E-UTRA Release 10 Compliant, Support DL MIMO 2 × 2
Frequency Bands (MHz)	-EM ( EMEA/ India/ Korea/ South Asia/ Latin America/ Australia/ ANZ/ South Africa) LTE-FDD: B1/2/3/4/5/7/8/20/28; LTE-TDD: B38/39/40/41; WCDMA: B1/2/4/5/8; GSM: 850/900/1800/1900MHz -NA (North America) LTE-FDD: B2/4/5/7/12/13/14/17/25/26/66/71; LTE-TDD: B41; WCDMA: B2/4/5 -JP (Japan) LTE-FDD: B1/3/5/8/11/18/19/21/26/28; LTE-TDD: B41; WCDMA: B1/6/8/19 -WF (Global) Only Wi-Fi & BT	LTE-FDD: B1/2/3/4/5/7/8/20/28; LTE-TDD: B38/40/41; WCDMA: B1/2/4/5/8; GSM: 850/900/1800/1900MHz LTE-FDD: B2/4/5/7/12/13/14/17/25/26/66/71; LTE-TDD: B41; WCDMA: B2/4/5 /
CPU	Qualcomm MSM8953 ARM Coretex 8 × A53@ 2.0 GHz	Qualcomm MSM8953 ARM Coretex 8 × A53@ 2.0 GHz
GPU	Qualcomm® Adreno™ 506 graphics processing unit (GPU) with 64-bit addressing	Qualcomm® Adreno™ 506 graphics processing unit (GPU) with 64-bit addressing
Memory	2GB LPDDR3 + 16GB eMMC	2GB LPDDR3 + 16GB eMMC
Operating System	Android 9/10	Yocto Linux (kernel 4.9)
Supply Voltage Range	3.55V ~ 4.4V, typ. 3.8V	3.55V ~ 4.4V, typ. 3.8V
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. 300 (DL)/Max. 50 (UL); LTE-TDD: Max. 285 (DL)/Max. 35 (UL) Cat 4: LTE-FDD: Max. 150 (DL)/Max. 50 (UL); LTE-TDD: Max. 130 (DL)/Max. 30 (UL)	Cat 6: LTE-FDD: Max. 300 (DL)/Max. 50 (UL); LTE-TDD: Max. 285 (DL)/Max. 35 (UL) Cat 4: LTE-FDD: Max. 150 (DL)/Max. 50 (UL); LTE-TDD: Max. 130 (DL)/Max. 30 (UL)
UMTS	DC-HSDPA: Max. 42Mbps (DL); DC-HSPA: Max. 11.2Mbps (UL); WCDMA: Max. 384Kbps (DL/UL)	DC-HSDPA: Max. 42Mbps (DL); DC-HSPA: Max. 11.2Mbps (UL); WCDMA: Max. 384Kbps (DL/UL)
GSM(Kbps)	EDGE: Max. 296 (DL)/236.8 (UL); GPRS: Max. 107 (DL)/85.6 (UL)	EDGE: Max. 296 (DL)/236.8 (UL); GPRS: Max. 107 (DL)/85.6 (UL)
Interfaces		
LCM	2 × 4-lane MIPI_DSI; WUXGA (1920 × 1200) @ 60 fps for primary display and FHD (1920 × 1080) @ 60 fps for secondary display; Wi-Fi display: 1080P @ 30 fps (UBWC)	2 × 4-lane MIPI_DSI; WUXGA (1920 × 1200) @ 60 fps for primary display and FHD (1920 × 1080) @ 60 fps for secondary display; Wi-Fi display: 1080P @ 30 fps (UBWC)
Camera	3 groups of 4-lane MIPI_CSI, up to 2.1 Gbps per lane. 2 × ISP; Support three cameras (4-lane + 4-lane + 4-lane) or four cameras (4-lane + 4-lane + 2-lane + 1-lane); Up to 24 MP with dual ISP	3 groups of 4-lane MIPI_CSI, up to 2.1 Gbps per lane. 2 × ISP; Support three cameras (4-lane + 4-lane + 4-lane) or four cameras (4-lane + 4-lane + 2-lane + 1-lane); Up to 24 MP with dual ISP
Touch Panel	× 2, Capacitive touchscreen, I2C controls	× 2, Capacitive touchscreen, I2C controls
Audio	Analog channels: Three inputs: MIC1, MIC2, MIC3 (including one noise-canceling MIC); Three outputs: speaker, earpiece, headphone	Analog channels: Three inputs: MIC1, MIC2, MIC3 (including one noise-canceling MIC); Three outputs: speaker, earpiece, headphone
Video	Encode and Decode: Up to 4K @ 30 fps; High frame rate encode: 720P @ 120 fps; 60 Mbps; Maximum 972000 macro block/s; 1080P @ 60 fps Decode + 1080P @ 30 fps Encode	Encode and Decode: Up to 4K @ 30 fps; High frame rate encode: 720P @ 120 fps; 60 Mbps; Maximum 972000 macro block/s; 1080P @ 60 fps Decode + 1080P @ 30 fps Encode
USB	× 1, USB 2.0/3.0 (Type-C), USB OTG + Charge	× 1, USB 2.0/3.0 (Type-C), USB OTG + Charge
I2C	Supported	Supported
(U)SIM	× 2, Support 1.8/ 2.95 V (U)SIM cards, with (U)SIM card detection function, DSDS supported	× 2, Support 1.8/ 2.95 V (U)SIM cards, with (U)SIM card detection function, DSDS supported
UART	×4, up to 4 Mbps, two of them support hardware flow control	×4, up to 4 Mbps, two of them support hardware flow control
SD Card	SD 3.0, 4-bit SDIO	SD 3.0, 4-bit SDIO
PWRKEY	Supported	Supported
SPI	Supported	Supported
ADC	Supported	Supported
GPIO	Supported	Supported
PWM	× 2	×2
Motor Driver	× 1	/
Flashlight Driver	× 2	/
WLED Sink	× 4	/
Antenna	× 4, Main/Rx-diversity/GNSS/Wi-Fi & Bluetooth	× 4, Main/Rx-diversity/GNSS/Wi-Fi & Bluetooth
Enhanced Features		
BT	Bluetooth 2.1 EDR/ 3.0 HS/ 4.2 LE; Support a maximum of 10 ACL/EL/SCO links	Bluetooth 2.1 EDR/3.0 HS/4.2 LE; Support a maximum of 10 ACL/EL/SCO links
Wi-Fi	2.4 & 5 GHz, 802.11a/b/g/n/ac; 433 Mbps, STA/AP/P2P	2.4 & 5 GHz, 802.11a/b/g/n/ac; 433 Mbps, STA/AP/P2P
GNSS	GNSS <sup>1</sup> : GPS/BDS/GLONASS or GPS/BDS/Galileo	GNSS <sup>2</sup> : GPS/BDS/GLONASS or GPS/BDS/Galileo
Charge Function	Build-in Charge IC & Fuel Gauge Qualcomm Quick Charge 3.0 technology	/
Dual LCD	support independent display for 2 LCDs	support independent display for 2 LCDs
DSDS	Support Dual SIM Dual Standby	Support Dual SIM Dual Standby
Firmware Upgrade	Firmware Upgrade via USB or OTA	Firmware Upgrade via USB or OTA
Certifications <sup>3</sup>	CE/RCM/GCF/NCC/Telstra/FCC/IC/PTCRB/AT&T/Verizon/T-Mobile/JATE/TELEC/KDDI/NTT DOCOMO/IFETEL/Anatel/KC	CE/RCM/GCF/FCC/IC/PTCRB/AT&T/Verizon
Recommended Applications	Smart POS, Smart Home Gateways, Smart Robots, Smart Wearables, Safety, PDAs & Tablets, Vending Machines, Delivery Lockers, Telematics, Mobile Computing, Police and Law Enforcement Equipment, In-car Video Streaming and Entertainment Systems, etc.	

Note 1: GNSS is not supported on SC600T-WF.

Note 2: GNSS is not supported on SC606T-WF.

Note 3: May depend on modules' variant.



# Smart Module Family

Product	SC66	SG560D
		
Form Factor	LCC+LGA	LGA
Dimensions(mm)	44.0 × 43.0 × 2.85	56.5×42.5× 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 (China)	-CN* (China)
	-E/EU (EMEA/Europe/India/Korea/South Asia/Latin America/Australia/South Africa)	-EU* (EMEA)
	-A/NA (North America)	-NA* (North America)
	-J (Japan)	N/A
	-MW/WF (Global)	-WF* (Wi-Fi) only Wi-Fi & BT
CPU	Qualcomm SDM660 ARM Cortex technology 4 × Kryo260 Gold@2.2 GHz + 4 × Kryo260 Silver@1.843 GHz	Qualcomm QCM6490 ARM Cortex technology 1 × Kryo670 Goldplus@ 2.7 GHz + 3 × Kryo670 Gold@ 2.4GHz + 4 × Kryo670 Silver@ 1.9GHz
GPU	Qualcomm® Adreno 512 @ 650 MHz, OpenGL ES3.1 + AEP, DX12_FL12, Vulkan, OpenGL2.0 FP, RenderScript	Qualcomm® Adreno™ 643 @ 812 MHz
Memory	3 GB LPDDR4X + 32 GB eMMC; 4 GB LPDDR4X + 64 GB eMMC	4 GB LPDDR4X + 64 GB UFS
Operating System	Android 9/10	Android 12/13/14/15 <sup>1</sup>
Supply Voltage Range	3.55V ~ 4.4V, typ. 4V	3.55V ~ 4.4V, typ. 4.0V
Weight (approx.) g	12.0	17.5
Operating Temperature	-35 °C ~ +75 °C	-35 °C ~ +75 °C
Data Transmission		
5G	/	5G SA: 2.1 Gbps (DL)/900 Mbps (UL); 5G NSA: 2.5 Gbps (DL)/650 Mbps (UL)
LTE (Mbps)	Cat 6*: LTE-FDD: Max. 300 (DL)/Max. 50 (UL); LTE-TDD: Max. 265 (DL)/Max. 30 (UL) Cat 4: LTE-FDD: Max. 150 (DL)/Max. 50 (UL); LTE-TDD: Max. 130 (DL)/Max. 30 (UL)	Cat18: 1.2 (DL)/200 (UL)
UMTS	DC-HSDPA: Max. 42Mbps (DL); DC-HSUPA: Max. 5.76Mbps (UL); WCDMA: Max. 384Kbps (DL/UL)	DC-HSPA+: 42Mbps (DL)/5.76Mbps (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(Kbps)	EDGE: Max. 296 (DL)/236.8 (UL) ; GPRS: Max. 107 (DL)/85.6 (UL)	SG560D-EU: EDGE: 296 (DL)/236.8 (UL); GPRS: 107 (DL)/85.6 (UL)
Interfaces		
LCM	2 × 4-lane MIPI DSI Default: MIPI_DSI (2560 × 1600 @ 60 fps) + DP over USB Type-C (4096 × 2160 @ 30 fps) ; Optional: MIPI_DSI0 (1920 × 1080 @ 60 fps) + MIPI_DSI1 (1920 × 1080 @ 60 fps) ; Wi-Fi display: 1080P @ 30 fps	1 × 4-lane MIPI_DSI, support up to 2.5 Gbps/ lane, 1200 × 2520 @ 144 fps; 1 × DP over Type C, support up to 4K (3840 × 2160) @ 60 fps; Support Wi-Fi Miracast 4K @ 60fps
Camera	3 × 4-lane CSIs (4/ 4/ 4 or 4/ 4/ 2/ 1) D-PHY 1.2 @ 2.1 Gbps/ lane, or 3 × 3-lane C-PHY 1.0 at 17 Gbps (2.5 G symbols per trio per second); 2 × ISP: 16 MP (30 fps ZSL) @ 1 × ISP + 16 MP (30 fps ZSL) @ 1 × ISP; Max. 24 MP (30 fps ZSL) @ 2 × ISP	4 × 4-lane MIPI_CSI, Supports up to 2.5 Gbps/ lane; 3 × ISP, 3 × 27 MP @ 24 fps; or 3 × 22MP @ 30 fps; or 36 MP + 27 MP @ 24 fps; or 36MP + 22MP @ 30 fps; or Max. 1×64 MP @ 30 fps
Touch Panel	Capacitive touch panel, I2C controls	Capacitive touchscreen, I2C controls
Audio	Analog channels: 3 inputs: MIC1, MIC2, MIC3 (including one noise-canceling MIC); 3 outputs: speaker, earpiece, headphone	Needs external audio codec
Video	Decode: 4K @ 30 fps; H.264, VP8, VP9 and HEVC; Encode: 4K @ 30 fps; HEVC, H.264, VP8 and MPEG-4	Encode: 4K (H.264/ H.265) @ 30 fps; Decode: 4K (H.264/ H.265/ VP9) @ 30 fps
USB	× 2 USB 3.1, supports DP over Type-C, compatible with USB 2.0 USB 2.0, only supports USB Host mode	× 2, USB 3.1 Type-C with DisplayPort 1.4, compatible with USB 2.0; USB 2.0 Host
I2C	Supported	Supported
(U)SIM	× 2, Support 1.8/ 2.95 V (U)SIM cards, with (U)SIM card detection function, DSDS supported	× 2, Support 1.8/ 2.95 V (U)SIM cards, with (U)SIM card detection function; Support DSDS
UART	× 3, Up to 3 Mbps, one of them is used for debugging only	× 3, supports 4 Mbps with Hardware Flow Control
SD Card	× 1, SD 3.0, 4-bit SDIO	× 1, SD 3.0, 4-bit SDIO
PWRKEY	Supported	Supported
SPI	Supported	Supported
ADC	Supported	Supported
GPIO	Supported	Supported
PWM	× 1	× 1
Motor Driver	/	× 1
Flashlight Driver	/	× 1
Antenna	× 4, Main/Rx-diversity/GNSS/Wi-Fi & Bluetooth	Cellular antenna × 4, Wi-Fi/Bluetooth antenna × 1, Wi-Fi MIMO antenna × 1, GNSS antenna × 1
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/5.2 LE
Wi-Fi	Wi-Fi <sup>2</sup> : 2.4 & 5 GHz, 802.11a/b/g/n/ac; 2 × 2 MIMO Wi-Fi	2.4 & 5 & 6 GHz, 802.11a/b/g/n/ac/ax; Wi-Fi 6E, 2 × 2 MU-MIMO, DBS
GNSS	GNSS <sup>3</sup> : GPS/GLONASS/BDS/Galileo/QZSS/SBAS	GNSS <sup>4</sup> : 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 independent display for 2 LCDs	/
DSDS	Support Dual SIM Dual Standby	Support Dual SIM Dual Standby
Firmware Upgrade	Firmware Upgrade via USB or OTA	Firmware Upgrade via USB or OTA
Certifications <sup>5</sup>	CE/GCF/FCC/PTCRB/NCC/AT&T/Verizon/RCM/IC/JATE/TELEC/CCC/SRRC/NAL/KC/UKCA	CE*/GCF*/UCKA*/CCC/ SRRC*/ NAL/FCC*/IC*/PTCRB*/Verizon*/AT&T*/T-Mobile*
Recommended Applications	Smart POS, Smart Home Gateways, Smart Robots, Smart Wearables, Safety, PDAs & Tablets, Vending Machines, Delivery Lockers, Telematics, Mobile Computing, Police and Law Enforcement Equipment, In-car Video Streaming and Entertainment Systems, etc.	

Note 1: TBD.

Note 2: 2 × 2 MIMO Wi-Fi is not supported on SC66-CE.

Note 3: GNSS is not supported on SC66-MW.

Note 4: GNSS is not supported on SG560D-WF.

Note 5: May depend on modules' variant.




\* Planning/Under development

# Smart Module Family

Product	SA800U	SG865W
		
Form Factor	B2B Connector	LGA
Dimensions(mm)	60.0 × 37.0 × 6.55	42.0 × 46.0 × 2.95
Frequency Bands (MHz)	-WF(Global) -AP(Global)	- WF* (Wi-Fi) only Wi-Fi & BT
CPU	Qualcomm SDA845 ARM Coretex technology 4 x Kryo385 Gold@2.649 GHz + 4 x Kryo385 Silver@1.766 GHz	Qualcomm QCS8250 ARM Coretex technology 1 x Kryo585 Goldprime@ 2.842 GHz + 3 x Kryo585 Gold@2.419 GHz + 4 x Kryo585 Silver@ 1.805GHz
GPU	Adreno 630 – 4K 60 fps UI or 2 × 2K 90 fps UI	Adreno 650 at 587 MHz– 4K 60 fps UI or 2 × 2K 60 fps UI
Memory	4 GB LPDDR4X + 64 GB UFS; 8 GB LPDDR4X + 256 GB UFS	8 GB LPDDR5 + 64 GB UFS 2.1
Operating System	Android 10	Android 10
Supply Voltage Range	3.55V – 4.4V, typ. 3.8V	3.55V – 4.4V, typ. 3.8V
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	2 × 4-lane MIPI DSI; 3840 × 2400 @ 60 fps primary display; 4K @ 60 fps over DP; Wi-Fi display: 4K @ 30 fps	2 × 4-lane MIPI DSI; 5040 × 2160 @ 60 fps with 8-lane MIPI; 2 × (2560 × 2560 @ 60 fps with 4-lane MIPI); 2 × 4K @ 60 fps over DP (MST Mode); Wi-Fi display: 4K @ 60 fps
Camera	3 × 4-lane CSI with C-PHY/ D-PHY + 1 × 2-lane CSI with D-PHY ; 2 × ISP + 1 × Lite ISP: 16 MP (30 fps ZSL ) @ 1 × ISP + 16 MP (30 fps ZSL) @ 1 × ISP; Max. 32 MP (30 fps ZSL) @ 2 × ISP	6 × 4-lane MIPI CSI; 2 × Full ISP + 2 × Lite ISP; 2 × Front-end input: 25 MP (4:3 aspect ratio) or 18 MP (16:9 aspect ratio); 2 × Front-end input: Mono/ YUV interface; Max. 64 MP @ 30 fps ZSL @ 2 × ISP
Touch Panel	Capacitive-screen, I2C controls	Capacitive-screen, I2C controls
Audio	Needs external audio codec	Needs external audio codec
Video	Decode: 4K @ 60 fps; H.264 High Profile, H.265 Main 10 Profile and VP9 Profile 2; Encode: 4K @ 60 fps; H.264 High Profile, H.265 Main 10 Profile; Encode: 4K @ 30 fps; VP8; Supports HDR 10-bit video playback (HLG, HDR10); Supports HDR 10-bit capture (HLG)	Encode: 4K @ 120 fps; 8K @ 30 fps; Decode: 4K @ 240 fps; 8K @ 60 fps; H.264 High Profile, H.265 Main 10 Profile,VP8, HDR 10-bit video playback (HLG, HDR10), HDR 10-bit capture (HLG)
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 wdisplayPor× 2; USB 3.1, compatible with USB 2.0, one of them supports DisplayPort v1.4
I2C	Supported	Supported
UART	× 3, up to 3 Mbps, one of them is used for debugging only	× 3, Up to 3 Mbps, one of them is used for debugging only
SD Card	× 1, SD 3.0, 4-bit SDIO	× 1, SD 3.0, 4-bit SDIO
PWRKEY	Supported	Supported
SPI	Supported	Supported
ADC	Supported	Supported
GPIO	Supported	Supported
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	× 2, Wi-Fi & Bluetooth antenna connector respectively	× 2, Wi-Fi & Bluetooth antenna connectors
Enhanced Features		
BT	Bluetooth 2.1 EDR/3.0 HS/4.2 LE/5.0 LE	Bluetooth 2.1 EDR/3.0 HS/4.2 LE/5.1 LE
WLAN	2.4 & 5 GHz, 2 × 2 MIMO, 802.11a/b/g/n/ac, DBS	2.4 & 5 GHz, 2 × 2 MIMO, 802.11a/b/g/n/ac/ax, Wi-Fi 6, DBS
GNSS	NA, can be supported by using Quectel 4G/5G/GNSS modules	NA, can be supported by using Quectel 4G/5G/GNSS modules
Charge Function	Build-in Charge IC & Fuel Gauge Qualcomm Quick Charge technology	Used for battery voltage detection, fuel gauge, battery temperature detection
Dual LCD	support independent display for 2 LCDs	support independent display for 2 LCDs
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 <sup>1</sup>	BG95xA-GL Series
			
Form Factor	LGA	LGA	LGA
Dimensions (mm)	22.5 × 26.5 × 2.3	19.9 × 23.6 × 2.2	19.9 × 23.6 × 2.2 (BG950A-GL/BG951A-GL/BG952A-GL/BG955A-GL); 19.9 × 23.6 × 2.3 (BG953A-GL)
RAT	LTE Cat M1/ NB1/ EGPRS	LTE Cat M1/Cat NB2/EGPRS	LTE Cat M1/Cat NB1/NB2* (BG950A-GL/BG951A-GL/BG952A-GL/BG953A-GL); LTE Cat M1/NB1/NB2*/GPRS (BG955A-GL)
Frequency Bands (MHz)	LTE-FDD: B1/2/3/4/5/8/12/13/18/19/20/26*/28; EGPRS: 850/900/1800/1900MHz	LTE-FDD: B1/2/3/4/5/8/12/13/18/19/20/25/26(Cat M1 Only)/27 (Cat M1 Only)/28/31/66/71 (Cat NB2 Only)/72/73/85/86 <sup>4,2</sup> (Cat NB2 only)/87 <sup>4,2</sup> /88 <sup>4,2</sup> ; EGPRS: 850/900/1800/1900MHz	LTE-FDD: B1/2/3/4/5/8/12/13/17(Cat NB1/NB2* Only)/18/19/20/25/26(Cat M1 Only)/27 (Cat M1 Only)/28/66 (BG950A-GL/BG951A-GL/BG952A-GL/BG953A-GL); LTE-FDD: B1/2/3/4/5/8/12/13/17(Cat NB1/NB2 Only)/18/19/20/25/26(Cat M1 Only)/27 (Cat M1 Only)/28/66; GPRS: 850/900/1800/1900MHz(BG955A-GL)
Weight (approx.) g	3.1	2.15	2.15 (BG950A-GL/BG951A-GL/BG952A-GL/BG953A-GL); TBD (BG955A-GL)
Operating Temperature	-35°C ~ +75°C	-35°C ~ +75°C	-35°C ~ +75°C
Extended Temperature	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C
Data Transmission			
LTE Cat M1 data rate (Kbps)	Max. 375 (DL), Max. 375 (UL)	Max. 588 (DL), Max. 1119 (UL)	Max. 588 (DL), Max. 1119 (UL)
LTE Cat NB1 data rate (Kbps)	Max. 32 (DL), Max. 70 (UL)	Max. 32 (DL), Max. 70 (UL)	Max. 27.2 (DL), Max. 62.5 (UL)
LTE Cat NB2 data rate (Kbps)	/	Max. 127 (DL), Max. 158.5 (UL)	Max. 127 (DL), Max. 158.5 (UL)
EDGE data rate (Kbps)	Max. 296 (DL), Max. 236.8 (UL)	Max. 296 (DL), Max. 236.8 (UL)	/
GPRS data rate (Kbps)	Max. 107 (DL), Max. 85.6 (UL)	Max. 107 (DL), Max. 85.6 (UL)	Max. 85.6 (DL), Max. 42.8 (UL)(BG955A-GL)
SMS	•	Point-to-point MO and MT; Text and PDU Mode; SMS Cell Broadcast	Point-to-point MO and MT; Text and PDU Mode; SMS Cell Broadcast
Protocols	PPP/TCP/UDP/SSL/TLS/FTP(S)/HTTP(S)/NITZ/PING/MQTT(S)/LwM2M/CoAP(S)/IPv6/DNS/NTP	PPP/TCP/UDP/SSL/TLS/FTP(S)/HTTP(S)/NITZ/PING/MQTT(S)/MQTT-SN/LwM2M/CoAP(S)/IPv6/DNS/NTP	PPP/TCP/UDP/SSL/TLS/FTP(S)/HTTP(S)/NITZ/ PING/MQTT/LwM2M
Interfaces			
(U)SIM	1.8V/ 3V	1.8V	1.8V
UART	× 3 (MAIN, DEBUG, NMEA)	× 3 (MAIN, DEBUG, NMEA)	× 3 (MAIN, DEBUG, GNSS)(BG950A-GL/BG951A-GL/BG953A-GL/BG955A-GL); × 2 (BG952A-GL)
USB	USB 2.0 × 1	USB 2.0 × 1	USB 2.0 × 1
I2C	I2C <sup>3</sup> × 1	I2C <sup>3</sup> × 1	I2C* × 2 (BG952A-GL)
ADC	ADC × 2	ADC × 1	ADC × 2
GPIO	GPIO × 2 (I2C and NMEA can be re-configured as GPIO)	GPIO <sup>4</sup> × 9	GPIO × 9 (BG950A-GL/BG951A-GL/BG953A-GL/BG955A-GL); GPIO Max. × 15 (BG952A-GL)
RESET	RESET × 1	RESET × 1	RESET × 1
PCM	PCM <sup>5</sup> × 1	PCM <sup>5</sup> × 1	/
Antenna	Primary, GNSS	Antenna <sup>5, 2</sup> (for Main Antenna and GNSS Antenna, respectively)	2 (for Main Antenna and GNSS Antenna, respectively)
Enhanced Features			
QuecOpen <sup>6</sup>	Simplifies the Development of Embedded Applications	Simplifies the Development of Embedded Applications	Simplifies the Development of Embedded Applications (BG952A-GL)
iSIM	/	/	•(BG953A-GL)
DFOTA	•	•	•
GNSS/RIL Driver	Android 4.x/5.x/6.x/7.x/8.x/9.x/10.x/11.x/12.x	Android 4.x/5.x/6.x/7.x/8.x/9.x/10.x/11.x/12.x	/
NDIS	Windows 7/8/8.1/10/11	/	/
USB Serial Driver	Windows 7/8/8.1/10/11, Linux 2.6 or later, Android 4.x/5.x/6.x/7.x/8.x/9.x/10.x/11.x/12.x	Windows 7/8/8.1/10/11, Linux 2.6-5.15, Android 4.x/5.x/6.x/7.x/ 8.x/9.x/10.x/11.x/12.x	/
SIM Detection	•	•	•
GNSS	Optional	Optional	GPS, GLONASS(BG950A-GL/BG952A-GL/BG953A-GL/BG955A-GL); GPS/GLONASS/Galileo/Beidou/QZSS, LTE & GNSS concurrency(BG951A-GL);
Firmware Update	via USB Interface	via USB Interface	via UART/USB*/DFOTA
Electrical Features			
Supply Voltage Range	3.3 ~ 4.3V, typ. 3.8V	typ. 3.8V / typ. 3.3V <sup>8</sup>	2.2-4.35 V, typ. 3.3 V . (BG950A-GL/BG951A-GL/BG952A-GL/BG953A-GL); 3.3-4.3 V, typ. 3.8 V (BG955A-GL)
Power Consumption	10µA@PSM	3.9µA@PSM <sup>7</sup>	1.5µA@ PSM (BG950A-GL/BG951A-GL/BG952A-GL/BG955A-GL); TBD (BG953A-GL)
Max Output Power	Power Class 3 23dBm @ LTE Bands	Power Class5 21dBm @ LTE Bands / Power Class3 23dBm@ LTE Bands <sup>9</sup> / 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
Certifications <sup>9</sup>	Vodafone/Deutsche Telekom/Telefónica/ Verizon/AT&T/ T-Mobile/Telus/Rogers/ SKT/LGU+/ NTT DOCOMO/SoftBank/ KDDI/ Telstra/GCF/CE/FCC/PTCRB/IC/IFETEL/CCC/KC/ NCC/JATE/TELEC/RCM/NBTC/IMDA/ICASA/U.S. Cellular	China Telecom*/China Mobile*/China Unicom*/Vodafone/ Deutsche Telekom/ Verizon/AT&T/T-Mobile/SKT/NTT DOCOMO/ SoftBank*/ KDDI/Telstra/SRRC*/NAL*/ CCC/GCF/CE/FCC/PTCRB/ IC/Anatel/KC/NCC/ JATE/TELEC/RCM/NBTC*/IMDA/RoHS/ATEX/ PEN/KT/UCCA/LGU+/Telefónica/U.S.Cellular/Telus/Orange/ Rogers/IMDA/IFETEL	Vodafone /Deutsche Telekom/Verizon*/ AT&T-Mobile*/SKT*/ LGU+/ NTT DOCOMO*/ KDDI*/Telstra*/GCF/CE/FCC/PTCRB/IC/KC/ JATE/TELEC/RCM/KT
Recommended Applications	Gas Detectors, Soil PH Testers, Optical Sensors, Machinery Alarm Systems, Irrigation Controllers, Elevators, Asset Tracking Electronics, Person/ Pet Tracking, Water/ Gas Metering, Smart Parking Systems, Fire Hydrants, Smoke Alarms, Smart Bins, Street Lighting		

Note 1: For different variants, please refer to the BG95 specification.  
 Note 2: BG95-M9 support B86/B87/B88.  
 Note 3: For Voice Call only.  
 Note 4: BG95-MF provides 7 GPIO Interfaces, please refer to HD for details.  
 Note 5: BG95-MF provides 3 antenna interfaces, please refer to HD for details.

Note 6: For the supply voltage of different variants, please refer to the BG95 Hardware Design document.  
 Note 7: For the power consumption of different variants, please refer to the BG95 Hardware Design document.  
 Note 8: For the max output power of different variant, please refer to BG95 Hardware Design document.  
 Note 9: May depend on modules' variant.

\* Under development

# LPWA Module Family

Product	BG600L-M3	BG77	BG77xA-GL Series
			
Form Factor	LGA	LGA	LGA
Dimensions (mm)	16.0 × 18.7 × 2.1	12.9 × 14.9 × 1.7	12.9 × 14.9 × 1.9
RAT	LTE Cat M1/Cat NB2/E6PRS	LTE Cat M1/Cat NB2	LTE Cat M1/Cat NB1/NB2*
Frequency Bands (MHz)	LTE-FDD: B1/2/3/4/5/8/12/13/18/19/20/25/26(Cat M1 Only)/27 (Cat M1 Only)/28/66/71 (Cat NB2 Only)/85; E6PRS: 850/900/1800/1900MHz	LTE-FDD: B1/2/3/4/5/8/12/13/18/19/20/25/26(Cat M1 Only)/27 (Cat M1 Only)/28/66/71 (Cat NB2 Only)/85*	LTE-FDD: B1/2/3/4/5/8/12/13/17 (Cat NB1/NB2*Only)/18/19/20/25/26 (Cat M1 Only)/27 (Cat M1 Only)/28/66
Weight (approx.) g	1.25	0.73	0.85
Operating Temperature	-35°C ~ +75°C	-35°C ~ +75°C	-35°C ~ +75°C
Extended Temperature	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C
Data Transmission			
LTE Cat M1 data rate (Kbps)	Max. 588 (DL), Max. 1119 (UL)	Max. 588 (DL), Max. 1119 (UL)	Max. 588 (DL), Max. 1119 (UL)
LTE Cat NB1 data rate (Kbps)	Max. 32 (DL), Max. 70 (UL)	Max. 32 (DL), Max. 70 (UL)	Max. 27.2 (DL), Max. 62.5 (UL)
LTE Cat NB2 data rate (Kbps)	Max. 127 (DL), Max. 158.5 (UL)	Max. 127 (DL), Max. 158.5 (UL)	Max. 127 (DL), Max. 158.5 (UL)
EDGE data rate (Kbps)	Max. 296 (DL), Max. 236.8 (UL)	/	/
GPRS data rate (Kbps)	Max. 107 (DL), Max. 85.6 (UL)	/	/
SMS	Point-to-point 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
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/TLS/FTP(S)/HTTP(S)/LwM2M/IPv4/IPv6/TLS/DTLS/CoAP/NITZ/Polite(BG770A-GL/BG772A-GL); PPP/TCP/UDP/SSL/TLS/FTP(S)/HTTP(S)/NITZ/PING/MQTT/LwM2M(BG773A-GL)
Interfaces			
(U)SIM	1.8V	1.8V	1.8V
UART	× 3 (MAIN, DEBUG, NMEA)	× 3 (MAIN, DEBUG, NMEA)	× 3 (MAIN, DEBUG, AUX)(BG770A-GL); × 3 (MAIN, DEBUG, GNSS) (BG772A-GL/BG773A-GL)
USB	USB 2.0 × 1	USB 2.0 × 1	USB 2.0 × 1
I2C	I2C <sup>1</sup> × 1	I2C <sup>1</sup> × 1	I2C* × 2(BG772A-GL)
ADC	ADC × 1	ADC × 2	ADC × 2
GPIO	GPIO × 6	GPIO × 7	GPIO × 7(BG770A-GL/BG773A-GL); GPIO Max. × 15 (BG772A-GL)
RESET	RESET × 1	RESET × 1	RESET × 1
PCM	PCM <sup>1</sup> × 1	PCM <sup>1</sup> × 1	/
Antenna	2 (for Main Antenna and GNSS Antenna, respectively)	2 (for Main Antenna and GNSS Antenna, respectively)	2 (for Main Antenna and GNSS Antenna, respectively)
Enhanced Features			
QuecOpen <sup>®</sup>	Simplifies the Development of Embedded Applications	Simplifies the Development of Embedded Applications	Simplifies the Development of Embedded Applications (BG772A-GL)
iSIM	/	/	•(BG773A-GL)
DFOTA	•	•	•
GNSS/RIL Driver	Android 4.x/5.x/6.x/7.x/8.x/9.x/10.x/11.x/12.x	Android 4.x/5.x/6.x/7.x/8.x/9.x/10.x/11.x/12.x	/
USB Serial Driver	Windows 7/8/8.1/10/11, Linux 2.6-5.15, Android 4.x/5.x/6.x/7.x/8.x/9.x/10.x/11.x/12.x	Windows 7/8/9/10/11, Linux 2.6-5.15, Android 4.x/5.x/6.x/7.x/8.x/9.x/10.x/11.x/12.x	/
SIM Detection	•	•	•
GNSS	Optional	Optional	GPS, GLONASS
RAI	/	/	/
Firmware Update	via USB Interface	via USB Interface	via UART/USB*/DFOTA
Electrical Features			
Supply Voltage Range	3.3V-4.3V, typ. 3.8V	2.6V-4.8V, typ. 3.3V <sup>2</sup>	VBAT_BB: 2.2-4.35 V, typ. 3.3 V VBAT_RF: 3.1-4.2 V, typ. 3.3 V
Power Consumption	4.0µA@PSM	3.44µA@PSM	1.4µA@PSM (BG770A-GL/BG772A-GL); TBD (BG773A-GL)
Max Output Power	Power Class 5 21dBm @ LTE Bands	Power Class 5 21dBm @ LTE Bands	Power Class 3 23dBm @ LTE Bands
Certifications <sup>3</sup>	Vodafone/Deutsche Telekom/Telefónica*/Verizon*/AT&T*/T-Mobile/CCC*/GCF/CE/FCC/RCM/PTCRB/IC/RoHS/Anatel/UKCA	China Telecom*/China Mobile*/China Unicom*/Vodafone/Deutsche Telekom/Verizon/AT&T*/T-Mobile/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/KT/LGU+NTT DOCOMO*/KDDI*/Telstra*/ICASA/Softbank*/T-Mobile*
Recommended Applications	Gas Detectors, Soil PH Testers, Optical Sensors, Machinery Alarm Systems, Irrigation Controllers, Elevators, Asset Tracking Electronics, Person/ Pet Tracking, Water/ Gas Metering, Smart Parking Systems, Fire Hydrants, Smoke Alarms, Smart Bins, Street Lighting		






Note 1: For Voice Call only.

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

Note 3: May depend on modules' variant.

\* Under development


# LPWA Module Family

Product	BC660K-GL	BC65	BC92	BC95-GV	BC68-GV
					
Form Factor	LCC	LCC	LCC	LCC	LCC
Dimensions (mm)	15.8 × 17.7 × 2.0	15.8 × 17.7 × 2.2	19.9 × 23.6 × 2.2	19.9 × 23.6 × 2.2	15.8 × 17.7 × 2.0
RAT	LTE Cat NB2	LTE Cat NB2	LTE Cat NB2/GSM	LTE Cat NB2	LTE Cat NB2
Frequency Bands (MHz)	LTE Cat NB2: B1/2/3/4/5/8/12/13/17/18/19/20/ 25/28/66/70/85	LTE Cat NB2: B1*/3/5/8/20/28	LTE Cat NB2: B3/5/8/20/28; 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	1.0±0.2	1.2±0.2	1.8±0.1	1.5±0.2	1.0±0.2
Operating Temperature	-35°C ~ +75°C	-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
Data Transmission					
LTE Cat NB1 data rate (Kbps)	Single-tone: 25.5 (DL) / 16.7 (UL) Multi-tone: 127 (DL) / 158.5 (UL)	Single-Tone: 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)	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/PING/LwM2M/SNTP/MQTT/ MQTTS/SSL/TLS	UDP/TCP/SNTP/MQTT/CoAP/PPP/TLS/ DTLS/CoAPS/HTTP/HTTPS	UDP/TCP/SNTP/PPP/MQTT/CoAP/HTTP/ HTTPS/FTP/CoAPS	IPv4/IPv6/UDP/TCP/Non-IP/CoAP/ LwM2M/DTLS/MQTT/HTTP*/DNS/TLS*/ MQTTS*	IPv4/IPv6/UDP/TCP/Non-IP/CoAP/ LwM2M/DTLS/MQTT/HTTP*/DNS/TLS*/ MQTTS*
Interfaces					
(U)SIM	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	UART × 2 (for QuecOpen <sup>®</sup> version, × 3)	× 3 (MAIN, DEBUG, AUX)	× 2 (MAIN, DEBUG)	× 2 (QuecOpen <sup>®</sup> Version: × 3)	× 2 (QuecOpen <sup>®</sup> Version: × 3)
I2C	× 1 (QuecOpen Version only)	/	/	Max. × 4 (QuecOpen <sup>®</sup> Version Only)	Max. × 3 (QuecOpen <sup>®</sup> Version Only)
ADC	ADC × 1 (for QuecOpen <sup>®</sup> version, × 2)	× 1	× 1	× 2 (QuecOpen <sup>®</sup> Version: × 4)	× 2 (QuecOpen <sup>®</sup> Version: × 3)
GPIO	GPIO × 4 (for QuecOpen <sup>®</sup> version, × 13)	/	/	Config (QuecOpen <sup>®</sup> Version Only)	Config (QuecOpen <sup>®</sup> Version Only)
RESET(RESET_N)	× 1	× 1	× 1	× 1	× 1
SPI	SPI × 1 (for QuecOpen <sup>®</sup> version only)	/	/	× 2 (QuecOpen <sup>®</sup> Version Only)	× 2 (QuecOpen <sup>®</sup> Version Only)
PWM	× 1 (QuecOpen Version Only)	/	/	× 2 (QuecOpen <sup>®</sup> Version Only)	× 2 (QuecOpen <sup>®</sup> Version Only)
RI	× 1	× 1	× 1	× 1	× 1
PSM_EINT	PSM_ENIT × 1 (for QuecOpen <sup>®</sup> version, × 2)	× 1	× 1	/	/
I2S	/	/	/	/	/
NETLIGHT	× 1	/	/	× 1	× 1
WAKEUP_OUT	/	/	/	× 1	× 1
Antenna	Primary	Primary	Primary	Pads for primary and BLE	Pads for primary and BLE
Enhanced Features					
QuecOpen <sup>®</sup>	•	/	/	•	•
DFOTA	•	•	•	•	•
BLE 5.0	/	/	/	•	•
Firmware Update	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
eSIM*	Optional	Optional	Optional	Optional	Optional
Electrical Features					
Supply Voltage Range	2.2–4.3 V, typ. 3.3 V	3.2V–4.2V, typ. 3.8V	3.4V–4.2V, typ. 3.8V	2.1–4.2 V, typ. 3.0/3.6 V	2.1–4.2 V, typ. 3.0/3.6 V
Power Consumption	800 nA @ PSM	4µA @PSM	4µA @PSM	2 µA <sup>1</sup> @ PSM 0.15 mA @ Idle Mode, DRX = 2.56 s, ECL0 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 <sup>1</sup> @ PSM 0.15 mA @ Idle Mode, DRX = 2.56 s, ECL0 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 <sup>2</sup>	CE/RCM/FCC/IC/PTCRB/GCF/AT&T/ Verzion/Deutsche Telekom/ Vodafone/KC/LGU+/KT/ICASA/Anatel/ Telefonica*/NBTC/IMDA/T-Mobile/ Orange*/Telstra*	CE/RCM/GCF/Deutsche Telekom/ Vodafone/Telefónica	CE/RCM/GCF/Vodafone/MTN/ICASA/ Vodacom/Anatel/FAC/Deutsche Telekom	CE/GCF/RCM/NCC/KC/NBTC*/ATEX*/ IMDA*/Anatel*/FAC*/LGU/KT*/ Vodafone*/TIM*/Telstra*/Deutsche Telekom*/Telefónica*/Spark*	CE/GCF/RCM/NCC/ATEX*/IMDA*/ Anatel*/FAC*/Vodafone*/TIM*/ Deutsche Telekom*/Telstra*/ Telefónica*/Altice-MEO*
Recommended Applications	Gas Detectors, Soil PH Testers, Optical Sensors, Machinery Alarm Systems, Parking Systems, Fire Hydrants, Smoke Alarms, Smart Bins, Street Lighting		Irrigation Controllers, Elevators, Asset Tracking, Electronics, Person/Pet Tracking, Water/Gas Metering, Smart		

Note 1: Reference data provided by baseband chip platform.  
Note 2: May depend on modules' variant.


\* 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, typ. 3.8V VBAT_RF: 4.75V~5.25V, typ. 5.0V
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)	AG215S-CN/ -GL: 33.0 × 33.5 × 3.25 ; AG215S-GLR: 35.0 × 33.5 × 3.25
Weight (approx.) g	7.07
Operating Temperature	-40 °C ~ +85 °C
Application Processor Module	Based on Automotive Grade Application Processor for C-V2X and Telematics
Interfaces	
SDIO	•
PCIe	PCIe Gen2*
USB	USB 3.0*1 and USB2.0*1
RGMI	RGMI up to 1 Gbps
UART	•
SPI	•
I2C	•
1PPS (Input),	•
ADC	•
Enhanced Features	
Powerful Cores	64-bit ARM Cortex-A53 Microprocessor Cores, 1.4 GHz Dual-Core Processor (Quad-Core Processor Optional), Optimized communication performance with Quectel AG520R/ AG550Q/AG553Q, Dedicated AP for ITS stack and applications
Embedded ECDSA Hardware Engine	Supports NIST p-384, NIST p-256, Brainpool p-384, Brainpool p-256, SM2 256 bit Curves
Scalable ECDSA Capability	Up to 2500TPS through embedded engine and CPU (based on NIST p-256 and SM2)
Hardware Crypto Engine Embedded(Optional)	Secret key generation and storage, digital signature and verification, Up to 2000TPS ECDSA capability (based on NIST p-256 and SM2)

\* Under development

Product	AG35	
		
Form Factor	LGA	
Dimensions (mm)	37.5 × 33.0 × 3.0	
4G	LTE Cat 4	
Frequency Bands (MHz)	-E (EMEA/Korea/Australia/India/Southeast Asia)	LTE-FDD: B1/3/5/7/8/20/28; LTE-TDD: B38/40; WCDMA: B1/5/8; GSM: B3/8
	-CE (China/India)	LTE-FDD: B1/3/5/8; LTE-TDD: B34/38/39/40/41; WCDMA: B1/8; TD-SCDMA: B34/39; CDMA2000 1X/EVDO(Optional); BC0; GSM: B3/8
	-NA (North America)	LTE-FDD: B2/4/5/7/12(B17)/13; WCDMA: B2/4/5; GSM: B2/5
	-J (Japan)	LTE-FDD: B1/3/5/8/9/19/21/28; LTE-TDD: B41; WCDMA: B1/3/5/6/8/19
	-LA (Latin America)	LTE-FDD: B1/2/3/4/5/7/8/28; WCDMA: B1/2/3/4/5/8; GSM: B2/3/5/8
Weight (approx.) g	8.1	
Operating Temperature	-40°C ~ +85°C	
<b>Data Transmission</b>		
LTE data rate (Mbps)	LTE-FDD: Max. 150 (DL)/ Max. 50 (UL) ; LTE-TDD: Max. 130 (DL)/ Max. 30 (UL)	
DC-HSPA+ data rate (Mbps)	Max. 42 (DL)/ Max. 5.76 (UL)	
WCDMA data rate (Kbps)	Max. 384 (DL)/ Max. 384 (UL)	
TD-SCDMA data rate (Mbps)	Max. 4.2 (DL)/ Max. 2.2 (UL)	
EDGE data rate (Kbps)	Max. 296 (DL)/ Max. 236.8 (UL)	
GPRS data rate (Kbps)	Max. 107 (DL)/ Max. 85.6 (UL)	
SMS	Point-to-point MO/MT, SMS Cell Broadcast, Text and PDU Mode	
Protocols	TCP/UDP/PPP/PING/FTP(S)/HTTP(S)/SMTP/SSL/TLS/MMS/NTP/FILE/QMI	
<b>Interfaces</b>		
(U)SIM	× 1 (Support 1.8V/ 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	
<b>Enhanced Features</b>		
QuecOpen™ (Open Linux)	•	
eCall	•	
Era Glonass	•	
Multi-APN	•	
Temperature Management	•	
DFOTA	•	
Voice over USB (USB Audio)	•	
QDR	Optional	
PPE (RTK)	Optional (Support only in China)	
GNSS	GPS/GLONASS/Beidou/Galileo/QZSS	
<b>Advanced Security Feature</b>		
TrustZone	•	
Secure Boot	•	
Code/User Data Backup	•	
<b>Software Features</b>		
RIL Driver/ GNSS Driver	Android 4.x~9.x	
RNDIS Driver	Windows 7/8/8.1/10, Linux 2.6~5.4	
ECM Driver/ GobiNet Driver	Linux 2.6~5.4	
QMI_WWAN Driver	Linux 3.4~5.4	
USB Serial Driver	Windows 7/8/8.1/10, Linux 2.6~5.4, Android 4.x~9.x	
<b>Electrical Features</b>		
Supply Voltage Range	3.3V~4.3V, typ. 3.8V	
Power Consumption	20µA @Power off/ 1.9mA @LTE Sleep, PF=128/ 1.6mA @LTE Sleep, PF=256/ 22mA @Idle, Typ.	
Certifications <sup>1</sup>	CCC/SRRC/NAL/GCF/CE/FCG/KC/RCM/Anatel/KT/STK*LGU+*/PTCRB/IC/AT&T/ Rogers/T-Mobile/Verizon/JATE/TELEC/NTT DOCOMO	
Recommended Applications	Automotive	

Note 1: May depend on modules' variant.

\* Under development

# Automotive LTE-A Module Family

Product	AG52xR (x=0, 1, 5, 9)	
		
Form Factor	LGA	
Dimensions (mm)	42.0 x 38.0 x 2.65	
4.5G	-CN Cat 6; -EU/NA/JP Cat 12, Cat 16, Cat 9, Cat 6 as option	
Frequency Bands (MHz)	-CN(China)	LTE: B1/3/5/7/8/34/38/39/40/41; UMTS: B1/8; CDMA(Optional): B00; GSM: 1800MHz/900MHz
	-EU(EMEA/ Korea/ Brazil/ India/ Australia)	LTE: B1/3/5/7/8/20/28/32(DL)/38/40/41; UMTS: B1/3/5/8; GSM: 1800MHz/900MHz
	-NA(North America)	LTE-FDD: B2/4/5/7/12/13/14/25/26/29/30 <sup>1</sup> /66/71
	-JP(Japan)	LTE-FDD: B1/3/5/8/9/11/18/19/21/28; LTE-TDD: B41; WCDMA: B1/3/5/8/9/19
	-GL(Global)	LTE-FDD: B1/2/3/4/5/7/8/9/11/12/13/18/19/20/21/25/26/28/29 <sup>1</sup> /30 <sup>1,2</sup> /32 <sup>2</sup> /66/71; LTE-TDD: B34/38/39/40/41; WCDMA: B1/2/3/4/5/6/8/19; GSM: 850/900/1800/1900MHz
Weight (approx.) g	9.23	
Operating Temperature	-40°C ~ +85°C (eCall: +95°C)	
Data Transmission		
LTE data rate (Mbps)	AG521R series/AG525R series: LTE Cat 12: LTE-FDD: Max. 600 (DL)/150 (UL), LTE-TDD: Max. 410 (DL)/90 (UL) LTE Cat 6: LTE-FDD: Max. 300 (DL)/50 (UL), LTE-TDD: Max. 226 (DL)/28 (UL) AG520R series: LTE Cat 12: LTE-FDD: Max. 600 (DL)/75 (UL), LTE-TDD: Max. 410 (DL)/45 (UL) LTE Cat 6: LTE-FDD: Max. 300 (DL)/50 (UL), LTE-TDD: Max. 226 (DL)/28 (UL)	
DC-HSPA+ data rate (Mbps)	Max. 42 (DL)/Max. 5.76 (UL)	
WCDMA data rate (Kbps)	Max. 384 (DL)/Max. 384 (UL)	
TD-SCDMA data rate (Mbps)	/	
EDGE data rate (Kbps)	Max. 296 (DL)/Max. 236.8 (UL)	
GPRS data rate (Kbps)	Max. 107 (DL)/Max. 85.6 (UL)	
C-V2X data rate (Mbps)	Max. 30 (Tx)/Max. 30(Rx)	
SMS	Point-to-point MO and MT, SMS Cell Broadcast, Text and PDU Mode	
Protocols	TCP/UDP/PPP/PING/FTP(S)/HTTP(S)/SMTP/SSL/TLS/MMS/NTP/DTMF*/FILE/QMI	
Interfaces		
(U)SIM	/	
USIM	× 1 (default), × 2 (optional)	
UART	3 × UARTs	
USB	× 1	
SDIO	× 1 (eMMC)	
SPI	× 1	
I2S/PCM	× 1 I2S, × 1 PCM	
I2C	× 1	
RGMII	× 1	
ADC	× 2	
PCIe	× 1	
GPIO	× 8 (Only Open)	
JTAG/QDSS	Yes	
RESET	Yes	
Antenna	5 (2 × 2 MIMO), Reserve for 7 antennas(4 × 4 MIMO) as option	
Enhanced Features		
QuecOpen™ (Open Linux)	•	
PCIe for WLAN Function	•	
UART/PCM for Bluetooth Function	•	
Gigabit Ethernet	Optional	
eCall	•	
Multi-APN	•	
Temperature Management	•	
DFOTA	•	
eSIM (eUICC)	Optional	
(U)SIM Detection	•	
QDR	Optional	
PPE (RTK)	Optional	
GNSS	GPS/GLONASS/BeiDou/Galileo/QZSS	
ESD/EMI Protection	Realized through Internal Specific Circuits and Components (Electrostatic Discharge Conforms to ±10KV air discharge and ±6KV of contact discharge)	
C-V2X	Optional	
QDR 3.0 (External IMU Required)	Optional	
Multi-Frequency GNSS (L1/L5)	Optional	
Advanced Security Feature		
TrustZone	TrustZone™/TPM*: •	
Secure Boot	Secure Boot*: •	
SE-Linux	•	
Code/User Data Backup	•	
Software Features		
RNDIS Driver	Windows 7/8/8.1/10, Linux 2.6-5.12	
ECM Driver/ GobiNet Driver	Linux 2.6-5.12	
QMI_WWAN Driver	Linux 3.4-5.12	
USB Serial Driver	Windows 7/8/8.1/10, Linux 2.6-5.12	
Electrical Features		
Supply Voltage Range	VBAT_BB/VBAT_RF: 3.3V-4.3V (typ. 3.8V) , VBAT_C-V2X: 4.75V-5.25V (typ. 5.0V)	
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 <sup>3</sup>	CCC/SRRC/NAL/FCC/IC/PTCRB/GCF/CE/RCM/Verizon/AT&T-Mobile/Telus/KT/NTT DOCOMO/Telstra/UKCA/IFETEL/KC/NCC/JATE/TELEC	
Recommended Applications	Automotive	

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

\* Under development



# Automotive LTE-A Module Family

<b>Product</b>	<b>AG519M</b>	
		
Form Factor	LGA	
Dimensions (mm)	42.0 × 38.0 × 3.05	
4G	LTE Cat 6	
Frequency Bands (MHz)	-CN (China/India)	LTE-FDD: B1/3/5/8; LTE-TDD: B34/38/39/40/41; WCDMA: B1/8; GSM: 900/1800MHz
	-EU (EMEA/ Korea/ Australia/Southeast Asia/ Brazil)	LTE-FDD: B1/3/5/7/8/20/28; LTE-TDD: B38/41; WCDMA: B1/5/8; GSM: 900/1800MHz
	-NA (North America/ Mexico/Latin America)	LTE-FDD: B2/4/5/7/12/13/17/28/29/30 <sup>1</sup> /66/71; WCDMA: B2/4/5; GSM: 850/1900MHz
	-JP (Japan)	LTE-FDD: B1/3/5/7/8/9/11/19/21/28; LTE-TDD: B41; WCDMA: B1/3/5/8/9/19
Weight (approx.) g	10	
Operating Temperature	-40 °C ~ +85 °C (eCall: +95 °C)	
<b>Data Transmission</b>		
LTE FDD Data Rate (Mbps)	Max. 300 (DL)/ Max. 50 (UL)	
LTE TDD Data Rate (Mbps)	Max. 240 (DL)/ Max. 30 (UL)	
DC-HSDPA/HSUPA Data Rate (Mbps)	Max. 42 (DL)/ Max. 5.76 (UL)	
WCDMA Data Rate (Kbps)	Max. 384 (DL)/ Max. 384 (UL)	
EDGE Data Rate (Kbps)	Max. 236.8 (DL) / Max. 236.8 (UL)	
GPRS Data Rate (Kbps)	Max. 85.6 (DL) / Max. 85.6 (UL)	
SMS	Point-to-point MO and MT; SMS Cell Broadcast; Text and PDU Mode	
Protocols	TCP/UDP/PPP/PING/FTP(S)/HTTP(S)/SMTP/SSL/TLS/MMS/NTP/DTMF*/FILE	
<b>Interfaces</b>		
(U)SIM	× 2	
UART	× 3	
USB 2.0/3.1	× 1	
PCIe/USB 3.0 (PCIe by default)	× 1	
IIC	× 2	
RGMI	× 1	
SDIO	× 1	
SPI	× 3	
ADC	× 3	
GPIO	× 15	
RESET_N	× 1	
Antenna	Main × 1; Diversity × 1; Wi-Fi/BT × 1; GNSS × 1	
<b>Enhanced Features</b>		
QuecOpen® (Open Linux)	•	
eCall	•	
Dual/AB System*	•	
eSIM (eUICC)	•	
(U)SIM Detection	•	
Temperature Management	•	
GNSS	GPS/ GLONASS/ BeiDou/ Galileo	
ESD/EMI Protection	Realized through Internal Specific Circuits and Components (Electrostatic Discharge Conforms to ±12KV air discharge and ±8KV of contact discharge)	
Gigabit Ethernet	Optional	
RTK/ADR	Optional	
Multi-Frequency GNSS (L1/L5)	Optional	
UART Interface for BT Function	Optional	
<b>Advanced Security Feature</b>		
TrustZone/ TPM*	•	
Secure Boot	•	
SE-Linux	•	
<b>Software Features</b>		
RIL Driver	Android 4.x/ 5.x/ 6.x/ 7.x/ 8.x/ 9.x	
GNSS Driver	Android 4.x/ 5.x/ 6.x/ 7.x/ 8.x/ 9.x	
RNDIS	Windows 7/8/8.1/10, Linux 2.6-5.0	
ECM	Linux 2.6-5.0	
Gobinet	Linux 2.6-5.0, Android 4.x/ 5.x/ 6.x/ 7.x/ 8.x/ 9.x	
QMI_WWAN Driver	Linux 3.4-5.0, Android 4.x/5.x/6.x/7.x/8.x/9.x	
USB Serial Driver	Windows 7/8/8.1/10, Linux 2.6-5.0, Android 4.x/5.x/6.x/7.x/8.x/9.x	
<b>Electrical Features</b>		
Supply Voltage Range	VBAT_BB/VBAT_RF: 3.8V-4.3V (typ. 4.0V)	
Power Consumption	TBD @Power off TBD @Sleep, Typ. TBD @Idle	
Certifications <sup>2</sup>	CCC/SRRC/NAL/FCC*/IC*/PTCRB*/GCF*/AT&T*/CE*/KC*/JATE*/TELEC*/RCM*	
Recommended Applications	Automotive	

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

\* Under development

# Automotive 5G Module Family

Product	AG55xQ	
		
Form Factor	LGA	
Dimensions (mm)	53.0 × 54.5 × 3.45	
5G	Sub-6G	
4G	LTE Cat 19	
Frequency Bands (MHz)	-CN (China)	5G-FDD: n1 <sup>1</sup> /3 <sup>1</sup> /28 <sup>1</sup> ; 5G-TDD: n41/78/79; LTE-FDD: B1/3/5/7/8; LTE-TDD: B34/38/39/40/41; WCDMA: B1/8; GSM: 900/1800 MHz; C-V2X: B47 (For AG550Q/AG553Q Series)
	-EU (EMEA/Australia, Korea/India/Southeast Asia/Latin America exl. Mexico)	5G-FDD: n1/3/8/20/28; 5G-TDD: n41/78; LTE-FDD: B1/2/3/4/5/7/8/20/28/32 <sup>2</sup> ; LTE-TDD: B38/40/41/42; WCDMA: B1/3/5/6/8; GSM: 900/1800/850/1900 MHz; C-V2X: B47 (For AG550Q/AG553Q Series)
	-NA (North America/Mexico)	5G-FDD: n2/5/25/66/71; 5G-TDD: n41/48/77/78; LTE-FDD: B2/4/5/7/12/13/14/17/25/26/28/29 <sup>3</sup> /30 <sup>3</sup> /66/71; LTE-TDD: B41/48; WCDMA: B2/4/5; GSM: 1900 MHz; C-V2X: B47 (For AG550Q/AG553Q Series)
	-JP* (Japan)	5G-FDD: n1/3; 5G-TDD: n77/78/79; LTE-FDD: B1/3/5/7/8/9/11/19/21/28; LTE-TDD: B41; WCDMA: B1/3/5/8/9/19; C-V2X: B47 (For AG550Q/AG553Q Series)
Weight (approx.) g	21	
Operating Temperature	-40°C ~ +85°C (eCall: +95°C)	
<b>Data Transmission</b>		
5G SA	Max. 2.0Gbps (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	
<b>Interfaces</b>		
(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 Quec0pen <sup>®</sup> version only)	
RESET_N	× 1 (Reset the module)	
Antenna	Main × 1; Diversity × 1; MIMO 3 × 1; MIMO 4 × 1; C-V2X × 2; GNSS × 1; DSDA × 2	
<b>Enhanced Features</b>		
Quec0pen <sup>®</sup> (Open Linux)	•	
eCall	•	
DFOTA	•	
eSIM (eUICC)	Optional	
(U)SIM Detection	•	
Temperature Management	•	
GNSS	GPS/ GLONASS/ BeiDou/ Galileo /QZSS	
ESD/EMI Protection	Realized through Internal Specific Circuits and Components (Electrostatic Discharge Conforms to ±12KV air discharge and ±8KV of contact discharge)	
Gigabit Ethernet	Optional	
C-V2X TDD B47	Optional	
DSDA (Dual SIM Dual Activation)	Optional	
QDR 3.0 (External IMU Required)	Optional	
RTK/PPE	Optional	
Multi-Frequency GNSS (L1/L5)	Optional	
UART Interface for BT Function	Optional	
<b>Advanced Security Feature</b>		
TrustZone/ TPM*	•	
Secure Boot	•	
SE-Linux	•	
<b>Software Features</b>		
RIL Driver	/	
GNSS Driver	/	
USB ECM Driver	Linux 2.6~5.12	
USB RNDIS Driver	Windows 7/8/8.1/10, Linux 2.6~5.12	
USB GobiNet Driver	Linux 2.6~5.12	
USB QMI_wwan Driver	Linux 3.4~5.12	
USB Serial Driver	Windows 7/8/8.1/10, Linux 2.6~5.12	
<b>Electrical Features</b>		
Supply Voltage Range	VBAT_BB/VBAT_RF: 3.3V~4.3V (typ. 3.8V) ; VBAT_C-V2X: 4.75V~5.25V (typ. 5.0V)	
Power Consumption	0.04mA @Power off; 1.4mA @Sleep(Typ.); 25.0mA @Idle	
Certifications <sup>3</sup>	CCC/SRRC/NAL/FCC*/IC*/PTCRB*/GCF*/AT&T*/CE(AG551Q-EU)/KC*/JATE*/TELEC*/RCM(AG551Q-EU)	
Recommended Applications	Automotive	

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

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

Note 3: May depend on modules' variant.

\* Under development

# Automotive 5G Module Family

Product	AG57xQ	
		
Form Factor	LGA	
Dimensions (mm)	53.0 x 54.5 x 3.45	
5G	Sub-6G	
4G	LTE Cat 15	
Frequency Bands (MHz)	-CN (China)	5G-FDD: n1/3/28A <sup>1</sup> ; 5G-TDD: n41/77/78/79 <sup>2</sup> ; LTE-FDD: B1/3/5/7/8; LTE-TDD: B34/38/39/40/41; WCDMA: B1/8; GSM: 900/1800MHz
	-EU (EMEA/Australia, Korea/India/Southeast Asia/Latin America exl. Mexico)	5G-FDD: n1/3/5 <sup>3</sup> or n71 <sup>2</sup> /8/20/28A; 5G-TDD: n38 <sup>2</sup> /40 <sup>2</sup> /41/78; LTE-FDD: B1/3/5 <sup>3</sup> or B71 <sup>2</sup> /7/8/20/28A/32 <sup>2</sup> ; LTE-TDD: B38/40/41/42 <sup>2</sup> ; WCDMA: B1/3/5 <sup>2</sup> /8; GSM: 900/1800MHz
	-NA (North America/Mexico)	5G-FDD: n2/5/12/25/66/71; 5G-TDD: n41/78; LTE-FDD: B2/4/5/7/12/13/14/17/25/26/29 <sup>3</sup> /30 <sup>3</sup> /66/71; LTE-TDD: N41; WCDMA: B41
	-ROW (Japan, Latin America)	5G-FDD: n1/3/28; 5G-TDD: n41/77/78/79 <sup>2</sup> ; LTE-FDD: B1/2/3/4/5/7/8/9/11 <sup>2</sup> /18/19/21/26/28; WCDMA: B1/3/5/6/7/8/9/19; GSM: 900/1800/850/1900MHz
Weight (approx.) g	TBD	
Operating Temperature	-40 °C ~ +85 °C (eCall: +95 °C)	
<b>Data Transmission</b>		
5G SA	2.0 Gbps (DL)/450 Mbps (UL)	
5G NSA	2.2 Gbps (DL)/550 Mbps (UL)	
LTE FDD Data Rate	800 Mbps (DL)/200 Mbps (UL)	
LTE TDD Data Rate	500 Mbps (DL)/120 Mbps (UL)	
DC-HSDPA/HSUPA Data Rate(Mbps)	42 Mbps/5.76 Mbps	
WCDMA Data Rate (Kbps)	384 kbps (DL)/384 kbps (UL)	
EDGE Data Rate (Kbps)	296 kbps (DL)/236.8 kbps (UL)	
GPRS Data Rate (Kbps)	107 kbps (DL)/85.6 kbps (UL)	
C-V2X Data Rate (Mbps)	48 Mbps (Tx)/48 Mbps (Rx)	
SMS	Point-to-point MO and MT, SMS Cell Broadcast, Text and PDU Mode	
Protocols	TCP/UDP/PPP/PING/FTP(S)/HTTP(S)/SMTP/SSL/TLS/MMS/NTP/FILE/QMI	
<b>Interfaces</b>		
(U)SIM	x2	
UART	x3 (Main/Debug/BT UART)	
USB 2.0/3.1	x1	
PCIe 3.0	x1	
IIC	x1	
IIS	x1	
RGMII	x1	
SDIO	x1 (for eMMC/SD)	
SPI	x2	
Audio Digital (PCM)	x1	
ADC	x2 (15-bit)	
GPIO	x15 (For QuecOpen® version only)	
RESET_N	x1 (Reset the module)	
Antenna	Main x 1; Diversity x 1; MIMO 3 x 1; MIMO 4 x 1; C-V2X x 2; GNSS x 1; DSDA x 2	
<b>Enhanced Features</b>		
QuecOpen <sup>®</sup> (Open Linux)	•	
eCall	•	
DFOTA	•	
eSIM (eUICC)	Optional	
(U)SIM Detection	•	
Temperature Management	•	
GNSS	GPS/GLONASS/BeiDou/Galileo/QZSS	
ESD/EMI Protection	Realized through Internal Specific Circuits and Components	
Gigabit Ethernet	Optional	
C-V2X TDD B47	Optional	
DSDA (Dual SIM Dual Activation)	Optional	
QDR 3.0 (External IMU Required)	Optional	
RTK/PPE	Optional	
Multi-Frequency GNSS (L1/L5)	Optional	
UART Interface for BT Function	Optional	
<b>Advanced Security Feature</b>		
TrustZone/ TPM*	•	
Secure Boot	•	
SE-Linux	•	
<b>Software Features</b>		
RIL Driver	Android 4.x/ 5.x/ 6.x/ 7.x/ 8.x/ 9.x	
GNSS Driver	Android 4.x/ 5.x/ 6.x/ 7.x/ 8.x/ 9.x	
USB ECM Driver	Linux 2.6-5.0	
USB RNDIS Driver	Windows 7/8/8.1/10, Linux 2.6-5.0	
USB GobiNet Driver	Linux 2.6-5.0, Android 4.x/ 5.x/ 6.x/ 7.x/ 8.x/ 9.x	
USB QMI_WWAN Driver	Linux 3.4-5.0, Android 4.x/5.x/6.x/7.x/8.x/9.x	
USB Serial Driver	Windows 7/8/8.1/10, Linux 2.6-5.0, Android 4.x/5.x/6.x/7.x/8.x/9.x	
<b>Electrical Features</b>		
Supply Voltage Range	VBAT_BB/VBAT_RF: 3.3V-4.3V (typ. 3.8V) VBAT_C-V2X: 4.75V-5.25V (typ. 5.0V)	
Power Consumption	TBD @Power off, TBD @Sleep, Typ., TBD @Idle	
Certifications <sup>4</sup>	CCC*/SRRC*/NAL*/FCC*/IC*/PTCRB*/GCF*/AT&T*/CE*/KC*/JATE*/TELEC*/RCM*	
Recommended Applications	Automotive	

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



Note 2: Optional.

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

Note 4: May depend on modules' variant.

\* Under development









# Automotive 5G Module Family

Product	AG568N	AG569N	
			
Form Factor	LGA	LGA	
Dimensions (mm)	46.9 × 45.0 × 3.25	53.0 × 54.5 × 3.65	
5G	Sub-6G	Sub-6G	
4G	LTE Cat 18	LTE Cat 18	
Frequency Bands (MHz)	-CN (China)	5G-FDD: n1/3/28A <sup>1</sup> ; 5G-TDD: n41/78; LTE-FDD: B1/3/5/7/8; LTE-TDD: B34/38/39/40/41; WCDMA: B1/8; GSM: 900/1800MHz	5G-FDD: n1/3/28A <sup>1</sup> ; 5G-TDD: n41/78; LTE-FDD: B1/3/5/7/8; LTE-TDD: B34/38/39/40/41; WCDMA: B1/8; GSM: 900/1800MHz
	-EU (EMEA/ Korea/ Australia/ India/ Southeast Asia)	5G-FDD: n1/3/7/8/20/28; 5G-TDD: n77/78; LTE-FDD: B1/3/5/7/8/20/28/32 <sup>2</sup> ; LTE-TDD: B38/40; WCDMA: B1/3/5/8; GSM: 900/1800MHz	5G-FDD: n1/3/7/8/20/28; 5G-TDD: n77/78; LTE-FDD: B1/3/5/7/8/20/28/32 <sup>2</sup> ; LTE-TDD: B38/40; WCDMA: B1/3/5/8; GSM: 900/1800MHz
	-NA (North America)	5G-FDD: n2/5/12/25/66/71; 5G-TDD: n41/78; LTE-FDD: B2/4/5/7/12/13/14/17/25/26/29 <sup>2</sup> /30 <sup>2</sup> /66/71; LTE-TDD: B38/41/48; WCDMA: B2/4/5	5G-FDD: n2/5/12/25/66/71; 5G-TDD: n41/78; LTE-FDD: B2/4/5/7/12/13/14/17/25/26/29 <sup>2</sup> /30 <sup>2</sup> /66/71; LTE-TDD: B38/41/48; WCDMA: B2/4/5
	-ROW (Japan/ Latin America/ Brazil/ Mexico/...)	5G-FDD: n1/3/20/28; 5G-TDD: n41/77/78/79; LTE-FDD: B1/3/4/5/7/8/9/11 <sup>3</sup> /18/19/20/21/26/28; LTE-TDD: B38/40/41; WCDMA: B1/3/5/6/8/9/19; GSM: 900/1800/850/1900 MHz	5G-FDD: n1/3/20/28; 5G-TDD: n41/77/78/79; LTE-FDD: B1/3/4/5/7/8/9/11 <sup>3</sup> /18/19/20/21/26/28; LTE-TDD: B38/40/41; WCDMA: B1/3/5/6/8/9/19; GSM: 900/1800/850/1900 MHz
	Weight (approx.) g	16	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	
RGMI	× 1	× 1	
SGMI	× 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			
QuecOpen® (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 (typ. 3.8V)	VBAT_BB/VBAT_RF: 3.3V~4.3V (typ. 3.8V) VBAT_C-V2X: 4.75V~5.25V (typ. 5.0V)	
Power Consumption	TBD @Power off TBD @Sleep, Typ. TBD @Idle	TBD @Power off TBD @Sleep, Typ. TBD @Idle	
Certifications <sup>4</sup>	CCC/RRRC/NAL/FCC*/IC*/PTCRB*/GCF*/AT&T*/CE*/KC*/JATE*/TELEC*/RCM*	CCC/RRRC/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.  
 Note 4: May depend on modules' variant.

\* Under development







# Wi-Fi & BT Module Family

Automotive Wi-Fi & BT Modules								
Product	AF20	AF50T	AF51Y	AF56C*	AH20C*	AF31G	AF66T	AF68E*
								
Band	2.4/5	2.4/5	2.4/5	2.4/5	2.4	/	/	2.4/5/6
MIMO	/	2 × 2 + 2 × 2, Dual MAC, support DBS	2 × 2 + 1 × 1, Dual MAC	2 × 2	/	/	/	2 × 2 + 2 × 2, Dual MAC, support BDS
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	/	IEEE 802.11 a/b/g/n/ac	IEEE 802.11 a/b/g/n/ac/ax	IEEE 802.11a/b/g/n/ac/ax
BT Standard	BT 5.0	BT 5.2	BT 5.2	BT 5.2	BT 5.2	/	/	BT 5.2
Form Factor	LGA	LGA	LGA	LGA	LGA	LGA	LGA	LGA
Dimensions (mm)	15.2 × 17.2 × 2.26	21.5 × 19.5 × 2.3	21.5 × 19.5 × 2.5	23.5 × 21.5 × 2.85	13.0 × 13.0 × 2.45	23.0 × 23.0 × 3.0	23.0 × 23.0 × 3.0	23.0 × 23.0 × 3.0
Operating Temperature	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C
Weight (approx.) g	1.26	2.1	2.32	3.11	0.71	3.11	3.36	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	Wi-Fi 2.4 GHz/5 GHz	Wi-Fi 2.4 GHz/5 GHz	Wi-Fi 2.4GHz + 5GHz + 6GHz & BT 5.2
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	CCK/DSSS/OFDM/BPSK/QPSK/QAM	Wi-Fi: DSSS, CCK, OFDM, OFDMA, BPSK, QPSK, QAM, BT: GFSK, π/4 DQPSK, 8DPSK	CCK/BPSK/QPSK/16QAM/64QAM/256QAM/1024QAM/4096QAM
Encryption Mode	WEP/TKIP/AES/WPA-PSK/WPA2-PSK	WPA3	WPA3	WPA3	/	WPA 3	WPA 3	WPA 3
AP (Max Access Point)	16	32	32	16	/	10	32	32
Operator Mode	AP/STA	AP/STA	AP/STA	AP/STA	/	AP/STA	AP/STA	AP/STA
I/O Interfaces								
PCIe	/	1 (PCIe 2.0)	1 (PCIe 2.0)	PCIe Gen3	/	1	1	PCIe Gen3
SDIO	1 (SDIO 3.0)	/	/	1 (optional)	/	/	/	/
UART	1	1	1	1	1	1	1	1
PCM	1	1	1	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	2×Wi-Fi Ant with shared BT Ant, independent ant is optional	2×Wi-Fi Ant with shared BT Ant, independent ant is optional	2×Wi-Fi Ant with shared BT Ant, independent ant is optional
Electrical Characteristics								
Supply Voltage Range	Core Supply Voltage : 3.3V; 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	VDD_RF: 3.14~3.46 V, typ. 3.3 V VDD_IO: 1.71~1.89 V, typ. 1.8 V	VDD_RF: 3.3~4.25 V, typ. 3.85 V VDD_CORE: 1.90 V, 1.35 V, 0.95 V VDD_IO: 1.71~1.89 V, typ. 1.8 V	VDD_PA_A: 3.3 V VDD_PA_B: 1.8 V VDD_CORE: 1.90 V, 1.35 V, 0.95 V
Power Consumption	TBD	TBD	TBD	TBD	TBD	/	/	TBD
Data Transmission								
802.11a	Max. 54Mbps	Max. 54Mbps	Max. 54Mbps	Max. 54Mbps	/	Max. 54 Mbps	Max. 54 Mbps	Max. 54Mbps
802.11b	Max. 11Mbps	Max. 11Mbps	Max. 11Mbps	Max. 11Mbps	/	Max. 11 Mbps	Max. 11 Mbps	Max. 11Mbps
802.11g	Max. 54Mbps	Max. 54Mbps	Max. 54Mbps	Max. 54Mbps	/	Max. 54 Mbps	Max. 54 Mbps	Max. 54Mbps
802.11n	Max. 135Mbps	Max. 600Mbps	Max. 300Mbps	Max. 600Mbps	/	Max. 300 Mbps	Max. 300 Mbps	Max. 600Mbps
802.11ac	Max. 433Mbps	Max. 866Mbps	Max. 866Mbps	Max. 866Mbps	/	Max. 866 Mbps	Max. 866 Mbps	/
802.11ax	/	Max. 1774.5Mbps	/	Max. 1.2Gbps	/	/	2G Max. 573.5 Mbps, 5G Max. 120 Mbps	Max. 3.6Gbps
BLE	Max. 1Mbps	Max. 2Mbps	Max. 2Mbps	Max. 2Mbps	Max. 2Mbps	TBD	Max. 2 Mbps	Max. 2Mbps
Recommended Applications	Automotive	Automotive	Automotive	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 AG55x0 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	FC909A	FC20	FC21	FC80A	FC905A*
						
Band	2.4GHz	2.4GHz	2.4GHz+5GHz	2.4GHz+5GHz	2.4GHz+5GHz	2.4GHz+5GHz
MIMO	1 × 1	1 × 1	1 × 1	1 × 1	2 × 2 or 1 × 1 + 1 × 1 in RSDB (Real Simultaneous Dual Band) mode	1 × 1
WLAN Standard	IEEE 802.11b/g/n	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	IEEE 802.11a/b/g/n/ac
BT Standard	/	BT 5.2	BT 5.0	BT 5.0	BT 5.1	BT 5.0
Form Factor	LCC	LCC	LCC	LCC	LCC	LCC
Dimensions (mm)	12.0 × 12.0 × 2.1	12.0 × 12.0 × 1.95	13.0 × 16.6 × 2.05	13.0 × 16.6 × 2.05	13.0 × 15.0 × 2.2	12.0 × 12.0 × 1.75
Operating Temperature	-30°C ~ +85°C	-30°C ~ +75°C	-40°C ~ +85°C	-40°C ~ +85°C	-30°C ~ +75°C	-30°C ~ +75°C
Weight (approx.) g	0.58	0.6	0.81	0.73	0.86	0.6
General Features						
Function	Wi-Fi 2.4GHz	Wi-Fi 2.4GHz & BT 5.2	Wi-Fi 2.4GHz+5GHz & BT 5.0	Wi-Fi 2.4GHz + 5GHz & BT 5.0	Wi-Fi 2.4GHz + 5GHz & BT 5.1	Wi-Fi 2.4GHz+5GHz & BT 5.0
Modulation Mode	BPSK/QPSK/CCK/16QAM/64QAM	DSSS/OFDM/DBPSK/DQPSK/CCK/BPSK/QPSK/16QAM/64QAM	CCK/BPSK/QPSK/16QAM/64QAM/256QAM	BPSK/QPSK/CCK/16QAM/64QAM/256QAM	BPSK/QPSK/CCK/16QAM/64QAM/256QAM	DSSS/CCK/BPSK/QPSK/DBPSK/DQPSK/16QAM/64QAM/256QAM
Encryption Mode	TKIP/AES/WPA-PSK/WPA2-PSK	WPA3	WEP/TKIP/AES/WPA-PSK/WPA2-PSK	WEP/TKIP/AES/WPA-PSK/WPA2-PSK	WPA3	WEP/WPA/WPA2
Operator Mode	AP/STA	AP/ STA	AP/STA	AP/STA	AP/STA	AP/STA
I/O Interfaces						
SDIO	1 (SDIO 3.0)	1 (SDIO 2.0)	1 (SDIO 3.0)	1 (SDIO 3.0)	1 (SDIO 3.0)	1
UART	/	1	1	1	1	1
PCM	/	1	1	1	1	1
Antenna	1 (Wi-Fi Antenna)	1 (Wi-Fi & BT Antenna)	1 (Wi-Fi & BT Antenna)	1 (Wi-Fi & BT Antenna)	2 × Wi-Fi Ant. with shared BT Ant, independent BT ant is optional*	1 (Wi-Fi & BT Antenna)
Electrical Characteristics						
Supply Voltage Range	VBAT: 3.0 ~ 3.6V, typ. 3.3V VDDIO: 1.75 ~ 1.89V, typ. 1.8V	VBAT: 3.0~4.8 V, typ. 3.3 V VDDIO: 1.71~3.63 V, typ. 1.8/3.3 V	VBAT: 3.14 ~ 3.46V, typ. 3.3V VDDIO: 1.71 ~ 3.46V, typ. 1.8V/3.3V	VBAT: 3.14 ~ 3.46V, typ. 3.3V VDDIO: 1.71 ~ 3.46V, typ. 1.8V/3.3V	VBAT: 3.2~4.5 V, typ. 3.3 V VDDIO: 1.7~3.6 V, typ. 1.8/3.3 V	VBAT: 3.13~4.8 V, typ. 3.6 V VDDIO: 1.71~3.63 V, typ. 1.8/3.3 V
Power Consumption	OFF State: 31 µA @ VDD3V3 power supply 1 µA @ VDD, SDIO power supply Idle (no connection): 60 mA @ VDD3V3 power supply 2 mA @ VDD, SDIO power supply	Max. current at Tx mode: 300 mA @ VBAT 0.7 mA @ VIO	OFF State (Wi-Fi is disabled): 2 µA @ 3.3 V WLAN power supply 554 µA @ 1.8 V I/O Pins power supply Idle (Wi-Fi is enabled without any device connected): 66 mA @ 3.3 V WLAN power supply 6.5 mA @ 1.8 V I/O Pins power supply	OFF State (Wi-Fi is disabled): 0 µA @ 3.3 V WLAN power supply 179 µA @ 1.8 V I/O Pins power supply Idle (Wi-Fi is enabled without any device connected): 31 mA @ 3.3 V WLAN power supply 2.8 mA @ 1.8 V I/O Pins power supply	Max. current at Tx mode: 627 mA @ VBAT 0.7 mA @ VIO	Max. current at Tx mode: 380 mA @ VBAT 0.7 mA @ VIO
Data Transmission						
802.11a	/	/	Max. 54Mbps	Max. 54Mbps	Max. 54Mbps	Max. 54Mbps
802.11b	Max. 11Mbps	Max. 11Mbps	Max. 11Mbps	Max. 11Mbps	Max. 11Mbps	Max. 11Mbps
802.11g	Max. 54Mbps	Max. 54Mbps	Max. 54Mbps	Max. 54Mbps	Max. 54Mbps	Max. 54Mbps
802.11n	Max. 150Mbps	Max. 72Mbps	Max. 150Mbps	Max. 150Mbps	Max. 300Mbps	Max. 72Mbps
802.11ac	/	/	Max. 433Mbps	Max. 433Mbps	Max. 866Mbps	Max. 433Mbps
802.11ax	/	/	/	/	/	/
Recommended Applications	Telematics, Smart Metering, Mobile POS Terminals, Gateways, Safety, Tracking and Tracing, Remote Maintenance and Control, Networking, Mobile Computing, Healthcare, etc.	OTT, Smart Speaker, Projector, POS, IPC	Telematics, Smart Metering, Mobile POS Terminals, Gateways, Safety, Tracking and Tracing, Remote Maintenance and Control, Networking, Mobile Computing, Healthcare, etc.		Smart Home, Industrial Controls	can meet various needs of commercial and industrial applications, such as POS machine and speaker box

FC30R can work with Quectel EC20 R2.1/EC21/EC25/EC200A 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)		Non-Automotive Wi-Fi & BT Modules (Wi-Fi 6E)	Standalone Wi-Fi & BT Modules
Product	FG50V	FC62E*/FC64E*	FC65E*/FC66E*	FC41D
				
Band	2.4GHz + 5GHz	2.4GHz + 5GHz	2.4GHz + 5GHz + 6GHz	2.4GHz
MIMO	2 × 2 (support DBS)	2 × 2 (FC64E support DBS, FC62E not support DBS)	2 × 2 (FC66E support DBS, FC65E not support DBS)	/
WLAN Standard	IEEE 802.11a/b/g/n/ac/ax	IEEE 802.11a/b/g/n/ac/ax	IEEE 802.11a/b/g/n/ac/ax	802.11b/g/n
BT Standard	BT 5.2	BT 5.2	BT 5.2	BT 5.2
Form Factor	LGA	LCC	LCC	LCC
Dimensions (mm)	21.5 × 19.5 × 2.1	19.9 × 18.0 × 2.1	19.9 × 18.0 × 2.1	18.0 × 20.0 × 2.6
Operating Temperature	-30°C ~ +85°C	-30°C ~ +75°C	-30°C ~ +75°C	-40°C ~ +85°C
Weight (approx.) g	2.3	1.63	1.63	1.05
General Features				
Function	Wi-Fi 2.4GHz + 5GHz & BT 5.2	Wi-Fi 2.4GHz + 5GHz & BT 5.2	Wi-Fi 2.4GHz + 5GHz + 6GHz & BT 5.2	Wi-Fi 2.4G+BT 5.2
Modulation Mode	BPSK/QPSK/CCK/16QAM/64QAM/256QAM/1024QAM	DBPSK/DQPSK/CCK/BPSK/QPSK/QAM	DBPSK/DQPSK/CCK/BPSK/QPSK/QAM	BPSK/QPSK/CCK/16QAM/64QAM
Encryption Mode	WPA3	WPA3	WPA3	WPA3
AP (Max Access Point)	/	32	32	TBD
Operator Mode	AP/STA	AP/STA	AP/STA	AP/STA
I/O Interfaces				
PCIe	1 (PCIe 3.0)	1 (PCIe 3.0)	1 (PCIe 3.0)	/
UART	1	1	1	2
PCM	1	1	1	/
Antenna	2 × Wi-Fi Ant with shared BT Ant, independent BT ant is optional	2 × Wi-Fi Ant with shared BT Ant, independent BT ant is optional	2 × Wi-Fi Ant with shared BT Ant, independent BT ant is optional	× 1 (Built-out Pin antenna, IPEX antenna, PCB antenna)
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;	Core Supply Voltage: 0.95, 1.35, 1.95, 1.8, 2.2, 3.3(Optional) I/O Supply Voltage: 1.8V;	Power Supply Voltage: 3.3V
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	TBD	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. 600 Mbps	Max. 600 Mbps	Max. 600 Mbps	Max. 72Mbps
802.11ac	Max. 866Mbps	Max. 866 Mbps	Max. 1732 Mbps	/
802.11ax	Max. 1774.5Mbps	Max. 1174.5 Mbps	Max. 2400 Mbps	/
BLE	/	Max. 2Mbps	Max. 2Mbps	Max. 1Mbps
Recommended Applications	CPE, MIFI, OTT, Smart TV		CPE, MIFI, OTT, Smart TV	Smart Home, Industrial Controls

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

\* Under development






# UMTS/HSPA(+) Module Family

Product	UC200A-GL
	
Form Factor	LCC
Dimensions (mm)	32.0 × 29.0 × 2.4
3G	UMTS/HSPA+
Frequency Bands (MHz)	UMTS: B1/2/5/8; GSM: 850/900/1800/1900MHz
Region	Global
Weight (approx.) g	4.3
Operating Temperature	-35°C ~ +75°C
Extended Temperature	-40°C ~ +85°C
Data Transmission	
HSPA data rate (Mbps)	Max. 21 (DL)/ Max. 5.76 (UL)
UMTS data rate (Kbps)	Max. 384 (DL/UL)
GPRS data rate (Kbps)	Max. 85.6 (DL/UL)
EDGE data rate (Kbps)	Max. 236.8 (DL/UL)
SMS	•
CSD	•
Protocols	TCP/UDP/PPP/NTP/NITZ/FTP/HTTP/PING/CMUX/HTTPS/FTPS/SSL/FILE/MQTT/MMS/SMTP/SMTPS
Interfaces	
SIM	1.8V/ 3V
UART	2
USB	2.0 Hi-Speed
Audio Digital (PCM)	•
RTC Backup	•
ADC	× 2, 12bits
Antenna	Pads for Primary
Enhanced Features	
DTMF	•
QuecFOTA®	•
DFOTA	•
RIL Driver	Android 4.x~12.x
USB Serial Driver	Windows 7/8/8.1/10/11, Linux 2.6~5.15, Android 4.x~12.x
SIM Detection	•
Firmware Update	via USB/ DFOTA
Electrical Features	
Supply Voltage Range	3.4V~4.5V, typ. 3.8V
Power Consumption	17 μA @ Power Off 1 mA @ Sleep
Certifications	CE/FCC/Anatel/ RCM
Recommended Applications	Telematics, Smart Metering, Mobile POS Terminals, Gateways, Safety, Tracking and Tracing, Remote Maintenance and Control, Networking, Mobile Computing, Healthcare, etc.

\* Under development









# GSM/GPRS Module Family

Product	M66	M65	M95	M95-R	MC60/ MC60E
					
Form Factor	LCC	LCC	LCC	LCC	LCC
Dimensions (mm)	15.8 × 17.7 × 2.3	15.8 × 17.7 × 2.3	19.9 × 23.6 × 2.65	19.9 × 23.6 × 2.65	16.0 × 18.7 × 2.1
Frequency Range (MHz)	850/900/1800/1900	850/900/1800/1900	850/900/1800/1900	850/900/1800/1900	850/900/1800/1900
Weight (approx.) g	1.3	1.1	3.0	3.0	1.3
Operating Temperature	-35 °C ~ +75 °C	-35 °C ~ +75 °C	-35 °C ~ +75 °C	-35 °C ~ +75 °C	-35 °C ~ +75 °C
Extended Temperature	-40 °C ~ +85 °C	-40 °C ~ +85 °C	-40 °C ~ +85 °C	-40 °C ~ +85 °C	-40 °C ~ +85 °C
Data Transmission					
GPRS Multi-slot Class	12, 1-12 configurable	12, 1-12 configurable	12, 1-12 configurable	12, 1-12 configurable	12, 1-12 configurable
Data Rate (kbps)	85.6 (DL & UL)	85.6 (DL & UL)	85.6 (DL & UL)	85.6 (DL & UL)	85.6 (DL & UL)
SMS	•	•	•	•	•
Protocols	TCP/UDP/PPP/HTTP/FTP/SMT/PI/NT/NTZ/MMS Sending/SSL	TCP/UDP/PPP/HTTP/FTP/PI/NT/NTZ/SSL/IPV6*	TCP/UDP/PPP/MQTT/HTTP/FTP/SMT/PI/NT/NTZ/MMS Sending/SSL	TCP/UDP/PPP/MQTT/HTTP/FTP/PI/NT/NTZ/SSL	TCP/UDP/PPP/HTTP/FTP/SSL/PI/NT/NTZ/SMS/MQTT
Specifications for Voice					
Speech Codec Modes	HR/FR/EFR/AMR	HR/FR/EFR/AMR	HR/FR/EFR/AMR	HR/FR/EFR/AMR	HR/FR/EFR/AMR
Echo Arithmetic	Echo cancellation Echo suppression Noise reduction	Echo cancellation Echo suppression Noise reduction	Echo cancellation Echo suppression Noise reduction	Echo cancellation Echo suppression Noise reduction	Echo cancellation Echo suppression Noise reduction
Interfaces					
SIM	1.8V/3V	1.8V/3V	1.8V/ 3V	1.8V/ 3V	1.8V/ 3V
Audio Analog	1 input/2 outputs	1 input/2 outputs	2 inputs/ 2 outputs	2 inputs/ 2 outputs	1 input/ 2 outputs
Audio Digital (PCM)	•	/	•	•	•
RTC Backup	•	•	•	•	•
UART	3	3	2	2	4
ADC	× 1, 10bit	× 1, 10bit	/	/	× 1, 10bit
SD Card Interface	•	/	/	/	•
GPIO	/	/	/	/	•
Temperature Detection	/	/	•	/	•
Enhanced Features					
eCall	•	/	•	/	•
Jamming Detection	•	/	•	/	•
DTMF	•	o	•	•	•
Audio Playback/ Audio Recording	•	•	•	•	•
Dual-SIM	/	/	•	/	•
QuecFOTA®	•	DFOTA	•	•	•
QuecCell	•	•	•	•	•
QuecFile	•	•	/	/	•/o
QuecOpen®	•	•	/	/	•
MUX	•	•	•	•	•
Bluetooth	•	/	/	/	BT 3.0 (MC60) BT 3.0/ BT4.0 (MC60E)
GNSS	/	/	/	/	BEIDOU/ GPS/ GLONASS/Galileo/ QZSS
Electrical Features					
Power Supply	3.3 ~ 4.6V	3.45 ~ 4.25V	3.3 ~ 4.6V	3.45 ~ 4.25V	3.3 ~ 4.6V
Low Power Consumption	1.3mA @DRX=5 1.2mA @DRX=9	1.2mA @DRX=5 1.1mA @DRX=9	1.3mA @DRX=5 1.2mA @DRX=9	1.4mA @DRX=5 1.3mA @DRX=9	1.2mA @DRX=5 0.8mA @DRX=9
Certifications	CE/ Anatel/ ICASA/ GCF/UCRF/FCC/ FAC/Vodafone/Deutsche Telekom	CE/ Anatel	CE/GCF/Vodafone/PTCRB/FCC/IC/ Anatel/Rogers/RCM/NCC/ UCRF/ ICASA/Telenor	CE	CE/FCC/Anatel/ICASA/GCF/UCRF/FAC
Recommended Applications	Telematics, Smart Metering, Mobile POS Terminals, Gateways, Safety, Tracking and Tracing, Remote Maintenance and Control, Mobile Computing, Healthcare, etc.				


o & \* Under development

# GNSS Module Family

	DR and High Precison GNSS					
Product	L26-ADR	L26-UDR	LC29H(BA)	LC29H(CA)	LC29H(DA)	LC29H(EA)*
	Compatible			Compatible		
						
GNSS	GPS/Galileo/GLONASS/BDS/QZSS	GPS/Galileo/GLONASS/BDS/QZSS	GPS/QZSS: L1 C/A, L5; GLONASS: L1; Galileo: E1, E5a; BDS: B11, B2a	GPS/QZSS: L1 C/A, L5; GLONASS: L1; Galileo: E1, E5a; BDS: B11, B2a	GPS/QZSS: L1 C/A, L5; GLONASS: L1; Galileo: E1, E5a; BDS: B11, B2a	GPS/QZSS: L1 C/A, L5; GLONASS: L1; Galileo: E1, E5a; BDS: B11, B2a
Form Factor	LCC	LCC	LCC	LCC	LCC	LCC
Dimensions (mm)	16.0 × 12.2 × 2.3	16.0 × 12.2 × 2.3	16.0 × 12.2 × 2.5	16.0 × 12.2 × 2.5	16.0 × 12.2 × 2.5	16.0 × 12.2 × 2.5
Weight (approx.) g	0.9	0.9	0.9	0.9	0.9	0.9
Operating Temperature	-40 °C ~ +85 °C	-40 °C ~ +85 °C	-40 °C ~ +85 °C	-40 °C ~ +85 °C	-40 °C ~ +85 °C	-40 °C ~ +85 °C
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
<b>General Features</b>						
Working Mode	4wheels-ADR	4wheels-UDR	DR+RTK	DR	RTK	RTK
Chip Solution	Teseo III	Teseo III	AG3335A/T	AG3335A/T	AG3335A/T	AG3335AA/B
L1 Band Receiver (C/A Code) Channel Number	48 Track/2 Fast Acq	48 Track/2 Fast Acq	75 Acquisition Channels 135 Tracking Channels	75 Acquisition Channels 135 Tracking Channels	75 Acquisition Channels 135 Tracking Channels	75 Acquisition Channels 135 Tracking Channels
L1 Band Receiver (C/A Code) SBAS	WAAS/EGNOS/MSAS/GAGAN	WAAS/EGNOS/MSAS/GAGAN	Developing	Developing	Developing	Developing
A-GNSS	Supported	Supported	Supported	Supported	Supported	Supported
Sensitivity	Autonomous Acquisition	-145dBm	-145dBm	-147 dBm	-147 dBm	-147 dBm
	Reacquisition	-152dBm	-152dBm	-157 dBm	-157 dBm	-157 dBm
	Tracking	-162dBm	-162dBm	-165 dBm	-165 dBm	-165 dBm
TTFF (Time To First Fix)	Cold Start	32s, Autonomous	32s, Autonomous	26s	26s	26s
	Warm Start	25s, Autonomous	25s, Autonomous	16s	16s	16s
	Hot Start	2s	2s	1s	1s	1s
Position Accuracy(autonomous)	1.5m CEP	1.5m CEP	Autonomous: 1 m	Autonomous: 1 m	Autonomous: 1 m	Autonomous: 1 m RTK: 1 cm + 1 ppm
Position Accuracy(RTK)	/	/	RTK: < 0.1 m + 1 ppm	/	RTK: 1 cm + 1 ppm	RTK: 1 cm + 1 ppm
Velocity Accuracy(without aid)	0.1m/s	0.1m/s	0.03 m/s	0.03 m/s	0.03 m/s	0.03 m/s
Convergence Time (RTK)	/	/	RTK: < 10 s	/	RTK: < 10 s	RTK: < 10 s
Maximum Acceleration Accuracy (without aid)	0.1m/s <sup>2</sup>	0.1m/s <sup>2</sup>	/	/	/	/
Timing Accuracy	100ns	100ns	20ns	20ns	20ns	20ns
Max Update Rate	1Hz	10Hz	GNSS : 1 Hz IMU : 100 Hz(MAX)	GNSS : 1 Hz IMU : 100 Hz(MAX)	GNSS: 1 Hz RTK: 1 Hz	GNSS: 10 Hz RTK: 1~10 Hz
Baud Rate (default)	115200bps	115200bps	115200bps	115200bps	115200bps	115200bps
Geo-fence	/	/	Developing	Developing	Developing	Developing
Jamming Detection	/	•	•	•	•	•
Anti-jamming	/	/	/	/	/	/
Built-in LNA	•	•	•	•	•	•
<b>Electrical Data</b>						
Power Supply	3.0V to 3.6V	3.0V to 3.6V	3.1 to 3.6V	3.1 to 3.6V	3.1 to 3.6V	3.1 to 3.6V
I/O Voltage	3.0V to 3.6V	3.0V to 3.6V	2.8V	2.8V	2.8V	2.8V
Power Consumption (Acquisition)	72mA (GPS) 79mA (GPS+GLONASS+Galileo)	84mA (GPS+GLONASS+Galileo)	30mA	28mA	25mA	25mA
Power Consumption (Tracking)	58mA (GPS) 74mA (GPS+GLONASS+Galileo)	81mA (GPS+GLONASS+Galileo)	30mA	28mA	25mA	25mA
Power Consumption (Backup/Low Power mode)	8µA	8µA	25 µA	25 µA	25 µA	25 µA
<b>Interfaces</b>						
UART	•	•	Adjustable: 9600-3000000 bps Default: 115200 bps	Adjustable: 9600-3000000 bps Default: 115200 bps	Adjustable: 9600-3000000 bps Default: 115200 bps	Adjustable: 9600-3000000 bps Default: 115200 bps
IIC (NMEA)	/	/	•	•	•	•
Reset	•	•	•	•	•	•
Time Pulse	•	•	•	•	•	•
<b>Antenna</b>						
Short-Circuit Protection & Open-Circuit Detection	•	•	/	/	/	/
Antenna Type	Active or passive	Active or passive	Active or passive	Active or passive	Active or passive	Active or passive
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	Automotive Tracking , OBD		Automotive, High Precision Navigation, Delivery Robots			

\* Under development




# GNSS Module Family

DR and High Precison GNSS								
Product	LG69T(AA)	LG69T(AD)	LG69T(AB)*	LG69T(AM)	LG69T(AJ)	LG69T(AI)	LG69T(AQ)*	LG69T(AS)
Compatible								
								
GNSS	GPS/QZSS: L1 C/A; L5 Galileo: E1; E5a BDS: B11; B2a	GPS/QZSS: L1 C/A; L5 Galileo: E1; E5a BDS: B11; B2a	GPS/QZSS: L1 C/A; L2C or L5 Galileo: E1; E5b or E5a BDS: B11; B21 or B2a GLONASS: L1 or L2	GPS: L1 C/A; L5 Galileo: E1; E5a BDS: B11; B2a	GPS/QZSS: L1 C/A; L5 Galileo: E1; E5a BDS: B11; B2a	GPS/QZSS: L1 C/A; L2C or L5 Galileo: E1; E5b or E5a BDS: B11; B21 or B2a GLONASS: L1 or L2	GPS: L1 C/A; L5 Galileo: E1; E5a BDS: B11; B2a	GPS/QZSS: L1 C/A; L5 Galileo: E1; E5a BDS: B11; B2a
Form Factor	LGA	LGA	LGA	LGA	LGA	LGA	LGA	LGA
Dimensions (mm)	17.0 × 22.0 × 3.1	17.0 × 22.0 × 3.1	17.0 × 22.0 × 3.3	17.0 × 22.0 × 3.3	17.0 × 22.0 × 3.3	17.0 × 22.0 × 3.3	17.0 × 22.0 × 3.3	17.0 × 22.0 × 3.3
Weight (approx.) g	1.9	1.9	1.9	1.9	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	-40 °C ~ +105 °C	-40 °C ~ +105 °C	-40 °C ~ +85 °C	-40 °C ~ +85 °C
Storage Temperature	-40 °C ~ +95 °C	-40 °C ~ +95 °C	-40 °C to +105 °C	-40 °C ~ +95 °C	-40 °C ~ +105 °C	-40 °C ~ +105 °C	-40 °C ~ +95 °C	-40 °C ~ +95 °C
<b>General Features</b>								
Working Mode	DR*/Raw	PVT/Raw	Raw	RTK	RAW	RAW	DR+RTK	Base station
Chip Solution	TESEO V	TESEO V	TESEO APP	TESEO V	TESEO V	TESEO V	TESEO V	TESEO V
L1 Band Receiver (C/A Code) Channel Number	80 Tracking Channels 4 Fast Acquisition Channels	80 Tracking Channels 4 Fast Acquisition Channels	80 Tracking Channels 4 Fast Acquisition Channels	80 Tracking Channels 4 Fast Acquisition Channels	80 Tracking Channels 4 Fast Acquisition Channels	80 Tracking Channels 4 Fast Acquisition Channels	80 Tracking Channels 4 Fast Acquisition Channels	80 Tracking Channels 4 Fast Acquisition Channels
L1 Band Receiver (C/A Code) SBAS	*	*	/	/	/	/	/	/
A-GNSS	*	*	/	/	/	/	/	/
Sensitivity	Autonomous Acquisition	-145dBm	-145dBm	-144dBm*	-145dBm	-145dBm	TBD	-145dBm
	Reacquisition	-153dBm	-153dBm	-153dBm*	-153dBm	-153dBm	TBD	-153dBm
	Tracking	-160dBm	-160dBm	-159dBm*	-160dBm	-160dBm	TBD	-159dBm
TTFF (Time To First Fix)	Cold Start	36s	36s	36s*	40s	36s	36s	TBD
	Warm Start	30s	30s	30s*	*	30s	30s	TBD
	Hot Start	3s	3s	3s*	4.5s	3s	3s	TBD
Position Accuracy (autonomous)	1.0m CEP	1.0m CEP	1.0m CEP	1.0m CEP	1.0m CEP	1.0m CEP	1.0 m CEP	/
Position Accuracy (RTK)	cm <sup>1</sup>	cm <sup>1</sup>	cm <sup>1</sup>	0.1m+ppm CEP	cm <sup>1</sup>	cm <sup>1</sup>	0.01 m + 1ppm	/
Velocity Accuracy (without aid)	0.1m/s	0.1m/s	0.1m/s	0.1m/s	0.1m/s	0.1m/s	0.1m/s	/
Convergence Time (RTK)	/	/	/	<10s	/	/	TBD	/
Maximum Acceleration Accuracy (without aid)	0.1m/s <sup>2</sup>	0.1m/s <sup>2</sup>	0.1m/s <sup>2</sup>	0.1m/s <sup>2</sup>	0.1m/s <sup>2</sup>	0.1m/s <sup>2</sup>	0.1m/s <sup>2</sup>	/
Timing Accuracy	100ns	100ns	100ns	100ns	100ns	100ns	100ns	100ns
Max Update Rate	RAW: 10Hz; IMU: 100Hz	RAW: 10Hz; PVT: 1Hz	RAW: 10Hz	PVT: 10Hz	RAW: 10 Hz IMU: 100 Hz	RAW: 10 Hz	PVT: 10 Hz IMU raw data: 26 Hz	RAW: 1 Hz
Baud Rate(default)	460800bps(raw)	460800bps	460800bps	460800bps	460800bps	460800bps	460800bps	460800bps
Geo-fence	/	/	/	/	/	/	/	/
Jamming Detection	•	•	*	/	•	•	/	/
Built-in LNA	•	•	/	•	•	•	•	•
<b>Electrical Data</b>								
Power Supply	3.0V to 3.6V	3.0V to 3.6V	VCC:3.0~3.6V typ.3.3V, VCC_CORE:1.2V	3.0V to 3.6V	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	3.0V to 3.6V	3.0V to 3.6V	3.0V to 3.6V	3.0V to 3.6V
Power Consumption (Acquisition)	242mA	235 mA	VCC:65mA, VCC_CORE: 235mA	340 mA	245 mA	295 mA	TBD	360 mA
Power Consumption (Tracking)	237 mA	232 mA	VCC:65mA, VCC_CORE: 236mA	345 mA	245 mA	295 mA	TBD	360 mA
Power Consumption (Backup/Low power mode)	55µA	55µA	110µA	55 µA	55 µA	55 µA	TBD	55 µA
<b>Interfaces</b>								
UART	•	•	•	•	•	•	•	•
Reset	•	•	•	•	•	•	•	•
Time Pulse	•	•	•	•	•	•	•	•
<b>Antenna</b>								
Antenna Type	Active	Active	Active	Active	Active	Active	Active	Active
Antenna Power	External or internal	External or internal	External or internal	External or internal	External or internal	External or internal	External or internal	External or internal
Certifications	CE	CE	CE*/ ASIL-B*	CE	/	/	CE*	CE
Recommended Applications	Automotive, High Precision Navigation, Delivery Robots							

Note 1: Depending on external Precision Positioning Engine.

\* Under development







# GNSS Module Family

		Timing		
Product	L26-T	LC29T*	LC98S	
				
GNSS	GPS/Galileo/GLONASS/BDS/QZSS	GPS/Galileo/GLONASS/BDS/QZSS	GPS/BDS/GLONASS/Galileo/QZSS	
Form Factor	LCC	LCC	LCC	
Dimensions (mm)	16.0 × 12.2 × 2.3	16.0 × 12.2 × 3.1	17.0 × 22.4 × 2.6	
Weight (approx.) g	0.9	1.1	1.68	
Operating Temperature	-40 °C ~ +85 °C	-40 °C ~ +85 °C	-40 °C ~ +85 °C	
Storage Temperature	-40 °C ~ +90 °C	-40 °C ~ +90 °C	-40 °C ~ +90 °C	
<b>General Features</b>				
Working Mode	Timing Static Mode	Timing Static Mode	Timing Static Mode	
Chip Solution	Teseo III	Teseo V	Teseo III	
L1 Band Receiver (C/A Code) Channel Number	48 Track/2 Fast Acq	80 Track/4 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	
A-GNSS	Supported	Supported	Supported	
Sensitivity	Autonomous Acquisition	-147dBm	-146dBm <sup>1</sup>	
	Reacquisition	-154dBm	-155dBm <sup>1</sup>	
	Tracking	-162dBm	-161dBm <sup>1</sup>	
TTFF (Time To First Fix)	Cold Start	32s, Autonomous	29s, Autonomous	
	Warm Start	25s, Autonomous	28s, Autonomous	
	Hot Start	2s	2s	
Position Accuracy(autonomous)	1.5m CEP	1.1m CEP	1.5m CEP	
Timing Accuracy (1σ)	<6.8ns	<6ns	<6.8ns	
Frequency of Time Pulse Signal	/	10MHz	/	
Max Update Rate	10Hz	10Hz	10Hz	
Baud Rate (default)	9600bps	115200bps	115200bps	
Geo-fence	/	/	/	
Jamming Detection	•	•	•	
Anti-jamming	/	/	/	
Built-in LNA	•	•	/	
<b>Electrical Data</b>				
Power Supply	3.0V to 3.6V	3.0V to 3.6V	3.0V to 3.6V	
I/O Voltage	Typ. 3.3 V	3.0V to 3.6V	3.0V to 3.6V	
Power Consumption (Acquisition)	71 mA (GPS+GLONASS+Galileo)	222 mA (GPS+BDS+GLONASS+Galileo+QZSS)	78mA (GPS + GLONASS)	
Power Consumption (Tracking)	67mA (GPS+GLONASS+Galileo)	232 mA (GPS+BDS+GLONASS+Galileo+QZSS)	74mA (GPS + GLONASS)	
Power Consumption (Backup/Low Power mode)	9μA	55μA	/	
<b>Interfaces</b>				
UART	•	•	•	
IIC (NMEA)	/	*	*	
Reset	•	•	•	
Time Pulse	•	•	•	
<b>Antenna</b>				
Short-Circuit Protection & Open-Circuit Detection	•	•	•	
Antenna Type	Active or passive	Active or passive	Active or passive	
Antenna Power	External or internal	External or internal	External or internal	
Certifications	CE	/	CE	
Recommended Applications	High Precision Timing	High Precision Timing for Base Stations		

Note 1: Demonstrated with a good external LNA.




\* Under development

# GNSS Module Family

		Standard Precision GNSS-Single Band					
Product	LG77L(IC)	L76-L	LC76G(AB)	LC76G(PA)*	LC76F	LC26G(AB)	
		Compatible					
							
GNSS	GPS/GLONASS/Galileo/BDS/QZSS	GPS/GLONASS/Galileo/BDS/QZSS	GPS/GLONASS/Galileo/BDS/QZSS	GPS/GLONASS/Galileo/BDS/QZSS	GPS/GLONASS/Galileo/QZSS	GPS/GLONASS/Galileo/BDS/QZSS	
Form Factor	LCC	LCC	LCC	LCC	LCC	LCC	
Dimensions (mm)	7.0 × 7.0 × 2.0	9.7 × 10.1 × 2.5	9.7 × 10.1 × 2.4	9.7 × 10.1 × 2.4	9.7 × 10.1 × 2.3	16.0 × 12.2 × 2.4	
Weight (approx.) g	0.2	0.6	0.5	0.6	0.3	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	-45 °C ~ +90 °C	-40 °C ~ +90 °C	
<b>General Features</b>							
Working Mode	Standard	Standard	Standard	Standard	Standard	Standard	
Chip Solution	MT3333	MT3333	AG3352Q	AG3352Q	GK9501	AG3352Q	
L1 Band Receiver (C/A Code) Channel Number	33 Track/ 99 Acq	33 Track/ 99 Acq.	47track	47 track	24 track	47track	
L1 Band Receiver (C/A Code) SBAS	WAAS/EGNOS/MSAS/GAGAN	WAAS/EGNOS/MSAS/GAGAN	Supported	Supported	Supported	Supported	
A-GNSS	Supported	Supported	Supported	Supported	Supported	Supported	
Sensitivity	Autonomous Acquisition	-146dBm	-149dBm	-147dBm	-147dBm	-148dBm	-147dBm
	Reacquisition	-156dBm	-161dBm	-159dBm	-159dBm	-165dBm	-159dBm
	Tracking	-163dBm	-167dBm	-166dBm	-166dBm	-162dBm	-166dBm
TTFF (Time To First Fix)	Cold Start	25s, Autonomous 17s, With EASY™	32s, Autonomous 15s, With EASY™	26s, Autonomous 12s, with EASY™ 5s, with EP0™	26s, Autonomous 12s, with EASY™ 5s, with EP0™	30s, Autonomous 6s, With AGNSS	26s, Autonomous 12s, with EASY™ 5s, with EP0™
	Warm Start	23s, Autonomous 5s, With EASY™	30s, Autonomous 5s, With EASY™	20s, Autonomous 2s, with ESAY™	20s, Autonomous 2s, with ESAY™	2s	20s, Autonomous 2s, with ESAY™
	Hot Start	2s	2s	1s	1s	2s	1s
Position Accuracy (autonomous)	2.5m CEP	2.5m CEP	1.5m CEP	1.5m CEP	2m 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	50ns	100ns	100ns	100ns	100ns	100ns	
Max Update Rate	10Hz	10Hz	10Hz	1Hz	10Hz	10Hz	
Baud Rate(default)	9600bps	9600bps	115200bps	115200	9600 bps	115200bps	
Geo-fence	•	•	•	•	•	•	
Jamming Detection	•	•	•	•	•	•	
Anti-jamming	•	•	•	•	•	•	
Built-in LNA	/	•	•	•	•	•	
<b>Electrical Data</b>							
Power Supply	2.8V to 4.3V	2.8V to 4.3V	2.55 to 3.6V	2.55 to 3.6V	2.8V to 4.3V	2.55 to 3.6V	
I/O Voltage	1.7v to 1.9v/ 2.7v to 2.9v	2.7V to 2.9V	typ. 3.3V	typ. 3.3V	2.8V	typ. 3.3V	
Power Consumption (Acquisition)	24mA (GPS+GLONASS)	31mA (GPS+GLONASS)	36mA(G3B)	10.5mA(G3B)	30 mA(GPS+GLONASS)	36mA(G3B)	
Power Consumption (Tracking)	23.0mA (GPS+GLONASS)	31mA (GPS+GLONASS)	36mA(G3B)	10.5mA(G3B)	30 mA(GPS+GLONASS)	36mA(G3B)	
Power Consumption (Backup/Low power mode)	6µA	8µA	13µA	13µA	30µA	15µA	
<b>Interfaces</b>							
UART	•	•	•	•	•	•	
IIC (NMEA)	•	•	•	•	•	•	
Reset	•	•	•	•	•	•	
Time Pulse	•	•	•	•	•	•	
<b>Antenna</b>							
Short-Circuit Protection & Open-Circuit Detection	•	/	•	•	•	•	
Antenna Type	Active or passive	Active or passive	Active or passive	Active or passive	Active or passive	Active or passive	
Antenna Power	External	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, Safety, Industrial PDAs or PNDs, Digital Cameras, etc.						







\* Under development

# GNSS Module Family

		Standard Precision GNSS-Dual band		
Product	LC79D(D)	LC79H(AL)	LC29H(AA)	
Compatible				
				
GNSS	GPS L1 L5 Galileo E1 E5 QZSS L1 L5 IRNSS L5 GLONASS L1 BDS B1	GPS/QZSS: L1 C/A, L5 GLONASS: L1 Galileo: E1, E5a BDS: B11, B2a	GPS/QZSS: L1 C/A, L5 GLONASS: L1 Galileo: E1, E5a BDS: B11, B2a	
Form Factor	LCC	LCC	LCC	
Dimensions (mm)	9.7 × 10.1 × 2.4	9.7 × 10.1 × 2.4	16.0 × 12.2 × 2.5	
Weight (approx.) g	0.42	0.5	0.9	
Operating Temperature	-40 °C ~ +85 °C	-40 °C ~ +85 °C	-40 °C ~ +85 °C	
Storage Temperature	-40 °C ~ +90 °C	-40 °C ~ +90 °C	-40 °C ~ +90 °C	
<b>General Features</b>				
working mode	standard mode	standard mode	standard mode	
Chip Solution	BCM47755	AG3335M	AG3335M	
L1 Band Receiver (C/A Code) Channel Number	32 channels	75 Acquisition Channels 135 Tracking Channels	75 Acquisition Channels 135 Tracking Channels	
L1 Band Receiver (C/A Code) SBAS	Support (Only support GAGAN)*	WAAS, EGNOS, MSAS,GAGAN	WAAS, EGNOS, MSAS,GAGAN	
A-GNSS	Supported	Supported	Supported	
Sensitivity	Autonomous Acquisition	-147dBm	-148 dBm	
	Reacquisition	-158dBm	-159 dBm	
	Tracking	-163dBm	-166 dBm	
TTFF (Time To First Fix)	Cold Start	34s, Autonomous	26 s	
	Warm Start	30s, Autonomous	18 s	
	Hot Start	2s	1 s	
Position Accuracy (autonomous)	1.2m CEP	1.0 m CEP	1.0 m CEP	
Position Accuracy (RTK)	/	/	/	
Velocity Accuracy (without aid)	0.1m/s	0.03m/s	0.03m/s	
Velocity Accuracy (RTK)	/	/	/	
Convergence Time (RTK)	/	/	/	
Maximum Acceleration Accuracy (without aid)	0.1m/s <sup>2</sup>	/	/	
Timing Accuracy	100ns	20ns	20ns	
Max Update Rate	1Hz	PVT: 1 Hz	PVT: 1 Hz	
Baud Rate(default)	115200bps	115200bps	115200bps	
Geo-fence	•	Developing	Developing	
Jamming Detection	/	•	•	
Anti-jamming	/	/	/	
Built-in LNA	•	•	•	
<b>Electrical Data</b>				
Power Supply	1.7V to 1.9V	1.75 to 1.98 V	3.1 to 3.6V	
I/O Voltage	1.7V to 1.9V	2.8V	2.8V	
Power Consumption (Acquisition)	49mA(GPS + GLONASS + Galileo+BDS+QZSS)	33 mA	24mA	
Power Consumption (Tracking)	48mA(GPS + GLONASS + Galileo+BDS+QZSS)	33 mA	24mA	
Power Consumption (Backup/Low power mode)	91µA	20 µA	25 µA	
<b>Interfaces</b>				
UART	•	4800-460800(Default: 115200)	4800-460800(Default: 115200)	
IIC (NMEA)	/	•	•	
Reset	/	•	•	
Time Pulse	/	•	•	
<b>Antenna</b>				
Antenna Type	Active or passive	Active or passive	Active or passive	
Antenna Power	External or internal	External or internal	External or internal	
Certifications	TBD	CE	CE	
Recommended Applications	Shared Mobility, Delivery Robots, GIS			

\* Under development






# GNSS Module Family

	Integrated Antenna					
Product	LC86L (C)	LC86G(AA)	LC86G(LA)	L86	L89 R2.0	L96
	Compatible					
						
GNSS	GPS/GLONASS/Galileo/BDS/QZSS	GPS/BDS/Galileo	GPS/GLONASS/BDS/Galileo/QZSS	GPS/ GLONASS/BDS/Galileo/QZSS	GPS/ GLONASS/ BDS/Galileo/ IRNSS/QZSS	GPS/ GLONASS/BDS/Galileo/QZSS
Form Factor	LCC	LCC	LCC	LCC	LCC	LCC
Dimensions (mm) <sup>1</sup>	16.0 × 16.0 × 6.95	16.0 × 16.0 × 6.95	18.4 × 18.4 × 6.95	18.4 × 18.4 × 6.45	18.4 × 26.4 × 6.8	9.6 × 14.0 × 2.0
Weight (approx.) g	6	6.5g	7	7.6	8.2	0.6
Operating Temperature	-40 °C ~ +85 °C	-40 °C ~ +85 °C	-40 °C ~ +85 °C	-40 °C ~ +85 °C	-40 °C ~ +85 °C	-40 °C ~ +85 °C
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
<b>General Features</b>						
Chip Solution	MT3333	AG3352	AG3352	MT3333	AG3335	MT3333
L1 Band Receiver (C/A Code) Channel Number	33 Track/ 99 Acq	47Track/ 99 Acq	47 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	WAAS/EGNOS/MSAS/GAGAN
A-GNSS	Supported	Supported	Supported	Supported	Supported	Supported
Sensitivity	Autonomous Acquisition	-148dBm	-147dBm	-149dBm	-148dBm	-148dBm
	Reacquisition	-162dBm	-160 dBm	-160dBm	-161dBm	-160dBm
	Tracking	-166dBm	-166 dBm	-166dBm	-167dBm	-165dBm
TTFF (Time To First Fix)	Cold Start	35s, Autonomous 15s, With AGNSS	<25s, Autonomous <12s, With EASY™	25s, Autonomous 12s, With EASY™	35s, Autonomous 15s, With AGNSS	35s, Autonomous 15s, With EASY™
	Warm Start	30s, Autonomous 5s, With AGNSS	<22s, Autonomous <2s, With EASY™	22s, Autonomous 2s, With EASY™	30s, Autonomous 5s, With AGNSS	30s, Autonomous 5s, With EASY™
	Hot Start	2s	<1s	<1s	1s	<1s
Position Accuracy(autonomous)	2.5m CEP	1.5m CEP	1.5m CEP	2.5m CEP	1.8m CEP	2.5m CEP
Velocity Accuracy(without aid)	0.1m/s	0.1m/s	0.1m/s	0.1m/s	0.03m/s	0.1m/s
Maximum Acceleration Accuracy (without aid)	0.1m/s <sup>2</sup>	0.1m/s <sup>2</sup>	0.1m/s <sup>2</sup>	0.1m/s <sup>2</sup>	/	0.1m/s <sup>2</sup>
Timing Accuracy	100ns	100ns	100ns	100ns	100ns	100ns
Max Update Rate	10Hz	10Hz	1Hz	10Hz	1Hz	10Hz
Baud Rate(default)	9600bps	115200bps	115200bps	9600bps	9600bps	9600bps
Geo-fence	•	•	•	•	•	•
Jamming Detection	•	•	•	•	•	•
Anti-jamming	•	•	•	•	/	•
Built-in LNA	•	•	•	•	•	•
<b>Electrical Data</b>						
Power Supply	2.8V to 4.3V	2.55V to 3.6V	2.55V to 3.6V	2.8V to 4.3V	3.1V to 4.3V	2.8V to 4.3V
I/O Voltage	2.7V to 2.9V	2.55V to 3.6V	2.55V to 3.6V	2.7V to 2.9V	3.0 V	2.7V to 2.9V
Power Consumption (Acquisition)	32mA (GPS+GLONASS)	32mA	32mA	32mA (GPS+GLONASS)	32mA	25mA (GPS+GLONASS) 22mA (GPS)
Power Consumption (Tracking)	30mA (GPS+GLONASS)	32mA	32mA	30mA (GPS+GLONASS)	32mA	20mA (GPS+GLONASS)/ 20mA (GPS)
Power Consumption (Backup)	7µA	14µA	14µA	7µA	51µA	7µA
<b>Interfaces</b>						
UART	•	•	•	•	•	•
IIC (NMEA)	/	/	/	/	•	•
Reset	•	•	•	•	•	•
Time Pulse	•	•	•	•	•	•
<b>Antenna</b>						
Short-Circuit Protection & Open-Circuit Detection	•	/	/	•	•	/
Antenna Automatic Switch	•	/	/	•	•	/
Antenna Type	Embedded patch antenna or external active antenna	•	Embedded patch antenna and chip antenna, external active antenna	Embedded patch antenna or external active antenna	Embedded patch antenna and chip antenna, external active antenna	Embedded chip antenna or external active antenna
Antenna Power	Internal	Internal	Internal	Internal	Internal	Internal
Certifications	CE	CE	CE	CE	CE	CE
Recommended Applications	Vehicle or Asset Trackers, DVRs, Connected PNDs & PDAs, Safety, Digital Cameras, etc.				(Dedicated for India market) Standard Tracking	Asset Tracking, Digital Cameras

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

\* Under development

# 5G Antennas

Product	YE0001BA	YE0003AA	YE0007AA	YE0025AA	YECN009AA
					
Frequency Bands (MHz)	600-6000	699-5000	600-6000	698-960,1710-5000	600-6000
Technology	5G	5G	5G	5G	5G
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)	221 × 27.30 × 13.45	190 × Ø 16	152.4 × 21.79 × 14.49	199 × Ø 22	200 × 21
Matched Quectel Modules	5G/4G/3G/2G/LPWA				





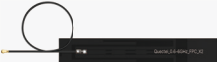
Product	YECN009BA	YE0028AA	YE0037AA
			
Frequency Bands (MHz)	600-6000	700-2700, 3300-5000	700-5000
Technology	5G	5G	5G
Cable Length (mm)	n/a	1500	1000
Connector Type	RP-SMA Male (center receptacle)	SMA Male (center pin)	SMA Male (center pin)
Mounting Type	Terminal	Magnetic	Magnetic
Dimensions (mm)	200 × 21	234 × Ø 60	88 × Ø 30
Matched Quectel Modules	5G/4G/3G/2G/LPWA		

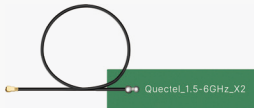
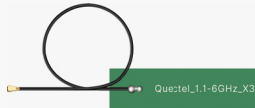

Product	YXH001AA	YB0016AA	YBY00A0KA
			
Frequency Bands (MHz)	700-960, 1710-2690, 3300-5000	698-960, 1710-2700, 3300-6000	700-960, 1710-2690, 3300-5000
Technology	5G	5G	5G
Cable Length (mm)	1000	3000	n/a
Connector Type	SMA Male (center pin)	SMA Male (center pin)	N-J (center pin)
Mounting Type	Magnetic	Screw	N-J
Dimensions (mm)	285 × 45	54 × 91	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			

The parameters shall be subject to the Specification.



Product	YC0018AA	YC0018AAEVB	YF0017AA	YF0017BA	YF0020AA
					
Frequency Bands (MHz)	600-960, 1427-1707, 1710-2170, 2300-2700, 3300-5000, 5100-6000	600-960, 1427-1707, 1710-2170, 2300-2700, 3300-5000, 5100-6000	1500-6000	1100-6000	600-6000
Technology	5G	5G	5G	5G	5G
Cable Length (mm)	n/a	n/a	193	193	184
Connector Type	n/a	n/a	IPEX IV	IPEX IV	IPEX IV
Mounting Type	SMD	n/a	Adhesive	Adhesive	Adhesive
Dimensions (mm)	40 × 7 × 3	141 × 40.4	49 × 13 × 0.13	49 × 13 × 0.13	90.15 × 15.2 × 0.13
Matched Quectel Modules	5G/4G/3G/2G/LPWA				

Product	YP0009AA	YP0009BA	YP0009CA
			
Frequency Bands (MHz)	1500-6000	1100-6000	600-6000
Technology	5G	5G	5G
Cable Length (mm)	193	193	188.5
Connector Type	IPEX IV	IPEX IV	IPEX IV
Mounting Type	Adhesive	Adhesive	Adhesive
Dimensions (mm)	49 × 13 × 0.95	49 × 13 × 0.95	78.5 × 14.2 × 0.95
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	698-960, 1695-2200, 2300-2700	698-960, 1695-2200, 2300-2700	700-960, 1710-2700, 3400-3800	700-960, 1710-2700, 3400-3800
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	25 × 7 × 3	140 × 36
Matched Quectel Modules	4G/3G/2G/LPWA					

Product	YF0022AA	YF0007BA	YPCA004AA	YFCA002AA	YF0006DA	YF0028AA
						
Frequency Bands (MHz)	700-960, 1710-2170, 2300-2690	600-960, 1427.9-1495.9, 1710-2170, 2300-2700	700-2690, 1710-2690	700-2690	690-2700	698-960, 1710-2690
Technology	LTE (4G)	LTE (4G)	LTE (4G)	LTE (4G)	LTE (4G)	LTE (4G)
Cable Length (mm)	75	75	100	75	150	150
Connector Type	RF1	RF1	IPEX I	RF1	IPEX I	IPEX I
Mounting Type	Adhesive	Adhesive	Adhesive	Adhesive	Adhesive	Adhesive
Dimensions (mm)	40 × 15 × 2	50 × 25 × 0.85	40 × 10 × 1	30 × 20 × 0.12	50 × 25 × 0.13	94 × 21 × 0.12
Matched Quectel Modules	4G/3G/2G/LPWA					

The parameters shall be subject to the Specification.

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

Product	YECT002AA	YECT003AA	YE0009AA	YPRO0A0AA	YCNO01AA	YDX001AA	YE0013CA
							
Frequency Bands (MHz)	700-960,1710-2690	690-2690	824-2700	700-2700	700-960,1560-1610,1710-2700	824-2690	700-960,1710-2170;2300-2700
Technology	LTE (4G)	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	n/a
Connector Type	SMA Male (center pin)	SMA Male (center pin)	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	Terminal	Screw
Dimensions (mm)	196.2 × 16 × 13	113 × Ø 10	190 × 16	194.3 × 15.95	144 × Ø 13	208 × Ø 12	Ø 10.2 × 115.4
Matched Quectel Modules	4G/3G/2G/LPWA						

Product	YGL001AA	YE0010AA	YB0010AA	YE0012AA	YE0006AA	YECT007AA
						
Frequency Bands (MHz)	600-960,1710-2690,3300-5000	698-2700	698-960,1710-2690	824-960,1710-2690	700-2700	698-960,1710-2690
Technology	5G	LTE (4G)	LTE (4G)	LTE (4G)	LTE (4G)	LTE (4G)
Cable Length (mm)	n/a	1000	2000	250	1500	n/a
Connector Type	SMA Male (center pin)	SMA Male (center pin)	SMA Male (center pin)	SMA Male (center pin)	SMA Male (center pin)	N-J
Mounting Type	Terminal	Adhesive	Magnetic	Adhesive	Magnetic	Bracket
Dimensions (mm)	196.2 × 16 × 13	152 × 18 × 5.9	Ø 84 × 81.5 × 15.5	116.5 × 21.7 × 5.6	318 × Ø 30	Ø 20 × 300
Matched Quectel Modules	4G/3G/2G/LPWA					

Product	YE0021KA	YE0029FA	YE0008BA	YE0011BA
				
Frequency Bands (MHz)	700-960,1710-2170,2300-2700	700-2700	698-960,1710-2690	820-960,1710-2690
Technology	LTE (4G)	LTE (4G)	LTE (4G)	LTE (4G)
Cable Length (mm)	1500	1000	n/a	n/a
Connector Type	SMA Male (center pin)	SMA Male (center pin)	SMA Male (center pin)	SMA Male (center pin)
Mounting Type	Magnetic	Magnetic	Terminal	Terminal
Dimensions (mm)	110 × Ø 30	88 × Ø 30	53 × Ø 10.5	50 × 16.4
Matched Quectel Modules	4G/3G/2G/LPWA			







# GNSS Antennas

Product	YC0013AA	YC0013AAEVB	YPGS001AA	YPGS001AAEVB
				
Frequency Bands (MHz)	1559-1606	1559-1606	1559-1609	1559-1609
Technology	GNSS	GNSS	GNSS	GNSS
Cable Length (mm)	n/a	n/a	n/a	n/a
Connector Type	n/a	n/a	n/a	n/a
Mounting Type	SMD	n/a	SMD	n/a
Dimensions (mm)	3.2 × 1.6 × 0.6	90 × 50	7.0 × 5.8 × 0.8	80 × 35
Matched Quectel Modules	GNSS L1 module series			


The parameters shall be subject to the Specification.

# GNSS Antennas

Product	YCGS004AA	YCGS005AA	YCGS006AA
			
Frequency Bands (MHz)	1560-1606	1575.42-1602	1575.42-1602
Technology	GNSS L1 & G1 (passive)	GNSS L1 & G1 (passive)	GNSS L1 & G1 (passive)
Cable Length (mm)	n/a	n/a	n/a
Connector Type	n/a	n/a	n/a
Mounting Type	SMD	SMD	SMD
Dimensions (mm)	9 × 9 × 4	18 × 18 × 4	25 × 25 × 4
Matched Quectel Modules	GNSS L1 module series		

Product	YCGA001AA	YCGA002AA	YCGA003AA	YG0038AA	YG0043AA	YG0046AA
						
Frequency Bands (MHz)	1575.45 ± 1.5	1560-1602	1559-1605	1561, 1575	1559-1606	1559-1606
Technology	GNSS L1 (passive)	GNSS L1 (passive)	GNSS L1 (passive)	GNSS L1 (passive)	GNSS L1 (passive)	GNSS L1 (passive)
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	Pin Mounting	Pin Mounting	Pin Mounting	Pin mounting	Pin Mounting	Pin Mounting
Dimensions (mm)	10 × 10 × 4	12 × 12 × 4	35 × 35 × 4	13 × 13 × 4	15 × 15 × 4	18 × 18 × 2
Matched Quectel Modules	GNSS L1 module series					

Product	YG0005AA	YG0062AA	YCGA012AA	YCGA013AA	YG0048AA	YCGS010AA	YPA00A0AA
							
Frequency Bands (MHz)	1565-1606	1559-1606	L5: 1166-1186 L1: 1559-1606	L5: 1166-1186 L1: 1559-1606	1176, 1575	1176.45-1278.75, 1575.42	Iridium (1616-1626.5)
Technology	GNSS L1 (passive)	GNSS L1 (passive)	GNSS L1&L5 (passive)	GNSS L1 & L5 (passive)	GNSS L1&L5 (passive)	GNSS	GNSS (passive)
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	Pin Mounting	Pin Mounting	Pin Mounting	Pin Mounting	Pin Mounting	SMD	Pin mounting
Dimensions (mm)	18.4 × 18.4 × 4	25 × 25 × 4	38 × 38 × 10 + 25 × 25 × 6	45 × 45 × 6 & 40 × 40 × 4	18 × 18 × 4 & 25 × 25 × 4	5 × 3 × 0.5	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	1575-1602	1559-1577	1575-1602	1560-1605	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	50	50	50	35	42
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 × 6.3	15 × 15 × 6.2	18 × 18 × 6.3	25 × 25 × 6.3	13 × 13 × 6.8	18.4 × 18.4 × 8.86
Matched Quectel Modules	GNSS L1 module series					





The parameters shall be subject to the Specification.

# GNSS Antennas

Product	YG0032AA	YG0015AA	YCGO008AA	YCGO009AA	YCGO010AA	YCGO011AA
						
Frequency Bands (MHz)	Beidou: 1561 ±5 ; GPS: 1575 ±5	1575.42-1602	1559-1606	1575-1602	1559-1577	1575-1602
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	48	50	95	50	50
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 × 7.6	10 × 10 × 6.3	15 × 15 × 6.2	18 × 18 × 6.3	25 × 25 × 6.3
Matched Quectel Modules	GNSS L1 module series					

Product	YCGA014AA	YAT001BA	YBS00A1AA
			
Frequency Bands (MHz)	GPS L5: 1176.45, GPS L1: 1575.42, GLONASS L1: 1602	1176, 1575	1166-1186, 1559-1606
Technology	GNSS L1 & L5(active)	GNSS L1 & L5 (active)	GNSS L1 & L5 (active)
Cable Length (mm)	100	40	60
Connector Type	IPEX MHF I	RF I	IPEX I
Mounting Type	Cable Mounting	Cable Mounting	Cable Mounting
Dimensions (mm)	25 × 25 × 11.9	25 × 25 × 2 & 18 × 18 × 2	40 × 40 × 4 & 45 × 45 × 6
Matched Quectel Modules	GNSS L1/L5 module series		






Product	YAT001CA	YG0030AA	YCGO014AA	YCGO022AA
				
Frequency Bands (MHz)	1176, 1575	1176, 1575	L5: 1166-1186, L1: 1559-1606	L1: 1559-1586, L5: 1164-1189
Technology	GNSS L1 & L5 (active)	GNSS L1 & L5 (passive)	GNSS L1 & L5 (passive)	GNSS L1 & L5(active)
Cable Length (mm)	40	60	142	100
Connector Type	RF I	IPEX I	IPEX I	IPEX MHF1
Mounting Type	Cable Mounting	Cable Mounting	Cable Mounting	Cable Mounting
Dimensions (mm)	25 × 25 × 2 & 18 × 18 × 4	50 × 50 × 9.3	38 × 38 × 10 & 25 × 25 × 6	50 × 50 × 13.4
Matched Quectel Modules	GNSS L1/L5 module series			

Product	YFGA001AA	YFGA002AA	YFGA003AA	YFGA004AA
				
Frequency Bands (MHz)	1160-1270, 1560-1605	1560-1605	1559-1609	1160-1270, 1560-1605
Technology	GNSS L1 & L2 & L5 & L6	GNSS L1	GNSS L1	GNSS L1 & L2 & L5 & L6
Cable Length (mm)	100	100	100	115
Connector Type	IPEX I	IPEX I	RF I	RF I
Mounting Type	Adhesive	Adhesive	Adhesive	Adhesive
Dimensions (mm)	74.56 × 24.5 × 0.25	61.15 × 11.24	39.45 × 13.25 × 0.13	43 × 24 × 0.12
Matched Quectel Modules	GNSS L1/L5 module series	GNSS L1 module series		GNSS L1/L5 modules

The parameters shall be subject to the Specification.


# GNSS Antennas

Product	YG0035AA	YEGM007AA	YEGM007BA	YEGS001AA	YEGM008AA	YB0017AA
						
Frequency Bands (MHz)	1561, 1575	1560-1580	1570-1610	1557-1606	1575 ±5, 1602 ±5	GPS L1/L5, BD B1/B2, GLONASS L1
Technology	GNSS L1 & B1 & G1 (active)	GNSS L1 & B1 (active)	GNSS L1 & G1 (active)	GNSS L1 (active)	GNSS	GNSS L1 & L5 (active)
Cable Length (mm)	3000	3000	3000	600	3000	3000
Connector Type	SMA Male (center pin)	SMA	SMA	N-Type Male	FAKRA C (Female)	SMA Male (center pin)
Mounting Type	Magnetic	Adhesive	Adhesive	Screw	Adhesive	Magnetic
Dimensions (mm)	50.3 × 38.4 × 17.1	38.6 × 50.9 × 17	38.6 × 50.9 × 17	∅ 85 × 25	50.4 × 38.3 × 18.2	61.5 × 56.5 × 23
Matched Quectel Modules	GNSS L1 module series					GNSS L1/L5 module series

Product	YG0063AA	YEGM011AA	YEGM011BA	YEGT001BA	YEGT002BA
					
Frequency Bands (MHz)	GPS L1/L2/L5; BDS B1/B2/B3; GLONASS L1/L2; Galileo E1/E5a/E5b/E6; L-band Corrections (active)	1166-1227, 1559-1606	1166-1227, 1559-1606	1561 ±5, 1575 ±5, 1602 ±5	1561 ±5, 1575 ±5, 1602 ±5
Technology	All GNSS bands + L-band Corrections (active)	GPS L1/L2/L5, BDS B1/B2, GLONASS G1 (active)	GPS L1/L2/L5, BDS B1/B2, GLONASS G1 (active)	GNSS L1	GNSS L1
Cable Length (mm)	n/a	4000	4000	n/a	n/a
Connector Type	TNC Female	Antenna: TNC Female, Cable: SMA to TNC Male	Antenna: TNC Female, Cable: SMA to TNC Male	SMA Male (center pin)	SMA Male (center pin)
Mounting Type	Screw	Thread and Magnet	Thread and Magnet	Terminal	Terminal
Dimensions (mm)	∅ 165 × 68	∅ 146.4 × 65	∅ 146.4 × 65	50 × 16.4	52 × ∅10.5
Matched Quectel Modules	/	GNSS L1/L2/L5 module series		All GNSS L1 modules	

# Wi-Fi & Bluetooth Antennas

Product	YC0009AA	YC0010AA	YXU00A0AA	YEW001AA
				
Frequency Bands (MHz)	2400-2500	2400-2500	2400-2500, 5150-7150	2400-2500
Technology	Wi-Fi (Bluetooth)	Wi-Fi (Bluetooth)	Wi-Fi (Bluetooth)	Wi-Fi (Bluetooth)
Cable Length (mm)	n/a	n/a	n/a	1500
Connector Type	n/a	n/a	n/a	SMA Male (center pin)
Mounting Type	SMD	SMD	SMD	Magnetic
Dimensions (mm)	3.2 × 1.6 × 0.5	5.2 × 2.0 × 1.2	8.0 × 6.6 × 1.6	∅ 30 × 77.4
Matched Quectel Modules	FC30R		All Wi-Fi/BT modules	FC30R






Product	YF0011AA	YF0026AA	YF0027AA	YF0029AA	YF0023AA	YF0023CA
						
Frequency Bands (MHz)	2400-2500, 5150-5850	2400-2500, 5150-5850, 5925-7125	2400-2500, 5150-5850, 5925-7125	2400-2500, 5150-5850, 5925-7125	2400-2500, 4900-5850, 5925-7125	2400-2500, 4900-5850, 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	100	100	100	100	100
Connector Type	UFL	IPEX MHF I	IPEX MHF I	IPEX MHF I	RF I	RF I
Mounting Type	Adhesive	Adhesive	Adhesive	Adhesive	Adhesive	Adhesive
Dimensions (mm)	38.9 × 9 × 0.12	28.9 × 11 × 0.12	38 × 7 × 0.12	29.98 × 30.85 × 0.12	22.9 × 11.7	37.8 × 7.5
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	

The parameters shall be subject to the Specification.

# Wi-Fi & Bluetooth Antennas

Product	YE0031BA	YE0032BA	YEWTO04AA	YEWNO01AA
				
Frequency Bands (MHz)	2400-2500, 5000-5800	2400-2500, 5000-5800	2400-2500, 5150-7150	2400-2500, 5150-5850
Technology	Wi-Fi (Bluetooth)	Wi-Fi (Bluetooth)	Wi-Fi 6E (Bluetooth)	Wi-Fi (Bluetooth)
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)	RP-SMA Male (inside hole of internal thread)
Mounting Type	Terminal	Terminal	Terminal	Terminal
Dimensions (mm)	52 x $\Phi$ 10.5	50 x 17 x 10.5	109 x $\Phi$ 10	$\Phi$ 13 x 200
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	YB0014AA	YW000A0AA	YB0032AA
					
Frequency Bands (MHz)	700-960, 1710-2690, 3300-5000	4G MAIN: 698-1000, 1700-2700; GNSS: 1575.42 $\pm$ 5, 1561.098 $\pm$ 5; 4G DIV: 698-1000, 1700-2700	4G: 698-1000, 1700-2700; 4G DIV: 698-1000, 1700-2700; GNSS: 1561.098 $\pm$ 3, 1575.42 $\pm$ 3	698-960, 1710-2690	700-2700
Technology	5G & GNSS	Main LTE & DIV LTE & GNSS	Main LTE & DIV LTE & GNSS	LTE MIMO	Main LTE & DIV LTE
Cable Length (mm)	500	300	3000	1500	2000
Connector Type	SMA Male (center pin)	SMA Male (center pin)	SMA Male (center pin)	SMA Male (center pin)	SMA Male (Center Pin)
Mounting Type	Screw	Adhesive	Screw	Screw	Screw
Dimensions (mm)	$\Phi$ 120 x 43	$\Phi$ 84 x 17.5	81 x 14.5	$\Phi$ 81 x 27.5	$\Phi$ 120 x 43
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		All 4G/3G/2G modules	

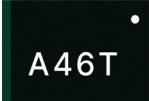
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Frequency Bands (MHz)	LTE Main & Div: 700-960, 1700-2700; GNSS: 1559-1610 (active)	LTE: 698-960; 1710-2690; GNSS: 1575.42 $\pm$ 5, 1561.098 $\pm$ 5	GPS L1/L5, BD B1/B2, GLONASS L1	600-6000	1575.42, 2400-2500	1575.42, 2400-2500, 5150-5850
Technology	Main LTE & DIV LTE & GNSS	LTE & GNSS	LTE & GNSS	4G & 5G	GNSS & WiFi	GNSS & WiFi
Cable Length (mm)	2000	300	3000	150	n/a	n/a
Connector Type	SMA Male (Center Pin)	SMA Male (center pin)	4G: FAKRA D; GNSS: FAKRA C	IPEX I	n/a	n/a
Mounting Type	Screw	Adhesive	Adhesive	Adhesive	SMD	SMD
Dimensions (mm)	$\Phi$ 120 x 43	$\Phi$ 84 x 17.5	$\Phi$ 84 x 17.5	237 x 22	3.2 x 1.6 x 0.5	3.2 x 1.6 x 0.5
Matched Quectel Modules	4G/3G/2G modules & GNSS L1 modules			5G/4G/3G/2G/LPWA	Wi-Fi module & GNSS L1	

Product	YB0015AA	YB0022AA	YB0026AA	YEMA004AA	YEWNO04AA	YFWO001AA
						
Frequency Bands (MHz)	LTE: 698-960, 1700-2700; Wi-Fi, Bluetooth: 2400-2500; GNSS: 1561 $\pm$ 5, 1575 $\pm$ 5	LTE Main & Div: 700-2700; Wi-Fi: 2400-5850; GNSS: 1561/1575.42/1602	LTE: 700-2700; Wi-Fi: 2400-5850; GNSS: 1561/1575.42/1602	4G: 698-960, 1710-2690; Wi-Fi & Bluetooth: 2400-2500	2400-2500, 5150-5850	2400-2500, 5150-7150
Technology	LTE/GPS & BD/Wi-Fi	Main LTE & DIV LTE & GNSS & Wi-Fi1 & Wi-Fi2	LTE & GNSS & Wi-Fi1 & Wi-Fi2	LTE & Wi-Fi	Wi-Fi MIMO	Wi-Fi/Bluetooth
Cable Length (mm)	300	1000	1000	900	300	100
Connector Type	SMA Male (center pin)	FME Female Connector	GNSS: FAKRA_C, LTE: FAKRA_D, Wi-Fi 1: FAKRA_I, Wi-Fi 2: FAKRA_I	SMA Male (center pin)	SMA Male (center pin)	IPEX I
Mounting Type	Screw	Screw	Screw	Screw	Screw	Adhesive
Dimensions (mm)	54 x 91	$\Phi$ 120 x 43	$\Phi$ 120 x 43	$\Phi$ 81 x 14.5	$\Phi$ 46 x 15	78.6 x 21.4
Matched Quectel Modules	4G/3G/2G modules & GNSS L1 modules & Wi-Fi, Bluetooth modules			All 4G/3G/2G modules & Wi-Fi modules	Wi-Fi modules	All Wi-Fi/BT modules









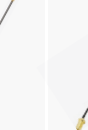
The parameters shall be subject to the Specification.



Product	YE0019AA	YE0039BA	YEIM001AA	YFOA004AA	YCIS003AA	YCIS002AA	YCIS001AA
							
Frequency Bands (MHz)	450-470	430-470, 790-960	465-475	410-470	902-928	863-870	863-870
Technology	ISM	ISM	ISM	ISM	ISM	ISM	ISM
Cable Length (mm)	/	75	2000	n/a	n/a	n/a	n/a
Connector Type	SMA Male (center pin)	SMA Male (center pin)	SMA Male (center pin)	IPEX MHF 1	n/a	n/a	n/a
Mounting Type	Terminal	Adhesive	Magnetic	Adhesive	SMD	SMD	SMD
Dimensions (mm)	109 × 10	117 × 21.81 × 5.47	Ø 30 × 131	100 × 20	10 × 3.2 × 0.5	10 × 3.2 × 0.5	5.0 × 3.0 × 0.5

## Tuner

Product	YSOS001AA
	
Frequency Bands (MHz)	≥ 0.1 GHz
Technology	tuner
Cable Length (mm)	n/a
Connector Type	n/a
Mounting Type	SMD
Dimensions (mm)	1.1 × 1.5
Matched Quectel Modules	Consult with Quectel for module information

## Cable Assemblies

Product	YM0003AA	YM0015AA	YM0003CA	YM0003AB	YM0013AA	YSAN025AA	YSAN026AA	YSAN027AA	YSAN028AA
									
Frequency Bands (MHz)	0-6000	0-6000	0-6000	0-6000	0-6000	0-6000	0-6000	0-6000	0-6000
Technology	Cable	Cable	Cable	Cable	Cable	Cable	Cable	Cable	Cable
Cable Length (mm)	100	150	200	200	300	100	100	100	100
Connector Type	SMA female to IPEX I	SMA female to IPEX I	SMA female to IPEX I	RP SMA female to IPEX I	SMA female to IPEX I	SMA Female to IPEX I(waterproof)	RP SMA Female to IPEX I(waterproof)	SMA Female to IPEX IV(waterproof)	RP SMA Female to IPEX IV(waterproof)
Mounting Type	Screw	Screw	Screw	Screw	Screw	screw	screw	screw	screw
Dimensions (mm)	100	150	200	200	300	100	100	100	100

Product	YSAN027FA	YSAN028FA	YM0004AA	YSAN001AA	YBY00A0HA	YBY00A0JA	YSAO001AA	YSAO002AA	YBY00A0IA
									
Frequency Bands (MHz)	0-6000	0-6000	0-6000	0-6000	0-6000	0-6000	DC-6000	DC-6000	n/a
Technology	Cable	Cable	Cable	Cable	Cable	Cable	Cable	Cable	Bracket
Cable Length (mm)	150	100	100	300	200	250	100	100	n/a
Connector Type	SMA Female to IPEX IV	RP SMA Female to IPEX IV	SMA female to IPEX IV	SMA female to RF IV	N-K-female to RF1	N-female to RF IV	FAKRA-D(Purple) to U.FL 1	FAKRA-C(Blue) to U.FL 1	n/a
Mounting Type	Screw	Screw	Screw	Screw	Screw	Screw	Fakra D to U.FL I	Fakra C to U.FL I	n/a
Dimensions (mm)	150	100	100	300	200	250	Ø1.13	Ø1.13	80 × 60 × 80

The parameters shall be subject to the Specification.

**Europe**

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

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

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 Vancouver, B.C

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



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**South Africa:** Gauteng/Johannesburg

**Asia Pacific**

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**India:** Bangalore/Delhi/Hyderabad/Mumbai  
**Indonesia:** Bandung/Jakarta  
**Japan:** Tokyo  
**Korea:** Seoul  
**Malaysia:** Penang  
**Pakistan:** Lahore  
**Philippines:** Manila/Pasay City  
**Singapore**  
**Thailand:** Bangkok/Samutprakarn  
**Vietnam:** Hanoi/HoChiMinh City

**Latin America**

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

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

**Overseas**

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

**Headquarters**

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

**Hefei R&D Center**

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

**Vancouver R&D Center**

10551 Shellbridge Way, Richmond, British Columbia,  
 BC V6X 2W9, Canada  
 Tel: +1 604 370 8741

**Shanghai R&D Center**

Building 13, Shanghai Business Park Phase III (Area B),  
 No.1036 Tianlin Road, Minhang District, Shanghai 200233, China  
 Tel: +86 21 5108 6236

**Foshan R&D Center**

Floor 9-10, Building 2, Sanshan Science and Technology Innovation Center,  
 No. 12 Gangkou Road, Sanshan New City, Guicheng Street, Nanhai District, Foshan,  
 Guangdong 528000, China  
 Tel: +86 757 6663 6236

**Belgrade R&D Center**

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

**Guilin R&D Center**

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

**Wuhan R&D Center**

Room 02, Floor 20, Optics Valley Innovation Harbour, No.55 Jiayuan Road,  
 East Lake High-tech Development Zone, Wuhan, Hubei 430074, China

**Penang R&D Center**

L3A-2, Level 3A, SPICE Arena 180, Jalan Tun Dr. Awang Relau BAYAN LEPAS  
 11900 Malaysia