Quectel EM060K Series

LTE-A Cat 6 M.2 Module

42.0 mm

EM060K-XX Q1-CXXXX
XX EM060KXXXX-XXX-XXXXX

SN:XXXXXXXXXXXXXX
IMEI:XXXXXXXXXXXXX

30.0 mm **2.3 mm**
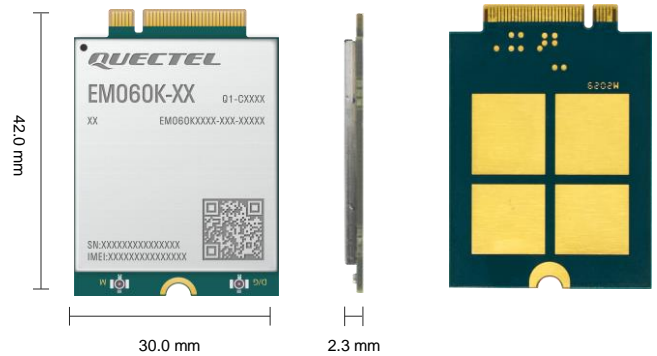
Quectel EM060K is a series of LTE Advanced Category 6 module. Adopting the 3GPP Release 12 technology, the module supports a theoretical peak data rate of 300 Mbps in the downlink and a theoretical peak data rate of 50 Mbps in the uplink. Designed in M.2 form factor, the module is compatible with Quectel LTE-A Cat 6 module EM06 Series, Cat 12 modules EM12-G/ EM120K-GL/ EM121R-GL/ EM120R-GL, Cat 16 module EM160R-GL, and 5G modules RM500Q/ RM502Q Series, which facilitates customers' migration between different modules. EM060K series contains 3 variants: EM060K-GL, EM060K-NA, and EM060K-EA.

EM060K series is designed for the global market and nearly covers all the mainstream carriers worldwide. The module is embedded with a multi-constellation and high-sensitivity GNSS (GPS, GLONASS, BDS, Galileo and QZSS) receiver for positioning. The integrated GNSS greatly simplifies product design, and provides quicker, more accurate and more dependable positioning capability.

A rich set of Internet protocols, industry-standard interfaces and abundant functionalities (USB drivers for Windows, Linux, Android/ optional built-in eSIM) extend the applicability of the module to a wide range of applications such as industrial routers, home gateways, set-top boxes, industrial laptops, consumer laptops, industrial PDAs, rugged tablet PCs, and digital signage, etc.

Key Features

- ✔ LTE-A Cat 6 module with M.2 form factor
- ✔ Support DL 2 Carrier Aggregation and 64QAM
- ✔ Worldwide LTE-A and UMTS/ HSPA+ coverage
- ✔ Built-in eSIM (optional), DSSS (Dual SIM Single Standby)
- ✔ Low power mode
- ✔ Multi-constellation GNSS receiver available for applications requiring fast and accurate fixes in any environment
- ✔ MIMO technology meets demands for data rate and link reliability in modem wireless communication systems

4G LTE Max. 300 Mbps (DL) Max. 50 Mbps (UL)	**3G HSPA+** Max. 42 Mbps (DL) Max. 5.76 Mbps (UL)	**M.2** M.2 Form Factor
Embedded Abundant Protocols	**PCIe** PCIe Gen2 Interface	Multi-constellation GNSS (Optional)
USB 2.0/ 3.0 Interface	**AT** Quectel Enhanced AT Commands	

Version: 1.5 | Status: Released

LTE Cat 6		EM060K-GL	EM060K-NA	EM060K-EA
Region/Operator		Global	North America	EMEA/ APAC①/ Brazil
Package		M.2 Package, Key-B	M.2 Package, Key-B	M.2 Package, Key-B
Dimensions (mm)		30.0 × 42.0 × 2.3	30.0 × 42.0 × 2.3	30.0 × 42.0 × 2.3
Weight (g)		6.2	6.2	6.2
Temperature Range				
Operating Temperature		-25 °C to +75 °C	-25 °C to +75 °C	-25 °C to +75 °C
Extended Temperature		-40 °C to +85 °C	-40 °C to +85 °C	-40 °C to +85 °C
Frequency Bands				
LTE	**LTE-FDD**	B1/ 2/ 3/ 4/ 5/ 7/ 8/ 12/ 13/ 14/ 17②/ 18/ 19/ 20/ 25/ 26/ 28/ 29③/ 30/ 32③/ 66/ 71	B2/ 4/ 5/ 7/ 12/ 13/ 14/ 17②/ 25/ 26/ 29③/ 30/ 66/ 71	B1/ 3/ 5/ 7/ 8/ 20/ 28/ 32③
	LTE-TDD	B34/ 38/ 39/ 40/ 41/ 42/ 43/ 46③ (LAA)/ 48 (CBRS)	B41/ 42/ 43/ 48	B38/ 40/ 41
	DL 2CA	Intra-band and Inter-band	Intra-band and Inter-band	Intra-band and Inter-band
	DL 64QAM/ UL 16QAM	●	●	●
UMTS	**WCDMA**	B1/ 2/ 3/ 4/ 5/ 6/ 8/ 19	-	B1/ 3/ 5/ 8
GNSS (Optional)		GPS/ GLONASS/ BDS/ Galileo/ QZSS	GPS/ GLONASS/ BDS/ Galileo/ QZSS	GPS/ GLONASS/ BDS/ Galileo/ QZSS
Certifications				
Regulatory		**Global:** GCF **Europe:** CE **North America:** PTCRB **America:** FCC **Canada:** IC **Taiwan, China:** NCC **Japan:** JATE/ TELEC **Australia/ New Zealand:** RCM	**Global:** GCF **America:** FCC **North America:** PTCRB **Canada:** IC	**Global:** GCF **Europe:** CE **Australia/ New Zealand:** RCM **Taiwan, China:** NCC
Carrier		**Europe:** Vodafone/ Deutsche Telekom/ Swisscom/ Telefonica **France:** Orange **America:** Verizon/AT&T/ T-Mobile **Japan:** NTT DOCOMO/ KDDI **Australia:** Telstra **British:** British Telecom	**America:** Verizon/ AT&T/ T-Mobile	**Australia:** Telstra
Others		WHQL	TBD	TBD
Data Rate (Max.)				
LTE (Mbps)		300 (DL)/ 50 (UL)	300 (DL)/ 50 (UL)	300 (DL)/ 50 (UL)
UMTS	**DC-HSDPA (Mbps)**	42 (DL)	-	42 (DL)
	HSUPA (Mbps)	5.76 (UL)	-	5.76 (UL)
	WCDMA (kbps)	384 (DL)/ 384 (UL)	-	384 (DL)/ 384 (UL)
Interfaces				
(U)SIM (1.8/ 3.0 V)		× 2	× 2	× 2
USB 2.0/ 3.0		× 1	× 1	× 1
PCIe (Optional)		× 1 (RC mode*: PCIe Gen 2, for Wi-Fi, ethernet functions)	× 1 (RC mode*: PCIe Gen 2, for Wi-Fi, ethernet functions)	× 1 (RC mode*: PCIe Gen 2, for Wi-Fi, ethernet functions)
PCM*		× 1	× 1	× 1

Note:
1. ①: Excl. China/ Japan.
2. ②: B17 is supported through MFBI + B12.
3. ③: LTE-FDD B29/ B32 and LTE-TDD B46 support Rx only and are only for secondary component carrier.
4. ●: Supported
5. TBD: To Be Determined.
6. *: Under development/ In progress.

QUECTEL

Quectel EM060K Series

LTE Cat 6	EM060K-GL	EM060K-NA	EM060K-EA
Control and Indication Interfaces*	× 6 (Airplane mode control, GNSS control, wake-up control, RF status indication, dynamic power reduction and self-protection of QLN control.)	× 5 (Airplane mode control, GNSS control, wake-up control, RF status indication and dynamic power reduction.)	× 5 (Airplane mode control, GNSS control, wake-up control, RF status indication and dynamic power reduction.)
Cellular/ WLAN COEX Interface*	× 1	× 1	× 1
Antenna Tuner Control Interfaces*	× 2	× 2	× 2
Configuration Pins	× 4	× 4	× 4
Antenna Interfaces	× 2 (Main, Rx-diversity/ GNSS)	× 3 (Main, Rx-diversity, GNSS)	× 3 (Main, Rx-diversity, GNSS)
Enhanced Features			
MIMO: DL 2 × 2	●	●	●
(U)SIM Card Detection & Hot-plug detect	●	●	●
Built-in eSIM	○	○	○
DSSA: Dual SIM, Single Active	●	●	●
DFOTA: Delta Firmware Over-the-Air	●	●	●
Embedded GNSS	○	○	○
SMS			
Point-to-point MO and MT	●	●	●
SMS Cell Broadcast	●	●	●
Text and PDU Mode	●	●	●
3GPP	●	●	●
Windows OS SMS Push Feature	●	●	●
Software Features			
3GPP	3GPP E-UTRA Release 12	3GPP E-UTRA Release 12	3GPP E-UTRA Release 12
AT Command	3GPP TS 27.007; Quectel Enhanced AT Commands	3GPP TS 27.007; Quectel Enhanced AT Commands	3GPP TS 27.007; Quectel Enhanced AT Commands
Protocols	QMI/ MBIM/ NITZ/ HTTP/ HTTPS/ FTP/ LwM2M/ PING	QMI/ MBIM/ NITZ/ HTTP/ HTTPS/ FTP/ LwM2M/ PING	QMI/ MBIM/ NITZ/ HTTP/ HTTPS/ FTP/ LwM2M/ PING
Electrical Features			
Supply Voltage Range	3.135–4.4 V, typ. 3.7 V	3.135–4.4 V, typ. 3.7 V	3.135–4.4 V, typ. 3.7 V
Transmitting Power (USB Mode)	LTE-FDD: Class 3 (23 dBm ±2 dB) LTE-TDD: Class 3 (23 dBm ±2 dB) WCDMA: Class 3 (23 dBm ±2 dB)	LTE-FDD: Class 3 (23 dBm ±2 dB) LTE-TDD: Class 3 (23 dBm ±2 dB)	LTE-FDD: Class 3 (23 dBm ±2 dB) LTE-TDD: Class 3 (23 dBm ±2 dB) WCDMA: Class 3 (23 dBm ±2 dB)
Power Consumption (USB Mode)	Power down: 0.07 mA; Sleep: 3.47 mA; Idle: 38 mA	Power down: 0.07 mA; Sleep: 3.31 mA; Idle: 38 mA	Power down: 0.064 mA; Sleep: 3.42 mA; Idle: 40.10 mA

Note:
1. ●: Supported; ○: Optional.
2. *: Under development/ In progress.

QUECTEL