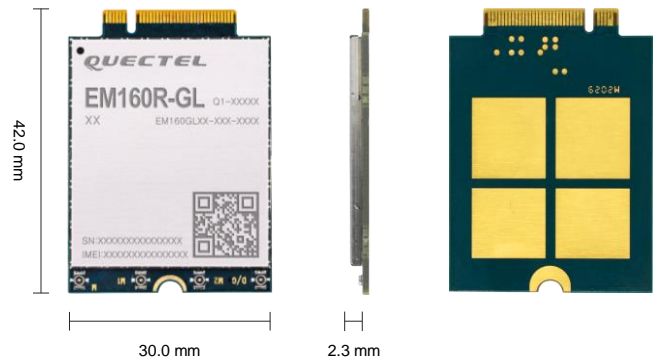




# Quectel EM160R-GL

## LTE-A Cat 16 M.2 Module



Quectel EM160R-GL is an LTE Advanced Category 16 module. Adopting the 3GPP Release 14 technology, it supports a theoretical downlink peak data rate of 1.0 Gbps and a theoretical uplink peak data rate of 150 Mbps. Designed in M.2 form factor, the module is compatible with Quectel LTE-A Cat 6 module EM06, Cat 12 modules EM12-G/EM120R-GL/EM121R-GL, which facilitates customers' migration between different modules.

EM160R-GL is designed for global market and nearly covers all the mainstream carriers worldwide. The module supports Qualcomm® IZat™ location technology Gen9-VT (GPS, GLONASS, BeiDou/Compass and Galileo). 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 (PCIe interface/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 router, home gateway, STB, industrial laptop, consumer laptop, industrial PDA, rugged tablet PC, and digital signage, etc.



### Key Features

- ✓ LTE-A Cat 16 module with M.2 form factor
- ✓ Support DL 5 Carrier Aggregation and 256QAM
- ✓ Worldwide LTE-A and UMTS/HSPA+ coverage
- ✓ Support PCIe Gen2 interface for PC/Laptop application
- ✓ Built-in eSIM (optional), DSSA
- ✓ 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



DL: LTE Cat 16  
UL: LTE Cat 13



Max. 42 Mbps (DL)  
Max. 5.76 Mbps (UL)



M.2 Form Factor



Embedded Abundant Protocols



PCIe Gen2 Interface



Multi-constellation GNSS



USB 2.0/3.0 High Speed Interface



Quectel Enhanced AT Commands

# Quectel EM160R-GL

LTE Cat 16		EM160R-GL
Region/Operator		Global
Package		M.2 Package, Key-B
Dimensions		42.0 mm × 30.0 mm × 2.3 mm
Weight		6.8 g
Temperature Range		
Operation Temperature		-25 °C to +75 °C
Extended Temperature		-40 °C to +85 °C
Frequency Bands		
LTE	LTE-FDD	B1/B2/B3/B4/B5/B7/B8/B12/B13/B14/B17/B18/B19/B20/B25/B26/B28/B29 <sup>①</sup> /B30/B32 <sup>①</sup> /B66
	LTE-TDD	B38/B39/B40/B41/B42/B43/B46 <sup>①</sup> (LAA)/B48 (CBRS)
	DL 2CA	Intra-band and Inter-band
	DL 3CA	Intra-band and Inter-band
	DL 4CA	Intra-band and Inter-band
	DL 5CA	Intra-band and Inter-band within 5 bands
	DL 4 × 4 MIMO	B1/B2/B3/B4/B7/B25/B30/B32 <sup>①</sup> /B38/B39/B40/B41/B66
	DL 256QAM	Supported
	UL 2CA	Intra-band
	UL 64QAM	Supported
UMTS	WCDMA	B1/B2/B3/B4/B5/B6/B8/B19
GNSS		GPS/GLONASS/BeiDou(COMPASS)/Galileo
Certifications		
Regulatory	Global: GCF	
	Europe: CE	
	North America: PTCRB	
	America: FCC	
	Canada: IC	
	Brazil: Anatel	
	Mexico: IFETEL	
	China: SRRC/ NAL/ CCC	
	Taiwan, China: NCC	
	South Korea: KC	
Japan: JATE/ TELEC		
Australia/New Zealand: RCM		
South Africa: ICASA		
Carrier	Europe: Vodafone/ British Telecom/ Swisscom	
	America: Verizon/ AT&T/ T-Mobile/ Sprint	
	China: China Mobile/ China Unicom	
	Japan: NTT DOCOMO/ SoftBank <sup>②</sup> / KDDI	
Australia: Telstra <sup>TBD</sup>		
Others*		WHQL
Data Rate (Max.)		
LTE	1.0 Gbps (DL); 150 Mbps (UL)	
	DC-HSDPA	42 Mbps (DL)
UMTS	DC-HSUPA	5.76Mbps (UL)
	WCDMA	384 kbps (DL); 384 kbps (UL)
Enhanced Features		
MIMO: DL 4 × 4, 4 × 2, 2 × 2		●
(U)SIM Card Detection & Hot Plug		●
Built-in eSIM		○
DSSA: Dual SIM, Single Active		●
DFOTA: Delta Firmware Over-the-Air		●
Embedded GNSS		●

## Notes:

- ①: For secondary component carrier only.
- ②: Currently, SoftBank certification is only supported for PC applications.
- \*: Under development/In progress.
- : Supported; ○: Optional.

# Quectel EM160R-GL

LTE Cat 16	EM160R-GL	
<b>SMS</b>		
Point-to-point MO and MT	•	
SMS Cell Broadcast	•	
Text and PDU Mode	•	
3GPP/3GPP2	•	
Windows OS SMS Push Feature	•	
<b>Software Features</b>		
3GPP	3GPP E-UTRA Release 14	
AT Command	3GPP TS27.007 Quectel Enhanced AT Commands	
Protocols	QMI/ MBIM/ NITZ/ PING/ HTTP/ HTTPS	
<b>Drivers</b>	<b>MBIM Driver</b>	Windows 10
	<b>USB Serial Driver</b>	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/10.x
	<b>RIL Driver</b>	Android 4.x/5.x/6.x/7.x/8.x/9.x/10.x
	<b>NDIS Driver</b>	Windows 7/8/8.1/10
	<b>ECM Driver*</b>	Linux 2.6/3.x/4.x/5.x
	<b>Gobinet Driver</b>	Linux 2.6/3.x/4.x/5.x
	<b>QMI_WWAN Driver</b>	3.x (3.4 or later)/ 4.x/5.x
	<b>PCIe MHI Driver</b>	Windows 10 Linux 3.10–5. 10
<b>Interfaces</b>		
(U)SIM Interfaces (1.8/3.0 V)	× 2	
USB 2.0/3.0, supporting Slave Mode	× 1	
PCIe Interface	× 1	
PCM*	× 1	
Control and Indication Interfaces*	× 7 (Airplane mode control, GNSS control, Wake-up control*, RF status indication, etc.)	
Cellular/WLAN COEX UART Interface*	× 1	
Antenna Tuner Control Interfaces*	× 2	
Configuration Pins	× 4	
Antenna Interfaces	× 4 (Main, Rx-diversity/GNSS, MIMO1, MIMO2)	
<b>Electrical Features</b>		
Supply Voltage Range	3.135–4.4 V, typ. 3.7 V	
<b>Transmitting Power</b>	<b>USB Mode</b>	
	<ul style="list-style-type: none"> <li>LTE-FDD: Class 3 (23 dBm ±2 dB)</li> <li>LTE-TDD: <ul style="list-style-type: none"> <li>B41 HPUE: Class 2 (25.5 dBm +1/-2 dB)</li> <li>Other bands: Class 3 (23 dBm ±2 dB)</li> </ul> </li> <li>WCDMA: Class 3 (24 dBm +1/-3 dB)</li> </ul> <b>PCIe Only Mode</b> <ul style="list-style-type: none"> <li>LTE-FDD: <ul style="list-style-type: none"> <li>B30: Class 3 (22 dBm +1/-2 dB)</li> <li>Other bands: Class 3 (24 dBm +1/-2 dB)</li> </ul> </li> <li>LTE-TDD: <ul style="list-style-type: none"> <li>B41: Class 3 (23 dBm +1/-2 dB)</li> <li>B42/B43/B48: Class 3 (21 dBm +1/-2 dB)</li> <li>B41 HPUE: Class 2 (25.5 dBm +1/-2 dB)</li> <li>Other bands: Class 3 (24 dBm +1/-2 dB)</li> </ul> </li> <li>WCDMA: Class 3 (24 dBm +1/-3 dB)</li> </ul>	
<b>Power Consumption</b>	<b>USB Mode</b>	
	66 µA @ Power down 1.78 mA @ Sleep (AT+CFUN=0, USB Suspend) 24.75 mA @ Idle (PF = 64, USB Active) <b>PCIe Only Mode</b> 66 µA @ Power down 2.38 mA @ Sleep (AT+CFUN=0, Modern standby) 15.38 mA @ Idle (PF = 64, PCIe Active)	

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