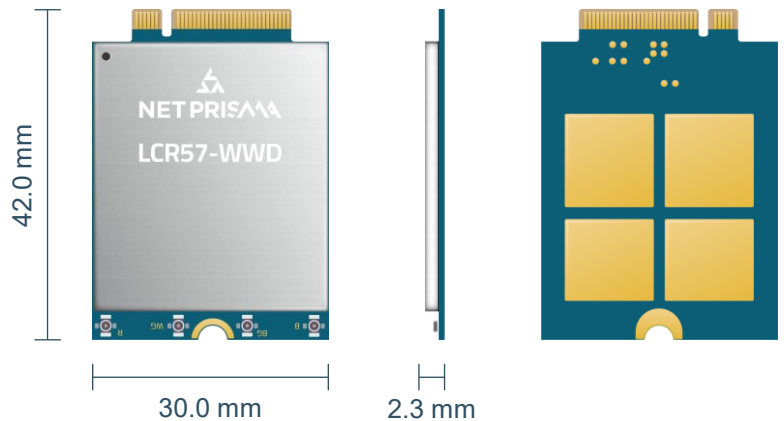# LCR57-WWD

LTE-A Cat 16
M.2 Module

42.0 mm

30.0 mm

2.3 mm

Product 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

LCR57-WWD 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 facilitates customers' migration between different modules.

LCR57-WWD is designed for global market and nearly covers all the mainstream carriers worldwide. The module supports Qualcomm® IZat^{TM} location technology Gen9-VT (GPS, GLONASS, BDS 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 suitability 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.

4G	DL: LTE Cat 16 UL: LTE Cat 13	**3G**	DL: max. 42 Mbps UL: max. 5.76 Mbps		M.2 form factor
	Embedded abundant protocols		PCIe Gen2 interface		Multi-constellation GNSS (optional)
	USB 2.0 high speed interface		Enhanced AT commands		

Version: 1.0.0
Status: Preliminary

LCR57-WWD

Mechanical Data

Region/operator	Global
Package	M.2 Package, Key-B
Dimensions (mm)	30.0 × 42.0 × 2.3
Weight (g)	6.8

Temperature Range

Operating temperature	-25 °C to +75 °C
Extended temperature	-40 °C to +85 °C

Frequency Bands

LTE	**LTE-FDD:** B1/ 2/ 3/ 4/ 5/ 7/ 8/ 12/ 13/ 14/ 18/ 19/ 20/ 25/ 26/ 28/ 29[1]/ 30/ 32[1]/ 66 **LTE-TDD:** B38/ 39/ 40/ 41/ 42/ 43/ 46[1] (LAA)/ 48 (CBRS) **DL 2/ 3/ 4CA:** intra-band and inter-band **DL 5CA:** intra-band and inter-band within 5 bands **UL 2CA:** intra-band **DL 4 × 4 MIMO:** B1/ 2/ 3/ 4/ 7/ 25/ 30/ 32[1]/ 38/ 39/ 40/ 41/ 66 **QAM:** DL 256QAM/UL 64QAM
UMTS	**WCDMA:** B1/ 2/ 3/ 4/ 5/ 6/ 8/ 19
GNSS	GPS/GLONASS/BDS/Galileo (optional)

Data Transmission

LTE data rate		Max. 1.0 Gbps (DL)/ 150 Mbps (UL)
UMTS data rate	**DC-HSDPA**	Max. 42 Mbps (DL)
	HSUPA	Max. 5.76 Mbps (UL)
	WCDMA	Max. 384 kbps (DL/UL)

Interfaces

(U)SIM interfaces (1.8/3.0 V)	× 2
USB 2.0/3.0	× 1 (Supporting slave mode)
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

SMS

Short Message Service	Point-to-point MO/MT SMS cell broadcast Text and PDU mode 3GPP/3GPP2 Windows OS SMS push feature

Enhanced Features

MIMO	DL 4 × 4, 4 × 2, and 2 × 2
USIM detection & hot plug	Supported
Built-in eSIM	Optional
DSSA (Dual SIM, Single Active)	Supported
DFOTA (Delta Firmware Over-the-Air)	Supported
Embedded GNSS	Optional

Software Features

Protocols	QMI/ MBIM/ NITZ/ PING/ HTTP/ HTTPS
3GPP	3GPP E-UTRA Release 14
MBIM driver	Windows 10
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/10.x
RIL driver	Android 4.x/5.x/6.x/7.x/8.x/9.x/10.x
NDIS driver	Windows 7/8/8.1/10
ECM driver*	Linux 2.6/3.x/4.x/5.x
Gobinet driver	Linux 2.6/3.x/4.x/5.x
QMI_WWAN driver	3.x (3.4 or later)/ 4.x/5.x
PCIE MHI driver	Windows 10 Linux 3.10–5. 10

Certifications

Carrier*	**Europe:** Vodafone/ British Telecom/ Swisscom **America:** Verizon/ AT&T/ T-Mobile/ Sprint **China:** China Mobile/ China Unicom **Japan:** NTT DOCOMO/ SoftBank/ KDDI **Australia:** Telstra
Regulatory*	GCF/ CE/ PTCRB/ FCC/ IC/ Anatel/ IFETEL/ SRRC/ NAL/ CCC/ NCC/ KC/ JATE/ TELEC/ RCM/ ICASA/
Others*	WHQL

Electrical Features

Supply voltage (V)	3.135–4.4, typ. 3.3
Max output power @ USB mode	**LTE-FDD:** Class 3 (23 dBm ±2 dB) **LTE-TDD:** B41 HPUE: Class 2 (25.5 dBm +1/-2 dB) Other bands: Class 3 (23 dBm ±2 dB) **WCDMA:** Class 3 (24 dBm +1/-3 dB)
Max output power @ PCIe-only mode	**LTE-FDD:** B30: Class 3 (22 dBm +1/-2 dB) Other bands: Class 3 (24 dBm +1/-2 dB) **LTE-TDD:** B41: Class 3 (23 dBm +1/-2 dB) B42/ 43/ 48: Class 3 (21 dBm +1/-2 dB) B41 HPUE: Class 2 (25.5 dBm +1/-2 dB) Other bands: Class 3 (24 dBm +1/-2 dB) **WCDMA:** Class 3 (24 dBm +1/-3 dB)
Power consumption @ USB mode	66 µA @ power down 1.78 mA @ sleep (AT+CFUN=0, USB suspend) 24.75 mA @ idle (PF = 64, USB active)
Power consumption @ PCIe-only mode	66 µA @ power down 2.38 mA @ sleep (AT+CFUN=0, modern standby) 15.38 mA @ idle (PF = 64, PCIe active)

[1]: For secondary component carrier only.

*: Under development/In progress.