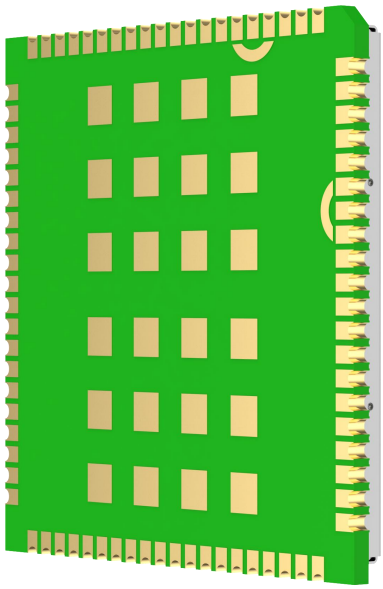
Private Network Expert

UNI450

ML661 410/450MHz

LTE
LTE-M
NB-IoT
Tri-Mode Module

Powered by GCT Semiconductor's 3rd-generation 4G modem chipset GDM7243SL, the ML661 is a high-performance dual-core processor-integrated modem supporting a full range of commercial LTE public frequency bands and LTE410/450 bands. Built with a single SoC modem chipset, it features an ultra-stable and highly cost-effective tri-mode design, boasting an extremely wide operating temperature range and delivering consistent high performance across diverse application scenarios.



Features

- The industry's first and exclusive SoC LTE410/450 multi-mode module supporting **LTE**,**LTE-M** and **NB-IoT**.
- Boasts a state-of-the-art 410/450MHz RF front-end design for class-leading performance.
- The sole Cat.1 module on the market with **switched Tx diversity** for LTE410/450 bands.
- Customized 450MHz LTE-M/NB-IoT RF design delivers **enhanced RX interference protection**.
- Versatile RF band configuration covering all commercial LTE FDD bands plus common LTE410/450 bands.
- Optimized baseband processing enables reliable operation in **high delay spread** scenarios of 410/450MHz bands.
- Powered by GCT Semiconductor's 3rd-generation 4G modem chipset GDM7243SL, compliant with **3GPP Release 14**.
- Supports 23dBm transmit power for LTE bands and an elevated **26dBm** for LTE-M bands (B31/B72/B87).
- Integrated Dual-SIM Dual-Standby (**DSDS**) support for hybrid private-public network deployments.
- Seamless migration for existing device partners from ML660/ML662 to the ML661 series with minimal engineering effort.
- PCIe-mini form factor available upon market demand.
- Laser engraving ensures superior heat dissipation and permanent, tamper-resistant marking.
- **15+** year product lifecycle commitment, paired with long-term technical support and firmware maintenance.
- An advanced module solution tailored for Smart Meter Gateways (**SMGW**), Advanced Metering Infrastructure (**AMI**) meters, and other high-end Low Power Wide Area (**LPWA**) industrial applications.

LTE410/450 Cat.1/Cat.1bis/LTE-M/NB-IoT ML661

Specification

Basic Modem Information

SoC	GCT GDM7243SL
CPU	RISC-V A45MP Dual core
UE Cat.	LTE Cat.1/1bis,LTE-M Cat.M1, NB-IoT Cat.NB2
3GPP Rel.	3GPP Release 14 for all UE categories
RF TRX	1T2R for B31/72/87, H-FDD for LTE-M and NB-IoT
RAM	PSRAM 128Mbit
Flash	NorFlash 128Mbit
OS	Zephyr V2.x

Basic Hardware Interface

SIM	x2,1.8V/3.0V (U)SIM Interface
USB	x1,USB 2.0 with high speed up to 480Mbps
UART	x2,Debug and AT command
I2C	x1
GPIO	x18
ADC	x1
RESET	x1,active LOW
PWRKEY	x1,active HIGH
Antenna Pad	x2, for Primary and Tx/Rx-diversity Antennae

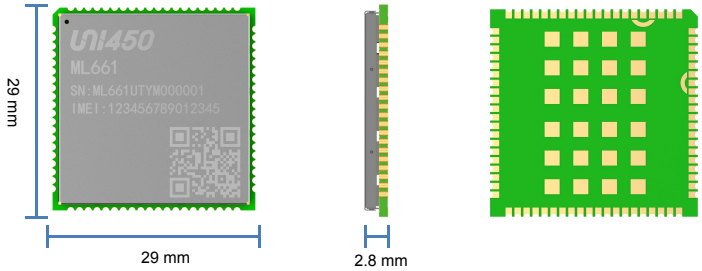
Physical Characteristic

Input Voltage	DC 3.3~4.2V,Typical 3.8V
Consumption	Max 2A
TX Power	23dBm ± 2dB(LTE bands,public LTE-M/NB-IoT) 26dBm ± 1dB(B31/B72/B87 LTE-M/NB-IoT)
Work Temp	-30℃ to 70 ℃
Extend Temp	-40℃ to 85 ℃ *
Size	29mm x 29mm x 2.8mm
PIN Number	LCC 80pin+ LGA 24pin
Weight	Approx. 5.2 gram

Package Information

Gift Box	Include 10 x trays in total 150pcs,Approx.1.4Kg
Carton Box	Include 4 x giftboxes in total 600pcs,Approx.6.0Kg

Mechanical Characteristic



Software Feature

LTE	APN Management
	BAND Management
	PIN Management
Dial Mode	Auto Call Manager
	Manually by AT command
Protocols	TCP
	UDP
	HTTP
	HTTPS
	LwM2M
USB Driver	Android RIL 10.x
	ECM Linux 3.x/4.x/5.x
	RNDIS WINDOW 7/10/11
	RNDIS Linux 3.x/4.x/5.x
AT Command	3GPP TS 27.007, 27.005
	UNI450 Enhanced AT commands

Data Rate**

LTE-FDD	Cat.1/Cat.1bis Download speed up to 10 Mbps
	Cat.1/Cat.1bis Upload speed up to 5 Mbps
LTE-M	Cat M1 Download speed up to 588 kbps
	Cat M1 Upload speed up to 1119 Kbps
NB-IoT	Cat NB2 Download speed up to 127 kbps
	Cat NB2 Upload speed up to 158.5 Kbps

Ordering Information

ML661DE	LTE Cat.1/Cat.1bis/LTE-M/NB-IoT Switched Tx Diversity for LTE B72, **1T2R** LTE B1/3/7/8/20/28/72, **1T1R**
ML661PL	LTE Cat.1/Cat.1bis/LTE-M/NB-IoT Switched Tx Diversity for LTE B31, **1T2R** LTE B1/3/7/8/20/31, **1T1R**
ML661IR	LTE Cat.1/Cat.1bis/LTE-M/NB-IoT Switched Tx Diversity for LTE B87, **1T2R** LTE B1/3/7/8/20/28/87, **1T1R**

*: At this temperature, certain RF performance indicators may deviate from 3GPP specifications.
**: Actual over-the-air data rates are subject to the actual terminal design and network environment.

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