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HFOXCOM 31PHBM2000A Smart Automotive LTE Module

HFOXCOM 31PHBM2000A Smart Automotive LTE Module Instructions

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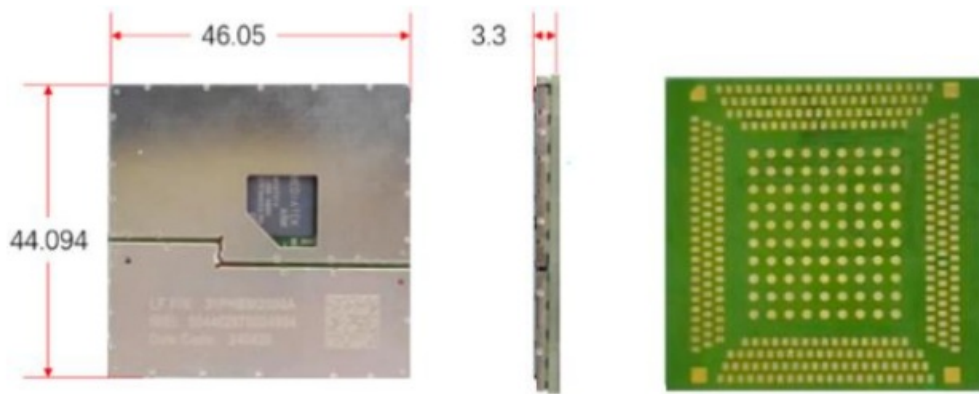
HFOXCOM 31PHBM2000A Smart Automotive LTE Module

Specifications

- Product Name: 31PHBM2000A
- Manufacturer: FIH
- Functionality: Smart automotive LTE module with Wi-Fi and multi-GNSS support
- Compliance: IATF 16949:2016
- Processor: ARM Cortex-A53 1.46GHz dual-core
- Operating System: Linux OS
- Network Coverage: Full mode network coverage
- GNSS Receivers: GPS, Glonass, Beidou, Galileo, QZSS
- Wireless Connectivity: LTE/WCDMA/GSM, 802.11 a/b/g/n/ac WLAN
- Interfaces: PCIE, USB, RGMII, UART, I2C, SPI
- Dimensions: Module size mm
- Weight: Package Weight g
- Temperature Range: Operation temperature range / Storage temperature range

FIH 31PHBM2000A

- Smart automotive LTE module
- Support Wi-Fi, multi-GNSS function

Dimension

31PHBM2000A is a smart automotive LTE module, which is designed by FIH, with strictly follow IATF 16949:2016 global technical specification and quality management standard for automotive industry. This NAD module could afford harsh environmental tests and has superior performance for ESD and EMC. It is a solution designed specifically for automotive industry, on intelligent connected vehicle application field.

31PHBM2000A is an intelligent vehicle module based on MTK MT2731 platform, which is dual-core high performance ARM®Cortec-A53 MPCoreTM operating up to 1.46GHz Soc, equipped with Linux OS (version: Yocto Telematics Baseline (Poky/meta-mediatek-ivt) 12.0.0 (nostromo)) operating system.

31PHBM2000A is suitable for Automotive applications based on its LTE/WCDMA/GSM communication, 802.11 a/b/g/n/ac 1T1R WLAN, And multi-GNSS system (GPS, Glonass, Beidou, Galileo and QZSS) features, which support good network connection, and achieve fast and accurate positioning performance.

The 31PHBM2000A integrates rich interfaces such as PCIE, USB, RGMII, UART, I2C and SPI interfaces, greatly expanding its application in vehicle multimedia area. It can support rich in car functions such as navigation, entertainment, etc.

Main features

- Aimed at IATF 16949:2016 quality management standard for automotive industry.

- Operation temperature range -40°C ~ +85°C excellent EMI capacity for harsh vehicle application environment request

- Based on MTK dual core ARM®Cortec-A53 MP Core TM processor.

- Full mode network coverage

- Integrated multiple constellation GNSS receivers, to meet fast and accurate positioning in harsh environments.

ARM Cortex-A53
1.46GHz dual-core

Linux OS

LTE Cat4
Max 150Mbps (Downlink)
Max 50Mbps (Upli

IEEE 802.11
a/b/g/n/ac

GPS/Glonass/Beid
ou/Galileo/QZSS

LGA

LTE Cat 4 31PHBM2000A

- Area/Operation North America/AT&T
- MT2731, dual-core high performance ARM®Cortec-A53 MPCoreTM
- Operating up to 1.46GHz
- CPU
- Memory 1GB NAND+1GB LPDDR4
- Operation system Linux OS version: Yocto Telematics Baseline (Poky/meta-mediatek-ivt) 12.0.0 (nostromo)
- Module size mm 44.094 × 46.05 × 3.3
- Package LGA
- Weight g 13.6

Temperature range

- Operation temperature range -40°C ~ +95 °C
- Storage temperature range -40 °C ~ +95°C

Bands information

- LTE-FDD B2/B4/B5/B7/B12/B13/B17/B25/B26/B66/B71
- LTE-TDD NA
- WCDMA B2/B4/B5
- EVDO/CDMA NA
- GSM/EDGE NA
- WLAN 2.4/5 GHz, 802.11a/b/g/n/ac (Not support MIMO)
- Bluetooth NA
- GNSS GPS/Glonass/Beidou/Galileo/QZSS

Certification

- Operator TA AT&T*
- Regulatory/Conformance TA FCC/PTCRB

Environmental

- Regulatory compliant RoHS/REACH/POPs

Data transfer speed

- LTE-FDD (Mbps) 150 downlink / 50 uplink
- LTE-TDD (Mbps) NA
- DC-HSPA+ (Mbps) 42 downlink / 5.7 uplink
- WCDMA (kbps) 384 downlink / 384 uplink
- EVDO (Mbps) NA
- EDGE (kbps) NA
- GPRS (kbps) NA

Highlight features

- 3GPP E-UTRA Release 9
- Bandwidth 1.4/3/5/10/15/20 MHz
- Rx-diversity Yes
- DL MIMO 2 × 2 Yes
- (U)SIM Card detection Yes
- DSDS No
- Dual screen display NA
- Upgrade through USB Yes
- Upgrade through OTA Yes

LTE Cat 4	31PHBM2000A characteristic
Interfaces	
Display	NA
Audio (analog)	x2, support 2 Diff input and 1 Diff output
MSDC	x1, 1 set with 8-bit data lines
USB	×1, support USB 2.0 OTG
(U)SIM	×2, support 1.8/3.0 V USIM card; Support SIM slot or eSIM
UART	×2, 1 set supports HW flow control with CTS/RTS pin 1 set for debug
PCIE	x1, support PCIe gen2,RC mode
ADC	×2, ADC channel with 12-bit resolution
I2C	×2, 1 set supports push-pull and OD mode, speed up to 400K/1 set supports GPIO mode
Audio(digital)	×1, support I2S
SPI	×3, support HW master interface
RGMII	x1, support GbE with MDIO
GPIO	×6
Antenna	×4, Main Ant, Diversity Ant, WIFI2.4G/5G, GNSS Ant
Electrical Characteristics	
Power supply	3.6V~4.2V, 4.0V Typ.
Power consumption	TBD

Notes:
* Under development.

INTEGRATION INSTRUCTIONS
This modular transmitter complies with FCC Rules Part 15C, Part 22,24,27,90

Specific operational use conditions
This module can be used in IOT devices, the input voltage to the module is nominally 4V, and the Operating Temperature is -40°C ~ 85°C.

Antenna Change Notice to Host manufacturer
Recommend using antenna which certified with this module mentioned in this manual.
If you desire to increase antenna gain and either change antenna type or use same antenna type certified, a Class II permissive change application is required to be filed by us, or you (host manufacturer) can take responsibility through the change in FCC ID (new application) procedure followed by a Class II permissive change application, based on the new emissions testing. Please perform testing on frequency bands where the antenna gain is highest, worst-case band-edges based on original filing, and only on frequency bands where the antenna gain is highest.

a list of all antenna types

Antenna Type	Max. Antenna Gain
Dipole Antenna	2.4G WIFI: 2.5dBi 5G WIFI: U-NII-1:-3.02dBi, U-NII-3:-2.37dBi
Dipole Antenna	(Max allowed gain): WCDMA B2:7dBi; B4: 4dBi; B5:9.42 dBi LTE B2:8dBi; B4: 5dBi; B5:9.41dBi, B7:8dBi, B12:8.7dBi, B13:9.16dBi, B17: 8.74dBi, B25: 8.0dBi; B26:9.36dBi; B66:5dBi, B71:8.48dBi

Instruction to Host product manufacturer when choosing external connector
Unique antenna connector must be used on our FCC Part 15 authorized transmitters used in the host product.

Labelling and compliance statement instruction for host product manufacturer
Please notice that if the FCC identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: "Contains FCC ID: RYQ31PHBM2000A" any similar wording that expresses the same meaning may be used.

§ 15.19 Labelling requirements shall be complied on end user device.
Labelling rules for special device, please refer to §2.925, § 15.19 (a)(5) and relevant KDB publications. For E-label, please refer to §2.935.
FCC regulatory Compliance Statement mentioned in this manual shall be properly included in host product manual per FCC Rules.
The host product manufacturer shall be aware not to provide information to the end user on how to install or remove this module in your host product manual.

Guide on test modes and additional testing requirements
Host product manufacturer is ultimately responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, additional transmitter(s) in the host, etc.).
For test modes, please contact original manufacturer for help.
Disclaimer on additional testing, Part 15 Subpart B compliance of Host Product
This modular transmitter is only FCC authorized for the specific rule parts listed on our grant, host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification.
Host manufacturer in any case shall ensure host product which is installed and operating with the module is in compliant with Part 15B requirements.
Please note that For a Class B or Class A digital device or peripheral, the instructions furnished the user manual of the end-user product shall include statement set out in §15.105 Information to the user or such similar statement and place it in a prominent location of host product manual. Original texts from FCC Rules are as following you may refer to:

For Class B

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off

and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC regulatory compliance statement

§15.19 Statement
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

Information to user
Warning: changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

RF Exposure compliance statement
This module complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

ISED compliance statement
This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s).

The user manual for LE-LAN devices shall contain instructions related to the restrictions mentioned in the above sections, namely that: the device for operation in the band 5150–5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems;

ISED Radiation Exposure statement
This equipment complies with IC RSS-102 radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator and your body.

Please notice that if the IC identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: "Contains IC:6989A-31PHBM2000A" any similar wording that expresses the same meaning may be used.

This radio transmitter [IC: 6989A-31PHBM2000A] has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

FAQs

- **Q: What kind of network coverage does the 31PHBM2000A offer?**

  A: The 31PHBM2000A provides full mode network coverage.

- **Q: What are the main wireless connectivity features of the 31PHBM2000A?**

  A: The module supports LTE/WCDMA/GSM communication and 802.11 a/b/g/n/ac WLAN.

- **Q: What GNSS systems are integrated into the 31PHBM2000A?**

  A: The module integrates GPS, Glonass, Beidou, Galileo, and QZSS GNSS systems for fast and accurate positioning.

Documents / Resources

[**HFOXCOM 31PHBM2000A Smart Automotive LTE Module**](#) [pdf] Instructions
31PHBM2000A, RYQ31PHBM2000A, 31PHBM2000A Smart Automotive LTE Module, 31PHBM 2000A, Smart Automotive LTE Module, Automotive LTE Module, LTE Module

References

- [**User Manual**](#)