

The background of the top half of the page features a world map composed of small grey dots. The Fibocom logo is positioned in the upper left area of this map.

Fibocom

PERFECT WIRELESS EXPERIENCE

FG131-NA

Hardware Guide

V1.0

Disclaimer

Any action you take in the course of using this document is at your own risk, and Fibocom shall not be liable for any damages or losses under any circumstances. Due to product version upgrade or other reasons, Fibocom reserves the right to modify any information in this document at any time without prior notice and any responsibility. Unless otherwise agreed, all statements, information and suggestions in this document do not constitute any express or implied guarantee.

This document may include the third-party information covering products, services, software, data, and so on. Fibocom does not control and assumes no responsibility for the third-party content, including but not limited to the accuracy, compatibility, reliability, availability, legitimacy, appropriateness, performance, non-infringement, and status update, unless otherwise specified in this document. Fibocom does not provide any guarantee or authorization for the third-party content mentioned or referenced in this document. If you need a third-party license, obtain it in an authorized or legal way, unless otherwise specified in this document.

Copyright Notice

Copyright © 2024 Fibocom Wireless Inc. All rights reserved.

Unless specially authorized by the Company, the recipient of the documents shall keep the documents and information received confidential, and shall not use them for any purpose other than the implementation and development of this project. Without the written permission of the Company, no unit or individual shall extract or copy part or all of the contents of this document without authorization, or transmit them in any form. The Company has the right to investigate legal liabilities for any offense and tort in connection with violation of confidentiality obligations, or unauthorized use or malicious use of the said documents and information in other illegal forms.

Trademark Statement

Fibocom The trademark is registered and owned by Fibocom Wireless Inc.

Other trademarks, product names, service names and company names appearing in this document are owned by their respective owners.

Contact Information

Website: <https://www.fibocom.com>

Address: 1101, Tower A, Building 6, Shenzhen International Innovation Valley, Dashi 1st Rd, Nanshan,,Shenzhen, China

Tel: 0755-26733555

Contents

Applicable Models 4

Change History 5

1 Foreword 6

 1.1 Introduction 6

2 Overview..... 7

 2.1 Introduction 7

 2.2 Antenna Band Introduction..... 7

 2.3 Key Feature Introduction 7

 2.4 Waring 9

 2.4.1 Important Notice to OEM integrators 9

 2.4.2 FCC Statement 11

Applicable Models

No.	Applicable Model	Description
1	FG131-NA	3 ANT, 2Gb LPDDR2+4Gb NAND LTE: Band 2/4/5/7/12/13/14/17/25/26/30/66/71/38/41/42/43/48 NR: Band 2/5/7/12/13/14/25/26/30/66/70/71/38/41/48/77/78 GNSS

Change History

V1.0 (2024-04-23) Initial version.

1 Foreword

1.1 Introduction

This document describes information on electrical characteristics, RF performance, structural dimensions and application environment of the FG131-NA module. With the help of this document and other related documents, the application developer can quickly understand the hardware functions of the FG131-NA module and develop the hardware of the product.

2 Overview

2.1 Introduction

The FG131-NA products are packaged in LGA, which is a highly integrated 5G wireless communication module and supports LTE-FDD/LTE-TDD/RedCap network modes. The module can provide stable and high-speed data transmission services, suitable for most mobile operator networks around the world, and can be used in CPE, VR/AR, gateways, TV boxes, intelligent monitoring and other applications.

2.2 Antenna Band Introduction

Table 1. Band Introduction

Model	Number of Antennas	Band Configuration
FG131-NA-00	3 antennas	LTE: B2/B4/B5/B7/B12/B13/B14/B17/B25/B26/B30/B66/B71/B38/B41/ B42/B43/B48 NR: n2/n5/n7/n12/n13/n14/n25/n26/n30/n38/n41/n48/n66/n70/n71/ n77/n78 GNSS: GPS/GLONASS/BeiDou/Galileo/QZSS

2.3 Key Feature Introduction

Category	Function Description	Item
Power supply	DC: 3.3V~4.4V, typical voltage: 3.8V	FG131-NA Series
Processor	Qualcomm SDX35	FG131-NA Series
Operating system	Linux/Android/Windows	FG131-NA Series
Network protocol	Support IPV4/IPV6	FG131-NA Series
SMS	Support	FG131-NA Series
Storage configuration	2Gb LPDDR2+4Gb NAND Flash	FG131-NA Series
Function interface	Dual SIM card single standby, supporting 3V/1.8V	FG131-NA Series
	PCIe2.0×1	FG131-NA Series
	SGMII	FG131-NA Series
	High speed USB	FG131-NA Series

	W_Disable#	FG131-NA Series
	Antenna Tuner	FG131-NA Series
	SPI	FG131-NA Series
	UART	FG131-NA Series
	PCM	FG131-NA Series
	I2C	FG131-NA Series
Power class	Class 3 (24dBm±1.5dB) for LTE bands Class 2 (27dBm±1.5dB) for LTE band41 Class 3 (24dBm±1.5dB) for NR redcap bands	FG131-NA Series
LTE features	3GPP R16 is supported UL supports QPSK, 16QAM and 64QAM modulations DL supports QPSK, 16QAM, 64QAM and 256QAM modulations LTE: maximum uplink rate of 75 Mbps and a maximum downlink rate of 195 Mbps	FG131-NA Series
NR features	3GPP R17 is supported UL supports BPSK QPSK, 16QAM, 64QAM and 256QAM modulations DL supports QPSK, 16QAM, 64QAM and 256QAM modulations NR: maximum uplink rate of 122.98 Mbps (UL overhead of 7%) maximum downlink rate of 223Mbps(DL overhead of 15%)	FG131-NA Series
Physical features	Dimensions: 39.5 mm x 37 mm x 2.65 mm Package: 339 pin LGA Weight: 7.8g±0.5g	FG131-NA Series
Temperature features	Operating temperature: -30°C to +75°C, which meets the requirements of 3GPP standard Expansion temperature: -40 °C to +85 °C, and some indexes may exceed 3GPP standard Storage temperature: -40 °C to +85 °C, the temperature range for normal storage of the module without power on	FG131-NA Series

2.4 Waring

2.4.1 Important Notice to OEM integrators

1. This module is limited to OEM installation ONLY.
2. This module is limited to installation in fixed applications, according to Part 2.1091(b).
3. The separate approval is required for all other operating configurations, including portable configurations with respect to Part 2.1093 and different antenna configurations
4. For FCC Part 15.31 (h) and (k): The host manufacturer is responsible for additional testing to verify compliance as a composite system. When testing the host device for compliance with Part

15 Subpart B, the host manufacturer is required to show compliance with Part 15 Subpart B while the transmitter module(s) are installed and operating. The modules should be transmitting and the evaluation should confirm that the module's intentional emissions are compliant (i.e. fundamental and out of band emissions). The host manufacturer must verify that there are no additional unintentional emissions other than what is permitted in Part 15 Subpart B or emissions are complaint with the transmitter(s) rule(s).

The Grantee will provide guidance to the host manufacturer for Part 15 B requirements if needed.

Important Note

notice that any deviation(s) from the defined parameters of the antenna trace, as described by the instructions, require that the host product manufacturer must notify to Fibocom Wireless Inc. that they wish to change the antenna trace design. In this case, a Class II permissive change application is required to be filed by the USI, or the host manufacturer can take responsibility through the change in FCC ID (new application) procedure followed by a Class II permissive change application.

End Product Labeling

When the module is installed in the host device, the FCC ID label must be visible through a window on the final device or it must be visible when an access panel, door or cover is easily re-moved. If not, a second label must be placed on the outside of the final device that contains the following text: "Contains FCC ID: ZMOFG131NA"

The FCC ID can be used only when all FCC compliance requirements are met.

Antenna Installation

- (1) The antenna must be installed such that **20** cm is maintained between the antenna and users,
- (2) The transmitter module may not be co-located with any other transmitter or antenna.
- (3) Only antennas of the same type and with equal or less gains as shown below may be used with this module. Other types of antennas and/or higher gain antennas may require additional authorization for operation.
- (4)The max allowed antenna gain is **2.98dBi** for external dipole antenna.

In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

Antenna Type	Bands	Peak Gain
Dipole	LTE B2	2.85
	LTE B4	2.98
	LTE B5	1.32
	LTE B7	2.21
	LTE B12	1.61
	LTE 13	1.83
	LTE 14	2.19
	LTE 17	1.61
	LTE B25	2.88
	LTE B26	1.32
	LTE B30	-2.22
	LTE B66	2.98
	LTE B71	1.61
	LTE B38	1.71
	LTE B41	2.21
	LTE B42	-4.13
	LTE B43	-4.13
	LTE B48	-4.13
	5G NR n2	2.85
	5G NR n5	1.32
	5G NR n7	2.21

	5G NR n12	1.61
	5G NR n13	1.83
	5G NR n14	2.19
	5G NR n25	2.88
	5G NR n26	1.32
	5G NR n30	-2.22
	5G NR n66	2.98
	5G NR n70	2.86
	5G NR n71	1.61
	5G NR n38	1.71
	5G NR n41	2.21
	5G NR n48	-4.13
	5G NR n77	-4.13
	5G NR n78	-4.13

Manual Information to the End User

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module. The end user manual shall include all required regulatory information/warning as show in this manual.

2.4.2 FCC Statement

Federal Communication Commission Interference 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.

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 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.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

This device is intended only for OEM integrators under the following conditions: (For module device use)

- 1) The antenna must be installed such that 20 cm is maintained between the antenna and users, and
- 2) The transmitter module may not be co-located with any other transmitter or antenna.

As long as 2 conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed.

Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance **20** cm between the radiator & your body.

List of applicable FCC rules:

47 CFR Part 22, 24, 27, 90

Summarize the specific operational use conditions.

This module can be used in IOT devices, the input voltage to the module is nominally 3.8V.

Limited module procedures

This module is a single module.

Trace antenna designs

The antenna is not a trace antenna.