



FG332-NA

User Manual

V1.0

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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

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Applicable Models

No.	Applicable Model	Description
1	FG332-NA	3 ANT, 2 Gb LPDDR4X+2 Gb NAND 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



Change History

V1.0 (2026-02-1)	Initial version.
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1 Foreword

1.1 Description

This document describes information on electrical characteristics, RF performance, structural dimensions, and application environment of the FG332-NA series module. With the help of this document and other related documents, the application developers can quickly understand the hardware functions of the FG332-NA module and develop the hardware of the product.

2 Product Overview

2.1 Product Introduction

The FG332-NA product is a highly integrated 5G RedCap wireless communication module that supports LTE-FDD, LTE-TDD, and RedCap. This module delivers stable, high-speed data transmission services, making it compatible with most mobile operator networks worldwide. It is suitable for a wide range of applications, including CPE, VR/AR, gateways, TV boxes, intelligent monitoring, and more. The following table describes the product frequency bands.

Table 1. Band introduction

Model	Number of Antennas	Band Configuration
FG332-NA	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

2.2 Key Features

Table 2. Key features

Category	Function Description
Power supply	DC: 3.3V~4.4V, typical voltage: 3.8V
Network protocol	Support IPV4/IPV6
SMS	Support
LTE features	Support 3GPP R16 Modulations: UL (QPSK,16QAM,64QAM) DL (QPSK,16QAM,64QAM) MIMO capability: DL Max 2×2 MIMO Rate: UL Max TBD Mbps, DL Max TBD Mbps
NR features	Support: 3GPP R17 Modulations: UL (PI/2 BPSK, QPSK,16QAM,64QAM,256QAM) DL (QPSK,16QAM,64QAM,256QAM)
Physical features	Dimensions: 32 mm x 29 mm x 2.4 mm Package: 204 pin LGA Weight: 5.3 g±0.5 g

Temperature features	<p data-bbox="502 203 1452 275">Operating temperature: -30°C to +75°C, which meets the requirements of 3GPP standard</p> <p data-bbox="502 293 1452 365">Expansion temperature: -40°C to +85°C, and some indexes may exceed 3GPP standard</p> <p data-bbox="502 383 1452 443">Storage temperature: -40°C to +85°C, the temperature range for normal storage of the module without power on</p>
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2.3 Operating Frequency

Table 3. Cellular frequency reference table

Operating Band	Standard	Tx (MHz)	Rx (MHz)
B2/n2	LTE-FDD/ NR redcap-FDD	1850~1910	1930~1990
B4	LTE-FDD	1710~1755	2110~2155
B5/n5	LTE-FDD/NR redcap-FDD	824~849	869~894
B7/n7	LTE-FDD/ NR redcap-FDD	2500~2570	2620~2690
B12/n12	LTE-FDD/ NR redcap-FDD	699~716	729~746
B13/n13	LTE-FDD/ NR redcap-FDD	777~787	746~756
B14/n14	LTE-FDD/ NR redcap-FDD	788~798	758~768
B17	LTE-FDD	704~716	734~746
B25/n25	LTE-FDD/ NR redcap-FDD	1850~1915	1930~1995
B26/n26	LTE-FDD/ NR redcap-FDD	814~849	859~894
B30/n30	LTE-FDD/ NR redcap-FDD	2305~2315	2350~2360
B66/n66	LTE-FDD/ NR redcap-FDD	1710~1780	2110~2180
N70	NR redcap-FDD	1695~1710	1995~2020
B71/n71	LTE-FDD/ NR redcap-FDD	663~698	617~652
B38/n38	LTE-TDD/ NR redcap-FDD	2570~2620	2570~2620
B41/n41	LTE-TDD/ NR redcap-FDD	2496~2690	2496~2690
B42	LTE-TDD	3400~3600	3400~3600
B43	LTE-TDD	3600~3800	3600~3800
B48/n48	LTE-TDD/ NR redcap-TDD	3550~3700	3550~3700
N77	NR redcap-TDD	3300~4200	3300~4200
N78	NR redcap-TDD	3300~3800	3300~3800

2.4 Maximum Transmit Power

The maximum transmitting power is the transmitting power measured at the antenna pin at an ambient temperature of 25°C. The maximum transmitting power of the module is as follows:

Table 4. Maximum transmit power (dBm)

Mode	Band	3GPP Requirement	FG332-NA
LTE FDD 10M 12RB	B2/4/7/25/30/66	23±2.7	23±1.5
LTE FDD 10M 12RB	B5/12/13/14/17/26/71	23±2.7	24±1.5
LTE TDD 10M 12RB	B38/41	23±2.7	23±1.5
LTE TDD 10M 12RB	B42/43/48	23±2.7	24±1.5
LTE TDD 10M 12RB	B41	26±2.7	26±1.5
NR redcap-FDD 10M Inner Full	N2/7/25/30/66/70	23±2.7	23±1.5
NR redcap-FDD 10M Inner Full	N5/12/13/14/26/71	23±2.7	24±1.5
NR redcap-TDD 10M Inner Full	N38/41	23±2.7	23±1.5
NR redcap-TDD 10M Inner Full	N48/77/78	23±2.7	24±1.5

3 Storage, Production and Packaging

3.1 Storage Conditions

Modules are shipped in vacuum-sealed bags. The moisture sensitivity level of the modules is **MSL 3**, and their storage must adhere to the following conditions:

1. Storage Conditions (Recommended):

- Temperature: $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$
- Relative Humidity (RH): 35%–70%

2. Storage Duration (Vacuum-Sealed Packaging):

- Under the recommended storage conditions, the shelf life is 12 months.

3. Workshop Shelf Life After Unsealing:

- In workshop conditions with a temperature of $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$ and relative humidity below 60%, the shelf life of an unsealed module is 168 hours. Under these conditions, the module can be directly subjected to reflow production or other high-temperature operations.
- If these conditions are not met, the module must be stored in an environment with relative humidity below 10% (e.g., a moisture-proof cabinet) to maintain dryness.

4. Pre-Bake Treatment Requirements:

- Modules must undergo pre-bake treatment to prevent moisture absorption and subsequent PCB issues (such as blistering, cracking, and delamination) during high-temperature soldering if they are subjected to any of the following conditions:
 - Storage Conditions Deviate from Recommendations: The storage temperature and humidity do not meet the recommended conditions.
 - Post-Unsealing Conditions Deviate from Recommendations: The module does not meet the recommended storage conditions after being unsealed.
 - Compromised Vacuum Packaging: The vacuum packaging is compromised or the material is bulk-packaged.
 - Before Module Rework: The module undergoes rework prior to final assembly.

5. Module baking:

- Bake the module at a temperature of $120 \pm 5^{\circ}\text{C}$ for 8 hours.
- Modules that have been baked for second time must be welded within 24 hours after baking. Otherwise, the module must be stored in a drying oven.

4.Waring

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: ZMOFG332NA"**

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	1.94
	LTE 14	2.19
	LTE 17	1.61
	LTE B25	2.85
	LTE B26	1.32
	LTE B30	-1.2
	LTE B66	2.98
	LTE B71	1.61
	LTE B38	1.71
	LTE B41	2.21
	LTE B42	-2.18
	LTE B43	-2.58
	LTE B48	-2.18
	5G NR n2	2.85
	5G NR n5	1.32
	5G NR n7	2.21
	5G NR n12	1.61
	5G NR n13	1.94
	5G NR n14	2.19
	5G NR n25	2.85
	5G NR n26	1.32
	5G NR n30	-1.2
	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	-2.18
	5G NR n77	-2.18
	5G NR n78	-2.18

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.

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.

4.3 Antenna trace design

The trace reference design is as follows

