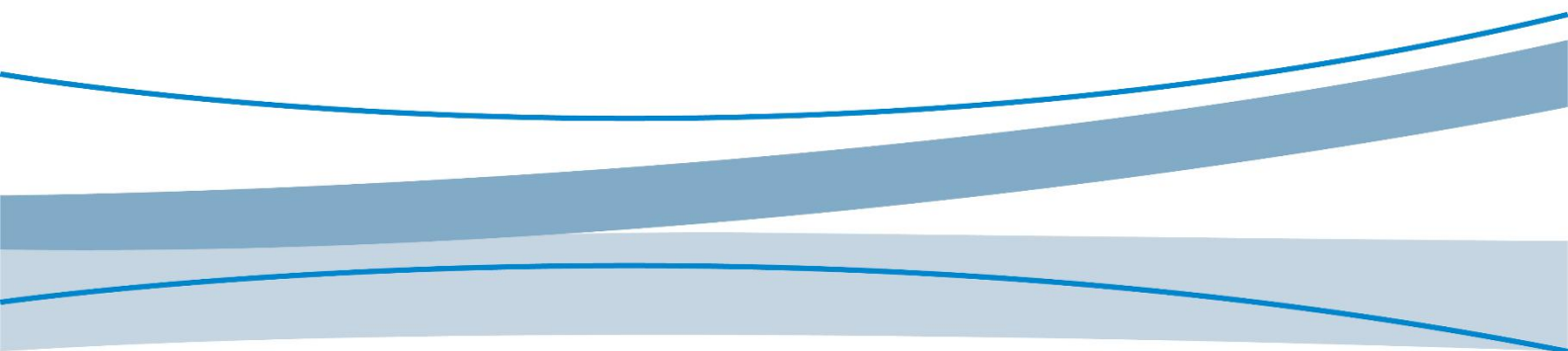




SC126-NA1

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 © 2025 Fibocom Wireless Inc. All rights reserved.

Unless specially authorized by Fibocom, 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 Fibocom, no unit or individual shall extract or copy part or all the contents of this document without authorization, or transmit them in any form. Fibocom 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

 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: 11F, Block A, Building 6, Shenzhen International Innovation Valley, Dashi First Road, Xili Community, Xili Subdistrict, Nanshan District, Shenzhen

Tel: 0755-26733555

Contents

Applicable Model	2
1 Product Overview	3
1.1 Product Introduction	3
1.2 Band Introduction	3
1.3 Key Features	3
1.4 Warning	4
2 Antenna Interfaces	11
2.1 Antenna Interface Definition	11
2.2 Operating Bands	11
2.3 Antenna Requirements	12
3 Storage, Usage and Packaging	13
3.1 Storage	13
3.2 Usage	13
3.3 Packaging	14

Applicable Model

No.	Applicable Model	Description
1	SC126-NA1	North America version of the 4G communication module

1 Product Overview

1.1 Product Introduction

The module integrates core components such as Baseband, eMCP, PMU, Transceiver, PA, etc. It supports long-distance communication modes of various standards including FDD/TDD-LTE, WCDMA, GSM, and short-range wireless transmission technologies such as WIFI/BT. It also supports GNSS wireless positioning technology. The module embeds an open Android operating system and supports multiple interfaces including MIPI/USB/UART/SPI/I2C, making it an ideal solution for the core system of wireless intelligent products. The corresponding network standards and frequency bands of the module are as follows:

1.2 Band Introduction

Table 1. Band introduction

Module	Band Configuration
SC126-NA1	FDD-LTE: Band 2/4/5/7/12/13/17/25/26/66/71
	TDD-LTE: Band 41(2496-2690MHz)
	WIFI802.11a/b/g/n/ac:2402~2482MHz;5170~5835MHz
	BT5.0:2402~2480MHz
	GNSS:GPS/GLONASS/BeiDou/Galileo/SBAS

1.3 Key Features

Table 2. Key features

Category	Function Description
Power Supply	DC: 3.5-4.4V, typical voltage: 3.8V
CPU	ARM® Cortex-A53 Quad-core 64-bit CPU up to 2.0GHz
Memory	64GB eMMC +32Gb LPDDR4X Flash
RF Power class	Class 3 (23dBm ± 2dB) for LTE FDD bands Class 3 (23dBm ± 2dB) for LTE TDD bands
LTE feature	Support FDD/TDD R10
	Support FDD/TDD CAT4
	Support 1.4-20M RF Bandwidth
	DL support 2 × 2 MIMO
	UL 50Mbps, DL 150Mbps

Category	Function Description
WLAN feature	Support 2.4G and 5GWLAN, Support 802.11a、802.11b、802.11g、802.11n、802.11ac
BT feature	BT5.0 (BR/EDR+BLE)
GNSS feature	GPS/GLONASS/BeiDou/Galileo/SBAS
Physical Characteristics	Dimensions: (40.5 ± 0.15) mm $\times$ (40.5 ± 0.15) mm $\times$ (2.55 ± 0.2) mm Package: 146 LCC pin+116 LGA pin Weight: About 9.7 g
Temperature Characteristics	Normal operating temperature: -30°C to 75°C ¹ Extended operating temperature: -40°C to 85°C ² Storage temperature: -40°C to 85°C



1. When the temperature keeps in the range of -30°C to 75°C , the module can work normally. Module performance meets the 3GPP specifications.
2. When the temperature keeps in the range of -40°C to 85°C , the module performance may be slightly out of 3GPP specifications.
3. The NR throughput listed here is calculated using the formula defined in 3GPP TS 38.306. Slot format is all downstream time slots for DL throughput and all upstream time slots for UL throughput. This rate is theoretical, and does not exist in the actual scenario. In the measured TDD 8D1U slot configuration, the maximum rate of SA DL is 4.07 Gbps and that of NSA DL is 5.82 Gbps.

1.4 Warning

FCC Regulatory Compliance

Important Notice to OEM integrators

1. This module is limited to OEM installation ONLY.
2. This module is limited to installation in mobile or 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 compli

ance 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 wires 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.

The antenna is external detachable antenna; It needs to be connected to the device via RF cable.

End Product Labeling

When the module is installed in the host device, the FCC/IC 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: ZMOSC126NA1".

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

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.

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.

List of applicable FCC rules

This module has been tested and found to comply with part 15, part 22, part 24, part 27, part 90 requirements for Modular Approval.

The modular transmitter is only FCC authorized for the specific rule parts (i.e., FCC transmitter rules) listed on the grant, and that the 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. If the grantee markets their product as being Part 15 Subpart B compliant (when it also contains unintentional-radiator digital circuitry), then the grantee shall provide a notice stating that the final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed.

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.

Industry Canada Statement

This device complies with Industry Canada's licence-exempt RSSs. Operation is subject to the following two conditions:

- (1) This device may not cause interference; and
- (2) This device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

- (1) l'appareil ne doit pas produire de brouillage, et
- (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement."

Radiation Exposure Statement

This equipment complies with IC 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.

Déclaration d'exposition aux radiations:

Cet équipement est conforme aux limites d'exposition aux rayonnements ISED établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 20 cm de distance entre la source de rayonnement et votre corps.

(For module device use)

1) The antenna must be installed such that 20 cm is maintained between the ant

This device is intended only for OEM integrators under the following conditions:

enna 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.

conditions suivantes: (Pour utilisation de dispositif module)

1) L'antenne doit être ins

tallée de telle sorte qu'une distance de 20 cm est respectée entre l'antenne et les utilisateurs, et 2) Le module émetteur peut ne pas être coïmplanté avec un autre émetteur ou antenne.

Tant que les 2 conditions ci-dessus sont remplies, des essais supplémentaires sur l'émetteur ne seront pas nécessaires. Toutefois, l'intégrateur OEM est toujours responsable des essais sur son produit final pour toutes exigences de conformité supplémentaires requis pour ce module installé.

Cet appareil est conçu uniquement pour les intégrateurs OEM dans les

IMPORTANT NOTE:

In the event that these conditions can not be met (for example certain laptop configurations or colocation with

another transmitter), then the Canada authorization is no longer considered valid and the IC ID can not 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 Canada authorization.

NOTE IMPORTANTE:

Dans le cas où ces conditions ne peuvent être satisfaites (par exemple pour certaines configurations d'ordinateur portable ou de certaines co-localisation avec un autre émetteur), l'autorisation du Canada n'est plus considérée comme valide et l'ID IC ne peut pas être utilisé sur le produit final. Dans ces circonstances, l'intégrateur

OEM sera chargé de réévaluer le produit final (y compris l'émetteur) et l'obtention d'une autorisation distincte au Canada.

End Product Labeling

Plaquette signalétique du produit final

Ce module émetteur est autorisé uniquement pour une utilisation dans un dispositif où l'antenne peut être installée de telle sorte qu'une distance de 20cm peut être maintenue entre l'antenne et les utilisateurs. Le produit final doit être étiqueté dans un endroit visible avec l'inscription suivante: "Contient des IC: 21374-SC126NA1".

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 should

include all required regulatory information/warning as shown in this manual.

Manuel d'information à l'utilisateur final

L'intégrateur OEM doit être conscient de ne pas fournir des informations à l'utilisateur final quant à la façon d'installer ou de supprimer ce module RF dans le manuel de l'utilisateur du produit final qui intègre ce module. Le manuel de l'utilisateur final doit inclure toutes les informations réglementaires requises et avertissements comme indiqué dans ce manuel.

2 Antenna Interfaces

2.1 Antenna Interface Definition

The module provides two 2G/3G/4G antenna interfaces. ANT_MAIN is used for transmitting and receiving RF signals, while ANT_DRX is used for diversity reception.

Table 3. SC126-NA1 antenna configuration

Pin Name	Functional Description
ANT_MAIN	2G/3G/4G main antenna interface
ANT_DRX	4G diversity antenna interface
WIFI/BT_ANT	WIFI/BT antenna interface
GNSS_ANT	GNSS antenna interface

2.2 Operating Bands

Table 4. Operating bands

Mode	Band	TX (MHz)	RX (MHz)
LTE FDD	Band 2	1850~1910	1930~1990
	Band 4	1710~1755	2110~2155
	Band 5	824~849	869~894
	Band 7	2500~2570	2620~2690
	Band 12	698~716	728~746
	Band 13	777~787	746~756
	Band 17	704~716	734~746
	Band 25	1850~1915	1930~1995
	Band 26	814~849	859~894
	Band 66	1710~1780	2110~2180
	Band 71	663~698	617~652
LTE TDD	Band 41	2496~2690	2496~2690

2.3 Antenna Requirements

Table 5. Module antenna requirements

SC126-NA1 Module Antenna Requirements	
---------------------------------------	--

WCDMA/LTE/NR	VSWR: $\leq 2:1$
	Input power (W): $> 28\text{dBm}$ average power WCDMA & LTE & NR
	Input impedance (Ω): 50
	Antenna isolation (dB): > 25

3 Storage, Usage and Packaging

3.1 Storage

The humidity sensitivity level of SC126-NA1 module is MSL 3.

- Storage conditions (recommended): temperature $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$, relative humidity RH 35%–70%.
- Storage life (sealed vacuum bag): 12 months under the recommended storage conditions.
- According to IPC/JEDEC J-STD standard, the SC126 module has a humidity sensitivity level of 3. The level 3 moisture sensitive products, after unpacking, must be reflowed or operated at high temperature within 168 hours under the environment of workshop temperature of $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$ and relative humidity lower than 60%, or stored in an environment with relative humidity lower than 10% to maintain the dryness of the products. If the humidity in the workshop can only be controlled at lower than 70%, the preceding operation must be completed in 24 hours, otherwise, need to bake the module before reflow or heat the module, or vacuum packaging after baking (with desiccant and humidity indicator card inside).
- Recommended baking methods and conditions: Transfer the module into a tray that can withstand high temperature. The recommended baking temperature is $125^{\circ}\text{C} \pm 5^{\circ}\text{C}$ and the baking time is 8 hours.

3.2 Usage

It is recommended to use no-clean solder paste so that no cleaning is required after soldering. SAC305 or other low temperature solder paste with melting point not exceeding 220°C , and mainstream brands such as Alpha, Indium are preferred.

The recommended reflow profile and parameter requirements are as follows:

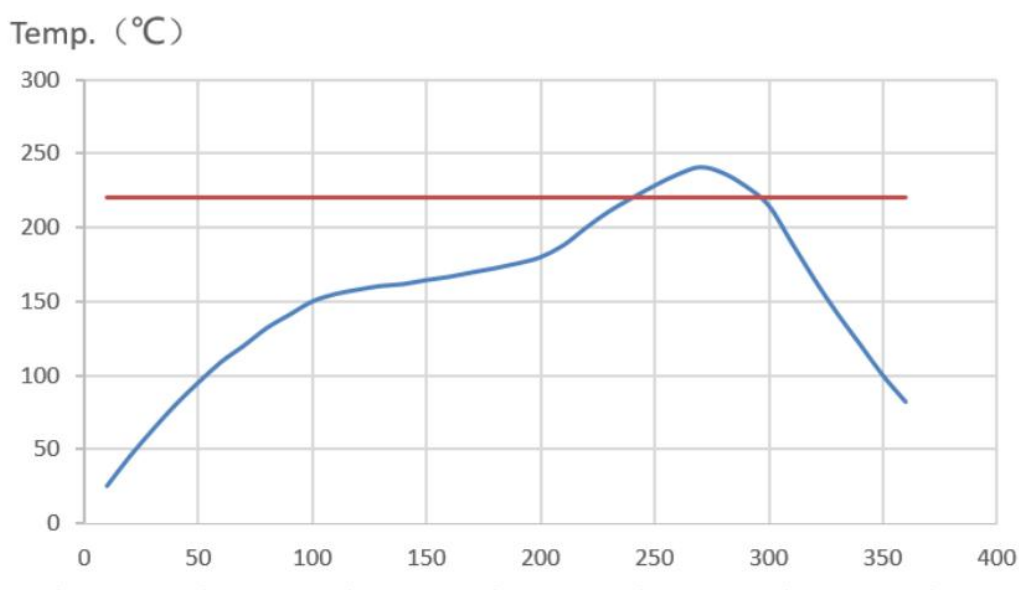


Figure 1. Recommended reflow profile

Table 6. Parameters of recommended reflow temperature profile

Parameter	Recommended Value Range
Preheating ramp-up slope	1°C/s to 3°C/s
Soak time (150°C to 180°C)	70s to 120s
Peak temperature	238°C to 245°C
Time above 220°C	45s to 70s
Cooling phase slope	-3°C/s to -1°C/s

3.3 Packaging

The module adopts tray and sealed vacuum packaging mode, combined with the outer packaging mode of a rigid cardboard box, as shown in the following figures. It provides a maximum protection for storage, transportation, and usage of the module.



Figure 2. Module vacuum packaging

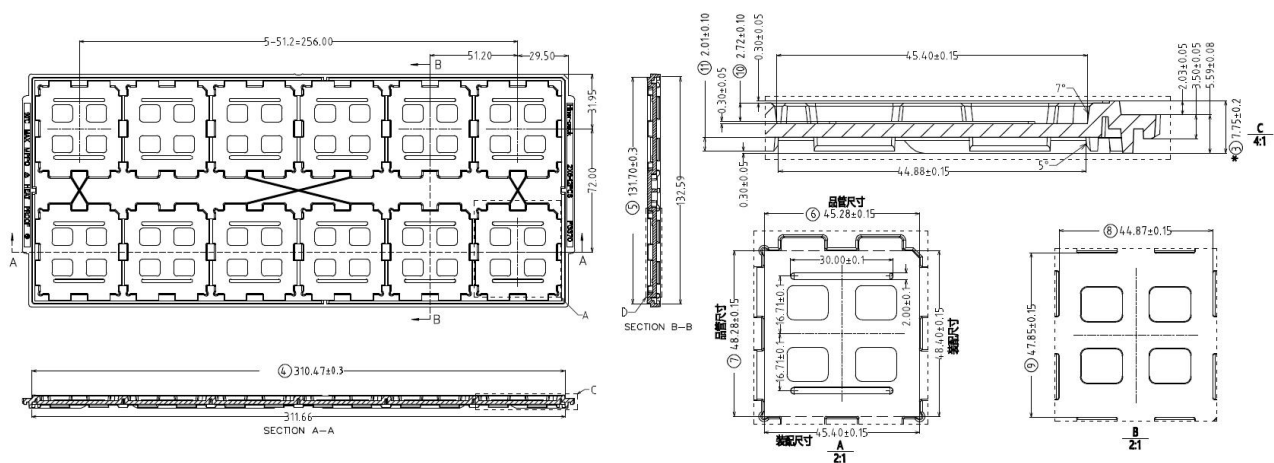


Figure 3. Tray dimensions

