



Product Specification

Model: FLC8720FRA-B-01

Jiangsu Fulian Communication Technology Co., Ltd.

Approved By	Reviewed By	Prepared By	Version	Date
			V1.4	2026.03.05



Version History

Date	Version	Updates
2024-12-20	V1.0	Initial Release
2025-03-05	V1.1	Add timing diagrams, reference designs, and power consumption data
2025-04-30	V1.2	Update module size
2026-02-06	V1.3	Update packaging information
2026-03-05	V1.4	Add description for series model FLC8720FRA-B-01



Product Overview

The FLC8720FRA-B module integrates the RTL8720DF dual-core Cortex-M33 & M23 processor platform (up to 200MHz), supporting IEEE 802.11a/b/g/n Wi-Fi and Bluetooth Low Energy (BLE 5.0) across 2.4 GHz and 5 GHz bands. With built-in 512KB RAM and 4MB Flash, it delivers high-speed data processing capabilities.

Featuring an LGA package (13.2×12.5×2.0mm) and superior RF performance, it is widely used in IoT applications:

- Consumer IP cameras
- Dashcams
- Entry-level smart TVs
- Robotic vacuums
- Drones

Key Features

- Dual-band support: 2.4GHz (802.11b/g/n) & 5GHz (802.11a/n)
- Compact dimensions: (13.2±0.2) x(12.5±0.2) x(2.0±0.15)mm
- LGA package design
- Power input: 3.0V–3.6V (Typ. 3.3V)
- Operating temperature: -40°C to +85°C
- 40MHz external crystal oscillator



Technical Specifications

Parameter	Description
Model Number	FLC8720FRA-B, FLC8720FRA-B-01
Module Type	Wi-Fi 1T1R and BT/BLE Combo Module
Main Chip	RTL8720DF
Standards	802.11 a/b/g/n, BLE 5.0
Data Rates	802.11b: 1 Mbps, 2 Mbps, 5.5 Mbps, 11 Mbps 802.11a/g: 6 Mbps, 9 Mbps, 12 Mbps, 18 Mbps, 24 Mbps, 36 Mbps, 48 Mbps, 54 Mbps 802.11n: HT20/HT40 (MCS 0~MCS 7)
Modulation Schemes	DBPSK, DQPSK, CCK, BPSK, QPSK, 16QAM, 64QAM, GFSK
Frequency Bands	2.4 GHz: 2.400~2.4835 GHz 5 GHz: 5.150~5.850 GHz
Security	WPA-PSK, WPA2-PSK, WPA3-SAE, AES-128, DES, SHA, TrustZone, Secure Boot
Interface	SDIO\UART\USB\SPI\I2C\PWM
Power Supply	DC3.3V (3.0V - 3.6V)
Operation temp	-40~+85° C
Storage Temp	-20 ~ 95° C
Dimensions	(13.2±0.2) x (12.5±0.2) x (2.0±0.15)mm



Hardware Architecture ($(13.2 \pm 0.2) \times (12.5 \pm 0.2) \times (2.0 \pm 0.15) \text{mm}$)

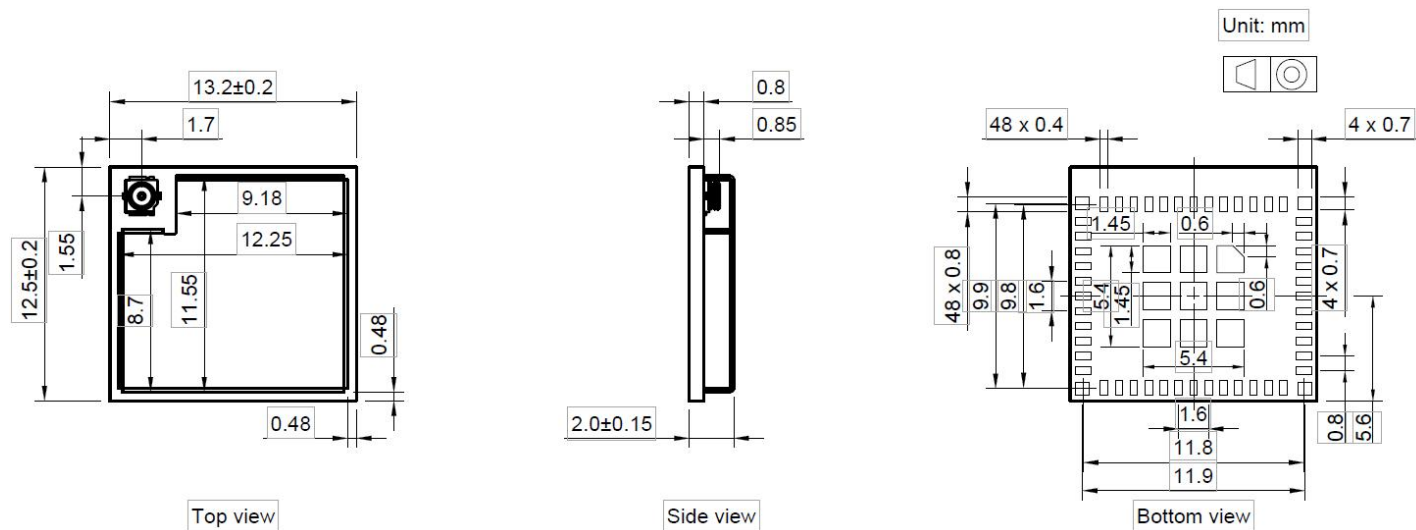


Figure 2. FLC8720FRA-B Physical Dimensions

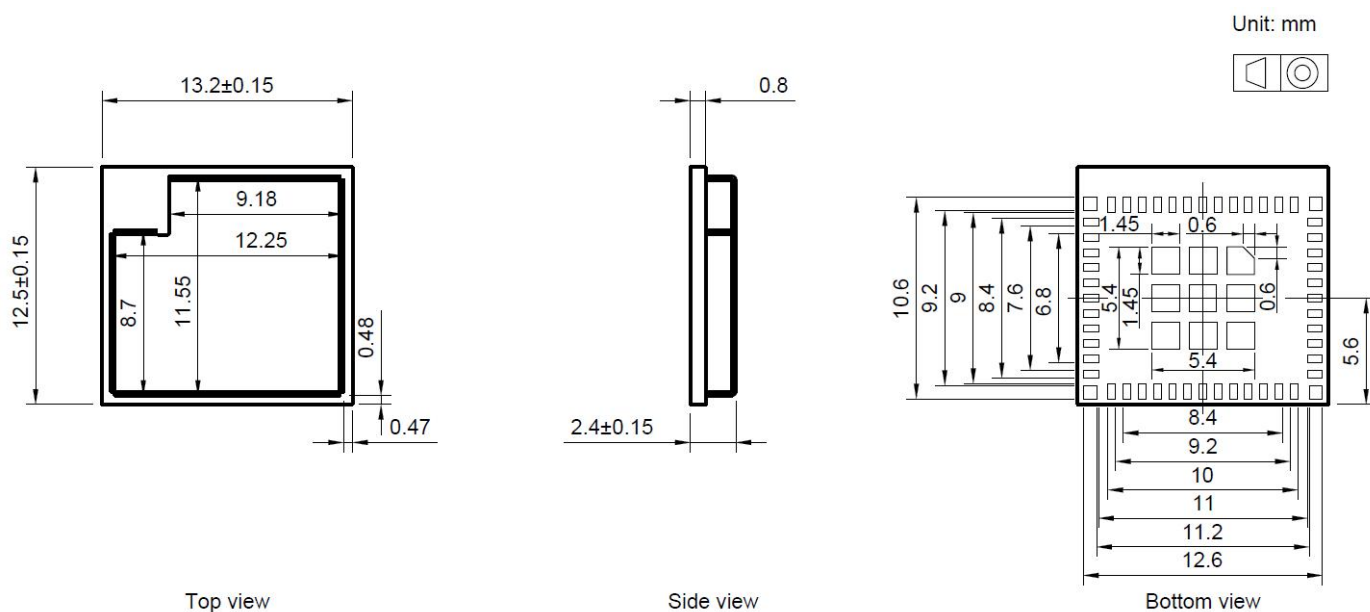


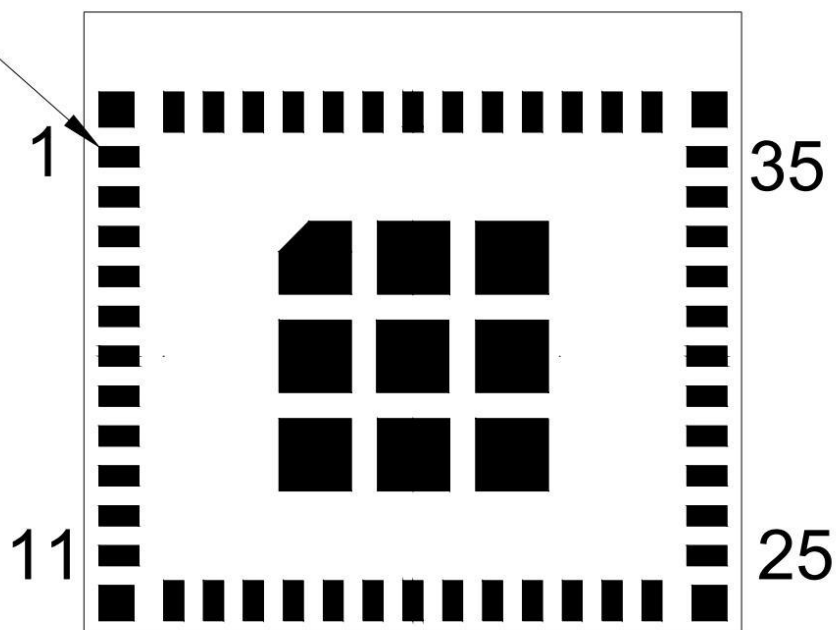
Figure 3. FLC8720FRA-B-01 Physical Dimensions

*(FLC8720FRA-B-01 module without coaxial connector)

Pin Layout



Pin 1



Pin Definition Top View



Table 1 Pin Definitions

No.	Name	Function	Notes
1, 2, 11, 14, 36~46, 48~61	GND	GND	
3	VCC	Power:Vmax=3.6V Vmin=3.0V	
8	CHIP_EN	High: on, enable chip Low: off, chip power off	
31	UART1_TXD	UART1 TXD	UART
30	UART1_RXD	UART1 RXD	
19	UART2_TXD	UART2 TXD	
20	UART2_RXD	UART2 RXD	
5	GPIO10	GPIO	
6	GPIO9	GPIO	
12	GPIO15	GPIO	
13	GPIO14	GPIO	
16	GPIO3	GPIO	
17	GPIO2	GPIO	
18	GPIO1	GPIO	
21	GPIO0	GPIO	
22	GPIO6	GPIO	
23	GPIO8	GPIO	
26	GPIO7	GPIO	
27	GPIO5	GPIO	
28	GPIO4	GPIO	
33	GPIO16	GPIO	
34	GPIO17	GPIO	
35	GPIO11	GPIO	
47	ANT_WIFI/BT	WiFi/BLE Ant	50 Ω
4, 7, 9, 10, 15, 24, 25, 29, 32	RESERVED	NC	suspended



GPIO Functions

Pin Number	Pin Name	GPIO	Function 1	Function 2	Function 3	Function 4
19	UART2_TXD	PA7	/	/	/	/
20	UART2_RXD	PA8	/	/	/	/
21	GPI00	PA12	SPI_MOSI	/	/	/
18	GPI01	PA13	SPI_MISO	/	/	/
17	GPI02	PA14	SPI_CLK	/	/	/
16	GPI03	PA15	SPI_CS	/	/	/
28	GPI04	PA25	USB_DM	/	/	I2C1_SCL
27	GPI05	PA26	USB_DP	/	/	I2C1_SDA
22	GPI06	PA27	/		SWDIO1	/
26	GPI07	PA28	RREF	/	/	/
23	GPI08	PA30	/	/	/	/
6	GPI09	PB1	ADC4	/	/	/
5	GPI010	PB2	ADC5	/	/	/
35	GPI011	PB3	ADC6	/	SWCLK1	/
30	UART1_RXD	PB18	/	SDIO_DATA2	SWCLK2	/
31	UART1_TXD	PB19	/	SDIO_DATA3	SWDIO2	/
13	GPI014	PB20	/	SDIO_CMD	PWM0	I2C_SCL
12	GPI015	PB21	/	SDIO_CLK	PWM1	I2C_SDA
33	GPI016	PB22	/	SDIO_DATA0	PWM2	/
34	GPI017	PB23	/	SDIO_DATA1	PWM3	/



Laser marking instructions:





①: QR Code Content: SN-MAC, 15-digit SN + 12-digit MAC Address

YYMMDD00000001

T: P (RF PIN) or E(Ipex)

YY:Year, e.g., 26 for 2026

MM:Month, e.g., 10 for October

DD: Day, e.g., 08 for the 8th day

00000001:Cumulative serial number:0~99999999

②:Module Model: FLC8720FRA-B, FLC8720FRA-B-01

③:12-digit MAC Address of the module

④:CMIIT ID:25J32F1KF720(M)

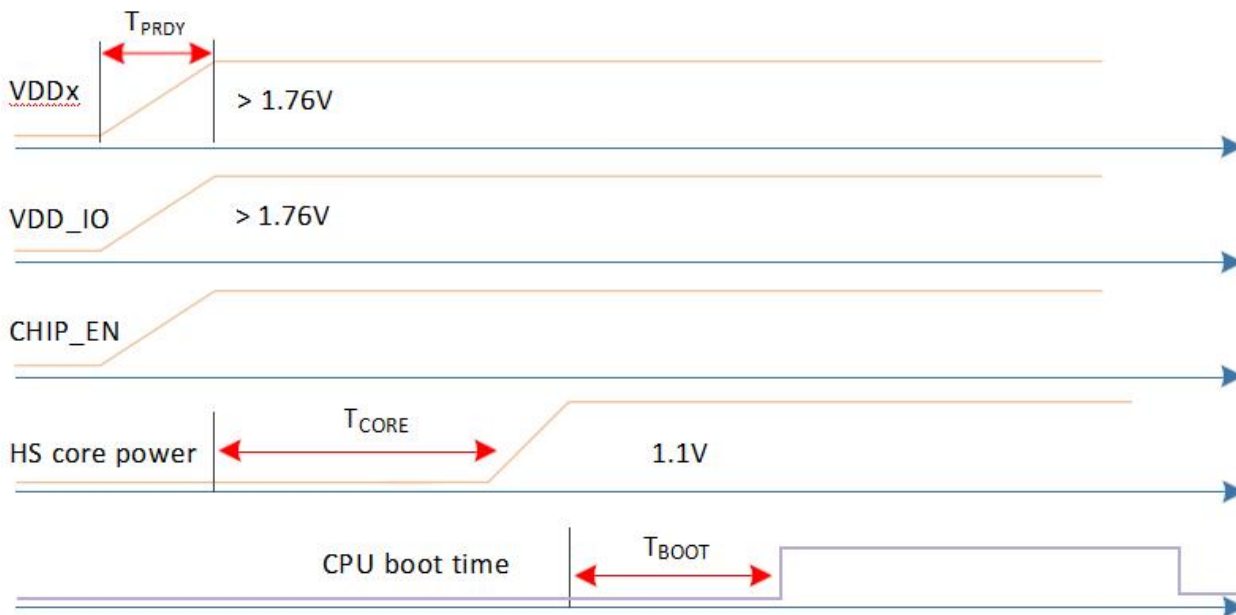
⑤:Company Name:Jiangsu Fulian Communication Technology Co., Ltd.



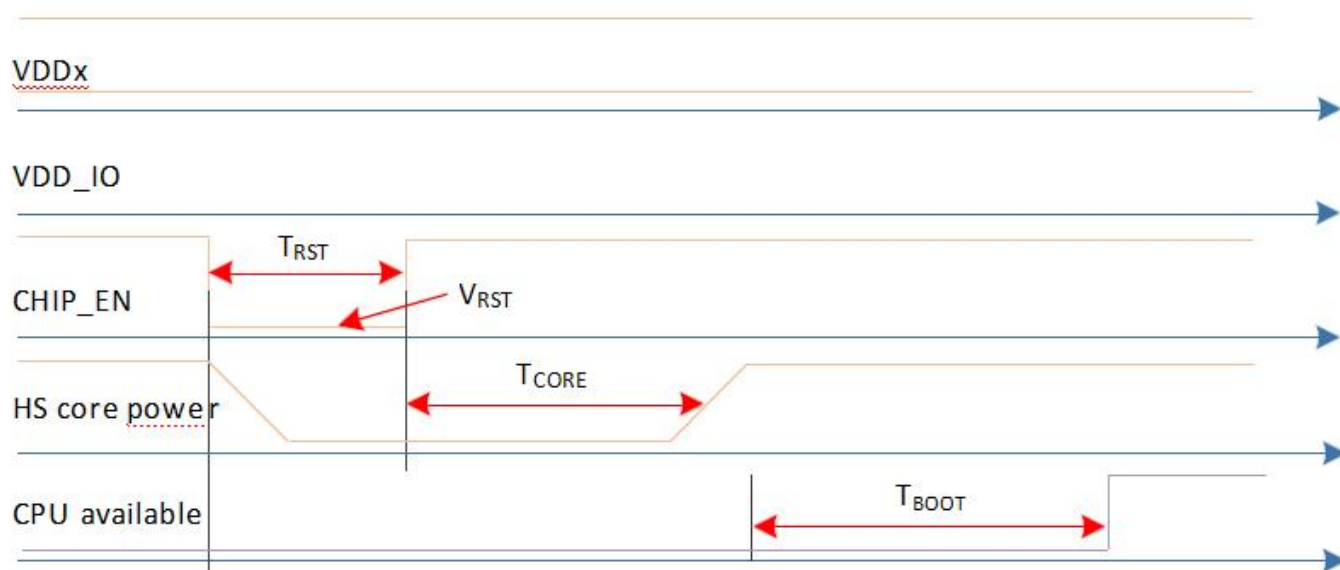
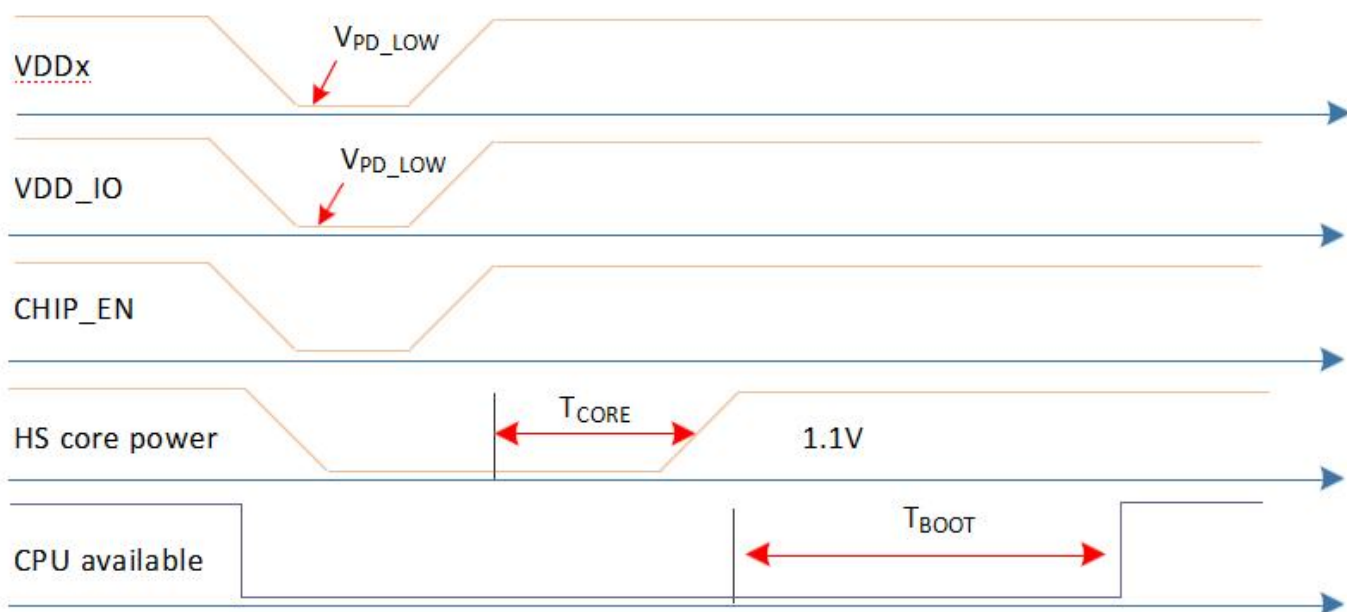
Timing diagram

Symbol	Parameter	Min.	Typ.	Max.	Unit
T_{PRDY}	VDDx ready time	0.1	0.6	4.6	ms
T_{CORE}	HS core power ready time		15	–	ms
T_{BOOT}	HS MCU boot time	200	200	–	ms
V_{PD_LOW}	Power-down low voltage	0	0	0.3	V
V_{RST}	Shutdown occurs after CHIP_EN lower than this voltage	0	0	$0.2 * V_{DDX}$	V
T_{RST}	Required time that CHIP_EN lower than V_{RST}	1	1	–	ms

A、Power on or deep sleep wake-up timing



B、Power off timing



Power consumption data



Reflow Profile

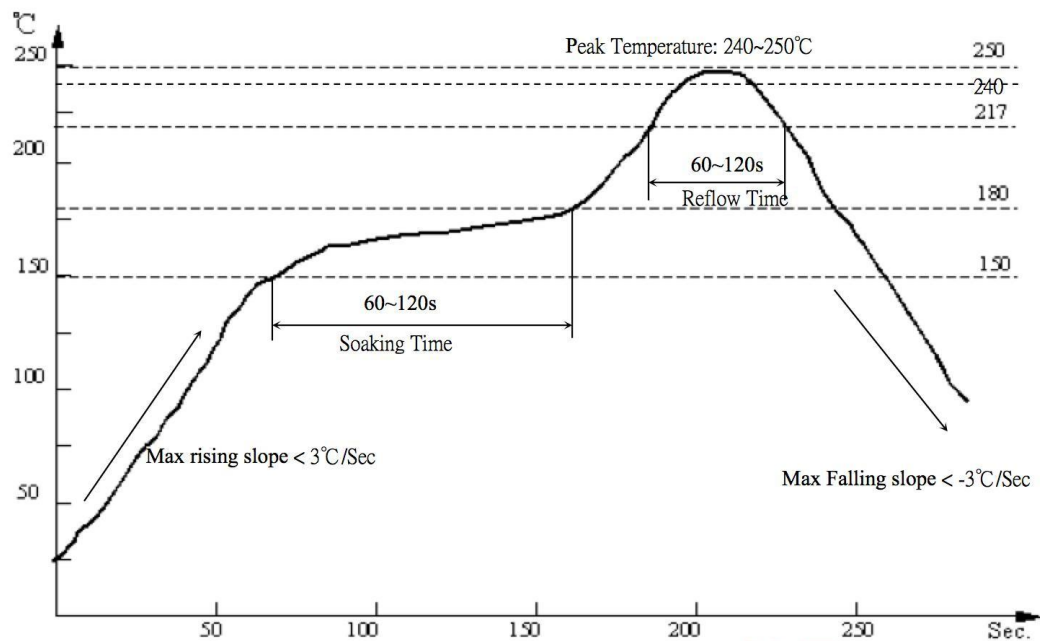
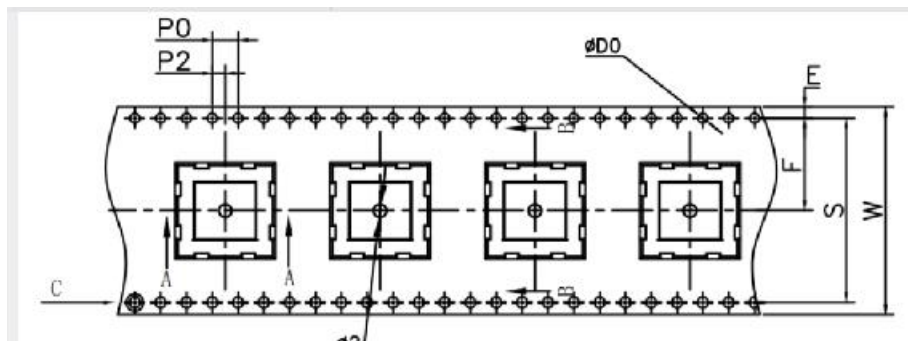


Figure 3.FLC8720FRA-B Reflow Temperature

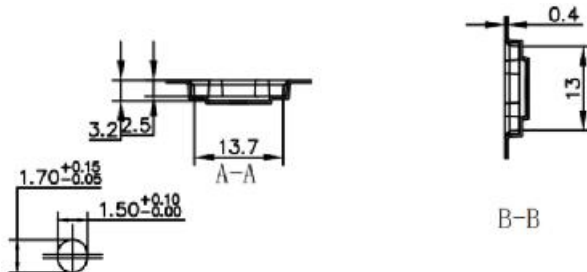
Packaging method

13.1 Carrier tape dimensions





E	1.75 ± 0.10
F	14.20 ± 0.10
S	28.40 ± 0.10
P2	2.00 ± 0.10
ϕD_0	$1.50 \pm \begin{smallmatrix} 0.10 \\ 0.00 \end{smallmatrix}$
$\phi D1$	2.00 ± 0.10
PO	4.00 ± 0.10
10PO	40.00 ± 0.20
W	32.00 ± 0.30
P	24.00 ± 0.10
AO	13.70 ± 0.10
BO	13.00 ± 0.10
KO	2.50 ± 0.10
T	0.40 ± 0.05

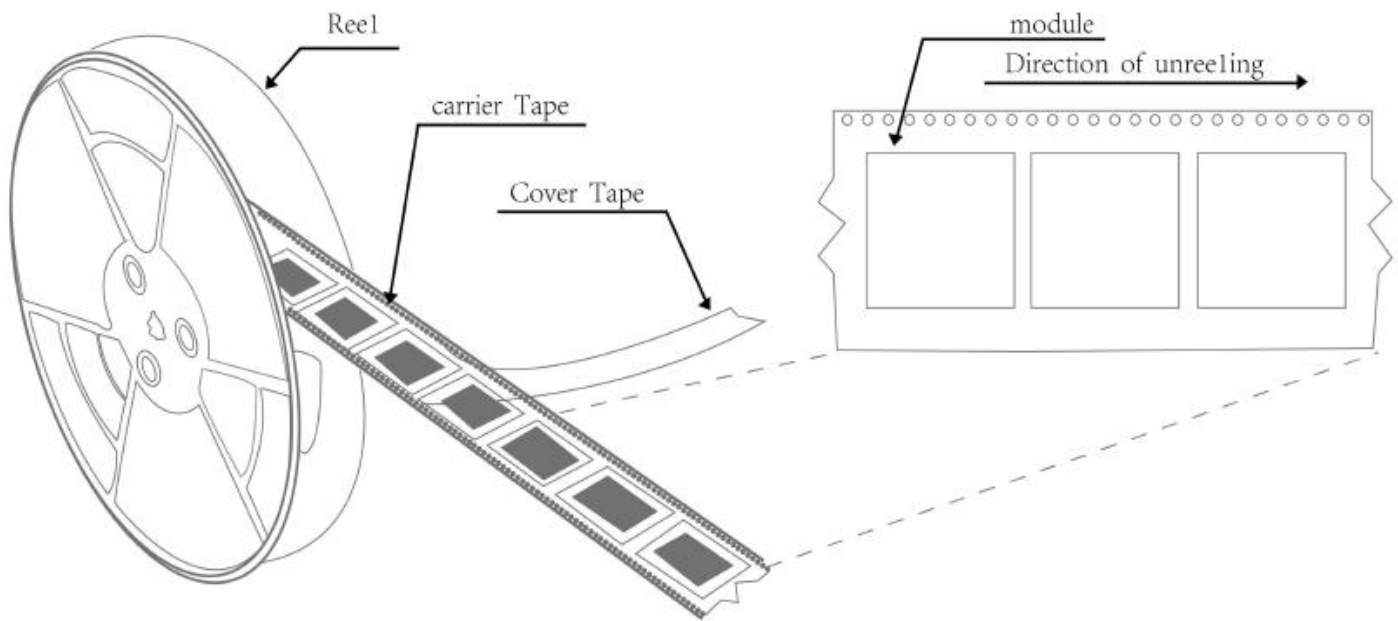


Notes:

- 1.The cumulative tolerance of 10 edge holes must not exceed ± 0.2 mm.
- 2.Material specification: PS black, thickness 0.40 mm.
- 3.13-inch reel packaging length: 19.68 m. (Leading empty pocket length: 0.24 m; component packaging length: 19.20 m; trailing empty pocket length: 0.24 m.)
- 4.Total number of parts packed on a 13-inch reel: 820 pcs. (Leading empty pockets: 10 pcs; actual packed parts: 800 pcs; trailing empty pockets: 10 pcs.)

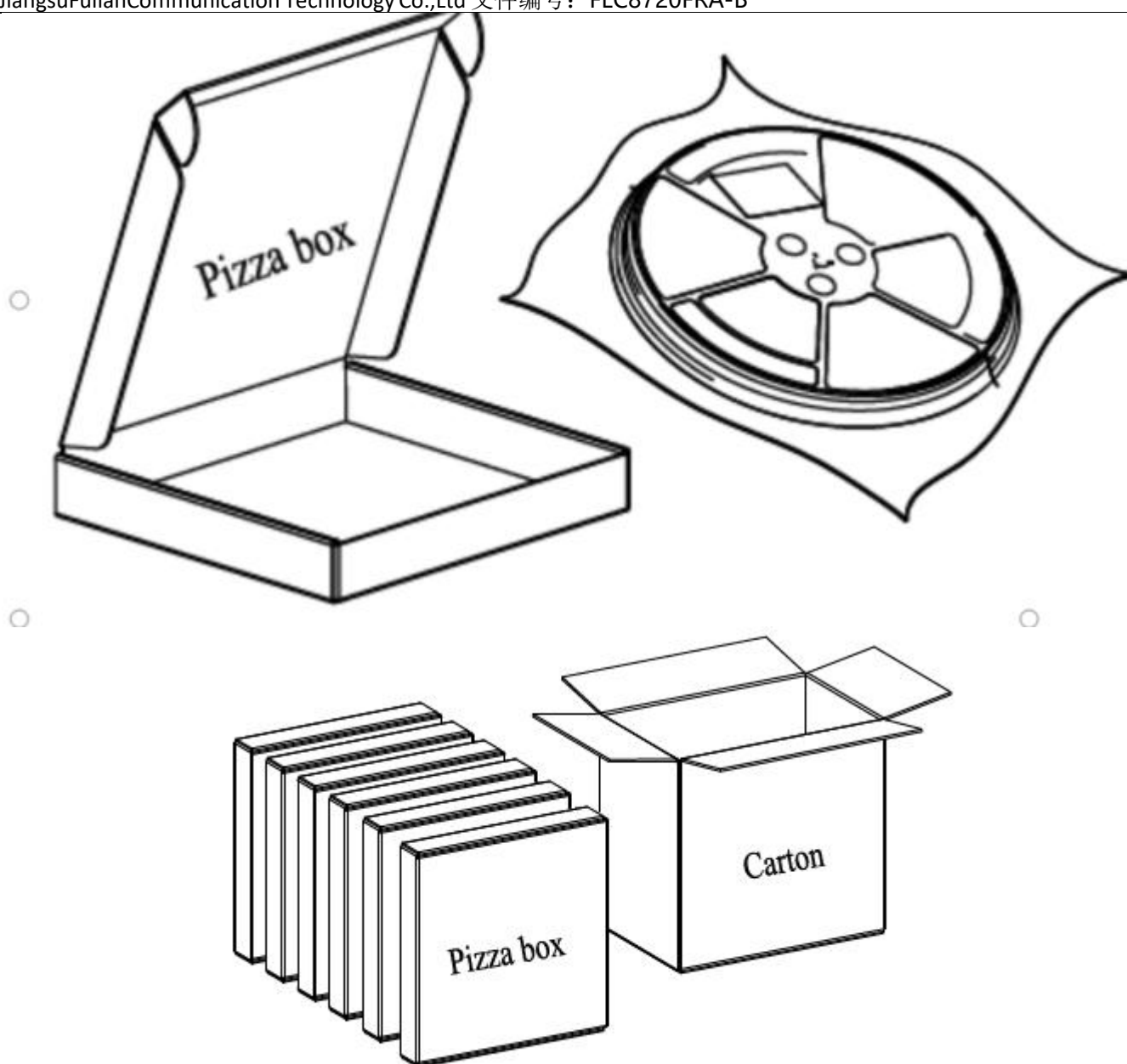


13.2 Packaging method



The products are shipped on reels for ease of SMT processing by customers. Each reel includes a humidity indicator card and desiccant, is vacuum-sealed in an anti-static bag, and then packaged in a carton for shipment. Both the reels and the outer cartons are labeled with manufacturer labels and a QR code for inspection and outbound tracking, facilitating traceability and anti-counterfeiting measures.





6 pizza boxes are placed into one carton, and the carton is sealed. Each carton contains 4800 pieces.

Figure 4. FLC8720FRA-B Packing

14、 Ordering Instructions

Purchase Code	Operating Temperature Range	Antenna
FLC8720FRA-B	-40~85℃	4th Generation RF Coaxial Connector
FLC8720FRA-B-01	-40~85℃	Pin Antenna



ESD Protection: Mandatory during handling

	CAUTION	LEVEL
	This bag contains MOISTURE-SENSITIVE DEVICES	3
If Blank, see adjacent bar code label		
1. Calculated shelf life in sealed bag: 12 months at $< 40^{\circ}\text{C}$ and $< 90\%$ relative humidity (RH)		
2. Peak package body temperature: <u>260</u> $^{\circ}\text{C}$ If Blank, see adjacent bar code label		
3. After bag is opened, devices that will be subjected to reflow solder or other high temperature process must		
a) Mounted within: <u>168</u> hrs. of factory conditions If Blank, see adjacent bar code label		
$\leq 30^{\circ}\text{C}/60\%\text{RH}$, OR		
b) Stored at $<10\%$ RH		
4. Devices require bake, before mounting, if:		
a) Humidity Indicator Card is $> 10\%$ when read at $23 \pm 5^{\circ}\text{C}$		
b) 3a or 3b not met.		
5. If baking is required, devices may be baked for 48 hrs. at $125 \pm 5^{\circ}\text{C}$		
Note: If device containers cannot be subjected to high temperature or shorter bake times are desired, reference IPC/JEDEC J-STD-033 for bake procedure		
Bag Seal Date: _____ If Blank, see adjacent bar code label		
Note: Level and body temperature defined by IPC/JEDEC J-STD-020		



Figure 5. FLC8720FRA-B storage and ESD protection

Support & Contact

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Business Hours: Mon–Sat 8:00–12:00 & 13:00–17:00 (GMT+8)



FCC 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.

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.

Note: The Grantee is not responsible for any changes or modifications not expressly approved by the party responsible for compliance. Such modifications could void the user's authority to operate the equipment.

The device has been evaluated to meet general RF exposure requirement. To maintain compliance with FCC's RF exposure guidelines, the distance must be at least 20 cm between the radiator and your body, and fully supported by the operating and installation configurations of the transmitter and its antenna(s).

Integration instructions for host product manufacturers according to KDB 996369 D03 OEM Manual v01

2.2 List of applicable FCC rules

FCC Part 15 Subpart C 15.247

[FCC Part 15 Subpart C 15.407](#)

2.3 Specific operational use conditions



The module can be used for mobile applications with a maximum antenna gain of 1.98dBi at 2.4 GHz and 3.20 dBi at 5 GHz. The host manufacturer installing this module into their product must ensure that the final composite product complies with the FCC requirements by a technical assessment or evaluation to the FCC rules, including the transmitter operation. The host manufacturer 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 shown in this manual.

2.4 Limited module procedures

The device is a Single module and complies with the requirement of FCC Part 15.212.

2.5 Trace antenna designs

Not applicable. The module has its own antenna, and doesn't need a host printed board micro strip trace antenna, etc.

2.6 RF exposure considerations

The device has been evaluated to meet general RF exposure requirement. The device can be used in portable exposure condition without restriction, and if RF exposure statement or module layout is changed, then the host product manufacturer is required to take responsibility of the module through a change in FCC ID or new application. The FCC ID of the module cannot be used on the final product. In these circumstances, the host manufacturer will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

2.7 Antennas

Antenna Specification are as follows. Type of antenna: FPC Antenna. Gain of antenna: 2.4GHz @ 1.98 dBi Max. 5GHz @ 3.20 dBi Max. This device is intended only for host manufacturers under the following conditions: The transmitter module may not be co-located with any other transmitter or antenna. The module shall be only used with the internal antenna(s) that has been originally tested and certified with this module. The antenna must be either permanently attached or employ a "unique" antenna coupler. As long as the conditions above are met, further transmitter test will not be required. However, the host manufacturer is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).



2.8 Label and compliance information

Host product manufacturers need to provide a physical or e-label stating "Contains FCC ID: 2AXS5-[FLC8720FRAB01](#)" with their finished product.

2.9 Information on test modes and additional testing requirements

Host manufacturer must perform test of radiated & conducted emission and spurious emission, etc. according to the actual test modes for a stand-alone modular transmitter in a host, as well as for multiple simultaneously transmitting modules or other transmitters in a host product. Only when all the test results of test modes comply with FCC requirements, then the end product can be sold legally.

2.10 Additional testing, Part 15 Subpart B disclaimer

The modular transmitter is only FCC authorized for FCC Part 15 Subpart C 15.247 ,[FCC Part 15 Subpart C 15.407](#) 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 circuit), 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.