



**FT1821CE**  
**-20PW5A22D1**  
**Module Datasheet**

# FT1821CE -20PW5A22D1 Module Datasheet

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Customer Approval

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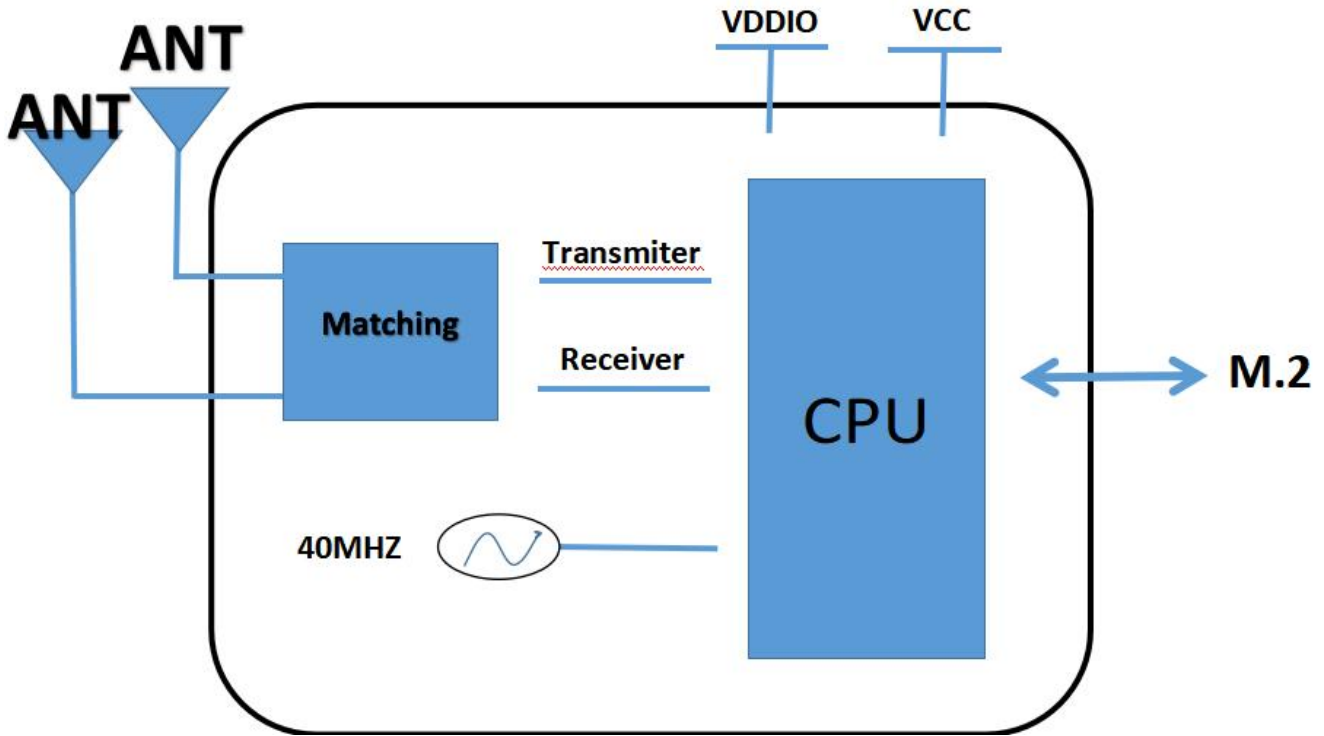
Version	Date	Revision	Content	Editorialstaff	approval
XFE	2023.08.15	V@	-q•cç^!•q}		

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### 1.3 Block Diagram



### 1.4 General Specification

T [ a^  Pæ ^	ØVFÌ GFÒÈÈÙY Í ØEGÖF
Ú! [ a~ &cÖ^•&ā q }	Y ØØ æ ā Ó ^q [ c@ T È T [ a~  ^
Öā ^}•ā }	Šç Y ç PKGGç HÈç GÈJ Ç± ÈHD{ {
Y äÖā Qc^!-æ^	Ù ] ] [ !cT È
ÓV ā c^!-æ^	Ù ] ] [ !cT È
UÙ Ù ] ] [ !c	Y ā ā [ , • GÈÈÈÝÚHGÈ   Èä æHGÈ   Èý ā ĩ HGÈ   Èý ā ā [ , • FÈÈ æÈ
U ] ^!æā * c^ [ ] ^!æ^  ^	€ q É5€» Ô
Ùq !æ^ c^ [ ] ^!æ^  ^	È Ĩ »Ô q FG »Ô

## 1.5 DC Characteristics

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Symbol	Parameter	Minimum	Typical	Maximum	Units
XÖÖH	HÈX @ Ú]] ^ X[ æ^	HÈ	HÈH	HÈ	X
ÖÖH	HÈX Üæã * Ô^ !!^} c	Đ	Đ	ì €€	{ OE

## 2 RF Specifications

### 2.1 2.4GHz RF Specification

Ø^æ  ^•	Ö^•&āā }		
Y ŠÖP Ûæå ååå	ØØØ802.11b/g/n		
Ø^~^} & Üæ *^	GÈ FGIGÈ Î GÖP: ÁGÈ ÖP: ÁÜT ÁÓæ åD		
T [ ä~  æā } T^c@å	ÖÜÜÜÖÓÜÜSÊÖÜÜÜSÊÖÖS æ å UØÖT ÖÜÜSÊÜÜÜSÊFÍ ÜÖÆ È I ÜÖÆ D		
Þ~ { à! [ ~Ö@æ } ^	GÈ ÖP: K FFKÖ@ÈFÈFD. W, æ^å Üææ^• FHKÖ@ÈFÈFD. Ö~   [ ] ^ FIKÖ@ÈFÈFI D. Rææ æ ÓV GÈ ÖP: K Ö@È€ dī ì , 0-39		
GÈ Ö Viæ • { æ^! Û ] ^ & äāæā } •			
<b>TX Rate</b>	<b>TX Power</b>	<b>TX Power Tolerance</b>	<b>EVM</b>
ì €GÈFàO FFT à) •	Fī åÓ{	† GåÓ{	≤-13åÓ
ì €GÈF*O Í I T à) •	Fì åÓ{	† GåÓ{	≤ÈÍ åÓ
ì €GÈF} O ÓY GÈ T Ô ÜÏ	FHåÓ{	† GåÓ{	≤-28åÓ
ì €GÈF} O ÓY I € T Ô ÜÏ	FHåÓ{	† GåÓ{	≤ÈÍ åÓ
Ø^~^} & Ò:   [ ] : † FGÚÚT			
GÈ Ö Ü^&æ^! Û ] ^ & äāæā } •			
<b>RX Rate</b>	<b>Standard Value</b>		<b>PER</b>
ì €GÈFàO FFT à) •	≤È ì åÓ{		8%
ì €GÈF*O Í I T à) •	≤È ì åÓ{		10%
ì €GÈF} O ÓY GÈ T Ô ÜÏ	≤È ì åÓ{		10%
ì €GÈF} O ÓY I € T Ô ÜÏ	≤È ì åÓ{		10%



## 2.2 5GHz RF Specification

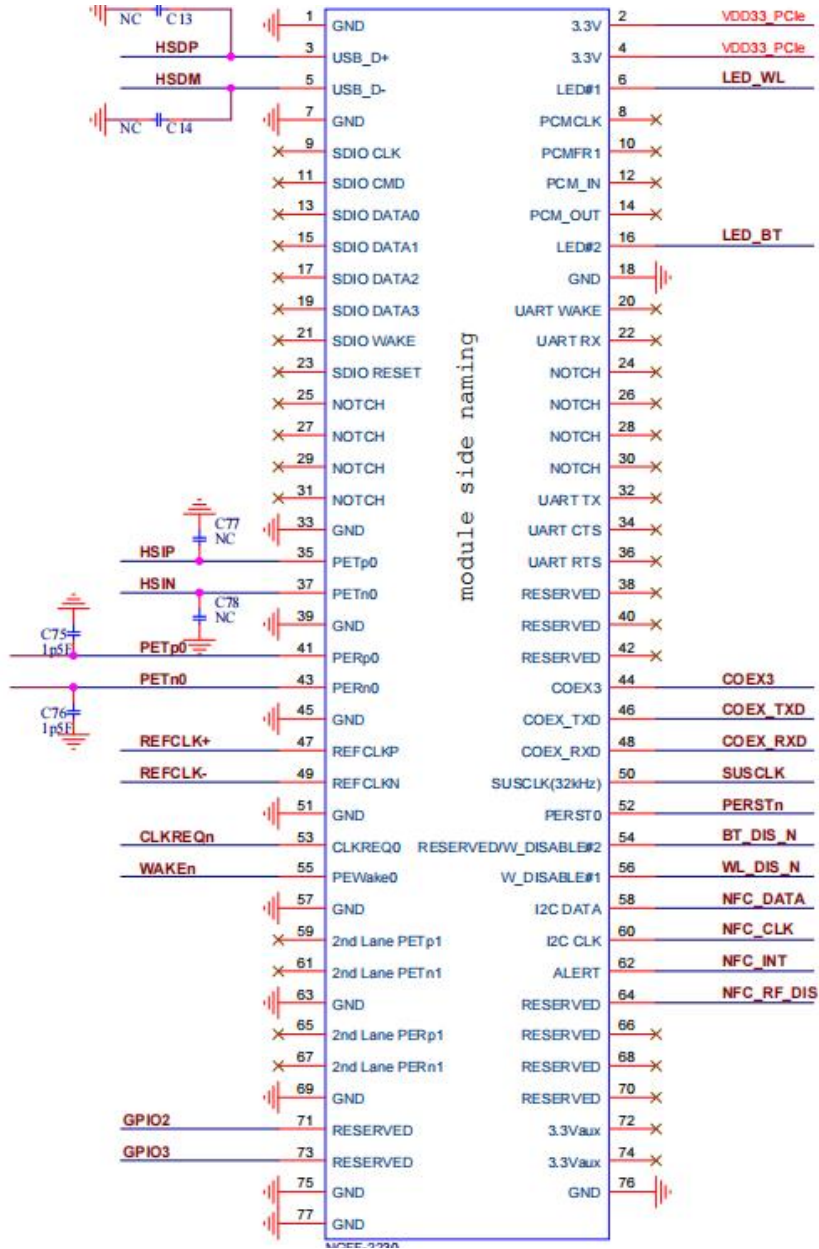
$\frac{P_{max}}{P_{min}}$		$\frac{P_{max}}{P_{min}}$	
$\frac{P_{max}}{P_{min}}$		$\frac{P_{max}}{P_{min}}$	
$\frac{P_{max}}{P_{min}}$		$\frac{P_{max}}{P_{min}}$	
$\frac{P_{max}}{P_{min}}$		$\frac{P_{max}}{P_{min}}$	
$\frac{P_{max}}{P_{min}}$			
<b>TX Rate</b>	<b>TX Power</b>	<b>TX Power Tolerance</b>	<b>EVM</b>
$\frac{P_{max}}{P_{min}}$	$\frac{P_{max}}{P_{min}}$	$\frac{P_{max}}{P_{min}}$	$\leq -25\text{dB}$
$\frac{P_{max}}{P_{min}}$	$\frac{P_{max}}{P_{min}}$	$\frac{P_{max}}{P_{min}}$	$\leq -25\text{dB}$
$\frac{P_{max}}{P_{min}}$	$\frac{P_{max}}{P_{min}}$	$\frac{P_{max}}{P_{min}}$	$\leq -28\text{dB}$
$\frac{P_{max}}{P_{min}}$	$\frac{P_{max}}{P_{min}}$	$\frac{P_{max}}{P_{min}}$	$\leq -28\text{dB}$
$\frac{P_{max}}{P_{min}}$			
<b>RX Rate</b>	<b>Standard Value</b>		<b>PER</b>
$\frac{P_{max}}{P_{min}}$	$\frac{P_{max}}{P_{min}}$		$\leq 10^{-3}$
$\frac{P_{max}}{P_{min}}$	$\frac{P_{max}}{P_{min}}$		$\leq 10^{-3}$
$\frac{P_{max}}{P_{min}}$	$\frac{P_{max}}{P_{min}}$		$\leq 10^{-3}$
$\frac{P_{max}}{P_{min}}$	$\frac{P_{max}}{P_{min}}$		$\leq 10^{-3}$

## 2.3 Bluetooth Specification

Feature	Description
<b>General Specification</b>	
Ó¸^¸ [ c@Ù¸] à¸à	Ó¸^¸ [ c@Ù¸] ~FÊG¸ à HT à] •È
P [ •cQ¸¸-¸¸^	W0EÛV
Ø^~^} & Ó¸ à	2402 ~ 2480MHz
¸ { à¸ [ ~Ô¸] } ¸•	Ï J/40 &¸] } ¸•
T [ à¸¸ ]	GFSK, PI/4 DQPSK, 8DPSK
<b>RF Specification</b>	
Ú [ , ¸! ¸ÖÜ: ÒØÙS¸T à] •D	€àÓ¸ dF€àÓ¸
Ú [ , ¸! ¸ÖÜ: ¸ÖÛÙÙS¸T à] •D	€àÓ¸ dF€àÓ¸
Ú [ , ¸! ¸ÖÜ: 8DPSK¸T à] •D	€àÓ¸ dF€àÓ¸
Ú [ , ¸! ¸Ö: ÒØÙS¸FT à] •D	€àÓ¸ dF€àÓ¸
Ú [ , ¸! ¸Ö: ÒØÙS¸ET à] •D	€àÓ¸ dF€àÓ¸
Ù¸} •¸¸¸ O ÓÖÛMÈFÃ ¸! ¸ÖÜ: ÒØÙS¸T à] •D	È ì àÓ¸
Ù¸} •¸¸¸ O ÓÖÛMÈFÃ ¸! ¸ÖÜ: ¸ÖÛÙÙS¸T à] •D	ÈF àÓ¸
Ù¸} •¸¸¸ O ÓÖÛMÈFÃ ¸! ¸ÖÜ: 8DPSK¸T à] •D	È í àÓ¸
Ù¸} •¸¸¸ O ÓÖÛMÈÈÃ ¸! ¸Ö: ÒØÙS¸FT à] •D	ÈF àÓ¸
Ù¸} •¸¸¸ O ÓÖÛMÈÈÃ ¸! ¸Ö: ÒØÙS¸ET à] •D	È€ àÓ¸
ÒXT ÙÙÒÒ¸àD	ÓÖÜ: ÒØÙS¸FT à] •Kì í SPZ
	ÒÖØ: ¸ÖÛÙÙS¸T à] •Kì í SPZ
	ÒÖÜ: 8DPSK¸T à] •Kì í SPZ
	ÓÖ: ÒØÙS¸FT à] •Kì í SPZ
	ÓÖ: ÒØÙS¸ET à] •Kì í SPZ

# 3 Pin Assignments

## 3.1 Pin Outline



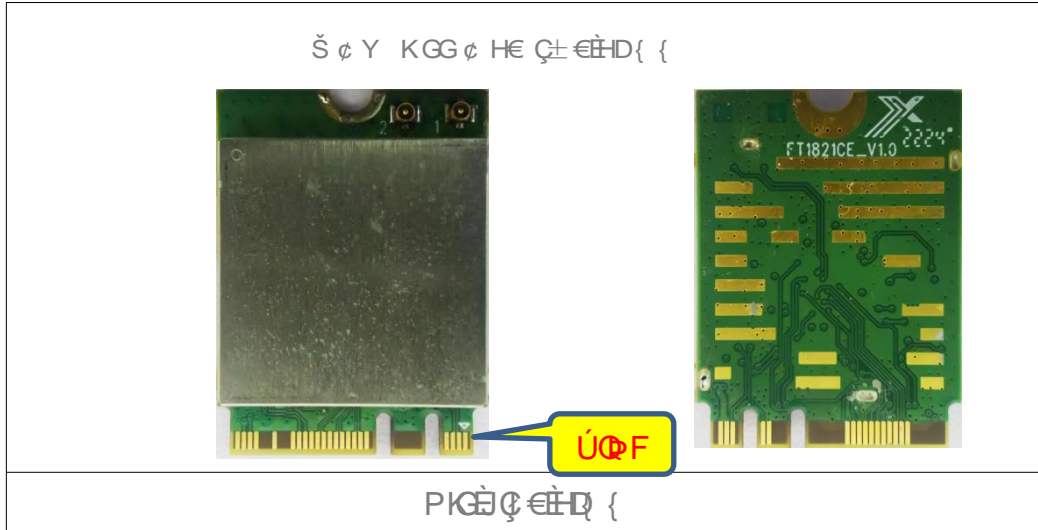
### 3.2 Pin Definition

NO	Name	Description
1	ÕPÖ	Õ {~}á &}}^&ç}•
2	HÈX	HÈX ][, ^! •~]] ^
3	WÙÓ' Ö' Ú	WÙÓ Öã-^/^\} çæ •ã} æ
4	HÈX	HÈX ][, ^! •~]] ^
5	WÙÓ' Ö' Þ	WÙÓ' Ö' Þ WÙÓ Öã-^/^\} çæ •ã} æ
6	ŠÒÖ' Y ŠÖÞ' Š	Öçæ^ [ , •ã} æÈV@ •ã} æ ä ~•^á ç ] çæ^ •çæ • ä áææ   • çæ ŠÖÖ
7	ÕPÖ	Õ {~}á &}}^&ç}•
16	ŠÒÖ' ÓV' Š	Öçæ^ [ , •ã} æÈV@ •ã} æ ä ~•^á ç ] çæ^ •çæ • ä áææ   • çæ ŠÖÖ
17	ÞÔ	Ø  ææ * Úä ÈÞ[ &}}^&c ç æ^ çæ * È
18	ÕPÖ	Õ {~}á &}}^&ç}•
19	ÞÔ	Ø  ææ * Úä ÈÞ[ &}}^&c ç æ^ çæ * È
20	ÞÔ	Ø  ææ * Úä ÈÞ[ &}}^&c ç æ^ çæ * È
21	ÞÔ	Ø  ææ * Úä ÈÞ[ &}}^&c ç æ^ çæ * È
22	ÞÔ	Ø  ææ * Úä È Þ[ &}}^&c ç æ^ çæ * È
23	ÞÔ	Ø  ææ * Úä ÈÞ[ &}}^&c ç æ^ çæ * È
32	ÞÔ	Ø  ææ * Úä ÈÞ[ &}}^&c ç æ^ çæ * È
33	ÕPÖ	Õ {~}á &}}^&ç}•
34	ÞÔ	Ø  ææ * Úä ÈÞ[ &}}^&c ç æ^ çæ * È
35	ÚÒÛ] €	Öã-^/^\} çæ  ^&^ç^
36	ÞÔ	Ø  ææ * Úä ÈÞ[ &}}^&c ç æ^ çæ * È
37	ÚÒÛ] €	Öã-^/^\} çæ  ^&^ç^
38	ÞÔ	Ø  ææ * Úä ÈÞ[ &}}^&c ç æ^ çæ * È
39	ÕPÖ	Õ {~}á &}}^&ç}•
40	ÞÔ	Ø  ææ * Úä ÈÞ[ &}}^&c ç æ^ çæ * È
41	ÚÒV] €	Öã-^/^\} çæ dæ •{ æÈ
42	ÞÔ	Ø  ææ * Úä ÈÞ[ &}}^&c ç æ^ çæ * È
43	ÚÒV] €	Öã-^/^\} çæ dæ •{ æ
44	ÔUÒÝH	Ô[ ^çã ç) &^È
45	ÕPÖ	Õ {~}á &}}^&ç}•
46	ÔUÒÝ' VÝÖ	Ô[ ^çã ç) &^
47	ÛÒØÖŠŠÚ	Öã-^/^\} çæ  ^/^\} & &  & È
48	ÔUÒÝ' ÜÝÖ	Ô[ ^çã ç) &^
49	ÛÒØÖŠŠÞ	Öã-^/^\} çæ  ^/^\} & &  & È

50	ÚWUÔŠS	HGSP: &[ & ā ] ~ c
51	ÕPÖ	Õ:[ ~ } á & } } ^ & c } •
52	ÚÒÛÙÈ	ÚÒÛÙÈ • ^ c ā æ ~ } & c } } ã   ^ • ^ c d @ & ã ã æ á ^ ã ^ á à ^ @ ÚÒÛÙÈ T ã ã Õ ã ã Õ Õ T • ] ^ & ã ã ã } È
53	ÔŠSÛÒÛÈ	Û ^ ^   ^ ) & [ & [ &   ^ ~ ^ • c
54	ÓV' ÖW' P	ÓV' á ã ã   ^ & } d [   È
55	ÚÒY OSÒÈ	U ] ^ } O   ã ã ã   ^ S [ , • ã } ã E V @ ã • ã } ã ã ~ • ^ á d   ^ ~ ^ • c @ ã @ ã • ^ • c {   ^ c } } { { æ •   ^   B ~ • ] ^ } á á • ã ã d • ^   ç ã ^ æ ~ } & c } } ã ã ã ã ã , ã ^ ^ ç ^ } È
56	Y Š' ÖW' P	Y Š' ã ã ã   ^ & } d [   È
57	ÕPÖ	Õ:[ ~ } á & } } ^ & c } •
58-62	ÐÔ	Ð [ ã ã * Ú ã È P [ & } } ^ & c d ã ^ c ã * È
63	ÕPÖ	Õ:[ ~ } á & } } ^ & c } •
64	ÐÔ	Ð [ ã ã * Ú ã È P [ & } } ^ & c d ã ^ c ã * È
65	ÐÔ	Ð [ ã ã * Ú ã È P [ & } } ^ & c d ã ^ c ã * È
66	ÐÔ	Ð [ ã ã * Ú ã È P [ & } } ^ & c d ã ^ c ã * È
67	ÐÔ	Ð [ ã ã * Ú ã È P [ & } } ^ & c d ã ^ c ã * È
68	ÐÔ	Ð [ ã ã * Ú ã È P [ & } } ^ & c d ã ^ c ã * È
69	ÕPÖ	Õ:[ ~ } á & } } ^ & c } •
70	ÐÔ	Ð [ ã ã * Ú ã È P [ & } } ^ & c d ã ^ c ã * È
71	ÕÚWIG	Û ^ • ^   ç ^ á
72	ÐÔ	Ð [ ã ã * Ú ã È P [ & } } ^ & c d ã ^ c ã * È
73	ÕÚWH	Û ^ • ^   ç ^ á
74	ÐÔ	Ð [ ã ã * Ú ã È P [ & } } ^ & c d ã ^ c ã * È
75	ÕPÖ	Õ:[ ~ } á & } } ^ & c } •
76	ÕPÖ	Õ:[ ~ } á & } } ^ & c } •
77	ÕPÖ	Õ:[ ~ } á & } } ^ & c } •

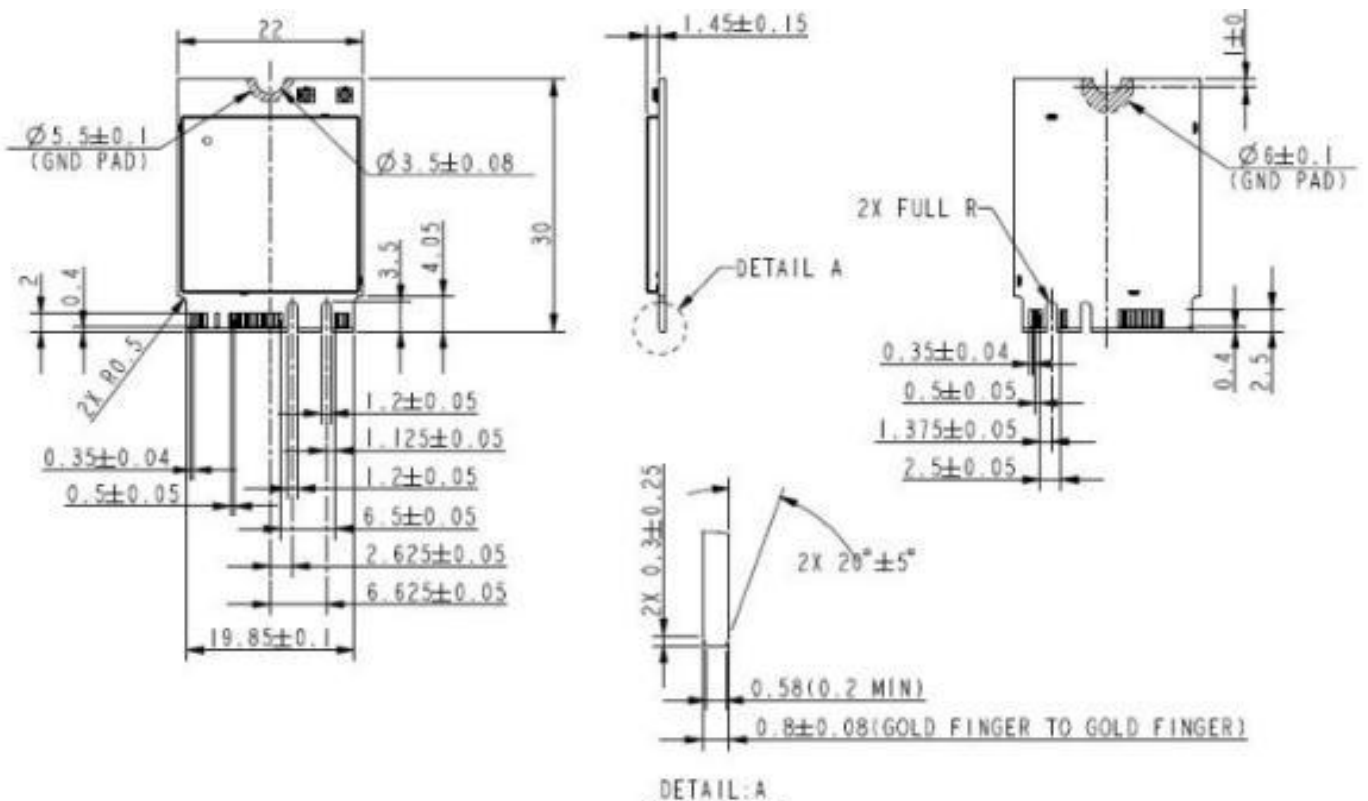
## 4 Dimensions

### 4.1 Module Picture



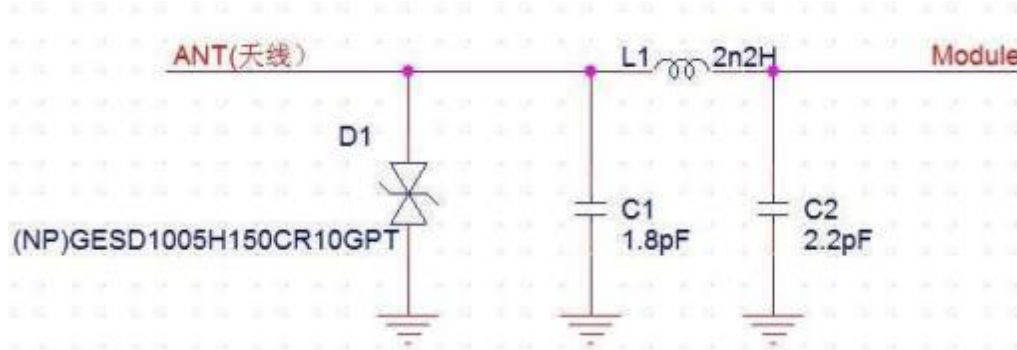
### 4.2 Module Physical Dimensions

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## 5 Reference Design

### 5.1 WIFI RF Circuit reference pictures



1. Above the dotted box part of the antenna matching is needed, the actual antenna matching electronic parameters shall prevail.

2. For RF part layout to do 50 ohm impedance. can't go on 90° of layout. The line length can't more than 20 mm.

⊂[ ⅈKÚ^æ^ à^ •~|^ ⅈ æá æVXÙ ç à^ æⓄ ^} á [ ~Ⓞ , ^|á̄ \* æ ⅈ} } æⅈ ]|^ç^} ⓄÙÖ •ææ  
 ^|^dææ ÷[{ áæ ǣ̄ \* Ⓞ Y ⓄQ [ á^ | ç •Ⓞ, } ⅈ Ⓞ|^-|^} & æ& ææ[ ç^E

## 6 The Key Material List

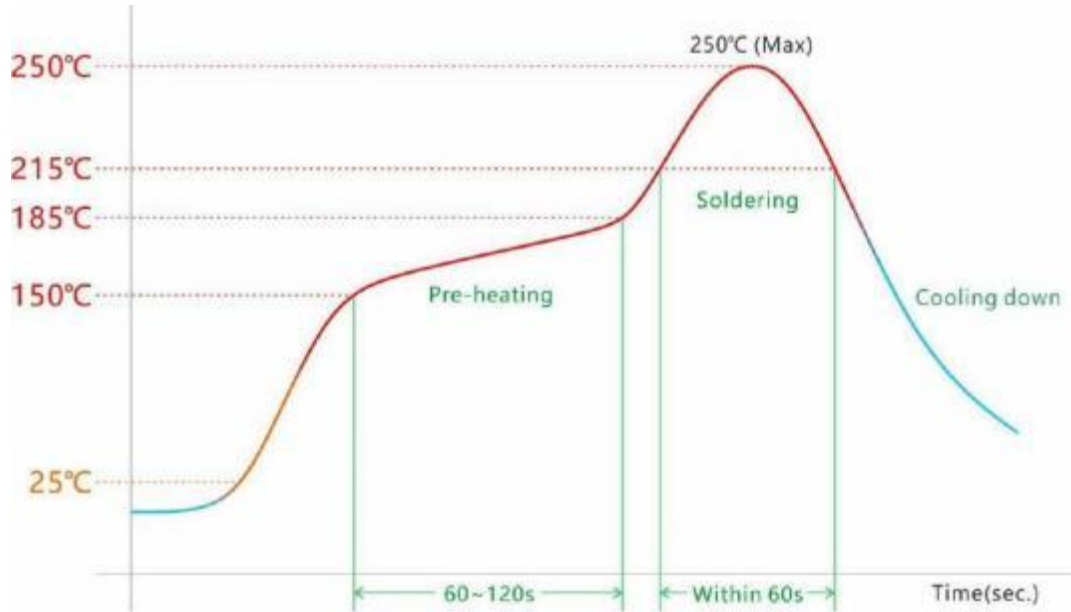
No.	Parts	Specification	Manufacturer	Note
1	Ô@ •^c	ÜVŠì   GFÔÒÈXÔÈÖ	Ü^æç\ Ü^ { æ } á~ &ç   Ô[  ]	
2	ÚÔÓ	ØVFì GFÔÒ`XFÈÈ	Ú@}: @} çæ *^~ &æ& æ& ÈÈŠVÖ	
3	ÚÔÓ	ØVFì GFÔÒ`XFÈÈ	Ú@}: @} S^çæ * Ú ^ǣ̄ } Ôæ& æV^&@ [    *^ Ô[ ÈÈŠVÖ	
4	Ô ^ •æ [ •& æ;	Í GEI €T PZ FÉÚÚT FGÚØ çççç Èí   度D	@-ǣ̄ * , ^æç Ò ^çç [ } æ • Ô[ È ŠçÈÈ	
5	Ô ^ •æ [ •& æ;	Í GEI €T PZ FGÚØ† FÉÚÚT ÈÈÈÍ €度	Z@çæ * Šǣ̄ * T æ [ ^ ^çç [ } æ Ô[ ÈÈŠVÖÈ	
6	ã~ ^ç	双工器 FÈ ÈÈ { { ÍÚ çÈ ÖÈ Í ÌÍ Ö ÈÈ € ÈÍ   »	• @}: @} çæçæ } * Ò ^çç [ } æ V^&@ [    *^ Ô[ ÈÈŠVÖ	

## 7 Recommended Reflow Profile

Referred to IPC/JEDEC standard.

Peak Temperature : <math><250^{\circ}\text{C}</math>

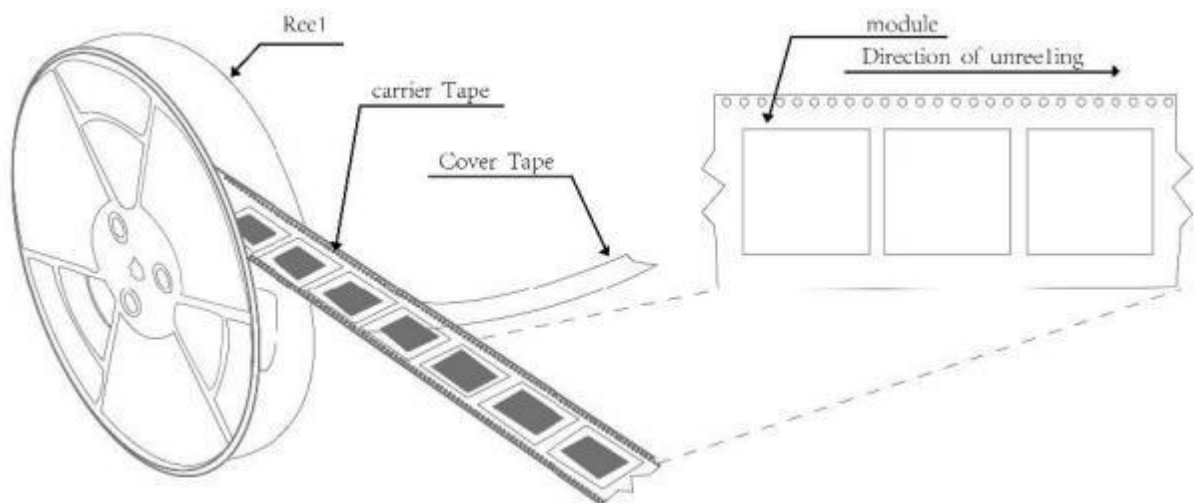
Number of Times :  $\leq 2$  times



## 8 Package Information

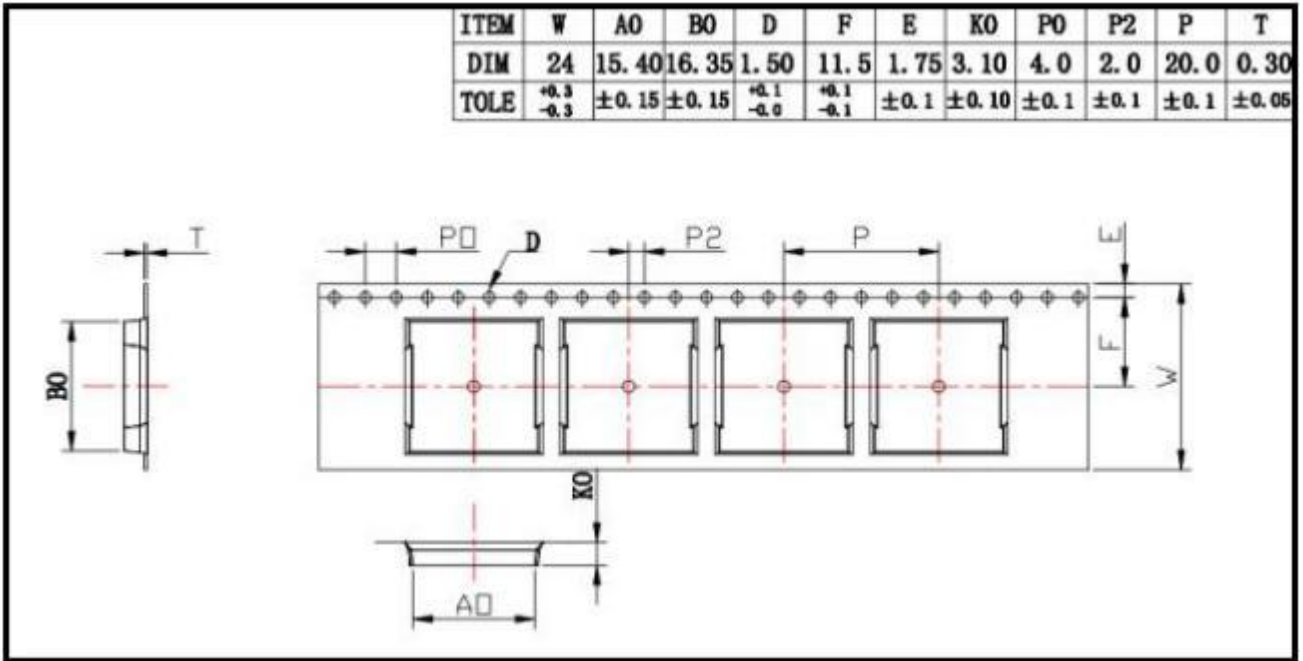
### 8.1 Reel

0E: [ || [ ~GEEE] &

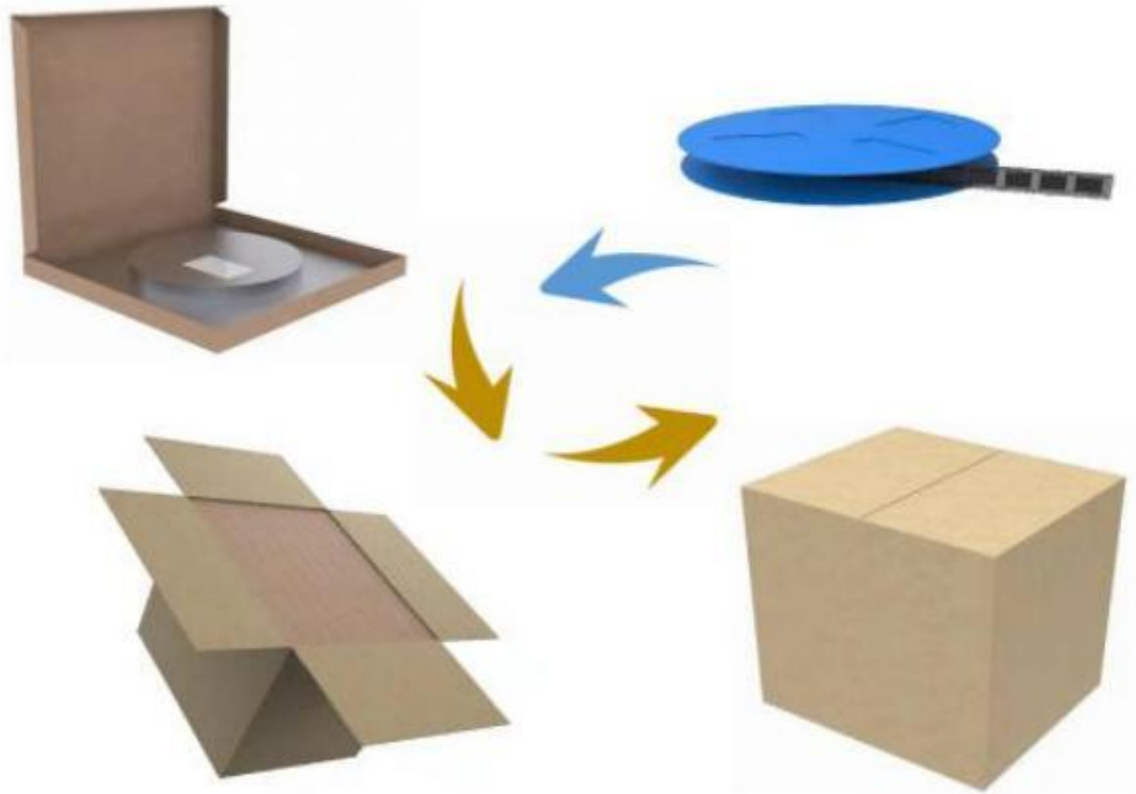




## 8.2 Carrier Tape Detail



## 8.3 Packaging Detail



## 8.4 Moisture sensitivity

V@ T[á^|^• ã æT[ãç|^ Ù^}•ãã^ Ö^çã^ |^ç^| HÉ ã æ&|ãã\* ,ã@  
•æãããá WÔBRÒÒÒÒ RËUVÖËEGÉæ^ &æ^ æ| @ |^|ãã^• |^~ã^{| ^}• |^~ã^\*  
@ã \ãá [-&{| |^}•É

T[|^|^ç^|^É@ &•ç{| ^| @æ ç æ^ &æ^ [-@ |^| |, ã\* &|ãã}•K  
æD Óæ&|æãá •@|~|ã^ ã •^æãá àæKFG { |^}@ æ L| €^Ó æãá LJÉÃ |^|ãã^  
@{ ææ Ç|PÉ

àD)çã[|{| ^}æ&|ãã} á~|ã\* @ |{|ã~&ã}K H€^Ó D ÍÉÃ ÜP æ&|ãã\*  
ç WÔBRÒÒÒÒ RËUVÖËHCE] ææ|æ @Í É

&DV@ { æã ~{ ç^ à^ç ^^} @ [|^}ã\* [-@ •^æãá àæ æãá @ |^|^| ,  
|{| &•• { ~•cà^ F|ì @^|• ã&|ãã}

àD%WÔBRÒÒÒÒ RËUVÖËHCE] ææ|æ @Í É+ã |^•|^&çá

^DÓæã\* Á^Á~ã^áÁ&|ãã}•ÁD|ÁDæ^Á [Á^•|^&çá

D Óæã\* Á^Á~ã^áÁ@Á@ { ææ Áããæ|Áã •ã^Á@Áæ Áããæ •ÁÉÃ ÁÜPÁ|Á  
{ |^

## 9. FCC Certification Requirements

According to the definition of mobile and fixed device is described in Part 2.1091(b), this device is a mobile device. And the following conditions must be met:

1. This Modular Approval is limited to OEM installation for mobile and fixed applications only. The antenna installation and operating configurations of this transmitter, including any applicable source-based timeaveraging duty factor, antenna gain, and cable loss must satisfy MPE categorical Exclusion Requirements of 2.1091.
2. The EUT is a mobile device; maintain at least a 20 cm separation between the EUT and the user's body and must not transmit simultaneously with any other antenna or transmitter.
3. A label with the following statements must be attached to the host end product: This device contains FT1821CEV2, FT1821CE-20PW5A22D1, LK-A51 FCC ID: 2AU7O-FT1821CE
4. This module must not transmit simultaneously with any other antenna or transmitter
5. The host end product must include a user manual that clearly defines operating requirements and conditions that must be observed to ensure compliance with current FCC RF exposure guidelines.

For portable devices, in addition to the conditions 3 through 6 described above, a separate approval is required to satisfy the SAR requirements of FCC Part 2.1093

If the device is used for other equipment that separate approval is required for all other operating configurations, including portable configurations with respect to 2.1093 and different antenna configurations.

For this device, OEM integrators must be provided with labeling instructions of finished products.

Please refer to KDB784748 D01 v07, section 8. Page 6/7 last two paragraphs:

A certified modular has the option to use a permanently affixed label, or an electronic label. For a permanently affixed label, the module must be labeled with an FCC ID - Section 2.926 (see 2.2 Certification (labeling requirements) above). The OEM manual must provide clear instructions explaining to the OEM the labeling requirements, options and OEM user manual instructions that are required (see next paragraph).

For a host using a certified modular with a standard fixed label, if (1) the module's FCC ID is not visible when installed in the host, or (2) if the host is marketed so that end users do not have straightforward commonly used methods for access to remove the module so that the FCC ID of the module is visible; then an additional permanent label referring to the enclosed module: FT1821CEV2, FT1821CE-20PW5A22D1, LK-A51:

"Contains Transmitter Module FCC ID: 2AU7O-FT1821CE" or "Contains FCC ID: 2AU7O-FT1821CE"

The host OEM user manual must also contain clear instructions on how end users can find and/or access the module and the FCC ID.

### 9.1 Radiation Exposure Statement:

This module support BT(2402-2480MHz) ,WIFI(2412~2462 MHz,5180~5240MHz)which compliance with part 15.249,15.247,15.407 and apply for single module approval .

The module is limited to OEM installation only.

The OEM integrator is responsible for ensuring that the end-user has no manual instruction to remove or install module.

OEM integrator shall equipped the antenna to compliance with antenna requirement part 15.203& 15.204 and must not be co-located or operating in conjunction with any other antenna or transmitters. And OEM host shall implement a Class II Permissive Change (C2PC) or a new FCC ID to demonstrate complied with FCC standard.

The OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed.

The final end product must be labelled in a visible area with the following: "Contains FCC ID:2AU7O-FT1821CE"

The final host / module combination may also need to be evaluated against the FCC Part 15B criteria for unintentional radiators in order to be properly authorized for operation as a Part 15 digital device.

The user's manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes, or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. In cases where the manual is provided only in a form other than paper, such as on a computer disk or over the Internet, the information required by this section may be included in the manual in that alternative form, provided the user can reasonably be expected to have the capability to access information in that form.

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.

Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

To ensure compliance with all non-transmitter functions the host manufacturer is responsible for ensuring compliance with the module(s) installed and fully operational. For example, if a host was previously authorized as an unintentional radiator under the Supplier's Declaration of Conformity procedure without a transmitter certified module and a module is added, the host manufacturer is responsible for ensuring that after the module is installed and operational the host continues to be compliant with the Part 15B unintentional radiator requirements.

## 9.2 Class B digital device

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.

## 9.3 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.

## 9.4 Important Note:

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.

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

### 10.1 List of applicable FCC rules

CFR 47 FCC PART 15 SUBPART C has been investigated. It is applicable to the modular transmitter

### 10.2 Specific operational use conditions

This module is stand-alone modular. If the end product will involve the Multiple simultaneously transmitting condition or different operational conditions for a stand-alone modular transmitter in a host, host manufacturer have to consult with module manufacturer for the installation method in end system.

1. According to the following requirements of the power supply, power up, about 3 seconds to to complete the initial.
2. Iphone/Android mobile phone BT/WIFI function to open, search to the corresponding Wireless network adapter name (name can be changed according to customer production requirements), click the name of the BT/WIFI and select the connection.
3. open application software (need to install the company's specific application software development, application software interface can be customized according to customer's product requirements), click on the interface to see the scene.

### 10.3 Limited module procedures

This module needs to supply a regulated voltage from host device. The FCC ID of the module is indicated by the location of the nameplate on the shield of the product.

If the FCC ID is visible when the module is installed inside another device, then the module is installed must also display a label referring to the enclosed module.

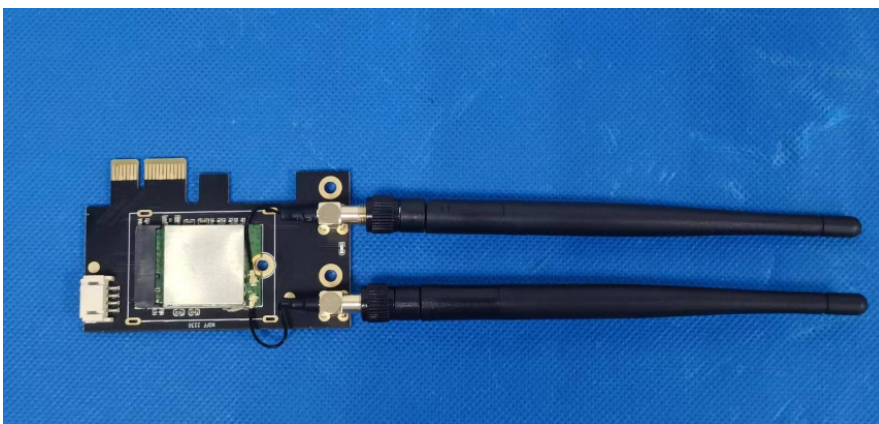
Host Manufacturer: Shenzhen Phaten Technology Co., Ltd.

Host Model Number: FTY-CS-ZJ-178

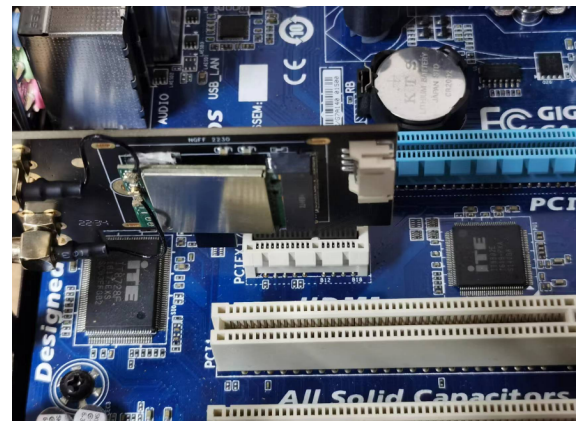
Product name: Test host, Aluminium casing

Host Installation instructions: Plug the signal port of the module into the corresponding port on the main board of the host. See the figure below, marked in the red box.

Length, width and height: 16cm\*7cm\*17cm



The module is installed inside the host



Note: See Appendix 1 at the end for detailed instructions on how to install.

## 10.4 Trace antenna designs

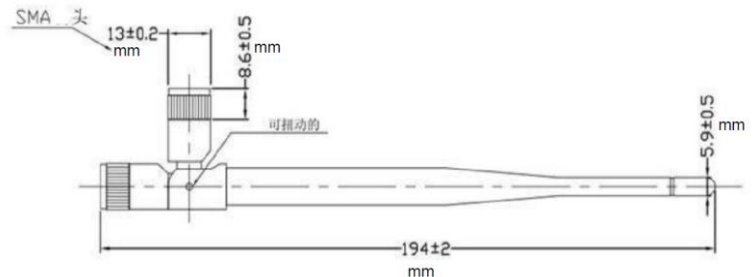
Please perform the Trace antenna design that followed the specifications of the antenna.

The concrete contents of a check are the following three points.

- 1) It is the same type as the antenna type of antenna specifications.  
Confirm the same size as the Gerber file.
- 2) An antenna gain is lower than a gain given in antenna specifications.  
Measure the gain, and confirm the peak gain is less than the application value.
- 3) The emission level is not getting worse.  
Measure the spurious, and confirm degradation of less than 3dB than spurious value of worst of report used for the application.

Please refer to the following figure for antenna information.

Frequency Range	5180-5240MHZ, 2400-2500MhZ
VSWR	≤2.0
GAIN	5.2G: -4.62dBi 2.4G: 1.08dBi
Input Impedance	50 Ω



## 10.5 RF exposure considerations

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

## 10.6 Antennas

This radio transmitter FCC ID: 2AU7O-FT1821CE has been approved by Federal Communications Commission to operate with the antenna types listed below, with the maximum permissible gain indicated. This device does not use antenna types whose gain is greater than the maximum gain of any of the listed types not included below. The antenna is External antenna, It's not permanently fixed. the antenna is 2.4G 1.08dBi, 5.2G -4.62dBi), This antenna is permanently paired with a product to sell.

Antenna Specification are as follows:

Type: External dipole antenna\*2

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.)

Important Note:

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.

## 10.7 Label and compliance information

The final end product must be labeled in a visible area with the following" Contains FCC ID: 2AU7O-FT1821CE ".

## 10.8 Information on test modes and additional testing requirements

Host manufacturer is strongly recommended to confirm compliance with FCC requirements for the transmitter when the module is installed in the host.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment and meets the FCC radio frequency (RF) Exposure Guidelines. This equipment should be installed and operated keeping the radiator at least 20cm or more away from person's body.

When the host is a portable device, it is necessary to take a SAR test with your set mounting this module.

(except to use only Bluetooth LE or 2.4GHz-WLAN)

Class II permissive change application is necessary using the SAR report. Please contact Murata (Aftersaleservice12@outlook.com). And an application for a Class II permissive change from a Mobile equipment to a Portable equipment is also required.

Note) Portable equipment : Equipment for which the spaces between human body and antenna are used within 20cm. Mobile equipment : Equipment used at position in which the spaces between human body and antenna exceeded 20cm.

## 10.9 Additional testing, Part 15 Subpart B disclaimer

The modular transmitter is only FCC authorized for the specific rule parts (i.e., FCC transmitter rules) listed on the grant, and 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.

The final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed.

Note EMI Considerations:

Note that a host manufacture is recommended to use KDB 996369 D04 Module Integration Guide recommending as "best practice" RF design engineering testing and evaluation in case non-linear interactions generate additional non-compliant limits due to module placement to host components or properties.

For standalone mode, reference the guidance in D04 Module Integration Guide and for simultaneous mode7; see D02 Module Q&A Question 12, which permits the host manufacturer to confirm compliance.

How to make changes:

When changing from the conditions of approval, please present technical documentation that it is equivalent to a Class I change.

For example, when adding or changing an antenna, the following technical documents are required.

1) The document indicating the same type as the original antenna

2) Technical document showing that the gain is the same with the gain at the time of the original approval. If the antenna gain is lower than the antenna gain value compared with the original approval, a class II permissive change should be followed.

3) Technical document showing that the radiated emissions level is no more than the worse value than when it was originally certified.

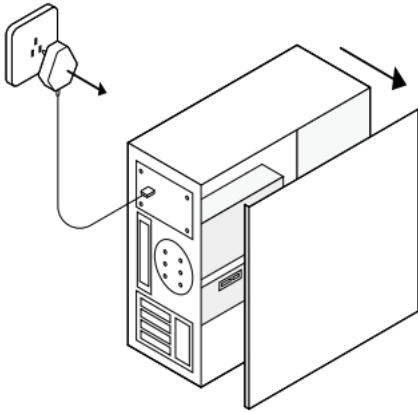
## Appendix 1-Quick Installation Guide

### 1.Connect to a Computer

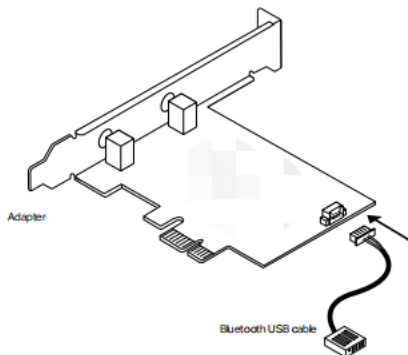
(This chapter introduces how to connect the adapter to your computer. Please note that images are for demonstration only)

### 2.Follow the steps below to insert the adapter into your computer:

2.1. Turn off your computer, unplug the power cable then remove the case panel.

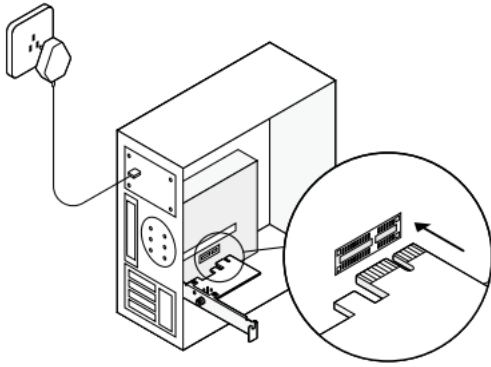


2.2. Connect the provided Bluetooth USB cable to the adapter





2.3. Locate an available PCIE slot and carefully insert the adapter.

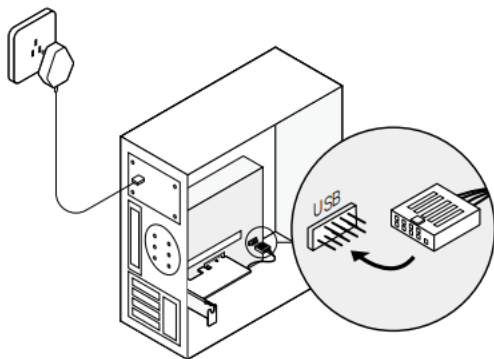


2.4. Locate an available F\_USB connector and carefully plug the Bluetooth USB cable into it.

2.4.1. Locate an available F\_USB connector and carefully plug the Bluetooth USB cable into it.

Note:

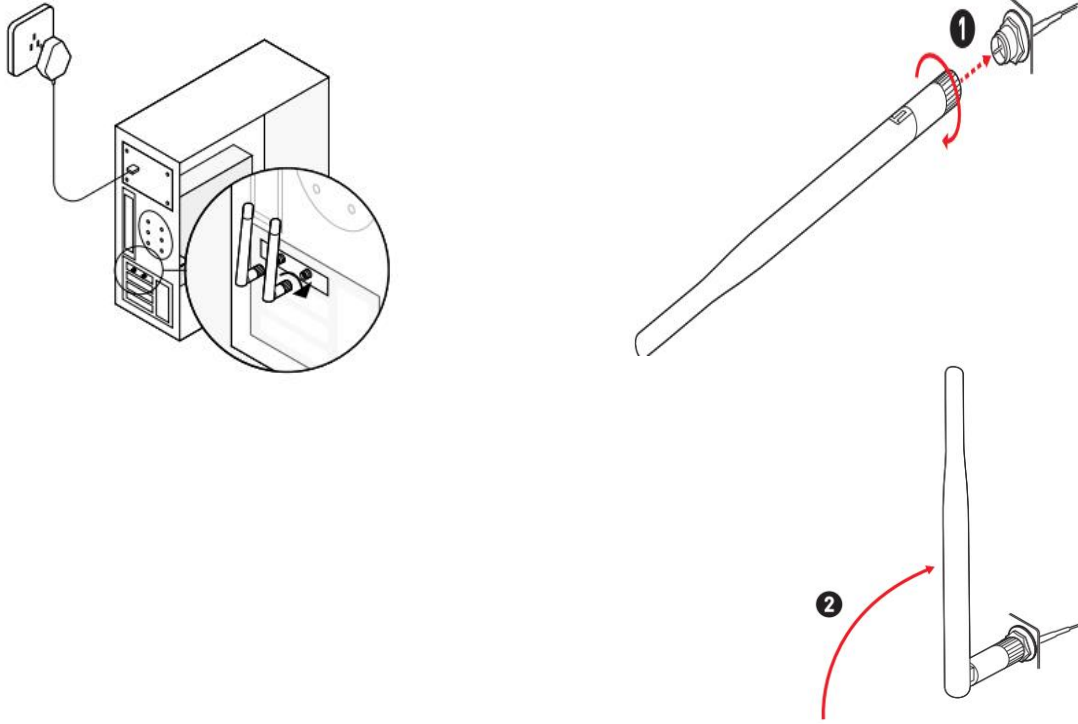
If the Bluetooth USB cable is not correctly connected to the motherboard, Bluetooth function won't work even after driver installation.



2.5. Connect the antenna(s) to the module.

Tip: To maximize performance, make sure the path between the antenna(s) and your router is clear. Installing Antennas

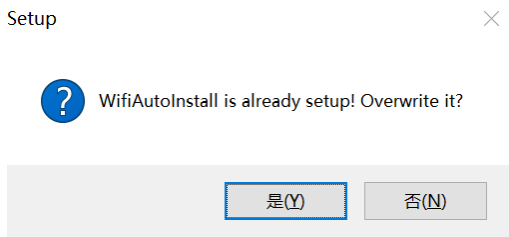
1. Screw the antennas tight to the antenna connectors as shown below.
2. Orient the antennas.



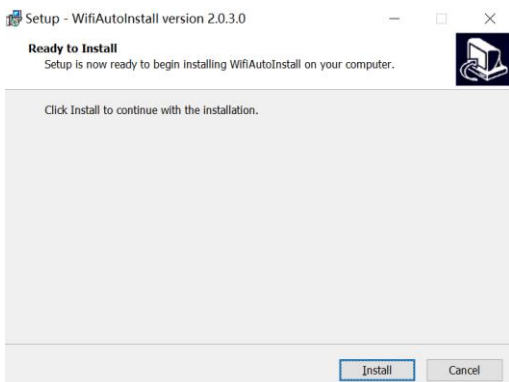
2.6. Replace the case panel, plug in the power cable and turn on your computer. install Wi-Fi and Bluetooth drivers.

**2.6.1 Install Drivers**


Insert the CD and open the directory. Select the corresponding driver file according to the adapter model and operating system.



Follow the prompts on the screen to complete the installation.




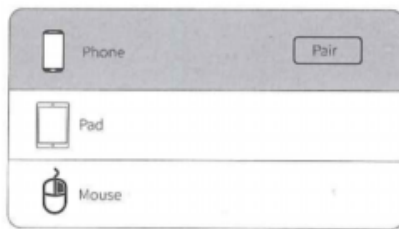
### 2.6.2 Join a Wireless Network:

Click the network icon  on the taskbar, select your WiFi network and enter the password.



### 2.6.3 Pair with Bluetooth Devices:

Click the  (Bluetooth) icon on the taskbar, Scan Add Device.  
Select your Bluetooth device from the list and follow the onscreen instructions to complete pairing.



## Appendix: Troubleshooting

### T1. What should I do if the adapter is not detected?

- Make sure the adapter is securely located in the appropriate PCI-E slot.
- Make sure you meet the system requirements for the adapter.
- Make sure you use the latest driver for your specific adapter. The latest drivers can be found at the product's Support page at [https:// www.phaten.com](https://www.phaten.com).
- Try restarting the computer or try the adapter on a different computer.

### T2. How to check if I have installed the drivers successfully or not?

#### Check your taskbar if there are Wi-Fi and Bluetooth icons.

- If you can see the icon ( Wireless Network ) on the taskbar, you have already installed the Wi-Fi driver successfully.
- If you can see the (Bluetooth) icon on the taskbar, you have already installed the Bluetooth driver successfully.

### T3. What should I do if can't connect to the Wi-Fi after installing the driver?

- Refer to T2 to check if you have installed the driver for your adapter successfully .
- Disable the antivirus software and firewall, then try again.
- Try a different PCI-E slot on the computer.
- Restart your computer and try again.
- Reinstall the driver and try again.

### T4. What should I do if the Bluetooth icon doesn't appear?

- Make sure you have turned on the Bluetooth in your Windows settings. To enable Bluetooth, go to Start > Settings > Devices > Bluetooth & other devices and turn on Bluetooth.

- **Make sure there are no other Bluetooth devices on the computer. If there are, disable**

all existing Bluetooth devices in Device Manager, then reinstall the adapter and try again.

Tip: To go to Device Manager: Right-click My Computer or This PC, select Manage, go to Device Manager

and disable all existing Bluetooth devices.

Note: The module itself is designed to be used only in the specific type of Host shown in the instructions. The module is sold with a separate PCIE interface board. The design specifications such as PIN pins can only be used in the host PC, and cannot be used in electronic products such as portable notebooks. If the integrator or final product manufacturer changes the design for use in portable products, they have the responsibility and obligation to apply for a new FCC ID authorization and add related tests such as SAR.

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.

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

**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.

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