



PRODUCT SPECIFICATION

8276M-PU

Wi-Fi7 Tri-band 2T2R DBS +Bluetooth 5.3

PCIe Combo Module

Version:v1.3

Customer: _____

Customer P/N: _____

Signature: _____

Date: _____

Office: 14th floor, Block B, phoenix zhigu, Xixiang Street, Baoan District, Shenzhen

Factory: NO.8, Litong RD., Liuyang Economic & Technical Development Zone, Changsha, CHINA

TEL:+86-755-2955-8186

Website:www.fn-link.com

8276M-PU Module Datasheet

Ordering Information	Part NO.	Description
	FG8276MPUX-00	QCA2076,WiFi7,DBS 802.11a/b/g/n/ac/ax/be +BT5.3,2T2R, PCIe/USB,22*30mm M.2 interface

Target power

2.4G:

5G:

6G:

FN-LINK 欧智通

CONTENTS

1. General Description	5
1.1 Introduction	5
1.2 Description	5
2. Features	6
3. Block Diagram	7
4. General Specification	7
4.1 2.4GHz RF Specification	7
4.2 5GHz RF Specification	8
4.3 6GHz RF Specification	10
4.2 Bluetooth Specification	11
5. ID setting information	12
6. Pin Definition	12
6.1 Pin Outline	12
6.2 Pin Definition details	13
7. Electrical Specifications	15
7.1 Power Supply DC Characteristics	15
7.2 Power Consumption	15
7.3 Interface Circuit time series	16
7.3.1 PCIe Bus during Power On Sequence	16
8. Size reference	17
8.1 Module Picture	17
8.2 Marking Description	17
8.3 Physical Dimensions	18
9. The Key Material List	19
10. Reference Design	20
10.1 Reference design	20
10.2 Connector Specification	20
11. Recommended Reflow Profile	21
12. RoHS compliance	21
13. Package	22
13.1 Tray	22
14. Moisture sensitivity	23

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1. General Description

1.1 Introduction

8276M-PU is a highly integrated System-On-Chip (SoC) supporting Wi-Fi 7 and Bluetooth (BT) 5.3. supports simultaneous operation on 2.4 GHz +5 GHz, 2.4 GHz + 6 GHz and 5 GHz + 6 GHz.

1.2 Description

Model Name	8276M-PU
Product Description	Support Wi-Fi/Bluetooth functionalities
Dimension	L x W x H: 22x 30x 2.4 (typical) mm
Wi-Fi Interface	Support PCIe
BT Interface	USB
OS supported	Android /Linux/ Win CE /iOS /XP/WIN7/WIN10
Operating temperature	-30°C to 85°C
Storage temperature	-40°C to 85°C

2. Features

General Features

- Support IEEE802.11a/b/g/n/ac/ax/be.
- Support Multi-link Operation (MLO)
- Supports 2x2 Multi-User Multiple-Input Multiple-Output (MU-MIMO).
- Support tri-band 2.4 GHz/5 GHz/6 GHz
- Support up to 4096 QAM modulation at each band
- Channel bandwidth up to 40 MHz at 2.4 GHz, up to 160 MHz at 5GHz and 6 GHz
- Dual Band Simultaneous (DBS) up to 2.4 GHz + 5 GHz / 6 GHz .
- Up to 5.3 Gbps data rate (2x2 5 GHz 160 MHz + 2x2 6 GHz 160MHz with 4K QAM modulation)
- Dynamic Frequency Selection (DFS) radar detection

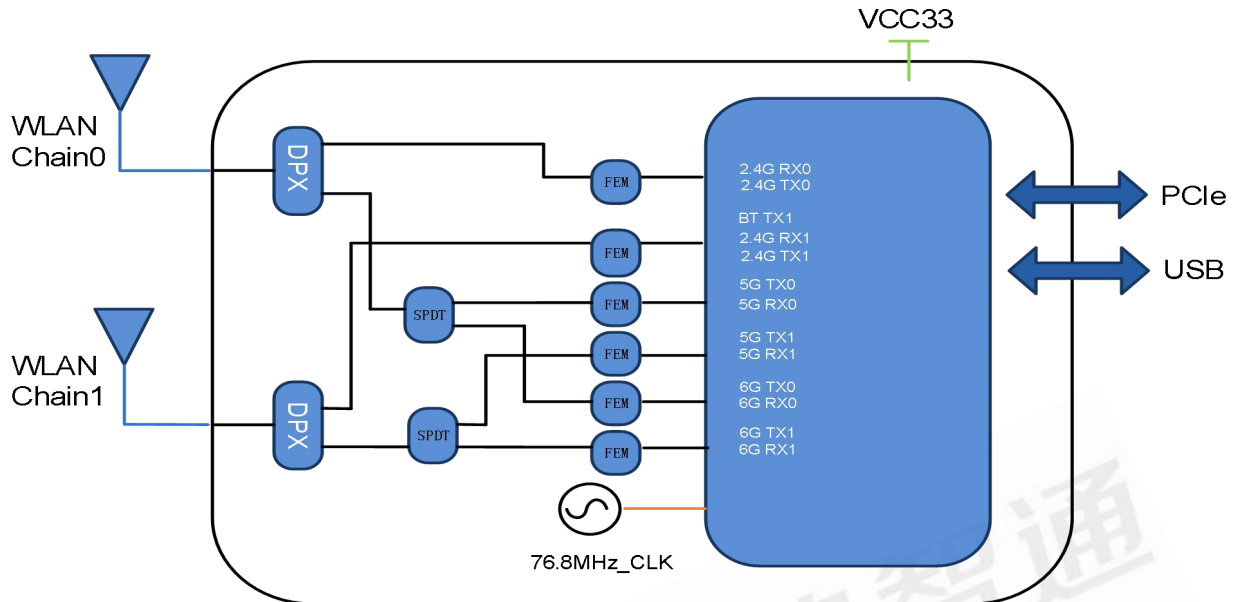
WLAN Interface

- Low-power PCIe (with L1 substate) Gen 3 interface.

Bluetooth Features

- Compliant with Bluetooth 5.3 and ANT+
- Support dual Bluetooth, Simultaneous Bluetooth connection and Bluetooth scan/Discovery; MRC receiver and implicit beamforming transmitter.
- Support LE audio
- Support 2 Mbps Bluetooth Low Energy (BLE), BLE Long Range
- BT host digital interface: USB

3. Block Diagram



4. General Specification

4.1 2.4GHz RF Specification

Feature	Description	
WLAN Standard	IEEE 802.11 b/g/n/ax Wi-Fi compliant	
Frequency Range	2.400 GHz ~ 2.4835 GHz (2.4 GHz ISM Band)	
Number of Channels	2.4GHz: Ch1 ~ Ch14	
Test Items	Typical Value	EVM
Output Power ¹	802.11b /11Mbps : 18dBm ± 3 dB	EVM ≤ -9dB
	802.11g /54Mbps : 16dBm ± 3dB	EVM ≤ -25dB
	802.11n20 MCS7 : 16dBm ± 3 dB	EVM ≤ -28dB
	802.11n40 MCS7 : 13.5dBm ± 3 dB	EVM ≤ -28dB
	802.11ax20 MCS11: 14.5dBm ± 3 dB	EVM ≤ -35dB
	802.11ax40 MCS11: 12.5dBm ± 3 dB	EVM ≤ -35dB
	802.11be20 MCS13: 13dBm ± 3 dB	EVM ≤ -38dB
	802.11be40 MCS13: 11.5dBm ± 3 dB	EVM ≤ -38dB

Spectrum Mask	Meet with IEEE standard	
Freq. Tolerance	$\pm 20\text{ppm}$	
Test Items	TYP Test Value	Standard Value
SISO Receive Sensitivity (11b,20MHz) @8% PER	- 11Mbps @ -85 dBm	$\leq -76\text{ dBm}$
SISO Receive Sensitivity (11g,20MHz) @10% PER	- 54Mbps @ -71 dBm	$\leq -65\text{ dBm}$
SISO Receive Sensitivity (11n,20MHz) @10% PER	- MCS=7 @ -69 dBm	$\leq -64\text{ dBm}$
SISO Receive Sensitivity (11n ,40MHz) @10% PER	- MCS=7 @ -66 dBm	$\leq -61\text{ dBm}$
SISO Receive Sensitivity (11ax,20MHz) @10% PER	- MCS=11 @ -57 dBm	$\leq -52\text{ dBm}$
SISO Receive Sensitivity (11ax ,40MHz) @10% PER	- MCS=11 @ -54 dBm	$\leq -49\text{ dBm}$
SISO Receive Sensitivity (11be ,20MHz) @10% PER	- MCS=13 @ -51 dBm	$\leq -47\text{ dBm}$
SISO Receive Sensitivity (11be ,40MHz) @10% PER	- MCS=13 @ -48 dBm	$\leq -44\text{ dBm}$
Maximum Input Level	802.11b : -10 dBm	
	802.11g/n : -20 dBm	
Antenna Reference	Small antennas with 0~2 dBi peak gain	

4.2 5GHz RF Specification

Conditions : VBAT=3.3V ; Temp:25°C

Feature	Description	
WLAN Standard	IEEE 802.11a/n/ac/ax, Wi-Fi compliant	
Frequency Range	5.1500 GHz ~ 5.850 GHz (5.0 GHz ISM Band)	
Number of Channels	full band supported	
Test Items	Typical Value	EVM
Output Power ¹	802.11a 54Mbps: 13 dBm $\pm 3\text{ dB}$	EVM $\leq -25\text{dB}$
	802.11n20 MCS7: 12dBm $\pm 3\text{ dB}$	EVM $\leq -28\text{dB}$
	802.11n40 MCS7: 11.5dBm $\pm 3\text{ dB}$	EVM $\leq -28\text{dB}$
	802.11ac MCS9: 10 dBm $\pm 3\text{ dB}$	EVM $\leq -32\text{dB}$

	802.11ax MCS11: 9.5 dBm $\pm$ 3 dB	EVM $\leq$ -35dB
	802.11be MCS13: 9 dBm $\pm$ 3 dB	EVM $\leq$ -38dB
Test Items	Test Value	Standard Value
SISO Receive Sensitivity (11a,20MHz) @10% PER	- 54Mbps @ -71 dBm	$\leq$ -65
SISO Receive Sensitivity (11n,20MHz) @10% PER	- MCS=7 @ -69 dBm	$\leq$ -64
SISO Receive Sensitivity (11n,40MHz) @10% PER	- MCS=7 @ -66 dBm	$\leq$ -61
SISO Receive Sensitivity (11ac,20MHz)@10% PER	- MCS=8 @ -64 dBm	$\leq$ -57
SISO Receive Sensitivity (11ac,40MHz) @10% PER	- MCS=9 @ -59 dBm	$\leq$ -54
SISO Receive Sensitivity (11ac,80MHz) @10% PER	- MCS=9 @ -56 dBm	$\leq$ -51
SISO Receive Sensitivity (11ac,160MHz) @10% PER	- MCS=9 @ -54 dBm	$\leq$ -48
SISO Receive Sensitivity (11ax,20MHz) @10% PER	- MCS=11 @ -58 dBm	$\leq$ -52
SISO Receive Sensitivity (11ax,40MHz) @10% PER	- MCS=11 @ -54 dBm	$\leq$ -49
SISO Receive Sensitivity (11ax,80MHz) @10% PER	- MCS=11 @ -48 dBm	$\leq$ -46
SISO Receive Sensitivity (11ax,160MHz) @10% PER	- MCS=11 @ -46 dBm	$\leq$ -43
SISO Receive Sensitivity (11be,20MHz) @10% PER	- MCS=13 @ -50 dBm	$\leq$ -47
SISO Receive Sensitivity (11be,40MHz) @10% PER	- MCS=13 @ -47 dBm	$\leq$ -44
SISO Receive Sensitivity (11be,80MHz) @10% PER	- MCS=13 @ -44 dBm	$\leq$ -41
SISO Receive Sensitivity (11be,160MHz) @10% PER	- MCS=13 @ -41 dBm	$\leq$ -38
Maximum Input Level	802.11a/n: -20 dBm	
Antenna Reference	Small antennas with 0~2 dBi peak gain	

4.3 6GHz RF Specification

Feature	Description	
WLAN Standard	IEEE 802.11a/n/ac/ax, Wi-Fi compliant	
Frequency Range	5.925 GHz ~ 7.125 GHz	
Number of Channels	Full band supported	
Test Items	Typical Value	EVM
Output Power ¹	802.11a 54Mbps: 13 dBm $\pm$ 3 dB	EVM $\leq$ -25dB
	802.11ax MCS11: 9.5 dBm $\pm$ 3 dB	EVM $\leq$ -35dB
	802.11be MCS13: 9 dBm $\pm$ 3 dB	EVM $\leq$ -38dB
Test Items	Test Value	Standard Value
SISO Receive Sensitivity (11a,20MHz) @10% PER	- 54Mbps @ -71 dBm	$\leq$ -65
SISO Receive Sensitivity (11ax,20MHz) @10% PER	- MCS=11 @ -58 dBm	$\leq$ -52
SISO Receive Sensitivity (11ax,40MHz) @10% PER	- MCS=11 @ -54 dBm	$\leq$ -49
SISO Receive Sensitivity (11ax,80MHz) @10% PER	- MCS=11 @ -48 dBm	$\leq$ -46
SISO Receive Sensitivity (11ax,160MHz) @10% PER	- MCS=11 @ -46 dBm	$\leq$ -43
SISO Receive Sensitivity (11be,20MHz) @10% PER	- MCS=13 @ -50 dBm	$\leq$ -47
SISO Receive Sensitivity (11be,40MHz) @10% PER	- MCS=13 @ -47 dBm	$\leq$ -44
SISO Receive Sensitivity (11be,80MHz) @10% PER	- MCS=13 @ -44 dBm	$\leq$ -41
SISO Receive Sensitivity (11be,160MHz) @10% PER	- MCS=13 @ -41 dBm	$\leq$ -38
Maximum Input Level	802.11a/n: -30 dBm	
Antenna Reference	Small antennas with 0~2 dBi peak gain	

4.2 Bluetooth Specification

Feature	Description
General Specification	
Bluetooth Standard	BDR,EDR(1Mbps & 2Mbps & 3Mbps),LE(1Mbps),2LE(2Mbps)
Host Interface	UART
Frequency Band	2400 MHz ~ 2483.5 MHz
Number of Channels	79 channels for classic,40 channels for BLE
Modulation	GFSK, $\pi/4$ -DQPSK,8DPSK
RF Specification	
Output Power ¹, tolerance ± 3 dB	
	CL1(dBm)
BDR Output Power	14
EDR Output Power	11
BLE Output Power	5
Sensitivity, tolerance : /	
Sensitivity @ BER=0.1% for GFSK (1Mbps)	-92
Sensitivity @ BER=0.01% for $\pi/4$ -DQPSK (2Mbps)	-86
Sensitivity @ BER=0.01% for 8DPSK (3Mbps)	-85
Sensitivity @ BLE=30.8% for LE (1Mbps)	-90
Sensitivity @ BLE=30.8% for 2LE (2Mbps)	-90
Maximum Input Level	GFSK (1Mbps):-20dBm
	$\pi/4$ -DQPSK (2Mbps) :-20dBm
	8DPSK (3Mbps) :-20dBm

1.2.4G/5G/6G/BT output power may update by future version.

5. ID setting information

WI-FI

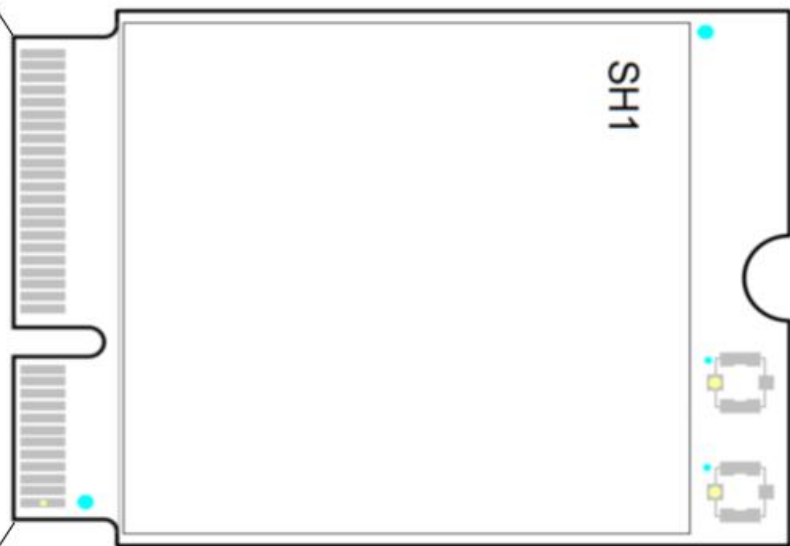
Vendor ID	-
Product ID	-

6. Pin Definition

6.1 Pin Outline

< TOP VIEW >

BOT		TOP	
Signal	PIN	Signal	PIN
3V3	74	GND	75
3V3	72	NC	73
NC	70	NC	71
NC	68	GND	69
NC	66	PCIE_TXN1	67
NC/VIO	64	PCIE_TXP1	65
NC/SENS_TXD	62	GND	63
NC/WL_DBGUART_RX	60	PCIE_RXN1	61
NC/WL_DBGUART_TX	58	PCIE_RXP1	59
WL_RF_KILL	56	GND	57
BT_RF_KILL	54	PCIE_WAKE	55
PCIE_RST	52	CLKREQ	53
SUSCLK	50	GND	51
NC/LTE_COEX_RXD	48	PCIE_CLKN	49
NC/LTE_COEX_TXD	46	PCIE_CLKP	47
NC	44	GND	45
NC	42	PCIE_TXN	43
NC	40	PCIE_TXP	41
NC	38	GND	39
NC	36	PCIE_RXN	37
NC	34	PCIE_RXP	35
NC	32	GND	33
KEY-E	24-30	KEY-E	25-31
NC	22	NC	23
NC/BT_WAKE_HOST	20	NC	21
GND	18	NC	19
NC/BT_LED	16	NC	17
BT_I2S_SDI	14	NC	15
BT_I2S_SDO	12	NC	13
BT_I2S_WS	10	NC	11
BT_I2S_SCK	8	NC	9
NC/WL_LED	6	GND	7
3V3	4	USB-	5
3V3	2	USB+	3
		GND	1



6.2 Pin Definition details

NO	Name	Type	Description	Voltage
1	GND	-	Ground connections	
3	USB_D+	I/O	USB differential line for BT	
5	USB_D-	I/O	USB differential line for BT	
7	GND	-	Ground connections	
9	NC	-	Floating (NC)	
11	NC		Floating (NC)	
13	NC		Floating (NC)	
15	NC		Floating (NC)	
17	NC	-	Floating (NC)	
19	NC	-	Floating (NC)	
21	NC	-	Floating (NC)	
23	NC	-	Floating (NC)	
33	GND	-	Ground connections	
35	PCIE_RXP	I	PCIe RX differential signals	
37	PCIE_RXN	I		
39	GND	-	Ground connections	
41	PCIE_TXP	O	PCIe TX differential signals	
43	PCIE_TXN	O		
45	GND	-	Ground connections	
47	PCIE_CLKP	I	PCIe clock differential input signal	
49	PCIE_CLKN	I		
51	GND		Ground connections	
53	CLKREQ	O	PCIe reference clock request signal, open drain, active low. must be driven to low or high by host.	3.3V
55	PCIE_WAKE	O	PCIe wake up host, open drain, active low. must be driven to low or high by host.	3.3V
57	GND	-	Ground connections	
59	PCIE_RXP1	I	PCIe RX differential signals	
61	PCIE_RXN1	I	PCIe RX differential signals	
63	GND	-	Ground connections	
65	PCIE_TXP1	O	PCIe TX differential signals	
67	PCIE_TXN1	O	PCIe TX differential signals	

69	GND	-	Ground connections	
71	NC	-	Floating (NC)	
73	NC	-	Floating (NC)	
75	GND	-	Ground connections	

Bottom side

NO	Name	Type	Description	Voltage
2	3V3	P	Power supply	3.3V
4	3V3	P	Power supply	3.3V
6	NC/WL_LED	O	No function,Floating (NC)	3.3V
8	BT_I2S_SCK	-	Or PCM CLK,If not used can Floating	1.8V
10	BT_I2S_WS	-	Or PCM SYNC,If not used can Floating	1.8V
12	BT_I2S_SDO	-	Or PCM OUT,If not used can Floating Reserve 10k pull up.	1.8V
14	BT_I2S_SDI	-	Or PCM IN,If not used can Floating	1.8V
16	NC/BT_LED	O	No function,Floating (NC)	3.3V
18	GND	-	Ground connections	
20	NC/BT_WAKE_HOST	-	No function,Floating (NC)	3.3V
22	NC	-	Floating (NC)	
32	NC		Floating (NC)	
34	NC	-	Floating (NC)	
36	NC	-	Floating (NC)	
38	NC	-	Floating (NC)	
40	NC	-	Floating (NC)	
42	NC	-	Floating (NC)	
44	NC	-	Floating (NC)	
46	NC/LTE_COEX_TXD	O	No function,Floating (NC).	1.8V
48	NC/LTE_COEX_RXD	I	No function,Floating (NC).	1.8V
50	SUSCLK	I	No function,Floating (NC),External 32.768K clock input,when NC can use internal 32K.	1.8V
52	PCIE__RST	I	PCIe reset signal, active low,must be driven to low or high by host.	3.3V
54	BT_RF_KILL	I	Bluetooth enable signal. It is an input, active	3.3V

			high to enable Bluetooth operation.must be driven to low or high by host.	
56	WL_RF_KILL	I	WLAN enable signal. It is an input, active high to enable WLAN operation. must be driven to low or high by host.	3.3V
58	NC/WL_DBGUART_TX	-	Floating (NC)	1.8V
60	NC/WL_DBGUART_RX	-	Floating (NC)	1.8V
62	NC/SENS_TXD	-	Floating (NC)	1.8V
64	NC/VIO	-	Floating (NC)	1.8V
66	NC	-	Floating (NC)	1.8V
68	NC	-	Floating (NC)	1.8V
70	NC	-	Floating (NC)	1.8V
72	3V3	P	Power supply	3.3V
74	3V3	P	Power supply	3.3V

P:POWER I:INPUT O:OUTPUT

7. Electrical Specifications

7.1 Power Supply DC Characteristics

	MIN	TYP	MAX	Unit
Operating Temperature	-30	25	85	deg.C
VDD33	3.0	3.3	3.6	V

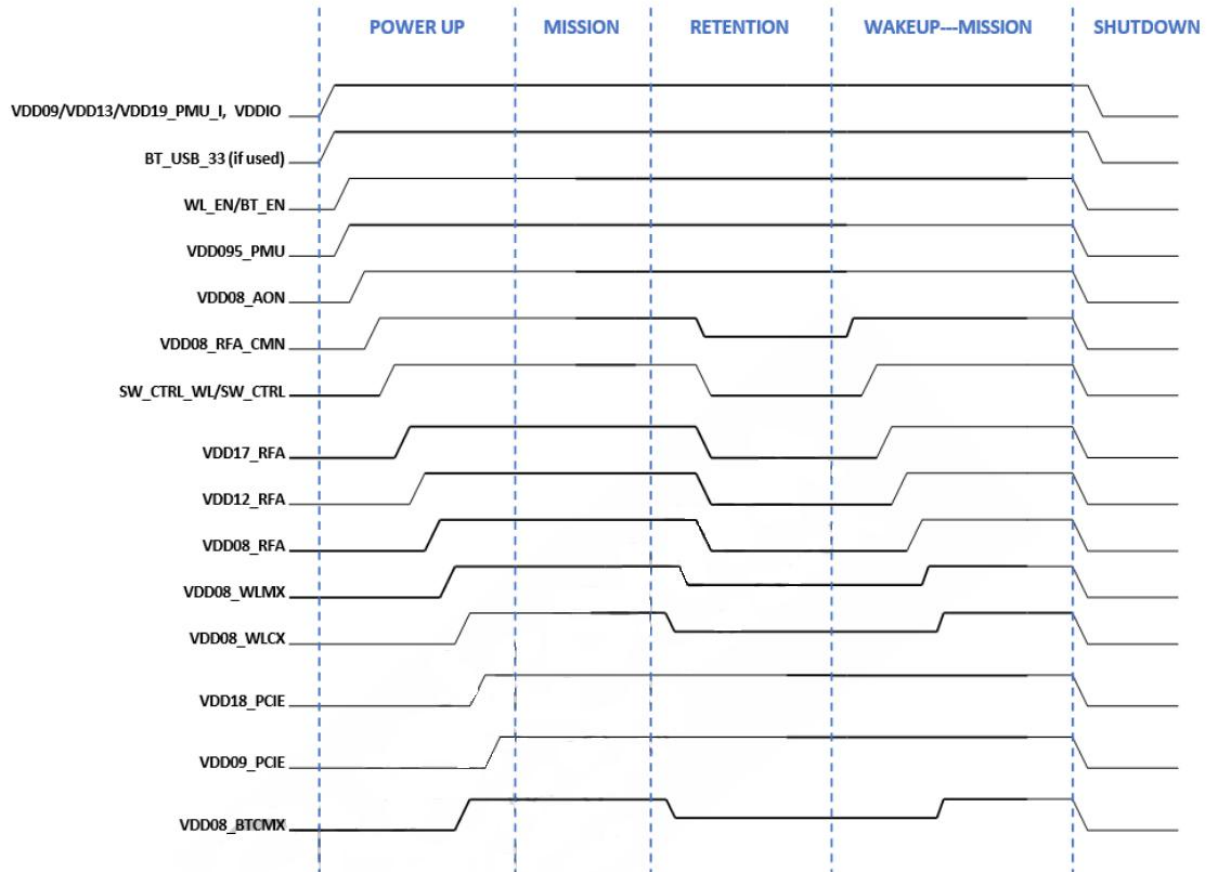
7.2 Power Consumption

This information will be included in future revisions.

7.3 Interface Circuit time series

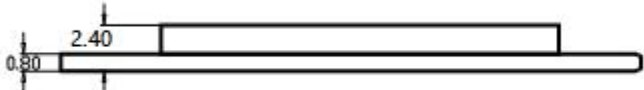
7.3.1 PCIe Bus during Power On Sequence

All input supplies must be ON and available before WLAN/BT_EN is asserted. There is no requirement on the order of input supply.



8. Size reference

8.1 Module Picture

L x W : 22 x 30 (+0.3/-0.1) mm 	
H: 2.4 (±0.2) mm	
Weight	2.53 g

实物图片丝印最终按 8.2 节二维码标识。

8.2 Marking Description

< TOP VIEW >



备注：

二维码内容：112233445566;FG8276MPUX-00

1. Fn-Link 商标 logo

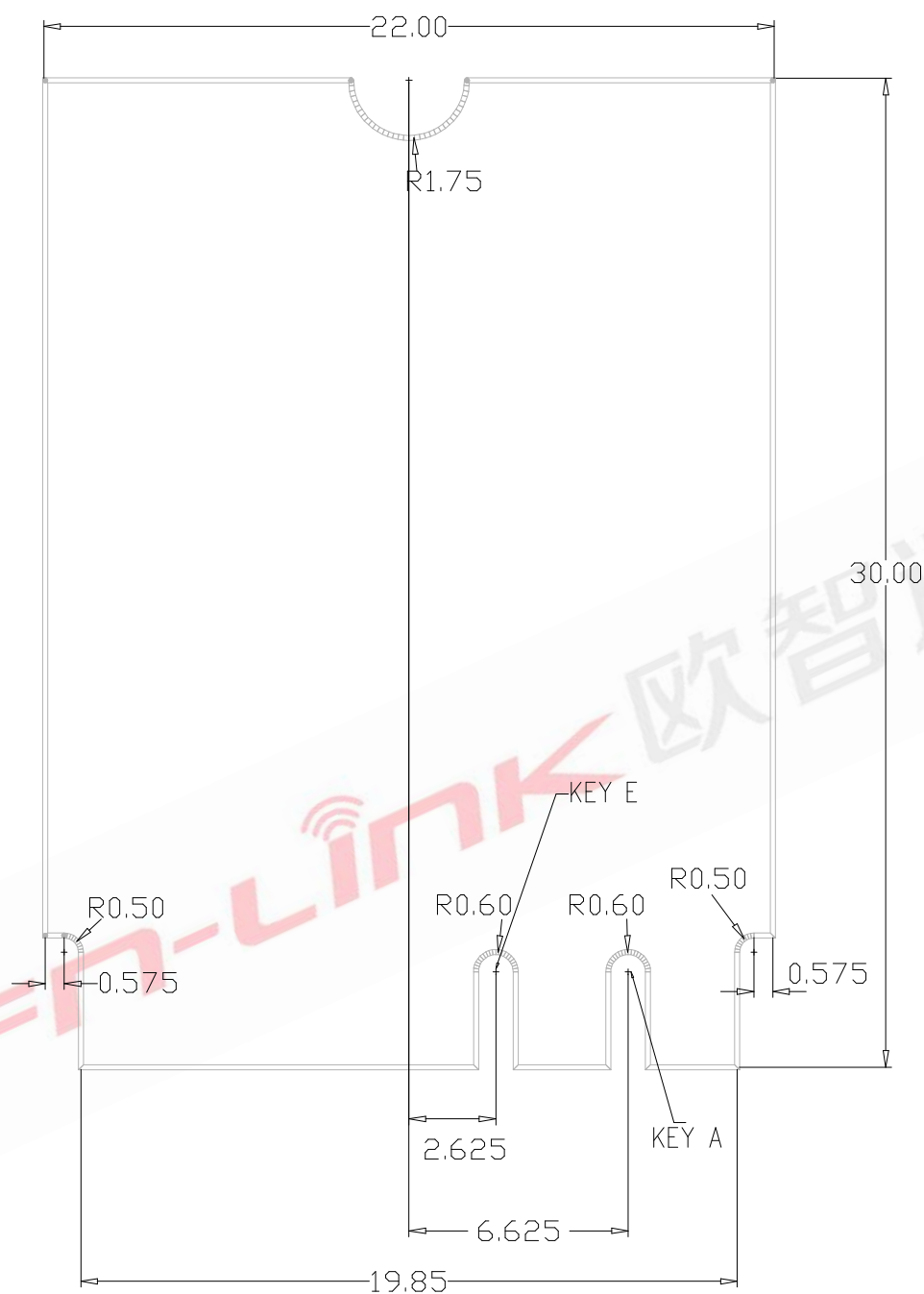
2. 机型：8276M-PU

3. 二维码：编码规则为“wifi mac 地址;成品料号”

例如：112233445566;FG8276MPUX-00（MAC 地址以实际为准）

-----BT MAC 在 WIFI MAC 基础上+1（WIFI 地址需跳 1，不能与 BT 地址重复），二维码中不显示此内容。

<TOP View>



module is key-E type

9. The Key Material List

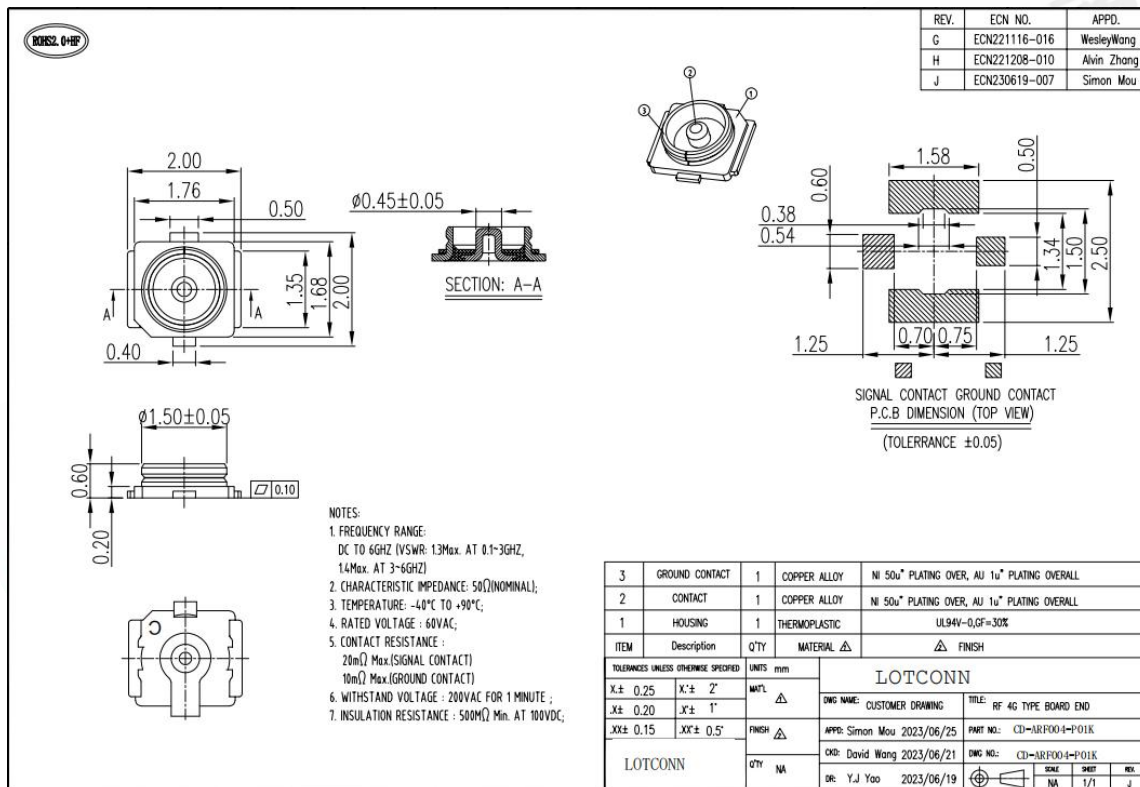
Item	Part Name	Description	Manufacturer
1	PCB	8276M-PU Green,HDI 6L,FR4,AU,22X30X0.8mm	Sunlord, GDKX, Truly, Brain-power
2	Inductor	2012 1uH, $\pm 20\%$, Isat=2.8A Irms=2.1A	Sunlord, Ceaiya, CYNTEC, Cenker, Chilisin, Murata, INPAQ
3	Inductor	2520 1uH 20% Isat4.3A /Irms3.9A	CYNTEC, Sunlord, Ceaiya, Cenker, Chilisin, Murata, INPAQ
4	Diplexer	BB76C; QXF2076 (000-0)	QCA
5	Crystal	1210, 76.8MHZ, ± 10 PPM, 10PF	ECEC, TKD, Hosonic, JWT, TXC
6	Chipset	QCC-2076-0-NSP334-TR-01-0, NSP334, WI-FI 7, 6.8X8.5-0.65mm (Qualcomm)	Qualcomm
7	Shielding	8276M-PU, Shielding cover, 21.45X20.57X1.5mm, T=0.2mm	Suntech, JLitong, 卓益
8	Filter	BF1411-R6R1NGWT/LF, BPF 5150-7125 MHz FILTER, BAW WLAN 2G 2442MHZ ,BF87A RFBPF1005040K38Q1C ,BPF, 5150-7125MHZ	ACX, QCA, Walsin
9	SWITCH	SPDT Switch, MXD8723E	卓胜微
10	Diplexer	Diplexer, 1608	ACX, TDK, FTR, GLEAD, Walsin, Murata
11	FEM	QXM1086 (0J4-0) ,LGA17D, 5-7GHZ FEM QXM1083 (0H6-0) ,LGA19, 2.4GHZ FEM	Qualcomm
12	DC-DC	MP1605GTF-Z, DC-DC, VIN2.3~5.5V, 0.6V/2A, 2.2MHz, SOT563	MPS
13	DC-DC	MT3124NQR, DC-DC, VIN2.5~6V, 0.6V/3.5A, 1.2MHz, QFN2X2_12L	M3TEK
14	ipex	4代 TA-RF03-001-03-811, CD-ARF004-P01K	创迪尔

10. Reference Design

10.1 Reference design

1. PCIe differential keep 100 ohm trace.
2. USB differential keep 90 ohm trace.

10.2 Connector Specification



11. Recommended Reflow Profile

No need to do SMT reflow process.

12. RoHS compliance

All hardware components are fully compliant with EU RoHS directive

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13. Package

13.1 Tray

Layer size: L250.0*W190.0 mm

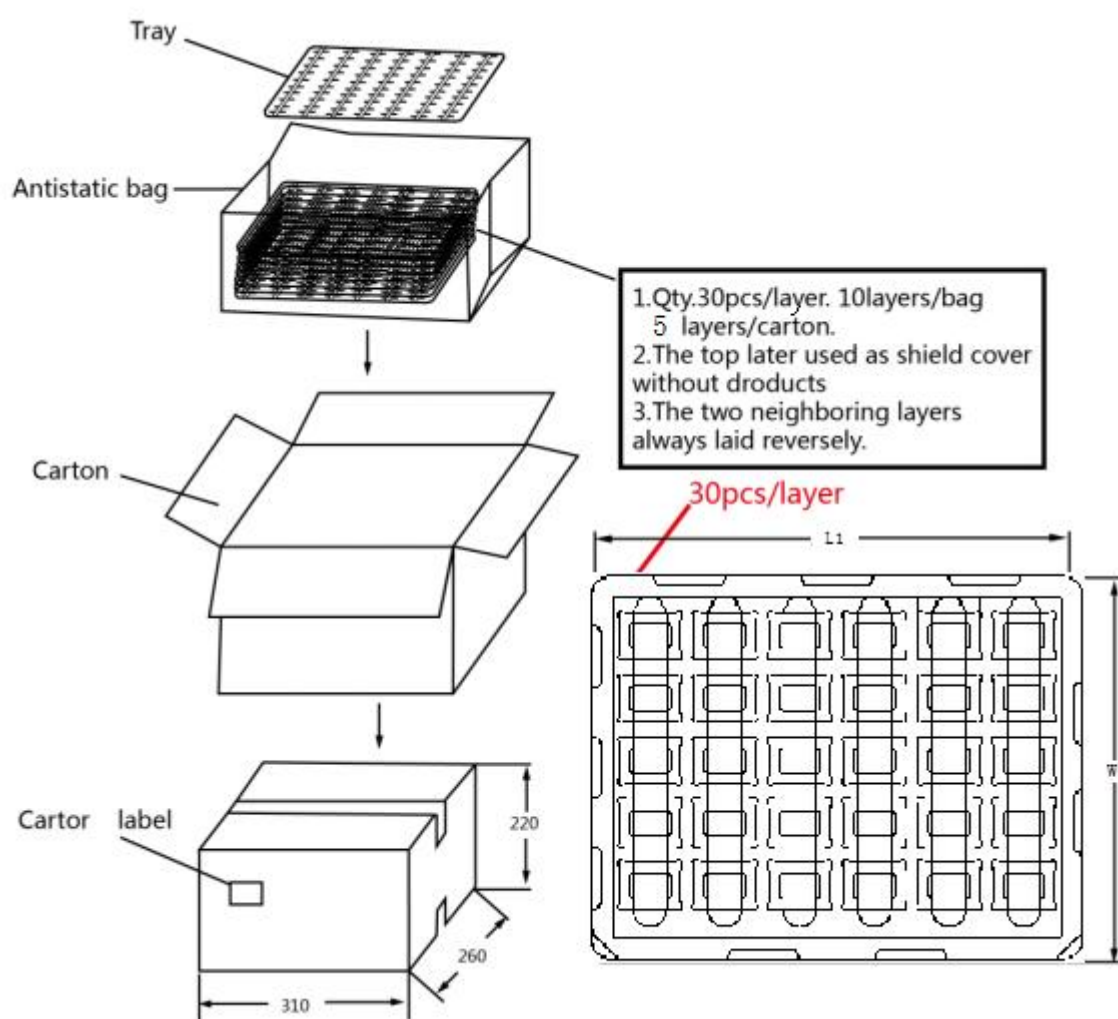
Layer material: PVC

Carton size: L310.0*W260.0*H220.0 mm

Carton material: A=A

Total=1500pcs

Use pallet packaging for less than 300 pieces



14. Moisture sensitivity

The Modules is a Moisture Sensitive Device level 3, in according with standard IPC/JEDEC J-STD-020, take care

all the relatives requirements for using this kind of components.

Moreover, the customer has to take care of the following conditions:

- a) Calculated shelf life in sealed bag: 12 months at <40°C and <90% relative humidity (RH)
- b) Environmental condition during the production: 30°C / 60% RH according to IPC/JEDEC J-STD-033A paragraph 5
- c) The maximum time between the opening of the sealed bag and the reflow process must be 168 hours if condition
- d) “IPC/JEDEC J-STD-033A paragraph 5.2” is respected
- e) Baking is required if conditions b) or c) are not respected
- f) Baking is required if the humidity indicator inside the bag indicates 10% RH or more