FIBOCOM FB520 Hardware Guide_Generic

V1.0.0

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Contents

Applicable Model

No.	Applicable Model	Description
1	FB520-00-00	NA

Change History

V1.0.0 (2022-05-31)	Draft Version

1 Overview

1.1 Introduction

FB520 is a highly integrated IOT wireless communication module which uses M.2 form factor interface. That support multi-mode such as LTE (LTE FDD Cat.M1), GSM (GSM, GPRS, EGPRS) and GNSS (GPS, GLONASS, Galileo, BEIDOU).

1.2 specification

Specification		
Operating Band	LTE FDD CatM1: Band 1, 2, 3, 4, 5, 8, 12, 13, 14,18, 19, 20, 25, 26, 27, 28, 66, 85	
	GSM/GPRS/EGPRS: 850, 900, 1800, 1900 MHz	
	GNSS: Support GPS, GLONASS, Galileo, BEIDOU	
Data Transmission	LTE FDD	Cat M1 Rel. 14: UL 1119 Kbps, DL 375 Kbps
	GSM	GPRS (Class12): UL 85.6 Kbps, DL 107 Kbps
		EGPRS (Class12): UL 236.8kbps, DL 296 Kbps
Power Supply	DC 3.135V～3.63V, Typical 3.3V	
Temperature	Normal operating temperature: –30°C to +75°C Extended operating temperature: –40°C to +85°C[1]	
	Storage temperature: –40°C to +90°C	
Physical characteristics	Interface: M.2 Key-B	
	Dimension：22.0 mm × 42.0 mm × 2.3 mm	
	Weight: about 5.5 g	
Interface		
Antenna Connector	WWAN Antenna × 1	
	GNSS Antenna × 1	
Function Interface	I2C (Master Mode)	
	USB 2.0 (For debug)	
	eSIM(Internal)	
	W_DISABLE1# (Reserved)	

Specification	
	W_DISABLE2# (Reserved)
	WOWWAN# (Reserved)
	DPR
	LED
	Tunable antenna (Reserved)
Software	
AT commands	3GPP TS 27.007 and 27.005,Fibocom AT Commands
Firmware update	1. DFOTA (for after marketing firmware update) 2. USB Flashing (for Factory firmware update & Diagnostic firmware update).
OS	Windows10

Note:

When temperature goes beyond normal operating temperature range of –30°C to +75°C, RF performance of module may be slightly off 3GPP specifications.

1.3 Application Framework

The peripheral applications for FB520 module are shown in Figure 1-1:

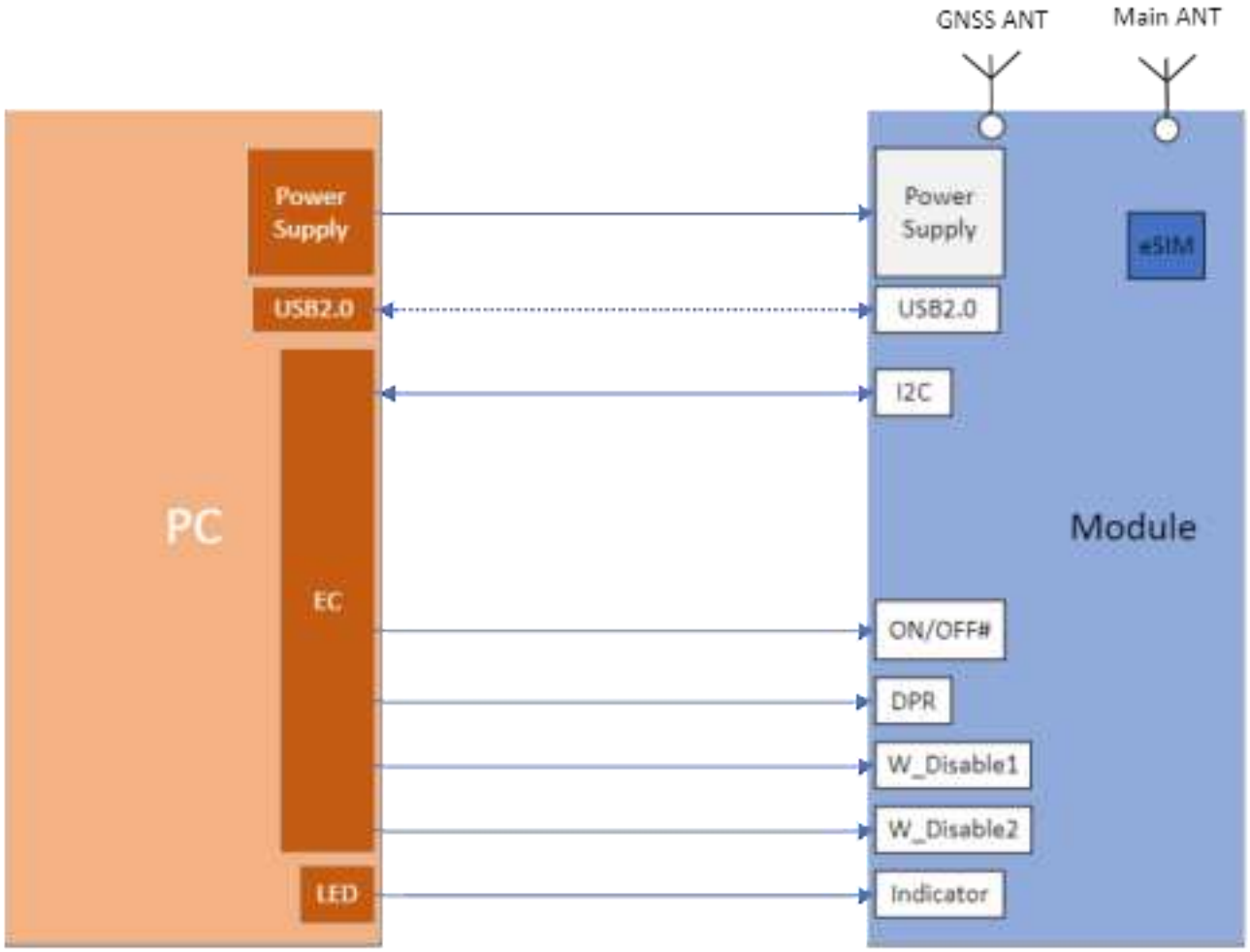

Figure 1-1 Application framework

1.4 Hardware Block Diagram

The hardware block diagram in Figure 1-2 shows the main hardware functions of FB520 module, including base band and RF functions.

Baseband contains the followings:

- LTE controller
- PMU
- Application interface

RF contains the followings:

- RF Transceiver
- RF Power/PA
- RF Front end
- RF Filter
- Antenna Connector

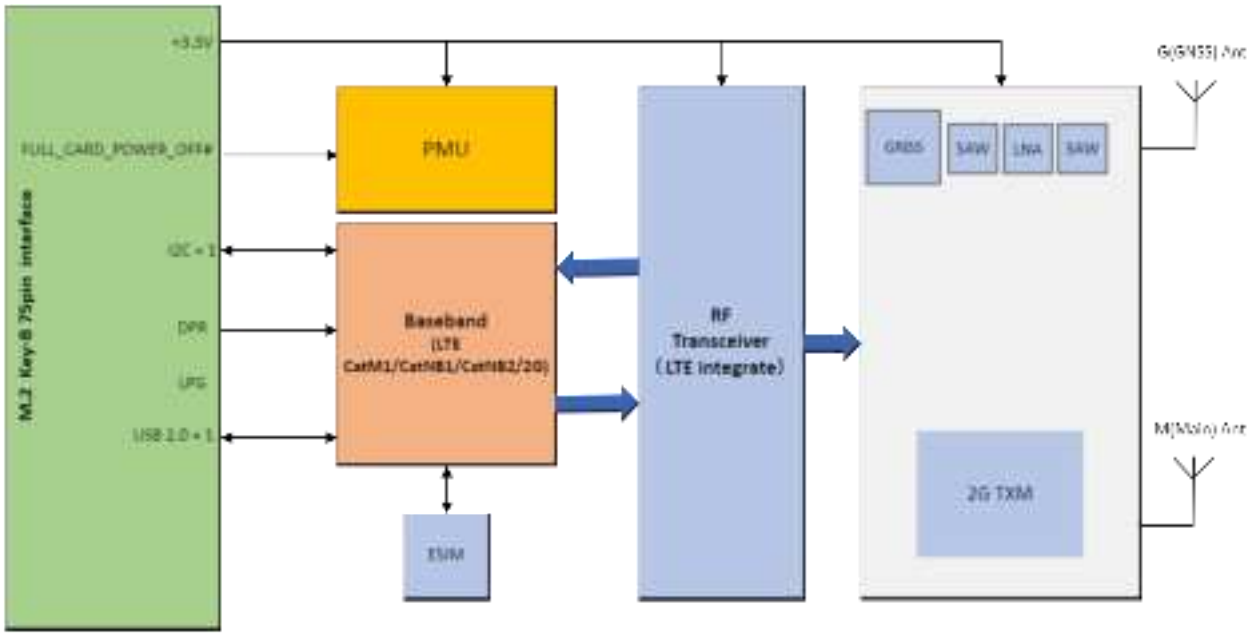

Figure 1-2 Hardware block diagram

1.5 Antenna Configuration

FB520 module support two antennas and the configuration is as below table:

Antenna Connector	Function Description	Band configuration
M	Main ANT	LTE&GSM TX/RX
G	GNSS ANT	GNSS Only

2 Application Interface

2.1 M.2 Interface

The FB520 module applies standard M.2 Key-B interface, with a total of 75 pins.

2.1.1 Pin Map

74	+3.3V	CONFIG_2	75
72	+3.3V	VIO_CFG(GND)	73
70	+3.3V	GND	71
68	NC	CONFIG_1	69
66	NC	NC	67
64	NC	NC	65
62	NC	NC	63
60	NC	NC	61
58	NC	NC	59
56	NC	GND	57
54	NC	NC	55
52	NC	NC	53
50	NC	GND	51
48	NC	NC	49
46	NC	NC	47
44	I2C1_IRQ#(1.8V)	GND	45
42	I2C1_SDA(1.8V,I2C Master)	NC	43
40	I2C1_SCL(1.8V,I2C Master)	NC	41
38	NC	GND	39
36	NC	NC	37
34	NC	NC	35
32	NC	GND	33
30	NC	NC	31
28	NC	NC	29
26	W_DISABLE2#(3.3/1.8V)	GND	27
24	NC	DPR(3.3/1.8V),internal pull High	25
22	NC	WOWWAN#(1.8V)	23
20	NC	CONFIG_0	21
	Notch	Notch	
	Notch	Notch	
	Notch	Notch	
	Notch	Notch	
10	LED1#(3.3V OD)	GND	11
8	W_DISABLE1#(3.3/1.8V)	USB D-	9
6	FULL_CARD_POWER_OFF#(3.3/1.8V)	USB D+	7
4	+3.3V	GND	5
2	+3.3V	GND	3
		CONFIG_3	1

Figure 2-1. Pin map

2.1.2 Pin Definition

The pin definition is list out in Table 1 as follows:

Table 1 Pin definition

Pin	Pin Name	I/O	Default Value	Pin Description	Level
1	CONFIG_3	DO	-	GND	-
2	+3.3V	PI	-	Power input	Power Supply
3	GND	-	-	GND	Power Supply
4	+3.3V	PI	-	Power input	Power Supply
5	GND	-	-	GND	Power Supply
6	FULL_CARD_ POWER_OFF#	DI	High-Z	Power enable, module power on input.	3.3/1.8V
7	USB D+	AIO	-	USB data plus	0.3---3V
8	W_DISABLE1#	I	PU	WWAN disable, active low, reserved.	3.3/1.8V
9	USB D-	AIO	-	USB data minus	0.3---3V
10	LED1#	O	High-Z	System status LED, reserved	3.3V
11	GND	-	-	GND	Power Supply

Pin	Pin Name	I/O	Default Value	Pin Description	Level
12	Notch			Notch	
13	Notch			Notch	
14	Notch			Notch	
15	Notch			Notch	
16	Notch			Notch	
17	Notch			Notch	
18	Notch			Notch	
19	Notch			Notch	
20	NC	-	-	-	-
21	CONFIG_0	O	-	GND	-
22	NC	-	-	-	-
23	WOWWAN#(1.8V)	DO	PU	Wake up host, reserved.	1.8V
24	NC	-	-	-	-

Pin	Pin Name	I/O	Default Value	Pin Description	Level
25	DPR(3.3/1.8V)	DI	PU	Body SAR Detect, internal pull high, reserved.	3.3/1.8V
26	W_DISABLE2#	DI	PU	GNSS disable, active low, reserved.	3.3/1.8V
27	GND	-	-	GND	Power Supply
28	NC	-	-	-	-
29	NC	-	-	-	-
30	NC	-	-	-	-
31	NC	-	-	-	-
32	NC	-	-	-	-
33	GND	-	-	GND	Power Supply
34	NC	-	-	-	-
35	NC	-	-	-	-
36	NC	-	-	-	-
37	NC	-	-	-	-

Pin	Pin Name	I/O	Default Value	Pin Description	Level
38	NC		-	-	-
39	GND	-	-	GND	Power Supply
40	I2C_SCL	DO	PU	I2C master clock	1.8V
41	NC	-	-	-	-
42	I2C_SDA	DIO	PU	I2C master data	1.8V
43	NC	-	-	-	-
44	I2C_IRQ#	DI	PU	I2C interrupt request	1.8V
45	GND	-	-	GND	Power Supply
46	NC	-	-	-	-
47	NC	-	-	-	-
48	NC	-	-	-	-
49	NC	-	-	-	-
50	NC	-	-	-	
51	GND	-	-	GND	Power Supply

Pin	Pin Name	I/O	Default Value	Pin Description	Level
52	NC	-	-	-	-
53	NC	-	-	-	-
54	NC	-	-	-	-
55	NC	-	-	-	-
56	NC	-	-	-	-
57	GND			GND	Power Supply
58	NC	-	-	-	-
59	NC	-	-	-	-
60	NC	-	-	-	-
61	NC	-	-	-	-
62	NC	-	-	-	-
63	NC	-	-	-	-
64	NC	-	-	-	-
65	NC	-	-	-	-

Pin	Pin Name	I/O	Default Value	Pin Description	Level
66	NC	-	-	-	-
67	NC	-	-	-	-
68	NC	-	-	-	-
69	CONFIG_1	DO	-	GND	-
70	+3.3V	PI	-	Power input	Power Supply
71	GND	-	-	GND	Power Supply
72	+3.3V	PI	-	Power input	Power Supply
73	VIO_CFG(GND)	-	-	GND	Power Supply
74	+3.3V	PI	-	Power input	Power Supply
75	CONFIG_2	DO	-	NC	-

2.2 Power Supply

2.2.1 Power Supply

The FB520 module should be powered through the +3.3V pins, and the power supply design is shown in Figure 2-2.

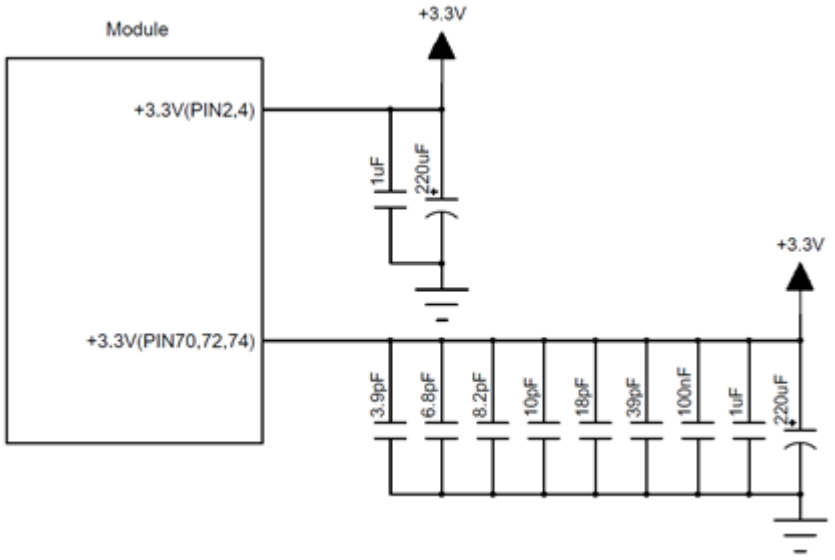

Figure 2-2 Power Supply Design

The filter capacitor design for power supply as shown in the following table:

Recommended capacitance	Application	Description
220uF x 2	Voltage-stabilizing capacitors	Reduce power fluctuations of the module in operation, requiring capacitors with low ESR. LDO or DC/DC power supply requirements. The capacitance is not less than 440uF@ DC 3.135–3.63V. Suggests tantalum capacitance.
1uF, 100nF	Digital signal noise	Filter out the interference generated from the clock and digital signals

39pF	700/800,850/900MHz frequency band	Filter out low frequency band RF interference
18pF, 10pF, 8.2pF, 6.8pF, 3.9pF	1500/1800, 2100/2300 MHz	Filter out medium/high frequency band RF interference

The stable power supply can ensure the normal operation of FB520 module; and the ripple of the power supply should be less than 300mVpp and the min. voltage must not less than 3.135V. The power supply limits are shown in Figure 2-3:

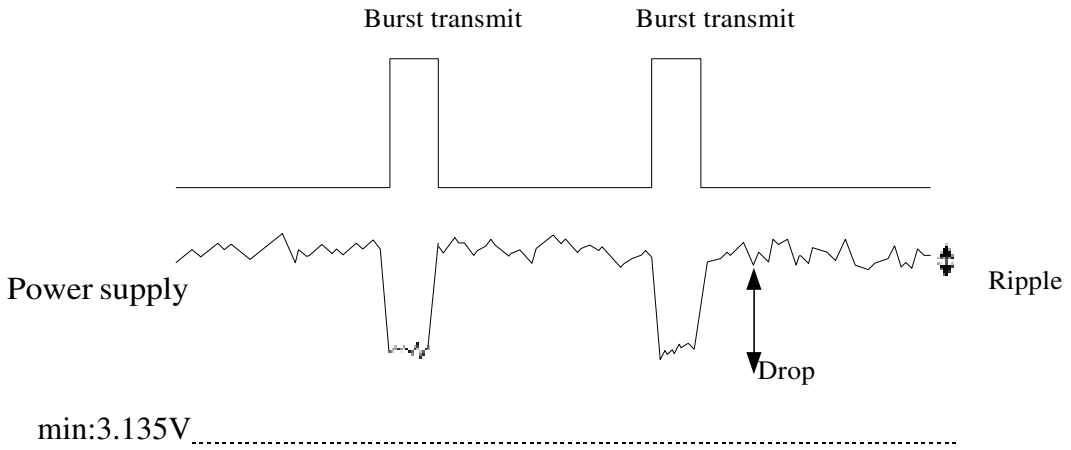

Figure 2-3. Power supply requirement

2.2.2 Logic Level

The FB520 module 1.8V logic level definition as shown in the following table:

Parameters	Minimum	Typical	Maximum	Unit
1.8V logic level	1.71	1.8	1.89	V
V_{IH}	1.3	1.8	1.89	V
V_{IL}	-0.3	0	0.3	V

The FB520 module 3.3V logic level definition as shown in the following table:

Parameters	Minimum	Typical	Maximum	Unit
3.3V logic level	3.135	3.3	3.465	V
V_{IH}	2.3	3.3	3.465	V
V_{IL}	-0.3	0	0.3	V

2.3 Control Signal

The FB520 module provides one control signals for power on/off, the pin defined as shown in the following table:

Pin	Pin Name	I/O	Default Value	Functions	Type
6	FULL_CARD_POWER_OFF#	I	High-Z	Module power on/off input, Power on: High Power off: Low	3.3/1.8V

2.3.1 Module Start-Up

2.3.1.1 Start-up circuit

The FCPO# (FULL_CARD_POWER_OFF #) pin needs an external 1.8V or 3.3V pull up for booting up. AP (Application Processor) controls the module start-up. The recommended design is using a default PD port to control FCPO#. The circuit design is shown in Figure 2-4:

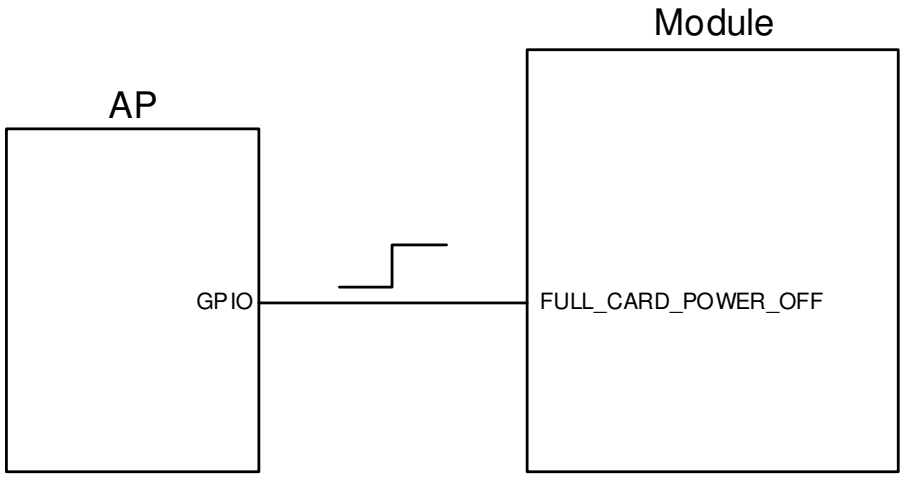

Figure 2-4 Circuit for module start-up controlled by AP

2.3.1.2 Start-up Timing Sequence

When power supply is ready, the PMU of module will power on and start initialization process by pulling high FCPO# signal. After about 5s, module will complete initialization process. The start-up timing is shown in Figure 2-5:

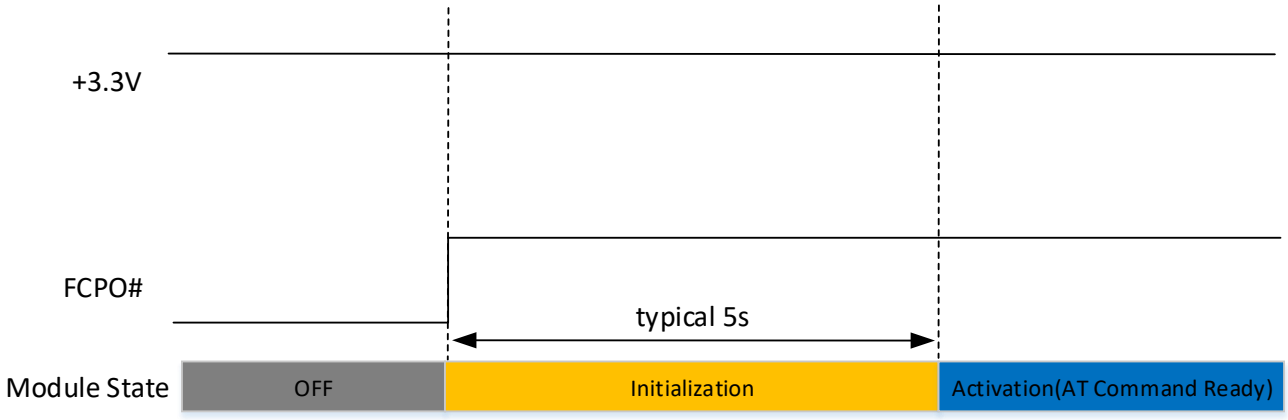

Figure 2-5 Timing control for start-up

2.3.2 Module Reboot

Module will reset by following state:

Shutdown Control	Action	Condition
Hardware	Pull down FCPO# pin	Only use when EC can't detect the module's Heartbeat

The FB520 module can reset to its initial status by pulling down the FCPO# signal more than 500ms, and module will restart after FCPO# signal is released. The reset timing is shown in Figure 2-6:

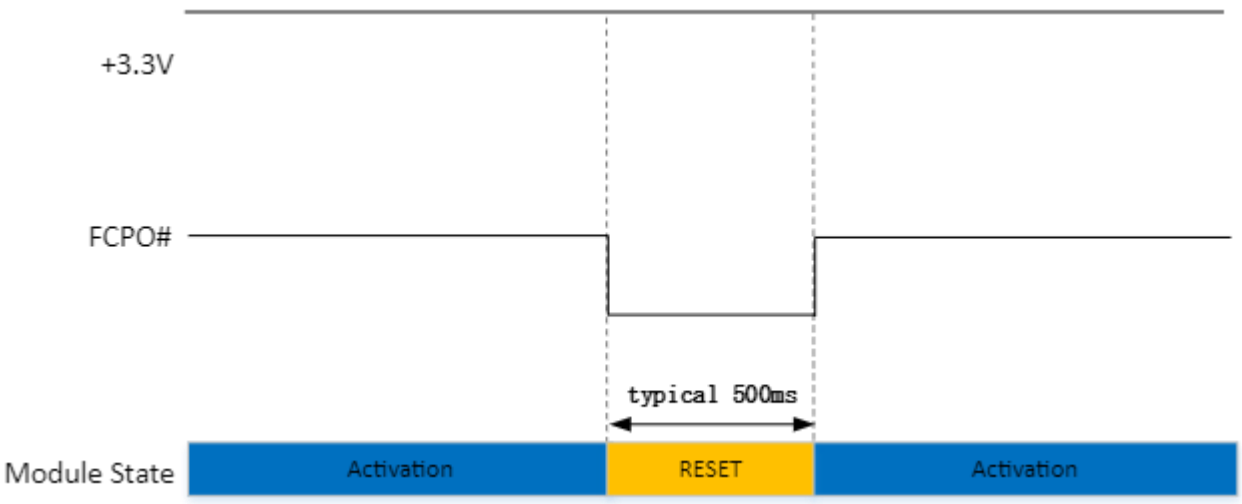

Figure 2-6 Hardware control reset timing

2.4 I2C Interface

The FB520 module support I2C interface. I2C is applied to PC IOT. The I2C is connected with the embedded controller (EC) of the host. The cloud information is sent to the host through the I2C of the module to manage and control the PC remotely.

Pin	Pin Name	I/O	Reset Value	Description	Level
40	I2C_SCL	DO	PU	I2C clock, master mode	1.8V
42	I2C_SDA	DIO	PU	I2C date, master mode	1.8V
44	I2C_IRQ#	DI	PD	I2C interrupt, used for wake up I2C host (Module)	1.8V

The I2C Interface speed support 100KHz and 400KHz, default is 100KHz.

2.5 USB Interface

FB520 module support USB for factory testing、R&D debug and diagnostic.

2.5.1 USB Interface

The FB520 module supports USB2.0 which is compatible with USB High-Speed (480 Mbps) and USB Full-Speed (12 Mbps). For the USB timing and electrical specification of FB520

module, please refer to “Universal Serial Bus Specification 2.0”.

USB interface initialized with host driver, and then mapped AT, Modem, Diagnostic ports. When module in factory mode, USB will be enumerated(default). When module in Default mode or IOT Service Mode, USB will not be enumerated (default). After enable the PC IOT Diagnostic function, USB will be enumerated.

2.5.1.1 USB Interface Definition

Pin#	Pin Name	I/O	Description	Type
7	USB_D+	I/O	USB data plus	0.3–3V, USB2.0
9	USB_D-	I/O	USB data minus	0.3–3V, USB2.0

2.5.1.2 USB 2.0 Interface Application

The reference circuit is shown in Figure 2-7:

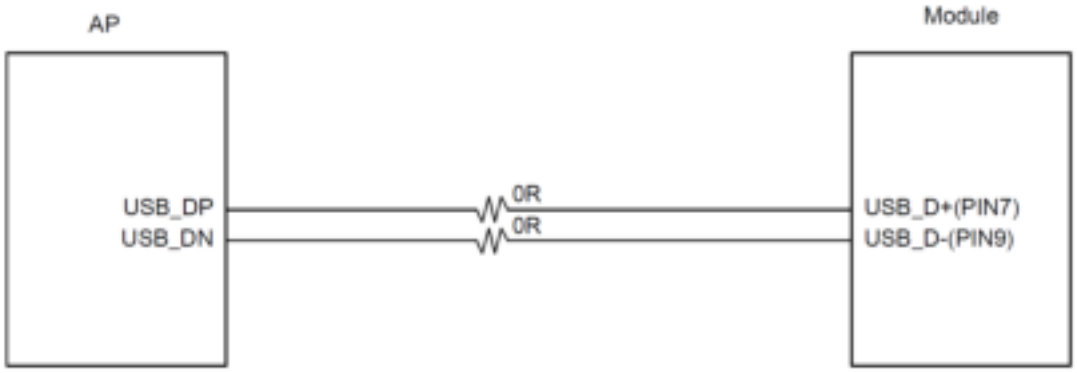

Figure 2-7 Reference circuit for USB 2.0 interface

USB_D- and USB_D+ are high speed differential signal lines with the maximum transfer rate of 480 Mbps, so the following rules should be followed carefully in the case of PCB layout:

- USB_D- and USB_D+ signal lines should have the differential impedance of 90Ω.
- USB_D- and USB_D+ signal lines should be parallel and have the equal length. The right angle routing should be avoided.
- USB_D- and USB_D+ signal lines should be routed on the layer that is adjacent to the ground layer, and wrapped with GND vertically and horizontally.

Note:

USB interface need to sustain connectivity in the hardware for factory manufacture and debug.

2.6 Status Indicator

The FB520 module provides two signals to indicate the operating status of the module, and the status indicator pins as shown in the following table:

Pin	Pin Name	I/O	Reset Value	Pin Description	Type
10	LED1#	O	T	System status LED, drain output.	CMOS 3.3V
23	WOWWAN#	O	PD	Module wakes up Host (AP), reserved	CMOS 1.8V

2.6.1 LED#1 Signal

The LED#1 signal is used to indicate the operating status of the module, and the detailed description as shown in the following table:

Module Status	LED1# Signal
RF function ON	Low level (LED on)
RF function OFF	High level (LED off)

The LED driving circuit is shown in figure 2-8:

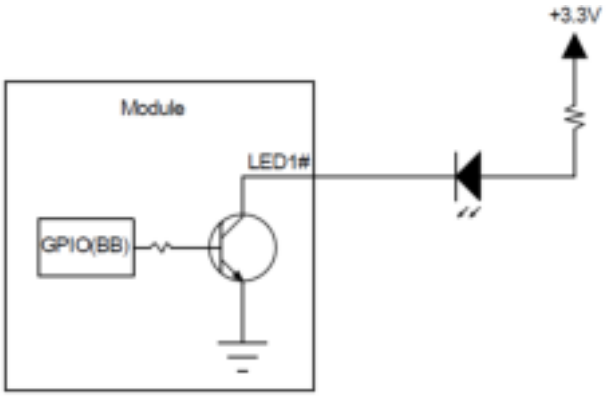

Figure 2-8 LED driving circuit

Note:

The resistance of LED current-limiting resistor is selected according to the driving voltage and the driving current.

2.6.2 WOWWAN# (software function Reserved)

The WOWWAN# signal is used to wake the Host (AP) when there comes the data request.

The definition of WOWWAN# signal is as follows:

Operating Mode	WOWWAN# Signal
SMS or data requests	Pull low 1s then pull high (pulse signal).
Idle/Sleep	High level

The WOWWAN# timing is shown in Figure 2-9:

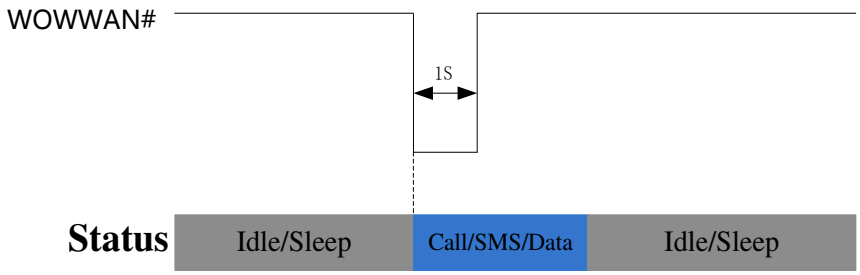

Figure 2-9 WOWWAN# timing

Note:

SMS wake-up host need send AT command: AT+GTSMSFILTERWUPEN=1 to enable this function.

3 Radio Frequency

3.1 RF Interface

3.1.1 RF Interface Functionality

The FB520 module supports two RF connectors used for external antenna connection. As the Figure 3-1 shows, “M” is for Main antenna, used to receive and transmit RF signals; “G” is for GNSS antenna, used to receive the GPS signals.

Figure 3-1 RF connectors

3.2 Operating Band

The FB520 module operating bands of the antennas are as follows:

Network mode	Band	Receive	Transmit	Unit
GSM	GSM850	869–894	824–849	MHz
	EGSM900	925–960	880–915	MHz
	DCS1800	1805–1880	1710–1785	MHz
	PCS1900	1930–1990	1850–1910	MHz

Network mode	Band	Receive	Transmit	Unit
FDD-LTE	Band1	2110–2170	1920–1980	MHz
	Band2	1930–1990	1850–1910	MHz
	Band3	1805–1880	1710–1785	MHz
	Band4	2110–2155	1710–1755	MHz
	Band5	869–894	824–849	MHz
	Band8	925–960	880–915	MHz
	Band12	728–746	699–716	MHz
	Band13	746–756	777–787	MHz
	Band14	758–768	788–798	MHz
	Band18	860–875	815–830	MHz
	Band19	875–890	830–845	MHz
	Band20	791–821	832–862	MHz
	Band25	1930–1995	1850–1915	MHz
	Band26	859–894	814–849	MHz
	Band27	852–869	807–824	MHz
	Band28	758–803	703–748	MHz
	Band66	2110–2180	1710–1780	MHz
	Band85	728–746	698–716	MHz

3.3 Output Power

The following table describes the RF output power of the FB520 series modules.

Table 3-1 Output power

Network Mode	Band	Maximum Value
GSM	GSM850	32.5 dBm±2 dB
	EGSM900	32.5 dBm±2 dB
	DCS1800	29.5 dBm±1 dB
	PCS1900	29 dBm±1 dB
FDD-LTE	Band1	20 dBm±1 dB
	Band2	20 dBm±1 dB
	Band3	20 dBm±1 dB
	Band4	20 dBm±1 dB
	Band5	20 dBm±1 dB
	Band8	20 dBm±1 dB
	Band12	20 dBm±1 dB
	Band13	20 dBm±1 dB
	Band14	20 dBm±1 dB
	Band18	20 dBm±1 dB
	Band19	20 dBm±1 dB
	Band20	20 dBm±1 dB
	Band25	20 dBm±1 dB
	Band26	20 dBm±1 dB
	Band27	20 dBm±1 dB
	Band28	20 dBm±1 dB
	Band66	20 dBm±1 dB
	Band85	20 dBm±1 dB

3.4 Antenna Design

The FB520 module provides main and GNSS antenna interfaces, and the antenna design requirements as shown in the following table:

FB520 Module Antenna Requirements	
Frequency range	It must use the most suitable antenna to adapt to the relevant frequency band
Bandwidth（GSM）	GSM850: 70 MHz GSM900: 80 MHz GSM1800 (DCS): 170 MHz GSM1900 (DCS): 140 MHz
Bandwidth (LTE)	LTE band 1 (2100): 250 MHz LTE band 2 (1900): 140 MHz LTE Band 3 (1800): 170 MHz LTE Band 4 (2100): 445 MHz LTE Band 5 (850): 70 MHz LTE Band 8 (900): 80 MHz LTE Band 12 (700): 47 MHz LTE Band 13 (700): 41 MHz LTE Band 14 (700): 40 MHz LTE Band 18 (700): 60 MHz LTE Band 19 (700): 60 MHz LTE Band 20 (700): 71 MHz LTE Band 25 (700): 145 MHz LTE Band 26 (700): 80 MHz LTE Band 27 (700): 62 MHz LTE Band 28 (700): 100 MHz LTE Band 66 (2100): 470 MHz LTE band 85 (2300): 48 MHz
GNSS	GPS L1: 1575.42±1.023 MHz GLONASS L1: 1602.5625±4 MHz BDS: 1561.098±2.046 MHz Galileo: 1575.42±1.023 MHz
Impedance	50Ω

FB520 Module Antenna Requirements	
Input power	> 35dBm(GSM) > 23dBm(LTE)
Standing wave ratio recommended	≤ 2:1

4 Structure Specification

4.1 Dimension of Structure

The structural dimension of the FB520 module is shown in Figure 4-1:

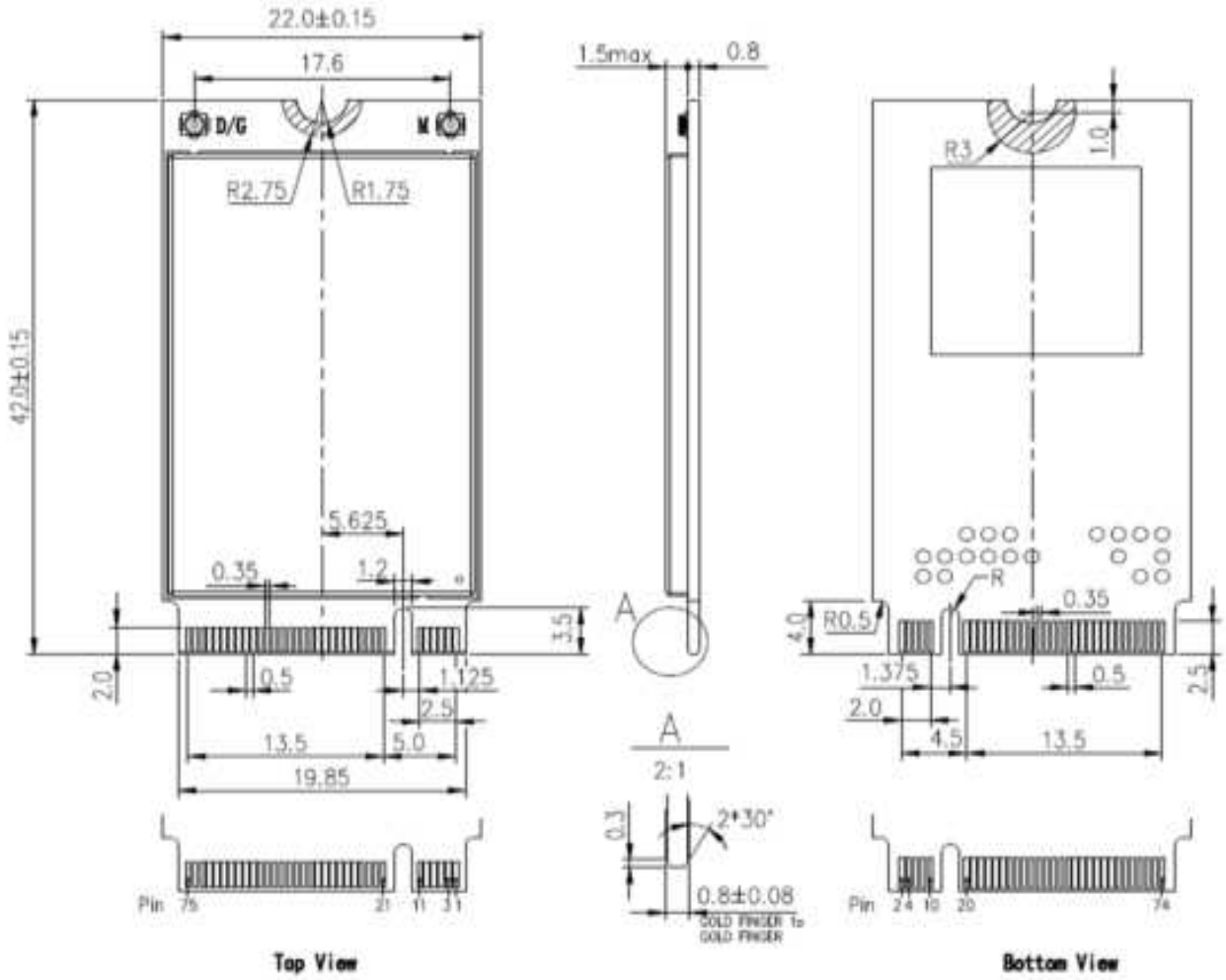

Figure 4-2 Dimension of structure

FCC Conformance information

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.

Important Notice to OEM integrators

1. This module is limited to OEM installation ONLY.

2. This module is limited to installation in mobile 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/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:ZMOFB520”

“Contains IC: 21374-FB520 “

The FCC ID/IC ID can be used only when all FCC/IC 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.

In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC/IC authorization is no longer considered valid and the FCC ID/IC 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/IC authorization.

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.

ISED Conformance information

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.

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.

Cet appareil est conçu uniquement pour les intégrateurs OEM dans les conditions suivantes: (Pour utilisation de dispositif module)

1) L'antenne doit être installée 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

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 considéré 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

This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be
labeled in a visible area with the following: “Contains IC:21374-FB520”.

Plaque 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-FB520".

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.

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.

Antenna information

Antenna Type	Bands	Peak Gain
PIFA	GSM 850	3
	GSM 1900	3
	LTE B2	3
	LTE B4	3
	LTE B5	3
	LTE B12	3
	LTE B13	3
	LTE B14	3
	LTE B25	3
	LTE B26	3
	LTE B66	3
	LTE B85	3