SIM7500

The UHF reading and writing module
Hardware use manual
Rev 1.0

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1.Revised records

document number	version	Date of formulation / modification	Reason	Change the content
	V1.0	2021-11-25	The initial version	/

2.Product presentation

Ultra-small RFID module SIM7500 is a cost-effective ultra-high frequency RFID reading and writing module developed by the technical team of Core Alliance Exhibition based on the IMPINJ new generation RF chip E710. SIM7500 The module is only the size of a coin, and it is designed for high-performance RFID handheld devices and mobile portable devices. SIM7500 Its low power consumption, small size, good RF performance, and advanced anti-interference design make it a priority for low-cost mobile devices.

3.Product characteristics

The new generation of E710 RF chip

Using IMPINJ new generation E710 UHF RF reader chip, high sensitivity, wide reading range, low power consumption.

Low-power design

Low power design, maximum power consumption 4.5W.

Patch design

With stamp hole mode for facilitate patch mounting.

Small size

The exterior size of the module is only 28mm * 28mm * 4mm, which is the size of a coin. The small size is suitable for a variety of installation scenarios.

4.Electrical character

Parameter	Condition	Min	Typical	Max	Unit
Frequency					
Frequency range	According Customization	840		960	MHz
Frequency step value	According Customization		250/500		KHz
output					
output power		5		30	dBm
Output power accuracy			+/- 1		dB
Output power flatness			+/- 0.5		dB
Label					
Receiving sensitivity		-88			dBm

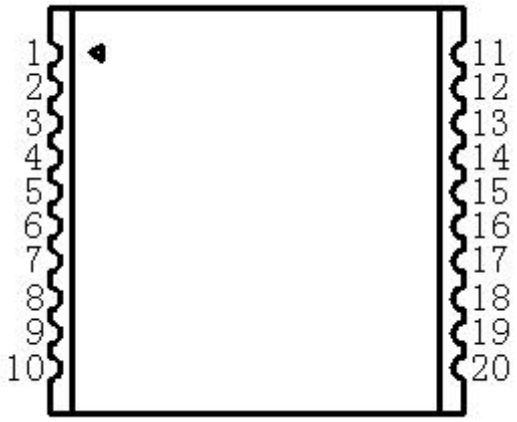
Stock the label peak speed			900		tag/s
Label cache area	96 bit EPC		1000		tag
logic level					
VIL，Input Low Voltage		-0.5		0.8	V
VIH，Input High Voltage		2		Vdd+0.5	V
Temperature range					
Storage temperature		-40		85	℃
Working temperature		-20		55	℃
Enter the power supply					
Supply voltage		3.6	5.0	5.25	V
Standby mode			165		mA
Card reading mode	Pout=30dBm, 50 Ω Load		900		mA

(1) The current varies depending on the load.

Absolute maximum rated parameter

parameter	Rating
Service voltage	+3.6～+5V±5%
Digital I/O Voltage to GND	3.3V
Working temperature	-20～+55℃
Storage temperature	-40～+85℃

5.Pin configuration and function description



Pin	Definition
1	VCC(+3.6 - 5V)
2	GND
3	EN Module power enabling:LOW(POWER DOWN) HIGH&DISCONNECT(ACTIVE)
4	Digital Output 2 (GPIO OUT2)
5	Digital Input 1 (GPIO IN 1)

6	Digital Input 2 （GPIO IN 2）
7	RXD (DATA INPUT, TTL level)
8	TXD (DATA OUTPUT, TTL level)
9	RST (LOW ACTIVE, Do not use, please hover)
10	Digital Output 1 （GPIO OUT1）
11	GND
12	Module 3.3V output
13	SWCLK SWD Burning the interface clock line
14	SWDIO SWDBurning the interface clock line
15	RFU
16	RFU
17	GND
18	GND
19	ANT
20	GND

6.Application message

Enter the power supply

The VCC port is recommended to filter with a tantalum capacitor of 100 to 470 uF to reduce the quick on and off power traction of the power amplifier during RF transmission.0.1 uF and 100 pF capacitor filter out the power ripple in different frequency bands.

Enable / reset

EN enables, built-in 47K pull resistance to VCC, high level or suspended when the module power, low level when the module power (low level should be less than 0.4V, high level should be greater than 0.9V less than VCC). RST reset, built-in pull resistance to 3.3V, connected to the low level reset.

GPIO joggle

Input:

Logic low <0.8 V	minimum 0V
Logic high >2V	maximum 3.3V

output:

Logic low	maximum 0.4V
Logic high	minimum 2.9V, maximum 3.3V

The maximum output current of the IO port is 5 mA.

Antenna connection

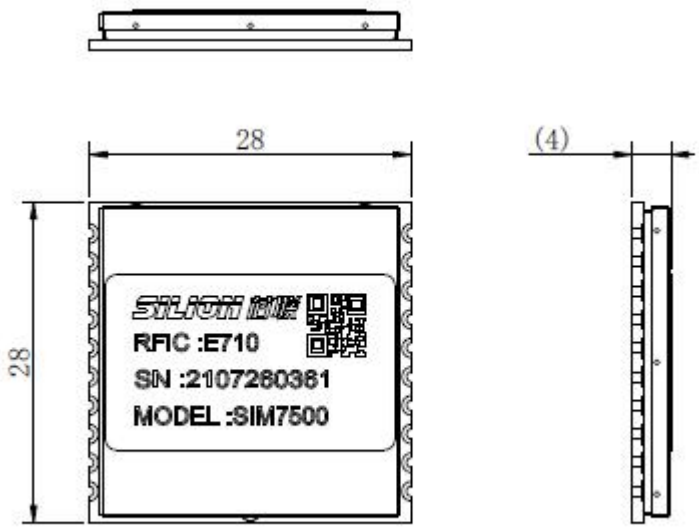
The antenna port output impedance is 50 ohm, and please use the 50 ohm microstrip line or strip line for the PCB connection. The impedance of the antenna should also be 50 ohm, the antenna standing wave ratio is recommended to be less than 1.5, better antenna standing wave ratio can get better card reading effect.

Communication interface RXD and TXD

The communication interface RXD and TXD are both TTL level, and it is recommended to refer to the above application schematic diagram to connect. The communication wave rate was 115,200 bps

7.Physical characteristics

Product size ： 28mm*28mm*4mm



FCC STATEMENT

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
This device may not cause harmful interference, and
This device must accept any interference received, including interference that may cause undesired operation.
Warning: 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.

FCC 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 20mm between the radiator & your body.

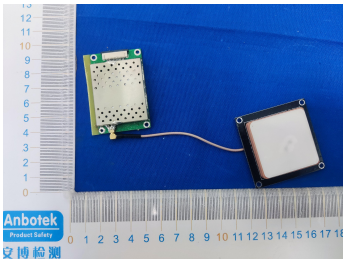
Integration instructions for host product manufacturers according to KDB 996369 D03 OEM Manual v01

2.2 List of applicable FCC rules
FCC Part 15 Subpart C 15.247 & 15.207 & 15.209

2.3 Specific operational use conditions
Operation Frequency:902-928MHz
Number of Channel:50 Channels
Modulation Type:ASK
Antenna Type:Ceramic antenna
Antenna Gain(Peak):2.5 dBi (Provided by customer)
The module can be used for mobile or portable applications with a maximum 2.5dBi antenna. The host manufacturer installing this module into their product must ensure that the final composit product complies with the FCC requirements by a technical assessment or evaluation to the FCC rules, including the transmitter operaition. 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 show in this manual.

2.4 Limited module procedures
Not applicable. The module is a Single module and complies with the requirement of FCC Part 15.212.

Trace antenna designs
Not applicable. The module has its own antenna, and doesn't need a host's printed board microstrip trace antenna etc.



2.5 RF exposure considerations
The module must be installed in the host equipment such that at least 20mm is maintained between the antenna and users' body; and if RF exposure statement or module layout is changed, then the host product manufacturer 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.

2.6 Antennas
Antenna Specification are as follows:
Antenna Type:Ceramic antenna
Antenna Gain(Peak):2.5 dBi (Provided by customer)
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 External 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.).

2.7 Label and compliance information

Host product manufacturers need to provide a physical or e-label stating "Contains FCC ID 2AQ9M-SIM7500 With their finished product.

2.8 Information on test modes and additional testing requirements

Operation Frequency:902-928MHz

Number of Channel:50 Channels

Modulation Type:ASK

Antenna Type:Ceramic antenna

Antenna Gain(Peak):2.5 dBi (Provided by customer)

Host manufacturer must perfom test of radiated & conducted emission and spurious emission, etcaccording 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 canbe sold legally.

2.9 Additional testing, Part 15 Subpart B disclaimer

The modular transmitter is **only** FCC authorized for FCC Part 15 Subpart C 15.247 & 15.207 & 15.209and that the host product manufacturer is responsible for compliance to any other FCC rules that applyto 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 circuity), 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.