

Z CAM USB WIFI 5G Module

WIFIM5G01

WiFi 802.11 a/n 2X2 5G Only High Power

Module Datasheet

CONTENTS

1. Introduction.....	1
2. Features.....	2
3. General Specification.....	3
3.1 General Specification.....	3
4. WiFi RF Specification.....	4
4.2 5GHz RF Specification.....	5
5. Pin Assignments.....	6
6. Dimensions	7
6.1 Physical Outline.....	7
6.2 Layout Recommendation	8
7. Reference Design	9
8. Recommended Reflow Profile.....	10
9. Package Information	11
10.Integration Introductions.....	12

1. Introduction

Shenzhen ImagineVision Technology Limited announce a low-cost and high-power consumption module which has 5g of the WiFi functionalities. The highly integrated module makes the possibilities of web browsing, VoIP, Long-distance audio and video transmission, Wireless HDMI Extender applications. With seamless roaming capabilities and advanced security, also could interact with different vendors' 802.11a/n 2x2 5G only Access Points in the wireless LAN.

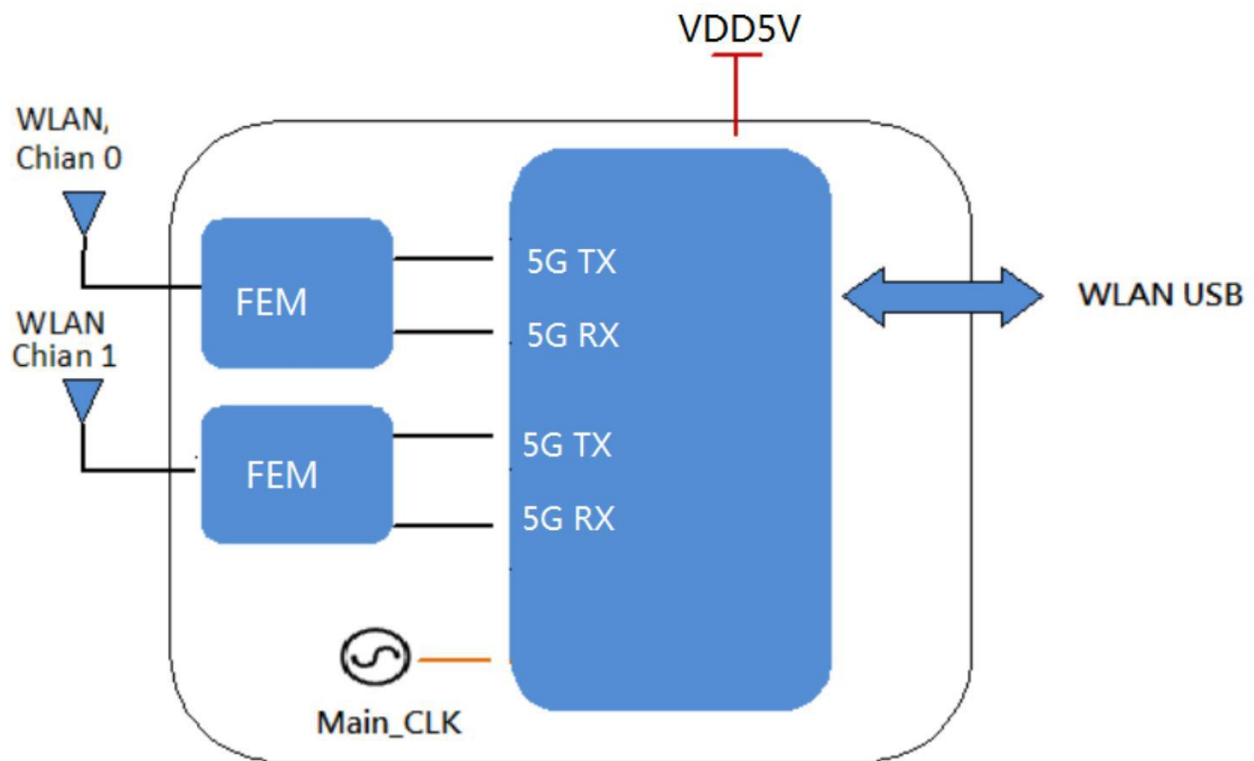
The wireless module complies with IEEE 802.11 a/n 2x2 MIMO standard and it can achieve up to a speed of 300Mbps with dual stream in 802.11n to connect the wireless LAN. The integrated module provides USB interface for WiFi .

Product Name	Z CAM USB WIFI 5G Module
Model	WIFIM5G01
Trade Mark	Z CAM
Hardware Version	Ver0
Software Version	Ver0
Applicable End Products	Camera
Manufacturer	HUNAN FN-LINK TECHNOLOGY LIMITED
	No.8, LiTong Road, Liuyang Economic and Technological Development Zone, Liuyang City, Changsha City, Hunan Province, P.R China
5150-5350 MHz for this device are restricted to indoor use only within all European Union countries.	
Hereby, [Shenzhen ImagineVision Technology Limited] declares that the radio equipment type [WIFIM5G01] is in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address: http://www.z-cam.com/ .	
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.	

2. Features

- Highly integrated wireless local area network(WLAN) system-on-chip (SOC) for 5 GHZ 802.11a/n WLAN applications.
- Dual-stream spatial multiplexing up to 300 Mbps data rate.
- Supports 20/40MHz Bandwidth
- Supports USB interface for WLAN.
- Integrated high power FEM.

A simplified block diagram of the module is depicted in the figure below.



3. General Specification

3.1 General Specification

Model Name	WIFIM5G01
Product Description	Support WiFi
Dimension	L x W x H: 27 x 20 x 2.3 (typical) mm
WiFi Interface	Support USB2.0
Operating temperature	-30°C to 85°C
Storage temperature	-40°C to 125°C
Humidity	Operating Humidity 10% to 95% Non-Condensing

3.1.2 Recommended Operating Rating

	Min.	Typ.	Max.	Unit
Operating Temperature	-30	25	85	deg.C
VCC5V	4.8	5.0	5.2	V

3.1.3 Current consumption measurement for Real working mode

Status	VCC=5V (Unit : mA)
All off	39
Wifi on mode	103
WiFi scan mode	132
WiFi link mode	138
TX Throughput Test	193
RX Throughput Test	194

4. WiFi RF Specification

4.1 5GHz RF Specification

Feature	Description		
WLAN Standard	IEEE 802.11a/n 2x2, WiFi compliant		
Frequency Range	5180-5240 MHz, 5745-5825 MHz		
Number of Channels	5.0GHz: Please see the table		
Output Power	18.85dBm max. (for EU)		
Test Items	Typical Value		Standard Value
SISO Receive Sensitivity (11a,20MHz) @10% PER	- 6Mbps	PER @ -90 dBm	≤-85
	- 9Mbps	PER @ -87 dBm	≤-84
	- 12Mbps	PER @ -86 dBm	≤-82
	- 18Mbps	PER @ -83 dBm	≤-80
	- 24Mbps	PER @ -80 dBm	≤-77
	- 36Mbps	PER @ -77 dBm	≤-73
	- 48Mbps	PER @ -75 dBm	≤-69
	- 54Mbps	PER @ -73 dBm	≤-68
MIMO Receive Sensitivity (11a,20MHz) @10% PER	- 6Mbps	PER @ -90 dBm	≤-86
	- 9Mbps	PER @ -89 dBm	≤-85
	- 12Mbps	PER @ -88 dBm	≤-83
	- 18Mbps	PER @ -86 dBm	≤-81
	- 24Mbps	PER @ -83 dBm	≤-78
	- 36Mbps	PER @ -80 dBm	≤-75
	- 48Mbps	PER @ -75 dBm	≤-69
	- 54Mbps	PER @ -73 dBm	≤-66
SISO Receive Sensitivity (11n,20MHz) @10% PER	- MCS=0	PER @ -88 dBm	≤-85
	- MCS=1	PER @ -85 dBm	≤-82
	- MCS=2	PER @ -83 dBm	≤-80
	- MCS=3	PER @ -80 dBm	≤-77
	- MCS=4	PER @ -76 dBm	≤-73
	- MCS=5	PER @ -71 dBm	≤-69
	- MCS=6	PER @ -72 dBm	≤-68
	- MCS=7	PER @ -68 dBm	≤-67
MIMO Receive Sensitivity (11n,20MHz) @10% PER	- MCS=0	PER @ -89 dBm	≤-82
	- MCS=1	PER @ -88 dBm	≤-80
	- MCS=2	PER @ -86 dBm	≤-79

	- MCS=3	PER @ -83 dBm	≤-78
	- MCS=4	PER @ -79 dBm	≤-74
	- MCS=5	PER @ -74 dBm	≤-68
	- MCS=6	PER @ -73 dBm	≤-66
	- MCS=7	PER @ -71 dBm	≤-64
	- MCS=8	PER @ -88 dBm	≤-84
	- MCS=15	PER @ -68 dBm	≤-63
SISO Receive Sensitivity (11n,40MHz) @10% PER	- MCS=0	PER @ -85 dBm	≤-82
	- MCS=1	PER @ -82 dBm	≤-79
	- MCS=2	PER @ -80 dBm	≤-77
	- MCS=3	PER @ -77 dBm	≤-74
	- MCS=4	PER @ -73 dBm	≤-70
	- MCS=5	PER @ -72 dBm	≤-66
	- MCS=6	PER @ -70 dBm	≤-65
	- MCS=7	PER @ -68 dBm	≤-64
MIMO Receive Sensitivity (11n,40MHz) @10% PER	- MCS=0	PER @ -87 dBm	≤-79
	- MCS=1	PER @ -85 dBm	≤-76
	- MCS=2	PER @ -83 dBm	≤-74
	- MCS=3	PER @ -80 dBm	≤-71
	- MCS=4	PER @ -76 dBm	≤-67
	- MCS=5	PER @ -75 dBm	≤-63
	- MCS=6	PER @ -73 dBm	≤-62
	- MCS=7	PER @ -71 dBm	≤-63
	- MCS=8	PER @ -70 dBm	≤-79
	- MCS=15	PER @ -68 dBm	≤-61
Maximum Input Level	802.11a/n : -30 dBm		

15GHz(20MHz) Channel table

Band range	Operating Channel Numbers	Channel center frequencies(MHz)
5180MHz~5240MHz	36	5180
	40	5200
	44	5220
	48	5240
5745MHz~5825MHz	149	5745
	153	5765
	157	5785
	161	5805
	165	5825

5. Pin Assignments



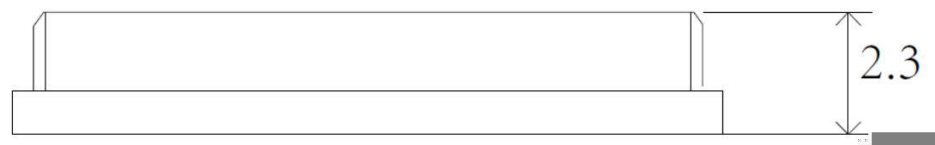
NO.	Name	Type	Description
1	POWER_EN	I	Module working enable,High: power on,low: power off. 3.3V
2	WPS	I/O	WiFi protected setup
3	GND	-	Ground
4	D+	I/O	USB2.0 Data+
5	D-	I/O	USB2.0 Data-
6	VDD5V	P	5V Power Input
7	LED	O	Driving LED to indicate WiFi state
8	GND	-	Ground
9	RF1	I/O	5G WiFi RF signal pin1
10	RF0	I/O	5G WiFi RF signal pin0
11	GND	-	Ground

6. Dimensions

6.1 Physical Outline

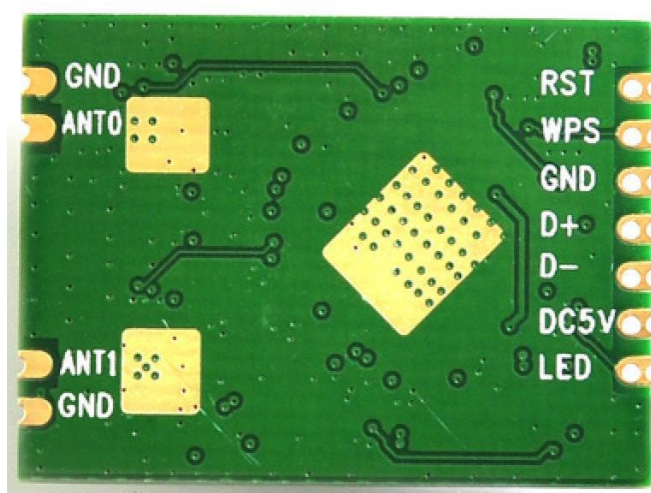
(Unit: mm)

< TOP VIEW >

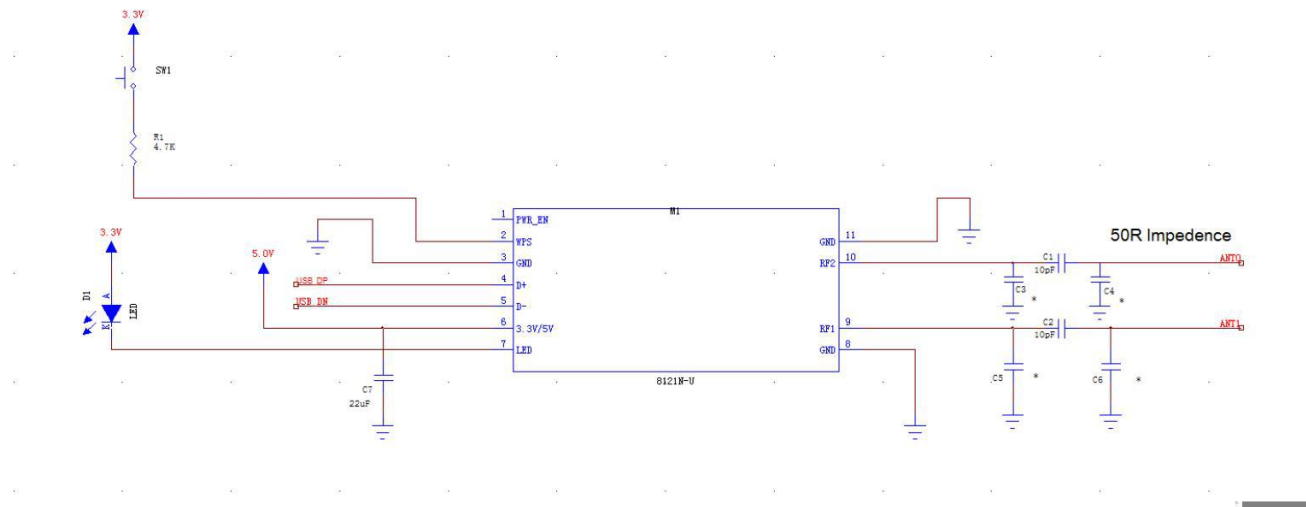


6.2 Module Photo

< TOP VIEW >



7. Reference Design

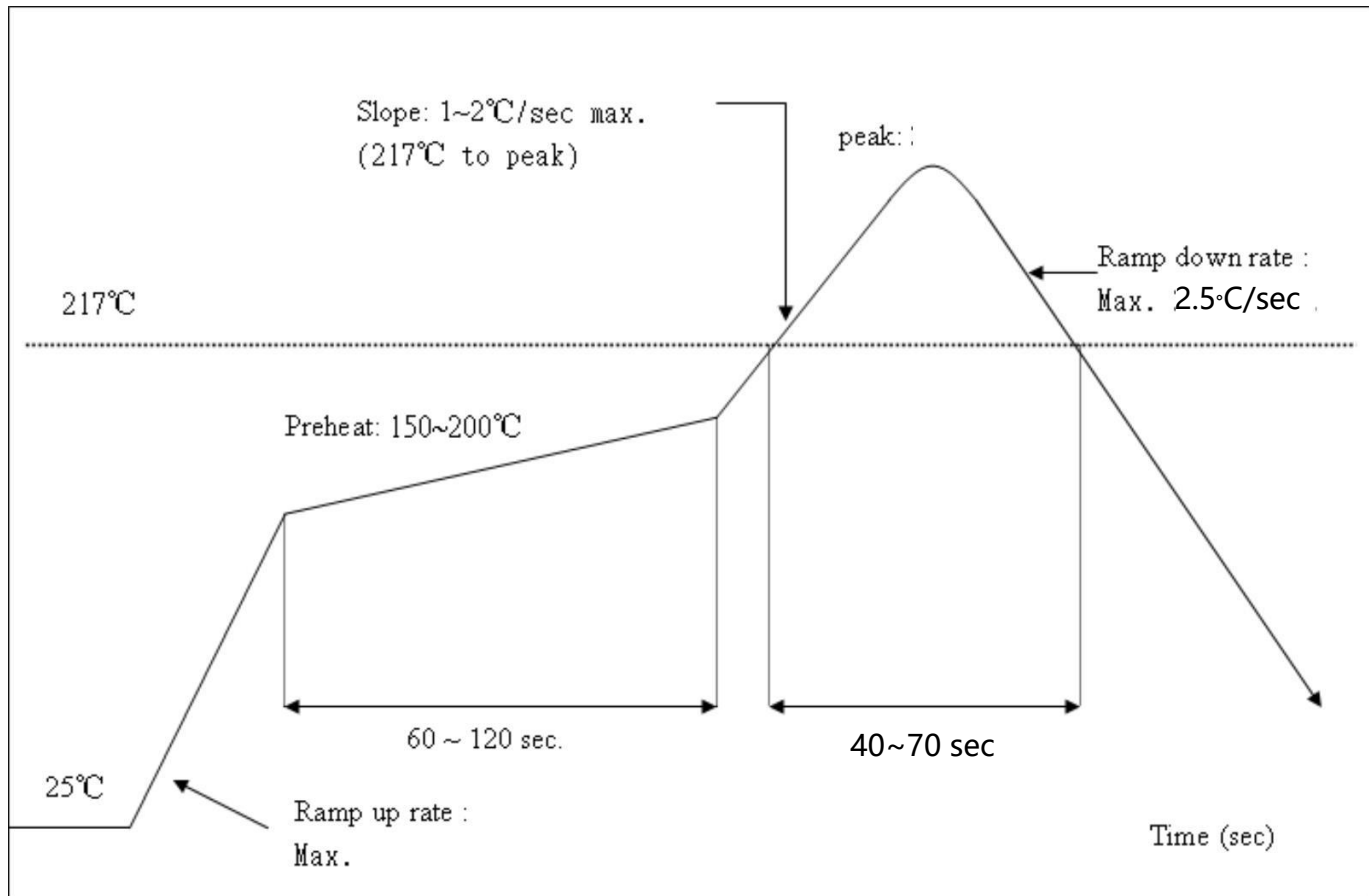


8. Recommended Reflow Profile

Referred to IPC/JEDEC standard.

Peak Temperature: $<250^{\circ}\text{C}$

Number of Times: 2 times



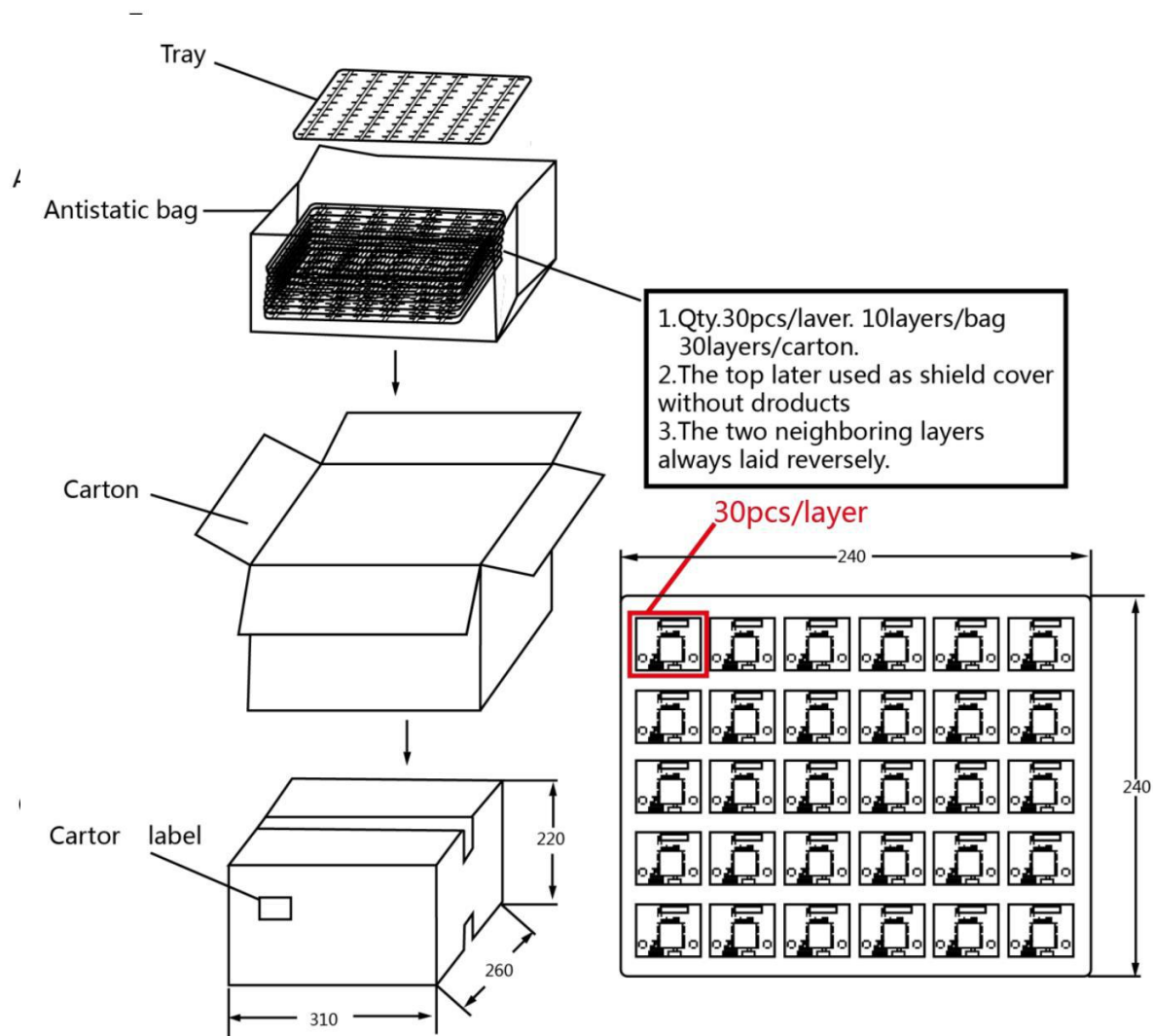
9. Package Information

Layer size: L300.0*W240.0 mm

Layer material: PVC

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

Carton material: A=A



10. Integration Introductions

2.2

This modular transmitter complies with FCC Rules Part 15, Subpart E 15.407.

2.3 Specific operational use conditions

Antenna Change Notice to Host manufacturer

Recommend using antenna which certified with this module mentioned in this manual. If you desire to increase antenna gain and either change antenna type or use same antenna type certified, a Class II permissive change application is required to be filed by us, or you (host manufacturer) can take responsibility through the change in FCC ID (new application) procedure followed by a Class II permissive change application, based on the new emissions testing. Please perform testing on frequency bands where the antenna gain is highest, worst-case band-edges based on original filing, and only on frequency bands where the antenna gain is highest.

Notice regarding trace antenna to host product manufacturer

Any deviation(s) from the defined parameters of the antenna trace, as described by this instruction, host product manufacturer must notify us that you wish to change the antenna trace design. In this case, a Class II permissive change application is required to be filed by us, or you (host manufacturer) can take responsibility through the change in FCC ID (new application) procedure followed by a Class II permissive change application.

2.6 RF exposure compliance instruction

This module is limited to installation in mobile application with a minimum separation distance of at least 20 cm from a person's body, a separate approval is required for all other operating configurations, including portable configurations with respect to §2.1093 and different antenna configurations.

Host product manufacturer shall at least provide information of minimum separation distance to end users in RF exposure compliance statement to end users in their end-product manuals.

2.7 This module is tested with the following antenna

Antenna Type	Max. Antenna Gain
Mushroom antenna	3.89dBi
Dipole antenna	3.45dBi

2.8 Labelling and compliance statement instruction for host product manufacturer

Please notice that if the FCC identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: "Contains FCC ID: 2AENNWFM5G01" any similar wording that expresses the same meaning may be used.

§ 15.19 Labelling requirements shall be complied on end user device.

Labelling rules for special device, please refer to §2.925, § 15.19 (a)(5) and relevant KDB publications. For E-label, please refer to §2.935.

FCC regulatory Compliance Statement mentioned in this manual shall be properly included in host product manual per FCC Rules.

The host product manufacturer shall be aware not to provide information to the end user on how to install or remove this module in your host product manual.

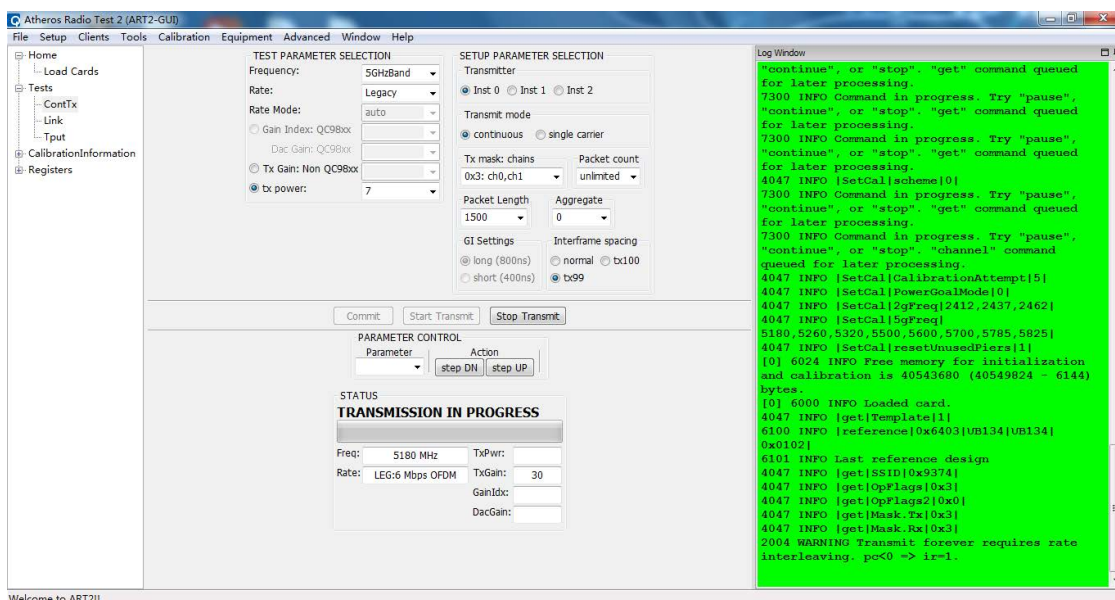
2.9 Guide on test modes and additional testing requirements

Host product manufacturer is ultimately responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, additional transmitter(s) in the host, etc.).

Furthermore, FCC KDB 996369 D04 Module Integration Guide v01 has elaborated guidance for modular transmitter integration for host product manufacturers.

Test software access to different test modes: artgui.exe

Frequencies, Transmit Power, Test Antennas can be selected on the software UI.



2.10 Disclaimer on additional testing, Part 15 Subpart B compliance of Host Product

This modular transmitter is only FCC authorized for the specific rule parts listed on our grant, 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.

Host manufacturer in any case shall ensure host product which is installed and operating with the module is in compliant with Part 15B requirements.

Please note that For a Class B or Class A digital device or peripheral, the instructions furnished the user manual of the end-user product shall include statement set out in §15.105 Information to the user or such similar statement and place it in a prominent location in the text of host product manual. Original texts from FCC Rules are as following you may refer to:

For Class B

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.*

For Class A

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

FCC regulatory compliance statement

§15.19 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.

§15.21 Information to user

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

RF Exposure compliance statement

This module complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.