

# User manual

## Document modification history

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# Chapter 1 Product Overview

## 1.1 8812C Application Scope

8812C can be used in android OPS box. It is also widely used in: OPS digital signage, OPS education AIO machine, OPS conference AIO machine, OPS self-service terminal machine, etc.

## 1.2 Description

8812C is based on RK3399 (Dual-core Cortex-A72 up to 2.0GHz, Quad-core Cortex-A53 up to 1.5GHz) with Android7.1. It adopted Mali-T860MP4 GPU , supported 4K、 H.265 Hardware Decode. It contained Rich interface and used MINIOPS interface: plug and play, simple maintenance; It is the best choice for digital signage, education, conference, self-service terminal industry.

## 1.3 Feature

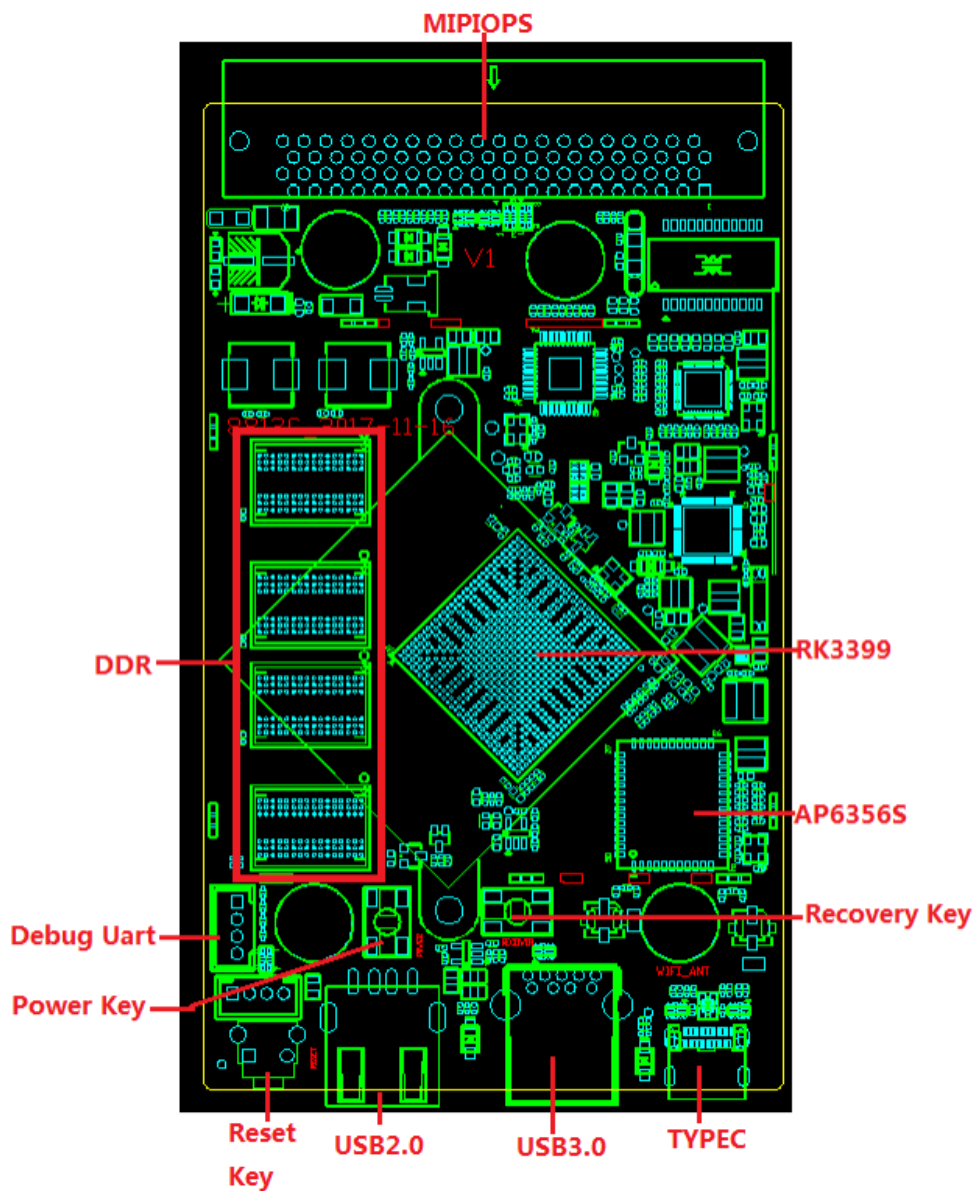
- ◆ Powered by RK3399 hexa-core Cortex A72/A53 processor with Android 7.1, Faster and better performance.
- ◆ Supported 5G&2.4G WIFI.
- ◆ Supported 1000M LAN.
- ◆ 80pin MINIOPS , Fanless , Plug&Play.
- ◆ Rich extension interface. Six USB interfaces(1XUSB3.0 , 1XUSB

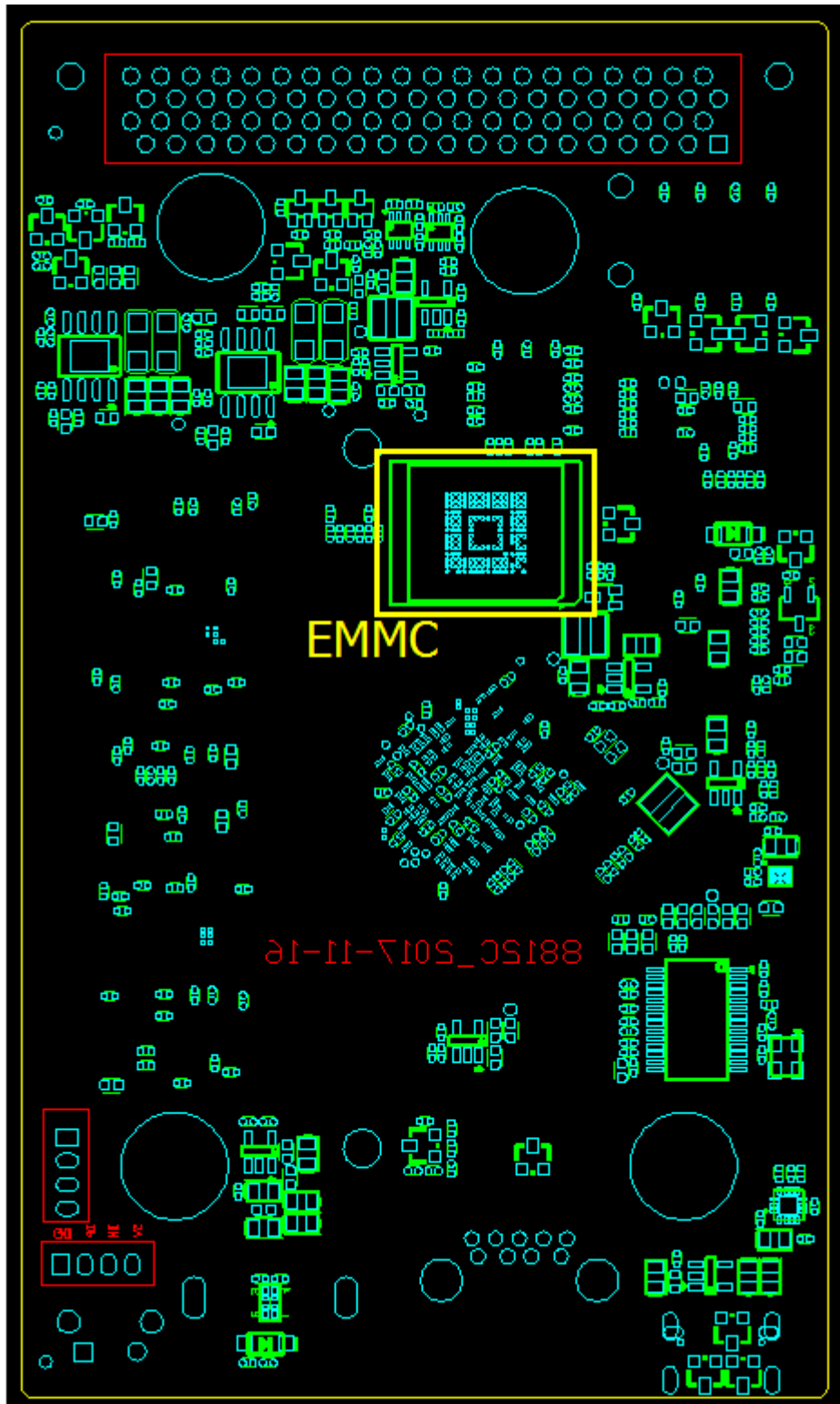
Host 2.0 +4XHUB USB2.0 , 1XTYPE C) , 1XTTL Uart, 1XTTL Debug Uart. Satisfy all kinds of peripheral needs.

- ◆ Supports Android system customization, provides reference code for the system API, and perfectly supports the application development of the upper layer.

## 1.4 Sketch map of appearance and interface

TOP/Bottom :





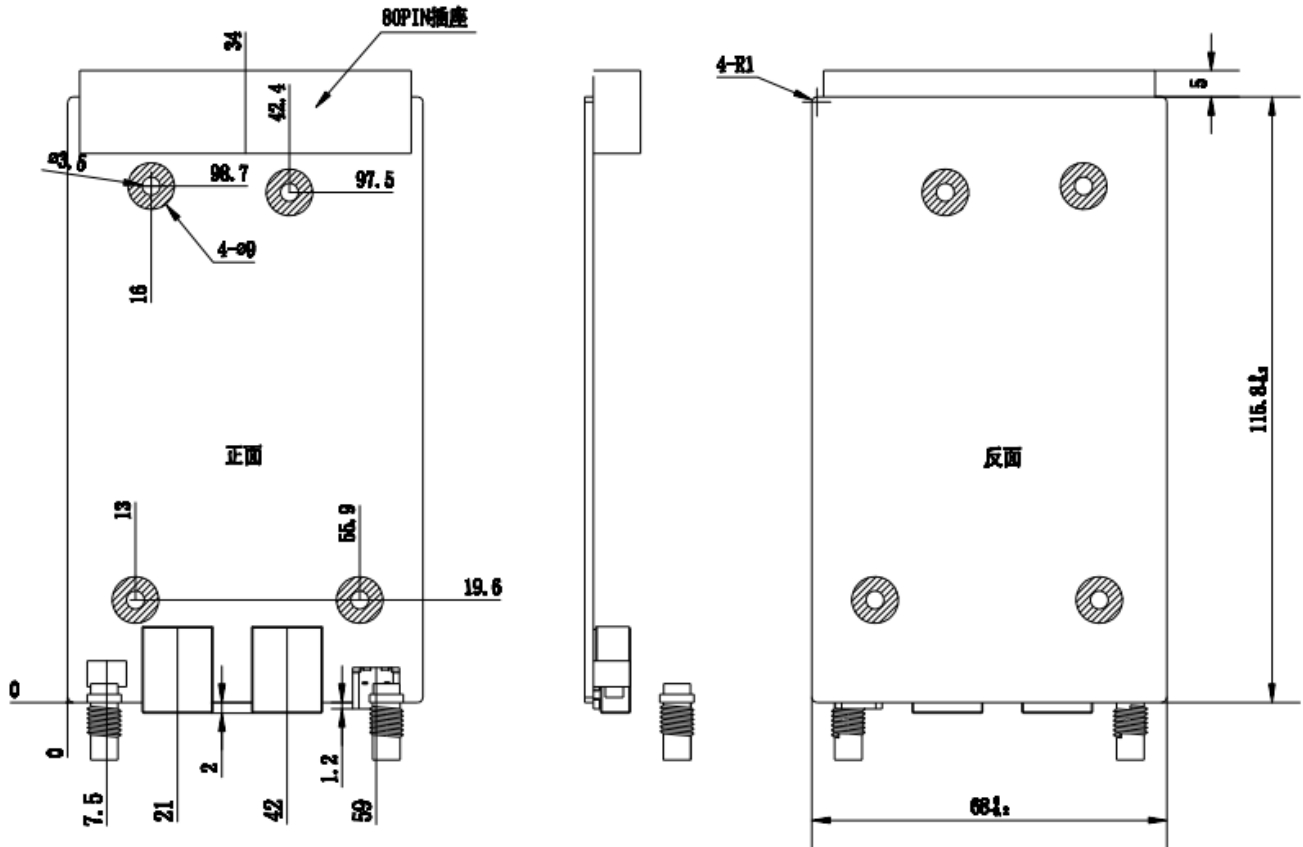
# Chapter 2 Basic Function List

RK3399 Hardware Spec sheet	
Platform	Rockchip RK3399
CPU	hexa-core bit.LITTLE processor with dual core Cortex A72 up to 2.0 GHz and quad core Cortex A53 processor
GPU	ARM Mali-T860MP4 GPU, support OpenGL ES1.1/2.0/3.0, OpenCL1.2, DirectX11.1 etc Embedded 4 shader cores with shared hierarchical tiler
Video Decode	4K VP9 and 10-bit H.265 video codec support up to 60 fps
PMU	RK808 PMU
Memory	Dynamic Memory Interface DDR3 :2G
FLASH	eMMC 5.1 :16G
WIFI&BT	AP6356S
Enthernet	X1, 10M/100M/1000M Self-adaption
USB Interface	4*USB 2.0 HOST+1*USB 3.0 HOST+ 1*Type-C
UART	1*UART TTL (ttyS4) ; UART2 Debug, TTL;
HDMI OUT	X1, support 4K
Audio OUT	HDMI audio out
RTC	Support
Key	RESET Key, RECOVER Key, POWER Key
Power	DC12V~19V-2A

System/Software	
System	Android 7.1
Programming language	C、C++、Kotlin、Java、Shell、Pyhon, etc
Fireware update	OTA update

# Chapter 3 PCB Size&Layout

## 3.1 PCB Drawing



PCB : 8 layers

Size : 68mm\*115.8mm\*1.6mm

Screw Hole :  $\phi$ 3.5mm x 4

## 3.2 Interface Parameter

### ◆ 80PIN MIPIOPS Pin Definition :

1	LAN_P3-
2	LAN_P3+
3	
4	LAN_P4-
5	LAN_P4+
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	GND
17	TMDS_CLK-
18	TMDS_CLK+
19	GND
20	TMDS0-
21	TMDS0+
22	GND
23	TMDS1-
24	TMDS1+
25	GND
26	TMDS2-
27	TMDS2+
28	GND
29	DVI_DDC_DATA
30	DVI_DDC_CLK
31	DVI_HPD
32	GND
33	12V~19V
34	12V~19V
35	12V~19V

36	12V~19V
37	12V~19V
38	12V~19V
39	12V~19V
40	12V~19V
41	LAN_P2-
42	LAN_P2+
43	RESET#
44	LAN_P1-
45	LAN_P1+
46	IR
47	I2C_SCL
48	I2C-SDA
49	I2C_3.3V
50	
51	UART_RXD
52	UART_TXD
53	GND
54	StdA_SSRX-
55	StdA_SSRX+
56	GND
57	StdA_SSTX-
58	StdA_SSTX+
59	GND
60	USB_PN2
61	USB_PP2
62	GND
63	USB_PN1
64	USB_PP1
65	GND
66	USB_PN0
67	USB_PP0
68	GND
69	
70	

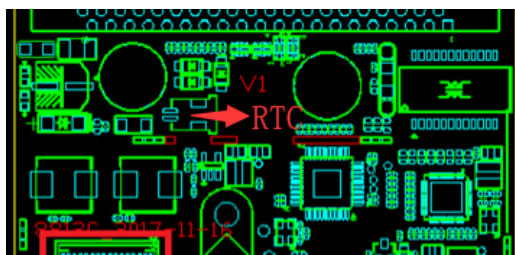


71	CEC
72	PB_DET
73	PS_ON#
74	PWR_STATUS
75	GND

76	GND
77	GND
78	GND
79	GND
80	GND

◆ **BAT RTC Interface**

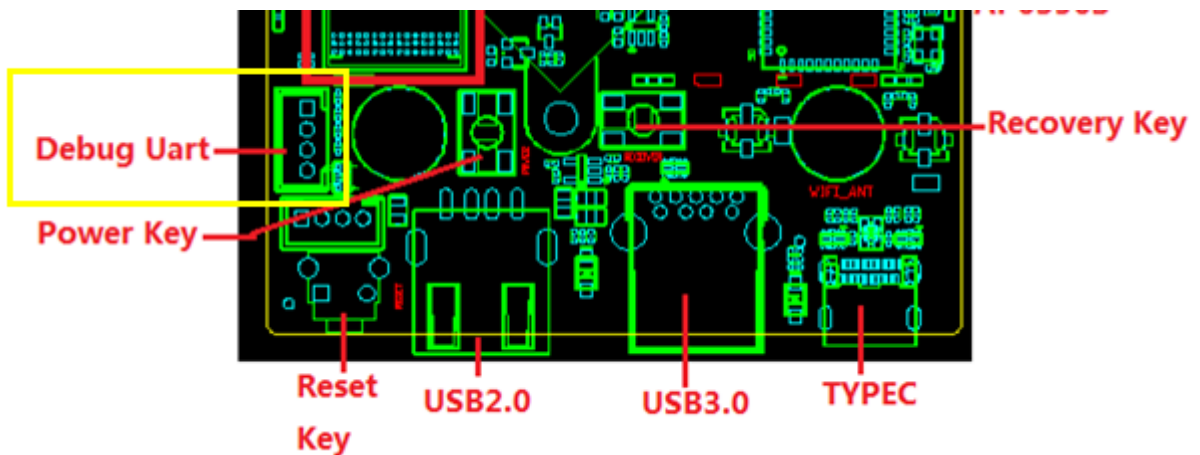
Used to power the system clock when power is off



NO	Definition	Property	Discription
1	RTC	Power IN	3V IN
2	GND	GND	GND

◆ **Debug UART**

If the connection level of the serial port is higher than 3.3v, there should be damaged board.

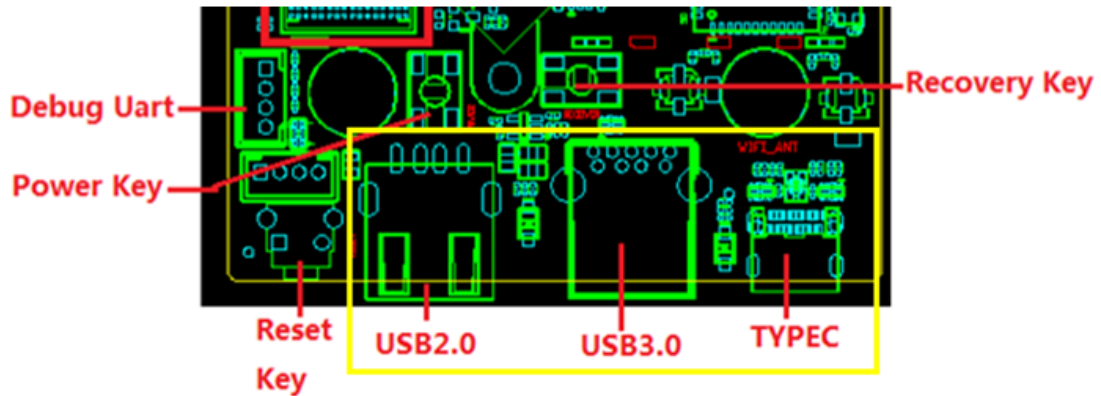


NO	Definition	Poperty	Discription
1	GND	GND	GND
2	RX	Input	RX
3	TX	Output	TX

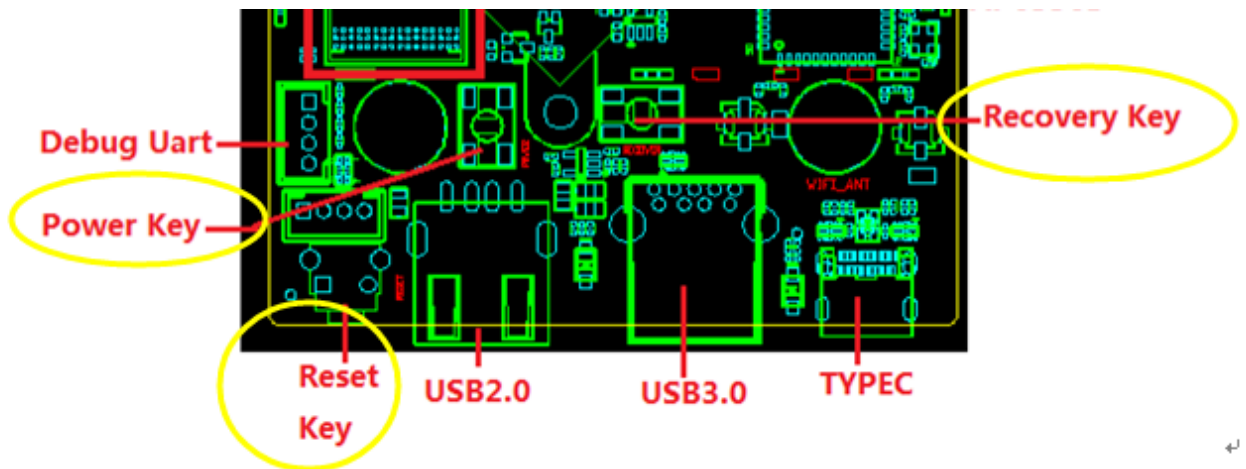
4	VCC	Power	3.3V
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◆ **USB Ports**

8812C has 4xUSB2.0, 1xUSB3.0 and 1xTYPEC interface. The external interface of board is: 1xUSB2.0; Three interfaces were extended through the 80PIN MINIOPS.



◆ **Keys**



Power Key	When the low level time is detected over 500ms, the machine will start up automatically. After starting up, if the PWRON is pulled down more than 6s, it will be forced shutdown (usually used to force shutdown when the system crash and start up again). During sleep and wake up operations, the low level of the PWRON needs to be maintained over 30ms.
Reset Key	Reset is valid with low level. In order to ensure stable and normal operation, the minimum Reset time is 100 main clock cycles of 24MHz, at least 4us.
Recovery Key	Press this button for a long time before starting the machine, it will enter the Recovery mode. The firmware can be brushed by wire.

## Chapter4 Electrical Performance

Item		Min	Typ	Max
Supply Voltage	Voltage	12	16V	19V
	Ripple	--	--	50mV
	Current	2A		
Working Environment	Relative humidity	--	--	80%
	Operating temperature	0°C	--	40°C
	Storage temperature	-20°C		70°C

## Chapter5 Assembly Notes

During assembly, please note the following (not limited to) problem points.

- 1.Short circuit problem of board and peripheral equipment.
- 2.During installation and fixation, board should be avoided deformation for fixed reasons.
- 3.When installing peripheral devices (USB, IO, uart.etc.), pay attention to external IO voltage level and current output problems.
- 4.When installing serial port, whether TX and RX are connected correctly
- 5.Whether the input voltage, current, etc. meet the requirements, according to the full peripherals.

## FCC STATEMENT

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

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 Statement:

This equipment complies with FCC radiation limits set forth for an uncontrolled environment. This equipment must not be colocated or operating with any other antenna or transmitter.

This module is designed to comply with FCC statement FCC ID is: 2AKP8-RK3399

The host system using this module should have label in a visible area indicated the following texts "Contains FCC ID: 2AKP8-RK3399".

2.4G and 5G can transmit simultaneously when sharing antennas.

Operations in the 5.15-5.25GHz band are restricted to indoor usage only.

## FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. In order to avoid the possibility of exceeding the FCC radio frequency exposure limits, Human proximity to the antenna shall not be less than 20cm (8 inches) during normal operation.

When OEG purchase the module, they can only buy this antenna to match the Modules. The max antenna gain of antenna is 2dBi. The following is a example of the module and antenna:

