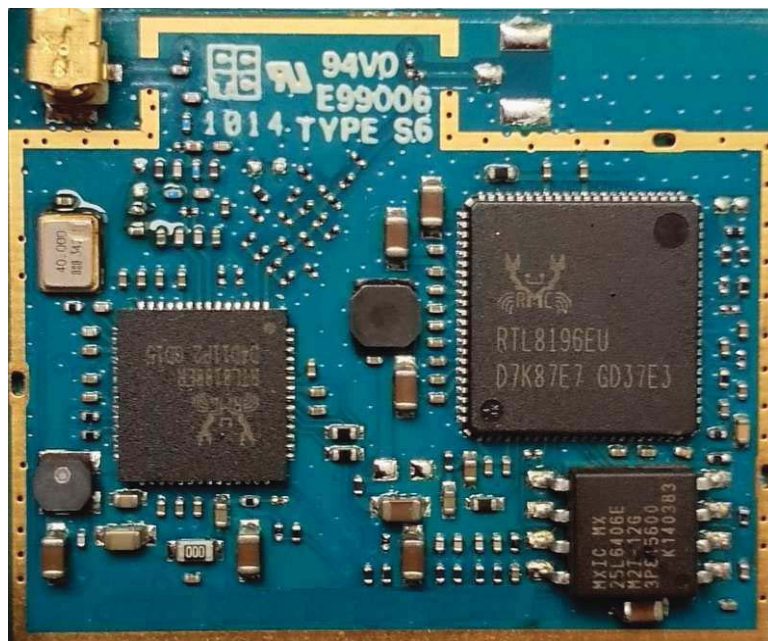


# User Manual

## **IEEE 802.11 b/g/n 2.4GHz 1T1R**

iCOM Smart WiFi Module

## WFM-210 iAudio(Airplay/DLNA) (Realtek RTL8196EU+RTL8188ER) Single Module



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## 1. Product Overview

WFM-210 Serial iAudio(Airplay/DLNA) module is a single chip wireless audio module that developed by Rayson Technology(Shenzhen) Ltd Company .

WFM-210 Serial Wi-Fi Audio module integrates multiple audio formats such as MP3, WMA, RA, AAC, WAV, APE, FLAC and Hi-Fi lossless music decoding, maximum decoding capacity up to 4.5Mbps (24bit/192kHz) · the biggest advantage in the ability for loss free streaming media transmission bandwidth and network . Also can support AIRPLAY protocol for APPLE device, support DLNA protocol for ANDROID device, support network media streaming protocol, remote control base on TCP/IP .

WFM-210 Serial Wi-Fi Audio module can also be used for constructing the wireless network security monitoring, Intelligent wireless audio, wireless intelligent household appliances . Support 802.11 b/g/n wireless standard, which can work in wireless AP/STA mode . For the main Wi-Fi standard 802.11g and 802.11n, the transmission rate is 54Mbps for 802.11g, 150Mbps for 802.11n, all far more than the CD level quality required bandwidth . At the same time, WFM-210 can realize two device point to point direct, and also can through Wireless routing network. .

For example, Android smart mobile phone connect to music box through WFM-210 can achieve shared music between multiple mobile phone, t the same time, can also satisfy the network multicasting, browsing demand, this is the Bluetooth cannot does .

WFM-210 Serial Wi-Fi Audio module also support extended interfaces, such as Ethernet interface support cable internet access, USB interface can access USB extend storage device . Support standard UART interface, and can be connected with MCU to achieve Wi-Fi wireless network control .

### 1.1 Extended Application

- Wireless intelligent audio
- Wireless intelligent speaker
- Wireless intelligent router and music player
- Wireless home entertainment center

## 2. Module Parameter

### 2.1 Basic Parameter

Feature	Detailed Description
Antenna Type	IPEX compatible antenna
Main chip	RTL8196EU
Frequency range	2.412GHz-2.462GHz
CPU clock	400MHz
DDR1 speed	156.25MHz
DDR1 size	32MB
Flash size	8MB SPI Flash
PCB stack	4 layers
Operating Voltage	3.3VDC +/- 10%
Power Consumption	1.3W@1T1R
Operation current	136mA~187mA
Form factor	Half size Mini-Card 32x27x1 mm
Main Interface	10/100M FE PHY
Network Protocol	TCP/IP/UDP/HTTP/UPNP
Network Type	AP/STA
Other Interface	USB, UART

### 2.2 Regulation Requirements

Feature	Detailed Description
United States	IEEE 802.11 b/g/n FCC part 15.247, 15.205, 15.209 Safety: UL1950-3 for CSA mark
Europe	IEEE 802.11 b/g/n EMC: EN 300 328, EN 300 826, EN 60950

## 2.3 Environment Requirements

Feature	Detailed Description
Operating Temperature Conditions	The product is capable of continuous reliable operation when operating in ambient temperature of 0°C to +50°C
Operating Temperature Conditions	Neither subassemblies is damaged nor the operational performance is degraded when restored to the operating temperature after exposing to storage temperature in the range of -20°C to +75°C
Operating Humidity Conditions	The product is capable of continuous reliable operation when subjected to relative humidity in the range of 10% and 90% non-condensing.
Non-Operating Humidity Conditions	The product is not damaged nor the performance is degraded after exposure to relative humidity range from 5% to 95% non-condensing

## 2.4 RF Power Consumption

Test Environment :

Platform : Lenovo CPU: Intel i5-3230M @2.6GHz

OS: Win7 32bits Encryption: No encryption

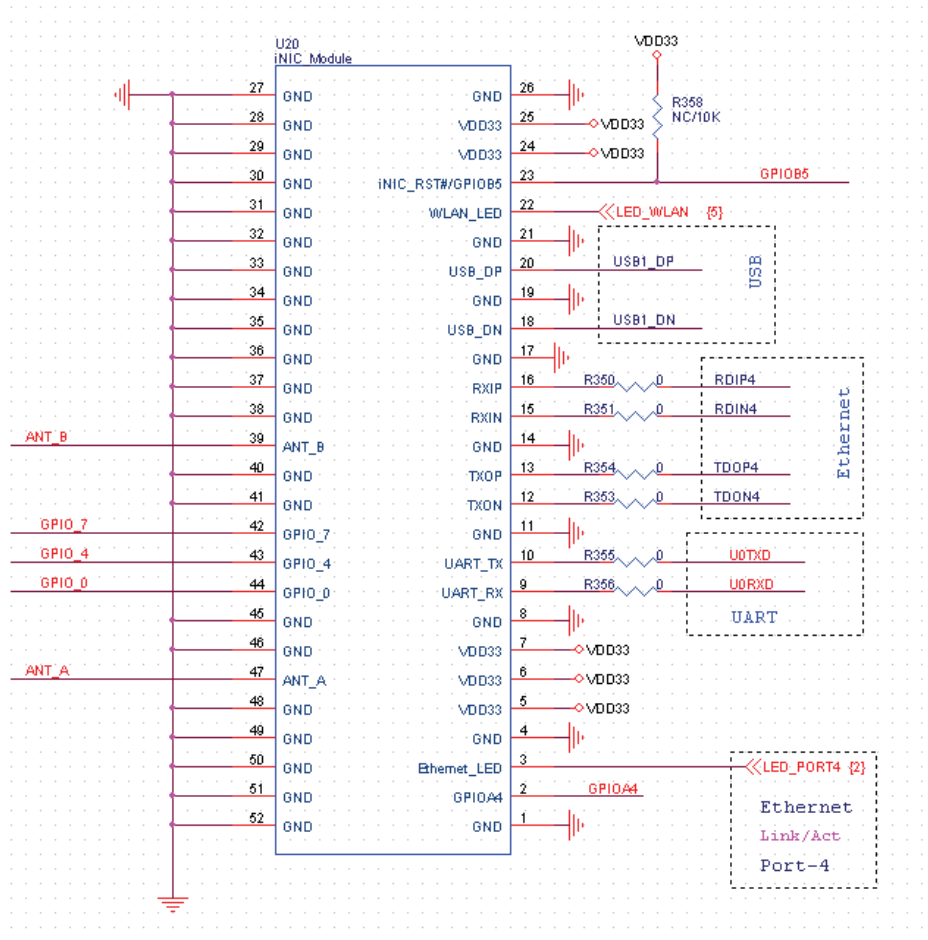
Mode 3.3V	Power consumption (mA)	Throughput (Mbps)
Non-Associated	2	N/A
Associated Idle	2~116	N/A
Radio off	2	N/A
Disable	2	N/A
Tx n mode 40 MHz	187	93
Rx n mode 40 MHz	155	90.9
Tx n mode 20 MHz	172	48.3
Rx n mode 20 MHz	136	53.7
Tx g mode	173	30.3
Rx g mode	142	29.7
Tx b mode	160	6
Rx b mode	136	6.1

### 3. Pin Assignment on module

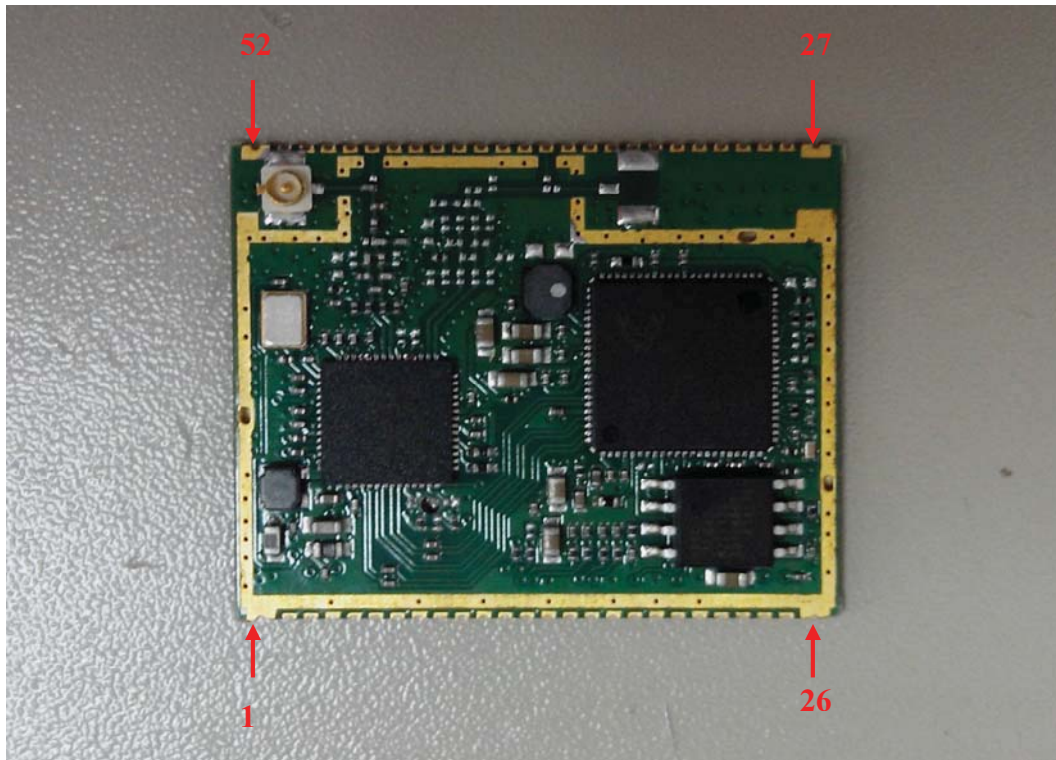
Abbreviations in used:

I: Input      AI: Analog Input      O: Output      AO: Analog Output  
 IO: Bi-Directional Input/Output      AI/O: Analog Bi-Directional Input/Output  
 P: Digital Power G: Digital Ground

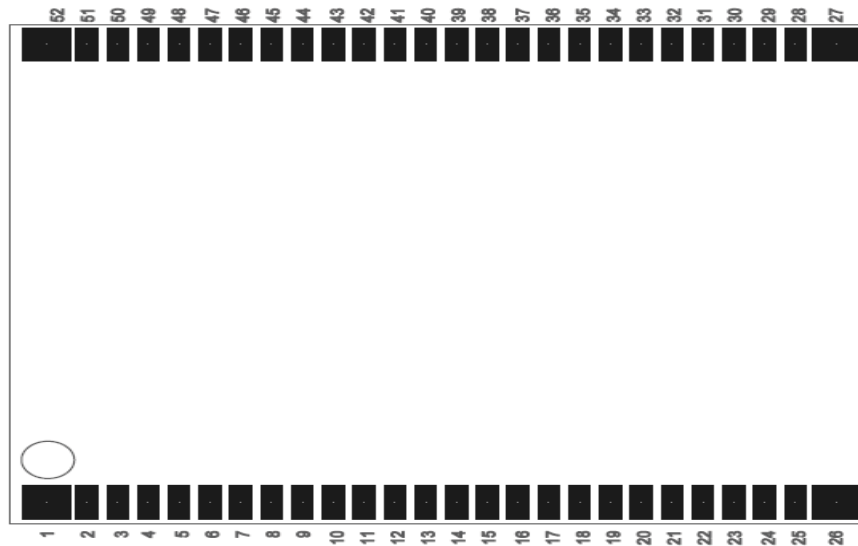
PIN	NAME	TYPE	PIN	NAME	TYPE
1	GND	G	52	GND	G
2	GPIO_A4	I/O	51	GND	G
3	Ethernet_LED	O	50	GND	G
4	GND	G	49	GND	G
5	3.3V	P	48	GND	G
6	3.3V	P	47	ANT_A(1T1R_ANT)	A
7	3.3V	P	46	GND	G
8	GND	G	45	GND	G
9	UARTTRXD	I	44	GPIO_0	I/O
10	UARTTTXD	O	43	GPIO_4	I/O
11	GND	G	42	GPIO_7	I/O
12	TXON	AO	41	GND	G
13	TXOP	AO	40	GND	G
14	GND	G	39	ANT_B	A
15	RXIN	AI	38	GND	G
16	RXIO	AI	37	GND	G
17	GND	G	36	GND	G
18	USB_DN	AI/O	35	GND	G
19	GND	G	34	GND	G
20	USB_DP	AI/O	33	GND	G
21	GND	G	32	GND	G
22	WLAN_LED	O	31	GND	G
23	iNIC_RST#/GPIOB5	I/O	30	GND	G
24	3.3V	P	29	GND	G
25	3.3V	P	28	GND	G
26	GND	G	27	GND	G

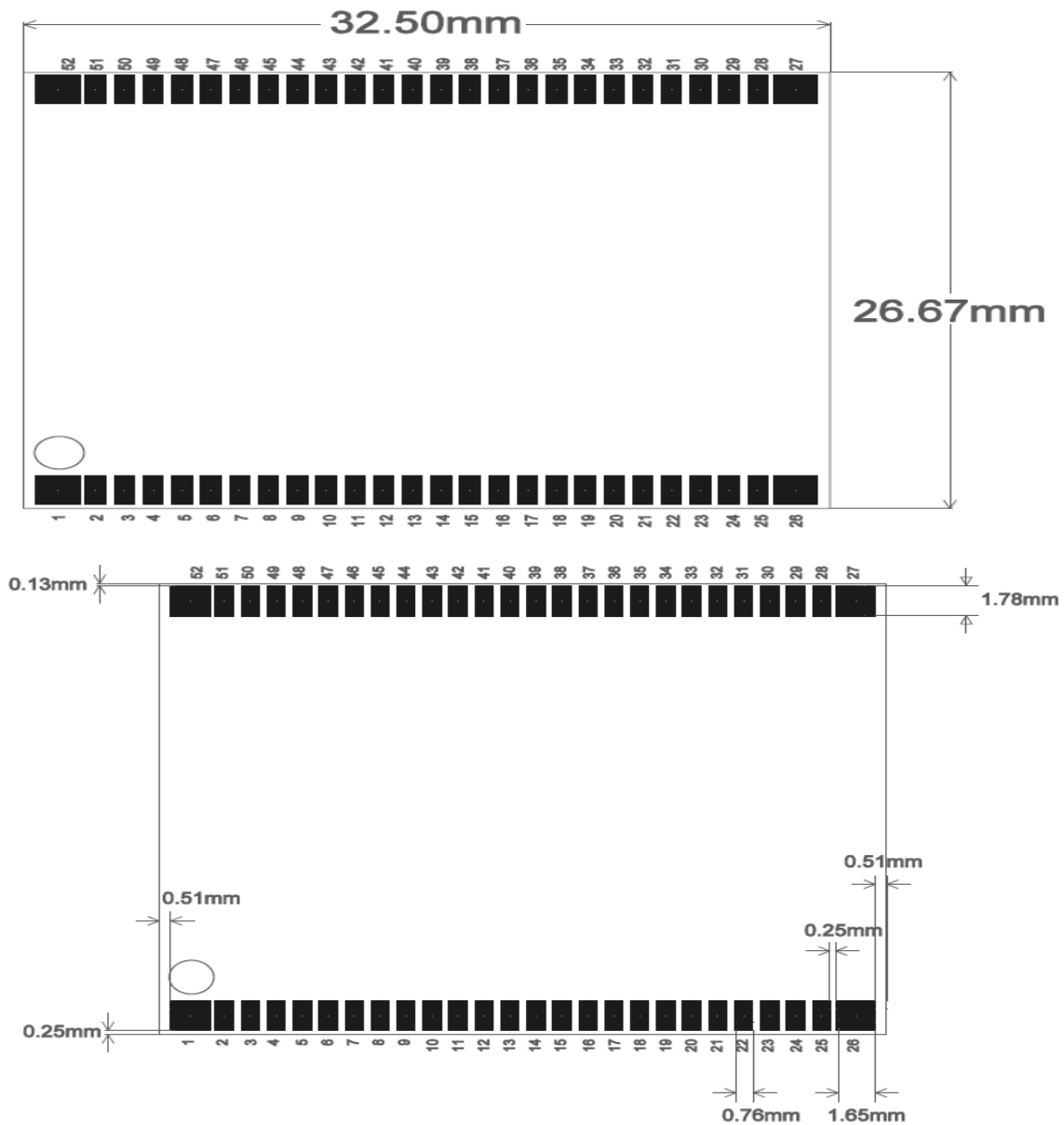




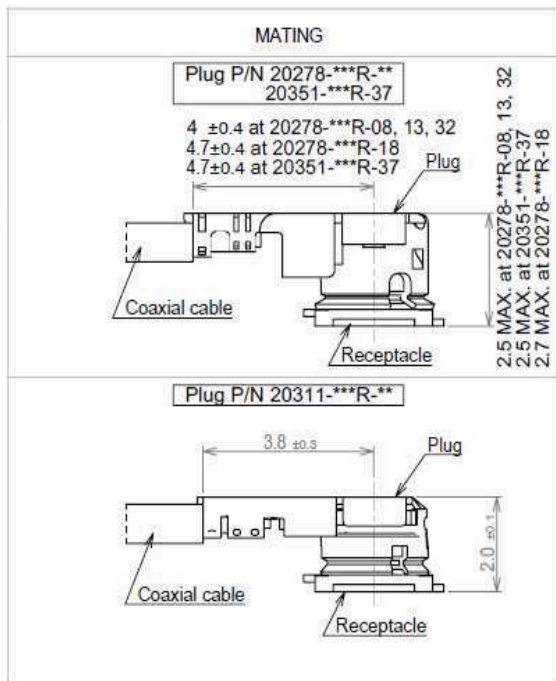
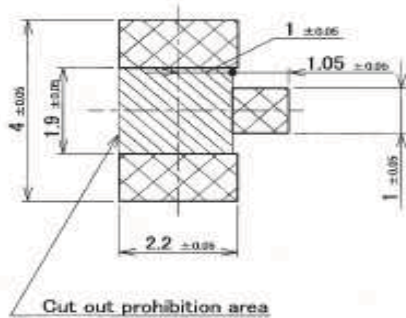
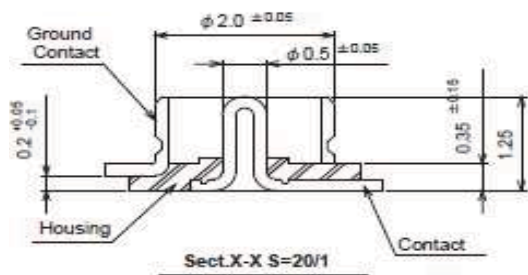
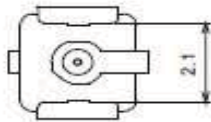
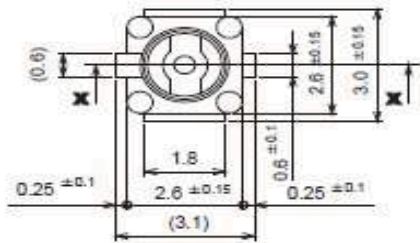


## 4.Interface Specifications





## 6.RF Connector



## Antenna Information

Antenna Type: PCB Antenna

Antenna Gain: 3.3dBi

Manufacturer: Unicon Technology Corporation

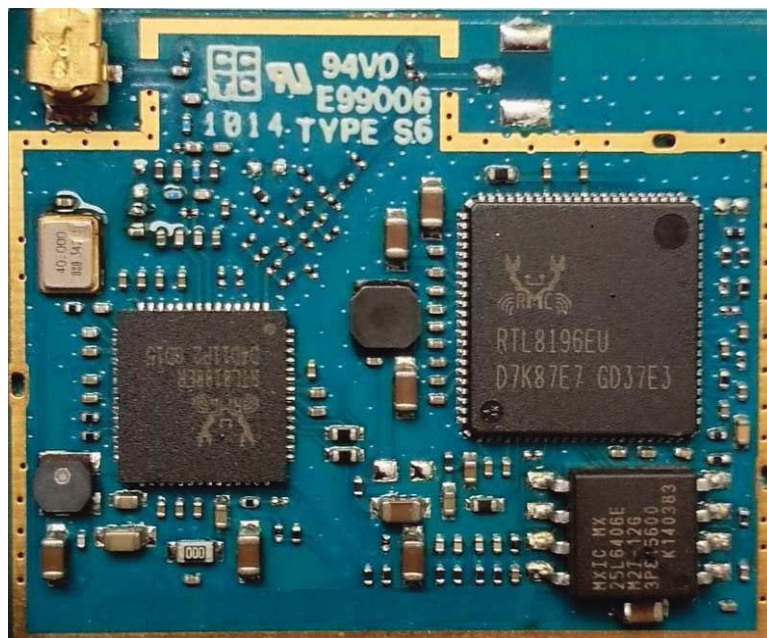
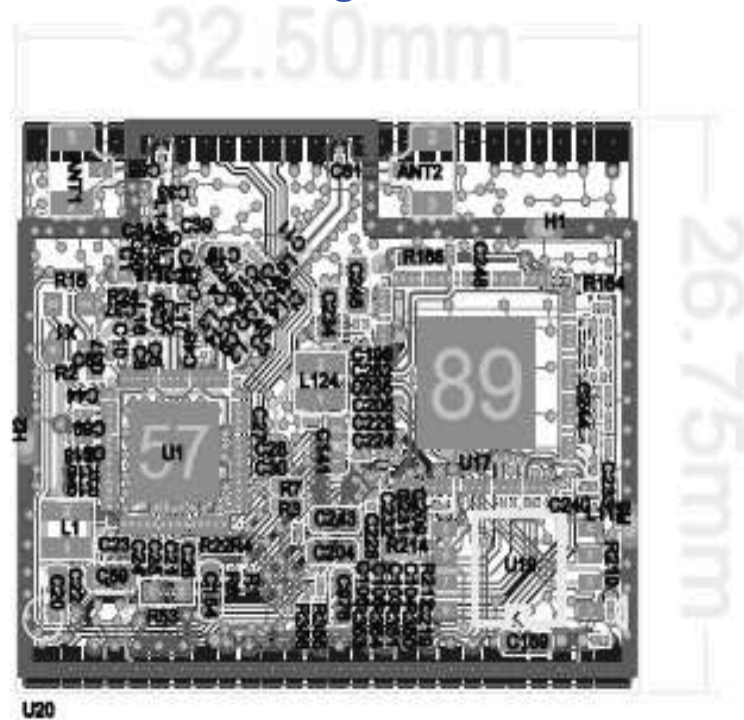
Model Number: AA107

Patent No.: US 8,106,833 B2

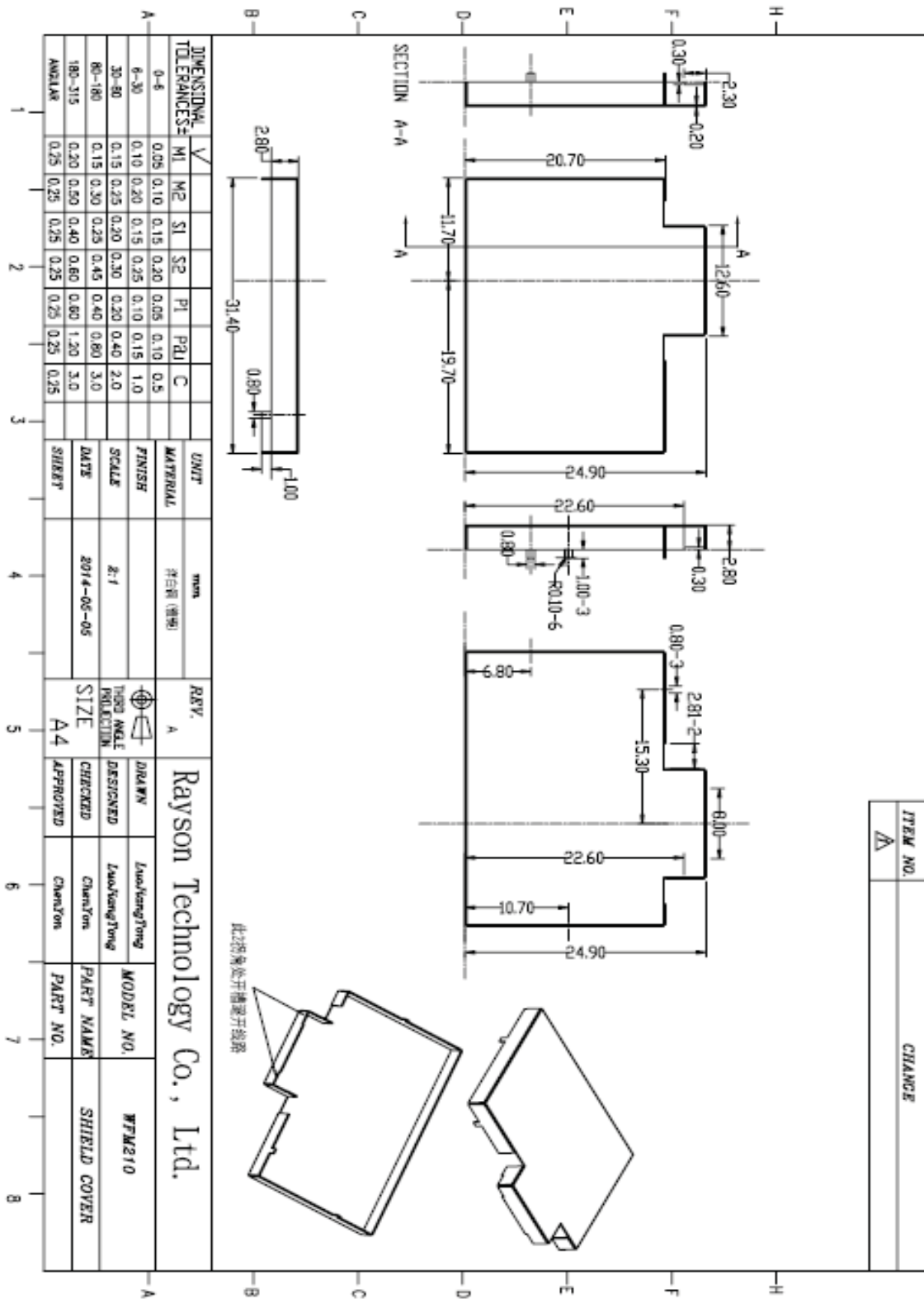


## 7. Outline Drawing

### 7.1 PCB outline drawing



## 7.2 shield cover outline drawing



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

#### FCC Radiation Exposure Statement

The modular can be installed or integrated in mobile or fix devices only. This modular cannot be installed in any portable device, for example, USB dongle like transmitters is forbidden.

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

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 Transmitter Module FCC ID: QWOWFM210 Or Contains FCC ID: QWOWFM210 "

When the module is installed inside another device, the user manual of this device must contain below warning statements;

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.
- (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.

The devices must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the product