《Operation manual of WLAN module》

VER：	V2.0
Product name：	Network Module (2019) For Conference Display
Model No.	AZ720

Fictioner ： Liu Zhi Yong
Checker ： Zhang Chao Bing
Approver ： Zeng Xiang Long 、Tan Yi
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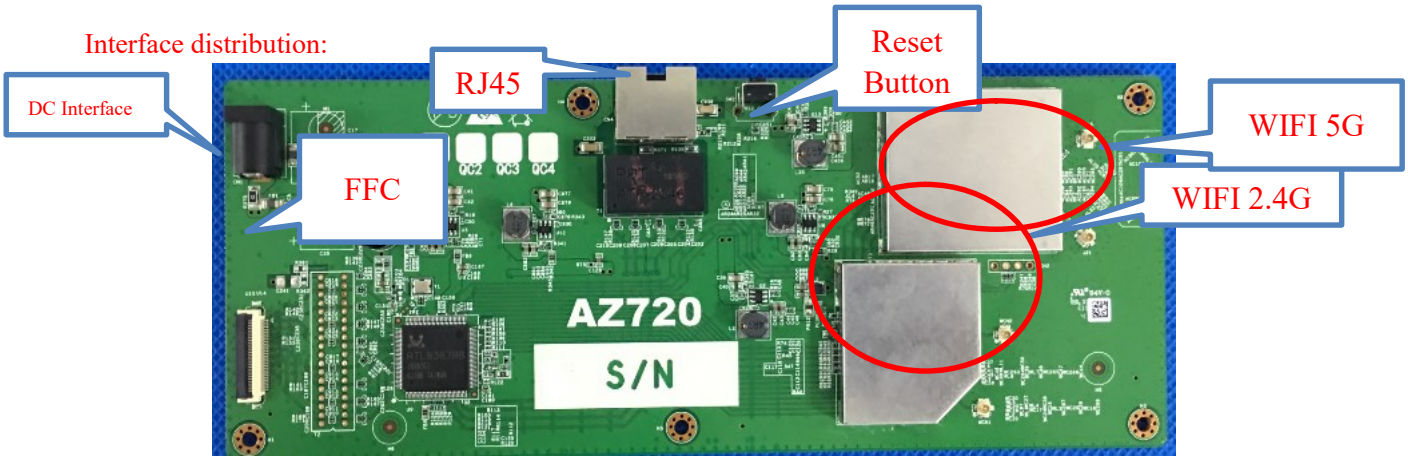
Product Description

The product described in this document is the basic information of network module hardware, and the unified model name of network module is az720. This module mainly establishes the network foundation for the large screen customer environment of commercial display. The products respectively support wired and wireless wan to realize data access to the external network, and provide high-speed and stable wireless hot spots to meet the terminal wireless internet access and business needs.

1. Basic information of network module products

Hardware interface and function

Interface distribution:



Port Name	Function Explain
FFC	It is mainly connected with Android main board through FFC cable to realize module power supply (voltage 12V, current 1.5A). At the same time, it integrates two LAN ports to realize LAN data transmission
RJ45	One support 10 \ 100 \ 1000m Ethernet port, realize WAN port data access function
Reset Button	Realize the module to restore the default factory settings. Press and hold the reset button for 5 seconds, and the reset function will take effect.
Wifi 2.4G	WiFi 2.4G part Operation frequency ranges: 2412MHz~2462MHz
Wifi 5G	WiFi 5g section. As a wireless hotspot, the product provides wireless access / transmission services for terminal equipment 2 * 2 MIMO antenna with the highest link rate of 867Mbps Operation frequency ranges: 5150MHz~5250MHz; 5725MHz~5850MHz.
DC Interface	DC seat material: dc005-2.0；Power rating: DC 12V 1A

2. General information

Product name		wireless module
Model name.		AZ720
FCC ID		2ACYT-AZ720
Standard		47 CFR FCC Part 15, Subpart C (Section 15.247) FCC Part 15, Subpart E, Section 15.407 ANSI C63.10:2013 FCC Part 2 (Section 2.1091) KDB 447498 D01 IEEE C95.1 FCC Part 15 Subpart B, Class B (sDoC)
Power supply		DC12V from DC port input
Modulation technology		OFDM
Modulation type		256QAM, 64QAM, 16QAM, QPSK, BPSK CCK, DQPSK,DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
Transfer rate	5180~5240MHz, 5745~5825MHz	802.11a: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11ac : up to 867Mbps 802.11n: up to 300.0Mbps
	2412~2462MHz	802.11b:11.0/ 5.5/ 2.0/ 1.0Mbps 802.11g: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11n: up to 300.0Mbps
Operating frequency		2412MHz~2462MHz 5180~5240MHz, 5745~5825MHz
Conducted output power		13.73dBm for 2412MHz~2462MHz 14.57dBm for 5150 ~ 5250MHz (Maximum AVG Power) 17.01dBm for 5725 ~ 5850MHz (Maximum AVG Power)
Spurious emissions: 9kHz~40GHz		Part 15 of the FCC Rules limits have been met. 62.54dBuV@3m
Antenna type& Antenna Gain		2412 ~ 2462MHz: PCB antenna with 6dBi gain 5180 ~ 5240MHz: PCB antenna with 7dBi gain 5745 ~ 5825MHz: PCB antenna with 7dBi gain
Antenna connector		I-PEX
2.4GHz Band Antenna cable		Shielding,0.4m with I-PEX connector, cable loss: 3dB
5GHz Band Antenna cable		Shielding,0.5m with I-PEX connector, cable loss: 5dB

The EUT incorporates a MIMO function. Physically,
The EUT provides 2 completed transmitter and 2 receiver:

Support mode	Transmit and receive mode	Transmit and Receive Chain
802.11b	MIMO	2TX,2RX
802.11g	MIMO	2TX,2RX
802.11a	MIMO	2TX,2RX
802.11n HT20	MIMO	2TX,2RX
802.11n HT40	MIMO	2TX,2RX
802.11ac VHT20	MIMO	2TX,2RX
802.11ac VHT40	MIMO	2TX,2RX
802.11ac VHT80	MIMO	2TX,2RX

3. Channels List(operating fundamental frequencies.)

For 2.4GHz Band:

11 channels are provided for 802.11b, 802.11g and 802.11n (20MHz):

Channel	Frequency	Channel	Frequency
1	2412MHz	7	2442MHz
2	2417MHz	8	2447MHz
3	2422MHz	9	2452MHz
4	2427MHz	10	2457MHz
5	2432MHz	11	2462MHz
6	2437MHz		

7 channels are provided for 802.11n (40MHz):

Channel	Frequency	Channel	Frequency
3	2422MHz	7	2442MHz
4	2427MHz	8	2447MHz
5	2432MHz	9	2452MHz
6	2437MHz		

For U-NII-1

4 channels are provided for 802.11a, 802.11a c 20MHz, 802.11n (20MHz):

Channel	Frequency	Channel	Frequency
36	5180 MHz	40	5200 MHz
44	5220 MHz	48	5240 MHz

2 channels are provided for 802.11a c 40MHz, 802.11n (40MHz):

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac (80MHz):

Channel	Frequency	Channel	Frequency
42	5210MHz	--	--

For U-NII-3

5 channels are provided for 802.11a, 802.11a c 20MHz, 802.11n (20MHz):

Channel	Frequency	Channel	Frequency
149	5745MHz	153	5765MHz
157	5785MHz	161	5805MHz
165	5825MHz	--	--

2 channels are provided for 802.11a c 40MHz, 802.11n (40MHz):

Channel	Frequency	Channel	Frequency
151	5755MHz	159	5795MHz

1 channel is provided for 802.11ac (80MHz):

Channel	Frequency	Channel	Frequency
155	5775MHz	--	--

4. Product block diagram description

1、The network module is integrated in the display screen, and the power supply and power failure of the module are provided by the internal power bus of the display screen.

2、 The wifi antenna of the network module is installed internally and integrated. The antenna uses IPEX connection interface mode to ensure good contact.

Built in diagram of network module：

It is essential for module grantees to clearly and explicitly state the RF exposure conditions that permit a host product manufacturer to use the module. Two types of instructions are required for RF exposure information: (1) to the host product manufacturer, to define the application conditions (mobile, portable – xx cm from a person's body); and (2) additional text needed for the host product manufacturer to provide to end users in their end-product manuals. If RF exposure statements and use conditions are not provided, then the host product manufacturer is required to take responsibility of the module through a change in FCC ID (new application).

5. FCC Notice:

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.

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.

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

The equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This device should be installed and operated with minimum distance 20cm between the radiator & your body.

This device is intended only for OEM integrators under the following conditions:

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

To the host product manufacturer：

This module need to ≥20 cm from a person's body.

Frequency band (MHz)	Max power (mW)	Antenna gain (dBi)	Distance (cm)	Power density (mW/cm^2)	Limit (mW/cm^2)
2412~2462MHz	23.608	6.0	20	0.018698	1.0
5180 ~ 5240MHz	28.625	7.0	20	0.028541	1.0
5745 ~ 5825MHz	50.272	7.0	20	0.050125	1.0

Note: These bands cannot transmit simultaneously at 2.4G and 5GHz band.

Conclusion: Therefore, the worst-case situation is 0.050087mW/cm^2, which is less than "1". This confirmed that the device compliance with FCC 1.1310 MPE limit.

IMPORTANT NOTE:

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

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 FCC ID: 2ACYT-AZ720”. The grantee's FCC ID can be used only when all FCC compliance requirements are met.

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.

The modular transmitter is only FCC authorized for the specific rule parts (i.e., FCC transmitter rules) listed on the grant, and that the 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. 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.