深圳市拓频物联技术有限公司

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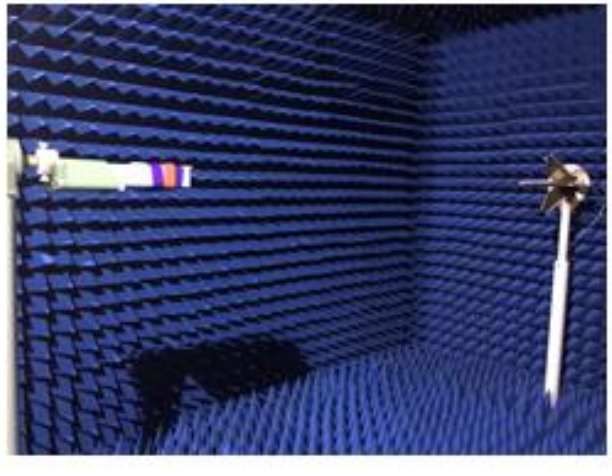
Test environment

	Test items	Equipment
1. S参数 （S-parameter）	1. 回波损耗 （Return Loss） 2. 电压驻波比（VSWR）	Network Analyzer: Agilent E5071B HP 8753D
2. 有源测试（Active ）	1. 发射功率 （TRP） 2. 接收灵敏度（TIS） 3.Frequency Error 4.Screen off, screen on	1. D arkroom： ETS 7x4x3 m (3D) Chamber ETS 5x3x3 m (3D) Chamber 2.Comprehensive tester: Agilent 8960 E5515B ×2 StarPoint SP6011
3.无源测试（Passive）	1.天线增益 （Gain） 2.天线效率 （Efficiency）	1. D arkroom： ETS 7x4x3 m (3D) Chamber ETS 5x3x3 m (3D) Chamber2. Network Analyzer： Agilent E5071B HP 8753D



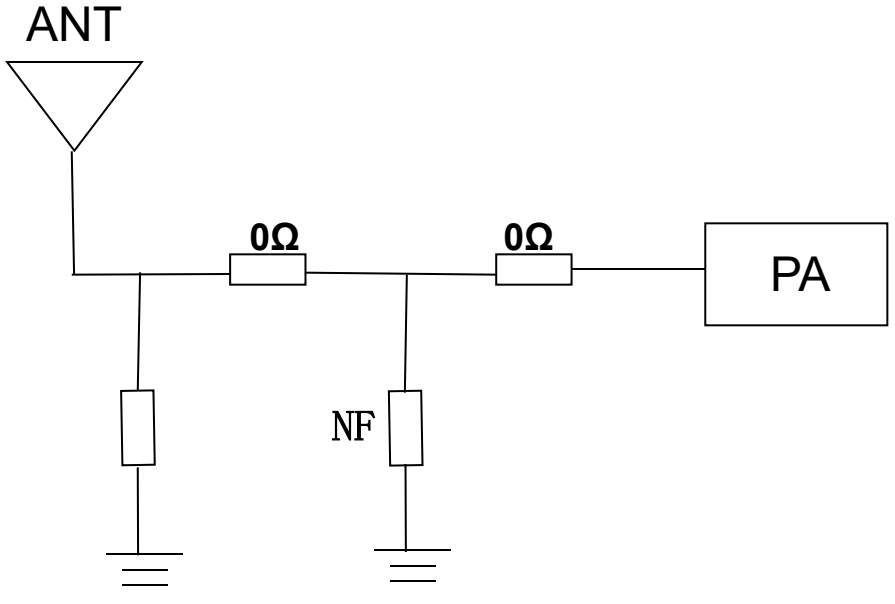
Description of previous commissioning records

Date	Edition	Description of commissioning records
2024-02-26	A1	Bluetooth cable, test prototype

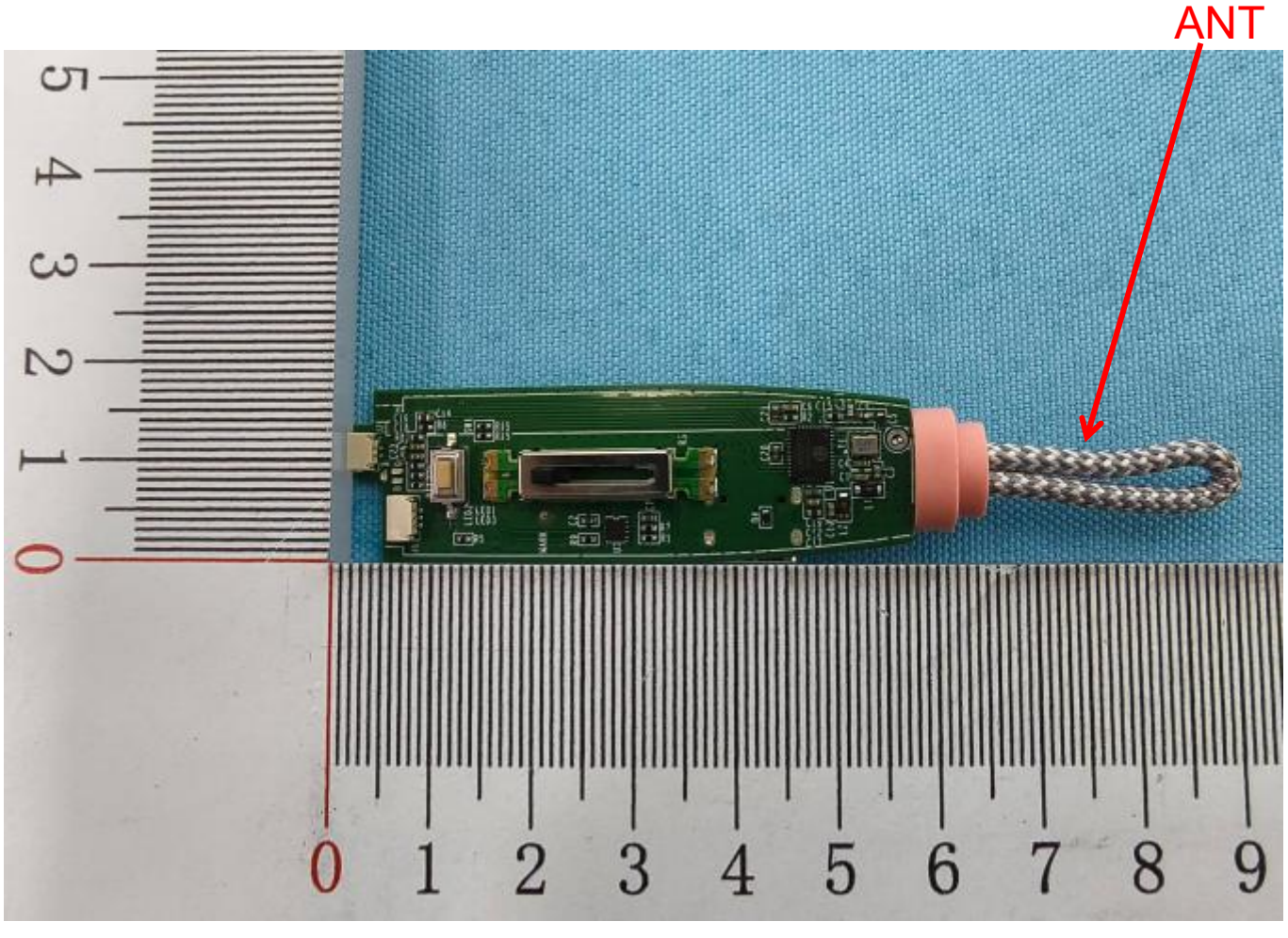
Complete machine debugging instructions

Model	Bluetooth watch						
Typography	A main board						
Antenna overview		Antenna status		Antenna status	Antenna form	Design area	Match Changes
	Bluetooth antenna	BT	2.4GHz~2.5GHz	Bluetooth cable D:0.6mm L:25mm	Monopole	支架	无
Prototype status	Commissioning the machine			Environmental treatment	Multiple locations		

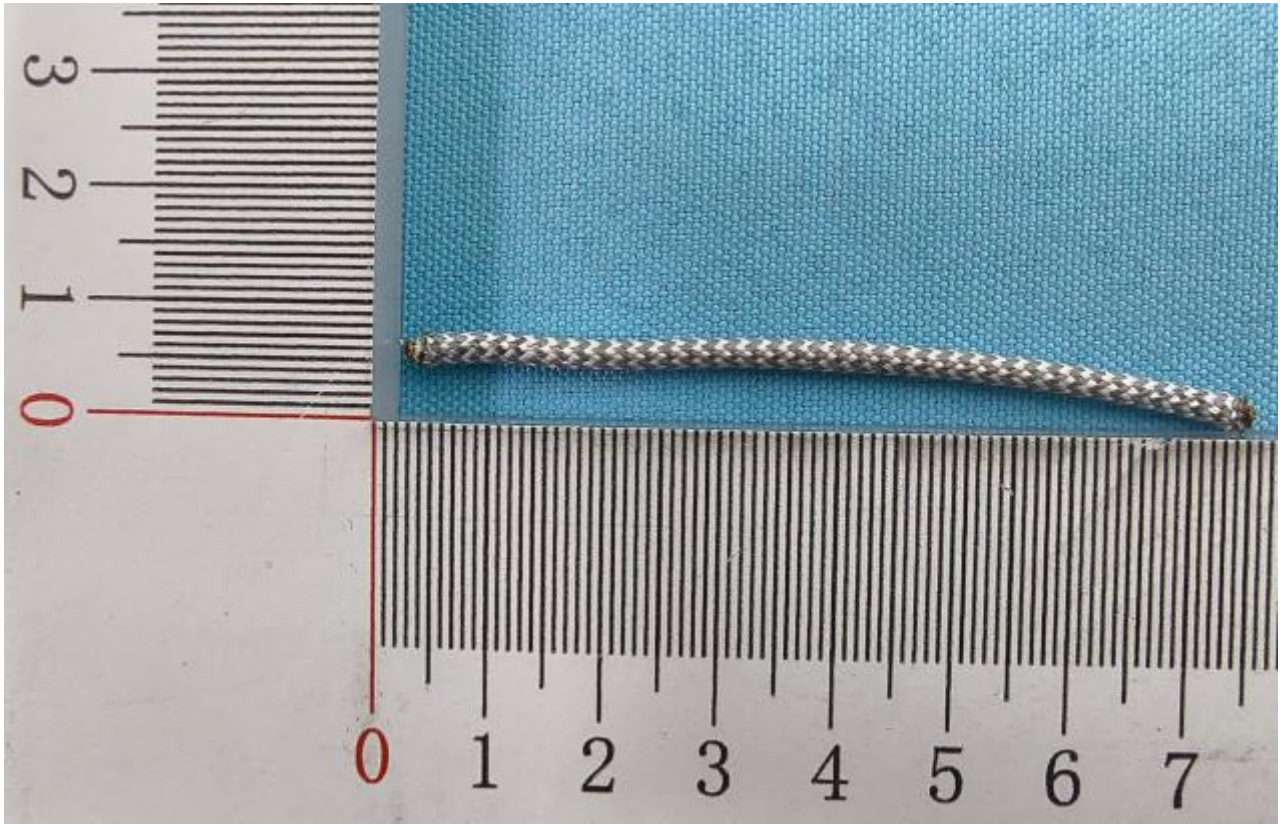
Matching circuit - BT antenna



Environmental treatment：



Environmental treatment：



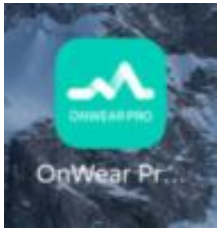
Follow the sample environment provided by your company

Actual measurement of BT antenna：

1. Android mobile phone connects to the bracelet, and the mobile phone plays music (Indoor) The straight-line distance of the front test is 36m when there is no obstacle. The straight distance of back to back test is 26m when there is no obstacle.

2. Android mobile phone connects to the bracelet, and the mobile phone plays music (Outdoor) The straight-line distance of the front test is 25m when there is no obstacle. The straight distance of back to back test is 13m when there is no obstacle。

3. Android mobile phone connects to the bracelet, and APP searches for watches (Indoor) The straight-line distance of the front test is 40m when there is no obstacle. The straight distance of back to back test is 30m when there is no obstacle.

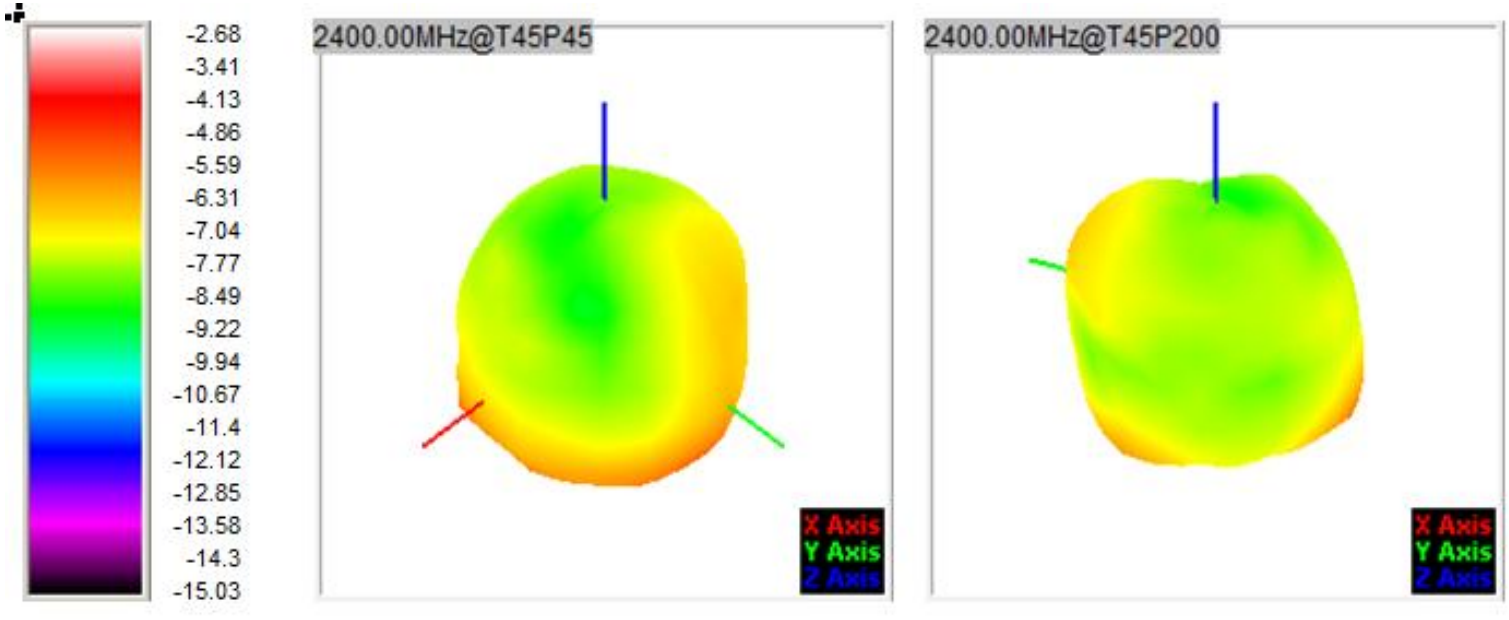


Testing software

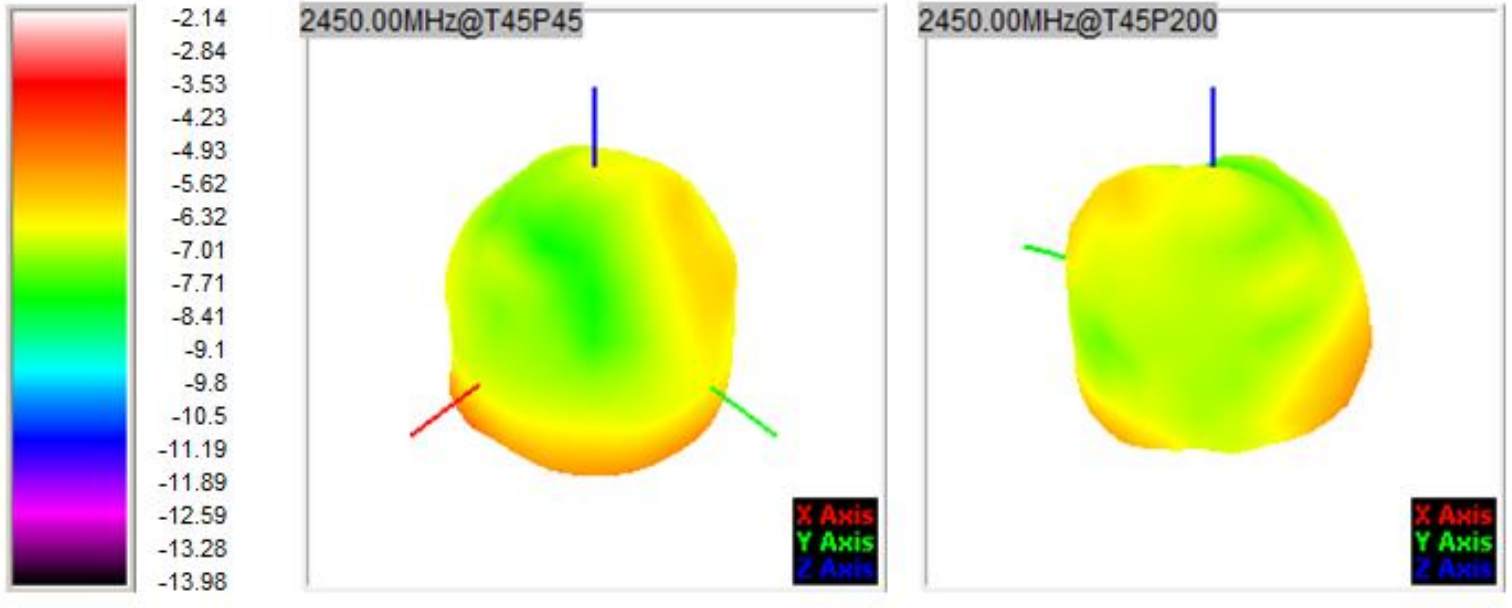
Antenna Passive Efficiency Gain Data

Frequency ID	1	2	3	4	5	6	7	8	9	10	11
Frequency (MHz)	**2400.0**	**2410.0**	**2420.0**	**2430.0**	**2440.0**	**2450.0**	**2460.0**	**2470.0**	**2480.0**	**2490.0**	**2500.0**
Point Values											
Ant. Port Input Pwr. (dBm)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tot. Rad. Pwr. (dBm)	**-7.55**	**-7.70**	**-7.81**	**-7.66**	**-7.78**	**-7.52**	**-7.65**	**-7.84**	**-7.83**	**-7.63**	**-7.61**
Peak EIRP (dBm)	**-2.68**	**-2.69**	**-2.77**	**-2.59**	**-2.49**	**-2.14**	**-2.30**	**-2.55**	**-2.63**	**-2.48**	**-2.39**
Directivity (dBi)	4.86	5.01	5.04	5.07	5.29	5.38	5.35	5.28	5.21	5.15	5.22
Efficiency (dB)	**-7.55**	**-7.70**	**-7.81**	**-7.66**	**-7.78**	**-7.52**	**-7.65**	**-7.84**	**-7.83**	**-7.63**	**-7.61**
Efficiency (%)	**17.60**	**17.00**	**16.50**	**17.20**	**16.70**	**17.70**	**17.20**	**16.50**	**16.50**	**17.30**	**17.30**
Gain (dBi)	-2.68	-2.69	-2.77	-2.59	-2.49	-2.14	-2.30	-2.55	-2.63	-2.48	-2.39
NHPRP ±Pi/4 (dBm)	-9.03	-9.20	-9.35	-9.22	-9.35	-9.09	-9.21	-9.40	-9.41	-9.24	-9.28
NHPRP ±Pi/6 (dBm)	-10.63	-10.78	-10.91	-10.76	-10.90	-10.63	-10.74	-10.93	-10.99	-10.89	-10.98
NHPRP ±Pi/8 (dBm)	-11.89	-12.00	-12.11	-11.94	-12.07	-11.81	-11.93	-12.15	-12.25	-12.19	-12.33
Upper Hem. PRP (dBm)	-12.40	-12.50	-12.59	-12.41	-12.48	-12.14	-12.18	-12.28	-12.19	-11.93	-11.83
Lower Hem. PRP (dBm)	-9.27	-9.45	-9.57	-9.42	-9.58	-9.35	-9.53	-9.77	-9.82	-9.64	-9.68
Upper Hem. PRP (%)	5.76	5.63	5.51	5.74	5.65	6.11	6.05	5.91	6.04	6.42	6.57
Lower Hem. PRP (%)	11.84	11.36	11.03	11.42	11.02	11.61	11.14	10.54	10.43	10.86	10.77

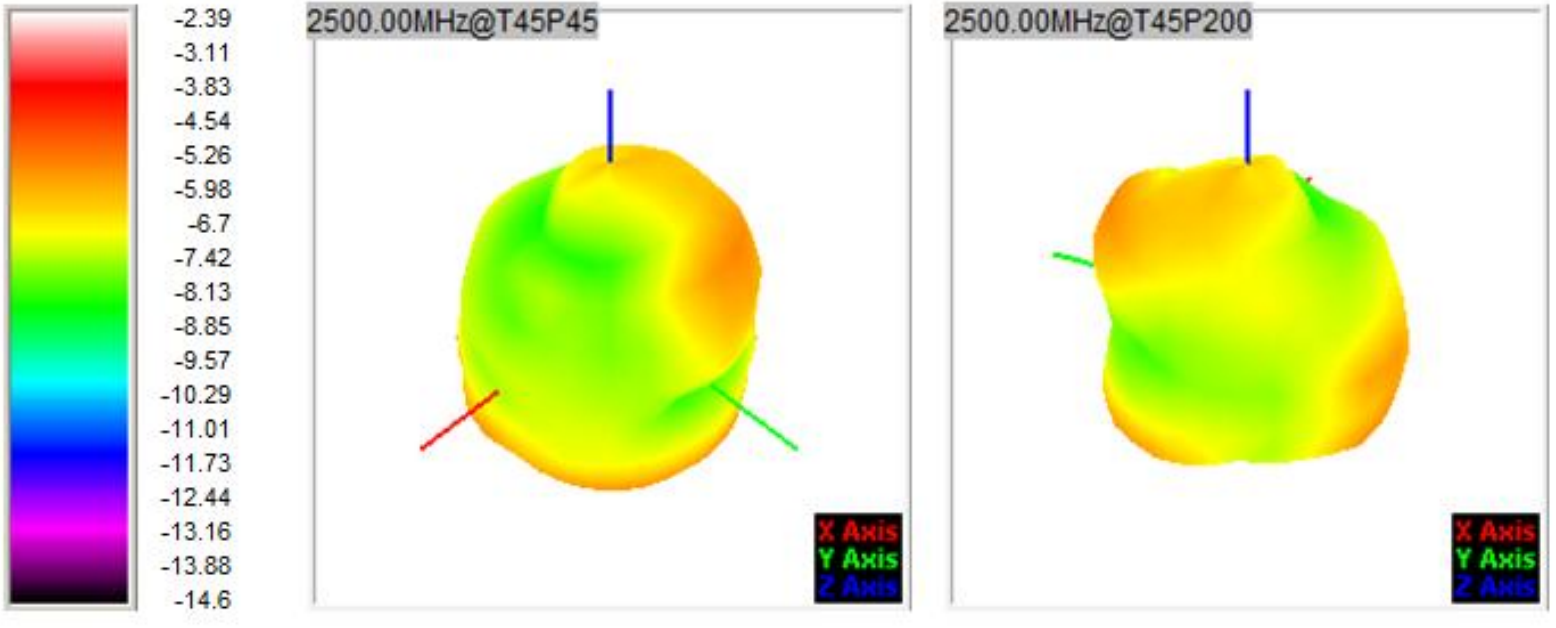
Antenna pattern and apple chart



Antenna pattern and apple chart



Antenna pattern and apple chart



Prompt description

Tips:

1、 This data is only for the data generated by the prototype provided by the customer, and does not represent the customer's final mass production status;

2、 The customer is requested to carefully confirm the description of matching circuit modification and environmental treatment in our report;

3、 Before mass production, please provide trial production prototype to our company for secondary verification; Please inform us in advance if there are material changes, software updates and environmental treatment;

4、 If the customer needs a third party to retest or send it to the customer for testing, please come to our company for verification before sending the prototype; Prevent the machine from being different from the commissioning machine;

5： We do not accept the machine data other than our debugging and other darkroom test data, but you can refer to it, except for the certified darkroom. If there is any difference in the data, the debugging machine shall prevail to find the reason.

Thanks!