

JMGO Sample Confirmation Letter

SupplierName: SHENZHEN YINGJIACHUANG TECHNOLOGY ELECTRONIC CO. LTD

Material Name: BT 2.4 G Black FPC built- in Antenna (K62A)

Material No.: 23040323& YJC-6N165-B26

Material Description: BT 2.4 G Black FPC built- in Antenna (K62A)

Version: A0

Drawing Version: A0

Supplier Approved This needs to be stamped, and each acknowledgment letter needs to be stamped with a riding seal.			Shenzhen Holatek Approved			
R&D/Engineering	Quality	Approved	Product Center	R&D	Supply-Chain Center	Quality Management Department
Yin FeiJie	Yang YunGang	 Xiao Han				

Address: Building C , Hongyu Guangming Valley , No . 11, Shiwei Community , Matian Office , Guangming District , Shenzhen

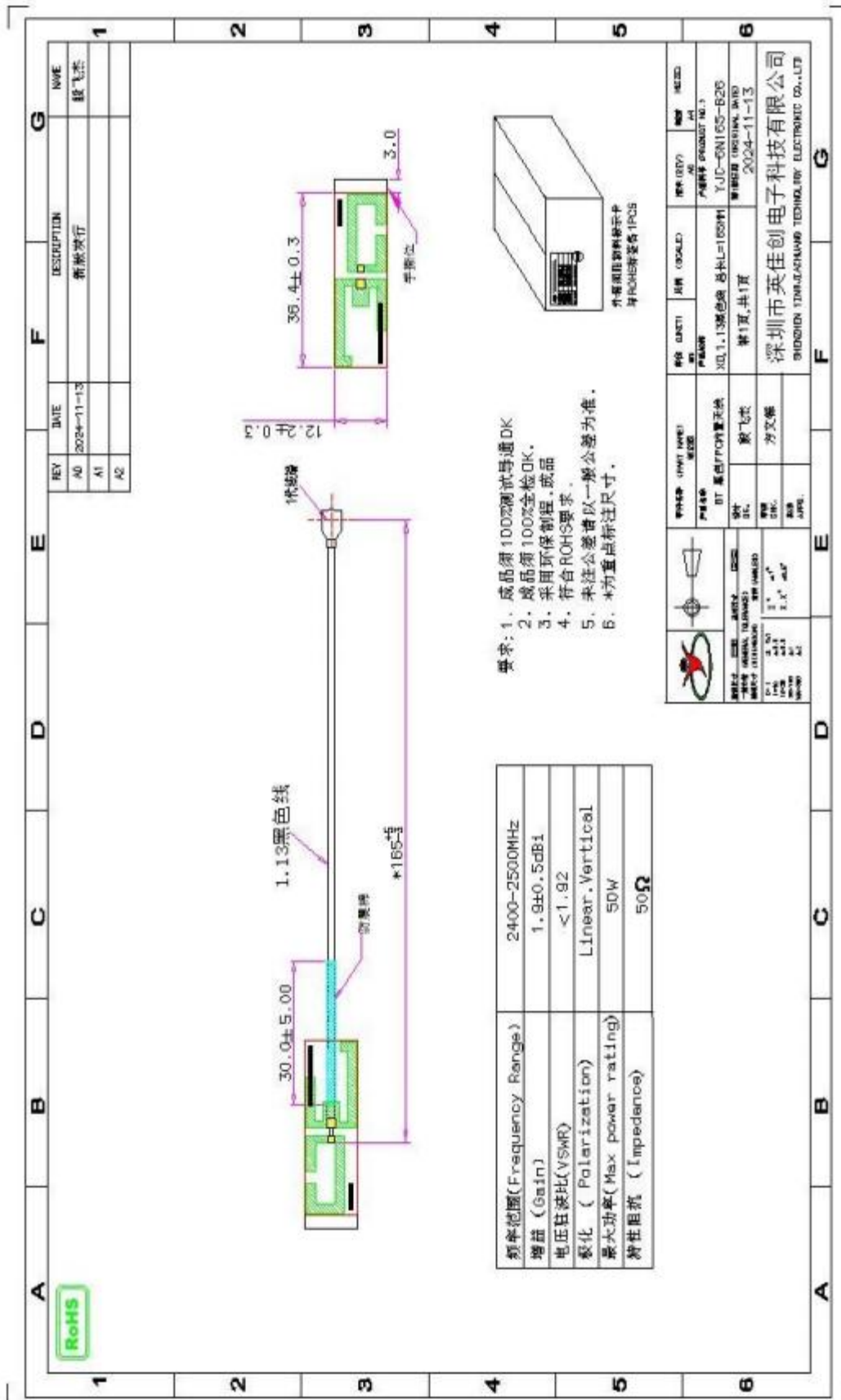
Phone: +86-755-27810060/23192 199

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JMGO Directory

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3	Product drawings
4	Specification
5	Process Flow Diagram
6	BOM list
7	Performance testing reports
8	SGS Environmental Protection Report for Raw Materials

Product drawings:



Specification:

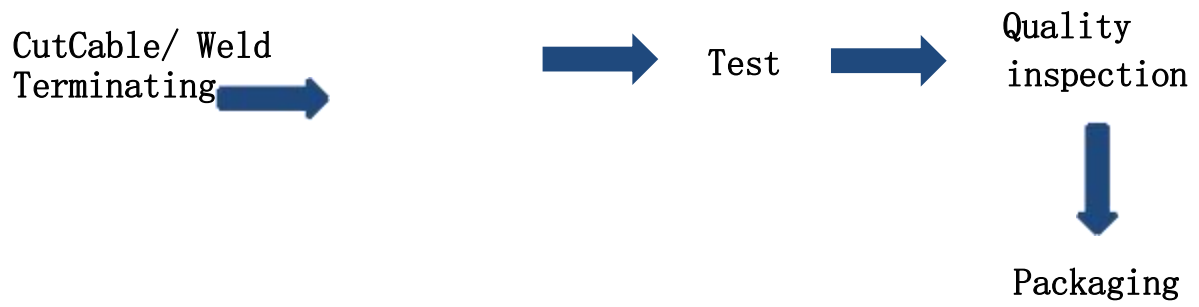
Electrical Specifications	
Frequency Range	2400-2500 MHz
VSWR	<1.92
Input Impedance	50 Ω
Direction	All
Gain	1.90 dBi
Mechanical Specifications	
Cable Color	Black
Input connector	XD
Cable length	165mm (Total Length)
Working Temperature	-20°C~+70°C
Working Humidity	20%~80%

Environmental performance test:

Project	Test condition	Standard
Storage Conditions	In the absence of specified test temperature, humidity, air pressure is as follows: 1. Temperature is -20°C~+70°C 2. Relative humidity of 45% to 85% 3. Air pressure is 86 kpa to 106 kpa	Electrical and mechanical properties are normal
High and low temperature test	Between 70°C and -20°C for 5 loops, then 1-2 h under normal conditions, check the appearance quality.	Size should meet the requirements and should satisfy the content with the electrical and mechanical properties
Constant damp and hot resistance test	95%±3% relative humidity, temperature test: 40°C. Lasts 2 h after, try to take out the determination of electrical properties, within 5 min after try 1-2 h under article normal thing, check the appearance quality	Size should meet the requirements and should satisfy the content with the electrical and mechanical properties

vibration test	Vibration frequency range:10-55 Hz, vibration frequency range of displacement amplitude: 0.35 MM, acceleration amplitude: 50.0 M/S, sweepcycles: 30 times	Electrical and mech anical propertiesis normal
Fall down test	1 m high altitude inaccordance with theperpendicular axis free drop 3 times	Electrical and mech anical propertiesis normal

Process Flow Diagram



BOM list

FPC、Cable、Terminal、PE packaging bag、C arton

Performance testing reports:

Antenna physical image:



Antenna performance testchart:



Frequency (MHz)	2400	2450	2500
VSWR (dB)	1.17	1.31	1.69

BT and WiFi 1 isolation test diagram



BT and WiFi 2 isolation test diagram

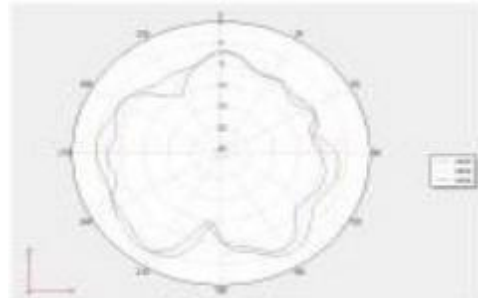
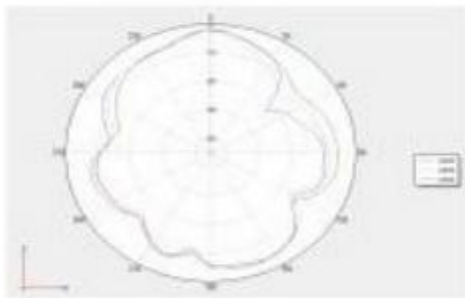


Frequency (MHz)	2400	2450	2500	5150	5725	5850
WIFI1 and BT isolation (dB)	-21	-22	-24	-30	-37	-34
WIFI2 and BT isolation (dB)	-26	-23	-22	-30	-32	-28

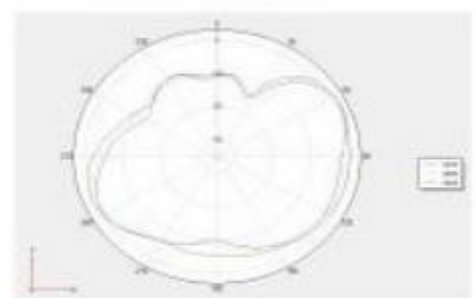
2D、 3 D test data (BT):

Frequency	Efficiency(%)	Gain. (dBi)
2400MHz	57.12	1.90
2410MHz	58.21	1.85
2420MHz	60.34	1.77
2430MHz	55.71	1.90
2440MHz	60.21	1.85
2450MHz	61.62	1.88
2460MHz	63.88	1.71
2470MHz	56.17	1.86
2480MHz	59.2	1.62
2490MHz	56.29	1.61
2500MHz	61.62	1.75

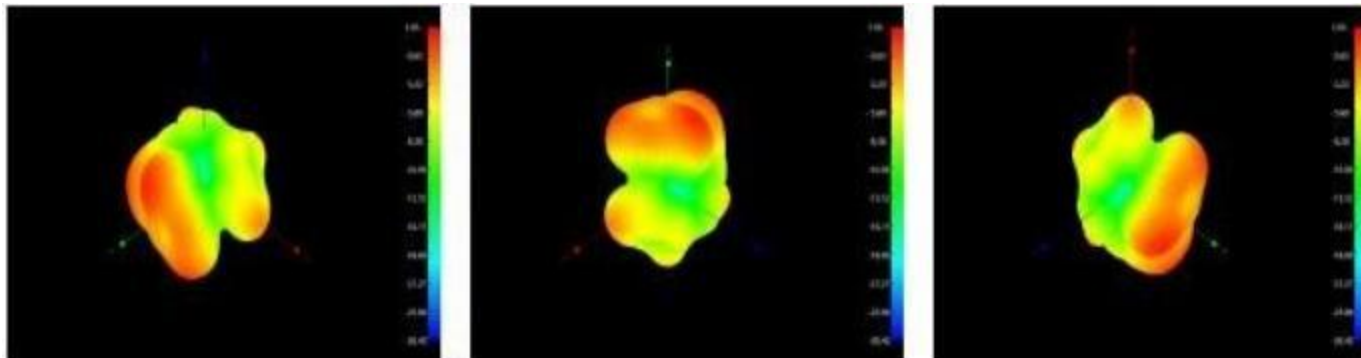
Phi 0 2D: Phi 90 2D



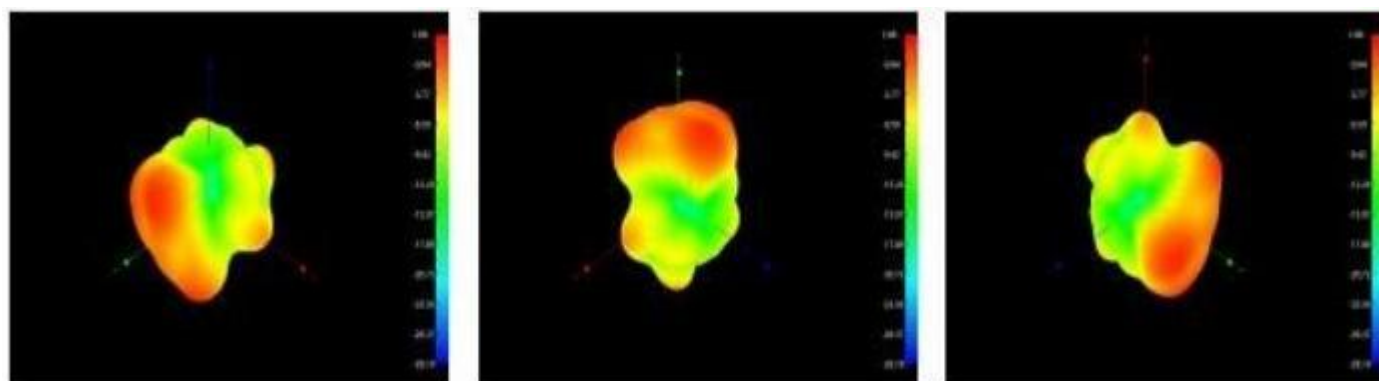
Theta 90 2D



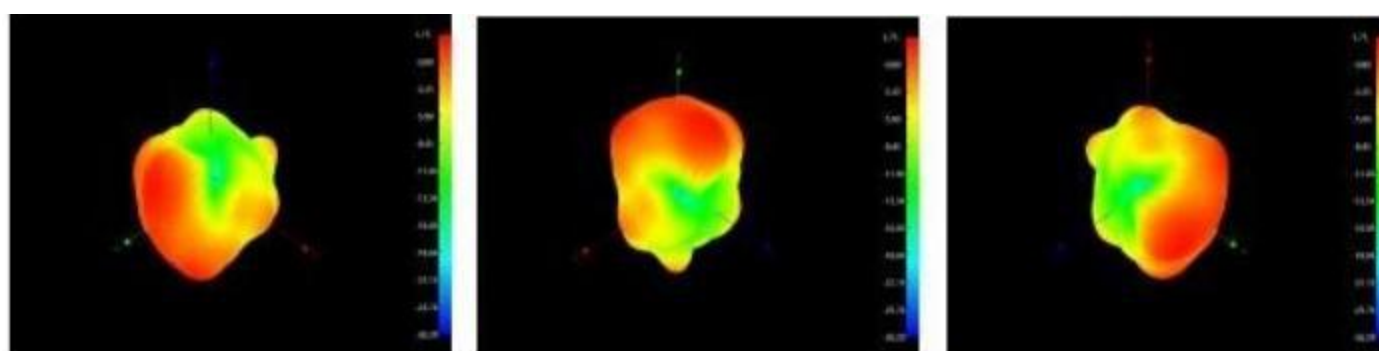
3D 2400:



3D 2450:



3D 2500:



OTA active testdata:

Item	Measurement	Band	Channel	Frequency	Total
1	TRP	BLUETOOTH	0	2402	3.61
2	TRP	BLUETOOTH	39	2441	3.64
3	TRP	BLUETOOTH	78	2480	3.63
4	TIS(EIRP)	BLUETOOTH	0	2402	-86.9
5	TIS(EIRP)	BLUETOOTH	39	2441	-87.78
6	TIS(EIRP)	BLUETOOTH	78	2480	-87.54
7	TRP	BLUETOOTH	0	2402	3.51
8	TRP	BLUETOOTH	39	2441	3.27
9	TRP	BLUETOOTH	78	2480	3.57
10	TIS(EIRP)	BLUETOOTH	0	2402	-87.62
11	TIS(EIRP)	BLUETOOTH	39	2441	-88.2
12	TIS(EIRP)	BLUETOOTH	78	2480	-87.67
13	TRP	BLUETOOTH	0	2402	3.60
14	TRP	BLUETOOTH	39	2441	3.57
15	TRP	BLUETOOTH	78	2480	3.61
16	TIS(EIRP)	BLUETOOTH	0	2402	-80.61
17	TIS(EIRP)	BLUETOOTH	39	2441	-80.24
18	TIS(EIRP)	BLUETOOTH	78	2480	-81.74

Material RoHS conformity de clARATION form

This is to certify that the delivery to your company's components, raw materials, auxiliary materials used and the additives in the production engine ord with RoHS environmental requirements of the restrictions on the use of hazardous substances directive (RoHS directive 2011/65 / EC)

About components used raw materials, packaging materials, auxiliary materials and additives used in the production process such as composition of the report is as follows:

Component/ Part Name	Material Composition	ICP report #	Test Org.	Test Date	Content of harmful substances (ppm)						PASS ?
					Cd	Pb	Hg	Cr6+	PBB	PBDE	PASS
FPC	Ink	ETR24902229M01	SGS	24/09/23	ND	ND	ND	ND	ND	ND	PASS
	Copper	A2240082746101006E	CTI	24/03/01	ND	ND	ND	ND	ND	ND	PASS
	FPC	FTS2302160201-01C1	SGS	23/02/20	ND	ND	ND	ND	ND	ND	PASS
Wire	Series Coaxial Cables	CANEC24002746206	SGS	24/02/23	ND	ND	ND	ND	ND	ND	PASS
Terminal	Copper	CANEC24000977302	SGS	24/01/22	ND	6	ND	ND	ND	ND	PASS
	Au plating	A2240410234101001E	CTI	24/07/16	ND	ND	ND	ND	ND	ND	PASS
	Rubber core	A2240126395101003E	CTI	24/03/16	ND	ND	ND	ND	ND	ND	PASS
Environm entally friendly Tin wire	Environmen tally friendly Tin wire	SHAEC24006459102	SGS	24/04/10	ND	78	ND	ND	ND	ND	PASS

JMGO Sample Confirmation Letter

SupplierName: SHENZHEN YINGJIACHUANG TECHNOLOGY ELECTRONIC CO. LTD

Material Name: WiFi 12.4G/5.8 G Black FPC built- in Antenna (K62A)

Material No.: 23040324& YJC-6N160-B45

Material Description: /

Version: A0

Drawing Version: A0

Supplier Approved This needs to be stamped, and each acknowledgment letter needs to be stamped with a riding seal.			Shenzhen Holatek Approved			
R&D/Engineering	Quality	Approved	Product Center	R&D	Supply-Chain Center	Quality Management Department
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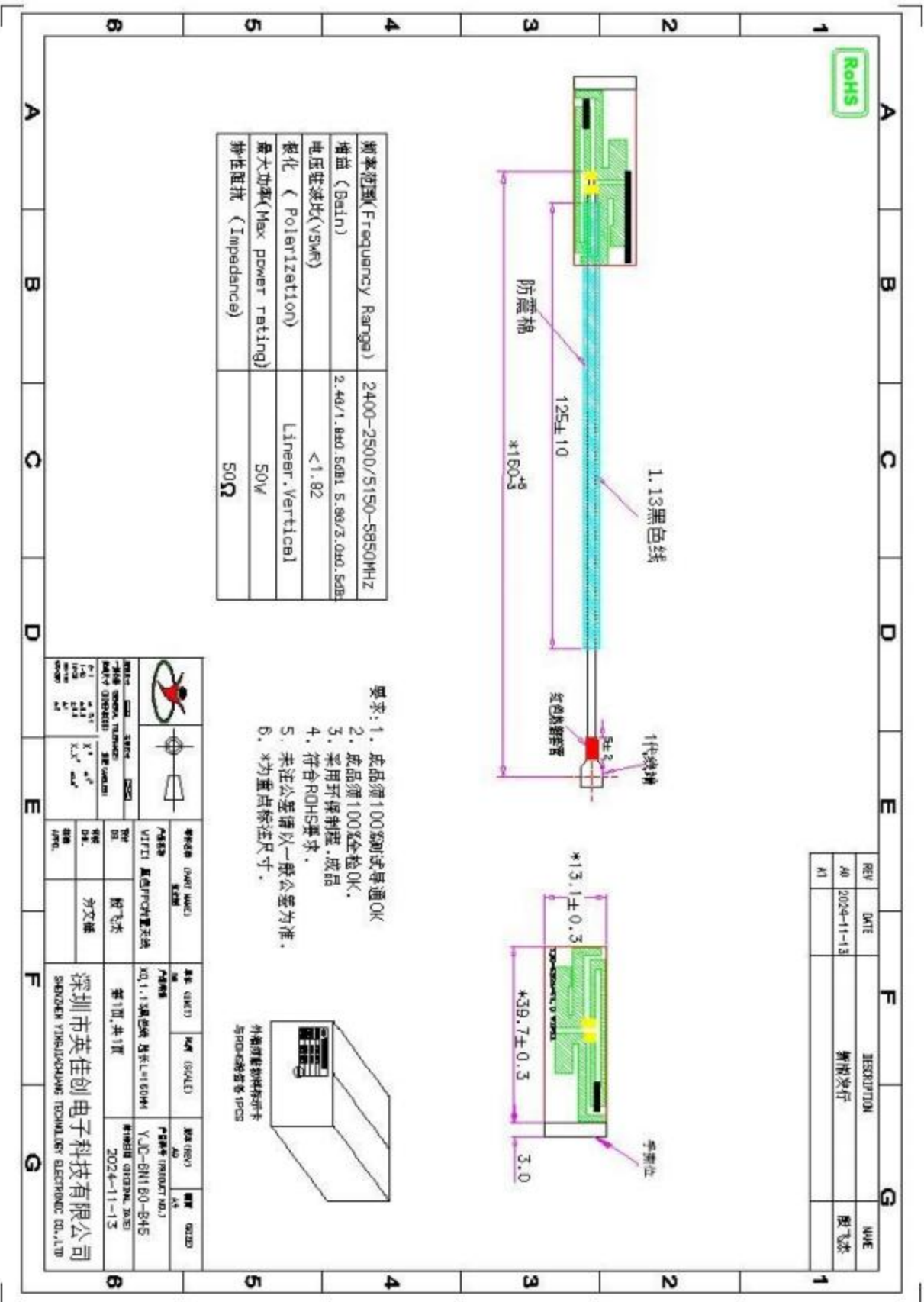
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Product drawings:



Specification:

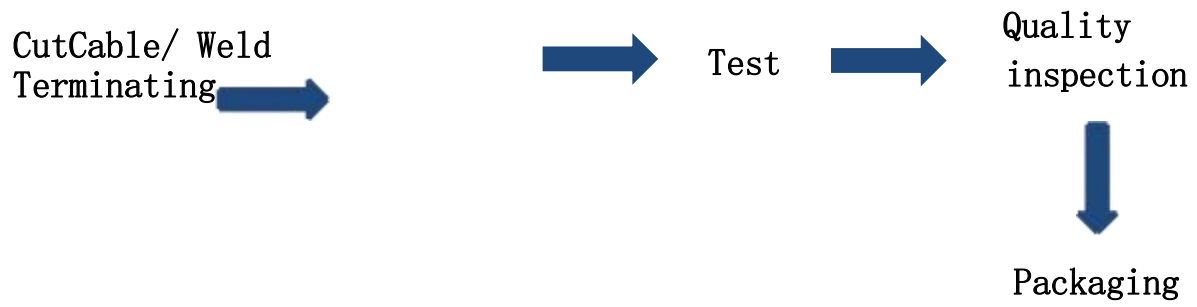
Electrical Specifications	
Frequency Range	2400-2500/5150-5850 MHz
VSWR	<1.92
Input Impedance	50 Ω
Direction	All
Gain(2.4G)	1.9 dBi
Gain(5.1G)	3.2 dBi
Gain(5.8G)	3.1 dBi
Mechanical Specifications	
Cable Color	Black
Input connector	XD
Cable length	160mm(Total Length)
Working Temperature	-20°C~+70°C
Working Humidity	20%~80%

Environmental performance test:

Project	Test condition	Standard
Storage Conditions	In the absence of specified test temperature, humidity, air pressure is as follows: 1. Temperature is -20°C~+70°C 2. Relative humidity of 45% to 85% 3. Air pressure is 86 kpa to 106 kpa	Electrical and mechanical properties are normal
High and low temperature test	Between 70°C and -20°C for 5 loops, then 1-2 h under normal conditions, check the appearance quality.	Size should meet the requirements and should satisfy the content with the electrical and mechanical properties
Constant damp and hot resistance test	95%±3% relative humidity, temperature test: 40°C. Lasts 2 h after, try to take out the determination of electrical properties, within 5 min after try 1-2 h under article normal thing, check the appearance quality	Size should meet the requirements and should satisfy the content with the electrical and mechanical properties

vibration test	Vibration frequency range:10-55 Hz, vibration frequency range of displacement amplitude: 0.35 MM, acceleration amplitude: 50.0 M/S, sweepcycles: 30 times	Electrical and mechanical properties is normal
Fall down test	1 m high altitude in accordance with the perpendicular axis free drop 3 times	Electrical and mechanical properties is normal

rocess Flow Diagram



BOM list

FPC、Cable、Terminal、PE packaging bag、Carton

Performance testing reports:

Antenna physical image:



Antenna performance testchart:



Frequency (MHz)	2400	2450	2500	5150	5725	5850
VSWR (dB)	1.78	1.27	1.33	1.69	1.59	1.72

WIFI1 and WIFI 2 isolation test diagram



WIFI1 and BT isolation test diagram

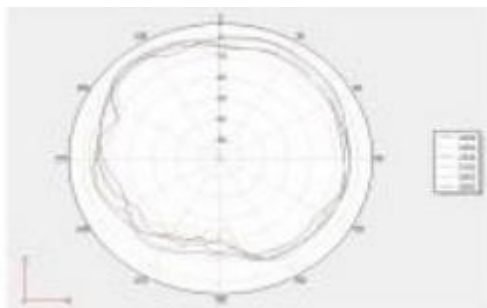


Frequency (MHz)	2400	2450	2500	5150	5725	5850
WIFI1 and BT isolation (dB)	-21	-22	-24	-30	-37	-34
WIFI1 and WIFI2isolation (dB)	-49	-42	-44	-47	-43	-42

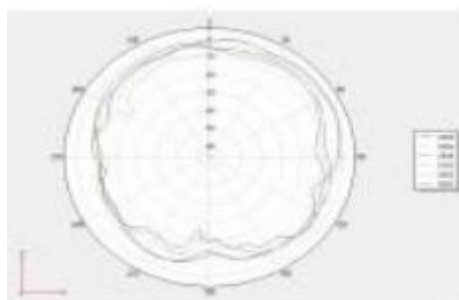
D、 3Dtest data (WIFI 1):

Frequency	Efficiency (%)	Gain. (dBi)
2400MHz	58.65	1.82
2410MHz	57.32	1.73
2420MHz	63.58	1.75
2430MHz	59.16	1.76
2440MHz	61.76	1.90
2450MHz	63.21	1.68
2460MHz	63.21	1.70
2470MHz	62.89	1.63
2480MHz	61.76	1.68
2490MHz	61.17	1.90
2500MHz	62.28	1.81
5150MHz	54.16	3.20
5250MHz	56.94	2.94
5350MHz	54.12	2.98
5450MHz	56.83	3.18
5550MHz	57.82	3.20
5650MHz	56.53	3.19
5750MHz	54.15	2.99
5850MHz	53.83	3.10

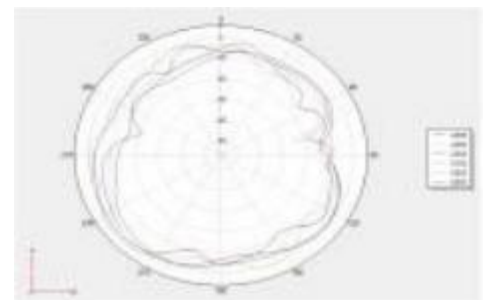
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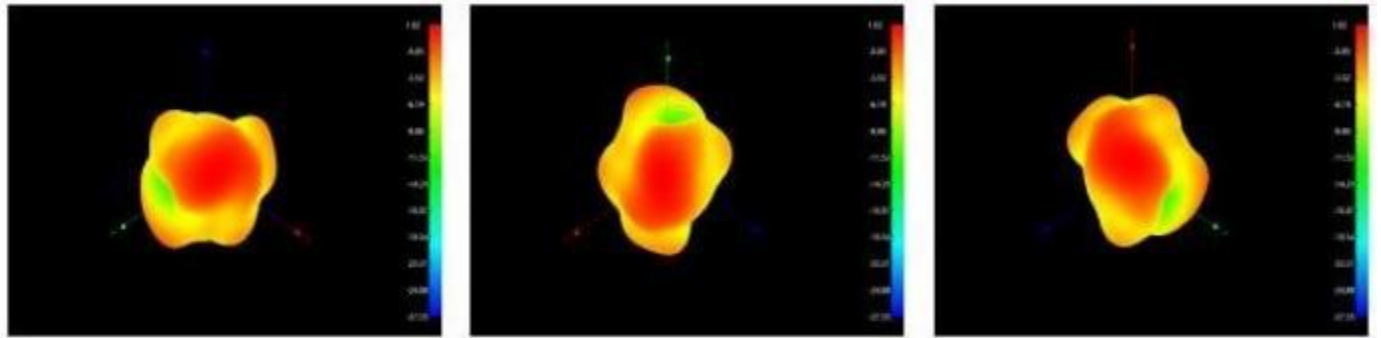
Phi 90 2D



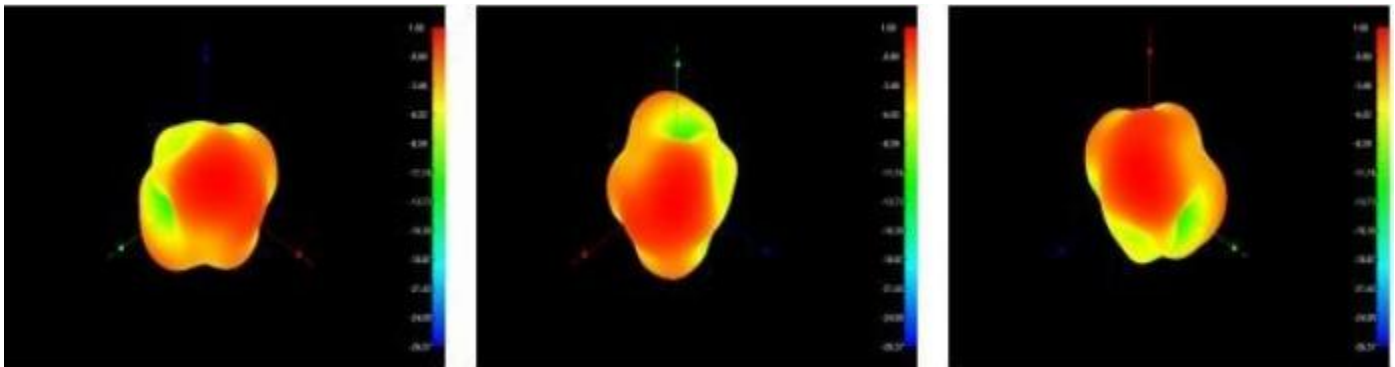
Theta 90 2D



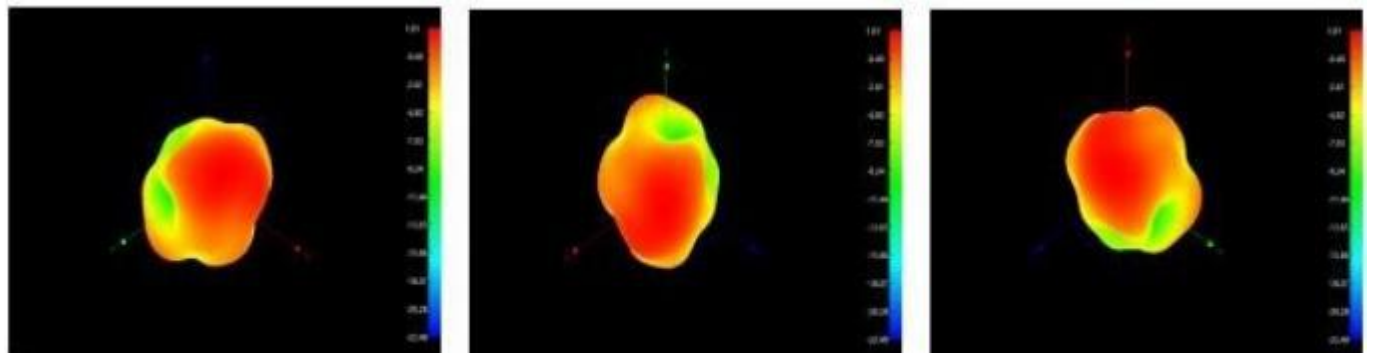
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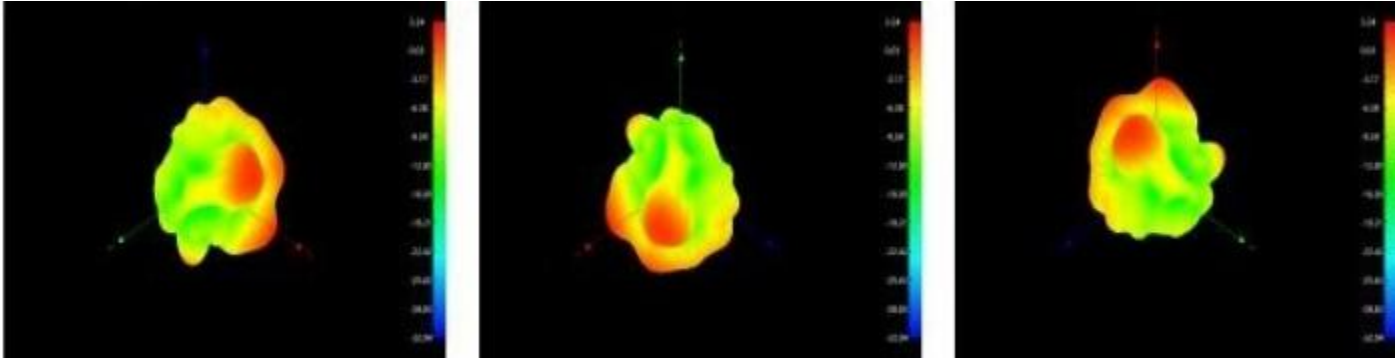
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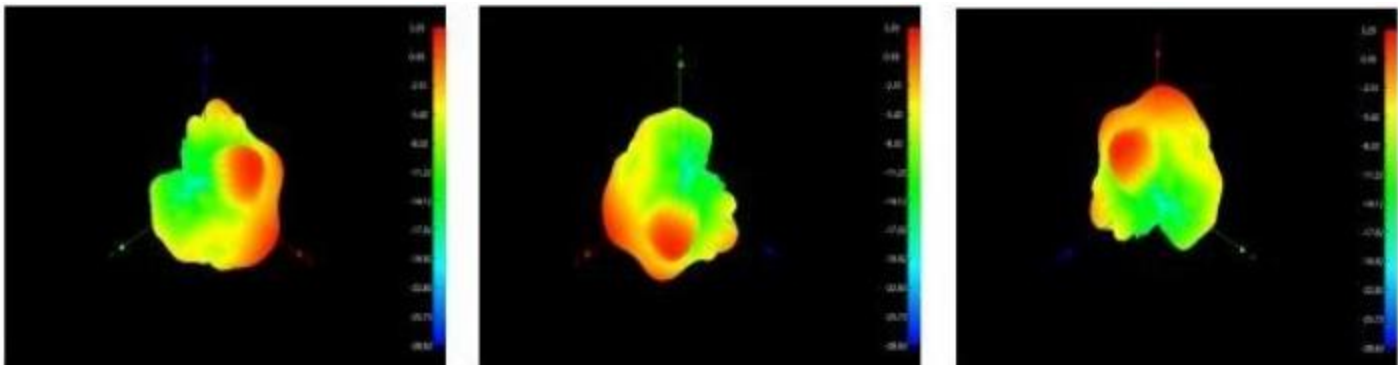
3D 2500:



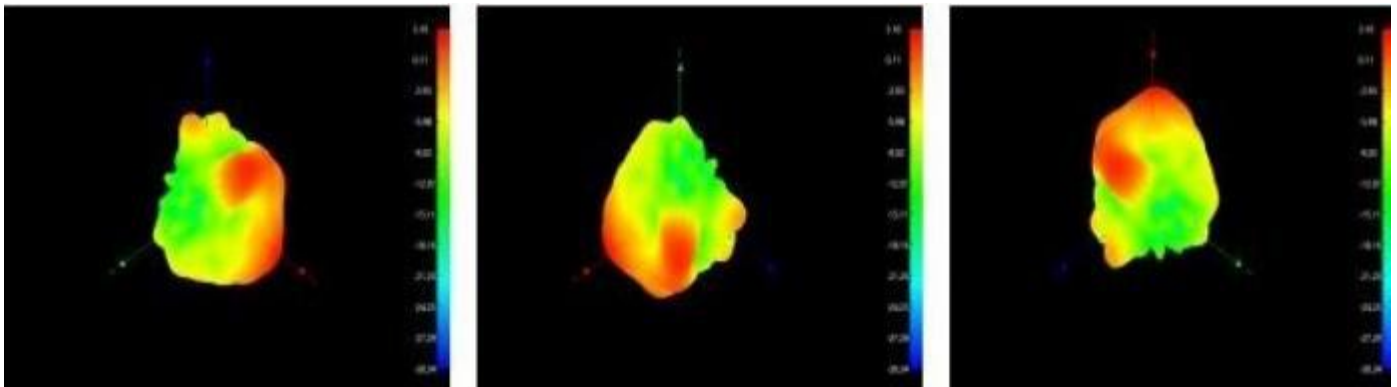
3D 5150:



3 D 5500:



3D 5850:



OTA active testdata:

Item	Measurement	Band	Channel	Frequency	Total
1	TRP	WIFI_B (11M)	1	2412	16.78
2	TRP	WIFI_B (11M)	6	2437	16.46
3	TRP	WIFI_B (11M)	11	2462	17.05
4	TIS(EIRP)	WIFI_B (11M)	1	2412	-82.52
5	TIS(EIRP)	WIFI_B (11M)	6	2437	-81.5
6	TIS(EIRP)	WIFI_B (11M)	11	2462	-81.43
7	TRP	WIFI_G (54M)	1	2412	15.64
8	TRP	WIFI_G (54M)	6	2437	15.22
9	TRP	WIFI_G (54M)	11	2462	15.43
10	TIS(EIRP)	WIFI_G (54M)	1	2412	-70.2
11	TIS(EIRP)	WIFI_G (54M)	6	2437	-70.89
12	TIS(EIRP)	WIFI_G (54M)	11	2462	-71.08
13	TRP	WIFI_N_ ISM (65M)	1	2412	16.81
14	TRP	WIFI_N_ ISM (65M)	6	2437	16.73
15	TRP	WIFI_N_ ISM (65M)	11	2462	17.41
16	TIS(EIRP)	WIFI_N_ ISM (65M)	1	2412	-66.27
17	TIS(EIRP)	WIFI_N_ ISM (65M)	6	2437	-65.35
18	TIS(EIRP)	WIFI_N_ ISM (65M)	11	2462	-67.13
19	TRP	WIFI_A (54M)	36	5180	16.42
20	TRP	WIFI_A (54M)	149	5745	17.91
21	TRP	WIFI_A (54M)	165	5825	18.31
22	TIS(EIRP)	WIFI_A (54M)	36	5180	-73.94
23	TIS(EIRP)	WIFI_A (54M)	149	5745	-74.23
24	TIS(EIRP)	WIFI_A (54M)	165	5825	-73.26

Material RoHS conformity de clARATION form

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About components used raw materials, packaging materials, auxiliary materials and additives used in the production process such as composition of the report is as follows:

Component/ Part Name	Material Composition	ICP report #	Test Org.	Test Date	Content of harmful substances (ppm)						PASS ?
					Cd	Pb	Hg	Cr6+	PBB	PBDE	PASS
FPC	Ink	ETR24902229M01	SGS	24/09/23	ND	ND	ND	ND	ND	ND	PASS
	Copper	A2240082746101006E	CTI	24/03/01	ND	ND	ND	ND	ND	ND	PASS
	FPC	SHAEC23021627701	SGS	23/12/27	ND	ND	ND	ND	ND	ND	PASS
Wire	Series Coaxial Cables	CANEC24002746206	SGS	24/02/23	ND	ND	ND	ND	ND	ND	PASS
Terminal	Copper	CANEC24000977302	SGS	24/01/22	ND	6	ND	ND	ND	ND	PASS
	Au plating	A2240410234101001E	CTI	24/07/16	ND	ND	ND	ND	ND	ND	PASS
	Rubber core	A2240126395101003E	CTI	24/03/16	ND	ND	ND	ND	ND	ND	PASS
Environm entally friendly Tin wire	Environmen tally friendly Tin wire	SHAEC24006459102	SGS	24/04/10	ND	78	ND	ND	ND	ND	PASS

JMGO Sample Confirmation Letter

SupplierName: SHENZHEN YINGJIACHUANG TECHNOLOGY ELECTRONIC CO. LTD

Material Name: WiFi 22.4G/5.8 G Black FPC built- in Antenna (K62A)

Material No.: 23040325& YJC-6N240-B09

Material Description: WiFi 22.4G/5.8 G Black FPC built- in Antenna (K62A)

Version: A0

Drawing Version: A0

Supplier Approved			Shenzhen Holatek Approved			
This needs to be stamped, and each acknowledgment letter needs to be stamped with a riding seal.						
R&D/Engineering	Quality	Approved	Product Center	R&D	Supply-Chain Center	Quality Management Department
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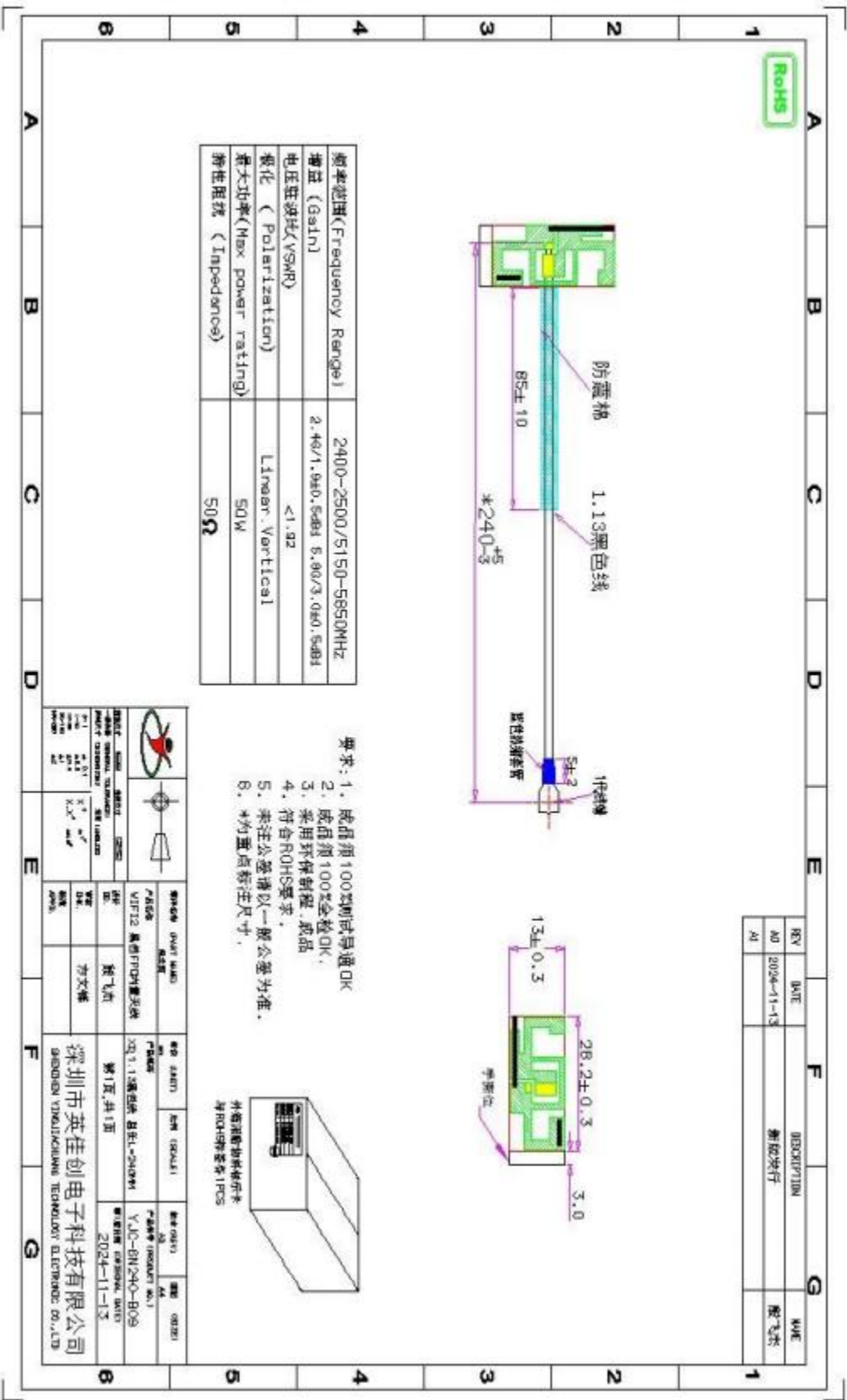
Address: Building C , Hongyu Guangming Valley , No . 11, Shiwei Community , Matian Office , Guangming District , Shenzhen

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Product drawings:



Antenna technology parameters:

Electrical Specifications	
Frequency Range	2400-2500/5150-5850 MHz
VSWR	<1.92
Input Impedance	50 Ω
Direction	All
Gain(2.4G)	1.9dBi
Gain(5.1G)	3.1dBi
Gain(5.4G)	3.2dBi
Gain(5.8G)	3.1dBi
Mechanical Specifications	
Cable Color	Black
Input connector	XD
Cable length	280mm(Total length)
Working Temperature	-20°C~+70°C
Working Humidity	20%~80%

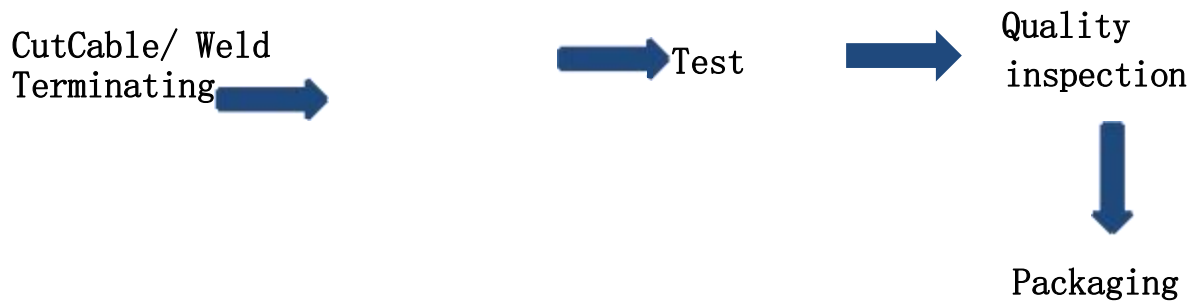
Environmental performance test:

Project	Test condition	Standard
Storage Conditions	In the absence of specified test temperature, humidity, air pressure is as follows: 1. Temperature is -20°C~+70°C 2. Relative humidity of 45% to 85% 3. Air pressure is 86 kpa to 106 kpa	Electrical and mechanical properties are normal
High and low temperature test	Between 70°C and -20°C for 5 loops, then 1-2 h under normal conditions, check the appearance quality.	Size should meet the requirements and should satisfy the content with the electrical and mechanical properties
Constant damp and hot resistance test	95%±3% relative humidity, temperature test: 40°C. Lasts 2 h after, try to take out the determination of electrical properties, within 5 min after try 1-2 h under normal conditions, check the appearance quality	Size should meet the requirements and should satisfy the content with the electrical and mechanical properties

vibration test	Vibration frequency range:10-55 Hz, vibration frequency range of displacement amplitude: 0.35 MM, acceleration amplitude: 50.0 M/S, sweepcycles: 30 times	Electrical and mech anical properties is normal
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Fall down test	1 m high altitude in accordance with the perpendicular axis free drop 3 times	Electrical and mechanical properties is normal
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Process Flow Diagram



BOM list

FPC、Cable、Terminal、PE packaging bag、Carton

Performance testing reports:

Antenna physical image:



Antenna performance test chart:



Frequency (MHz)	2400	2450	2500	5150	5725	5850
VSWR (dB)	1.56	1.55	1.42	1.88	1.16	1.22

WIFI 2 and BT isolation test diagram



WIFI 2 and WIFI 1 isolation test diagram

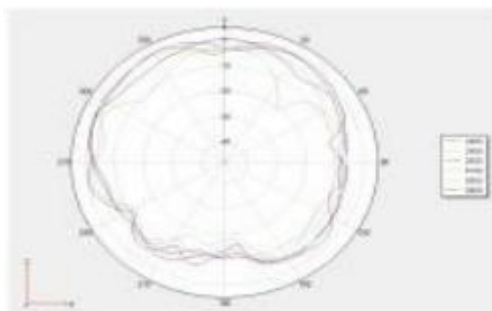


Frequency (MHz)	2400	2450	2500	5150	5725	5850
WIFI1 and WIFI2isolation (dB)	-49	-42	-44	-47	-43	-42
WIFI2 and BT isolation (dB)	-26	-23	-22	-30	-32	-28

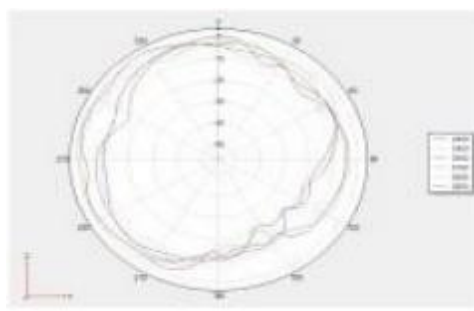
2D、 3 D test data (WIFI 2):

Frequency	Efficiency(%)	Gain. (dBi)
2400MHz	61.89	1.74
2410MHz	63.75	1.87
2420MHz	64.94	1.82
2430MHz	58.7	1.66
2440MHz	63.24	1.63
2450MHz	63.07	1.83
2460MHz	65.71	1.89
2470MHz	64.09	1.71
2480MHz	63.53	1.84
2490MHz	61.8	1.90
2500MHz	65.77	1.8
5150MHz	52.9	2.93
5250MHz	53.97	2.89
5350MHz	53.21	3.10
5450MHz	53.46	3.20
5550MHz	54.7	3.20
5650MHz	52.84	2.86
5750MHz	54.2	2.86
5850MHz	52.64	3.10

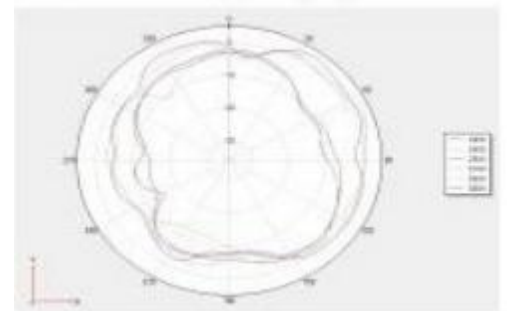
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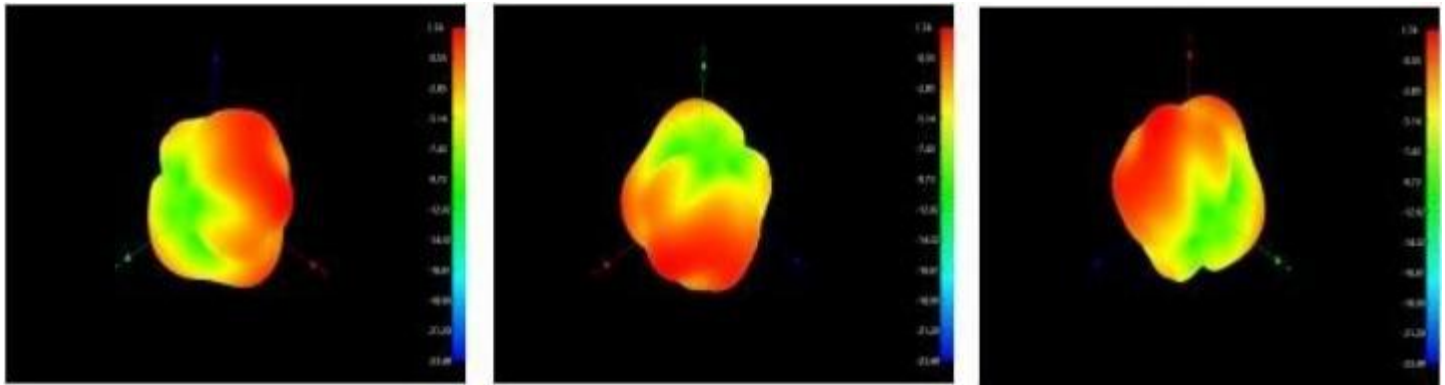
Phi90 2D



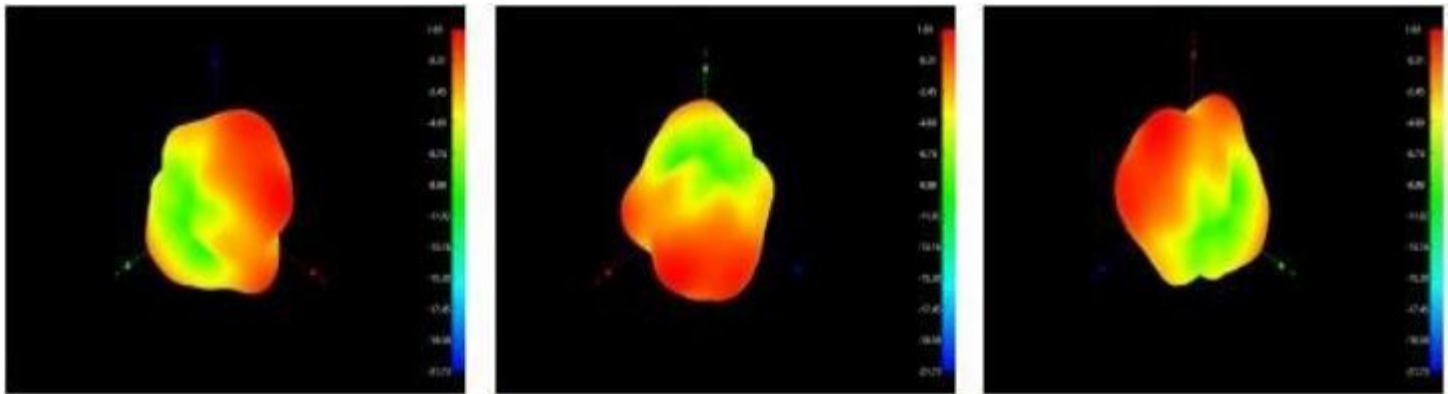
Theta 90 2D



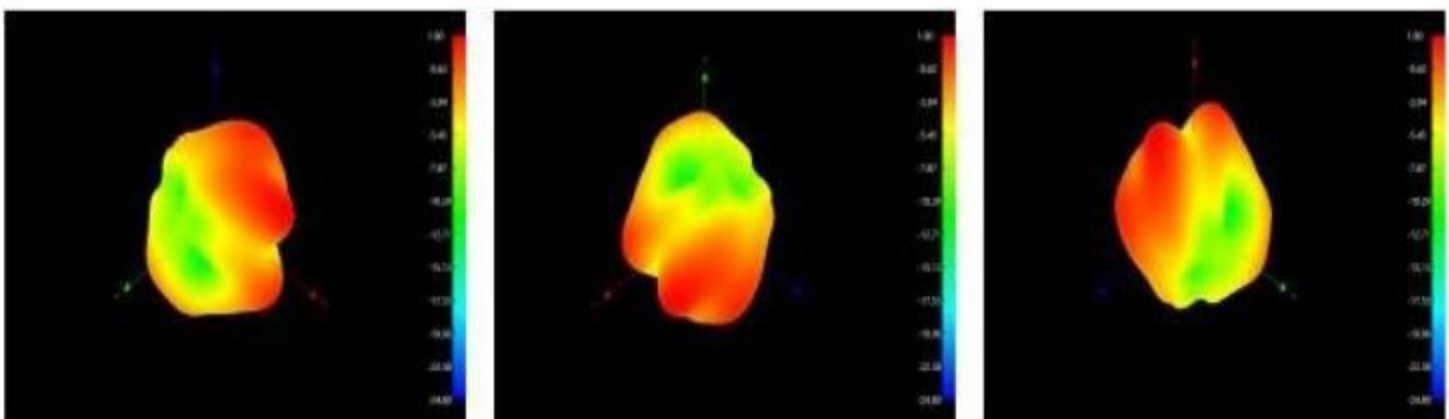
3D 2400:



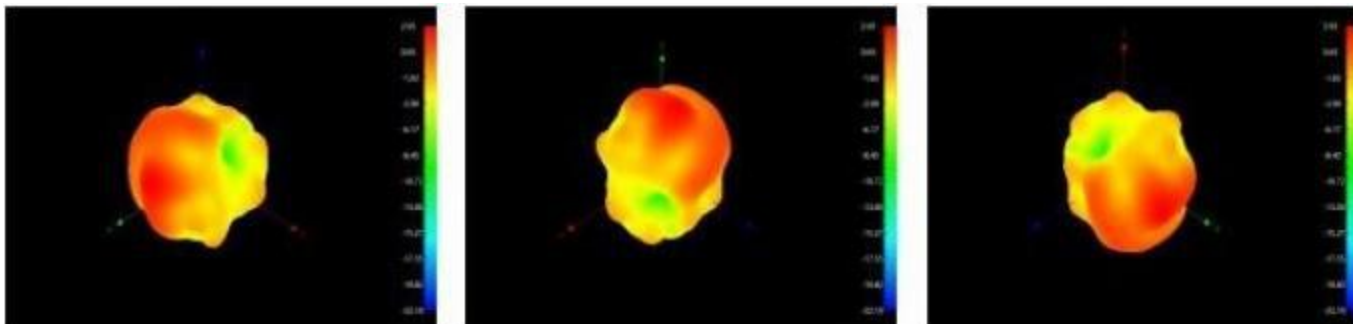
3D 2450:



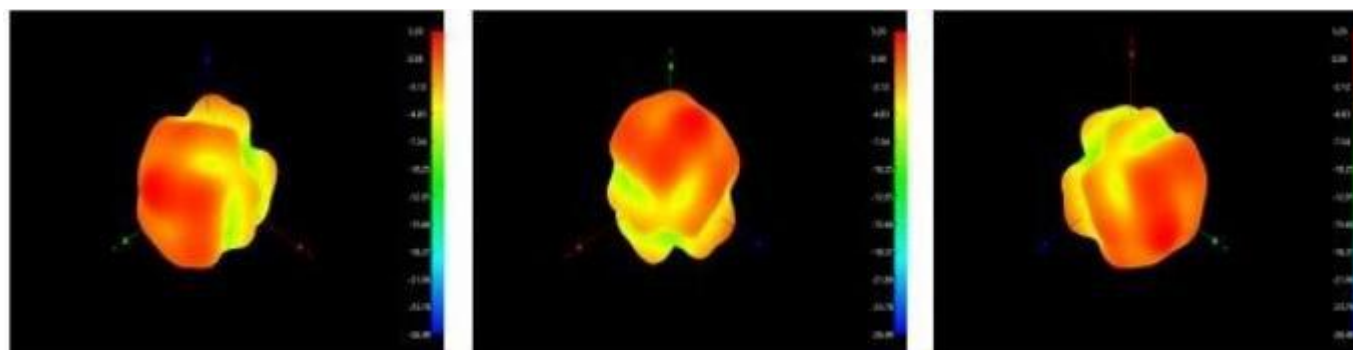
3D 2500:



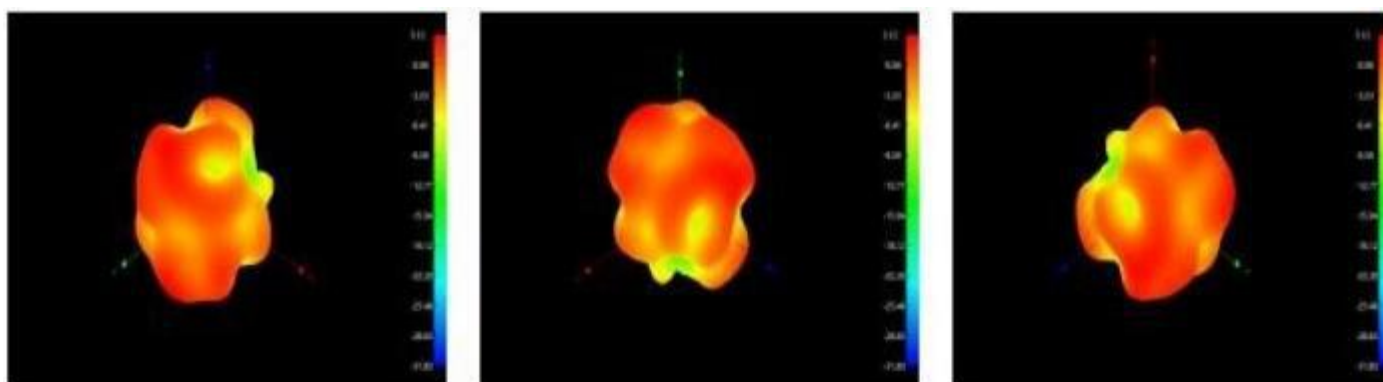
3D 5150:



3D 5500:



3D 5850:



OTA active testdata:

Item	Measurement	Band	Channel	Frequency	Total
1	TRP	WIFI_B (11M)	1	2412	16.78
2	TRP	WIFI_B (11M)	6	2437	16.46
3	TRP	WIFI_B (11M)	11	2462	17.05
4	TIS(EIRP)	WIFI_B (11M)	1	2412	-82.52
5	TIS(EIRP)	WIFI_B (11M)	6	2437	-81.5
6	TIS(EIRP)	WIFI_B (11M)	11	2462	-81.43
7	TRP	WIFI_G (54M)	1	2412	15.64
8	TRP	WIFI_G (54M)	6	2437	15.22
9	TRP	WIFI_G (54M)	11	2462	15.43
10	TIS(EIRP)	WIFI_G (54M)	1	2412	-70.2
11	TIS(EIRP)	WIFI_G (54M)	6	2437	-70.89
12	TIS(EIRP)	WIFI_G (54M)	11	2462	-71.08
13	TRP	WIFI_N_ ISM (65M)	1	2412	16.81
14	TRP	WIFI_N_ ISM (65M)	6	2437	16.73
15	TRP	WIFI_N_ ISM (65M)	11	2462	17.41
16	TIS(EIRP)	WIFI_N_ ISM (65M)	1	2412	-66.27
17	TIS(EIRP)	WIFI_N_ ISM (65M)	6	2437	-65.35
18	TIS(EIRP)	WIFI_N_ ISM (65M)	11	2462	-67.13
19	TRP	WIFI_A (54M)	36	5180	16.42
20	TRP	WIFI_A (54M)	149	5745	17.91
21	TRP	WIFI_A (54M)	165	5825	18.31
22	TIS(EIRP)	WIFI_A (54M)	36	5180	-73.94
23	TIS(EIRP)	WIFI_A (54M)	149	5745	-74.23
24	TIS(EIRP)	WIFI_A (54M)	165	5825	-73.26

Material RoHS conformity de clARATION form											
This is to certify that the delivery to your company's components, raw materials, auxiliary materials used and the additives in the production engine ord with RoHS environmental requirements of the restrictions on the use of hazardous substances directive (RoHS directive 2011/65 / EC)											
About components used raw materials, packaging materials, auxiliary materials and additives used in the production process such as composition of the report is as follows:											
Component/ Part Name	Material Composition	ICP report #	Test Org.	Test Date	Content of harmful substances (ppm)						PASS ?
					Cd	Pb	Hg	Cr6+	PBB	PBDE	PASS
FPC	Ink	ETR24902229M01	SGS	24/09/23	ND	ND	ND	ND	ND	ND	PASS
	Copper	A2240082746101006E	CTI	24/03/01	ND	ND	ND	ND	ND	ND	PASS
	FPC	SHAEC23021627701	SGS	23/12/27	ND	ND	ND	ND	ND	ND	PASS
Wire	Series Coaxial Cables	CANEC24002746206	SGS	24/02/23	ND	ND	ND	ND	ND	ND	PASS
Terminal	Copper	CANEC24000977302	SGS	24/01/22	ND	6	ND	ND	ND	ND	PASS
	Au plating	A2240410234101001E	CTI	24/07/16	ND	ND	ND	ND	ND	ND	PASS
	Rubber core	A2240126395101003E	CTI	24/03/16	ND	ND	ND	ND	ND	ND	PASS
Environm entally friendly Tin wire	Environmen tally friendly Tin wire	SHAEC24006459102	SGS	24/04/10	ND	78	ND	ND	ND	ND	PASS