# JMGO Sample Confirmation Letter

Supplier Name	e: SHENZHEN YINGJIACHUANG TECHNOLOGY ELECTRONIC CO. LTD						
Material Name		/				_	24)
Material Desc Version:	<u> </u>	<u> </u>	<u>3G</u>	Black FPC	, bullt-in	Antenna (N9	3A)
Drawing Versi	on:A(	)					
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 Jan 工程专用章					
Address Ruilding	r C Hongyu Guane	rming Valley No	. 1	1 Shiwai C	ommunity Mati	an Office Guar	namina District

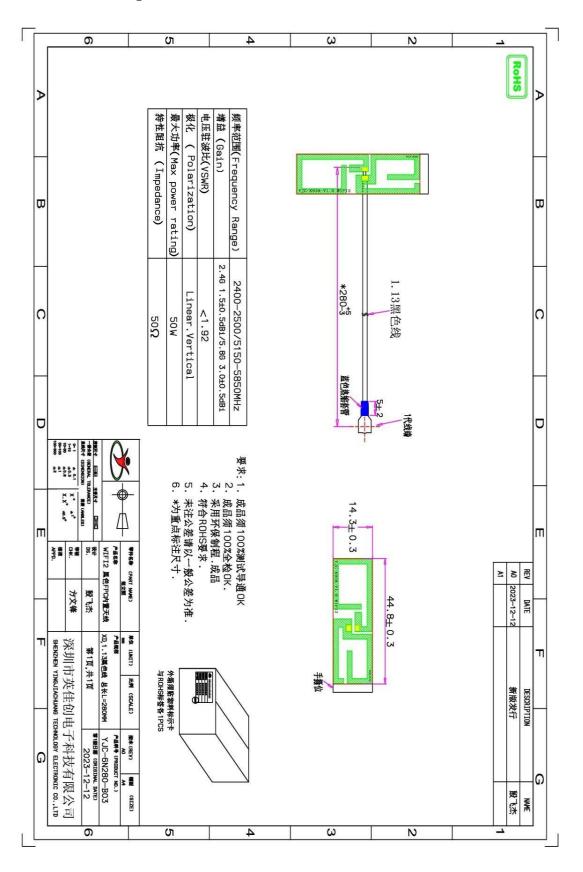
Address: Building C, Hongyu Guangming Valley, No. 11, Shiwei Community, Matian Office, Guangming District, Shenzhen

Phone: +86-755-27810060/23192199

Fax: +86-0755-27810057

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6	BOM list					
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#### Product drawings:



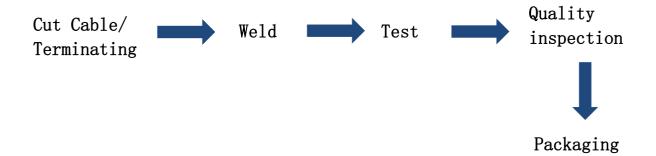
#### Antenna technology parameters:

Electrical Specifications				
Frequency Range	2400-2500/5150-5850MHz			
VSWR	<1.92			
Input Impedance	50 Ω			
Direction	A11			
Gain(2.4G)	1.7dBi			
Gain (5.1G)	3.3dBi			
Gain (5.8G)	3. 2dBi			
Mechanical Specif	cations			
Cable Color	Black			
Input connector	XD			
Cable length	280mm(Total length)			
Working Temperature	-20°C <sup>~</sup> +70°C			
Working Humidity	20%~80%			

## Environmental performance test:

Project	Test condition	Standard
Storage Conditions	II. Temperature is - 20 °C  → 70 °C	Electrical and mechanical properties is normal
temperature	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	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.	Size should meet the requirements and should satisfy the content with the electrical and mechanical properties
vibration test		Electrical and mechanical properties is normal
Fall down test		Electrical and mechanical properties is normal

#### 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)	1.52	1.61	1.57	1.22	1.39	1.27

WIFI2 and BT isolation test diagram



WIFI 2 and WIFI 1 isolation test diagram

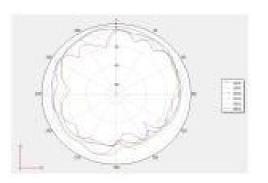


Frequency (MHz)	2400	2450	2500	5150	5725	5850
WIFI1 and WIFI2 isolation (dB)	-24	-20	-16	-30	-27	-27
WIFI2 and BT isolation (dB)	-28	-29	-34	-39	-39	-37

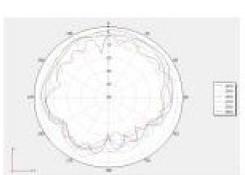
## 2D, 3D test data (WIFI 2):

Frequency	Efficiency (%)	Gain.(dBi)
2400MHz	50.35	1.39
2410MHz	54.02	1.47
2420MHz	57.46	1.68
2430MHz	54.41	1.57
2440MHz	55.9	1.61
2450MHz	54.67	1.52
2460MHz	55.98	1.62
2470MHz	56.36	1.70
2480MHz	58.16	1.69
2490MHz	55.89	1.58
2500MHz	56.89	1.70
5150MHz	47.48	3.3
5250MHz	45.7	3.1
5750MHz	46.06	3.2
5850MHz	45.72	3.05

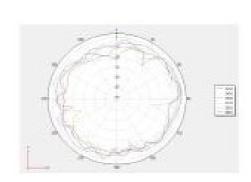
Phi 0 2D:



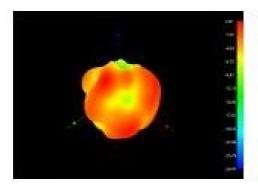
Phi 90 2D

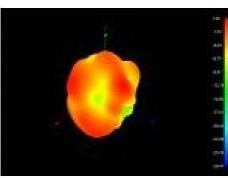


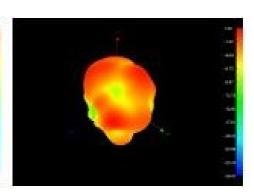
Theta 90 2D



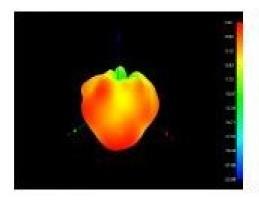
## 3D 2400:

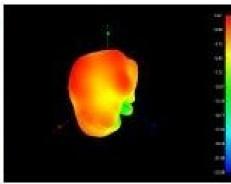


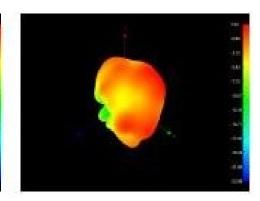




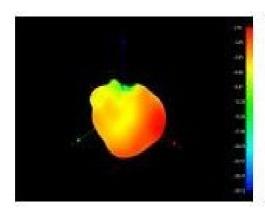
3D 2450:

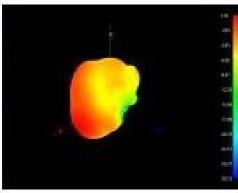


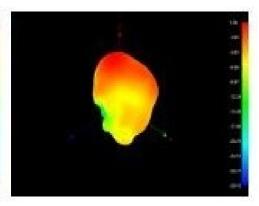




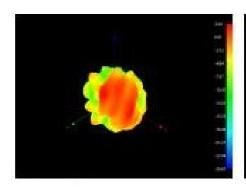
3D 2500:

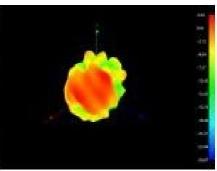


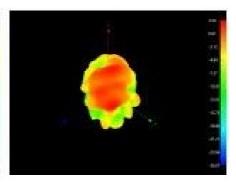




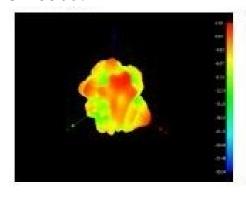
## 3D 5150:

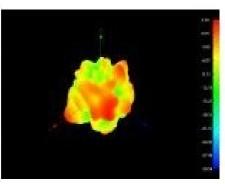


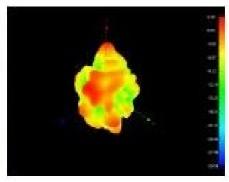




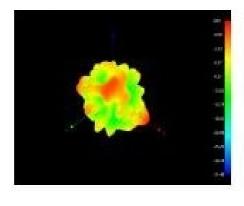
#### 3D 5500:

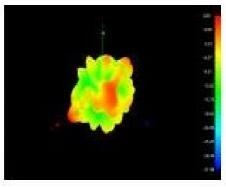


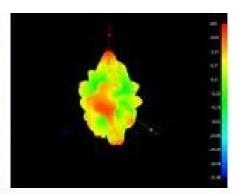




#### 3D 5850:







#### OTA active test data:

Item	Measurement	Band	Channel	Frequency	Total
1	TRP	WIFI_B (11M)	1	2412	12.63
2	TRP	WIFI_B (11M)	6	2437	12.34
3	TRP	WIFI_B (11M)	11	2462	12.37
4	TIS(EIRP)	WIFI_B (11M)	1	2412	-82.74
5	TIS(EIRP)	WIFI_B (11M)	6	2437	-81.4
6	TIS(EIRP)	WIFI_B (11M)	11	2462	-83.03
7	TRP	WIFI_G (54M)	1	2412	12.66
8	TRP	WIFI_G (54M)	6	2437	12.77
9	TRP	WIFI_G (54M)	11	2462	13.54
10	TIS(EIRP)	WIFI_G (54M)	1	2412	-69.15
11	TIS(EIRP)	WIFI_G (54M)	6	2437	-70.45
12	TIS(EIRP)	WIFI_G (54M)	11	2462	-70.44
13	TRP	WIFI_N_ISM (65M)	1	2412	12.64
14	TRP	WIFI_N_ISM (65M)	6	2437	11.89
15	TRP	WIFI_N_ISM (65M)	11	2462	13.01
16	TIS(EIRP)	WIFI_N_ISM (65M)	1	2412	-67.7
17	TIS(EIRP)	WIFI_N_ISM (65M)	6	2437	-68.85
18	TIS(EIRP)	WIFI_N_ISM (65M)	11	2462	-69.27
19	TRP	WIFI_A (54M)	36	5180	14.14
20	TRP	WIFI_A (54M)	149	5745	14.01
21	TRP	WIFI_A (54M)	165	5825	14.25
22	TIS(EIRP)	WIFI_A (54M)	36	5180	-74.94
23	TIS(EIRP)	WIFI_A (54M)	149	5745	-73.17
24	TIS(EIRP)	WIFI_A (54M)	165	5825	-73.9

#### Material RoHS conformity declaration 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 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:

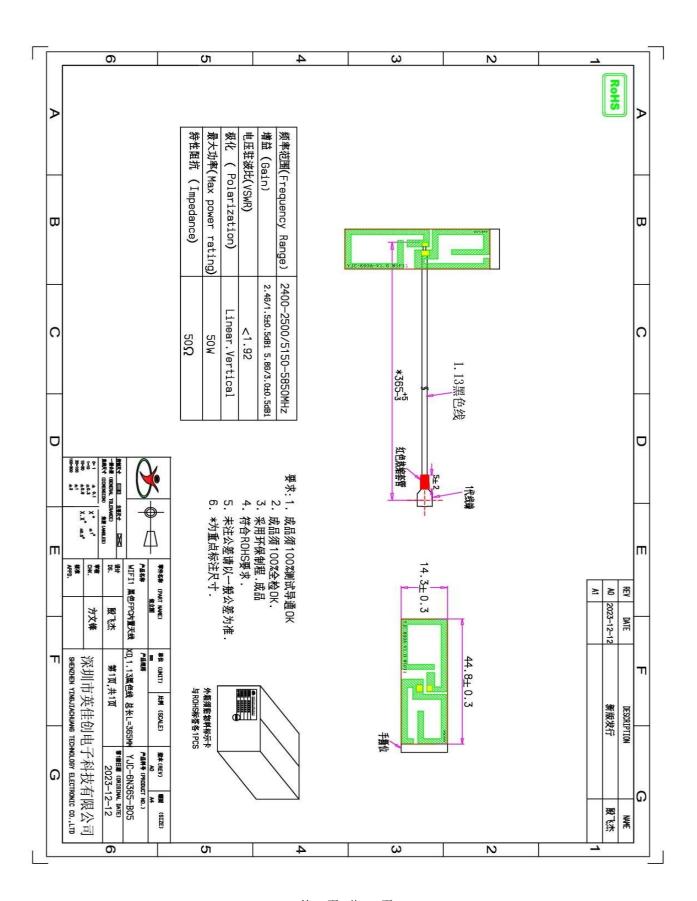
Component	Material		Test			Content	of harmf	ul subst	ances (pp	om)	PASS?
/Part Name	Composition	ICP report #	Org.	Test Date	Cd	Pb	Hg	Cr 6+	PBB	PBDE	PASS
FPC	FPC	FTS2302160201-01C1	SGS	23/02/20	ND	ND	ND	ND	ND	ND	PASS
Wire	Series Coaxial Cables	CANEC2301851703	SGS	23/02/23	ND	ND	ND	ND	ND	ND	PASS
	Copper	CANEC2301145810	SGS	23/02/08	ND	5	ND	ND	ND	ND	PASS
Terminal	Au plating	A2230400553101001E	CTI	23/08/12	ND	ND	ND	ND	ND	ND	PASS
	Rubber core	A2230035037101002E	SGS	23/02/06	ND	ND	ND	ND	ND	ND	PASS
Environm entally friendly Tin wire	Environmen tally friendly Tin wire	SHAEC23006357502	SGS	23/05/23	ND	43	ND	ND	ND	ND	PASS

# JMGO Sample Confirmation Letter

	-					
Supplier Name	e: <u>SHENZHEN Y</u>	/INGJIACHUANG	TECHNOLOG	Y ELECTRON	IC CO. LTD	
Material Name Material No.:		G/5.8G Black	FPC built	-in Antenna	(K93A)	
Material Desc Version:	cription:	/				
Drawing Versi	on:A(	)				
Sup This needs to be letter needs to be		acknowledgment		Shenzhen I	Holatek App	roved
R&D/Engineering	Quality	Approved	Product Center	R&D	Supply-Chain Center	Quality Management Department
Yin FeiJie	Yang YunGang	Xiao Han				
Address: Building Shenzhen	g C, Hongyu Guang	gming Valley, No.	11, Shiwei C	ommunity, Mati	an Office, Gua	ngming District,
Phone: +86-755-27 Fax: +86-0755-278	•					

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#### Product drawings:



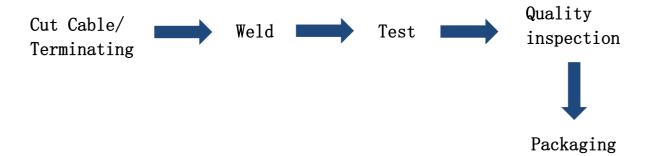
## Specification:

Electrical Specifications				
Frequency Range	2400-2500/5150-5850MHz			
VSWR	<1.92			
Input Impedance	50 Ω			
Direction	A11			
Gain(2.4G)	1.8 dBi			
Gain (5.1G)	3.3 dBi			
Gain (5.8G)	3.3 dBi			
Mechanical Specif	ications			
Cable Color	Black			
Input connector	XD			
Cable length	365mm (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 is normal
	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
C 1	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	Size should meet the requirements and should satisfy the content with the electrical and mechanical properties
vibration test	and its day 0.25 MM and long time and its day	Electrical and mechanical properties is normal
Fall down test	ŭ .	Electrical and mechanical properties is normal

## Process Flow Diagram



#### BOM list

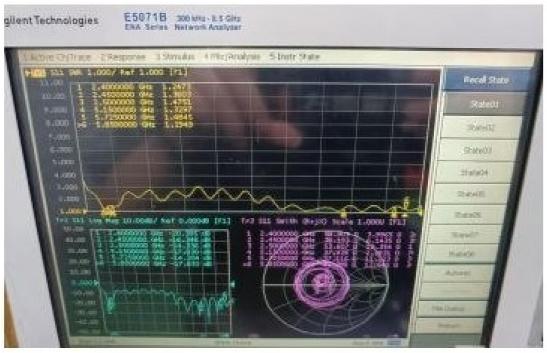
FPC, Cable, Terminal, PE packaging bag, Carton

#### Performance testing reports:

#### Antenna physical image:



#### Antenna performance test chart:



Frequency (MHZ)	2400	2450	2500	5150	5725	5850
VSWR (dB)	1.24	1.36	1.47	1.32	1.48	1.29

WIFI1 and WIFI2 isolation test diagram



WIFI1 and BT isolation test diagram

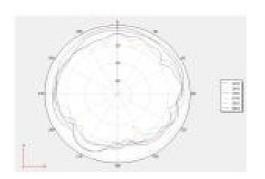


Frequency (MHz)	2400	2450	2500	5150	5725	5850
WIFI1 and BT isolation (dB)	-28	-30	-28	-34	-37	-36
WIFI1 and WIFI2 isolation (dB)	-24	-20	-16	-30	-27	-27

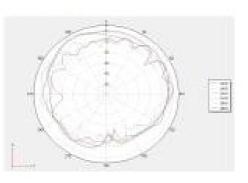
## 2D, 3D test data (WIFI 1):

Frequency	Efficiency (%)	Gain. (dBi)
2400MHz	56.06	1.80
2410MHz	54.21	1.66
2420MHz	54.28	1.55
2430MHz	55.48	1.71
2440MHz	55.4	1.62
2450MHz	56.65	1.76
2460MHz	54.22	1.51
2470MHz	55.31	1.55
2480MHz	53.64	1.49
2490MHz	54.59	1.57
2500MHz	55.4	1.74
5150MHz	49.11	3.3
5250MHz	47.99	3.17
5750MHz	48.92	3.3
5850MHz	48.42	3.23

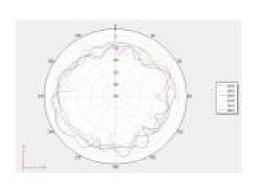
Phi 0 2D:



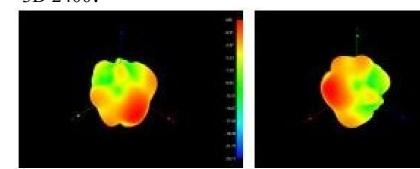
Phi 90 2D

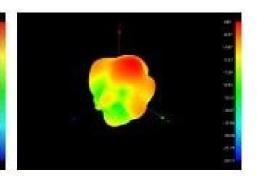


Theta 90 2D

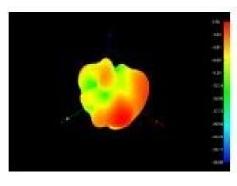


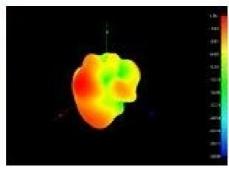
## 3D 2400:

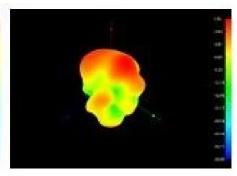




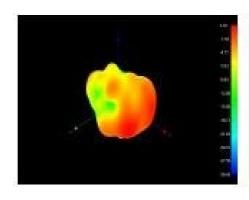
#### 3D 2450:

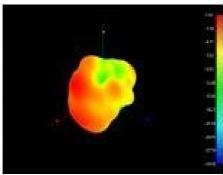


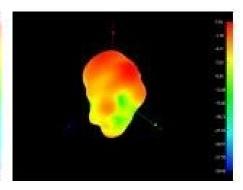




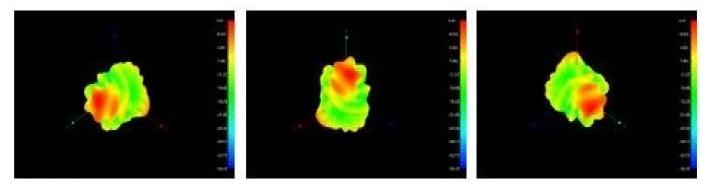
#### 3D 2500:



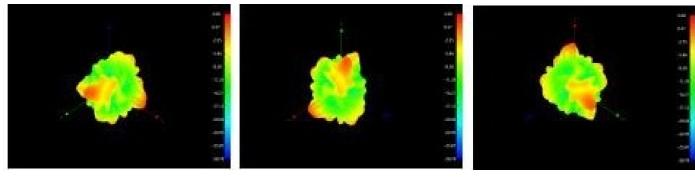




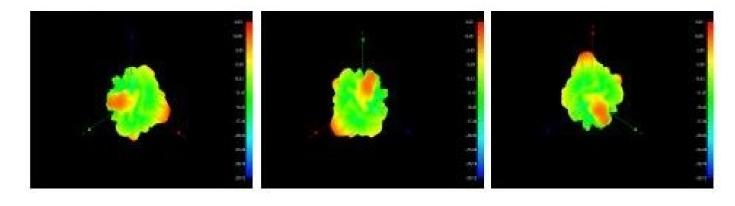
## 3D 5150:



#### 3D 5500:



#### 3D 5850:



#### OTA active test data:

Item	Measurement	Band	Channel	Frequency	Total
1	TRP	WIFI_B (11M)	1	2412	12.63
2	TRP	WIFI_B (11M)	6	2437	12.34
3	TRP	WIFI_B (11M)	11	2462	12.37
4	TIS(EIRP)	WIFI_B (11M)	1	2412	-82.74
5	TIS(EIRP)	WIFI_B (11M)	6	2437	-81.4
6	TIS(EIRP)	WIFI_B (11M)	11	2462	-83.03
7	TRP	WIFI_G (54M)	1	2412	12.66
8	TRP	WIFI_G (54M)	6	2437	12.77
9	TRP	WIFI_G (54M)	11	2462	13.54
10	TIS(EIRP)	WIFI_G (54M)	1	2412	-69.15
11	TIS(EIRP)	WIFI_G (54M)	6	2437	-70.45
12	TIS(EIRP)	WIFI_G (54M)	11	2462	-70.44
13	TRP	WIFI_N_ISM (65M)	1	2412	12.64
14	TRP	WIFI_N_ISM (65M)	6	2437	11.89
15	TRP	WIFI_N_ISM (65M)	11	2462	13.01
16	TIS(EIRP)	WIFI_N_ISM (65M)	1	2412	-67.7
17	TIS(EIRP)	WIFI_N_ISM (65M)	6	2437	-68.85
18	TIS(EIRP)	WIFI_N_ISM (65M)	11	2462	-69.27
19	TRP	WIFI_A (54M)	36	5180	14.14
20	TRP	WIFI_A (54M)	149	5745	14.01
21	TRP	WIFI_A (54M)	165	5825	14.25
22	TIS(EIRP)	WIFI_A (54M)	36	5180	-74.94
23	TIS(EIRP)	WIFI_A (54M)	149	5745	-73.17
24	TIS(EIRP)	WIFI_A (54M)	165	5825	-73.9

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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:

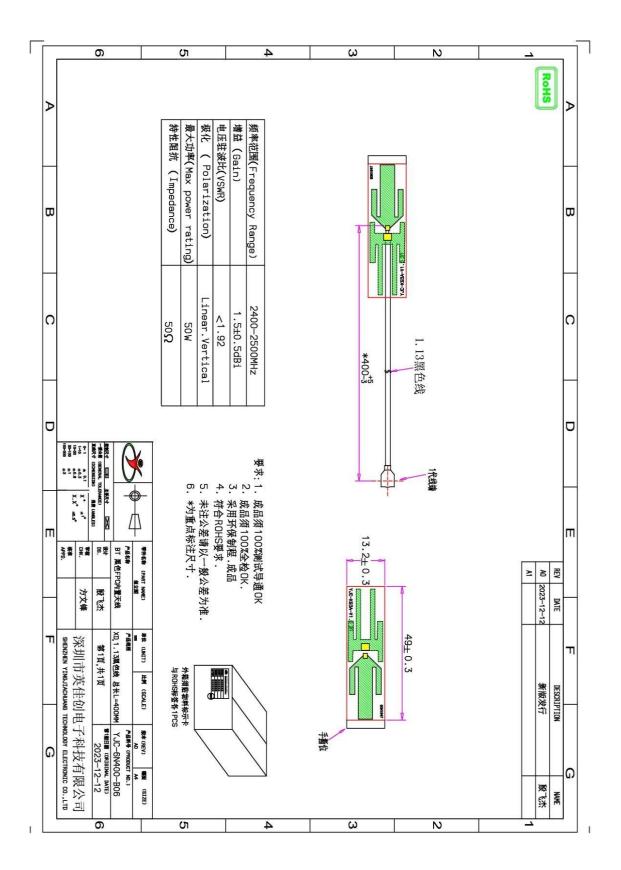
Component	Material		Test		Content of harmful substances (ppm)					om)	PASS?
/Part Name	Composition	ICP report #	Org.	Test Date	Cd	Pb	Hg	Cr 6+	PBB	PBDE	PASS
FPC	FPC	FTS2302160201-01C1	SGS	23/02/20	ND	ND	ND	ND	ND	ND	PASS
Wire	Series Coaxial Cables	CANEC2301851703	SGS	23/02/23	ND	ND	ND	ND	ND	ND	PASS
	Copper	CANEC2301145810	SGS	23/02/08	ND	5	ND	ND	ND	ND	PASS
Terminal	Au plating	A2230400553101001E	CTI	23/08/12	ND	ND	ND	ND	ND	ND	PASS
	Rubber core	A2230035037101002E	SGS	23/02/06	ND	ND	ND	ND	ND	ND	PASS
Environm entally friendly Tin wire	Environmen tally friendly Tin wire	SHAEC23006357502	SGS	23/05/23	ND	43	ND	ND	ND	ND	PASS

# JMGO Sample Confirmation Letter

Supplier Name	e: <u>SHENZHEN</u>	YINGJIACHUAN	G 1	<u>rechnolog</u>	Y ELECTRONI	C CO. LTD	
Material Name Material No.: Material Desc Version: Drawing Versi	eription: <u>B</u> A0	/ C 2.4G Black				(K93A)	
Sup This needs to be s letter needs to be		acknowledgment			Shenzhen H	olatek App	roved
R&D/Engineering	Quality	Approved		Product Center	R&D	Supply-Chain Center	Quality Management Department
Yin FeiJie	Yang YunGang	Xiao Han 工程专用章					
Address: Building Shenzhen	; C, Hongyu Guan	gming Valley, No	. 1	1, Shiwei C	ommunity, Matia	an Office, Gua	ngming District,
Phone: +86-755-27 Fax: +86-0755-2781	•						

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#### Product drawings:



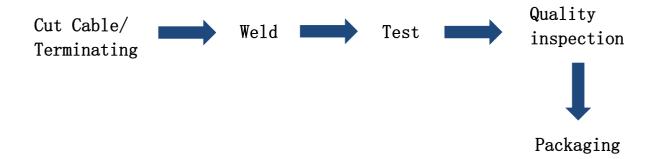
## Specification:

Electrical Specifications					
Frequency Range	2400-2500MHz				
VSWR	<1.92				
Input Impedance	50 Ω				
Direction	A11				
Gain	1.80 dBi				
Mechanical Specif	fications				
Cable Color	Black				
Input connector	XD				
Cable length	400mm (Total Length)				
Working Temperature	-20°C <sup>~</sup> +70°C				
Working Humidity	20%~80%				

## Environmental performance test:

Project	Test condition	Standard
Storage Conditions	ll. Temperature is - 20 °C ~ + 70 °C	Electrical and mechanical properties is normal
	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	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	Size should meet the requirements and should satisfy the content with the electrical and mechanical properties
vibration test	amplitude, 0.25 MM secolometica amplitude.	Electrical and mechanical properties is normal
Fall down test		Electrical and mechanical properties is normal

#### Process Flow Diagram



#### BOM list

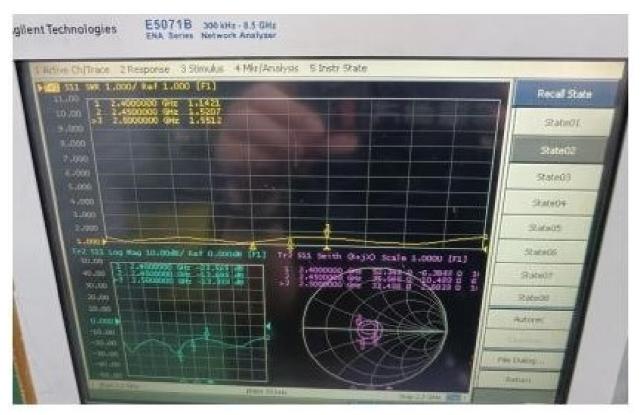
FPC, Cable, Terminal, PE packaging bag, Carton

#### Performance testing reports:

#### Antenna physical image:



#### Antenna performance test chart:



Frequency (MHZ)	2400	2450	2500
VSWR (dB)	1.14	1.52	1.55

BT and WiFi 1 isolation test diagram



BT and WiFi 2 isolation test diagram



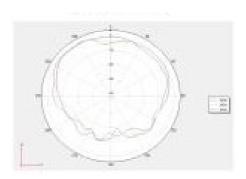
Frequency (MHz)	2400	2450	2500	5150	5725	5850
WIFI1 and BT isolation (dB)	-28	-30	-28	-34	-37	-36
WIFI2 and BT isolation (dB)	-28	-29	-34	-39	-39	-37

## 2D, 3D test data (BT):

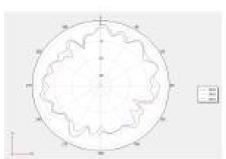
Frequency	Efficiency (%)	Gain. (dBi)
2400MHz	56.78	1.79
2410MHz	55.54	1.64
2420MHz	54.98	1.58
2430MHz	54.19	1.41
2440MHz	55.67	1.66
2450MHz	54.59	1.48
2460MHz	54.65	1.43
2470MHz	57.08	1.80
2480MHz	55.24	1.59
2490MHz	53.36	1.43
2500MHz	55.81	1.68

Phi 0 2D:

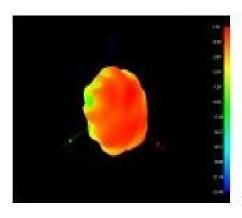
Phi 90 2D

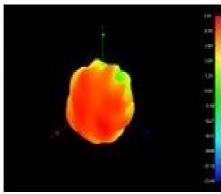


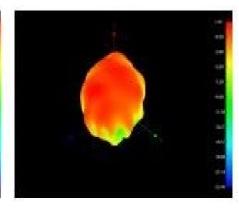
Theta 90 2D



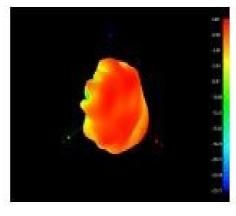
#### 3D 2400:

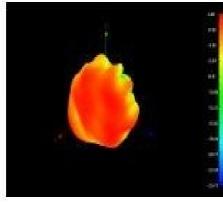


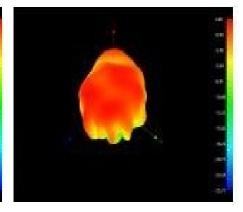




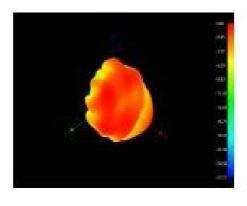
## 3D 2450:



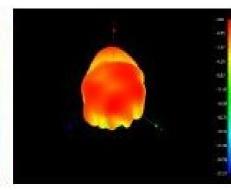




#### 3D 2500:







#### OTA active test data:

Item	Measurement	Band	Channel	Frequency	Total	
1	TRP	BLUETOOTH	0	2402	4.15	
2	TRP	BLUETOOTH	39	2441	4.47	
3	TRP	BLUETOOTH	78	2480	4.4	
4	TIS(EIRP)	BLUETOOTH	0	2402	-86.13	
5	TIS(EIRP)	BLUETOOTH	39	2441	-85.92	
6	TIS(EIRP)	BLUETOOTH	78	2480	-88.58	
7	TRP	BLUETOOTH	0	2402	1.44	
8	TRP	BLUETOOTH	39	2441	1.85	
9	TRP	BLUETOOTH	78	2480	1.79	
10	TIS(EIRP)	BLUETOOTH	0	2402	-86.06	
11	TIS(EIRP)	BLUETOOTH	39	2441	-86.08	
12	TIS(EIRP)	BLUETOOTH	78	2480	-87.93	
13	TRP	BLUETOOTH	0	2402	1.47	
14	TRP	BLUETOOTH	39	2441	1.91	
15	TRP	BLUETOOTH	78	2480	1.81	
16	TIS(EIRP)	BLUETOOTH	0	2402	-80.5	
17	TIS(EIRP)	BLUETOOTH	39	2441	-79.24	
18	TIS(EIRP)	BLUETOOTH	78	2480	-81.56	

#### Material RoHS conformity declaration 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 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	Material Composition ICP report #	Test		Content of harmful substances (ppm)				PASS?			
/Part Name		ICP report #	Org.	Test Date	Cd	Pb	Hg	Cr 6+	PBB	PBDE	PASS
FPC	FPC	FTS2302160201-01C1	SGS	23/02/20	ND	ND	ND	ND	ND	ND	PASS
Wire	Series Coaxial Cables	CANEC2301851703	SGS	23/02/23	ND	ND	ND	ND	ND	ND	PASS
Terminal	Copper	CANEC2301145810	SGS	23/02/08	ND	5	ND	ND	ND	ND	PASS
	Au plating	A2230400553101001E	CTI	23/08/12	ND	ND	ND	ND	ND	ND	PASS
	Rubber core	A2230035037101002E	SGS	23/02/06	ND	ND	ND	ND	ND	ND	PASS
Environm entally friendly Tin wire	Environmen tally friendly Tin wire	SHAEC23006357502	SGS	23/05/23	ND	43	ND	ND	ND	ND	PASS