亦 轩 <东莞> 电 子 科 技 有 限 公 司

YIXUAN DongGuan DianZI KeJi YouXianGongSi

客户名称:深圳市轩辕星电子科技有限公司

机型:X9

天线类型:WIFI 天线

天线频段：2.4G

材质要求: PCB板载天线　　颜色: 黑色

天线料号:X9-YX 制作日期: 2024-05-8

Version：A

承 认 签 章 Admit that signature			
亦轩 承 认 **Confirmation Signature**		客 户 承 认 Customer Approved	
承辦人 Responsible	张立	**承辦人 Responsible**	
品质 QC	雷桃	**主管 Chief**	
核准 Approve	申中秋	**核准 Approve**	
日 期 **Date**	2024/05/08	日 期 **Date**	

[1]广东省东莞市长安镇涌头新围南路五巷二号 8 楼
电话：13058053185

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一：概述

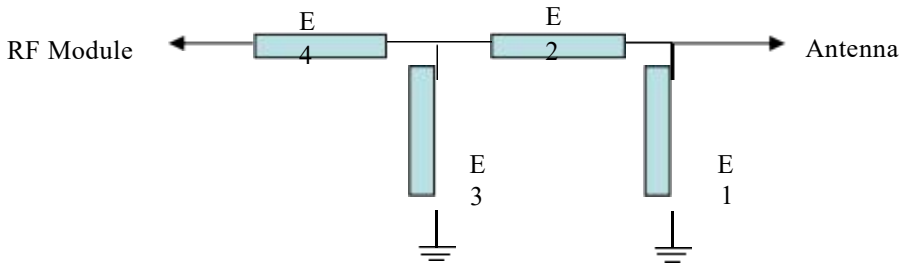
- This approval sheet supports for MID project. PCB antennas include in this project. This report is for the performance of WLAN ,4G antenna.
- Antenna shape size：Meet the requirement of MID
- Antenna band：2400MHz~2500MHz,
- Antenna material：Antenna material meet the requirement of MID
- Antenna performance meet the spec below：

Description	2.4GHz~2.5GHz	Units
VSWR	≤2.0	
Average Antenna Gain	≥1.5	dB
Antenna Efficiency	≥40	%
Feed Impedance	50 ohms	
Operating Temperature	-40 to +85 deg C	
Polarization / Azimuth	Linear / Omni-directional	

- Mechanical Information

Mechanical Dimension	
Cable Length	60mm/Black
Description	WLAN antenna
Material	FPC
Coaxial Cable	50Ohm/O.D.1.78mm
Environmental	
Operation Temperature	-40 to +85 deg C
Storage Temperature	-40 to +85 deg C

匹配电路图



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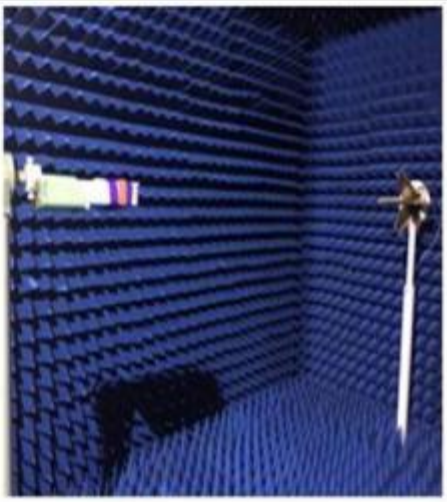
二. 测试环境

	测试项目	设备
1. S参数（S-parameter)	1. 回波损耗（Return Loss) 2. 电压驻波比（VSWR)	网络分析仪: Agilent E5071B HP 8753D
2. 有源测试（Active)	1. 发射功率（TRP） 2. 接收灵敏度（TIS) 3.频率误差 4.屏灭、屏亮	1. 暗室：ETS 7x4x3 m (3D) Chamber ETS 5x3x3 m (3D) Chamber 2.综合测试仪: 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. 暗室：ETS 7x4x3 m (3D) Chamber ETS 5x3x3 m (3D) Chamber 2. 网络分析仪：Agilent E5071B HP 8753D



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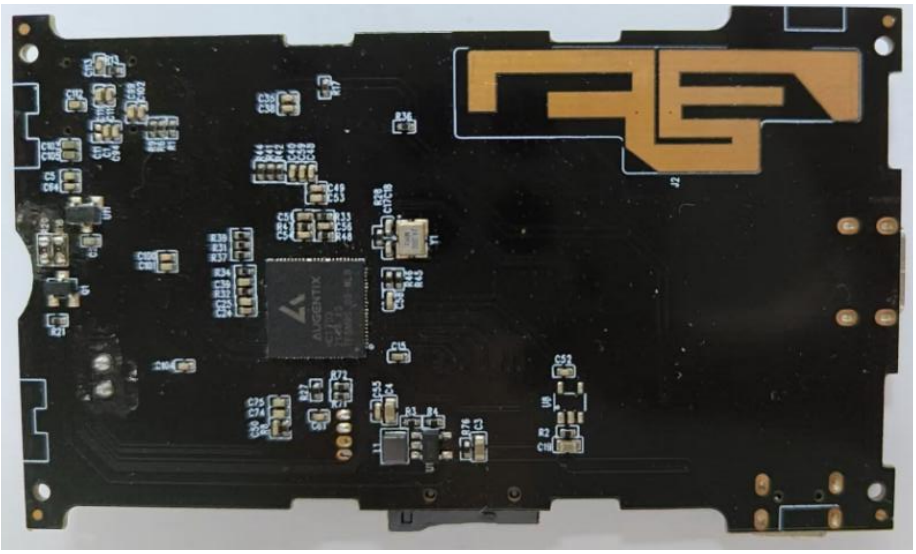
三.整机调试说明

1. 案室实测机器图



四. WIFI天线2.4G 效率：

1.WIFI天线无源参数:

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
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)	-6.36	-6.40	-6.33	-6.11	-6.07	-5.78	-5.83	-5.99	-5.91	-5.70	-5.64
Peak EIRP (dBm)	0.10	-0.12	-0.33	-0.16	0.05	0.33	0.31	0.33	0.59	0.99	1.24
Directivity (dBi)	6.47	6.28	5.99	5.96	6.12	6.10	6.15	6.32	6.50	6.69	6.88
Efficiency (dB)	-6.36	-6.40	-6.33	-6.11	-6.07	-5.78	-5.83	-5.99	-5.91	-5.70	-5.64
Efficiency (%)	23.10	22.90	23.30	24.50	24.70	26.50	26.10	25.20	25.70	26.90	27.30
Gain (dBi)	0.10	-0.12	-0.33	-0.16	0.05	0.33	0.31	0.33	0.59	0.99	1.24
NHPRP ±Pi/4 (dBm)	-8.24	-8.30	-8.26	-8.08	-8.09	-7.82	-7.88	-8.02	-7.90	-7.66	-7.58
NHPRP ±Pi/6 (dBm)	-9.73	-9.82	-9.79	-9.63	-9.66	-9.40	-9.47	-9.62	-9.52	-9.28	-9.21
NHPRP ±Pi/8 (dBm)	-10.88	-10.99	-10.99	-10.83	-10.87	-10.62	-10.71	-10.87	-10.79	-10.56	-10.50
Upper Hem. PRP (dBm)	-9.30	-9.28	-9.21	-9.05	-9.06	-8.83	-8.94	-9.12	-9.04	-8.87	-8.83
Lower Hem. PRP (dBm)	-9.45	-9.55	-9.46	-9.20	-9.11	-8.74	-8.75	-8.89	-8.79	-8.55	-8.48
Upper Hem. PRP (%)	11.74	11.80	11.99	12.45	12.42	13.08	12.77	12.24	12.47	12.99	13.10
Lower Hem. PRP (%)	11.36	11.10	11.31	12.02	12.28	13.38	13.33	12.92	13.20	13.96	14.20

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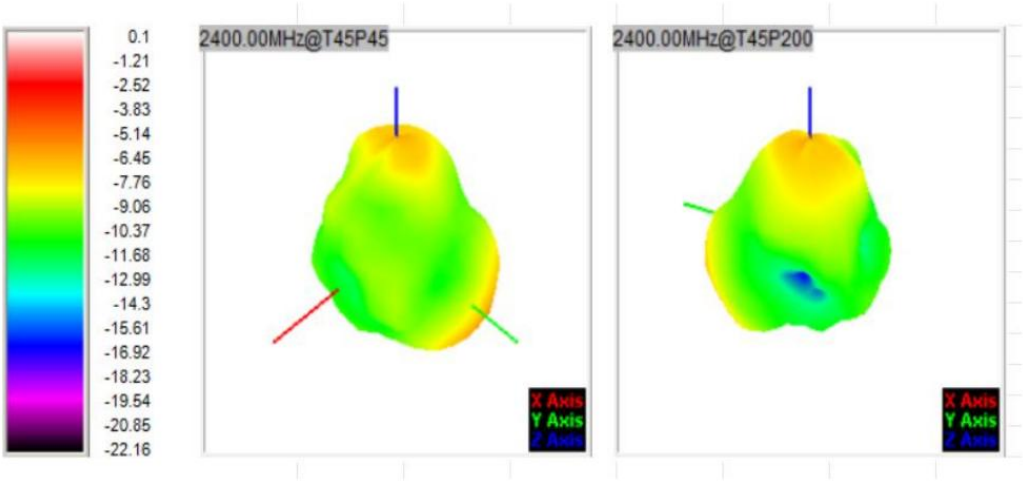
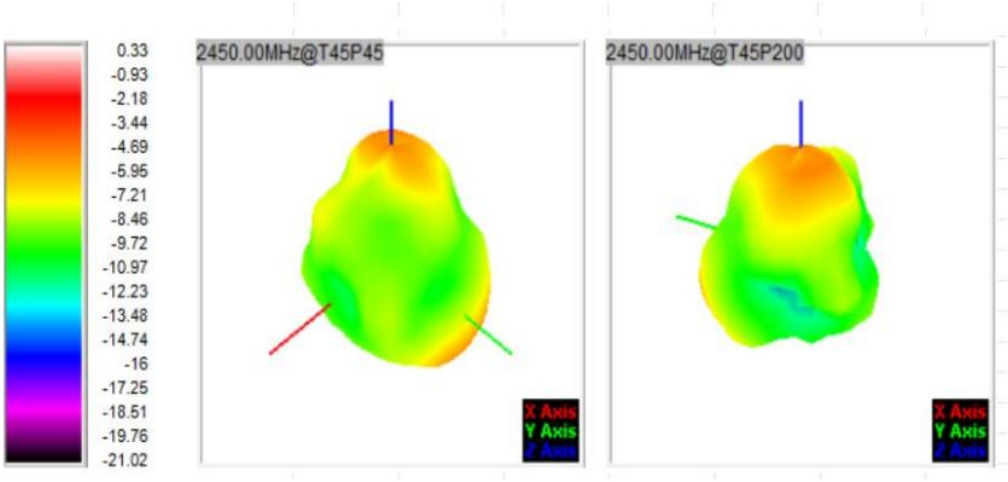
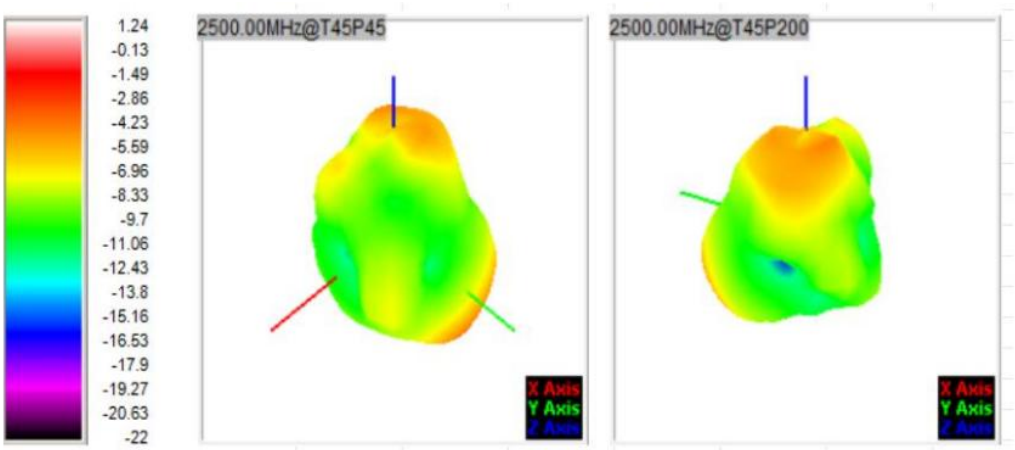
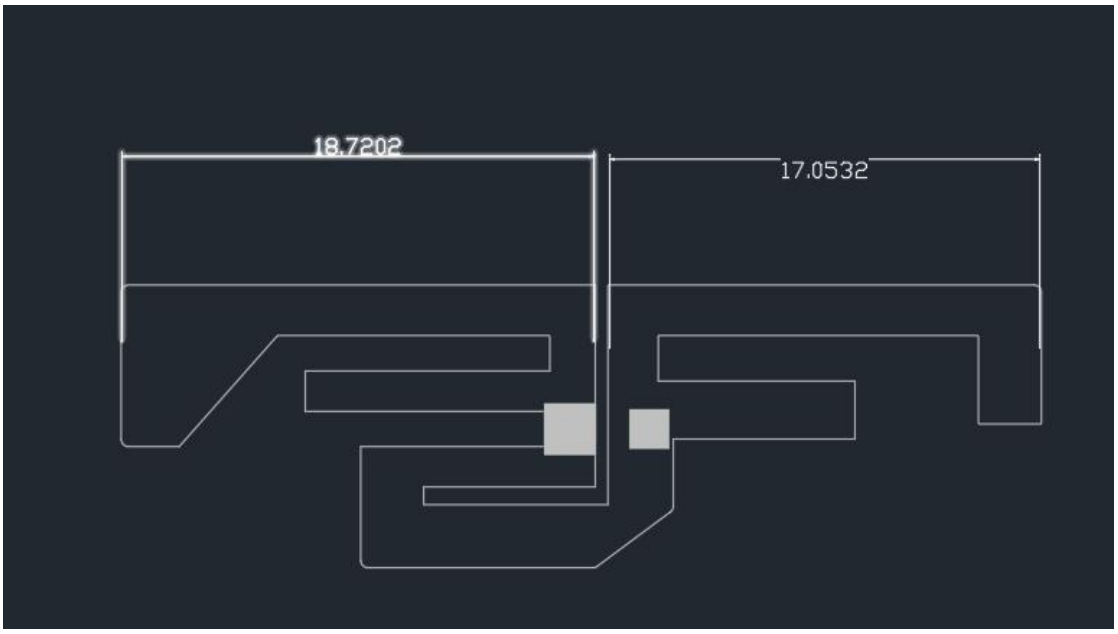

0.1
-1.21
-2.52
-3.83
-5.14
-6.45
-7.76
-9.06
-10.37
-11.68
-12.99
-14.3
-15.61
-16.92
-18.23
-19.54
-20.85
-22.16
2400.00MHz@T45P45
2400.00MHz@T45P200
X Axis
Y Axis
Z Axis


0.33
-0.93
-2.18
-3.44
-4.69
-5.95
-7.21
-8.46
-9.72
-10.97
-12.23
-13.48
-14.74
-16
-17.25
-18.51
-19.76
-21.02
2450.00MHz@T45P45
2450.00MHz@T45P200
X Axis
Y Axis
Z Axis


1.24
-0.13
-1.49
-2.86
-4.23
-5.59
-6.96
-8.33
-9.7
-11.06
-12.43
-13.8
-15.16
-16.53
-17.9
-19.27
-20.63
-22
2500.00MHz@T45P45
2500.00MHz@T45P200
X Axis
Y Axis
Z Axis

五：结构图



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