

电连技术股份有限公司

APPROVAL SHEET 承認書

CUSTOMER NAME (客户名称)	深圳方位智联科技有限公司
CUSTOMER P/N (客户料号)	8180FW001
PART NAME (品 名)	2. 4GFPC天线
ECT P/N (料 号)	8180FW001
APPROVAL REV. 版次	X1
DELIVERY DATE 送样日期	2025.10.29
PREPARED BY (承 办)	匡鑫
CHECKED BY (审 核)	丁第斌
APPROVED BY (核 准)	刘晓峰

Customer Approved(客户承认)

Approved By (核 准)	Checked By (审 核)	Prepared By (承 办)

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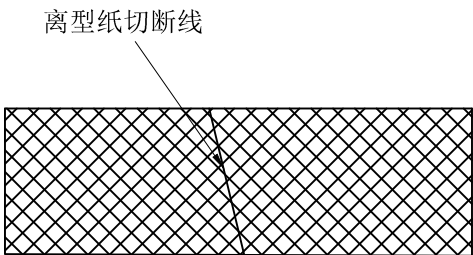
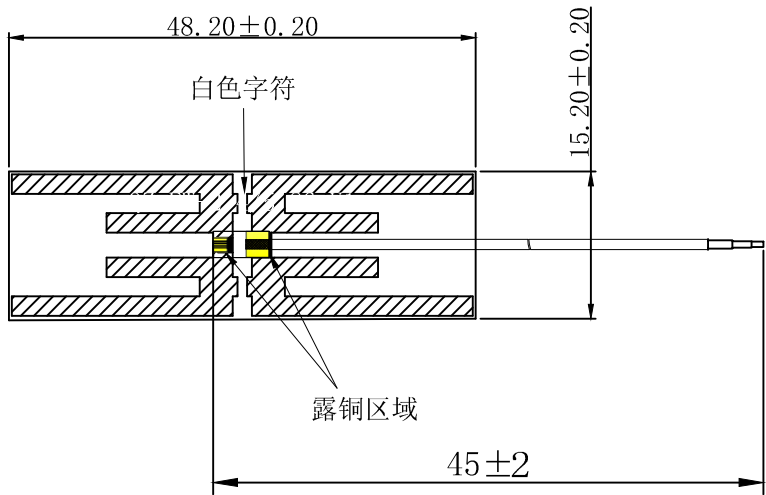
记录管制编号: FM-QE-E-02-14B

1. Antenna Specification/天线标准

Antenna Specification/天线技术参数		
Electrical Specification/电气特性		
Item/目录	Specification/规格	Comment/备注
Freq. Range/频段范围	2400MHz-2500MHz	
Impedance/阻抗	50 (Ω)	
VSWR/驻波比	≤ 3	
Directional/辐射方向	Omni directional/全向辐射	
Polarization/极化形式	Vertical polarization/垂直极化	
Peak Gain/峰值增益	6.89dBi	
Test condition/测试条件	passive test (无源测试)	
Total Efficiency/无源效率	$\geq 62\%$	
Mechanical Specification/机械指标		
Antenna type/天线类型	FPC 天线	
Connector Type/连接器类型	/	
RF Cable Type/射频线型号	1.13 黑色线 L45mm	
Connector Torque Test/连接器扭力	N/A	
Connector Pull Test/连接器拉力	N/A	
Salt Spray/盐雾测试	48 (H)	
Environmental Specification /环境指标		
Operating temp/工作温度	-40°C ~ +60°C	
Storage temp/存储温度	-40°C ~ +60°C	

2. Antenna Picture/天线图片

REV.	ECN NUMBER	DESCRIPTION	DATE	DRAWN	CHECKED	APPROVED
X1	ECN25****	FIRST RELEASE	10/28' 25	刘晓峰	丁第斌	黄颖



- 注:
- 图中  为线路区域,  为焊盘区域,  为背胶区域, 外形轮廓为基材区域。
 - 材料: FPC, 总厚度0.10±0.03mm(不含离型纸), 表面处理: 黑油。
 - 丝印字符要求: 白色。
 - FPC按照 整版 来料。
 - 标有“Q”为QC重点检测尺寸, 未注尺寸按照公差表要求。
 - 有害物质须符合ECT《QE-Q-19-001环境有害物质管理基准》管控标准。

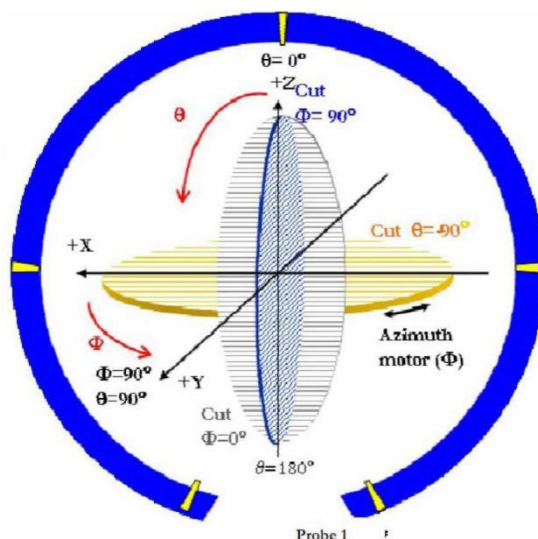
- NOTE:
- DIAGRAM  FOR THE LINE AREA,  FOR NICKEL PLATING AREA,  FOR THE BACK GLUE AREA, THE OUTLINE FOR BASE MATERIAL AREA.
 - MATERIAL: FPC, THE TOTAL THICKNESS OF 0.10±0.03MM (EXCLUDING FROM TYPE PAPER), SURFACE TREATMENT: BLACK OIL.
 - THE PRINTING CHARACTER REQUIREMENTS: WHITE.
 - FPC ACCORDING TO THE SHEET OF THE MATERIAL.
 - MARKED WITH "Q" KEY SIZE DETECTION FOR QC, NOT NOTE SIZE ACCORDING TO THE TOLERANCE TABLE.
 - HSF SHALL CONFORM TO THE STANDARD QE-Q-19-001 ENVIRONMENTAL HAZARDOUS SUBSTANCES MANAGEMENT

射频线	黑色1.13线			
焊盘	OSP			
油墨	T=10 μ m			黑色 LPI SOLDER MASK
FPC	18ED Cu+20.0AD+25.0PI 单面电解铜			
双面胶	T=0.05mm		3M9471	
各层材质	规格	品牌	型号	颜色或其它

	GENERAL TOLERANCE		SCALE:	DRAWN:	DATE:	DWG. NO:	TITLE:	REV.
	天线图形 ±0.05mm	孔与外形 ±0.10mm	1:1	刘晓峰	10/28' 25			X1
	模切外形 ±0.2mm	孔与孔位置 ±0.05mm	UNIT:	CHECK:	DATE:	PARTS NO. (INTENDED USE):	8180FW001-2.4GFPC天线	SHEET:
	孔径公差 ±0.05mm	天线图形到外形 ±0.15mm	mm	APPROVE:	DATE:			1/1
		金手指油墨位置 ±0.30mm	SIZE: A4					

4.1 The gain and total efficiency test/增益和效率测试

4.1.1 The definition of coordinate system/坐标系定义-Satimo SG24



The coordinate system of Chamber/暗室坐标系

The production test position/天线测试放置位置



24 探头微波暗室测试设备

4.1.2 The test result of total efficiency and total gain/天线效率及增益测试结果

LTE

2400MHz-2500MHz/5150MHz-5850MHz

Frequency	Efficiency (%)	Gain(dBi)
Frequency	E Total. dB(dB)	Efficiency()
2400MHz	6.89	67%
2410MHz	6.88	68%
2420MHz	6.78	66%
2430MHz	6.52	63%
2440MHz	6.41	64%
2450MHz	6.48	67%
2460MHz	6.41	69%
2470MHz	5.94	67%
2480MHz	5.93	66%
2490MHz	5.60	65%
2500MHz	5.20	63%

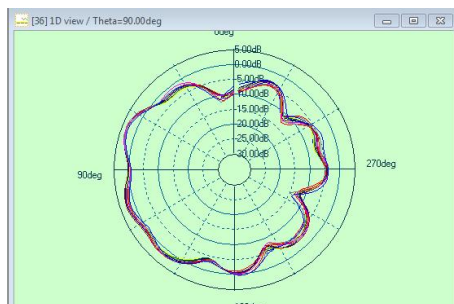
4.1.3 TRP&TIS

	Standard	Band	Channel	Frequency	Total
TRP	WIFI_B	B_11M	1	2412	20.96
	WIFI_B	B_11M	6	2437	20.57
	WIFI_B	B_11M	13	2472	21.14
TIS	WIFI_B	B_11M	1	2412	-82.73
	WIFI_B	B_11M	6	2437	-83.06
	WIFI_B	B_11M	13	2472	-68.54

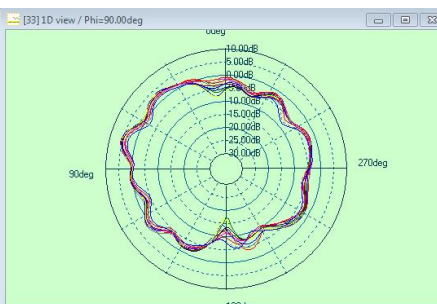
4.1.4 The antenna radiation pattern(2D)/天线辐射方向图 (2D)

LTE

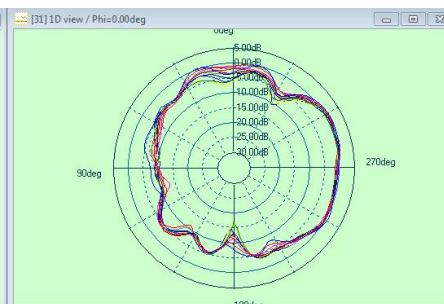
2400MHz-2500MHz



XOY



YOZ



XOZ

4.1.5 The antenna radiation pattern(3D)/天线辐射方向图 (3D)

WIFI

Frequency/频点 2450MHz

XOY

YOZ

XOZ

