



项目名称 (Project Name): EX4000-三合一

EX4000-WIFI&BT&GPS

天线型号 (Antenna model): ZTX-EX4000-W/B/G-ANT

A

物料编码 (Item number): E.03.00817

MPN 码 (MPN) : B0680328D

日期 (Date) : 2023-5-26

设计公司: 福州中天迅通信技术有限公司

Design company: Fuzhou zhongtianxxun communication technology Co., Ltd

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版本 Edition	日期 Date	状态 Status
A1	2022-12-6	规格书制定。 Specifications.
A2	2023-2-15	增加性能数据；FPC 结构图纸更新。 Add performance data; FPC structural drawing updated.
A3	2023-4-3	图纸更新，性能数据更新。 Drawings updated, performance data updated.
A4	2023-5-26	FPC 外形更新。 FPC form factor update.





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1 名词解释 (Noun interpretation)

dBi	Decibel relative isotropic antenna
Tx	Transmit frequency
Rx	Receive frequency
TRP	Total Radiated Power
TIS	Total Isotropic Sensitivity
VSWR	Voltage Standing Wave Ratio
GSM	Global Service for Mobile communication
DCS	Digital Communication System
CDMA	Code Division Multiple Access
WCDMA	Wideband Code Division Multiple Access

2 测试设备 (Test equipment)

矢量网络分析仪 (Vector network analyzer)	安捷伦 8753E (Agilent 8753E)
频谱分析仪 (Frequency analyzer)	
综合测试仪 (General-purpose tester)	安捷伦 8960 E5515C
标准高性能无反射屏蔽暗室 (High performance no-reflection shielding darkroom)	ETS
8m*4m*4m	

3 适用频段 (Applied frequency band)

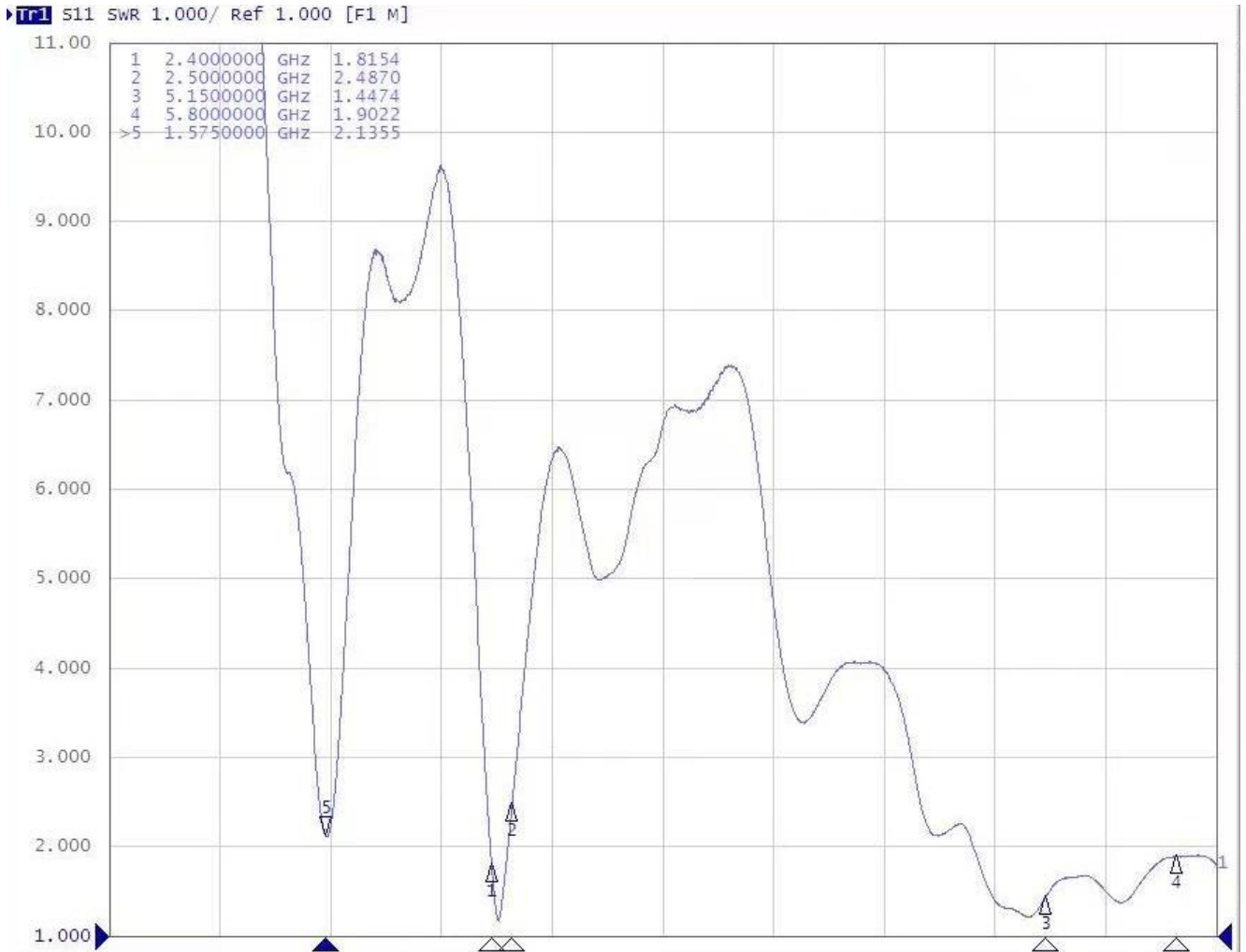
Frequency Band	Frequency
三合一	1550-1620MHz, 2400-2500MHz, 5150-5850MHz。





4. 测试指标和数据图表 (Test metrics and data charts)

4.1 驻波图 (VSWR)





4.2 无源效率 (Passive efficiency)

chNo	Freq (MHz)	Gain (dBi)	Efficiency_Pcent (%)
1	1550	-2.840693	22.530043
2	1555	-2.657925	23.745111
3	1560	-2.313856	24.952168
4	1565	-2.283235	24.506304
5	1570	-2.336127	24.88837
6	1575	-2.433081	24.969801
7	1580	-2.665282	24.562768
8	1585	-2.898736	24.091603
9	1590	-2.691075	23.654225
10	1595	-2.566369	24.455626
11	1600	-2.118148	26.4209
12	1605	-2.027053	26.008596
13	1610	-1.897507	25.353641
14	1615	-1.834048	24.546532
15	1620	-1.896284	23.548223
16	1625	-1.949206	22.325057





chNo	Freq (MHz)	Gain (dBi)	Efficiency_Pcent (%)
17	2400	-7.24524	18.85715
18	2410	-6.95825	20.14536
19	2420	-6.77677	21.00499
20	2430	-6.89102	20.45966
21	2440	-7.09352	19.52755
22	2450	-7.07797	19.059761
23	2460	-7.07663	20.00365
24	2470	-6.83822	20.7099
25	2480	-6.95067	20.18056
26	2490	-6.96729	20.10349
27	2500	-6.66523	21.55149
28	5150	-2.693299	21.55149
29	5200	-2.044277	20.68806
30	5250	-1.466045	20.430073
31	5300	-1.997082	22.403377
32	5350	-2.508789	25.165241





chNo	Freq (MHz)	Gain (dBi)	Efficiency_Pcent (%)
33	5400	0.0900223	30.494266
34	5450	0.6499624	29.58646
35	5500	-1.08377	25.861612
36	5550	-1.712714	23.409058
37	5600	-2.092564	20.210568
38	5650	-2.045162	21.837575
39	5700	-1.512854	20.605174
40	5750	-1.77265	20.153659
41	5800	-1.02563667	21.157309
42	5850	-1.211737	23.623683





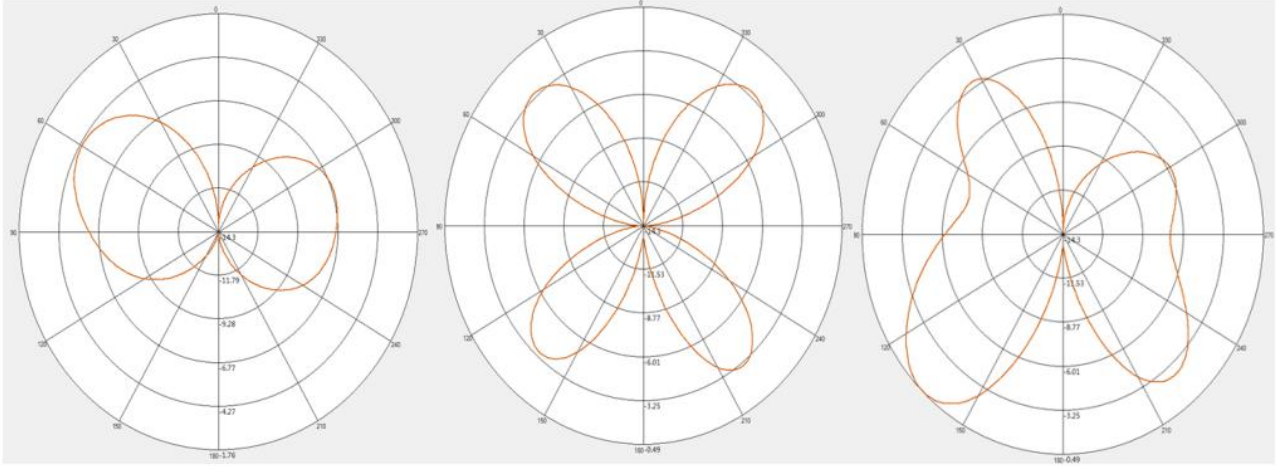
4.3 2D 方向图 (2D pattern)

1575MHz

XOY

XOZ

YOZ

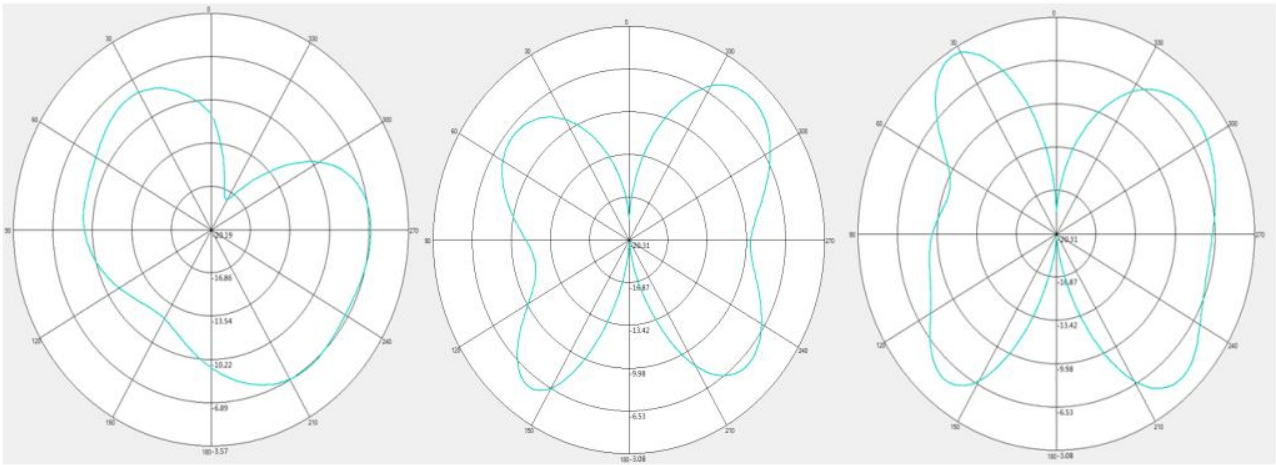


2450MHz

XOY

XOZ

YOZ



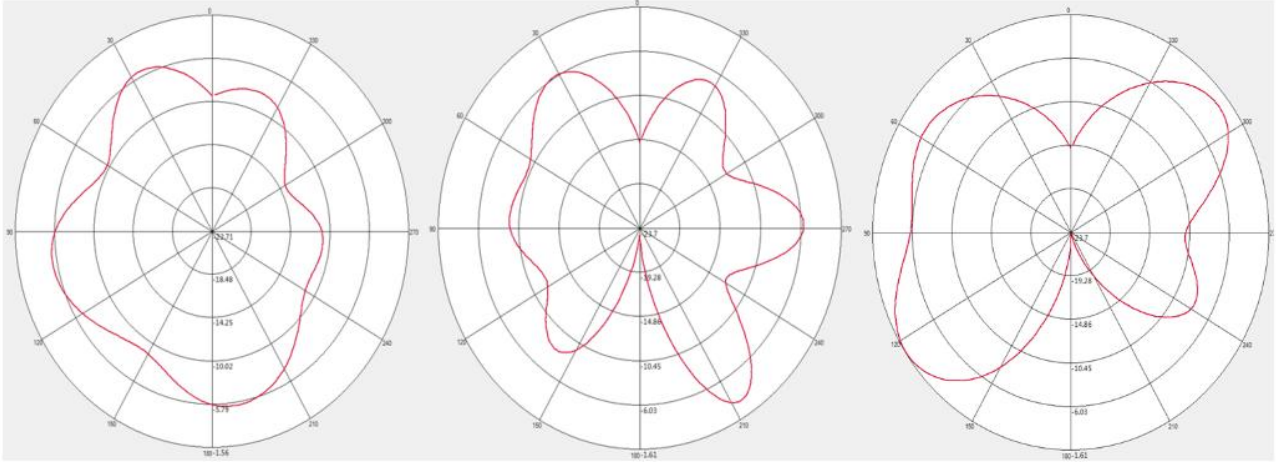


5500MHz

XOY

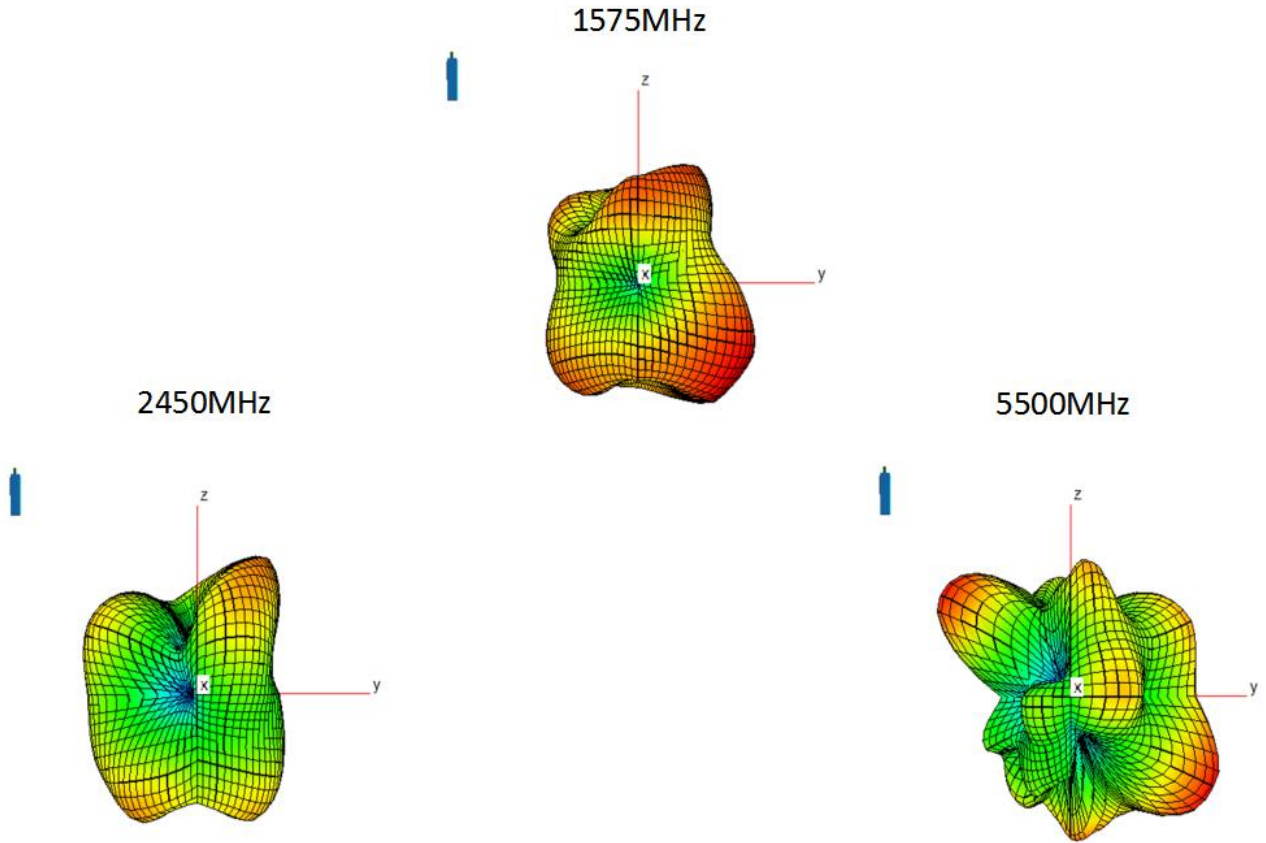
XOZ

YOZ





4.4 3D 辐射图 (3d radiation map)





4.5 有源数据 (Active data)

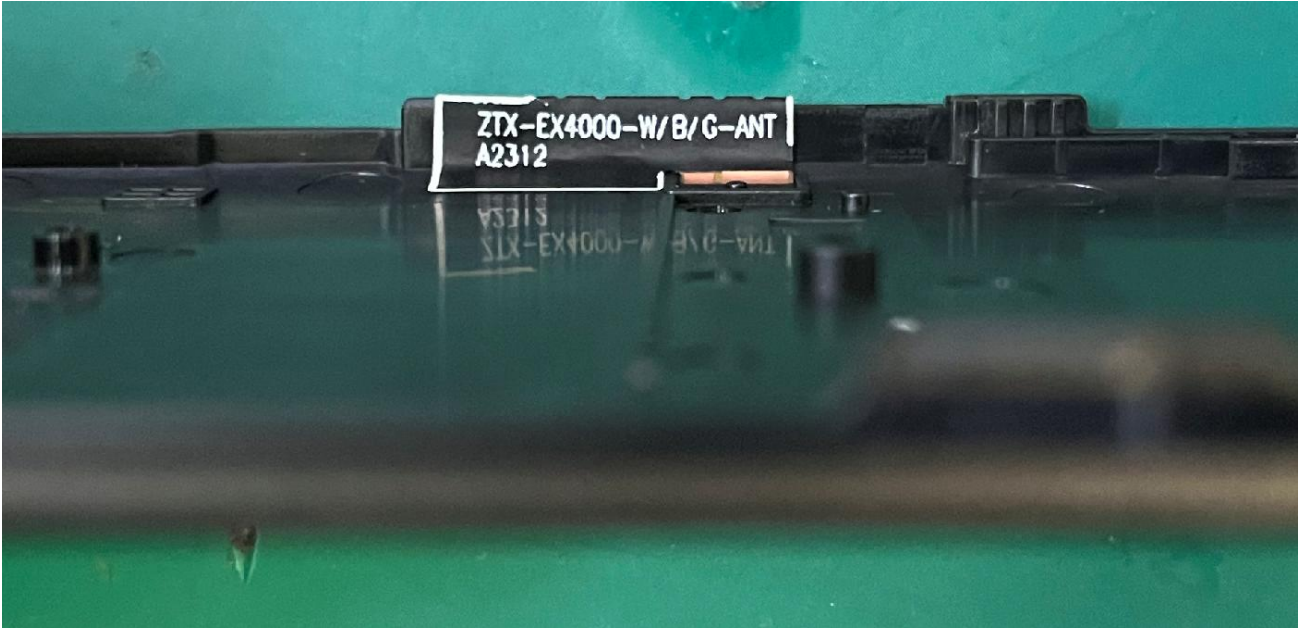
频段 Frequency band	参数\信道 Parameter \ channel	1	7	13
WIFI-11B	TRP (dBm)	13.49	13.57	11
	TIS (dBm)	-76.22	-78.07	-75.22
频段 Frequency band	参数\信道 Parameter \ channel	1	7	13
WIFI-11G	TRP (dBm)	13.12	13.24	10.25
	TIS (dBm)	-64.55	-67.02	-64.12
频段 Frequency band	参数\信道 Parameter \ channel	1	7	13
WIFI-11N	TRP (dBm)	13.09	13.41	10.57
	TIS (dBm)	-61.17	-63.04	-60.49

频段 Frequency band		
GPS	TIS (dBm)	-146.27



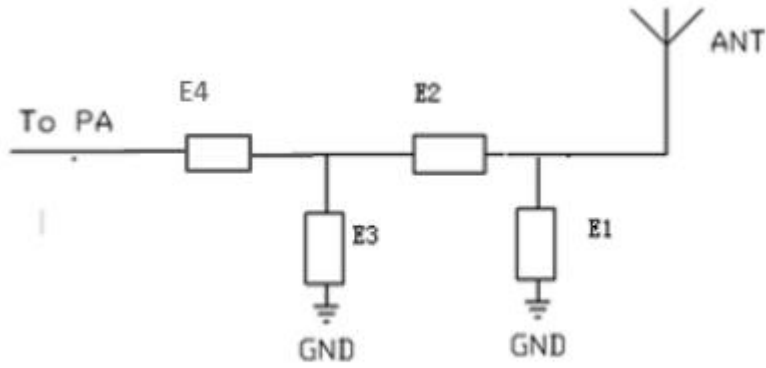


4.6 装配图 (Environment treatment)





5. 匹配说明 (Matching circuit)

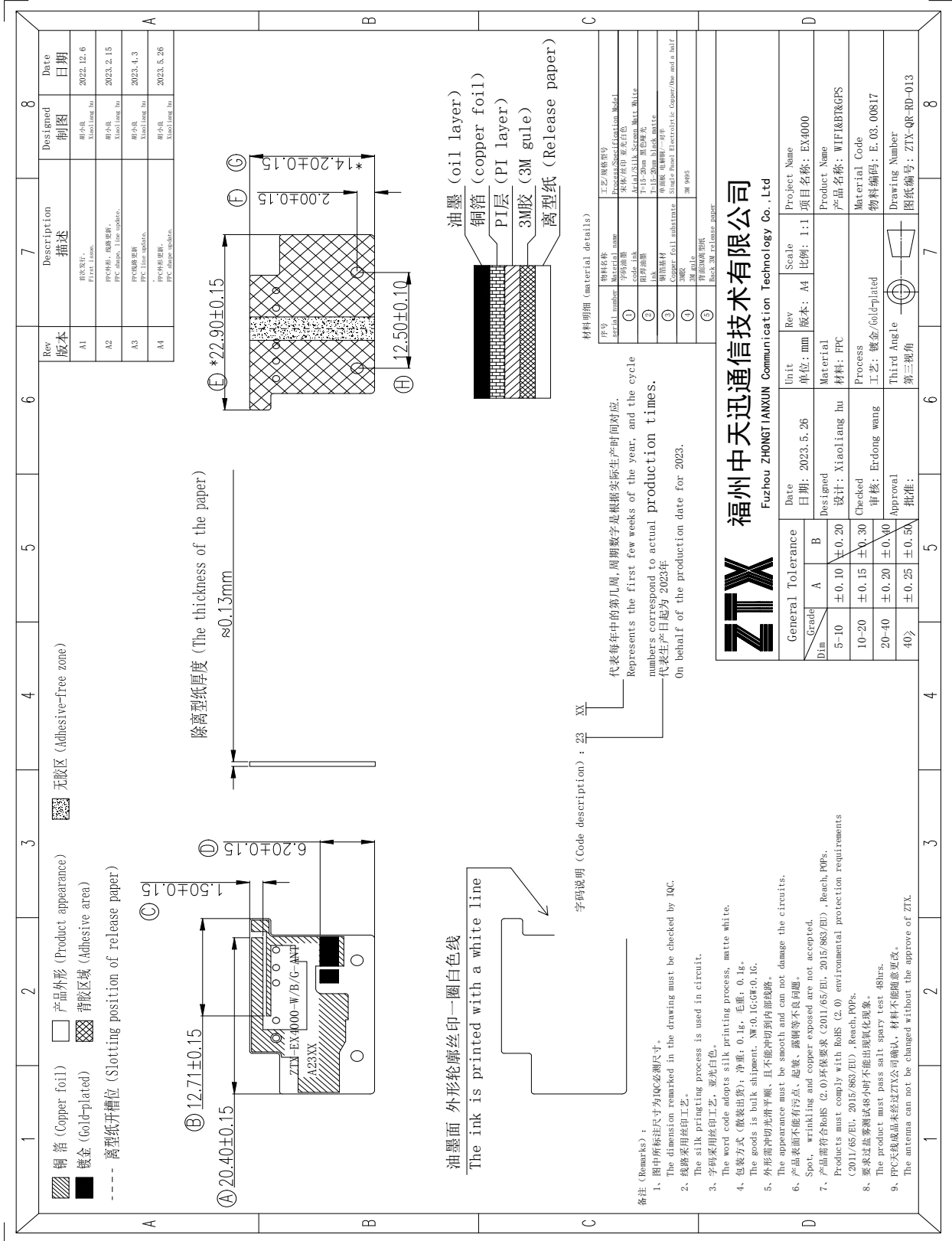


匹配说明 Matching structure	
E1	12nH
E2	1.5nH
E3	NC
E4	0Ω



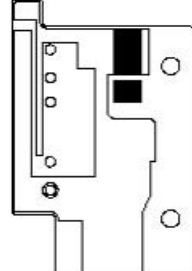





6. 天线外形图 (Mechanical Specification)

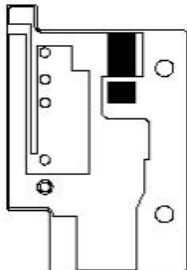







7. 包装作业指导 (Packaging operation instruction)

福州中天迅通信技术有限公司 Fuzhou ZHONGTIANXUN Communication Technology Co.,Ltd					作业指导书																																													
产品名称	产品型号	文件编号	版本	工序序号/名称	工序工时	日产量																																												
三合一	EX4000	ZTX-QD-WI-024	A1	包装	/	/																																												
<p>作业方法 (自该工序作业合格后,方能流入下一道工序)</p> <p>1. 产品采用单PCS出货,每(100pcs)产品用90*130mmPE封口膜</p> <p>2. 每个160*240mmPE开口膜袋装10小袋(1000PCS),尾数除外;</p> <p>3. 外箱上除标签贴外,不能有任何丝印(即空白纸箱)出货;</p> <p>4. 将包装好的产品装入纸箱,每箱数量根据订单数量要求进行数量确认,保证每箱装入的数量正确。</p> <p>5. 在装好产品的箱子上将外箱标签及物料追溯码,RoHS贴于外箱的右上角,打印标签内容包含(生产产家,型号,产品名称,客户编码,数量,订单号,日期,QA检验,)</p>																																																		
<p>注意事项:</p> <p>1. 发现重量有超出公差范围时,须对数量进行清点</p> <p>2. 外箱只允许有1个物料标签,其余如有多余标签时须将其清理干净。</p> <p>3. 条码标签在贴于外箱时,应尽量平整,避免应起皱影响客户入库。</p> <p>4. 条码需清晰可扫描</p>																																																		
<table border="1"> <thead> <tr> <th>物料编号</th> <th>物料名称及规格</th> <th>用量</th> <th>工/夹具治具</th> </tr> </thead> <tbody> <tr> <td></td> <td>纸箱(45*32.5*21)cm</td> <td>1</td> <td>电子称</td> </tr> <tr> <td></td> <td>PE封口袋(90*130)mm</td> <td>200</td> <td>封口机</td> </tr> <tr> <td></td> <td>PE开口袋(160*240)mm</td> <td>20</td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>							物料编号	物料名称及规格	用量	工/夹具治具		纸箱(45*32.5*21)cm	1	电子称		PE封口袋(90*130)mm	200	封口机		PE开口袋(160*240)mm	20																													
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<p>图1: 确认数量</p>  <p>图2: 每10小袋用大PE袋包装</p>  <p>图3: 小标签及追溯码</p>  <p>图4: 贴外箱标签,封箱</p> 																																																		
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制订	胡小良	审核	易爱玲	品质确认	胡春梅	批准																																												
						张武民																																												



product name	product model	File Number	version	Process number/name	process man-hour	Daily output																																								
三合一	EX4000	ZTX-QD-WI-024	A1	package	/	/																																								
Packaging process																																														
<p>1. The products are shipped in a single PCS, and each (100pcs) product is packed in a 90*130mm PE sealing plastic bag:</p>  <p>Figure 1: Confirmed quantity</p>  <p>Figure 2: Every 10 sachets are packed in large PE bags</p>  <p>Figure 3: Small label and traceability code</p>  <p>Figure 4: Attach the outer box label and seal the box</p>																																														
<p>2. Each 160*240mm PE open plastic bag is packed in 10 sachets (1000PCS), except the mantissa.</p> <p>3. Except for the label, the outer box cannot be shipped with any silk screen (ie blank carton):</p> <p>4. Put the packaged products into cartons, and confirm the quantity of each box according to the order quantity requirements to ensure that the quantity of each box is correct.</p> <p>5. Put the outer box label and material traceability code, RoHS on the upper right corner of the outer box on the box with the product, and the printed label content includes (manufacturer, model, product name, customer code, quantity, order number, date , QA inspection,)</p>																																														
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<p>Precautions</p> <p>1. When it is found that the weight is out of the tolerance range, the quantity must be counted</p> <p>2. Only 1 material label is allowed in the outer box. If there are extra labels, they must be cleaned up.</p> <p>3. When the bar code label is attached to the outer box, it should be as flat as possible to avoid wrinkling that affects the customer's storage.</p> <p>4. The barcode must be clear and scannable</p>																																														
modify the content																																														
version						Revision date	Revised by																																							
Formulate	Xiaoliang hu	Review	Ailing yi	Quality confirmation	Chunmei hu	Approve	Wumin zhang																																							