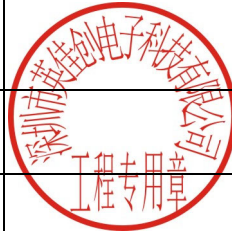




# APPROVAL SHEET

## 承认书

CUSTOMER NAME 客戶名稱		
CUSTOMER P/N 客戶料號		
PART NAME 品名	2.4G/5G 內置金屬插件天線 (WIFI-L) 2.4G/5G built-in metal plug-in antenna	
P/ N 料號	YJC-6N000-B402	
APPROVAL REV. 版次	A1	
DELIVERY DATE 送樣日期	2022 年 11 月 24 日	
PREPARED BY 承辦	吳佳雄	
CHECKED BY 審核	方文鋒	
APPROVED BY 核準	肖漢	
Customer Approved 客戶承認		
Prepared By 承辦	Checked By 審核	Approved By 核準



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## 目錄 (Catalogue)

1、	封面 (Cover) .....	1
2、	目錄 (Catalogue) .....	2
3、	履歷表 (Resume) .....	3
4、	產品平面圖 (Product plan) .....	4
5、	天線技術參數 (Antenna technical parameters) .....	5
6、	環境性能測試 (Environmental performance testing) .....	6
7、	天線貼附位置圖 (Antenna attachment position diagram) .....	7
8、	天線性能測試圖 (Antenna performance test diagram) .....	7
9、	隔離度測試圖 (Isolation test chart) .....	8
10、	2D. 3D (2. 4G/5G) 測試數據 (Test data) .....	9-13
11、	吞吐量測試數據 (Throughput test data) .....	14-17
12、	OTA有源測試數據統計 (OTA active test data statistics) .....	18
13、	ROHS物料控制報告 (ROHS Material control report) .....	19



履歷表(Resumer):

版本 Version	變更內容及更改原因 Changes and reasons	發行 publish	發行 publish
A/0	初版發行 (Issued)	2022 年 10 月 28 日 (October 28, 2022)	
A/1	增加鋼印 (Adding steel marks)	2022 年 11 月 24 日 (November 24, 2022)	



產品平面圖 (Product plan):

由 Autodesk 教育版产品制作

A	B	C	D	E	F	G												
1						1												
2						2												
3	<p style="color: red; font-weight: bold; font-size: 1.2em;">WIFI-1L</p>					3												
4	<p>Requirement:</p> <ol style="list-style-type: none"> <li>1. The finished product must be tested 100% through OK</li> <li>2. The finished product shall be subject to 100% full inspection OK.</li> <li>3. Adopt environmental protection process. Finished product</li> <li>4. Meet ROHS requirements</li> <li>5. No tolerance shall be subject to general tolerances</li> <li>6. The packing method is braided tape packing.</li> </ol>					4												
5	<p>要求: 1. 成品須100%测试导通OK</p> <p>2. 成品須100%全检OK.</p> <p>3. 采用环保制程. 成品</p> <p>4. 符合ROHS要求.</p> <p>5. 未注公差请以一般公差为准.</p> <p>6. *包装方式采用编带包装.</p>					5												
6	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">频率范围(Frequency Range)</td> <td>2400-2500/5150-5850MHz</td> </tr> <tr> <td>增益 (Gain)</td> <td>4DBI</td> </tr> <tr> <td>电压驻波比(VSWR)</td> <td>&lt;1.92</td> </tr> <tr> <td>极化 (Polarization)</td> <td>Linear. Vertical</td> </tr> <tr> <td>最大功率(Max power rating)</td> <td>50W</td> </tr> <tr> <td>特性阻抗 (Impedance)</td> <td>50Ω</td> </tr> </table>					频率范围(Frequency Range)	2400-2500/5150-5850MHz	增益 (Gain)	4DBI	电压驻波比(VSWR)	<1.92	极化 (Polarization)	Linear. Vertical	最大功率(Max power rating)	50W	特性阻抗 (Impedance)	50Ω	6
频率范围(Frequency Range)	2400-2500/5150-5850MHz																	
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特性阻抗 (Impedance)	50Ω																	
A	B	C	D	E	F	G												

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REV	DATE	DESCRIPTION	NAME
A0	2022-10-27	NEW	吴佳雄
A1	2022-11-24	更新增加钢印	吴佳雄

	<p>零件名称 (PART NAME)</p> <p>2.4G/5G 内置贴片金属天线</p>	<p>单位 (UNIT)</p> <p>20.3*3.2mm*0.3mm</p>	<p>版本 (REV)</p> <p>A0</p>	<p>日期 (DATE)</p> <p>2022-11-24</p>
<p>设计</p> <p>吴佳雄</p>	<p>第1页,共1页</p>	<p>深圳市英佳创电子科技有限公司</p> <p>SHENZHEN YINGJIACHUANG TECHNOLOGY ELECTRONIC CO.,LTD</p>		

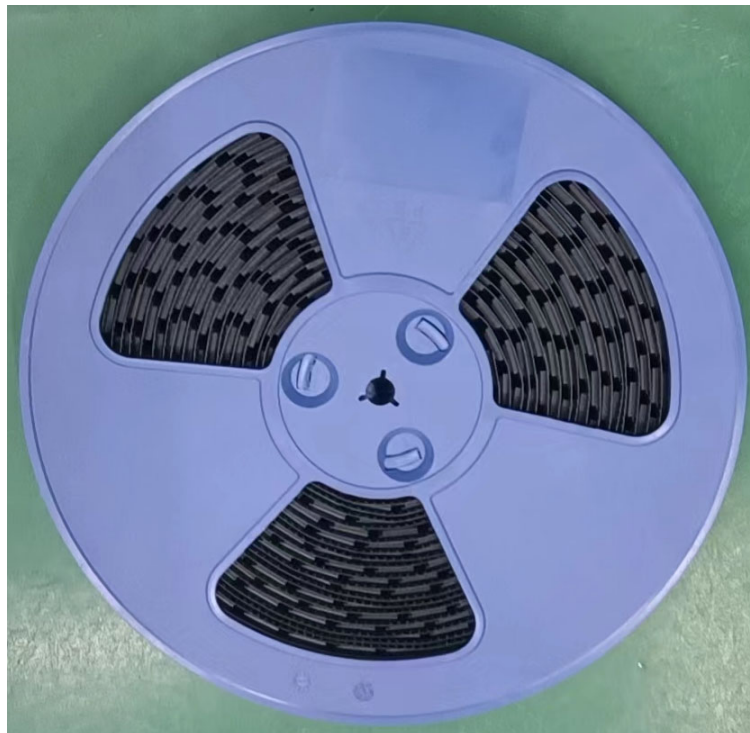
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天線技術參數(Antenna technical parameters):

電氣技術參數 (Electrical technical parameters)	
電性能指標 (Electrical Specifications)	
頻率範圍 (Frequency Range)	2400 -2500/5150-5850MHZ
電壓駐波比 (VSWR)	<1.92
輸入阻抗 (Input Impedance)	50 Ω
方向 (Direction)	全向
增益 (Gain)	WiFi1: 2.4G $\geq$ 1.81dBi, 5G $\geq$ 2.09dBi
機械指標 (Mechanical Specifications)	
材質	304 不鏽鋼 (Stainless steel)
工作溫度	-20°C~+70°C
工作溼度	20~80%

包裝方式 (The packing way):





環境性能測試(Environmental performance testing):

項目(Project)	測試條件 (Test condition)	規格(Specification)
儲存環境 Storage Conditions	In the absence of specified test temperature, humidity, air pressure is as follows: 在沒有指定的情況下測試溫度、溼度、氣壓如下: 1. Temperature is $-30\text{ }^{\circ}\text{C} \sim +80\text{ }^{\circ}\text{C}$ 1. 溫度為 $-30^{\circ}\text{C} \sim +80^{\circ}\text{C}$ 2. Relative humidity of 45% to 85% 2. 相對溼度為45%-85% 3. Air pressure is 86 kpa to 106 kpa 3. 氣壓為86kpa-106kpa	Electrical and mechanical properties is normal 電氣機械性能正常
高低溫試驗 high and low temperature test	Between $70\text{ }^{\circ}\text{C}$ and $-20\text{ }^{\circ}\text{C}$ for 5 loops, then 1-2 h under normal conditions, check the appearance quality. 在 $70^{\circ}\text{C}$ 與 $-20^{\circ}\text{C}$ 之間進行5次循環,然後在正常條件下1-2H,檢查外觀質量。	Size should meet the requirements and should satisfy the content with the electrical and mechanical properties 尺寸應滿足規定並應滿足於機械、電氣性能
耐恆定 溼熱試驗 Constant damp and hot resistance test	95 + / - 3% relative humidity, temperature test: $40\text{ }^{\circ}\text{C}$ . 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 相對溼度 $95\pm 3\%$ , 試驗溫度: $40^{\circ}\text{C}$ .持續 2H 作用後, 試品取出後 5min 之內測定電氣性能, 試品在正常條件下 1-2H, 檢查外觀質量	Size should meet the requirements and should satisfy the content with the electrical and mechanical properties 尺寸應滿足規定並應於機械、電氣性能
振動試驗 vibration test	10-55 hz, vibration frequency range of displacement amplitude: 0.35 MM, acceleration amplitude: 50.0 M/S, sweep cycles: 30 times 振頻範圍 10-55HZ, 位移幅值: 0.35MM, 加速度幅值: 50.0M/S, 掃頻循環次數: 30 次	Electrical and mechanical properties is normal 電氣機械性能正常
跌落試驗 fall down test	1 m high altitude in accordance with the perpendicular axis free drop 3 times 1M高空按照互相垂直的軸方向自由跌落3次	Electrical and mechanical properties is normal 電氣機械性能正常

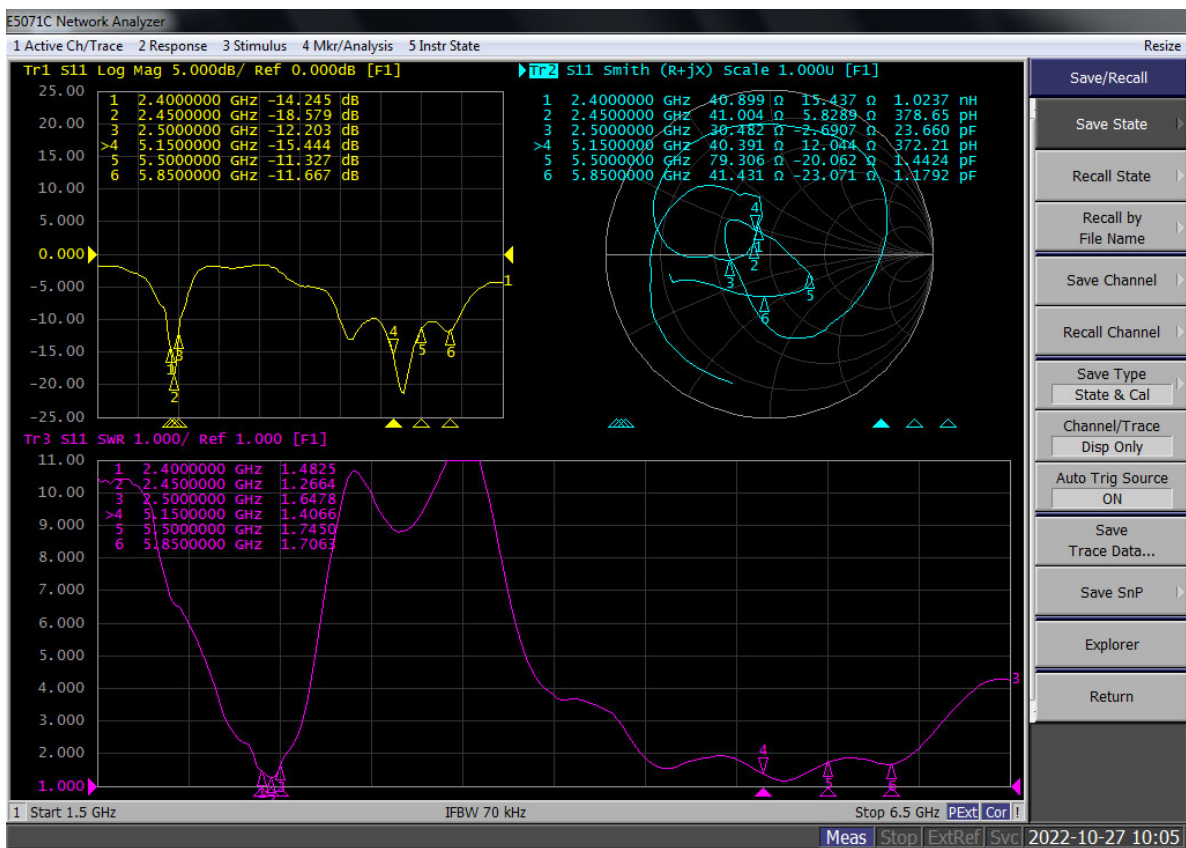


天線貼附位置圖 (Antenna attachment position diagram) :

天線貼附位置圖  
Antenna attachment position diagram

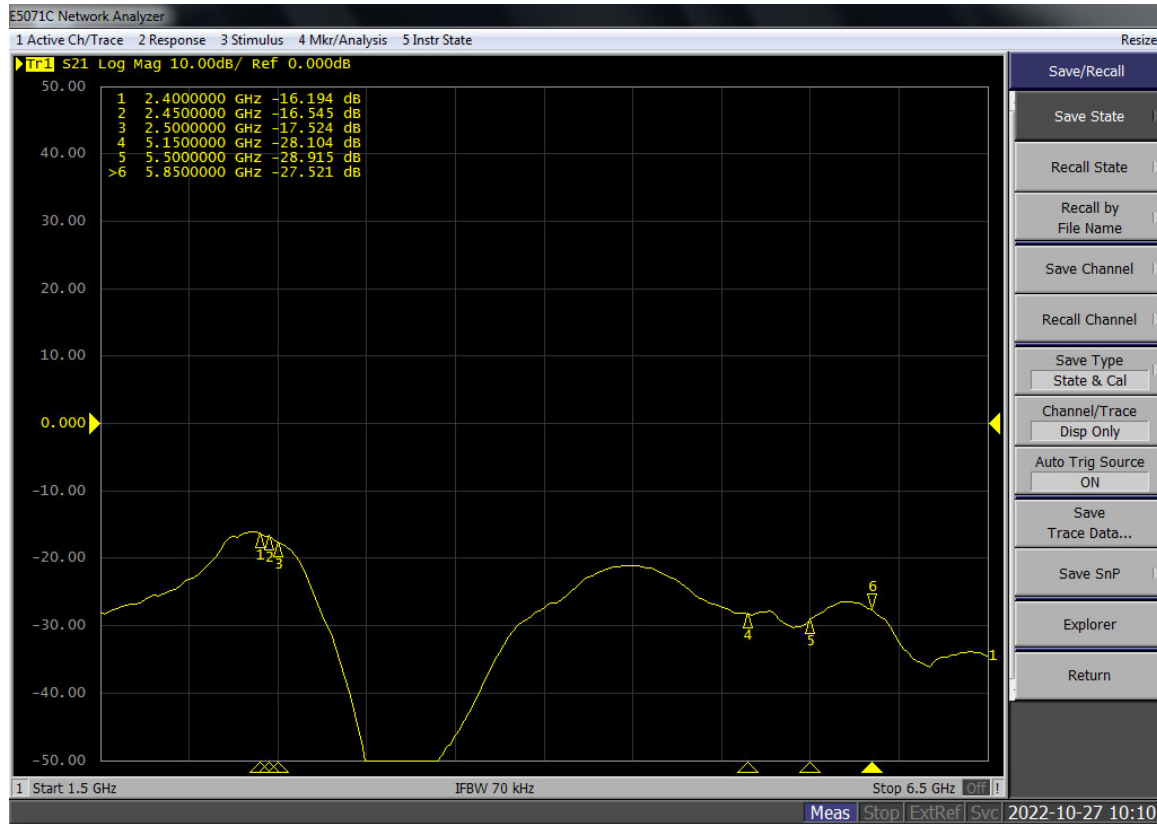


天線性能測試圖 (Antenna performance test diagram) (WIFI1) :

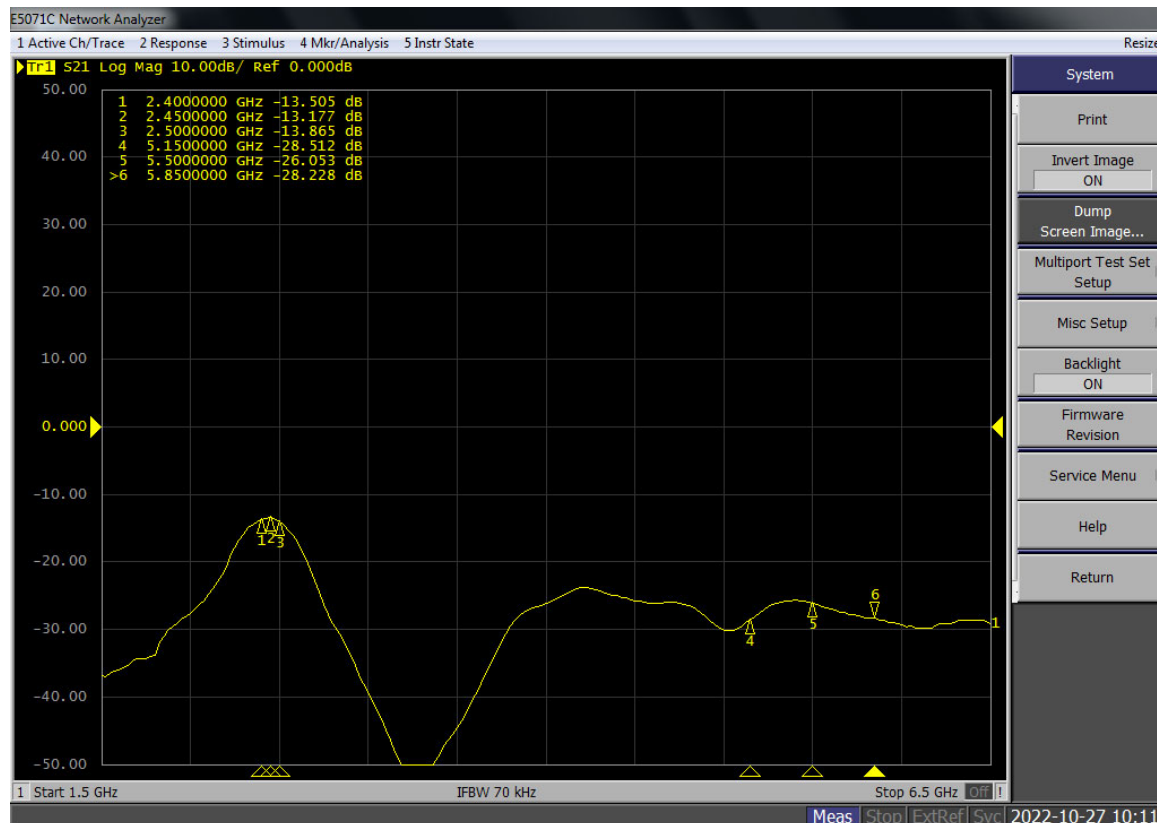




## WIFI 1--WIFI 2 隔離層



## WIFI 1--BT 隔離層







2D、3D 測試數據 Test data(WIFI 1: 2.4G/5G) :

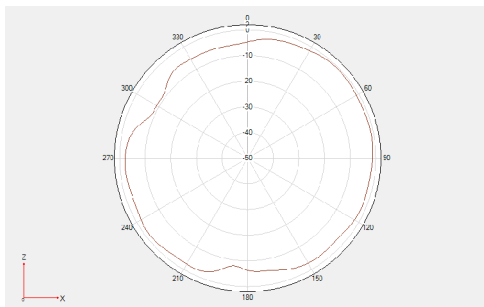
Frequency (MHz)	Efficiency (%)	Gain. (dBi)
2400	62.37	2.92
2410	61.24	2.78
2420	61.09	2.75
2430	59.7	2.6
2440	59.98	2.6
2450	58.75	2.52
2460	58.34	2.46
2470	57.02	2.16
2480	55.85	1.81
2490	54.95	2.05
2500	53.58	2.08
5000	64.27	2.09
5025	65.46	2.43
5050	65.92	2.76
5075	64.12	2.79
5100	64.86	2.99
5125	66.37	3.28
5150	64.42	3.3
5175	63.97	3.48
5200	64.57	3.69
5225	64.12	3.57
5250	63.68	3.43
5275	65.01	3.58
5300	67.61	3.99
5325	67.92	4.07
5350	67.76	4.04
5375	69.34	4.21
5400	69.34	4.34
5425	68.23	4.08
5450	67.61	3.93
5475	65.61	3.97
5500	63.97	3.9
5525	61.38	3.66
5550	60.95	3.58
5575	60.81	3.71
5600	58.61	3.81



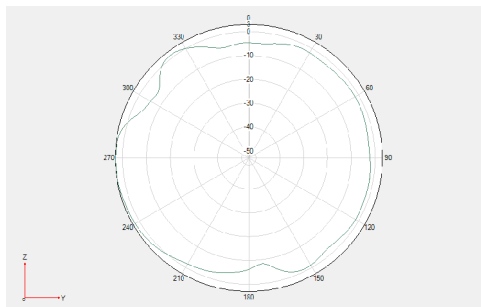
Frequency (MHz)	Efficiency (%)	Gain. (dBi)
5625	58.08	3.77
5650	56.62	3.69
5675	54.45	3.7
5700	54.7	3.8
5725	54.58	3.73
5750	53.83	3.68
5775	53.83	3.83
5800	52	3.74
5825	56.25	3.67
5850	54.57	3.78

WIFI 1 天線方向圖-2.4G/5G(Antenna direction diagram - 2.4G/5G)

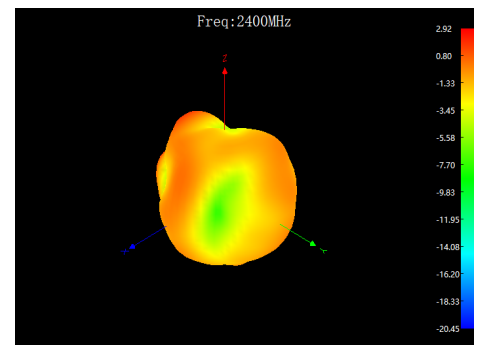
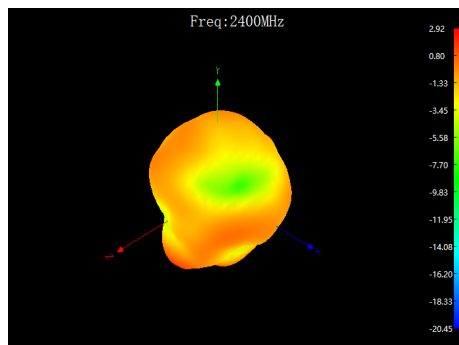
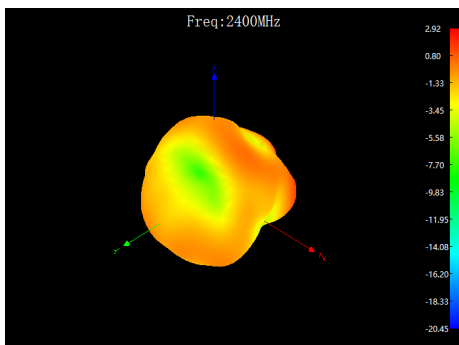
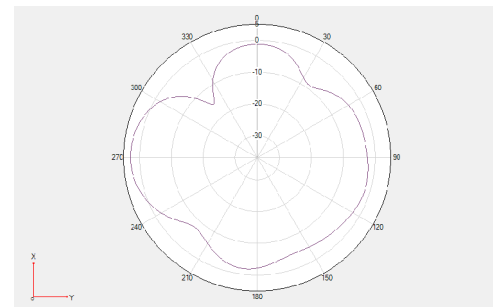
Phi =0 freq=2400MHz



Phi =90 freq=2400MHz

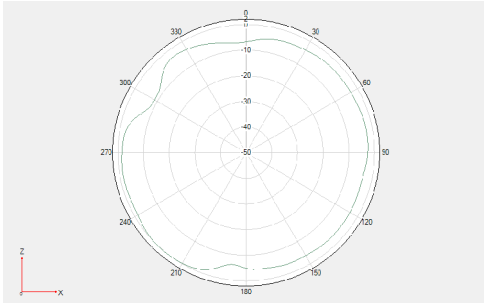


Theta =90 freq=2400MHz

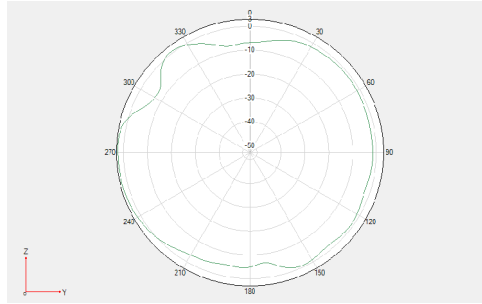




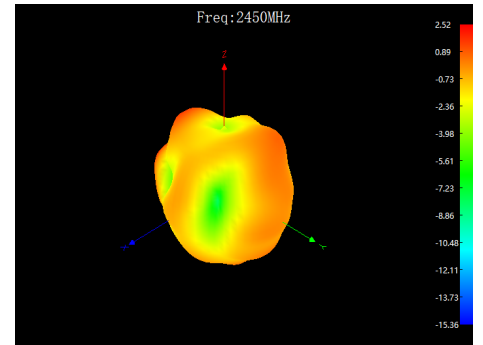
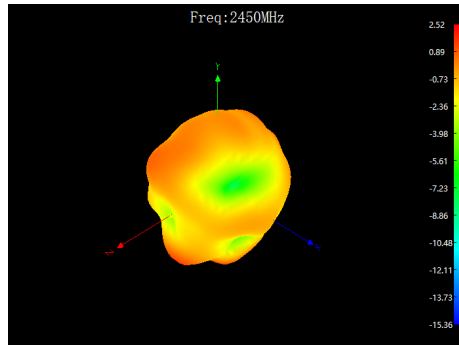
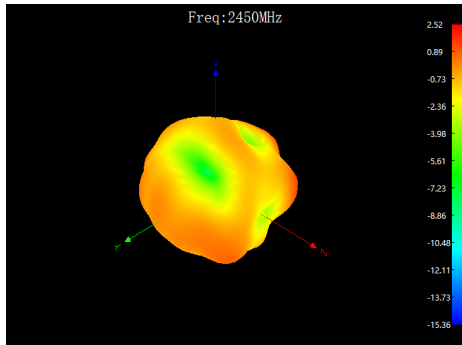
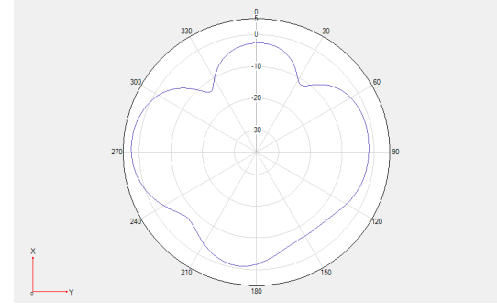
Phi =0 freq=2450MHz



Phi =90 freq=2450MHz

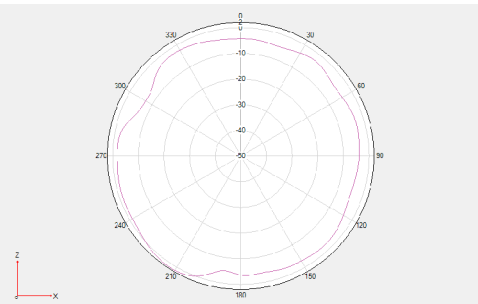


Theta =90 freq=2450MHz

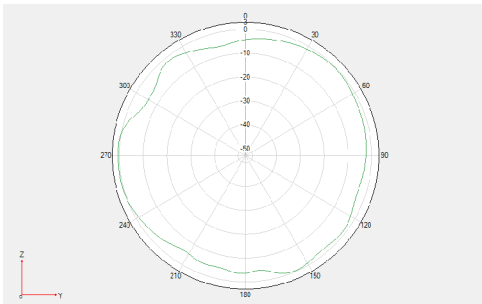


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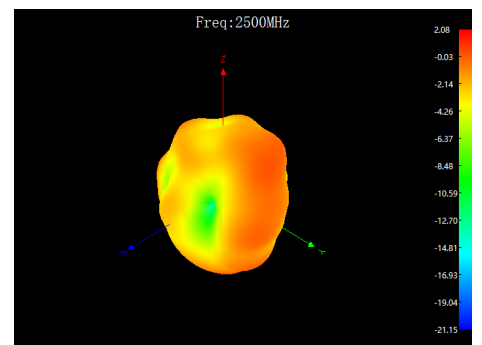
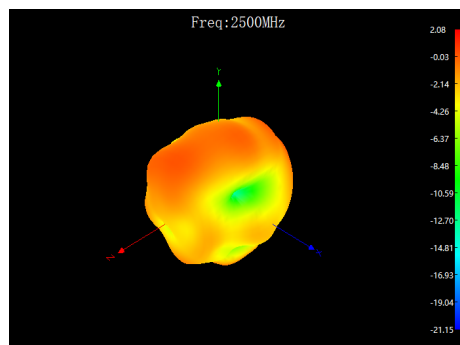
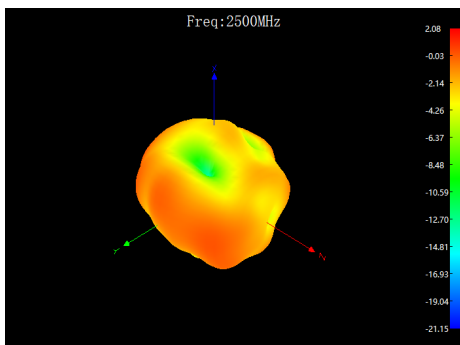
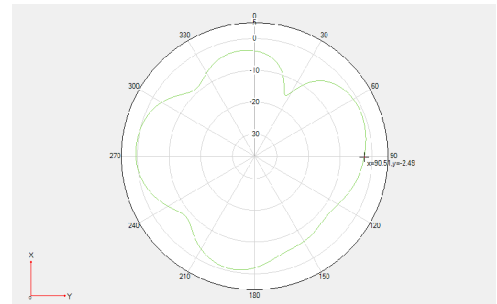
S



Phi =90 freq=2500MHz

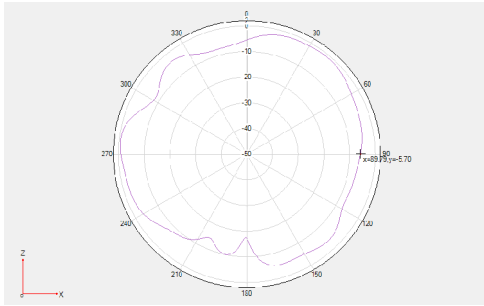


Theta =90 freq=2500MHz

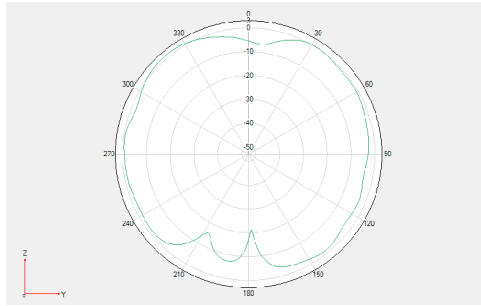




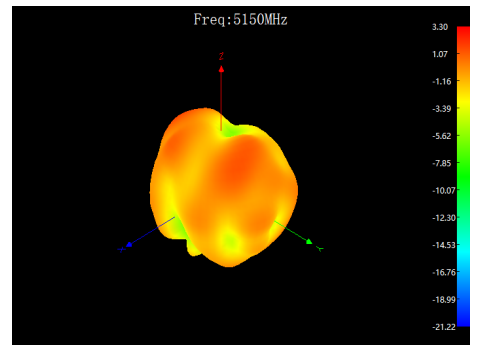
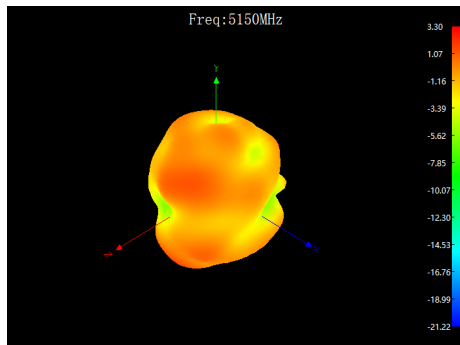
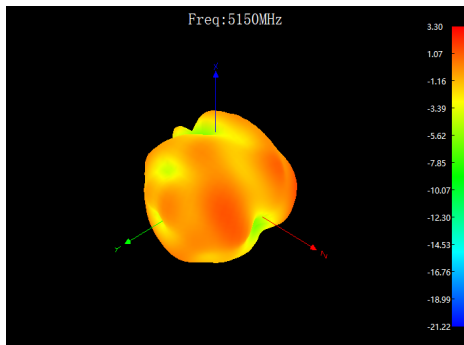
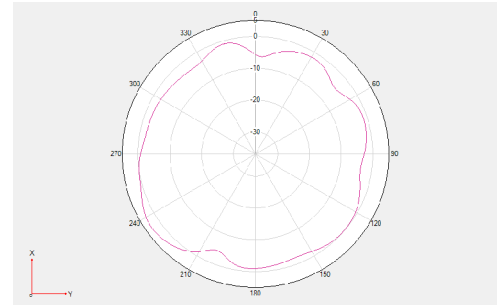
Phi =0 freq=5150MHz



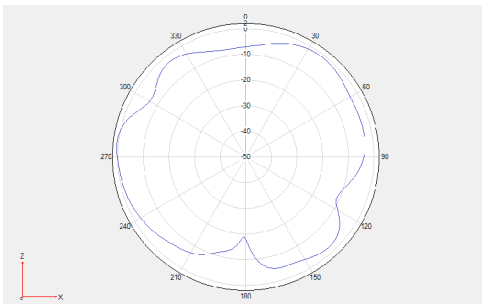
Phi =90 freq=5150MHz



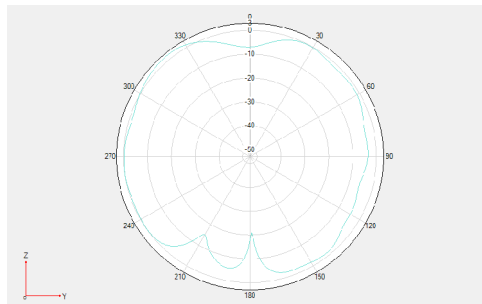
Theta =90 freq=5150MHz



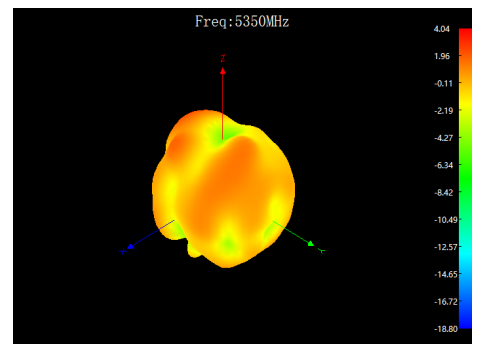
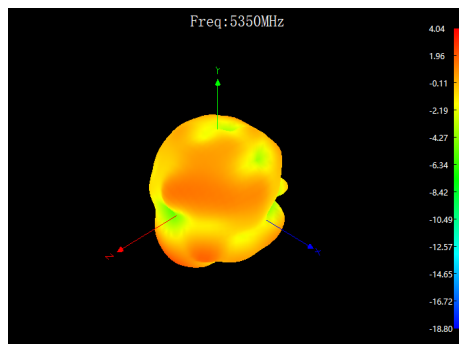
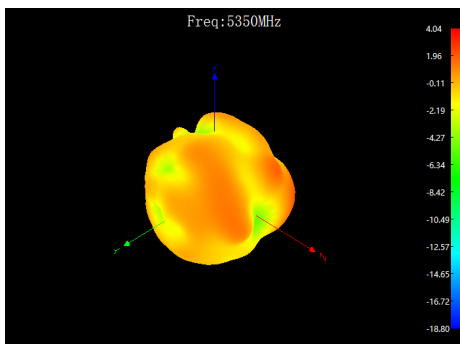
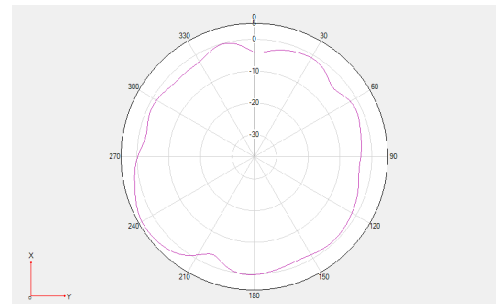
Phi =0 freq=5350MHz



Phi =90 freq=5350MHz

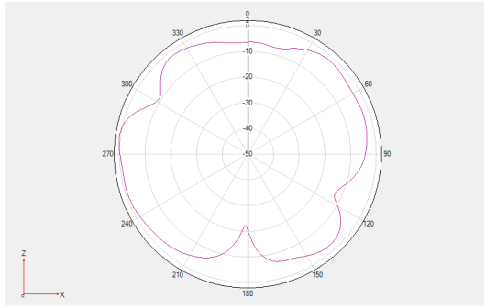


Theta =90 freq=5350MHz

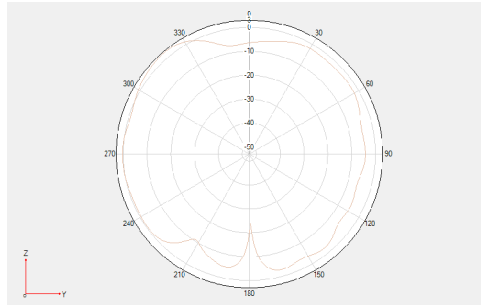




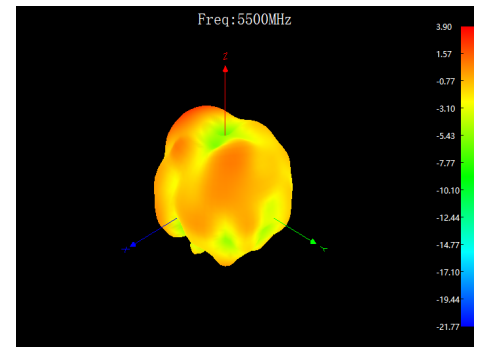
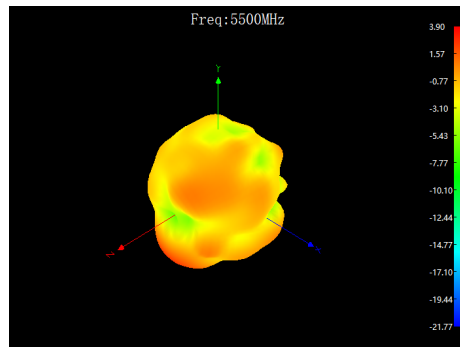
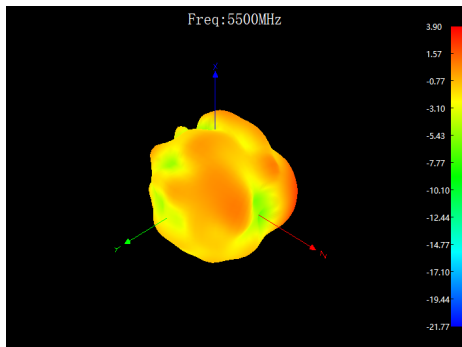
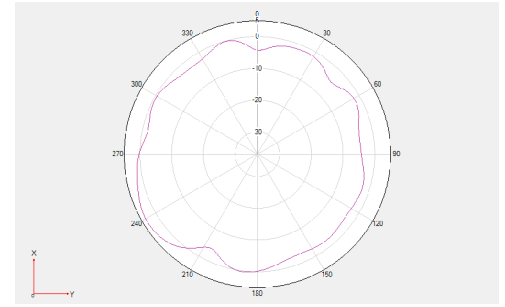
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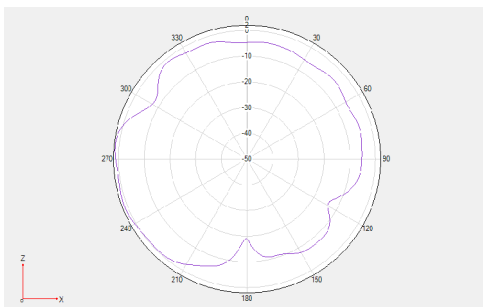
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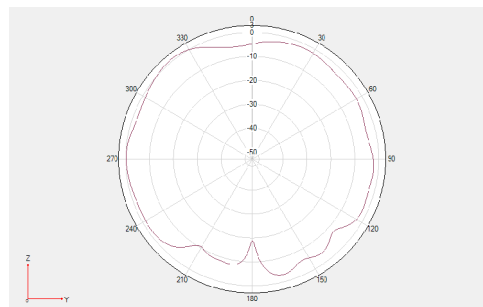
Theta =90 freq=5500MHz



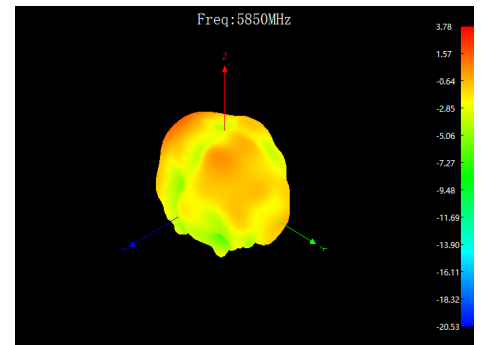
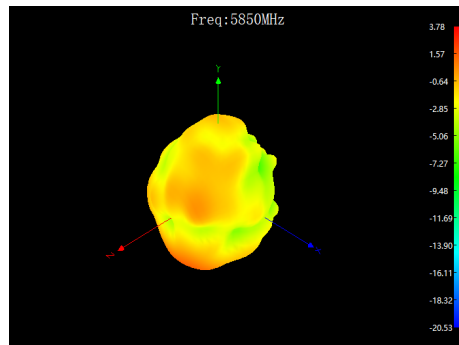
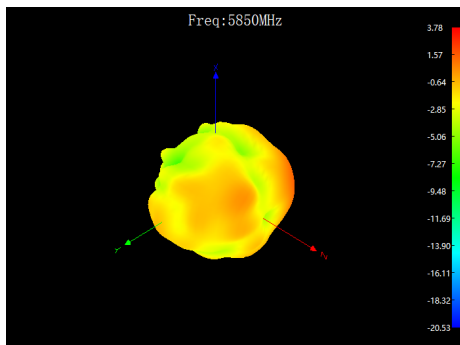
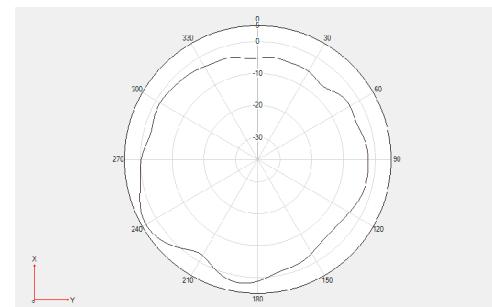
Phi =0 freq=5850MHz



Phi =90 freq=5850MHz



Theta =90 freq=5850MHz





吞吐量測試數據(Throughput test data):

**2.4G 11n HT20**

NO.	Item	CH	ATT (Unit:dB)	Standard	Throughput	
					RX (Unit:Mb)	TX (Unit:Mb)
1	Attenuation throughput test 11n HT20	1	0	RX>90M TX>70M	109	108
2			25	RX>80%Peak value TX>80%Peak value	113	108
3			45		33	98
4		6	0	RX>90M TX>70M	109	108
5			25	RX>80%Peak value TX>80%Peak value	112	107
6			45		44	102
7		11	0	RX>90M TX>70M	111	107
8			25	RX>80%Peak value TX>80%Peak value	112	107
9			45		31	99

**2.4G 11n HT40**

NO.	Item	CH	ATT (Unit:dB)	Standard	Throughput	
					RX (Unit:Mb)	TX (Unit:Mb)
1	Attenuation throughput test 11n HT40	1	0	RX>180M TX>140M	231	215
2			25	RX>70%Peak value TX>70%Peak value	227	211
3			45		27	162
4		6	0	RX>180M TX>140M	233	218
5			25	RX>70%Peak value TX>70%Peak value	221	217
6			45		62	175
7		11	0	RX>180M TX>140M	229	212
8			25	RX>70%Peak value TX>70%Peak value	220	211
9			45		43	164



5G 11ac HT80

NO.	Item	CH	ATT (Unit:dB)	Standard	Throughput	
					RX (Unit:Mb)	TX (Unit:Mb)
1	Attenuation throughput test 11ac HT80	36	0	RX>350M TX>250M	483	481
2			5	RX>80%Peak value TX>70%Peak value	476	480
3			25		209	439
4		64	0	RX>350M TX>250M	472	484
5			5	RX>80%Peak value TX>70%Peak value	462	481
6			25		159	433
7		100	0	RX>350M TX>250M	459	484
8			5	RX>80%Peak value TX>70%Peak value	446	486
9			25		104	337
10		161	0	RX>350M TX>250M	448	486
11			5	RX>80%Peak value TX>70%Peak value	456	483
12			25		243	351



**2.4G 11n HT20**

NO.	Item	Distance (Unit:m)	CH	Angle	ATT (Unit:dB)	RSSI (Unit:dBm)	Standard (Unit:Mb)	Throughput	
								RX	TX
								Average (Unit:Mb)	Average (Unit:Mb)
1	Angle throughput test 11n HT20	25	1	0°	0	-43	RXTput>80 TX Tput>60	101	96
2				90°	0	-44		103	93
3				180°	0	-44		105	93
4				270°	0	-43		99	94
5			6	0°	0	-41	RXTput>80 TX Tput>60	109	93
6				90°	0	-42		110	97
7				180°	0	-40		110	99
8				270°	0	-41		101	82
9			11	0°	0	-43	RXTput>80 TX Tput>60	96	92
10				90°	0	-45		109	78
11				180°	0	-43		102	90
12				270°	0	-45		85	81

**2.4G 11n HT40**

NO.	Item	Distance (Unit:m)	CH	Angle	ATT (Unit:dB)	RSSI (Unit:dBm)	Standard (Unit:Mb)	Throughput	
								RX	TX
								Average (Unit:Mb)	Average (Unit:Mb)
1	Angle throughput test 11n HT40	25	1	0°	0	-43	RXTput>140 TX Tput>120	180	187
2				90°	0	-43		174	166
3				180°	0	-43		204	187
4				270°	0	-41		161	164
5			6	0°	0	-40	RXTput>140 TX Tput>120	206	171
6				90°	0	-44		201	173
7				180°	0	-43		197	146
8				270°	0	-45		174	178
9			11	0°	0	-43	RXTput>140 TX Tput>120	169	166
10				90°	0	-43		173	183
11				180°	0	-44		187	188
12				270°	0	-47		170	154





5G 11ac HT80

NO.	Item	Distance (Unit:m)	CH	Angle	ATT (Unit:dB)	RSSI (Unit:dBm)	Standard (Unit:Mb)	Throughput	
								RX	TX
								Average (Unit:Mb)	Average (Unit:Mb)
1	Angle throughput test 11ac HT80	25	36	0°	0	-46	RXTput>320 TX Tput>220	457	465
2				90°	0	-41		428	462
3				180°	0	-43		446	463
4				270°	0	-42		436	460
5			64	0°	0	-52	RXTput>320 TX Tput>220	419	475
6				90°	0	-49		416	475
7				180°	0	-49		411	461
8				270°	0	-47		406	462
9			100	0°	0	-48	RXTput>320 TX Tput>220	408	474
10				90°	0	-49		384	453
11				180°	0	-52		382	467
12				270°	0	-51		391	475
13			161	0°	0	-42	RXTput>320 TX Tput>220	433	473
14				90°	0	-43		440	474
15				180°	0	-41		440	477
16				270°	0	-44		443	475

2.4G 11n HT20

Item	Bluetooth	CH	ATT (Unit:dB)	Standard	RX (Unit:Mb)	TX (Unit:Mb)
2.4G 11n HT20	Bluetooth speaker Disconnected to play audio	1	0	RX>90M TX>70M	109	108
		6	0	RX>90M TX>70M	109	108
		11	0	RX>90M TX>70M	111	107
	Bluetooth speaker Connected to play audio	1	0	RX>60%Peak value TX>60%Peak value &Smooth audio	109	108
		6	0	RX>60%Peak value TX>60%Peak value &Smooth audio	109	108
		11	0	RX>60%Peak value TX>60%Peak value &Smooth audio	110	108



OTA 有源測試數據統計(OTA active test data statistics):

Item	Measurement	Band	Channel	Frequency	Total
1	TRP	WIFI_B (11M)	1	2412	12.91
2	TRP	WIFI_B (11M)	6	2437	13.83
3	TRP	WIFI_B (11M)	11	2462	14.87
4	TIS FAST	WIFI_B (11M)	1	2412	-81.74
5	TIS FAST	WIFI_B (11M)	6	2437	-72.79
6	TIS FAST	WIFI_B (11M)	11	2462	-72.86
7	TRP	WIFI_A (54M)	36	5180	14.32
8	TRP	WIFI_A (54M)	64	5320	14.79
9	TRP	WIFI_A (54M)	100	5500	15.58
10	TRP	WIFI_A (54M)	161	5805	13.73
11	TIS FAST	WIFI_A (54M)	36	5180	-70.08
12	TIS FAST	WIFI_A (54M)	64	5320	-70.06
13	TIS FAST	WIFI_A (54M)	100	5500	-67.16
14	TIS FAST	WIFI_A (54M)	161	5805	-69.61
15	TRP	WIFI_N_ISM (65M)	1	2412	10.16
16	TRP	WIFI_N_ISM (65M)	6	2437	11.73
17	TRP	WIFI_N_ISM (65M)	11	2462	11.86
18	TIS FAST	WIFI_N_ISM (65M)	1	2412	-67.32
19	TIS FAST	WIFI_N_ISM (65M)	6	2437	-61.67
20	TIS FAST	WIFI_N_ISM (65M)	11	2462	-60.73
21	TRP	WIFI_N_UNII (65M)	36	5180	13.04
22	TRP	WIFI_N_UNII (65M)	64	5320	13.63
23	TRP	WIFI_N_UNII (65M)	100	5500	14.3
24	TRP	WIFI_N_UNII (65M)	161	5805	12.59
25	TIS FAST	WIFI_N_UNII (65M)	36	5180	-67.44
26	TIS FAST	WIFI_N_UNII (65M)	64	5320	-66.59
27	TIS FAST	WIFI_N_UNII (65M)	100	5500	-62.74
28	TIS FAST	WIFI_N_UNII (65M)	161	5805	-66.26



# 深圳市英佳創電子科技有限公司

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## ROHS 物料控制報告 (ROHS Material control report)

茲證明向貴司交貨的零組件、輔助材料所使用的原材料、以及生產工程中的添加劑等均符合 RoHS 限制使用有害物質指令的環保要求 (RoHS 指令 2011/65/EU)  
This is to certify that the components delivered to your company, the raw materials used for auxiliary materials, and the additives used in the production project all meet the environmental requirements of the RoHS directive on limiting the use of hazardous substances. (RoHS 指令 2011/65/EU)

關於零組件、輔助材料所使用的原材料、包裝材料以及和產過程中使用的添加劑等的構成成份報告如下：

The report on the composition of raw materials, packaging materials, and additives used in the manufacturing process for component auxiliary materials is as follows

組成物料名稱 Component /Part Name	組成材料 Material Composition	ICP 報告編號 ICP report #	測試機構 Test Org.	測試時間 Test Date	有害物質含量(ppm)						是否合格? PASS?
					Cd	Pb	Hg	Cr <sup>6+</sup>	PBB	PBDE	PASS
金屬件	304 不鏽鋼 Stainless steel	A2230142930101003	SGS	23/04/06	ND	ND	ND	ND	ND	ND	PASS