



# Internal Antenna Product Specification

**Customer Name:** Quectel Wireless Solutions Co., Ltd.

**Project Name:** 4G-LTE External Antenna

**Part Number:** SAA30968A

**VENDOR NAME:** Shanghai Saintenna Electronic  
Technology Co., Ltd.

**Tel: 021- 36307272**      **Fax: 021- 36307757**

Approval Sheet	
Customer	Saintenna

Rev	Change Summary	Date	Author
1.0	Preliminary Release	2014-07-26	Kevin Cui

PREPARED BY

上海圣丹纳电子科技股份有限公司

Shanghai Saintenna Electronic Technology Co., Ltd.

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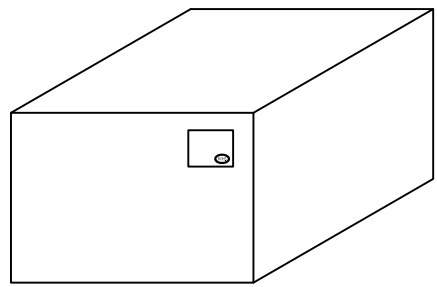
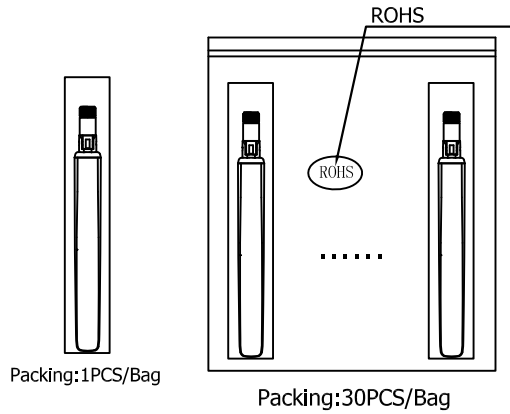
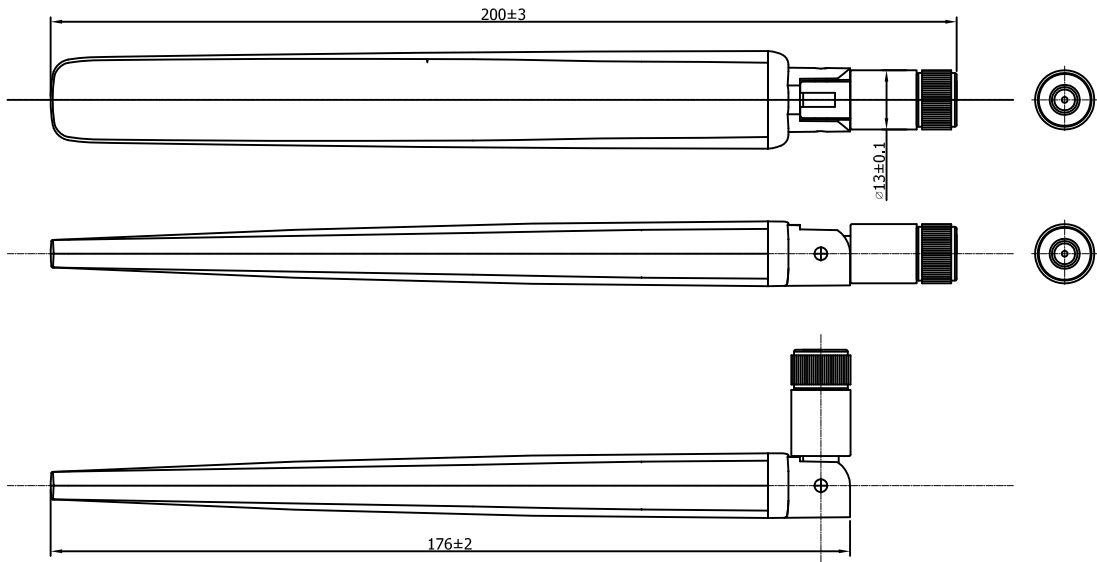
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Building 8, No. 611 BaoQI Road, Baoshan District Shanghai 200444, P.R. China

# Catalog

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ROHS



6	Connector	SMA Straight Plug Standard for RG-178	1	
5	Cable	RG-178 Cable,Transparency Brown,50Ω	1	
4	Rivet	PBT+PC,Color:Black	2	
3	Bottom Base	PBT+PC,Color:Black	1	
2	Upper Base	ABS,Color:Black	1	
1	Antenna Cap(L)	ABS,Color:Black	1	
NO.	DESCRIPTION		Q'TY	REMARK

DWG: SAA30968A		SDN-4G-EXT-D01		S1	2016.06.22
PG: 1/1		MATERIAL: SEE NOTES		REV	DATE
UNIT: mm		DR :mayuxue		2016.06.22	TOL UNLESS NOTED
SCALE:1,000		CH:		.X: ±0.20	.XX: ±0.10
THIRD PROJECTION		SAINTENNA		ANGULAR ±30'	
P H:66136101 FAX:66136102		CONFIDENTIAL ALL INFORMATION CONTAINED IN THIS DOCUMENT IS PROPRIETARY.IT MAY NOT BE REPRODUCED OR USED WITHOUT EXPRESS WRITTEN PERMISSION OF SAINTENNA CO.,LTD.			

# Standard parameter

## 一、Specifications

Frequency range	699~960MHz/1710~2700MHz
S. W. R	≤3
Gain	4.0dBi
Connector	SMA Plug
Impedance	50 Ohm

## 二、Reliability test

Project	Test condition	Result
Storage environment	Temperature, humidity, air pressure test are as follows: 1. Temperature: -30℃~+80℃ 2. Humidity: 45%-85% 3. Pressure: 86kpa-106kpa	Normal electrical and mechanical properties
Temperature cycle test	The 5 cycle is between 70℃ and 40℃. Then check the appearance quality	Meet the mechanical and electrical properties
Moisture test	Temperature: 40℃, Humidity: 90%, Duration: 72h	Meet the mechanical and electrical properties
Vibration test	Vibration frequency 10-55HZ, displacement: 0.35MM, acceleration: 50.0M/S, Frequency sweep frequency: 30 times	Normal electrical and mechanical properties
Drop test	1m height drop	Normal electrical and mechanical properties
Drawing force test	Push pull tester to test the strength of the instrument: ≥10N	Normal electrical and mechanical properties
Voltage resistance	1. Insulation spark voltage 1.5KV 2. Sheath spark voltage 1.5KV 3. Insulation resistance to sheath voltage 0.5KV	Normal electrical and mechanical properties



Shanghai Saintenna Electronic Technology Co., Ltd.

Company / project	External antenna	Working frequency band	All
Test date	2016/6/22	Test person	Victor Peng
Version number	V1.0	Test sample description	Mould

**Free space test data of whole machine passive efficiency:**

Freq	Gain	Efficiency
700	1.66	41.00%
710	3.26	49.30%
720	3.95	58.30%
730	3.6	58.10%
740	3.85	55.50%
750	4.04	54.40%
760	3.44	53.30%
770	3.98	57.30%
780	4.45	63.50%
790	3.63	66.00%
800	3.47	67.30%
810	3.19	62.40%
820	2.53	59.20%
830	2.13	57.60%
840	1.89	56.30%
850	2.29	57.10%
860	2.64	60.50%
870	3.01	61.20%
880	2.98	60.60%
890	2.46	57.00%
900	2.38	54.80%
910	2.06	52.30%
920	1.91	51.50%
930	2.06	51.30%
940	2.27	55.40%
950	2.04	54.10%

Freq	Gain	Efficiency
960	1.7	51.90%
970	1.23	47.10%
980	1	44.80%
990	0.82	41.90%
1000	1.17	40.70%
1700	1.67	63.40%
1720	1.94	62.90%
1740	2	64.80%
1760	1.57	60.40%
1780	0.97	56.80%
1800	1.33	55.90%
1820	1.17	56.20%
1840	1.36	55.70%
1860	1.25	51.40%
1880	1.38	49.90%
1900	1.59	51.70%
1920	1.36	52.00%
1940	1.01	49.40%
1960	1.41	51.60%
1980	1.53	53.20%
2000	1.84	52.70%
2020	2.1	50.40%
2040	2.65	54.50%
2060	3.22	56.90%
2080	3.69	56.60%
2100	4.01	59.20%

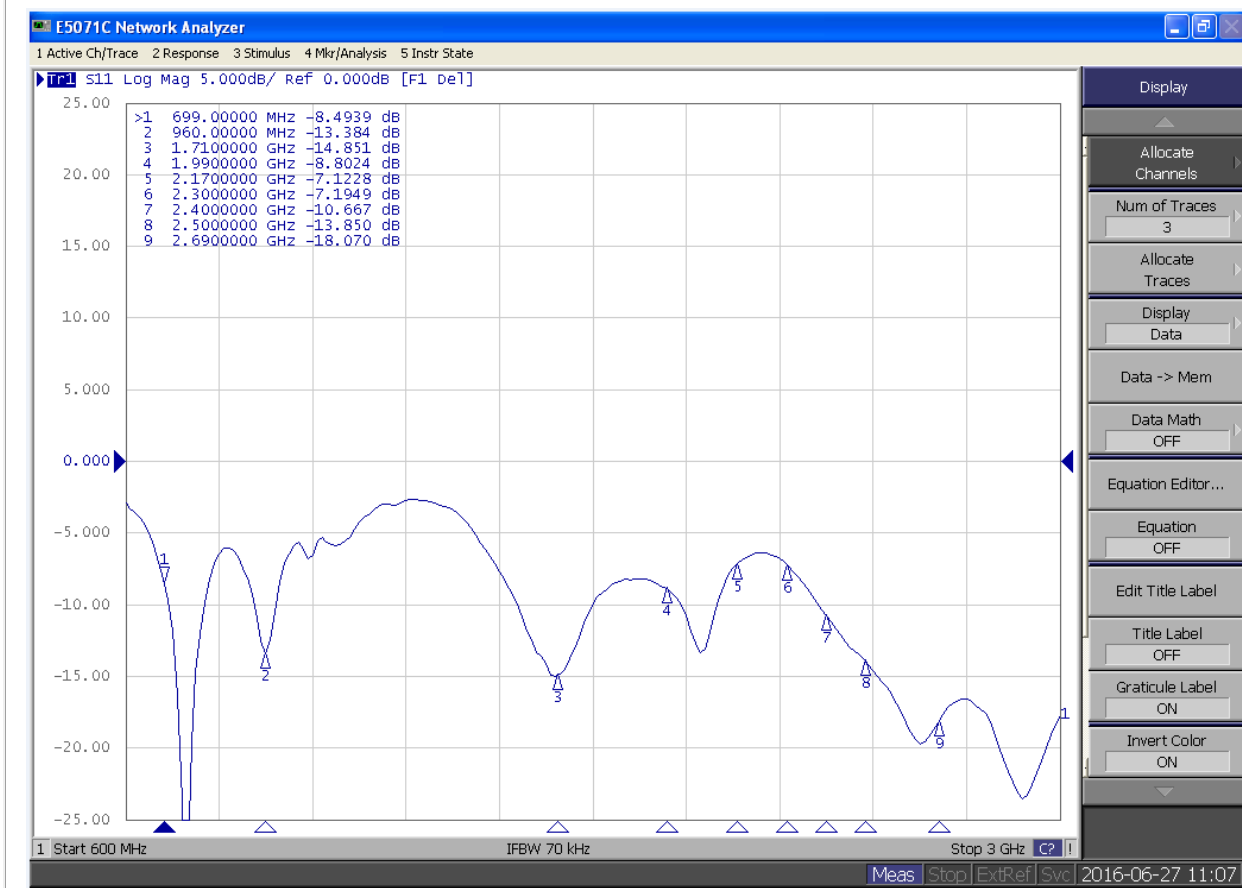
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Freq	Gain	Efficiency
2120	3.69	59.60%
2140	3.22	56.00%
2160	2.46	52.20%
2180	1.45	47.30%
2300	1.25	46.90%
2320	1.49	50.10%
2340	1.49	50.60%
2360	1.49	49.90%
2380	1.57	51.90%
2400	1.88	54.40%
2420	2.15	57.80%
2440	2.85	60.80%
2460	3.35	64.80%
2480	3.6	69.50%

Freq	Gain	Efficiency
2500	3	67.00%
2520	2.68	68.00%
2540	2.44	68.80%
2560	2.3	66.30%
2580	2	59.90%
2600	2.04	60.30%
2620	2.06	61.10%
2640	2	60.70%
2660	1.71	59.90%
2680	1.71	58.60%
2700	1.78	59.00%

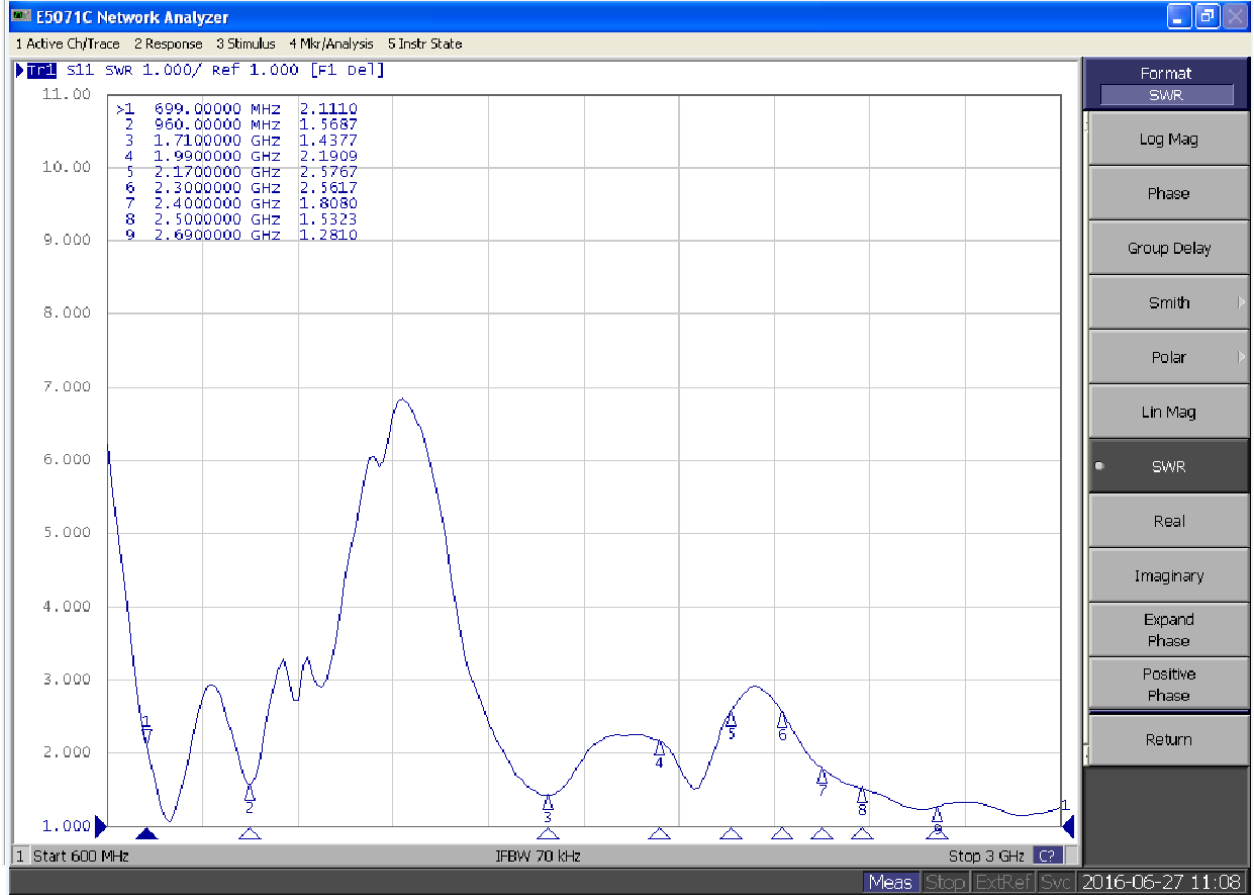
LOG MAG:



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# VSWR



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# ROHS

Product :RF Antenna Assembly												
Supplier Part No. (供應商料號)	ITEM (品名)	RAW MATERIAL (部件/原材料/輔助材料 名稱)	RAW MATERIAL SUPPLIER (供應商名稱)	Cd(鎘)含 量 (ppm)	Pb(鉛)含 量 (ppm)	Cr6+(六價 鉻) 含量(ppm)	Hg(汞) 含量 (ppm)	PBBS(聚 溴聯苯) 含量 (ppm)	PBDES(溴 聯苯 醚)含量 (ppm)	Test organization  测试机构	Test report No.  測試報告號碼	SGS Report date
1	RG-178	Silver plated copper wire	JIANGSU YUANDA	N.D	N.D	Negative	N.D	N.D	N.D	CTI	ECL01H051755017	2015.10.23
		FEP		N.D	N.D	N.D	N.D	N.D				
		Tin plated copper wire		N.D	N.D	Negative	N.D	N.D	N.D			
		Brown color		N.D	N.D	N.D	N.D	N.D	N.D			
2	Rod sleeve	ABS	Chemical fiber	N.D	N.D	N.D	N.D	N.D	N.D	SGS	CE/2016/13616	2016.01.25
3	Fixed	PBT+PC		N.D	N.D	N.D	N.D	N.D	N.D	SGS	CE/2015/C5211	2015.12.30
4	Solid	PBT+PC		N.D	N.D	N.D	N.D	N.D	N.D	SGS		
5	Connector	POM	Formosa	N.D	N.D	N.D	N.D	N.D	N.D	SGS	KE/2015/C2285A-01	2015.12.28
		NI-Plated	LIANFENG	N.D	N.D	Negative	N.D	/	/	SGS	CANEC1517911004	2015.10.26
		Gold-Plated	LIANFENG	N.D	N.D	Negative	N.D	/	/	SGS	CANEC1517911006	2015.10.26
		PTFE		N.D	N.D	N.D	N.D	N.D	N.D	CTI	SCL01H013440001C	2016.03.07
		Brass	SHIYANG	14	31782	Negative	N.D	/	/	SGS	CANEC1603095201	2016.03.09
6	Toner	Black masterbatch	HEN-CHEN	N.D	N.D	N.D	N.D	N.D	N.D	SGS	CANEC1601390003	2016.01.28
7	PCB	FR4	Huake	N.D	N.D	N.D	N.D	N.D	N.D	SGS	SCL01H099132001C	2015.11.23
								/	/			
								/	/			
								/	/			
								/	/			



**Dipole Antenna**

**- RFDPA870900SBLB805 for Single Band 2.4/5.x GHz Application**

**ELECTRICAL CHARACTERISTICS**

Item	Specification
Working Frequency Range	2.4 ~ 2.5 / 5.15 ~ 5.85 GHz (Note-1)
Gain	2.4 ~ 2.5 GHz : 2.2 dBi 5.15 ~ 5.85GHz : 3 dBi
Return Loss	-10dB(Max)
VSWR	2 max.
Polarization	Linear
Radiation Pattern	Omni-directional
Impedance	50Ω

\*Note 1. Central Frequency should be defined after customers' application approval.

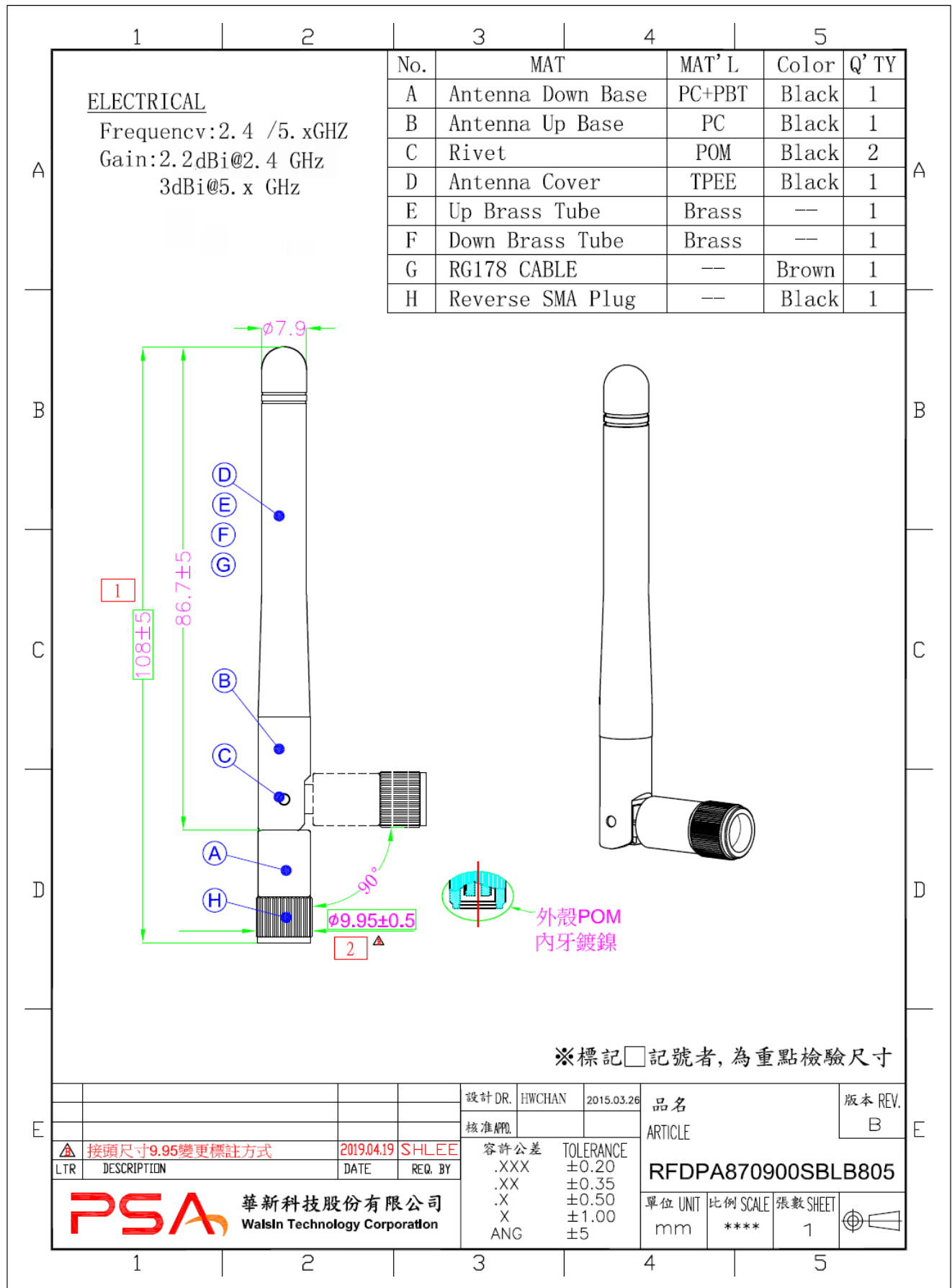
**MATERIAL TABLE**

Items	Description
Cable	RG178(Brown)
Antenna Cover	TPEE
Antenna Base	PC/PBT
Connector	Reverse SMA Plug
Color	Black
Brass Tube	Brass
Spring	Phosphor Bronze
Tube	CB-HFT

**ORDERING RULE**

RF	DPA	8709	00	S	B	L	B	8	05
Type Code	Product Code	Dipole Dimension (Unit: mm)	Cable Length (unit: cm)	Connector Brand	Type of Connector	Application	Project status	Wire Diameter	Project
Walsin RF Device	DPA: Dipole Antenna	Per 2 digits of length, width e.g.: 8709 Length 86.7mm, Width 9.95mm	2 digits for cable length e.g.: 00 None Cable	A: N C:MCX D:IPEX III E: IPEX IV F: IPEX A13 H: Hirose I: IPEX M: MMCX S: SMA T: TNC U:MURATA N: None	A: Reverse Female B: Reverse Male F: Female M: Male N: None	0: 0GHz 3: 3GHz 5: 5 GHz 6: 6GHz A: 2.4GHz ISM band B: GSM 900/1800 dual band G: GPS band L: 2.4/5.2/5.8 GHz tri-band N: NFC T:LTE band W: WCDMA band	B: MP T:During Test X: Pile Run	0:None 1:φ0.81 3:φ1.13 6:RG316 7:φ1.37 8:RG178	01~99 series number

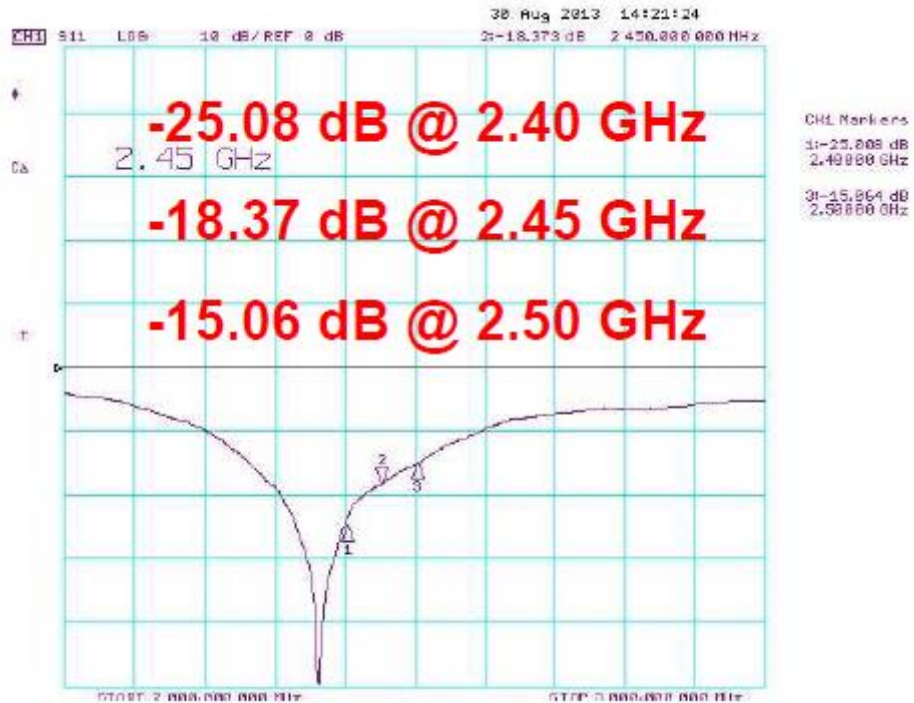
**DIMENSIONS**



# Test Report

## ELECTRICAL CHARACTERISTICS

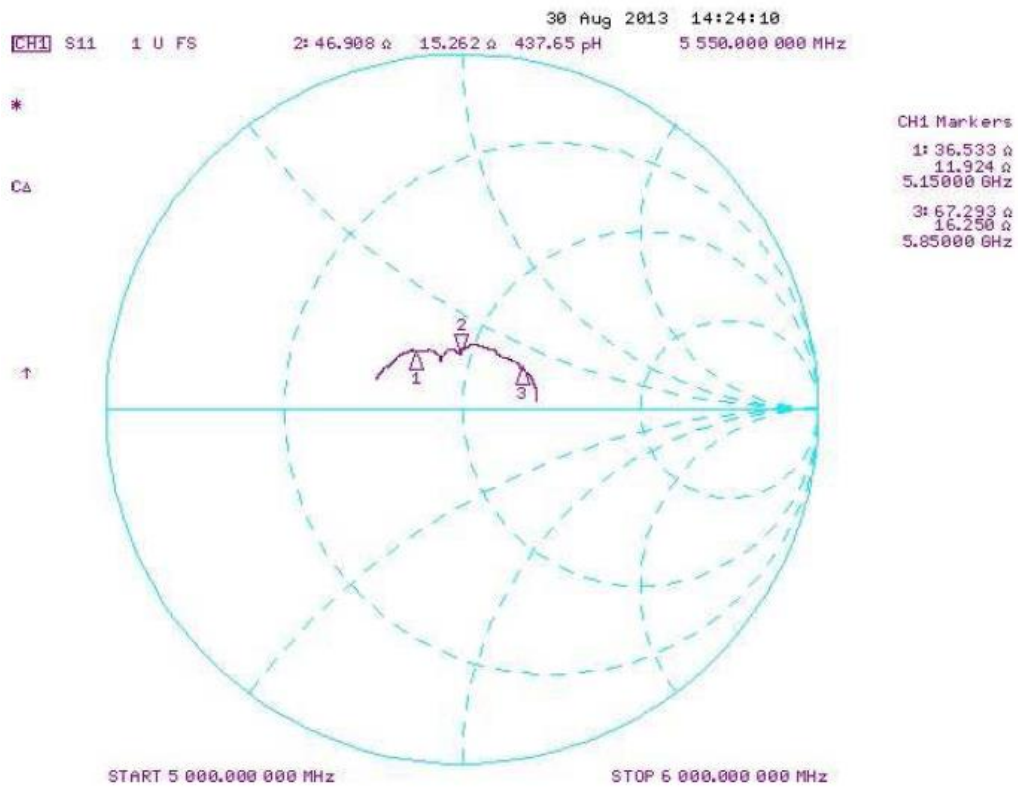
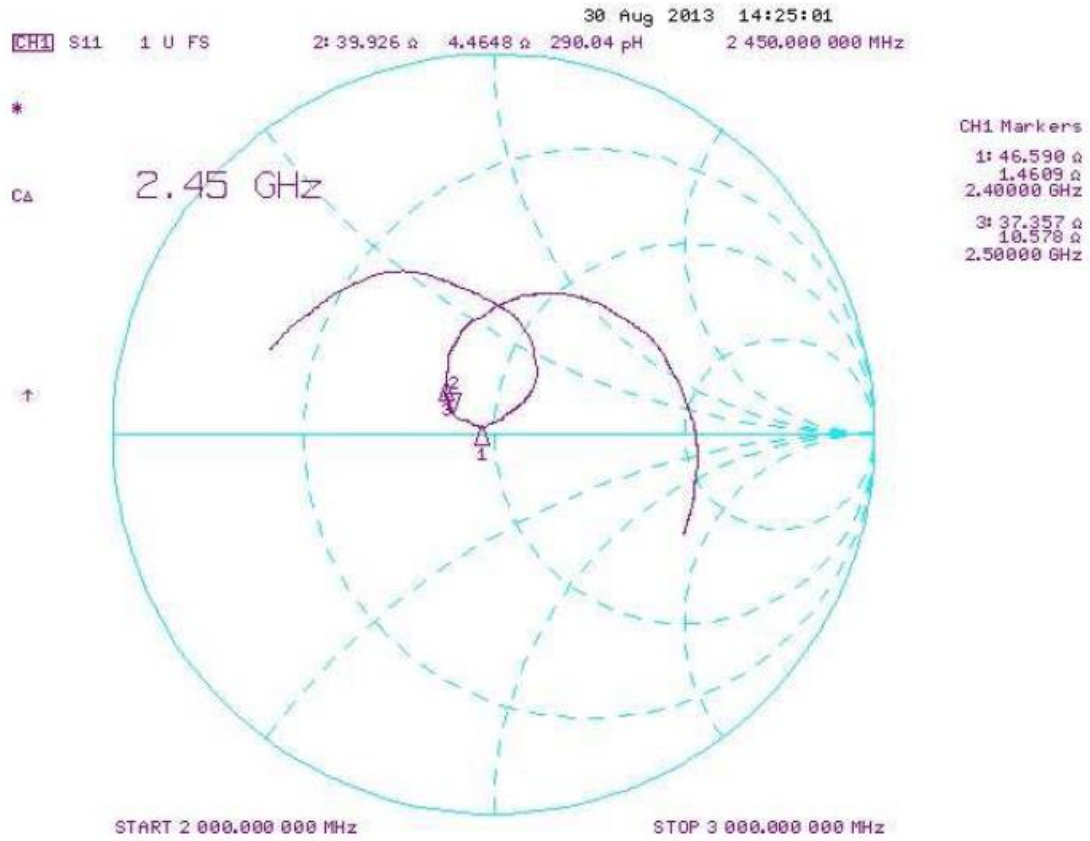
### Return Loss



# VSWR



### Smith Chart





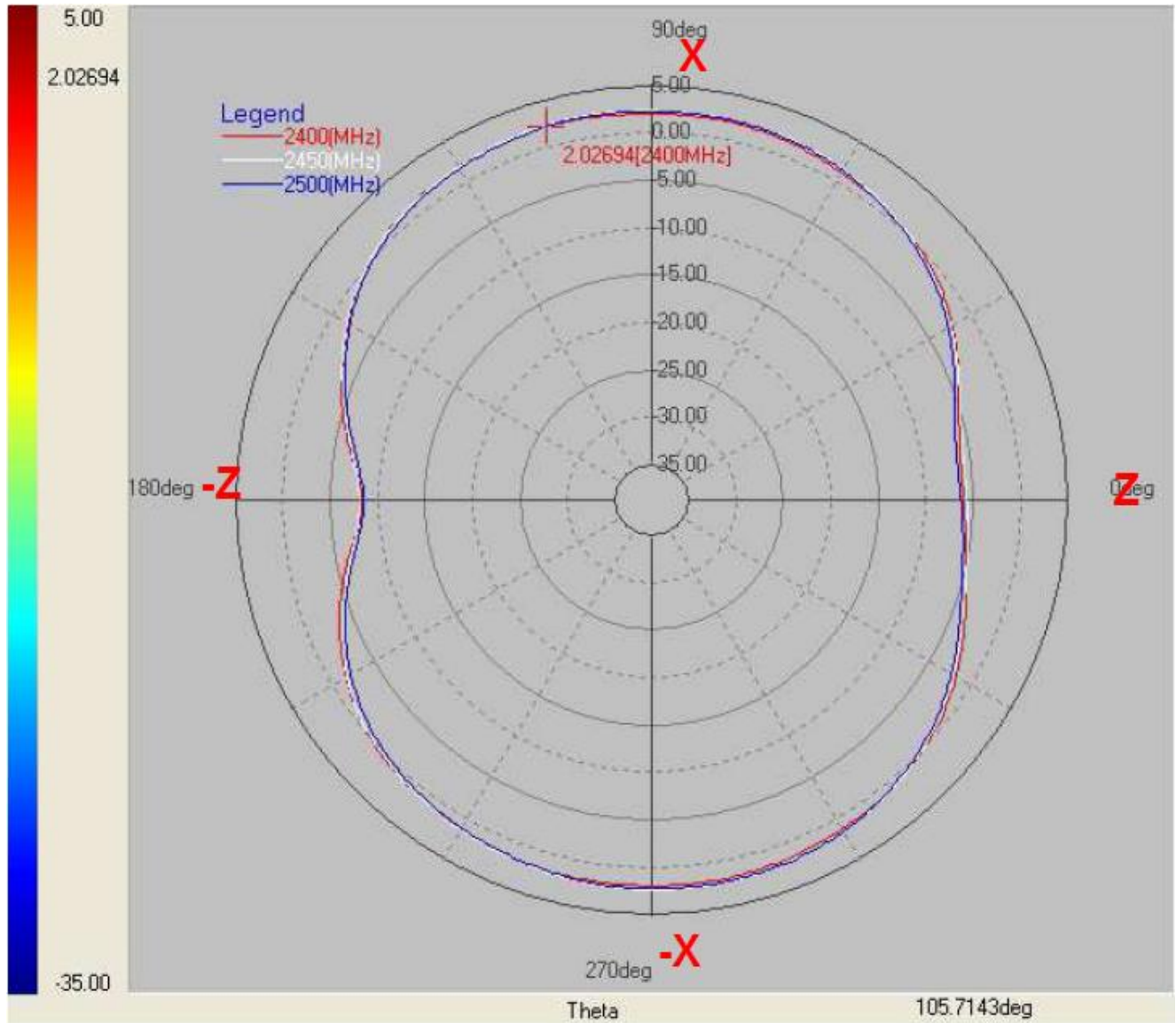
**RADIATION PATTERN**

**2400~2500 MHz**

**X-Z Plane**

**Phi=0.00deg**

**Gain . dB**



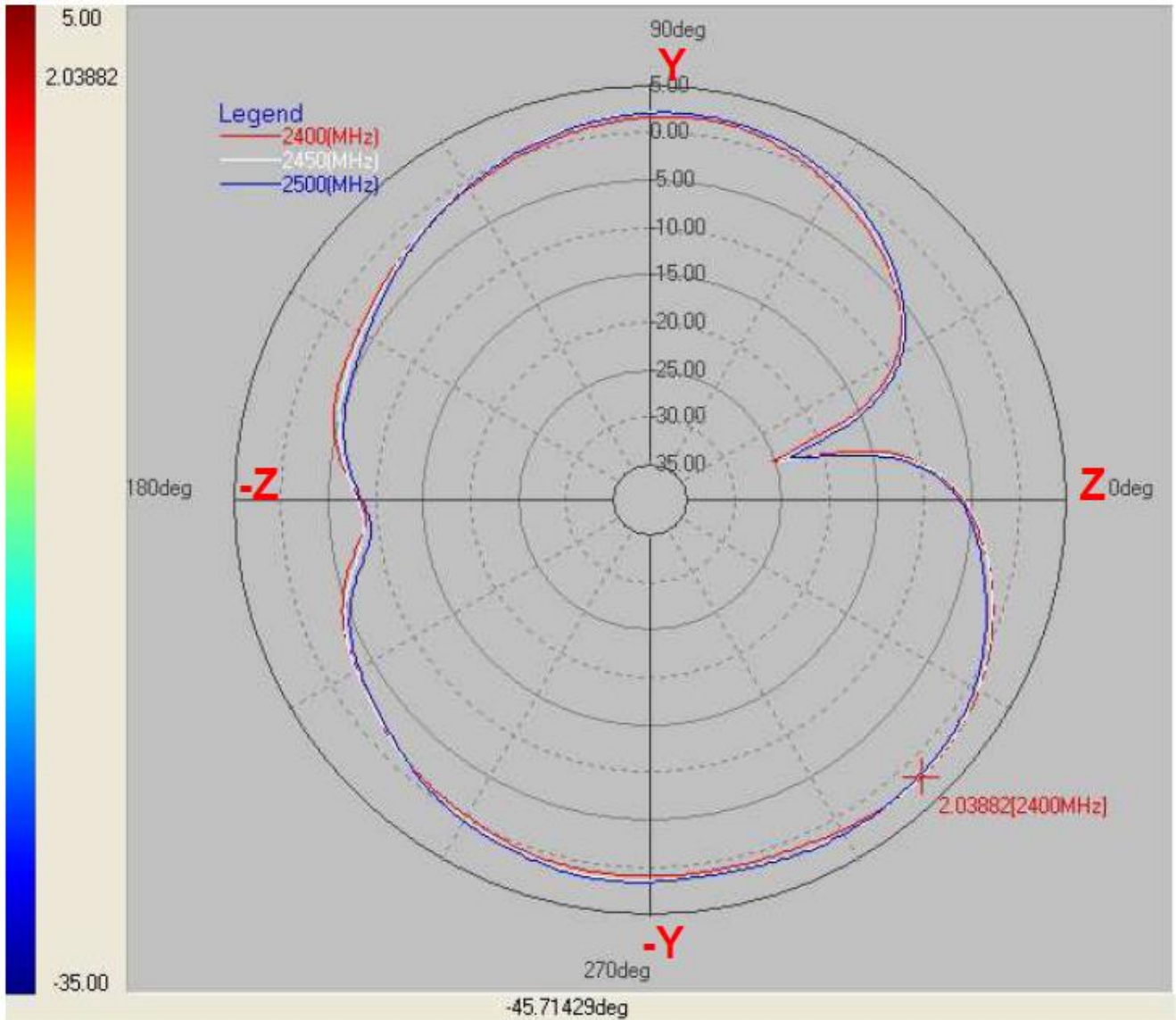
Layer	Max value	Min value	Average
2400(MHz)	2.03	-8.37	-0.17
2450(MHz)	2.20	-8.08	-0.04
2500(MHz)	2.12	-8.53	-0.21

**2400~2500 MHz**

**Y-Z Plane**

**Phi=90.00deg**

**Gain . dB**



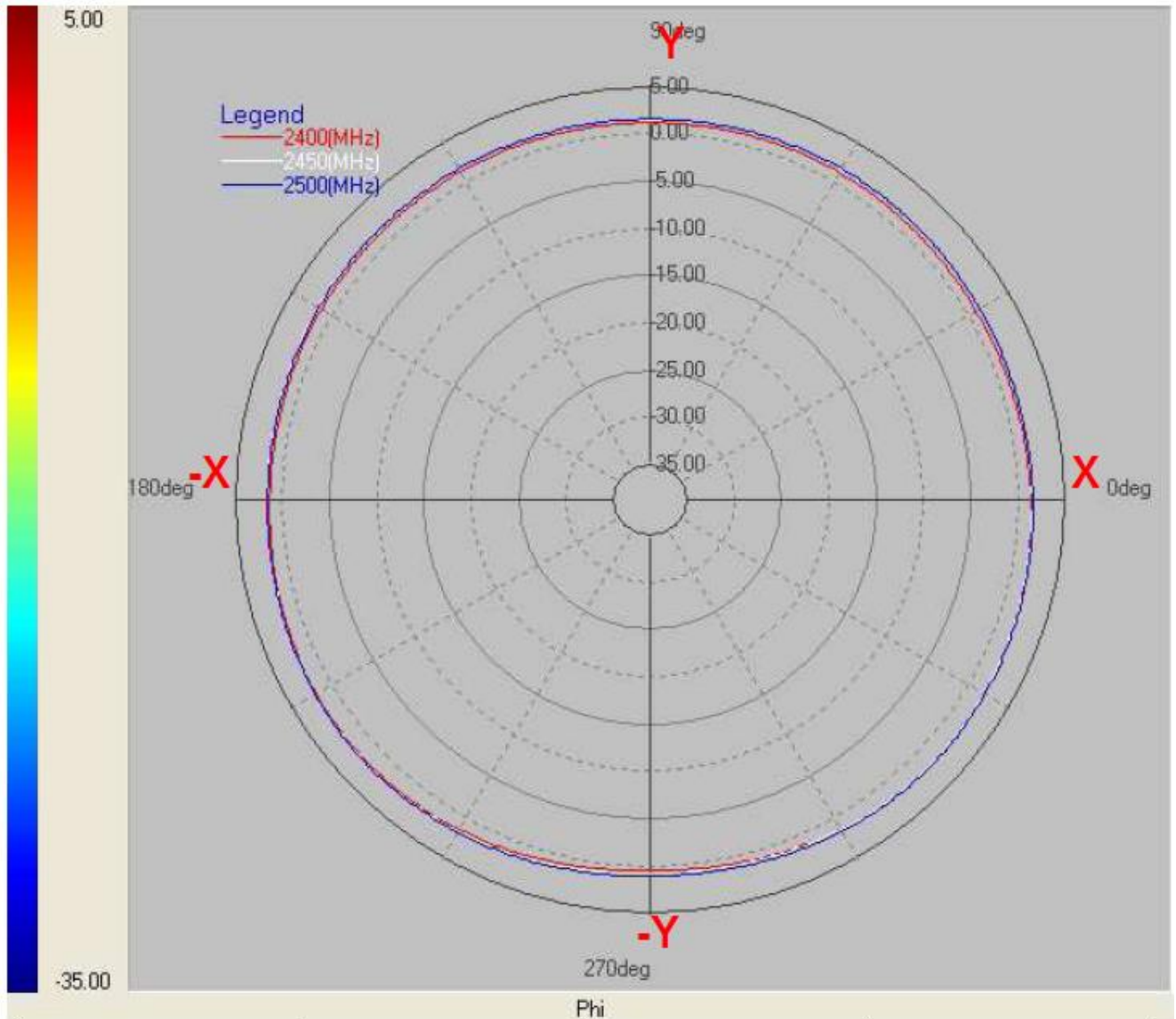
Layer	Max value	Min value	Average
2400(MHz)	2.04	-25.82	-1.07
2450(MHz)	2.02	-25.22	-0.82
2500(MHz)	2.01	-23.79	-1.07

**2400~2500 MHz**

**X-Y Plane**

**Theta=90.00deg**

**Gain . dB**



Layer	Max value	Min value	Average
2400(MHz)	2.10	0.35	1.32
2450(MHz)	2.08	0.65	1.55
2500(MHz)	2.13	0.91	1.60

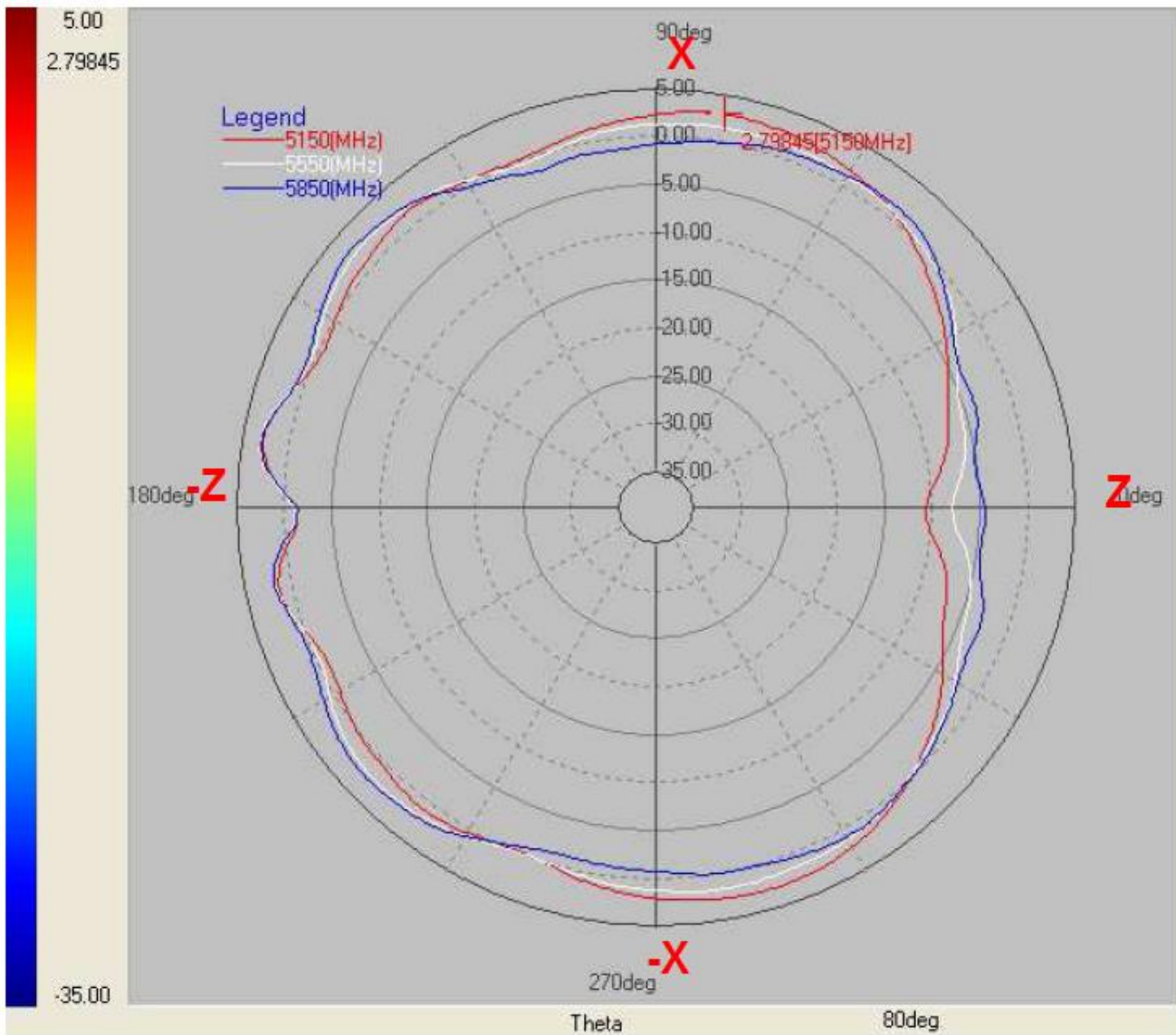


**5150~5850 MHz**

**X-Z Plane**

**Phi=0.00deg**

**Gain . dB**



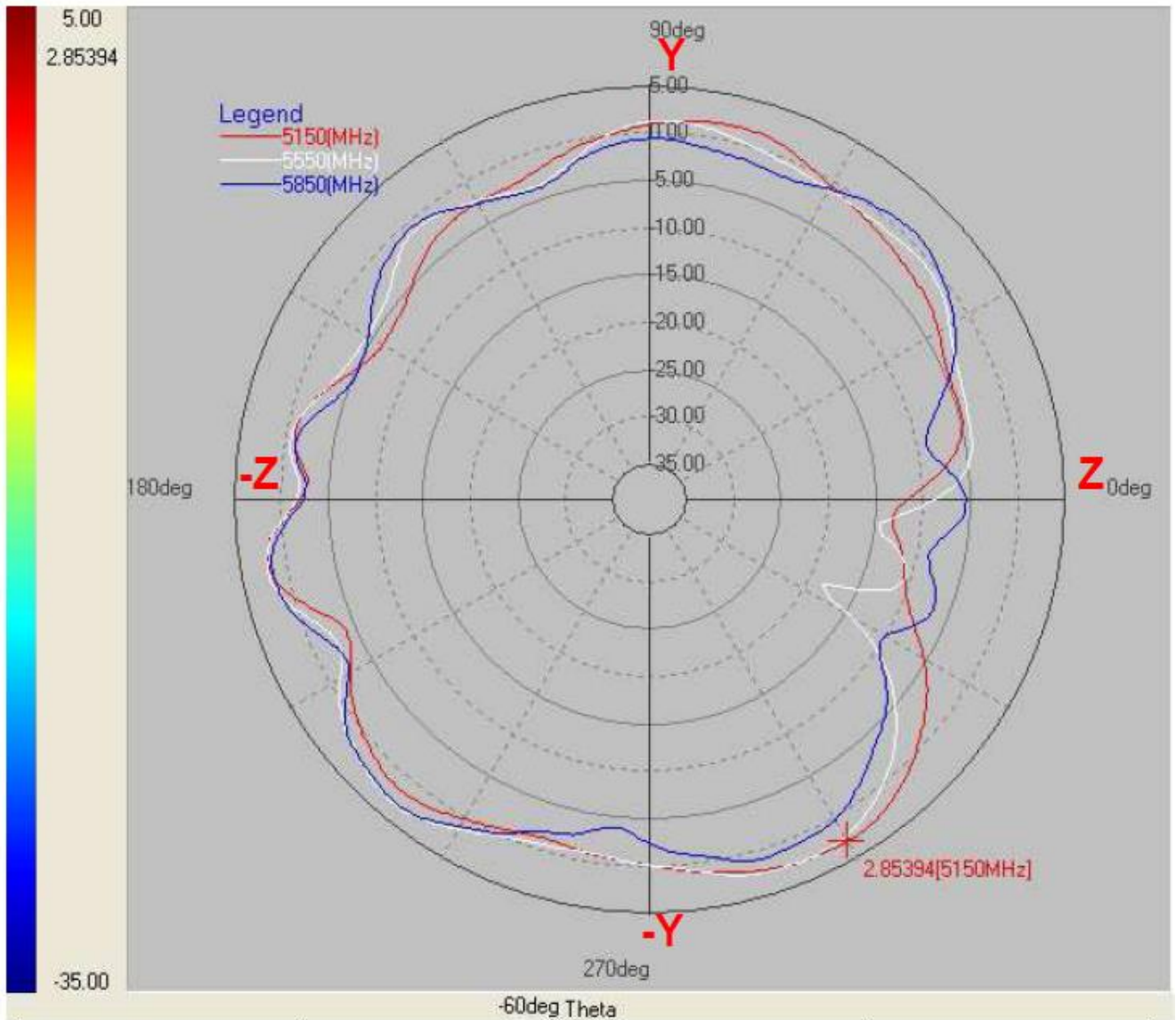
Layer	Max value	Min value	Average
5150MHz)	2.80	-10.65	0.29
5550(MHz)	3.05	-7.90	0.32
5850 (MHz)	2.93	-6.22	-0.90

### 5150~5850 MHz

Y-Z Plane

Phi=90.00deg

Gain . dB



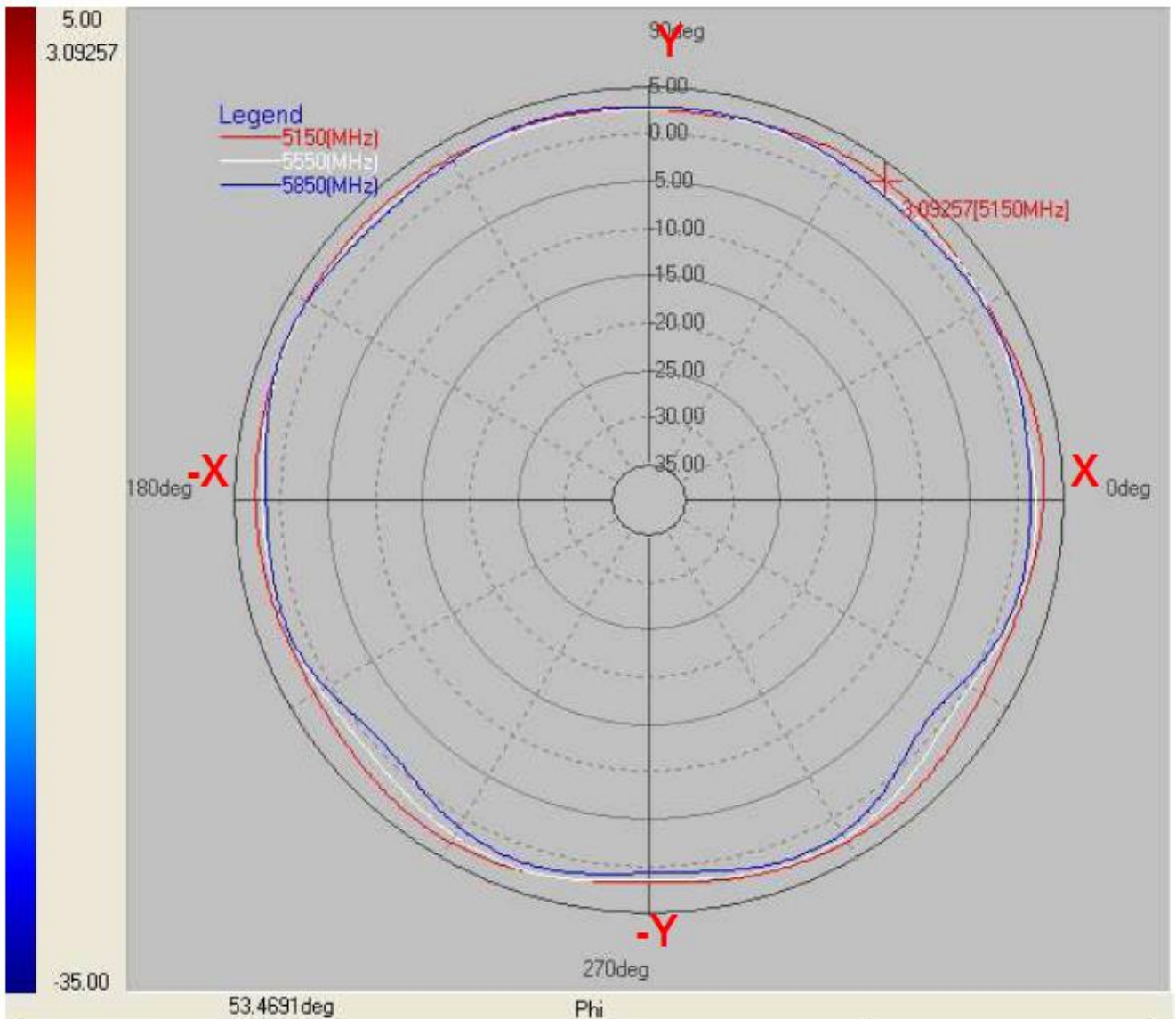
Layer	Max value	Min value	Average
5150MHz)	2.85	-13.11	-1.04
5550MHz)	3.12	-18.74	-0.84
5850(MHz)	2.95	-10.38	-1.48

**5150~5850 MHz**

**X-Y Plane**

**Theta=90.00deg**




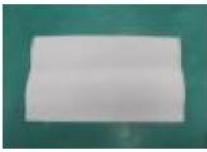






**Gain . dB**



Layer	Max value	Min value	Average
5150(MHz)	3.09	1.52	2.58
5550(MHz)	2.84	0.31	2.03
5850(MHz)	3.01	-1.36	1.69



# Package

<b>華新科技股份有限公司</b>														
RFDPA870900SBLB8G1 製品工程表	頁次： 1 之 1													
	規章編號：	版次：A版												
	制修訂日期：2014/8/15													
<b>包裝圖</b>														
<b>圖一</b>														
	→													
單PCS產品		→												
														
		10pcs/PE袋												
<b>圖二</b>														
	→													
		→												
														
<b>圖三</b>														
	→													
		→												
														
<p><b>產品包裝規範：</b></p> <ol style="list-style-type: none"> <li>將每10PCS產品裝入PE袋中、封口，並在PE袋中上方粘貼製造標籤。(如圖一)</li> <li>將珍珠棉放入外箱中(如圖示二)</li> <li>將裝好的成品(如圖示三)放入外箱中，每箱放1500pcs產品，上下各放1片珍珠棉，標籤需貼到最小包裝。</li> </ol> <p><b>製標圖示：</b> 實物標籤內容僅作參考 具體內容以出貨料號為準</p>														
		<p>(NO 1.): Spec desc.                  (NO 2.): 料號 批號 數量(PN &amp; LOT &amp; QTY)                  (NO 3.): 盤點條碼(Inventory check barcode)                  (NO 4.): 列印時間-總張數(print system time-total piece this print)                  (NO 5.): 表示 BULK LOT                  (NO 6.): 表示該張標籤流水序號</p>												
<p>標籤注釋權屬華科電子有限公司</p>														
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>變更時間</th> <th>變更版別</th> <th>變更內容</th> </tr> </thead> <tbody> <tr> <td>2014/8/15</td> <td>A</td> <td>新版發行</td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>			變更時間	變更版別	變更內容	2014/8/15	A	新版發行						
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2014/8/15	A	新版發行												
核准：	何耀輝	審核：	何耀輝	制定：	袁蕊蕊									