Well Green Technology Co., Ltd
No. 20, Alley51 ,Lane 118,ShuangLian Sec.2,Mintzu Rd.,
PingJen City, TaoYuan Hsien, Taiwan, R.O.C
TEL: (03)420-6428 FAX: (03) 420-6418

UMPC (Open)
Antenna Test Report

RD Manager	Supervisor	RD engineer	Sales engineer
Joy	Johnson	Jason	Bryan

Wireless LAN Antenna Specification

1. 802.11b.g Spec.

1.1. Frequency range ：2.4~2.5GHz

1.2. Impedance ：50Ω

1.3. System Plane ：XY plane

1.4. VSWR ：≦2

1.5. Return Loss ：≦-10dB

1.6. Average gain & Peak gain

Antenna	Peak Gain(dBi)			Average gain (dBi)		
	Frequency			Frequency		
	2.4GHz	2.45GHz	2.5GHz	2.4GHz	2.45GHz	2.5GHz
Main	≦2.6	≦2.6	≦2.6	≧-4	≧-4	≧-4
Auxiliary	≦2.6	≦2.6	≦2.6	≧-4	≧-4	≧-4

2. 802.11a Spec.

2.1. Frequency range ：4.9~5.85GHz

2.2. Impedance ：50Ω

2.3. System Plane ：XY plane

2.4. VSWR ：≦2.5

2.5. Return Loss ：≦-7.36dB

2.6. Average gain & Peak gain

Antenna	Peak Gain(dBi)			Peak Gain(dBi)			Peak Gain(dBi)			Peak Gain(dBi)		
	Frequency			Frequency			Frequency			Frequency		
	4.9GHz	5.075GHz	5.25GHz	5.15GHz	5.25GHz	5.35GHz	5.47GHz	5.597GHz	5.725GHz	5.725GHz	5.785GHz	5.85GHz
Main	≦5	≦5	≦5	≦5	≦5	≦5	≦5	≦5	≦5	≦5	≦5	≦5
Auxiliary	≦5	≦5	≦5	≦5	≦5	≦5	≦5	≦5	≦5	≦5	≦5	≦5

Antenna	Average gain (dBi)			Average gain (dBi)			Average gain (dBi)			Average gain (dBi)		
	Frequency			Frequency			Frequency			Frequency		
	4.9GHz	5.075GHz	5.25GHz	5.15GHz	5.25GHz	5.35GHz	5.47GHz	5.597GHz	5.725GHz	5.725GHz	5.785GHz	5.85GHz
Main	≧-5	≧-5	≧-5	≧-5	≧-5	≧-5	≧-5	≧-5	≧-5	≧-5	≧-5	≧-5
Auxiliary	≧-5	≧-5	≧-5	≧-5	≧-5	≧-5	≧-5	≧-5	≧-5	≧-5	≧-5	≧-5

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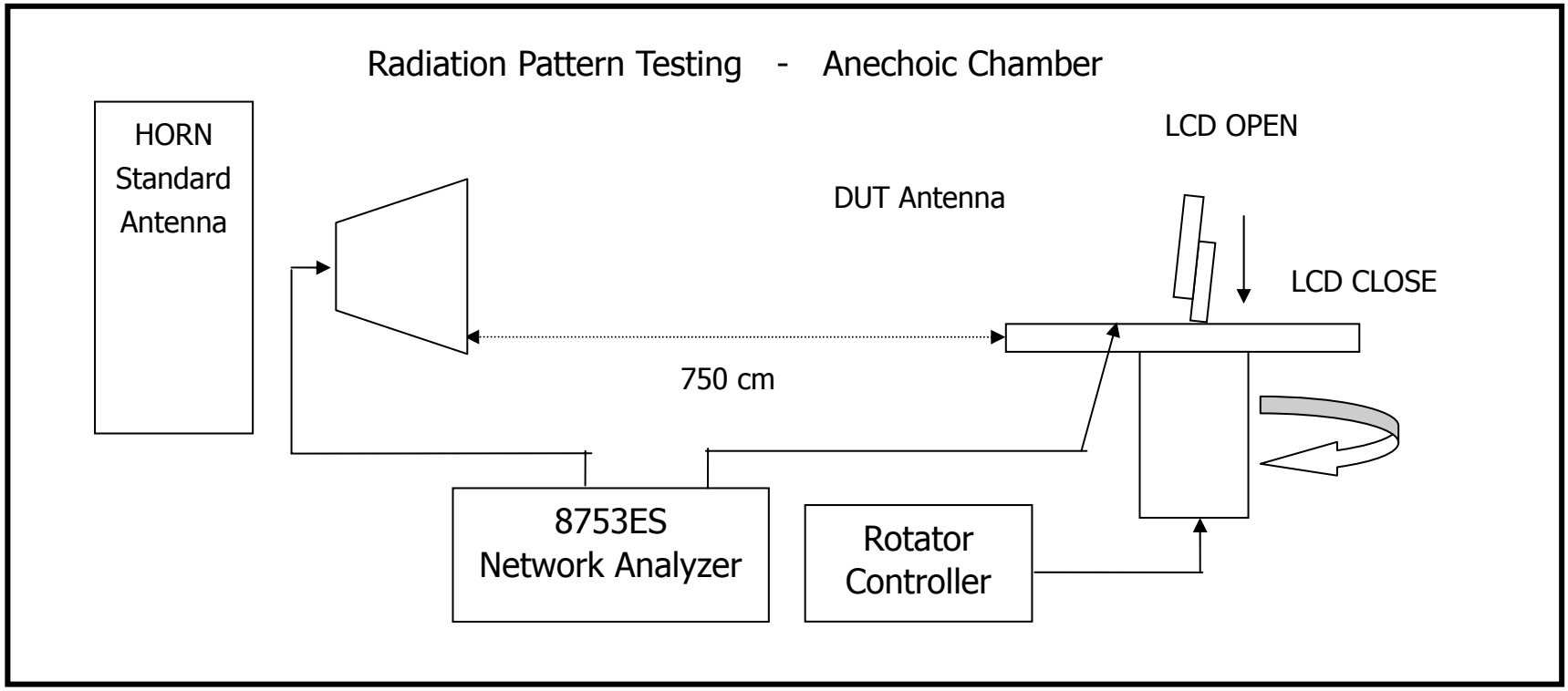
Ⅰ、Antenna Testing Conditions:

1. Testing set up:



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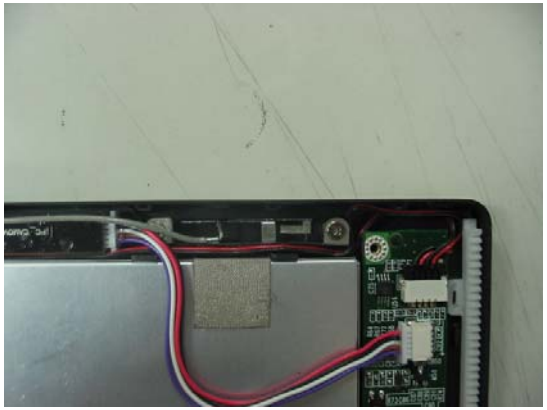
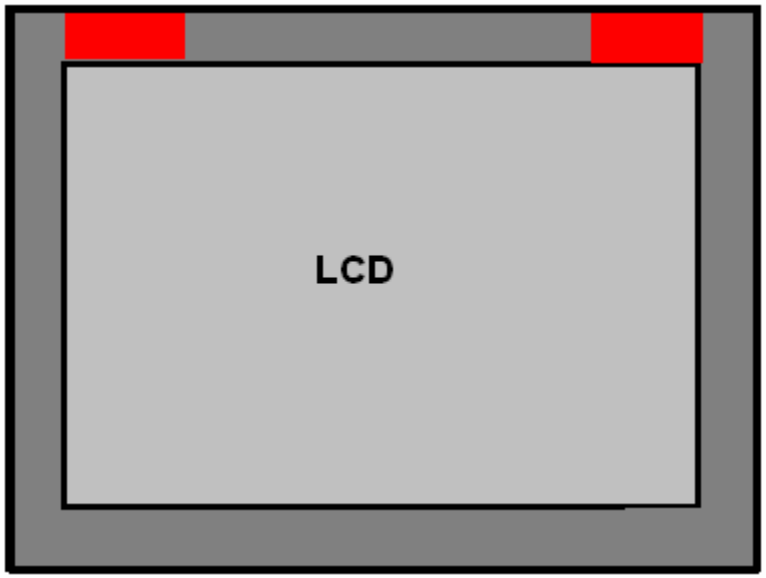
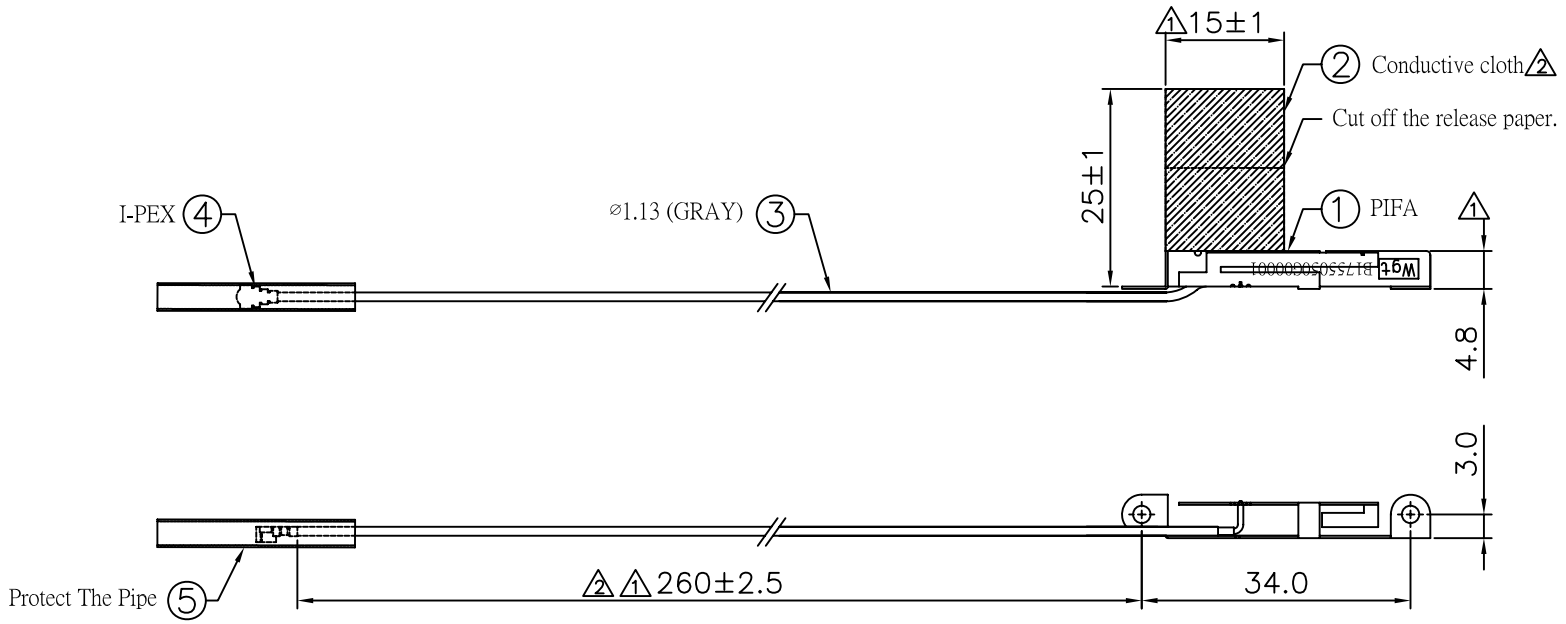
2. Mechanical dimensions



ARUMPWIPI01+D



ARUMPWIPI02+C



No.	Description	Specification	Qty	Notes
5	Protect The Pipe	ϕ2.5×25mm	1	Equivalent
4	CONNECT	I-PEX 20278-101R-13/20278-111R-13	1	
3	MHF PLUG OD	ϕ 1.13 Axon AWG32 TS GRAY	1	Equivalent
2	CONDUCTIVE CLOTH	CATERON 85773 L 25×W15×T0.1mm	1	
1	PIFA	SPTE t=0.3mm	1	

Item	Description	Date
△1	變更鐵件&出線&導電貼布	kaien Dec/06/06
△2	變更出線長&導電貼布位置	kaien Dec/15/06
△3	增加導電布離形紙中間截斷	kaien Jan/04/07
△4		
△5		

TOLERANCE			
LEVER	A±	B±	C±
0-6	0.05	0.10	0.20
6-30	0.07	0.20	0.50
30-100	0.10	0.30	0.80
100-300	0.20	0.50	1.20
300-	0.30	0.80	2.00

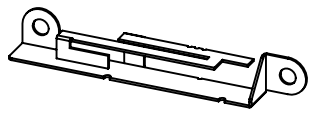
DATE: Oct/26/'06
QUANTITY: 1 PCS/SET
SCALE: 1:1
UNIT: MM
MATERIAL:
FINISH:
APPROVAL | CHECKER | DRAWED: KAIEN

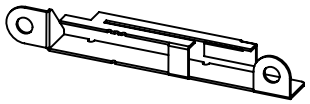
精乘科技股份有限公司
WELL GREEN TECHNOLOGY CO.,LTD

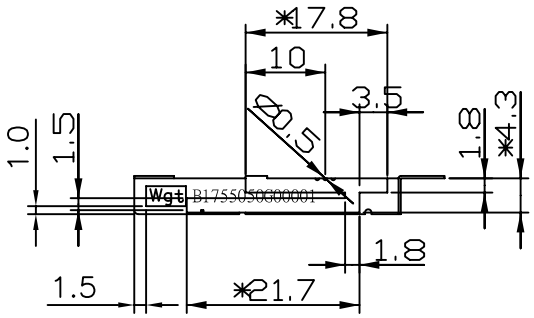
TITLE: UMPC ANTENNA-L
Part No. ARUMPWIPI01+D
DWG No. UMP-WIR-AAR01+D
SHEET 1 OF 1
REV D

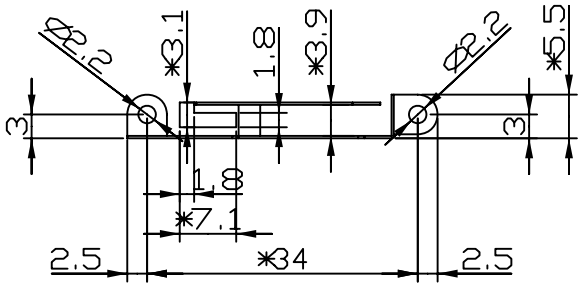
Please,Don't measure dimension on drawing

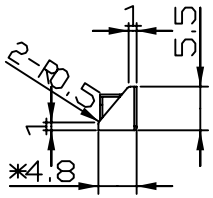
Notes:
1.未標示R=0.3mm
2.表面不得有毛邊
3.外觀不得有油污、壓傷、刮傷
4.折彎處皆爲90°

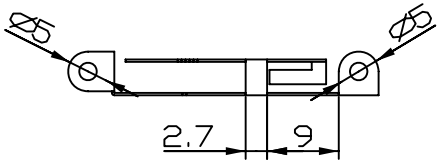


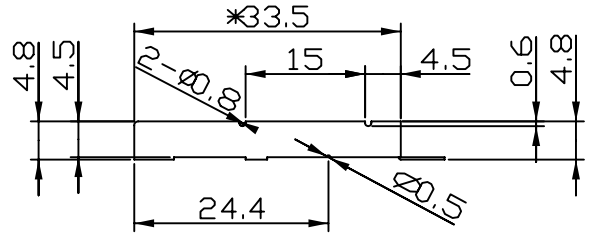












" * " IS THE CHECK DIMENSION

Item	Description	Date
1		
2		
3		
4		
5		

TOLERANCE			
LEVER	A±	B±	C±
0-6	0.05	0.10	0.20
6-30	0.07	0.20	0.50
30-100	0.10	0.30	0.80
100-300	0.20	0.50	1.20
300-	0.30	0.80	2.00

DATE: Dec/01/'06
QUANTITY: 1 PCS/SET
SCALE: 1:1
UNIT: MM

MATERIAL: SPTE t=0.3mm
FINISH:

APPROVAL	CHECKER	DRAWED
		KAIEN

精乘科技股份有限公司
WELL GREEN TECHNOLOGY CO.,LTD

TITLE: UMPC PIFA-L
Part No. MM-0203-00+A
DWG No. MM-0203-00+A
SHEET 1 OF 1
REV A

Please,Don't measure dimension on drawing

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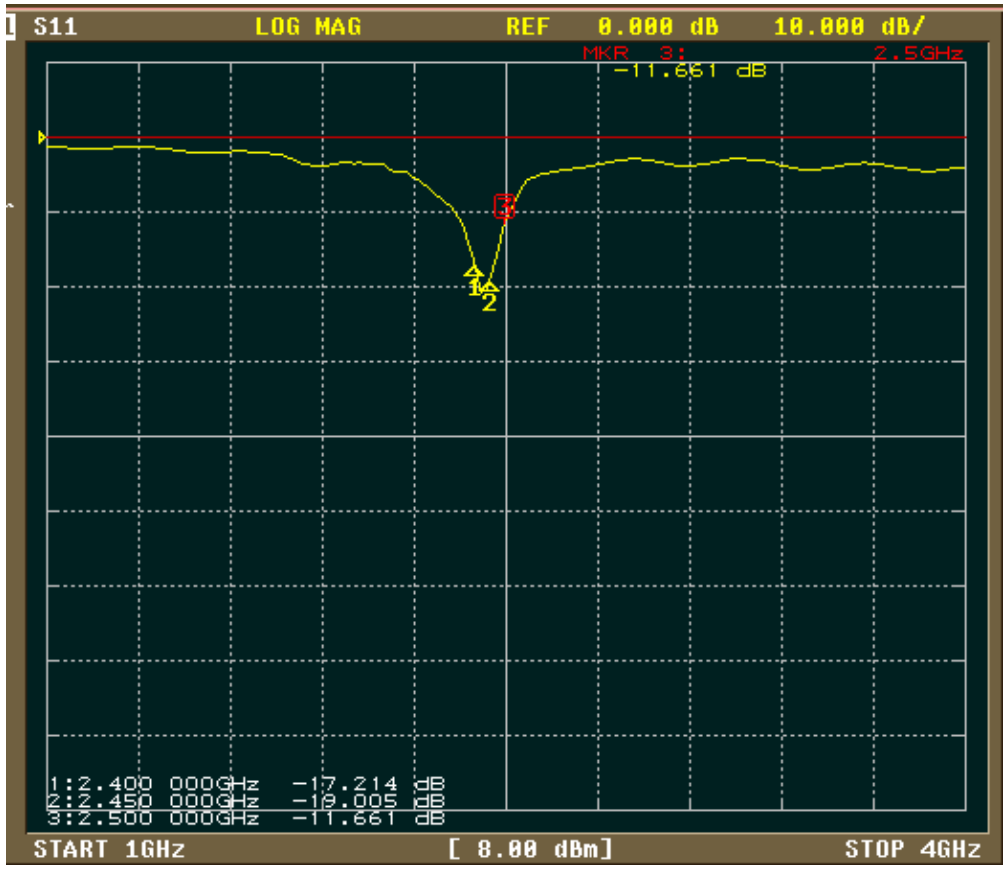
II. Test results

Antenna	Application	Placement	Cable dia. Φ mm
UMPC	Wireless LAN	Left up	1.13

1. Return Loss

Antenna	Center freg. @MHz	BW @MHz	Return Loss		
			2.4GHz	2.45GHz	2.5GHz
UMPC	2450		-17.21	-19.00	-11.66



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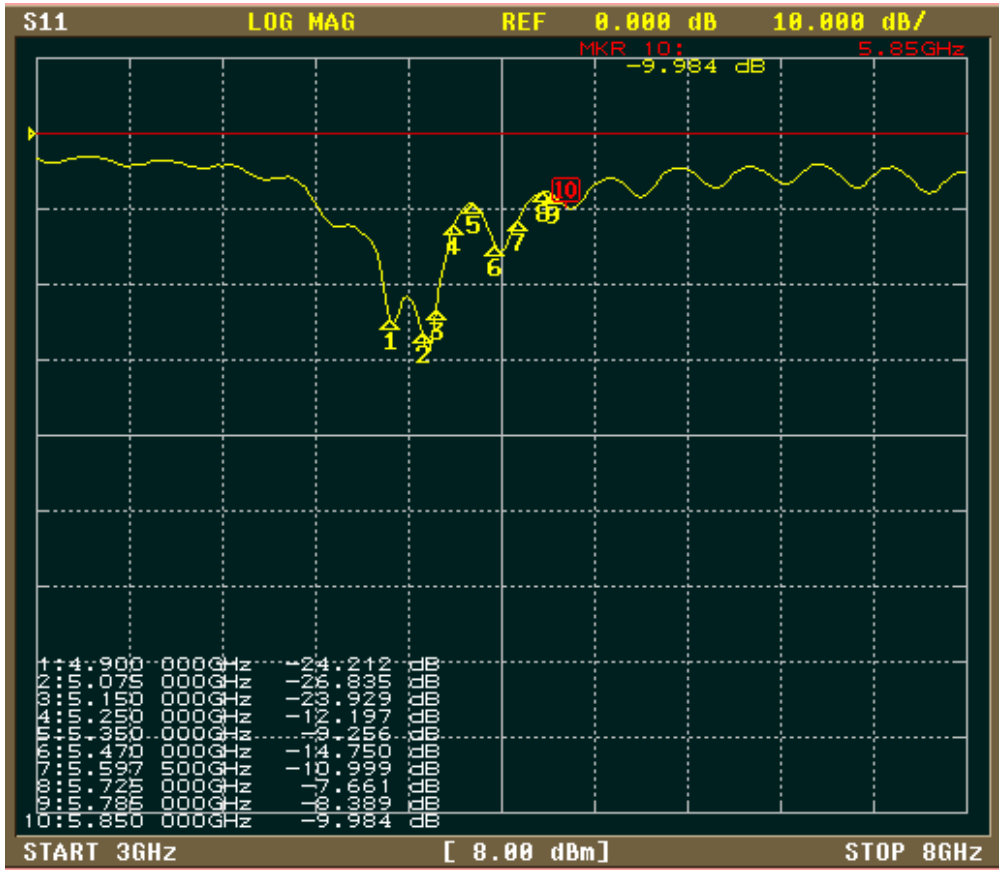
1-1. Return Loss

Antenna	Center freg. @MHz	BW @MHz	Return Loss		
			5.15GHz	5.25GHz	5.35GHz
UMPC	2450		-23.92	-12.19	-9.25



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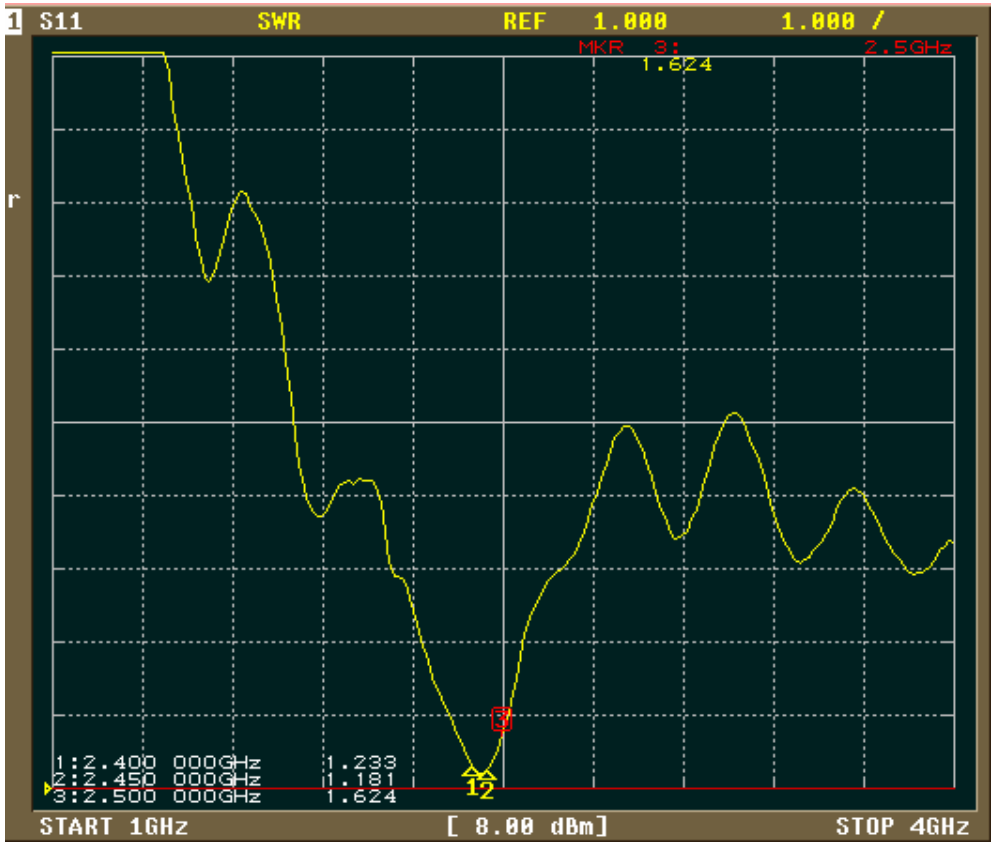
2. VSWR

Antenna	Center freg. @MHz	BW @MHz	VSWR		
			2.4GHz	2.45GHz	2.5GHz
UMPC	2450		1.23	1.18	1.62



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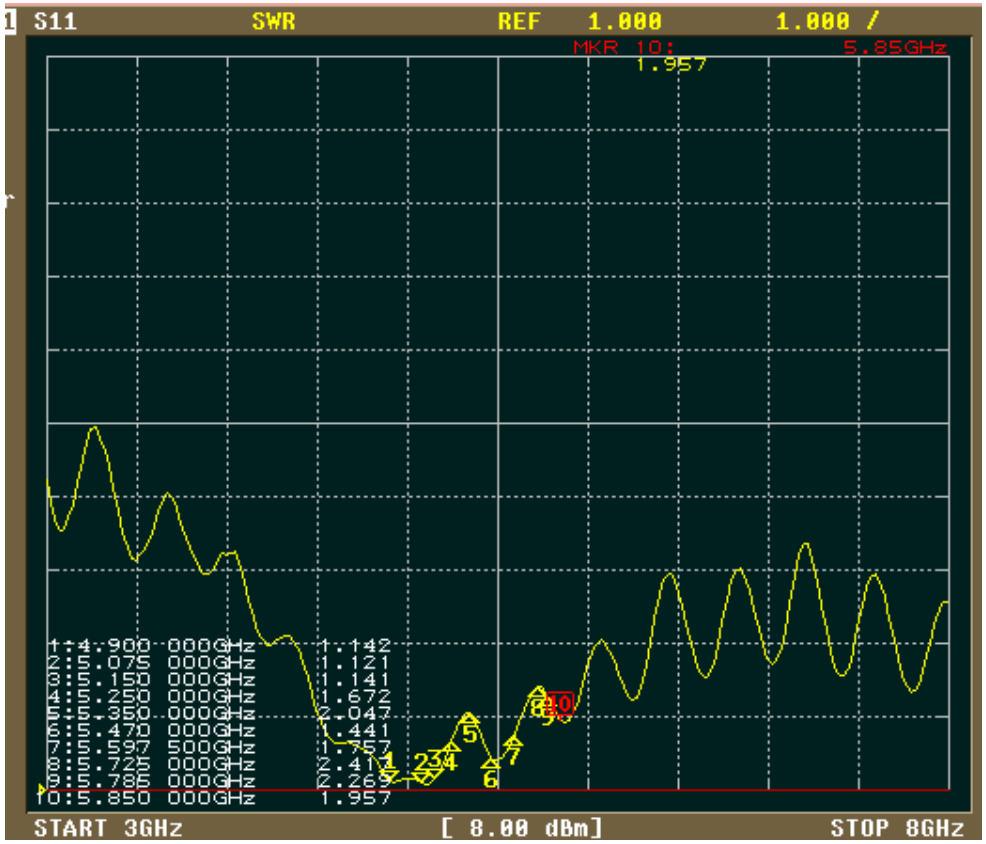
2-2. VSWR

Antenna	Center freg. @MHz	BW @MHz	VSWR		
			5.15GHz	5.25GHz	5.35GHz
UMPC	2450		1.14	1.67	2.04



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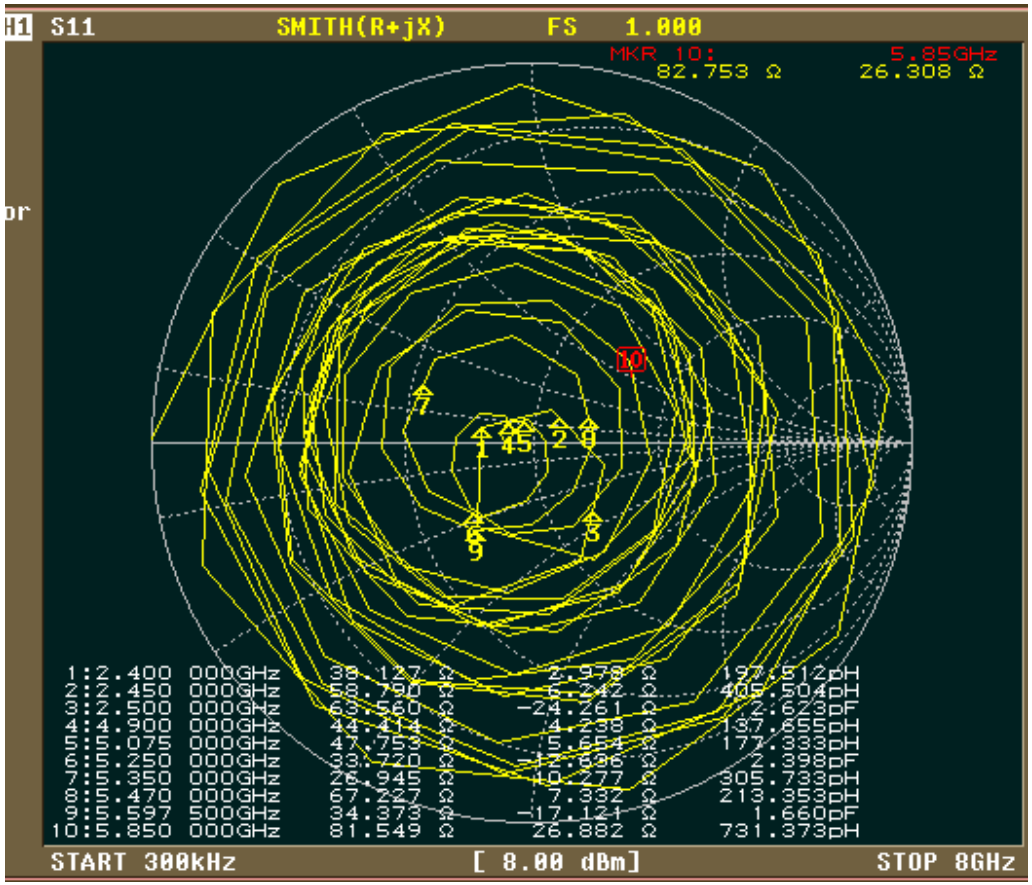
3. Smith Chart



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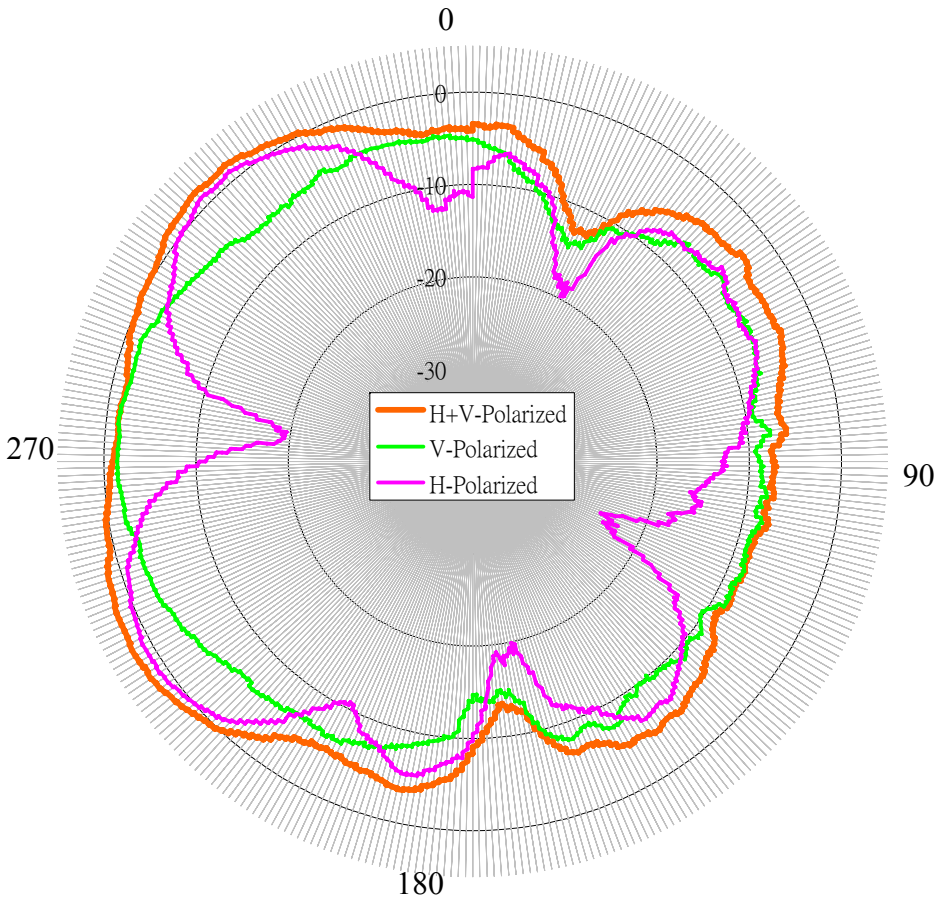
4. Radiation Pattern of **XY Plane(Azimuth)-(Open)**



Center Frequency	2400 MHz
Vertical peak Gain (dBi)	-1.36
Vertical Average Gain (dBi)	-5.89
Horizontal peak Gain (dBi)	1.07
Horizontal Average Gain (dBi)	-5.12
Hori+Vert peak Gain (dBi)	2.23
Hori+Vert Average Gain (dBi)	-2.48

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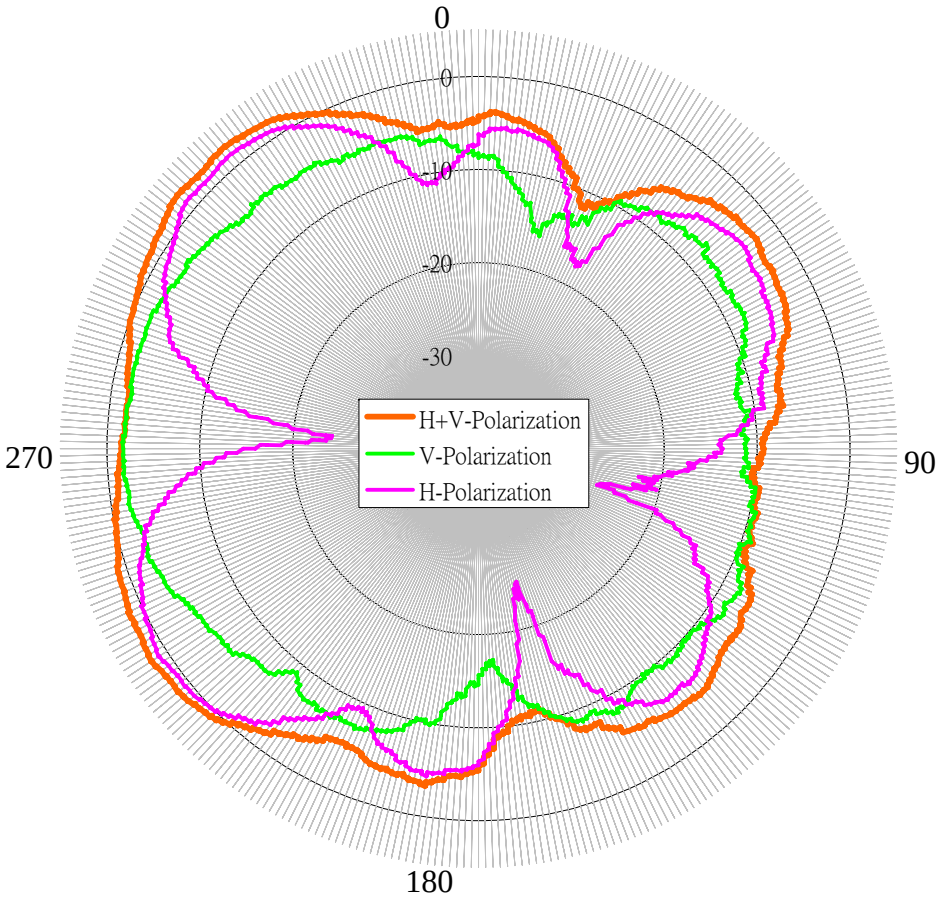
5. Radiation Pattern of **XY Plane(Azimuth)- (Open)**



Center Frequency	**2450 MHz**
Vertical peak Gain (dBi)	-1.63
Vertical Average Gain (dBi)	-6.36
Horizontal peak Gain (dBi)	1.37
Horizontal Average Gain (dBi)	-4.57
Hori+Vert peak Gain (dBi)	2.41
Hori+Vert Average Gain (dBi)	-2.37

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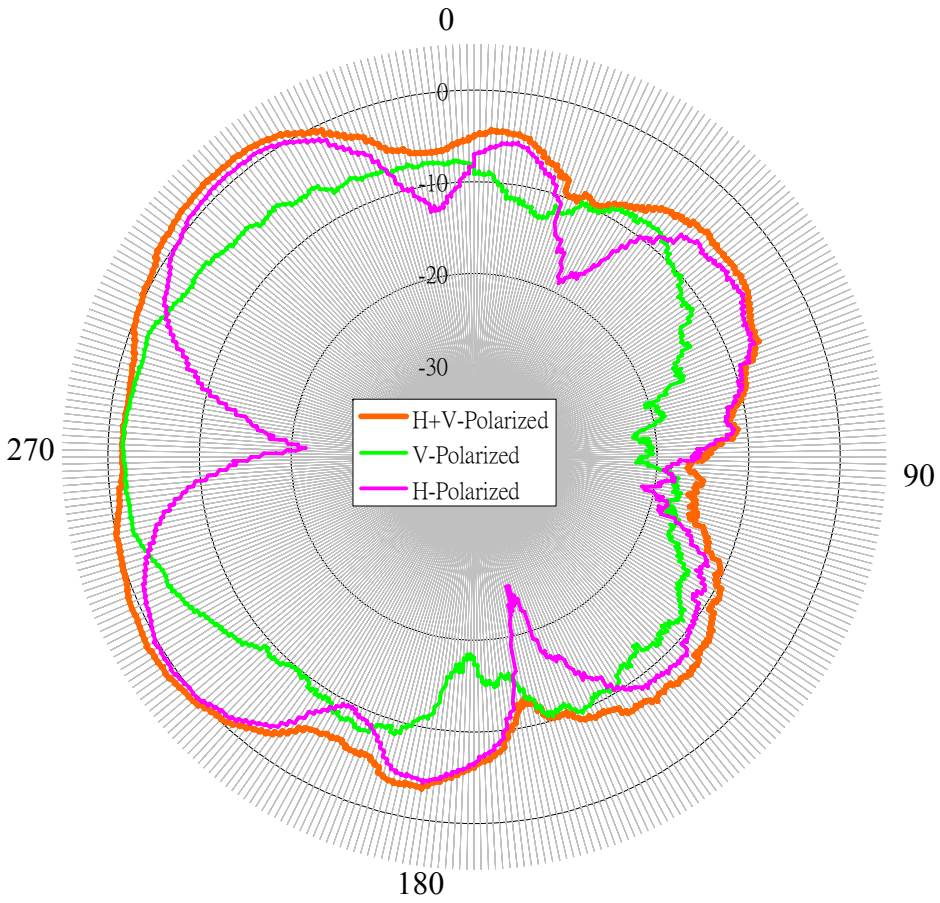
6. Radiation Pattern of **XY Plane(Azimuth)- (Open)**



Center Frequency	**2500 MHz**
Vertical peak Gain (dBi)	-1.57
Vertical Average Gain (dBi)	-7.32
Horizontal peak Gain (dBi)	0.94
Horizontal Average Gain (dBi)	-5.14
Hori+Vert peak Gain (dBi)	1.92
Hori+Vert Average Gain (dBi)	-3.08

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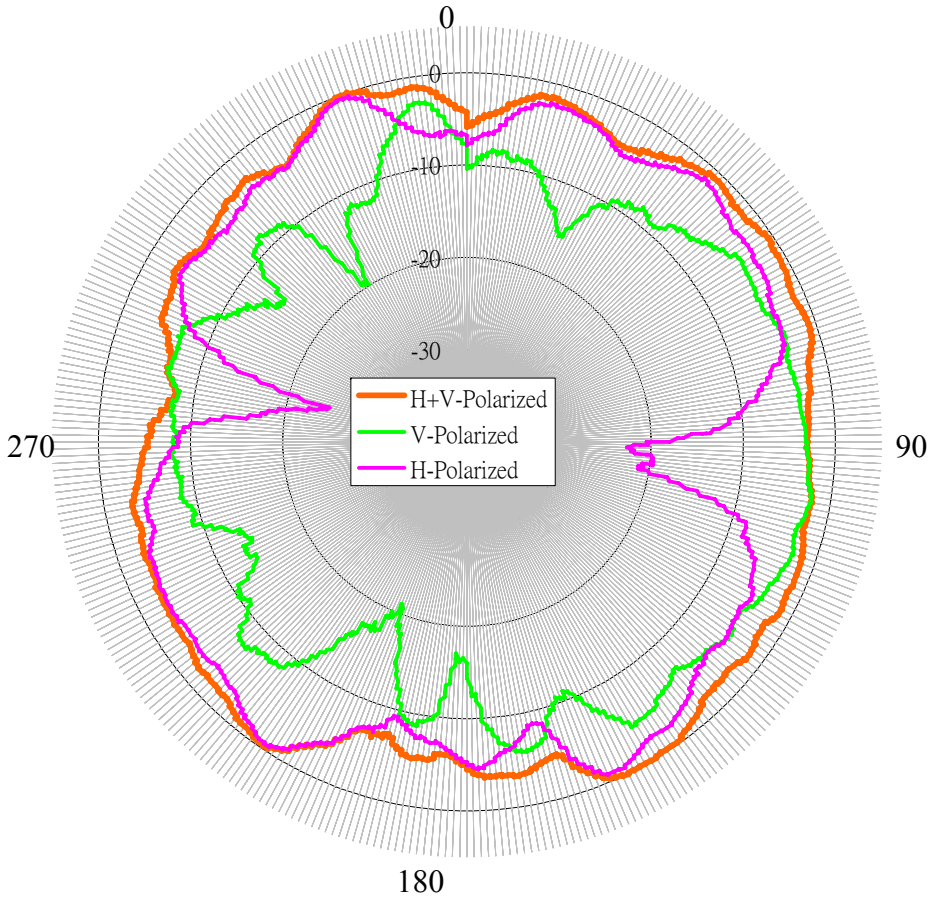
7. Radiation Pattern of **XY Plane(Azimuth)- (Open)**



Center Frequency	4900 MHz
Vertical peak Gain (dBi)	-2.06
Vertical Average Gain (dBi)	-7.01
Horizontal peak Gain (dBi)	-0.39
Horizontal Average Gain (dBi)	-4.42
Hori+Vert peak Gain (dBi)	0.07
Hori+Vert Average Gain (dBi)	-2.51

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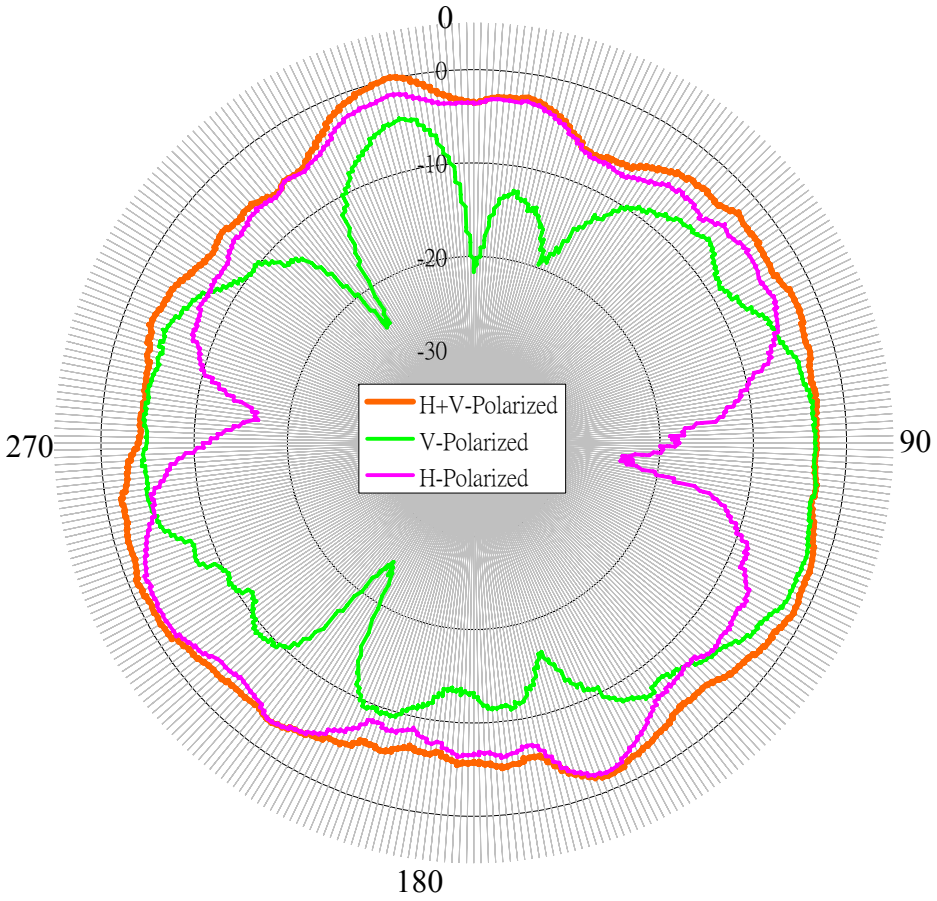
8. Radiation Pattern of **XY Plane(Azimuth)- (Open)**



Center Frequency	**5075 MHz**
Vertical peak Gain (dBi)	-2.26
Vertical Average Gain (dBi)	-7.13
Horizontal peak Gain (dBi)	-1.64
Horizontal Average Gain (dBi)	-5.41
Hori+Vert peak Gain (dBi)	0.20
Hori+Vert Average Gain (dBi)	-3.17

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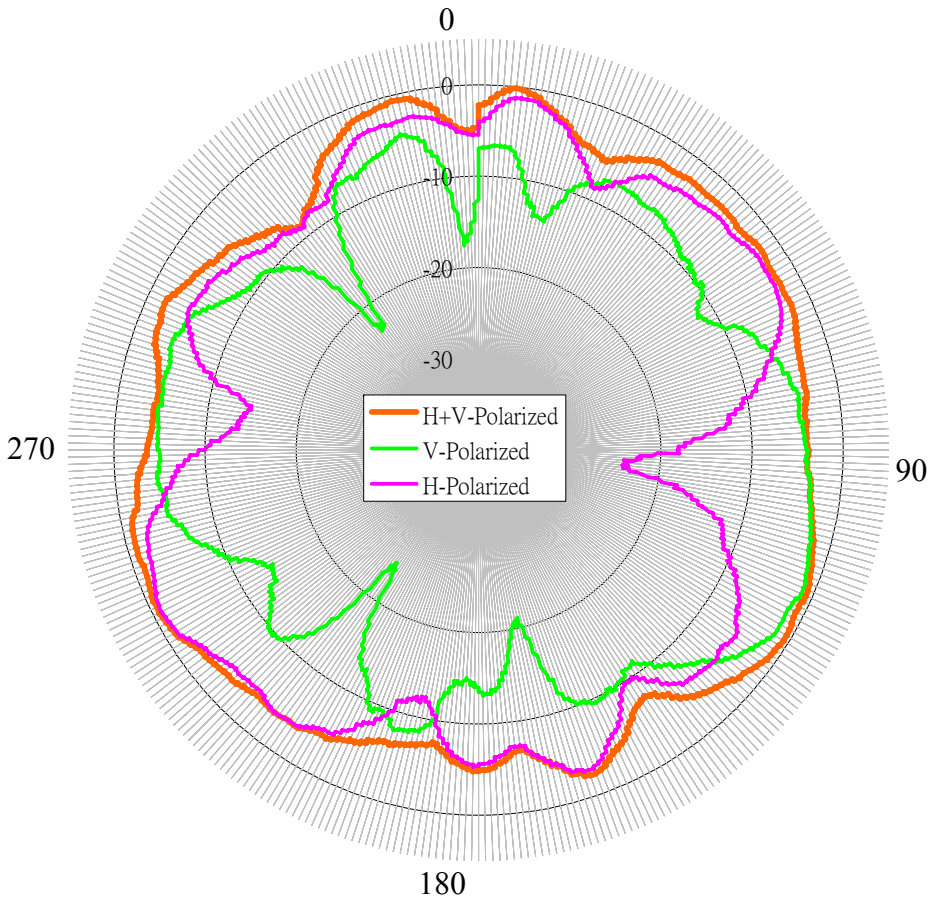
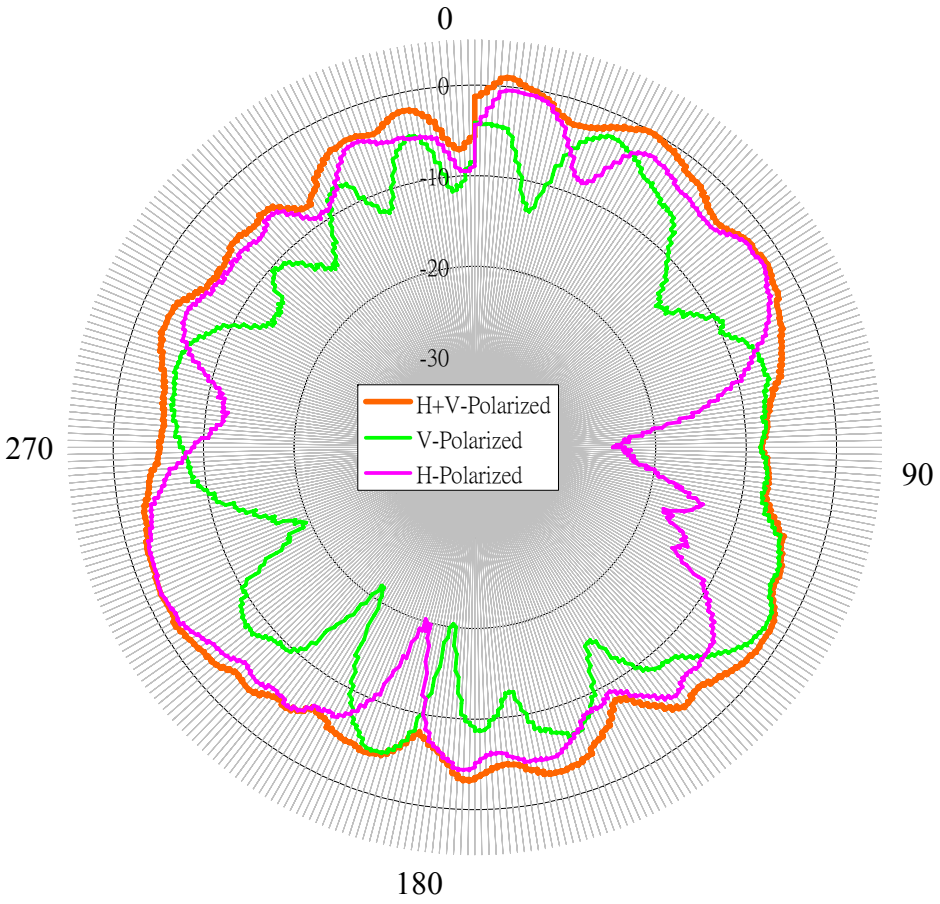
9. Radiation Pattern of **XY Plane(Azimuth)- (Open)**



Center Frequency	**5150 MHz**
Vertical peak Gain (dBi)	-1.26
Vertical Average Gain (dBi)	-7.03
Horizontal peak Gain (dBi)	-0.96
Horizontal Average Gain (dBi)	-5.30
Hori+Vert peak Gain (dBi)	-0.16
Hori+Vert Average Gain (dBi)	-3.07

10. Radiation Pattern of **XY Plane(Azimuth)- (Open)**



Center Frequency	**5250 MHz**
Vertical peak Gain (dBi)	-2.21
Vertical Average Gain (dBi)	-7.67
Horizontal peak Gain (dBi)	-0.41
Horizontal Average Gain (dBi)	-5.61
Hori+Vert peak Gain (dBi)	1.00
Hori+Vert Average Gain (dBi)	-3.51

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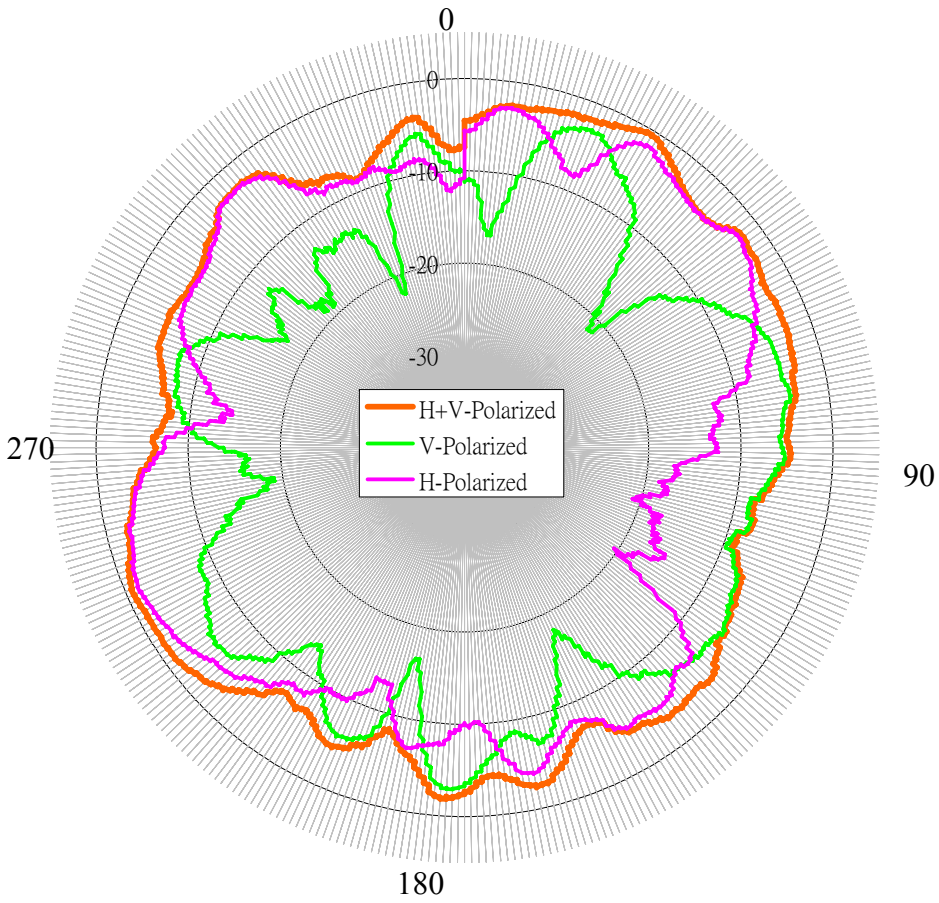
11. Radiation Pattern of **XY Plane(Azimuth)- (Open)**



Center Frequency	**5350 MHz**
Vertical peak Gain (dBi)	-2.94
Vertical Average Gain (dBi)	-8.20
Horizontal peak Gain (dBi)	-1.42
Horizontal Average Gain (dBi)	-5.97
Hori+Vert peak Gain (dBi)	-0.46
Hori+Vert Average Gain (dBi)	-3.93

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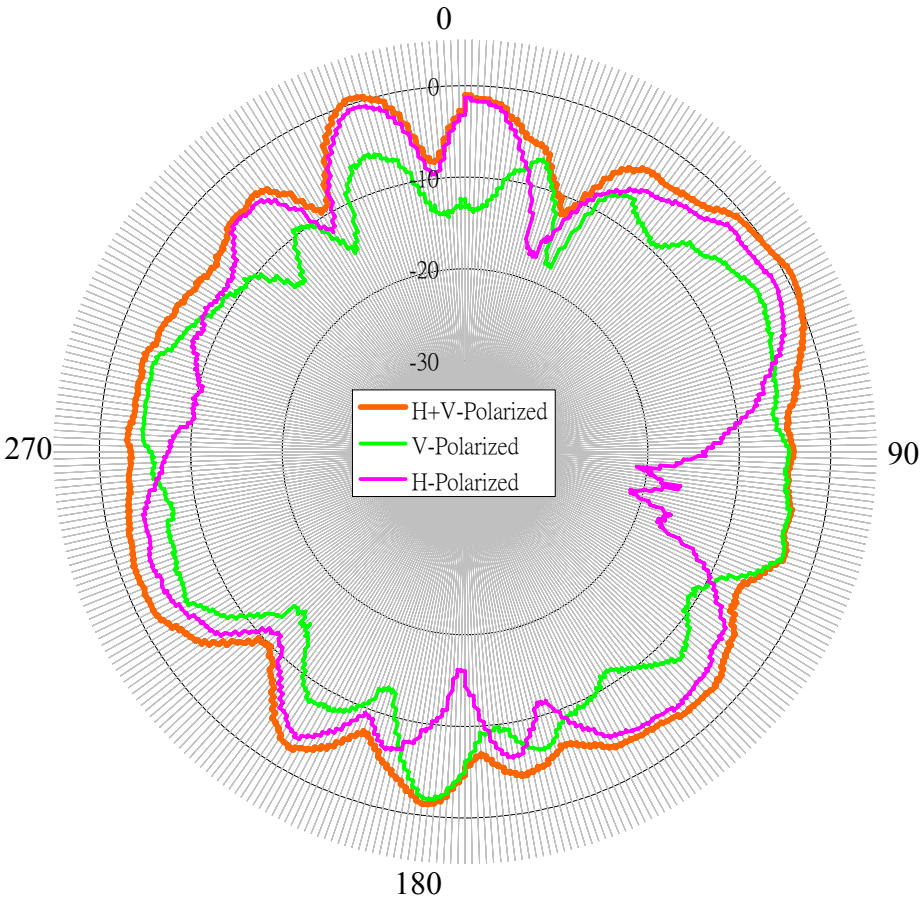
12. Radiation Pattern of **XY Plane(Azimuth)- (Open)**



Center Frequency	**5470 MHz**
Vertical peak Gain (dBi)	-1.84
Vertical Average Gain (dBi)	-7.15
Horizontal peak Gain (dBi)	-0.56
Horizontal Average Gain (dBi)	-5.89
Hori+Vert peak Gain (dBi)	0.66
Hori+Vert Average Gain (dBi)	-3.47

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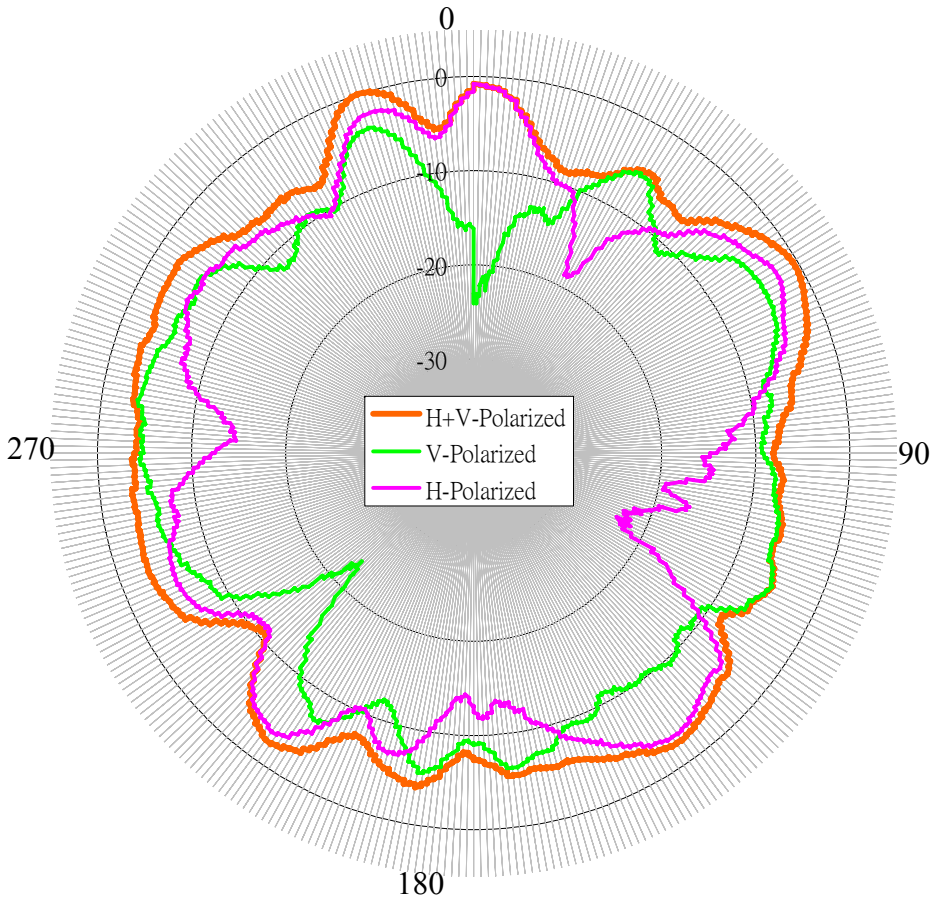
13. Radiation Pattern of **XY Plane(Azimuth)- (Open)**



Center Frequency	**5597.5 MHz**
Vertical peak Gain (dBi)	-3.66
Vertical Average Gain (dBi)	-7.71
Horizontal peak Gain (dBi)	-0.81
Horizontal Average Gain (dBi)	-6.86
Hori+Vert peak Gain (dBi)	0.08
Hori+Vert Average Gain (dBi)	-4.26

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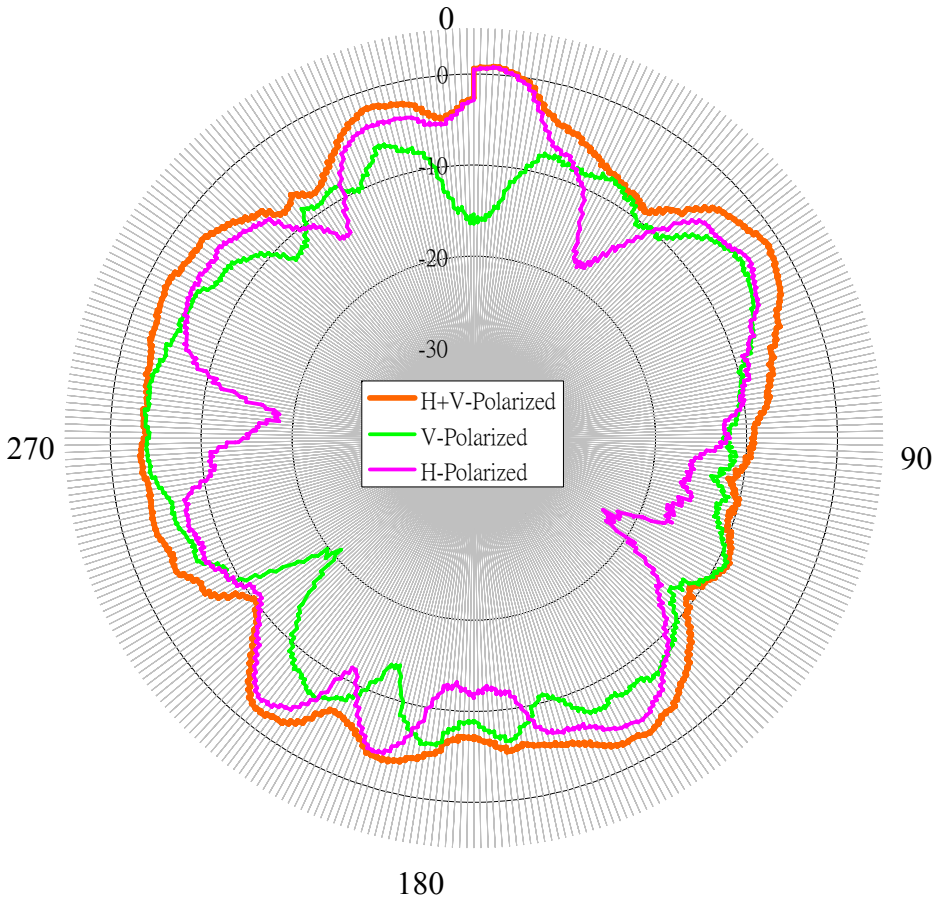
14. Radiation Pattern of **XY Plane(Azimuth)- (Open)**



Center Frequency	**5725 MHz**
Vertical peak Gain (dBi)	-3.67
Vertical Average Gain (dBi)	-8.01
Horizontal peak Gain (dBi)	0.77
Horizontal Average Gain (dBi)	-6.95
Hori+Vert peak Gain (dBi)	0.87
Hori+Vert Average Gain (dBi)	-4.43

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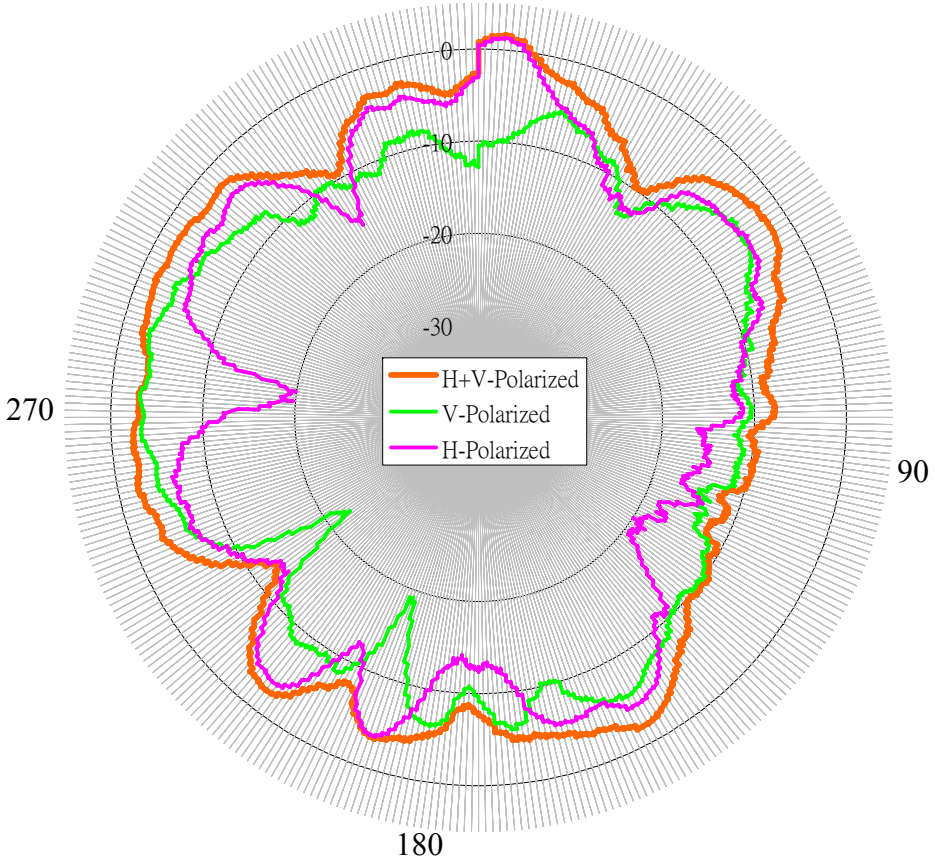
15. Radiation Pattern of **XY$_0$Plane(Azimuth)- (Open)**



Center Frequency	**5785 MHz**
Vertical peak Gain (dBi)	-2.95
Vertical Average Gain (dBi)	-7.85
Horizontal peak Gain (dBi)	1.32
Horizontal Average Gain (dBi)	-6.90
Hori+Vert peak Gain (dBi)	1.64
Hori+Vert Average Gain (dBi)	-4.34

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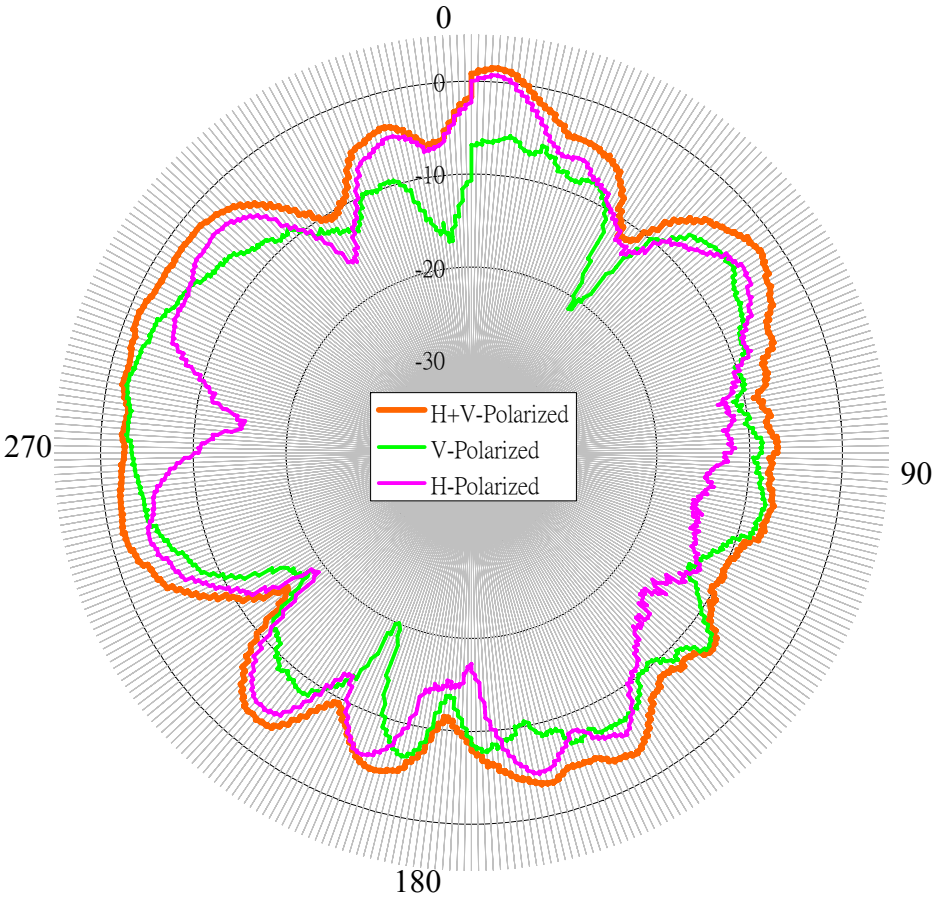
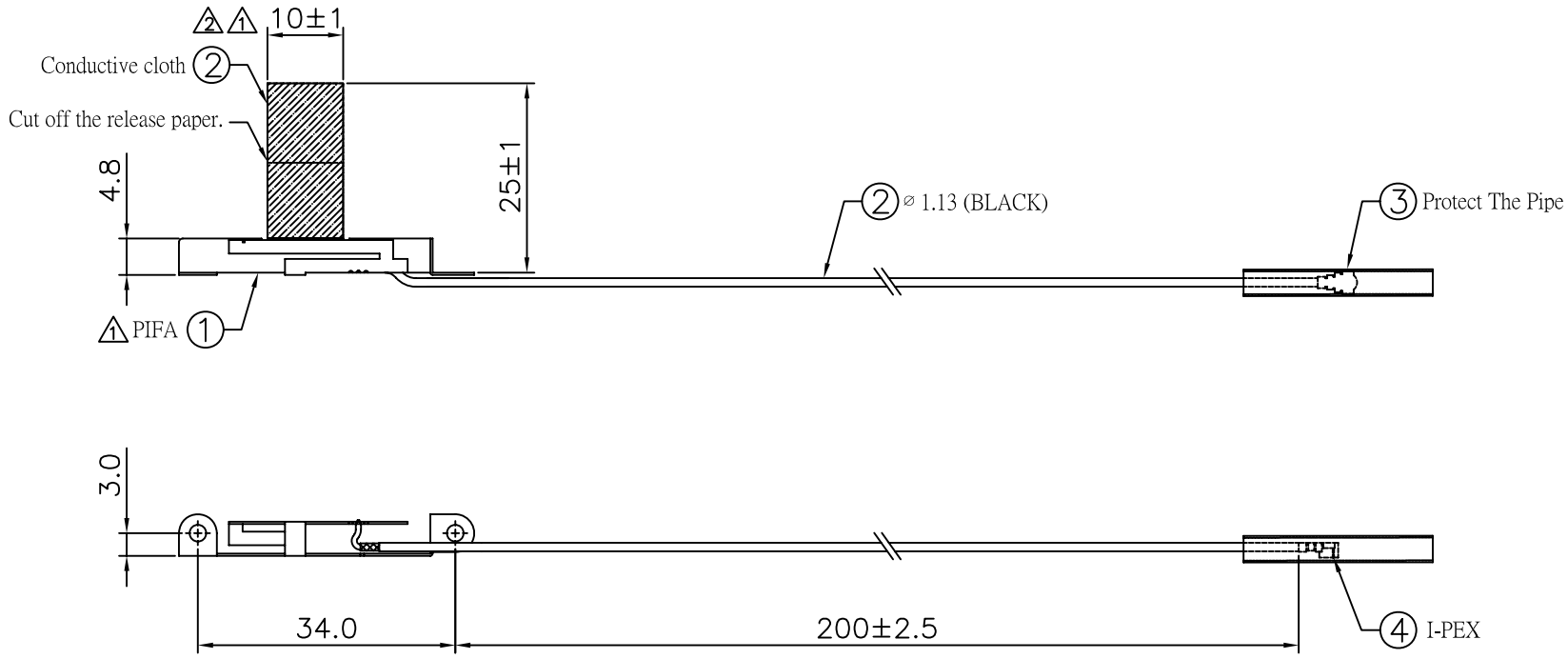
16. Radiation Pattern of **XY Plane(Azimuth)- (Open)**



Center Frequency	**5850 MHz**
Vertical peak Gain (dBi)	-2.09
Vertical Average Gain (dBi)	-7.71
Horizontal peak Gain (dBi)	0.71
Horizontal Average Gain (dBi)	-7.20
Hori+Vert peak Gain (dBi)	1.48
Hori+Vert Average Gain (dBi)	-4.44



No.	Description	Specification	Qty	Notes
5	CONNECT	I-PEX 20278-101R-13/20278-111R-13	1	
4	Protect The Pipe	ϕ2.5×25mm	1	Equivalent
3	MHF PLUG OD	ϕ 1.13 Axon AWG32 TS BLACK	1	Equivalent
2	CONDUCTIVE CLOTH	CATERON 85773 L 25×W10×T0.1mm	1	
1	PIFA	SPTE t=0.3mm	1	

Item	Description	Date
△1	變更鐵件&導電貼布	kaien Dec/06/06
△2	增加導電布離形紙中間截斷	kaien Jan/04/'07
△3		
△4		
△5		

TOLERANCE			
LEVER	A±	B±	C±
0-6	0.05	0.10	0.20
6-30	0.07	0.20	0.30
30-100	0.10	0.30	0.80
100-300	0.20	0.50	1.20
300-	0.30	0.80	2.00

DATE: Oct/26/'06
QUANTITY: 1 PCS/SET
SCALE: 1:1
UNIT: MM
MATERIAL:
FINISH:

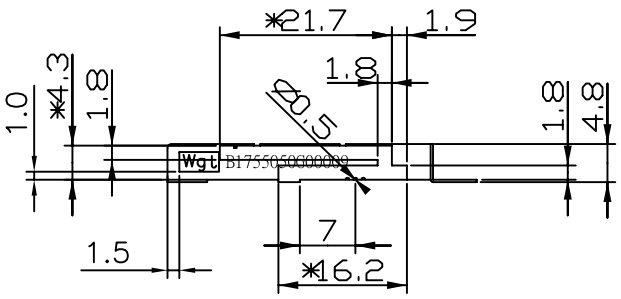
APPROVAL	CHECKER	DRAWED
		KAIEN

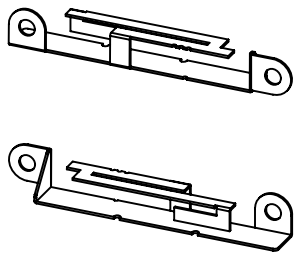
精乘科技股份有限公司
WELL GREEN TECHNOLOGY CO.,LTD

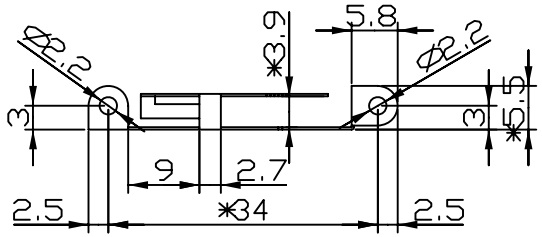
TITLE: UMPC ANTENNA-R
Part No. ARUMPWIP102+C
DWG No. UMP-WIR-AAR02+C
SHEET 1 OF 1
REV C

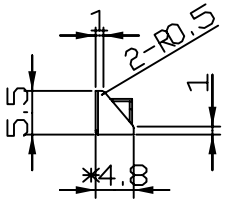
Please,Don't measure dimension on drawing

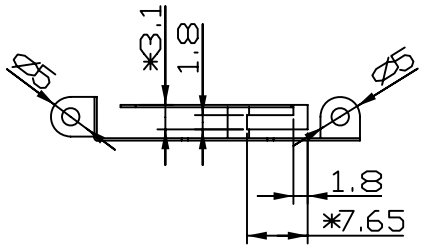
Notes:
1.未標示R=0.3mm
2.表面不得有毛邊
3.外觀不得有油污、壓傷、刮傷
4.折彎處皆爲90°

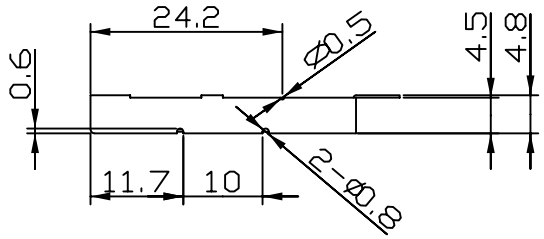












" * " IS THE CHECK DIMENSION

Item	Description	Date
1		
2		
3		
4		
5		

TOLERANCE			
LEVER	A±	B±	C±
0–6	0.05	0.10	0.20
6–30	0.07	0.20	0.50
30–100	0.10	0.30	0.80
100–300	0.20	0.50	1.20
300–	0.30	0.80	2.00

DATE: Dec/01/'06
QUANTITY: 1 PCS/SET
SCALE: 1:1
UNIT: MM

MATERIAL: SPTE t=0.3mm
FINISH:

APPROVAL	CHECKER	DRAWED
		KAIEN

精乘科技股份有限公司
WELL GREEN TECHNOLOGY CO.,LTD

TITLE: UMPC PIFA-R
Part No. MM-0204-00+A
DWG No. MM-0204-00+A
SHEET 1 OF 1 REV A

Please,Don't measure dimension on drawing

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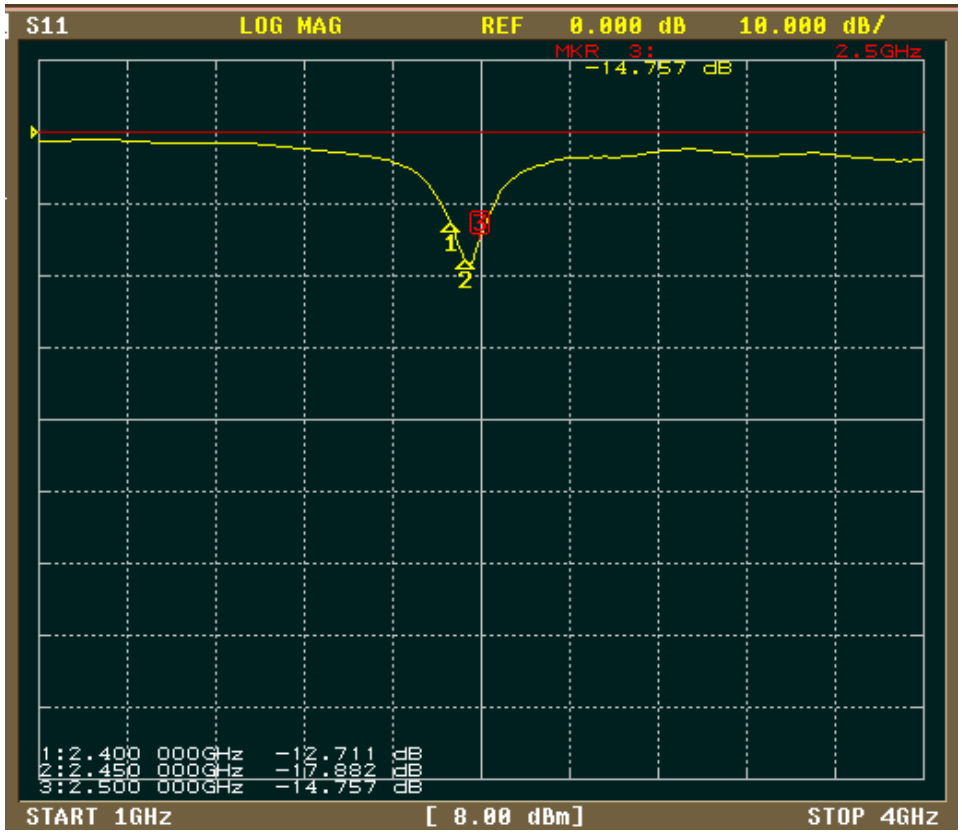
Ⅲ. Test results

Antenna	Application	Placement	Cable dia. Φ mm
UMPC	Wireless LAN	Right up	1.13

1. Return Loss

Antenna	Center freg. @MHz	BW @MHz	Return Loss		
			2.4GHz	2.45GHz	2.5GHz
UMPC	2450		-12.71	-17.88	-14.75



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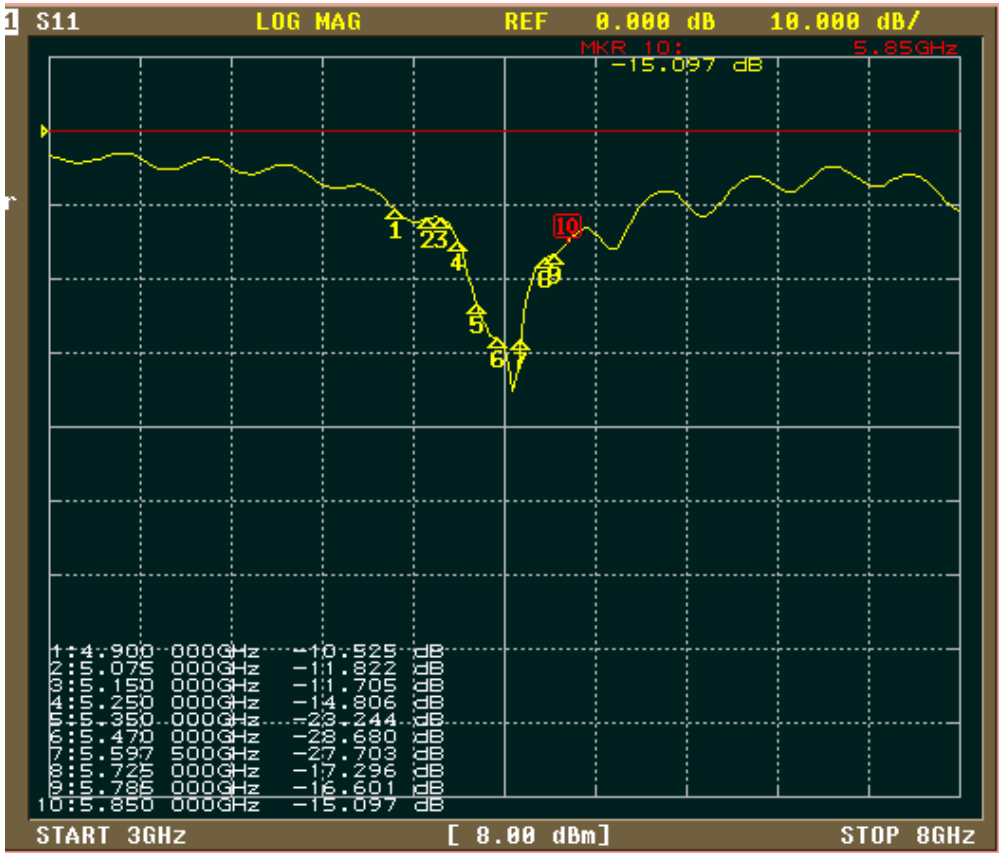
1-1. Return Loss

Antenna	Center freg. @MHz	BW @MHz	Return Loss		
			5.15GHz	5.25GHz	5.35GHz
UMPC	2450		-11.70	-14.80	-23.24



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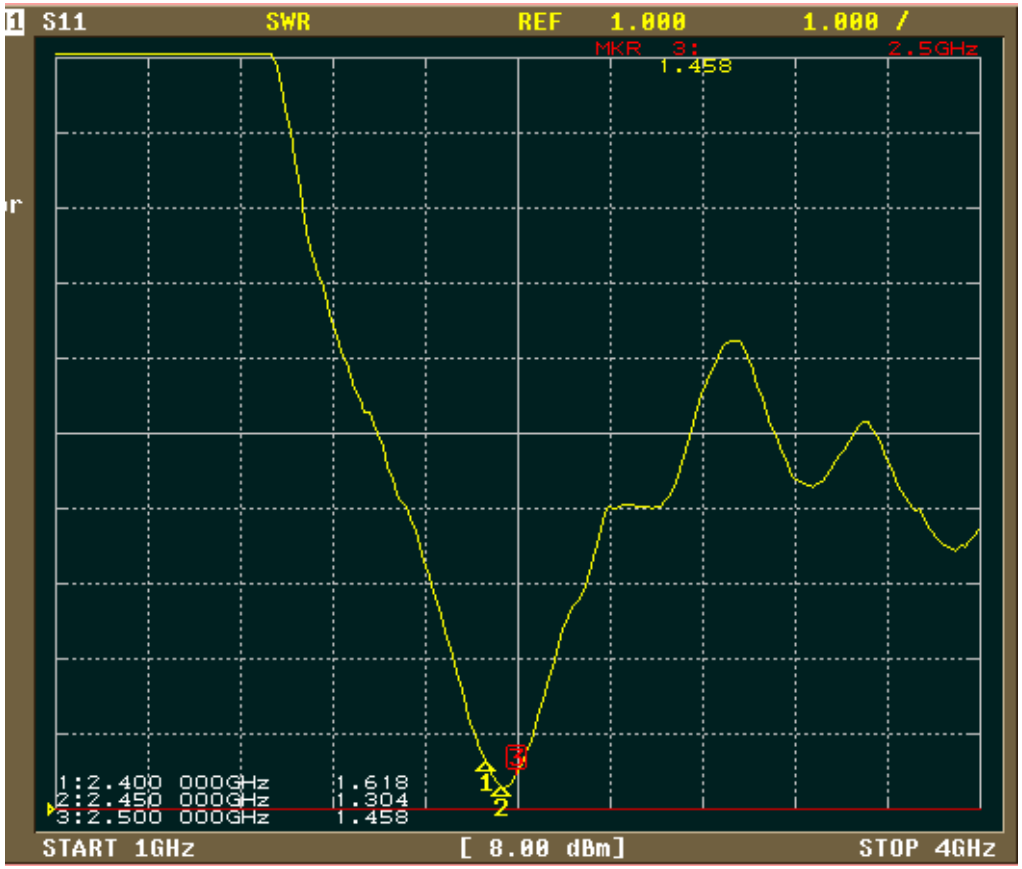
2. VSWR

Antenna	Center freg. @MHz	BW @MHz	VSWR		
			2.4GHz	2.45GHz	2.5GHz
UMPC	2450		1.61	1.30	1.45



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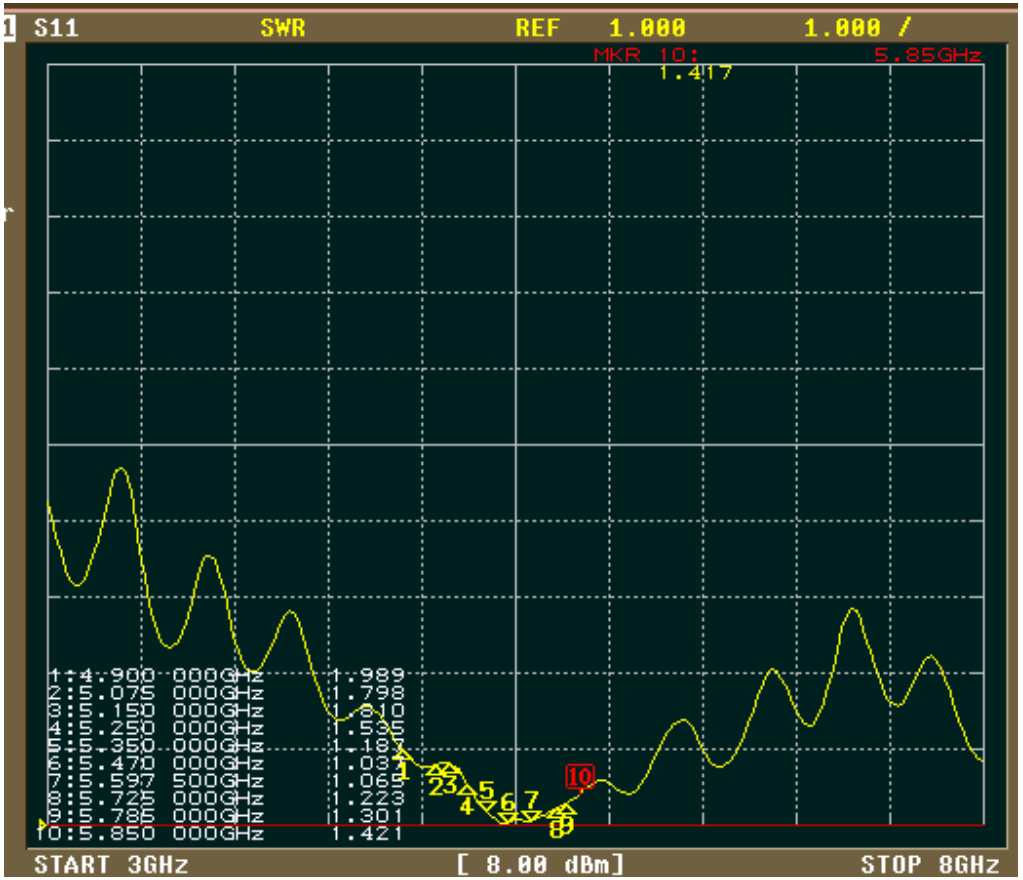
2-2. VSWR

Antenna	Center freg. @MHz	BW @MHz	VSWR		
			5.15GHz	5.25GHz	5.35GHz
UMPC	2450		1.81	1.53	1.18



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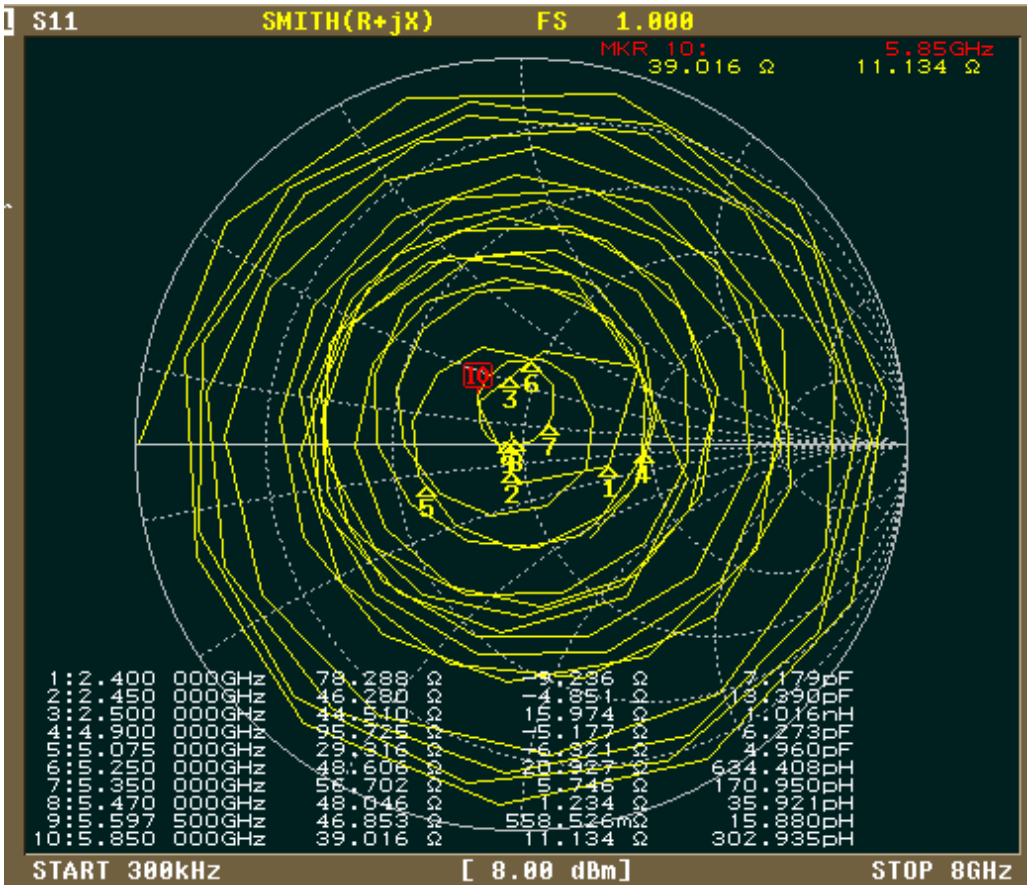
3. Smith Chart



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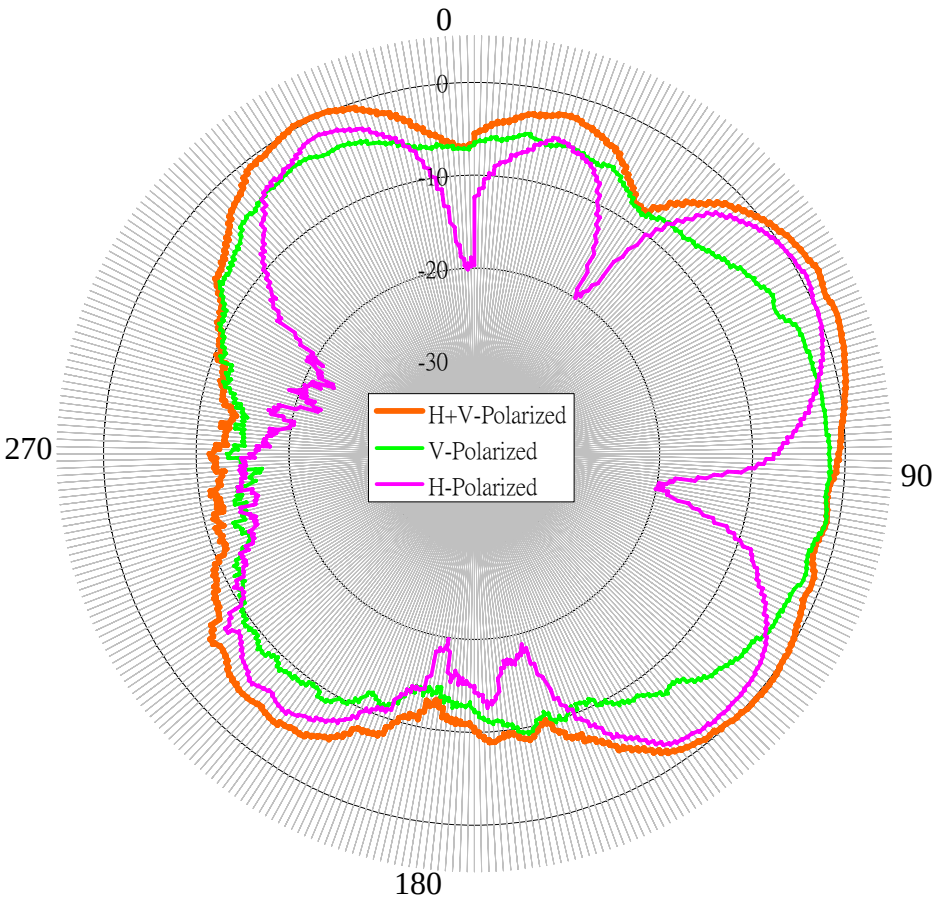
4. Radiation Pattern of **XY Plane(Azimuth)- (Open)**



Center Frequency	**2400 MHz**
Vertical peak Gain (dBi)	-1.37
Vertical Average Gain (dBi)	-6.13
Horizontal peak Gain (dBi)	0.66
Horizontal Average Gain (dBi)	-5.85
Hori+Vert peak Gain (dBi)	2.07
Hori+Vert Average Gain (dBi)	-2.97

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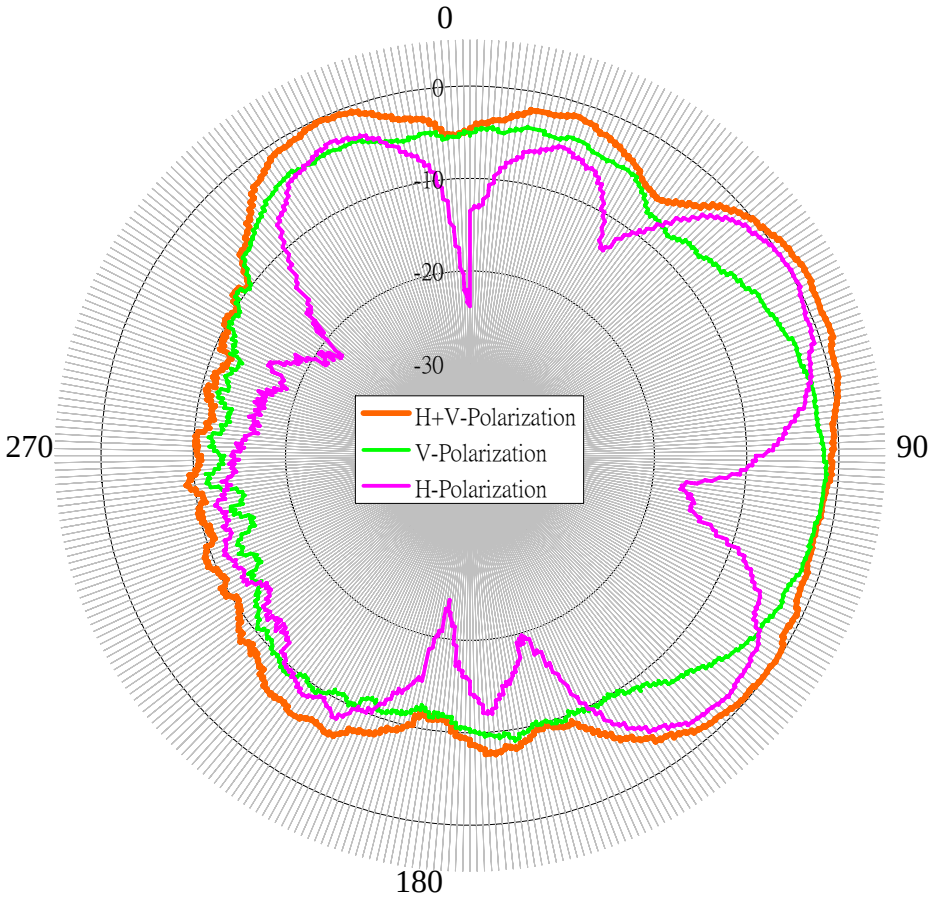
5. Radiation Pattern of **XY Plane(Azimuth)- (Open)**



Center Frequency	**2450 MHz**
Vertical peak Gain (dBi)	-1.23
Vertical Average Gain (dBi)	-6.07
Horizontal peak Gain (dBi)	0.23
Horizontal Average Gain (dBi)	-6.58
Hori+Vert peak Gain (dBi)	1.56
Hori+Vert Average Gain (dBi)	-3.31

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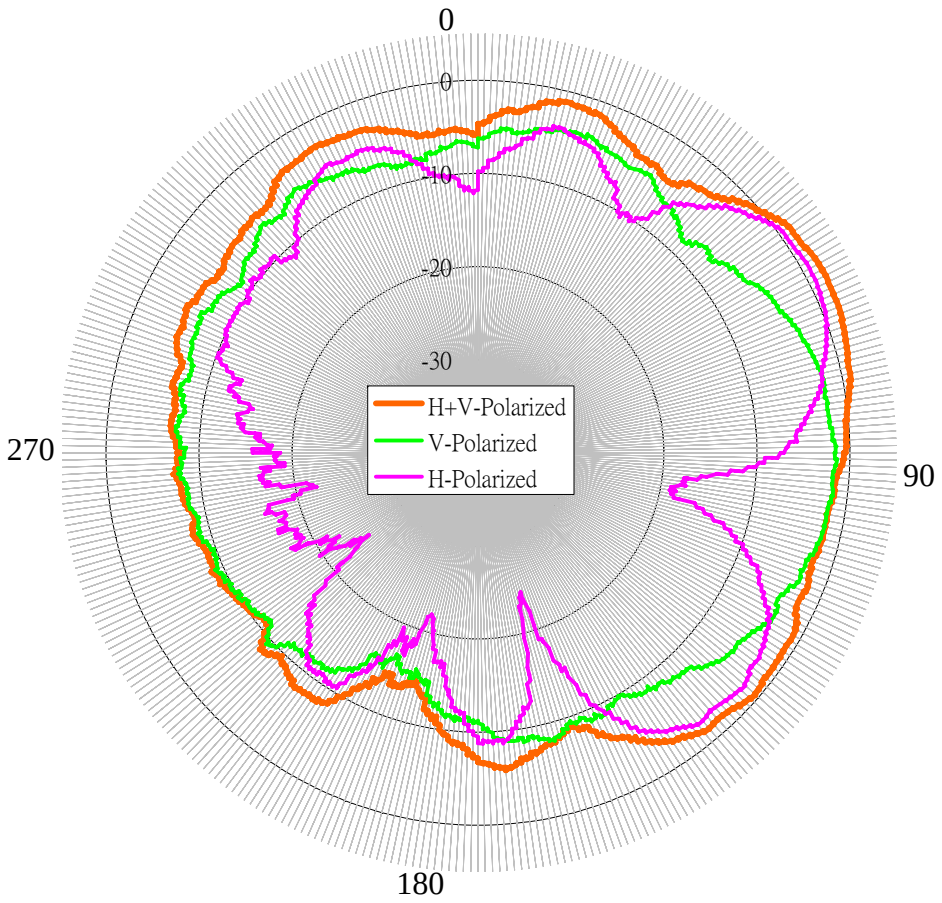
6. Radiation Pattern of **XY Plane(Azimuth)- (Open)**



Center Frequency	**2500 MHz**
Vertical peak Gain (dBi)	-1.39
Vertical Average Gain (dBi)	-6.28
Horizontal peak Gain (dBi)	0.80
Horizontal Average Gain (dBi)	-6.40
Hori+Vert peak Gain (dBi)	1.97
Hori+Vert Average Gain (dBi)	-3.33

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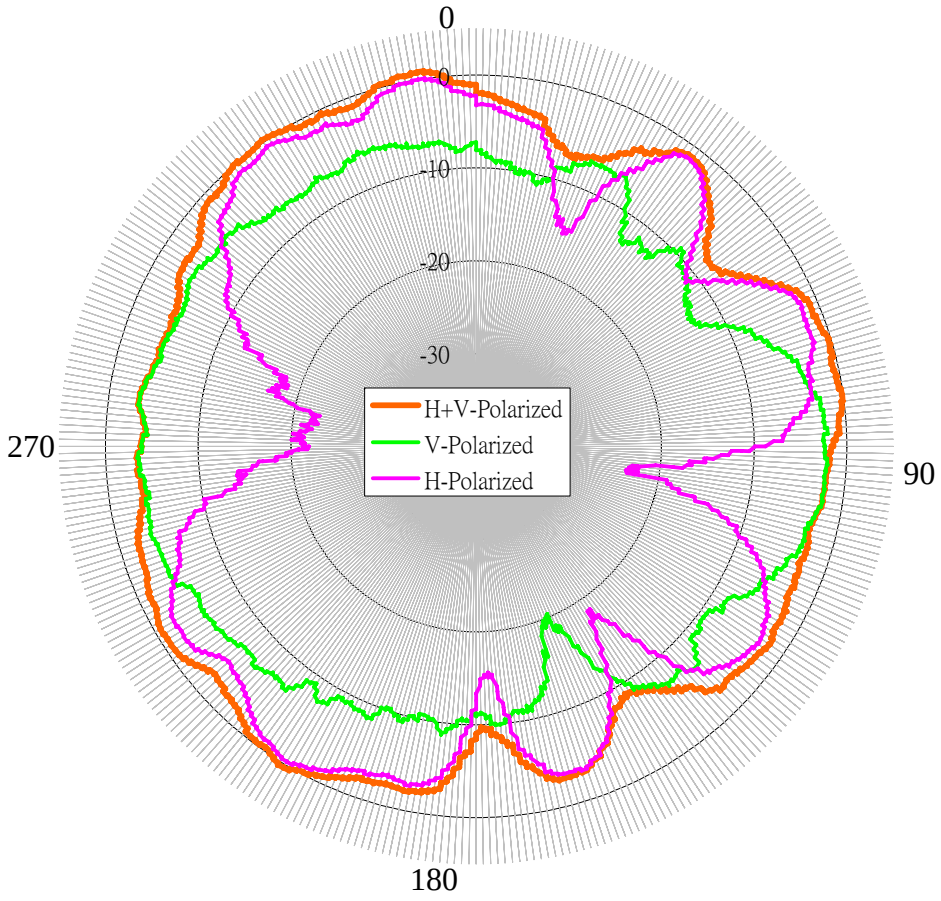
7. Radiation Pattern of **XY Plane(Azimuth)- (Open)**



Center Frequency	**4900 MHz**
Vertical peak Gain (dBi)	-2.04
Vertical Average Gain (dBi)	-6.38
Horizontal peak Gain (dBi)	0.02
Horizontal Average Gain (dBi)	-4.53
Hori+Vert peak Gain (dBi)	0.80
Hori+Vert Average Gain (dBi)	-2.35

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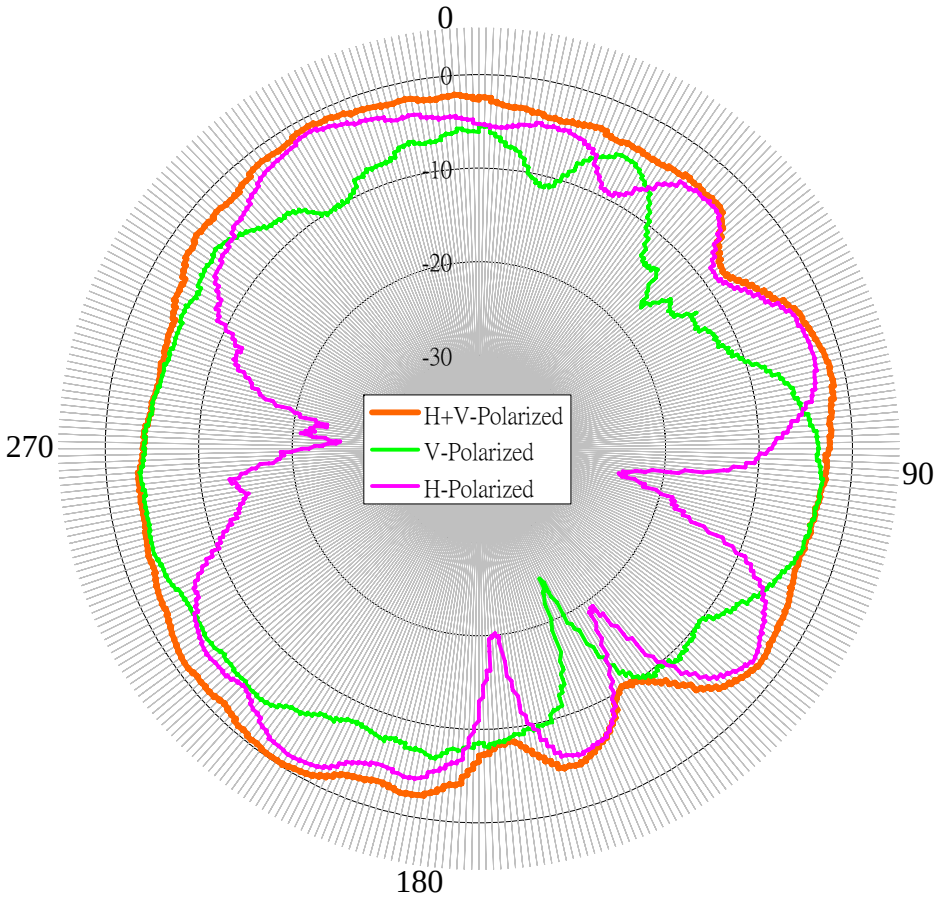
8. Radiation Pattern of **XY Plane(Azimuth)- (Open)**



Center Frequency	**5075 MHz**
Vertical peak Gain (dBi)	-3.03
Vertical Average Gain (dBi)	-6.55
Horizontal peak Gain (dBi)	-1.44
Horizontal Average Gain (dBi)	-5.65
Hori+Vert peak Gain (dBi)	-0.22
Hori+Vert Average Gain (dBi)	-3.07

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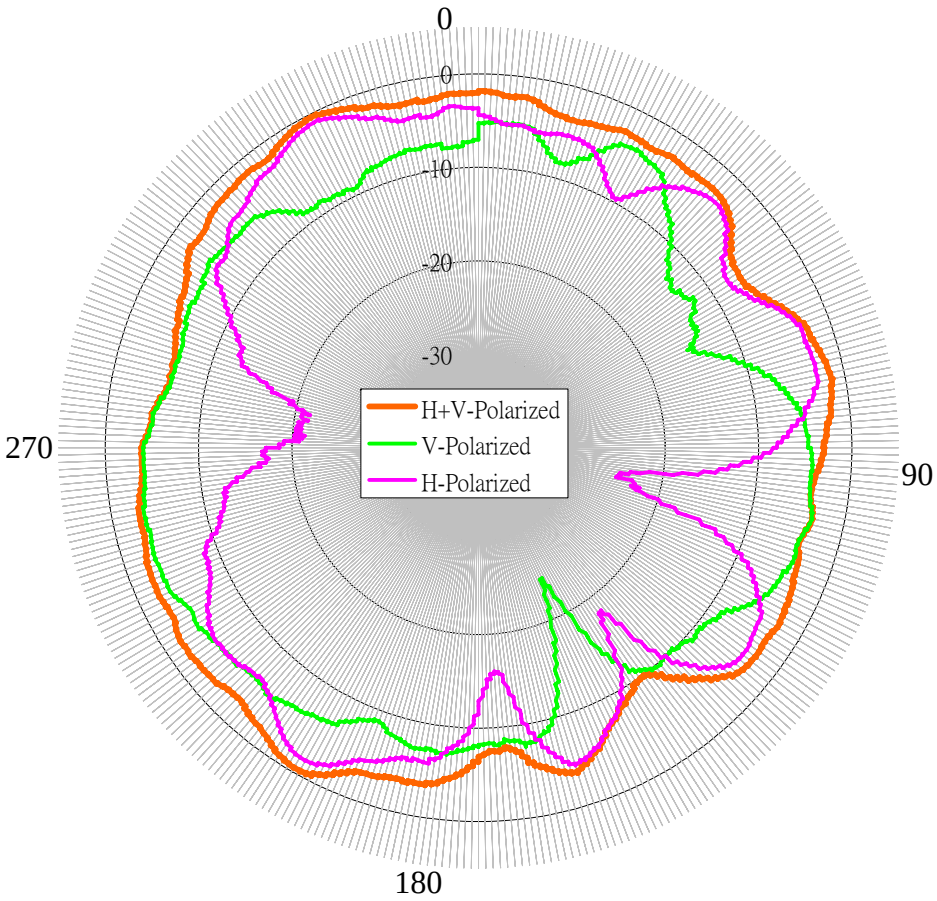
9. Radiation Pattern of **XY Plane(Azimuth)- (Open)**



Center Frequency	5150 MHz
Vertical peak Gain (dBi)	-3.34
Vertical Average Gain (dBi)	-6.51
Horizontal peak Gain (dBi)	-0.93
Horizontal Average Gain (dBi)	-5.85
Hori+Vert peak Gain (dBi)	-0.33
Hori+Vert Average Gain (dBi)	-3.16

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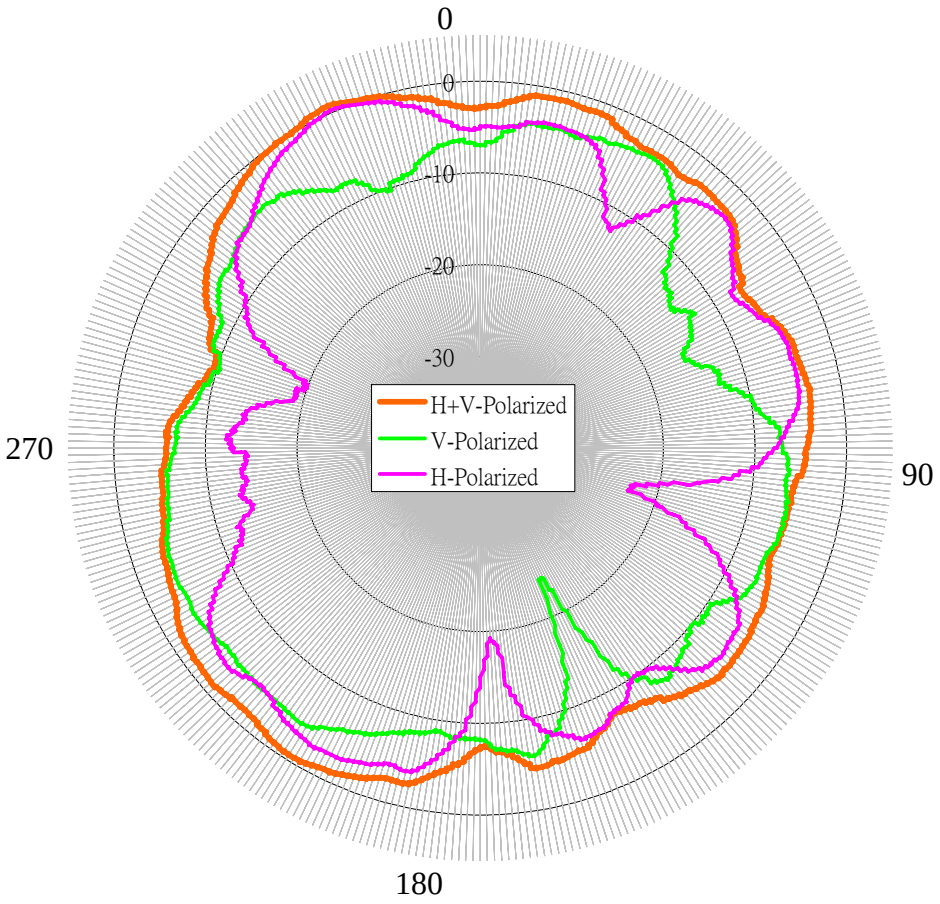
10. Radiation Pattern of **XY Plane(Azimuth)- (Open)**



Center Frequency	**5250 MHz**
Vertical peak Gain (dBi)	-3.19
Vertical Average Gain (dBi)	-6.70
Horizontal peak Gain (dBi)	0.29
Horizontal Average Gain (dBi)	-5.69
Hori+Vert peak Gain (dBi)	0.84
Hori+Vert Average Gain (dBi)	-3.16

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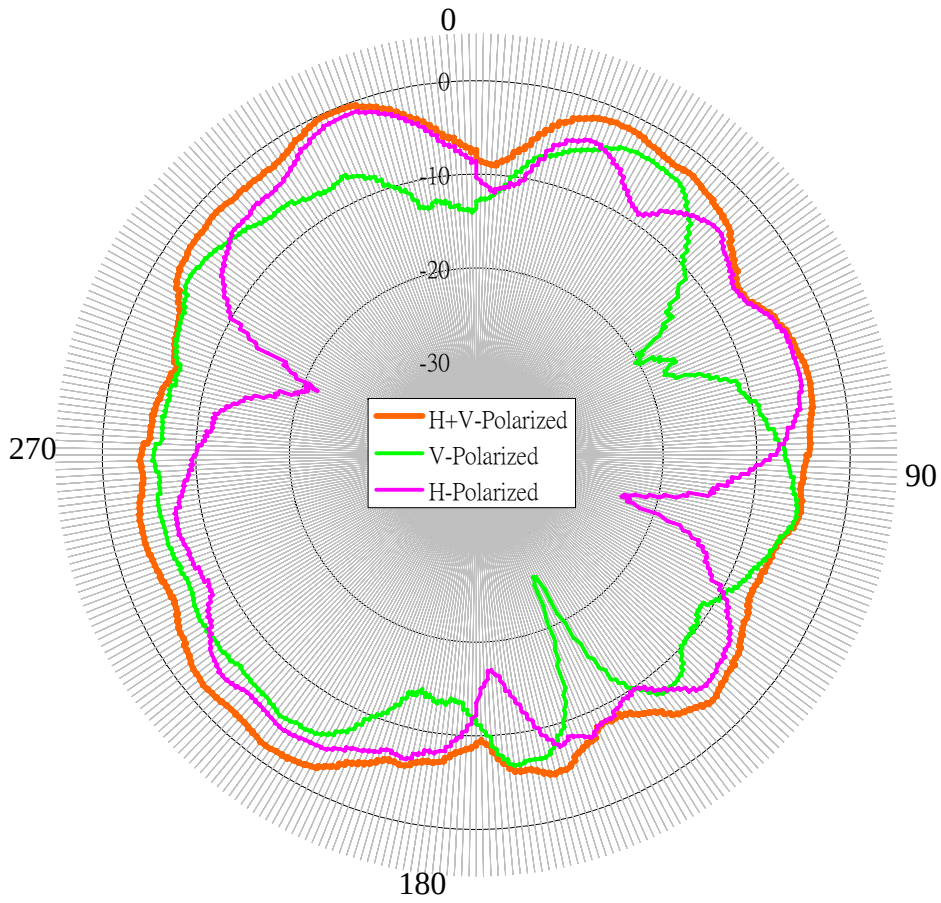
11. Radiation Pattern of **XY Plane(Azimuth)- (Open)**



Center Frequency	**5350 MHz**
Vertical peak Gain (dBi)	-3.34
Vertical Average Gain (dBi)	-7.33
Horizontal peak Gain (dBi)	-1.07
Horizontal Average Gain (dBi)	-6.54
Hori+Vert peak Gain (dBi)	-0.32
Hori+Vert Average Gain (dBi)	-3.91

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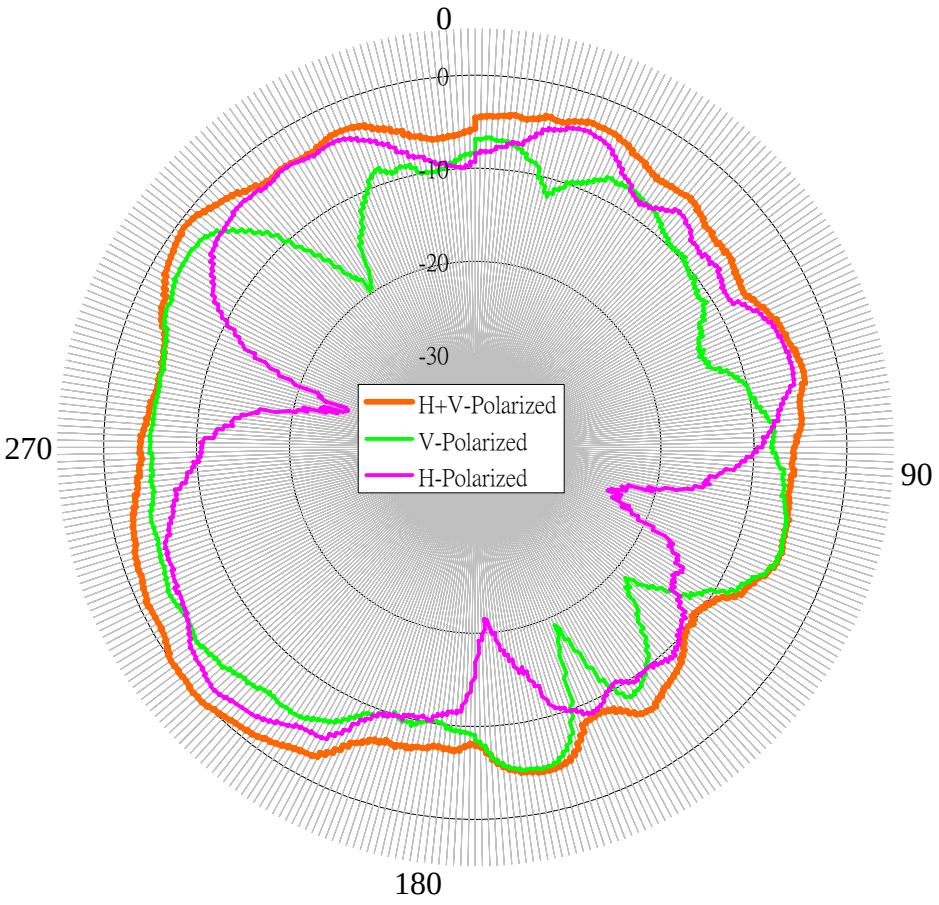
12. Radiation Pattern of **XY Plane(Azimuth)- (Open)**



Center Frequency	**5470 MHz**
Vertical peak Gain (dBi)	-2.81
Vertical Average Gain (dBi)	-7.03
Horizontal peak Gain (dBi)	-1.62
Horizontal Average Gain (dBi)	-6.94
Hori+Vert peak Gain (dBi)	0.24
Hori+Vert Average Gain (dBi)	-3.98

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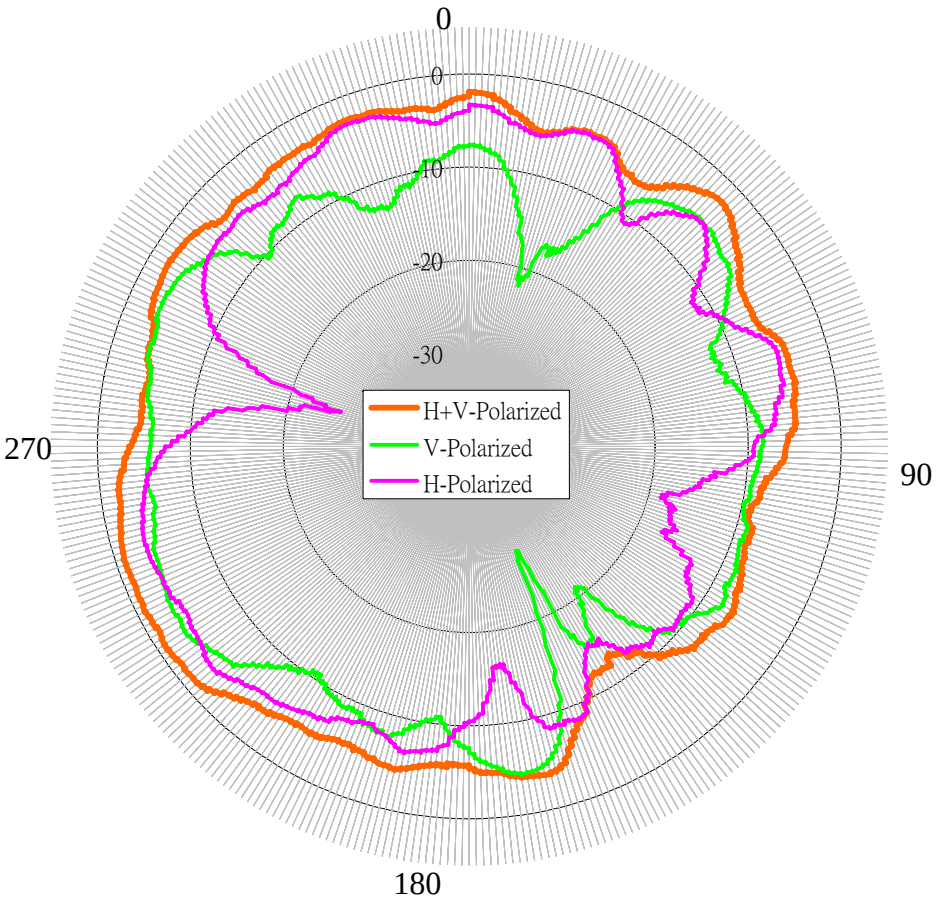
13. Radiation Pattern of **XY Plane(Azimuth)- (Open)**



Center Frequency	**5597.5 MHz**
Vertical peak Gain (dBi)	-3.49
Vertical Average Gain (dBi)	-7.53
Horizontal peak Gain (dBi)	-2.98
Horizontal Average Gain (dBi)	-6.77
Hori+Vert peak Gain (dBi)	-0.82
Hori+Vert Average Gain (dBi)	-4.12

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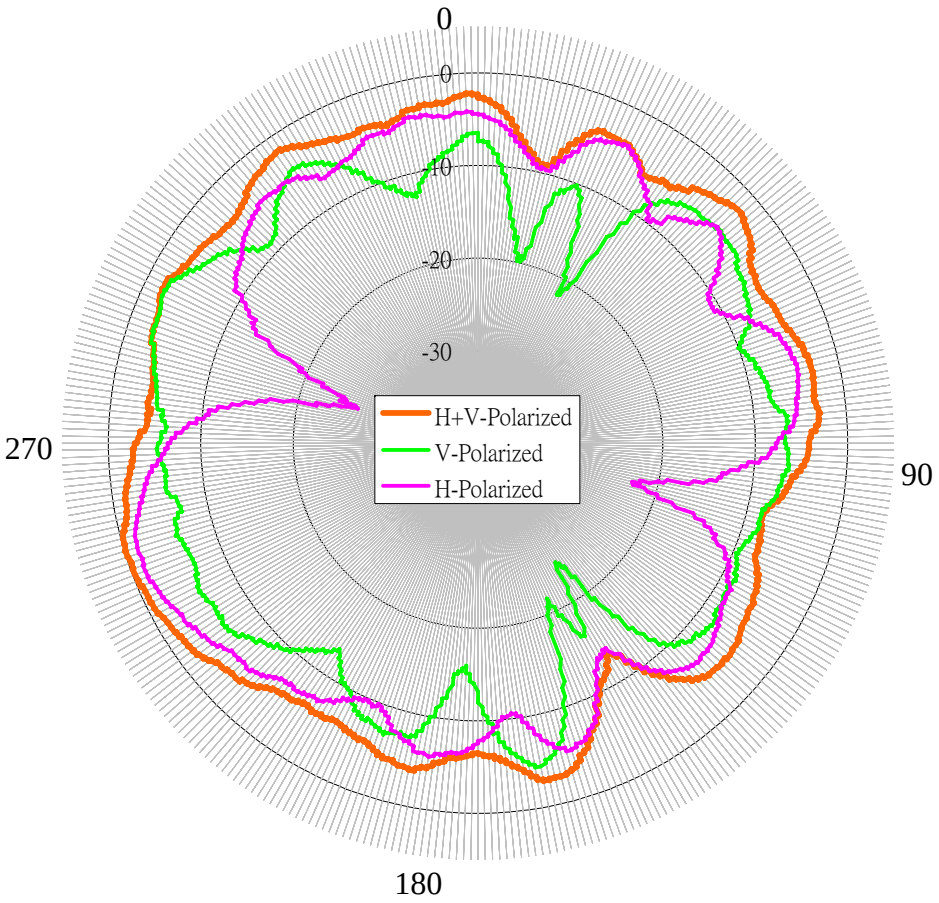
14. Radiation Pattern of **XY Plane(Azimuth)- (Open)**



Center Frequency	**5725 MHz**
Vertical peak Gain (dBi)	-2.25
Vertical Average Gain (dBi)	-7.43
Horizontal peak Gain (dBi)	-1.40
Horizontal Average Gain (dBi)	-6.48
Hori+Vert peak Gain (dBi)	-0.07
Hori+Vert Average Gain (dBi)	-3.92

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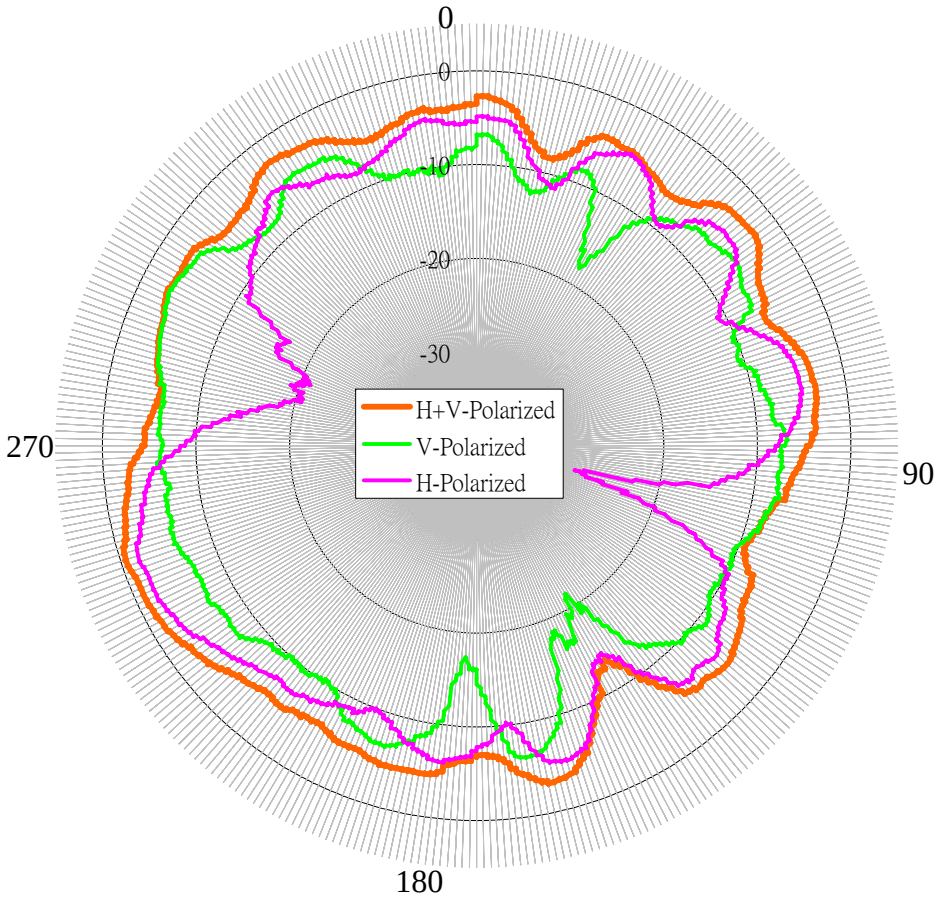
15. Radiation Pattern of **XY Plane(Azimuth)- (Open)**



Center Frequency	**5785 MHz**
Vertical peak Gain (dBi)	-3.24
Vertical Average Gain (dBi)	-7.88
Horizontal peak Gain (dBi)	-1.89
Horizontal Average Gain (dBi)	-7.01
Hori+Vert peak Gain (dBi)	-0.52
Hori+Vert Average Gain (dBi)	-4.41

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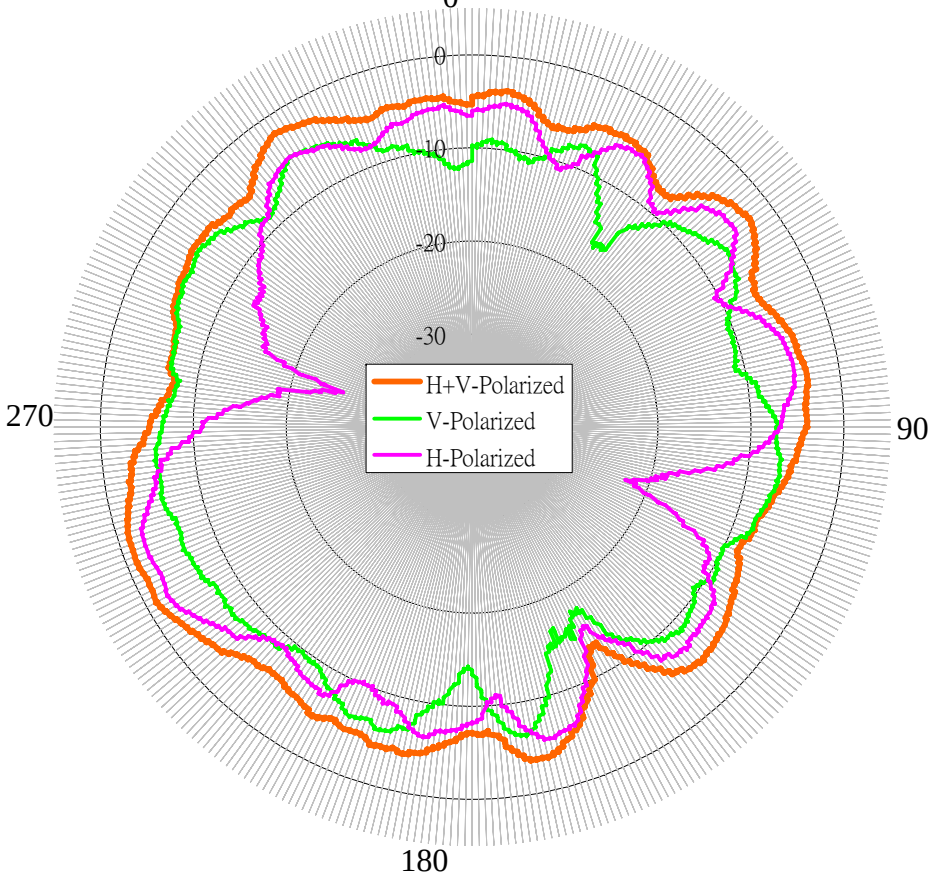
16. Radiation Pattern of **XY Plane(Azimuth)- (Open)**



Center Frequency	5850 MHz
Vertical peak Gain (dBi)	-4.95
Vertical Average Gain (dBi)	-8.09
Horizontal peak Gain (dBi)	-2.47
Horizontal Average Gain (dBi)	-7.34
Hori+Vert peak Gain (dBi)	-1.08
Hori+Vert Average Gain (dBi)	-4.69

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Ⅰ Antenna Type

Position	Antenna	Antenna
Antenna Type	PIFA	PIFA
Material	Metal sheet	Metal sheet

Ⅱ VSWR

VSWR	2G4 ISM (2.400GHz-2.5GHz)			JAPAN (4.90GHz-5.25GHz)			U-NII (5.150GHz-5.350GHz)			HyperLAN (5.470GHz-5.725GHz)			(5.725GHz-5.850GHz)		
	2.40	2.45	2.50	4.90	5.075	5.25	5.15	5.25	5.35	5.47	5.5975	5.725	5.725	5.785	5.85
L	1.23	1.18	1.62	1.14	1.12	1.67	1.14	1.67	2.04	1.44	1.75	2.41	2.41	2.26	1.95
R	1.61	1.30	1.45	1.98	1.79	1.53	1.61	1.53	1.18	1.03	1.06	1.22	1.22	1.30	1.42

Ⅲ Peak Gain

Antenna Gain		2G4 ISM (2.400GHz-2.5GHz)			JAPAN (4.90GHz-5.25GHz)			U-NII (5.150GHz-5.350GHz)			HyperLAN (5.470GHz-5.725GHz)			(5.725GHz-5.850GHz)		
		2.40	2.45	2.50	4.90	5.075	5.25	5.15	5.25	5.35	5.47	5.5975	5.725	5.725	5.785	5.85
L	Peak dBi	2.23	2.41	1.92	0.07	0.20	1.00	-0.16	1.00	-0.46	0.66	0.08	0.87	0.87	1.64	1.48
	Avg dBi	-2.48	-2.37	-3.08	-2.51	-3.17	-3.51	-3.07	-3.51	-3.93	-3.47	-4.26	-4.43	-4.43	-4.34	-4.44
R	Peak dBi	2.07	1.56	1.97	0.80	-0.22	0.84	-0.33	0.84	-0.32	0.24	-0.82	-0.07	-0.07	-0.52	-1.08
	Avg dBi	-2.97	-3.31	-3.33	-2.35	-3.07	-3.16	-3.16	-3.16	-3.91	-3.98	-4.12	-3.92	-3.92	-4.41	-4.69