WHA YU INDUSTRIAL CO., LTD.(HEAD OFFICE)
DONGGUAN AEON TECH CO.,LTD.(CHINA)
SUZHOU AEON TECH CO.,LTD.(CHINA)
AEON TECH (SHANGHAI) CO.,LTD(CHINA)
DONGGUAN PARNER TECH CO.,LTD.(CHINA)

SPECIFICATION FOR APPROVAL

CUSTOMER: *ASUS*

PART NAME: RF Antenna Cable Assembly

PART NO.: *REVISION:*

W. Y. P/NO.: C660-510468-A *REV.: X1*

	MANUFACTURER SIGNATURE	CUSTOMER SIGNATURE
APPROVED BY :		
DATE :		

WHA YU GROUP

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Dong Guan City, Guangdong, China
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3.	……	測試報告	……	3~14

RF Antenna Assembly

Specification(with cable loss)

1. Electrical Properties :

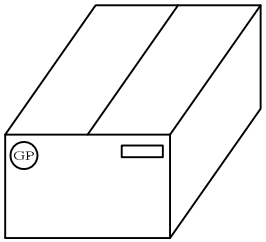
1.1	Frequency Range……	2.412GHz ~ 2.472GHz / 5.18GHz ~ 5.825GHz
1.2	Impedance ……	50Ω Nominal
1.3	VSWR ……	(1.92:1Max)
1.4	Return Loss……	(10dB Min)
1.5	Radiation ……	Omni-directional
1.6	Gain(Peak)…….……	2.412~2.472GHz(1.61 dBi) 5.18~5.25GHz(1.74 dBi) 5.25~5.32GHz(1.84dBi) 5.50~5.7GHz(1.86 dBi) 5.745~5.825GHz(1.67dBi)
1.7	Efficiency……	2.4G(>80%) / 5G(>70%)
1.8	Polarization……	Linear ; Vertical
1.9	Admitted Power……	1W
1.10	Cable……	1.37 Cable Black
1.11	Connector…...……	(I-PEX)

2. Physical Properties :

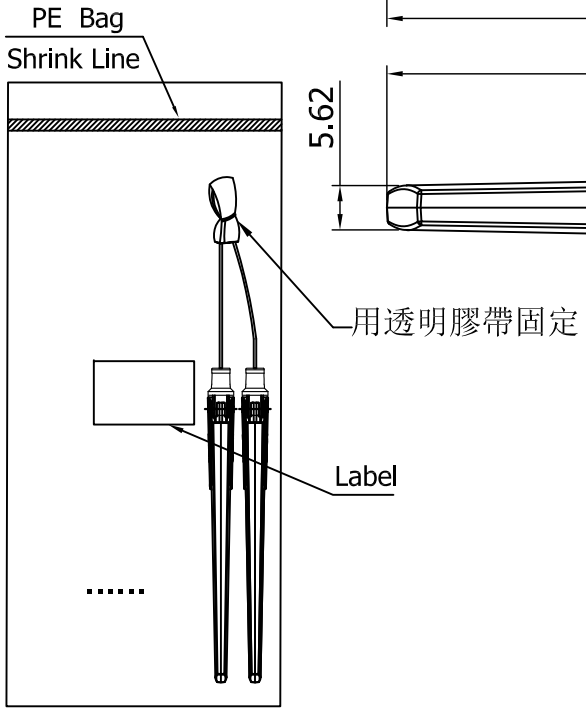
2.1	Operating Temp. ……	-10℃ ~ +60℃
2.2	Storage Temp. ……	-10℃ ~ +70℃

CG-XXXX

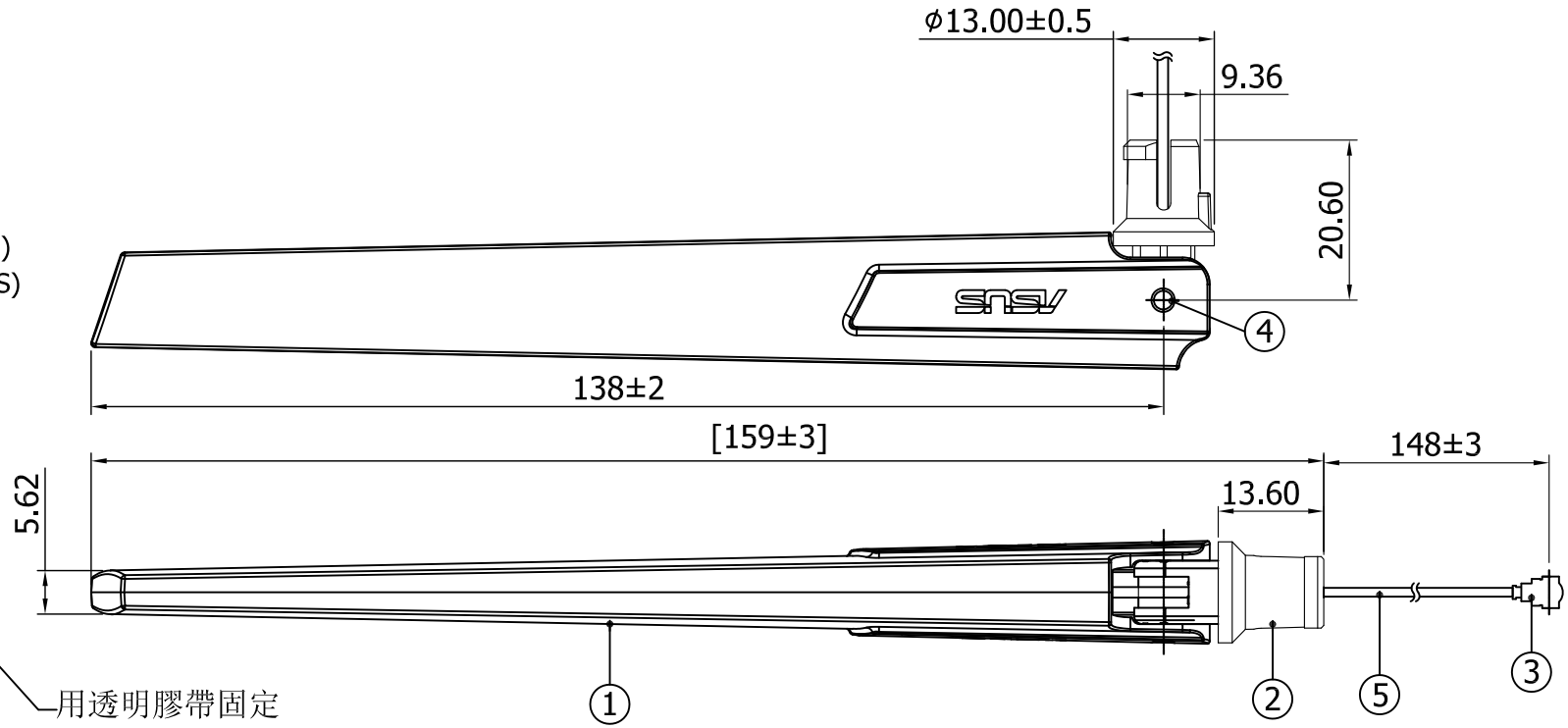
REV	DATE	DESCRIPTION
X1	06/26-2019	New Issue



GP標籤貼於紙箱側麥左上角(共2PCS)
外箱標籤貼於紙箱側麥右上角(共1PCS)



Packing:10PCS/bag



NO	DESCRIPTION		Q'TY	REMARK
5	Cable	ϕ1.37 Cable;Black	1	
4	Rivet	POM ; Black	2	
3	Connector	MHF Plug	1	
2	Antenna Base	(CD-1636)PC/PBT ;Color:Black(W.Y-002)	1	
1	Antenna Cap	(CD-1086)ABS ;Color:Black(W.Y-002)	1	

CUSTOMER'S SINGATURE

XX.	± 3.0	APPROVED
X.	± 2.0	
.X	± 1.0	CHECKED
.XX	± 0.5	
.XXX	± 0.1	DRAWING

CUSTOMER:	ASUS		
PART NO :			
PARTNAME:	RF Antenna Assembly		
W.Y P/NO :	C660-510468-A		
REV	UNIT	FILE :	SRF2019810
X1	m/m	SHEET :	1/1

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C660-510468-A
NE3-18139
Antenna
Test Report

Version: ***V 1.03***
Released Date: ***2019/06/27***
Prepared By: Cathy
Reviewed By: ***Sky Lo***

WHA YU INDUSTRIAL CO., LTD.
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E-mail : market@whayu.com

Contents

- Revised History
- Conclusion & Comments
- Specification
- Antenna Placement & Solution
- Test Setup for S-parameter Measurement
- Return Loss Results
- Isolation Results
- Test Setup for Radiation Pattern Measurement
- 2D Radiation Pattern Results
- Results Summary (return loss, isolation, peak gain, efficiency)

Specification

Requirements of Antenna Design

RF Function	Number of ANT	Frequency Band	Remark
WiFi	1	2.412G Hz~2.472GHz/5.180GHz~5.825GHz	

Requirements of Measurement

Test Item	Specification	Remark
Return Loss	> 10dB	
Isolation	NA	
Efficiency	2.4G> 80% / 5G>65%	
Radiation pattern	Scale: +10 ~ -40dBi, Angle step size: 5 degree	

Antenna Placement & Solution

Antenna	ANT Type	Size (L * W * H)	Cable Length (mm)	Cable Type
ANT1(DualBand)-148mm	Metal Dipole		Exp148(Black)	Ø1.37

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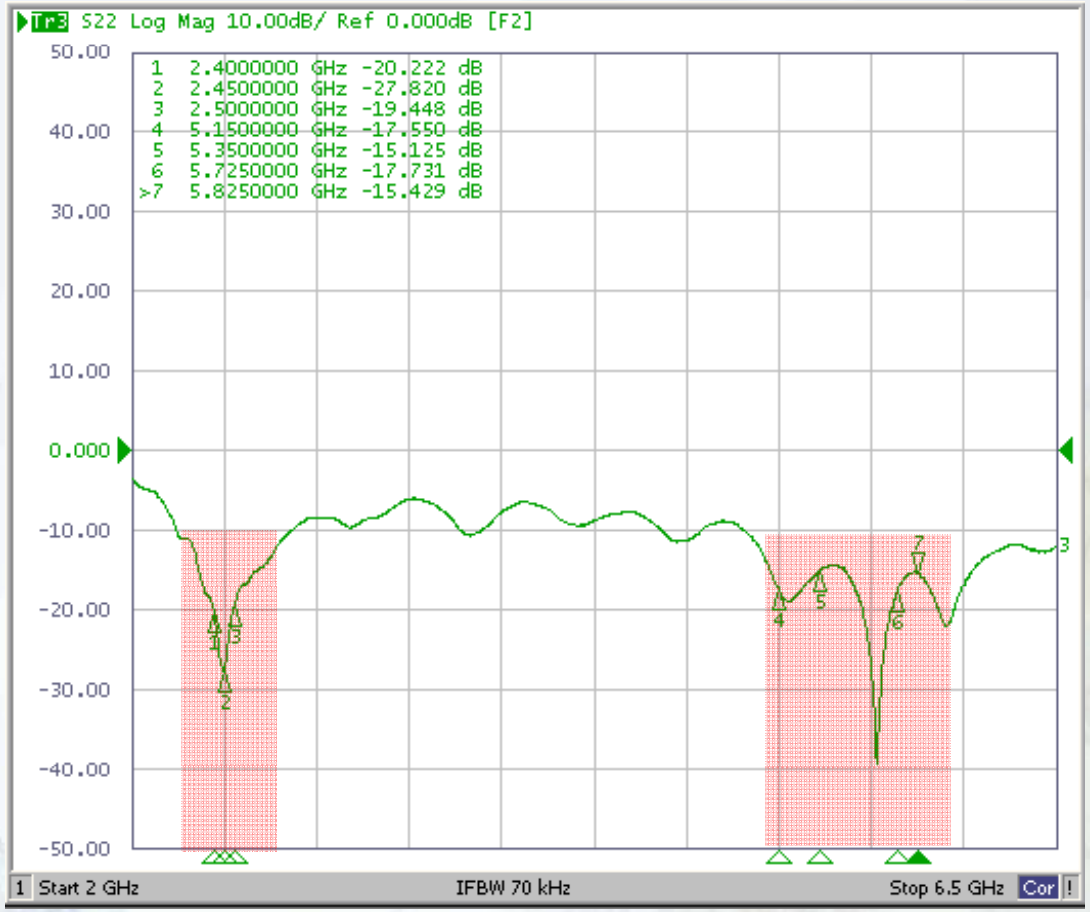
Antenna Placement & Solution

Antenna	Previous Version	Current Version
ANT1	ANT1_v1.00	

Return Loss Results

ANT1 (2400MH~2500MHz/5150MHz~5825MHz) (Criterion:>10 dB)



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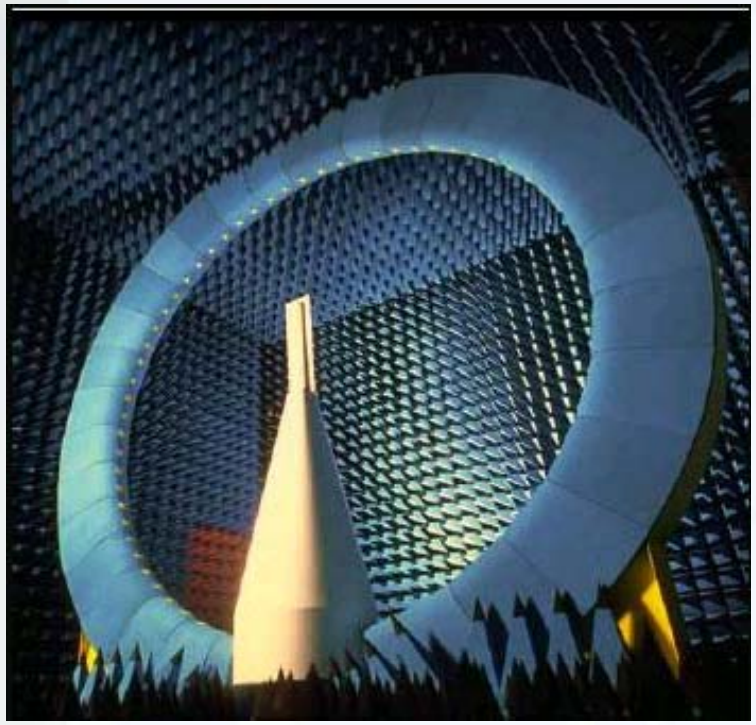
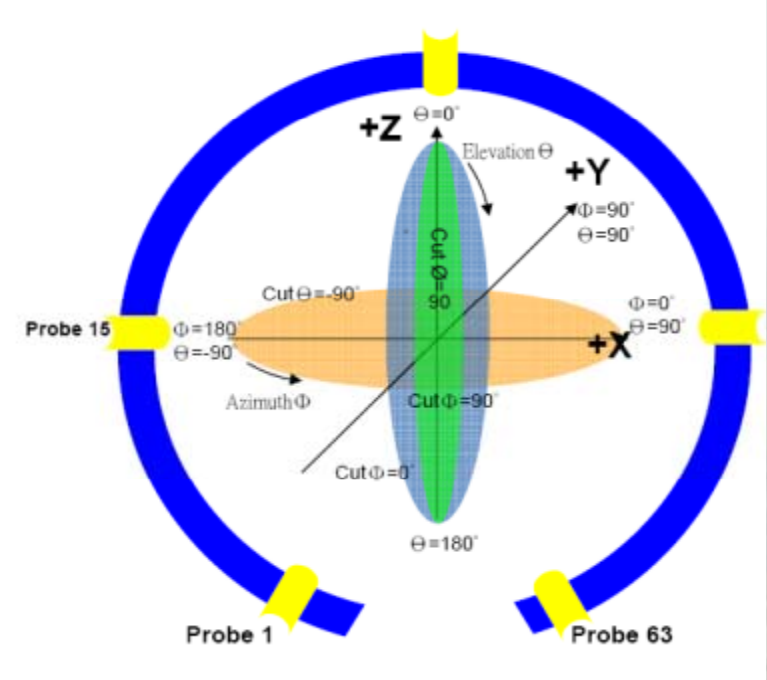
Chamber Information





Chamber	Brand	Model	Location
SATIMO	SATIMO	SG-64	Taiwan HsinChu

	θ	φ
Total angle	175°	360°
How many angle scan one point	5°	5°
Total scan point	36	73

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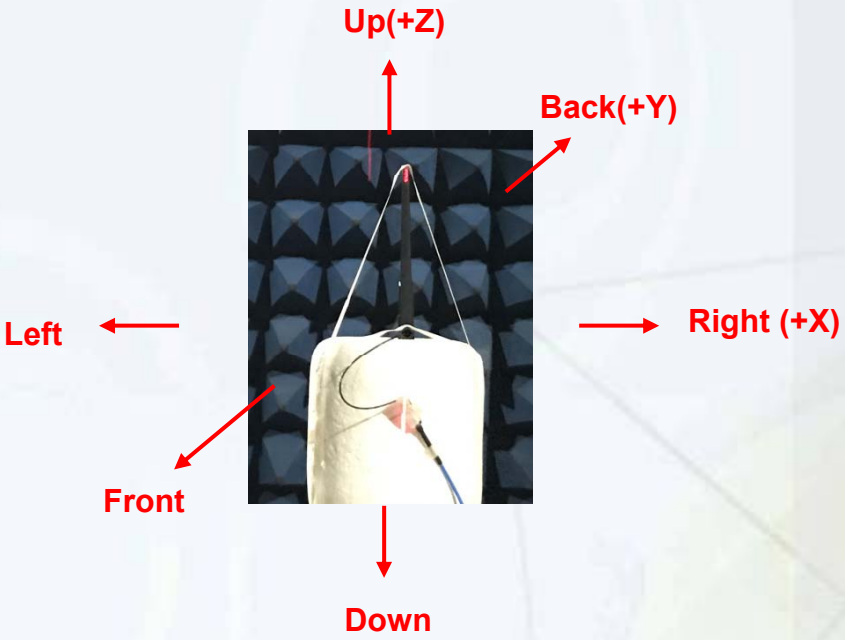
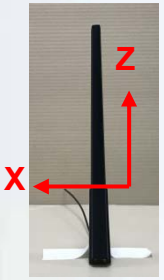
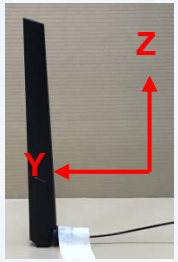
Test Setup for Radiation Pattern Measurement

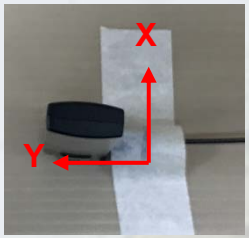


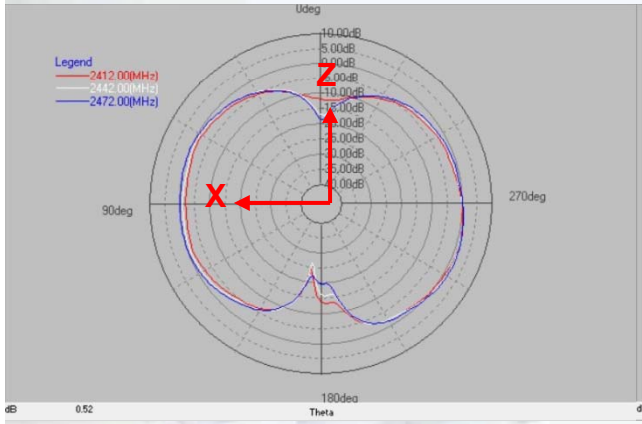
2D Radiation Pattern Results

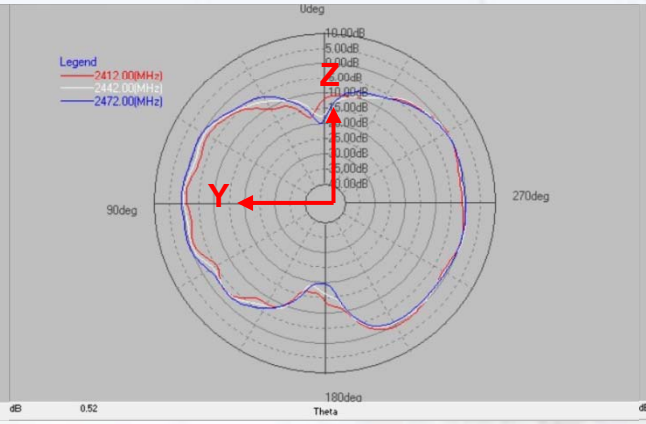
Dipole(Dual Band)_ANT1 (2.4G)

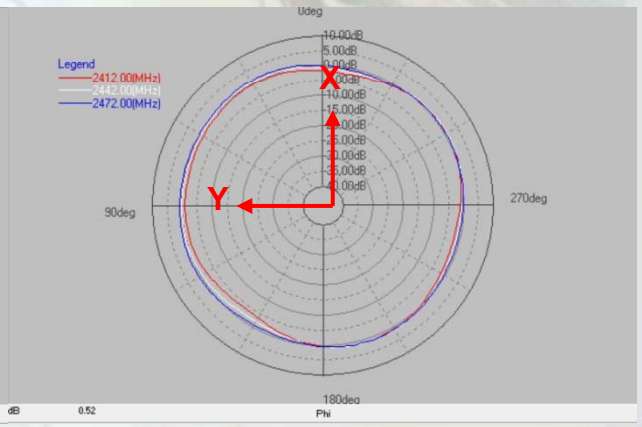






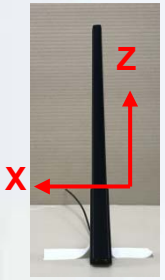


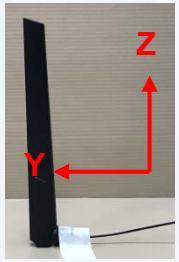


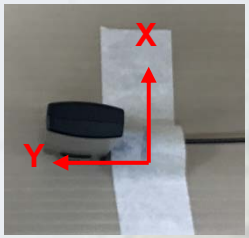


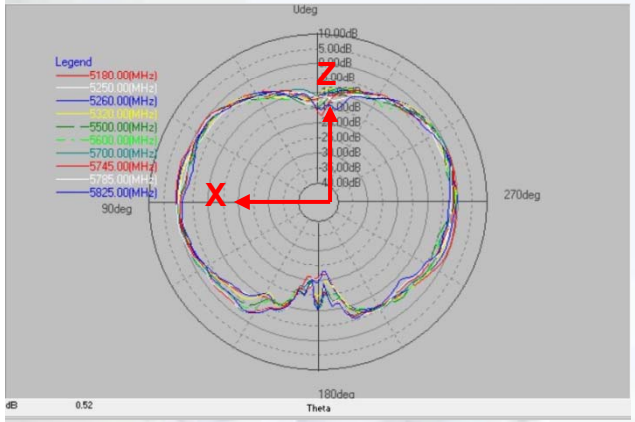
2D Radiation Pattern Results

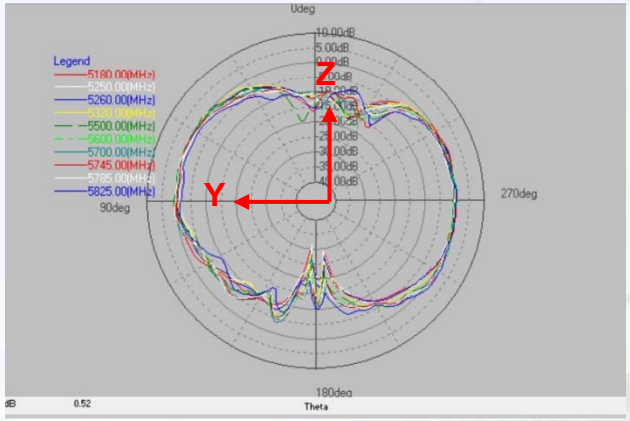
Dipole(Dual Band)_ANT1 (5G)

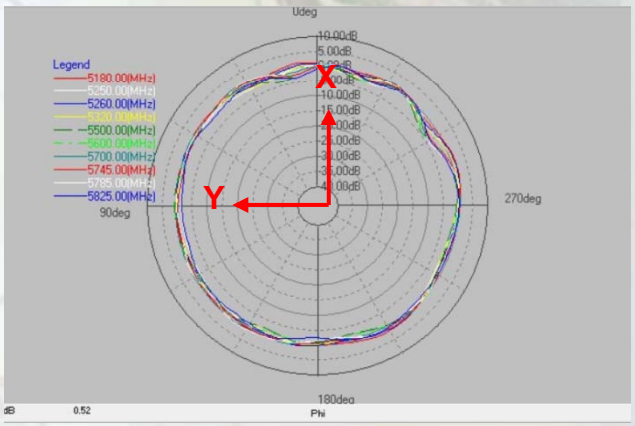












Results Summary

Return Loss (Criterion: >10dB)

Frequency (MHz)	ANT1
2400MHz	20
2450MHz	27
2500MHz	19
5150MHz	17
5350MHz	15
5725MHz	17
5825MHz	15

Results Summary

Gain & Efficiency

Frequency (MHz)	Ant1(Dual Band-135mm)	
	Gain(dBi)	Efficiency (%)
2412MHz	1.51	82
2442MHz	1.61	84
2472MHz	1.60	82
5180MHz	1.74	71
5250MHz	1.71	74
5260MHz	1.72	71
5320MHz	1.84	72
5500MHz	1.78	73
5600MHz	1.69	71
5700MHz	1.86	74
5745MHz	1.65	72
5785MHz	1.66	72
5825MHz	1.67	71

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SPECIFICATION FOR APPROVAL

CUSTOMER: *ASUS*

PART NAME: RF Antenna Cable Assembly

PART NO.: *REVISION:*

W. Y. P/NO.: C660-510469-A *REV.: X1*

	MANUFACTURER SIGNATURE	CUSTOMER SIGNATURE
APPROVED BY :	Danzu 7/2'19 何明春	
DATE :	黃春廷 7/2'19 7/1'19	

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RF Antenna Assembly

Specification(with cable loss)

1. Electrical Properties :

1.1 Frequency Range…… 5.18GHz ~ 5.825GHz

1.2 Impedance ……50Ω Nominal

1.3 VSWR …… (1.92:1Max)

1.4 Return Loss…… (10dB Min)

1.5 Radiation …… Omni-directional

1.6 Gain(Peak)…….…… 5.18~5.25GHz(1.76 dBi)
5.25~5.32GHz(1.8 dBi)
5.50~5.7GHz(1.87 dBi)
5.745~5.825GHz(1.87 dBi)

1.7 Efficiency…… 5G(>70%)

1.8 Polarization…… Linear ; Vertical

1.9 Admitted Power…… 1W

1.10 Cable……1.37 Cable White

1.11 Connector…...…… (I-PEX)

2. Physical Properties :

2.1 Operating Temp. ……-10℃ ~ +60℃

2.2 Storage Temp. …… -10℃ ~ +70℃

CG-XXXX

REV	DATE	DESCRIPTION
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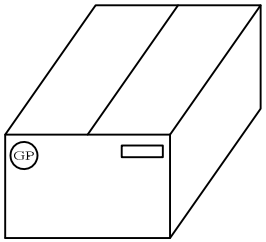

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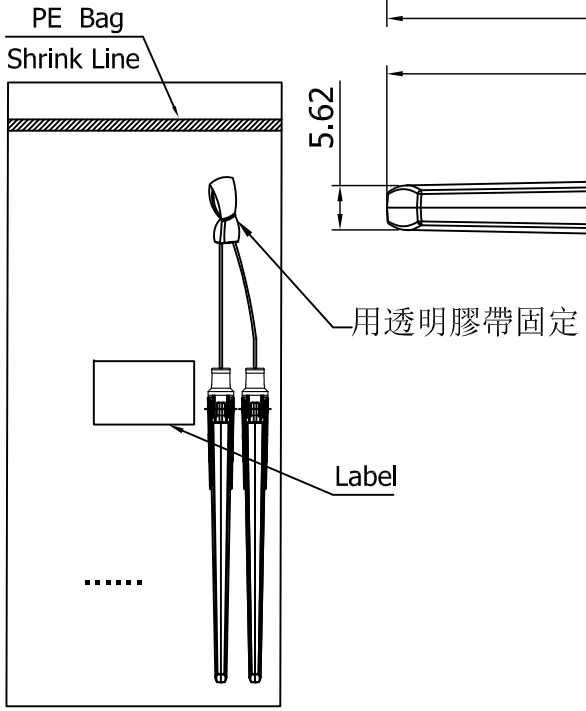

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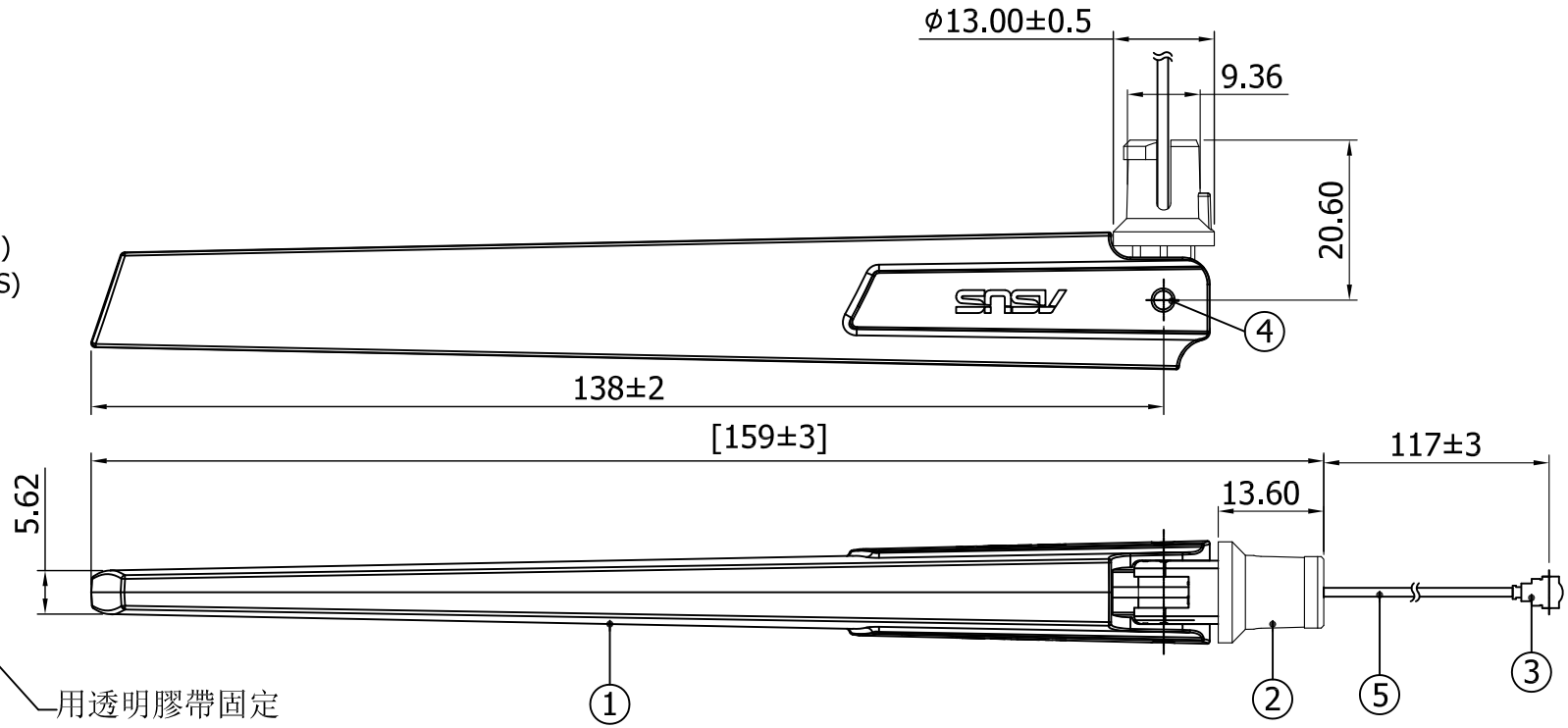

NO	DESCRIPTION		Q'TY	REMARK
5	Cable	ϕ1.37 Cable;White	1	
4	Rivet	POM ; Black	2	
3	Connector	MHF Plug	1	
2	Antenna Base	(CD-1636)PC/PBT ;Color:Black(W.Y-002)	1	
1	Antenna Cap	(CD-1086)ABS ;Color:Black(W.Y-002)	1	

CUSTOMER'S SINGATURE

XX.	± 3.0	APPROVED
X.	± 2.0	
.X	± 1.0	CHECKED
.XX	± 0.5	
.XXX	± 0.1	DRAWING

CUSTOMER:	ASUS		
PART NO :			
PARTNAME:	RF Antenna Assembly		
W.Y P/NO :	C660-510469-A		
REV	UNIT	FILE :	SRF2019811
X1	m/m	SHEET :	1/1

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NE3-18139
Antenna
Test Report

Version: ***V 1.03***
Released Date: ***2019/06/27***
Prepared By: Cathy
Reviewed By: ***Sky Lo***

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Specification

Requirements of Antenna Design

RF Function	Number of ANT	Frequency Band	Remark
WiFi	2	5.180GHz~5.825GHz	

Requirements of Measurement

Test Item	Specification	Remark
Return Loss	> 10dB	
Isolation	NA	
Efficiency	5G>65%	
Radiation pattern	Scale: +10 ~ -40dBi, Angle step size: 5 degree	

Antenna Placement & Solution

Antenna	ANT Type	Size (L * W * H)	Cable Length (mm)	Cable Type
ANT2(5G)-117mm	Metal Dipole		Exp117(White)	Ø1.37

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Antenna Placement & Solution

Antenna	Previous Version	Current Version
ANT1	ANT1_v1.00	

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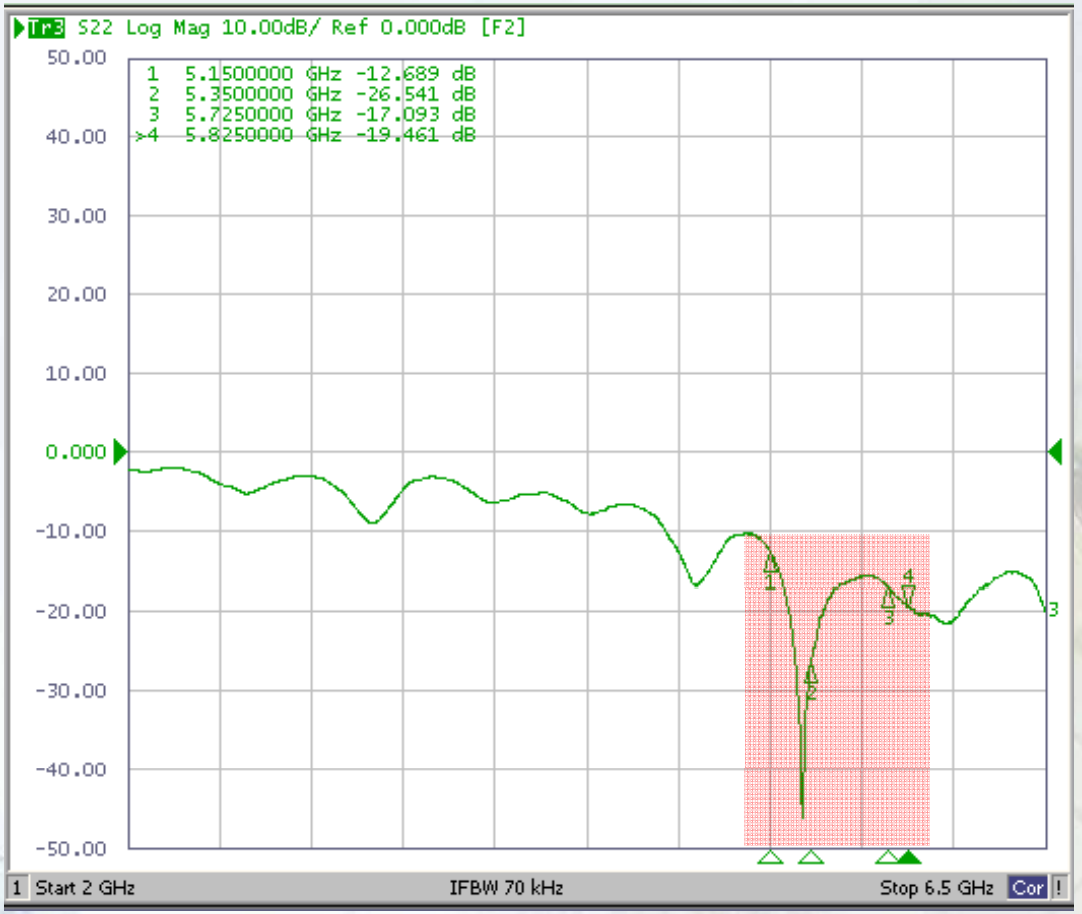
Return Loss Results

ANT2 (5150MH~5825MHz) (Criterion:>10 dB)



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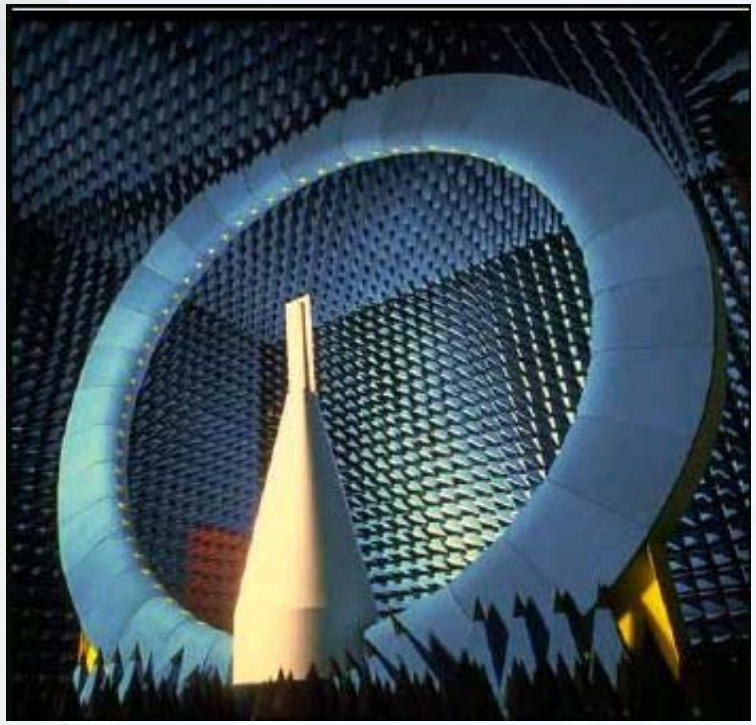
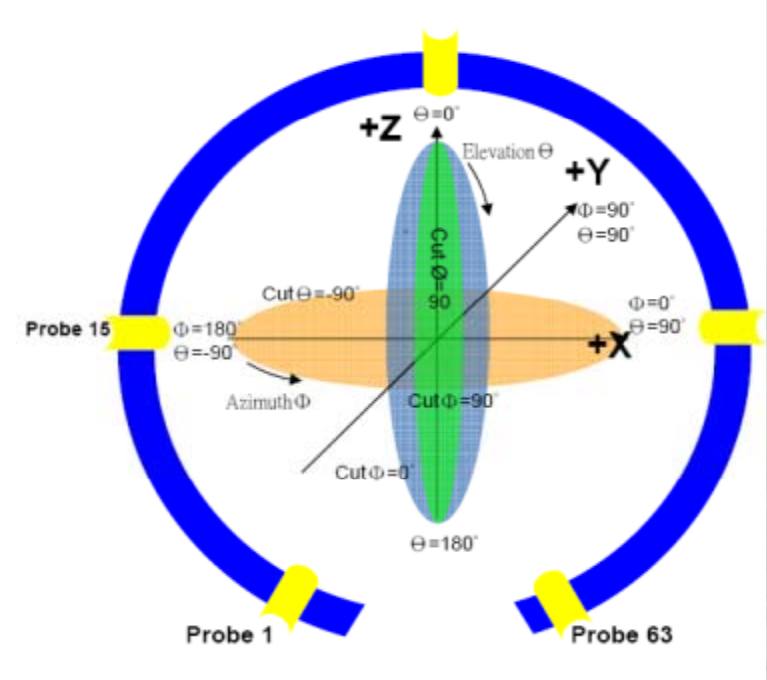
E-mail : market@whayu.com

Chamber Information





Chamber	Brand	Model	Location
SATIMO	SATIMO	SG-64	Taiwan HsinChu

	θ	φ
Total angle	175°	360°
How many angle scan one point	5°	5°
Total scan point	36	73

M.gear
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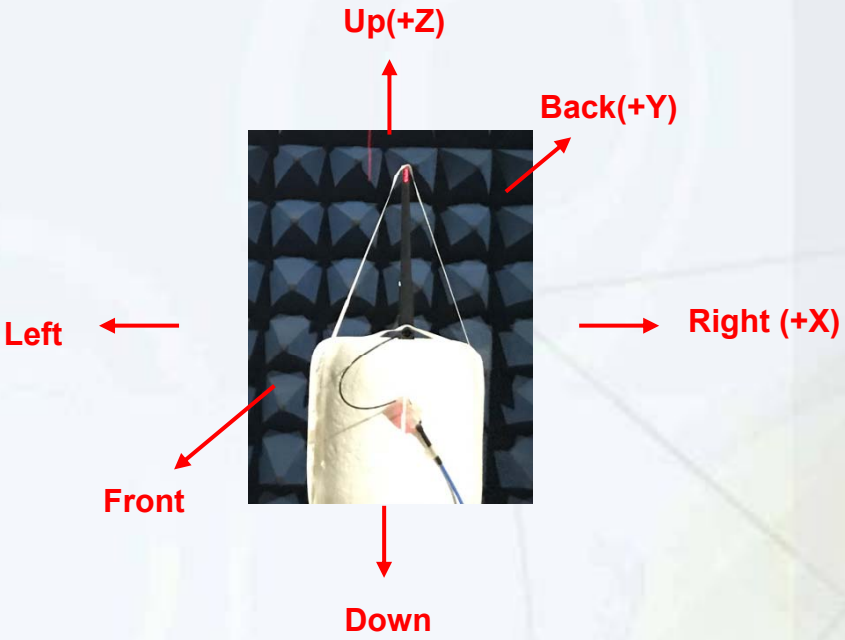
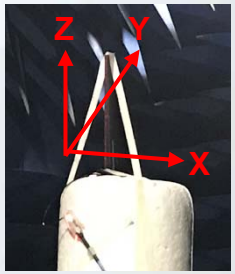
TEL : 886-3-5714225 FAX : 886-3-5713853 / 5723607
Website : www.whayu.com
E-mail : market@whayu.com

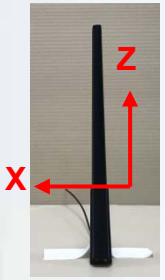
Test Setup for Radiation Pattern Measurement

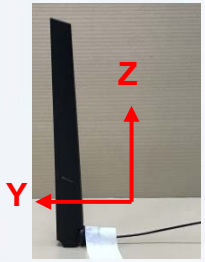


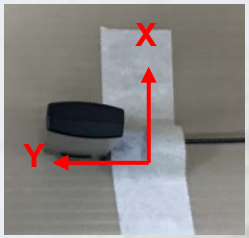
2D Radiation Pattern Results

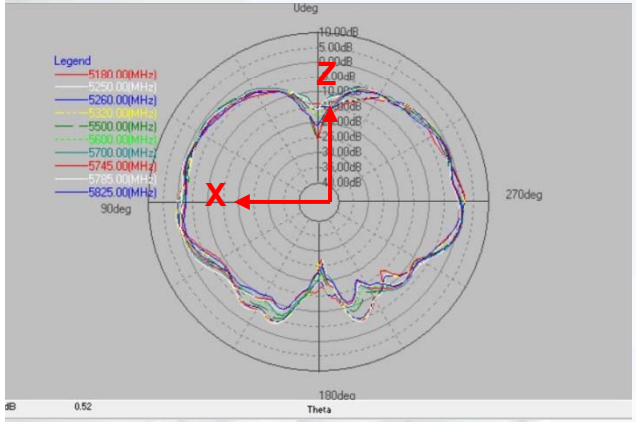


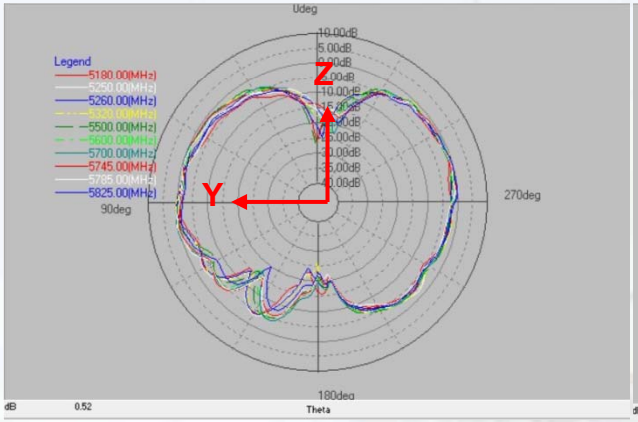
Dipole(5G)_ANT2

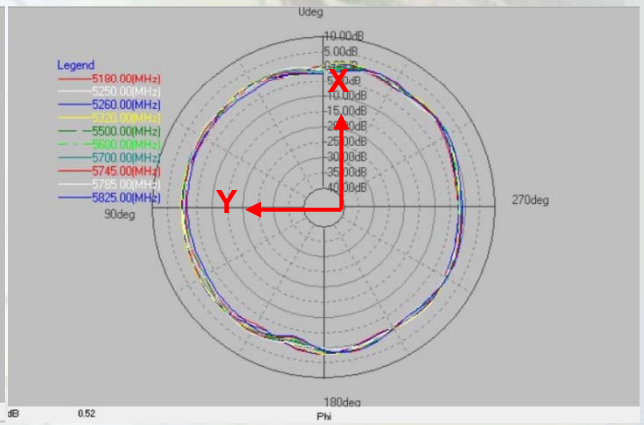












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E-mail : market@whayu.com

Results Summary

Return Loss (Criterion: >10dB)

Frequency (MHz)	ANT2
5150MHz	12
5350MHz	26
5725MHz	17
5825MHz	19

Results Summary

Gain & Efficiency

Frequency (MHz)	Ant1(Dual Band-135mm)	
	Gain(dBi)	Efficiency (%)
5180MHz	1.76	72
5250MHz	1.73	72
5260MHz	1.67	73
5320MHz	1.80	71
5500MHz	1.68	72
5600MHz	1.87	71
5700MHz	1.79	73
5745MHz	1.82	74
5785MHz	1.87	72
5825MHz	1.80	70

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E-mail : market@whayu.com

WHA YU INDUSTRIAL CO., LTD.(HEAD OFFICE)
DONGGUAN AEON TECH CO.,LTD.(CHINA)
SUZHOU AEON TECH CO.,LTD.(CHINA)
AEON TECH (SHANGHAI) CO.,LTD(CHINA)
DONGGUAN PARNER TECH CO.,LTD.(CHINA)

SPECIFICATION FOR APPROVAL

CUSTOMER: *ASUS*

PART NAME: RF Antenna Cable Assembly

PART NO.: *REVISION:*

W. Y. P/NO.: C660-510470-A *REV.: X1*

	MANUFACTURER SIGNATURE	CUSTOMER SIGNATURE
APPROVED BY :	Dong 7/19 何曉	華裕實業股份有限公司
DATE :	鄭香廷 7/2/19 7/19	

WHA YU GROUP

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Wujiang City,Jiangsu Province,China
Tel:+86-512-63627980 Fax:+86-512-63627981

AEON TECH (SHANGHAI) CO.,LTD(CHINA)
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Tel:+86-21-64959151 Fax:+86-21-64959059

DONGGUAN PARNER TECH CO.,LTD.(CHINA)
東莞倍能電子有限公司
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Dong Guan City, Guangdong, China
Tel:+86-769-81662366 Fax:+86-769-81602681

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2.	……	成品圖	……	2
3.	……	測試報告	……	3~13

RF Antenna Assembly

Specification(with cable loss)

1. Electrical Properties :

1.1 Frequency Range…… 5.18GHz ~ 5.825GHz

1.2 Impedance …… 50Ω Nominal

1.3 VSWR ……(1.92:1Max)

1.4 Return Loss…… (10dB Min)

1.5 Radiation ……Omni-directional

1.6 Gain(Peak)……..…… 5.18~5.25GHz(1.66 dBi)
5.25~5.32GHz(1.72 dBi)
5.50~5.7GHz(1.69 dBi)
5.745~5.825GHz(1.84 dBi)

1.7 Efficiency…… 5G(>70%)

1.8 Polarization……Linear ; Vertical

1.9 Admitted Power……1W

1.10 Cable…… 1.37 Cable Blue

1.11 Connector…...……(I-PEX)

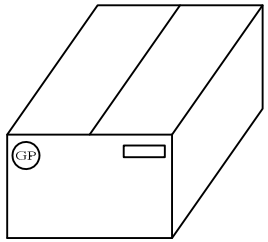
2. Physical Properties :

2.1 Operating Temp. …… -10℃ ~ +60℃

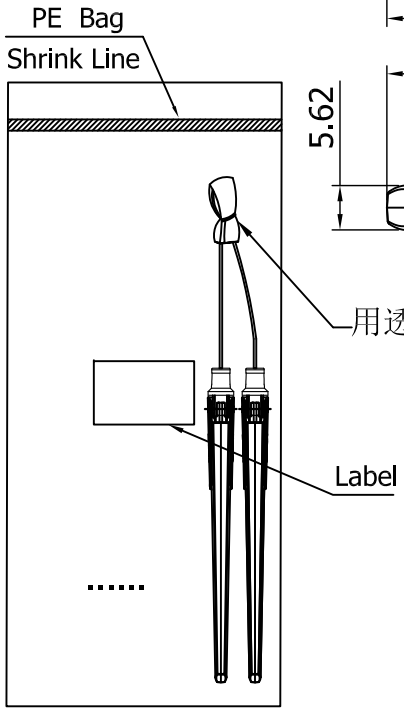
2.2 Storage Temp. ……-10℃ ~ +70℃

CG-XXXX

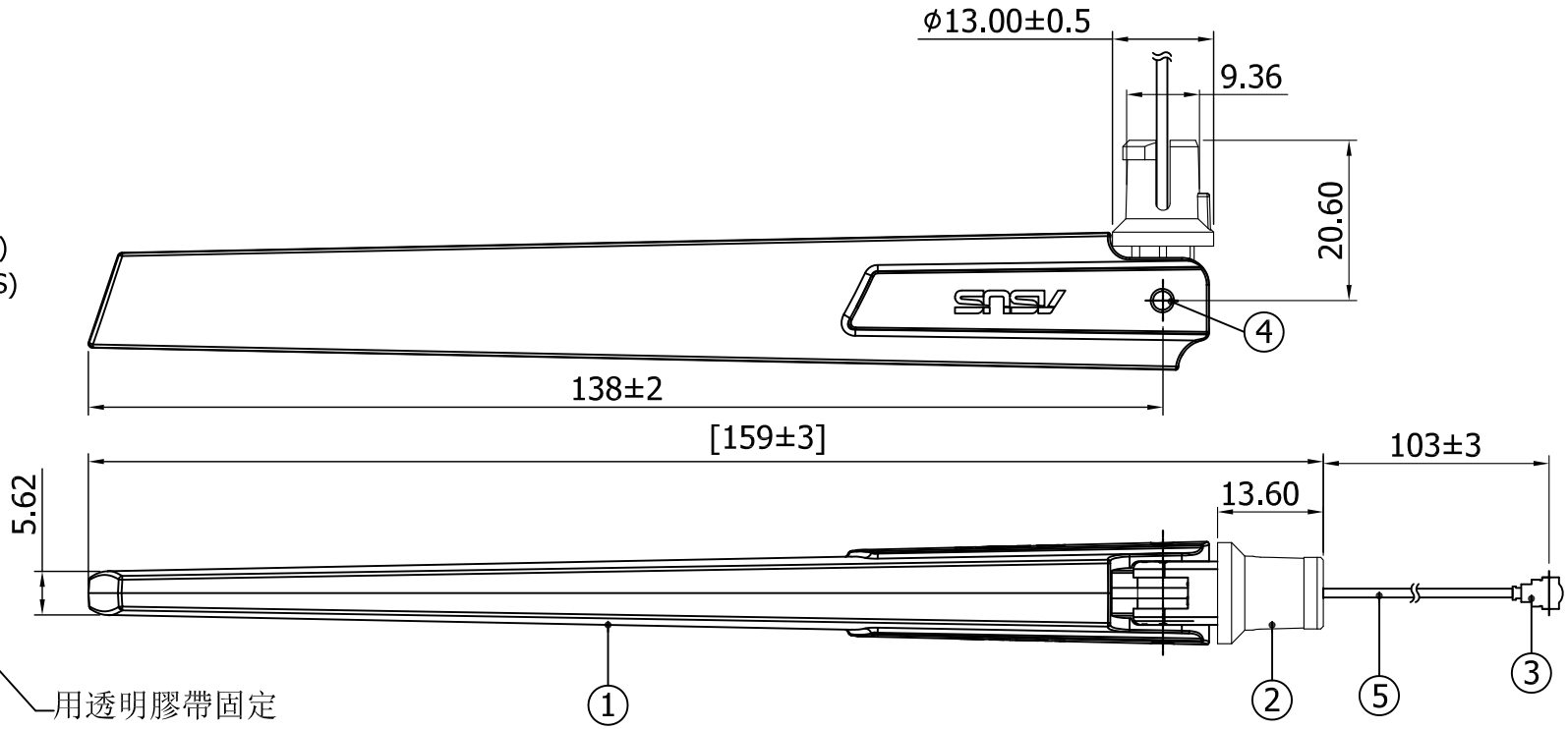
REV	DATE	DESCRIPTION
X1	06/26-2019	New Issue



GP標籤貼於紙箱側麥左上角(共2PCS)
外箱標籤貼於紙箱側麥右上角(共1PCS)



Packing:10PCS/bag



NO	DESCRIPTION		Q'TY	REMARK
5	Cable	ϕ1.37 Cable;Blue	1	
4	Rivet	POM ; Black	2	
3	Connector	MHF Plug	1	
2	Antenna Base	(CD-1636)PC/PBT ;Color:Black(W.Y-002)	1	
1	Antenna Cap	(CD-1086)ABS ;Color:Black(W.Y-002)	1	

CUSTOMER'S SINGATURE

XX.	± 3.0	APPROVED
X.	± 2.0	
.X	± 1.0	CHECKED
.XX	± 0.5	
.XXX	± 0.1	DRAWING

CUSTOMER:	ASUS		
PART NO :			
PARTNAME:	RF Antenna Assembly		
W.Y P/NO :	C660-510470-A		
REV	UNIT	FILE :	SRF2019812
X1	m/m	SHEET :	1/1

M.gear Wha Yu Group

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C660-510470-A
NE3-18139
Antenna
Test Report

Version: ***V 1.03***
Released Date: ***2019/06/27***
Prepared By: Cathy
Reviewed By: ***Sky Lo***

WHA YU INDUSTRIAL CO., LTD.
TEL : 886-3-5714225 FAX : 886-3-5713853 / 5723600
Website : www.whayu.com
E-mail : market@whayu.com

Contents

- Revised History
- Conclusion & Comments
- Specification
- Antenna Placement & Solution
- Test Setup for S-parameter Measurement
- Return Loss Results
- Isolation Results
- Test Setup for Radiation Pattern Measurement
- 2D Radiation Pattern Results
- Results Summary (return loss, isolation, peak gain, efficiency)

Specification

Requirements of Antenna Design

RF Function	Number of ANT	Frequency Band	Remark
WiFi	3	5.180GHz~5.825GHz	

Requirements of Measurement

Test Item	Specification	Remark
Return Loss	> 10dB	
Isolation	NA	
Efficiency	5G>65%	
Radiation pattern	Scale: +10 ~ -40dBi, Angle step size: 5 degree	

Antenna Placement & Solution

Antenna	ANT Type	Size (L * W * H)	Cable Length (mm)	Cable Type
ANT3(5G)-103mm	Metal Dipole		Exp103(Blue)	Ø1.37

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Antenna Placement & Solution

Antenna	Previous Version	Current Version
ANT1	ANT1_v1.00	

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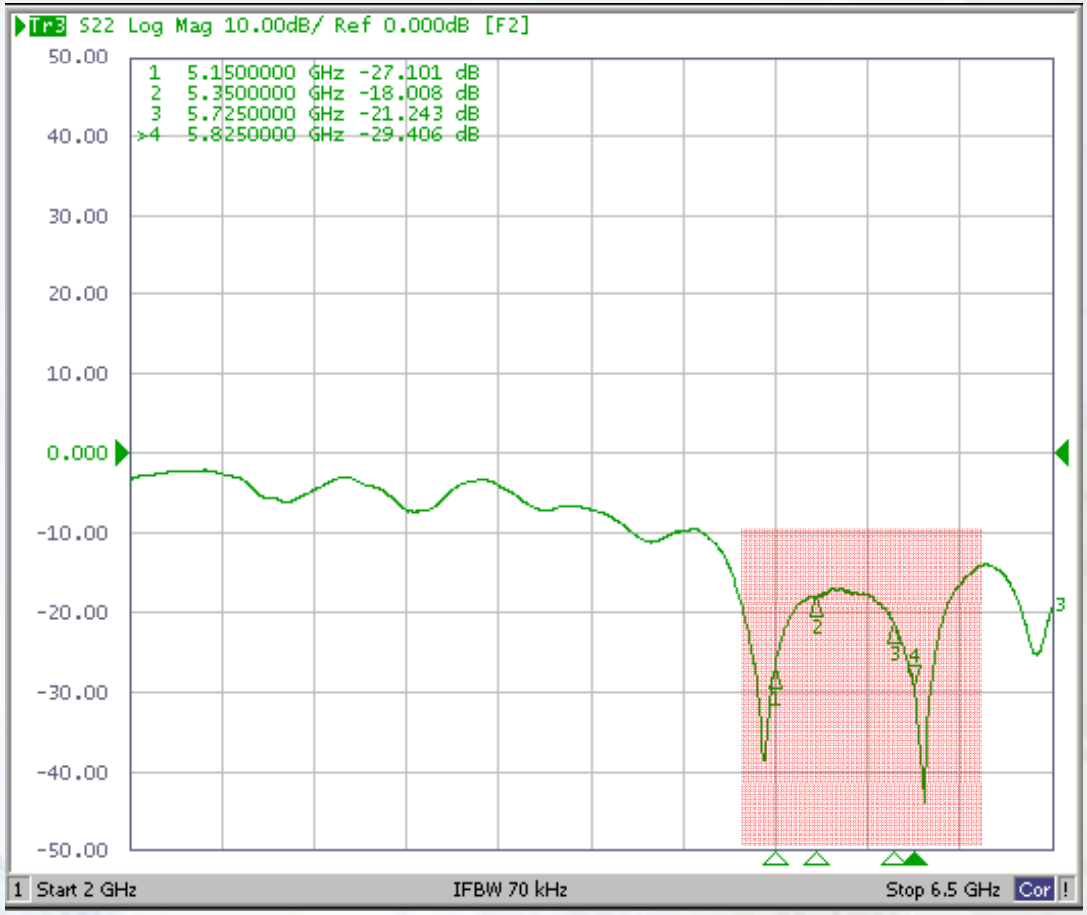
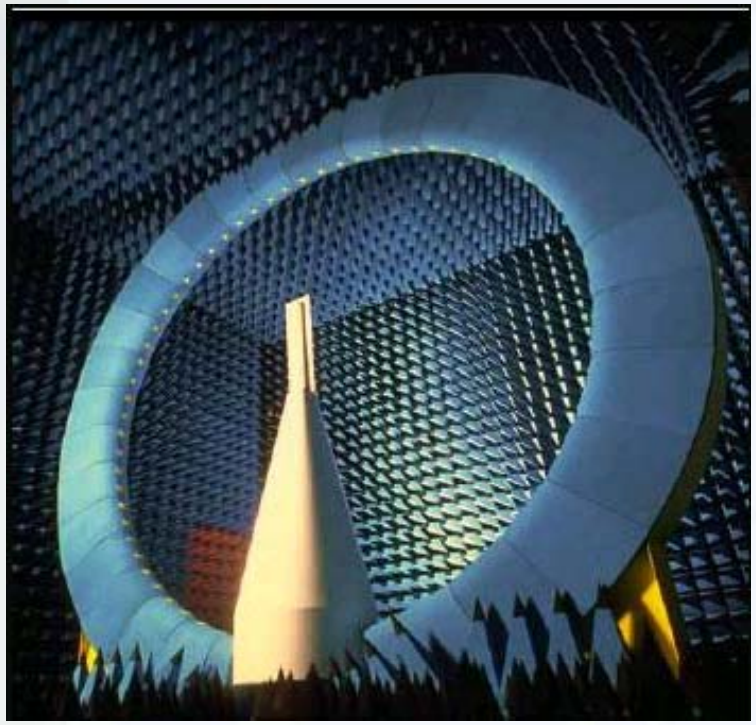
Return Loss Results

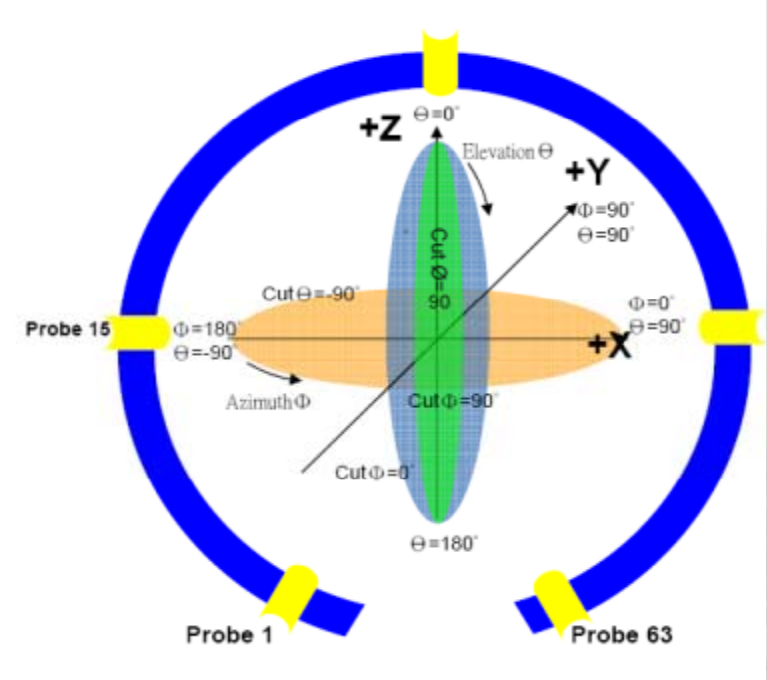
ANT3 (5150MHz~5825MHz) (Criterion:>10 dB)



WHA YU INDUSTRIAL CO., LTD.
TEL : 886-3-5714225 FAX : 886-3-5713853 / 5723606
Website : www.whayu.com
E-mail : market@whayu.com

Chamber Information





Chamber	Brand	Model	Location
SATIMO	SATIMO	SG-64	Taiwan HsinChu

	θ	φ
Total angle	175°	360°
How many angle scan one point	5°	5°
Total scan point	36	73

M.gear
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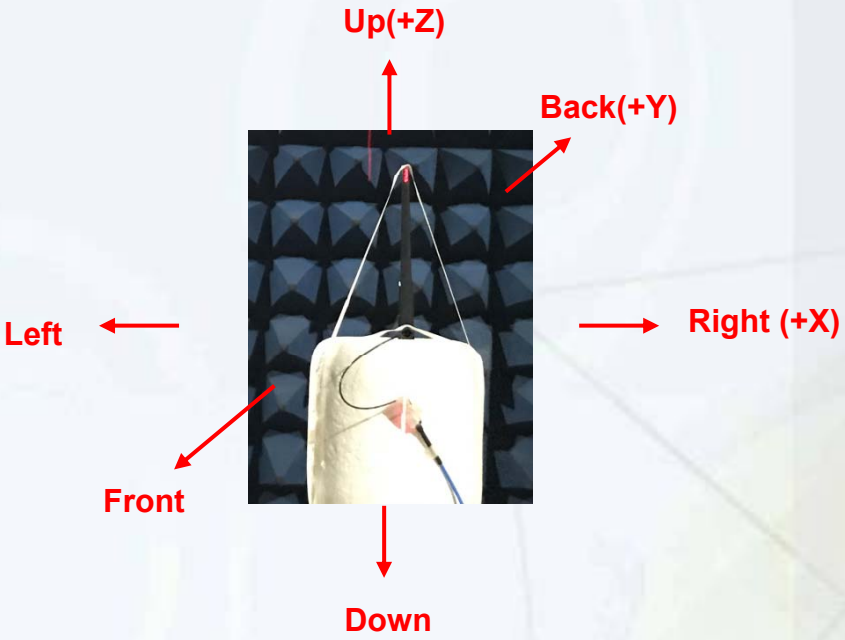
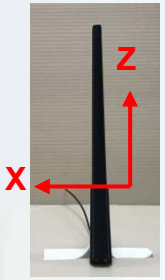
Website : www.whayu.com
E-mail : market@whayu.com

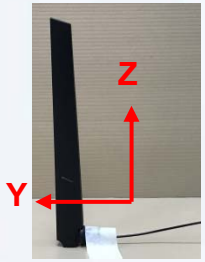
Test Setup for Radiation Pattern Measurement

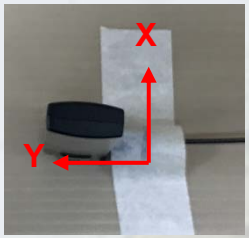


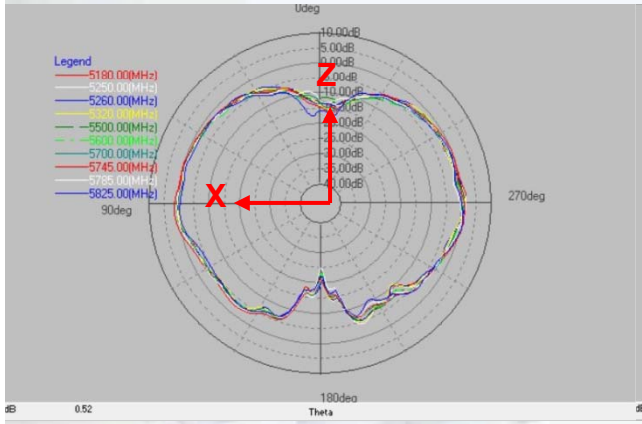
2D Radiation Pattern Results

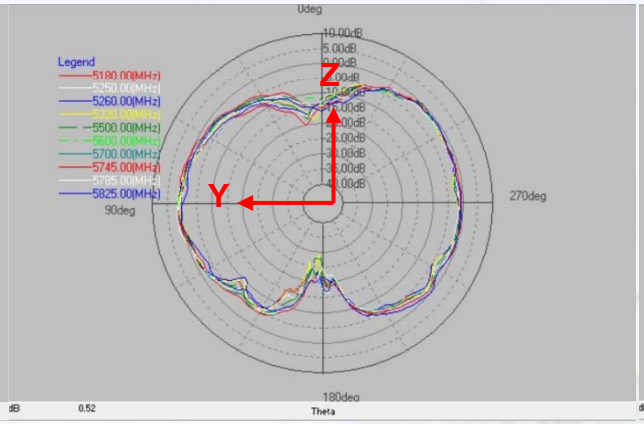
Dipole(5G)_ANT3

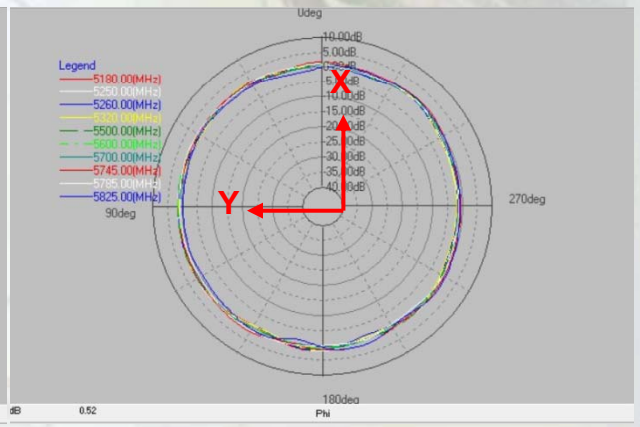












Results Summary

Return Loss (Criterion: >10dB)

Frequency (MHz)	ANT3
5150MHz	27
5350MHz	18
5725MHz	21
5825MHz	29

Results Summary

Gain & Efficiency

Frequency (MHz)	Ant3(5G-95mm)	
	Gain(dBi)	Efficiency (%)
5180MHz	1.64	72
5250MHz	1.66	74
5260MHz	1.65	75
5320MHz	1.72	75
5500MHz	1.69	74
5600MHz	1.58	76
5700MHz	1.68	75
5745MHz	1.84	73
5785MHz	1.73	74
5825MHz	1.73	72

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SUZHOU AEON TECH CO.,LTD.(CHINA)
AEON TECH (SHANGHAI) CO.,LTD(CHINA)
DONGGUAN PARNER TECH CO.,LTD.(CHINA)

SPECIFICATION FOR APPROVAL

CUSTOMER: *ASUS*

PART NAME: RF Antenna Cable Assembly

PART NO.: *REVISION:*

W. Y. P/NO.: C660-510471-A *REV.: X1*

	MANUFACTURER SIGNATURE	CUSTOMER SIGNATURE
APPROVED BY :	Dorrie 7/10 何明泰 7/19	
DATE :	鄭春廷 7/19	

WHA YU GROUP

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RF Antenna Assembly

Specification(with cable loss)

1. Electrical Properties :

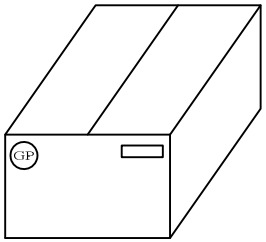
1.1	Frequency Range……	2.412GHz ~ 2.472GHz / 5.18GHz ~ 5.825GHz
1.2	Impedance ……	50Ω Nominal
1.3	VSWR ……	(1.92:1Max)
1.4	Return Loss……	(10dB Min)
1.5	Radiation ……	Omni-directional
1.6	Gain(Peak)…….……	2.412~2.472GHz(1.6 dBi) 5.18~5.25GHz(1.88 dBi) 5.25~5.32GHz(1.82 dBi) 5.50~5.7GHz(1.85 dBi) 5.745~5.825GHz(1.86 dBi)
1.7	Efficiency……	2.4G(>80%) / 5G(>70%)
1.8	Polarization……	Linear ; Vertical
1.9	Admitted Power……	1W
1.10	Cable……	1.37 Cable Gray
1.11	Connector…...……	(I-PEX)

2. Physical Properties :

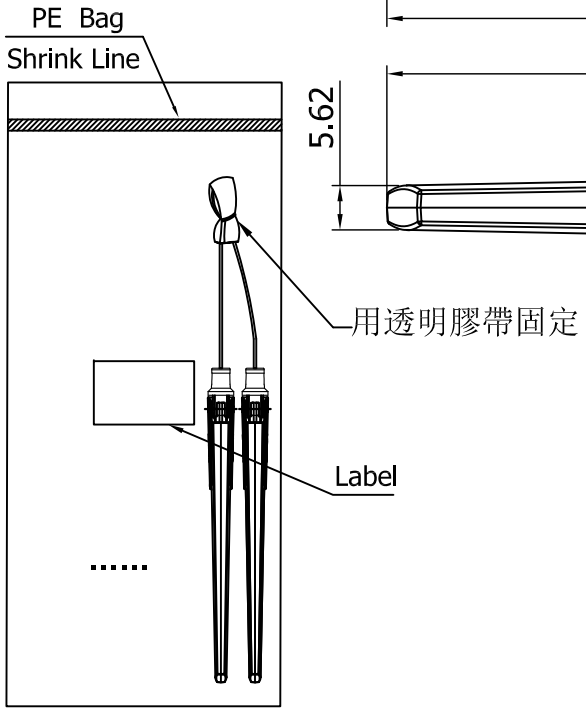
2.1	Operating Temp. ……	-10℃ ~ +60℃
2.2	Storage Temp. ……	-10℃ ~ +70℃

CG-XXXX

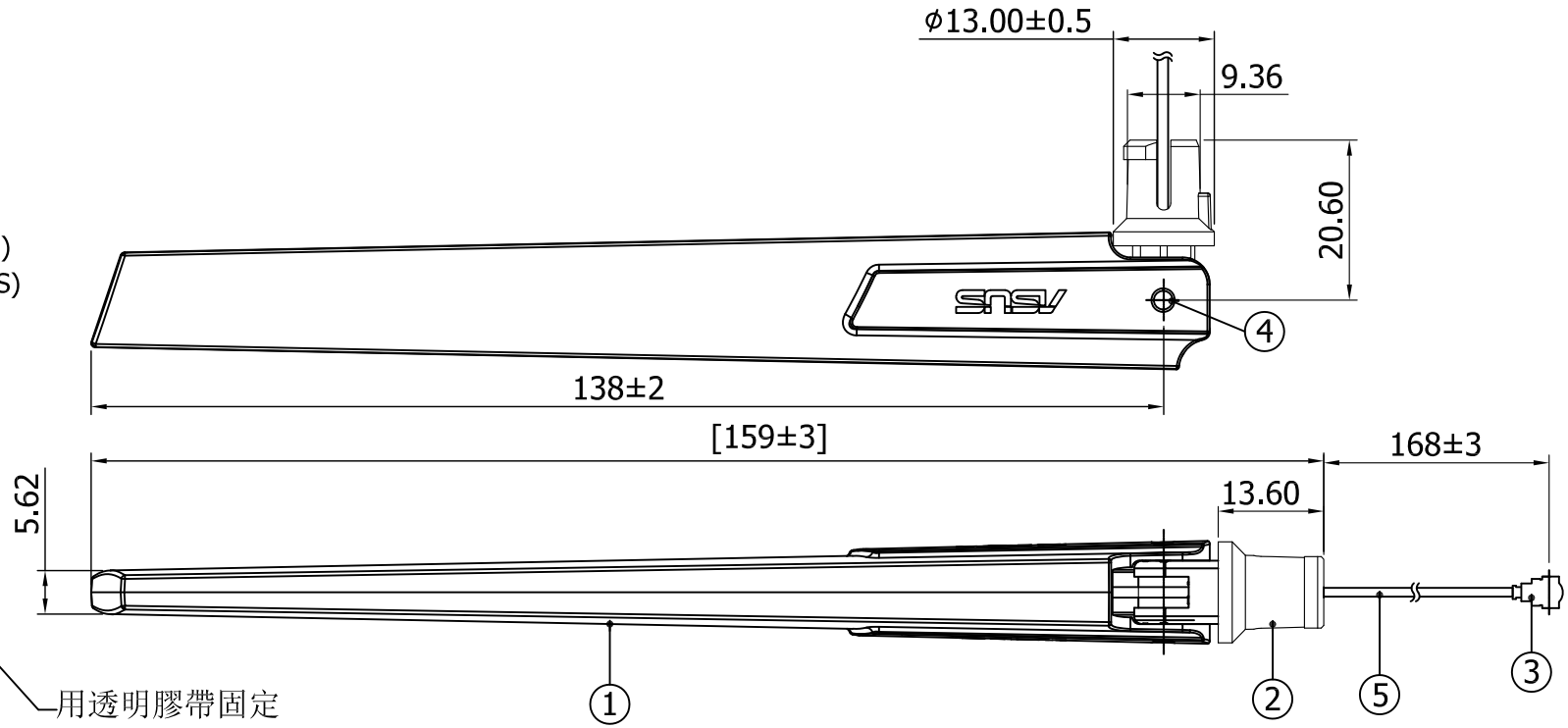
REV	DATE	DESCRIPTION
X1	06/26-2019	New Issue



GP標籤貼於紙箱側麥左上角(共2PCS)
外箱標籤貼於紙箱側麥右上角(共1PCS)



Packing:10PCS/bag



NO	DESCRIPTION		Q'TY	REMARK
5	Cable	ϕ1.37 Cable;Gray	1	
4	Rivet	POM ; Black	2	
3	Connector	MHF Plug	1	
2	Antenna Base	(CD-1636)PC/PBT ;Color:Black(W.Y-002)	1	
1	Antenna Cap	(CD-1086)ABS ;Color:Black(W.Y-002)	1	

CUSTOMER'S SINGATURE

XX.	± 3.0	APPROVED
X.	± 2.0	
.X	± 1.0	CHECKED
.XX	± 0.5	
.XXX	± 0.1	DRAWING

CUSTOMER:		ASUS	
PART NO :			
PARTNAME:		RF Antenna Assembly	
W.Y P/NO :		C660-510471-A	
REV	UNIT	FILE :	SRF2019813
X1	m/m	SHEET :	1/1

M.gear Wha Yu Group

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C660-510471-A
NE3-18139
Antenna
Test Report

Version: ***V 1.03***
Released Date: ***2019/06/27***
Prepared By: Cathy
Reviewed By: ***Sky Lo***

WHA YU INDUSTRIAL CO., LTD.
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Contents

- Revised History
- Conclusion & Comments
- Specification
- Antenna Placement & Solution
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- Results Summary (return loss, isolation, peak gain, efficiency)

Specification

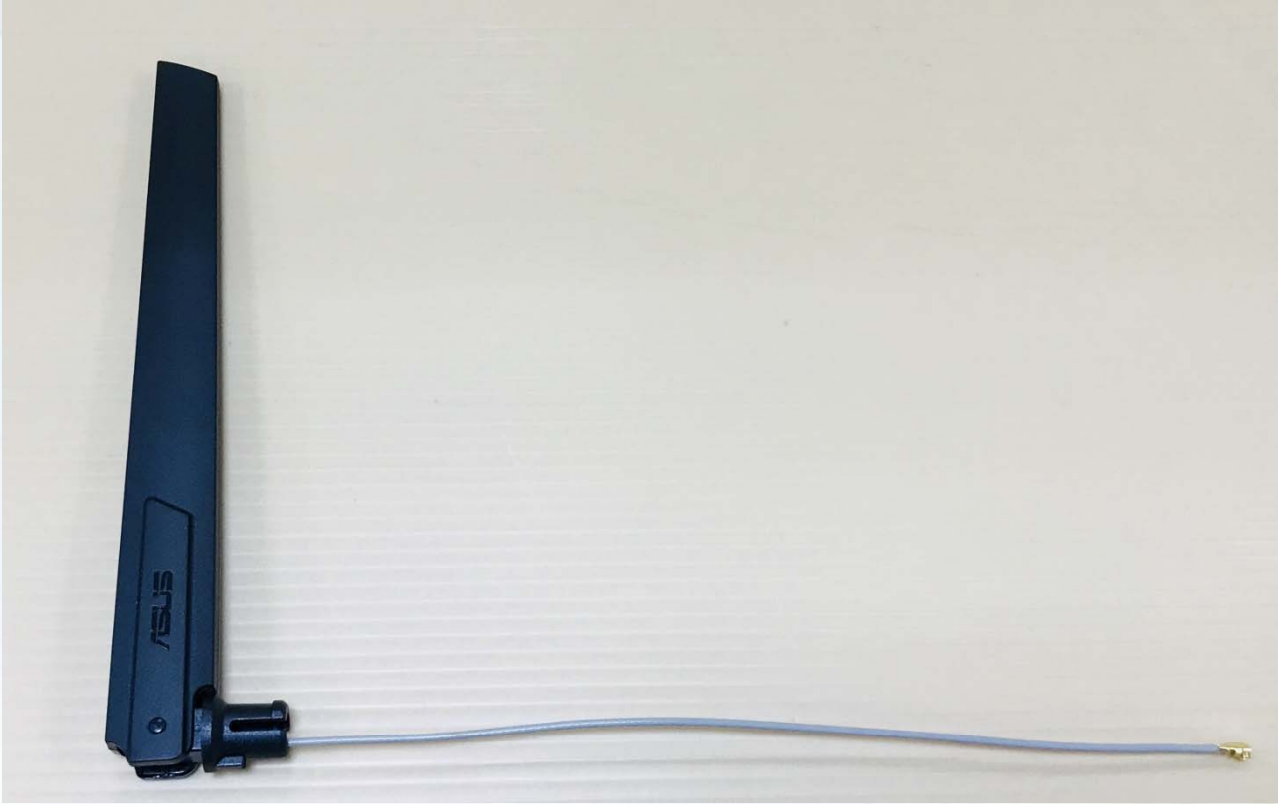
Requirements of Antenna Design

RF Function	Number of ANT	Frequency Band	Remark
WiFi	4	2.412G Hz~2.472GHz/5.180GHz~5.825GHz	

Requirements of Measurement

Test Item	Specification	Remark
Return Loss	> 10dB	
Isolation	NA	
Efficiency	2.4G> 80% / 5G>65%	
Radiation pattern	Scale: +10 ~ -40dBi, Angle step size: 5 degree	

Antenna Placement & Solution



Antenna	ANT Type	Size (L * W * H)	Cable Length (mm)	Cable Type
ANT4(DualBand)-168mm	Metal Dipole		Exp168(Gray)	Ø1.37

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Antenna Placement & Solution

Antenna	Previous Version	Current Version
ANT1	ANT1_v1.00	

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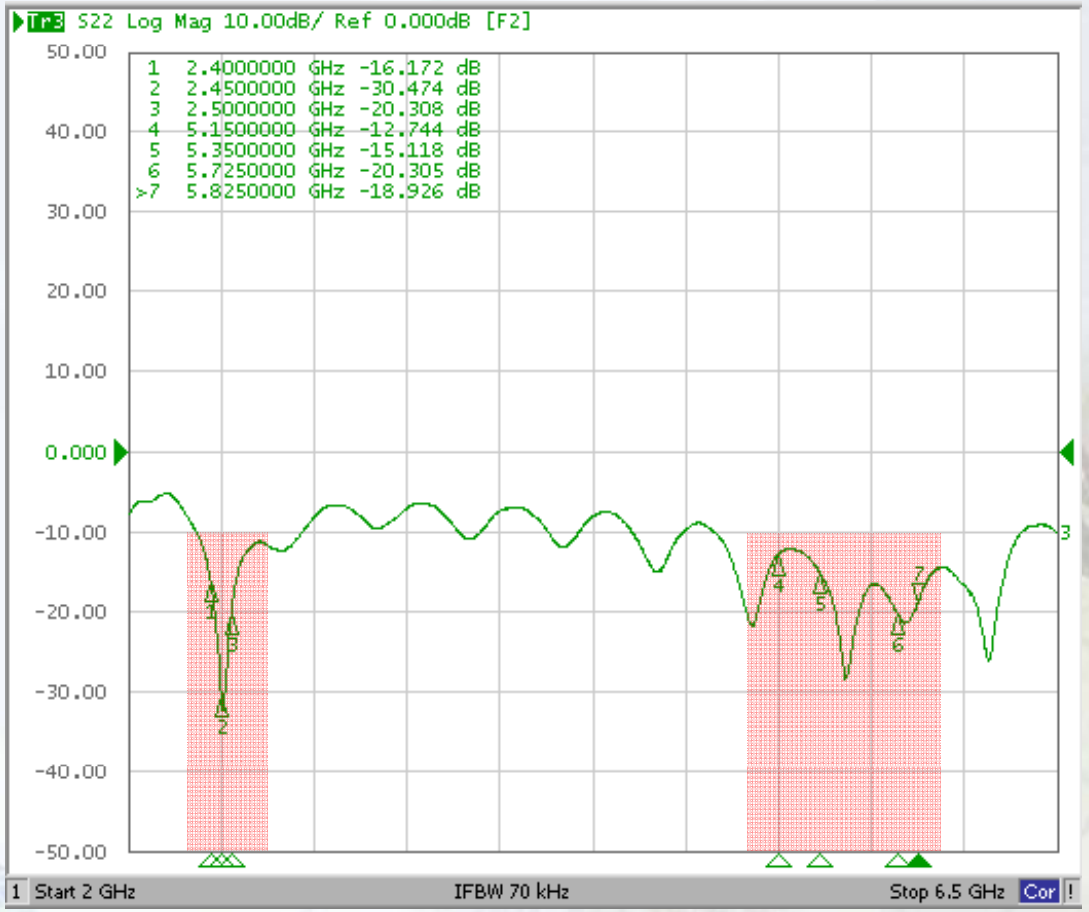
Return Loss Results

ANT4 (2400MHz~2500MHz/5150MHz~5825MHz) (Criterion:>10 dB)



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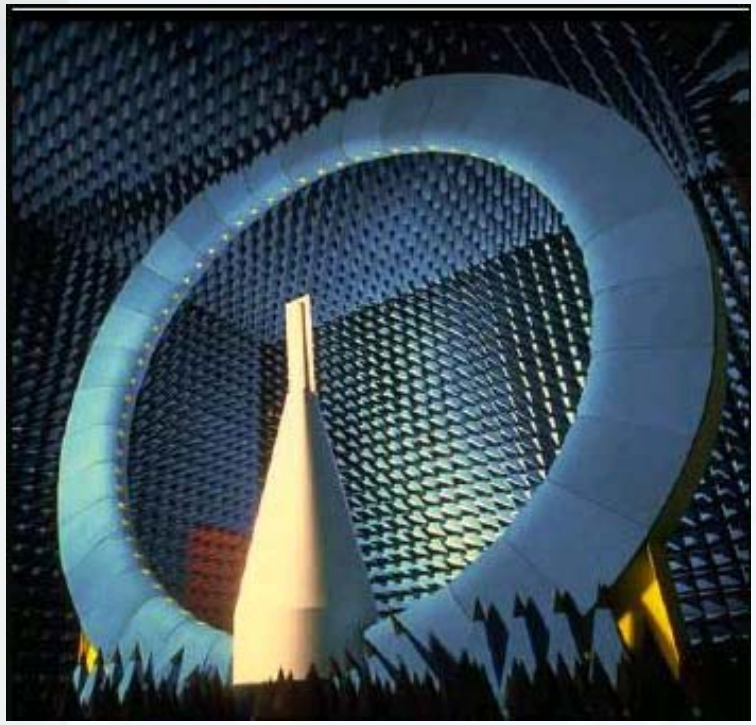
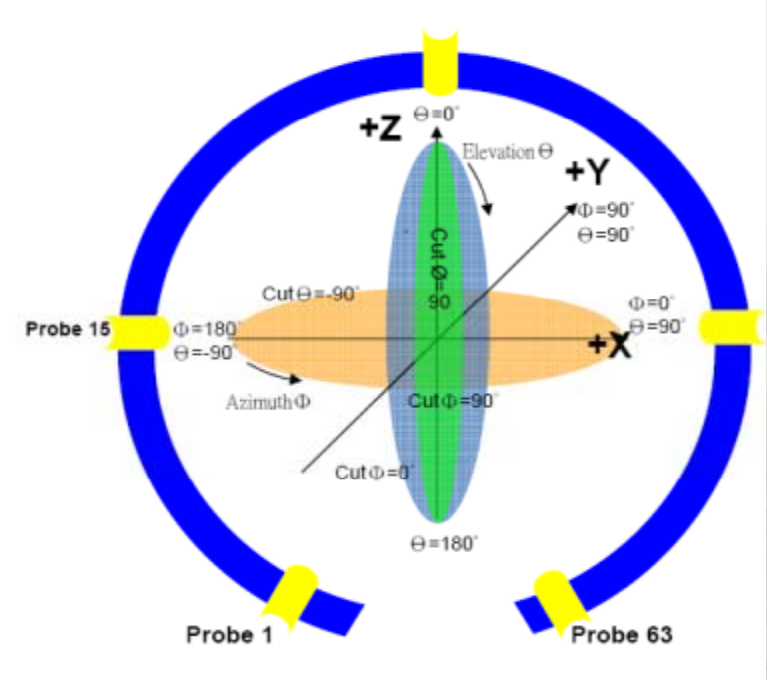
Chamber Information





Chamber	Brand	Model	Location
SATIMO	SATIMO	SG-64	Taiwan HsinChu

	θ	φ
Total angle	175°	360°
How many angle scan one point	5°	5°
Total scan point	36	73

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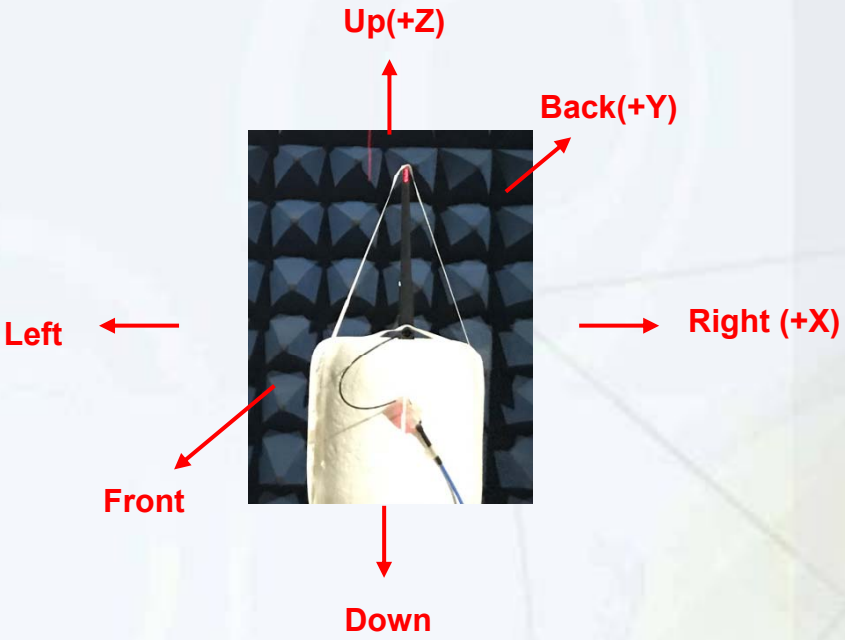
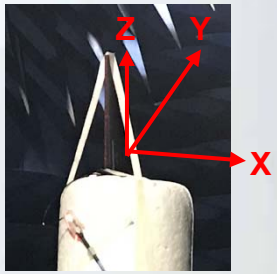
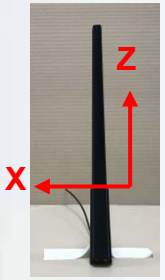
Test Setup for Radiation Pattern Measurement

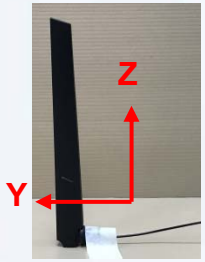


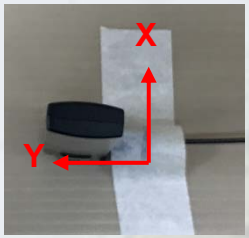
2D Radiation Pattern Results

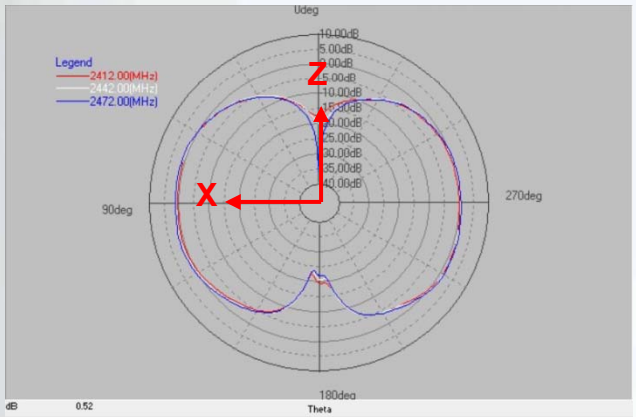


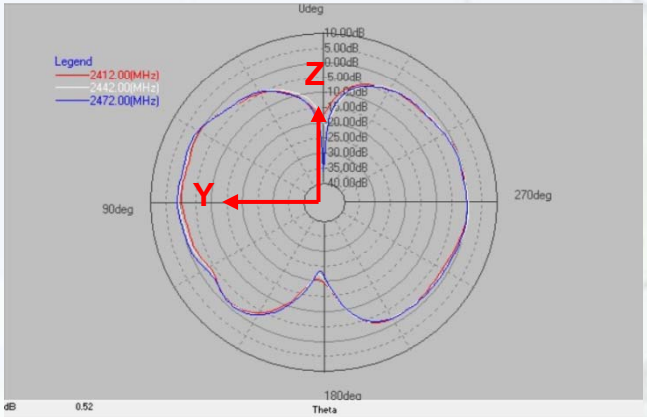
Dipole(Dual Band)_ANT4 (2.4G)

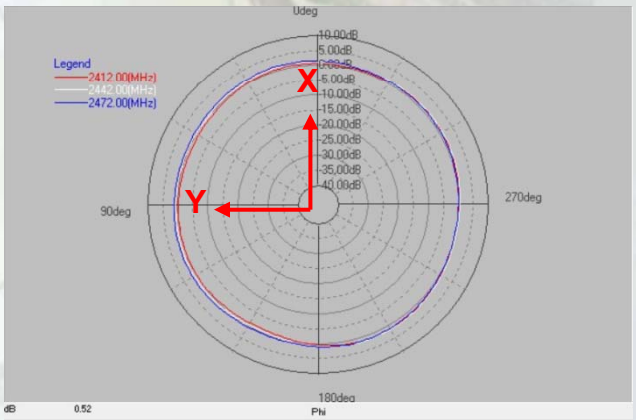




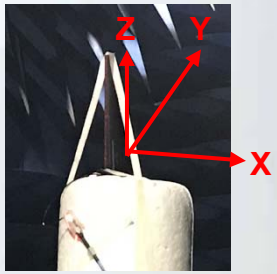




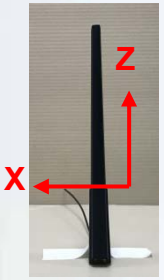


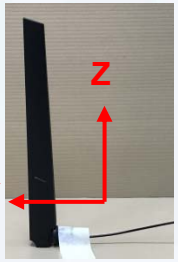


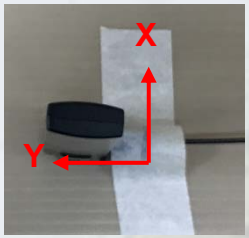
2D Radiation Pattern Results

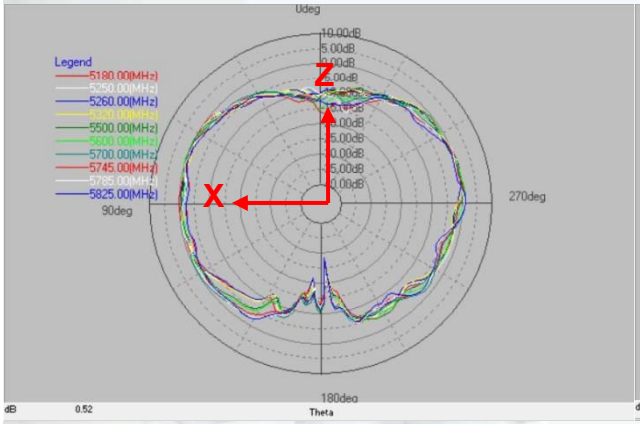


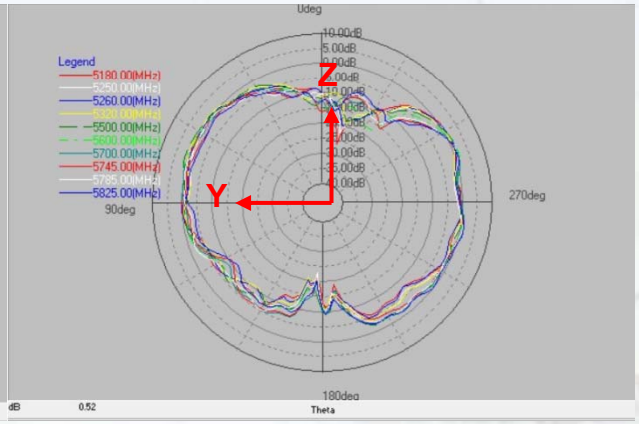
Dipole(Dual Band)_ANT4 (5G)

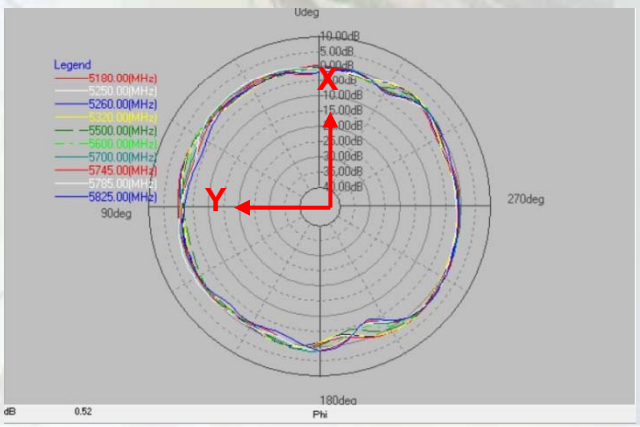












Results Summary

Return Loss (Criterion: >10dB)

Frequency (MHz)	ANT4
2400MHz	16
2450MHz	30
2500MHz	20
5150MHz	12
5350MHz	15
5725MHz	20
5825MHz	18

Results Summary

Gain & Efficiency

Frequency (MHz)	Ant4(Dual Band-165mm)	
	Gain(dBi)	Efficiency (%)
2412MHz	1.56	80
2442MHz	1.6	82
2472MHz	1.60	83
5180MHz	1.88	70
5250MHz	1.72	70
5260MHz	1.82	72
5320MHz	1.76	73
5500MHz	1.85	74
5600MHz	1.76	72
5700MHz	1.59	71
5745MHz	1.64	73
5785MHz	1.70	73
5825MHz	1.86	71

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