Approval Sheet

Customer	AAEON
Description	BT+WIFI MIMO ANTENNA
Customer P/N	170X000221
Revision	N/A
SINBON P/N	A9706679
Revision	11
Date	3/23/2022
company name	TongchengSINBON Electronics Co., Ltd.
Company address	Tongcheng Anhui 168 Xinglong Middle Rd.
Pages	142(Cover Page Included)

Approved by	*(Print) Owen Zhang*
Checked by	*(Print) Tone He*

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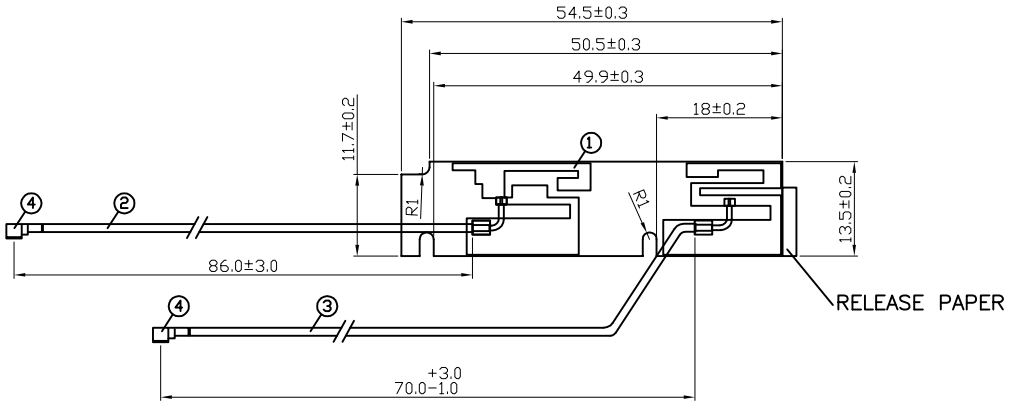
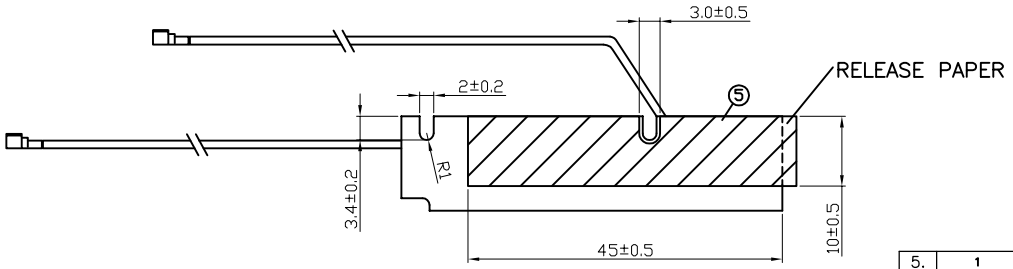
REV.	ECN NO.	DATE	BY	DESCRIPTION
01	N/A	May/22/2018	Sean Chan	RELEASED
02	N/A	Aug/13/2018	Sean Chan	UPDATED CUSTOMER P/N
03	N/A	Dec/20/2018	Sean Chan	RELEASED
04	N/A	Feb/27/2020	Sean Chan	RELEASED
05	N/A	Sep/07/2020	Sean Chan	RELEASED (PATTERN & MIMO)
06	N/A	Nov/16/2020	Sean Chan	RELEASED (MIMO PATTERN FINE TURN)
07	N/A	May/04/2021	Sean Chan	UPDATED PATTERN & CABLE LENGTH
08	N/A	Sep/09/2021	Sean Chan	UPDATED BLACK CABLE LENGTH TOLERANCE AND PCB、ADHESIVE DIMENSION
09	N/A	Oct/27/2021	Sean Chan	UPDATED PCB AND ADHESIVE DIMENSION
10	N/A	Nov/01/2021	Sean Chan	UPDATED PCB DIMENSION
11	N/A	Nov/24/2021	Sean Chan	PATTERN FINE TURN

RoHS





NOTE:
FREQUENCY RANGE : 2400~2500/5150~5850MHz
VSWR : N/A
ANTENNA TYPE : PIFA
IMPEDANCE : 50Ω

PRELIMINARY

ITEM	QTY	DESCRIPTION
5.	1	ADHESIVE 3M467MP 45*10*0.05mm
4.	2	CONNECTOR I-PEX MHF4L
3.	1	CABLE OD 1.13mm BLACK
2.	1	CABLE OD 1.13mm WHITE
1.	1	PCB 54.5*13.5*0.6mm BLACK

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AND IS TO BE RETURNED PROMPTLY UPON REQUEST BY SINBON ELECTRONICS CO., LTD.

CUSTOMER : AAEON

CUSTOMER P/N : 170X000221 | REV. N/A

UNLESS OTHERWISE SPECIFIED TOLERANCE :
1 ~ 10 : ±0.2
11 ~ 30 : ±0.3
31 ~ 50 : ±0.5
51 ~ 200 : ±0.8
201 ~ 400 : ±1.2
> 401 : ±2.0
ANGLES : ±1°

DRA. Nov/24/2021 Sean Chan
CHK. Nov/24/2021 Oscar Lin
APR. Nov/24/2021 Dio Chung

SINBON Electronics Co., Ltd.

DESCRIPTION : BT+WIFI MIMO ANTENNA

PART NUMBER : A9706679 | REV. 11

SIZE A3 | UNIT mm | SCALE NONE | SHEET 1 of 1

SINBON

物料表(BOM)

成品料号 SINBON P/N：A9706679-D　　版本(次) REV.：A

Item	Combination Qty	Denominator Qty	Unit	Location	UTE(1)/ SUB(2)	SINBON P/N	Part Description	Manufacturer	Manufacturer P/N	CPN	Loss Rate (%)	Part Qty	Note
项次	组成用量	主件底数	单位	位置标示	取代/替代料	信邦料号	物料名称	制造商	制造商料号	对应客户零件料号	损耗率(%)	组件数量	备注
1	1	1	PCS			A60604529001SD	PCB,06,FR4,54.5*13.5mm,T=0.6mm,1LAYER,1 PNL=1*1,FLEXIBLE,BT+WIFI MIMO PCB,N/A	FLEXIBLE		BT+WIFI MIMO PCB	0.5		
2	0.5	1	PCS			A12501942001SD	ASSEMBLY PART,CONN.*2,M+COAXIAL CABLE,IMP.50Ohm,WHITE,OD=1.13,L=260	I-PEX			0.5		
3	0.5	1	PCS			A12500634001SD	ASSEMBLY PART,CONN.*2,M+COAXIAL CABLE,IMP.50Ω,BLACK,OD=1.13,200V,L=260	I-PEX			0.5		
4	1	1	PCS			A00101314001SD	DOUBLE SIDED TAPE,L=45,W=10,T=0.05,TRANS-CLEAR,3M467,N/A	HUA JIE			0.5		
5	1	5	PCS			A0155017200SD	PE BAG,70*150*0.05,HF						
6	1	1500	PCS			A0100007600SD	CARTON,430*300*60,3LAYERS						
7	1	1500	PCS			A0210000600SD	BLANK LABEL,100*50,ART PAPER,WHITE						
8	1	7500	PCS			A0100007700SD	CARTON,460*320*350,5LAYERS						
9	1	7500	PCS			A0215183400SD	ROUND LABEL,OD=35,WHITE TEXT ON GREEN BACKGROUND,ART PAPER						

do the MAGIC+

AAEON

RTC-1010 WiFi MIMO antenna report

Rev L

16 Mar-2022

Revision History

Revision	Date	Description of changes
A	03 Feb -2020	Modify cable line and fine-tuning the antenna.
B	11 Feb -2020	Modify cable routing.
C	03 Mar -2020	Re-design MIMO antenna and fine-tuning LTE antenna.
E	12 Mae-2020	Modify antenna cable routing.
F	13 Nov-2020	Modify antenna cable routing.
G	01 Apr-2021	Modify antenna cable length.
H	28 Apr-2021	Modify cable length and fine-tuning the antenna.
I	07 Sep-2021	Modify antenna cable length.
J	28 Oct-2021	Modify PCB Outline.
K	24 Nov-2021	Measure antenna official samples and modify official sample pattern.
L	16 Mar-2022	Content update radiation pattern.

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Content

1.0		Summary
2.0		Test fixture
3.0		Matching Network Circuitry
4.0		Test setup (Network Analyzer)
	4.1	Laboratory Equipment
	4.2	ETS Chamber - AMS-8500
5.0		S11/VSWR
	5.1	Efficiency
6.0		Radiation pattern

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1.0 Summary

- According to the AAEON requested, SINBON engineer measure antenna samples provided the result in this report.
- All the measurements are base on the test fixture shown in section 2.

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2.0 Test fixtures pictures

Front view

Rear view

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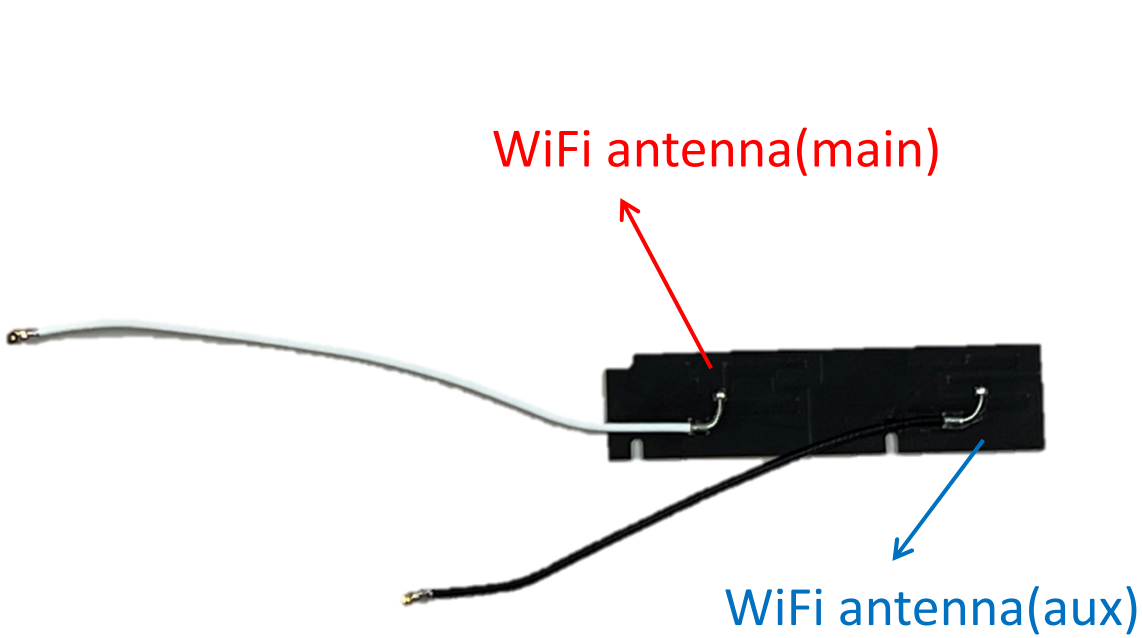
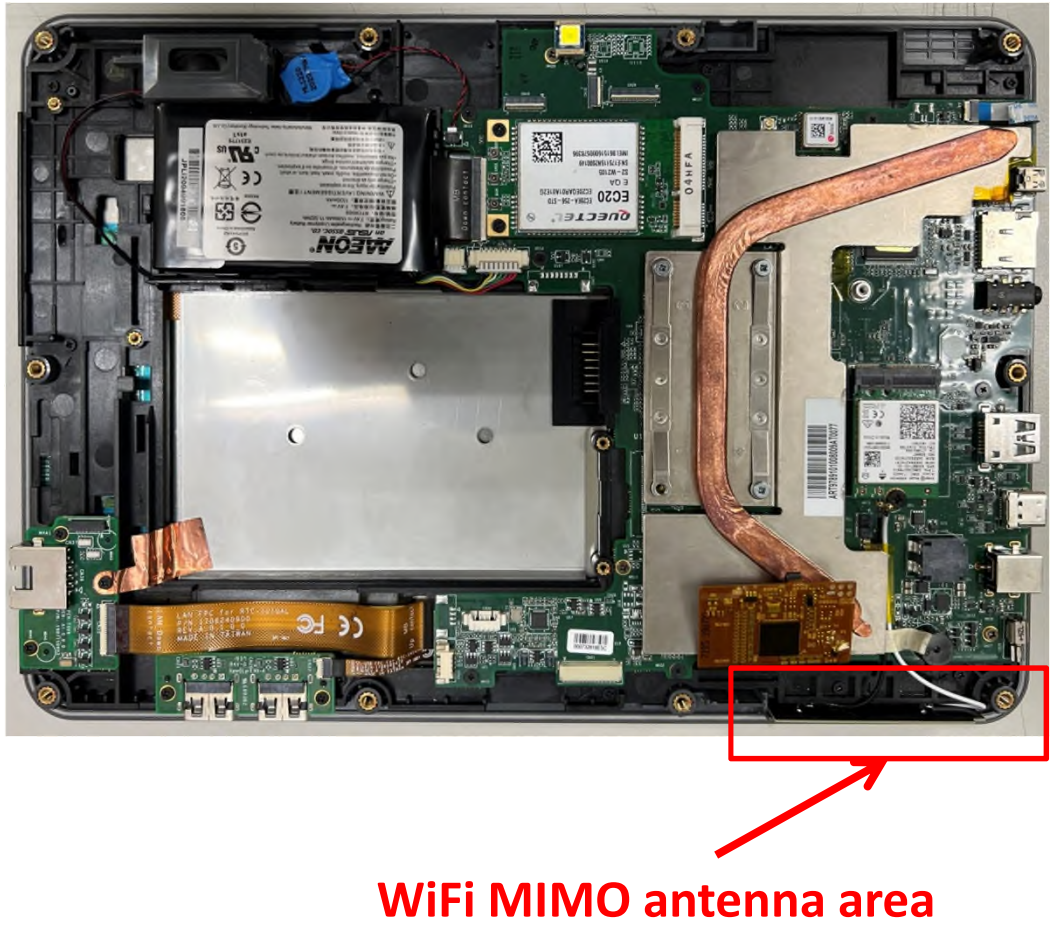
2.0 Test fixtures pictures





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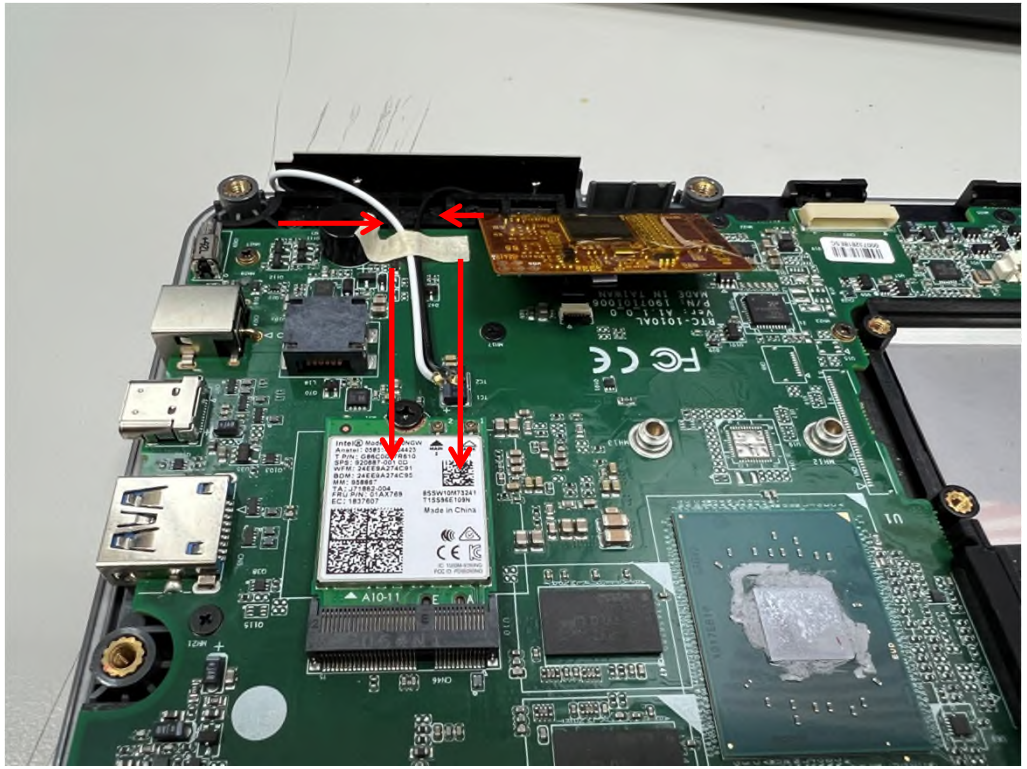
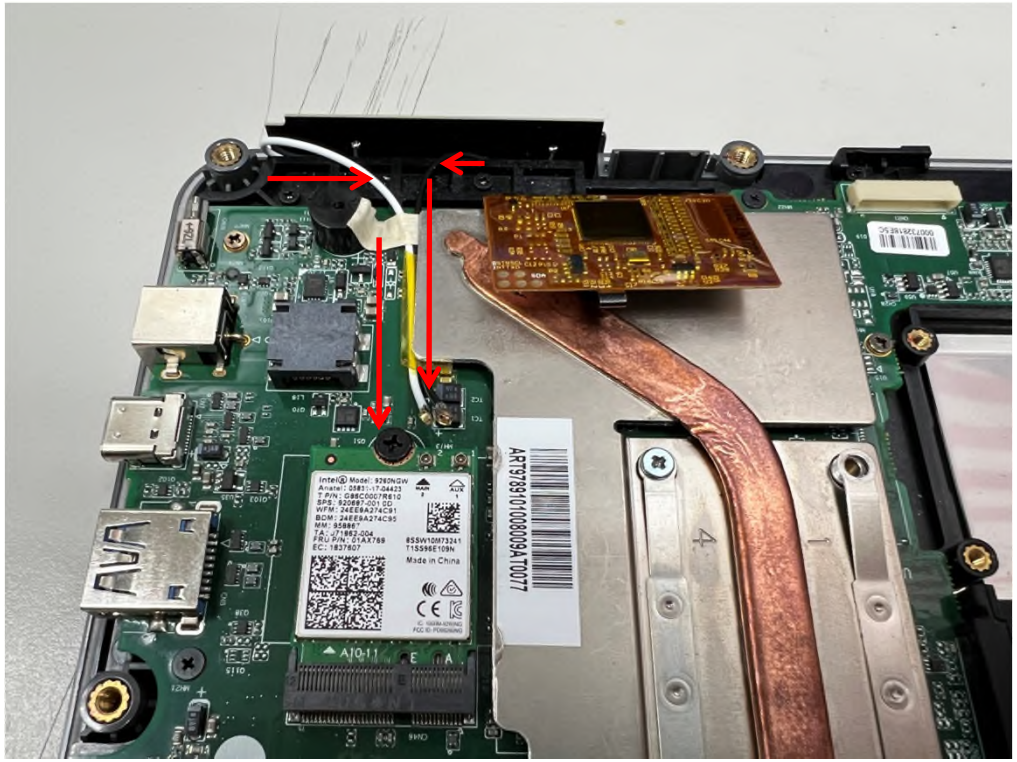
2.0 Test fixtures pictures



Cable routing



Cable routing

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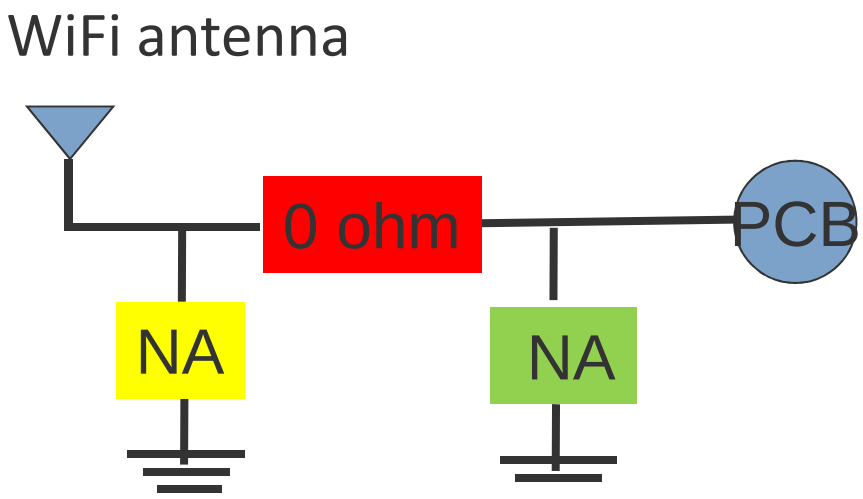
3.0 Matching network circuitry



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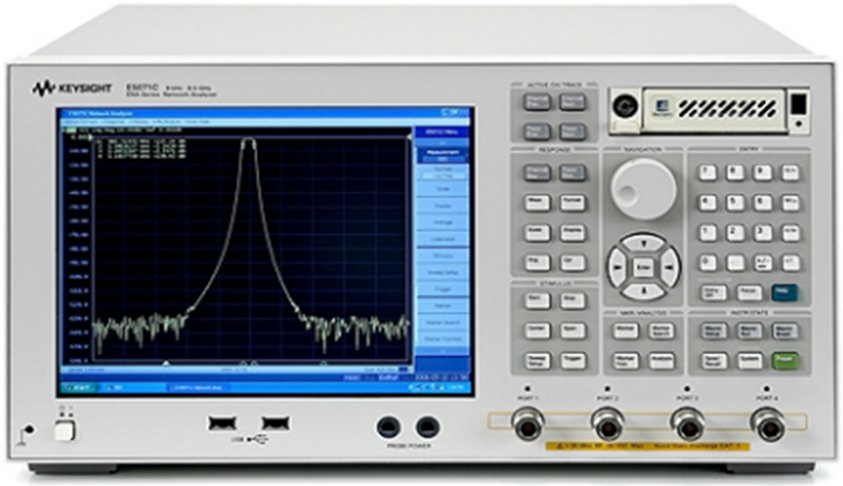
4.0 Test setup (Network Analyzer)



VSWR / S11 measurements were performed using an Agilent E5071C Network Analyzer and the test fixture shown in section 2. The testing was performed in free space. The complete VSWR and isolation plots are provided in section 5.0.

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4.1 Laboratory equipment

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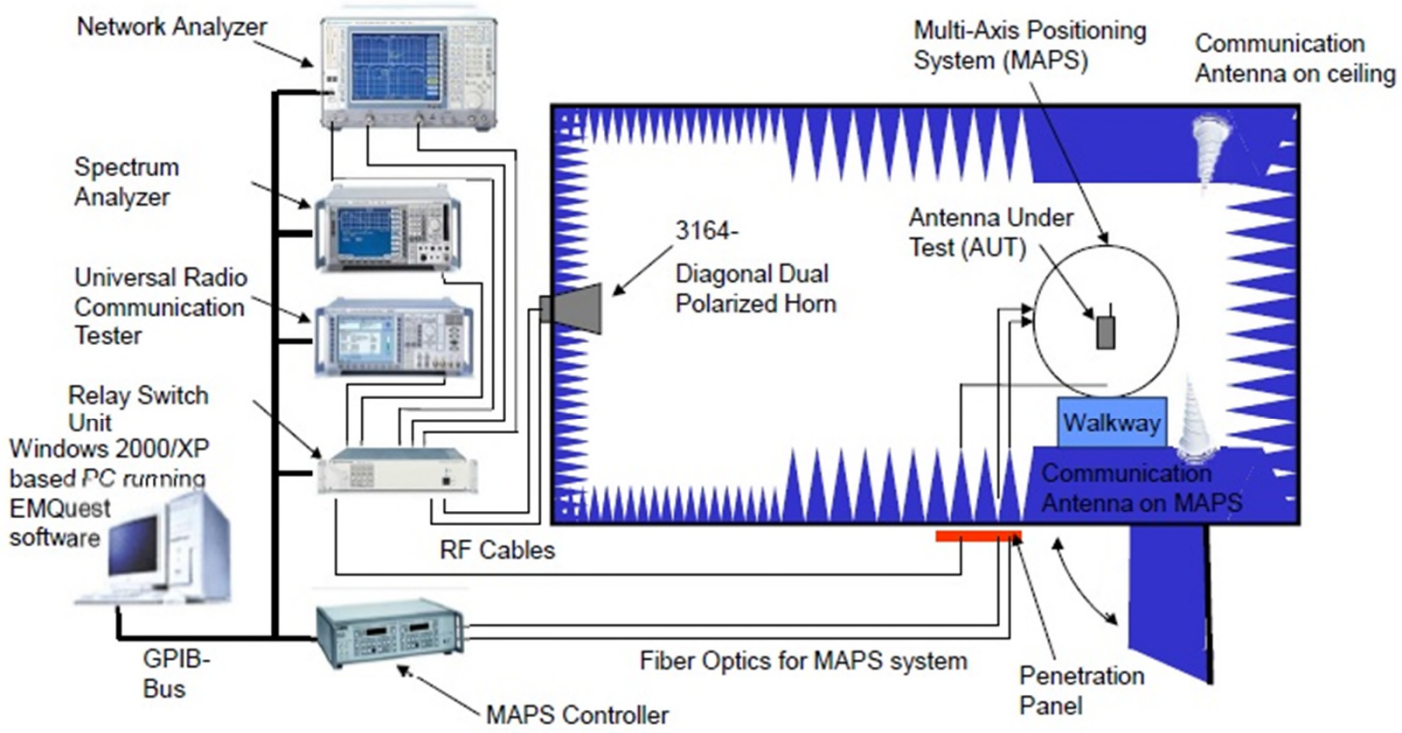
4.2 ETS Chamber - AMS-8500



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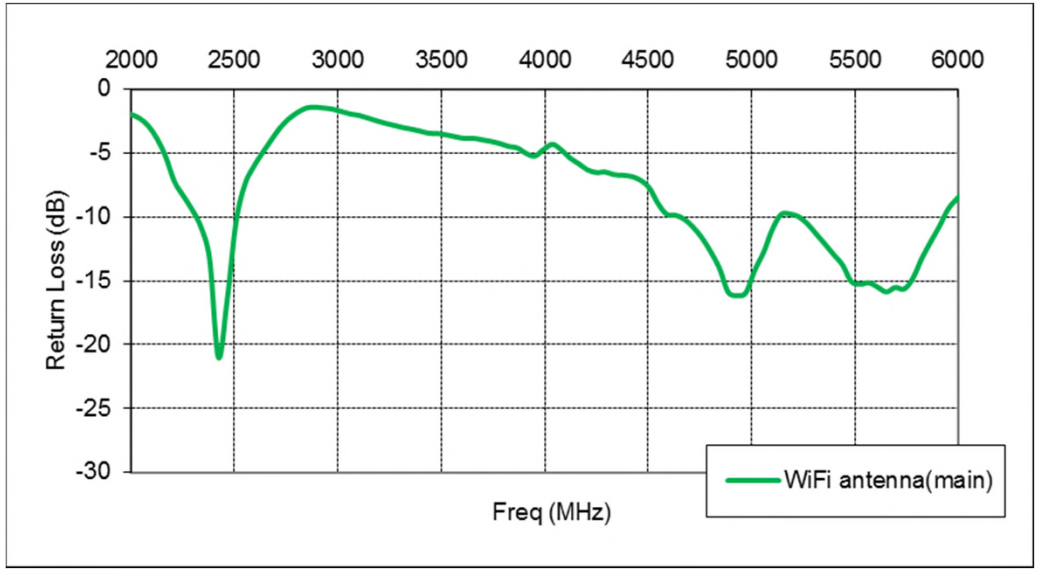
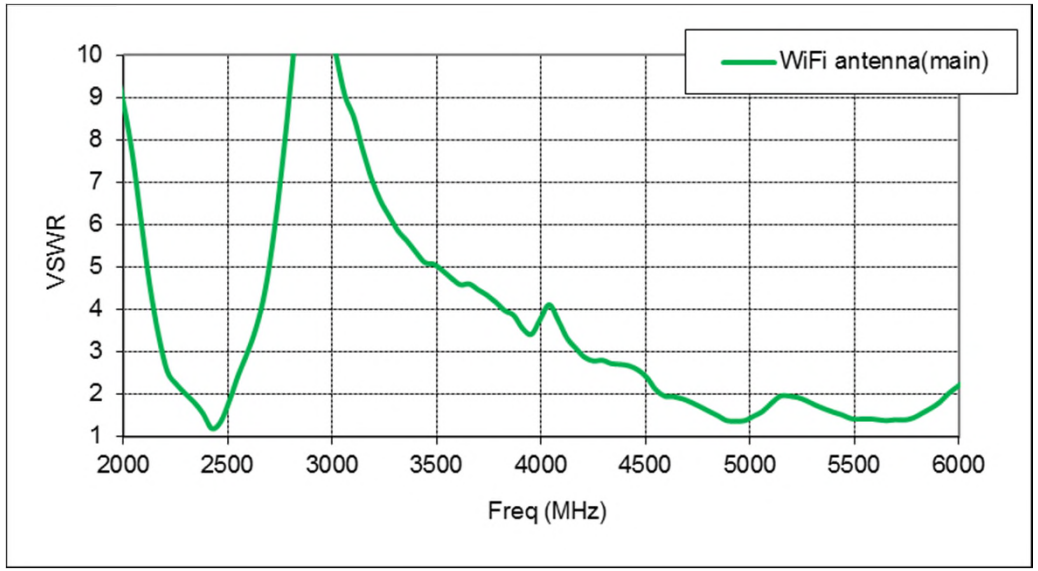
5.0 WiFi antenna(main) S11/VSWR





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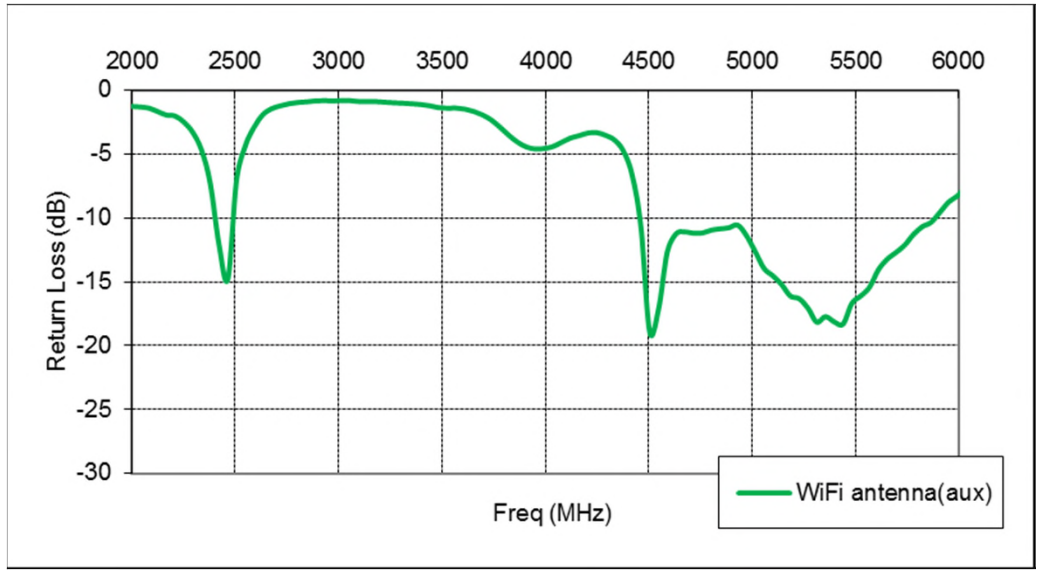
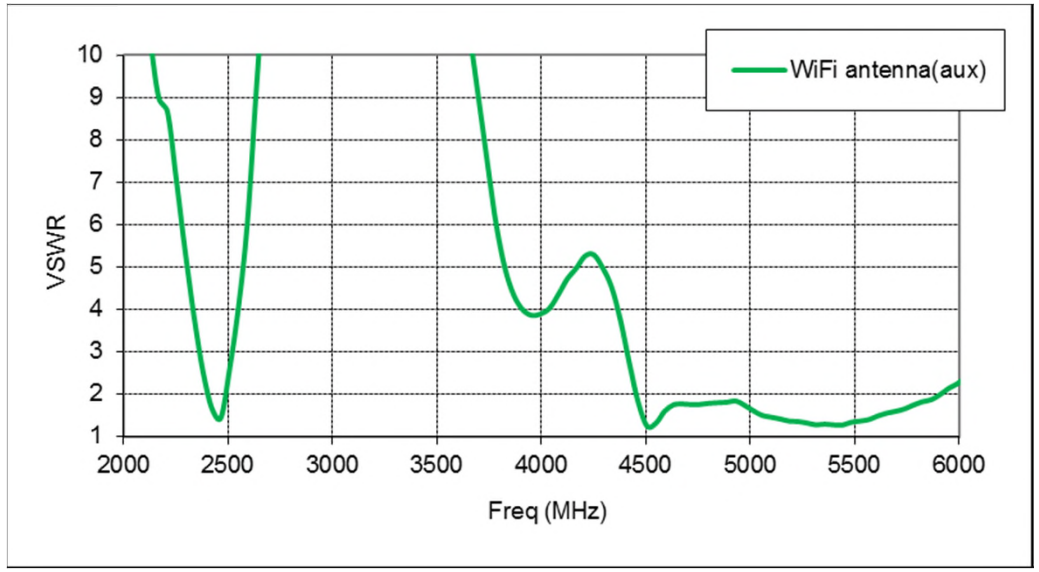
5.0 WiFi antenna(aux) S11/VSWR





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5.1 WiFi MIMO antenna efficiency

	WiFi antenna(main)			WiFi antenna(aux)		
	16-Mar-22			16-Mar-22		
	Free Space			Free Space		
MHz	Efficiency (%)	Efficiency (dB)	Peak Gain(dBi)	Efficiency (%)	Efficiency (dB)	Peak Gain(dBi)
2400	43	-3.7	2.0	28	-5.5	-0.3
2410	47	-3.3	2.5	31	-5.1	0.1
2420	50	-3.0	2.7	33	-4.9	0.4
2430	52	-2.8	2.8	33	-4.8	0.7
2440	50	-3.0	2.7	33	-4.9	0.5
2450	47	-3.2	2.7	31	-5.0	0.3
2460	47	-3.3	2.5	31	-5.1	-0.1
2470	46	-3.3	2.3	30	-5.4	-0.5
2480	46	-3.3	2.2	27	-5.6	-0.9
2490	45	-3.5	2.0	25	-6.0	-1.2
2500	43	-3.6	1.6	24	-6.3	-1.6
5150	50	-3.0	2.5	46	-3.4	2.9
5250	40	-4.0	1.0	46	-3.3	2.5
5350	40	-3.9	0.9	44	-3.6	1.9
5470	36	-4.5	1.1	42	-3.7	0.9
5600	30	-5.2	0.1	41	-3.9	1.6
5725	31	-5.0	0.7	43	-3.7	2.1
5785	33	-4.8	0.9	49	-3.1	2.9
5875	33	-4.8	0.6	42	-3.8	2.9

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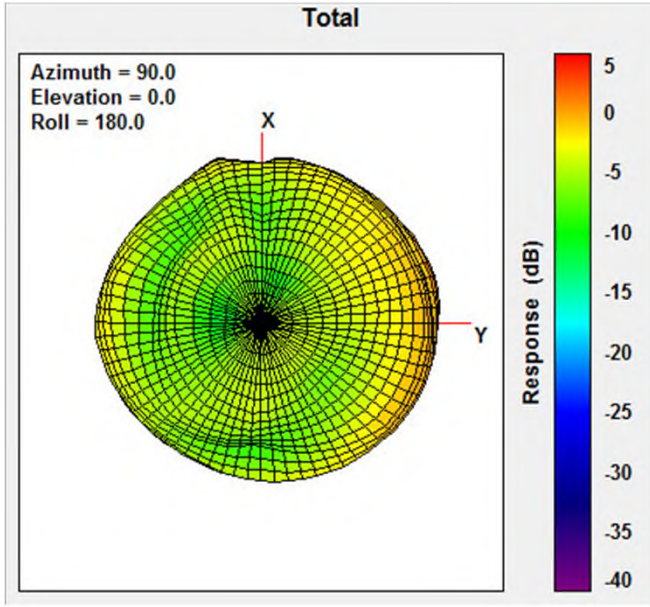
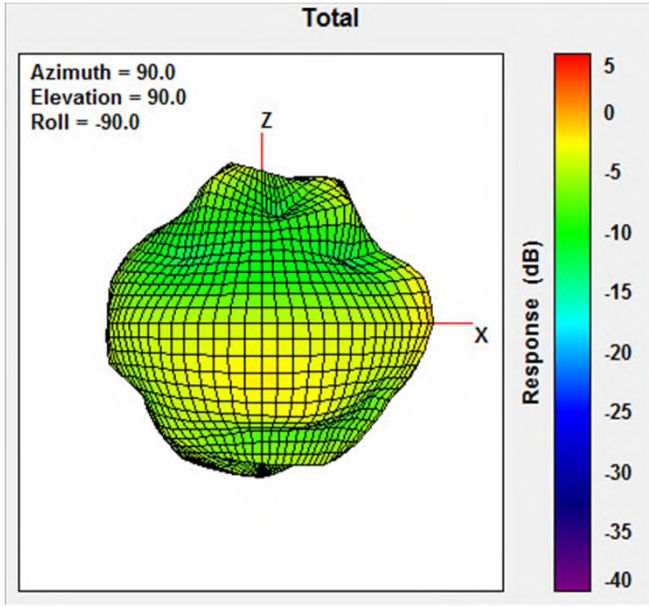
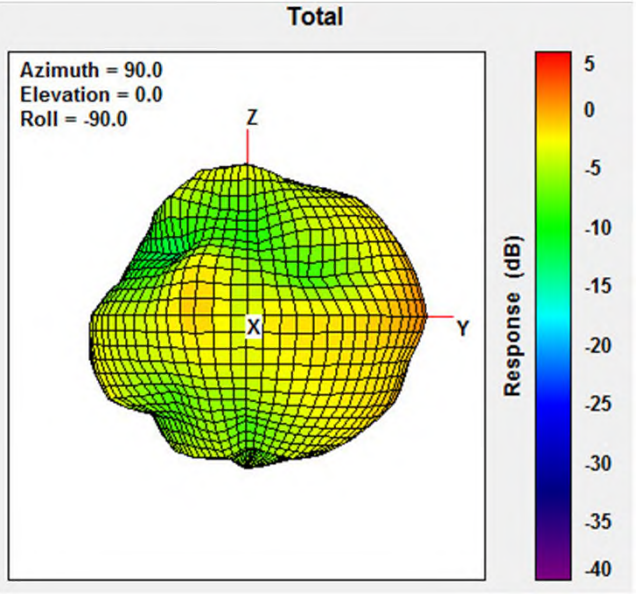
6.0 Radiation pattern(main)

2400 MHz







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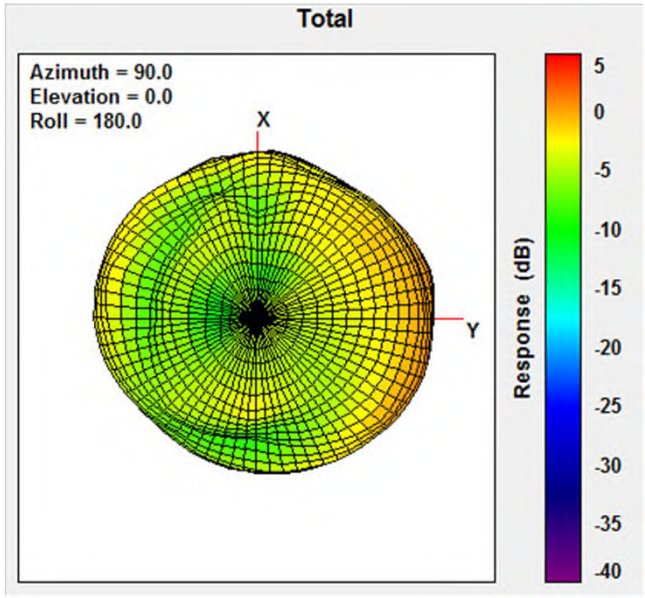
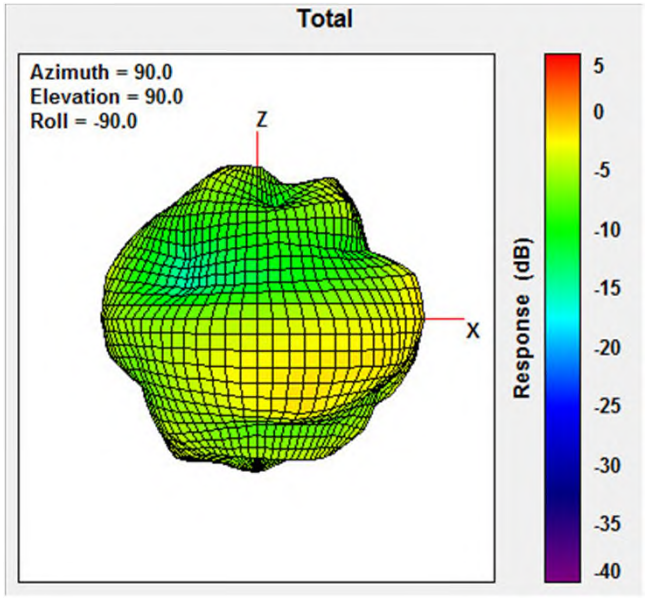
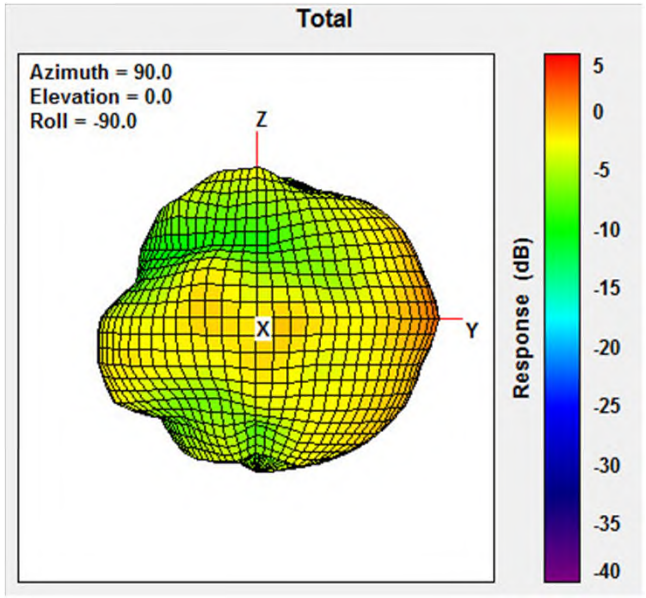
6.0 Radiation pattern(main)

2450 MHz







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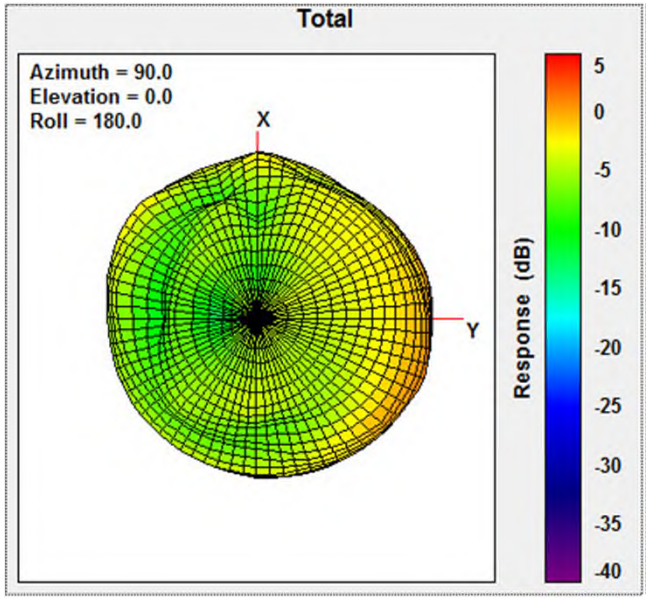
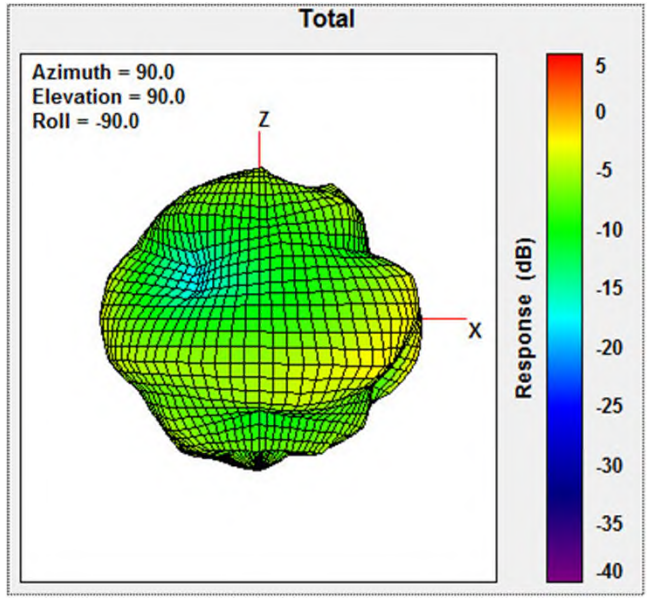
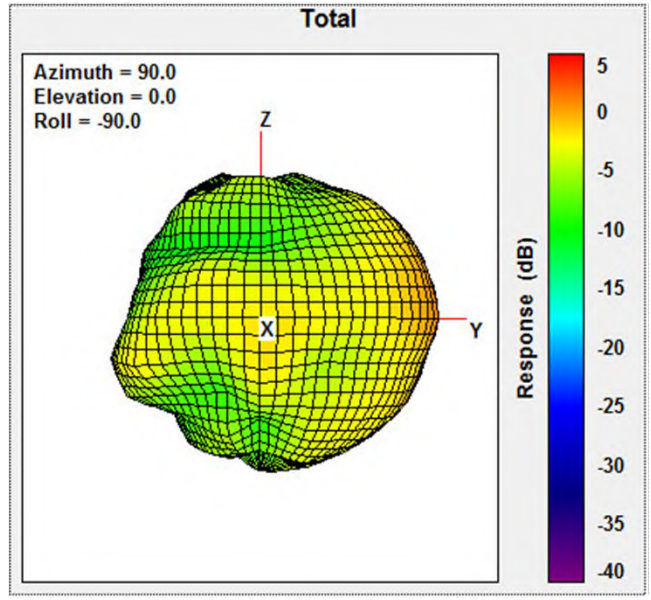
6.0 Radiation pattern(main)

2500 MHz







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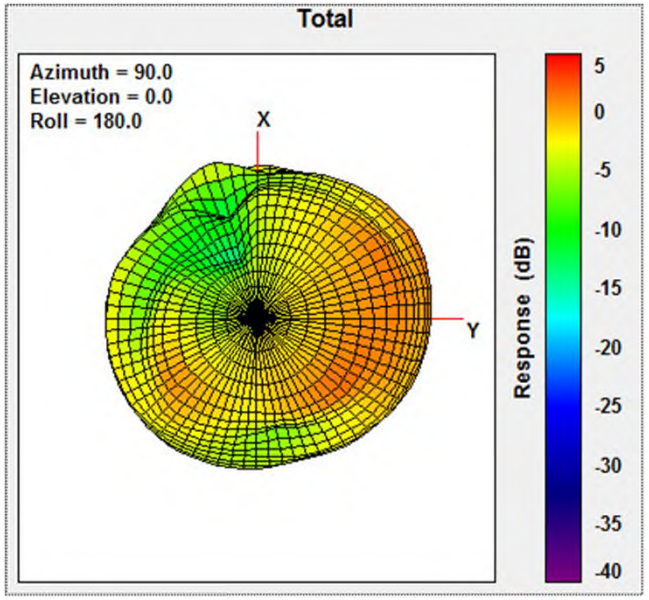
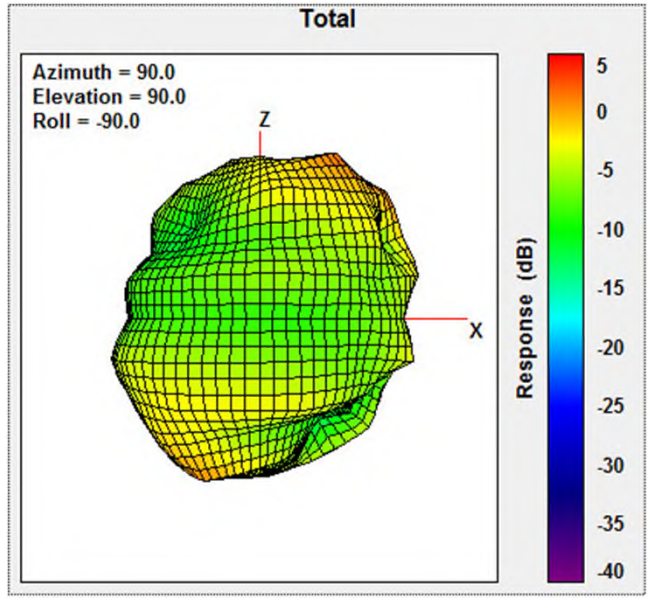
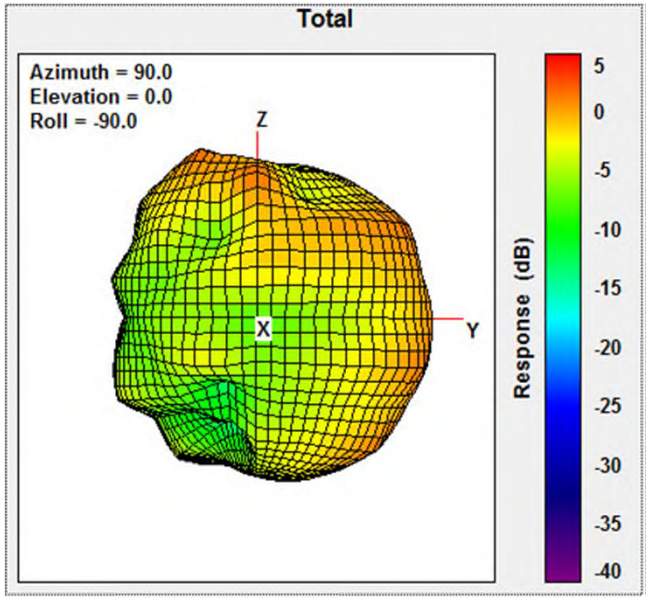
6.0 Radiation pattern(main)

5150 MHz







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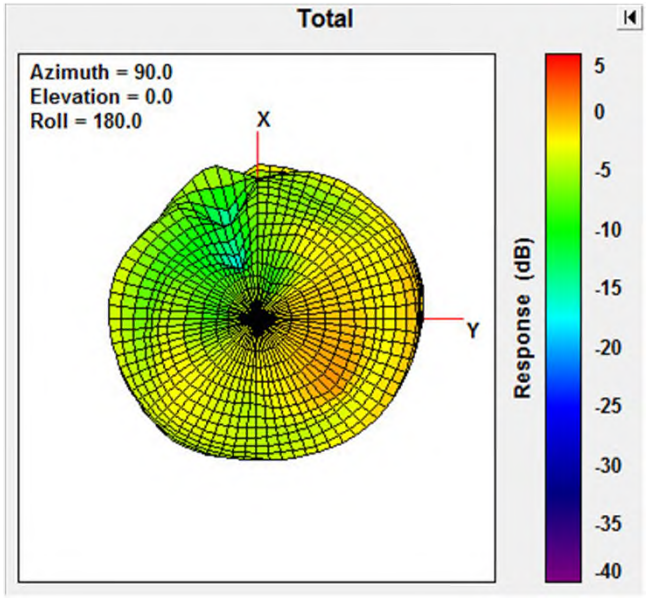
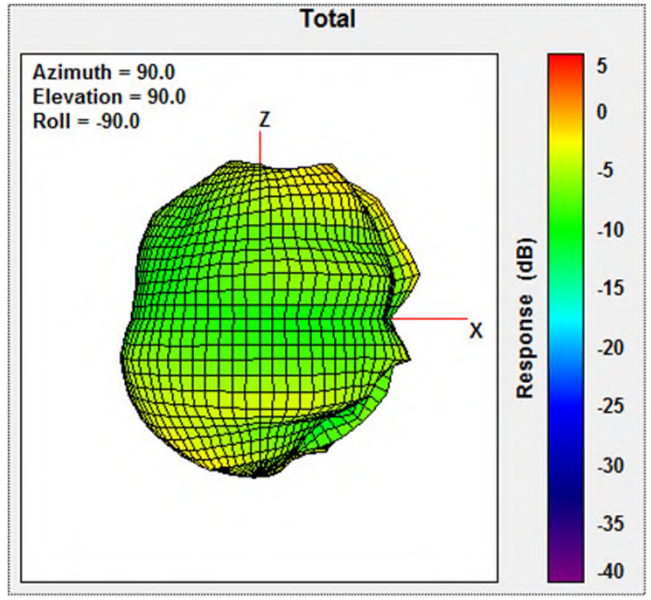
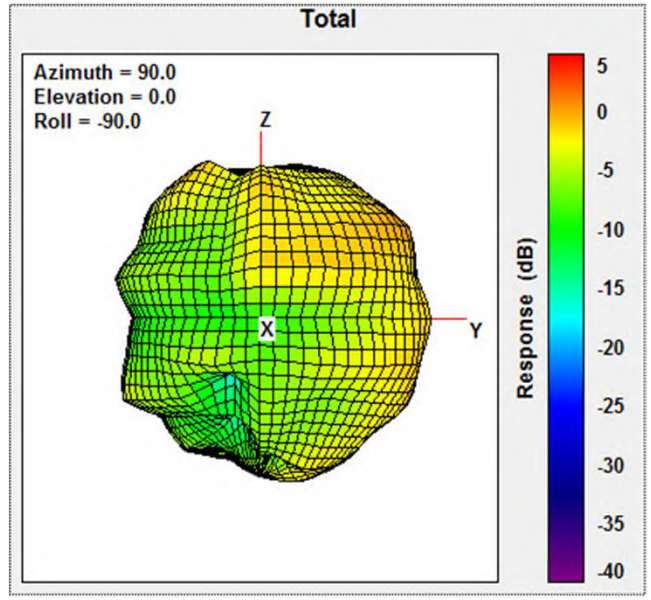
6.0 Radiation pattern(main)

5250 MHz







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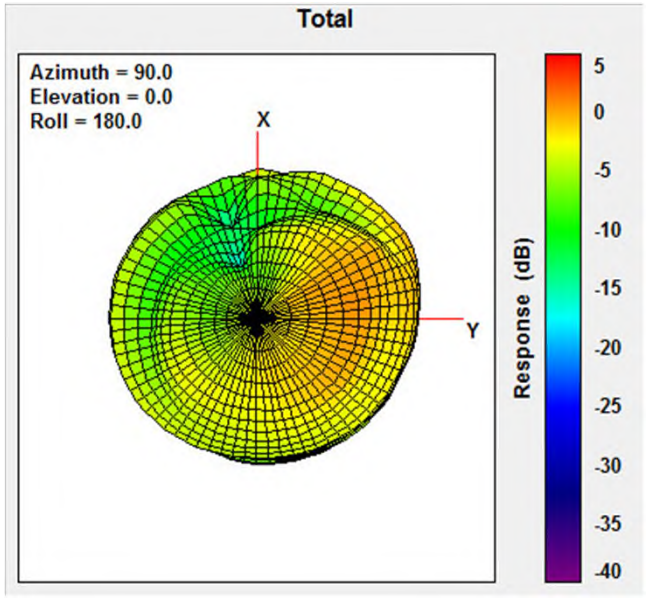
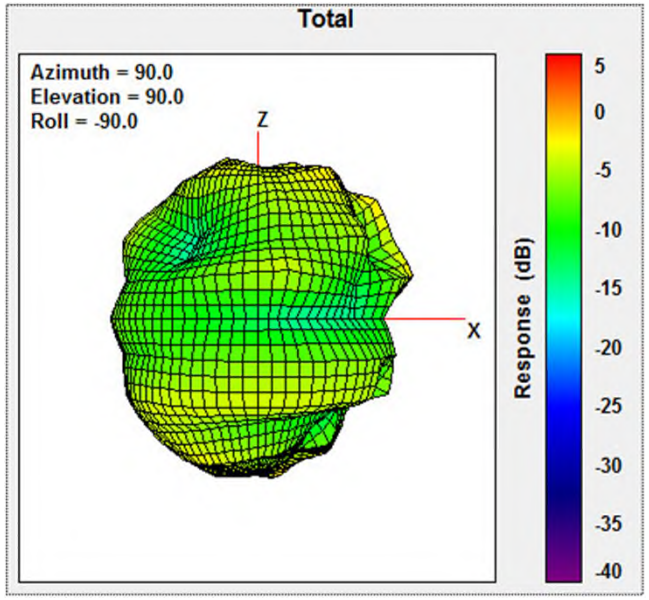
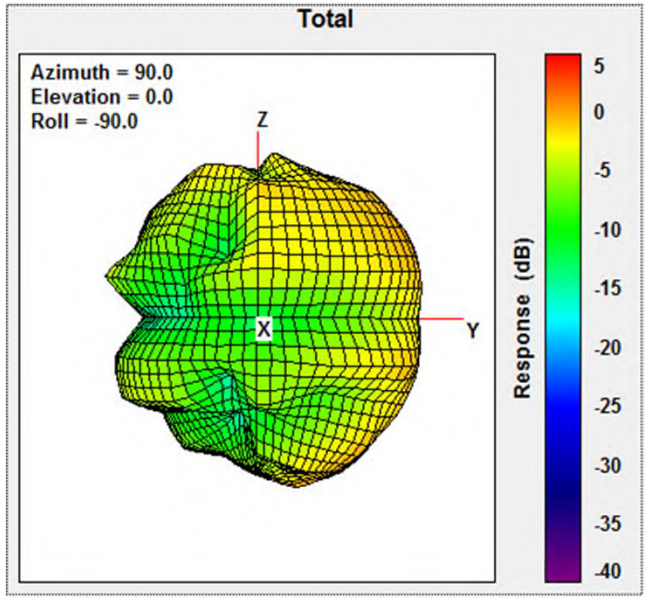
6.0 Radiation pattern(main)

5350 MHz







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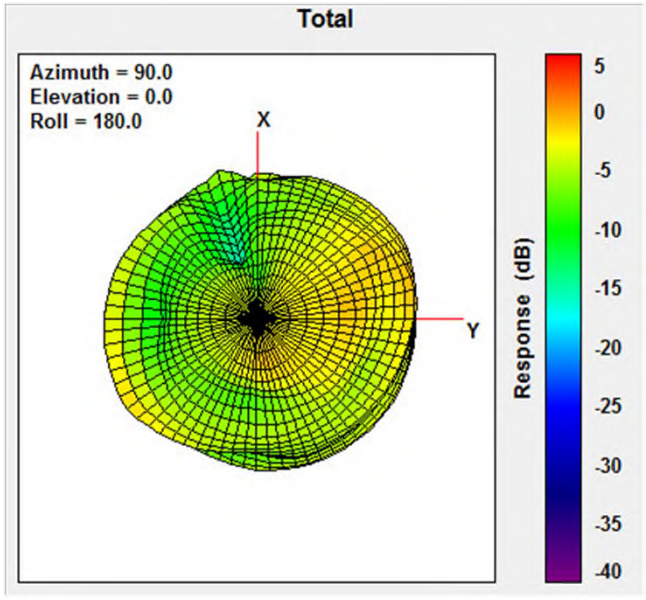
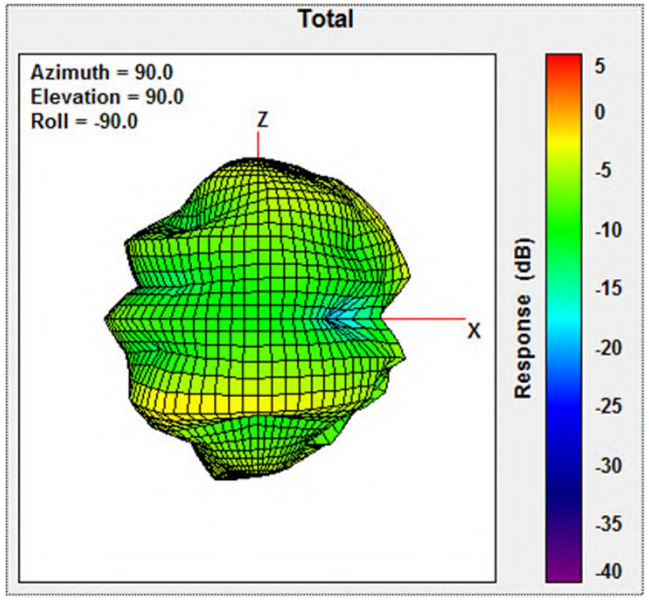
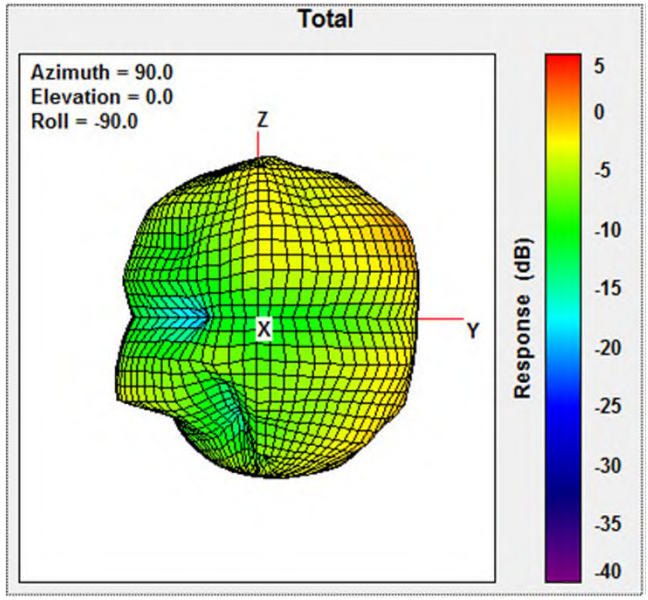
6.0 Radiation pattern(main)

5470 MHz







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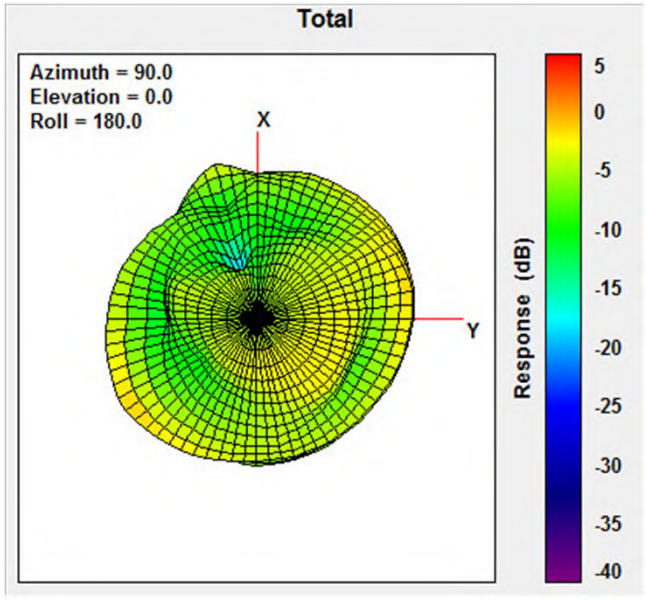
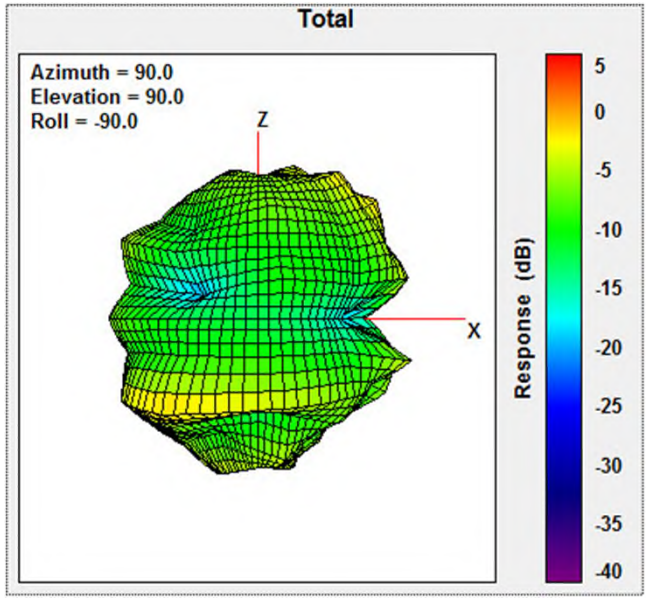
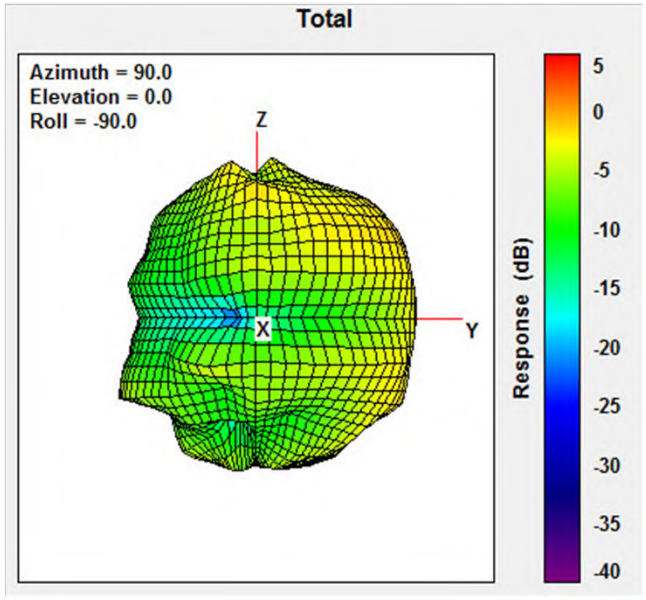
6.0 Radiation pattern(main)

5600 MHz







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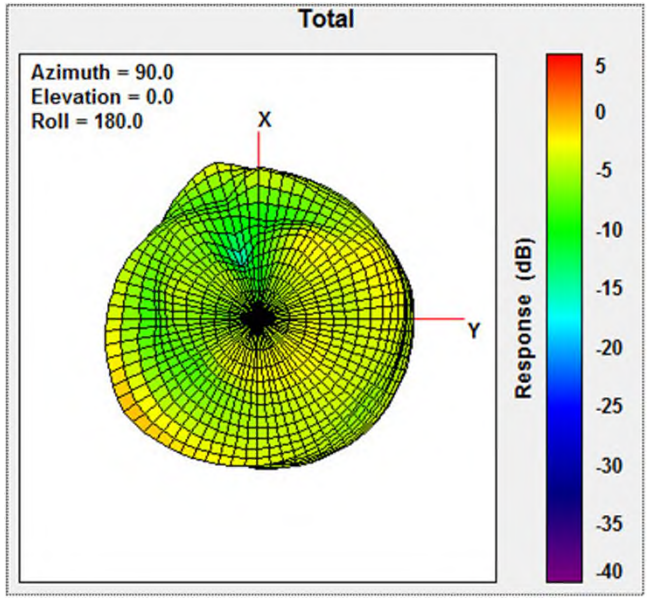
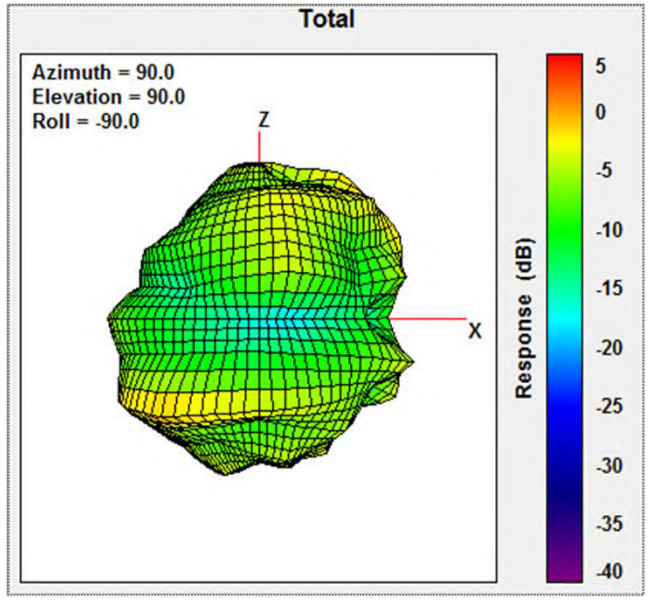
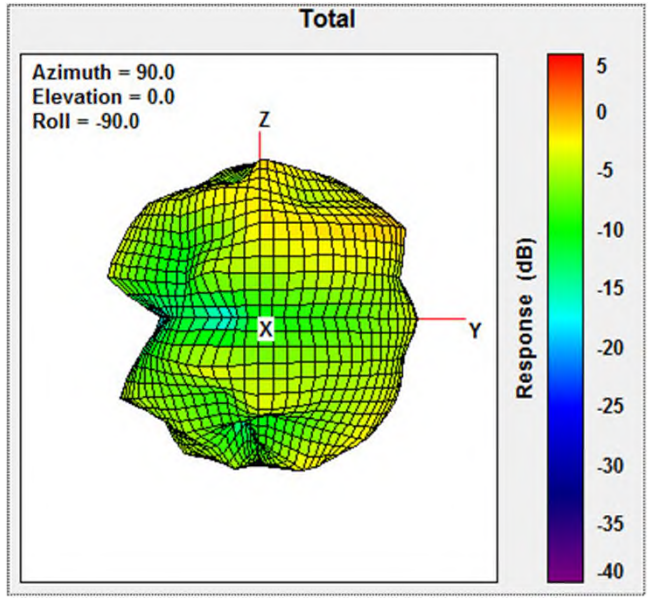
6.0 Radiation pattern(main)

5725 MHz







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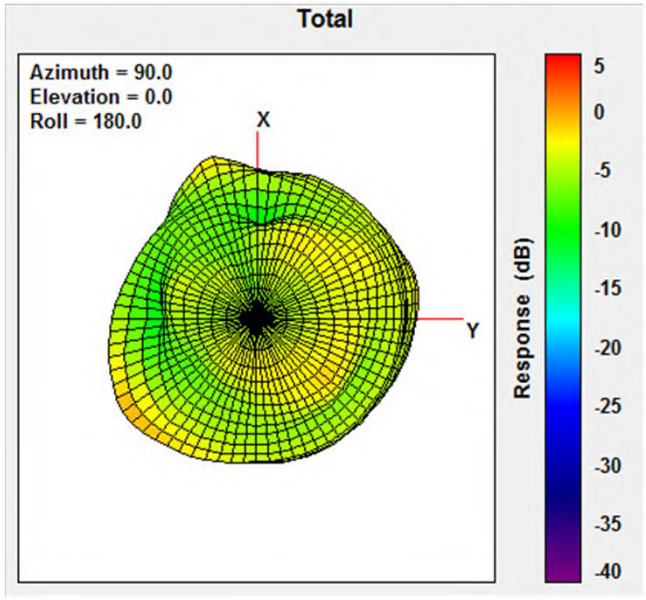
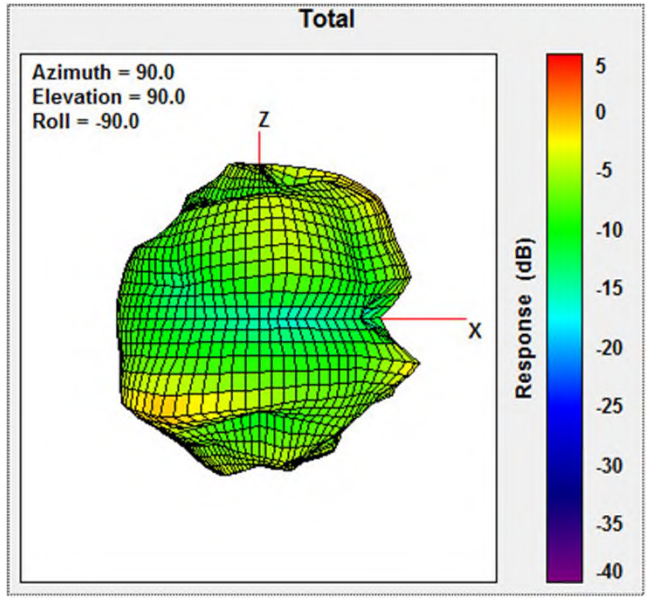
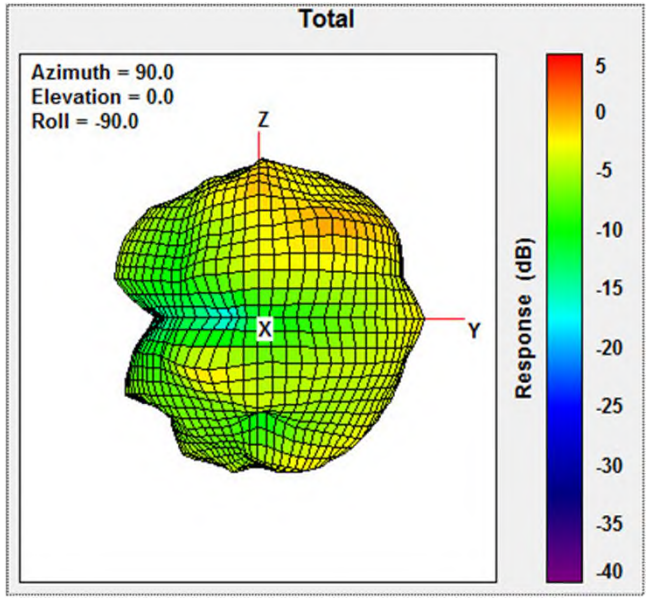
6.0 Radiation pattern(main)

5785 MHz







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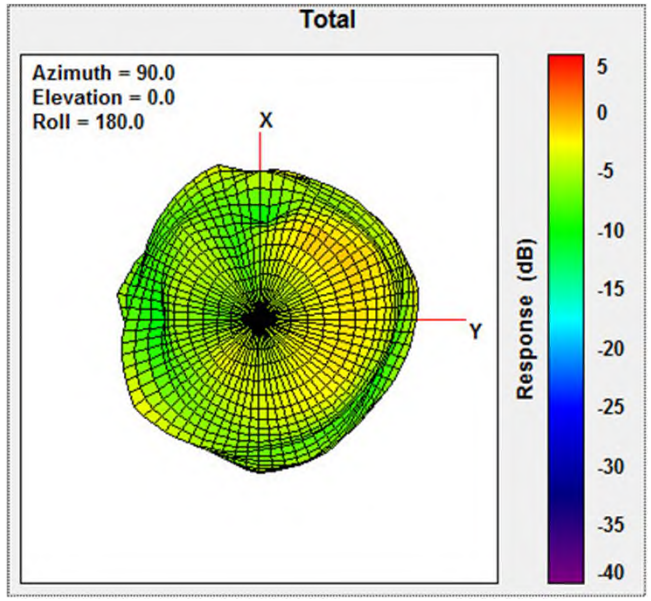
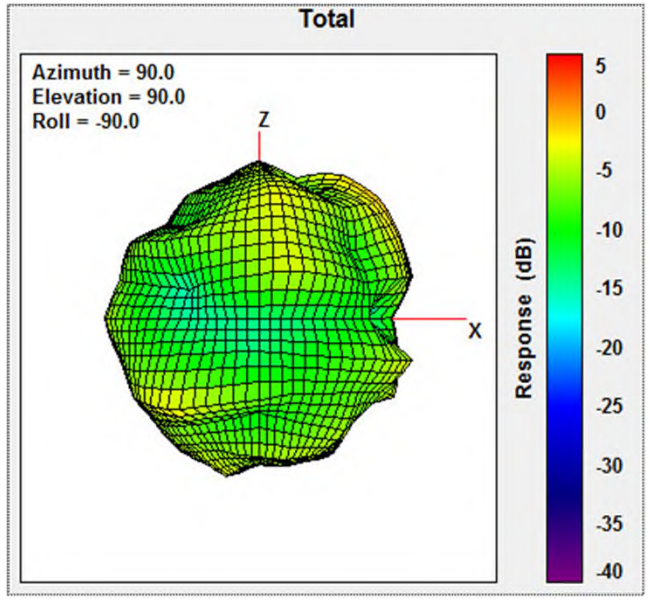
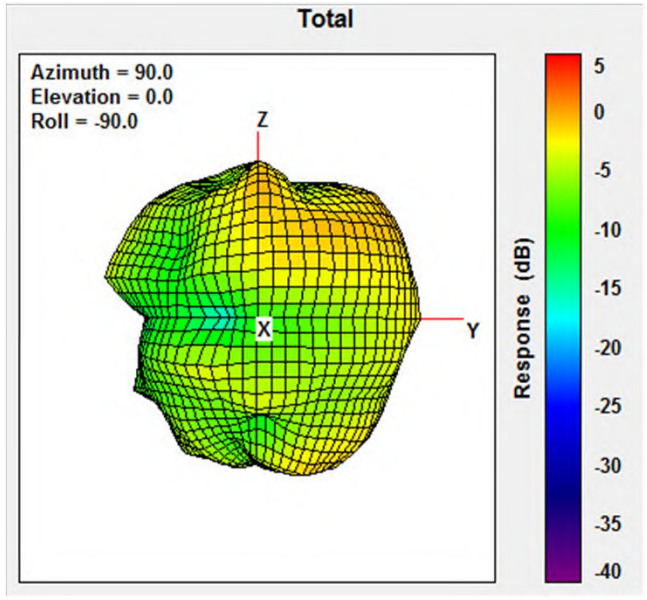
6.0 Radiation pattern(main)

5875 MHz







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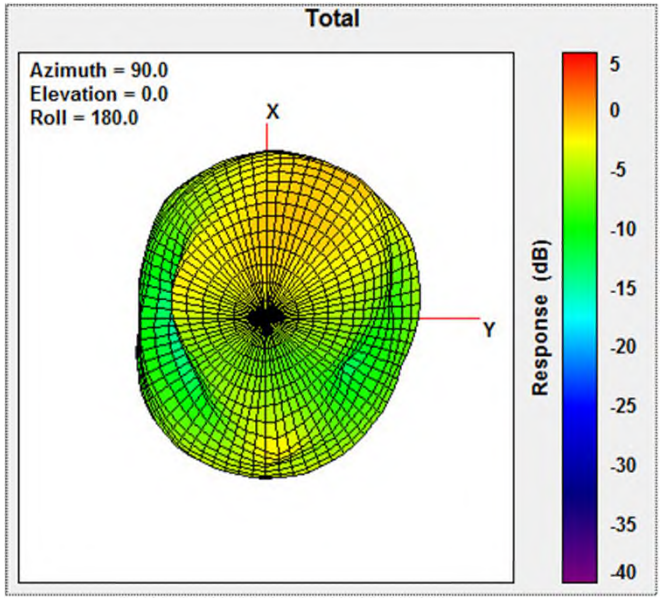
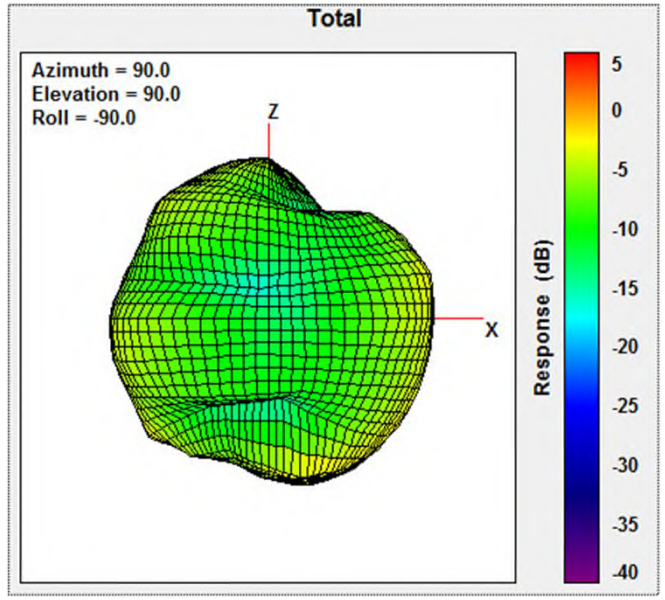
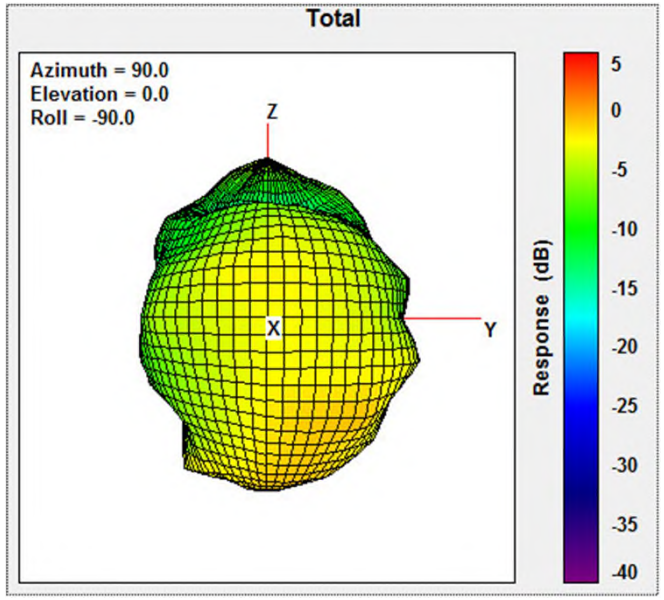
6.0 Radiation pattern(aux)

2400 MHz







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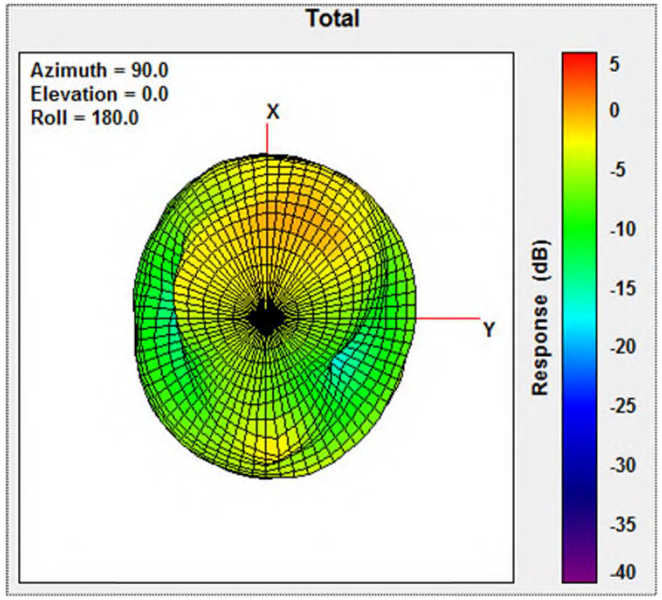
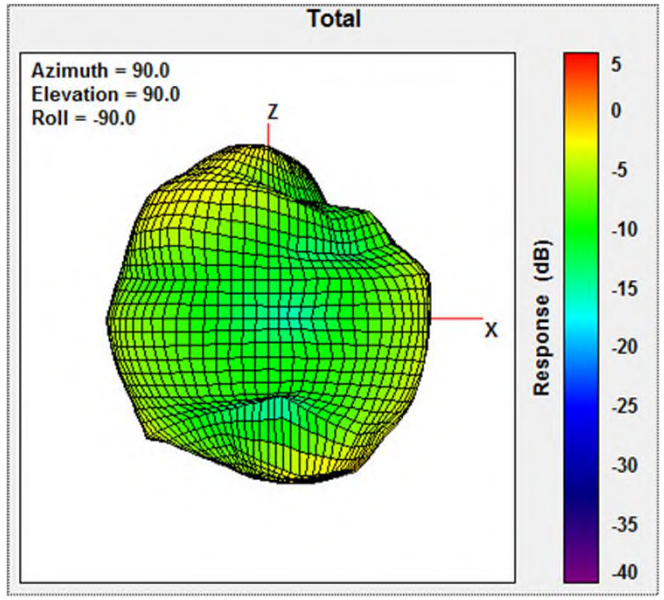
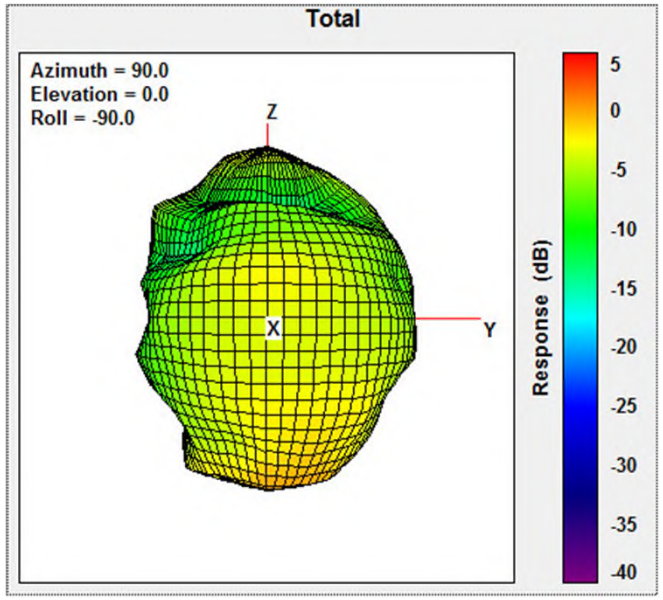
6.0 Radiation pattern(aux)

2450 MHz







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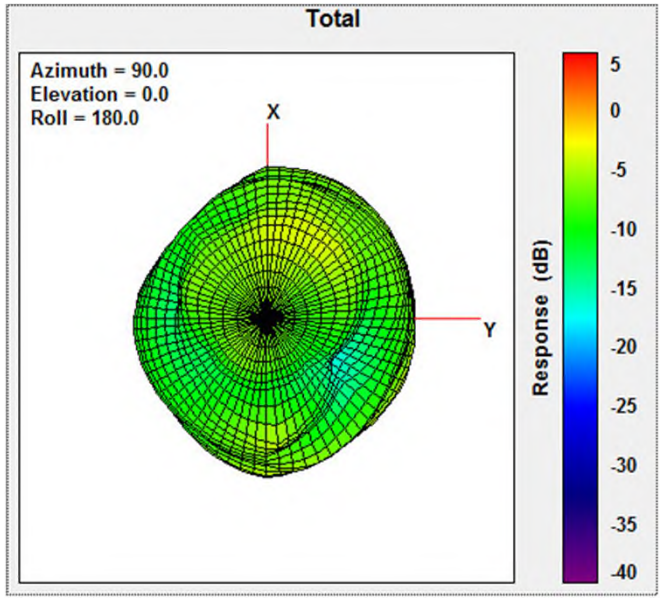
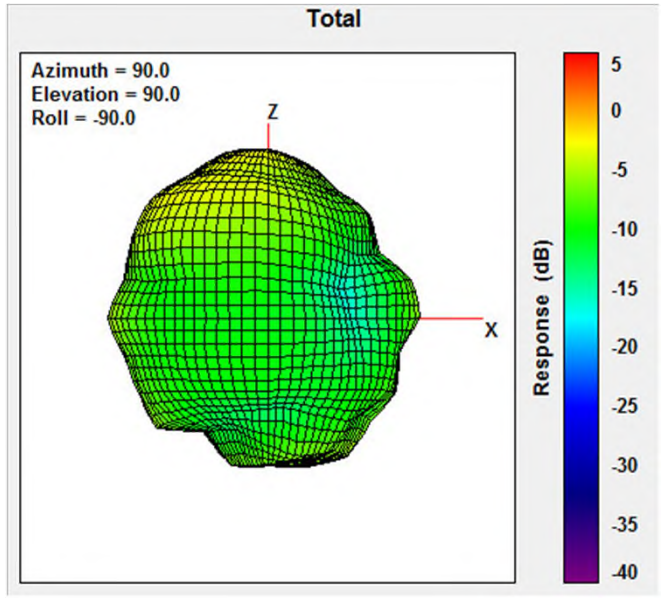
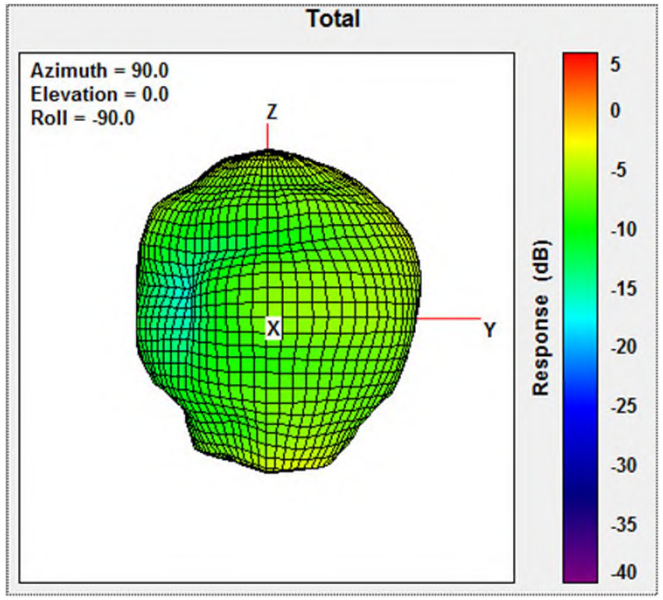
6.0 Radiation pattern(aux)

2500 MHz







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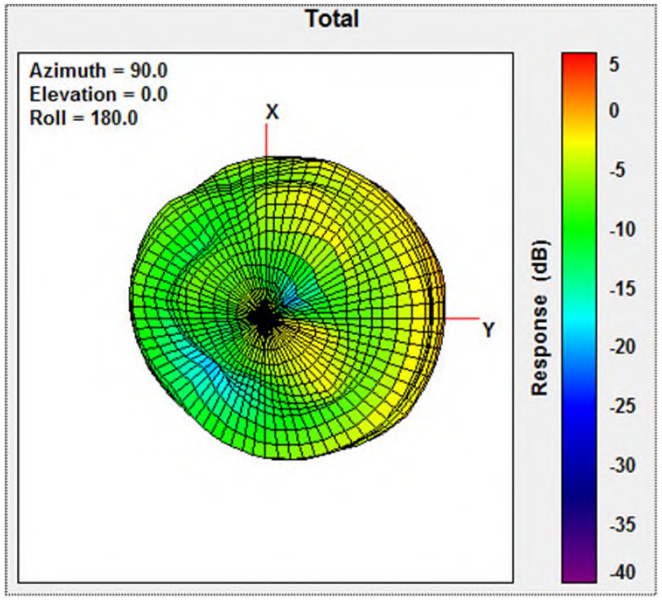
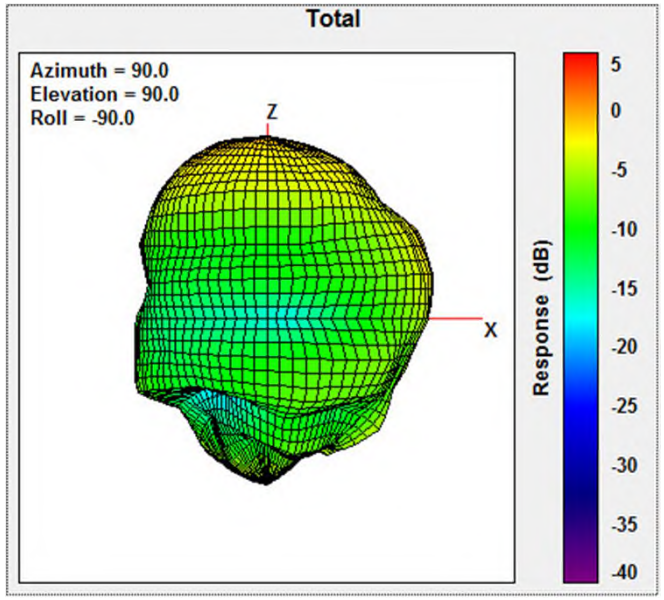
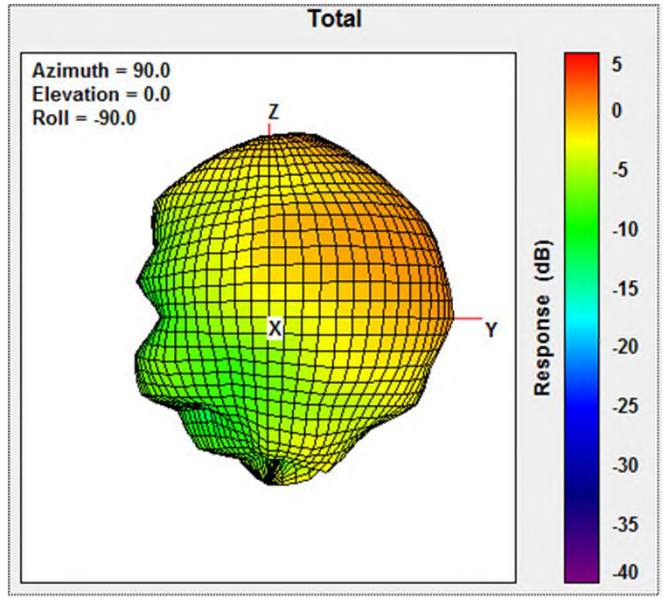
6.0 Radiation pattern(aux)

5150 MHz







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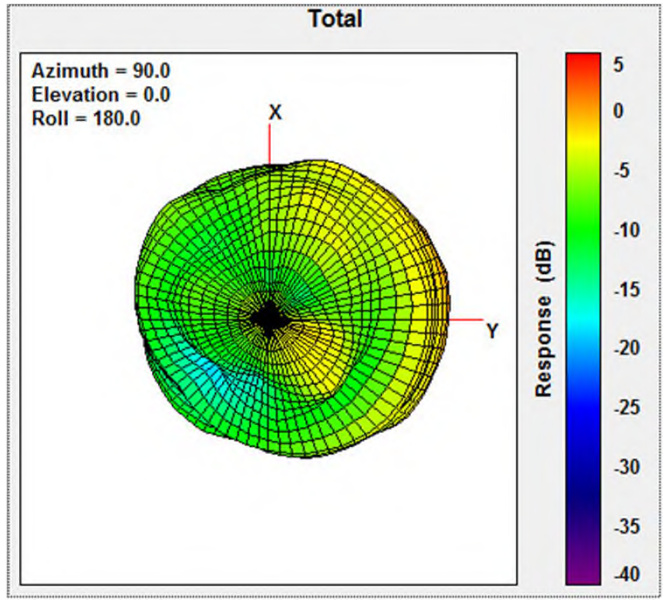
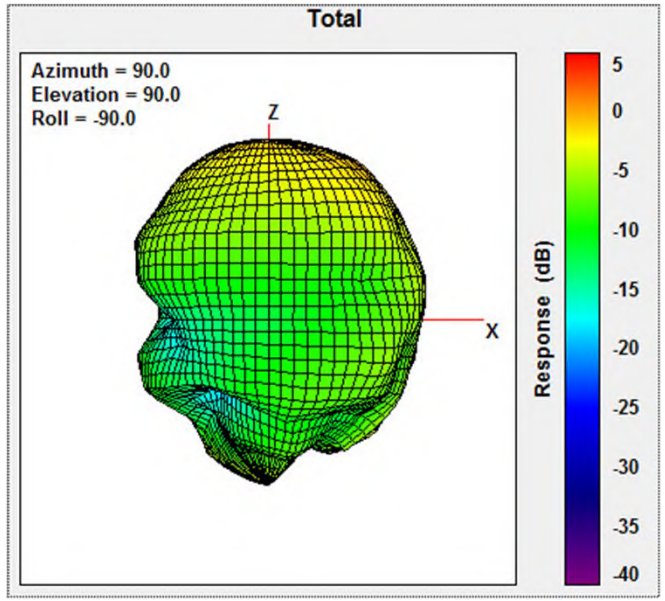
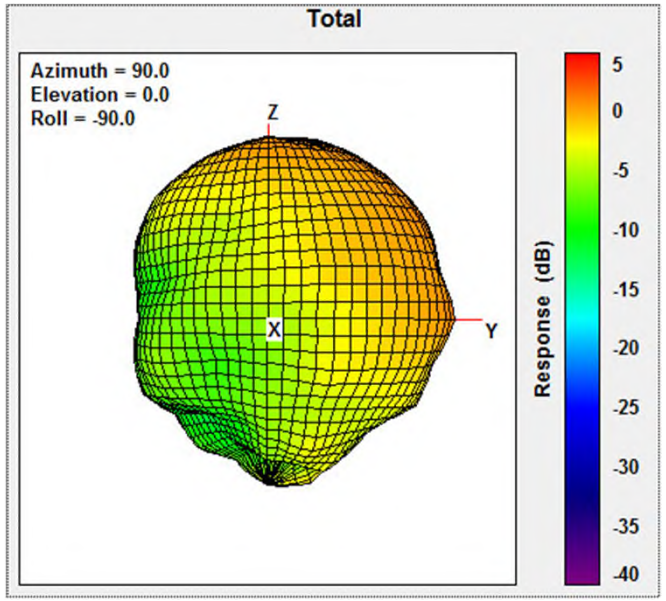
6.0 Radiation pattern(aux)

5250 MHz







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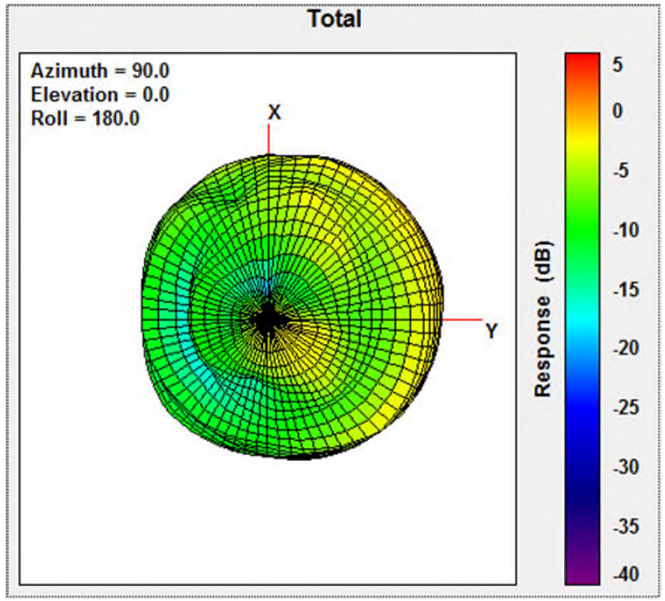
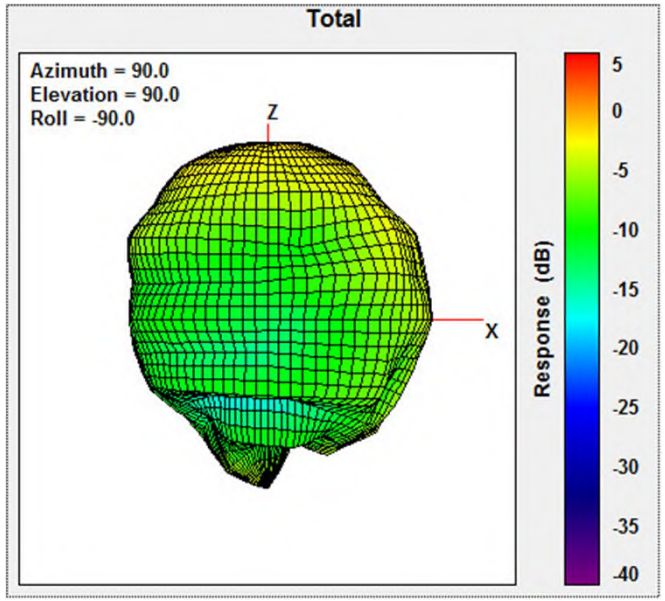
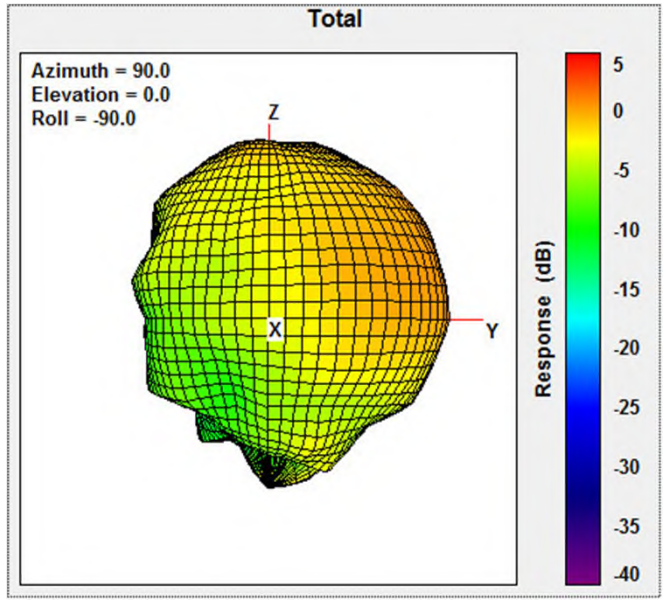
6.0 Radiation pattern(aux)

5350 MHz







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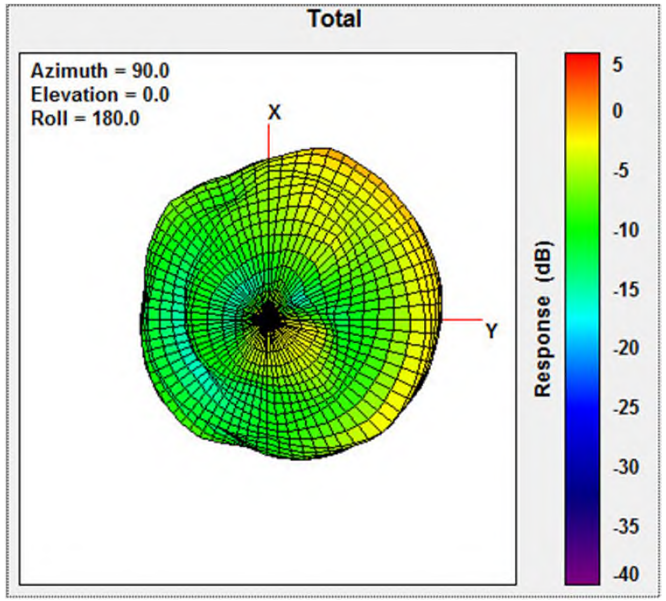
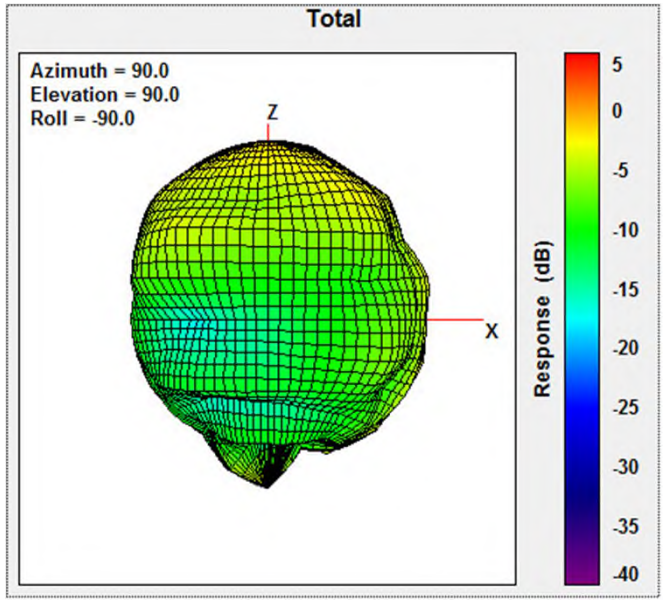
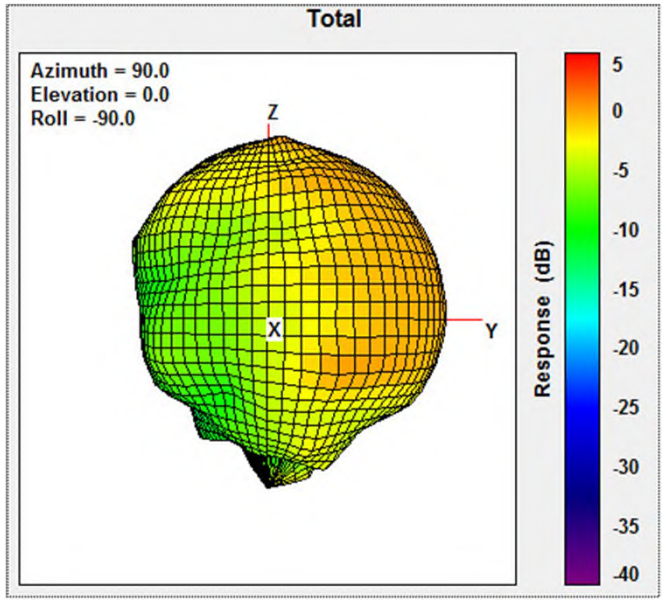
6.0 Radiation pattern(aux)

5470 MHz







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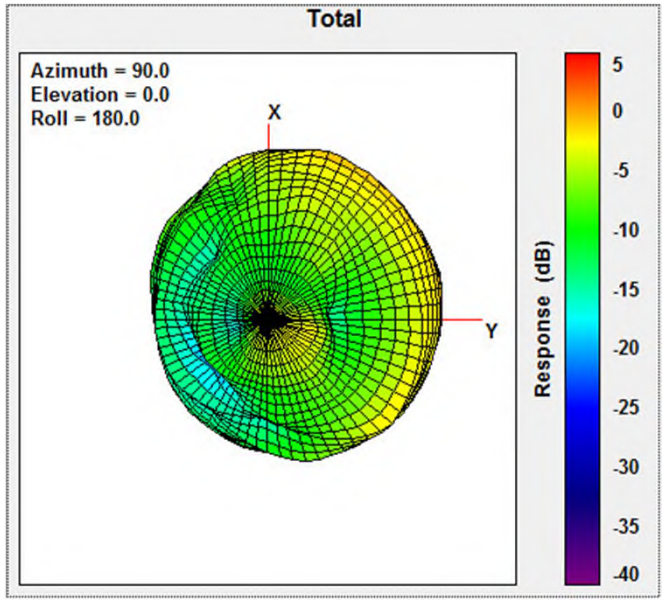
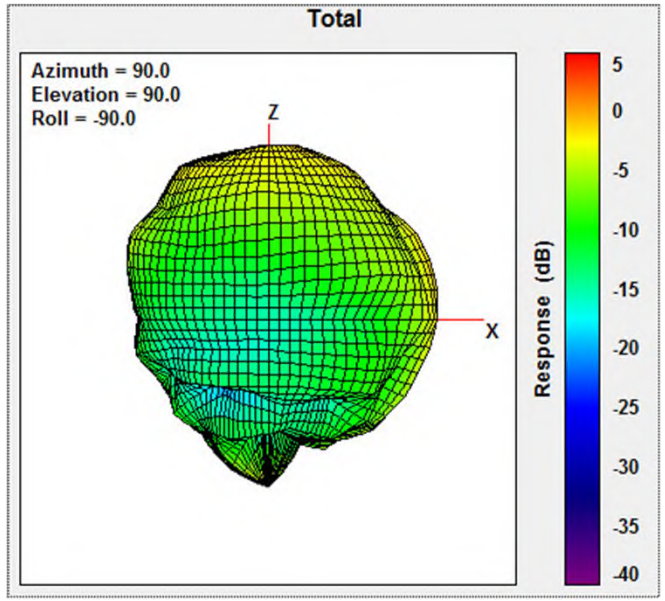
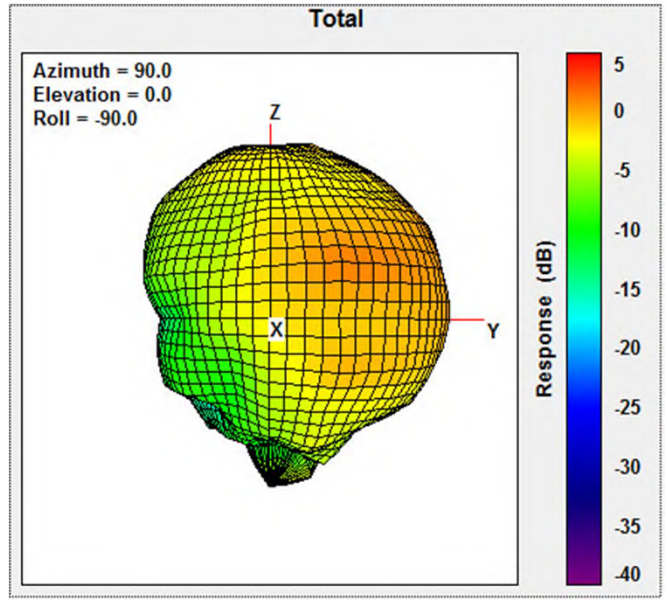
6.0 Radiation pattern(aux)

5600 MHz







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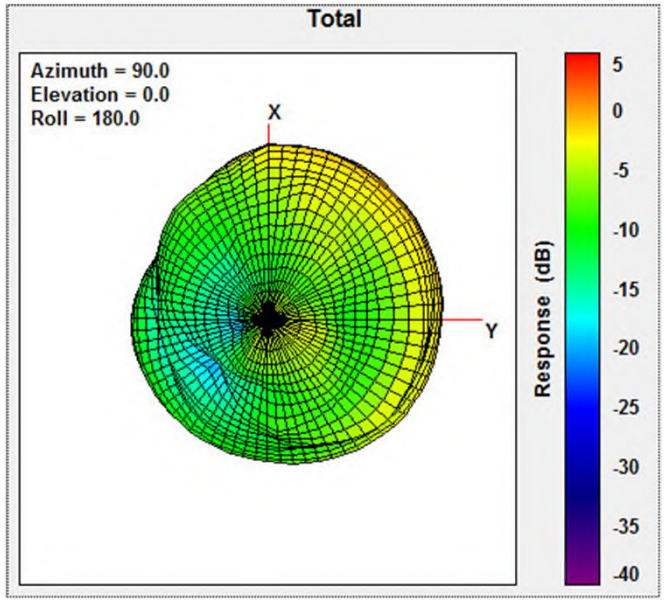
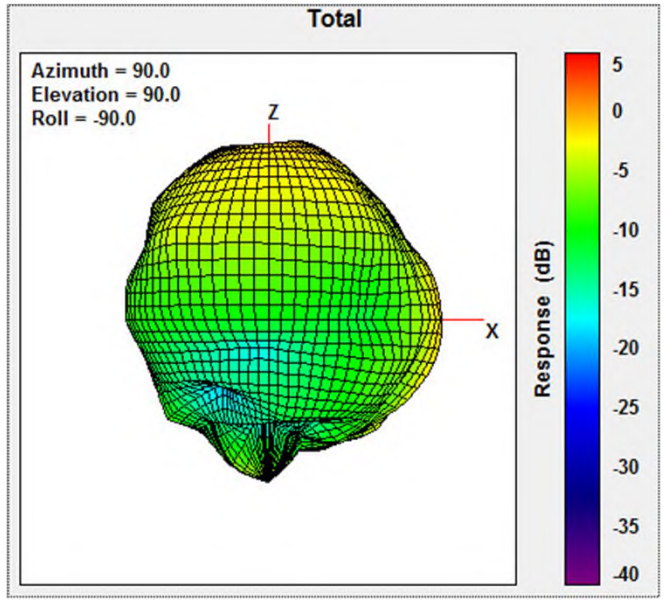
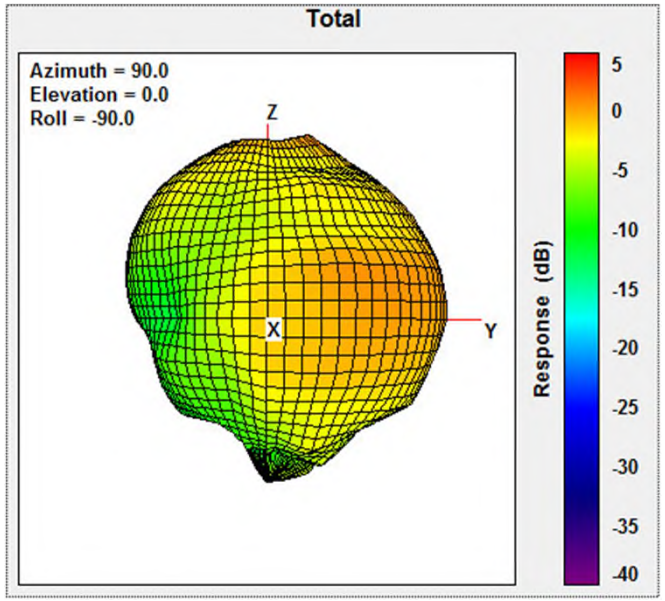
6.0 Radiation pattern(aux)

5725 MHz







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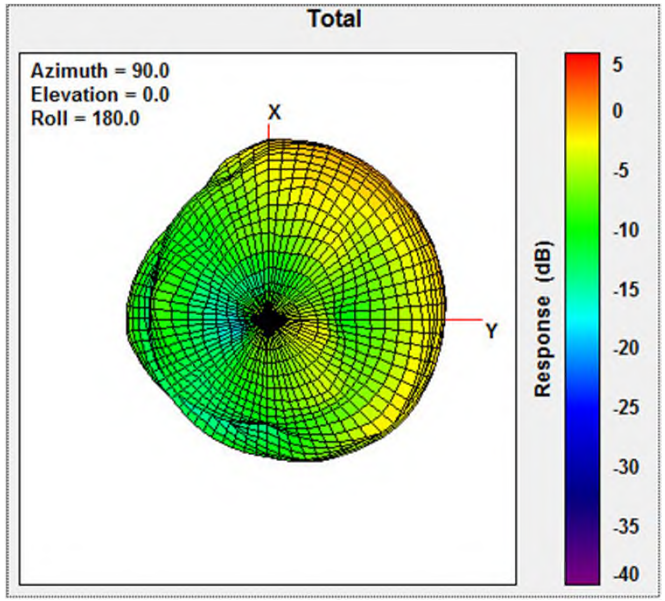
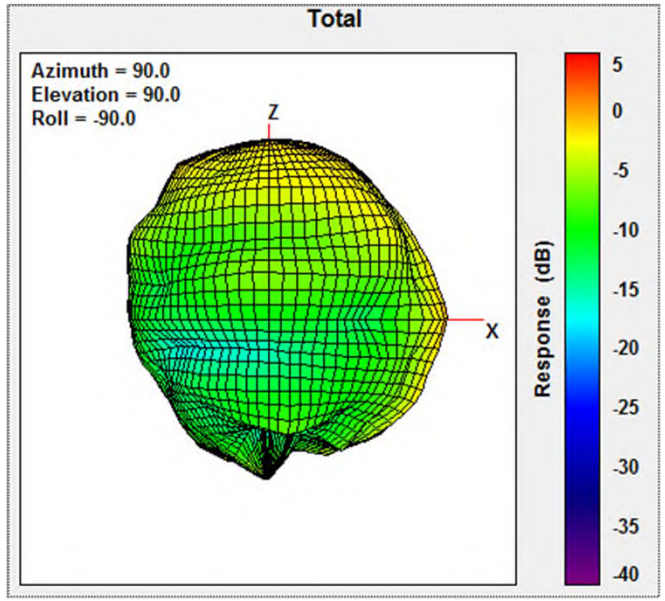
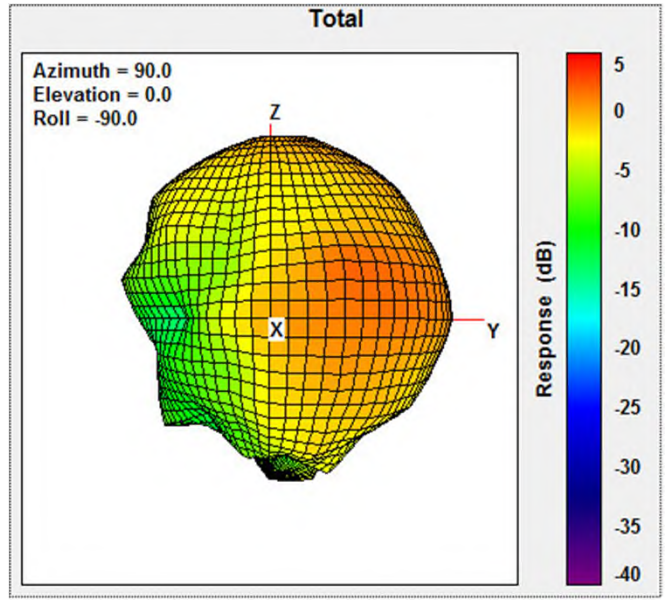
6.0 Radiation pattern(aux)

5785 MHz







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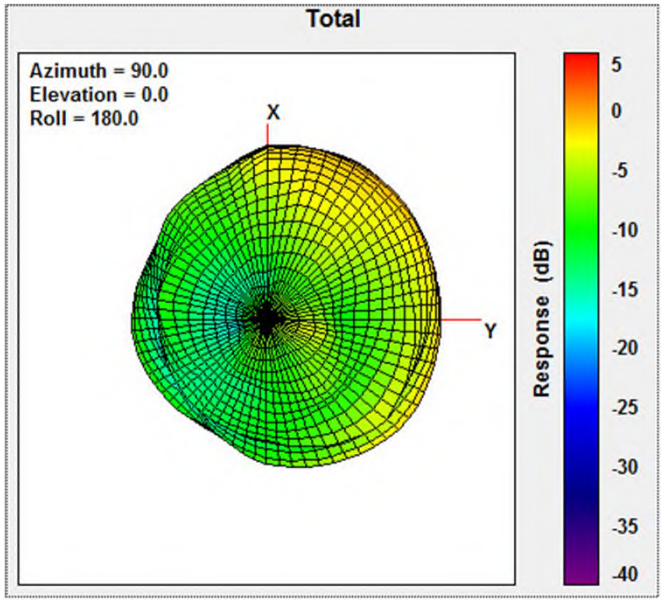
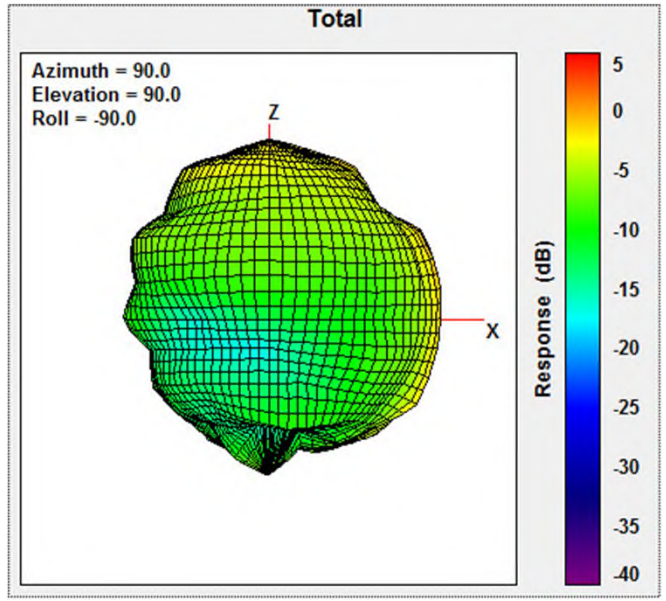
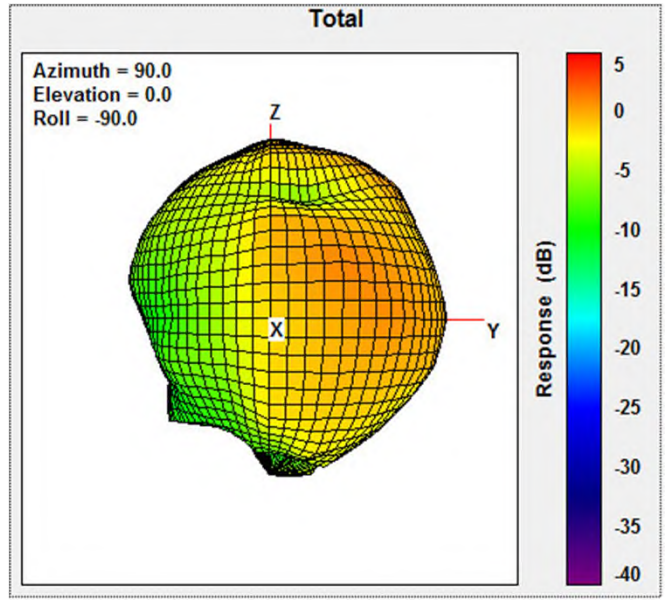
6.0 Radiation pattern(aux)

5875 MHz







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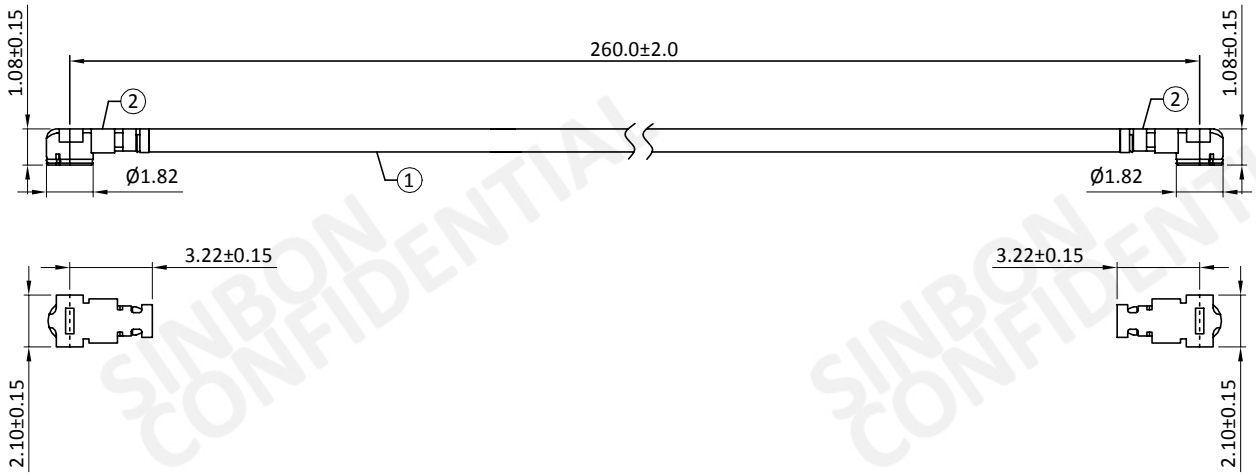
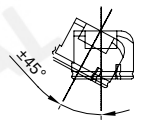
REV.	ECN NO.	DATE	BY	DESCRIPTION
01		Nov/12/2021	Zoey Zhang	RELEASED





TWO RELATIVE ANGLE
CONNECTOR REQUIREMENTS

NOTES:

1. TESTING SPEC.:
   FREQUENCY RANGE: DC TO 6 GHZ
   NOMINAL IMPEDANCE: 50 OHM
   TEMPERATURE RANGE: -40℃ TO +80℃
   THE TEST VOLTAGE: AC 200V
   INSULATION RESISTANCE: 5MOHM MIN
   CONDUCTION IMPEDANCE: 5Ω

ITEM	QTY	DESCRIPTION
2.	2	I-PEX 20535-001R-13
1.	A/R	COAXIAL CABLE,WHITE,OD=1.13

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AND IS TO BE RETURNED PROMPTLY UPON REQUEST BY SINBON ELECTRONICS CO., LTD.

CUSTOMER : AAEON

CUSTOMER P/N : N/A

REV. : NA

UNLESS OTHERWISE SPECIFIED TOLERANCE :
1 ~ 10 : ± 1
11 ~ 30 : ± 2
31 ~ 50 : ± 3
51 ~ 200 : ± 5
201 ~ 400 : ± 7
> 401 : ± 10
ANGLES : ± 1°

DRA. Nov/12/2021 Zoey Zhang
CHK. Nov/12/2021 Owen Zhang
APR. Nov/12/2021 Happy Zhang

SINBON Electronics Co., Ltd.

DESCRIPTION : I-PEX 4L 1.13 COAXIAL CABLE ASSEMBLY

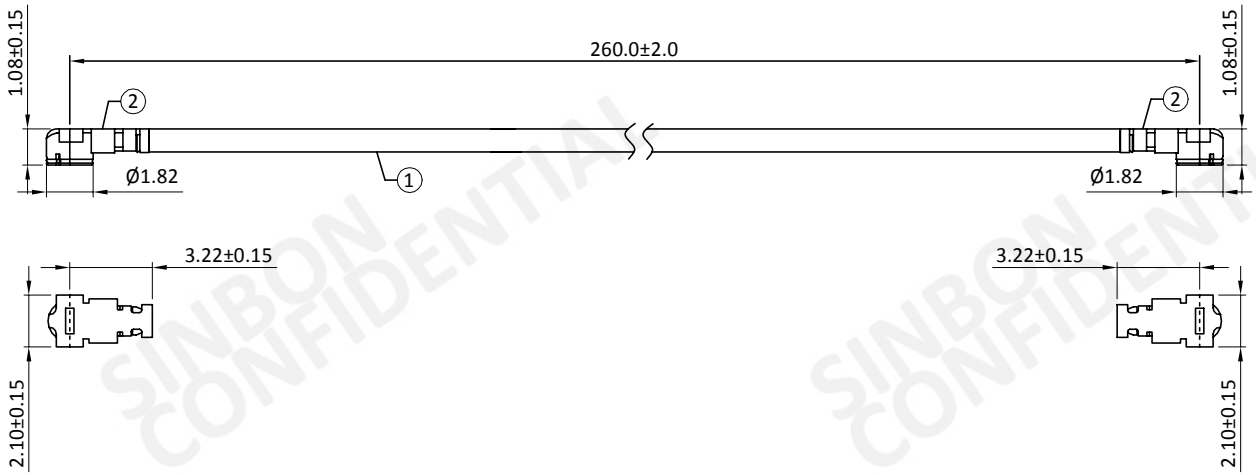
PART NUMBER : N/A

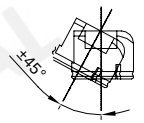
REV. : 01

SIZE A3 | UNIT mm | SCALE NONE | SHEET 1 of 1

GDP-D-071 A

REV.	ECN NO.	DATE	BY	DESCRIPTION
01		Nov/12/2021	Zoey Zhang	RELEASED





TWO RELATIVE ANGLE
CONNECTOR REQUIREMENTS

NOTES:

1. TESTING SPEC.:
   FREQUENCY RANGE: DC TO 6 GHZ
   NOMINAL IMPEDANCE: 50 OHM
   TEMPERATURE RANGE: -40℃ TO +80℃
   THE TEST VOLTAGE: AC 200V
   INSULATION RESISTANCE: 5MOHM MIN
   CONDUCTION IMPEDANCE: 5Ω

ITEM	QTY	DESCRIPTION
2.	2	I-PEX 20535-001R-13
1.	A/R	COAXIAL CABLE,BLACK,OD=1.13

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CUSTOMER : AAEON

CUSTOMER P/N : N/A

REV. : NA

SINBON Electronics Co., Ltd.

DESCRIPTION : I-PEX 4L 1.13 COAXIAL CABLE ASSEMBLY

PART NUMBER : N/A

REV. : 01

UNLESS OTHERWISE SPECIFIED TOLERANCE :
1 ~ 10 : ± 1
11 ~ 30 : ± 2
31 ~ 50 : ± 3
51 ~ 200 : ± 5
201 ~ 400 : ± 7
> 401 : ± 10
ANGLES : ± 1°

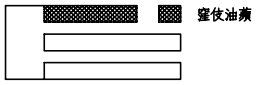
DRA. Nov/12/2021 Zoey Zhang
CHK. Nov/12/2021 Owen Zhang
APR. Nov/12/2021 Happy Zhang

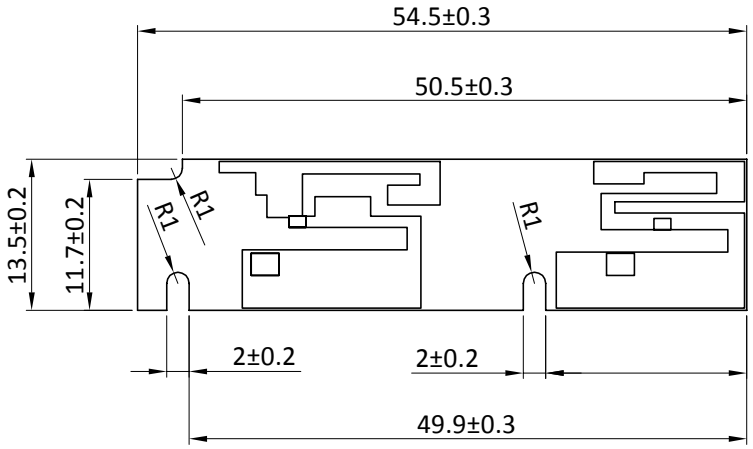
SIZE A3 | UNIT mm | SCALE NONE | SHEET 1 of 1

GDP-D-071 A

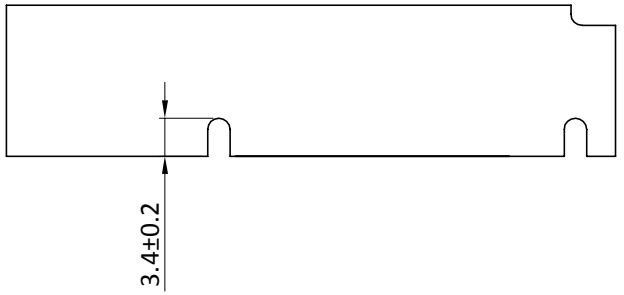
REV.	ECN NO.	DATE	BY	DESCRIPTION
01	N/A	May/22/2018	*Sean Chan*	RELEASED
02	N/A	Sep/07/2020	*Sean Chan*	RELEASED (PATTERN)
03	N/A	Nov/16/2020	*Sean Chan*	RELEASED (MIMO PATTERN FINE TURN)
04	N/A	May/04/2021	*Sean Chan*	UPDATED PATTERN
05	N/A	Sep/09/2021	*Sean Chan*	UPDATED PCB DIMENSION
06	N/A	Oct/27/2021	*Sean Chan*	UPDATED PCB DIMENSION
07	N/A	Nov/24/2021	*Sean Chan*	PATTERN FINE TURN

RoHS





(TOP SIDE)



(BOTTOM SIDE)

Note:
標准"CU"腔區域祥上窪伎油蘋

1. 桶酸處燴　　全酸葡蓋窪伎油蘋乙PAD區 OSP
2. 綠僅要求 −−− 1 oz CU / 0.6 mm FR−4
3. PCB加工用OSP工艺

PRELIMINARY

ITEM	QTY	DESCRIPTION
1.	1	PCB 54.5*13.5*0.6mm BLACK

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CUSTOMER : AAEON

CUSTOMER P/N : N/A　　REV. N/A

UNLESS OTHERWISE SPECIFIED TOLERANCE :
1 ~ 10 : ±0.2
11 ~ 30 : ±0.3
31 ~ 50 : ±0.5
51 ~ 200 : ±0.8
201 ~ 400 : ±1.2
> 401 : ±2.0
ANGLES : ±1°

DRA. Nov/24/2021 *Sean Chan*
CHK. Nov/24/2021 *Oscar Lin*
APR. Nov/24/2021 *Dio Chung*

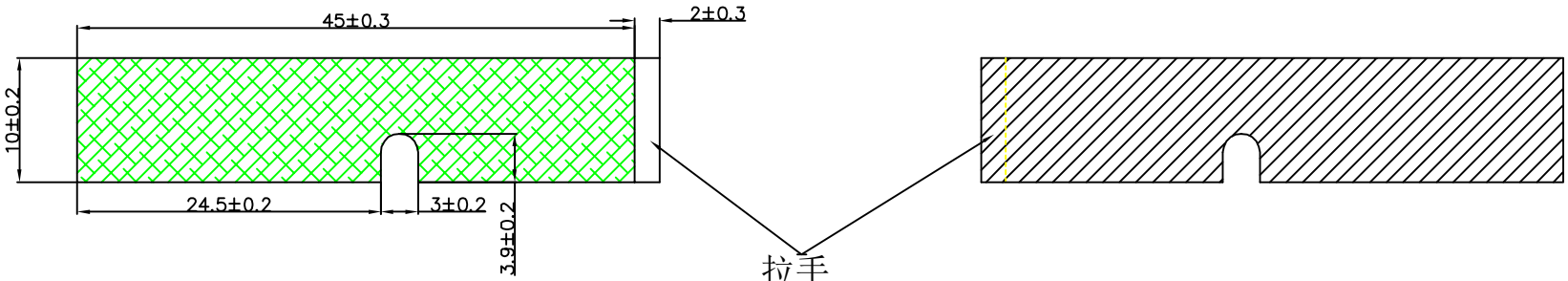
SINBON Electronics Co., Ltd.

DESCRIPTION : BT+WIFI MIMO PCB

PART NUMBER : N/A　　REV. 07

SIZE A3 | UNIT mm | SCALE NONE | SHEET 1 of 1

图号:HJ210771061
日期:2021/11/10



3m467胶面

3m467离型纸面

- GB/T1804 2000 未标注公差的线性和角度尺寸的公差
- M中等级精度尺寸分段/线性尺寸的极限偏差数值
- > 0.5-3±0.1
- >3-6±0.1
- >6-30±0.2
- >30-120±0.3
- >120-400±0.5
- >400-1000±0.8
- >1000-2000±1.2
- >2000-4000±2

苏州华捷电子有限公司

技术要求:
1. 材质：3M467,厚度：0.05mm。
2. 颜色：透明
3. 表面不可有毛边、脏污、破损、油垢等不良，
4. 产品符合RoHS要求；
5. 未注尺寸公差按GB/T 1804-2000 m级；

版本	审核	核准	制图
A00	向涛	江文保	姚杰

Ò g	FÖ
品 名	3M467
Ò g É'	
~ § É'	
?ô I	

图样比例

1:1

× ñM' A

1. 正面 ○
2. 胶面 ○
3. 侧面 ○

● OK ○ ON

Test Report

No. NGBML2200124301 Date: 27 Jan 2022

ZHEJIANG JUHUA CO,.LTD

JUHUA,KECHENG DISTRICT,QUZHOU CITY,ZHEJIANG PROVINCE,P.R.CHINA

The following sample(s) was/were submitted and identified on behalf of the clients as : FLUORINATED ETHYLENE-PROPYLENE COPOLYMER

SGS Job No. :	NBIN2201000866PC - NB
Client Ref. Information :	FJP-T1,FJP-T2,FJP-T3,FJP-810,FJP-820,FJP-830,FJP-610,FJP-620,FJP-630,FJP-640
Date of Sample Received :	21 Jan 2022
Testing Period :	21 Jan 2022 - 27 Jan 2022
Test Requested :	Selected test(s) as requested by client.
Test Method :	Please refer to next page(s).
Test Results :	Please refer to next page(s).
Conclusion :	Based on the performed tests on submitted sample(s), the results of Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBBs), Polybrominated diphenyl ethers (PBDEs) and Phthalates such as Bis(2-ethylhexyl) phthalate (DEHP) , Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP) , and Diisobutyl phthalate (DIBP) comply with the limits as set by RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.

Signed for and on behalf of
SGS-CSTC Standards Technical Services Co., Ltd. Ningbo Branch

Iris Xiao
Approved Signatory

scan to see the report
NGBML2200124301

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Test Results :

Test Part Description :

Specimen No.	SGS Sample ID	Description
SN1	NGB22-001243.001	TRANSPARENT SOLID GRAINS

Remarks :

(1) 1 mg/kg = 0.0001%
(2) MDL = Method Detection Limit
(3) ND = Not Detected (< MDL)
(4) "-" = Not Regulated

RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU

Test Method : With reference to IEC 62321-4:2013+AMD1:2017, IEC62321-5:2013, IEC62321-7-2:2017, IEC 62321-6:2015 and IEC62321-8:2017, analyzed by ICP-OES, UV-Vis and GC-MS.

Test Item(s)	Limit	Unit	MDL	*001*
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1000	mg/kg	2	ND
Mercury (Hg)	1000	mg/kg	2	ND
Hexavalent Chromium (Cr(VI))	1000	mg/kg	8	ND
Sum of PBBs	1000	mg/kg	-	ND
Monobromobiphenyl	-	mg/kg	5	ND
Dibromobiphenyl	-	mg/kg	5	ND
Tribromobiphenyl	-	mg/kg	5	ND
Tetrabromobiphenyl	-	mg/kg	5	ND
Pentabromobiphenyl	-	mg/kg	5	ND
Hexabromobiphenyl	-	mg/kg	5	ND
Heptabromobiphenyl	-	mg/kg	5	ND
Octabromobiphenyl	-	mg/kg	5	ND
Nonabromobiphenyl	-	mg/kg	5	ND
Decabromobiphenyl	-	mg/kg	5	ND
Sum of PBDEs	1000	mg/kg	-	ND
Monobromodiphenyl ether	-	mg/kg	5	ND
Dibromodiphenyl ether	-	mg/kg	5	ND
Tribromodiphenyl ether	-	mg/kg	5	ND
Tetrabromodiphenyl ether	-	mg/kg	5	ND
Pentabromodiphenyl ether	-	mg/kg	5	ND
Hexabromodiphenyl ether	-	mg/kg	5	ND

SGS-CSTC Standards Technical Services Co., Ltd. Ningbo Branch Chemical Laboratory 检验检测专用章 Inspection & Testing Services

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Test Item(s)	Limit	Unit	MDL	001
Heptabromodiphenyl ether	-	mg/kg	5	ND
Octabromodiphenyl ether	-	mg/kg	5	ND
Nonabromodiphenyl ether	-	mg/kg	5	ND
Decabromodiphenyl ether	-	mg/kg	5	ND
Di-butyl Phthalate (DBP)	1000	mg/kg	50	ND
Benzyl Butyl Phthalate (BBP)	1000	mg/kg	50	ND
Bis(2-ethylhexyl) Phthalate(DEHP)	1000	mg/kg	50	ND
Diisobutyl Phthalates (DIBP)	1000	mg/kg	50	ND

Notes :

(1) The maximum permissible limit is quoted from RoHS Directive (EU) 2015/863.
(2) IEC 62321 series is equivalent to EN 62321 series https://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101::::FSP_ORG_ID,FSP_LANG_ID:1258637,25.
(3) The restriction of DEHP, BBP, DBP and DIBP shall apply to medical devices, including in vitro medical devices, and monitoring and control instruments, including industrial monitoring and control instruments, from 22 July 2021.

Element(s)

Test Method : With reference to US EPA Method 3052:1996, analysis was performed by ICP-OES.

Test Item(s)	Unit	MDL	001
Red Phosphor (As P)	mg/kg	20	ND

Notes :

These tests are not accredited by CNAS.

Halogen

Test Method : With reference to EN 14582: 2016 , analysis was performed by IC.

Test Item(s)	Unit	MDL	001
Fluorine (F)	mg/kg	50	>100000
Chlorine (Cl)	mg/kg	200	ND
Bromine (Br)	mg/kg	50	ND
Iodine (I)	mg/kg	50	ND

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Tetrabromobisphenol A (TBBP-A)

Test Method : With reference to US EPA 3540C: 1996, analysis was performed by GC-MS.

Test Item(s)	Unit	MDL	*001*
Tetrabromobisphenol A (TBBP-A)	mg/kg	10	ND

Polycyclic aromatic hydrocarbons (PAHs)

Test Method : With reference to AfPS GS 2019:01 PAK, analysis was performed by GC-MS.

Test Item(s)	Unit	MDL	001
Naphthalene(NAP)	mg/kg	0.1	ND
Phenanthrene(PHE)	mg/kg	0.1	ND
Anthracene(ANT)	mg/kg	0.1	ND
Fluoranthene(FLT)	mg/kg	0.1	ND
Pyrene(PYR)	mg/kg	0.1	ND
Benzo(a)anthracene(BaA)	mg/kg	0.1	ND
Chrysene(CHR)	mg/kg	0.1	ND
Benzo(b)fluoranthene(BbF)	mg/kg	0.1	ND
Benzo(j)fluoranthene(BjF)	mg/kg	0.1	ND
Benzo(k)fluoranthene(BkF)	mg/kg	0.1	ND
Benzo(a)pyrene(BaP)	mg/kg	0.1	ND
Benzo(e)pyrene(BeP)	mg/kg	0.1	ND
Indeno(1,2,3-c,d)pyrene(IPY)	mg/kg	0.1	ND
Dibenzo(a,h)anthracene(DBA)	mg/kg	0.1	ND
Benzo(g,h,i)perylene(BPE)	mg/kg	0.1	ND
Sum of Phenanthrene, Pyrene, Anthracene, Fluoranthene	mg/kg	-	ND
Sum of 15 PAHs	mg/kg	-	ND

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