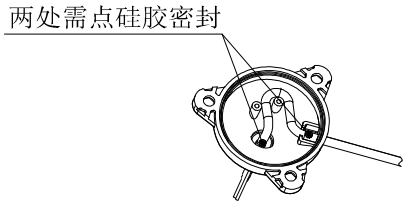
1. Antenna Specification/天线标准

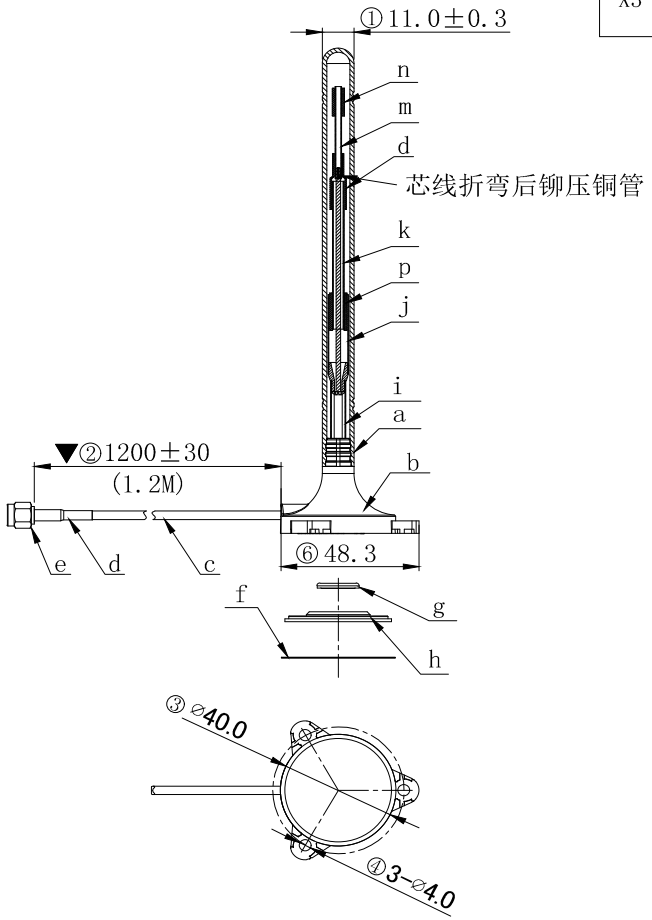
Antenna Specification/天线技术参数		
Electrical Specification/电气特性		
Item/目录	**Specification/规格**	**Comment/备注**
Freq. Range/频段范围	700 MHz -960 MHz 1710 MHz -2690 MHz	
Impedance/阻抗	50 (Ω)	
VSWR/驻波比	700 MHz -960 MHz≤3.0 1710 MHz -2690 MHz≤3.0	
Directional/辐射方向	Omni directional	
Polarization/极化形式	Vertical	
Peak Gain/峰值增益	7.13(dBi)	
Average Gain/平均增益	4.59(dBi)	
Test condition/测试条件	passive test（无源测试）	
Total Efficiency/无源效率	700 MHz -960 MHz＞47% 1710 MHz -2690 MHz＞43%	
Mechanical Specification/机械指标		
Antenna type/天线类型	吸盘天线	
Connector Type/连接器类型	SMA-J	
RF Cable Type/射频线型号	S-1.5DS	
Connector Pull Test/连接器拉力	≥3.0Kgf	
Salt Spray/盐雾测试	72 (H)	
Environmental Specification /环境指标		
Operating temp/工作温度	-40℃～+80℃	
Storage temp/存储温度	-40℃～+85℃	

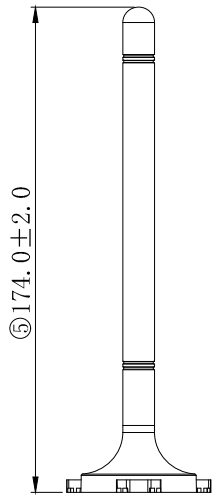
2. Antenna Picture/天线图片

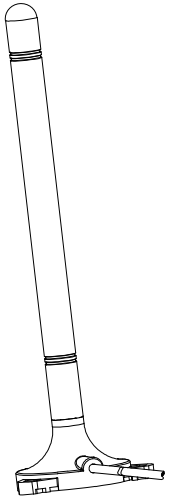
REV.	ECN NUMBER	DESCRIPTION	DATE	DRAWN	CHECKED	APPROVED
X1	ECN202487	初版发行	09/18'20	王卫杰	丁第斌	张英杰
X2	ECN202487	X2 *1依客户要求增加螺丝	10/16'20	王卫杰	丁第斌	张英杰
X3	ECN202487	X3 *1 更改线材供应商：由住友更改为艾力升	10/23'20	王卫杰	丁第斌	张英杰



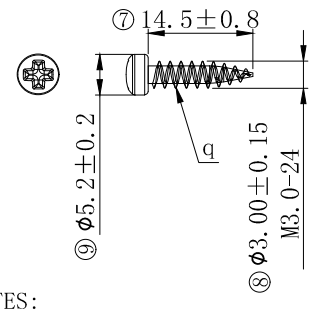
底座内部绕线图







螺丝：

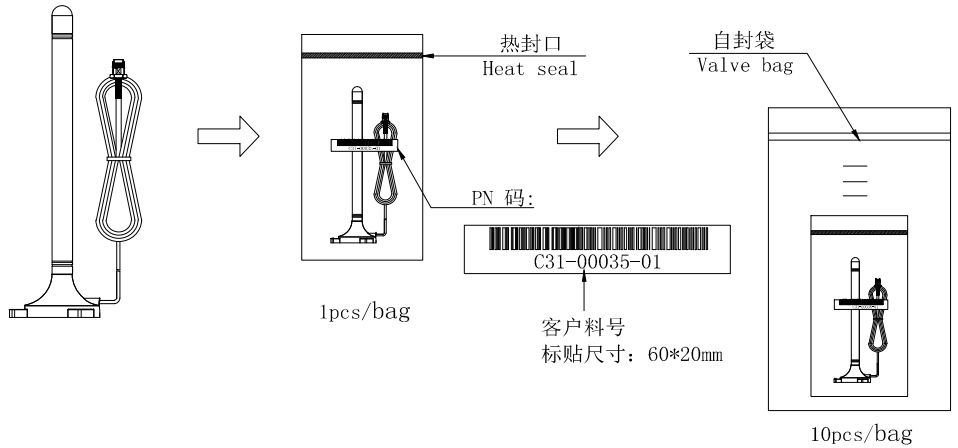


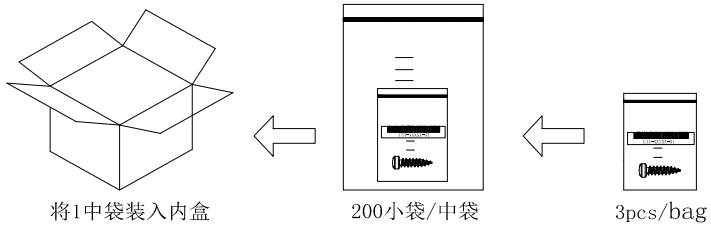
	ITEM	PART NAME	Q'TY	MATERIAL / FINISH
X2	q	螺丝	3	十字自攻螺丝，BA3.0*14.5，碳钢，镀环彩
	p	防震棉	1	防震棉，14*34.5mm,T=1.0mm，EVA,黑色
	n	防震棉	1	防震棉，20*10mm,T=1.0mm，EVA,黑色
	m	振子	1	振子管，OD2.2*33mm,黄铜
	k	振子	1	振子管，OD4.0*53mm,黄铜
	j	振子	1	振子管，OD7.0*34.8mm,黄铜
	i	振子	1	振子管，OD5.2*20.6mm,黄铜
	h	底盖	1	吸盘天线 底盖 OD37*3.6mm PC+PBT 黑色
	g	磁铁	1	吸盘天线-磁铁OD14.5*1.9mm,强磁
	f	贴纸	1	贴纸，OD39.5mm，T=0.3mm,PVC,黑色
	e	连接器	1	SMA-J(公头公针)，黄铜镀镍,过72H盐雾
	d	热缩管	2	黑色PE料,外径Φ3.5MM,L=20mm
X3	c	cable	1	1.5DS-QFB-FOAM PE 同轴线，黑色PVC外被 OD：3.0mm
	b	底座	1	吸盘天线-底座 OD56*32mm PC+PBT 黑色
	a	杆套	1	杆套 OD11*150mm TPEE 黑色

NOTES:
1. 材质：详见右下角标记.
2. 未标尺寸以此电子档实测为准.
3. 标有“ ▼ ”为QC重点检测尺寸.
4. 频率范围：700-960/1710-2690 MHz；
   驻 波 比：3.0 Max @ 700-960/1710-2690 MHz
   测试仪器：矢量网络分析仪；
5. 有害物质须符合ECT《QE-Q-19-001环境有害物质管理基准》管控标准。
   线材为PVC外被，不做卤素管控。

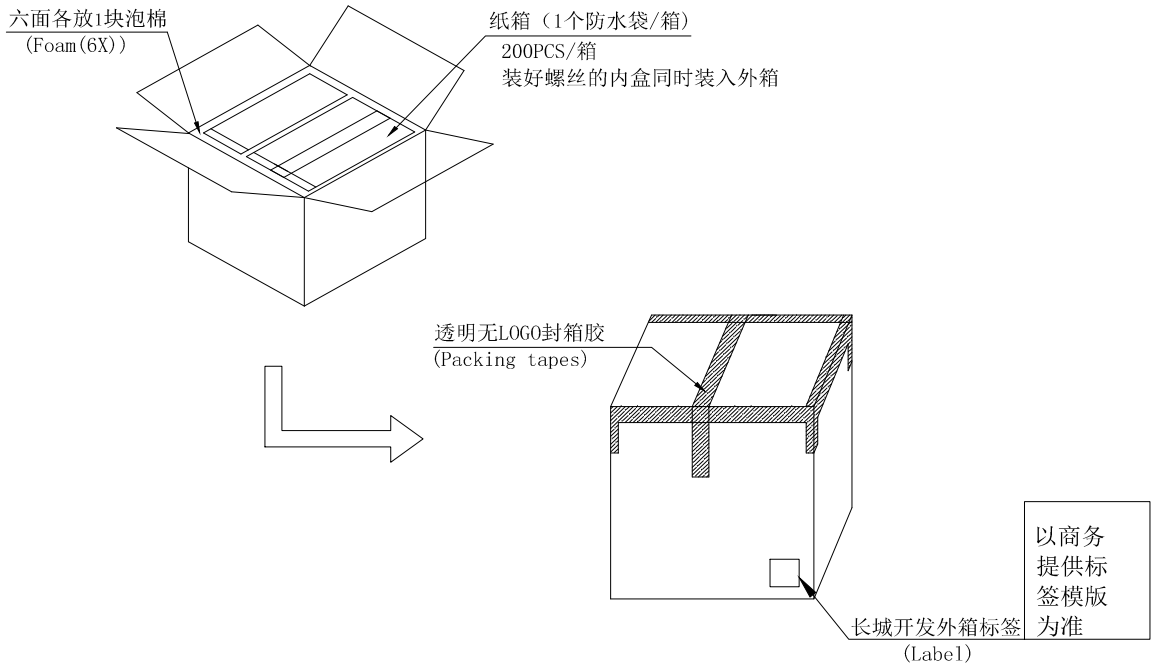
ELECTRIC CONNECTOR TECHNOLOGY	GENERAL TOLERANCE: .X± 0.30, XX.± 2°, .XX± 0.10, X.± 1°	SCALE: 1:1	DRAWN: 王卫杰	DATE: 10/23'20	DWG.NO: 600-U549-01	TITLE: ANT_EX_4G_S-1.5_1.2M TO SMA-J_CAMEL01DCU 成品图
		UNIT: mm	CHECK:	DATE:	PARTS NO.(INTENDED USE): 81800U549	REV. X3
		SIZE: A4	APPROVE:	DATE:		SHEET: 1/1

REV.	ECN NUMBER	DESCRIPTION	DATE	DRAWN	CHECKED	APPROVED
X1	ECN202487	FIRST RELEASE	09/18'20	丁第斌	张英杰	牛宝星
X2	ECN202487	依客户要求增加螺丝	10/16'20	丁第斌	张英杰	牛宝星





NOTES:
1. 包装时产品轻拿轻放,避免产品变形.
2. 整盘包装好后,检查是否有漏装,产品的放置方向是否正确.
3. 检查是否有产品被压死,检查整摞层数是否正确.
4. 若有未装满之零数箱,须以缓冲材塞满.
5. 整箱封好后,检查标签是否贴好,干净,字迹清晰,标签内容是否正确,完善.
6. 纸箱:内尺寸540*410*280mm,七层纸,K三K,加强芯,含ECT LOGO.



包装材料			产品包装数量				产品包装重量(kg)		
项目	料号	数量	Pcs/小袋	Pcs/中袋	中袋/箱	PCS/箱	单重	净重	总重
纸箱	604010073	1	1	10	20	200			
PE袋	604020039	200							
PE袋	604020037	20							
PE袋	840000520	200	包装螺丝						
PE袋	840000511	1							
内盒	840000614	1							
防水袋	604020010	1							
上带									
纸板									
作业标签									
珍珠绵									
透明胶带									

ELECTRIC CONNECTOR TECHNOLOGY

GENERAL TOLERANCE	
XX. ± 0.25	XX. ° ± 2°
X. ± 0.20	X. ° ± 1°
.X± 0.13	.X° ± 0.5°
.XX± 0.05	

SCALE: 1:1
UNIT: mm
SIZE: A4

DRAWN: 丁第斌 DATE: 10/16'20
CHECK: DATE:
APPROVE: DATE:

DWG.NO: 551-U549-01
PARTS NO.(INTENDED USE): 81800U549

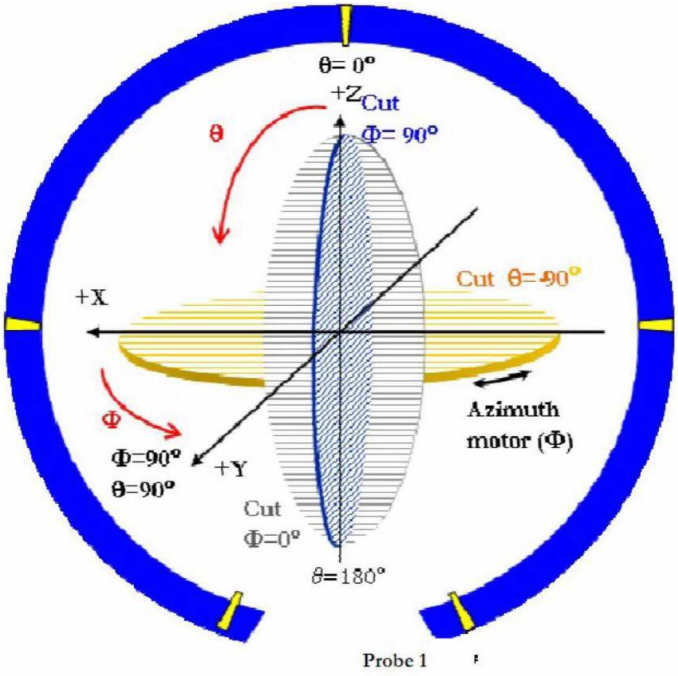
TITLE: ANT_EX_4G_S-1.5_1.2M TO SMA-J_CAMEL01DCU 包规图

REV. X2
SHEET: 1/1

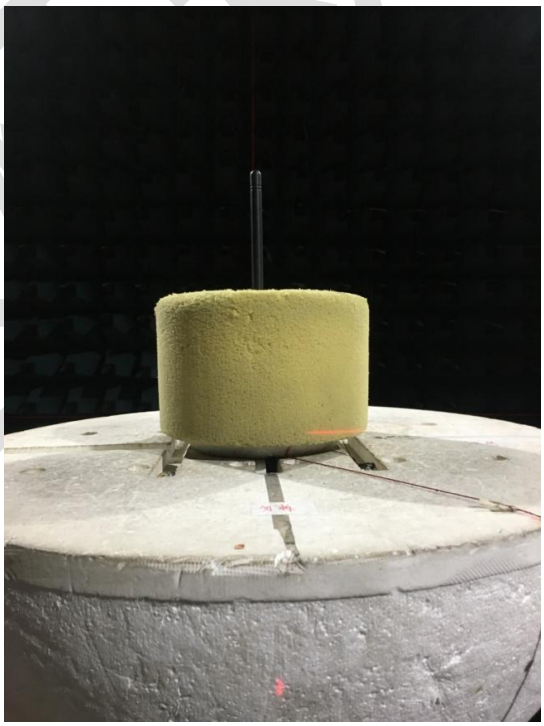
5. Antenna test result/测试结果

5.1The gain and total efficiency test/增益和效率测试

5.1.1 The definition of coordinate system/坐标系定义-Satimo SG24



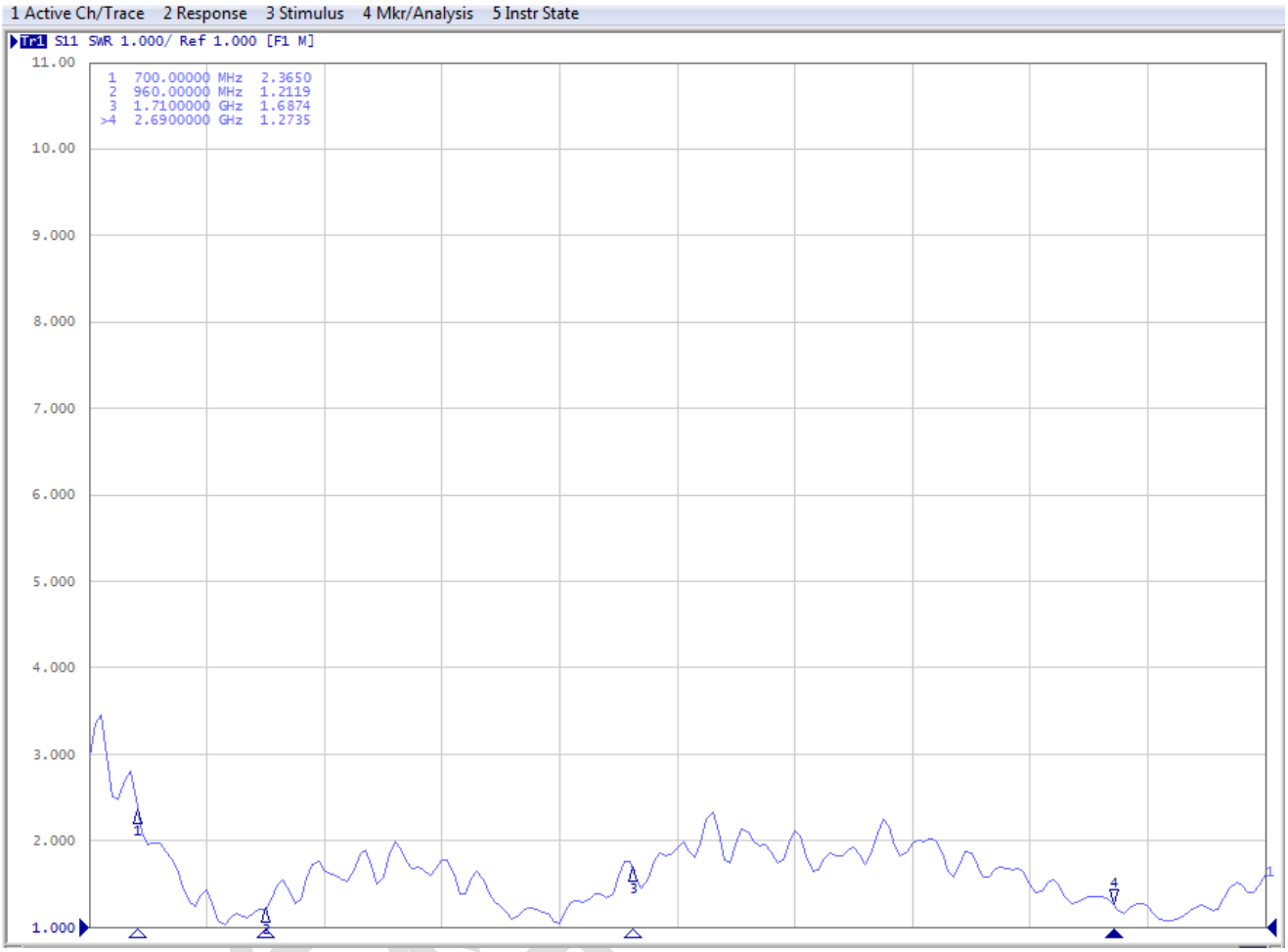
The coordinate system of Chamber/暗室坐标系



The production test position/天线测试放置位置

5.2Antenna test result/测试结果

5.2.1Return loss/Smith chart/VSWR/回波损耗/史密斯图/驻波比



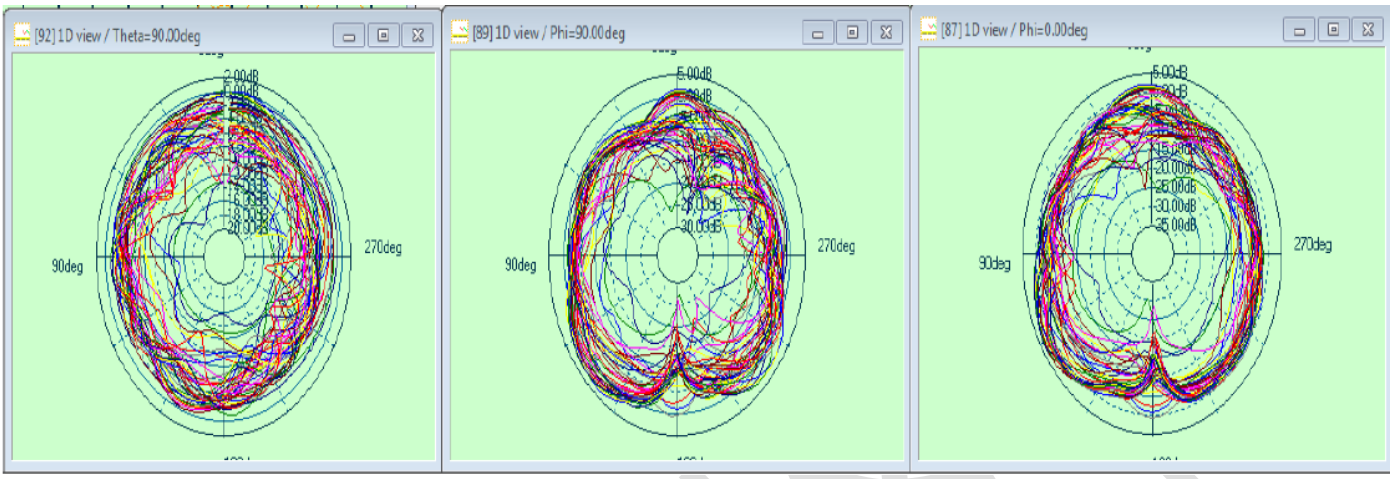
5.2.2 The test result of total efficiency and total gain/天线效率及增益测试结果

700-960MHz/1710-2690MHz

Frequency	Efficiency	Gain(dB)	Frequency	Efficiency	Gain(dB)
700MHz	48%	2.60	1910MHz	55%	5.65
710MHz	47%	2.34	1930MHz	51%	5.37
720MHz	54%	2.77	1950MHz	46%	4.93
730MHz	64%	3.47	1970MHz	50%	5.08
740MHz	72%	4.01	1990MHz	54%	5.44
750MHz	72%	3.84	2010MHz	54%	6.26
760MHz	64%	3.13	2030MHz	50%	5.97
770MHz	67%	3.13	2050MHz	48%	5.68
780MHz	68%	3.58	2070MHz	52%	6.37
790MHz	65%	3.77	2090MHz	59%	6.98
800MHz	58%	3.72	2110MHz	57%	7.13
810MHz	58%	4.01	2130MHz	49%	6.23
820MHz	62%	4.58	2150MHz	48%	6.45
830MHz	64%	5.03	2170MHz	51%	6.58
840MHz	61%	5.01	2300MHz	45%	5.29
850MHz	58%	4.85	2310MHz	45%	5.40
860MHz	57%	4.63	2320MHz	45%	5.12
870MHz	61%	4.78	2330MHz	44%	5.10
880MHz	68%	5.12	2340MHz	47%	5.47
890MHz	71%	5.23	2350MHz	49%	5.91
900MHz	73%	5.39	2360MHz	49%	6.12
910MHz	68%	4.91	2370MHz	49%	6.14
920MHz	63%	4.28	2380MHz	48%	6.02
930MHz	61%	3.76	2390MHz	46%	5.76
940MHz	60%	3.37	2400MHz	46%	5.80
950MHz	67%	3.68	2500MHz	46%	4.29
960MHz	70%	3.89	2520MHz	47%	4.23
1710MHz	53%	2.92	2540MHz	48%	4.03
1730MHz	59%	3.23	2560MHz	46%	3.96
1750MHz	58%	3.47	2580MHz	46%	3.96
1770MHz	49%	3.06	2600MHz	45%	3.76
1790MHz	46%	2.92	2620MHz	46%	4.13
1810MHz	52%	3.79	2640MHz	45%	3.89
1830MHz	54%	4.34	2660MHz	44%	3.73
1850MHz	45%	3.87	2680MHz	45%	3.85
1870MHz	43%	4.14	2700MHz	44%	3.30
1890MHz	49%	5.08			

5.2.3The antenna radiation pattern(2D)/天线辐射方向图（2D）

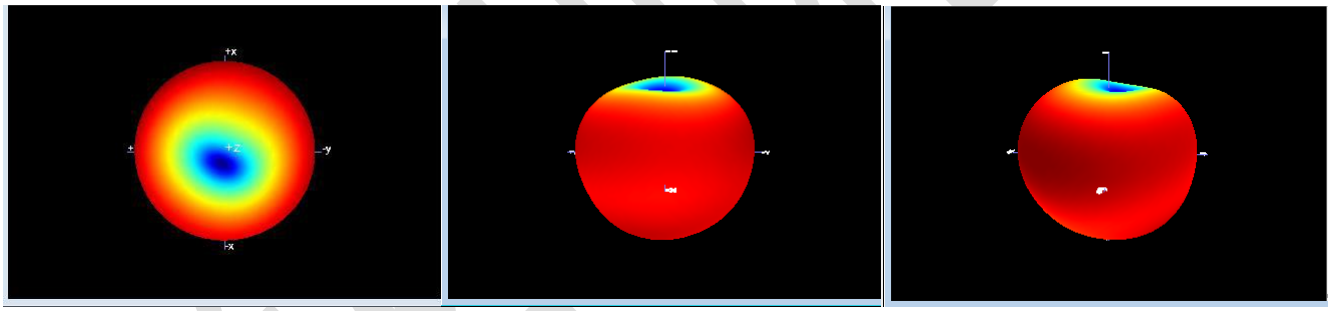
700-960MHz/1710-2690MHz



XOY **YOZ** **XOZ**

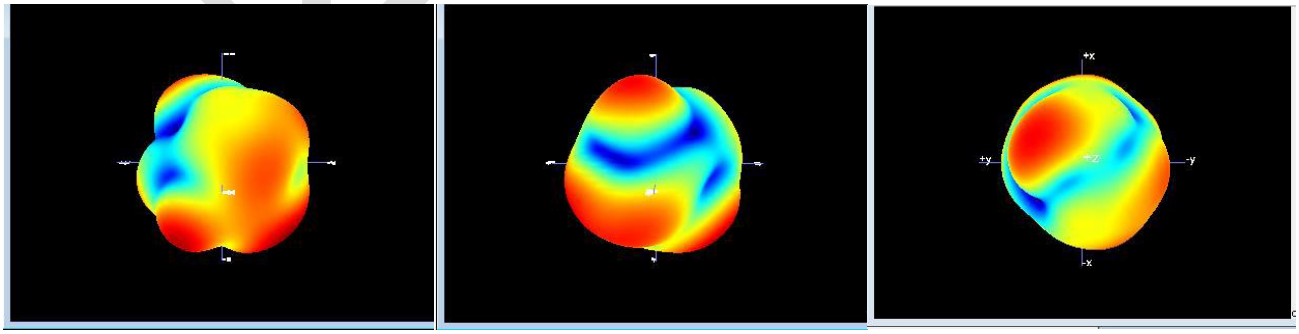
5.2.4The antenna radiation pattern(3D)/天线辐射方向图（3D）

Frequency/频点 960MHz



XOY YOZ XOZ

Frequency/频点 1710MHz



XOY YOZ XOZ

6. Reliability Test / 可靠性测试

Test Items		Test Condition and Procedure	Requirements
1	Vibration	Amplitude:0.76mm Freq:10 to 55Hz 2 hours for each direction	1.No Visual Damage 2.Frequency Tol.≤5%
2	Random Drop	Height:1.2m; 3 directions; 1 time for each direction	1.No parts separated 2.Frequency Tol.≤5%
3	Terminal-Pull Test	Holding with individual specification; force applied To axis of terminal	1.Directive DUT specification 2.Frequency Tol.≤5%
4	Salt Spray	Temp:35°C; RH:≥ 85%; NaCl solution:≥ 5%; Time:72hours	After 2 Hours Recovery 1.No Visual Damage 2.Frequency Tol.≤5%
5	Thermal Shock	Cycle:-40°C±2°C(1 hours) to +85°C±2°C (1hours) Cycles:24 times	After 2 Hours Recovery 1.No Visual Damage 2.Frequency Tol.≤5%
6	Low Temp	Temp:-40°C±3°C; Time:24 hours	After 2 Hours Recovery 1.No Visual Damage 2.Frequency Tol.≤5%
7	High Temp	Temp:85°C±3°C; Time:24 hours	After 2 Hours Recovery 1.No Visual Damage 2.Frequency Tol.≤5%
8	Temperature and Humidity Chamber	Temp: 85°C±3°C; RH: ≥85%; Time: 500 hours	After 2 Hours Recovery 1.No Visual Damage 2.Frequency Tol.≤5%
9	RoHS	With Reference to IEC62321 with flow chart Directive RoHS2015/863	Directive RoHS 2015/863/EU