

Specification

- Part No. : **TG.45.8113W**
- Product Name : Apex III Ultra-Wideband 4G LTE
Dipole Terminal Antenna with 450MHz band
90° Hinged R/A SMA(M) Connector
- Features : Highest efficiency for worldwide LTE and Wi-Fi
LTE / HSPA / GSM / CDMA / DCS / PCS / WCDMA
UMTS / GPRS / EDGE / GPS / Wi-Fi
Dipole Swivel Terminal Antenna
Hinged 90° termination with SMA(M) Connector
Enhanced hinge design for vibration environments
Dimensions: 218 * 58mm
Connector Customizable
RoHS Compliant



1. Introduction

The hinged Apex III TG.45 Ultra-Wideband Dipole Antenna has been designed to cover all Cellular, ISM and Wi-Fi working frequencies in the 696 to 6000MHz spectrum and includes LTE Band 31 at 450MHz. Evolved from the already highly successful Apex II TG.35, the TG.45 has the highest wideband efficiency in its range of any terminal antenna on the market today. The extended lower frequency coverage at 450MHz makes the TG.45 ideal for IoT applications, such as remote monitoring of smart utilities.

The Apex III has been primarily designed for use with 4G LTE modules and devices that require the highest possible efficiency and peak gain to deliver best in class throughput on all major worldwide cellular bands (4G/3G/2G) for access points, terminals and routers. High efficiency is vital for applications such as high speed video and real-time streaming or high capacity MIMO networks on public transportation.

This attractive slim-line antenna is ground plane independent, meaning it does not need to be connected to the ground-plane of a device to radiate efficiently. On the other hand, neither is it seriously detuned by connecting to a ground-plane, thus avoiding a problem notorious to smaller antennas.

It comes with a SMA(M) connector and swivel mechanism that allows the antenna to be rotated to fit in tight environments. The 90° hinge structure has been improved and strengthened so that the antenna in a 90° position would not drop down if used in environments prone to vibration.

The Apex III is backward compatible with 3G and 2G cellular applications such as HSPA, GSM, GPRS, UMTS, Wi-Fi and even has GPS included for Assisted GPS and/or E911 applications.

In summary, the Apex III is the ideal solution for any device requiring high, reliable performance. It will meet most type approval or carrier certification requirements from an efficiency standpoint. The antenna also makes an excellent reference antenna for test purposes. It has been designed as an omni-directional antenna and the radiation patterns prove this, being stable across all bands.



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Connector type is customizable and the housing is also available in black. Contact Taoglas regional sales office for more information.



2. Specification

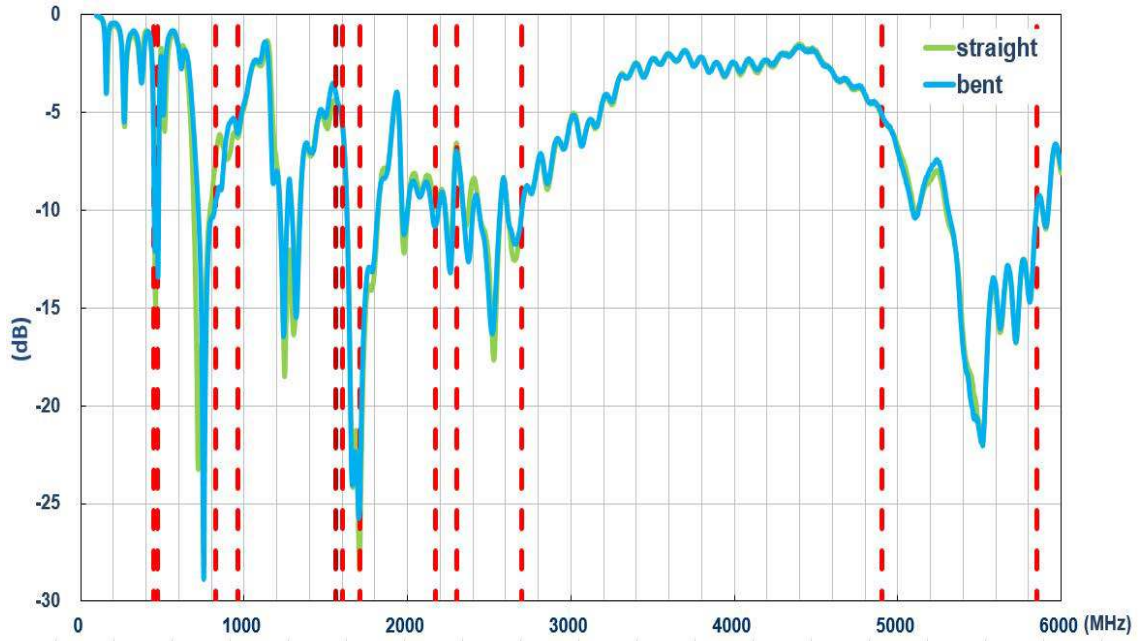
ELECTRICAL													
Standard	LTE 450	LTE 700	LTE 800	GSM 850	GSM 900	GPS/GLON-ASS/BEIDOU	DCS	PCS	UMTS1	LTE 2300	LTE 2600	LTE 3500	WIFI 5G
Frequency (MHz)	450 ~470	698 ~806	703 ~803	824 ~894	880 ~960	1561 ~1602	1710 ~1880	1850 ~1990	1920 ~2170	2305 ~2360	2300 ~2690	3400 ~3600	4900 ~5850
Efficiency (%)													
Straight	64.47	74.08	79.22	73.61	66.84	29.65	71.46	57.68	64.54	58.02	65.96	23.51	61.35
Bent	60.92	75.72	78.56	59.62	58.46	30.10	72.00	57.09	64.21	55.38	65.54	23.39	61.37
Peak Gain (dBi)													
Straight	1.46	2.87	2.87	3.26	3.58	0.75	3.95	4.17	4.85	2.82	4.16	0.26	3.88
Bent	1.17	2.77	2.77	2.48	3.12	0.56	2.82	3.63	4.57	2.50	3.76	-0.12	4.24
Average Gain (dBi)													
Straight	-1.93	-1.36	-1.04	-1.35	-1.75	-5.39	-1.47	-2.53	-2.05	-2.42	-1.84	-6.29	-2.17
Bent	-2.16	-1.23	-1.06	-2.28	-2.38	-5.31	-1.43	-2.58	-2.07	-2.61	-1.88	-6.31	-2.16
Impedance	50Ω												
Polarization	Linear												
Radiation Pattern	Omnidirectional												
Input Power	5 W												
MECHANICAL													
Casing	UV Resistant PC/ABS												
Connector	SMA Male Hinged 90°												
Weight	75g												
Recommended Torque for Mounting	0.9 N·m												
Max torque for Mounting	1.176 N·m												
ENVIRONMENTAL													
Temperature Range	-40°C to 85°C												
Humidity	Non-condensing 65°C 95% RH												

LTE BANDS				
Band Number	LTE / LTE-Advanced / WCDMA / HSPA / HSPA+ / TD-SCDMA			
	Uplink	Downlink	Covered	Covered
1	UL: 1920 to 1980	DL: 2110 to 2170	✓	✓
2	UL: 1850 to 1910	DL: 1930 to 1990	✓	✓
3	UL: 1710 to 1785	DL: 1805 to 1880	✓	✓
4	UL: 1710 to 1755	DL: 2110 to 2155	✓	✓
5	UL: 824 to 849	DL: 869 to 894	✓	✓
7	UL: 2500 to 2570	DL: 2620 to 2690	✓	✓
8	UL: 880 to 915	DL: 925 to 960	✓	✓
9	UL: 1749.9 to 1784.9	DL: 1844.9 to 1879.9	✓	✓
11	UL: 1427.9 to 1447.9	DL: 1475.9 to 1495.9	✓	✓
12	UL: 699 to 716	DL: 729 to 746	✓	✓
13	UL: 777 to 787	DL: 746 to 756	✓	✓
14	UL: 788 to 798	DL: 758 to 768	✓	✓
17	UL: 704 to 716	DL: 734 to 746 (LTE only)	✓	✓
18	UL: 815 to 830	DL: 860 to 875 (LTE only)	✓	✓
19	UL: 830 to 845	DL: 875 to 890	✓	✓
20	UL: 832 to 862	DL: 791 to 821	✓	✓
21	UL: 1447.9 to 1462.9	DL: 1495.9 to 1510.9	✓	✓
22	UL: 3410 to 3490	DL: 3510 to 3590	✓	✓
23	UL: 2000 to 2020	DL: 2180 to 2200 (LTE only)	✓	✓
24	UL: 1625.5 to 1660.5	DL: 1525 to 1559 (LTE only)	✓	✓
25	UL: 1850 to 1915	DL: 1930 to 1995	✓	✓
26	UL: 814 to 849	DL: 859 to 894	✓	✓
27	UL: 807 to 824	DL: 852 to 869 (LTE only)	✓	✓
28	UL: 703 to 748	DL: 758 to 803 (LTE only)	✓	✓
29	UL: -	DL: 717 to 728 (LTE only)	✓	✓
30	UL: 2305 to 2315	DL: 2350 to 2360 (LTE only)	✓	✓
31	UL: 452.5 to 457.5	DL: 462.5 to 467.5 (LTE only)	✓	✓
32	UL: -	DL: 1452 - 1496	✓	✓
35		1850 to 1910	✓	✓
38		2570 to 2620	✓	✓
39		1880 to 1920	✓	✓
40		2300 to 2400	✓	✓
41		2496 to 2690	✓	✓
42		3400 to 3600	✓	✓
43		3600 to 3800	✓	✓

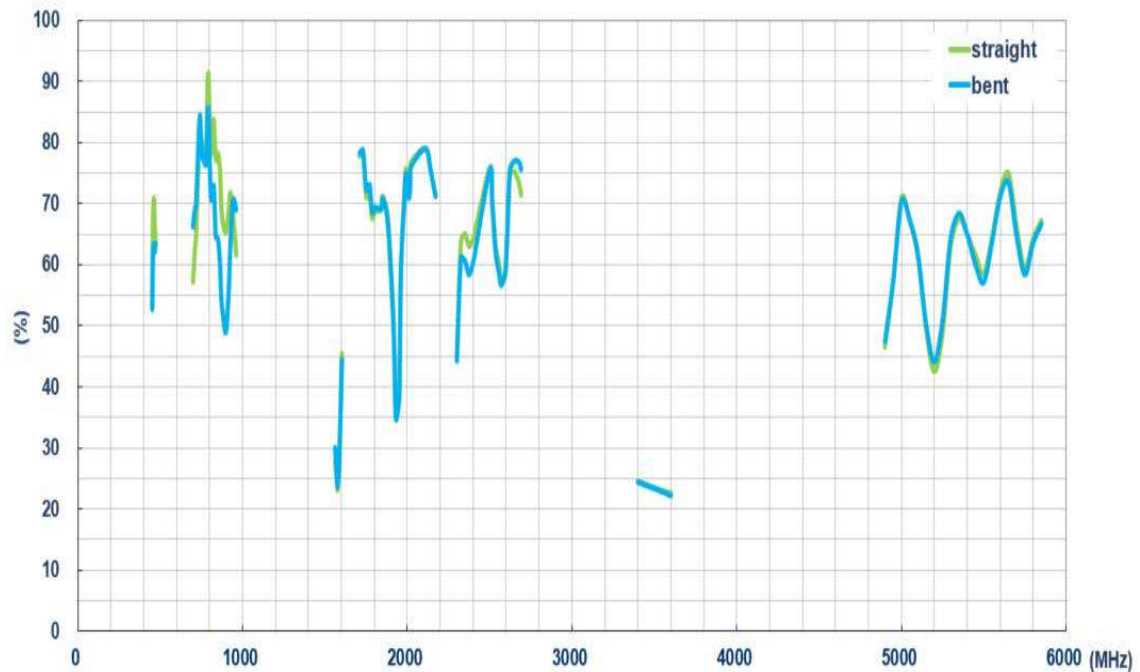


3. Antenna Characteristics

3.1. Return Loss

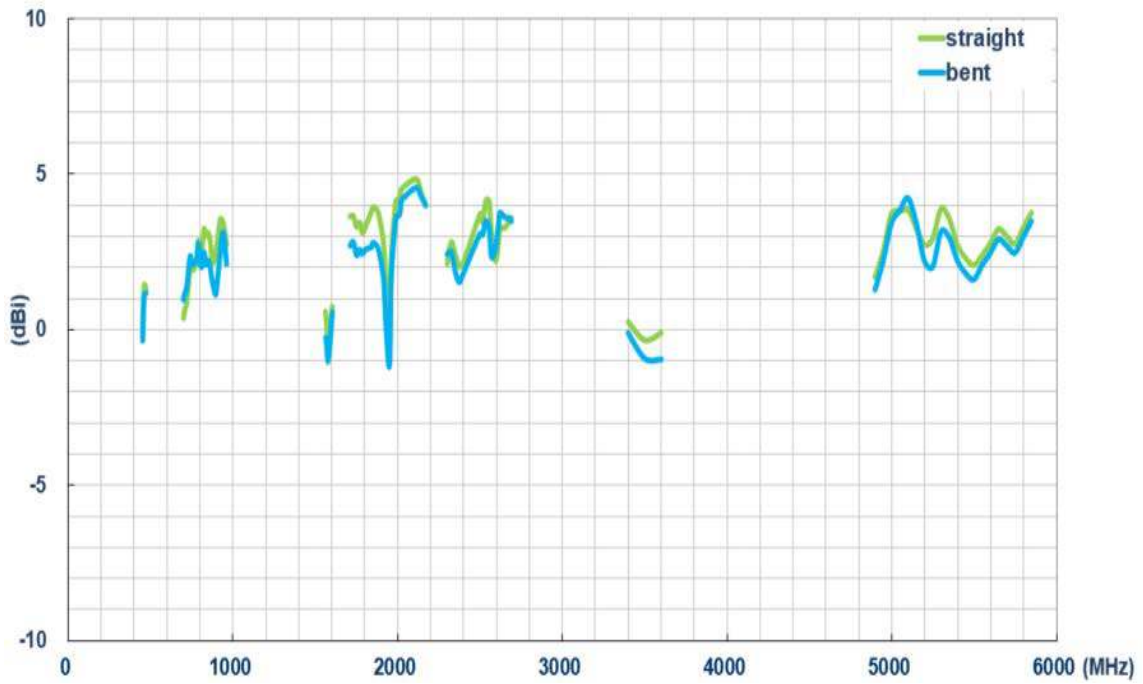


3.2. Efficiency

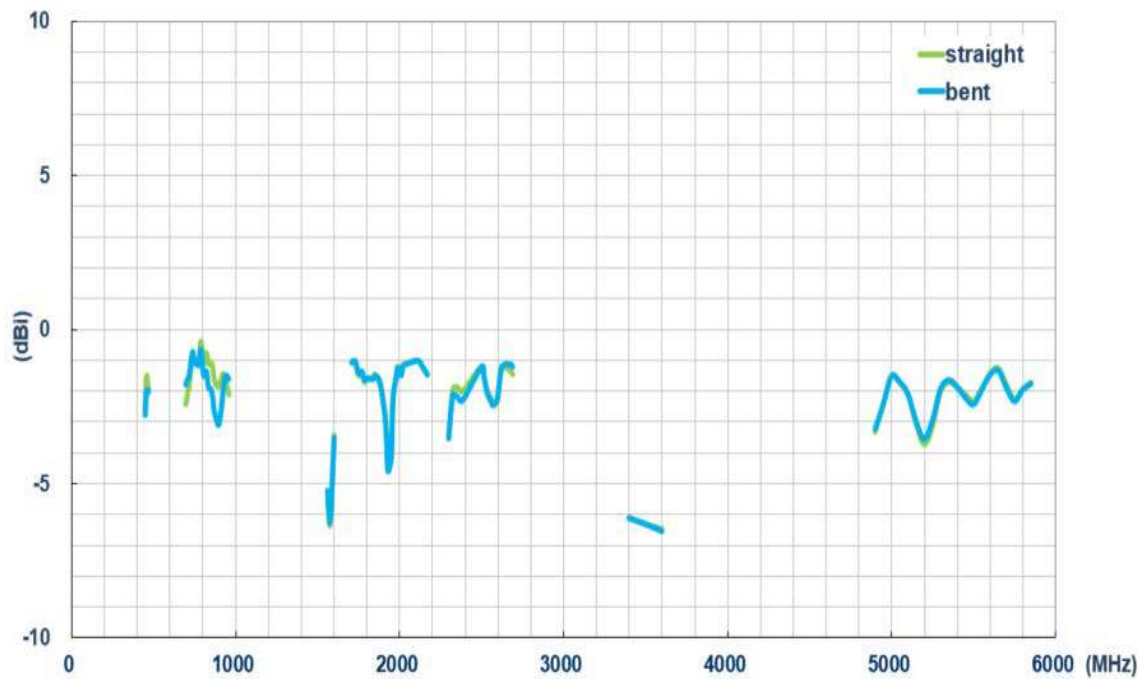




3.3. Peak Gain

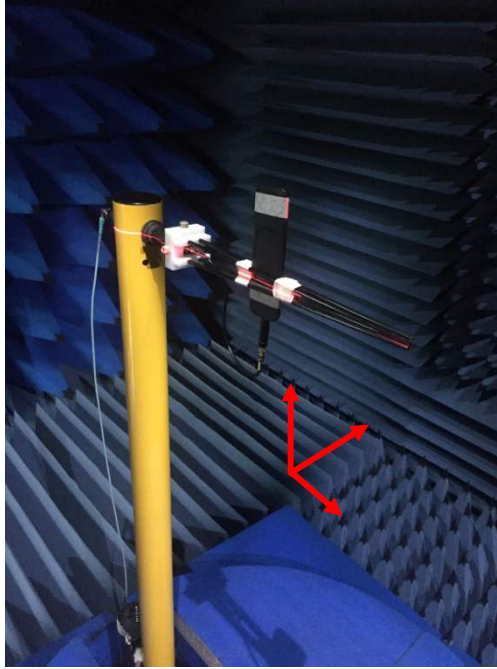


3.4. Average Gain



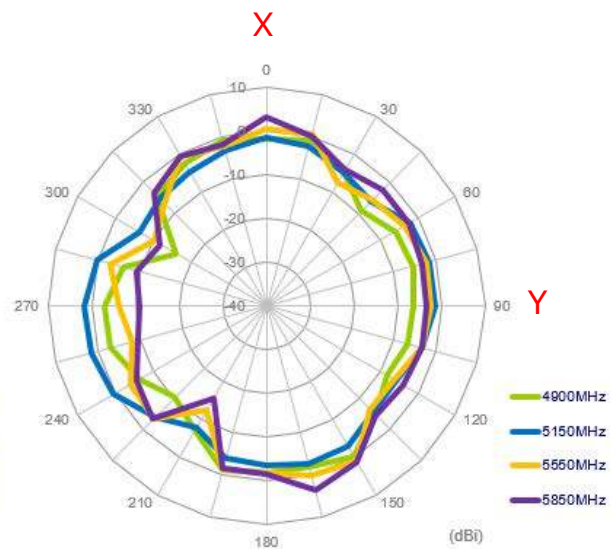
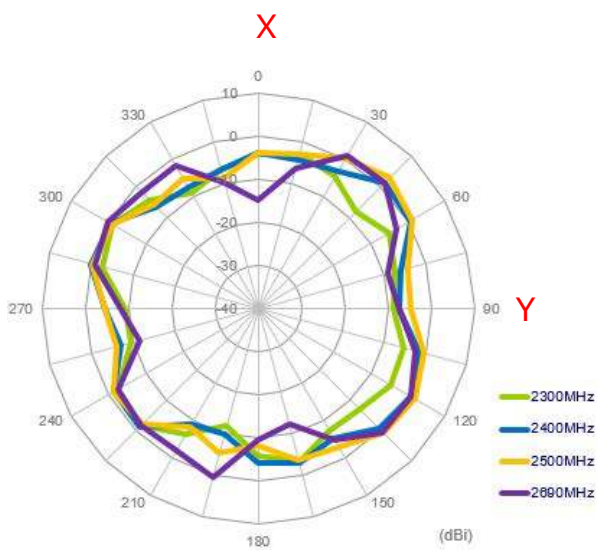
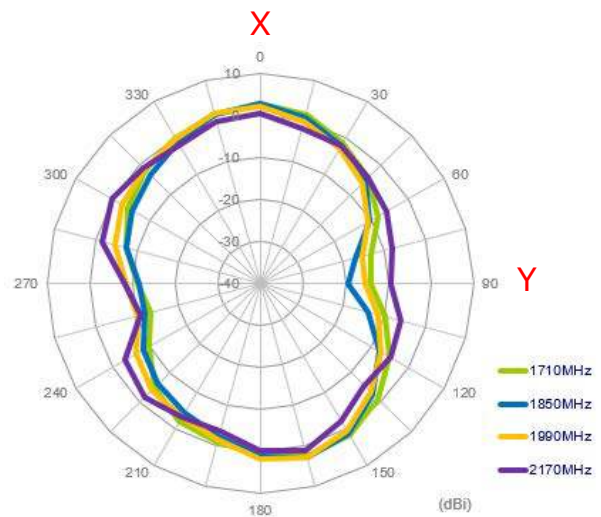
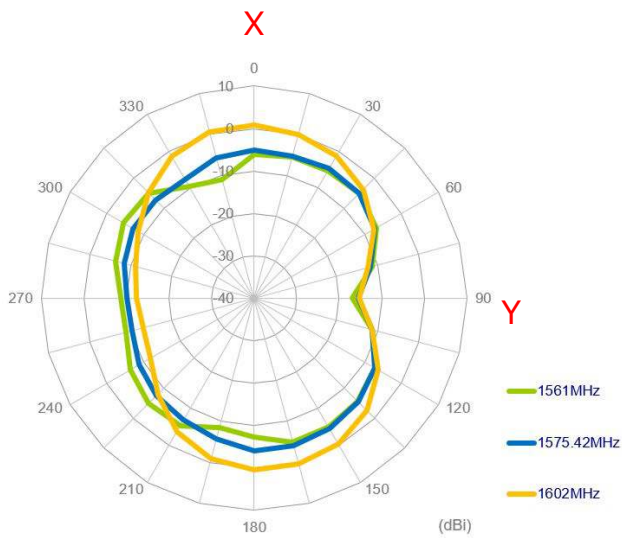
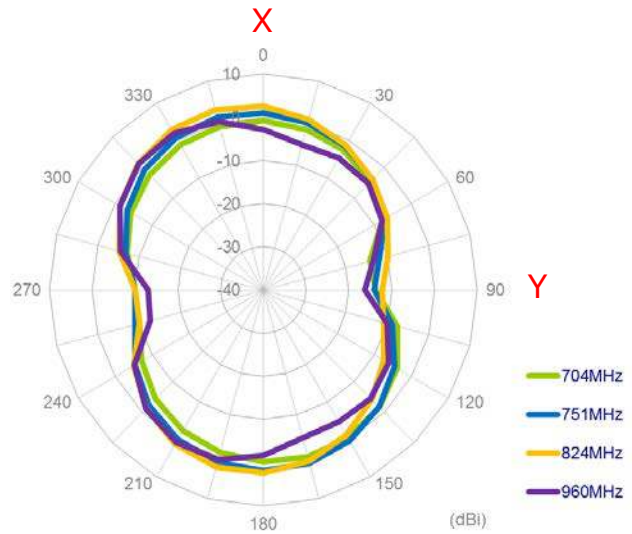
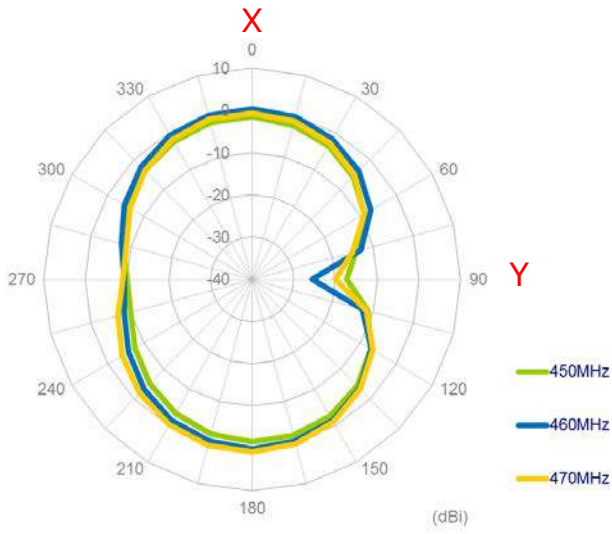
4. Antenna Radiation Patterns

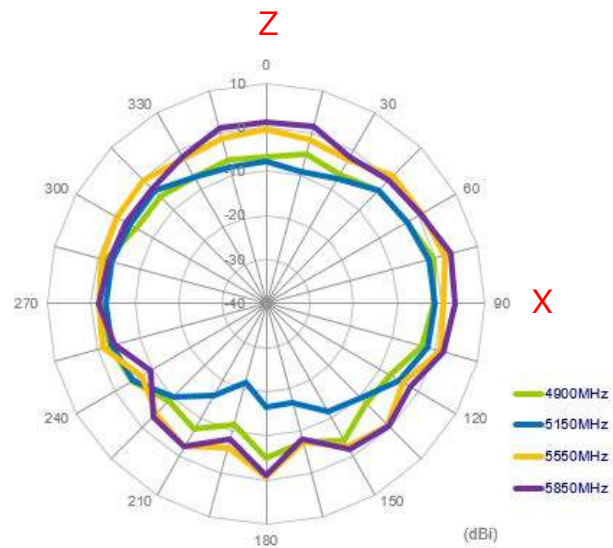
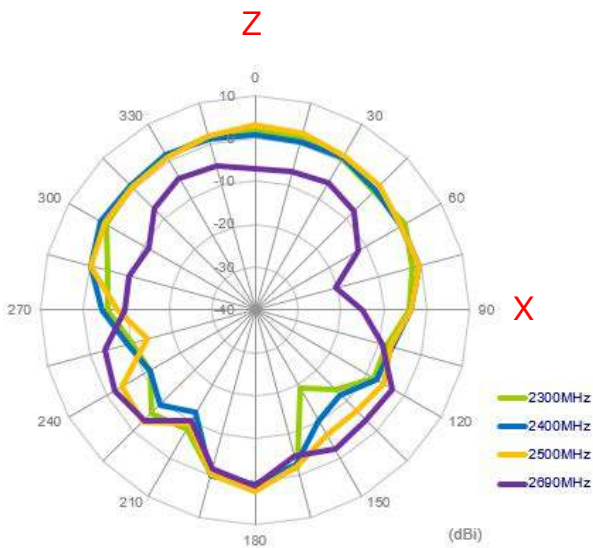
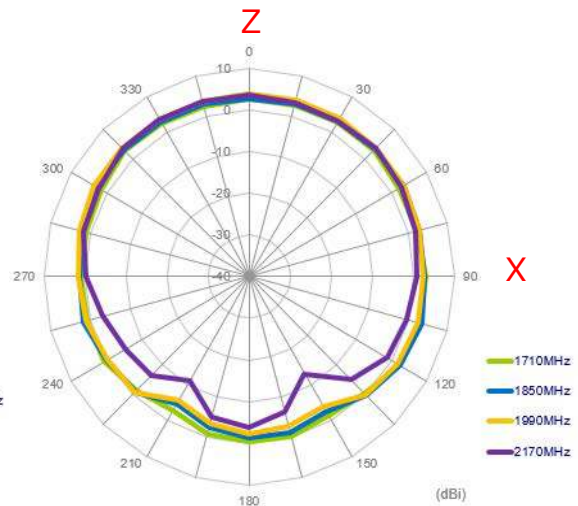
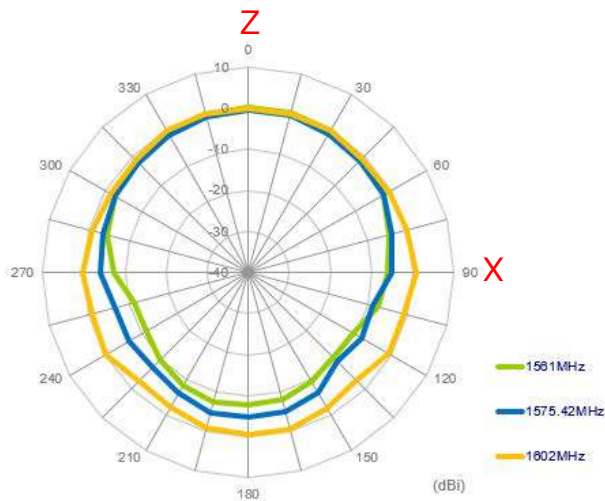
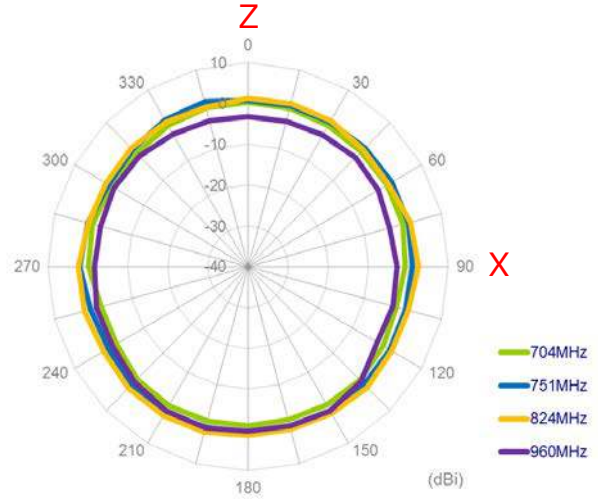
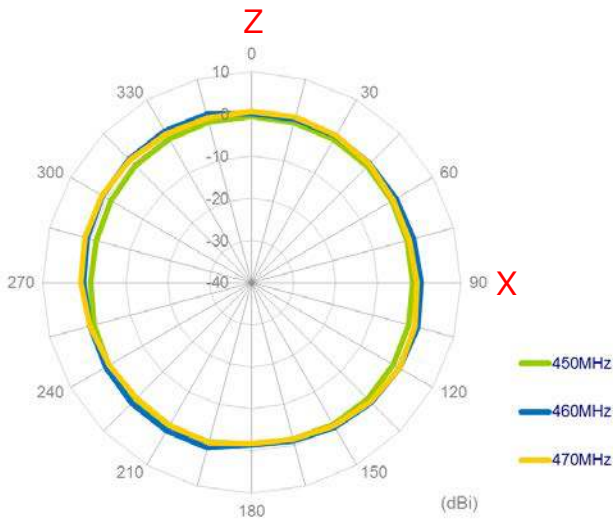
4.1. Antenna Setup (Straight Position)

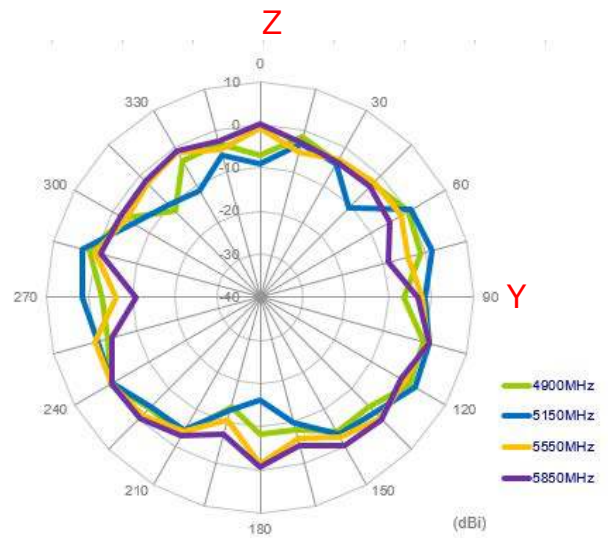
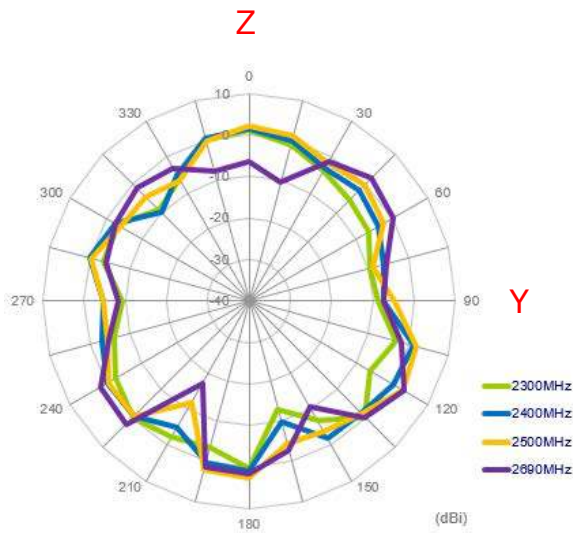
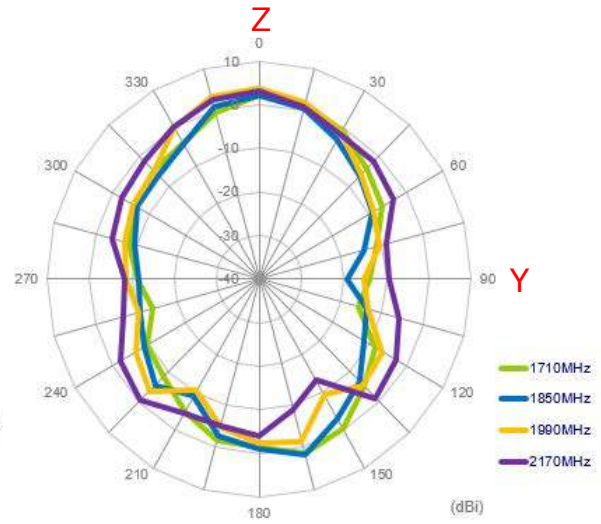
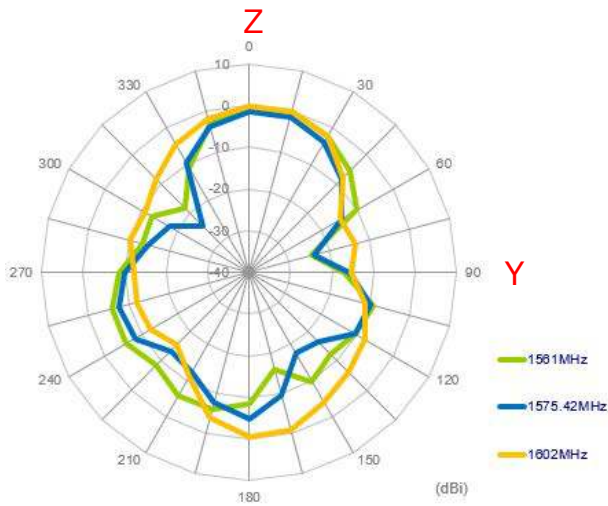
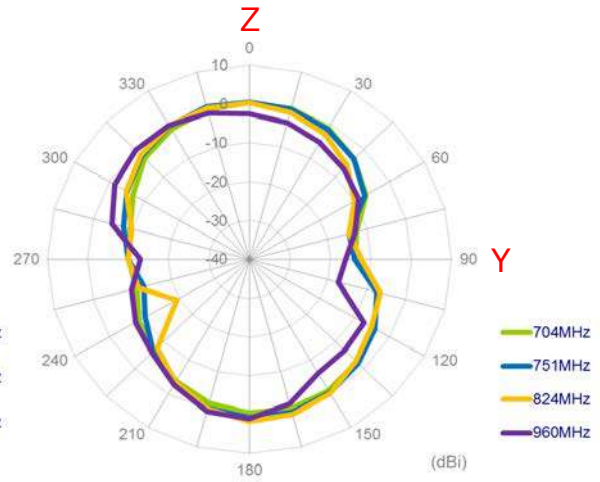
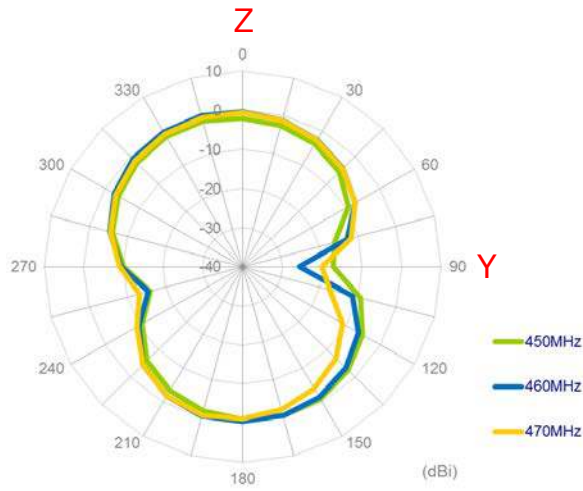




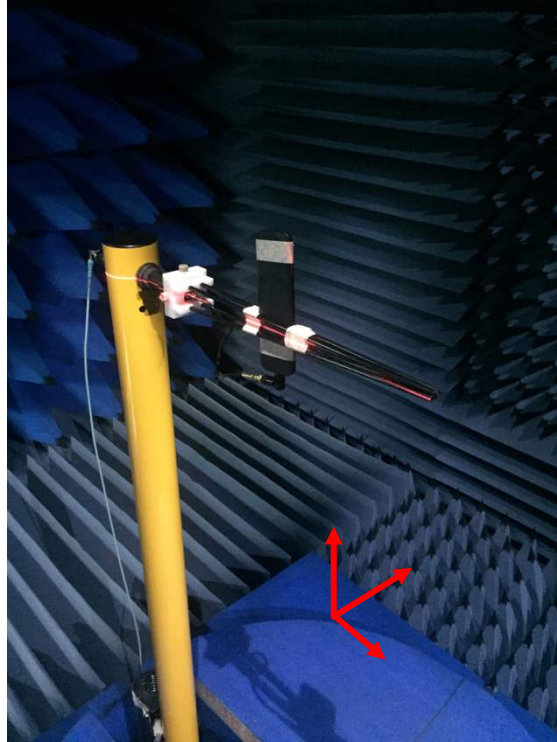
4.2. Radiation Patterns





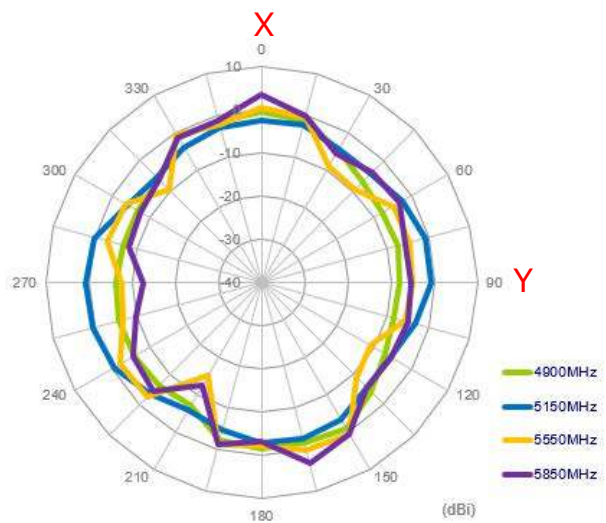
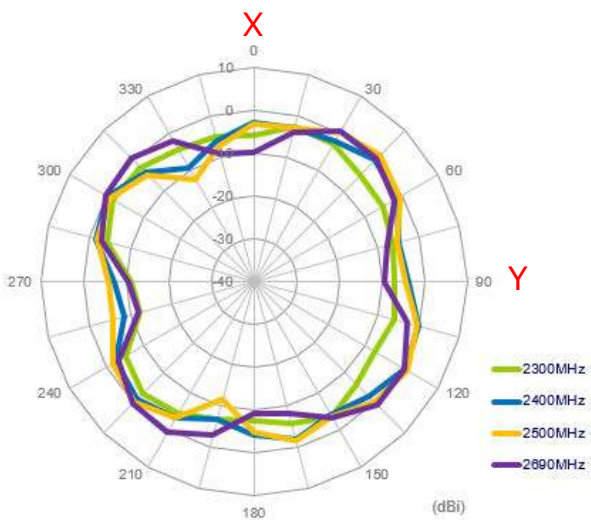
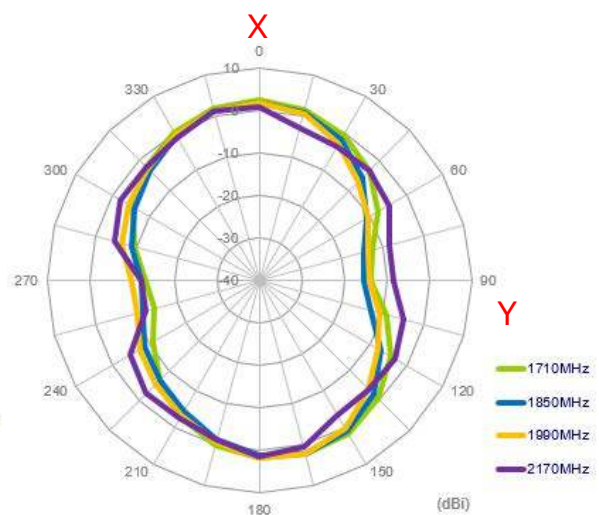
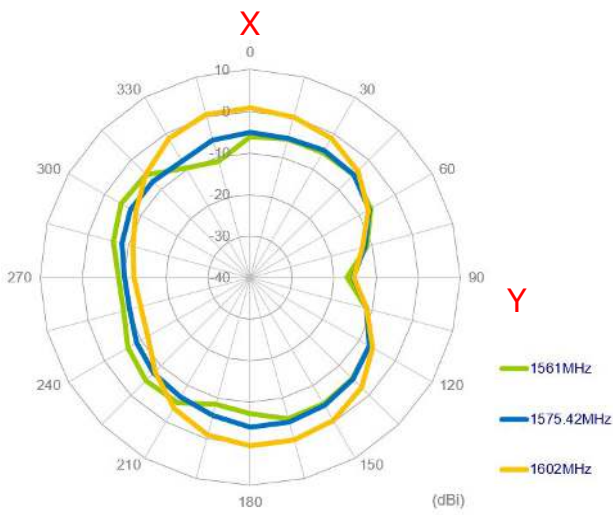
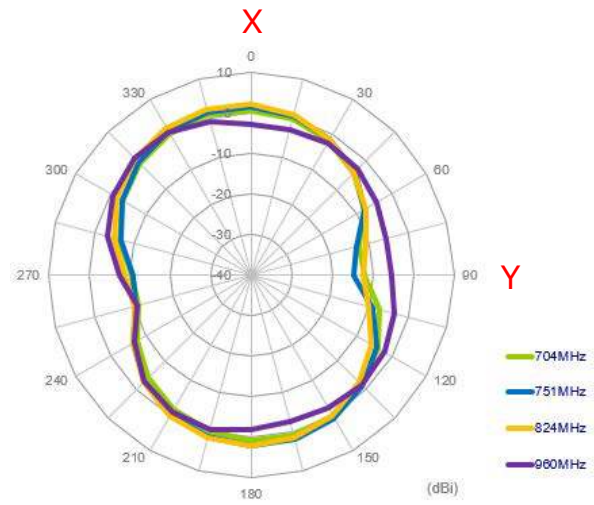
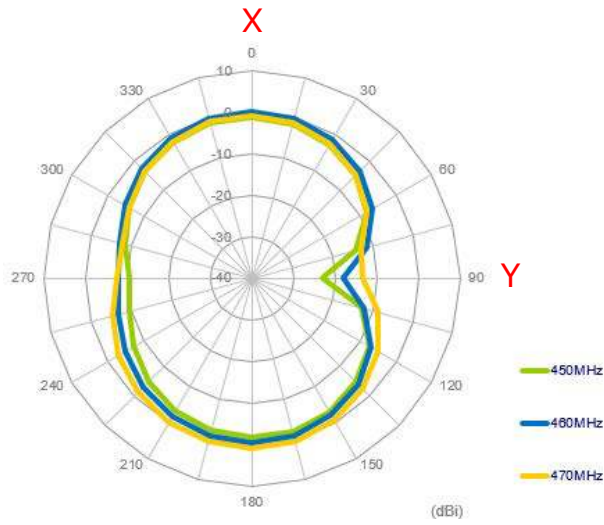


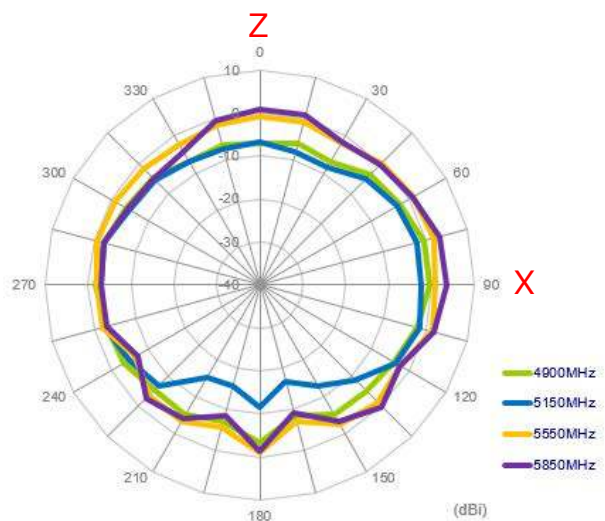
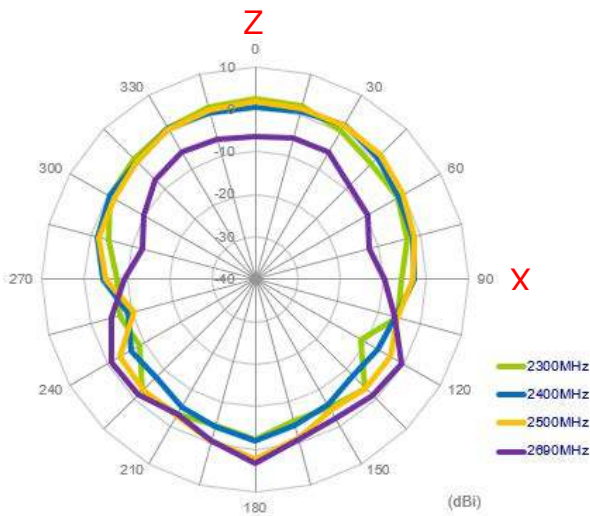
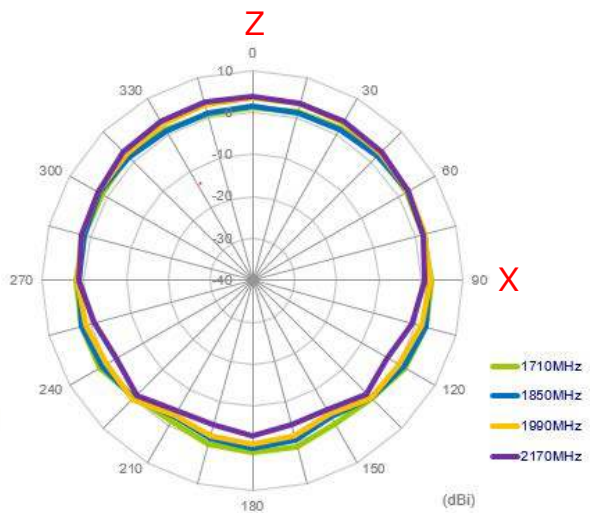
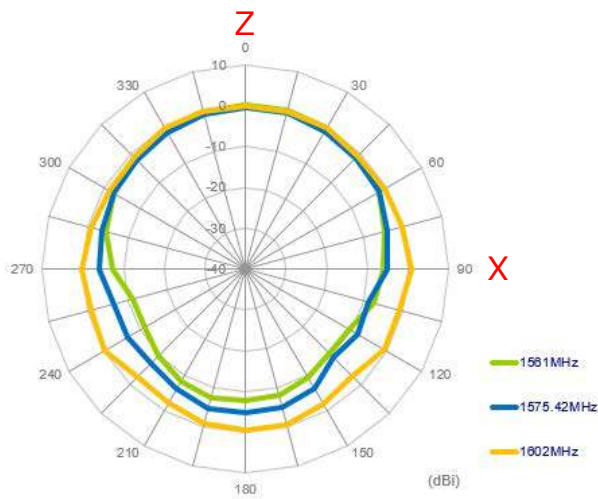
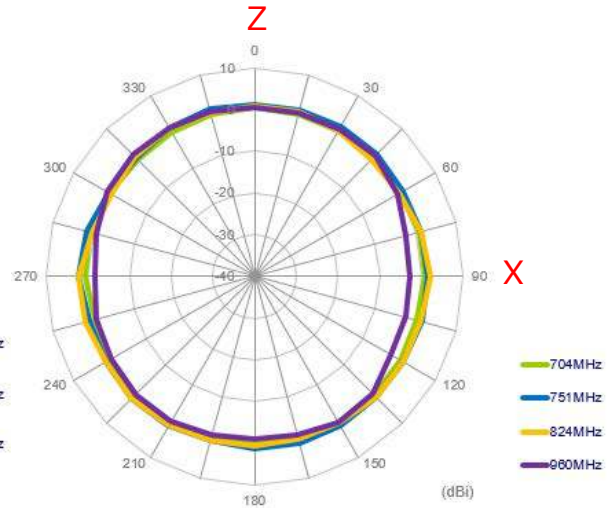
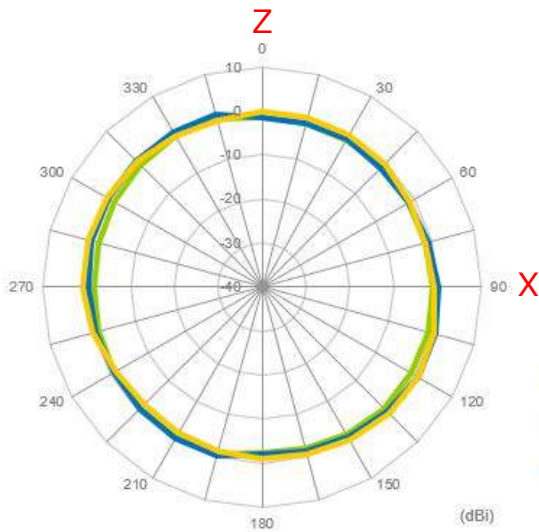
4.3 Antenna Setup (Right Angle Position)

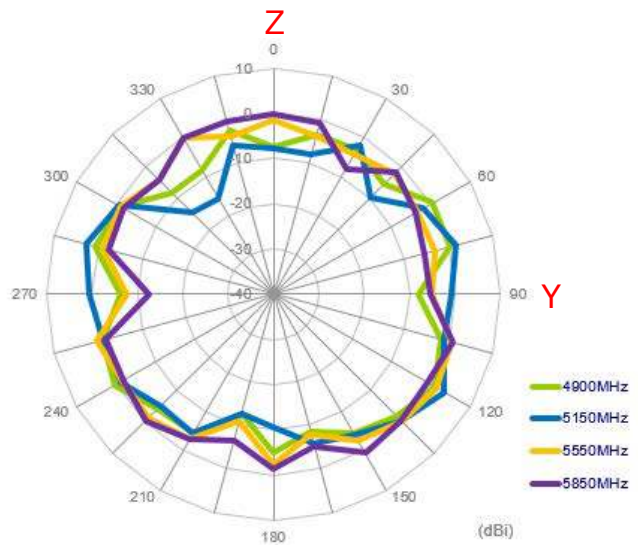
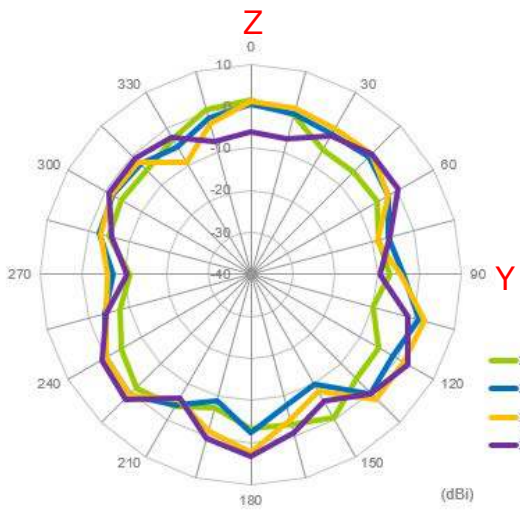
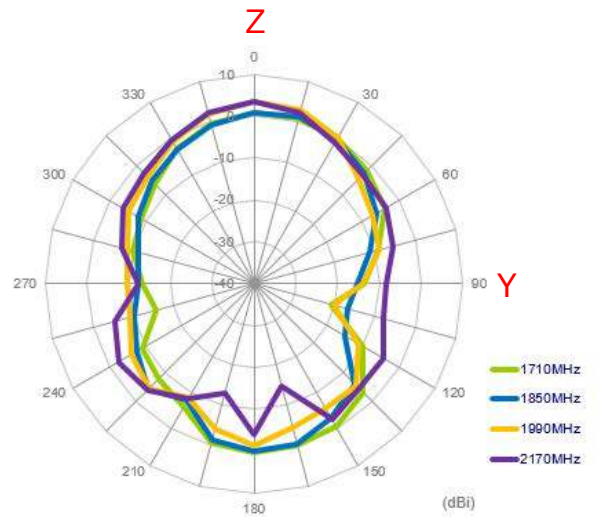
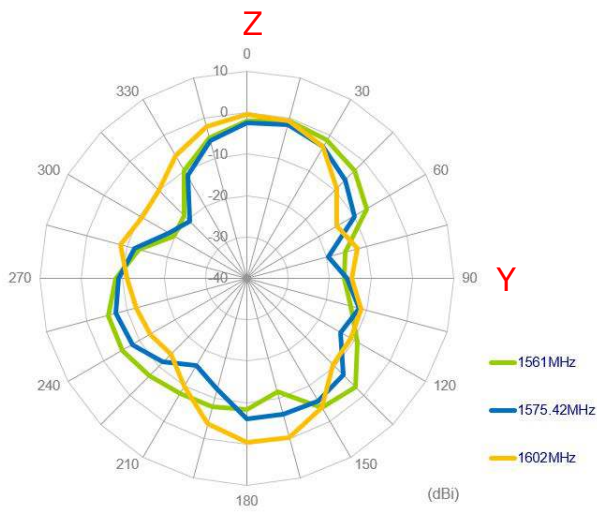
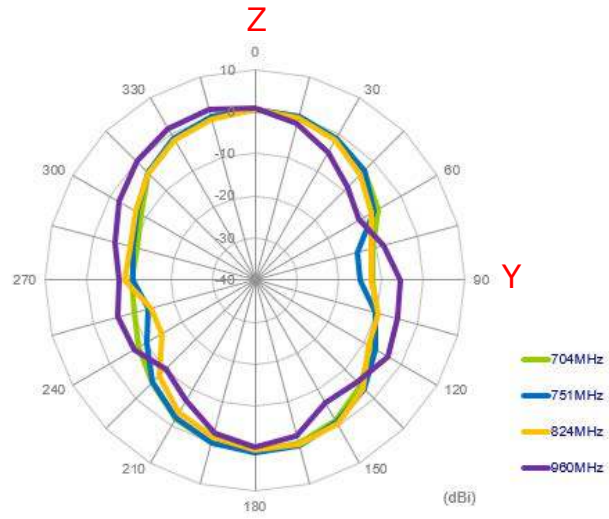
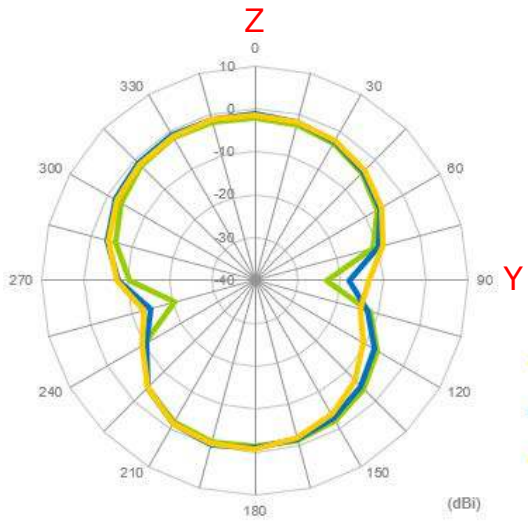




4.4 Radiation Patterns

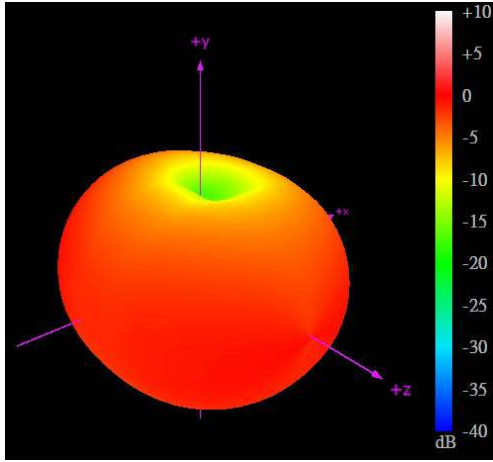




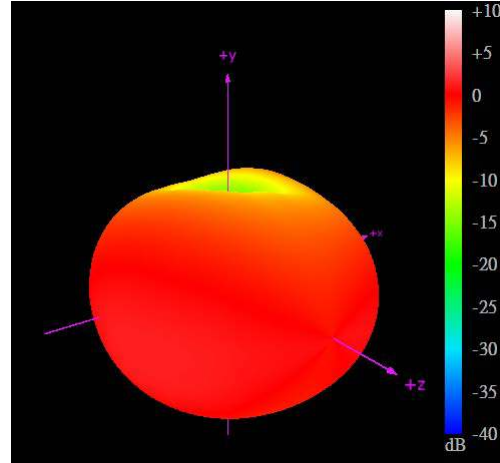




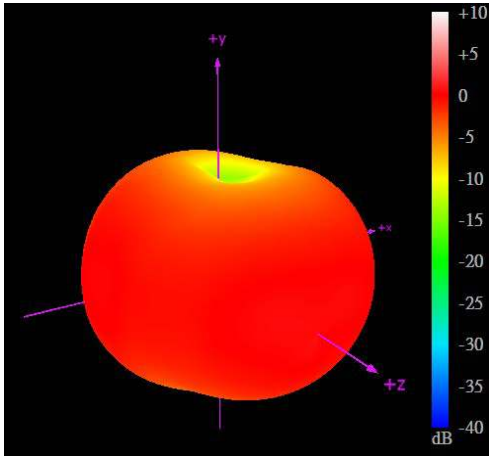
4.5 3D Radiation Patterns (Straight Position)



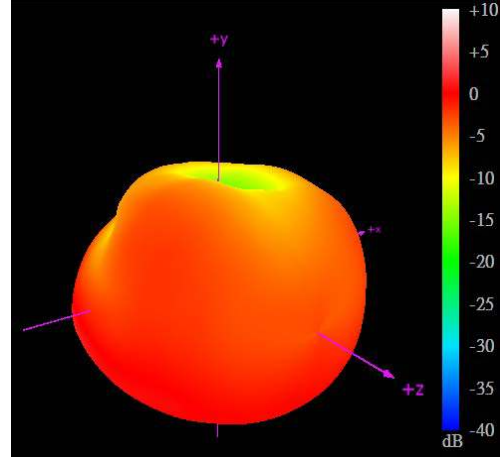
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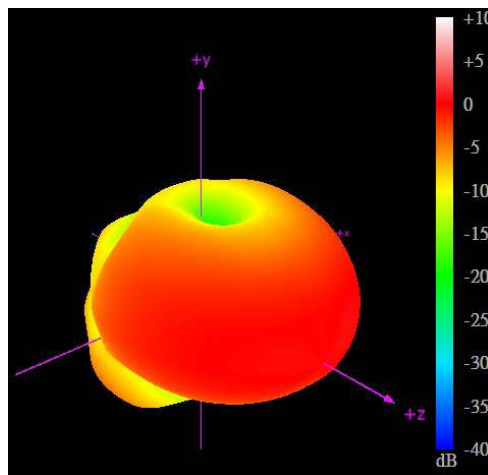
470MHz



704MHz



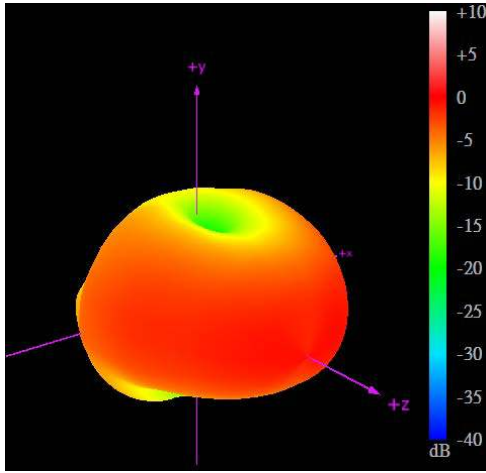
960MHz



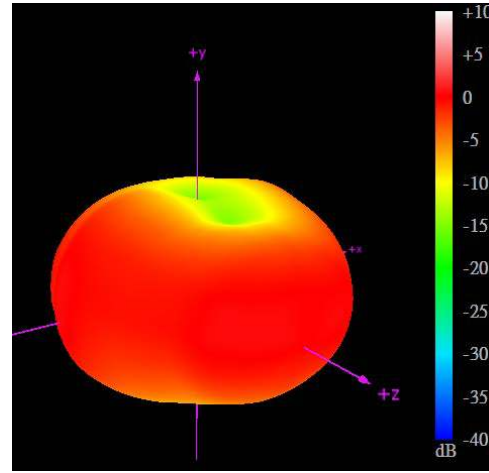
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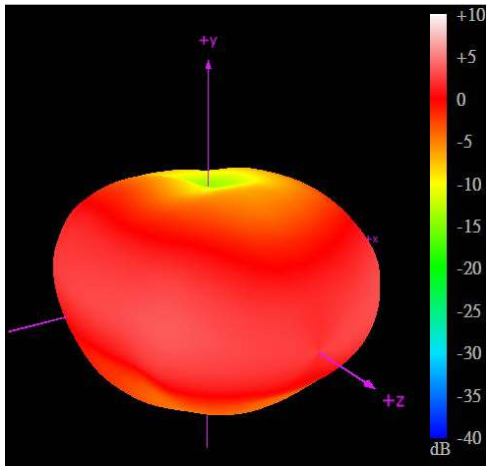
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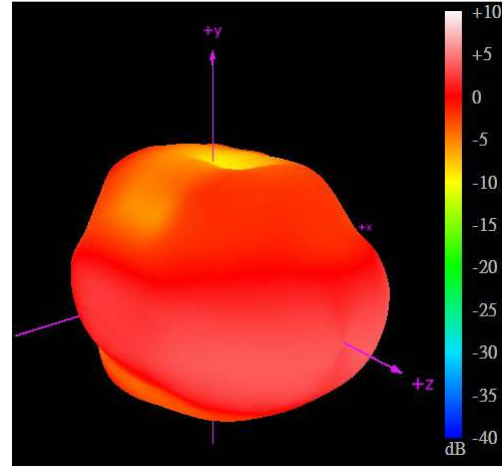
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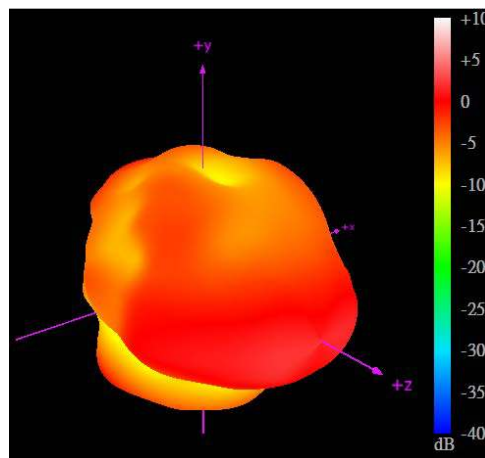
1602MHz



1710MHz



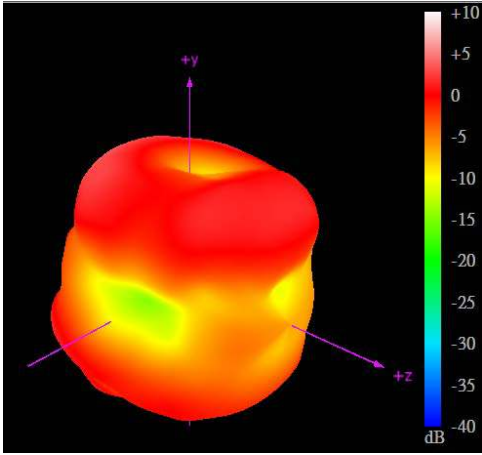
2170MHz



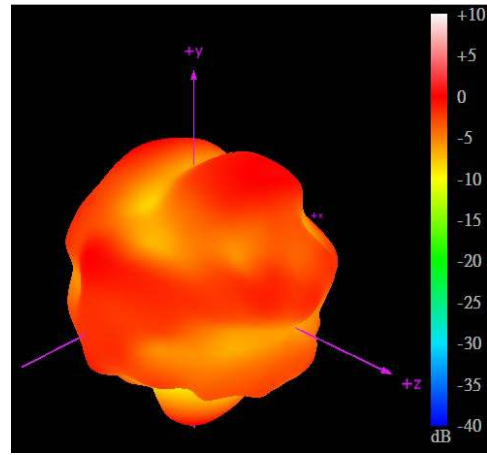
2300MHz



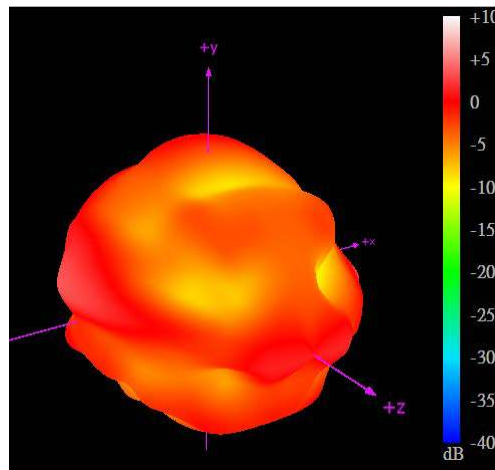
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2690MHz



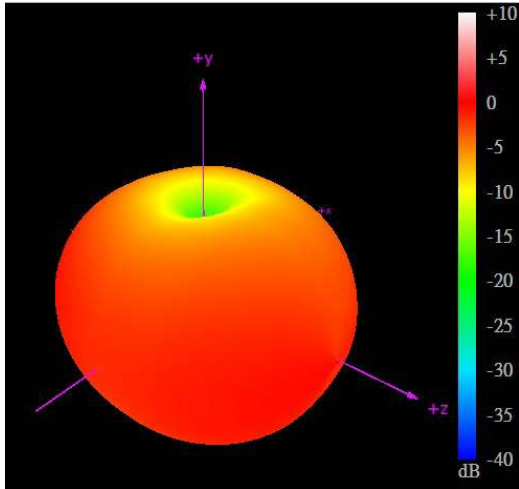
4900MHz



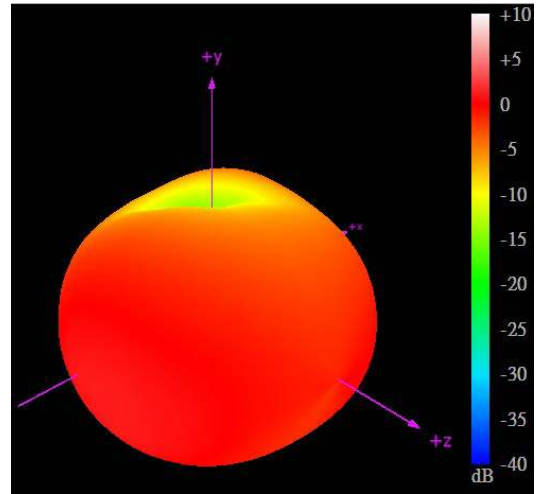
5850MHz



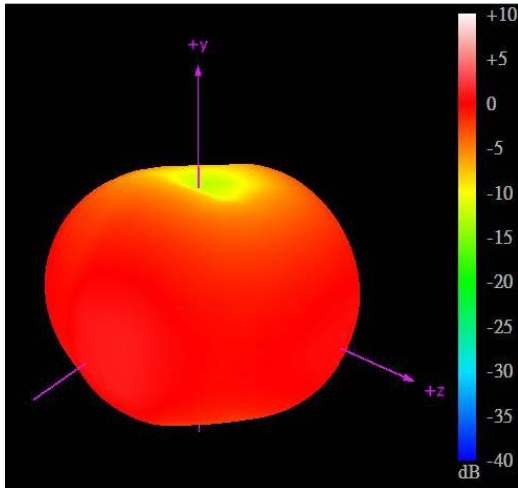
4.6 3D Radiation Patterns (Right Angle Position)



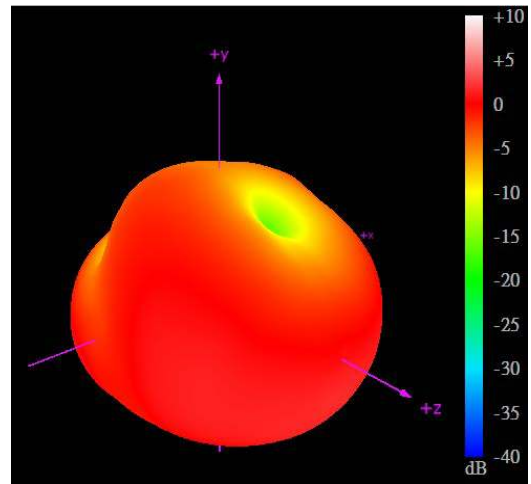
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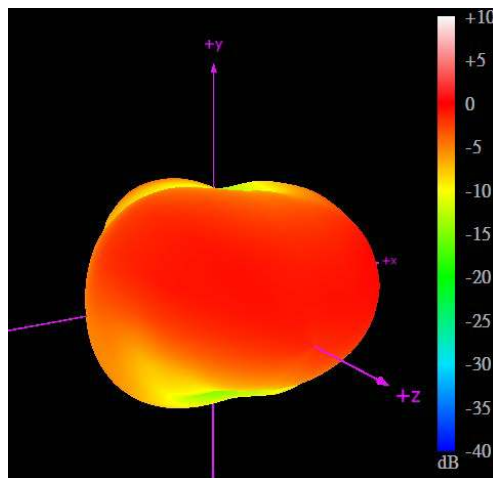
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704MHz



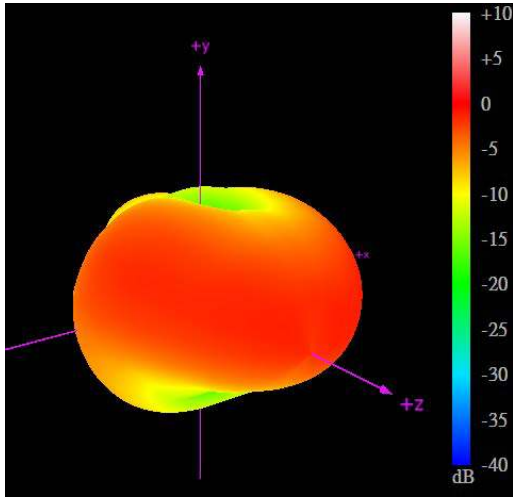
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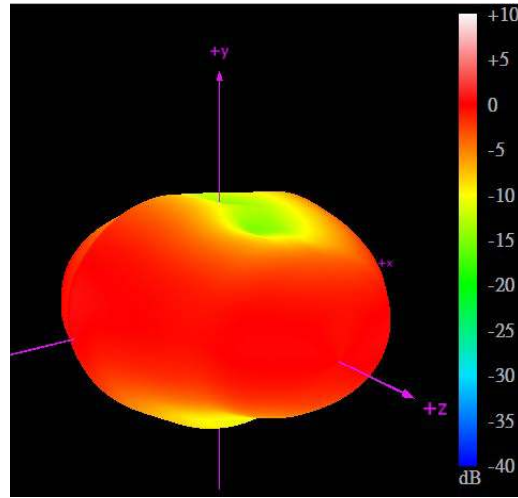
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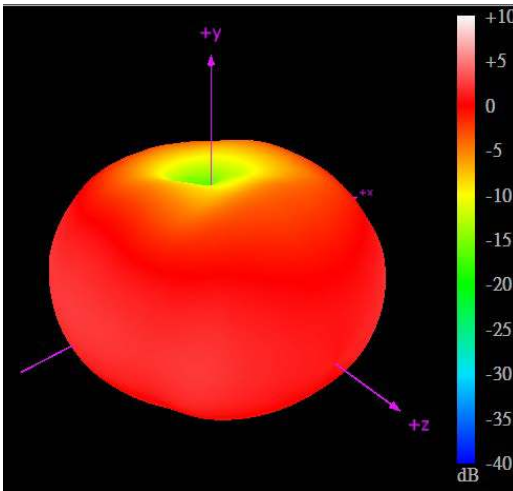
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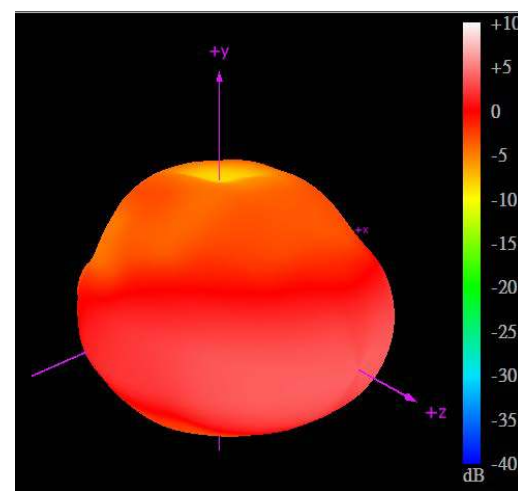
1575.42MHz



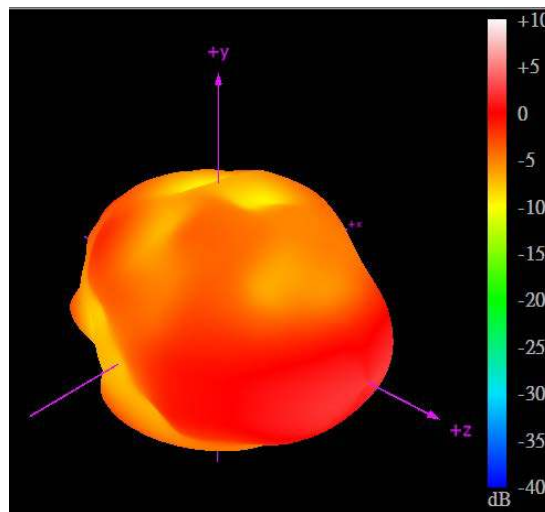
1602MHz



1710MHz



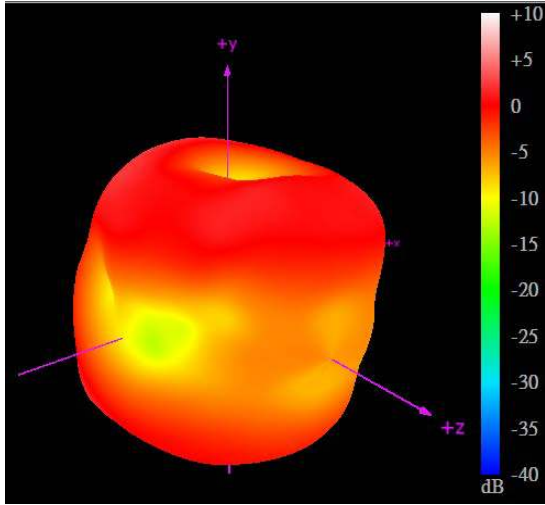
2170MHz



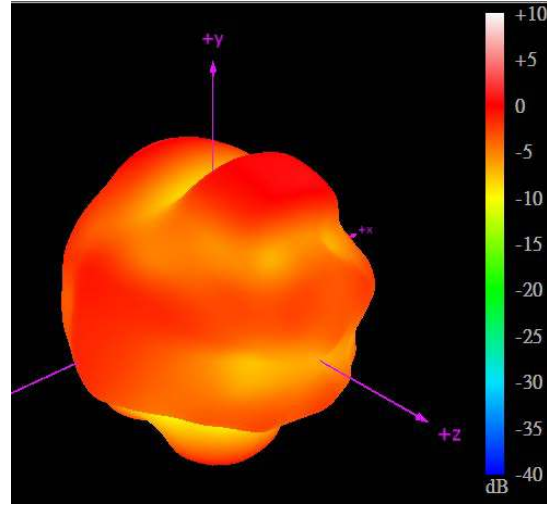
2300MHz



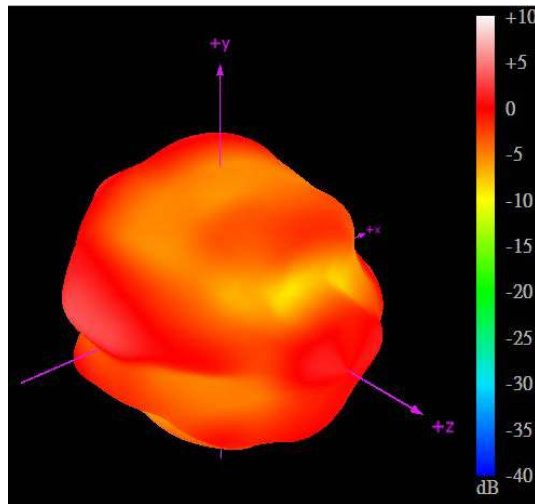
TAOGLAS®



2690MHz



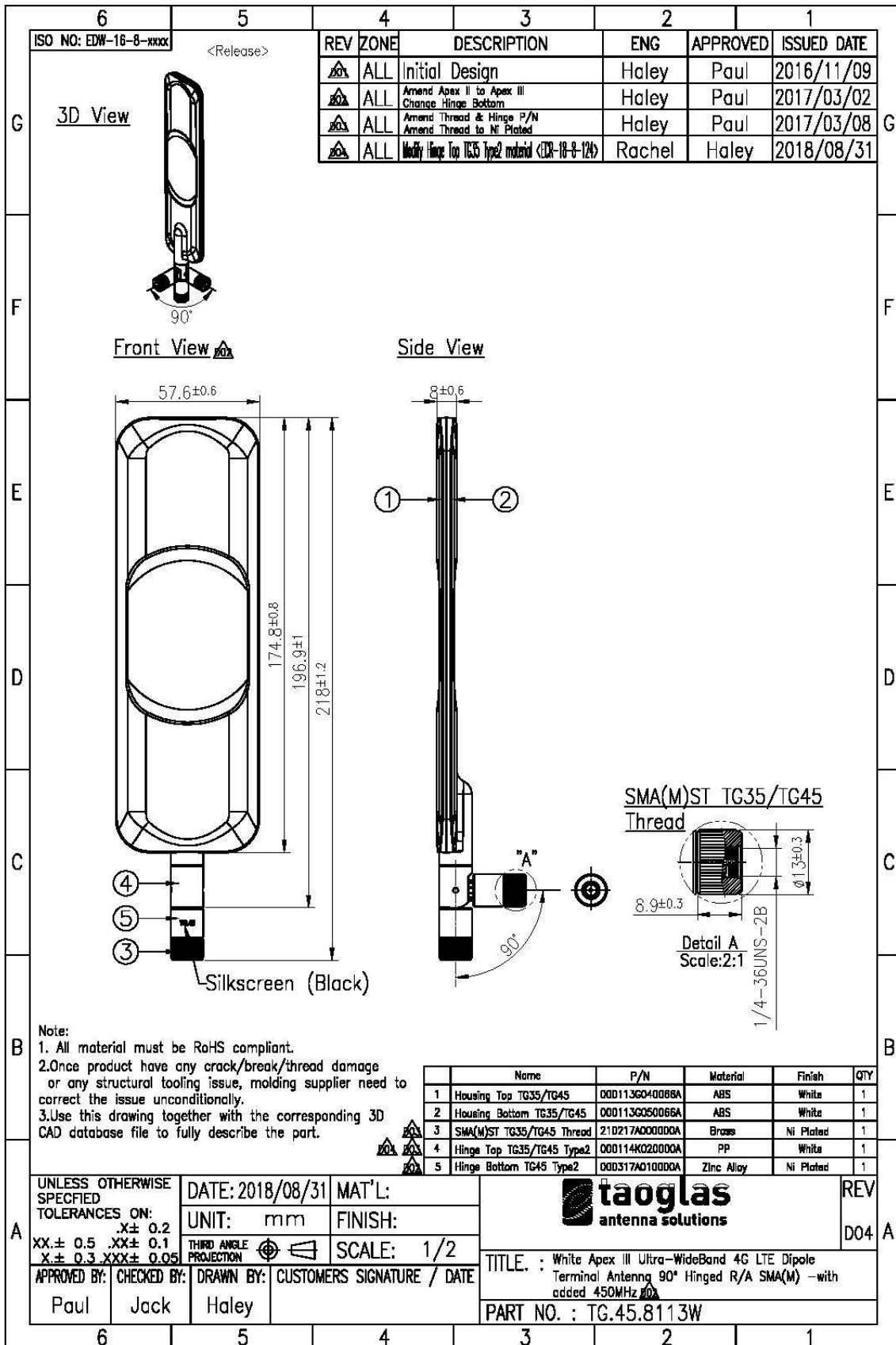
4900MHz



5850MHz



5. Mechanical Drawing (Unit: mm)



6. Installation Guide

TG.35/45 Installation Instructions

The TG.35/45 antenna has an independent rotating SMA connector, which enables users to install the antenna in a preferable direction. After tightening the SMA connector, the antenna will sit firmly on users' base/router either on a table or on a wall. This installation sheet illustrates using the TG.35/45 on a wall mounted device as an example.

Step 1.

Adjust the antenna to preferable direction, then mount the SMA(M) connector on devices SMA(F) connector. (See figure 1)

Step 2.

Hold the antenna housing with one hand, while rotating the SMA(M) connector with the other hand until the connector is tight. If the connector was tightened properly, the antenna will keep its position without slipping down. (See figure 2)

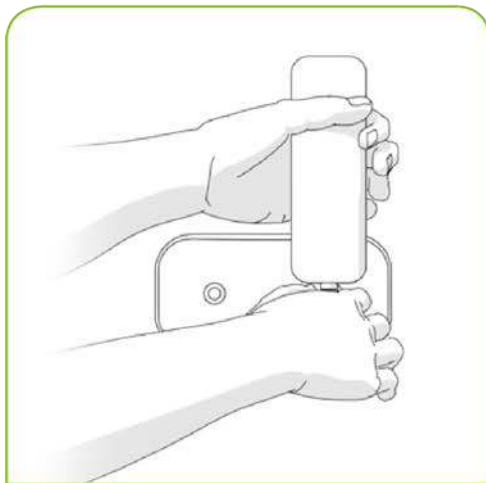


Figure 1. Place the TG.35/45 antenna onto the connector of the device and hold the antenna in the preferred orientation.

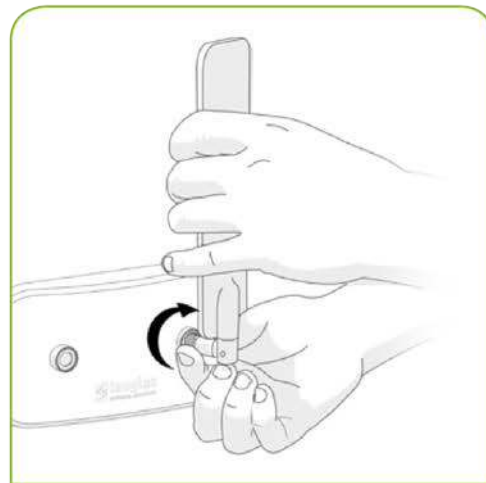


Figure 2. Fix the connector to the device by twisting the rotating head of the SMA connector until it is tight enough to hold the antenna in the correct position.

www.taoglas.com/tg35-tg45-installation-instructions/

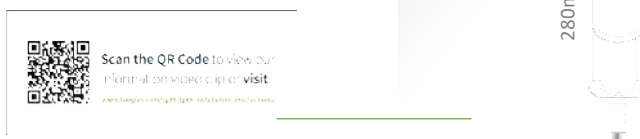


7. Packaging

1pc TG.35.8113W per Small PE Bag with Video Link Label

Dimensions: 100*280mm

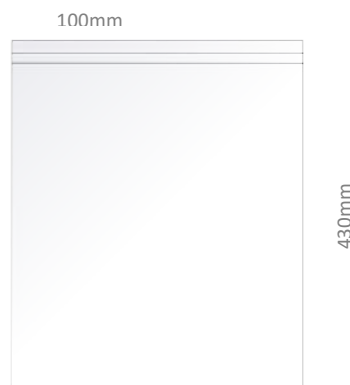
Weight: 73.5g



25pcs per Large PE Bag

Dimensions: 280*430mm

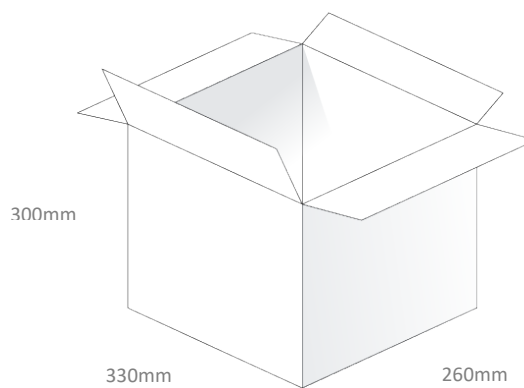
Weight: 1.85Kg



75pcs TG.35.8113 per Carton

Carton Dimensions: 330*260*300mm

Weight: 6.1Kg



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