



Specification

Part No.	MA140.A.LB.001
Product Name	<p>Olympian 2in1 LTE 2G/3G/4G and GPS/GLONASS</p> <ul style="list-style-type: none"> • LTE 698-960/1710-2700MHz 1M RG-316 SMA(M) • GPS 1575MHz-Glonass 1602MHz 1M RG-RG-174 SMA(M)
Feature	<p>48mm Height/50mm Diameter Heavy duty screw mount UV and vandal resistant ABS housing and thread. IP-67 Waterproof Cables and Connectors Customizable RoHS Compliant</p>



1. Introduction

The Olympian MA140 is a high performance combination LTE and GPS/GLONASS screw mount antenna in a compact housing, for external use on vehicles and outdoor assets worldwide. The LTE antenna functions equally well on 2G and 3G. The GPS/Glonass antenna has stable gain and radiation patterns on both bands.

The antenna can be mounted on metal and plastic structures. Customized cable length and connectors are available.

Durable UV resistant IP67 ABS housing is resistant to vandalism and direct attack. A rubber O-ring is provided under the antenna to prevent water entering under the antenna. If the lower frequency bands are required the antenna functions best when mounted on a metal ground-plane, but can still work well with short cable lengths below 1 metres on plastic structures and is locked from the inside of the structure by a nut. The thread is extra small, allowing for installation in the tightest of environments.

Customized cable length and connectors are available. Taoglas recommends minimum of 1m cable length for stable antenna performance. When mounted on a ground-plane, the antenna can function well at all frequencies up to 3 metres cable length. Generally, antenna efficiency of less than 20% at the connector would lead to unreliable wireless system performance.

For better efficiency especially on longer cable lengths up to 5 metres, a short 300mm cable can be used as standard, and then add a low loss 5 metre CFD200 extension cable SMA(F) to SMA(M) [CAB.0149].

If your device requires certification for PTCRB or US/Canadian network operators please contact Taoglas USA to check is this antenna suitable.

2. Specification

2.1 LTE Antenna

ELECTRICAL			
Measurement Environment	In free space		
STANDARD	2G / 3G / 4G		
Operation Frequency(MHz)	698~960	1710~2170	2500~2800
Peak Gain (dBi)			
30cm Cable Length	2.74	4.39	3.49
1M Cable Length	1.58	2.70	1.11
2M Cable Length	1.79	2.06	1.44
3M Cable Length	1.04	-0.42	-0.97
5M Cable Length	0.59	-1.98	-4.40
Efficiency (%)			
30cm Cable Length	44.39	61.48	52.47
1M Cable Length	30.70	47.06	35.83
2M Cable Length	28.61	36.48	26.16
3M Cable Length	22.44	22.25	19.34
5M Cable Length	22.02	15.21	8.77
Average Gain (dBi)			
30cm Cable Length	-3.57	-2.12	-2.83
1M Cable Length	-6.07	-3.32	-4.47
2M Cable Length	-5.90	-4.40	-5.83
3M Cable Length	-6.79	-6.55	-7.16
5M Cable Length	-7.16	-8.21	-10.58

2.1 LTE Antenna

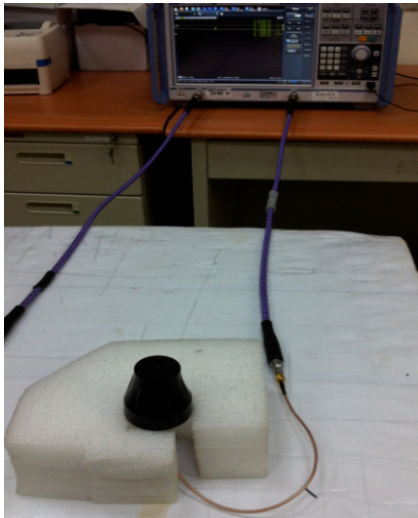
Measurement Environment	On 30x30 metal ground		
STANDARD	2G / 3G / 4G		
Operation Frequency(MHz)	698~960	1710~2170	2500~2800
	Peak Gain (dBi)		
30cm Cable Length	3.84	3.76	1.42
1M Cable Length	4.92	2.40	-0.10
2M Cable Length	4.69	2.05	-0.49
3M Cable Length	0.34	-0.55	-2.57
5M Cable Length	1.37	-2.59	-5.67
	Efficiency (%)		
30cm Cable Length	45.11	60.43	41.00
1M Cable Length	50.13	51.74	32.31
2M Cable Length	47.54	36.99	21.57
3M Cable Length	29.03	26.41	15.28
5M Cable Length	25.50	15.68	7.88
	Average Gain (dBi)		
30cm Cable Length	-3.50	-2.21	-3.89
1M Cable Length	-3.03	-2.89	-4.92
2M Cable Length	-3.31	-4.34	-6.68
3M Cable Length	-5.46	-5.81	-8.16
5M Cable Length	-5.98	-8.07	-11.04
VSWR	< 3		
Impedance	< 50ohm		
Polarization	Linear		
Radiation Pattern	Omni-directional		
Max Input Power	5 W		

2.2 GPS/GLONASS Antenna

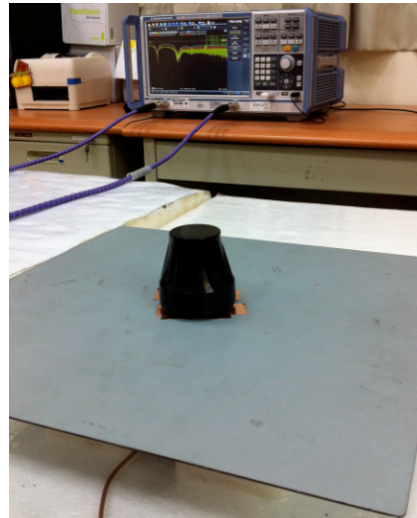
GPS-GLONASS	
Center Frequency	GPS:1575.42 MHz GLONASS:1602 MHz
Gain	2dBic (Zenith)
VSWR	<1.5
Impedance	50Ω
Polarization	RHCP
Cable	1M RG174 standard, fully customizable
Connector	SMA(M) standard, fully customizable
LNA Electrical Properties	
Center Frequency	GPS:1575.42 MHz GLONASS:1602 MHz
Impedance	50 Ω
VSWR	<2.0
Ex-band Attenuation	35dB@CF±50MHz/50dB@CF±100MHz
Gain	24±2dB @ DC 3V
DC Power Input	2.2~5V DC
Noise Figure	<1.5
Power Consumption	5~15mA
MECHANICAL	
Dimensions (mm)	Height=48mm and Diameter=50mm
Cable	GPS/GLONASS:RG174/1M GSM:RG316/1M
Connector	SMA(M)
Casing	UV Resistant ABS
Mounted Method	Screw
Rec Mounting Torque	2.94N·m
Max Mounting Torque	3.92N·m
Base and Thread	Nickel plated Copper
Nut	Nut M12
Sealant	Rubber Stopper
Weight	160g
ENVIRONMENTAL	
Operation Temperature	-40°C to 85°C
Storage Temperature	-40°C to 85°C
Humidity	Up to 95%
Ingress Protection	IP67 (exclude cable outlet)
Vibration	10 to 55Hz with 1.5mm amplitude 2hours
Environmentally Friendly	ROHS Compliant
Cable Pull	8Kgf(* 1 meters)

3. Antenna Characteristics

3.1 Test setup



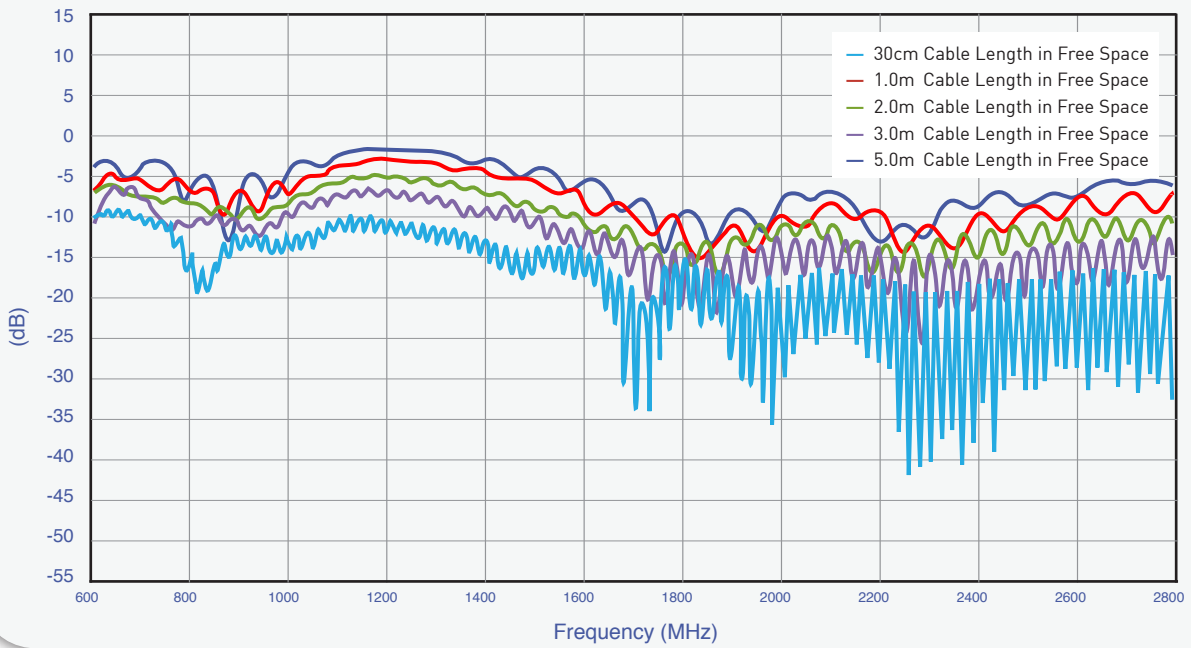
In free space



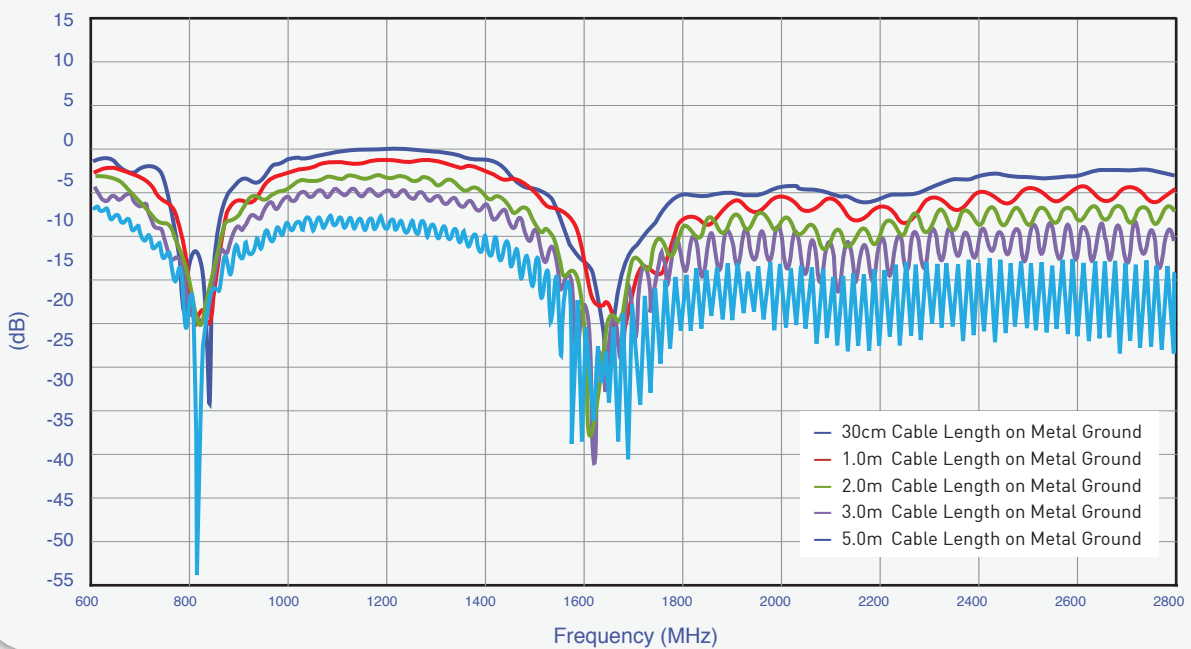
On 30x30 metal ground

3.2 Return Loss

3.2.1 In free space

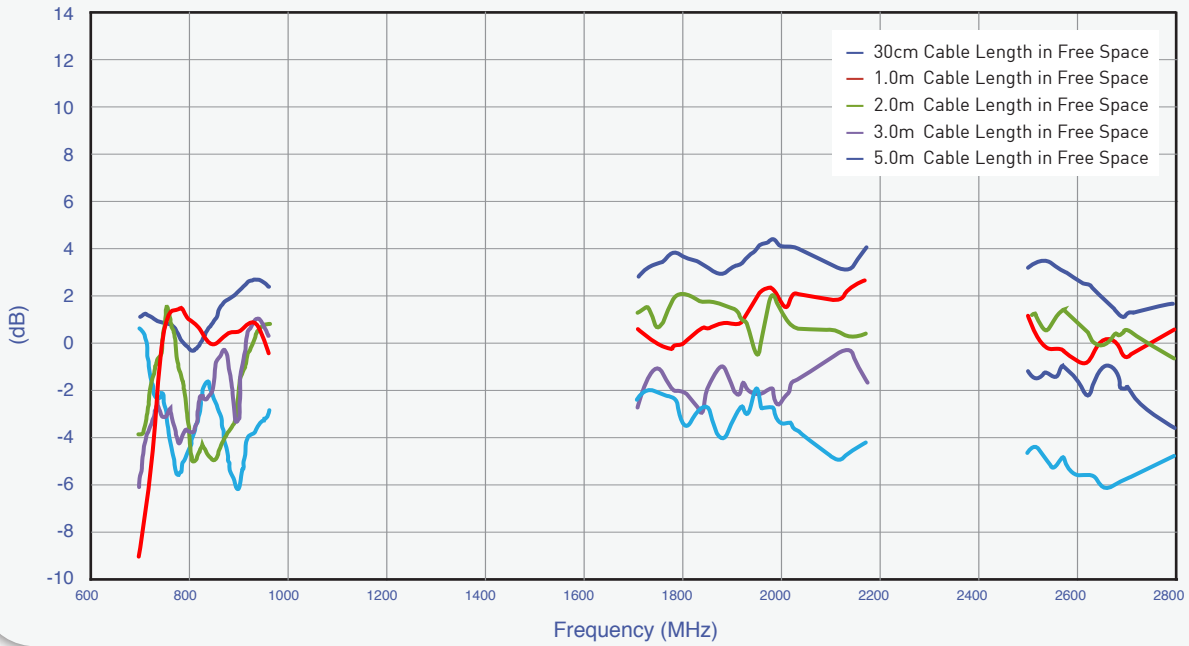


3.2.2 On 30x30 metal ground

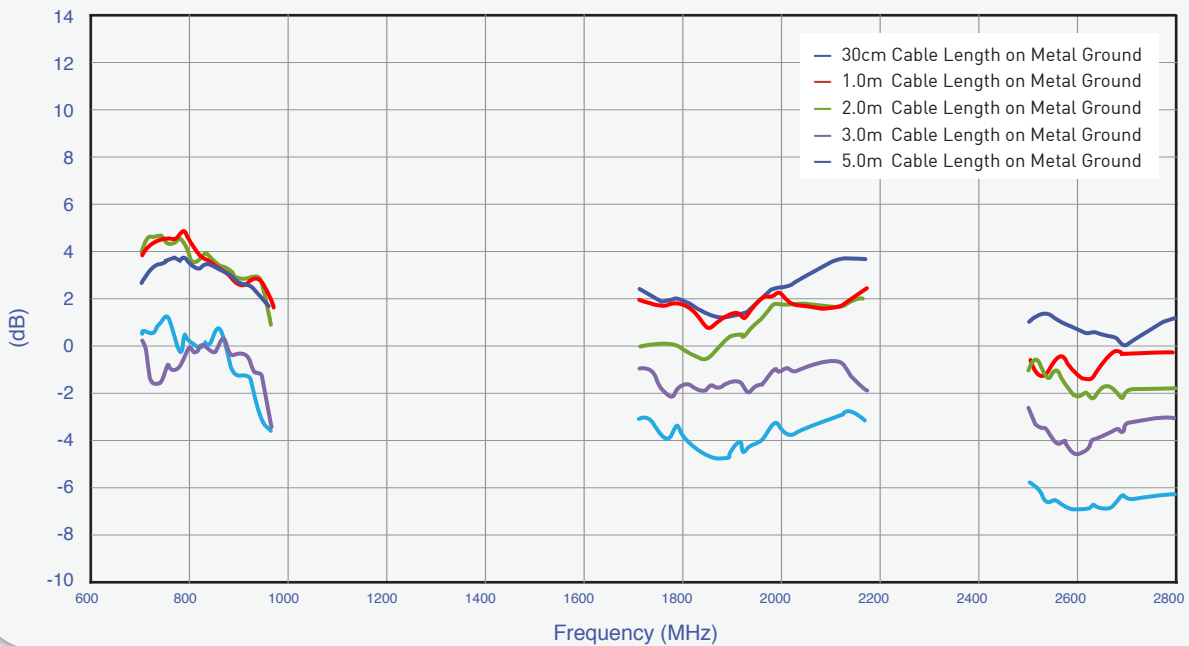


3.3 Peak Gain

3.3.1 In free space

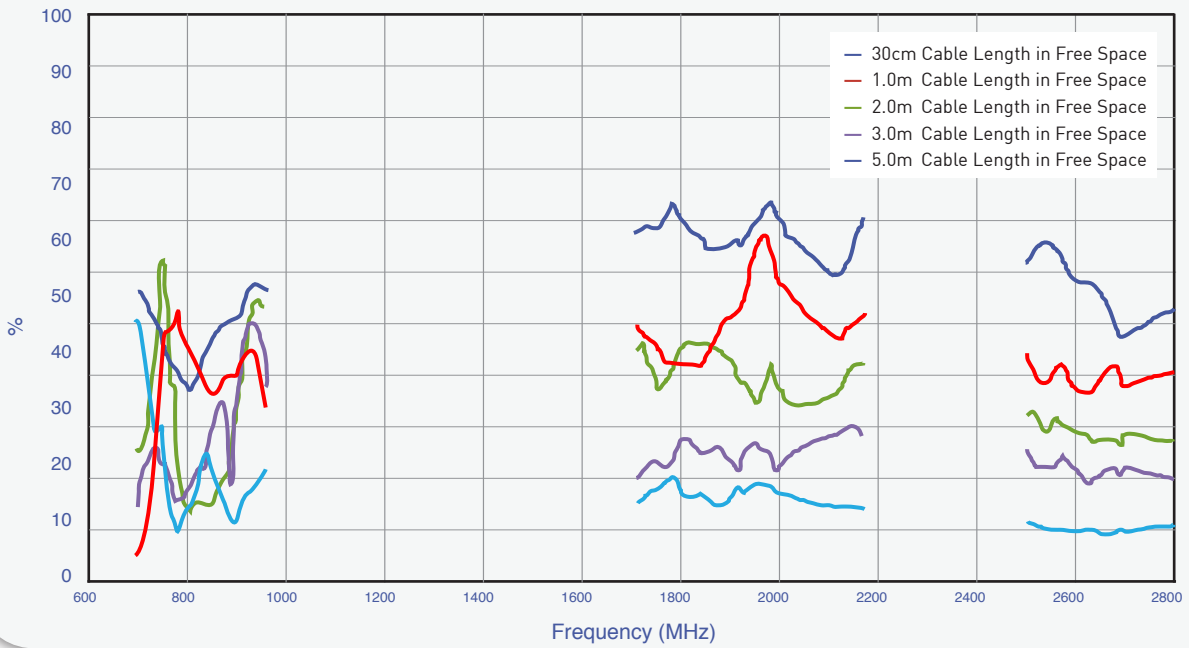


3.3.2 On 30x30 metal ground

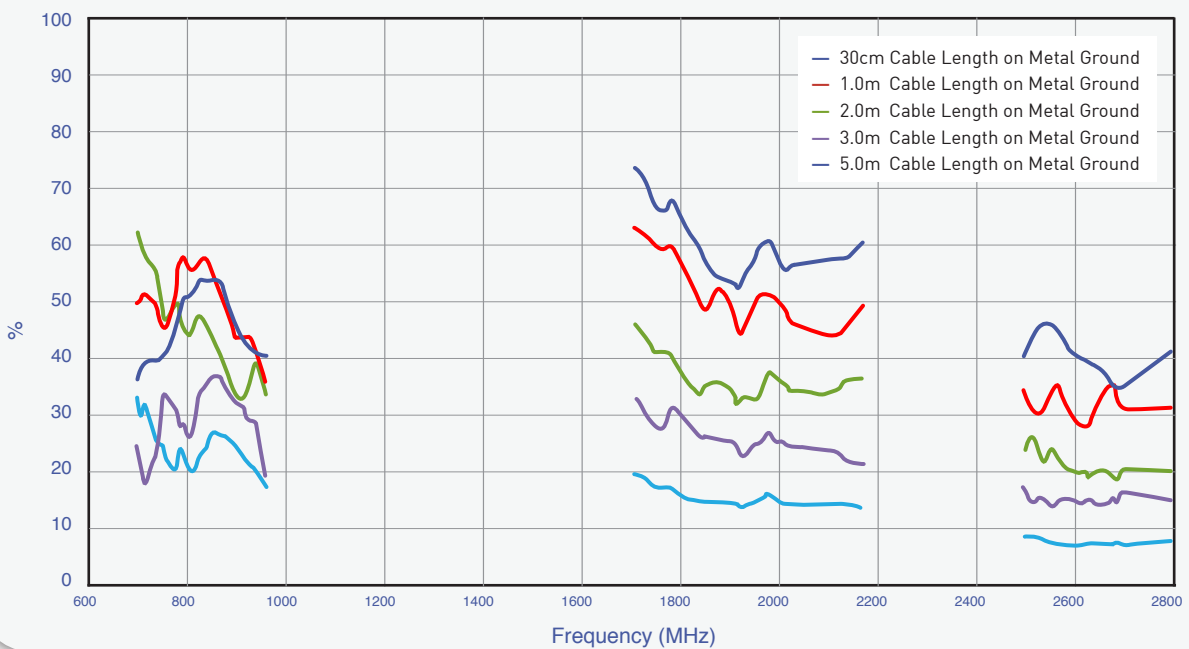


3.4 Efficiency(%)

3.4.1 In free space

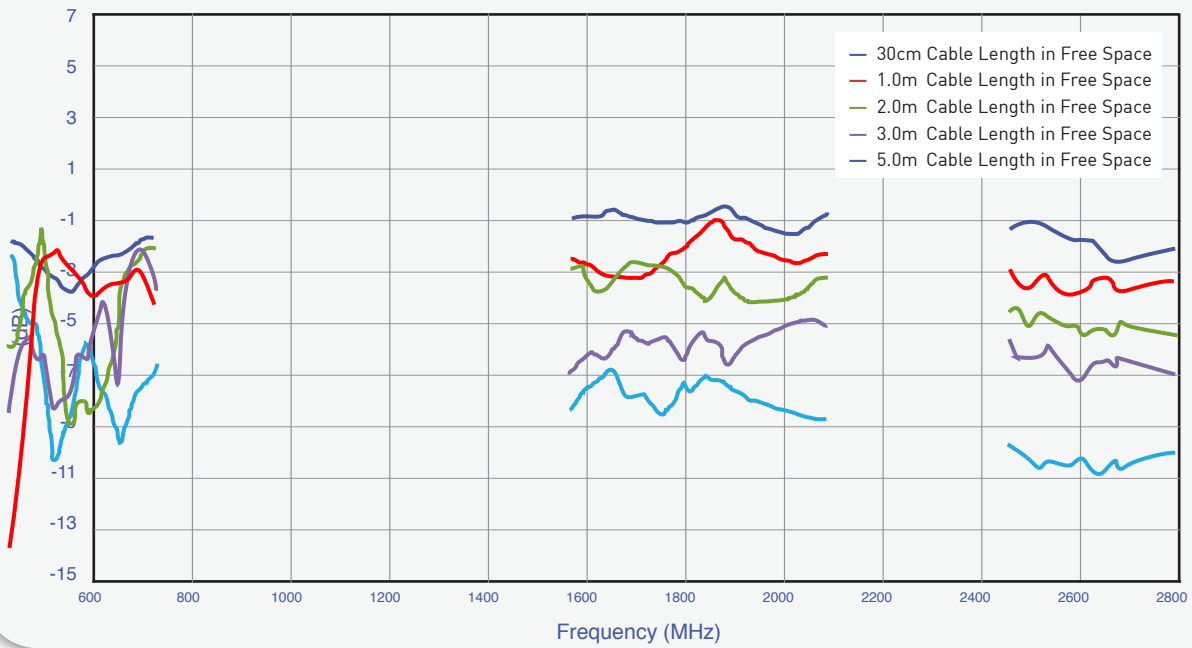


3.4.2 On 30x30 metal ground

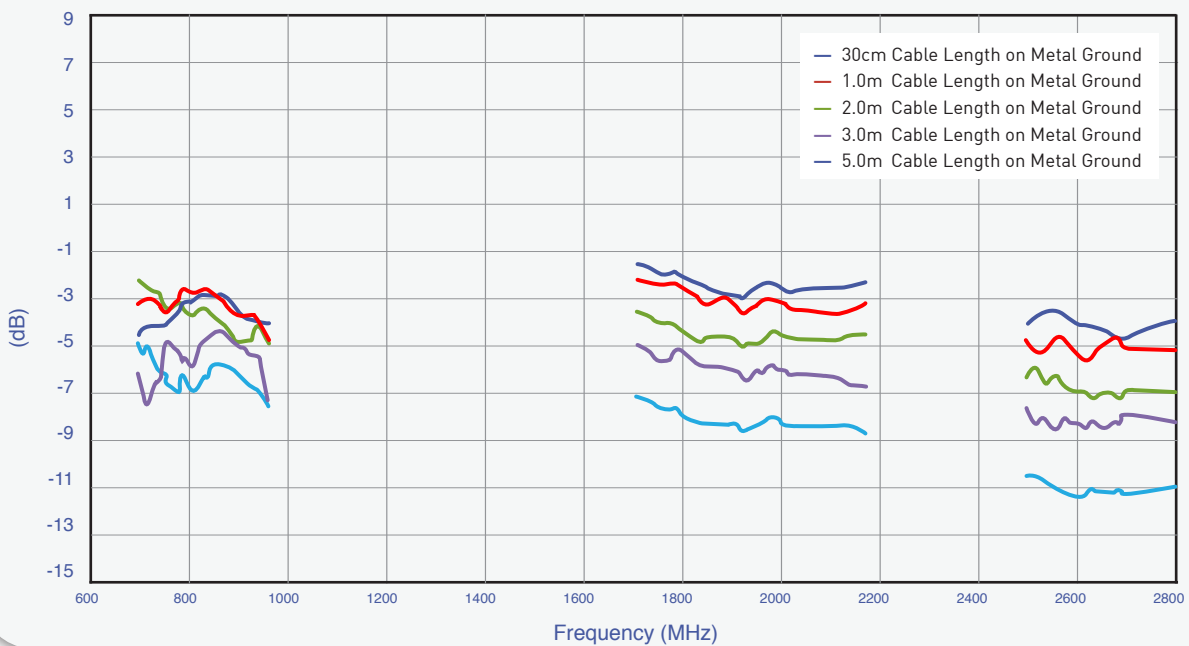


3.5 Average Gain

3.5.1 In free space

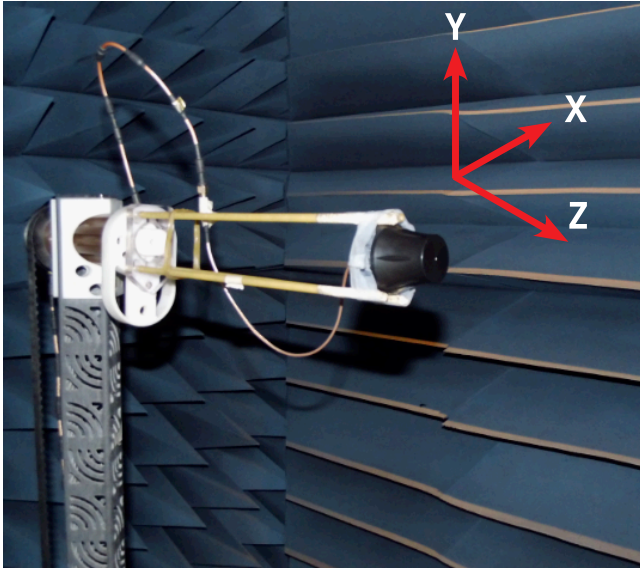


3.5.2 On 30x30 metal ground

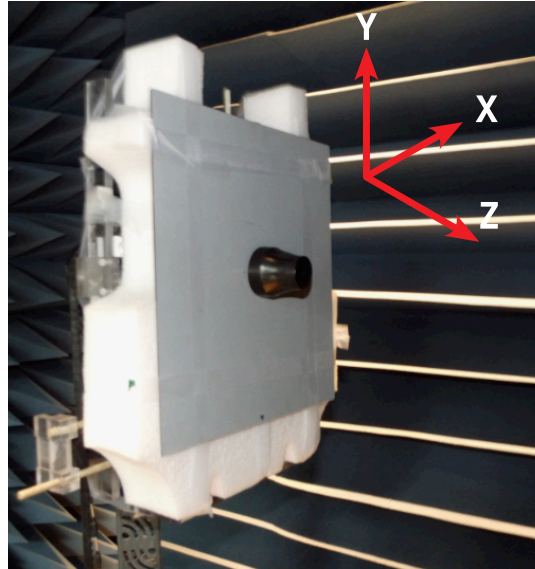


4. Antenna Radiation Patterns

4.1 Antenna setup



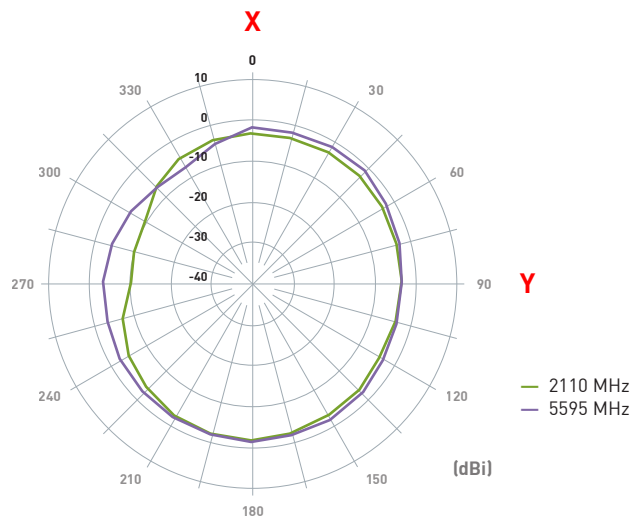
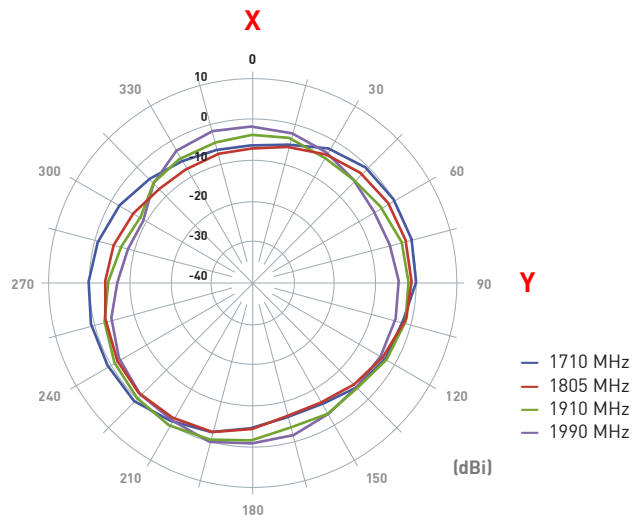
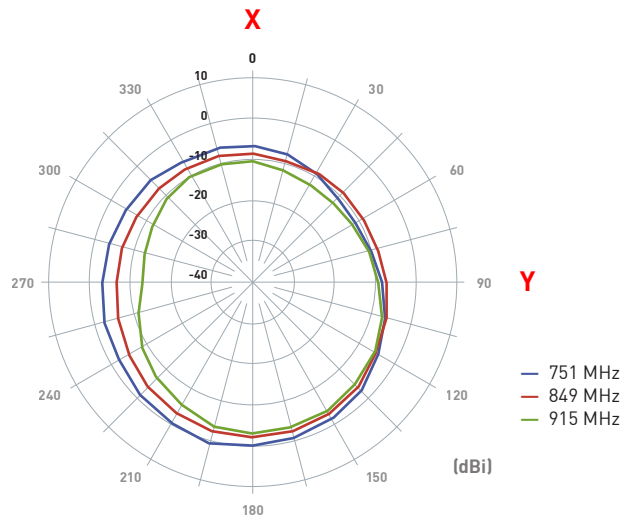
In free space



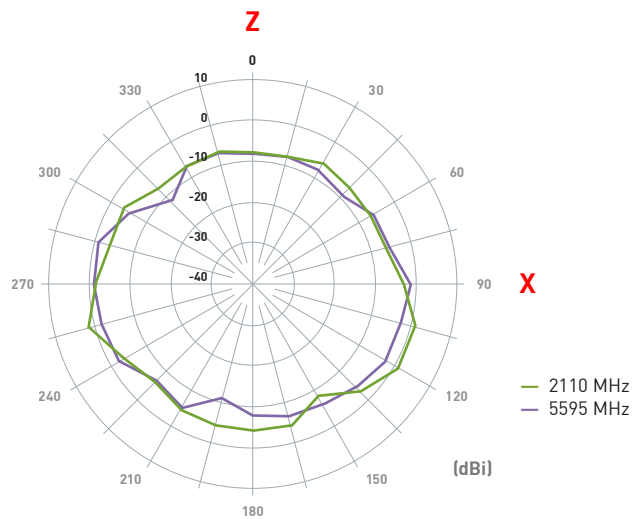
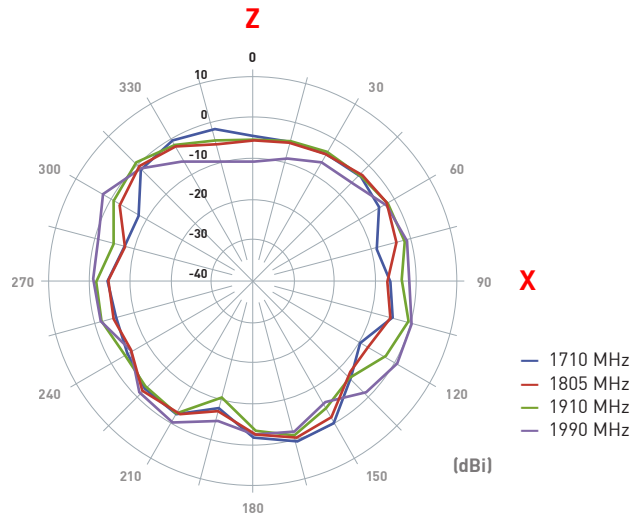
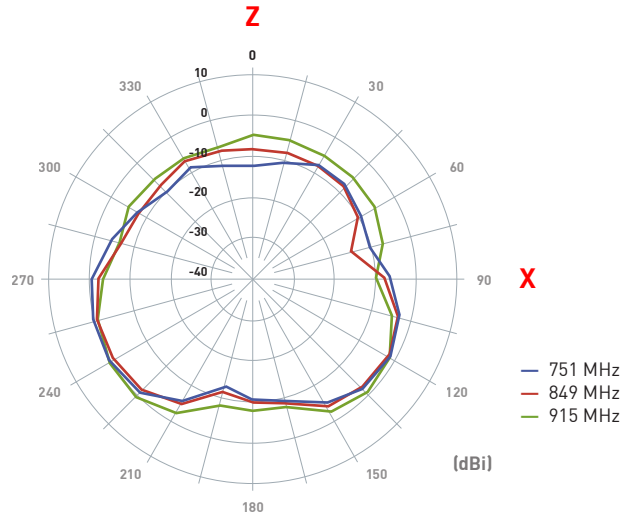
On 30x30 metal ground

4.2 In free space

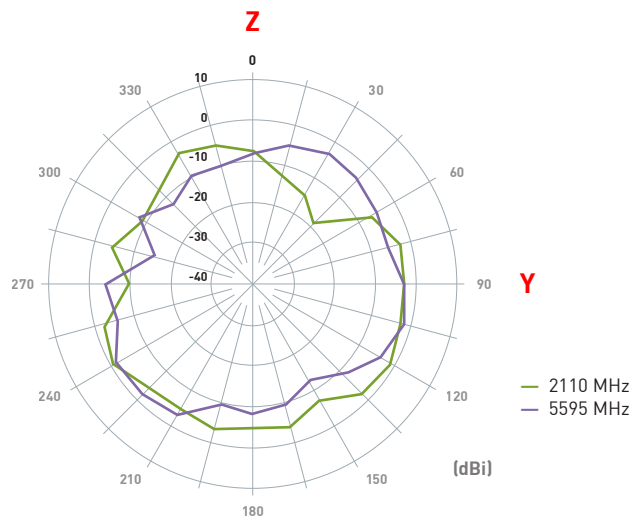
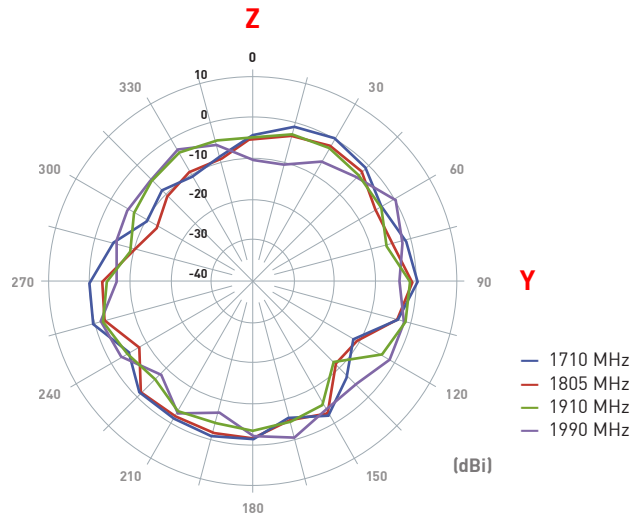
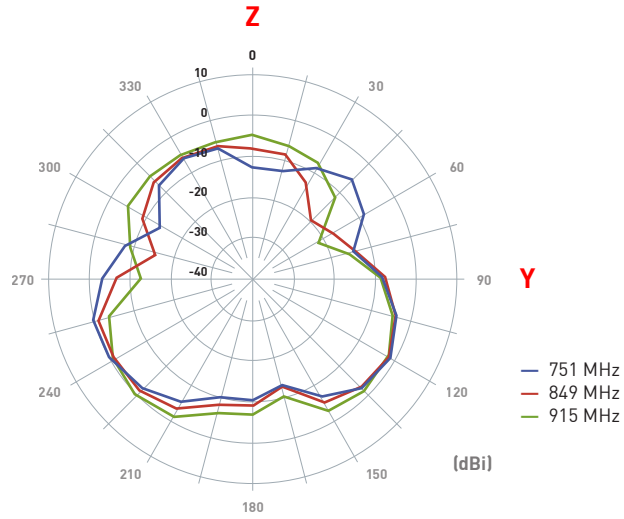
XY Plane



X Z Plane

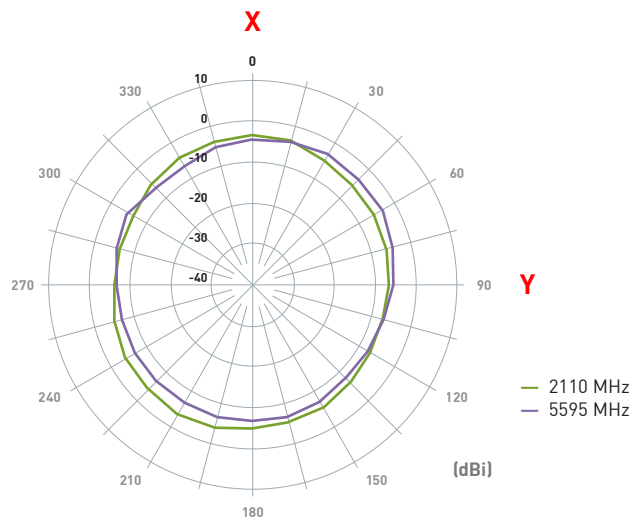
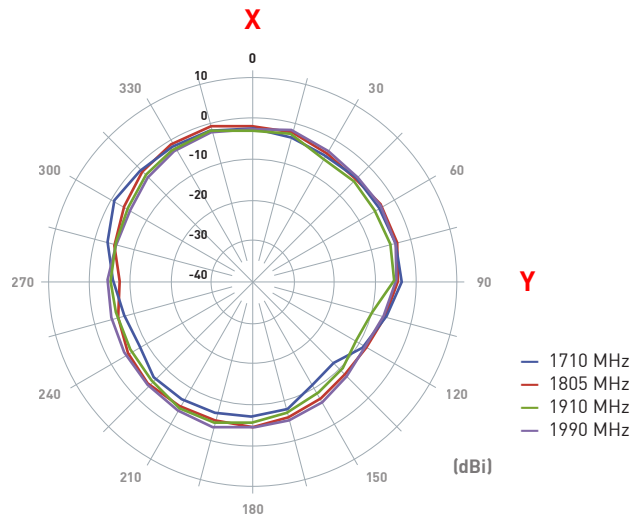
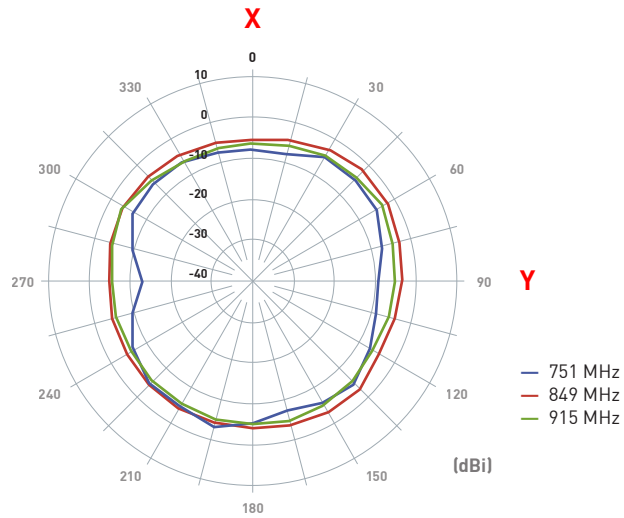


Y Z Plane

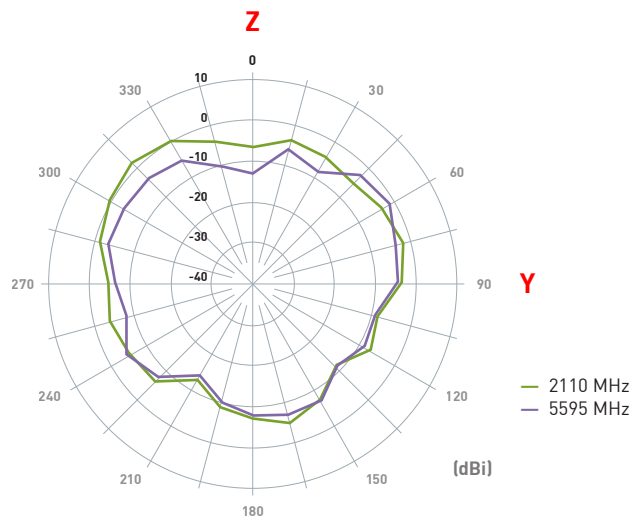
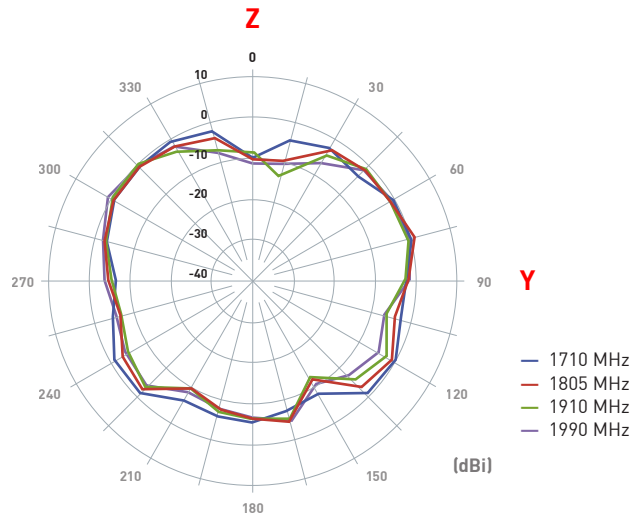
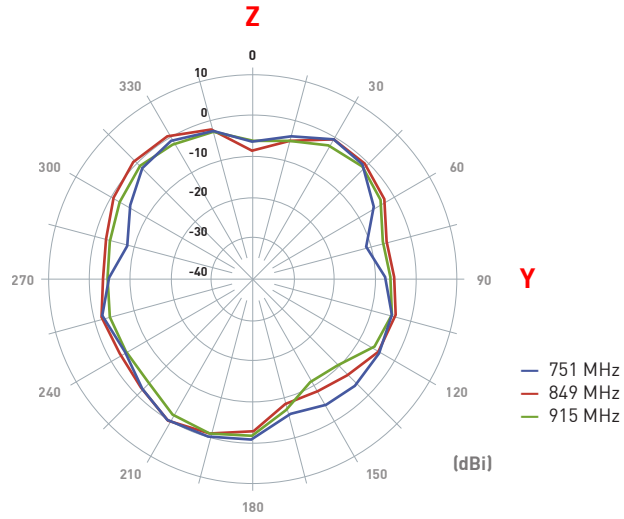


4.3 On 30x30cm Metal Ground Plane

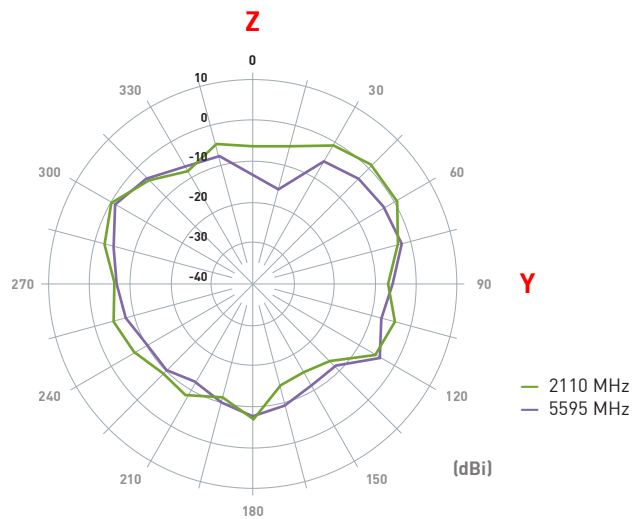
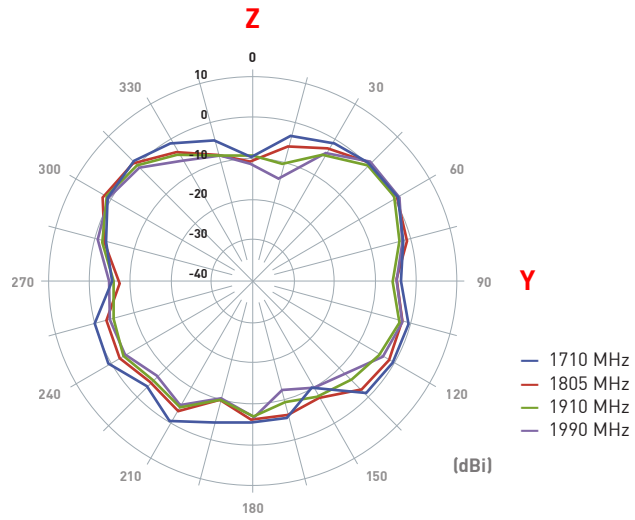
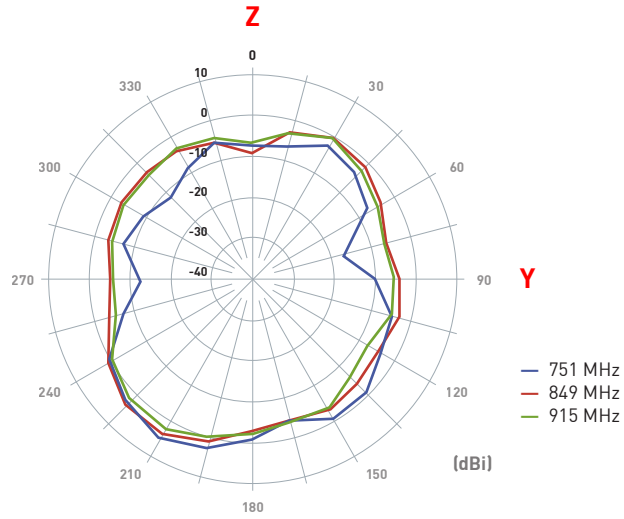
X Y Plane



Y Z Plane

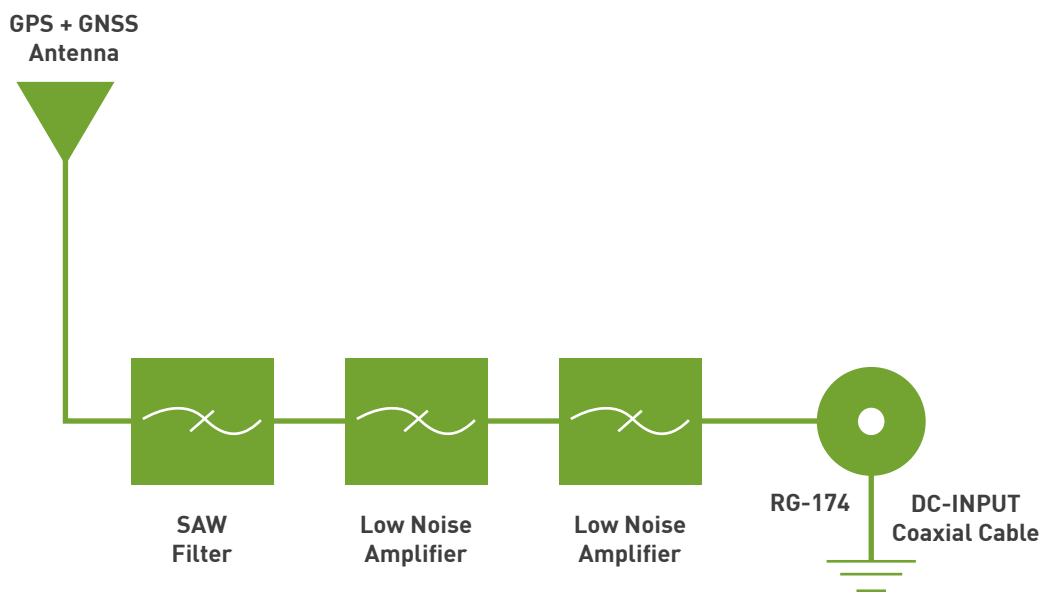


Y Z Plane

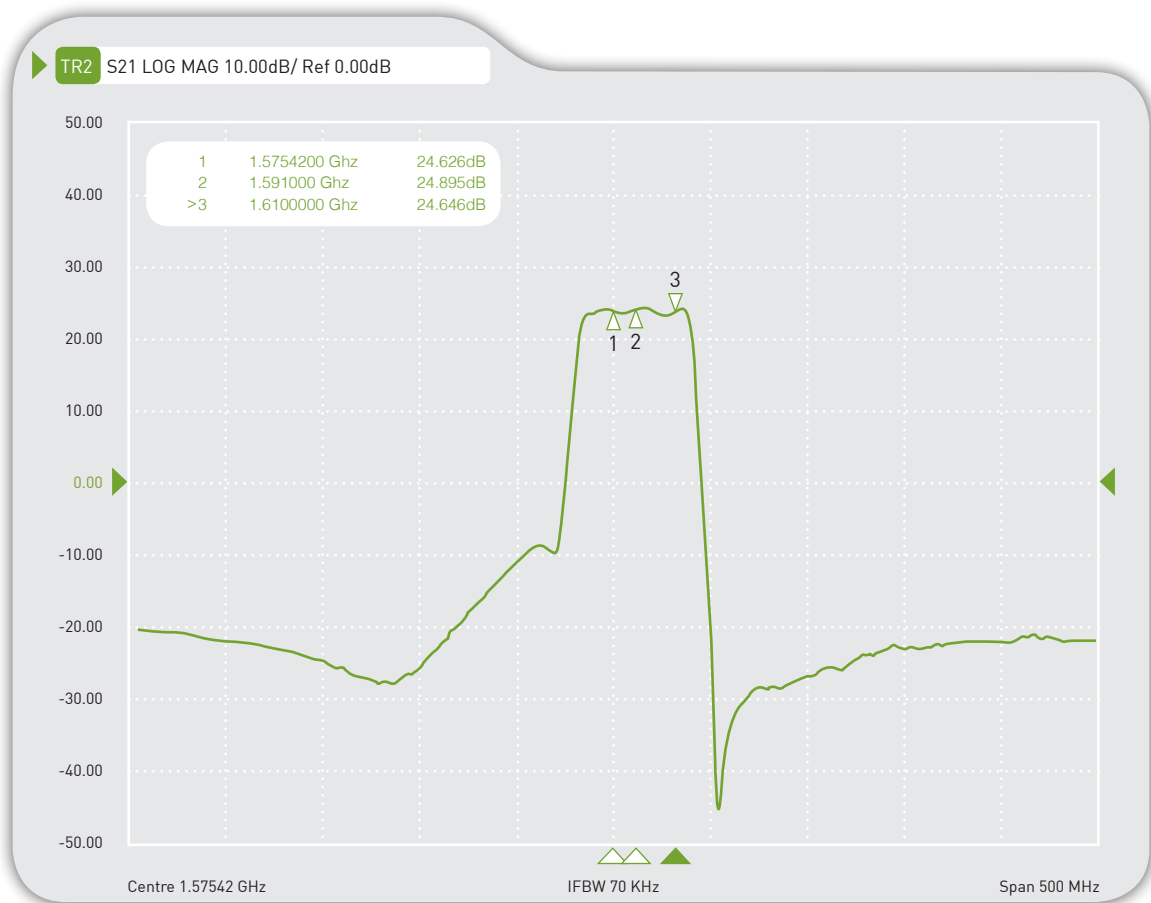


5. GPS/GLONASS Antenna

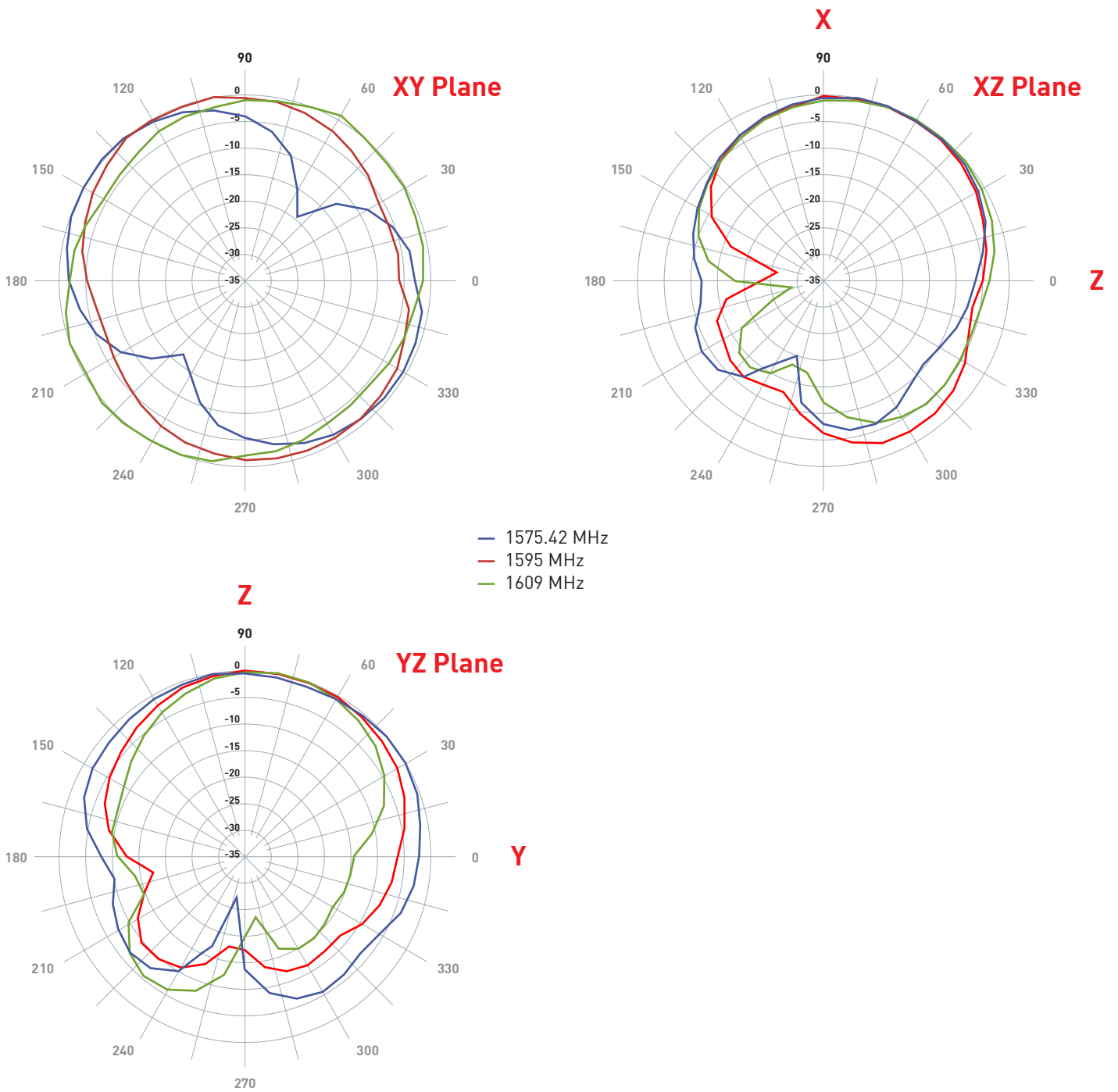
5.1 GPS/GLONASS Antenna Block Diagram



5.2 GPS/GLONASS LNA S21 Parameter Results

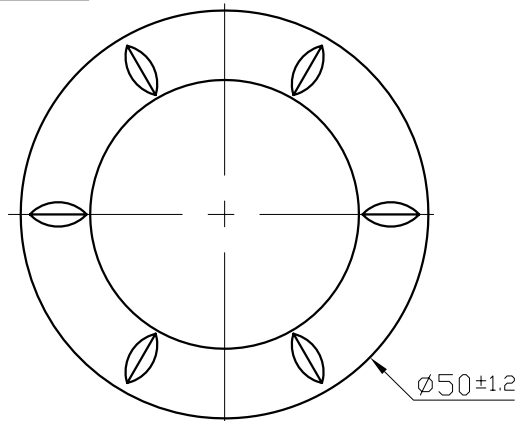


5.3 GPS/GLONASS LNA S21 Parameter Results

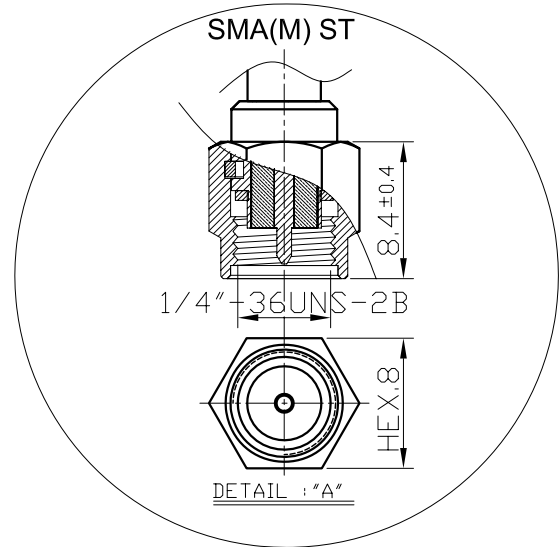
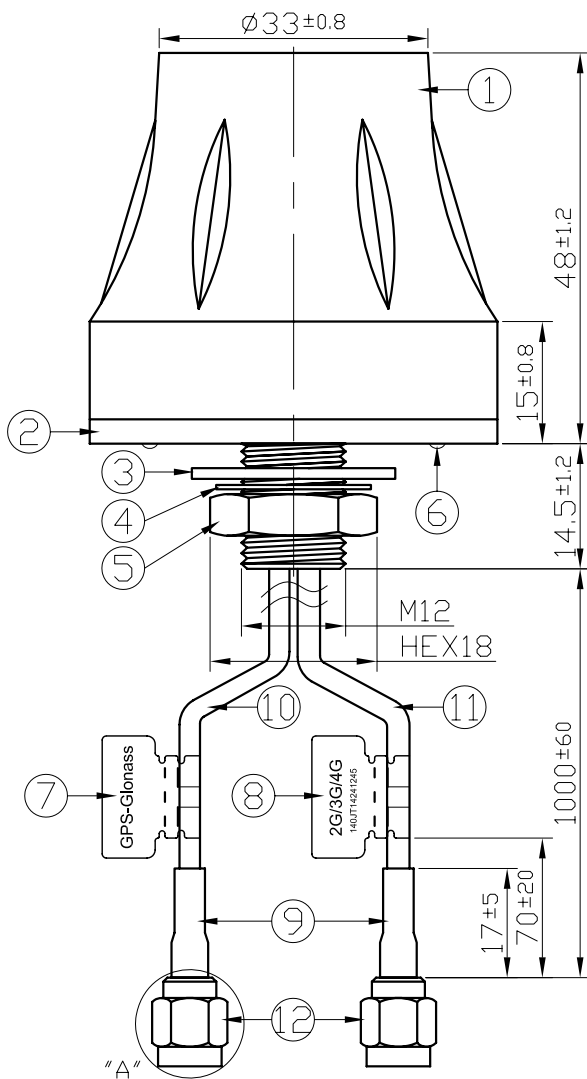


6.0 Drawing

Top view

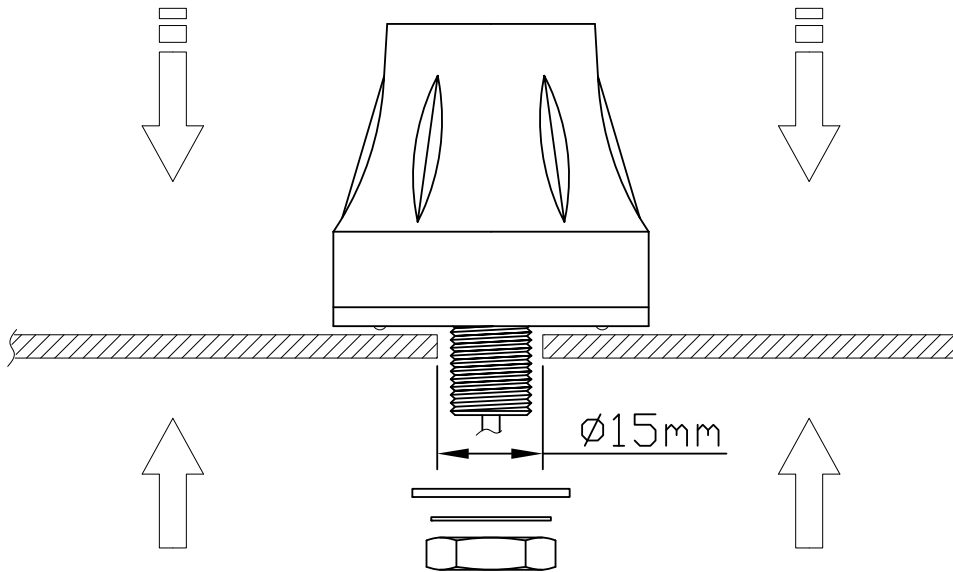


Side view



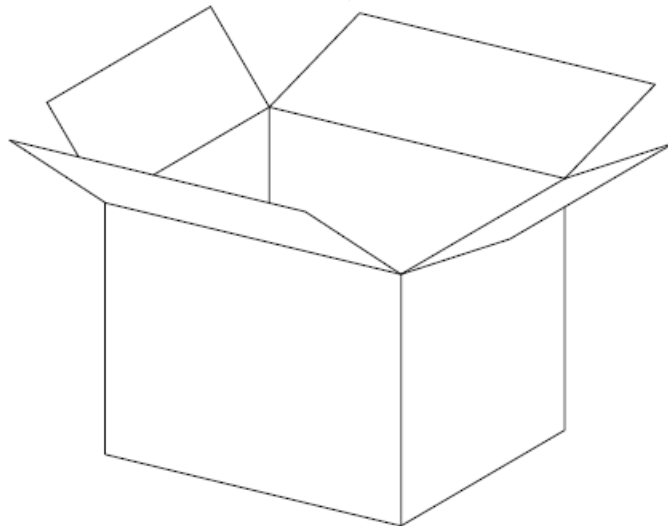
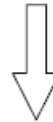
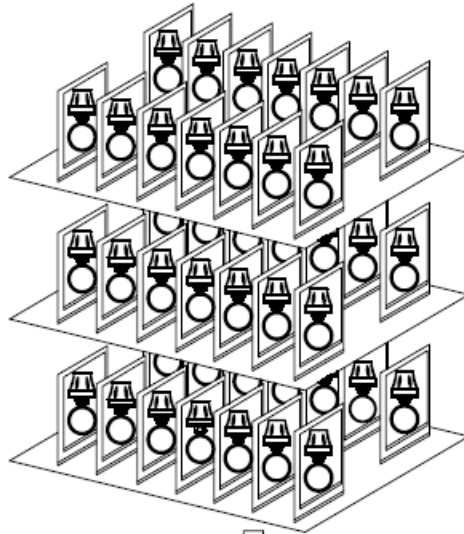
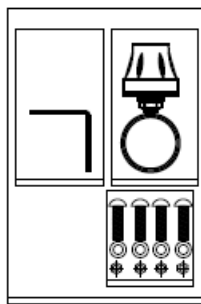
	Name	Material	Finish	QTY
1	Housing Top	ABS	Black	1
2	Housing Bottom	ABS	Black	1
3	Gasket	POM	Red	1
4	Multi Tooth Washer	Iron	Zinc	1
5	Nut M12	Copper	Nickel	1
6	O-Ring	NBR	Black	1
7	GPS-Glonass Label	Coated Paper	Orange	1
8	LTE Label	PET	White	1
9	Heat Shrink Tube	PE	Black	2
10	RG174	PVC	Black	1
11	RG316	FEP	Brown	1
12	SMA(M) ST	Brass	Gold	2

7.0 Installation



Recommended torque for mounting is 2.94 N·m
Maximum torque for mounting is 3.92 N·m

8. Packaging



1 Set Unit per PE Bag - 160g
50 PE Bags per Carton

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