SPECIFICATION

Part No. : **AA.109.301111**

Product Name : Active GPS/GALILEO Antenna [Single Stage LNA]

Features :
Magnetic Mount
Covert Stylish Design
Wide Band Input Voltage
Single Stage LNA
IP67
47mm x 45mm x 14.5mm
1575.42MHz Center Frequency
3m RG-174 Cable - Customizable
Output Connector: SMA (M) – Customizable
RoHS & REACH Compliant

Introduction

The AA.109 is provided with a one stage low gain LNA in order to be compatible with modules that have an integrated LNA with no automatic gain control.

Examples are Navman modules Jupiter 3 Jupiter 30xLP, Jupiter 32xLP, Jupiter 31 and Micro Modular Technologies MN1818, MN3310, MN5010HS.

Using a high gain GPS/GALILEO antenna such as the AA.105 can deliver too much gain when using these modules. However please note that there are losses in antenna cables and connectors and it is not advised to use the AA.109 with more than 3m of cable

1. Specifications

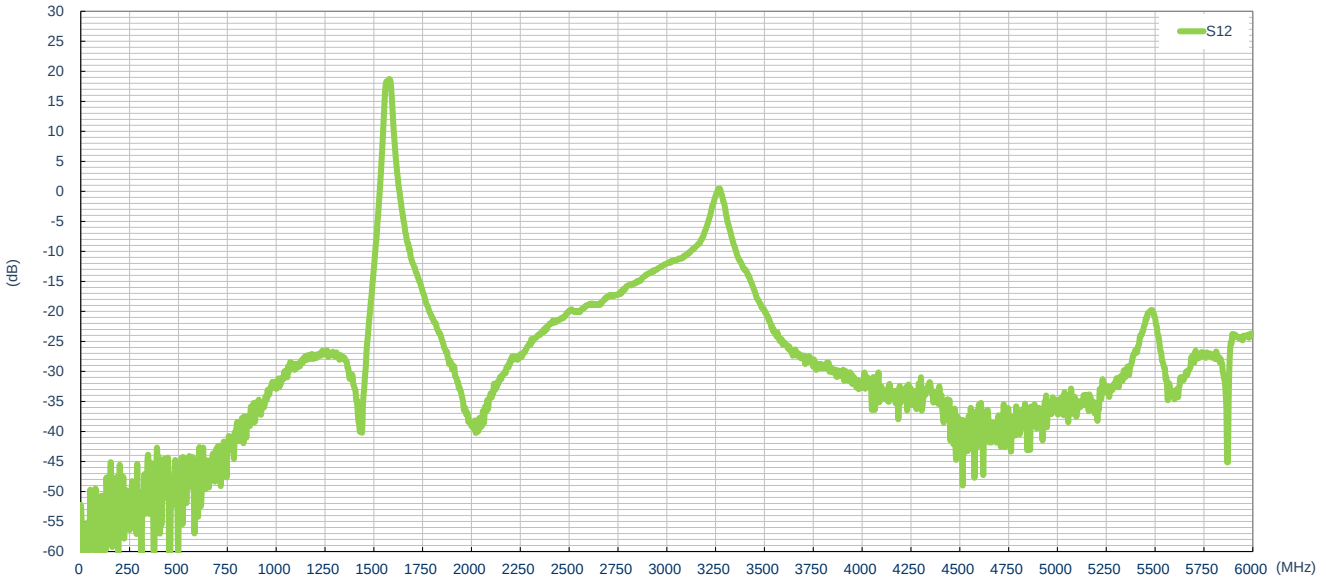
ELECTRICAL	
Frequency	1575.42 MHz ± 1.023 MHz
Bandwidth Return Loss <-10 dB	15MHz min
VSWR	1.5 max
Gain at Zenith	5.0dBic Typical
Gain at 10°elevation	-1.0 dBic min
Axial Ratio	< 3 dB
Polarization	RHCP
Impedance	50 Ohms
FILTER / LNA	
Centre Frequency	1575.42 MHz ± 1.023 MHz
Gain	20dB typical (VDC = 3v)
Noise figure	1.3dB typical (VDC = 3v)
Output V.S.W.R.	2.0 max
Voltage	DC = 2.4V - 5.5V
Current	DC = 5mA - 16mA (Typ: 3V draws 7mA)
MECHANICAL	
Ceramic Dimension	47 x 45 x 14.5 mm
Weight	110±10g (typical)
Color	Black
Mounting	Magnetic or 3M Double-Sided Adhesive
Magnetic Pull Force	1.3kgF
Cable Length / Type	3m RG-174 standard (Customizable)
Output Connector	SMA(M) standard (Customizable)
Housing Material	ABS
ENVIRONMENTAL	
Operating Temperature	-40°C to +85°C
Storage Temperature	-40°C to +85°C

***Measured on a 300mm x 300mm ground plane**

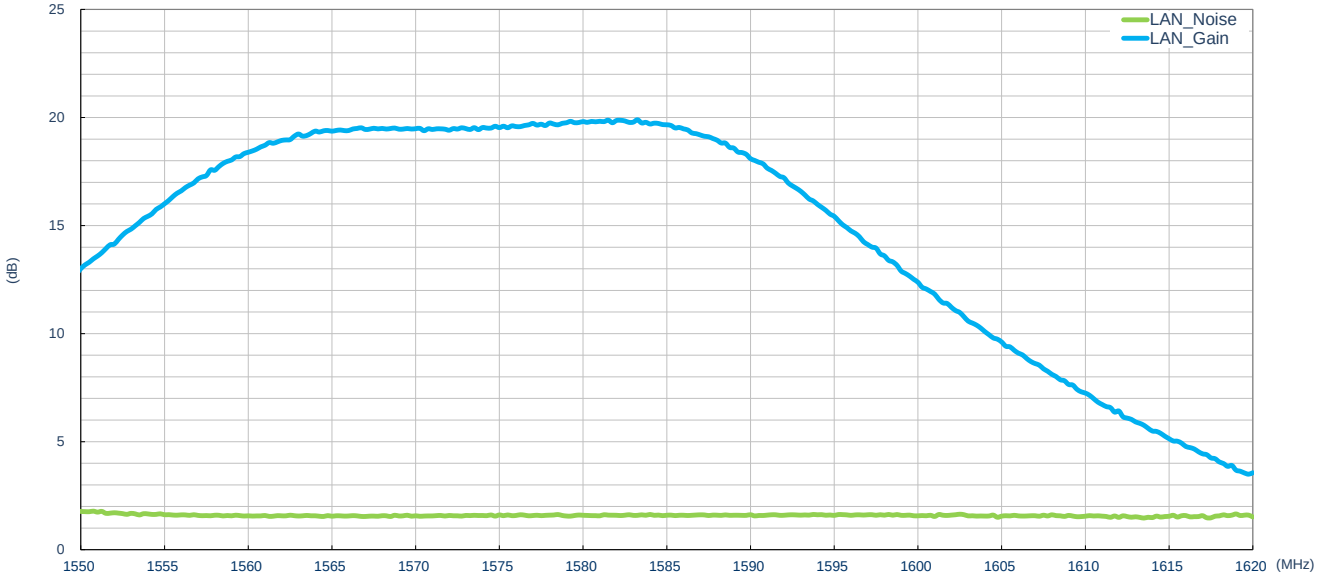
****Changes in user ground plane and environment will offset center frequency**

2. LNA Properties

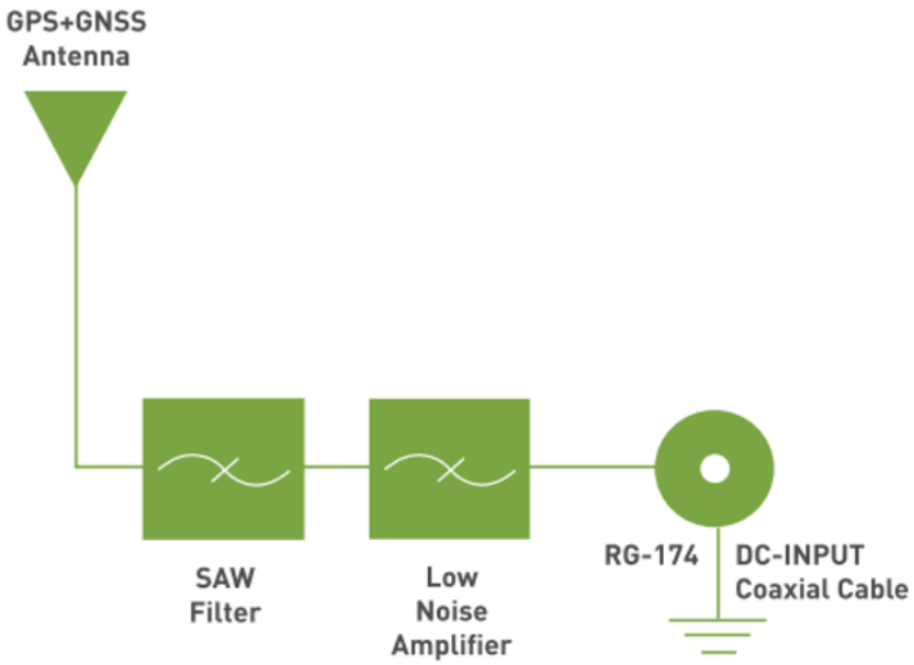
2.1 SAW Filter Properties



2.2 LNA Noise and Gain

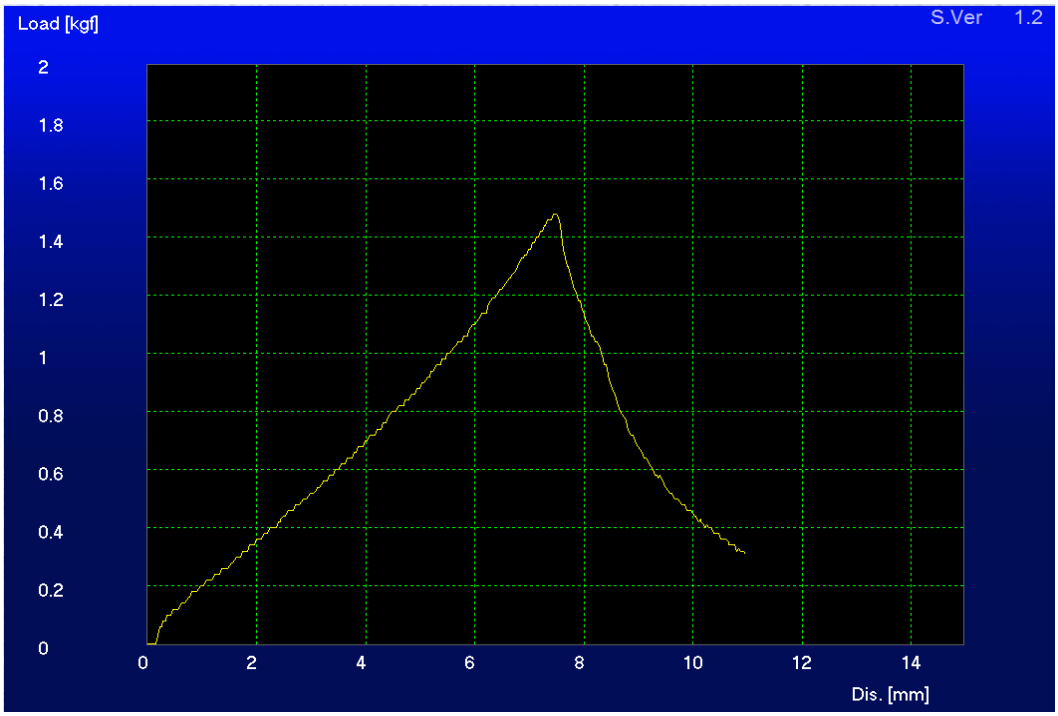


2.3 Block Diagram



2.4 Magnetic Pull Force

Vertical Axis



Result: 1.3kgF

3. Test Setup

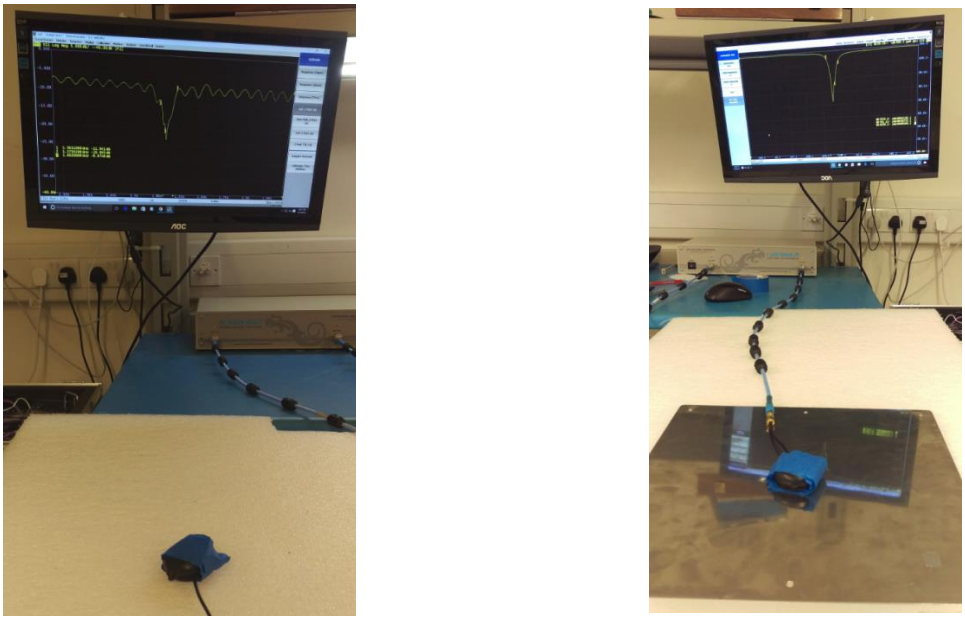


Figure 1. Return Loss measurement of the AA.109.301111 in Free Space and on a 300mm x 300mm Ground Plane

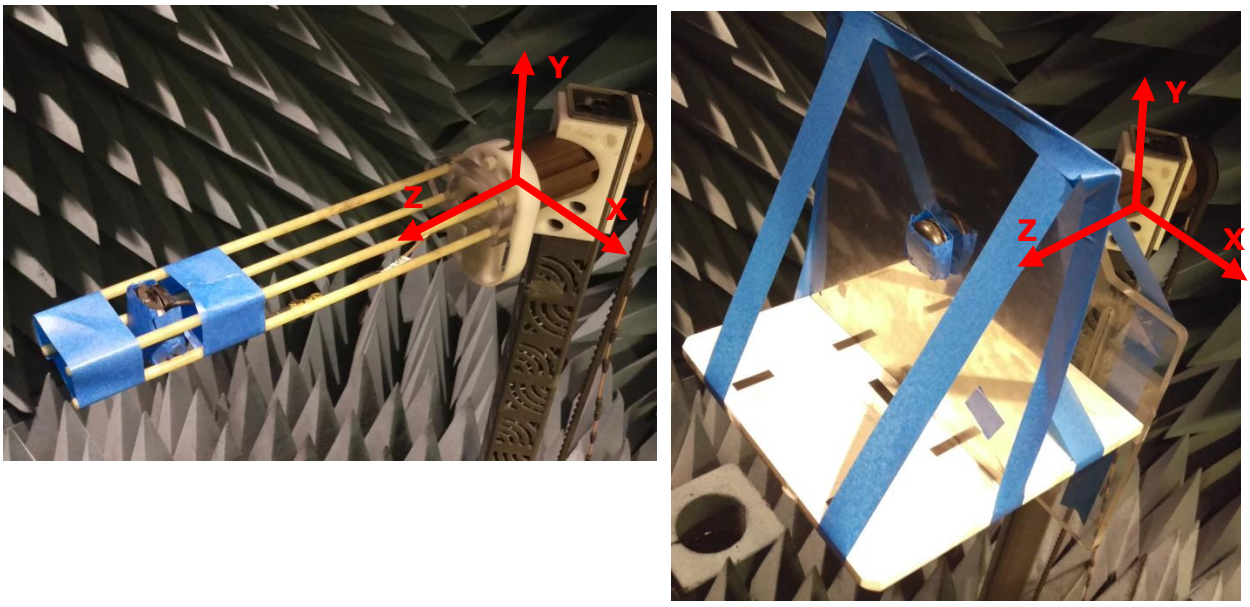
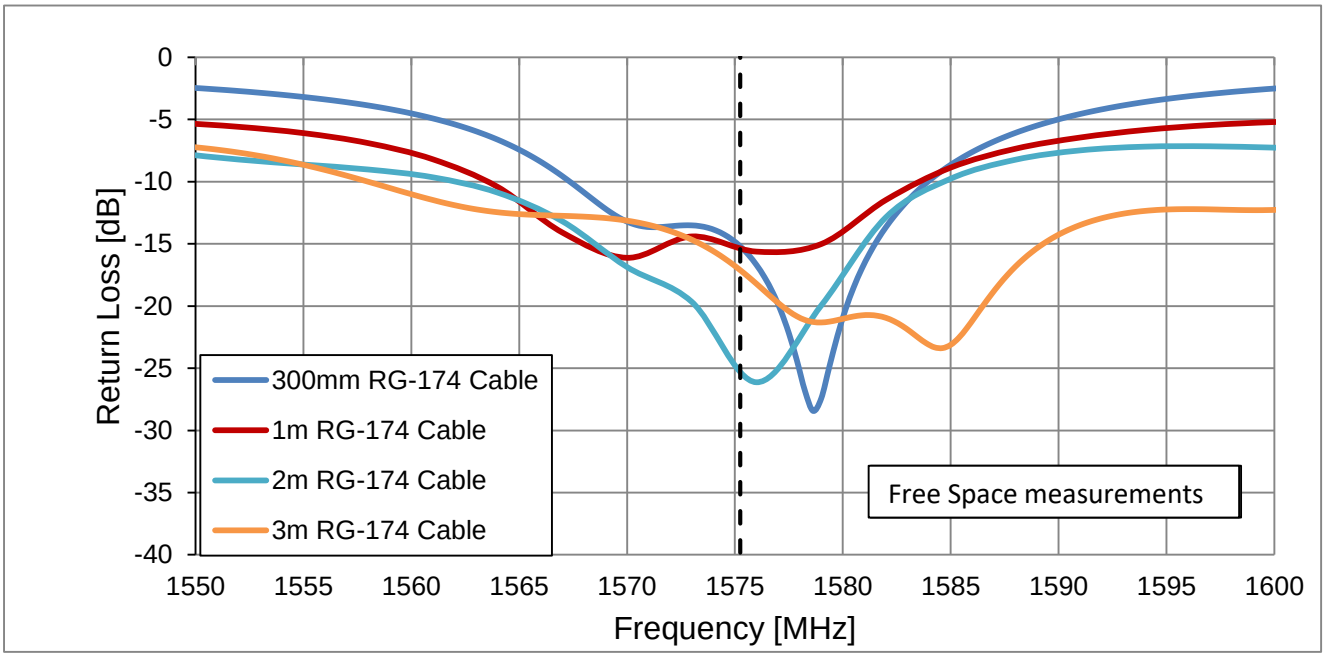


Figure 2. Peak gain, efficiency, and radiation pattern test setup

The antenna was tested in Free Space and on a 300mm x 300mm Ground Plane with different cable lengths: 300mm, 1m, 2m, 3m, 4m, 5m of RG-174 cable.

4. Antenna Properties

4.1 Return Loss



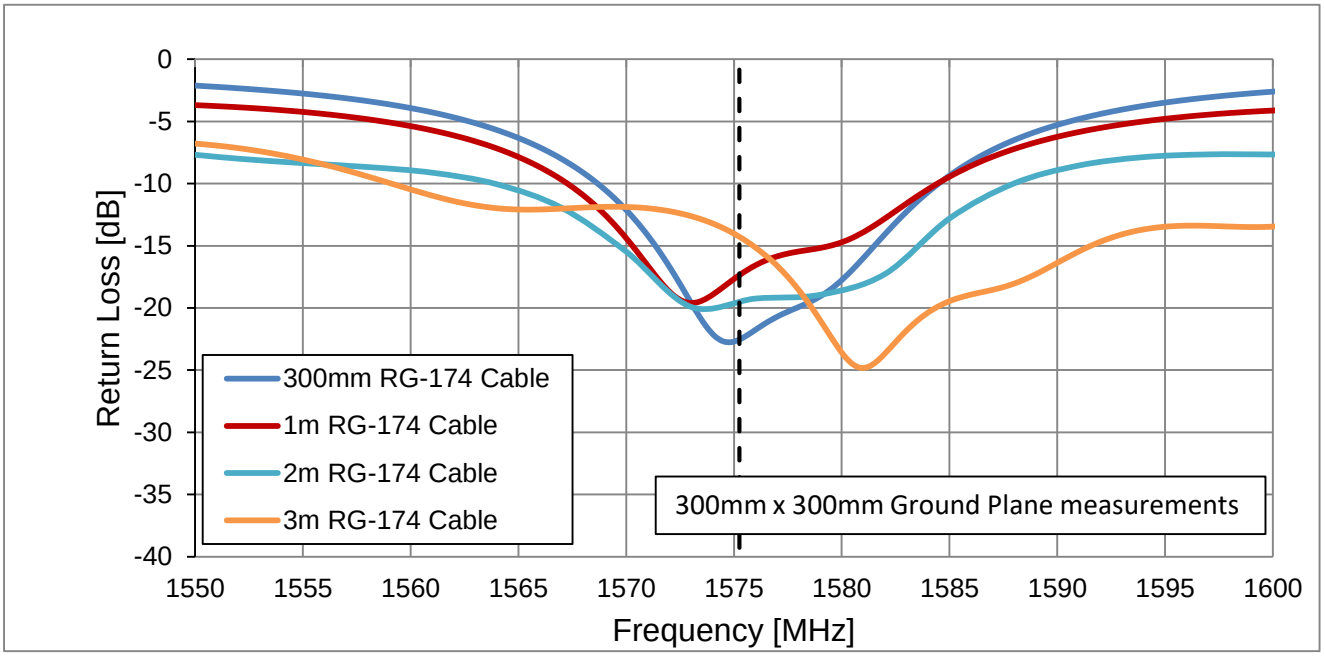


Figure 3. Return Loss of the AA.109 antenna

4.2 VSWR

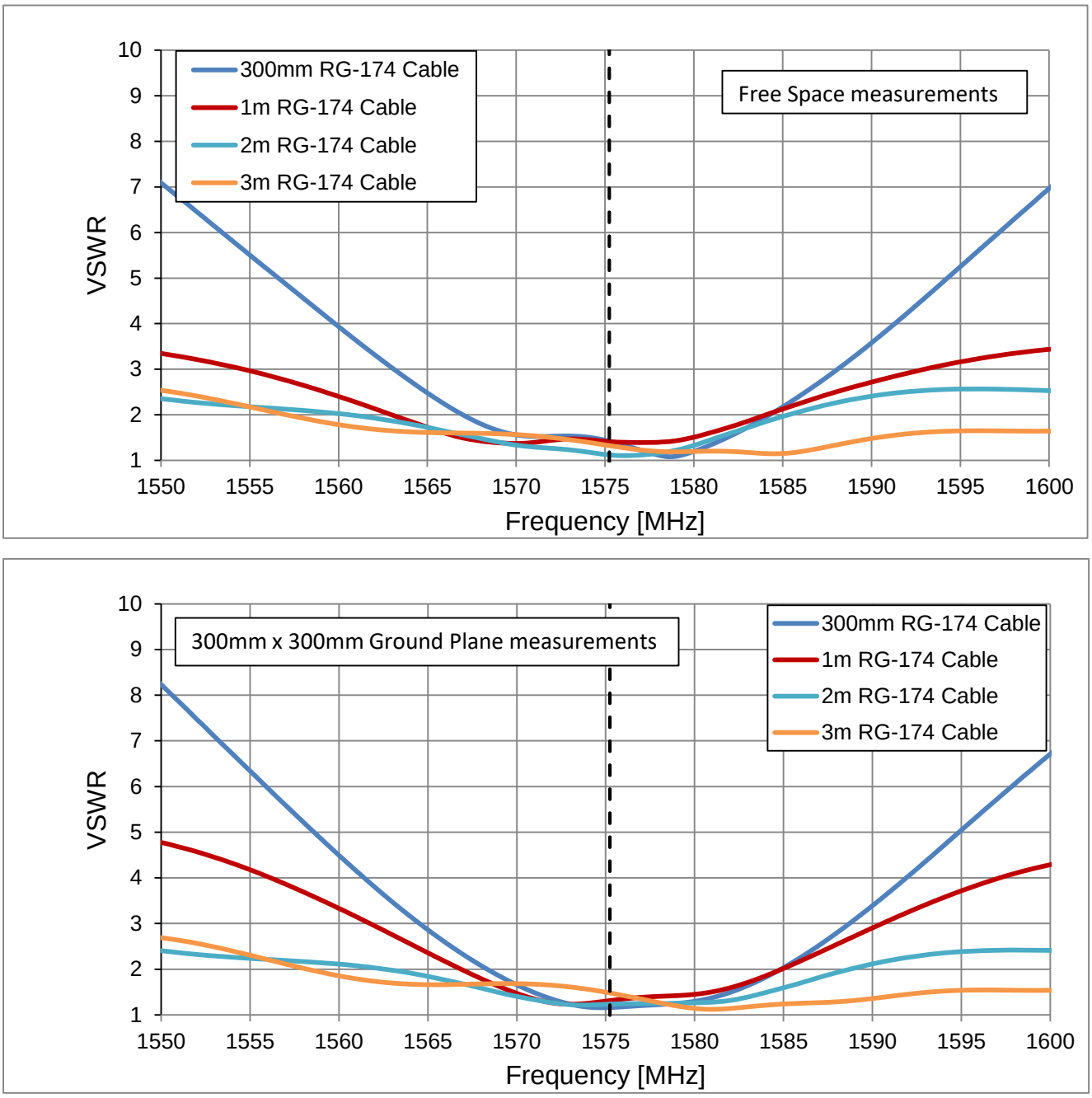
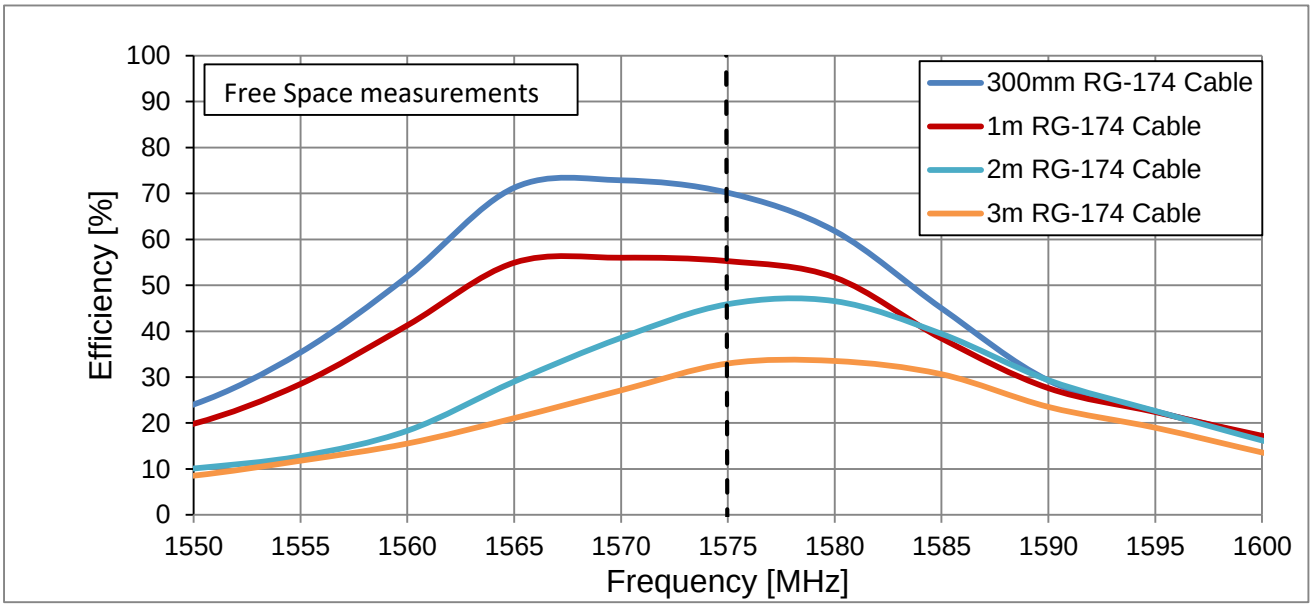


Figure 4. VSWR of the AA.109 antenna.

4.3 Efficiency



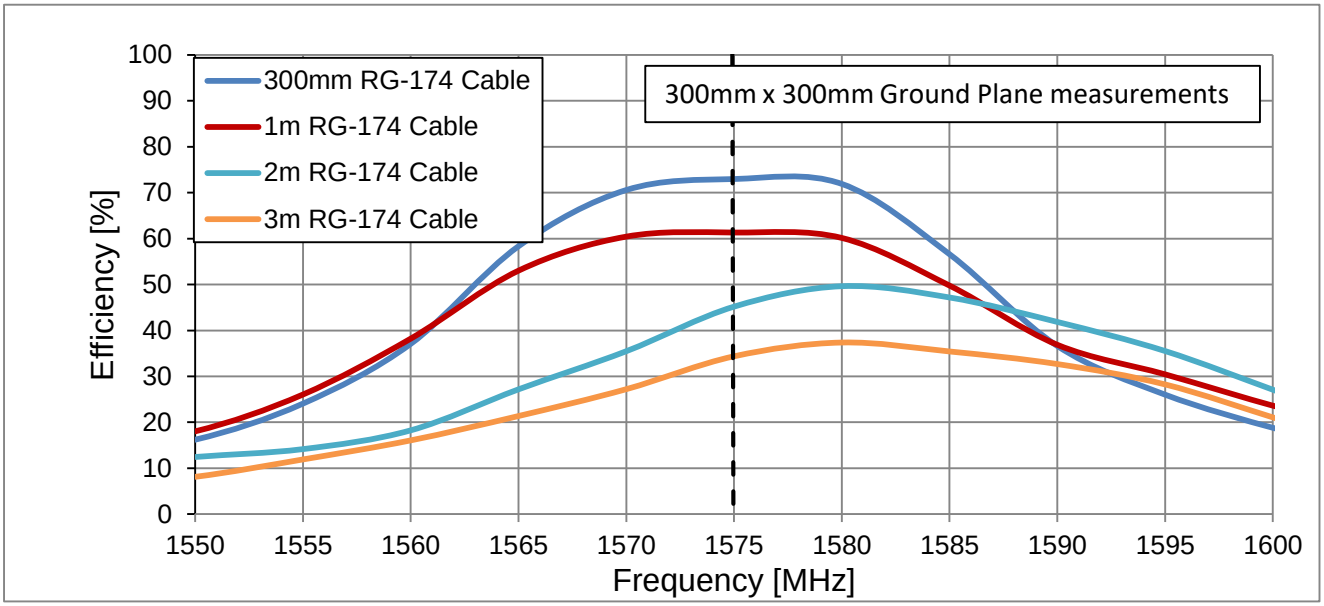
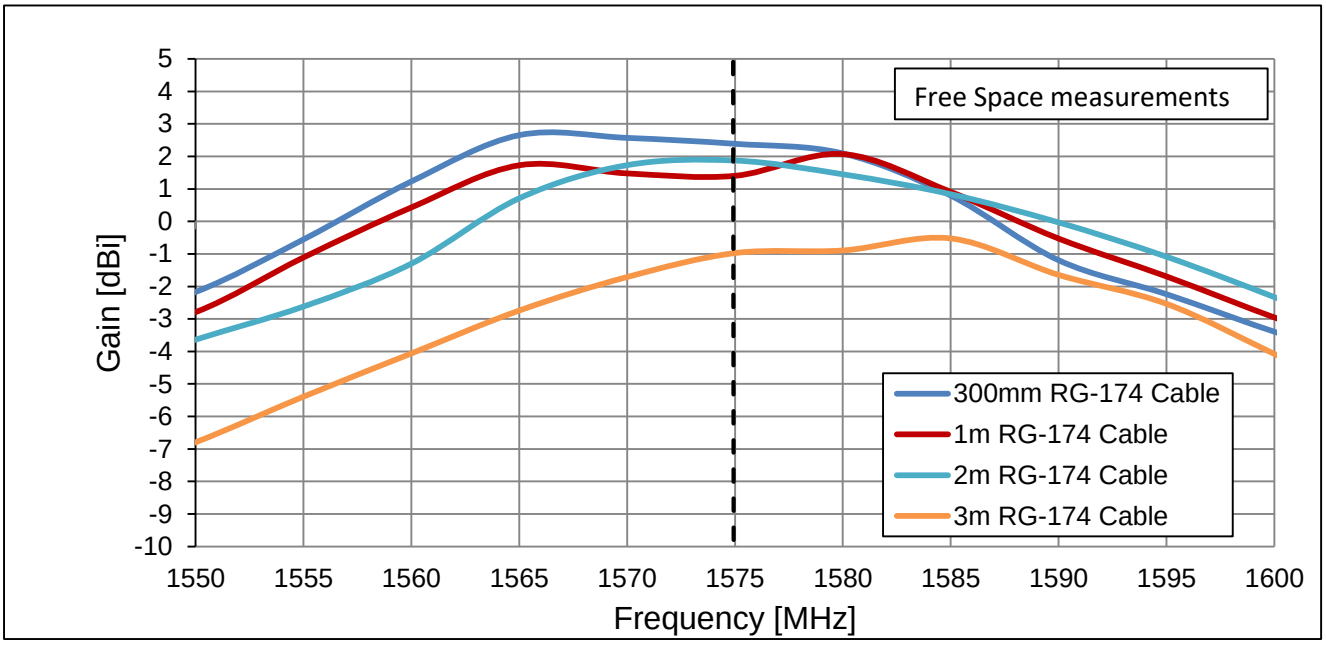


Figure 5. Efficiency of the AA.109 antenna.

4.4 Peak Gain



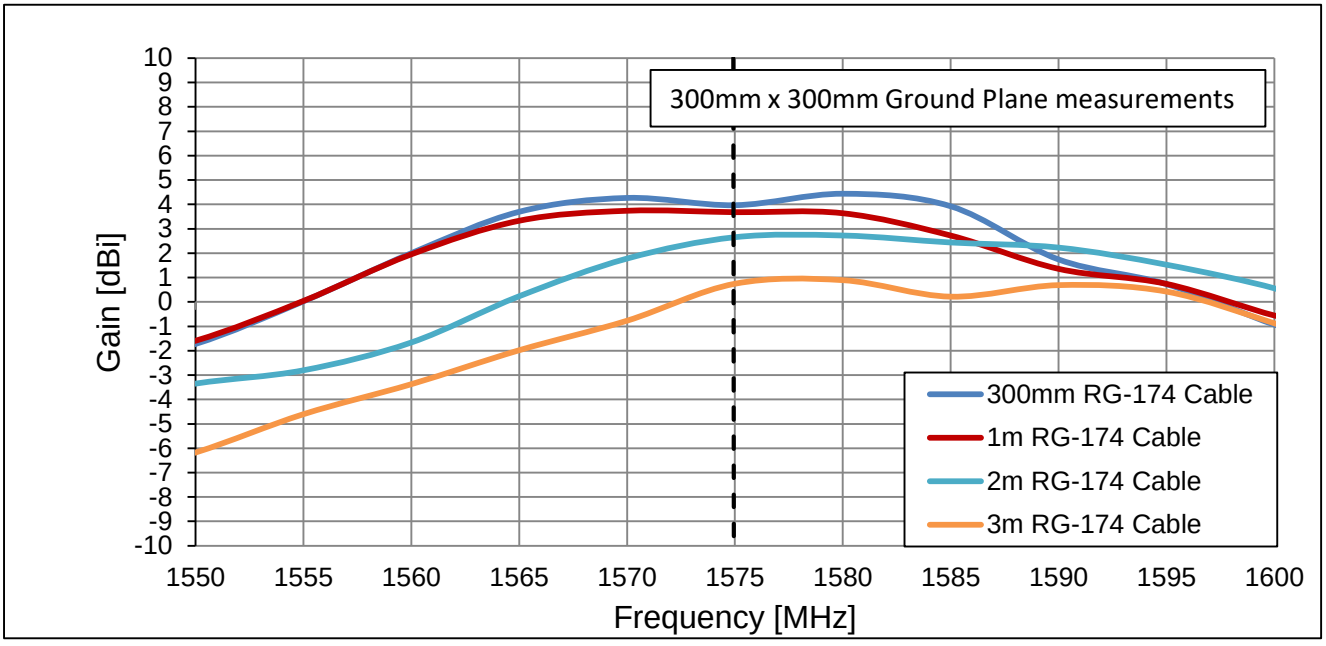


Figure 6. Peak Gain of the AA.109 antenna.

4.5 Average Gain

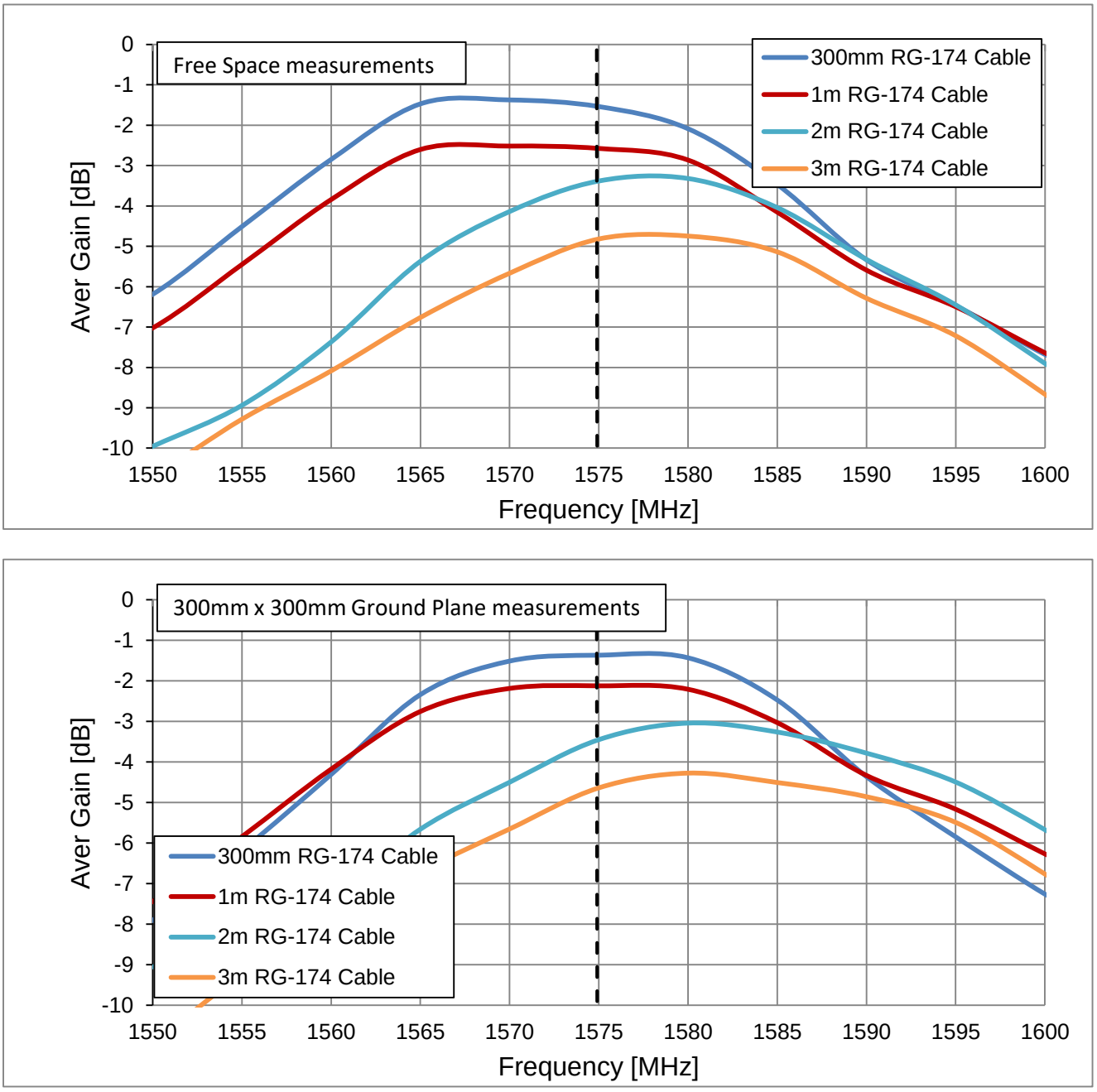
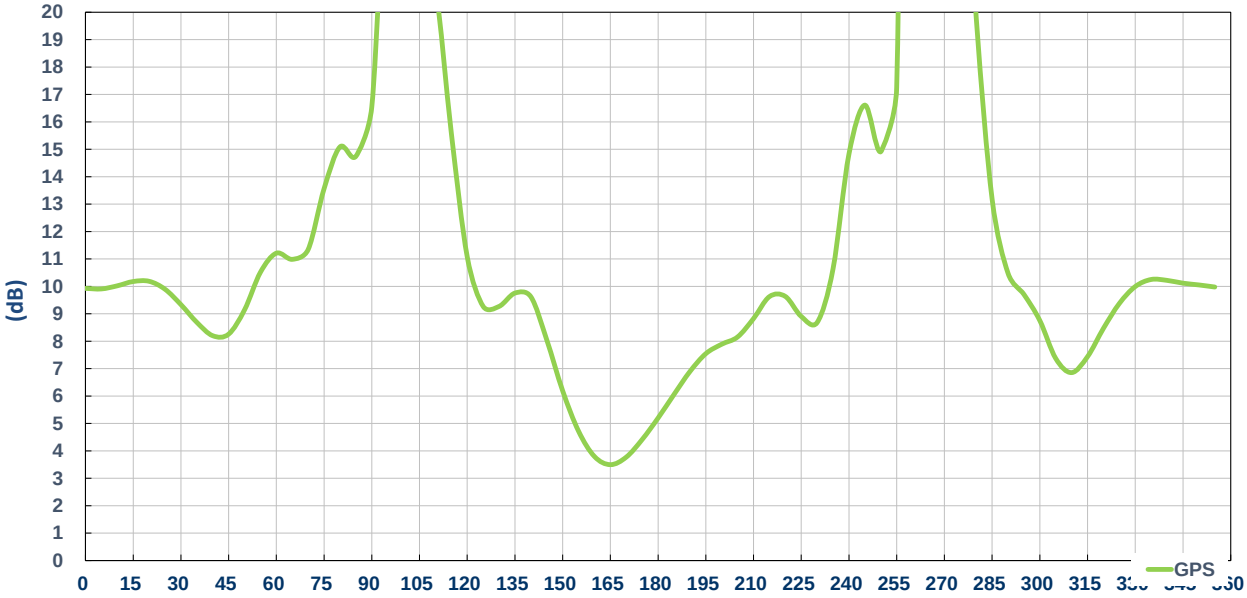
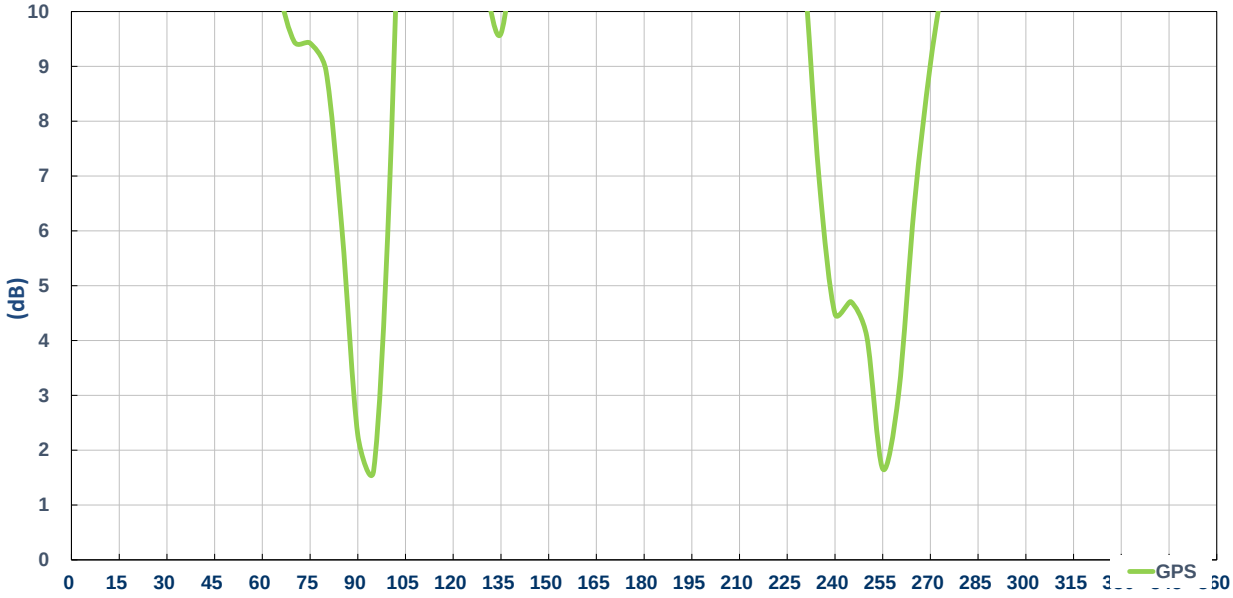


Figure 7. Average Gain of the AA.109 antenna.

4.6 Axial Ratio





5. Radiation Patterns

5.1 3D Radiation Patterns

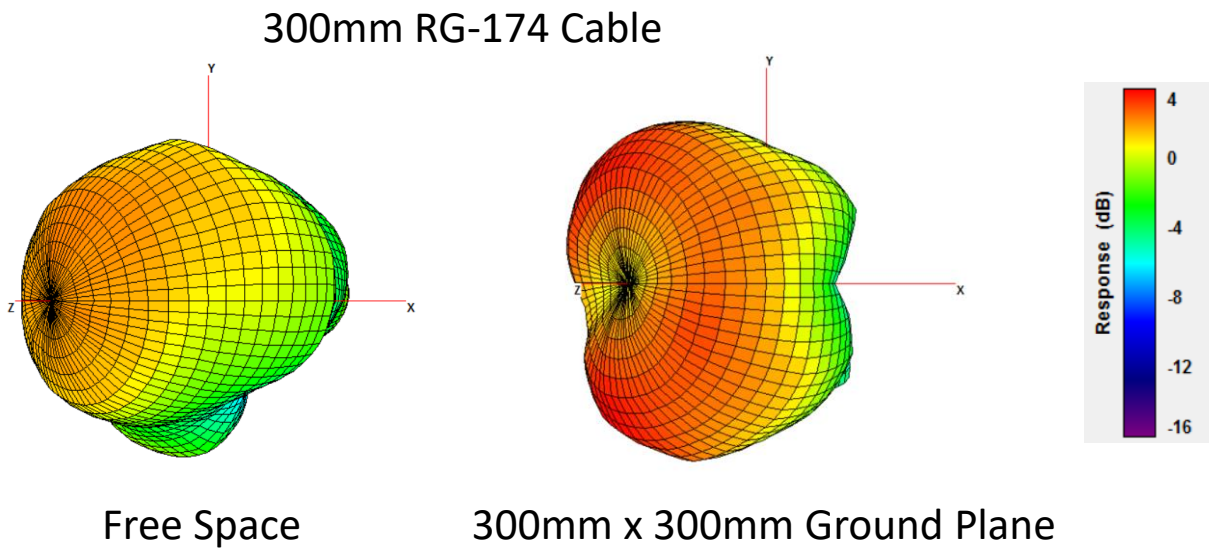


Figure 8. Radiation Pattern of the AA.109 at 1575 MHz with 300mm cable.

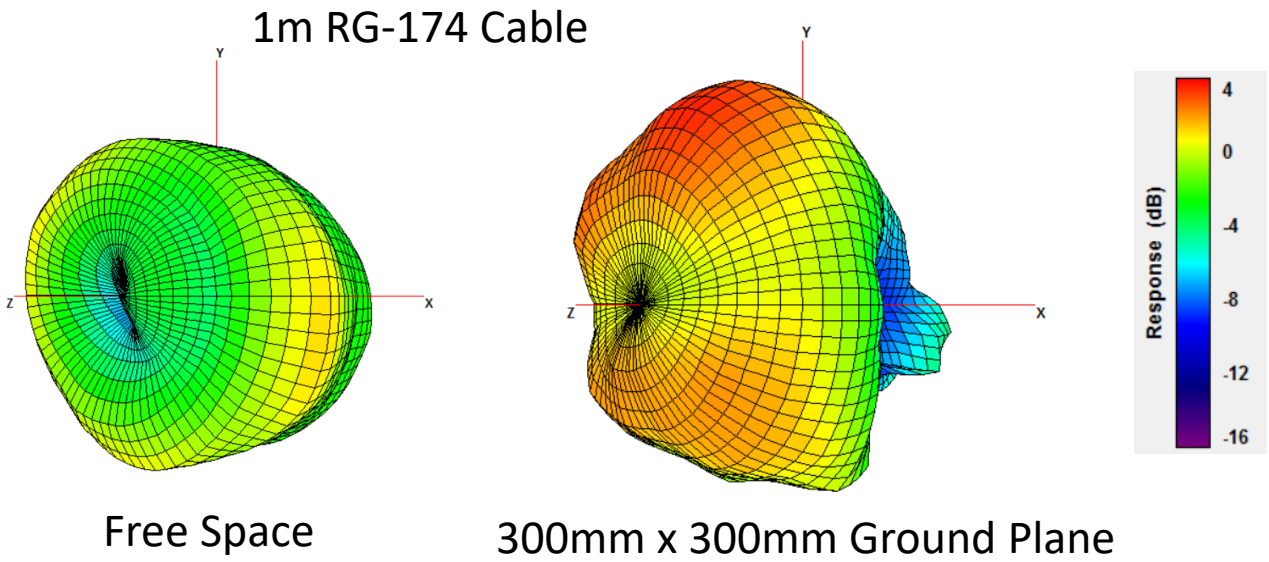


Figure 9. Radiation Pattern of the AA.109 at 1575 MHz with 1m cable.

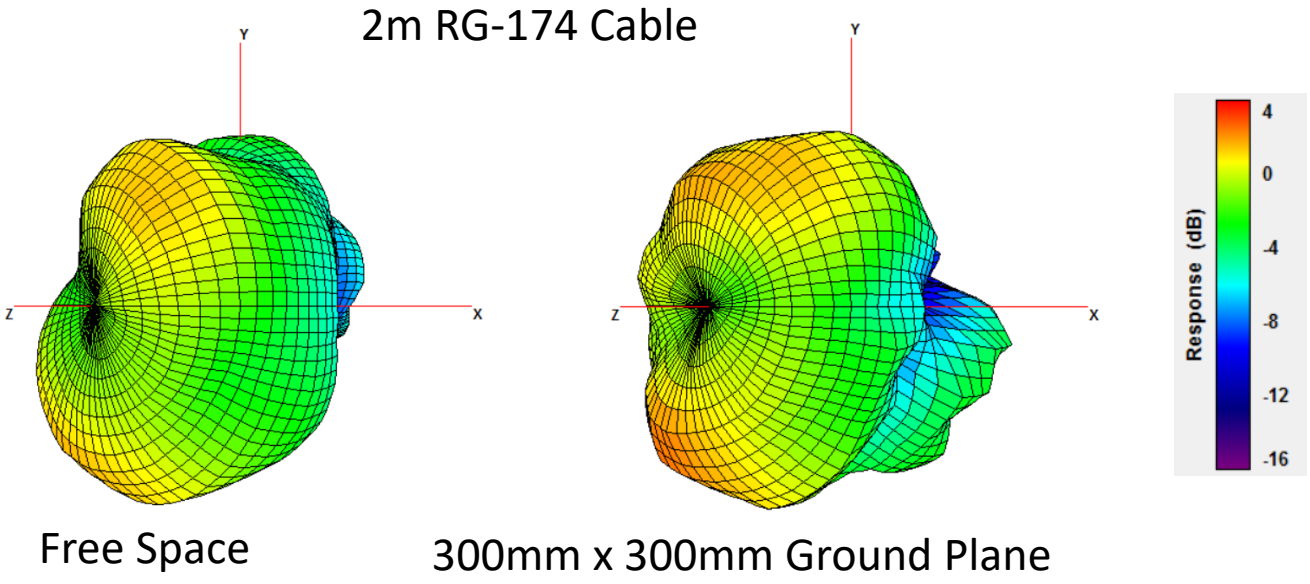


Figure 10. Radiation Pattern of the AA.109 at 1575 MHz with 2m cable.

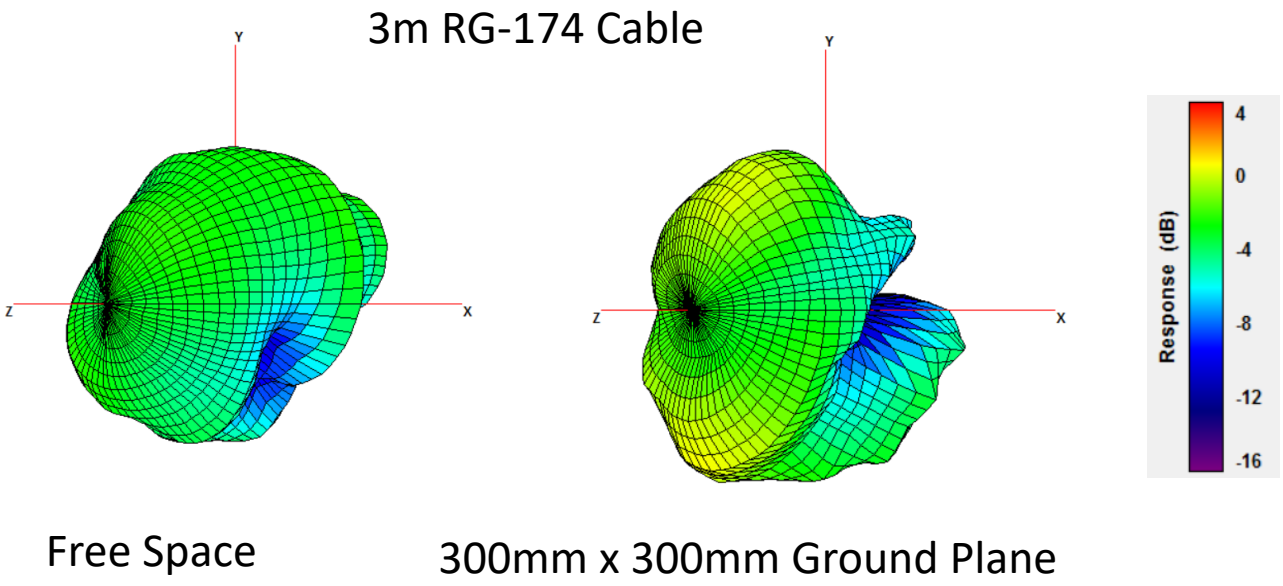


Figure 11. Radiation Pattern of the AA.109 at 1575 MHz with 3m cable.

5.2 2D Radiation Patterns

5.2.1 300mm Cable Free Space

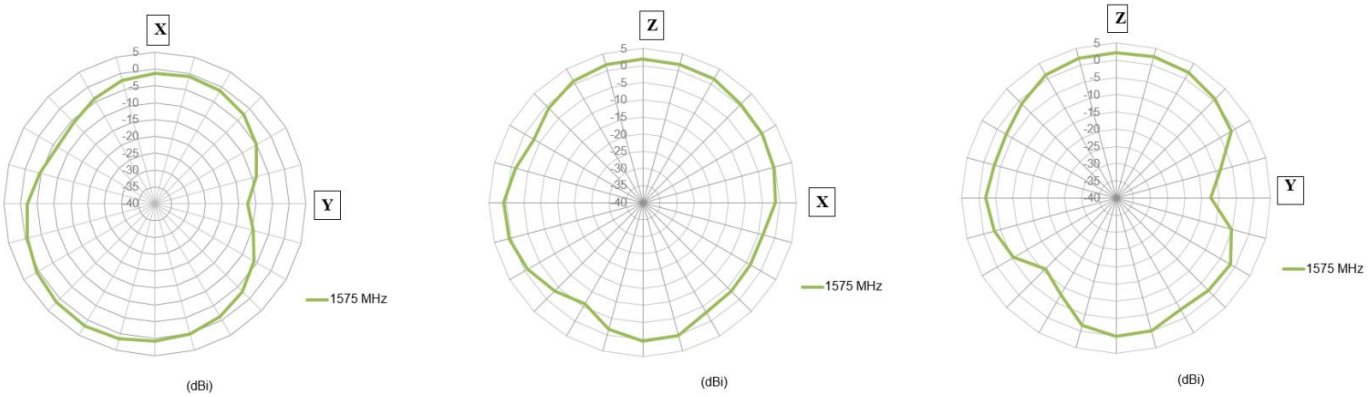


Figure 12. 2D Radiation Pattern of the AA.109 at 1575 MHz with 300mm cable – Free Space.

5.2.2 300mm Cable on 300mm x 300mm Ground Plane

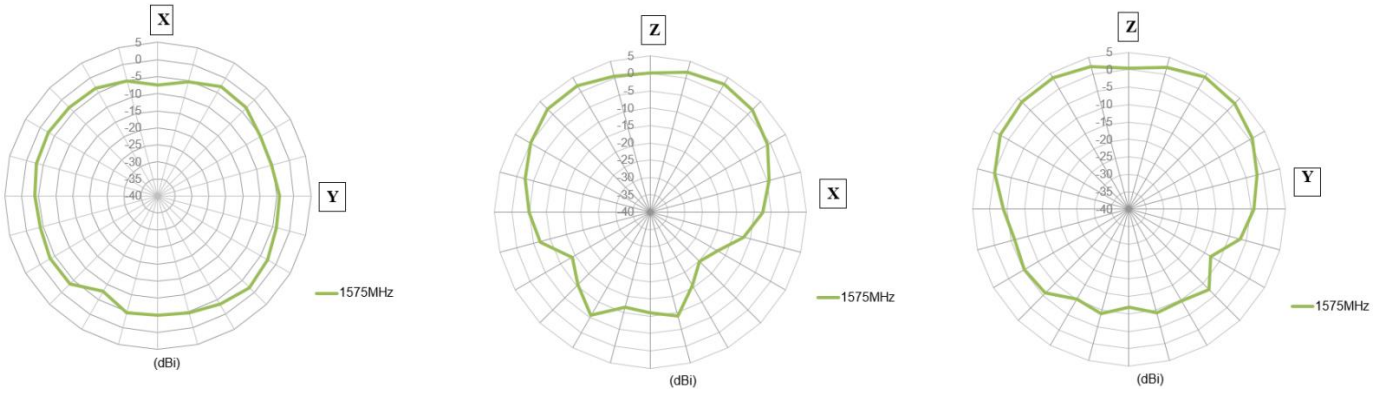


Figure 13. 2D Radiation Pattern of the AA.109 at 1575 MHz with 300mm cable – 300mm x 300mm Ground Plane.

5.2.3 1m Cable Free Space

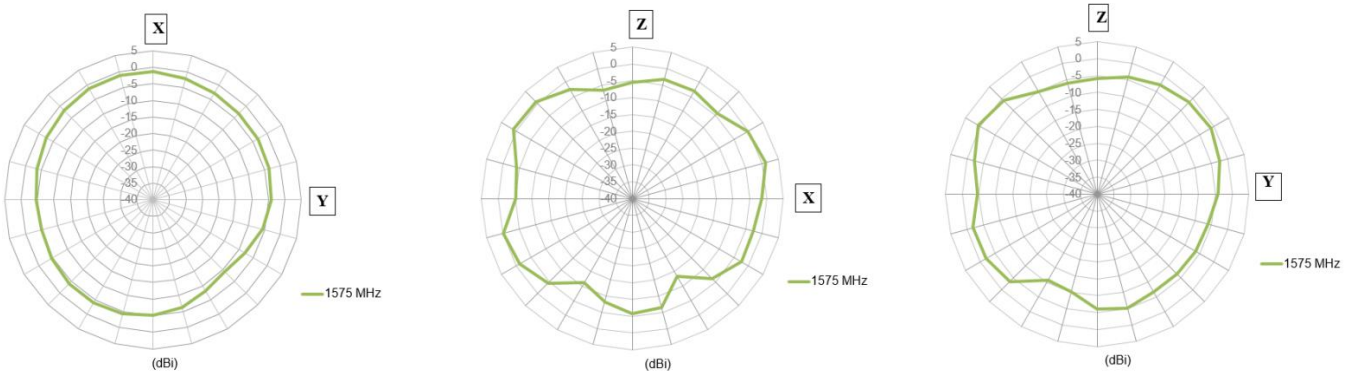


Figure 14. 2D Radiation Pattern of the AA.109 at 1575 MHz with 1m cable – Free Space.

5.2.4 1m Cable on 300mm x 300mm Ground Plane

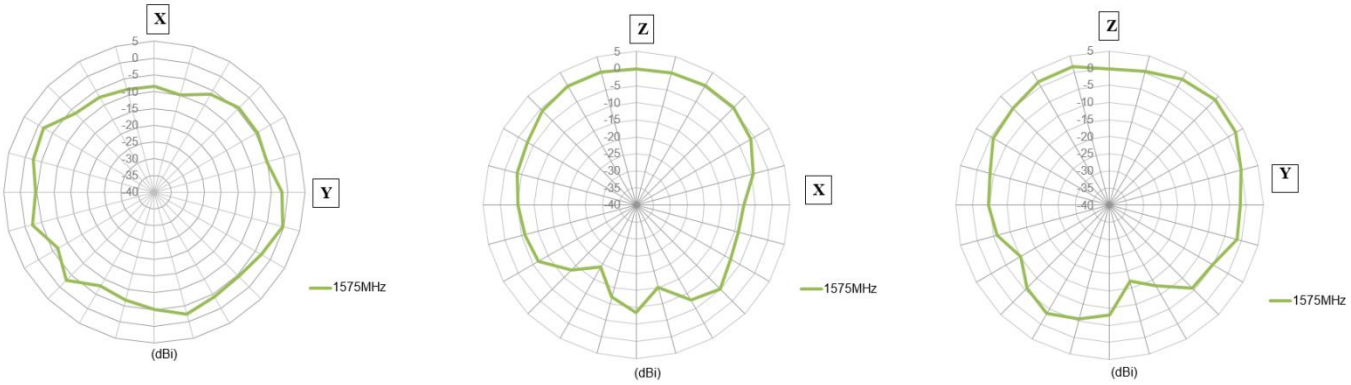


Figure 15. 2D Radiation Pattern of the AA.109 at 1575 MHz with 1m cable – 300mm x 300mm Ground Plane.

5.2.5 2m Cable Free Space

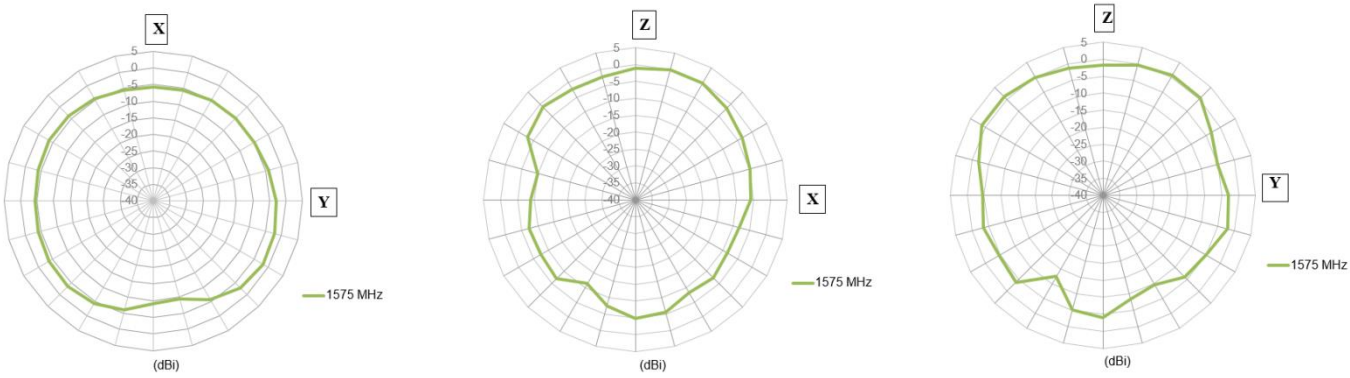


Figure 16. 2D Radiation Pattern of the AA.109 at 1575 MHz with 2m cable – Free Space.

5.2.6 2m Cable on 300mm x 300mm Ground Plane

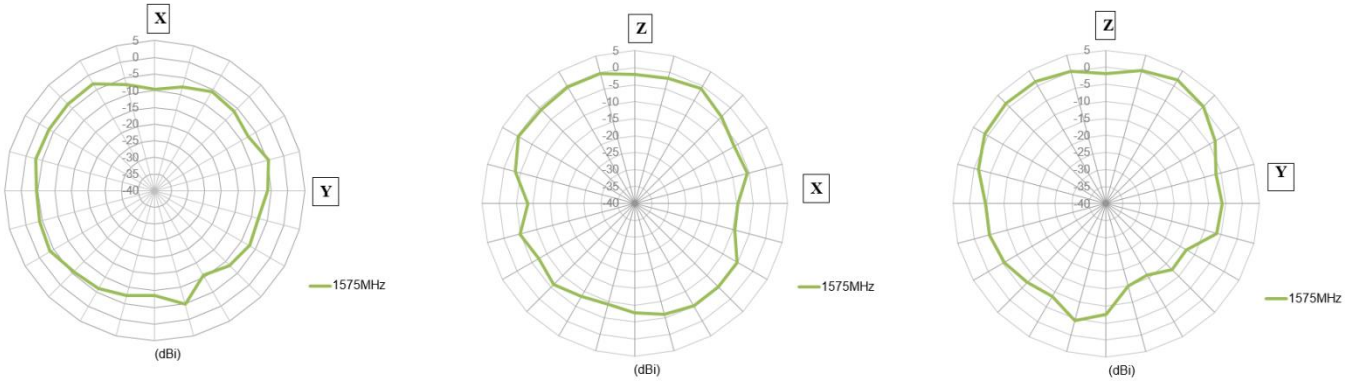


Figure 17. 2D Radiation Pattern of the AA.109 at 1575 MHz with 2m cable – 300mm x 300mm Ground Plane.

5.2.7 3m Cable Free Space

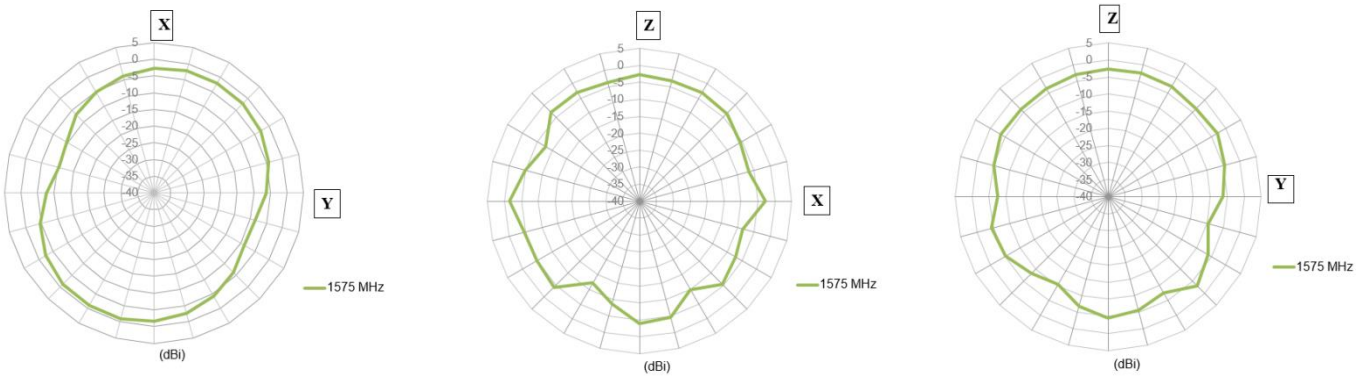


Figure 18. 2D Radiation Pattern of the AA.109 at 1575 MHz with 3m cable – Free Space.

5.2.8 3m Cable on 300mm x 300mm Ground Plane

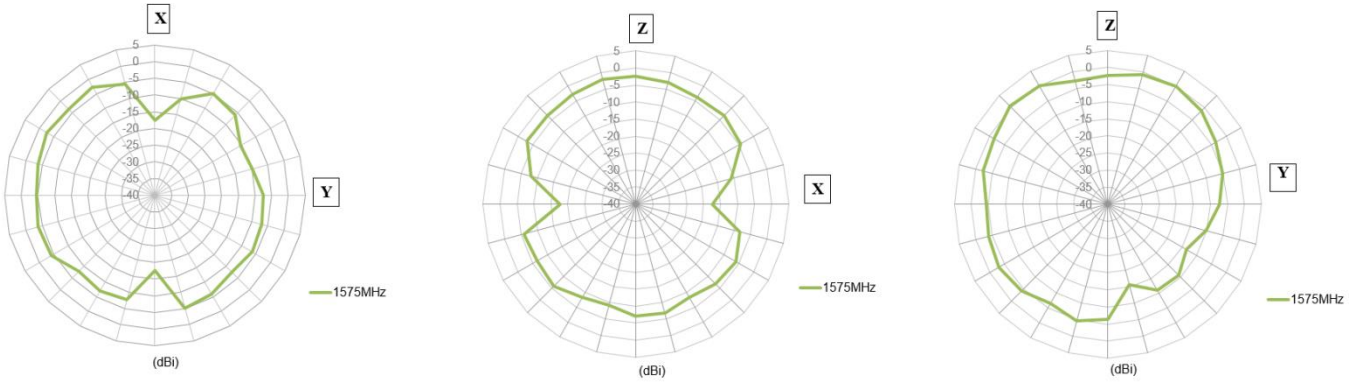


Figure 19. 2D Radiation Pattern of the AA.109 at 1575 MHz with 3m cable – 300mm x 300mm Ground Plane.

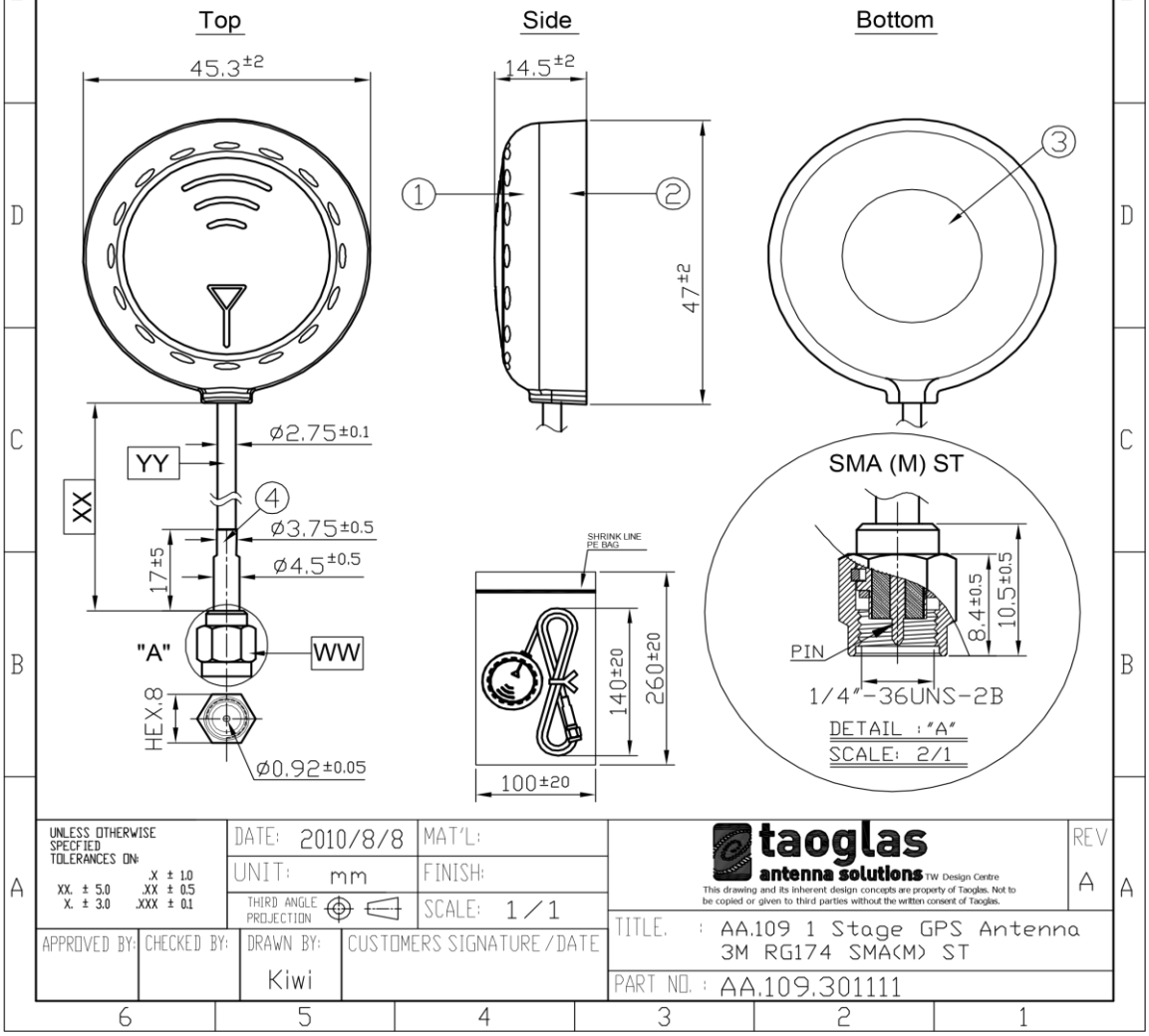
6. Mechanical Specifications (Units: mm)

ISO NO:EDW-11-8-383

REV	ZONE	DESCRIPTION	ENG	APPROVED	ISSUED DATE
A	ALL	Initial Design	Kiwi		2011/8/8

	Name	Material	Finish	QTY
1	GPS Antenna Housing Top	ABS	Black	1
2	GPS Antenna Housing Bottom	ABS	Black	1
3	Sticker	Matte Silver PET	Silver	1
4	Heat Shrink Tube	PE	Black	1

	Name	Spec	Finish	QTY
WW	Connector Type	SMA(M) ST	Gold	1
XX	Cable Length	3000±30mm	Black	1
YY	Cable Type	RG174	Black	1



UNLESS OTHERWISE SPECIFIED TOLERANCES ON:
.X ± 1.0
XX. ± 5.0 .XX ± 0.5
X. ± 3.0 .XXX ± 0.1

DATE: 2010/8/8 | MAT'L: | REV A

UNIT: mm | FINISH:

THIRD ANGLE PROJECTION | SCALE: 1/1

taoglas antenna solutions TW Design Centre

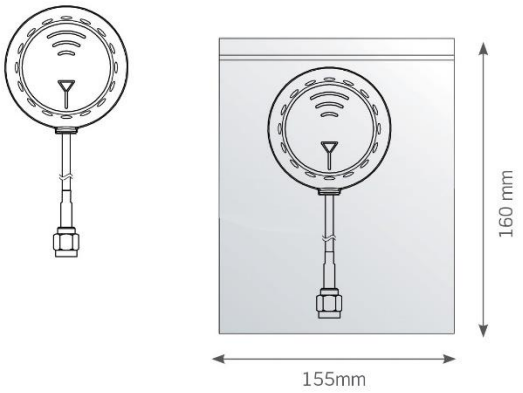
TITLE: AA.109 1 Stage GPS Antenna 3M RG174 SMA(M) ST

PART NO.: AA.109.301111

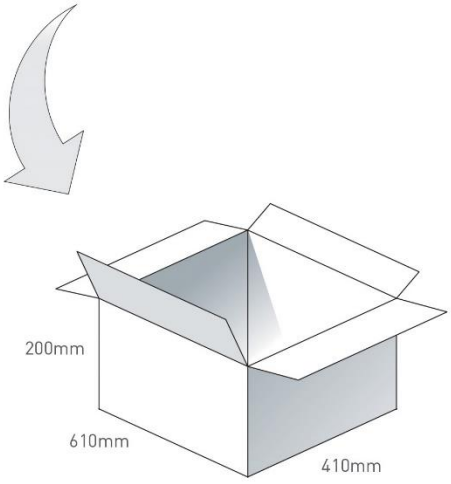
APPROVED BY: | CHECKED BY: | DRAWN BY: Kiwi | CUSTOMERS SIGNATURE / DATE

7. Packaging

1 pc AA.109.301111 in PE Bag
Dimensions - 155*160mm
Weight - 80g



1000 pcs
Carton Dimensions - 610*410*200mm
Weight - 8.8Kg



Pallet Dimensions 1200*1000*1400mm
24 Cartons per Pallet
6 Cartons per layer
4 Layers