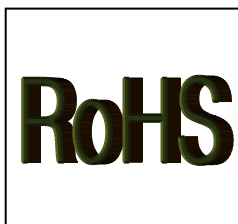


Data Sheet

Product Name : GNSS L1 & L2 Multi band Active antenna
AMOTECH Part No. : AGA424214-S0-A1


	Designed	Checked		Approved
Date	/	/	/	/

Revision no	Content	Page	Date	Name
0	First, documented	-	2019.02.08	I.J. Jeong
1	PCB modification (2.1 Outer Appearance)	4	2019.04.16	Kim Han-gyeul



<p>■ HEAD OFFICE 5B-1L, 617, NAMCHON-DONG, NAMDONG-GU, INCHOEN-CITY, KOREA TEL : 82-32-821-0363 FAX : 82-32-811-0283</p> <p>■ CHINA FACTORY WAISHANGGONGYEYUAN HIGH NEW TECHNOLOGY DEVELOPMENT AREA ZIBO SHANDONG P.R.CHINA 255086 TEL: 86-0533-358-7691 FAX: 86-0533-358-7689</p>	Designed	Checked		Approved
	2019.04.16	2019.04.16		2019.04.16

Notes
*The contents of this data sheet are subject to change without notice.
 Please confirm the specifications and delivery conditions when placing your order.*

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1. Specifications


1.1 Patch Antenna Element Electrical Specifications

No	Item	Spec.		Unit	Remark
		L1 Band	L2 Band		
1	Frequency	1559.0~1606.0	1197.0~1249.0	MHz	Note: 1)
2	Polarization	RHCP	RHCP	-	Note: 1)
3	Gain @ Zenith	Typ. 3.5	Typ. 0~2.0	dBic	Note: 1)
4	Axial Ratio	Typ. 2.0 @Zenith	Typ. 2.0 @Zenith	dB	Note: 1)
5	Bandwidth @ -10dB	200 min.	200 min.	MHz	Note: 1)
6	Impedance	50		ohm	Note: 1)
7	Patch antenna	ASPA - A28A (Ø42 – 13T)			Note: 1)

Note: 1) Measured on the 150Ø mm ground plane / with case

1.2 LNA Electrical Specifications

No	Item	Spec.		Unit	Remark
		L1 Band	L2 Band		
1	Frequency	1559.0~1606.0	1197.0~1249.0	MHz	
2	Gain	28.0 ± 3.0 @5V	28.0 ± 3.0 @5V	dB	
3	Noise Figure	Typ. 2.8 @5V	Typ. 3.2 @5V	dB	
4	Output VSWR	Typ. 2.0 : 1	Typ. 2.0 : 1	-	
5	Voltage Range	DC 3.0~5.0		V	
6	Maximum Voltage Rating	10		V	
6	Current	15.0 Typ. @ 5.0V		mA	
7	Impedance	50		ohm	

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1.3 Overall Performance

No	Item	Spec.		Unit	Remark
		L1 Band	L2 Band		
1	Frequency	1559.0~1606.0	1197.0~1249.0	MHz	Note:4)
2	Total System Zenith Gain	Typ. 24~27	Typ. 24~27	dBic	
3	Axial Ratio	Typ. 2.0 @Zenith	Typ. 2.0 @Zenith	dB	
4	Output VSWR	Typ. 2.0 : 1	Typ. 2.0 : 1	-	
5	Output Impedance	50		ohm	


Note:4) Measured on the 150Ø mm ground plane, with Case, DC 5V, 5m cable.

1.4 Mechanical Specifications

No	Item	Spec.	Unit
1	Width	43(L) x 43(W) ± 1.0	mm
2	Height	Max 18.0	mm
3	Weight	Typ 70.0	g
3	Cable / Connector	Φ1.13, L1=100±3mm / ECT 818000089 (U.FL compatible)	-

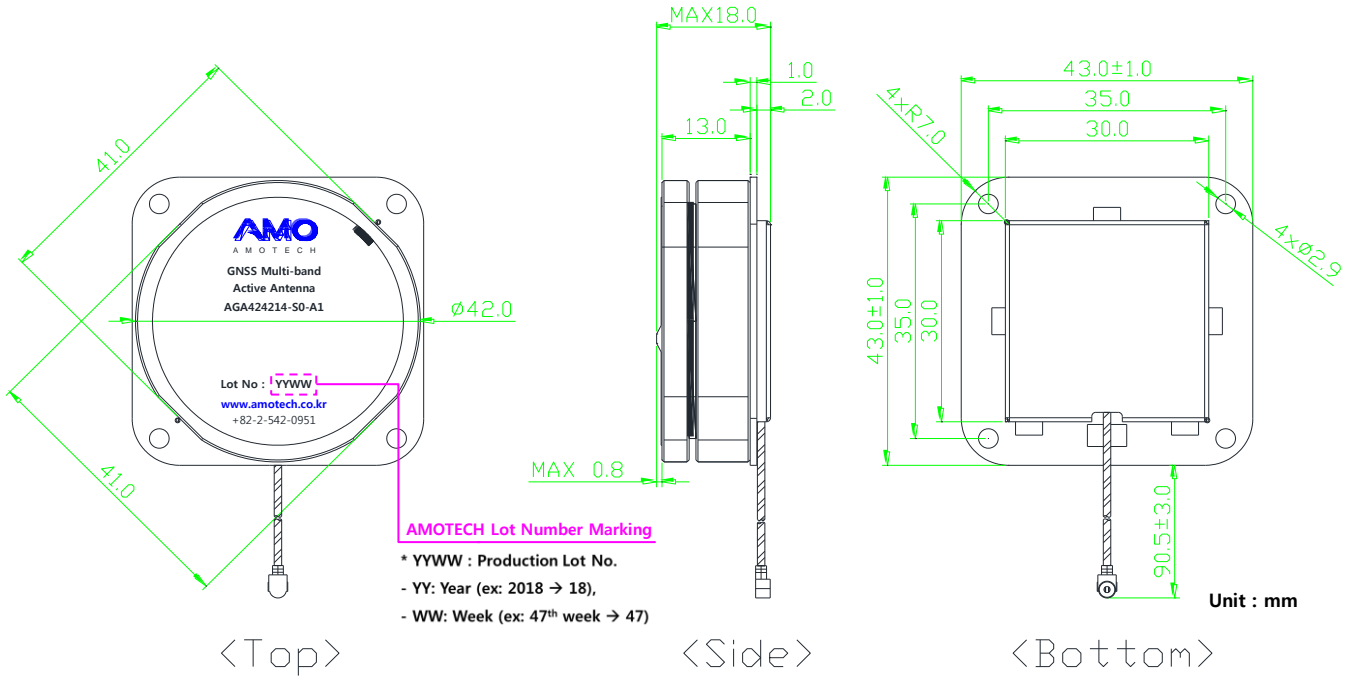
1.5 Radiation Inspections

No	Item	Spec.		Unit
		L1 Band	L2 Band	
1	Frequency	1559.0 ~ 1606.0	1197.0 ~ 1249.0	MHz
2	S21	TBD		dB
3	Current	TBD		mA

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2. Appearance

2.1 Outer Appearance Rev.1



3. Part No.

Part No. : AGA (1) - XXXXXX (2) - XX (3) - XX (4)

- (1) : AMOTECH GNSS Active Antenna
- (2) : Antenna Size
- (3) : Revision No.
- (4) : Model No.

4. Environmental Specifications

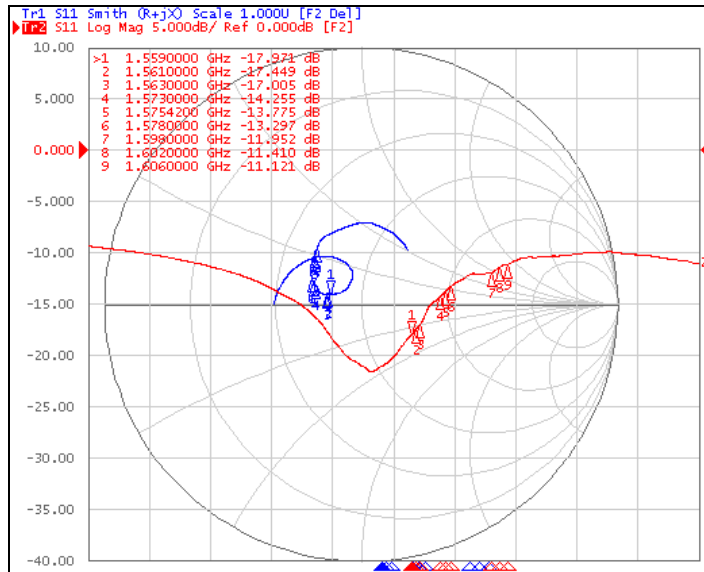
No	Item	Spec.	Unit
1	Operating Temp.	-40 ~ +85	°C
2	Storage Temp.	-40 ~ +85	°C

5. Typical Characteristics

5.1 Typical S11 of Patch Antenna

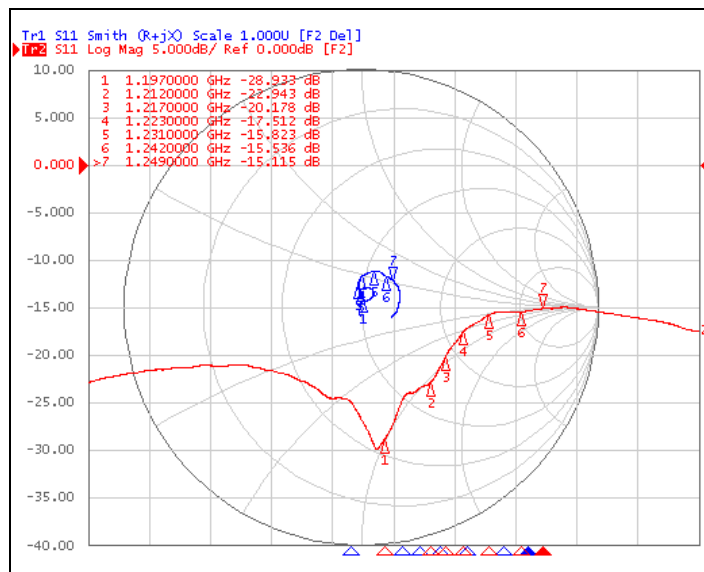
(Test condition: with case, Hybrid coupler, on the 150Ø mm Ground plane)

5.1.1 L1 Band (1559~1606MHz)



[Log mag & Smith Chart]

5.1.2 L2 Band (1197~1249MHz)

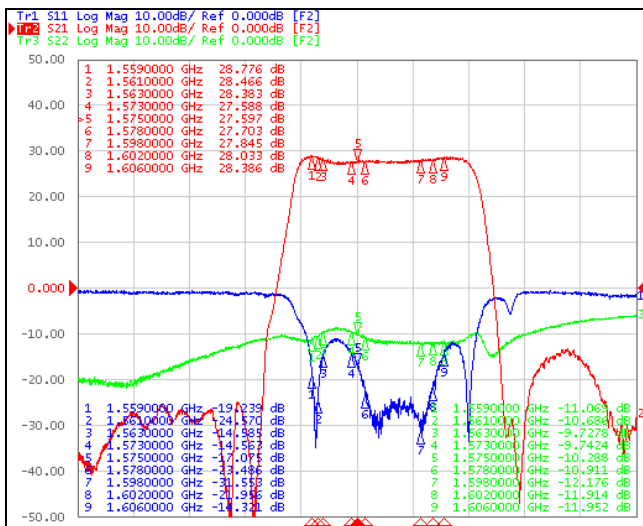
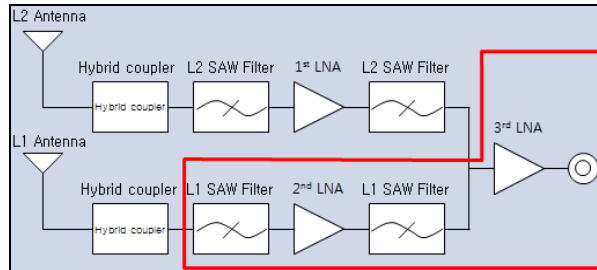


[Log mag & Smith Chart]

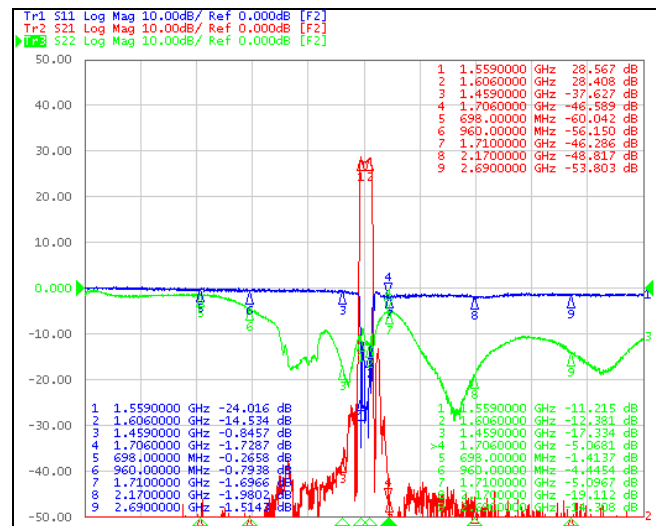
5.2 Typical LNA Electrical Characteristics

(Test condition: Only LNA Circuit, 50mm Semi-Rigid Cable, 15mA @ 5V Voltage.)

5.2.1 L1 band



< In band >



< Out of band >

▶ In band Gain

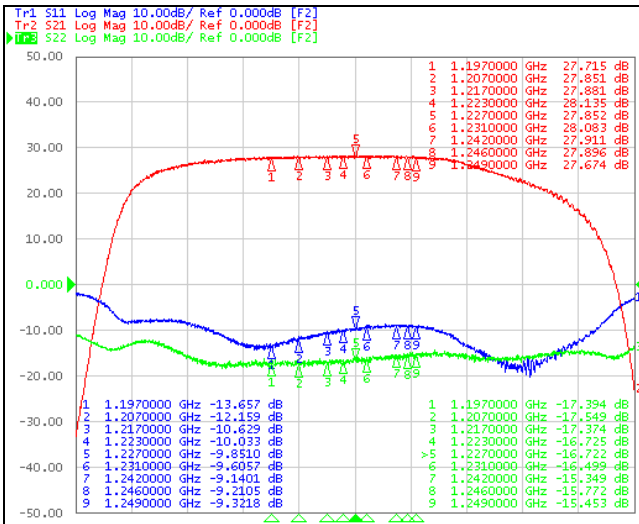
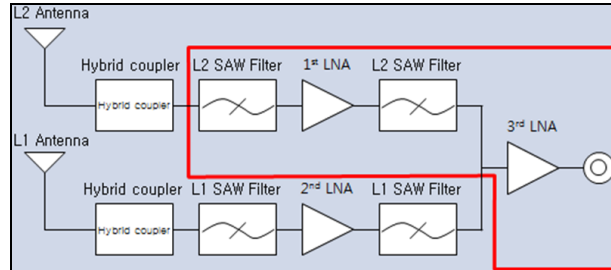
Freq.(MHz)	1559	1561	1563	1573	1575	1578	1598	1602	1606
Gain(dB)	28.77	28.46	28.38	27.58	27.59	27.70	27.84	28.03	28.38
NF(dB)	2.48	2.75	2.72	2.49	2.30	2.15	2.21	2.35	2.49

▶ Out of band Attenuation

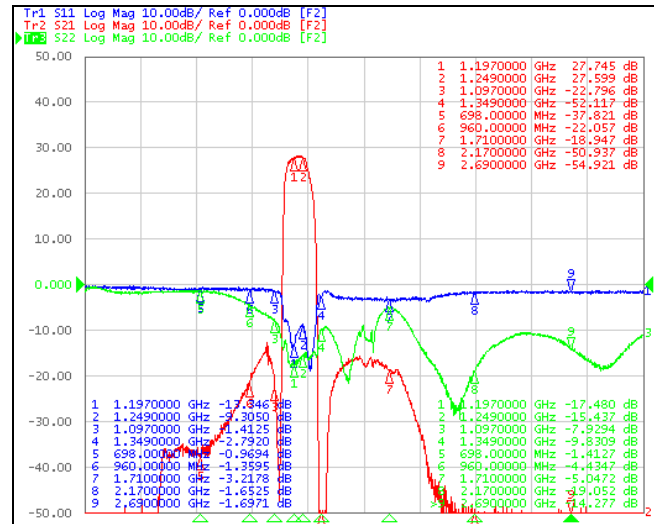
Freq.(MHz)	698	960	1459 (F ₀ -100MHz)	1706 (F ₀ +100MHz)	1710	2170	2690
Atten.(dB)	88.60	84.17	66.19	74.99	74.69	77.22	82.21

- ※ L1 Band F₀ : 1559MHz, 1606MHz.
- ※ 698, 960, 1710, 2170, 2690 (MHz) is cellular band.

5.2.2 L2 band



< In band >



< Out of band >

► In band Gain

Freq.(MHz)	1197	1207	1217	1223	1227	1231	1242	1246	1249
Gain(dB)	27.71	27.85	27.88	28.13	27.85	28.08	27.91	27.89	27.67
NF(dB)	3.14	2.97	2.85	2.94	2.93	2.93	3.08	3.10	3.17

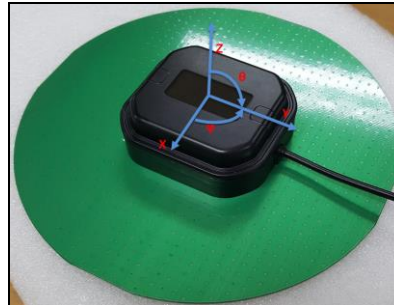
► Out of band Attenuation

Freq.(MHz)	698	960	1097 (F ₀ -100MHz)	1349 (F ₀ +100MHz)	1710	2170	2690
Atten.(dB)	65.56	49.80	50.54	79.71	46.54	78.53	82.52

- ※ L2 band F₀ : 1197MHz, 1249MHz.
- ※ 698, 960, 1710, 2170, 2690 (MHz) is cellular band.

5.3 Overall Gain / Axial Ratio of active antenna

(Test condition: 5m RG174 Cable, On 150Ø mm ground plane, with case, Current 15mA @ 5V Voltage)



5.3.1 L1 Band Antenna RHCP Gain

Frequency [MHz]	Average Gain [dBic]	Peak Gain [dBic]	Zenith Gain [dBic]	Zenith AR [dB]
1559	18.52	25.34	25.27	0.84
1561	18.66	25.51	25.43	0.80
1563	18.69	25.55	25.47	0.76
1573	19.94	26.83	26.71	0.66
1575	20.13	27.07	26.90	0.65
1578	20.17	27.08	26.93	0.68
1598	20.44	27.43	27.30	1.05
1602	20.15	27.14	27.02	1.14
1606	20.05	27.06	26.91	1.19

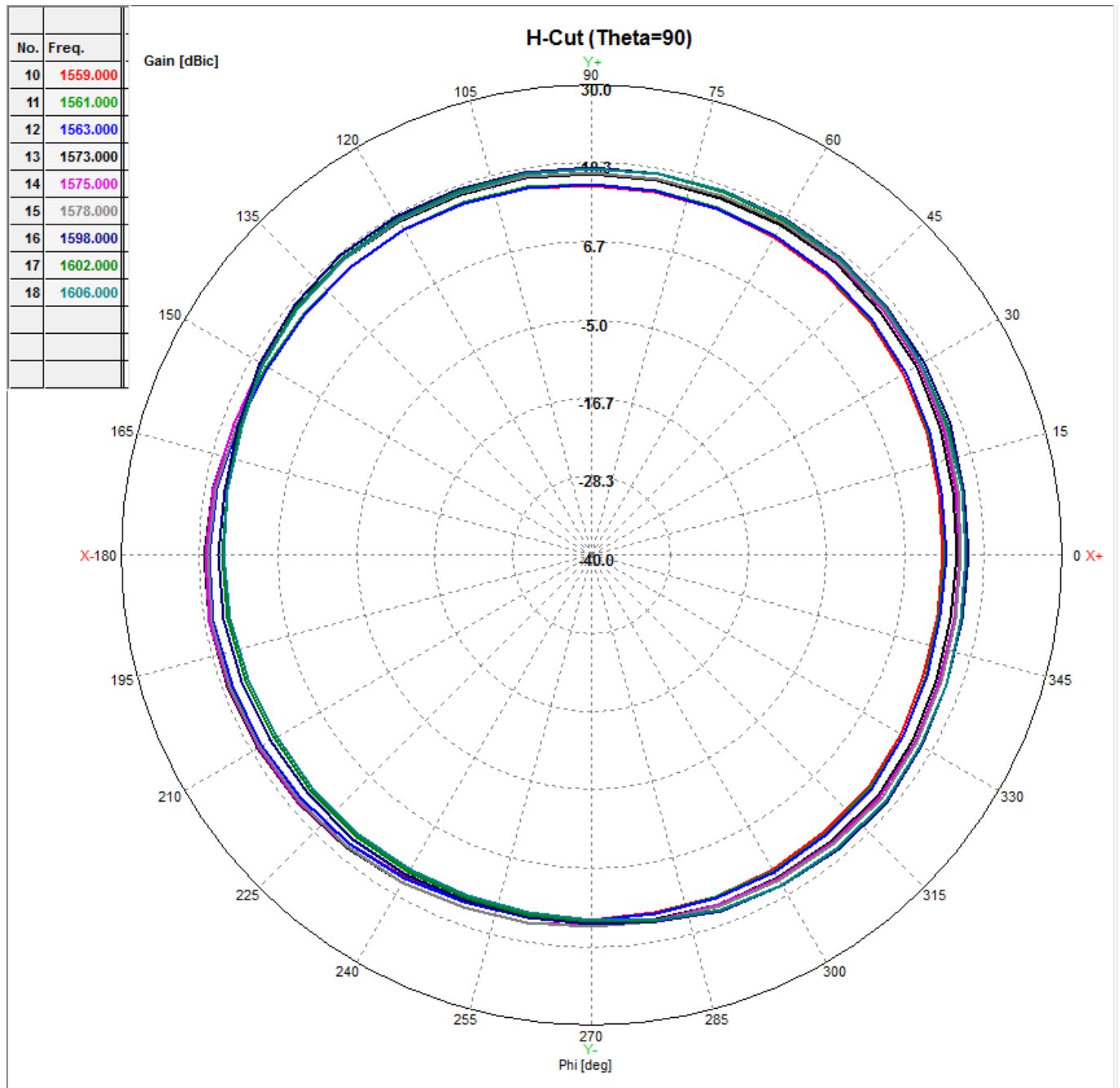
5.3.2 L2 Band Antenna RHCP Gain

Frequency [MHz]	Average Gain [dBic]	Peak Gain [dBic]	Zenith Gain [dBic]	Zenith AR [dB]
1197	18.68	24.78	24.68	1.81
1207	19.96	26.03	25.93	1.40
1217	21.15	27.45	27.15	1.96
1223	21.54	27.98	27.70	1.88
1227	21.76	28.32	28.07	1.75
1231	21.58	28.29	28.01	1.66
1242	19.83	26.74	26.54	1.65
1246	19.15	26.11	25.94	1.73
1249	18.67	25.68	25.51	1.81

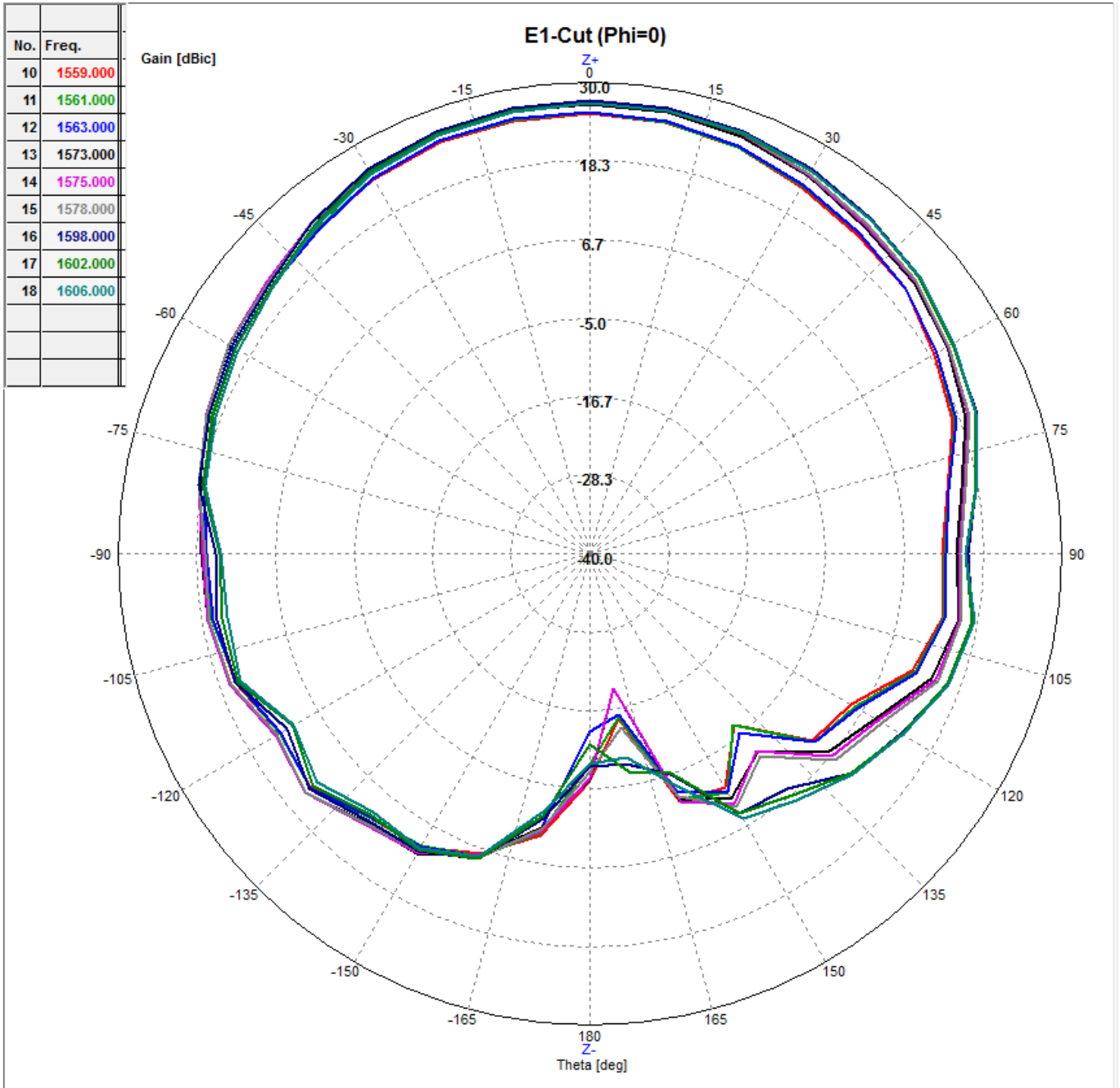
5.4 Radiation patterns of Active antenna

(Test condition: 5m RG174 Cable, on 150Ø mm ground plane, with case, Current 15mA @ 5V Voltage)

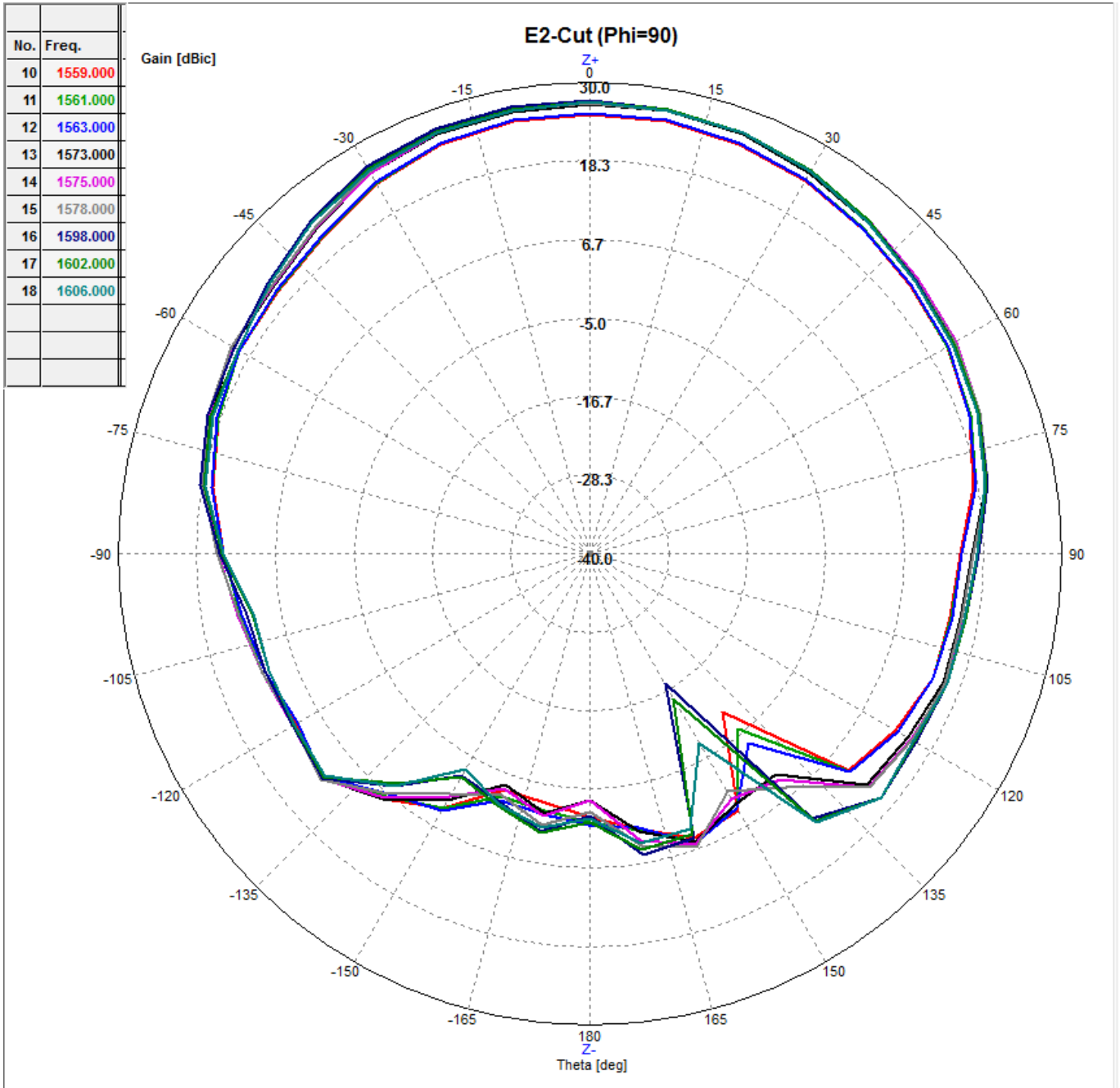
5.4.1 L1 Band



<L1 Band – XY Plane>

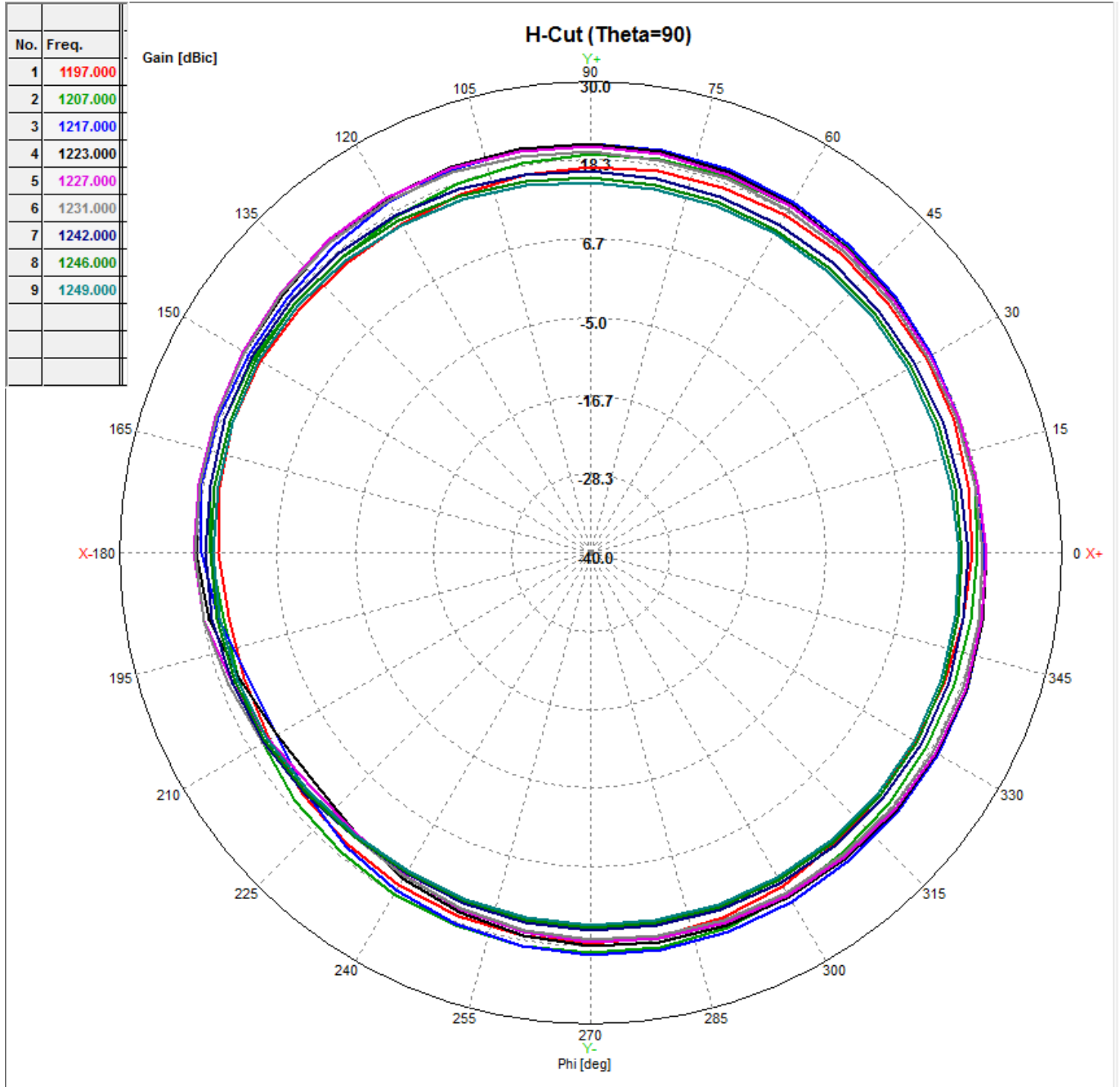


<L1 Band - XZ Plane>

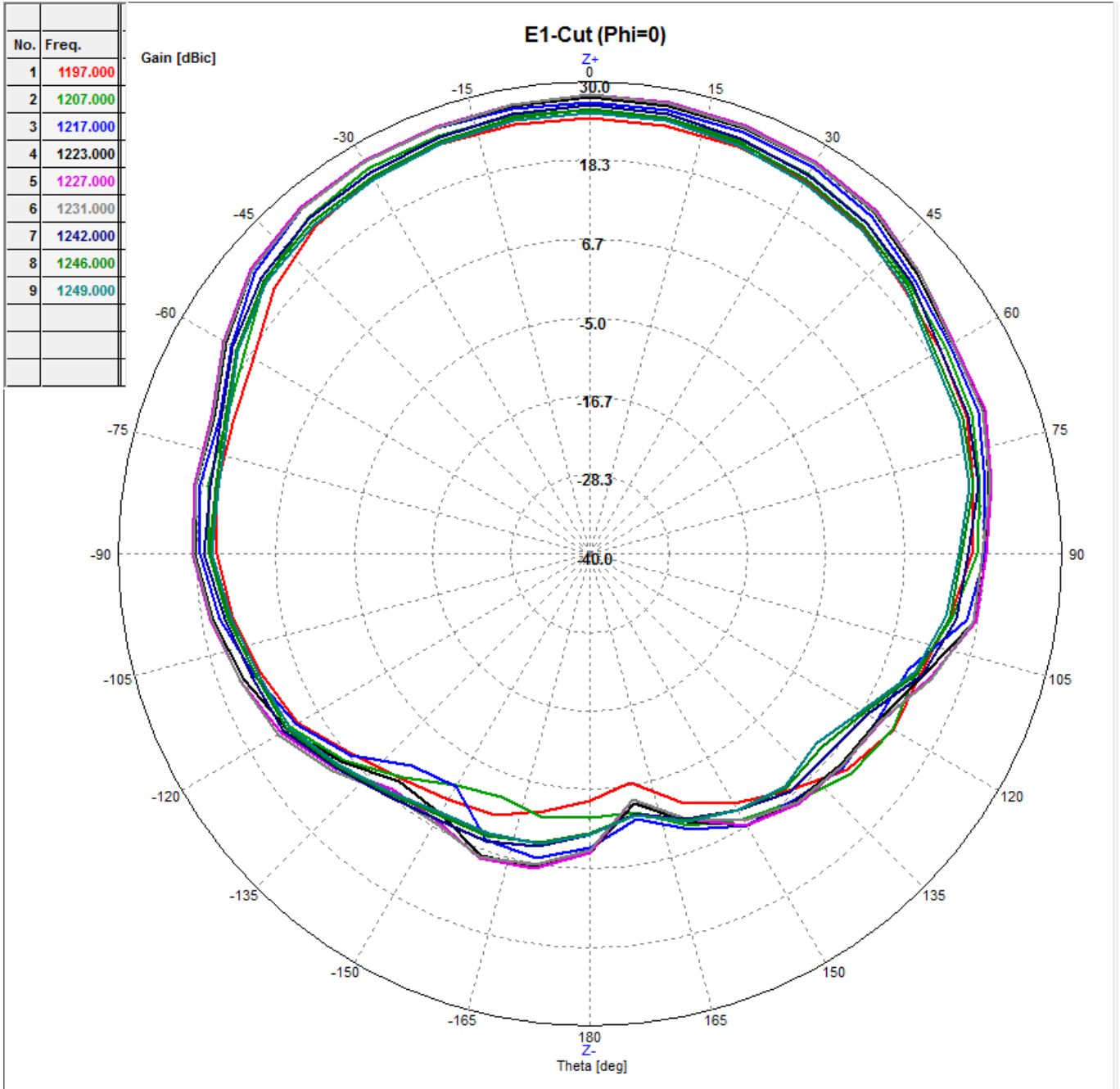


<L1 Band - YZ Plane>

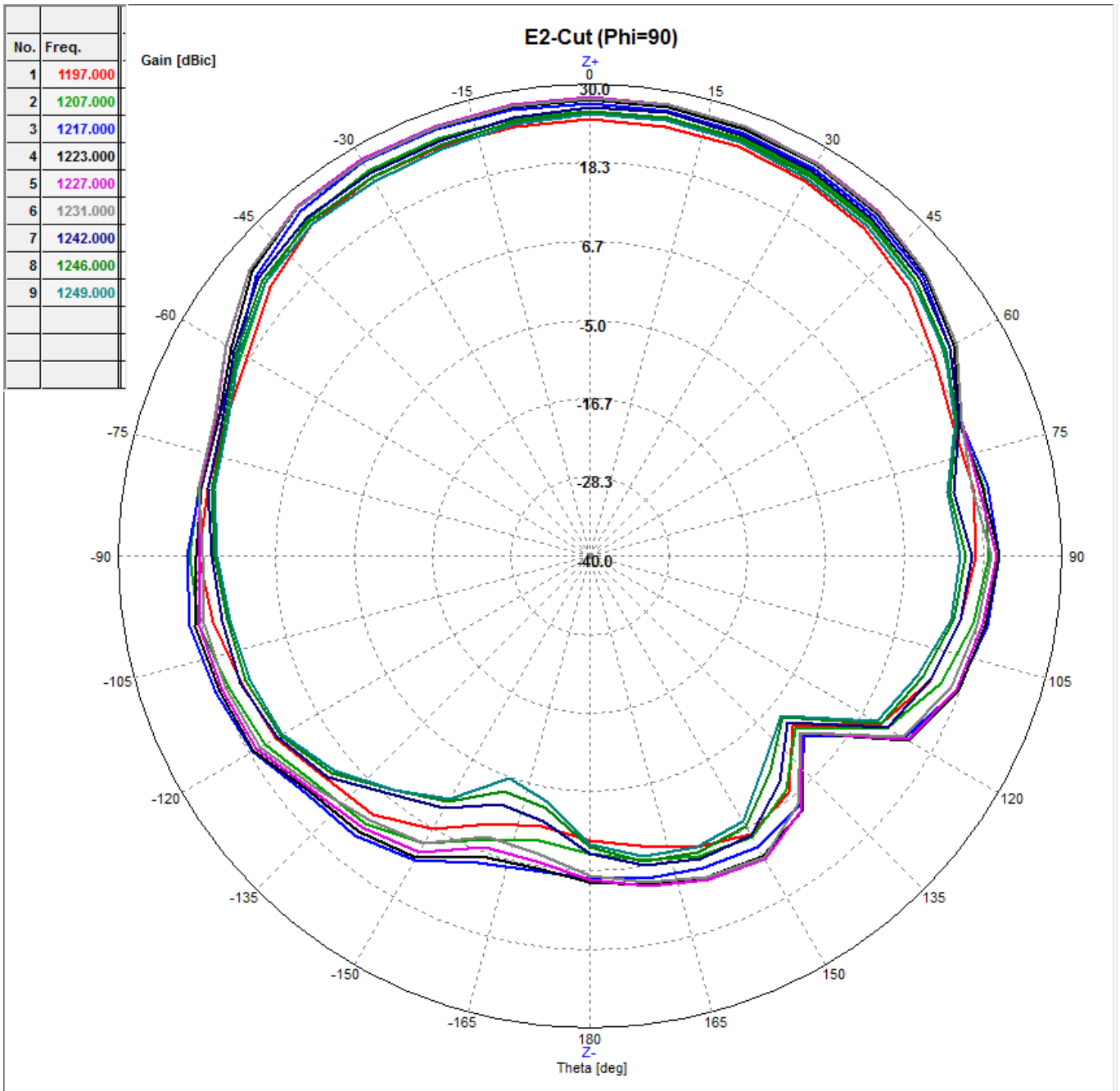
5.4.2 L2 Band



<L2 Band – XY Plane>



<L2 Band – XZ Plane>



<L2 Band – YZ Plane>

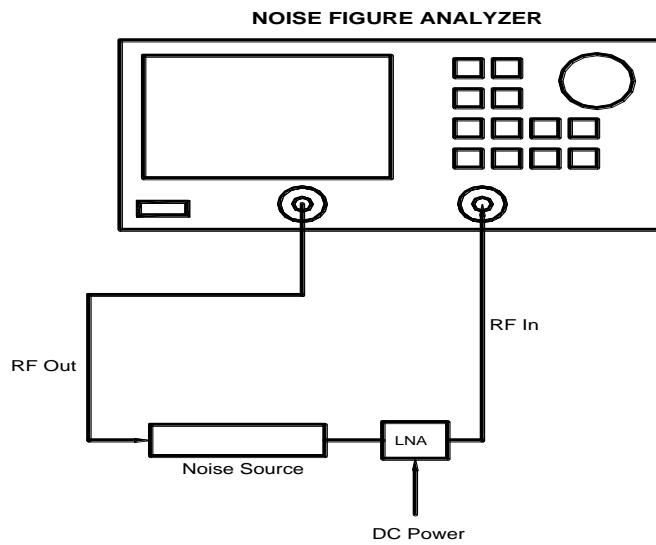
6. Test Method

6.1 LNA Gain and Noise Figure and Current Measurement

6.1.1 Measurement Equipment

- Noise Figure Analyzer, Power Supply, Bias Tee

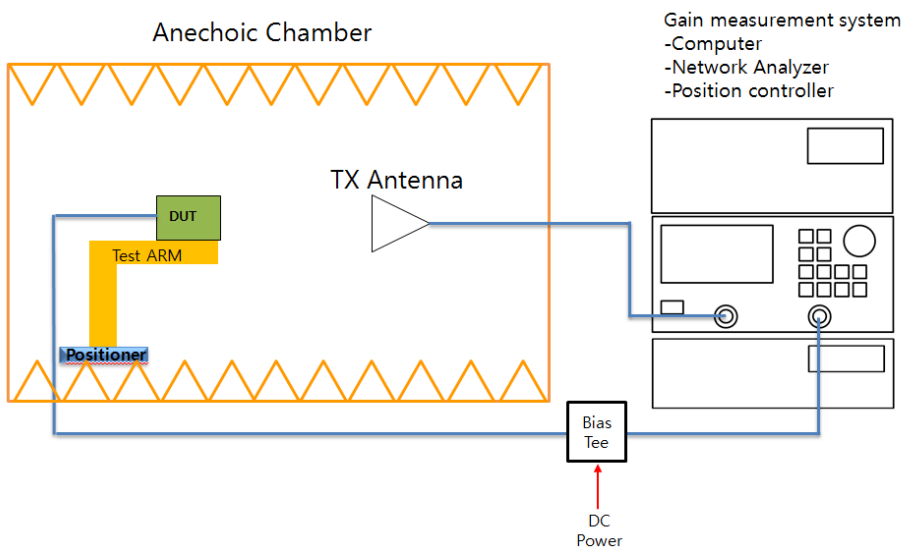
6.1.2 Measurement Diagram



6.2 Overall Performance Measurement

6.2.1 Measurement Equipment

- Network Analyzer, Anechoic chamber System, Power Supply, Bias-Tee



6.3 Radiation inspection

6.3.1 Measurement Equipment

- Manual Jig, Network Analyzer, DC power supply, Bias Tee

6.3.2 Measurement Diagram

