

UE/MS OTA Antenna Performance Summary Report

Prüfbericht-Nr.: Test Report No.:	Auftrags-Nr.: Order No.: 238516896
Kunden-Referenz-Nr.: Client Reference No.: N/A	Auftragsdatum: Order date: 2021-06-01
Auftraggeber: Client:	孕龍科技股份有限公司 新北市中和區建八路 121 號 3 樓
Prüfgegenstand: Test item:	2400 ~ 2500 MHz
Bezeichnung / Typ-Nr.: Identification / Type No.:	ANT-S
Auftrags-Inhalt: Order content:	Test Report for Antenna gain
Prüfgrundlage: Test specification:	
Wareneingangsdatum: Date of receipt:	2021-06-01
Prüfmuster-Nr.: Test sample No.:	A003064064-001
Prüfzeitraum: Testing period:	
Ort der Prüfung: Place of testing:	Fully Laboratory Taipei
Prüflaboratorium: Testing laboratory:	Taipei Testing Laboratories
Prüfergebnis*: Test result*:	
Sonstiges / Other:	
<p>Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.</p> <p>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</p>	

1. Statement of Performance

The best results of antenna Performance found during testing for the Sigfox passive antenna are as below :

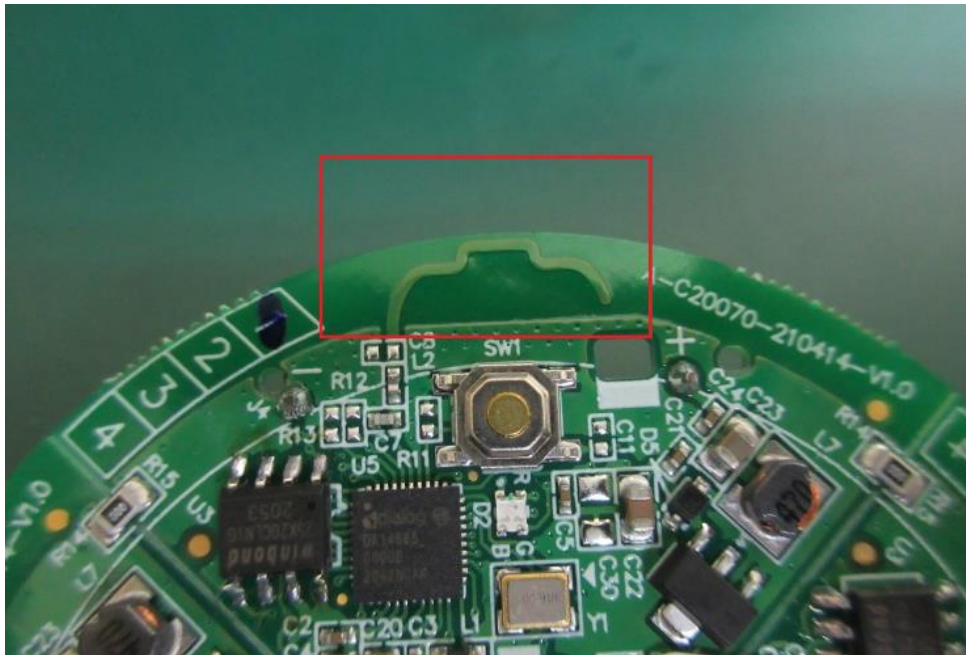
Function	Position	PK gain (dBi)	AVG gain (dBi)
Sigfox passive antenna (2400MHz)	Free Space	-7.06	-12.02
Sigfox passive antenna (2450MHz)	Free Space	-1.98	-7.04
Sigfox passive antenna (2500MHz)	Free Space	-6.03	-11.96

2. General Information

2.1 Description of Device Under Test (DUT)

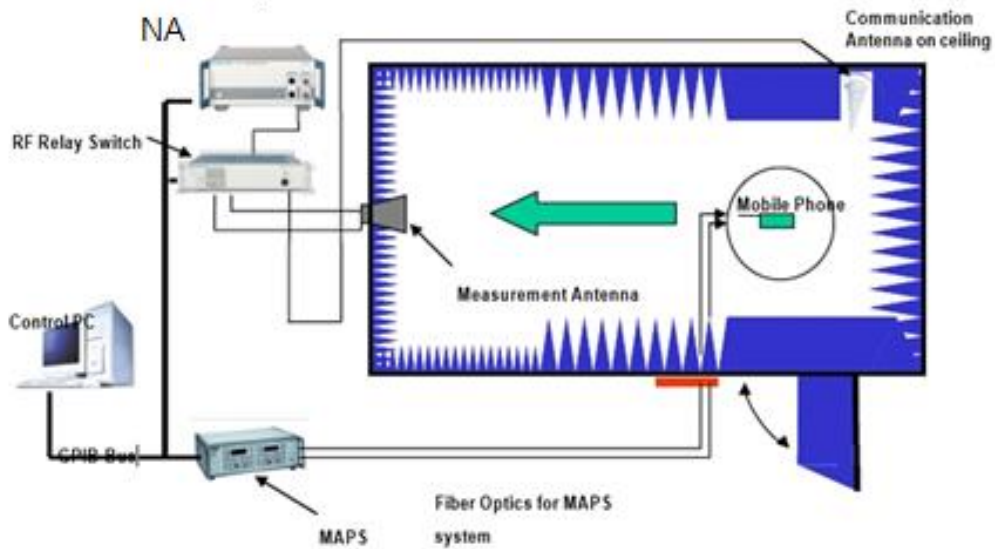
Product Feature & Specification	
DUT Type	Sigfox Passive antenna (PCB antenna)
Brand Name	Zeroplus
Model Name	ANT-S
Type Name	Brook-ANT

2.2 Product Photo

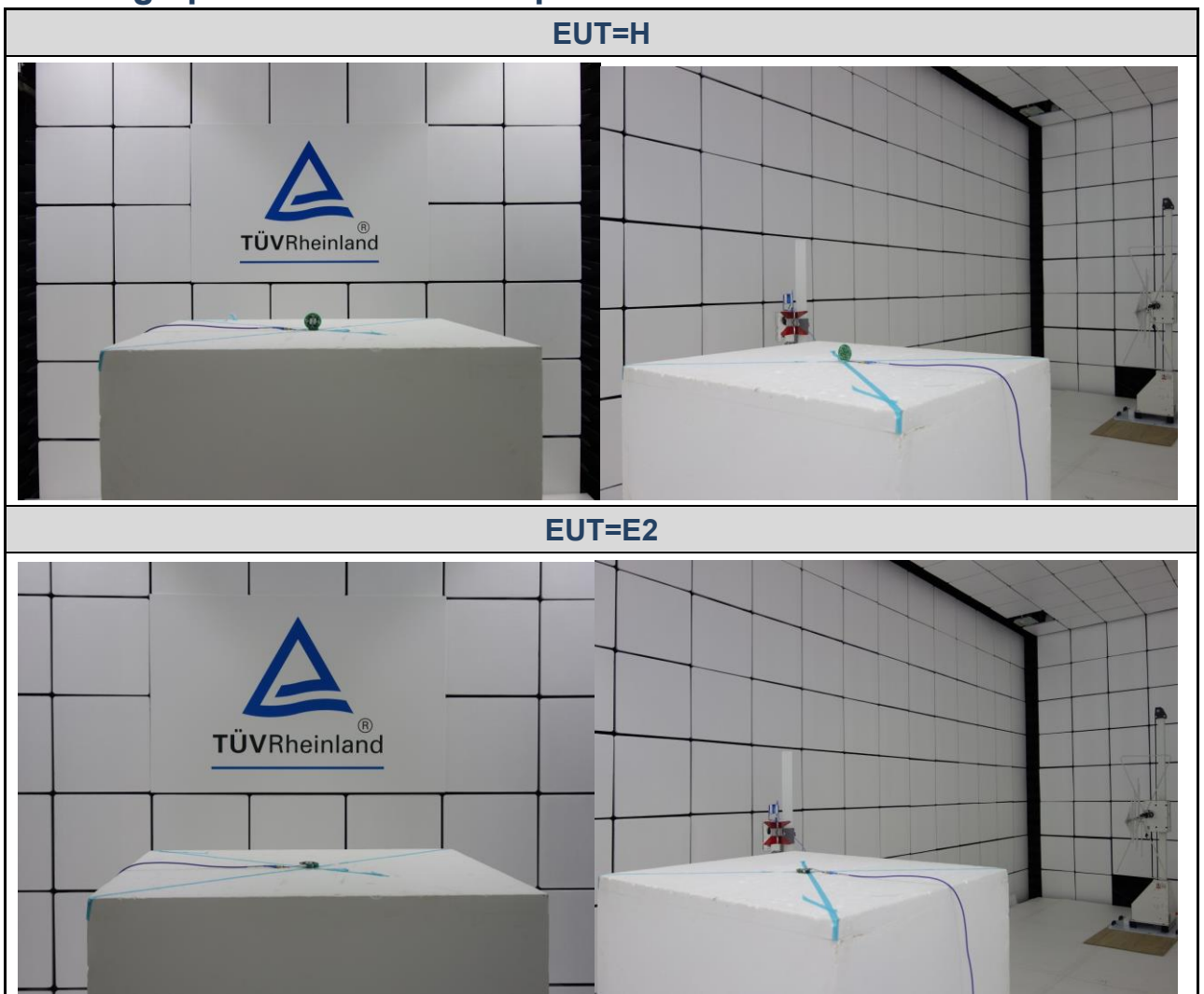


3. Measurement Environment

3.1 Antenna gain Measurement Setup

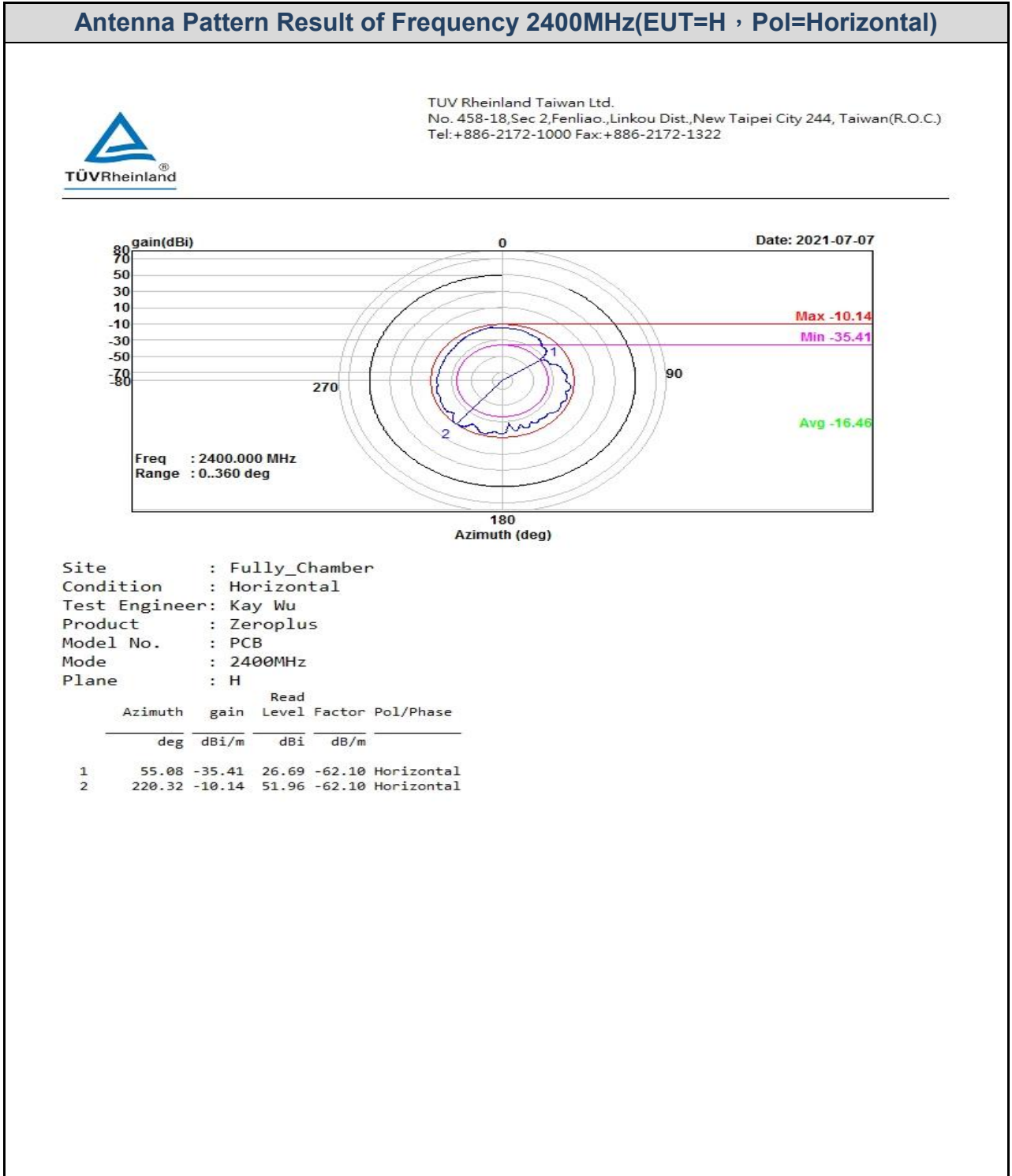


4. Photographs of the Test Set-Up



5. Summary of Test Result

5.1 Test Results of Antenna Pattern

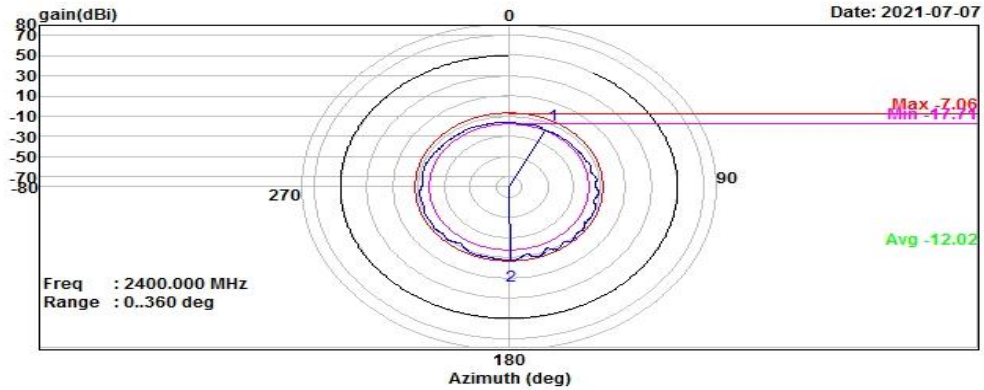


UE/MS OTA Antenna Performance Summary Report

Antenna Pattern Result of Frequency 2400MHz(EUT=H , Pol=Vertical)



TUV Rheinland Taiwan Ltd.
 No. 458-18,Sec 2,Fenliao.,Linkou Dist.,New Taipei City 244, Taiwan(R.O.C.)
 Tel:+886-2172-1000 Fax:+886-2172-1322



Site : Fully_Chamber
 Condition : Vertical
 Test Engineer: Kay Wu
 Product : Zeroplus
 Model No. : PCB
 Mode : 2400MHz
 Plane : H

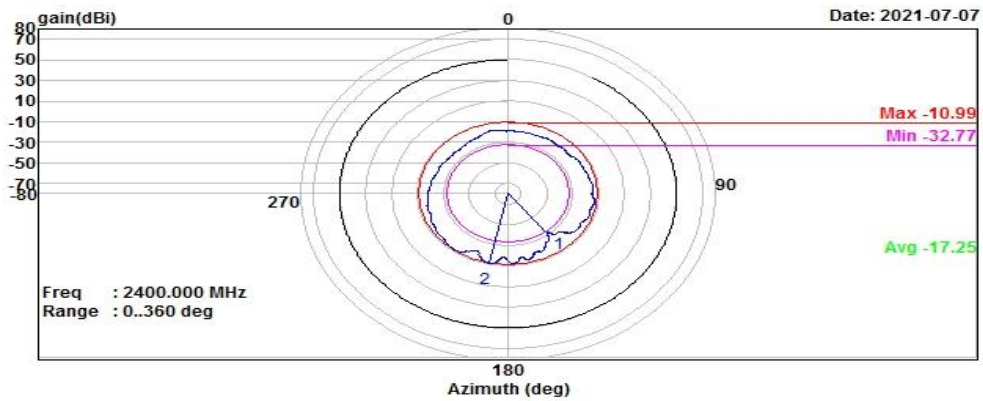
Azimuth	gain	Read	Factor	Pol/Phase
deg	dBi/m	Level	dB/m	
1	26.28	-17.71	44.39	-62.10 Vertical
2	178.92	-7.06	55.04	-62.10 Vertical

UE/MS OTA Antenna Performance Summary Report

Antenna Pattern Result of Frequency 2400MHz(EUT=E2 , Pol=Horizontal)



TUV Rheinland Taiwan Ltd.
 No. 458-18, Sec 2, Fenliao., Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
 Tel: +886-2172-1000 Fax: +886-2172-1322



Site : Fully Chamber
 Condition : Horizontal
 Test Engineer: Kay Wu
 Product : Zeroplus
 Model No. : PCB
 Mode : 2400MHz
 Plane : E2

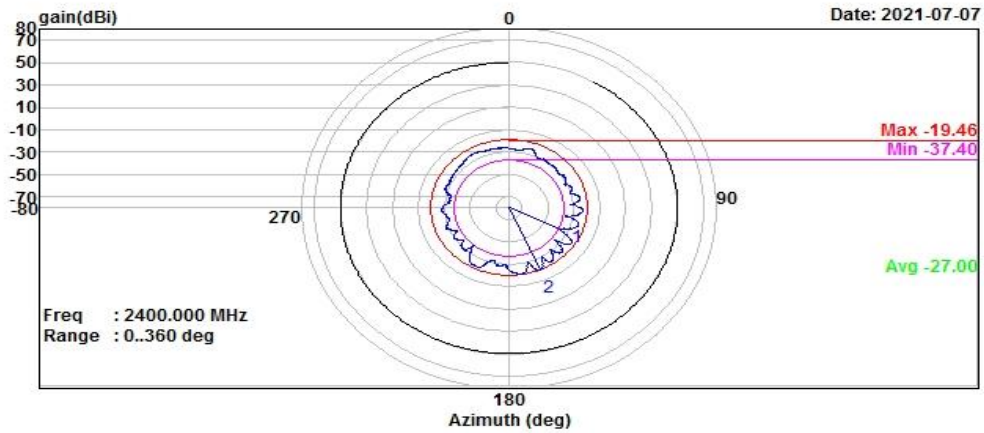
	Azimuth deg	gain	Read	Factor	Pol/Phase
		dBi/m	Level		
1	141.12	-32.77	29.33	-62.10	Horizontal
2	191.88	-10.99	51.11	-62.10	Horizontal

UE/MS OTA Antenna Performance Summary Report

Antenna Pattern Result of Frequency 2400MHz(EUT=E2 , Pol= Vertical)



TUV Rheinland Taiwan Ltd.
 No. 458-18, Sec 2, Fenliao., Linkou Dist., New Taipei City 244, Taiwan (R.O.C.)
 Tel: +886-2172-1000 Fax: +886-2172-1322



Site : Fully_Chamber
 Condition : Vertical
 Test Engineer: Kay Wu
 Product : Zeroplus
 Model No. : PCB
 Mode : 2400MHz
 Plane : E2

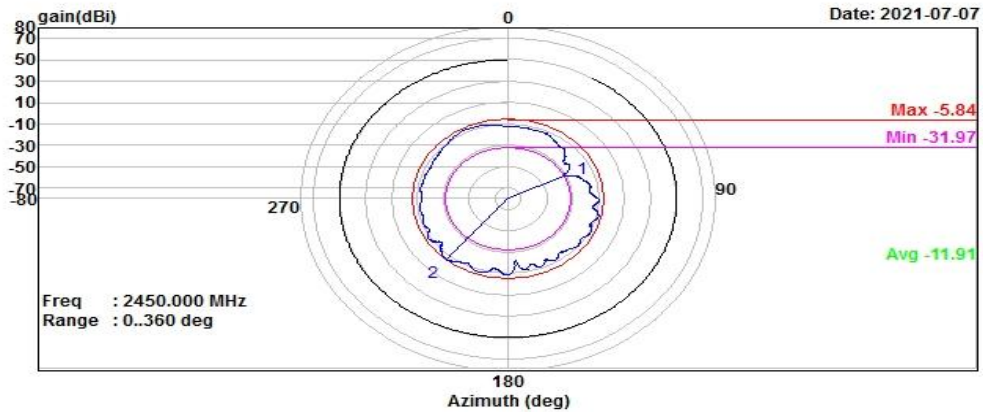
	Azimuth deg	gain dBi/m	Read		Pol/Phase
			Level dBi	Factor dB/m	
1	115.92	-37.40	24.70	-62.10	Vertical
2	156.24	-19.46	42.64	-62.10	Vertical

UE/MS OTA Antenna Performance Summary Report

Antenna Pattern Result of Frequency 2450MHz(EUT=H , Pol=Horizontal)



TUV Rheinland Taiwan Ltd.
 No. 458-18,Sec 2,Fenliao.,Linkou Dist.,New Taipei City 244, Taiwan(R.O.C.)
 Tel:+886-2172-1000 Fax:+886-2172-1322



Site : Fully_Chamber
 Condition : Horizontal
 Test Engineer: Kay Wu
 Product : Zeroplus
 Model No. : PCB
 Mode : 2450MHz
 Plane : H

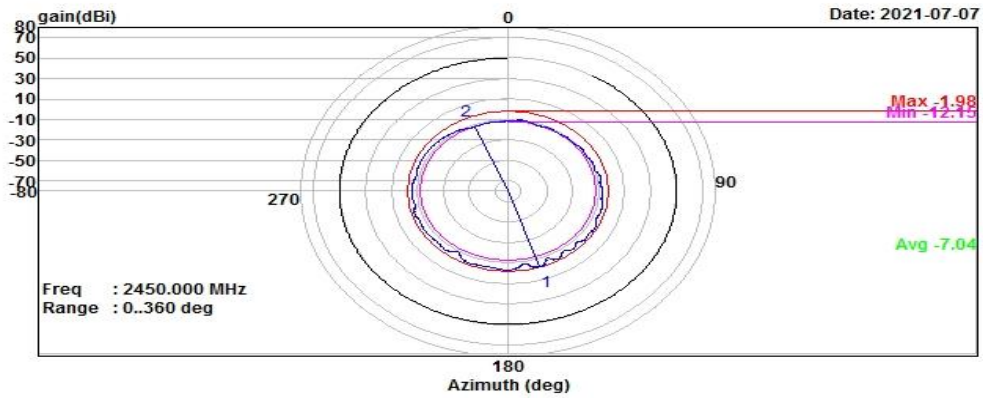
	Azimuth deg	gain	Read	Factor	Pol/Phase
		dBi/m	Level		
1	63.72	-31.97	29.93	-61.90	Horizontal
2	219.60	-5.84	56.06	-61.90	Horizontal

UE/MS OTA Antenna Performance Summary Report

Antenna Pattern Result of Frequency 2450MHz(EUT=H , Pol=Vertical)



TUV Rheinland Taiwan Ltd.
 No. 458-18,Sec 2,Fenliao.,Linkou Dist.,New Taipei City 244, Taiwan(R.O.C.)
 Tel: +886-2172-1000 Fax: +886-2172-1322



Site : Fully_Chamber
 Condition : Vertical
 Test Engineer: Kay Wu
 Product : Zeroplus
 Model No. : PCB
 Mode : 2450MHz
 Plane : H

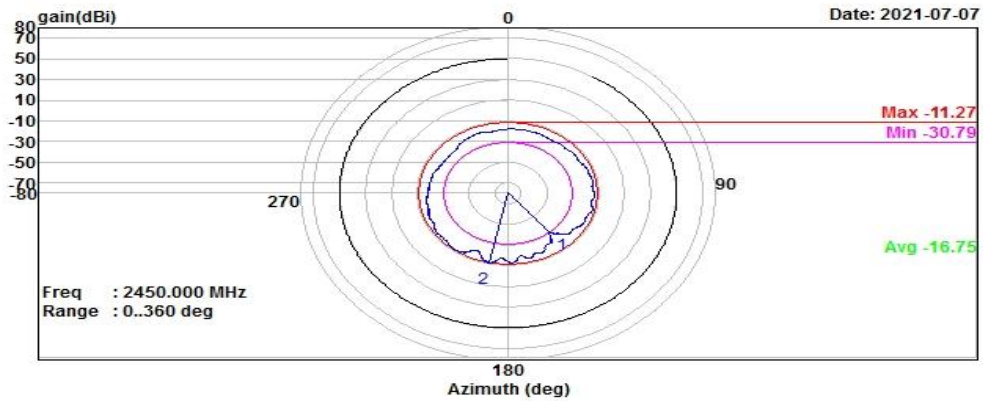
	Azimuth deg	gain	Read	Factor	Pol/Phase
		dBi/m	Level		
1	161.64	-1.98	59.92	-61.90	Vertical
2	337.68	-12.15	49.75	-61.90	Vertical

UE/MS OTA Antenna Performance Summary Report

Antenna Pattern Result of Frequency 2450MHz(EUT=E2 , Pol=Horizontal)



TUV Rheinland Taiwan Ltd.
 No. 458-18, Sec 2, Fenliao., Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
 Tel: +886-2172-1000 Fax: +886-2172-1322



Site : Fully_Chamber
 Condition : Horizontal
 Test Engineer: Kay Wu
 Product : Zeroplus
 Model No. : PCB
 Mode : 2450MHz
 Plane : E2

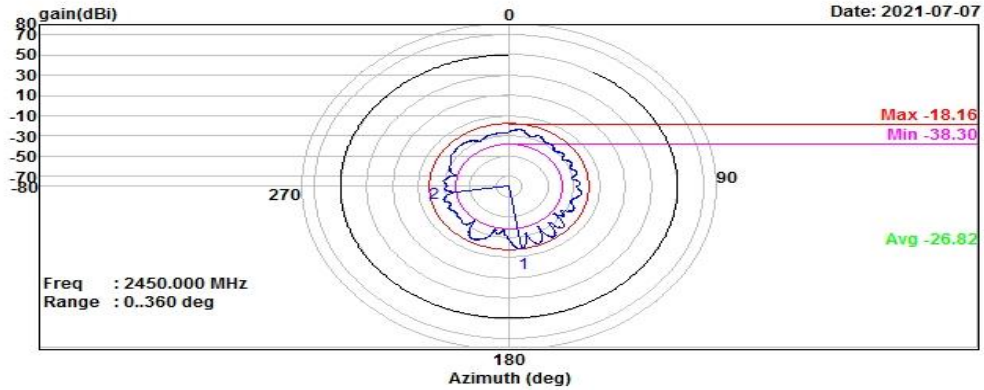
	Azimuth	gain	Read Level	Factor	Pol/Phase
	deg	dBi/m	dBi	dB/m	
1	140.04	-30.79	31.11	-61.90	Horizontal
2	192.60	-11.27	50.63	-61.90	Horizontal

UE/MS OTA Antenna Performance Summary Report

Antenna Pattern Result of Frequency 2450MHz(EUT=E2 , Pol= Vertical)



TUV Rheinland Taiwan Ltd.
 No. 458-18,Sec 2,Fenliao.,Linkou Dist.,New Taipei City 244, Taiwan(R.O.C.)
 Tel: +886-2172-1000 Fax: +886-2172-1322



Site : Fully_Chamber
 Condition : Vertical
 Test Engineer: Kay Wu
 Product : Zeroplus
 Model No. : PCB
 Mode : 2450MHz
 Plane : E2

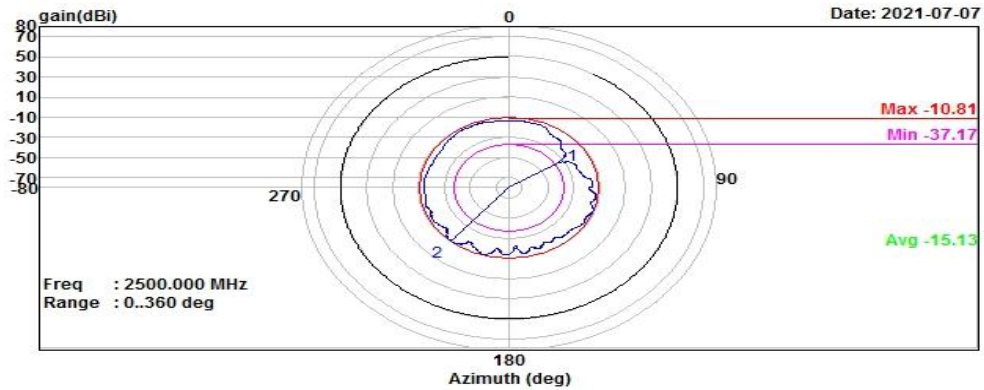
	Azimuth	gain	Read	Factor	Pol/Phase
	deg	dBi/m	Level	dB/m	
1	171.36	-18.16	43.74	-61.90	Vertical
2	262.44	-38.30	23.60	-61.90	Vertical

UE/MS OTA Antenna Performance Summary Report

Antenna Pattern Result of Frequency 2500MHz(EUT=H , Pol=Horizontal)



TUV Rheinland Taiwan Ltd.
 No. 458-18, Sec 2, Fenliao, Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
 Tel: +886-2172-1000 Fax: +886-2172-1322



Site : Fully_Chamber
 Condition : Horizontal
 Test Engineer: Kay Wu
 Product : Zeroplus
 Model No. : PCB
 Mode : 2500MHz
 Plane : H

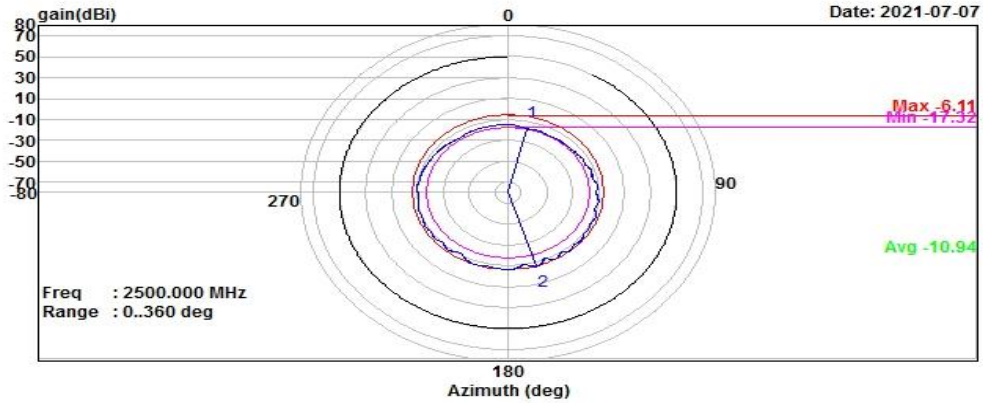
	Azimuth	gain	Read	Factor	Pol/Phase
	deg	dBi/m	Level	dB/m	
1	56.88	-37.17	24.53	-61.70	Horizontal
2	220.32	-10.81	50.89	-61.70	Horizontal

UE/MS OTA Antenna Performance Summary Report

Antenna Pattern Result of Frequency 2500MHz(EUT=H , Pol=Vertical)



TUV Rheinland Taiwan Ltd.
 No. 458-18, Sec 2, Fenliao., Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
 Tel: +886-2172-1000 Fax: +886-2172-1322



Site : Fully_Chamber
 Condition : Vertical
 Test Engineer: Kay Wu
 Product : Zeroplus
 Model No. : PCB
 Mode : 2500MHz
 Plane : H

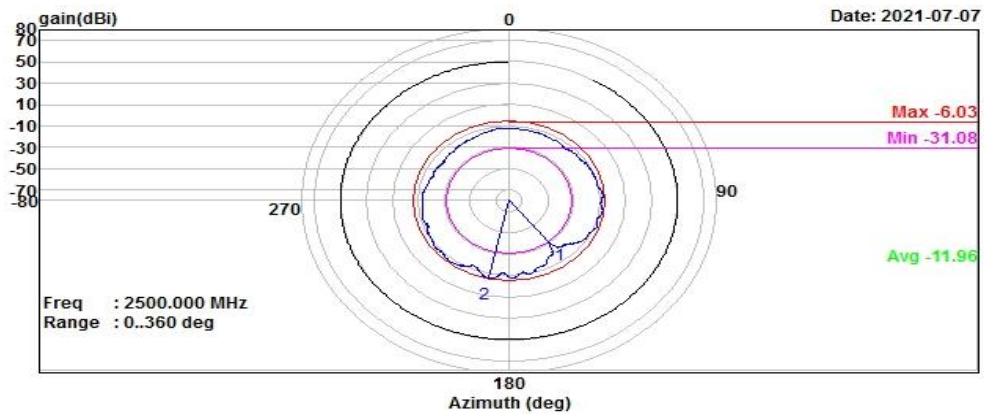
	Azimuth	gain	Read	Factor	Pol/Phase
	deg	dBi/m	Level	dB/m	
1	13.68	-17.32	44.38	-61.70	Vertical
2	162.36	-6.11	55.59	-61.70	Vertical

UE/MS OTA Antenna Performance Summary Report

Antenna Pattern Result of Frequency 2500MHz(EUT=E2 , Pol=Horizontal)



TUV Rheinland Taiwan Ltd.
 No. 458-18,Sec 2,Fenliao.,Linkou Dist.,New Taipei City 244, Taiwan(R.O.C.)
 Tel:+886-2172-1000 Fax:+886-2172-1322



Site : Fully_Chamber
 Condition : Horizontal
 Test Engineer: Kay Wu
 Product : Zeroplus
 Model No. : PCB
 Mode : 2500MHz
 Plane : E2

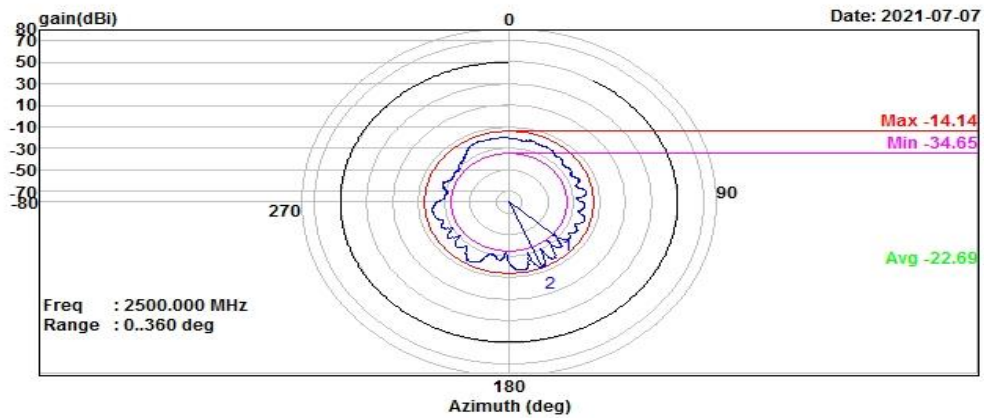
	Azimuth deg	gain dBi/m	Read		Pol/Phase
			Level dBi	Factor dB/m	
1	142.20	-31.08	30.62	-61.70	Horizontal
2	192.24	-6.03	55.67	-61.70	Horizontal

UE/MS OTA Antenna Performance Summary Report

Antenna Pattern Result of Frequency 2500MHz(EUT=E2 , Pol= Vertical)



TUV Rheinland Taiwan Ltd.
 No. 458-18, Sec 2, Fenliao., Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
 Tel: +886-2172-1000 Fax: +886-2172-1322



Site : Fully_Chamber
 Condition : Vertical
 Test Engineer: Kay Wu
 Product : Zeroplus
 Model No. : PCB
 Mode : 2500MHz
 Plane : E2

	Azimuth	gain	Read		Pol/Phase
			Level	Factor	
	deg	dBi/m	dBi	dB/m	
1	131.40	-34.65	27.05	-61.70	Vertical
2	156.96	-14.14	47.56	-61.70	Vertical