



云辰 SC109

Engineer : Gary

Report date : 2019/01/28 REV.03



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- ◆ **The antenna Vector network analyzer measurement**
 - **Antenna S Parameter measurement**
- ◆ **The antenna anechoic chamber measurement**
 - **Antenna Gain Value**

Manufacturer:	Everspring Industry Co., Ltd.
Address of Manufacturer:	3F., No.50, Sec. 1, Zhonghua Rd., Tucheng Dist., New Taipei City 236, CHINESE Taiwan

Antenna specification

BLE

Frequency Range : 2400-2500 MHz

WiFi -2.4G

Frequency Range : 2400-2500 MHz

WiFi - 5G

Frequency Range : 5150-5850 MHz

GSM

Frequency Range : 824MHz-960MHz/1710MHz-1990MHz

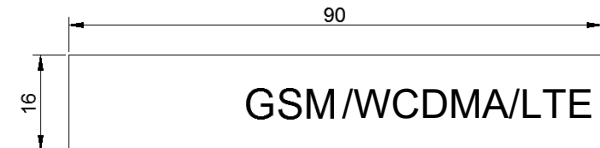
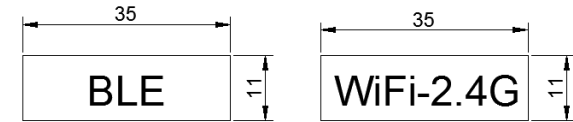
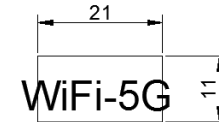
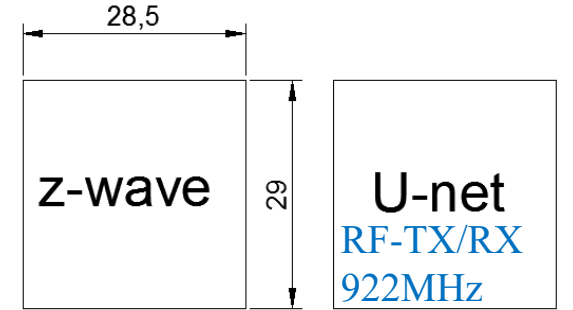
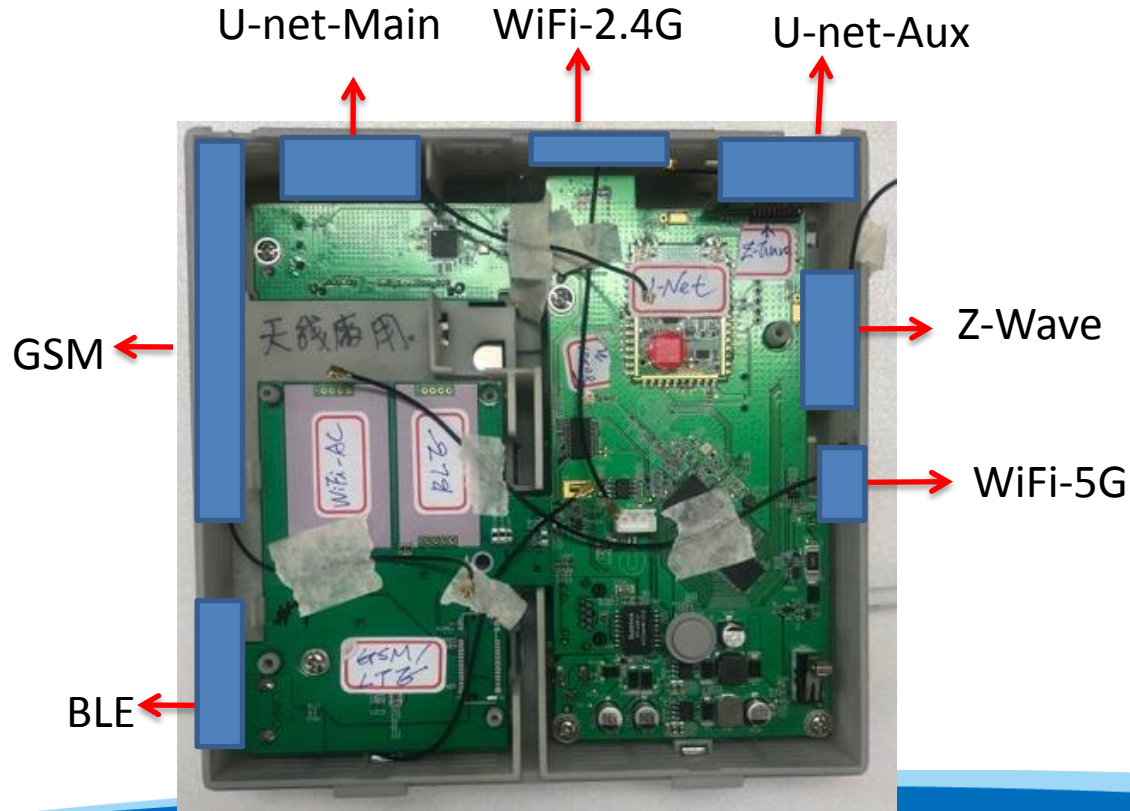
Z-wave

Frequency Range : 868.3MHz-923MHz

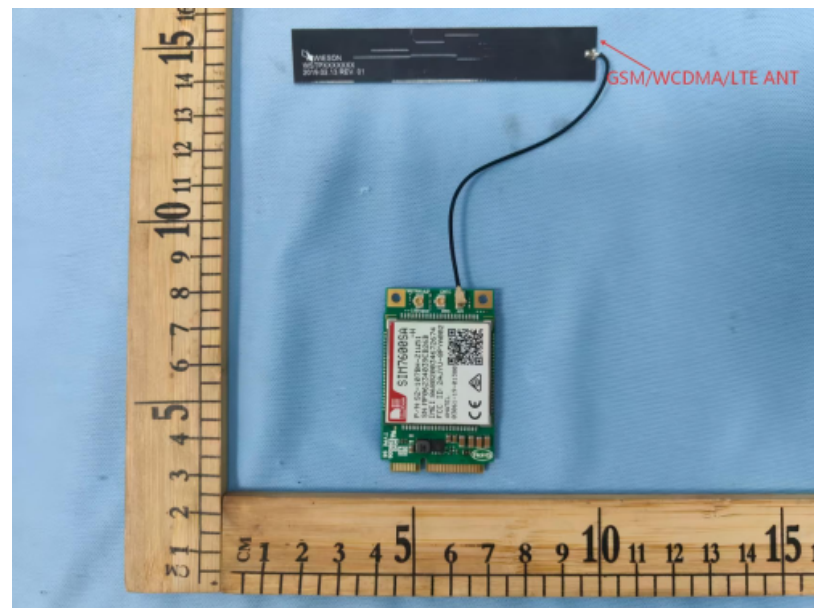
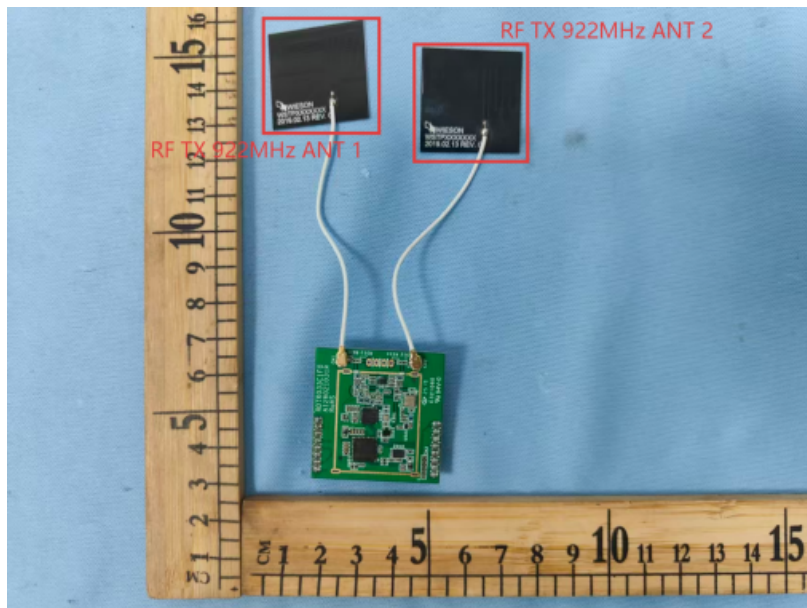
U-net

Frequency Range : 868.3MHz-923MHz

Antenna photo

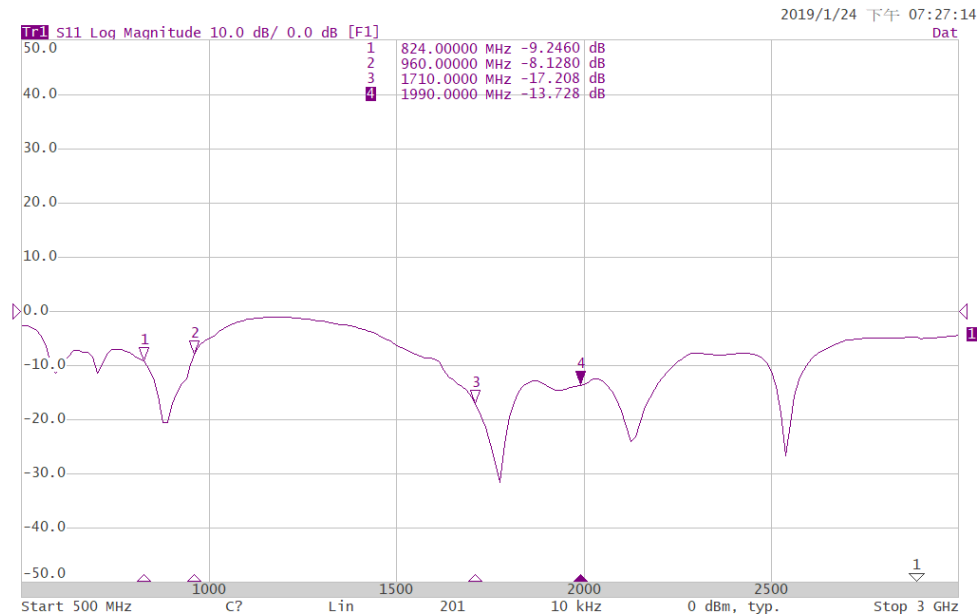


Antenna photo



Antenna Measurement Vector Network Analyzer

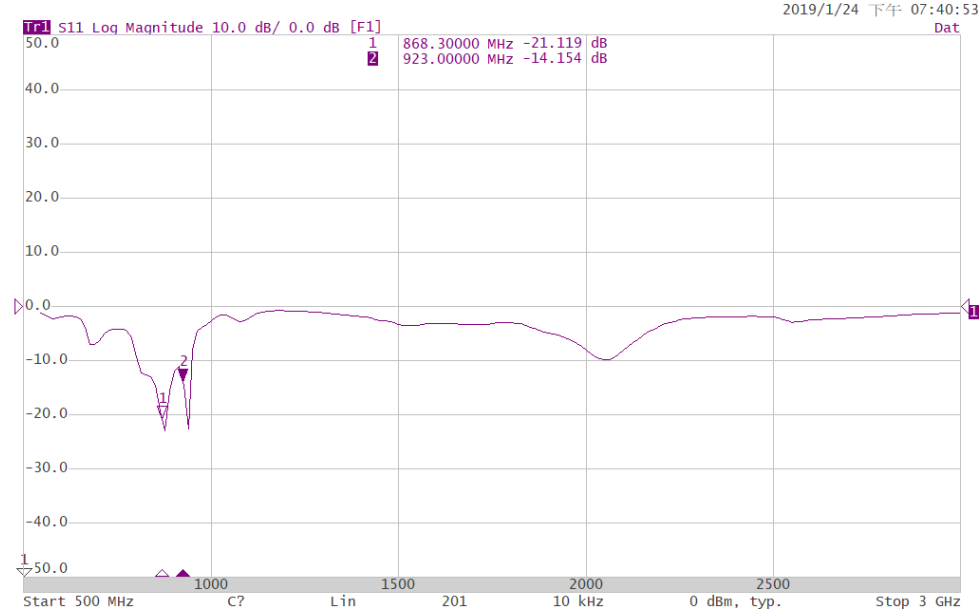
GSM/WCDMA/LTE Return Loss



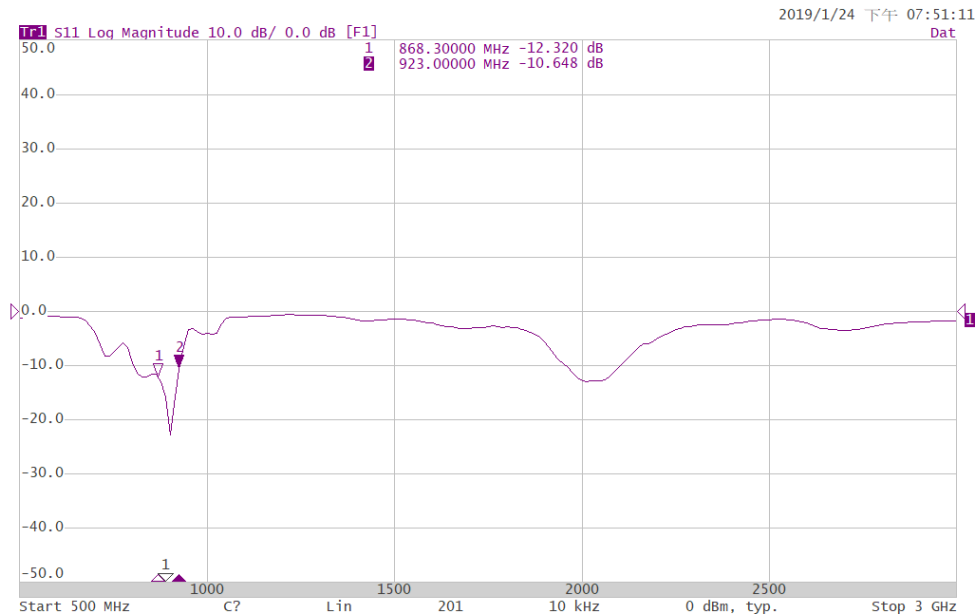
Frequency (MHz)	824	960	1710	1990
dB	-9.24	-8.12	-17.2	-13.7

U-net-Main

Return Loss



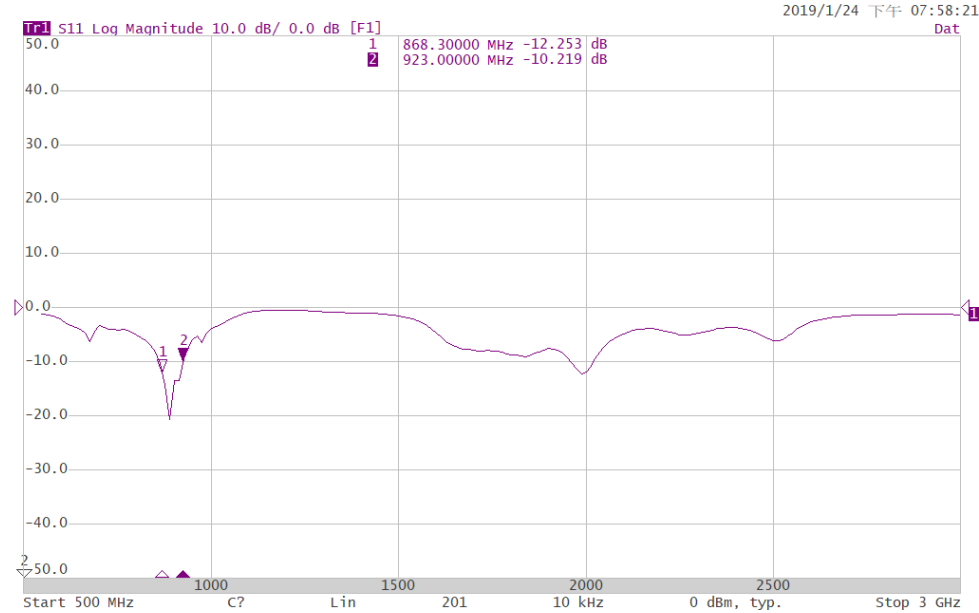
Frequency (MHz)	868.3	923
dB	-21.1	-14.1



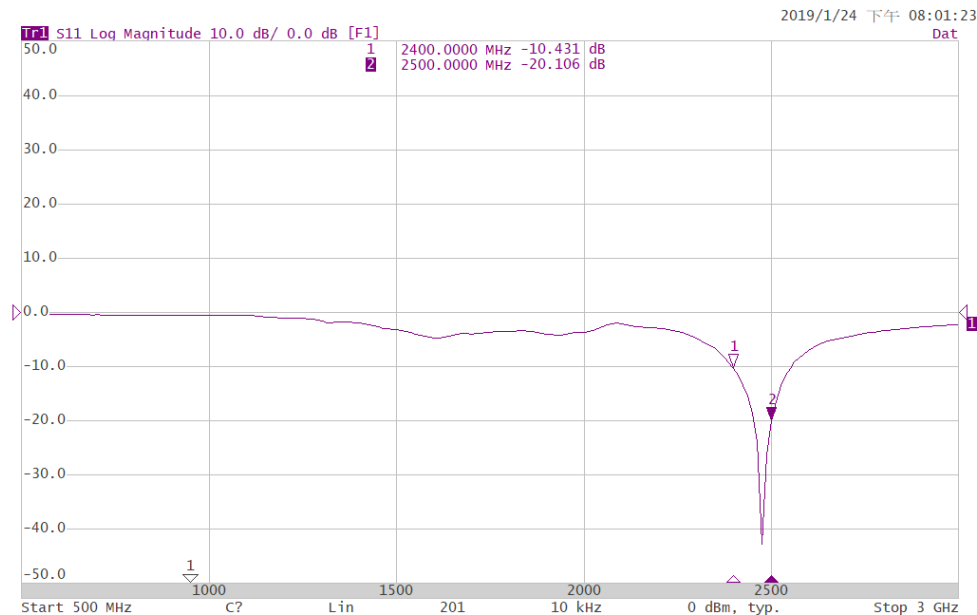
Frequency (MHz)	868.3	923
dB	-12.3	-10.6

Z-wave

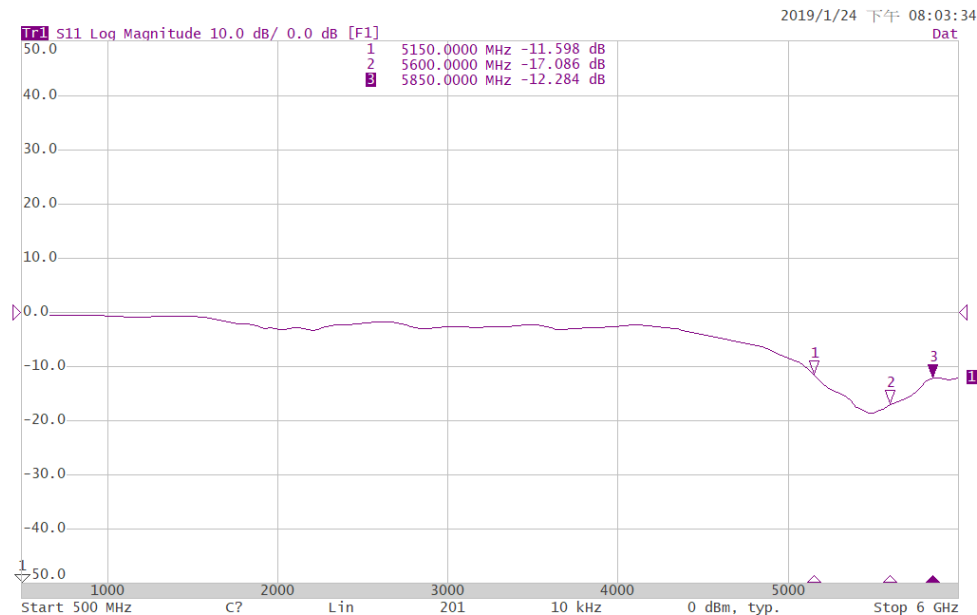
Return Loss



Frequency (MHz)	868.3	923
dB	-12.2	-10.2



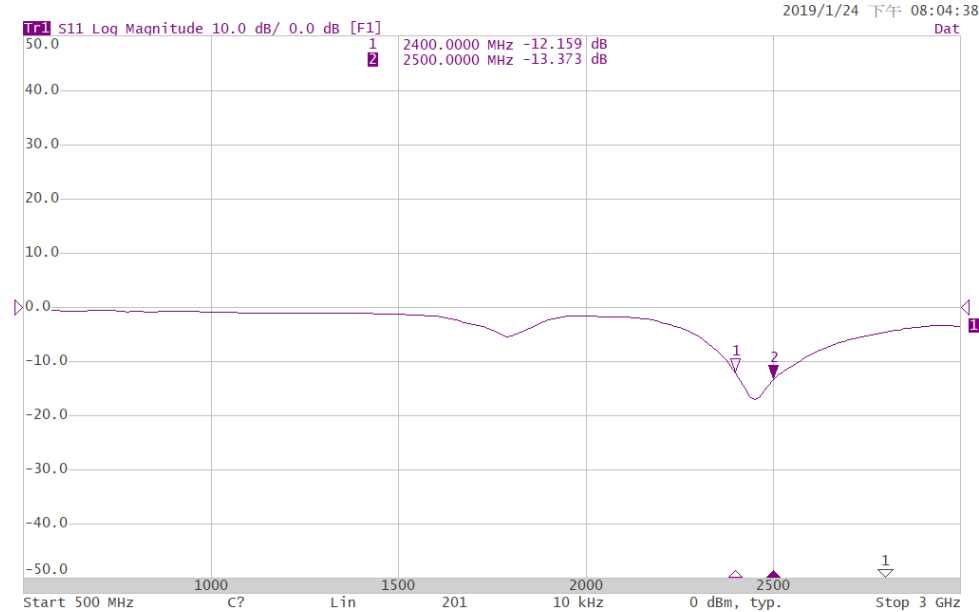
Frequency (MHz)	2400	2500
dB	-10.4	-20.1



Frequency (MHz)	5150	5600	5850
dB	-11.5	-17.0	-12.2

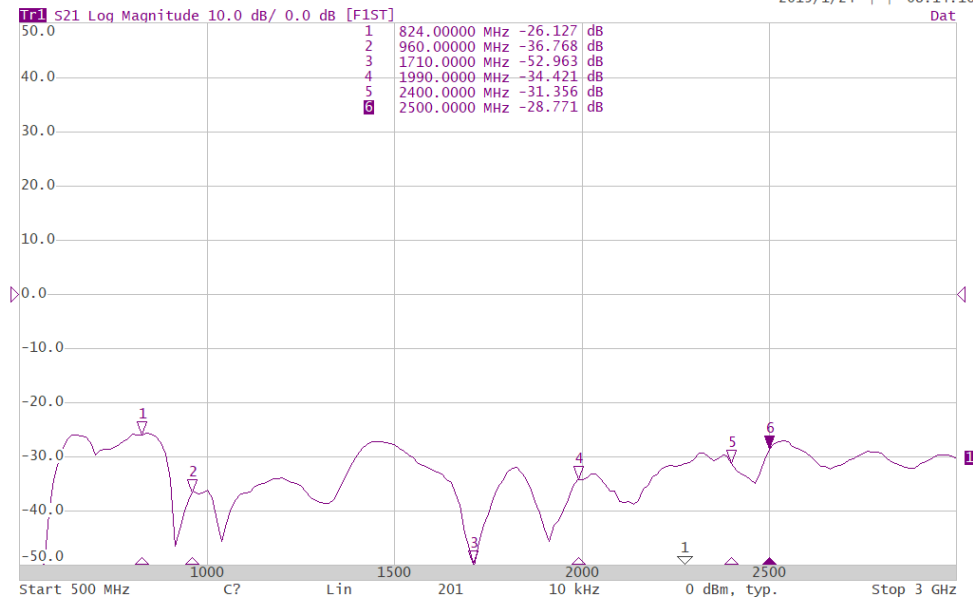
BLE

Return Loss



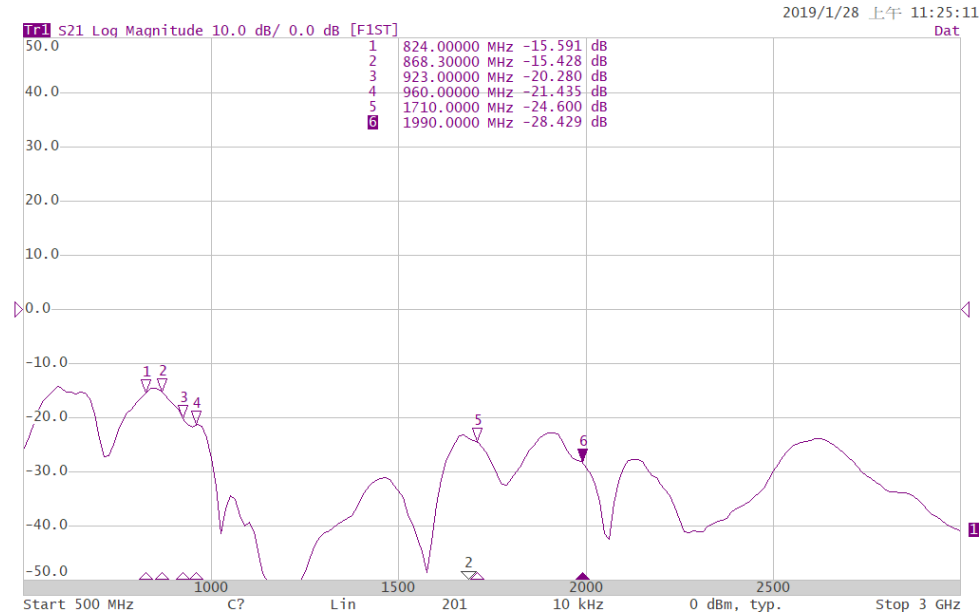
Frequency (MHz)	2400	2500
dB	-12.1	-13.3

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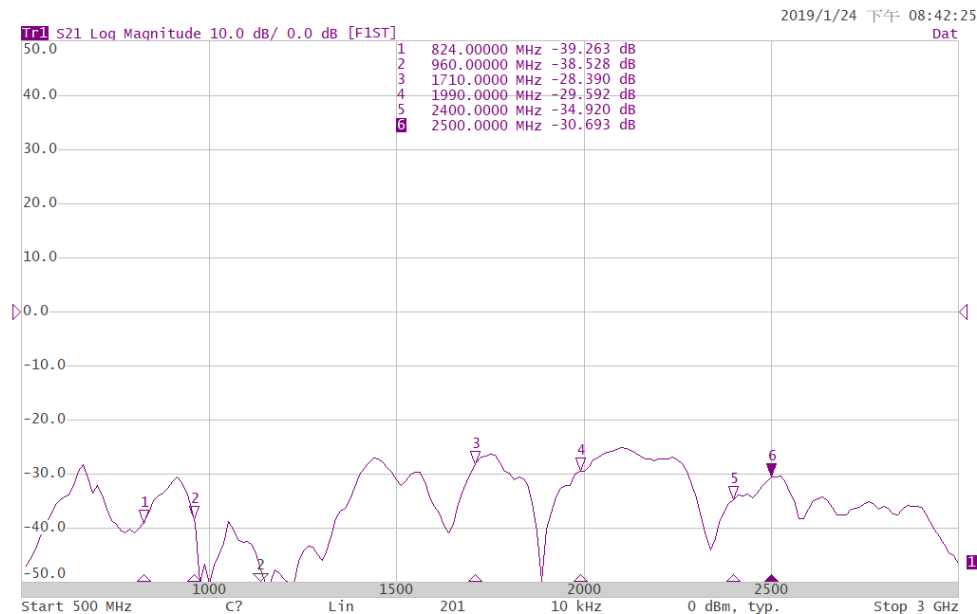
Frequency (MHz)	824	960	1710	1990	2700	2500
dB	-26.1	-36.7	-52.9	-34.4	-31.3	-28.7

GSM/ U-net-Main Isolation



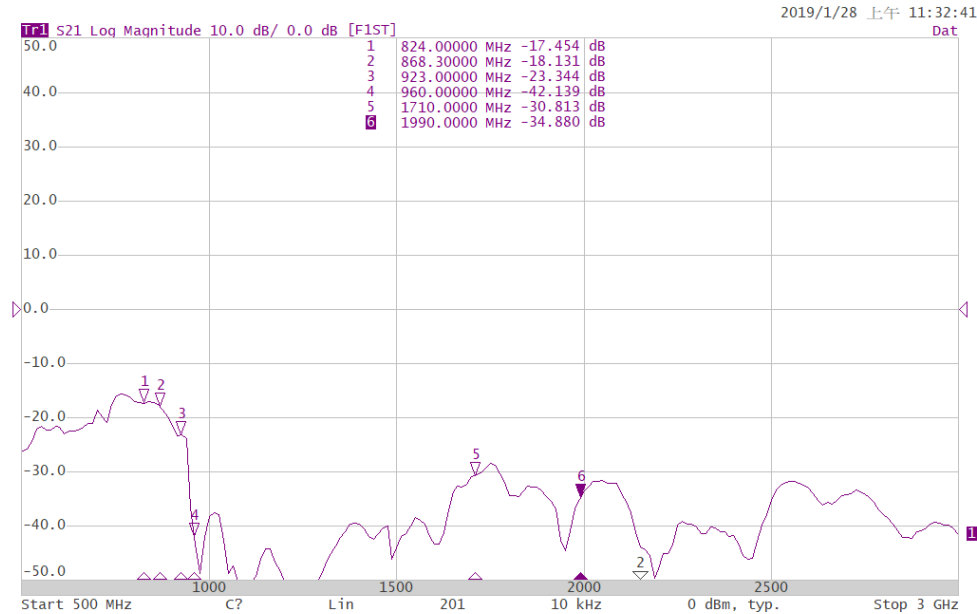
Frequency (MHz)	824	868.3	923	960	1710	1990
dB	-15.5	-15.4	-20.2	-21.4	-24.6	-28.4

GSM/WiFi-2.4G Isolation



Frequency (MHz)	824	960	1710	1990	2700	2500
dB	-39.2	-38.5	-28.3	-29.5	-34.9	-30.6

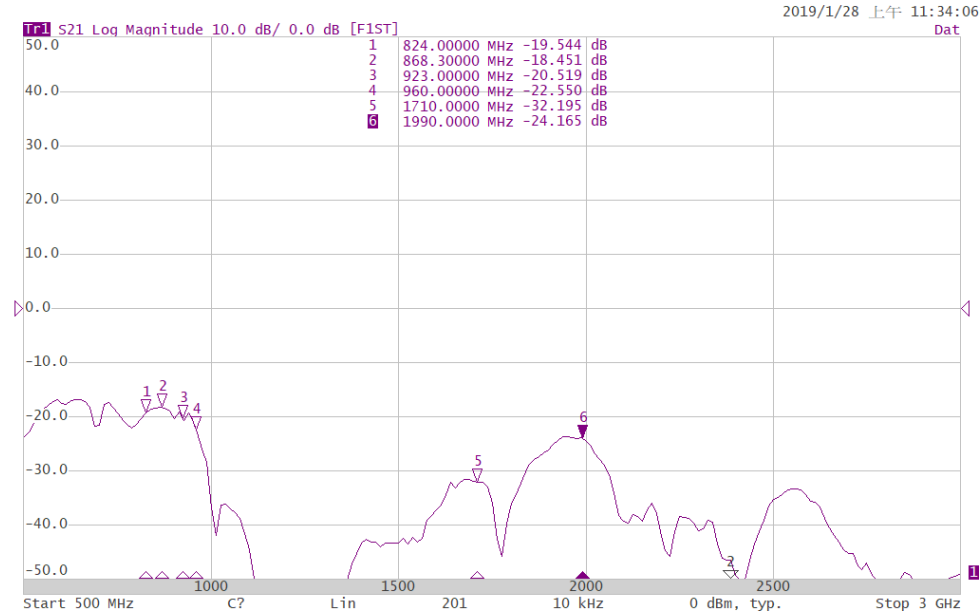
GSM/ U-net-Aux Isolation



Frequency (MHz)	824	868.3	923	960	1710	1990
dB	-17.4	-18.1	-23.3	-42.1	-30.8	-34.8

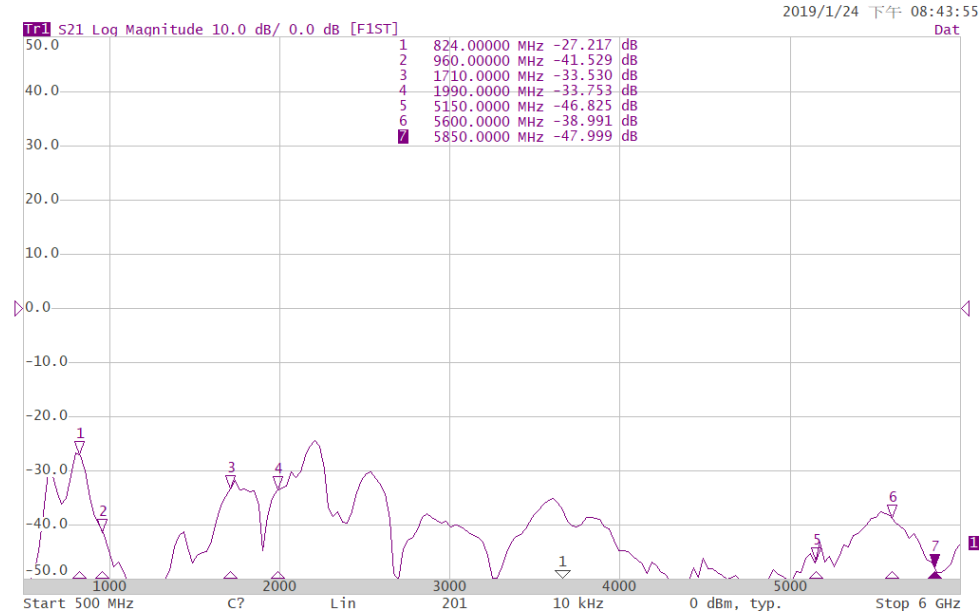
GSM/ Z-wave

Isolation



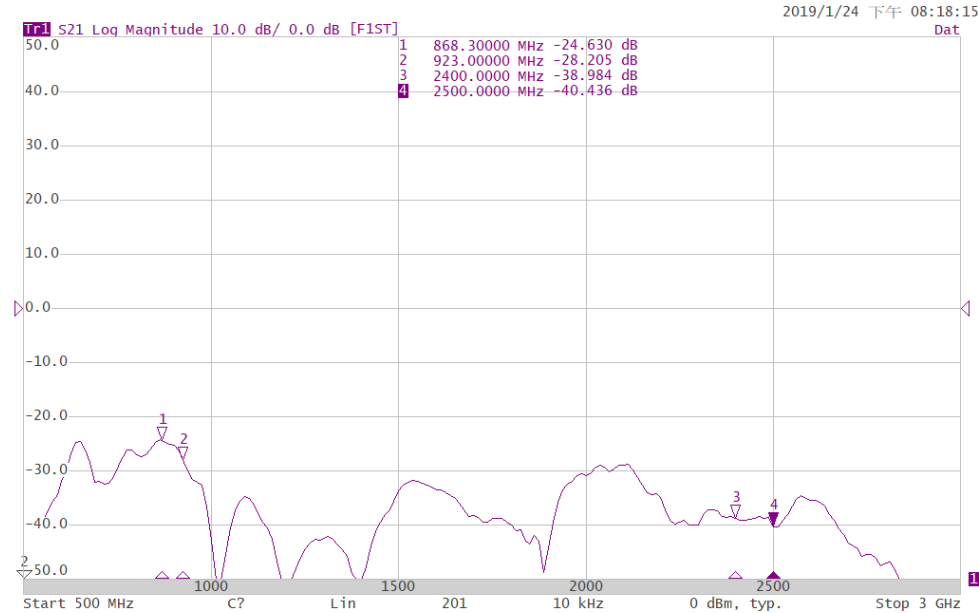
Frequency (MHz)	824	868.3	923	960	1710	1990
dB	-19.5	-18.4	-20.5	-22.5	-32.1	-24.1

GSM/ WiFi-5G Isolation



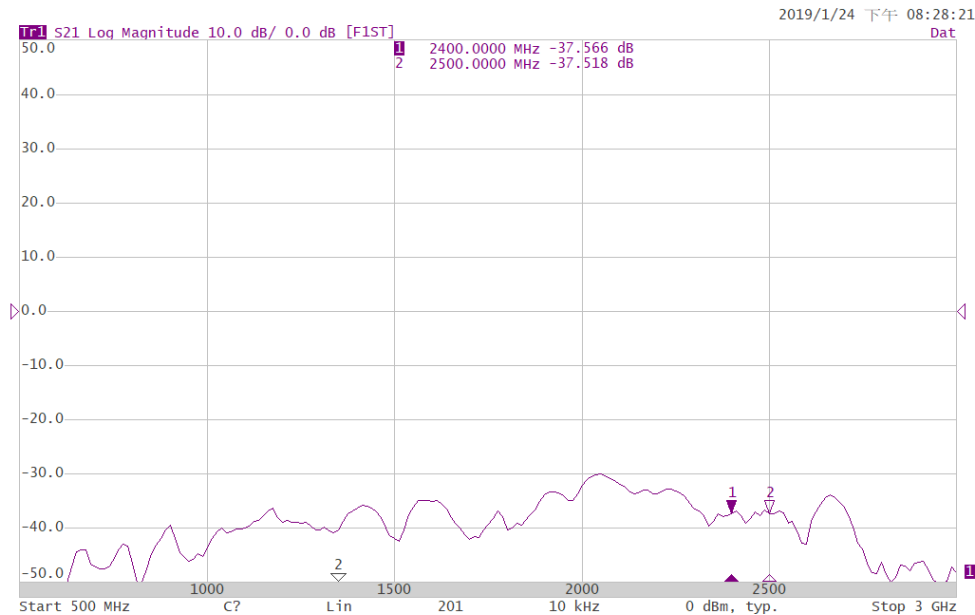
Frequency (MHz)	824	960	1710	1990	5150	5600	5850
dB	-27.2	-41.5	-33.5	-33.7	-46.8	-38.9	-47.9

BLE / U-net-Main Isolation



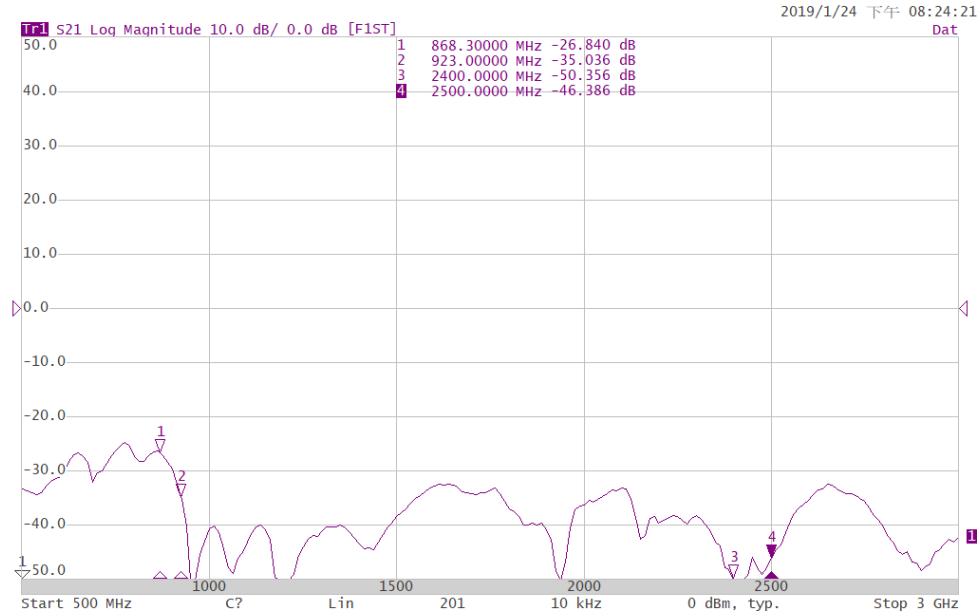
Frequency (MHz)	868.3	923	2400	2500
dB	-24.6	-28.2	-38.9	-40.4

BLE /WiFi-2.4G Isolation



Frequency (MHz)	2400	2500
dB	-37.5	-37.5

BLE / U-net-Aux Isolation

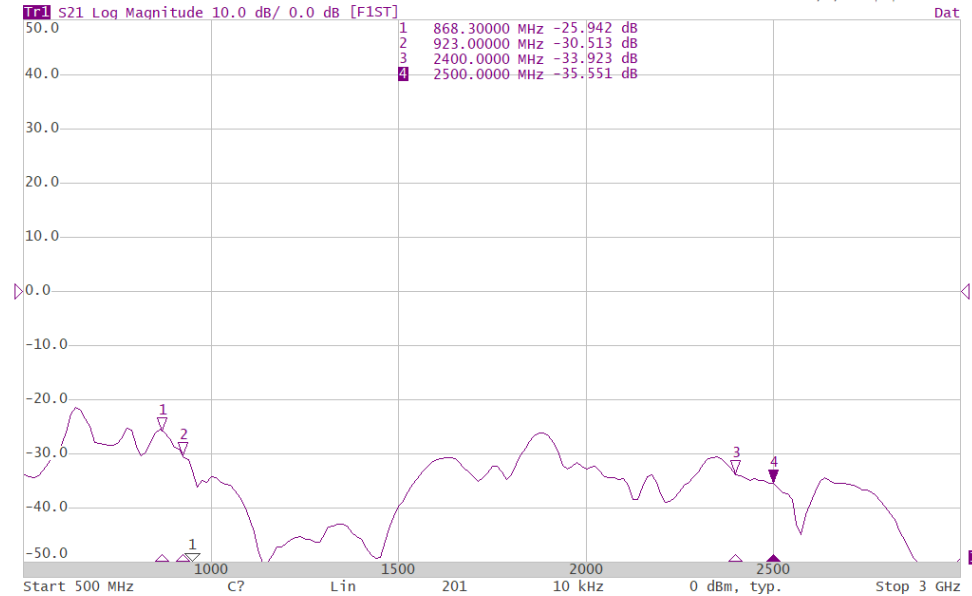


Frequency (MHz)	868.3	923	2400	2500
dB	-26.8	-35.0	-50.3	-46.3

BLE / Z-wave

Isolation

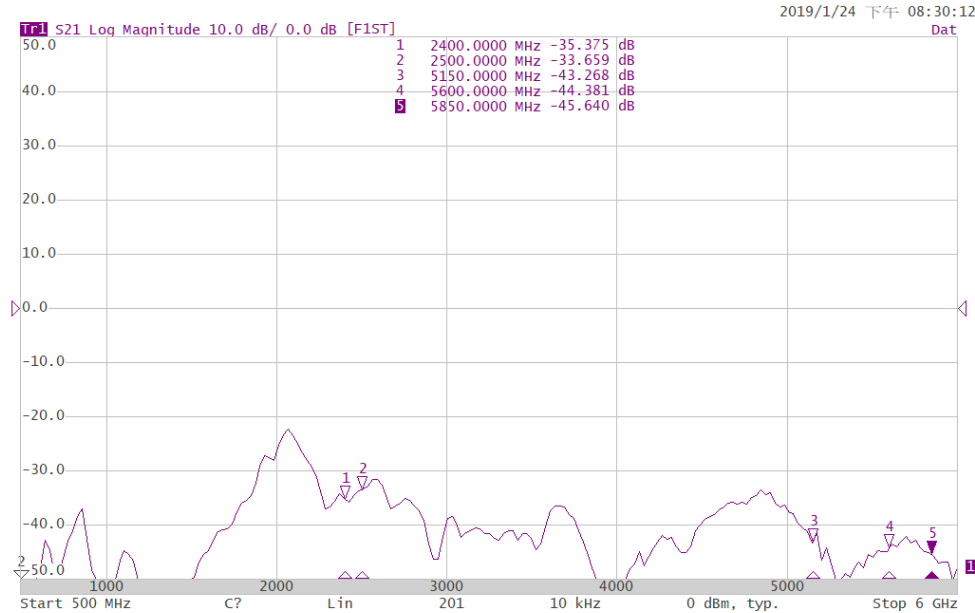
2019/1/24 下午 08:26:44



Frequency (MHz)	868.3	923	2400	2500
dB	-25.9	-30.5	-33.9	-35.5

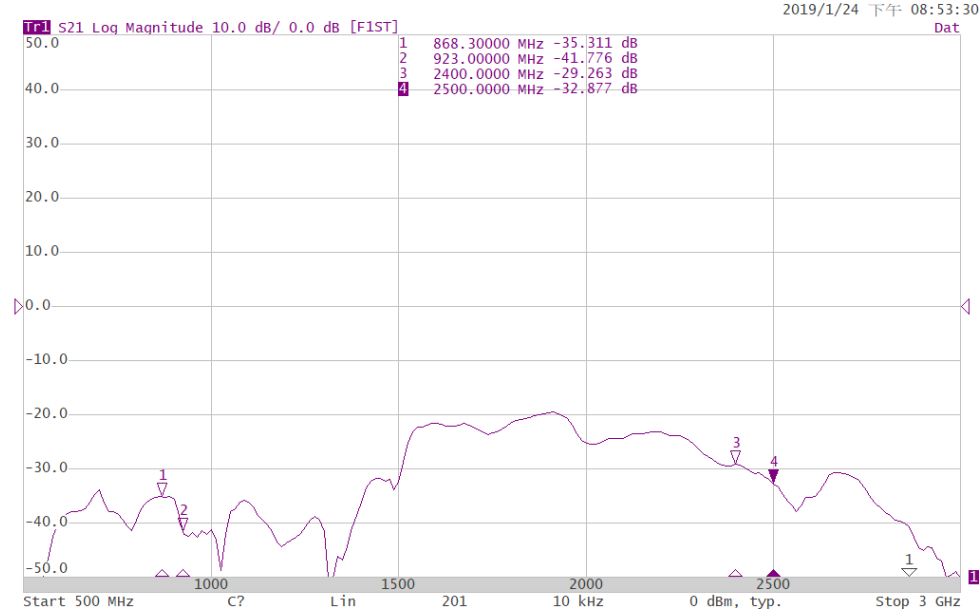
BLE / WiFi-5G

Isolation



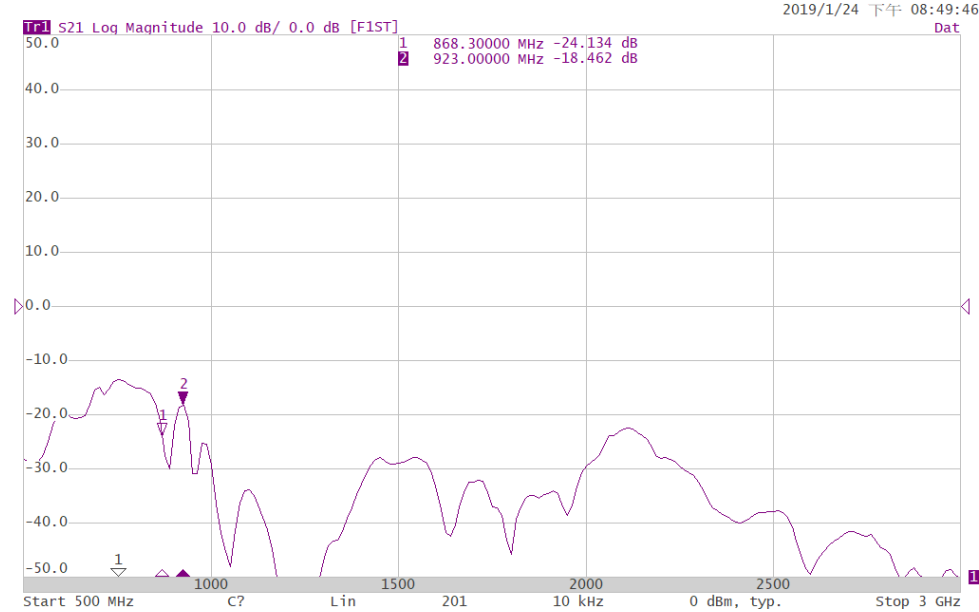
Frequency (MHz)	2400	2500	5150	5600	5850
dB	-35.3	-33.6	-43.2	-44.3	-45.6

U-net-Main/WiFi-2.4G Isolation



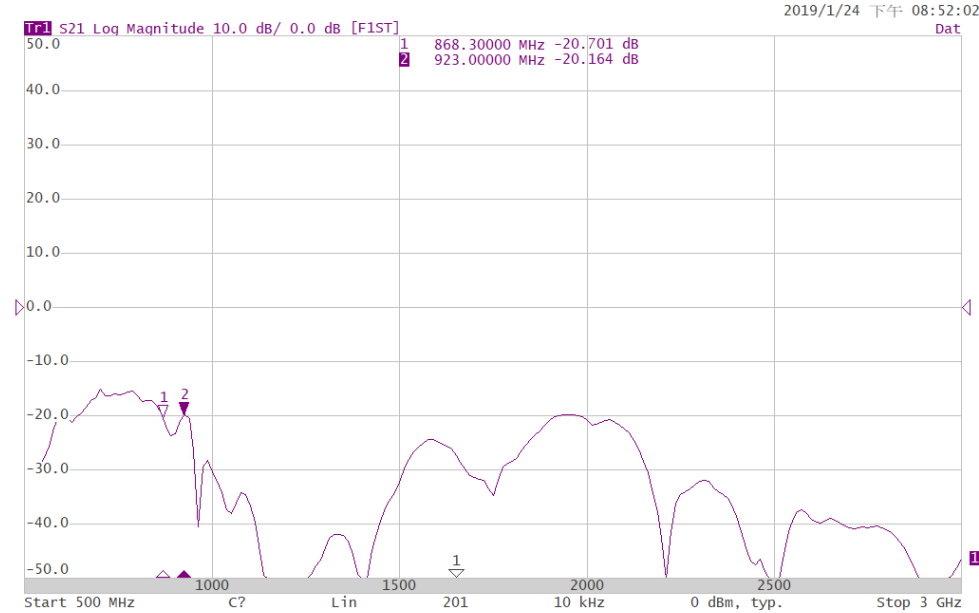
Frequency (MHz)	868.3	923	2400	2500
dB	-35.3	-41.7	-29.2	-32.8

U-net-Main/ U-net-Aux Isolation



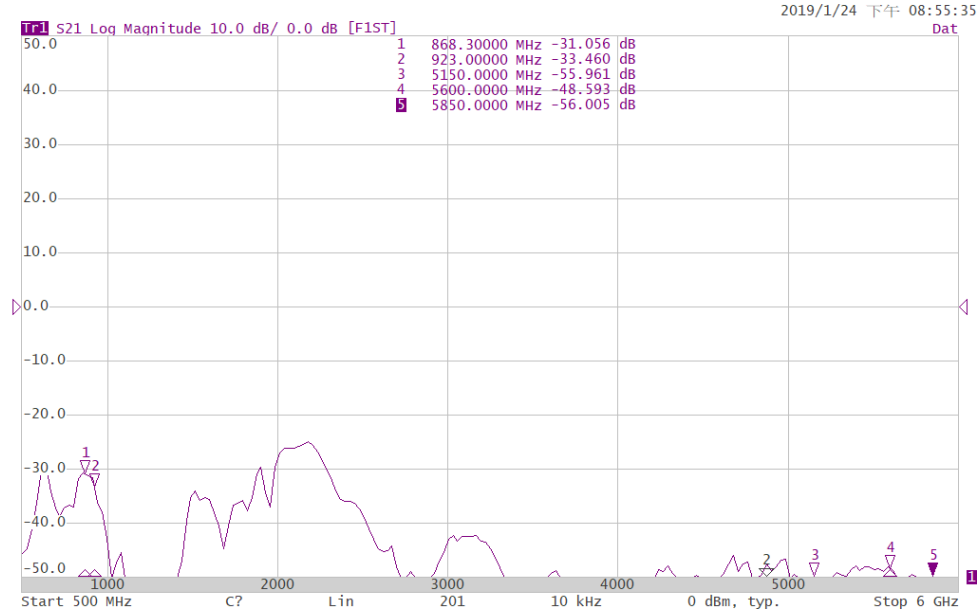
Frequency (MHz)	868.3	923
dB	-24.1	-18.4

U-net-Main/ Z-wave Isolation



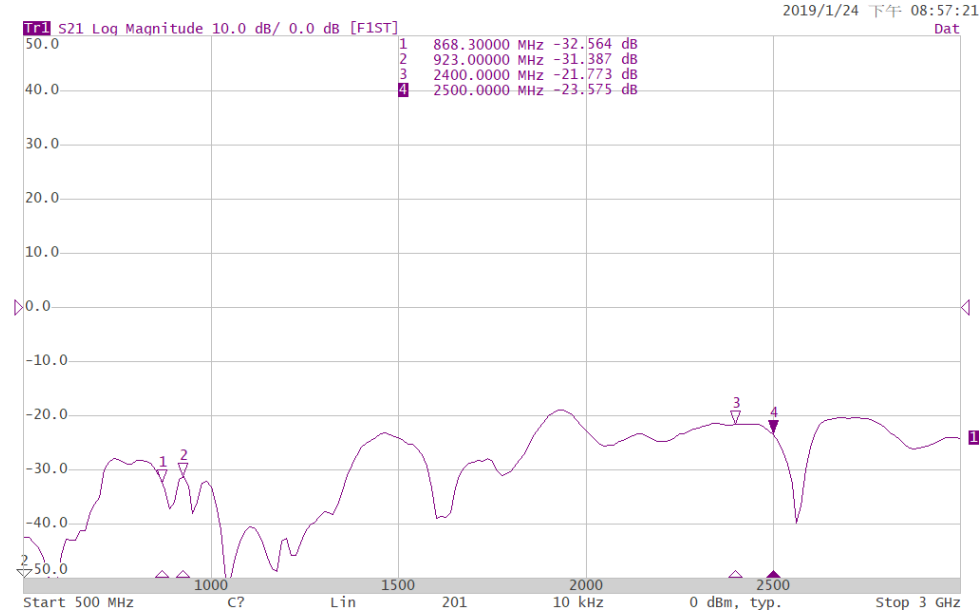
Frequency (MHz)	868.3	923
dB	-20.7	-20.1

U-net-Main/ WiFi-5G Isolation



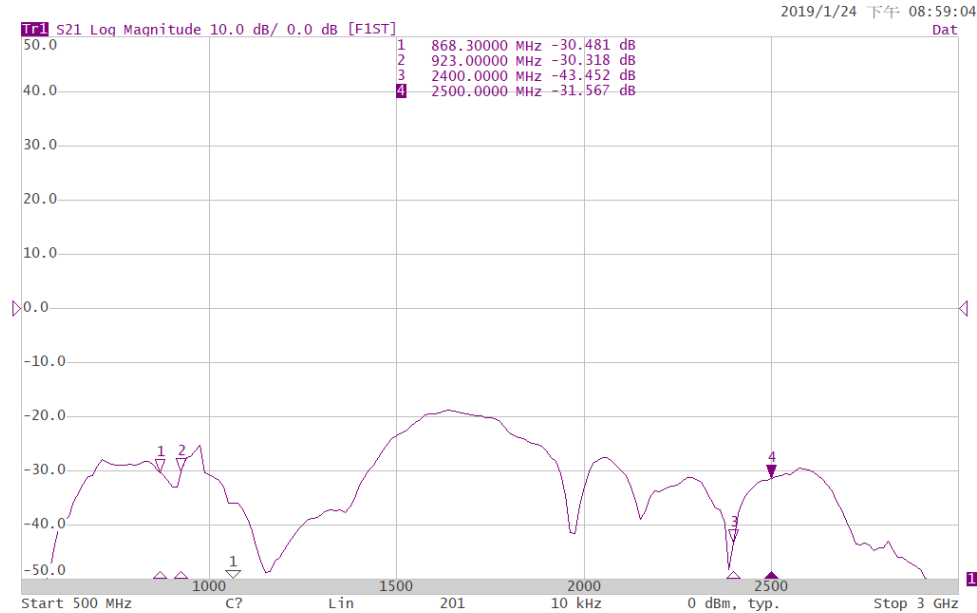
Frequency (MHz)	868.3	923	5150	5600	5850
dB	-31.0	-33.4	-55.9	-48.5	-56.0

WiFi-2.4G/ U-net-Aux Isolation



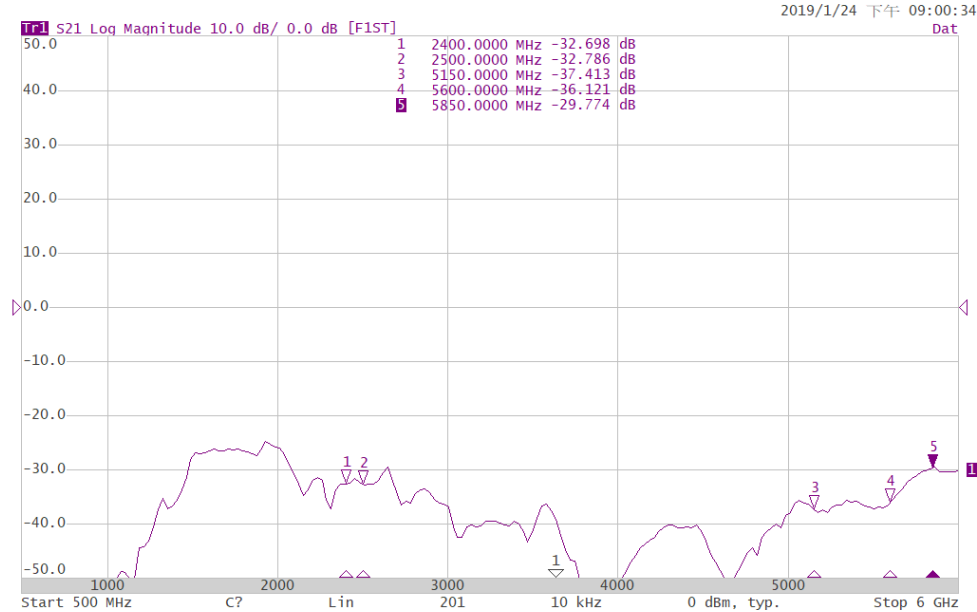
Frequency (MHz)	868.3	923	2400	2500
dB	-32.5	-31.3	-21.7	-23.5

WiFi-2.4G/ Z-wave Isolation



Frequency (MHz)	868.3	923	2400	2500
dB	-30.4	-30.3	-43.4	-31.5

WiFi-2.4G/ WiFi-5G Isolation



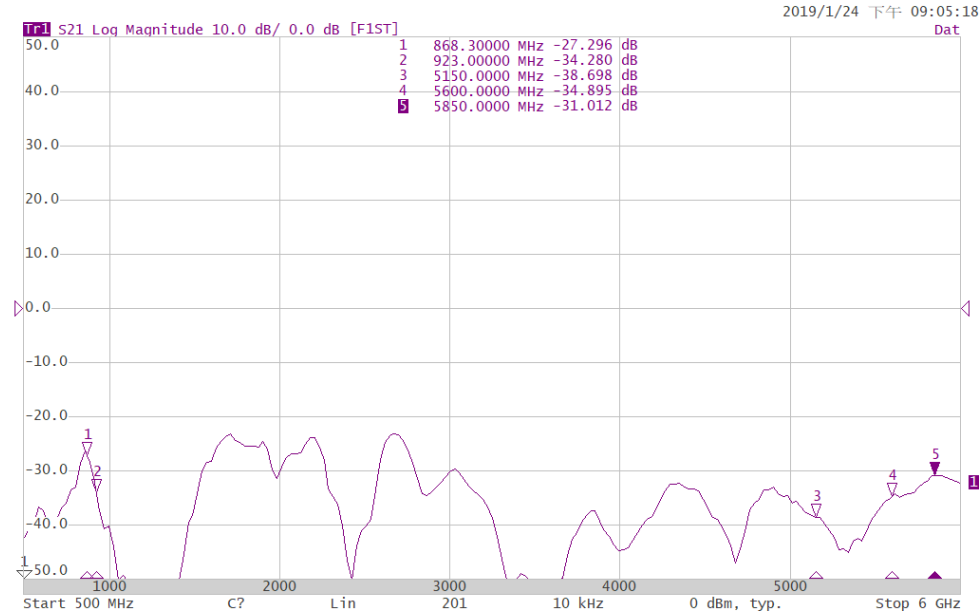
Frequency (MHz)	2400	2500	5150	5600	5850
dB	-32.6	-32.7	-37.4	-36.1	-29.7

U-net-Aux/ Z-wave Isolation

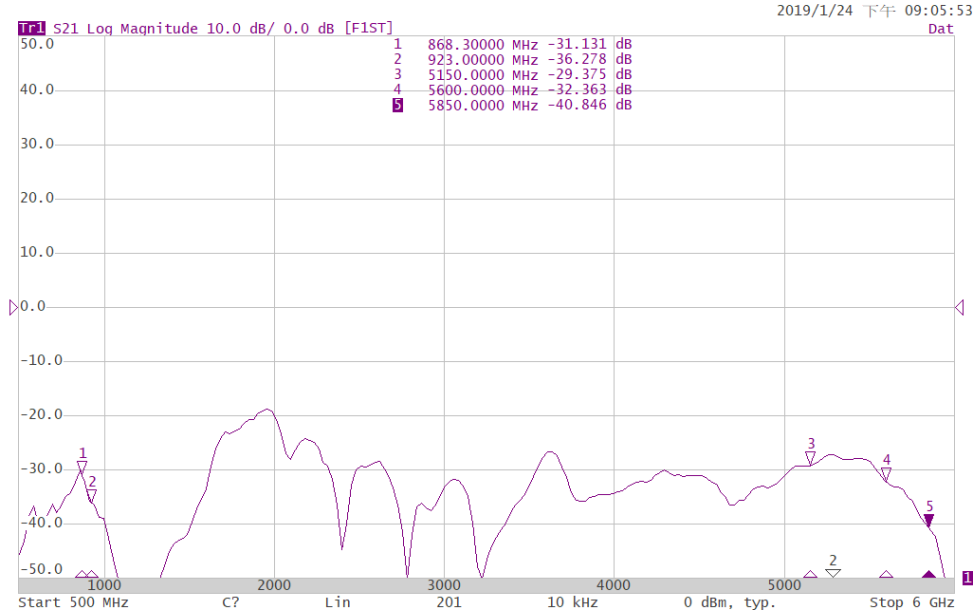


Frequency (MHz)	868.3	923
dB	-15.6	-18.3

U-net-Aux/ WiFi-5G Isolation

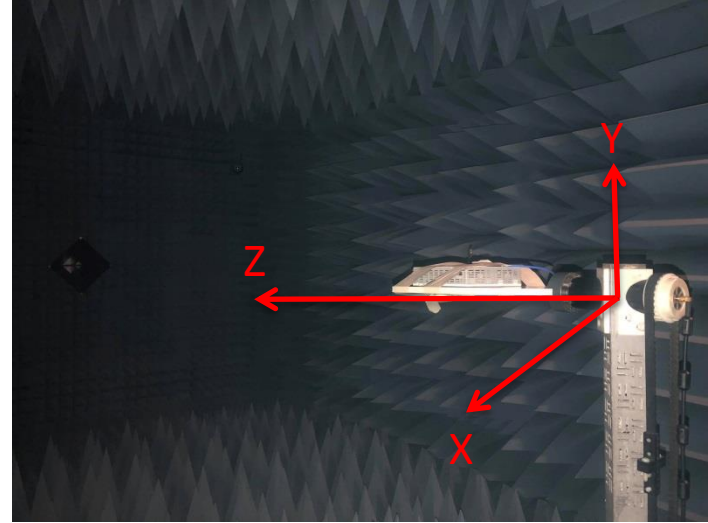
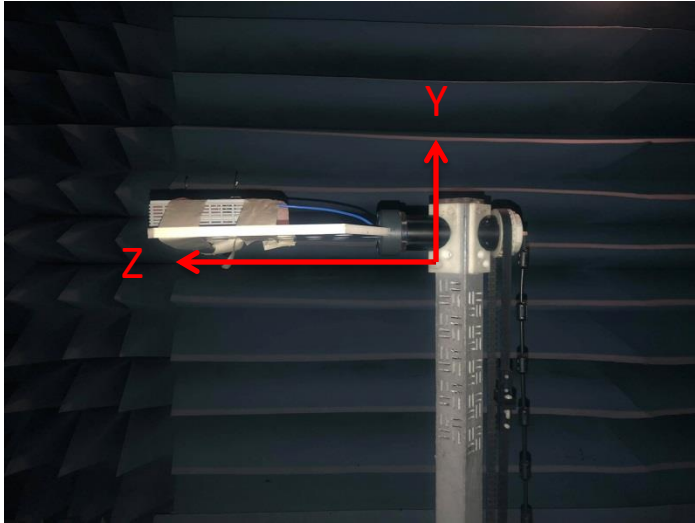


Frequency (MHz)	868.3	923	5150	5600	5850
dB	-27.2	-34.2	-38.6	-34.8	-31.0



Frequency (MHz)	868.3	923	5150	5600	5850
dB	-31.1	-36.2	-29.3	-32.3	-40.8

chamber measurement photo



3D Gain Total

GSM/WCDMA/LTE



Frequency (MHz)	Peak Gain (dBi)	3D-avgGain (dBi)	3D Radiation Efficiency (%)
824	0.49	-3.92	41
869	1.19	-4.09	39
894	0.76	-4.64	34
925	-0.02	-4.94	32
960	0.03	-5.04	31
1710	1.31	-3.84	41
1755	1.24	-3.97	40
1800	0.80	-4.08	39
1880	0.58	-3.77	42
1920	1.46	-3.43	45
1990	1.85	-3.65	43

Main RF-TX 922MHz

Aux RF-TX 922MHz

Frequency (MHz)	Peak Gain (dBi)	3D-avgGain (dBi)	3D Radiation Efficiency (%)
868.3	0.25	-4.29	37
880.0	0.08	-4.57	35
894.0	-0.02	-4.82	33
900.0	-0.16	-4.99	32
915.0	-0.49	-5.29	30
920.0	-0.34	-5.16	30
923.0	-0.27	-5.12	31

Frequency (MHz)	Peak Gain (dBi)	3D-avgGain (dBi)	3D Radiation Efficiency (%)
868.3	0.12	-4.65	34
880.0	-0.19	-4.82	33
894.0	-0.28	-4.75	34
900.0	-0.67	-4.97	32
915.0	-0.76	-4.99	32
920.0	-0.99	-5.14	31
923.0	-1.20	-5.29	30

Frequency (MHz)	Peak Gain (dBi)	3D-avgGain (dBi)	3D Radiation Efficiency (%)
868.3	0.05	-4.43	36
880.0	0.23	-4.72	34
894.0	0.02	-5.13	31
900.0	-0.32	-5.28	30
915.0	0.08	-5.17	30
920.0	0.18	-5.15	31
923.0	0.36	-4.99	32

Frequency (MHz)	Peak Gain (dBi)	3D-avgGain (dBi)	3D Radiation Efficiency (%)
2400	2.67	-3.28	47
2450	3.36	-2.51	56
2500	3.74	-2.39	58

Frequency (MHz)	Peak Gain (dBi)	3D-avgGain (dBi)	3D Radiation Efficiency (%)
5150	4.24	-2.94	51
5250	5.08	-2.11	62
5350	4.36	-2.45	57
5470	4.71	-1.98	63
5600	4.13	-2.39	58
5725	4.39	-2.41	57
5785	4.21	-2.13	61
5850	4.64	-2.01	63

3D Gain Total BLE



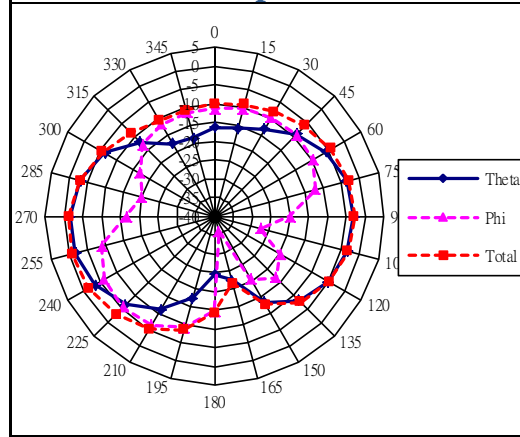
Frequency (MHz)	Peak Gain (dBi)	3D-avgGain (dBi)	3D Radiation Efficiency (%)
2400	2.87	-3.01	50
2450	2.70	-3.14	49
2500	1.82	-3.82	42

OTA Measurement Result 3D pattern

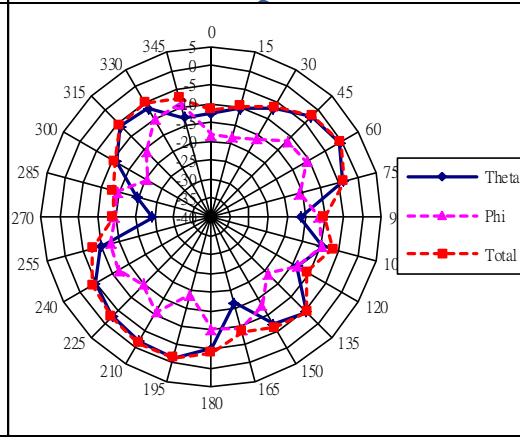
GSM/WCDMA/LTE Antenna Pattern

Frequency: 824 MHz

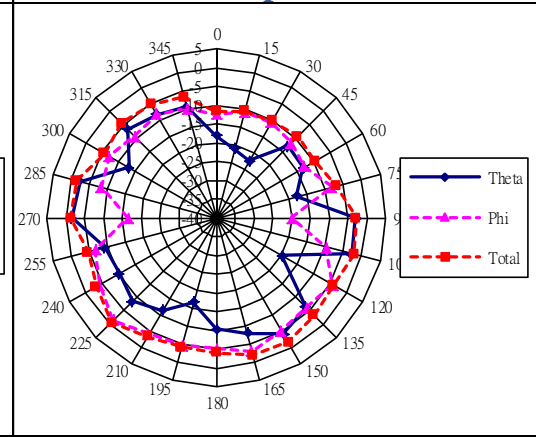
XY-plane



XZ-plane



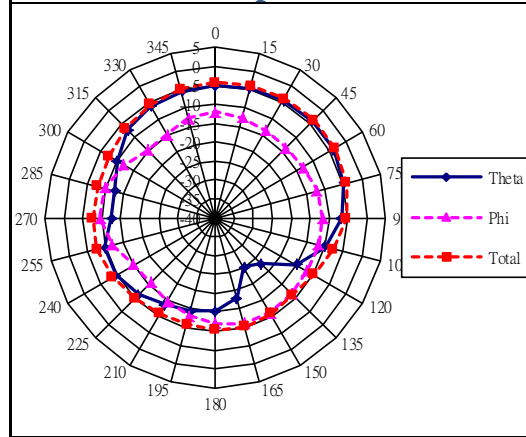
YZ-plane



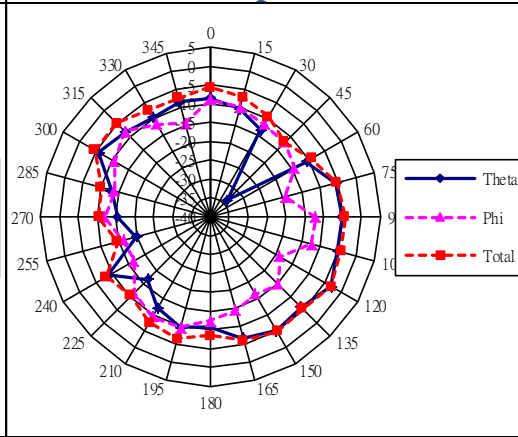
GSM/WCDMA/LTE Antenna Pattern

Frequency: 960 MHz

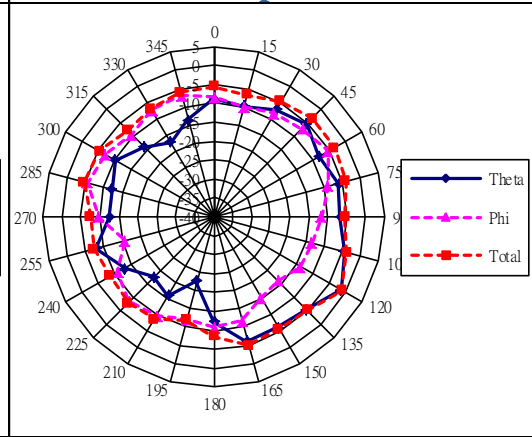
XY-plane



XZ-plane

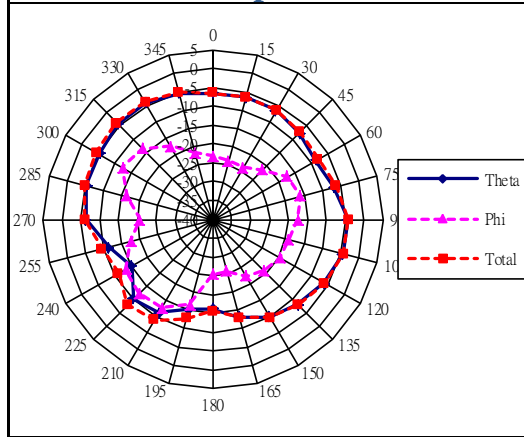


YZ-plane

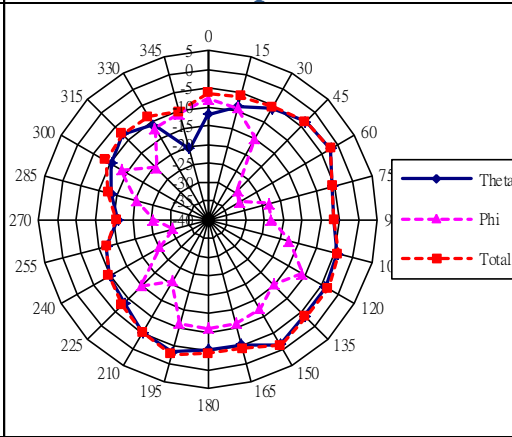


Frequency: 1710MHz

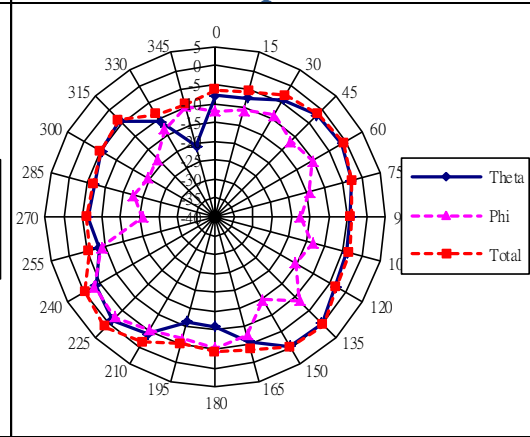
XY-plane



XZ-plane



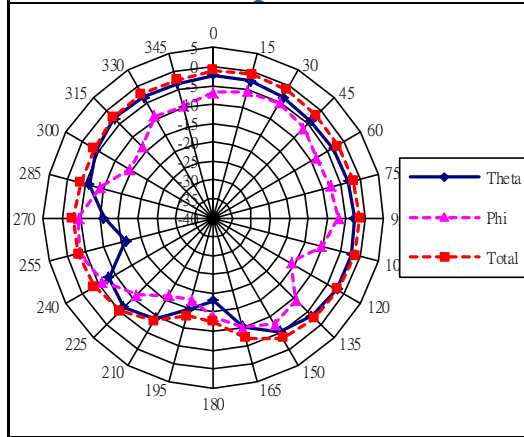
YZ-plane



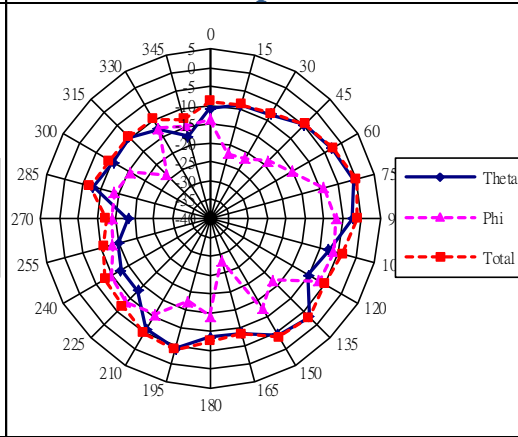
GSM/WCDMA/LTE Antenna Pattern

Frequency: 1990MHz

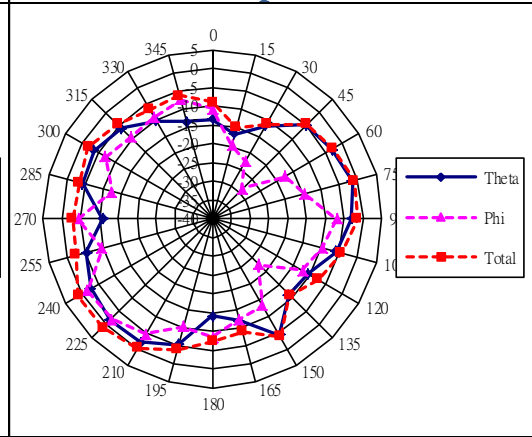
XY-plane



XZ-plane

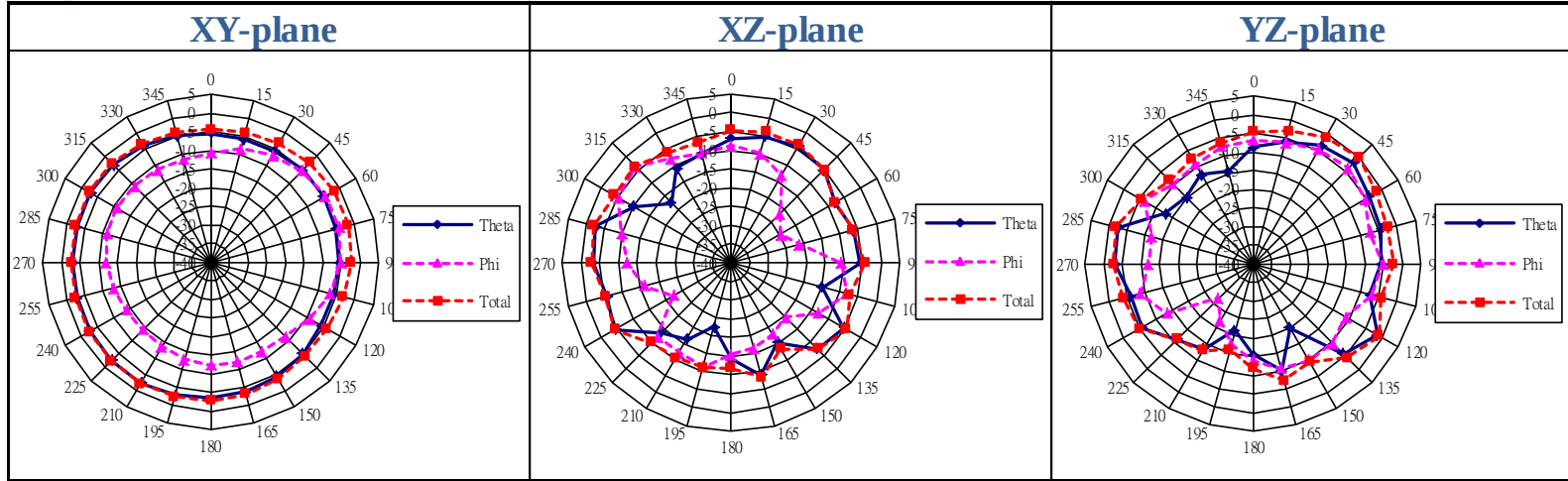


YZ-plane



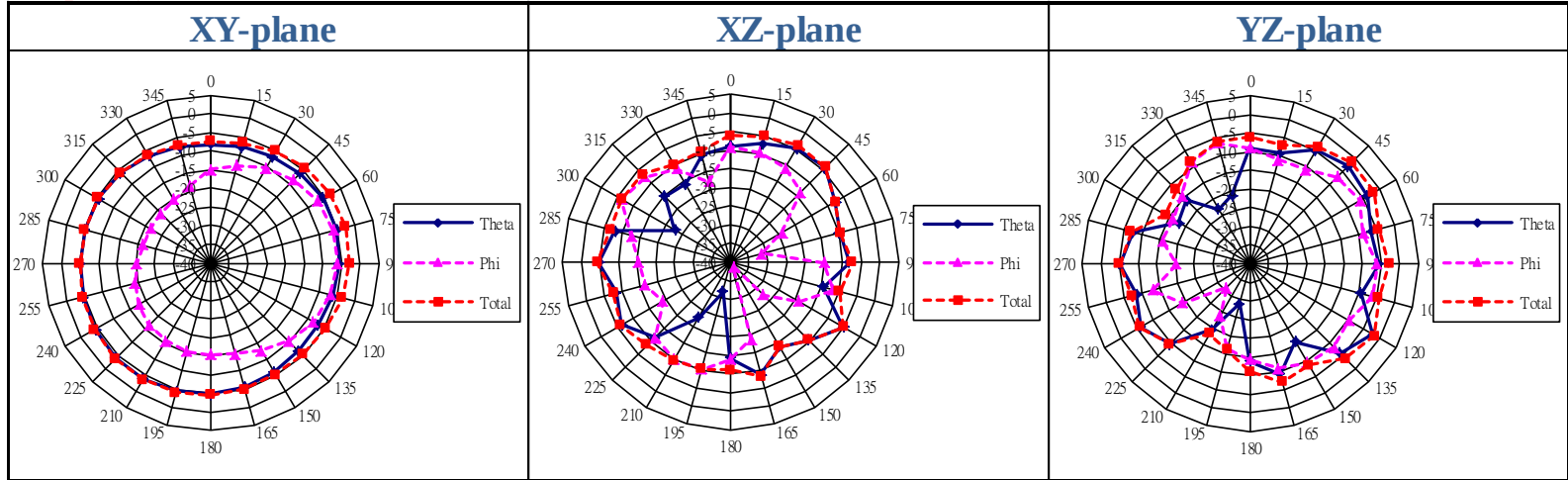
U-net-Main Antenna Pattern

Frequency: 868.3MHz



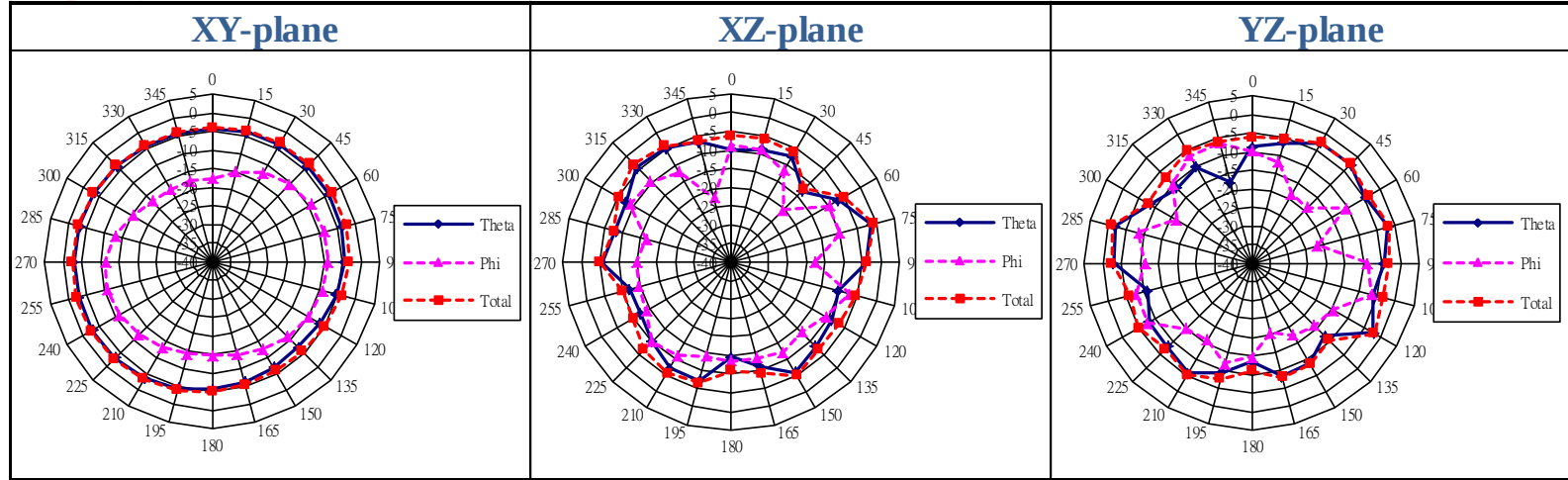
U-net-Main Antenna Pattern

Frequency: 923 MHz



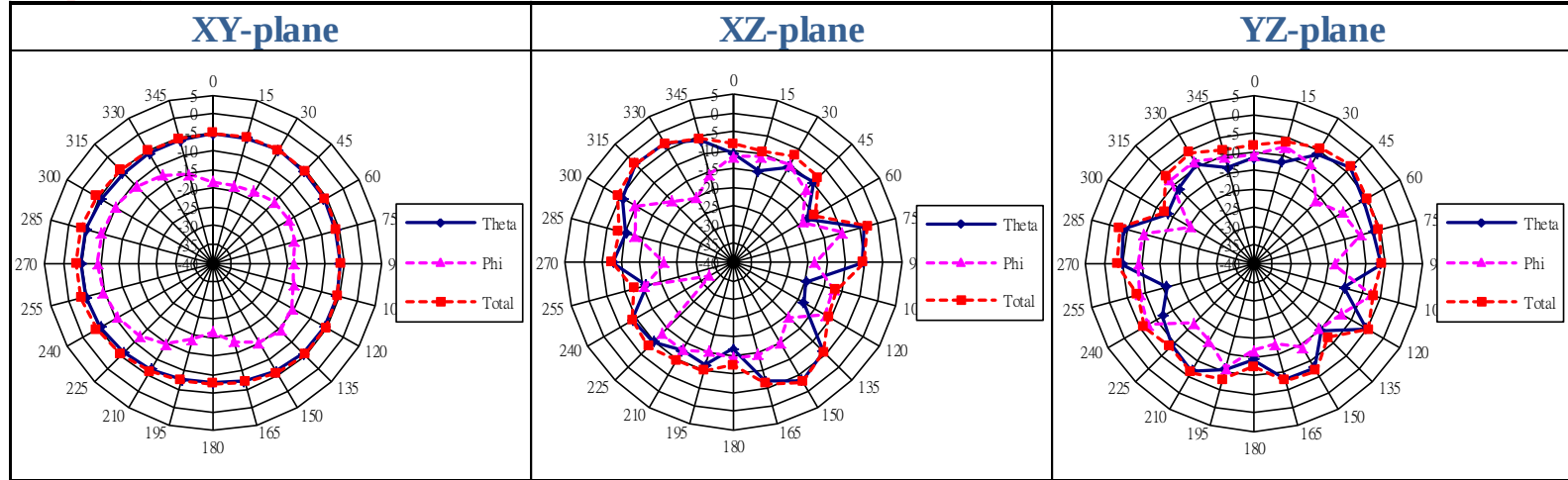
U-net-Aux Antenna Pattern

Frequency: 868.3MHz



U-net-Aux Antenna Pattern

Frequency: 923 MHz

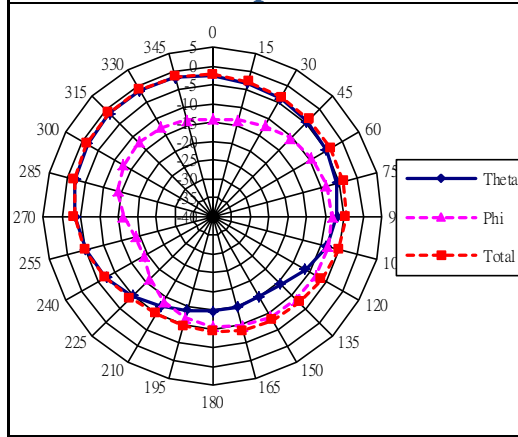


Z-wave

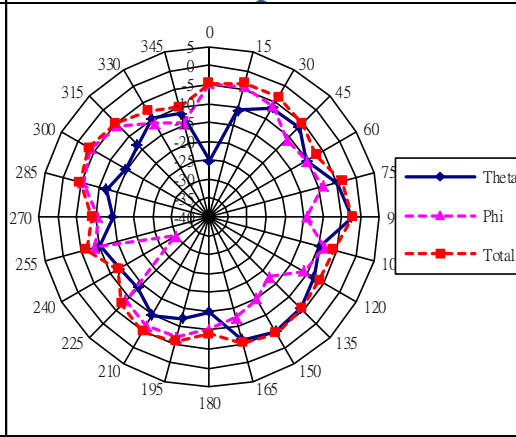
Antenna Pattern

Frequency: 868.3MHz

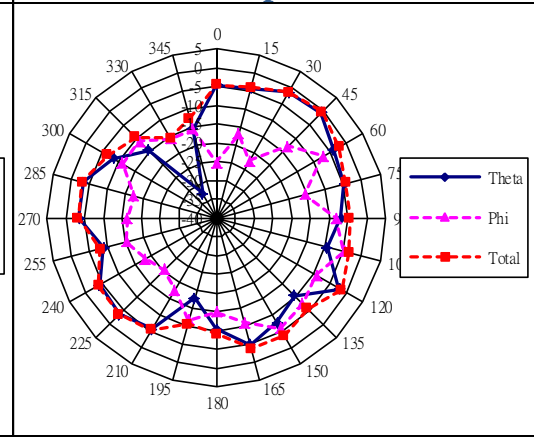
XY-plane



XZ-plane



YZ-plane

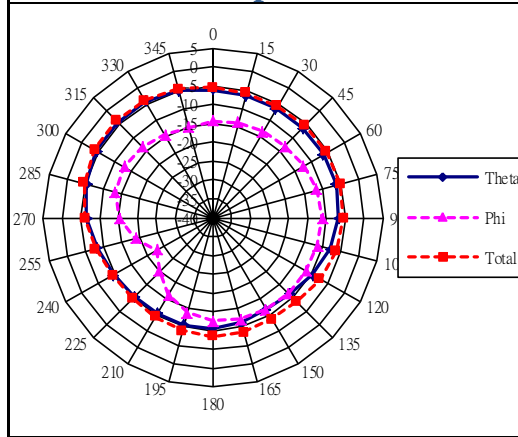


Z-wave

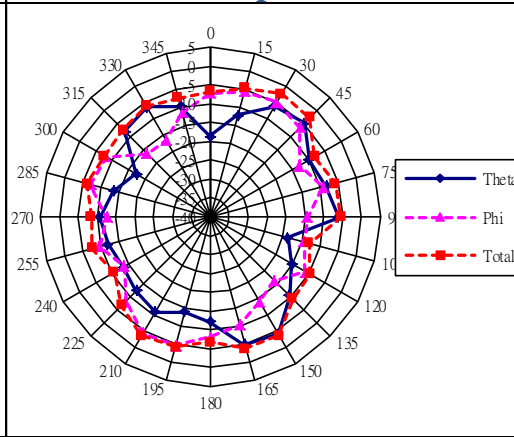
Antenna Pattern

Frequency: 923 MHz

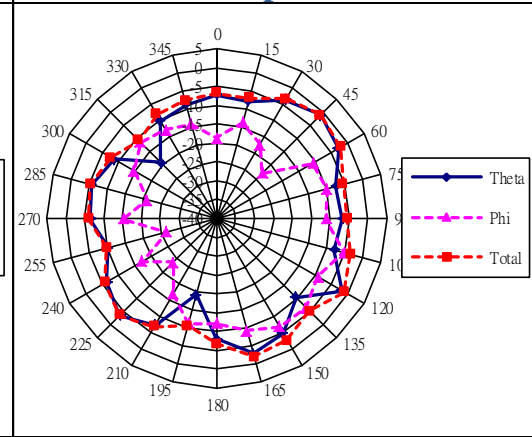
XY-plane



XZ-plane

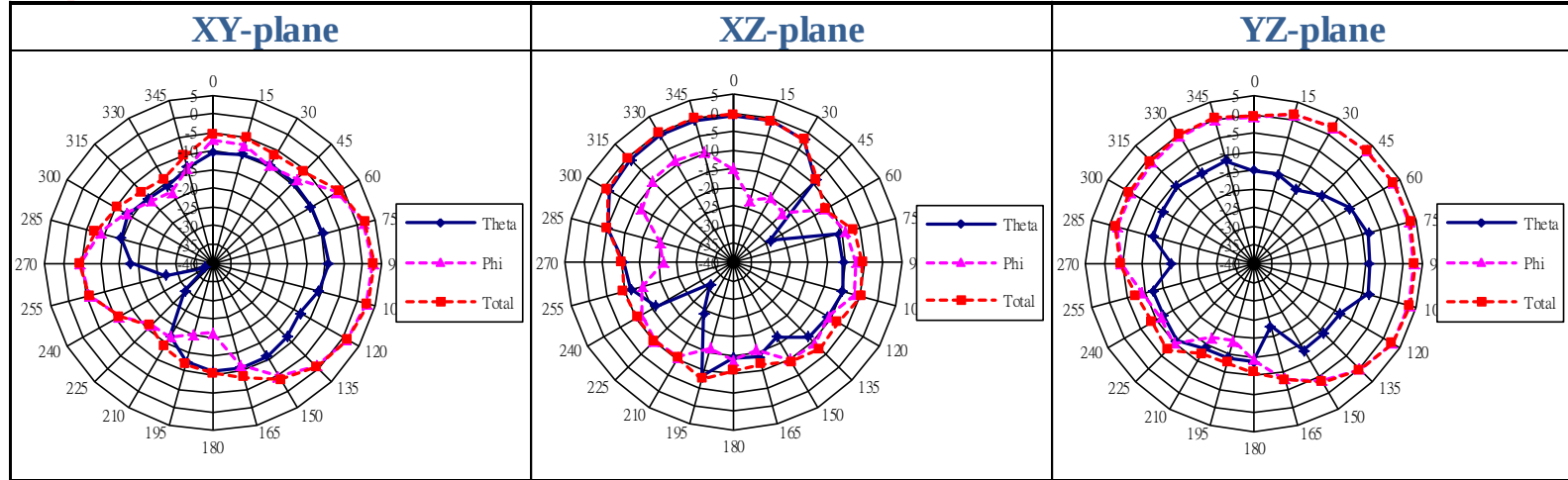


YZ-plane



WiFi-2.4G Antenna Pattern

Frequency: 2450MHz



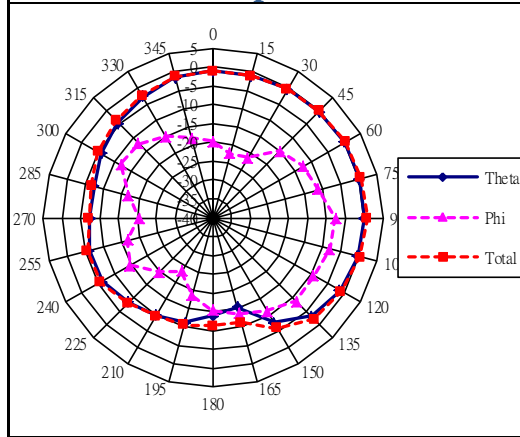
Y

BLE

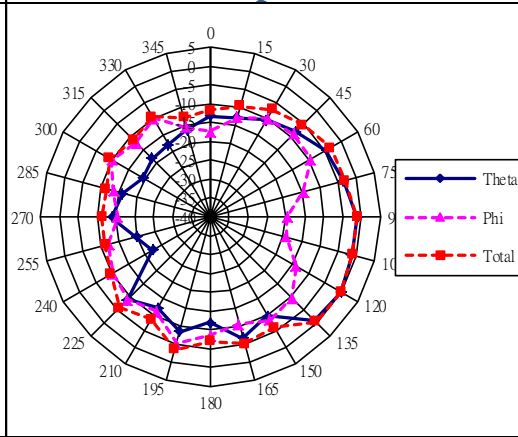
Antenna Pattern

Frequency: 2450MHz

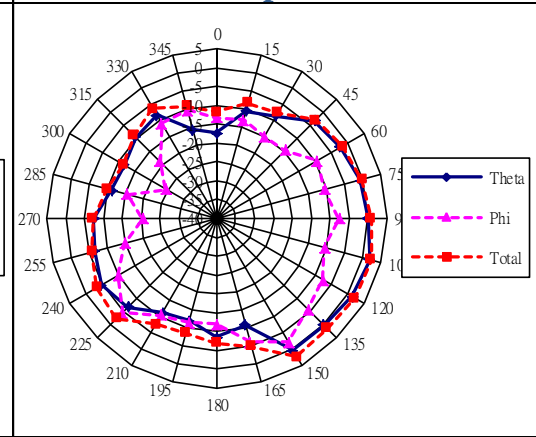
XY-plane



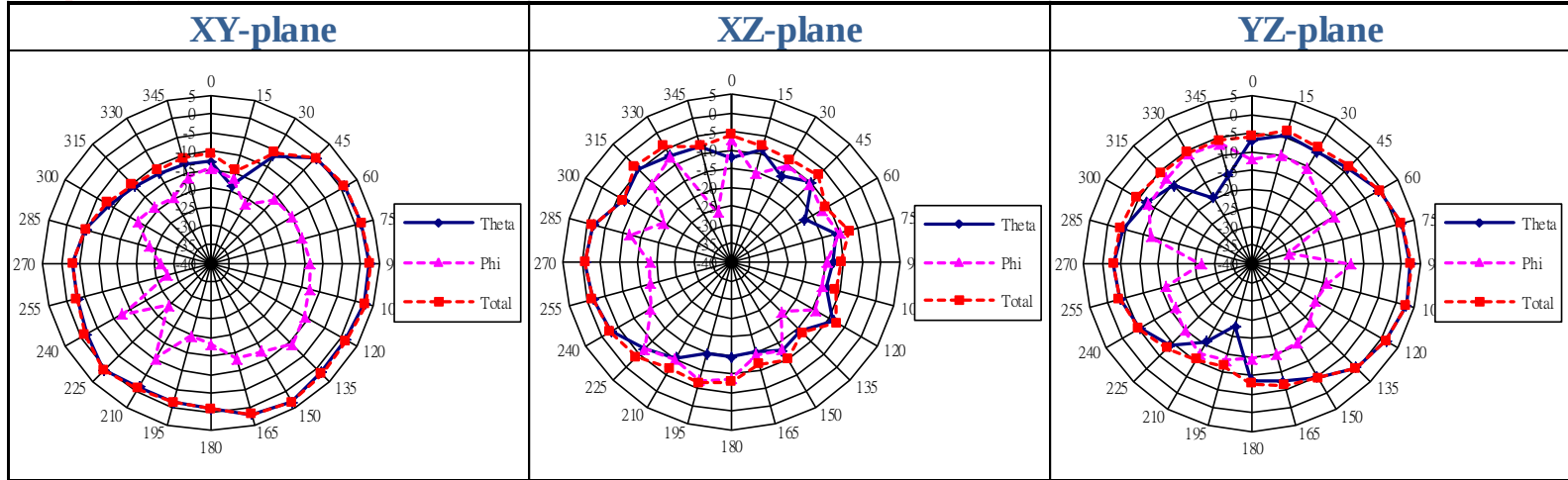
XZ-plane



YZ-plane



Frequency: 5600MHz





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MAKING THE PERFECT CONNECTION

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N° 2016/70254.3

AFNOR Certification certifies that the management system implemented by:
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for the following activities:
pour les activités suivantes :

DESIGN, MANUFACTURING AND SALES OF ELECTRONIC AND AUTOMOTIVE CONNECTORS, CABLES,
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电子和车用连接器、连接线、线束、无线射频天线产品、注塑成型部件、
冲压部件, 塑胶五金模具的设计、生产和销售

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Ce certificat est valable à compter du (année/mois/jour)

2021-01-18

Until
Jusqu'au

2024-01-17



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