



FCC RADIO TEST REPORT

FCC ID : XMR2023RM520NGLT
Equipment : 5G Sub-6 GHz M.2 Module
Brand Name : Quectel
Model Name : RM520N-GL
Applicant : Quectel Wireless Solutions Co., Ltd.
Building 5, Shanghai Business Park Phase III (Area B), No.1016
Tianlin Road, Minhang District, Shanghai, China, 200233
Manufacturer : LCFC (HeFei) Electronics Technology Co., Ltd.
No. 3188-1, Yungu Road (Hefei Export Processing Zone), Hefei
Economics & Technology Development Area, Anhui, CHINA
Standard : FCC 47 CFR Part 2, 96

Equipment: Quectel RM520N-GL tested inside of Lenovo Notebook Computer.

The product was received on Nov. 13, 2023 and testing was performed from Nov. 30, 2023 to Dec. 22, 2023. We, Sporton International Inc. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI / TIA-603-E and has been in compliance with the applicable technical standards.

The test results in this partial report apply exclusively to the tested model / sample. Without written approval from Sporton International Inc. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Louis Wu

Approved by: Louis Wu

Sporton International Inc. EMC & Wireless Communications Laboratory



Table of Contents

History of this test report.....	3
Summary of Test Result.....	4
1 General Description	5
1.1 Product Feature of Equipment Under Test	5
1.2 Product Specification of Equipment Under Test	6
1.3 Modification of EUT	6
1.4 Testing Location	6
1.5 Applied Standards	7
2 Test Configuration of Equipment Under Test	8
2.1 Test Mode.....	8
2.2 Connection Diagram of Test System	9
2.3 Support Unit used in test configuration	9
2.4 Frequency List of Low/Middle/High Channels.....	9
3 Conducted Test Items.....	10
3.1 Measuring Instruments.....	10
3.2 Conducted Output Power	11
3.3 EIRP	12
4 Radiated Test Items	13
4.1 Measuring Instruments.....	13
4.2 Test Setup	13
4.3 Test Result of Radiated Test.....	14
4.4 Radiated Spurious Emission	15
5 List of Measuring Equipment.....	16
6 Measurement Uncertainty	17
Appendix A. Test Results of Conducted Test	
Appendix B. Test Results of Radiated Test	
Appendix C. Test Setup Photographs	



History of this test report

Report No.	Version	Description	Issue Date
FG3N1058E	01	Initial issue of report	Jan. 25, 2024
FG3N1058E	02	Revise Antenna Information This report is an updated version, replacing the report issued on Jan. 25, 2024.	Feb. 15, 2024
FG3N1058E	03	Add Antenna Information Remark 2 and Test Mode Remark 3 This report is an updated version, replacing the report issued on Feb. 15, 2024.	Feb. 19, 2024

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.2	§2.1046	Conducted Output Power	Reporting only	-
-	§96.41	Peak-to-Average Ratio	-	See Note
3.3	§96.41	Effective Isotropic Radiated Power and EIRP PSD	Pass	-
-	§2.1049 §96.41	Occupied Bandwidth	-	See Note
-	§2.1051 §96.41	Conducted Band Edge Measurement	-	See Note
-	§2.1051 §96.41	Conducted Spurious Emission	-	See Note
-	§2.1055	Frequency Stability for Temperature & Voltage	-	See Note
4.4	§2.1051 §96.41	Radiated Spurious Emission	Pass	1.15 dB under the limit at 11043.00 MHz

Remark:

- For host device, Radiated Spurious Emission and Equivalent Isotropic Radiated Power are verified and complies with the limit in this test report.
- For host device, the Conducted Output Power is no difference after compared to module (Model: RM520N-GL)

Conformity Assessment Condition:

- The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacture who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account.
- The measurement uncertainty please refer to each test result in the section "Measurement Uncertainty".

Disclaimer:

The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.

Reviewed by: Sheng Kuo

Report Producer: Rachel Hsieh

1 General Description

1.1 Product Feature of Equipment Under Test

Product Feature	
Equipment	5G Sub-6 GHz M.2 Module
Brand Name	Quectel
Model Name	RM520N-GL
FCC ID	XMR2023RM520NGLT
Sample 1	EUT with Host 1
Sample 2	EUT with Host 2
EUT supports Radios application	WCDMA/HSPA/LTE/5G NR/GNSS
EUT Stage	Production Unit

Remark:

1. The above EUT's information was declared by manufacturer.
2. Equipment: Quectel RM520N-GL tested inside of Lenovo Notebook Computer.

The product was installed into Notebook Computer (Brand Name: Lenovo, Model Name: TP00159A, TP00159B) during test, and the host information was recorded in the following table.

Host Information	
Host 1	Host with Amphenol Taiwan Corporation Antenna
Host 2	Host with AWAN Antenna

Support band and evaluated information	
Supported band	n48
Evaluated and Tested band	n48
MIMO2 Antenna	n48

WWAN Antenna Information for Host				
Main Antenna	Manufacturer	Amphenol Taiwan Corporation	Peak gain (dBi)	5GNR n48 : 0.98
	Part number	DC330022K00 DC330022K70	Type	PIFA
	Manufacturer	AWAN	Peak gain (dBi)	5GNR n48 : 0.98
	Part number	DC330022H00 DC330022H70	Type	PIFA
MIMO 2 Antenna	Manufacturer	Amphenol Taiwan Corporation	Peak gain (dBi)	5GNR n48 : 0.36
	Part number	DC330022K10	Type	PIFA
	Manufacturer	AWAN	Peak gain (dBi)	5GNR n48 : 0.36
	Part number	DC330022H10	Type	PIFA

Remark:

1. The above EUT's information was declared by manufacturer. Please refer to Disclaimer in report summary.
2. SA mode only perform in MIMO2 Tx Antenna.

1.2 Product Specification of Equipment Under Test

Product Specification is subject to this standard	
Tx Frequency	3552.5 MHz ~ 3697.5 MHz
Rx Frequency	3552.5 MHz ~ 3697.5 MHz
Bandwidth	10 MHz / 20 MHz / 30 MHz / 40 MHz
Maximum Output Power to Antenna	<SISO Mode>: 20.65 dBm <MIMO Mode>: 19.67 dBm
Type of Modulation	PI/2 BPSK / QPSK / 16QAM / 64QAM / 256QAM

1.3 Modification of EUT

No modifications are made to the EUT during all test items.

1.4 Testing Location

Test Site	Sporton International Inc. EMC & Wireless Communications Laboratory
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333
Test Site No.	Sporton Site No. TH03-HY
Test Engineer	George Chenh
Temperature (°C)	20~24
Relative Humidity (%)	50~58

Test Site	Sporton International Inc. Wensan Laboratory.
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010
Test Site No.	Sporton Site No. 03CH22HY (TAF Code: 3786)
Test Engineer	LU WEN-KAI, Karl Hou and Bank LIN
Temperature (°C)	18.9~24.8
Relative Humidity (%)	61.3~70.4
Remark	The Radiated Spurious Emission test item subcontracted to Sporton International Inc. Wensan Laboratory.

Note: The test site complies with ANSI C63.4 2014 requirement.

FCC Designation No.: TW1190 and TW3786



1.5 Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ ANSI C63.26-2015
- ♦ ANSI / TIA-603-E
- ♦ FCC 47 CFR Part 2, 96
- ♦ FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01
- ♦ FCC KDB 940660 D01 Part 96 CBRS Eqpt v03
- ♦ FCC KDB 412172 D01 Determining ERP and EIRP v01r01
- ♦ FCC KDB 414788 D01 Radiated Test Site v01r01
- ♦ FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. The TAF code is not including all the FCC KDB listed without accreditation.

2 Test Configuration of Equipment Under Test

2.1 Test Mode

Antenna port conducted and radiated test items listed below are performed according to KDB 971168 D01 Power Meas. License Digital Systems v03r01 with maximum output power.

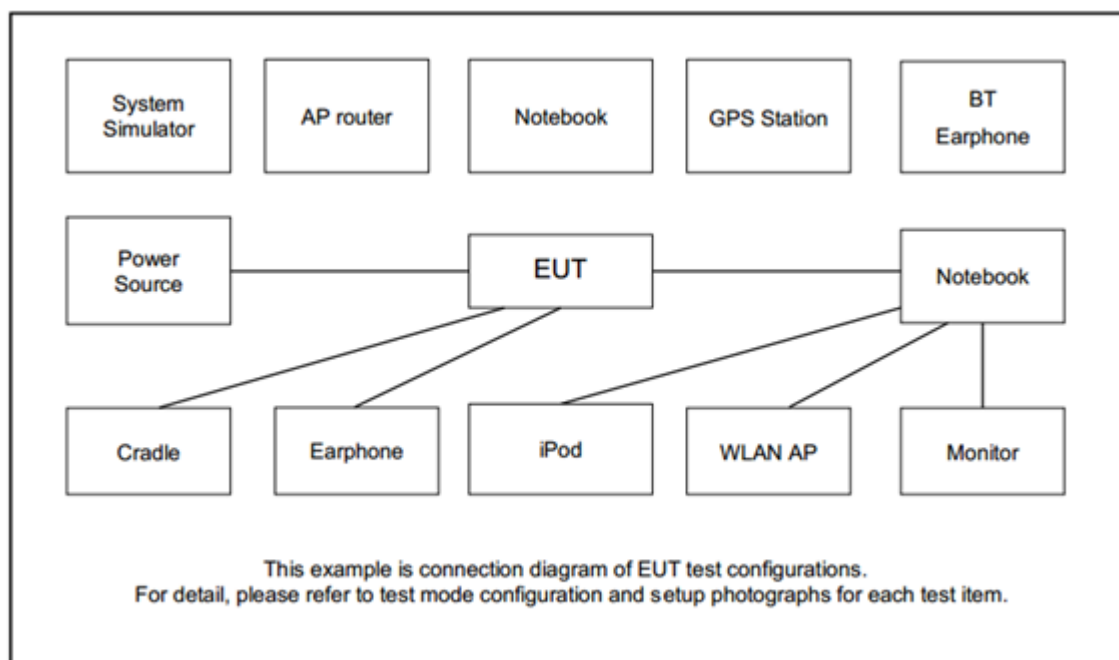
Modulation Type	Modulation	Modulation Type	Modulation
A	DFT-s-OFDM pi/2 BPSK	N/A	N/A
B	DFT-s-OFDM QPSK	F	CP-OFDM QPSK
C	DFT-s-OFDM 16QAM	G	CP-OFDM 16QAM
D	DFT-s-OFDM 64QAM	H	CP-OFDM 64QAM
E	DFT-s-OFDM 256QAM	I	CP-OFDM 256QAM

Test Item	Modulation Type	Bandwidth	RB Size	Channel
Conducted Power (for n48)	A, B, C, F, G	All	1RB	L, M, H
EIRP (for n48)	A, B, C, F, G	All	1RB	L, M, H
RSE	A	20 MHz or less	Inner_1RB	L, M, H

Remark:

1. Evaluated all the transmitter signal and reporting worst-case configuration among all modulation types.
2. The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst-case emissions are reported.
3. For modulation of Pi/2 BPSK & QPSK & 16QAM, the maximum power of Pi/2 BPSK & QPSK & 16QAM is higher than other modulation(64QAM/256QAM), therefore, according to engineering evaluation , we choose higher power (Pi/2 BPSK & QPSK & 16QAM) to perform tests and show in the report.
4. During the RSE preliminary test, the standalone mode and charging modes were verified. It is determined that the charging modes is the worst case for the official test.
5. All the radiated test cases were performed with Sample 1.

2.2 Connection Diagram of Test System



2.3 Support Unit used in test configuration

Item	Equipment	Brand Name	Model No.	FCC ID	Data Cable	Power Cord
1.	System Simulator	Anritsu	MT8000A	N/A	N/A	Unshielded, 1.8 m
2.	iPod Earphone	Apple	N/A	Verification	Unshielded, 1.0 m	N/A

2.4 Frequency List of Low/Middle/High Channels

NR Band n48 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
40	Channel	638000	641666	645332
	Frequency	3570.0	3624.99	3679.98
30	Channel	637668	641666	645666
	Frequency	3565.02	3624.99	3684.99
20	Channel	637334	641666	646000
	Frequency	3560.01	3624.99	3690.0
10	Channel	637000	641666	646332
	Frequency	3555.0	3624.99	3694.98

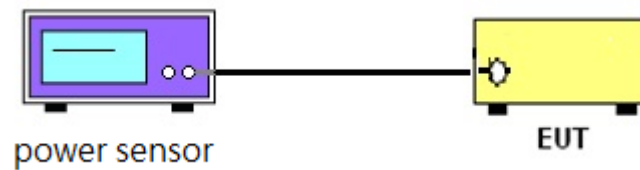
3 Conducted Test Items

3.1 Measuring Instruments

See list of measuring instruments of this test report.

3.1.1 Test Setup

3.1.2 Conducted Output Power



3.1.3 Test Result of Conducted Test

Please refer to Appendix A.

3.2 Conducted Output Power

3.2.1 Description of the Conducted Output Power Measurement

A power sensor was used to establish communication with the EUT. Its parameters were set to force the EUT transmitting at maximum output power. The measured power in the radio frequency on the transmitter output terminals shall be reported.

3.2.2 Test Procedures

1. The transmitter output port was connected to the power sensor.
2. Set EUT at maximum power.
3. Select lowest, middle, and highest channels for each band and different modulation.
4. Measure and record the power level from the power sensor
5. The measure-and-sum technique is used for measuring in-band transmit power of a device.

Total power is the sum of the conducted power levels measured at the various output ports.

3.3 EIRP

3.3.1 Description of the EIRP Measurement

The EIRP of category A CBSD must not exceed 30 dBm / 10 megahertz.

The EIRP PSD of category A CBSD must not exceed 20 dBm / 1 megahertz.

The testing follows ANSI C63.26-2015 Section 5.2.5.5

According to KDB 412172 D01 Power Approach,

$EIRP = P_T + G_T - LC$, where

P_T = transmitter output power in dBm

G_T = gain of the transmitting antenna in dBi

LC = signal attenuation in the connecting cable between the transmitter and antenna in dB

Device	Maximum EIRP (dBm/10 MHz)	Maximum PSD (dBm/MHz)
Category A CBSD	30	20

3.3.2 Test Procedures

1. The testing follows procedure in Section 5.2 of ANSI C63.26-2015 and KDB 940660 D01 Part 96 CBRS Eqpt v03 Section 3.2(b)(2) and 3.2(b)(3)
2. Determine the EIRP by adding the effective antenna gain to the measured average conducted power level.
3. For MIMO measurement, the KDB 662911 E)2)c) is used as following:
Measure and add $10 \log(NANT)$ dB, where NANT is the number of outputs. With this technique, spectrum measurements are performed at each output of the device, but rather than summing the spectra or the spectral peaks across the outputs, the quantity $10 \log(NANT)$ dB is added to each spectrum value before comparing to the emission limit.

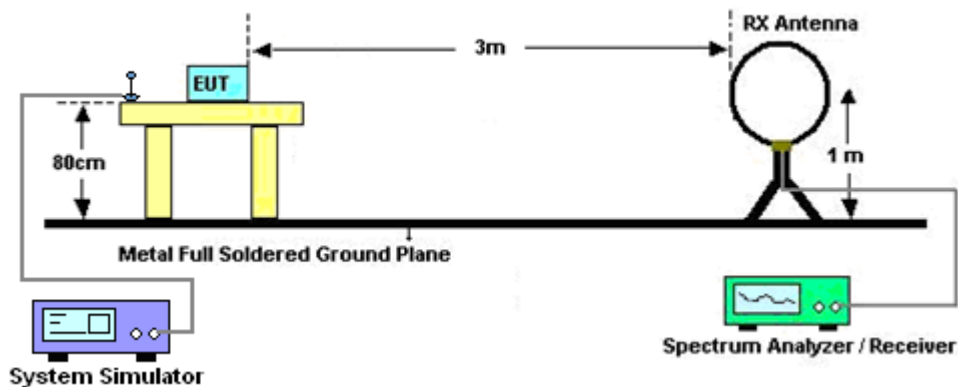
4 Radiated Test Items

4.1 Measuring Instruments

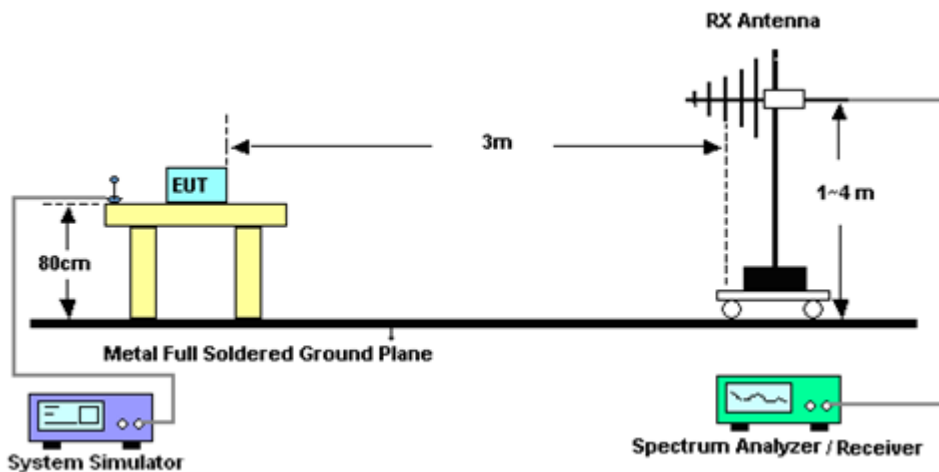
See list of measuring instruments of this test report.

4.2 Test Setup

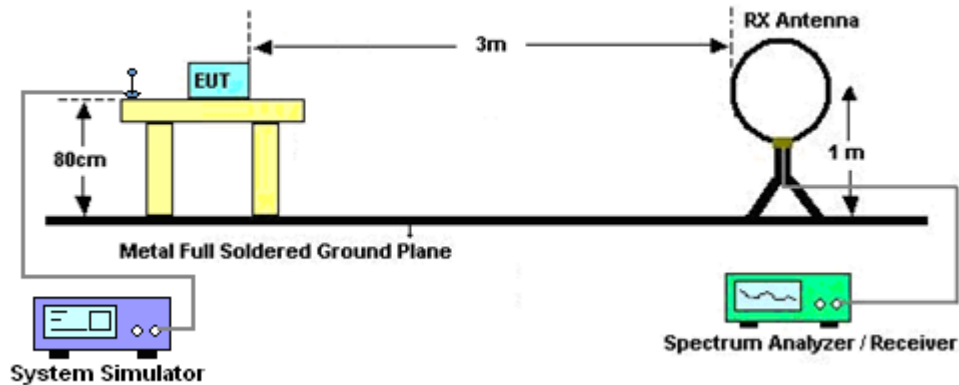
For radiated emissions below 30MHz



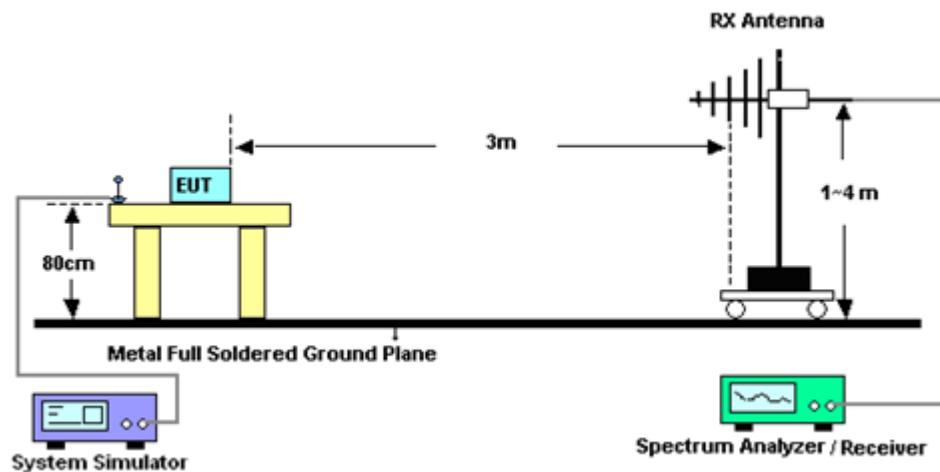
For radiated emissions from 30MHz to 1GHz



For radiated emissions from 1GHz to 18GHz



For radiated emissions above 18GHz



4.3 Test Result of Radiated Test

Please refer to Appendix B.

Note:

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

There is adequate comparison measurement of both open-field test site and alternative test site - semi-Anechoic chamber according to 414788 D01 Radiated Test Site v01r01, and the result came out very similar.

4.4 Radiated Spurious Emission

4.4.1 Description of Radiated Spurious Emission Measurement

The radiated spurious emission was measured by substitution method according to ANSI / TIA-603-E.

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least -40dBm / MHz .

The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

4.4.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 7 and ANSI C63.26-2015 section 5.5.4

Radiated measurement using the field strength method

1. The EUT was placed on a turntable with 0.8 meter height for frequency below 1GHz and 1.5 meter height for frequency above 1GHz respectively above ground.
2. The EUT was set 3 meters from the receiving antenna mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between 1m to 4m to search the maximum spurious emission for both horizontal and vertical polarizations.
5. During the measurement, the system simulator parameters were set to force the EUT transmitting at maximum output power.
6. To convert spectrum reading E(dBuV/m) to EIRP(dBm)
$$\text{EIRP(dBm)} = \text{Level (dBuV/m)} + 20\log(d) - 104.77$$
, where d is the distance at which field strength limit is specified in the rules.
7.
$$\text{Field Strength Level (dBm)} = \text{Spectrum Reading (dBm)} + \text{Antenna Factor} + \text{Cable Loss} + \text{Read Level} - \text{Preamp Factor}.$$
8.
$$\text{ERP (dBm)} = \text{EIRP (dBm)} - 2.15$$
9. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.



5 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Base Station (Measure)	Anritsu	MT8821C	6262116730	LTE	Jun. 10, 2023	Nov. 30, 2023~ Dec. 08, 2023	Jun. 09, 2024	Conducted (TH03-HY)
Base Station (Measure)	Anritsu	MT8000A	6262134933	FR1	Jun. 10, 2023	Nov. 30, 2023~ Dec. 08, 2023	Jun. 09, 2024	Conducted (TH03-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Sep. 12, 2023	Dec. 12, 2023~ Dec. 22, 2023	Sep. 11, 2024	Radiation (03CH22-HY)
Bilog Antenna	TESEQ	CBL 6111D & 00802N1D-06	63304 & 002	30MHz~1GHz	Oct. 15, 2023	Dec. 12, 2023~ Dec. 22, 2023	Oct. 14, 2024	Radiation (03CH22-HY)
Amplifier	SONOMA	310N	421581	N/A	Jul. 15, 2023	Dec. 12, 2023~ Dec. 22, 2023	Jul. 14, 2024	Radiation (03CH22-HY)
Double Ridged Guide Horn Antenna	RFSPIN	DRH18-E	LE2C04A18EN	1GHz~18GHz	Jul. 12, 2023	Dec. 12, 2023~ Dec. 22, 2023	Jul. 11, 2024	Radiation (03CH22-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	1224	18GHz~40GHz	Jul. 10, 2023	Dec. 12, 2023~ Dec. 22, 2023	Jul. 09, 2024	Radiation (03CH22-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	1223	18GHz~40GHz	Jul. 10, 2023	Dec. 12, 2023~ Dec. 22, 2023	Jul. 09, 2024	Radiation (03CH22-HY)
Amplifier	EMEC	EM01G18GA	060877	N/A	Sep. 28, 2023	Dec. 12, 2023~ Dec. 22, 2023	Sep. 27, 2024	Radiation (03CH22-HY)
Preamplifier	EMEC	EM18G40G	060872	18-40GHz	Sep. 06, 2023	Dec. 12, 2023~ Dec. 22, 2023	Sep. 05, 2024	Radiation (03CH22-HY)
Signal Analyzer	Keysight	N9010B	MY62170278	10Hz~44GHz	Aug. 31, 2023	Dec. 12, 2023~ Dec. 22, 2023	Aug. 30, 2024	Radiation (03CH22-HY)
Hygrometer	TECPEL	DTM-303A	TP211568	N/A	Oct. 30, 2023	Dec. 12, 2023~ Dec. 22, 2023	Oct. 29, 2024	Radiation (03CH22-HY)
Controller	EMEC	EM1000	N/A	Control Turn table & Ant Mast	N/A	Dec. 12, 2023~ Dec. 22, 2023	N/A	Radiation (03CH22-HY)
Antenna Mast	ChainTek	MBS-520-1	N/A	1m~4m	N/A	Dec. 12, 2023~ Dec. 22, 2023	N/A	Radiation (03CH22-HY)
Turn Table	ChainTek	T-200-S-1	N/A	0~360 Degree	N/A	Dec. 12, 2023~ Dec. 22, 2023	N/A	Radiation (03CH22-HY)
Software	Audix	E3 6.09824_2019122	RK-002347	N/A	N/A	Dec. 12, 2023~ Dec. 22, 2023	N/A	Radiation (03CH22-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	803951/2	9kHz~30MHz	Mar. 07, 2023	Dec. 12, 2023~ Dec. 22, 2023	Mar. 06, 2024	Radiation (03CH22-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	804390/2,804611/2,804615/2	N/A	Oct. 24, 2023	Dec. 12, 2023~ Dec. 22, 2023	Oct. 23, 2024	Radiation (03CH22-HY)
Filter	Wainwright	WLK4-1000-1530-8000-40SS	SN29	1.53GHz Low Pass Filter	May 23, 2023	Dec. 12, 2023~ Dec. 22, 2023	May 22, 2024	Radiation (03CH22-HY)
Filter	Wainwright	WHKX12-2700-3000-18000-60ST	SN7	N/A	Dec. 01, 2023	Dec. 12, 2023~ Dec. 22, 2023	Nov. 30, 2024	Radiation (03CH22-HY)
Filter	Wainwright	WHKX8-5872.5-6750-18000-40ST	SN25	6.75GHz High Pass Filter	Nov. 13, 2023	Dec. 12, 2023~ Dec. 22, 2023	Nov. 12, 2024	Radiation (03CH22-HY)
Filter	Wainwright	WHKX12-900-1000-15000-60SS	SN8	1GHz High Pass Filter	Nov. 02, 2023	Dec. 12, 2023~ Dec. 22, 2023	Nov. 01, 2024	Radiation (03CH22-HY)

6 Measurement Uncertainty

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	3.03 dB
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Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	3.42 dB
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Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	3.91 dB
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Appendix A. Test Results of Conducted Test

Conducted Output Power(Average power) and EIRP

NR n48 Maximum Average Power [dBm] (GT - LC = 0.36 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP(W)
10	1	1	PI/2 BPSK	20.28	20.19	19.69	20.67	0.1167
10	1	1	QPSK	20.31	20.20	19.72		
10	1	1	16-QAM	19.82	19.96	19.88	20.32	0.1076
Limit	EIRP < 23dBm/10MHz			Result			Pass	

Total EIRP power is less than partial EIRP limit 23 dBm/10MHz.

NR n48 Maximum Average Power [dBm] (GT - LC = 0.36 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP(W)
20	1	1	PI/2 BPSK	20.48	20.35	20.05	20.84	0.1213
20	1	1	QPSK	20.45	20.37	19.95		
20	1	1	16-QAM	20.08	20.17	19.77	20.53	0.1130
Limit	EIRP < 23dBm/10MHz			Result			Pass	

Total EIRP power is less than partial EIRP limit 23 dBm/10MHz.

NR n48 Maximum Average Power [dBm] (GT - LC = 0.36 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP(W)
30	1	1	PI/2 BPSK	20.53	20.49	20.19	20.96	0.1247
30	1	1	QPSK	20.55	20.60	20.23		
30	1	1	16-QAM	20.10	20.05	19.68	20.46	0.1112
Limit	EIRP < 23dBm/10MHz			Result			Pass	

Total EIRP power is less than partial EIRP limit 23 dBm/10MHz.

NR n48 Maximum Average Power [dBm] (GT - LC = 0.36 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP(W)
40	1	1	PI/2 BPSK	20.62	20.58	20.23	21.01	0.1262
40	1	1	QPSK	20.63	20.65	20.28		
40	1	1	16-QAM	19.86	19.88	19.96	20.32	0.1076
Limit	EIRP < 23dBm/10MHz			Result			Pass	

Total EIRP power is less than partial EIRP limit 23 dBm/10MHz.



<MIMO Mode>

Part96 NR n48 Maximum Average Power [dBm], DG = 0.98 dBi														
BW	RB	RB	Mod	Antenna 2			Antenna 0			Combine			EIRP	EIRP
(MHz)	Size	Offset		Lowest	Middle	Highest	Lowest	Middle	Highest	Lowest	Middle	Highest	(dBm)	(W)
10	1	1	QPSK	16.16	16.05	16.02	15.95	15.83	15.60	19.07	18.95	18.83	20.05	0.1012
10	1	1	16-QAM	15.52	15.41	15.38	15.36	15.23	14.93	18.45	18.33	18.17	19.43	0.0877
Limit	EIRP < 23dBm/10MHz			Result									Pass	

Part96 NR n48 Maximum Average Power [dBm], DG = 0.98 dBi														
BW	RB	RB	Mod	Antenna 2			Antenna 0			Combine			EIRP	EIRP
(MHz)	Size	Offset		Lowest	Middle	Highest	Lowest	Middle	Highest	Lowest	Middle	Highest	(dBm)	(W)
20	1	1	QPSK	16.69	16.62	16.39	16.46	16.34	16.29	19.59	19.49	19.35	20.57	0.114
20	1	1	16-QAM	16.04	15.87	15.78	16.06	15.80	15.66	19.06	18.85	18.73	20.04	0.1009
Limit	EIRP < 23dBm/10MHz			Result									Pass	

Part96 NR n48 Maximum Average Power [dBm], DG = 0.98 dBi														
BW	RB	RB	Mod	Antenna 2			Antenna 0			Combine			EIRP	EIRP
(MHz)	Size	Offset		Lowest	Middle	Highest	Lowest	Middle	Highest	Lowest	Middle	Highest	(dBm)	(W)
30	1	1	QPSK	16.73	16.72	16.58	16.58	16.46	16.55	19.67	19.60	19.58	20.65	0.1161
30	1	1	16-QAM	16.05	15.98	15.92	15.94	16.09	15.78	19.01	19.05	18.86	20.03	0.1007
Limit	EIRP < 23dBm/10MHz			Result									Pass	

Part96 NR n48 Maximum Average Power [dBm], DG = 0.98 dBi														
BW	RB	RB	Mod	Antenna 2			Antenna 0			Combine			EIRP	EIRP
(MHz)	Size	Offset		Lowest	Middle	Highest	Lowest	Middle	Highest	Lowest	Middle	Highest	(dBm)	(W)
40	1	1	QPSK	16.64	16.66	16.51	16.45	16.52	16.32	19.56	19.60	19.43	20.58	0.1143
40	1	1	16-QAM	16.10	16.10	16.05	15.87	15.84	15.76	19.00	18.98	18.92	19.98	0.0995
Limit	EIRP < 23dBm/10MHz			Result									Pass	



Appendix B. Test Results of Radiated Test

B1. Summary of each worse mode

Mode	Part	Band	Ch	Freq (MHz)	Level (dBm)	Det	Ant Factor (dB)	AmplCbl (dB)	Filter (dB)	EIRPCF (dB)	Reading (dBuV)	Limit (dBm)	Margin (dB)	Pol	Ant
1	Part 96	5G NR n48	H	11043	-41.15	RMS	38.07	-20.49	0.53	-95.23	35.97	-40.00	-1.15	V	MIMO2

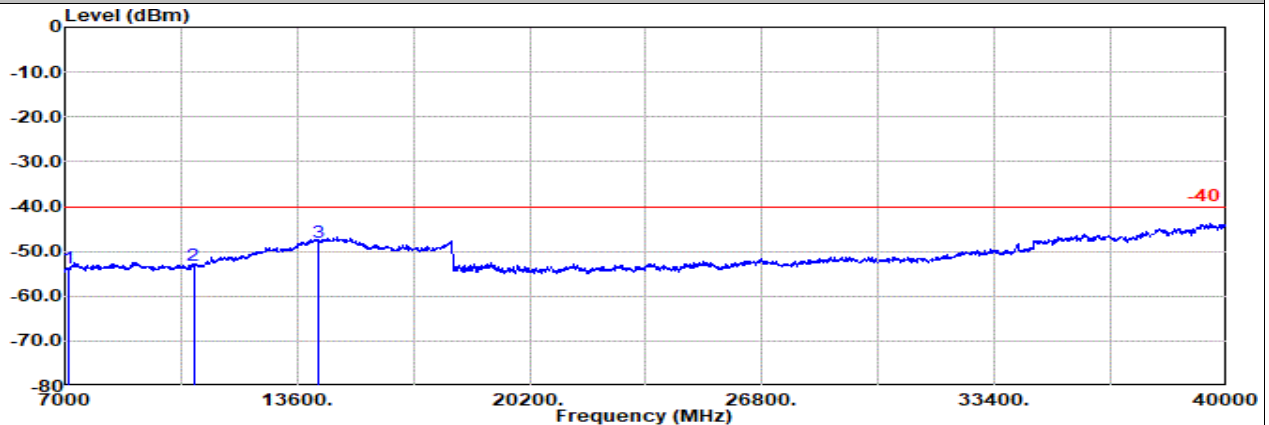


MIMO2

Part 96 Mode 1

5G NR n48 20M Ch637334 1RB0 BPSK

L

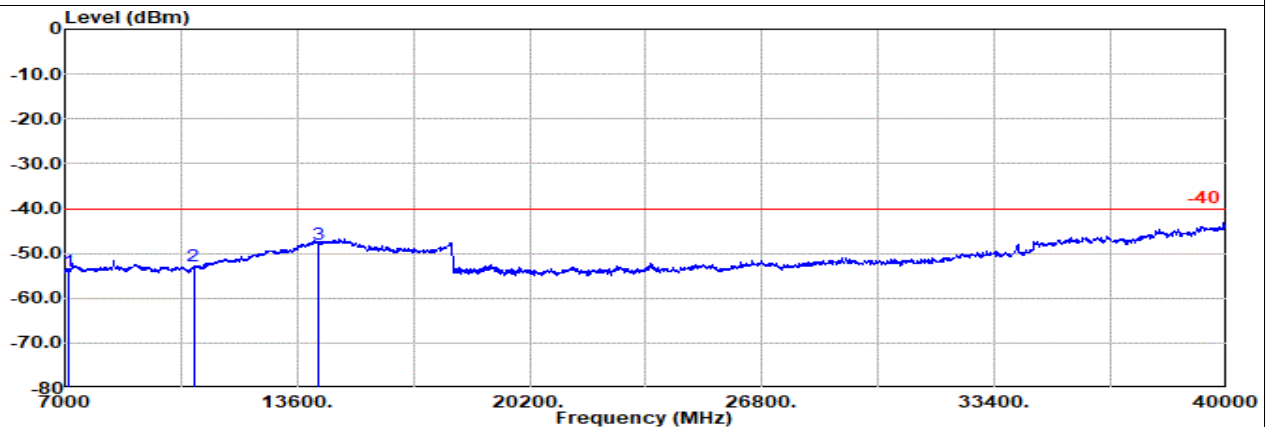


Site : 03CH22-HY

Condition: -40 3m DRH18-E_LE2C04A18EN Horizontal

: NR SA n48 20M Ch637334 1RB1 BPSK

	Freq MHz	Level dBm	Detector	Ant Amp\Cb Filter		EIRPCF	Readin g	Limit	Margin	Pol
				Factor	1					
1	7102.00	-53.73	RMS	36.80	-20.57	1.10 -95.23	24.17	-40.00	-13.73	Horizontal
2	10653.84	-53.14	RMS	37.50	-20.63	0.51 -95.23	24.71	-40.00	-13.14	Horizontal
3	14205.12	-47.99	RMS	42.19	-20.69	0.46 -95.23	25.28	-40.00	-7.99	Horizontal



Site : 03CH22-HY

Condition: -40 3m DRH18-E_LE2C04A18EN Vertical

: NR SA n48 20M Ch637334 1RB1 BPSK

	Freq MHz	Level dBm	Detector	Ant Amp\Cb Filter		EIRPCF	Readin g	Limit	Margin	Pol
				Factor	1					
1	7102.00	-53.90	RMS	36.80	-20.57	1.10 -95.23	24.00	-40.00	-13.90	Vertical
2	10653.84	-52.88	RMS	37.50	-20.63	0.51 -95.23	24.97	-40.00	-12.88	Vertical
3	14205.12	-48.04	RMS	42.19	-20.69	0.46 -95.23	25.23	-40.00	-8.04	Vertical

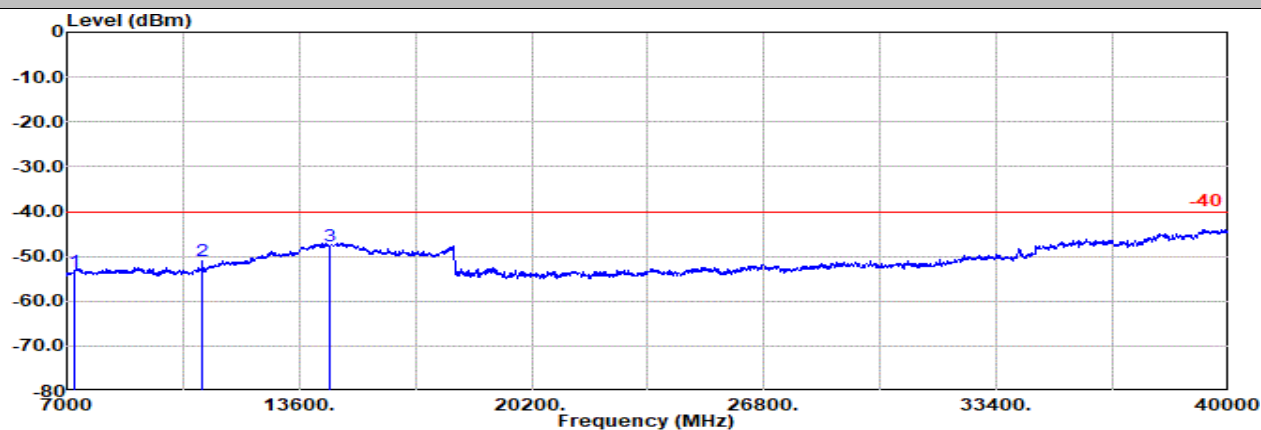


MIMO 2

Part 96 Mode 1

5G NR n48 20M Ch641666 1RB0 BPSK

M

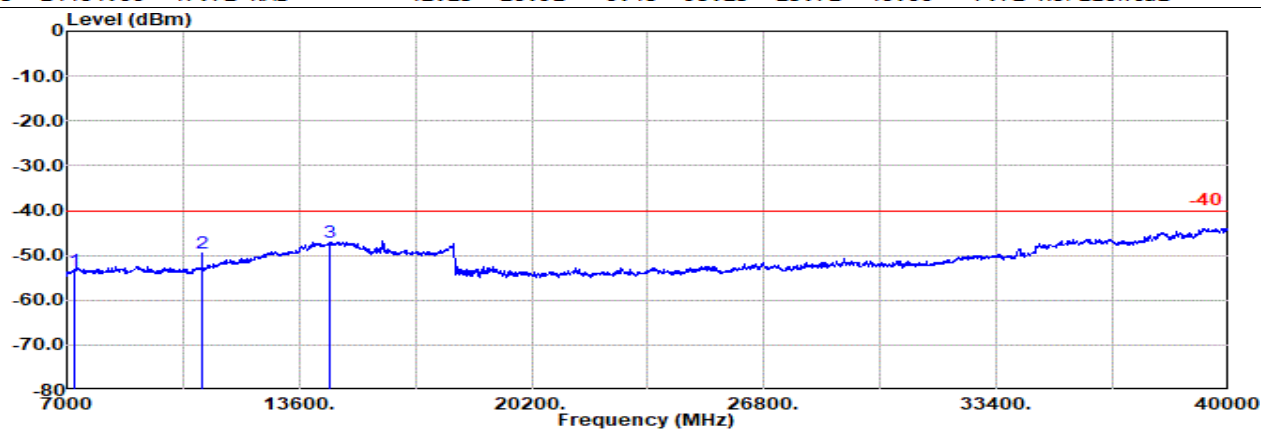


Site : 03CH22-HY

Condition: -40 3m DRH18-E_LE2C04A18EN Horizontal

: NR SA n48 20M Ch641666 1RB1 BPSK

	Freq MHz	Level dBm	Detector	Ant Amp\Cb Filter		EIRPCF	Readin g	Limit	Margin	Pol
				Factor	1					
1	7232.00	-53.46	RMS	37.36	-20.52	0.98 -95.23	23.95	-40.00	-13.46	Horizontal
2	10848.00	-51.00	RMS	37.60	-20.56	0.52 -95.23	26.67	-40.00	-11.00	Horizontal
3	14464.00	-47.72	RMS	42.23	-20.91	0.48 -95.23	25.71	-40.00	-7.72	Horizontal



Site : 03CH22-HY

Condition: -40 3m DRH18-E_LE2C04A18EN Vertical

: NR SA n48 20M Ch641666 1RB1 BPSK

	Freq MHz	Level dBm	Detector	Ant Amp\Cb Filter		EIRPCF	Readin g	Limit	Margin	Pol
				Factor	1					
1	7232.00	-53.45	RMS	37.36	-20.52	0.98 -95.23	23.96	-40.00	-13.45	Vertical
2	10848.00	-49.38	RMS	37.60	-20.56	0.52 -95.23	28.29	-40.00	-9.38	Vertical
3	14464.00	-47.21	RMS	42.23	-20.91	0.48 -95.23	26.22	-40.00	-7.21	Vertical

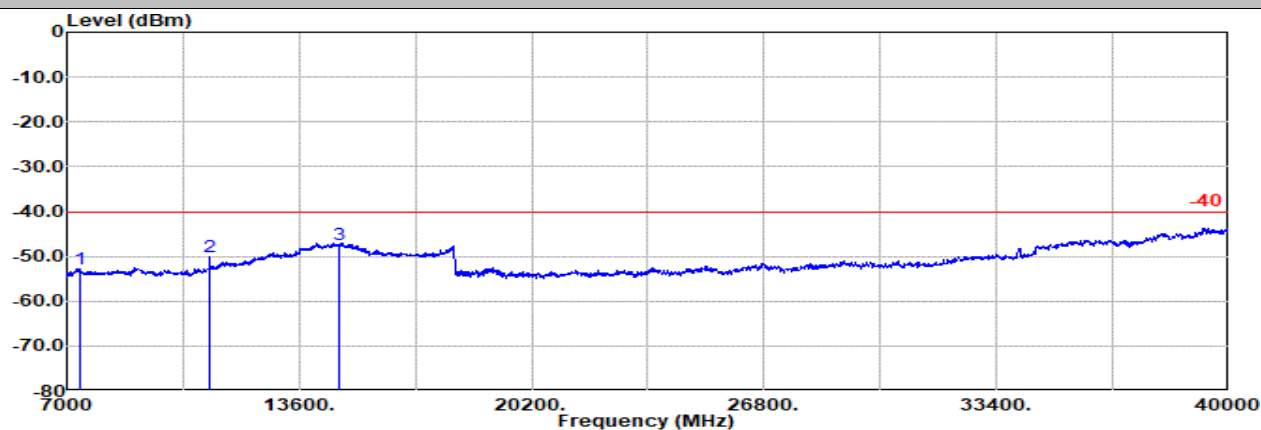


MIMO 2

Part 96 Mode 1

5G NR n48 20M Ch646000 1RB0 BPSK

H

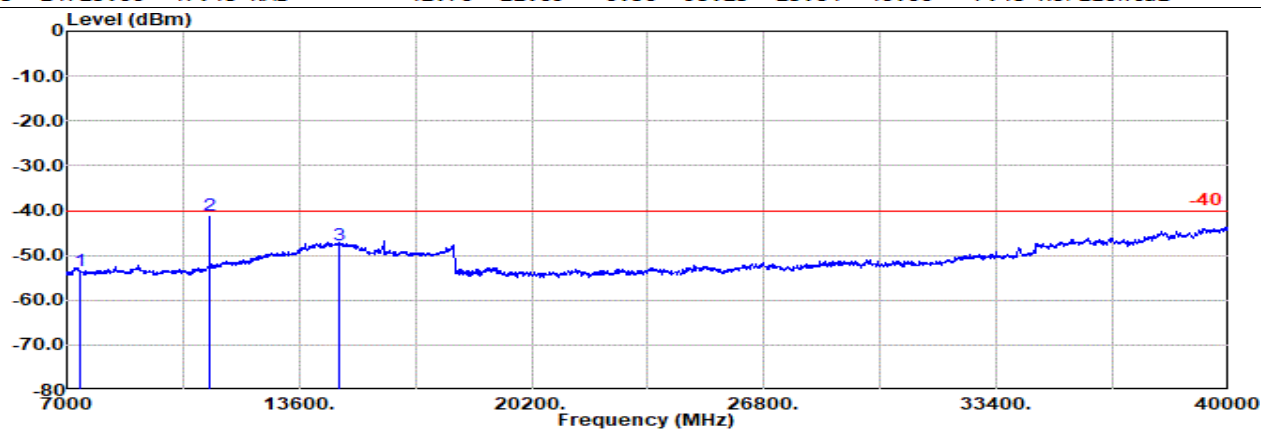


Site : 03CH22-HY

Condition: -40 3m DRH18-E_LE2C04A18EN Horizontal

: NR SA n48 20M Ch646000 1RB1 BPSK

	Freq MHz	Level dBm	Detector	Ant Amp\Cb Filter		EIRPCF		Readin g	Limit	Margin Pol	
				Factor	1						
1	7362.00	-52.90	RMS	37.48	-20.45	0.93	-95.23	24.37	-40.00	-12.90	Horizontal
2	11043.00	-50.18	RMS	38.07	-20.49	0.53	-95.23	26.94	-40.00	-10.18	Horizontal
3	14725.00	-47.48	RMS	42.70	-21.09	0.50	-95.23	25.64	-40.00	-7.48	Horizontal



Site : 03CH22-HY

Condition: -40 3m DRH18-E_LE2C04A18EN Vertical

: NR SA n48 20M Ch646000 1RB1 BPSK

	Freq MHz	Level dBm	Detector	Ant Amp\Cb Filter		EIRPCF		Readin g	Limit	Margin Pol	
				Factor	1						
1	7362.00	-53.57	RMS	37.48	-20.45	0.93	-95.23	23.70	-40.00	-13.57	Vertical
2	11043.00	-41.15	RMS	38.07	-20.49	0.53	-95.23	35.97	-40.00	-1.15	Vertical
3	14725.00	-47.82	RMS	42.70	-21.09	0.50	-95.23	25.30	-40.00	-7.82	Vertical

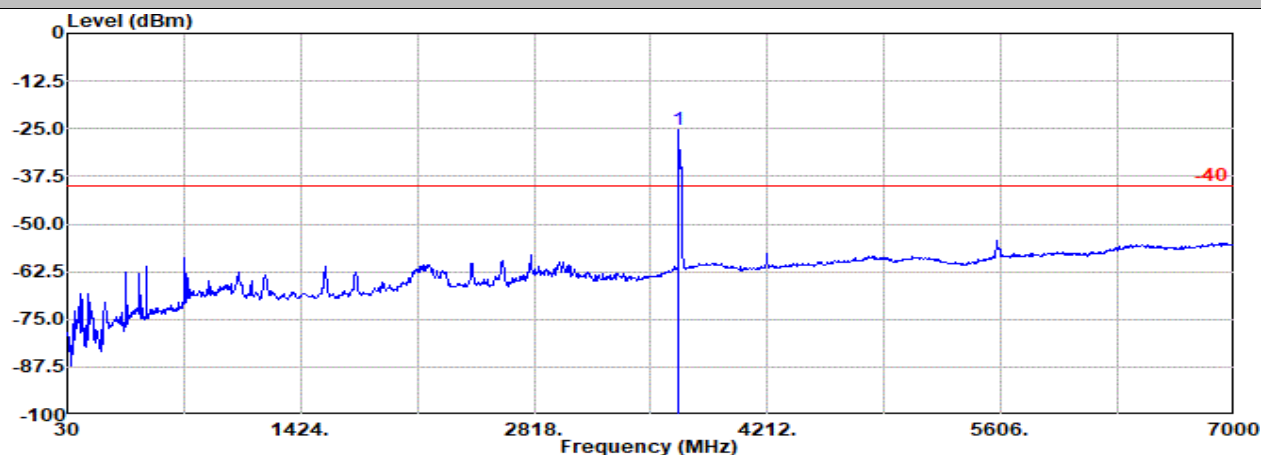


MIMO 2

Part 96 Mode 1

5G NR n48 20M Ch646000 1RB0 BPSK

H

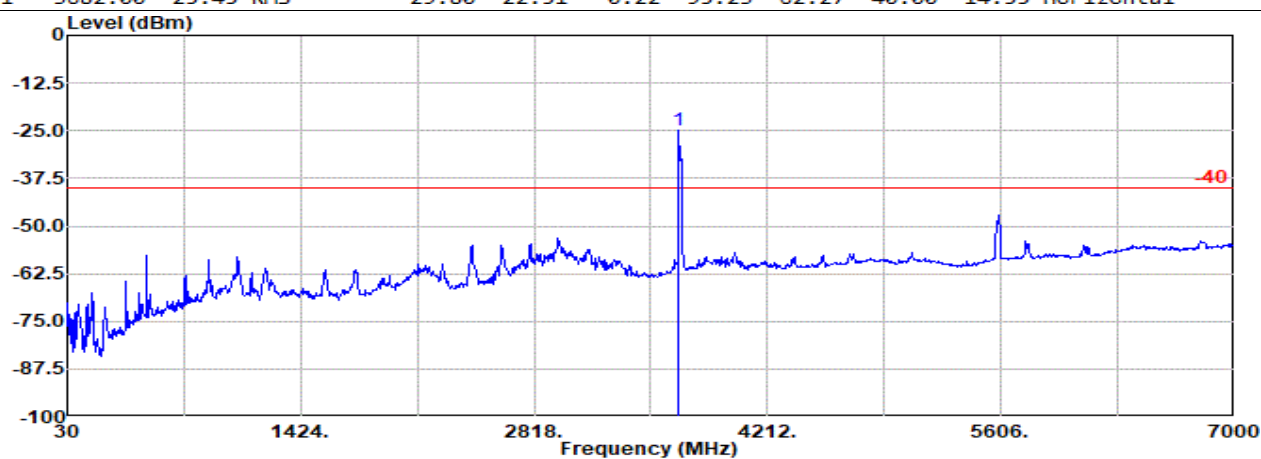


Site : 03CH22-HY

Condition: -40 3m Bilog_63304_231015 Horizontal

: NR SA n48 20M Ch646000 1RB1 BPSK

	Freq	Level	Detector	Ant Amp\Cb Filter		EIRPCF	Readin	Limit	Margin Pol	
				Factor	1					
	MHz	dBm		dB/m	dB	dB	dB	dBuV	dBm	dB
1	3682.00	-25.45	RMS	29.80	-22.51	0.22	-95.23	62.27	-40.00	14.55 Horizontal



Site : 03CH22-HY

Condition: -40 3m Bilog_63304_231015 Vertical

: NR SA n48 20M Ch646000 1RB1 BPSK

	Freq	Level	Detector	Ant Amp\Cb Filter		EIRPCF	Readin	Limit	Margin Pol	
				Factor	1					
	MHz	dBm		dB/m	dB	dB	dB	dBuV	dBm	dB
1	3682.00	-24.91	RMS	29.80	-22.51	0.22	-95.23	62.81	-40.00	15.09 Vertical

Remark: #1 is fundamental signal which can be ignored.