



FCC RADIO TEST REPORT

FCC ID : 2AJN7-TP00145AU
Equipment : Notebook Computer
Brand Name : Lenovo
Compliance ID : TP00145C
Applicant : LC Future Center Limited Taiwan Branch
7F., No.780, Beian Rd., Zhongshan Dist., Taipei 104, Taiwan
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: Fibocom FM350-GL tested inside of Lenovo Notebook Computer.

The product was received on Oct. 13, 2023 and testing was performed from Jan. 22, 2024 to Jan. 27, 2024. 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.

Approved by: Louis Wu

Sporton International Inc. EMC & Wireless Communications Laboratory



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History of this test report

Report No.	Version	Description	Issue Date
FG3O1322-01	01	Initial issue of report	Feb. 06, 2024
FG3O1322-01	02	1. Revise Appendix B 2. Revise Description of the EIRP Measurement This report is an updated version, replacing the report issued on Feb. 06, 2024.	Mar. 08, 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	10.76 dB under the limit at 14205.00 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: FM350-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/manufacturer 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: Ming Chen

1 General Description

1.1 Product Feature of Equipment Under Test

Product Feature	
Equipment	Notebook Computer
Brand Name	Lenovo
Compliance ID	TP00145C
FCC ID	2AJN7-TP00145AU
Sample 1	EUT with Amphenol Taiwan Corporation Antenna
Sample 2	EUT with Speed Antenna
Integrated WLAN Module	Brand Name: Intel® Wi-Fi 6E AX211 Model Name: AX211D2W FCC ID: PD9AX211D2
Integrated WLAN Module	Brand Name: Intel® BE200D2W Model Name: BE200D2W, BE200D2W M FCC ID: PD9BE200D2
Integrated NFC Module	Brand Name: Foxconn Model Name: T77H747
EUT supports Radios application	WCDMA/HSPA/LTE/5G NR/GNSS/NFC WLAN 11a/b/g/n HT20/HT40 WLAN 11ac VHT20/VHT40/VHT80/VHT160 WLAN 11ax HE20/HE40/HE80/HE160 Bluetooth BR/EDR/LE
EUT Stage	Production Unit

Remark:

1. The above EUT's information was declared by manufacturer.
2. Equipment: Fibocom FM350-GL tested inside of Lenovo Notebook Computer.

	Normal mode	TX switching mode
	TX/RX	TX/RX
Ant_0 (Main)	WCDMA : 2/4/5 LTE : 2/4/5/7/12/13/14/17/25/26/30/38/66/71 NR : 2/5/7/25/30/38/66/71	WCDMA : 5 LTE : 5/12/13/14/17/26/41/48/71 NR : 5/41/71/77/78
Ant_2 (MIMO2)	LTE : 41/48 NR : 41/77/78	WCDMA : 2/4 LTE : 2/4/7/25/30/38/66 NR : 2/7/25/30/38/66

WWAN Antenna Information				
Main Antenna	Manufacturer	Amphenol Taiwan Corporation	Peak gain (dBi)	5G NR n48 : 0.90
	Part number	DC33001YS50	Type	PIFA
	Manufacturer	Speed	Peak gain (dBi)	5G NR n48 : 0.90
	Part number	DC33001YT50	Type	PIFA
MIMO 2 Antenna	Manufacturer	Amphenol Taiwan Corporation	Peak gain (dBi)	5G NR n48 : 0.90
	Part number	DC33001YS40	Type	PIFA
	Manufacturer	Speed	Peak gain (dBi)	5G NR n48 : 0.90
	Part number	DC33001YT40	Type	PIFA

Remark: The above EUT's information was declared by manufacturer. Please refer to Disclaimer in report summary.

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	20.92 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	Ivy Yeh
Temperature (°C)	20.3~22.3
Relative Humidity (%)	51.4~56.7

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.
	03CH12-HY (TAF Code: 3786)
Test Engineer	Jesse Fan, Tim Lee and Wilson Wu
Temperature (°C)	20~25
Relative Humidity (%)	50~60
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.

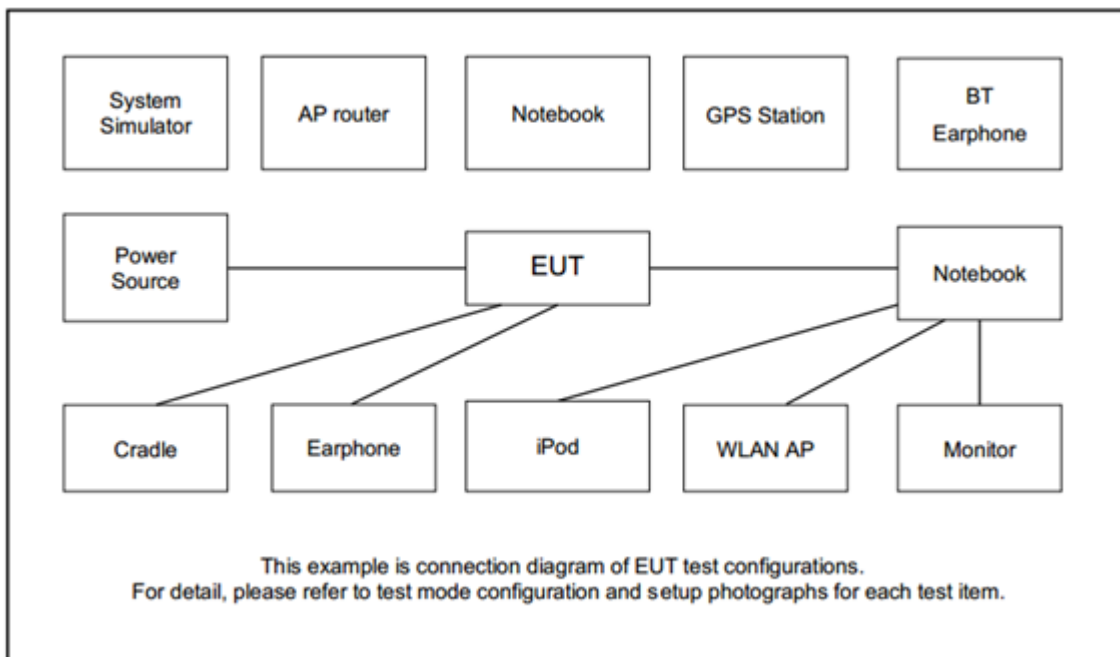
2 Test Configuration of Equipment Under Test

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.

Test Items	Band	Bandwidth (MHz)					Modulation					RB #			Test Channel		
		10	15	20	30	40	PI/2 BPSK	QPSK	16QAM	64QAM	256QAM	1	Half	Full	L	M	H
Max. Output Power	n48	v	v	v	v	v	v	v	v			v			v	v	v
E.I.R.P	n48	v	v	v	v	v	v	v	v			Max. Power					
Radiated Spurious Emission	n48	v		v		v	v	v				v		v	v	v	v
Remark	<ol style="list-style-type: none"> The mark "v" means that this configuration is chosen for testing The mark "-" means that this bandwidth is not supported. 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.- For modulation of 64QAM/256QAM, the maximum power of 64QAM/256QAM is lower than other modulation (QPSK/16QAM), therefore, according to engineering evaluation , we choose higher power (QPSK/16QAM) to perform all tests and show in the report. All the radiated test cases were performed with Battery 1 and 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.	System Simulator	Anritsu	MT8821C	N/A	N/A	Unshielded, 1.8 m
3.	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

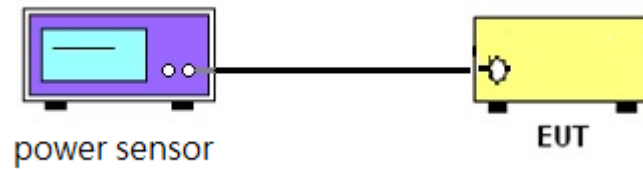
3 Conducted Test Items

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 mobile transmitters must not exceed 23 dBm /10 megahertz for 5G NR n48.

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)
End User Device	23	n/a

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.

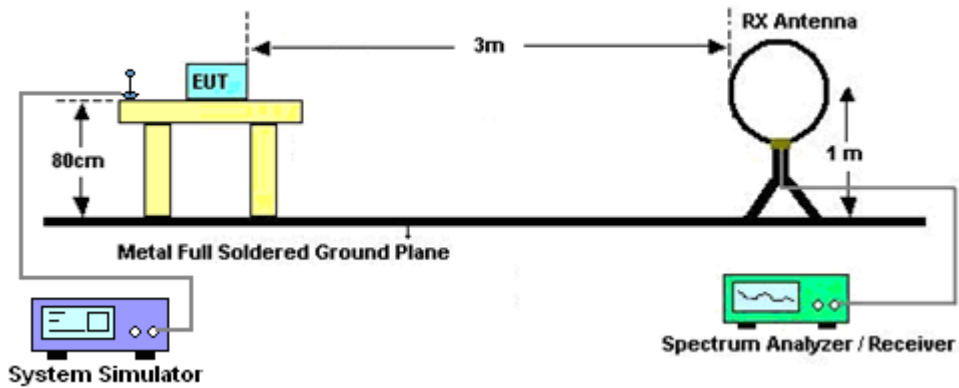
4 Radiated Test Items

4.1 Measuring Instruments

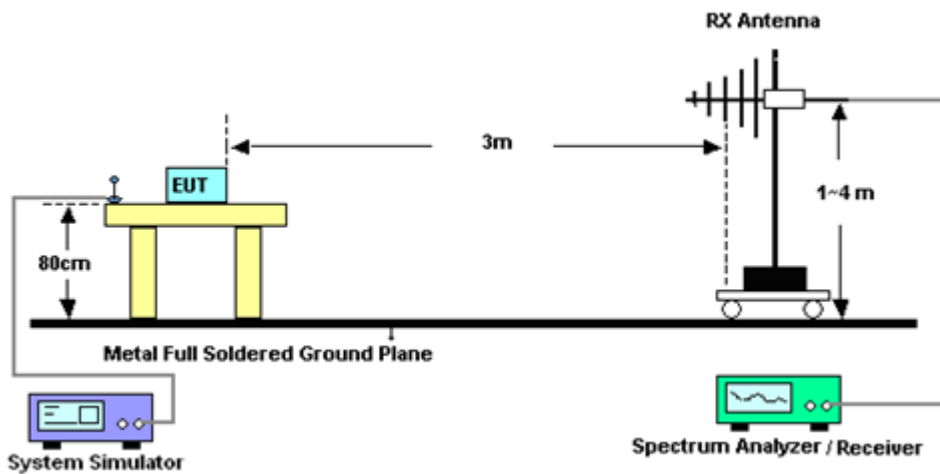
See list of measuring instruments of this test report.

4.2 Test Setup

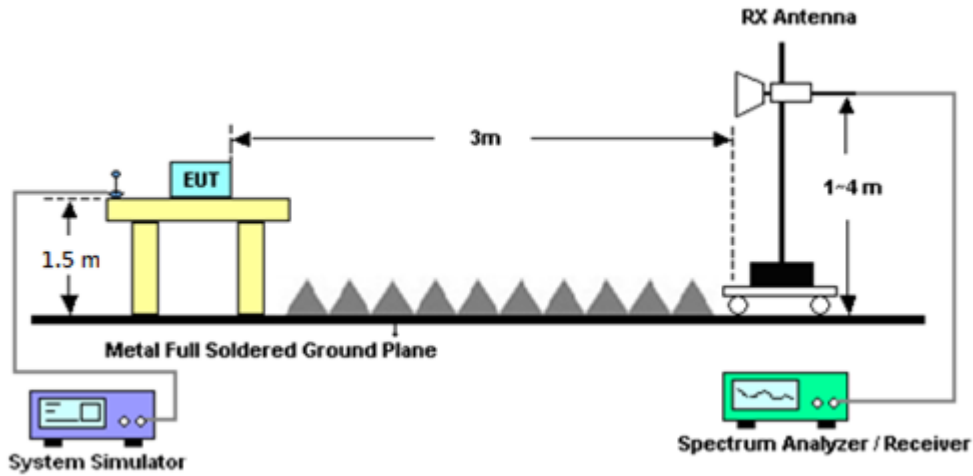
For radiated emissions below 30MHz



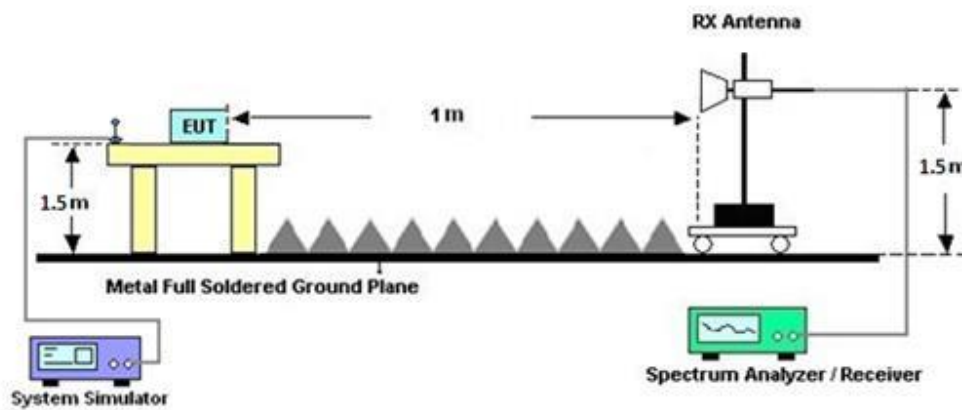
For radiated emissions from 30MHz to 1GHz



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)
 $EIRP(dBm) = Level (dBuV/m) + 20\log(d) - 104.77$, where d is the distance at which field strength limit is specified in the rules.
7. $Field\ Strength\ Level (dBm) = Spectrum\ Reading (dBm) + Antenna\ Factor + Cable\ Loss + Read\ Level - Preamp\ Factor.$
8. $ERP (dBm) = EIRP (dBm) - 2.15$
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
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Feb. 28, 2023	Jan. 27, 2024	Feb. 27, 2024	Radiation (03CH12-HY)
Bilog Antenna	TESEQ	CBL 6111D & 00800N1D01N-06	37059 & 01	30MHz~1GHz	Nov. 03, 2023	Jan. 27, 2024	Nov. 02, 2024	Radiation (03CH12-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-02114	1GHz~18GHz	Jul. 31, 2023	Jan. 27, 2024	Jul. 30, 2024	Radiation (03CH12-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA9170	00993	18GHz~40GHz	Nov. 24, 2023	Jan. 27, 2024	Nov. 23, 2024	Radiation (03CH12-HY)
Preamplifier	COM-POWER	PA-103A	161075	10MHz~1GHz	Mar. 21, 2023	Jan. 27, 2024	Mar. 20, 2024	Radiation (03CH12-HY)
Preamplifier	Agilent	8449B	3008A02375	1GHz~26.5GHz	May 23, 2023	Jan. 27, 2024	May 22, 2024	Radiation (03CH12-HY)
Preamplifier	E-INSTRUMENT TECH LTD.	ERA-100M-18G-56-01-A70	EC1900249	1GHz-18GHz	Dec. 20, 2023	Jan. 27, 2024	Dec. 19, 2024	Radiation (03CH12-HY)
Preamplifier	EMEC	EM18G40G	060715	18GHz~40GHz	Dec. 07, 2023	Jan. 27, 2024	Dec. 06, 2024	Radiation (03CH12-HY)
Spectrum Analyzer	Agilent	N9010A	MY53470118	10Hz~44GHz	Jan. 10, 2024	Jan. 27, 2024	Jan. 09, 2025	Radiation (03CH12-HY)
Filter	Wainwright	WHKX12-900-1000-15000-60SS	SN12	1GHz High Pass Filter	Sep. 11, 2023	Jan. 27, 2024	Sep. 10, 2024	Radiation (03CH12-HY)
Filter	Wainwright	WHKX12-2700-3000-18000-60ST	SN2	3GHz High Pass Filter	Mar. 14, 2023	Jan. 27, 2024	Mar. 13, 2024	Radiation (03CH12-HY)
Filter	Wainwright	WHKX8-5872.5-6750-18000-40ST	SN2	6.75GHz High Pass Filter	Mar. 14, 2023	Jan. 27, 2024	Mar. 13, 2024	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	803951/2	9kHz~30MHz	Mar. 07, 2023	Jan. 27, 2024	Mar. 06, 2024	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 126E	0058/126E	30MHz~18GHz	Dec. 18, 2023	Jan. 27, 2024	Dec. 17, 2024	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	505134/2	30MHz~40GHz	Dec. 18, 2023	Jan. 27, 2024	Dec. 17, 2024	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	803953/2	30MHz~40GHz	Dec. 18, 2023	Jan. 27, 2024	Dec. 17, 2024	Radiation (03CH12-HY)
Hygrometer	TECPEL	DTM-303B	TP210117	N/A	Oct. 19, 2023	Jan. 27, 2024	Oct. 18, 2024	Radiation (03CH12-HY)
Controller	EMEC	EM1000	N/A	Control Turn table & Ant Mast	N/A	Jan. 27, 2024	N/A	Radiation (03CH12-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1m~4m	N/A	Jan. 27, 2024	N/A	Radiation (03CH12-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	Jan. 27, 2024	N/A	Radiation (03CH12-HY)
Software	Audix	E3 6.2009-8-24	RK-000989	N/A	N/A	Jan. 27, 2024	N/A	Radiation (03CH12-HY)
Base Station (Measure)	Anritsu	MT8821C	6261940327	LTE	Nov. 16, 2023	Jan. 22, 2024	Nov. 15, 2024	Conducted (TH03-HY)
Base Station (Measure)	Anritsu	MT8000A	6261849015	FR1	Nov. 17, 2023	Jan. 22, 2024	Nov. 16, 2024	Conducted (TH03-HY)



6 Measurement Uncertainty

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	3.07 dB
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Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	3.63 dB
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Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.14 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 = 0.9 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP(W)
10	1	1	PI/2 BPSK	20.63	20.80	20.71	21.7	0.1479
10	1	1	QPSK	20.64	20.77	20.75		
10	1	1	16-QAM	19.68	19.90	19.82	20.8	0.1202
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 = 0.9 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP(W)
15	1	1	PI/2 BPSK	20.71	20.79	20.81	21.73	0.1489
15	1	1	QPSK	20.72	20.78	20.83		
15	1	1	16-QAM	19.78	19.88	19.86	20.78	0.1197
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 = 0.9 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP(W)
20	1	1	PI/2 BPSK	20.67	20.77	20.80	21.71	0.1483
20	1	1	QPSK	20.66	20.79	20.81		
20	1	1	16-QAM	19.70	19.85	19.88	20.78	0.1197
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 = 0.9 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP(W)
30	1	1	PI/2 BPSK	20.69	20.79	20.85	21.82	0.1521
30	1	1	QPSK	20.67	20.83	20.92		
30	1	1	16-QAM	19.84	19.88	19.99	20.89	0.1227
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 = 0.9 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP(W)
40	1	1	PI/2 BPSK	20.52	20.59	20.62	21.53	0.1422
40	1	1	QPSK	20.49	20.63	20.60		
40	1	1	16-QAM	19.62	19.69	19.67	20.59	0.1146
Limit	EIRP < 23dBm/10MHz			Result			Pass	

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



Appendix B. Test Results of Radiated Test

B1. Summary of each worse mode

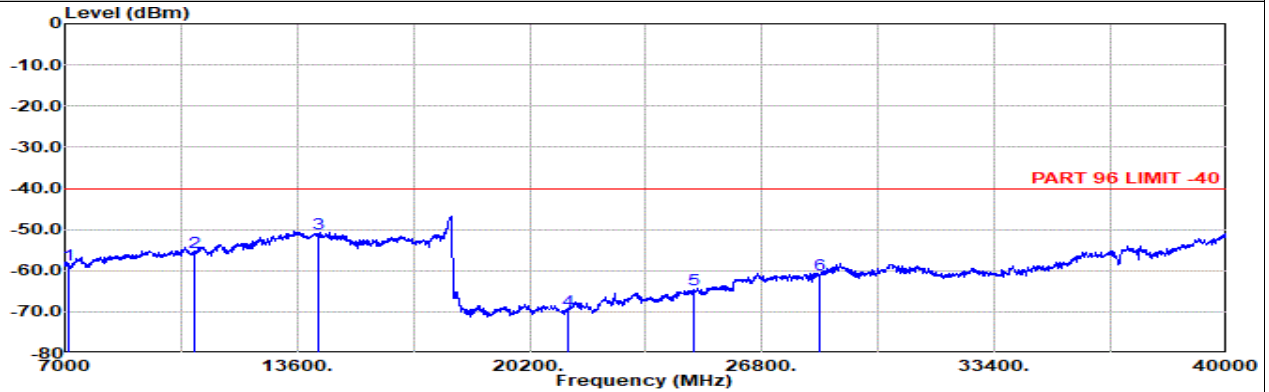
Mode	Part	Band	Ch	Freq (MHz)	Level (dBm)	Det	Ant Factor (dB)	Amp\Cbl (dB)	Filter (dB)	EIRPCF (dB)	Reading (dBuV)	Limit (dBm)	Margin (dB)	Pol	Ant
1	Part 96	NR SA n48	L	14209	-50.93	RMS	41.07	-45.87	0.77	-95.23	48.33	-40.00	-10.93	H	MIMO2
2	Part 96	EN-DC B2+n48	L	14205	-50.76	RMS	41.09	-45.89	0.77	-95.23	48.50	-40.00	-10.76	H	LTE Main + NR MIMO2



MIMO2

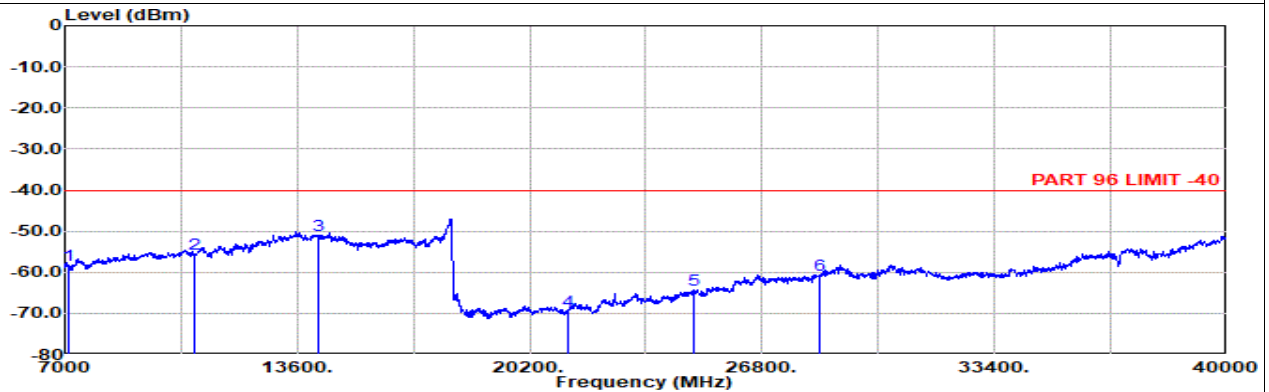
Part 96 Mode 1
NR SA n48 40M Ch638000 1RB1 BPSK

L



Site : 03CH12-HY
Condition: PART 96 LIMIT -40 3m 9120D-02114-230731 Horizontal
: SA n48 40M Ch638000 1RB1 BPSK

Freq	Level	Detector	Ant Factor	Amp\Cb	Filter	EIRPCF	Readin	Limit	Margin	Pol
MHz	dBm		dB/m	dB	dB	dB	dBuV	dBm	dB	
1 7104.00	-58.72	RMS	36.58	-51.92	1.16	-95.23	50.69	-40.00	-18.72	Horizontal
2 10656.00	-55.48	RMS	39.30	-50.06	0.54	-95.23	49.97	-40.00	-15.48	Horizontal
3 14209.00	-50.93	RMS	41.07	-45.87	0.77	-95.23	48.33	-40.00	-10.93	Horizontal
4 21313.00	-69.78	RMS	37.83	-32.04	-9.54	-95.23	29.20	-40.00	-29.78	Horizontal
5 24865.00	-64.59	RMS	39.26	-27.30	-9.54	-95.23	28.22	-40.00	-24.59	Horizontal
6 28418.00	-61.00	RMS	40.31	-25.56	-9.54	-95.23	29.02	-40.00	-21.00	Horizontal



Site : 03CH12-HY
Condition: PART 96 LIMIT -40 3m 9120D-02114-230731 Vertical
: SA n48 40M Ch638000 1RB1 BPSK

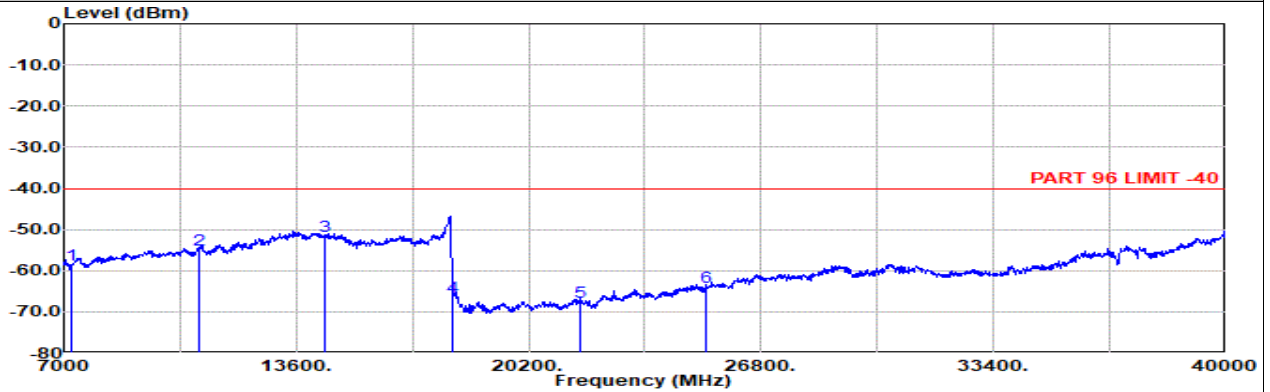
Freq	Level	Detector	Ant Factor	Amp\Cb	Filter	EIRPCF	Readin	Limit	Margin	Pol
MHz	dBm		dB/m	dB	dB	dB	dBuV	dBm	dB	
1 7104.00	-58.21	RMS	36.58	-51.92	1.16	-95.23	51.20	-40.00	-18.21	Vertical
2 10656.00	-55.68	RMS	39.30	-50.06	0.54	-95.23	49.77	-40.00	-15.68	Vertical
3 14209.00	-51.07	RMS	41.09	-45.89	0.77	-95.23	48.19	-40.00	-11.07	Vertical
4 21313.00	-69.34	RMS	37.96	-32.01	-9.54	-95.23	29.48	-40.00	-29.34	Vertical
5 24865.00	-64.27	RMS	39.27	-27.31	-9.54	-95.23	28.54	-40.00	-24.27	Vertical
6 28418.00	-60.75	RMS	40.31	-25.56	-9.54	-95.23	29.27	-40.00	-20.75	Vertical



MIMO2

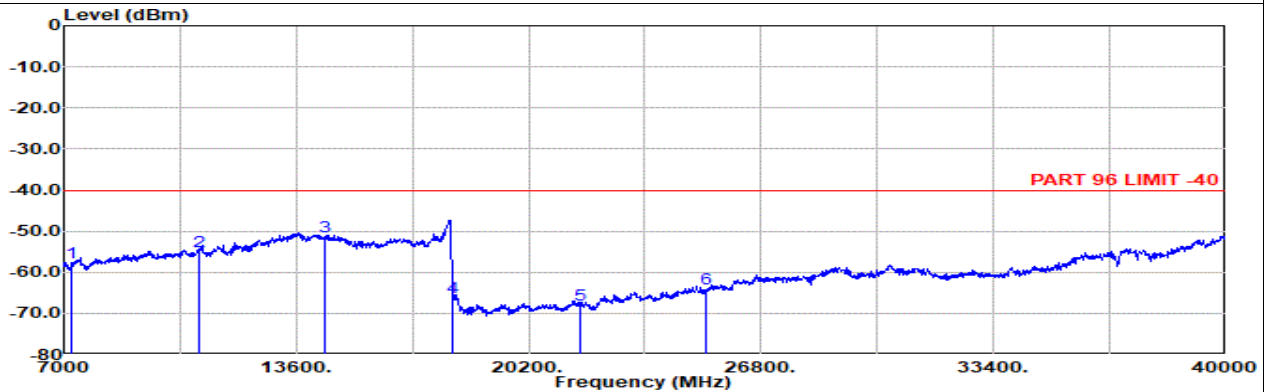
Part 96 Mode 1
NR SA n48 40M Ch641666 1RB1 BPSK

M



Site : 03CH12-HY
 Condition: PART 96 LIMIT -40 3m 9120D-02114-230731 Horizontal
 : SA n48 40M Ch641666 1RB1 BPSK

	Freq	Level	Detector	Ant Factor	Amp\Cb	Filter	EIRPCF	Readin	Limit	Margin	Pol
	MHz	dBm		dB/m	dB	dB	dB	dBuV	dBm	dB	
1	7214.00	-58.46	RMS	37.13	-51.96	1.00	-95.23	50.60	-40.00	-18.46	Horizontal
2	10821.00	-54.89	RMS	39.30	-49.84	0.55	-95.23	50.33	-40.00	-14.89	Horizontal
3	14429.00	-51.51	RMS	40.80	-45.51	0.78	-95.23	47.65	-40.00	-11.51	Horizontal
4	18036.00	-66.51	RMS	37.64	-34.74	-9.54	-95.23	35.36	-40.00	-26.51	Horizontal
5	21643.00	-67.52	RMS	37.82	-31.53	-9.54	-95.23	30.96	-40.00	-27.52	Horizontal
6	25250.00	-64.00	RMS	39.24	-26.67	-9.54	-95.23	28.20	-40.00	-24.00	Horizontal



Site : 03CH12-HY
 Condition: PART 96 LIMIT -40 3m 9120D-02114-230731 Vertical
 : SA n48 40M Ch641666 1RB1 BPSK

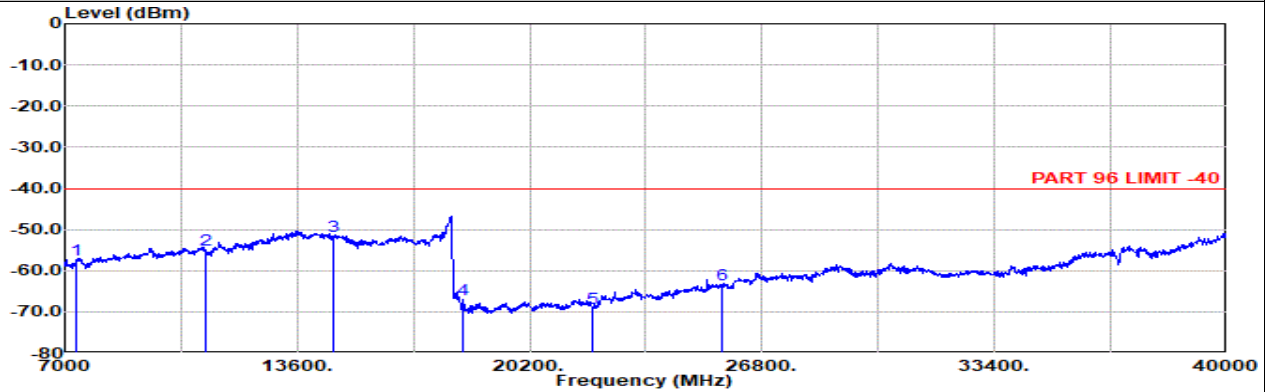
	Freq	Level	Detector	Ant Factor	Amp\Cb	Filter	EIRPCF	Readin	Limit	Margin	Pol
	MHz	dBm		dB/m	dB	dB	dB	dBuV	dBm	dB	
1	7214.00	-57.76	RMS	37.13	-51.96	1.00	-95.23	51.30	-40.00	-17.76	Vertical
2	10821.00	-54.83	RMS	39.30	-49.84	0.55	-95.23	50.39	-40.00	-14.83	Vertical
3	14429.00	-51.39	RMS	40.80	-45.51	0.78	-95.23	47.77	-40.00	-11.39	Vertical
4	18036.00	-66.15	RMS	37.64	-34.74	-9.54	-95.23	35.72	-40.00	-26.15	Vertical
5	21643.00	-67.78	RMS	37.81	-31.51	-9.54	-95.23	30.69	-40.00	-27.78	Vertical
6	25250.00	-64.05	RMS	39.28	-26.68	-9.54	-95.23	28.12	-40.00	-24.05	Vertical



MIMO2

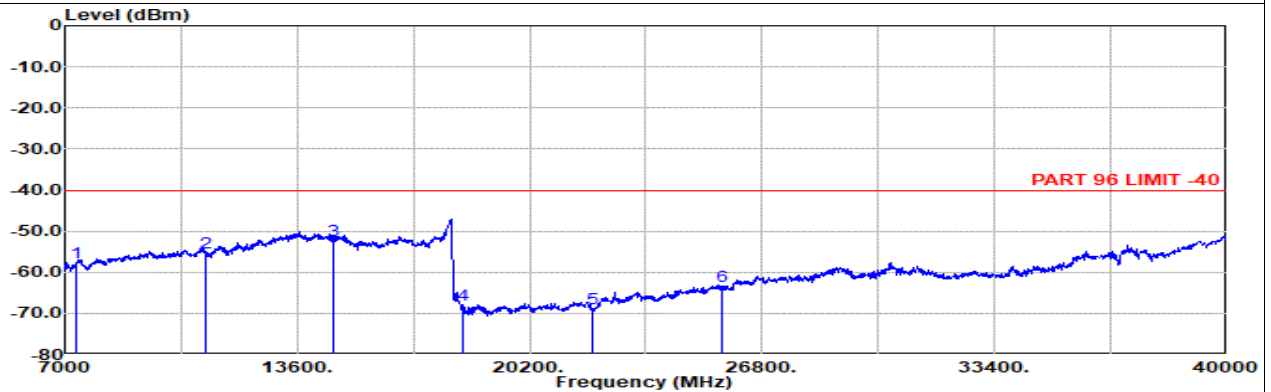
Part 96 Mode 1
NR SA n48 40M Ch645332 1RB1 BPSK

H



Site : 03CH12-HY
 Condition: PART 96 LIMIT -40 3m 9120D-02114-230731 Horizontal
 : SA n48 40M Ch645332 1RB1 BPSK

	Freq	Level	Detector	Ant Factor	Amp\Cb	Filter	EIRPCF	Readin	Limit	Margin	Pol
	MHz	dBm		dB/m	dB	dB	dB	dBuV	dBm	dB	
1	7324.00	-57.50	RMS	37.00	-51.73	0.97	-95.23	51.49	-40.00	-17.50	Horizontal
2	10986.00	-55.08	RMS	39.07	-49.63	0.55	-95.23	50.16	-40.00	-15.08	Horizontal
3	14649.00	-51.68	RMS	40.79	-45.51	0.78	-95.23	47.49	-40.00	-11.68	Horizontal
4	18311.00	-67.12	RMS	37.68	-34.39	-9.54	-95.23	34.36	-40.00	-27.12	Horizontal
5	21973.00	-69.05	RMS	38.00	-31.04	-9.54	-95.23	28.76	-40.00	-29.05	Horizontal
6	25635.00	-63.29	RMS	39.00	-26.19	-9.54	-95.23	28.67	-40.00	-23.29	Horizontal



Site : 03CH12-HY
 Condition: PART 96 LIMIT -40 3m 9120D-02114-230731 Vertical
 : SA n48 40M Ch645332 1RB1 BPSK

	Freq	Level	Detector	Ant Factor	Amp\Cb	Filter	EIRPCF	Readin	Limit	Margin	Pol
	MHz	dBm		dB/m	dB	dB	dB	dBuV	dBm	dB	
1	7324.00	-57.55	RMS	37.00	-51.73	0.97	-95.23	51.44	-40.00	-17.55	Vertical
2	10986.00	-55.10	RMS	39.03	-49.62	0.55	-95.23	50.17	-40.00	-15.10	Vertical
3	14649.00	-52.14	RMS	40.77	-45.49	0.78	-95.23	47.03	-40.00	-12.14	Vertical
4	18311.00	-67.78	RMS	37.68	-34.39	-9.54	-95.23	33.70	-40.00	-27.78	Vertical
5	21973.00	-68.79	RMS	38.00	-31.04	-9.54	-95.23	29.02	-40.00	-28.79	Vertical
6	25635.00	-63.33	RMS	39.00	-26.19	-9.54	-95.23	28.63	-40.00	-23.33	Vertical

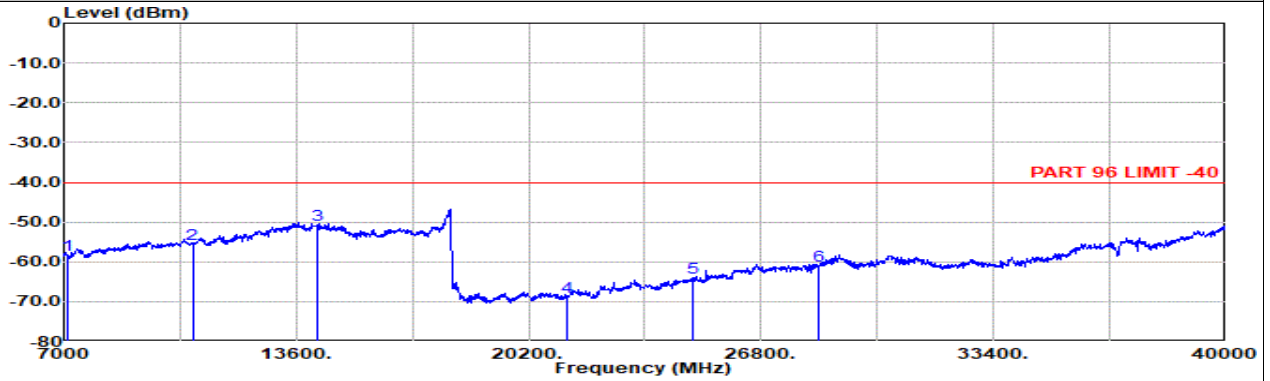


LTE Main + NR MIMO2

Part 96 Mode 2

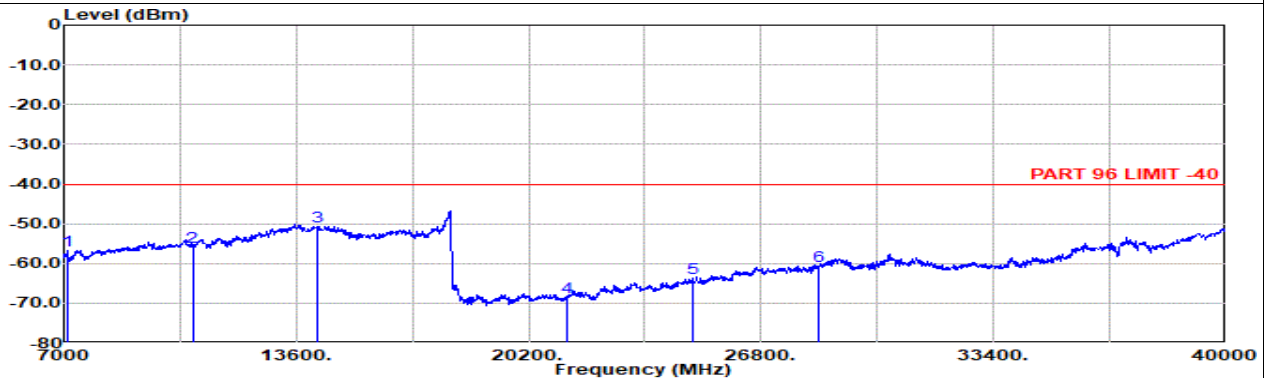
EN-DC B2+n48 10M + 20M Ch18900 1RB0 QPSK + Ch637334 1RB1 BPSK

L



Site : 03CH12-HY
 Condition: PART 96 LIMIT -40 3m 9120D-02114-230731 Horizontal
 : LTE Band 2 10M Ch18900 1RB0 QPSK
 : SA n48 20M Ch637334 1RB1 BPSK

Freq	Level	Detector	Ant Factor	Amp\Cb	Filter	EIRPCF	Readin	Limit	Margin	Pol
MHz	dBm			dB	dB	dB	dBuV	dBm	dB	
1 7102.00	-58.37	RMS	36.52	-51.91	1.17	-95.23	51.08	-40.00	-18.37	Horizontal
2 10653.00	-55.44	RMS	39.30	-50.06	0.54	-95.23	50.01	-40.00	-15.44	Horizontal
3 14205.00	-50.76	RMS	41.09	-45.89	0.77	-95.23	48.50	-40.00	-10.76	Horizontal
4 21307.00	-68.70	RMS	37.83	-32.04	-9.54	-95.23	30.28	-40.00	-28.70	Horizontal
5 24858.00	-64.11	RMS	39.29	-27.31	-9.54	-95.23	28.68	-40.00	-24.11	Horizontal
6 28410.00	-60.94	RMS	40.37	-25.56	-9.54	-95.23	29.02	-40.00	-20.94	Horizontal



Site : 03CH12-HY
 Condition: PART 96 LIMIT -40 3m 9120D-02114-230731 Vertical
 : LTE Band 2 10M Ch18900 1RB0 QPSK
 : SA n48 20M Ch637334 1RB1 BPSK

Freq	Level	Detector	Ant Factor	Amp\Cb	Filter	EIRPCF	Readin	Limit	Margin	Pol
MHz	dBm			dB	dB	dB	dBuV	dBm	dB	
1 7102.00	-56.79	RMS	36.52	-51.91	1.17	-95.23	52.66	-40.00	-16.79	Vertical
2 10653.00	-55.90	RMS	39.30	-50.06	0.54	-95.23	49.55	-40.00	-15.90	Vertical
3 14205.00	-50.84	RMS	41.09	-45.89	0.77	-95.23	48.42	-40.00	-10.84	Vertical
4 21307.00	-68.59	RMS	37.82	-32.06	-9.54	-95.23	30.42	-40.00	-28.59	Vertical
5 24858.00	-63.75	RMS	39.27	-27.31	-9.54	-95.23	29.06	-40.00	-23.75	Vertical
6 28410.00	-60.67	RMS	40.37	-25.56	-9.54	-95.23	29.29	-40.00	-20.67	Vertical

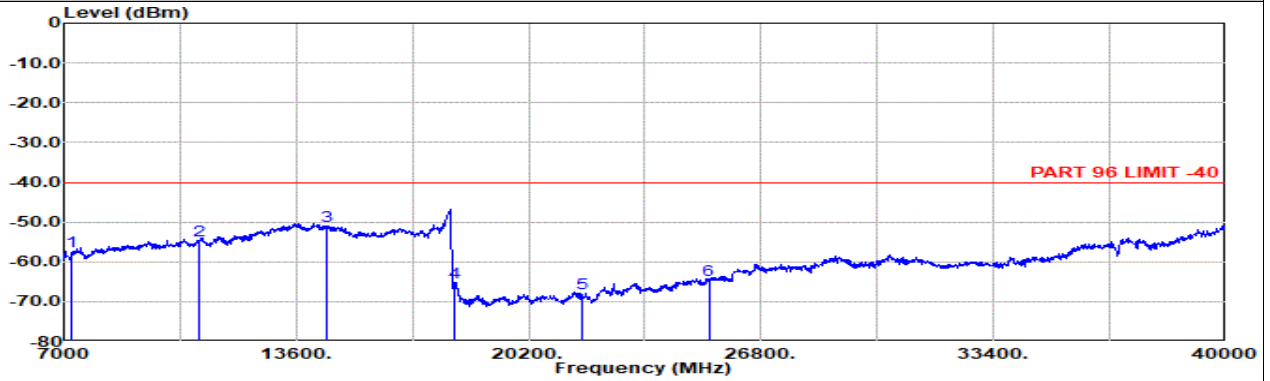


LTE Main + NR MIMO2

Part 96 Mode 2

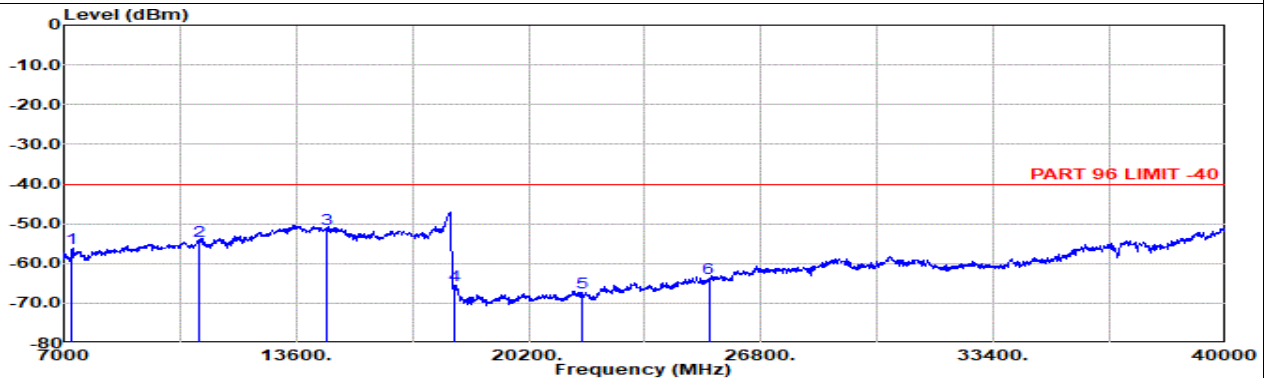
EN-DC B2+n48 10M + 20M Ch18900 1RB0 QPSK + Ch641666 1RB1 BPSK

M



Site : 03CH12-HY
 Condition: PART 96 LIMIT -40 3m 9120D-02114-230731 Horizontal
 : LTE Band 2 10M Ch18900 1RB0 QPSK
 : SA n48 20M Ch641666 1RB1 BPSK

	Freq	Level	Detector	Ant Factor	Amp\Cb	Filter	EIRPCF	Readin	Limit	Margin	Pol
	MHz	dBm		dB/m	dB	dB	dB	dBuV	dBm	dB	
1	7232.00	-57.21	RMS	37.16	-51.93	0.99	-95.23	51.80	-40.00	-17.21	Horizontal
2	10848.00	-54.59	RMS	39.30	-49.81	0.55	-95.23	50.60	-40.00	-14.59	Horizontal
3	14465.00	-51.13	RMS	40.80	-45.45	0.78	-95.23	47.97	-40.00	-11.13	Horizontal
4	18091.00	-65.14	RMS	37.98	-34.64	-9.54	-95.23	36.29	-40.00	-25.14	Horizontal
5	21697.00	-67.94	RMS	37.88	-31.46	-9.54	-95.23	30.41	-40.00	-27.94	Horizontal
6	25313.00	-64.48	RMS	39.10	-26.56	-9.54	-95.23	27.75	-40.00	-24.48	Horizontal



Site : 03CH12-HY
 Condition: PART 96 LIMIT -40 3m 9120D-02114-230731 Vertical
 : LTE Band 2 10M Ch18900 1RB0 QPSK
 : SA n48 20M Ch641666 1RB1 BPSK

	Freq	Level	Detector	Ant Factor	Amp\Cb	Filter	EIRPCF	Readin	Limit	Margin	Pol
	MHz	dBm		dB/m	dB	dB	dB	dBuV	dBm	dB	
1	7232.00	-56.29	RMS	37.16	-51.93	0.99	-95.23	52.72	-40.00	-16.29	Vertical
2	10848.00	-54.23	RMS	39.30	-49.81	0.55	-95.23	50.96	-40.00	-14.23	Vertical
3	14465.00	-51.22	RMS	40.80	-45.45	0.78	-95.23	47.88	-40.00	-11.22	Vertical
4	18091.00	-65.42	RMS	37.98	-34.64	-9.54	-95.23	36.01	-40.00	-25.42	Vertical
5	21697.00	-67.37	RMS	37.88	-31.46	-9.54	-95.23	30.98	-40.00	-27.37	Vertical
6	25313.00	-63.81	RMS	39.10	-26.56	-9.54	-95.23	28.42	-40.00	-23.81	Vertical

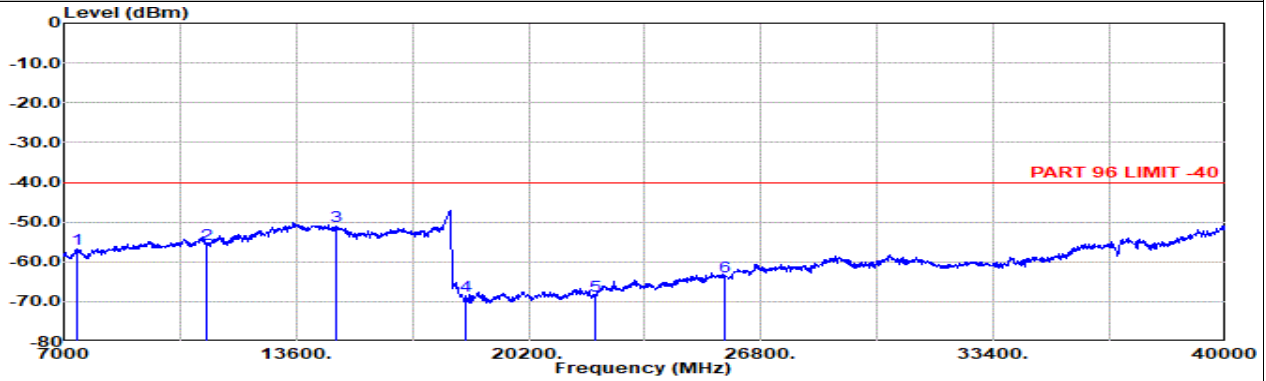


LTE Main + NR MIMO2

Part 96 Mode 2

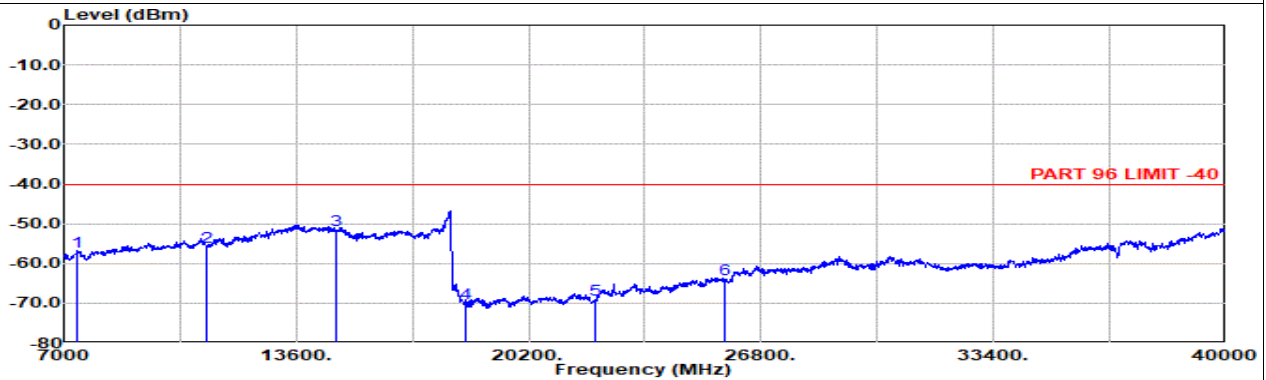
EN-DC B2+n48 10M + 20M Ch18900 1RB0 QPSK + Ch646000 1RB1 BPSK

H



Site : 03CH12-HY
 Condition: PART 96 LIMIT -40 3m 9120D-02114-230731 Horizontal
 : LTE Band 2 10M Ch18900 1RB0 QPSK
 : SA n48 20M Ch646000 1RB1 BPSK

Freq	Level	Detector	Ant Factor	Amp\Cb	Filter	EIRPCF	Readin	Limit	Margin	Pol
MHz	dBm		dB/m	dB	dB	dB	dBuV	dBm	dB	
1 7362.00	-56.72	RMS	36.93	-51.67	0.96	-95.23	52.29	-40.00	-16.72	Horizontal
2 11043.00	-55.68	RMS	38.91	-49.48	0.55	-95.23	49.57	-40.00	-15.68	Horizontal
3 14725.00	-51.15	RMS	40.65	-45.56	0.79	-95.23	48.20	-40.00	-11.15	Horizontal
4 18406.00	-68.67	RMS	37.70	-34.28	-9.54	-95.23	32.68	-40.00	-28.67	Horizontal
5 22087.00	-68.53	RMS	37.90	-30.97	-9.54	-95.23	29.31	-40.00	-28.53	Horizontal
6 25768.00	-63.60	RMS	39.00	-26.17	-9.54	-95.23	28.34	-40.00	-23.60	Horizontal



Site : 03CH12-HY
 Condition: PART 96 LIMIT -40 3m 9120D-02114-230731 Vertical
 : LTE Band 2 10M Ch18900 1RB0 QPSK
 : SA n48 20M Ch646000 1RB1 BPSK

Freq	Level	Detector	Ant Factor	Amp\Cb	Filter	EIRPCF	Readin	Limit	Margin	Pol
MHz	dBm		dB/m	dB	dB	dB	dBuV	dBm	dB	
1 7362.00	-57.14	RMS	36.93	-51.67	0.96	-95.23	51.87	-40.00	-17.14	Vertical
2 11043.00	-55.70	RMS	38.91	-49.48	0.55	-95.23	49.55	-40.00	-15.70	Vertical
3 14725.00	-51.69	RMS	40.65	-45.56	0.79	-95.23	47.66	-40.00	-11.69	Vertical
4 18406.00	-70.19	RMS	37.70	-34.28	-9.54	-95.23	31.16	-40.00	-30.19	Vertical
5 22087.00	-69.26	RMS	37.90	-30.96	-9.54	-95.23	28.57	-40.00	-29.26	Vertical
6 25768.00	-63.97	RMS	39.00	-26.17	-9.54	-95.23	27.97	-40.00	-23.97	Vertical

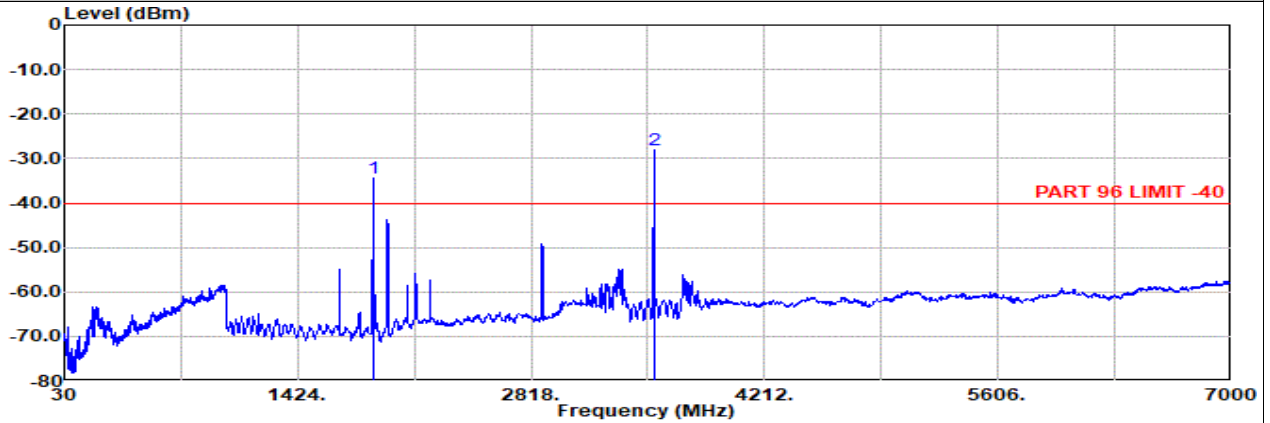


LTE Main + NR MIMO2

Part 96 Mode 2

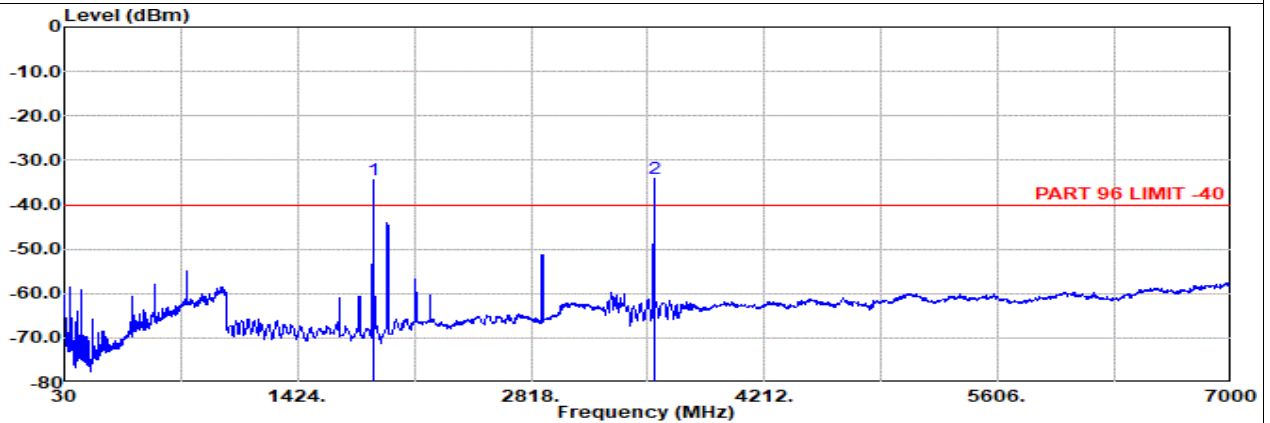
EN-DC B2+n48 10M + 20M Ch18900 1RB0 QPSK + Ch637334 1RB1 BPSK

L



Site : 03CH12-HY
 Condition: PART 96 LIMIT -40 3m 9120D-02114-230731 Horizontal
 : LTE Band 2 10M Ch18900 1RB0 QPSK
 : SA n48 20M Ch637334 1RB1 BPSK

	Freq	Level	Detector	Ant Factor	Amp	\Cb	Filter	EIRPCF	Readin	Limit	Margin	Pol
	MHz	dBm		dB/m	dB		dB	dB	dBuV	dBm	dB	
1	1874.73	-34.27	RMS	25.70	-60.47	0.21	-95.23	95.52	-----	-----	-----	Horizontal
2	3551.28	-28.17	RMS	29.60	-57.17	1.77	-95.23	92.86	-----	-----	-----	Horizontal



Site : 03CH12-HY
 Condition: PART 96 LIMIT -40 3m 9120D-02114-230731 Vertical
 : LTE Band 2 10M Ch18900 1RB0 QPSK
 : SA n48 20M Ch637334 1RB1 BPSK

	Freq	Level	Detector	Ant Factor	Amp	\Cb	Filter	EIRPCF	Readin	Limit	Margin	Pol
	MHz	dBm		dB/m	dB		dB	dB	dBuV	dBm	dB	
1	1874.73	-34.39	RMS	25.70	-60.47	0.21	-95.23	95.40	-----	-----	-----	Vertical
2	3551.25	-34.11	RMS	29.60	-57.17	1.77	-95.23	86.92	-----	-----	-----	Vertical

Remark : #1 & #2 is fundamental signal which can be ignored.