



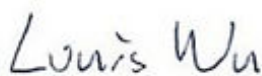
FCC RADIO TEST REPORT

FCC ID : 2BEY3FCUN69M
Equipment : 5G Sub-6 GHz M.2 Module
Brand Name : NETPRISMA INC.
Model Name : FCUN69-WWD
Applicant : NETPRISMA INC.
1301 6TH AVE, SEATTLE, WA, 98101-2304, UNITED STATES
Manufacturer : Lenovo PC HK Limited
23/F, Lincoln House, Taikoo Place 979 King's Road, Quarry
Bay, Hong Kong, P.R. China
Standard : FCC 47 CFR Part 2, 96

Equipment: NETPRISMA INC. FCUN69-WWD tested inside of Lenovo Notebook Computer.

The product was received on Aug. 21, 2024 and testing was performed from Sep. 04, 2024 to Oct. 22, 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 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
FG482037D	01	Initial issue of report	Nov. 18, 2024
FG482037D	02	Add Main Antenna in Appendix A This report is an updated version, replacing the report issued on Nov. 18, 2024.	Nov. 27, 2024
FG482037D	03	Revise Appendix B This report is an updated version, replacing the report issued on Nov. 27, 2024.	Dec. 05, 2024

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.2	§2.1046	Conducted Output Power	Pass	-
-	§96.41	Peak-to-Average Ratio	Pass	See Note
3.3	§96.41	Effective Isotropic Radiated Power	Pass	-
-	§2.1049 §96.41	Occupied Bandwidth	Pass	See Note
-	§2.1051 §96.41	Conducted Band Edge Measurement	Pass	See Note
-	§2.1051 §96.41	Conducted Spurious Emission	Pass	See Note
-	§2.1055	Frequency Stability for Temperature & Voltage	Pass	See Note
4.4	§2.1053 §96.41	Radiated Spurious Emission	Pass	10.92 dB under the limit at 14204.00 MHz

Remark:

- For host device, Radiated Spurious Emission and Effective 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: FCUN69-WWD)

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: Rebecca Wu

1 General Description

1.1 Product Feature of Equipment Under Test

Product Feature	
Equipment	5G Sub-6 GHz M.2 Module
Brand Name	NETPRISMA INC.
Model Name	FCUN69-WWD
FCC ID	2BEY3FCUN69M
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: NETPRISMA INC. FCUN69-WWD tested inside of Lenovo Notebook Computer.

The product was installed into Notebook Computer (Brand Name: Lenovo, Model Name: TP00151B) during test, and the host information was recorded in the following table.

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

Support band and evaluated information	
Supported band	B48
Evaluated and Tested band	B48
MIMO 2 Antenna	B48

TDD band Power Class		
	PC3	PC2
B48	V	-

WWAN Antenna Information for Host				
Main Antenna	Manufacturer	Amphenol	Peak gain (dBi)	LTE Band 48 : 1.00
	Part number	TKF436-16-000-R	Type	PIFA
	Manufacturer	Speed Taiwan Corporation	Peak gain (dBi)	LTE Band 48 : 0.97
	Part number	F-0G-JV-0228-001-00	Type	PIFA
MIMO2 Antenna	Manufacturer	Amphenol	Peak gain (dBi)	LTE Band 48 : -1.49
	Part number	TKF114-16-000-R	Type	PIFA
	Manufacturer	Speed Taiwan Corporation	Peak gain (dBi)	LTE Band 48 : -1.51
	Part number	F-0G-JV-0228-002-00	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	3550 MHz ~ 3700 MHz
Rx Frequency	3550 MHz ~ 3700 MHz
Bandwidth	5 MHz / 10 MHz / 15 MHz / 20 MHz
Maximum Output Power to Antenna	<Main Antenna> LTE Band 48: 20.84 dBm <MIMO2 Antenna> LTE Band 48: 20.90 dBm LTE Band 48C: 21.59 dBm
Type of Modulation	QPSK / 16QAM / 64QAM / 256QAM

1.3 Modification of EUT

No modifications made to the EUT during the testing.

1.4 Testing Site

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	Uchun Liu
Temperature (°C)	22.3~23.7
Relative Humidity (%)	50.3~55.4

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	Ken Kuo, 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 declared by the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ ANSI C63.26-2015
- ♦ 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

Remark:

1. All the test items were validated and recorded in accordance with the standards without any modification during the testing.
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.

For radiated measurement, the measured emission level of the EUT was maximized by rotating the EUT on a turntable, adjusting the orientation of the EUT and EUT antenna in Tablet Mode (three orthogonal axis (X: flat, Y: portrait, Z: landscape)) and Notebook Mode, and adjusting the measurement antenna orientation, following C63.26 exploratory test procedures and only the worst case emissions were reported in this report..

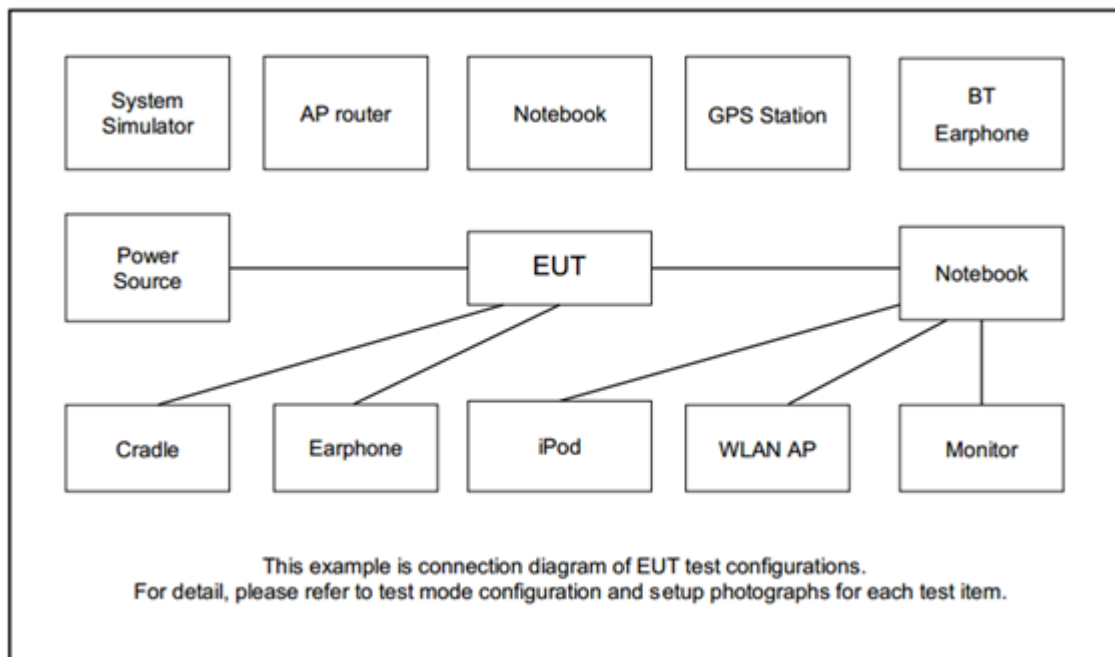
Modulation Type	Modulation
A	QPSK
B	16QAM
C	64QAM
D	256QAM

Test Item	Modulation Type	Bandwidth	RB Size	Channel
Conducted Power	A, B	All	1, Half, Full	L, M, H
EIRP	A, B	All	1, Half, Full	L, M, H
RSE	A	20 MHz or less	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. 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.
4. For modulation of QPSK & 16QAM, the maximum power of QPSK & 16QAM is higher than other modulation (64QAM/256QAM), therefore, according to engineering evaluation, we choose higher power (QPSK & 16QAM) to perform tests and show in the report.
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 and system

Item	Equipment	Brand Name	Model No.	FCC ID	Data Cable	Power Cord
1.	System Simulator	Anritsu	MT8821C	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

LTE Band 48 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
20	Channel	55340	55990	56640
	Frequency	3560	3625	3690
15	Channel	55315	55990	56665
	Frequency	3557.5	3625	3692.5
10	Channel	55290	55990	56690
	Frequency	3555	3625	3695
5	Channel	55265	55990	56715
	Frequency	3552.5	3625	3697.5

LTE Band 48C Channel and Frequency List_CA					
BW [MHz]	Channel/Frequency(MHz)		Lowest	Middle	Highest
20 + 20	PCC	Channel	55340	55891	56442
		Frequency	3560	3615.1	3670.2
	SCC	Channel	55538	56089	56640
		Frequency	3579.8	3634.9	3690.0
20 + 15	PCC	Channel	55340	55916	56491
		Frequency	3560	3617.6	3675.1
	SCC	Channel	55511	56087	56662
		Frequency	3577.1	3634.7	3692.2
15 + 20	PCC	Channel	55318	55893	56469
		Frequency	3557.8	3615.3	3672.9
	SCC	Channel	55489	56064	56640
		Frequency	3574.9	3632.4	3690.0
20 + 10	PCC	Channel	55340	55941	56541
		Frequency	3560	3620.1	3680.1
	SCC	Channel	55484	56085	56685
		Frequency	3574.4	3634.5	3694.5
10 + 20	PCC	Channel	55295	55896	56496
		Frequency	3555.5	3615.6	3675.6
	SCC	Channel	55439	56040	56640
		Frequency	3569.9	3630	3690
20 + 5	PCC	Channel	55340	55965	56590
		Frequency	3560	3622.5	3685
	SCC	Channel	55457	56082	56707
		Frequency	3571.7	3634.2	3696.7
5 + 20	PCC	Channel	55273	55896	56523
		Frequency	3553.3	3615.6	3678.3
	SCC	Channel	55390	56015	56640
		Frequency	3565	3627.5	3690.0

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 Measurement

3.2.1 Description of the Conducted Output Power Measurement

A base station simulator was used to establish communication with the EUT. Its parameters were set to transmit the maximum power on the EUT. 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 base station.
2. Set EUT at maximum power through base station.
3. Select lowest, middle, and highest channels for each band and different modulation.
4. Measure and record the power level from the system simulator.

3.3 EIRP

3.3.1 Description of the EIRP Measurement

The EIRP of mobile transmitters must not exceed 23 dBm /10 megahertz for LTE Band 48.

The testing follows ANSI C63.26-2015 Section 5.2.5.5.

According to KDB 412172 D01 Power Approach,

$EIRP = PT + GT - LC$, where

PT = transmitter output power in dBm

GT = 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

Remark: Total channel power is complied with EIRP limit 23dBm/10MHz.

3.3.2 Test Procedures

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)

Determine the EIRP by adding the effective antenna gain to the measured average conducted power level.

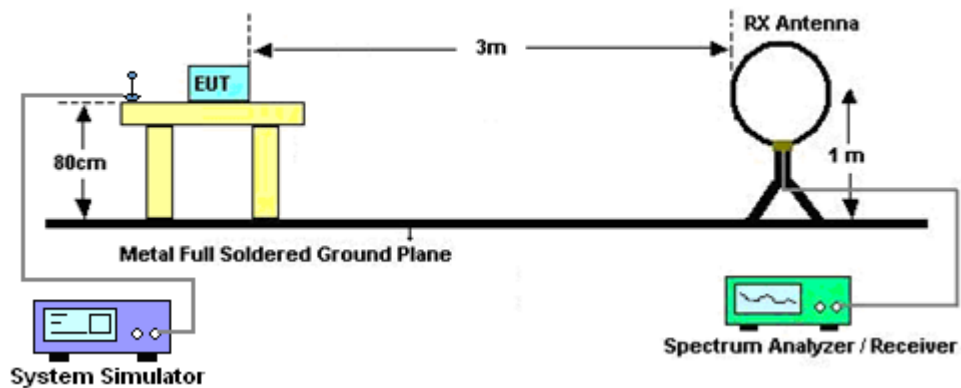
4 Radiated Test Items

4.1 Measuring Instruments

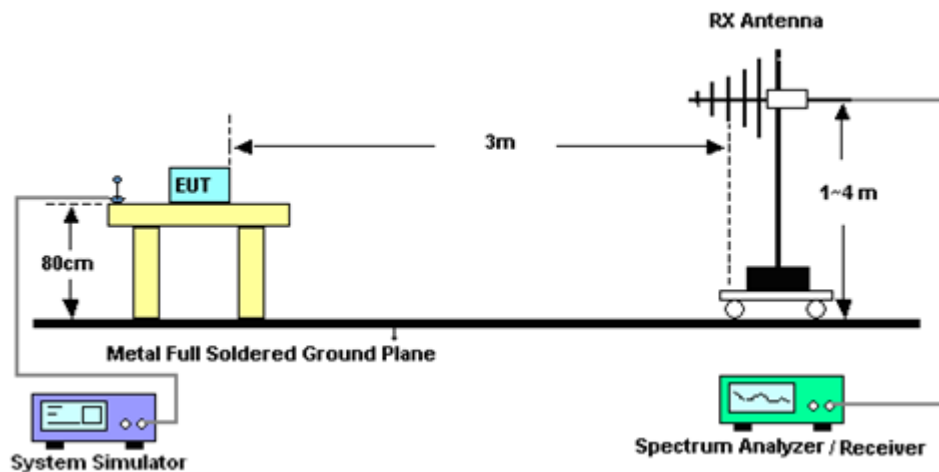
See list of measuring instruments of this test report.

4.2 Test Setup

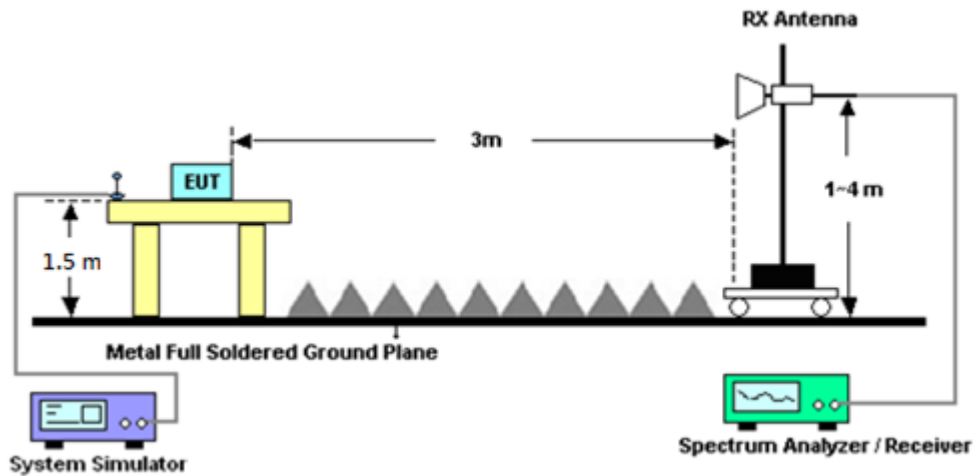
For radiated test below 30MHz



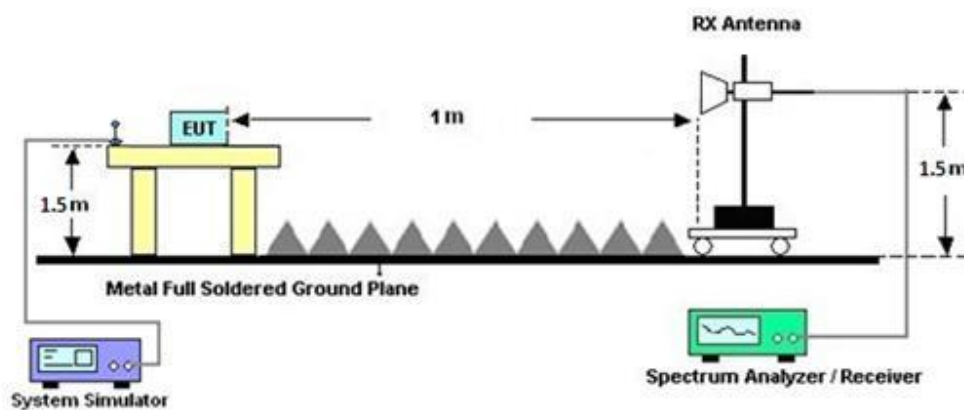
For radiated test from 30MHz to 1GHz



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

The radiated spurious emission was measured by substitution method according to ANSI C63.26-2015.

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 for frequency below 1GHz and 1.5 meter 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. 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. 23, 2024	Sep. 14, 2024~ Oct. 15, 2024	Feb. 22, 2025	Radiation (03CH12-HY)
Bilog Antenna	TESEQ	CBL 6111D & 00800N1D01 N-06	37059 & 01	30MHz~1GHz	Nov. 03, 2023	Sep. 14, 2024~ Oct. 15, 2024	Nov. 02, 2024	Radiation (03CH12-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120 D	9120D-021 14	1GHz~18GHz	Jul. 11, 2024	Sep. 14, 2024~ Oct. 15, 2024	Jul. 10, 2025	Radiation (03CH12-HY)
SHF-EHF Horn Antenna	SCHWARZBE CK	BBHA9170	00993	18GHz~40GHz	Nov. 24, 2023	Sep. 14, 2024~ Oct. 15, 2024	Nov. 23, 2024	Radiation (03CH12-HY)
Preamplifier	COM-POWER	PA-103	161075	10MHz~1GHz	Mar. 20, 2024	Sep. 14, 2024~ Oct. 15, 2024	Mar. 19, 2025	Radiation (03CH12-HY)
Preamplifier	Agilent	8449B	3008A023 75	1GHz~26.5GHz	May 22, 2024	Sep. 14, 2024~ Oct. 15, 2024	May 21, 2025	Radiation (03CH12-HY)
Preamplifier	E-INSTRUME NT TECH LTD.	ERA-100M-18 G-56-01-A70	EC190024 9	1GHz~18GHz	Dec. 20, 2023	Sep. 14, 2024~ Oct. 15, 2024	Dec. 19, 2024	Radiation (03CH12-HY)
Preamplifier	EMEC	EM18G40G	060715	18GHz~40GHz	Dec. 07, 2023	Sep. 14, 2024~ Oct. 15, 2024	Dec. 06, 2024	Radiation (03CH12-HY)
EMI Test Receiver	Agilent	N9038A(MXE)	MY532900 53	20Hz~26.5GHz	Sep. 09, 2024	Sep. 14, 2024~ Oct. 15, 2024	Sep. 08, 2025	Radiation (03CH12-HY)
Filter	Wainwright	WHKX12-900 -1000-15000- 60SS	SN11	1GHz High Pass Filter	Mar. 13, 2024	Sep. 14, 2024~ Oct. 15, 2024	Mar. 12, 2025	Radiation (03CH12-HY)
Filter	Wainwright	WLKS1200-1 2SS	SN2	1.2GHz Low Pass Filter	Mar. 13, 2024	Sep. 14, 2024~ Oct. 15, 2024	Mar. 12, 2025	Radiation (03CH12-HY)
Filter	Wainwright	WHKX12-270 0-3000-18000 -60SS	SN2	3GHz High Pass Filter	Mar. 13, 2024	Sep. 14, 2024~ Oct. 15, 2024	Mar. 12, 2025	Radiation (03CH12-HY)
Filter	Wainwright	WHKX8-5872. 5-6750-18000 -40ST	SN2	6.75GHz High Pass Filter	Mar. 13, 2024	Sep. 14, 2024~ Oct. 15, 2024	Mar. 12, 2025	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	803951/2	9kHz~30MHz	Mar. 06, 2024	Sep. 14, 2024~ Oct. 15, 2024	Mar. 05, 2025	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 126E	0058/126E	30MHz~18GHz	Dec. 18, 2023	Sep. 14, 2024~ Oct. 15, 2024	Dec. 17, 2024	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	505134/2	30MHz~40GHz	Dec. 18, 2023	Sep. 14, 2024~ Oct. 15, 2024	Dec. 17, 2024	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	803953/2	30MHz~40GHz	Dec. 18, 2023	Sep. 14, 2024~ Oct. 15, 2024	Dec. 17, 2024	Radiation (03CH12-HY)
Hygrometer	TECPEL	DTM-303B	TP210117	N/A	Oct. 19, 2023	Sep. 14, 2024~ Oct. 15, 2024	Oct. 18, 2024	Radiation (03CH12-HY)
Controller	EMEC	EM1000	N/A	Control Turn table & Ant Mast	N/A	Sep. 14, 2024~ Oct. 15, 2024	N/A	Radiation (03CH12-HY)
Antenna Mast	EMEC	AM-BS-4500- B	N/A	1m~4m	N/A	Sep. 14, 2024~ Oct. 15, 2024	N/A	Radiation (03CH12-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	Sep. 14, 2024~ Oct. 15, 2024	N/A	Radiation (03CH12-HY)
Software	Audix	E3 6.2009-8-24	RK-00098 9	N/A	N/A	Sep. 14, 2024~ Oct. 15, 2024	N/A	Radiation (03CH12-HY)



Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Radio Communication Analyzer	Anritsu	MT8821C	6262025353	LTE FDD/TDD LTE-2CC DLCA/ULCA	Oct. 03, 2023	Sep. 04, 2024~ Oct. 01, 2024	Oct. 02, 2024	Conducted (TH03-HY)
Radio Communication Analyzer	Anritsu	MT8821C	6262025353	LTE FDD/TDD LTE-2CC DLCA/ULCA	Oct. 01, 2024	Oct. 01, 2024~ Oct. 22, 2024	Sep. 30, 2025	Conducted (TH03-HY)
DC Power Supply	GW Instek	GPP-2323	GES906037	0V~64V : 0A~6A	Nov. 28, 2023	Sep. 04, 2024~ Oct. 22, 2024	Nov. 27, 2024	Conducted (TH03-HY)
Coupler+10dB+ RfCable	Warison + WoKen + E-Instrument	20dB 25W SMA Directional Coupler+ 10dB 18GHz 5W+ SFL405_1.5M	#A+#1+#1 +#7	1-18GHz	Jan. 02, 2024	Sep. 04, 2024~ Oct. 22, 2024	Jan. 01, 2025	Conducted (TH03-HY)
Power divider	Anritsu	K241C	2143398	9KHz~40GHz	Jun. 13, 2024	Sep. 04, 2024~ Oct. 22, 2024	Jun. 12, 2025	Conducted (TH03-HY)
Software	Sporton	LTE Conducted Test Tools	N/A	Conducted Test Item	N/A	Sep. 04, 2024~ Oct. 22, 2024	N/A	Conducted (TH03-HY)
Hygrometer	TECPEL	DTM-303B	TP210073	-10 ~ 50°C / 20 ~ 95%RH	Jun. 05, 2024	Sep. 04, 2024~ Oct. 22, 2024	Jun. 04, 2025	Conducted (TH03-HY)

6 Measurement Uncertainty

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	3.291 dB
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Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.073 dB
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Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.082 dB
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Appendix A. Test Results of Conducted Test

Conducted Output Power(Average power & EIRP)

<Main Antenna>

LTE Band 48 Maximum Average Power [dBm] (GT - LC = 1 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP (W)
20	1	0	QPSK	20.29	20.84	20.73	21.84	0.1528
20	1	0	16-QAM	19.66	20.21	20.08	21.21	0.1321
Limit	EIRP < 23dBm/10MHz			Result			Pass	

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

LTE Band 48 Maximum Average Power [dBm] (GT - LC = 1 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP (W)
15	1	0	QPSK	20.19	20.75	20.68	21.75	0.1496
15	1	0	16-QAM	19.59	20.11	20.00	21.11	0.1291
Limit	EIRP < 23dBm/10MHz			Result			Pass	

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

LTE Band 48 Maximum Average Power [dBm] (GT - LC = 1 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP (W)
10	1	0	QPSK	20.19	20.76	20.65	21.76	0.1500
10	1	0	16-QAM	19.59	20.16	20.00	21.16	0.1306
Limit	EIRP < 23dBm/10MHz			Result			Pass	

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

LTE Band 48 Maximum Average Power [dBm] (GT - LC = 1 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP (W)
5	1	0	QPSK	20.19	20.75	20.66	21.75	0.1496
5	1	0	16-QAM	19.58	20.14	20.01	21.14	0.1300
Limit	EIRP < 23dBm/10MHz			Result			Pass	

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

**<MIMO2 Antenna>**

LTE Band 48 Maximum Average Power [dBm] (GT - LC = -1.49 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP (W)
20	1	0	QPSK	20.90	20.71	20.78	19.41	0.0873
20	1	0	16-QAM	19.85	19.72	19.80	18.36	0.0685
Limit	EIRP < 23dBm/10MHz			Result			Pass	

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

LTE Band 48 Maximum Average Power [dBm] (GT - LC = -1.49 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP (W)
15	1	0	QPSK	20.70	20.60	20.64	19.21	0.0834
15	1	0	16-QAM	19.68	19.61	19.65	18.19	0.0659
Limit	EIRP < 23dBm/10MHz			Result			Pass	

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

LTE Band 48 Maximum Average Power [dBm] (GT - LC = -1.49 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP (W)
10	1	0	QPSK	20.74	20.53	20.66	19.25	0.0841
10	1	0	16-QAM	19.67	19.53	19.63	18.18	0.0658
Limit	EIRP < 23dBm/10MHz			Result			Pass	

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

LTE Band 48 Maximum Average Power [dBm] (GT - LC = -1.49 dB)								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP (W)
5	1	0	QPSK	20.72	20.61	20.59	19.23	0.0838
5	1	0	16-QAM	19.68	19.54	19.62	18.19	0.0659
Limit	EIRP < 23dBm/10MHz			Result			Pass	

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



LTE Band 48C_CA Maximum Average Power [dBm] (GT - LC = -1.49 dB)										
BW [MHz]	PCC		SCC		Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP (W)
	RB Size	RB Offset	RB Size	RB Offset						
20+20	1	99	1	0	QPSK	21.45	21.31	21.27	19.96	0.0991
20+20	1	99	1	0	16-QAM	21.02	20.89	20.83	19.53	0.0897
20+15	1	74	1	0	QPSK	21.39	21.27	21.38	19.90	0.0977
20+15	1	74	1	0	16-QAM	20.98	20.99	21.06	19.57	0.0906
15+20	1	74	1	0	QPSK	21.45	21.36	21.31	19.96	0.0991
15+20	1	74	1	0	16-QAM	21.04	20.94	20.79	19.55	0.0902
Limit	EIRP < 23dBm/10MHz					Result			Pass	

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

LTE Band 48C_CA Maximum Average Power [dBm] (GT - LC = -1.49 dB)										
BW [MHz]	PCC		SCC		Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP (W)
	RB Size	RB Offset	RB Size	RB Offset						
20+10	1	99	1	0	QPSK	21.42	21.36	21.28	19.93	0.0984
20+10	1	99	1	0	16-QAM	21.02	20.91	20.88	19.53	0.0897
10+20	1	49	1	0	QPSK	21.49	21.41	21.33	20.00	0.1000
10+20	1	49	1	0	16-QAM	21.10	20.91	20.90	19.61	0.0914
20+5	1	99	1	0	QPSK	21.45	21.31	21.35	19.96	0.0991
20+5	1	99	1	0	16-QAM	21.03	20.90	20.86	19.54	0.0899
Limit	EIRP < 23dBm/10MHz					Result			Pass	

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

LTE Band 48C_CA Maximum Average Power [dBm] (GT - LC = -1.49 dB)										
BW [MHz]	PCC		SCC		Mod	Lowest	Middle	Highest	EIRP (dBm)	EIRP (W)
	RB Size	RB Offset	RB Size	RB Offset						
5+20	1	24	1	0	QPSK	21.59	21.44	21.36	20.10	0.1023
5+20	1	24	1	0	16-QAM	21.24	21.12	21.01	19.75	0.0944
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
88	Part 96	LTE B48	L	14204	-50.92	RMS	40.99	-45.89	0.45	-95.23	48.76	-40.00	-10.92	H	MIMO2
89	Part 96	LTE CA B48C	M	14496	-50.96	RMS	40.69	-45.40	0.44	-95.23	48.54	-40.00	-10.96	V	MIMO2
113	Part 96	LTE B48	M	14204	-52.28	RMS	40.99	-48.22	0.45	-95.23	49.73	-40.00	-12.28	V	Main

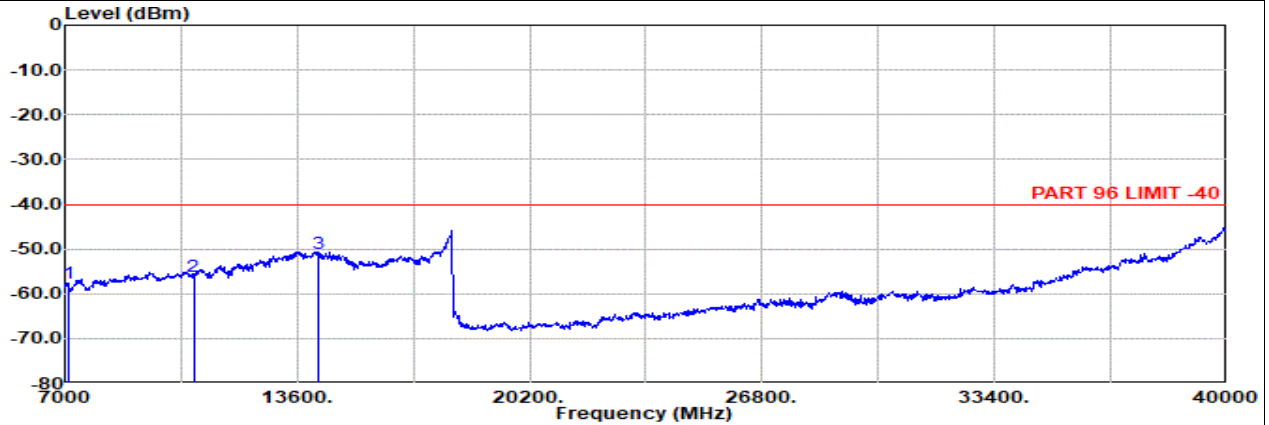


MIMO2 Antenna

Part 96 Mode 88

LTE B48 20M Ch55340 1RB0 QPSK

L

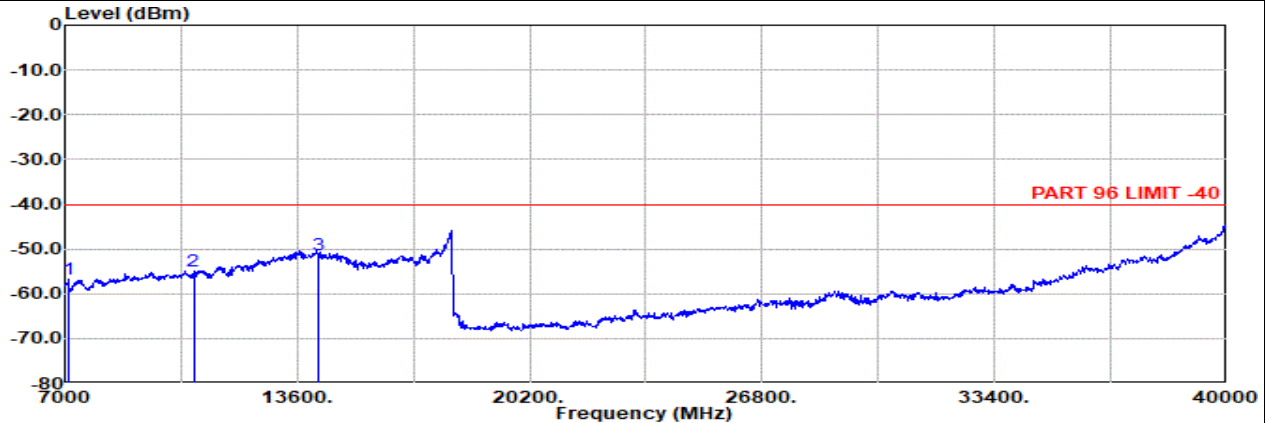


Site : 03CH12-HY

Condition: PART 96 LIMIT -40 1m SHF_00993_231124 Horizontal

: LTE Band 48 20M Ch55340 1RB0 QPSK

	Freq MHz	Level dBm	Detector	Ant Amp\Cb Filter		EIRPCF	Readin g	Limit		Margin	Pol
				Factor	1			dBm	dB		
1	7102.00	-57.53	RMS	36.61	-51.91	0.90	-95.23	52.10	-40.00	-17.53	Horizontal
2	10653.00	-56.11	RMS	39.20	-50.06	0.26	-95.23	49.72	-40.00	-16.11	Horizontal
3	14204.00	-50.92	RMS	40.99	-45.89	0.45	-95.23	48.76	-40.00	-10.92	Horizontal



Site : 03CH12-HY

Condition: PART 96 LIMIT -40 1m SHF_00993_231124 Vertical

: LTE Band 48 20M Ch55340 1RB0 QPSK

	Freq MHz	Level dBm	Detector	Ant Amp\Cb Filter		EIRPCF	Readin g	Limit		Margin	Pol
				Factor	1			dBm	dB		
1	7102.00	-56.84	RMS	36.61	-51.91	0.90	-95.23	52.79	-40.00	-16.84	Vertical
2	10653.00	-55.06	RMS	39.20	-50.06	0.26	-95.23	50.77	-40.00	-15.06	Vertical
3	14204.00	-51.28	RMS	40.99	-45.89	0.45	-95.23	48.40	-40.00	-11.28	Vertical

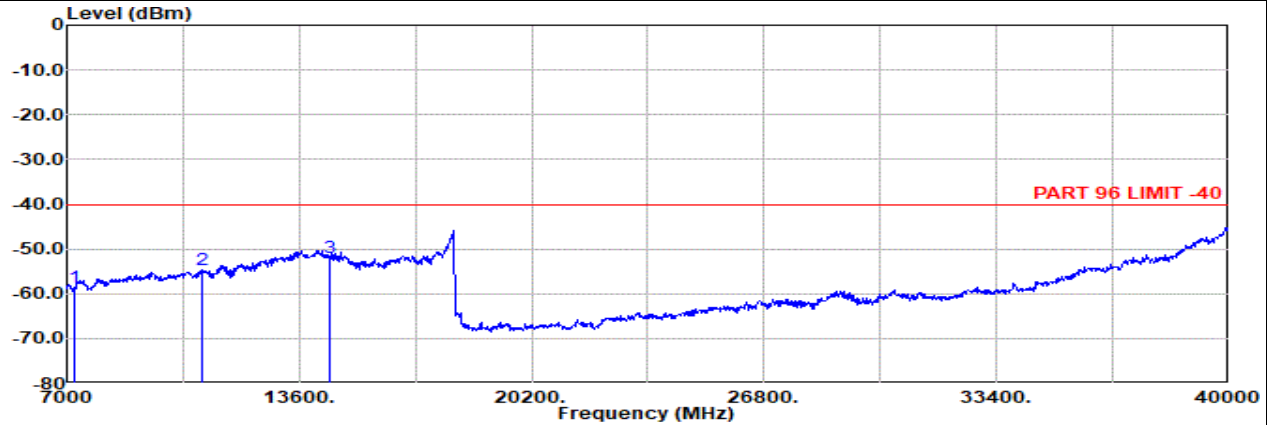


MIMO2 Antenna

Part 96 Mode 88

LTE B48 20M Ch55990 1RB0 QPSK

M

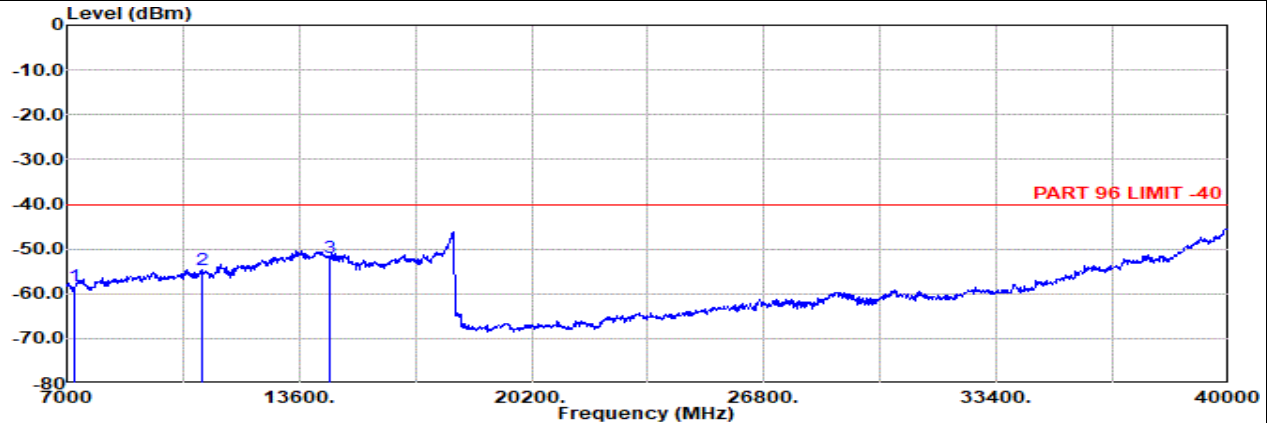


Site : 03CH12-HY

Condition: PART 96 LIMIT -40 1m SHF_00993_231124 Horizontal

: LTE Band 48 20M Ch55990 1RB0 QPSK

	Freq MHz	Level dBm	Detector	Ant Amp\Cb Filter		EIRPCF	Readin g	Limit		Margin	Pol
				Factor	1			dBm	dB		
1	7232.00	-58.65	RMS	37.13	-51.93	0.88	-95.23	50.50	-40.00	-18.65	Horizontal
2	10848.00	-54.78	RMS	39.20	-49.81	0.27	-95.23	50.79	-40.00	-14.78	Horizontal
3	14464.00	-51.94	RMS	40.63	-45.45	0.44	-95.23	47.67	-40.00	-11.94	Horizontal



Site : 03CH12-HY

Condition: PART 96 LIMIT -40 1m SHF_00993_231124 Vertical

: LTE Band 48 20M Ch55990 1RB0 QPSK

	Freq MHz	Level dBm	Detector	Ant Amp\Cb Filter		EIRPCF	Readin g	Limit		Margin	Pol
				Factor	1			dBm	dB		
1	7232.00	-58.28	RMS	37.13	-51.93	0.88	-95.23	50.87	-40.00	-18.28	Vertical
2	10848.00	-54.73	RMS	39.20	-49.81	0.27	-95.23	50.84	-40.00	-14.73	Vertical
3	14464.00	-52.00	RMS	40.63	-45.45	0.44	-95.23	47.61	-40.00	-12.00	Vertical

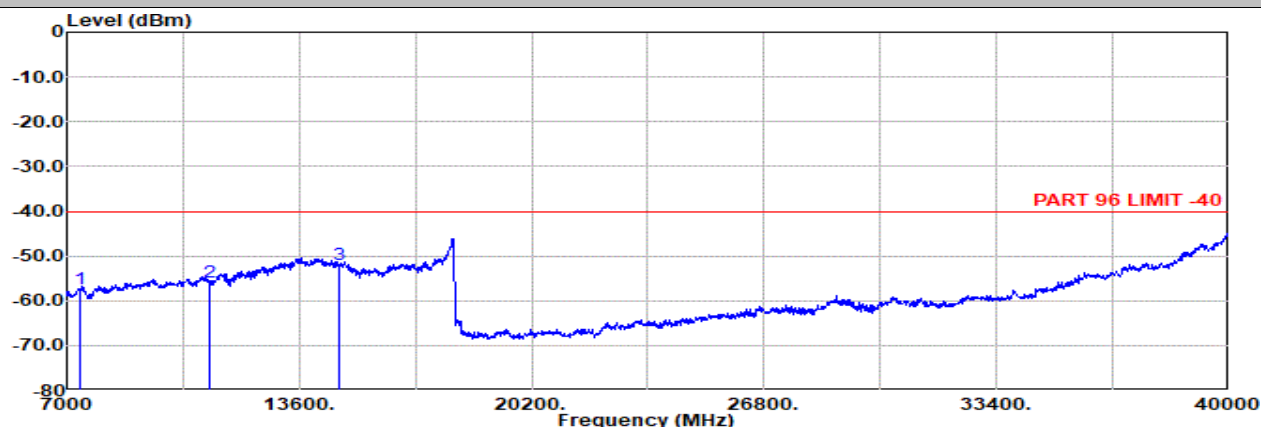


MIMO2 Antenna

Part 96 Mode 88

LTE B48 20M Ch56640 1RB0 QPSK

H

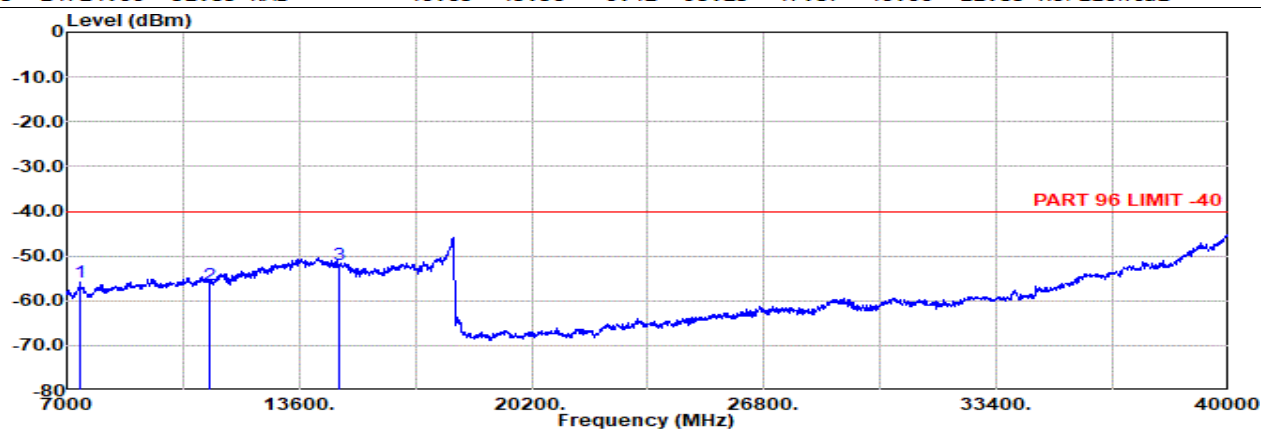


Site : 03CH12-HY

Condition: PART 96 LIMIT -40 1m SHF_00993_231124 Horizontal

: LTE Band 48 20M Ch56640 1RB0 QPSK

	Freq MHz	Level dBm	Detector	Ant Amp\Cb Filter		EIRPCF	Readin g	Limit	Margin Pol	
				Factor	1					
1	7362.00	-57.41	RMS	36.83	-51.67	0.83	-95.23	51.83	-40.00	-17.41 Horizontal
2	11043.00	-55.99	RMS	38.90	-49.48	0.28	-95.23	49.54	-40.00	-15.99 Horizontal
3	14724.00	-51.85	RMS	40.65	-45.56	0.42	-95.23	47.87	-40.00	-11.85 Horizontal



Site : 03CH12-HY

Condition: PART 96 LIMIT -40 1m SHF_00993_231124 Vertical

: LTE Band 48 20M Ch56640 1RB0 QPSK

	Freq MHz	Level dBm	Detector	Ant Amp\Cb Filter		EIRPCF	Readin g	Limit	Margin Pol	
				Factor	1					
1	7362.00	-55.83	RMS	36.83	-51.67	0.83	-95.23	53.41	-40.00	-15.83 Vertical
2	11043.00	-56.48	RMS	38.90	-49.48	0.28	-95.23	49.05	-40.00	-16.48 Vertical
3	14724.00	-51.84	RMS	40.65	-45.56	0.42	-95.23	47.88	-40.00	-11.84 Vertical

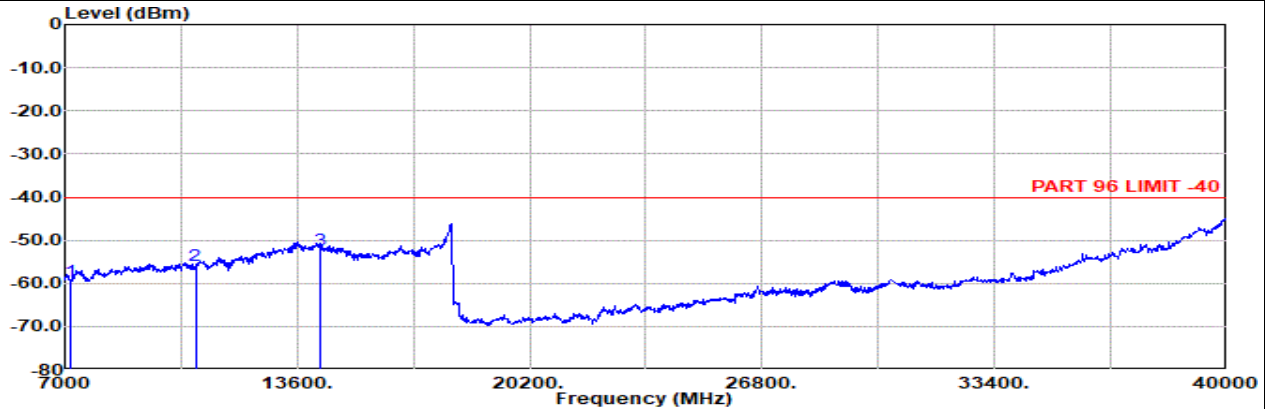


MIMO2 Antenna

Part 96 Mode 89

LTE CA B48C 20M + 20M Ch55340 1RB99 QPSK + Ch55538 1RB0 QPSK

L



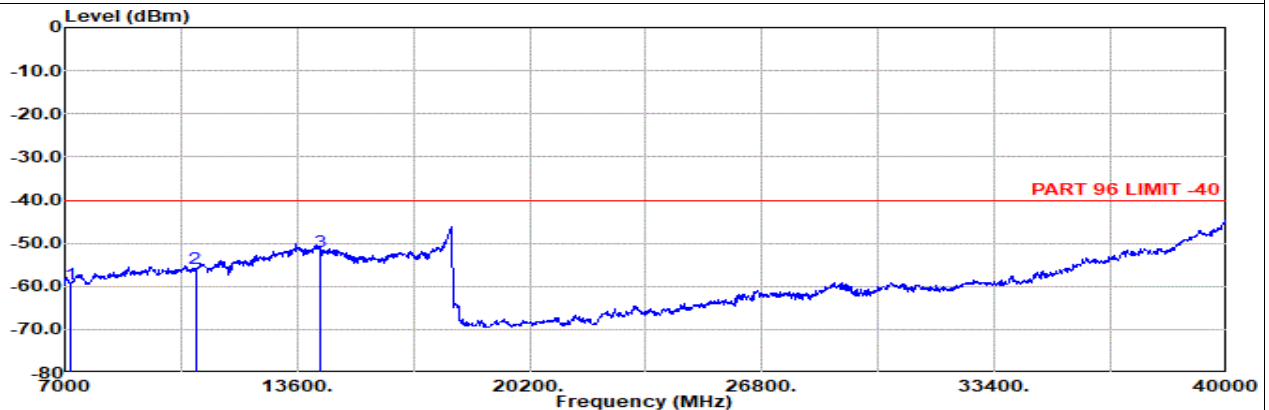
Site : 03CH12-HY

Condition: PART 96 LIMIT -40 1m SHF_00993_231124 Vertical

: LTE Band 48 20M Ch55340 1RB99 QPSK

: LTE Band 48 20M Ch55538 1RB0 QPSK

	Freq	Level	Detector	Ant Amp\Cb Filter		EIRPCF	Readin	Limit	Margin Pol	
				Factor	1					
	MHz	dBm								
1	7138.00	-59.54	RMS	36.75	-51.94	0.90	-95.23	49.98	-40.00	-19.54 Horizontal
2	10707.00	-55.77	RMS	39.19	-49.99	0.26	-95.23	50.00	-40.00	-15.77 Horizontal
3	14276.00	-52.17	RMS	40.90	-45.77	0.45	-95.23	47.48	-40.00	-12.17 Horizontal



Site : 03CH12-HY

Condition: PART 96 LIMIT -40 1m SHF_00993_231124 Horizontal

: LTE Band 48 20M Ch55340 1RB99 QPSK

: LTE Band 48 20M Ch55538 1RB0 QPSK

	Freq	Level	Detector	Ant Amp\Cb Filter		EIRPCF	Readin	Limit	Margin Pol	
				Factor	1					
	MHz	dBm								
1	7138.00	-59.34	RMS	36.75	-51.94	0.90	-95.23	50.18	-40.00	-19.34 Vertical
2	10707.00	-55.84	RMS	39.19	-49.99	0.26	-95.23	49.93	-40.00	-15.84 Vertical
3	14276.00	-51.85	RMS	40.90	-45.77	0.45	-95.23	47.80	-40.00	-11.85 Vertical

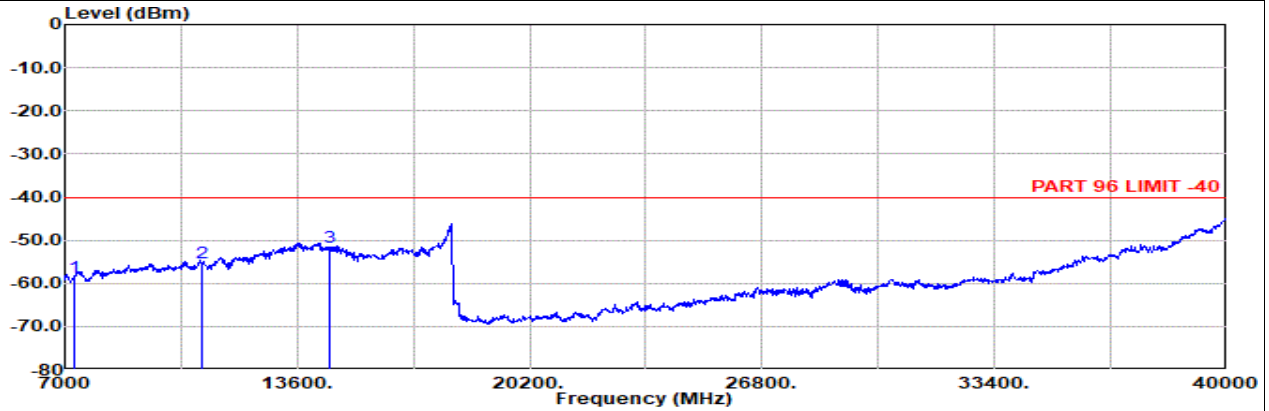


MIMO2 Antenna

Part 96 Mode 89

LTE CA B48C 20M + 20M Ch55891 1RB99 QPSK + Ch56089 1RB0 QPSK

M



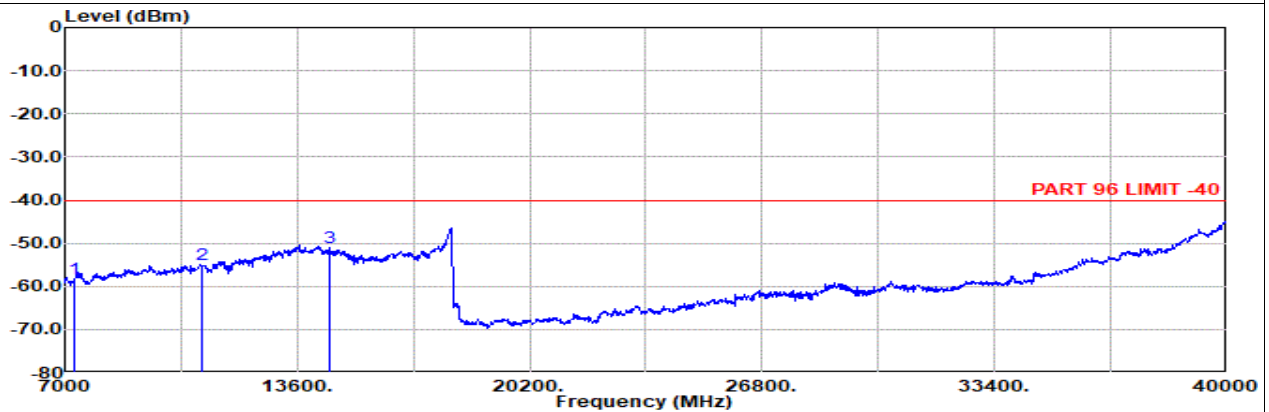
Site : 03CH12-HY

Condition: PART 96 LIMIT -40 1m SHF_00993_231124 Horizontal

: LTE Band 48 20M Ch55891 1RB99 QPSK

: LTE Band 48 20M Ch56089 1RB0 QPSK

	Freq Level		Detector	Ant Amp\Cb Filter		Factor	EIRPCF		Readin g	Limit		Margin	Pol
	MHz	dBm		dB/m	dB		dB	dB		dBuV	dBm	dB	
1	7248.00	-58.46	RMS	37.19	-51.89	0.87	-95.23	50.60	-40.00	-18.46	Horizontal		
2	10872.00	-55.14	RMS	39.16	-49.78	0.27	-95.23	50.44	-40.00	-15.14	Horizontal		
3	14496.00	-51.59	RMS	40.69	-45.40	0.44	-95.23	47.91	-40.00	-11.59	Horizontal		



Site : 03CH12-HY

Condition: PART 96 LIMIT -40 1m SHF_00993_231124 Vertical

: LTE Band 48 20M Ch55891 1RB99 QPSK

: LTE Band 48 20M Ch56089 1RB0 QPSK

	Freq Level		Detector	Ant Amp\Cb Filter		Factor	EIRPCF		Readin g	Limit		Margin	Pol
	MHz	dBm		dB/m	dB		dB	dB		dBuV	dBm	dB	
1	7248.00	-58.36	RMS	37.19	-51.89	0.87	-95.23	50.70	-40.00	-18.36	Vertical		
2	10872.00	-54.98	RMS	39.16	-49.78	0.27	-95.23	50.60	-40.00	-14.98	Vertical		
3	14496.00	-50.96	RMS	40.69	-45.40	0.44	-95.23	48.54	-40.00	-10.96	Vertical		

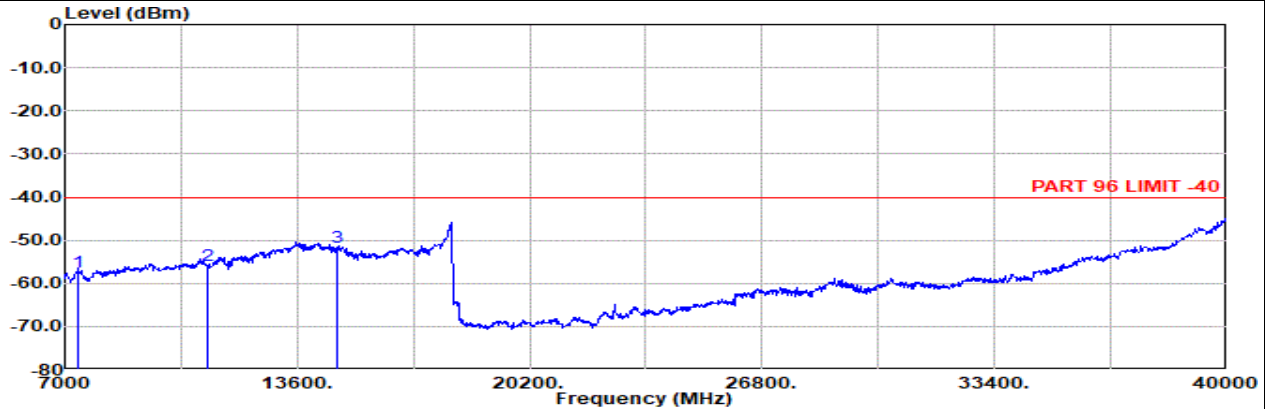


MIMO2 Antenna

Part 96 Mode 89

LTE CA B48C 20M + 20M Ch56442 1RB99 QPSK + Ch56640 1RB0 QPSK

H



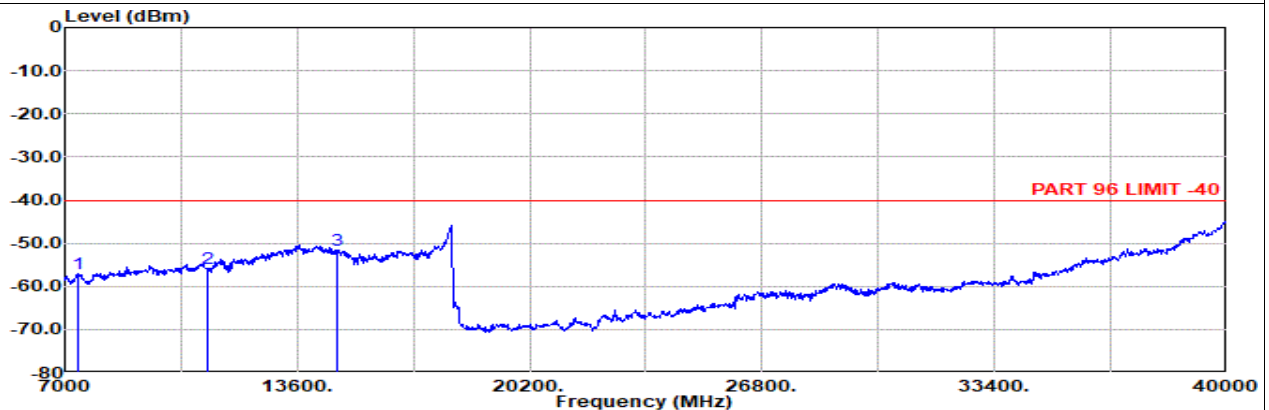
Site : 03CH12-HY

Condition: PART 96 LIMIT -40 1m SHF_00993_231124 Horizontal

: LTE Band 48 20M Ch56442 1RB99 QPSK

: LTE Band 48 20M Ch56640 1RB0 QPSK

	Freq MHz	Level dBm	Detector	Ant Amp\Cb Filter		EIRPCF	Readin g	Limit		Margin	Pol
				Factor	1			dBm	dB		
1	7358.00	-57.30	RMS	36.85	-51.68	0.83	-95.23	51.93	-40.00	-17.30	Horizontal
2	11037.00	-55.94	RMS	38.90	-49.50	0.28	-95.23	49.61	-40.00	-15.94	Horizontal
3	14716.00	-51.70	RMS	40.67	-45.55	0.42	-95.23	47.99	-40.00	-11.70	Horizontal



Site : 03CH12-HY

Condition: PART 96 LIMIT -40 1m SHF_00993_231124 Vertical

: LTE Band 48 20M Ch56442 1RB99 QPSK

: LTE Band 48 20M Ch56640 1RB0 QPSK

	Freq MHz	Level dBm	Detector	Ant Amp\Cb Filter		EIRPCF	Readin g	Limit		Margin	Pol
				Factor	1			dBm	dB		
1	7358.00	-57.13	RMS	36.85	-51.68	0.83	-95.23	52.10	-40.00	-17.13	Vertical
2	11037.00	-55.76	RMS	38.90	-49.50	0.28	-95.23	49.79	-40.00	-15.76	Vertical
3	14716.00	-51.68	RMS	40.67	-45.55	0.42	-95.23	48.01	-40.00	-11.68	Vertical

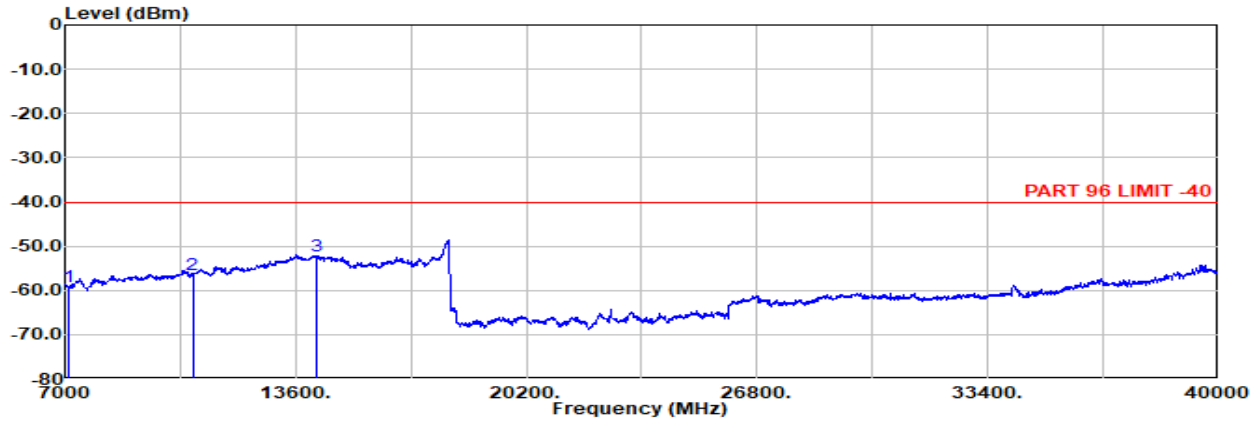


Main Antenna

Part 96 Mode 113

LTE B48 20M Ch55340 1RB0 QPSK

L

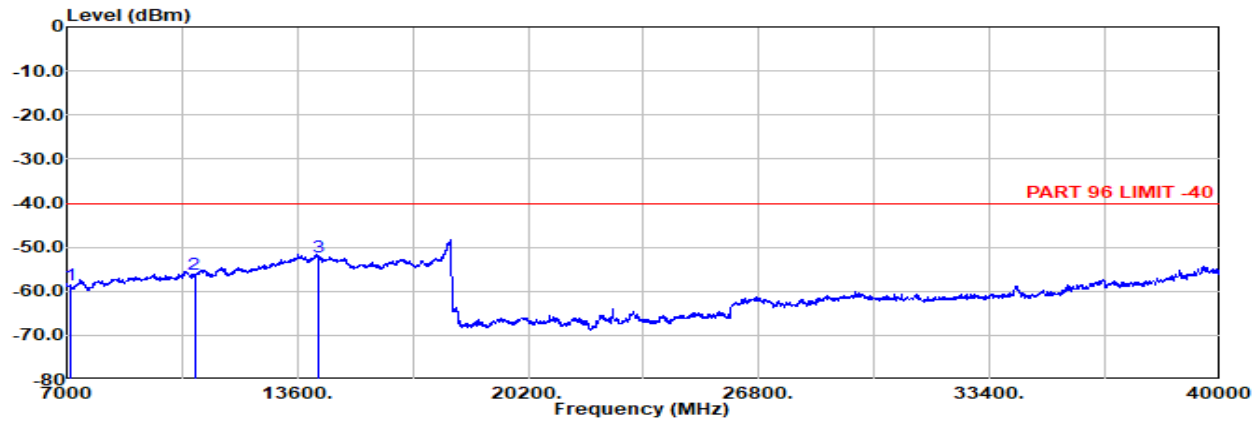


Site : 03CH12-HY

Condition: PART 96 LIMIT -40 3m 9120D-02114-240711 Horizontal

: LTE Band 48 20M Ch55340 1RB0 QPSK

	Freq MHz	Level dBm	Detector	Ant		Filter	EIRPCF	Readin g	Limit	Margin	Pol
				Factor	Amp\Cb 1						
1	7102.00	-59.07	RMS	36.61	-53.00	0.90	-95.23	51.65	-40.00	-19.07	Horizontal
2	10653.00	-56.52	RMS	39.20	-51.32	0.26	-95.23	50.57	-40.00	-16.52	Horizontal
3	14204.00	-52.37	RMS	40.99	-48.22	0.45	-95.23	49.64	-40.00	-12.37	Horizontal



Site : 03CH12-HY

Condition: PART 96 LIMIT -40 3m 9120D-02114-240711 Vertical

: LTE Band 48 20M Ch55340 1RB0 QPSK

	Freq MHz	Level dBm	Detector	Ant		Filter	EIRPCF	Readin g	Limit	Margin	Pol
				Factor	Amp\Cb 1						
1	7102.00	-58.62	RMS	36.61	-53.00	0.90	-95.23	52.10	-40.00	-18.62	Vertical
2	10653.00	-56.23	RMS	39.20	-51.32	0.26	-95.23	50.86	-40.00	-16.23	Vertical
3	14204.00	-52.28	RMS	40.99	-48.22	0.45	-95.23	49.73	-40.00	-12.28	Vertical

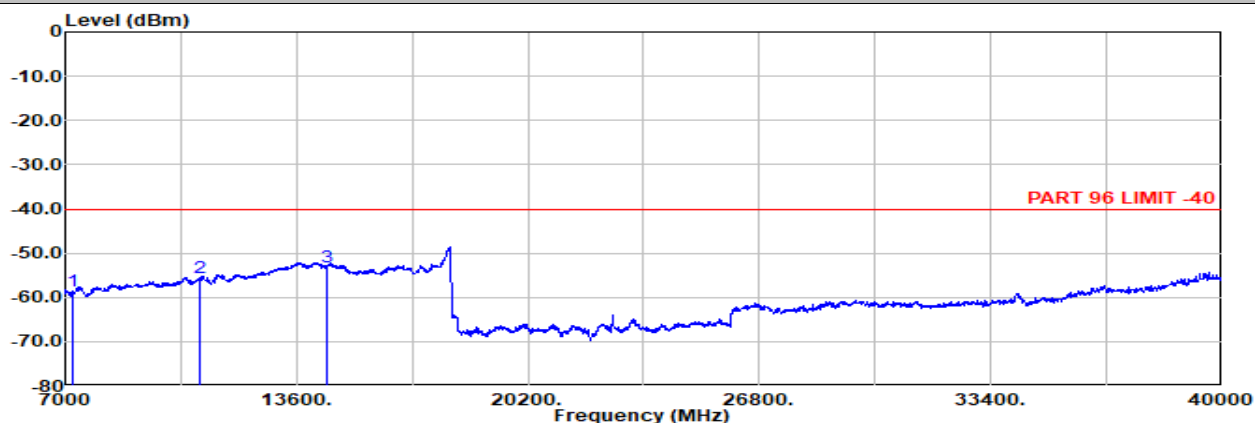


Main Antenna

Part 96 Mode 113

LTE B48 20M Ch55990 1RB0 QPSK

M

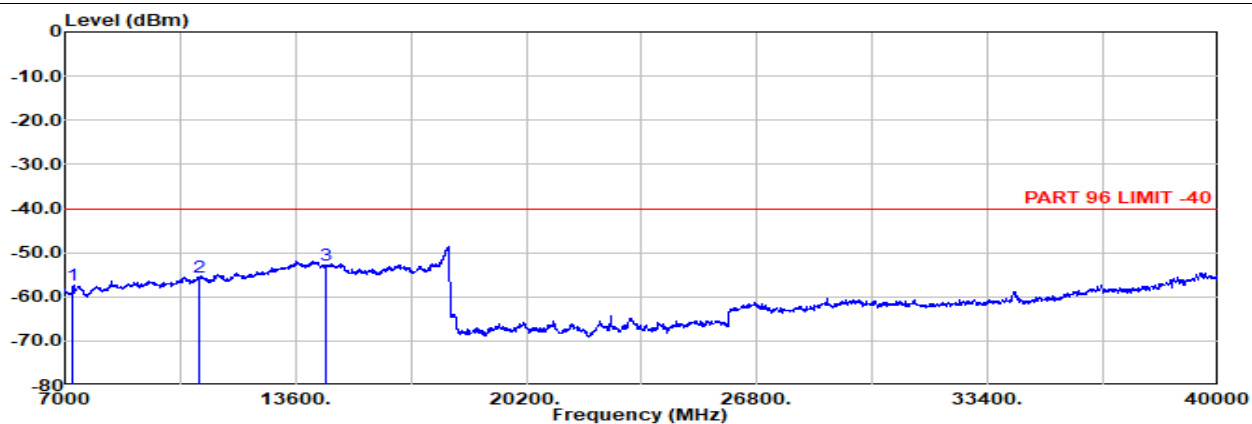


Site : 03CH12-HY

Condition: PART 96 LIMIT -40 3m 9120D-02114-240711 Horizontal

: LTE Band 48 20M Ch55990 1RB0 QPSK

	Freq MHz	Level dBm	Detector	Ant Amp\Cb Filter		EIRPCF	Readin g	Limit	Margin	Pol
				Factor	1					
				dB/m	dB	dB	dBuV	dBm	dB	
1	7232.00	-58.65	RMS	37.13	-52.95	0.88 -95.23	51.52	-40.00	-18.65	Horizontal
2	10848.00	-55.46	RMS	39.20	-51.08	0.27 -95.23	51.38	-40.00	-15.46	Horizontal
3	14464.00	-53.25	RMS	40.63	-47.72	0.44 -95.23	48.63	-40.00	-13.25	Horizontal



Site : 03CH12-HY

Condition: PART 96 LIMIT -40 3m 9120D-02114-240711 Vertical

: LTE Band 48 20M Ch55990 1RB0 QPSK

	Freq MHz	Level dBm	Detector	Ant Amp\Cb Filter		EIRPCF	Readin g	Limit	Margin	Pol
				Factor	1					
				dB/m	dB	dB	dBuV	dBm	dB	
1	7232.00	-57.25	RMS	37.13	-52.95	0.88 -95.23	52.92	-40.00	-17.25	Vertical
2	10848.00	-55.62	RMS	39.20	-51.08	0.27 -95.23	51.22	-40.00	-15.62	Vertical
3	14464.00	-52.72	RMS	40.63	-47.72	0.44 -95.23	49.16	-40.00	-12.72	Vertical

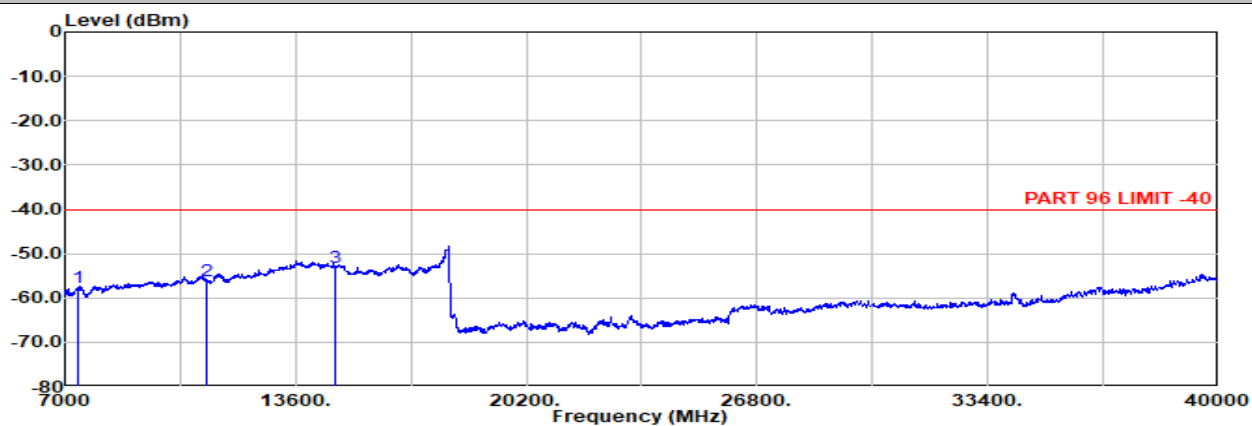


Main Antenna

Part 96 Mode 113

LTE B48 20M Ch56640 1RB0 QPSK

H

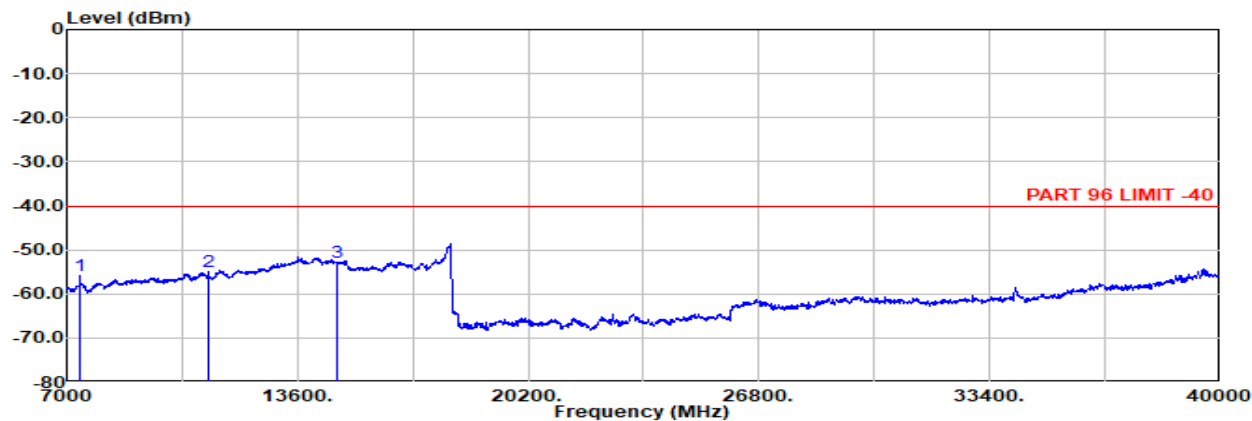


Site : 03CH12-HY

Condition: PART 96 LIMIT -40 3m 9120D-02114-240711 Horizontal

: LTE Band 48 20M Ch56640 1RB0 QPSK

	Freq	Level	Detector	Ant Factor	Amp\Cb	Filter 1	EIRPCF	Readin g	Limit	Margin	Pol
	MHz	dBm			dB/m	dB	dB	dBuV	dBm	dB	
1	7362.00	-57.61	RMS		36.83	-52.78	0.83	-95.23	52.74	-40.00	-17.61 Horizontal
2	11043.00	-56.06	RMS		38.90	-50.80	0.28	-95.23	50.79	-40.00	-16.06 Horizontal
3	14724.00	-53.12	RMS		40.65	-47.77	0.42	-95.23	48.81	-40.00	-13.12 Horizontal



Site : 03CH12-HY

Condition: PART 96 LIMIT -40 3m 9120D-02114-240711 Vertical

: LTE Band 48 20M Ch56640 1RB0 QPSK

	Freq	Level	Detector	Ant Factor	Amp\Cb	Filter 1	EIRPCF	Readin g	Limit	Margin	Pol
	MHz	dBm			dB/m	dB	dB	dBuV	dBm	dB	
1	7362.00	-55.94	RMS		36.83	-52.78	0.83	-95.23	54.41	-40.00	-15.94 Vertical
2	11043.00	-55.00	RMS		38.90	-50.80	0.28	-95.23	51.85	-40.00	-15.00 Vertical
3	14724.00	-52.69	RMS		40.65	-47.77	0.42	-95.23	49.24	-40.00	-12.69 Vertical

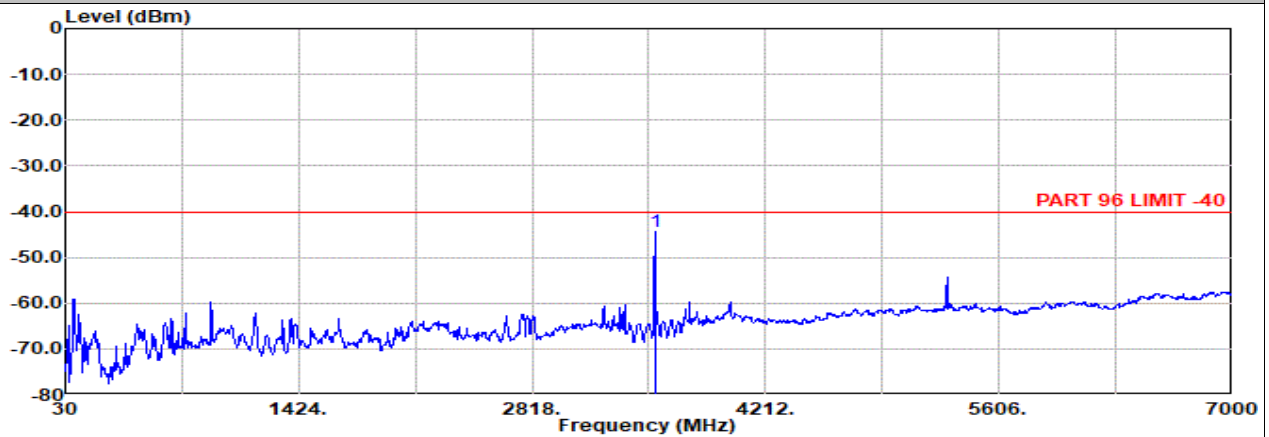


MIMO2 Antenna

Part 96 Mode 88

LTE B48 20M Ch55340 1RB0 QPSK

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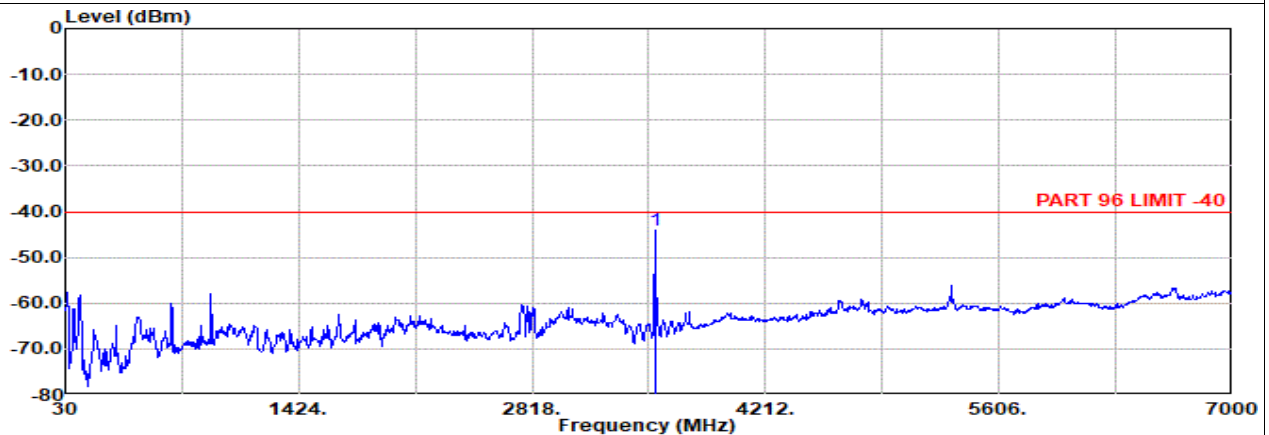
Site : 03CH12-HY

Condition: PART 96 LIMIT -40 3m 9120D-02114-240711 Horizontal

: LTE Band 48 20M Ch55340 1RB0 QPSK

: #1 is fundamental signal which can be ignored.

	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	3551.00	-44.24	RMS	29.60	-57.17	0.54	-95.23	78.02	-40.00	-4.24 Horizontal



Site : 03CH12-HY

Condition: PART 96 LIMIT -40 3m 9120D-02114-240711 Vertical

: LTE Band 48 20M Ch55340 1RB0 QPSK

: #1 is fundamental signal which can be ignored.

	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	3556.00	-43.94	RMS	29.60	-57.16	0.54	-95.23	78.31	-40.00	-3.94 Vertical

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