



FCC PART 15E TEST REPORT No.24T04Z102302-003

for

TCL Communication Ltd.

GSM/UMTS/LTE mobile phone

T509A

FCC ID:2ACCJB228

with

Hardware Version: 05

Software Version: BLC4

Issued Date: 2024-10-31

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of CTTL.

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No.24T04Z102302-003

REPORT HISTORY

Report Number	Revision	Description	Issue Date
24T04Z102302-003	Rev.0	1st edition	2024-10-31

Note: the latest revision of the test report supersedes all previous version.

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1. Test Laboratory

1.1. Introduction & Accreditation

Telecommunication Technology Labs, CAICT is an ISO/IEC 17025:2017 accredited test laboratory under American Association for Laboratory Accreditation (A2LA) with lab code 7049.01, and is also an FCC accredited test laboratory (CN1349), and ISED accredited test laboratory (CAB identifier:CN0066). The detail accreditation scope can be found on A2LA website.

1.2. Testing Location

Conducted testing Location: CTTL(Huayuan North Road)

Address: No. 52, Huayuan North Road, Haidian District, Beijing,
P. R. China100191

Radiated testing Location: CTTL(huayuan North Road)

Address: No. 52, Huayuan North Road, Haidian District, Beijing,
100191, P. R. China

1.3. Testing Environment

Normal Temperature: 15-35°C

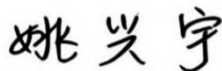
Relative Humidity: 20-75%

1.4. Project date

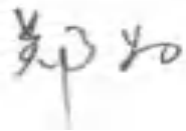
Testing Start Date: 2024-10-15

Testing End Date: 2024-10-31

1.5. Signature



Yao Xingyu
(Prepared this test report)



Zheng Wei
(Reviewed this test report)



Pang Shuai
(Approved this test report)

2. Client Information

2.1. Applicant Information

Company Name: TCL Communication Ltd.
Address/Post: 5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science
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City: Hong Kong
Postal Code: /
Country: China
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2.2. Manufacturer Information

Company Name: TCL Communication Ltd.
Address/Post: 5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science
Park, Shatin, NT, Hong Kong
City: Hong Kong
Postal Code: /
Country: China
Contact Person: Ting Wang
Contact Email: ting.wang.hz@tcl.com
Telephone: +86 752 2639091
Fax: 0086-755-36612000-81722

3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

3.1. About EUT

Description	GSM/UMTS/LTE mobile phone
Model name	T509A
FCC ID	2ACCJB228
WLAN Frequency Band	ISM Bands: -5150MHz~5250MHz -5250MHz~5350MHz -5470MHz~5725MHz
Type of modulation	OFDM
Antenna	Integral Antenna
Nominal Voltage	3.87V
Extreme High Voltage	4.45V
Extreme Low Voltage	3.6V

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version	Date of receipt
UT08a	359735331410231/ 359735331410249	05	BLC4	2024-10-18
UT10a	359735331410314/ 359735331410322	05	BLC4	2024-10-15

*EUT ID: is used to identify the test sample in the lab internally.

UT08a is used for Conduction test, UT10a is used for Radiation test.

3.3. Internal Identification of AE used during the test

AE ID*	Description	Model	Manufacture
AE1	Battery	TLp049B8	HuiZhou GanFeng LiEnergy Battery Technology Co., Ltd.
AE2	Charger1	UT-681A-5200MY	Shenzhen Baijunda Electronic Co.,Ltd.
AE3	USB Cable1	JWUB1686-M01R	Huizhou Juwei Electronics Co.,Ltd
AE4	USB Cable2	FKY-23-367	Qiyang Fukangyuan Electronic Technology Co., Ltd.

*AE ID: is used to identify the test sample in the lab internally.

3.4. General Description

The Equipment under Test (EUT) is a model of GSM/UMTS/LTE mobile phone with integrated antenna and inbuilt battery.

It consists of normal options: travel charger, USB cable.

Manual and specifications of the EUT were provided to fulfil the test.

Samples undergoing test were selected by the client.

3.5. Interpretation of the Test Environment

For the test methods, the test environment uncertainty figures correspond to an expansion factor $k=2$.

Measurement Uncertainty

Parameter	Uncertainty
temperature	0.48°C
humidity	2 %
DC voltages	0.003V

4. Reference Documents

4.1. Documents supplied by applicant

EUT feature information is supplied by the applicant or manufacturer, which is the basis of testing.

4.2. Reference Documents for testing

The following documents listed in this section are referred for testing.

FCC Part15	Title 47 of the Code of Federal Regulations; Chapter I Part 15 - Radio frequency devices	2021
ANSI C63.10	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	2013
UNII: KDB 789033 D02	General U-NII Test Procedures New Rules v02r01	2017-12

5. Laboratory Environment

Conducted RF performance testing is performed in shielding room.

EMC performance testing is performed in Semi-anechoic chamber.

6. Test Results

6.1. Summary of Test Results

SUMMARY OF MEASUREMENT RESULTS	Sub-clause of Part15E	Sub-clause of IC	Verdict
Maximum Output Power	15.407	/	P
Peak Power Spectral Density	15.407	/	P
26dB Emission Bandwidth	15.403	/	P
Radiated Unwanted Emission	15.407, 15.205, 15.209	/	P
AC Powerline Conducted Emission	15.107, 15.207	/	P
99% Occupied bandwidth	/	/	P
Transmit Power Control	15.407	/	NA

Please refer to **ANNEX A** for detail.

Terms used in Verdict column

P	Pass, The EUT complies with the essential requirements in the standard.
NM	Not measured, The test was not measured by CTTL
NA	Not Applicable, The test was not applicable
F	Fail, The EUT does not comply with the essential requirements in the standard

6.2. Statements

CTTL has evaluated the test cases as listed in section 6.1 of this report for the EUT specified in section 3 according to the standards or reference documents listed in section 4.

This report only deals with the WLAN function among the features described in section 3.

6.3. Test Conditions

For this report, all the test cases are tested under normal temperature and normal voltage, and also under norm humidity, the specific condition is shown as follows:

Temperature	26°C
Voltage	3.87V
Humidity	44%

7. Test Facilities Utilized

Conducted test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Period	Calibration Due date
1	Vector Signal Analyzer	FSQ40	200089	Rohde & Schwarz	1 year	2025-08-12
2	Vector Signal Analyzer	FSW67	104051	Rohde & Schwarz	1 year	2025-04-01
3	Test Receiver	ESCI 3	100344	R&S	1 year	2025-04-01
4	LISN	ENV216	101200	R&S	1 year	2025-05-16
5	Attenuator	10dB/2W	/	Rosenberger	/	/
6	Shielding Room	S81	/	ETS-Lindgren	/	/

Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Period	Calibration Due date
1	Test Receiver	ESW44	103023	Rohde & Schwarz	1 year	2025-07-06
2	EMI Antenna	VULB9163	01222	Schwarzbeck	1 year	2025-08-30
3	EMI Antenna	3115	00167250	ETS-Lindgren	1 year	2025-05-11
4	EMI Antenna	3116	2663	ETS-Lindgren	1 year	2025-03-21

8. Measurement Uncertainty

8.1 Transmitter Output Power

Measurement Uncertainty: 0.387dB,k=1.96

8.2 Peak Power Spectral Density

Measurement Uncertainty: 0.705dB,k=1.96

8.3 26dB Emission Bandwidth

Measurement Uncertainty: 60.80Hz,k=1.96

8.4 Band Edges Compliance

Measurement Uncertainty : 0.62dB,k=1.96

8.5 Spurious Emissions

Conducted (k=1.96)

Frequency Range	Uncertainty(dB)
$30\text{MHz} \leq f \leq 2\text{GHz}$	1.22
$2\text{GHz} \leq f \leq 3.6\text{GHz}$	1.22
$3.6\text{GHz} \leq f \leq 8\text{GHz}$	1.22
$8\text{GHz} \leq f \leq 12.75\text{GHz}$	1.51
$12.75\text{GHz} \leq f \leq 26\text{GHz}$	1.51
$26\text{GHz} \leq f \leq 40\text{GHz}$	1.59

8.6 Radiated Unwanted Emission

Frequency Range	Uncertainty(dB) (k=2)
9kHz-30MHz	/
$30\text{MHz} \leq f \leq 1\text{GHz}$	4.72
$1\text{GHz} \leq f \leq 18\text{GHz}$	4.84
$18\text{GHz} \leq f \leq 40\text{GHz}$	5.12

8.7 AC Power-line Conducted Emission

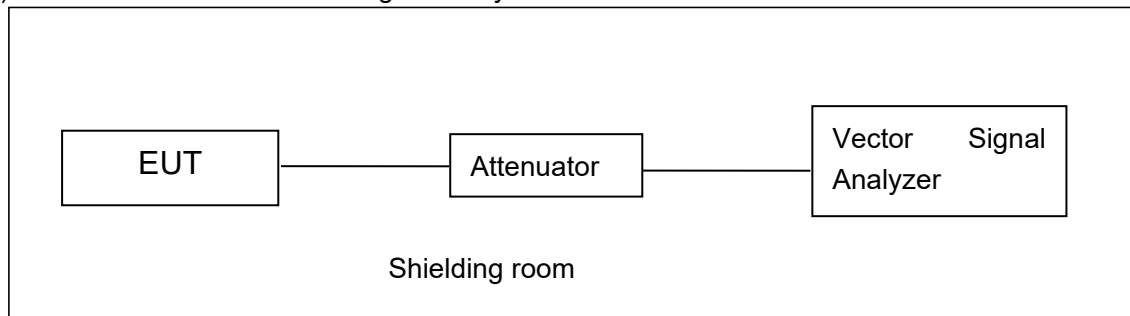
Measurement Uncertainty : 3.08dB,k=2

ANNEX A: Detailed Test Results

A.1. Measurement Method

A.1.1. Conducted Measurements

- 1). Connect the EUT to the test system correctly.
- 2). Set the EUT to the required work mode.
- 3). Set the EUT to the required channel.
- 4). Set the spectrum analyzer to start measurement.
- 5). Record the values. Vector Signal Analyzer



A.1.2. Radiated Emission Measurements

Measurement performed according to Clause 6.4, 6.5, 6.6 in ANSI C63.10-2013 and II.G.4, II.G.5, II.G.6 in KDB 789033.

The radiated emission test is performed in semi-anechoic chamber. The EUT was placed on a non-conductive table with 80cm above the ground plane for measurement below 1GHz and 1.5m above the ground plane for measurement above 1GHz. The measurement antenna was placed at a distance of 3 meters from the EUT. The test is carried out on both vertical and horizontal polarization and only maximization result of both polarizations is kept. During the test, the turntable is rotated from 0° to 360° and the measurement antenna is moved from 1m to 4m to get the maximization result. The maximization process was repeated with the EUT positioned in each of its three orthogonal orientations

A.2. Maximum output Power

Measurement Limit and Method:

Standard	Frequency (MHz)	Limit (dBm)
FCC CRF Part 15.407(a)	5150MHz~5250MHz	24dBm
	5250MHz~5350MHz	24dBm or 11+10logB
	5470MHz~5725MHz	24dBm or 11+10logB

Limit use the less value, and B is the 26dB bandwidth.

The measurement method SA-2 is made according to KDB 789033

A.2.1 Antenna Gain

Antenna gain is 1.5dBi and the value is supplied by the applicant or manufacturer.

A.2.2 Maximum output Power-Conducted

EUT ID: UT08a

Measurement Results:

802.11a mode

Mode	Frequency	Test Result (dBm)							
		Data Rate (Mbps)							
		6	9	12	18	24	36	48	54
802.11a	5180MHz	15.77	/	/	/	/	/	/	/
	5200MHz	15.28	/	/	/	/	/	/	/
	5240MHz	15.59	/	/	/	/	/	/	/
	5260MHz	15.88	/	/	/	/	/	/	/
	5280MHz	15.21	/	/	/	/	/	/	/
	5320MHz	15.53	/	/	/	/	/	/	/
	5500MHz	15.54	/	/	/	/	/	/	/
	5580MHz	15.66	/	/	/	/	/	/	/
	5700MHz	15.14	/	/	/	/	/	/	/
	5720MHz	15.33	/	/	/	/	/	/	/

The data rate 6Mbps is selected as worst condition, and the following cases are performed with this condition.

802.11n-HT20 mode

Mode	Frequency	Test Result (dBm)							
		Data Rate							
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
802.11n (HT20)	5180MHz	15.59	/	/	/	/	/	/	/
	5200MHz	15.61	/	/	/	/	/	/	/
	5240MHz	15.72	/	/	/	/	/	/	/
	5260MHz	15.44	/	/	/	/	/	/	/
	5280MHz	15.21	/	/	/	/	/	/	/
	5320MHz	15.33	/	/	/	/	/	/	/
	5500MHz	15.38	/	/	/	/	/	/	/

	5580MHz	15.17	/	/	/	/	/	/	/
	5700MHz	13.30	/	/	/	/	/	/	/
	5720MHz	15.23	/	/	/	/	/	/	/

The data rate MCS0 is selected as worst condition, and the following cases are performed with this condition.

802.11ac-VHT20 mode

Mode	Frequency	Test Result (dBm)								
		Data Rate								
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8
802.11ac (VHT20)	5180MHz	15.02	/	/	/	/	/	/	/	/
	5200MHz	15.25	/	/	/	/	/	/	/	/
	5240MHz	15.18	/	/	/	/	/	/	/	/
	5260MHz	15.05	/	/	/	/	/	/	/	/
	5280MHz	15.11	/	/	/	/	/	/	/	/
	5320MHz	15.15	/	/	/	/	/	/	/	/
	5500MHz	15.69	/	/	/	/	/	/	/	/
	5580MHz	15.26	/	/	/	/	/	/	/	/
	5700MHz	15.16	/	/	/	/	/	/	/	/
	5720MHz	15.48	/	/	/	/	/	/	/	/

The data rate MCS0 is selected as worst condition, and the following cases are performed with this condition.

802.11n-HT40 mode

Mode	Frequency	Test Result (dBm)							
		Data Rate							
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
802.11n (HT40)	5190MHz	14.69	/	/	/	/	/	/	/
	5230MHz	14.68	/	/	/	/	/	/	/
	5270MHz	15.04	/	/	/	/	/	/	/
	5310MHz	14.84	/	/	/	/	/	/	/
	5510MHz	13.33	/	/	/	/	/	/	/
	5550MHz	15.26	/	/	/	/	/	/	/
	5670MHz	15.03	/	/	/	/	/	/	/
	5710MHz	14.82	/	/	/	/	/	/	/

The data rate MCS0 is selected as worst condition, and the following cases are performed with this condition.

802.11ac-VHT40 mode

Mode	Frequency	Test Result (dBm)									
		Data Rate									
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8	MCS9
802.11ac (VHT40)	5190MHz	14.87	/	/	/	/	/	/	/	/	/
	5230MHz	14.65	/	/	/	/	/	/	/	/	/
	5270MHz	14.99	/	/	/	/	/	/	/	/	/
	5310MHz	15.04	/	/	/	/	/	/	/	/	/
	5510MHz	15.54	/	/	/	/	/	/	/	/	/
	5550MHz	15.37	/	/	/	/	/	/	/	/	/
	5670MHz	15.11	/	/	/	/	/	/	/	/	/
	5710MHz	15.07	/	/	/	/	/	/	/	/	/

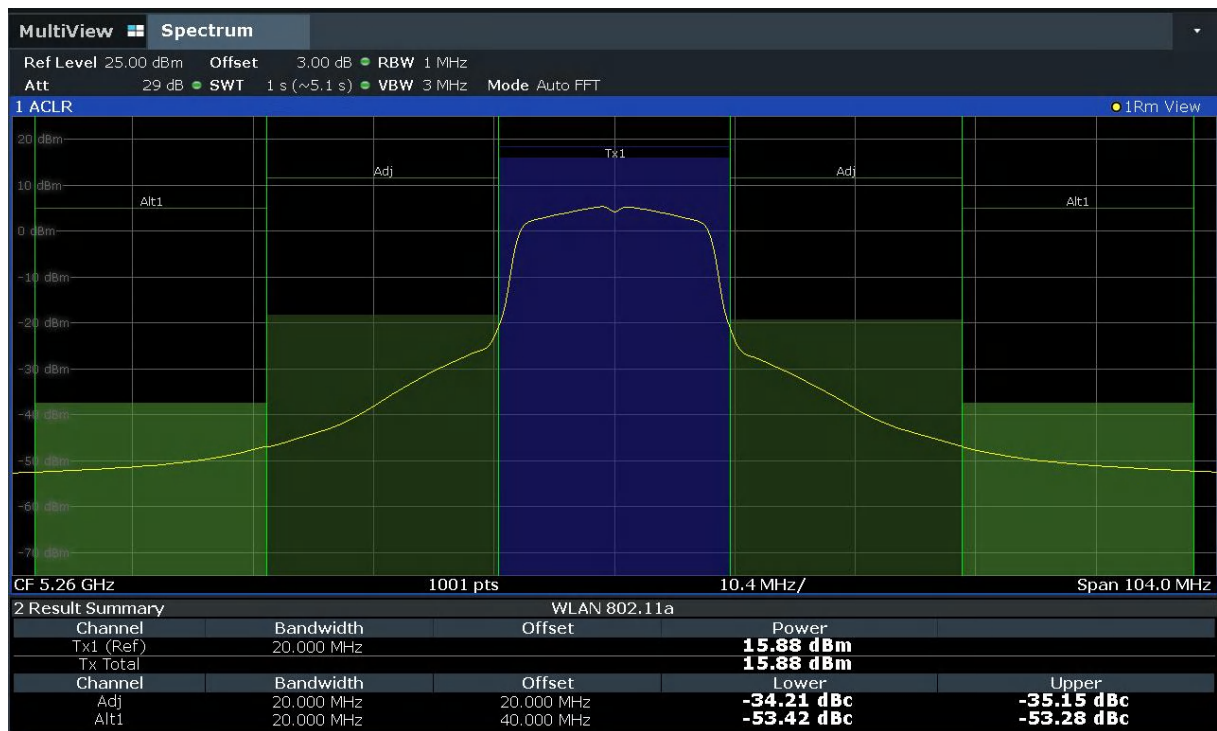
The data rate MCS0 is selected as worst condition, and the following cases are performed with this condition.

802.11ac-VHT80 mode

Mode	Frequency	Test Result (dBm)									
		Data Rate									
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8	MCS9
802.11ac (VHT80)	5210MHz	14.64	/	/	/	/	/	/	/	/	/
	5290MHz	14.62	/	/	/	/	/	/	/	/	/
	5530MHz	13.38	/	/	/	/	/	/	/	/	/
	5610MHz	15.14	/	/	/	/	/	/	/	/	/
	5690MHz	15.08	/	/	/	/	/	/	/	/	/

The data rate MCS0 is selected as worst condition, and the following cases are performed with this condition.

The duty cycle of all mode are 100%



Maximum output Power: 11a CH56

Conclusion: PASS

A.3. Peak Power Spectral Density (conducted)

Measurement Limit:

Standard	Frequency (MHz)	Limit (dBm/MHz)
FCC CRF Part 15.407(a)	5150MHz~5250MHz	11
	5250MHz~5350MHz	11
	5470MHz~5725MHz	11

The output power measurement method Section F is made according to KDB 789033

EUT ID: UT08a

Measurement Results:

TestMode	Frequency[MHz]	Result [dBm/MHz]	Limit[dBm/MHz]	Verdict
11A	5180	5.49	≤11.00	PASS
	5200	5.28	≤11.00	PASS
	5240	5.74	≤11.00	PASS
	5260	5.61	≤11.00	PASS
	5280	5.28	≤11.00	PASS
	5320	5.70	≤11.00	PASS
	5500	5.56	≤11.00	PASS
	5580	5.53	≤11.00	PASS
	5700	5.48	≤11.00	PASS
	5720	5.72	≤11.00	PASS
11N20SISO	5180	4.56	≤11.00	PASS
	5200	4.35	≤11.00	PASS
	5240	4.39	≤11.00	PASS
	5260	4.32	≤11.00	PASS
	5280	4.38	≤11.00	PASS
	5320	4.46	≤11.00	PASS
	5500	4.96	≤11.00	PASS
	5580	4.49	≤11.00	PASS
	5700	2.66	≤11.00	PASS
	5720	4.88	≤11.00	PASS
11AC40SISO	5190	1.42	≤11.00	PASS
	5230	1.76	≤11.00	PASS
	5270	1.52	≤11.00	PASS
	5310	1.41	≤11.00	PASS
	5510	1.65	≤11.00	PASS
	5550	1.74	≤11.00	PASS
	5670	1.80	≤11.00	PASS
	5710	1.61	≤11.00	PASS
11AC80SISO	5210	-1.88	≤11.00	PASS
	5290	-1.19	≤11.00	PASS
	5530	-1.10	≤11.00	PASS

	5610	-3.40	≤ 11.00	PASS
	5690	-1.08	≤ 11.00	PASS



Peak Power Spectral Density:11a CH48

Conclusion: PASS

A.4. 26dB Emission Bandwidth (conducted)

Measurement Limit:

Standard	Limit (kHz)
FCC 47 CFR Part 15.403 (i)	/

The measurement is made according to KDB 789033

Measurement Uncertainty:

Measurement Uncertainty	60.80Hz
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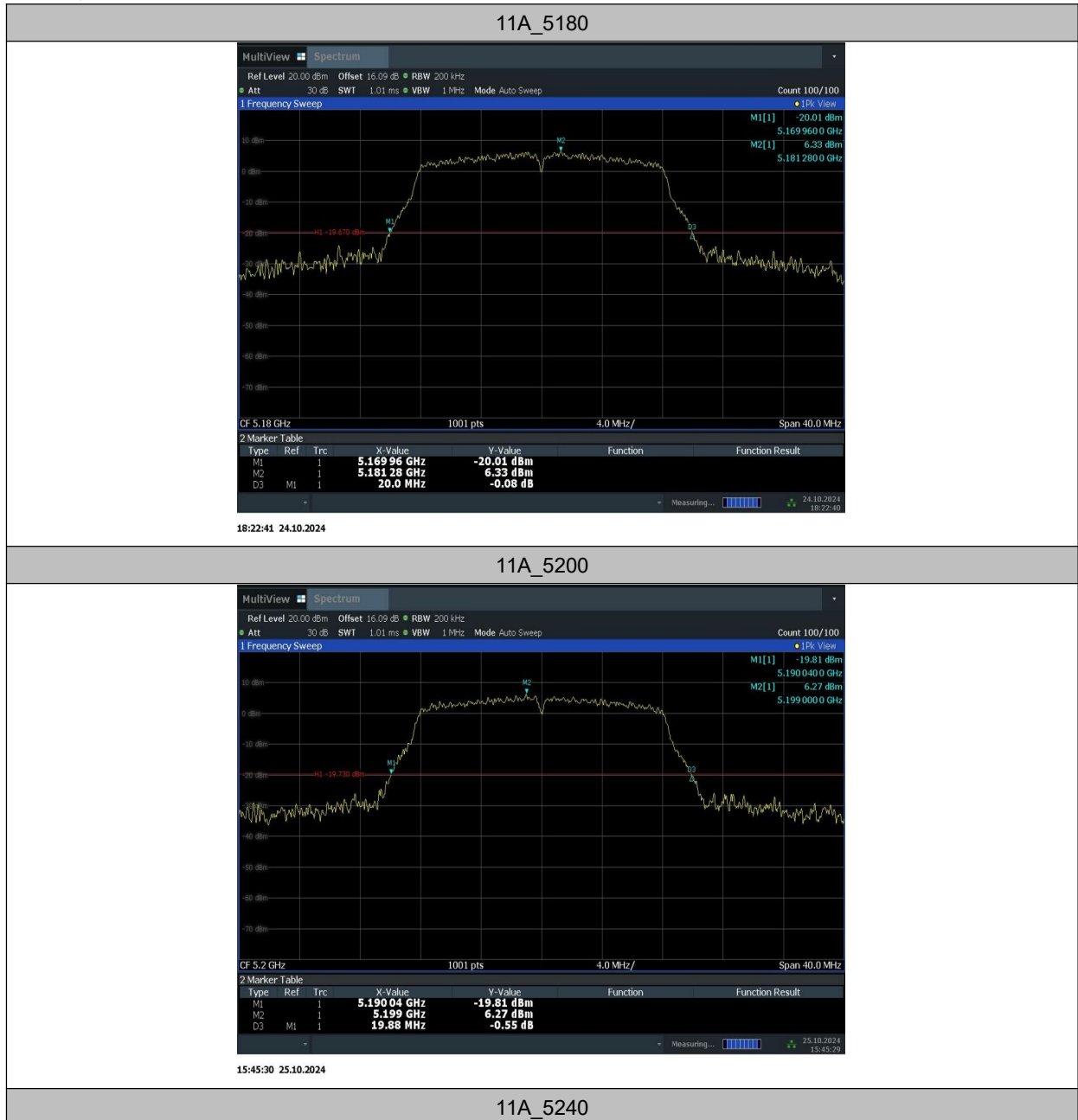
EUT ID: UT08a

Measurement Result:

TestMode	Frequency[MHz]	26db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	5180	20.00	5169.96	5189.96	---	---
	5200	19.88	5190.04	5209.92	---	---
	5240	19.92	5230.04	5249.96	---	---
	5260	20.08	5249.96	5270.04	---	---
	5280	19.88	5270.08	5289.96	---	---
	5320	20.28	5309.88	5330.16	---	---
	5500	20.04	5489.92	5509.96	---	---
	5580	20.08	5569.88	5589.96	---	---
	5700	20.00	5689.92	5709.92	---	---
	5720	20.20	5709.80	5730.00	---	---
11N20SISO	5180	20.36	5169.80	5190.16	---	---
	5200	20.36	5189.76	5210.12	---	---
	5240	20.32	5229.84	5250.16	---	---
	5260	20.44	5249.76	5270.20	---	---
	5280	20.36	5269.92	5290.28	---	---
	5320	20.52	5309.68	5330.20	---	---
	5500	20.40	5489.68	5510.08	---	---
	5580	20.44	5569.76	5590.20	---	---
	5700	20.28	5689.84	5710.12	---	---
	5720	20.36	5709.80	5730.16	---	---
11AC40SISO	5190	40.88	5169.52	5210.40	---	---
	5230	40.64	5209.68	5250.32	---	---
	5270	41.20	5249.52	5290.72	---	---
	5310	41.44	5289.28	5330.72	---	---
	5510	41.04	5489.60	5530.64	---	---
	5550	40.96	5529.52	5570.48	---	---
	5670	41.04	5649.44	5690.48	---	---
	5710	41.12	5689.28	5730.40	---	---
11AC80SISO	5210	81.60	5169.04	5250.64	---	---
	5290	81.44	5249.20	5330.64	---	---

	5530	81.76	5489.04	5570.80	---	---
	5610	81.12	5569.36	5650.48	---	---
	5690	81.76	5649.04	5730.80	---	---

Test graphs as below:





18:24:59 24.10.2024

11A_5260



16:27:55 25.10.2024

11A_5280



16:29:06 25.10.2024

11A_5320



16:29:45 25.10.2024

11A_5500



15:51:54 25.10.2024

11A_5580



16:30:55 25.10.2024

11A_5700



15:54:22 25.10.2024

11A_5720



15:55:32 25.10.2024

11N20SISO_5180



16:43:15 25.10.2024

11N20SISO_5200



16:44:26 25.10.2024

11N20SISO_5240



16:45:49 25.10.2024

11N20SISO_5260



16:46:51 25.10.2024

11N20SISO_5280



16:48:08 25.10.2024

11N20SISO_5320



16:49:18 25.10.2024

11N20SISO_5500



16:50:33 25.10.2024

11N20SISO_5580



16:51:36 25.10.2024

11N20SISO_5700



17:16:02 01.11.2024

11N20SISO_5720



16:54:01 25.10.2024

11AC40SISO_5190



17:14:55 25.10.2024

11AC40SISO_5230



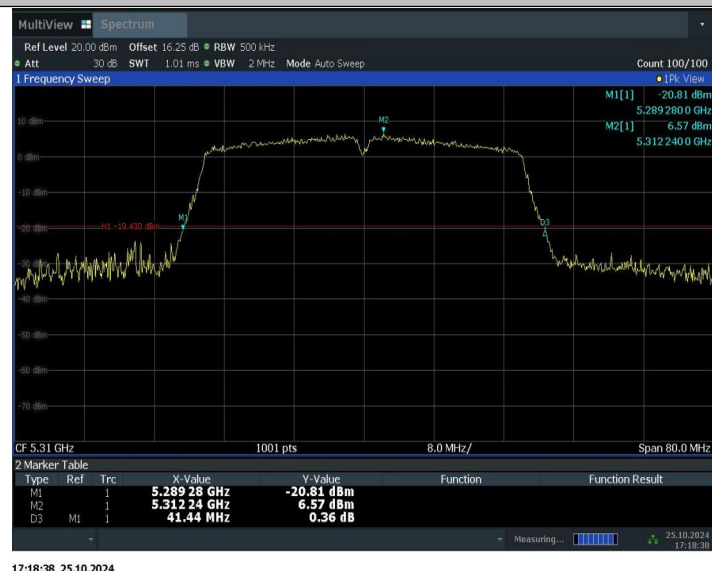
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11AC40SISO_5270



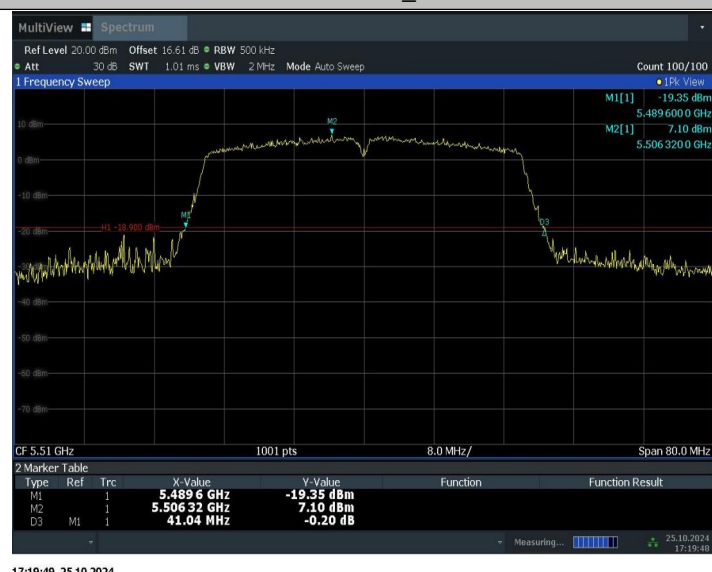
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11AC40SISO_5310



17:18:38 25.10.2024

11AC40SISO_5510



17:19:49 25.10.2024

11AC40SISO_5550



17:21:20 25.10.2024

11AC40SISO_5670



17:23:06 25.10.2024

11AC40SISO_5710



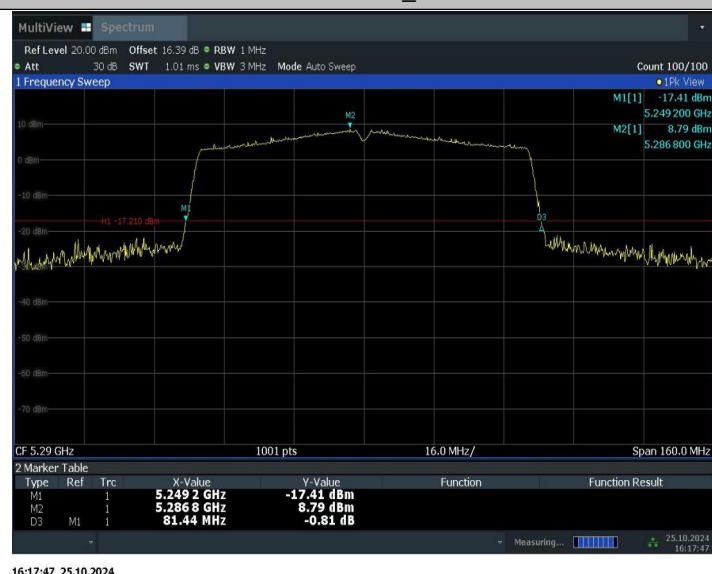
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11AC80SISO_5210



16:15:12 25.10.2024

11AC80SISO_5290



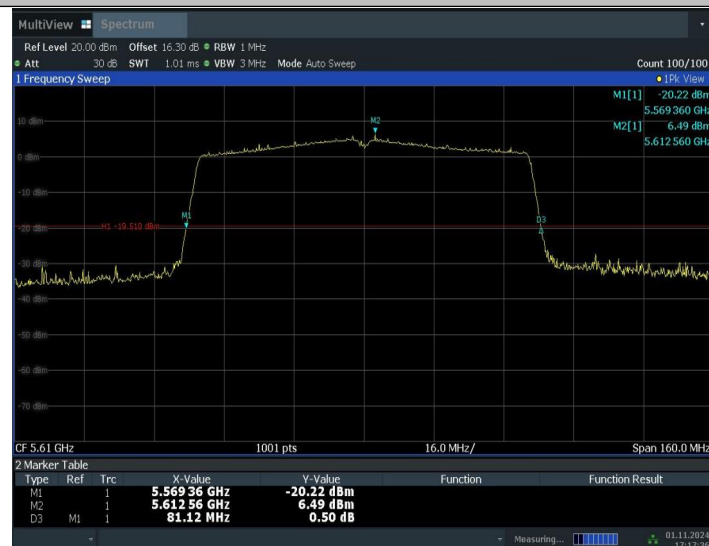
16:17:47 25.10.2024

11AC80SISO_5530



16:36:03 25.10.2024

11AC80SISO_5610



17:17:37 01.11.2024

11AC80SISO_5690



Conclusion: PASS

A.5. Radiated Unwanted Emission

A.5.1 Limits

Unwanted Emissions in the unrestricted bands shall not exceed the limits that shown in 15.407:

Standard	Limit
FCC 47 CFR Part 15.407	(1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz. (2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz. (3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c))

Frequency (MHz)	Field strength(μ V/m)	Measurement distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30

Frequency of emission (MHz)	Field strength (μ V/m)	Field strength (dBuV/m)	Measurement distance (m)
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

Note: When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor (as defined in KDB 789033 II.G.2.d).

A.5.2 Test setup

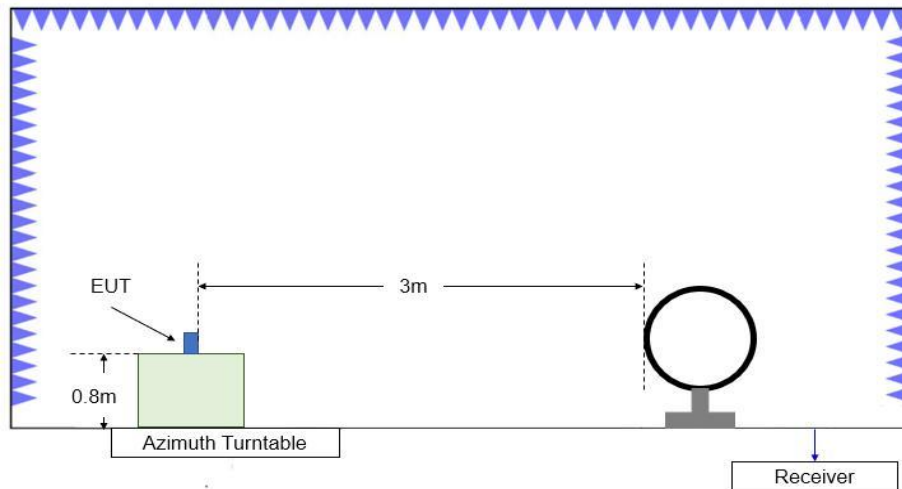


Figure A.5.1. Test Site Diagram (9kHz-30MHz)

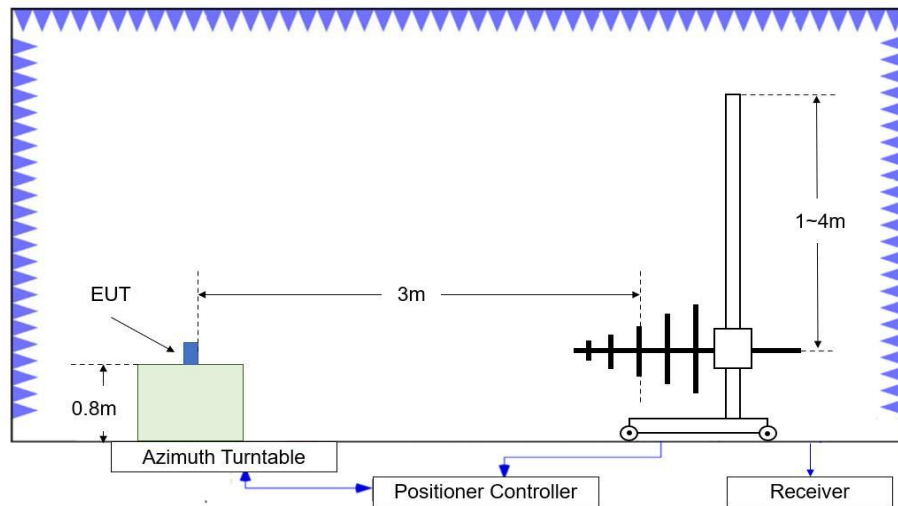


Figure A.5.2. Test Site Diagram (30MHz-1GHz)

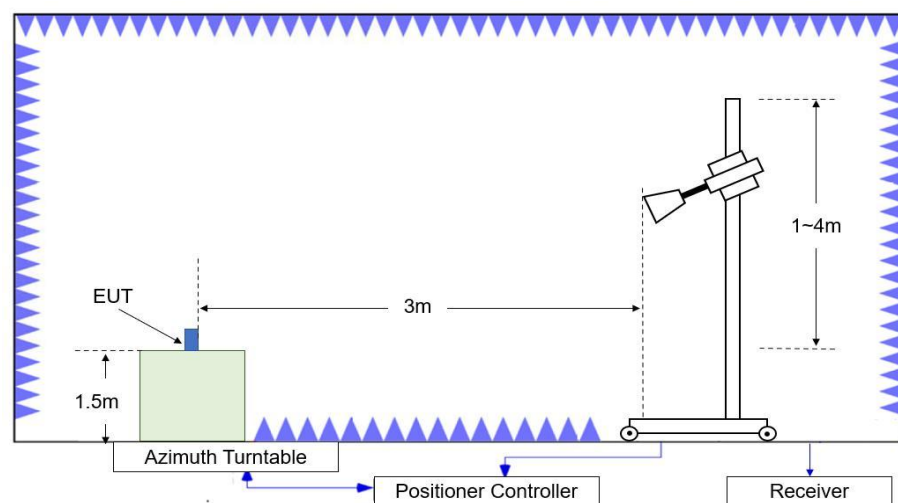


Figure A.5.3. Test Site Diagram (1GHz-40GHz)

A.5.3 Test Procedures

Radiated unwanted emissions from the EUT were measured according to ANSI C63.10 and KDB 789033 D02 v02r01.

Test setting

Frequency of emission (MHz)	RBW/VBW
30-1000	100kHz/300kHz
1000-4000	1MHz/3MHz
4000-18000	1MHz/3MHz
18000-26500	1MHz/3MHz
26500-40000	1MHz/3MHz

A.5.4 Calculation

1. The measurement results reported below is calculated by:

Measurement Results (dB μ V/m) = $P_{\text{measurement}}$ (dB μ V) + Cable Loss(dB) + Antenna Factor (dB/m)

Where: $P_{\text{measurement}}$ is the field strength recorded from the instrument

2. Convert the resultant EIRP level to an equivalent electric field strength using the following relationship:

$$E = \text{EIRP} - 20 \log(D) + 104.77$$

Where:

E is the field strength in dB μ V/m

D is the measurement distance in meters

EIRP is the equivalent isotropically radiated power in dBm

Test note

1. The EUT is operating at its maximum duty cycle and its maximum power control level.
2. Investigation has been done on all modes and modulations/data rates. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.
3. Spurious emissions for all channels were investigated and almost the same below 1GHz. According to FCC 47 CFR §15.31, emission levels are not report much lower than the limit by over 20dB
4. The test is carried out on both vertical and horizontal polarization and only maximization result of both polarizations is kept.
5. EUT in each of three orthogonal axis emissions had been tested out only the worst case (axis data) recorded in the report.
6. Measurement frequencies were performed from 9 kHz to the 10th harmonic of highest fundamental frequency or 40GHz, whichever is lower.
7. No spurious emissions were detected within 20dB of the limit below 30MHz. OFS and semi-chamber comparison testing had been performed and the result came out very similar. (KDB 414788)
8. The low/mid/high channels of all working mode with different bandwidths were all tested, only the worst ones were reported.

Measurement Results:
Average Results:
802.11a
Channel 36

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17921.350	45.45	-26.18	45.95	25.68	54.00	8.55	H
17915.850	45.14	-26.18	45.95	25.37	54.00	8.86	V
8287.550	41.59	-34.28	37.10	38.77	54.00	12.41	V
8288.100	40.22	-34.28	37.10	37.40	54.00	13.78	V
5148.900	46.86	-27.28	34.00	40.14	54.00	7.14	H
5146.580	46.41	-27.29	34.00	39.70	54.00	7.59	H

Channel 64

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17917.500	45.75	-26.18	45.95	25.98	54.00	8.25	H
17907.600	45.18	-26.18	45.95	25.41	54.00	8.82	H
14498.150	38.69	-28.77	41.90	25.56	54.00	15.31	V
13284.850	38.58	-30.02	40.60	28.00	54.00	15.42	H
11847.150	37.26	-31.54	39.15	29.65	54.00	16.74	V
11386.250	36.90	-32.13	39.00	30.03	54.00	17.10	V

Channel 100

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17913.100	45.32	-26.18	45.95	25.55	54.00	8.68	V
17916.400	45.23	-26.18	45.95	25.46	54.00	8.77	V
13343.700	38.92	-30.06	40.65	28.33	54.00	15.08	V
13296.400	38.75	-30.02	40.60	28.17	54.00	15.25	V
5456.515	43.71	-27.10	34.20	36.61	54.00	10.29	H
5456.350	43.68	-27.10	34.20	36.58	54.00	10.32	H

802.11n-HT20

Channel 36

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17919.700	45.09	-26.18	45.95	25.32	54.00	8.91	H
17926.300	45.07	-26.18	45.95	25.30	54.00	8.93	V
8287.550	41.71	-34.28	37.10	38.89	54.00	12.29	V
8288.100	40.82	-34.28	37.10	38.00	54.00	13.18	V
5149.120	45.21	-27.28	34.00	38.49	54.00	8.79	H
5147.900	45.19	-27.29	34.00	38.48	54.00	8.81	H

Channel 64

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17912.550	45.28	-26.18	45.95	25.51	54.00	8.72	V
17908.150	45.12	-26.18	45.95	25.35	54.00	8.88	V
13270.550	38.82	-30.02	40.60	28.24	54.00	15.18	H
13270.000	38.81	-30.02	40.60	28.23	54.00	15.19	H
5350.224	44.86	-27.12	34.20	37.78	54.00	9.14	H
5350.336	44.54	-27.12	34.20	37.46	54.00	9.46	H

Channel 100

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17914.200	45.16	-26.18	45.95	25.39	54.00	8.84	V
17941.150	45.03	-26.18	45.95	25.26	54.00	8.97	V
13270.000	38.74	-30.02	40.60	28.16	54.00	15.26	V
13274.950	38.68	-30.02	40.60	28.10	54.00	15.32	H
5442.490	43.93	-27.13	34.30	36.76	54.00	10.07	H
5451.340	43.68	-27.10	34.20	36.58	54.00	10.32	H

802.11n-HT40

Channel 38

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17920.250	45.39	-26.18	45.95	25.62	54.00	8.61	H
17916.950	44.98	-26.18	45.95	25.21	54.00	9.02	H
8303.500	41.10	-34.28	37.10	38.28	54.00	12.90	V
8304.050	40.43	-34.28	37.10	37.61	54.00	13.57	V
5149.820	48.59	-27.28	34.00	41.87	54.00	5.41	H
5149.400	47.77	-27.28	34.00	41.05	54.00	6.23	H

Channel 62

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17913.650	45.24	-26.18	45.95	25.47	54.00	8.76	V
17901.550	45.19	-26.18	45.95	25.42	54.00	8.81	V
8496.000	39.69	-33.91	37.30	36.30	54.00	14.31	V
13273.300	38.75	-30.02	40.60	28.17	54.00	15.25	V
5350.096	46.56	-27.12	34.20	39.48	54.00	7.44	H
5350.512	45.88	-27.12	34.20	38.80	54.00	8.12	H

Channel 102

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17931.800	44.99	-26.18	45.95	25.22	54.00	9.01	V
17923.000	44.95	-26.18	45.95	25.18	54.00	9.05	H
13284.300	39.11	-30.02	40.60	28.53	54.00	14.89	H
13289.800	38.99	-30.02	40.60	28.41	54.00	15.01	V
5459.965	44.09	-27.10	34.20	36.99	54.00	9.91	H
5454.505	44.03	-27.10	34.20	36.93	54.00	9.97	H

802.11ac-HT20

Channel 36

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17918.600	45.38	-26.18	45.95	25.61	54.00	8.62	V
17925.200	45.31	-26.18	45.95	25.54	54.00	8.69	H
8287.550	40.93	-34.28	37.10	38.11	54.00	13.07	V
8288.100	40.28	-34.28	37.10	37.46	54.00	13.72	V
5150.000	45.12	-27.28	34.00	38.40	54.00	8.88	H
5149.460	45.08	-27.28	34.00	38.36	54.00	8.92	H

Channel 64

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17912.550	45.14	-26.18	45.95	25.37	54.00	8.86	V
17911.450	44.89	-26.18	45.95	25.12	54.00	9.11	V
14496.500	39.11	-28.77	41.90	25.98	54.00	14.89	V
14497.600	39.07	-28.77	41.90	25.94	54.00	14.93	V
5350.192	45.02	-27.12	34.20	37.94	54.00	8.98	H
5351.456	44.68	-27.12	34.20	37.60	54.00	9.32	H

Channel 100

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17916.950	45.22	-26.18	45.95	25.45	54.00	8.78	H
17918.050	45.18	-26.18	45.95	25.41	54.00	8.82	V
14492.650	39.21	-28.77	41.90	26.08	54.00	14.79	H
14495.400	39.04	-28.77	41.90	25.91	54.00	14.96	V
5457.310	44.39	-27.10	34.20	37.29	54.00	9.61	H
5453.815	44.35	-27.10	34.20	37.25	54.00	9.65	H

802.11ac-HT40

Channel 38

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17920.250	45.35	-26.18	45.95	25.58	54.00	8.65	V
17915.300	45.11	-26.18	45.95	25.34	54.00	8.89	V
8304.050	41.01	-34.28	37.10	38.19	54.00	12.99	V
8303.500	40.60	-34.28	37.10	37.78	54.00	13.40	V
5144.020	47.07	-27.29	34.00	40.36	54.00	6.93	H
5143.600	46.81	-27.29	34.00	40.10	54.00	7.19	H

Channel 62

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17928.500	45.29	-26.18	45.95	25.52	54.00	8.71	H
17930.700	45.28	-26.18	45.95	25.51	54.00	8.72	V
8496.000	39.26	-33.91	37.30	35.87	54.00	14.74	V
14497.600	38.88	-28.77	41.90	25.75	54.00	15.12	V
5351.184	48.91	-27.12	34.20	41.83	54.00	5.09	H
5351.984	48.64	-27.12	34.20	41.56	54.00	5.36	H

Channel 102

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17908.700	45.18	-26.18	45.95	25.41	54.00	8.82	H
17922.450	45.02	-26.18	45.95	25.25	54.00	8.98	H
14480.550	38.91	-28.77	41.90	25.78	54.00	15.09	H
14484.400	38.90	-28.77	41.90	25.77	54.00	15.10	H
5459.050	45.50	-27.10	34.20	38.40	54.00	8.50	H
5458.930	45.45	-27.10	34.20	38.35	54.00	8.55	H

802.11ac-HT80

Channel 42

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17903.200	45.39	-26.18	45.95	25.62	54.00	8.61	V
17916.400	45.16	-26.18	45.95	25.39	54.00	8.84	H
8335.950	41.59	-34.27	37.20	38.66	54.00	12.41	V
8335.400	40.71	-34.27	37.20	37.78	54.00	13.29	V
5149.920	47.38	-27.28	34.00	40.66	54.00	6.62	H
5149.820	47.03	-27.28	34.00	40.31	54.00	6.97	H

Channel 58

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17938.950	45.51	-26.18	45.95	25.74	54.00	8.49	V
17905.950	45.29	-26.18	45.95	25.52	54.00	8.71	V
8464.100	39.09	-33.99	37.40	35.68	54.00	14.91	V
14495.950	38.94	-28.77	41.90	25.81	54.00	15.06	H
5350.608	49.86	-27.12	34.20	42.78	54.00	4.14	H
5354.368	49.21	-27.12	34.20	42.13	54.00	4.79	H

Channel 106

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17921.900	45.25	-26.18	45.95	25.48	54.00	8.75	H
17920.800	45.15	-26.18	45.95	25.38	54.00	8.85	H
14487.150	39.04	-28.77	41.90	25.91	54.00	14.96	V
13273.850	38.93	-30.02	40.60	28.35	54.00	15.07	V
5458.720	47.15	-27.10	34.20	40.05	54.00	6.85	H
5458.795	47.10	-27.10	34.20	40.00	54.00	6.90	H

Channel 122

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17922.450	45.09	-26.18	45.95	25.32	54.00	8.91	V
17930.150	45.08	-26.18	45.95	25.31	54.00	8.92	V
14483.850	38.89	-28.77	41.90	25.76	54.00	15.11	V
14494.850	38.84	-28.77	41.90	25.71	54.00	15.16	V
11210.250	36.82	-32.14	38.60	30.36	54.00	17.18	V
11226.750	36.73	-32.14	38.60	30.27	54.00	17.27	V

PEAK Results:
802.11a

Channel 36

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17931.250	56.26	-26.18	45.95	36.49	74.00	17.74	H
17938.950	55.95	-26.18	45.95	36.18	74.00	18.05	H
13692.950	51.62	-29.51	41.00	40.13	68.20	16.58	H
13744.100	51.48	-29.40	41.10	39.78	68.20	16.72	V
5149.280	66.96	-27.28	34.00	60.24	74.00	7.04	H
5148.220	66.93	-27.29	34.00	60.22	74.00	7.07	H

Channel 64

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17911.450	55.91	-26.18	45.95	36.14	74.00	18.09	H
17967.000	55.76	-26.18	45.95	35.99	74.00	18.24	V
14198.950	51.59	-28.90	41.70	38.79	68.20	16.61	V
14153.300	51.56	-28.86	41.70	38.72	68.20	16.64	H
11400.550	49.10	-32.13	39.00	42.23	74.00	24.90	V
11739.900	48.18	-31.80	39.20	40.78	74.00	25.82	V

Channel 100

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17910.350	56.06	-26.18	45.95	36.29	74.00	17.94	V
17912.550	56.03	-26.18	45.95	36.26	74.00	17.97	H
13597.800	51.47	-29.86	40.80	40.53	68.20	16.73	H
14114.250	51.44	-28.86	41.70	38.60	68.20	16.76	V
5455.195	56.08	-27.10	34.20	48.98	74.00	17.92	H
5468.170	62.19	-27.10	34.20	55.09	68.20	6.01	H

802.11n-HT20

Channel 36

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17920.250	57.18	-26.18	45.95	37.41	74.00	16.82	V
17907.600	56.29	-26.18	45.95	36.52	74.00	17.71	H
13612.100	51.60	-29.86	40.80	40.66	68.20	16.60	V
14193.450	51.58	-28.90	41.70	38.78	68.20	16.62	V
5145.620	64.55	-27.29	34.00	57.84	74.00	9.45	H
5146.160	64.46	-27.29	34.00	57.75	74.00	9.54	H

Channel 64

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17919.700	56.16	-26.18	45.95	36.39	74.00	17.84	V
17921.350	56.13	-26.18	45.95	36.36	74.00	17.87	H
14114.250	52.38	-28.86	41.70	39.54	68.20	15.82	V
14126.350	51.53	-28.86	41.70	38.69	68.20	16.67	H
5355.296	60.22	-27.12	34.20	53.14	74.00	13.78	H
5350.768	59.99	-27.12	34.20	52.91	74.00	14.01	H

Channel 100

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17842.700	56.33	-26.18	45.95	36.56	74.00	17.67	V
17939.500	55.98	-26.18	45.95	36.21	74.00	18.02	V
14539.400	51.81	-28.77	41.90	38.68	68.20	16.39	V
14156.050	51.38	-28.86	41.70	38.54	68.20	16.82	H
5458.930	57.55	-27.10	34.20	50.45	74.00	16.45	H
5467.960	64.52	-27.10	34.20	57.42	68.20	3.68	H

802.11n-HT40

Channel 38

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17911.450	56.04	-26.18	45.95	36.27	74.00	17.96	H
17926.300	55.89	-26.18	45.95	36.12	74.00	18.11	H
13708.350	51.89	-29.51	41.00	40.40	68.20	16.31	H
14152.750	51.32	-28.86	41.70	38.48	68.20	16.88	H
5149.760	70.32	-27.28	34.00	63.60	74.00	3.68	H
5149.820	70.03	-27.28	34.00	63.31	74.00	3.97	H

Channel 62

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17924.650	55.91	-26.18	45.95	36.14	74.00	18.09	H
17936.200	55.80	-26.18	45.95	36.03	74.00	18.20	H
13606.050	51.71	-29.86	40.80	40.77	68.20	16.49	V
13797.450	51.70	-29.37	41.20	39.87	68.20	16.50	V
5351.952	66.69	-27.12	34.20	59.61	74.00	7.31	H
5350.208	65.66	-27.12	34.20	58.58	74.00	8.34	H

Channel 102

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17907.600	56.28	-26.18	45.95	36.51	74.00	17.72	V
17930.150	56.22	-26.18	45.95	36.45	74.00	17.78	V
13724.300	51.63	-29.40	41.10	39.93	68.20	16.57	V
13692.950	51.53	-29.51	41.00	40.04	68.20	16.67	H
5457.205	57.98	-27.10	34.20	50.88	74.00	16.02	H
5469.730	65.46	-27.10	34.20	58.36	68.20	2.74	H

802.11ac-HT20

Channel 36

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17951.050	56.17	-26.18	45.95	36.40	74.00	17.83	V
17929.600	55.93	-26.18	45.95	36.16	74.00	18.07	V
13733.650	52.12	-29.40	41.10	40.42	68.20	16.08	V
13725.400	51.81	-29.40	41.10	40.11	68.20	16.39	H
5149.460	65.03	-27.28	34.00	58.31	74.00	8.97	H
5149.140	63.86	-27.28	34.00	57.14	74.00	10.14	H

Channel 64

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17918.600	56.00	-26.18	45.95	36.23	74.00	18.00	V
17822.900	55.86	-26.18	45.95	36.09	74.00	18.14	H
13756.200	51.49	-29.40	41.10	39.79	68.20	16.71	V
14088.400	51.49	-28.90	41.70	38.69	68.20	16.71	V
5350.416	59.53	-27.12	34.20	52.45	74.00	14.47	H
5350.240	59.51	-27.12	34.20	52.43	74.00	14.49	H

Channel 100

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17914.750	57.14	-26.18	45.95	37.37	74.00	16.86	V
17950.500	56.95	-26.18	45.95	37.18	74.00	17.05	V
14146.150	51.62	-28.86	41.70	38.78	68.20	16.58	H
14115.350	51.53	-28.86	41.70	38.69	68.20	16.67	V
5459.380	57.77	-27.10	34.20	50.67	74.00	16.23	H
5467.015	61.87	-27.10	34.20	54.77	68.20	6.33	H

802.11ac-HT40

Channel 38

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17897.700	56.09	-26.18	45.95	36.32	74.00	17.91	V
17914.750	55.88	-26.18	45.95	36.11	74.00	18.12	V
14190.700	51.74	-28.90	41.70	38.94	68.20	16.46	V
14179.700	51.62	-28.90	41.70	38.82	68.20	16.58	H
5147.400	65.78	-27.29	34.00	59.07	74.00	8.22	H
5139.900	64.60	-27.29	34.00	57.89	74.00	9.40	H

Channel 62

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17944.450	56.18	-26.18	45.95	36.41	74.00	17.82	V
17948.850	55.91	-26.18	45.95	36.14	74.00	18.09	H
14091.150	51.44	-28.90	41.70	38.64	68.20	16.76	V
14218.750	51.38	-28.94	41.75	38.57	68.20	16.82	H
5351.280	66.87	-27.12	34.20	59.79	74.00	7.13	H
5350.592	65.80	-27.12	34.20	58.72	74.00	8.20	H

Channel 102

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17912.000	56.82	-26.18	45.95	37.05	74.00	17.18	H
17928.500	56.12	-26.18	45.95	36.35	74.00	17.88	V
14173.100	51.91	-28.90	41.70	39.11	68.20	16.29	V
14130.750	51.55	-28.86	41.70	38.71	68.20	16.65	V
5459.575	60.85	-27.10	34.20	53.75	74.00	13.15	H
5469.760	65.92	-27.10	34.20	58.82	68.20	2.28	H

802.11ac-HT80

Channel 42

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17924.100	57.10	-26.18	45.95	37.33	74.00	16.90	H
17923.550	55.57	-26.18	45.95	35.80	74.00	18.43	H
13851.900	51.75	-29.34	41.25	39.84	68.20	16.45	V
13728.700	51.69	-29.40	41.10	39.99	68.20	16.51	H
5140.700	65.67	-27.29	34.00	58.96	74.00	8.33	H
5149.720	65.27	-27.28	34.00	58.55	74.00	8.73	H

Channel 58

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17904.300	55.93	-26.18	45.95	36.16	74.00	18.07	V
17943.350	55.90	-26.18	45.95	36.13	74.00	18.10	V
13702.850	51.40	-29.51	41.00	39.91	68.20	16.80	V
14121.400	51.39	-28.86	41.70	38.55	68.20	16.81	V
5350.752	68.00	-27.12	34.20	60.92	74.00	6.00	H
5354.752	67.70	-27.12	34.20	60.62	74.00	6.30	H

Channel 106

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17910.900	55.83	-26.18	45.95	36.06	74.00	18.17	V
17902.650	55.80	-26.18	45.95	36.03	74.00	18.20	V
14127.450	51.89	-28.86	41.70	39.05	68.20	16.31	V
14084.550	51.57	-28.90	41.70	38.77	68.20	16.63	V
5458.795	63.05	-27.10	34.20	55.95	74.00	10.95	H
5465.845	62.32	-27.10	34.20	55.22	68.20	5.88	H

Channel 122

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17901.550	56.38	-26.18	45.95	36.61	74.00	17.62	H
17938.400	55.62	-26.18	45.95	35.85	74.00	18.38	H
14107.100	52.19	-28.90	41.70	39.39	68.20	16.01	H
14162.100	51.52	-28.90	41.70	38.72	68.20	16.68	H
5727.403	57.18	-26.99	34.10	50.07	68.20	11.02	H
5740.930	56.47	-26.99	34.10	49.36	68.20	11.73	H

Conclusion: PASS

Band edge compliance

Mode	Channel	Test Results	Conclusion
802.11a	5180 MHz	Fig.1	P
	5320 MHz	Fig.2	P
	5500 MHz	Fig.3	P
	5700 MHz	Fig.4	P
802.11n HT20	5180 MHz	Fig.5	P
	5320 MHz	Fig.6	P
	5500 MHz	Fig.7	P
	5700 MHz	Fig.8	P
802.11n HT40	5190 MHz	Fig.9	P
	5310 MHz	Fig.10	P
	5510 MHz	Fig.11	P
	5670 MHz	Fig.12	P
802.11ac HT20	5180 MHz	Fig.13	P
	5320 MHz	Fig.14	P

	5500 MHz	Fig.15	P
	5700 MHz	Fig.16	P
802.11ac HT40	5190 MHz	Fig.17	P
	5310 MHz	Fig.18	P
	5510 MHz	Fig.19	P
	5670 MHz	Fig.20	P
802.11ac HT80	5210MHz	Fig.21	P
	5290MHz	Fig.22	P
	5530MHz	Fig.23	P
	5610MHz	Fig.24	P

Conclusion: PASS

Test graphs as below:

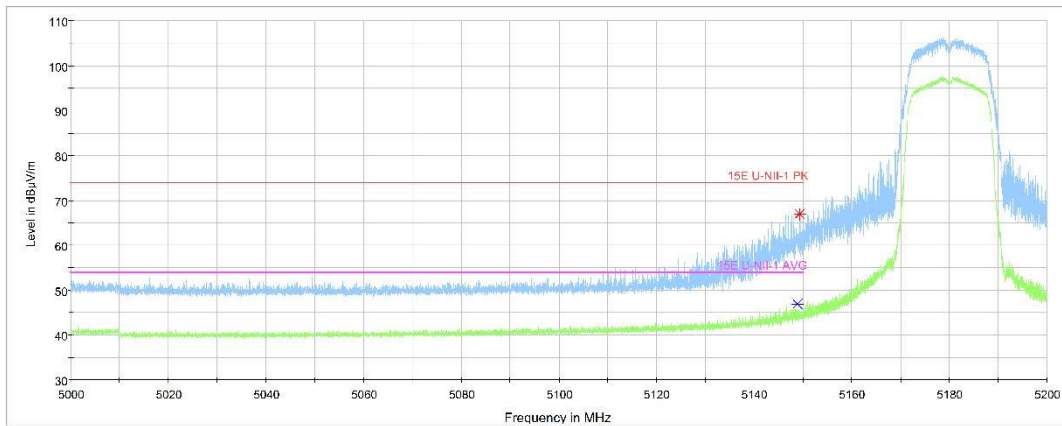


Fig. 1 Band Edges (802.11a Ch36, 5180MHz)

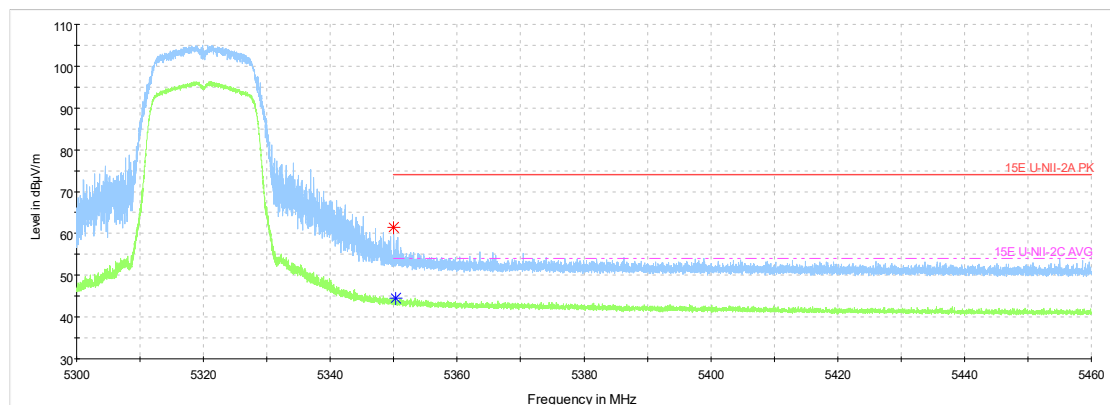


Fig. 2 Band Edges (802.11a Ch64, 5320MHz)

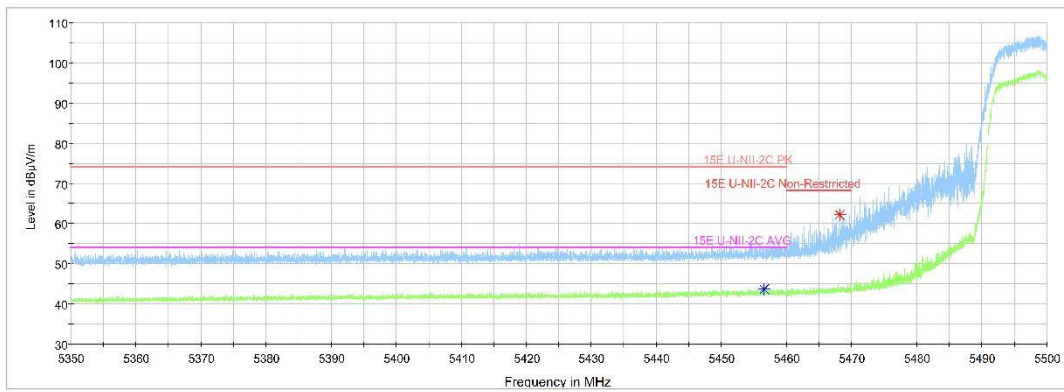


Fig. 3 Band Edges (802.11a Ch100, 5500MHz)

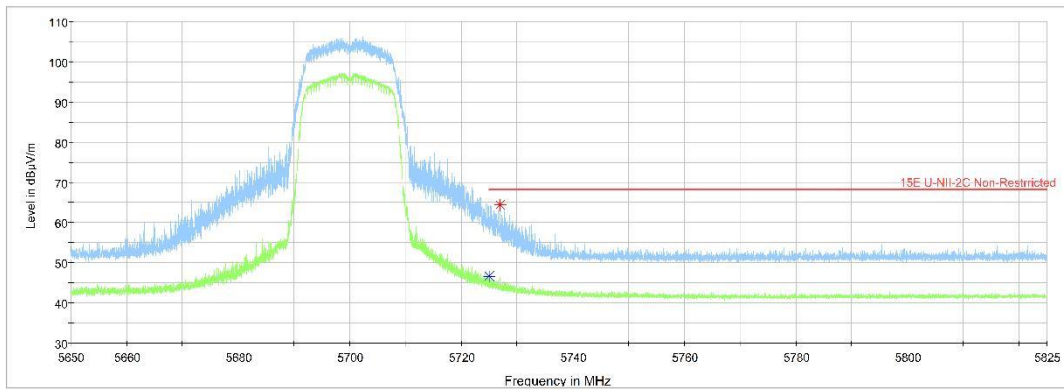


Fig. 4 Band Edges (802.11a Ch140, 5700MHz)

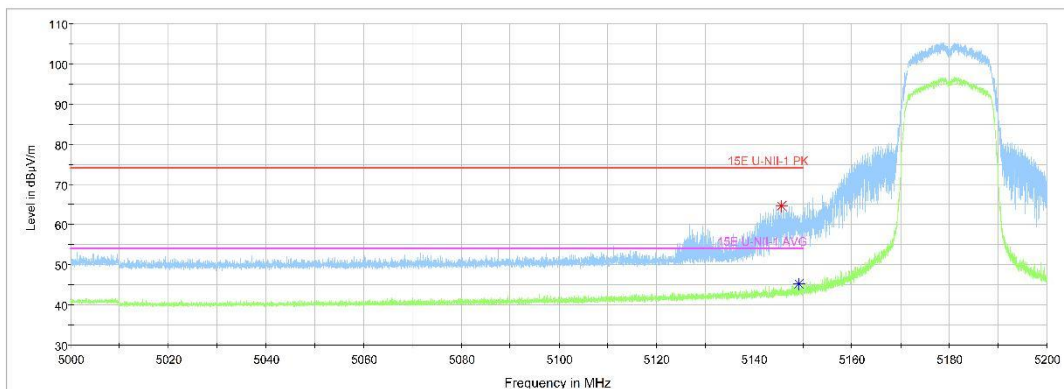


Fig. 5 Band Edges (802.11n-HT20 Ch36, 5180MHz)

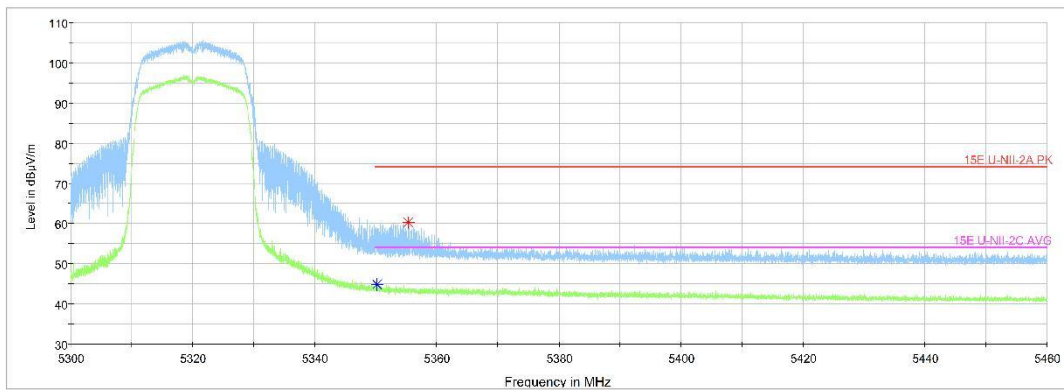


Fig. 6 Band Edges (802.11n-HT20 Ch64, 5320MHz)

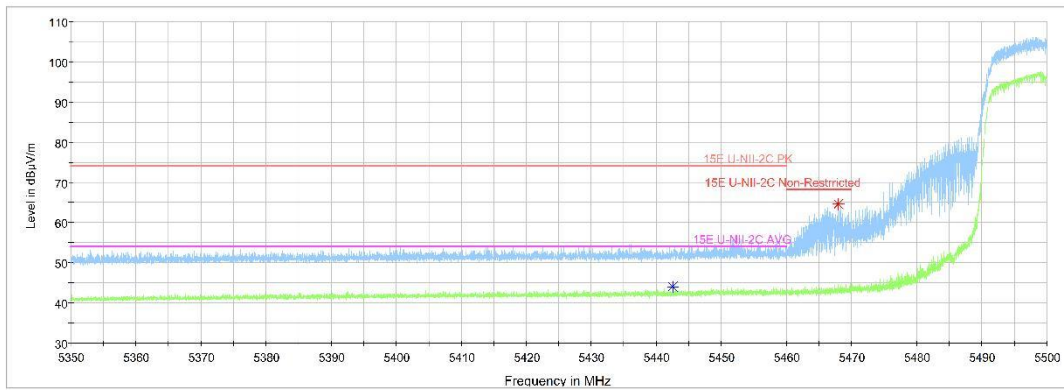


Fig. 7 Band Edges (802.11n-HT20 Ch100, 5500MHz)

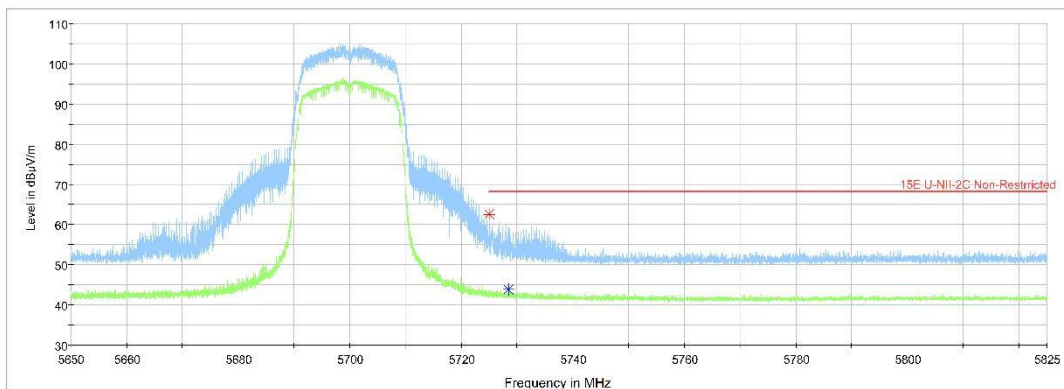


Fig. 8 Band Edges (802.11n-HT20 Ch140, 5700MHz)

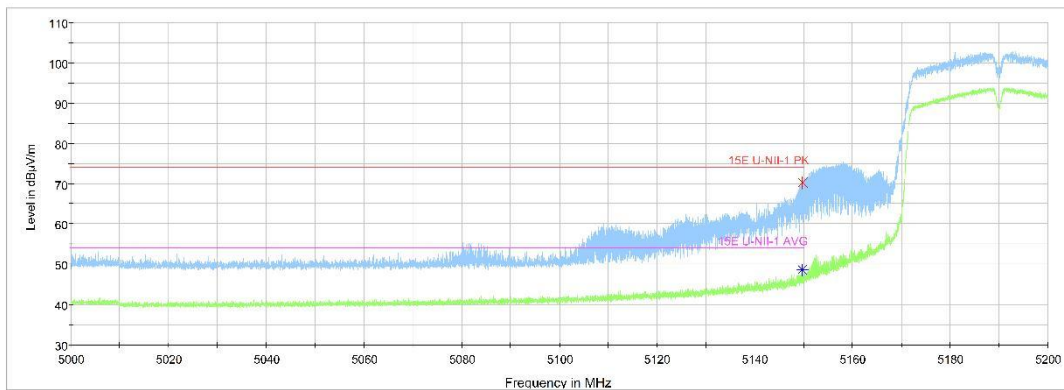


Fig. 9 Band Edges (802.11n-HT40 Ch38, 5190MHz)

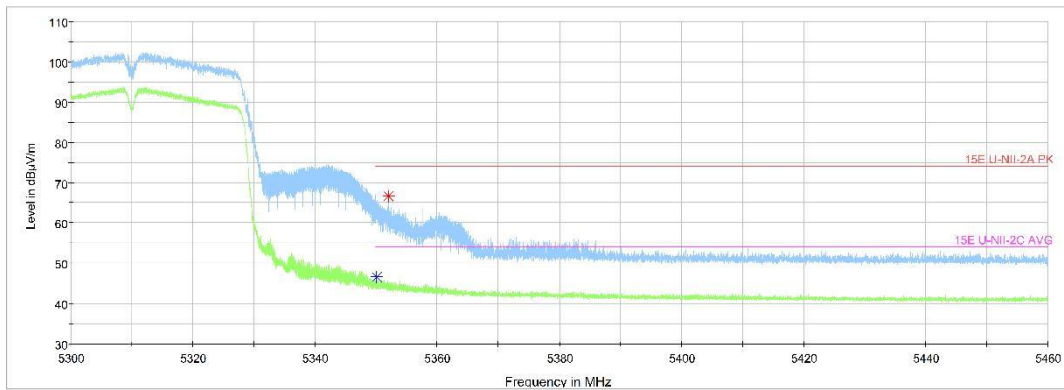


Fig. 10 Band Edges (802.11n-HT40 Ch62, 5310MHz)

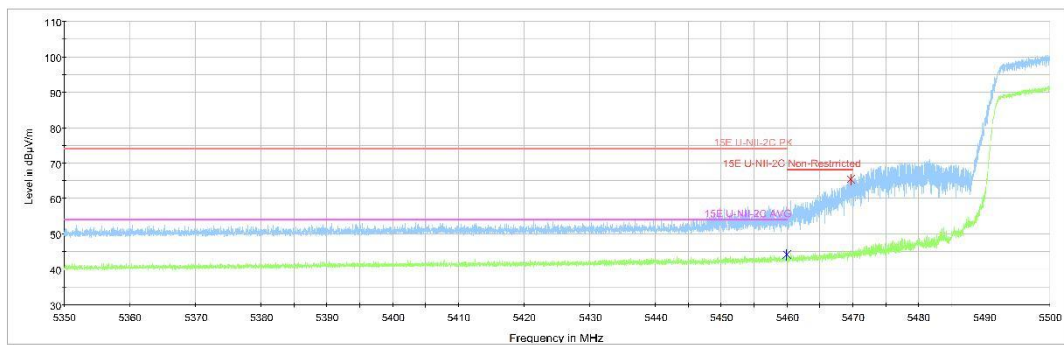


Fig. 11 Band Edges (802.11n-HT40 Ch102, 5510MHz)

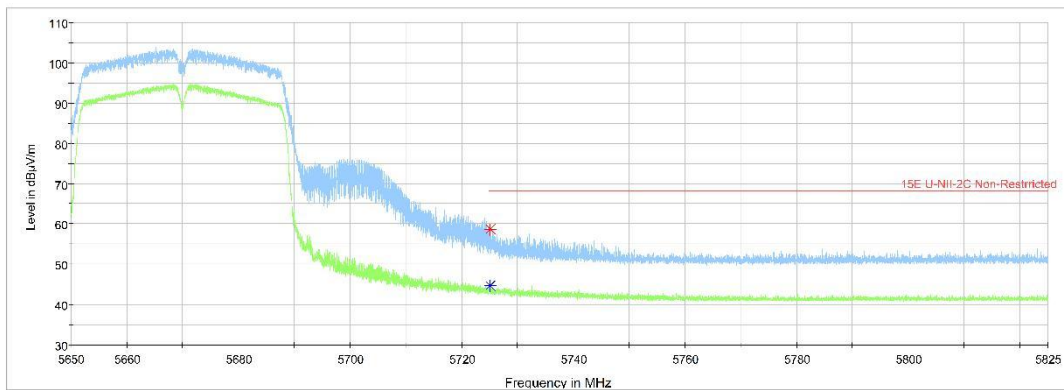


Fig. 12 Band Edges (802.11n-HT40 Ch134, 5670MHz)

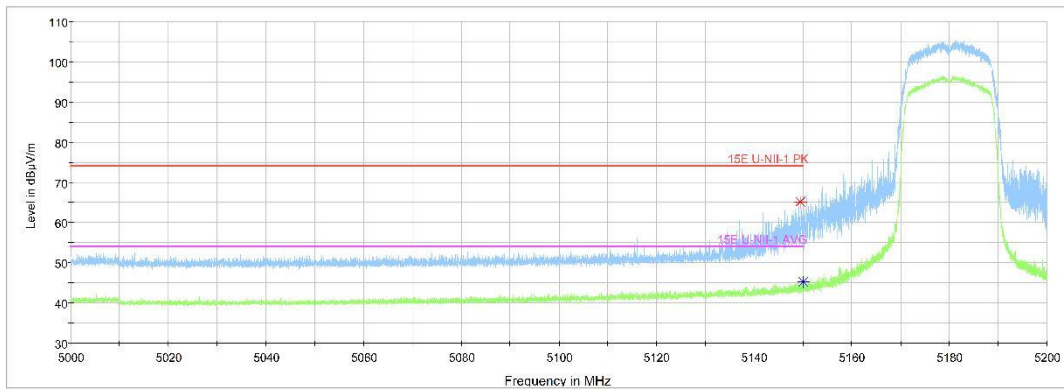


Fig. 13 Band Edges (802.11ac-HT20 Ch36, 5180MHz)

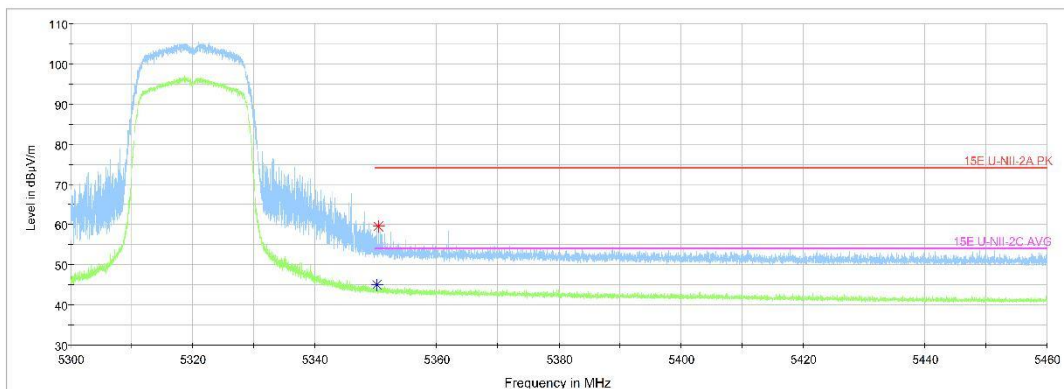


Fig. 14 Band Edges (802.11ac-HT20 Ch64, 5320MHz)

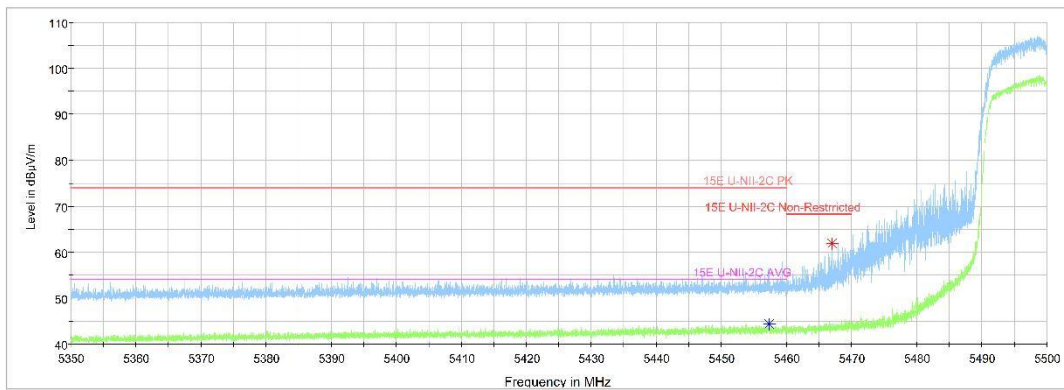


Fig. 15 Band Edges (802.11ac-HT20 Ch100, 5500MHz)

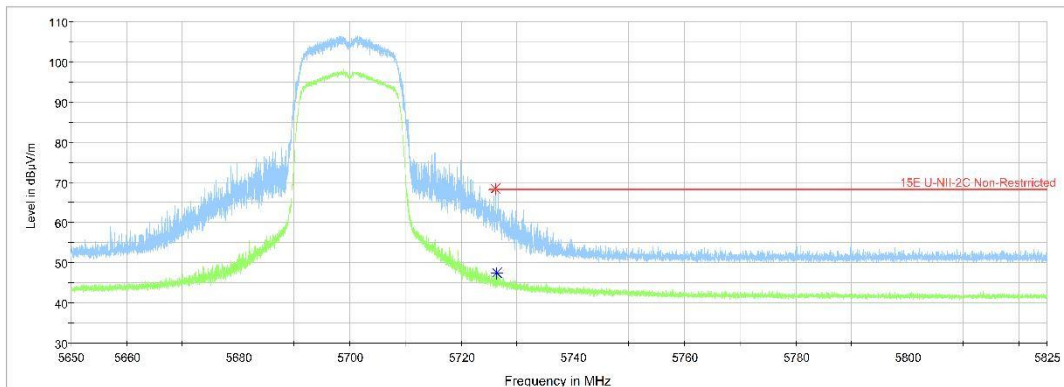


Fig. 16 Band Edges (802.11ac-HT20 Ch140, 5700MHz)

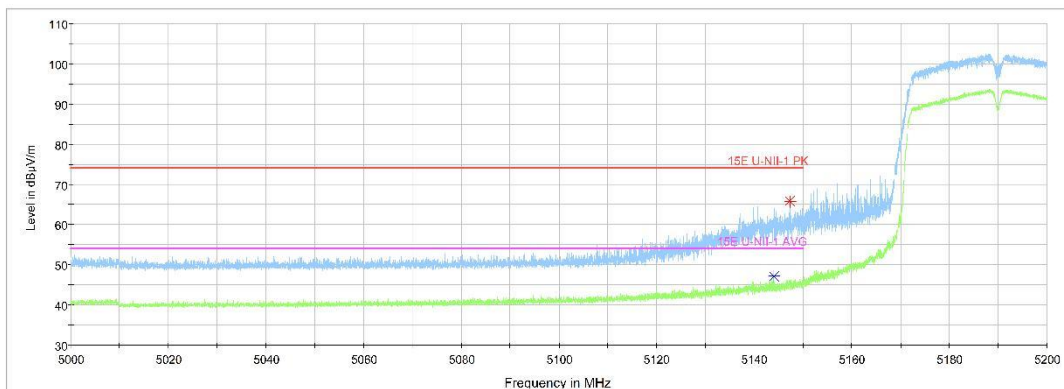


Fig. 17 Band Edges (802.11ac-HT40 Ch38, 5190MHz)

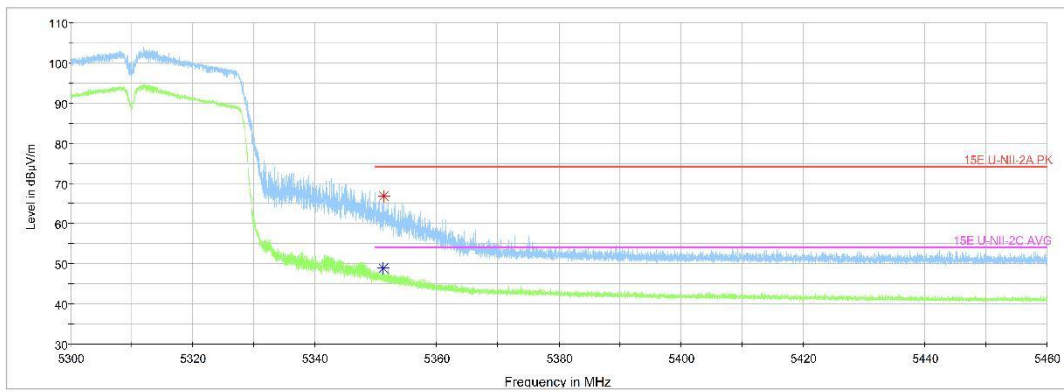


Fig. 18 Band Edges (802.11ac-HT40 Ch62, 5310MHz)

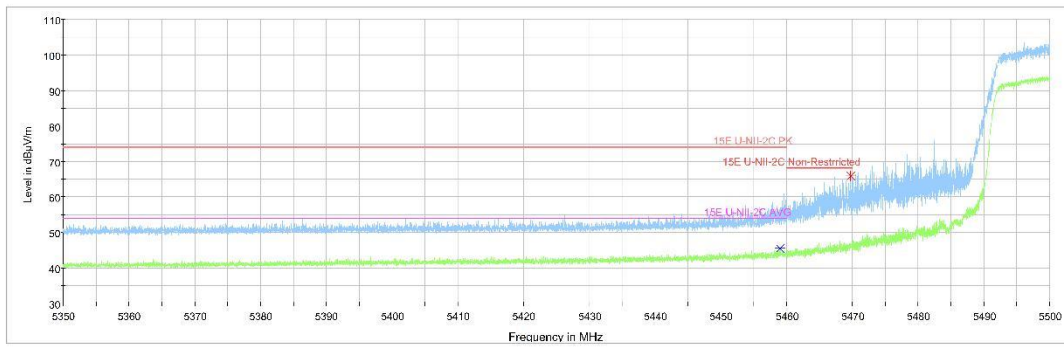


Fig. 19 Band Edges (802.11ac-HT40 Ch102, 5510MHz)

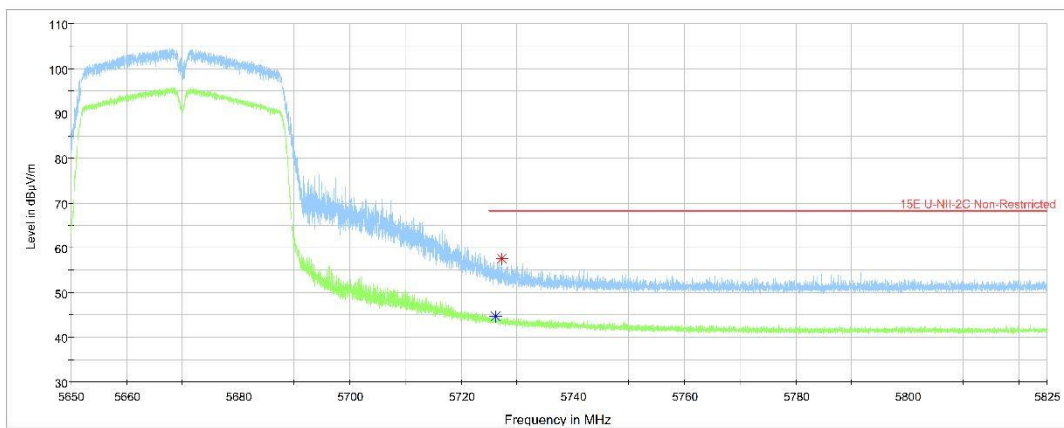


Fig. 20 Band Edges (802.11ac-HT40 Ch134, 5670MHz)

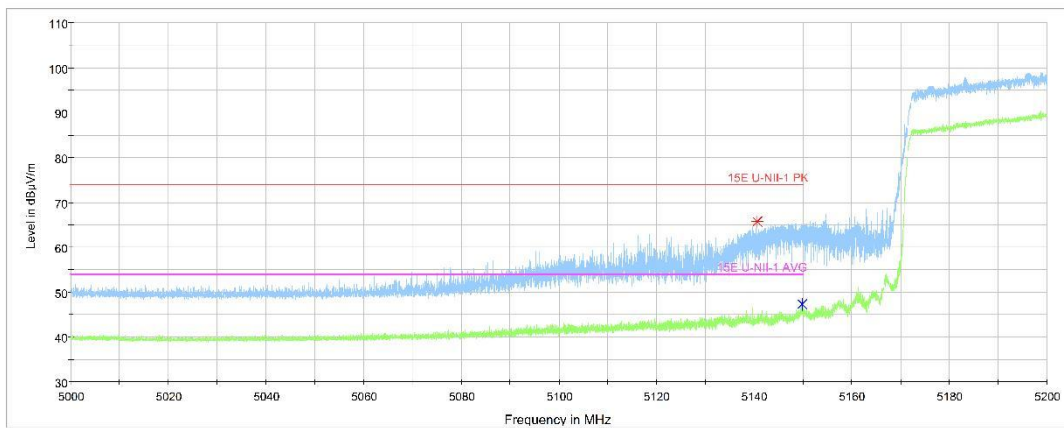


Fig. 21 Band Edges (802.11ac-HT80 Ch42 , 5210MHz)

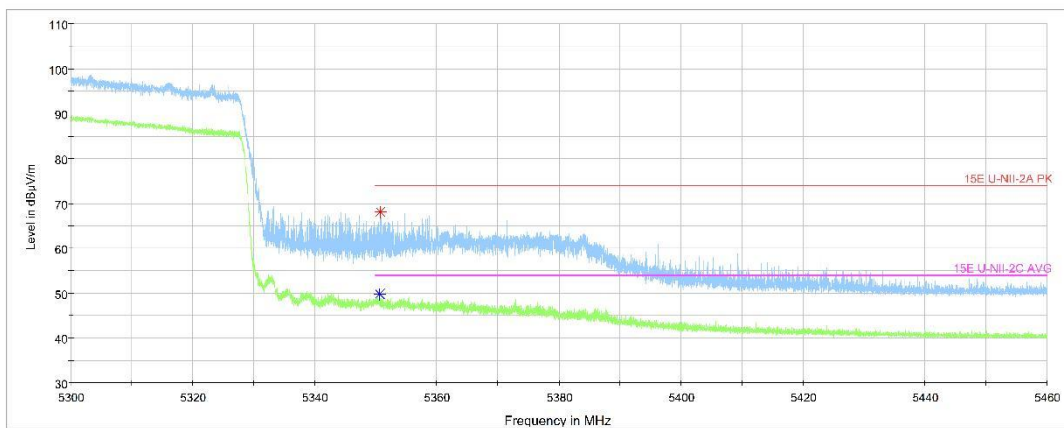


Fig. 22 Band Edges (802.11ac-HT80 Ch58, 5290MHz)

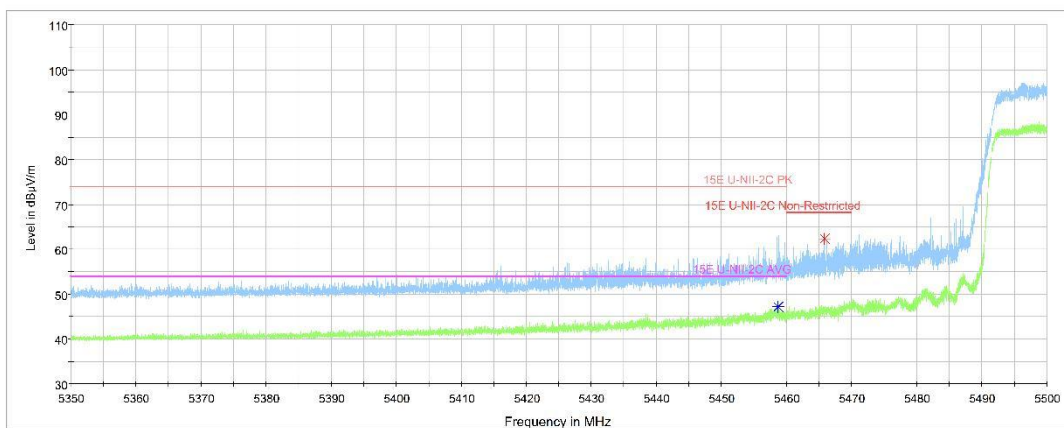


Fig. 23 Band Edges (802.11ac-HT80 Ch106, 5530MHz)

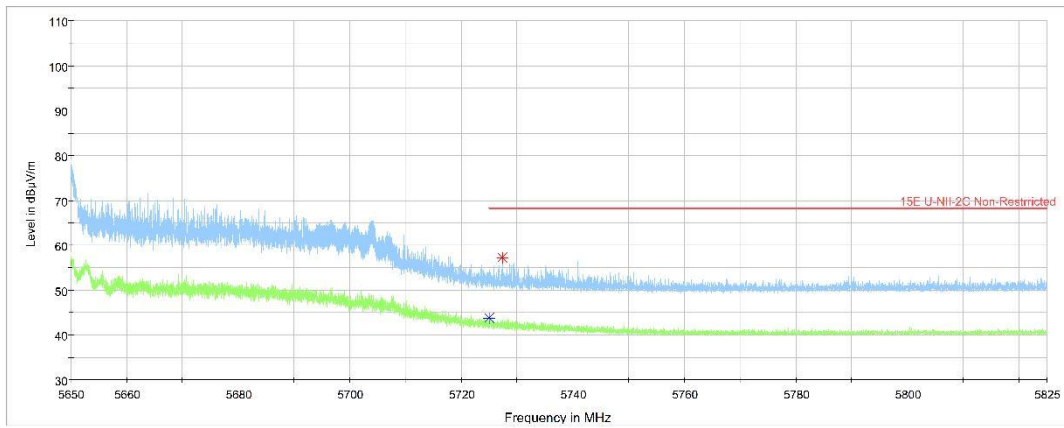


Fig. 24 Band Edges (802.11ac-HT80 Ch122, 5610MHz)

A.6. AC Powerline Conducted Emission (150kHz- 30MHz)

A.6.1 Summary

All AC line conducted spurious emissions are measured with a receiver connected to a grounded LISN while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates and modes were investigated for conducted spurious emissions. Only the conducted emissions of the configuration that produced the worst case emissions are reported in this section

A.6.2 Method of Measurement

See Clause 6.2 of ANSI C63.10 specifically.

See Clause 4 and Clause 5 of ANSI C63.10 generally.

The conducted emissions from the AC port of the EUT are measured in a shielding room. The EUT is connected to a Line Impedance Stabilization Network (LISN). An overview sweep with peak detection was performed. The measurements were performed with a quasi-peak detector and if required, an average detector.

The conducted emission measurements were made with the following detector of the test receiver:
Quasi-Peak / Average Detector.

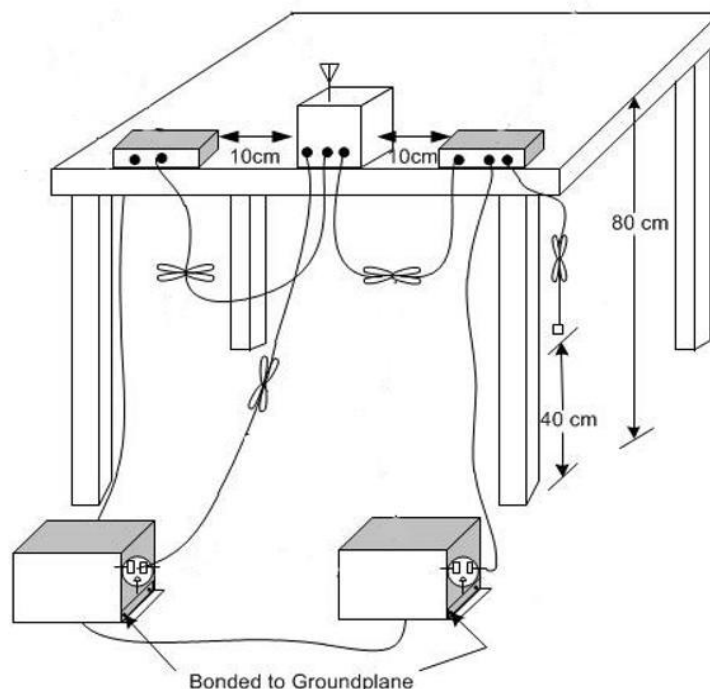
The measurement bandwidth is:

Frequency of Emission (MHz)	RBW/IF bandwidth
0.15-30	9kHz

A.6.3 Test Condition

Voltage (V)	Frequency (Hz)
120	60

A.6.4 Test setup



Measurement Result and limit:
WLAN (Quasi-peak Limit)

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Result (dBμV)		Conclusion
		With charger		
		11a mode	Idle	
0.15 to 0.5	66 to 56	Fig.25	Fig.26	P
0.5 to 5	56			
5 to 30	60			

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

WLAN (Average Limit)

Frequency range (MHz)	Average Limit (dBμV)	Result (dBμV)		Conclusion
		With charger		
		11a mode	Idle	
0.15 to 0.5	56 to 46	Fig.25	Fig.26	P
0.5 to 5	46			
5 to 30	50			

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

Conclusion: PASS

Test graphs as below:

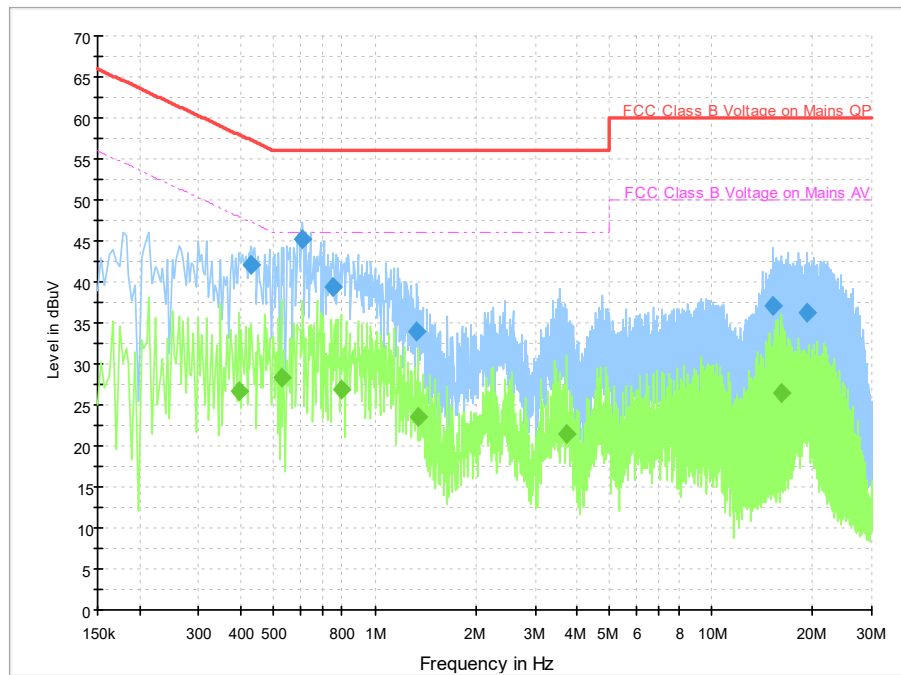


Fig.25 Conducted Emission(802.11a, Ch40, TX)

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.430000	42.0	2000.0	9.000	On	L1	20.0	15.2	57.3	
0.610000	45.1	2000.0	9.000	On	L1	20.0	10.9	56.0	
0.754000	39.3	2000.0	9.000	On	N	19.8	16.7	56.0	
1.334000	33.9	2000.0	9.000	On	L1	19.9	22.1	56.0	
15.294000	37.2	2000.0	9.000	On	L1	20.0	22.8	60.0	
19.182000	36.3	2000.0	9.000	On	L1	20.0	23.7	60.0	

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.394000	26.7	2000.0	9.000	On	N	19.9	21.3	48.0	
0.526000	28.3	2000.0	9.000	On	L1	20.0	17.7	46.0	
0.794000	26.9	2000.0	9.000	On	N	19.8	19.1	46.0	
1.346000	23.5	2000.0	9.000	On	N	19.7	22.5	46.0	
3.710000	21.4	2000.0	9.000	On	L1	19.8	24.6	46.0	
16.150000	26.5	2000.0	9.000	On	L1	20.0	23.5	50.0	

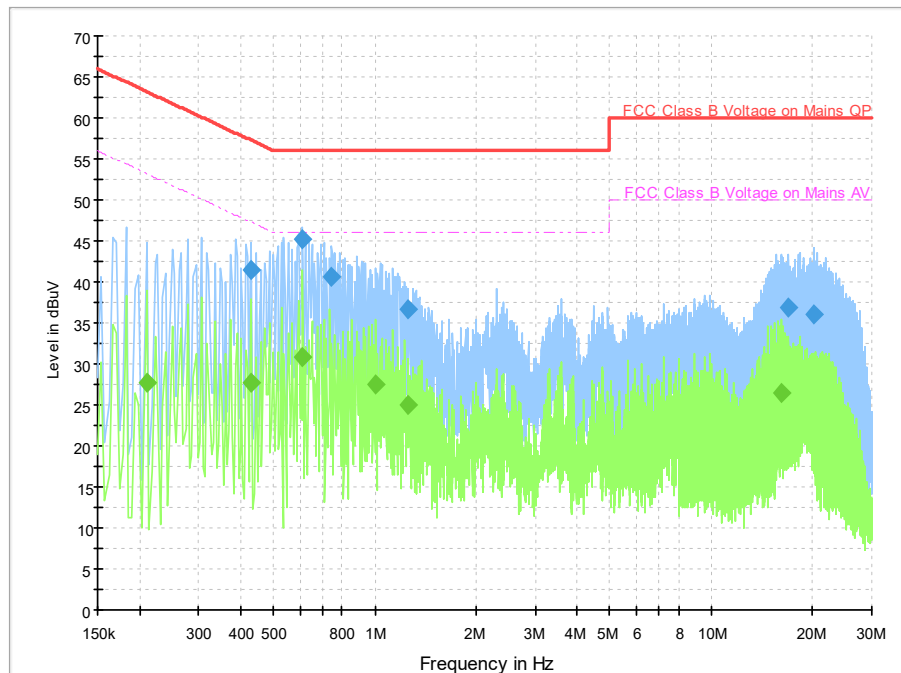


Fig.26 Conducted Emission(802.11a, IDLE)

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.430000	41.5	2000.0	9.000	On	L1	20.0	15.8	57.3	
0.610000	45.3	2000.0	9.000	On	L1	20.0	10.7	56.0	
0.746000	40.5	2000.0	9.000	On	N	19.8	15.5	56.0	
1.258000	36.6	2000.0	9.000	On	N	19.7	19.4	56.0	
16.850000	36.8	2000.0	9.000	On	L1	20.0	23.2	60.0	
20.130000	36.1	2000.0	9.000	On	L1	20.0	23.9	60.0	

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.210000	27.7	2000.0	9.000	On	N	19.8	25.5	53.2	
0.430000	27.8	2000.0	9.000	On	L1	20.0	19.5	47.3	
0.610000	30.9	2000.0	9.000	On	L1	20.0	15.1	46.0	
1.010000	27.5	2000.0	9.000	On	N	19.7	18.5	46.0	
1.258000	24.9	2000.0	9.000	On	N	19.7	21.1	46.0	
16.186000	26.5	2000.0	9.000	On	L1	20.0	23.5	50.0	

A.7. 99% Occupied bandwidth

Method of Measurement: See ANSI C63.10-2013-clause 12.4.2.

- a) The instrument center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be between 1.5 times and 5.0 times the OBW.
- b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW, and VBW shall be approximately three times the RBW, unless otherwise specified by the applicable requirement.
- c) Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than $[10 \log (OBW/RBW)]$ below the reference level. Specific guidance is given in 4.1.5.2.
- d) Step a) through step c) might require iteration to adjust within the specified range.
- e) Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
- f) Use the 99% power bandwidth function of the instrument (if available) and report the measured bandwidth.
- g) If the instrument does not have a 99% power bandwidth function, then the trace data points are recovered and directly summed in linear power terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5% of the total is reached; that frequency is recorded as the upper frequency. The 99% power bandwidth is the difference between these two frequencies.
- h) The occupied bandwidth shall be reported by providing plot(s) of the measuring instrument display; the plot axes and the scale units per division shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

Measurement Uncertainty:

Measurement Uncertainty	60.80Hz
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EUT ID: UT08a

Measurement Result:

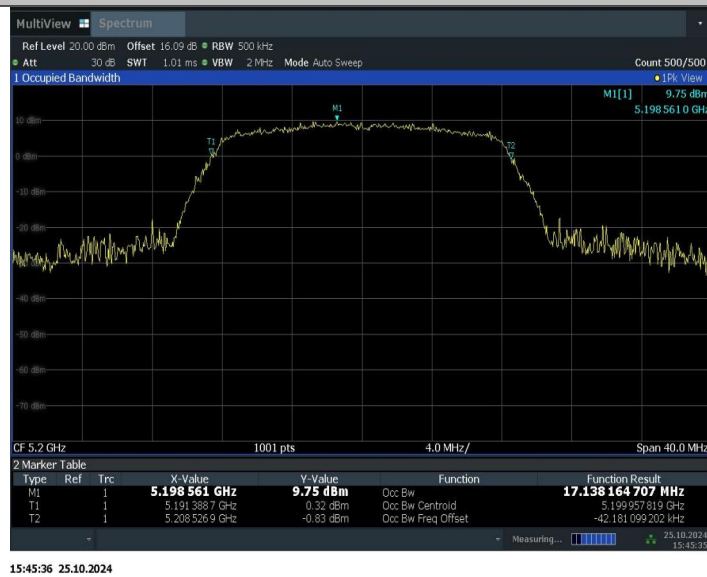
TestMode	Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	5180	17.196	5171.3890	5188.5855	---	---
	5200	17.138	5191.3887	5208.5269	---	---
	5240	17.191	5231.3511	5248.5424	---	---
11N20SISO	5180	18.056	5170.9453	5189.0011	---	---
	5200	17.999	5190.9437	5208.9424	---	---
	5240	17.988	5230.9657	5248.9533	---	---
11AC40SISO	5190	36.348	5171.7952	5208.1428	---	---
	5230	36.32	5211.8180	5248.1377	---	---
11AC80SISO	5210	75.293	5172.3671	5247.6600	---	---

Test graphs as below:

11A_5180



11A_5200



11A_5240



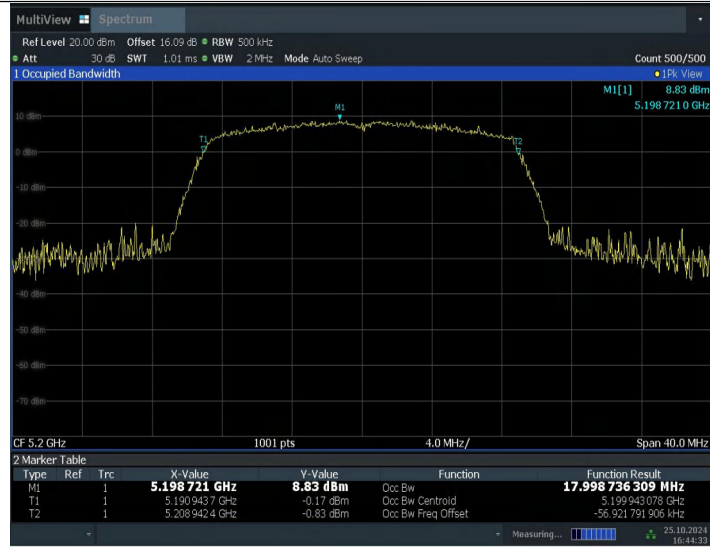
18:25:06 24.10.2024

11N20SISO_5180



16:43:21 25.10.2024

11N20SISO_5200



16:44:33 25.10.2024

11N20SISO_5240



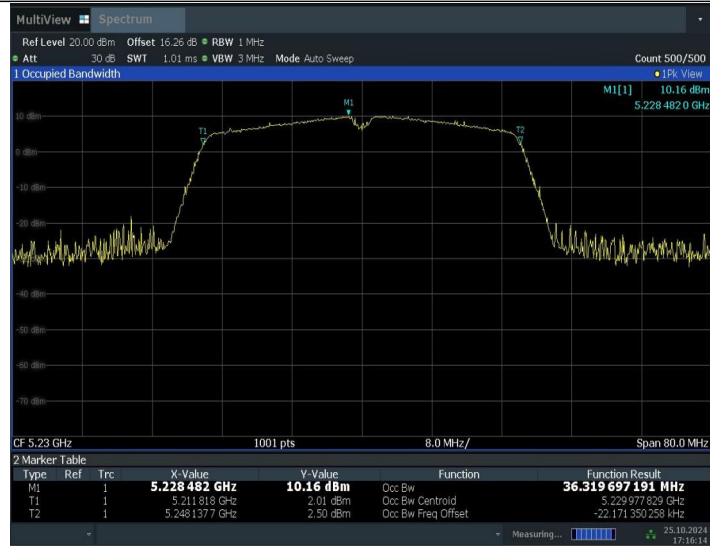
16:45:35 25.10.2024

11AC40SISO_5190



17:15:00 25.10.2024

11AC40SISO_5230



17:16:14 25.10.2024

11AC80SISO_5210



Conclusion: PASS

A.8. Antenna Requirement

The antenna of the device is permanently attached. There are no provisions for connection to an external antenna.

The unit complies with the requirement of FCC Part 15.203.

A.9. Power control

A Transmission Power Control mechanism is not required for systems with an e.i.r.p. of less than 27dBm (500 mW).

ANNEX B: EUT parameters

Disclaimer: The antenna gain and worse case provided by the client may affect the validity of the measurement results in this report, and the client shall bear the impact and consequences arising therefrom.

ANNEX C: Accreditation Certificate



Accredited Laboratory

A2LA has accredited

TELECOMMUNICATION TECHNOLOGY LABS, CAICT

Beijing, People's Republic of China

for technical competence in the field of

Electrical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 *General requirements for the competence of testing and calibration laboratories*. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).



Presented this 23rd day of July 2024.



Mr. Trace McInturf, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 7049.01
Valid to July 31, 2026

For the tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.

*** END OF REPORT BODY ***