



FCC PART 15 TEST REPORT No. I21Z70186-EMC12

for

Samsung Electronics Co., Ltd.

Notebook PC

XE315XDA

with

FCC ID: ZCAXE315XDA

Hardware Version: REV1.0

Software Version: Chrome

Issued Date: 2021-07-14

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.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government.

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No. I21Z70186-EMC12

REPORT HISTORY

Report Number	Revision	Description	Issue Date
I21Z70186-EMC12	Rev.0	1st edition	2021-07-14

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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 NATIONAL VOLUNTARY LABORATORY ACCREDITATION PROGRAM (NVLAP) with lab code 600118-0, and is also an FCC accredited test laboratory (CN5017), and ISED accredited test laboratory (ISED#: 24849). The detail accreditation scope can be found on NVLAP website.

1.2. Testing Location

Location 1:CTTL(Huayuan North Road)

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

Location 2:CTTL(BDA)

Address: No.18A, Kangding Street, Beijing Economic-Technology
Development Area, Beijing, P. R. China 100176

1.3. Testing Environment

Normal Temperature: 15-35°C

Relative Humidity: 20-75%

1.4. Project date

Testing Start Date: 2021-05-06

Testing End Date: 2021-07-02

1.5. Signature



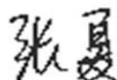
Li Yan

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Zhang Ying

(Reviewed this test report)



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Deputy Director of the laboratory

(Approved this test report)



2. CLIENT INFORMATION

2.1. Applicant Information

Company Name: Samsung Electronics Co., Ltd.
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2.2. Manufacturer Information

Company Name: Samsung Electronics Co., Ltd.
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Youngtong gu, Suwon city 443 742, Korea
Contact: Sunghoon Cho
Email: ggobi.cho@samsung.com
Telephone: +82-10-2722-4159
Fax: /

3. PRODUCT INFORMATION

3.1. About EUT

Description	Notebook PC
Model name	XE315XDA
FCC ID	ZCAXE315XDA

Note: Components list, please refer to documents of the manufacturer; it is also included in the original test record of T CTTL-Telecommunication Technology Labs, CAICT

3.2. Internal Identification of EUT used during the test

EUT ID*	IMEI	HW Version	SW Version
EUT1	2170186UT44a	REV1.0	Chrome
EUT2	2170186UT25a	REV1.0	Chrome

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

3.3. Internal Identification of AE used during the test

AE ID*	Description	SN	Remarks
AE1	Travel Adapter	/	/
AE2	Travel Adapter	/	/
AE3	battery	/	Inbuilt

AE1

Model	EP-TA845
Manufacturer	DONGYANG E&P Inc
Length of cable	/

AE2

Model	EP-TA845
Manufacturer	SOLUM CO.,LTD
Length of cable	/

AE3

Model	/
Manufacturer	/

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

3.4. General Description

The Equipment Under Test (EUT) was a Notebook Computer with Bluetooth, Bluetooth Low Energy and 802.11 a/b/g/n/ac/ax capabilities in the 2.4 GHz and 5 GHz bands.

Antenna information

Item	Spec.	Vendor	Vendor P/N	Sample under test
Antenna	Main antenna (Chain A)	AWAN	/	EUT2
	Auxiliary antenna (Chain B)			
Antenna	Main antenna (Chain A)	SPEED	/	EUT1
	Auxiliary antenna (Chain B)			

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

Samples undergoing test were selected by the Client.

For more EUT information please refers to the manufacturer's specifications or user's manual.

3.5. Test Configuration

For 802.11a mode the EUT can transmit at both CHAIN A and CHAIN B RF outputs individually, but not simultaneously.

For 802.11n20 & 802.11ax20 (20 MHz channel bandwidth), 802.11n40 & 802.11ax40 (40MHz channel bandwidth) and 802.11ac80 & 802.11ax80 (80MHz channel bandwidth) modes the EUT can transmit at both CHAIN A and CHAIN B RF outputs individually, and also simultaneously(MIMO).

The software DRTU provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.

3.6. 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.

Reference	Title	Version
FCC Part15	FCC CFR 47, Part 15, Subpart C and E: 15.205 Restricted bands of operation; 15.209 Radiated emission limits, general requirements; 15.407 General technical requirements	2019
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

Note: The test methods have no deviation with standards.

5. SUMMARY OF TEST RESULTS

5.1. Summary of Test Results

SUMMARY OF MEASUREMENT RESULTS	Sub-clause of Part15	Verdict
Radiated Spurious Emission	15.407, 15.205, 15.209	P
AC Power line Conducted Emission	15.407, 15.207	P

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

Terms used in Verdict column

P	Pass, The EUT complies with the essential requirements in the standard.
NP	Not Perform, The test was not performed by CTTL
BR	Re-use test data from basic model report.
NA	Not Applicable, The test was not applicable
F	Fail, The EUT does not comply with the essential requirements in the standard

5.2. Statements

The test cases as listed in section 5.1 of this report for the EUT specified in section 3 was performed by CTTL and according to the standards or reference documents listed in section 4.2 The EUT met all requirements of the standards or reference documents, and only the WLAN function was tested in this report.

5.3. Test Conditions

T nom	Normal Temperature
T min	Low Temperature
T max	High Temperature
V nom	Normal Voltage

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

Temperature	T nom	26°C
Voltage	V nom	4.0V
Humidity	H nom	20-75%

6. TEST EQUIPMENTS UTILIZED

Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Period	Calibration Due date
1	Test Receiver	ESU26	100376	R&S	1 year	2021-09-04
2	BiLog Antenna	VULB9163	9163-482	Schwarzbeck	1 year	2021-11-04
3	Dual-Ridge Waveguide Horn Antenna	3117	00139065	ETS-Lindgren	1 year	2021-10-11
4	Dual-Ridge Waveguide Horn Antenna	3116	2663	ETS-Lindgren	1 year	2021-08-05
5	Analytical Spectrometer	FSV40	R&S	101047	1 year	2022-05-17
6	Loop Antenna	HFH2-Z2	829324/007	R&S	1 year	2021-12-10
7	Test Receiver	ESU26	100235	R&S	1 year	2022-02-23

AC Powerline Conducted Emission

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Period	Calibration Due date
1	LISN	ENV216	101459	R&S	1 year	2021-04-09
2	Test Receiver	ESCI	100766	R&S	1 year	2022-03-09

7. Measurement Uncertainty

Radiated Spurious Emission

(k=2)

Frequency Range	Uncertainty(dB)
9kHz-30MHz	/
$30\text{MHz} \leq f \leq 1\text{GHz}$	5.40
$1\text{GHz} \leq f \leq 18\text{GHz}$	4.32
$18\text{GHz} \leq f \leq 40\text{GHz}$	5.26

AC Power-line Conducted Emission

Measurement Uncertainty: 3.10dB,k=2

ANNEX A: EUT parameters

Disclaimer: The antenna gain and setting power 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 B: Antenna Requirements

According to FCC 47 CFR § 15.203, §15.407:

“An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.”

- (1) The antennas of the EUT are permanently attached.
- (2) The EUT complies with the requirement of §15.203, §15.407.

ANNEX C: Detailed Test Results

C.1. Radiated Spurious Emission

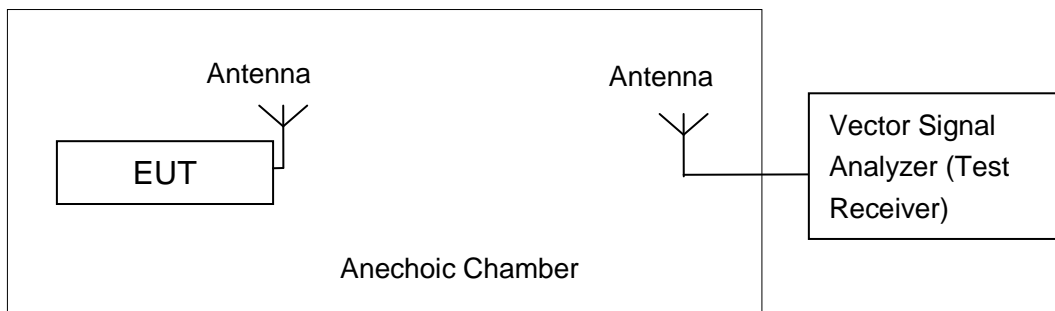
Specification Reference

FCC 47 CFR Part 15, Clause 15.407 (b) Clause 15.205 Clause 15.209

Method of Measurement

Testing was performed in accordance with ANSI C63.10-2013 and KDB 789033.

The radiated emission test is performed in a semi-anechoic chamber. The distance from the EUT to the reference point of measurement antenna is 3m. The test is carried out on both vertical and horizontal polarization and only the maximization result of both polarizations is kept. During the test, the turntable is rotated 360° and the measurement antenna is moved from 1m to 4m to get the maximization result.



Measurement Limit

Standard	Limit (dBm/MHz)	
FCC 47 CFR Part 15.407 RSS-247, 6.2	at the band edge	27
	at 5 MHz above or below the band edge	15.6
	at 25 MHz above or below the band edge	10
	at 75 MHz or more above or below the band edge	-27
	Note: Increasing linearly from point to point.	

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)).

Limit in restricted band:

Frequency (MHz)	Field strength(μV/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(dB μ V/m)	Measurement distance(m)
30-88	40.0	3
88-216	43.5	3
216-960	46.0	3
Above 960	54.0	3

Test settings

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

Sample Calculation

1. 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

2. The measurement results are obtained as described below:

$$\text{Result} = P_{\text{Mea}} + A_{\text{Rpl}} = P_{\text{Mea}} + \text{Cable Loss} + \text{Antenna Factor}$$

A "reference path loss" is established and the A_{Rpl} is the attenuation of "reference path loss", and including the gain of receive antenna, the gain of the preamplifier, the cable loss.

P_{Mea} is the field strength recorded from the instrument.

Test Notes

1. The EUT is operating at its maximum duty cycle and its maximum power control level.
2. Investigation has been done on all channel, modes and modulations/data rates. Only the radiated emissions of the configurations that produced the worst case emissions are reported in this section.
- 3.

For EUT1 with SPEED antenna the measurements were performed separately in Chain A, Chain B, and MIMO (Chain A+B), and only the worst cases are shown in this report.

For EUT2 with AWAN antenna the measurements were performed separately in Chain A, Chain B, and MIMO (Chain A+B), and only the worst cases are shown in this report.

C.1.1 Radiated Spurious Emission- above 1GHz

SPEED

The measurements were performed separately in Chain A, Chain B, and MIMO (Chain A+B), and only the worst cases are shown in this section.

Average Results:

802.11a

Channel 149

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)
5392.000	39.25	-22.29	34.36	27.18	54.00	14.75	V
5441.800	39.08	-22.64	34.38	27.34	54.00	14.92	V
11490.400	29.89	-29.15	38.20	20.84	54.00	24.11	H
17235.200	35.84	-22.85	41.92	16.77	54.00	18.16	V
17829.600	36.87	-22.47	41.53	17.81	54.00	17.13	H
17908.000	37.02	-22.63	41.52	18.13	54.00	16.98	H

Channel 157

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)
5388.700	39.44	-22.29	34.36	27.37	54.00	14.56	V
5442.100	39.12	-22.64	34.38	27.39	54.00	14.88	V
11570.400	29.61	-29.25	38.27	20.59	54.00	24.39	H
17355.200	35.47	-22.93	41.77	16.63	54.00	18.53	V
17749.600	36.87	-22.29	41.55	17.61	54.00	17.13	H
17966.400	36.89	-22.75	41.51	18.13	54.00	17.11	V

Channel 165

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)
5437.600	39.17	-22.61	34.38	27.40	54.00	14.83	V
5449.000	39.02	-22.70	34.38	27.33	54.00	14.98	V
11650.400	29.87	-29.41	38.35	20.93	54.00	24.13	H
17475.200	35.93	-23.07	41.63	17.37	54.00	18.07	H
17780.000	36.70	-22.36	41.54	17.52	54.00	17.30	H
17929.600	36.85	-22.68	41.51	18.02	54.00	17.15	V

802.11n-HT20

Channel 149

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)
5405.200	39.17	-22.36	34.36	27.16	54.00	14.83	V
5438.200	39.14	-22.61	34.38	27.38	54.00	14.86	V
11490.400	30.07	-29.15	38.20	21.02	54.00	23.93	H
17235.200	35.92	-22.85	41.92	16.85	54.00	18.08	V
17788.000	36.84	-22.38	41.54	17.68	54.00	17.16	V
17936.800	37.01	-22.69	41.51	18.19	54.00	16.99	V

Channel 157

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)
5392.900	39.18	-22.29	34.36	27.10	54.00	14.82	V
5438.800	39.08	-22.62	34.38	27.32	54.00	14.92	V
11570.400	29.81	-29.25	38.27	20.79	54.00	24.19	H
17355.200	35.52	-22.93	41.77	16.68	54.00	18.48	V
17718.400	36.88	-22.22	41.56	17.55	54.00	17.12	V
17832.800	37.02	-22.48	41.53	17.97	54.00	16.98	V

Channel 165

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)
5420.200	39.06	-22.47	34.37	27.16	54.00	14.94	V
5443.600	39.08	-22.66	34.38	27.35	54.00	14.92	V
11650.400	30.08	-29.41	38.35	21.13	54.00	23.92	V
17475.200	36.09	-23.07	41.63	17.53	54.00	17.91	H
17755.200	36.92	-22.31	41.55	17.68	54.00	17.08	V
17904.000	37.20	-22.63	41.52	18.31	54.00	16.80	H

802.11n-HT40

Channel 151

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)
5430.400	39.03	-22.55	34.37	27.21	54.00	14.97	V
5442.100	39.20	-22.64	34.38	27.47	54.00	14.80	V
11510.400	30.13	-29.15	38.21	21.06	54.00	23.87	H
17264.800	36.28	-22.80	41.88	17.21	54.00	17.72	V
17748.800	37.11	-22.29	41.55	17.85	54.00	16.89	V
17898.400	37.19	-22.62	41.52	18.29	54.00	16.81	H

Channel 159

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)
5433.100	38.99	-22.57	34.37	27.19	54.00	15.01	V
5444.200	39.18	-22.66	34.38	27.46	54.00	14.82	V
11590.400	30.11	-29.28	38.29	21.10	54.00	23.89	H
17384.800	35.86	-23.00	41.74	17.13	54.00	18.14	H
17836.000	37.08	-22.49	41.53	18.03	54.00	16.92	V
17943.200	37.25	-22.71	41.51	18.44	54.00	16.75	H

802.11ax-HT20

Channel 149

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)
5434.000	39.14	-22.58	34.37	27.34	54.00	14.86	V
5440.000	39.22	-22.63	34.38	27.47	54.00	14.78	V
11490.400	30.14	-29.15	38.20	21.09	54.00	23.86	H
17235.200	36.00	-22.85	41.92	16.93	54.00	18.00	V
17735.200	37.03	-22.26	41.55	17.74	54.00	16.97	V
17951.200	37.01	-22.72	41.51	18.22	54.00	16.99	H

Channel 157

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)
5439.400	39.20	-22.62	34.38	27.45	54.00	14.80	V
5447.500	39.00	-22.69	34.38	27.31	54.00	15.00	V
11570.400	29.94	-29.25	38.27	20.91	54.00	24.06	H
17355.200	35.70	-22.93	41.77	16.87	54.00	18.30	H
17836.000	37.05	-22.49	41.53	18.00	54.00	16.95	V
17916.800	37.20	-22.65	41.52	18.33	54.00	16.80	H

Channel 165

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)
5385.400	39.26	-22.29	34.36	27.19	54.00	14.74	V
5439.700	39.18	-22.62	34.38	27.43	54.00	14.82	V
11650.400	30.24	-29.41	38.35	21.30	54.00	23.76	H
17475.200	36.18	-23.07	41.63	17.61	54.00	17.82	H
17762.400	37.02	-22.32	41.55	17.79	54.00	16.98	H
17988.000	37.19	-22.79	41.50	18.48	54.00	16.81	H

802.11ax-HT40

Channel 151

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)
5424.400	39.06	-22.51	34.37	27.19	54.00	14.94	V
5442.400	39.14	-22.65	34.38	27.41	54.00	14.86	V
11510.400	30.27	-29.15	38.21	21.21	54.00	23.73	V
17264.800	36.39	-22.80	41.88	17.31	54.00	17.61	H
17718.400	37.08	-22.22	41.56	17.74	54.00	16.92	H
17892.800	37.24	-22.60	41.52	18.32	54.00	16.76	H

Channel 159

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)
5429.800	39.13	-22.55	34.37	27.30	54.00	14.87	V
5446.900	39.04	-22.68	34.38	27.34	54.00	14.96	V
11590.400	30.26	-29.28	38.29	21.24	54.00	23.74	V
17384.800	35.89	-23.00	41.74	17.16	54.00	18.11	V
17768.000	37.07	-22.34	41.55	17.86	54.00	16.93	H
17830.400	37.19	-22.48	41.53	18.13	54.00	16.81	H

802.11ax-HT80

Ch155

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)
5426.500	39.2	-22.5	34.5	27.14	54.0	14.8	V
5440.000	39.3	-22.6	34.6	27.36	54.0	14.7	V
11550.400	30.7	-29.2	38.5	21.40	54.0	23.3	H
17324.800	35.9	-22.9	41.4	17.36	54.0	18.1	H
17756.800	37.4	-22.3	41.3	18.47	54.0	16.6	V
17910.400	37.6	-22.6	41.3	18.91	54.0	16.4	H

802.11ac-HT80

Ch155

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)
5429.800	39.1	-22.5	34.5	27.12	54.0	14.9	V
5439.700	39.1	-22.6	34.6	27.22	54.0	14.9	V
11550.400	30.6	-29.2	38.5	21.32	54.0	23.4	V
17324.800	35.8	-22.9	41.4	17.31	54.0	18.2	H
17749.600	37.5	-22.3	41.3	18.50	54.0	16.5	V
17904.000	37.6	-22.6	41.3	18.94	54.0	16.4	V

Peak Results:
802.11a

Channel 149

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)
5652.323	53.89	-22.84	34.68	42.05	69.92	16.03	H
5655.417	54.01	-22.84	34.69	42.16	72.21	18.20	H
11490.200	45.08	-29.15	38.20	36.03	74.00	28.92	H
17234.950	54.91	-22.85	41.92	35.84	68.30	13.39	H
17311.950	55.61	-22.83	41.82	36.62	68.30	12.69	H
17425.250	56.18	-23.10	41.69	37.59	68.30	12.12	V

Channel 157

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)
5754.400	53.90	-22.93	34.87	41.96	68.30	14.40	H
5827.000	54.54	-22.56	35.00	42.11	68.30	13.76	V
11569.950	45.99	-29.24	38.27	36.96	74.00	28.01	V
17354.850	54.67	-22.93	41.77	35.83	68.30	13.63	H
17503.350	56.64	-22.88	41.60	37.92	68.30	11.66	V
17638.650	56.49	-22.04	41.57	36.95	68.30	11.81	V

Channel 165

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)
5922.159	55.28	-22.23	35.16	42.35	70.30	15.02	V
5922.827	54.34	-22.22	35.17	41.40	69.81	15.47	V
11650.250	46.10	-29.41	38.35	37.16	74.00	27.90	V
17474.750	54.08	-23.07	41.63	35.52	68.30	14.22	V
17593.550	56.28	-22.28	41.58	36.98	68.30	12.02	V
17695.300	56.33	-22.17	41.56	36.93	68.30	11.97	V

802.11n-HT20

Channel 149

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)
5651.196	53.66	-22.84	34.68	41.82	69.09	15.43	H
5652.116	53.60	-22.84	34.68	41.76	69.77	16.16	H
11490.200	45.75	-29.15	38.20	36.70	74.00	28.25	H
17234.950	54.05	-22.85	41.92	34.98	68.30	14.25	V
17304.055	55.36	-22.81	41.83	36.34	68.30	12.94	V
17487.400	56.90	-22.99	41.61	38.27	68.30	11.40	V

Channel 157

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)
5764.800	53.81	-22.91	34.89	41.84	68.30	14.49	H
5803.400	53.82	-22.74	34.96	41.60	68.30	14.48	V
11569.950	45.54	-29.24	38.27	36.51	74.00	28.46	V
17354.850	54.65	-22.93	41.77	35.81	68.30	13.65	H
17409.300	56.08	-23.06	41.71	37.43	68.30	12.22	V
17436.800	50.05	-23.13	41.67	31.51	68.30	18.25	H

Channel 165

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)
5918.709	54.53	-22.25	35.16	41.62	72.85	18.32	V
5923.620	55.07	-22.22	35.17	42.12	69.22	14.16	H
11650.250	46.10	-29.41	38.35	37.16	68.30	22.20	H
17474.750	54.08	-23.07	41.63	35.52	68.30	14.22	V
17503.350	56.64	-22.88	41.60	37.92	68.30	11.66	V
17557.800	56.39	-22.52	41.59	37.32	68.30	11.91	H

802.11n-HT40

Channel 151

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)
5650.885	53.77	-22.84	34.68	41.93	68.85	15.09	H
5653.553	54.29	-22.84	34.68	42.44	70.83	16.54	H
11510.000	44.96	-29.14	38.21	35.90	74.00	29.04	V
16868.200	56.72	-23.00	42.02	37.71	68.30	11.58	V
17265.200	53.30	-22.80	41.88	34.22	68.30	15.00	H
17596.850	57.27	-22.26	41.58	37.95	68.30	11.03	V

Channel 159

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)
5922.642	54.85	-22.22	35.17	41.91	69.94	15.10	H
5924.896	55.22	-22.21	35.17	42.26	68.28	13.06	H
11589.750	44.31	-29.28	38.29	35.30	74.00	29.69	V
17032.000	57.06	-23.03	42.16	37.93	68.30	11.24	V
17385.100	53.27	-23.01	41.74	34.54	68.30	15.03	H
17519.850	56.43	-22.77	41.60	37.60	68.30	11.87	H

802.11ax-HT20

Channel 149

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)
5650.621	54.35	-22.84	34.68	42.51	68.66	14.31	H
5652.392	53.52	-22.84	34.68	41.68	69.97	16.45	H
11490.200	45.88	-29.15	38.20	36.83	74.00	28.12	H
17234.950	55.16	-22.85	41.92	36.10	68.30	13.14	V
17315.250	55.87	-22.84	41.82	36.88	68.30	12.43	V
17506.100	56.85	-22.86	41.60	38.11	68.30	11.45	V

Channel 157

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)
5764.600	54.11	-22.91	34.89	42.14	68.30	14.19	H
5803.400	54.22	-22.74	34.96	42.00	68.30	14.08	H
11569.950	45.14	-29.24	38.27	36.12	68.30	23.16	V
17354.850	53.90	-22.93	41.77	35.06	68.30	14.40	V
17446.700	55.86	-23.15	41.66	37.35	68.30	12.44	H
17607.300	56.62	-22.19	41.58	37.23	68.30	11.68	V

Channel 165

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)
5920.538	54.57	-22.24	35.16	41.64	71.50	16.93	V
5921.734	54.51	-22.23	35.16	41.57	70.62	16.11	V
11650.250	45.88	-29.41	38.35	36.94	68.30	22.42	V
17474.750	55.38	-23.07	41.63	36.82	68.30	12.92	V
17516.560	56.15	-22.79	41.60	37.35	68.30	12.15	V
17607.300	56.62	-22.19	41.58	37.23	68.30	11.68	H

802.11ax-HT40

Channel 151

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)
5652.116	54.14	-22.84	34.68	42.29	69.77	15.63	V
5655.336	54.00	-22.84	34.69	42.15	72.15	18.14	H
11510.000	44.56	-29.14	38.21	35.50	74.00	29.44	H
16865.350	57.00	-23.00	42.01	37.99	68.30	11.30	H
17265.200	54.40	-22.80	41.88	35.32	68.30	13.90	V
17502.800	57.67	-22.88	41.60	38.96	68.30	10.63	V

Channel 159

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)
5923.885	55.48	-22.22	35.17	42.52	69.03	13.55	V
5924.483	54.69	-22.21	35.17	41.73	68.58	13.90	H
11589.750	44.75	-29.28	38.29	35.74	74.00	29.25	V
16920.900	56.90	-23.01	42.09	37.82	68.30	11.40	V
17385.100	53.76	-23.01	41.74	35.03	68.30	14.54	H
17641.950	56.63	-22.04	41.57	37.10	68.30	11.67	H

802.11ax-HT80

Ch155

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)
5651.288	53.6	-22.8	34.8	41.62	68.3	14.7	V
5652.128	53.8	-22.8	34.8	41.81	68.3	14.5	H
5922.102	54.7	-22.2	35.1	41.80	68.3	13.6	V
5923.137	54.4	-22.2	35.1	41.51	68.3	13.9	V
17325.150	54.0	-22.9	41.4	35.52	68.3	14.3	V
17540.750	57.1	-22.6	41.2	38.50	68.3	11.2	H

802.11ac-HT80

Ch155

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)
5651.047	53.4	-22.8	34.8	41.49	68.3	14.9	H
5652.898	54.2	-22.8	34.8	42.22	68.3	14.1	H
5921.412	54.5	-22.2	35.1	41.65	68.3	13.8	H
5923.540	54.5	-22.2	35.1	41.57	68.3	13.8	V
17325.150	54.0	-22.9	41.4	35.50	68.3	14.3	H
17661.750	56.8	-22.1	41.2	37.62	68.3	11.5	V

Note: the spurious emission above 18G is noise only

Conclusion: pass

AWAN

The measurements were performed separately in Chain A, Chain B, and MIMO (Chain A+B), and only the worst cases are shown in this section.

Average Results:

802.11a

Channel 149

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)
5408.500	40.13	-27.65	32.75	35.03	54.00	13.87	V
5452.000	40.13	-27.74	32.77	35.11	54.00	13.87	V
11490.062	34.32	-35.09	39.20	30.22	54.00	19.68	H
16182.250	37.32	-32.80	39.62	30.50	54.00	16.68	H
17725.000	40.31	-31.43	42.08	29.66	54.00	13.69	H
17850.125	40.14	-31.46	41.91	29.69	54.00	13.86	H

Channel 157

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)
5392.000	40.15	-27.64	32.74	35.05	54.00	13.85	V
5409.500	40.18	-27.65	32.75	35.09	54.00	13.82	V
11569.812	33.77	-34.94	39.19	29.53	54.00	20.23	H
16182.250	37.31	-32.80	39.62	30.49	54.00	16.69	V
17730.500	40.11	-31.44	42.07	29.48	54.00	13.89	H
17850.812	39.98	-31.45	41.91	29.53	54.00	14.02	V

Channel 165

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)
5409.000	40.13	-27.65	32.75	35.04	54.00	13.87	V
5425.000	40.08	-27.69	32.76	35.01	54.00	13.92	V
11650.250	34.42	-34.73	39.17	29.98	54.00	19.58	V
16162.312	37.30	-32.88	39.56	30.62	54.00	16.70	H
17724.312	40.40	-31.43	42.08	29.74	54.00	13.60	H
17835.000	40.02	-31.50	41.93	29.59	54.00	13.98	H

802.11n-HT20

Channel 149

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)
5391.500	40.30	-27.64	32.74	35.20	54.00	13.70	V
5421.000	40.17	-27.68	32.75	35.10	54.00	13.83	V
11490.062	33.93	-35.09	39.20	29.83	54.00	20.07	V
16172.625	38.96	-32.84	39.59	32.21	54.00	15.04	H
17718.125	39.90	-31.42	42.09	29.23	54.00	14.10	V
17981.438	40.30	-31.12	41.73	29.70	54.00	13.70	H

Channel 157

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)
5409.500	40.25	-27.65	32.75	35.16	54.00	13.75	V
5421.000	40.21	-27.68	32.75	35.14	54.00	13.79	V
11569.812	33.61	-34.94	39.19	29.37	54.00	20.39	V
16166.438	37.22	-32.86	39.57	30.51	54.00	16.78	H
17726.375	40.24	-31.43	42.08	29.60	54.00	13.76	V
17954.625	39.98	-31.19	41.76	29.41	54.00	14.02	H

Channel 165

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)
5391.500	40.23	-27.64	32.74	35.14	54.00	13.77	V
5410.500	40.25	-27.66	32.75	35.16	54.00	13.75	V
11650.250	34.25	-34.73	39.17	29.80	54.00	19.75	V
15905.875	37.38	-32.91	39.08	31.20	54.00	16.62	V
17714.688	40.25	-31.42	42.10	29.57	54.00	13.75	H
17975.250	40.18	-31.14	41.73	29.58	54.00	13.82	H

802.11n-HT40

Channel 151

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)
5426.000	39.97	-27.69	32.76	34.91	54.00	14.03	V
5454.000	40.01	-27.73	32.77	34.97	54.00	13.99	V
11510.000	33.91	-35.06	39.20	29.77	54.00	20.09	V
16187.062	37.43	-32.78	39.63	30.58	54.00	16.57	V
17724.312	40.37	-31.43	42.08	29.71	54.00	13.63	V
17983.500	40.33	-31.12	41.72	29.73	54.00	13.67	H

Channel 159

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)
5392.000	40.01	-27.64	32.74	34.91	54.00	13.99	V
5409.000	40.03	-27.65	32.75	34.93	54.00	13.97	V
11589.750	34.14	-34.91	39.18	29.87	54.00	19.86	V
16187.062	37.42	-32.78	39.63	30.57	54.00	16.58	V
17718.812	40.05	-31.42	42.09	29.38	54.00	13.95	H
17980.750	40.40	-31.12	41.73	29.80	54.00	13.60	H

802.11ax-HT20

Channel 149

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)
5421.000	40.2	-27.7	32.8	35.18	54.0	13.8	V
5437.500	40.2	-27.7	32.8	35.18	54.0	13.8	V
11490.063	33.7	-35.1	39.2	29.64	54.0	20.3	H
16198.750	37.0	-32.7	39.7	30.09	54.0	17.0	H
17730.500	40.1	-31.4	42.1	29.49	54.0	13.9	H
17920.938	39.7	-31.3	41.8	29.18	54.0	14.3	H

Channel 157

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)
5392.000	40.3	-27.6	32.7	35.22	54.0	13.7	V
5455.000	40.2	-27.7	32.8	35.16	54.0	13.8	V
11569.813	33.7	-34.9	39.2	29.47	54.0	20.3	H
16182.250	37.4	-32.8	39.6	30.62	54.0	16.6	V
17714.000	40.2	-31.4	42.1	29.57	54.0	13.8	H
17975.250	40.4	-31.1	41.7	29.80	54.0	13.6	H

Channel 165

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)
5443.000	40.0	-27.7	32.8	35.01	54.0	14.0	V
5452.500	40.1	-27.7	32.8	35.06	54.0	13.9	V
11650.250	34.3	-34.7	39.2	29.82	54.0	19.7	V
16136.188	37.0	-33.0	39.5	30.51	54.0	17.0	H
17712.625	40.0	-31.4	42.1	29.36	54.0	14.0	V
17965.625	40.0	-31.2	41.7	29.40	54.0	14.0	H

802.11ax-HT40

Channel 151

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)
5405.500	40.0	-27.6	32.7	34.86	54.0	14.0	V
5440.000	40.0	-27.7	32.8	34.94	54.0	14.0	V
11510.000	33.9	-35.1	39.2	29.73	54.0	20.1	H
16165.750	37.3	-32.9	39.6	30.57	54.0	16.7	H
17725.000	40.4	-31.4	42.1	29.72	54.0	13.6	H
17955.313	40.0	-31.2	41.8	29.44	54.0	14.0	H

Channel 159

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)
5396.500	40.0	-27.6	32.7	34.85	54.0	14.0	V
5424.000	40.0	-27.7	32.8	34.97	54.0	14.0	V
11589.750	34.0	-34.9	39.2	29.76	54.0	20.0	V
16153.375	37.3	-32.9	39.5	30.64	54.0	16.7	H
17733.938	39.9	-31.4	42.1	29.26	54.0	14.1	V
17959.438	40.1	-31.2	41.8	29.51	54.0	13.9	H

802.11ax-HT80

Channel 155

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)
5392.000	40.1	-27.6	32.7	34.99	54.0	13.9	V
5409.500	40.1	-27.7	32.7	35.00	54.0	13.9	V
11549.875	33.8	-35.0	39.2	29.57	54.0	20.2	H
16147.188	37.2	-32.9	39.5	30.57	54.0	16.8	V
17725.000	40.4	-31.4	42.1	29.71	54.0	13.6	V
17964.250	40.0	-31.2	41.7	29.42	54.0	14.0	H

802.11ac-HT80

Channel 155

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)
5391.500	40.1	-27.6	32.7	34.98	54.0	13.9	V
5397.000	40.1	-27.6	32.7	34.95	54.0	13.9	V
11549.875	33.7	-35.0	39.2	29.45	54.0	20.3	V
16086.688	37.0	-33.0	39.3	30.66	54.0	17.0	V
17725.688	40.2	-31.4	42.1	29.58	54.0	13.8	H
17873.500	40.0	-31.4	41.9	29.49	54.0	14.0	V

Peak Results:
802.11a

Channel 149

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)
5650.748	55.21	-27.57	33.02	49.76	68.75	13.54	H
5653.464	55.92	-27.57	33.02	50.47	70.76	14.84	H
11490.062	46.87	-35.09	39.20	42.76	74.00	27.13	H
17235.156	51.41	-31.89	41.77	41.53	68.30	16.89	H
17480.594	54.36	-31.53	42.35	43.54	68.30	13.94	V
17600.906	54.79	-31.34	42.26	43.87	68.30	13.51	H

Channel 157

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)
5762.500	57.34	-27.44	33.18	51.61	68.30	10.96	H
5807.500	57.45	-27.50	33.24	51.70	68.30	10.85	H
11570.156	46.41	-34.94	39.19	42.17	74.00	27.59	V
17355.125	51.47	-31.77	42.06	41.18	68.30	16.83	V
17488.500	54.45	-31.52	42.37	43.60	68.30	13.85	V
17614.656	54.64	-31.32	42.24	43.72	68.30	13.66	H

Channel 165

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)
5922.240	54.53	-27.21	33.40	48.35	70.24	15.71	H
5924.439	54.84	-27.21	33.40	48.64	68.61	13.78	V
11649.906	45.98	-34.73	39.17	41.54	74.00	28.02	H
17470.625	54.20	-31.55	42.33	43.42	68.30	14.10	H
17475.094	53.49	-31.54	42.34	42.69	68.30	14.81	H
17604.344	54.39	-31.33	42.25	43.48	68.30	13.91	H

802.11n-HT20

Channel 149

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)
5651.552	55.82	-27.57	33.02	50.37	69.35	13.53	V
5653.177	56.23	-27.57	33.02	50.78	70.55	14.32	H
11490.062	46.02	-35.09	39.20	41.91	74.00	27.98	V
17235.156	52.98	-31.89	41.77	43.10	68.30	15.32	V
17476.125	54.10	-31.54	42.34	43.30	68.30	14.20	V
17589.219	54.38	-31.36	42.27	43.46	68.30	13.92	H

Channel 157

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)
5764.500	57.27	-27.44	33.18	51.54	68.30	11.03	H
5808.000	58.80	-27.50	33.24	53.06	68.30	9.50	V
11570.156	45.53	-34.94	39.19	41.29	74.00	28.47	V
17355.125	51.84	-31.77	42.06	41.55	68.30	16.46	V
17587.156	54.37	-31.36	42.28	43.45	68.30	13.93	H
17672.750	53.81	-31.35	42.16	43.00	68.30	14.49	V

Channel 165

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)
5923.059	54.79	-27.21	33.40	48.60	69.64	14.85	H
5923.462	55.37	-27.21	33.40	49.18	69.34	13.97	V
11649.906	46.60	-34.73	39.17	42.16	74.00	27.40	H
17475.094	52.46	-31.54	42.34	41.66	68.30	15.84	V
17647.656	54.01	-31.31	42.19	43.13	68.30	14.29	V
17741.500	54.75	-31.46	42.06	44.15	74.00	19.25	H

802.11n-HT40

Channel 151

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)
5652.900	54.95	-27.57	33.02	49.50	70.35	15.39	H
5653.967	55.50	-27.57	33.02	50.05	71.14	15.64	V
11510.000	46.17	-35.06	39.20	42.03	68.30	22.12	V
17265.062	50.58	-31.89	41.84	40.63	68.30	17.72	V
17470.969	54.62	-31.55	42.33	43.84	68.30	13.68	H
17579.250	54.49	-31.37	42.29	43.58	68.30	13.81	H

Channel 159

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)
5921.104	54.76	-27.21	33.39	48.58	71.08	16.32	V
5923.735	54.90	-27.21	33.40	48.71	69.14	14.24	V
11590.094	46.09	-34.91	39.18	41.82	68.30	22.21	H
17385.031	51.49	-31.71	42.13	41.07	68.30	16.81	V
17507.406	54.27	-31.49	42.39	43.37	68.30	14.03	H
17618.438	54.01	-31.31	42.23	43.09	68.30	14.29	V

802.11ax-HT20

Channel 149

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)
5651.768	55.3	-27.6	33.0	49.83	69.5	14.2	V
5654.413	55.8	-27.6	33.0	50.32	71.5	15.7	H
11490.063	46.0	-35.1	39.2	41.86	74.0	28.0	H
17235.156	51.4	-31.9	41.8	41.50	68.3	16.9	V
17601.250	54.7	-31.3	42.3	43.81	68.3	13.6	H
17692.688	53.8	-31.4	42.1	43.05	68.3	14.5	V

Channel 157

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)
5765.000	58.8	-27.4	33.2	53.05	68.3	9.5	V
5808.000	59.8	-27.5	33.2	54.06	68.3	8.5	H
11570.156	46.4	-34.9	39.2	42.20	74.0	27.6	V
17355.125	50.6	-31.8	42.1	40.33	68.3	17.7	H
17594.472	55.0	-31.4	42.3	44.05	68.3	13.3	V
17673.094	53.1	-31.4	42.2	42.28	68.3	15.2	H

Channel 165

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)
5925.500	55.0	-27.2	33.4	48.78	67.8	12.9	V
5924.353	54.9	-27.2	33.4	48.75	68.7	13.7	V
11649.906	46.1	-34.7	39.2	41.68	74.0	27.9	V
17475.094	52.3	-31.5	42.3	41.47	68.3	16.0	H
17590.938	55.3	-31.4	42.3	44.39	68.3	13.0	H
17659.000	54.1	-31.3	42.2	43.21	68.3	14.2	H

802.11ax-HT40

Channel 151

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)
5654.126	55.5	-27.6	33.0	50.01	71.3	15.8	V
5657.029	55.4	-27.6	33.0	49.90	73.4	18.0	V
11510.000	45.9	-35.1	39.2	41.79	68.3	22.4	V
17265.063	50.1	-31.9	41.8	40.19	68.3	18.2	H
17519.438	54.6	-31.5	42.4	43.65	68.3	13.7	V
17631.844	55.3	-31.3	42.2	44.35	68.3	13.0	H

Channel 159

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)
5919.322	55.4	-27.2	33.4	49.25	72.4	17.0	V
5921.076	55.4	-27.2	33.4	49.23	71.1	15.7	H
11590.094	47.0	-34.9	39.2	42.72	68.3	21.3	H
17385.031	50.8	-31.7	42.1	40.37	68.3	17.5	V
17572.375	54.2	-31.4	42.3	43.30	68.3	14.1	V
17648.344	54.9	-31.3	42.2	43.98	68.3	13.4	V

802.11ax-HT80

Channel 155

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)
5651.147	53.9	-27.4	32.7	48.58	71.08	17.2	V
5652.768	54.0	-27.5	32.7	48.71	69.14	15.2	V
5921.312	46.1	-34.9	39.2	41.82	68.3	22.2	V
5923.535	48.7	-31.8	39.3	41.07	68.3	19.6	V
17325.149	54.1	-31.4	42.1	43.37	68.3	14.2	H
17661.65	53.6	-31.4	41.9	43.09	68.3	14.7	V

802.11ac-HT80

Channel 155

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)
5651.168	54.0	-27.4	32.7	48.75	71.08	17.0	V
5652.138	54.6	-27.5	32.7	49.33	69.14	14.6	V
5922.152	47.1	-34.9	39.2	42.82	68.3	21.2	H
5923.177	48.0	-31.8	39.3	40.46	68.3	20.3	H
17325.156	56.0	-31.4	42.1	45.31	68.3	12.3	V
17540.757	54.3	-31.4	41.9	43.78	68.3	14.0	H

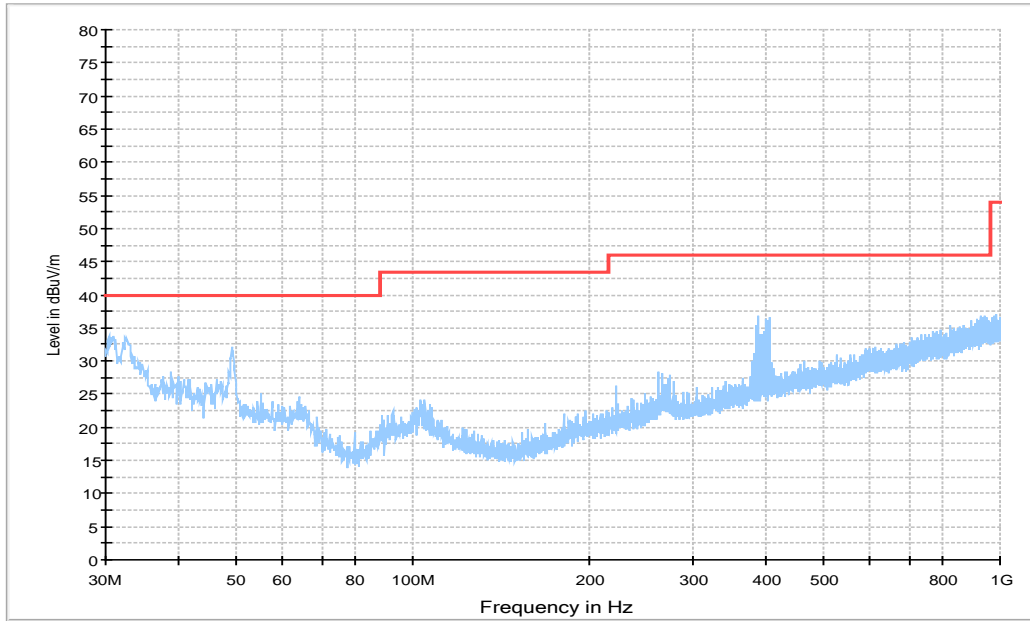
Note: the spurious emission above 18G is noise only

Conclusion: pass

C.1.2 Radiated Spurious Emission- Below 1GHz

WOSRT CASE BELOW 1GHz

- FCC Part 15C 30-1G Limit
- Peak Preview Result
- ◆ Final Result QPK



BELOW 30MHz

There are no emissions found below 30MHz with in 20dB of the limit.

C.1.3 Band Edges Compliance– Radiated

Measurement Result:

SPEED:

Mode	Channel	Test Results	Conclusion
802.11a	5745 MHz(CH149)	Fig.1	P
	5825 MHz(CH165)	Fig.2	P
802.11n HT20	5745 MHz(CH149)	Fig.3	P
	5825 MHz(CH165)	Fig.4	P
802.11n HT40	5755 MHz(CH151)	Fig.5	P
	5795 MHz(CH159)	Fig.6	P
802.11ax HT20	5745 MHz(CH149)	Fig.7	P
	5825 MHz(CH165)	Fig.8	P
802.11ax HT40	5755 MHz(CH151)	Fig.9	P
	5795 MHz(CH159)	Fig.10	P
802.11ax HT80	5775 MHz(CH155)	Fig.11 Fig.12	P
802.11ac HT80	5775 MHz(CH155)	Fig.13 Fig.14	P

The measurements were performed separately in Chain A, Chain B, and MIMO (Chain A+B), and only the worst cases are shown in this section.

Conclusion: PASS

AWAN:

Mode	Channel	Test Results	Conclusion
802.11a	5745 MHz(CH149)	Fig.15	P
	5825 MHz(CH165)	Fig.16	P
802.11n HT20	5745 MHz(CH149)	Fig.17	P
	5825 MHz(CH165)	Fig.18	P
802.11n HT40	5755 MHz(CH151)	Fig.19	P
	5795 MHz(CH159)	Fig.20	P
802.11ax HT20	5745 MHz(CH149)	Fig.21	P
	5825 MHz(CH165)	Fig.22	P
802.11ax HT40	5755 MHz(CH151)	Fig.23	P
	5795 MHz(CH159)	Fig.24	P
802.11ax HT80	5775 MHz(CH155)	Fig.25 Fig.26	P
802.11ac HT80	5775 MHz(CH155)	Fig.27 Fig.28	P

The measurements were performed separately in Chain A, Chain B, and MIMO (Chain A+B), and only the worst cases are shown in this section.

Conclusion: PASS

Test graphs as below:

— Peak Limits
— Peak Result

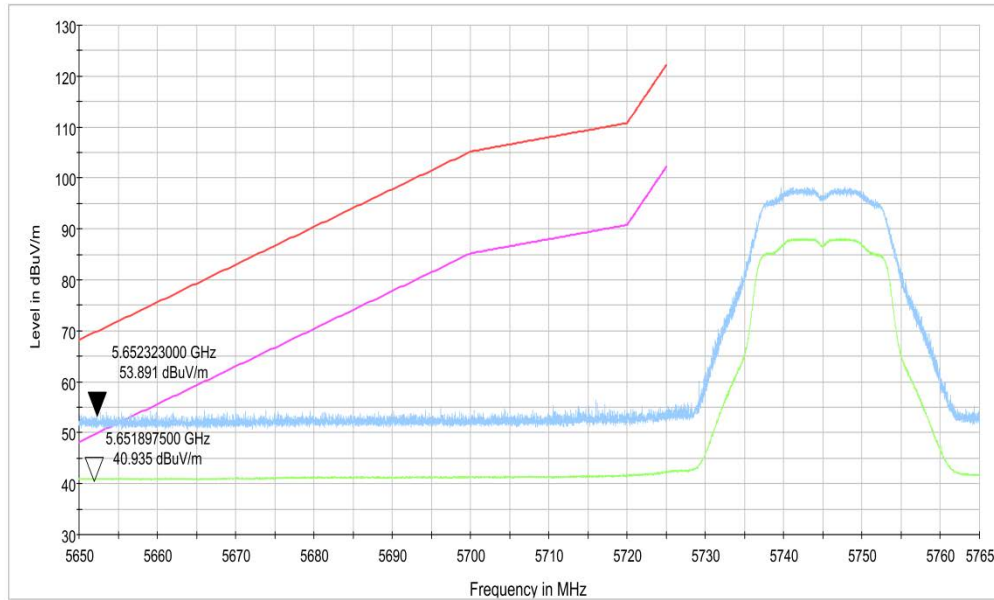


Fig. 1 Band Edges (802.11a, CH149, 5745MHz)

— Peak Limits
— Peak Result

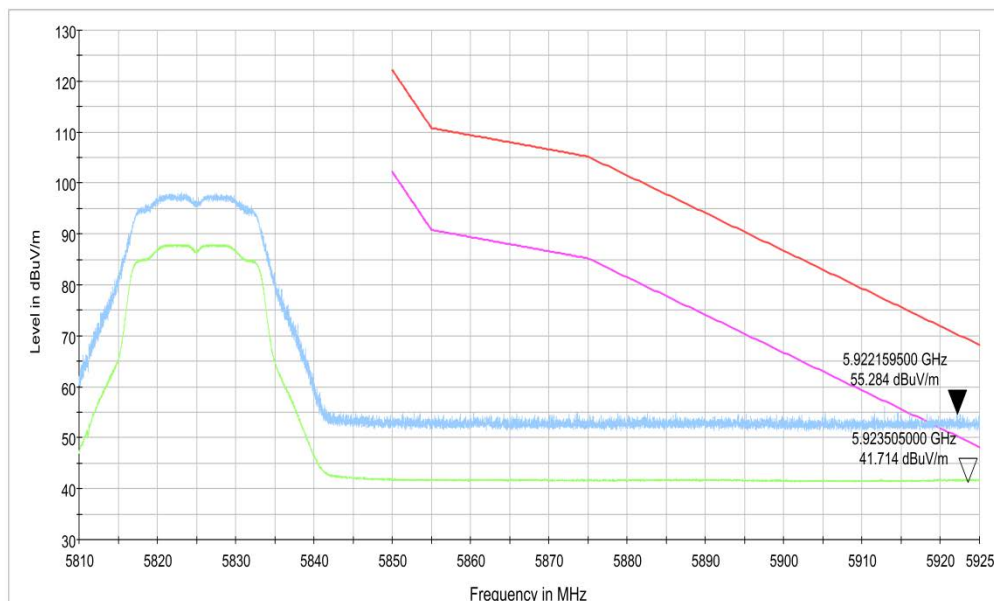


Fig. 2 Band Edges (802.11a, CH165, 5825MHz)

— Peak Limits
— Peak Result

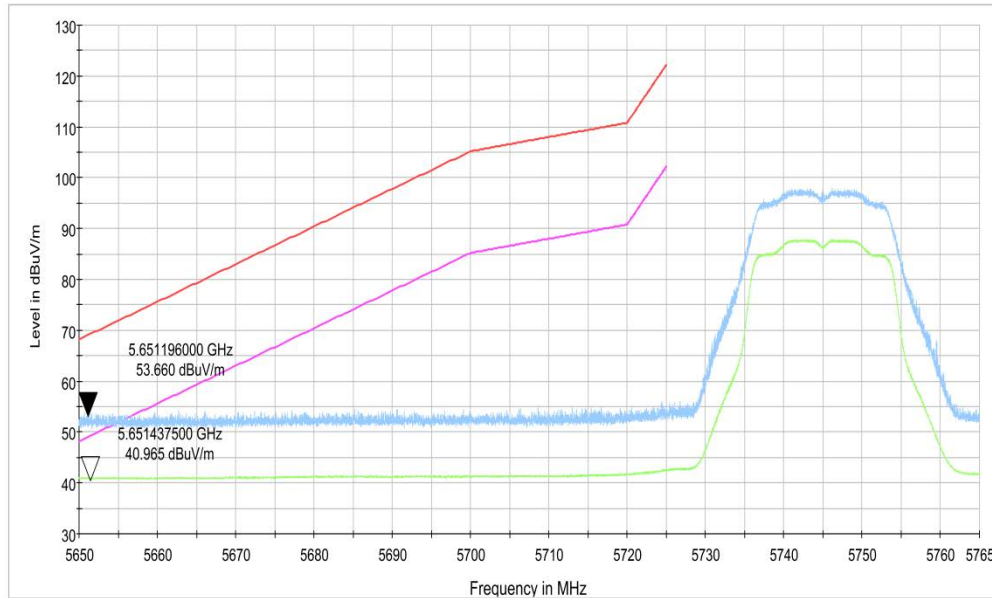


Fig. 3 Band Edges (802.11n-HT20, CH149, 5745MHz)

— Peak Limits
— Peak Result

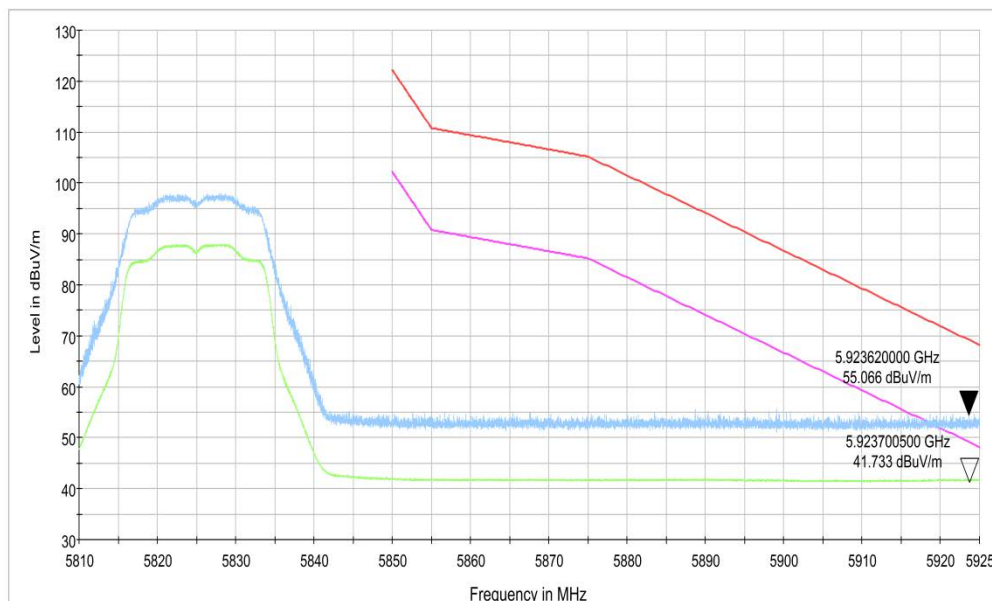


Fig. 4 Band Edges (802.11n-HT20, CH165, 5825MHz)

— Peak Limits
— Peak Result

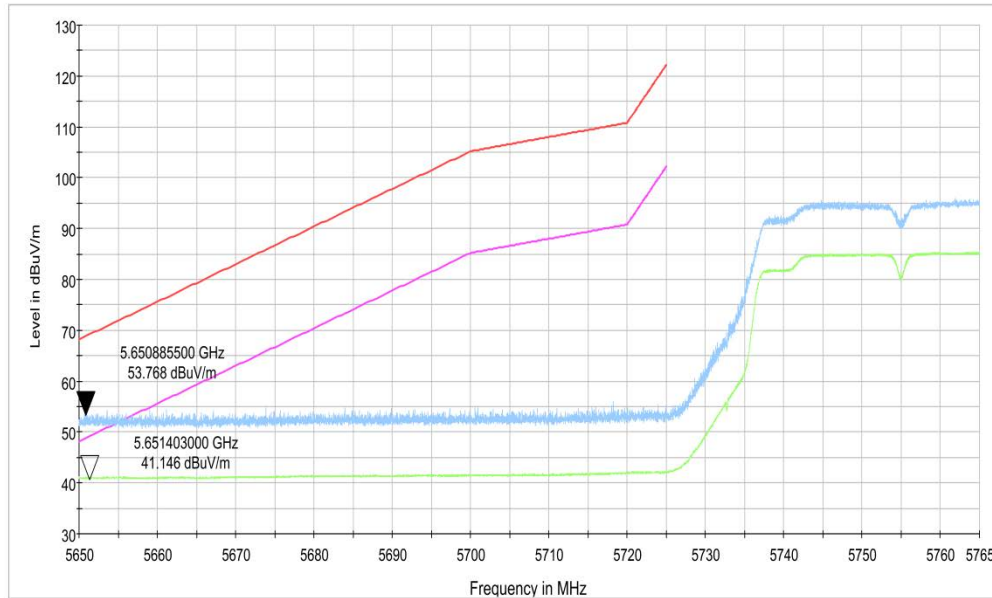


Fig. 5 Band Edges (802.11n-HT40, CH151, 5755MHz)

— Peak Limits
— Peak Result

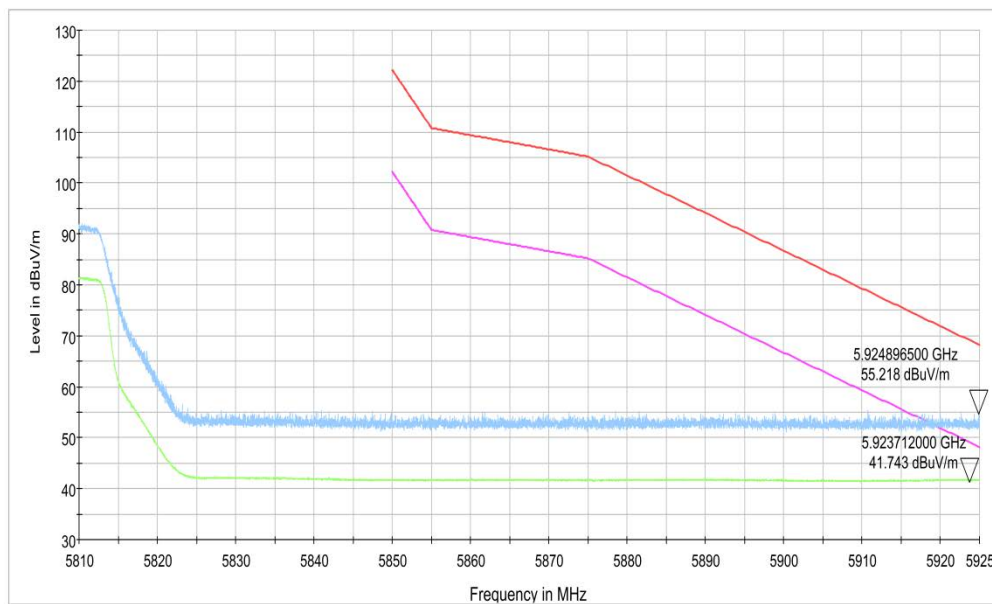


Fig. 6 Band Edges (802.11n-HT40, CH159, 5795MHz)

— Peak Limits
— Peak Result

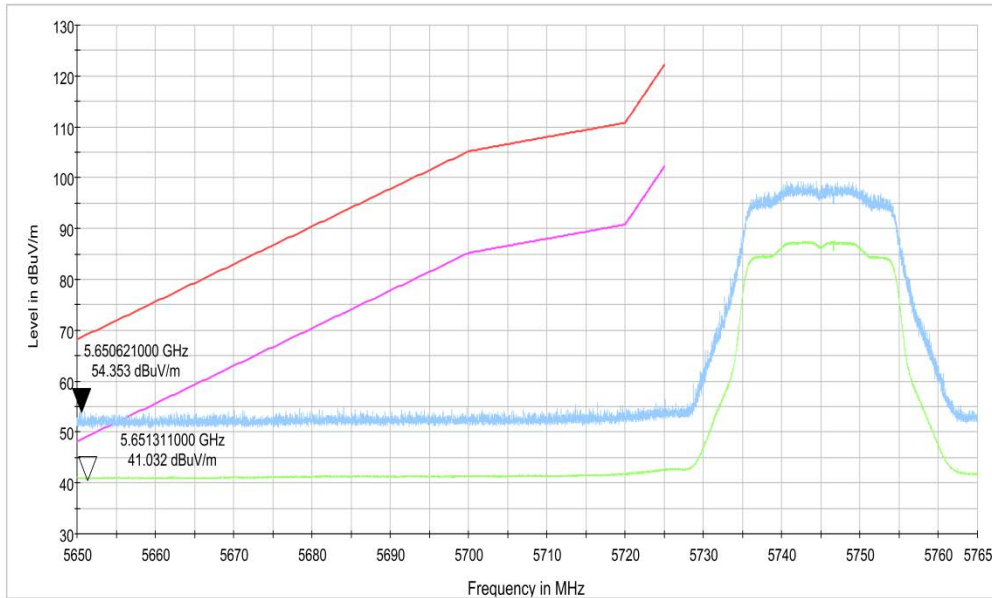


Fig. 7 Band Edges (802.11ax-HT20, CH149, 5745MHz)

— Peak Limits
— Peak Result

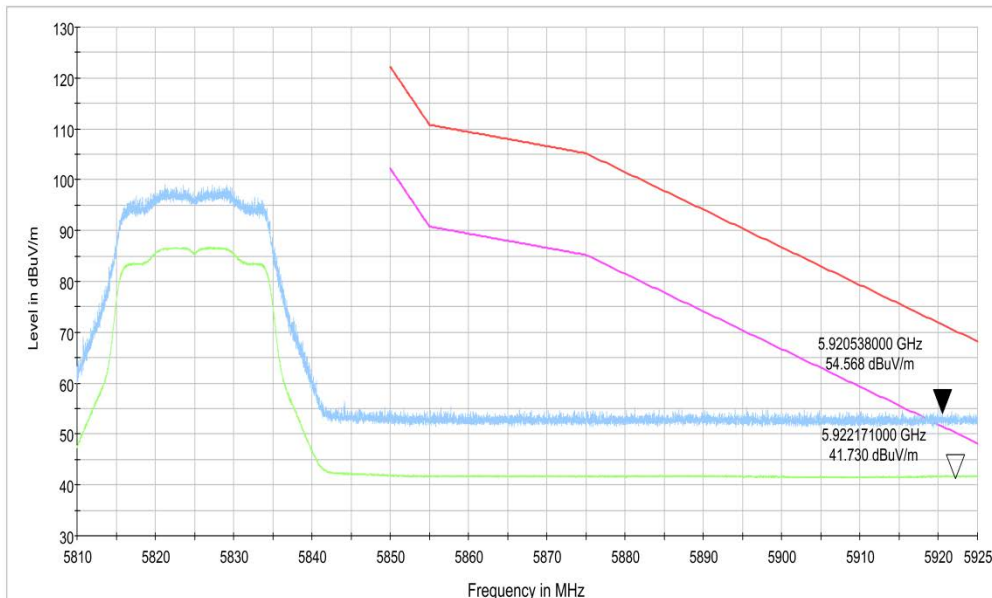


Fig. 8 Band Edges (802.11ax-HT20, CH165, 5825MHz)

— Peak Limits
— Peak Result

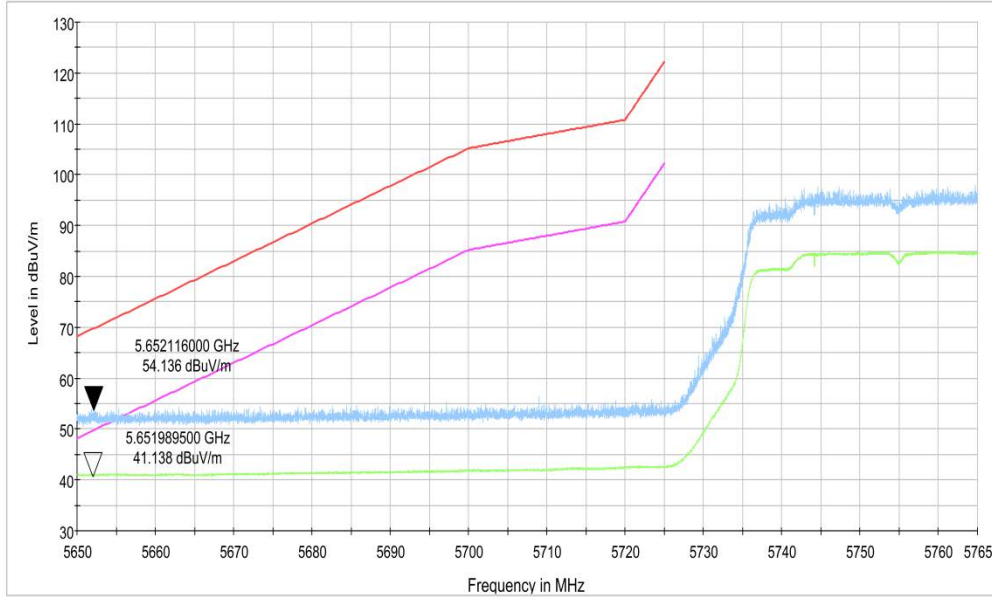


Fig. 9 Band Edges (802.11ax-HT40,CH151, 5755MHz)

— Peak Limits
— Peak Result

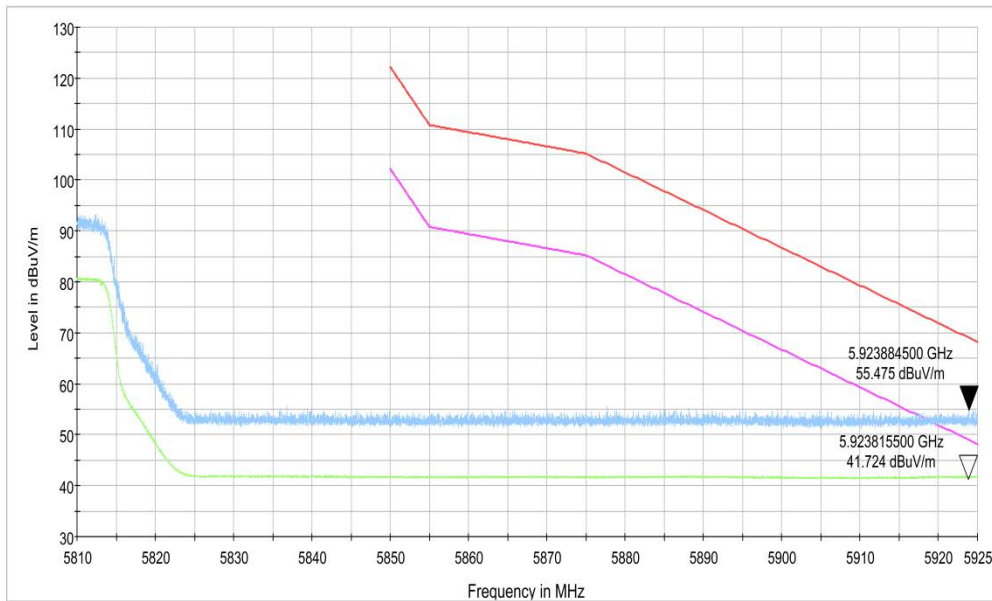


Fig. 10 Band Edges (802.11ax-HT40,CH159, 5795MHz)

— Peak Limits
— Peak Result

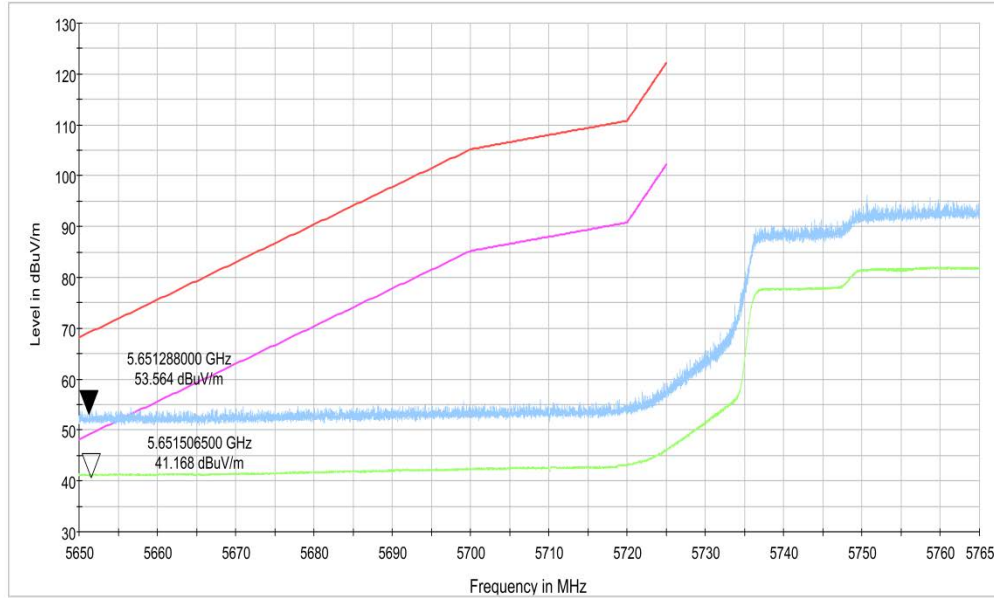


Fig. 11 Band Edges (802.11ax-HT80, CH155, 5775MHz)

— Peak Limits
— Peak Result

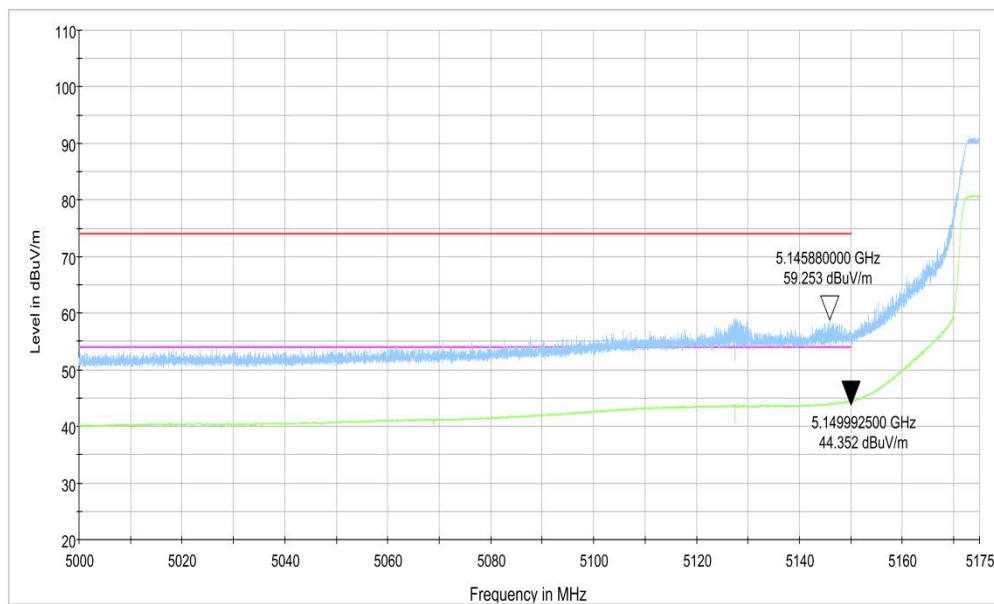


Fig. 12 Band Edges (802.11ax-HT80, CH155, 5775MHz)

— Peak Limits
 — Peak Result

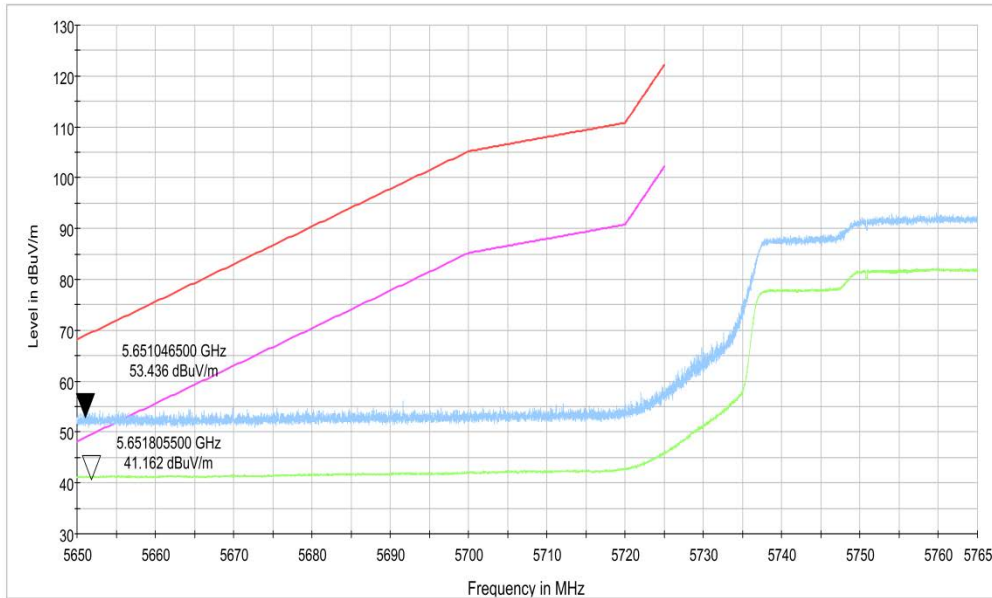


Fig. 13 Band Edges (802.11ac-HT80, CH155, 5775MHz)

— Peak Limits
 — Peak Result

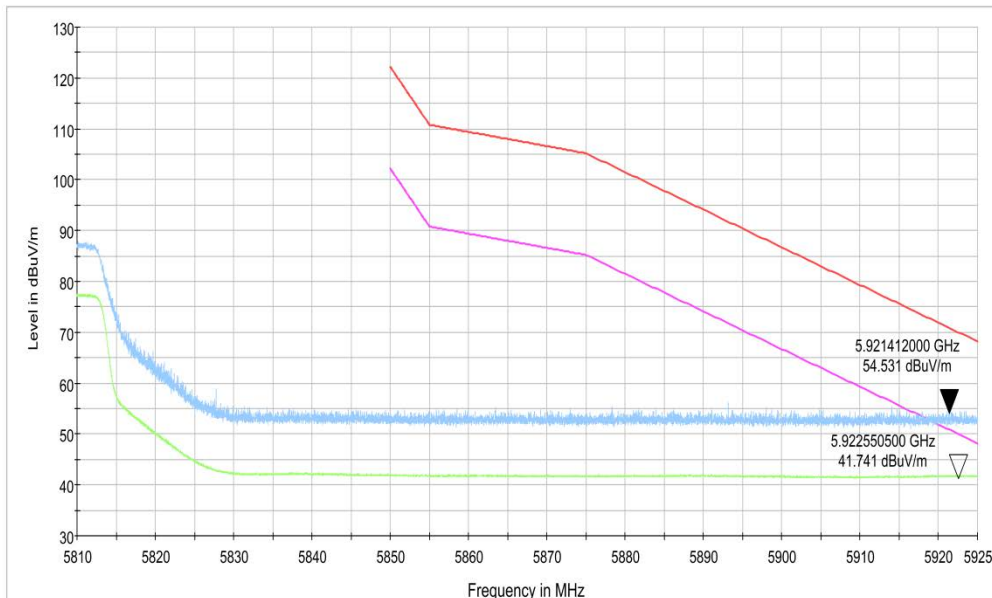


Fig. 14 Band Edges (802.11ax-HT80, CH155, 5775MHz)

— Peak Limits
— Peak Result

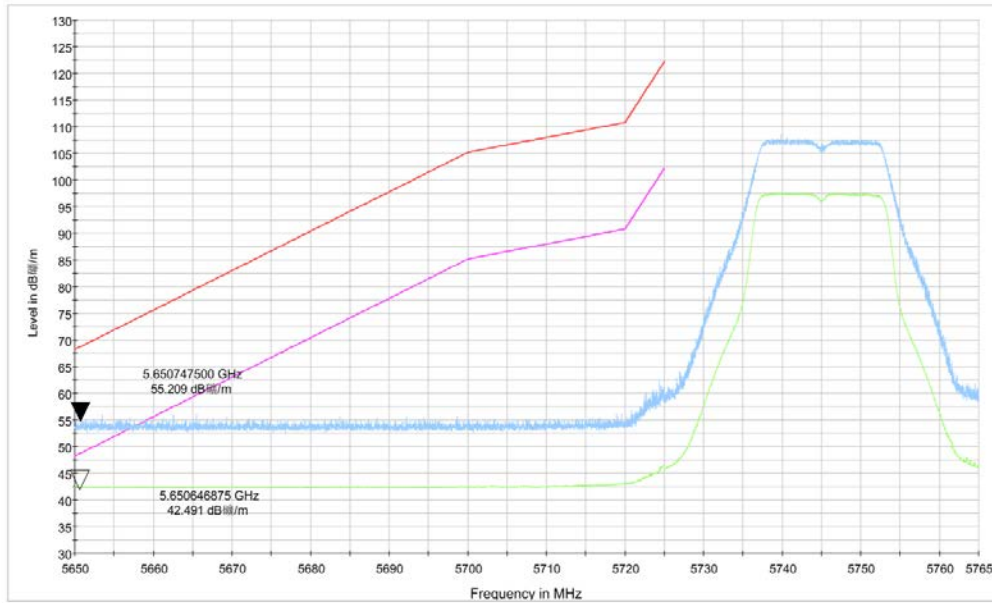


Fig. 15 Band Edges (802.11a, CH149, 5745MHz)

— Peak Limits
— Peak Result

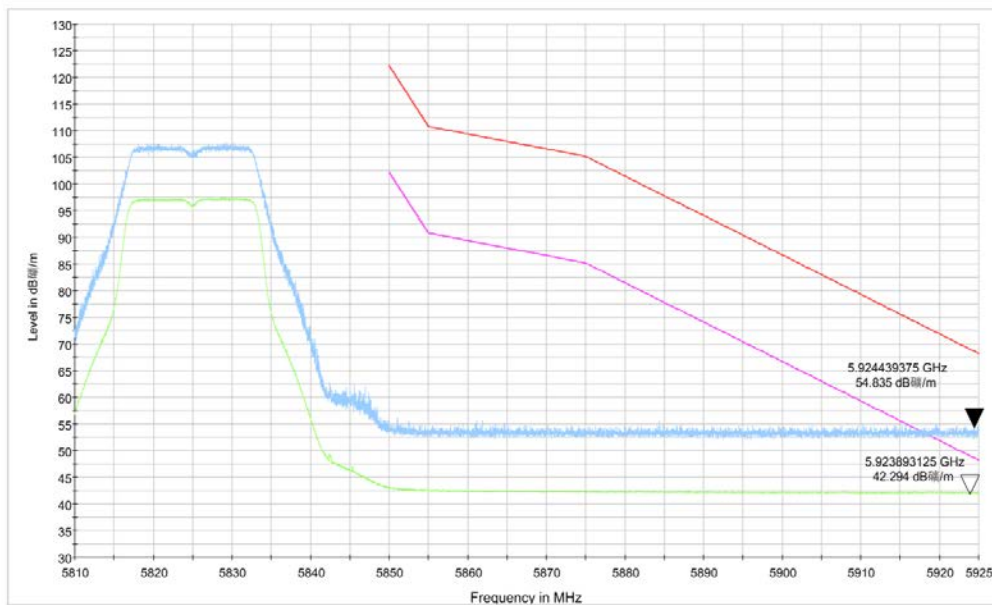


Fig. 16 Band Edges (802.11a, CH165, 5825MHz)

— Peak Limits
— Peak Result

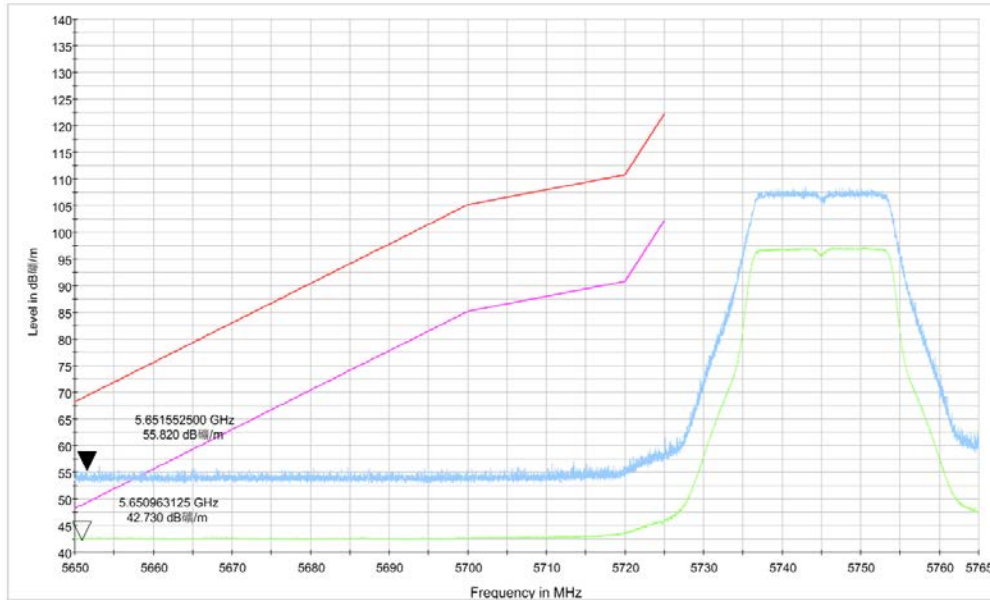


Fig. 17 Band Edges (802.11n-HT20, CH149, 5745MHz)

— Peak Limits
— Peak Result

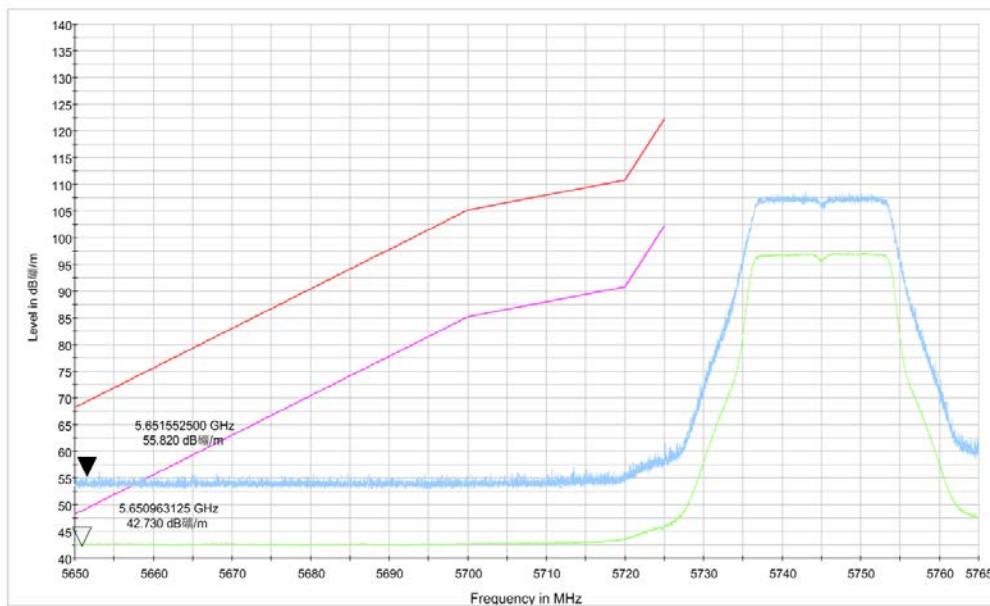


Fig. 18 Band Edges (802.11n-HT20, CH165, 5825MHz)

— Peak Limits
— Peak Result

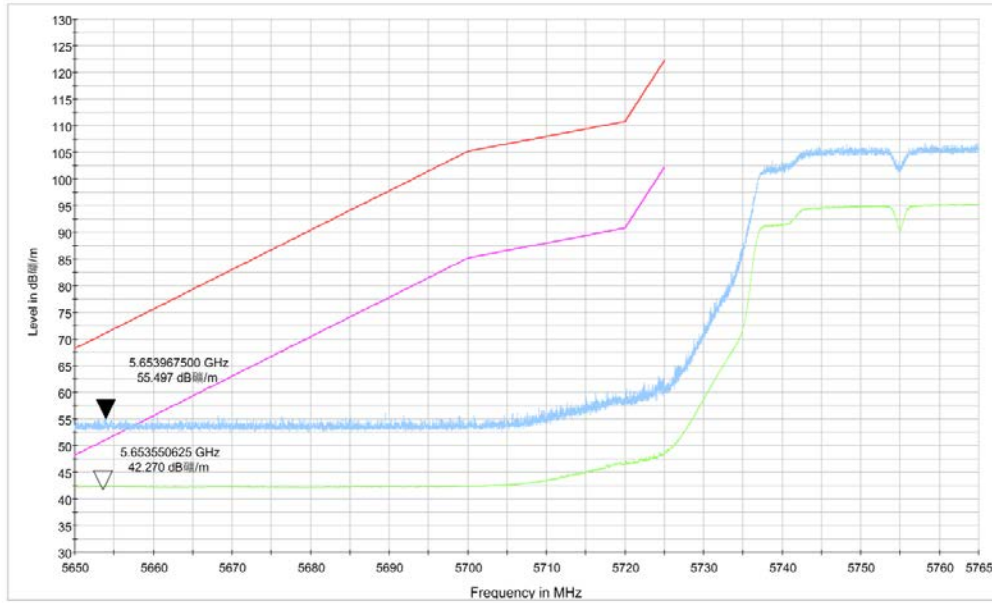


Fig. 19 Band Edges (802.11n-HT40, CH151, 5755MHz)

— Peak Limits
— Peak Result

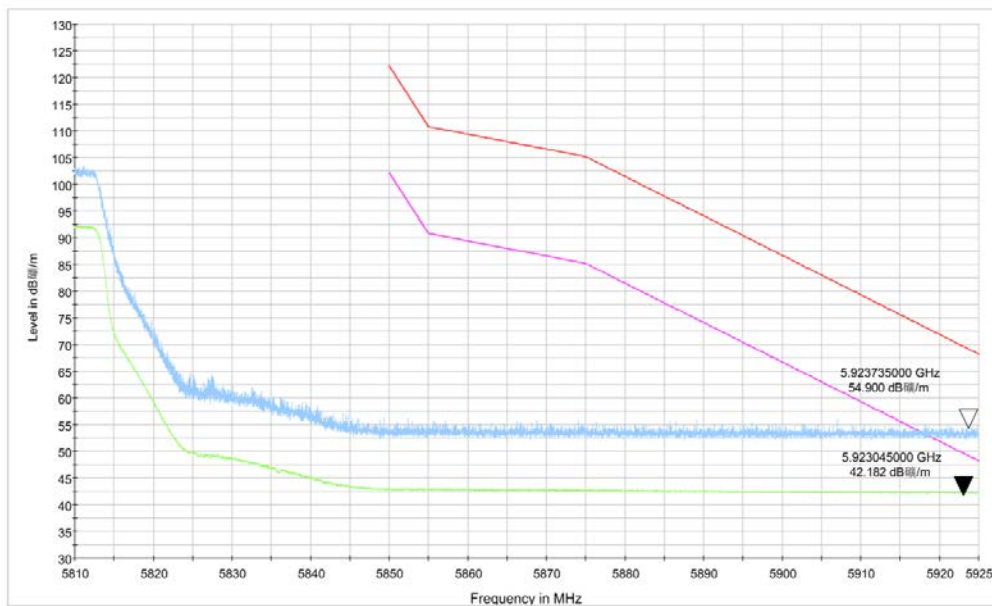


Fig. 20 Band Edges (802.11n-HT40, CH159, 5795MHz)

— Peak Limits
— Peak Result

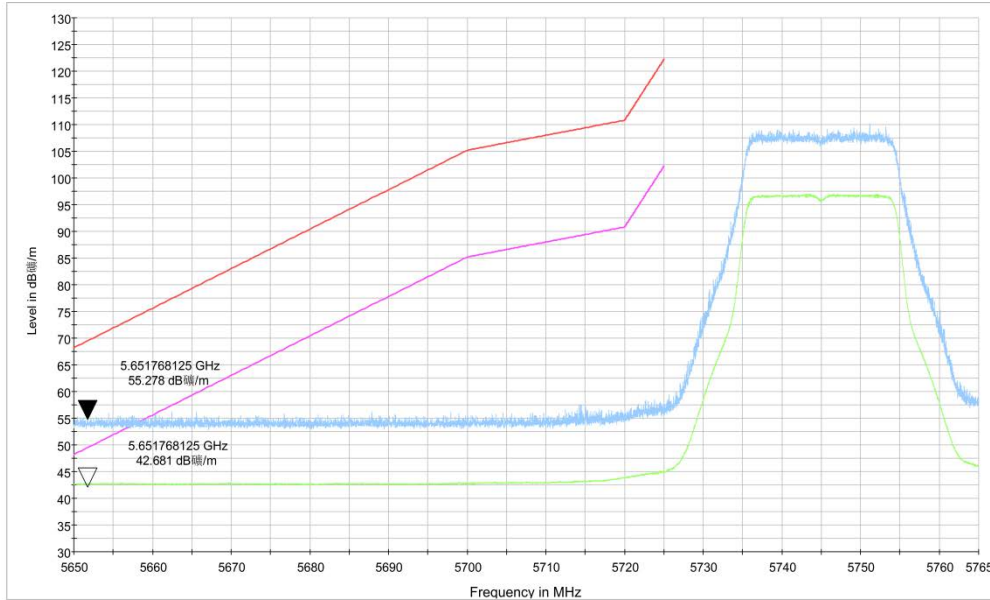


Fig. 21 Band Edges (802.11ax-HT20, CH149, 5745MHz)

— Peak Limits
— Peak Result

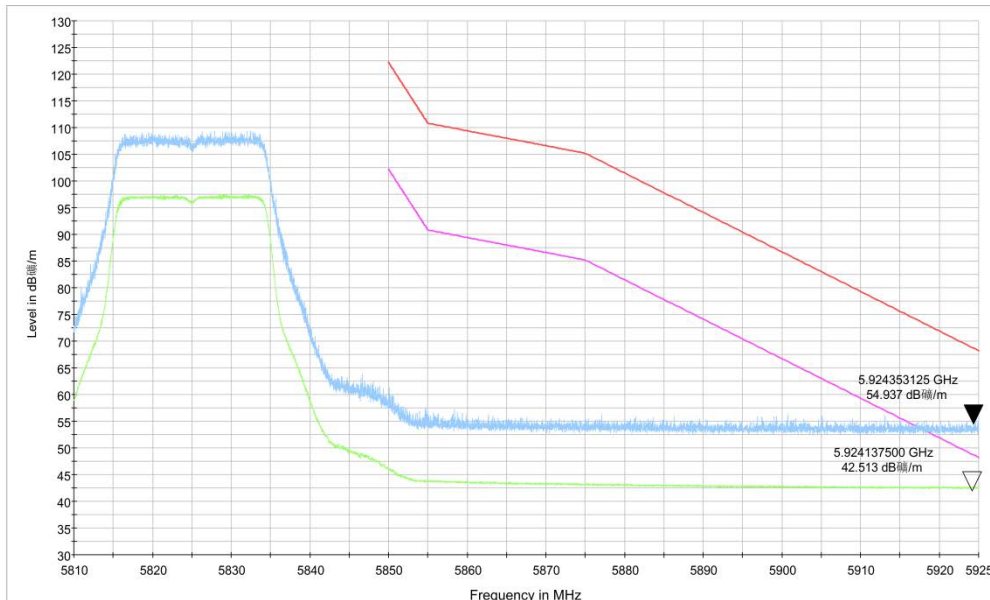


Fig. 22 Band Edges (802.11ax-HT20, CH165, 5825MHz)

— Peak Limits
— Peak Result

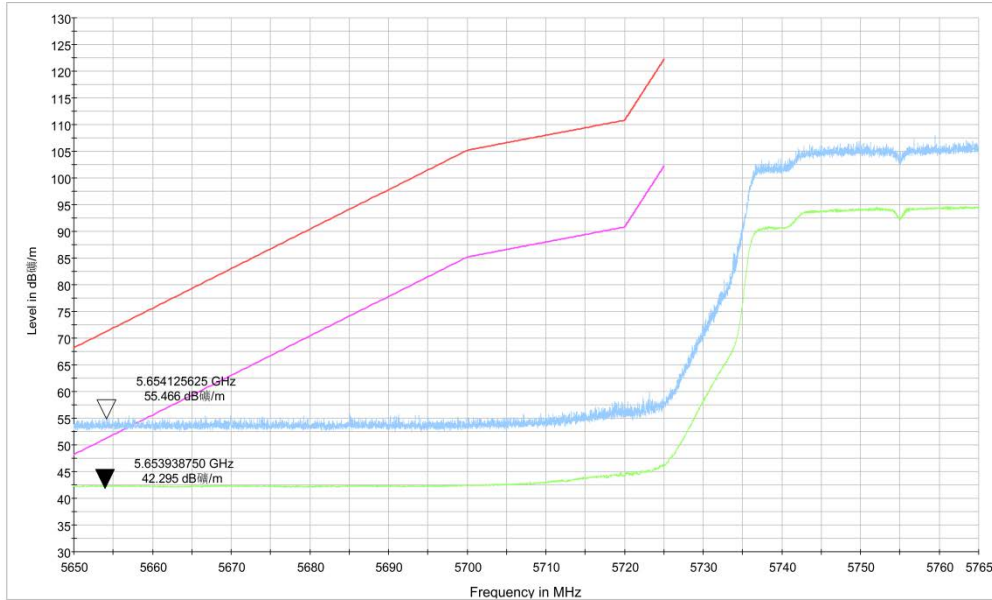


Fig. 23 Band Edges (802.11ax-HT40,CH151, 5755MHz)

— Peak Limits
— Peak Result

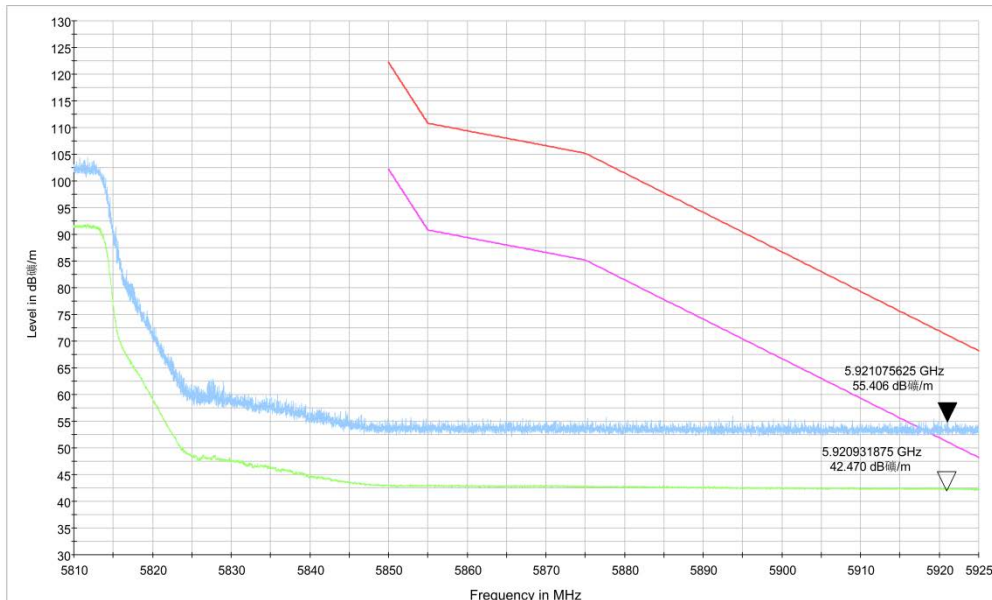


Fig. 24 Band Edges (802.11ax-HT40,CH159, 5795MHz)

— Peak Limits
— Peak Result

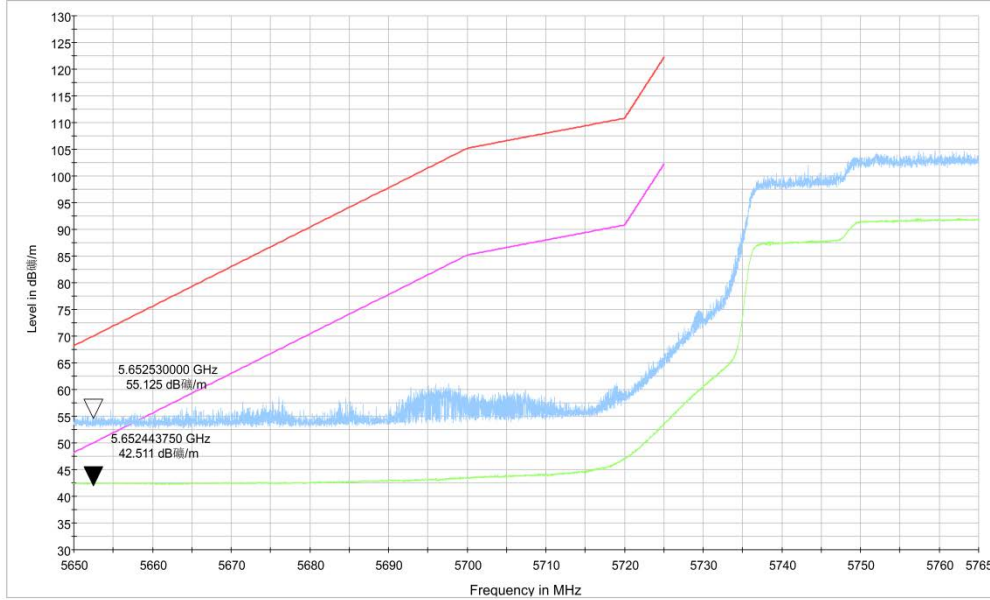


Fig. 25 Band Edges (802.11ax-HT80, CH155, 5775MHz)

— Peak Limits
— Peak Result

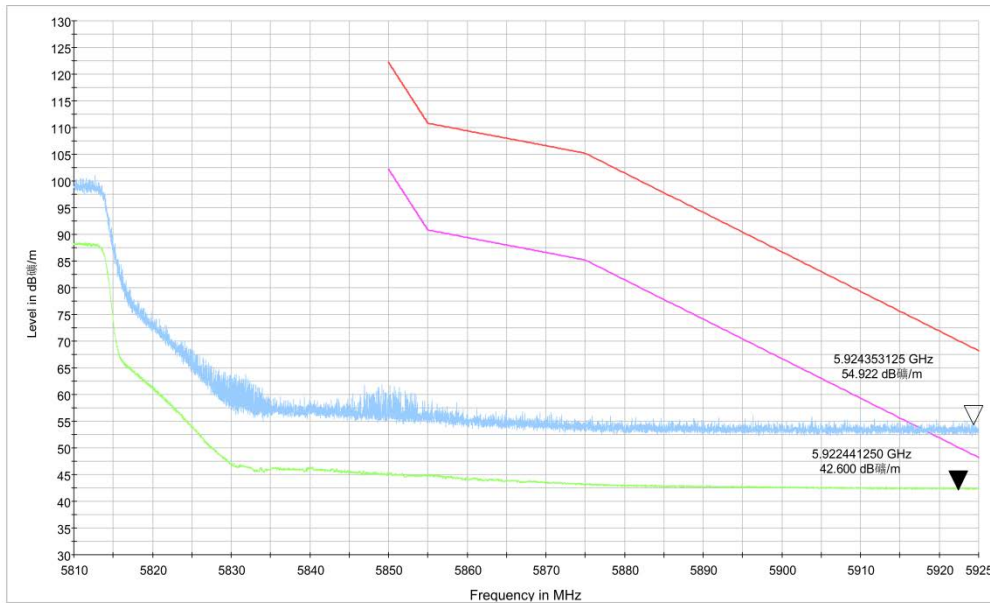


Fig. 26 Band Edges (802.11ax-HT80, CH155, 5775MHz)

— Peak Limits
 — Peak Result

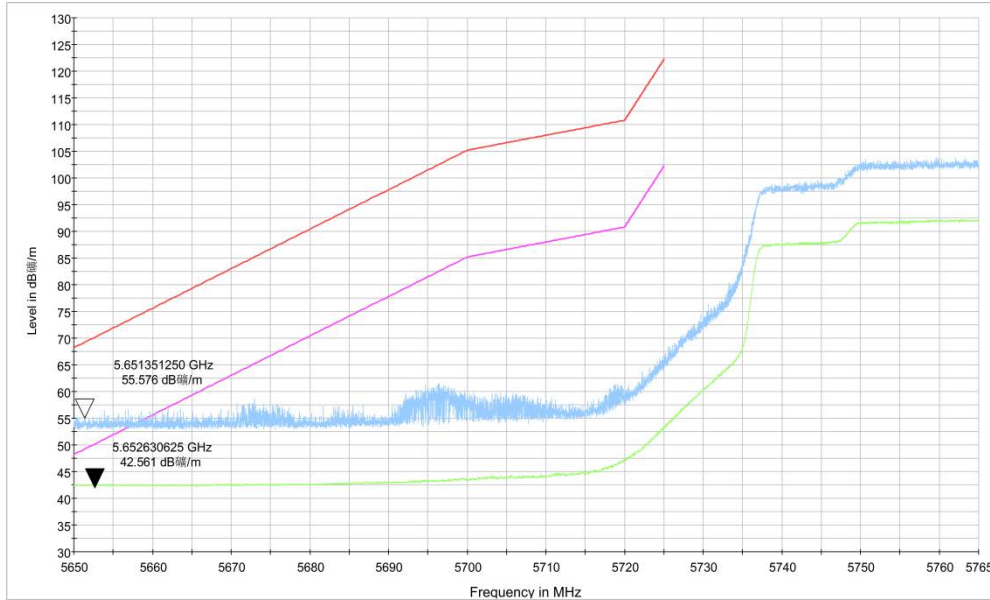


Fig. 27 Band Edges (802.11ac-HT80, CH155, 5775MHz)

— Peak Limits
 — Peak Result

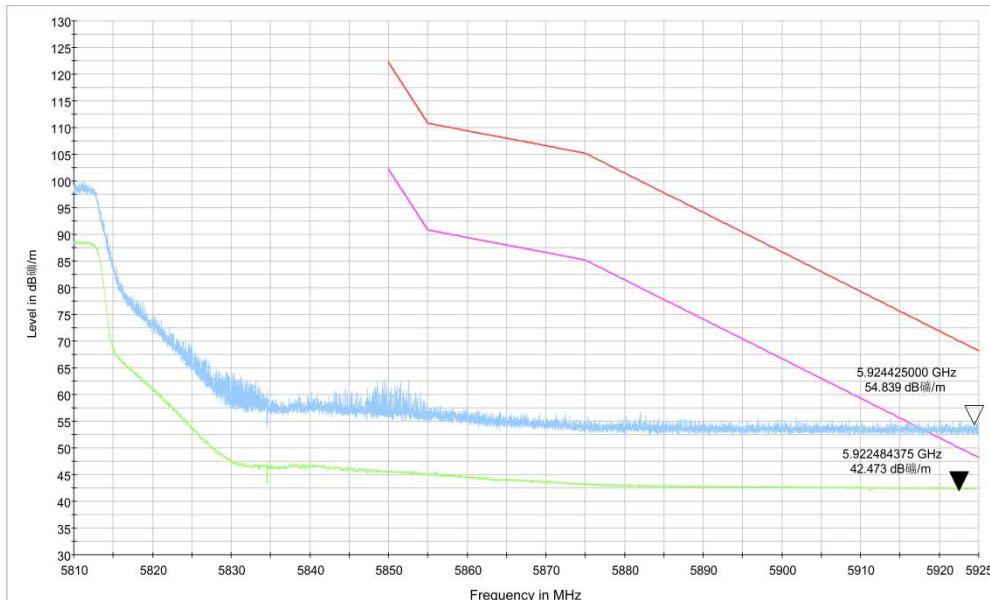


Fig. 28 Band Edges (802.11ax-HT80, CH155, 5775MHz)

C.2. AC Power-line Conducted Emission

Reference

FCC 47 CFR Part 15, Clause 15.407 Clause 15.207

Method of Measurement:

See Clause 6.2 of ANSI C63.10-2013 specifically.

See Clause 4 and Clause 5 of ANSI C63.10-2013 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.

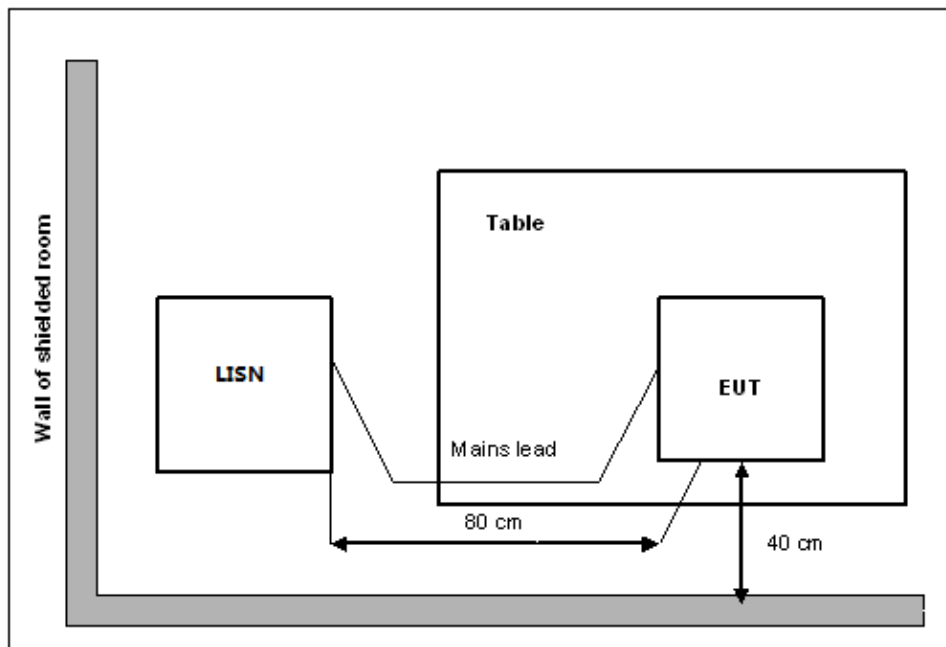
The measurement bandwidth is:

Frequency of Emission (MHz)	RBW/IF bandwidth	Sweep Time(s)
0.15-30	9kHz	1

Test Condition:

Voltage (V)	Frequency (Hz)
120	60

Measurement Setup



EUT Operating Mode and Test Conditions

The measurement of EUT is carried out under the transmit state.

The EUT is powered by an AC/travel adapter.

Measurement Result and limit:

WLAN (Quasi-peak Limit)

Frequency range (MHz)	Quasi-peak Limit (dB μ V)	Result (dB μ V)		Conclusion
		With charger		
		802.11a	Idle	
0.15 to 0.5	66 to 56	Fig.C.2.1	Fig.C.2.2	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 (dB μ V)	Result (dB μ V)		Conclusion
		With charger		
		802.11a	Idle	
0.15 to 0.5	56 to 46	Fig.C.2.1	Fig.C.2.2	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.

Note: all modes have been tested and the worst results shown here.

Conclusion: Pass

Test graphs as below:

Traffic:

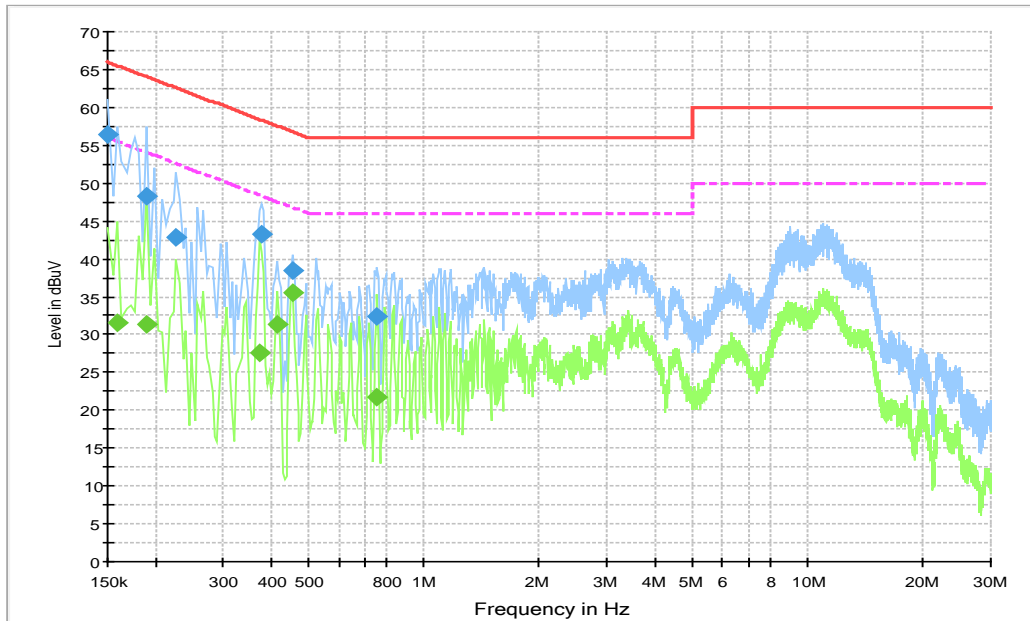


Fig.C.2.1 AC Power line Conducted Emission-802.11b

Note1: The graphic result above is the maximum of the measurements for both phase line and neutral line.

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	56.3	1000.	9.000	L1	19.6	9.7	66.0
0.190500	48.2	1000.	9.000	L1	19.7	15.8	64.0
0.226500	42.9	1000.	9.000	L1	19.7	19.7	62.6
0.379500	43.2	1000.	9.000	L1	19.8	15.1	58.3
0.456000	38.5	1000.	9.000	L1	19.8	18.3	56.8
0.757500	32.5	1000.	9.000	L1	19.7	23.5	56.0

Final Result 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.159000	31.6	1000.0	9.000	L1	19.7	23.9	55.5
0.190500	31.3	1000.0	9.000	L1	19.7	22.8	54.0
0.375000	27.7	1000.0	9.000	L1	19.8	20.7	48.4
0.415500	31.3	1000.0	9.000	L1	19.8	16.2	47.5
0.456000	35.5	1000.0	9.000	L1	19.8	11.3	46.8
0.757500	21.8	1000.0	9.000	L1	19.7	24.2	46.0

Idle:

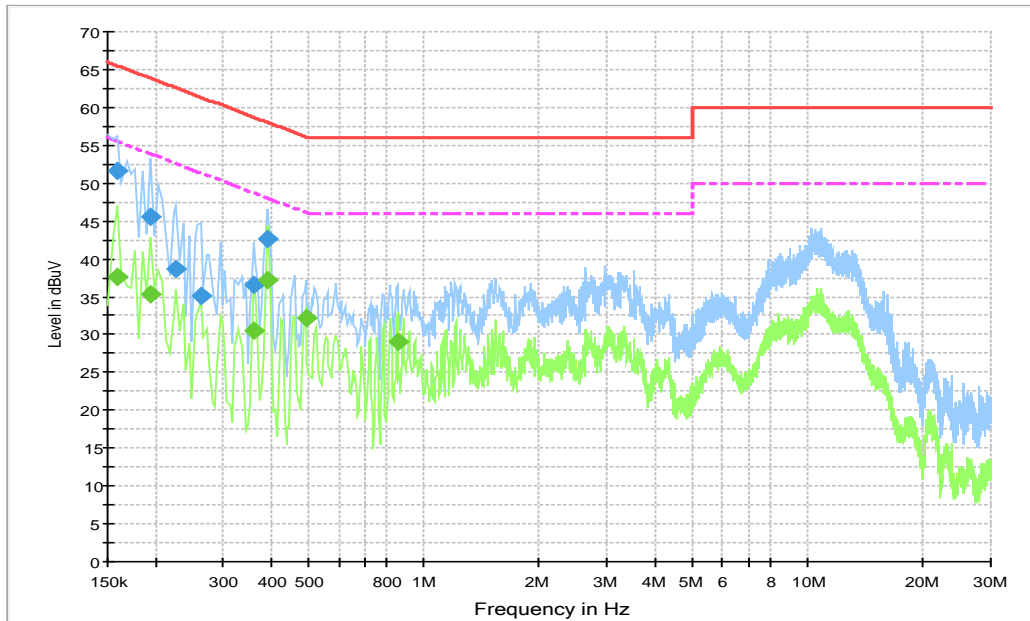


Fig.C.2.2 AC Power line Conducted Emission-Idle

Note1: The graphic result above is the maximum of the measurements for both phase line and neutral line.

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.159000	51.7	1000.	9.000	L1	19.7	13.8	65.5
0.195000	45.7	1000.	9.000	L1	19.6	18.2	63.8
0.226500	38.7	1000.	9.000	L1	19.7	23.9	62.6
0.262500	35.1	1000.	9.000	L1	19.7	26.3	61.4
0.361500	36.6	1000.	9.000	N	19.7	22.0	58.7
0.393000	42.6	1000.	9.000	L1	19.7	15.4	58.0

Final Result 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.159000	37.5	1000.0	9.000	L1	19.7	18.0	55.5
0.195000	35.3	1000.0	9.000	L1	19.6	18.5	53.8
0.361500	30.4	1000.0	9.000	N	19.7	18.3	48.7
0.393000	37.1	1000.0	9.000	L1	19.7	10.9	48.0
0.492000	32.2	1000.0	9.000	L1	19.8	13.9	46.1
0.852000	29.0	1000.0	9.000	L1	19.7	17.0	46.0

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