



TEST REPORT

No. I20D00149-SRD24

For

Client: Asiatelco Technologies Co.

Production: Home Phone Connect

Model Name: V810T/V810TD/V810V/

V810VD/V810A/V810AD

Brand Name: ATEL

FCC ID: XYO-V810

Hardware Version: V1.0

Software Version: QC25_V8100_1.0.4.802

Issued date: 2020-12-16

NOTE

1. The test results in this test report relate only to the devices specified in this report.
2. This report shall not be reproduced except in full without the written approval of East China Institute of Telecommunications.
3. For the test results, the uncertainty of measurement is not taken into account when judging the compliance with specification, and the results of measurement or the average value of measurement results are taken as the criterion of the compliance with specification directly.

Test Laboratory:

East China Institute of Telecommunications

Add: Block No.4, No.766, Jinggang Road, Pudong District, Shanghai, P. R. China

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Revision Version

Report Number	Revision	Date	Memo
I20D00149-SRD24	00	2020-12-01	Initial creation of test report
I20D00149-SRD24	01	2020-12-16	First modification of test report

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1. Test Laboratory

1.1. Testing Location

Company Name	East China Institute of Telecommunications
Address	Block No.4, No.766, Jinggang Road, Pudong District, Shanghai, P. R. China
Postal Code	200001
Telephone	+86 21 63843300
FCC registration No	CN1177

1.2. Testing Environment

Normal Temperature	15°C-35°C
Relative Humidity	20%-75%

1.3. Project Data

Project Leader	Chen Minfei
Testing Start Date	2020-10-30
Testing End Date	2020-12-15

1.4. Signature



Liu Yan
(Prepared this test report)



Fan Songyan
(Reviewed this test report)



Zheng Zhongbin
(Approved this test report)

2. Client Information

2.1. Applicant Information

Company Name	Asiatelco Technologies Co.
Address	#289 Bisheng Road, Building-8, 3F, Zhang jiang Hi-Tech Park, Pudong, Shanghai 201204, China
Telephone	/
Postcode	/

2.2. Manufacturer Information

Company Name	Asiatelco Technologies Co.
Address	#289 Bisheng Road, Building-8, 3F, Zhang jiang Hi-Tech Park, Pudong, Shanghai 201204, China
Telephone	/
Postcode	/

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

3.1. About EUT

Production	Home Phone Connect
Model name	V810T/V810TD/V810V/V810VD/ V810A/ V810AD
Occupied Channel Bandwidth	20 MHz: 802.11 a/n/ac 40 MHz: 802.11 n/ac 80 MHz: 802.11 ac
WLAN Frequency	UNII 1: 5150MHz-5250MHz
WLAN type of modulation	OFDM
Extreme Temperature	-20/+60°C
Nominal Voltage	4.75V
Extreme High Voltage	5.00 V
Extreme Low Voltage	5.25V
Maximum of Antenna Gain	WiFi 5GHz: 5.2dBi

Note:

- Photographs of EUT are shown in ANNEX A of this test report.
- The value of the antenna gain is provided by the customer. For specific antenna information, please check the antenna specifications of the customer.

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version	Date of receipt
N01	/	V1.0	QC25_V8100_1.0.4.802	2020-10-21
N04	/	V1.0	QC25_V8100_1.0.4.802	2020-10-21
N05	/	V1.0	QC25_V8100_1.0.4.802	2020-10-21

*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	Type	Manufacturer
AE1	RF cable	/	AE1

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

4. Reference Documents

4.1. Documents supplied by applicant

All technical documents are supplied by the client 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	Title 47 of the Code of Federal Regulations; Chapter I Part 15 - Radio frequency devices	2018-10-01
ANSI 63.10	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	2013
KDB 789033	Information Infrastructure (U-NII) Devices - Part 15, Subpart E	2017
KDB 905462	COMPLIANCE MEASUREMENT PROCEDURES FOR UNLICENSED-NATIONAL INFORMATION INFRASTRUCTURE DEVICES OPERATING IN THE 5250-5350 MHz AND 5470-5725 MHz BANDS INCORPORATING DYNAMIC FREQUENCY SELECTION	2016

5. Test Results

5.1. Summary of Test Results

Measurement Items	Sub-clause of Part15	Verdict
Maximum Output Power	15.407	P
Power Spectral Density	15.407	P
99% Occupied Bandwidth	15.407	P
Band edge compliance	15.407	P
Transmitter spurious emissions radiated	15.407	P
Spurious emissions radiated < 30 MHz	15.407	P
Spurious emissions conducted < 30 MHz	15.407	P
Peak Excursion	15.407	P
Frequency Stability	15.407	P
Transmit Power Control	15.407	P

Note: Please refer to section 6 for detail; please refer to Annex A in this test report for the detailed test results.

The following terms are used in the above table.

P	Pass, the EUT complies with the essential requirements in the standard.
NP	Not Perform, the test was not performed by ECIT.
NA	Not Applicable, the test was not applicable.
F	Fail, the EUT does not comply with the essential requirements in the standard.

Test Conditions

Tnom	Normal Temperature
Tmin	Low Temperature
Tmax	High Temperature
Vnom	Normal Voltage
Vmin	Low Voltage
Vmax	High Voltage

Hnom	Norm Humidity
Anom	Norm Air Pressure

For this report, all the test case listed above are tested under Normal Temperature and Normal Voltage, and also under norm humidity, the specific conditions as following:

Temperature	Tnom	25°C
Voltage	Vnom	5V
Humidity	Hnom	48%
Air Pressure	Anom	1010hPa

5.2. Statements

The V810T/V810TD/V810V/V810VD/ V810A/ V810AD is a parent model for testing.
ECIT only performed test cases which identified with P/NP/NA/F results in Annex A.

ECIT has verified that the compliance of the tested device specified in section 3 of this test report is successfully evaluated according to the procedure and test methods as defined in type certification requirement listed in section 4 of this test report.

6. Test Equipments Utilized

6.1. Conducted Test System

Item	Instrument Name	Type	SN	Manufacturer	Cal. Date	Cal. interval
1	Vector Signal Analyzer	FSQ40	200063	R&S	2020-05-10	1 year
2	DC Power Supply	ZUP60-14	LOC-220Z006-0007	TDL-Lambda	2020-05-10	1 year
3	Universal Radio Communication Tester	CMW500	104178	R&S	2020-05-10	1 year

6.2. Radiated Emission Test System

Item	Instrument Name	Type	Serial Number	Manufacturer	Cal. Date	Cal. interval
1	Universal Radio Communication Tester	CMU200	123123	R&S	2020-05-10	1 year
2	EMI Test Receiver	ESU40	100307	R&S	2020-05-10	1 year
3	TRILOG Broadband Antenna	VULB9163	VULB9163-515	Schwarzbeck	2020-02-28	2 years
4	Double- ridged Waveguide Antenna	ETS-3117	00135890	ETS	2020-02-28	2 years
5	2-Line V-Network	ENV216	101380	R&S	2020-05-10	1 year
6	Loop Antenna	AL-130R	121083	COM-POWER	2019-12-26	3 years

Climate chamber

No.	Equipment	Model	Serial Number	Manufacturer	Cal. Date	Cal. interval
1	Climate chamber	UT333 BT	C191995461	UNI-T	2020-05-10	1 year

Anechoic chamber

Fully anechoic chamber by ETS.

7. Measurement Uncertainty

Measurement uncertainty for all the testing in this report are within the limit specified in ECIT documents. The detailed measurement uncertainty is defined in ECIT documents.

Measurement Items	Range	Confidence Level	Calculated Uncertainty
Peak Output Power-Conducted	5100MHz-5850MHz	95%	$\pm 1.024\text{dB}$
Peak Power Spectral Density	5100MHz-5850MHz	95%	$\pm 1.024\text{dB}$
Occupied 6dB Bandwidth	5100MHz-5850MHz	95%	$\pm 62.04\text{Hz}$
Frequency Band Edges-Conducted	5100MHz-5850MHz	95%	$\pm 1.024\text{dB}$
Conducted Emission	30MHz-2GHz	95%	$\pm 0.90\text{dB}$
Conducted Emission	2GHz-3.6GHz	95%	$\pm 0.88\text{dB}$
Conducted Emission	3.6GHz-8GHz	95%	$\pm 0.96\text{dB}$
Conducted Emission	8GHz-20GHz	95%	$\pm 0.94\text{dB}$
Conducted Emission	20GHz-22GHz	95%	$\pm 0.88\text{dB}$
Conducted Emission	22GHz-26GHz	95%	$\pm 0.86\text{dB}$
Transmitter Spurious Emission-Radiated	9KHz-30MHz	95%	$\pm 5.66\text{dB}$
Transmitter Spurious Emission-Radiated	30MHz-1000MHz	95%	$\pm 4.98\text{dB}$
Transmitter Spurious Emission-Radiated	1000MHz -18000MHz	95%	$\pm 5.06\text{dB}$
Transmitter Spurious Emission-Radiated	18000MHz -40000MHz	95%	$\pm 5.20\text{dB}$
AC Power line Conducted Emission	0.15MHz-30MHz	95%	$\pm 3.66\text{ dB}$

8. Test Environment

Shielding Room1 (6.0 meters×3.0 meters×2.7 meters) did not exceed following limits along the conducted RF performance testing:

Temperature	Min. = 15 °C, Max. = 35 °C
Relative humidity	Min. = 20 %, Max. = 75 %
Shielding effectiveness	> 100 dB
Ground system resistance	< 0.5 Ω

Control room did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 35 °C
Relative humidity	Min. =30 %, Max. = 60 %
Shielding effectiveness	> 100 dB
Electrical insulation	> 10 kΩ
Ground system resistance	< 0.5 Ω

Fully-anechoic chamber1 (6.9 meters×10.9 meters×5.4 meters) did not exceed following limits along the EMC testing:

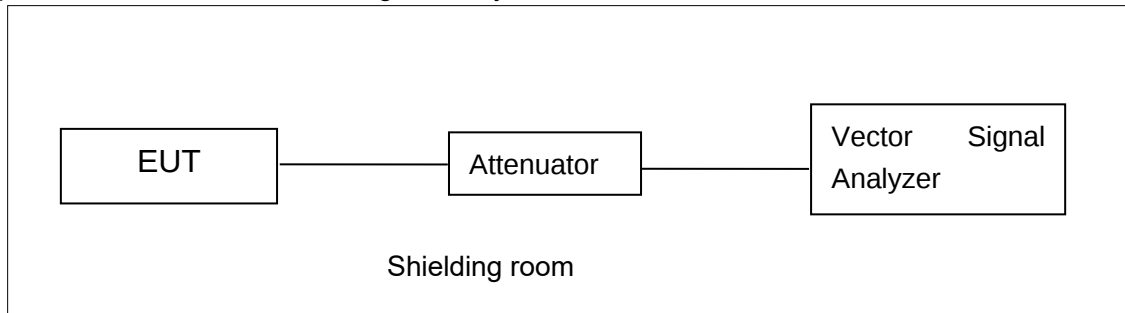
Temperature	Min. = 15 °C, Max. = 35 °C
Relative humidity	Min. = 25 %, Max. = 75 %
Shielding effectiveness	> 100 dB
Electrical insulation	> 10 kΩ
Ground system resistance	< 0.5 Ω
VSWR	Between 0 and 6 dB, from 1GHz to 18GHz
Site Attenuation Deviation	Between -4 and 4 dB,30MHz to 1GHz
Uniformity of field strength	Between 0 and 6 dB, from 80MHz to 3000 MHz

ANNEX A. Detailed Test Results

ANNEX 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

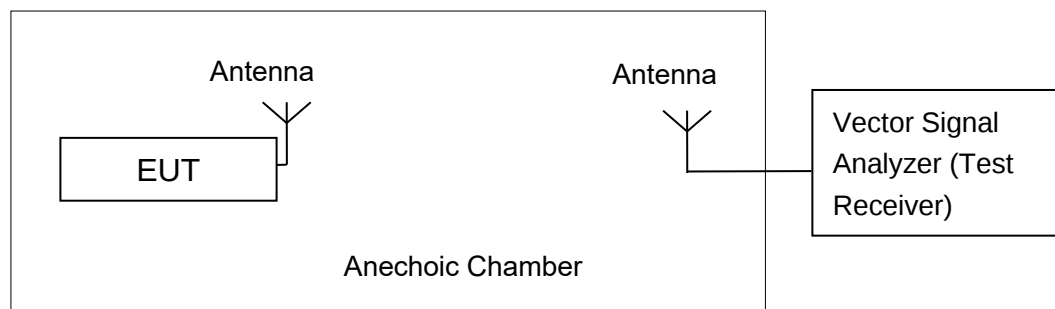


A.1.2. Radiated Emission Measurements

In the case of radiated emission, the used settings are as follows,

Sweep frequency from 30 MHz to 1GHz, RBW = 100 kHz, VBW = 300 kHz;

Sweep frequency from 1 GHz to 26GHz, RBW = 1MHz, VBW = 10Hz;



The measurement is made according to KDB 789033

The radiated emission test is performed in 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 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.

ANNEX 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-1 is made according to KDB 789033.

Set the spectrum analyzer in the following:

Detector: RMS.

RBW=1MHz.

VBW=3MHz.

Sweep time = AUTO.

Span: 30MHz (for 20MHz); 60MHz (for 40MHz); 120MHz (for 80MHz).

Measurement Results:

U-NII-1

Mode	Data Rate	Test Result(dBm)		
		5180MHz	5200MHz	5240MHz
802.11a	6Mbps	17.13	16.89	17.10
Duty Cycle Factor (dB)		0.13	0.13	0.13
802.11n(20MHz)	MCS0	16.83	16.81	16.88
Duty Cycle Factor (dB)		0.00	0.00	0.00
802.11ac(20MHz)	MCS0	16.86	17.02	16.94
Duty Cycle Factor (dB)		0.00	0.00	0.00
Mode	Data Rate	5190MHz	/	5230MHz
802.11n(40MHz)	MCS0	9.89	/	16.63
Duty Cycle Factor (dB)		0.15	/	0.15
802.11ac(40MHz)	MCS0	13.82	/	16.70
Duty Cycle Factor (dB)		0.15	/	0.15
Mode	Data Rate	/	5210MHz	/
802.11ac(80MHz)	MCS0	/	12.11	/
Duty Cycle Factor (dB)		/	0.37	/

The data rate 6 or MCS0 are selected as worse condition, and the following cases are performed with this condition.

ANNEX A.3. Peak Power Spectral Density (conducted)

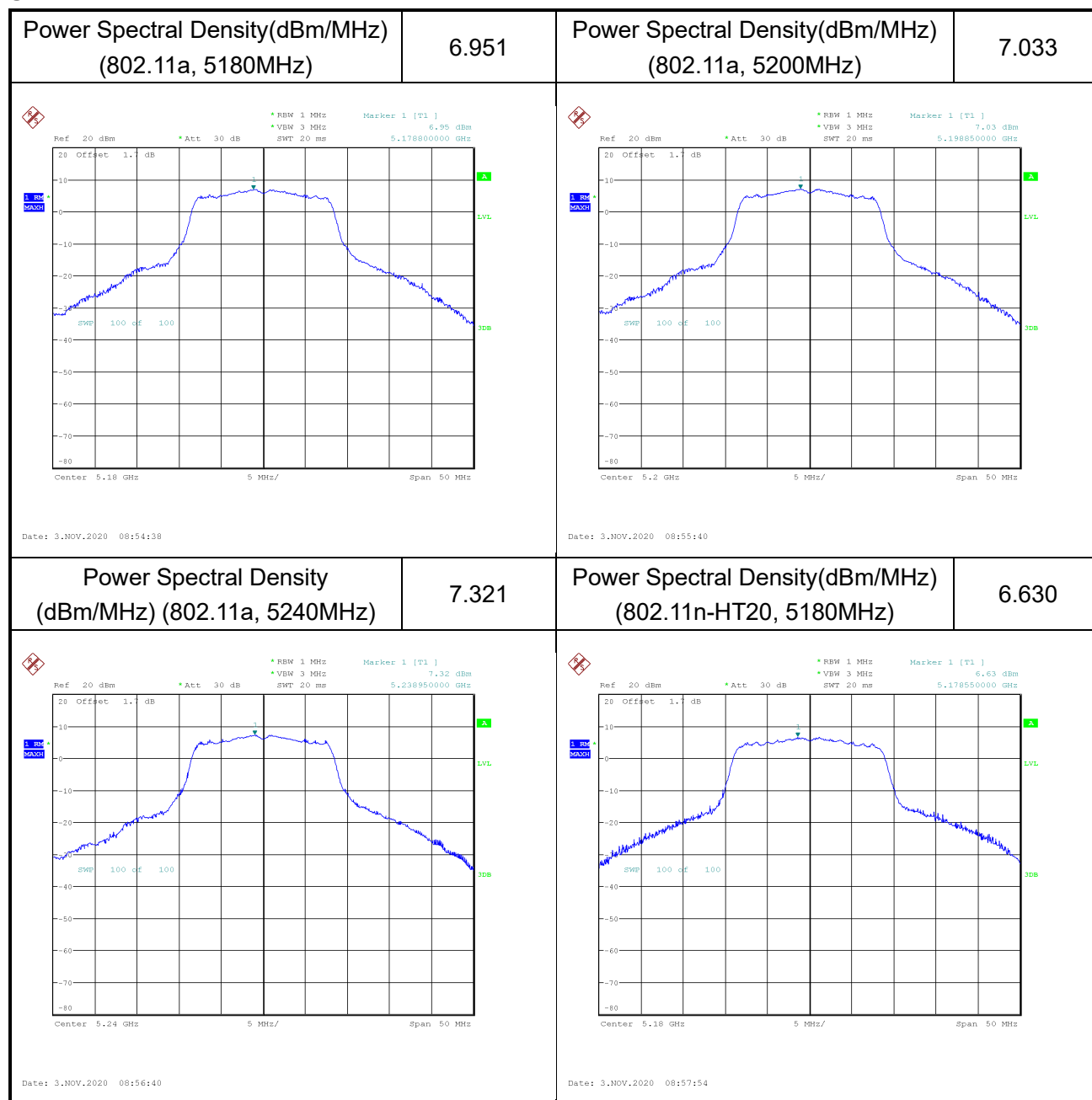
Measurement Limit:

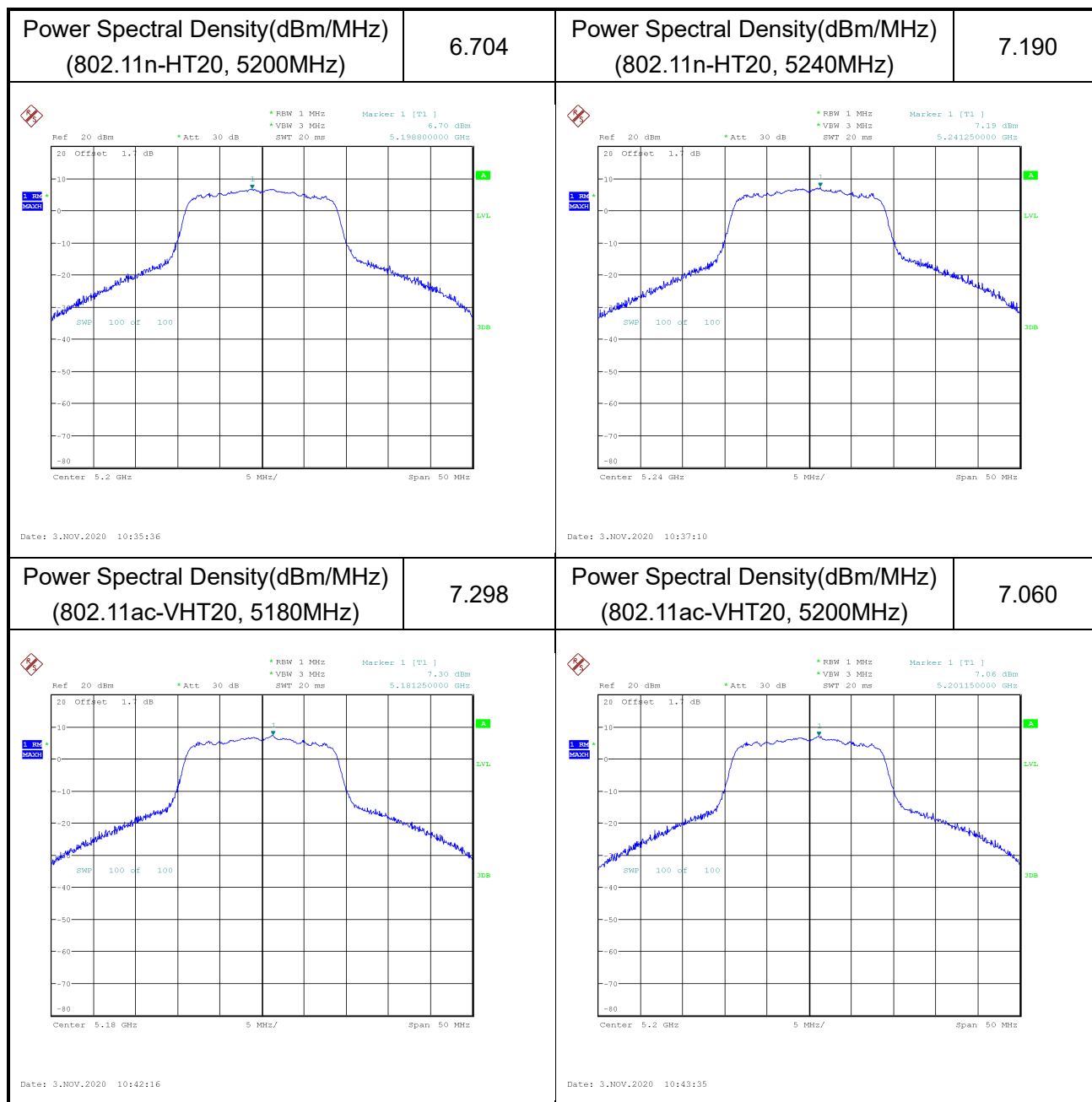
Standard	Frequency (MHz)	Limit (dBm/MHz)
FCC CRF Part 15.407(a)	5150MHz~5250MHz	11
	5250MHz~5350MHz	11
	5470MHz~5725MHz	11

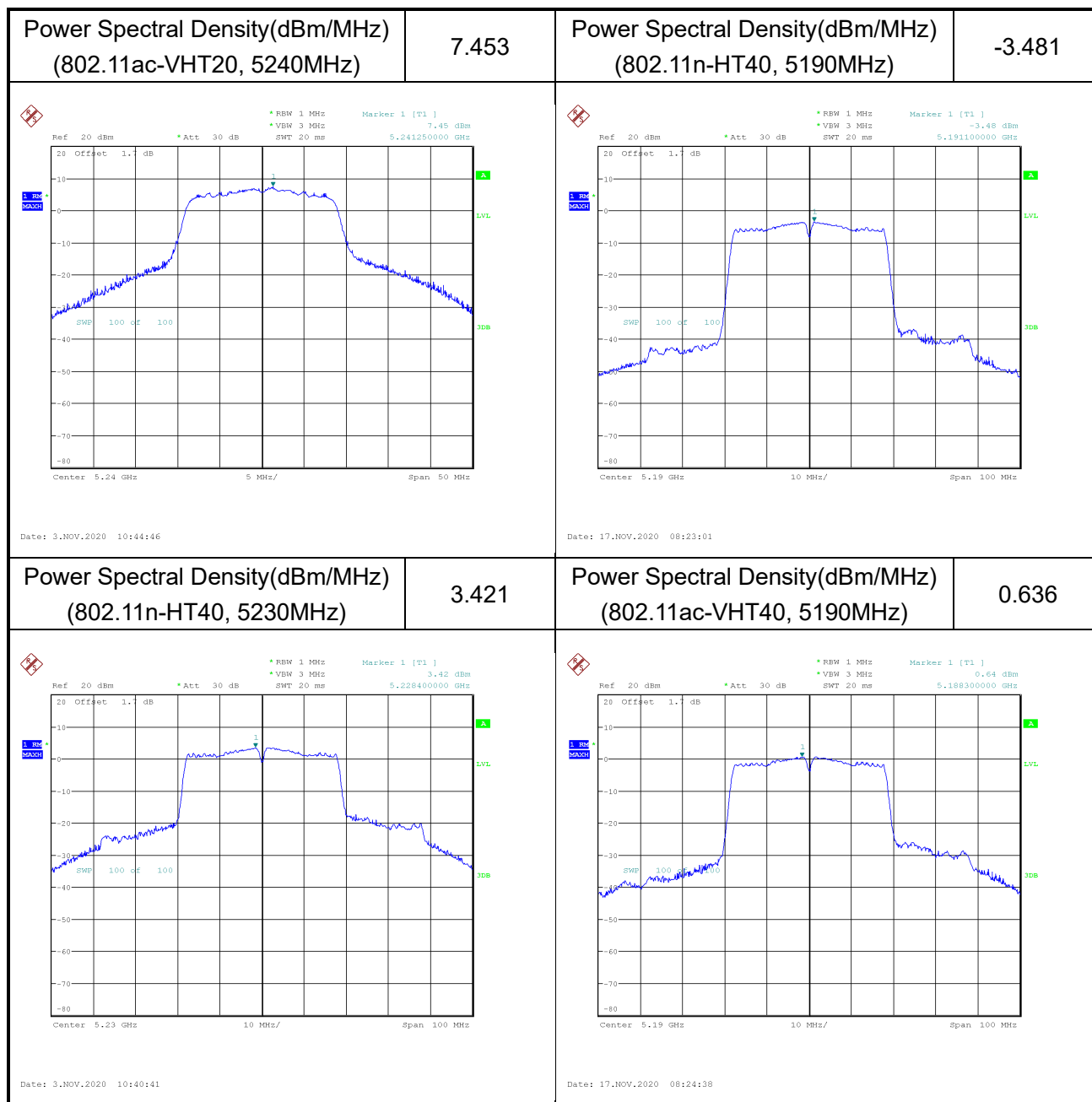
The output power measurement method SA-1 is made according to KDB 789033

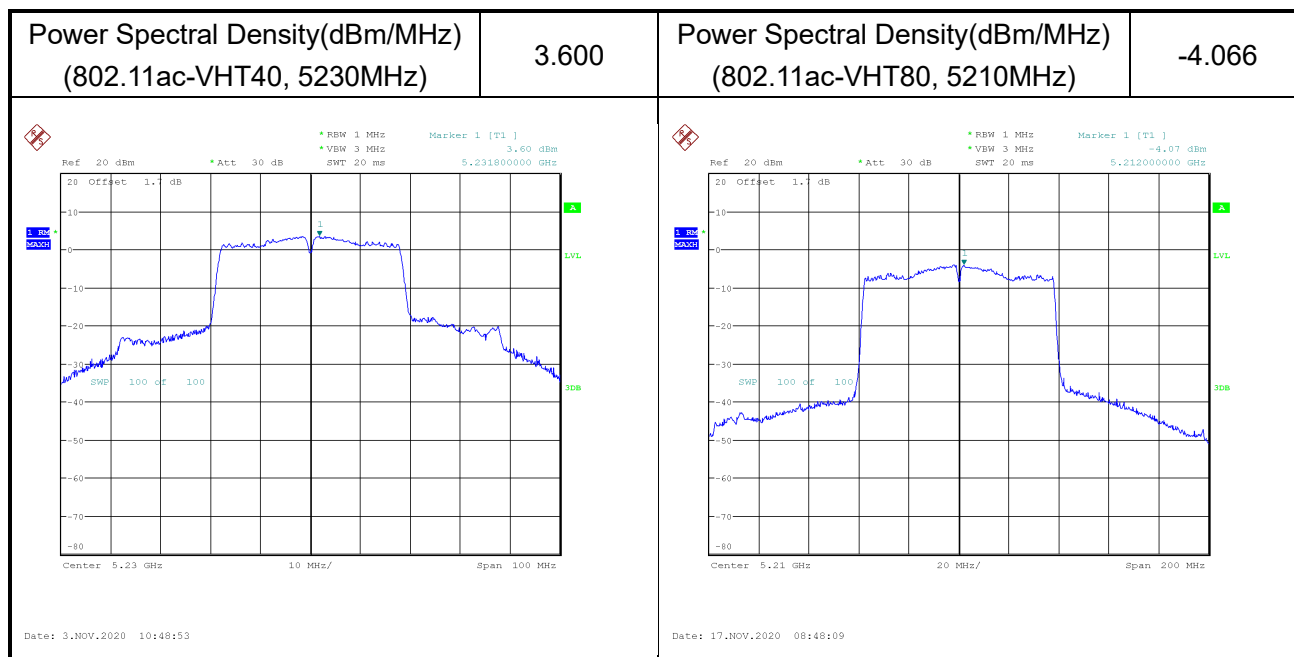
Measurement Results:

U-NII-1:









ANNEX A.4. Occupied 26dB Bandwidth (conducted)

Measurement Limit:

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

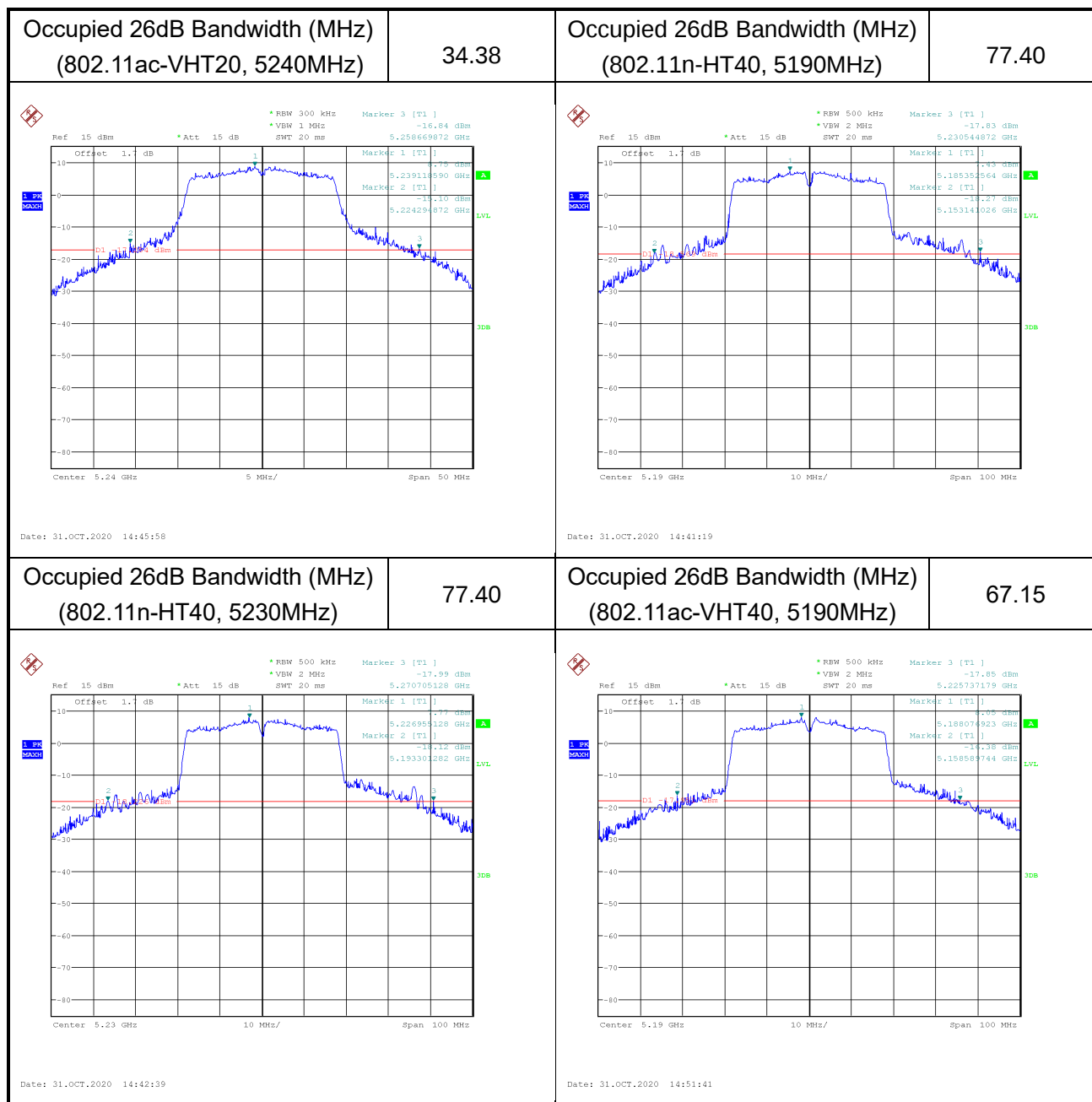
The measurement is made according to KDB 789033

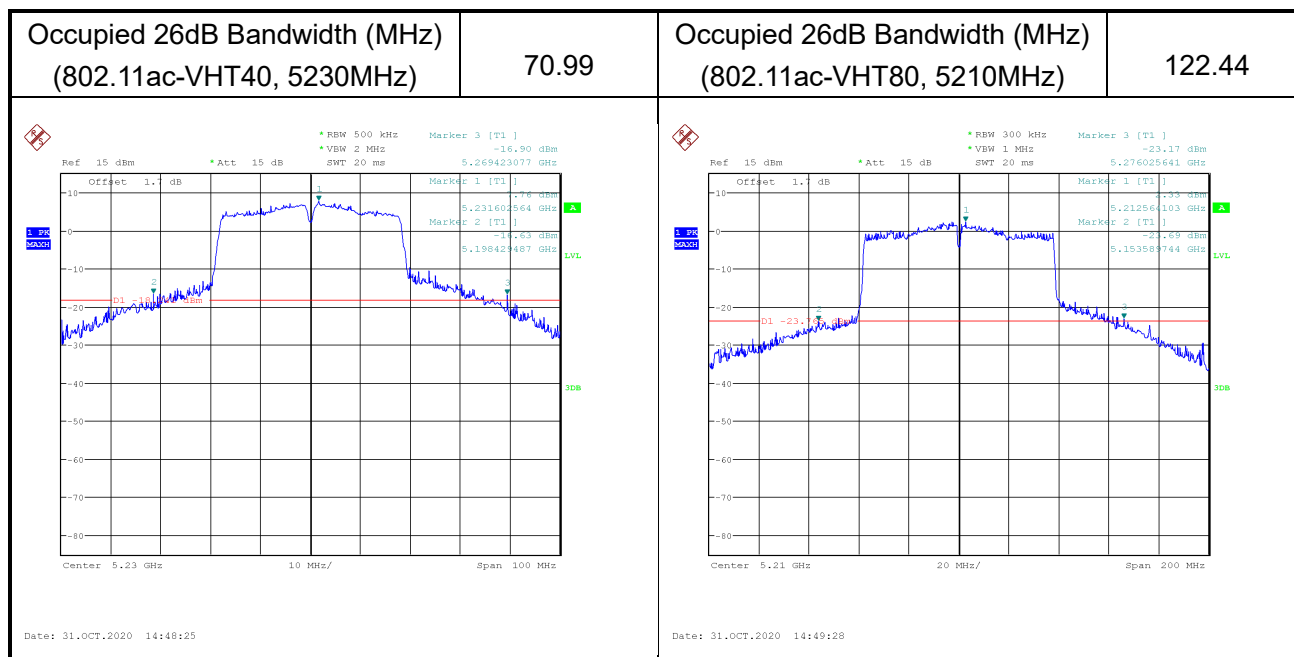
Measurement Result:

U-NII-1:

Occupied 26dB Bandwidth (MHz) (802.11a, 5180MHz)	31.73	Occupied 26dB Bandwidth (MHz) (802.11a, 5200MHz)	31.81
Ref 15 dBm Att 15 dB RBW 300 kHz Marker 3 [T1] -16.49 dBm VBW 1 MHz SWT 20 ms 5.195304487 GHz Marker 1 [T1] -16.49 dBm Marker 2 [T1] -16.49 dBm Marker 3 [T1] -16.49 dBm D1 -16.49 dBm Center 5.18 GHz 5 MHz/ Span 50 MHz Date: 31.OCT.2020 14:32:36		Ref 15 dBm Att 15 dB RBW 300 kHz Marker 3 [T1] -16.46 dBm VBW 1 MHz SWT 20 ms 5.215464744 GHz Marker 1 [T1] -16.46 dBm Marker 2 [T1] -16.46 dBm Marker 3 [T1] -16.46 dBm D1 -16.46 dBm Center 5.2 GHz 5 MHz/ Span 50 MHz Date: 31.OCT.2020 14:35:05	
Occupied 26dB Bandwidth (MHz) (802.11a, 5240MHz)	31.17	Occupied 26dB Bandwidth (MHz) (802.11n-HT20, 5180MHz)	36.14
Ref 15 dBm Att 15 dB RBW 300 kHz Marker 3 [T1] -16.63 dBm VBW 1 MHz SWT 20 ms 5.255705128 GHz Marker 1 [T1] -16.63 dBm Marker 2 [T1] -16.63 dBm Marker 3 [T1] -16.63 dBm D1 -16.63 dBm Center 5.24 GHz 5 MHz/ Span 50 MHz Date: 31.OCT.2020 14:36:26		Ref 15 dBm Att 15 dB RBW 300 kHz Marker 3 [T1] -16.61 dBm VBW 1 MHz SWT 20 ms 5.198589744 GHz Marker 1 [T1] -16.61 dBm Marker 2 [T1] -16.61 dBm Marker 3 [T1] -16.61 dBm D1 -16.61 dBm Center 5.18 GHz 5 MHz/ Span 50 MHz Date: 31.OCT.2020 14:37:42	

Occupied 26dB Bandwidth (MHz) (802.11n-HT20, 5200MHz)	35.18	Occupied 26dB Bandwidth (MHz) (802.11n-HT20, 5240MHz)	33.49
Ref 15 dBm Att 15 dB RBW 300 kHz Marker 3 [T1] -16.72 dBm VSW 1 MHz SWT 20 ms 5.218189103 GHz Marker 1 [T1] 5.199118590 GHz -16.78 dBm Marker 2 [T1] 5.183011821 GHz -16.93 dBm Center 5.2 GHz 5 MHz/ Span 50 MHz Date: 31.OCT.2020 14:38:46		Ref 15 dBm Att 15 dB RBW 300 kHz Marker 3 [T1] -17.01 dBm VSW 1 MHz SWT 20 ms 5.258189103 GHz Marker 1 [T1] 5.239118590 GHz -16.78 dBm Marker 2 [T1] 5.224695513 GHz -16.94 dBm Center 5.24 GHz 5 MHz/ Span 50 MHz Date: 31.OCT.2020 14:39:54	
Occupied 26dB Bandwidth (MHz) (802.11ac-VHT20, 5180MHz)	35.50	Occupied 26dB Bandwidth (MHz) (802.11ac-VHT20, 5200MHz)	34.53
Ref 15 dBm Att 15 dB RBW 300 kHz Marker 3 [T1] -16.50 dBm VSW 1 MHz SWT 20 ms 5.197868590 GHz Marker 1 [T1] 5.178954333 GHz -16.78 dBm Marker 2 [T1] 5.162371795 GHz -16.28 dBm Center 5.18 GHz 5 MHz/ Span 50 MHz Date: 31.OCT.2020 14:43:43		Ref 15 dBm Att 15 dB RBW 300 kHz Marker 3 [T1] -16.66 dBm VSW 1 MHz SWT 20 ms 5.218189103 GHz Marker 1 [T1] 5.197754410 GHz -16.78 dBm Marker 2 [T1] 5.183653846 GHz -16.85 dBm Center 5.2 GHz 5 MHz/ Span 50 MHz Date: 31.OCT.2020 14:44:43	





ANNEX A.5. 99% Occupied Bandwidth (conducted)

Measurement Limit:

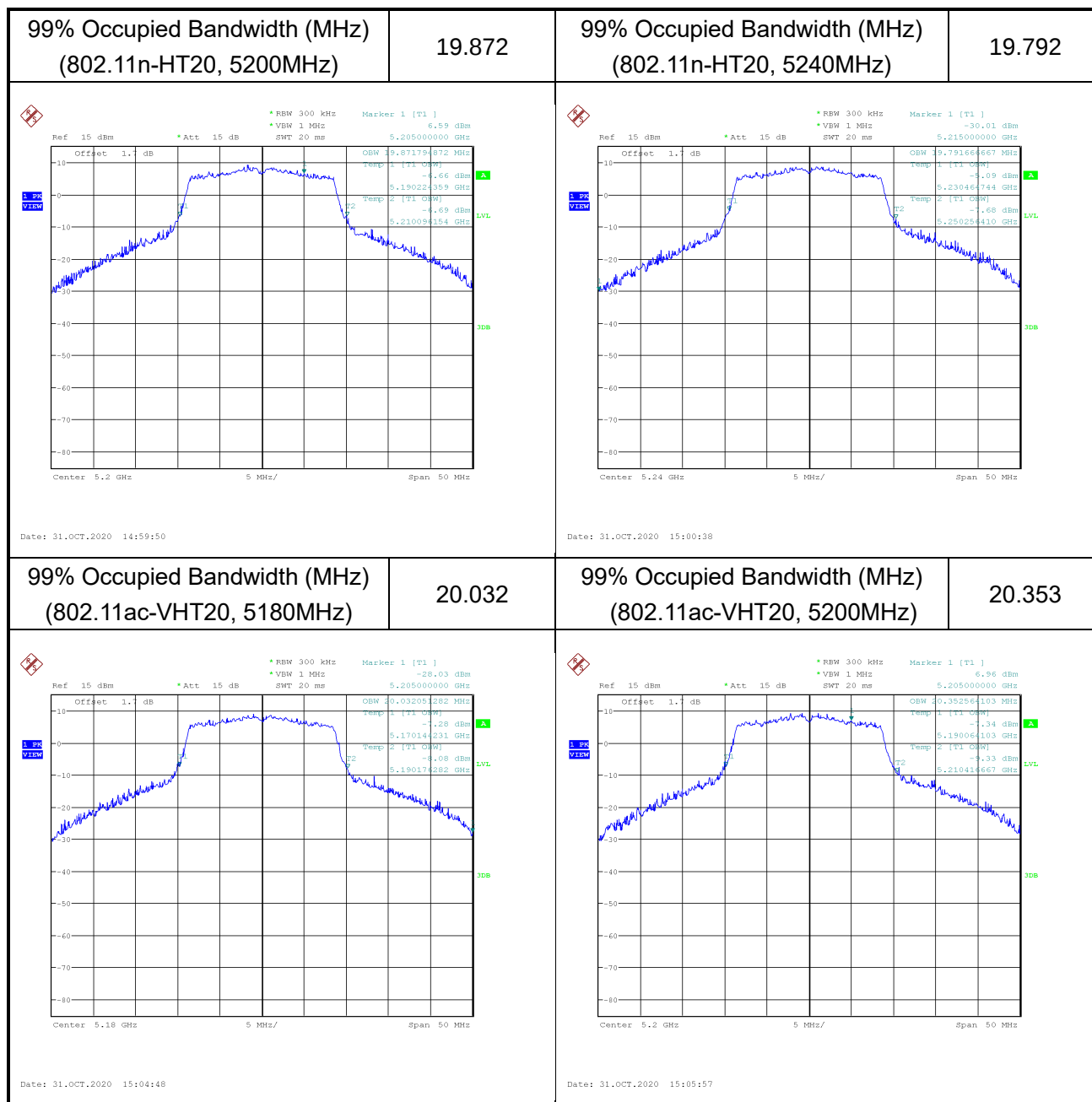
Standard	Limit (MHz)
FCC 47 CFR Part 15.407 (e)	/

The measurement is made according to KDB 789033

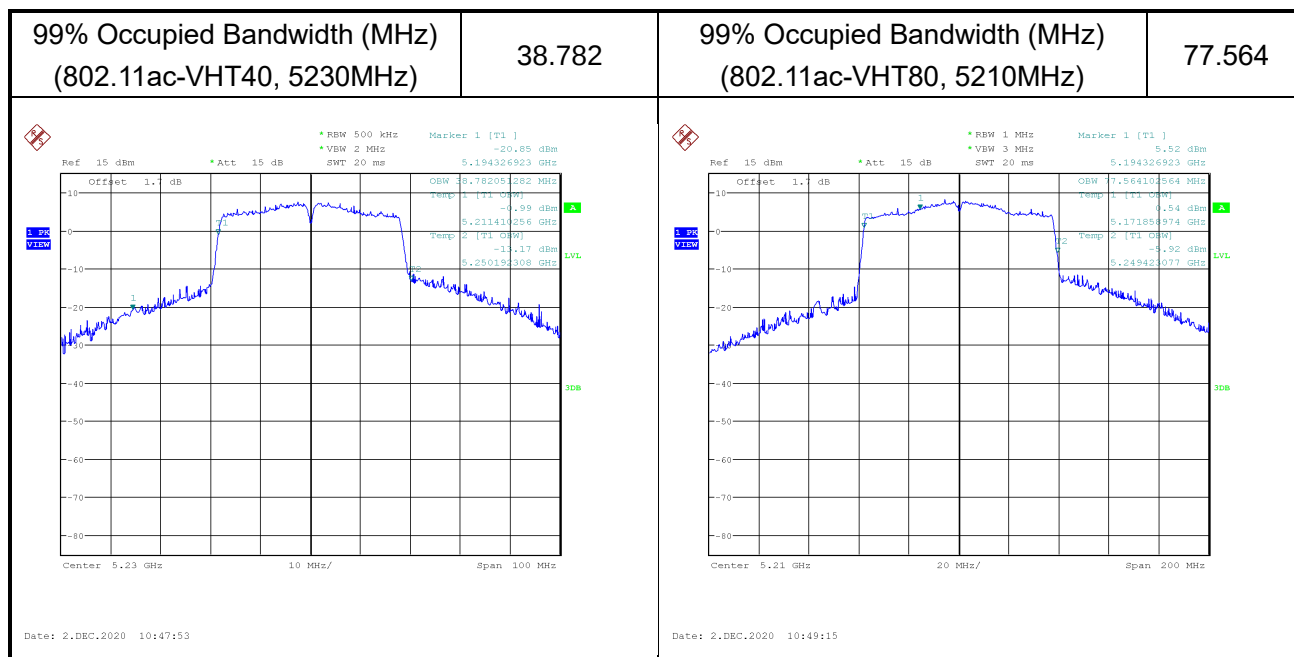
Measurement Result:

U-NII-1:

99% Occupied Bandwidth (MHz) (802.11a, 5180MHz)	19.551	99% Occupied Bandwidth (MHz) (802.11a, 5200MHz)	19.712
Ref 15 dBm Att 15 dB RBW 300 kHz Marker 1 [T1] 9.60 dBm VSW 1 MHz SWT 20 ms 5.178317308 GHz Offset 1.1 dB Center 5.18 GHz 5 MHz/ Span 50 MHz Date: 31.OCT.2020 14:55:18		Ref 15 dBm Att 15 dB RBW 300 kHz Marker 1 [T1] -22.89 dBm VSW 1 MHz SWT 20 ms 5.178317308 GHz Offset 1.1 dB Center 5.2 GHz 5 MHz/ Span 50 MHz Date: 31.OCT.2020 14:56:25	
99% Occupied Bandwidth (MHz) (802.11a, 5240MHz)	19.151	99% Occupied Bandwidth (MHz) (802.11n-HT20, 5180MHz)	20.192
Ref 15 dBm Att 15 dB RBW 300 kHz Marker 1 [T1] -27.66 dBm VSW 1 MHz SWT 20 ms 5.215000000 GHz Offset 1.1 dB Center 5.24 GHz 5 MHz/ Span 50 MHz Date: 31.OCT.2020 14:57:29		Ref 15 dBm Att 15 dB RBW 300 kHz Marker 1 [T1] -26.10 dBm VSW 1 MHz SWT 20 ms 5.205000000 GHz Offset 1.1 dB Center 5.18 GHz 5 MHz/ Span 50 MHz Date: 31.OCT.2020 14:58:46	



99% Occupied Bandwidth (MHz) (802.11ac-VHT20, 5240MHz)	20.192	99% Occupied Bandwidth (MHz) (802.11n-HT40, 5190MHz)	40.865
Date: 31.OCT.2020 15:14:58		Date: 2.DEC.2020 10:43:59	
99% Occupied Bandwidth (MHz) (802.11n-HT40, 5230MHz)	40.064	99% Occupied Bandwidth (MHz) (802.11ac-VHT40, 5190MHz)	40.385
Date: 2.DEC.2020 10:45:02		Date: 2.DEC.2020 10:46:41	



ANNEX A.6. Band Edges Compliance

A.6.1 Band Edges - conducted

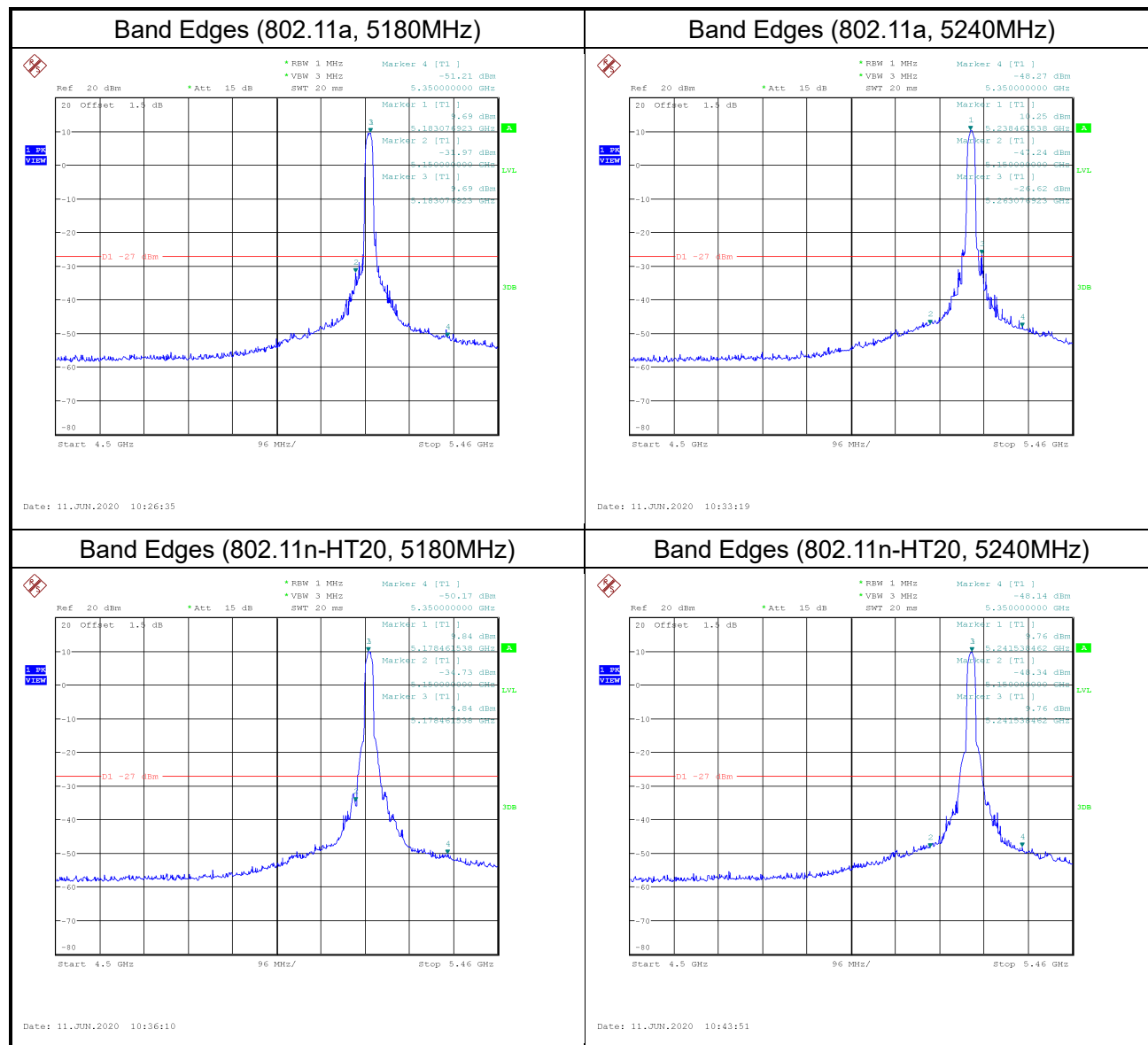
Measurement Limit:

Standard	Limit (dBm/MHz)
FCC 47 CFR Part 15.407	< -27

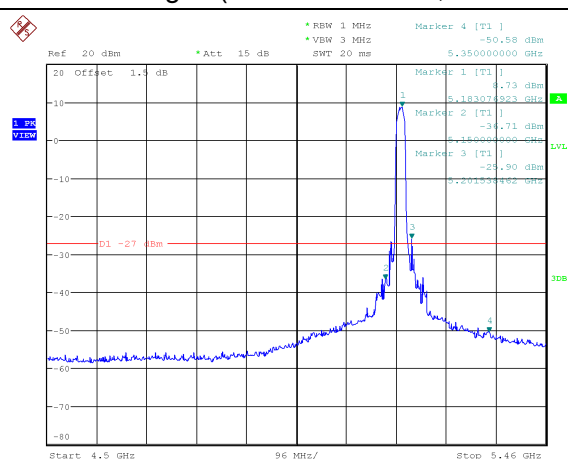
The measurement is made according to KDB 789033

Measurement Result:

U-NII-1:

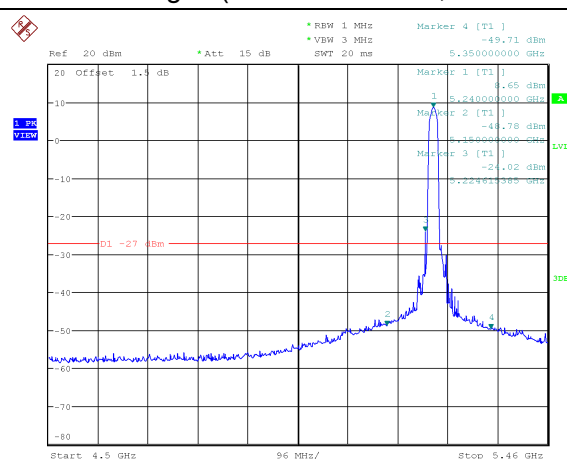


Band Edges (802.11ac-VHT20, 5180MHz)



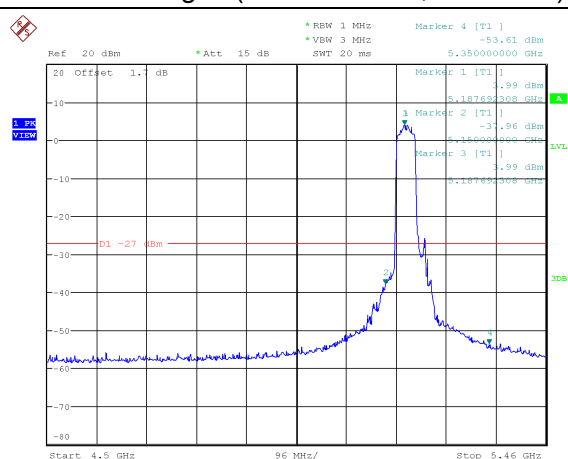
Date: 11.JUN.2020 10:52:24

Band Edges (802.11ac-VHT20, 5240MHz)



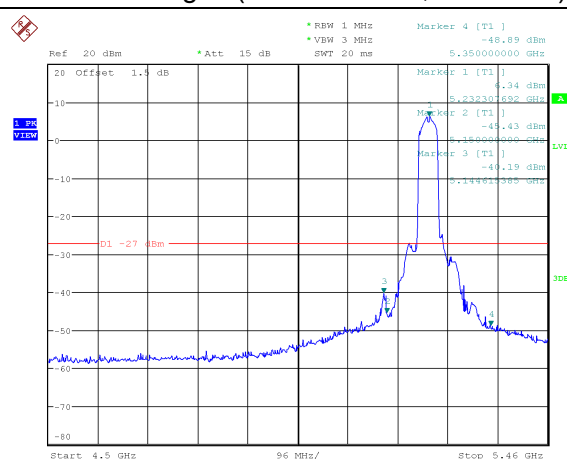
Date: 11.JUN.2020 10:57:35

Band Edges (802.11n-HT40, 5190MHz)



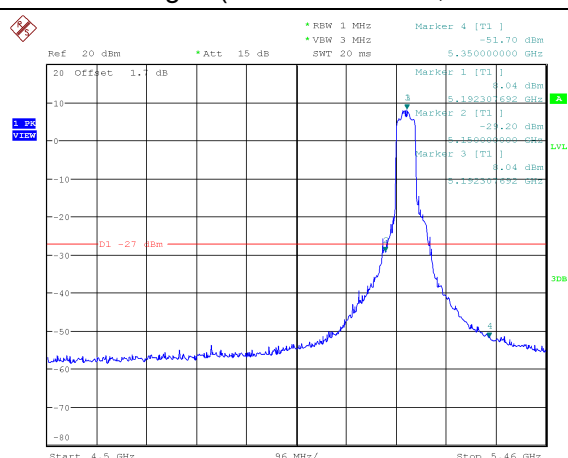
Date: 17.NOV.2020 08:50:17

Band Edges (802.11n-HT40, 5230MHz)



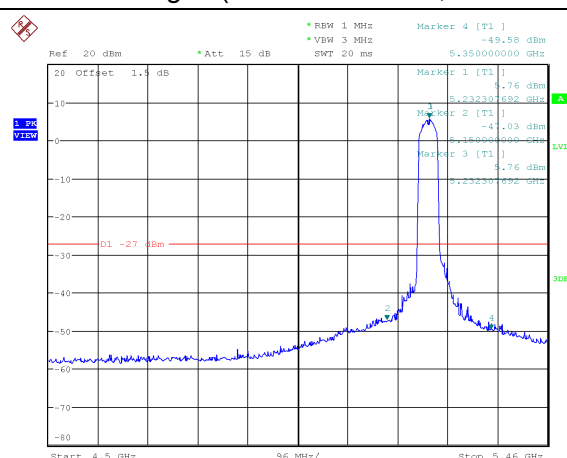
Date: 11.JUN.2020 10:49:36

Band Edges (802.11ac-VHT40, 5190MHz)

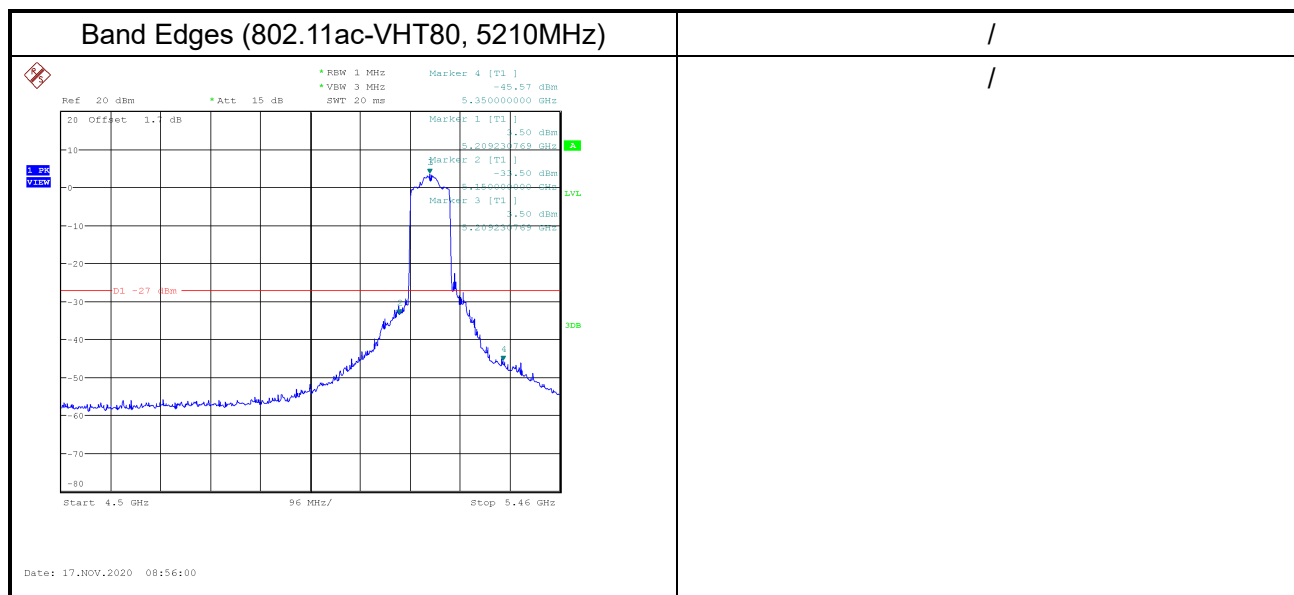


Date: 17.NOV.2020 08:53:11

Band Edges (802.11ac-VHT40, 5230MHz)



Date: 11.JUN.2020 11:02:56



A.6.2 Band Edges - Radiated

Measurement Limit:

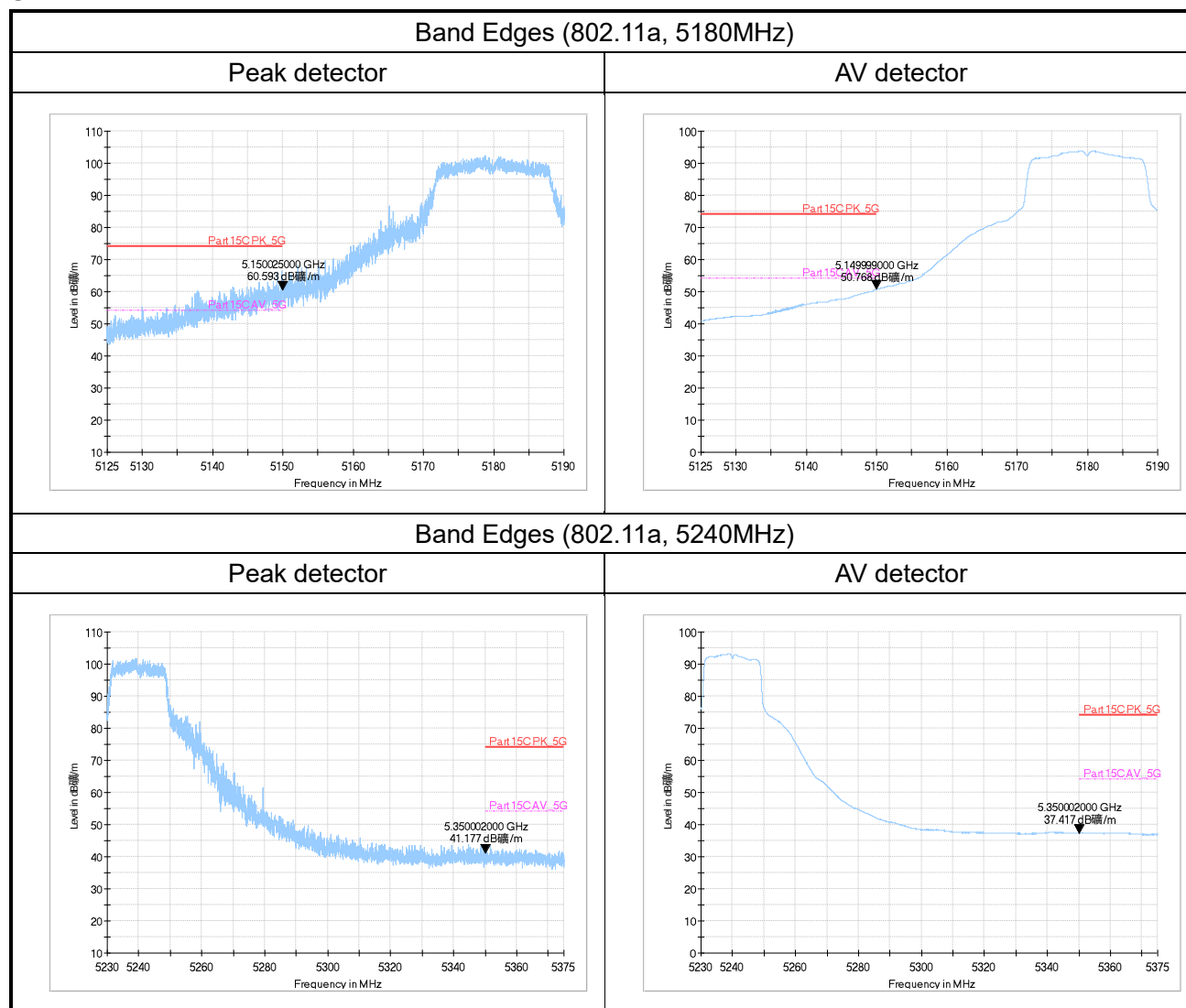
Standard	Limit (dB μ V/m)	
FCC 47 CFR Part 15.209	Peak	68.2
	Average	54

The measurement is made according to KDB 789033.

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)).

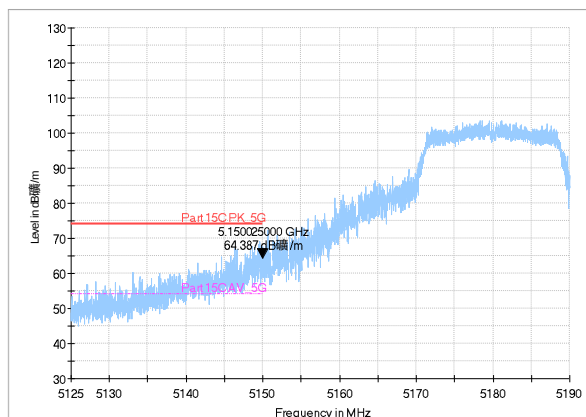
Measurement Result:

U-NII-1:

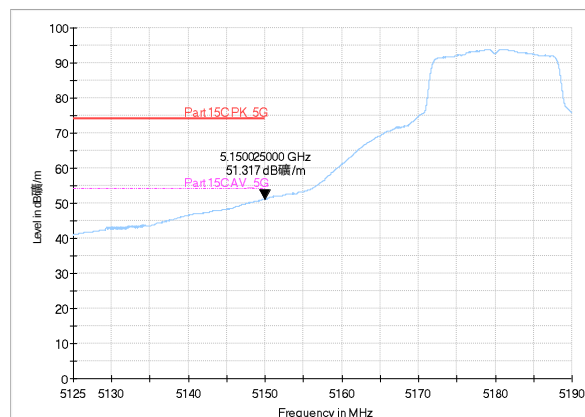


Band Edges (802.11n-HT20, 5180MHz)

Peak detector

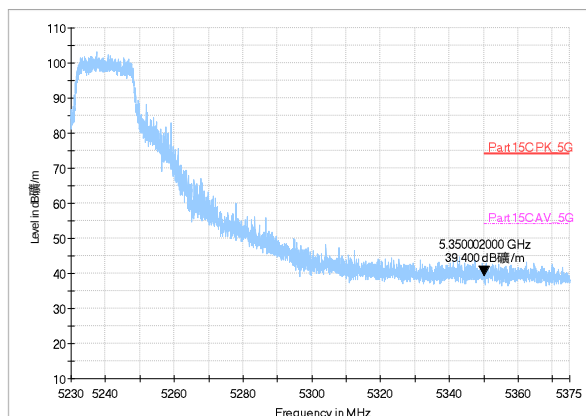


AV detector

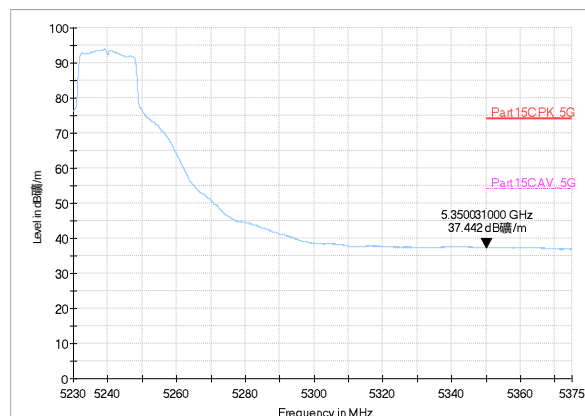


Band Edges (802.11n-HT20, 5240MHz)

Peak detector

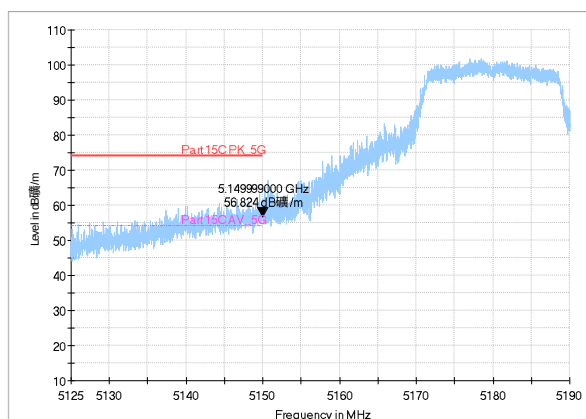


AV detector

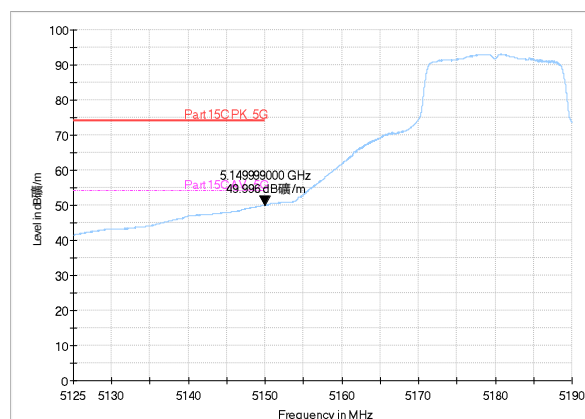


Band Edges (802.11ac-VHT20, 5180MHz)

Peak detector

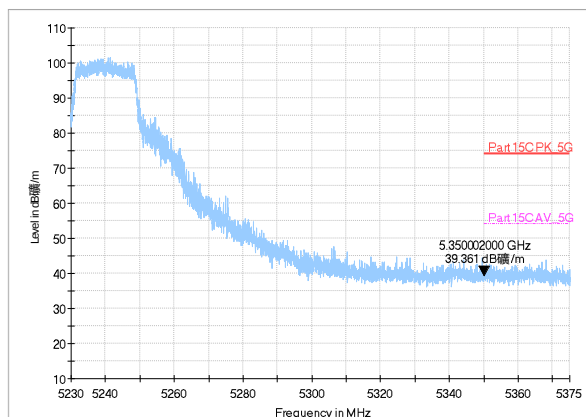


AV detector

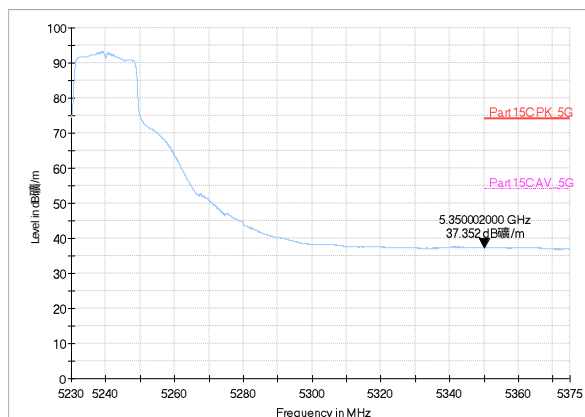


Band Edges (802.11ac-VHT20, 5240MHz)

Peak detector

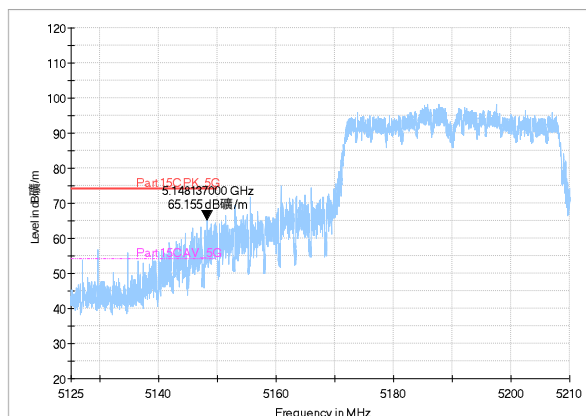


AV detector

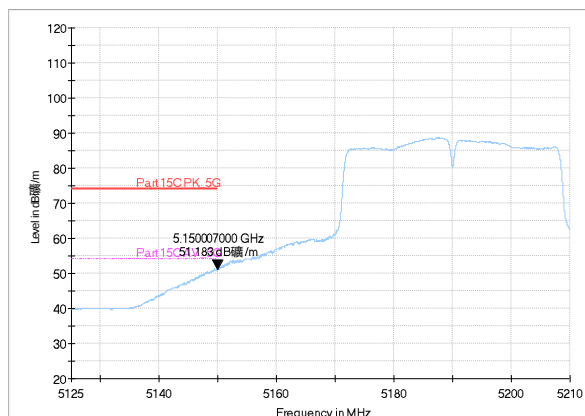


Band Edges (802.11n-HT40, 5190MHz)

Peak detector

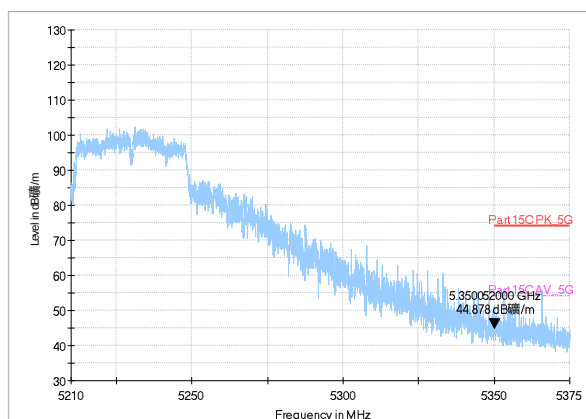


AV detector

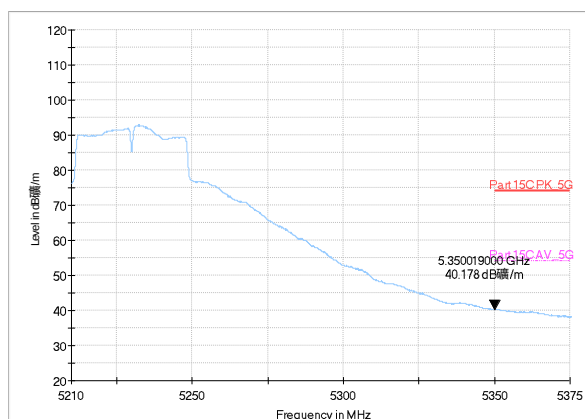


Band Edges (802.11n-HT40, 5230MHz)

Peak detector

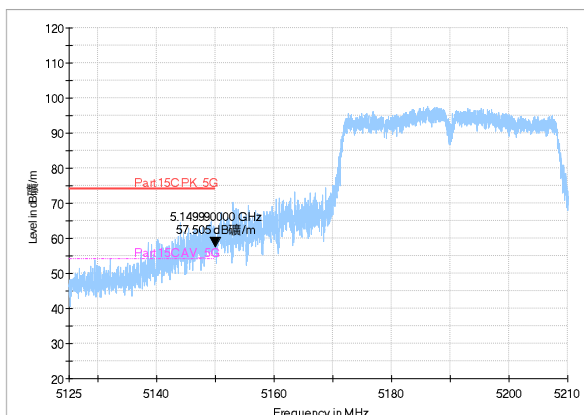


AV detector

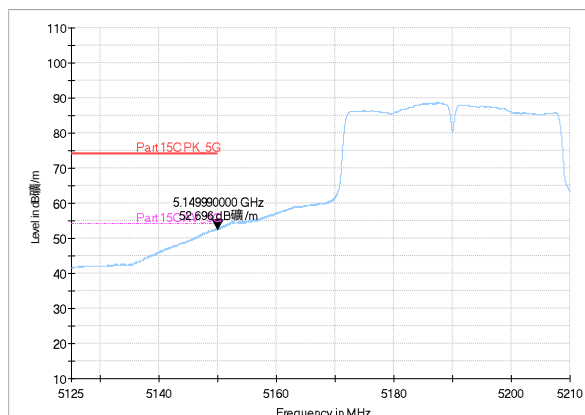


Band Edges (802.11ac-VHT40, 5190MHz)

Peak detector

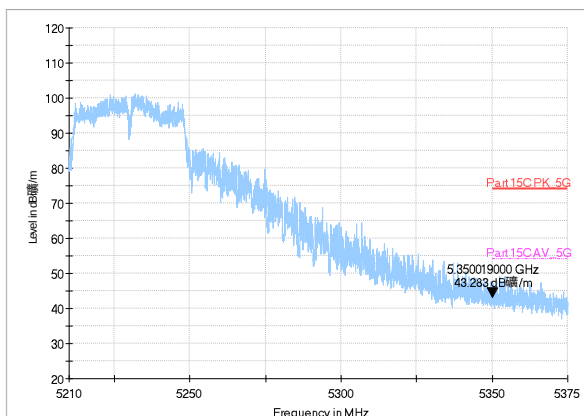


AV detector

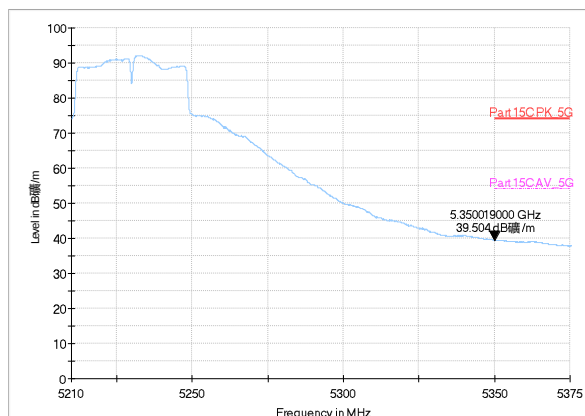


Band Edges (802.11ac-VHT40, 5230MHz)

Peak detector

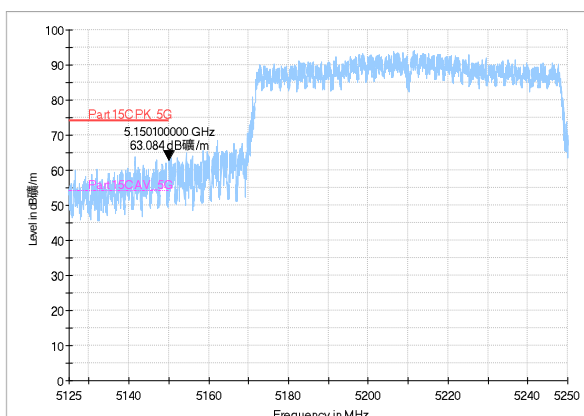


AV detector

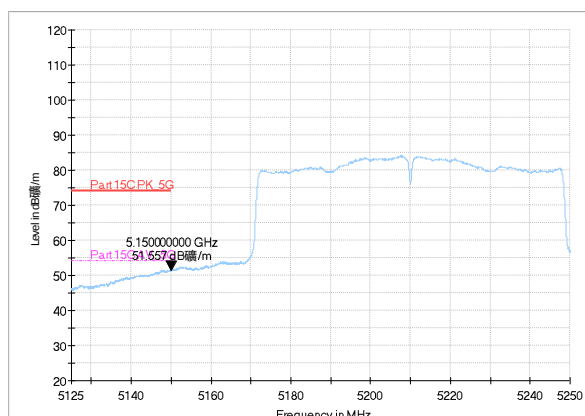


Band Edges (802.11ac-VHT80, 5210MHz)

Peak detector



AV detector



ANNEX A.7. Transmitter Spurious Emission

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.407	-27 dBm/MHz

The measurement is made according to KDB 789033

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)).

The Equipment Under Test (EUT) was set up on a non-conductive table in the semi-anechoic chamber. The test was performed at the distance of 3 m between the EUT and the receiving antenna. The radiated emissions measurements were made in a typical installation configuration.

During the test, the height of receive antenna shall be moved from 1 to 4 meters, and the antenna shall be performed under horizontal and vertical polarization. The turntable shall be rotated from 0 to 360 degrees for detecting the maximum of radiated spurious signal level. The measurements shall be repeated with orthogonal polarization of the test antenna. The data of cable loss and antenna factor has been calibrated in full testing frequency range before the testing.

Set the spectrum analyzer in the following:

Below 1GHz (detector: Peak and Quasi-Peak)

RBW=100kHz / VBW=300kHz / Sweep=AUTO

Above 1GHz (detector: Peak):

(a) PEAK: RBW=1MHz / VBW=3MHz / Sweep=AUTO

(b) AVERAGE: RBW=1MHz / VBW=3MHz / Sweep= AUTO

Limit in restricted band:

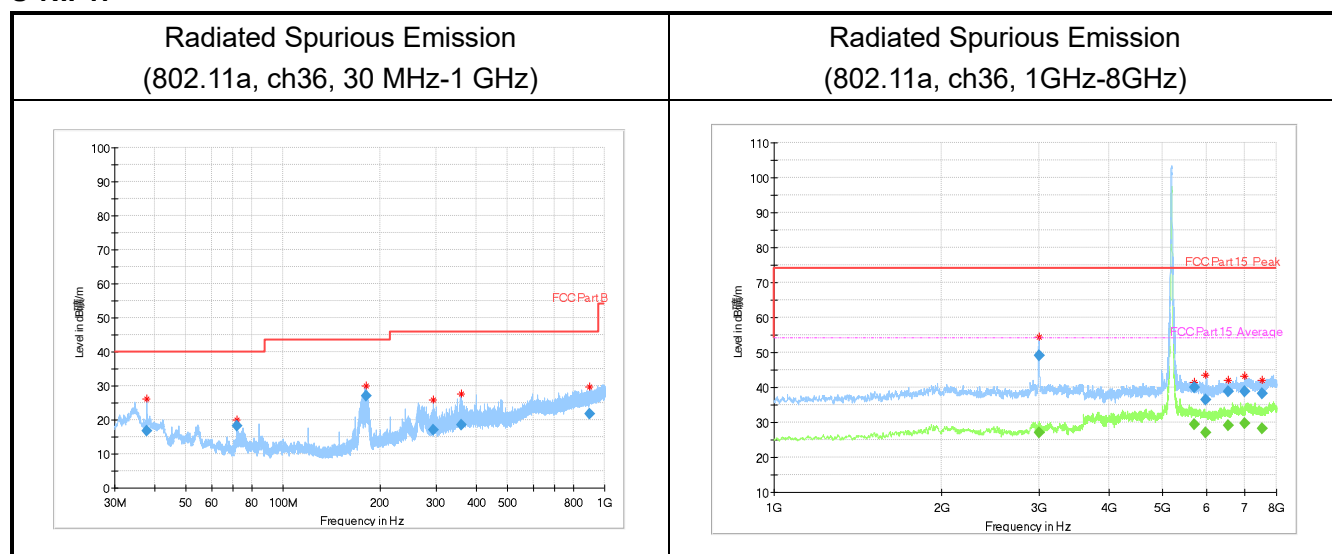
Frequency of emission (MHz)	Field strength(dBμV/m)	Measurement distance(m)
0.009-0.490	129-94	3
0.490-1.705	74-63	3
1.705-30	70	3
30-88	40.0	3
88-216	43.5	3
216-960	46.0	3
Above 960	54.0	3

Note: for frequency range below 960MHz, the limit in 15.209 is defined in 10m test distance. The limit used above is calculated from 10m to 3m

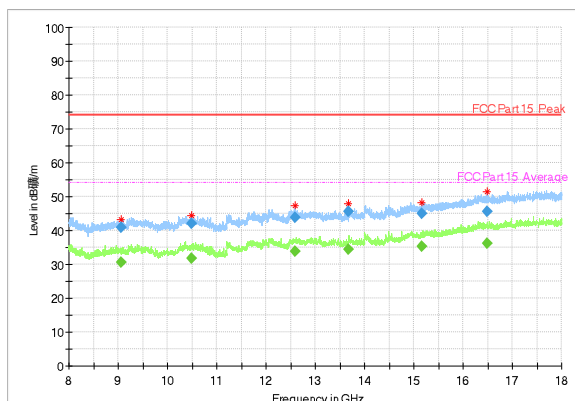
Modulation type and data rate tested (Only worst case result is given below):

U-NII-1:

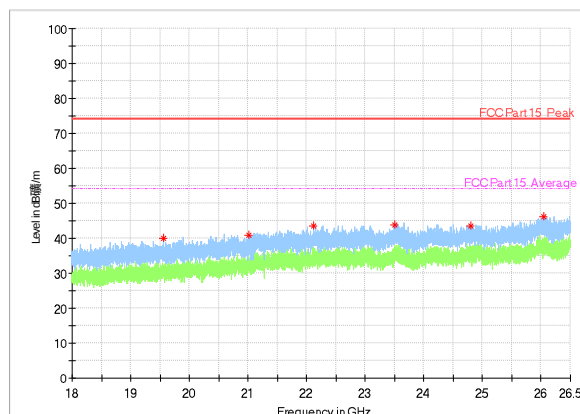
Mode	Data rate	Channel
802.11a	6Mbps	40(5200MHz)
802.11n-HT20	MCS0	48(5240MHz)
802.11ac-VHT20	MCS0	40(5200MHz)
802.11n-HT40	MCS0	46(5230MHz)
802.11ac-VHT40	MCS0	46(5230MHz)
802.11ac-VHT80	MCS0	42(5210MHz)

Measurement Results:
U-NII-1:


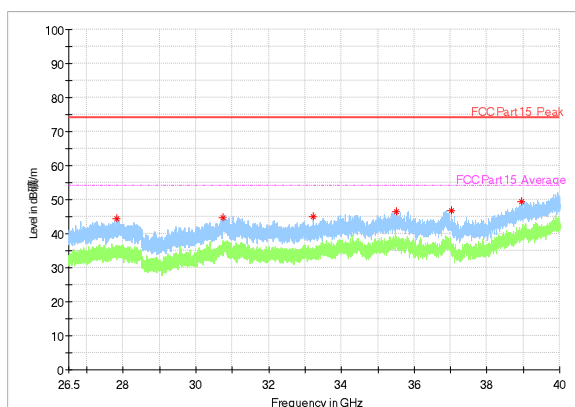
Radiated Spurious Emission
(802.11a, ch36, 8GHz-18GHz)



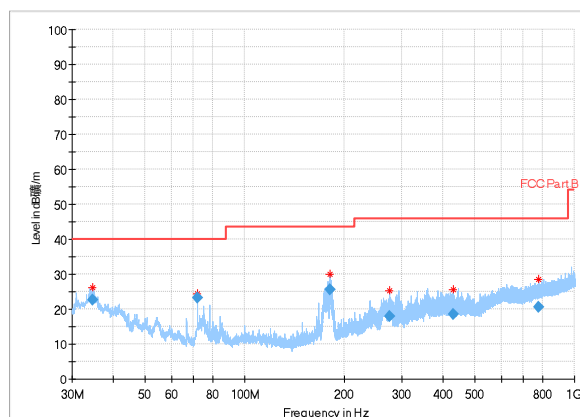
Radiated Spurious Emission
(802.11a, ch36, 18GHz-25.6GHz)



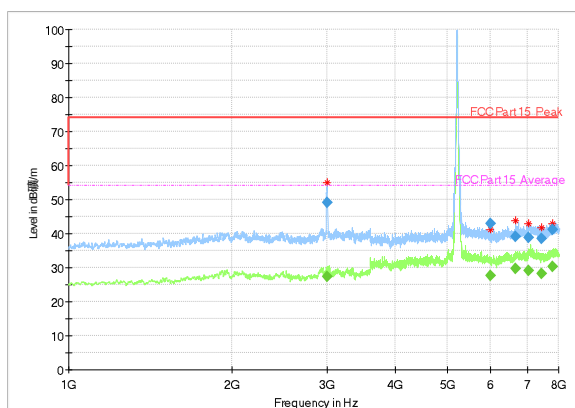
Radiated Spurious Emission
(802.11a, ch36, 25.6GHz-40GHz)



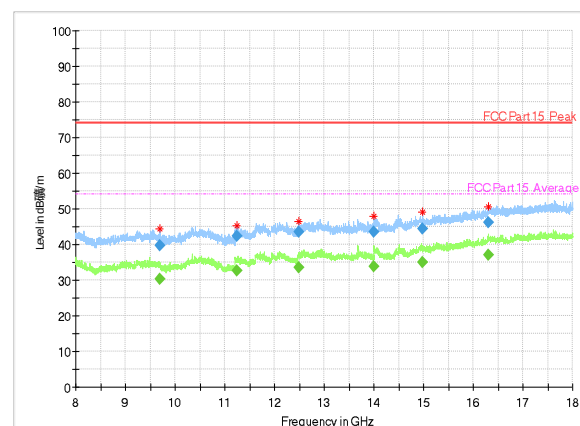
Radiated Spurious Emission
(802.11n-HT20, ch40, 30 MHz-1 GHz)



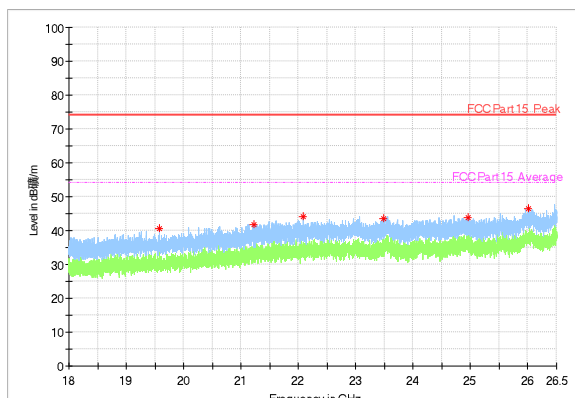
Radiated Spurious Emission
(802.11n-HT20, ch40, 1GHz-8GHz)



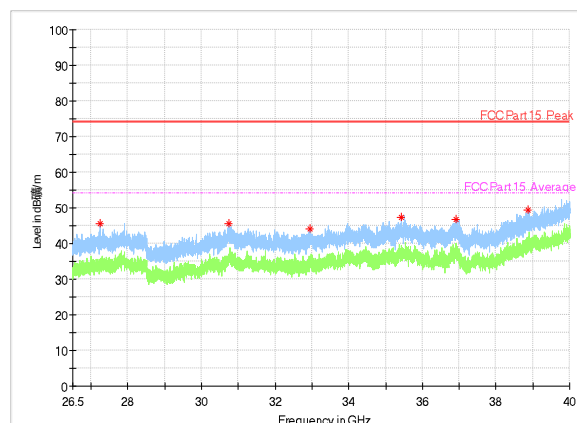
Radiated Spurious Emission
(802.11n-HT20, ch40, 8GHz-18GHz)



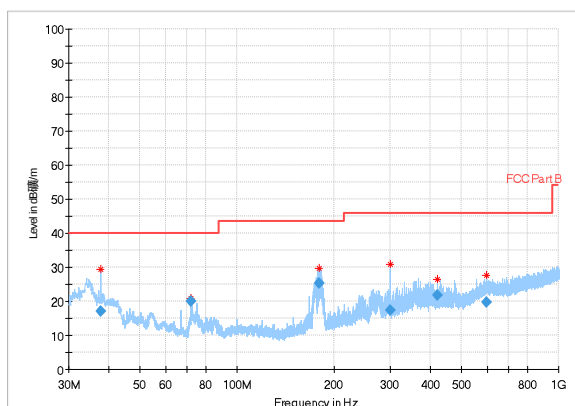
Radiated Spurious Emission
(802.11n-HT20, ch40, 18GHz-25.6GHz)



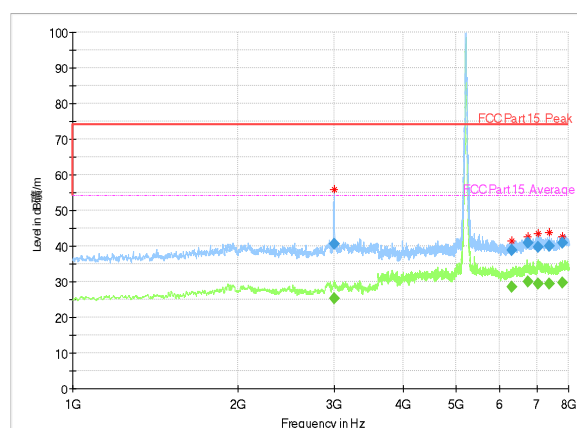
Radiated Spurious Emission
(802.11n-HT20, ch40, 25.6GHz-40GHz)



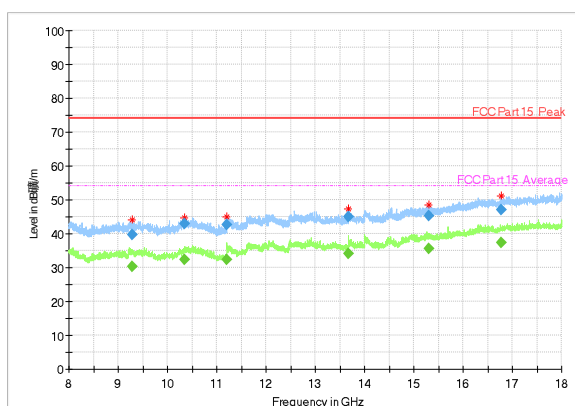
Radiated Spurious Emission
(802.11ac-VHT20, ch40, 30 MHz-1 GHz)



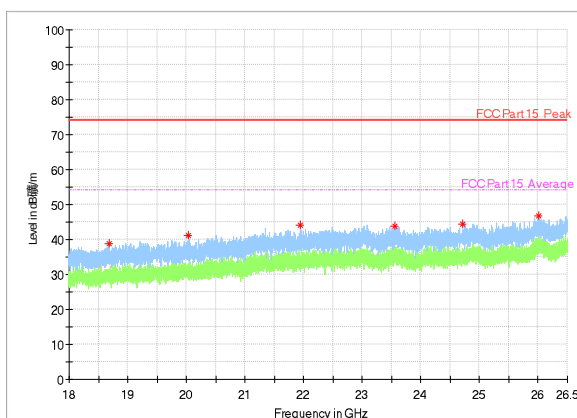
Radiated Spurious Emission
(802.11ac-VHT20, ch40, 1GHz-8GHz)



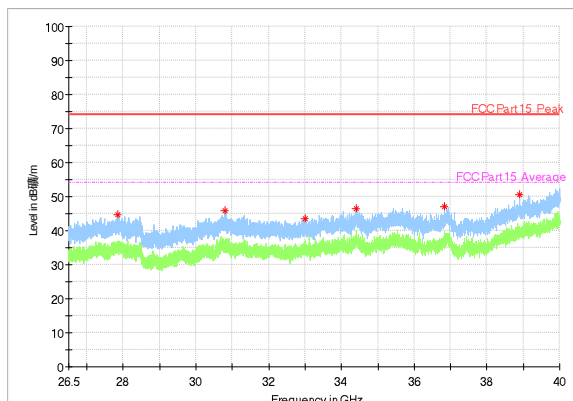
Radiated Spurious Emission
(802.11ac-VHT20, ch40, 8GHz-18GHz)



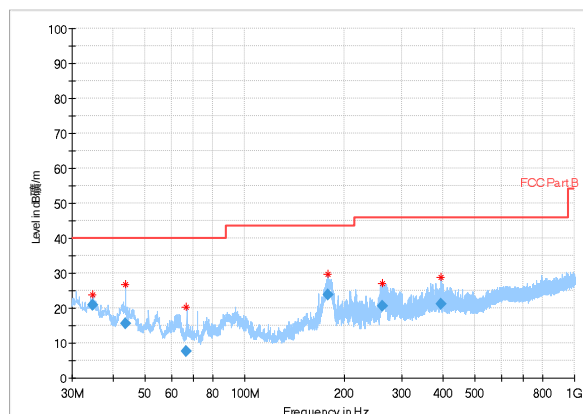
Radiated Spurious Emission
(802.11ac-VHT20, ch40, 18GHz-25.6GHz)



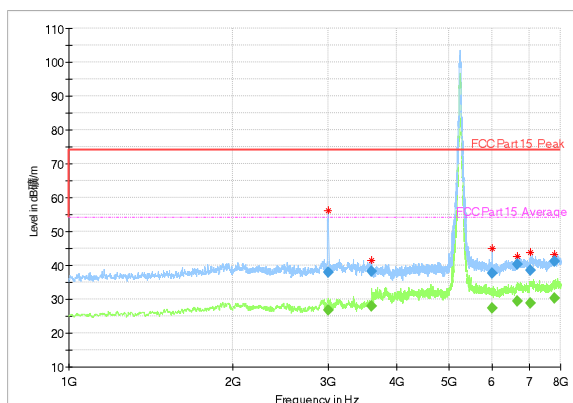
Radiated Spurious Emission
(802.11ac-VHT20, ch40, 25.6GHz-40GHz)



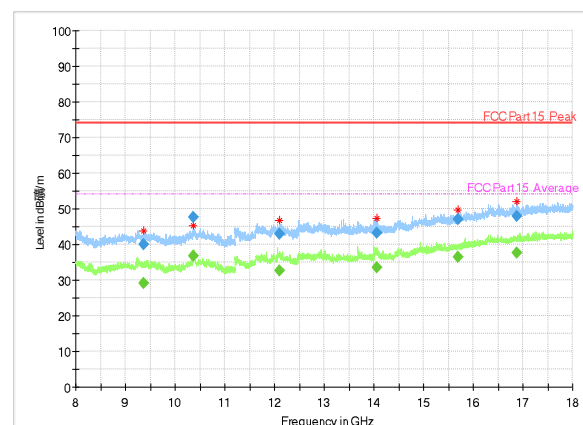
Radiated Spurious Emission
(802.11n-HT40, ch46, 30 MHz-1 GHz)



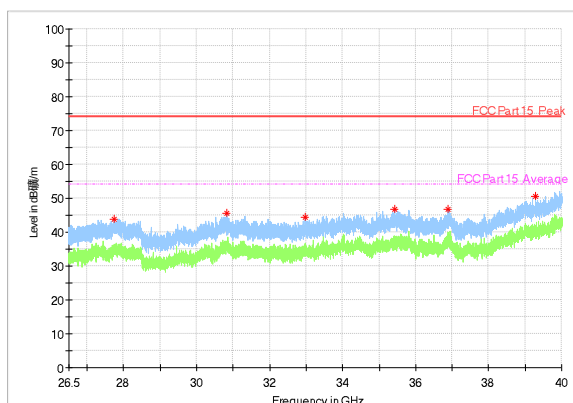
Radiated Spurious Emission
(802.11n-HT40, ch46, 1GHz-8GHz)



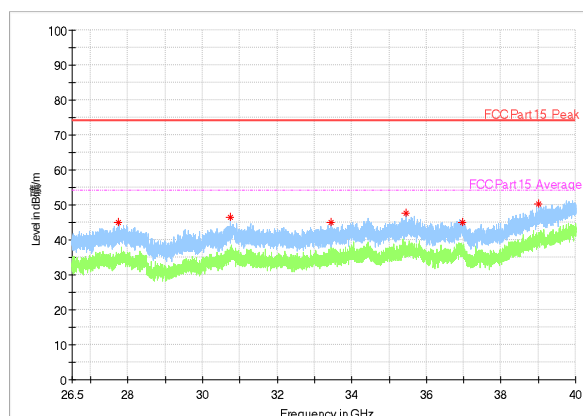
Radiated Spurious Emission
(802.11n-HT40, ch46, 8GHz-18GHz)



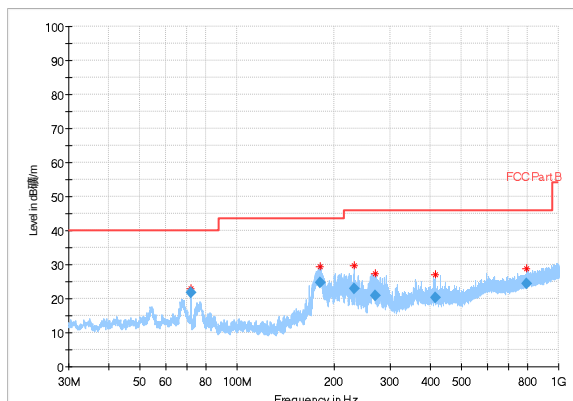
Radiated Spurious Emission
(802.11n-HT40, ch46, 18GHz-25.6GHz)



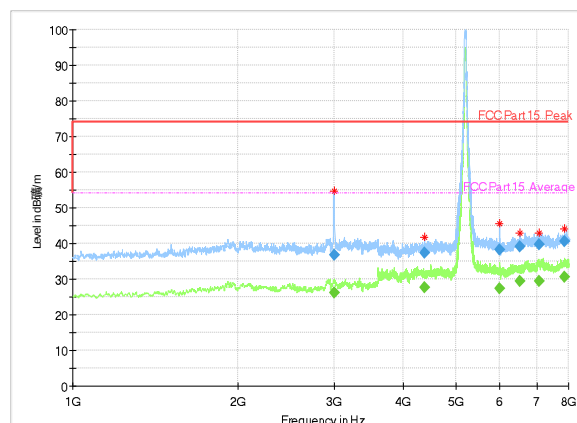
Radiated Spurious Emission
(802.11n-HT40, ch46, 25.6GHz-40GHz)



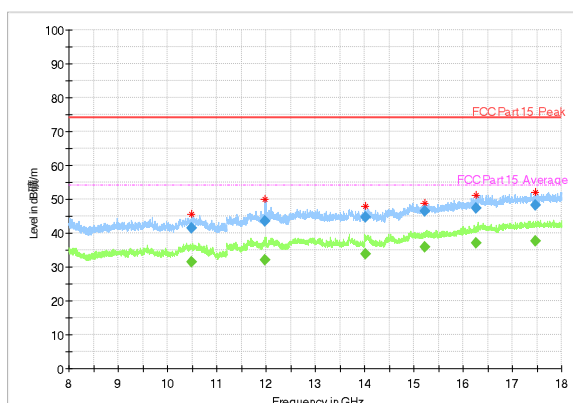
Radiated Spurious Emission
(802.11ac-VHT40, ch38, 30 MHz-1 GHz)



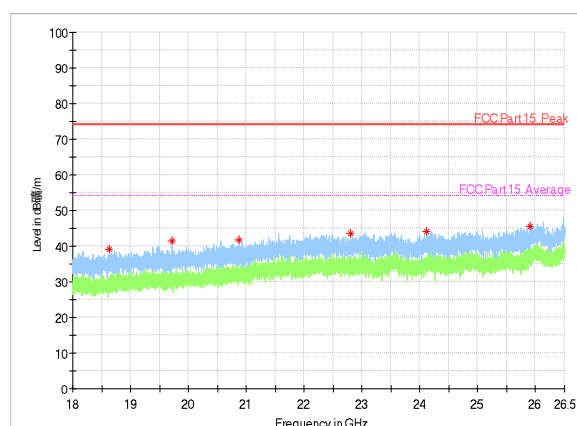
Radiated Spurious Emission
(802.11ac-VHT40, ch38, 1GHz-8GHz)



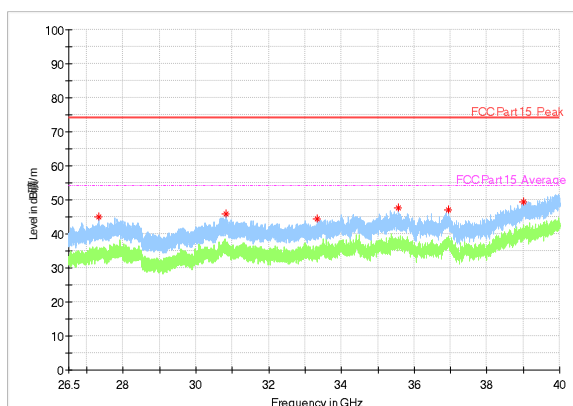
Radiated Spurious Emission
(802.11ac-VHT40, ch38, 8GHz-18GHz)



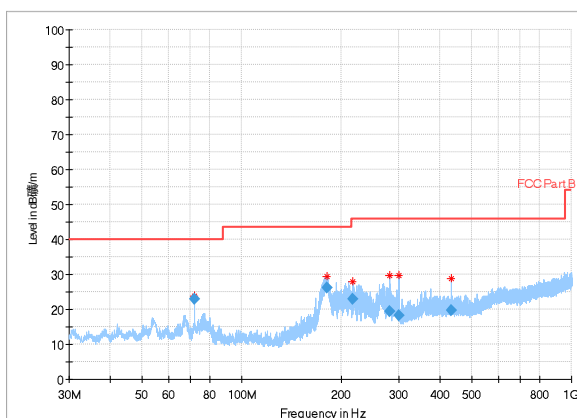
Radiated Spurious Emission
(802.11ac-VHT40, ch38, 18GHz-25.6GHz)



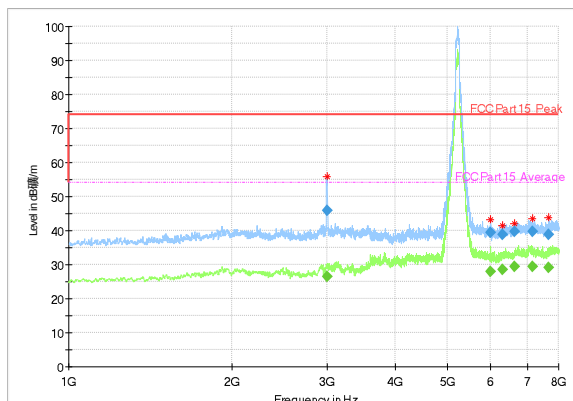
Radiated Spurious Emission
(802.11ac-VHT40, ch38, 25.6GHz-40GHz)



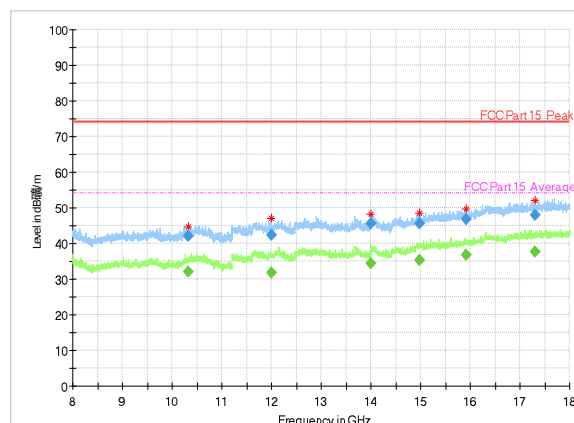
Radiated Spurious Emission
(802.11ac-VHT80, ch42, 30 MHz-1 GHz)



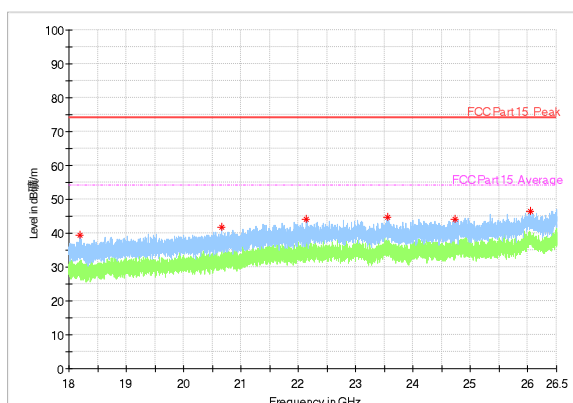
Radiated Spurious Emission
(802.11ac-VHT80, ch42, 1GHz-8GHz)



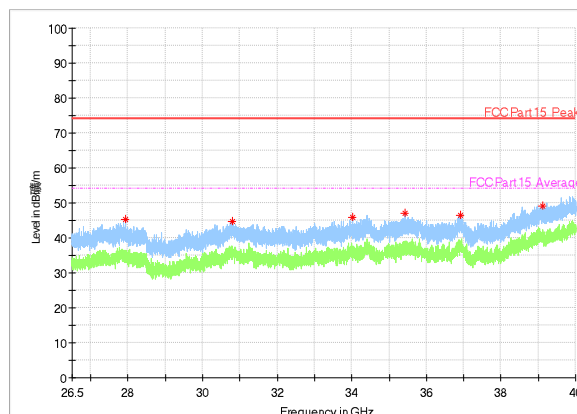
Radiated Spurious Emission
(802.11ac-VHT80, ch42, 8GHz-18GHz)



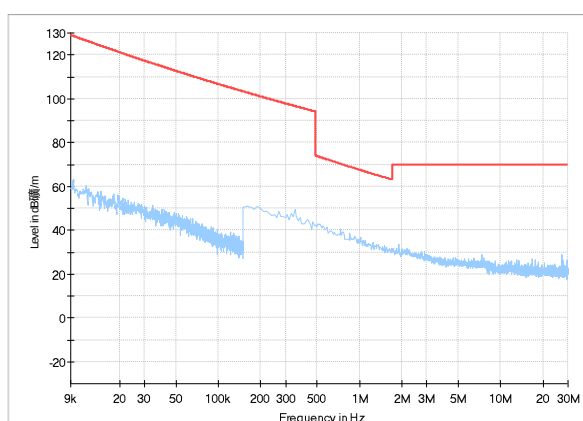
Radiated Spurious Emission
(802.11ac-VHT80, ch42, 18GHz-25.6GHz)



Radiated Spurious Emission
(802.11ac-VHT80, ch42, 25.6GHz-40GHz)



Radiated Spurious Emission (9kHz-30MHz)



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Note:

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.

The measurement results are obtained as described below:

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

U-NII-1:

RSE-11A-CH36-30M-1G-N04

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
37.8	16.62	-16.4	33.02	V
72.0	18.37	-18.5	36.87	V
181.2	27.01	-15.8	42.81	H
293.2	16.94	-11.6	28.54	H
357.4	18.54	-9.7	28.24	H
899.8	21.87	-0.6	22.47	V

RSE-11A-CH36-1G-8G-N04

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
2998.6	49.16	3.2	45.96	H
5690.4	40.01	3.2	36.81	V
5977.4	36.53	2.7	33.83	H
6557.4	38.86	3.8	35.06	H
7026.4	38.89	5	33.89	V
7540.6	38.1	3.9	34.2	H

RSE-11A-CH36-8G-18G-N04

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
9055.0	40.76	5.3	35.46	V
10489.4	41.94	7.9	34.04	V
12587.4	43.88	11.3	32.58	V
13682.6	45.66	12.1	33.56	V
15163.2	45.02	14.6	30.42	H
16494.6	45.69	17.8	27.89	H

RSE-11A-CH36-18G-26.5G-N04

Frequency (MHz)	Result (dB μ V/m)	ARpl (dB)	PMea (dB μ V/m)	Polarity
19551.2	39.96	-5.3	45.26	V
21018.4	40.76	-4.1	44.86	V
22116.6	43.56	-3.1	46.66	H
23509.7	43.74	-2.8	46.54	V
24800.8	43.68	-2.2	45.88	H
26046.1	46.14	-2	48.14	H

RSE-11A-CH36-26.5G-40G-N04

Frequency (MHz)	Result (dB μ V/m)	ARpl (dB)	PMea (dB μ V/m)	Polarity
27835.2	44.44	-0.4	44.84	H
30740.4	44.69	0.1	44.59	V
33214.9	45.09	1	44.09	H
35499.1	46.33	1.5	44.83	V
37030.0	46.77	1.2	45.57	H
38964.6	49.42	4	45.42	H

RSE-11N-CH40-30M-1G-N04

Frequency (MHz)	Result (dB μ V/m)	ARpl (dB)	PMea (dB μ V/m)	Polarity
34.7	22.53	-16.7	39.23	V
72.0	23.09	-18.5	41.59	V
181.2	25.7	-15.8	41.5	H
275.8	17.9	-11.9	29.8	H
428.4	18.44	-8.4	26.84	H
776.6	20.61	-2.2	22.81	H

RSE-11N-CH40-1G-8G-N04

Frequency (MHz)	Result (dB μ V/m)	ARpl (dB)	PMea (dB μ V/m)	Polarity
2998.8	49.09	3.2	45.89	H
5988.6	42.85	2.6	40.25	H
6654.4	39.11	4.2	34.91	V
7048.6	38.96	5	33.96	V
7442.4	38.65	4.3	34.35	H
7804.8	41.06	4.8	36.26	V

RSE-11N-CH40-8G-18G-N04

Frequency (MHz)	Result (dB μ V/m)	ARpl (dB)	PMea (dB μ V/m)	Polarity
9694.4	39.81	6	33.81	V
11237.0	42.46	8.5	33.96	V
12488.6	43.51	11	32.51	H
14001.4	43.67	12.7	30.97	H
14984.4	44.55	14.5	30.05	V
16308.2	46.19	17.3	28.89	V

RSE-11N-CH40-18G-26.5G-N04

Frequency (MHz)	Result (dB μ V/m)	ARpl (dB)	PMea (dB μ V/m)	Polarity
19584.4	40.54	-5.2	45.74	V
21219.0	41.86	-3.9	45.76	H
22088.5	44.01	-3.1	47.11	V
23485.0	43.66	-2.7	46.36	V
24949.6	43.7	-2.4	46.1	V
26017.2	46.38	-2	48.38	H

RSE-11N-CH40-26.5G-40G-N04

Frequency (MHz)	Result (dB μ V/m)	ARpl (dB)	PMea (dB μ V/m)	Polarity
27233.0	45.51	-1	46.51	V
30736.3	45.46	0.1	45.36	H
32951.6	43.97	1	42.97	H
35419.4	47.29	1.6	45.69	H
36905.8	46.75	1.8	44.95	V
38870.0	49.36	3.7	45.66	H

RSE-11AC-CH40-30M-1G-N04

Frequency (MHz)	Result (dB μ V/m)	ARpl (dB)	PMea (dB μ V/m)	Polarity
37.7	17	-16.4	33.4	V
72.0	20.11	-18.5	38.61	V
180.7	25.27	-15.8	41.07	H
299.2	17.38	-11.5	28.88	H
420.7	21.62	-8.3	29.92	H
598.2	19.63	-3.1	22.73	H

RSE-11AC-CH40-1G-8G-N04

Frequency (MHz)	Result (dB μ V/m)	ARpl (dB)	PMea (dB μ V/m)	Polarity
2994.4	40.53	3.3	37.23	H
6294.4	38.75	3.6	35.15	H
6753.0	40.92	4.3	36.62	H
7052.8	39.81	5	34.81	V
7371.8	39.95	4.5	35.45	V
7811.8	40.9	4.8	36.1	V

RSE-11AC-CH40-8G-8G-N04

Frequency (MHz)	Result (dB μ V/m)	ARpl (dB)	PMea (dB μ V/m)	Polarity
9277.4	39.69	5.7	33.99	V
10352.4	43.05	8.1	34.95	H
11201.2	42.75	8.4	34.35	H
13678.4	44.86	12.1	32.76	H
15314.4	45.4	15.3	30.1	V
16773.0	47.2	17.7	29.5	H

RSE-11AC-CH40-18G-26.5G-N04

Frequency (MHz)	Result (dB μ V/m)	ARpl (dB)	PMea (dB μ V/m)	Polarity
18690.2	38.71	-5.6	44.31	V
20031.5	41.16	-4.8	45.96	V
21937.2	43.97	-3.4	47.37	H
23559.8	43.88	-2.8	46.68	V
24706.5	44.5	-2.3	46.8	H
26007.8	46.86	-2	48.86	H

RSE-11AC-CH40-26.5G-40G-N04

Frequency (MHz)	Result (dB μ V/m)	ARpl (dB)	PMea (dB μ V/m)	Polarity
27847.3	44.61	-0.4	45.01	V
30809.2	45.83	0.2	45.63	H
32990.8	43.54	1.1	42.44	H
34404.2	46.53	1.4	45.13	H
36820.8	47.05	2.3	44.75	H
38887.6	50.69	3.7	46.99	H

RSE-11N(40M)-CH46-30M-1G-N04

Frequency (MHz)	Result (dB μ V/m)	ARpl (dB)	PMea (dB μ V/m)	Polarity
34.7	21.01	-16.7	37.71	V
43.6	15.62	-15.9	31.52	V
66.7	7.72	-17.4	25.12	V
179.3	23.72	-15.8	39.52	H
262.4	20.59	-12.5	33.09	H
394.8	21.22	-8.7	29.92	H

RSE-11N(40M)-CH46-1G-8G-N04

Frequency (MHz)	Result (dB μ V/m)	ARpl (dB)	PMea (dB μ V/m)	Polarity
2993.4	38	3.3	34.7	H
3597.0	38.17	1.9	36.27	V
6000.2	37.78	2.6	35.18	H
6670.6	40.23	4.4	35.83	H
7030.8	38.63	5.1	33.53	V
7789.6	41.14	4.8	36.34	V

RSE-11N(40M)-CH46-8G-18G-N04

Frequency (MHz)	Result (dB μ V/m)	ARpl (dB)	PMea (dB μ V/m)	Polarity
9373.6	39.88	6.5	33.38	V
10369.0	47.77	8.1	39.67	H
12102.0	42.92	10.9	32.02	H
14053.0	43.15	12.7	30.45	H
15695.2	46.96	15.8	31.16	V
16880.4	47.88	18.3	29.58	V

RSE-11N(40M)-CH46-18G-26.5G-N04

Frequency (MHz)	Result (dB μ V/m)	ARpl (dB)	PMea (dB μ V/m)	Polarity
27750.1	43.84	-0.5	44.34	V
30820.0	45.62	0.3	45.32	V
32971.9	44.34	1	43.34	H
35422.2	46.85	1.6	45.25	H
36899.0	46.79	1.9	44.89	H
39294.0	50.57	4.1	46.47	V

RSE-11N(40M)-CH46-26.5G-40G-N04

Frequency (MHz)	Result (dB μ V/m)	ARpl (dB)	PMea (dB μ V/m)	Polarity
27738.0	45.05	-0.6	45.65	V
30736.3	46.39	0.1	46.29	H
33444.4	45.11	1.2	43.91	V
35446.4	47.64	1.6	46.04	V
36962.5	45.13	1.6	43.53	H
39003.7	50.25	4.1	46.15	H

RSE-11AC(40M)-CH38-30M-1G-N04

Frequency (MHz)	Result (dB μ V/m)	ARpl (dB)	PMea (dB μ V/m)	Polarity
72.0	21.75	-18.5	40.25	V
181.5	24.78	-15.8	40.58	H
231.5	22.84	-13.5	36.34	H
269.5	20.79	-12	32.79	H
414.8	20.18	-8.4	28.58	H
796.5	24.49	-1.9	26.39	V

RSE-11AC(40M)-CH38-1G-8G-N04

Frequency (MHz)	Result (dB μ V/m)	ARpl (dB)	PMea (dB μ V/m)	Polarity
2991.4	36.84	3.3	33.54	H
4378.2	37.5	2	35.5	V
5995.6	38.24	2.5	35.74	V
6526.8	39.15	3.7	35.45	H
7068.6	39.79	5	34.79	H
7873.2	40.58	4.9	35.68	V

RSE-11AC(40M)-CH38-8G-18G-N04

Frequency (MHz)	Result (dB μ V/m)	ARpl (dB)	PMea (dB μ V/m)	Polarity
10488.6	41.48	7.9	33.58	V
11977.2	43.55	10.3	33.25	H
14021.0	44.72	12.7	32.02	V
15220.4	46.54	15	31.54	V
16269.8	47.46	17.1	30.36	H
17469.0	48.25	18.5	29.75	V

RSE-11AC(40M)-CH38-18G-26.5G-N04

Frequency (MHz)	Result (dB μ V/m)	ARpl (dB)	PMea (dB μ V/m)	Polarity
18637.5	38.97	-5.7	44.67	V
19723.8	41.48	-5.1	46.58	V
20872.2	41.89	-4.1	45.99	V
22809.3	43.55	-2.9	46.45	V
24116.6	44.05	-2.8	46.85	H
25905.8	45.46	-2	47.46	H

RSE-11AC(40M)-CH38-26.5G-40G-N04

Frequency (MHz)	Result (dB μ V/m)	ARpl (dB)	PMea (dB μ V/m)	Polarity
27337.0	45.03	-1	46.03	V
30820.0	45.99	0.3	45.69	H
33345.8	44.48	1.1	43.38	V
35558.5	47.56	1.5	46.06	H
36930.1	47.19	1.7	45.49	V
39002.4	49.53	4.1	45.43	V

RSE-11AC(80M)-CH42-30M-1G-N04

Frequency (MHz)	Result (dB μ V/m)	ARpl (dB)	PMea (dB μ V/m)	Polarity
72.0	23.02	-18.5	41.52	V
181.1	26.06	-15.8	41.86	H
216.9	22.94	-14	36.94	H
281.9	19.28	-11.8	31.08	H
299.1	18.36	-11.5	29.86	H
433.3	19.78	-8.4	28.18	H

RSE-11AC(80M)-CH42-1G-8G-N04

Frequency (MHz)	Result (dB μ V/m)	ARpl (dB)	PMea (dB μ V/m)	Polarity
2996.0	45.81	3.2	42.61	H
5993.2	39.38	2.5	36.88	H
6315.0	38.96	3.6	35.36	V
6637.0	39.57	4	35.57	V
7154.0	39.7	4.7	35	H
7680.8	38.7	4.4	34.3	V

RSE-11AC(80M)-CH42-8G-18G-N04

Frequency (MHz)	Result (dB μ V/m)	ARpl (dB)	PMea (dB μ V/m)	Polarity
10316.8	42.12	8	34.12	V
11994.2	42.23	10.4	31.83	H
14002.0	45.48	12.7	32.78	H
14988.2	45.58	14.5	31.08	V
15923.2	46.8	16.4	30.4	H
17308.8	47.95	18.5	29.45	V

RSE-11AC(80M)-CH42-18G-26.5G-N04

Frequency (MHz)	Result (dB μ V/m)	ARpl (dB)	PMea (dB μ V/m)	Polarity
18193.8	39.52	-6.3	45.82	H
20655.4	41.88	-4.4	46.28	V
22134.4	44.01	-3	47.01	V
23560.7	44.74	-2.8	47.54	H
24725.2	44.25	-2.2	46.45	H
26038.4	46.36	-2	48.36	H

RSE-11AC(80M)-CH42-26.5G-40G-N04

Frequency (MHz)	Result (dB μ V/m)	ARpl (dB)	PMea (dB μ V/m)	Polarity
27927.0	45.23	-0.3	45.53	H
30809.2	44.83	0.2	44.63	V
34018.2	45.97	1.5	44.47	H
35428.9	46.97	1.6	45.37	V
36912.6	46.39	1.8	44.59	H
39107.6	49.06	4.2	44.86	H

ANNEX A.8. Conducted Emission (150kHz- 30MHz)

Test Condition:

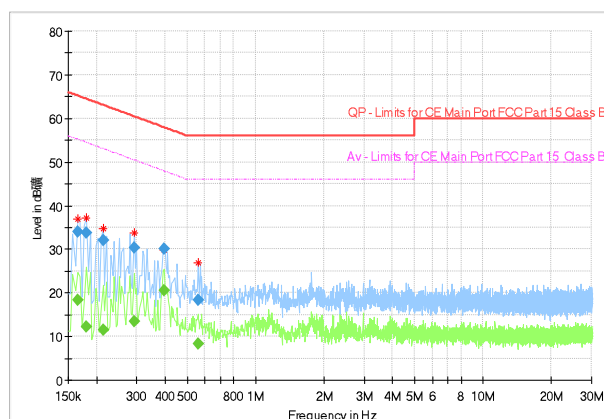
Voltage (V)	Frequency (Hz)
110	60

Measurement Result and limit:

WLAN (Quasi-peak Limit)

Frequency range (MHz)	Quasi-peak Limit (dB μ V)	Conclusion
0.15 to 0.5	66 to 56	P
0.5 to 5	56	
5 to 30	60	

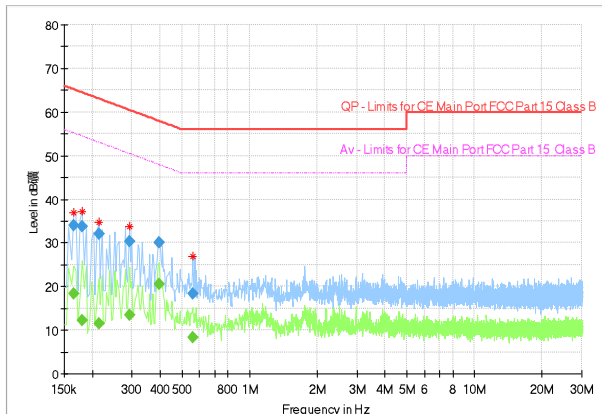
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.



WLAN (Average Limit)

Frequency range (MHz)	Average Limit (dBμV)	Conclusion
0.15 to 0.5	56 to 46	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.



The graph plots 'Level in dBμV' on the y-axis (0 to 80) against 'Frequency in Hz' on a logarithmic x-axis (150k to 30M). Two limit lines are shown: a red line for 'QP - Limits for CE Main Port FCC Part 15 Class B' and a magenta line for 'Av - Limits for CE Main Port FCC Part 15 Class B'. Both lines decrease linearly from 0.15 MHz to 0.5 MHz and then remain constant. The measured signal is shown as a blue line with peaks marked by red stars. The signal level is generally below the limits, with some peaks reaching up to 40 dBμV at lower frequencies.

Measurement Result:

Frequency (MHz)	Quasi Peak (dB μ V)	Average (dB μ V)	Limit (dB μ V)	Marg in (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.164925	34.03	---	65.21	31.18	15000.0	9.000	N	ON	9.7
0.164925	---	18.31	55.21	36.90	15000.0	9.000	N	ON	9.7
0.179850	33.67	---	64.49	30.82	15000.0	9.000	L1	ON	9.6
0.179850	---	12.23	54.49	42.26	15000.0	9.000	L1	ON	9.6
0.213431	32.09	---	63.07	30.98	15000.0	9.000	L1	ON	9.6
0.213431	---	11.38	53.07	41.69	15000.0	9.000	L1	ON	9.6
0.291788	30.38	---	60.47	30.09	15000.0	9.000	L1	ON	9.6
0.291788	---	13.55	50.47	36.93	15000.0	9.000	L1	ON	9.6
0.396263	30.05	---	57.93	27.88	15000.0	9.000	L1	ON	9.6
0.396263	---	20.64	47.93	27.30	15000.0	9.000	L1	ON	9.6
0.556706	18.38	---	56.00	37.62	15000.0	9.000	L1	ON	9.6
0.556706	---	8.31	46.00	37.69	15000.0	9.000	L1	ON	9.6

ANNEX B. Accreditation Certificate



*****END OF REPORT*****