



RADIO TEST REPORT

Report No.:STS2112357W04

Issued for
BARTEC

Max-Eyth-Str. 16 97980 Bad Mergentheim Germany

Product Name:	Pixavi Cam
Brand Name:	BARTEC GmbH
Model Name:	Pixavi Cam
Series Model:	17-S13*-10*1/***** (Where * can be A-Z,a-z,0-9,"-",Blank or Slash)
FCC ID:	TBU-X8KPC
Test Standard:	FCC Part 15.407

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TEST RESULT CERTIFICATION

Applicant's Name..... : BARTEC

Address : Max-Eyth-Str. 16 97980 Bad Mergentheim Germany

Manufacture's Name..... : BARTEC GmbH

Address : Max-Eyth-Str. 16 97980 Bad Mergentheim Germany

Product Description

Product Name..... : Pixavi Cam

Brand Name : BARTEC GmbH

Model Name : Pixavi Cam

Series Model..... : 17-S13*-10*1/***** (Where * can be A-Z,a-z,0-9,"-",Blank or Slash)

Test Standards..... : FCC Part15.407

Test Procedure..... ANSI C63.10-2013

This device described above has been tested by STS, the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Date of Test..... :

Date of receipt of test item : 11 Mar. 2022

Date (s) of performance of tests : 11 Mar. 2022 ~ 19 Apr. 2022

Date of Issue..... : 19 Apr. 2022

Test Result..... : **Pass**

Testing Engineer :

(Chris Chen)

Technical Manager :

(Sean she)

Authorized Signatory :

(Bovey Yang)





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**Revision History**

Rev.	Issue Date	Report NO.	Effect Page	Contents
00	19 Apr. 2022	STS2112357W04	ALL	Initial Issue





1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

§ 15.407, KDB 789033 D02 General U-NII Test Procedures New Rules v02r01

FCC Part 15.407		
FCC standard	Test Item	Results
15.207	AC Conducted Emission	PASS
§ 15.407 (2) (26 dB) / § 15.407 (e) (6 dB) / § 15.407 (a) (99%)	26dB/6dB & 99% Bandwidth	PASS
15.407(a) (1).(2).(3).(4).(5)	Maximum Conducted Output Power	PASS
15.407(b) & 15.209	Radiated Emission And (bandedge Emissions) Measurement	PASS
15.407(b)7	Conducted Emission And (bandedge Emissions) Measurement	PASS
15.407(a) (1).(2).(3).(4).(5)	Power Spectral Density	PASS
15.407(c)	Automatically Discontinue Transmission	PASS
15.203/15.204	Antenna Requirement	PASS

NOTE:

(1) "N/A" denotes test is not applicable in this Test Report.

(2) All tests are according to ANSI C63.10-2013.



1.1 TEST FACTORY

SHENZHEN STS TEST SERVICES CO., LTD

Add. : A 1/F, Building B, Zhuoke Science Park, No.190 Chongqing Road, HepingShequ, Fuyong Sub-District, Bao'an District, Shenzhen, Guang Dong, China

FCC test Firm Registration Number: 625569

IC test Firm Registration Number: 12108A

A2LA Certificate No.: 4338.01

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately **95 %**.

No.	Item	Uncertainty
1	RF output power, conducted	$\pm 0.87\text{dB}$
2	Unwanted Emissions, conducted	$\pm 2.895\text{dB}$
3	All emissions, radiated 30-1GHz	$\pm 3.80\text{dB}$
4	All emissions, radiated 1G-6GHz	$\pm 4.09\text{dB}$
5	All emissions, radiated >6G	$\pm 4.92\text{dB}$
6	Conducted Emission (9KHz-150KHz)	$\pm 5.49\text{dB}$
7	Conducted Emission (150KHz-30MHz)	$\pm 2.73\text{dB}$



2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF THE EUT

Product Name	Pixavi Cam								
Trade Name	BARTEC GmbH								
Model Name	Pixavi Cam								
Series Model	17-S13*-10*1/***** (Where * can be A-Z,a-z,0-9,"-",Blank or Slash)								
Model Difference	Models are named differently for different regions.								
Product Description	The EUT is a Pixavi Cam <table><tr><td>Operation Frequency:</td><td>IEEE 802.11a/ n(HT20)/ac(VHT20): 5.180GHz-5.240GHz IEEE 802.11n(HT40)/ac(VHT40): 5.190GHz-5.230GHz IEEE 802.11ac(VHT80): 5.210GHz IEEE 802.11a/ n(HT20)/ac(VHT20): 5.260GHz-5.320GHz IEEE 802.11n(HT40)/ac(VHT40): 5.270GHz-5.310GHz IEEE 802.11ac(VHT80): 5.290GHz IEEE 802.11a/ n(HT20)/ac(VHT20): 5.500GHz-5.700GHz IEEE 802.11n(HT40)/ac(VHT40): 5.510GHz-5.670GHz IEEE 802.11ac(VHT80): 5.530GHz-5.610GHz</td></tr><tr><td>Modulation Type:</td><td>802.11a(OFDM): BPSK,QPSK,16-QAM,64-QAM 802.11n(OFDM): BPSK,QPSK,16-QAM,64-QAM 802.11ac(OFDM): BPSK,QPSK,16-QAM,64-QAM,256-QAM</td></tr><tr><td>Antenna Designation:</td><td>Please refer to the Note 3.</td></tr><tr><td>Max.Output Power(Conducted):</td><td>12.73 dBm</td></tr></table> More details of EUT technical specification, please refer to the User's Manual.	Operation Frequency:	IEEE 802.11a/ n(HT20)/ac(VHT20): 5.180GHz-5.240GHz IEEE 802.11n(HT40)/ac(VHT40): 5.190GHz-5.230GHz IEEE 802.11ac(VHT80): 5.210GHz IEEE 802.11a/ n(HT20)/ac(VHT20): 5.260GHz-5.320GHz IEEE 802.11n(HT40)/ac(VHT40): 5.270GHz-5.310GHz IEEE 802.11ac(VHT80): 5.290GHz IEEE 802.11a/ n(HT20)/ac(VHT20): 5.500GHz-5.700GHz IEEE 802.11n(HT40)/ac(VHT40): 5.510GHz-5.670GHz IEEE 802.11ac(VHT80): 5.530GHz-5.610GHz	Modulation Type:	802.11a(OFDM): BPSK,QPSK,16-QAM,64-QAM 802.11n(OFDM): BPSK,QPSK,16-QAM,64-QAM 802.11ac(OFDM): BPSK,QPSK,16-QAM,64-QAM,256-QAM	Antenna Designation:	Please refer to the Note 3.	Max.Output Power(Conducted):	12.73 dBm
Operation Frequency:	IEEE 802.11a/ n(HT20)/ac(VHT20): 5.180GHz-5.240GHz IEEE 802.11n(HT40)/ac(VHT40): 5.190GHz-5.230GHz IEEE 802.11ac(VHT80): 5.210GHz IEEE 802.11a/ n(HT20)/ac(VHT20): 5.260GHz-5.320GHz IEEE 802.11n(HT40)/ac(VHT40): 5.270GHz-5.310GHz IEEE 802.11ac(VHT80): 5.290GHz IEEE 802.11a/ n(HT20)/ac(VHT20): 5.500GHz-5.700GHz IEEE 802.11n(HT40)/ac(VHT40): 5.510GHz-5.670GHz IEEE 802.11ac(VHT80): 5.530GHz-5.610GHz								
Modulation Type:	802.11a(OFDM): BPSK,QPSK,16-QAM,64-QAM 802.11n(OFDM): BPSK,QPSK,16-QAM,64-QAM 802.11ac(OFDM): BPSK,QPSK,16-QAM,64-QAM,256-QAM								
Antenna Designation:	Please refer to the Note 3.								
Max.Output Power(Conducted):	12.73 dBm								
Test Channel	Please refer to the Note 2.								
Adapter	Input: 100-240V~50/60Hz 0.5A Output: (QC3.0 USB-A) 5.0V $\overline{\text{---}}$ 3.0A, 9.0V $\overline{\text{---}}$ 2.0A, 12.0V $\overline{\text{---}}$ 1.5A								
Battery	Rated Voltage: 3.8 V (Nominal) Charge Limit Voltage: 4.35 V Capacity: 3200mAh								
Hardware version number	X8K_Main_Board RevC								
Software version number	PWG1.200910.756								
Connecting I/O Port(s)	Please refer to the Note 1.								

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User Manual.



Operation Frequency of channel			
5.180GHz-5.240GHz		5.500GHz-5.720GHz	
Channel	Frequency	Channel	Frequency
36	5180	100	5500
38	5190	102	5510
40	5200	104	5520
42	5210	108	5540
44	5220	110	5550
46	5230	112	5560
48	5240	116	5580
		118	5590
		120	5600
5.260GHz-5.320GHz		124	5620
Channel	Frequency	126	5630
52	5260	128	5640
54	5270	132	5660
56	5280	134	5670
58	5290	136	5680
60	5300	140	5700
62	5310		
64	5320		

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Carrier Frequency Channel

5GHz:

For 802.11a/n(HT20) /ac (VHT20)

Channel	Freq.(MHz)	Channel	Freq.(MHz)
36	5180	52	5260
40	5200	60	5300
48	5240	64	5320

For 802.11a/n(HT20) /ac (VHT20)

Channel	Freq.(MHz)	Channel	Freq.(MHz)
100	5500	116	5580
140	5700		

For 802.11n(HT40) /ac (VHT40)

Channel	Freq.(MHz)	Channel	Freq.(MHz)
38	5190	54	5270
46	5230	62	5310



For 802.11n(HT40) /ac (VHT40)

Channel	Freq.(MHz)	Channel	Freq.(MHz)
102	5510	110	5550
134	5670		

For 802.11ac (VHT80)

Channel	Freq.(MHz)	Channel	Freq.(MHz)
42	5210	155	5775

For 802.11ac (VHT80)

Channel	Freq.(MHz)	Channel	Freq.(MHz)
106	5530	122	5610

3.	Ant	Brand	Model Name	Ant Type	Connector	Gain (dBi)	NOTE
	A	BARTEC GmbH	Pixavi Cam	PIFA	N/A	-0.6dBi	WLAN Ant

Note: The antenna information refer the manufacturer provide report, applicable only to the tested sample identified in the report. Due to the incorrect antenna information, a series of problems such as the accuracy of the test results will be borne by the customer.



2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generated from EUT, the test system was pre-scanning tested based on the consideration of following EUT operation mode or test configuration mode which possibly have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Worst Mode	Description	Data Rate
Mode 1	TX IEEE 802.11a HT20 CH36&CH40&CH48	6 Mbps
Mode 2	TX IEEE 802.11a HT20 CH52&CH60&CH64	6 Mbps
Mode 3	TX IEEE 802.11a HT20 CH100&CH116&CH140	6 Mbps
Mode 4	TX IEEE 802.11n HT20 CH36&CH40&CH48	MCS 0
Mode 5	TX IEEE 802.11ac HT20 CH36&CH40&CH48	NSS1 MCS0
Mode 6	TX IEEE 802.11n HT20 CH52&CH60&CH64	MCS 0
Mode 7	TX IEEE 802.11ac HT20 CH52&CH60&CH64	NSS1 MCS0
Mode 8	TX IEEE 802.11n HT20 CH100&CH116&CH140	MCS 0
Mode 9	TX IEEE 802.11ac HT20 CH100&CH116&CH140	NSS1 MCS0
Mode 10	TX IEEE 802.11n HT40 CH38&CH46	MCS 0
Mode 11	TX IEEE 802.11ac HT40 CH38&CH46	NSS1 MCS0
Mode 12	TX IEEE 802.11n HT40 CH54 &CH62	MCS 0
Mode 13	TX IEEE 802.11ac HT40 CH54 &CH62	NSS1 MCS0
Mode 14	TX IEEE 802.11n HT40 CH102&CH110&CH134	MCS 0
Mode 15	TX IEEE 802.11ac HT40 CH102&CH110&CH134	NSS1 MCS0
Mode 16	TX IEEE 802.11ac HT80 CH42	NSS1 MCS0
Mode 17	TX IEEE 802.11ac HT80 CH58	NSS1 MCS0
Mode 18	TX IEEE 802.11ac HT80 CH106&122	NSS1 MCS0

Note: (1) The measurements are performed at the highest, middle, lowest available channels.

(2) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported.

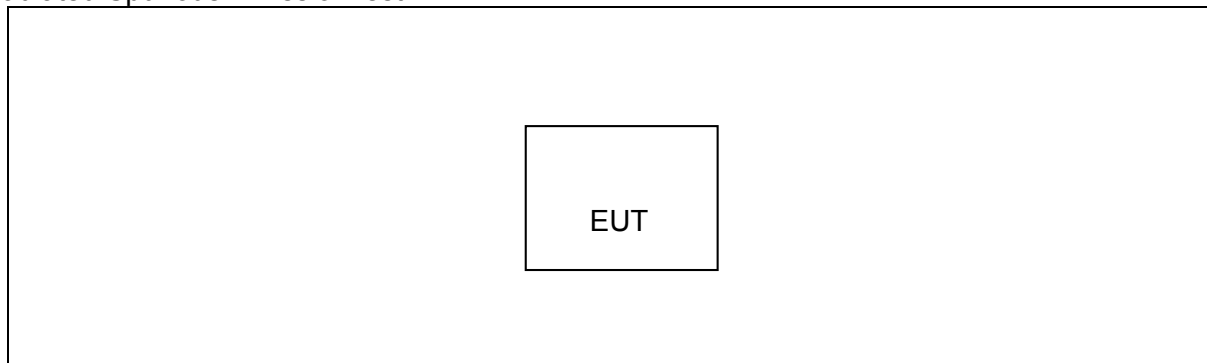
(3) We have been tested for all available U.S. voltage and frequencies (For 120V, 50/60Hz and 240V, 50/60Hz) for which the device is capable of operation.

AC Conducted Emission

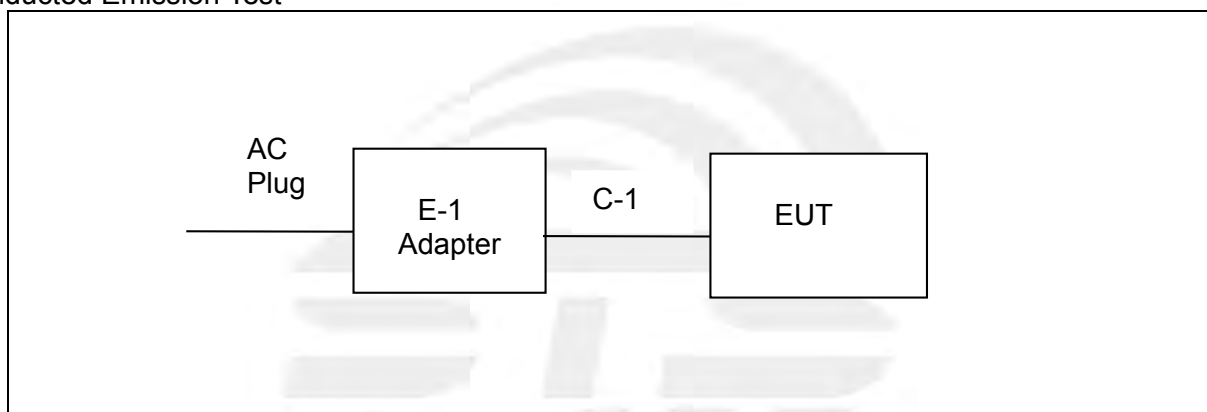
Test Case	
AC Conducted Emission	Mode 19: Keeping TX + WLAN Link

2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Radiated Spurious Emission Test



Conducted Emission Test





2.4 DESCRIPTION OF NECESSARY ACCESSORIES AND SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Necessary accessories

Item	Equipment	Mfr/Brand	Model/Type No.	Length	Note
E-1	Adapter	N/A	TU-18W	N/A	N/A
C-1	DC Cable	N/A	N/A	85cm	YES

Support units

Item	Equipment	Mfr/Brand	Model/Type No.	Length	Note
N/A	N/A	N/A	N/A	N/A	N/A

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.



2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Test Receiver	R&S	ESCI	101427	2021.09.30	2022.09.29
Signal Analyzer	Agilent	N9020A	101823	2021.09.30	2022.09.29
Active loop Antenna	ZHINAN	ZN30900C	16035	2021.04.11	2023.04.10
Bilog Antenna	TESEQ	CBL6111D	34678	2020.10.12	2022.10.11
Horn Antenna	SCHWARZBECK	BBHA 9120D(1201)	02014	2021.10.11	2023.10.10
SHF-EHF Horn Antenna (18G-40GHz)	A-INFO	LB-180400-KF	J211020657	2020.10.12	2022.10.11
Pre-Amplifier (0.1M-3GHz)	EM	EM330	060665	2021.10.08	2022.10.07
Pre-Amplifier (1G-18GHz)	SKET	LNPA-01018G-45	SK2018080901	2021.09.30	2022.09.29
Pre-Amplifier (18G-40GHz)	SKET	LNPA-1840-50	SK2018101801	2021.09.28	2022.09.27
Temperature & Humidity	HH660	Mieo	N/A	2021.10.09	2022.10.08
turn table	EM	SC100_1	60531	N/A	N/A
Antenna mast	EM	SC100	N/A	N/A	N/A
Test SW	FARAD	EZ-EMC(Ver.STSLAB-03A1 RE)			

Conduction Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Test Receiver	R&S	ESCI	101427	2021.09.30	2022.09.29
LISN	R&S	ENV216	101242	2021.09.30	2022.09.29
LISN	EMCO	3810/2NM	23625	2021.09.30	2022.09.29
Temperature & Humidity	HH660	Mieo	N/A	2021.10.09	2022.10.08
Test SW	FARAD	EZ-EMC(Ver.STSLAB-03A1 CE)			

RF Connected Test

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Power Sensor	Keysight	U2021XA	MY55520005	2021.09.30	2022.09.29
			MY55520006	2021.09.30	2022.09.29
			MY56120038	2021.09.30	2022.09.29
			MY56280002	2021.09.30	2022.09.29
Signal Analyzer	Agilent	N9020A	MY51110105	2022.03.01	2023.02.28
Temperature & Humidity	HH660	Mieo	N/A	2021.10.09	2022.10.08
Test SW	FARAD	LZ-RF /LzRf-3A3			



3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class B (dBuV)		Standard
	Quasi-peak	Average	
0.15 -0.5	66 - 56 *	56 - 46 *	CISPR
0.50 -5.0	56.00	46.00	CISPR
5.0 -30.0	60.00	50.00	CISPR

0.15 -0.5	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	56.00	46.00	FCC
5.0 -30.0	60.00	50.00	FCC

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

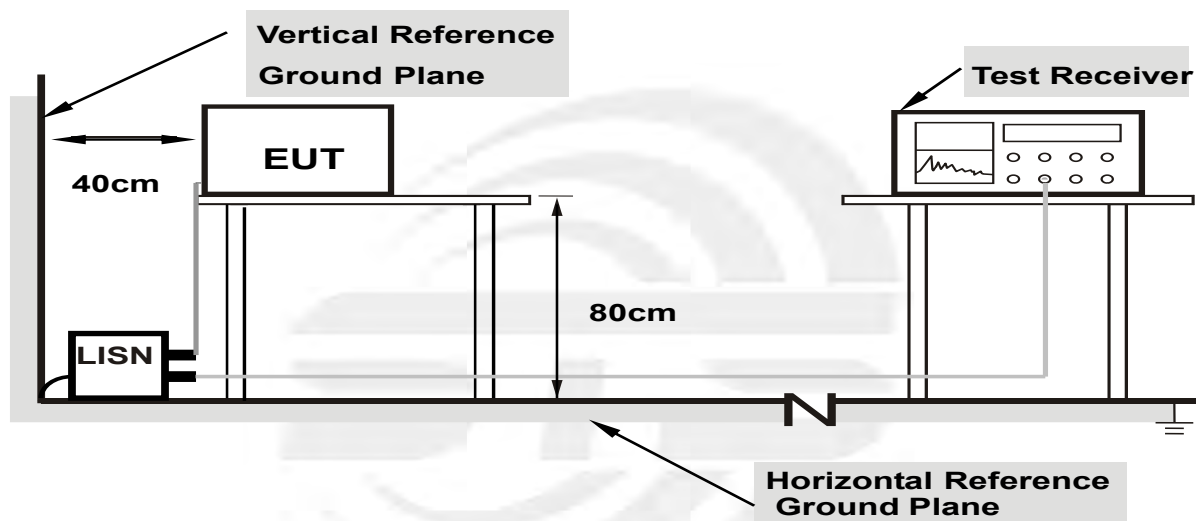
3.1.2 TEST PROCEDURE

- The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- LISN at least 80 cm from nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3 DEVIATION FROM TEST STANDARD

No deviation

3.1.4 TEST SETUP



Note: 1.Support units were connected to second LISN.

2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

3.1.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.



3.1.6 TEST RESULTS

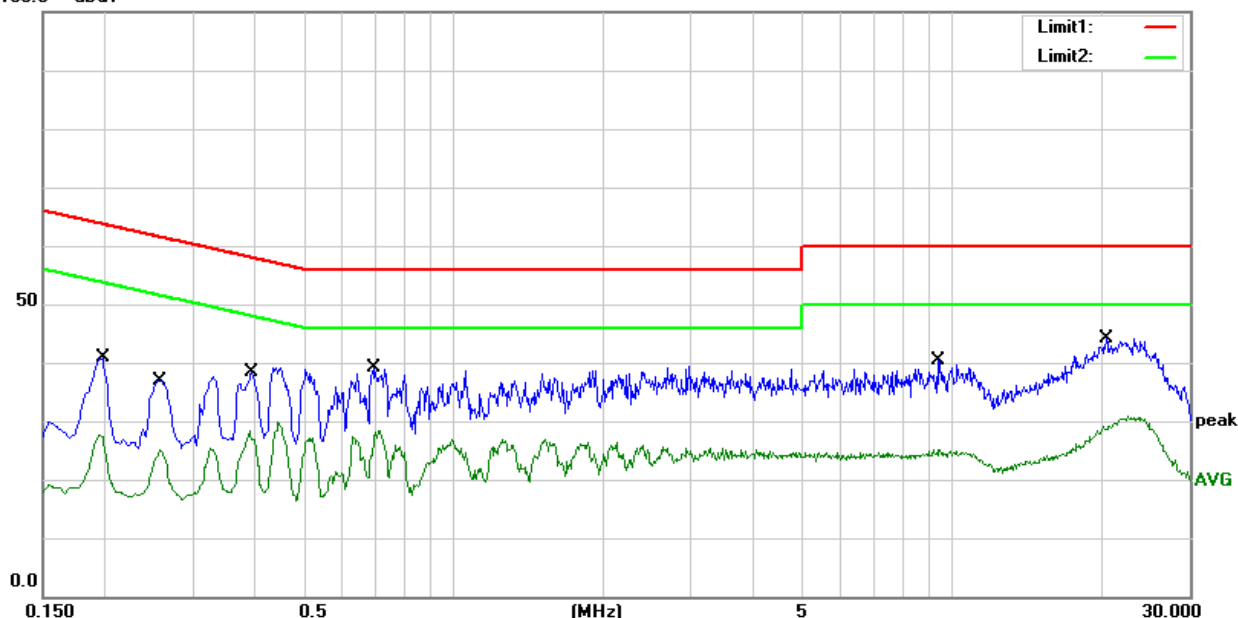
Temperature:	23.2(C)	Relative Humidity:	44%RH
Test Voltage:	AC 120V/60Hz	Phase:	L
Test Mode :	Mode 19		

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1900	18.87	20.31	39.18	64.04	-24.86	QP
2	0.1900	5.12	20.31	25.43	54.04	-28.61	AVG
3	0.4420	15.71	20.54	36.25	57.02	-20.77	QP
4	0.4420	5.97	20.54	26.51	47.02	-20.51	AVG
5	1.0580	14.70	20.30	35.00	56.00	-21.00	QP
6	1.0580	4.50	20.30	24.80	46.00	-21.20	AVG
7	2.5020	14.91	20.33	35.24	56.00	-20.76	QP
8	2.5020	3.50	20.33	23.83	46.00	-22.17	AVG
9	10.7980	16.93	21.29	38.22	60.00	-21.78	QP
10	10.7980	1.89	21.29	23.18	50.00	-26.82	AVG
11	23.1340	22.08	22.71	44.79	60.00	-15.21	QP
12	23.1340	8.06	22.71	30.77	50.00	-19.23	AVG

Remark:

1. All readings are Quasi-Peak and Average values.
2. Margin = Result (Result = Reading + Factor) - Limit

100.0 dBuV



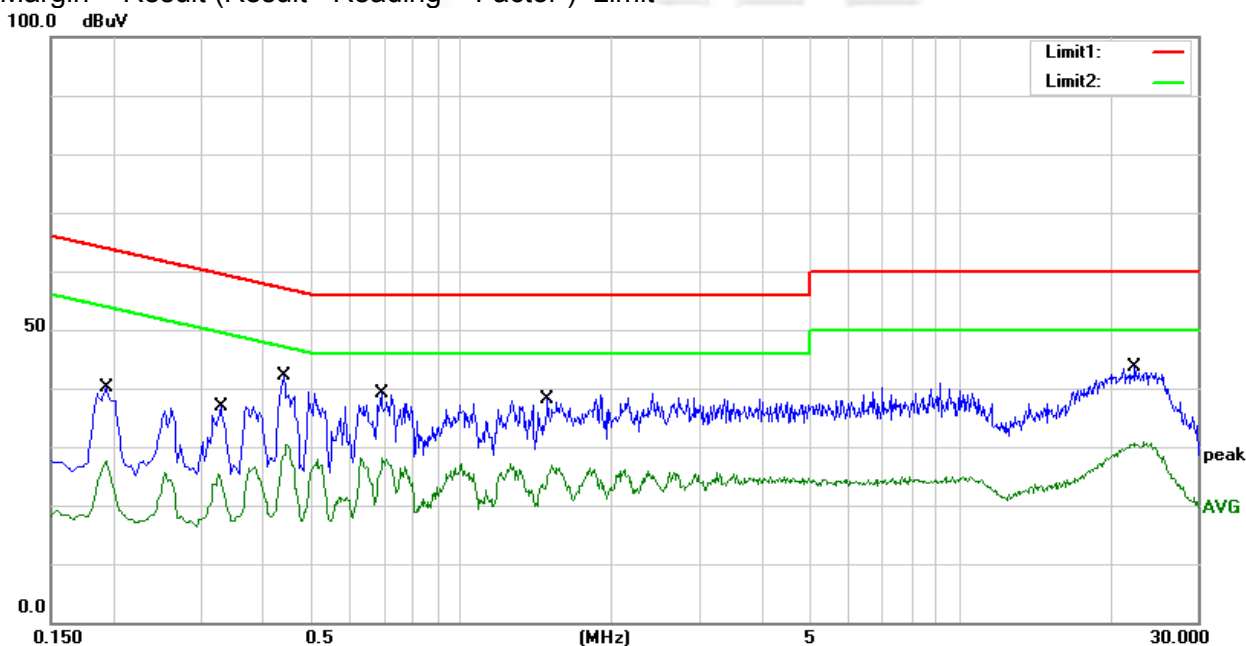


Temperature:	23.2(C)	Relative Humidity:	44%RH
Test Voltage	AC 120V/60Hz	Phase:	N
Test Mode	Mode 19		

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1940	19.82	20.31	40.13	63.86	-23.73	QP
2	0.1940	7.31	20.31	27.62	53.86	-26.24	AVG
3	0.3300	16.18	20.69	36.87	59.45	-22.58	QP
4	0.3300	5.86	20.69	26.55	49.45	-22.90	AVG
5	0.4420	21.52	20.54	42.06	57.02	-14.96	QP
6	0.4420	9.91	20.54	30.45	47.02	-16.57	AVG
7	0.6900	18.74	20.36	39.10	56.00	-16.90	QP
8	0.6900	7.66	20.36	28.02	46.00	-17.98	AVG
9	1.4940	17.94	20.30	38.24	56.00	-17.76	QP
10	1.4940	6.46	20.30	26.76	46.00	-19.24	AVG
11	22.4700	20.93	22.75	43.68	60.00	-16.32	QP
12	22.4700	8.01	22.75	30.76	50.00	-19.24	AVG

Remark:

1. All readings are Quasi-Peak and Average values.
2. Margin = Result (Result = Reading + Factor) - Limit





3.2 RADIATED EMISSION AND (BANDEDGE) MEASUREMENT

3.2.1 RADIATED EMISSION LIMITS (Frequency Range 9kHz-1000MHz)

In case the emission fall within the restricted band specified on 15.407(b)7& 15.205/209(a), then the (a); limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (microvolt/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Class B (dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	68.2	54

Notes:

- (1) The limit for radiated test was performed according to FCC PART 15E.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

LIMITS OF RESTRICTED FREQUENCY BANDS

FREQUENCY (MHz)	FREQUENCY (MHz)	FREQUENCY (MHz)	FREQUENCY (GHz)
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	Above 38.6
13.36-13.41			



Spectrum Parameter	Setting
Attenuation	Auto
Detector	Peak
Start Frequency	1000 MHz(Peak/AV)
Stop Frequency	10th carrier harmonic (Peak/AV)
RB / VB (emission in restricted band)	1 MHz / 1 MHz, AV=1 MHz /3 MHz

For Band edge

Spectrum Parameter	Setting
Detector	Peak
RB / VB (emission in restricted band)	1 MHz / 1 MHz, AV=1 MHz /3 MHz

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~90kHz / RB 200Hz for PK & AV
Start ~ Stop Frequency	90kHz~110kHz / RB 200Hz for QP
Start ~ Stop Frequency	110kHz~490kHz / RB 200Hz for PK & AV
Start ~ Stop Frequency	490kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

3.2.2 TEST PROCEDURE

- The measuring distance of at 3 m shall be used for measurements at frequency 0.009MHz up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- The EUT was placed on the top of a rotating table 0.8 meters(above 1GHz is 1.5 m) above the ground at a 3 meter anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The height of the equipment shall be 0.8 m(above 1GHz is 1.5 m); the height of the test antenna shall vary between 1 m to 4 m. Horizontal and vertical polarizations of the antenna are set to make the measurement
- The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

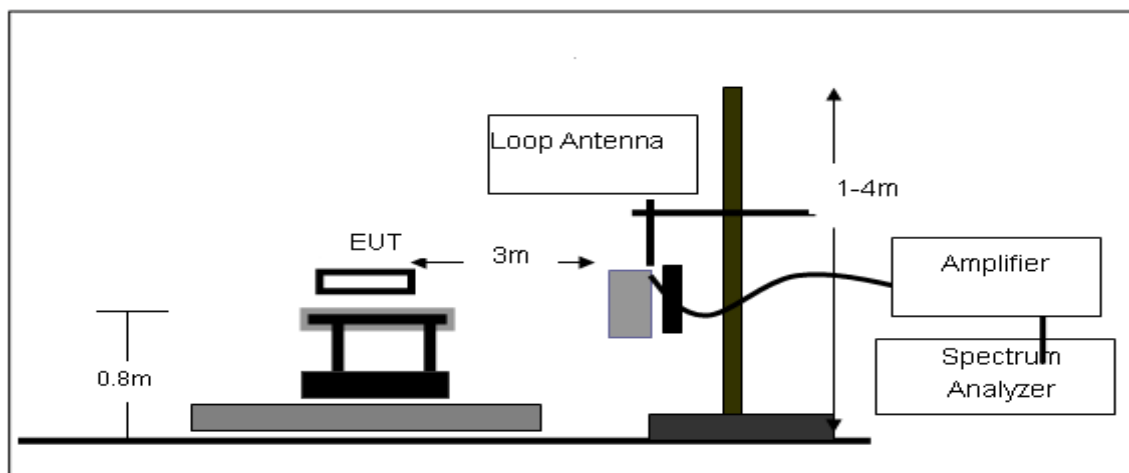
Both horizontal and vertical antenna polarities were tested and performed test to three orthogonal axis. The worst case emissions were reported

3.2.2 DEVIATION FROM TEST STANDARD

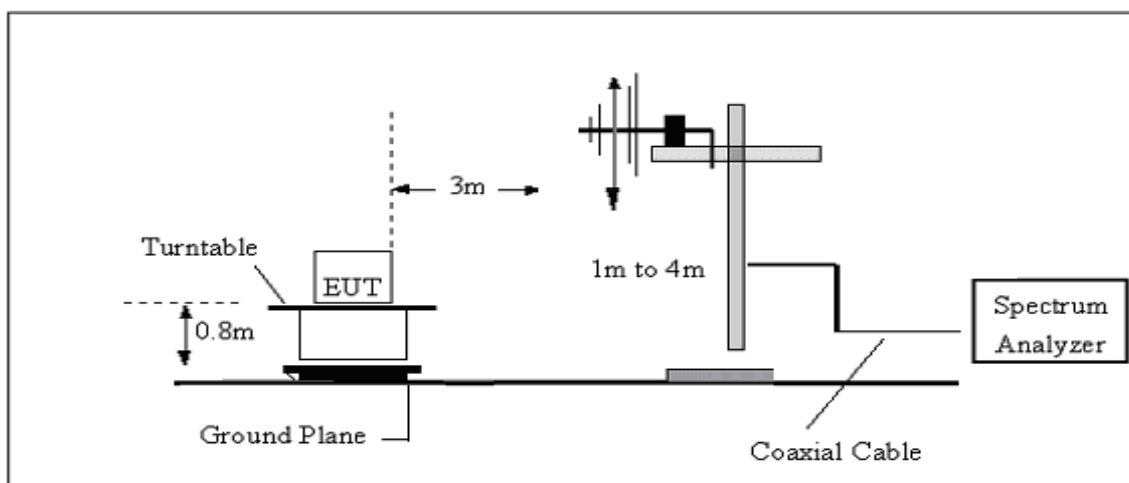
No deviation

3.2.3 TEST SETUP

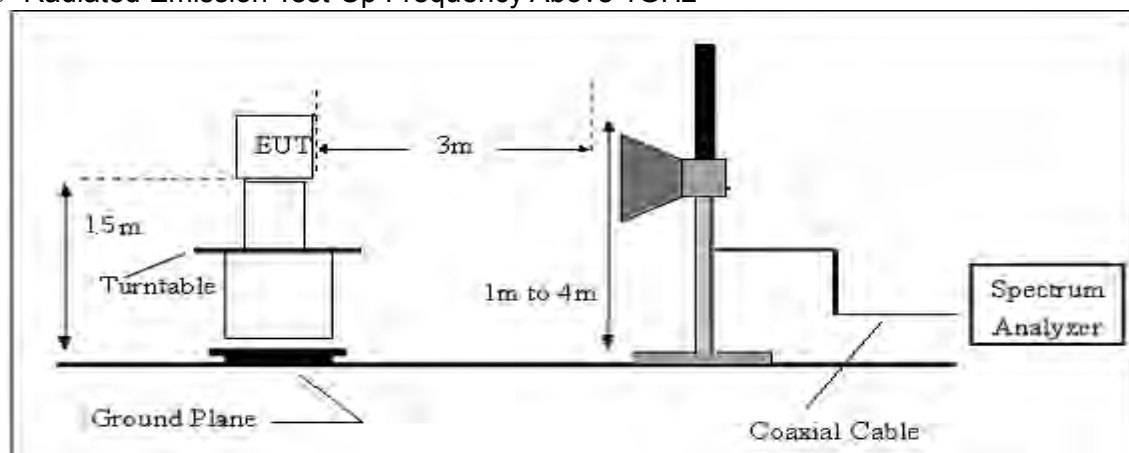
(A) Radiated Emission Test-Up Frequency Below 30MHz



(B) Radiated Emission Test-Up Frequency 30MHz~1GHz



(C) Radiated Emission Test-Up Frequency Above 1GHz





3.2.4 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

3.2.5 FIELD STRENGTH CALCULATION

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

Where

FS = Field Strength

CL = Cable Attenuation Factor (Cable Loss)

RA = Reading Amplitude

AG = Amplifier Gain

AF = Antenna Factor

For example

Frequency	FS	RA	AF	CL	AG	Factor
(MHz)	(dBμV/m)	(dBμV/m)	(dB)	(dB)	(dB)	(dB)
300	40	58.1	12.2	1.6	31.9	-18.1

$$\text{Factor} = \text{AF} + \text{CL} - \text{AG}$$

**3.2.6 TEST RESULTS (Between 9KHz – 30 MHz)**

Temperature:	23.1(C)	Relative Humidity:	60%RH
Test Voltage :	DC 3.8V	Polarization :	--
Test Mode :	TX Mode		

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	PASS
--	--	--	--	PASS

Note:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor = $40 \log (\text{specific distance/test distance})$ (dB);

Limit line = specific limits(dBuV) + distance extrapolation factor.

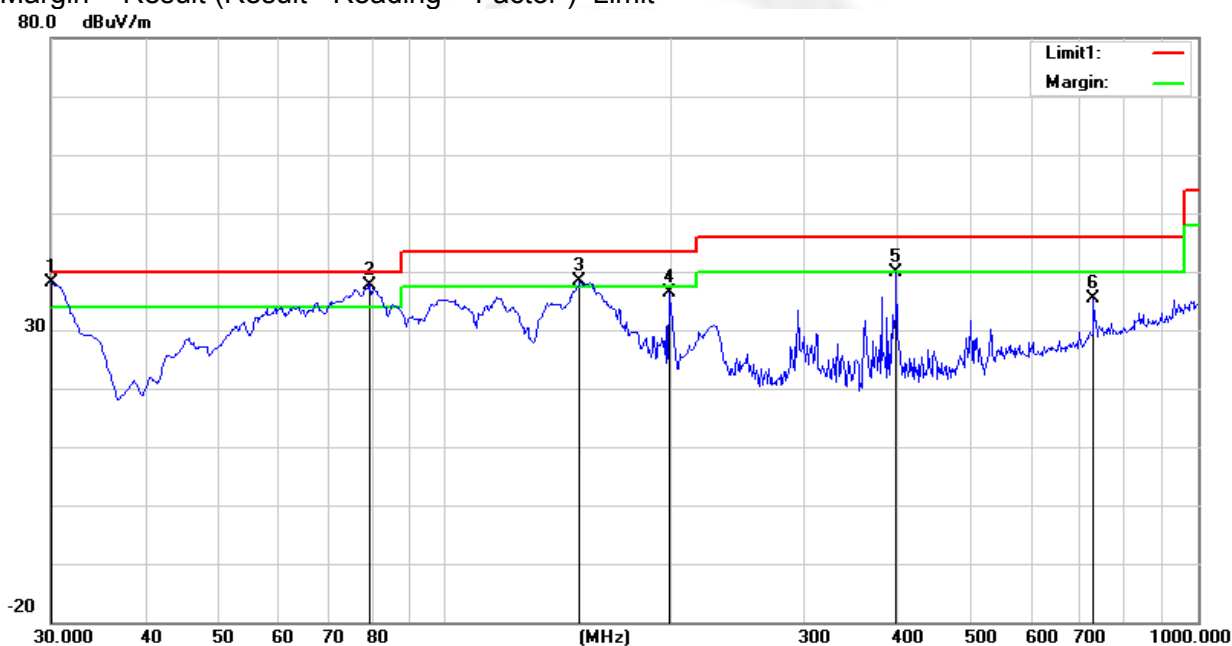
**3.2.7 TEST RESULTS (Between 30MHz – 1GHz)**

Temperature	23.1(C)	Relative Humidity:	60%RH
Test Voltage	DC 3.8V	Polarization:	Horizontal
Test Mode	Mode 1~18(Mode 3 worst mode)		

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	30.0000	50.99	-12.85	38.14	40.00	-1.86	peak
2	79.5210	60.63	-23.10	37.53	40.00	-2.47	peak
3	151.2500	56.84	-18.55	38.29	43.50	-5.21	peak
4	198.7800	57.53	-21.12	36.41	43.50	-7.09	peak
5	398.6000	51.04	-11.20	39.84	46.00	-6.16	peak
6	727.4300	37.96	-2.68	35.28	46.00	-10.72	peak

Remark:

1. Margin = Result (Result = Reading + Factor) – Limit



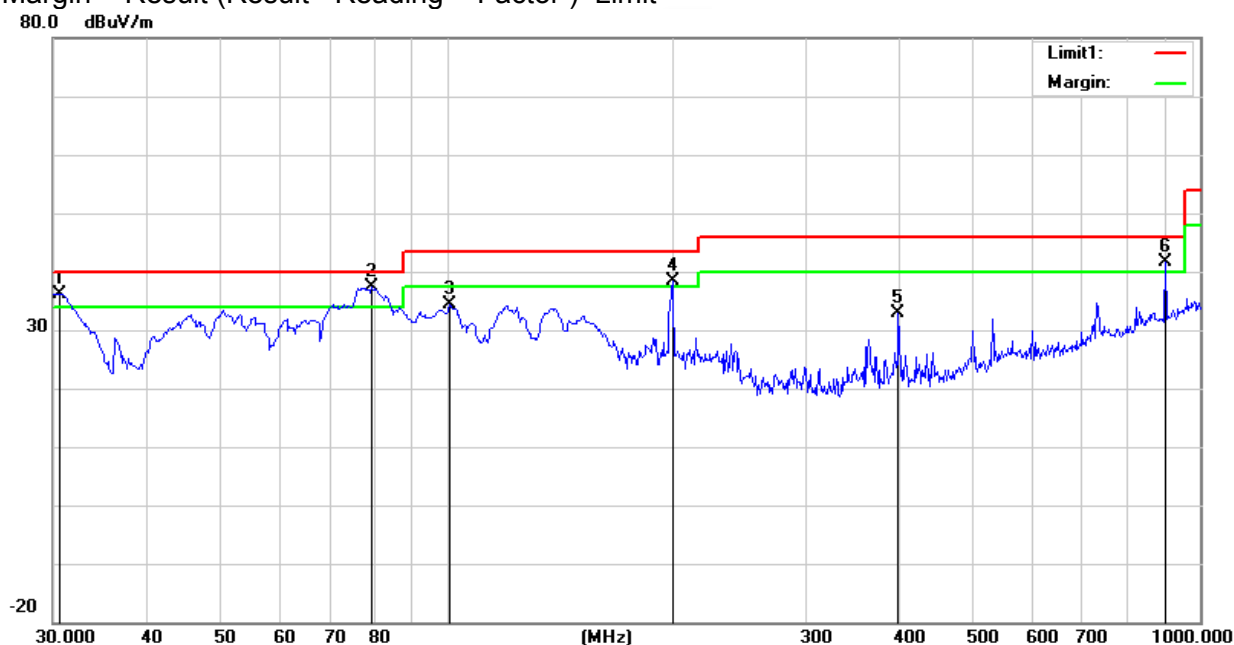


Temperature	23.1(C)	Relative Humidity:	60%RH
Test Voltage	DC 3.8V	Polarization:	Vertical
Test Mode	Mode 1~18(Mode 3 worst mode)		

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	30.6380	49.22	-13.18	36.04	40.00	-3.96	peak
2	79.5210	60.44	-23.10	37.34	40.00	-2.66	peak
3	100.9340	54.49	-20.03	34.46	43.50	-9.04	peak
4	199.7500	59.55	-21.11	38.44	43.50	-5.06	peak
5	398.6000	44.01	-11.20	32.81	46.00	-13.19	peak
6	902.0300	41.97	-0.40	41.57	46.00	-4.43	peak

Remark:

1. Margin = Result (Result =Reading + Factor)-Limit





3.2.8 TEST RESULTS (Above 1000 MHz)

U-NII-1 5150-5250MHz

Frequency (MHz)	Reading (dBuV)	Amplifier (dB)	Loss (dB)	Antenna Factor (dB/m)	Orrected Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Comment
Low Channel (802.11n(HT40)/ 5190 MHz)										
3270.52	44.36	44.70	6.70	28.20	-9.80	34.56	68.20	-33.64	Pk	Vertical
3270.52	41.20	44.70	6.70	28.20	-9.80	31.40	54.00	-22.60	AV	Vertical
3260.03	44.88	44.70	6.70	28.20	-9.80	35.08	74.00	-38.92	Pk	Horizontal
3260.03	41.21	44.70	6.70	28.20	-9.80	31.41	54.00	-22.59	AV	Horizontal
4000.58	39.21	44.20	7.90	29.70	-6.60	32.61	74.00	-41.39	Pk	Vertical
4000.58	37.07	44.20	7.90	29.70	-6.60	30.47	54.00	-23.53	AV	Vertical
3997.12	38.75	44.20	7.90	29.70	-6.60	32.15	74.00	-41.85	Pk	Horizontal
3997.12	37.04	44.20	7.90	29.70	-6.60	30.44	54.00	-23.56	AV	Horizontal
7232.44	36.71	43.50	11.40	35.50	3.40	40.11	68.20	-28.09	Pk	Vertical
7232.44	33.59	43.50	11.40	35.50	3.40	36.99	54.00	-17.01	AV	Vertical
7231.52	37.86	43.50	11.40	35.50	3.40	41.26	68.20	-26.94	Pk	Horizontal
7231.52	34.47	43.50	11.40	35.50	3.40	37.87	54.00	-16.13	AV	Horizontal
10379.98	39.42	44.50	13.80	38.80	8.10	47.52	68.20	-20.68	Pk	Vertical
10379.98	36.48	44.50	13.80	38.80	8.10	44.58	54.00	-9.42	AV	Vertical
10380.32	39.55	44.50	13.80	38.80	8.10	47.65	68.20	-20.55	Pk	Horizontal
10380.32	36.57	44.50	13.80	38.80	8.10	44.67	54.00	-9.33	AV	Horizontal
11042.45	32.71	43.60	14.30	39.50	10.20	42.91	74.00	-31.09	Pk	Vertical
11042.45	30.00	43.60	14.30	39.50	10.20	40.20	54.00	-13.80	AV	Vertical
11054.15	33.26	43.60	14.30	39.50	10.20	43.46	74.00	-30.54	Pk	Horizontal
11054.15	30.48	43.60	14.30	39.50	10.20	40.68	54.00	-13.32	AV	Horizontal
13322.72	32.66	42.60	15.90	38.90	12.20	44.86	74.00	-29.14	Pk	Vertical
13322.72	29.81	42.60	15.90	38.90	12.20	42.01	54.00	-11.99	AV	Vertical
13306.45	32.97	42.60	15.90	38.90	12.20	45.17	74.00	-28.83	Pk	Horizontal
13306.45	28.80	42.60	15.90	38.90	12.20	41.00	54.00	-13.00	AV	Horizontal
High Channel (802.11n(HT40)/ 5230 MHz)										
3276.36	44.13	44.70	6.70	28.20	-9.80	34.33	68.20	-33.87	Pk	Vertical
3276.36	41.33	44.70	6.70	28.20	-9.80	31.53	54.00	-22.47	AV	Vertical
3281.78	44.35	44.70	6.70	28.20	-9.80	34.55	68.20	-33.65	Pk	Horizontal
3281.78	41.07	44.70	6.70	28.20	-9.80	31.27	54.00	-22.73	AV	Horizontal
4009.53	39.90	44.20	7.90	29.70	-6.60	33.30	74.00	-40.70	Pk	Vertical
4009.53	36.58	44.20	7.90	29.70	-6.60	29.98	54.00	-24.02	AV	Vertical
4004.43	39.72	44.20	7.90	29.70	-6.60	33.12	74.00	-40.88	Pk	Horizontal
4004.43	36.22	44.20	7.90	29.70	-6.60	29.62	54.00	-24.38	AV	Horizontal
7277.31	36.43	43.50	11.40	35.50	3.40	39.83	74.00	-34.17	Pk	Vertical
7277.31	34.44	43.50	11.40	35.50	3.40	37.84	54.00	-16.16	AV	Vertical
7258.30	37.64	43.50	11.40	35.50	3.40	41.04	74.00	-32.96	Pk	Horizontal
7258.30	34.34	43.50	11.40	35.50	3.40	37.74	54.00	-16.26	AV	Horizontal
10460.06	39.59	44.50	13.80	38.80	8.10	47.69	68.20	-20.51	Pk	Vertical
10460.06	36.55	44.50	13.80	38.80	8.10	44.65	54.00	-9.35	AV	Vertical
10459.94	38.85	44.50	13.80	38.80	8.10	46.95	68.20	-21.25	Pk	Horizontal
10459.94	35.98	44.50	13.80	38.80	8.10	44.08	54.00	-9.92	AV	Horizontal
11095.71	33.77	43.60	14.30	39.50	10.20	43.97	74.00	-30.03	Pk	Vertical
11095.71	30.17	43.60	14.30	39.50	10.20	40.37	54.00	-13.63	AV	Vertical
11097.11	33.17	43.60	14.30	39.50	10.20	43.37	74.00	-30.63	Pk	Horizontal
11097.11	30.68	43.60	14.30	39.50	10.20	40.88	54.00	-13.12	AV	Horizontal
13363.49	32.07	42.60	15.90	38.90	12.20	44.27	74.00	-29.73	Pk	Vertical
13363.49	28.94	42.60	15.90	38.90	12.20	41.14	54.00	-12.86	AV	Vertical
13357.60	31.70	42.60	15.90	38.90	12.20	43.90	74.00	-30.10	Pk	Horizontal
13357.60	29.58	42.60	15.90	38.90	12.20	41.78	54.00	-12.22	AV	Horizontal

Remark:

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.

2. Scan with 802.11a, 802.11n (HT-20), 802.11n (HT-40), 802.11ac (VHT-20), 802.11ac (VHT-40), 802.11ac (VHT-80) the worst case is 802.11n (HT-40).

3. The frequency emission of peak points that did not show above the forms are at least 20dB below the limit, the frequency emission is mainly from the environment noise.



U-NII-2A 5250-5350MHz

Frequency (MHz)	Reading (dBuV)	Amplifier (dB)	Loss (dB)	Antenna Factor (dB/m)	Orrected Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Comment
Low Channel (802.11ac(VHT40)/ 5270 MHz)										
3253.62	44.07	44.70	6.70	28.20	-9.80	34.27	68.20	-33.93	Pk	Vertical
3253.62	41.63	44.70	6.70	28.20	-9.80	31.83	54.00	-22.17	AV	Vertical
3260.42	44.61	44.70	6.70	28.20	-9.80	34.81	74.00	-39.19	Pk	Horizontal
3260.42	41.62	44.70	6.70	28.20	-9.80	31.82	54.00	-22.18	AV	Horizontal
3991.60	39.40	44.20	7.90	29.70	-6.60	32.80	74.00	-41.20	Pk	Vertical
3991.60	36.30	44.20	7.90	29.70	-6.60	29.70	54.00	-24.30	AV	Vertical
3993.15	39.60	44.20	7.90	29.70	-6.60	33.00	74.00	-41.00	Pk	Horizontal
3993.15	35.83	44.20	7.90	29.70	-6.60	29.23	54.00	-24.77	AV	Horizontal
7236.03	37.02	43.50	11.40	35.50	3.40	40.42	68.20	-27.78	Pk	Vertical
7236.03	34.11	43.50	11.40	35.50	3.40	37.51	54.00	-16.49	AV	Vertical
7232.64	37.24	43.50	11.40	35.50	3.40	40.64	68.20	-27.56	Pk	Horizontal
7232.64	34.92	43.50	11.40	35.50	3.40	38.32	54.00	-15.68	AV	Horizontal
10540.24	40.06	44.50	13.90	38.80	8.20	48.26	68.20	-19.94	Pk	Vertical
10540.24	36.28	44.50	13.90	38.80	8.20	44.48	54.00	-9.52	AV	Vertical
10540.39	39.87	44.50	13.90	38.80	8.20	48.07	68.20	-20.13	Pk	Horizontal
10540.39	36.15	44.50	13.90	38.80	8.20	44.35	54.00	-9.65	AV	Horizontal
11053.17	33.33	43.60	14.30	39.50	10.20	43.53	74.00	-30.47	Pk	Vertical
11053.17	30.33	43.60	14.30	39.50	10.20	40.53	54.00	-13.47	AV	Vertical
11057.20	33.74	43.60	14.30	39.50	10.20	43.94	74.00	-30.06	Pk	Horizontal
11057.20	30.35	43.60	14.30	39.50	10.20	40.55	54.00	-13.45	AV	Horizontal
13306.18	31.76	42.60	15.90	38.90	12.20	43.96	74.00	-30.04	Pk	Vertical
13306.18	29.60	42.60	15.90	38.90	12.20	41.80	54.00	-12.20	AV	Vertical
13310.74	32.85	42.60	15.90	38.90	12.20	45.05	74.00	-28.95	Pk	Horizontal
13310.74	29.91	42.60	15.90	38.90	12.20	42.11	54.00	-11.89	AV	Horizontal
High Channel (802.11ac(VHT40)/ 5310 MHz)										
3262.50	44.32	44.70	6.70	28.20	-9.80	34.52	74.00	-39.48	Pk	Vertical
3262.50	41.49	44.70	6.70	28.20	-9.80	31.69	54.00	-22.31	AV	Vertical
3262.89	44.33	44.70	6.70	28.20	-9.80	34.53	74.00	-39.47	Pk	Horizontal
3262.89	41.85	44.70	6.70	28.20	-9.80	32.05	54.00	-21.95	AV	Horizontal
4005.32	39.50	44.20	7.90	29.70	-6.60	32.90	74.00	-41.10	Pk	Vertical
4005.32	36.60	44.20	7.90	29.70	-6.60	30.00	54.00	-24.00	AV	Vertical
3993.60	38.79	44.20	7.90	29.70	-6.60	32.19	74.00	-41.81	Pk	Horizontal
3993.60	35.93	44.20	7.90	29.70	-6.60	29.33	54.00	-24.67	AV	Horizontal
7246.39	37.81	43.50	11.40	35.50	3.40	41.21	68.20	-26.99	Pk	Vertical
7246.39	34.88	43.50	11.40	35.50	3.40	38.28	54.00	-15.72	AV	Vertical
7247.26	37.32	43.50	11.40	35.50	3.40	40.72	68.20	-27.48	Pk	Horizontal
7247.26	33.64	43.50	11.40	35.50	3.40	37.04	54.00	-16.96	AV	Horizontal
10619.95	38.91	44.50	13.80	38.80	8.10	47.01	74.00	-26.99	Pk	Vertical
10619.95	35.86	44.50	13.80	38.80	8.10	43.96	54.00	-10.04	AV	Vertical
10620.21	39.80	44.50	13.80	38.80	8.10	47.90	74.00	-26.10	Pk	Horizontal
10620.21	36.10	44.50	13.80	38.80	8.10	44.20	54.00	-9.80	AV	Horizontal
11037.75	33.20	43.60	14.30	39.50	10.20	43.40	74.00	-30.60	Pk	Vertical
11037.75	30.91	43.60	14.30	39.50	10.20	41.11	54.00	-12.89	AV	Vertical
11051.96	32.86	43.60	14.30	39.50	10.20	43.06	74.00	-30.94	Pk	Horizontal
11051.96	31.02	43.60	14.30	39.50	10.20	41.22	54.00	-12.78	AV	Horizontal
13310.61	32.24	42.60	15.90	38.90	12.20	44.44	74.00	-29.56	Pk	Vertical
13310.61	28.75	42.60	15.90	38.90	12.20	40.95	54.00	-13.05	AV	Vertical
13318.91	32.18	42.60	15.90	38.90	12.20	44.38	74.00	-29.62	Pk	Horizontal
13318.91	28.98	42.60	15.90	38.90	12.20	41.18	54.00	-12.82	AV	Horizontal

Remark:

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.
2. Scan with 802.11a, 802.11n (HT-20), 802.11n (HT-40), 802.11ac (VHT-20), 802.11ac (VHT-40), 802.11ac (VHT-80) the worst case is 802.11ac (VHT-40).
3. The frequency emission of peak points that did not show above the forms are at least 20dB below the limit, the frequency emission is mainly from the environment noise.



U-NII-2C 5470-5725MHz

Frequency (MHz)	Reading (dBuV)	Amplifier (dB)	Loss (dB)	Antenna Factor (dB/m)	Orrected Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Comment
Low Channel (802.11a/ 5500 MHz)										
3262.05	43.98	44.70	6.70	28.20	-9.80	34.18	74.00	-39.82	Pk	Vertical
3262.05	41.65	44.70	6.70	28.20	-9.80	31.85	54.00	-22.15	AV	Vertical
3265.08	44.49	44.70	6.70	28.20	-9.80	34.69	74.00	-39.31	Pk	Horizontal
3265.08	41.65	44.70	6.70	28.20	-9.80	31.85	54.00	-22.15	AV	Horizontal
3996.85	39.53	44.20	7.90	29.70	-6.60	32.93	74.00	-41.07	Pk	Vertical
3996.85	36.72	44.20	7.90	29.70	-6.60	30.12	54.00	-23.88	AV	Vertical
3983.54	38.96	44.20	7.90	29.70	-6.60	32.36	74.00	-41.64	Pk	Horizontal
3983.54	36.49	44.20	7.90	29.70	-6.60	29.89	54.00	-24.11	AV	Horizontal
7227.00	37.65	43.50	11.40	35.50	3.40	41.05	68.20	-27.15	Pk	Vertical
7227.00	33.55	43.50	11.40	35.50	3.40	36.95	54.00	-17.05	AV	Vertical
7236.05	37.25	43.50	11.40	35.50	3.40	40.65	68.20	-27.55	Pk	Horizontal
7236.05	33.74	43.50	11.40	35.50	3.40	37.14	54.00	-16.86	AV	Horizontal
10342.20	39.97	44.50	13.80	38.80	8.10	48.07	68.20	-20.13	Pk	Vertical
10342.20	36.62	44.50	13.80	38.80	8.10	44.72	54.00	-9.28	AV	Vertical
10347.20	39.70	44.50	13.80	38.80	8.10	47.80	68.20	-20.40	Pk	Horizontal
10347.20	36.14	44.50	13.80	38.80	8.10	44.24	54.00	-9.76	AV	Horizontal
11000.26	33.36	43.60	14.30	39.50	10.20	43.56	74.00	-30.44	Pk	Vertical
11000.26	30.84	43.60	14.30	39.50	10.20	41.04	54.00	-12.96	AV	Vertical
11000.03	33.29	43.60	14.30	39.50	10.20	43.49	74.00	-30.51	Pk	Horizontal
11000.03	30.43	43.60	14.30	39.50	10.20	40.63	54.00	-13.37	AV	Horizontal
13284.74	32.13	42.60	15.90	38.90	12.20	44.33	74.00	-29.67	Pk	Vertical
13284.74	29.92	42.60	15.90	38.90	12.20	42.12	54.00	-11.88	AV	Vertical
13284.81	32.16	42.60	15.90	38.90	12.20	44.36	74.00	-29.64	Pk	Horizontal
13284.81	29.27	42.60	15.90	38.90	12.20	41.47	54.00	-12.53	AV	Horizontal
Mid Channel (802.11a/ 5580 MHz)										
3254.57	43.87	44.70	6.70	28.20	-9.80	34.07	68.20	-34.13	Pk	Vertical
3254.57	42.12	44.70	6.70	28.20	-9.80	32.32	54.00	-21.68	AV	Vertical
3254.14	44.45	44.70	6.70	28.20	-9.80	34.65	68.20	-33.55	Pk	Horizontal
3254.14	41.54	44.70	6.70	28.20	-9.80	31.74	54.00	-22.26	AV	Horizontal
3991.93	38.73	44.20	7.90	29.70	-6.60	32.13	74.00	-41.87	Pk	Vertical
3991.93	36.26	44.20	7.90	29.70	-6.60	29.66	54.00	-24.34	AV	Vertical
3997.73	39.65	44.20	7.90	29.70	-6.60	33.05	74.00	-40.95	Pk	Horizontal
3997.73	36.86	44.20	7.90	29.70	-6.60	30.26	54.00	-23.74	AV	Horizontal
7223.31	36.48	43.50	11.40	35.50	3.40	39.88	68.20	-28.32	Pk	Vertical
7223.31	33.86	43.50	11.40	35.50	3.40	37.26	54.00	-16.74	AV	Vertical
7219.11	37.09	43.50	11.40	35.50	3.40	40.49	68.20	-27.71	Pk	Horizontal
7219.11	34.69	43.50	11.40	35.50	3.40	38.09	54.00	-15.91	AV	Horizontal
10391.83	39.97	44.50	13.80	38.80	8.10	48.07	68.20	-20.13	Pk	Vertical
10391.83	36.90	44.50	13.80	38.80	8.10	45.00	54.00	-9.00	AV	Vertical
10386.45	39.86	44.50	13.80	38.80	8.10	47.96	68.20	-20.24	Pk	Horizontal
10386.45	35.68	44.50	13.80	38.80	8.10	43.78	54.00	-10.22	AV	Horizontal
11160.38	33.62	43.60	14.30	39.50	10.20	43.82	74.00	-30.18	Pk	Vertical
11160.38	30.42	43.60	14.30	39.50	10.20	40.62	54.00	-13.38	AV	Vertical
11160.40	33.88	43.60	14.30	39.50	10.20	44.08	74.00	-29.92	Pk	Horizontal
11160.40	29.91	43.60	14.30	39.50	10.20	40.11	54.00	-13.89	AV	Horizontal
13295.89	32.76	42.60	15.90	38.90	12.20	44.96	74.00	-29.04	Pk	Vertical
13295.89	29.95	42.60	15.90	38.90	12.20	42.15	54.00	-11.85	AV	Vertical
13290.38	33.02	42.60	15.90	38.90	12.20	45.22	74.00	-28.78	Pk	Horizontal
13290.38	29.53	42.60	15.90	38.90	12.20	41.73	54.00	-12.27	AV	Horizontal



High Channel (802.11a/ 5700 MHz)										
3261.20	44.08	44.70	6.70	28.20	-9.80	34.28	74.00	-39.72	Pk	Vertical
3261.20	40.97	44.70	6.70	28.20	-9.80	31.17	54.00	-22.83	AV	Vertical
3254.63	44.92	44.70	6.70	28.20	-9.80	35.12	68.20	-33.08	Pk	Horizontal
3254.63	41.98	44.70	6.70	28.20	-9.80	32.18	54.00	-21.82	AV	Horizontal
3996.25	39.76	44.20	7.90	29.70	-6.60	33.16	74.00	-40.84	Pk	Vertical
3996.25	36.95	44.20	7.90	29.70	-6.60	30.35	54.00	-23.65	AV	Vertical
3985.60	39.79	44.20	7.90	29.70	-6.60	33.19	74.00	-40.81	Pk	Horizontal
3985.60	36.99	44.20	7.90	29.70	-6.60	30.39	54.00	-23.61	AV	Horizontal
7222.02	36.76	43.50	11.40	35.50	3.40	40.16	68.20	-28.04	Pk	Vertical
7222.02	34.01	43.50	11.40	35.50	3.40	37.41	54.00	-16.59	AV	Vertical
7219.21	36.60	43.50	11.40	35.50	3.40	40.00	68.20	-28.20	Pk	Horizontal
7219.21	34.46	43.50	11.40	35.50	3.40	37.86	54.00	-16.14	AV	Horizontal
10471.74	40.05	44.50	13.80	38.80	8.10	48.15	68.20	-20.05	Pk	Vertical
10471.74	36.26	44.50	13.80	38.80	8.10	44.36	54.00	-9.64	AV	Vertical
10464.70	39.51	44.50	13.80	38.80	8.10	47.61	68.20	-20.59	Pk	Horizontal
10464.70	36.48	44.50	13.80	38.80	8.10	44.58	54.00	-9.42	AV	Horizontal
11399.94	32.89	43.60	14.30	39.50	10.20	43.09	74.00	-30.91	Pk	Vertical
11399.94	29.83	43.60	14.30	39.50	10.20	40.03	54.00	-13.97	AV	Vertical
11400.05	33.84	43.60	14.30	39.50	10.20	44.04	74.00	-29.96	Pk	Horizontal
11400.05	31.02	43.60	14.30	39.50	10.20	41.22	54.00	-12.78	AV	Horizontal
13297.96	32.65	42.60	15.90	38.90	12.20	44.85	74.00	-29.15	Pk	Vertical
13297.96	29.69	42.60	15.90	38.90	12.20	41.89	54.00	-12.11	AV	Vertical
13294.47	31.65	42.60	15.90	38.90	12.20	43.85	74.00	-30.15	Pk	Horizontal
13294.47	29.23	42.60	15.90	38.90	12.20	41.43	54.00	-12.57	AV	Horizontal

Remark:

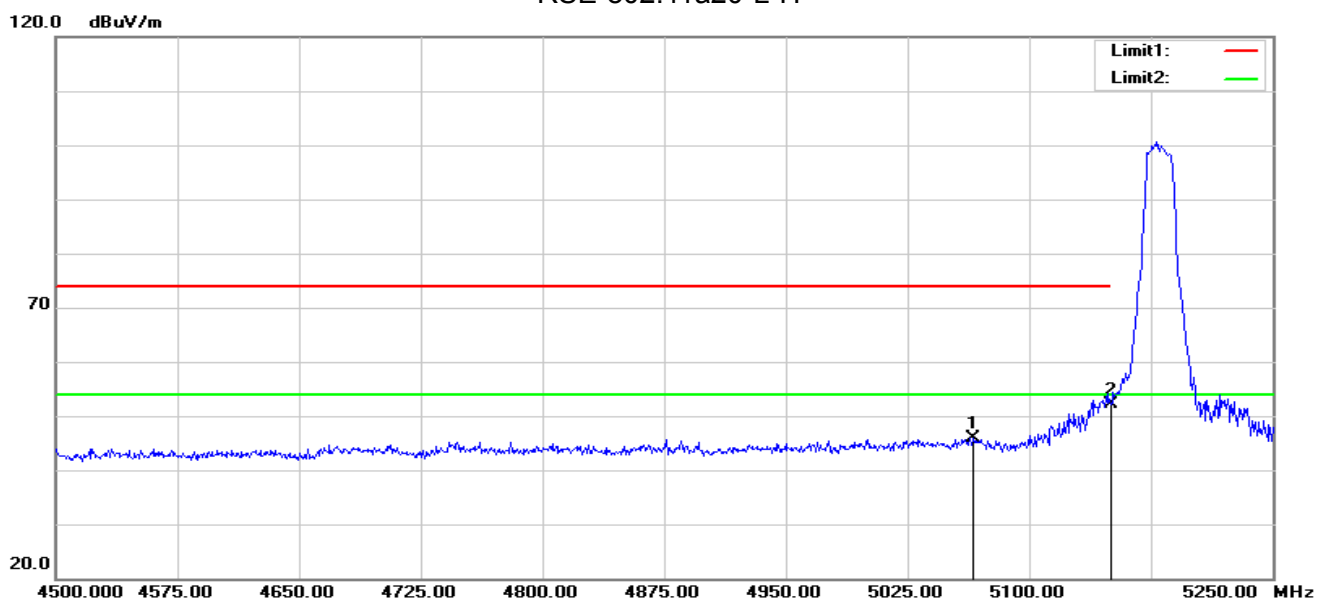
1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.
2. Scan with 802.11a, 802.11n (HT-20), 802.11n (HT-40), 802.11ac (VHT-20), 802.11ac (VHT-40), 802.11ac (VHT-80) the worst case is 802.11a.
3. The frequency emission of peak points that did not show above the forms are at least 20dB below the limit, the frequency emission is mainly from the environment noise.



3.2.9 RESTRICTED FREQUENCY BANDS AND BAND EDGE

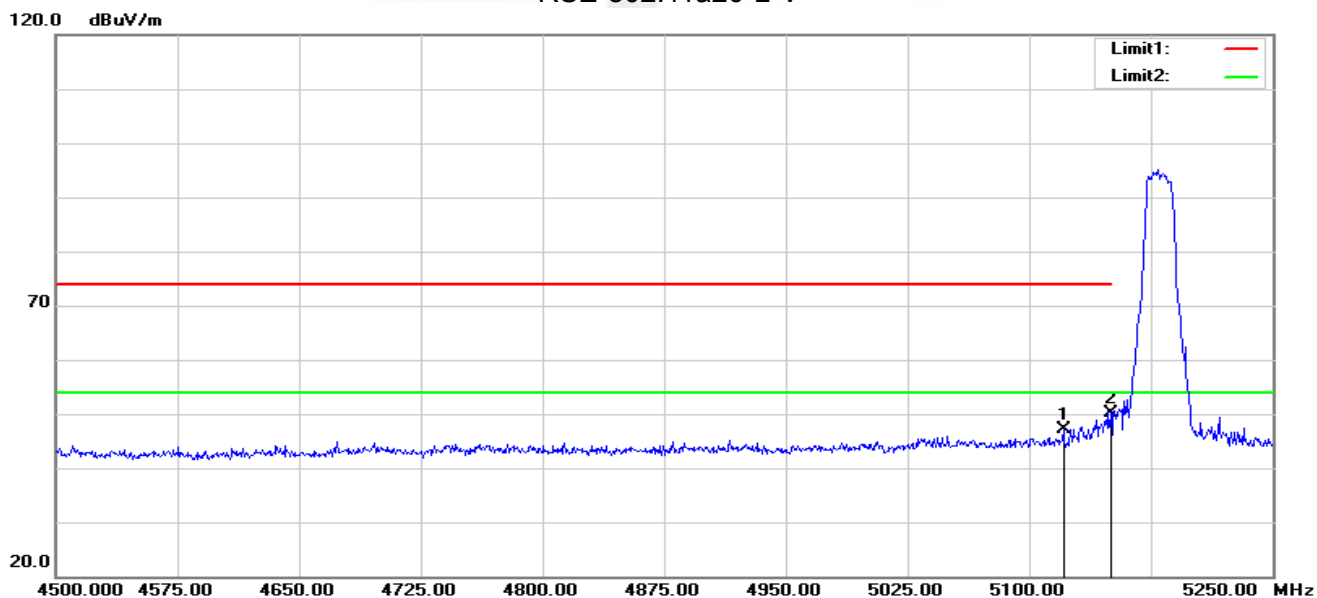
U-NII-1 5150-5250MHz

RSE-802.11a20-L-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5065.500	51.84	-5.90	45.94	74.00	-28.06	peak
2	5150.000	57.98	-5.73	52.25	74.00	-21.75	peak

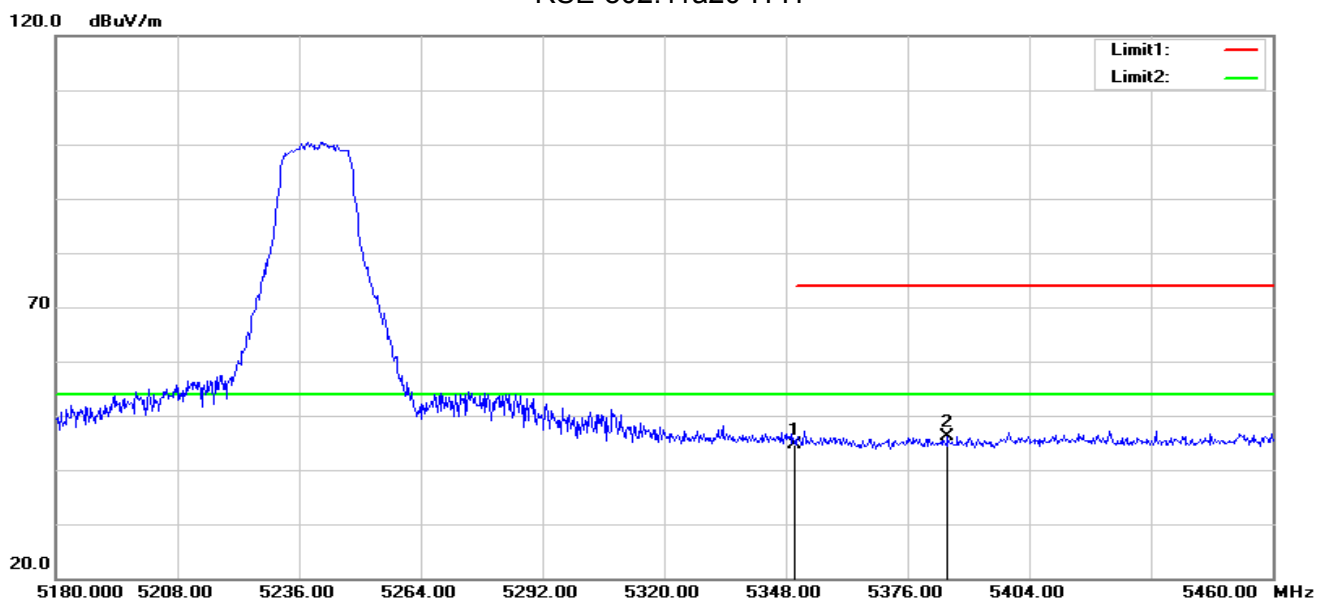
RSE-802.11a20-L-V



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5121.000	52.98	-5.73	47.25	74.00	-26.75	peak
2	5150.000	55.78	-5.73	50.05	74.00	-23.95	peak

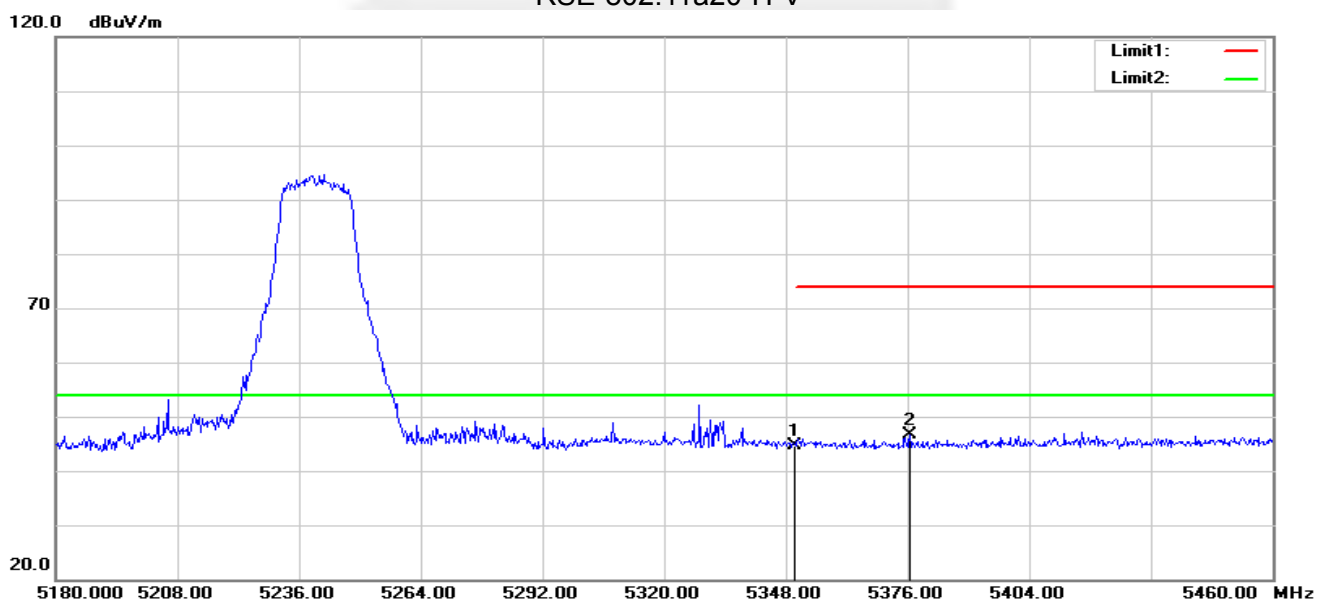


RSE-802.11a20-H-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5350.000	49.95	-5.23	44.72	74.00	-29.28	peak
2	5385.240	51.36	-5.24	46.12	74.00	-27.88	peak

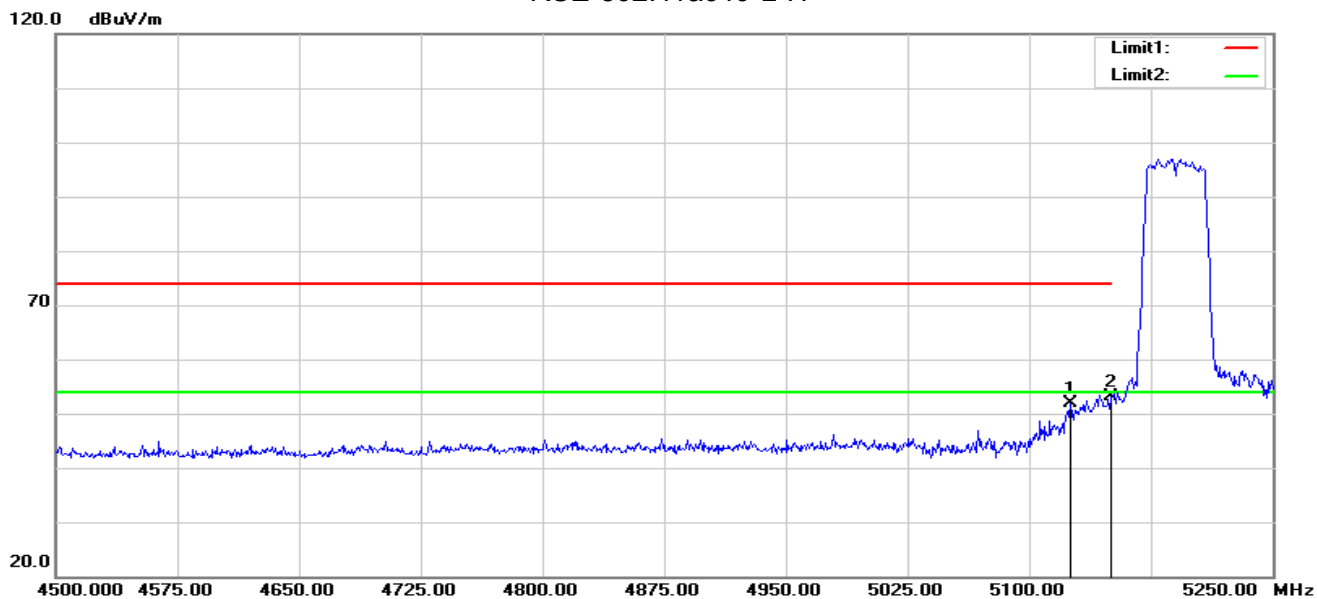
RSE-802.11a20-H-V



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5350.000	49.80	-5.23	44.57	74.00	-29.43	peak
2	5376.560	51.88	-5.24	46.64	74.00	-27.36	peak

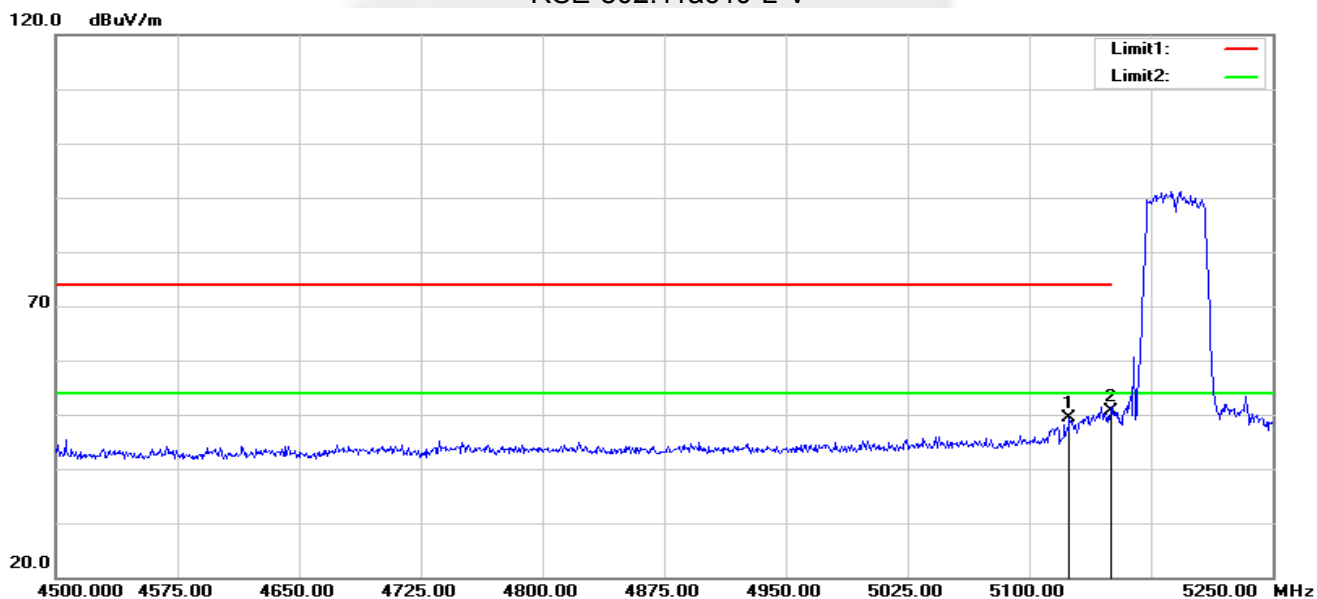


RSE-802.11ac40-L-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5125.500	57.59	-5.74	51.85	74.00	-22.15	peak
2	5150.000	58.78	-5.73	53.05	74.00	-20.95	peak

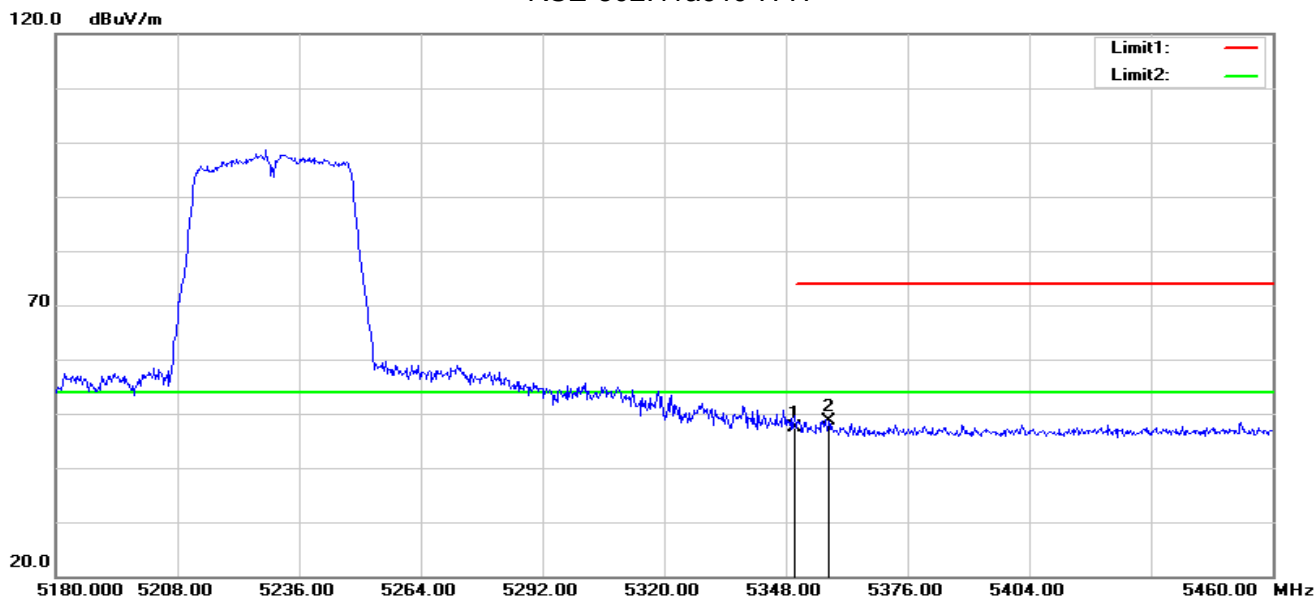
RSE-802.11ac40-L-V



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5124.750	55.02	-5.74	49.28	74.00	-24.72	peak
2	5150.000	56.39	-5.73	50.66	74.00	-23.34	peak

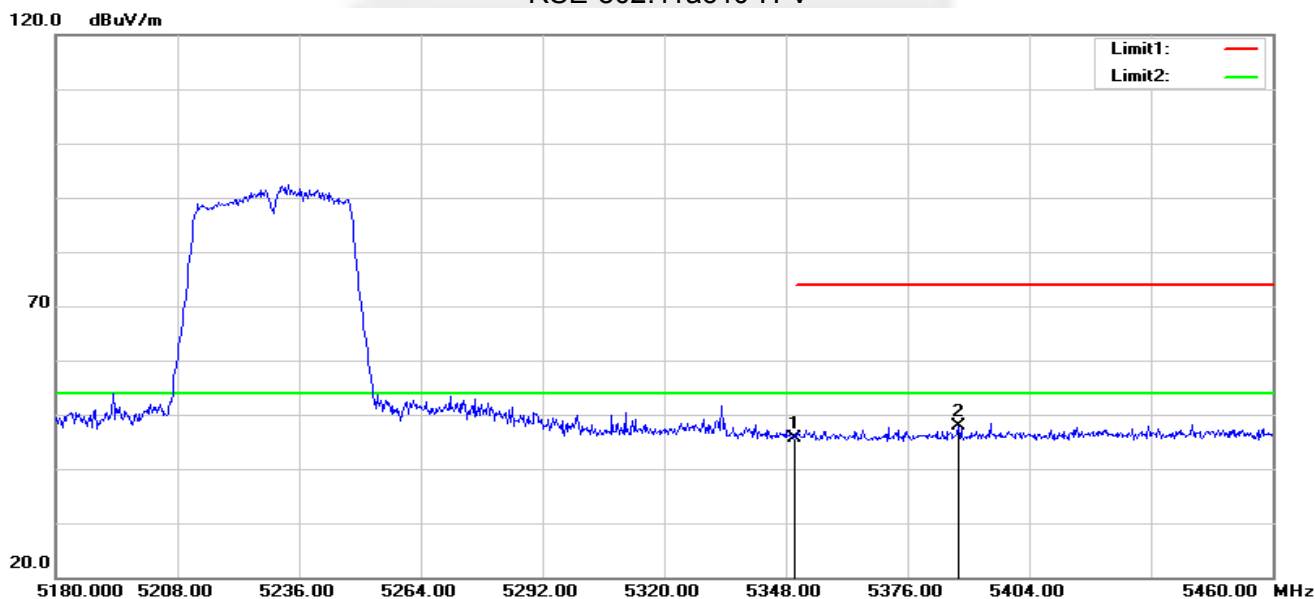


RSE-802.11ac40-H-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5350.000	52.52	-5.23	47.29	74.00	-26.71	peak
2	5357.800	53.77	-5.23	48.54	74.00	-25.46	peak

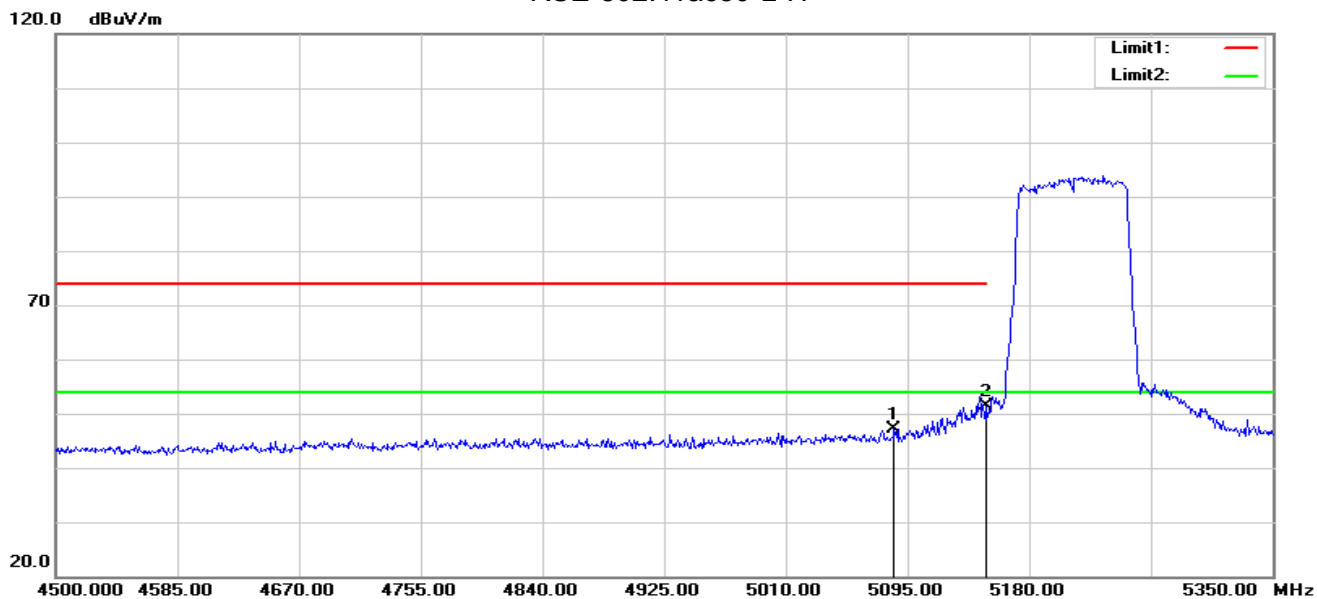
RSE-802.11ac40-H-V



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5350.000	50.97	-5.23	45.74	74.00	-28.26	peak
2	5387.760	53.08	-5.25	47.83	74.00	-26.17	peak

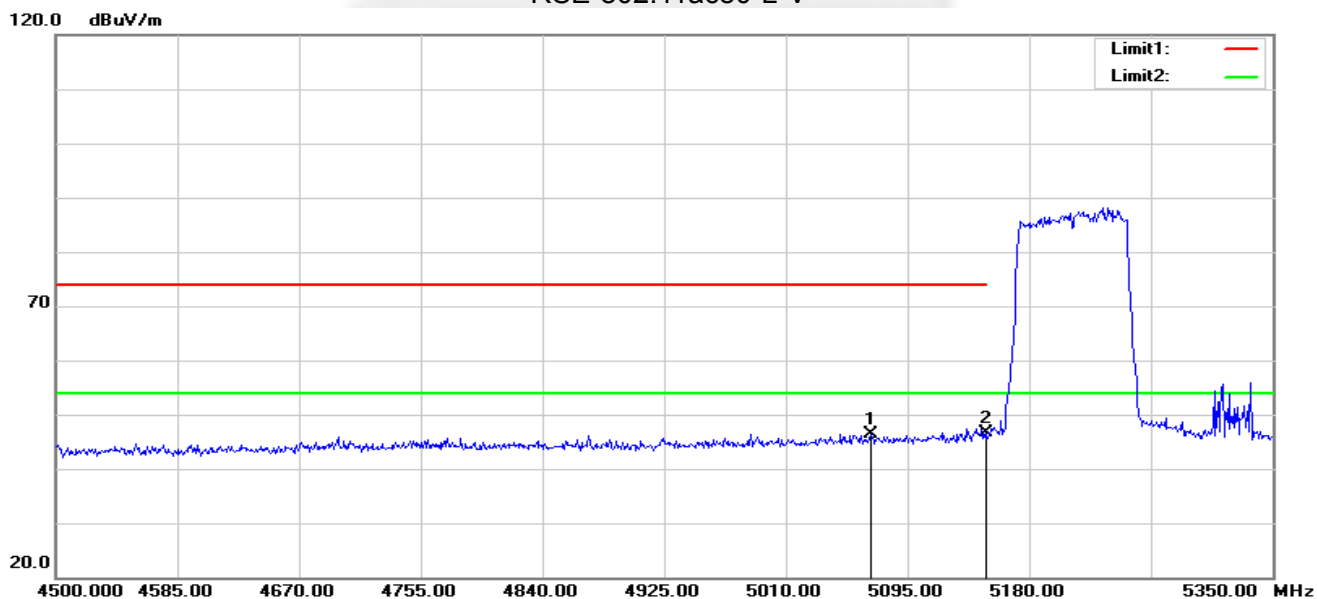


RSE-802.11ac80-L-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5085.650	52.99	-5.80	47.19	74.00	-26.81	peak
2	5150.000	57.05	-5.73	51.32	74.00	-22.68	peak

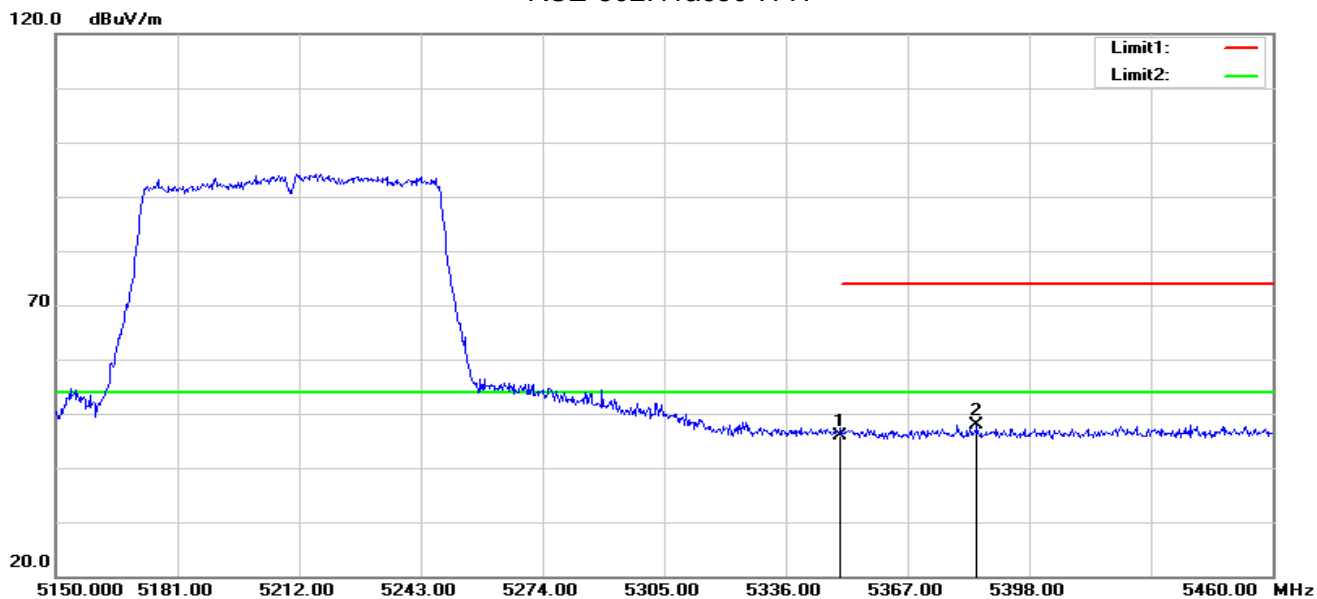
RSE-802.11ac80-L-V



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5069.500	52.36	-5.87	46.49	74.00	-27.51	peak
2	5150.000	52.46	-5.73	46.73	74.00	-27.27	peak

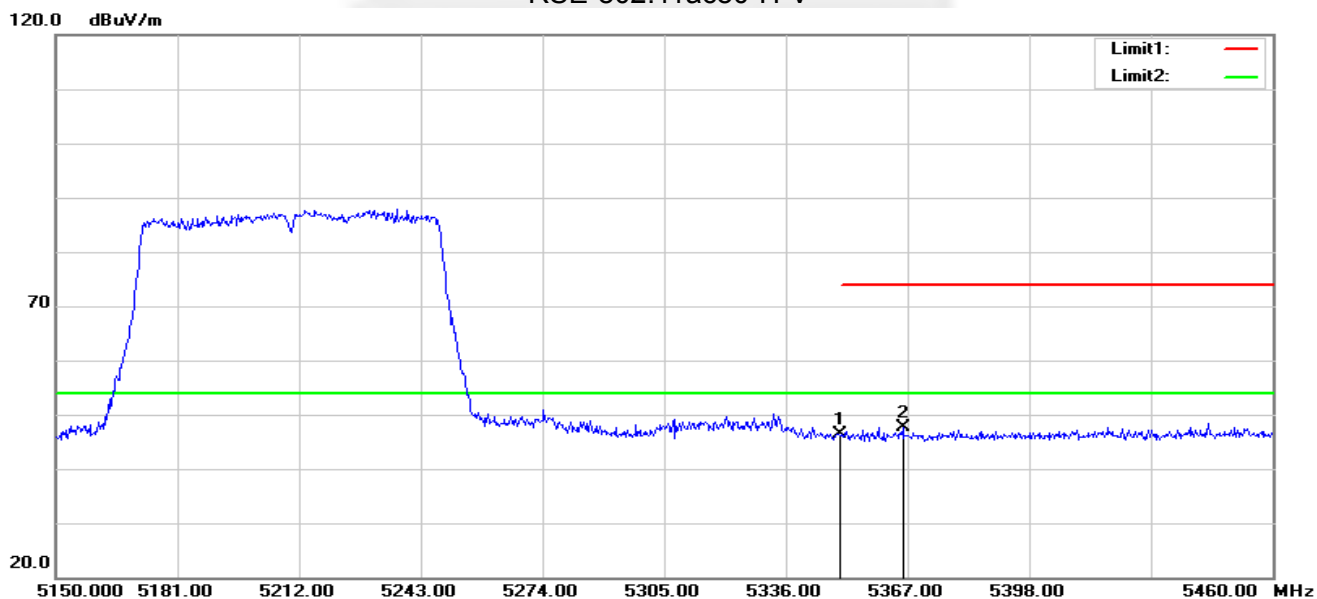


RSE-802.11ac80-H-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5350.000	51.07	-5.23	45.84	74.00	-28.16	peak
2	5384.670	53.05	-5.24	47.81	74.00	-26.19	peak

RSE-802.11ac80-H-V



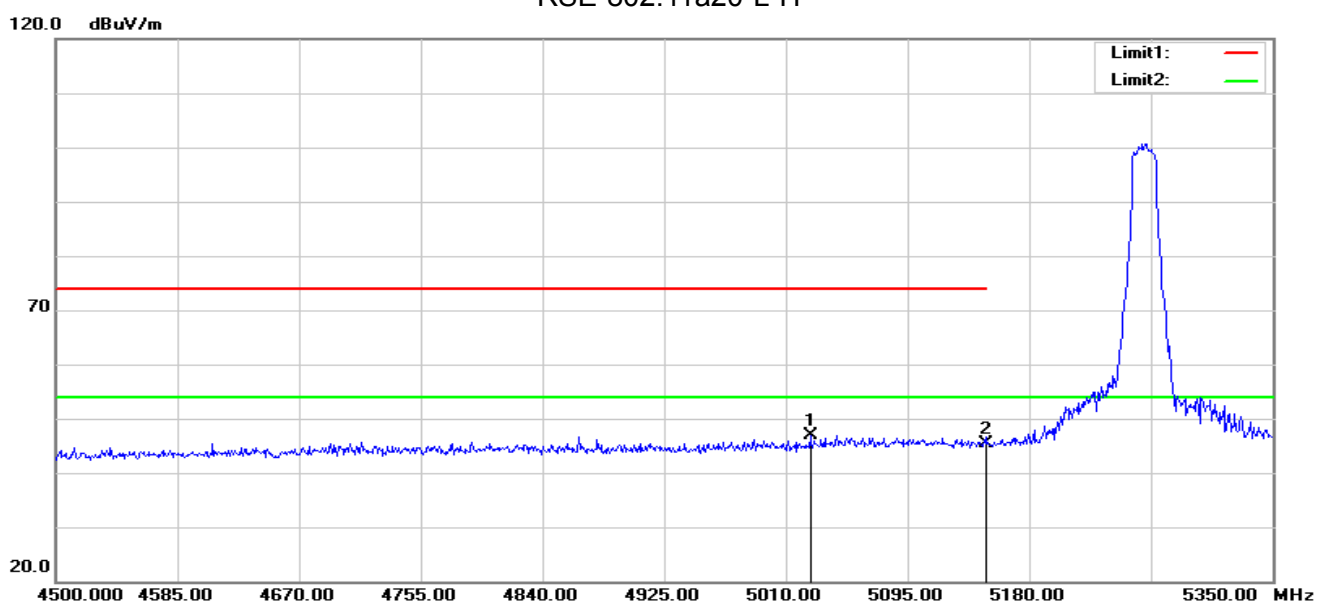
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5350.000	51.73	-5.23	46.50	74.00	-27.50	peak
2	5365.760	52.88	-5.24	47.64	74.00	-26.36	peak

Note: All modes have been tested. Only the worst mode shown in the report.



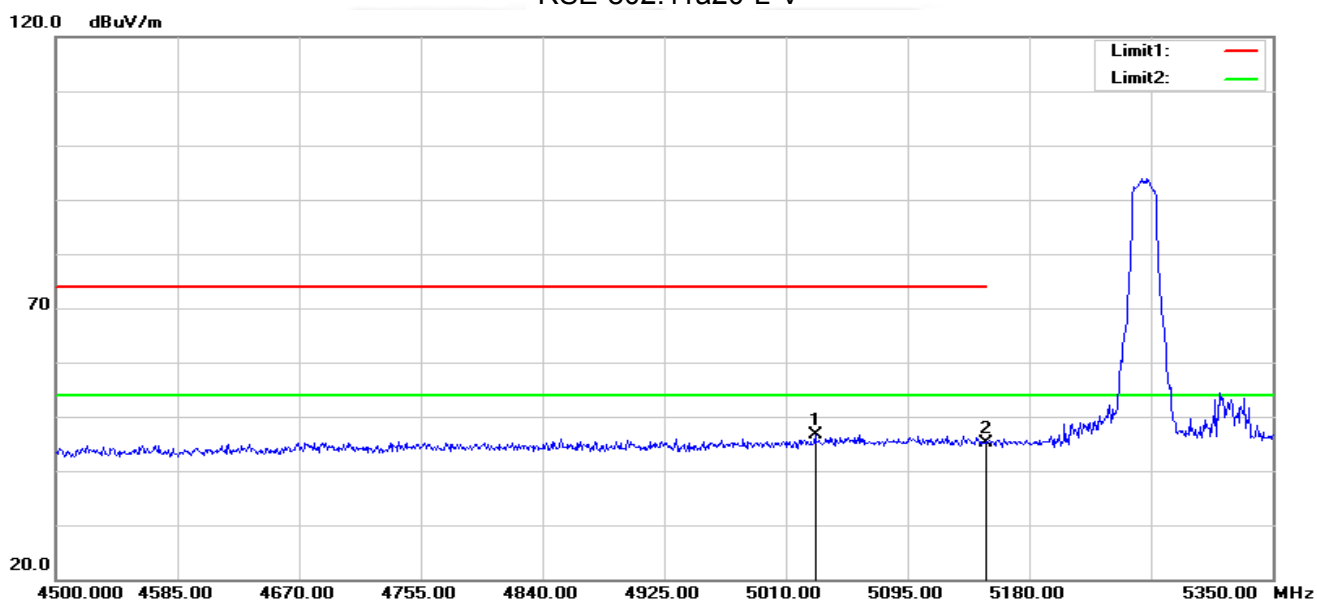
U-NII-2A 5250-5350MHz

RSE-802.11a20-L-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5027.000	53.03	-6.07	46.96	74.00	-27.04	peak
2	5150.000	51.15	-5.73	45.42	74.00	-28.58	peak

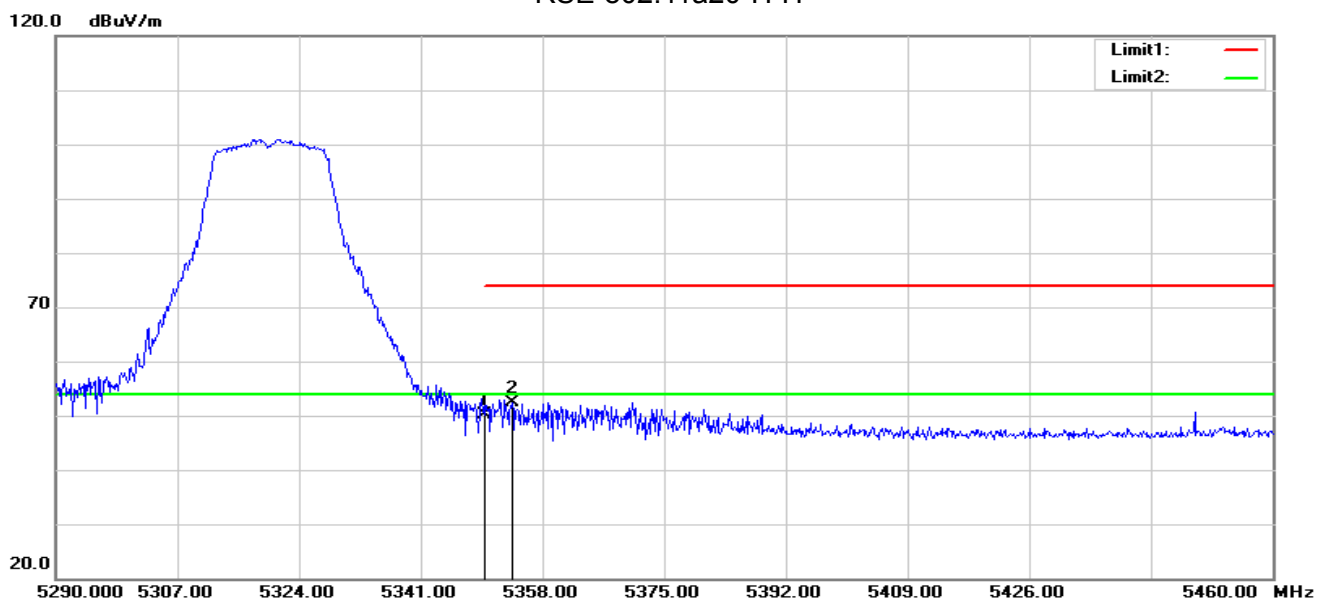
RSE-802.11a20-L-V



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5030.400	52.70	-6.06	46.64	74.00	-27.36	peak
2	5150.000	50.93	-5.73	45.20	74.00	-28.80	peak

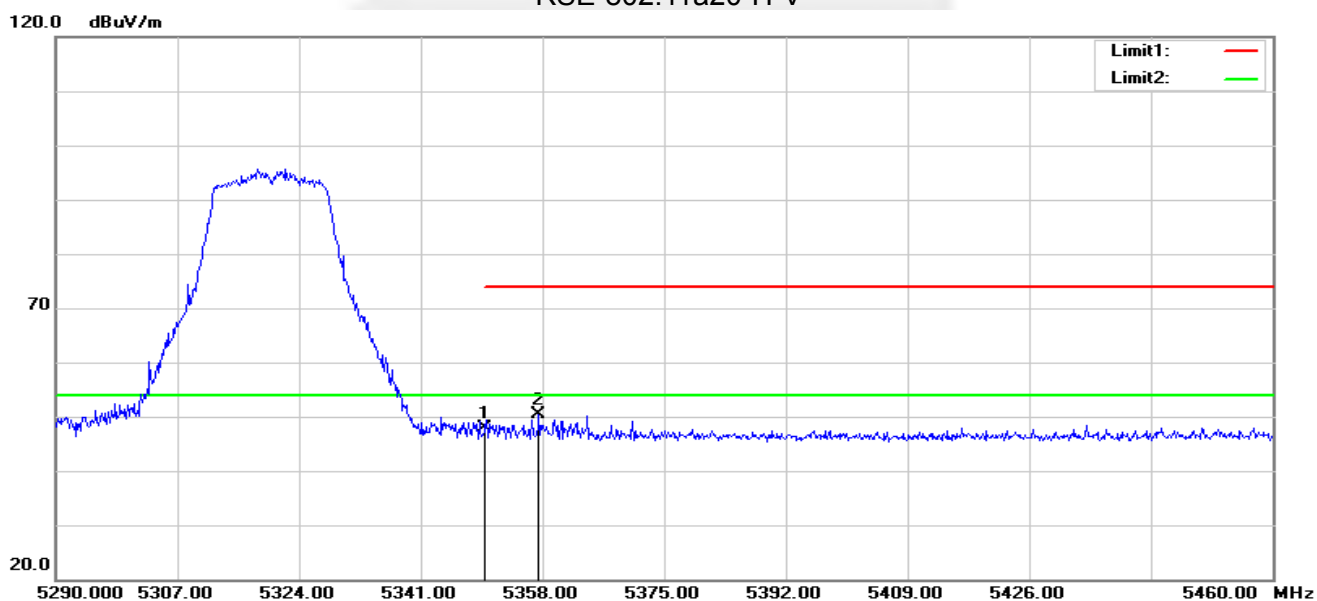


RSE-802.11a20-H-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5350.000	55.43	-5.23	50.20	74.00	-23.80	peak
2	5353.750	57.61	-5.23	52.38	74.00	-21.62	peak

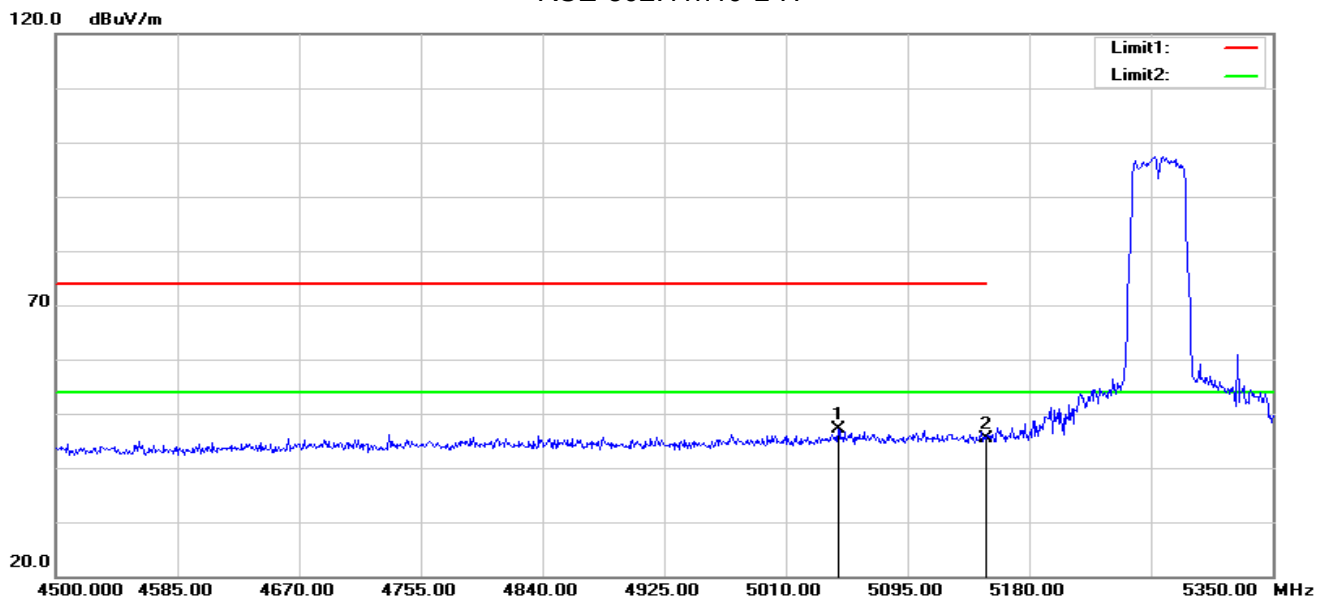
RSE-802.11a20-H-V



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5350.000	53.03	-5.23	47.80	74.00	-26.20	peak
2	5357.490	55.64	-5.23	50.41	74.00	-23.59	peak

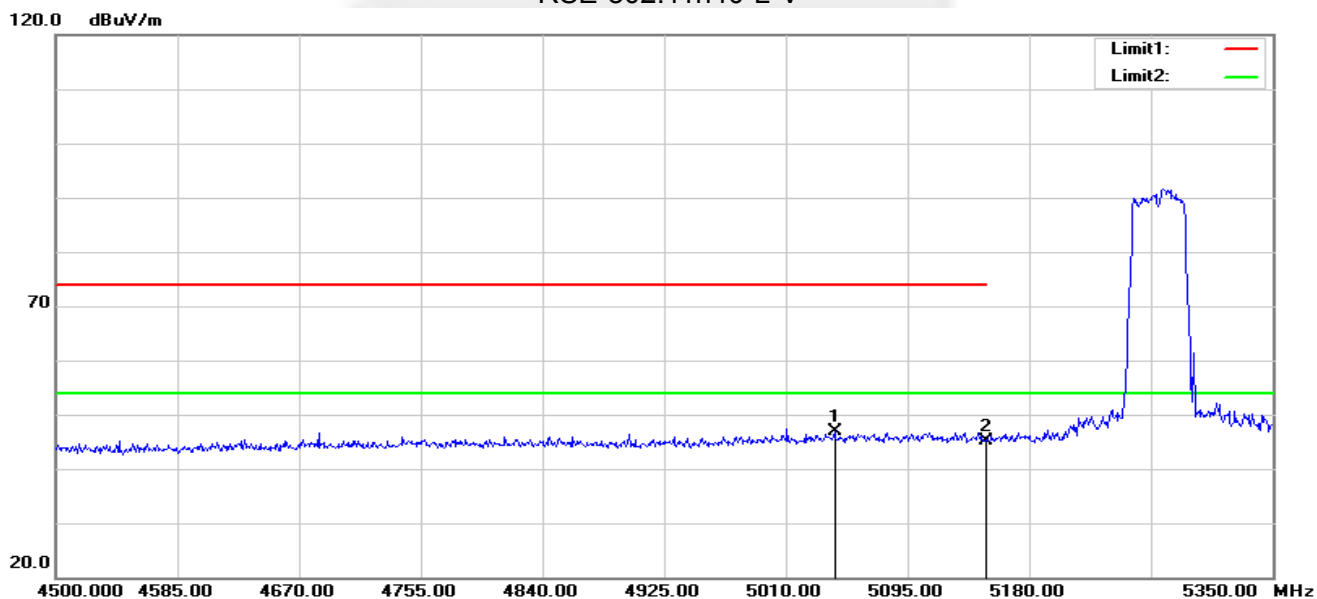


RSE-802.11n40-L-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5046.550	53.14	-5.98	47.16	74.00	-26.84	peak
2	5150.000	51.01	-5.73	45.28	74.00	-28.72	peak

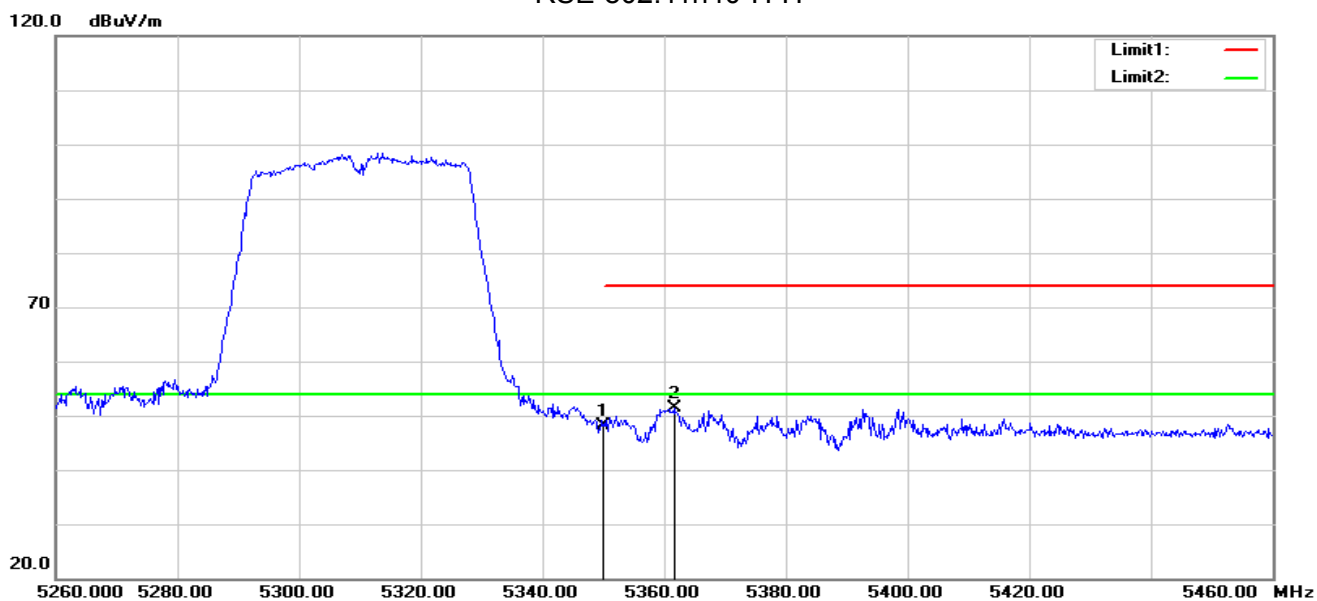
RSE-802.11n40-L-V



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5044.000	52.75	-5.99	46.76	74.00	-27.24	peak
2	5150.000	50.98	-5.73	45.25	74.00	-28.75	peak

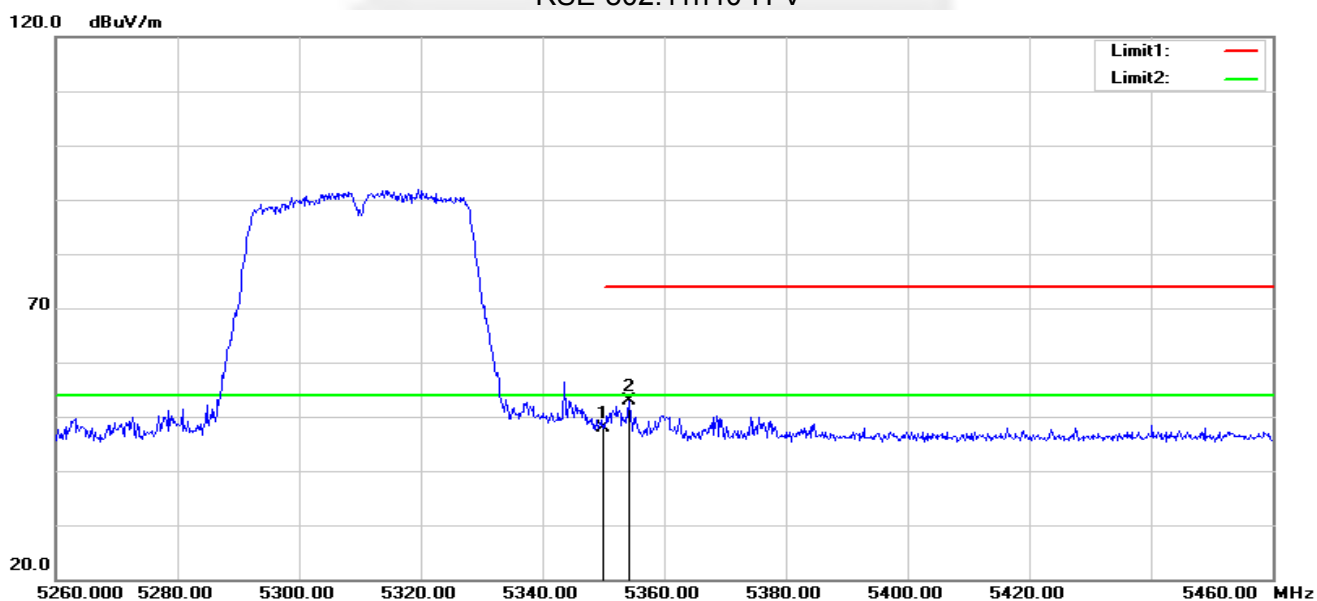


RSE-802.11n40-H-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5350.000	53.33	-5.23	48.10	74.00	-25.90	peak
2	5361.600	56.49	-5.23	51.26	74.00	-22.74	peak

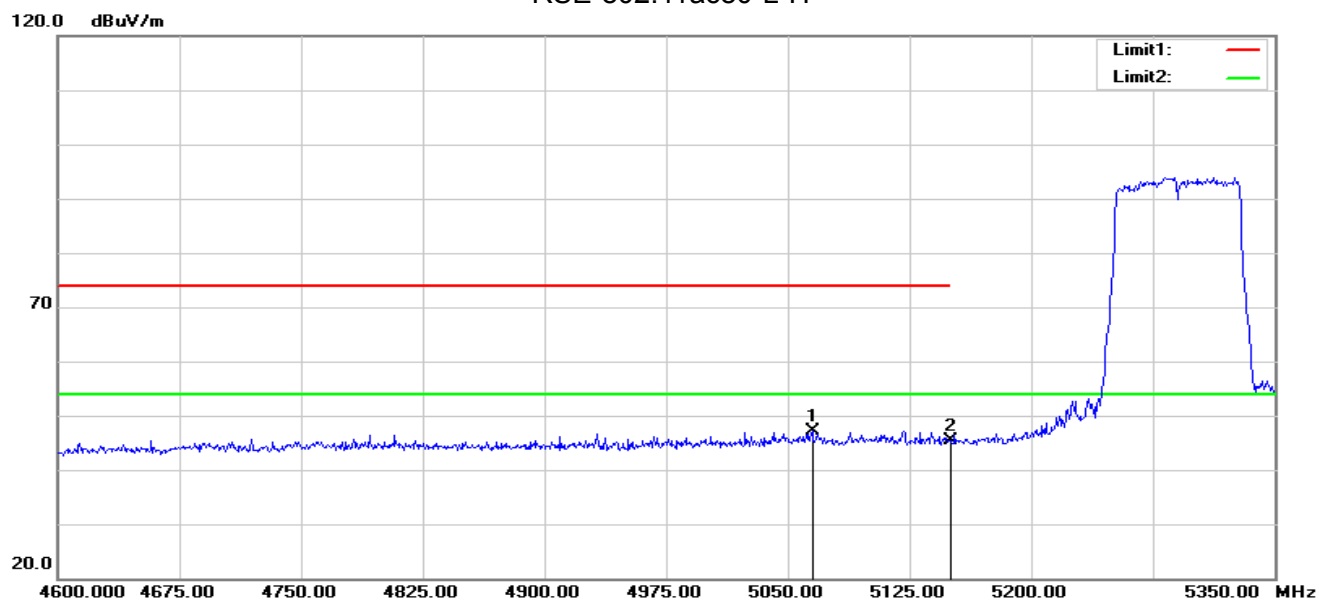
RSE-802.11n40-H-V



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5350.000	53.21	-5.23	47.98	74.00	-26.02	peak
2	5354.200	58.00	-5.24	52.76	74.00	-21.24	peak

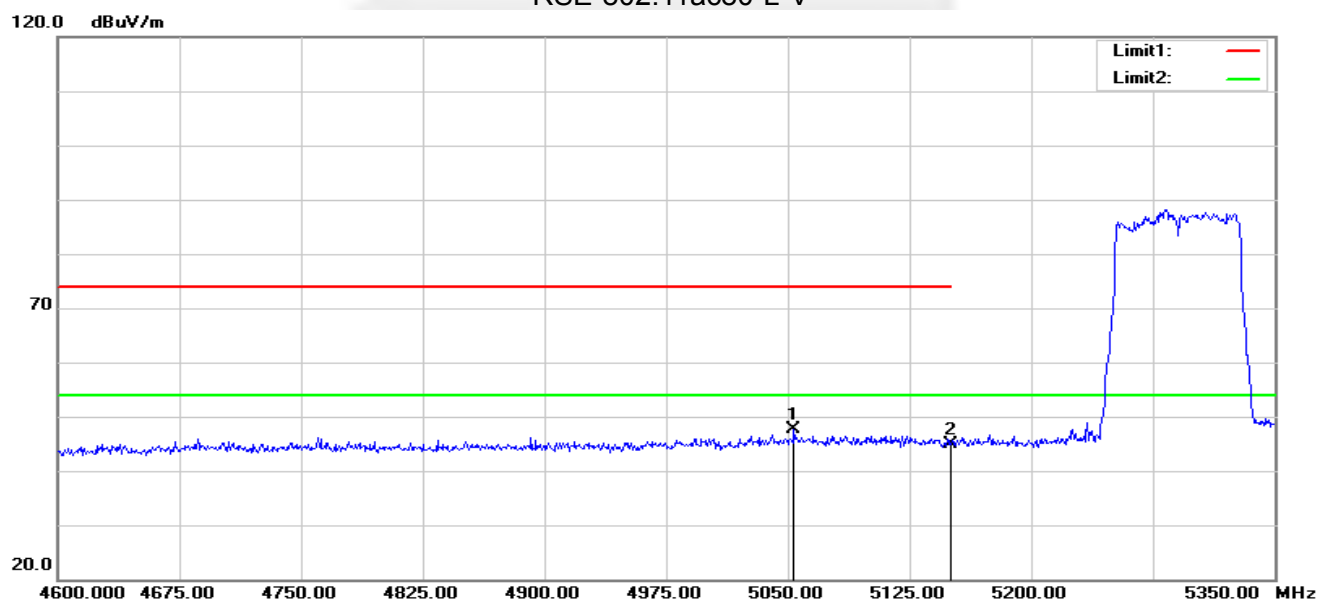


RSE-802.11ac80-L-H



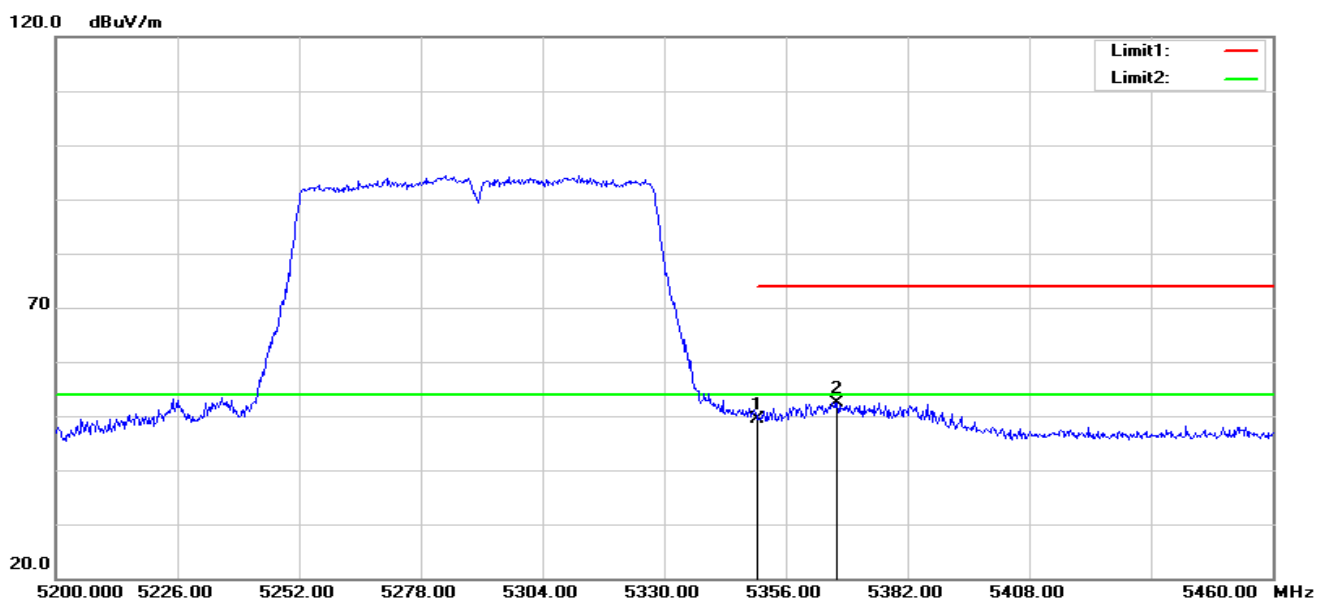
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5065.000	52.91	-5.90	47.01	74.00	-26.99	peak
2	5150.000	51.09	-5.73	45.36	74.00	-28.64	peak

RSE-802.11ac80-L-V



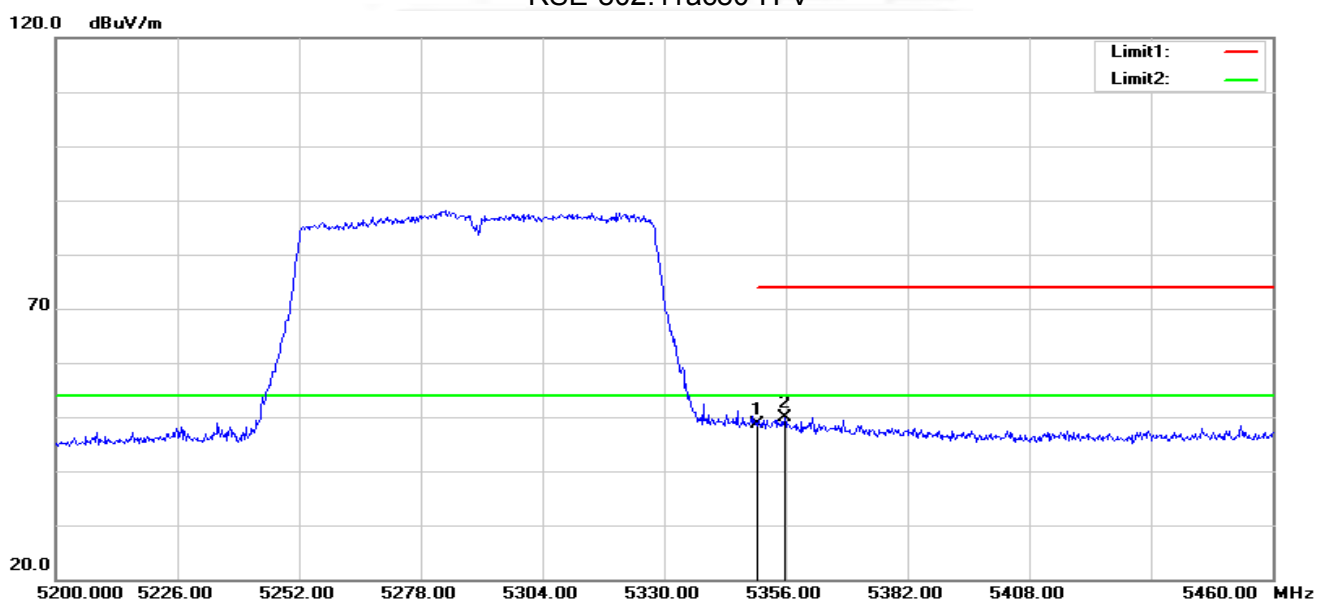
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5053.750	53.49	-5.95	47.54	74.00	-26.46	peak
2	5150.000	50.64	-5.73	44.91	74.00	-29.09	peak

RSE-802.11ac80-H-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5350.000	54.57	-5.23	49.34	74.00	-24.66	peak
2	5366.920	57.71	-5.24	52.47	74.00	-21.53	peak

RSE-802.11ac80-H-V



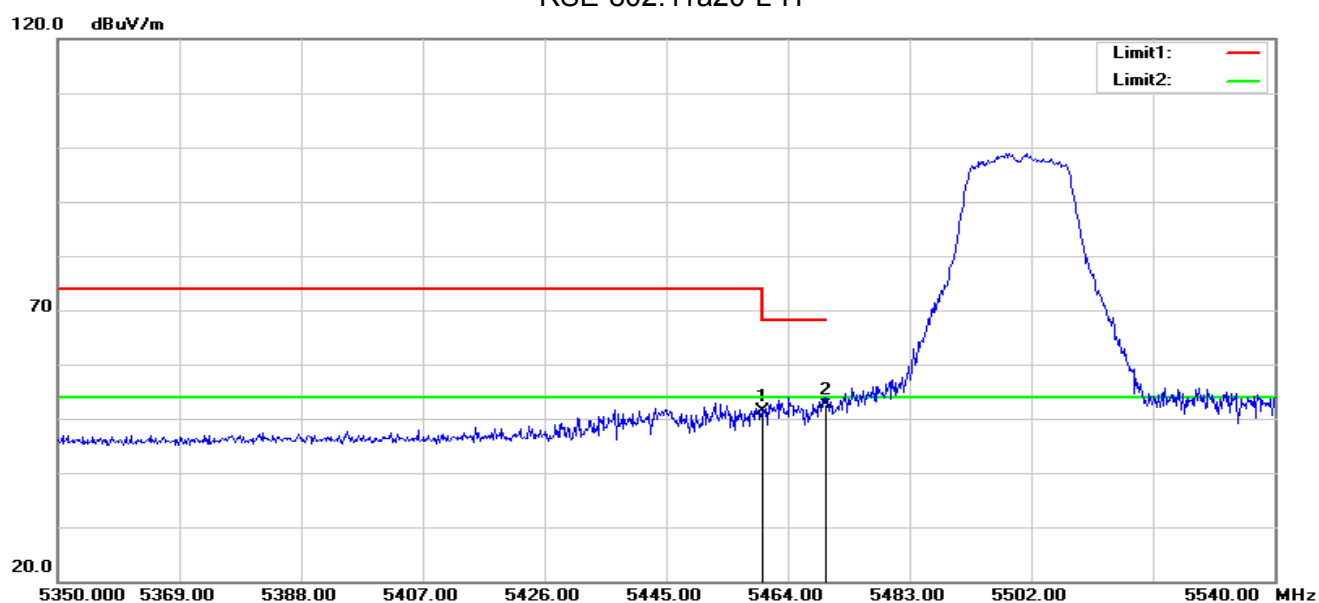
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5350.000	53.76	-5.23	48.53	74.00	-25.47	peak
2	5355.740	55.23	-5.24	49.99	74.00	-24.01	peak

Note: All modes have been tested. Only the worst mode shown in the report.



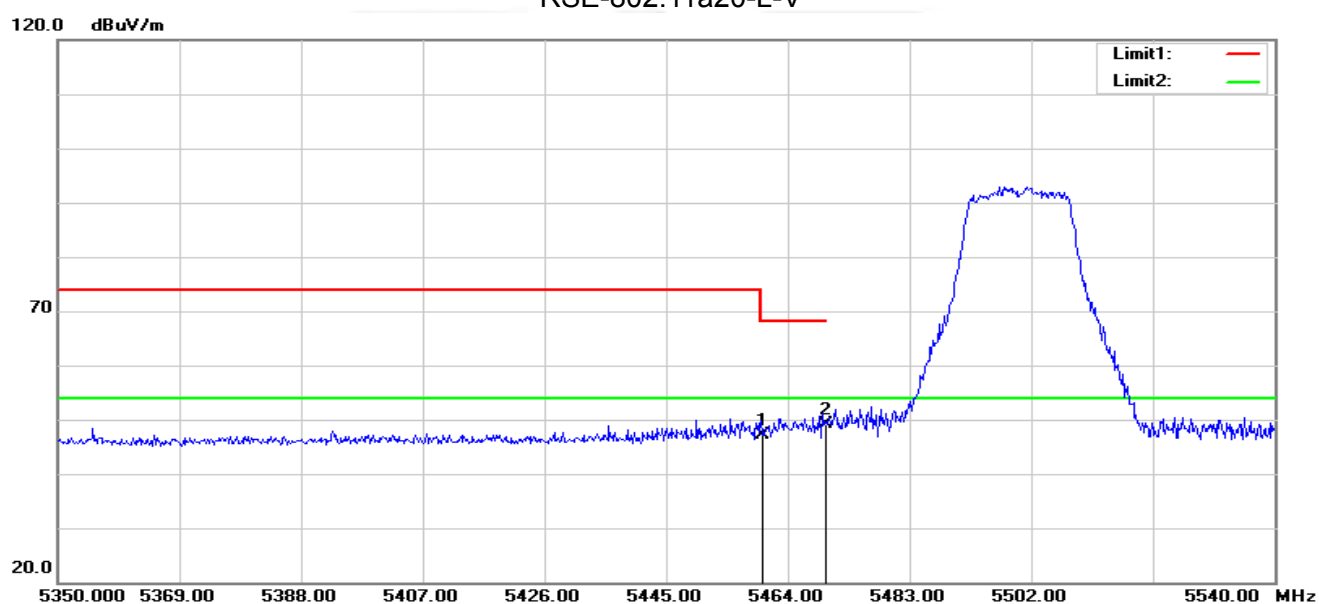
U-NII-2C 5470-5725MHz

RSE-802.11a20-L-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5460.000	56.58	-5.11	51.47	68.20	-16.73	peak
2	5470.000	57.81	-5.09	52.72	68.20	-15.48	peak

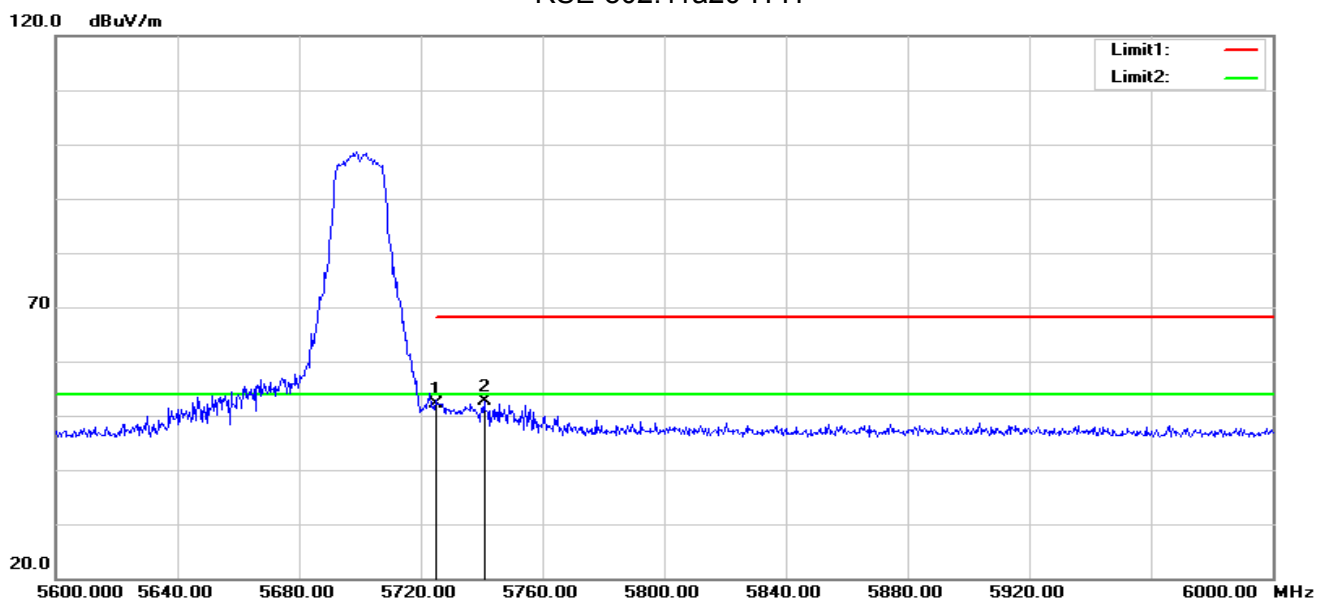
RSE-802.11a20-L-V



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5460.000	52.28	-5.11	47.17	68.20	-21.03	peak
2	5470.000	54.31	-5.09	49.22	68.20	-18.98	peak

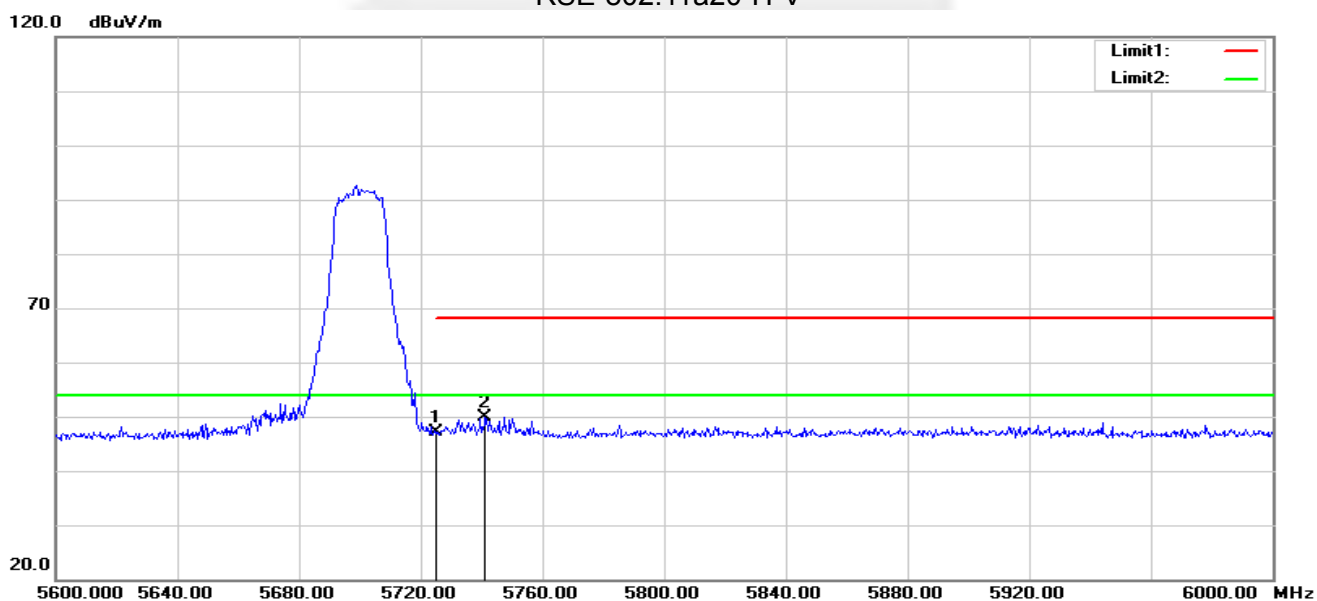


RSE-802.11a20-H-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5725.000	56.62	-4.57	52.05	68.20	-16.15	peak
2	5740.800	57.12	-4.52	52.60	68.20	-15.60	peak

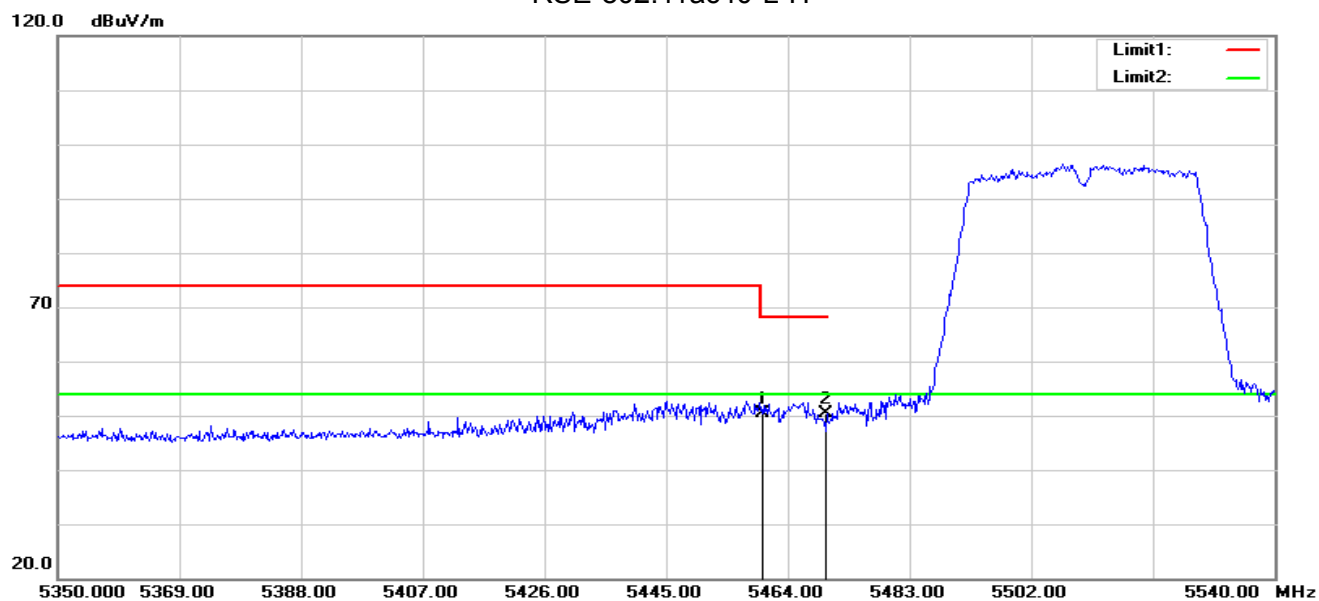
RSE-802.11a20-H-V



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5725.000	51.60	-4.57	47.03	68.20	-21.17	peak
2	5741.200	54.49	-4.52	49.97	68.20	-18.23	peak

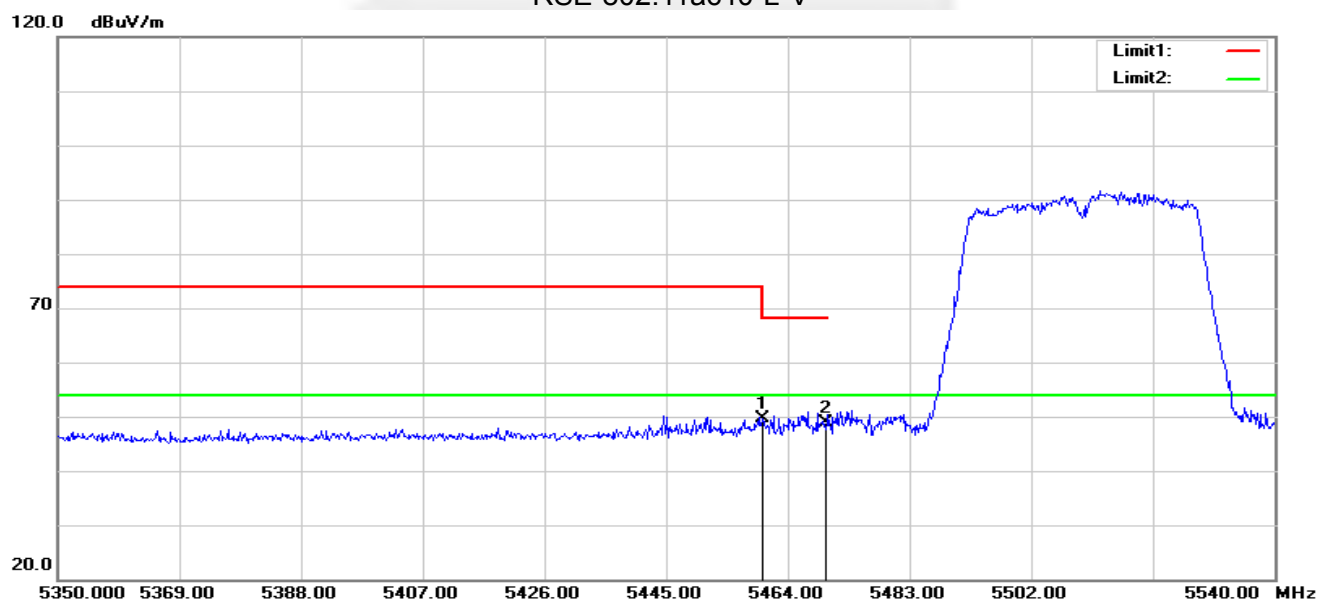


RSE-802.11ac40-L-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5460.000	55.49	-5.11	50.38	68.20	-17.82	peak
2	5470.000	55.58	-5.09	50.49	68.20	-17.71	peak

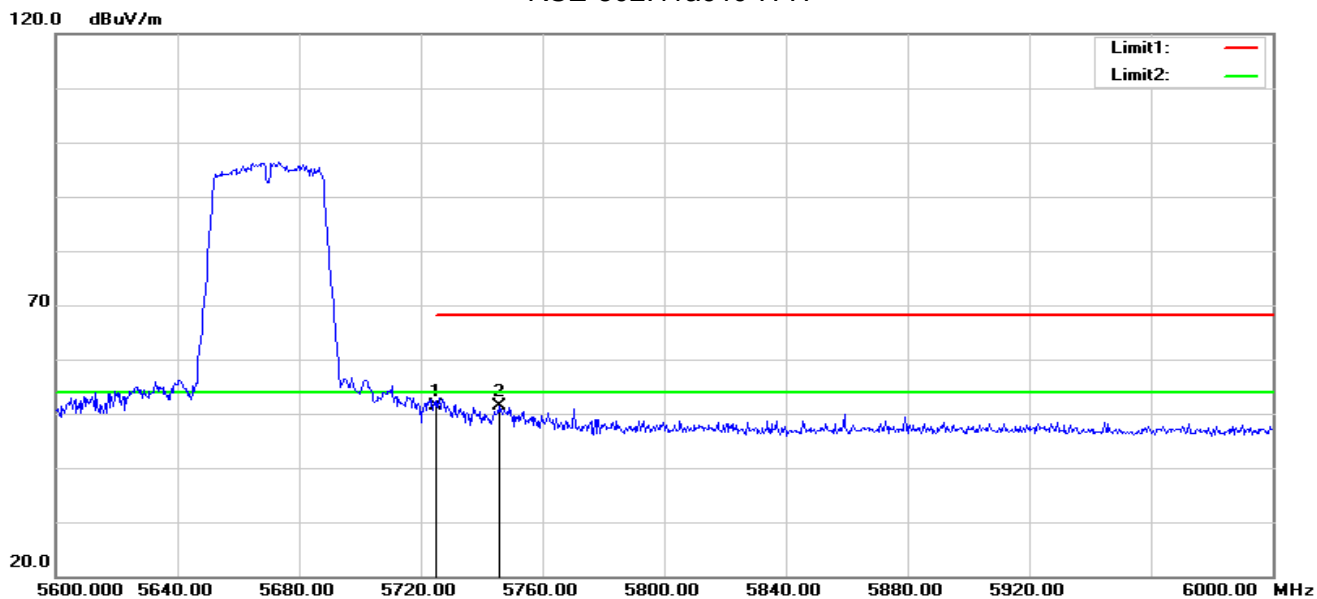
RSE-802.11ac40-L-V



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5460.000	54.62	-5.11	49.51	68.20	-18.69	peak
2	5470.000	53.96	-5.09	48.87	68.20	-19.33	peak

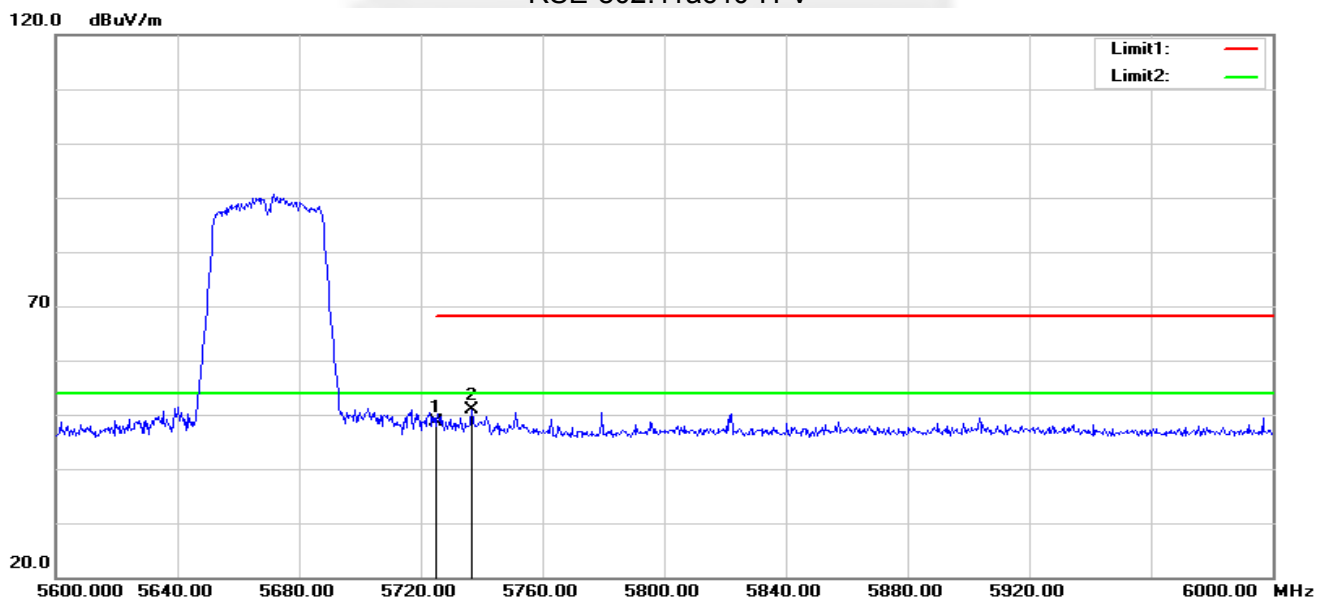


RSE-802.11ac40-H-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5725.000	56.01	-4.57	51.44	68.20	-16.76	peak
2	5745.600	55.89	-4.51	51.38	68.20	-16.82	peak

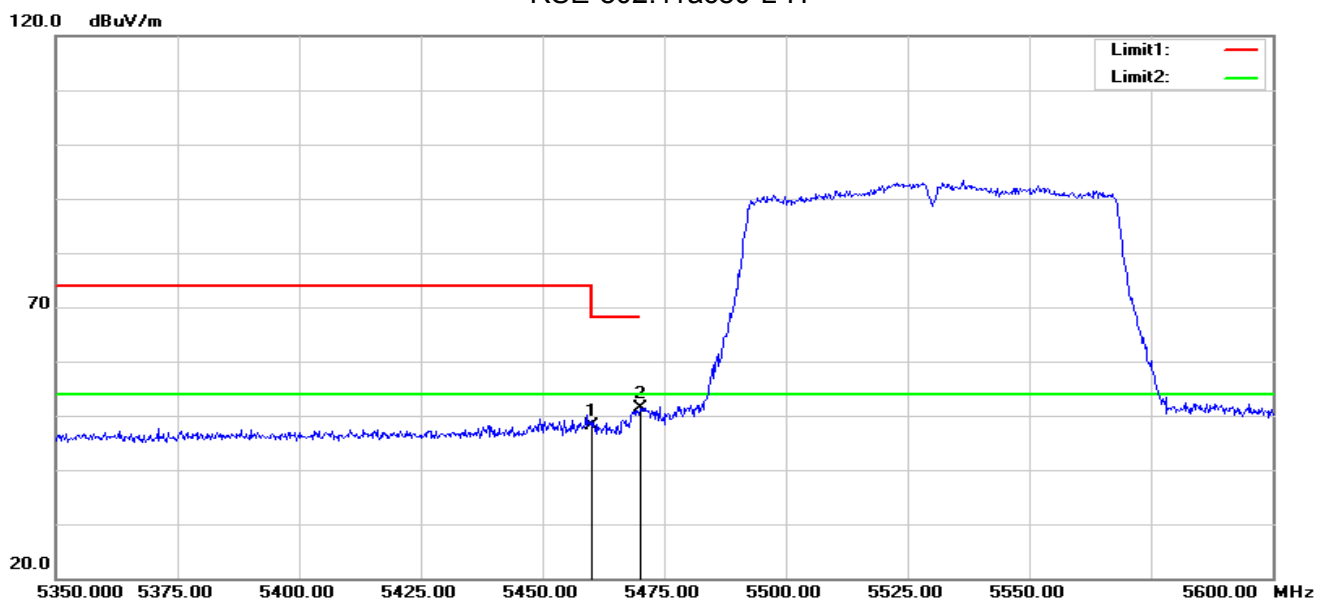
RSE-802.11ac40-H-V



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5725.000	53.10	-4.57	48.53	68.20	-19.67	peak
2	5736.800	55.49	-4.53	50.96	68.20	-17.24	peak

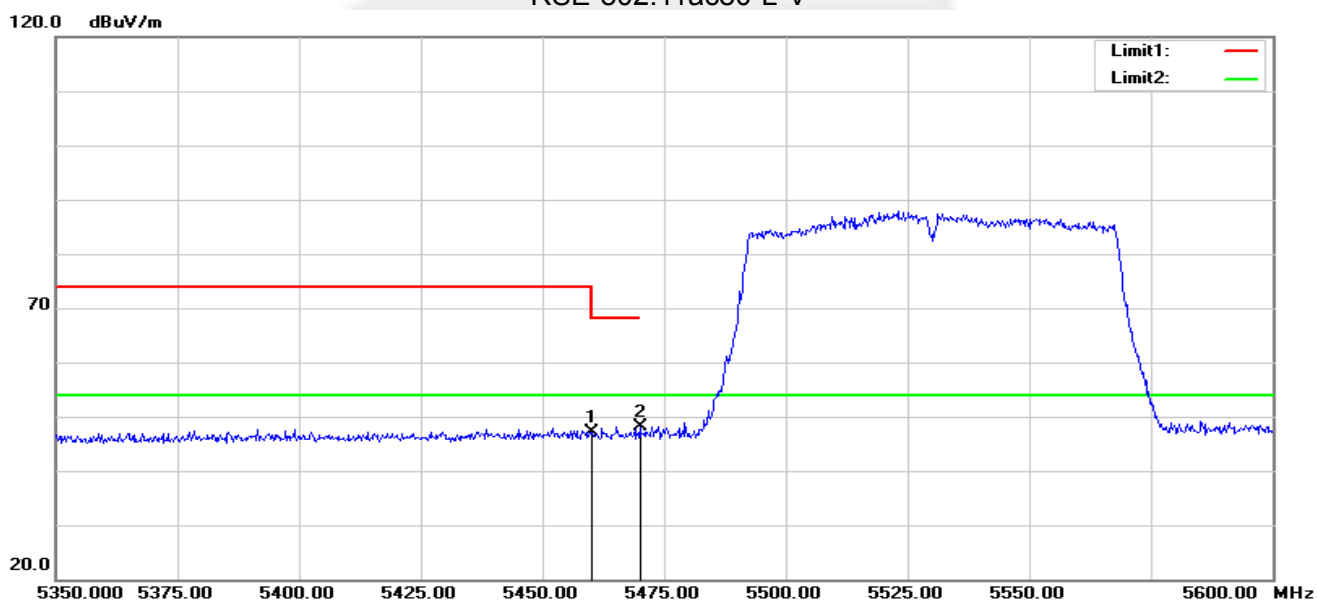


RSE-802.11ac80-L-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5460.000	53.33	-5.11	48.22	68.20	-19.98	peak
2	5470.000	56.56	-5.09	51.47	68.20	-16.73	peak

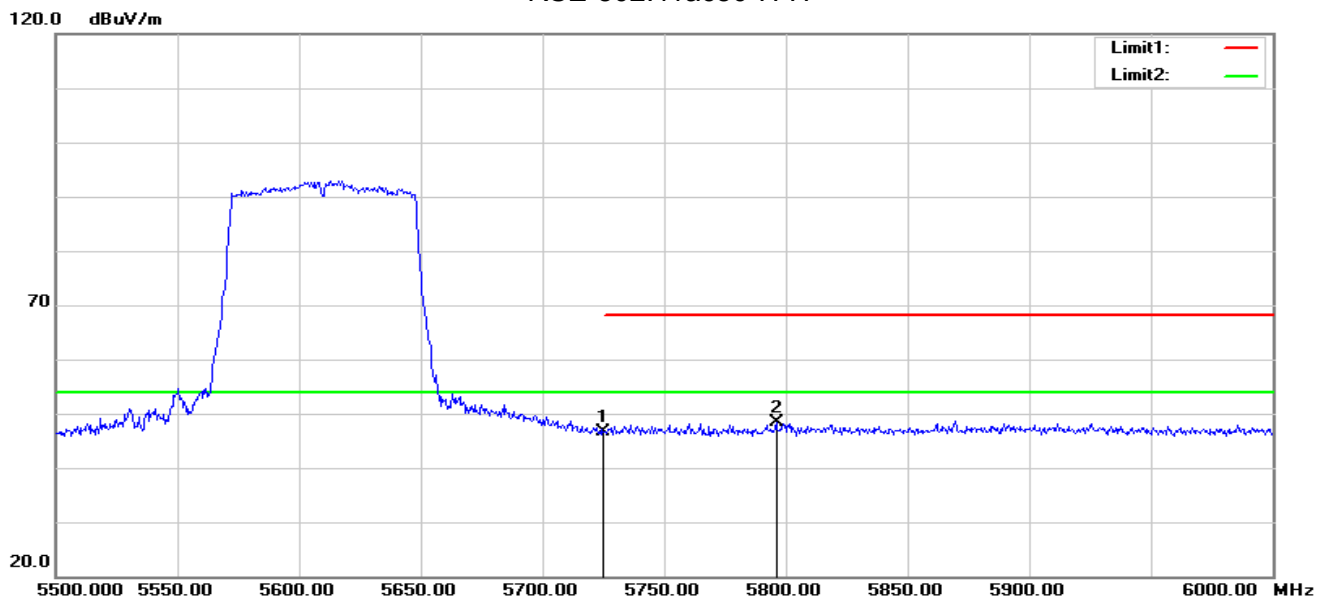
RSE-802.11ac80-L-V



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5460.000	52.14	-5.11	47.03	68.20	-21.17	peak
2	5470.000	53.10	-5.09	48.01	68.20	-20.19	peak

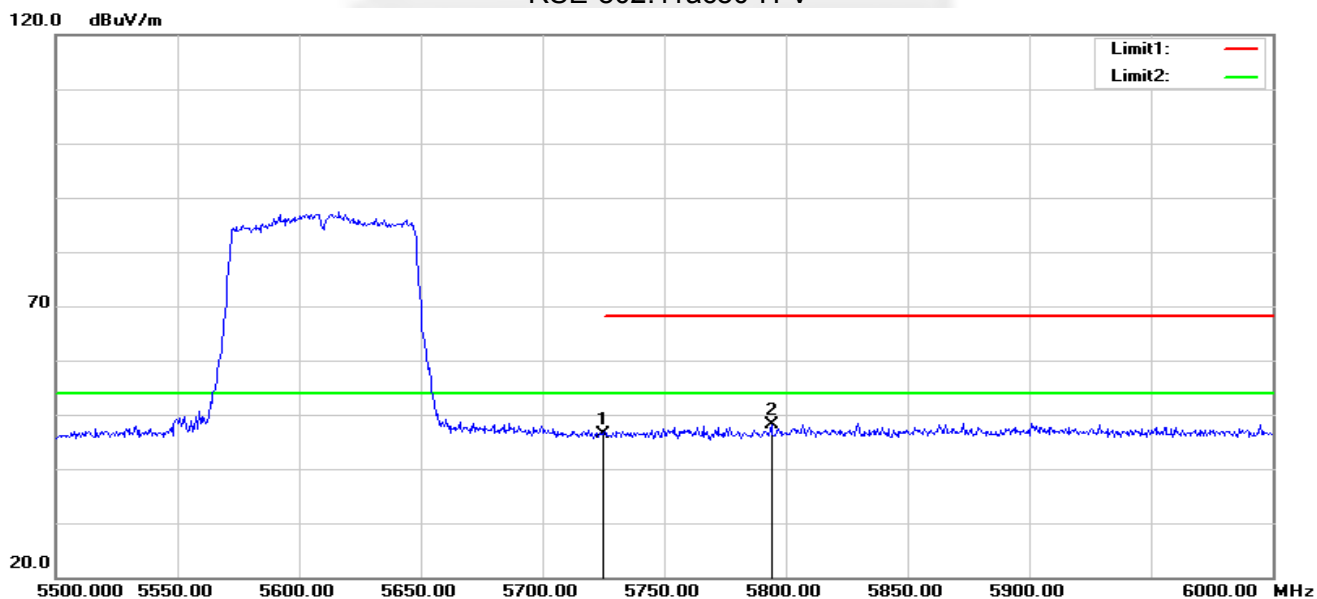


RSE-802.11ac80-H-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5725.000	51.21	-4.57	46.64	68.20	-21.56	peak
2	5796.000	52.70	-4.34	48.36	68.20	-19.84	peak

RSE-802.11ac80-H-V



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5725.000	51.07	-4.57	46.50	68.20	-21.70	peak
2	5794.000	52.45	-4.34	48.11	68.20	-20.09	peak

Note: All modes have been tested. Only the worst mode shown in the report.



4. POWER SPECTRAL DENSITY TEST

4.1 LIMIT

1. For mobile and portable client devices in the 5.15-5.25 GHz band, , the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
2. For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
3. For the band 5.725-5.850 GHz, the peak power spectral density shall not exceed 30 dBm in any 500KHz band. If transmitting antenna directional gain is greater than 6 dBi, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

4.2 TEST PROCEDURE

1. The setting follows Method SA-1 of FCC KDB D02 General UNII Test Procedures New Rules v01r03.

For devices operating in the band, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500 kHz, "provided that the measured power is integrated over the full reference bandwidth" to show the total power over the specified measurement bandwidth (*i.e.*, 1 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500 kHz) and integrated over 1 MHz, or 500 KHz bandwidth, the following adjustments to the procedures apply:

- a) Set $RBW \geq 1/T$, where T is defined in section II.B.I.a).
- b) Set $VBW \geq 3 RBW$.
- c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add $10 \log (500\text{kHz}/RBW)$ to the measured result, whereas $RBW (< 500 \text{ kHz})$ is the reduced resolution bandwidth of the spectrum analyzer set during measurement.
- d) If measurement bandwidth of Maximum PSD is specified in 1 MHz, add $10 \log (1\text{MHz}/RBW)$ to the measured result, whereas $RBW (< 1 \text{ MHz})$ is the reduced resolution bandwidth of spectrum analyzer set during measurement.
- e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

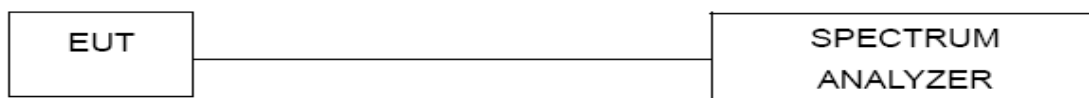
Note: As a practical matter, it is recommended to use reduced RBW of 100 kHz for the sections 5.c) and 5.d) above, since $RBW=100 \text{ KHZ}$ is available on nearly all spectrum analyzers.



4.3 DEVIATION FROM STANDARD

No deviation.

4.4 TEST SETUP



4.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.1 Unless otherwise a special operating condition is specified in the follows during the testing.

4.6 TEST RESULTS

5150-5250MHz					
Frequency	Direct measurement Power Density (dBm)	Duty cycle factor (dB)	Final Power Density (dBm)	Limit (dBm)	Result
802.11a					
5180	0.685	0.208	0.893	11	PASS
5200	0.594	0.208	0.802	11	PASS
5240	0.463	0.208	0.671	11	PASS
802.11n20					
5180	0.388	0.179	0.567	11	PASS
5200	0.588	0.179	0.767	11	PASS
5240	-0.174	0.179	0.005	11	PASS
802.11n40					
5190	-2.285	0.399	-1.886	11	PASS
5230	-2.923	0.399	-2.524	11	PASS
802.11ac20					
5180	0.062	0.199	0.261	11	PASS
5200	0.230	0.199	0.429	11	PASS
5240	-0.021	0.199	0.178	11	PASS
802.11ac40					
5190	-2.407	0.357	-2.050	11	PASS
5230	-3.010	0.357	-2.653	11	PASS
802.11ac80					
5210	-6.525	0.749	-5.776	11	PASS



5250-5350MHz					
Frequency	Direct measurement Power Density (dBm)	Duty cycle factor (dB)	Final Power Density (dBm)	Limit (dBm)	Result
802.11a					
5260	1.083	0.187	1.270	11	PASS
5300	0.267	0.187	0.454	11	PASS
5320	-0.293	0.187	-0.106	11	PASS
802.11n20					
5260	0.179	0.190	0.369	11	PASS
5300	-0.325	0.190	-0.135	11	PASS
5320	-0.535	0.190	-0.345	11	PASS
802.11n40					
5270	-2.710	0.373	-2.337	11	PASS
5310	-3.470	0.373	-3.097	11	PASS
802.11ac20					
5260	0.282	0.189	0.471	11	PASS
5300	-3.050	0.189	-2.861	11	PASS
5320	-0.089	0.189	0.100	11	PASS
802.11ac40					
5270	-2.431	0.408	-2.023	11	PASS
5310	-3.306	0.408	-2.898	11	PASS
802.11ac80					
5290	-6.434	0.729	-5.705	11	PASS



5470-5725MHz					
Frequency	Direct measurement Power Density (dBm)	Duty cycle factor (dB)	Final Power Density (dBm)	Limit (dBm)	Result
802.11a					
5500	-0.204	0.198	-0.006	11	PASS
5580	-0.055	0.198	0.143	11	PASS
5700	2.135	0.198	2.333	11	PASS
802.11n20					
5500	-0.958	0.200	-0.758	11	PASS
5580	-0.819	0.200	-0.619	11	PASS
5700	1.594	0.200	1.794	11	PASS
802.11n40					
5510	-3.304	0.397	-2.907	11	PASS
5550	-3.764	0.397	-3.367	11	PASS
5670	-1.451	0.397	-1.054	11	PASS
802.11ac20					
5500	-0.872	0.189	-0.683	11	PASS
5580	-0.534	0.189	-0.345	11	PASS
5700	1.608	0.189	1.797	11	PASS
802.11ac40					
5510	-3.792	0.357	-3.435	11	PASS
5550	-3.621	0.357	-3.264	11	PASS
5670	-1.375	0.357	-1.018	11	PASS
802.11ac80					
5530	-7.794	0.744	-7.050	11	PASS
5610	-5.705	0.744	-4.961	11	PASS

Data see Attachment A



5. BANDWIDTH MEASUREMENT

5.1 EMISSION BANDWIDTH (EBW) 26 BANDWID PROCEDURES / LIMIT

See list of measuring instruments of this test report.

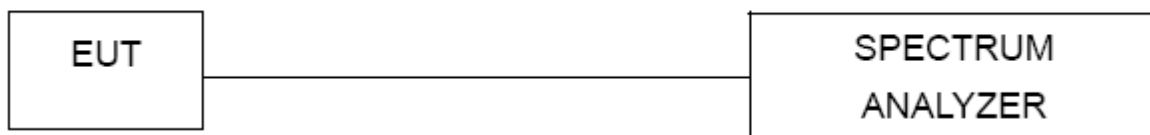
5.1.1 TEST PROCEDURE

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01
2. Set RBW = approximately 1% of the emission bandwidth.
3. Set the VBW $\geq$ RBW.
4. Detector = Peak.
5. Trace mode = max hold.
6. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

5.1.2 DEVIATION FROM STANDARD

No deviation.

5.1.3 TEST SETUP



5.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

**5.1.5 TEST RESULTS**

Frequency (MHz)	26dB Bandwidth (MHz)	Pass/Fail
802.11a		
5180	22.45	Pass
5200	22.90	Pass
5240	22.89	Pass
802.11n(HT20)		
5180	22.55	Pass
5200	22.94	Pass
5240	22.99	Pass
802.11n(HT40)		
5190	41.24	Pass
5230	41.08	Pass
802.11ac(VHT20)		
5180	24.14	Pass
5200	23.09	Pass
5240	23.52	Pass
802.11ac(VHT40)		
5190	41.28	Pass
5230	41.50	Pass
802.11ac(VHT80)		
5210	83.17	Pass

Frequency (MHz)	26dB Bandwidth (MHz)	Pass/Fail
802.11a		
5260	22.19	Pass
5300	21.68	Pass
5320	22.58	Pass
802.11n(HT20)		
5260	23.18	Pass
5300	23.25	Pass
5320	23.28	Pass
802.11n(HT40)		
5270	41.45	Pass
5310	41.18	Pass
802.11ac(VHT20)		
5260	22.75	Pass
5300	23.63	Pass
5320	22.60	Pass
802.11ac(VHT40)		
5270	41.24	Pass
5310	41.15	Pass
802.11ac(VHT80)		
5290	82.97	Pass



Frequency (MHz)	26dB Bandwidth (MHz)	Pass/Fail
802.11a		
5500	22.29	Pass
5580	22.13	Pass
5700	22.65	Pass
802.11n(HT20)		
5500	23.04	Pass
5580	23.47	Pass
5700	23.61	Pass
802.11n(HT40)		
5510	41.14	Pass
5550	41.28	Pass
5670	41.31	Pass
802.11ac(VHT20)		
5500	23.27	Pass
5580	23.68	Pass
5700	22.89	Pass
802.11ac(VHT40)		
5510	41.10	Pass
5550	40.80	Pass
5670	41.26	Pass
802.11ac(VHT80)		
5530	82.14	Pass
5610	82.69	Pass

Test plot see Attachment B



5.2 OCCUPIED BANDWIDTH (99%) TEST APPLIED PROCEDURES / LIMIT

The following procedure shall be used for measuring (99 %) power bandwidth:

5.2.1 TEST PROCEDURE

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures v02r01.

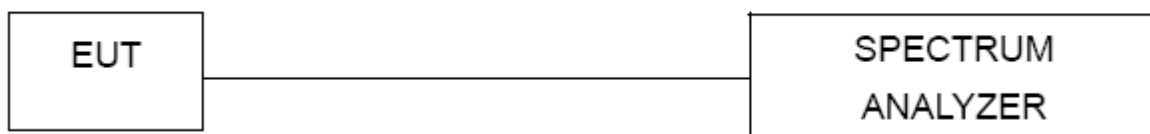
The following procedure shall be used for measuring (99 %) power bandwidth:

1. Set center frequency to the nominal EUT channel center frequency.
2. Set span = 1.5 times to 5.0 times the OBW.
3. Set RBW = 1 % to 5 % of the OBW
4. Set VBW $\geq 3 \cdot$ RBW
5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
6. Use the 99 % power bandwidth function of the instrument (if available).
7. If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.

5.2.2 DEVIATION FROM STANDARD

No deviation.

5.2.3 TEST SETUP



5.2.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

**6.2.5 TEST RESULTS**

Frequency (MHz)	99% Bandwidth (MHz)	Pass/Fail
802.11a		
5180	16.58	Pass
5200	16.57	Pass
5240	16.56	Pass
802.11n(HT20)		
5180	17.71	Pass
5200	17.71	Pass
5240	17.68	Pass
802.11n(HT40)		
5190	36.21	Pass
5230	36.21	Pass
802.11ac(VHT20)		
5180	17.72	Pass
5200	17.73	Pass
5240	17.71	Pass
802.11ac(VHT40)		
5190	36.20	Pass
5230	36.20	Pass
802.11ac(VHT80)		
5210	75.63	Pass

Frequency (MHz)	99% Bandwidth (MHz)	Pass/Fail
802.11a		
5260	16.58	Pass
5300	16.56	Pass
5320	16.53	Pass
802.11n(HT20)		
5260	17.72	Pass
5300	17.69	Pass
5320	17.70	Pass
802.11n(HT40)		
5270	36.21	Pass
5310	36.21	Pass
802.11ac(VHT20)		
5260	17.71	Pass
5300	17.70	Pass
5320	17.72	Pass
802.11ac(VHT40)		
5270	36.21	Pass
5310	36.22	Pass
802.11ac(VHT80)		
5290	75.70	Pass



Frequency (MHz)	99% Bandwidth (MHz)	Pass/Fail
802.11a		
5500	16.58	Pass
5580	16.58	Pass
5700	16.55	Pass
802.11n(HT20)		
5500	17.72	Pass
5580	17.69	Pass
5700	17.70	Pass
802.11n(HT40)		
5510	36.25	Pass
5550	36.22	Pass
5670	36.23	Pass
802.11ac(VHT20)		
5500	17.71	Pass
5580	17.72	Pass
5700	17.70	Pass
802.11ac(VHT40)		
5510	36.23	Pass
5550	36.21	Pass
5670	36.21	Pass
802.11ac(VHT80)		
5530	75.65	Pass
5610	75.65	Pass

Test plot See Attachment B

6. MAXIMUM CONDUCTED OUTPUT POWER

6.1 LIMIT

For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz, If transmitting antennas of directional gain greater than 6 dBi are used.

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. If transmitting antennas of directional gain greater than 6 dBi are used.

FCC Part15 (15.407) , Subpart E				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.407(a) (1) (iv)	Peak Output Power	0.25 watt	5150-5250	PASS
		The lesser of 250 mW or 11 dBm + 10 log (26 dB emission bandwidth)	5250-5350 5470-5725	
15.407(a) (3)		1 watt	5725-5825	

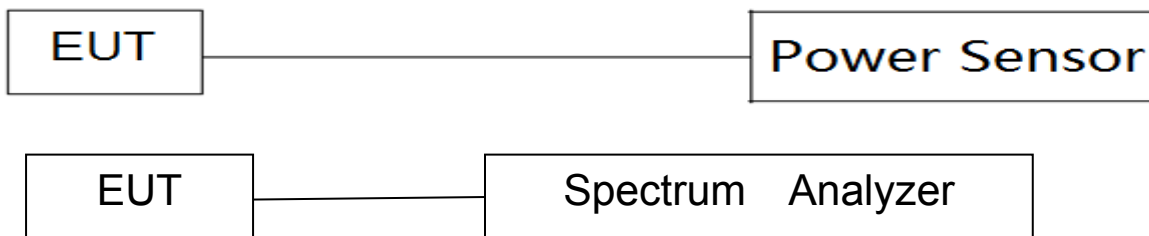
6.2 TEST PROCEDURE

The EUT was directly connected to the Power Sensor&PC

6.3 DEVIATION FROM STANDARD

No deviation.

6.4 TEST SETUP



6.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 5 Unless otherwise a special operating condition is specified in the follows during the testing.



6.6 TEST RESULTS

Note:

1. For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 0.25 W.
2. For mobile and portable client devices in the 5.25-5.35 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 0.25 W.

For mobile and portable client devices in the 5.47-5.725 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 0.25 W.

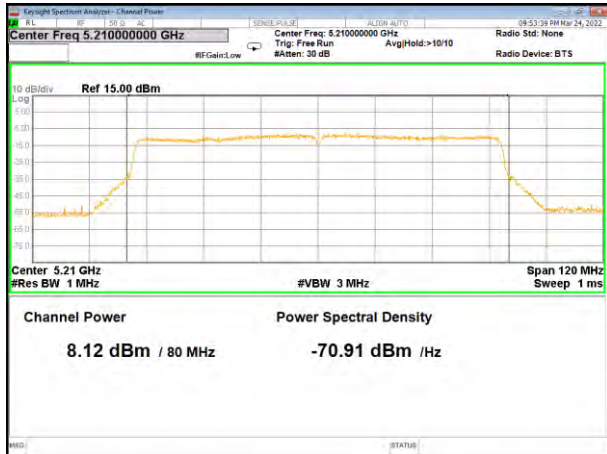
U-NII-1 (5.15-5.25GHz)					
Test Channel	Frequency (MHz)	Direct measurement AV Power (dBm)	Duty cycle factor (dB)	Final AV Power (dBm)	LIMIT (dBm)
802.11a					
36	5180	11.30	0.208	11.51	23.98
40	5200	11.00	0.208	11.21	23.98
48	5240	10.95	0.208	11.16	23.98
802.11n(HT20)					
36	5180	11.15	0.179	11.33	23.98
40	5200	11.06	0.179	11.24	23.98
48	5240	10.81	0.179	10.99	23.98
802.11n(HT40)					
38	5190	11.15	0.399	11.55	23.98
46	5230	10.66	0.399	11.06	23.98
802.11ac(VHT20)					
36	5180	11.11	0.199	11.31	23.98
40	5200	11.11	0.199	11.31	23.98
48	5240	10.74	0.199	10.94	23.98
802.11ac(VHT40)					
38	5190	11.19	0.357	11.55	23.98
46	5230	10.68	0.357	11.04	23.98
802.11ac(VHT80)					
42	5210	8.12	0.749	8.87	23.98



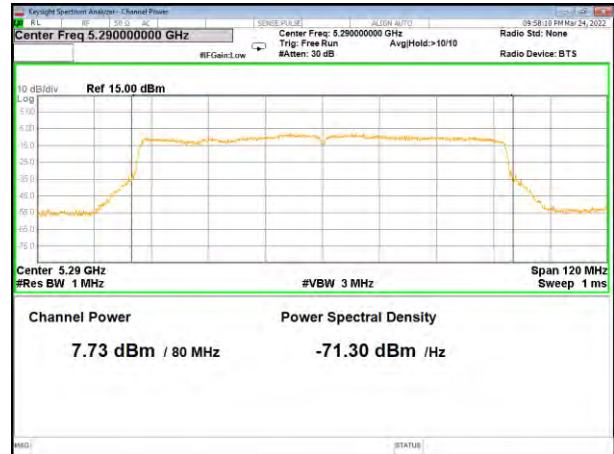
U-NII-2A(5.25-5.35GHz)					
Test Channel	Frequency (MHz)	Direct measurement AV Power (dBm)	Duty cycle factor (dB)	Final AV Power (dBm)	LIMIT (dBm)
802.11a					
52	5260	11.29	0.187	11.48	23.98
60	5300	10.85	0.187	11.04	23.98
64	5320	10.67	0.187	10.86	23.98
802.11n(HT20)					
52	5260	11.06	0.190	11.25	23.98
60	5300	10.70	0.190	10.89	23.98
64	5320	10.61	0.190	10.80	23.98
802.11n(HT40)					
54	5270	11.12	0.373	11.49	23.98
62	5310	10.63	0.373	11.00	23.98
802.11ac(VHT20)					
52	5260	11.04	0.189	11.23	23.98
60	5300	10.74	0.189	10.93	23.98
64	5320	10.57	0.189	10.76	23.98
802.11ac(VHT40)					
54	5270	11.09	0.408	11.50	23.98
62	5310	10.62	0.408	11.03	23.98
802.11ac(VHT80)					
58	5290	7.73	0.729	8.46	23.98



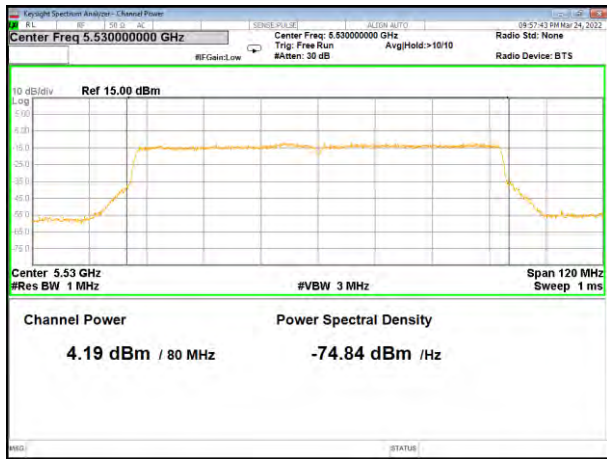
U-NII-2C(5.47-5.725GHz)					
Test Channel	Frequency (MHz)	Direct measurement AV Power (dBm)	Duty cycle factor (dB)	Final AV Power (dBm)	LIMIT (dBm)
802.11a					
100	5500	10.63	0.198	10.83	23.98
116	5580	10.76	0.198	10.96	23.98
140	5700	12.53	0.198	12.73	23.98
802.11n(HT20)					
100	5500	10.47	0.200	10.67	23.98
116	5580	10.62	0.200	10.82	23.98
140	5700	12.32	0.200	12.52	23.98
802.11n(HT40)					
102	5510	10.57	0.397	10.97	23.98
110	5550	10.23	0.397	10.63	23.98
134	5670	12.15	0.397	12.55	23.98
802.11ac(VHT20)					
100	5500	10.45	0.189	10.64	23.98
116	5580	10.62	0.189	10.81	23.98
140	5700	12.36	0.189	12.55	23.98
802.11ac(VHT40)					
102	5510	10.56	0.357	10.92	23.98
110	5550	10.20	0.357	10.56	23.98
134	5670	12.20	0.357	12.56	23.98
802.11ac(VHT80)					
106	5530	5.47	0.744	6.21	23.98
122	5610	4.19	0.744	4.93	23.98



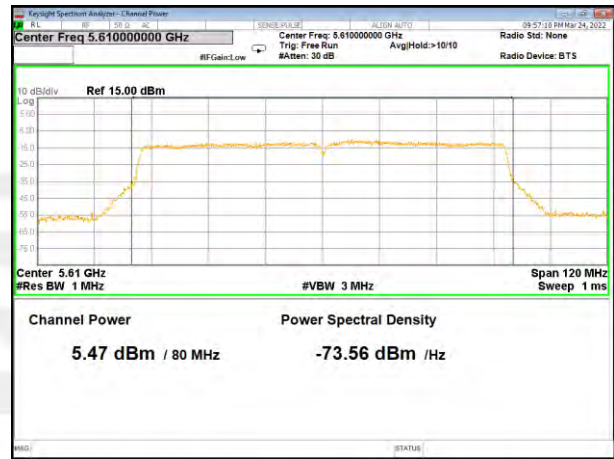
5210MHz



5290MHz



5530MHz

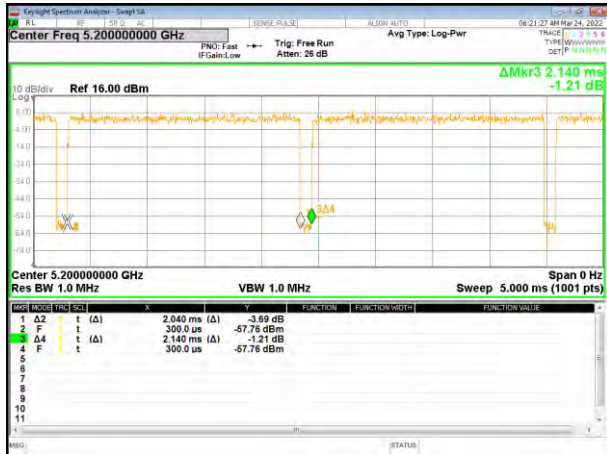


5610MHz

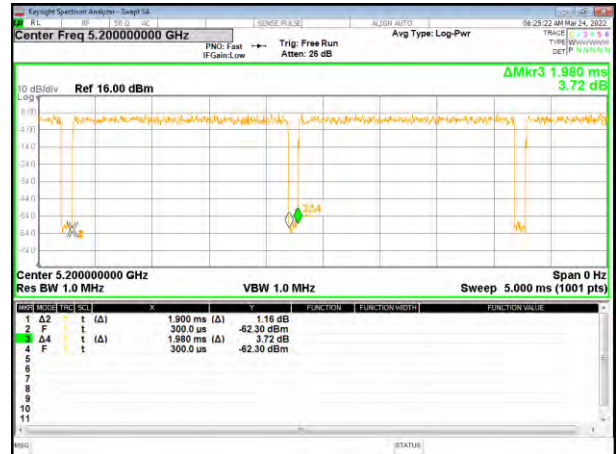


Duty cycle

Band1				
Mode	Ton(ms)	Tp(ms)	Duty cycle(%)	Duty factor(dB)
a	2.040	2.140	95.33%	0.208
n20	1.900	1.980	95.96%	0.179
n40	0.936	1.026	91.23%	0.399
ac20	1.915	2.005	95.51%	0.199
ac40	0.945	1.026	92.11%	0.357
ac80	0.465	0.552	84.17%	0.749
Band2				
Mode	Ton(ms)	Tp(ms)	Duty cycle(%)	Duty factor(dB)
a	2.040	2.130	95.77%	0.187
n20	1.900	1.985	95.72%	0.190
n40	0.936	1.020	91.76%	0.373
ac20	1.915	2.000	95.75%	0.189
ac40	0.945	1.038	91.04%	0.408
ac80	0.462	0.546	84.54%	0.729
Band3				
Mode	Ton(ms)	Tp(ms)	Duty cycle(%)	Duty factor(dB)
a	2.040	2.135	95.55%	0.198
n20	1.905	1.995	95.49%	0.200
n40	0.939	1.029	91.25%	0.397
ac20	1.910	1.995	95.74%	0.189
ac40	0.945	1.026	92.11%	0.357
ac80	0.460	0.546	84.26%	0.744



Band 1-a20



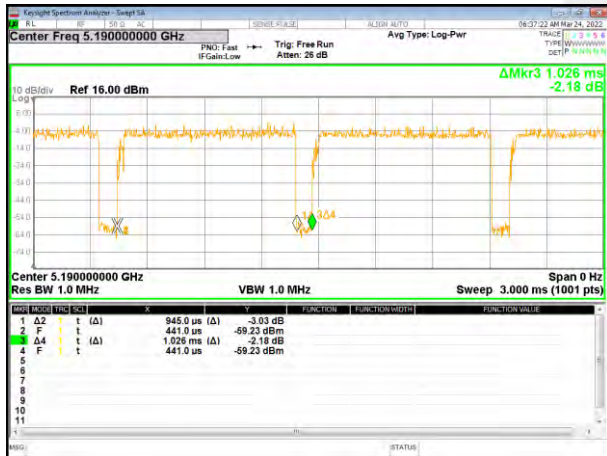
Band 1-n20



Band 1-n40



Band 1-ac20



Band 1-ac40



Band 1-ac80



Band 2-a20



Band 2-n20



Band 2-n40



Band 2-ac20



Band 2-ac40



Band 2-ac80



Band 3-a20



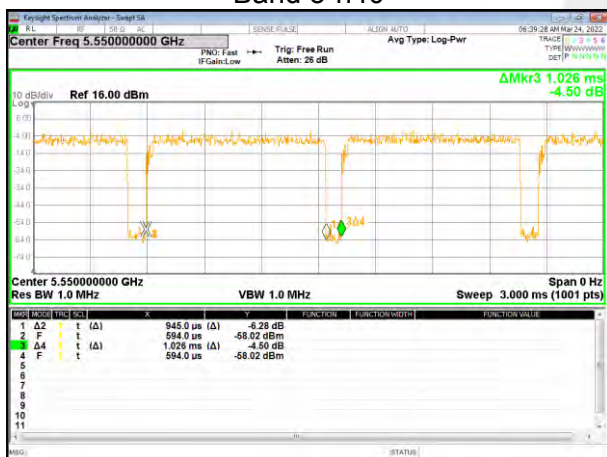
Band 3-n20



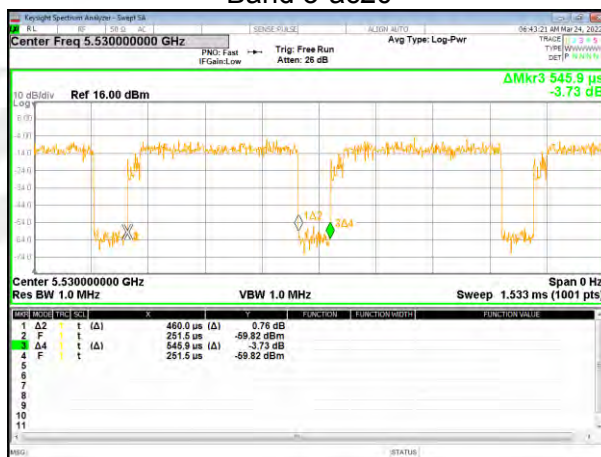
Band 3-n40



Band 3-ac20



Band 3-ac40



Band 3-ac80



7. AUTOMATICALLY DISCONTINUE TRANSMISSION

7.1 LIMIT OF AUTOMATICALLY DISCONTINUE TRANSMISSION

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signaling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization to describe how this requirement is met.

7.2 TEST RESULT OF AUTOMATICALLY DISCONTINUE TRANSMISSION

During no any information transmission, the EUT can automatically discontinue transmission and become standby mode for power saving. The EUT can detect the controlling signal of ACK message transmitting from remote device and verify whether it shall resend or discontinue transmission





8. ANTENNA REQUIREMENT

8.1 STANDARD REQUIREMENT

15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

8.2 EUT ANTENNA

The EUT antenna is PIFA Antenna. It comply with the standard requirement.



**APPENDIX - PHOTOS OF TEST SETUP**

Note: See test photos in setup photo document for the actual connections between Product and support equipment.

※※※※※END OF THE REPORT※※※※※

