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CNAS L7649

RADIO TEST REPORT

Report No.:STS2104040W10

Issued for

Chengdu XGIMI Technology Co., Ltd.

Building A4, No. 1129 Century City Road, New and High-tech
zones, Chengdu City, China

Product Name:	Projector
Brand Name:	XGIMI
Model Name:	WM03A
Series Model:	WM04A,WM05A,WM06A,WM07A,WM08A, WM09A,WM10A,WM11A,WM12A,WM13A, WM14A,WM15A,WM16A,WM17A,WM18A, WM19A,WM20A,WM21A,WM22A,WM23A, WM24A,WM25A,WM26A,WM27A,WM28A, WM29A,WM30A,WM31A,WM32A
FCC ID:	2AFENWM03A
Test Standard:	FCC Part 15.407

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TEST RESULT CERTIFICATION

Applicant's Name : Chengdu XGIMI Technology Co., Ltd.
Address : Building A4, No. 1129 Century City Road, New and High-tech zones, Chengdu City, China
Manufacturer's Name : Chengdu XGIMI Technology Co., Ltd.
Address : Building A4, No. 1129 Century City Road, New and High-tech zones, Chengdu City, China

Product Description

Product Name : Projector
Brand Name : XGIMI
Model Name : WM03A
Series Model : WM04A, WM05A, WM06A, WM07A, WM08A, WM09A, WM10A, WM11A, WM12A, WM13A, WM14A, WM15A, WM16A, WM17A, WM18A, WM19A, WM20A, WM21A, WM22A, WM23A, WM24A, WM25A, WM26A, WM27A, WM28A, WM29A, WM30A, WM31A, WM32A

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 09 Apr. 2021

Date (s) of performance of tests 09 Apr. 2021 ~ 07 May 2021

Date of Issue 07 May 2021

Test Result **Pass**

Testing Engineer :

(Chris Chen)

Technical Manager :

(Sean she)

Authorized Signatory :

(Vita Li)





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**Revision History**

Rev.	Issue Date	Report NO.	Effect Page	Contents
00	07 May 2021	STS2104040W10	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 (a) /15.407 (e)	26dB/6dB &99% Bandwidth	PASS
15.407(a)	Maximum Conducted Output Power	PASS
15.407(b)/15.205/15.209	Radiated Emission And (bandedge Emissions) Measurement	PASS
15.407(a)	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	$\pm 0.68\text{dB}$
2	Unwanted Emissions, conducted	$\pm 2.988\text{dB}$
3	All emissions, radiated 9K-30MHz	$\pm 2.84\text{dB}$
4	All emissions, radiated 30M-1GHz	$\pm 4.39\text{dB}$
5	All emissions, radiated 1G-6GHz	$\pm 5.10\text{dB}$
6	All emissions, radiated >6G	$\pm 5.48\text{dB}$
7	Conducted Emission (9KHz-150KHz)	$\pm 2.79\text{dB}$
8	Conducted Emission (150KHz-30MHz)	$\pm 2.80\text{dB}$



2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF THE EUT

Product Name	Projector	
Trade Name	XGIMI	
Model Name	WM03A	
Series Model	WM04A,WM05A,WM06A,WM07A,WM08A,WM09A,WM10A,WM11A,WM12A,WM13A,WM14A,WM15A,WM16A,WM17A,WM18A,WM19A,WM20A,WM21A,WM22A,WM23A,WM24A,WM25A,WM26A,WM27A,WM28A,WM29A,WM30A,WM31A,WM32A	
Model Difference	Only the appearance color and model name are different, others are exactly the same.	
Product Description	The EUT is a Projector	
	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 802.11 n(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 802.11 n(HT40)/ac(VHT40): 5.510GHz-5.670GHz IEEE 802.11ac(VHT80): 5.530GHz-5.610GHz
		IEEE 802.11a/ n(HT20)/ac(VHT20): 5.745GHz-5.825GHz IEEE 802.11a/ n(HT40)/ac(VHT40): 5.755GHz-5.795GHz IEEE 802.11ac(VHT80): 5.775GHz
	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):	14.653 dBm
	More details of EUT technical specification, please refer to the User Manual.	
Test Channel	Please refer to the Note 2.	
Adapter	Input: 100-240V~ 50/60Hz 1.5A Output: 19VDC, 4.74A, 90.06W	
Battery	Rated Voltage: 14.4V	
Hardware version number	V03	
Software version number	V1.0.0	
Connecting I/O Port(s)	Please refer to the Note 1.	

Note

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



2. 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	106	5530
44	5220	108	5540
46	5230	110	5550
48	5240	112	5560
		116	5580
		118	5590
5.260GHz-5.320GHz		120	5600
Channel	Frequency	122	5610
52	5260	124	5620
54	5270	126	5630
56	5280	128	5640
58	5290	132	5660
60	5300	134	5670
62	5310	136	5680
64	5320	140	5700
5.745GHz-5.825GHz			
Channel	Frequency		
149	5745		
151	5755		
153	5765		
157	5785		
159	5795		
161	5805		
165	5825		

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	149	5745
116	5580	157	5785
140	5700	165	5825



For 802.11 n(HT40)/ac(VHT40)			
Channel	Freq.(MHz)	Channel	Freq.(MHz)
38	5190	54	5270
46	5230	62	5310

For 802.11 n(HT40)/ac(VHT40)			
Channel	Freq.(MHz)	Channel	Freq.(MHz)
102	5510	151	5755
110	5550	159	5795
134	5670		

For 802.11ac (VHT80)			
Channel	Freq.(MHz)	Channel	Freq.(MHz)
42	5210	58	5290

For 802.11ac (VHT80)			
Channel	Freq.(MHz)	Channel	Freq.(MHz)
106	5530	155	5775
122	5610		

3. KDB 662911 D01 Multiple Transmitter Output v02r01

2) Directional Gain Calculations for In-Band Measurements

a) Basic methodology with NANT transmit antennas, each with the same directional gain G_{ANT} dBi, being driven by NANT transmitter outputs of equal power. Directional gain is to be computed as follows:

(i) If any transmit signals are correlated with each other,

$$\text{Directional gain} = G_{ANT} + 10 \log(NANT) \text{ dBi}$$

(ii) If all transmit signals are completely uncorrelated with each other,

$$\text{Directional gain} = G_{ANT}$$

Antenna number: 2

Antenna A gain : 6.99dBi

Antenna B gain : 6.99dBi

$G_{ANT} + 10 \log(NANT)$ dBi

MIMO technology Directional gain=10dBi

Ant	Brand	Model Name	Ant Type	Connector	Gain (dBi)	NOTE
A	XGIMI	WM03A	PIFA Antenna	N/A	ANT A: 6.99 ANT B: 6.99 MIMO A+B: 10	WLAN Ant

Note: The antenna information refer the manufacturer provide report, applicable only to the tested sample identified in the report.



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 802.11a HT20 CH149&CH157&CH165	6 Mbps
Mode 5	TX IEEE 802.11n HT20 CH36&CH40&CH48	MCS 0
Mode 6	TX IEEE 802.11ac HT20 CH36&CH40&CH48	NSS1 MCS0
Mode 7	TX IEEE 802.11n HT20 CH52&CH60&CH64	MCS 0
Mode 8	TX IEEE 802.11ac HT20 CH52&CH60&CH64	NSS1 MCS0
Mode 9	TX IEEE 802.11n HT20 CH100&CH116&CH140	MCS 0
Mode 10	TX IEEE 802.11ac HT20 CH100&CH116&CH140	NSS1 MCS0
Mode 11	TX IEEE 802.11n HT20 CH149&CH157&CH165	MCS 0
Mode 12	TX IEEE 802.11ac HT20 CH149&CH157&CH165	NSS1 MCS0
Mode 13	TX IEEE 802.11n HT40 CH38&CH46	MCS 0
Mode 14	TX IEEE 802.11ac HT40 CH38&CH46	NSS1 MCS0
Mode 15	TX IEEE 802.11n HT40 CH54 &CH62	MCS 0
Mode 16	TX IEEE 802.11ac HT40 CH54 &CH62	NSS1 MCS0
Mode 17	TX IEEE 802.11n HT40 CH102&CH110&CH134	MCS 0
Mode 18	TX IEEE 802.11ac HT40 CH102&CH110&CH134	NSS1 MCS0
Mode 19	TX IEEE 802.11n HT40 CH151&CH159	MCS 0
Mode 20	TX IEEE 802.11ac HT40 CH151&CH159	NSS1 MCS0
Mode 21	TX IEEE 802.11ac HT80 CH42	NSS1 MCS0
Mode 22	TX IEEE 802.11ac HT80 CH58	NSS1 MCS0
Mode 23	TX IEEE 802.11ac HT80 CH106&122	NSS1 MCS0
Mode 24	TX IEEE 802.11ac HT80 CH155	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.
(4) The battery is fully-charged during the radiated and RF conducted test.



AC Conducted Emission

Test Case	
AC Conducted Emission	Mode 25: Keeping TX + WLAN Link

2.3 TEST SOFTWARE AND POWER LEVEL

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level.

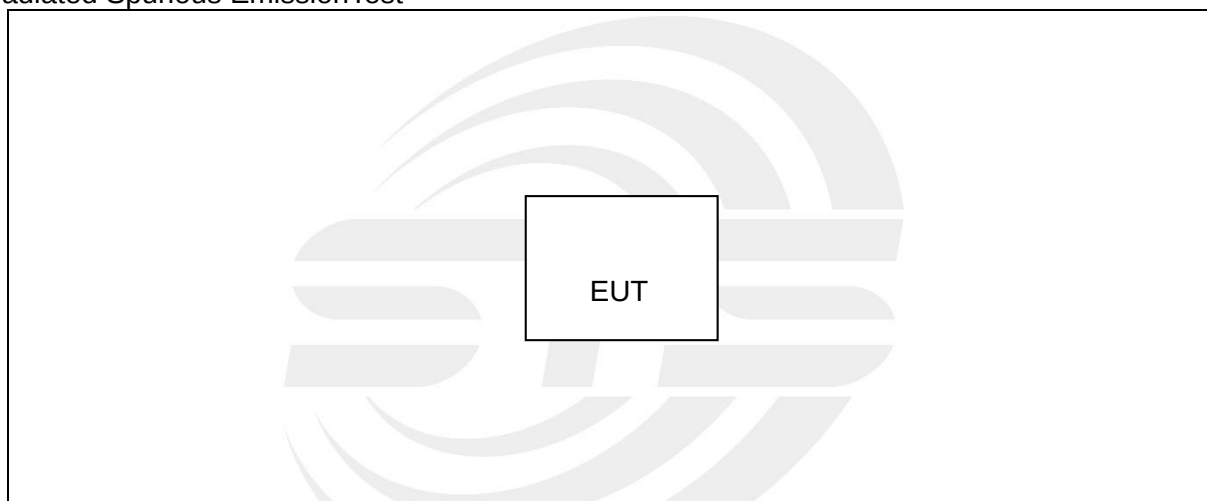
RF Function	Type	Mode Or Modulation type	ANT Gain(dBi)	ANT_A Power Class	ANT_B Power Class	Software For Testing
WIFI(5G)	5G WIFI Band1 (5150MHz-5250MHz)	802.11a	ANT A: 6.99 ANT B: 6.99 MIMO A+B: 10	12	12	QATool_Dbg
		802.11n(HT20)		12	12	
		802.11n(HT40)		8	8	
		802.11ac(VHT20)		12	12	
		802.11ac(VHT40)		8	8	
		802.11ac(VHT80)		8	8	
RF Function	Type	Mode Or Modulation type	ANT Gain(dBi)	ANT_A Power Class	ANT_B Power Class	Software For Testing
WIFI(5G)	5G WIFI Band2 (5250MHz-5350MHz)	802.11a	ANT A: 6.99 ANT B: 6.99 MIMO A+B: 10	12	12	QATool_Dbg
		802.11n(HT20)		12	12	
		802.11n(HT40)		10	10	
		802.11ac(VHT20)		12	12	
		802.11ac(VHT40)		10	10	
		802.11ac(VHT80)		10	10	
RF Function	Type	Mode Or Modulation type	ANT Gain(dBi)	ANT_A Power Class	ANT_B Power Class	Software For Testing
WIFI(5G)	5G WIFI Band3 (5470MHz-5725MHz)	802.11a	ANT A: 6.99 ANT B: 6.99 MIMO A+B: 10	10	10	QATool_Dbg
		802.11n(HT20)		10	10	
		802.11n(HT40)		10	10	
		802.11ac(VHT20)		10	10	
		802.11ac(VHT40)		10	10	
		802.11ac(VHT80)		10	10	



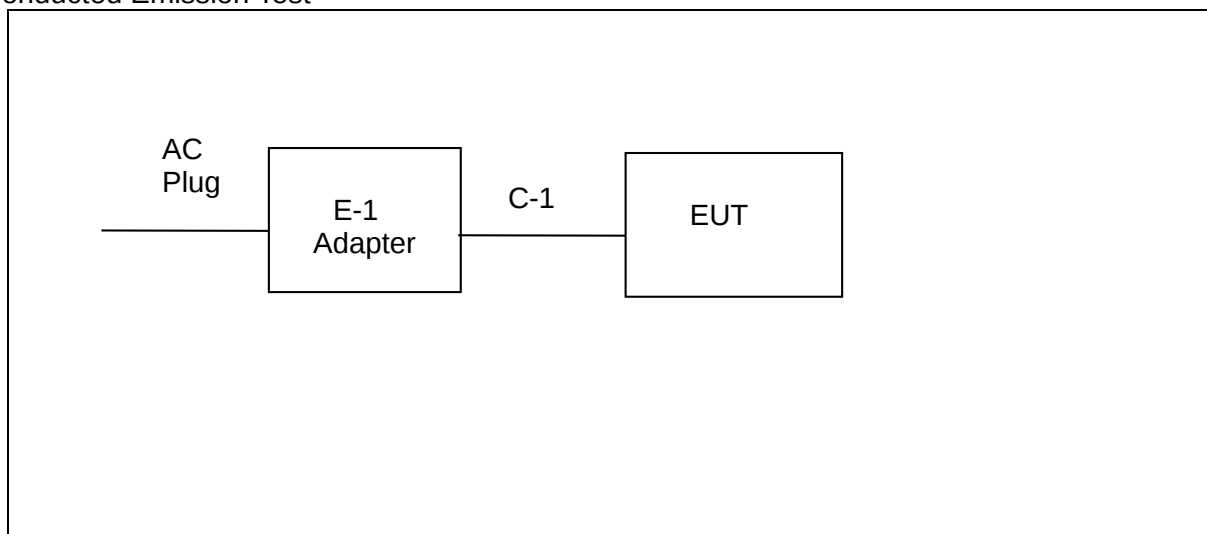
RF Function	Type	Mode Or Modulation type	ANT Gain(dBi)	ANT_A Power Class	ANT_B Power Class	Software For Testing
WIFI(5G)	5G WIFI Band4 (5725MHz-5850MHz)	802.11a	ANT A: 6.99 ANT B: 6.99 MIMO A+B: 10	12	12	QATool_Dbg
		802.11n(HT20)		12	12	
		802.11n(HT40)		12	12	
		802.11ac(VHT20)		12	12	
		802.11ac(VHT40)		12	12	
		802.11ac(VHT80)		12	12	

2.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Radiated Spurious EmissionTest



Conducted Emission Test





2.5 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-2	Adapter	XGIMI	HKA09019047-6P	N/A	N/A
C-1	DC Cable	N/A	N/A	125cm	YES
/	AC Cable	N/A	N/A	110cm	NO

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) For detachable type I/O cable should be specified the length in cm in 『Length』 column.



2.6 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	2020.10.12	2021.10.11
Signal Analyzer	R&S	FSV 40-N	101823	2020.10.10	2021.10.09
Active loop Antenna	ZHINAN	ZN30900C	16035	2019.07.11	2021.07.10
Bilog Antenna	TESEQ	CBL6111D	34678	2020.10.12	2022.10.11
Horn Antenna	SCHWARZBECK	BBHA 9120D	02014	2019.10.15	2021.10.14
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	2020.10.12	2021.10.11
Pre-Amplifier (1G-18GHz)	SKET	LNPA-01018G-45	SK2018080901	2020.10.12	2021.10.11
Pre-Amplifier (18G-40GHz)	SKET	LNPA-1840-50	SK2018101801	2020.10.10	2021.10.09
Temperature & Humidity	HH660	Mieo	N/A	2020.10.13	2021.10.12
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	2020.10.12	2021.10.11
LISN	R&S	ENV216	101242	2020.10.12	2021.10.11
LISN	EMCO	3810/2NM	23625	2020.10.12	2021.10.11
Temperature & Humidity	HH660	Mieo	N/A	2020.10.13	2021.10.12
Test SW	FARAD	EZ-EMC(Ver.STSLAB-03A1 CE)			



RF Connected Test

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
MIMO Power measurement test Set	Keysight	U2021XA	MY55520005	2020.10.10	2021.10.09
			MY55520006	2020.10.10	2021.10.09
			MY56120038	2020.10.10	2021.10.09
			MY56280002	2020.10.10	2021.10.09
Signal Analyzer	Agilent	N9020A	MY51110105	2021.03.04	2022.03.03
Temperature & Humidity	HH660	Mieo	N/A	2020.10.13	2021.10.12
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

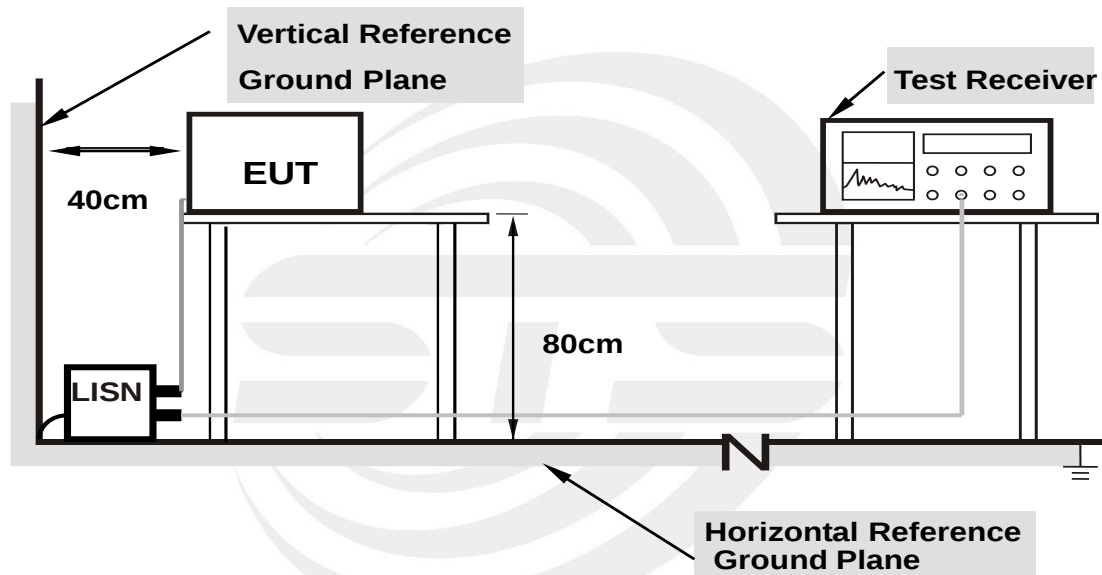
3.1.2 TEST PROCEDURE

- The EUT is 0.8 m from the horizontal ground plane and 0.4 m from the vertical ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments are powered from additional LISN(s). The LISN provides 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 is at least 80 cm from the 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 cm from other units and other metal planes support units.

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

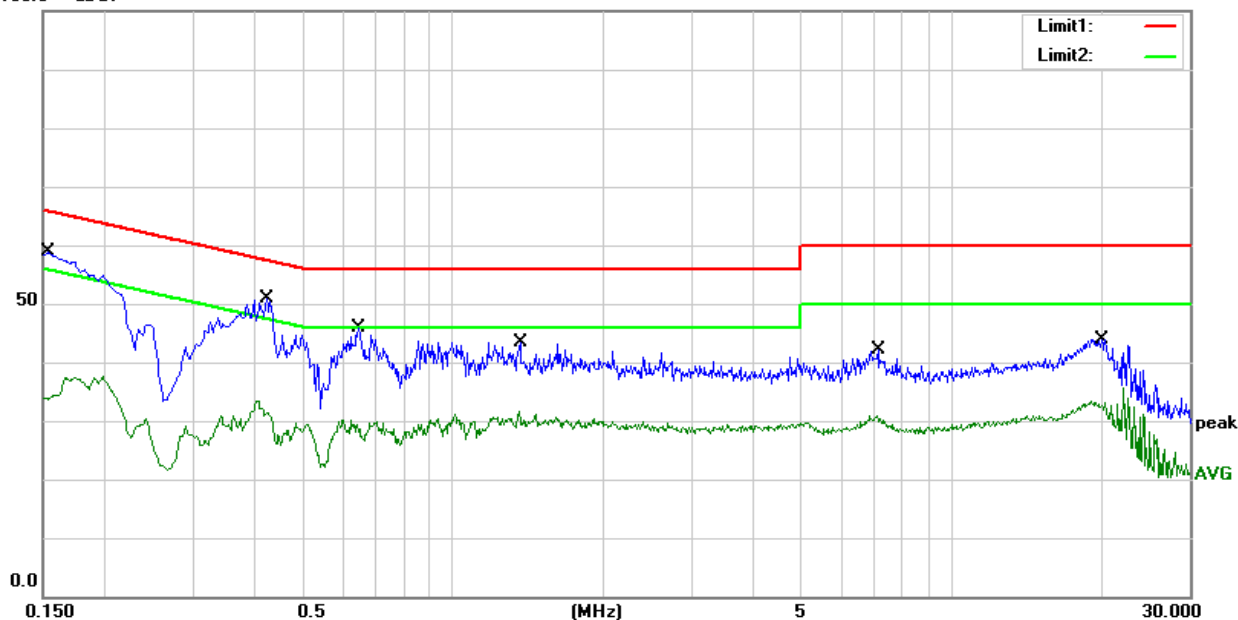
Temperature:	22.0(C)	Relative Humidity:	36%RH
Test Voltage:	AC 120V/60Hz	Phase:	L
Test Mode :	Mode 25		

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1556	38.19	20.30	58.49	65.70	-7.21	QP
2	0.1556	14.14	20.30	34.44	55.70	-21.26	AVG
3	0.4220	30.25	20.55	50.80	57.41	-6.61	QP
4	0.4220	10.92	20.55	31.47	47.41	-15.94	AVG
5	0.6460	25.43	20.40	45.83	56.00	-10.17	QP
6	0.6460	9.06	20.40	29.46	46.00	-16.54	AVG
7	1.3620	23.16	20.34	43.50	56.00	-12.50	QP
8	1.3620	11.23	20.34	31.57	46.00	-14.43	AVG
9	7.1060	21.50	20.59	42.09	60.00	-17.91	QP
10	7.1060	10.25	20.59	30.84	50.00	-19.16	AVG
11	19.9660	21.09	22.90	43.99	60.00	-16.01	QP
12	19.9660	10.28	22.90	33.18	50.00	-16.82	AVG

Remark:

1. All readings are Quasi-Peak and Average values
2. Margin = Result (Result = Reading + Factor) – Limit
3. Factor = LISN factor + Cable loss + Limiter (10dB)

100.0 dBuV



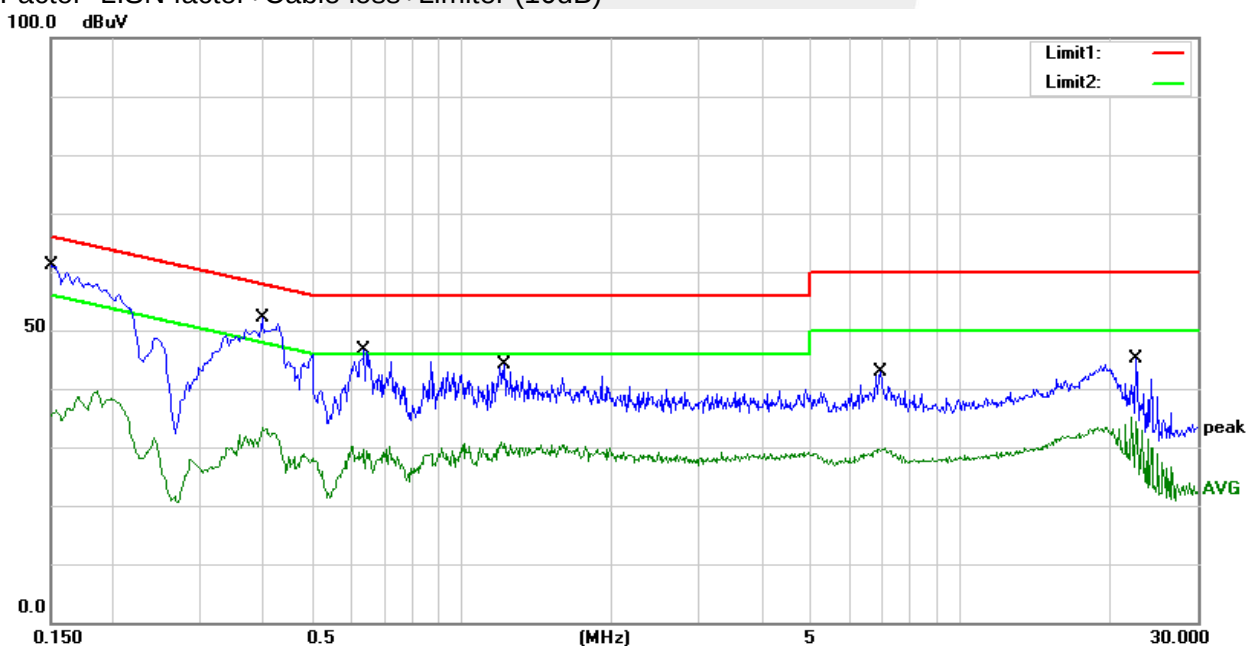


Temperature:	22.0(C)	Relative Humidity:	36%RH
Test Voltage	AC 120V/60Hz	Phase:	N
Test Mode	Mode 25		

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1500	40.74	20.29	61.03	66.00	-4.97	QP
2	0.1500	16.05	20.29	36.34	56.00	-19.66	AVG
3	0.3980	31.45	20.57	52.02	57.90	-5.88	QP
4	0.3980	12.71	20.57	33.28	47.90	-14.62	AVG
5	0.6380	26.21	20.41	46.62	56.00	-9.38	QP
6	0.6380	8.99	20.41	29.40	46.00	-16.60	AVG
7	1.2220	23.80	20.32	44.12	56.00	-11.88	QP
8	1.2220	10.62	20.32	30.94	46.00	-15.06	AVG
9	6.9260	22.26	20.58	42.84	60.00	-17.16	QP
10	6.9260	9.34	20.58	29.92	50.00	-20.08	AVG
11	22.6540	22.33	22.81	45.14	60.00	-14.86	QP
12	22.6540	12.32	22.81	35.13	50.00	-14.87	AVG

Remark:

1. All readings are Quasi-Peak and Average values
2. Margin = Result (Result = Reading + Factor) - Limit
3. Factor = LISN factor + Cable loss + Limiter (10dB)





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 limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/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			

Note: In case the emission radiated emission above 1000MHz fall within the restricted band the restricted frequency bands, the peak limit is 74 dBuV/m.

**LIMITS OF EMISSIONS OUTSIDE OF THE FREQUENCY BANDS**

Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

- (1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (4) For transmitters operating in the 5.725-5.85 GHz band:
 - (i) All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

Note: dBuV/m(at 3M) = EIRP(dBm) + 95.2.

Peak Limit = -27dBm/MHz + 95.2 = 68.2 dBuV/m.

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

- a. The measuring distance at 3 m shall be used for measurements at frequency 0.009MHz up to 1GHz, and above 1GHz.
- b. The EUT was placed on the top of a rotating table 0.8 m (above 1GHz is 1.5 m) above the ground at a 3 m anechoic chamber test site. The table was rotated 360 degree to determine the position of the highest radiation.
- c. 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 polarization of the antenna are set to make the measurement.
- d. 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 QuasiPeak detector mode will be re-measured.
- e. If the Peak Mode measured value is compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and no additional QP Mode measurement was performed.
- f. 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 pretest to three orthogonal axis. The worst case emissions were reported.

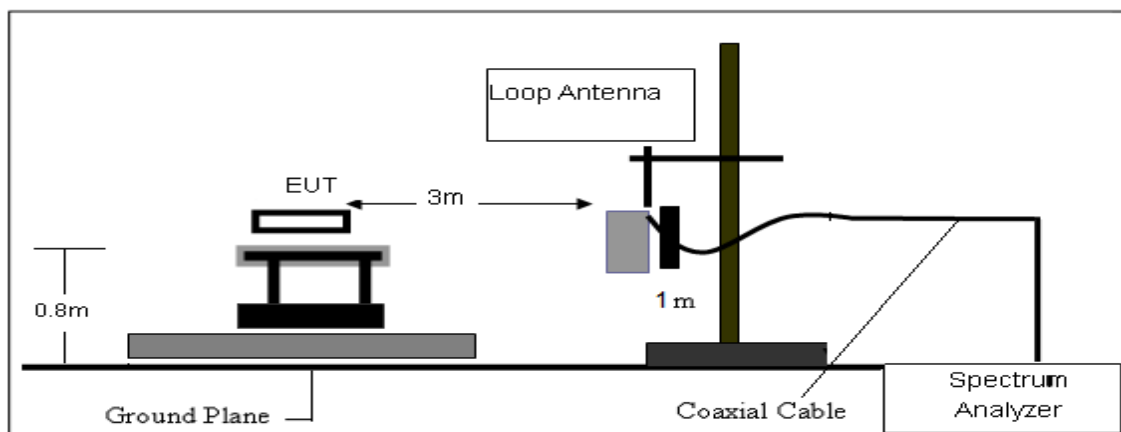
3.2.2 DEVIATION FROM TEST STANDARD

No deviation

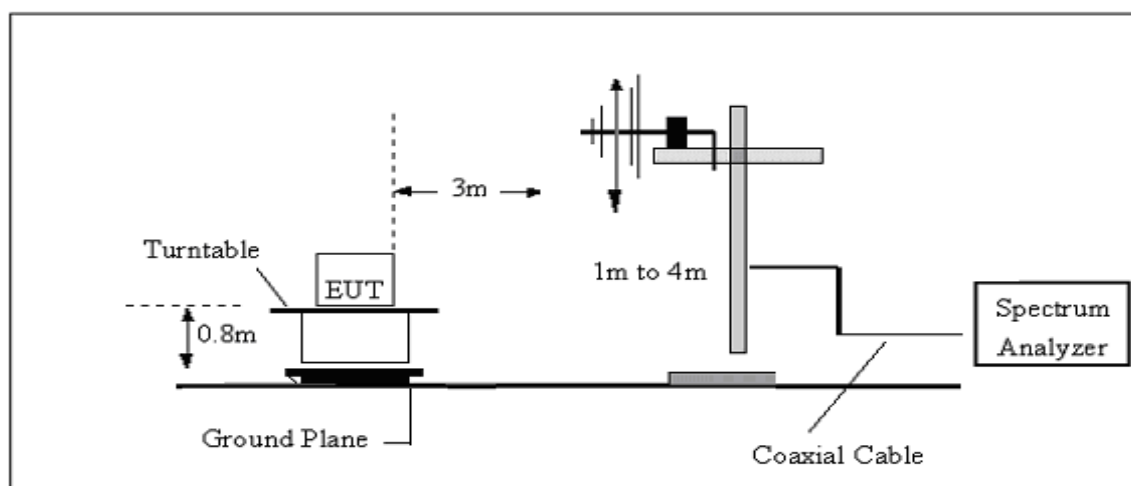


3.2.3 TEST SETUP

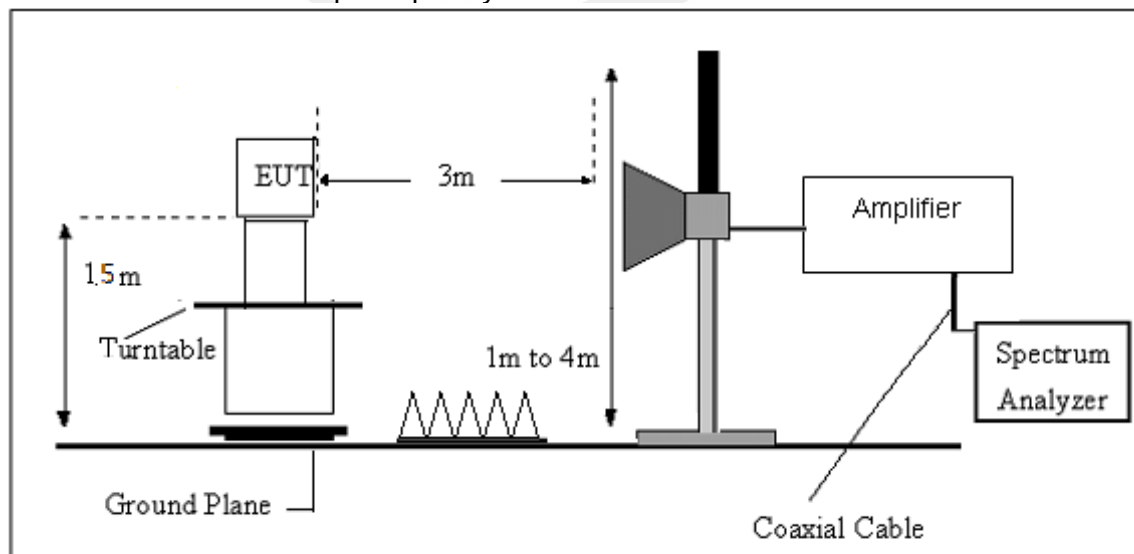
(A) Radiated Emission Test-Up Frequency Below 30MHz



(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:	AC 120V/60Hz	Polarization :	--
Test Mode:	TX Mode		

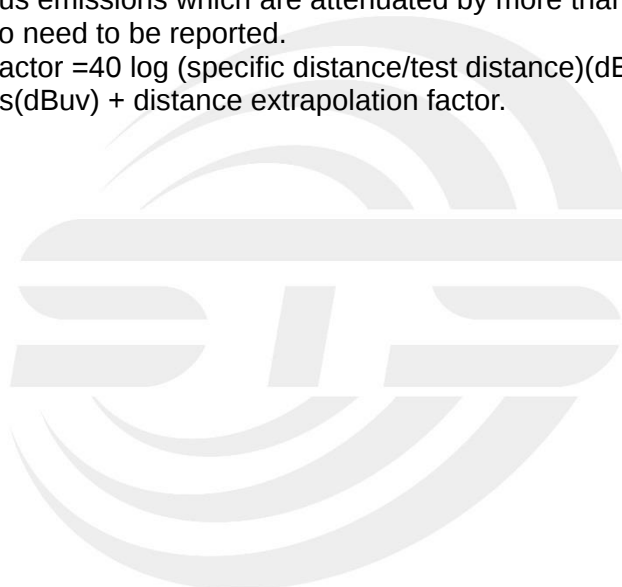
Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	PASS
--	--	--	--	PASS

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

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	AC 120V/60Hz	Polarization:	Horizontal
Test Mode	Mode 1~24(Mode 20 worst mode)		

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	113.4200	50.18	-18.73	31.45	43.50	-12.05	QP
2	336.5200	53.84	-13.51	40.33	46.00	-5.67	QP
3	480.0800	40.00	-8.65	31.35	46.00	-14.65	QP
4	779.8100	42.13	-2.22	39.91	46.00	-6.09	QP
5	868.0800	33.36	-0.51	32.85	46.00	-13.15	QP
6	991.2700	30.80	2.05	32.85	54.00	-21.15	QP

Remark:

1. Margin = Result (Result = Reading + Factor) – Limit
2. Factor = Antenna factor + Cable attenuation factor (cable loss) – Amplifier gain



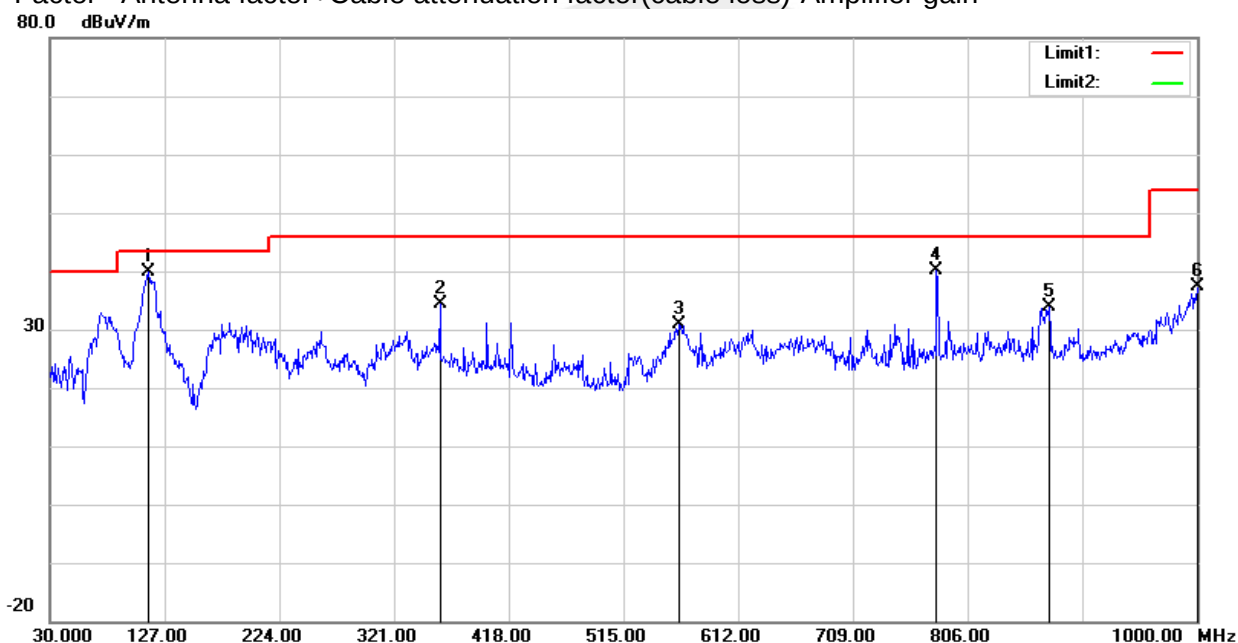


Temperature	23.1(C)	Relative Humidity:	60%RH
Test Voltage	AC 120V/60Hz	Polarization:	Vertical
Test Mode	Mode 1~24(Mode 20 worst mode)		

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	113.4200	58.61	-18.73	39.88	43.50	-3.62	QP
2	359.8000	47.36	-12.87	34.49	46.00	-11.51	QP
3	561.5600	36.40	-5.51	30.89	46.00	-15.11	QP
4	779.8100	42.47	-2.22	40.25	46.00	-5.75	QP
5	874.8700	34.38	-0.59	33.79	46.00	-12.21	QP
6	1000.0000	35.23	2.04	37.27	54.00	-16.73	QP

Remark:

1. Margin = Result (Result = Reading + Factor) - Limit
2. Factor = Antenna factor + Cable attenuation factor (cable loss) - Amplifier gain





3.2.8 TEST RESULTS (Above 1000 MHz)

Band I 5150-5250MHz

Frequency (MHz)	Reading (dBuV)	Amplifier (dB)	Loss (dB)	Antenna Factor (dB/m)	Corrected Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Comment
Low Channel (802.11ac(VHT40)/ 5190 MHz)										
3262.11	44.05	44.70	6.70	28.20	-9.80	34.25	68.20	-33.95	Pk	Vertical
3262.11	41.46	44.70	6.70	28.20	-9.80	31.66	54.00	-22.34	AV	Vertical
3262.31	45.17	44.70	6.70	28.20	-9.80	35.37	68.20	-32.83	Pk	Horizontal
3262.31	41.09	44.70	6.70	28.20	-9.80	31.29	54.00	-22.71	AV	Horizontal
3989.53	39.16	44.20	7.90	29.70	-6.60	32.56	68.20	-35.64	Pk	Vertical
3989.53	36.46	44.20	7.90	29.70	-6.60	29.86	54.00	-24.14	AV	Vertical
3996.01	38.79	44.20	7.90	29.70	-6.60	32.19	68.20	-36.01	Pk	Horizontal
3996.01	37.03	44.20	7.90	29.70	-6.60	30.43	54.00	-23.57	AV	Horizontal
7243.75	37.18	43.50	11.40	35.50	3.40	40.58	68.20	-27.62	Pk	Vertical
7243.75	33.47	43.50	11.40	35.50	3.40	36.87	54.00	-17.13	AV	Vertical
7235.57	37.52	43.50	11.40	35.50	3.40	40.92	68.20	-27.28	Pk	Horizontal
7235.57	34.04	43.50	11.40	35.50	3.40	37.44	54.00	-16.56	AV	Horizontal
10380.31	38.85	44.50	13.80	38.80	8.10	46.95	68.20	-21.25	Pk	Vertical
10380.31	36.21	44.50	13.80	38.80	8.10	44.31	54.00	-9.69	AV	Vertical
10380.30	39.22	44.50	13.80	38.80	8.10	47.32	68.20	-20.88	Pk	Horizontal
10380.30	36.23	44.50	13.80	38.80	8.10	44.33	54.00	-9.67	AV	Horizontal
11047.88	33.21	43.60	14.30	39.50	10.20	43.41	68.20	-24.79	Pk	Vertical
11047.88	30.42	43.60	14.30	39.50	10.20	40.62	54.00	-13.38	AV	Vertical
11054.12	33.83	43.60	14.30	39.50	10.20	44.03	68.20	-24.17	Pk	Horizontal
11054.12	29.81	43.60	14.30	39.50	10.20	40.01	54.00	-13.99	AV	Horizontal
13315.73	32.94	42.60	15.90	38.90	12.20	45.14	68.20	-23.06	Pk	Vertical
13315.73	29.77	42.60	15.90	38.90	12.20	41.97	54.00	-12.03	AV	Vertical
13308.52	31.98	42.60	15.90	38.90	12.20	44.18	68.20	-24.02	Pk	Horizontal
13308.52	29.72	42.60	15.90	38.90	12.20	41.92	54.00	-12.08	AV	Horizontal
High Channel (802.11ac(VHT40)/ 5230 MHz)										
3281.19	44.85	44.70	6.70	28.20	-9.80	35.05	68.20	-33.15	Pk	Vertical
3281.19	42.02	44.70	6.70	28.20	-9.80	32.22	54.00	-21.78	AV	Vertical
3267.70	45.09	44.70	6.70	28.20	-9.80	35.29	68.20	-32.91	Pk	Horizontal
3267.70	42.04	44.70	6.70	28.20	-9.80	32.24	54.00	-21.76	AV	Horizontal
4015.71	38.72	44.20	7.90	29.70	-6.60	32.12	68.20	-36.08	Pk	Vertical
4015.71	35.72	44.20	7.90	29.70	-6.60	29.12	54.00	-24.88	AV	Vertical
4012.90	39.98	44.20	7.90	29.70	-6.60	33.38	68.20	-34.82	Pk	Horizontal
4012.90	36.48	44.20	7.90	29.70	-6.60	29.88	54.00	-24.12	AV	Horizontal
7273.99	36.50	43.50	11.40	35.50	3.40	39.90	68.20	-28.30	Pk	Vertical
7273.99	33.46	43.50	11.40	35.50	3.40	36.86	54.00	-17.14	AV	Vertical
7268.03	37.26	43.50	11.40	35.50	3.40	40.66	68.20	-27.54	Pk	Horizontal
7268.03	34.30	43.50	11.40	35.50	3.40	37.70	54.00	-16.30	AV	Horizontal
10460.26	38.96	44.50	13.80	38.80	8.10	47.06	68.20	-21.14	Pk	Vertical
10460.26	36.46	44.50	13.80	38.80	8.10	44.56	54.00	-9.44	AV	Vertical
10460.01	39.84	44.50	13.80	38.80	8.10	47.94	68.20	-20.26	Pk	Horizontal
10460.01	36.96	44.50	13.80	38.80	8.10	45.06	54.00	-8.94	AV	Horizontal
11083.52	32.99	43.60	14.30	39.50	10.20	43.19	68.20	-25.01	Pk	Vertical
11083.52	29.76	43.60	14.30	39.50	10.20	39.96	54.00	-14.04	AV	Vertical
11089.46	33.03	43.60	14.30	39.50	10.20	43.23	68.20	-24.97	Pk	Horizontal
11089.46	29.83	43.60	14.30	39.50	10.20	40.03	54.00	-13.97	AV	Horizontal
13362.77	32.40	42.60	15.90	38.90	12.20	44.60	68.20	-23.60	Pk	Vertical
13362.77	29.45	42.60	15.90	38.90	12.20	41.65	54.00	-12.35	AV	Vertical
13363.31	32.13	42.60	15.90	38.90	12.20	44.33	68.20	-23.87	Pk	Horizontal
13363.31	29.66	42.60	15.90	38.90	12.20	41.86	54.00	-12.14	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) all have been tested the antenna A, antenna B and antenna A+B, the worst case is 802.11ac (VHT-40) of the antenna A+B.
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.



Band II 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)										
3257.20	44.46	44.70	6.70	28.20	-9.80	34.66	68.20	-33.54	Pk	Vertical
3257.20	42.10	44.70	6.70	28.20	-9.80	32.30	54.00	-21.70	AV	Vertical
3262.75	45.05	44.70	6.70	28.20	-9.80	35.25	68.20	-32.95	Pk	Horizontal
3262.75	42.15	44.70	6.70	28.20	-9.80	32.35	54.00	-21.65	AV	Horizontal
4000.96	39.57	44.20	7.90	29.70	-6.60	32.97	68.20	-35.23	Pk	Vertical
4000.96	36.79	44.20	7.90	29.70	-6.60	30.19	54.00	-23.81	AV	Vertical
4000.77	38.70	44.20	7.90	29.70	-6.60	32.10	68.20	-36.10	Pk	Horizontal
4000.77	36.63	44.20	7.90	29.70	-6.60	30.03	54.00	-23.97	AV	Horizontal
7239.72	37.26	43.50	11.40	35.50	3.40	40.66	68.20	-27.54	Pk	Vertical
7239.72	34.74	43.50	11.40	35.50	3.40	38.14	54.00	-15.86	AV	Vertical
7231.71	36.78	43.50	11.40	35.50	3.40	40.18	68.20	-28.02	Pk	Horizontal
7231.71	34.52	43.50	11.40	35.50	3.40	37.92	54.00	-16.08	AV	Horizontal
10379.81	39.63	44.50	13.80	38.80	8.10	47.73	68.20	-20.47	Pk	Vertical
10379.81	36.08	44.50	13.80	38.80	8.10	44.18	54.00	-9.82	AV	Vertical
10380.05	39.38	44.50	13.80	38.80	8.10	47.48	68.20	-20.72	Pk	Horizontal
10380.05	37.00	44.50	13.80	38.80	8.10	45.10	54.00	-8.90	AV	Horizontal
11057.00	33.40	43.60	14.30	39.50	10.20	43.60	68.20	-24.60	Pk	Vertical
11057.00	31.06	43.60	14.30	39.50	10.20	41.26	54.00	-12.74	AV	Vertical
11038.58	33.91	43.60	14.30	39.50	10.20	44.11	68.20	-24.09	Pk	Horizontal
11038.58	29.72	43.60	14.30	39.50	10.20	39.92	54.00	-14.08	AV	Horizontal
13317.37	32.34	42.60	15.90	38.90	12.20	44.54	68.20	-23.66	Pk	Vertical
13317.37	28.72	42.60	15.90	38.90	12.20	40.92	54.00	-13.08	AV	Vertical
13324.76	32.74	42.60	15.90	38.90	12.20	44.94	68.20	-23.26	Pk	Horizontal
13324.76	29.61	42.60	15.90	38.90	12.20	41.81	54.00	-12.19	AV	Horizontal
High Channel (802.11ac(VHT40)/ 5310 MHz)										
3263.89	44.40	44.70	6.70	28.20	-9.80	34.60	68.20	-33.60	Pk	Vertical
3263.89	40.90	44.70	6.70	28.20	-9.80	31.10	54.00	-22.90	AV	Vertical
3257.37	45.08	44.70	6.70	28.20	-9.80	35.28	68.20	-32.92	Pk	Horizontal
3257.37	41.32	44.70	6.70	28.20	-9.80	31.52	54.00	-22.48	AV	Horizontal
4001.58	38.71	44.20	7.90	29.70	-6.60	32.11	68.20	-36.09	Pk	Vertical
4001.58	36.32	44.20	7.90	29.70	-6.60	29.72	54.00	-24.28	AV	Vertical
4004.95	39.75	44.20	7.90	29.70	-6.60	33.15	68.20	-35.05	Pk	Horizontal
4004.95	36.19	44.20	7.90	29.70	-6.60	29.59	54.00	-24.41	AV	Horizontal
7240.59	36.64	43.50	11.40	35.50	3.40	40.04	68.20	-28.16	Pk	Vertical
7240.59	33.51	43.50	11.40	35.50	3.40	36.91	54.00	-17.09	AV	Vertical
7243.77	37.89	43.50	11.40	35.50	3.40	41.29	68.20	-26.91	Pk	Horizontal
7243.77	34.49	43.50	11.40	35.50	3.40	37.89	54.00	-16.11	AV	Horizontal
10419.68	38.98	44.50	13.80	38.80	8.10	47.08	68.20	-21.12	Pk	Vertical
10419.68	36.65	44.50	13.80	38.80	8.10	44.75	54.00	-9.25	AV	Vertical
10419.66	39.58	44.50	13.80	38.80	8.10	47.68	68.20	-20.52	Pk	Horizontal
10419.66	36.48	44.50	13.80	38.80	8.10	44.58	54.00	-9.42	AV	Horizontal
11039.39	33.85	43.60	14.30	39.50	10.20	44.05	68.20	-24.15	Pk	Vertical
11039.39	30.03	43.60	14.30	39.50	10.20	40.23	54.00	-13.77	AV	Vertical
11050.67	33.38	43.60	14.30	39.50	10.20	43.58	68.20	-24.62	Pk	Horizontal
11050.67	29.94	43.60	14.30	39.50	10.20	40.14	54.00	-13.86	AV	Horizontal
13309.62	32.44	42.60	15.90	38.90	12.20	44.64	68.20	-23.56	Pk	Vertical
13309.62	28.64	42.60	15.90	38.90	12.20	40.84	54.00	-13.16	AV	Vertical
13313.94	32.47	42.60	15.90	38.90	12.20	44.67	68.20	-23.53	Pk	Horizontal
13313.94	30.00	42.60	15.90	38.90	12.20	42.20	54.00	-11.80	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) all have been tested the antenna A, antenna B and antenna A+B, the worst case is 802.11ac (VHT-40) of the antenna A+B.
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.



Band III 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 (802.11ac(VHT20)/ 5500 MHz)										
3255.91	45.11	44.70	6.70	28.20	-9.80	35.31	68.20	-32.89	Pk	Vertical
3255.91	41.98	44.70	6.70	28.20	-9.80	32.18	54.00	-21.82	AV	Vertical
3256.49	44.15	44.70	6.70	28.20	-9.80	34.35	68.20	-33.85	Pk	Horizontal
3256.49	40.75	44.70	6.70	28.20	-9.80	30.95	54.00	-23.05	AV	Horizontal
3989.22	38.85	44.20	7.90	29.70	-6.60	32.25	68.20	-35.95	Pk	Vertical
3989.22	36.69	44.20	7.90	29.70	-6.60	30.09	54.00	-23.91	AV	Vertical
3984.07	39.76	44.20	7.90	29.70	-6.60	33.16	68.20	-35.04	Pk	Horizontal
3984.07	36.40	44.20	7.90	29.70	-6.60	29.80	54.00	-24.20	AV	Horizontal
7236.14	37.06	43.50	11.40	35.50	3.40	40.46	68.20	-27.74	Pk	Vertical
7236.14	33.59	43.50	11.40	35.50	3.40	36.99	54.00	-17.01	AV	Vertical
7234.56	37.86	43.50	11.40	35.50	3.40	41.26	68.20	-26.94	Pk	Horizontal
7234.56	33.56	43.50	11.40	35.50	3.40	36.96	54.00	-17.04	AV	Horizontal
10360.00	39.80	44.50	13.80	38.80	8.10	47.90	68.20	-20.30	Pk	Vertical
10360.00	36.07	44.50	13.80	38.80	8.10	44.17	54.00	-9.83	AV	Vertical
10360.23	39.93	44.50	13.80	38.80	8.10	48.03	68.20	-20.17	Pk	Horizontal
10360.23	37.09	44.50	13.80	38.80	8.10	45.19	54.00	-8.81	AV	Horizontal
11029.92	33.26	43.60	14.30	39.50	10.20	43.46	68.20	-24.74	Pk	Vertical
11029.92	31.00	43.60	14.30	39.50	10.20	41.20	54.00	-12.80	AV	Vertical
11033.18	32.76	43.60	14.30	39.50	10.20	42.96	68.20	-25.24	Pk	Horizontal
11033.18	29.90	43.60	14.30	39.50	10.20	40.10	54.00	-13.90	AV	Horizontal
13282.10	32.66	42.60	15.90	38.90	12.20	44.86	68.20	-23.34	Pk	Vertical
13282.10	28.89	42.60	15.90	38.90	12.20	41.09	54.00	-12.91	AV	Vertical
13296.40	32.79	42.60	15.90	38.90	12.20	44.99	68.20	-23.21	Pk	Horizontal
13296.40	29.16	42.60	15.90	38.90	12.20	41.36	54.00	-12.64	AV	Horizontal
Mid Channel (802.11ac(VHT20)/ 5580 MHz)										
3249.88	45.11	44.70	6.70	28.20	-9.80	35.31	68.20	-32.89	Pk	Vertical
3249.88	42.12	44.70	6.70	28.20	-9.80	32.32	54.00	-21.68	AV	Vertical
3260.52	44.15	44.70	6.70	28.20	-9.80	34.35	68.20	-33.85	Pk	Horizontal
3260.52	42.01	44.70	6.70	28.20	-9.80	32.21	54.00	-21.79	AV	Horizontal
3991.77	38.80	44.20	7.90	29.70	-6.60	32.20	68.20	-36.00	Pk	Vertical
3991.77	35.68	44.20	7.90	29.70	-6.60	29.08	54.00	-24.92	AV	Vertical
3994.97	39.28	44.20	7.90	29.70	-6.60	32.68	68.20	-35.52	Pk	Horizontal
3994.97	37.12	44.20	7.90	29.70	-6.60	30.52	54.00	-23.48	AV	Horizontal
7231.81	37.84	43.50	11.40	35.50	3.40	41.24	68.20	-26.96	Pk	Vertical
7231.81	34.03	43.50	11.40	35.50	3.40	37.43	54.00	-16.57	AV	Vertical
7234.27	36.72	43.50	11.40	35.50	3.40	40.12	68.20	-28.08	Pk	Horizontal
7234.27	34.05	43.50	11.40	35.50	3.40	37.45	54.00	-16.55	AV	Horizontal
10400.28	40.06	44.50	13.80	38.80	8.10	48.16	68.20	-20.04	Pk	Vertical
10400.28	35.96	44.50	13.80	38.80	8.10	44.06	54.00	-9.94	AV	Vertical
10400.23	39.43	44.50	13.80	38.80	8.10	47.53	68.20	-20.67	Pk	Horizontal
10400.23	37.12	44.50	13.80	38.80	8.10	45.22	54.00	-8.78	AV	Horizontal
11032.72	33.89	43.60	14.30	39.50	10.20	44.09	68.20	-24.11	Pk	Vertical
11032.72	30.40	43.60	14.30	39.50	10.20	40.60	54.00	-13.40	AV	Vertical
11034.53	32.71	43.60	14.30	39.50	10.20	42.91	68.20	-25.29	Pk	Horizontal
11034.53	30.49	43.60	14.30	39.50	10.20	40.69	54.00	-13.31	AV	Horizontal
13287.00	31.52	42.60	15.90	38.90	12.20	43.72	68.20	-24.48	Pk	Vertical
13287.00	29.92	42.60	15.90	38.90	12.20	42.12	54.00	-11.88	AV	Vertical
13284.76	32.31	42.60	15.90	38.90	12.20	44.51	68.20	-23.69	Pk	Horizontal
13284.76	29.71	42.60	15.90	38.90	12.20	41.91	54.00	-12.09	AV	Horizontal



High Channel (802.11ac(VHT20)/ 5700 MHz)										
3249.19	44.77	44.70	6.70	28.20	-9.80	34.97	68.20	-33.23	Pk	Vertical
3249.19	41.96	44.70	6.70	28.20	-9.80	32.16	54.00	-21.84	AV	Vertical
3256.25	43.76	44.70	6.70	28.20	-9.80	33.96	68.20	-34.24	Pk	Horizontal
3256.25	41.18	44.70	6.70	28.20	-9.80	31.38	54.00	-22.62	AV	Horizontal
3988.97	39.84	44.20	7.90	29.70	-6.60	33.24	68.20	-34.96	Pk	Vertical
3988.97	35.79	44.20	7.90	29.70	-6.60	29.19	54.00	-24.81	AV	Vertical
3994.87	39.64	44.20	7.90	29.70	-6.60	33.04	68.20	-35.16	Pk	Horizontal
3994.87	35.71	44.20	7.90	29.70	-6.60	29.11	54.00	-24.89	AV	Horizontal
7222.30	37.13	43.50	11.40	35.50	3.40	40.53	68.20	-27.67	Pk	Vertical
7222.30	34.14	43.50	11.40	35.50	3.40	37.54	54.00	-16.46	AV	Vertical
7231.46	36.82	43.50	11.40	35.50	3.40	40.22	68.20	-27.98	Pk	Horizontal
7231.46	34.46	43.50	11.40	35.50	3.40	37.86	54.00	-16.14	AV	Horizontal
10480.10	39.56	44.50	13.80	38.80	8.10	47.66	68.20	-20.54	Pk	Vertical
10480.10	37.13	44.50	13.80	38.80	8.10	45.23	54.00	-8.77	AV	Vertical
10480.41	39.18	44.50	13.80	38.80	8.10	47.28	68.20	-20.92	Pk	Horizontal
10480.41	37.09	44.50	13.80	38.80	8.10	45.19	54.00	-8.81	AV	Horizontal
11021.98	33.05	43.60	14.30	39.50	10.20	43.25	68.20	-24.95	Pk	Vertical
11021.98	29.89	43.60	14.30	39.50	10.20	40.09	54.00	-13.91	AV	Vertical
11032.56	33.28	43.60	14.30	39.50	10.20	43.48	68.20	-24.72	Pk	Horizontal
11032.56	30.44	43.60	14.30	39.50	10.20	40.64	54.00	-13.36	AV	Horizontal
13295.60	31.86	42.60	15.90	38.90	12.20	44.06	68.20	-24.14	Pk	Vertical
13295.60	28.53	42.60	15.90	38.90	12.20	40.73	54.00	-13.27	AV	Vertical
13290.72	32.56	42.60	15.90	38.90	12.20	44.76	68.20	-23.44	Pk	Horizontal
13290.72	28.99	42.60	15.90	38.90	12.20	41.19	54.00	-12.81	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) all have been tested the antenna A, antenna B and antenna A+B, the worst case is 802.11n (HT-20) of the antenna A+B.
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.



Band IV(5.725-5.850) GHz

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)/ 5755 MHz)										
3265.44	44.97	44.70	6.70	28.20	-9.80	35.17	68.20	-33.03	Pk	Vertical
3265.44	42.04	44.70	6.70	28.20	-9.80	32.24	54.00	-21.76	AV	Vertical
3254.99	43.94	44.70	6.70	28.20	-9.80	34.14	68.20	-34.06	Pk	Horizontal
3254.99	41.99	44.70	6.70	28.20	-9.80	32.19	54.00	-21.81	AV	Horizontal
4001.65	40.13	44.20	7.90	29.70	-6.60	33.53	68.20	-34.67	Pk	Vertical
4001.65	36.16	44.20	7.90	29.70	-6.60	29.56	54.00	-24.44	AV	Vertical
4002.63	39.37	44.20	7.90	29.70	-6.60	32.77	68.20	-35.43	Pk	Horizontal
4002.63	36.48	44.20	7.90	29.70	-6.60	29.88	54.00	-24.12	AV	Horizontal
7243.88	37.12	43.50	11.40	35.50	3.40	40.52	68.20	-27.68	Pk	Vertical
7243.88	34.37	43.50	11.40	35.50	3.40	37.77	54.00	-16.23	AV	Vertical
7247.21	36.49	43.50	11.40	35.50	3.40	39.89	68.20	-28.31	Pk	Horizontal
7247.21	33.69	43.50	11.40	35.50	3.40	37.09	54.00	-16.91	AV	Horizontal
10378.26	39.71	44.50	13.80	38.80	8.10	47.81	68.20	-20.39	Pk	Vertical
10378.26	35.91	44.50	13.80	38.80	8.10	44.01	54.00	-9.99	AV	Vertical
10378.35	39.35	44.50	13.80	38.80	8.10	47.45	68.20	-20.75	Pk	Horizontal
10378.35	35.89	44.50	13.80	38.80	8.10	43.99	54.00	-10.01	AV	Horizontal
11050.99	33.39	43.60	14.30	39.50	10.20	43.59	68.20	-24.61	Pk	Vertical
11050.99	30.85	43.60	14.30	39.50	10.20	41.05	54.00	-12.95	AV	Vertical
11049.90	33.42	43.60	14.30	39.50	10.20	43.62	68.20	-24.58	Pk	Horizontal
11049.90	30.56	43.60	14.30	39.50	10.20	40.76	54.00	-13.24	AV	Horizontal
13320.17	31.81	42.60	15.90	38.90	12.20	44.01	68.20	-24.19	Pk	Vertical
13320.17	28.54	42.60	15.90	38.90	12.20	40.74	54.00	-13.26	AV	Vertical
13304.76	31.56	42.60	15.90	38.90	12.20	43.76	68.20	-24.44	Pk	Horizontal
13304.76	28.93	42.60	15.90	38.90	12.20	41.13	54.00	-12.87	AV	Horizontal
High Channel (802.11ac(VHT40)/ 5795MHz)										
3258.54	43.87	44.70	6.70	28.20	-9.80	34.07	68.20	-34.13	Pk	Vertical
3258.54	41.88	44.70	6.70	28.20	-9.80	32.08	54.00	-21.92	AV	Vertical
3268.96	44.34	44.70	6.70	28.20	-9.80	34.54	68.20	-33.66	Pk	Horizontal
3268.96	40.94	44.70	6.70	28.20	-9.80	31.14	54.00	-22.86	AV	Horizontal
4005.19	40.10	44.20	7.90	29.70	-6.60	33.50	68.20	-34.70	Pk	Vertical
4005.19	36.56	44.20	7.90	29.70	-6.60	29.96	54.00	-24.04	AV	Vertical
3987.45	39.34	44.20	7.90	29.70	-6.60	32.74	68.20	-35.46	Pk	Horizontal
3987.45	36.09	44.20	7.90	29.70	-6.60	29.49	54.00	-24.51	AV	Horizontal
7230.89	36.67	43.50	11.40	35.50	3.40	40.07	68.20	-28.13	Pk	Vertical
7230.89	34.27	43.50	11.40	35.50	3.40	37.67	54.00	-16.33	AV	Vertical
7240.74	37.36	43.50	11.40	35.50	3.40	40.76	68.20	-27.44	Pk	Horizontal
7240.74	34.70	43.50	11.40	35.50	3.40	38.10	54.00	-15.90	AV	Horizontal
10417.93	39.40	44.50	13.80	38.80	8.10	47.50	68.20	-20.70	Pk	Vertical
10417.93	36.59	44.50	13.80	38.80	8.10	44.69	54.00	-9.31	AV	Vertical
10418.33	39.22	44.50	13.80	38.80	8.10	47.32	68.20	-20.88	Pk	Horizontal
10418.33	36.82	44.50	13.80	38.80	8.10	44.92	54.00	-9.08	AV	Horizontal
11052.19	33.59	43.60	14.30	39.50	10.20	43.79	68.20	-24.41	Pk	Vertical
11052.19	30.85	43.60	14.30	39.50	10.20	41.05	54.00	-12.95	AV	Vertical
11052.74	33.96	43.60	14.30	39.50	10.20	44.16	68.20	-24.04	Pk	Horizontal
11052.74	30.21	43.60	14.30	39.50	10.20	40.41	54.00	-13.59	AV	Horizontal
13309.72	31.54	42.60	15.90	38.90	12.20	43.74	68.20	-24.46	Pk	Vertical
13309.72	28.93	42.60	15.90	38.90	12.20	41.13	54.00	-12.87	AV	Vertical
13322.29	32.12	42.60	15.90	38.90	12.20	44.32	68.20	-23.88	Pk	Horizontal
13322.29	29.12	42.60	15.90	38.90	12.20	41.32	54.00	-12.68	AV	Horizontal

Remark:

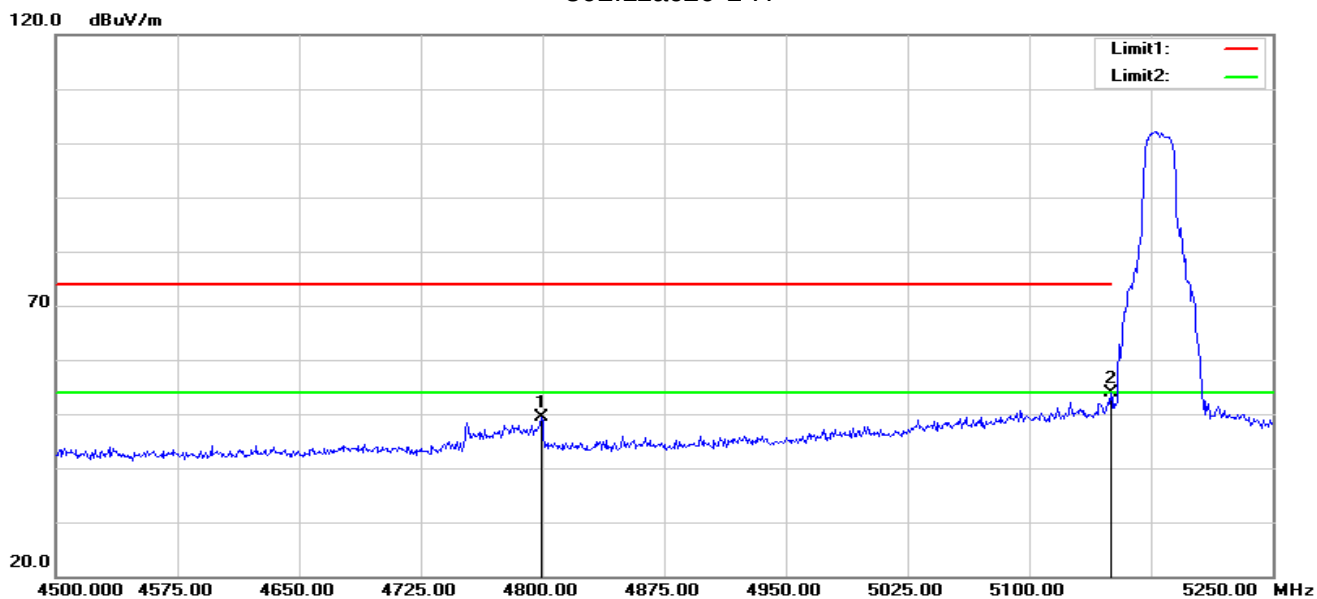
1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.
2. Scan with 802.11a, 802.11n (HT-20), 802.11n (HT-40), 802.11ac (VHT-20), 802.11ac (VHT-40), 802.11ac (VHT-80) all have been tested the antenna A, antenna B and antenna A+B, the worst case is 802.11ac (VHT-40) of the antenna A+B.
3. The frequency 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

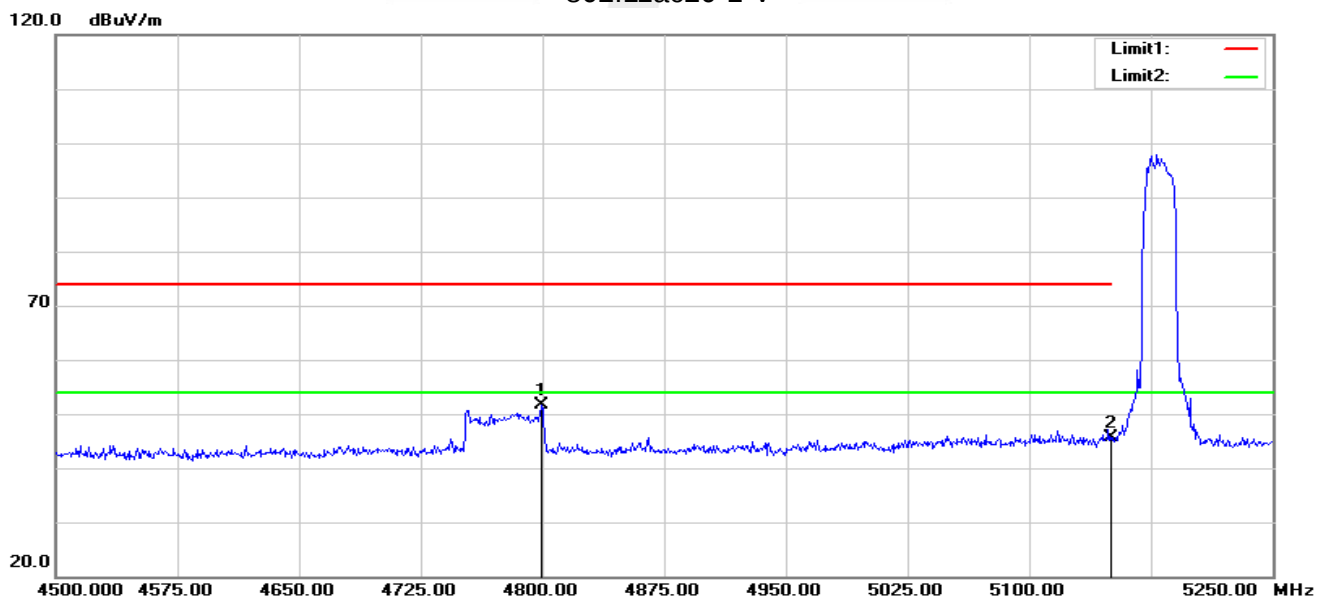
Band I 5150-5250MHz

802.11ac20-L-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4799.250	56.70	-7.22	49.48	74.00	-24.52	peak
2	5150.000	59.52	-5.73	53.79	74.00	-20.21	peak

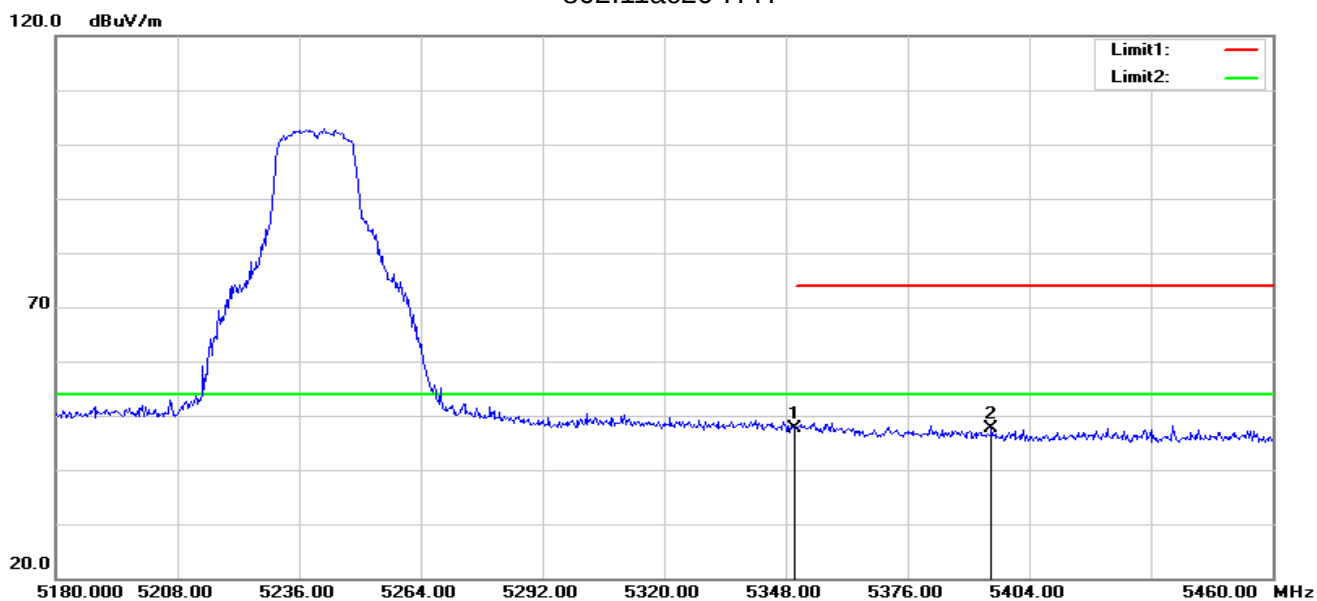
802.11ac20-L-V



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4799.250	58.90	-7.22	51.68	74.00	-22.32	peak
2	5150.000	51.44	-5.73	45.71	74.00	-28.29	peak

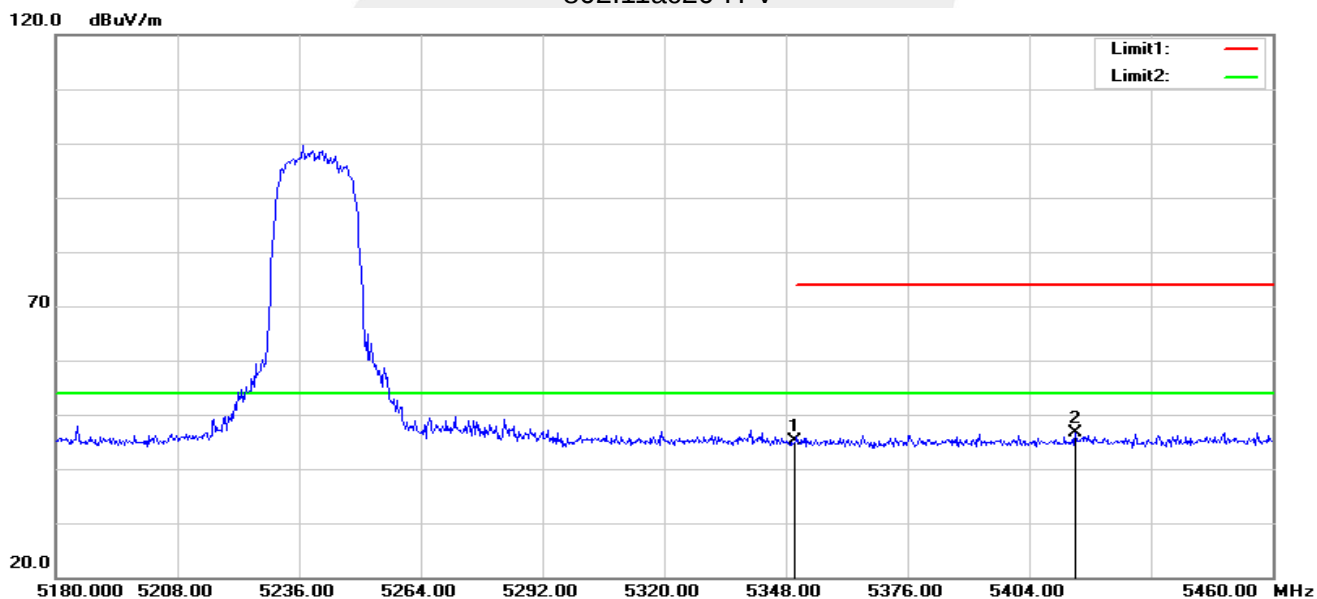


802.11ac20-H-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5350.000	52.98	-5.23	47.75	74.00	-26.25	peak
2	5395.320	52.85	-5.24	47.61	74.00	-26.39	peak

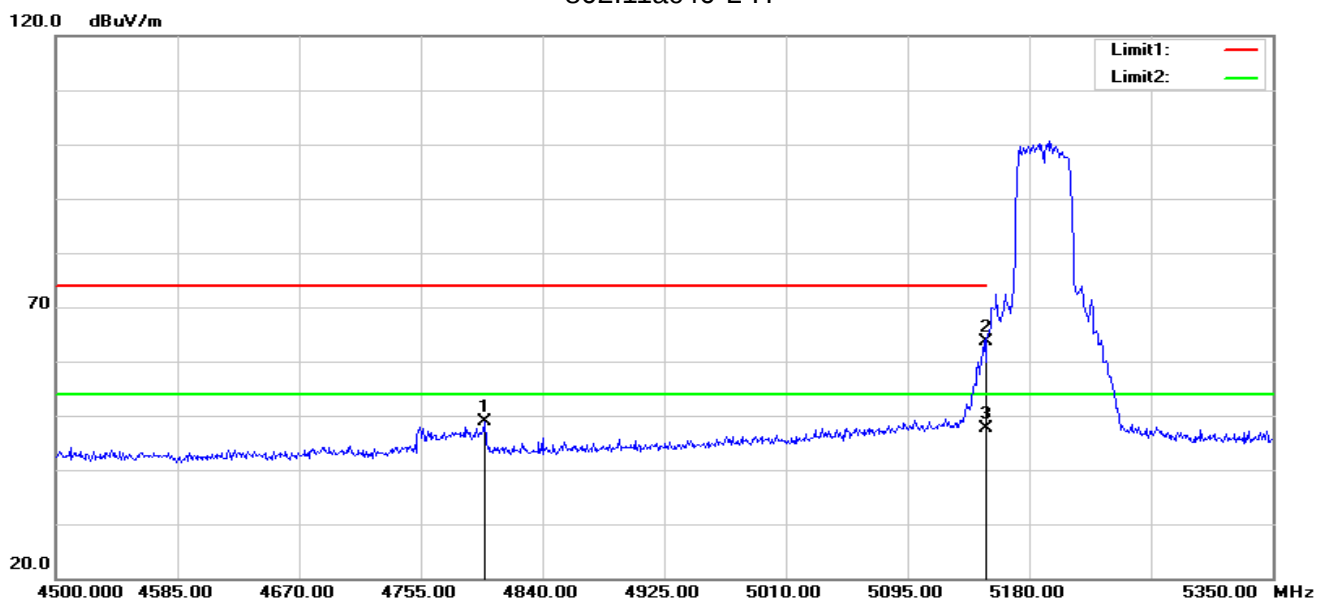
802.11ac20-H-V



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5350.000	50.40	-5.23	45.17	74.00	-28.83	peak
2	5414.640	51.77	-5.22	46.55	74.00	-27.45	peak

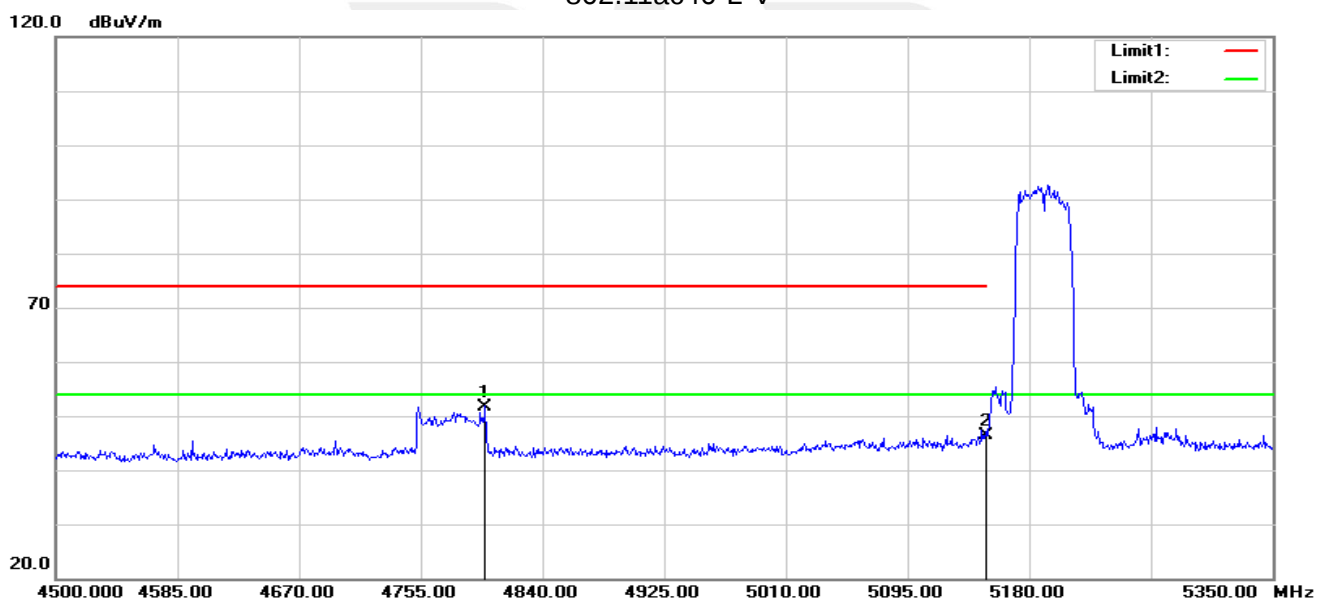


802.11ac40-L-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4800.050	56.06	-7.22	48.84	74.00	-25.16	peak
2	5150.000	69.40	-5.73	63.67	74.00	-10.33	peak
3	5150.000	53.38	-5.73	47.65	54.00	-6.35	AVG

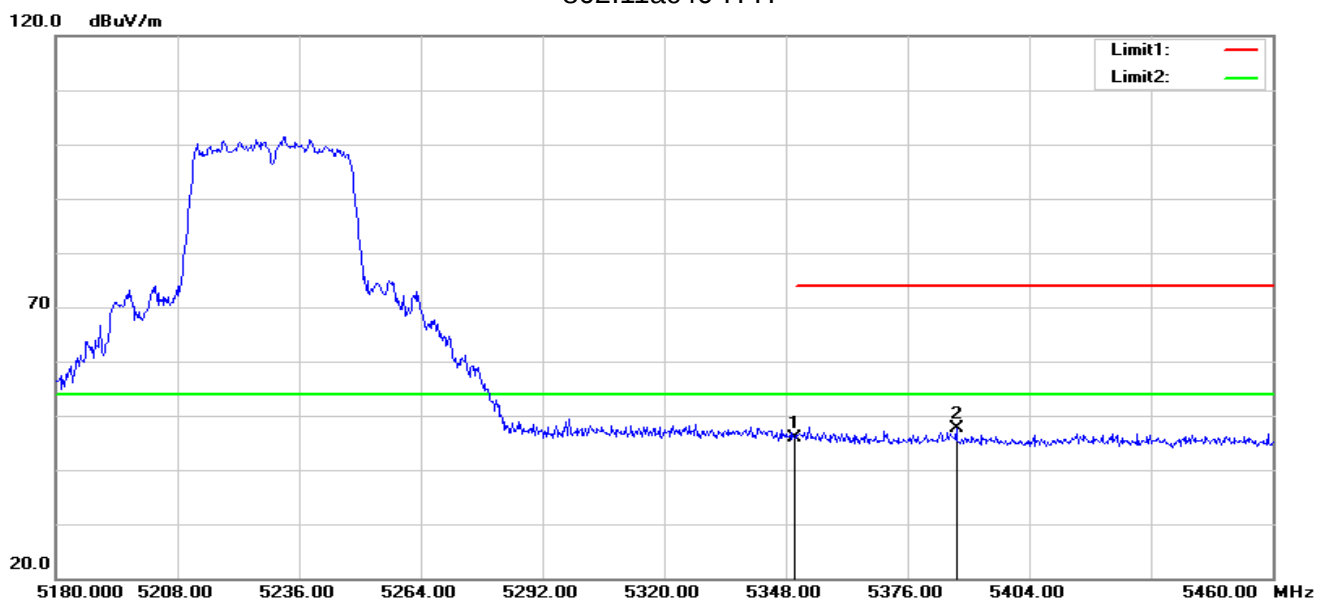
802.11ac40-L-V



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4800.050	58.97	-7.22	51.75	74.00	-22.25	peak
2	5150.000	52.18	-5.73	46.45	74.00	-27.55	peak

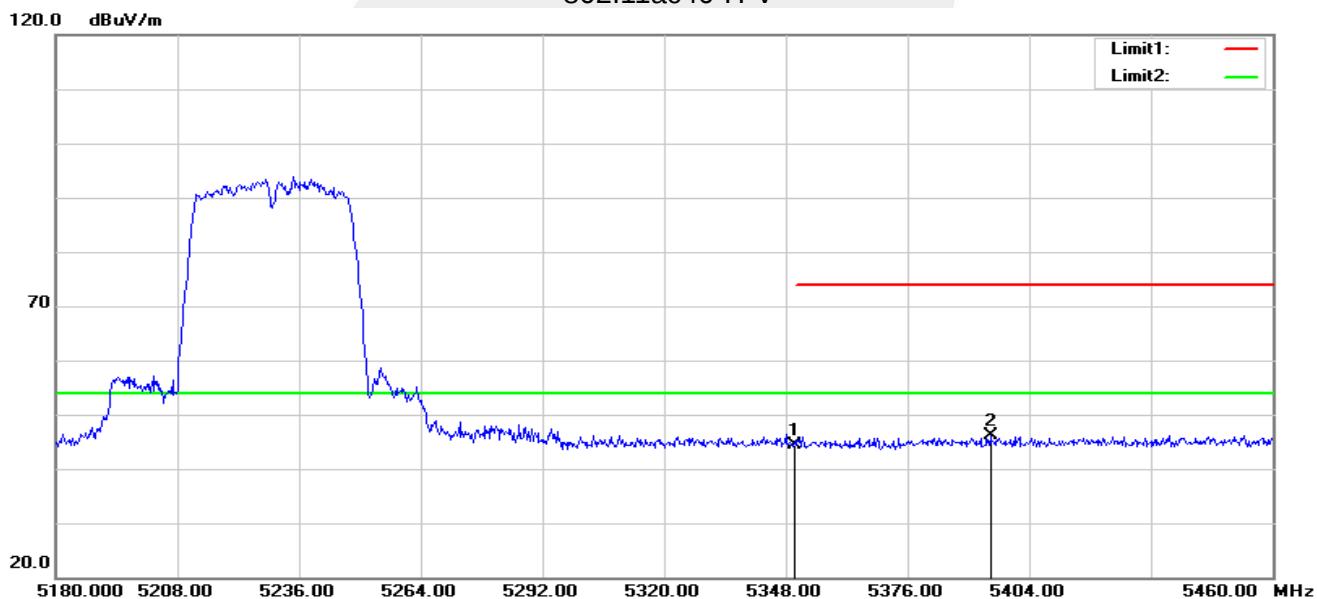


802.11ac40-H-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5350.000	51.16	-5.23	45.93	74.00	-28.07	peak
2	5387.200	52.82	-5.24	47.58	74.00	-26.42	peak

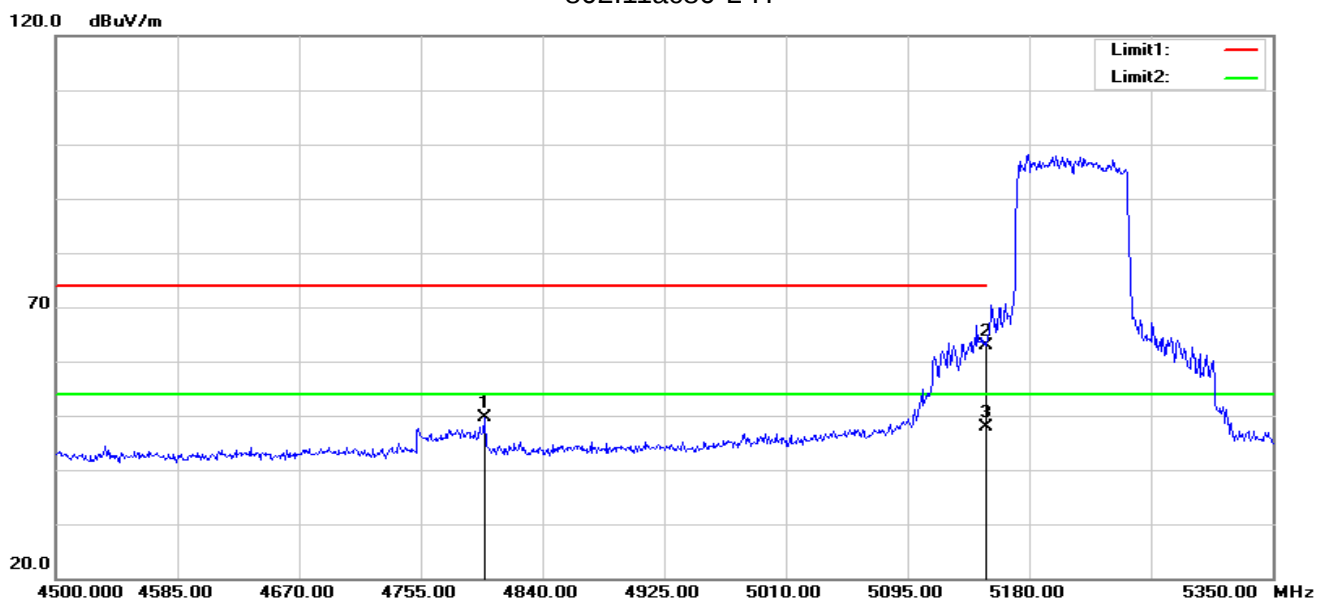
802.11ac40-H-V



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5350.000	49.67	-5.23	44.44	74.00	-29.56	peak
2	5395.040	51.46	-5.24	46.22	74.00	-27.78	peak

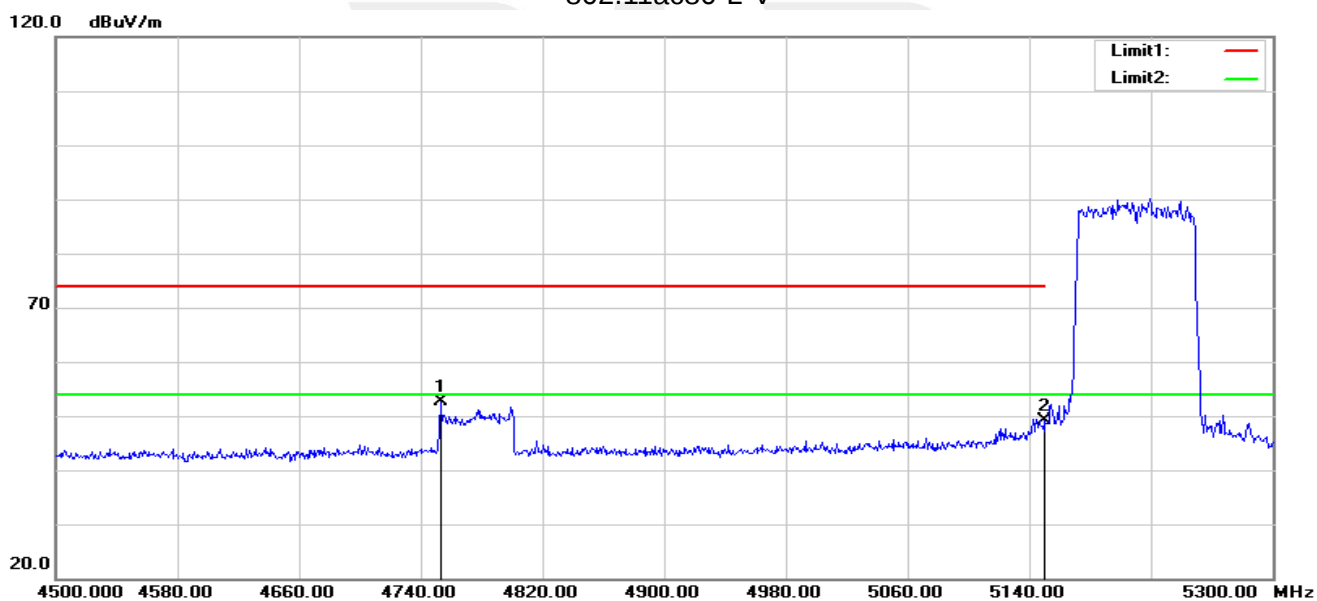


802.11ac80-L-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4799.200	56.91	-7.22	49.69	74.00	-24.31	peak
2	5150.000	68.70	-5.73	62.97	74.00	-11.03	peak
3	5150.000	53.68	-5.73	47.95	54.00	-6.05	AVG

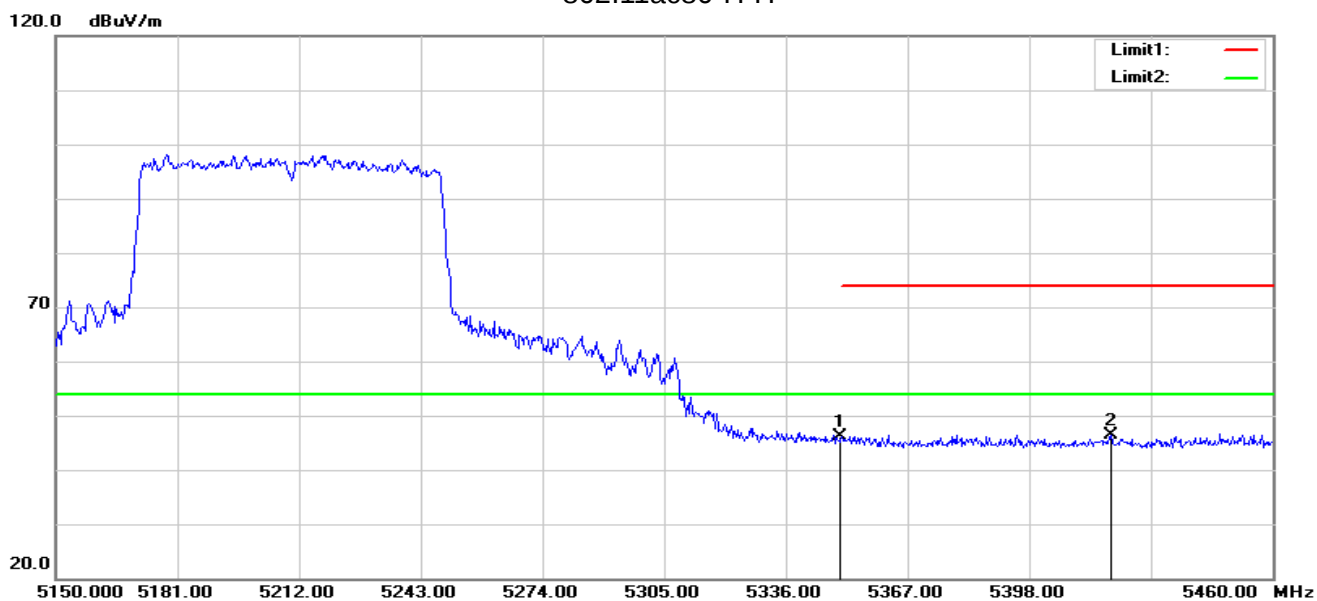
802.11ac80-L-V



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4752.800	60.00	-7.28	52.72	74.00	-21.28	peak
2	5150.000	54.97	-5.73	49.24	74.00	-24.76	peak

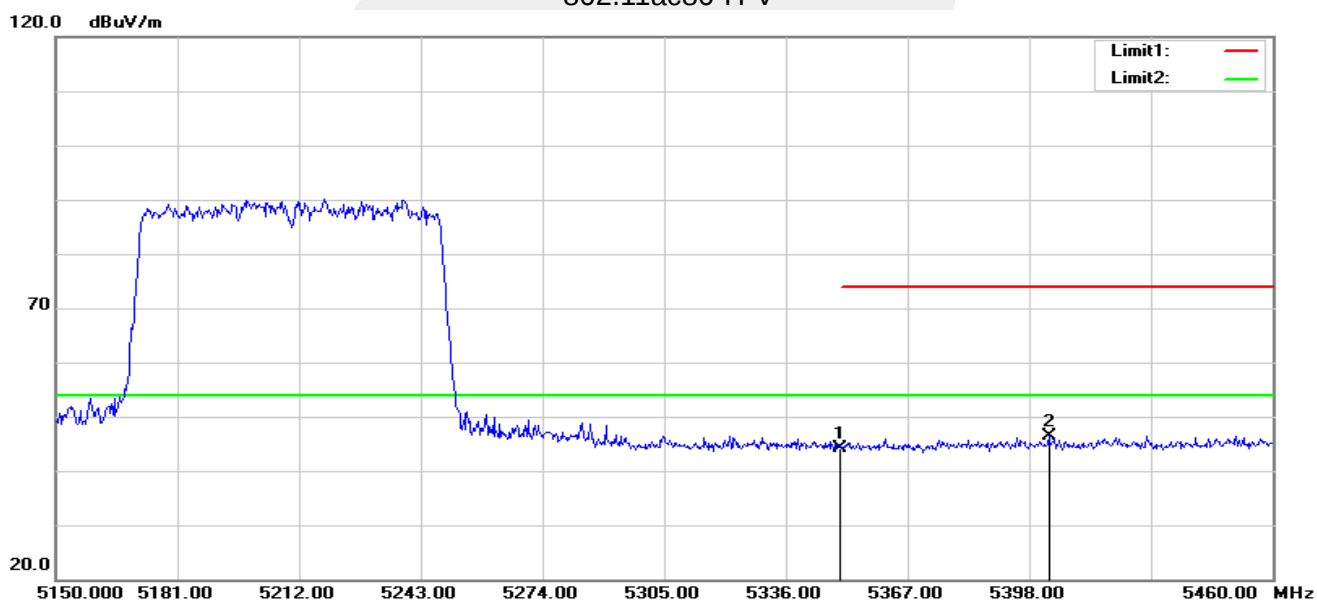


802.11ac80-H-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5350.000	51.37	-5.23	46.14	74.00	-27.86	peak
2	5418.770	51.60	-5.20	46.40	74.00	-27.60	peak

802.11ac80-H-V



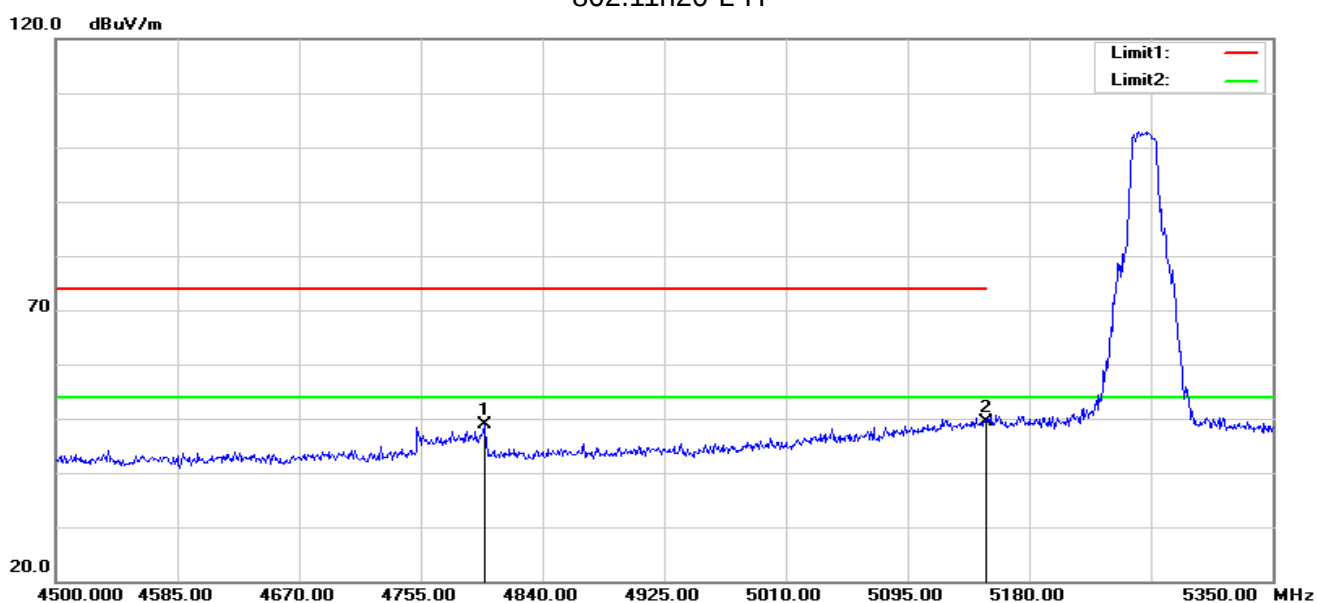
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5350.000	49.47	-5.23	44.24	74.00	-29.76	peak
2	5402.960	51.57	-5.25	46.32	74.00	-27.68	peak

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



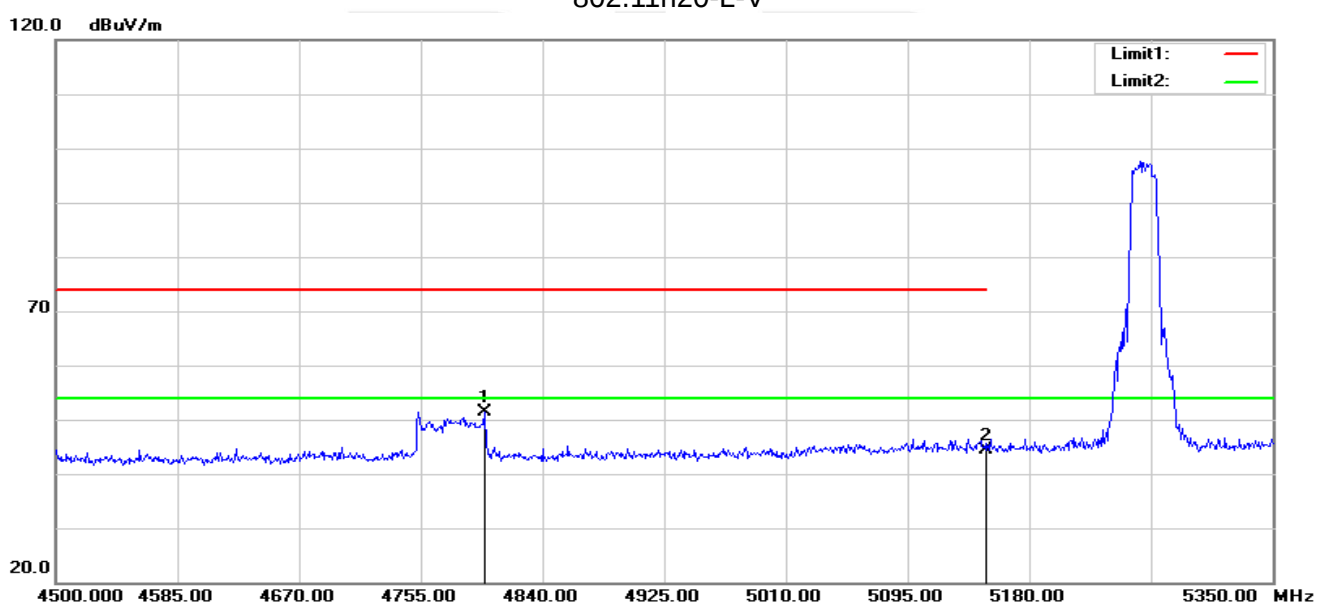
Band II 5250-5350MHz

802.11n20-L-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4799.200	56.01	-7.22	48.79	74.00	-25.21	peak
2	5150.000	55.22	-5.73	49.49	74.00	-24.51	peak

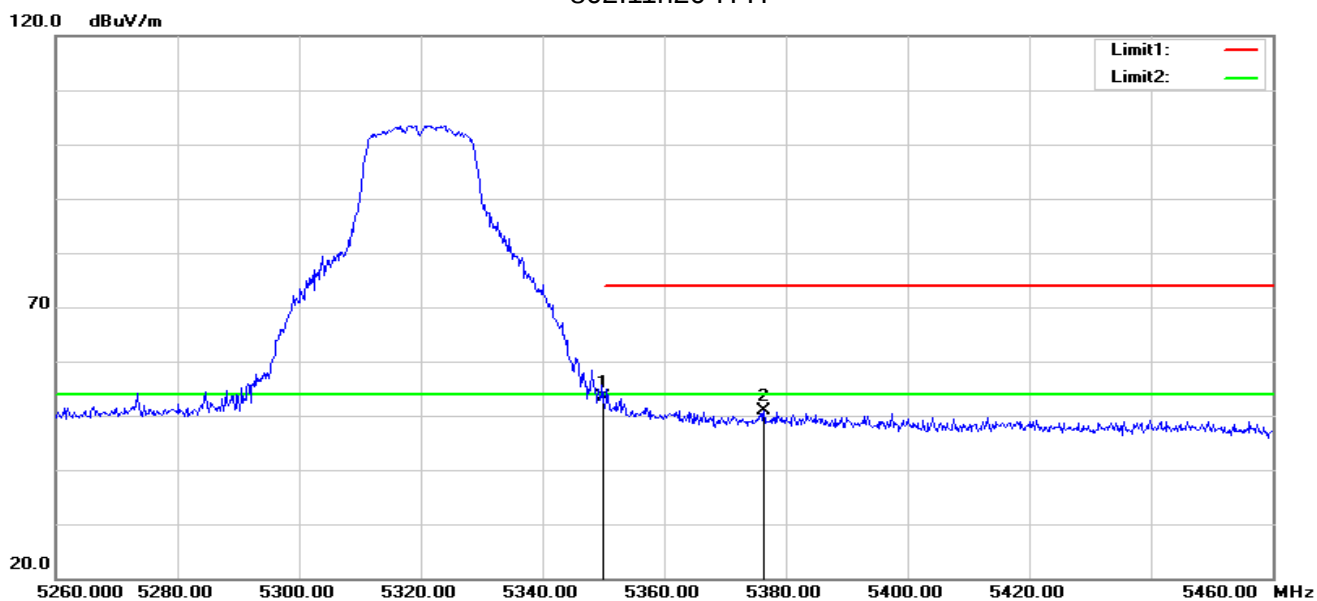
802.11n20-L-V



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4799.200	58.57	-7.22	51.35	74.00	-22.65	peak
2	5150.000	50.22	-5.73	44.49	74.00	-29.51	peak

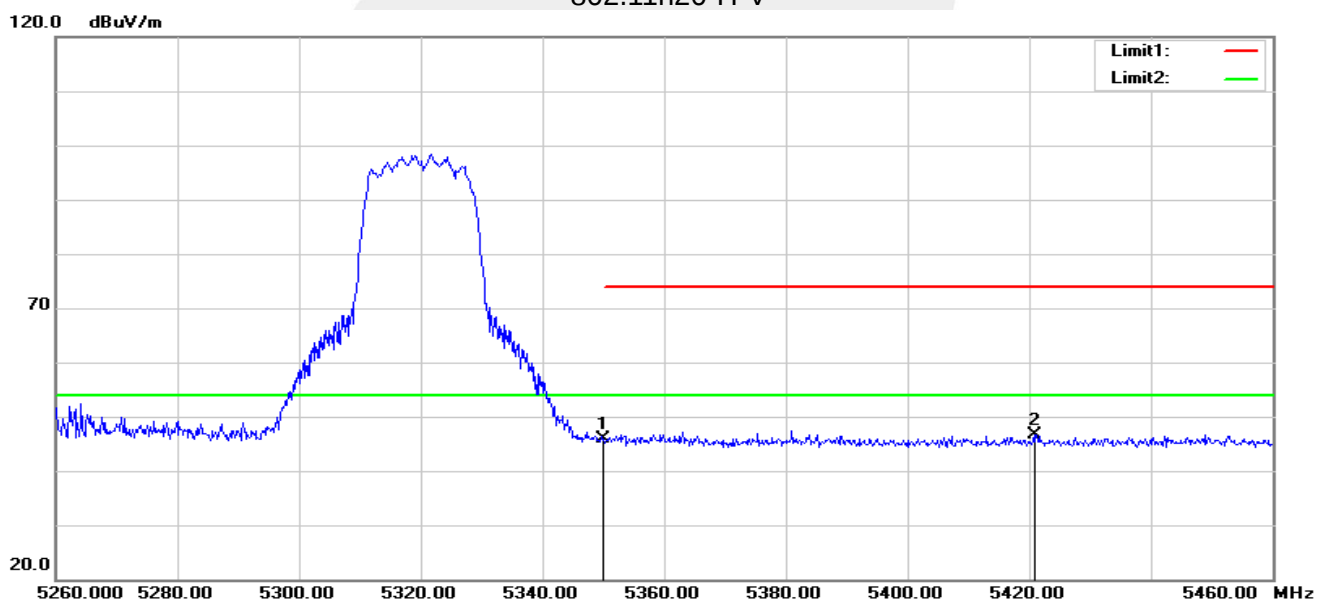


802.11n20-H-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5350.000	58.72	-5.23	53.49	74.00	-20.51	peak
2	5376.400	56.08	-5.24	50.84	74.00	-23.16	peak

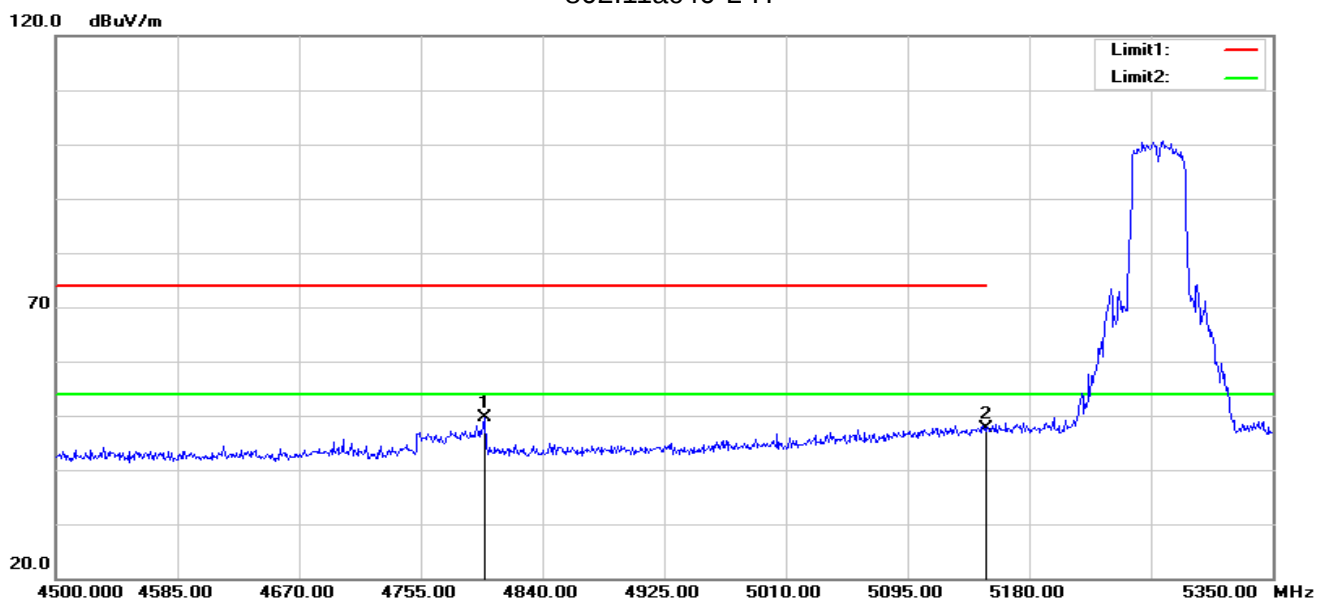
802.11n20-H-V



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5350.000	51.16	-5.23	45.93	74.00	-28.07	peak
2	5420.800	51.88	-5.20	46.68	74.00	-27.32	peak

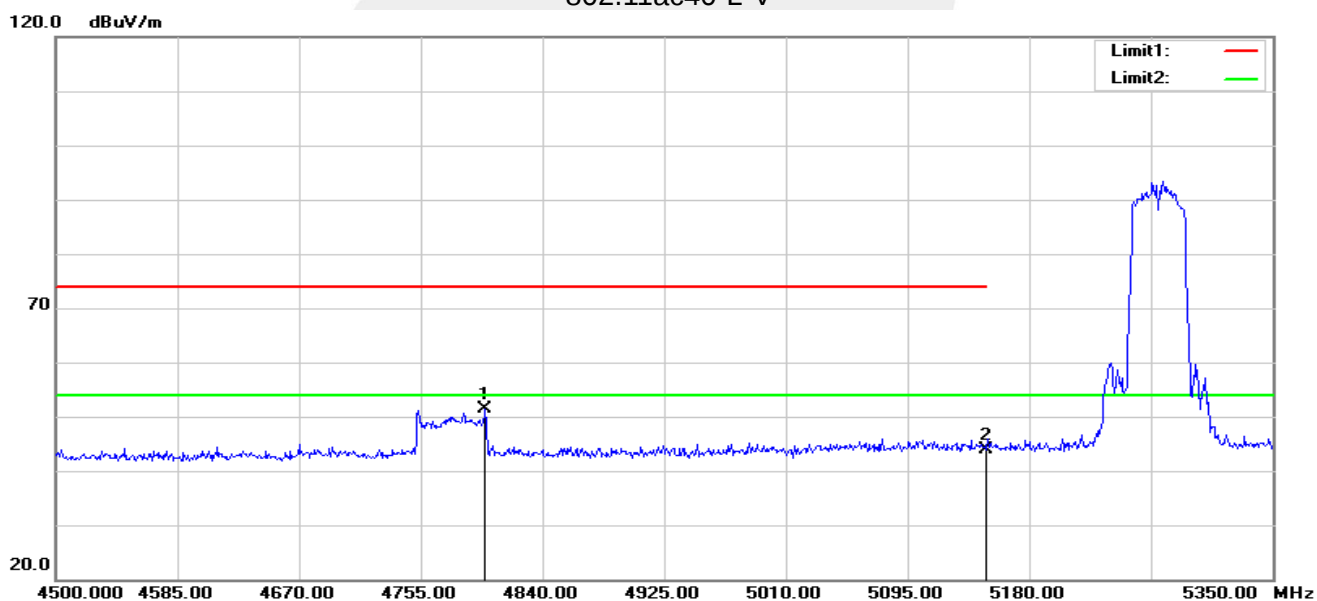


802.11ac40-L-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4799.200	56.83	-7.22	49.61	74.00	-24.39	peak
2	5150.000	53.40	-5.73	47.67	74.00	-26.33	peak

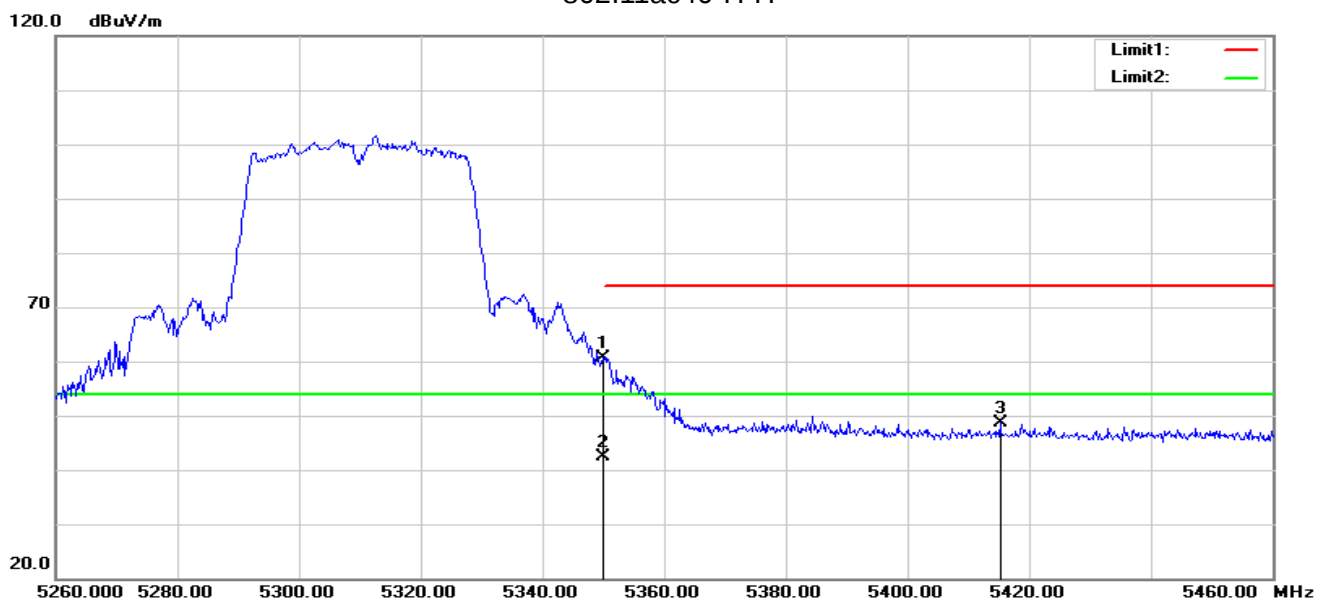
802.11ac40-L-V



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4800.050	58.63	-7.22	51.41	74.00	-22.59	peak
2	5150.000	49.70	-5.73	43.97	74.00	-30.03	peak

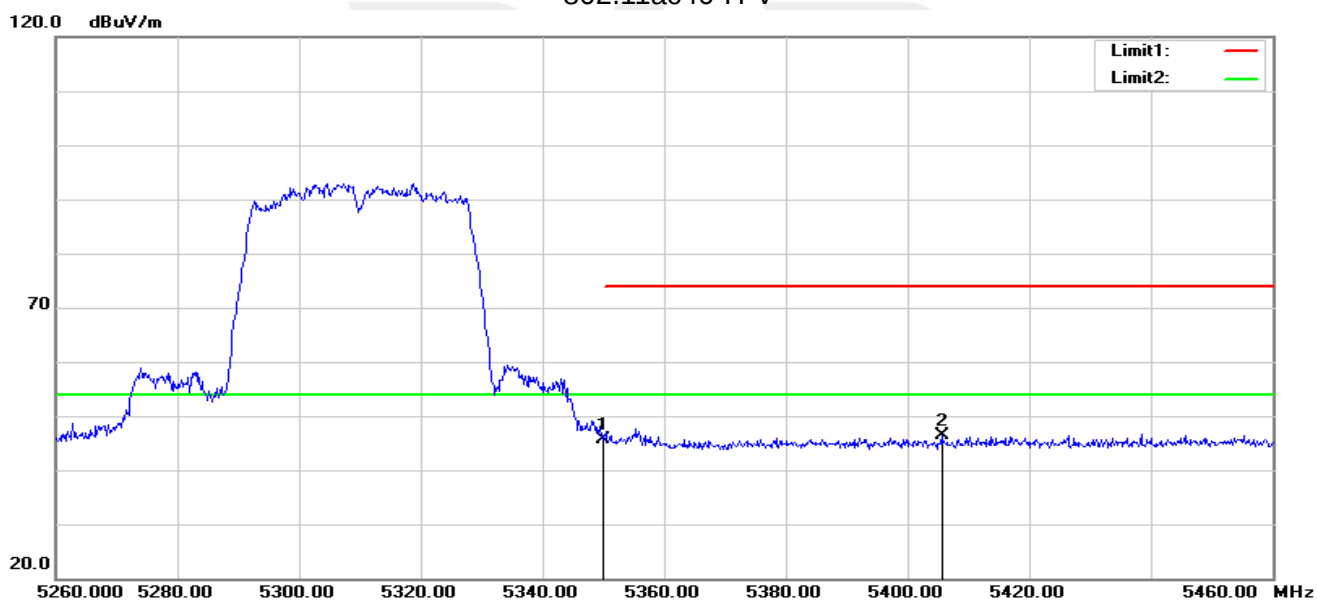


802.11ac40-H-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5350.000	65.83	-5.23	60.60	74.00	-13.40	peak
2	5350.000	47.59	-5.23	42.36	54.00	-11.64	AVG
3	5415.200	53.73	-5.22	48.51	74.00	-25.49	peak

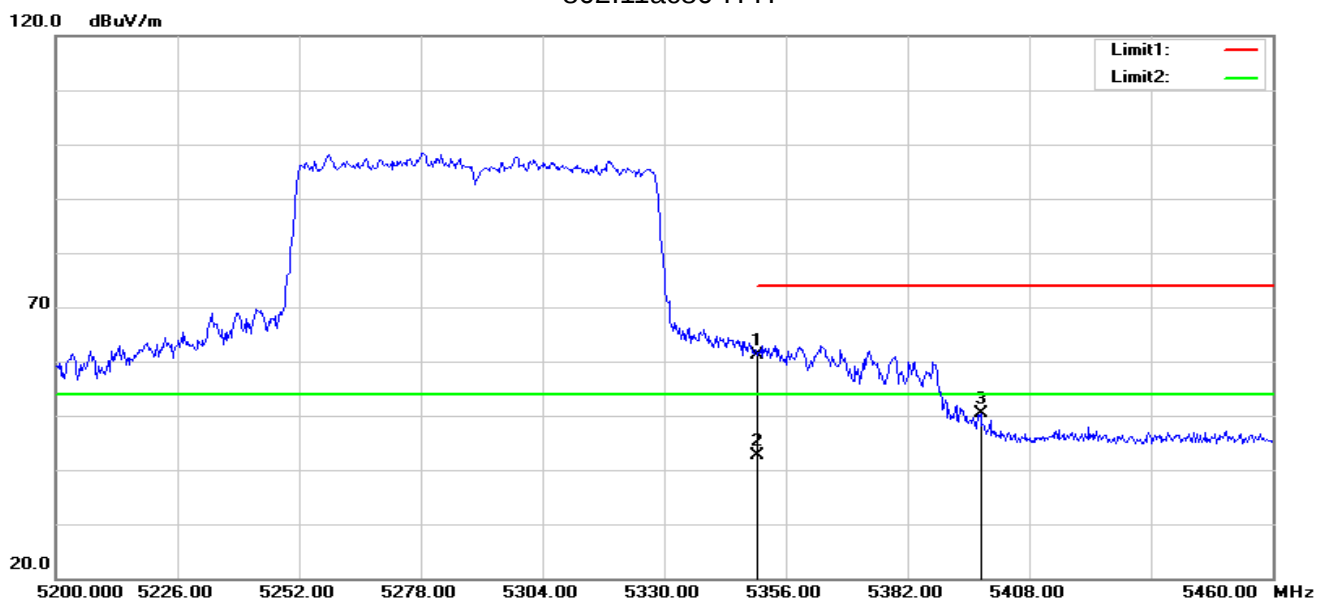
802.11ac40-H-V



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5350.000	50.91	-5.23	45.68	74.00	-28.32	peak
2	5405.600	51.51	-5.24	46.27	74.00	-27.73	peak

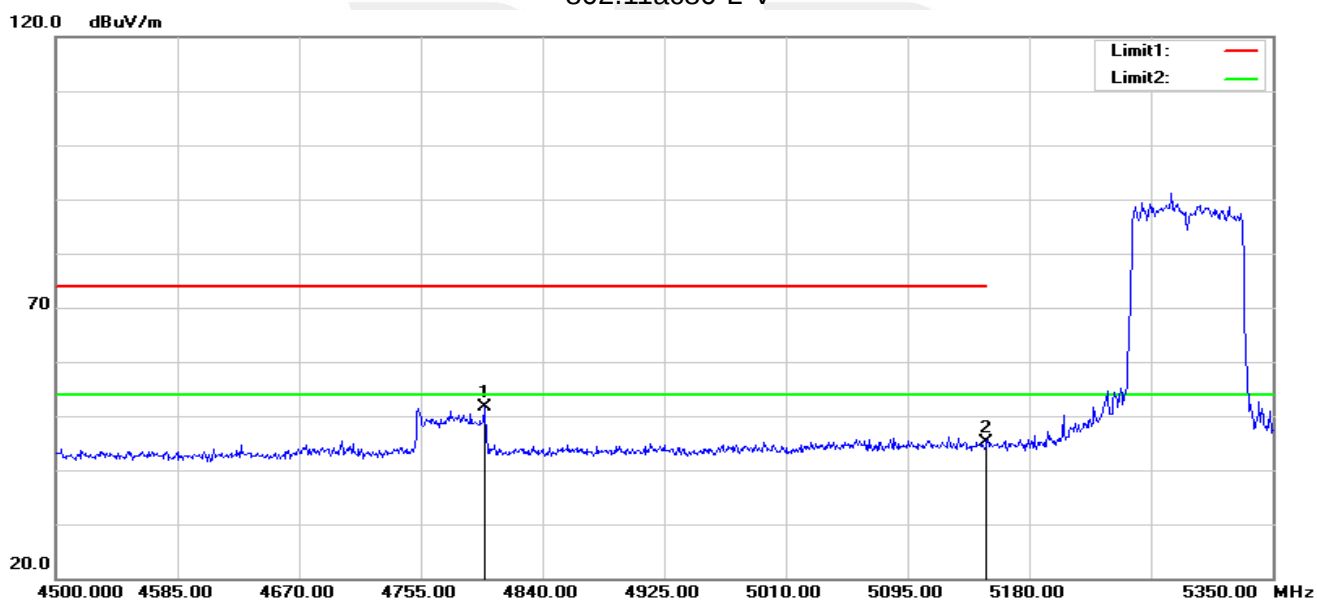


802.11ac80-H-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5350.000	66.42	-5.23	61.19	74.00	-12.81	peak
2	5350.000	47.90	-5.23	42.67	54.00	-11.33	AVG
3	5397.600	55.73	-5.25	50.48	74.00	-23.52	peak

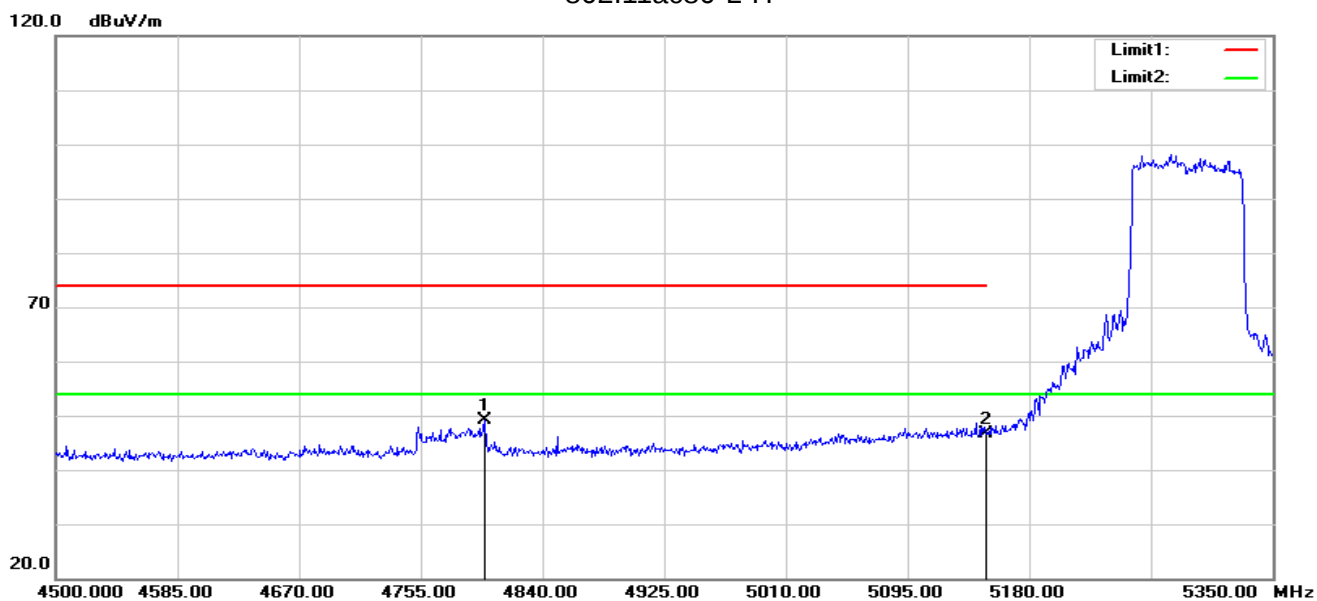
802.11ac80-L-V



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4799.200	58.73	-7.22	51.51	74.00	-22.49	peak
2	5150.000	50.92	-5.73	45.19	74.00	-28.81	peak

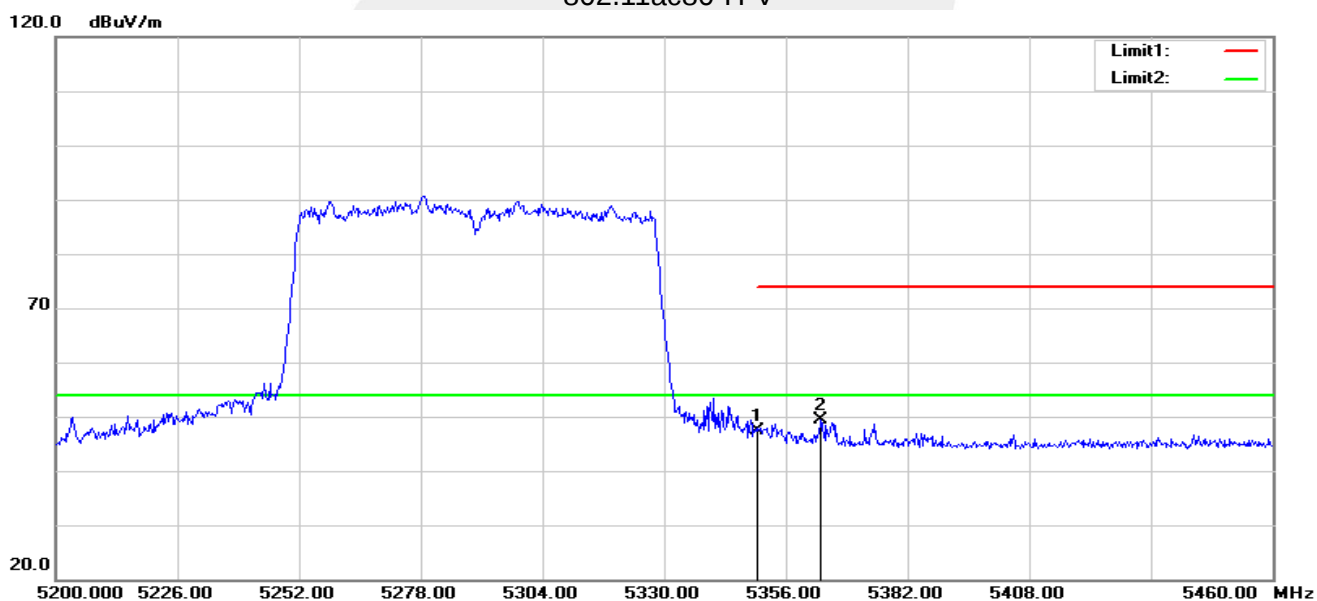


802.11ac80-L-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4799.200	56.30	-7.22	49.08	74.00	-24.92	peak
2	5150.000	52.30	-5.73	46.57	74.00	-27.43	peak

802.11ac80-H-V



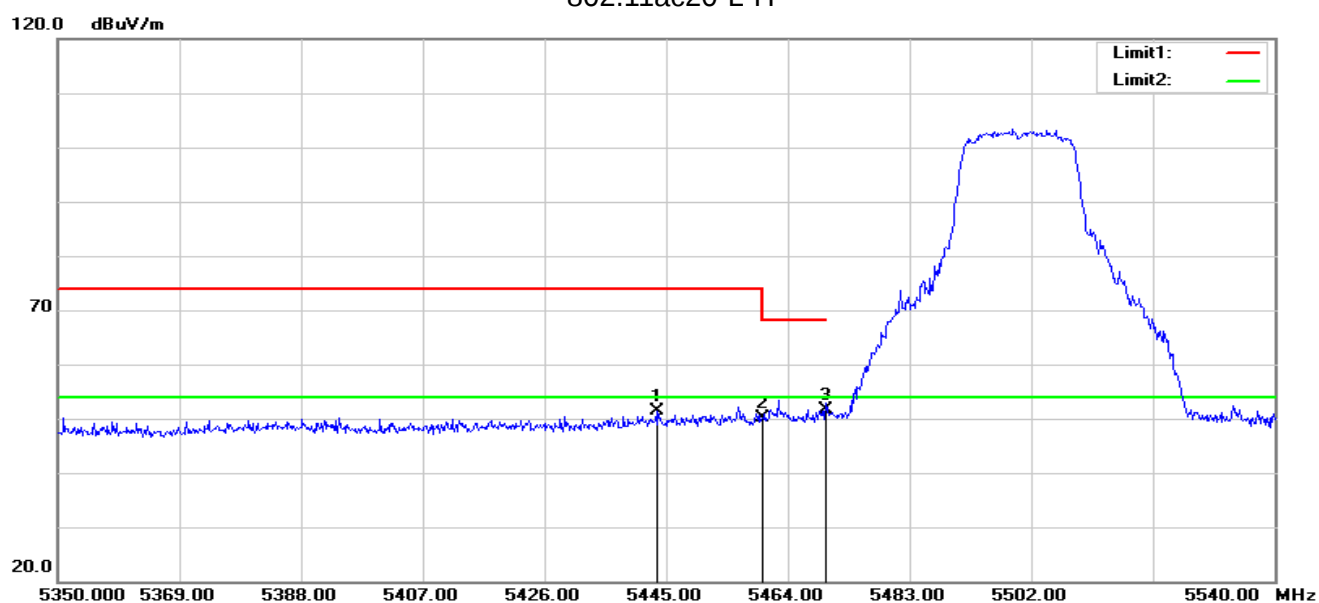
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5350.000	52.55	-5.23	47.32	74.00	-26.68	peak
2	5363.540	54.52	-5.24	49.28	74.00	-24.72	peak

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



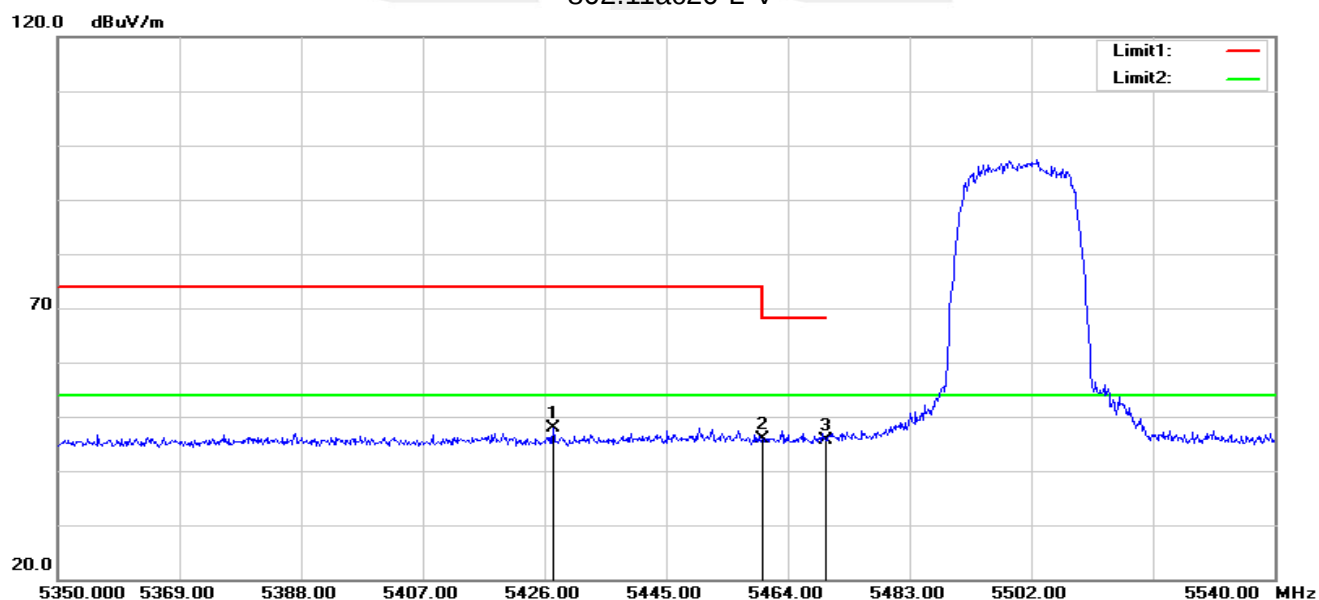
Band III 5470-5725MHz

802.11ac20-L-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5443.480	56.58	-5.15	51.43	74.00	-22.57	peak
2	5460.000	55.20	-5.11	50.09	68.20	-18.11	peak
3	5470.000	56.71	-5.09	51.62	68.20	-16.58	peak

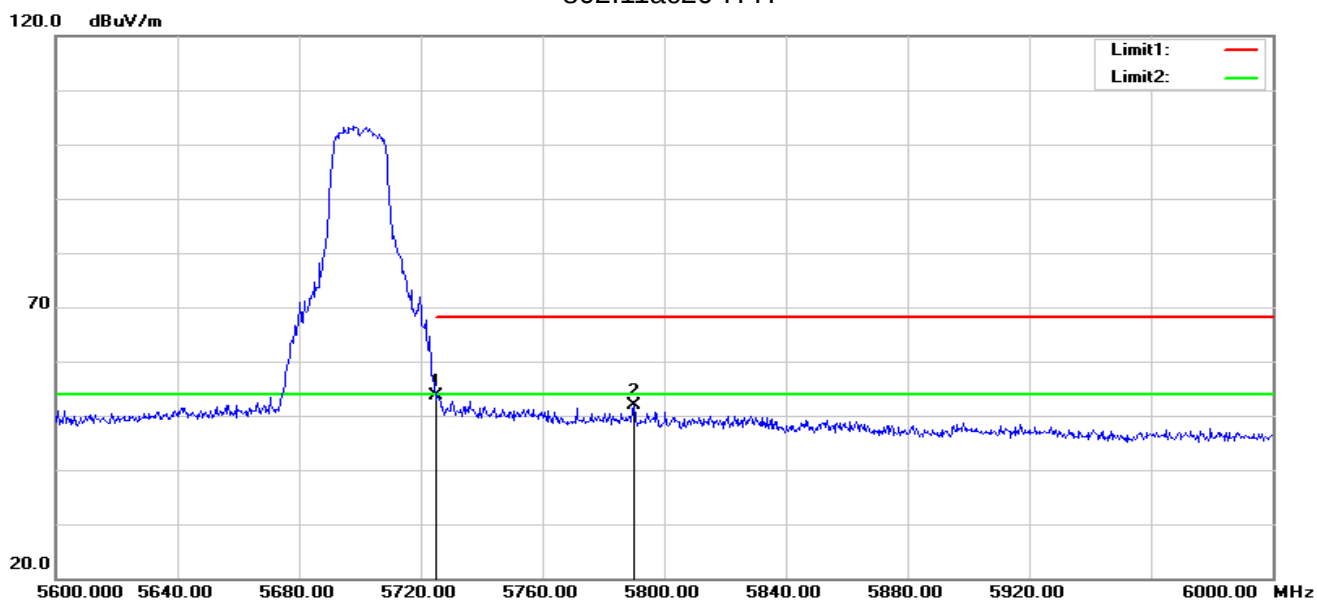
802.11ac20-L-V



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5427.330	53.12	-5.19	47.93	74.00	-26.07	peak
2	5460.000	51.01	-5.11	45.90	68.20	-22.30	peak
3	5470.000	50.63	-5.09	45.54	68.20	-22.66	peak

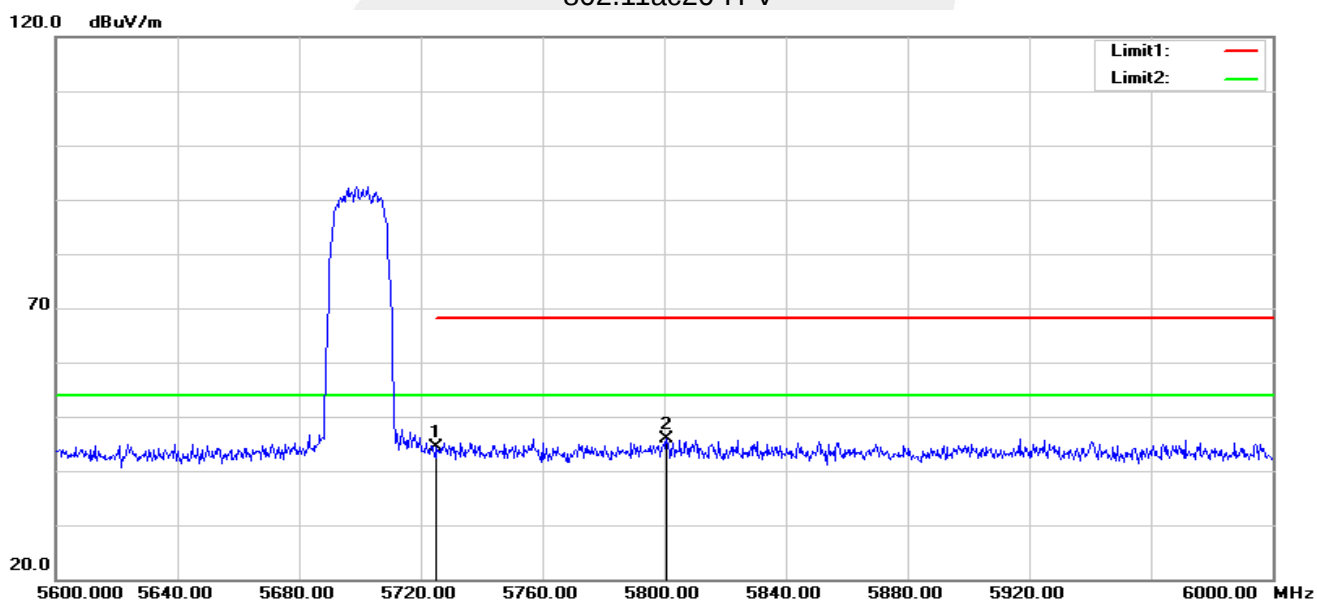


802.11ac20-H-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5725.000	58.09	-4.57	53.52	68.20	-14.68	peak
2	5790.000	56.16	-4.36	51.80	68.20	-16.40	peak

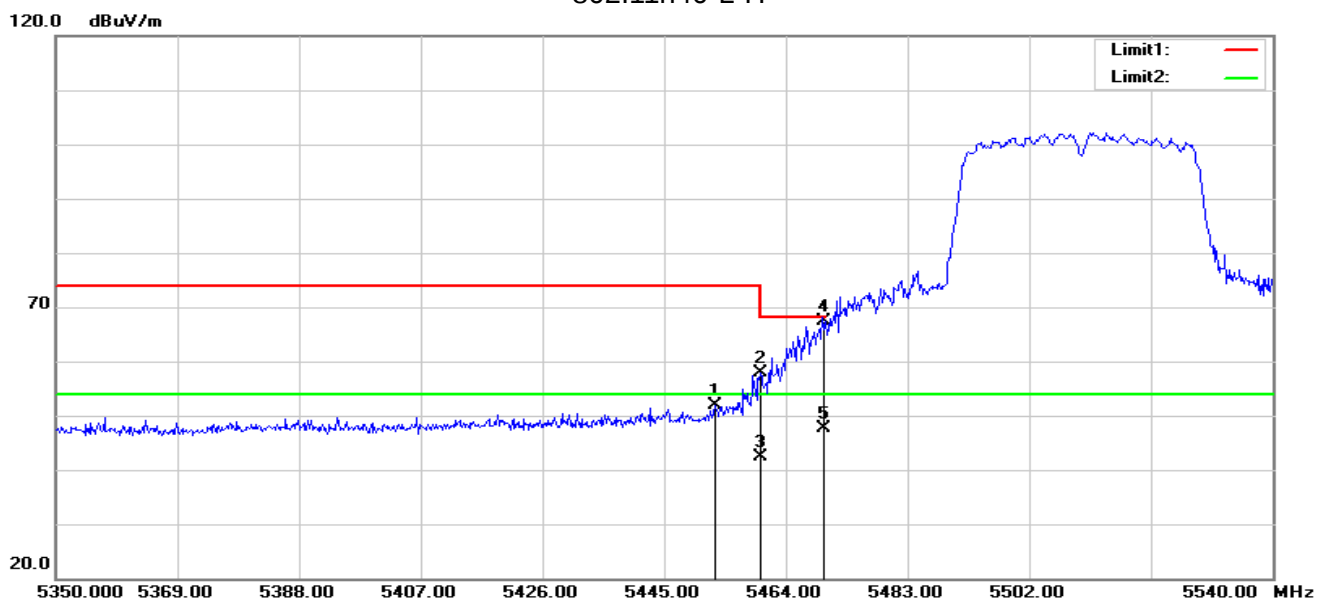
802.11ac20-H-V



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5725.000	48.89	-4.57	44.32	68.20	-23.88	peak
2	5800.800	50.08	-4.32	45.76	68.20	-22.44	peak

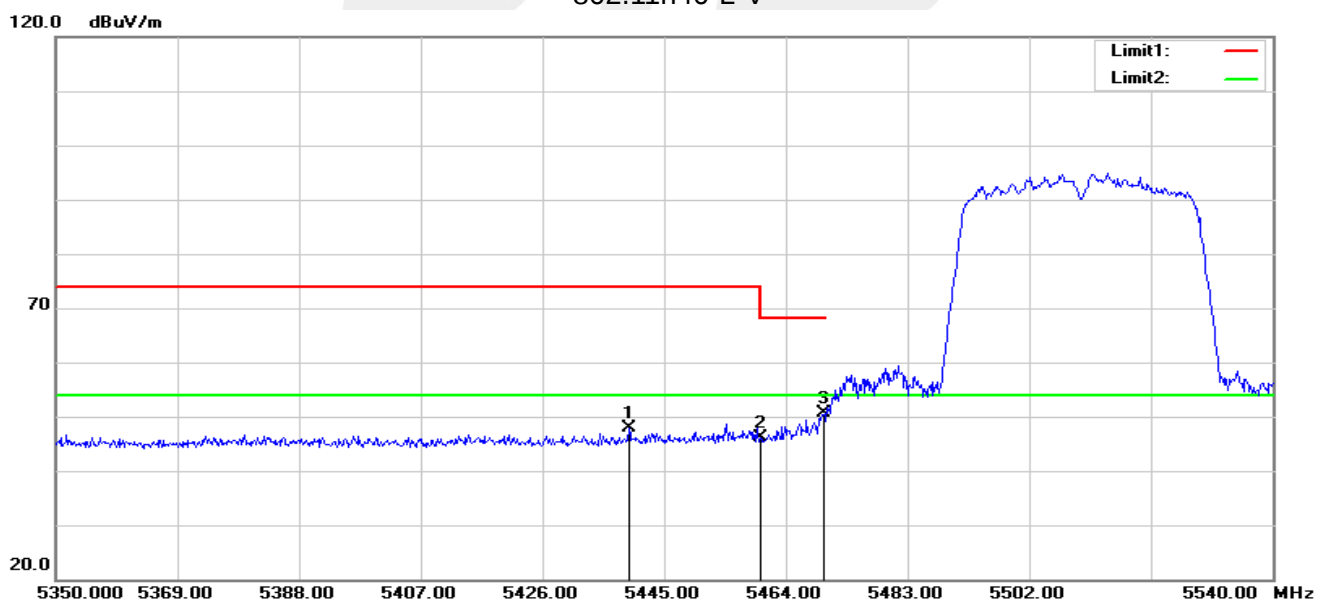


802.11n40-L-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5452.980	56.89	-5.13	51.76	74.00	-22.24	peak
2	5460.000	62.87	-5.11	57.76	68.20	-10.44	peak
3	5460.000	47.50	-5.11	42.39	54.00	-11.61	AVG
4	5470.000	72.40	-5.09	67.31	68.20	-0.89	peak
5	5470.000	52.68	-5.09	47.59	54.00	-6.41	AVG

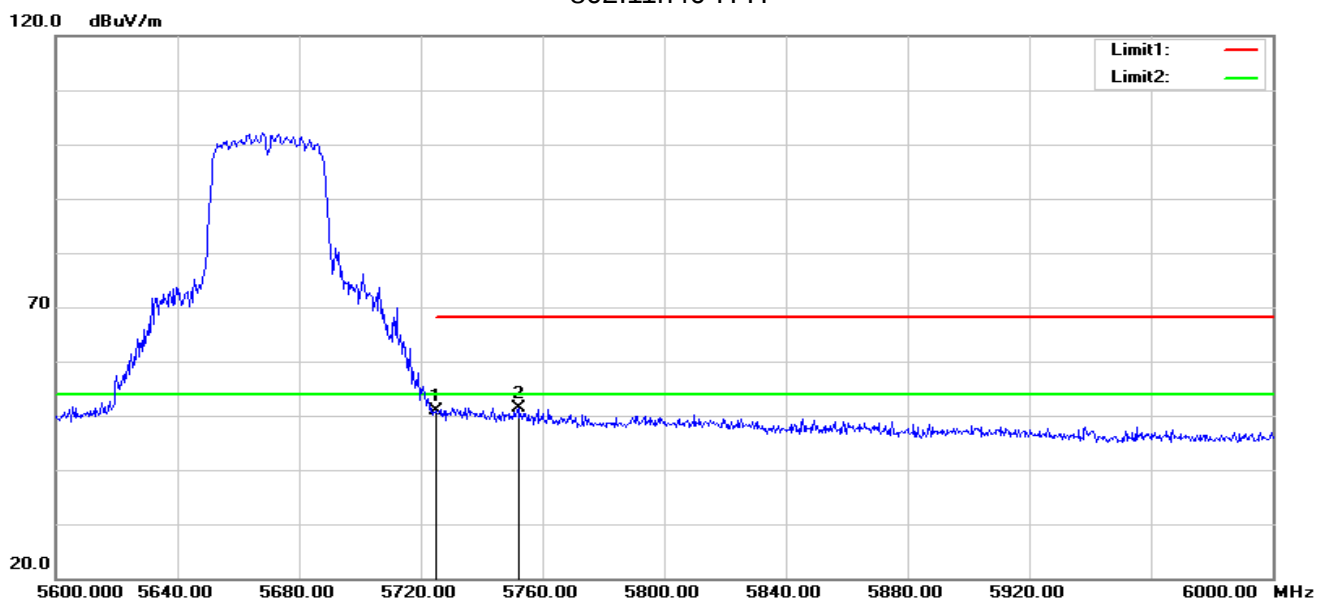
802.11n40-L-V



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5439.490	53.00	-5.16	47.84	74.00	-26.16	peak
2	5460.000	51.32	-5.11	46.21	68.20	-21.99	peak
3	5470.000	55.71	-5.09	50.62	68.20	-17.58	peak

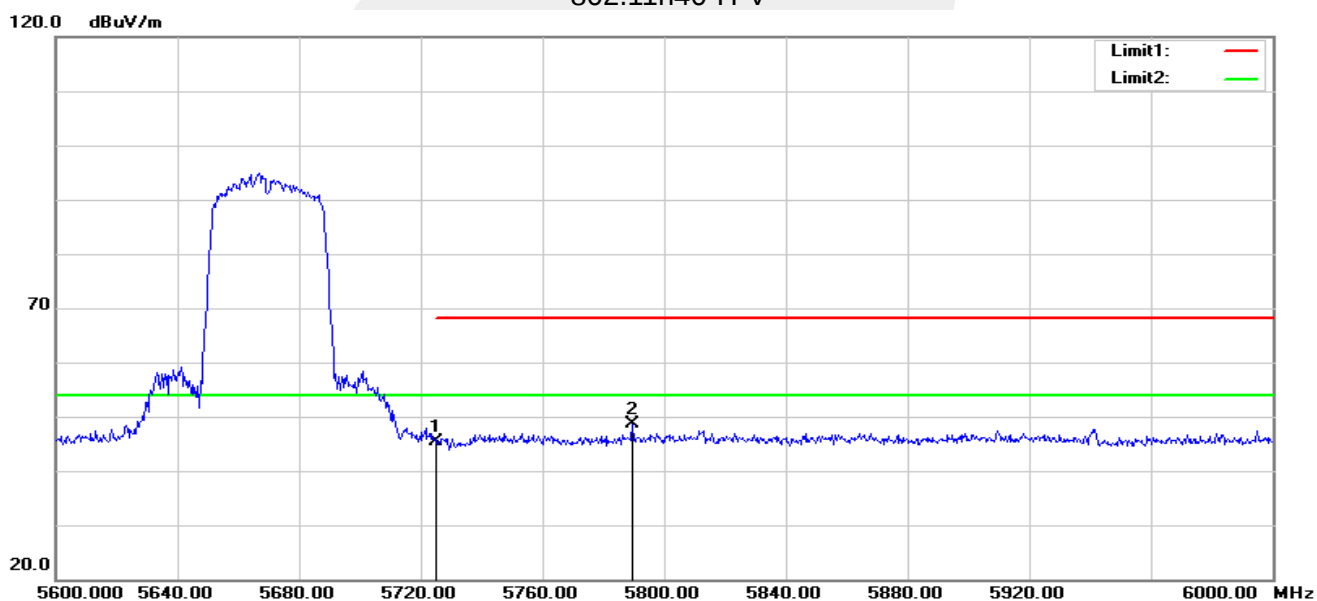


802.11n40-H-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5725.000	55.33	-4.57	50.76	68.20	-17.44	peak
2	5752.000	55.76	-4.49	51.27	68.20	-16.93	peak

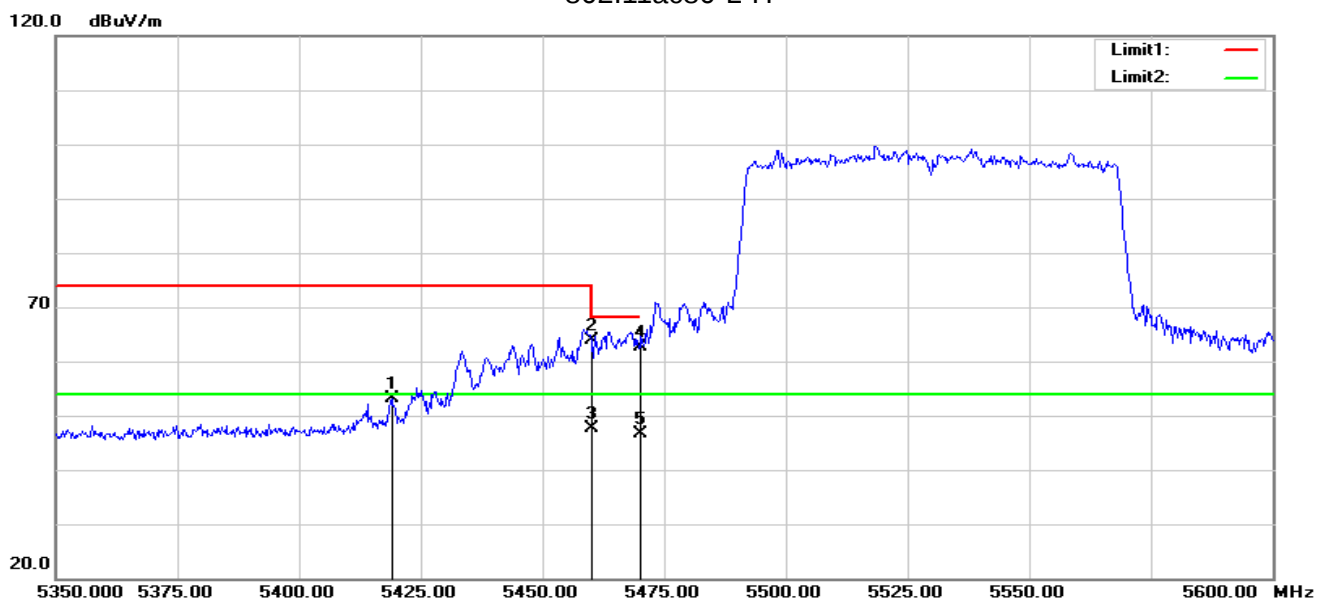
802.11n40-H-V



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5725.000	49.95	-4.57	45.38	68.20	-22.82	peak
2	5789.600	53.04	-4.36	48.68	68.20	-19.52	peak

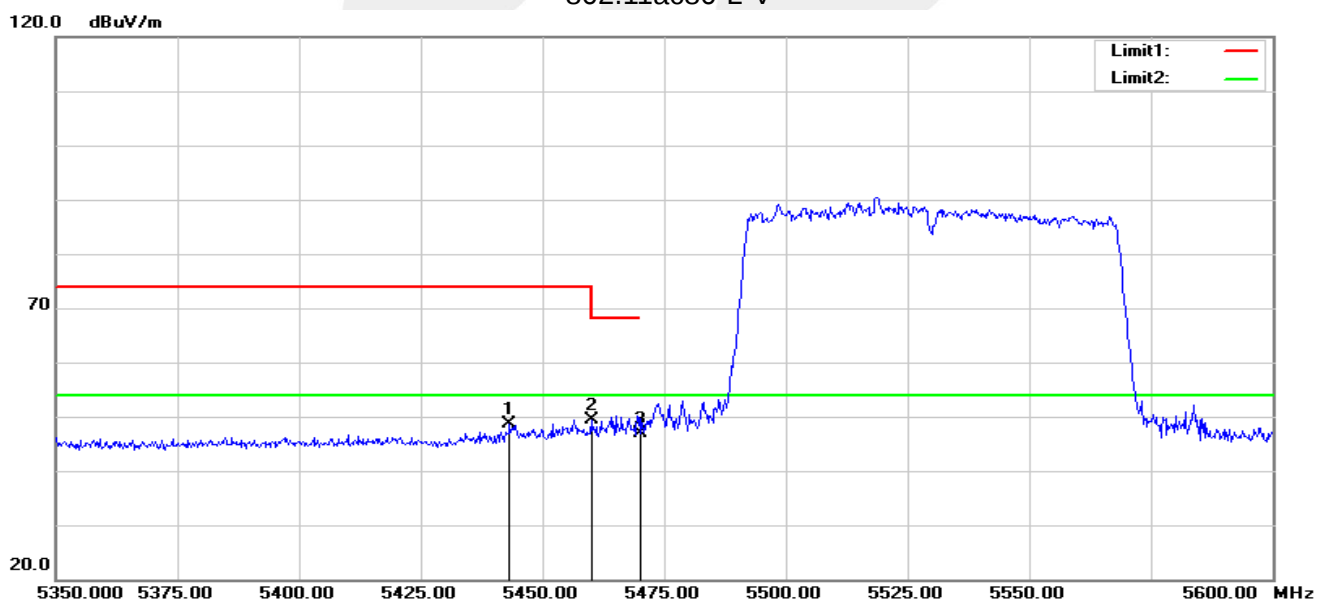


802.11ac80-L-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5419.000	58.29	-5.20	53.09	74.00	-20.91	peak
2	5460.000	68.90	-5.11	63.79	68.20	-4.41	peak
3	5460.000	52.76	-5.11	47.65	54.00	-6.35	AVG
4	5470.000	67.78	-5.09	62.69	68.20	-5.51	peak
5	5470.000	51.67	-5.09	46.58	54.00	-7.42	AVG

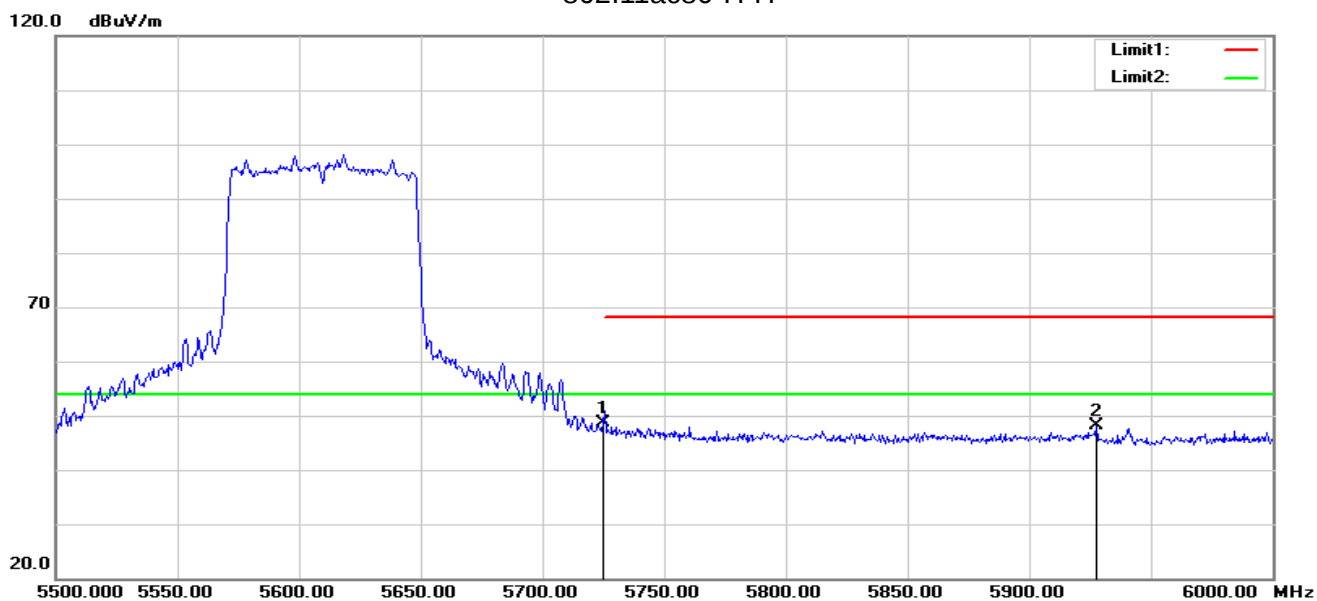
802.11ac80-L-V



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5443.250	53.87	-5.16	48.71	74.00	-25.29	peak
2	5460.000	54.50	-5.11	49.39	68.20	-18.81	peak
3	5470.000	51.99	-5.09	46.90	68.20	-21.30	peak

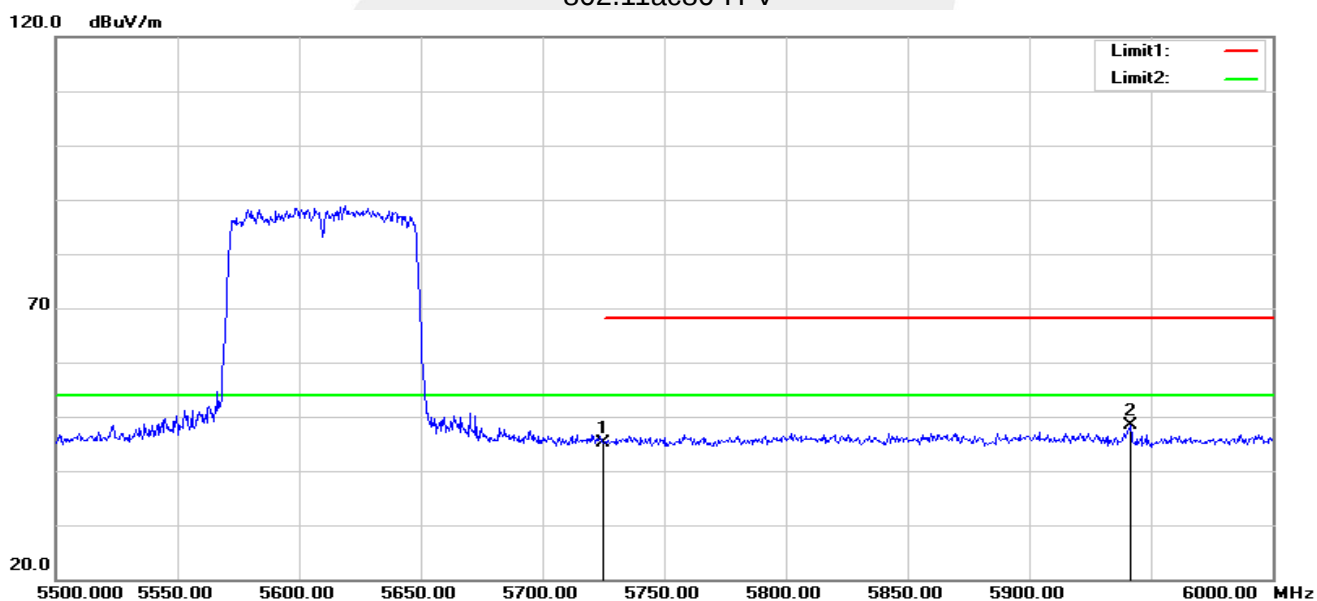


802.11ac80-H-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5725.000	53.23	-4.57	48.66	68.20	-19.54	peak
2	5927.500	51.94	-3.93	48.01	68.20	-20.19	peak

802.11ac80-H-V



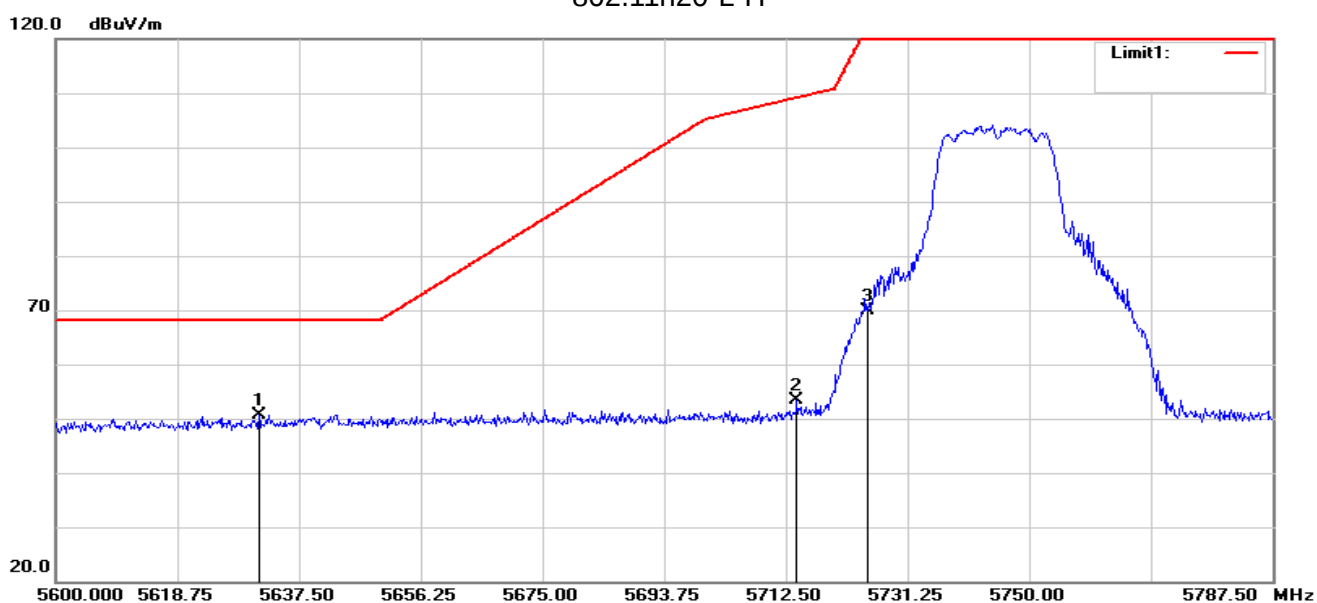
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5725.000	49.69	-4.57	45.12	68.20	-23.08	peak
2	5941.500	52.32	-3.95	48.37	68.20	-19.83	peak

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



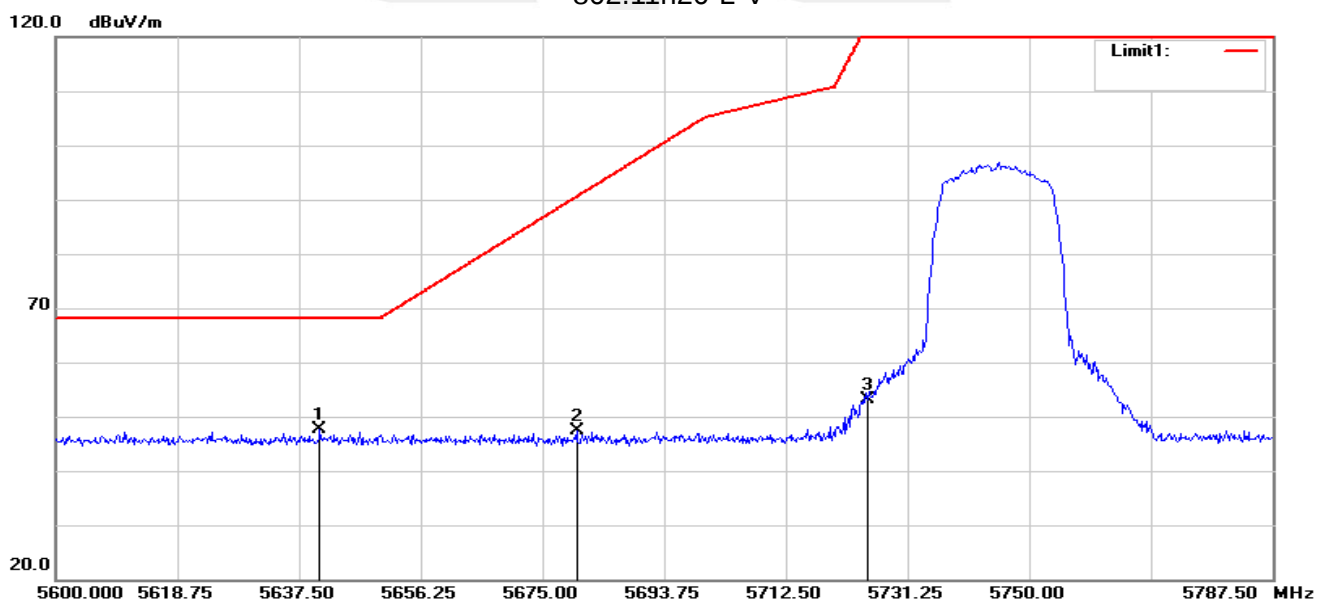
Band IV(5.725-5.85 GHz)

802.11n20-L-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5631.313	55.39	-4.69	50.70	68.20	-17.50	peak
2	5714.188	57.95	-4.61	53.34	109.17	-55.83	peak
3	5725.000	74.56	-4.57	69.99	122.20	-52.21	peak

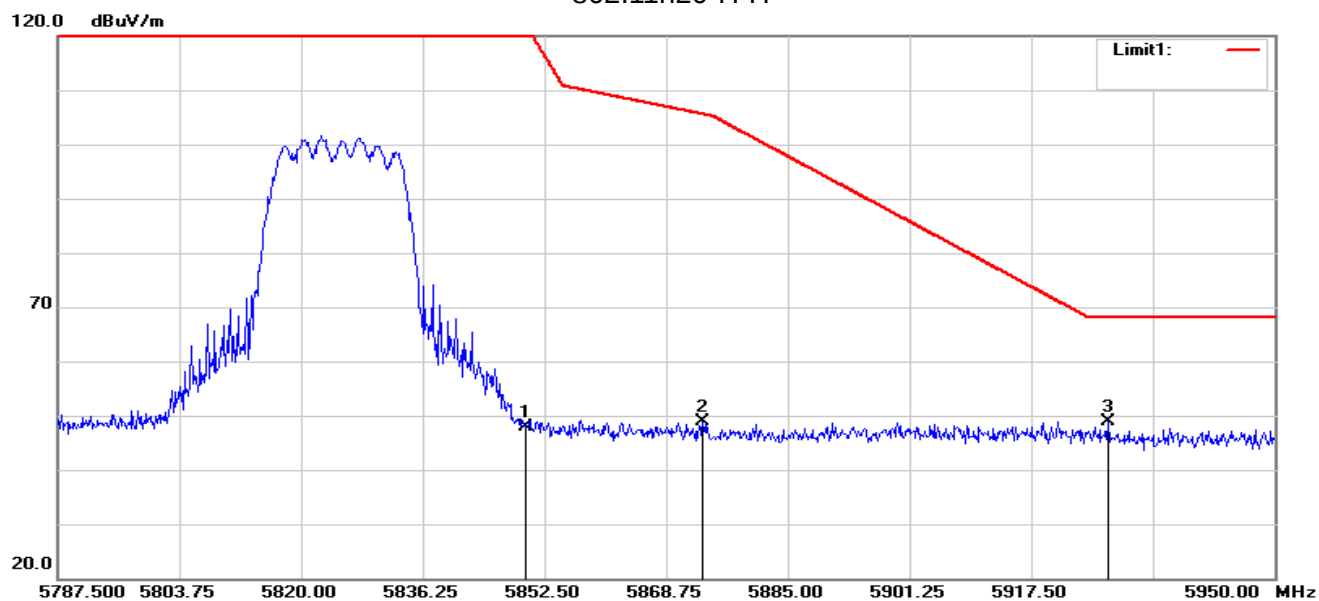
802.11n20-L-V



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5640.688	52.24	-4.68	47.56	68.20	-20.64	peak
2	5680.250	52.12	-4.67	47.45	90.59	-43.14	peak
3	5725.000	57.68	-4.57	53.11	122.20	-69.09	peak

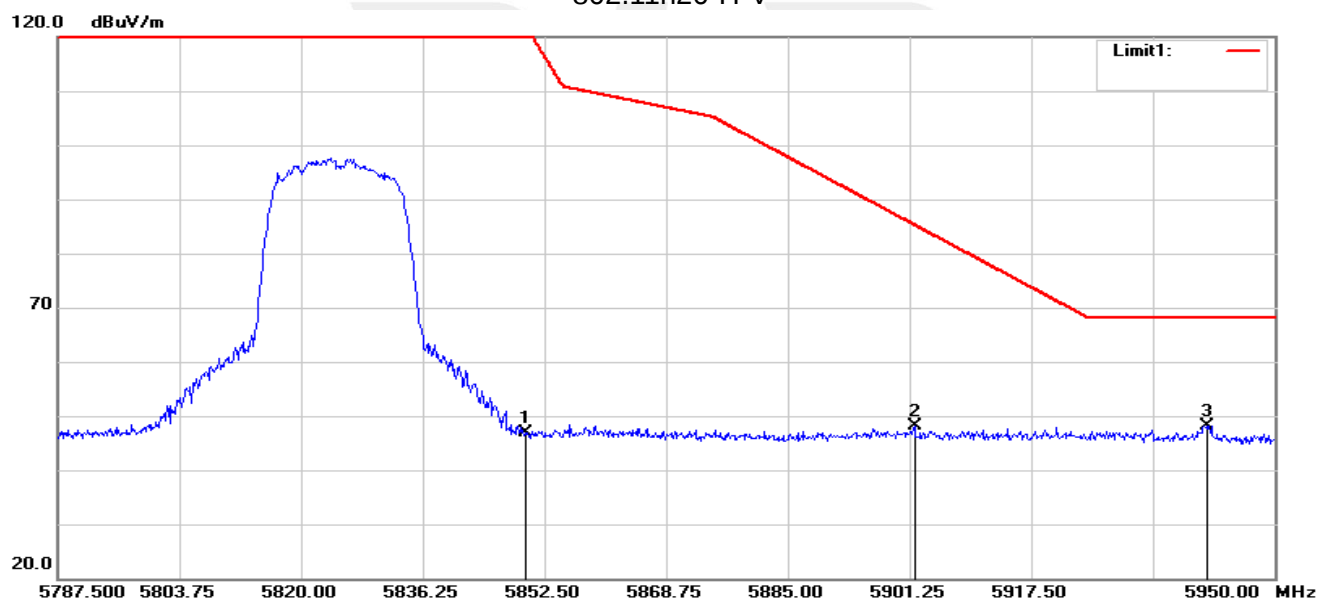


802.11n20-H-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5850.000	52.10	-4.10	48.00	122.20	-74.20	peak
2	5873.625	52.83	-3.99	48.84	105.59	-56.75	peak
3	5927.738	52.93	-3.93	49.00	68.20	-19.20	peak

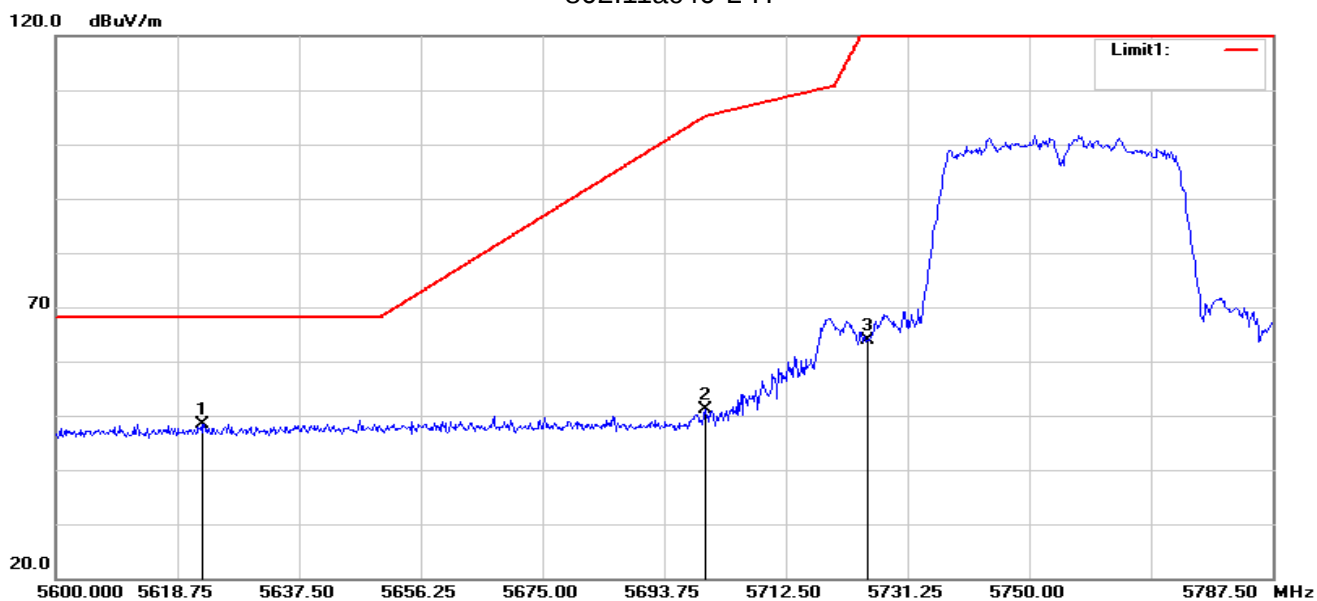
802.11n20-H-V



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5850.000	50.87	-4.10	46.77	122.20	-75.43	peak
2	5901.900	51.92	-3.89	48.03	85.29	-37.26	peak
3	5941.063	52.14	-3.95	48.19	68.20	-20.01	peak

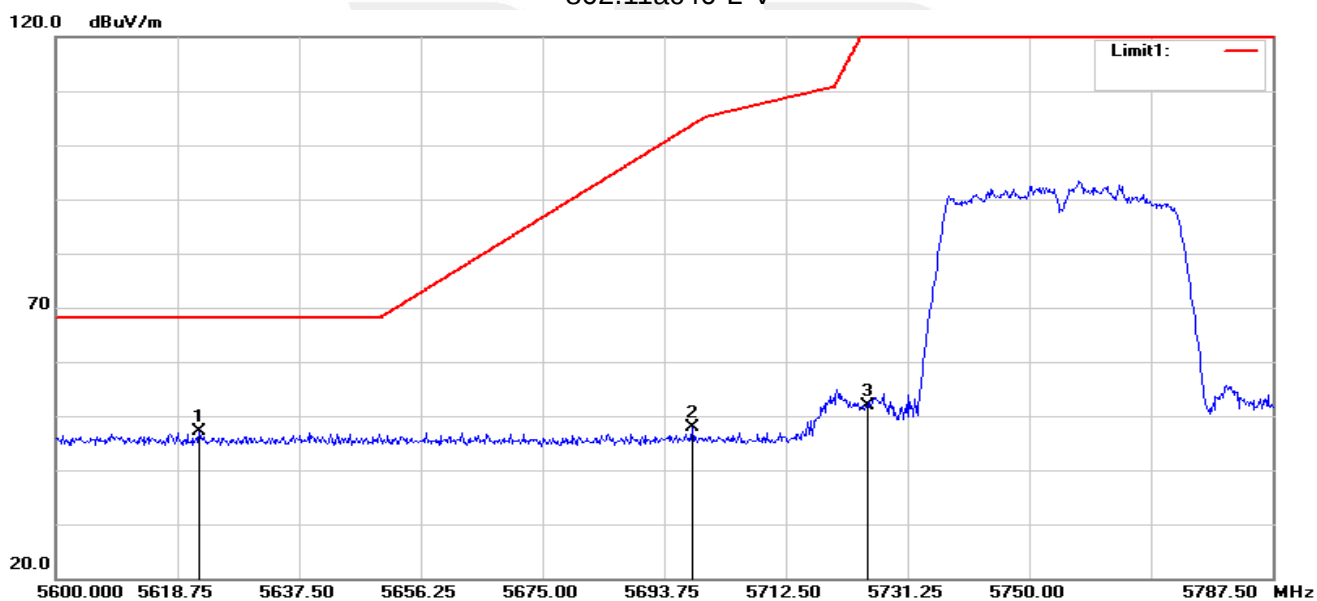


802.11ac40-L-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5622.500	53.18	-4.69	48.49	68.20	-19.71	peak
2	5700.125	55.83	-4.66	51.17	105.23	-54.06	peak
3	5725.000	68.42	-4.57	63.85	122.20	-58.35	peak

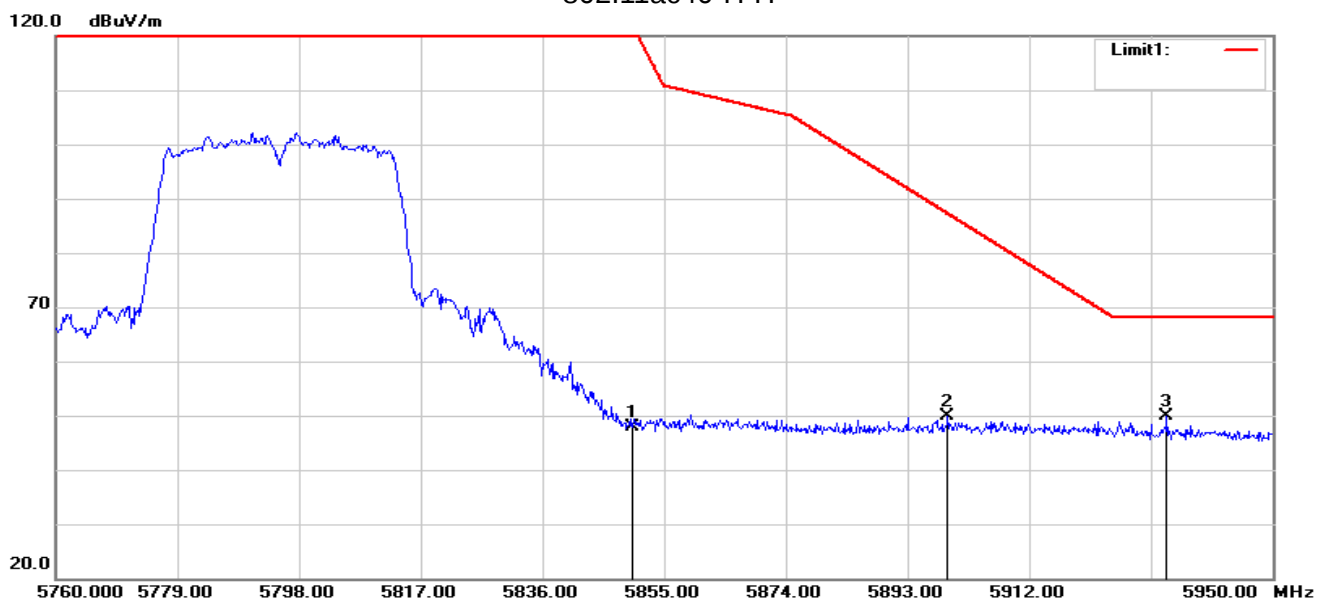
802.11ac40-L-V



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5622.125	51.70	-4.69	47.01	68.20	-21.19	peak
2	5698.063	52.43	-4.66	47.77	103.77	-56.00	peak
3	5725.000	56.38	-4.57	51.81	122.20	-70.39	peak

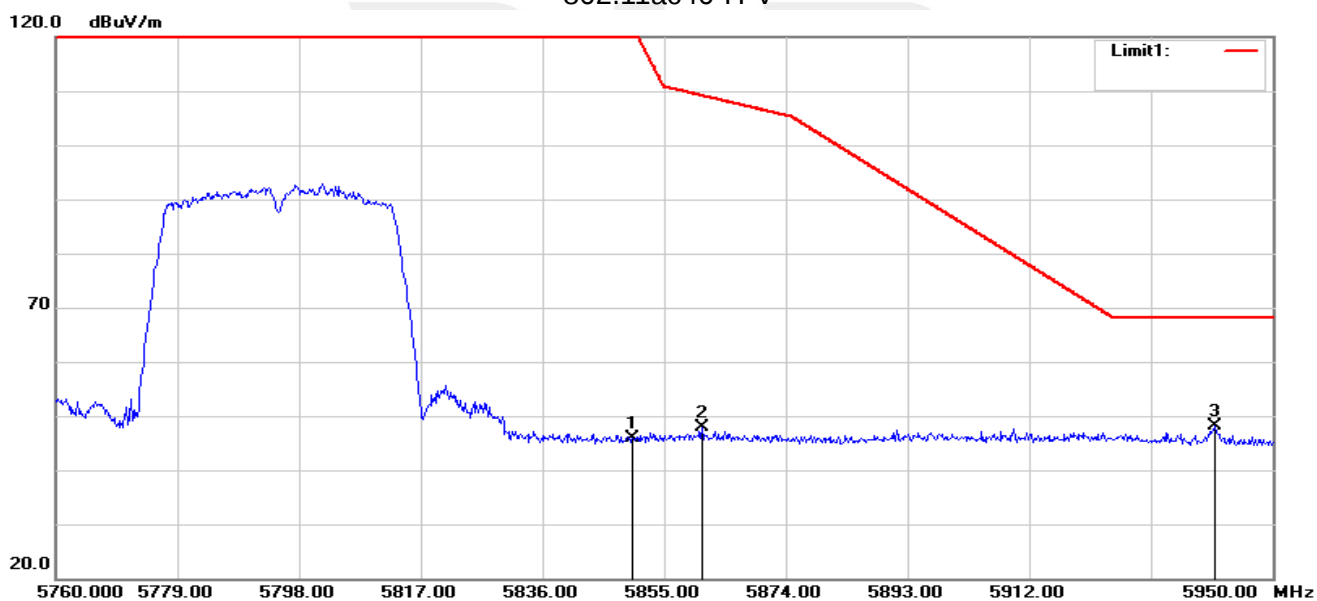


802.11ac40-H-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5850.000	51.91	-4.10	47.81	122.20	-74.39	peak
2	5899.270	53.65	-3.88	49.77	87.24	-37.47	peak
3	5933.470	53.74	-3.94	49.80	68.20	-18.40	peak

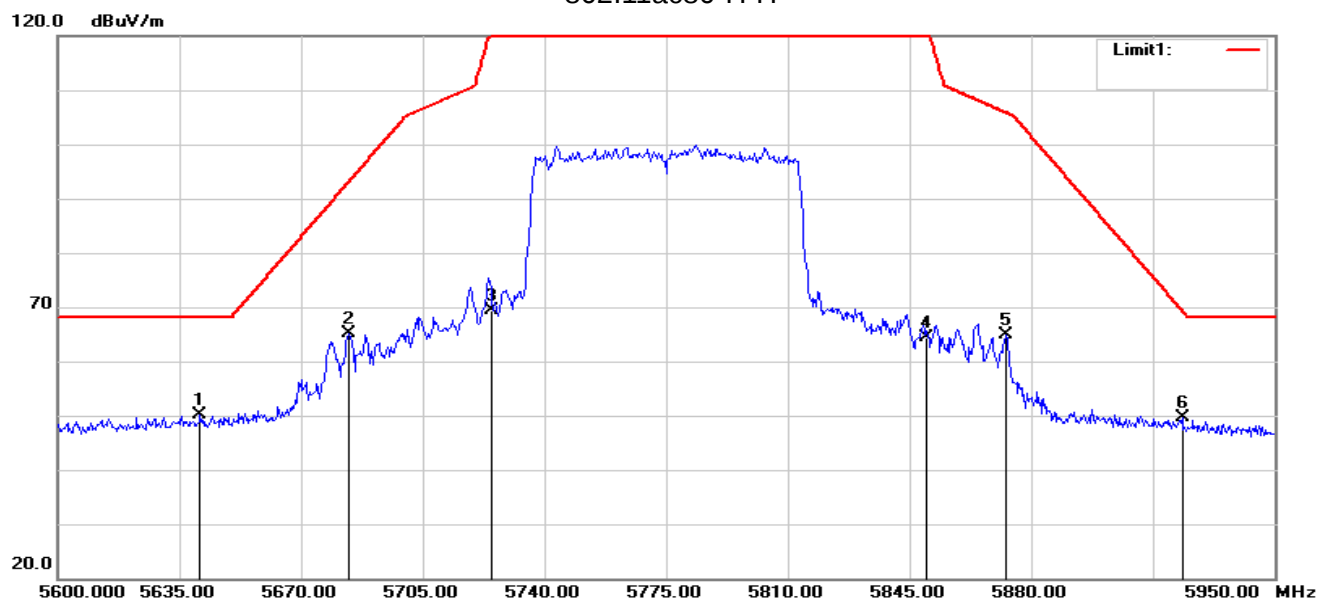
802.11ac40-H-V



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5850.000	50.03	-4.10	45.93	122.20	-76.27	peak
2	5860.890	51.96	-4.05	47.91	109.15	-61.24	peak
3	5941.070	52.13	-3.95	48.18	68.20	-20.02	peak



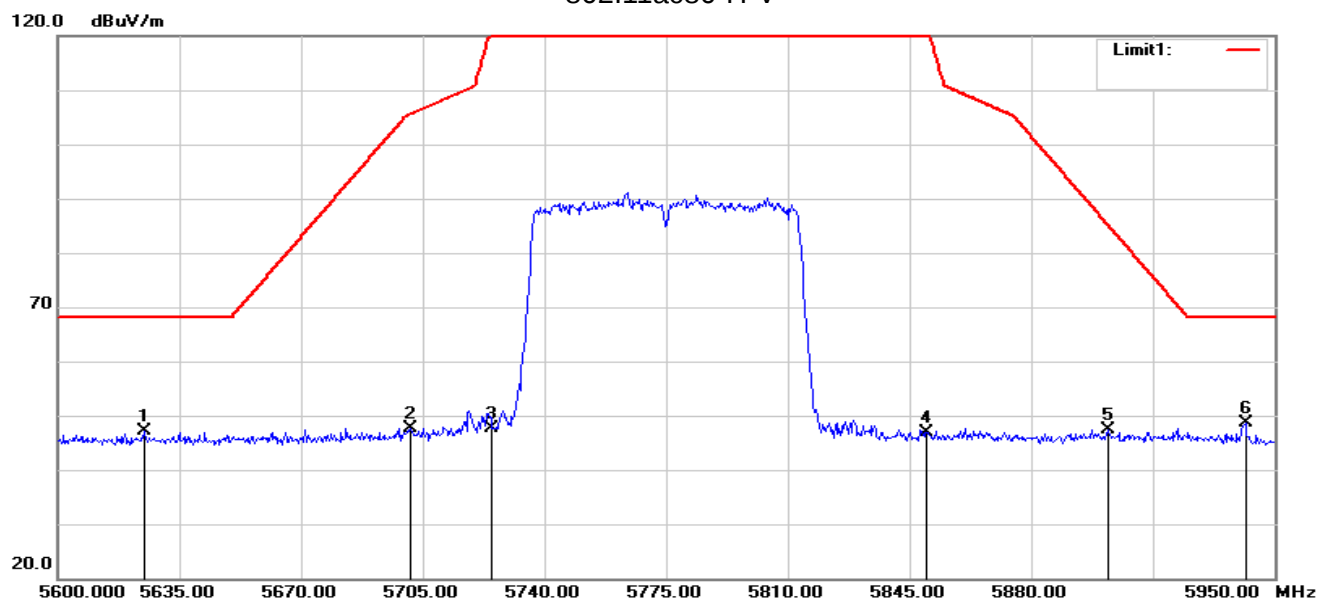
802.11ac80-H-H



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5640.950	54.75	-4.68	50.07	68.20	-18.13	peak
2	5683.650	69.78	-4.67	65.11	93.10	-27.99	peak
3	5725.000	73.93	-4.57	69.36	122.20	-52.84	peak
4	5850.000	68.60	-4.10	64.50	122.20	-57.70	peak
5	5872.650	68.83	-4.00	64.83	105.86	-41.03	peak
6	5923.400	53.65	-3.92	49.73	69.38	-19.65	peak



802.11ac80-H-V



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5624.850	51.70	-4.69	47.01	68.20	-21.19	peak
2	5701.500	52.38	-4.66	47.72	105.62	-57.90	peak
3	5725.000	52.10	-4.57	47.53	122.20	-74.67	peak
4	5850.000	51.05	-4.10	46.95	122.20	-75.25	peak
5	5902.050	51.31	-3.89	47.42	85.18	-37.76	peak
6	5941.600	52.61	-3.95	48.66	68.20	-19.54	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 789033 D02 General U-NII Test Procedures New Rules v02r01.

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 Ant_A Power Density (dBm)	Direct measurement Ant_B Power Density (dBm)	Duty cycle factor	Final Ant_A Power Density (dBm)	Final Ant_B Power Density (dBm)	Power Density Total (dBm)	Limit (dBm)	Result
802.11a								
5180	-4.143	-0.161	0.061	-4.082	-0.100	--	10.01	PASS
5200	-3.956	0.106	0.061	-3.895	0.167	--	10.01	PASS
5240	-4.415	0.381	0.061	-4.354	0.442	--	10.01	PASS
802.11n20								
5180	-4.988	-1.367	0.066	-4.922	-1.301	0.265	7	PASS
5200	-5.190	-1.244	0.066	-5.124	-1.178	0.292	7	PASS
5240	-5.534	-1.373	0.066	-5.468	-1.307	0.103	7	PASS
802.11n40								
5190	-8.950	-5.651	0.168	-8.782	-5.483	-3.816	7	PASS
5230	-8.932	-5.549	0.168	-8.764	-5.381	-3.740	7	PASS
802.11ac20								
5180	-5.360	-1.806	0.161	-5.199	-1.645	-0.058	7	PASS
5200	-5.768	-1.395	0.161	-5.607	-1.234	0.118	7	PASS
5240	-5.797	-1.323	0.161	-5.636	-1.162	0.163	7	PASS
802.11ac40								
5190	-10.252	-7.511	0.327	-9.925	-7.184	-5.331	7	PASS
5230	-10.152	-7.016	0.327	-9.825	-6.689	-4.970	7	PASS
802.11ac80								
5210	-15.484	-12.213	2.153	-13.331	-10.060	-8.384	7	PASS



5250-5350MHz								
Frequency	Direct measurement Ant_A Power Density (dBm)	Direct measurement Ant_B Power Density (dBm)	Ant_A Duty cycle factor	Final Ant_A Power Density (dBm)	Final Ant_B Power Density (dBm)	Power Density Total (dBm)	Limit (dBm)	Result
802.11a								
5260	0.037	0.995	0.086	0.123	1.081	--	10.01	PASS
5300	0.716	0.240	0.086	0.802	0.326	--	10.01	PASS
5320	0.754	0.227	0.086	0.840	0.313	--	10.01	PASS
802.11n20								
5260	-1.004	-0.276	0.079	-0.925	-0.197	2.464	7	PASS
5300	-0.701	-0.921	0.079	-0.622	-0.842	2.279	7	PASS
5320	-0.771	-0.882	0.079	-0.692	-0.803	2.263	7	PASS
802.11n40								
5270	-5.301	-4.694	0.169	-5.132	-4.525	-1.808	7	PASS
5310	-4.815	-4.783	0.169	-4.646	-4.614	-1.620	7	PASS
802.11ac20								
5260	-0.989	-0.508	0.185	-0.804	-0.323	2.453	7	PASS
5300	-0.659	-0.865	0.185	-0.474	-0.680	2.434	7	PASS
5320	-0.831	-1.950	0.185	-0.646	-1.765	1.841	7	PASS
802.11ac40								
5270	-6.645	-6.477	0.336	-6.309	-6.141	-3.213	7	PASS
5310	-6.438	-5.984	0.336	-6.102	-5.648	-2.858	7	PASS
802.11ac80								
5290	-12.283	-11.517	2.119	-10.164	-9.398	-6.754	7	PASS



5470-5725MHz								
Frequency	Direct measurement Ant_A Power Density (dBm)	Direct measurement Ant_B Power Density (dBm)	Ant_A Duty cycle factor	Final Ant_A Power Density (dBm)	Final Ant_B Power Density (dBm)	Power Density Total (dBm)	Limit (dBm)	Result
802.11a								
5500	-0.158	0.651	0.074	-0.084	0.725	--	10.01	PASS
5580	-0.715	-0.193	0.074	-0.641	-0.119	--	10.01	PASS
5700	-0.434	-0.727	0.074	-0.360	-0.653	--	10.01	PASS
802.11n20								
5500	-1.187	-0.141	0.065	-1.122	-0.076	2.443	7	PASS
5580	-2.047	-1.113	0.065	-1.982	-1.048	1.520	7	PASS
5700	-1.657	-1.429	0.065	-1.592	-1.364	1.534	7	PASS
802.11n40								
5510	-4.618	-3.610	0.167	-4.451	-3.443	-0.907	7	PASS
5550	-4.855	-3.785	0.167	-4.688	-3.618	-1.110	7	PASS
5670	-6.113	-5.835	0.167	-5.946	-5.668	-2.794	7	PASS
802.11ac20								
5500	-1.759	-0.627	0.185	-1.574	-0.442	2.039	7	PASS
5580	-1.901	-1.317	0.185	-1.716	-1.132	1.596	7	PASS
5700	-1.694	-2.097	0.185	-1.509	-1.912	1.304	7	PASS
802.11ac40								
5510	-6.368	-5.356	0.291	-6.077	-5.065	-2.531	7	PASS
5550	-6.676	-5.562	0.291	-6.385	-5.271	-2.782	7	PASS
5670	-7.582	-7.547	0.291	-7.291	-7.256	-4.263	7	PASS
802.11ac80								
5530	-11.553	-10.639	2.197	-9.356	-8.442	-5.865	7	PASS
5610	-13.145	-12.279	2.197	-10.948	-10.082	-7.483	7	PASS



5725-5850MHz										
Frequency	Use RBW 510KHz direct measurement Ant_A Power Density (dBm)	Use RBW 510KHz direct measurement Ant_B Power Density (dBm)	Convert to RBW 500KHz direct measurement Ant_A Power Density (dBm)	Convert to RBW 500KHz direct measurement Ant_B Power Density (dBm)	Duty cycle factor (dB)	Final Ant_A Power Density (dBm)	Final Ant_B Power Density (dBm)	Power Density Total (dBm)	Limit (dBm)	Result
802.11a										
5745	-1.906	-2.342	-1.992	-2.428	0.061	-1.931	-2.367	--	29.01	PASS
5785	-2.413	-3.251	-2.499	-3.337	0.061	-2.438	-3.276	--	29.01	PASS
5825	-3.115	-3.072	-3.201	-3.158	0.061	-3.140	-3.097	--	29.01	PASS
802.11n20										
5745	-3.749	-3.639	-3.835	-3.725	0.079	-3.756	-3.646	-0.691	26	PASS
5785	-3.745	-4.297	-3.831	-4.383	0.079	-3.752	-4.304	-1.009	26	PASS
5825	-4.209	-4.117	-4.295	-4.203	0.079	-4.216	-4.124	-1.160	26	PASS
802.11n40										
5755	-6.959	-7.230	-7.045	-7.316	0.181	-6.864	-7.135	-3.987	26	PASS
5795	-7.144	-8.118	-7.230	-8.204	0.181	-7.049	-8.023	-4.498	26	PASS
802.11ac20										
5745	-3.459	-3.926	-3.545	-4.012	0.161	-3.384	-3.851	-0.601	26	PASS
5785	-3.731	-4.448	-3.817	-4.534	0.161	-3.656	-4.373	-0.990	26	PASS
5825	-4.423	-4.505	-4.509	-4.591	0.161	-4.348	-4.430	-1.379	26	PASS
802.11ac40										
5755	-7.847	-8.199	-7.933	-8.285	0.338	-7.595	-7.947	-4.757	26	PASS
5795	-8.594	-8.489	-8.680	-8.575	0.338	-8.342	-8.237	-5.279	26	PASS
802.11ac80										
5775	-13.408	-13.554	-13.494	-13.640	2.163	-11.331	-11.477	-8.393	26	PASS

Note: 1. RB conversion formula: $10 \cdot \log(500\text{KHz}/\text{RBW})$

2. Test plots see Attachment A.

3. The MIMO antenna gain is 10dBi, which is greater than 6dBi, so the limit of MIMO mode will be reduced by 4dBi.

5. BANDWIDTH MEASUREMENT

5.1 EMISSION BANDWIDTH (EBW) 26 BANDWID PROCEDURES / LIMIT

The following procedure shall be used for measuring 26 bandwidth.

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	19.25	Pass
5200	19.42	Pass
5240	19.42	Pass
802.11n(HT20)		
5180	19.84	Pass
5200	19.81	Pass
5240	19.85	Pass
802.11n(HT40)		
5190	39.92	Pass
5230	39.73	Pass
802.11ac(VHT20)		
5180	19.89	Pass
5200	19.83	Pass
5240	19.88	Pass
802.11ac(VHT40)		
5190	39.92	Pass
5230	39.90	Pass
802.11ac(VHT80)		
5210	79.73	Pass

Frequency (MHz)	26dB Bandwidth (MHz)	Pass/Fail
802.11a		
5260	19.33	Pass
5300	19.54	Pass
5320	19.37	Pass
802.11n(HT20)		
5260	19.79	Pass
5300	19.85	Pass
5320	19.76	Pass
802.11n(HT40)		
5270	39.77	Pass
5310	39.76	Pass
802.11ac(VHT20)		
5260	19.90	Pass
5300	19.83	Pass
5320	19.86	Pass
802.11ac(VHT40)		
5270	40.01	Pass
5310	39.98	Pass
802.11ac(VHT80)		
5290	80.09	Pass



Frequency (MHz)	26dB Bandwidth (MHz)	Pass/Fail
802.11a		
5500	19.41	Pass
5580	19.45	Pass
5700	19.26	Pass
802.11n(HT20)		
5500	19.72	Pass
5580	19.99	Pass
5700	19.72	Pass
802.11n(HT40)		
5510	39.77	Pass
5550	39.84	Pass
5670	39.73	Pass
802.11ac(VHT20)		
5500	19.79	Pass
5580	19.83	Pass
5700	19.83	Pass
802.11ac(VHT40)		
5510	40.18	Pass
5550	40.17	Pass
5670	40.14	Pass
802.11ac(VHT80)		
5530	79.77	Pass
5610	80.02	Pass

Frequency (MHz)	26dB Bandwidth (MHz)	Pass/Fail
802.11a		
5745	19.39	Pass
5785	19.36	Pass
5825	19.33	Pass
802.11n(HT20)		
5745	19.79	Pass
5785	19.68	Pass
5825	19.68	Pass
802.11n(HT40)		
5755	39.76	Pass
5795	39.99	Pass
802.11ac(VHT20)		
5745	19.83	Pass
5785	19.84	Pass
5825	19.89	Pass
802.11ac(VHT40)		
5755	40.01	Pass
5795	40.14	Pass
802.11ac(VHT80)		
5775	79.75	Pass

Note:

1. Antenna B Power > Antenna A Power, Both antenna A and B have been test, Only show the worst data of Antenna B.
2. 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.

**5.2.5 TEST RESULTS**

Frequency (MHz)	99% Bandwidth (MHz)	Pass/Fail
802.11a		
5180	16.32	Pass
5200	16.32	Pass
5240	16.32	Pass
802.11n(HT20)		
5180	17.50	Pass
5200	17.50	Pass
5240	17.49	Pass
802.11n(HT40)		
5190	36.14	Pass
5230	36.09	Pass
802.11ac(VHT20)		
5180	17.55	Pass
5200	17.55	Pass
5240	17.54	Pass
802.11ac(VHT40)		
5190	36.05	Pass
5230	36.04	Pass
802.11ac(VHT80)		
5210	75.77	Pass

Frequency (MHz)	99% Bandwidth (MHz)	Pass/Fail
802.11a		
5260	16.34	Pass
5300	16.34	Pass
5320	16.33	Pass
802.11n(HT20)		
5260	17.50	Pass
5300	17.52	Pass
5320	17.52	Pass
802.11n(HT40)		
5270	36.15	Pass
5310	36.14	Pass
802.11ac(VHT20)		
5260	17.50	Pass
5300	17.55	Pass
5320	17.53	Pass
802.11ac(VHT40)		
5270	36.08	Pass
5310	36.01	Pass
802.11ac(VHT80)		
5290	75.75	Pass



Frequency (MHz)	99% Bandwidth (MHz)	Pass/Fail
802.11a		
5500	16.32	Pass
5580	16.32	Pass
5700	16.34	Pass
802.11n(HT20)		
5500	17.49	Pass
5580	17.49	Pass
5700	17.49	Pass
802.11n(HT40)		
5510	36.14	Pass
5550	36.16	Pass
5670	36.14	Pass
802.11ac(VHT20)		
5500	17.54	Pass
5580	17.54	Pass
5700	17.54	Pass
802.11ac(VHT40)		
5510	36.07	Pass
5550	36.06	Pass
5670	36.05	Pass
802.11ac(VHT80)		
5530	75.69	Pass
5610	75.87	Pass

Frequency (MHz)	99% Bandwidth (MHz)	Pass/Fail
802.11a		
5745	16.33	Pass
5785	16.32	Pass
5825	16.32	Pass
802.11n(HT20)		
5745	17.48	Pass
5785	17.50	Pass
5825	17.51	Pass
802.11n(HT40)		
5755	36.14	Pass
5795	36.16	Pass
802.11ac(VHT20)		
5745	17.54	Pass
5785	17.54	Pass
5825	17.55	Pass
802.11ac(VHT40)		
5755	36.05	Pass
5795	36.06	Pass
802.11ac(VHT80)		
5775	75.82	Pass

Note:

1. Antenna B Power > Antenna A Power, Both antenna A and B have been test, Only show the worst data of Antenna B.
2. Test plot see Attachment B

5.3 MINIMUM EMISSION BANDWIDTH(6 DB) PROCEDURES / LIMIT

Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 KHz for the band 5.725-5.85 GHz. The following procedure shall be used for measuring this bandwidth.

5.3.1 TEST PROCEDURE

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures v02r01.
 - a) Set RBW = 100 kHz.
 - b) Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
 - c) Detector = Peak.
 - d) Trace mode = max hold.
 - e) Sweep = auto couple.
 - f) Allow the trace to stabilize.
 - g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

5.3.2 DEVIATION FROM STANDARD

No deviation.

5.3.3 TEST SETUP



5.3.4 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.

**5.3.5 TEST RESULTS**

Frequency (MHz)	6dB Bandwidth (MHz)	Pass/Fail
802.11a		
5745	15.09	Pass
5785	15.11	Pass
5825	15.12	Pass
802.11n(HT20)		
5745	16.52	Pass
5785	16.26	Pass
5825	16.30	Pass
802.11n(HT40)		
5755	35.13	Pass
5795	35.93	Pass
802.11ac(VHT20)		
5745	15.68	Pass
5785	15.09	Pass
5825	16.29	Pass
802.11ac(VHT40)		
5755	35.13	Pass
5795	35.13	Pass
802.11ac(VHT80)		
5775	76.40	Pass

Note:

1. Antenna B Power > Antenna A Power, Both antenna A and B have been test, Only show the worst data of Antenna B.
2. Test plot see Attachment C

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	

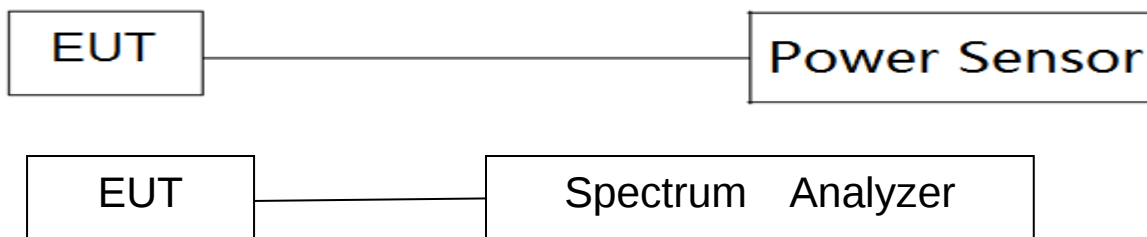
6.2 TEST PROCEDURE

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

Band I (5.15-5.25GHz)								
Test Channel	Frequency (MHz)	Direct measurement Ant_A AV Power (dBm)	Direct measurement Ant B_AV Power (dBm)	Duty cycle factor (dB)	Final Ant_A AV Power (dBm)	Final Ant_B AV Power (dBm)	AV Power Total (dBm)	LIMIT (dBm)
802.11a								
36	5180	8.56	9.70	0.061	8.62	9.76	--	22.99
40	5200	7.85	9.62	0.061	7.92	9.68	--	22.99
48	5240	8.61	9.35	0.061	8.67	9.41	--	22.99
802.11n(HT20)								
36	5180	8.25	8.96	0.066	8.31	9.02	11.69	19.98
40	5200	8.29	8.89	0.066	8.36	8.96	11.68	19.98
48	5240	8.18	8.70	0.066	8.24	8.76	11.52	19.98
802.11n(HT40)								
38	5190	7.76	8.76	0.168	7.93	8.93	11.47	19.98
46	5230	8.52	8.88	0.168	8.68	9.05	11.88	19.98
802.11ac(VHT20)								
36	5180	8.25	8.52	0.161	8.41	8.68	11.56	19.98
40	5200	8.08	8.52	0.161	8.24	8.68	11.48	19.98
48	5240	8.18	8.62	0.161	8.34	8.78	11.57	19.98
802.11ac(VHT40)								
38	5190	7.94	9.11	0.327	8.27	9.44	11.90	19.98
46	5230	8.04	9.42	0.327	8.37	9.75	12.12	19.98
802.11ac(VHT80)								
42	5210	3.71	3.97	2.153	5.86	6.12	9.01	19.98



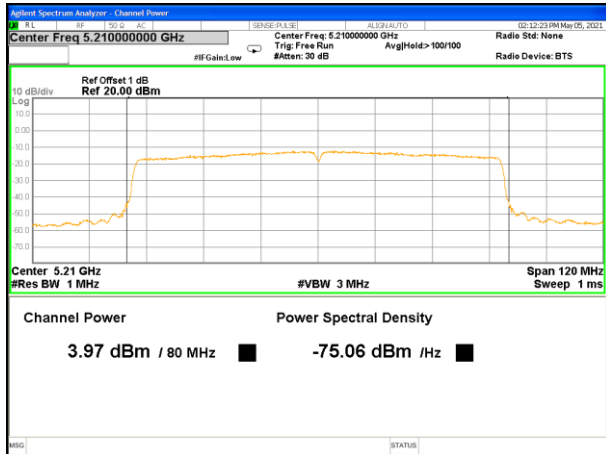
Band II(5.25-5.35GHz)								
Test Channel	Frequency (MHz)	Direct measurement Ant_A AV Power (dBm)	Direct measurement Ant B_AV Power (dBm)	Duty cycle factor (dB)	Final Ant_A AV Power (dBm)	Final Ant_B AV Power (dBm)	AV Power Total (dBm)	LIMIT (dBm)
802.11a								
52	5260	8.75	9.58	0.086	8.83	9.67	--	22.87
60	5300	8.68	9.82	0.086	8.77	9.91	--	22.92
64	5320	8.24	9.92	0.086	8.32	10.01	--	22.88
802.11n(HT20)								
52	5260	8.23	8.62	0.079	8.31	8.70	11.52	19.96
60	5300	8.22	8.86	0.079	8.30	8.94	11.64	19.98
64	5320	8.53	8.98	0.079	8.61	9.06	11.85	19.96
802.11n(HT40)								
54	5270	8.42	8.16	0.169	8.59	8.33	11.48	19.98
62	5310	9.09	8.48	0.169	9.26	8.65	11.98	19.98
802.11ac(VHT20)								
52	5260	8.21	8.28	0.185	8.40	8.46	11.44	19.98
60	5300	8.33	8.25	0.185	8.52	8.44	11.49	19.97
64	5320	8.38	8.70	0.185	8.57	8.89	11.74	19.98
802.11ac(VHT40)								
54	5270	8.46	9.12	0.336	8.80	9.46	12.15	19.98
62	5310	8.76	9.67	0.336	9.09	10.01	12.59	19.98
802.11ac(VHT80)								
58	5290	4.72	4.92	2.119	6.84	7.04	9.95	19.98



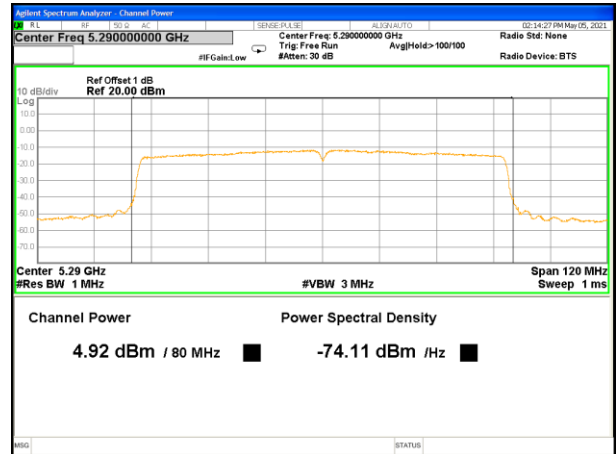
Band III(5.47-5.725GHz)								
Test Channel	Frequency (MHz)	Direct measurement Ant_A AV Power (dBm)	Direct measurement Ant B_AV Power (dBm)	Duty cycle factor (dB)	Final Ant_A AV Power (dBm)	Final Ant_B AV Power (dBm)	AV Power Total (dBm)	LIMIT (dBm)
802.11a								
100	5500	9.00	10.51	0.074	9.08	10.58	--	22.89
116	5580	7.50	9.49	0.074	7.58	9.56	--	22.90
140	5700	7.13	7.14	0.074	7.20	7.21	--	22.86
802.11n(HT20)								
100	5500	8.02	7.96	0.065	8.09	8.03	11.07	19.95
116	5580	6.65	7.70	0.065	6.71	7.76	10.28	19.98
140	5700	5.66	4.94	0.065	5.73	5.00	8.39	19.95
802.11n(HT40)								
102	5510	7.34	7.88	0.167	7.50	8.04	10.79	19.98
110	5550	7.06	7.43	0.167	7.23	7.60	10.43	19.98
134	5670	5.16	5.49	0.167	5.33	5.65	8.51	19.98
802.11ac(VHT20)								
100	5500	7.63	9.63	0.185	7.81	9.81	11.94	19.96
116	5580	6.89	7.86	0.185	7.07	8.04	10.59	19.97
140	5700	6.01	6.34	0.185	6.20	6.53	9.38	19.97
802.11ac(VHT40)								
102	5510	6.59	6.95	0.291	6.88	7.24	10.07	19.98
110	5550	6.41	6.79	0.291	6.70	7.08	9.91	19.98
134	5670	5.32	5.25	0.291	5.61	5.54	8.59	19.98
802.11ac(VHT80)								
106	5530	4.39	5.07	2.197	6.59	7.27	9.95	19.98
122	5610	4.46	4.93	2.197	6.66	7.13	9.91	19.98



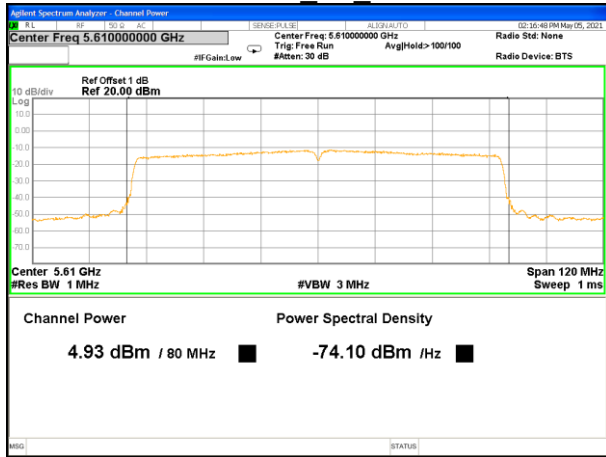
Band IV (5.725-5.85GHz)								
Test Channel	Frequency (MHz)	Direct measurement Ant_A AV Power (dBm)	Direct measurement Ant_B_AV Power (dBm)	Duty cycle factor (dB)	Final Ant_A AV Power (dBm)	Final Ant_B AV Power (dBm)	AV Power Total (dBm)	LIMIT (dBm)
802.11a								
149	5745	10.46	12.26	0.061	10.53	12.32	--	29.01
157	5785	8.87	10.93	0.061	8.93	10.99	--	29.01
165	5825	6.56	8.63	0.061	6.62	8.69	--	29.01
802.11n(HT20)								
149	5745	10.01	12.05	0.079	10.08	12.13	14.234	24.00
157	5785	8.81	10.88	0.079	8.89	10.96	13.055	24.00
165	5825	6.24	8.72	0.079	6.32	8.80	10.747	24.00
802.11n(HT40)								
151	5755	10.46	11.85	0.181	10.64	12.04	14.405	24.00
159	5795	8.42	10.25	0.181	8.60	10.43	12.620	24.00
802.11ac(VHT20)								
149	5745	10.47	12.12	0.161	10.63	12.29	14.546	24.00
157	5785	8.74	10.55	0.161	8.90	10.71	12.912	24.00
165	5825	6.73	8.73	0.161	6.89	8.89	11.012	24.00
802.11ac(VHT40)								
151	5755	10.34	12.10	0.338	10.68	12.43	14.653	24.00
159	5795	9.25	10.76	0.338	9.59	11.10	13.423	24.00
802.11ac(VHT80)								
155	5775	5.44	5.99	2.163	7.60	8.15	10.897	24.00



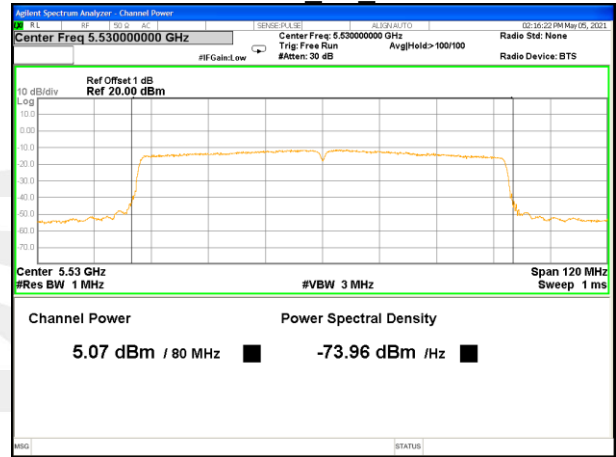
5210MHz_AV_Ant B



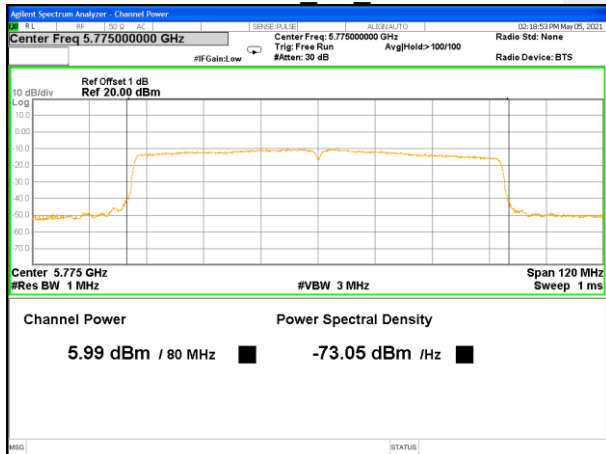
5290MHz_AV_Ant B



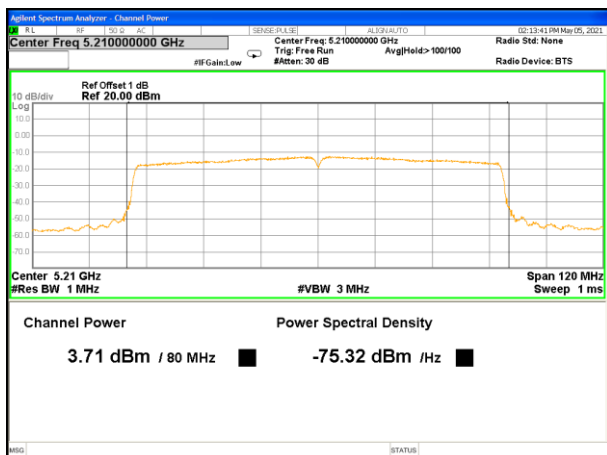
5510MHz_AV_Ant B



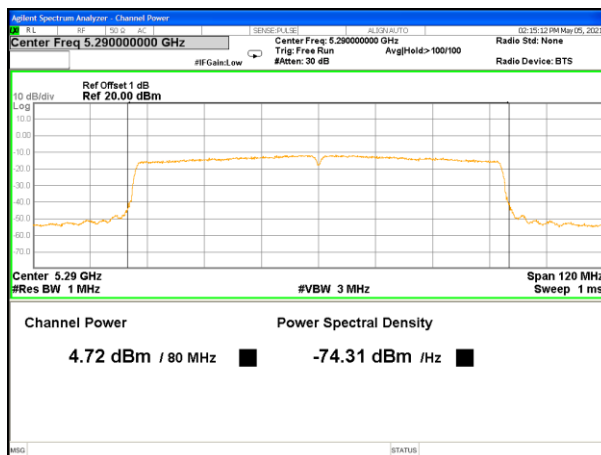
5530MHz_AV_Ant B



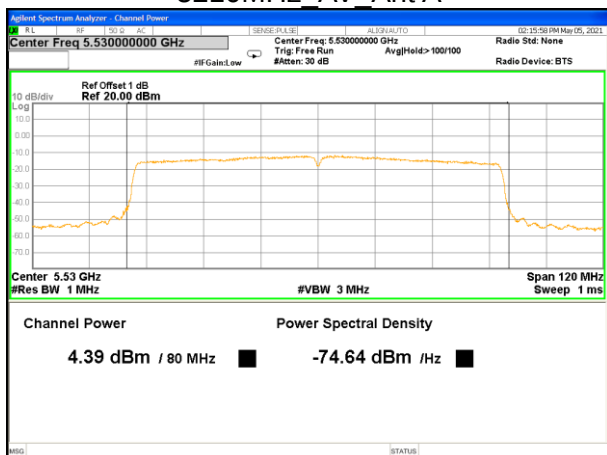
5775MHz_AV_Ant B



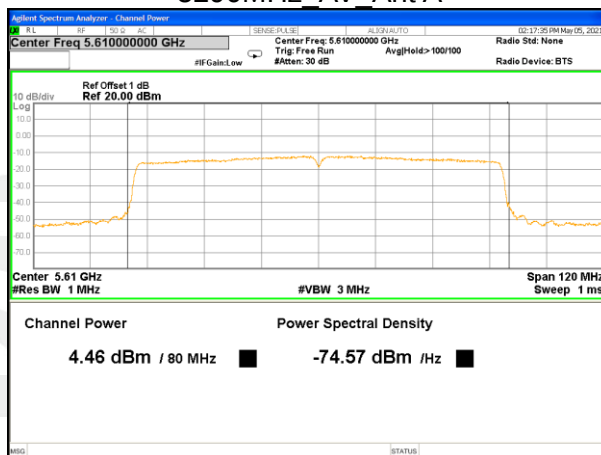
5210MHz_AV_Ant A



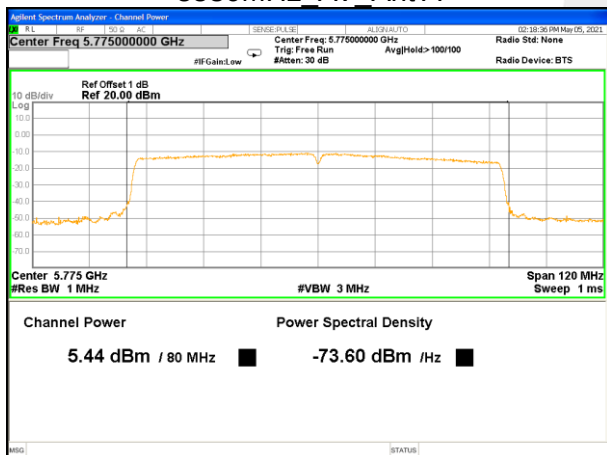
5290MHz_AV_Ant A



5530MHz_AV_Ant A



5610MHz_AV_Ant A



5775MHz_AV_Ant A



Duty cycle

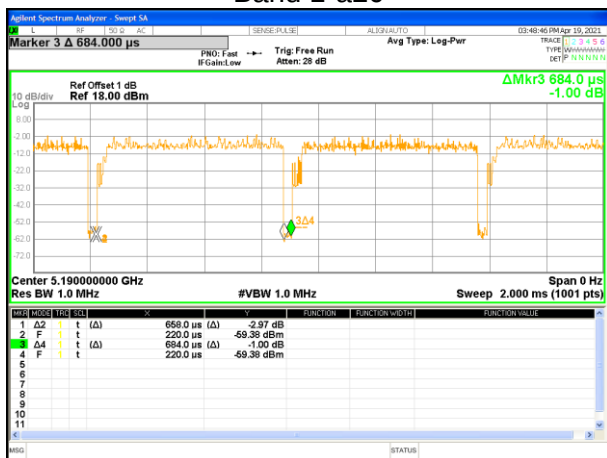
Band1				
Mode	Ton(ms)	Tp(ms)	Duty cycle(%)	Duty factor(dB)
a	1.404	1.424	98.60%	0.061
n20	1.316	1.336	98.50%	0.066
n40	0.658	0.684	96.20%	0.168
ac20	0.690	0.716	96.37%	0.161
ac40	0.358	0.386	92.75%	0.327
ac80	0.958	1.572	60.91%	2.153
Band2				
Mode	Ton(ms)	Tp(ms)	Duty cycle(%)	Duty factor(dB)
a	1.404	1.432	98.04%	0.086
n20	1.312	1.336	98.20%	0.079
n40	0.656	0.682	96.19%	0.169
ac20	0.690	0.720	95.83%	0.185
ac40	0.360	0.389	92.54%	0.336
ac80	0.970	1.580	61.39%	2.119
Band3				
Mode	Ton(ms)	Tp(ms)	Duty cycle(%)	Duty factor(dB)
a	1.404	1.428	98.32%	0.074
n20	1.324	1.344	98.51%	0.065
n40	0.662	0.688	96.22%	0.167
ac20	0.690	0.720	95.83%	0.185
ac40	0.361	0.386	93.52%	0.291
ac80	0.958	1.588	60.30%	2.197
Band4				
Mode	Ton(ms)	Tp(ms)	Duty cycle(%)	Duty factor(dB)
a	1.412	1.432	98.60%	0.061
n20	1.312	1.336	98.20%	0.079
n40	0.658	0.686	95.92%	0.181
ac20	0.690	0.716	96.37%	0.161
ac40	0.358	0.387	92.51%	0.338
ac80	0.965	1.588	60.77%	2.163



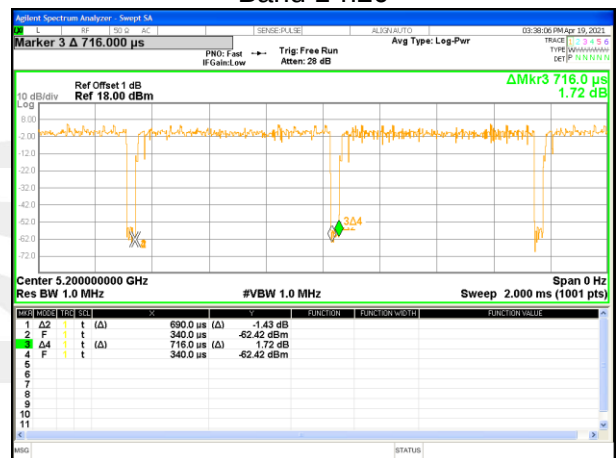
Band 1-a20



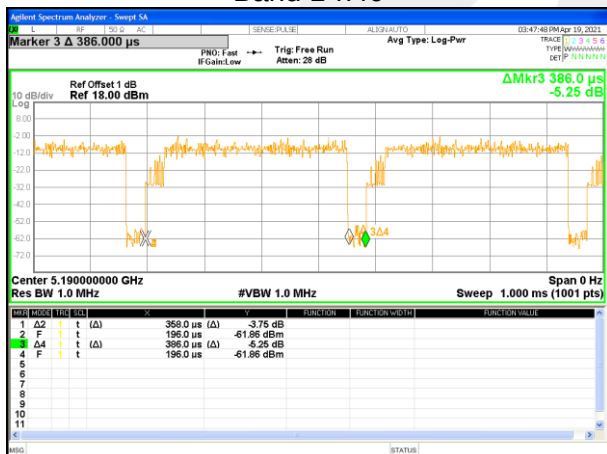
Band 1-n20



Band 1-n40



Band 1-ac20



Band 1-ac40



Band 1-ac80



Band 2-a20



Band 2-n20



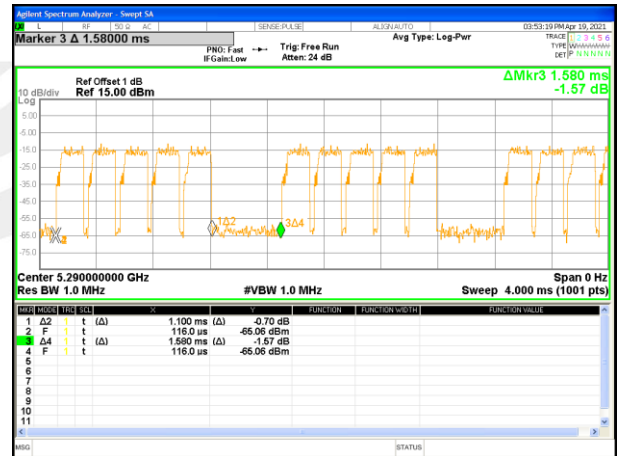
Band 2-n40



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



Band 4-a20



Band 4-n20



Band 4-n40



Band 4-ac20



Band 4-ac40



Band 4-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※※※※※

