FCC RADIO TEST REPORT

FCC 47 CFR PART 15 SUBPART E

Test Standard	**FCC Part 15.407**
Brand name	**Cubo**
Product name	**Cubo AI Baby Monitor**
Model No.	**Cubo1**
Test Result	**Pass**

The test Result was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were given in ANSI C63.10: 2013 and compliance standards.

The test results of this report relate only to the tested sample (EUT) identified in this report.
The test Report of full or partial shall not copy. Without written approval of Compliance Certification Services Inc. (Wugu Laboratory)

Approved by:

Sam Chuang
Manager

Tested by:

Jerry Chuang
Engineer

Revision History

Rev.	Issue Date	Revisions	Revised By
00	November 15, 2018	Initial Issue	May Lin
01	January 4, 2019	1. Revise section 4.5.4 Detector type to Peak in page 104, 105, 108-127 2. Revise section 4.6.2 in page 128.	Doris Chu

Table of contents

1. GENERAL INFORMATION....4
1.1 EUT INFORMATION....4
1.2 EUT CHANNEL INFORMATION....5
1.3 ANTENNA INFORMATION....6
1.4 MEASUREMENT UNCERTAINTY....6
1.5 FACILITIES AND TEST LOCATION....7
1.6 INSTRUMENT CALIBRATION....8
1.7 SUPPORT AND EUT ACCESSORIES EQUIPMENT....9
1.8 TEST METHODOLOGY AND APPLIED STANDARDS....9
2. TEST SUMMERY....10
3. DESCRIPTION OF TEST MODES....11
3.1 THE WORST MODE OF OPERATING CONDITION....11
3.2 THE WORST MODE OF MEASUREMENT....12
3.3 EUT DUTY CYCLE....13
4. TEST RESULT....14
4.1 AC POWER LINE CONDUCTED EMISSION....14
4.2 26dB BANDWIDTH, 6dB BANDWIDTH AND OCCUPIED BANDWIDTH(99%)....17
4.3 OUTPUT POWER MEASUREMENT....40
4.4 POWER SPECTRAL DENSITY....44
4.5 RADIATION BANDEDGE AND SPURIOUS EMISSION....58
4.6 FREQUENCY STABILITY....128
APPENDIX 1 - PHOTOGRAPHS OF EUT

1. GENERAL INFORMATION

1.1 EUT INFORMATION

Applicant	Yun yun AI Baby camera Co., Ltd. No.239, Hulin St., Xinyi Dist., Taipei City 110, Taiwan
Manufacturer	Qun-da Technology Co., Ltd. No.154-2, Yuan Pei St., HsinChu, Taiwan, (R.O.C.)
Equipment	Cubo AI Baby Monitor
Model Name	Cubo1
Model Discrepancy	N/A
Received Date	June 25, 2018
Date of Test	July 9 ~ August 27, 2018
Power Supply	VDC from Power Adapter Shenzhen Mingxin Power Technologies Co., Ltd. / MX520J I/P: 100-240Vac, 50-60Hz, 0.35A O/P: 5Vdc, 2A
Output Power(W)	

Band	Mode	Frequency Range (MHz)	Output Power (W)
U-NII-1	IEEE 802.11a	5180 ~ 5240	0.0302
	IEEE 802.11n HT 20	5180 ~ 5240	0.0492
	IEEE 802.11n HT 40	5190 ~ 5230	0.0286
	IEEE 802.11ac VHT 80	5210	0.1754
U-NII-3	IEEE 802.11a	5745 ~ 5825	0.0796
	IEEE 802.11n HT 20	5745 ~ 5825	0.1489
	IEEE 802.11n HT 40	5755 ~ 5795	0.1358
	IEEE 802.11ac VHT 80	5775	0.6808

1.2 EUT CHANNEL INFORMATION

Frequency Range	**UNII-1**
	IEEE 802.11a: 5180 ~ 5240 MHz
	IEEE 802.11n HT 20: 5180 ~ 5240 MHz
	IEEE 802.11n HT 40: 5190 ~ 5230 MHz
	IEEE 802.11ac VHT 80: 5210 MHz
	UNII-3
	IEEE 802.11a: 5745 ~ 5825 MHz
	IEEE 802.11n HT 20: 5745 ~ 5825 MHz
	IEEE 802.11n HT 40: 5755 ~ 5795 MHz
	IEEE 802.11ac VHT 80: 5775 MHz
Modulation Type	1. IEEE 802.11a mode: OFDM 2. IEEE 802.11n HT 20 mode: OFDM 3. IEEE 802.11n HT 40 mode: OFDM 4. IEEE 802.11ac VHT 80 mode: OFDM

Remark:
Refer as ANSI C63.10: 2013 clause 5.6.1 Table 4 for test channels

Number of frequencies to be tested		
Frequency range in which device operates	**Number of frequencies**	**Location in frequency range of operation**
☐ 1 MHz or less	1	Middle
☐ 1 MHz to 10 MHz	2	1 near top and 1 near bottom
☒ More than 10 MHz	3	1 near top, 1 near middle, and 1 near bottom

1.3 ANTENNA INFORMATION

Antenna Type	☒ FPC ☐ PCB ☐ Dipole ☐ Coils
Antenna Gain	

No.	Brand name	Model no.	Length of antenna cable	Peak Gain (dBi)
1	LB-LINK	FDG3L60IB	60mm	3
2	LB-LINK	FDG3L60IB	60mm	3

1.4 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
AC Powerline Conducted Emission	+/- 1.2575
Emission bandwidth, 20dB bandwidth	+/- 1.4003
RF output power, conducted	+/- 1.1372
Power density, conducted	+/- 1.4003
3M Semi Anechoic Chamber / 30M~200M	+/- 4.0138
3M Semi Anechoic Chamber / 200M~1000M	+/- 3.9483
3M Semi Anechoic Chamber / 1G~8G	+/- 2.5975
3M Semi Anechoic Chamber / 8G~18G	+/- 2.6112
3M Semi Anechoic Chamber / 18G~26G	+/- 2.7389
3M Semi Anechoic Chamber / 26G~40G	+/- 2.9683

***Remark**:*
1.This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2
2. ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report.

1.5 FACILITIES AND TEST LOCATION

All measurement facilities used to collect the measurement data are located at *No.11, Wugong 6th Rd., Wugu Dist., New Taipei City 24891, Taiwan. (R.O.C.)*

Test site	Test Engineer	Remark
AC Conduction Room	Dally Hong	-
Radiation	Jerry Chuang	-
RF Conducted	Jerry Chuang	-

Remark: *The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.*

1.6 INSTRUMENT CALIBRATION

RF Conducted Test Site					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal Date**	**Cal Due**
Coaxial Cable	Woken	WC12	CC001	06/29/2018	06/28/2019
Power Meter	Anritsu	ML2495A	1149001	02/06/2018	02/05/2019
Power Seneor	Anritsu	MA2491A	030982	02/07/2018	02/06/2019
Signal Analyzer	R&S	FSV 40	101561	08/24/2018	08/23/2019
Thermostatic/ Hrgrosatic Chamber	GWINSTEK	GTC-288MH-CC	TH160402	05/17/2018	05/16/2019

3M 966 Chamber Test Site					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal Date**	**Cal Due**
Bilog Antenna	Sunol Sciences	JB1	A052609	03/14/2018	03/13/2019
Cable	HUBER SUHNER	SUCOFLEX 104PEA	25157	06/29/2018	06/28/2019
Cable	HUBER SUHNER	SUCOFLEX 104PEA	20995	06/29/2018	06/28/2019
Digital Thermo-Hygro Meter	WISEWIND	1206	D07	02/08/2018	02/07/2019
Double Ridged Guide Horn Antenna	ETC	MCTD 1209	DRH13M02003	08/25/2017	08/24/2018
High Pass Filters	MICRO TRONICS	HPM13195	003	05/14/2018	05/13/2019
Horn Antenna	ETS LINDGREN	3116	00026370	01/04/2018	01/03/2019
Loop Ant	COM-POWER	AL-130	121051	03/21/2018	03/20/2019
Pre-Amplifier	EMEC	EM330	060609	06/29/2018	06/28/2019
Pre-Amplifier	MITEQ	AMF-6F-260400-40-8P	985646	06/21/2018	06/20/2019
Pre-Amplifier	HP	8449B	3008A00965	06/29/2018	06/28/2019
PSA Series Spectrum Analyzer	Agilent	E4446A	MY46180323	05/31/2018	05/30/2019
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R	N.C.R

AC Conducted Emissions Test Site					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal Date**	**Cal Due**
CABLE	EMCI	CFD300-NL	CERF	07/03/2018	07/02/2019
EMI Test Receiver	R&S	ESCI	100064	07/24/2018	07/23/2019
LISN	SCHWARZBECK	NSLK 8127	8127-541	02/09/2018	02/08/2019
LISN	SCHAFFNER	NNB41	03/10013	02/06/2018	02/05/2019

Remark: *Each piece of equipment is scheduled for calibration once a year.*

1.7 SUPPORT AND EUT ACCESSORIES EQUIPMENT

EUT Accessories Equipment					
No.	**Equipment**	**Brand**	**Model**	**Series No.**	**FCC ID**
	N/A				

Support Equipment					
No.	**Equipment**	**Brand**	**Model**	**Series No.**	**FCC ID**
1.	NB	HP	dv6-1332TX	CNF9491GPS	N/A
2.	NB(H)	Acer	Aspire 4320 series	R33142	QDS-BRCM1018

1.8 TEST METHODOLOGY AND APPLIED STANDARDS

The test methodology, setups and results comply with all requirements in accordance with ANSI C63.10:2013, FCC Part 2, FCC Part 15.407, KDB 662911 D01, KDB 789033 D02

2. TEST SUMMERY

FCC Standard Sec.	Chapter	Test Item	Result
15.203	1.3	Antenna Requirement	Pass
15.207	4.1	AC Conducted Emission	Pass
15.403(i)	4.2	26dB Bandwidth	Pass
15.407(e)	4.2	6dB Bandwidth	Pass
2.1049	4.2	Occupied Bandwidth (99%)	Pass
15.407(a)	4.3	Output Power Measurement	Pass
15.407(a)	4.4	Power Spectral Density	Pass
15.407(b)	4.5	Radiation Band Edge	Pass
15.407(b)	4.5	Radiation Spurious Emission	Pass
15.407(g)	4.6	Frequency Stability	Pass

3. DESCRIPTION OF TEST MODES

3.1 THE WORST MODE OF OPERATING CONDITION

<table>
<tr><td>Operation mode</td><td>1. IEEE 802.11a mode: 6Mbps
2. IEEE 802.11n HT 20 mode: MCS8
3. IEEE 802.11n HT 40 mode: MCS8
4. IEEE 802.11ac VHT 80 mode: MCS8</td></tr>
<tr><td>Operating Frequency Range &
Number of Channels</td><td>
<table>
<tr><th></th><th>Mode</th><th>Frequency Range (MHz)</th><th>Number of Channels</th></tr>
<tr><td rowspan="4">U-NII-1</td><td>IEEE 802.11a</td><td>5180 ~ 5240</td><td>4 Channels</td></tr>
<tr><td>IEEE 802.11n HT 20</td><td>5180 ~ 5240</td><td>4 Channels</td></tr>
<tr><td>IEEE 802.11n HT 40</td><td>5190 ~ 5230</td><td>2 Channels</td></tr>
<tr><td>IEEE 802.11ac VHT 80</td><td>5210</td><td>1 Channels</td></tr>
<tr><td rowspan="4">U-NII-3</td><td>IEEE 802.11a</td><td>5745 ~ 5825</td><td>5 Channels</td></tr>
<tr><td>IEEE 802.11n HT 20</td><td>5745 ~ 5825</td><td>5 Channels</td></tr>
<tr><td>IEEE 802.11n HT 40</td><td>5755 ~ 5795</td><td>2 Channels</td></tr>
<tr><td>IEEE 802.11ac VHT 80</td><td>5775</td><td>1 Channels</td></tr>
</table>
</td></tr>
</table>

3.2 THE WORST MODE OF MEASUREMENT

AC Power Line Conducted Emission	
Test Condition	AC Power line conducted emission for line and neutral
Power supply Mode	Mode 1: EUT power by adapter
Worst Mode	☒ Mode 1 ☐ Mode 2 ☐ Mode 3 ☐ Mode 4

Radiated Emission Measurement Above 1G	
Test Condition	Band edge, Emission for Unwanted and Fundamental
Power supply Mode	Mode 1: EUT power by adapter
Worst Mode	☒ Mode 1 ☐ Mode 2 ☐ Mode 3 ☐ Mode 4
Worst Position	☐ Placed in fixed position. ☒ Placed in fixed position at X-Plane (E2-Plane) ☐ Placed in fixed position at Y-Plane (E1-Plane) ☐ Placed in fixed position at Z-Plane (H-Plane)
Worst Polarity	☐ Horizontal ☒ Vertical

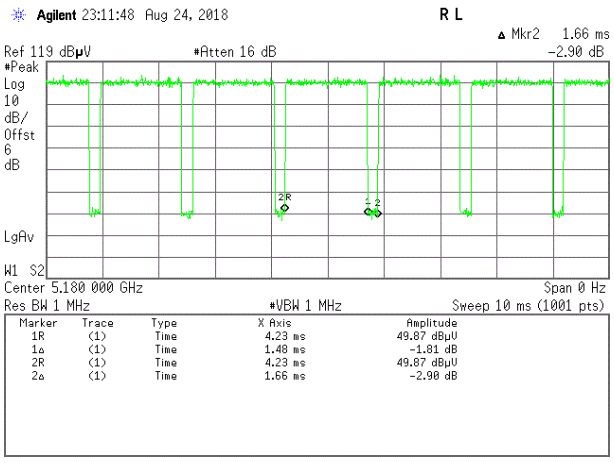
Radiated Emission Measurement Below 1G	
Test Condition	Radiated Emission Below 1G
Power supply Mode	Mode 1: EUT power by adapter
Worst Mode	☒ Mode 1 ☐ Mode 2 ☐ Mode 3 ☐ Mode 4

Remark:
1. The worst mode was record in this test report.
2. EUT pre-scanned in three axis, X, Y, Z and two polarity, Horizontal and Vertical for radiated measurement. The worst case (X-Plane and Vertical) were recorded in this report
3. AC power line conducted emission and for below 1G radiation emission were performed the EUT transmit at the highest output power channel as worse case.

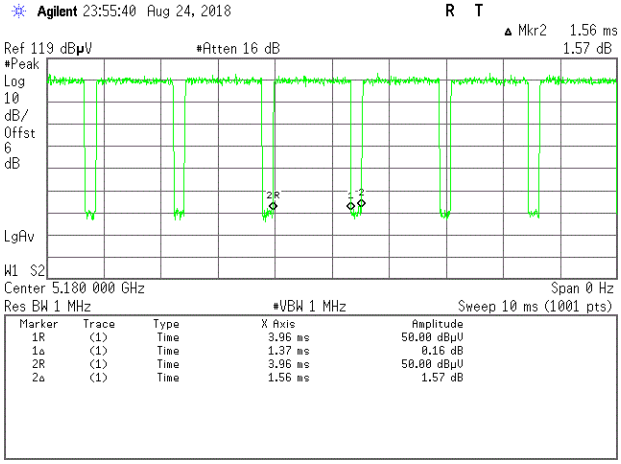
3.3 EUT DUTY CYCLE

Duty Cycle			
Configuration	TX ON (ms)	TX ALL (ms)	Duty Cycle (%)
802.11a	1.4800	1.6600	89.16%
802.11n HT20	1.3700	1.5600	87.82%
802.11n HT40	0.7000	0.8900	78.65%
802.11ac VHT80	0.3800	0.5300	71.70%

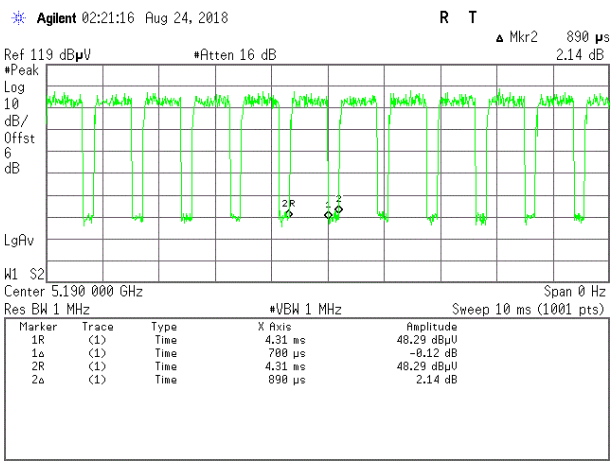
802.11a



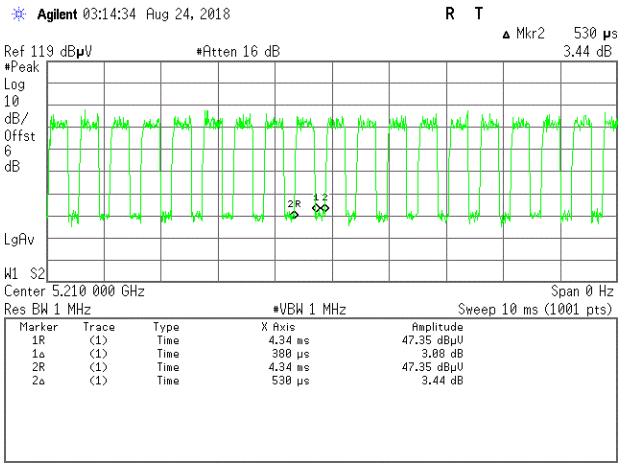
802.11n HT20



802.11n HT40



802.11ac VHT80



4. TEST RESULT

4.1 AC POWER LINE CONDUCTED EMISSION

4.1.1 Test Limit

According to §15.207(a)

Frequency Range (MHz)	Limits(dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50

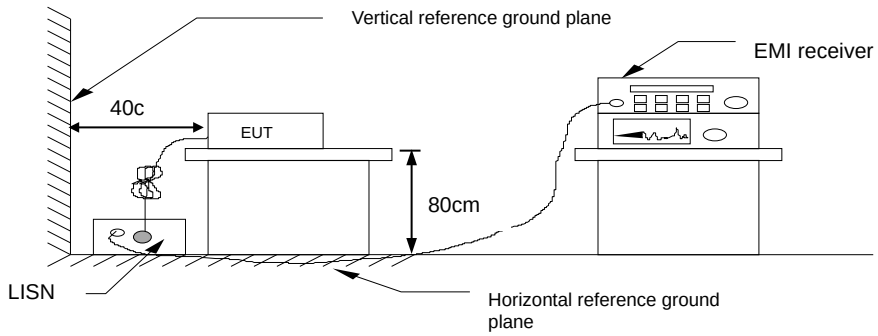
* Decreases with the logarithm of the frequency.

4.1.2 Test Procedure

Test method Refer as ANSI C63.10: 2013 clause 6.2,

1. The EUT was placed on a non-conducted table, which is 0.8m above horizontal ground plane and 0.4m above vertical ground plane.
2. EUT connected to the line impedance stabilization network (LISN)
3. Receiver set RBW of 9kHz and Detector Peak, and note as quasi-peak and average.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. Recorded Line for Neutral and Line.

4.1.3 Test Setup

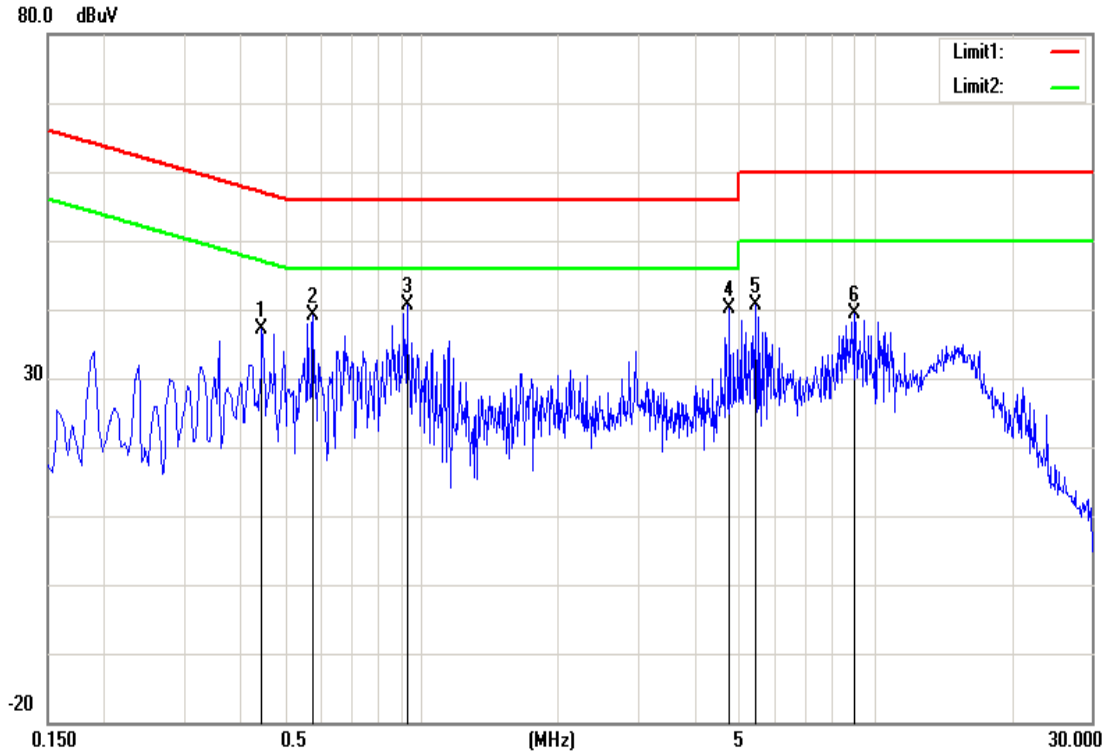


4.1.4 Test Result

Pass.

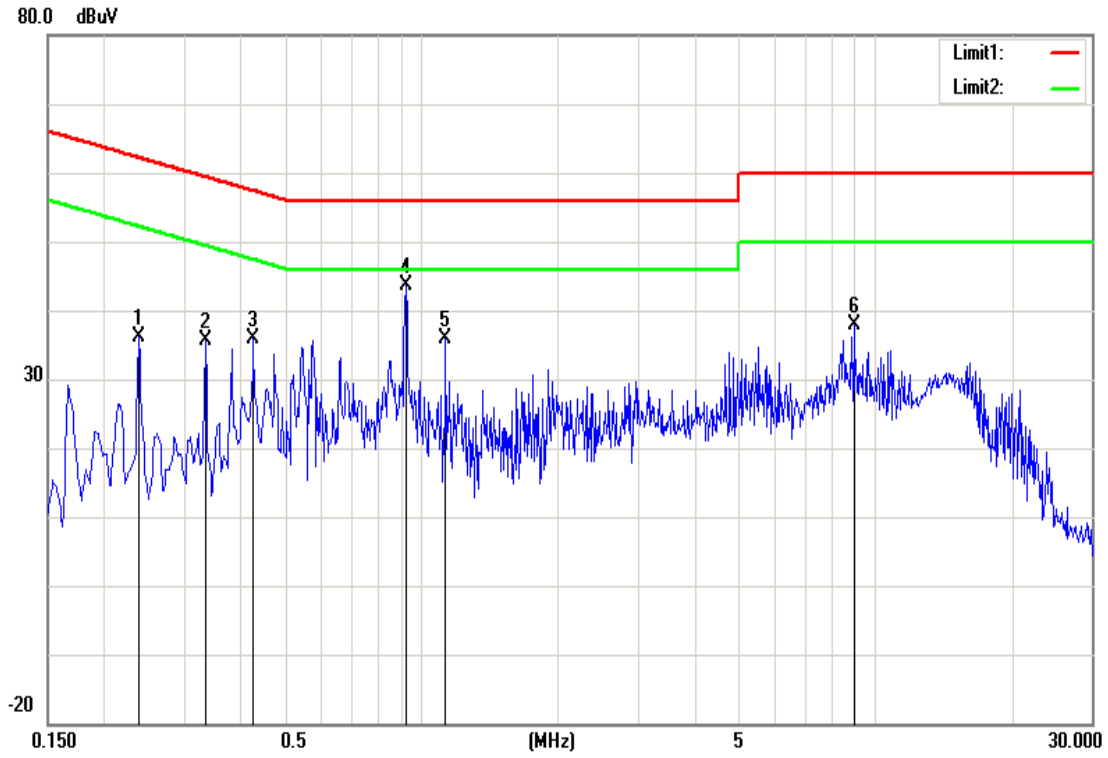
Test Data

Test Mode	Mode 1	Temp/Hum	24(℃)/ 50%RH
Phase	Line	Test Date	July 30, 2018
Test Voltage:	120Vac	Test Engineer	Dally Hong



Frequency (MHz)	Quasi Peak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	Quasi Peak result (dBuV)	Average result (dBuV)	Quasi Peak limit (dBuV)	Average limit (dBuV)	Quasi Peak margin (dB)	Average margin (dB)	Remark
0.4460	33.74	27.09	0.12	33.86	27.21	56.95	46.95	-23.09	-19.74	Pass
0.5780	38.59	34.89	0.12	38.71	35.01	56.00	46.00	-17.29	-10.99	Pass
0.9300	40.30	25.78	0.13	40.43	25.91	56.00	46.00	-15.57	-20.09	Pass
4.7860	37.97	33.49	0.20	38.17	33.69	56.00	46.00	-17.83	-12.31	Pass
5.4580	39.70	34.56	0.22	39.92	34.78	60.00	50.00	-20.08	-15.22	Pass
8.9980	38.96	32.04	0.28	39.24	32.32	60.00	50.00	-20.76	-17.68	Pass

Test Mode	Mode 1	Temp/Hum	24(℃)/ 50%RH
Phase	Neutral	Test Date	July 30, 2018
Test Voltage:	120Vac	Test Engineer	Dally Hong



Frequency (MHz)	Quasi Peak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	Quasi Peak result (dBuV)	Average result (dBuV)	Quasi Peak limit (dBuV)	Average limit (dBuV)	Quasi Peak margin (dB)	Average margin (dB)	Remark
8.9980	34.28	25.85	0.28	34.56	26.13	60.00	50.00	-25.44	-23.87	Pass
0.3340	22.48	11.58	0.13	22.61	11.71	59.35	49.35	-36.74	-37.64	Pass
0.4260	25.15	16.73	0.13	25.28	16.86	57.33	47.33	-32.05	-30.47	Pass
0.9260	41.46	24.83	0.14	41.60	24.97	56.00	46.00	-14.40	-21.03	Pass
1.1340	27.57	16.50	0.14	27.71	16.64	56.00	46.00	-28.29	-29.36	Pass
9.0020	35.17	27.38	0.28	35.45	27.66	60.00	50.00	-24.55	-22.34	Pass

4.2 26dB BANDWIDTH, 6dB BANDWIDTH AND OCCUPIED BANDWIDTH (99%)

4.2.1 Test Limit

26 dB Bandwidth ：For reporting purposes only.

6 dB Bandwidth ：Least 500kHz.

Occupied Bandwidth(99%) ： For reporting purposes only.

4.2.2 Test Procedure

Test method Refer as KDB 789033 D02 and ANSI C63.10: 2013 clause 6.9.2,

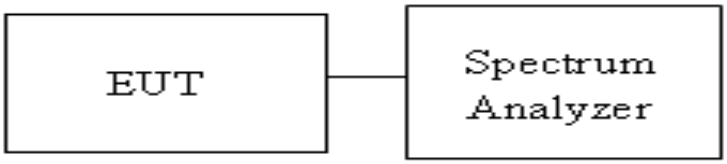
1. The EUT RF output connected to the spectrum analyzer by RF cable.
2. Setting maximum power transmit of EUT
3. UNII-1, UNII-2a and UNII-2c,

   (1) BW=20MHz : SA set RBW = 300kHz, VBW = 1MHz and Detector = Peak, to measurement 26 dB Bandwidth and 99% Bandwidth

   (2) BW=40MHz : SA set RBW = 1MHz, VBW = 3MHz and Detector = Peak, to measurement 26 dB Bandwidth and 99% Bandwidth

   (3) BW=80MHz : SA set RBW = 1MHz, VBW = 3MHz and Detector = Peak, to measurement 26 dB Bandwidth and 99% Bandwidth
4. UNII-3, SA set RBW = 100kHz, VBW = 300kHz and Detector = Peak, to measurement 6 dB Bandwidth and 99% Bandwidth
5. SA set RBW = 1% ~ 5% OBW, VBW = three times the RBW and Detector = Peak, to measurement 99% Bandwidth
6. Measure and record the result of 6 dB Bandwidth and 99% Bandwidth. in the test report.

4.2.3 Test Setup



4.2.4 Test Result

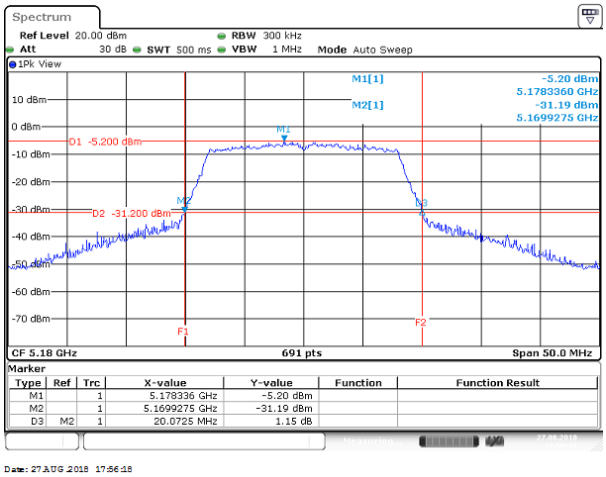
UNII-1					
Test mode: IEEE 802.11a mode					
Channel	**Frequency (MHz)**	**Chain 0 OBW(99%) (MHz)**	**Chain 1 OBW(99%) (MHz)**	**Chain 0 26dB BW (MHz)**	**Chain 1 26dB BW (MHz)**
Low	5180	16.7872	-	20.0725	-
Mid	5220	16.6425	-	20.2899	-
High	5240	16.5701	-	20.1449	-
Test mode: IEEE 802.11n HT20 mode					
Channel	**Frequency (MHz)**	**Chain 0 OBW(99%) (MHz)**	**Chain 1 OBW(99%) (MHz)**	**Chain 0 26dB BW (MHz)**	**Chain 1 26dB BW (MHz)**
Low	5180	17.7279	17.5832	20.6522	20.2899
Mid	5220	17.7279	17.6555	20.6522	20.3623
High	5240	17.5832	17.5832	20.5072	20.1499
Test mode: IEEE 802.11n HT40 mode					
Channel	**Frequency (MHz)**	**Chain 0 OBW(99%) (MHz)**	**Chain 1 OBW(99%) (MHz)**	**Chain 0 26dB BW (MHz)**	**Chain 1 26dB BW (MHz)**
Low	5190	36.2373	36.0057	41.971	41.623
High	5230	36.1215	36.0057	41.739	41.739
Test mode: IEEE 802.11ac VHT80 mode					
Channel	**Frequency (MHz)**	**Chain 0 OBW(99%) (MHz)**	**Chain 1 OBW(99%) (MHz)**	**Chain 0 26dB BW (MHz)**	**Chain 1 26dB BW (MHz)**
Mid	5210	75.0217	74.7901	80.928	81.391

UNII-3					
Test mode: IEEE 802.11a mode					
Channel	**Frequency (MHz)**	**Chain 0 OBW(99%) (MHz)**	**Chain 1 OBW(99%) (MHz)**	**Chain 0 6dB BW (MHz)**	**Chain 1 6dB BW (MHz)**
Low	5745	18.1620	-	16.3043	-
Mid	5785	18.0897	-	16.3043	-
High	5825	18.3068	-	16.3478	-
Test mode: IEEE 802.11n HT20 mode					
Channel	**Frequency (MHz)**	**Chain 0 OBW(99%) (MHz)**	**Chain 1 OBW(99%) (MHz)**	**Chain 0 6dB BW (MHz)**	**Chain 1 6dB BW (MHz)**
Low	5745	18.5962	17.9450	17.0435	17.5217
Mid	5785	18.4515	18.9580	17.0	17.5652
High	5825	18.7409	18.3791	16.8696	17.5652
Test mode: IEEE 802.11n HT40 mode					
Channel	**Frequency (MHz)**	**Chain 0 OBW(99%) (MHz)**	**Chain 1 OBW(99%) (MHz)**	**Chain 0 6dB BW (MHz)**	**Chain 1 6dB BW (MHz)**
Low	5755	38.0897	37.3950	35.13	35.13
High	5795	39.1316	37.9739	35.13	35.13
Test mode: IEEE 802.11ac VHT80 mode					
Channel	**Frequency (MHz)**	**Chain 0 OBW(99%) (MHz)**	**Chain 1 OBW(99%) (MHz)**	**Chain 0 6dB BW (MHz)**	**Chain 1 6dB BW (MHz)**
Mid	5775	75.7163	75.4848	75.13	75.13

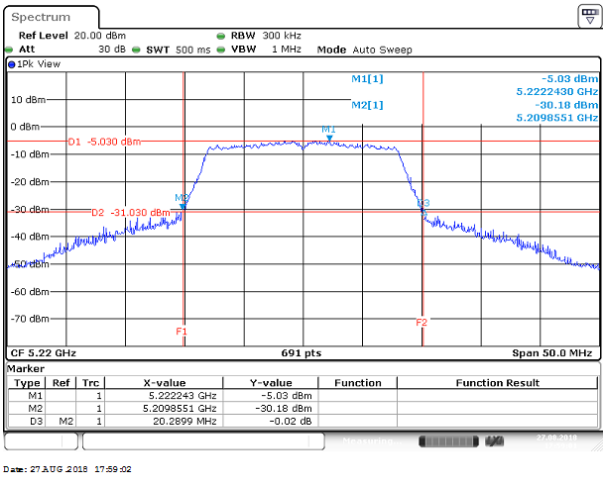
Test Data 26dB BANDWIDTH

UNII-1 IEEE 802.11a mode- chain 0

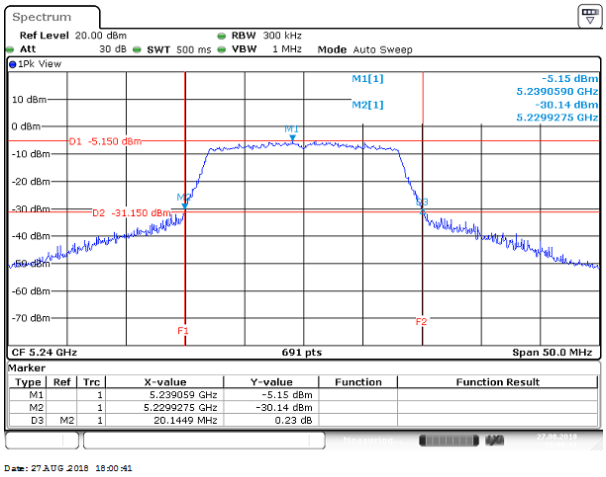
Low CH

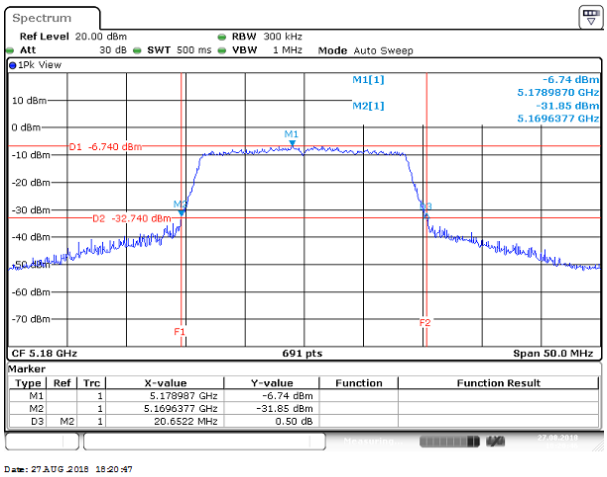
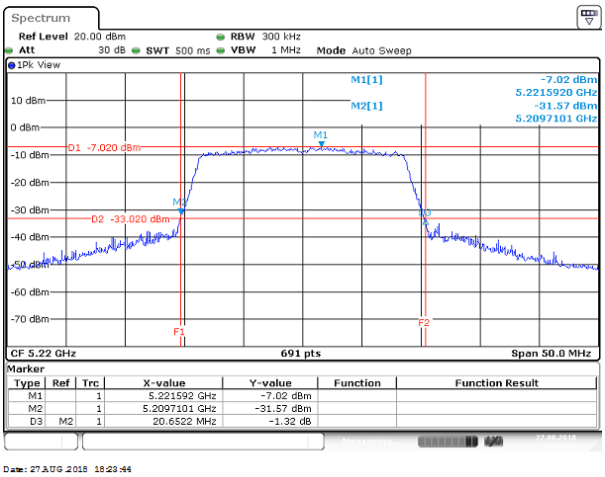
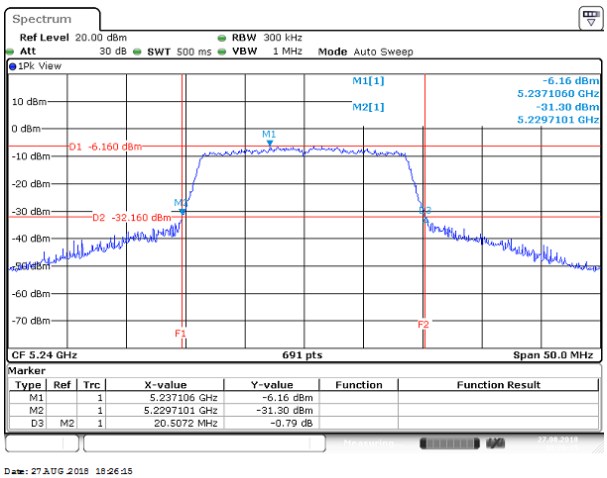


Mid CH



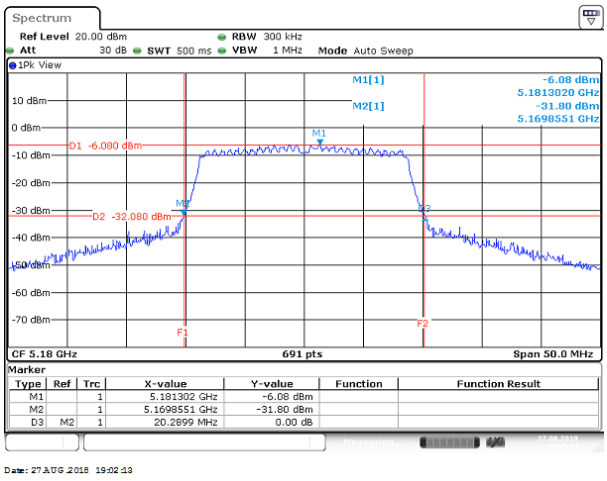
High CH



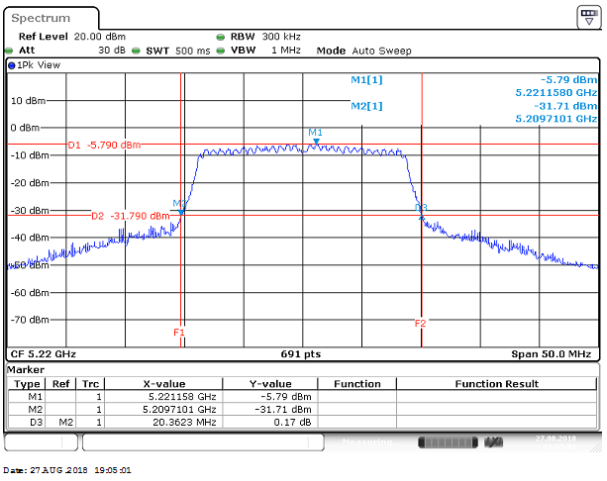
UNII-1 IEEE 802.11n HT20 mode- chain 0	
Low CH	**Mid CH**
	
High CH	
	

UNII-1 IEEE 802.11n HT20 mode- chain 1

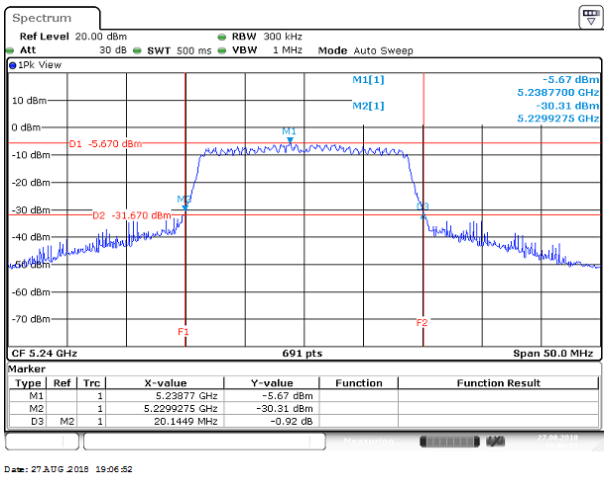
Low CH

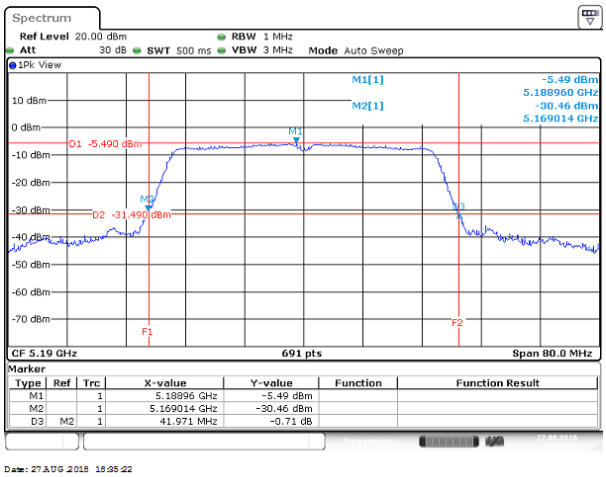
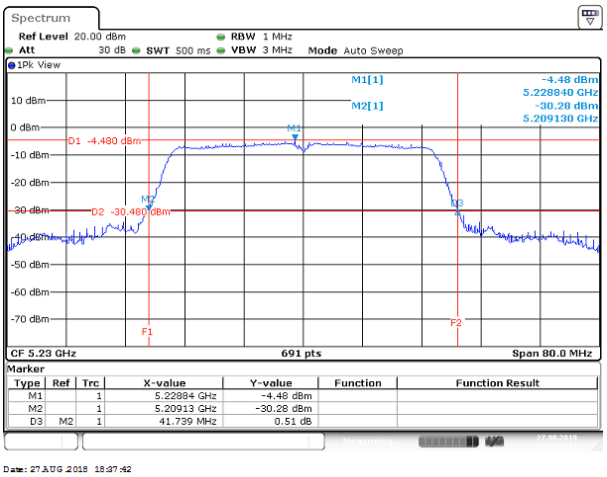


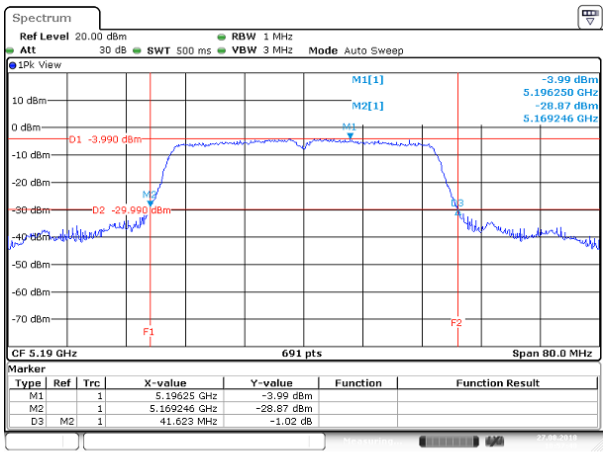
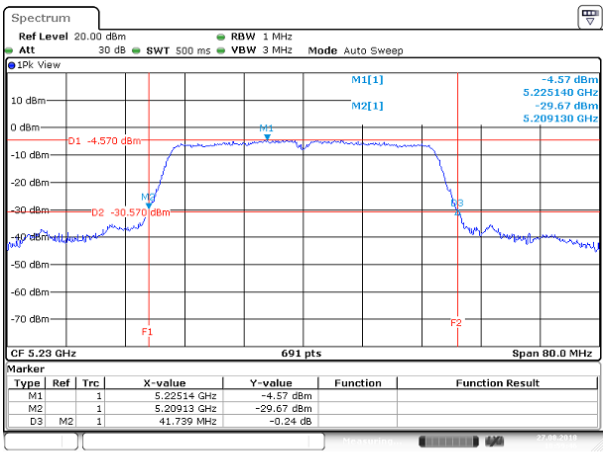
Mid CH

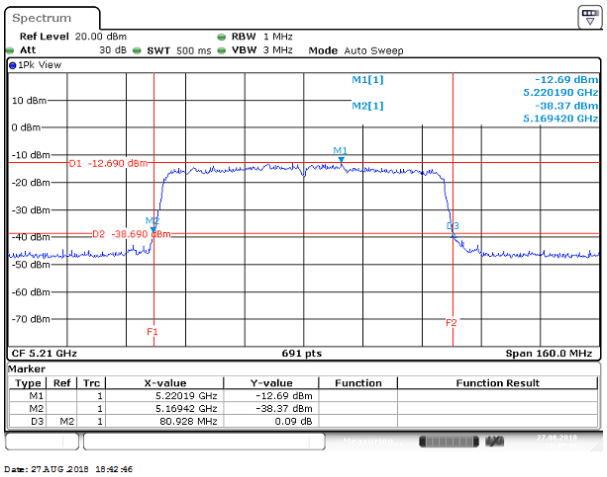


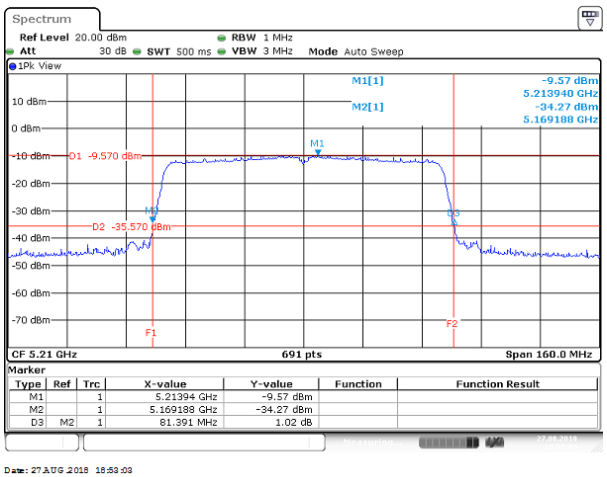
High CH



UNII-1 IEEE 802.11n HT40 mode- chain 0	
Low CH	**High CH**
	

UNII-1 IEEE 802.11n HT40 mode- chain 1	
Low CH	**High CH**
	

UNII-1 IEEE 802.11ac VHT80 mode- chain 0	
Mid CH	
	

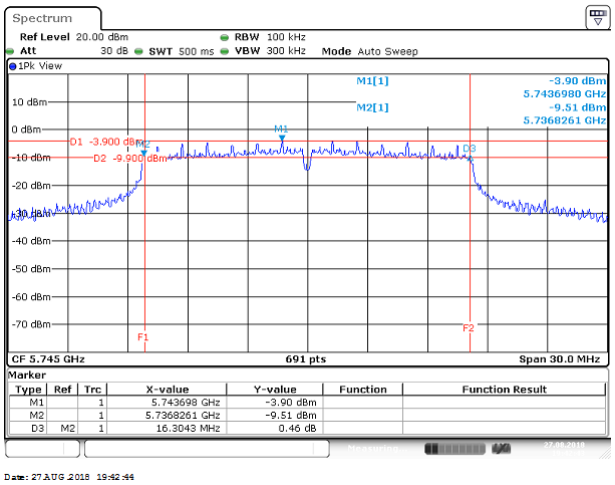
UNII-1 IEEE 802.11ac VHT80 mode- chain 1	
Mid CH	
	

Report No.: T180625W01-RP2

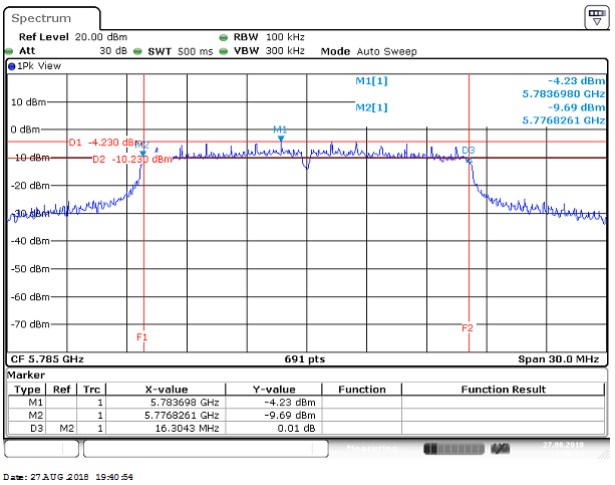
Test Data 6dB BANDWIDTH

UNII-3 IEEE 802.11a mode- chain 0

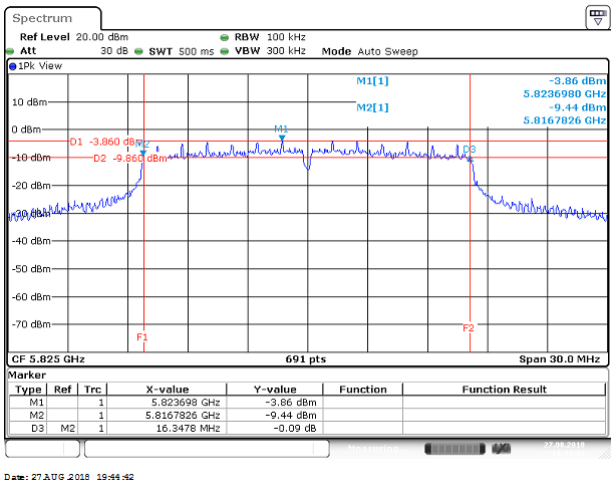
Low CH

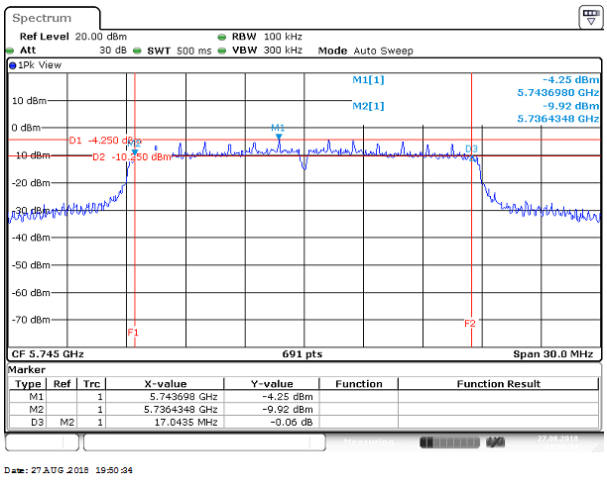
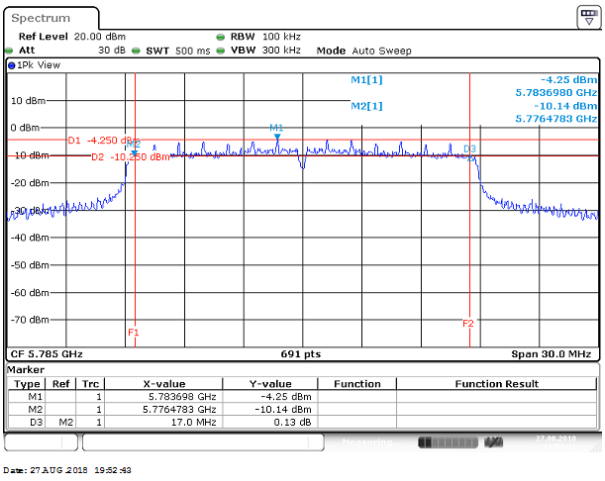
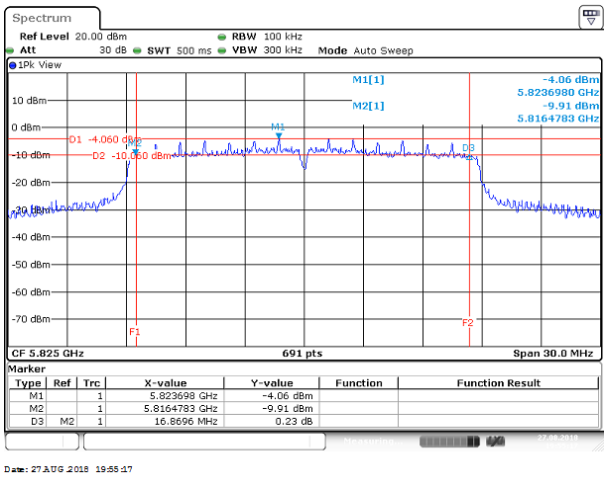


Mid CH



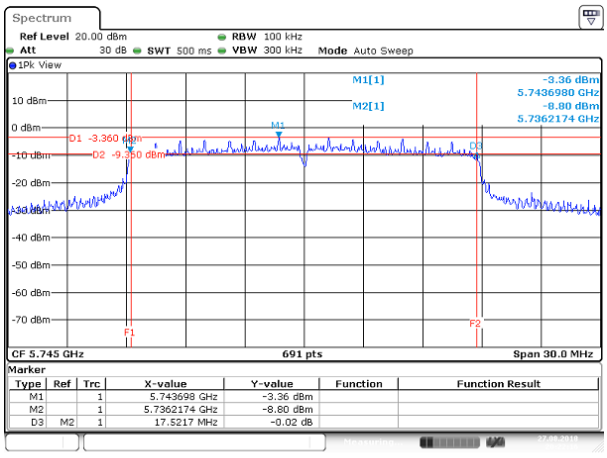
High CH



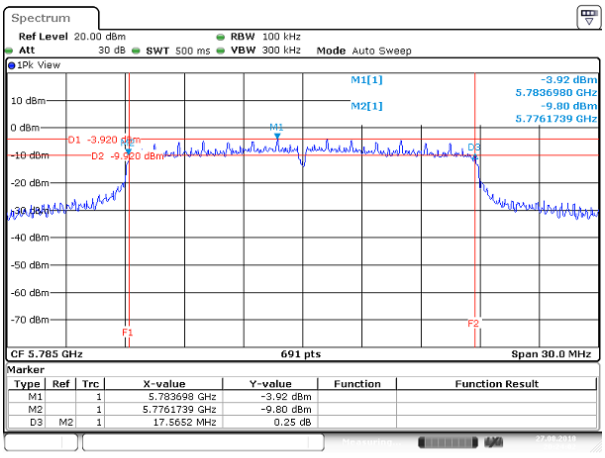
UNII-3 IEEE 802.11n HT20 mode- chain 0	
Low CH	**Mid CH**
	
High CH	
	

UNII-3 IEEE 802.11n HT20 mode- chain 1

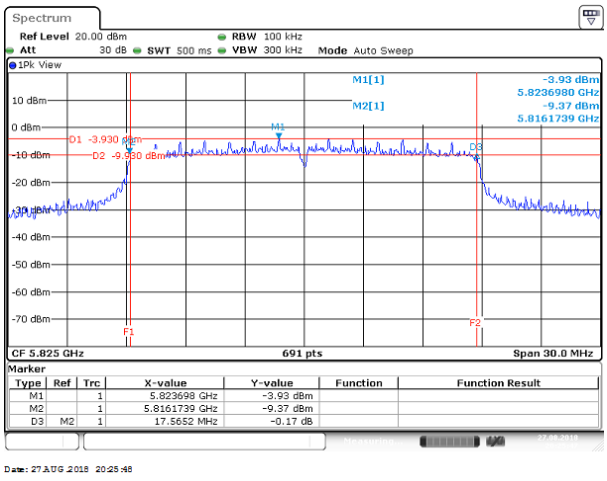
Low CH

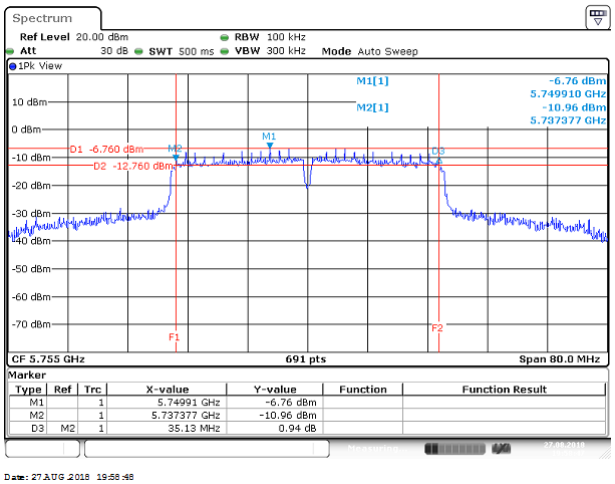
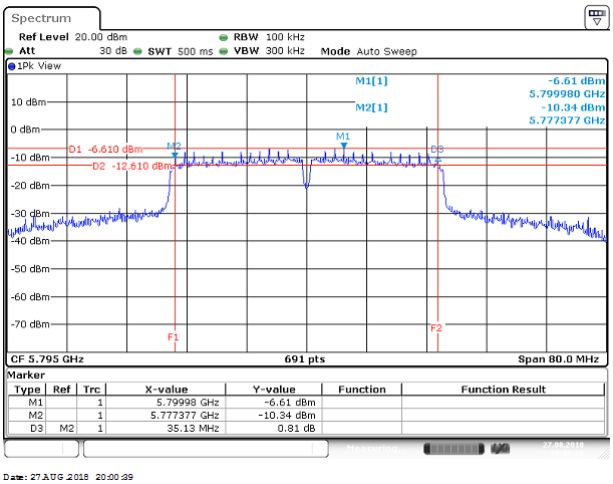


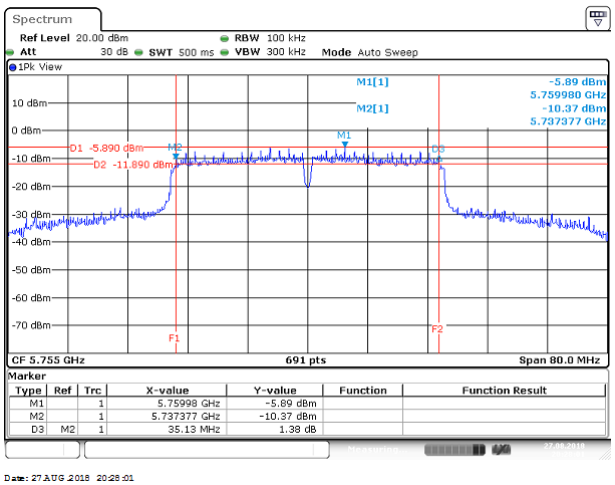
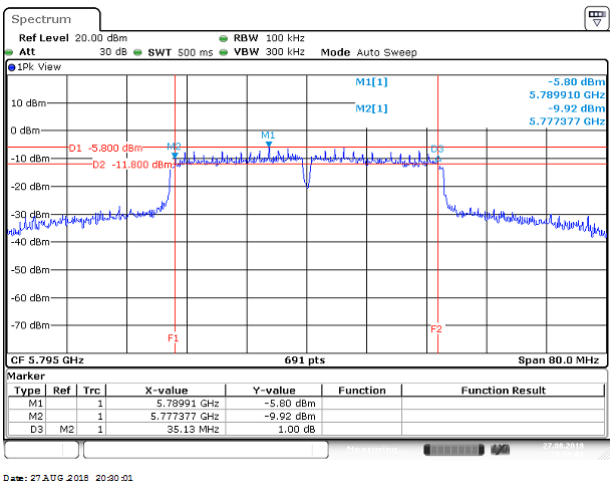
Mid CH

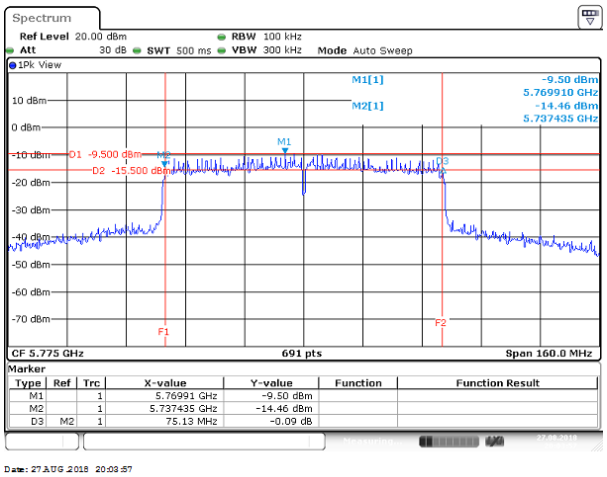


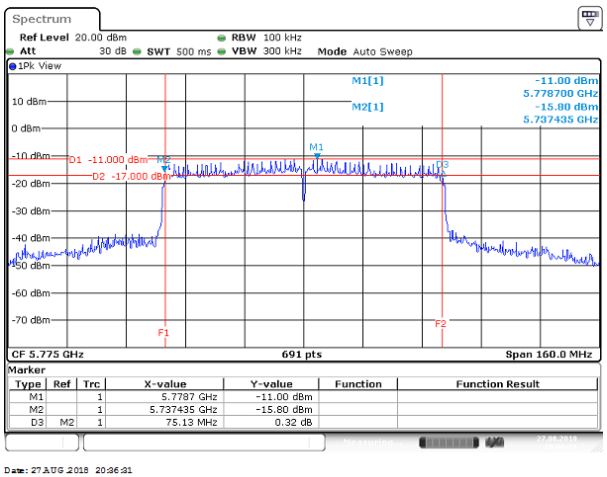
High CH



UNII-3 IEEE 802.11n HT40 mode- chain 0	
Low CH	**High CH**
	

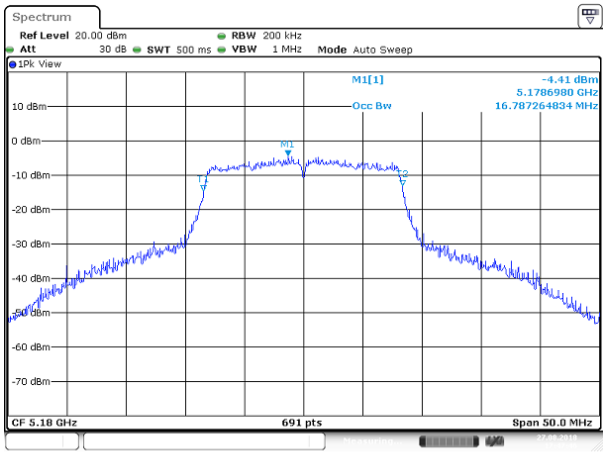
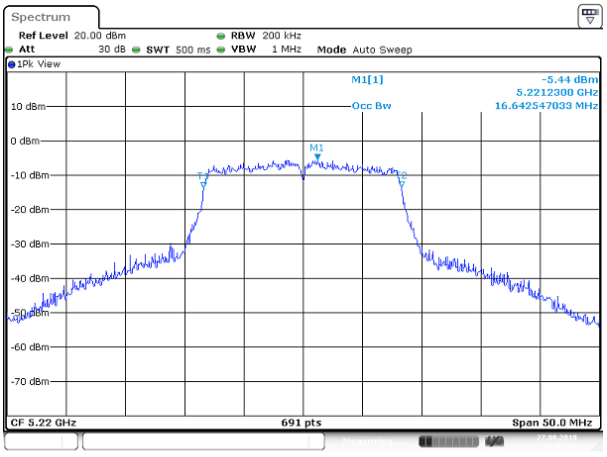
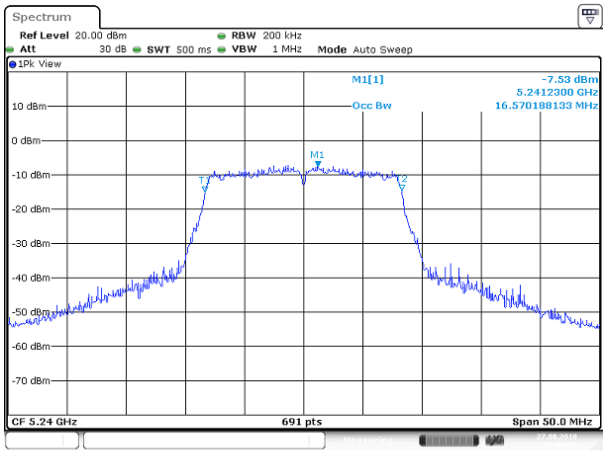
UNII-3 IEEE 802.11n HT40 mode- chain 1	
Low CH	**High CH**
	

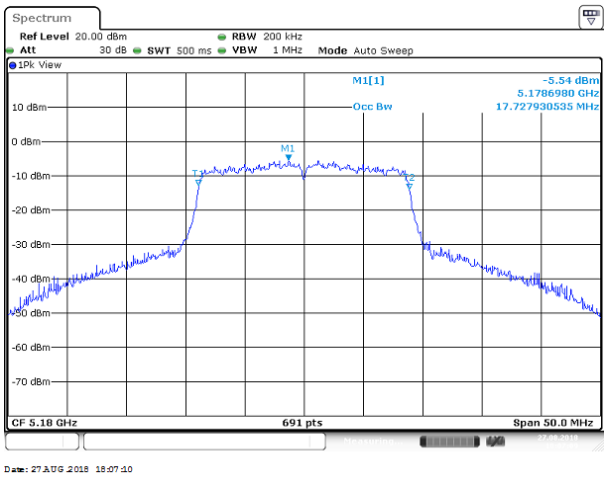
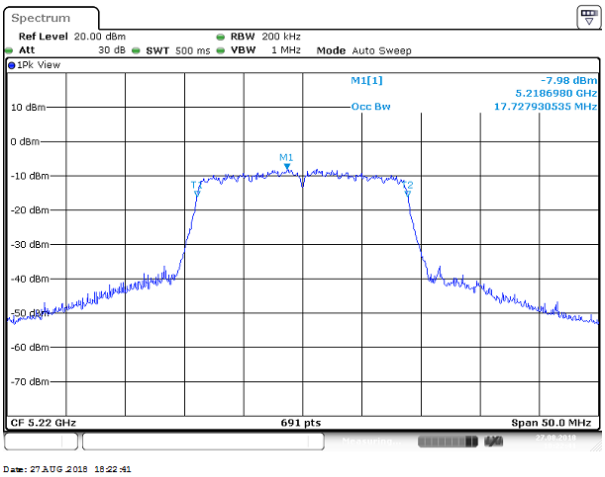
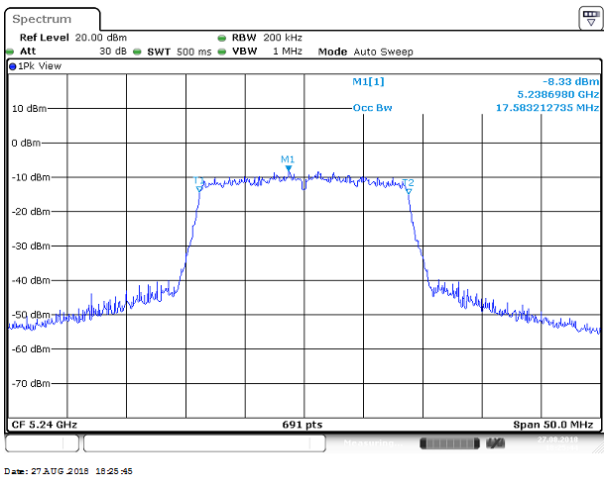
UNII-3 IEEE 802.11ac VHT80 mode- chain 0	
Mid CH	
	

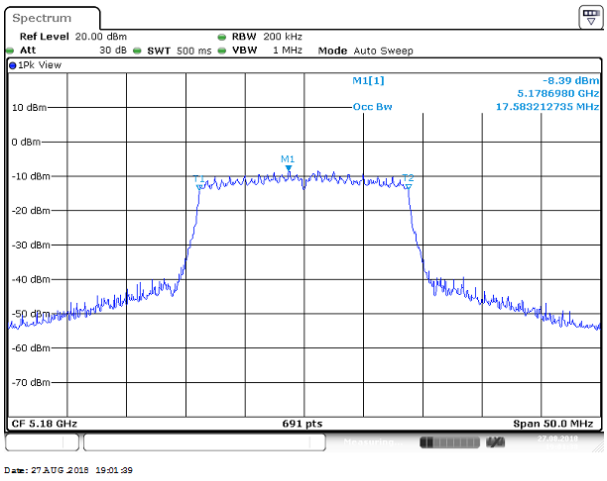
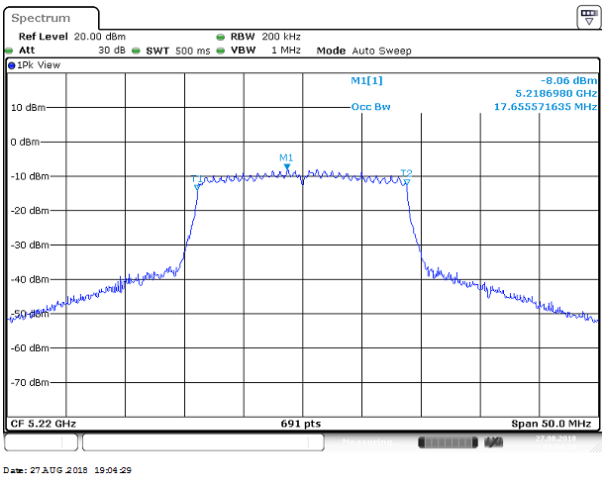
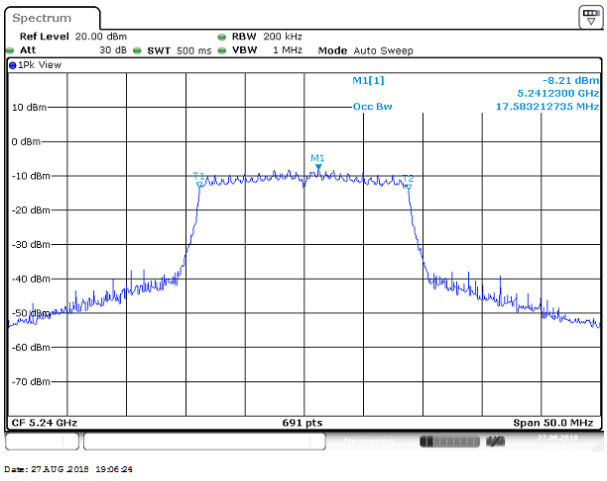
UNII-3 IEEE 802.11ac VHT80 mode- chain 1	
Mid CH	
	

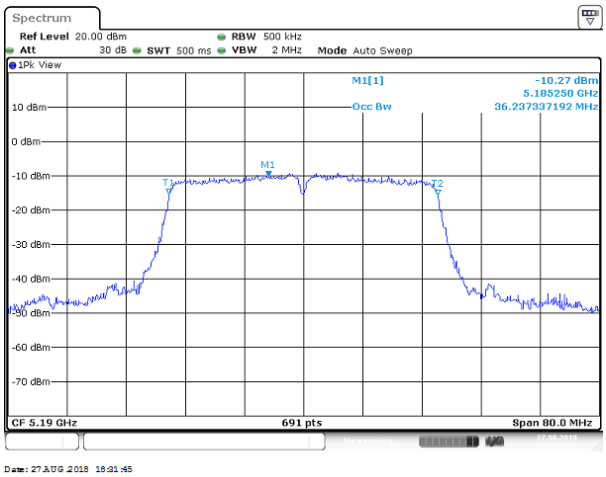
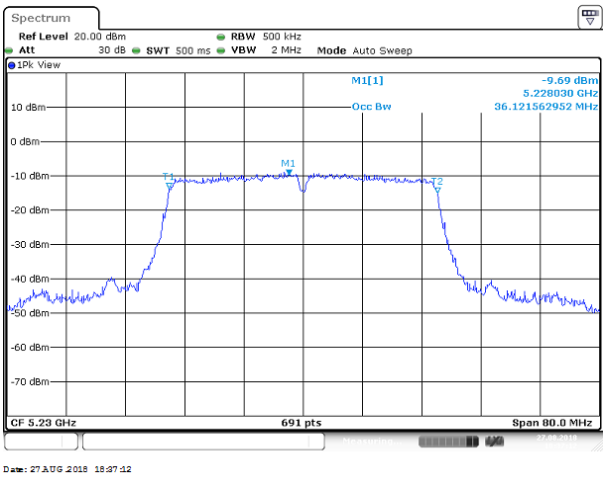
Report No.: T180625W01-RP2

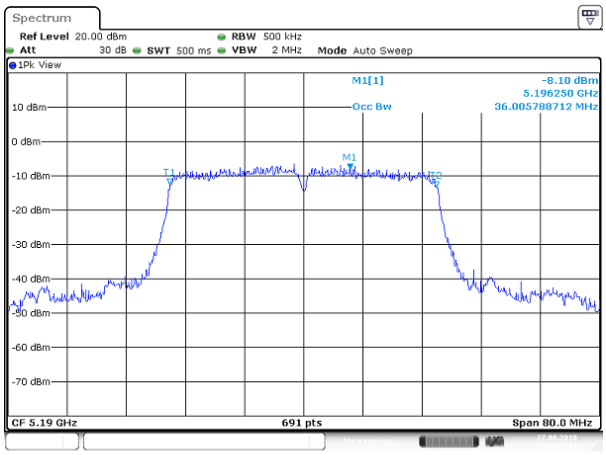
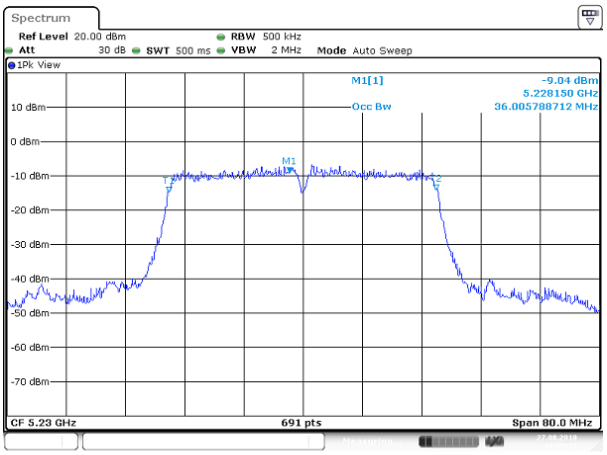
Test Data BANDWIDTH (99%)

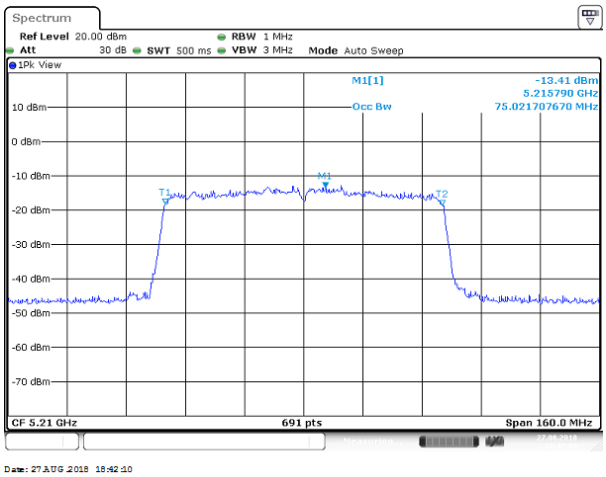
UNII-1 IEEE 802.11a mode- chain 0	
Low CH	**Mid CH**
	
High CH	
	

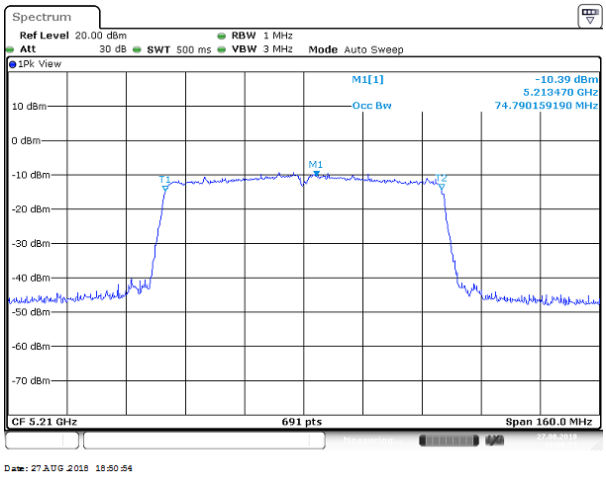
UNII-1 IEEE 802.11n HT20 mode- chain 0	
Low CH	**Mid CH**
	
High CH	
	

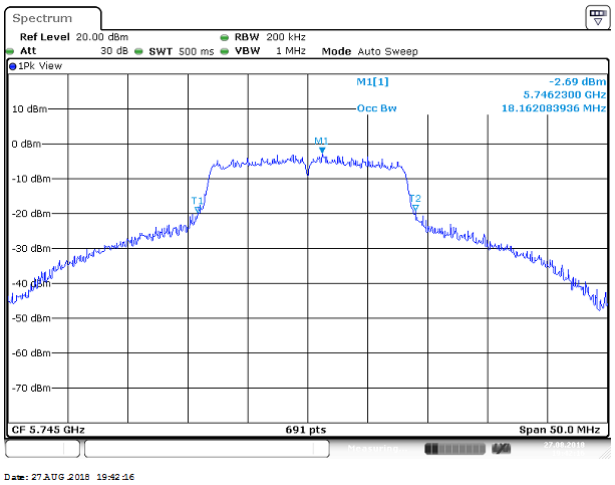
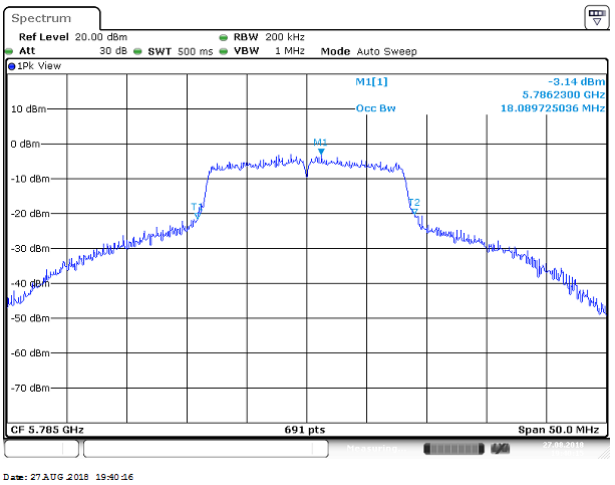
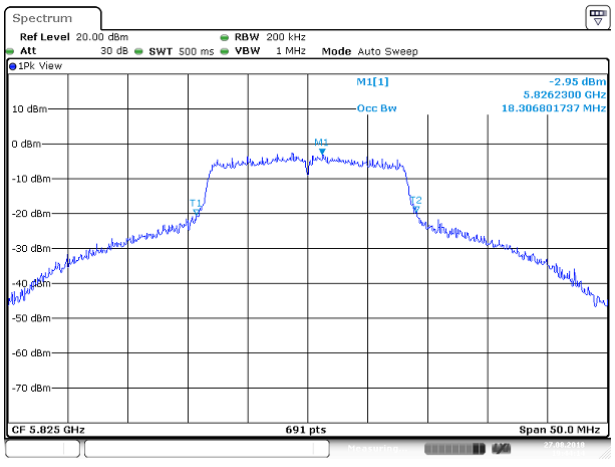
UNII-1 IEEE 802.11n HT20 mode- chain 1	
Low CH	**Mid CH**
	
High CH	
	

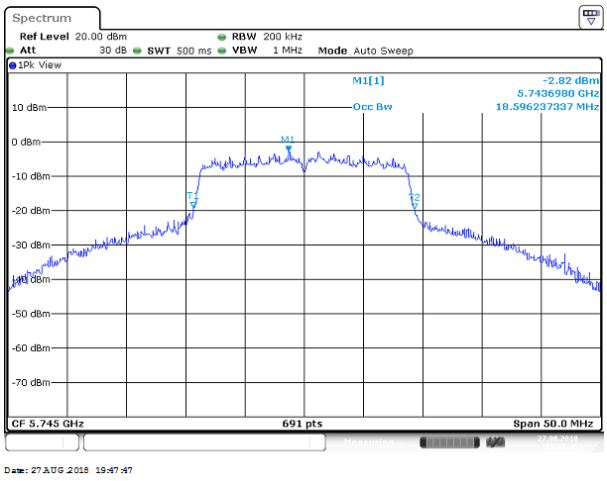
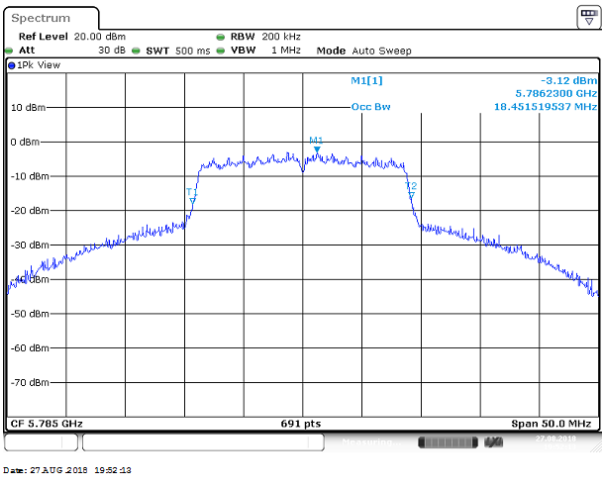
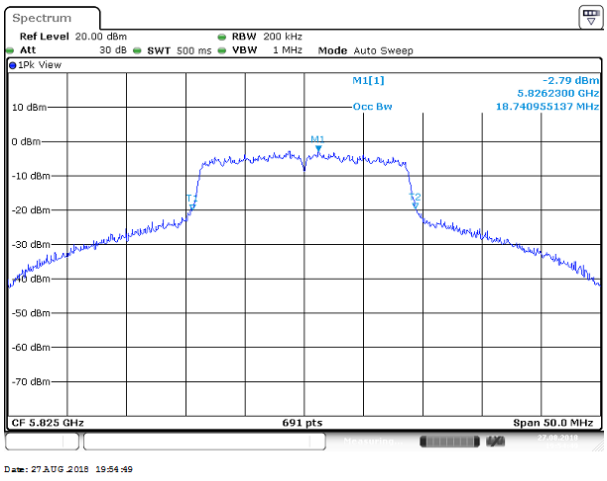
UNII-1 IEEE 802.11n HT40 mode- chain 0	
Low CH	**High CH**
	

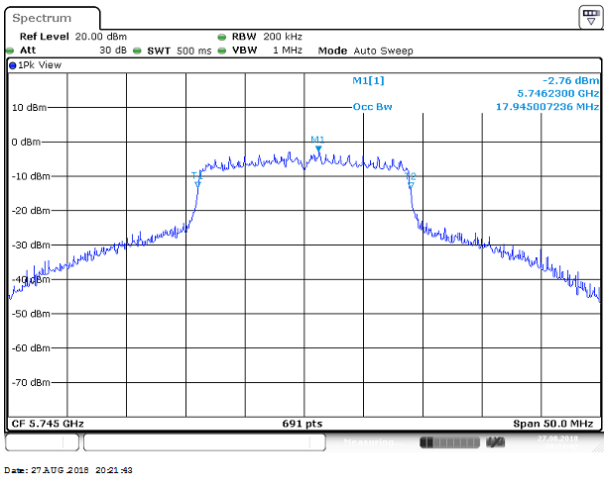
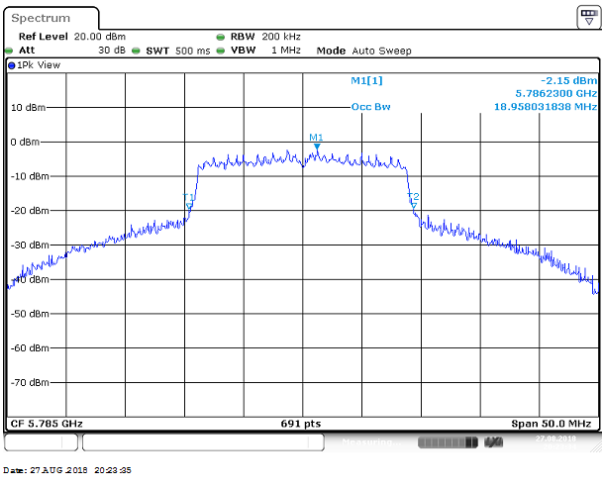
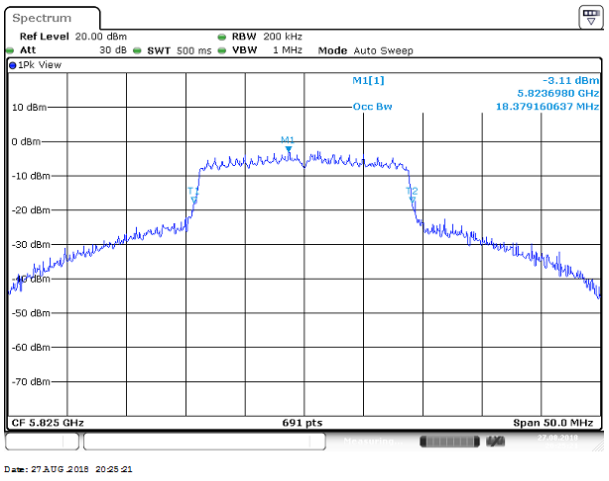
UNII-1 IEEE 802.11n HT40 mode- chain 1	
Low CH	**High CH**
	

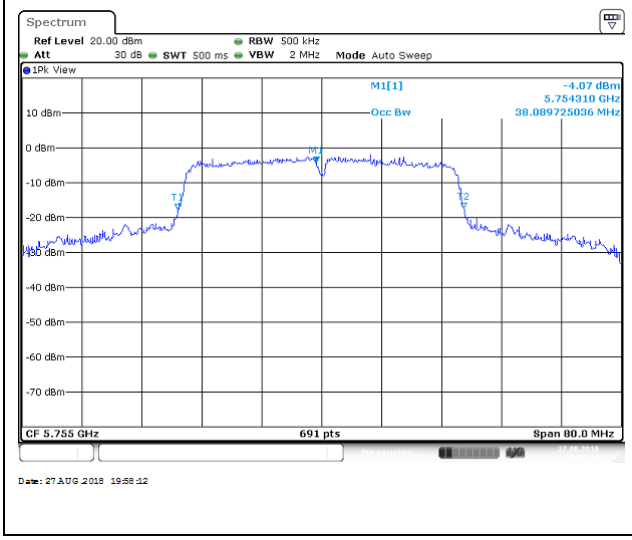
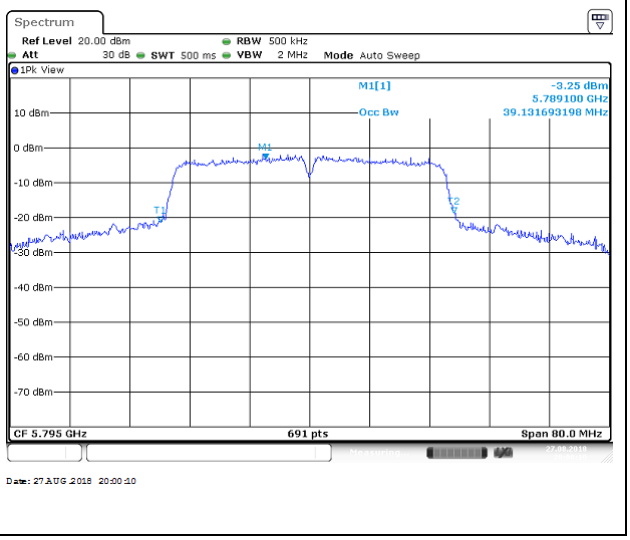
UNII-1 IEEE 802.11ac VHT80 mode- chain 0	
Mid CH	
	

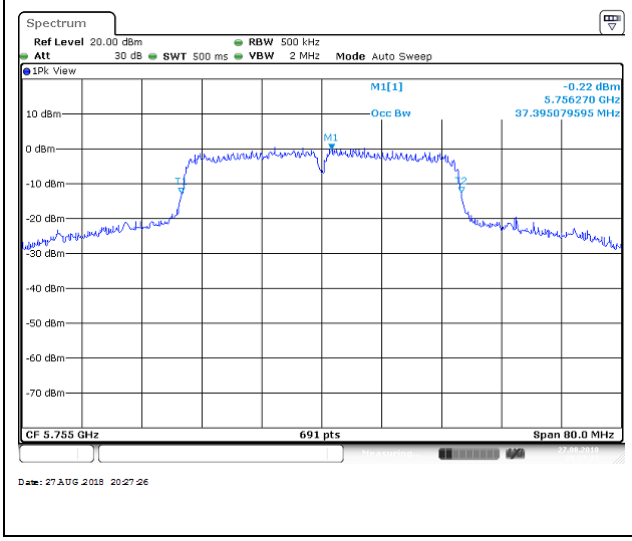
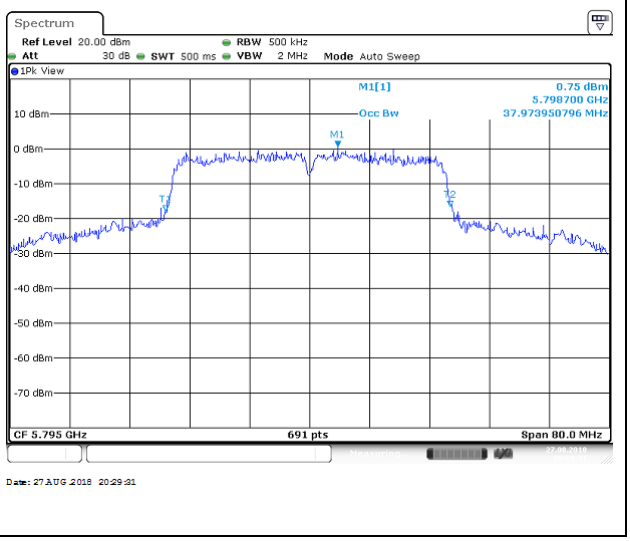
UNII-1 IEEE 802.11ac VHT80 mode- chain 1	
Mid CH	
	

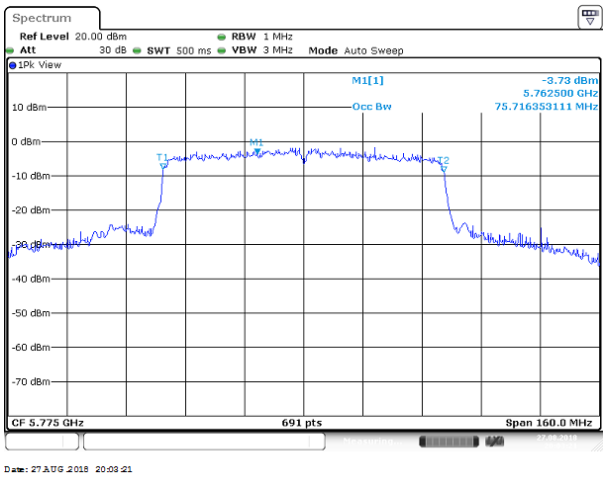
UNII-3 IEEE 802.11a mode- chain 0	
Low CH	**Mid CH**
	
High CH	
	

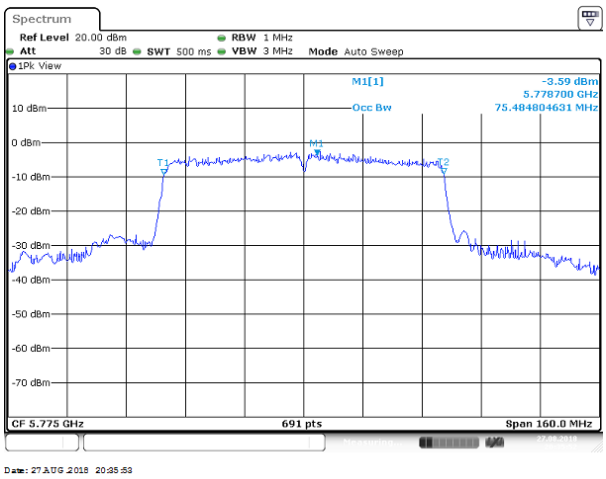
UNII-3 IEEE 802.11n HT20 mode- chain 0	
Low CH	**Mid CH**
	
High CH	
	

UNII-3 IEEE 802.11n HT20 mode- chain 1	
Low CH	**Mid CH**
	
High CH	
	

UNII-3 IEEE 802.11n HT40 mode- chain 0	
Low CH	**High CH**
	

UNII-3 IEEE 802.11n HT40 mode- chain 1	
Low CH	**High CH**
	

UNII-3 IEEE 802.11ac VHT80 mode- chain 0	
Mid CH	
	

UNII-3 IEEE 802.11ac VHT80 mode- chain 1	
Mid CH	
	

4.3 OUTPUT POWER MEASUREMENT

4.3.1 Test Limit

According to §15.407 (a)(1) and 15.407(a)(3)

UNII-1 :

For 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. In addition, 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.

UNII-3:

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz 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.

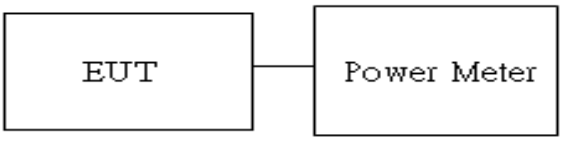
UNII-1 Limit	☒ Antenna not exceed 6 dBi：24dBm ☐ Antenna with DG greater than 6 dBi： [Limit = 24 – (DG – 6)]
UNII-3 Limit	☒ Antenna not exceed 6 dBi：30dBm ☐ Antenna with DG greater than 6 dBi： [Limit = 30 – (DG – 6)]

4.3.2 Test Procedure

Test method Refer as KDB 789033 D02, Section E.3.b.

1. The EUT RF output connected to the power meter by RF cable.
2. Setting maximum power transmit of EUT.
3. The path loss was compensated to the results for each measurement.
4. Measure and record the result of Average output power. in the test report.

4.3.3 Test Setup



4.3.4 Test Result

Conducted output power：

UNII-1									
Config	CH	Freq. (MHz)	Power Set		AV Power(dBm)		AV Total Power (dBm)	AV Total Power (W)	Limit (dBm)
			chain0	chain1	chain0	chain1			
IEEE 802.11a	36	5180	18	-	14.24	-	14.24	0.0265	24
	44	5220	18	-	14.65	-	14.65	0.0292	
	48	5240	18	-	14.80	-	14.80	0.0302	
IEEE 802.11n HT20	36	5180	15	15	12.91	14.71	16.92	0.0492	
	44	5220	15	15	11.29	12.87	15.16	0.0328	
	48	5240	15	15	13.11	13.02	16.08	0.0406	
IEEE 802.11n HT40	38	5190	14	14	10.56	11.80	14.23	0.0265	
	46	5230	14	14	11.33	11.77	14.56	0.0286	
IEEE 802.11ac VHT80	42	5210	10	10	19.41	19.45	22.44	0.1754	

UNII-3									
Config	CH	Freq. (MHz)	Power Set		AV Power(dBm)		AV Total Power (dBm)	AV Total Power (W)	Limit (dBm)
			chain0	chain1	chain0	chain1			
IEEE 802.11a	149	5745	21	-	18.66	-	18.66	0.0735	30
	157	5785	21	-	18.93	-	18.93	0.0782	
	165	5825	21	-	19.01	-	19.01	0.0796	
IEEE 802.11n HT20	149	5745	20	20	18.33	18.37	21.36	0.1368	
	157	5785	20	20	18.54	18.40	21.48	0.1406	
	165	5825	20	20	18.50	18.92	21.73	0.1489	
IEEE 802.11n HT40	151	5755	21	21	17.88	18.72	21.33	0.1358	
	159	5795	21	21	16.42	17.27	19.88	0.0973	
IEEE 802.11ac VHT80	155	5775	24	24	25.95	24.58	28.33	0.6808	

4.4 POWER SPECTRAL DENSITY

4.4.1 Test Limit

According to §15.407 (a)(1) and 15.407(a)(3)

UNII-1 :

For 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. In addition, 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.

UNII-3:

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz 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.i.

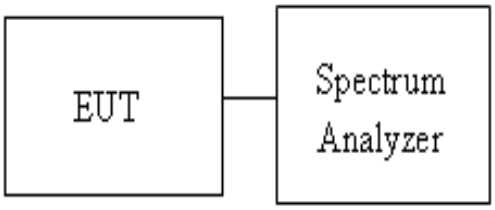
UNII-1 Limit	☒ Antenna not exceed 6 dBi：11 dBm ☐ Antenna with DG greater than 6 dBi： [Limit = 11 – (DG – 6)]
UNII-3 Limit	☒ Antenna not exceed 6 dBi：30 dBm ☐ Antenna with DG greater than 6 dBi： [Limit = 30 – (DG – 6)]

4.4.2 Test Procedure

Test method Refer as KDB 789033 D02.

1. The EUT RF output connected to the spectrum analyzer by RF cable.
2. Setting maximum power transmit of EUT
3. UNII-1, UNII-2a and UNII-2c, SA set RBW = 1MHz, VBW = 3MHz and Detector = RMS, to measurement Power Density.
4. UNII-3, SA set RBW = 500kHz, VBW = 2MHz and Detector = RMS, to measurement Power Density
5. The path loss and Duty Factor were compensated to the results for each measurement by SA.
6. Mark the maximum level.
7. Measure and record the result of power spectral density. in the test report.

4.4.3 Test Setup

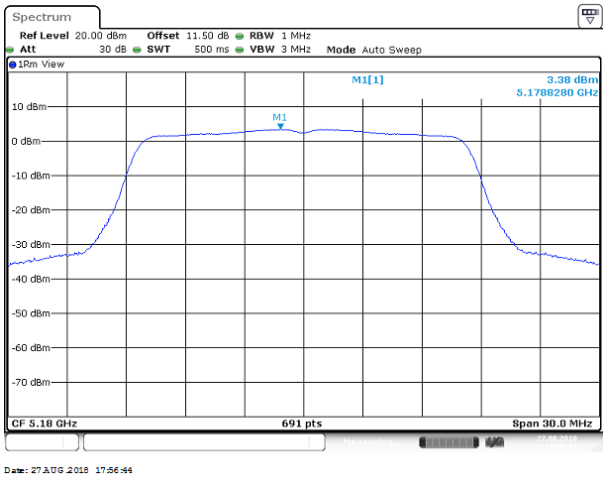
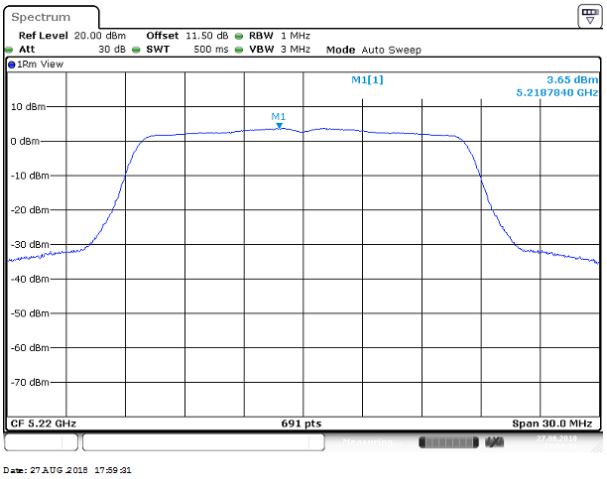
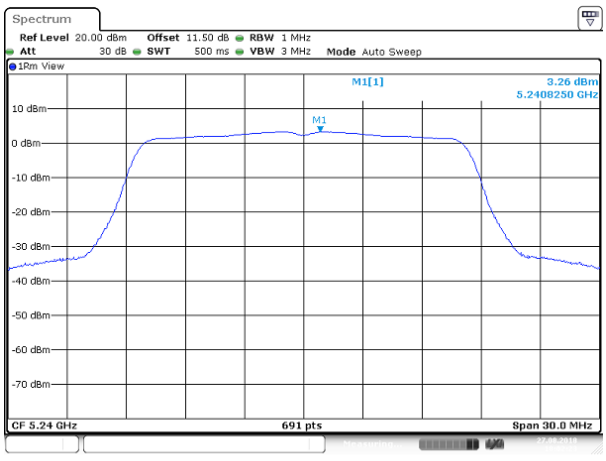


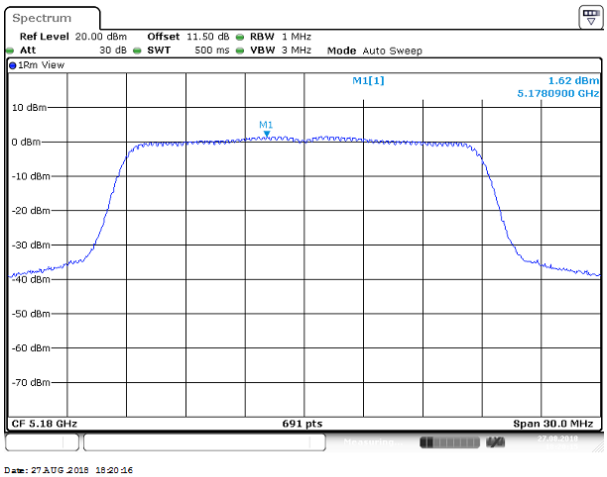
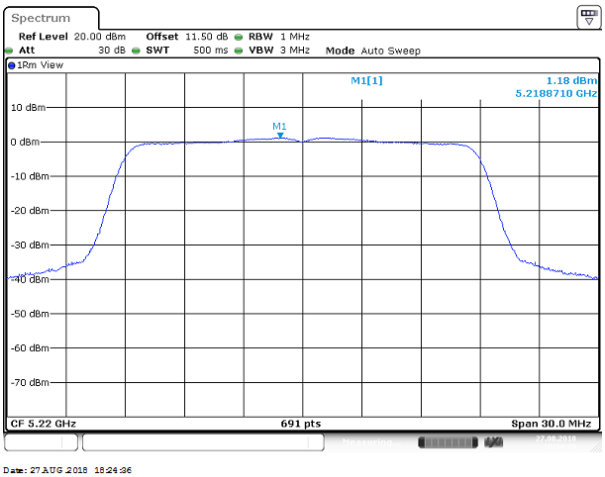
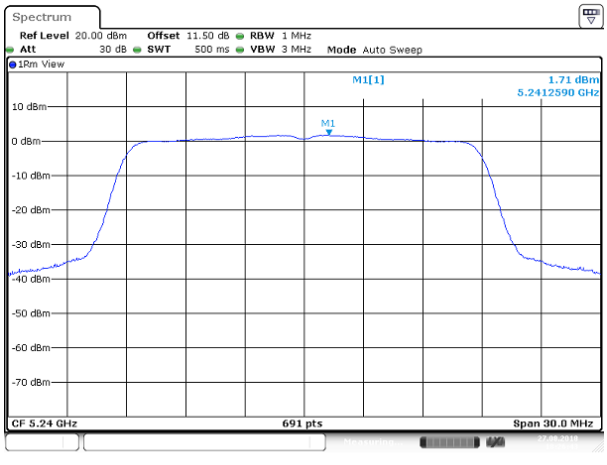
4.4.4 Test Result

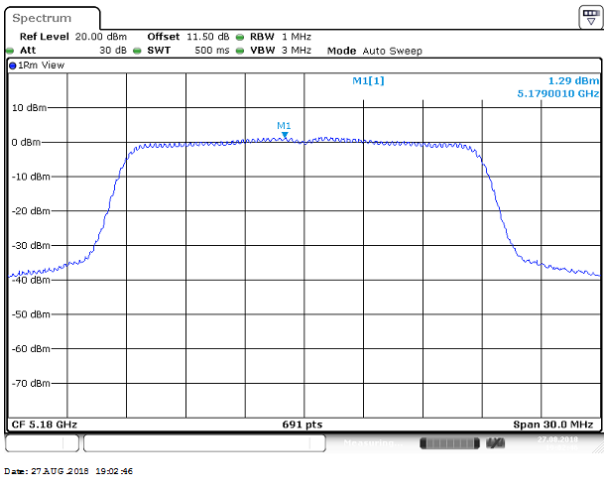
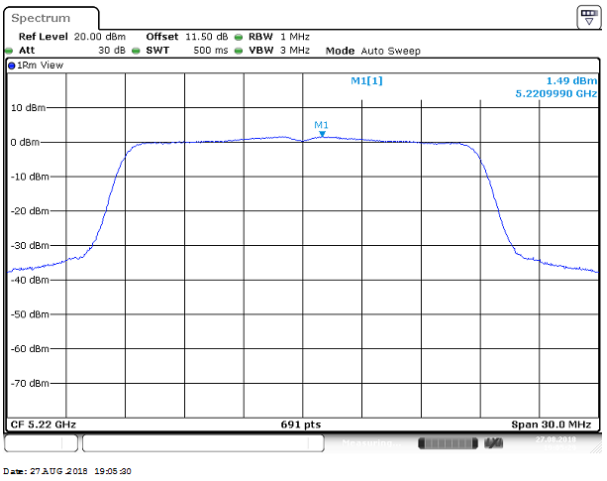
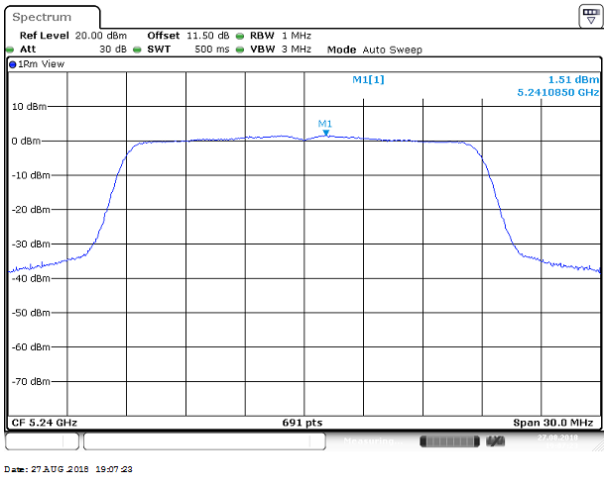
UNII-1					
Test mode: IEEE 802.11a mode					
Channel	**Frequency (MHz)**	**Chain 0 PPSD (dBm)**	**Chain 1 PPSD (dBm)**	**Total PSSD (dBm)**	**Limit (dBm)**
Low	5180	3.38	-	3.38	11
Mid	5220	3.65	-	3.65	
High	5240	3.26	-	3.26	
Test mode: IEEE 802.11n HT20 mode					
Channel	**Frequency (MHz)**	**Chain 0 PPSD (dBm)**	**Chain 1 PPSD (dBm)**	**Total PSSD (dBm)**	**Limit (dBm)**
Low	5180	1.62	1.29	4.47	11
Mid	5220	1.18	1.49	4.35	
High	5240	1.71	1.51	4.62	
Test mode: IEEE 802.11n HT40 mode					
Channel	**Frequency (MHz)**	**Chain 0 PPSD (dBm)**	**Chain 1 PPSD (dBm)**	**Total PSSD (dBm)**	**Limit (dBm)**
Low	5190	-4.04	-3.12	-0.55	11
High	5230	-3.68	-3.39	-0.52	
Test mode: IEEE 802.11ac VHT80 mode					
Channel	**Frequency (MHz)**	**Chain 0 PPSD (dBm)**	**Chain 1 PPSD (dBm)**	**Total PSSD (dBm)**	**Limit (dBm)**
Mid	5210	-8.64	-8.81	-5.71	11

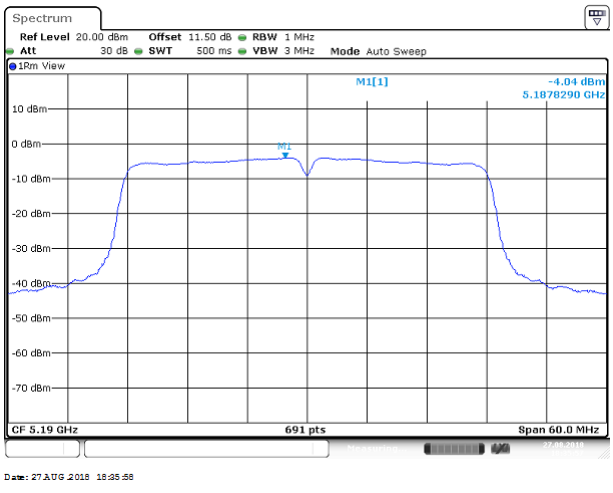
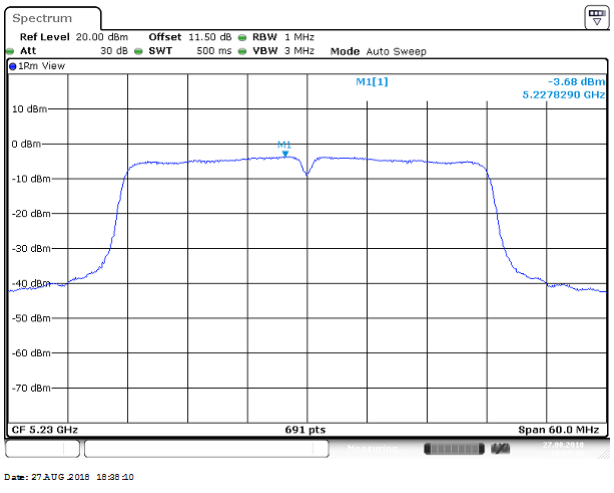
UNII-3					
Test mode: IEEE 802.11a mode					
Channel	**Frequency (MHz)**	**Chain 0 PPSD (dBm)**	**Chain 1 PPSD (dBm)**	**Total PSSD (dBm)**	**Limit (dBm)**
Low	5745	12.66	-	12.66	30
Mid	5785	12.30	-	12.30	
High	5825	12.78	-	12.78	
Test mode: IEEE 802.11n HT20 mode					
Channel	**Frequency (MHz)**	**Chain 0 PPSD (dBm)**	**Chain 1 PPSD (dBm)**	**Total PSSD (dBm)**	**Limit (dBm)**
Low	5745	11.96	14.23	16.25	30
Mid	5785	11.83	14.27	16.23	
High	5825	12.12	14.67	16.59	
Test mode: IEEE 802.11n HT40 mode					
Channel	**Frequency (MHz)**	**Chain 0 PPSD (dBm)**	**Chain 1 PPSD (dBm)**	**Total PSSD (dBm)**	**Limit (dBm)**
Low	5755	9.83	11.95	14.03	30
High	5795	9.98	11.83	14.01	
Test mode: IEEE 802.11ac VHT80 mode					
Channel	**Frequency (MHz)**	**Chain 0 PPSD (dBm)**	**Chain 1 PPSD (dBm)**	**Total PSSD (dBm)**	**Limit (dBm)**
Mid	5775	7.19	6.16	9.72	30

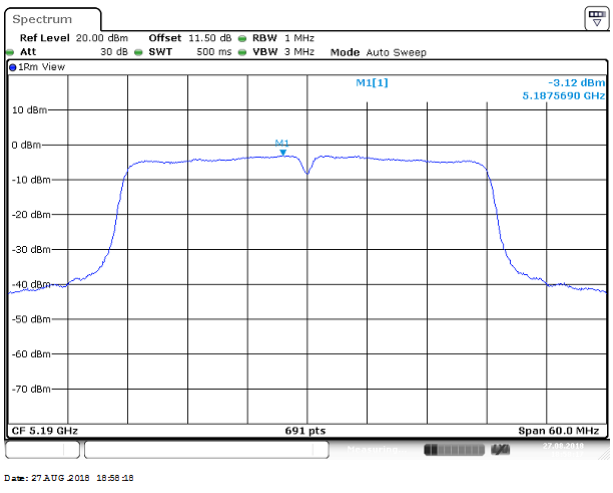
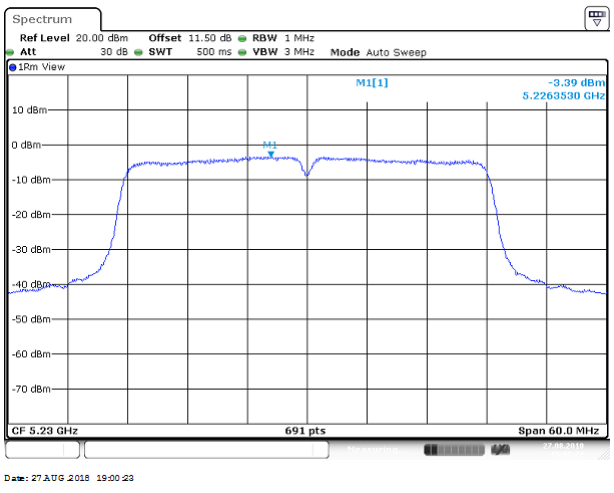
Test Data

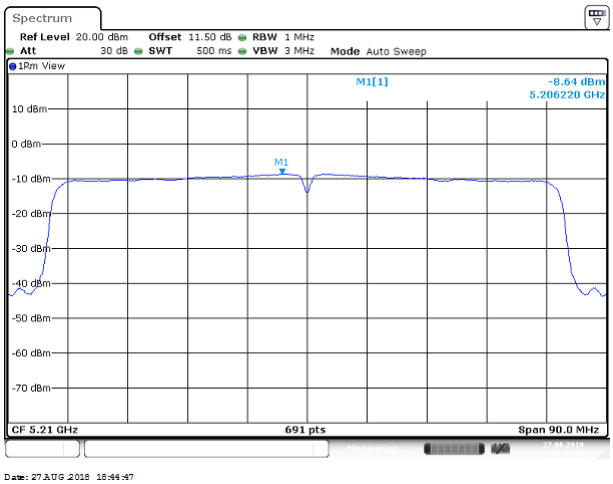
UNII-1 IEEE 802.11a mode- chain 0	
Low CH	**Mid CH**
	
High CH	
	

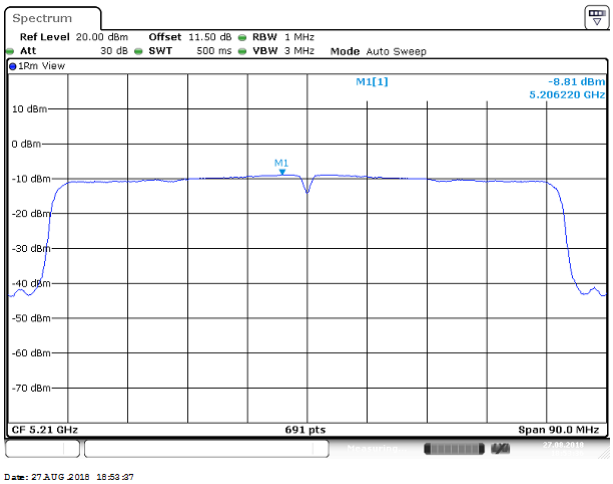
UNII-1 IEEE 802.11n HT20 mode- chain 0	
Low CH	**Mid CH**
	
High CH	
	

UNII-1 IEEE 802.11n HT20 mode- chain 1	
Low CH	**Mid CH**
	
High CH	
	

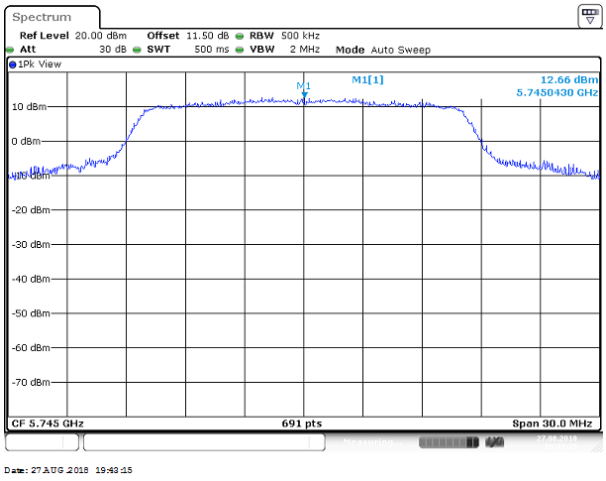
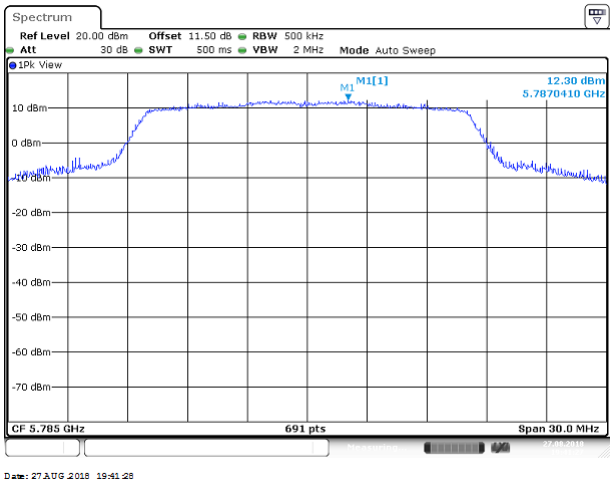
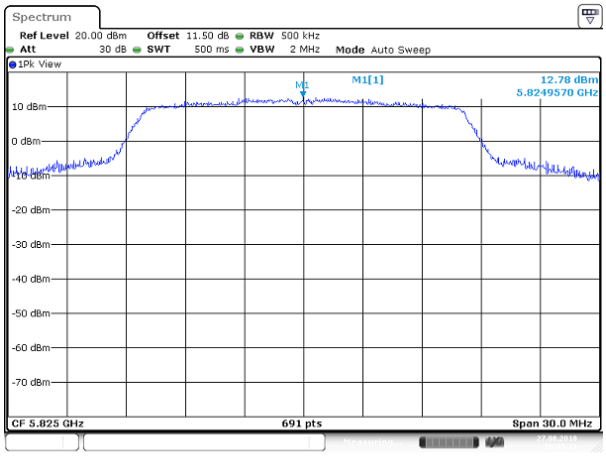
UNII-1 IEEE 802.11n HT40 mode- chain 0	
Low CH	High CH
	

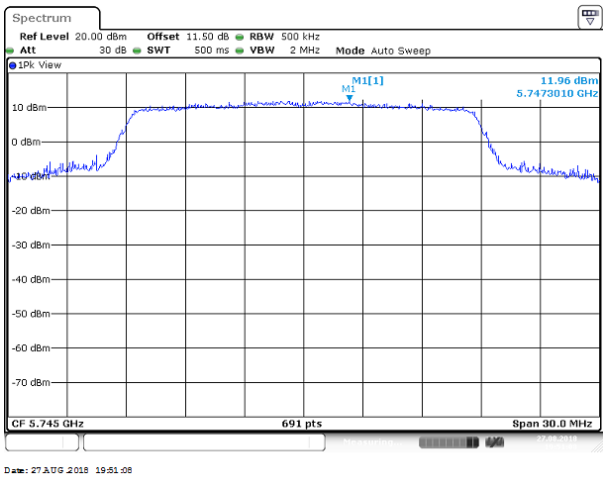
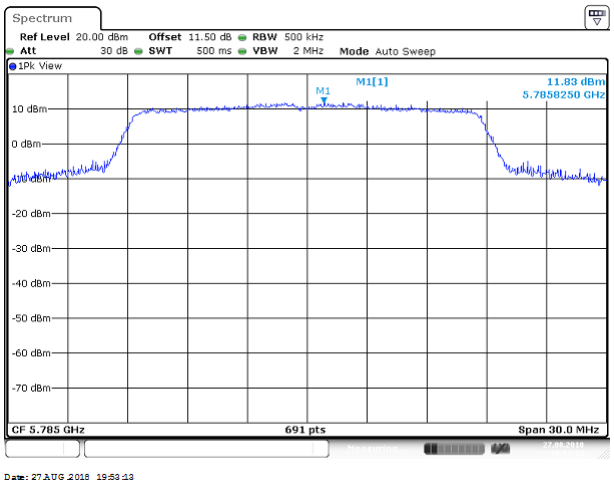
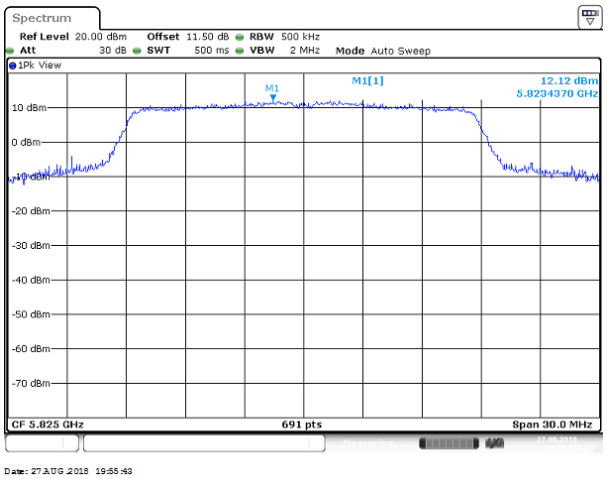
UNII-1 IEEE 802.11n HT40 mode- chain 1	
Low CH	High CH
	

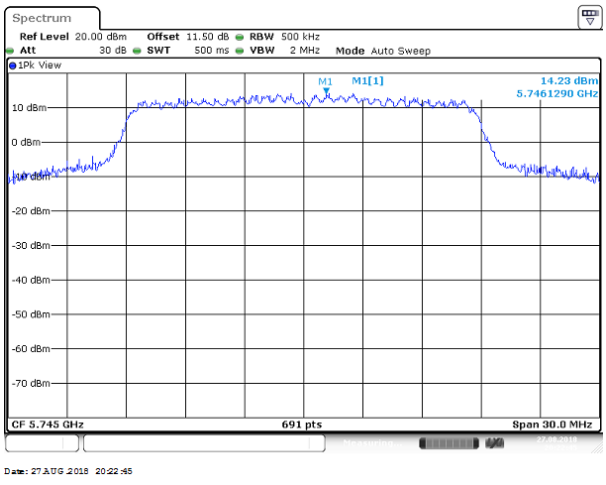
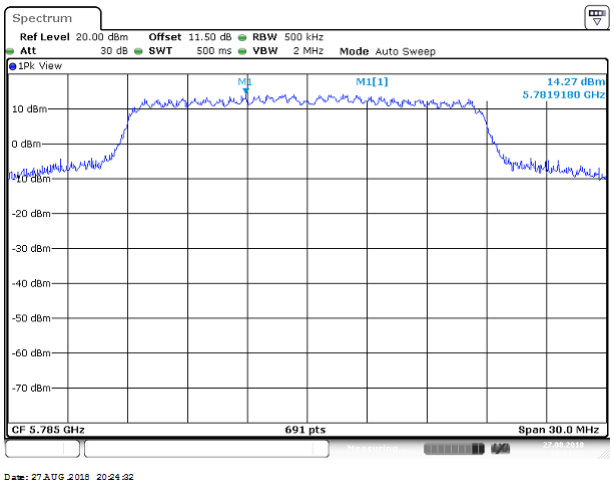
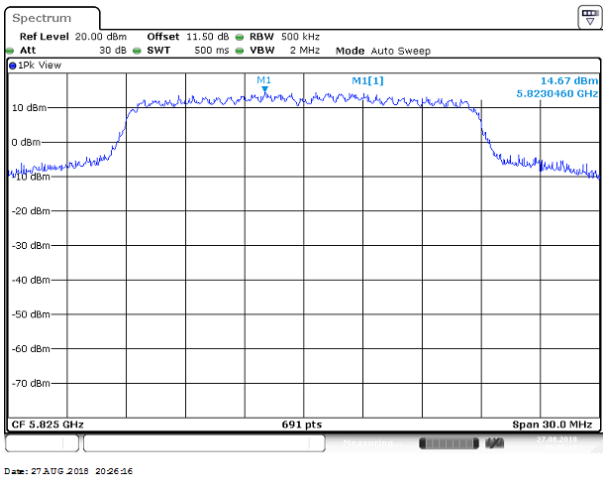
UNII-1 IEEE 802.11ac VHT80 mode- chain 0	
Mid CH	
	

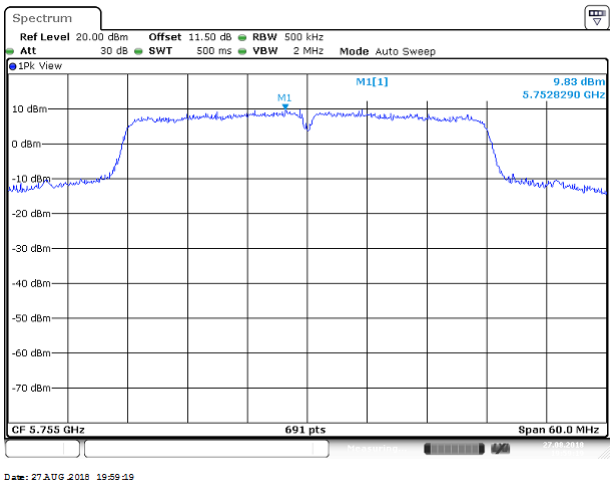
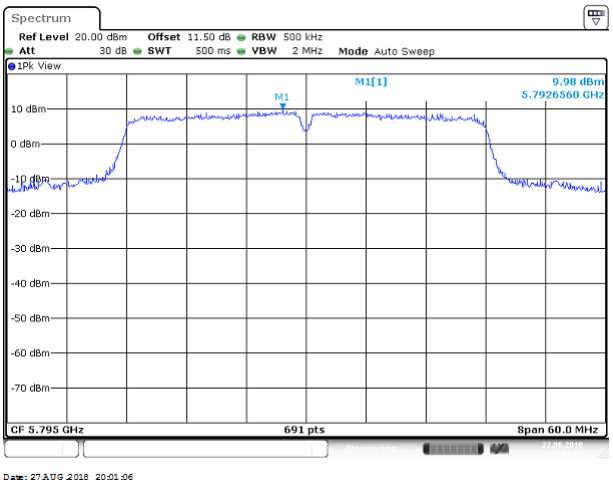
UNII-1 IEEE 802.11ac VHT80 mode- chain 1	
Mid CH	
	

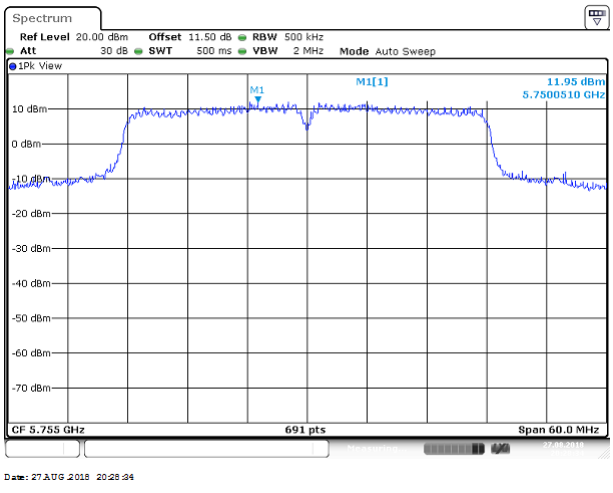
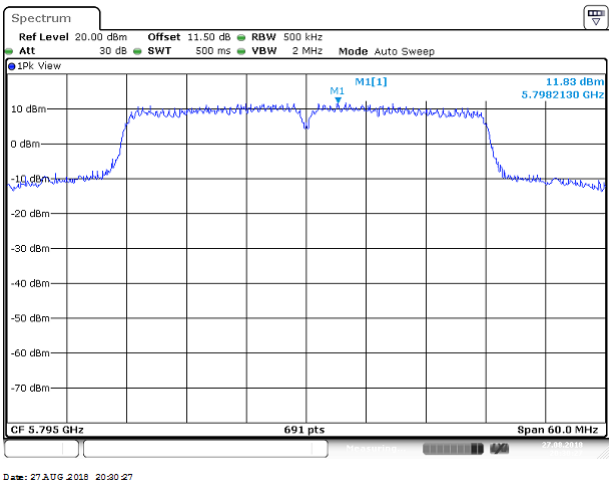
Test Data

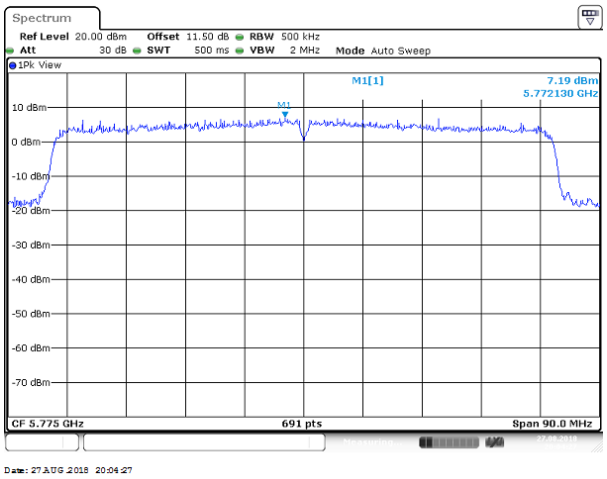
UNII-3 IEEE 802.11a mode- chain 0	
Low CH	**Mid CH**
	
High CH	
	

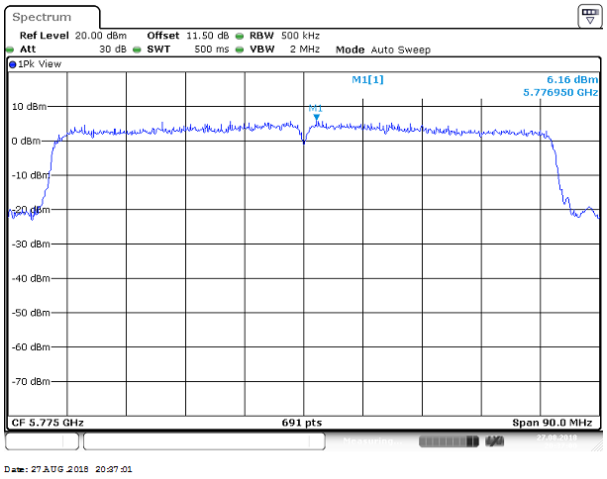
UNII-3 IEEE 802.11n HT20 mode- chain 0	
Low CH	**Mid CH**
	
High CH	
	

UNII-3 IEEE 802.11n HT20 mode- chain 1	
Low CH	**Mid CH**
	
High CH	
	

UNII-3 IEEE 802.11n HT40 mode- chain 0	
Low CH	**High CH**
	

UNII-3 IEEE 802.11n HT40 mode- chain 1	
Low CH	**High CH**
	

UNII-3 IEEE 802.11ac VHT80 mode- chain 0	
Mid CH	
	

UNII-3 IEEE 802.11ac VHT80 mode- chain 1	
Mid CH	
	

4.5 RADIATION BANDEDGE AND SPURIOUS EMISSION

4.5.1 Test Limit

FCC according to §15.407, §15.209 and §15.205,

Below 30 MHz

Frequency	Field Strength (microvolts/m)	Magnetic H-Field (microamperes/m)	Measurement Distance (metres)
9-490 kHz	2,400/F (F in kHz)	2,400/F (F in kHz)	300
490-1,705 kHz	24,000/F (F in kHz)	24,000/F (F in kHz)	30
1.705-30 MHz	30	N/A	30

Above 30 MHz

Frequency (MHz)	Field Strength microvolts/m at 3 metres (watts, e.i.r.p.)	
	Transmitters	Receivers
30-88	100 (3 nW)	100 (3 nW)
88-216	150 (6.8 nW)	150 (6.8 nW)
216-960	200 (12 nW)	200 (12 nW)
Above 960	500 (75 nW)	500 (75 nW)

UNII-1 :

For transmitters operating in the band 5150-5250 MHz, all emissions outside the band 5150-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p. However, any unwanted emissions that fall into the band 5250-5350 MHz must be 26 dBc, when measured using a resolution bandwidth between 1 and 5% of the occupied bandwidth, above 5.25 GHz. Otherwise, the transmission is considered as intentional and the devices shall implement dynamic frequency selection (DFS) and transmitter power control (TPC) as per the requirements for the band 5250-5350 MHz

UNII-3:

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.

4.5.2 Test Procedure

Test method Refer as KDB 789033 D02, Section G.3, G.4, G.5, and G.6,.

1. The EUT is placed on a turntable, Above 1 GHz is 1.5m and below 1 GHz is 0.8m above ground plane. The EUT Configured un accordance with ANSI C63.10: 2013, and the EUT set in a continuous mode.

2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level. And EUT is set 3m away from the receiving antenna, which is scanned from 1m to 4m above the ground plane to find out the highest emissions. Measurement are made polarized in both the vertical and the horizontal positions with antenna.

3. Span shall wide enough to full capture the emission measured. The SA from 30MHz to 26.5GHz set to the low, Mid and High channels with the EUT transmit.

Remark:
1. Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30 m open are test site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788.
2. No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz).

4. The SA setting following：

(1) Below 1G：RBW = 100kHz, VBW ≥ 3*RBW, Sweep = Auto, Detector = Peak, Trace = Max hold.

(2) Above 1G：

(2.1) For Peak measurement：RBW = 1MHz, VBW ≥ 3 RBW, Sweep = Auto, Detector = Peak, Trace = Max hold.

(2.2) For Average measurement：RBW = 1MHz, VBW

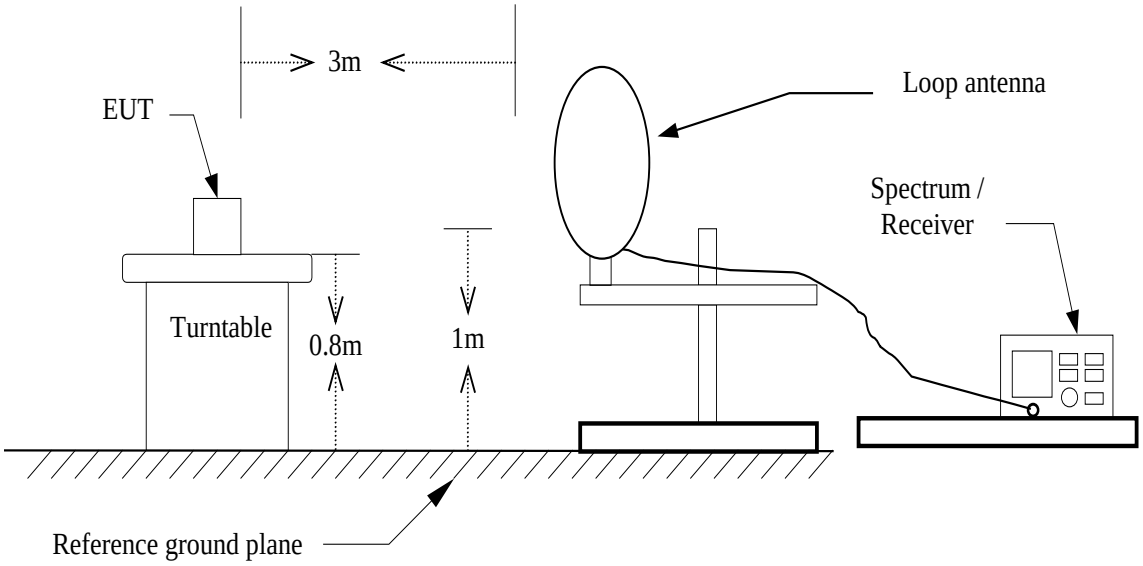
˙If Duty Cycle ≥ 98%, VBW=10Hz.

˙If Duty Cycle < 98%, VBW=1/T.

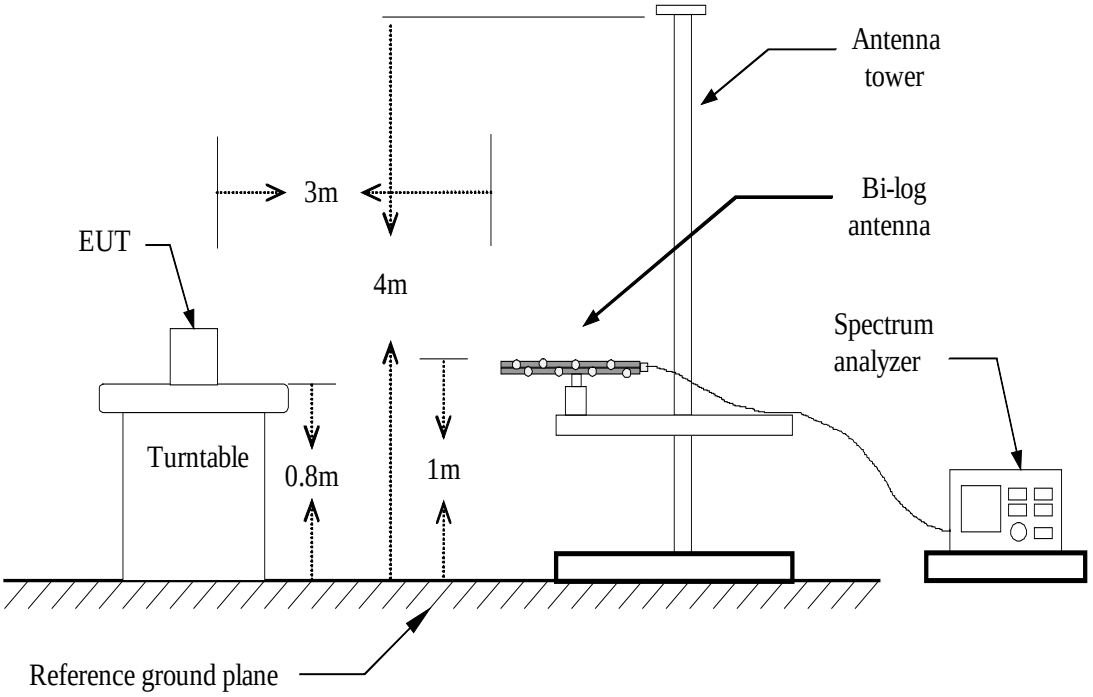
Configuration	Duty Cycle (%)	T(ms)	1/T (Hz)	VBW Setting
802.11a	89%	1.4800	0.676	680Hz
802.11n HT20	88%	1.3700	0.730	750Hz
802.11n HT40	79%	0.7000	1.429	1.5KHz
802.11ac VHT80	72%	0.3800	2.632	2.7KHz

4.5.3 Test Setup

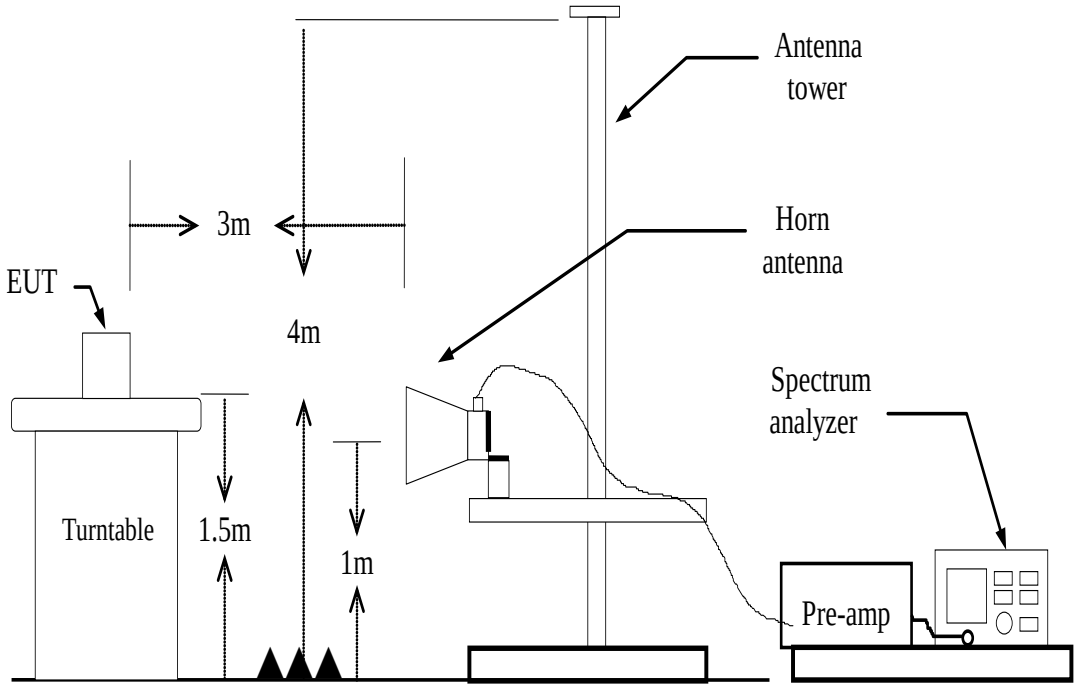
9kHz ~ 30MHz



30MHz ~ 1GHz



Above 1 GHz

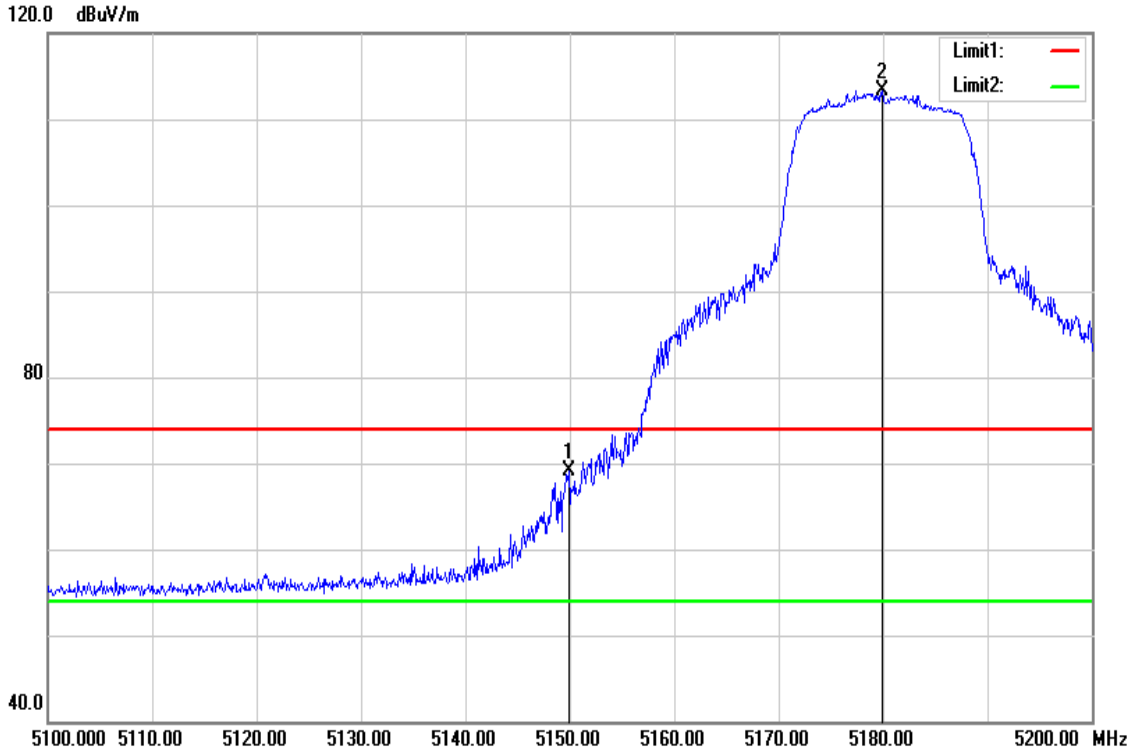


4.5.4 Test Result

Test Data

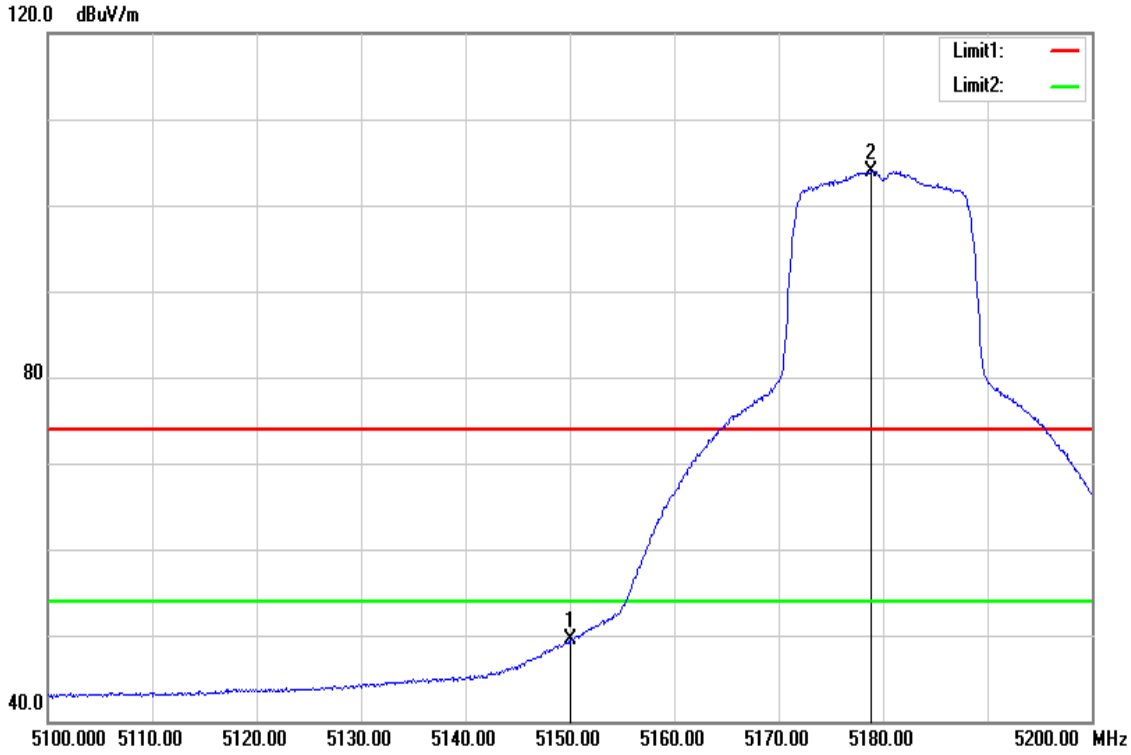
Band Edge Test Data for UNII-1

Test Mode	IEEE 802.11a Low CH	Temp/Hum	24(℃)/ 39%RH
Test Item	Band Edge	Test Date	August 24, 2018
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak		



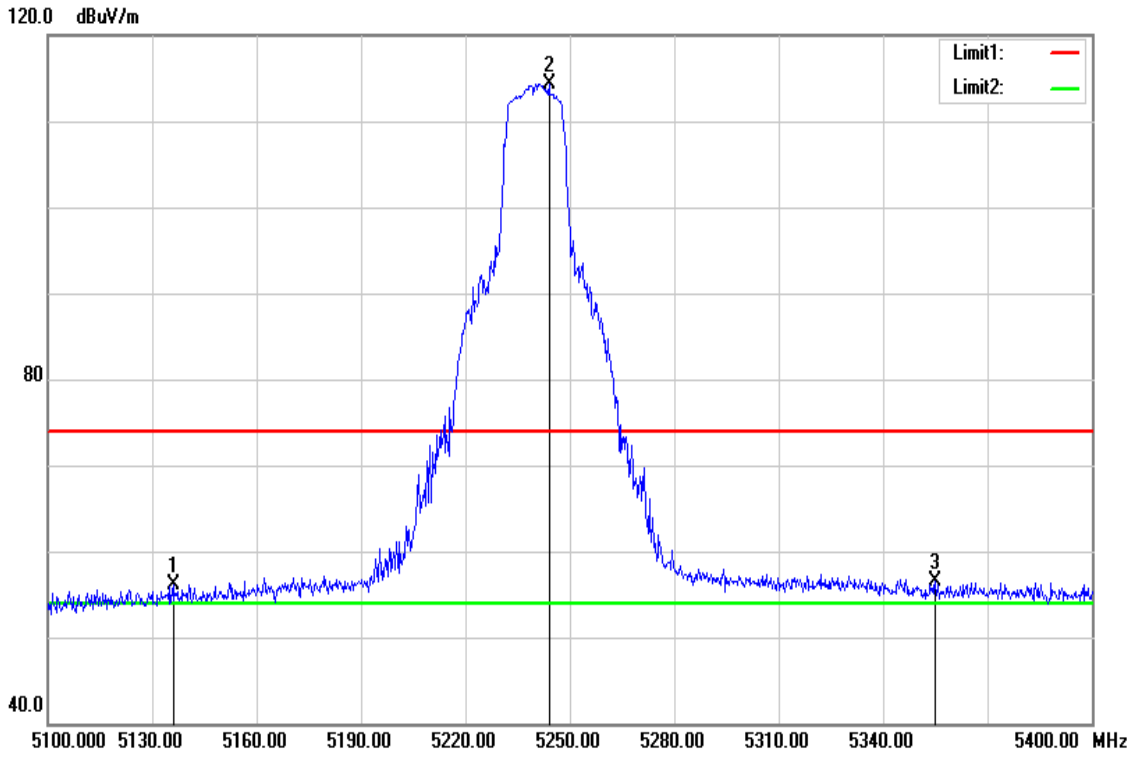
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5149.900	64.08	5.00	69.08	74.00	-4.92	peak
5179.900	108.18	5.13	113.31	-	-	peak

Test Mode	IEEE 802.11a Low CH	Temperature	24(℃)/ 39%RH
Test Item	Band Edge	Test Date	August 24, 2018
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Average		



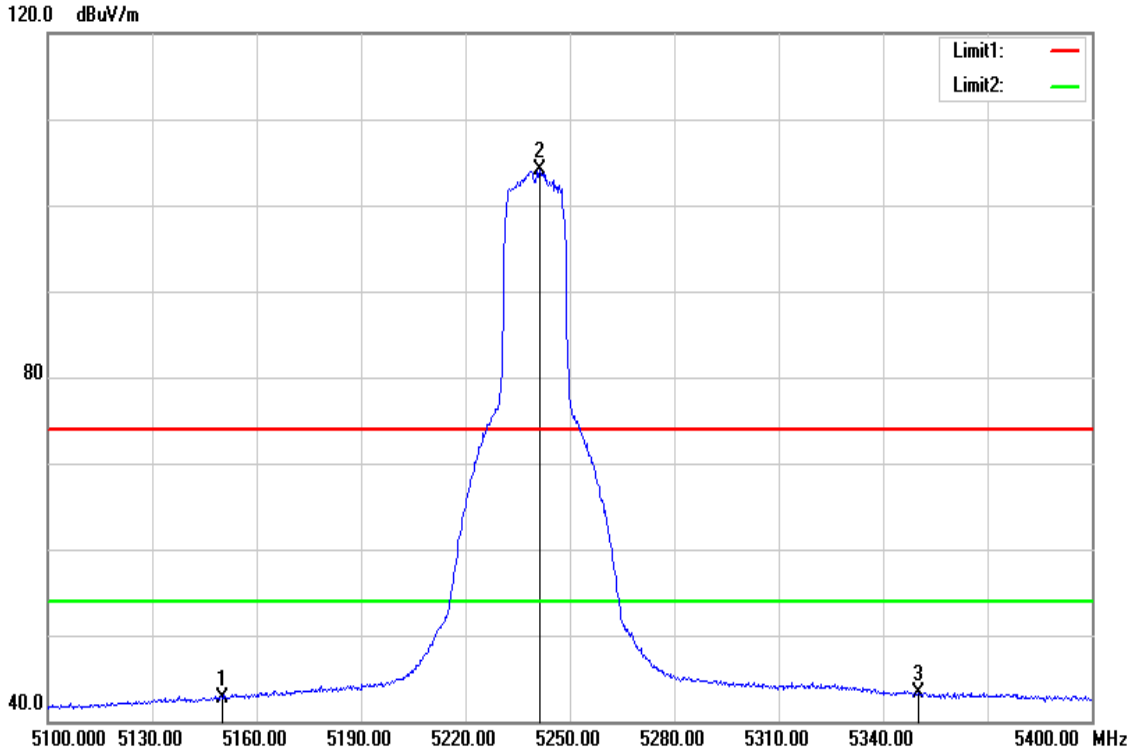
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5150.000	44.42	5.00	49.42	54.00	-4.58	AVG
5178.900	98.82	5.12	103.94	-	-	AVG

Test Mode	IEEE 802.11a High CH	Temp/Hum	24(℃)/ 39%RH
Test Item	Band Edge	Test Date	August 24, 2018
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak		



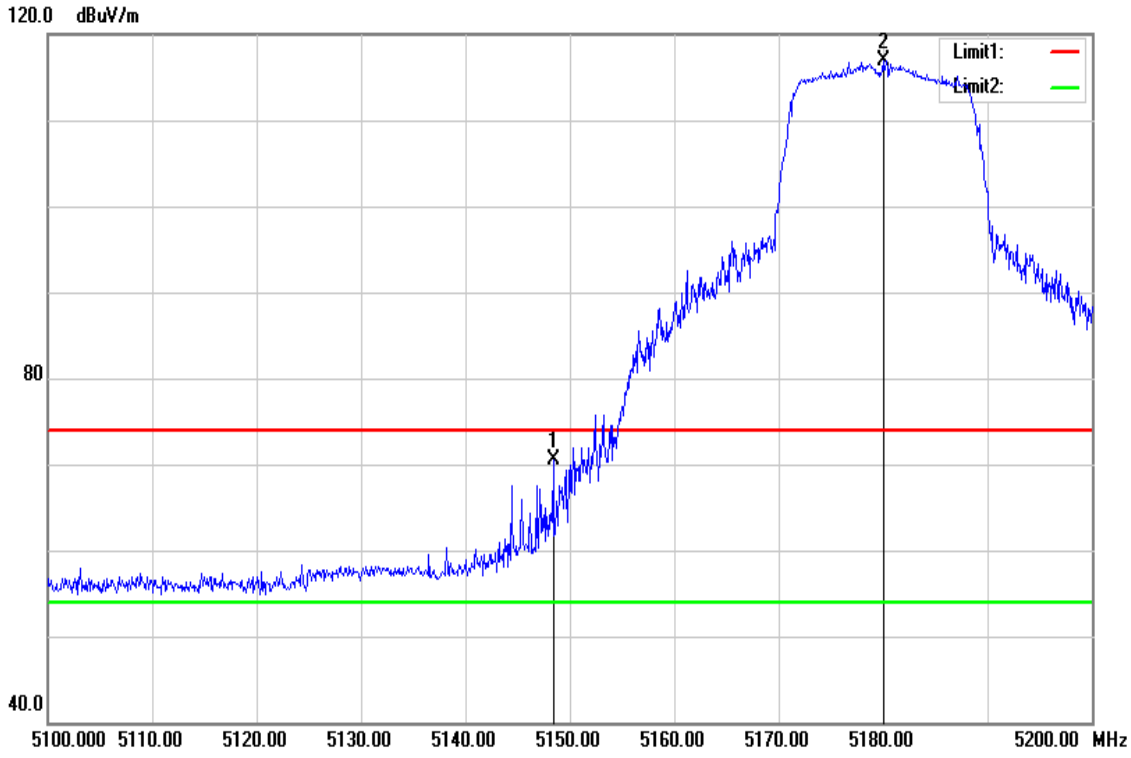
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5136.000	51.17	4.95	56.12	74.00	-17.88	peak
5244.000	109.08	5.25	114.33	-	-	peak
5355.000	51.06	5.37	56.43	74.00	-17.57	peak

Test Mode	IEEE 802.11a High CH	Temperature	24(℃)/ 39%RH
Test Item	Band Edge	Test Date	August 24, 2018
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Average		



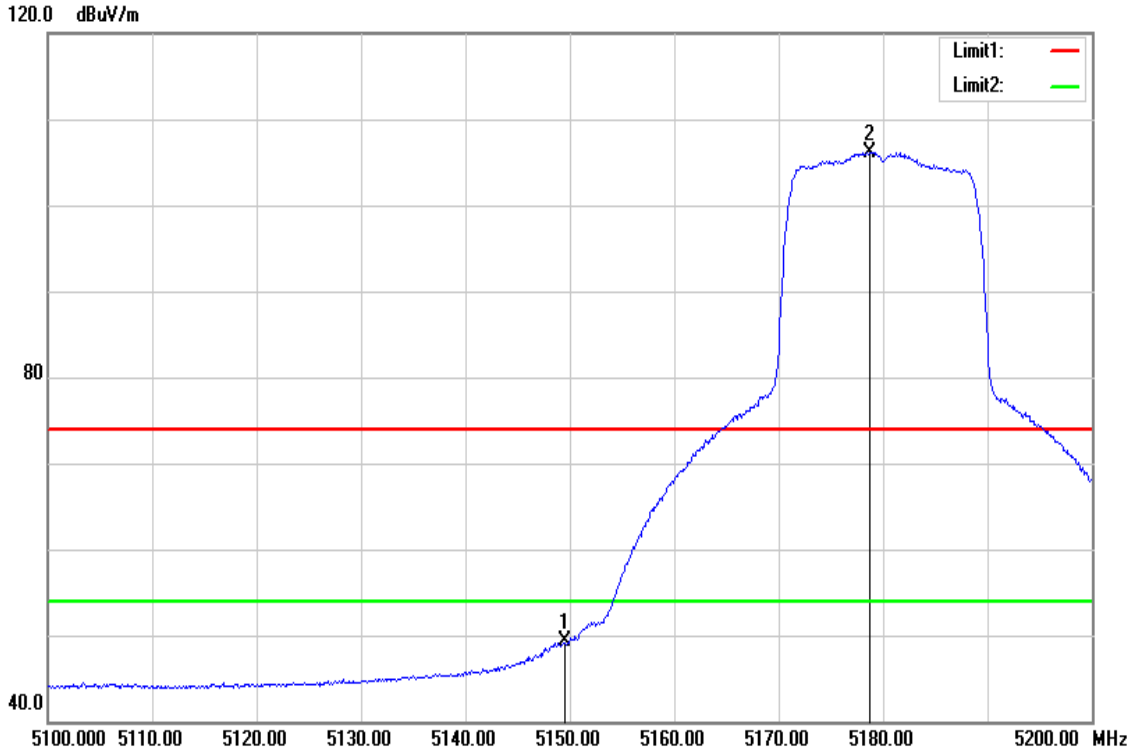
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5150.000	37.63	5.00	42.63	54.00	-11.37	AVG
5241.300	98.81	5.25	104.06	-	-	AVG
5350.000	37.91	5.36	43.27	54.00	-10.73	AVG

Test Mode	IEEE 802.11n HT20 Low CH	Temp/Hum	24(℃)/ 39%RH
Test Item	Band Edge	Test Date	August 24, 2018
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak		



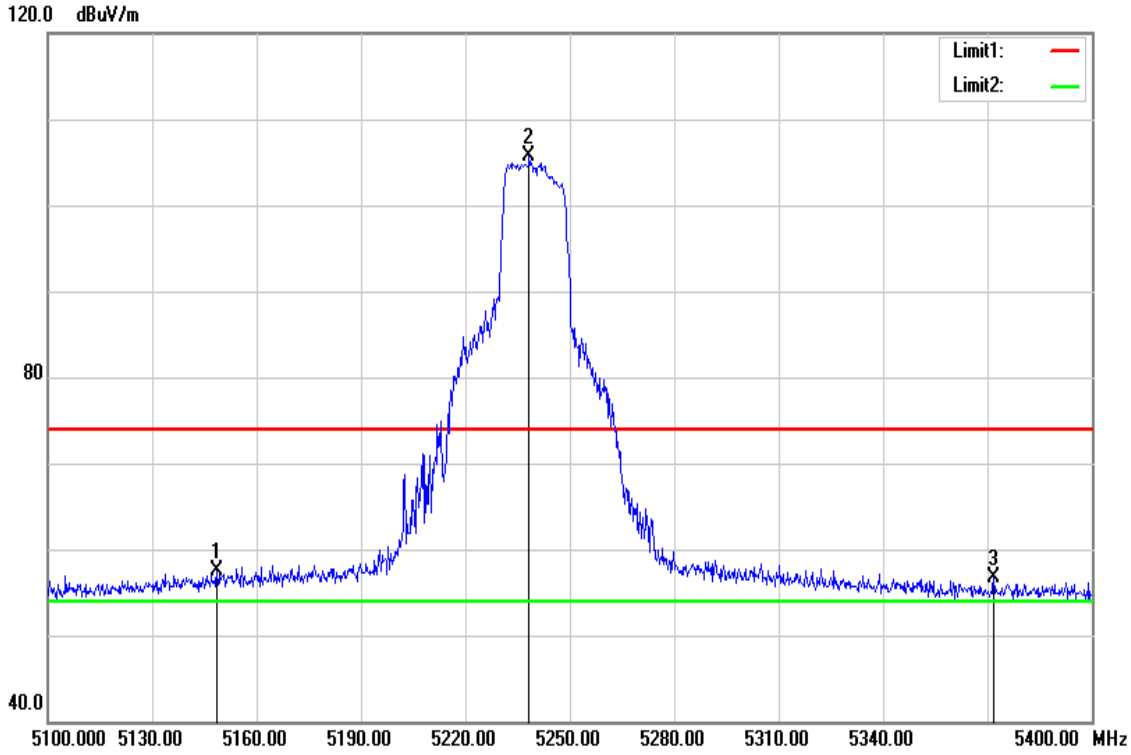
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5148.400	65.58	5.00	70.58	74.00	-3.42	peak
5180.000	111.86	5.13	116.99	-	-	peak

Test Mode	IEEE 802.11n HT20 Low CH	Temperature	24(℃)/ 39%RH
Test Item	Band Edge	Test Date	August 24, 2018
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Average		



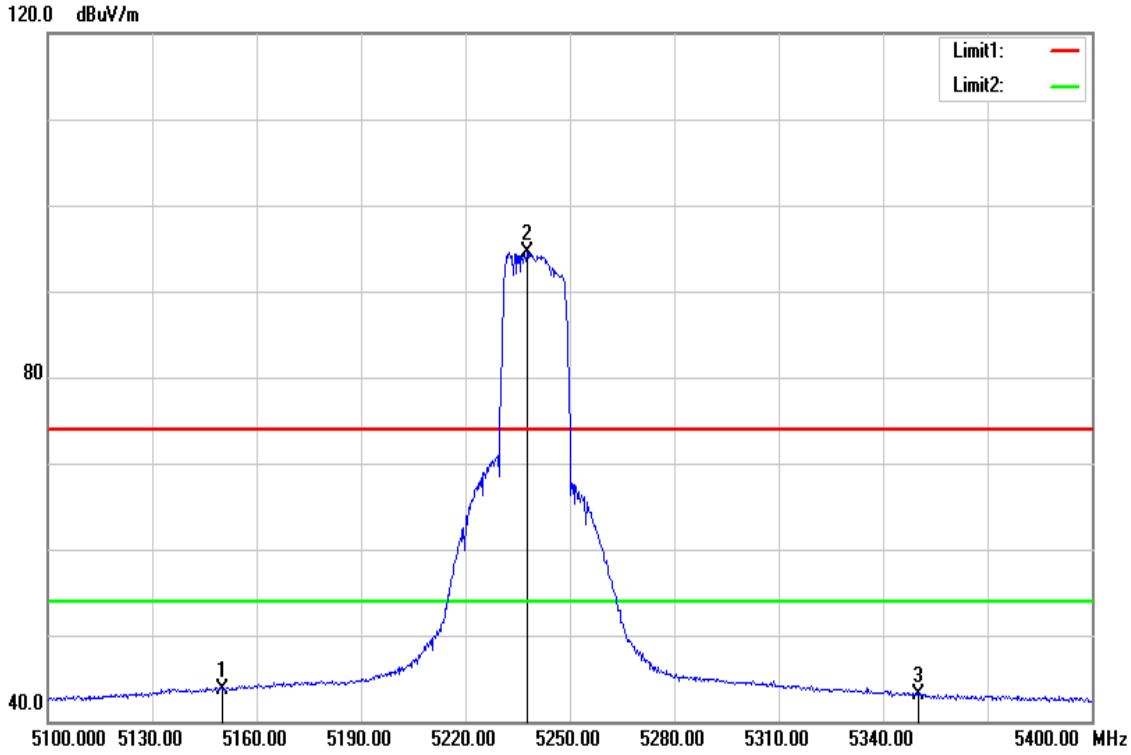
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5149.500	44.20	5.00	49.20	54.00	-4.80	AVG
5178.700	101.06	5.12	106.18	-	-	AVG

Test Mode	IEEE 802.11n HT20 High CH	Temp/Hum	24(℃)/ 39%RH
Test Item	Band Edge	Test Date	August 24, 2018
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak		



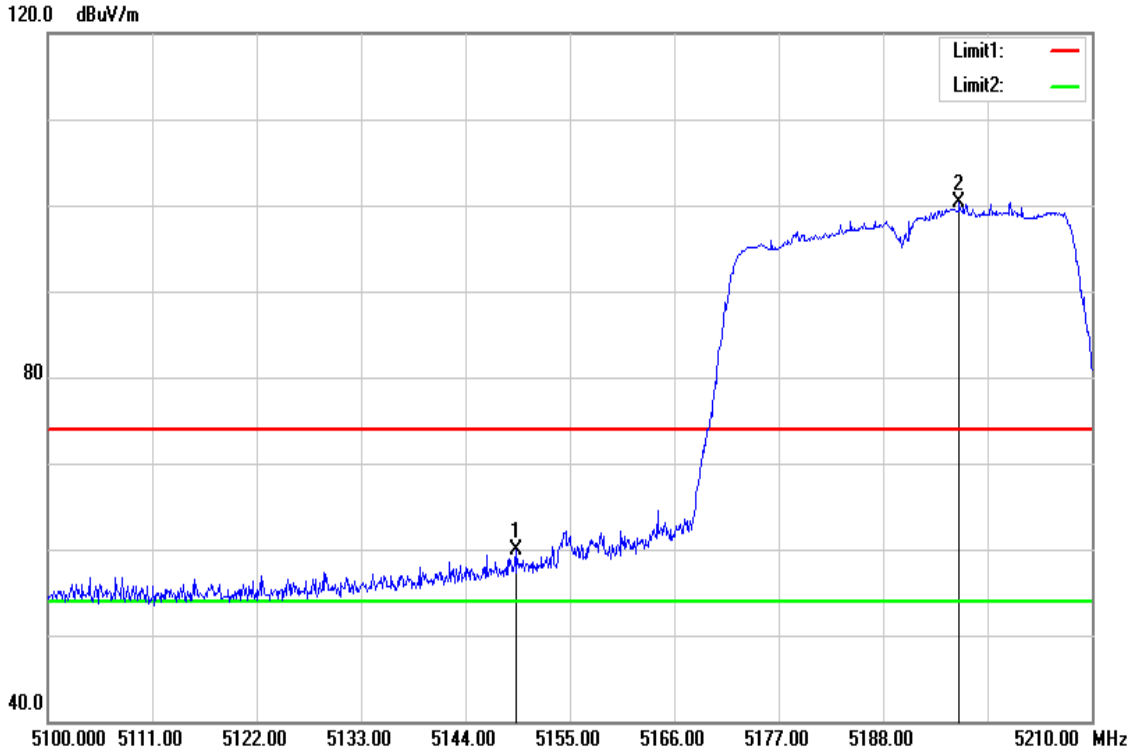
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5148.600	52.48	5.00	57.48	74.00	-16.52	peak
5238.300	100.44	5.24	105.68	-	-	peak
5371.800	51.35	5.38	56.73	74.00	-17.27	peak

Test Mode	IEEE 802.11n HT20 High CH	Temperature	24(℃)/ 39%RH
Test Item	Band Edge	Test Date	August 24, 2018
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Average		



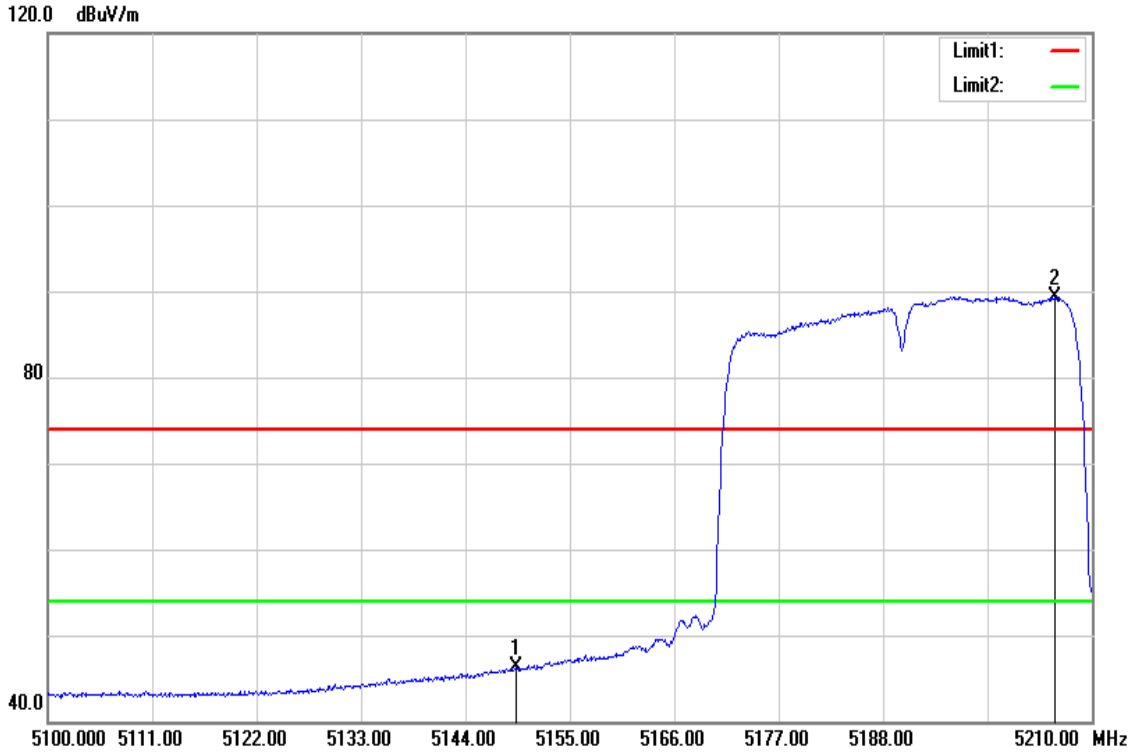
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5150.000	38.77	5.00	43.77	54.00	-10.23	AVG
5237.700	89.27	5.24	94.51	-	-	AVG
5350.000	37.66	5.36	43.02	54.00	-10.98	AVG

Test Mode	IEEE 802.11n HT40 Low CH	Temp/Hum	24(℃)/ 39%RH
Test Item	Band Edge	Test Date	August 24, 2018
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak		



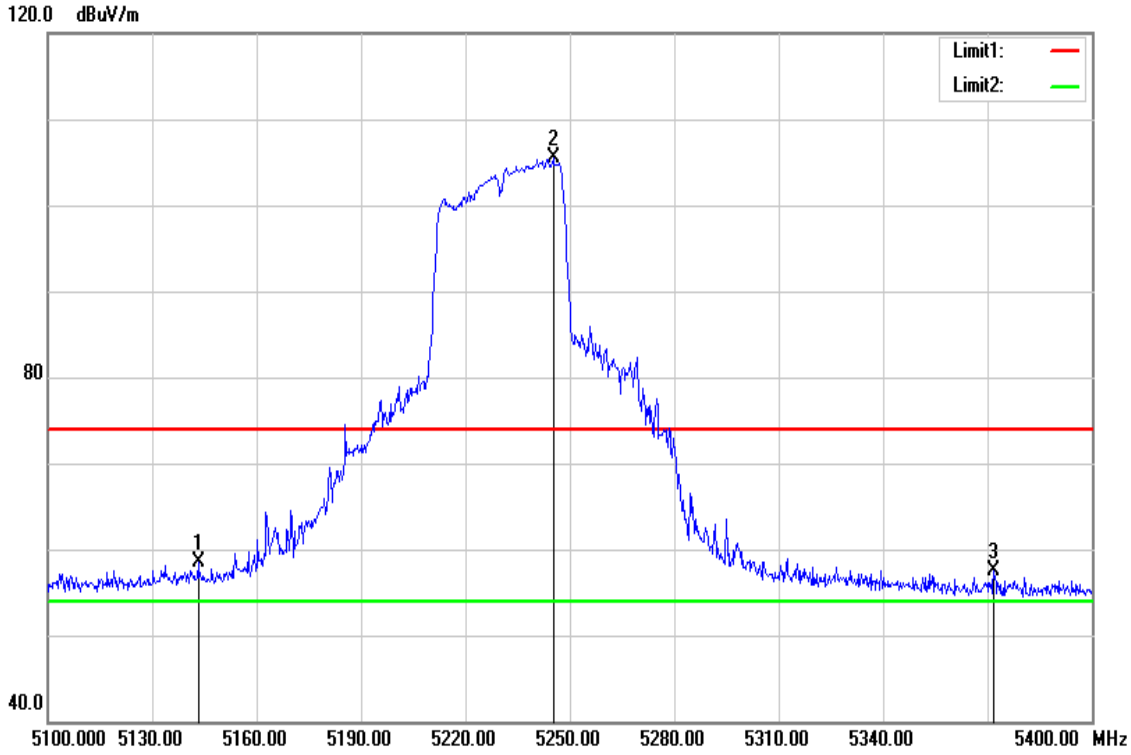
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5149.280	54.87	5.00	59.87	74.00	-14.13	peak
5196.030	95.17	5.19	100.36	-	-	peak

Test Mode	IEEE 802.11n HT40 Low CH	Temperature	24(℃)/ 39%RH
Test Item	Band Edge	Test Date	August 24, 2018
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Average		



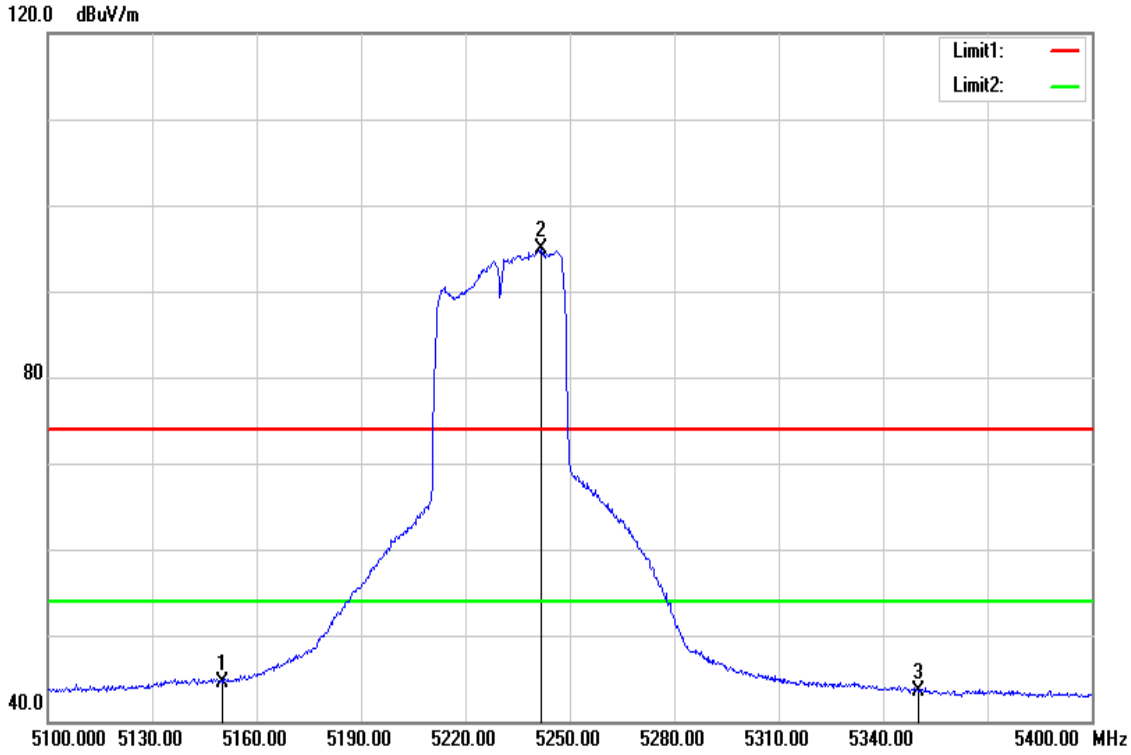
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5149.390	41.28	5.00	46.28	54.00	-7.72	AVG
5206.040	84.10	5.21	89.31	-	-	AVG

Test Mode	IEEE 802.11n HT40 High CH	Temp/Hum	24(℃)/ 39%RH
Test Item	Band Edge	Test Date	August 24, 2018
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak		



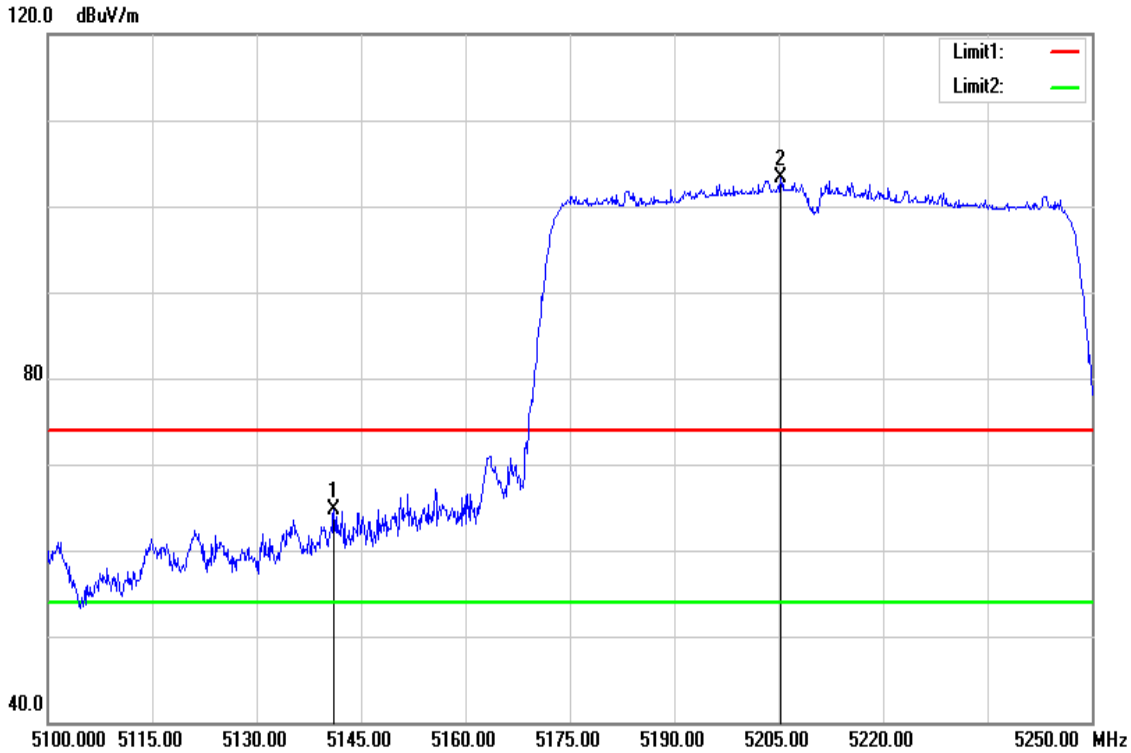
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5143.200	53.49	4.98	58.47	74.00	-15.53	peak
5245.200	100.32	5.25	105.57	-	-	peak
5371.800	52.10	5.38	57.48	74.00	-16.52	peak

Test Mode	IEEE 802.11n HT40 High CH	Temperature	24(℃)/ 39%RH
Test Item	Band Edge	Test Date	August 24, 2018
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Average		



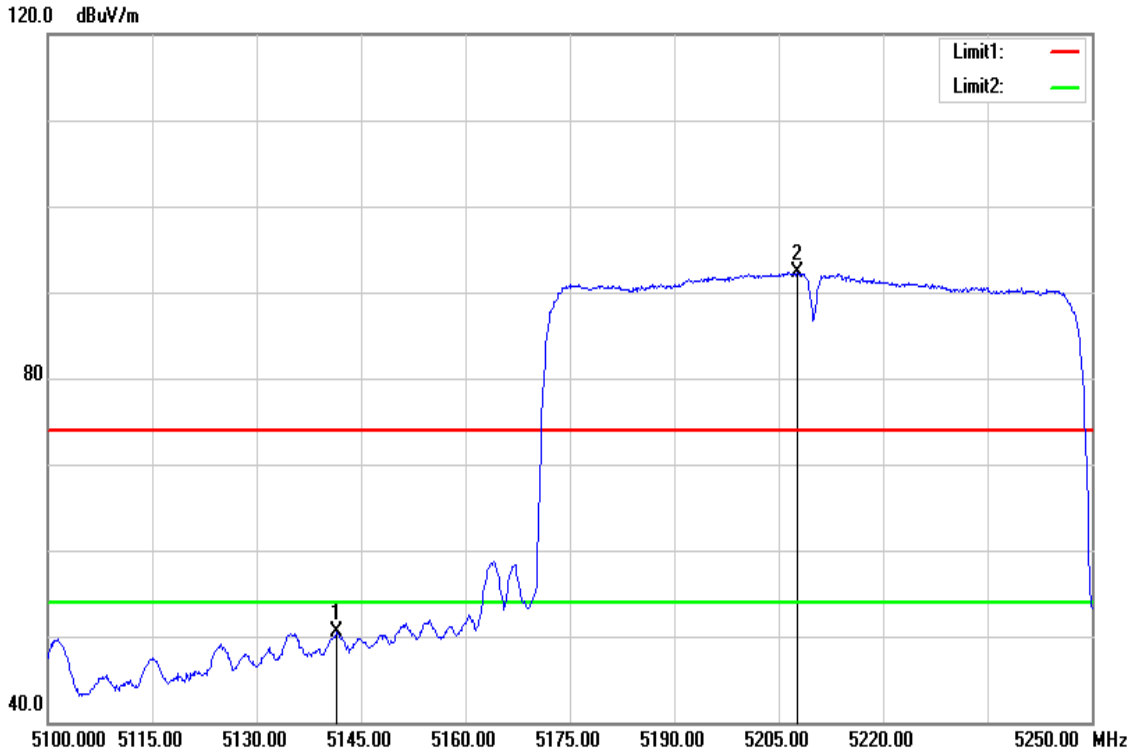
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5150.000	39.55	5.00	44.55	54.00	-9.45	AVG
5241.900	89.67	5.25	94.92	-	-	AVG
5350.000	38.20	5.36	43.56	54.00	-10.44	AVG

Test Mode	IEEE 802.11ac VHT80 Mid CH	Temp/Hum	24(℃)/ 39%RH
Test Item	Band Edge	Test Date	August 24, 2018
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak		



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5141.100	59.73	4.97	64.70	74.00	-9.30	peak
5205.300	98.04	5.21	103.25	-	-	peak

Test Mode	IEEE 802.11ac VHT80 Mid CH	Temperature	24(℃)/ 39%RH
Test Item	Band Edge	Test Date	August 24, 2018
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Average		

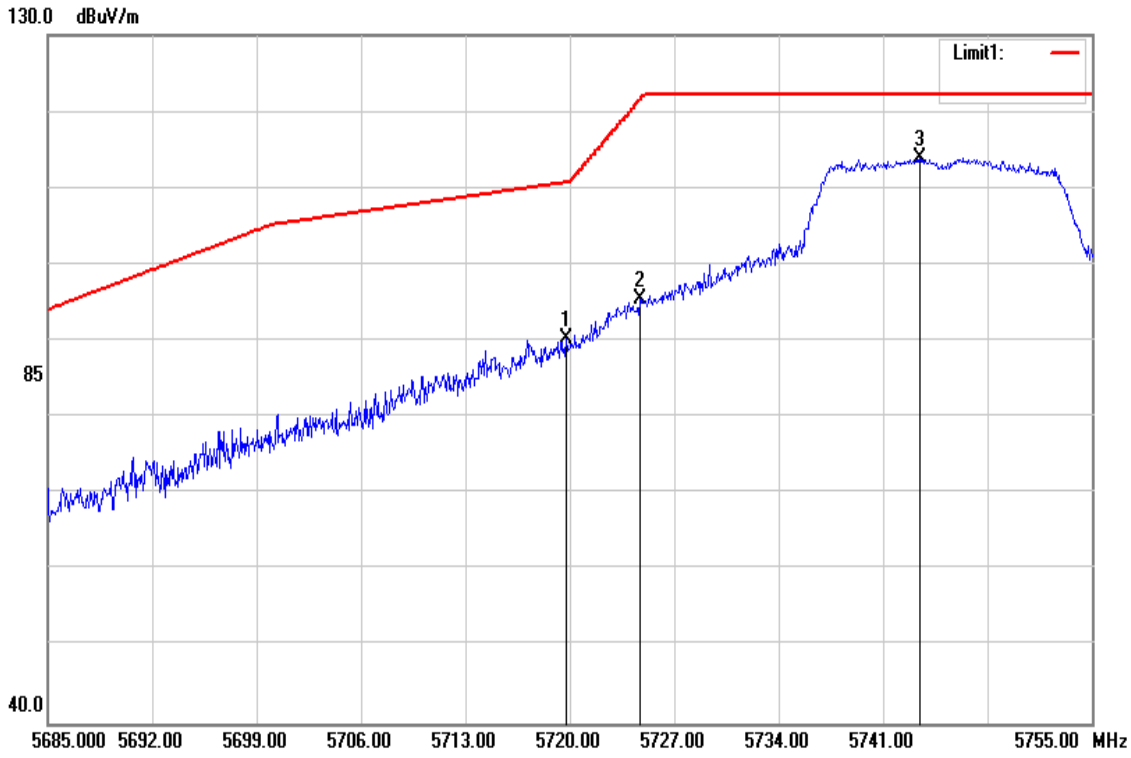


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5141.400	45.49	4.97	50.46	54.00	-3.54	AVG
5207.700	87.09	5.21	92.30	-	-	AVG

Test Data

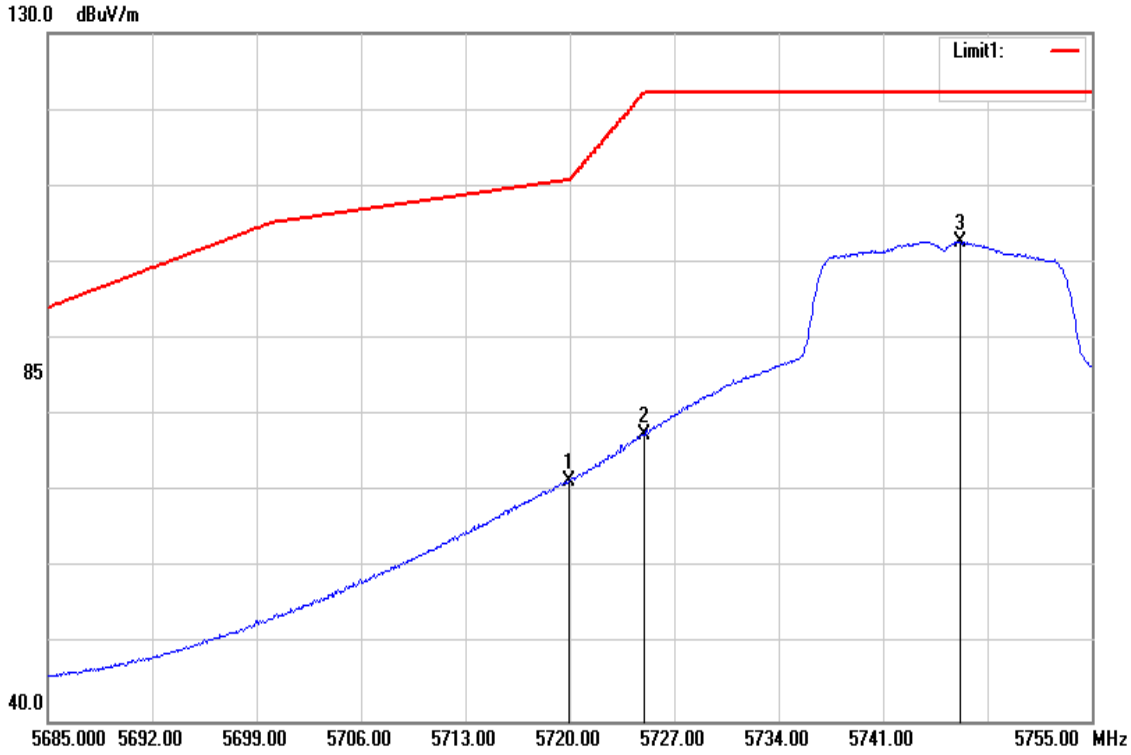
Band Edge Test Data for UNII-3

Test Mode	IEEE 802.11a Low CH	Temp/Hum	24(℃)/ 39%RH
Test Item	Band Edge	Test Date	July 9, 2018
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak		



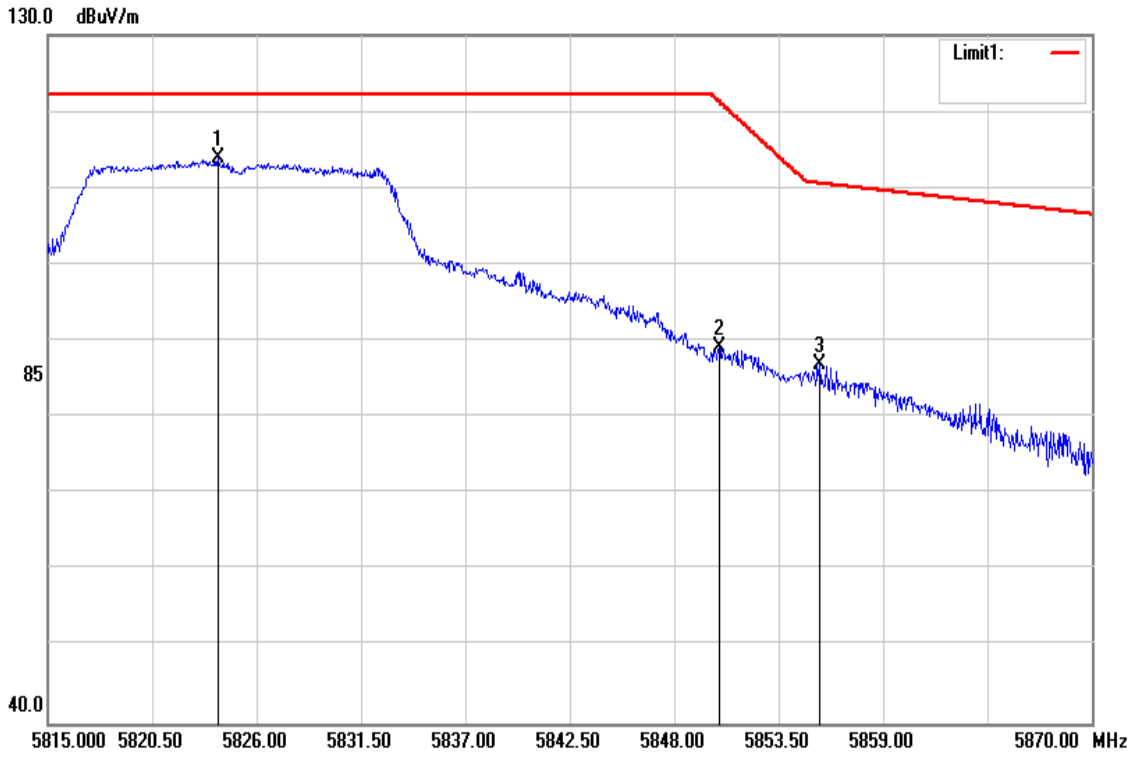
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5719.790	83.75	6.50	90.25	110.74	-20.49	peak
5724.690	88.92	6.52	95.44	121.49	-26.05	peak
5743.450	107.32	6.57	113.89	-	-	peak

Test Mode	IEEE 802.11a Low CH	Temperature	24(℃)/ 39%RH
Test Item	Band Edge	Test Date	July 9, 2018
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Average		



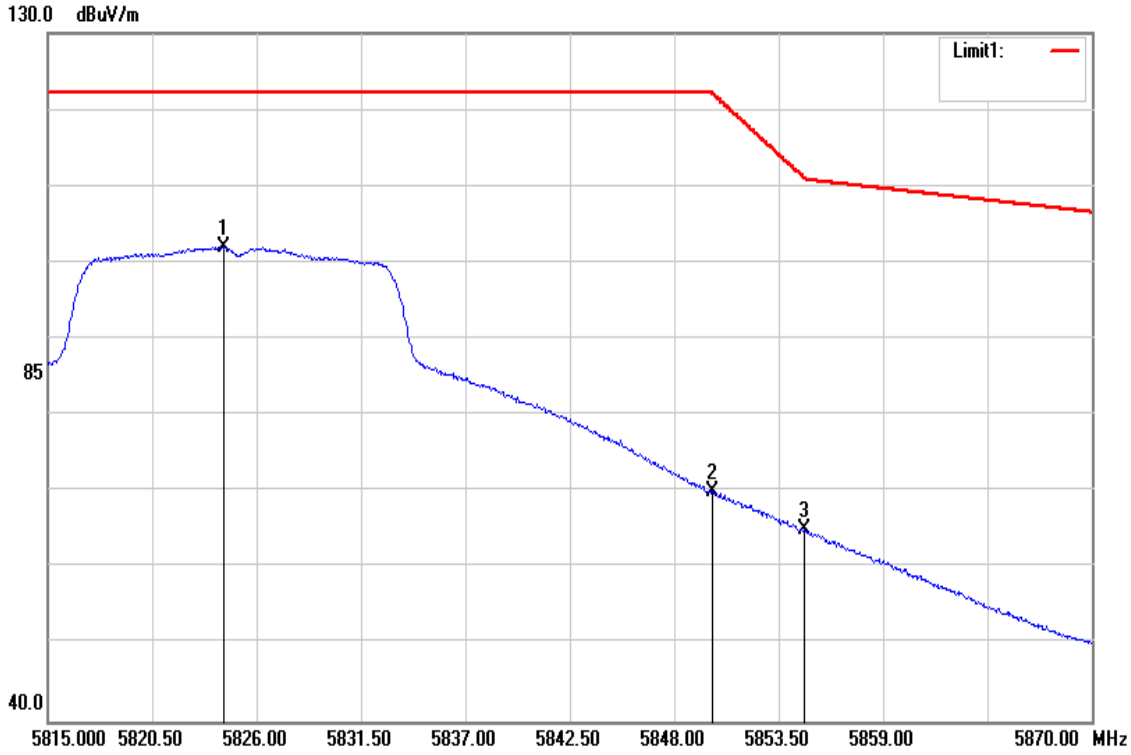
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5719.930	64.88	6.50	71.38	110.78	-39.40	AVG
5724.970	70.94	6.52	77.46	122.13	-44.67	AVG
5746.180	96.14	6.58	102.72	-	-	AVG

Test Mode	IEEE 802.11a High CH	Temp/Hum	24(℃)/ 39%RH
Test Item	Band Edge	Test Date	July 9, 2018
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak		



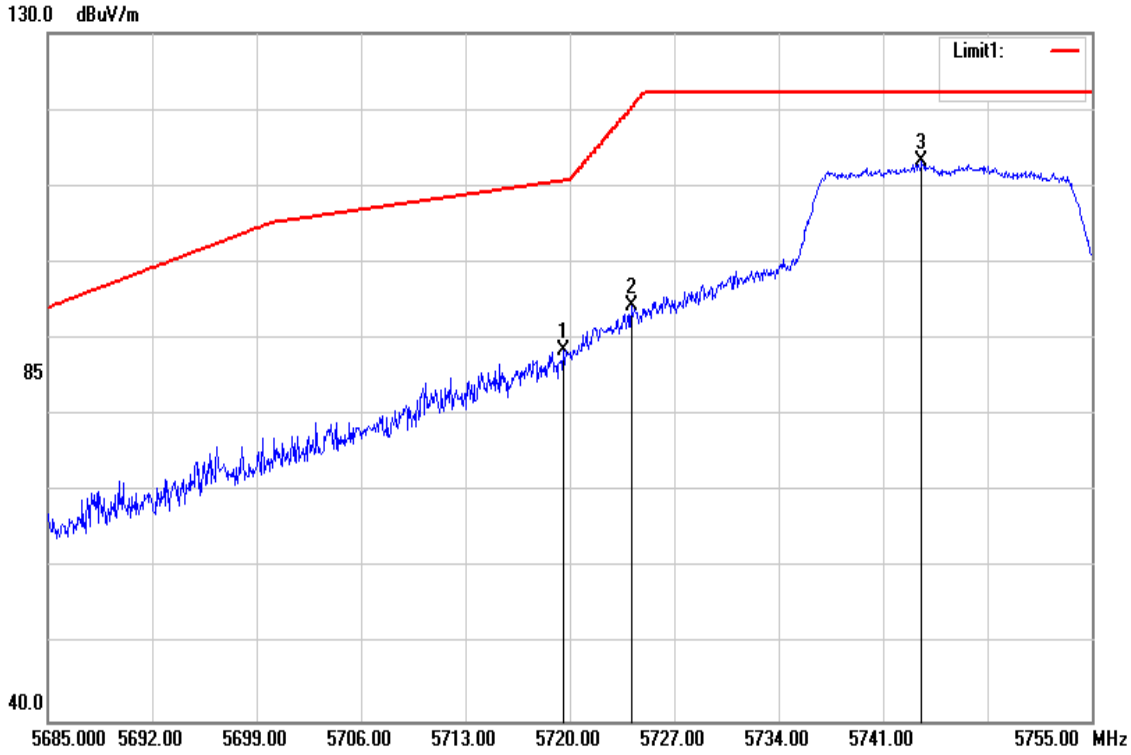
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5823.965	107.15	6.78	113.93	-	-	peak
5850.365	82.21	6.85	89.06	121.37	-32.31	peak
5855.645	80.06	6.86	86.92	110.62	-23.70	peak

Test Mode	IEEE 802.11a High CH	Temperature	24(℃)/ 39%RH
Test Item	Band Edge	Test Date	July 9, 2018
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Average		



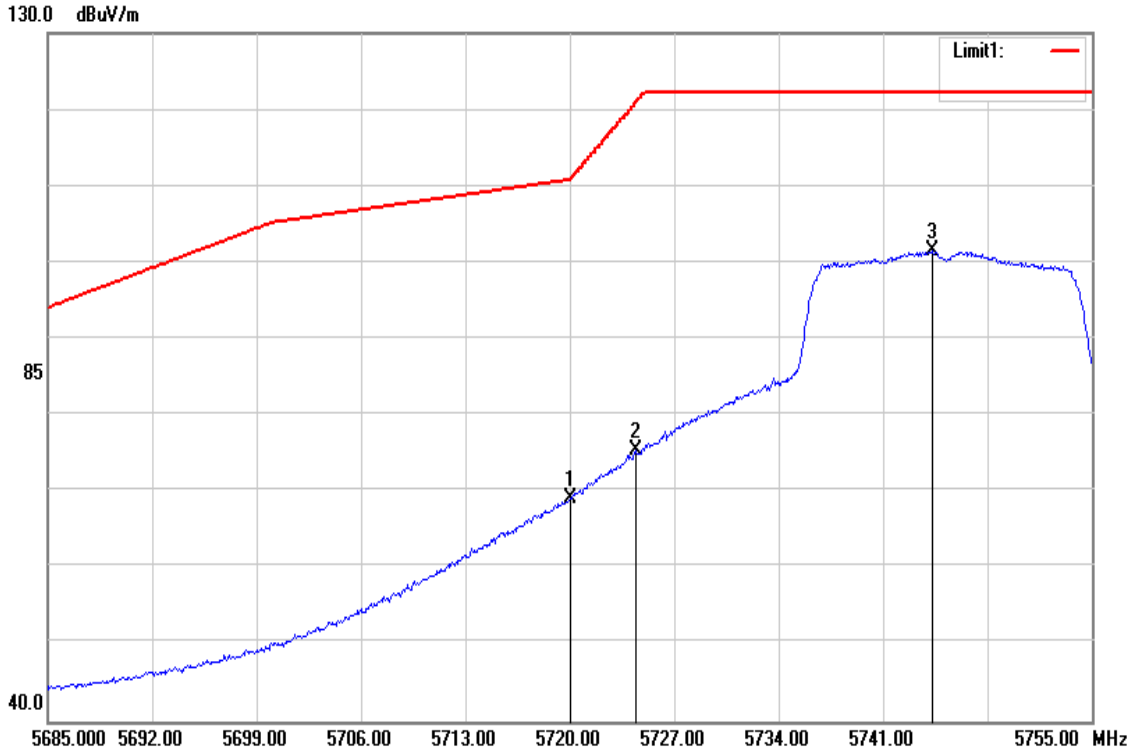
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5824.240	95.21	6.78	101.99	-	-	peak
5850.035	63.27	6.85	70.12	122.12	-52.00	peak
5854.820	58.24	6.86	65.10	111.21	-46.11	peak

Test Mode	IEEE 802.11n HT20 Low CH	Temp/Hum	24(℃)/ 39%RH
Test Item	Band Edge	Test Date	July 9, 2018
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak		



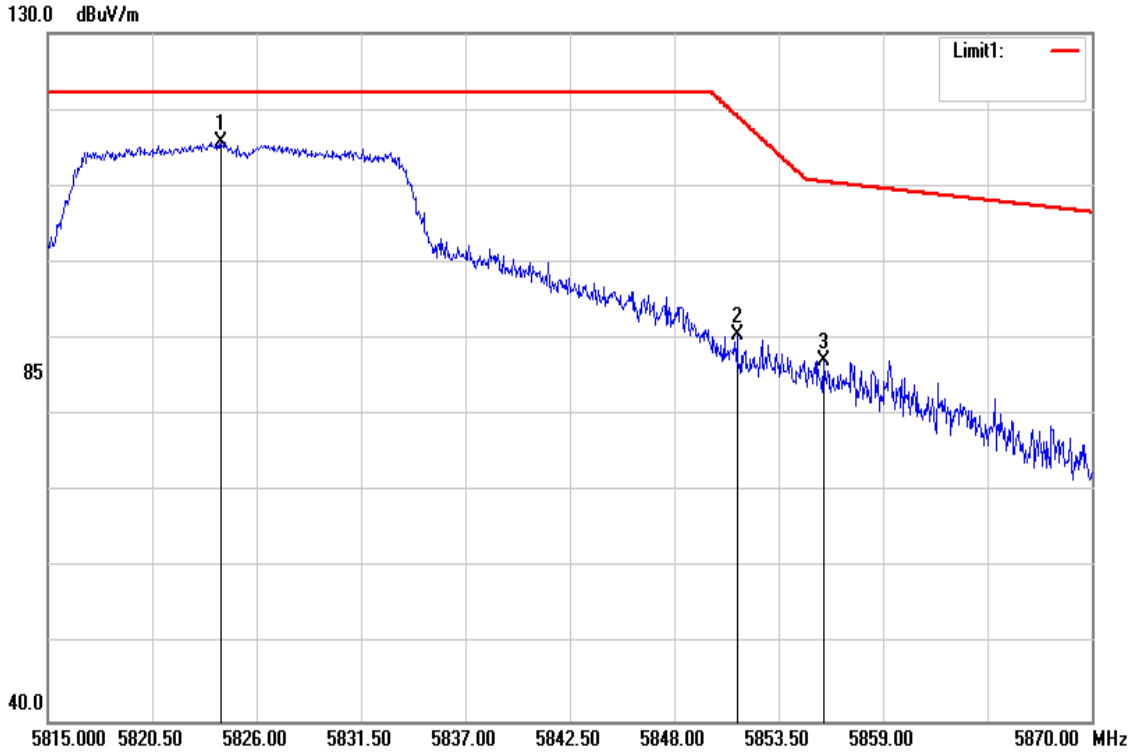
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5719.580	82.10	6.50	88.60	110.68	-22.08	peak
5724.130	87.80	6.52	94.32	120.22	-25.90	peak
5743.590	106.57	6.57	113.14	-	-	peak

Test Mode	IEEE 802.11n HT20 Low CH	Temperature	24(℃)/ 39%RH
Test Item	Band Edge	Test Date	July 9, 2018
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Average		



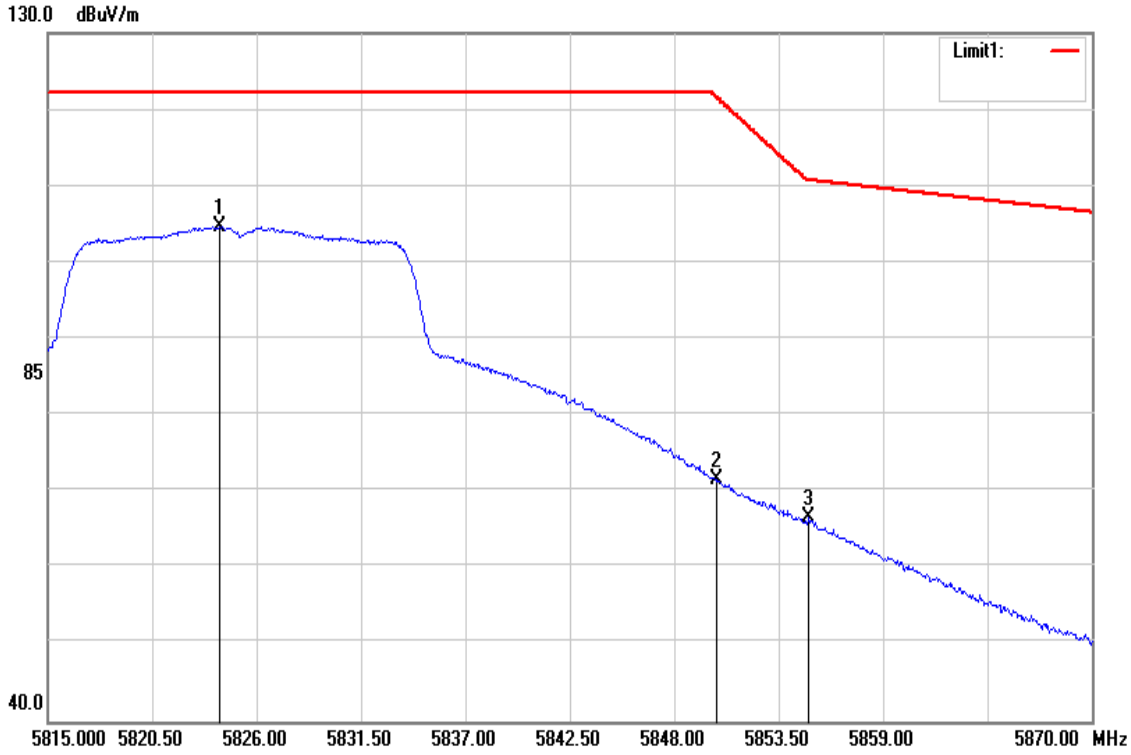
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5720.000	62.75	6.50	69.25	110.80	-41.55	AVG
5724.410	68.90	6.52	75.42	120.85	-45.43	AVG
5744.290	94.94	6.57	101.51	-	-	AVG

Test Mode	IEEE 802.11n HT20 High CH	Temp/Hum	24(℃)/ 39%RH
Test Item	Band Edge	Test Date	July 9, 2018
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak		



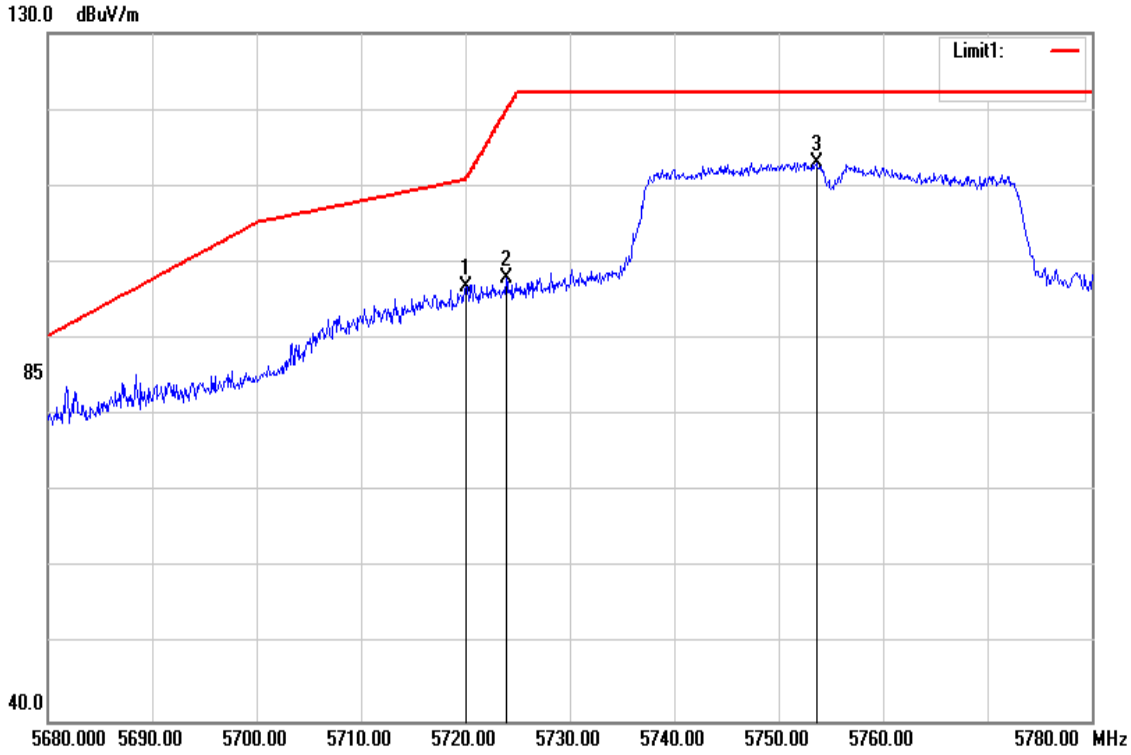
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5824.130	108.98	6.78	115.76	-	-	peak
5851.300	83.76	6.85	90.61	119.24	-28.63	peak
5855.865	80.38	6.86	87.24	110.56	-23.32	peak

Test Mode	IEEE 802.11n HT20 High CH	Temperature	24(℃)/ 39%RH
Test Item	Band Edge	Test Date	July 9, 2018
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Average		



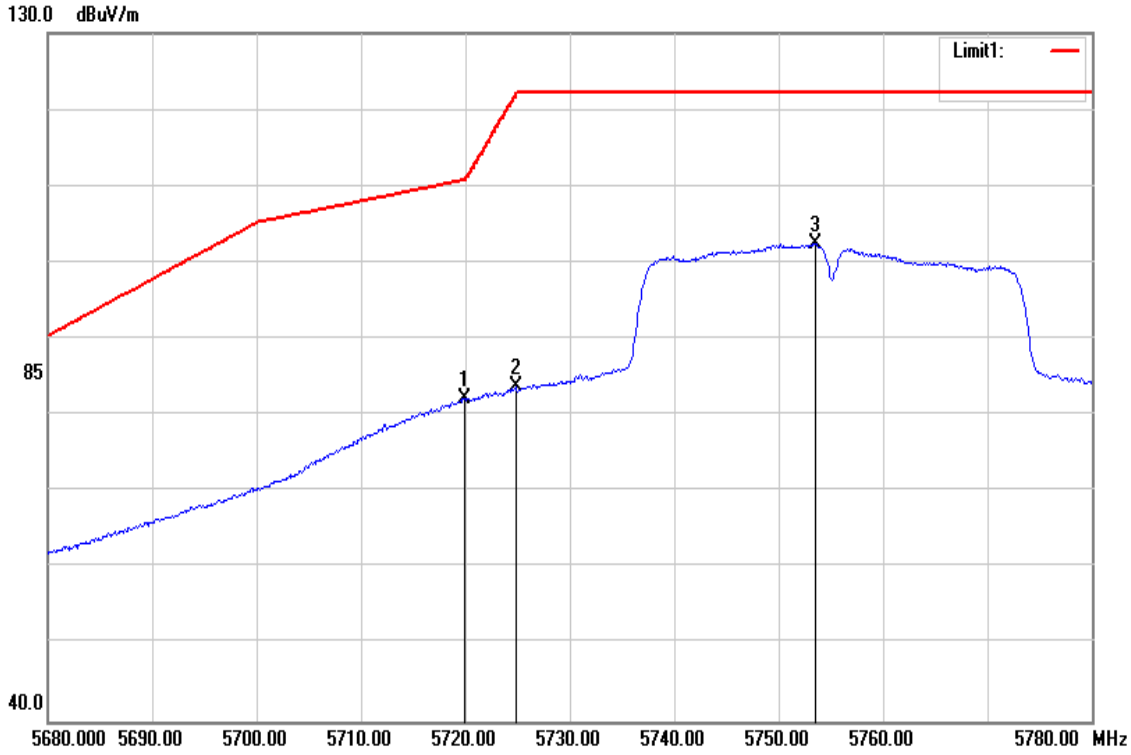
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5824.020	97.98	6.78	104.76	-	-	AVG
5850.200	64.82	6.85	71.67	121.74	-50.07	AVG
5855.095	59.77	6.86	66.63	110.77	-44.14	AVG

Test Mode	IEEE 802.11n HT40 Low CH	Temp/Hum	24(℃)/ 39%RH
Test Item	Band Edge	Test Date	July 9, 2018
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak		



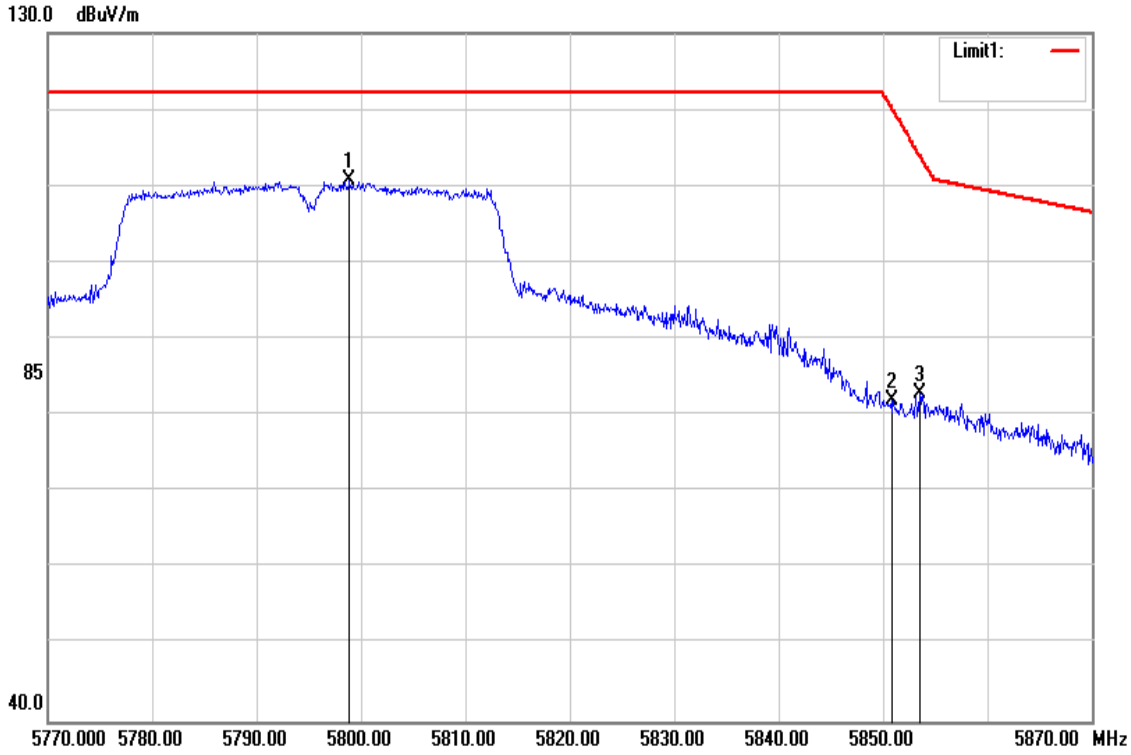
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5720.100	90.38	6.50	96.88	111.03	-14.15	peak
5723.900	91.43	6.52	97.95	119.69	-21.74	peak
5753.600	106.49	6.59	113.08	-	-	peak

Test Mode	IEEE 802.11n HT40 Low CH	Temperature	24(℃)/ 39%RH
Test Item	Band Edge	Test Date	July 9, 2018
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Average		



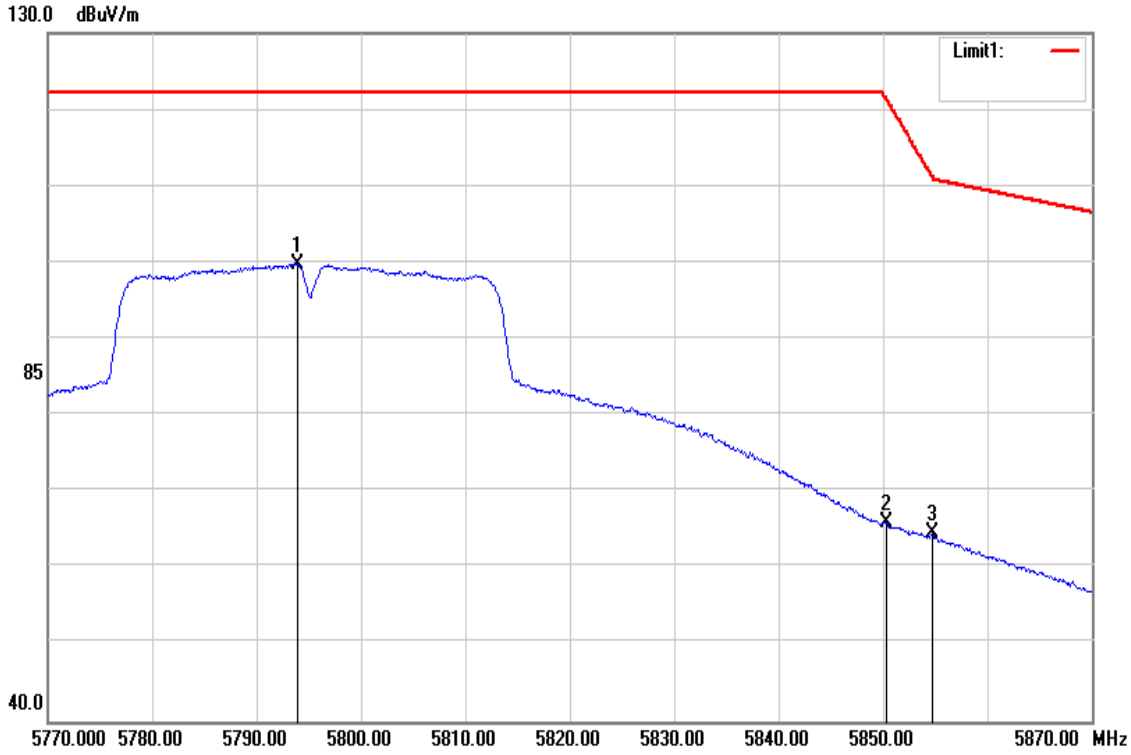
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5719.900	75.75	6.50	82.25	110.77	-28.52	AVG
5724.800	77.20	6.52	83.72	121.74	-38.02	AVG
5753.500	95.94	6.59	102.53	-	-	AVG

Test Mode	IEEE 802.11n HT40 High CH	Temp/Hum	24(℃)/ 39%RH
Test Item	Band Edge	Test Date	July 9, 2018
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak		



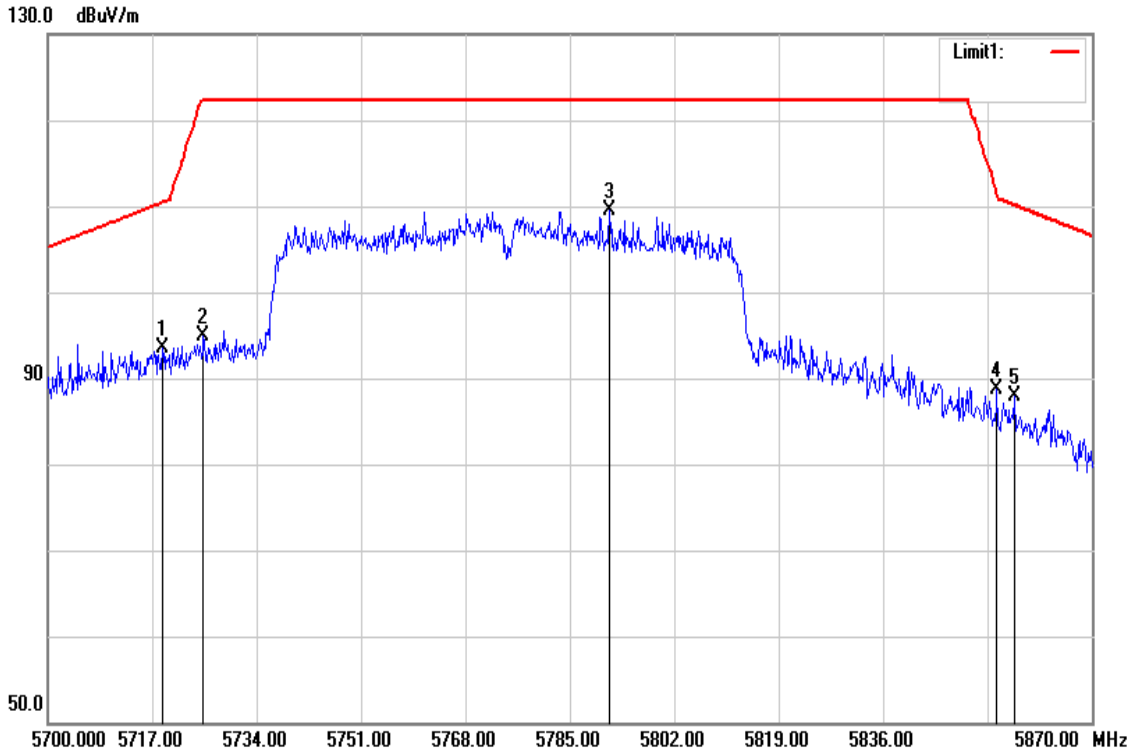
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5798.900	104.03	6.72	110.75	-	-	peak
5850.900	75.11	6.85	81.96	120.15	-38.19	peak
5853.500	76.04	6.85	82.89	114.22	-31.33	peak

Test Mode	IEEE 802.11n HT40 High CH	Temperature	24(℃)/ 39%RH
Test Item	Band Edge	Test Date	July 9, 2018
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Average		



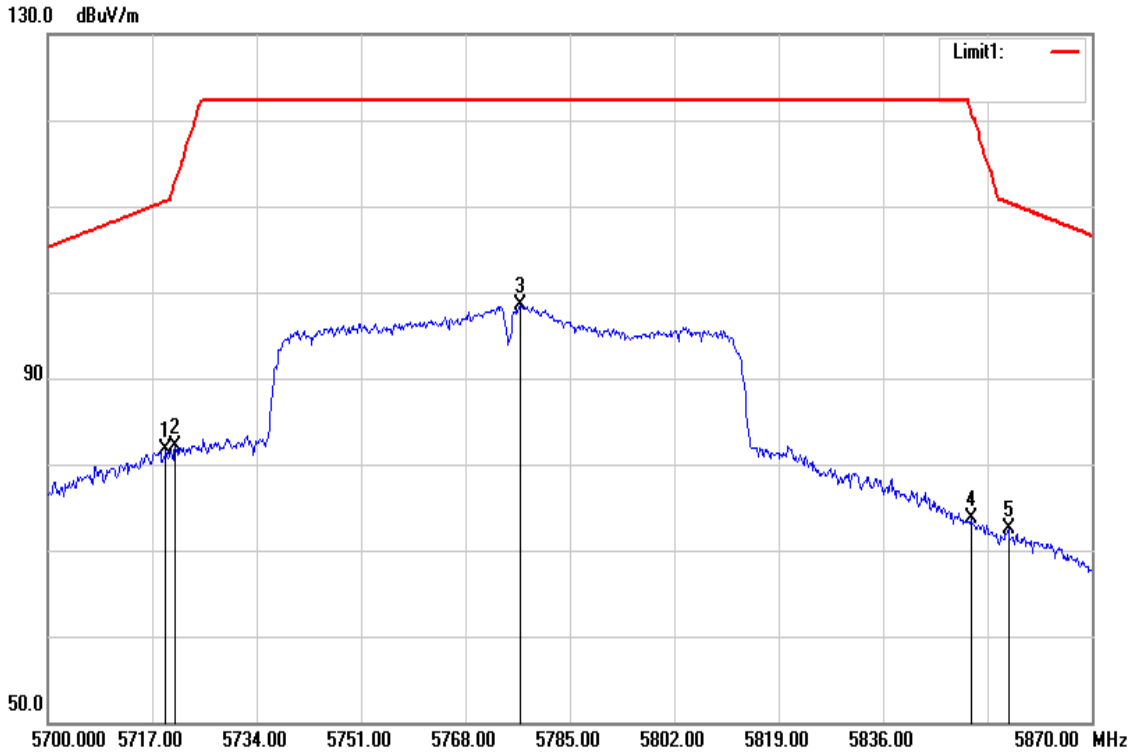
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5793.900	93.06	6.70	99.76	-	-	AVG
5850.300	59.21	6.85	66.06	121.52	-55.46	AVG
5854.700	57.74	6.86	64.60	111.48	-46.88	AVG

Test Mode	IEEE 802.11ac VHT80 Mid CH	Temp/Hum	24(℃)/ 39%RH
Test Item	Band Edge	Test Date	July 9, 2018
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak		



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5718.700	87.06	6.50	93.56	110.44	-16.88	peak
5725.330	88.33	6.52	94.85	122.20	-27.35	peak
5791.460	102.79	6.69	109.48	-	-	peak
5854.530	81.79	6.86	88.65	111.87	-23.22	peak
5857.420	81.12	6.86	87.98	110.12	-22.14	peak

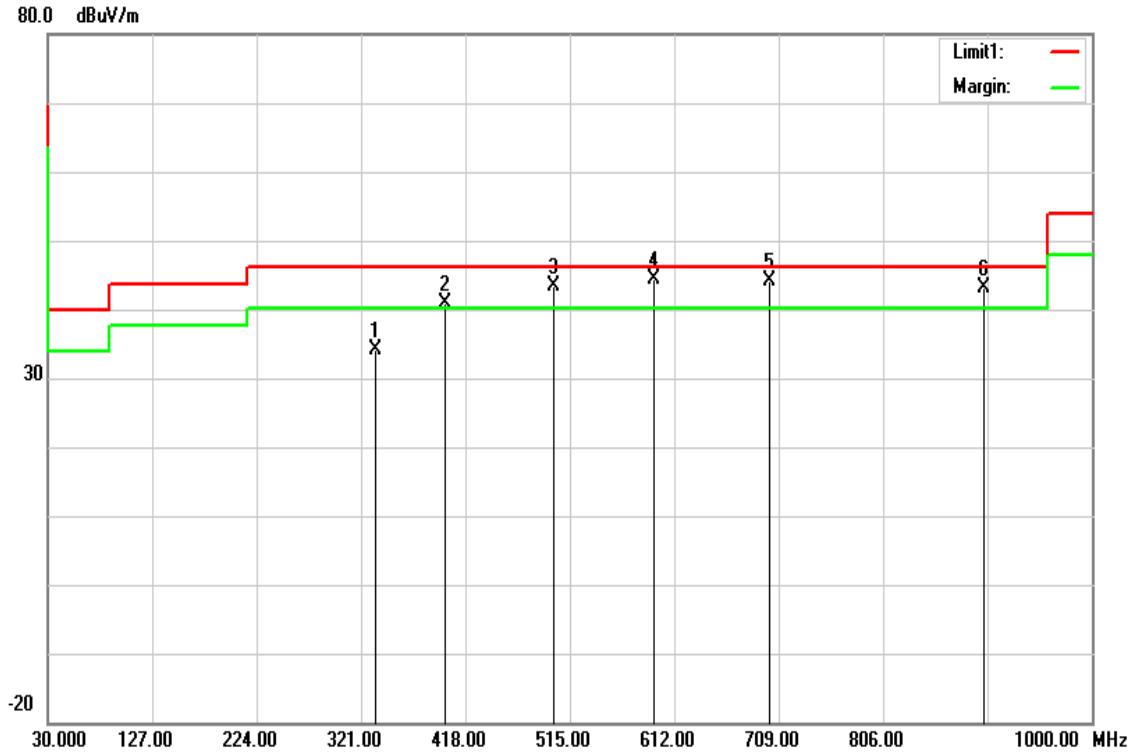
Test Mode	IEEE 802.11ac VHT80 Mid CH	Temperature	24(℃)/ 39%RH
Test Item	Band Edge	Test Date	July 9, 2018
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Average		



Frequency (MHz	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
5719.210	75.13	6.50	81.63	110.58	-28.95	AVG
5720.740	75.66	6.50	82.16	112.49	-30.33	AVG
5776.840	91.77	6.65	98.42	-	-	AVG
5850.280	66.82	6.85	73.67	121.56	-47.89	AVG
5856.400	65.71	6.86	72.57	110.41	-37.84	AVG

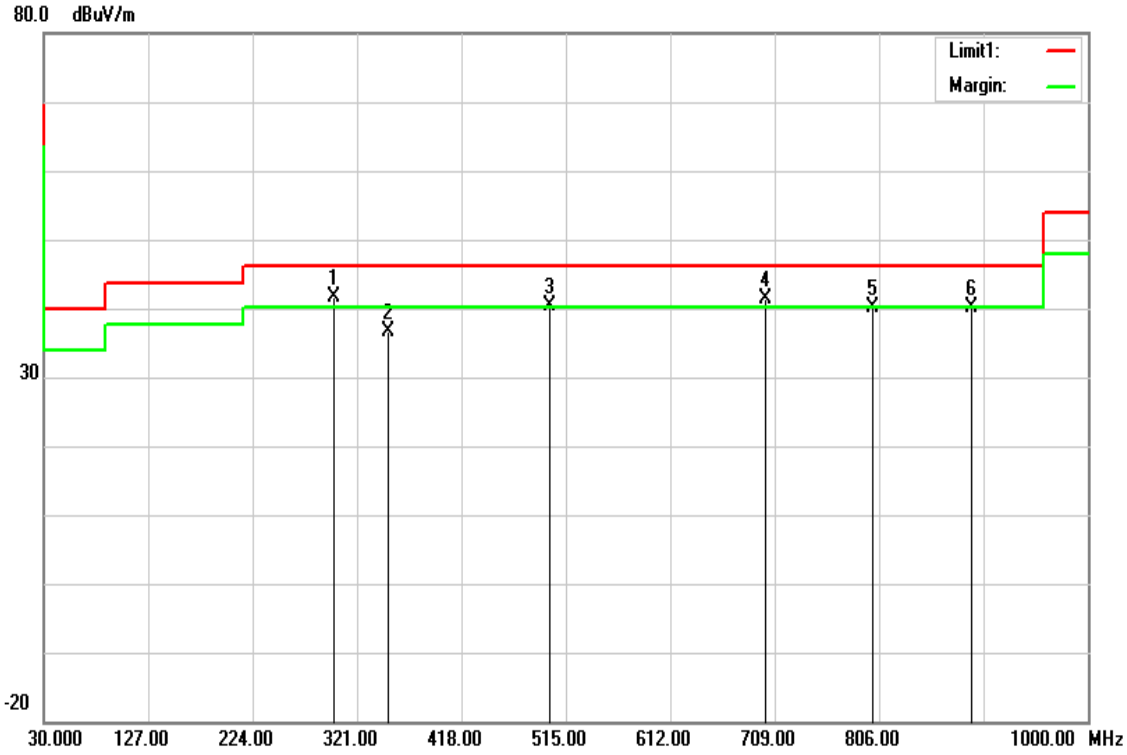
Below 1G Test Data

Test Mode	Mode 1	Temp/Hum	24(℃)/ 39%RH
Test Item	30MHz-1GHz	Test Date	July 24, 2018
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak and Qusi-peak		



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
334.5800	41.25	-7.15	34.10	46.02	-11.92	peak
399.5700	46.07	-5.30	40.77	46.02	-5.25	QP
500.4500	45.97	-2.58	43.39	46.02	-2.63	QP
593.5700	45.51	-1.21	44.30	46.02	-1.72	QP
700.2700	43.04	1.01	44.05	46.02	-1.97	QP
900.0900	38.76	4.49	43.25	46.02	-2.77	QP

Test Mode	Mode 1	Temp/Hum	24(℃)/ 39%RH
Test Item	30MHz-1GHz	Test Date	July 24, 2018
Polarize	Horizontal	Test Engineer	Jerry Chuang
Detector	Peak and Qusi-peak		

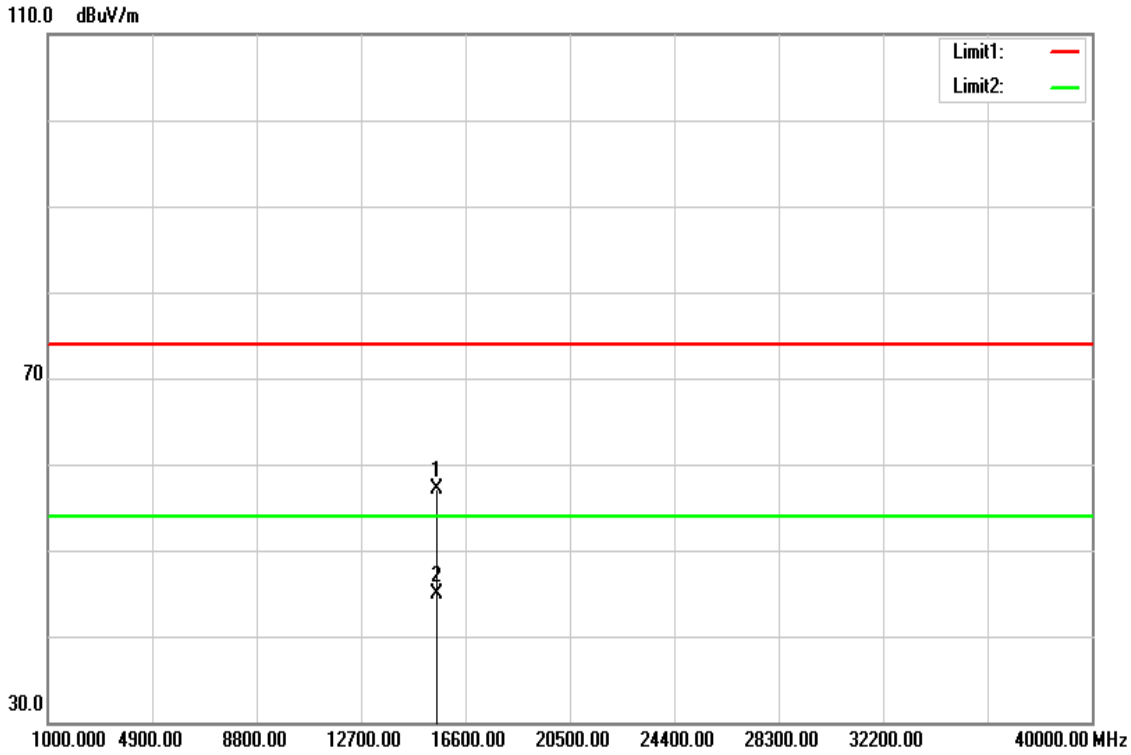


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB	Remark
299.6600	49.24	-7.51	41.73	46.02	-4.29	QP
350.1000	42.81	-6.22	36.59	46.02	-9.43	peak
500.4500	42.54	-2.28	40.26	46.02	-5.76	QP
700.2700	39.96	1.31	41.27	46.02	-4.75	QP
800.1800	37.21	3.04	40.25	46.02	-5.77	QP
891.3600	35.65	4.58	40.23	46.02	-5.79	QP

Report No.: T180625W01-RP2

Above 1G Test Data for UNII-1

Test Mode	IEEE 802.11a Low CH	Temp/Hum	24(℃)/ 39%RH
Test Item	Harmonic	Test Date	August 24, 2018
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak and Average		

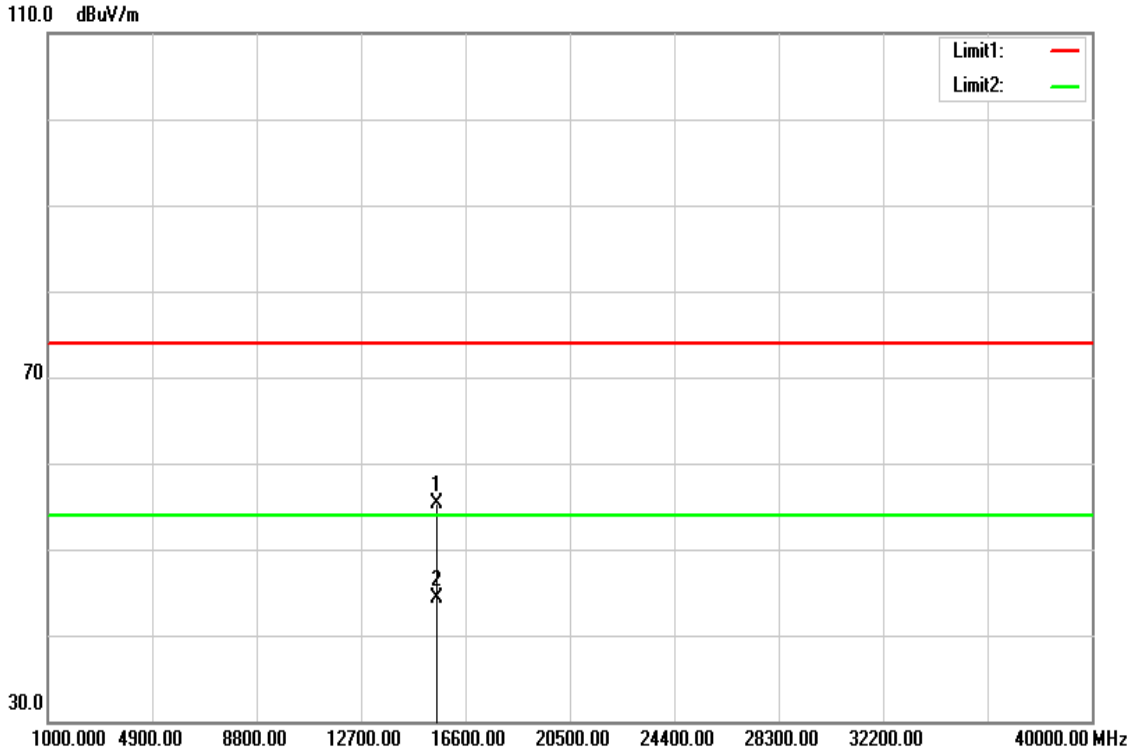


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
15550.000	39.25	17.78	57.03	74.00	-16.97	peak
15550.000	27.21	17.78	44.99	54.00	-9.01	AVG
N/A						

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*

Test Mode	IEEE 802.11a Low CH	Temp/Hum	24(℃)/ 39%RH
Test Item	Harmonic	Test Date	August 24, 2018
Polarize	Horizontal	Test Engineer	Jerry Chuang
Detector	Peak and Average		

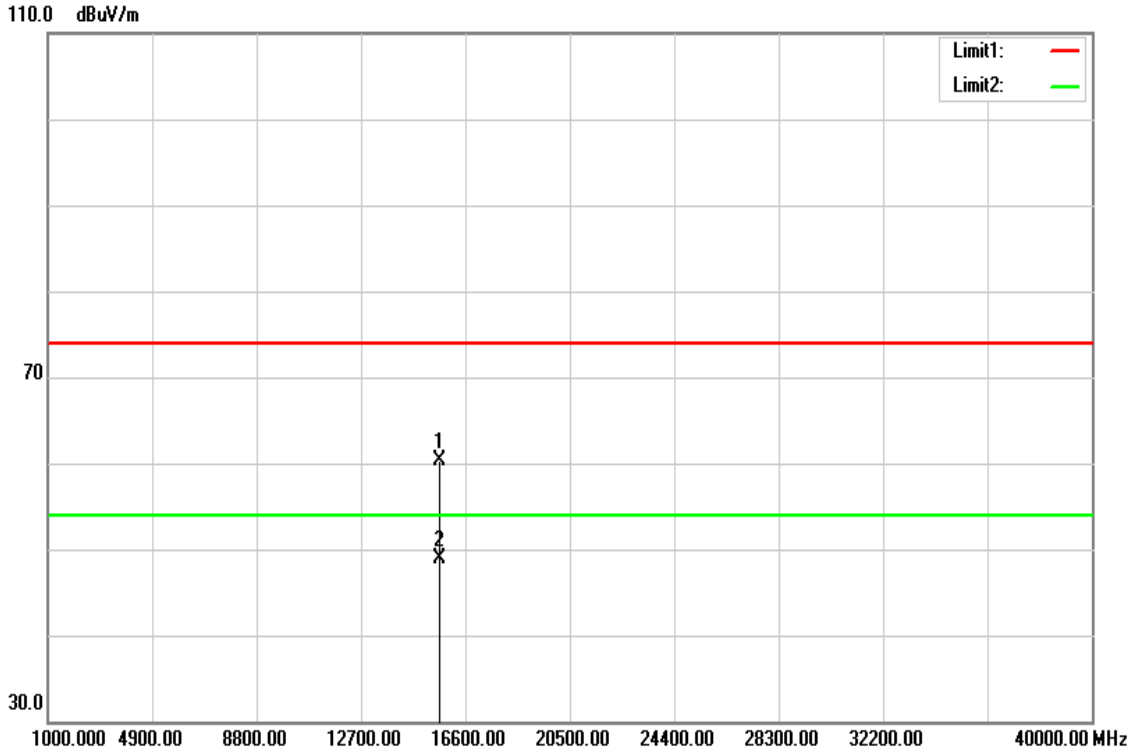


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
15530.000	37.51	17.82	55.33	74.00	-18.67	peak
15530.000	26.38	17.82	44.20	54.00	-9.80	AVG
N/A						

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*

Test Mode	IEEE 802.11a Mid CH	Temp/Hum	24(℃)/ 39%RH
Test Item	Harmonic	Test Date	August 24, 2018
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak and Average		

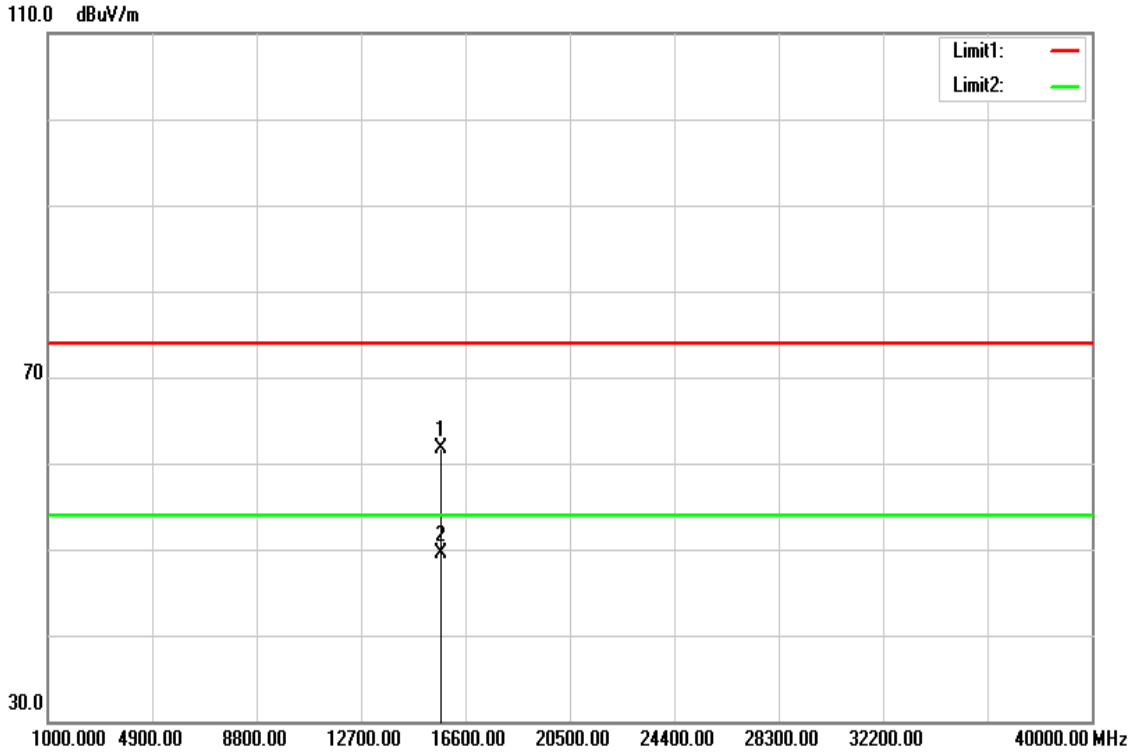


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
15660.000	42.37	18.00	60.37	74.00	-13.63	peak
15660.000	30.93	18.00	48.93	54.00	-5.07	AVG
N/A						

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*

Test Mode	IEEE 802.11a Mid CH	Temp/Hum	24(℃)/ 39%RH
Test Item	Harmonic	Test Date	August 24, 2018
Polarize	Horizontal	Test Engineer	Jerry Chuang
Detector	Peak and Average		

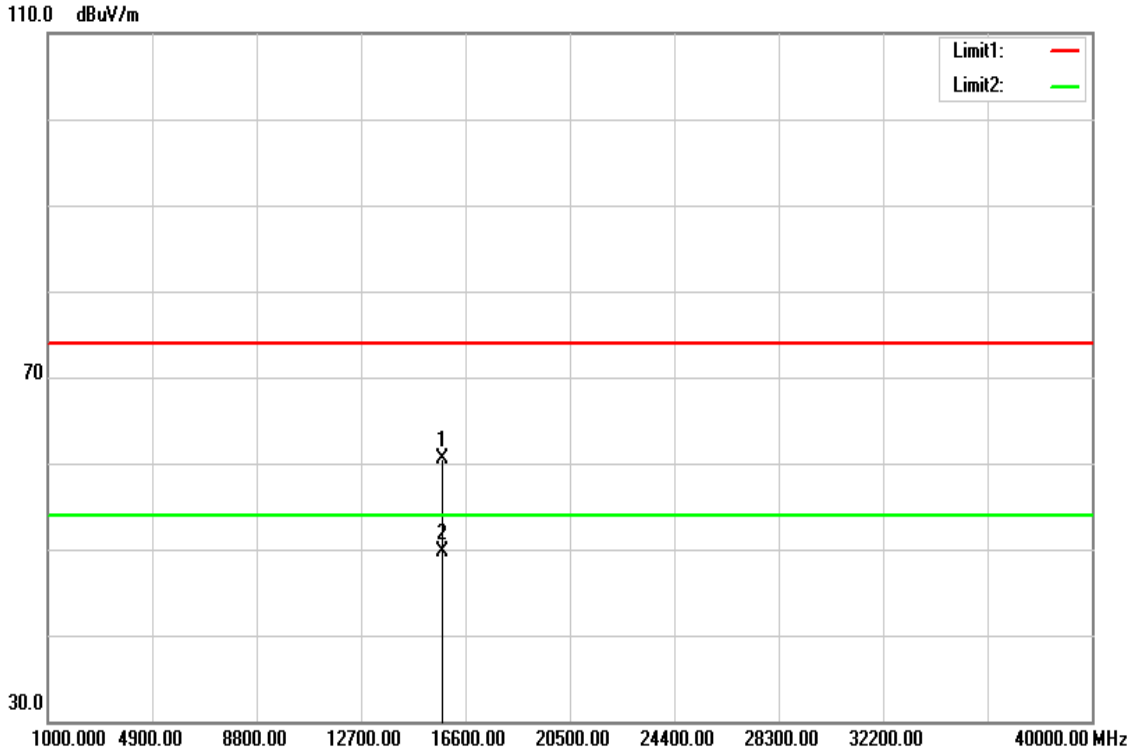


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
15670.000	43.60	18.05	61.65	74.00	-12.35	peak
15670.000	31.38	18.05	49.43	54.00	-4.57	AVG
N/A						

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*

Test Mode	IEEE 802.11a High CH	Temp/Hum	24(℃)/ 39%RH
Test Item	Harmonic	Test Date	August 24, 2018
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak and Average		

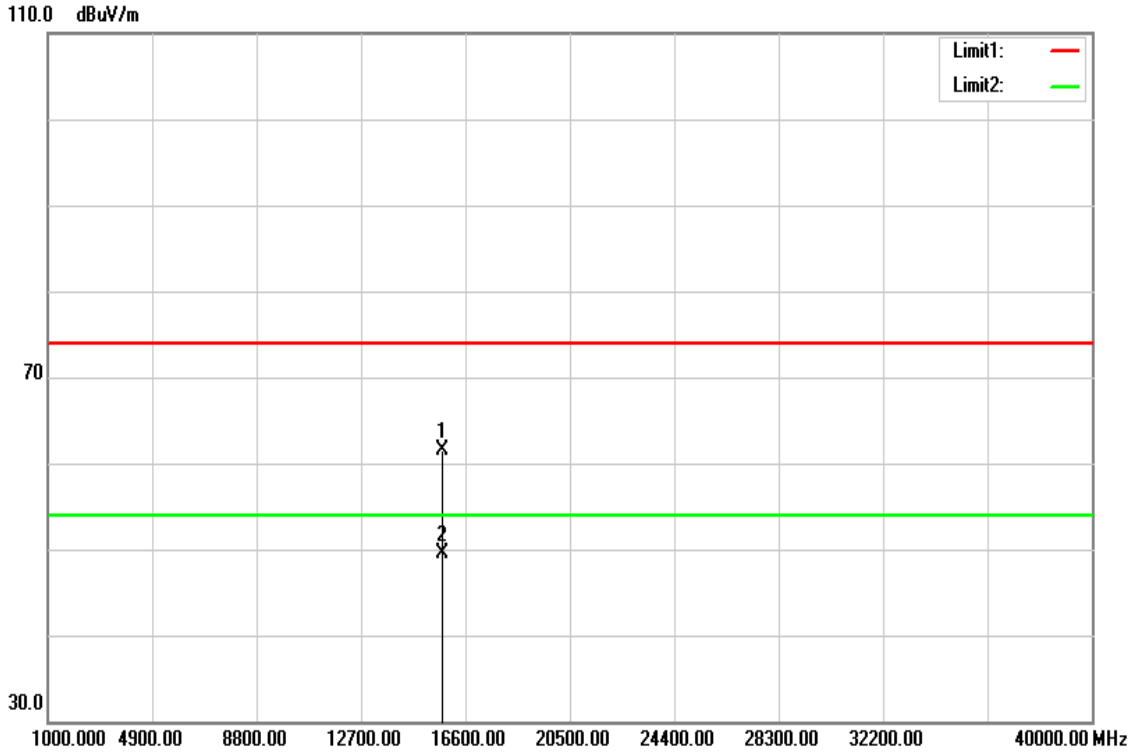


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
15720.000	42.08	18.33	60.41	74.00	-13.59	peak
15720.000	31.43	18.33	49.76	54.00	-4.24	AVG
N/A						

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*

Test Mode	IEEE 802.11a High CH	Temp/Hum	24(℃)/ 39%RH
Test Item	Harmonic	Test Date	August 24, 2018
Polarize	Horizontal	Test Engineer	Jerry Chuang
Detector	Peak and Average		

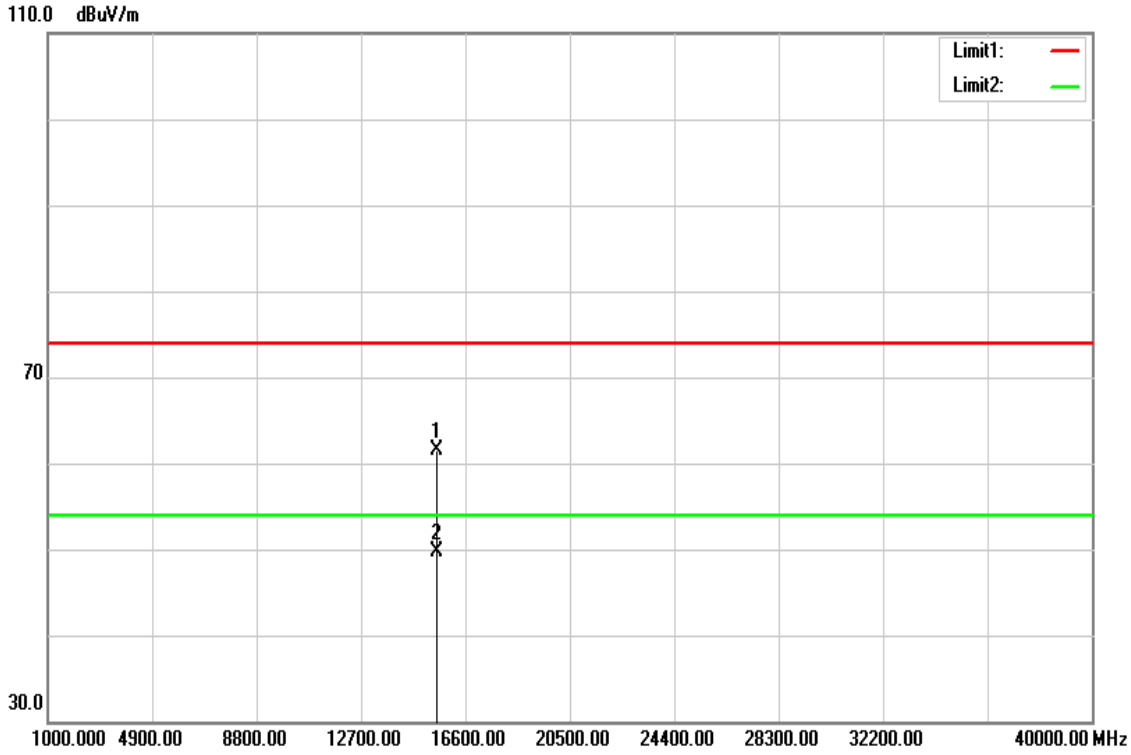


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
15720.000	43.27	18.33	61.60	74.00	-12.40	peak
15720.000	31.16	18.33	49.49	54.00	-4.51	AVG
N/A						

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*

Test Mode	IEEE 802.11n HT20 Low CH	Temp/Hum	24(℃)/ 39%RH
Test Item	Harmonic	Test Date	August 24, 2018
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak and Average		

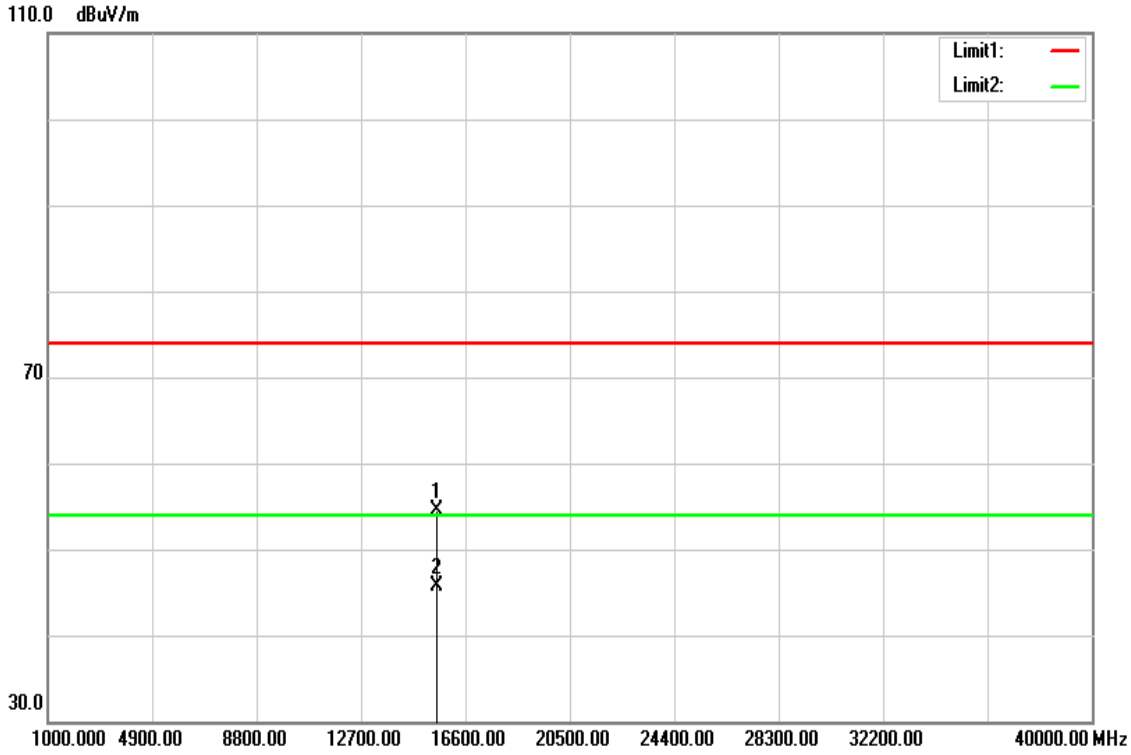


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
15540.000	43.65	17.80	61.45	74.00	-12.55	peak
15540.000	31.90	17.80	49.70	54.00	-4.30	AVG
N/A						

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*

Test Mode	IEEE 802.11n HT20 Low CH	Temp/Hum	24(℃)/ 39%RH
Test Item	Harmonic	Test Date	August 24, 2018
Polarize	Horizontal	Test Engineer	Jerry Chuang
Detector	Peak and Average		

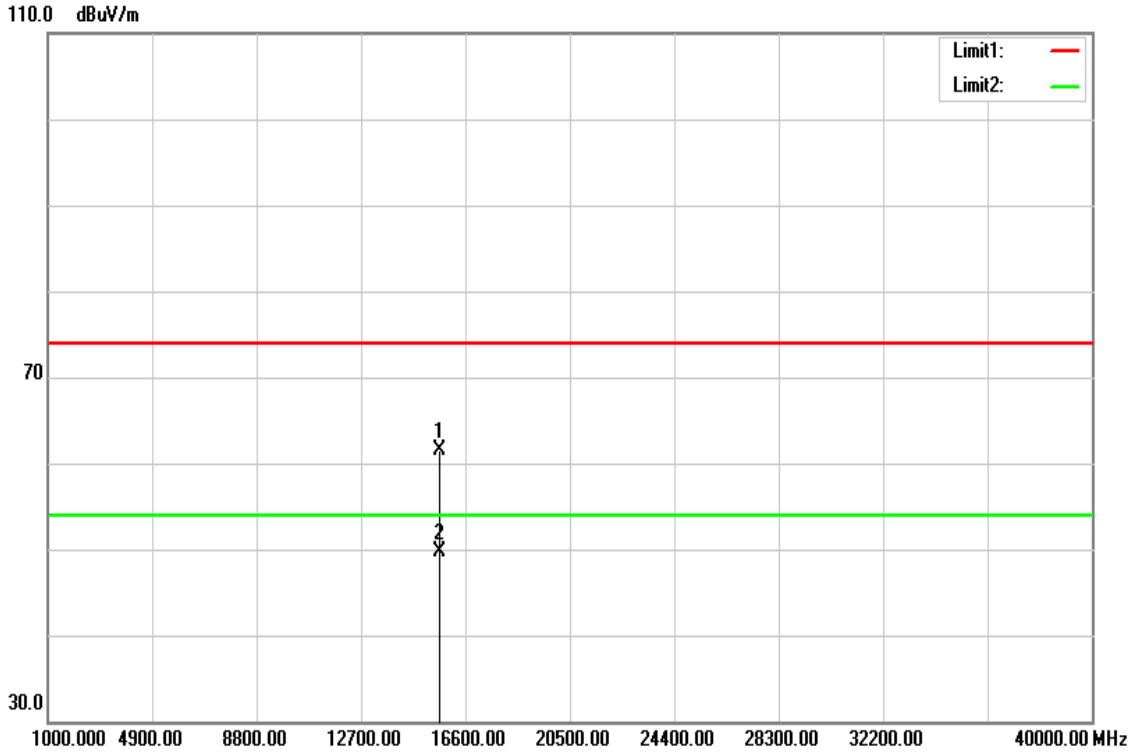


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
15540.000	36.72	17.80	54.52	74.00	-19.48	peak
15540.000	28.00	17.80	45.80	54.00	-8.20	AVG
N/A						

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*

Test Mode	IEEE 802.11n HT20 Mid CH	Temp/Hum	24(℃)/ 39%RH
Test Item	Harmonic	Test Date	August 24, 2018
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak and Average		

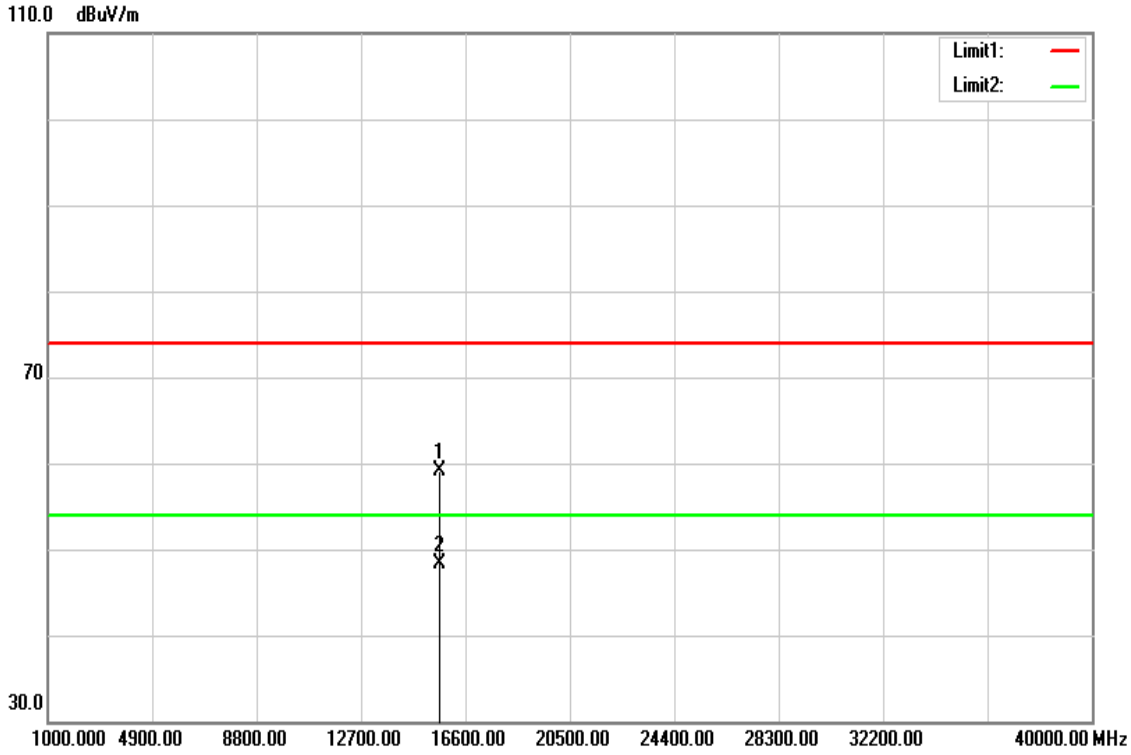


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
15660.000	43.45	18.00	61.45	74.00	-12.55	peak
15660.000	31.70	18.00	49.70	54.00	-4.30	AVG
N/A						

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*

Test Mode	IEEE 802.11n HT20 Mid CH	Temp/Hum	24(℃)/ 39%RH
Test Item	Harmonic	Test Date	August 24, 2018
Polarize	Horizontal	Test Engineer	Jerry Chuang
Detector	Peak and Average		

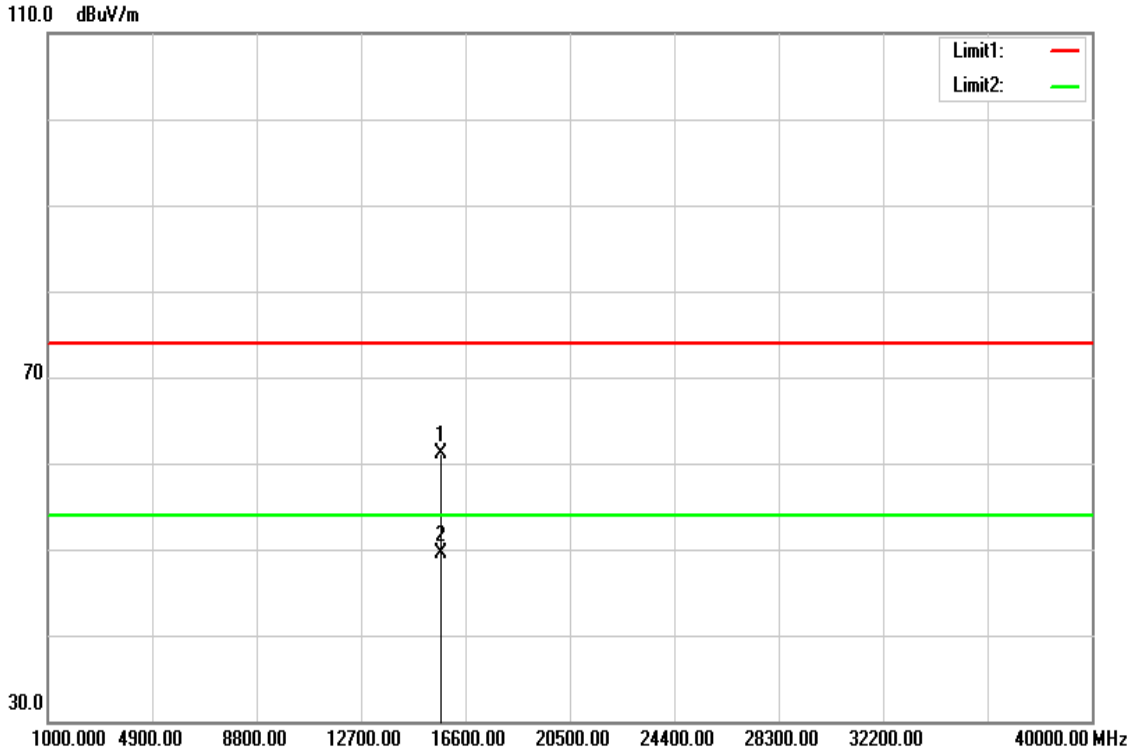


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
15650.000	41.25	17.95	59.20	74.00	-14.80	peak
15650.000	30.37	17.95	48.32	54.00	-5.68	AVG
N/A						

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*

Test Mode	IEEE 802.11n HT20 High CH	Temp/Hum	24(℃)/ 39%RH
Test Item	Harmonic	Test Date	August 24, 2018
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak and Average		

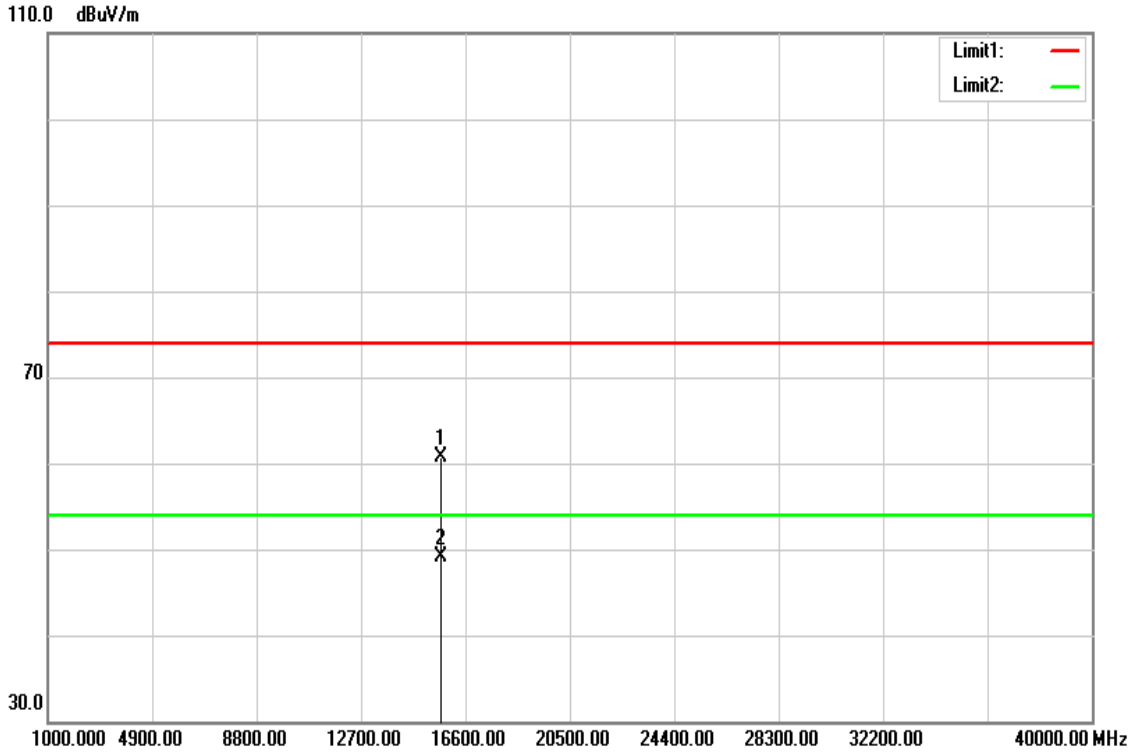


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
15710.000	42.88	18.28	61.16	74.00	-12.84	peak
15710.000	31.25	18.28	49.53	54.00	-4.47	AVG
N/A						

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*

Test Mode	IEEE 802.11n HT20 High CH	Temp/Hum	24(℃)/ 39%RH
Test Item	Harmonic	Test Date	August 24, 2018
Polarize	Horizontal	Test Engineer	Jerry Chuang
Detector	Peak and Average		

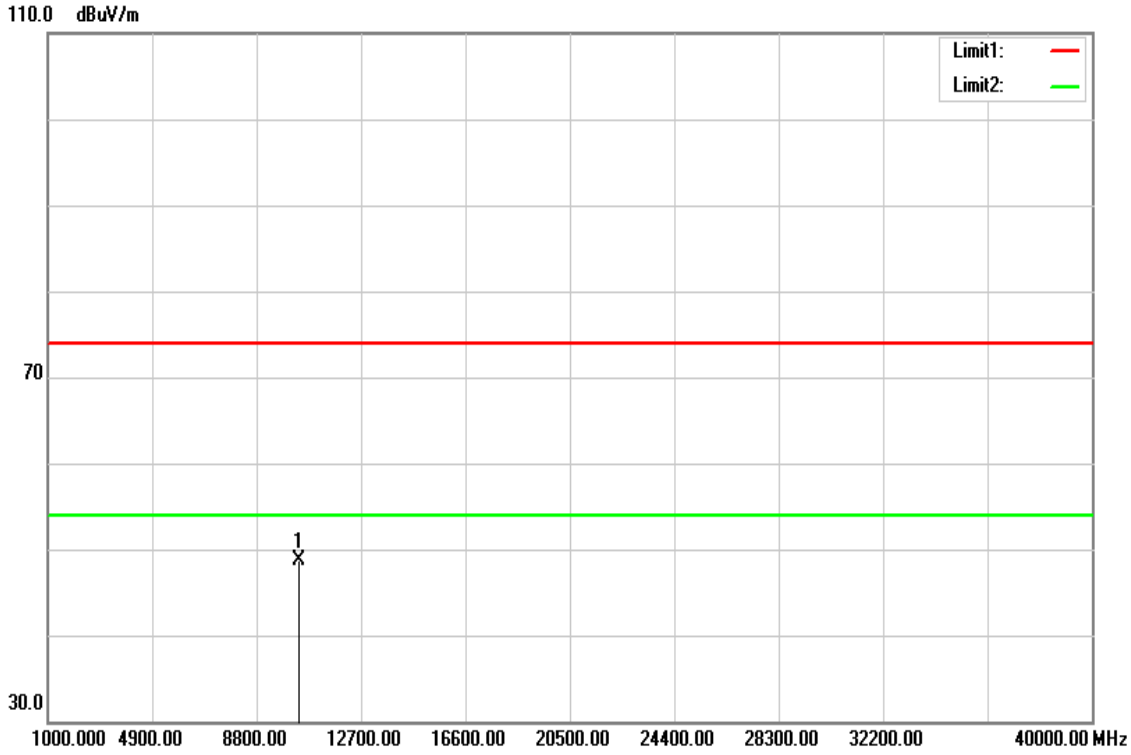


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
15710.000	42.45	18.28	60.73	74.00	-13.27	peak
15710.000	30.76	18.28	49.04	54.00	-4.96	AVG
N/A						

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*

Test Mode	IEEE 802.11n HT40 Low CH	Temp/Hum	24(℃)/ 39%RH
Test Item	Harmonic	Test Date	August 24, 2018
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak		

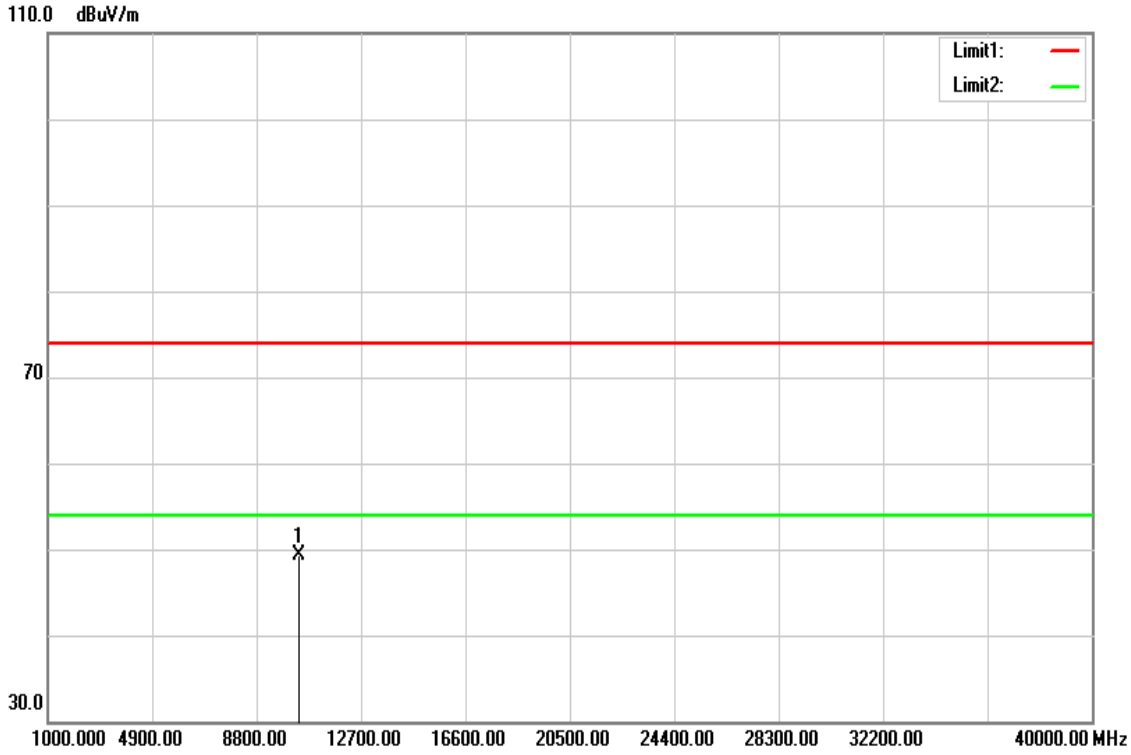


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
10380.000	33.89	14.83	48.72	74.00	-25.28	peak
N/A						

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

Test Mode	IEEE 802.11n HT40 Low CH	Temp/Hum	24(℃)/ 39%RH
Test Item	Harmonic	Test Date	August 24, 2018
Polarize	Horizontal	Test Engineer	Jerry Chuang
Detector	Peak		

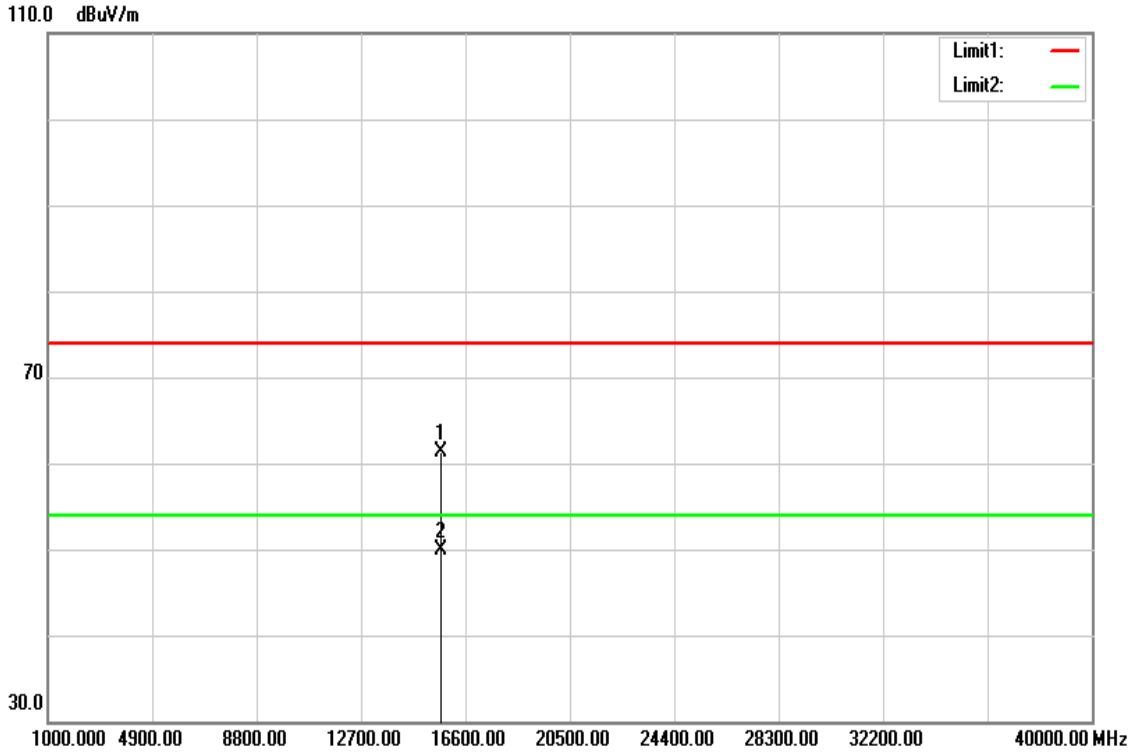


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
10380.000	34.43	14.83	49.26	74.00	-24.74	peak
N/A						

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

Test Mode	IEEE 802.11n HT40 High CH	Temp/Hum	24(℃)/ 39%RH
Test Item	Harmonic	Test Date	August 24, 2018
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak and Average		

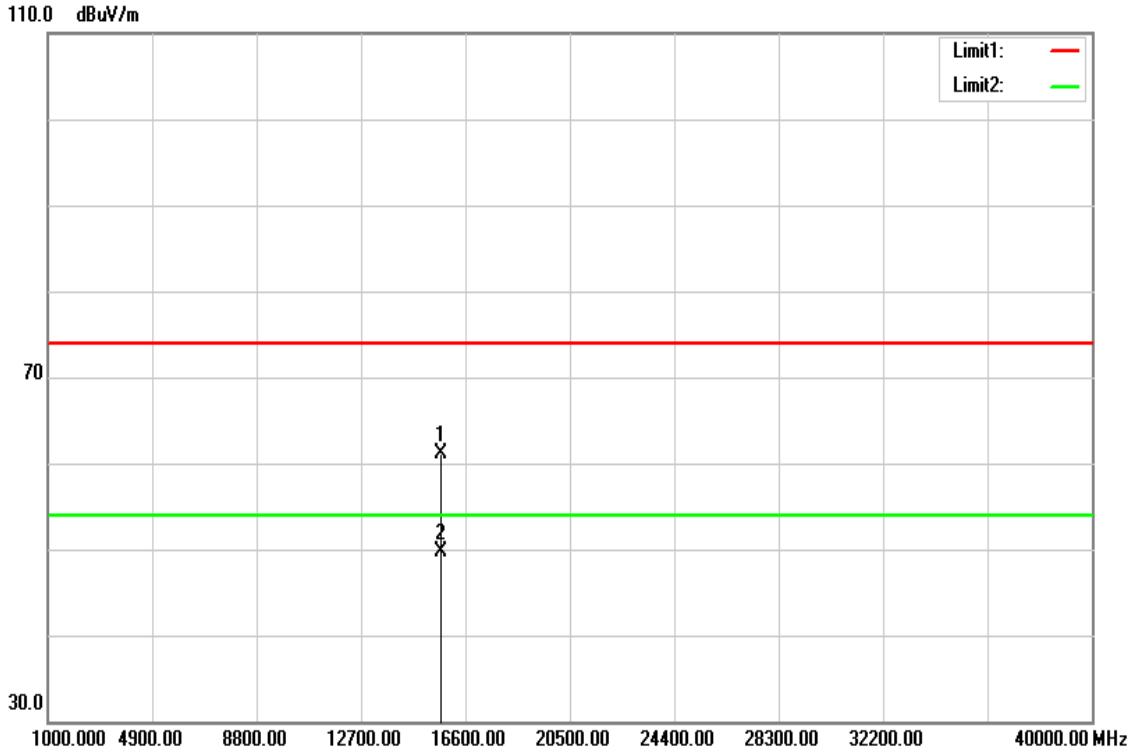


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
15690.000	43.05	18.16	61.21	74.00	-12.79	peak
15690.000	31.74	18.16	49.90	54.00	-4.10	AVG
N/A						

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*

Test Mode	IEEE 802.11n HT40 High CH	Temp/Hum	24(℃)/ 39%RH
Test Item	Harmonic	Test Date	August 24, 2018
Polarize	Horizontal	Test Engineer	Jerry Chuang
Detector	Peak and Average		

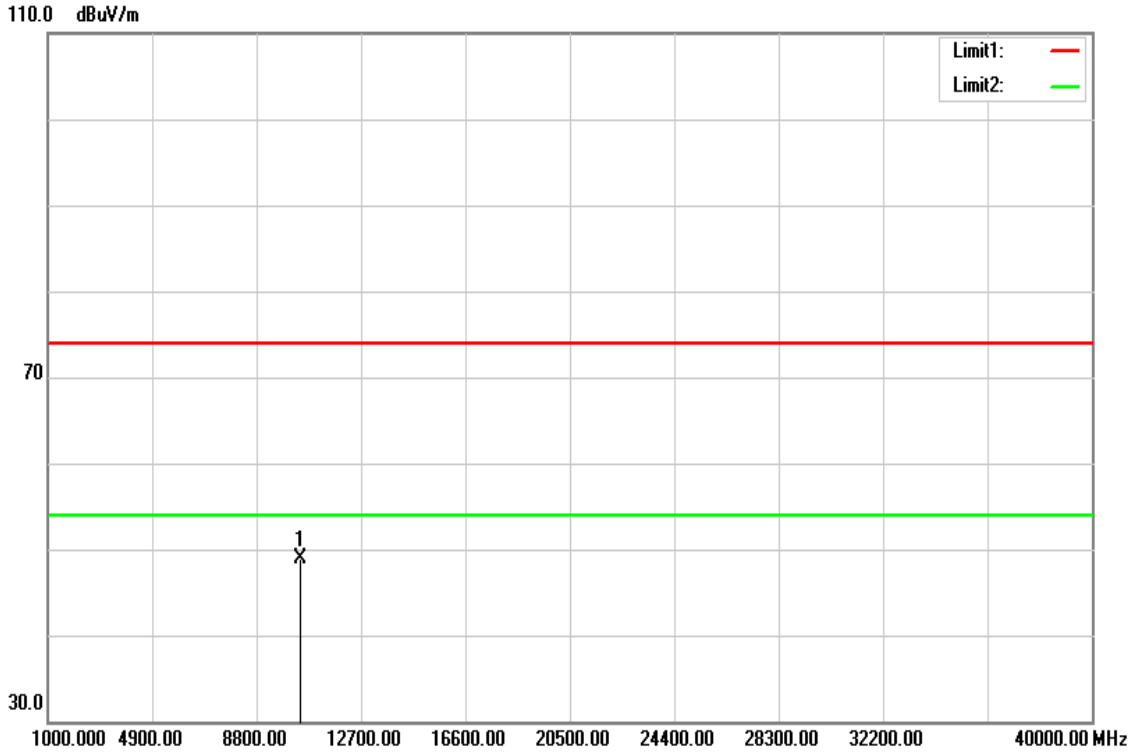


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
15700.000	42.91	18.23	61.14	74.00	-12.86	peak
15700.000	31.50	18.23	49.73	54.00	-4.27	AVG
N/A						

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*

Test Mode	IEEE 802.11ac VHT80 Mid CH	Temp/Hum	24(℃)/ 39%RH
Test Item	Harmonic	Test Date	August 24, 2018
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak		

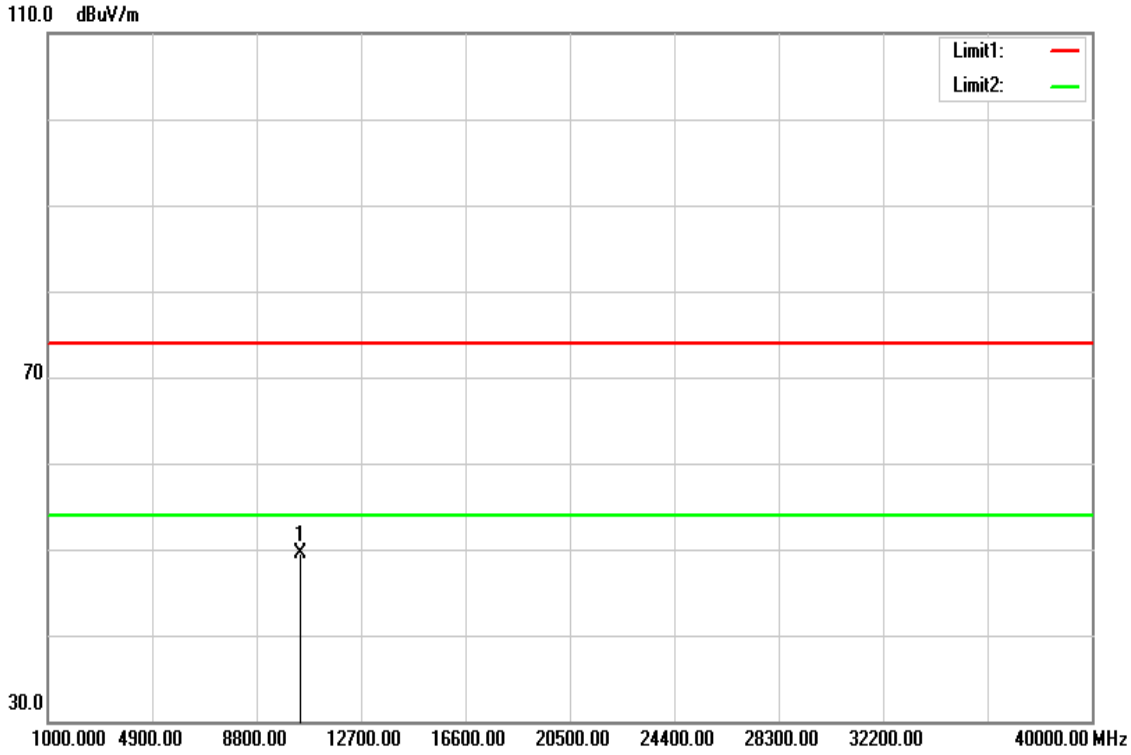


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
10420.000	33.86	14.96	48.82	74.00	-25.18	peak
N/A						

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

Test Mode	IEEE 802.11ac VHT80 Mid CH	Temp/Hum	24(℃)/ 39%RH
Test Item	Harmonic	Test Date	August 24, 2018
Polarize	Horizontal	Test Engineer	Jerry Chuang
Detector	Peak		



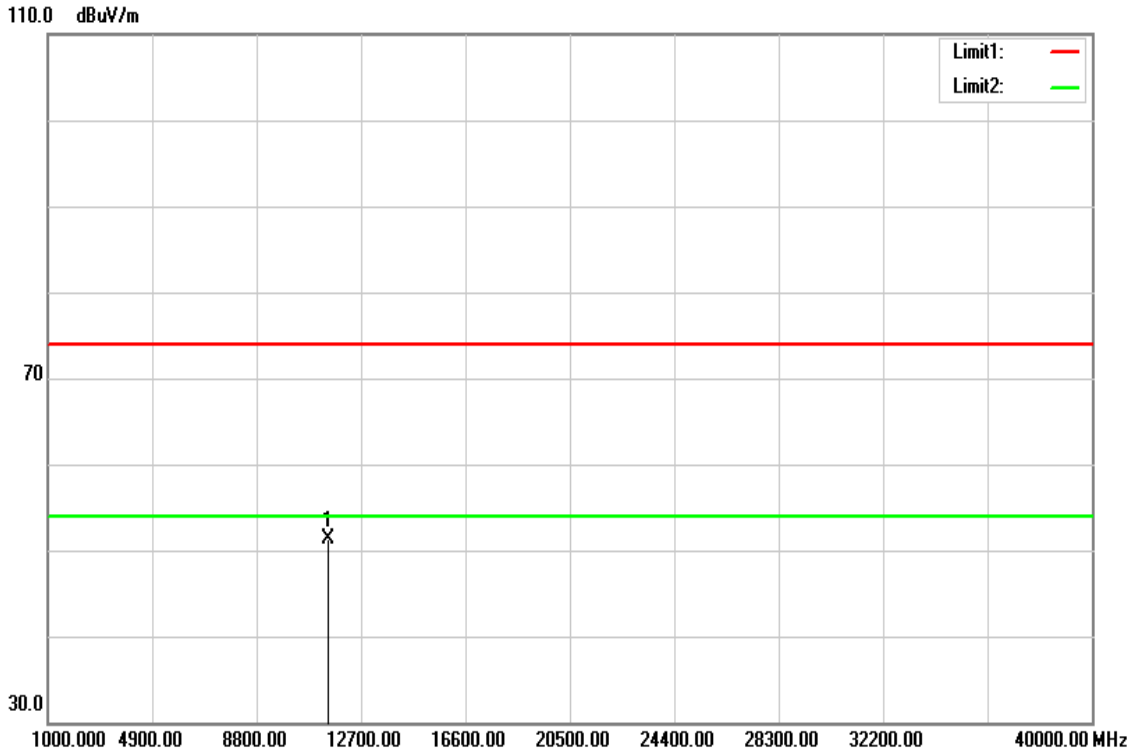
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
10420.000	34.57	14.96	49.53	74.00	-24.47	peak
N/A						

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

Above 1G Test Data for UNII-3

Test Mode	IEEE 802.11a Low CH	Temp/Hum	24(℃)/ 39%RH
Test Item	Harmonic	Test Date	August 24, 2018
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak		

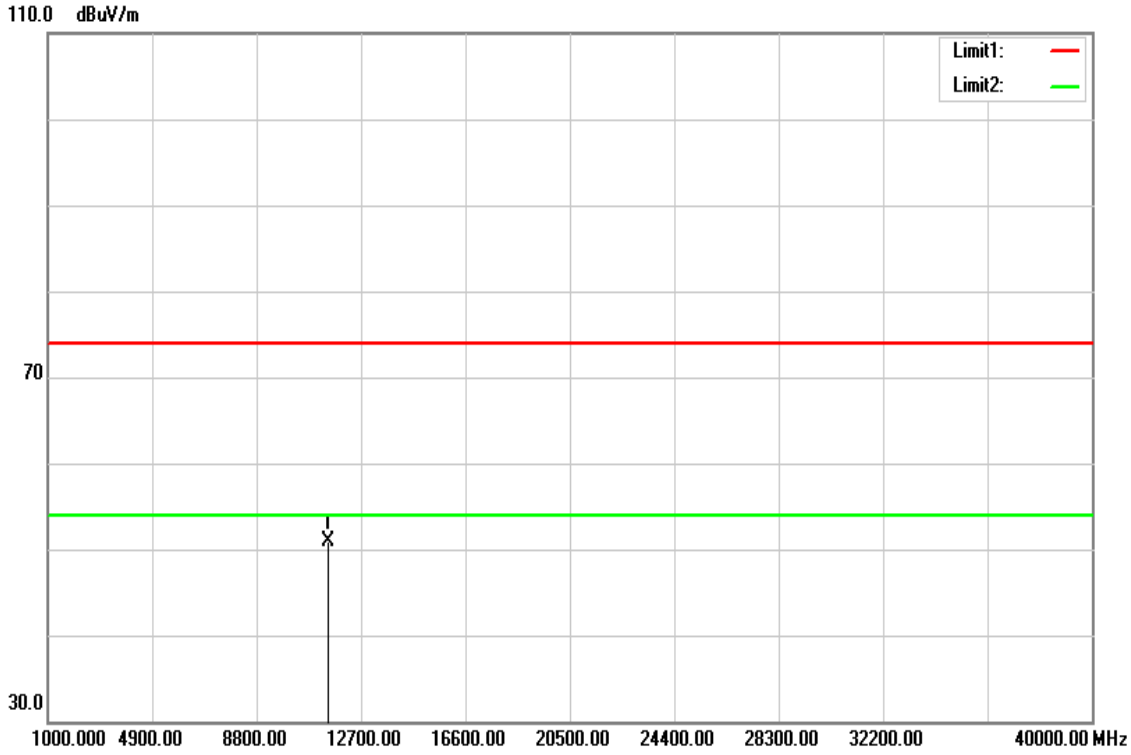


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
11490.000	35.65	15.62	51.27	74.00	-22.73	peak
N/A						

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

Test Mode	IEEE 802.11a Low CH	Temp/Hum	24(℃)/ 39%RH
Test Item	Harmonic	Test Date	August 24, 2018
Polarize	Horizontal	Test Engineer	Jerry Chuang
Detector	Peak		

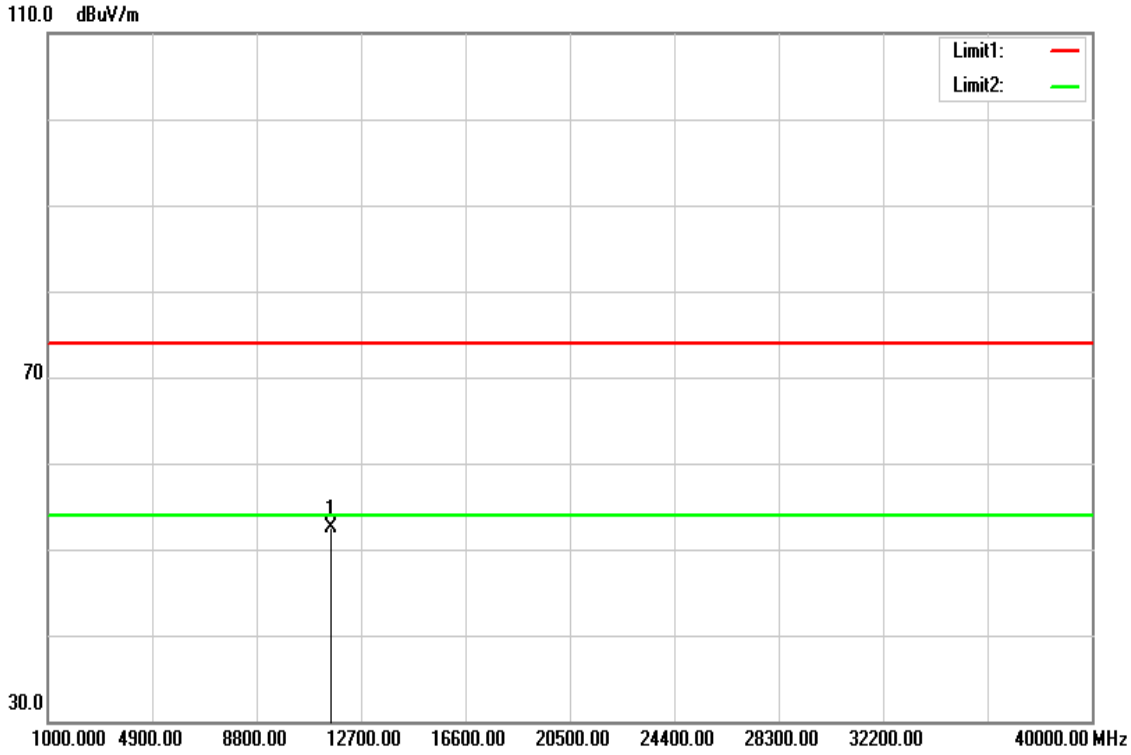


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
11490.000	35.19	15.62	50.81	74.00	-23.19	peak
N/A						

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

Test Mode	IEEE 802.11a Mid CH	Temp/Hum	24(℃)/ 39%RH
Test Item	Harmonic	Test Date	August 24, 2018
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak		

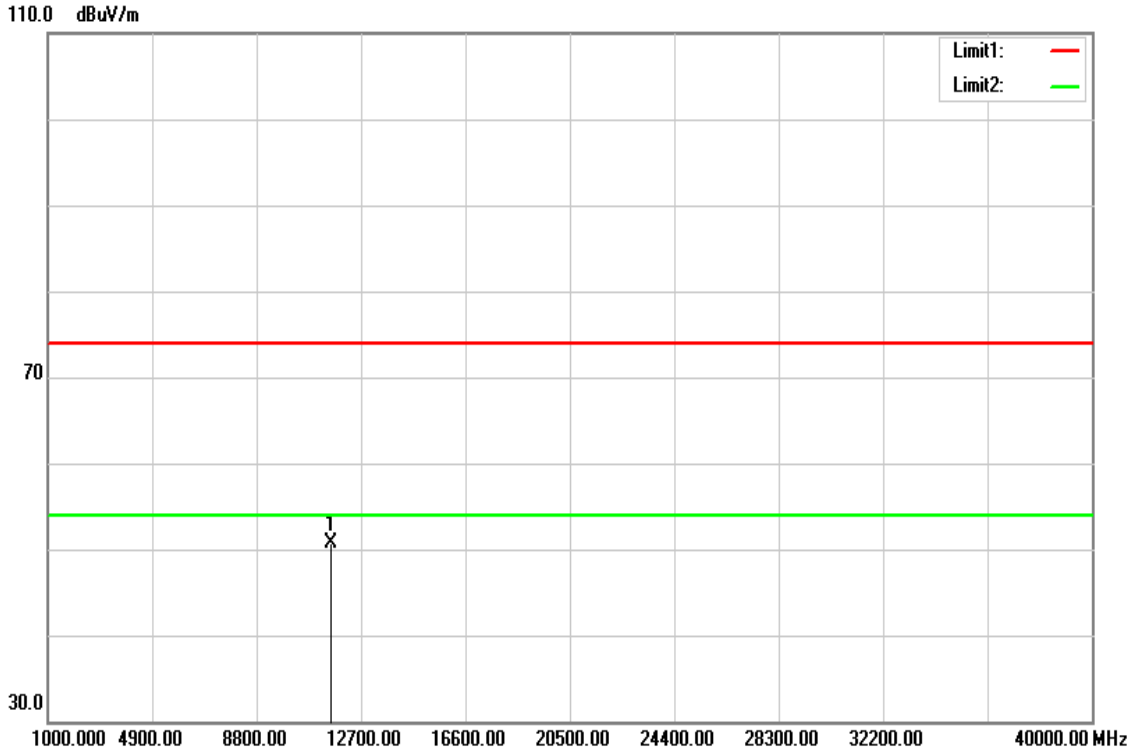


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
11570.000	36.90	15.61	52.51	74.00	-21.49	peak
N/A						

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

Test Mode	IEEE 802.11a Mid CH	Temp/Hum	24(℃)/ 39%RH
Test Item	Harmonic	Test Date	August 24, 2018
Polarize	Horizontal	Test Engineer	Jerry Chuang
Detector	Peak		

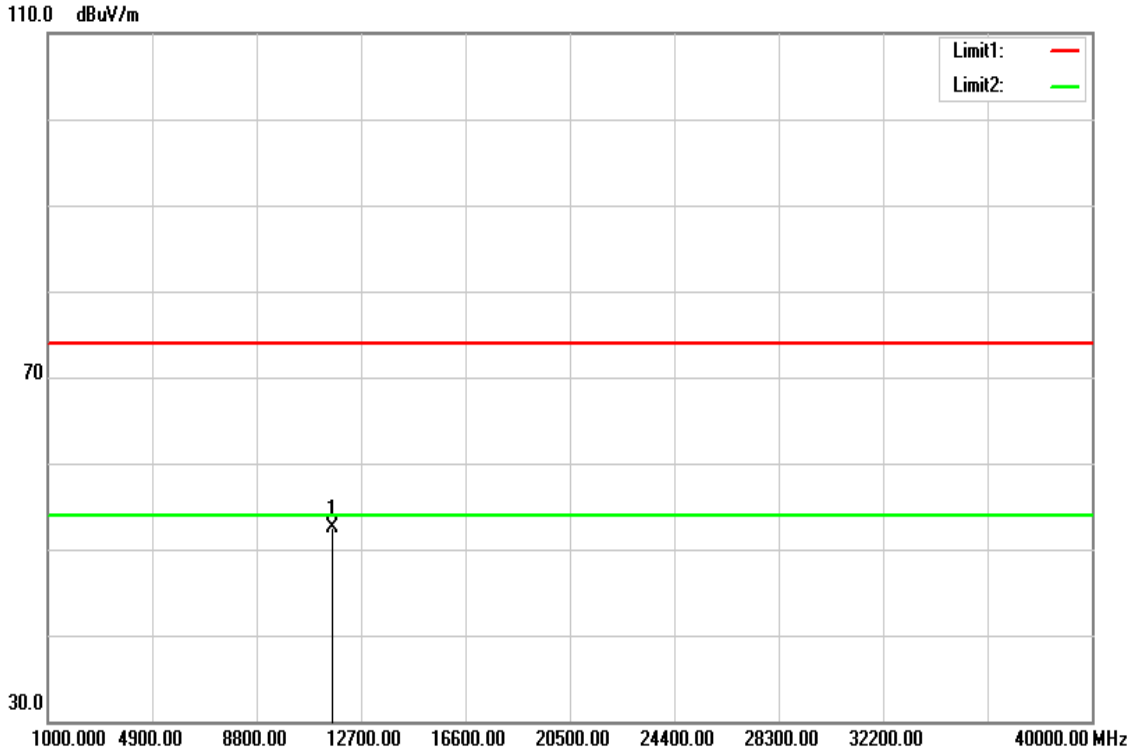


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
11570.000	35.08	15.61	50.69	74.00	-23.31	peak
N/A						

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

Test Mode	IEEE 802.11a High CH	Temp/Hum	24(℃)/ 39%RH
Test Item	Harmonic	Test Date	August 24, 2018
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak		

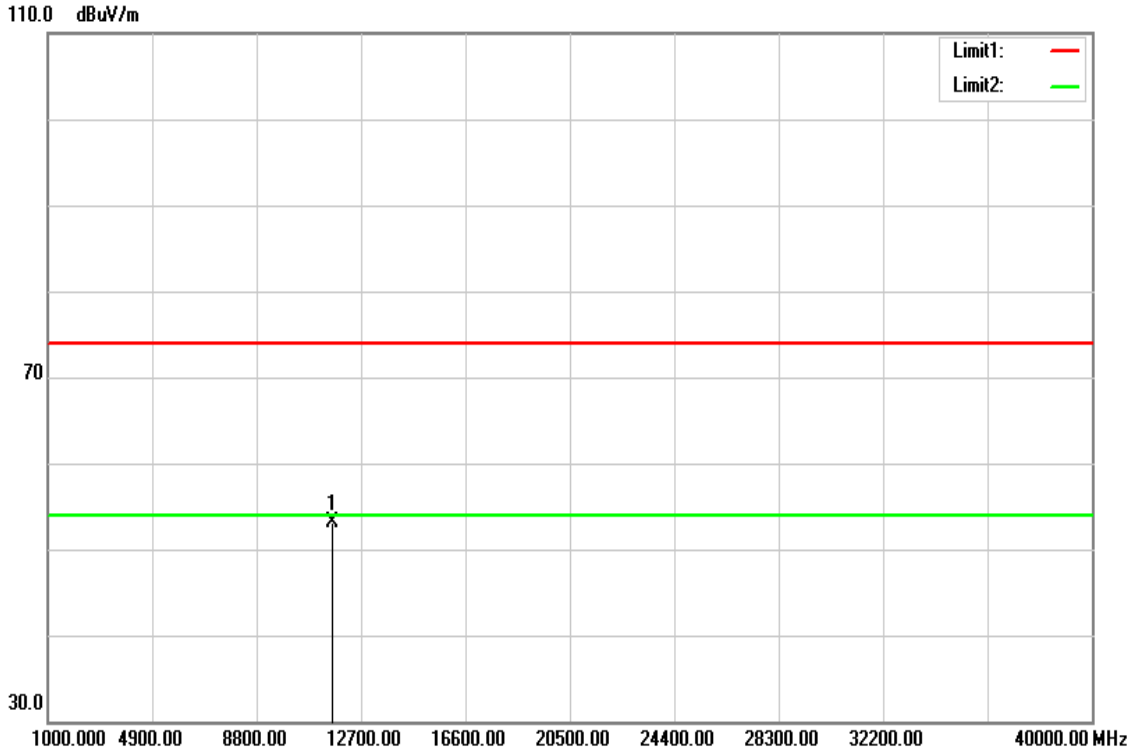


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
11650.000	36.95	15.58	52.53	74.00	-21.47	peak
N/A						

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

Test Mode	IEEE 802.11a High CH	Temp/Hum	24(℃)/ 39%RH
Test Item	Harmonic	Test Date	August 24, 2018
Polarize	Horizontal	Test Engineer	Jerry Chuang
Detector	Peak		

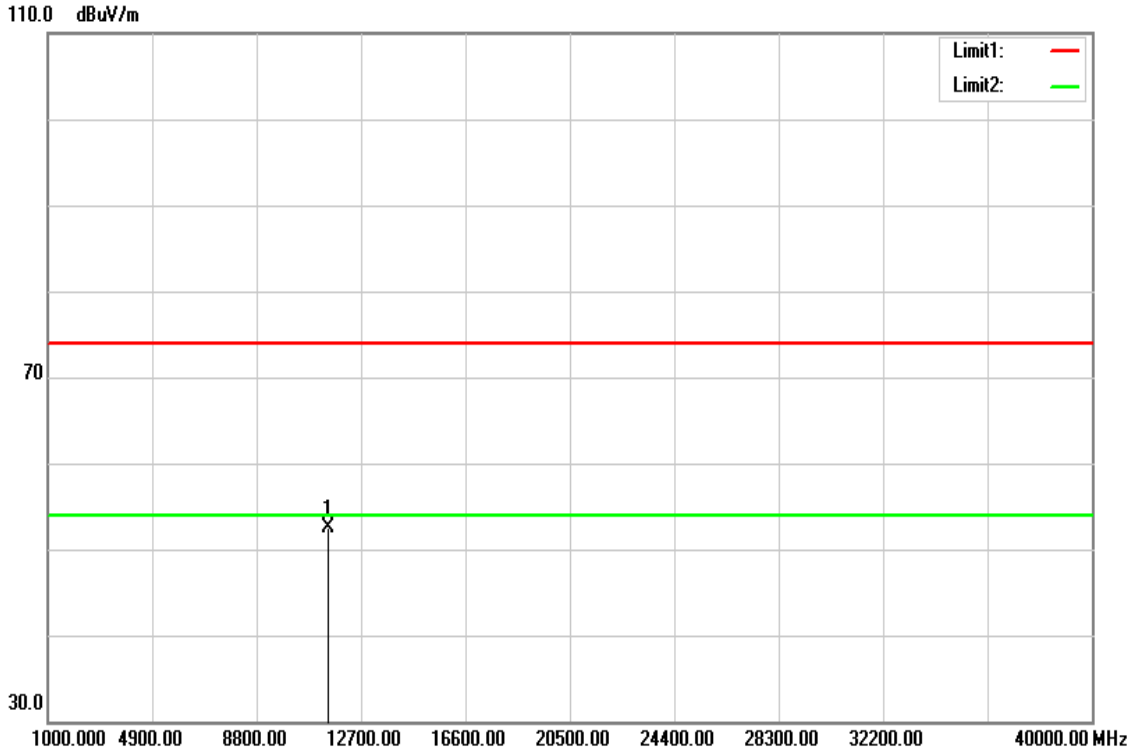


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
11650.000	37.46	15.58	53.04	74.00	-20.96	peak
N/A						

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

Test Mode	IEEE 802.11n HT20 Low CH	Temp/Hum	24(℃)/ 39%RH
Test Item	Harmonic	Test Date	August 24, 2018
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak		

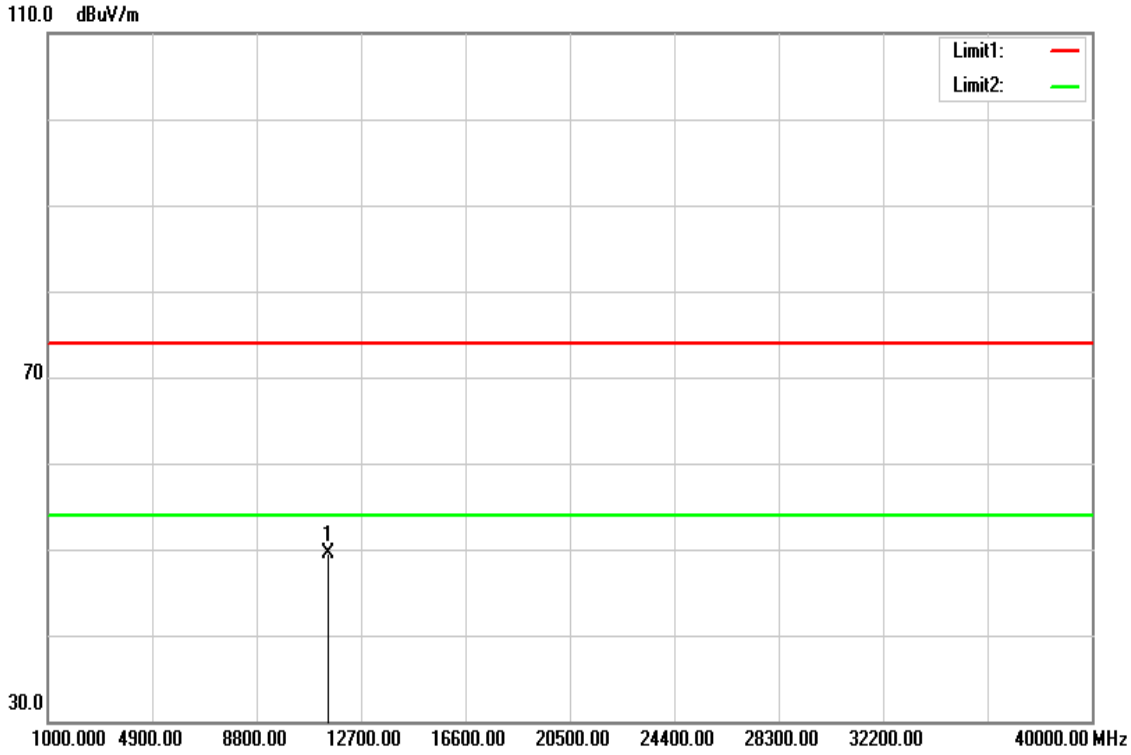


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
11500.000	36.94	15.63	52.57	74.00	-21.43	peak
N/A						

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

Test Mode	IEEE 802.11n HT20 Low CH	Temp/Hum	24(℃)/ 39%RH
Test Item	Harmonic	Test Date	August 24, 2018
Polarize	Horizontal	Test Engineer	Jerry Chuang
Detector	Peak		

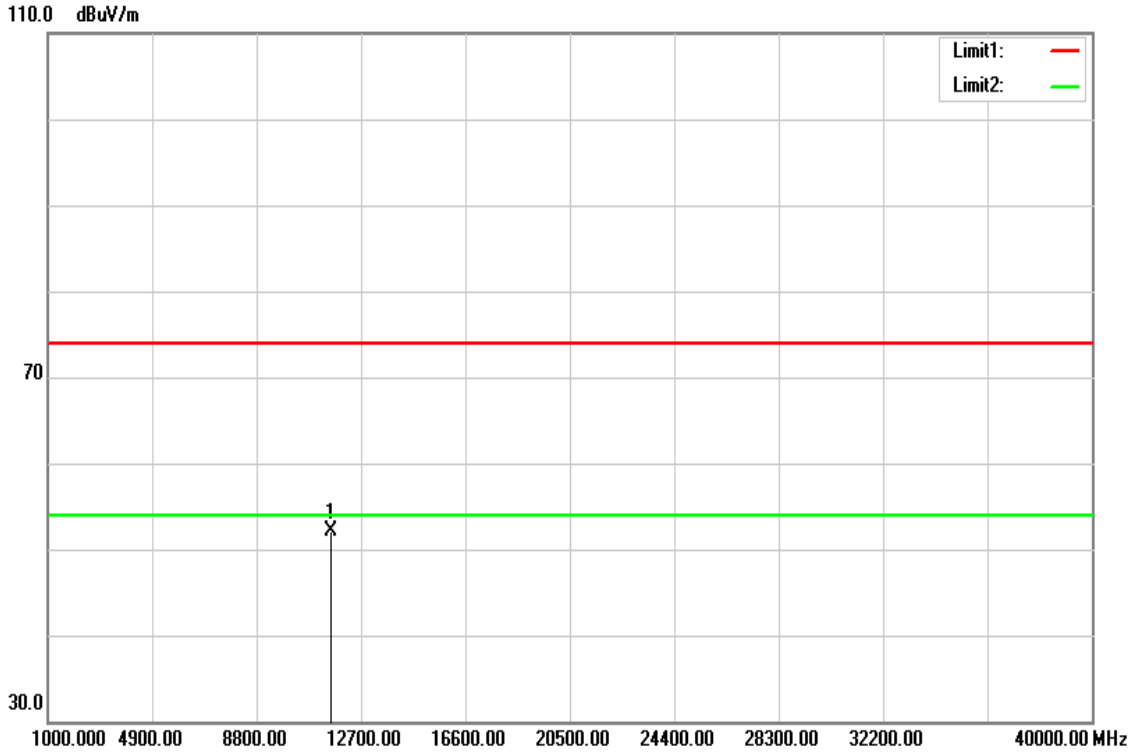


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
11490.000	33.90	15.62	49.52	74.00	-24.48	peak
N/A						

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

Test Mode	IEEE 802.11n HT20 Mid CH	Temp/Hum	24(℃)/ 39%RH
Test Item	Harmonic	Test Date	August 24, 2018
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak		

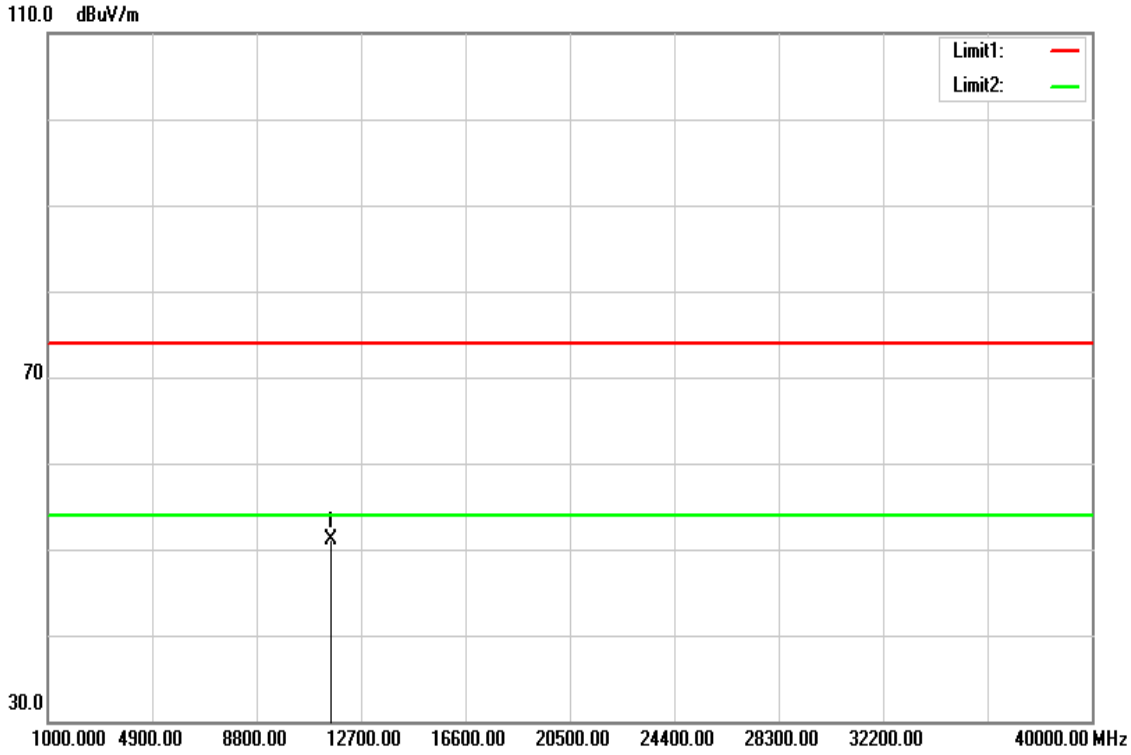


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
11570.000	36.57	15.61	52.18	74.00	-21.82	peak
N/A						

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

Test Mode	IEEE 802.11n HT20 Mid CH	Temp/Hum	24(℃)/ 39%RH
Test Item	Harmonic	Test Date	August 24, 2018
Polarize	Horizontal	Test Engineer	Jerry Chuang
Detector	Peak		

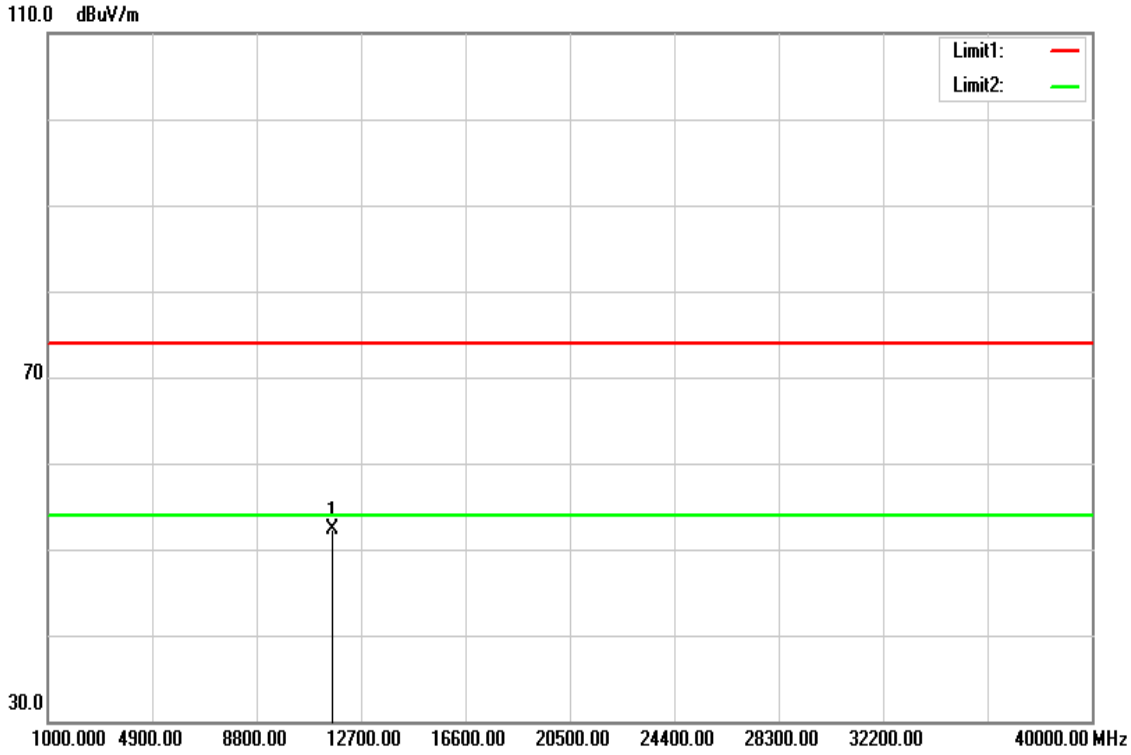


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
11570.000	35.52	15.61	51.13	74.00	-22.87	peak
N/A						

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

Test Mode	IEEE 802.11n HT20 High CH	Temp/Hum	24(℃)/ 39%RH
Test Item	Harmonic	Test Date	August 24, 2018
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak		

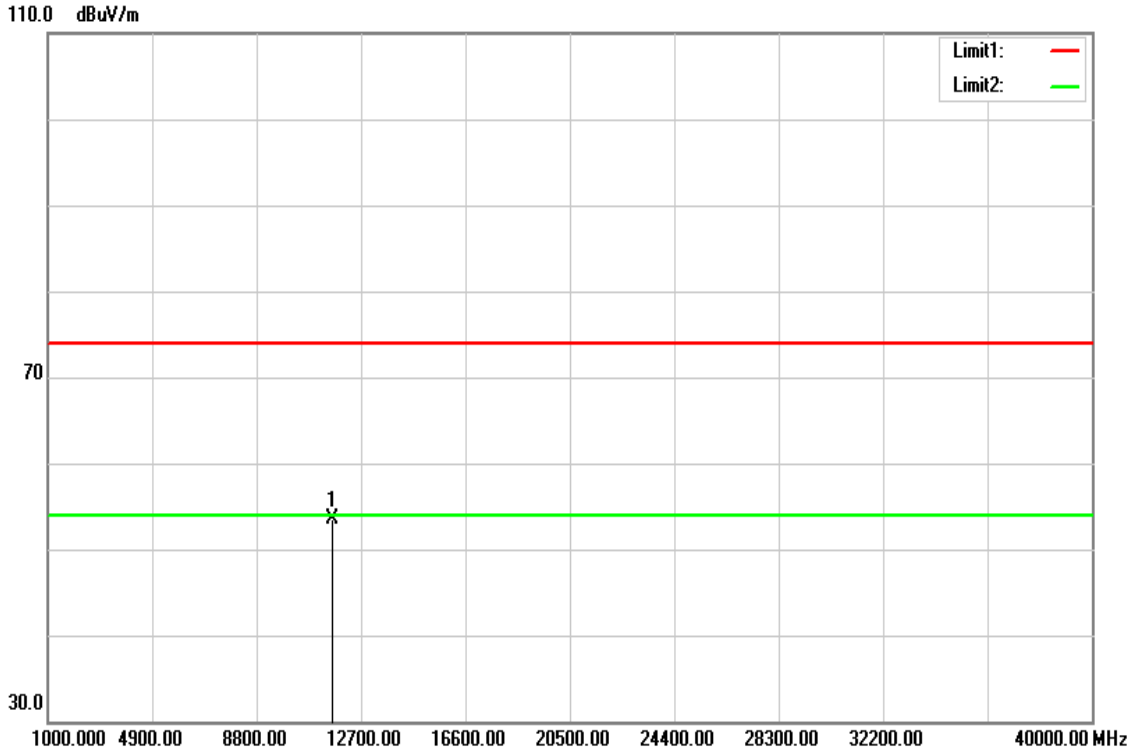


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
11650.000	36.69	15.58	52.27	74.00	-21.73	peak
N/A						

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

Test Mode	IEEE 802.11n HT20 High CH	Temp/Hum	24(℃)/ 39%RH
Test Item	Harmonic	Test Date	August 24, 2018
Polarize	Horizontal	Test Engineer	Jerry Chuang
Detector	Peak		

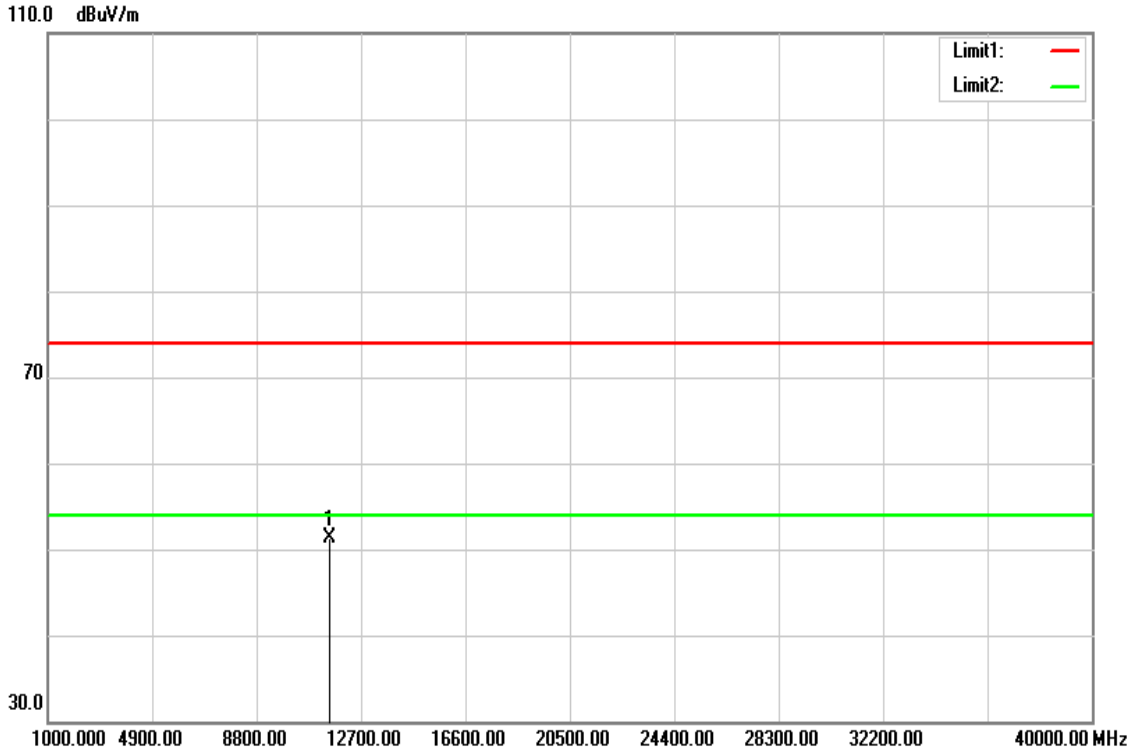


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
11650.000	37.94	15.58	53.52	74.00	-20.48	peak
N/A						

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

Test Mode	IEEE 802.11n HT40 Low CH	Temp/Hum	24(℃)/ 39%RH
Test Item	Harmonic	Test Date	August 24, 2018
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak		

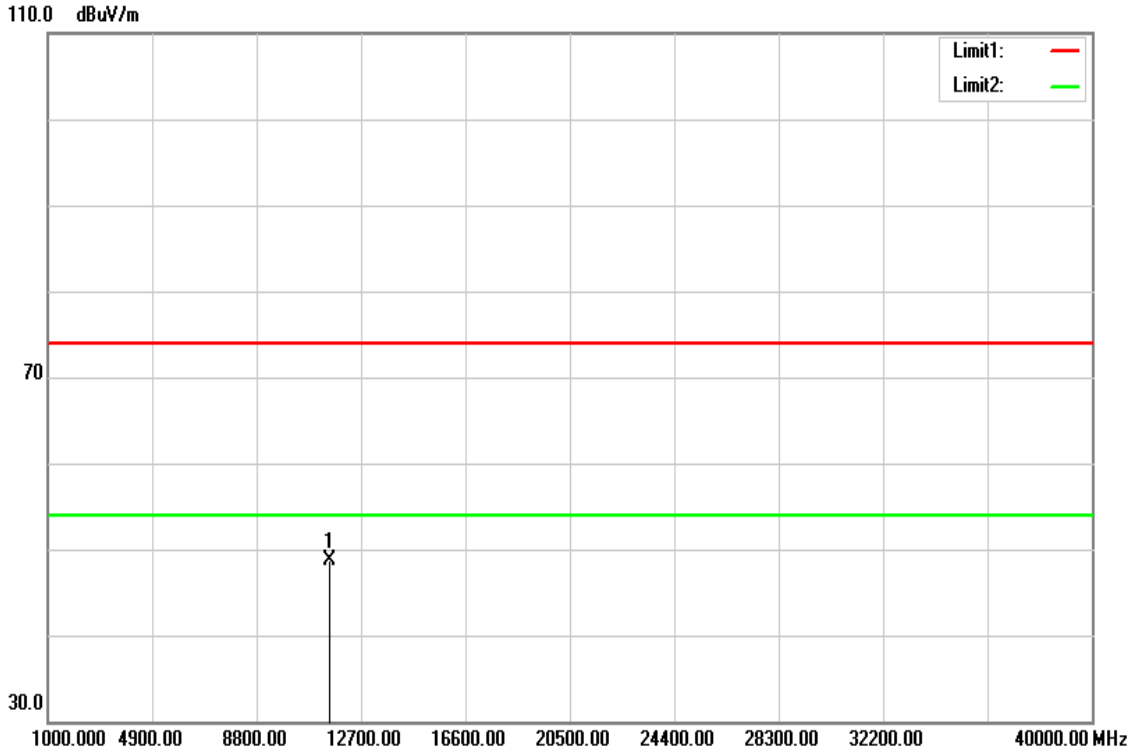


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
11510.000	35.70	15.62	51.32	74.00	-22.68	peak
N/A						

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

Test Mode	IEEE 802.11n HT40 Low CH	Temp/Hum	24(℃)/ 39%RH
Test Item	Harmonic	Test Date	August 24, 2018
Polarize	Horizontal	Test Engineer	Jerry Chuang
Detector	Peak		

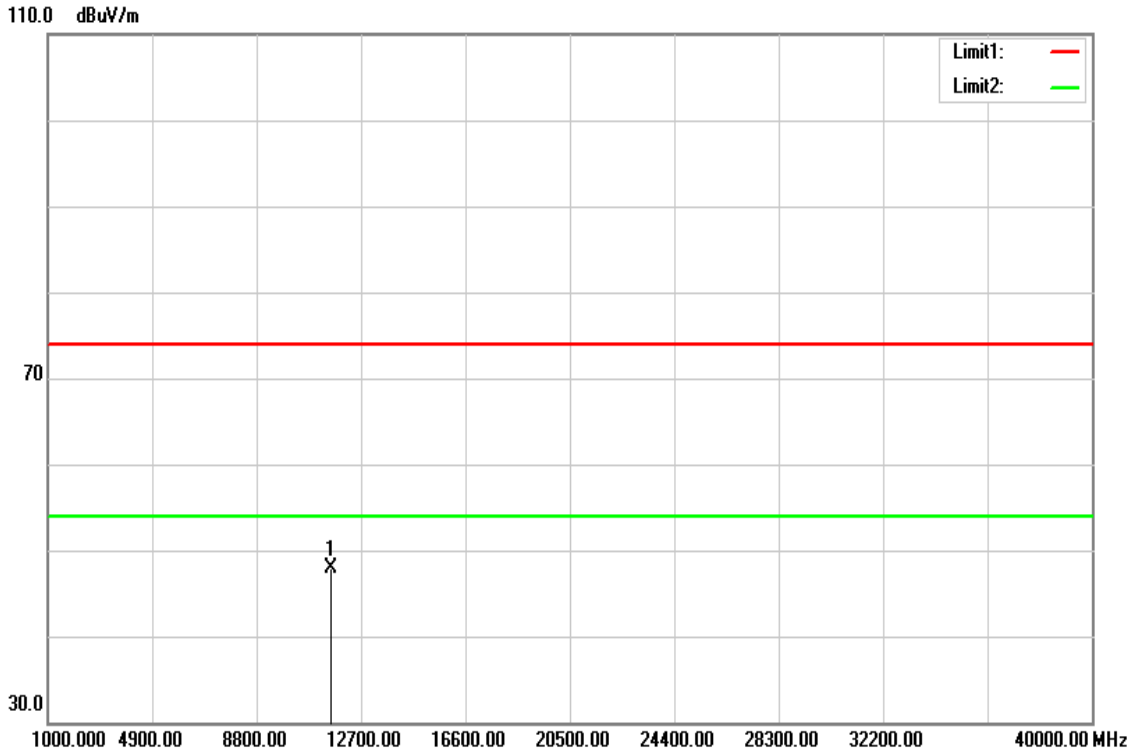


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
11550.000	33.00	15.61	48.61	74.00	-25.39	peak
N/A						

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

Test Mode	IEEE 802.11n HT40 High CH	Temp/Hum	24(℃)/ 39%RH
Test Item	Harmonic	Test Date	August 24, 2018
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak		

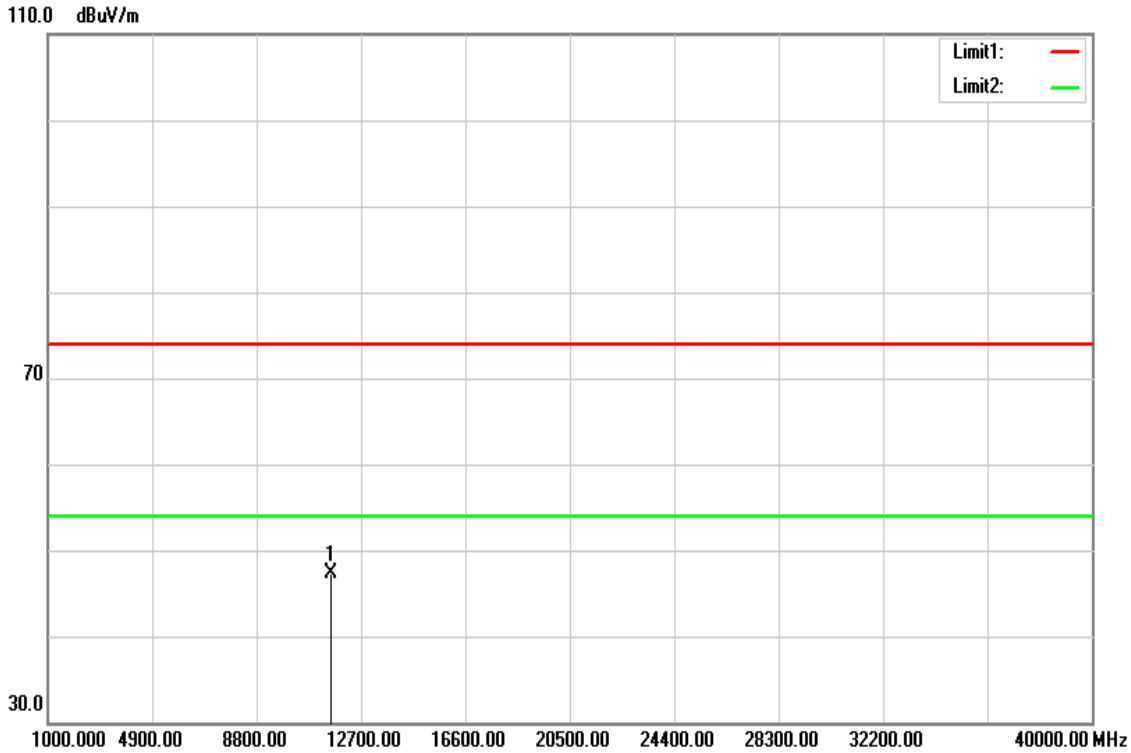


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
11590.000	32.35	15.61	47.96	74.00	-26.04	peak
N/A						

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

Test Mode	IEEE 802.11n HT40 High CH	Temp/Hum	24(℃)/ 39%RH
Test Item	Harmonic	Test Date	August 24, 2018
Polarize	Horizontal	Test Engineer	Jerry Chuang
Detector	Peak		

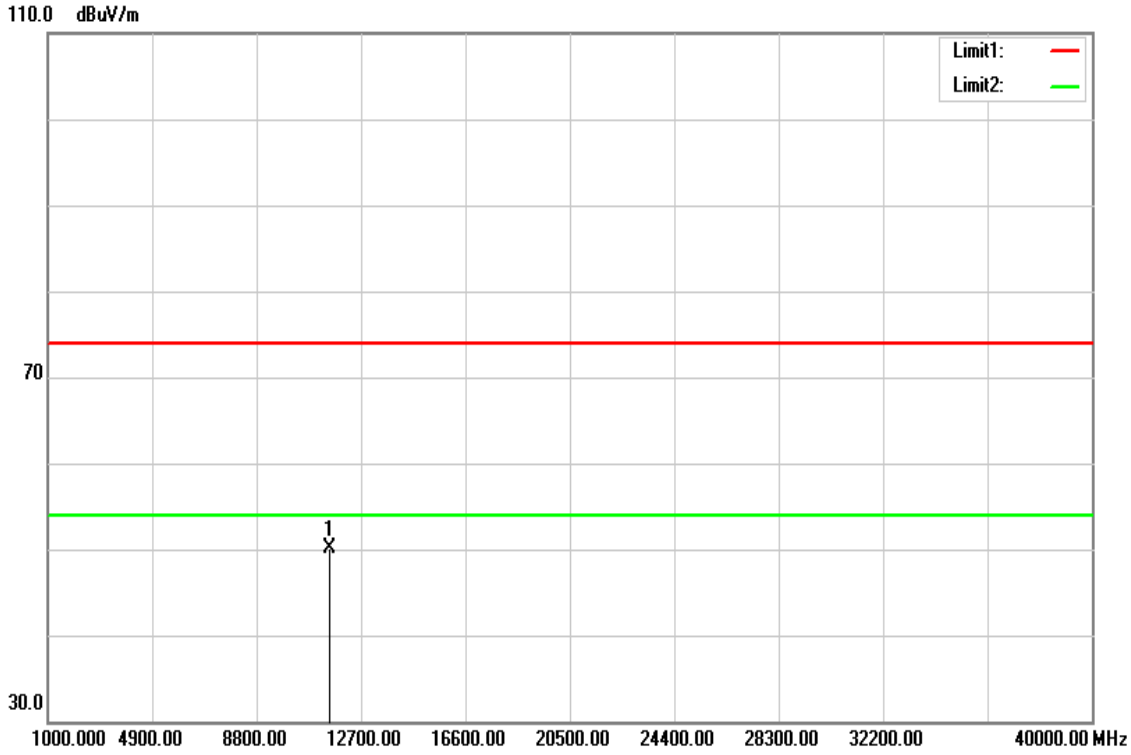


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
11590.000	31.63	15.61	47.24	74.00	-26.76	peak
N/A						

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

Test Mode	IEEE 802.11ac VHT80 Mid CH	Temp/Hum	24(℃)/ 39%RH
Test Item	Harmonic	Test Date	August 24, 2018
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak		

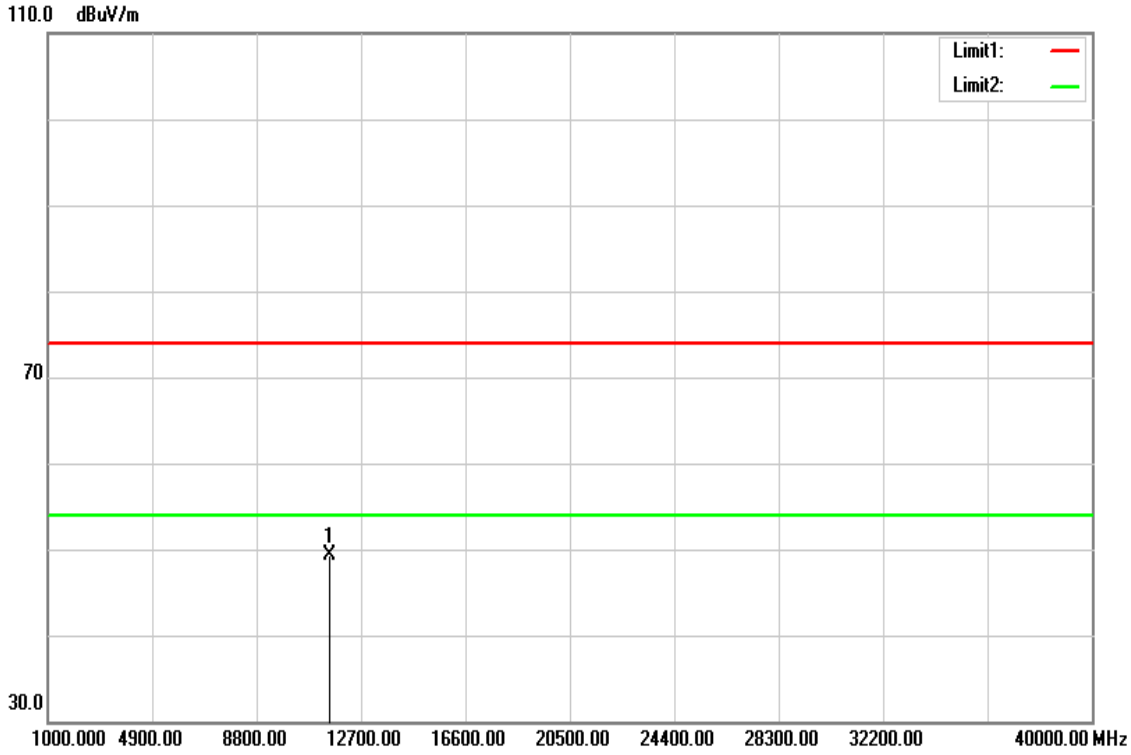


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
11550.000	34.57	15.61	50.18	74.00	-23.82	peak
N/A						

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

Test Mode	IEEE 802.11ac VHT80 Mid CH	Temp/Hum	24(℃)/ 39%RH
Test Item	Harmonic	Test Date	August 24, 2018
Polarize	Horizontal	Test Engineer	Jerry Chuang
Detector	Peak		



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
11550.000	33.62	15.61	49.23	74.00	-24.77	peak
N/A						

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

4.6 FREQUENCY STABILITY

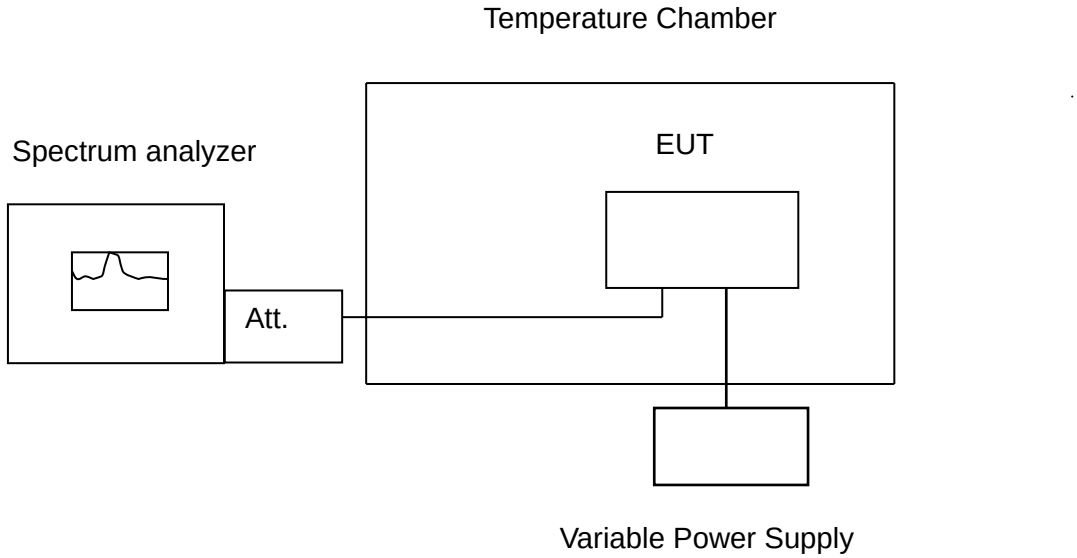
4.6.1 Test Limit

According to §15.407(g) manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the operational description.

4.6.2 Test Procedure

1. The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20ºC operating frequency as reference frequency. Turn EUT off and set the chamber temperature to –10ºC. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10ºC increased per stage until the highest temperature of +50ºC reached.
2. Set the EUT transmit at un-modulation mode to test frequency stability.

4.6.3 Test Setup



4.6.4 Test Result

Temp. (ºC)	Voltage (V)	Measured Frequency	5180		(MHz)	Limit				Result
		Time (min)				20ppm				
Operating Frequency:		0 min	2 min	5 min	10 min	0 min	2 min	5 min	10 min	
50	120	5180.10316	5180.10228	5180.10122	5180.10010	19.9151	19.7452	19.5398	19.3243	Pass
40	120	5180.09530	5180.09513	5180.09432	5180.09231	18.3977	18.3649	18.2085	17.8205	Pass
30	120	5180.08123	5180.08412	5180.07641	5180.07921	15.6815	16.2394	14.7510	15.2915	Pass
25	120	5180.08536	5180.07559	5180.05634	5180.06552	16.4788	14.5927	10.8764	12.6486	Pass
10	120	5180.04552	5180.04311	5180.04621	5180.03156	8.7876	8.3224	8.9208	6.0927	Pass
0	120	5180.02199	5180.02563	5180.03465	5180.02010	4.2442	4.9483	6.6892	3.8803	Pass
-10	120	5180.00148	5180.00362	5180.00441	5180.07910	0.2857	0.6988	0.8517	15.2703	Pass
Temp. (ºC)	Voltage (V)	Measured Frequency	5180		(MHz)	Limit				Result
		Time (min)				20ppm				
Operating Frequency:		0 min	2 min	5 min	10 min	0 min	2 min	5 min	10 min	
25	108	5180.085440	5180.07543	5180.05685	5180.06522	16.4942	14.5618	10.9749	12.5907	Pass
25	120	5180.08536	5180.07559	5180.05634	5180.06552	16.4788	14.5927	10.8764	12.6486	Pass
25	132	5180.077960	5180.07781	5180.07880	5180.07666	15.0502	15.0212	15.2124	14.7992	Pass

Temp. (ºC)	Voltage (V)	Measured Frequency	5745		(MHz)	Limit				Result
		Time (min)				20ppm				
Operating Frequency:		0 min	2 min	5 min	10 min	0 min	2 min	5 min	10 min	
50	120	5745.10548	5745.10182	5745.10694	5745.10650	18.3594	17.7232	18.6147	18.5379	Pass
40	120	5745.09784	5745.09841	5745.09212	5745.09078	17.0306	17.1297	16.0353	15.8016	Pass
30	120	5745.08412	5745.08048	5745.08774	5745.07022	14.6428	14.0085	15.2726	12.2222	Pass
25	120	5745.07023	5745.07315	5745.07154	5745.07945	12.2247	12.7332	12.4519	13.8296	Pass
10	120	5745.05153	5745.05123	5745.05979	5745.05059	8.9697	8.9175	10.4071	8.8057	Pass
0	120	5745.03412	5745.03824	5745.03323	5745.03985	5.9391	6.6562	5.7842	6.9368	Pass
-10	120	5745.00875	5745.00895	5745.00923	5745.00874	1.5228	1.5571	1.6069	1.5215	Pass
Temp. (ºC)	Voltage (V)	Measured Frequency	5745		(MHz)	Limit				Result
		Time (min)				20ppm				
Operating Frequency:		0 min	2 min	5 min	10 min	0 min	2 min	5 min	10 min	
25	108	5745.07550	5745.07566	5745.07123	5745.07856	13.1419	13.1697	12.3986	13.6745	Pass
25	120	5745.07023	5745.07315	5745.07154	5745.07945	12.2247	12.7332	12.4519	13.8296	Pass
25	132	5745.07230	5745.07269	5745.07222	5745.07951	12.5849	12.6527	12.5709	13.8399	Pass

--End of Test Report--