FCC RADIO TEST REPORT

FCC 47 CFR PART 15 SUBPART C
INDUSTRY CANADA RSS-247

Test Standard	**FCC Part 15.247 and RSS-247 Issue 2**
FCC ID	**AK8WN4645R**
ISED ID	**409B-WN4645R**
Brand name	**SONY**
Applicant	**Sony Corporation**
Product name	**802.11n, 2.4G 2T2R Wireless LAN USB Module**
Model No.	**WN4645R**
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:

Ed Chiang
Engineer

Revision History

Rev.	Issue Date	Revisions	Revised By
00	June 29, 2017	Initial Issue	Vicki Huang

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1. GENERAL INFORMATION

1.1 EUT INFORMATION

Applicant	Sony Corporation
Applicant address	1-7-1 Konan Minato-ku, Tokyo 108-0075 Japan
Equipment	802.11n, 2.4G 2T2R Wireless LAN USB Module
Model Name	WN4645R
Model Discrepancy	N/A
Received Date	June 7, 2017
Date of Test	June 12 ~ 26, 2017
Output Power(W)	IEEE 802.11b mode: 0.0875 IEEE 802.11g mode: 0.2317 IEEE 802.11n HT 20 MHz mode: 0.3619 IEEE 802.11n HT 40 MHz mode: 0.3869
Power Operation	☐ AC 120V/60Hz ☐ Adapter ☐ PoE ☒ Host system(NB) ☐ DC Type : ☐ Battery ☐ DC Power Supply ☐ External DC adapter

1.2 EUT CHANNEL INFORMATION

Frequency Range	2412MHz-2462MHz
Modulation Type	1. IEEE 802.11b mode: CCK 2. IEEE 802.11g mode: OFDM 3. IEEE 802.11n HT 20 MHz mode: OFDM 4. IEEE 802.11n HT 40 MHz mode: OFDM
Bandwidth	1. IEEE 802.11b mode: 11 Channels 2. IEEE 802.11g mode: 11 Channels 3. IEEE 802.11n HT 20 MHz mode: 11 Channels 4. IEEE 802.11n HT 40 MHz mode: 7 Channels

Remark:
Refer as ANSI 63.10:2013 clause 5.6.1 Table 4

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	☒ PIFA ☐ PCB ☐ Dipole ☐ Coils
Antenna Gain	Walsin / RFMTA200700NNLB002 Antenna 1: Gain: 1.53dBi Antenna 2: Gain: -0.29dBi Directional Gain: 0.71 dBi

Note:
Directional gain=10log(((10^(Ant1/10)+10^(Ant2/10))/2))=10log(((10^(1.53/10)+10^(-0.29/10))/2))=0.71 dBi

1.4 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
Semi Anechoic Chamber (966 Chamber_B) / Radiated Emission, 30 to 1000 MHz	+/- 3.97
Semi Anechoic Chamber (966 Chamber_B) / Radiated Emission, 1 to 18GHz	+/- 3.58
Semi Anechoic Chamber (966 Chamber_B) / Radiated Emission, 18 to 26 GHz	+/- 3.59
Semi Anechoic Chamber (966 Chamber_B) / Radiated Emission, 26 to 40 GHz	+/- 3.81
Conducted Emission (Mains Terminals), 9kHz to 30MHz	+/- 2.48

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. 989-1 Wen Shan Rd., Shang Shan Village, Qionglin Township, Hsinchu County 30741, Taiwan (R.O.C.)

Test site	Test Engineer	Remark
AC Conduction Room	Stemmi Guo	
Radiation	ED Chiang	
RF Conducted	Eric Lee	

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**
Power Meter	Anritsu	ML2495A	1012009	07/04/2016	07/03/2017
Power Sensor	Anritsu	MA2411B	917072	07/04/2016	07/03/2017
Spectrum Analyzer	R&S	FSV 40	101073	10/05/2016	10/04/2017

3M 966 Chamber Test Site					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal Date**	**Cal Due**
Bilog Antenna	Sunol Sciences	JB3	A030105	07/03/2016	07/02/2017
Horn Antenna	EMCO	3117	00055165	02/20/2017	02/19/2018
Pre-Amplifier	EMCI	EMC 012635	980151	06/23/2017	06/22/2018
Pre-Amplifier	EMEC	EM330	060609	06/08/2017	06/05/2018
Spectrum Analyzer	Agilent	E4446A	US42510252	12/05/2016	12/04/2017
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R	N.C.R
Turn Table	CCS	CC-T-1F	N/A	N.C.R	N.C.R

AC Conducted Emissions Test Site					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal Date**	**Cal Due**
LISN	R&S	ENV216	101054	05/18/2017	05/17/2018
LISN	SCHWARZBECK	NSLK 8127	8127-541	02/14/2017	02/13/2018
Receiver	R&S	ESCI	101073	08/20/2016	08/19/2017

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	DELL	PP19L	R33002	E2KWM3945ABG

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 15.247, KDB 558074 D01 v03r05.

1.9 TABLE OF ACCREDITATIONS AND LISTINGS

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3M Semi Anechoic Chamber (FCC MRA: TW1039) to perform FCC Part 15 measurements	FCC MRA: TW1039
Canada	Industry Canada	3M Semi Anechoic Chamber (IC 2324G-1 / IC 2324G-2) to perform	Canada IC 2324G-1 IC 2324G-2

2. TEST SUMMERY

FCC Standard Section	IC Standard Section	Report Section	Test Item	Result
15.203	-	1.2	Antenna Requirement	Pass
15.207(a)	RSS-GEN 8.8	4.1	AC Conducted Emission	Pass
15.247(a)(2)	RSS-247(5.2)(1)	4.2	6 dB Bandwidth	Pass
-	RSS-GEN 6.6	4.2	Occupied Bandwidth (99%)	Pass
15.247(b)	RSS-247(5.4)(4)	4.3	Output Power Measurement	Pass
15.247(e)	RSS-247(5.2)(2)	4.4	Power Spectral Density	Pass
15.247(d)	RSS-247(5.5)	4.5	Conducted Band Edge	Pass
15.247(d)	RSS-247(5.5)	4.5	Conducted Emission	Pass
15.247(d)	RSS-GEN 8.9, 8.10	4.6	Radiation Band Edge	Pass
15.247(d)	RSS-GEN 8.9, 8.10	4.6	Radiation Spurious Emission	Pass

3. DESCRIPTION OF TEST MODES

3.1 THE WORST MODE OF OPERATING CONDITION

Operation mode	IEEE 802.11b mode :1Mbps IEEE 802.11g mode :6Mbps IEEE 802.11n HT20 mode :MCS8 IEEE 802.11n HT40 mode :MCS8
Test Channel Frequencies	**IEEE 802.11b mode :** 1. Lowest Channel : 2412MHz 2. Middle Channel : 2437MHz 3. Highest Channel : 2462MHz **IEEE 802.11g mode :** 1. Lowest Channel : 2412MHz 2. Middle Channel : 2437MHz 3. Highest Channel : 2462MHz **IEEE 802.11n HT20 mode :** 1. Lowest Channel : 2412MHz 2. Middle Channel : 2437MHz 3. Highest Channel : 2462MHz **IEEE 802.11n HT40 mode :** 1. Lowest Channel : 2422MHz 2. Middle Channel : 2437MHz 3. Highest Channel : 2452MHz
Operation Transmitter	IEEE 802.11b mode :1T1R IEEE 802.11g mode :1T1R IEEE 802.11n HT20 mode :2T2R IEEE 802.11n HT40 mode :2T2R

Remark:
1. EUT pre-scanned data rate of output power for each mode, the worst data rate were recorded in this report.

3.2 THE WORST MODE OF MEASUREMENT

AC Power Line Conducted Emission	
Test Condition	**AC Power line conducted emission for line and neutral**
Voltage/Hz	**120V/60Hz**
Test Mode	**Mode 1:EUT power by Host system.**
Worst Mode	**☒ Mode 1 ☐ Mode 2 ☐ Mode 3 ☐ Mode 4**

Radiated Emission Measurement Above 1G	
Test Condition	**Band edge, Emission for Unwanted and Fundamental**
Voltage/Hz	**120V/60Hz**
Test Mode	**Mode 1:EUT power by Host system.**
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**

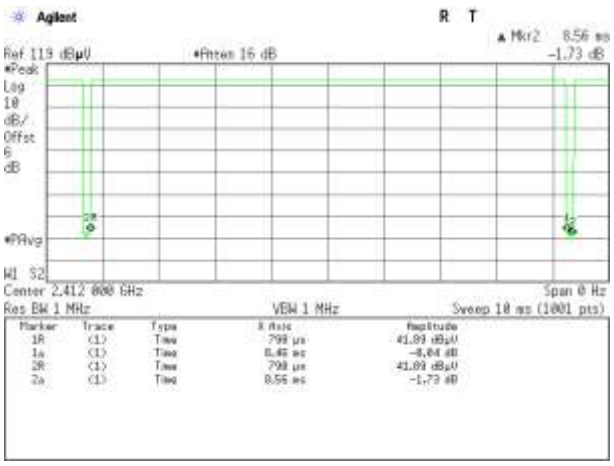
Radiated Emission Measurement Below 1G	
Test Condition	**Radiated Emission Below 1G**
Voltage/Hz	**120V/60Hz**
Test Mode	**Mode 1:EUT power by Host system.**
Worst Mode	**☒ Mode 1 ☐ Mode 2 ☐ Mode 3 ☐ Mode 4**

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(Z-Plane and Horizontal) 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.

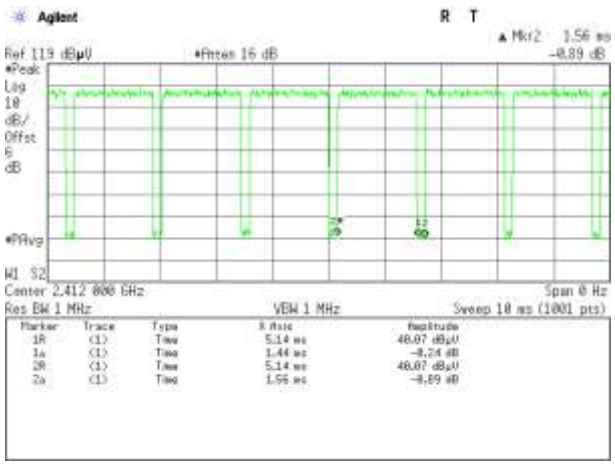
3.3 EUT DUTY CYCLE

Duty Cycle				
Configuration	TX ON (ms)	TX ALL (ms)	Duty Cycle (%)	Duty Factor(dB)
802.11b	8.4600	8.5600	98.83%	0.05
802.11g	1.4400	1.5600	92.31%	0.35
802.11n HT20	0.7200	0.8400	85.71%	0.67
802.11n HT40	0.4000	0.5400	74.07%	1.30

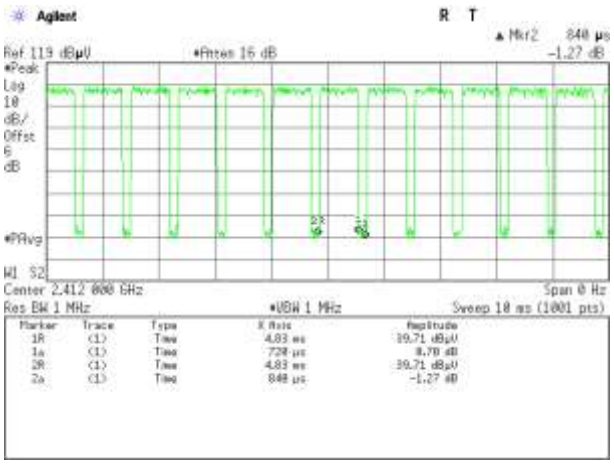
802.11b



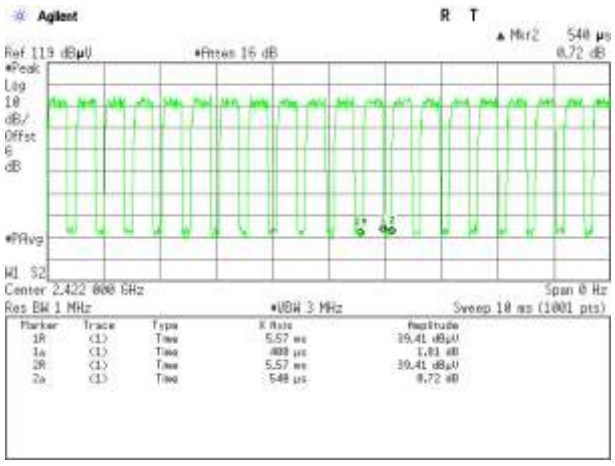
802.11g



802.11n HT20



802.11n HT40



4. TEST RESULT

4.1 AC POWER LINE CONDUCTED EMISSION

4.1.1 Test Limit

According to §15.207(a)(2)

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

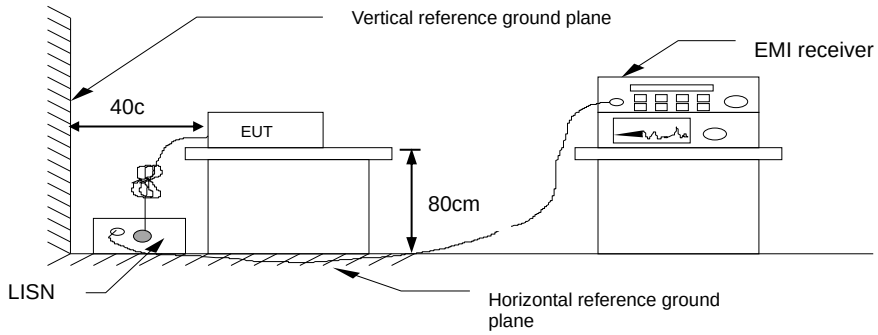
* Decreases with the logarithm of the frequency.

4.1.2 Test Procedure

Test method Refer as ANSI 63.10:2013 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

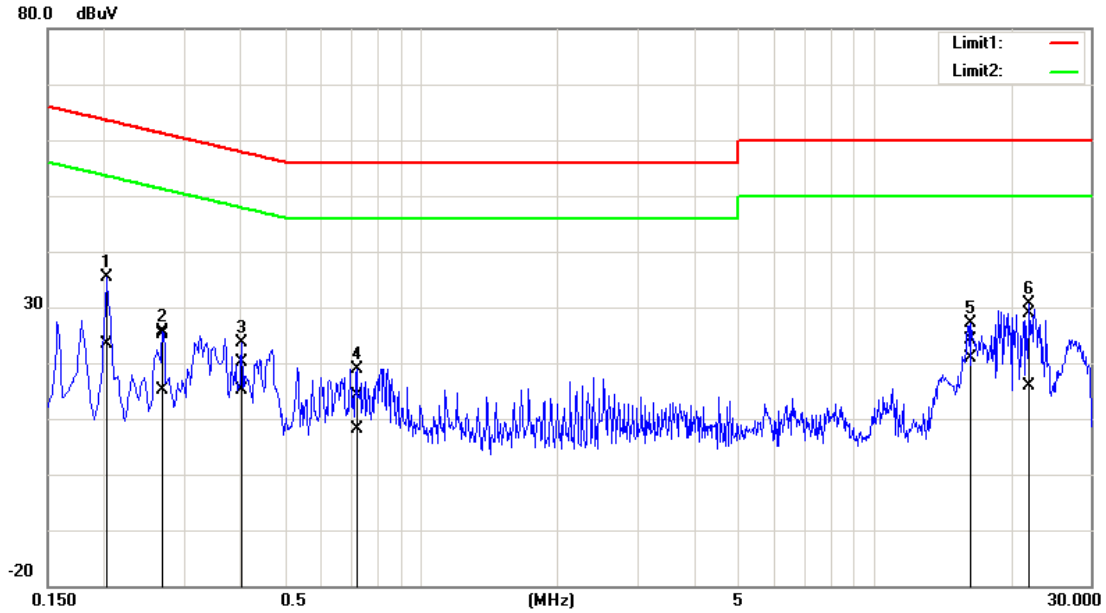


4.1.4 Test Result

Pass.

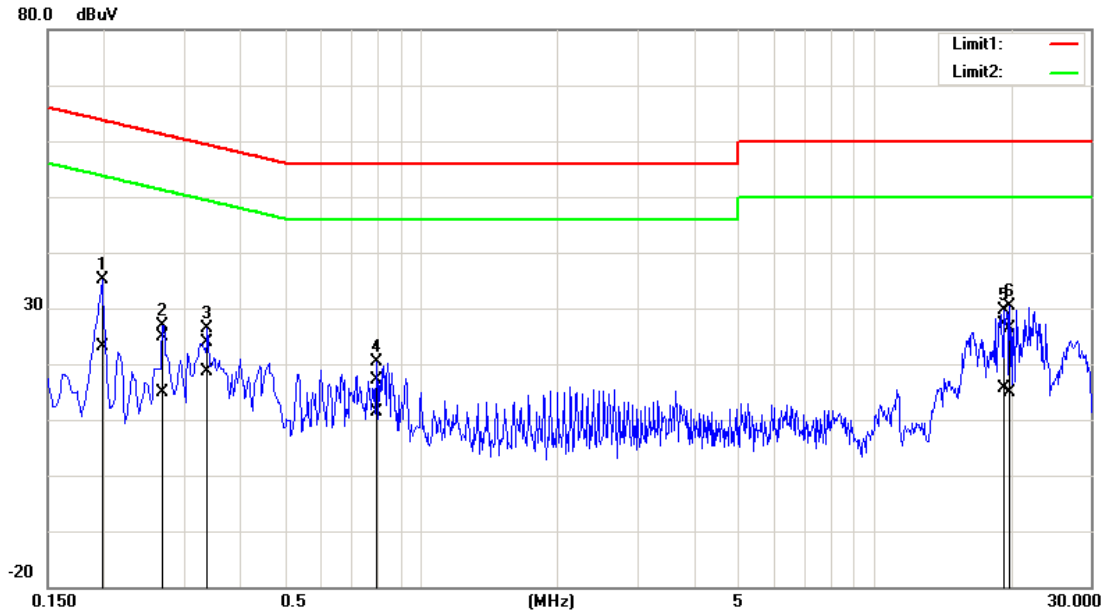
Test Data

Test Mode:	Mode 1	Temp/Hum	24(℃)/ 50%RH
Test Voltage:	120Vac / 60Hz	Test Date	2017/6/26
Phase:	Line	Test Engineer	Stemmi Guo



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
0.2020	35.52	23.47	-0.03	35.49	23.44	63.52	53.53	-28.03	-30.09	Pass
0.2700	25.08	15.18	-0.04	25.04	15.14	61.12	51.12	-36.08	-35.98	Pass
0.4020	20.15	15.07	-0.05	20.10	15.02	57.81	47.81	-37.71	-32.79	Pass
0.7220	14.28	8.19	-0.05	14.23	8.14	56.00	46.00	-41.77	-37.86	Pass
16.3180	24.34	21.14	-0.14	24.20	21.00	60.00	50.00	-35.80	-29.00	Pass
21.9860	29.35	16.26	-0.39	28.96	15.87	60.00	50.00	-31.04	-34.13	Pass

Test Mode:	Mode 1	Temp/Hum	24(℃)/ 50%RH
Test Voltage:	120Vac / 60Hz	Test Date	2017/6/26
Phase:	Neutral	Test Engineer	Stemmi Guo



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
0.1980	35.11	23.20	-0.10	35.01	23.10	63.69	53.69	-28.68	-30.59	Pass
0.2700	25.03	15.01	-0.11	24.92	14.90	61.12	51.12	-36.20	-36.22	Pass
0.3380	23.99	18.66	-0.12	23.87	18.54	59.25	49.25	-35.38	-30.71	Pass
0.7980	17.16	11.51	-0.13	17.03	11.38	56.00	46.00	-38.97	-34.62	Pass
19.3420	27.52	15.97	-0.33	27.19	15.64	60.00	50.00	-32.81	-34.36	Pass
19.9380	26.84	15.19	-0.34	26.50	14.85	60.00	50.00	-33.50	-35.15	Pass

4.2 6DB BANDWIDTH AND OCCUPIED BANDWIDTH(99%)

4.2.1 Test Limit

According to §15.247(a)(2) and RSS-247 section 5.2(a),

6 dB Bandwidth ：

Limit	Shall be at least 500kHz

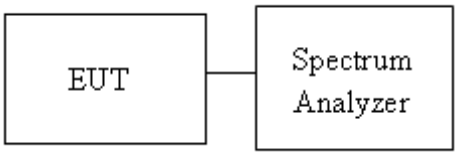
Occupied Bandwidth(99%) ： For reporting purposes only.

4.2.2 Test Procedure

Test method Refer as KDB 558074 D01 v03r05, Section 8.1 and ANSI 63.10:2013 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. SA set RBW = 100kHz, VBW = 300kHz and Detector = Peak, to measurement 6 dB Bandwidth.
4. 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

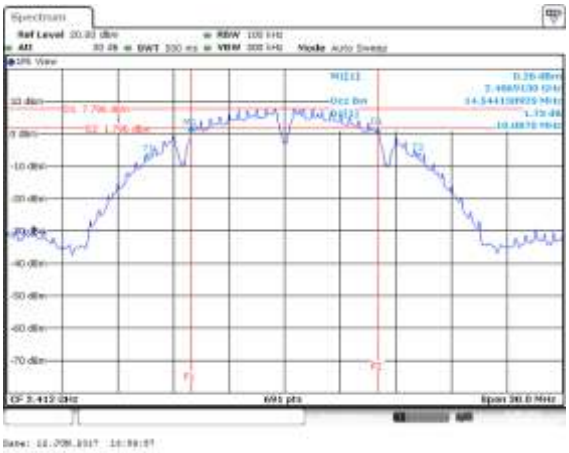
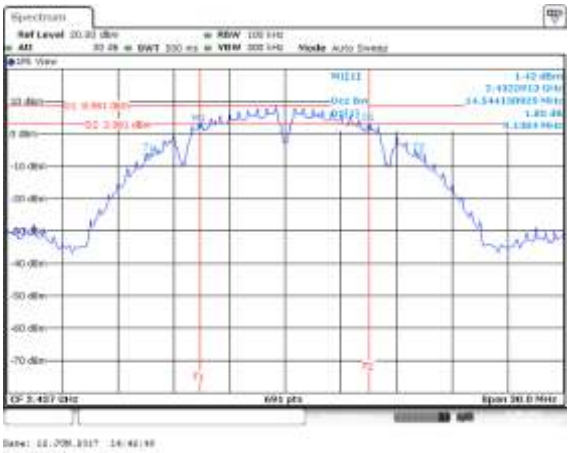
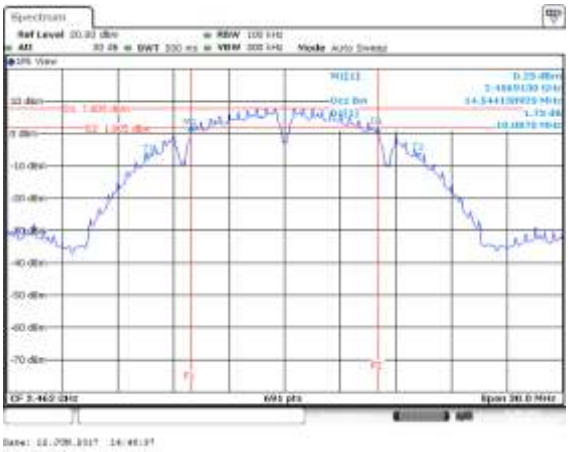
Test mode: IEEE 802.11b mode / 2412-2462 MHz						
Channel	Frequency (MHz)	Chain 0 OBW(99%) (MHz)	Chain 1 OBW(99%) (MHz)	Chain 0 6dB BW (MHz)	Chain 1 6dB BW (MHz)	6dB limit (kHz)
Low	2412	14.5441	-	10.0870	-	≥500
Mid	2437	14.5441	-	9.1304	-	
High	2462	14.5441	-	10.0870	-	

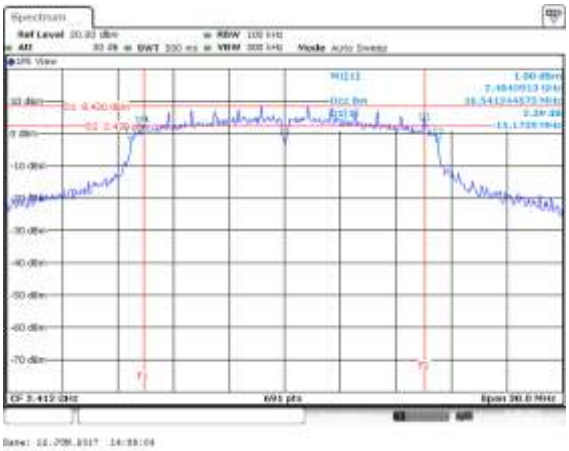
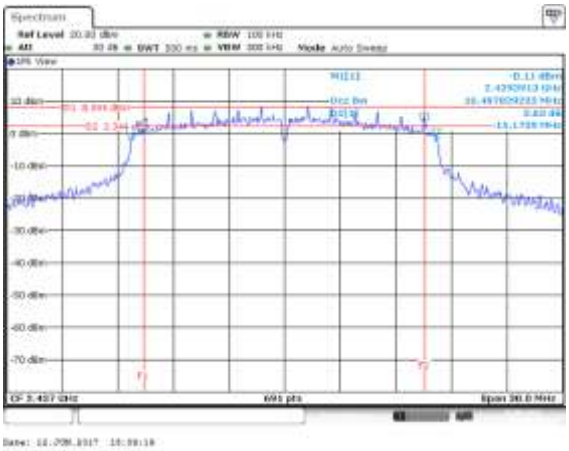
Test mode: IEEE 802.11g mode / 2412-2462 MHz						
Channel	Frequency (MHz)	Chain 0 OBW(99%) (MHz)	Chain 1 OBW(99%) (MHz)	Chain 0 6dB BW (MHz)	Chain 1 6dB BW (MHz)	6dB limit (kHz)
Low	2412	16.5412	-	15.1739	-	≥500
Mid	2437	16.4978	-	15.1739	-	
High	2462	16.5846	-	15.1739	-	

Test mode: IEEE 802.11n HT 20 MHz mode / 2412-2462 MHz						
Channel	Frequency (MHz)	Chain 0 OBW(99%) (MHz)	Chain 1 OBW(99%) (MHz)	Chain 0 6dB BW (MHz)	Chain 1 6dB BW (MHz)	6dB limit (kHz)
Low	2412	17.5397	17.5832	15.1739	15.1739	≥500
Mid	2437	17.5397	17.5832	15.1739	15.1739	
High	2462	17.5397	17.5832	15.1739	15.1739	

Test mode: IEEE 802.11n HT 40 MHz mode / 2422-2452 MHz						
Channel	Frequency (MHz)	Chain 0 OBW(99%) (MHz)	Chain 1 OBW(99%) (MHz)	Chain 0 6dB BW (MHz)	Chain 1 6dB BW (MHz)	6dB limit (kHz)
Low	2422	36.0057	36.0057	35.130	35.130	>500
Mid	2437	36.0057	36.0057	35.130	35.130	
High	2452	36.0057	36.0057	35.130	35.130	

Test Data

IEEE 802.11b mode- chain 0	
Low CH	**Mid CH**
	
High CH	
	

IEEE 802.11g mode- chain 0	
Low CH	**Mid CH**
	
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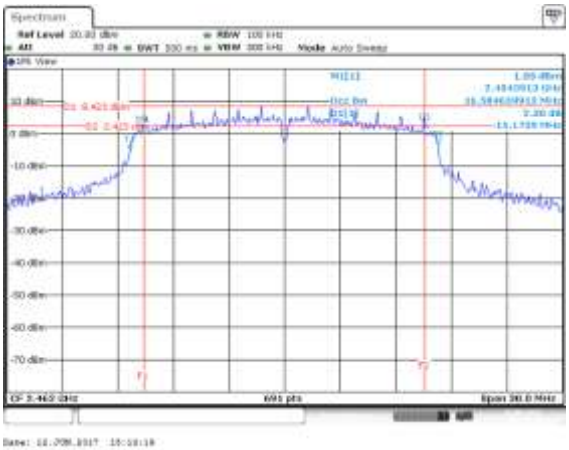
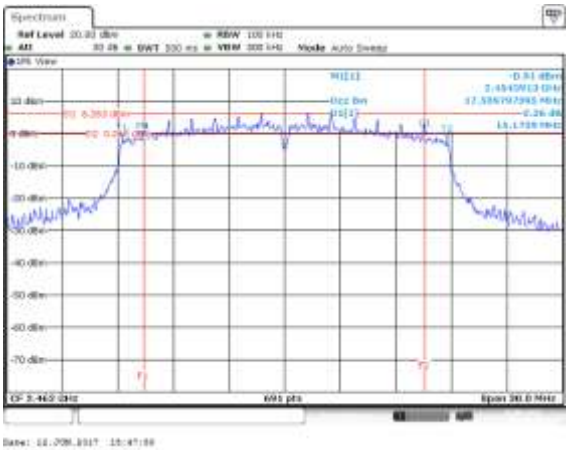
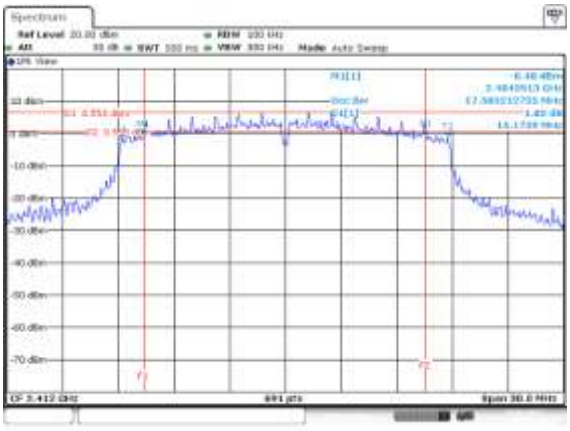
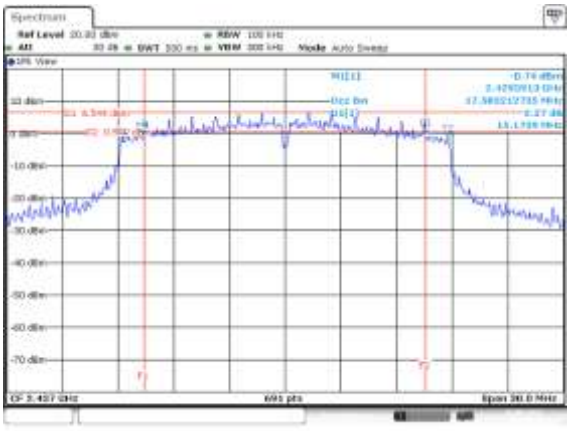
	

IEEE 802.11n HT20 mode- chain 0	
Low CH	**Mid CH**
	
High CH	
	

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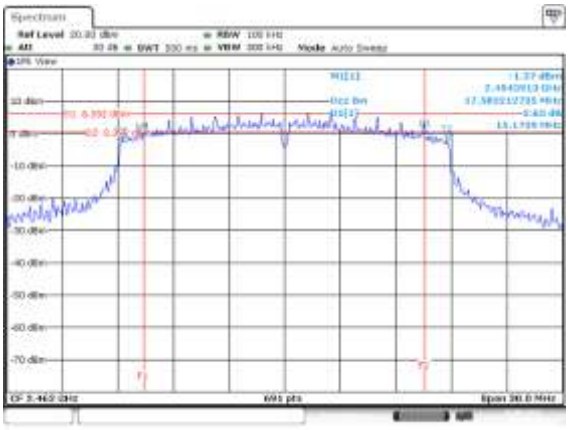
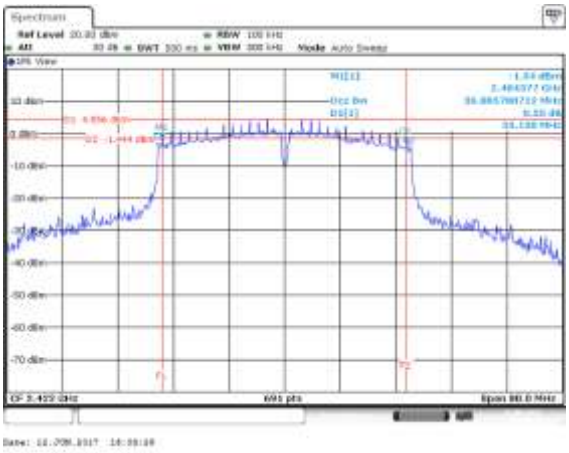
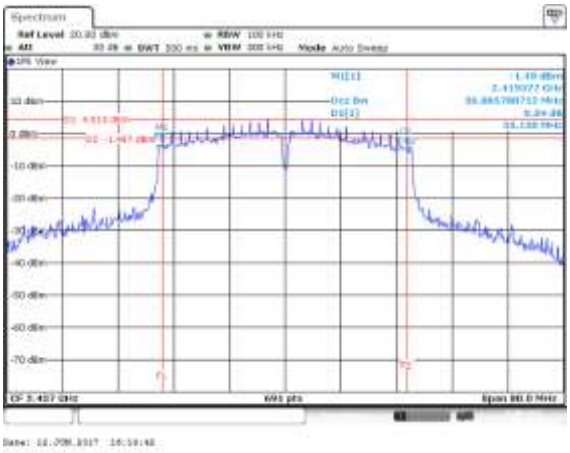
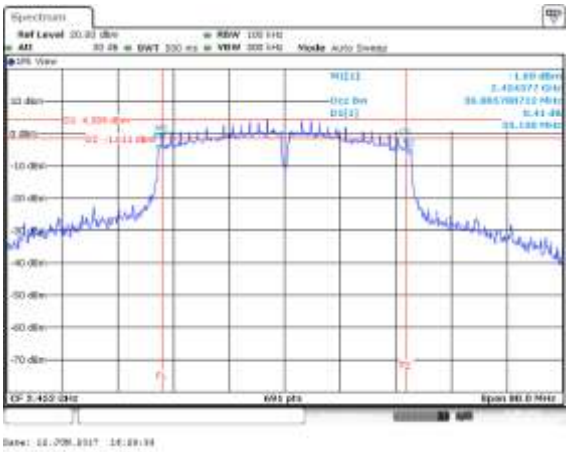
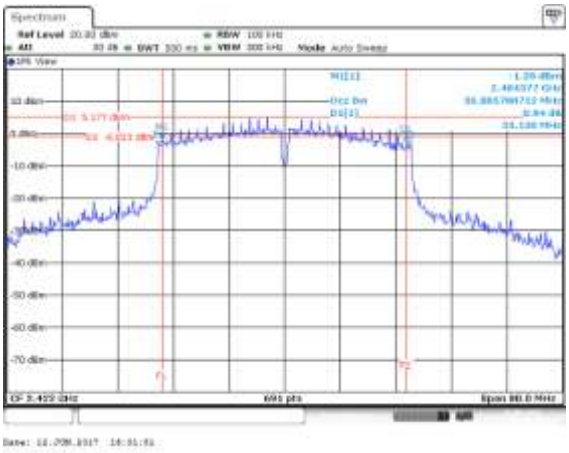
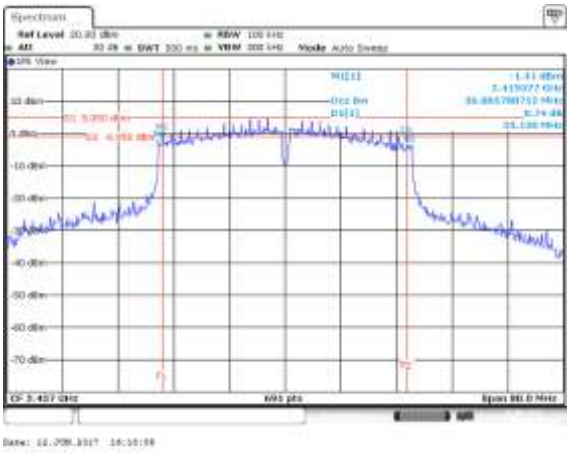
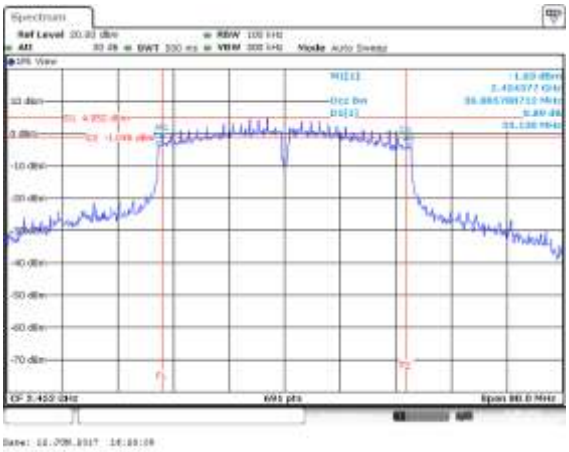
	

IEEE 802.11n HT40 mode- chain 0	
Low CH	**Mid CH**
	
High CH	
	

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

4.3 OUTPUT POWER MEASUREMENT

4.3.1 Test Limit

According to §15.247(b) and RSS-247 section 5.4(4),

Peak output power：

For systems using digital modulation in the 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt(30 dBm) and the e.i.r.p. shall not exceed 4Watt(36 dBm), base on the use of antennas with directional gain not exceed 6 dBi If transmitting antennas of directional gain greater than 6dBi are used the peak output power the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

Limit	☒ Antenna not exceed 6 dBi：30dBm ☐ Antenna with DG greater than 6 dBi： [Limit = 30 – (DG – 6)] ☐ Point-to-point operation：

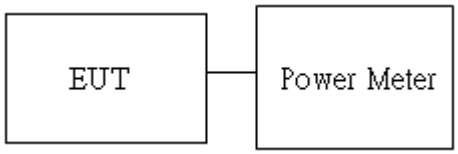
Average output power：For reporting purposes only.

4.3.2 Test Procedure

Test method Refer as KDB 558074 D01 v03r05, Section 9.1.2.

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 Peak output power and Average output power. in the test report.

4.3.3 Test Setup



4.3.4 Test Result

Peak output power：

Wifi 2.4G									
Config	CH	Freq. (MHz)	power set		PK Power(dBm)		PK Total Power (dBm)	PK Total Power (W)	Limit (dBm)
			chain0	chain1	chain0	chain1			
IEEE 802.11b Data rate: 1Mbps	Low	2412	26	-	19.27	-	19.27	0.0855	30
	Mid	2437	26	-	19.23	-	19.23	0.0848	
	High	2462	26	-	19.37	-	19.37	0.0875	
IEEE 802.11g Data rate: 6Mbps	Low	2412	21	-	22.70	-	22.70	0.1872	
	Mid	2437	28	-	23.63	-	23.63	0.2317	
	High	2462	1F	-	22.19	-	22.19	0.1666	
IEEE 802.11n HT20 Data rate: MCS8	Low	2412	1F	1F	20.68	20.58	23.64	0.2312	
	Mid	2437	27	27	22.53	22.62	25.59	0.3619	
	High	2462	1D	1D	19.56	19.70	22.64	0.1837	
IEEE 802.11n HT40 Data rate: MCS8	Low	2422	18	18	18.10	17.63	20.88	0.1225	
	Mid	2437	28	28	22.83	22.90	25.88	0.3869	
	High	2452	11	11	15.32	14.67	18.02	0.0633	

Average output power：

Wifi 2.4G					
Config	CH	Freq. (MHz)	AV Power(dBm)		AV Total Power (dBm)
			chain0	chain1	
IEEE 802.11b Data rate: 1Mbps	Low	2412	17.60	-	17.60
	Mid	2437	17.54	-	17.54
	High	2462	17.68	-	17.68
IEEE 802.11g Data rate: 6Mbps	Low	2412	15.13	-	15.13
	Mid	2437	17.98	-	17.98
	High	2462	14.16	-	14.16
IEEE 802.11n HT20 Data rate: MCS8	Low	2412	12.77	12.70	15.75
	Mid	2437	16.23	16.37	19.31
	High	2462	11.80	11.65	14.74
IEEE 802.11n HT40 Data rate: MCS8	Low	2422	9.22	9.21	12.23
	Mid	2437	16.56	17.04	19.82
	High	2452	5.46	5.52	8.50

4.4 POWER SPECTRAL DENSITY

4.4.1 Test Limit

According to §15.247(e) and RSS-247 section 5.2(2)

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

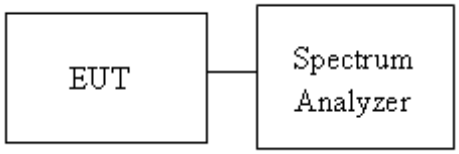
Limit	☒ Antenna not exceed 6 dBi：8dBm ☐ Antenna with DG greater than 6 dBi： [Limit = 8 – (DG – 6)] ☐ Point-to-point operation：

4.4.2 Test Procedure

Test method Refer as KDB 558074 D01 v03r05, Section 10.2

1. The EUT RF output connected to the spectrum analyzer by RF cable.
2. Setting maximum power transmit of EUT
3. SA set RBW = 3kHz, VBW = 30kHz, Span = 1.5 times DTS Bandwidth (6 dB BW), Detector = Peak, Sweep Time = Auto and Trace = Max hold.
4. The path loss and Duty Factor were compensated to the results for each measurement by SA.
5. Mark the maximum level.
6. Measure and record the result of power spectral density. in the test report.

4.4.3 Test Setup



4.4.4 Test Result

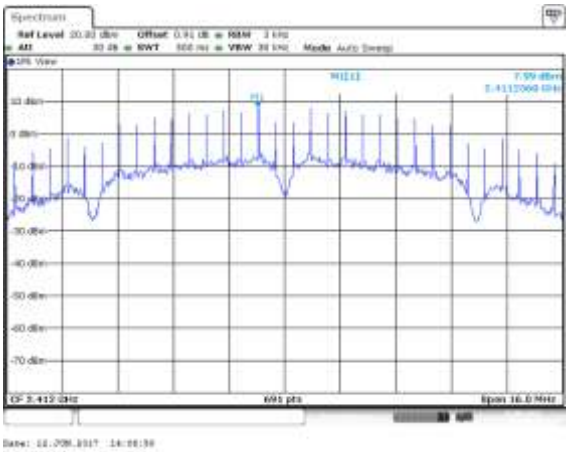
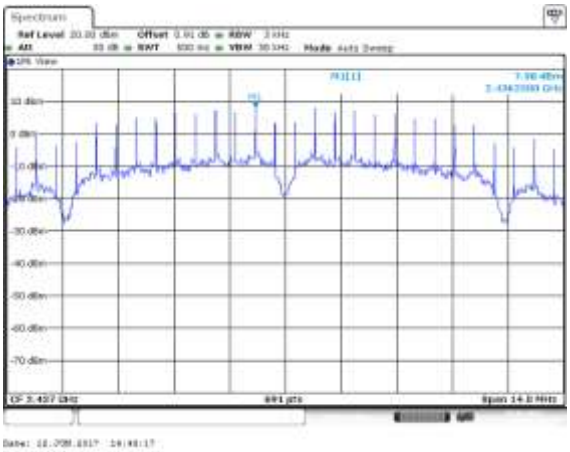
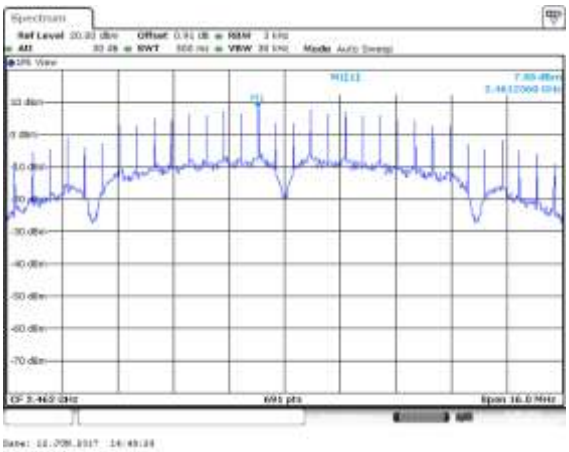
Test mode: IEEE 802.11b mode / 2412-2462 MHz					
Channel	**Frequency (MHz)**	**Chain 0 PPSD (dBm)**	**Chain 1 PPSD (dBm)**	**Total PSSD (dBm)**	**Limit (dBm)**
Low	2412	7.99	-	7.99	8
Mid	2437	8.08	-	7.98	
High	2462	7.95	-	7.95	

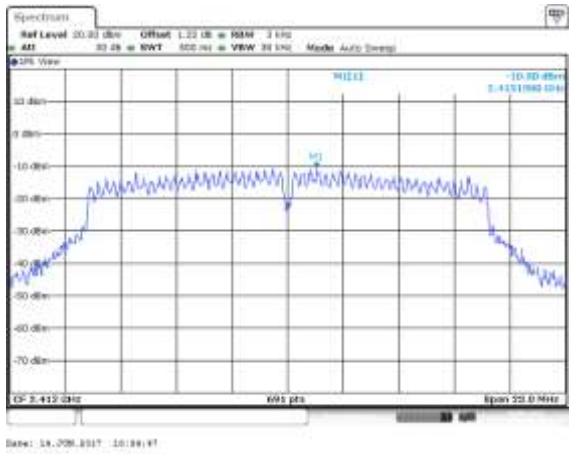
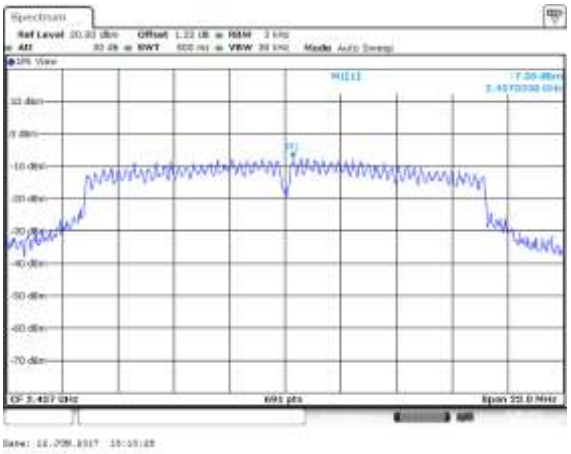
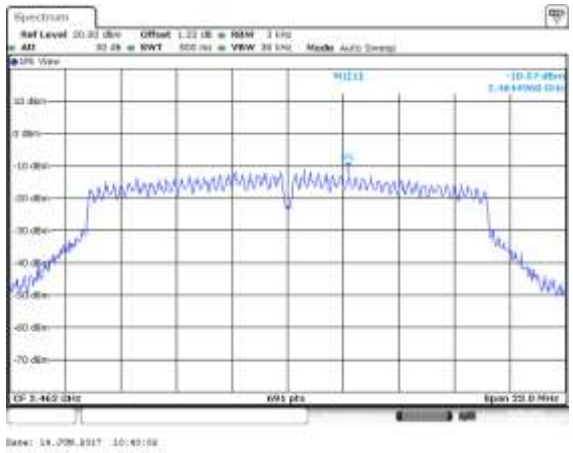
Test mode: IEEE 802.11g mode / 2412-2462 MHz					
Channel	**Frequency (MHz)**	**Chain 0 PPSD (dBm)**	**Chain 1 PPSD (dBm)**	**Total PSSD (dBm)**	**Limit (dBm)**
Low	2412	-10.50	-	-10.50	8
Mid	2437	-7.35	-	-7.35	
High	2462	-10.57	-	-10.57	

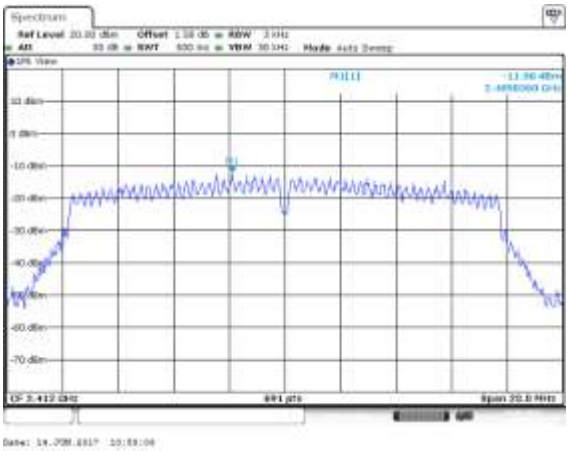
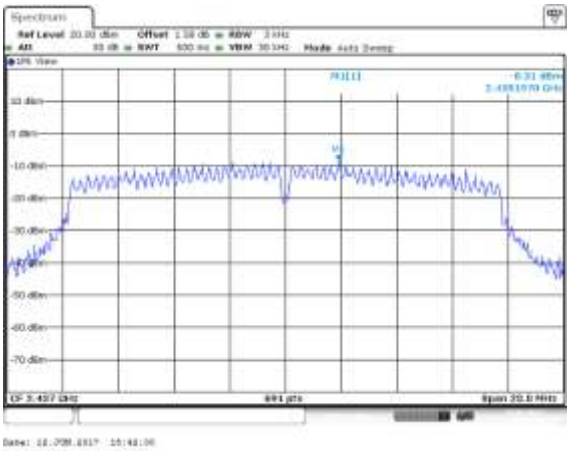
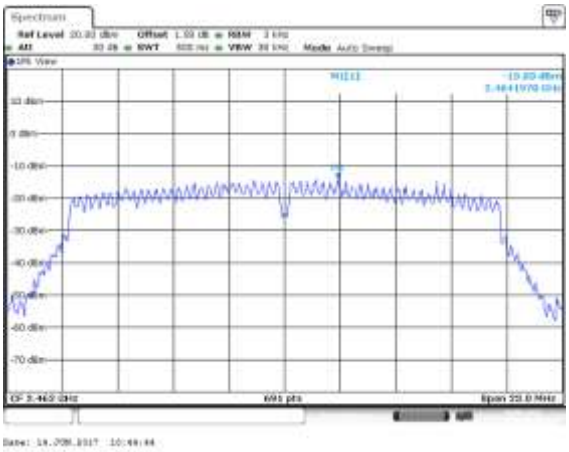
Test mode: IEEE 802.11n HT 20 MHz mode / 2412-2462 MHz					
Channel	**Frequency (MHz)**	**Chain 0 PPSD (dBm)**	**Chain 1 PPSD (dBm)**	**Total PSSD (dBm)**	**Limit (dBm)**
Low	2412	-11.96	-11.85	-8.89	8
Mid	2437	-8.31	-7.47	-4.86	
High	2462	-13.83	-12.22	-9.94	

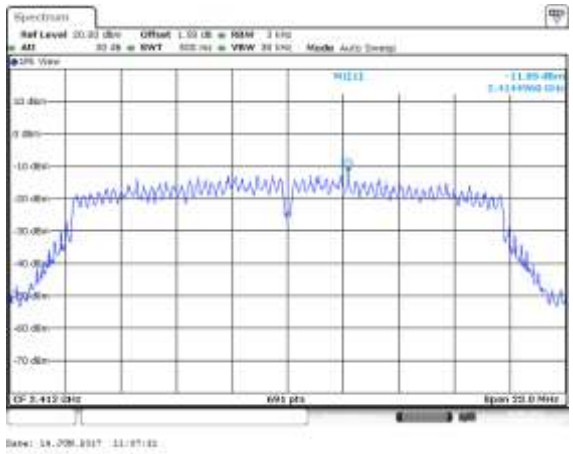
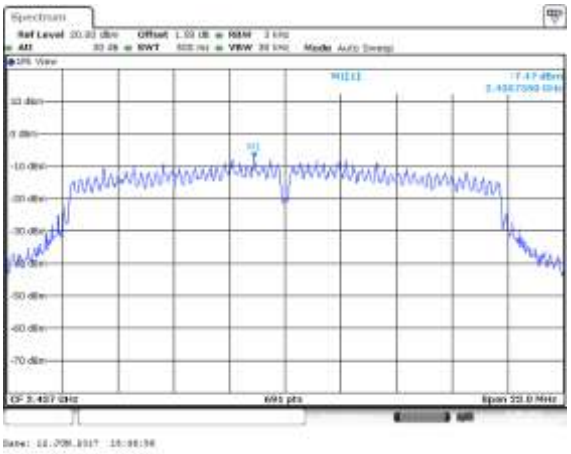
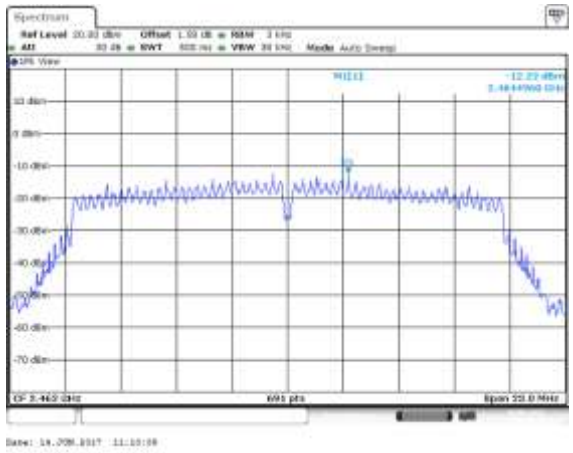
Test mode: IEEE 802.11n HT 40 MHz mode / 2422-2452 MHz					
Channel	**Frequency (MHz)**	**Chain 0 PPSD (dBm)**	**Chain 1 PPSD (dBm)**	**Total PSSD (dBm)**	**Limit (dBm)**
Low	2422	-17.30	-16.19	-13.70	8
Mid	2437	-8.65	-7.25	-4.88	
High	2452	-21.45	-20.00	-17.65	

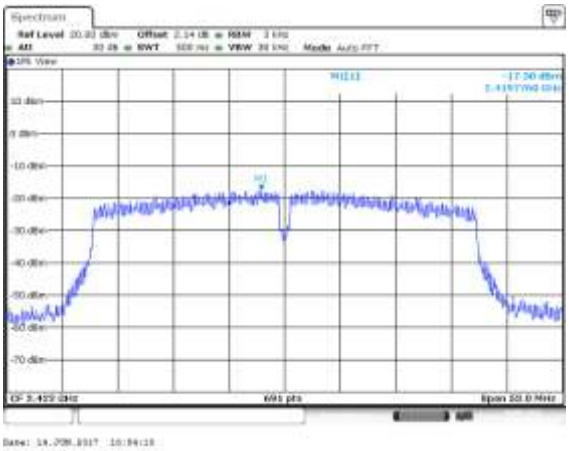
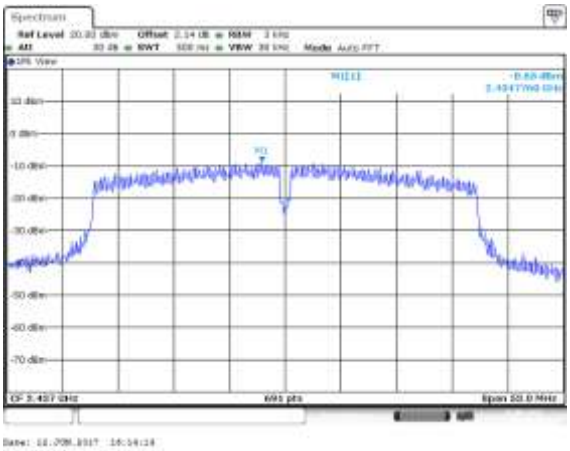
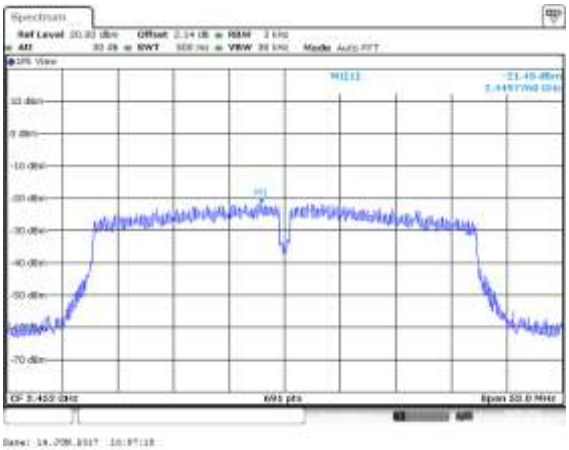
Test Data

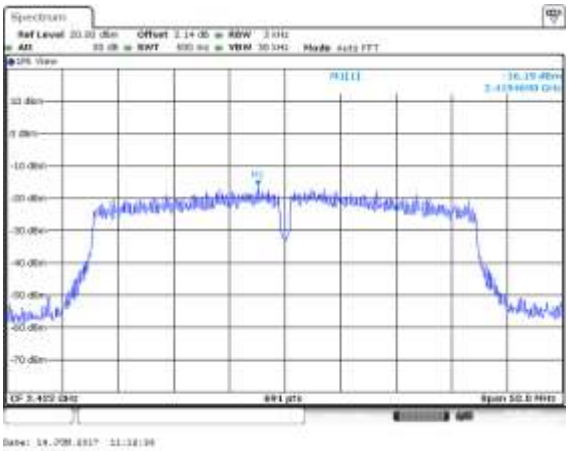
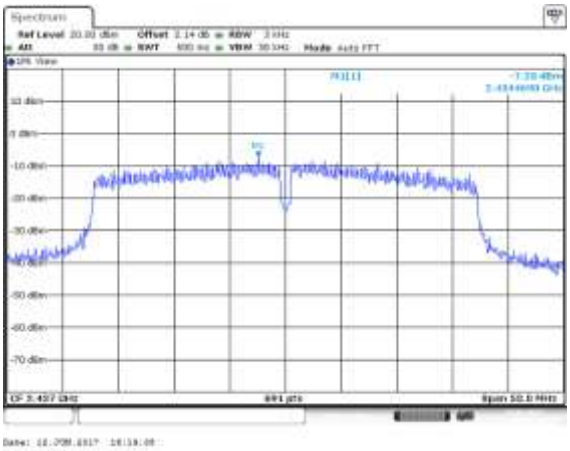
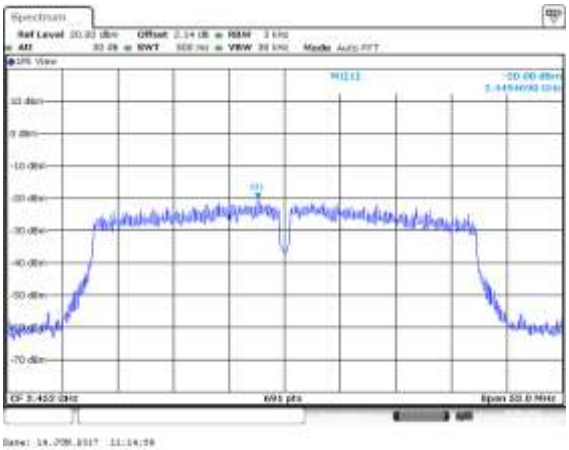
IEEE 802.11b mode- chain 0	
Low CH	**Mid CH**
	
High CH	
	

IEEE 802.11g mode- chain 0	
Low CH	**Mid CH**
	
High CH	
	

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

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

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

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

4.5 CONDUCTED BANDEDGE AND SPURIOUS EMISSION

4.5.1 Test Limit

According to §15.247(d) and RSS-247 section 5.5,

In any 100 kHz bandwidth outside the authorized frequency band,

Non-restricted bands shall be attenuated at least 20 dB/30 dB relative to the maximum PSD level in 100 kHz by RF conducted or a radiated measurement which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a).

4.5.2 Test Procedure

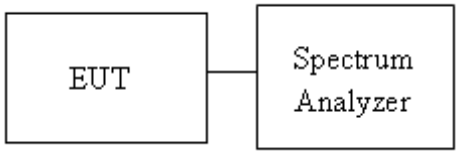
Test method Refer as KDB 558074 D01 v03r05, Section 11.

1. EUT RF output port connected to the SA by RF cable, and the path loss was compensated to result.

2. SA setting, RBW=100kHz, VBW=300kHz, Detector=Peak, Trace mode = max hold, SWT = Auto.

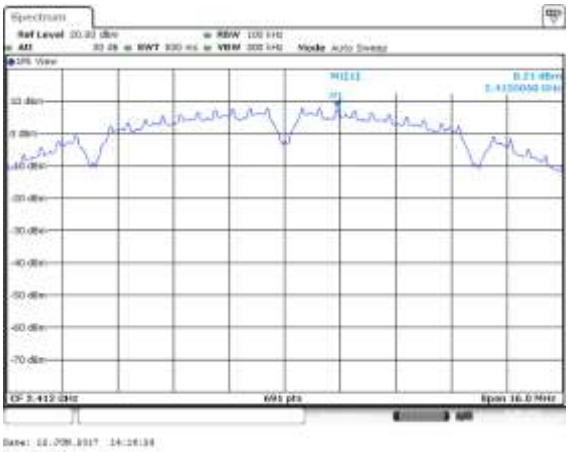
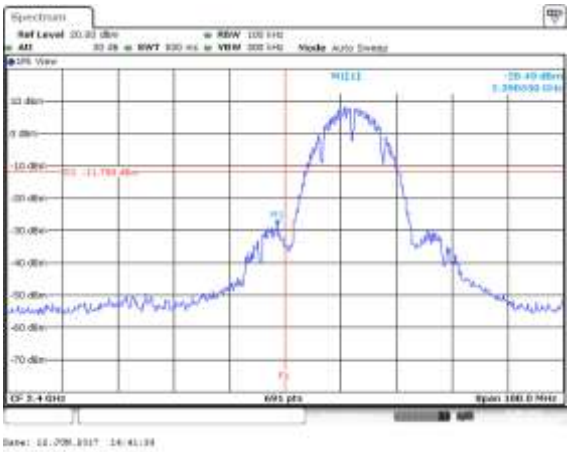
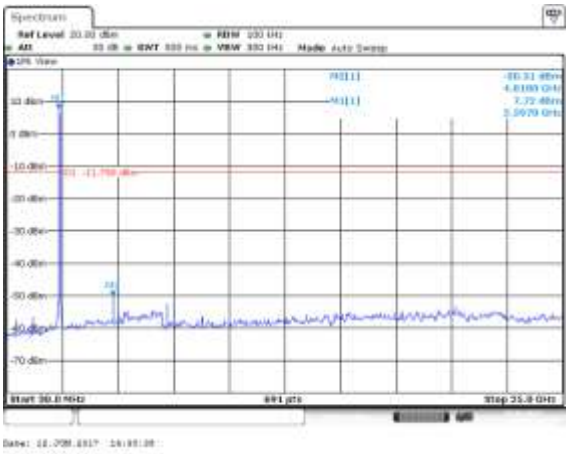
3. In any 100 kHz bandwidth outside the authorized frequency band, shall be attenuated at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when conducted power procedure is used. f the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

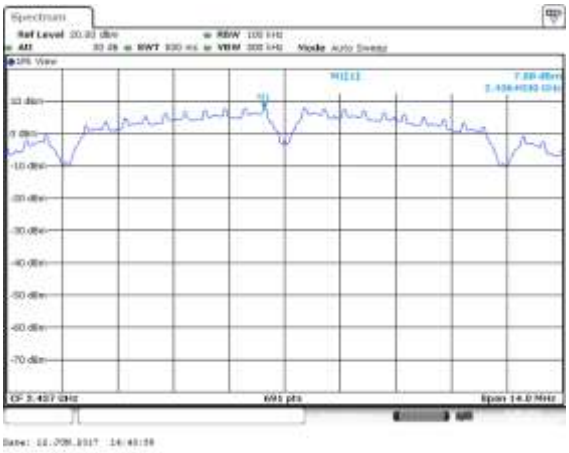
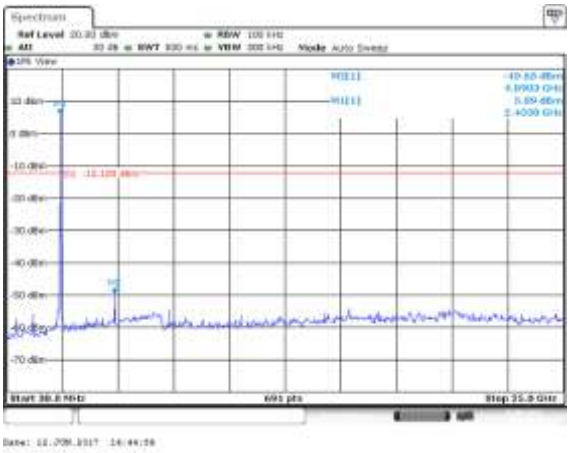
4.5.3 Test Setup

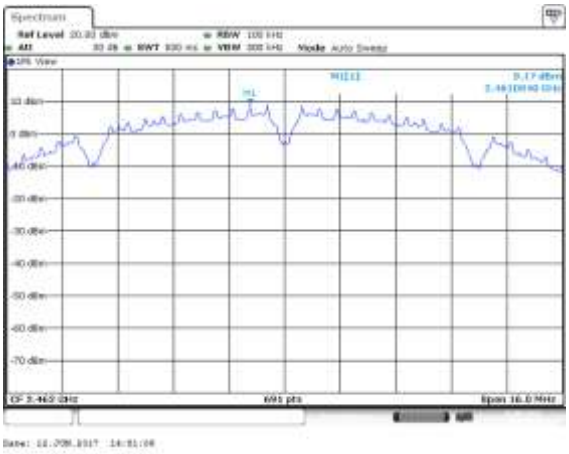
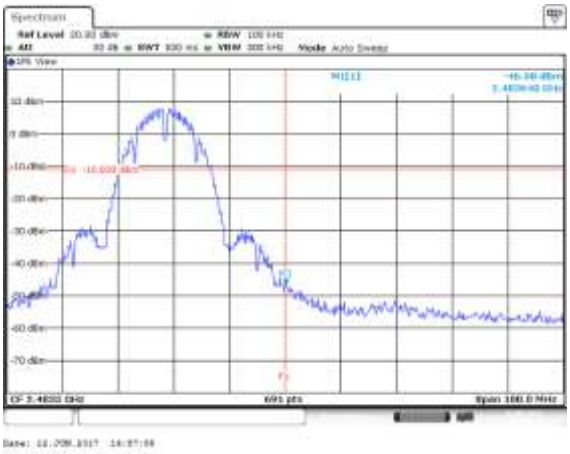
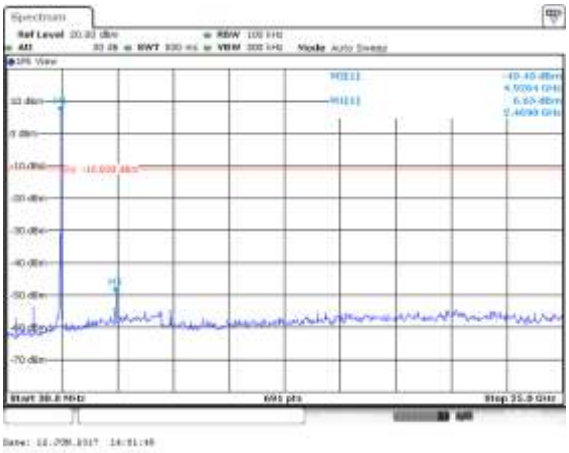


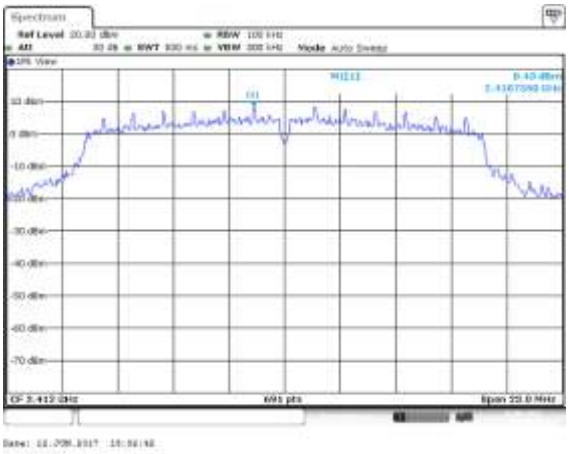
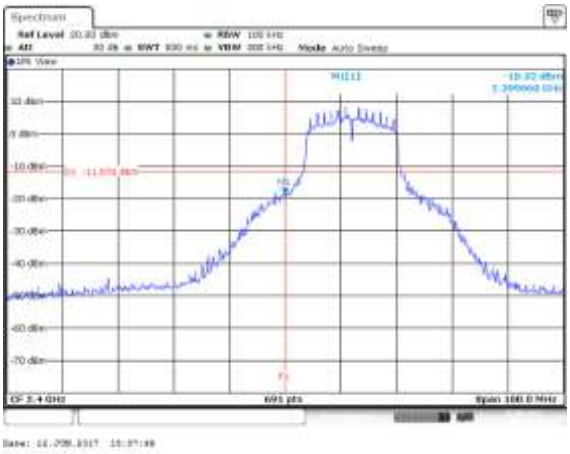
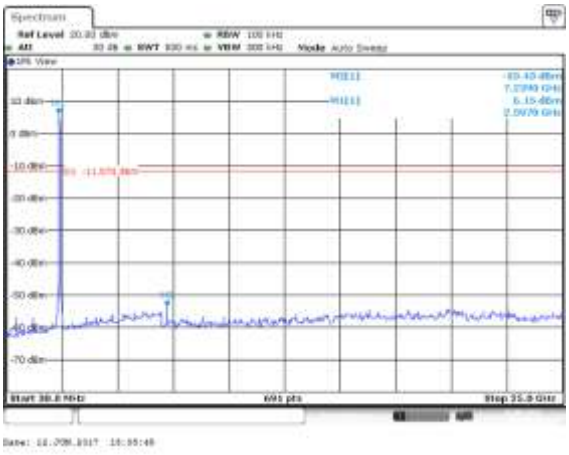
4.5.4 Test Result

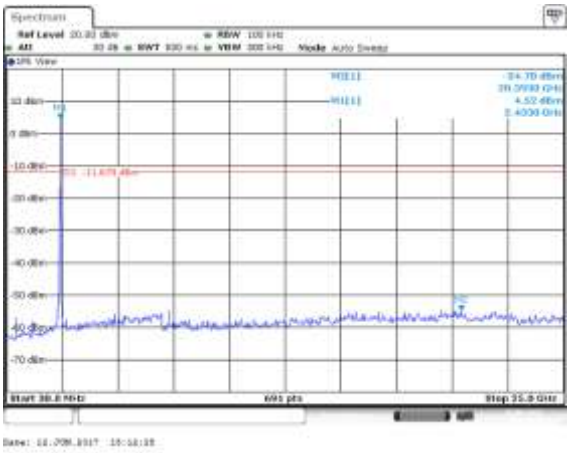
Test Data

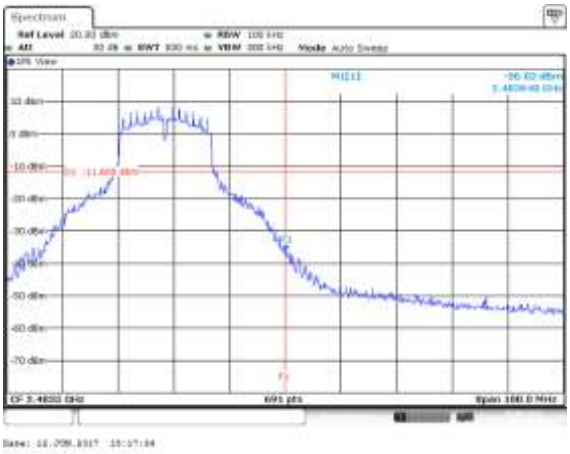
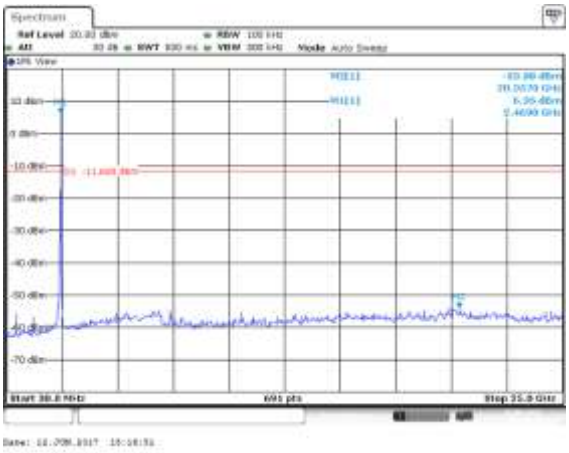
IEEE 802.11b mode Low CH chain 0	
Reference Level of PSD in 100kHz	**Band Edge**
	
Spurious Emission 30MHz-25GHz	
	

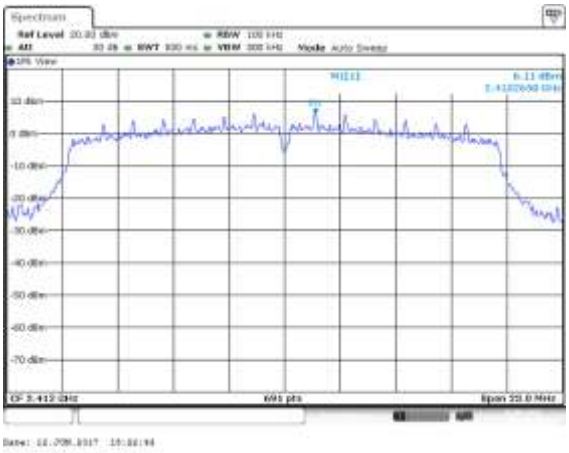
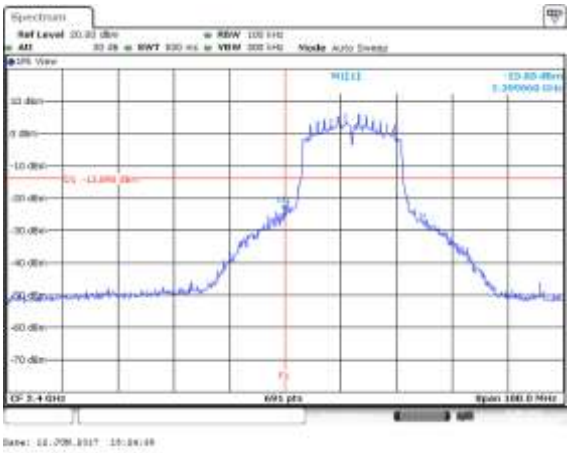
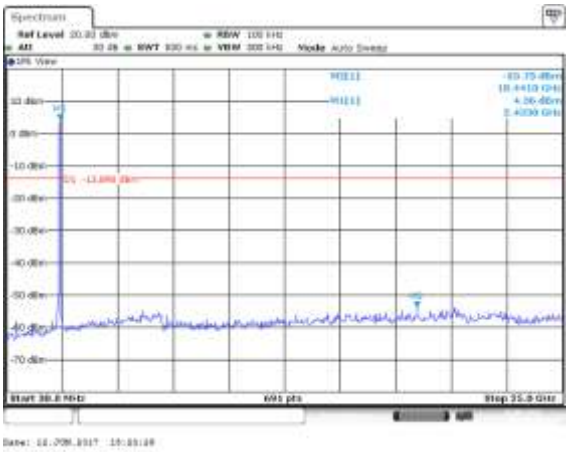
IEEE 802.11b mode Mid CH chain 0	
Reference Level of PSD in 100kHz	**Spurious Emission 30MHz-25GHz**
	

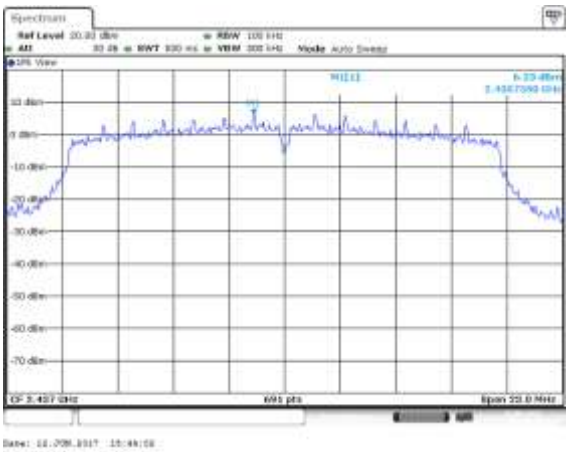
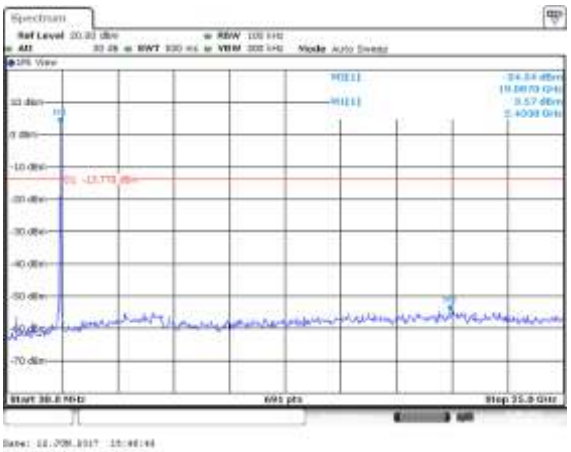
IEEE 802.11b mode High CH chain 0	
Reference Level of PSD in 100kHz	**Band Edge**
	
Spurious Emission 30MHz-25GHz	
	

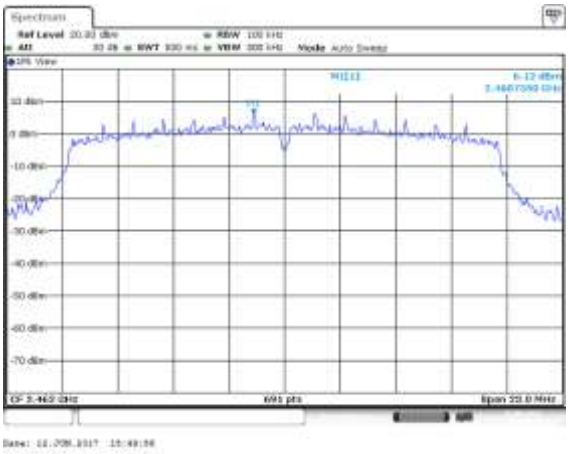
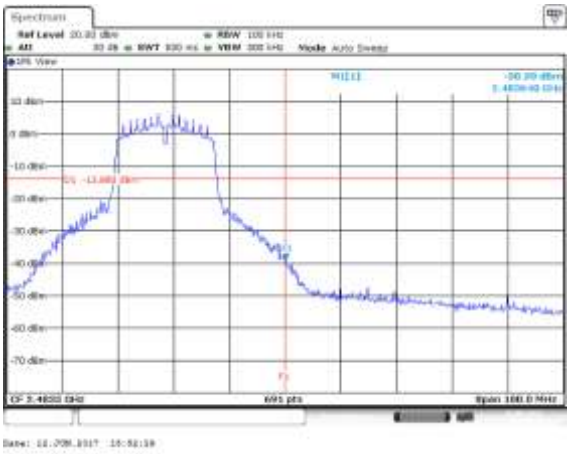
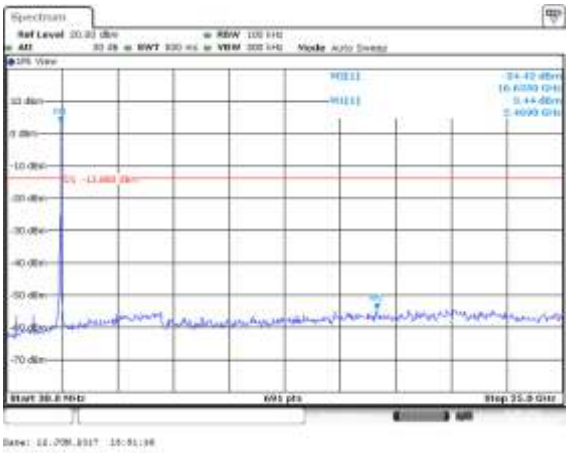
IEEE 802.11g mode Low CH chain 0	
Reference Level of PSD in 100kHz	**Band Edge**
	
Spurious Emission 30MHz-25GHz	
	

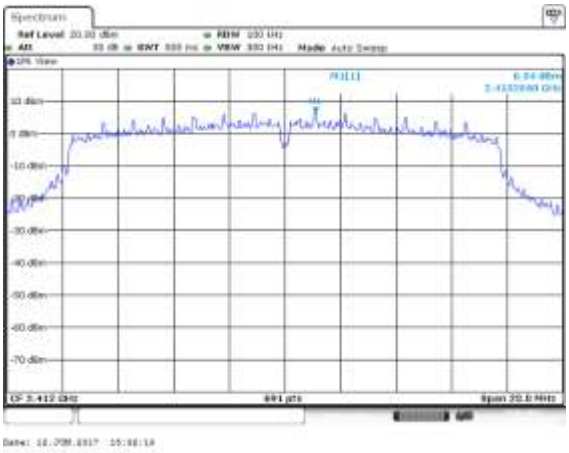
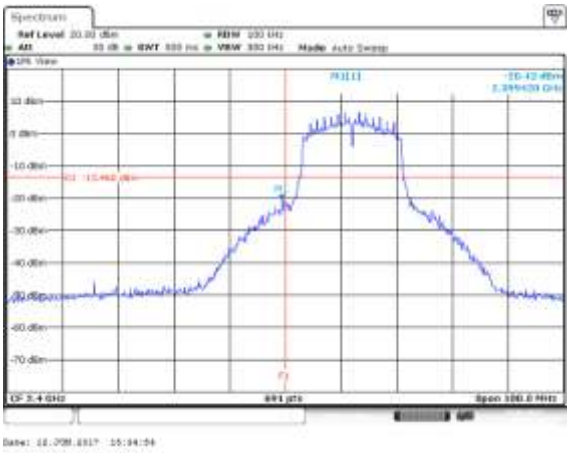
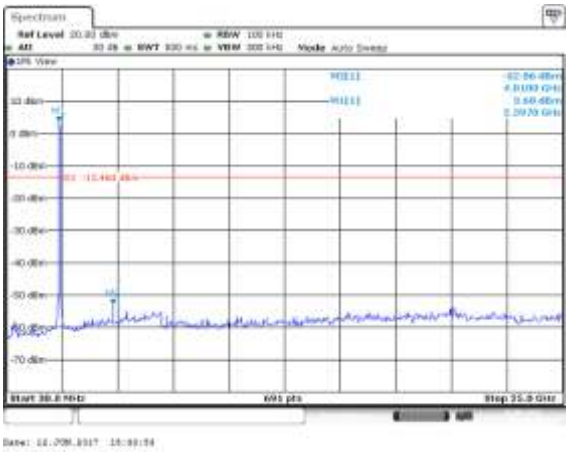
IEEE 802.11g mode Mid CH chain 0	
Reference Level of PSD in 100kHz	**Spurious Emission 30MHz-25GHz**
	

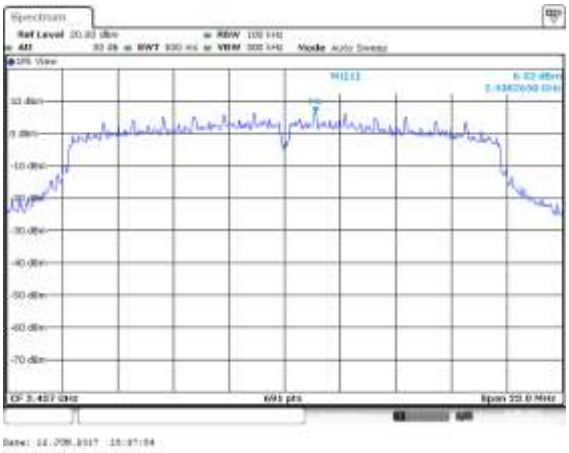
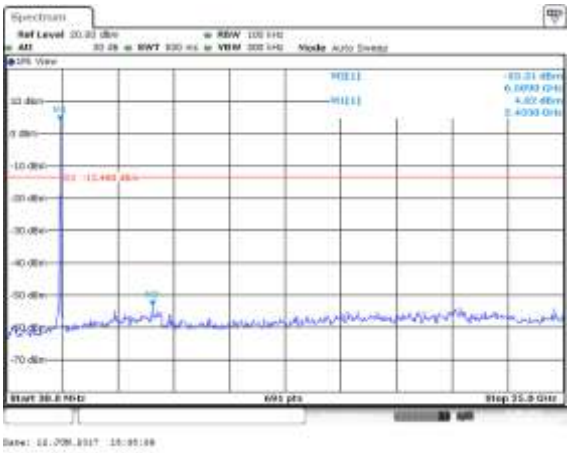
IEEE 802.11g mode High CH chain 1	
Reference Level of PSD in 100kHz	**Band Edge**
	
Spurious Emission 30MHz-25GHz	
	

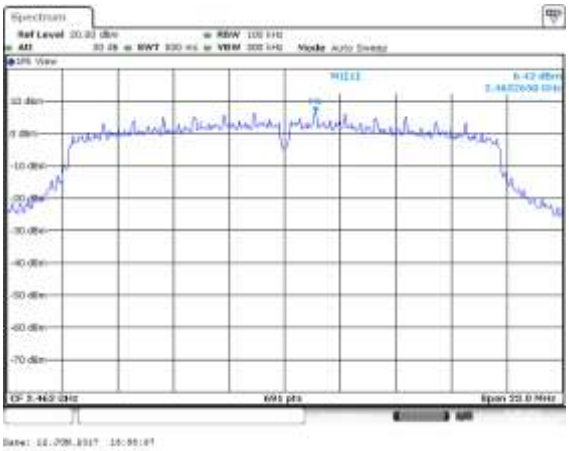
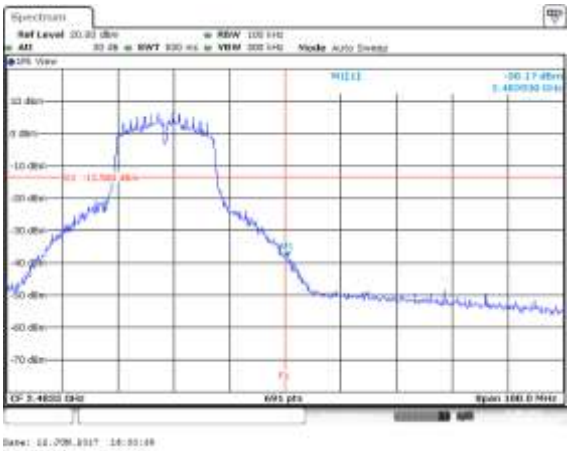
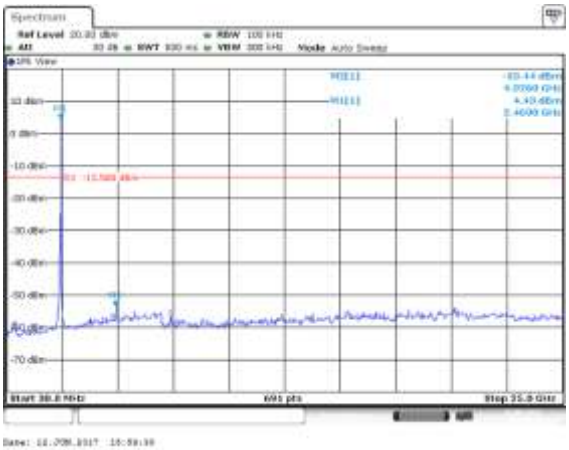
IEEE 802.11 n HT20 mode Low CH chain 0	
Reference Level of PSD in 100kHz	**Band Edge**
	
Spurious Emission 30MHz-25GHz	
	

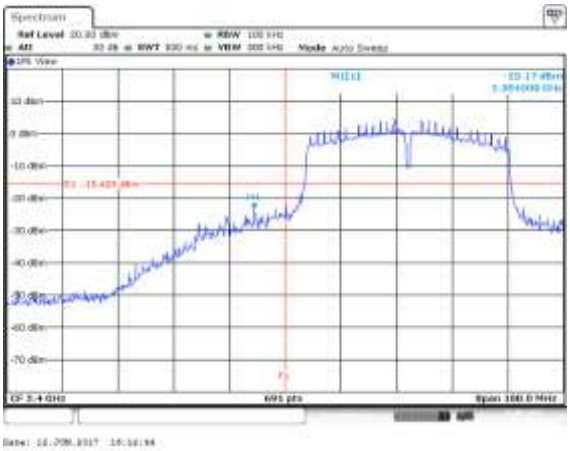
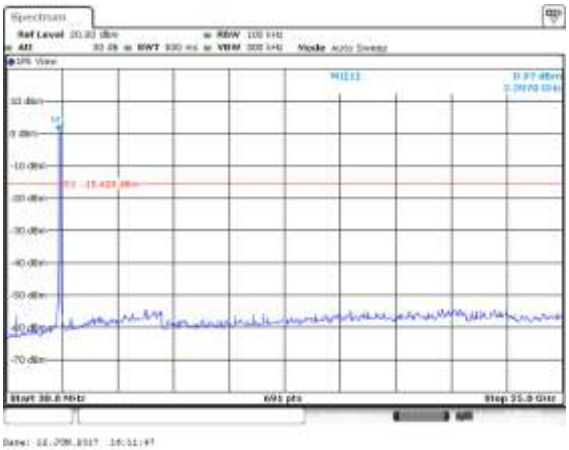
IEEE 802.11 n HT20 mode Mid CH chain 0	
Reference Level of PSD in 100kHz	**Spurious Emission 30MHz-25GHz**
	

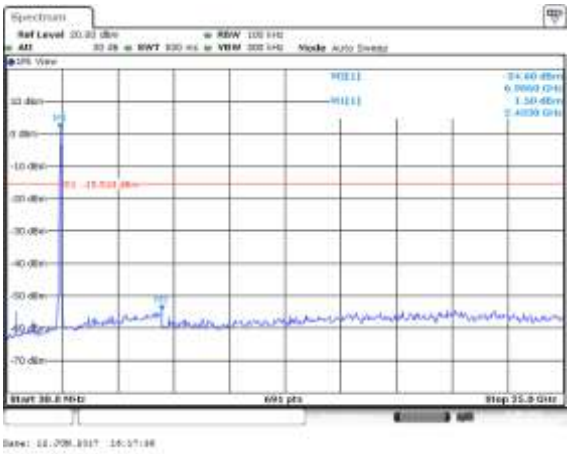
IEEE 802.11n HT20 mode High CH chain 0	
Reference Level of PSD in 100kHz	**Band Edge**
	
Spurious Emission 30MHz-25GHz	
	

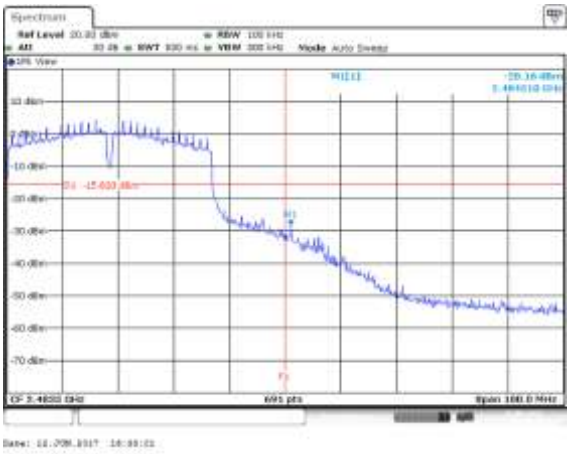
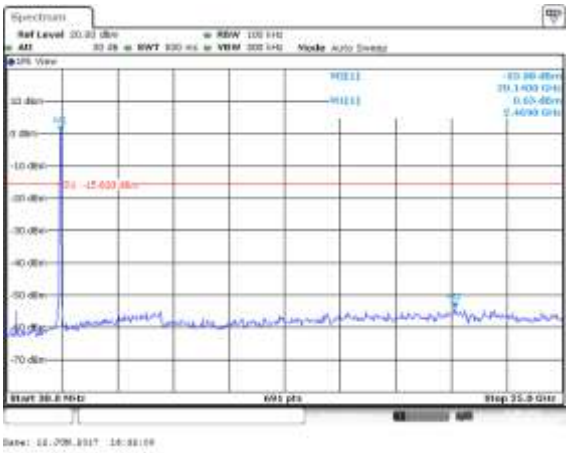
IEEE 802.11 n HT20 mode Low CH chain 1	
Reference Level of PSD in 100kHz	**Band Edge**
	
Spurious Emission 30MHz-25GHz	
	

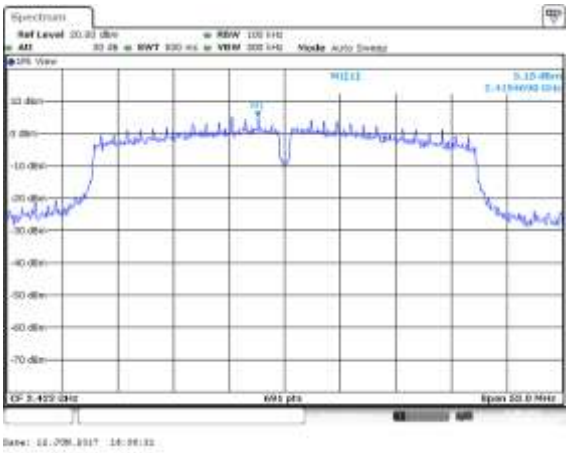
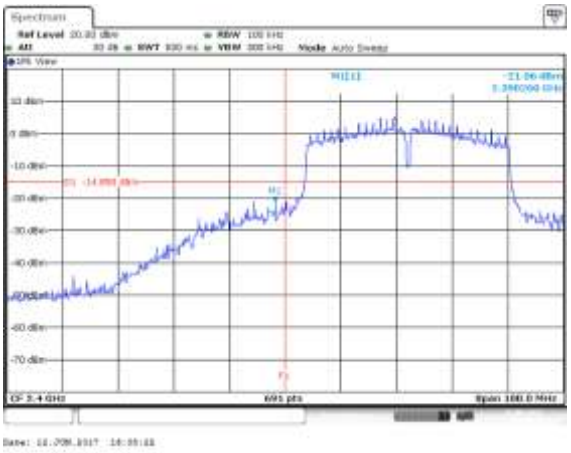
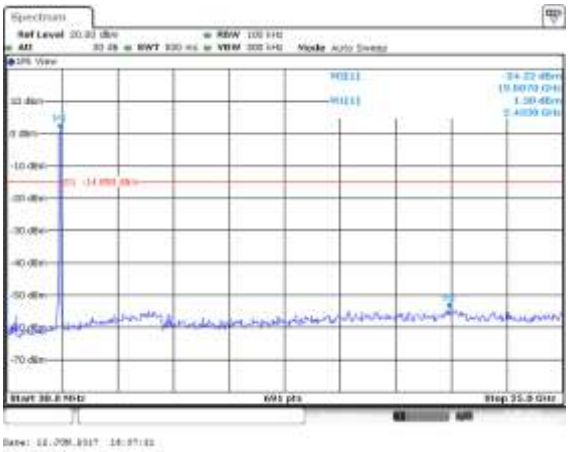
IEEE 802.11 n HT20 mode Mid CH chain 1	
Reference Level of PSD in 100kHz	**Spurious Emission 30MHz-25GHz**
	

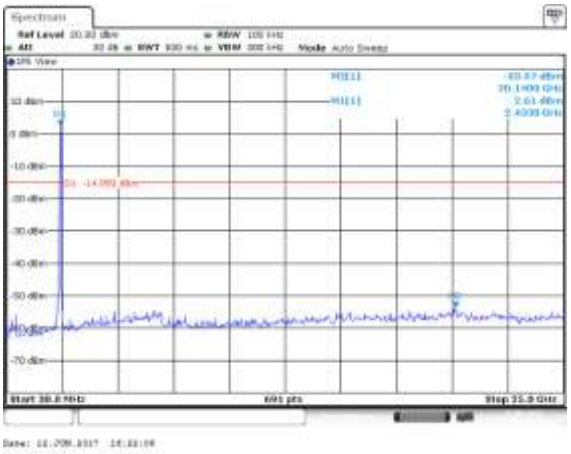
IEEE 802.11n HT20 mode High CH chain 1	
Reference Level of PSD in 100kHz	**Band Edge**
	
Spurious Emission 30MHz-25GHz	
	

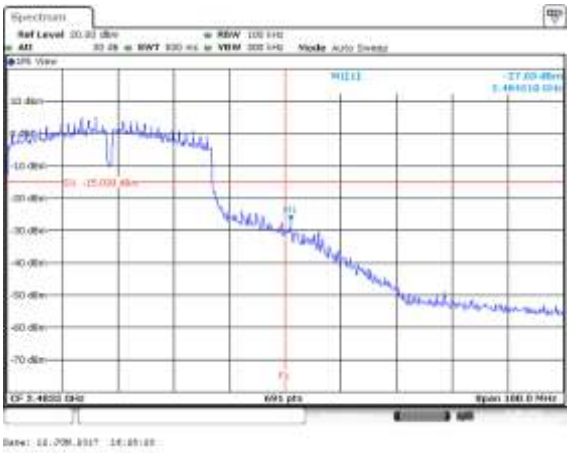
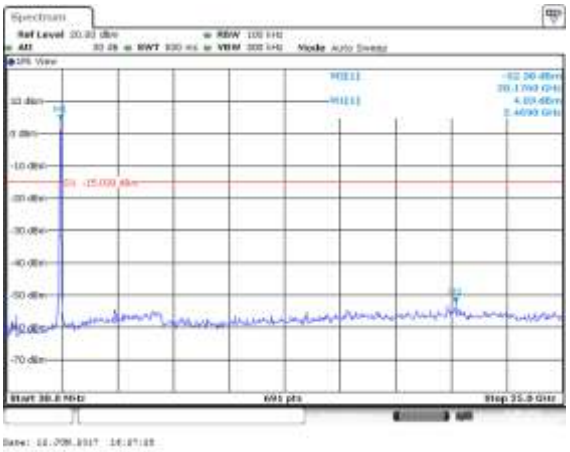
IEEE 802.11 n HT40 mode Low CH chain 0	
Reference Level of PSD in 100kHz	**Band Edge**
	
Spurious Emission 30MHz-25GHz	
	

IEEE 802.11 n HT40 mode Mid CH chain 0	
Reference Level of PSD in 100kHz	**Spurious Emission 30MHz-25GHz**
	

IEEE 802.11n HT40 mode High CH chain 0	
Reference Level of PSD in 100kHz	**Band Edge**
	
Spurious Emission 30MHz-25GHz	
	

IEEE 802.11 n HT40 mode Low CH chain 1	
Reference Level of PSD in 100kHz	**Band Edge**
	
Spurious Emission 30MHz-25GHz	
	

IEEE 802.11 n HT40 mode Mid CH chain 1	
Reference Level of PSD in 100kHz	**Spurious Emission 30MHz-25GHz**
	

IEEE 802.11n HT40 mode High CH chain 1	
Reference Level of PSD in 100kHz	**Band Edge**
	
Spurious Emission 30MHz-25GHz	
	

4.6 RADIATION BANDEDGE AND SPURIOUS EMISSION

4.6.1 Test Limit

FCC according to §15.247(d), §15.209 and §15.205,

IC according to RSS-247 section 5.5, RSS-Gen, Section 8.9 and 8.10

In any 100 kHz bandwidth outside the authorized frequency band, all harmonic and spurious must be least 20 dB below the highest emission level with the authorized frequency band. Radiation emission which fall in the restricted bands must also follow the FCC section 15.209 as below limit in table.

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	Field Strength (microvolts/m)	Measurement Distance (metres)
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

4.6.2 Test Procedure

Test method Refer as KDB 558074 D01 v03r05, Section 12.1.

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, 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.

5. 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.

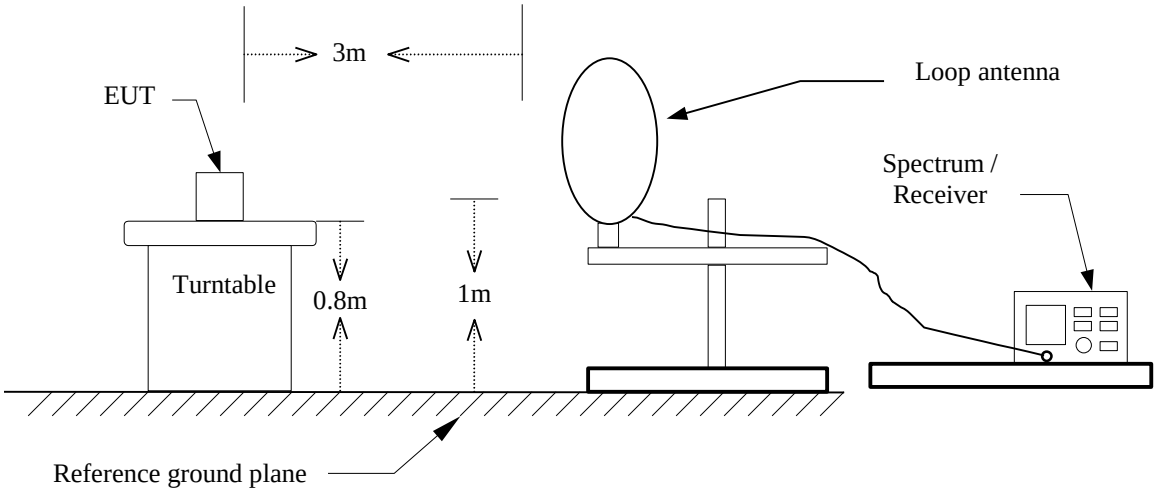
(2.2) For Average measurement：RBW = 1MHz, VBW

- If Duty Cycle ≥ 98%, VBW=10Hz.
- If Duty Cycle < 98%, VBW=1/T.

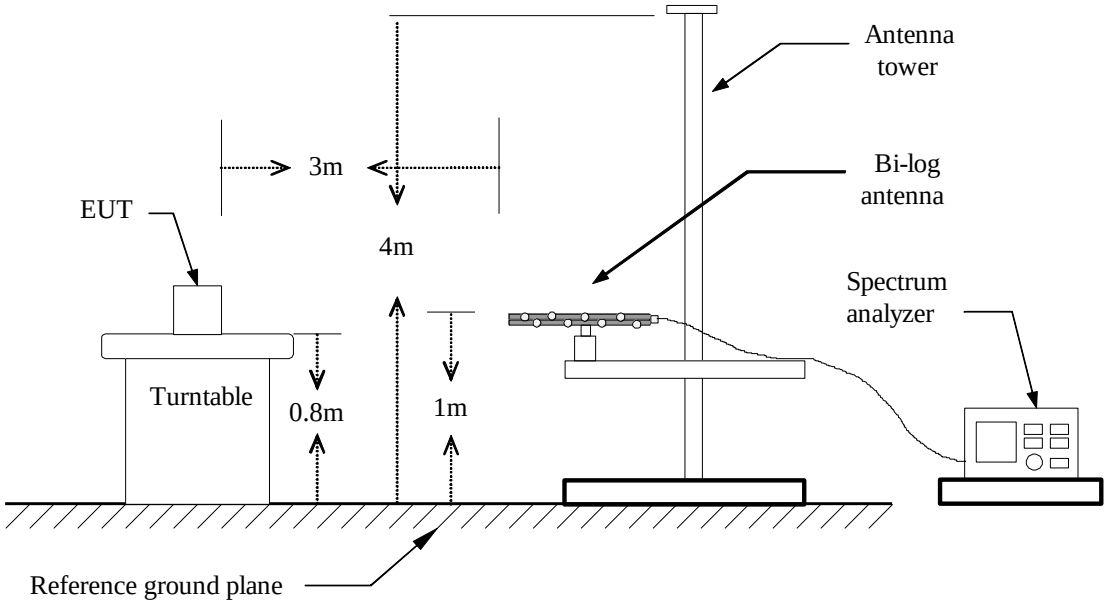
Configuration	Duty Cycle (%)	VBW
802.11b	99%	10Hz
802.11g	92%	750Hz
802.11n HT20	86%	1.5KHz
802.11n HT40	74%	2.7KHz

4.6.3 Test Setup

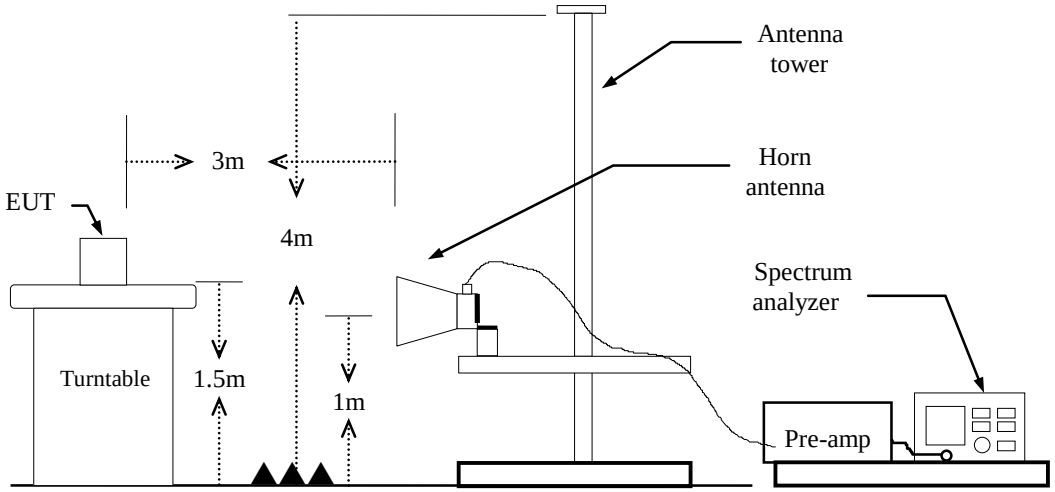
9kHz ~ 30MHz



30MHz ~ 1GHz



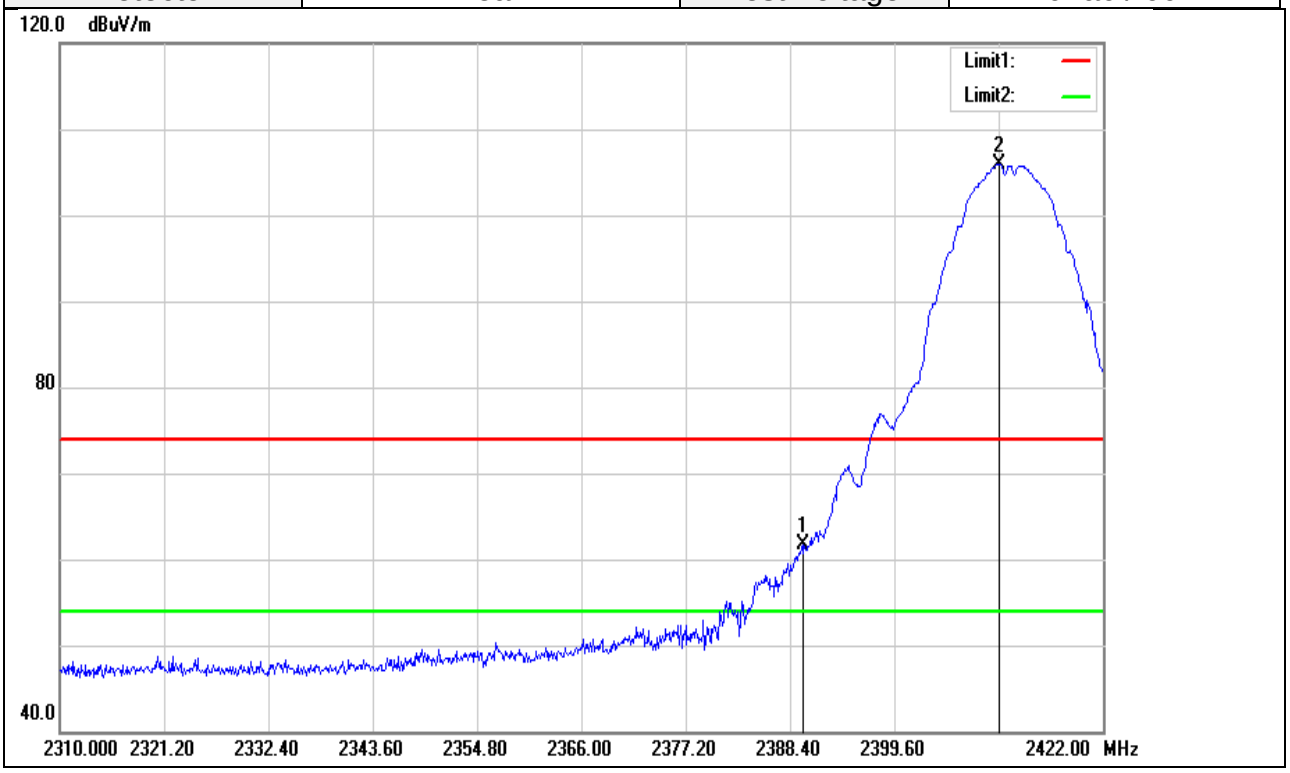
Above 1 GHz



4.6.4 Test Result

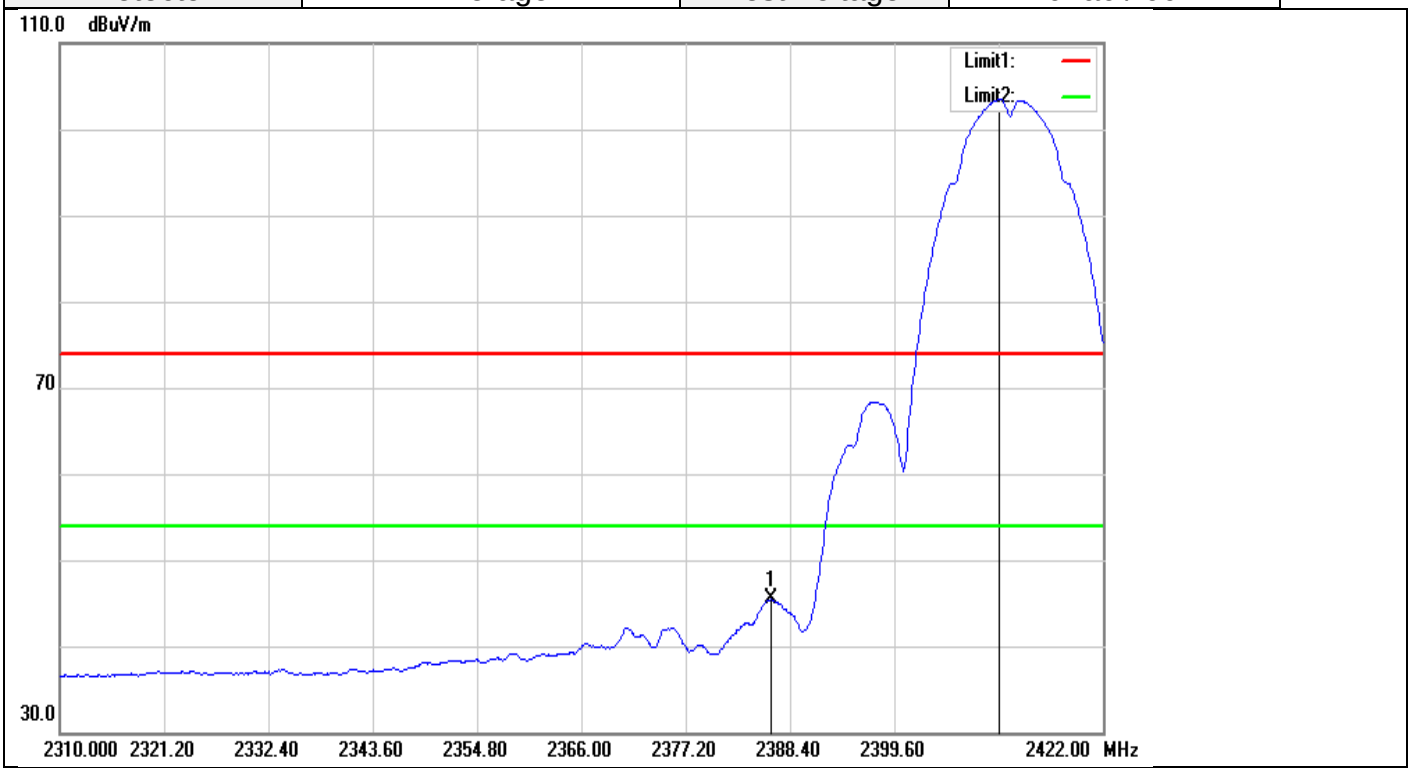
Band Edge Test Data

Test Mode	IEEE 802.11b Low CH	Temp/Hum	23(℃)/ 35%RH
Test Item	Band Edge	Test Date	2017/6/13
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Peak	Test Voltage	120Vac / 60Hz



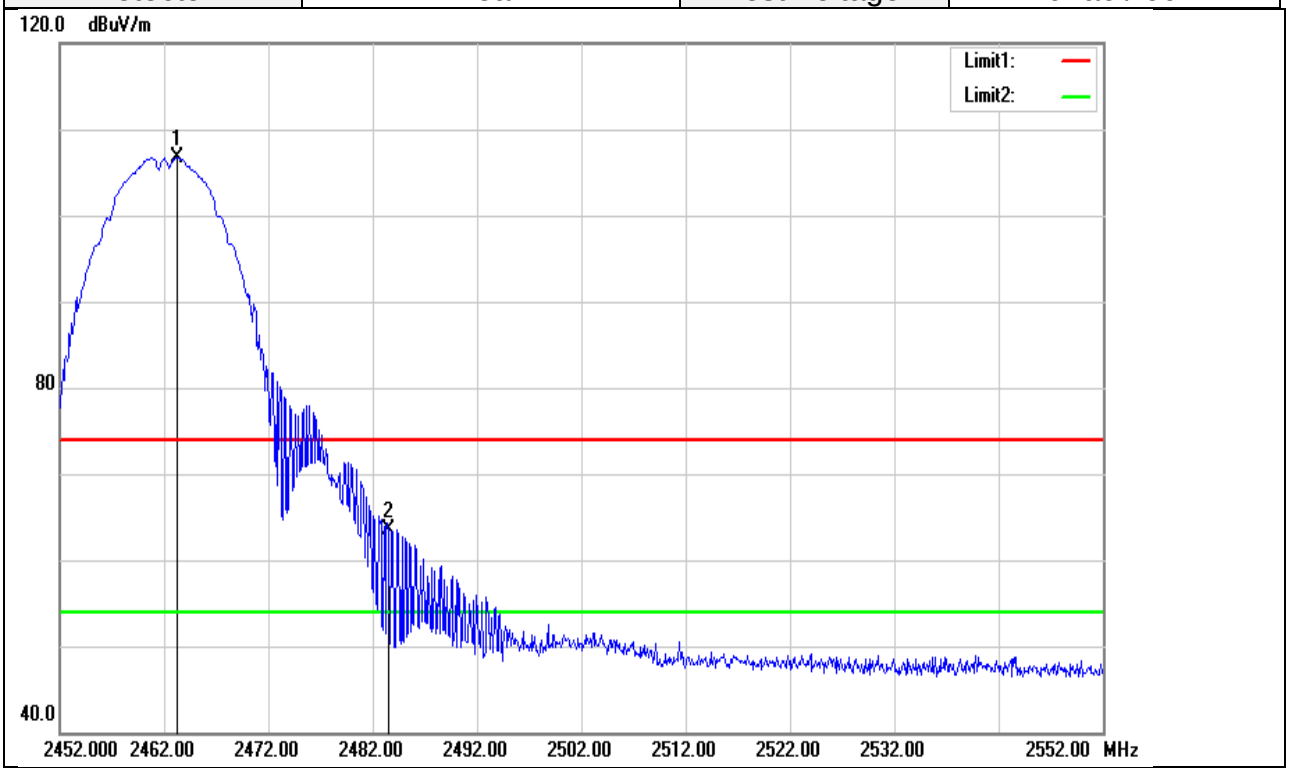
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2389.744	64.11	-2.49	61.62	74.00	-12.38	peak
2	2410.912	108.30	-2.42	105.88	--	--	peak

Test Mode	IEEE 802.11b Low CH	Temperature:	23(℃)/ 35%RH
Test Item	Band Edge	Test Date	2017/6/13
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Average	Test Voltage	120Vac / 60Hz



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2386.384	47.93	-2.52	45.41	54.00	-8.59	AVG
2	2410.912	105.87	-2.42	103.45	--	--	AVG

Test Mode	IEEE 802.11b High CH	Temp/Hum	23(℃)/ 35%RH
Test Item	Band Edge	Test Date	2017/6/13
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Peak	Test Voltage	120Vac / 60Hz

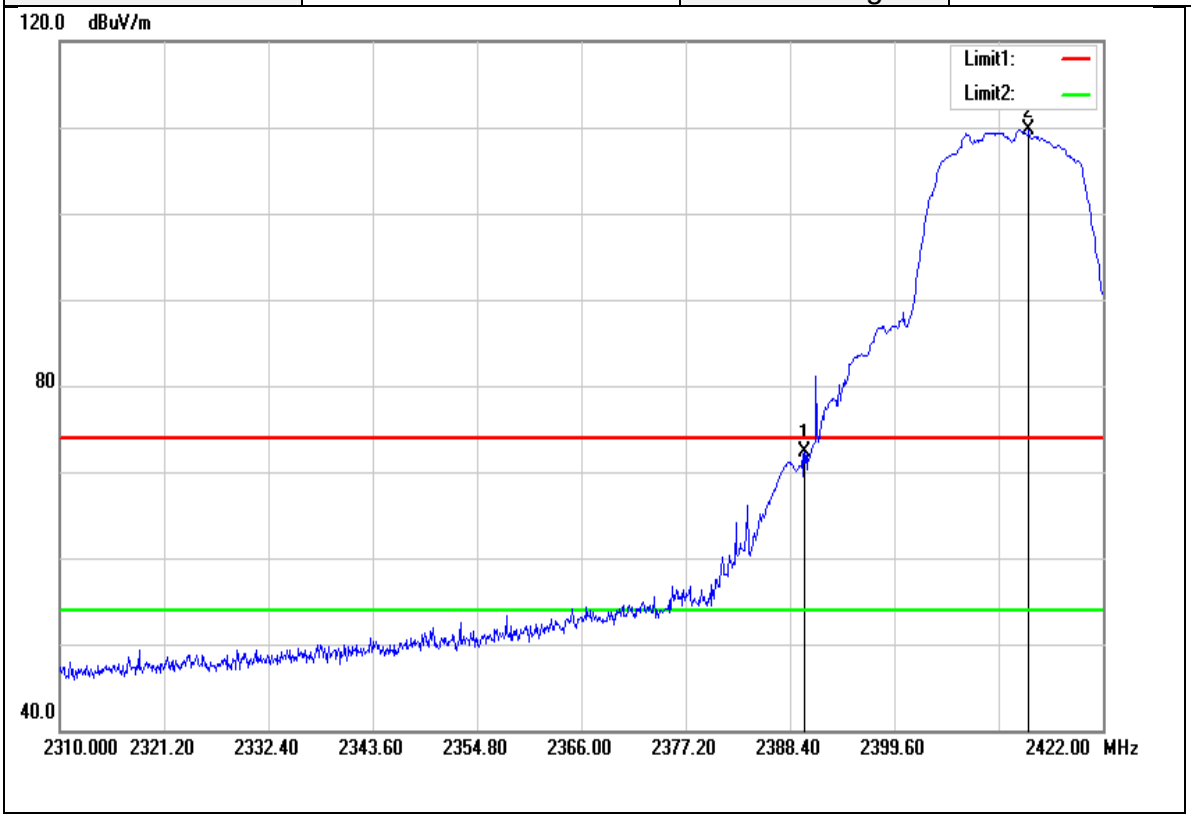


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2463.200	108.79	-2.09	106.70	--	--	peak
2	2483.500	65.59	-1.99	63.60	74.00	-10.40	peak

Test Mode	IEEE 802.11b High CH	Temperature:	23(℃)/ 35%RH
Test Item	Band Edge	Test Date	2017/6/13
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Average	Test Voltage	120Vac / 60Hz

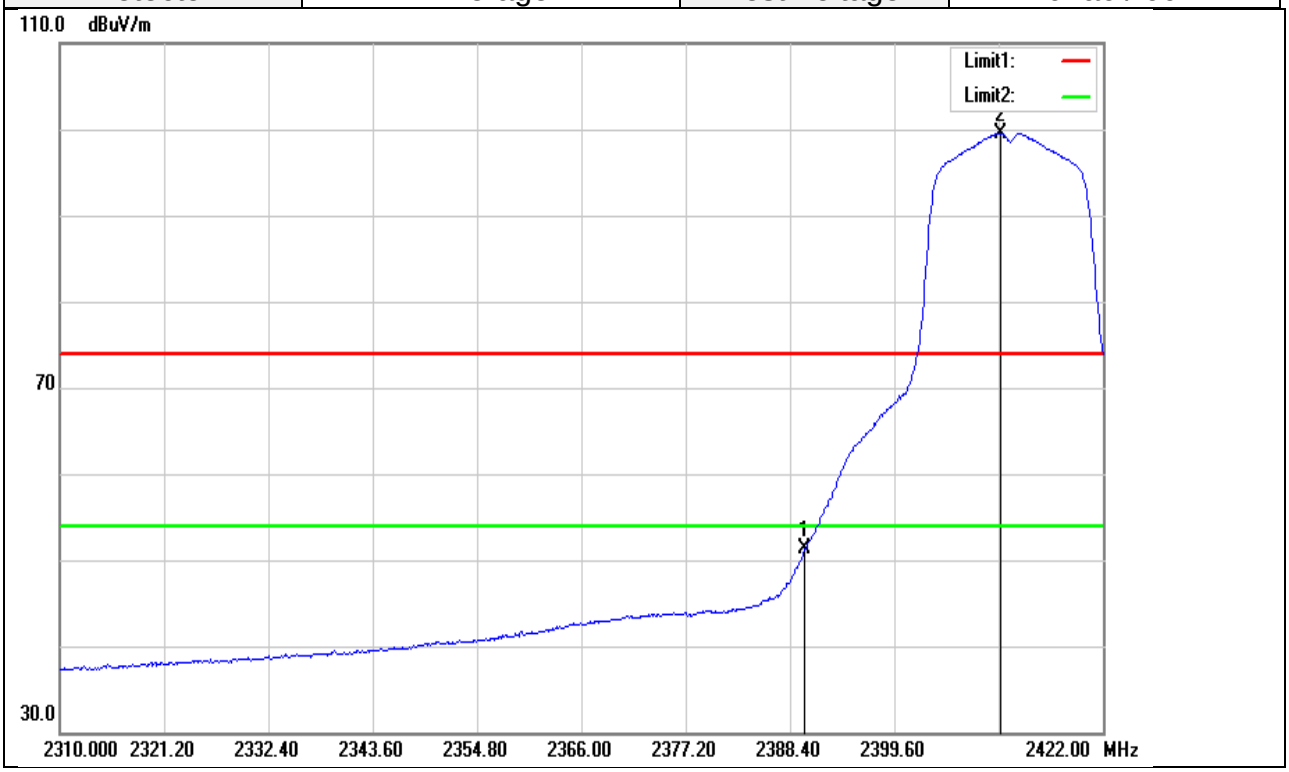
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2463.200	106.36	-2.09	104.27	--	--	AVG
2	2486.500	47.56	-1.96	45.60	54.00	-8.40	AVG

Test Mode	IEEE 802.11g Low CH	Temp/Hum	23(℃)/ 35%RH
Test Item	Band Edge	Test Date	2017/6/13
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Peak	Test Voltage	120Vac / 60Hz



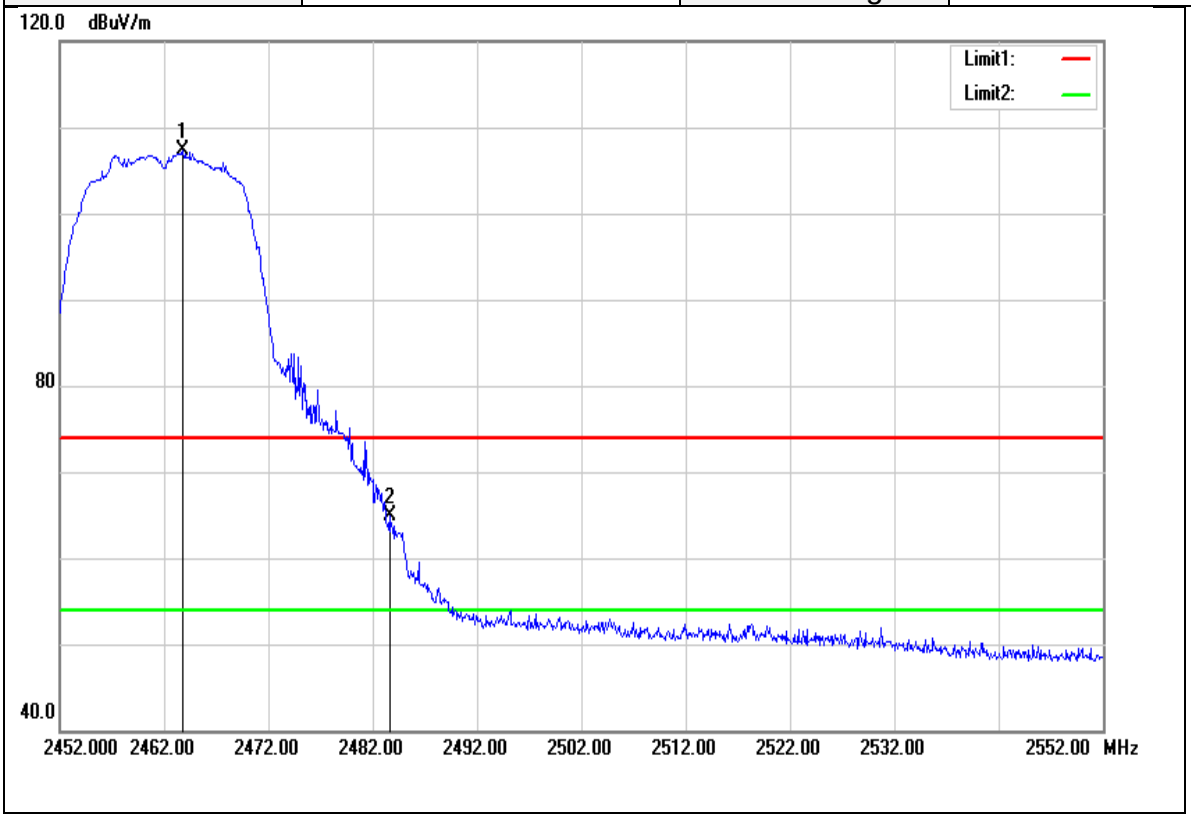
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2389.968	74.85	-2.49	72.36	74.00	-1.64	peak
2	2414.048	112.11	-2.40	109.71	--	--	peak

Test Mode	IEEE 802.11g Low CH	Temperature:	23(℃)/ 35%RH
Test Item	Band Edge	Test Date	2017/6/13
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Average	Test Voltage	120Vac / 60Hz



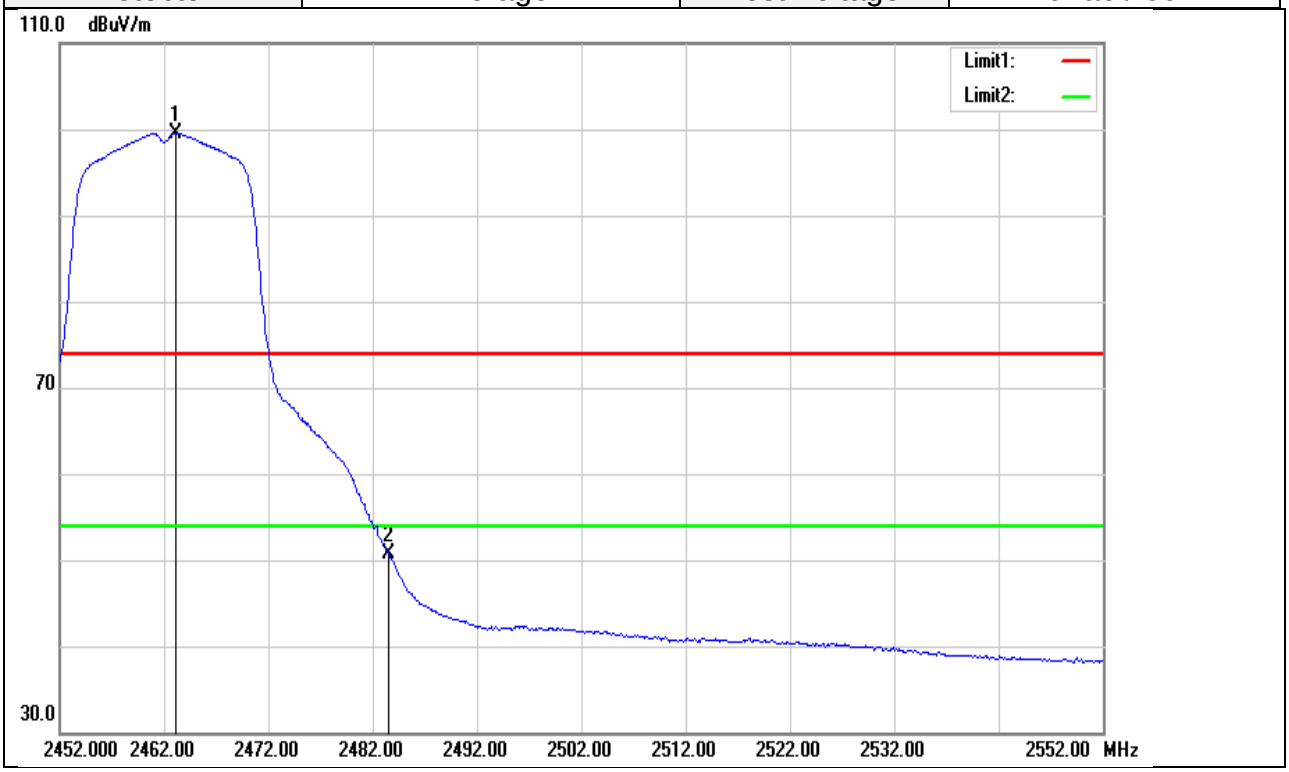
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	53.81	-2.49	51.32	54.00	-2.68	AVG
2	2411.024	101.99	-2.42	99.57	--	--	AVG

Test Mode	IEEE 802.11g High CH	Temp/Hum	23(℃)/ 35%RH
Test Item	Band Edge	Test Date	2017/6/13
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Peak	Test Voltage	120Vac / 60Hz



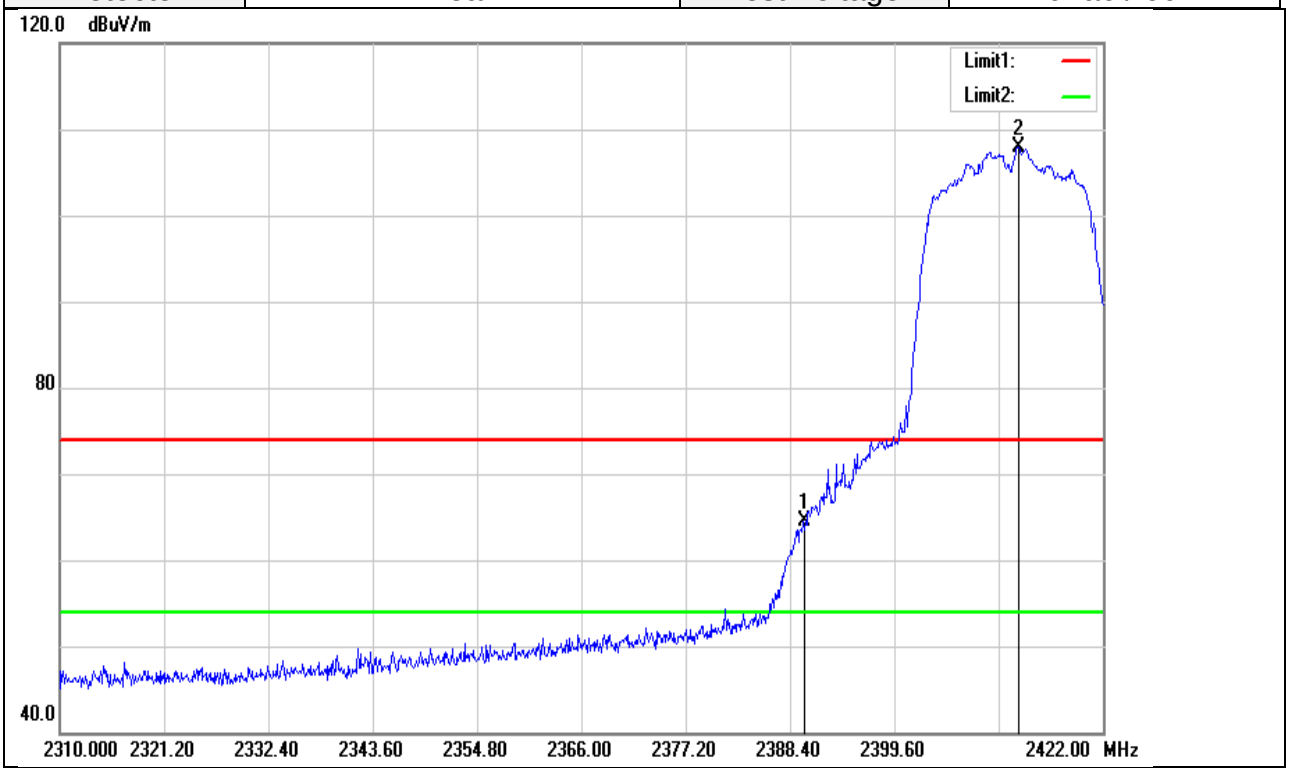
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2463.800	109.34	-2.09	107.25	--	--	peak
2	2483.600	66.99	-1.99	65.00	74.00	-9.00	peak

Test Mode	IEEE 802.11g High CH	Temperature:	23(℃)/ 35%RH
Test Item	Band Edge	Test Date	2017/6/13
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Average	Test Voltage	120Vac / 60Hz



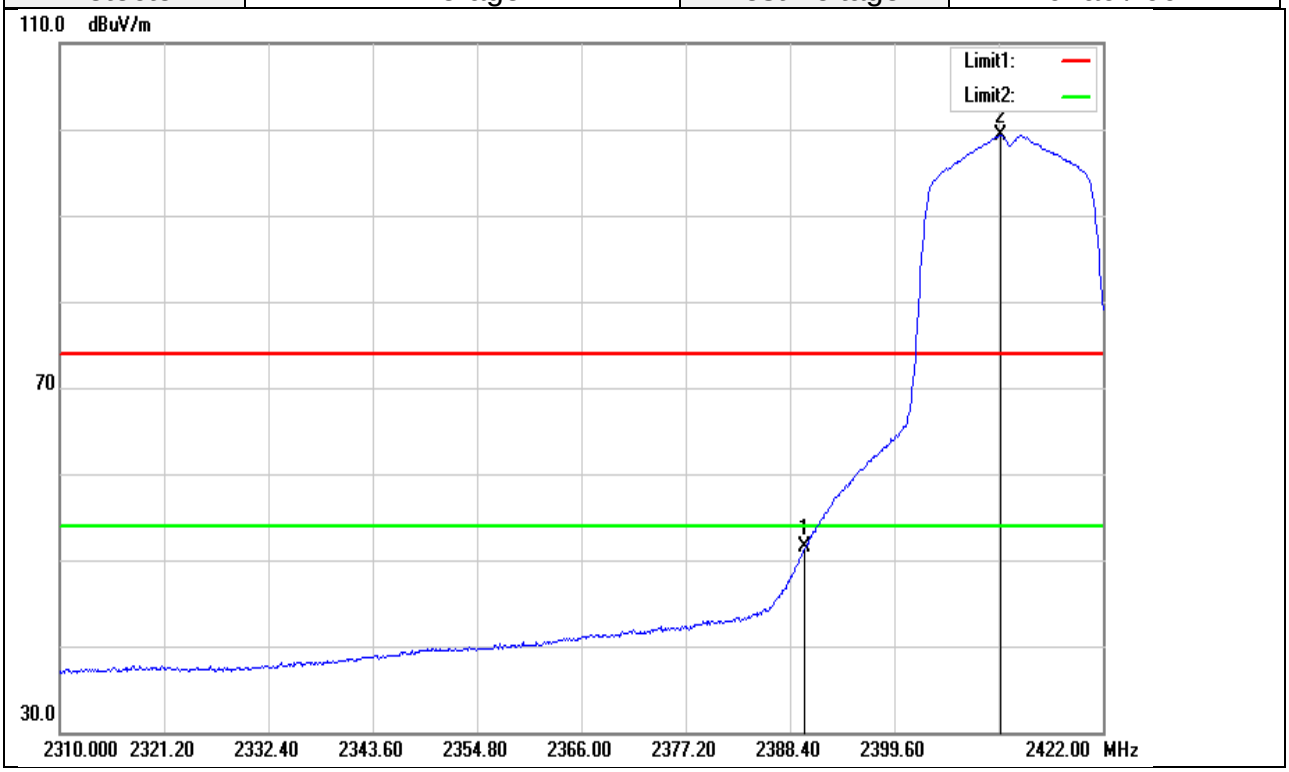
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2463.100	101.61	-2.09	99.52	--	--	AVG
2	2483.500	52.71	-1.99	50.72	54.00	-3.28	AVG

Test Mode	IEEE 802.11n HT20 Low CH	Temp/Hum	23(℃)/ 35%RH
Test Item	Band Edge	Test Date	2017/6/13
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Peak	Test Voltage	120Vac / 60Hz



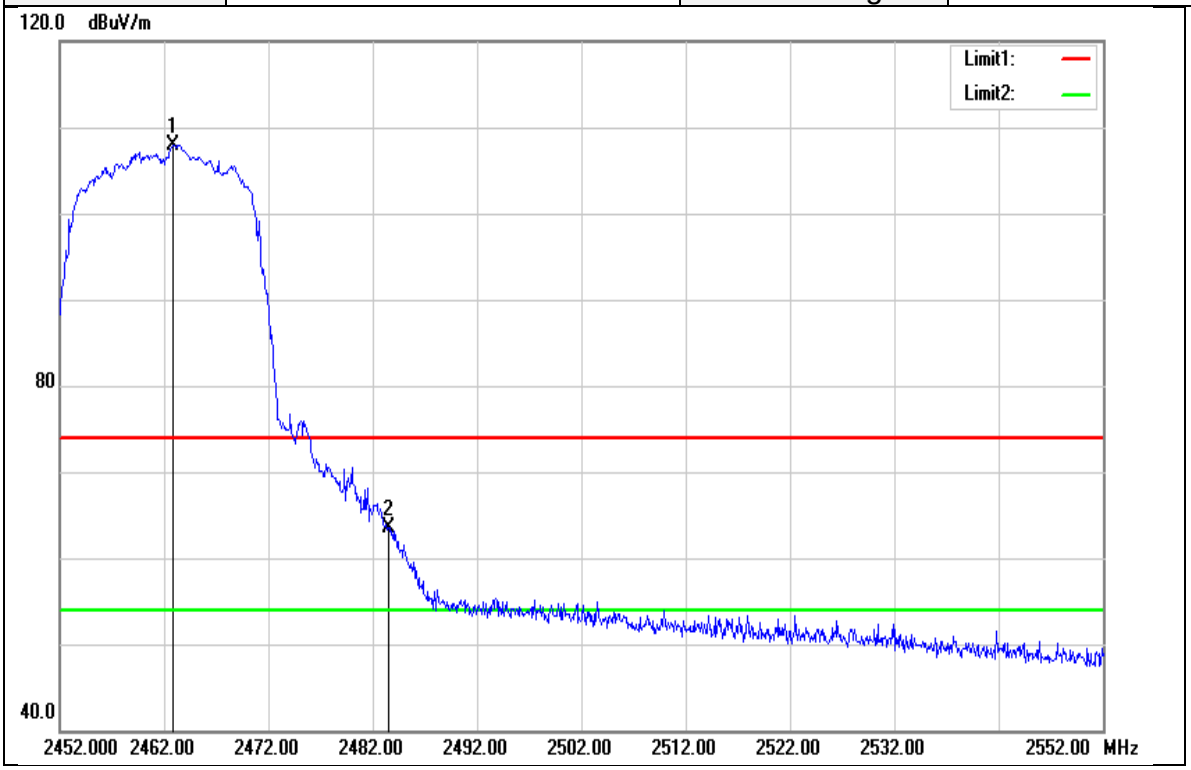
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	67.08	-2.49	64.59	74.00	-9.41	peak
2	2412.928	110.25	-2.41	107.84	--	--	peak

Test Mode	IEEE 802.11n HT20 Low CH	Temperature:	23(℃)/ 35%RH
Test Item	Band Edge	Test Date	2017/6/13
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Average	Test Voltage	120Vac / 60Hz



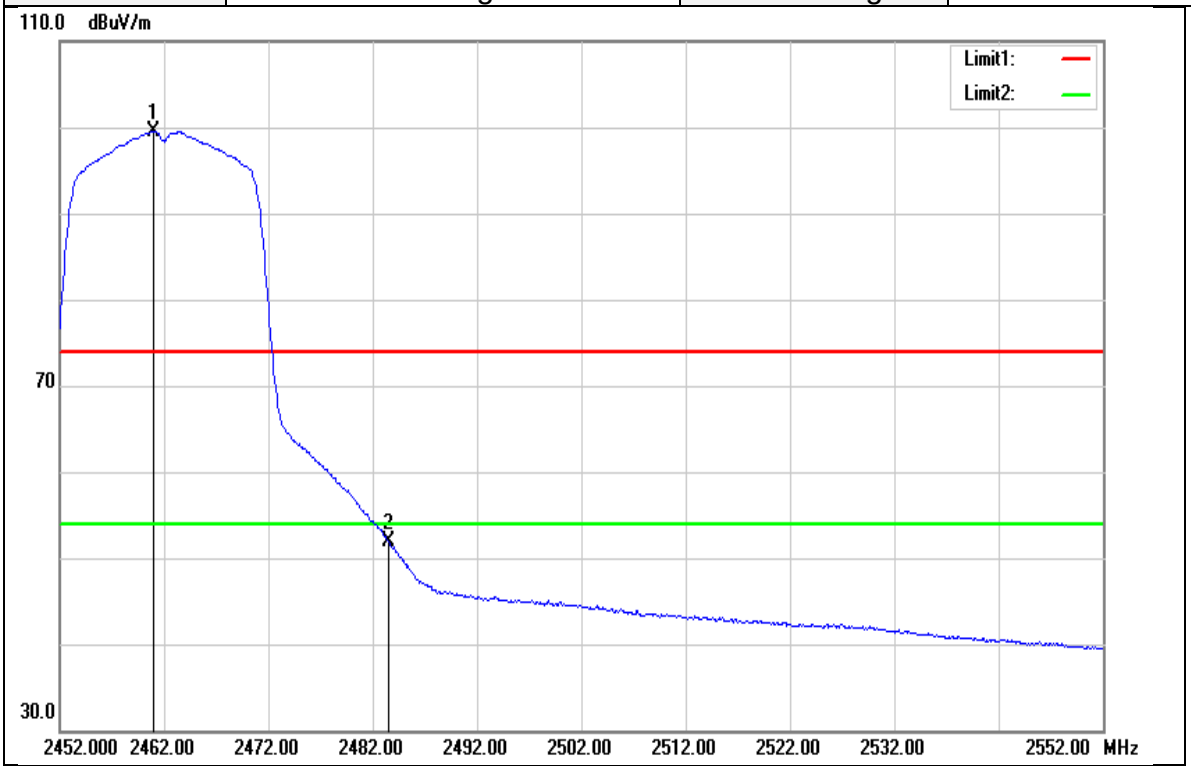
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	53.91	-2.49	51.42	54.00	-2.58	AVG
2	2411.024	101.72	-2.42	99.30	--	--	AVG

Test Mode	IEEE 802.11n HT20 High CH	Temp/Hum	23(℃)/ 35%RH
Test Item	Band Edge	Test Date	2017/6/13
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Peak	Test Voltage	120Vac / 60Hz



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2462.900	110.08	-2.09	107.99	--	--	peak
2	2483.500	65.48	-1.99	63.49	74.00	-10.51	peak

Test Mode	IEEE 802.11n HT20 High CH	Temperature:	23(℃)/ 35%RH
Test Item	Band Edge	Test Date	2017/6/13
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Average	Test Voltage	120Vac / 60Hz

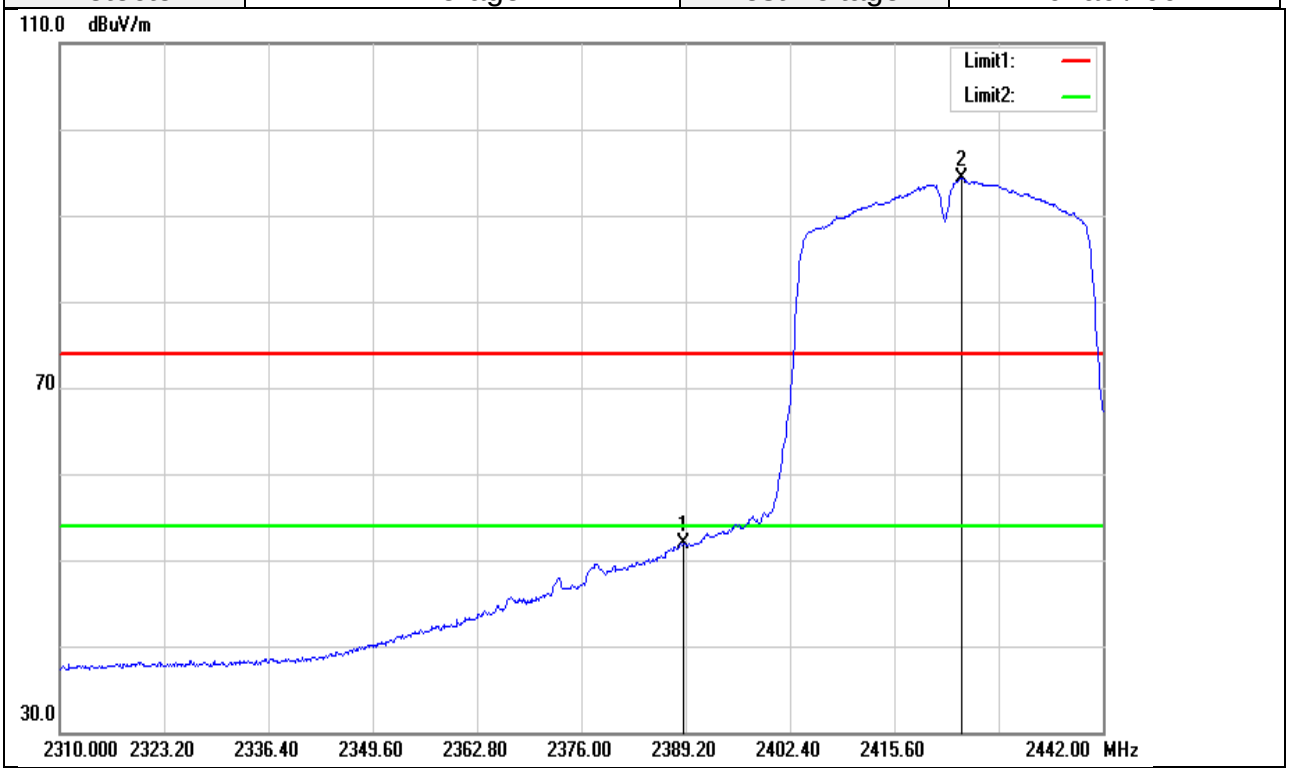


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2461.000	101.66	-2.10	99.56	--	--	AVG
2	2483.500	53.88	-1.99	51.89	54.00	-2.11	AVG

Test Mode	IEEE 802.11n HT40 Low CH	Temp/Hum	23(℃)/ 35%RH
Test Item	Band Edge	Test Date	2017/6/13
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Peak	Test Voltage	120Vac / 60Hz

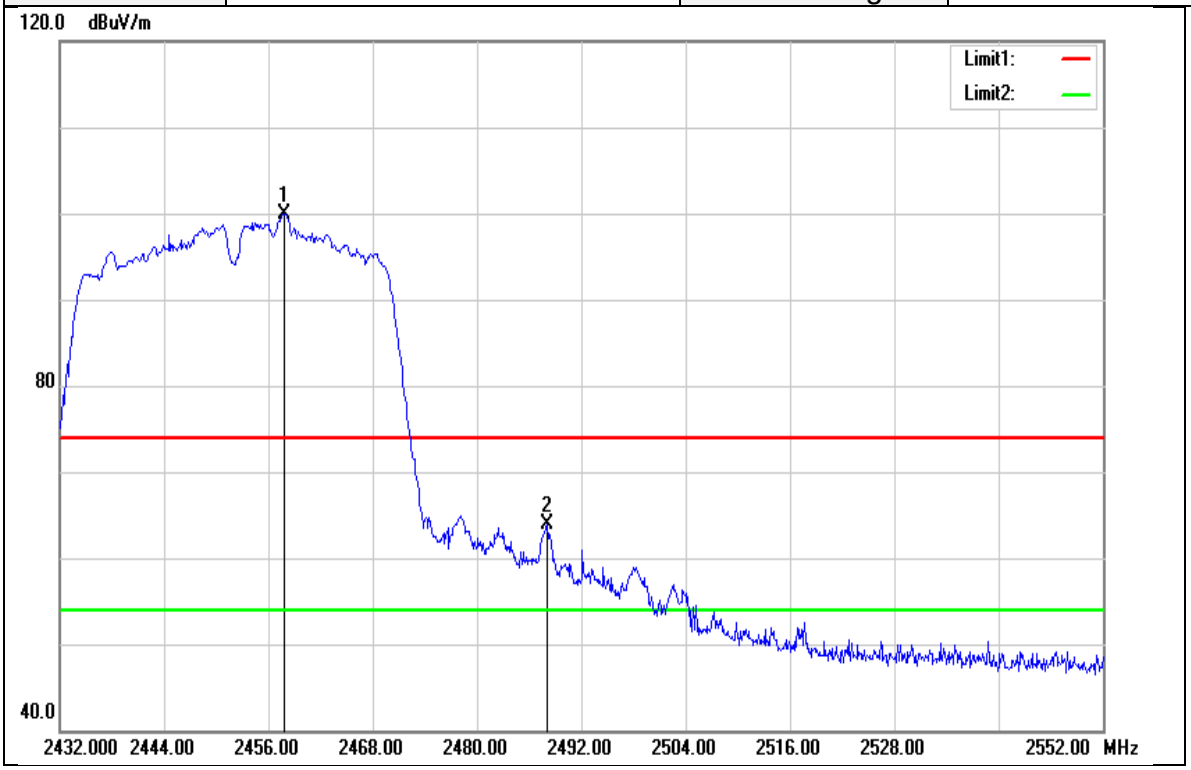
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2388.012	68.59	-2.51	66.08	74.00	-7.92	peak
2	2427.216	105.52	-2.31	103.21	--	--	peak

Test Mode	IEEE 802.11n HT40 Low CH	Temperature:	23(℃)/ 35%RH
Test Item	Band Edge	Test Date	2017/6/13
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Average	Test Voltage	120Vac / 60Hz



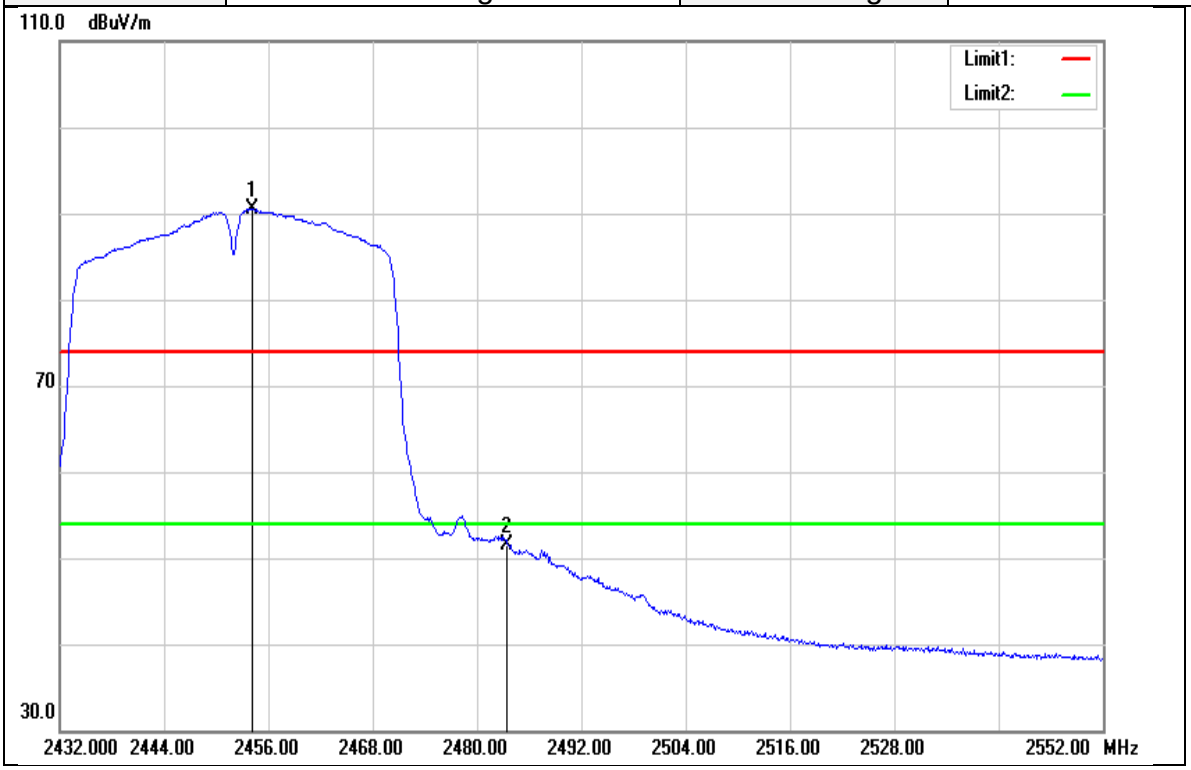
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2388.936	54.41	-2.50	51.91	54.00	-2.09	AVG
2	2424.048	96.58	-2.33	94.25	--	--	AVG

Test Mode	IEEE 802.11n HT40 High CH	Temp/Hum	23(℃)/ 35%RH
Test Item	Band Edge	Test Date	2017/6/13
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Peak	Test Voltage	120Vac / 60Hz



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2457.800	102.07	-2.11	99.96	--	--	peak
2	2488.040	65.93	-1.95	63.98	74.00	-10.02	peak

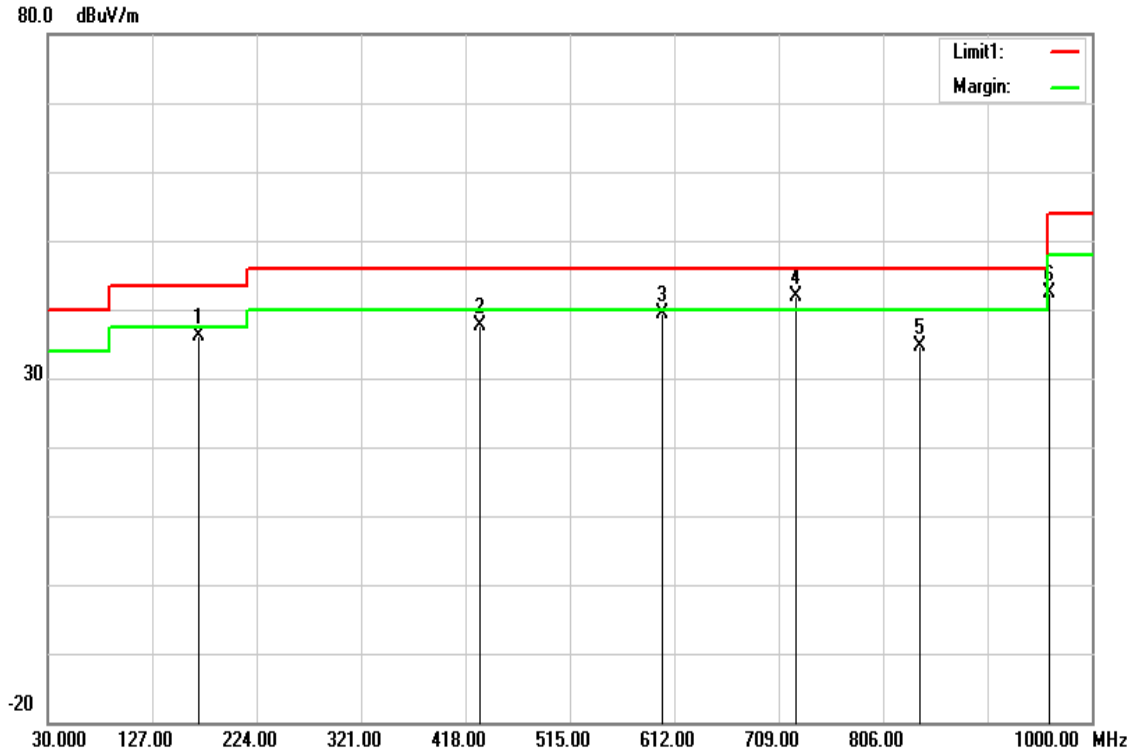
Test Mode	IEEE 802.11n HT40 High CH	Temperature:	23(℃)/ 35%RH
Test Item	Band Edge	Test Date	2017/6/13
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Average	Test Voltage	120Vac / 60Hz



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2454.080	92.69	-2.13	90.56	--	--	AVG
2	2483.500	53.49	-1.99	51.50	54.00	-2.50	AVG

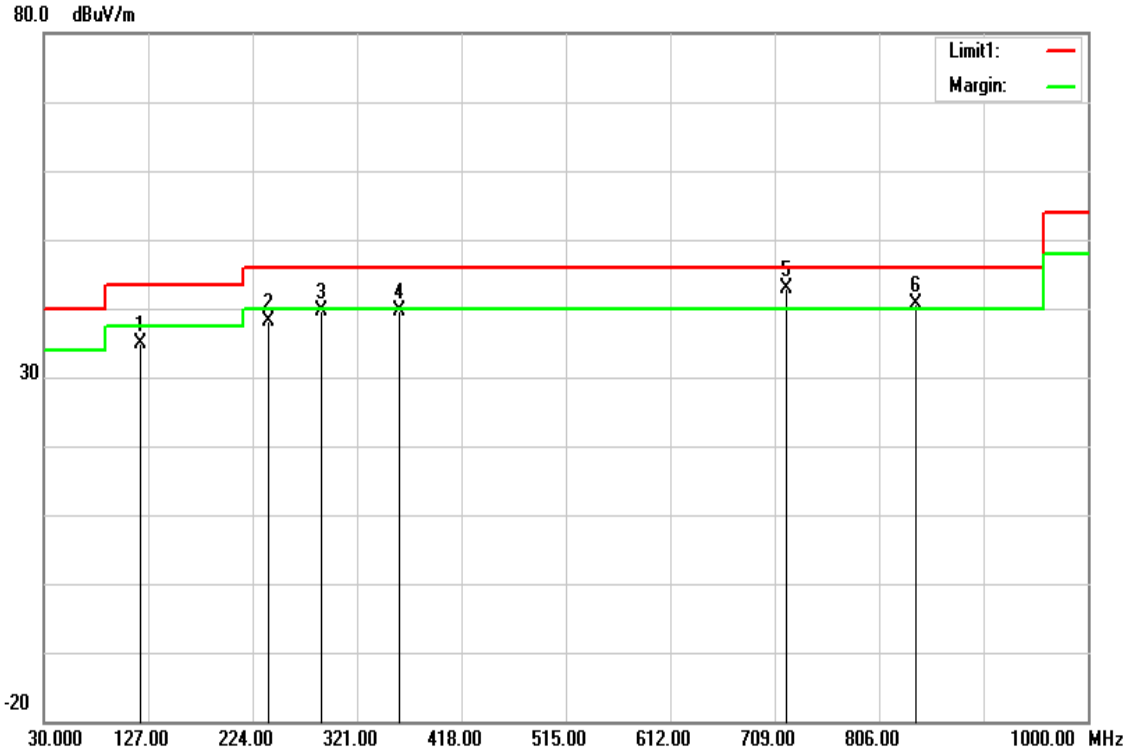
Below 1G Test Data

Test Mode	Mode 1	Temp/Hum	23(℃)/ 35%RH
Test Item	30MHz-1GHz	Test Date	2017/6/13
Polarize	Vertical	Test Engineer	ED Chiang
Detector	Peak and Qusi-peak	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
169.6800	52.88	-16.83	36.05	43.50	-7.45	peak
431.5800	48.26	-10.75	37.51	46.00	-8.49	peak
600.3600	47.02	-7.75	39.27	46.00	-6.73	QP
724.5200	47.27	-5.51	41.76	46.00	-4.24	QP
839.9500	38.50	-3.92	34.58	46.00	-11.42	QP
960.2300	44.52	-2.23	42.29	54.00	-11.71	peak

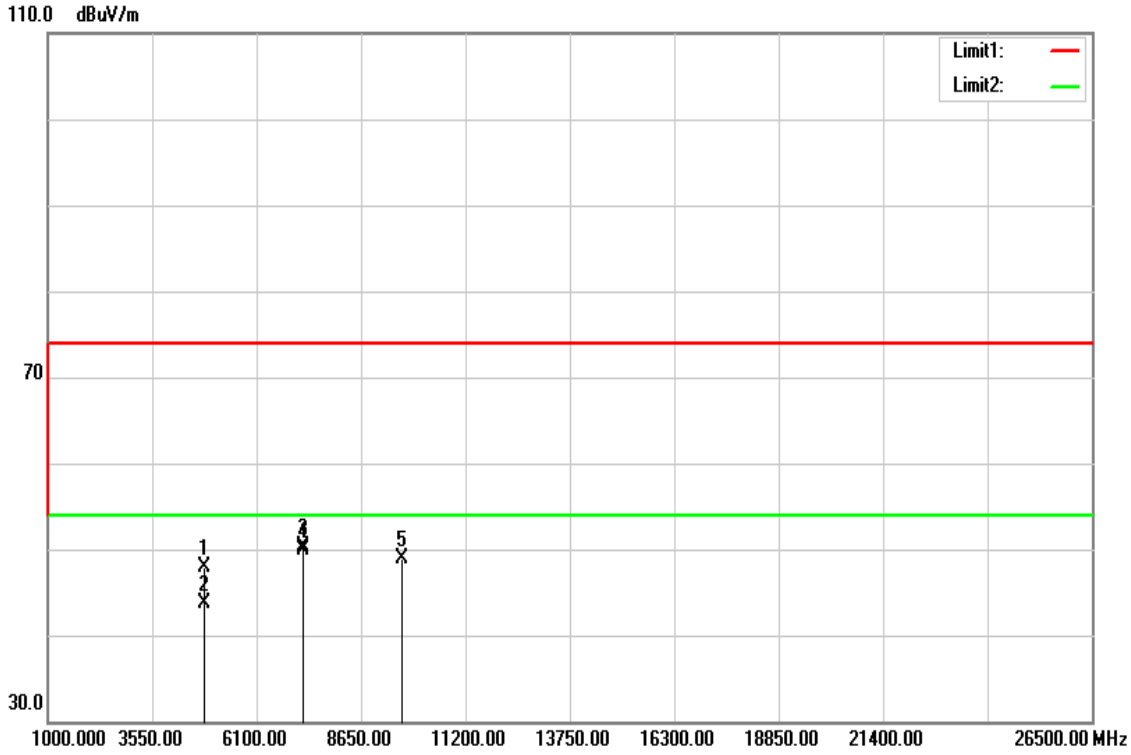
Test Mode	Mode 1	Temp/Hum	23(℃)/ 35%RH
Test Item	30MHz-1GHz	Test Date	2017/6/13
Polarize	Vertical	Test Engineer	ED Chiang
Detector	Peak and Qusi-peak	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB	Remark
120.2100	50.30	-15.50	34.80	43.50	-8.70	QP
238.5500	54.56	-16.54	38.02	46.00	-7.98	peak
288.0200	54.00	-14.46	39.54	46.00	-6.46	peak
359.8000	52.23	-12.66	39.57	46.00	-6.43	peak
719.6700	48.61	-5.62	42.99	46.00	-3.01	QP
839.9500	44.56	-3.92	40.64	46.00	-5.36	QP

Above 1G Test Data

Test Mode	IEEE 802.11b Low CH	Temp/Hum	23(℃)/ 35%RH
Test Item	Harmonic	Test Date	2017/6/14
Polarize	Vertical	Test Engineer	Ed Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz

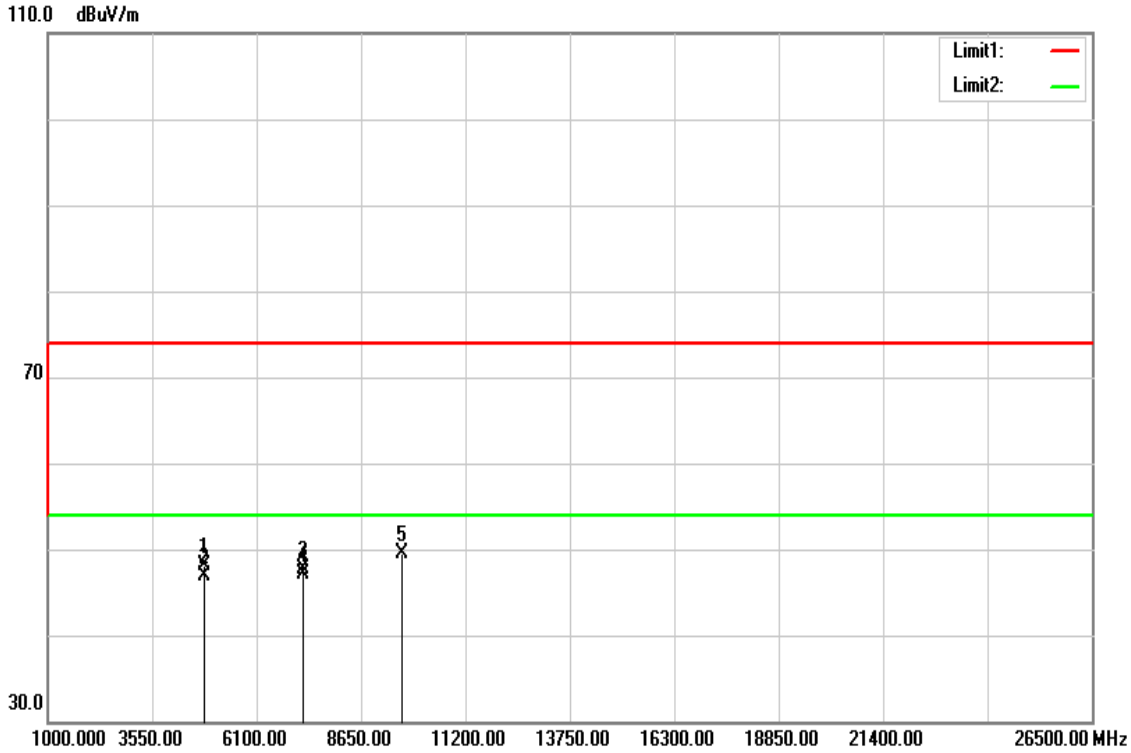


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4824.000	42.76	5.10	47.86	74.00	-26.14	peak
4824.000	38.57	5.10	43.67	54.00	-10.33	AVG
7236.000	37.64	12.71	50.35	74.00	-23.65	peak
7236.000	37.26	12.71	49.97	54.00	-4.03	AVG
9648.000	31.37	17.60	48.97	74.00	-25.03	peak

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 802.11b Low CH	Temp/Hum	23(℃)/ 35%RH
Test Item	Harmonic	Test Date	2017/6/14
Polarize	Horizontal	Test Engineer	Ed Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4824.000	43.09	5.10	48.19	74.00	-25.81	peak
4824.000	41.74	5.10	46.84	54.00	-7.16	AVG
7236.000	34.98	12.71	47.69	74.00	-26.31	peak
7236.000	34.42	12.71	47.13	54.00	-6.87	AVG
9648.000	31.90	17.60	49.50	74.00	-24.50	peak

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*

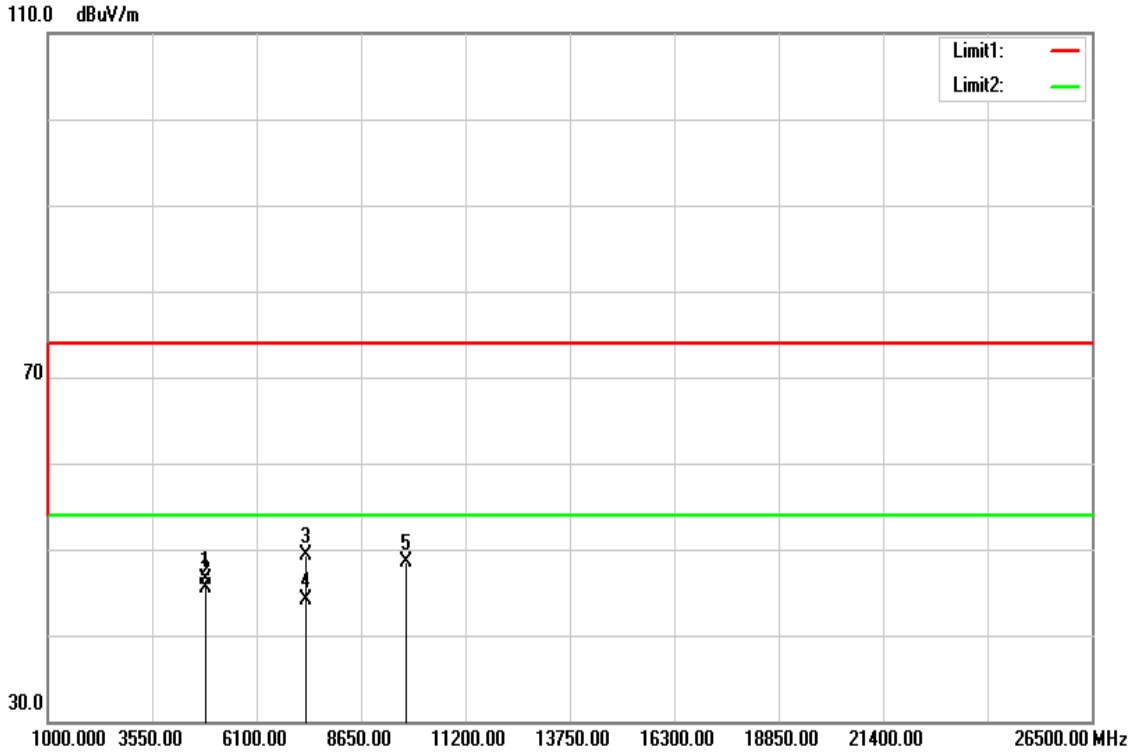
Test Mode	IEEE 802.11b Mid CH	Temp/Hum	23(℃)/ 35%RH
Test Item	Harmonic	Test Date	2017/6/14
Polarize	Vertical	Test Engineer	Ed Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4874.000	43.79	5.23	49.02	74.00	-24.98	peak
4874.000	42.02	5.23	47.25	54.00	-6.75	AVG
7311.000	36.21	12.94	49.15	74.00	-24.85	peak
7311.000	30.82	12.94	43.76	54.00	-10.24	AVG
9748.000	30.67	17.60	48.27	74.00	-25.73	peak

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 802.11b Mid CH	Temp/Hum	23(℃)/ 35%RH
Test Item	Harmonic	Test Date	2017/6/14
Polarize	Horizontal	Test Engineer	Ed Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4874.000	41.37	5.23	46.60	74.00	-27.40	peak
4874.000	40.20	5.23	45.43	54.00	-8.57	AVG
7311.000	36.33	12.94	49.27	74.00	-24.73	peak
7311.000	31.11	12.94	44.05	54.00	-9.95	AVG
9748.000	30.97	17.60	48.57	74.00	-25.43	peak

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*

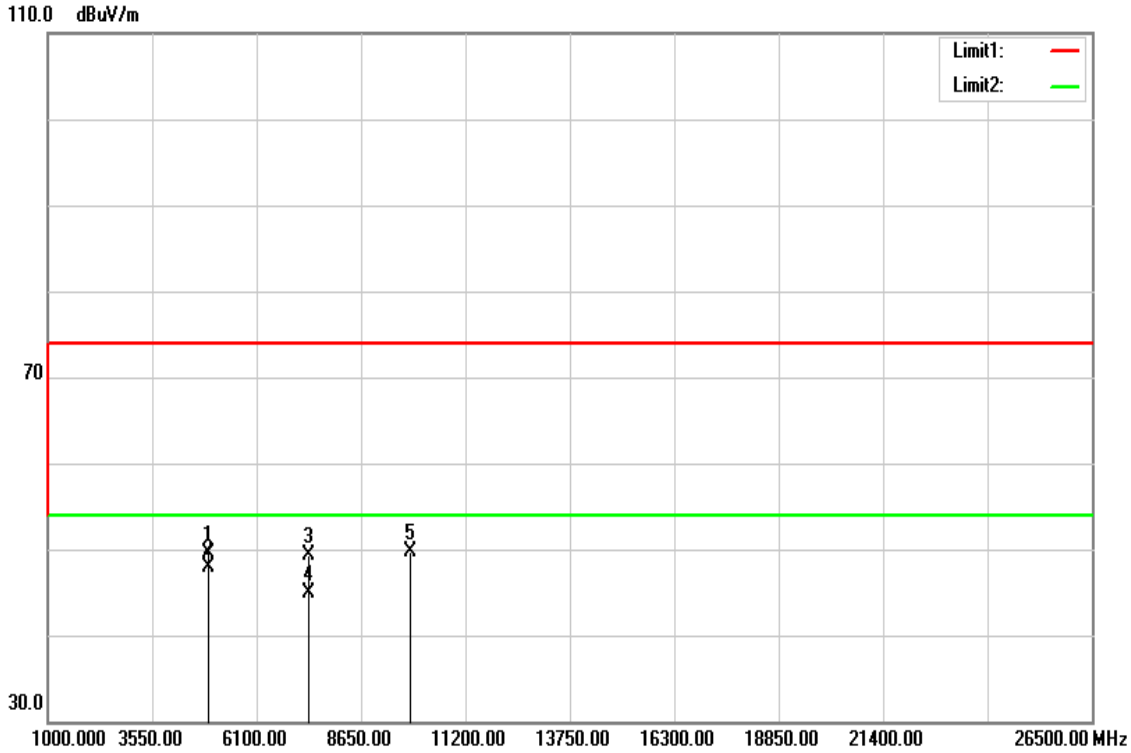
Test Mode	IEEE 802.11b High CH	Temp/Hum	23(℃)/ 35%RH
Test Item	Harmonic	Test Date	2017/6/14
Polarize	Vertical	Test Engineer	Ed Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4924.000	46.25	5.37	51.62	74.00	-22.38	peak
4924.000	44.89	5.37	50.26	54.00	-3.74	AVG
7386.000	35.35	13.17	48.52	74.00	-25.48	peak
7386.000	31.08	13.17	44.25	54.00	-9.75	AVG
9848.000	32.59	17.60	50.19	74.00	-23.81	peak

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 802.11b High CH	Temp/Hum	23(℃)/ 35%RH
Test Item	Harmonic	Test Date	2017/6/14
Polarize	Horizontal	Test Engineer	Ed Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz

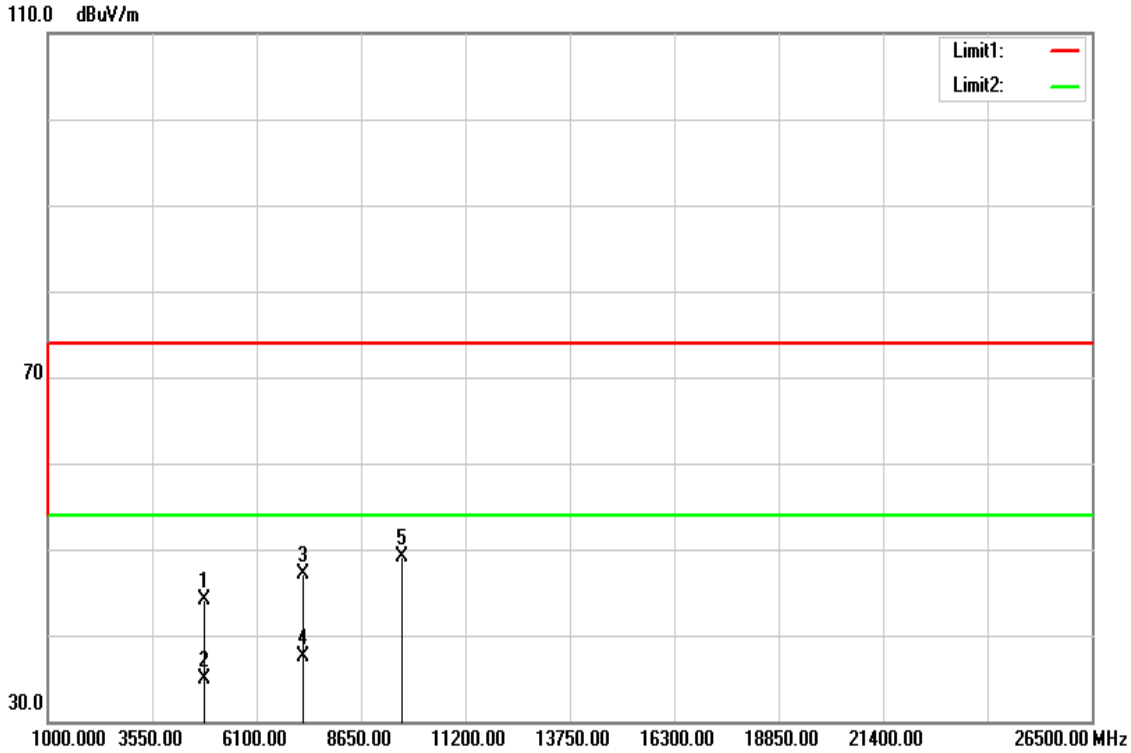


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB	Remark
4924.000	44.21	5.37	49.58	74.00	-24.42	peak
4924.000	42.45	5.37	47.82	54.00	-6.18	AVG
7386.000	36.08	13.17	49.25	74.00	-24.75	peak
7386.000	31.72	13.17	44.89	54.00	-9.11	AVG
9848.000	32.18	17.60	49.78	74.00	-24.22	peak

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 802.11g Low CH	Temp/Hum	23(℃)/ 35%RH
Test Item	Harmonic	Test Date	2017/6/14
Polarize	Vertical	Test Engineer	Ed Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz

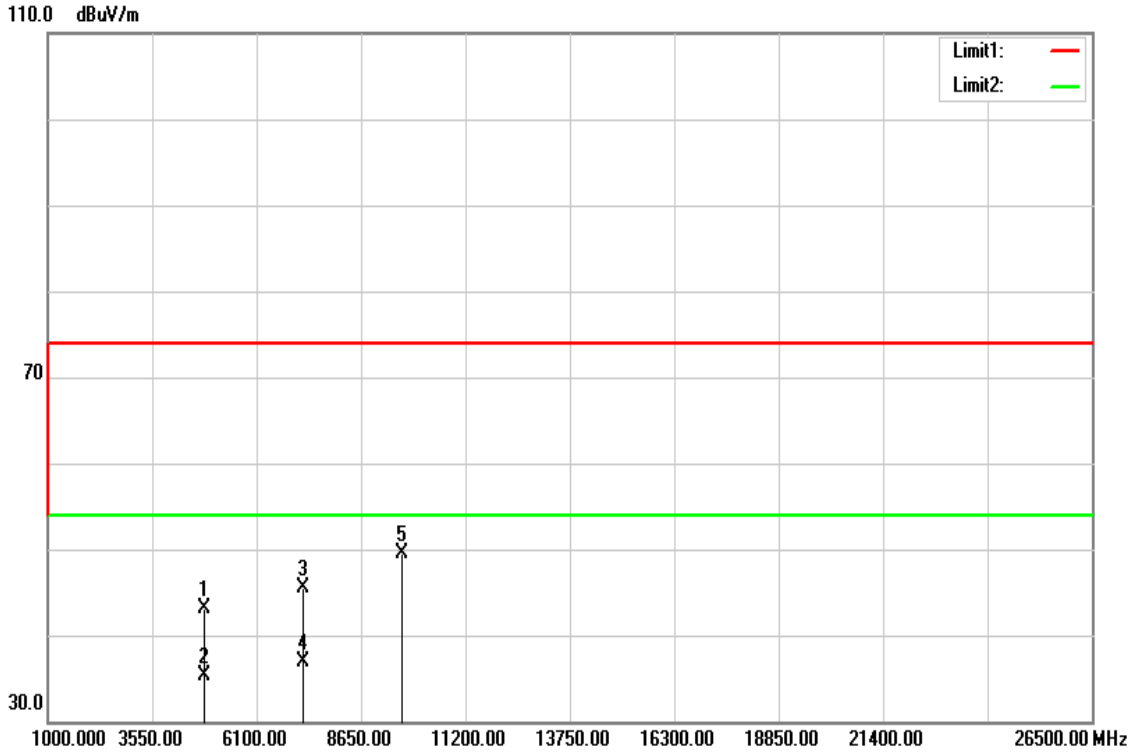


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4824.000	38.95	5.10	44.05	74.00	-29.95	peak
4824.000	29.82	5.10	34.92	54.00	-19.08	AVG
7236.000	34.30	12.71	47.01	74.00	-26.99	peak
7236.000	24.87	12.71	37.58	54.00	-16.42	AVG
9648.000	31.47	17.60	49.07	74.00	-24.93	peak

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 802.11g Low CH	Temp/Hum	23(℃)/ 35%RH
Test Item	Harmonic	Test Date	2017/6/14
Polarize	Horizontal	Test Engineer	Ed Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz

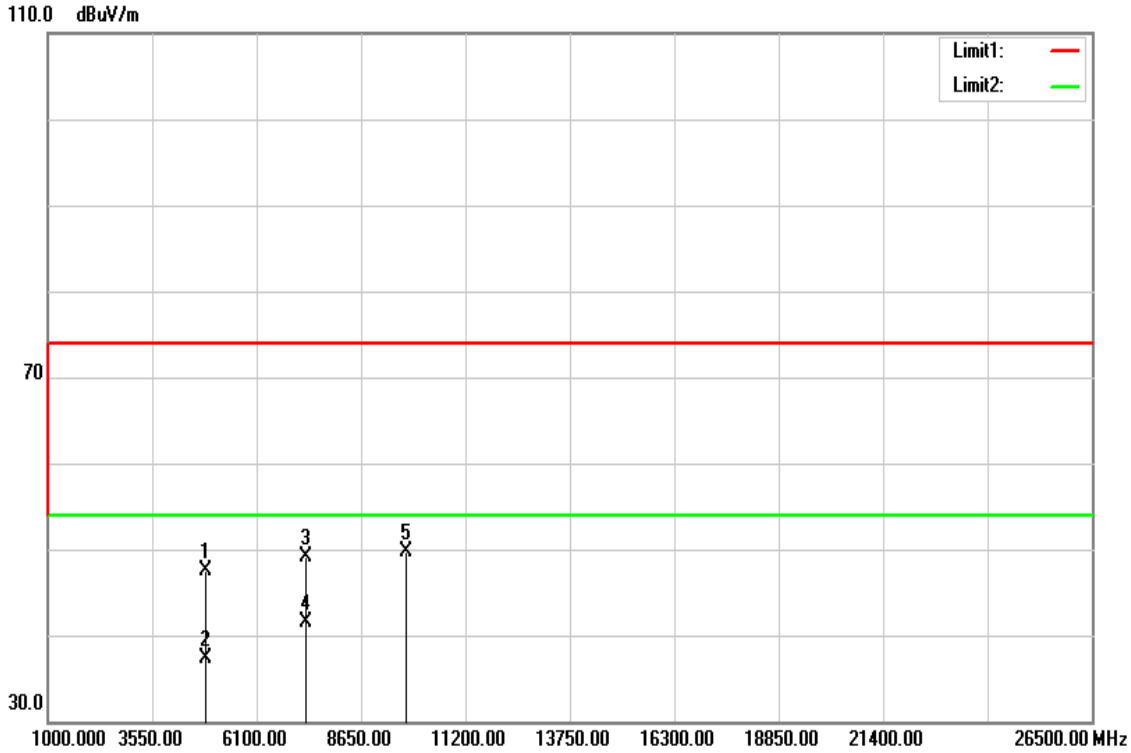


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4824.000	37.93	5.10	43.03	74.00	-30.97	peak
4824.000	30.14	5.10	35.24	54.00	-18.76	AVG
7236.000	32.81	12.71	45.52	74.00	-28.48	peak
7236.000	24.26	12.71	36.97	54.00	-17.03	AVG
9648.000	31.95	17.60	49.55	74.00	-24.45	peak

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 802.11g Mid CH	Temp/Hum	23(℃)/ 35%RH
Test Item	Harmonic	Test Date	2017/6/14
Polarize	Vertical	Test Engineer	Ed Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz

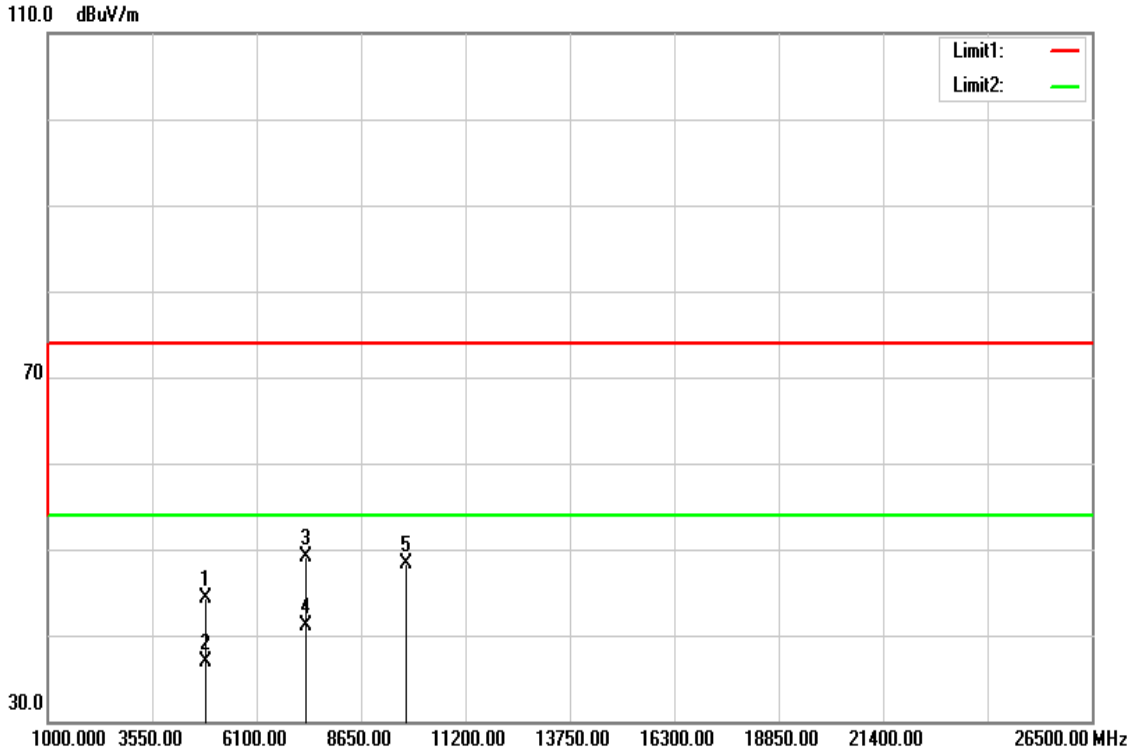


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4874.000	42.25	5.23	47.48	74.00	-26.52	peak
4874.000	31.99	5.23	37.22	54.00	-16.78	AVG
7311.000	36.08	12.94	49.02	74.00	-24.98	peak
7311.000	28.50	12.94	41.44	54.00	-12.56	AVG
9748.000	32.05	17.60	49.65	74.00	-24.35	peak

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 802.11g Mid CH	Temp/Hum	23(℃)/ 35%RH
Test Item	Harmonic	Test Date	2017/6/14
Polarize	Horizontal	Test Engineer	Ed Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz

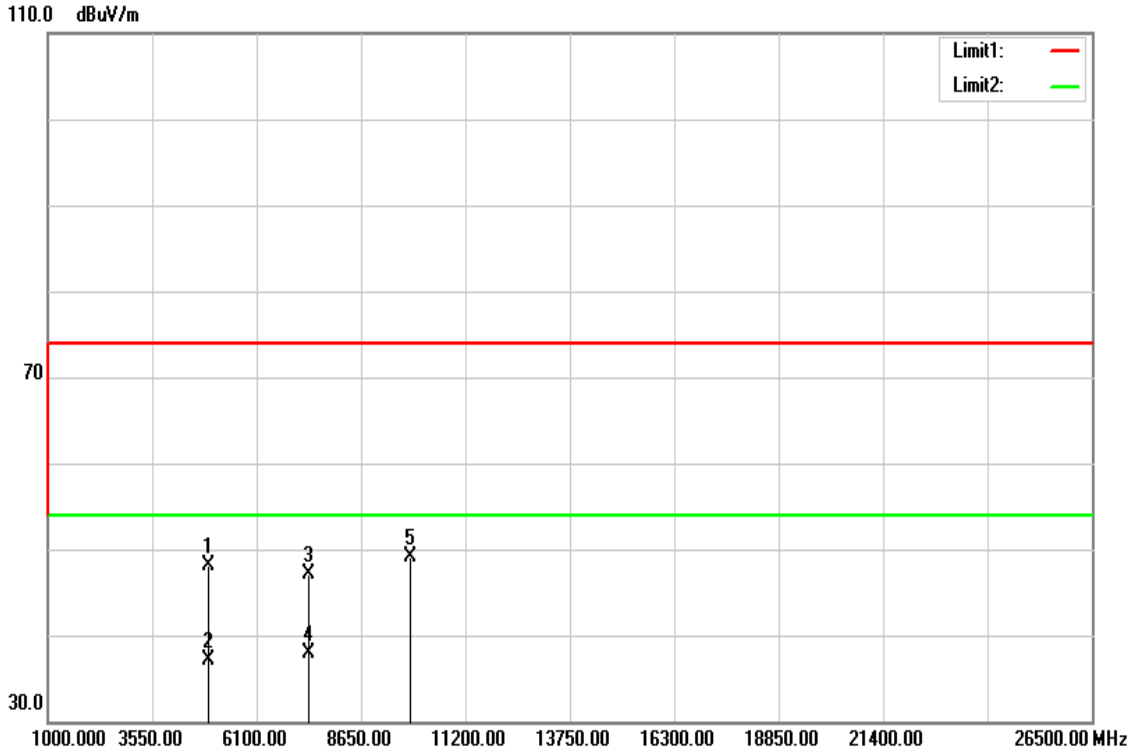


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (B)	Remark
4874.000	39.02	5.23	44.25	74.00	-29.75	peak
4874.000	31.73	5.23	36.96	54.00	-17.04	AVG
7311.000	36.11	12.94	49.05	74.00	-24.95	peak
7311.000	28.08	12.94	41.02	54.00	-12.98	AVG
9748.000	30.77	17.60	48.37	74.00	-25.63	peak

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 802.11g High CH	Temp/Hum	23(℃)/ 35%RH
Test Item	Harmonic	Test Date	2017/6/14
Polarize	Vertical	Test Engineer	Ed Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz

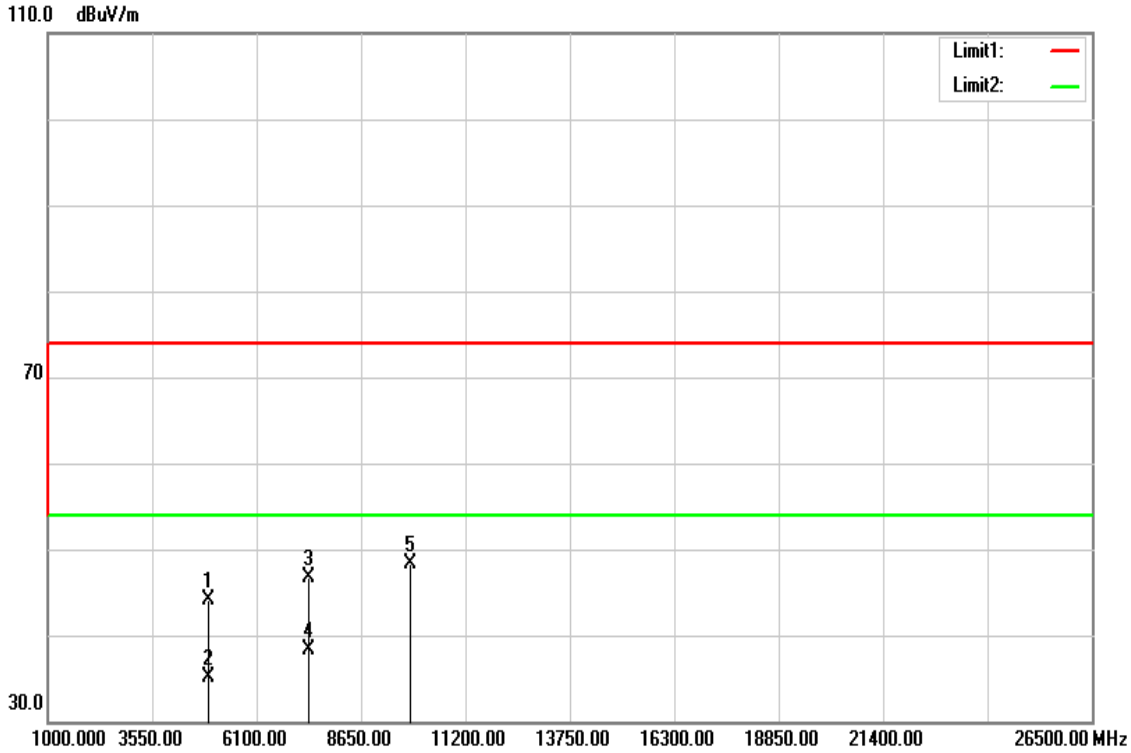


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4924.000	42.73	5.37	48.10	74.00	-25.90	peak
4924.000	31.68	5.37	37.05	54.00	-16.95	AVG
7386.000	33.84	13.17	47.01	74.00	-26.99	peak
7386.000	24.65	13.17	37.82	54.00	-16.18	AVG
9848.000	31.58	17.60	49.18	74.00	-24.82	peak

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 802.11g High CH	Temp/Hum	23(℃)/ 35%RH
Test Item	Harmonic	Test Date	2017/6/14
Polarize	Horizontal	Test Engineer	Ed Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz

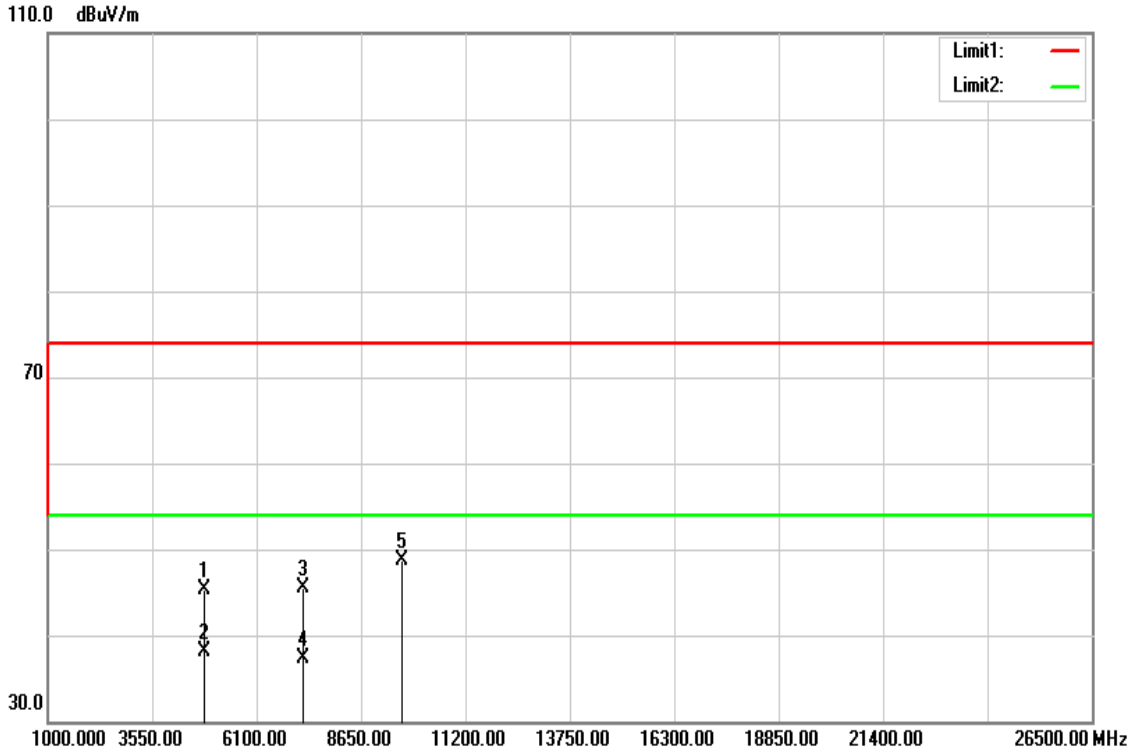


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB	Remark
4924.000	38.68	5.37	44.05	74.00	-29.95	peak
4924.000	29.73	5.37	35.10	54.00	-18.90	AVG
7386.000	33.47	13.17	46.64	74.00	-27.36	peak
7386.000	25.06	13.17	38.23	54.00	-15.77	AVG
9848.000	30.74	17.60	48.34	74.00	-25.66	peak

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	23(℃)/ 35%RH
Test Item	Harmonic	Test Date	2017/6/14
Polarize	Vertical	Test Engineer	Ed Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz

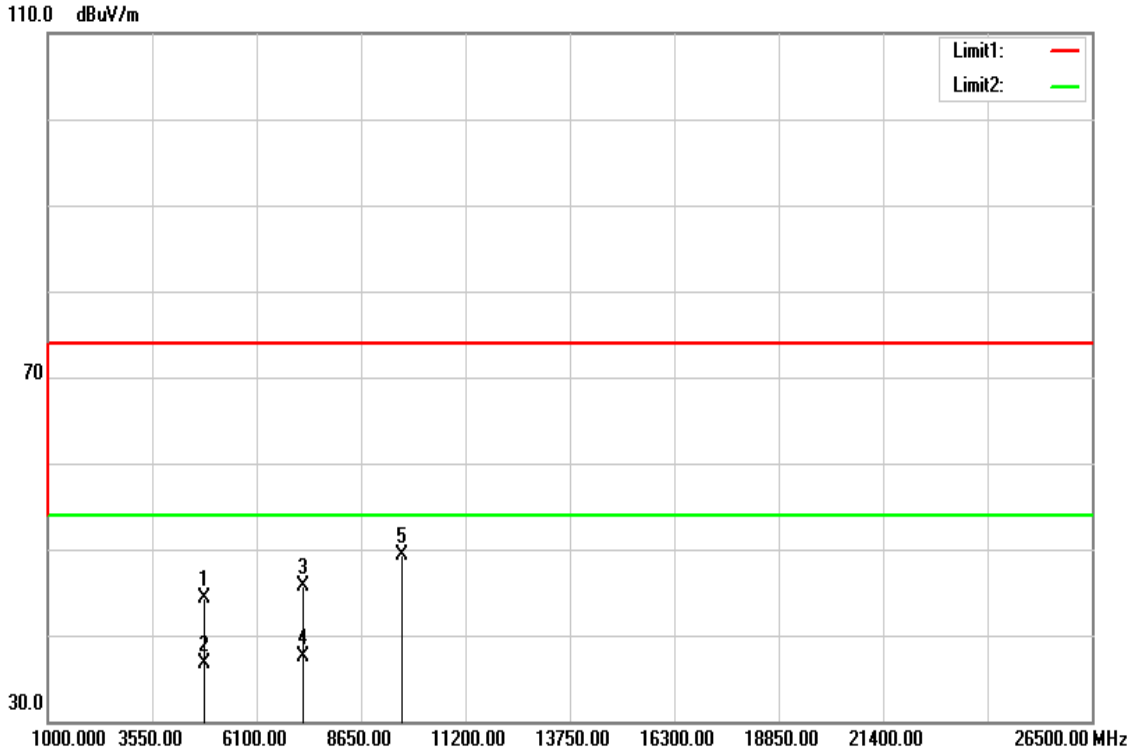


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	R mark
4824.000	40.12	5.10	45.22	74.00	-28.78	peak
4824.000	32.95	5.10	38.05	54.00	-15.95	AVG
7236.000	32.77	12.71	45.48	74.00	-28.52	peak
7236.000	24.66	12.71	37.37	54.00	-16.63	AVG
9648.000	31.08	17.60	48.68	74.00	-25.32	peak

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	23(℃)/ 35%RH
Test Item	Harmonic	Test Date	2017/6/14
Polarize	Horizontal	Test Engineer	Ed Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz

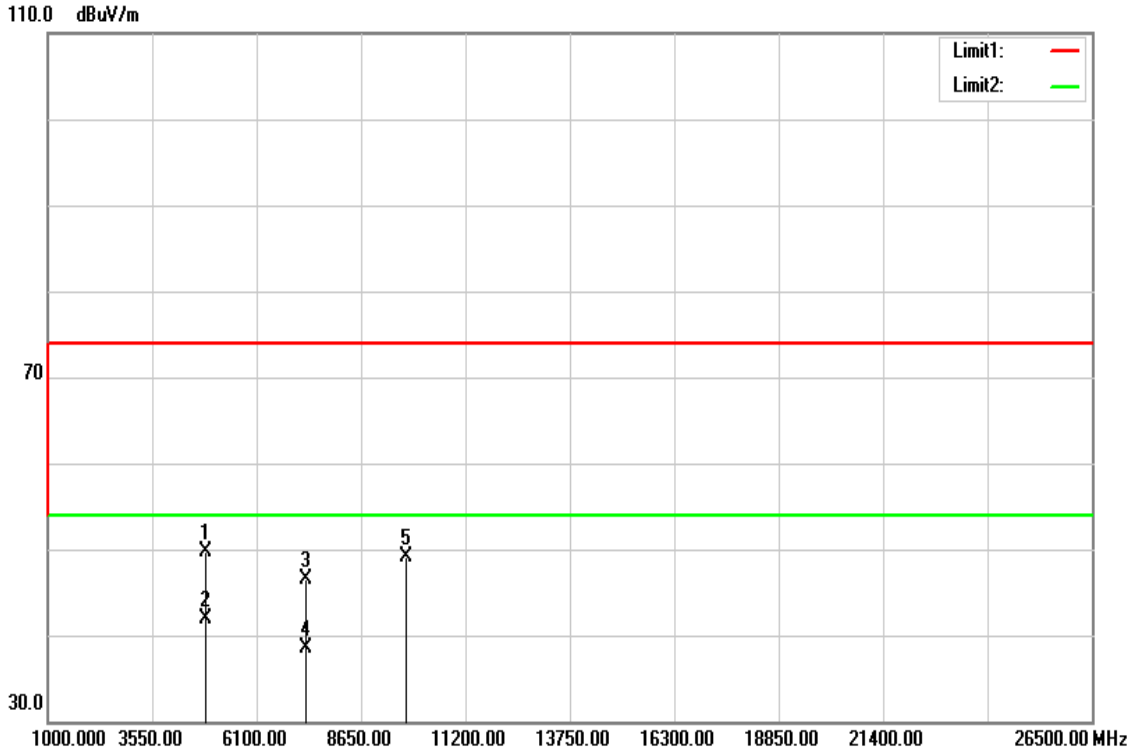


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4824.000	39.24	5.10	44.34	74.00	-29.66	peak
4824.000	31.62	5.10	36.72	54.00	-17.28	AVG
7236.000	33.01	12.71	45.72	74.00	-28.28	peak
7236.000	24.73	12.71	37.44	54.00	-16.56	AVG
9648.000	31.80	17.60	49.40	74.00	-24.60	peak

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	23(℃)/ 35%RH
Test Item	Harmonic	Test Date	2017/6/14
Polarize	Vertical	Test Engineer	Ed Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	R mark
4874.000	44.49	5.23	49.72	74.00	-24.28	peak
4874.000	36.59	5.23	41.82	54.00	-12.18	AVG
7311.000	33.61	12.94	46.55	74.00	-27.45	peak
7311.000	25.65	12.94	38.59	54.00	-15.41	AVG
9748.000	31.45	17.60	49.05	74.00	-24.95	peak

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*

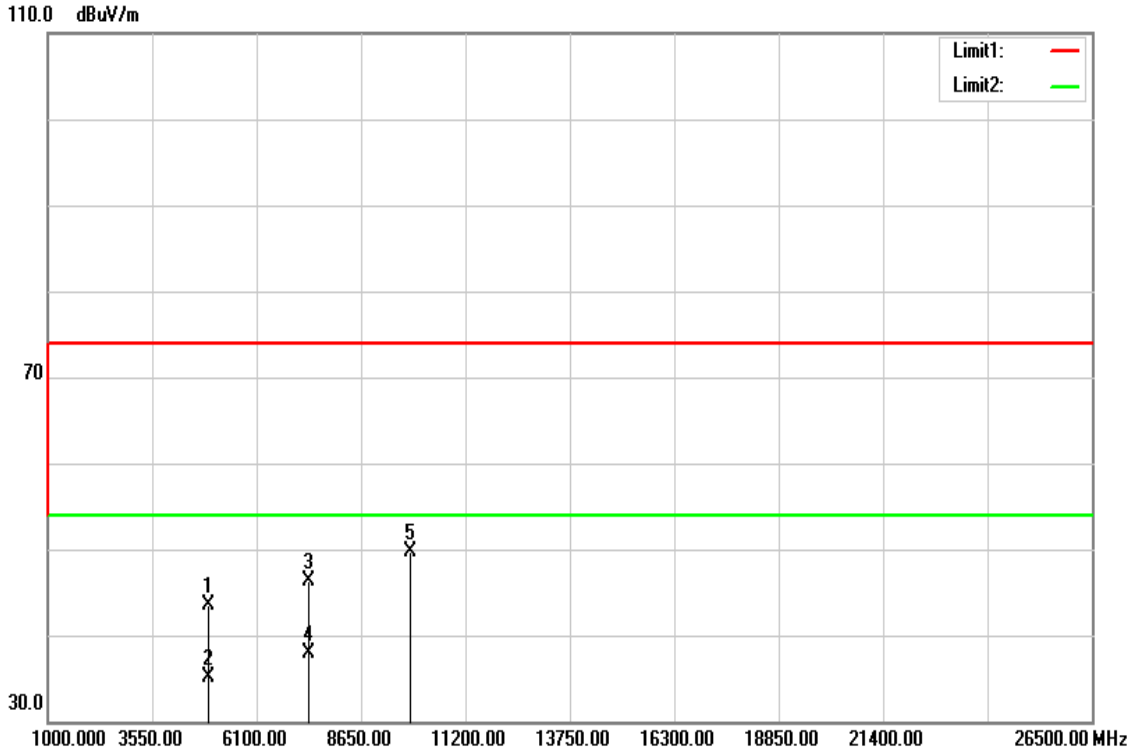
Test Mode	IEEE 802.11n HT20 Mid CH	Temp/Hum	23(℃)/ 35%RH
Test Item	Harmonic	Test Date	2017/6/14
Polarize	Horizontal	Test Engineer	Ed Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4874.000	42.04	5.23	47.27	74.00	-26.73	peak
4874.000	32.13	5.23	37.36	54.00	-16.64	AVG
7311.000	34.31	12.94	47.25	74.00	-26.75	peak
7311.000	25.22	12.94	38.16	54.00	-15.84	AVG
9748.000	32.13	17.60	49.73	74.00	-24.27	peak

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	23(℃)/ 35%RH
Test Item	Harmonic	Test Date	2017/6/14
Polarize	Vertical	Test Engineer	Ed Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz

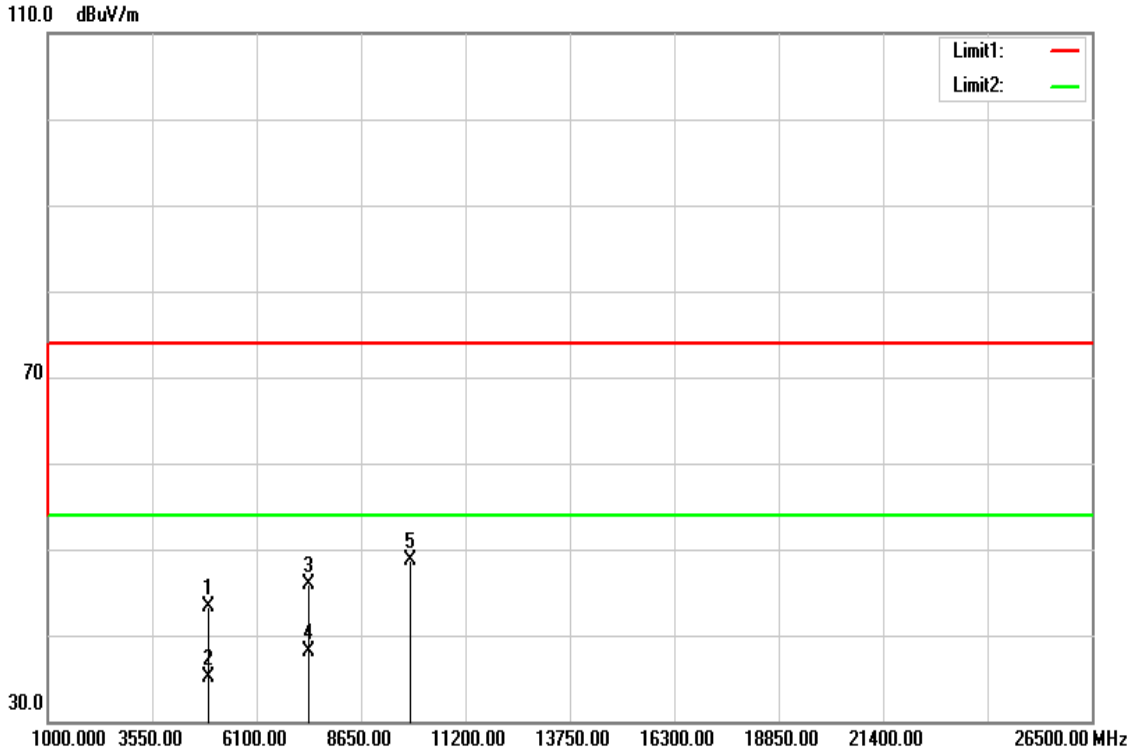


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4924.000	38.04	5.37	43.41	74.00	-30.59	peak
4924.000	29.64	5.37	35.01	54.00	-18.99	AVG
7386.000	33.04	13.17	46.21	74.00	-27.79	peak
7386.000	24.64	13.17	37.81	54.00	-16.19	AVG
9848.000	32.11	17.60	49.71	74.00	-24.29	peak

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	23(℃)/ 35%RH
Test Item	Harmonic	Test Date	2017/6/14
Polarize	Horizontal	Test Engineer	Ed Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz

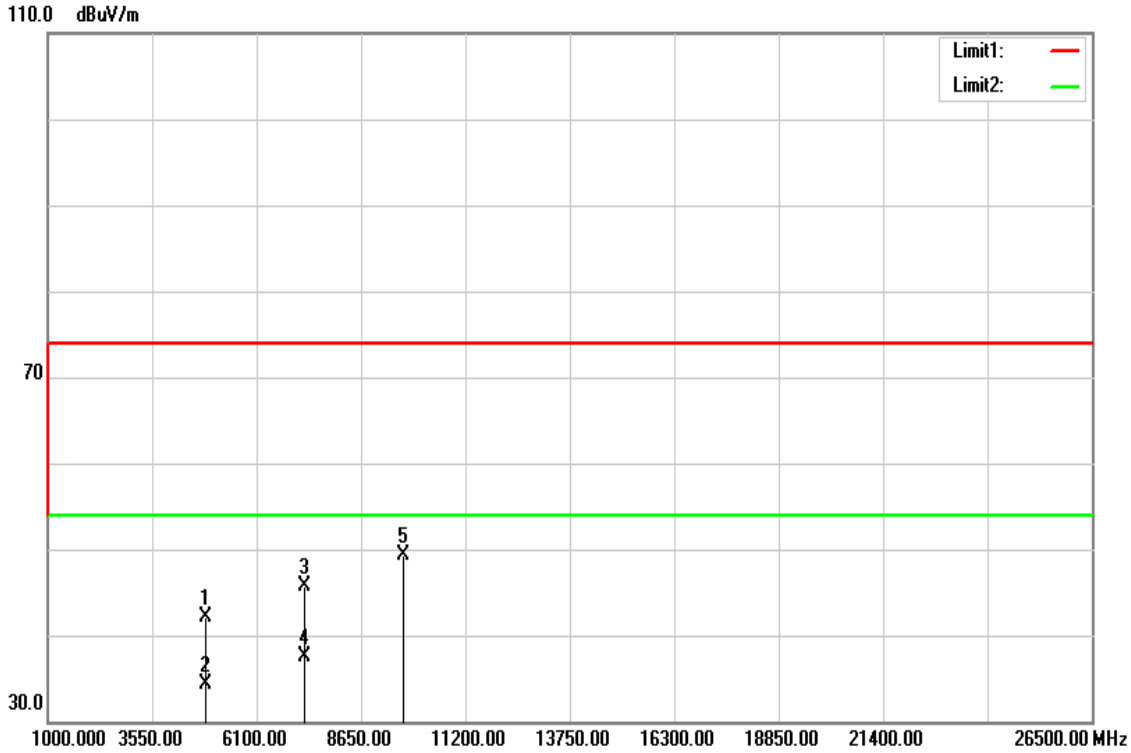


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4924.000	38.02	5.37	43.39	74.00	-30.61	peak
4924.000	29.67	5.37	35.04	54.00	-18.96	AVG
7386.000	32.72	13.17	45.89	74.00	-28.11	peak
7386.000	24.92	13.17	38.09	54.00	-15.91	AVG
9848.000	31.02	17.60	48.62	74.00	-25.38	peak

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	23(℃)/ 35%RH
Test Item	Harmonic	Test Date	2017/6/14
Polarize	Vertical	Test Engineer	Ed Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz

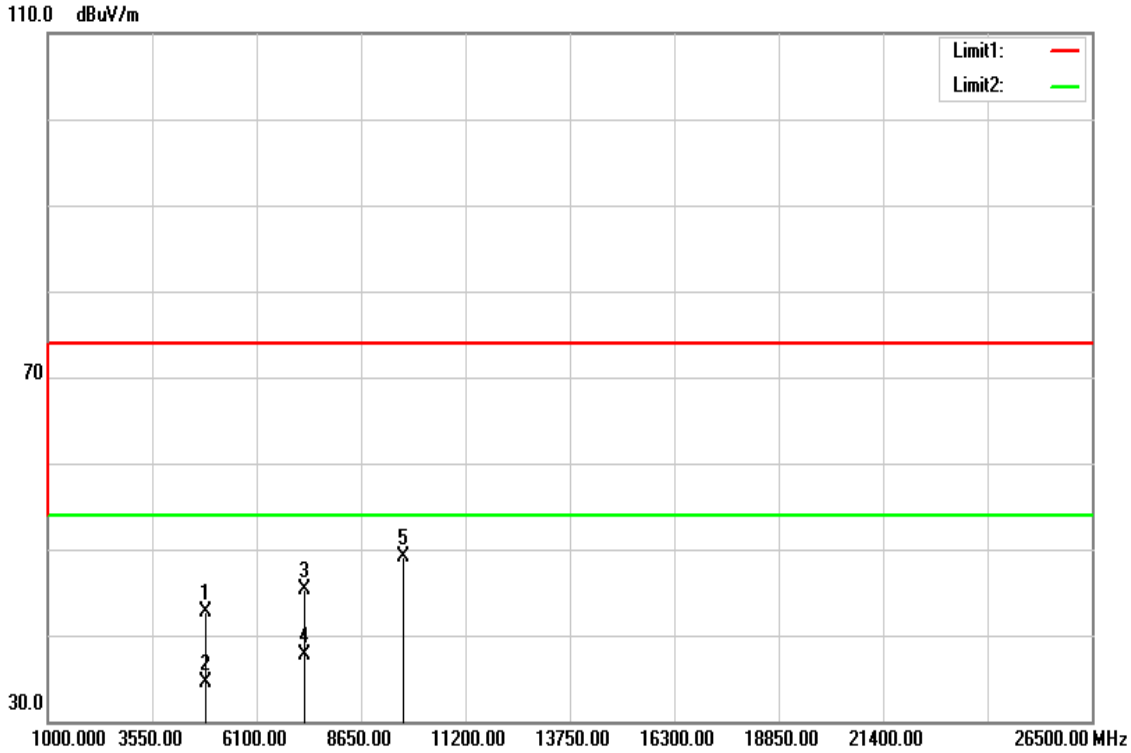


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4844.000	36.86	5.15	42.01	74.00	-31.99	peak
4844.000	29.17	5.15	34.32	54.00	-19.68	AVG
7266.000	32.93	12.80	45.73	74.00	-28.27	peak
7266.000	24.78	12.80	37.58	54.00	-16.42	AVG
9688.000	31.74	17.60	49.34	74.00	-24.66	peak

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	23(℃)/ 35%RH
Test Item	Harmonic	Test Date	2017/6/14
Polarize	Horizontal	Test Engineer	Ed Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz

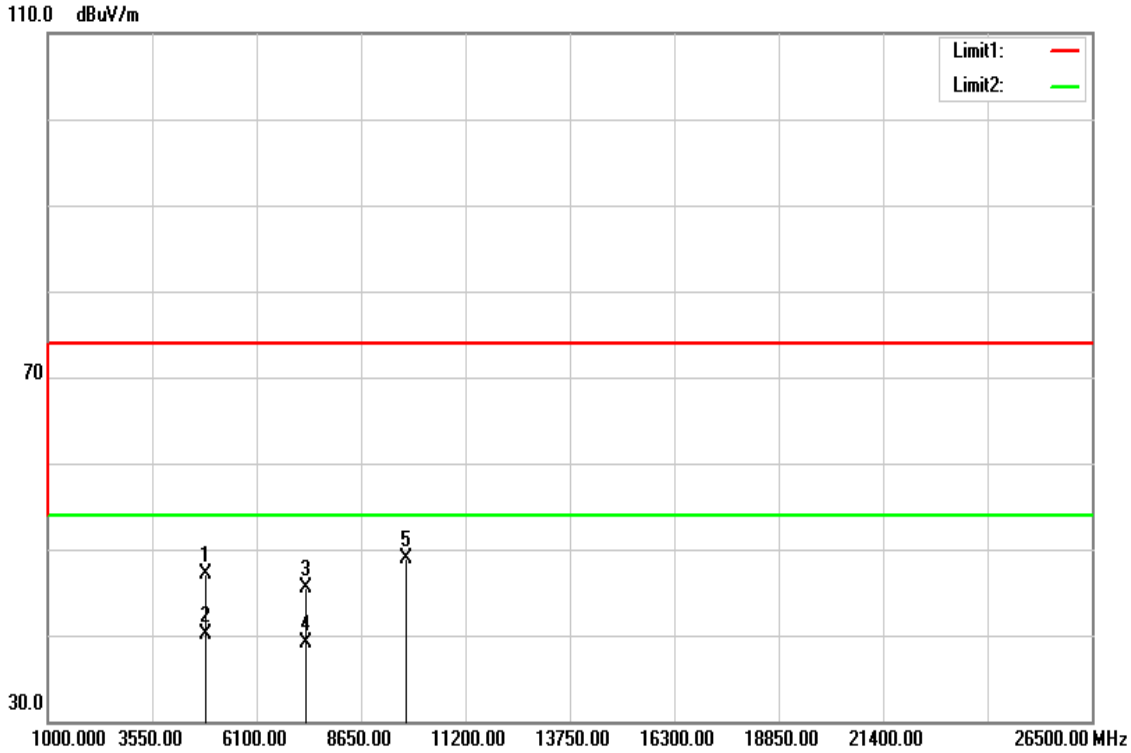


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4844.000	37.58	5.15	42.73	74.00	-31.27	peak
4844.000	29.37	5.15	34.52	54.00	-19.48	AVG
7266.000	32.42	12.80	45.22	74.00	-28.78	peak
7266.000	24.97	12.80	37.77	54.00	-16.23	AVG
9688.000	31.51	17.60	49.11	74.00	-24.89	peak

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 Mid CH	Temp/Hum	23(℃)/ 35%RH
Test Item	Harmonic	Test Date	2017/6/14
Polarize	Vertical	Test Engineer	Ed Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz

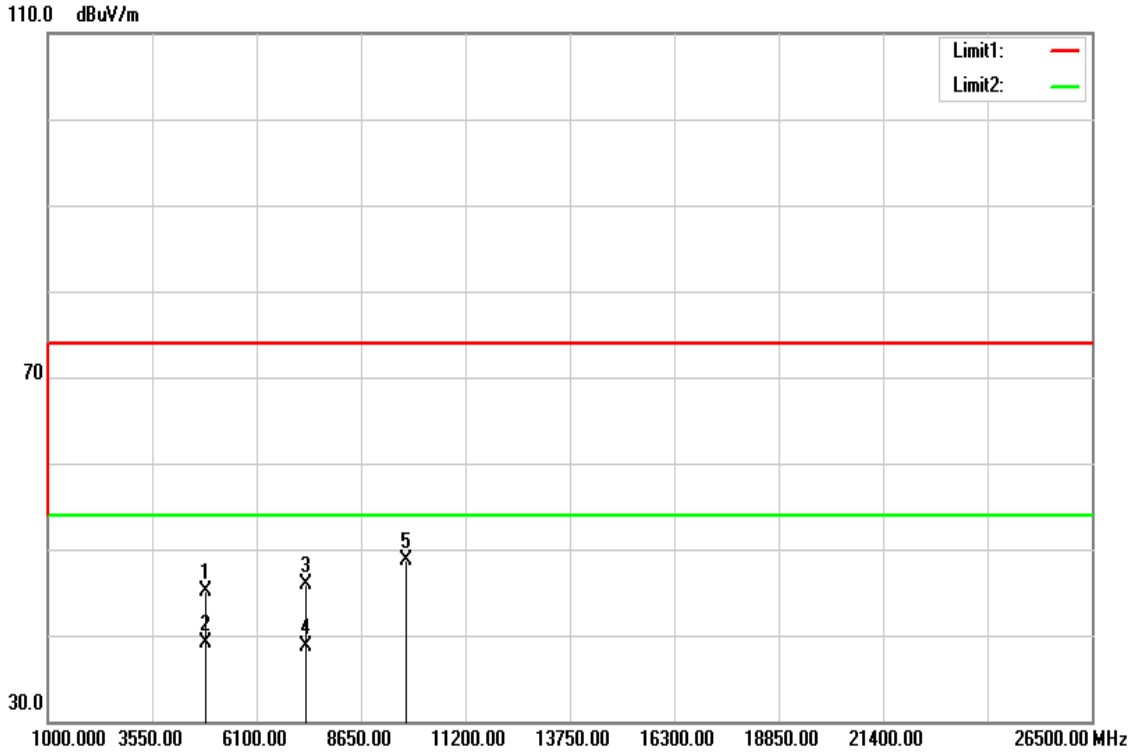


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4874.000	41.84	5.23	47.07	74.00	-26.93	peak
4874.000	34.85	5.23	40.08	54.00	-13.92	AVG
7311.000	32.54	12.94	45.48	74.00	-28.52	peak
7311.000	26.16	12.94	39.10	54.00	-14.90	AVG
9748.000	31.31	17.60	48.91	74.00	-25.09	peak

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 Mid CH	Temp/Hum	23(℃)/ 35%RH
Test Item	Harmonic	Test Date	2017/6/14
Polarize	Horizontal	Test Engineer	Ed Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz

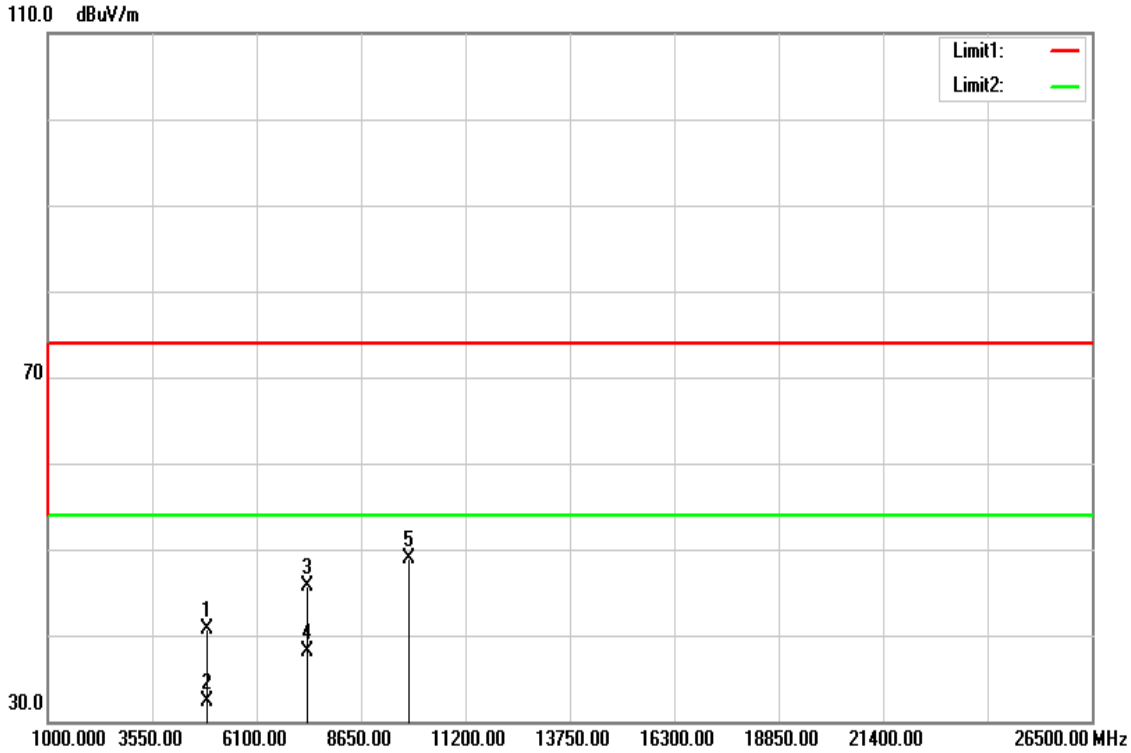


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4874.000	39.82	5.23	45.05	74.00	-28.95	peak
4874.000	33.90	5.23	39.13	54.00	-14.87	AVG
7311.000	32.95	12.94	45.89	74.00	-28.11	peak
7311.000	25.79	12.94	38.73	54.00	-15.27	AVG
9748.000	31.02	17.60	48.62	74.00	-25.38	peak

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	23(℃)/ 35%RH
Test Item	Harmonic	Test Date	2017/6/14
Polarize	Vertical	Test Engineer	Ed Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz

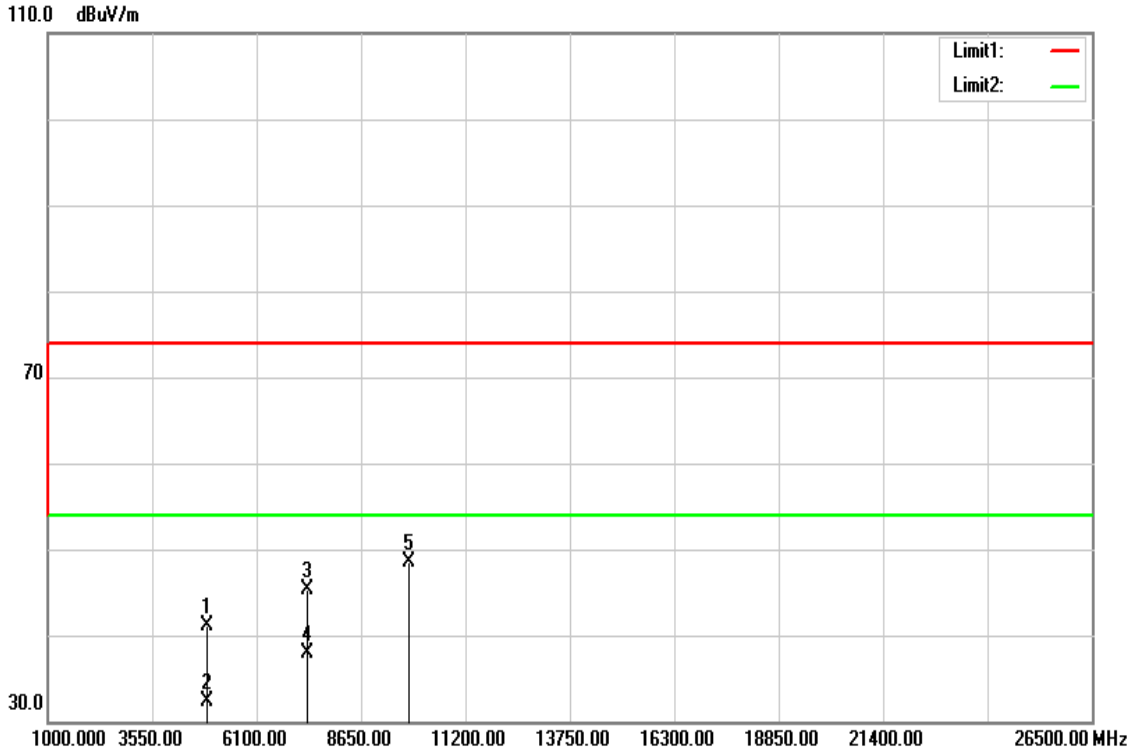


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4904.000	35.31	5.31	40.62	74.00	-33.38	peak
4904.000	26.91	5.31	32.22	54.00	-21.78	AVG
7356.000	32.62	13.08	45.70	74.00	-28.30	peak
7356.000	24.94	13.08	38.02	54.00	-15.98	AVG
9808.000	31.25	17.60	48.85	74.00	-25.15	peak

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	23(℃)/ 35%RH
Test Item	Harmonic	Test Date	2017/6/14
Polarize	Horizontal	Test Engineer	Ed Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4904.000	35.83	5.31	41.14	74.00	-32.86	peak
4904.000	26.91	5.31	32.22	54.00	-21.78	AVG
7356.000	32.25	13.08	45.33	74.00	-28.67	peak
7356.000	24.74	13.08	37.82	54.00	-16.18	AVG
9808.000	30.93	17.60	48.53	74.00	-25.47	peak

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*