FCC RADIO TEST REPORT
FCC 47 CFR PART 15 SUBPART C

Test Standard	**FCC Part 15.247**
FCC ID	**PPQ-WN4642R**
Brand name	**LITE-ON**
Applicant	**Lite-On Technology Corp.**
Product name	**802.11 b/g/n 2T2R Wireless LAN USB Module**
Model No.	**WN4642R**
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)

The sample selected for test was production product and was provided by manufacturer.

Testing Laboratory 1309

Approved by:

Sam Chuang
Manager

Reviewed by:

Ed Chiang
Engineer

Revision History

Rev.	Issue Date	Revisions	Revised By
00	February 23, 2017	Initial Issue	Angel Cheng
01	June 12, 2017	1. Remote notes in P.4. 2. Modify section 3.3 in P.12. 3. Modify Peak output power in P. 25. 4. Modify Average output power in P. 26.	Angel Cheng

Table of contents

1. GENERAL INFORMATION

1.1 EUT INFORMATION

Applicant	Lite-On Technology Corp.
Applicant address	Bldg. C, 90, Chien 1 Road, Chung Ho, New Taipei City 23585, Taiwan, R.O.C
Equipment	802.11 b/g/n 2T2R Wireless LAN USB Module
Model Name	WN4642R
Model Discrepancy	The model total of two sets of samples, the difference between the sample on the conductive connector and antenna (different brands, the same type) - with the connector board with antenna for the Auden label antenna (Antenna gain is larger) - the connector board is docked for the Walsin label antenna (Antenna gain is small)
Received Date	January 24, 2017
Date of Test	February 2~20, 2017
Output Power(W)	IEEE 802.11b mode: 0.0923 IEEE 802.11g mode: 0.3365 IEEE 802.11n HT 20 MHz mode: 0.5058 IEEE 802.11n HT 40 MHz mode: 0.5321
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 Category	☒ Integral: antenna permanently attached ☐ External dedicated antennas ☐ External Unique antenna connector
Antenna Type	☒ PIFA ☐ PCB ☐ Dipole ☐ Coils
Antenna Gain	Walsin / RFMTA200700NNLB002 Antenna 1: Gain: 1.53dBi Antenna 2: Gain: -0.29dBi Auden / T-0082 Antenna 1: Gain: 2.70dBi Antenna 2: Gain: 0.63dBi

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	Anderson Kuo	
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	7/4/2016	7/3/2017
Power Sensor	Anritsu	MA2411B	917072	7/4/2016	7/3/2017
Spectrum Analyzer	R&S	FSV 40	101073	10/5/2016	10/4/2017
Thermostatic/Hrgrosatic Chamber	GWINSTEK	GTC-288MH-CC	TH160402	5/4/2016	5/3/2017
USB Wideband Power Sensor	Agilent	U2021XA	MY54250027	5/12/2016	5/11/2017
USB Wideband Power Sensor	Agilent	U2021XA	MY54260016	5/12/2016	5/11/2017
USB Wideband Power Sensor	Agilent	U2021XA	MY54260020	5/12/2016	5/11/2017
USB Wideband Power Sensor	Agilent	U2021XA	MY54260007	5/12/2016	5/11/2017

3M 966 Chamber Test Site					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal Date**	**Cal Due**
Spectrum Analyzer	Agilent	E4446A	US42510252	12/5/2016	12/4/2017
Loop Ant	COM-POWER	AL-130	121051	2/25/2016	2/24/2017
Bilog Antenna	Sunol Sciences	JB3	A030105	7/3/2016	7/2/2017
Pre-Amplifier	EMEC	EM330	60609	6/8/2016	6/7/2017
Horn Antenna	ETC	MCTD 1209	DRH13M02003	9/2/2016	9/1/2017
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	5/11/2016	5/10/2017
LISN	SCHWARZBECK	NSLK 8128	5012	4/15/2016	4/17/2017
Receiver	R&S	ESCI	101073	8/20/2016	8/19/2017

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	Report Section	Test Item	Result
15.203	1.2	Antenna Requirement	Pass
15.207(a)	4.1	AC Conducted Emission	Pass
15.247(a)(2)	4.2	6 dB Bandwidth	Pass
15.247(b)	4.3	Output Power Measurement	Pass
15.247(e)	4.4	Power Spectral Density	Pass
15.247(d)	4.5	Conducted Band Edge	Pass
15.247(d)	4.5	Conducted Emission	Pass
15.247(d)	4.6	Radiation Band Edge	Pass
15.247(d)	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

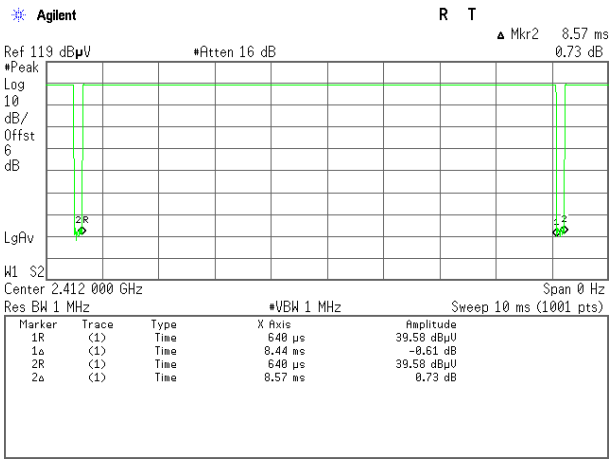
Radiated Emission Measurement Below 1G	
Test Condition	Radiated Emission Below 1G
Voltage/Hz	120V/60Hz
Test Mode	Mode 1: EUT power by host system
Worst Mode	☒ Mode 1 ☐ Mode 2 ☐ Mode 3 ☐ Mode 4

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(Y-Plane and Vertical) were recorded in this report.

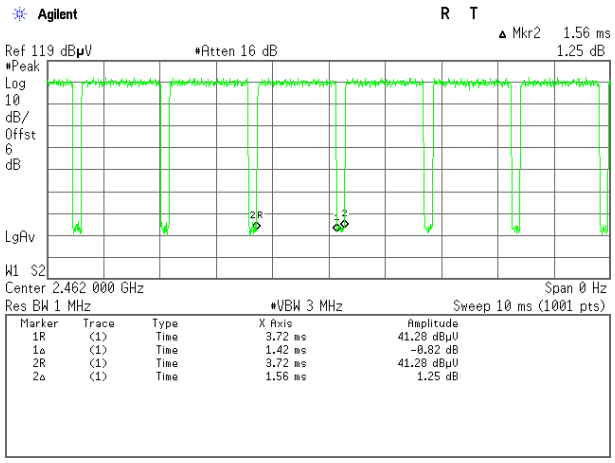
3.3 EUT DUTY CYCLE

Duty Cycle				
Configuration	TX ON (ms)	TX ALL (ms)	Duty Cycle (%)	Duty Factor(dB)
802.11b	8.44	8.57	98.48%	0.06
802.11g	1.42	1.56	91.02%	0.4
802.11n HT20	0.710	0.830	85.54%	0.67
802.11n HT40	0.37	0.51	72.55%	1.39

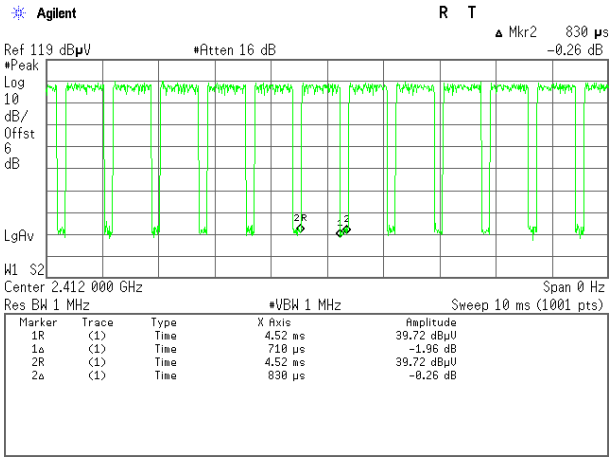
802.11b



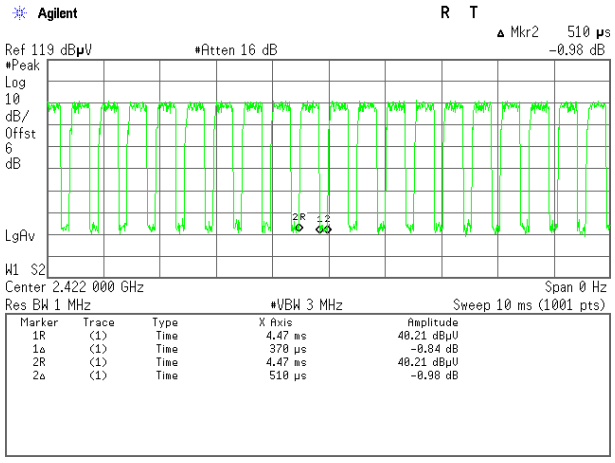
802.11g



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

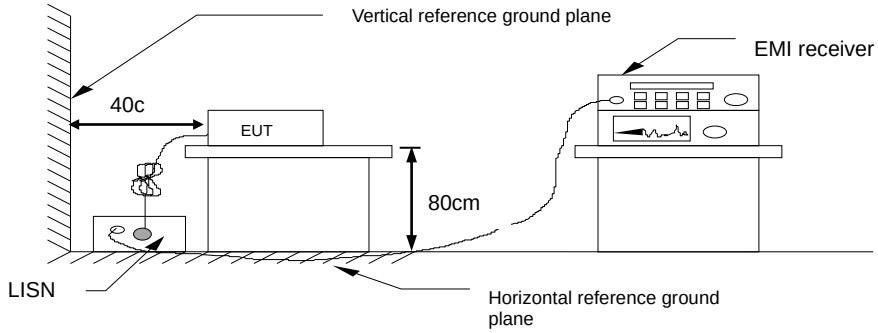
* Decreases with the logarithm of the frequency.

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

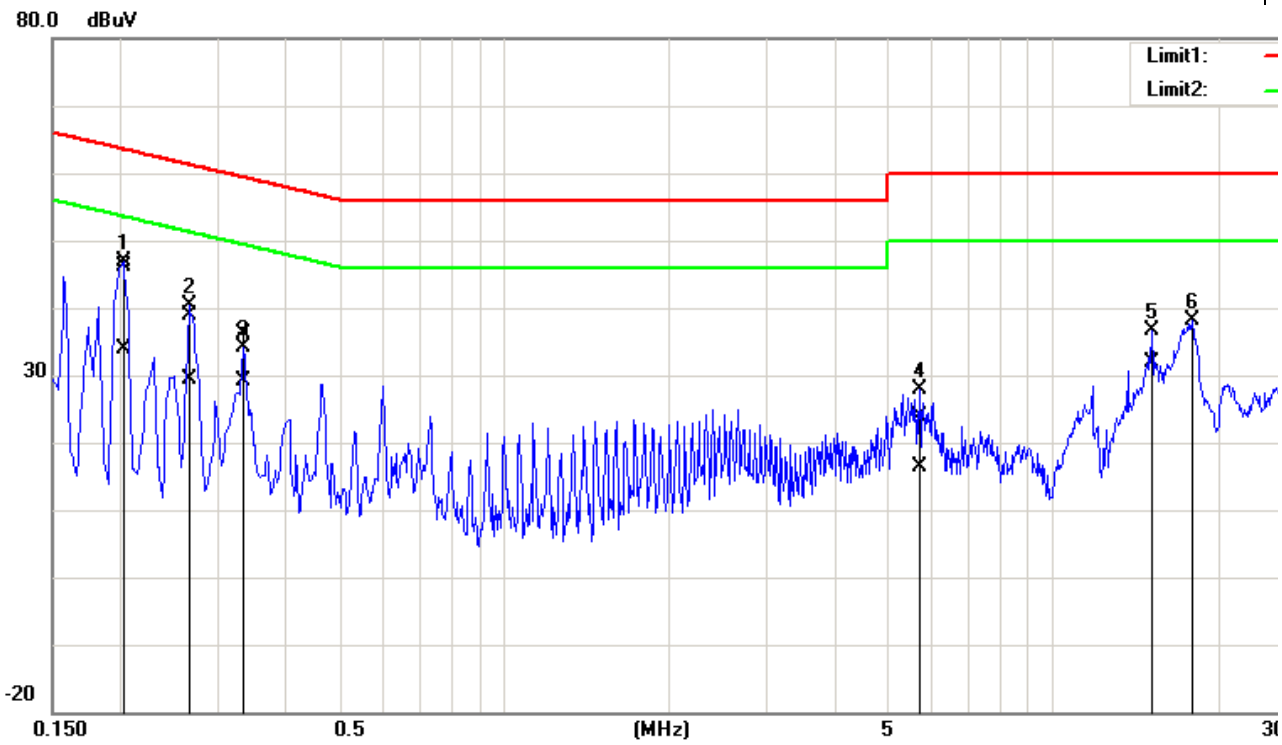


4.1.4 Test Result

Pass.

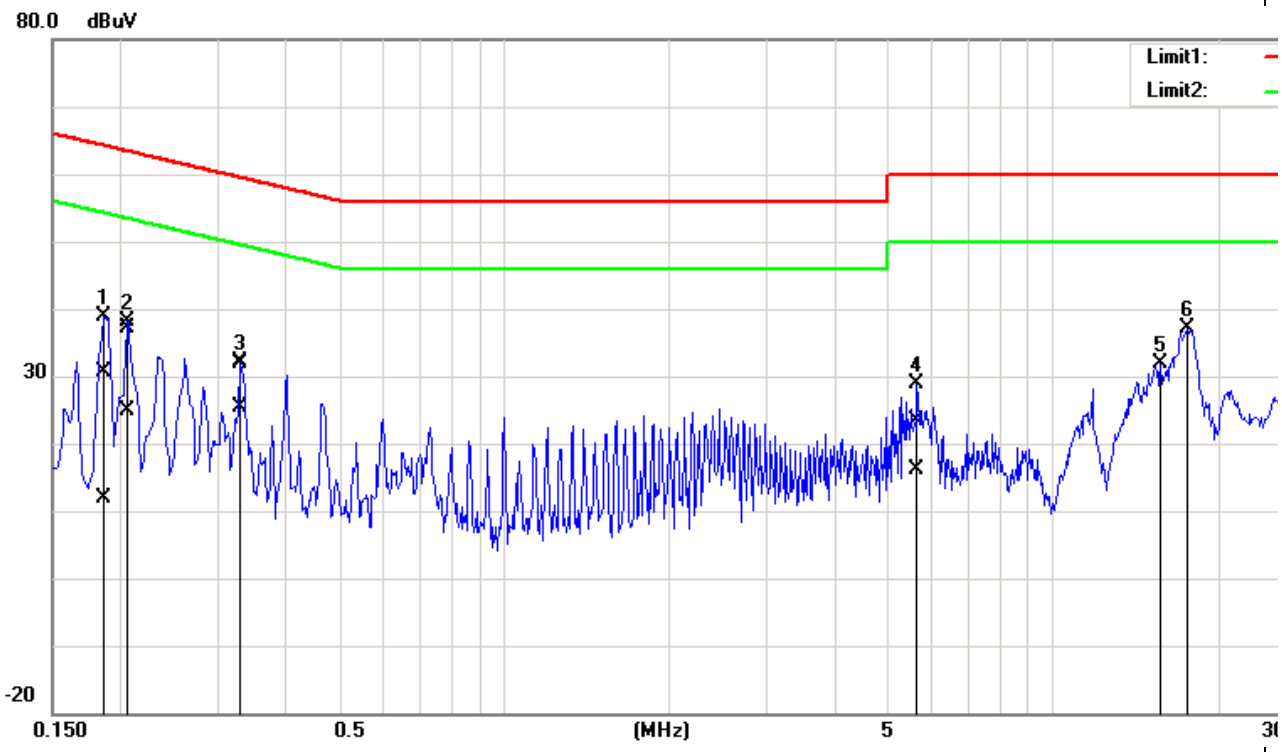
Test Data

Test Mode:	Mode 1	Temp/Hum	24(℃)/ 50%RH
Test Voltage:	120Vac / 60Hz	Test Date	2017/2/20
Phase:	Line	Test Engineer	Anderson Kuo



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	46.14	33.92	-0.03	46.11	33.89	63.53	53.53	-17.42	-19.64	Pass
0.2660	38.87	29.32	-0.04	38.83	29.28	61.24	51.24	-22.41	-21.96	Pass
0.3340	36.19	29.14	-0.04	36.15	29.10	59.35	49.35	-23.20	-20.25	Pass
5.7380	23.83	16.42	0.02	23.85	16.44	60.00	50.00	-36.15	-33.56	Pass
15.1500	36.74	31.91	-0.08	36.66	31.83	60.00	50.00	-23.34	-18.17	Pass
18.0180	33.44	27.86	-0.23	33.21	27.63	60.00	50.00	-26.79	-22.37	Pass

Test Mode:	Mode 1	Temp/Hum	27(℃)/ 53%RH
Test Voltage:	120Vac / 60Hz	Test Date	2017/2/20
Phase:	Neutral	Test Engineer	Anderson Kuo



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
0.1860	30.80	11.99	-0.10	30.70	11.89	64.21	54.21	-33.51	-42.32	Pass
0.2060	37.20	25.07	-0.10	37.10	24.97	63.37	53.37	-26.27	-28.40	Pass
0.3300	32.12	25.48	-0.12	32.00	25.36	59.45	49.45	-27.45	-24.09	Pass
5.6700	23.60	16.32	-0.16	23.44	16.16	60.00	50.00	-36.56	-33.84	Pass
15.7740	26.68	20.91	-0.29	26.39	20.62	60.00	50.00	-33.61	-29.38	Pass
17.5900	33.05	27.13	-0.31	32.74	26.82	60.00	50.00	-27.26	-23.18	Pass

4.2 6DB BANDWIDTH

4.2.1 Test Limit

According to §15.247(a)(2)

6 dB Bandwidth ：

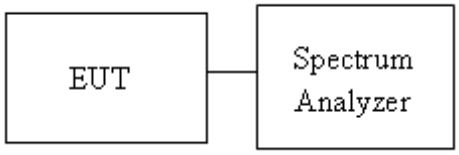
Limit	Shall be at least 500kHz

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

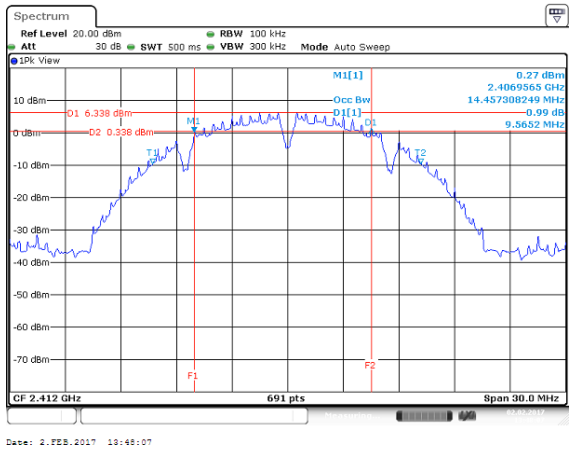
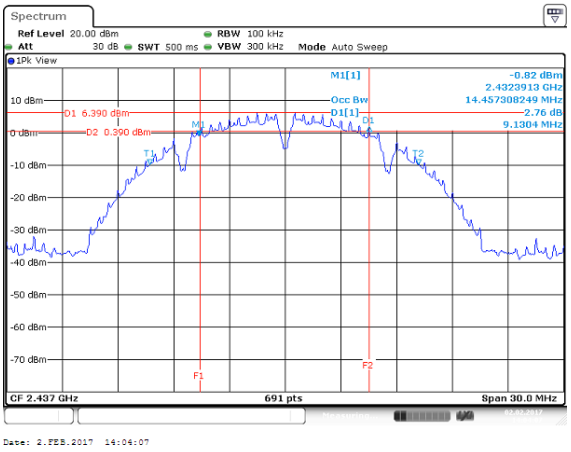
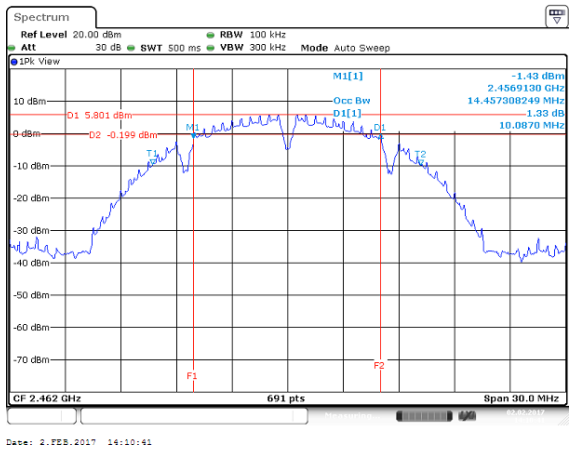
Test mode: IEEE 802.11b mode / 2412-2462 MHz				
Channel	**Frequency (MHz)**	**Chain 0 6dB BW (MHz)**	**Chain 1 6dB BW (MHz)**	**6dB limit (kHz)**
Low	2412	9.5652	-	≥500
Mid	2437	9.1304	-	
High	2462	10.0870	-	

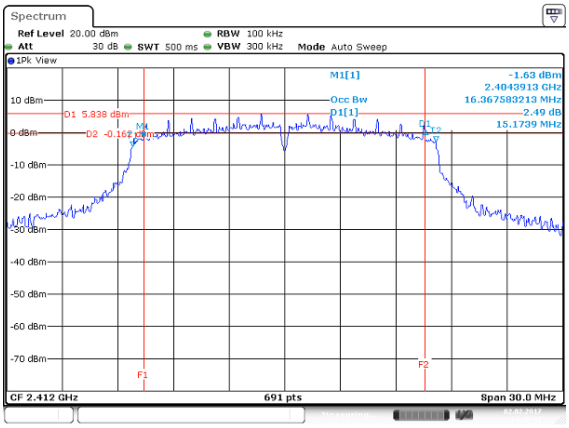
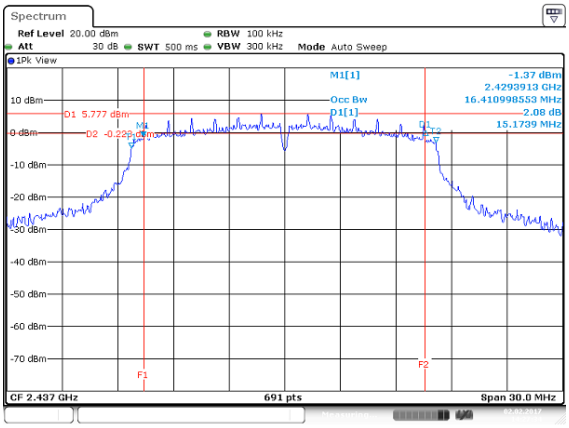
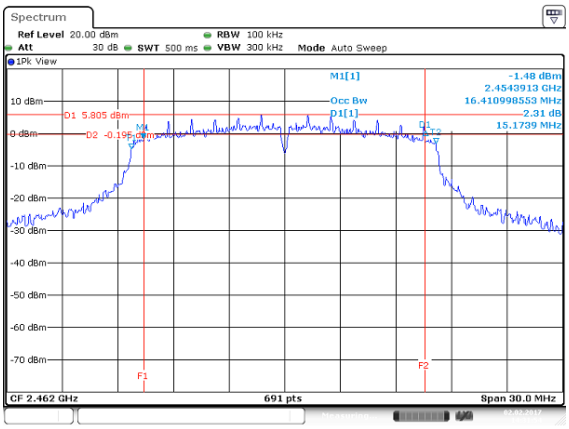
Test mode: IEEE 802.11g mode / 2412-2462 MHz				
Channel	**Frequency (MHz)**	**Chain 0 6dB BW (MHz)**	**Chain 1 6dB BW (MHz)**	**6dB limit (kHz)**
Low	2412	15.1739	-	≥500
Mid	2437	15.1739	-	
High	2462	15.1739	-	

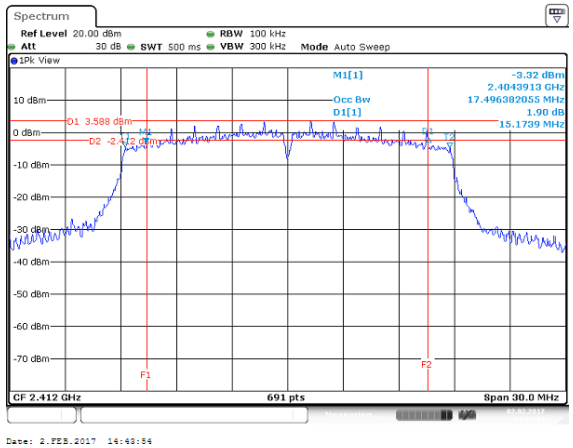
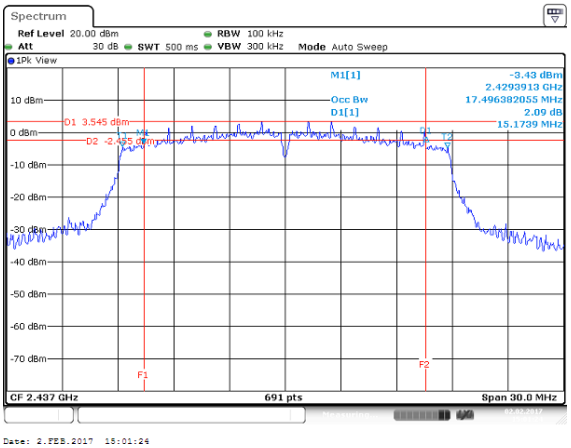
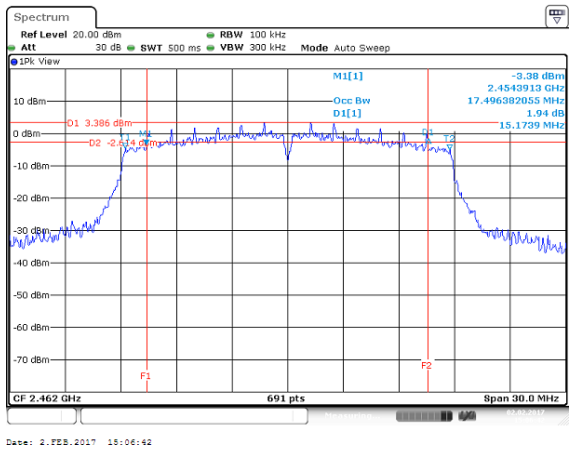
Test mode: IEEE 802.11n HT 20 MHz mode / 2412-2462 MHz				
Channel	**Frequency (MHz)**	**Chain 0 6dB BW (MHz)**	**Chain 1 6dB BW (MHz)**	**6dB limit (kHz)**
Low	2412	15.1739	15.1739	≥500
Mid	2437	15.1739	15.1739	
High	2462	15.1739	15.1739	

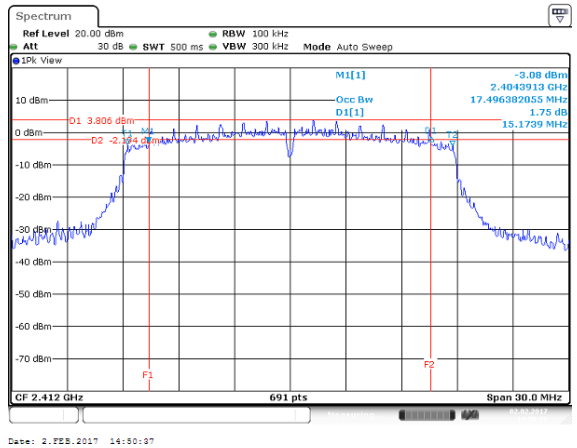
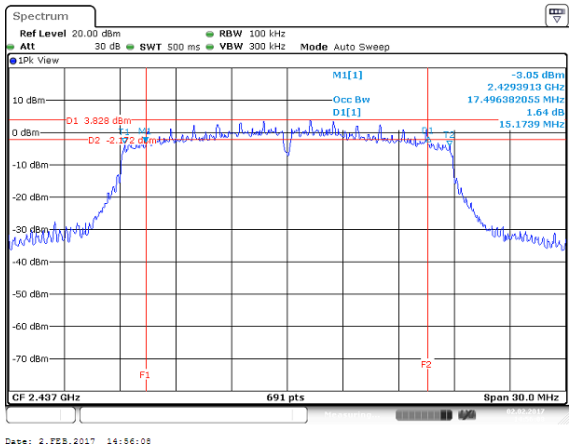
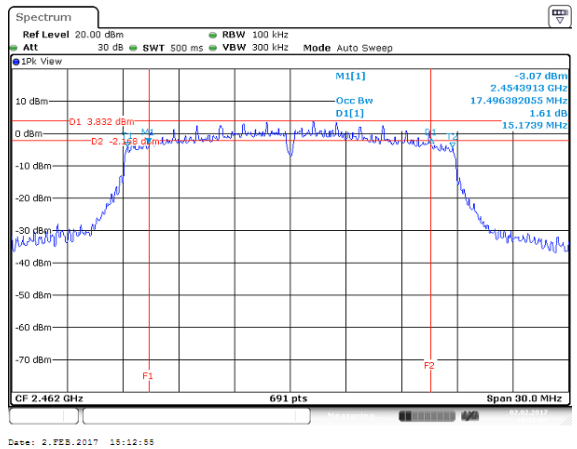
Test mode: IEEE 802.11n HT 40 MHz mode / 2422-2452 MHz				
Channel	**Frequency (MHz)**	**Chain 0 6dB BW (MHz)**	**Chain 1 6dB BW (MHz)**	**6dB limit (kHz)**
Low	2422	35.246	35.130	>500
Mid	2437	35.246	35.130	
High	2452	35.246	35.130	

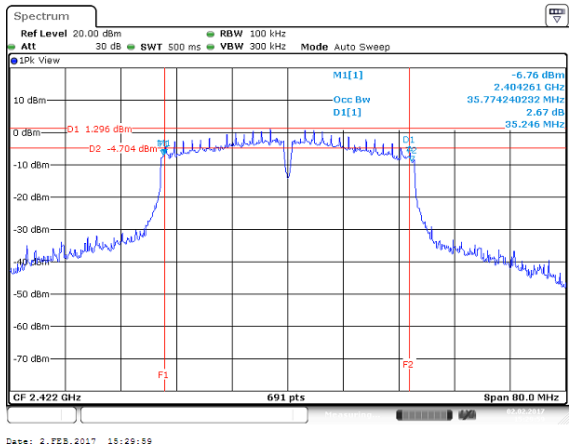
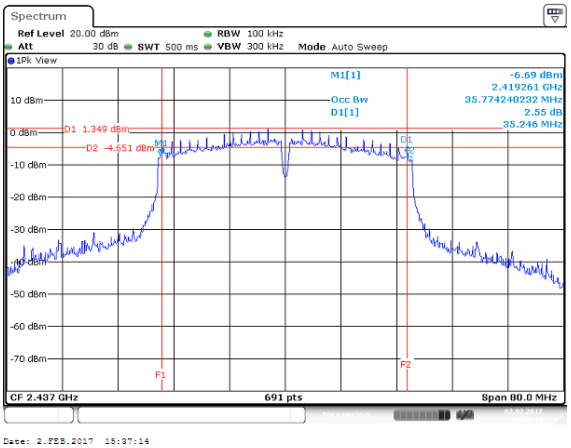
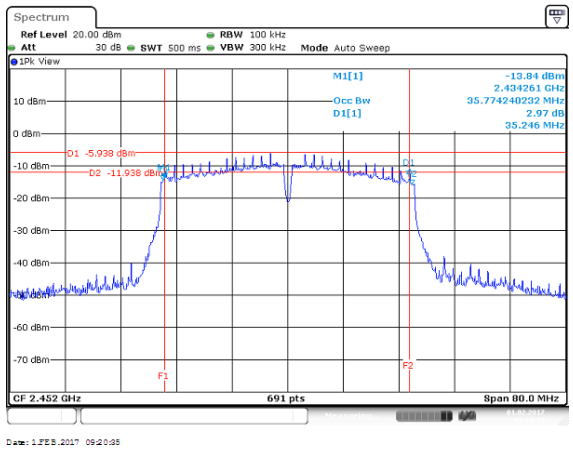
Test Data

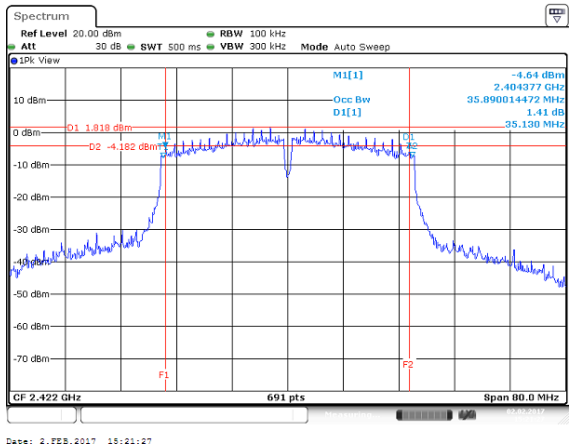
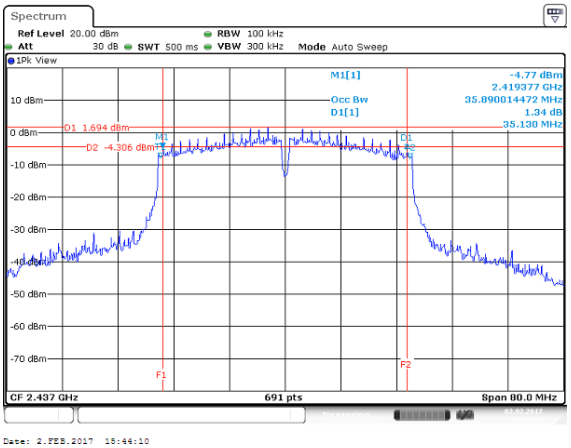
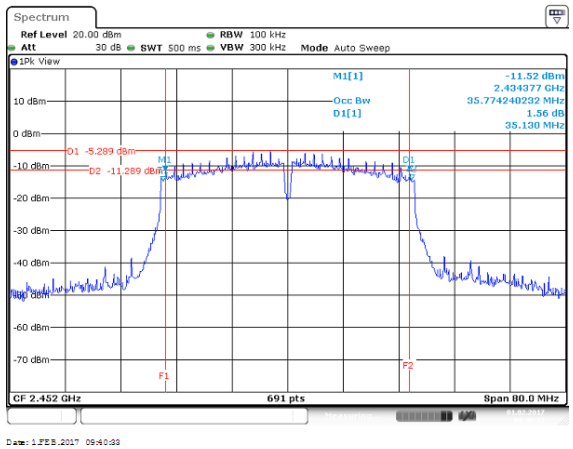
IEEE 802.11b mode- chain 0	
Low CH	**Mid CH**
	
High CH	
	

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

4.3 OUTPUT POWER MEASUREMENT

4.3.1 Test Limit

According to §15.247(b)

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：

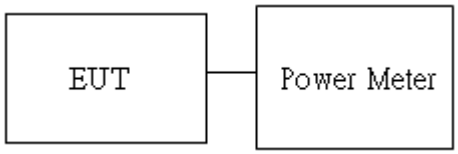
Average output power：For reporting purposes only.

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	21	-	19.65	-	19.65	0.0923	30
	Mid	2437	21	-	19.55	-	19.55	0.0902	
	High	2462	21	-	19.61	-	19.61	0.0914	
IEEE 802.11g Data rate: 6Mbps	Low	2412	1F	-	24.96	-	24.96	0.3133	
	Mid	2437	22	-	25.09	-	25.09	0.3228	
	High	2462	1F	-	25.27	-	25.27	0.3365	
IEEE 802.11n HT20 Data rate: MCS8	Low	2412	1E	1E	22.17	22.93	25.58	0.3614	
	Mid	2437	21	21	23.70	24.33	27.04	0.5058	
	High	2462	1F	1F	22.63	23.19	25.93	0.3917	
IEEE 802.11n HT40 Data rate: MCS8	Low	2422	18	18	20.05	20.29	23.18	0.2080	
	Mid	2437	21	21	23.84	24.63	27.26	0.5321	
	High	2452	1A	1A	21.54	21.33	24.45	0.2786	

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	17.64	-	17.64
	Mid	2437	17.57	-	17.57
	High	2462	17.62	-	17.62
IEEE 802.11g Data rate: 6Mbps	Low	2412	16.52	-	16.52
	Mid	2437	17.89	-	17.89
	High	2462	16.71	-	16.71
IEEE 802.11n HT20 Data rate: MCS8	Low	2412	13.95	14.27	17.12
	Mid	2437	15.58	15.85	18.73
	High	2462	14.32	14.82	17.59
IEEE 802.11n HT40 Data rate: MCS8	Low	2422	10.31	10.76	13.55
	Mid	2437	15.33	15.95	18.66
	High	2452	11.61	12.01	14.82

4.4 POWER SPECTRAL DENSITY

4.4.1 Test Limit

According to §15.247(e)

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.

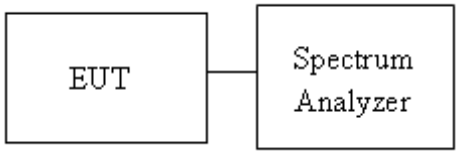
Limit	☒ Antenna not exceed 6 dBi：8dBm ☐ Antenna with DG greater than 6 dBi： [Limit = 8 – (DG – 6)] ☐ Point-to-point operation：

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

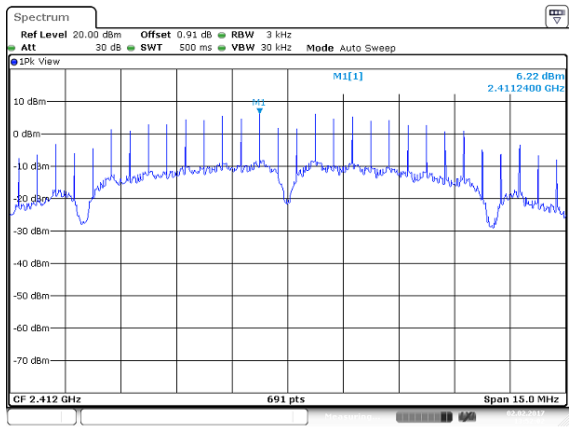
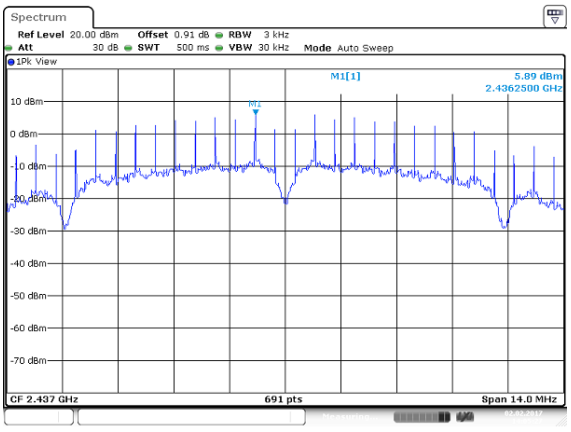
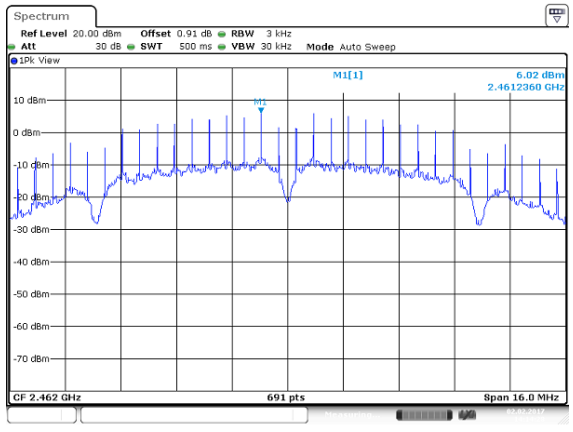
Test mode: IEEE 802.11b mode / 2412-2462 MHz					
Channel	**Frequency (MHz)**	**Chain 0 PPSD (dBm)**	**Chain 1 PPSD (dBm)**	**Total PSSD (dBm)**	**Limit (dBm)**
Low	2412	6.22	-	6.22	8
Mid	2437	5.89	-	5.89	
High	2462	6.02	-	6.02	

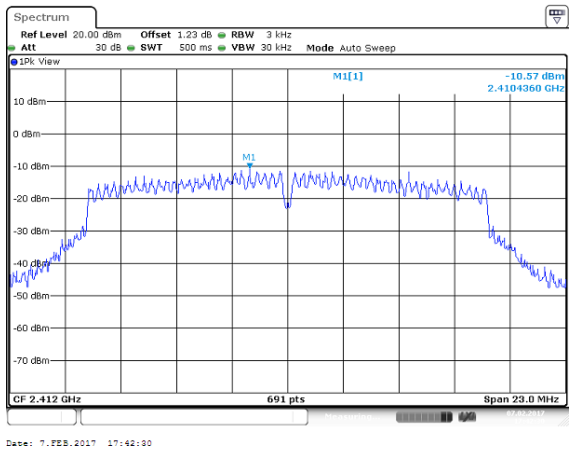
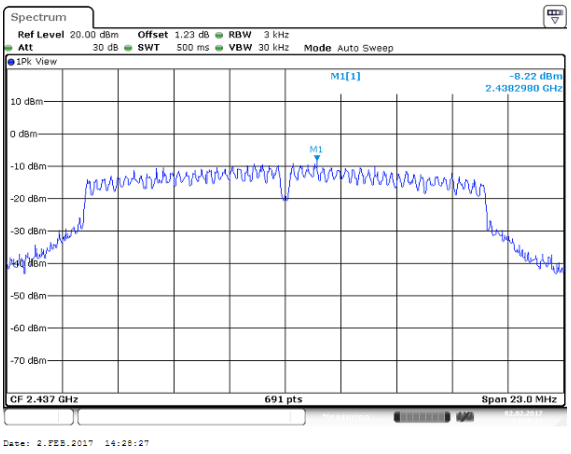
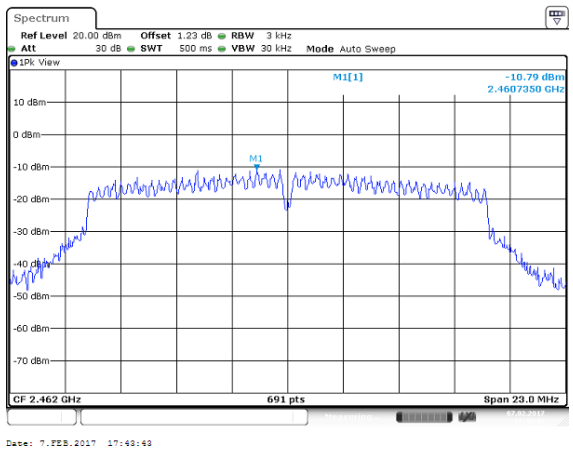
Test mode: IEEE 802.11g mode / 2412-2462 MHz					
Channel	**Frequency (MHz)**	**Chain 0 PPSD (dBm)**	**Chain 1 PPSD (dBm)**	**Total PSSD (dBm)**	**Limit (dBm)**
Low	2412	-10.57	-	-10.57	8
Mid	2437	-8.22	-	-8.22	
High	2462	-10.79	-	-10.79	

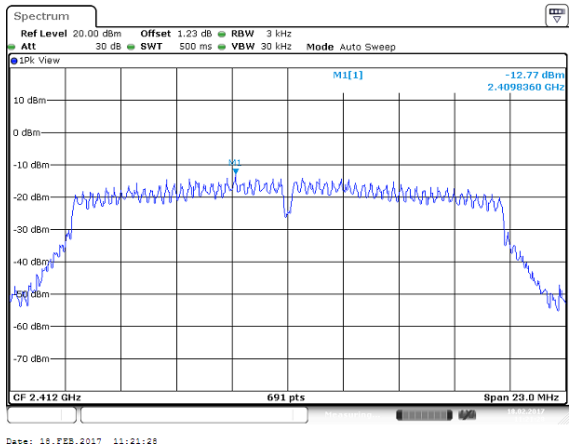
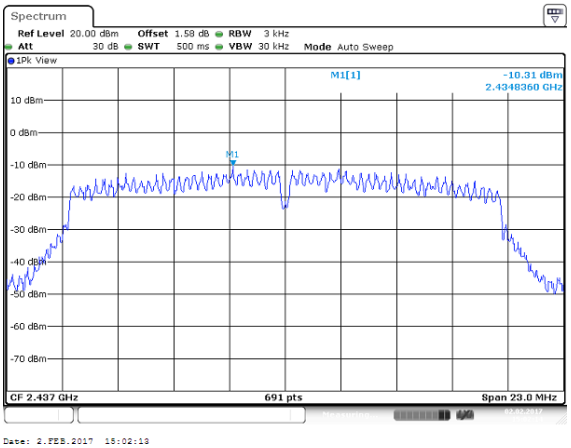
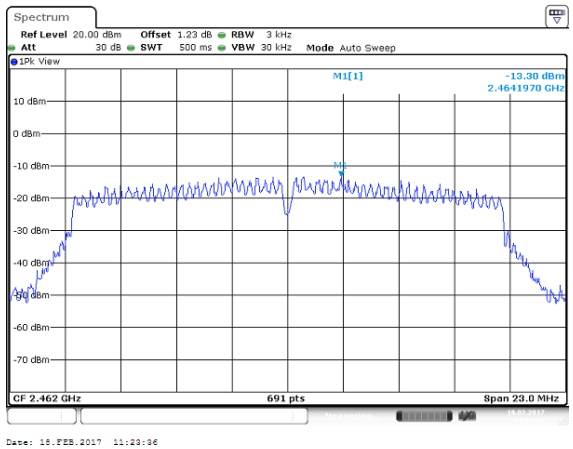
Test mode: IEEE 802.11n HT 20 MHz mode / 2412-2462 MHz					
Channel	**Frequency (MHz)**	**Chain 0 PPSD (dBm)**	**Chain 1 PPSD (dBm)**	**Total PSSD (dBm)**	**Limit (dBm)**
Low	2412	-12.77	-12.35	-9.54	8
Mid	2437	-10.31	-9.27	-6.75	
High	2462	-13.30	-12.18	-9.69	

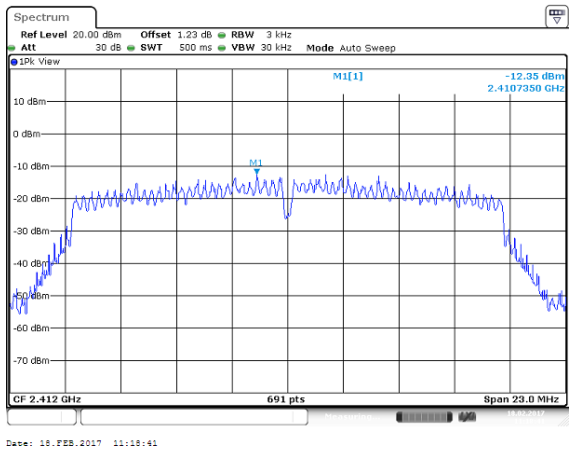
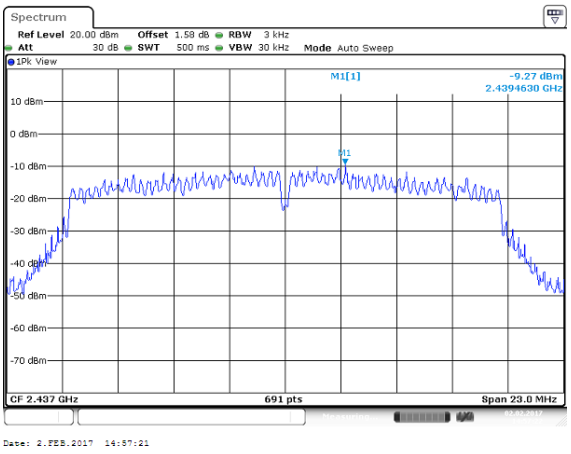
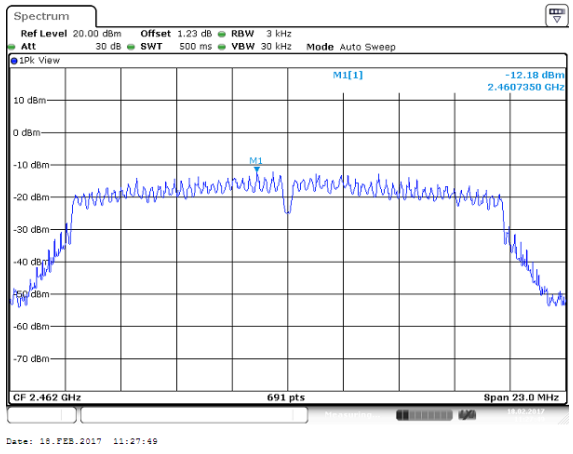
Test mode: IEEE 802.11n HT 40 MHz mode / 2422-2452 MHz					
Channel	**Frequency (MHz)**	**Chain 0 PPSD (dBm)**	**Chain 1 PPSD (dBm)**	**Total PSSD (dBm)**	**Limit (dBm)**
Low	2422	-17.73	-15.88	-13.70	8
Mid	2437	-12.14	-10.85	-8.44	
High	2452	-16.15	-14.51	-12.24	

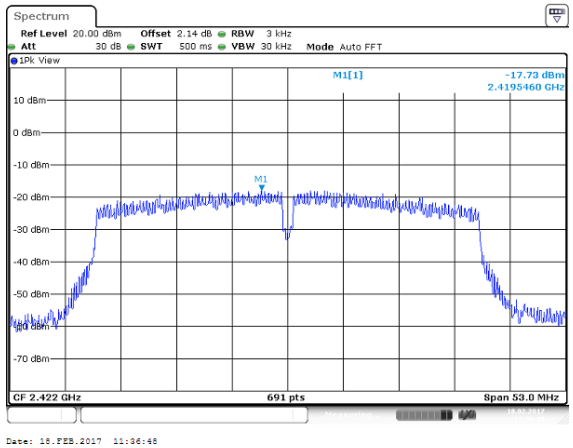
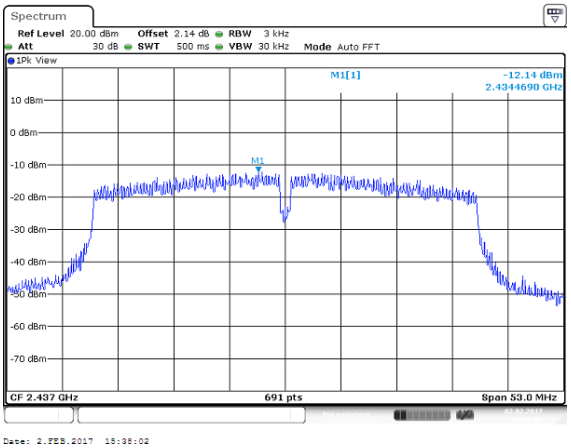
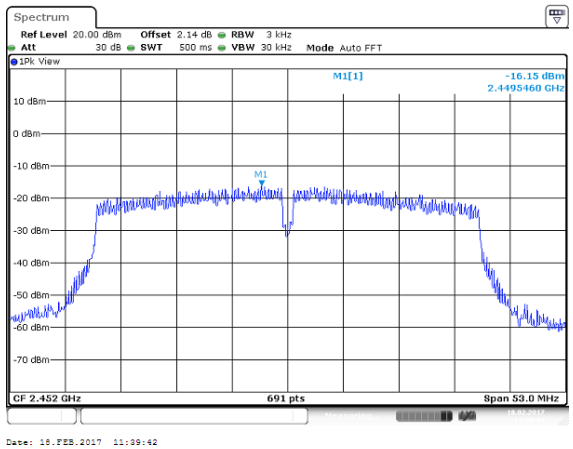
Test Data

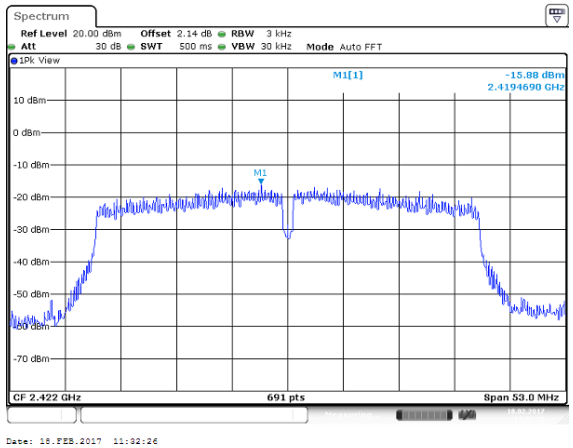
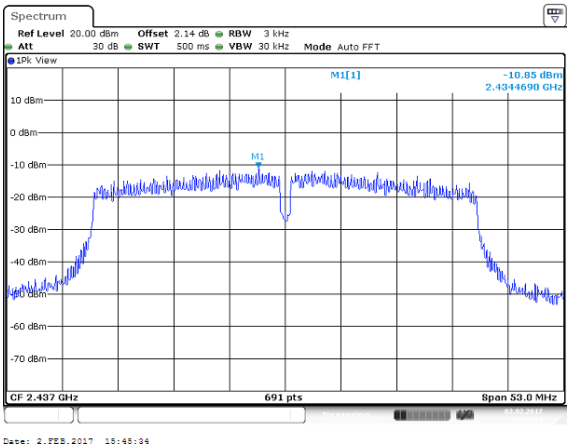
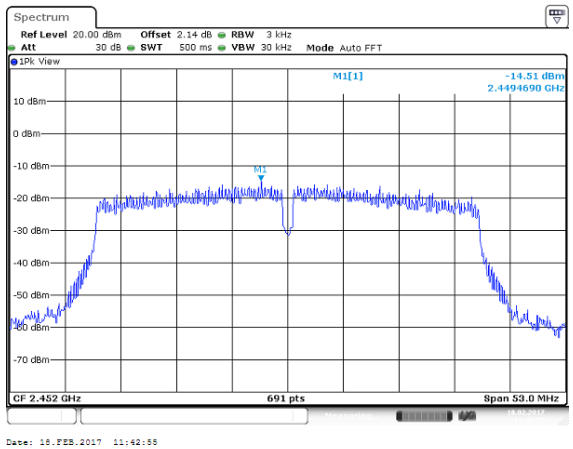
IEEE 802.11b mode- chain 0	
Low CH	**Mid CH**
	
High CH	
	

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)

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

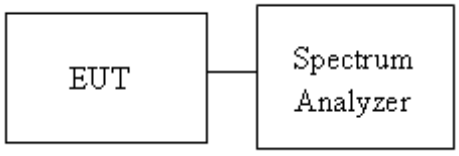
Test method Refer as KDB 558074 D01 v03r05, Section 11.

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.

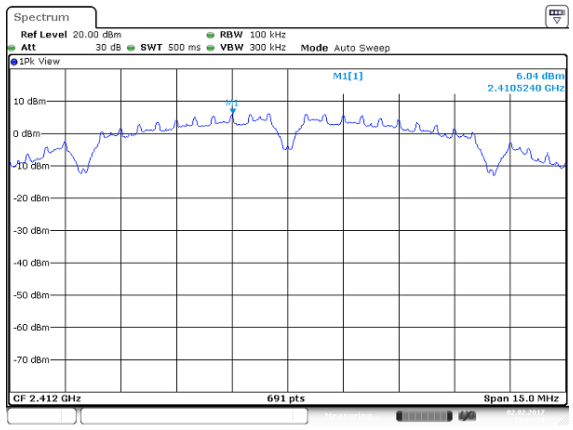
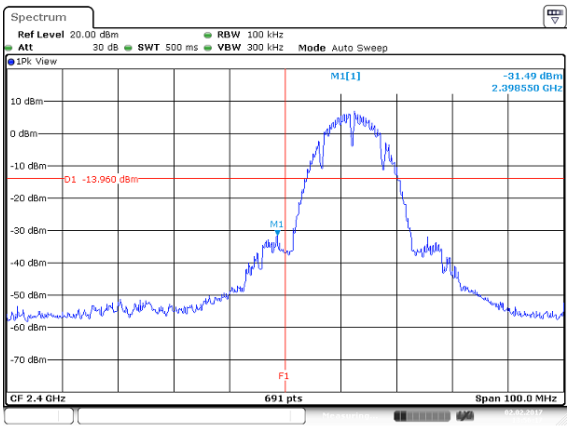
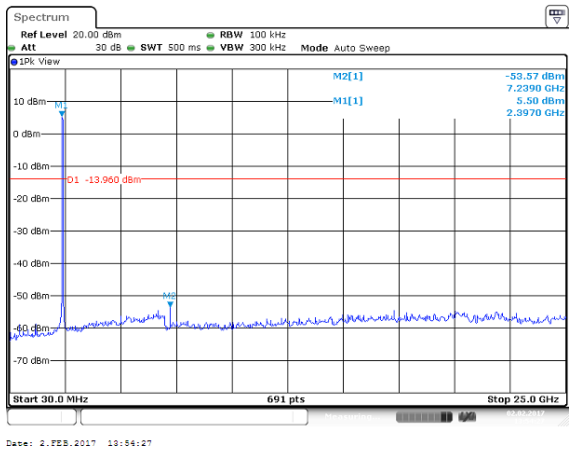
3. In any 100 kHz bandwidth outside the authorized frequency band, shall be attenuated at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when conducted power procedure is used. f the transmitter complies with the conducted power limits based on the use of RMS averaging over a time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

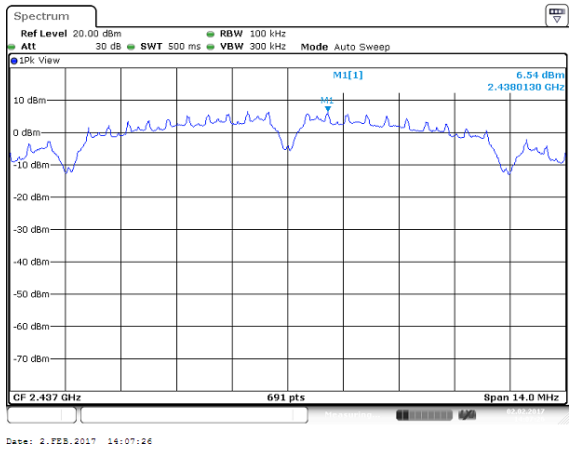
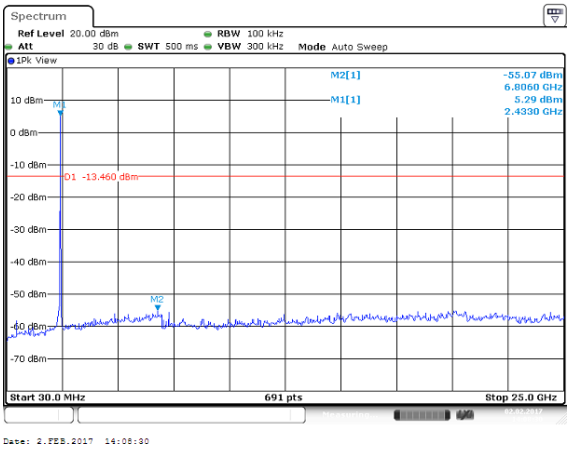
4.5.3 Test Setup

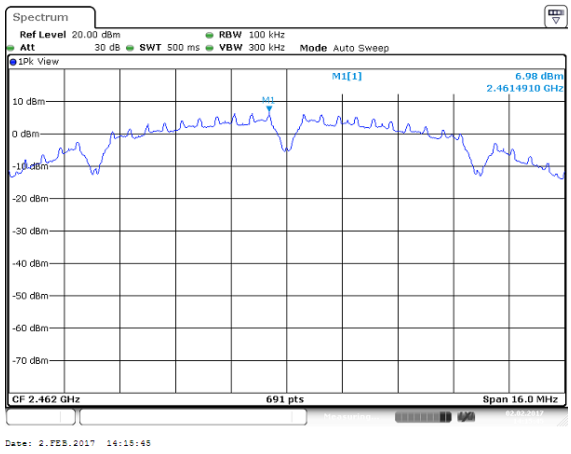
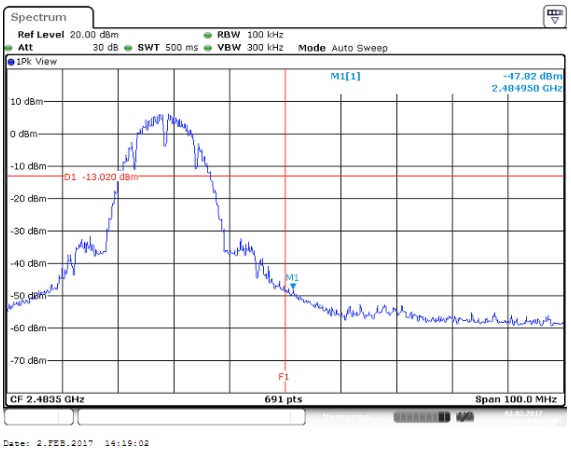
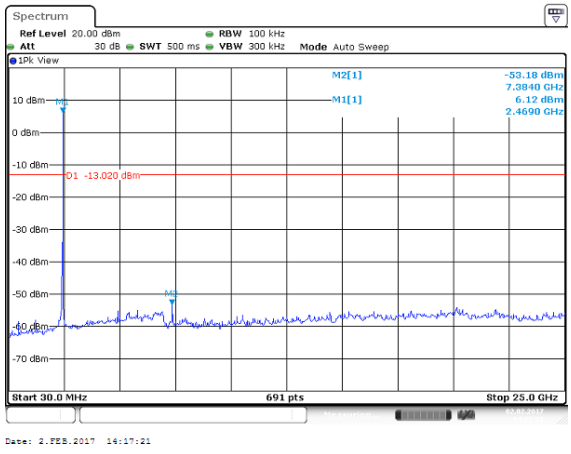


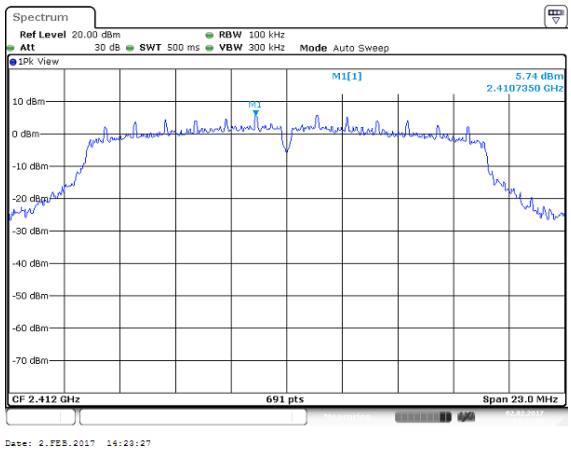
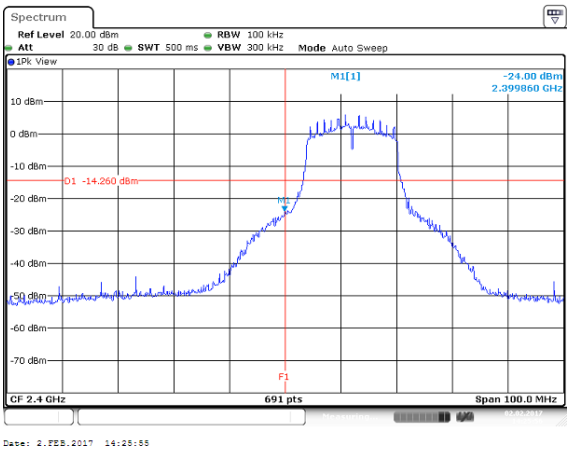
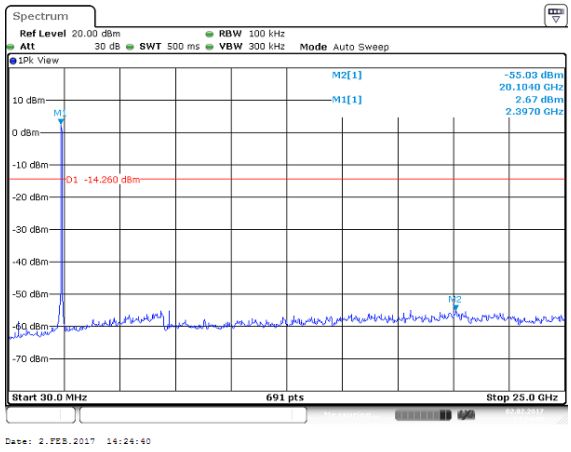
4.5.4 Test Result

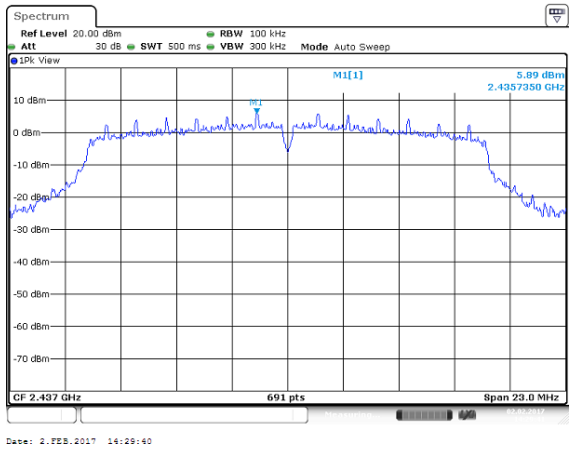
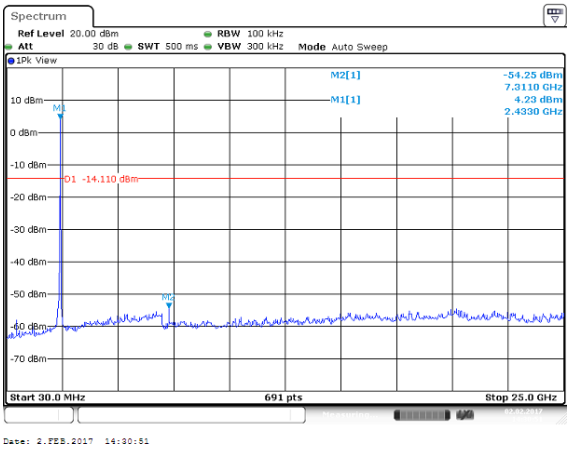
Test Data

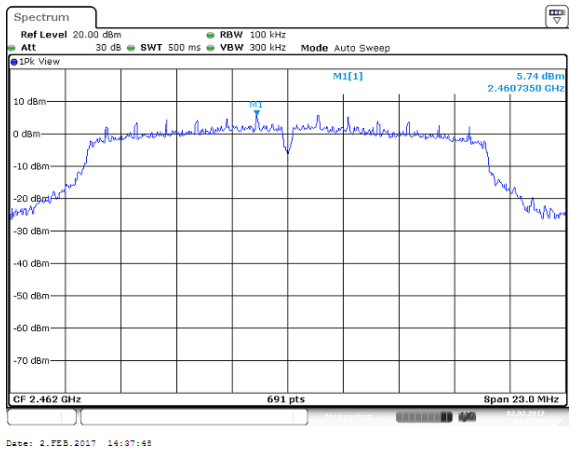
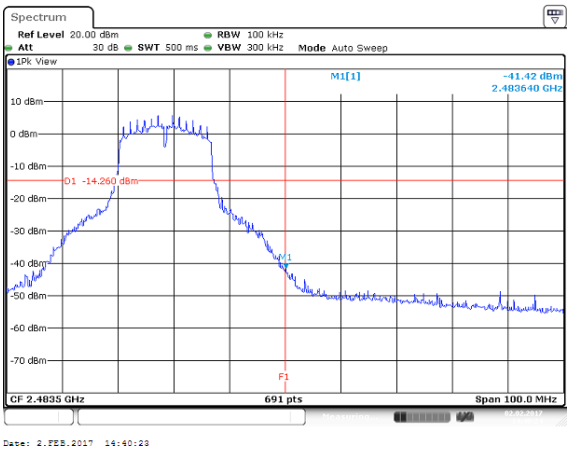
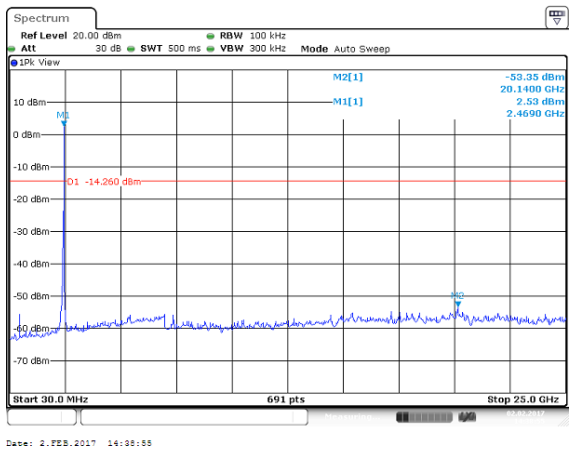
IEEE 802.11b mode Low CH chain 0	
Reference Level of PSD in 100kHz	**Band Edge**
	
Spurious Emission 30MHz-25GHz	
	

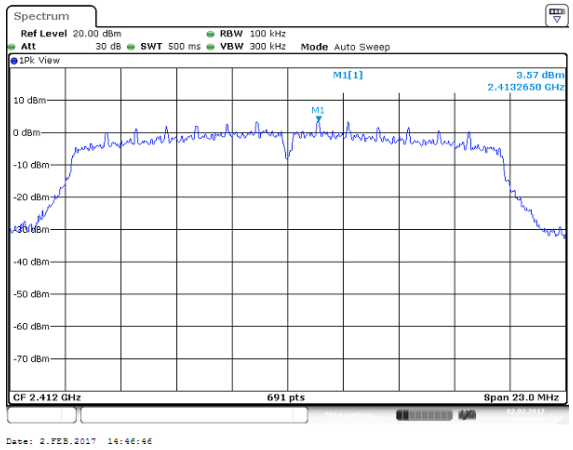
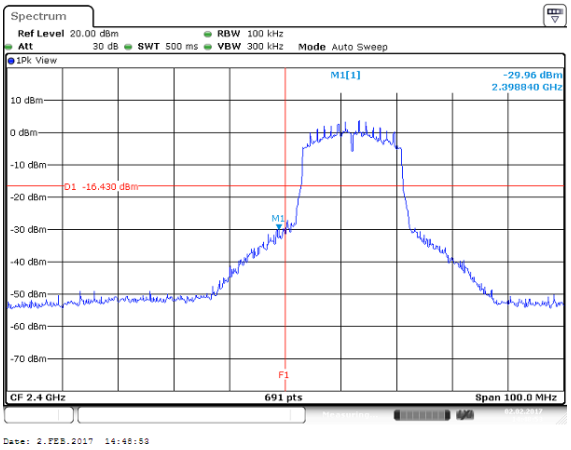
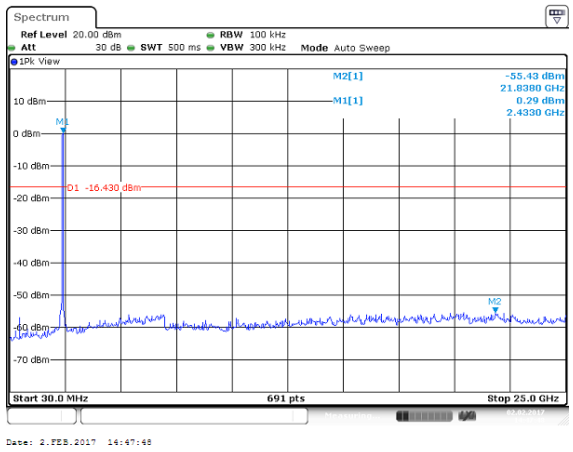
IEEE 802.11b mode Mid CH chain 0	
Reference Level of PSD in 100kHz	**Spurious Emission 30MHz-25GHz**
	

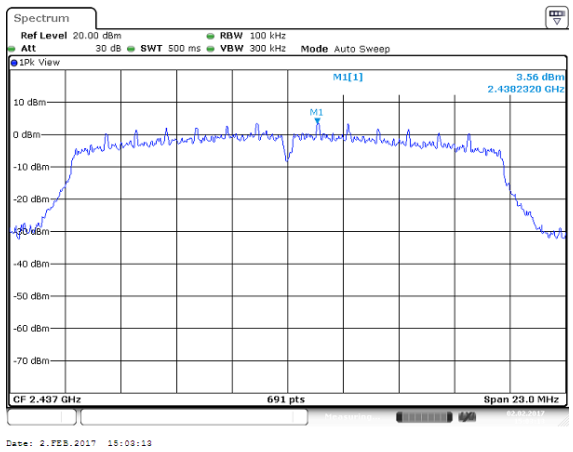
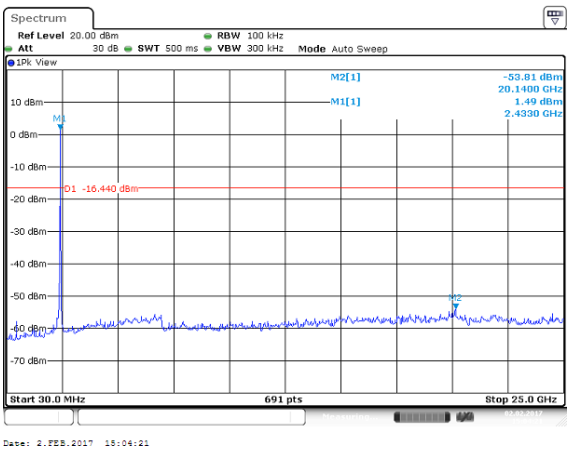
IEEE 802.11b mode High CH chain 0	
Reference Level of PSD in 100kHz	**Band Edge**
	
Spurious Emission 30MHz-25GHz	
	

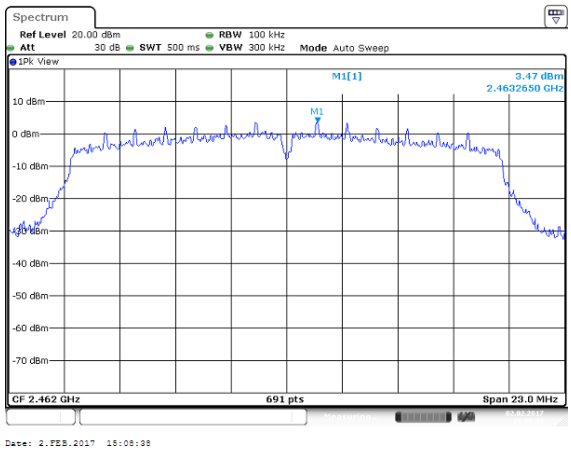
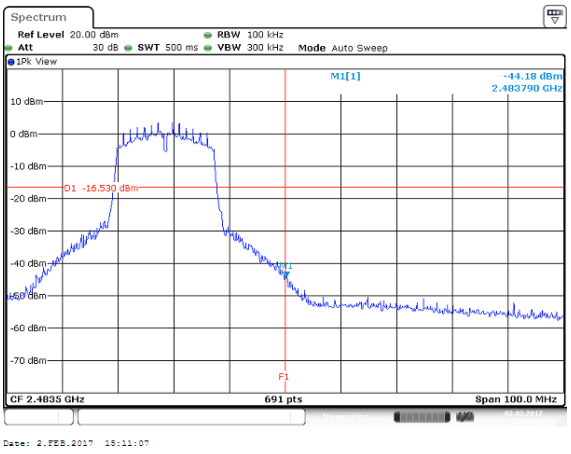
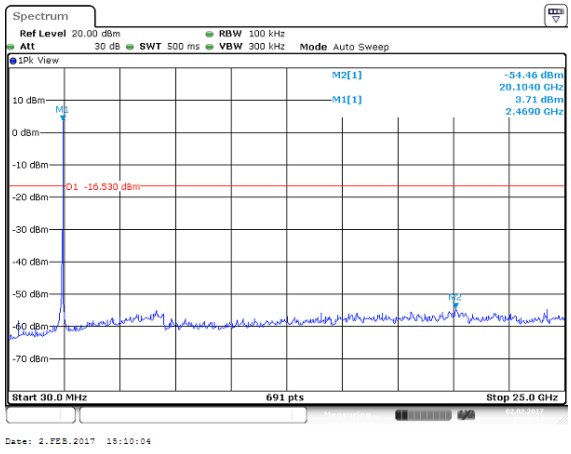
IEEE 802.11g mode Low CH chain 0	
Reference Level of PSD in 100kHz	**Band Edge**
	
Spurious Emission 30MHz-25GHz	
	

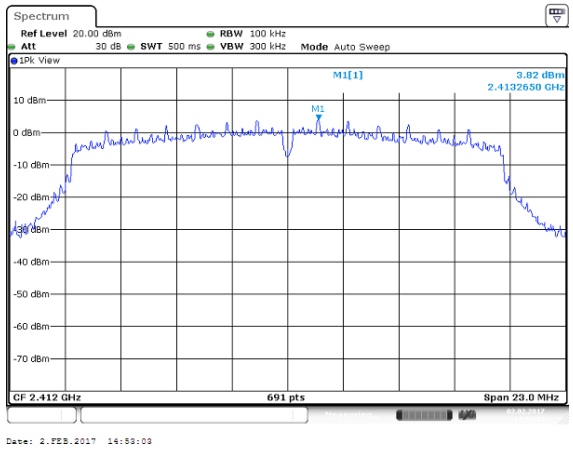
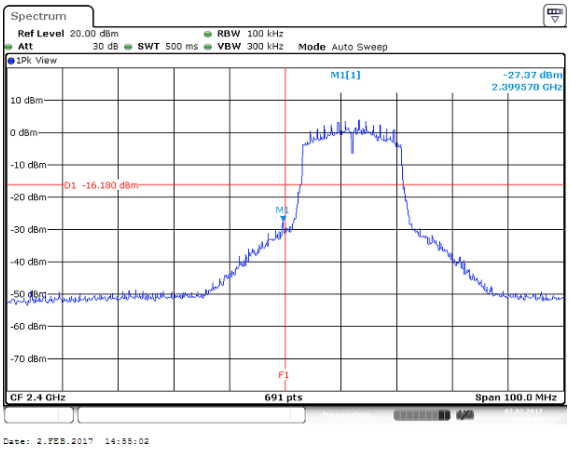
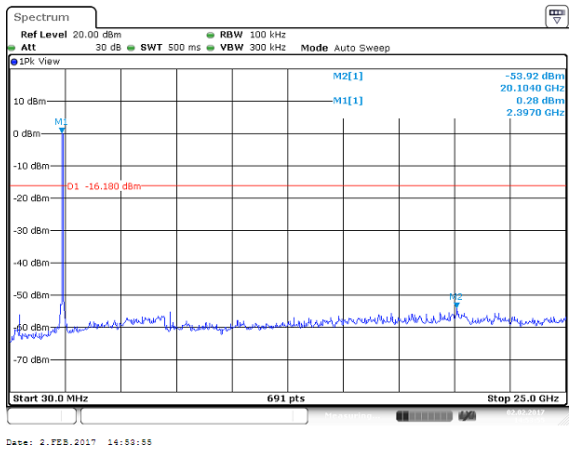
IEEE 802.11g mode Mid CH chain 0	
Reference Level of PSD in 100kHz	**Spurious Emission 30MHz-25GHz**
	

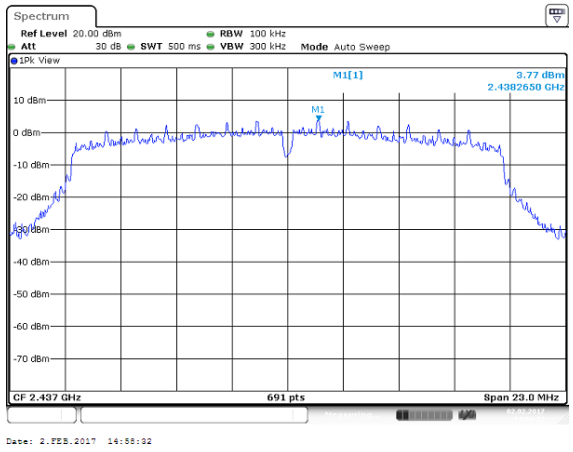
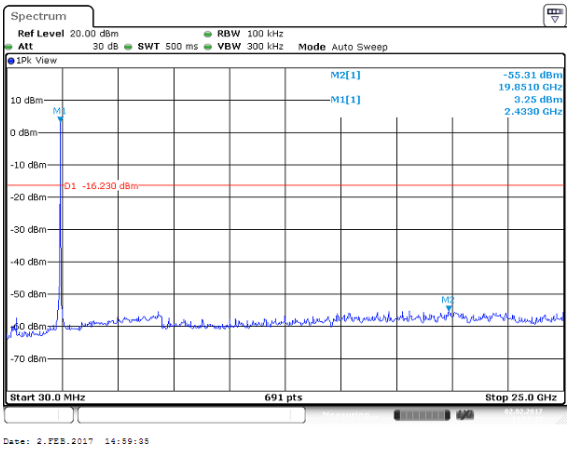
IEEE 802.11g mode High CH chain 1	
Reference Level of PSD in 100kHz	**Band Edge**
	
Spurious Emission 30MHz-25GHz	
	

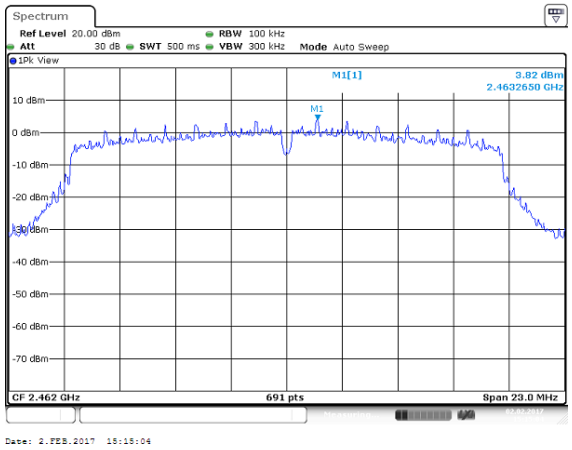
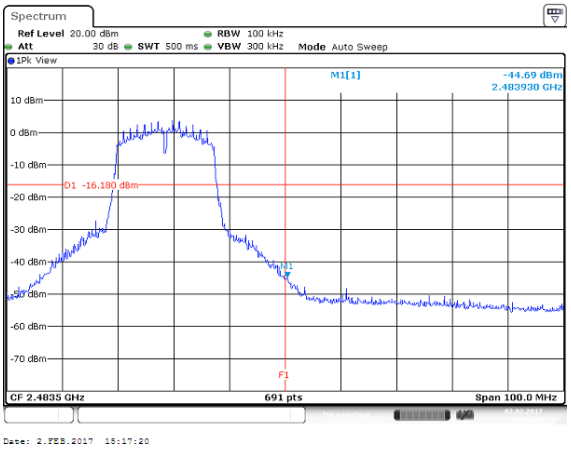
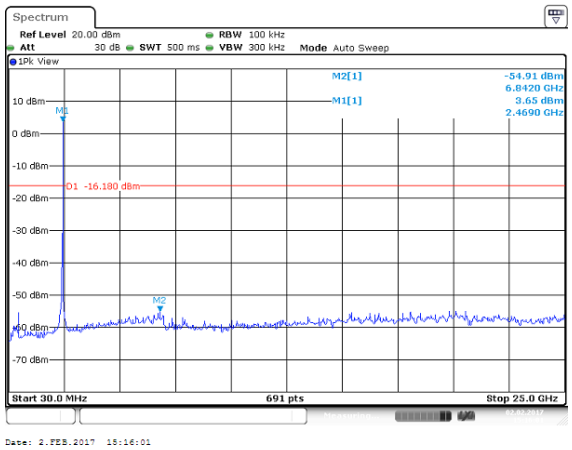
IEEE 802.11 n HT20 mode Low CH chain 0	
Reference Level of PSD in 100kHz	**Band Edge**
	
Spurious Emission 30MHz-25GHz	
	

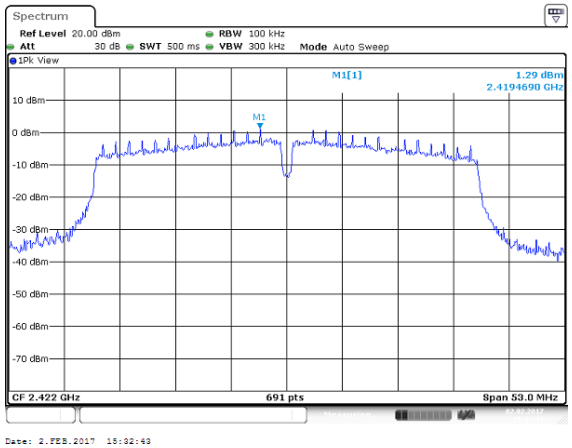
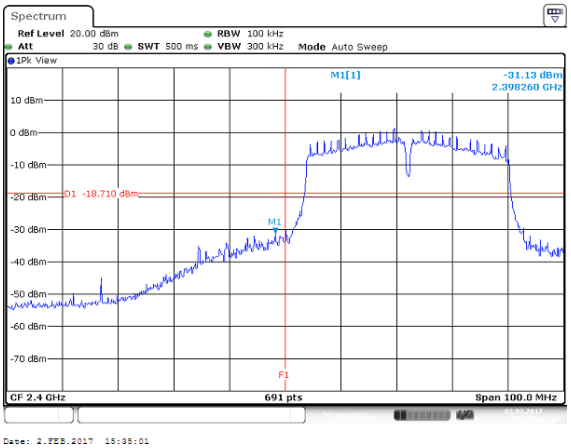
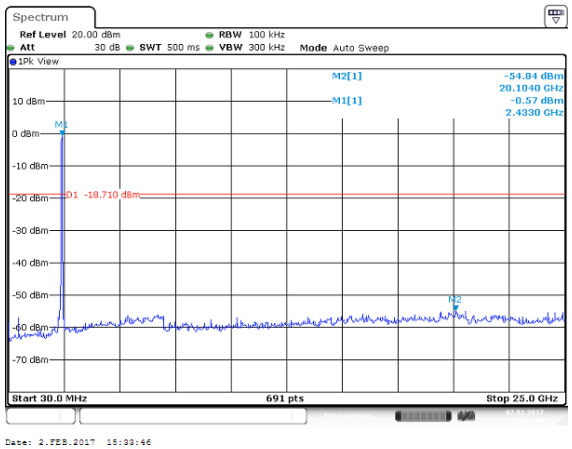
IEEE 802.11 n HT20 mode Mid CH chain 0	
Reference Level of PSD in 100kHz	**Spurious Emission 30MHz-25GHz**
	

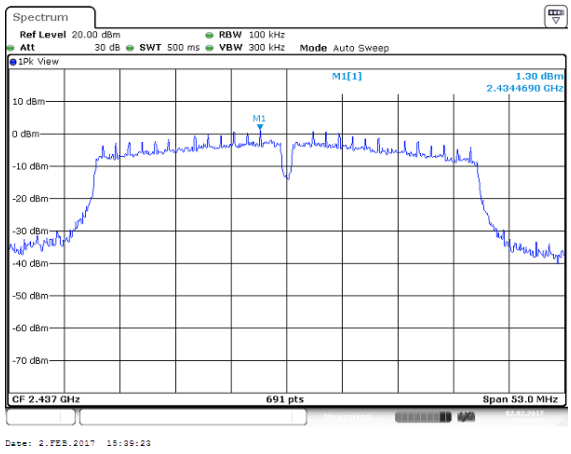
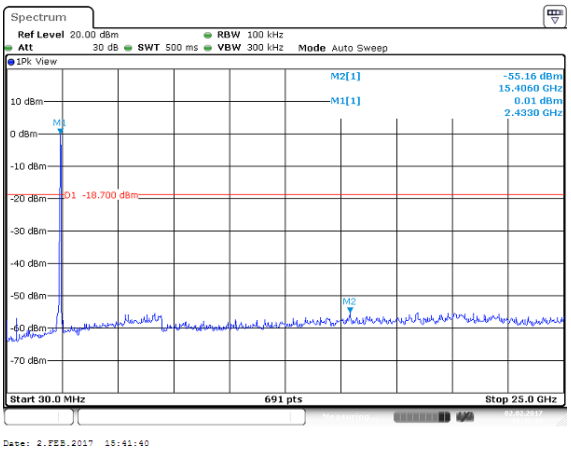
IEEE 802.11n HT20 mode High CH chain 0	
Reference Level of PSD in 100kHz	**Band Edge**
	
Spurious Emission 30MHz-25GHz	
	

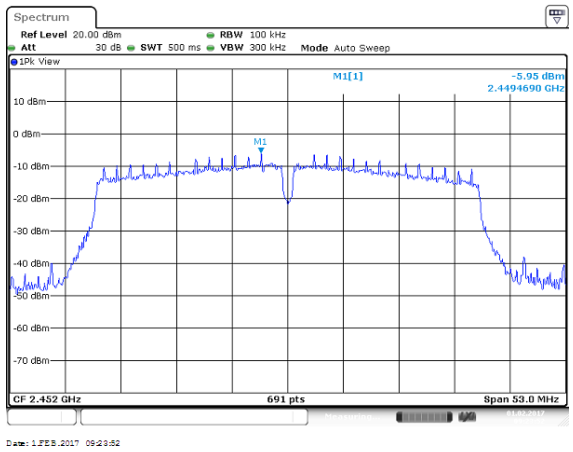
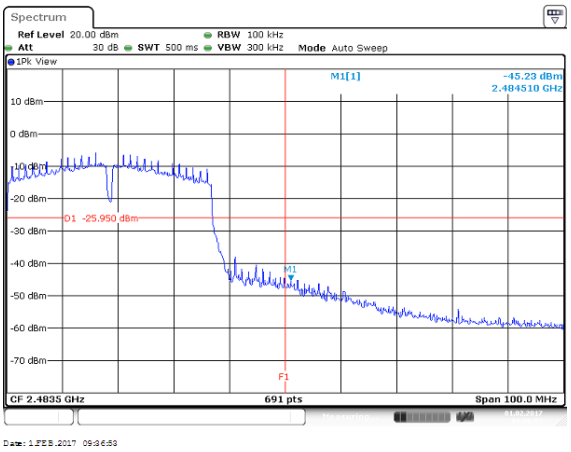
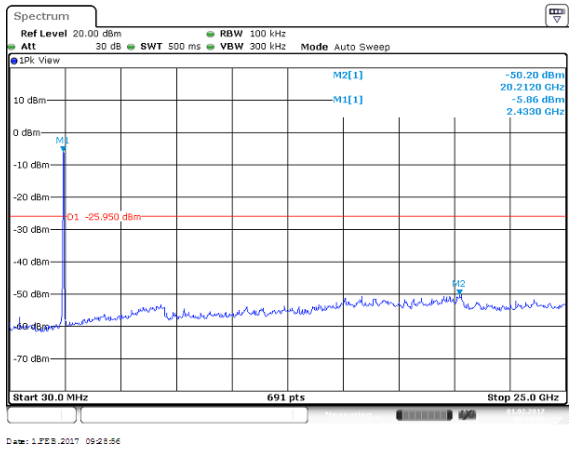
IEEE 802.11 n HT20 mode Low CH chain 1	
Reference Level of PSD in 100kHz	**Band Edge**
	
Spurious Emission 30MHz-25GHz	
	

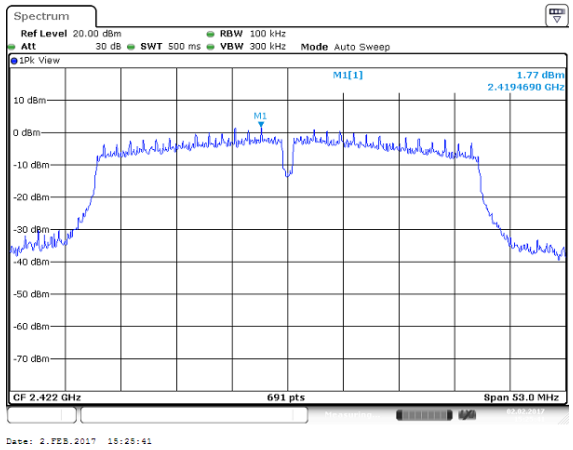
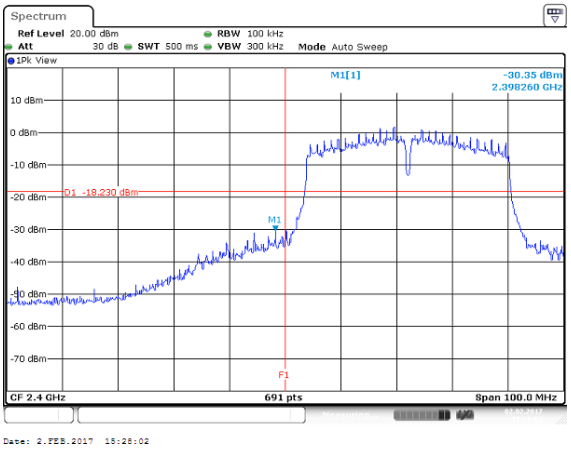
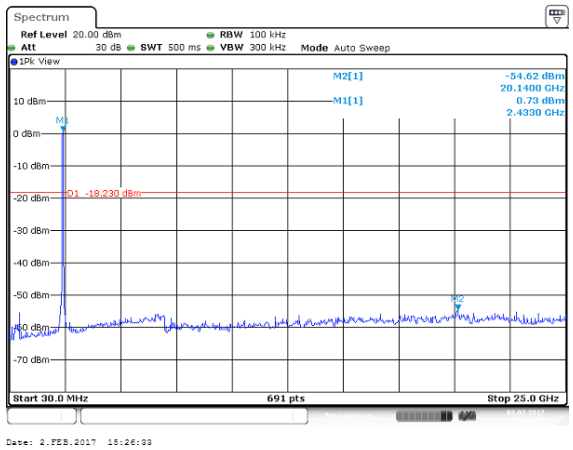
IEEE 802.11 n HT20 mode Mid CH chain 1	
Reference Level of PSD in 100kHz	**Spurious Emission 30MHz-25GHz**
	

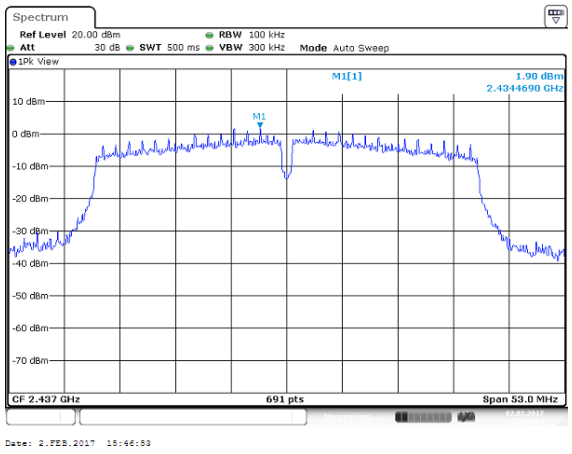
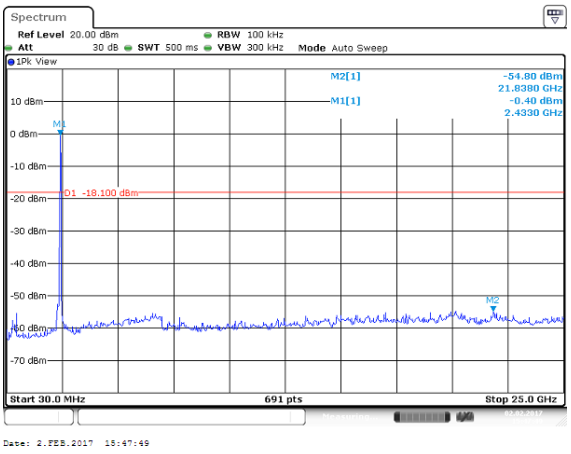
IEEE 802.11n HT20 mode High CH chain 1	
Reference Level of PSD in 100kHz	**Band Edge**
	
Spurious Emission 30MHz-25GHz	
	

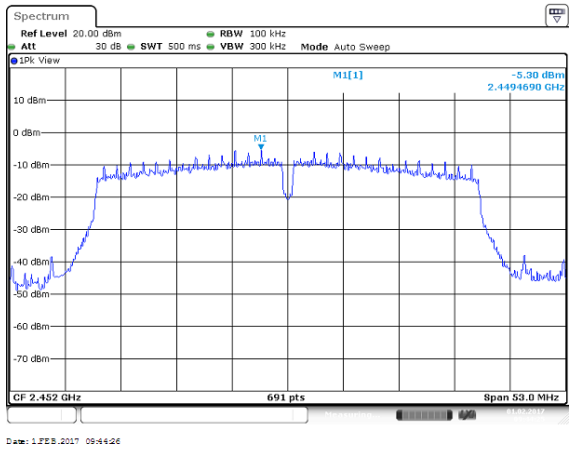
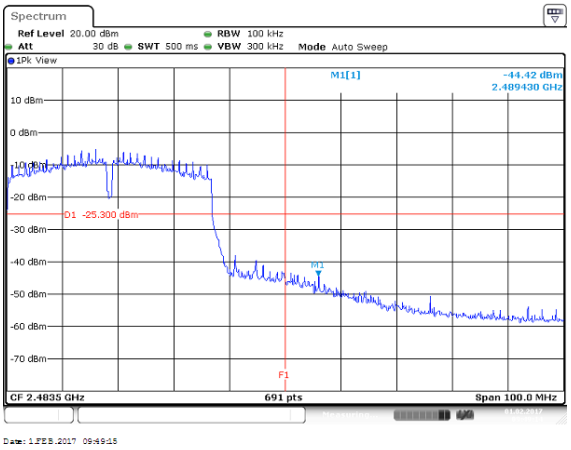
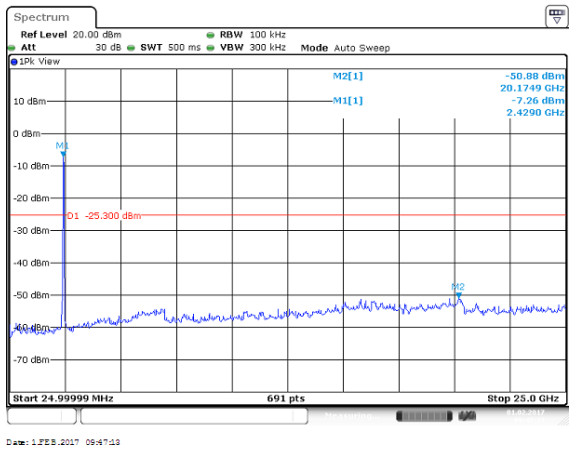
IEEE 802.11 n HT40 mode Low CH chain 0	
Reference Level of PSD in 100kHz	**Band Edge**
	
Spurious Emission 30MHz-25GHz	
	

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,

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.

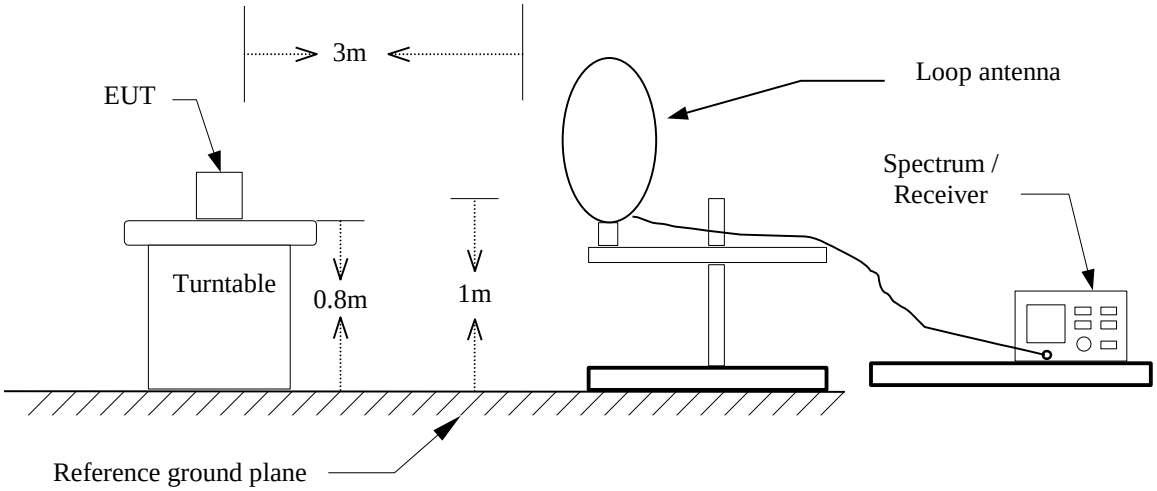
(2.2) For Average measurement：RBW = 1MHz, VBW

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

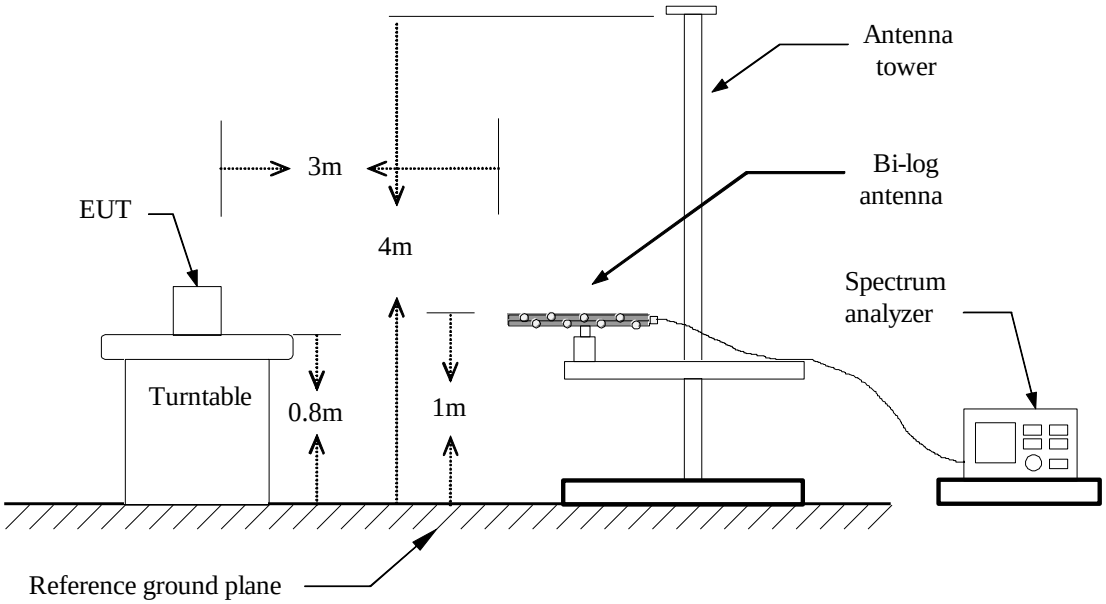
Configuration	Duty Cycle (%)	VBW
802.11b	100%	10Hz
802.11g	100%	10Hz
802.11n HT20	100%	10Hz
802.11n HT40	100%	10Hz

4.6.3 Test Setup

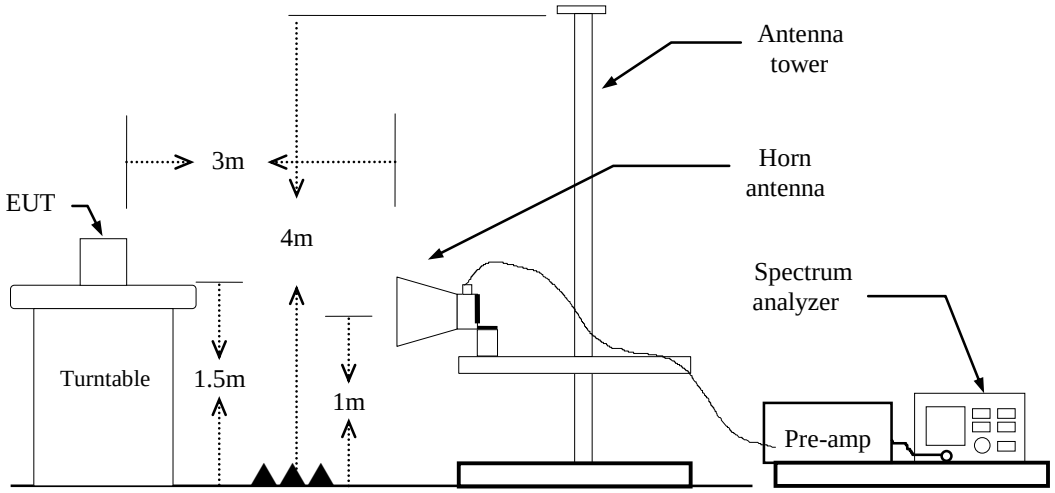
9kHz ~ 30MHz



30MHz ~ 1GHz



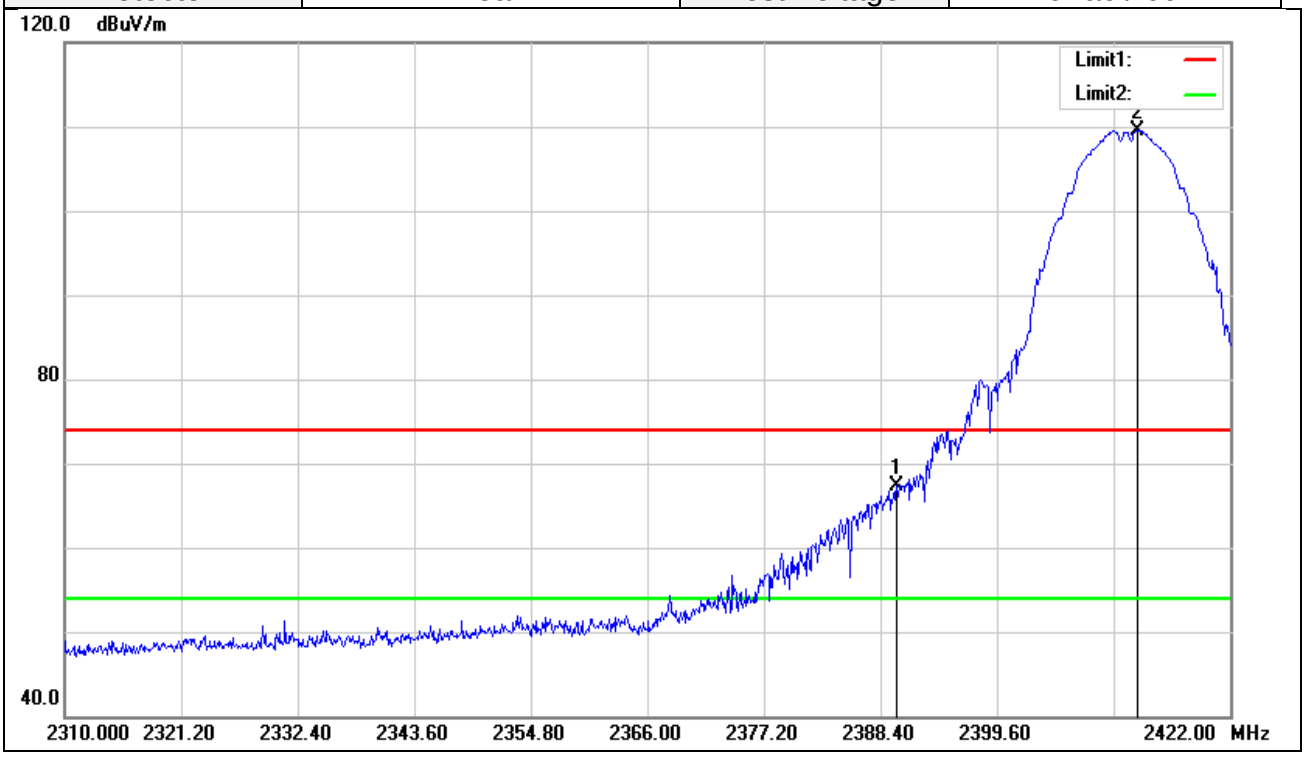
Above 1 GHz



4.6.4 Test Result

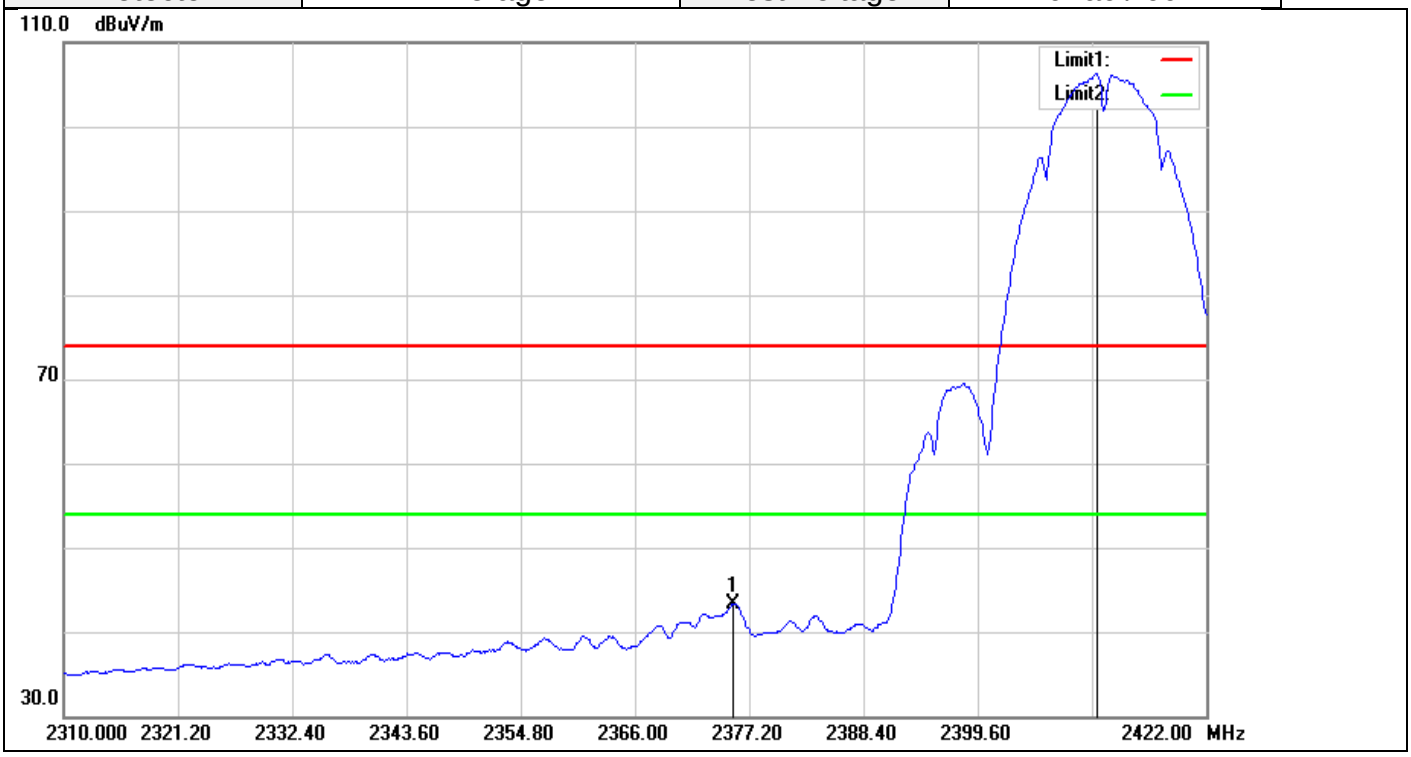
Band Edge Test Data

Test Mode	IEEE 802.11b Low CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Band Edge	Test Date	2017/2/6
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Peak	Test Voltage	120Vac / 60Hz



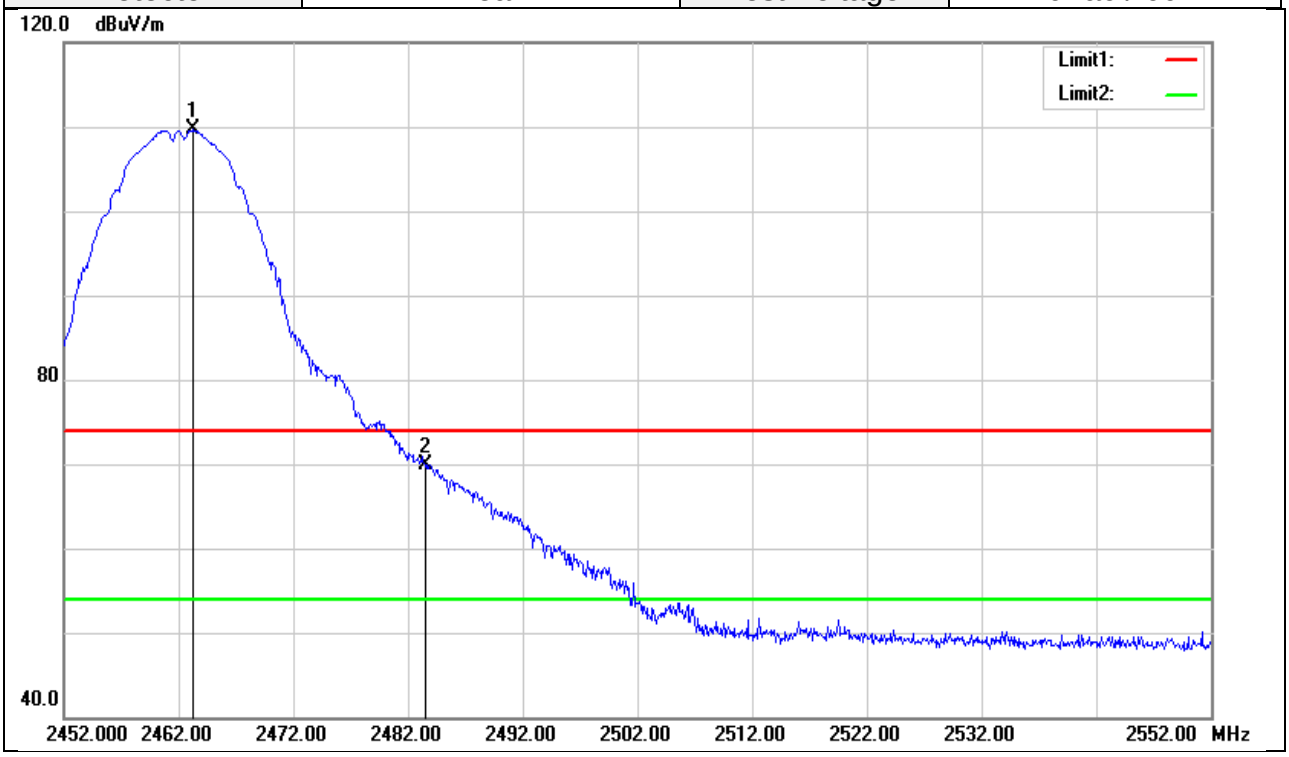
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2389.968	70.53	-3.28	67.25	74.00	-6.75	peak
2	2413.152	112.74	-3.23	109.51	-	-	peak

Test Mode	IEEE 802.11b Low CH	Temperature:	27(℃)/ 53%RH
Test Item	Band Edge	Test Date	2017/2/6
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Average	Test Voltage	120Vac / 60Hz



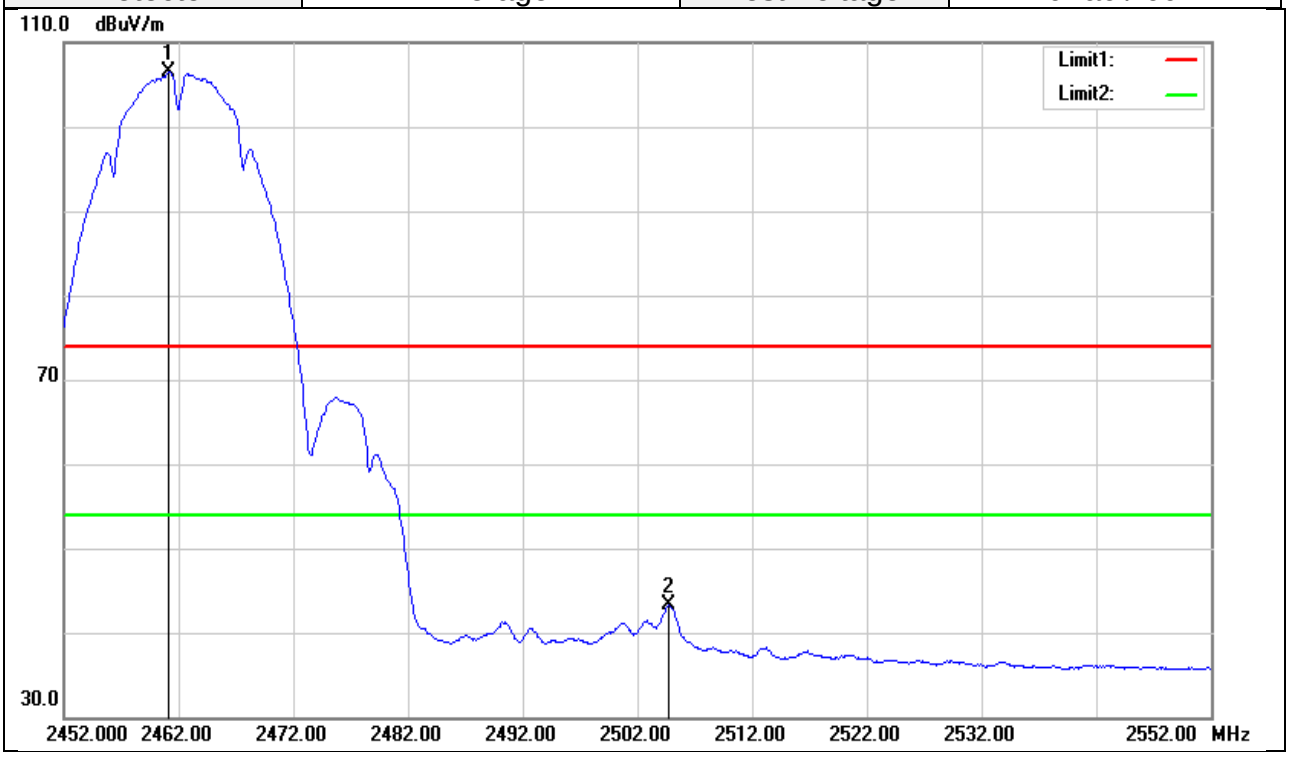
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2375.632	46.70	-3.38	43.32	54.00	-10.68	AVG
2	2411.248	109.50	-3.24	106.26	-	-	AVG

Test Mode	IEEE 802.11b High CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Band Edge	Test Date	2017/2/6
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Peak	Test Voltage	120Vac / 60Hz



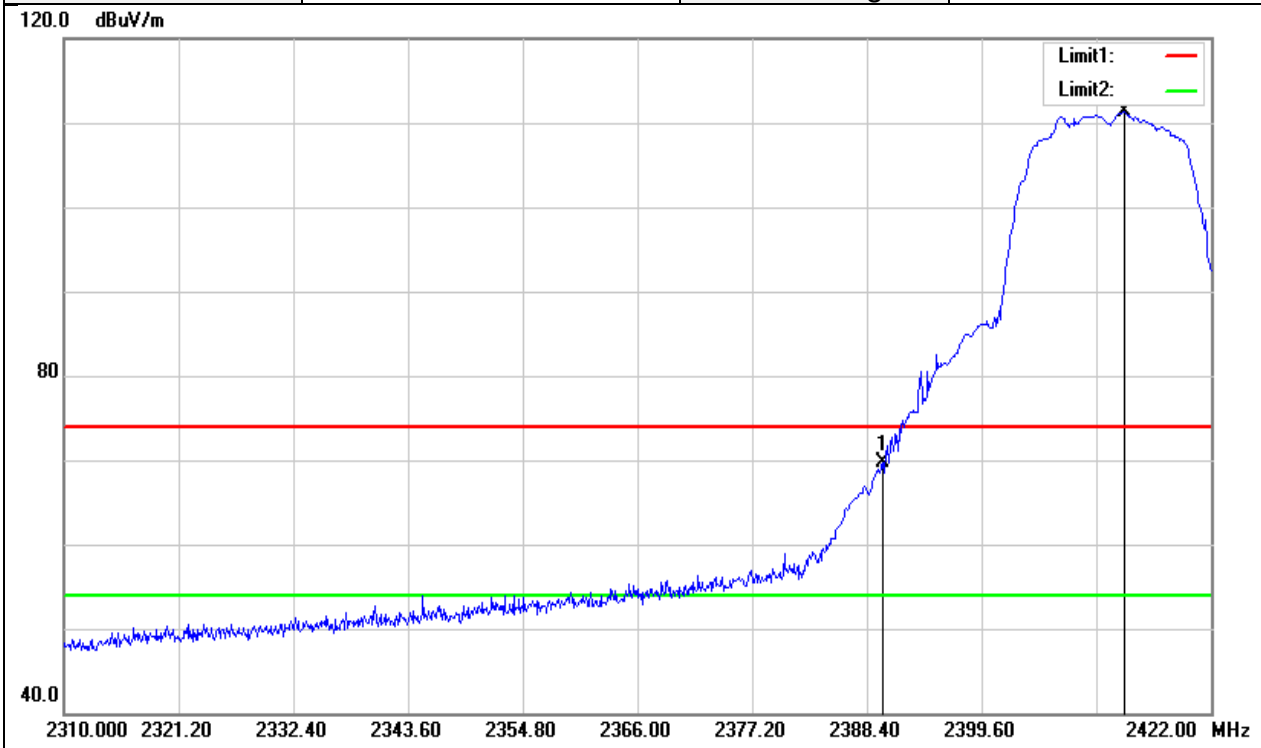
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2463.200	111.70	-2.09	109.61	-	-	peak
2	2483.500	71.83	-1.99	69.84	74.00	-4.16	peak

Test Mode	IEEE 802.11b High CH	Temperature:	27(℃)/ 53%RH
Test Item	Band Edge	Test Date	2017/2/6
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Average	Test Voltage	120Vac / 60Hz



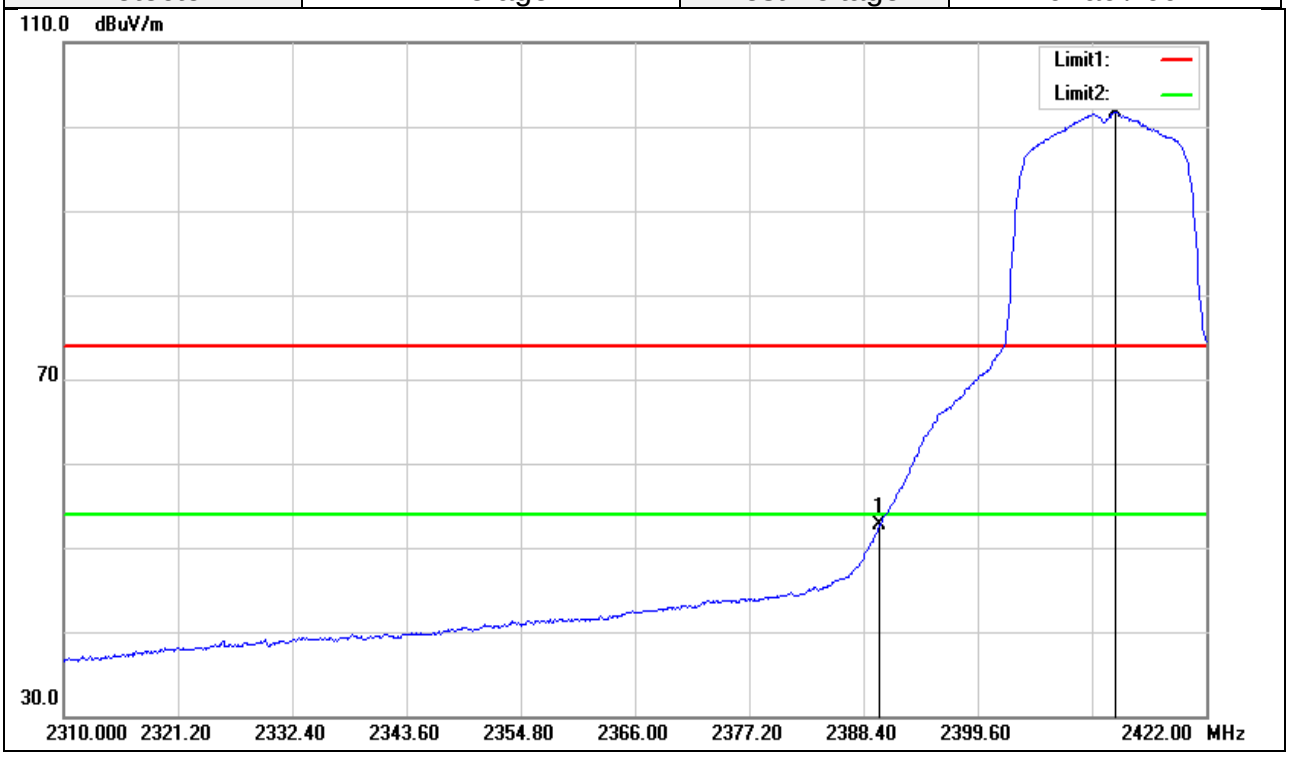
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2461.200	108.58	-2.10	106.48	-	-	AVG
2	2504.700	45.07	-1.85	43.22	54.00	-10.78	AVG

Test Mode	IEEE 802.11g Low CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Band Edge	Test Date	2017/2/6
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Peak	Test Voltage	120Vac / 60Hz



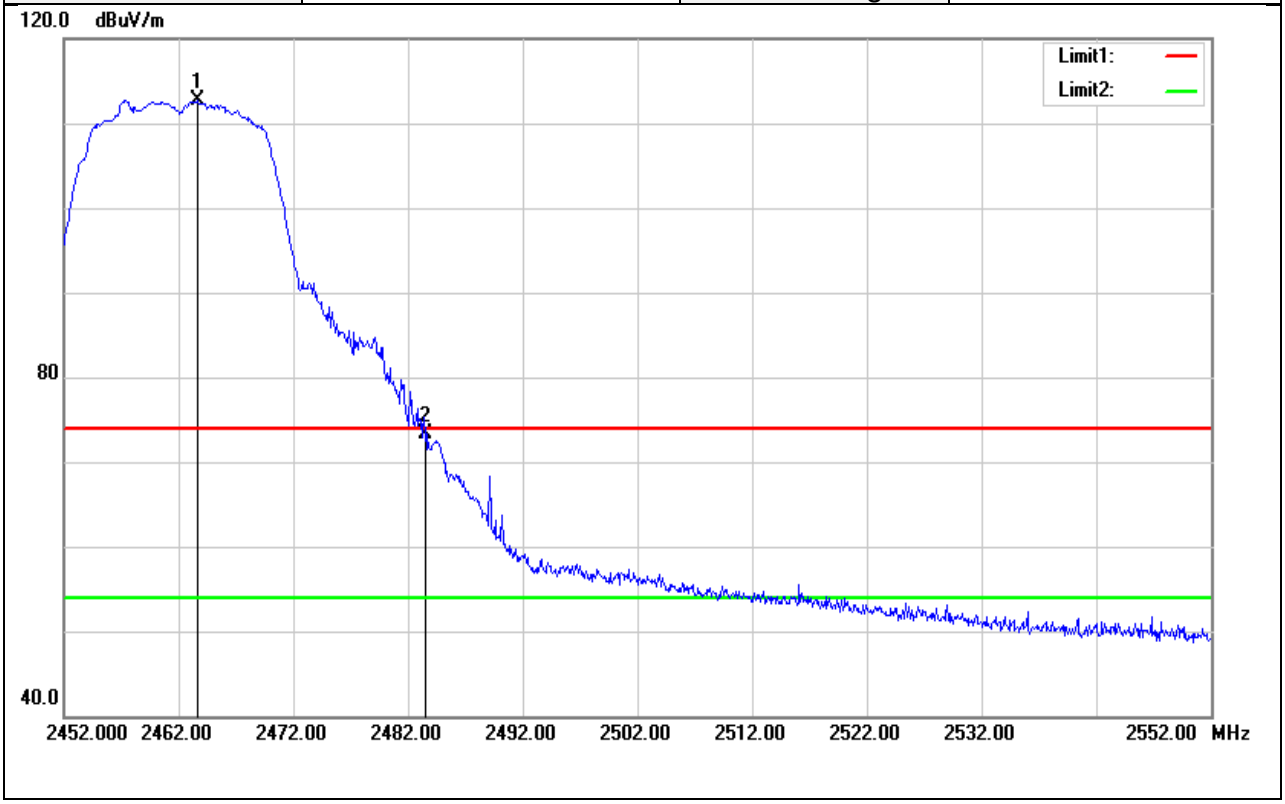
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2389.968	73.02	-3.28	69.74	74.00	-4.26	peak
2	2413.488	114.53	-3.23	111.30	-		peak

Test Mode	IEEE 802.11g Low CH	Temperature:	27(℃)/ 53%RH
Test Item	Band Edge	Test Date	2017/2/6
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Average	Test Voltage	120Vac / 60Hz



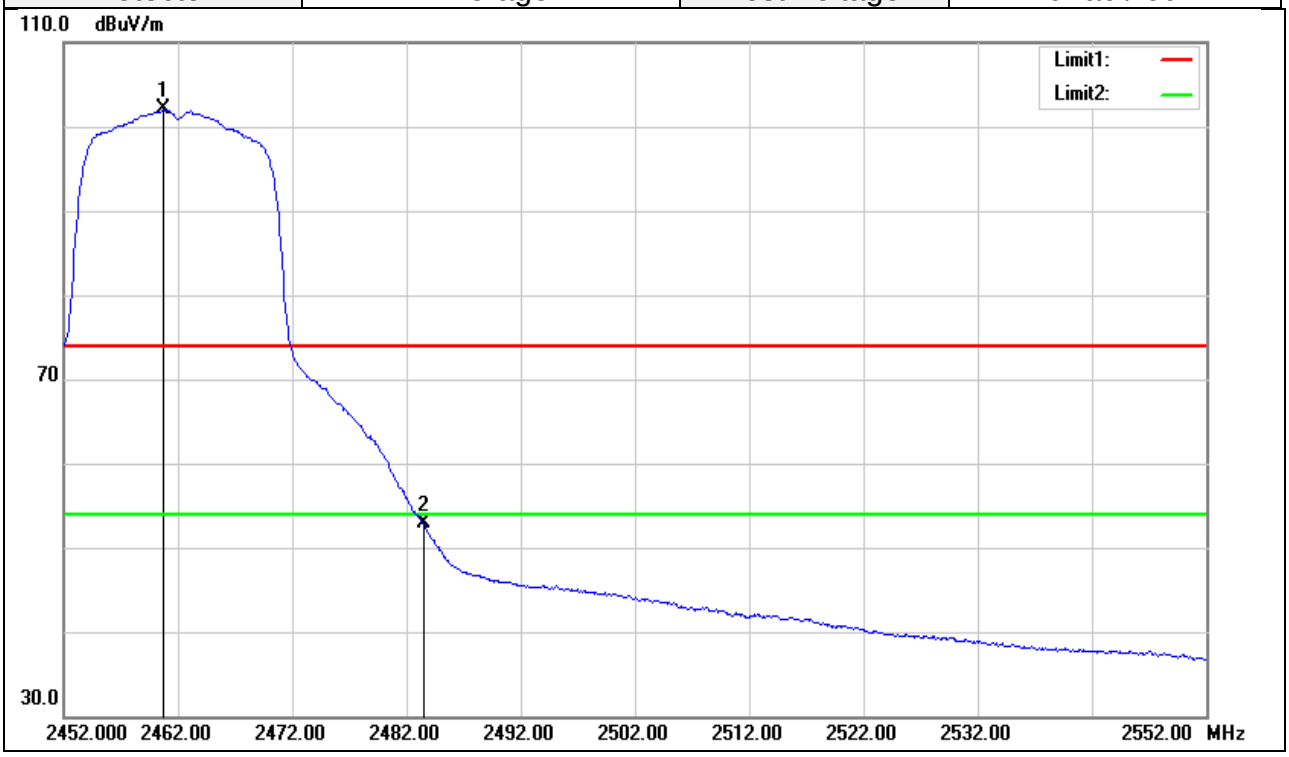
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	55.96	-3.28	52.68	54.00	-1.32	AVG
2	2413.040	104.98	-3.23	101.75	-	-	AVG

Test Mode	IEEE 802.11g High CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Band Edge	Test Date	2017/2/6
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Peak	Test Voltage	120Vac / 60Hz



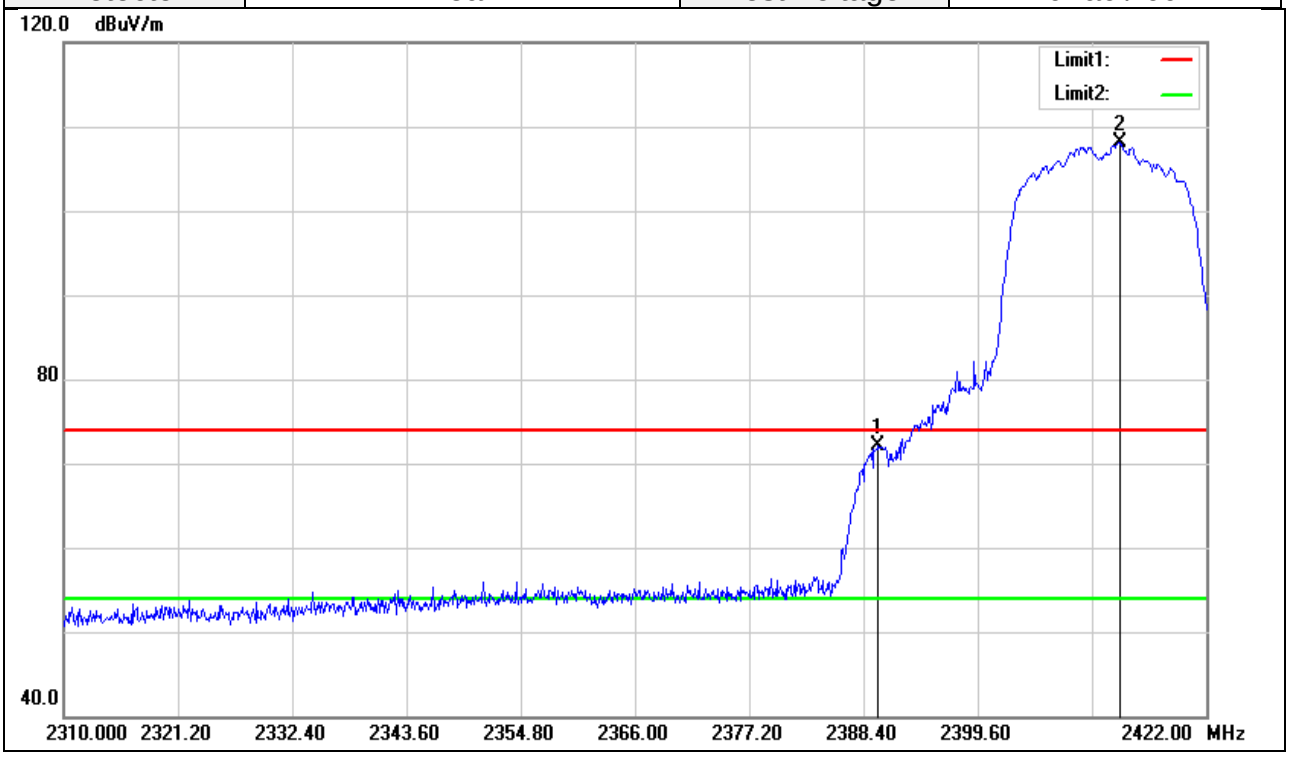
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2463.700	114.86	-2.09	112.77	-	-	peak
2	2483.500	75.29	-1.99	73.30	74.00	-0.70	peak

Test Mode	IEEE 802.11g High CH	Temperature:	27(℃)/ 53%RH
Test Item	Band Edge	Test Date	2017/2/6
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Average	Test Voltage	120Vac / 60Hz



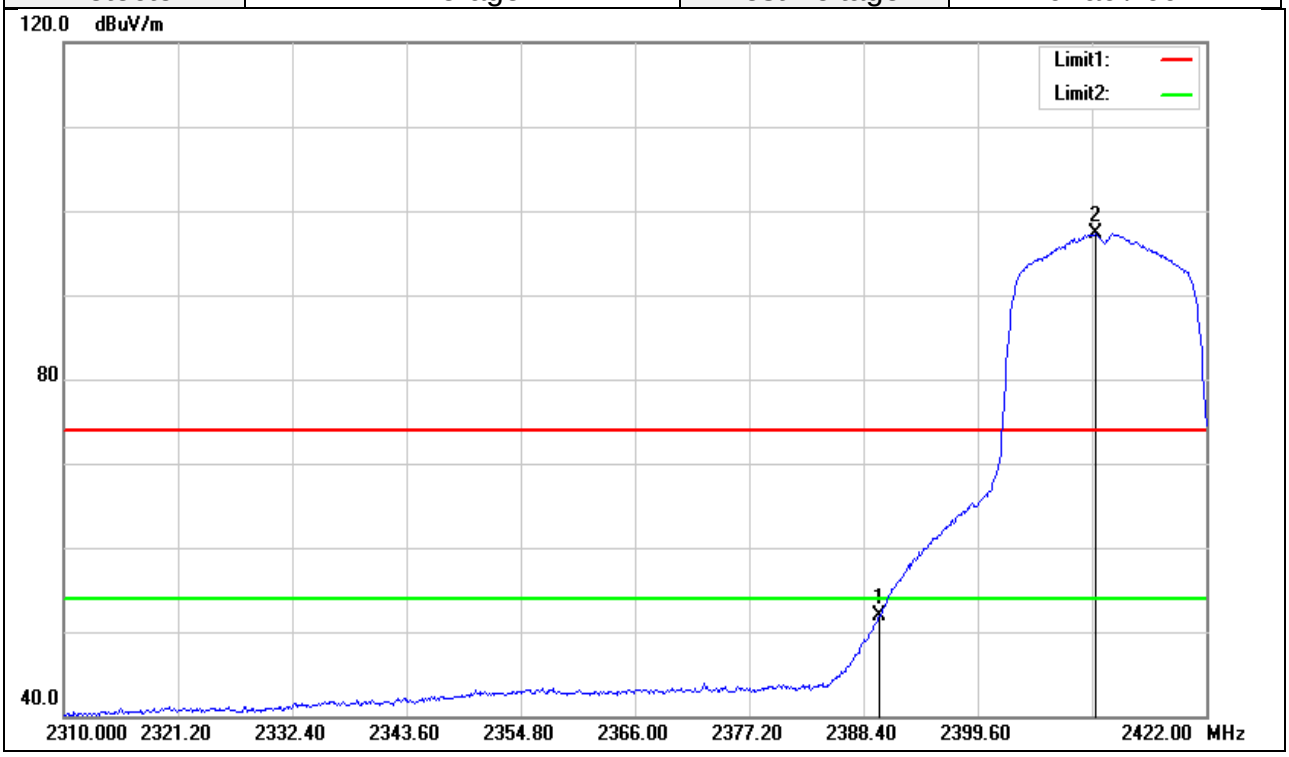
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2460.700	104.16	-2.10	102.06	-	-	AVG
2	2483.500	54.81	-1.99	52.82	54.00	-1.18	AVG

Test Mode	IEEE 802.11n HT20 Low CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Band Edge	Test Date	2017/2/6
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Peak	Test Voltage	120Vac / 60Hz



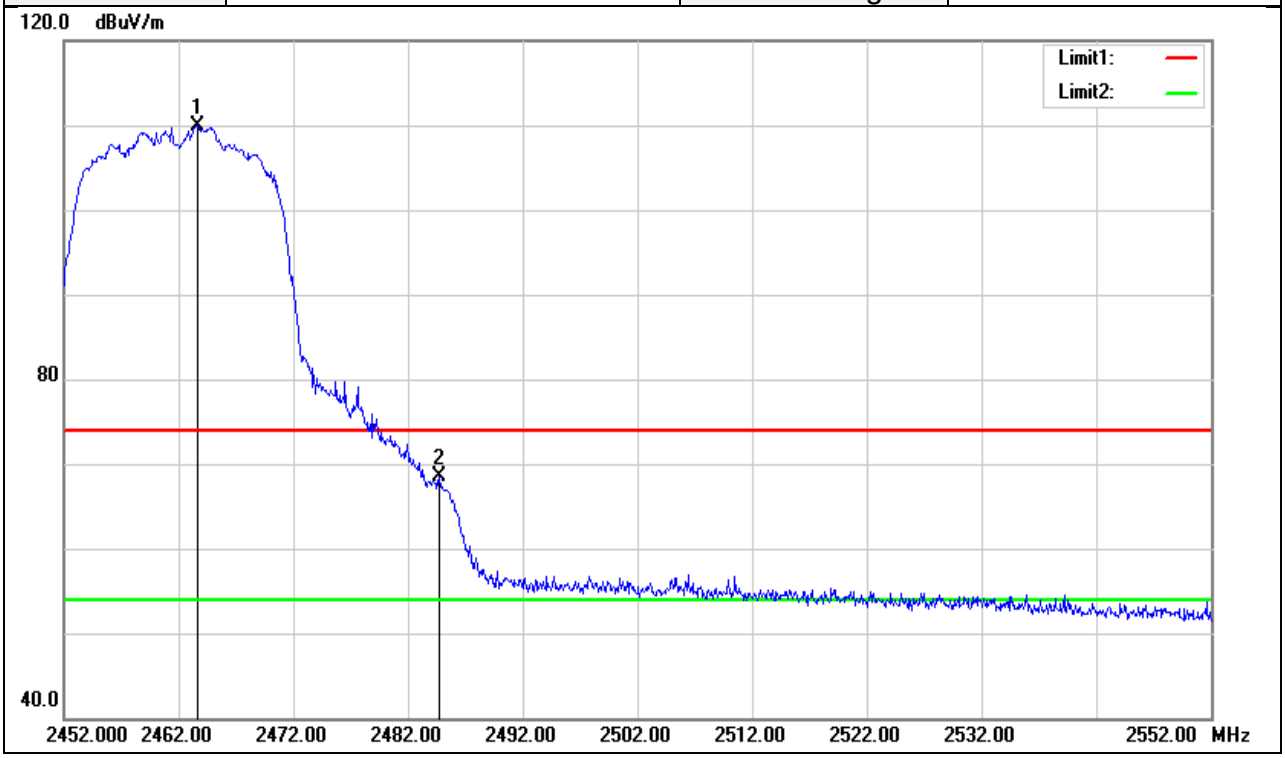
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2389.856	75.32	-3.28	72.04	74.00	-1.96	peak
2	2413.488	111.38	-3.23	108.15	-	-	peak

Test Mode	IEEE 802.11n HT20 Low CH	Temperature:	27(℃)/ 53%RH
Test Item	Band Edge	Test Date	2017/2/6
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Average	Test Voltage	120Vac / 60Hz



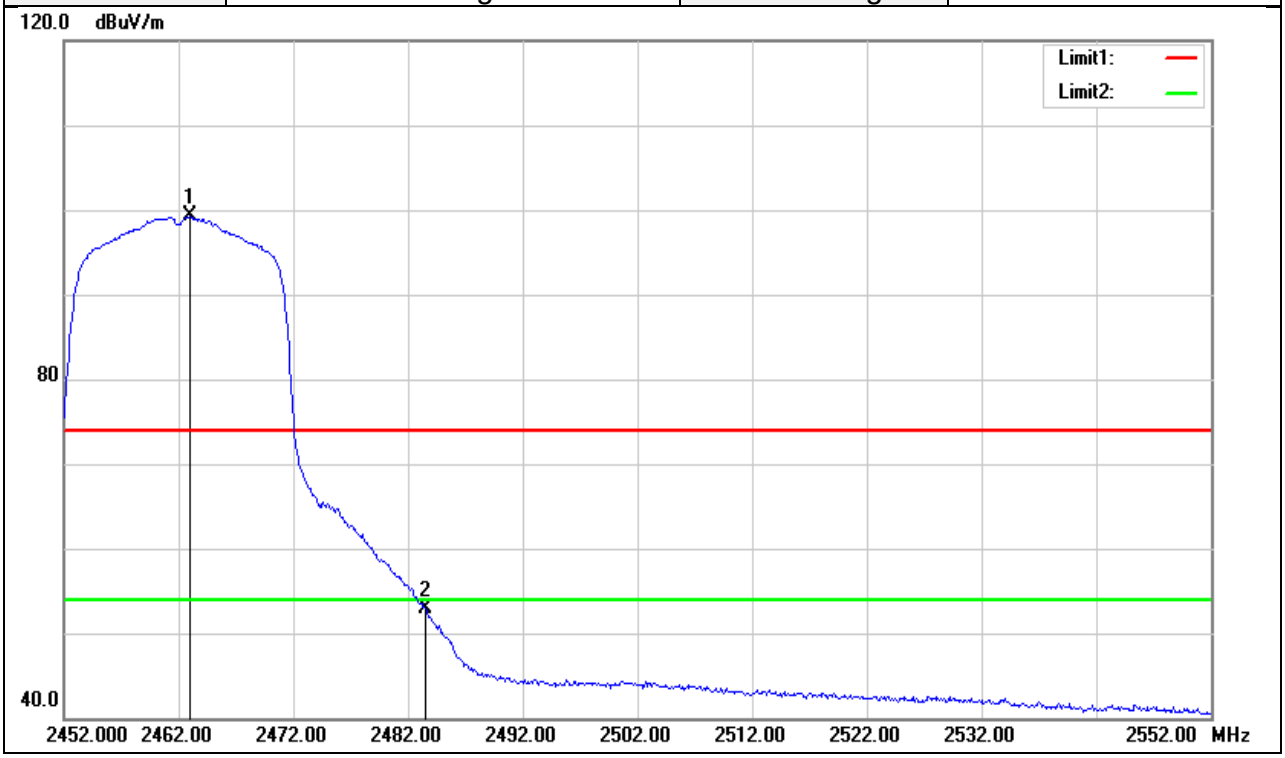
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2389.968	55.22	-3.28	51.94	54.00	-2.06	AVG
2	2411.136	100.51	-3.24	97.27	-	-	AVG

Test Mode	IEEE 802.11n HT20 High CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Band Edge	Test Date	2017/2/6
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Peak	Test Voltage	120Vac / 60Hz



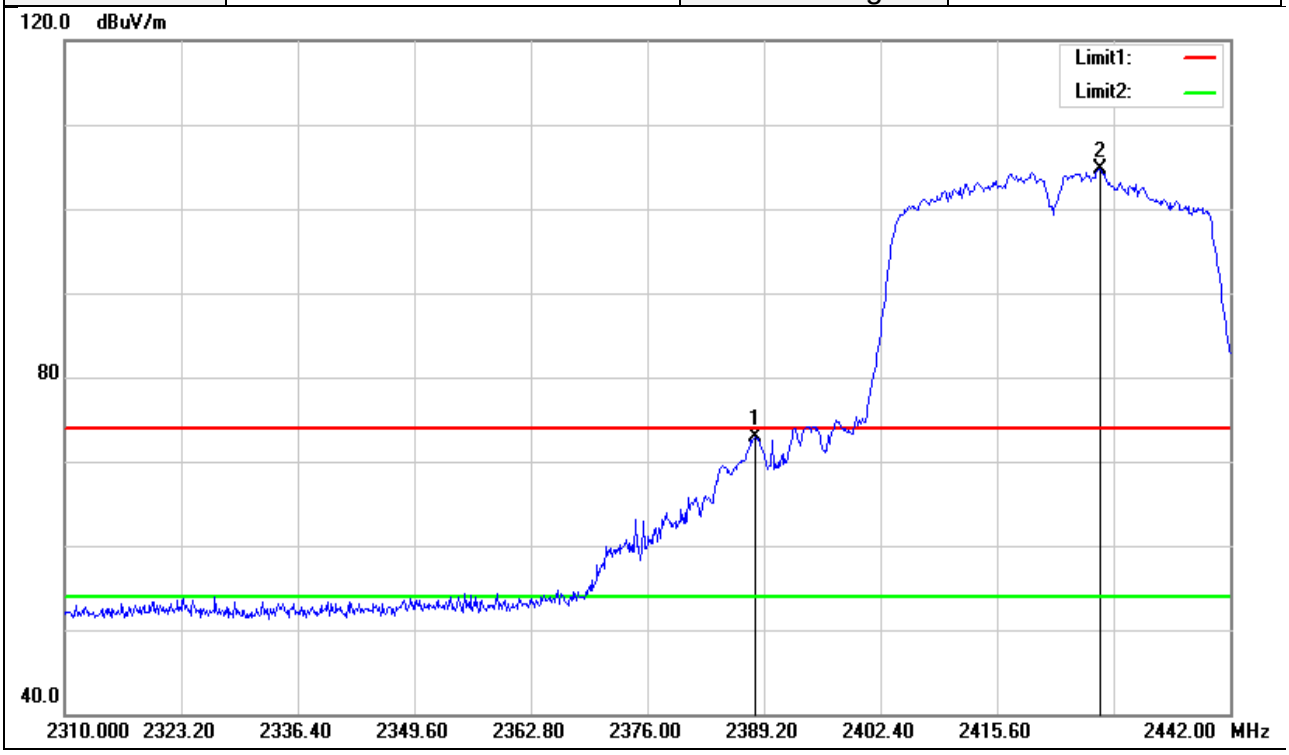
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2463.600	111.93	-2.09	109.84	-	-	peak
2	2484.700	70.54	-1.98	68.56	74.00	-5.44	peak

Test Mode	IEEE 802.11n HT20 High CH	Temperature:	27(℃)/ 53%RH
Test Item	Band Edge	Test Date	2017/2/6
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Average	Test Voltage	120Vac / 60Hz



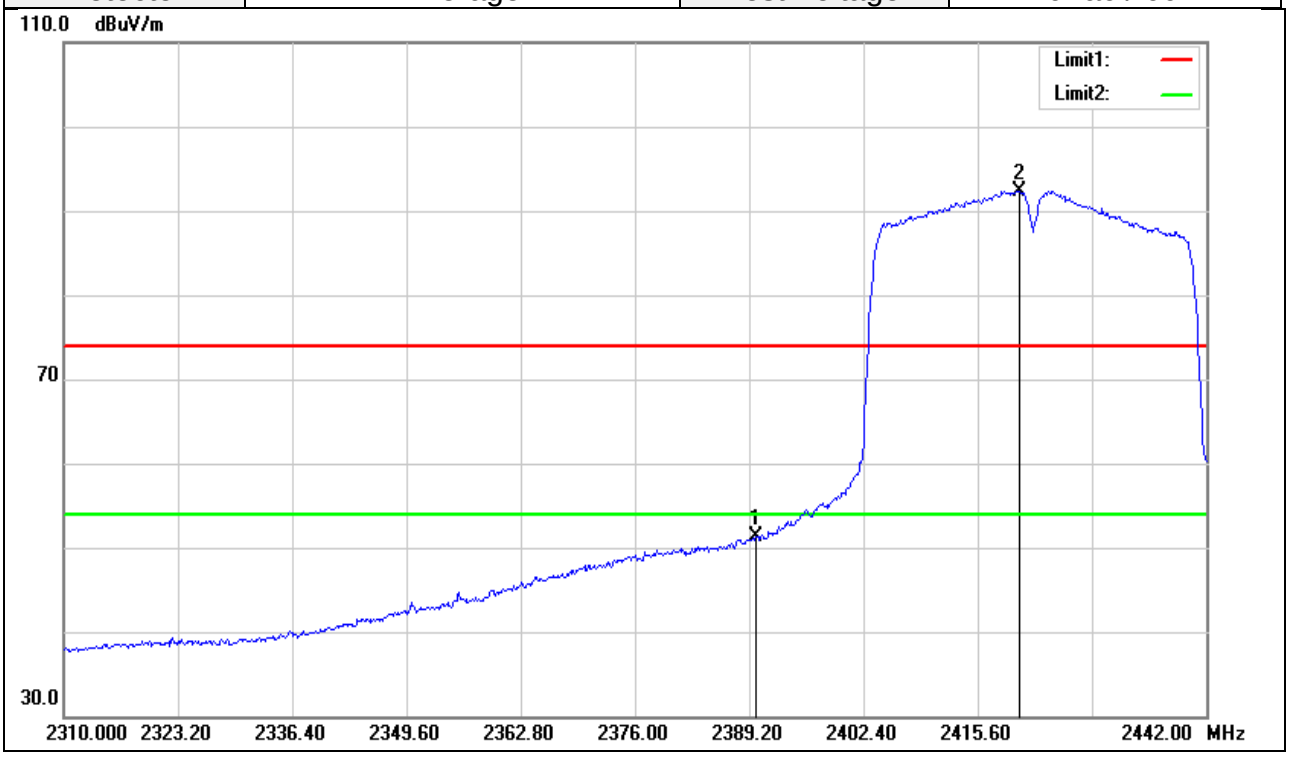
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2463.000	101.34	-2.09	99.25	-	-	AVG
2	2483.500	54.86	-1.99	52.87	54.00	-1.13	AVG

Test Mode	IEEE 802.11n HT40 Low CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Band Edge	Test Date	2017/2/6
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Peak	Test Voltage	120Vac / 60Hz



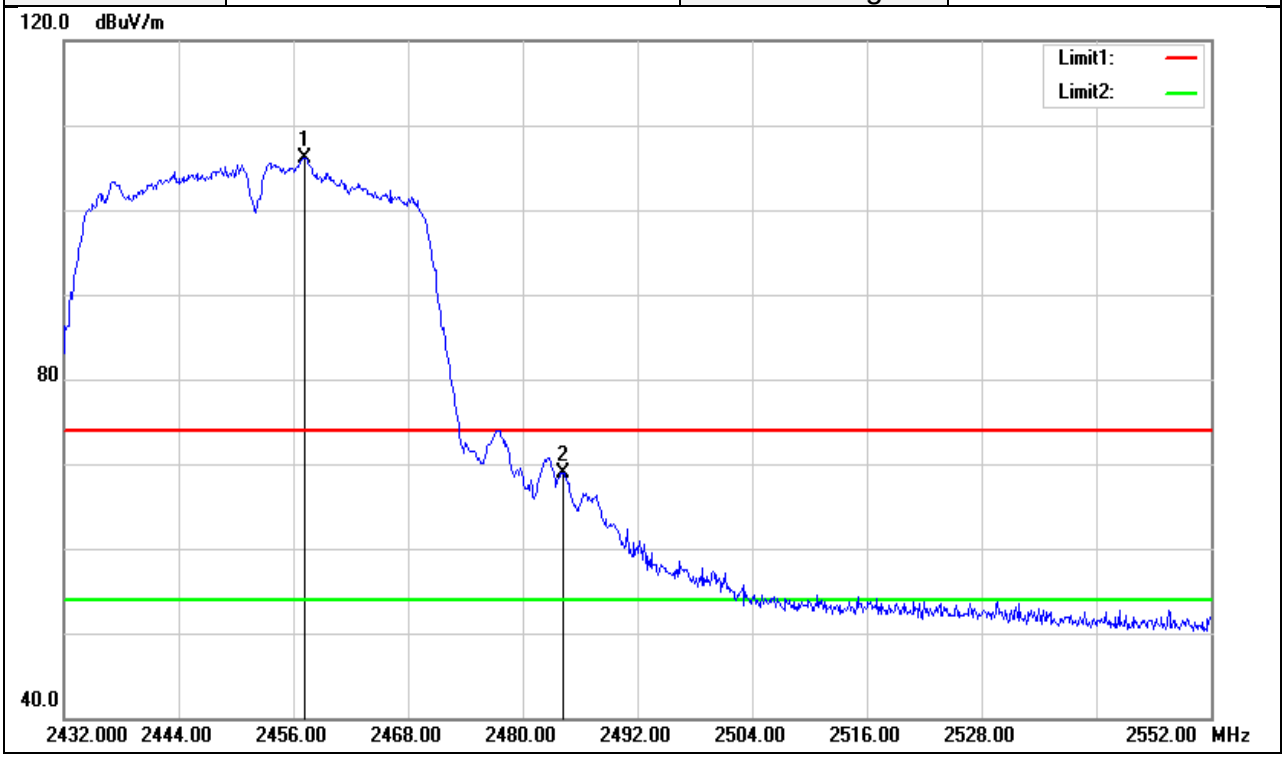
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2388.276	75.39	-2.51	72.88	74.00	-1.12	peak
2	2427.216	107.02	-2.31	104.71	-	-	peak

Test Mode	IEEE 802.11n HT40 Low CH	Temperature:	27(℃)/ 53%RH
Test Item	Band Edge	Test Date	2017/2/6
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Average	Test Voltage	120Vac / 60Hz



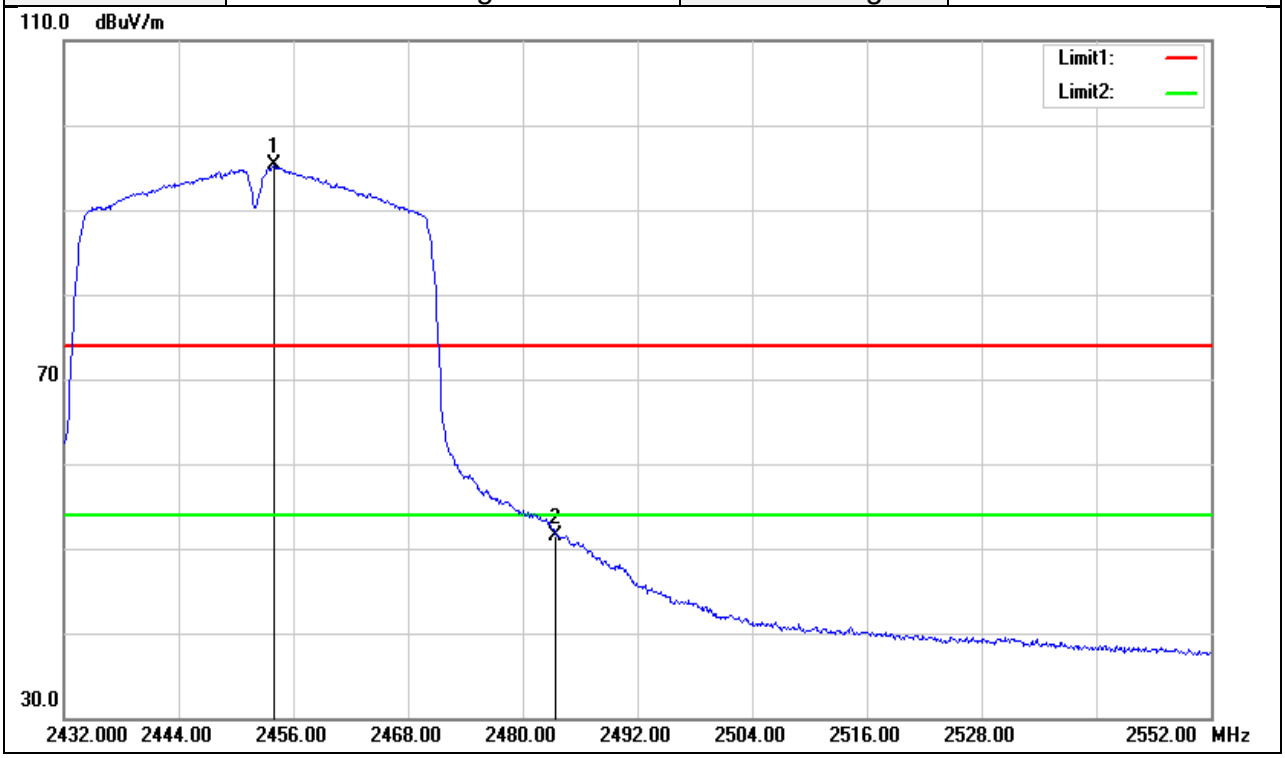
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2389.992	53.79	-2.49	51.30	54.00	-2.70	AVG
2	2420.352	94.72	-2.35	92.37	-	-	AVG

Test Mode	IEEE 802.11n HT40 High CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Band Edge	Test Date	2017/2/6
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	2457.200	108.27	-2.11	106.16	-	-	peak
2	2484.200	70.92	-1.99	68.93	74.00	-5.07	peak

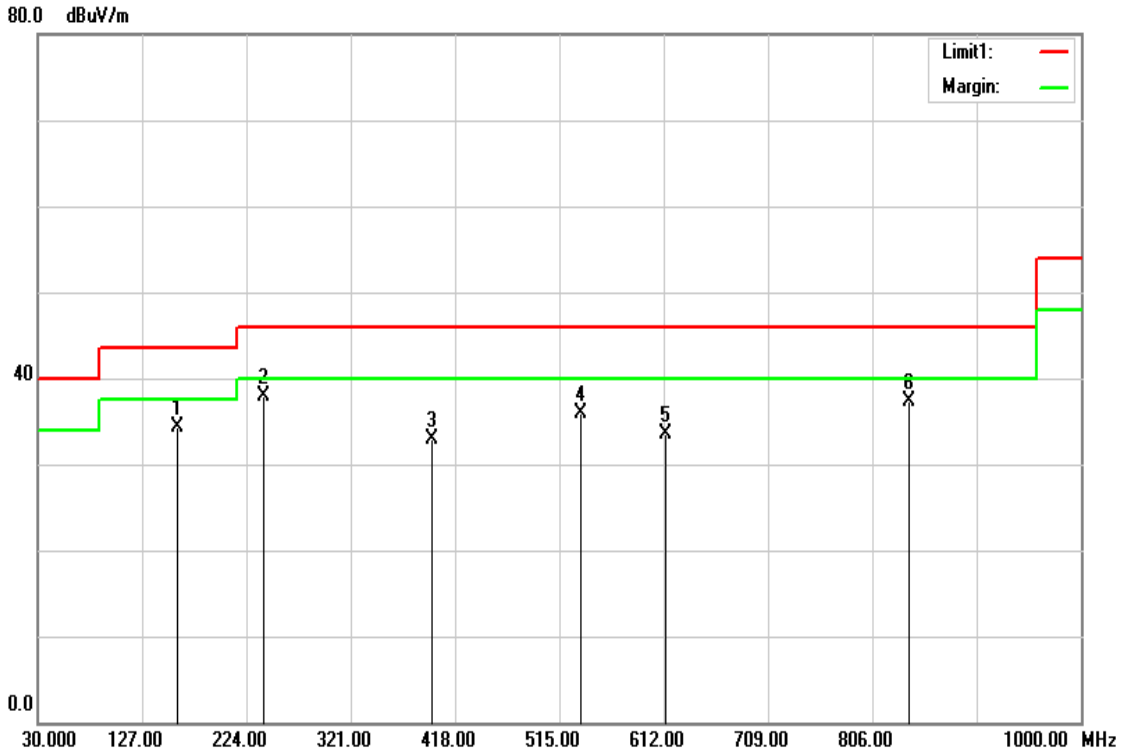
Test Mode	IEEE 802.11n HT40 High CH	Temperature:	27(℃)/ 53%RH
Test Item	Band Edge	Test Date	2017/2/6
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Average	Test Voltage	120Vac / 60Hz



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2453.960	97.39	-2.13	95.26	-	-	AVG
2	2483.500	53.58	-1.99	51.59	54.00	-2.41	AVG

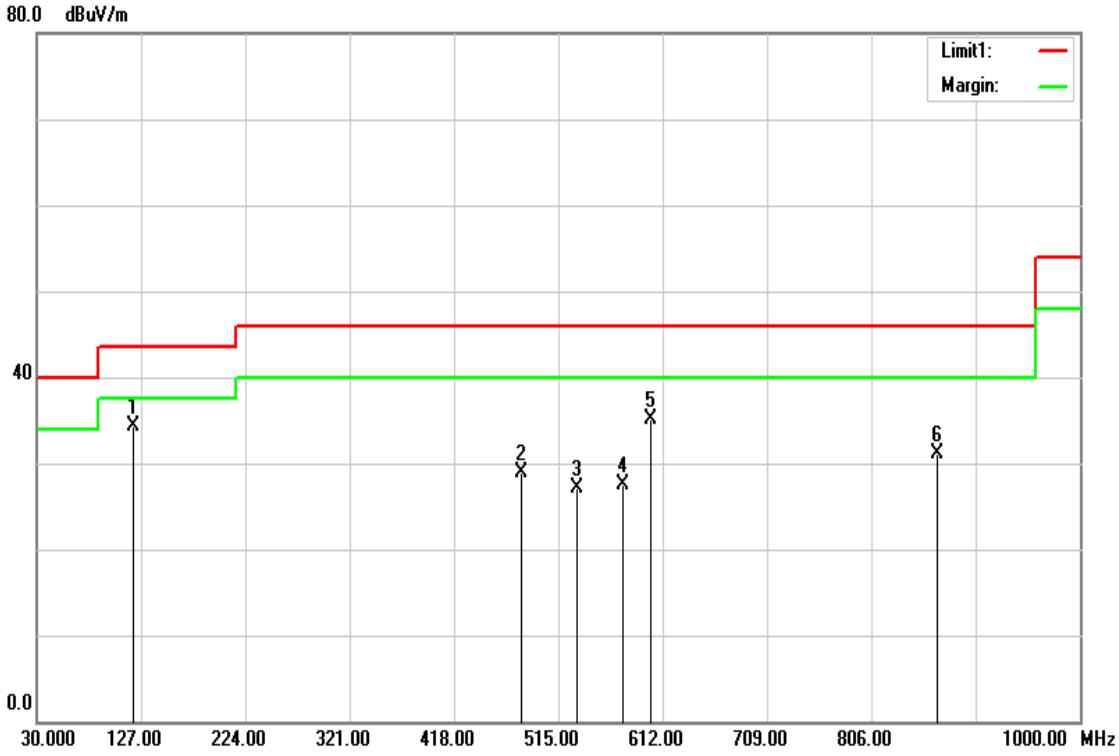
Below 1G Test Data

Test Mode	Mode 1	Temp/Hum	27(℃)/ 53%RH
Test Item	30MHz-1GHz	Test Date	2017/2/6
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
159.9800	50.66	-16.36	34.30	43.50	-9.20	peak
240.4900	54.41	-16.50	37.91	46.00	-8.09	peak
396.6600	44.65	-11.78	32.87	46.00	-13.13	peak
534.4000	44.67	-8.72	35.95	46.00	-10.05	peak
613.9400	40.97	-7.43	33.54	46.00	-12.46	peak
839.9500	41.17	-3.92	37.25	46.00	-8.75	peak

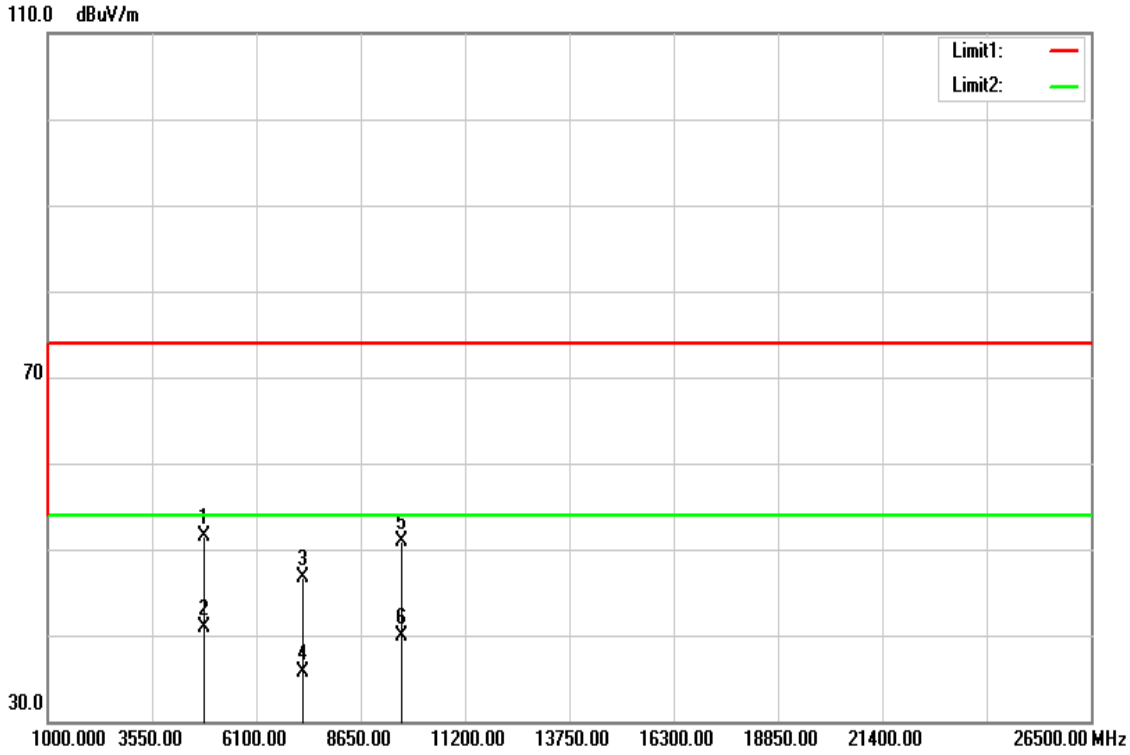
Test Mode	Mode 1	Temp/Hum	27(℃)/ 53%RH
Test Item	30MHz-1GHz	Test Date	2017/2/6
Polarize	Vertical	Test Engineer	ED Chiang
Detector	Peak and Qusi-peak	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB	Remark
120.2100	49.89	-15.50	34.39	43.50	-9.11	peak
480.0800	38.43	-9.62	28.81	46.00	-17.19	peak
532.4600	35.93	-8.75	27.18	46.00	-18.82	peak
575.1400	35.64	-8.12	27.52	46.00	-18.48	peak
600.3600	42.82	-7.75	35.07	46.00	-10.93	peak
867.1100	34.67	-3.58	31.09	46.00	-14.91	peak

Above 1G Test Data

Test Mode	IEEE 802.11b Low CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Harmonic	Test Date	2017/2/6
Polarize	Vertical	Test Engineer	ED Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz

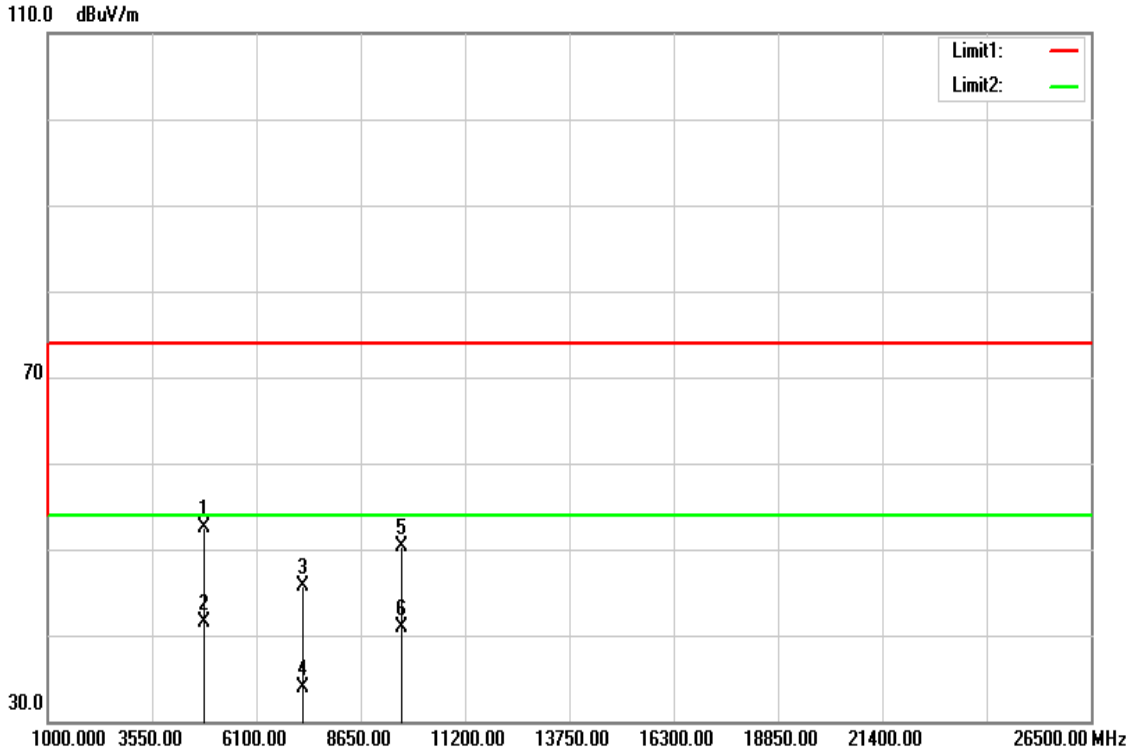


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4827.000	46.38	5.11	51.49	74.00	-22.51	peak
4827.000	35.78	5.11	40.89	54.00	-13.11	AVG
7236.000	33.93	12.71	46.64	74.00	-27.36	peak
7236.000	23.00	12.71	35.71	54.00	-18.29	AVG
9648.000	33.24	17.60	50.84	74.00	-23.16	peak
9648.000	22.29	17.60	39.89	54.00	-14.11	AVG

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	27(℃)/ 53%RH
Test Item	Harmonic	Test Date	2017/2/6
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz

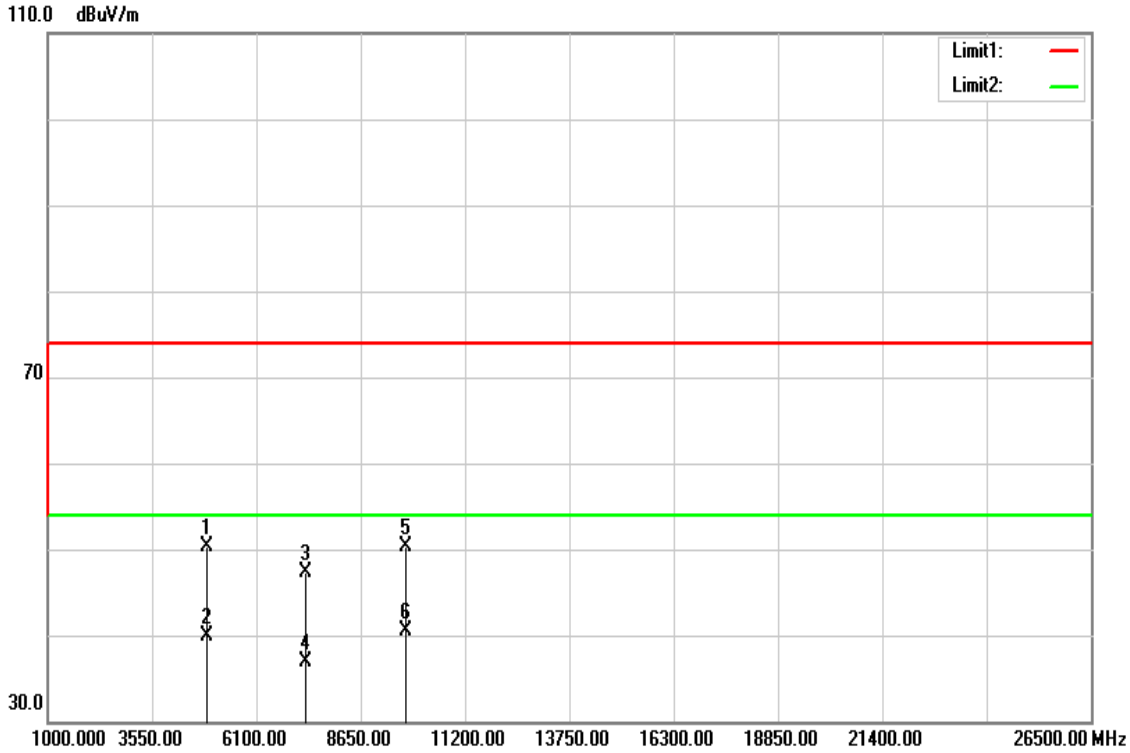


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4827.000	47.33	5.11	52.44	74.00	-21.56	peak
4827.000	36.44	5.11	41.55	54.00	-12.45	AVG
7236.000	32.92	12.71	45.63	74.00	-28.37	peak
7236.000	21.18	12.71	33.89	54.00	-20.11	AVG
9648.000	32.80	17.60	50.40	74.00	-23.60	peak
9648.000	23.34	17.60	40.94	54.00	-13.06	AVG

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	27(℃)/ 53%RH
Test Item	Harmonic	Test Date	2017/2/6
Polarize	Vertical	Test Engineer	ED Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz

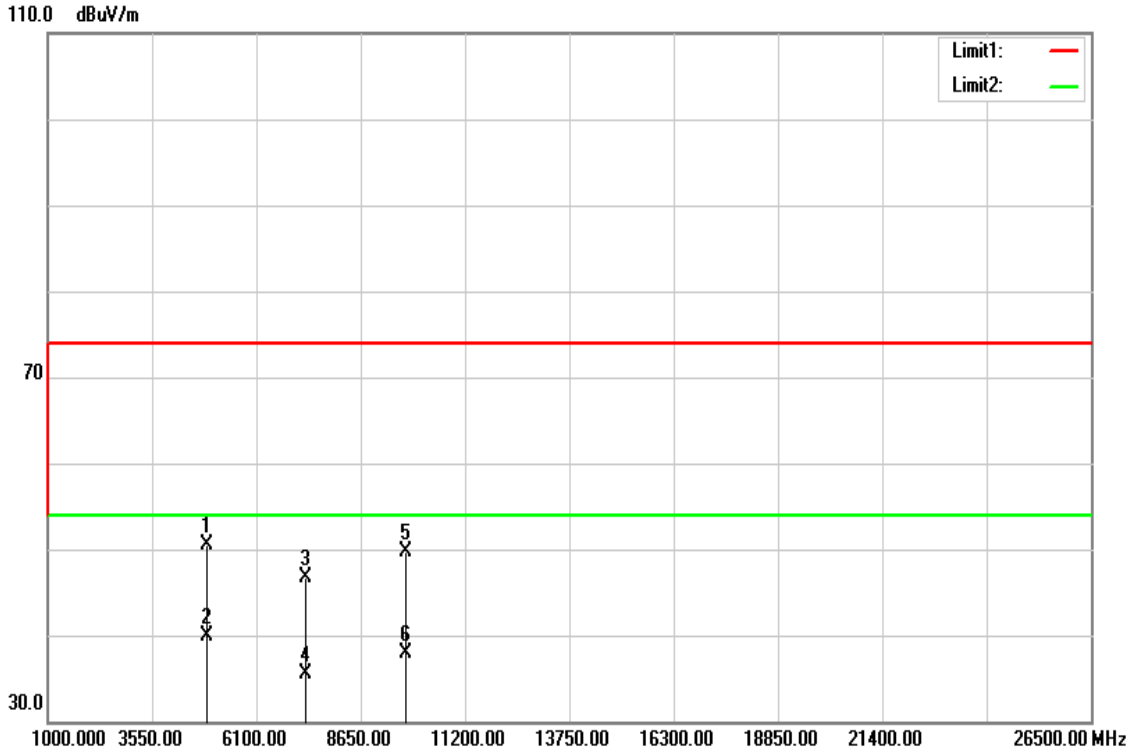


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4876.000	45.00	5.24	50.24	74.00	-23.76	peak
4876.000	34.60	5.24	39.84	54.00	-14.16	AVG
7311.000	34.32	12.94	47.26	74.00	-26.74	peak
7311.000	24.01	12.94	36.95	54.00	-17.05	AVG
9748.000	32.65	17.60	50.25	74.00	-23.75	peak
9748.000	22.88	17.60	40.48	54.00	-13.52	AVG

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	27(℃)/ 53%RH
Test Item	Harmonic	Test Date	2017/2/6
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz

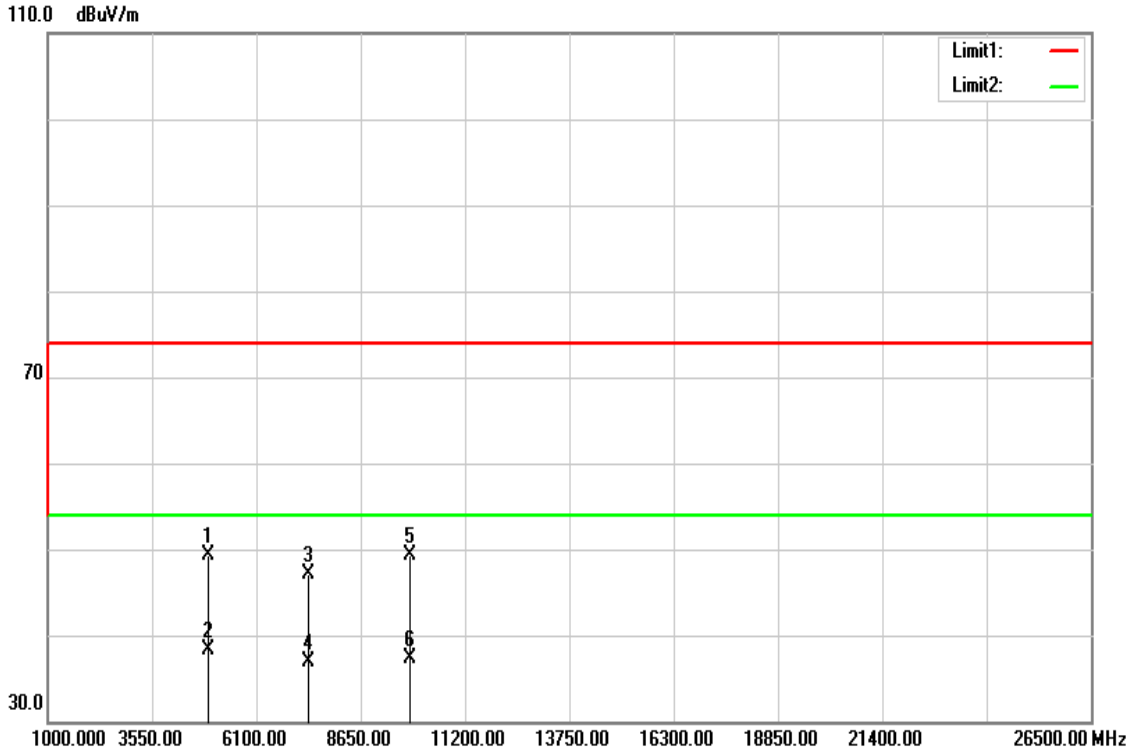


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4876.000	45.25	5.24	50.49	74.00	-23.51	peak
4876.000	34.60	5.24	39.84	54.00	-14.16	AVG
7311.000	33.70	12.94	46.64	74.00	-27.36	peak
7311.000	22.50	12.94	35.44	54.00	-18.56	AVG
9748.000	32.09	17.60	49.69	74.00	-24.31	peak
9748.000	20.38	17.60	37.98	54.00	-16.02	AVG

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	27(℃)/ 53%RH
Test Item	Harmonic	Test Date	2017/2/6
Polarize	Vertical	Test Engineer	ED Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz

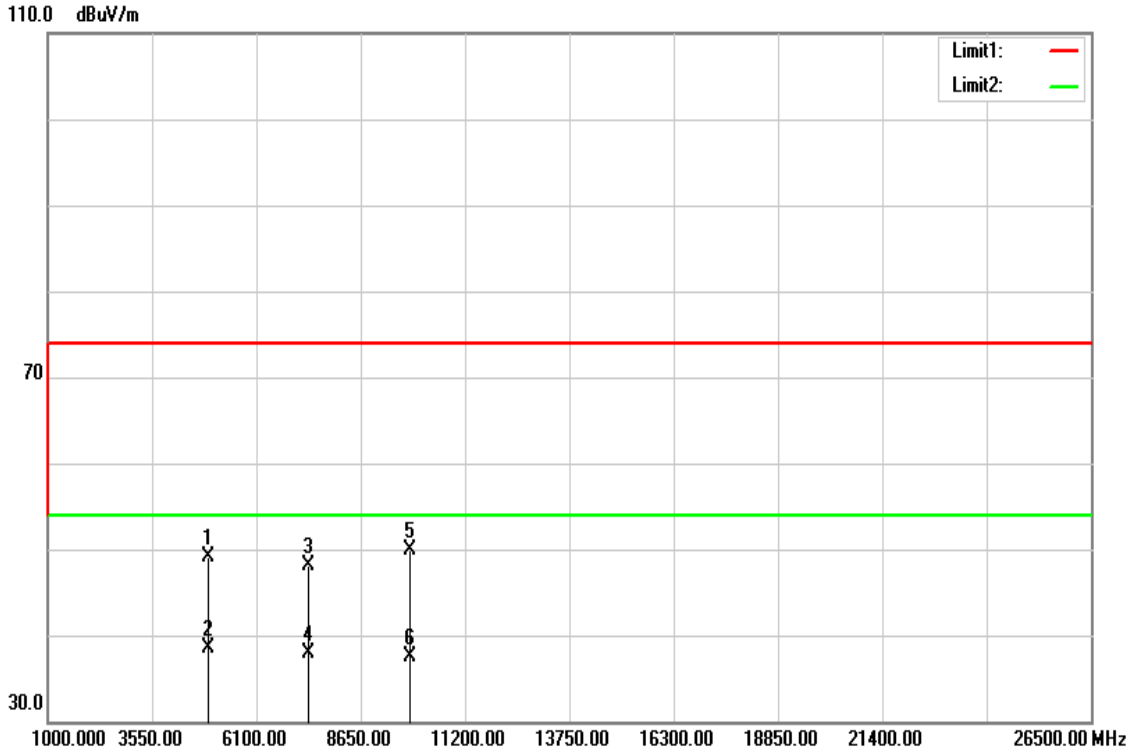


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4925.000	43.94	5.37	49.31	74.00	-24.69	peak
4925.000	32.91	5.37	38.28	54.00	-15.72	AVG
7386.000	33.97	13.17	47.14	74.00	-26.86	peak
7386.000	23.76	13.17	36.93	54.00	-17.07	AVG
9848.000	31.73	17.60	49.33	74.00	-24.67	peak
9848.000	19.66	17.60	37.26	54.00	-16.74	AVG

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	27(℃)/ 53%RH
Test Item	Harmonic	Test Date	2017/2/6
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz

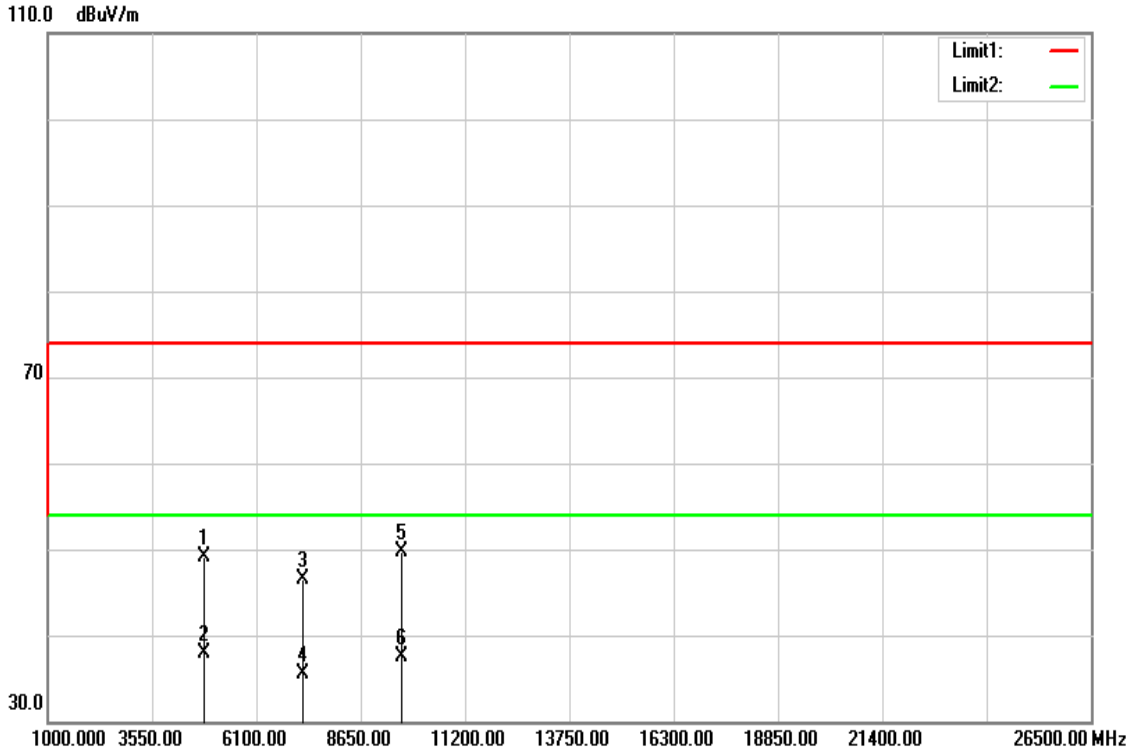


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB	Remark
4925.000	43.81	5.37	49.18	74.00	-24.82	peak
4925.000	33.07	5.37	38.44	54.00	-15.56	AVG
7386.000	34.92	13.17	48.09	74.00	-25.91	peak
7386.000	24.81	13.17	37.98	54.00	-16.02	AVG
9848.000	32.21	17.60	49.81	74.00	-24.19	peak
9848.000	19.82	17.60	37.42	54.00	-16.58	AVG

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	27(℃)/ 53%RH
Test Item	Harmonic	Test Date	2017/2/6
Polarize	Vertical	Test Engineer	ED Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz

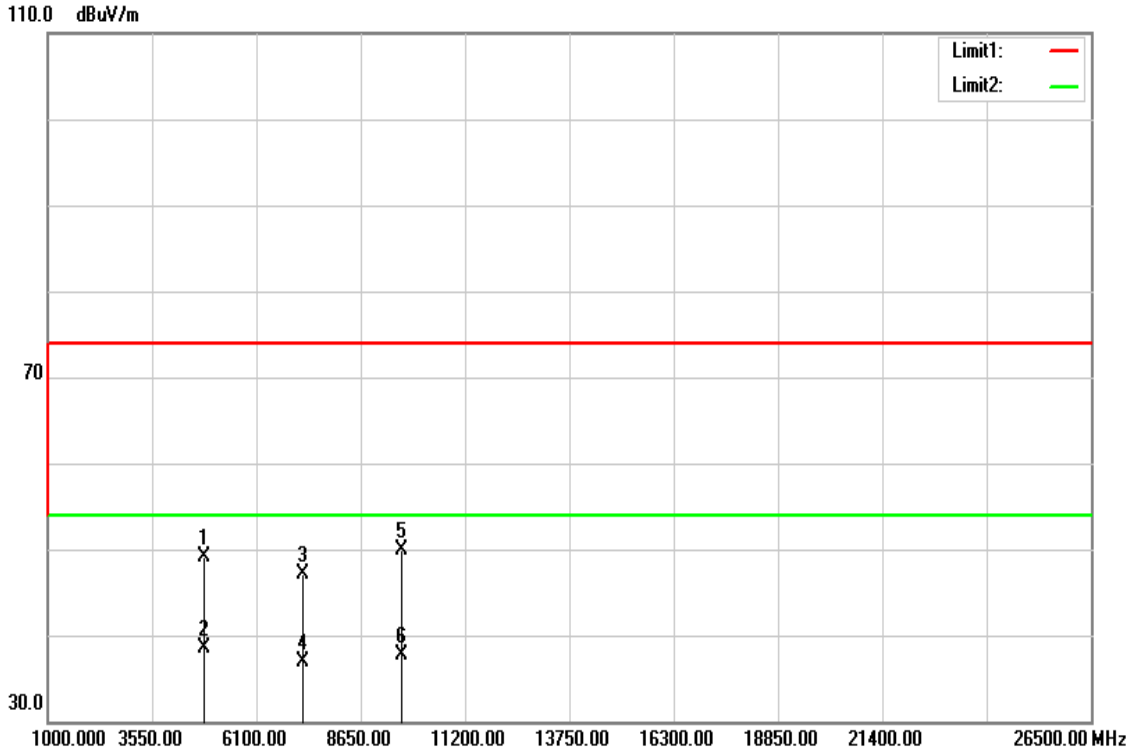


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4827.000	43.94	5.11	49.05	74.00	-24.95	peak
4827.000	32.75	5.11	37.86	54.00	-16.14	AVG
7236.000	33.81	12.71	46.52	74.00	-27.48	peak
7236.000	22.71	12.71	35.42	54.00	-18.58	AVG
9648.000	32.11	17.60	49.71	74.00	-24.29	peak
9648.000	19.84	17.60	37.44	54.00	-16.56	AVG

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	27(℃)/ 53%RH
Test Item	Harmonic	Test Date	2017/2/6
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz

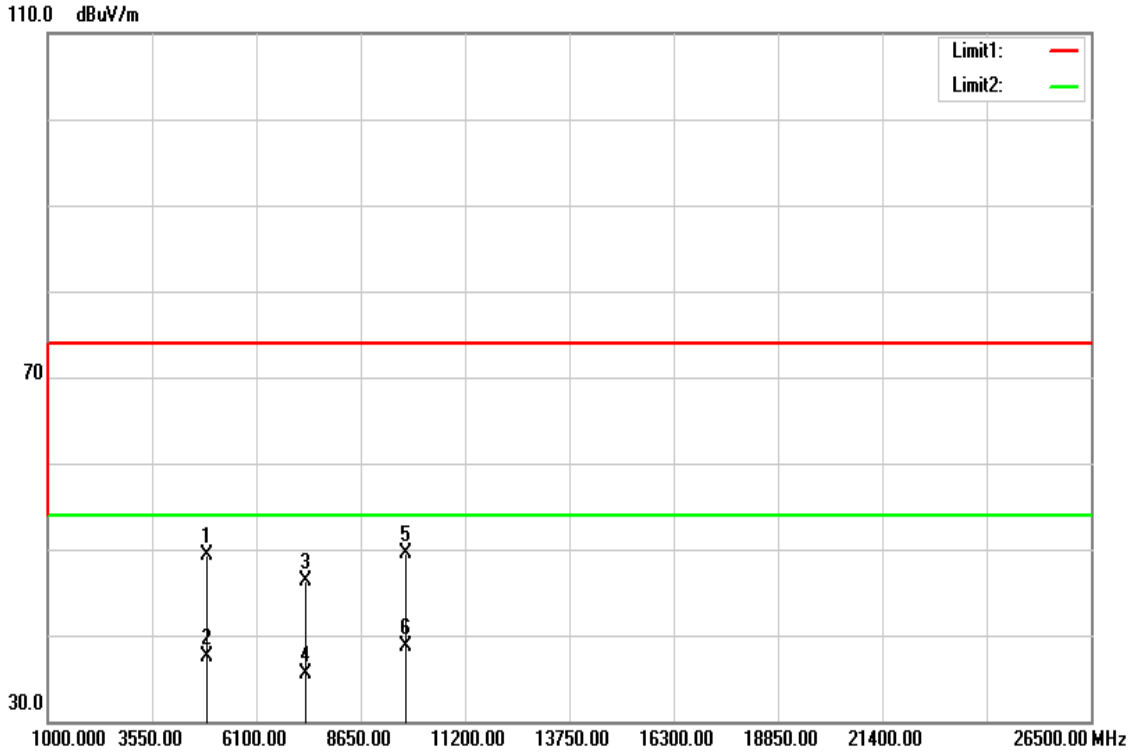


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4820.000	44.07	5.09	49.16	74.00	-24.84	peak
4820.000	33.39	5.09	38.48	54.00	-15.52	AVG
7236.000	34.37	12.71	47.08	74.00	-26.92	peak
7236.000	24.24	12.71	36.95	54.00	-17.05	AVG
9648.000	32.25	17.60	49.85	74.00	-24.15	peak
9648.000	20.12	17.60	37.72	54.00	-16.28	AVG

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	27(℃)/ 53%RH
Test Item	Harmonic	Test Date	2017/2/6
Polarize	Vertical	Test Engineer	ED Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz

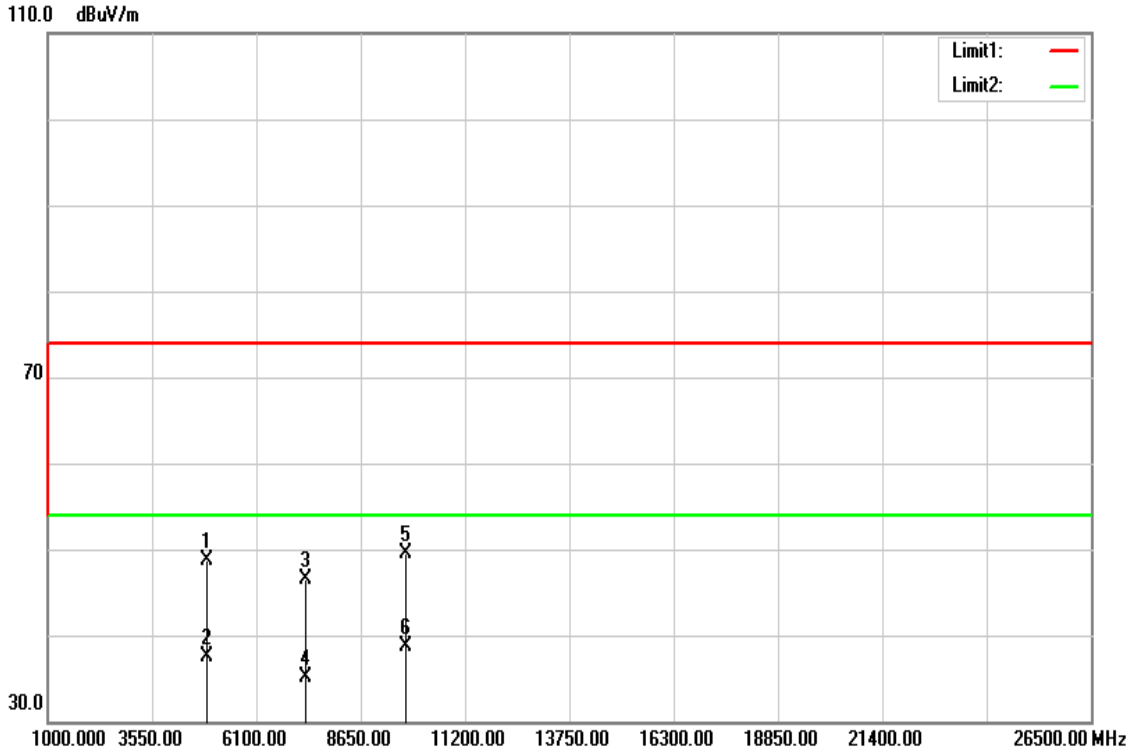


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4876.000	44.15	5.24	49.39	74.00	-24.61	peak
4876.000	32.31	5.24	37.55	54.00	-16.45	AVG
7311.000	33.42	12.94	46.36	74.00	-27.64	peak
7311.000	22.54	12.94	35.48	54.00	-18.52	AVG
9748.000	31.96	17.60	49.56	74.00	-24.44	peak
9748.000	21.11	17.60	38.71	54.00	-15.29	AVG

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	27(℃)/ 53%RH
Test Item	Harmonic	Test Date	2017/2/6
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz

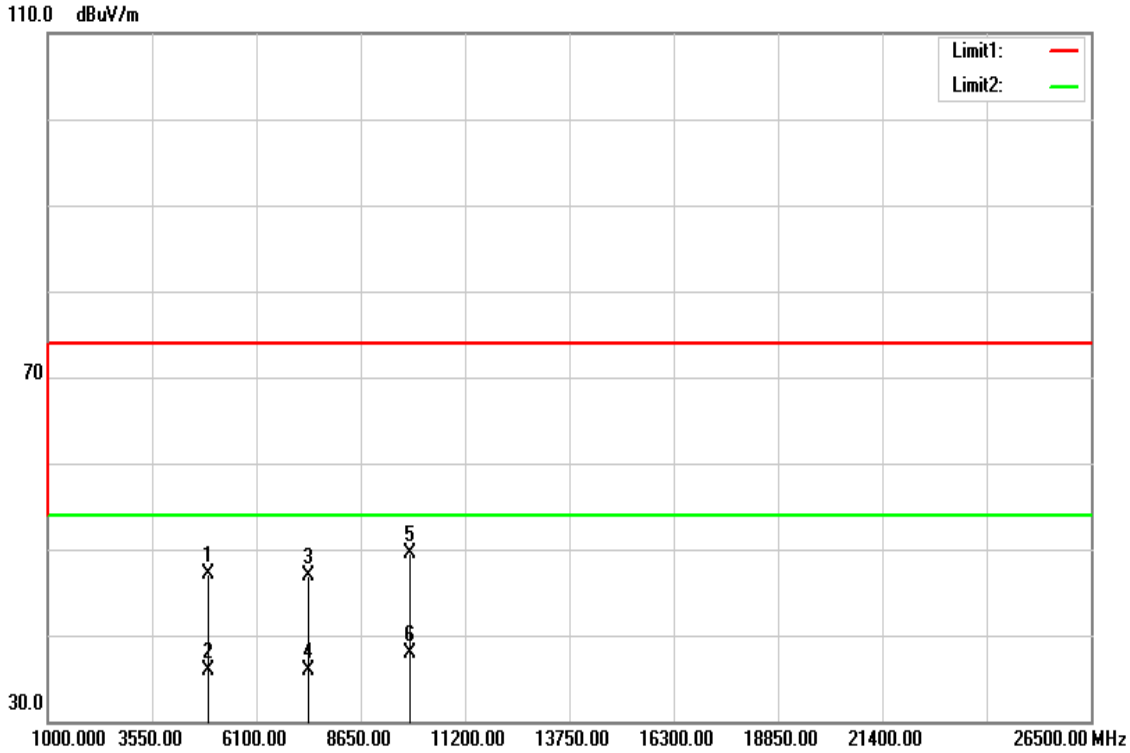


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (B)	Remark
4876.000	43.52	5.24	48.76	74.00	-25.24	peak
4876.000	32.34	5.24	37.58	54.00	-16.42	AVG
7311.000	33.49	12.94	46.43	74.00	-27.57	peak
7311.000	22.24	12.94	35.18	54.00	-18.82	AVG
9748.000	31.88	17.60	49.48	74.00	-24.52	peak
9748.000	21.15	17.60	38.75	54.00	-15.25	AVG

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	27(℃)/ 53%RH
Test Item	Harmonic	Test Date	2017/2/6
Polarize	Vertical	Test Engineer	ED Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz

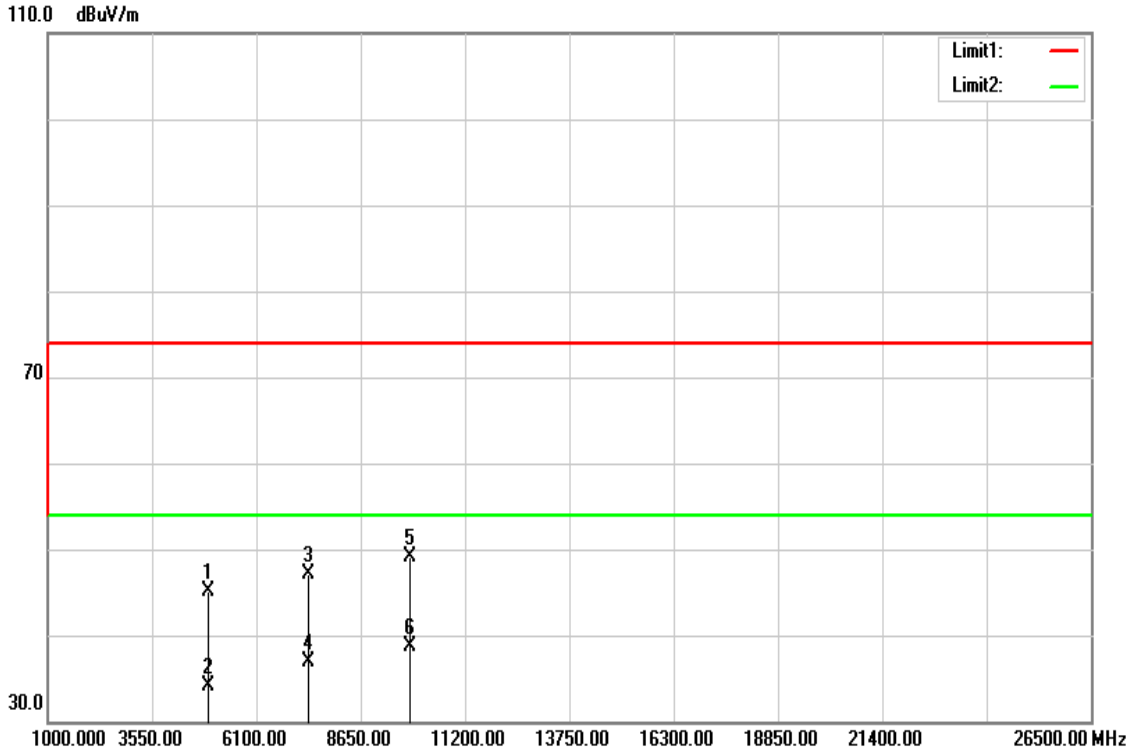


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4918.000	41.75	5.35	47.10	74.00	-26.90	peak
4918.000	30.65	5.35	36.00	54.00	-18.00	AVG
7386.000	33.79	13.17	46.96	74.00	-27.04	peak
7386.000	22.65	13.17	35.82	54.00	-18.18	AVG
9848.000	31.89	17.60	49.49	74.00	-24.51	peak
9848.000	20.24	17.60	37.84	54.00	-16.16	AVG

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	27(℃)/ 53%RH
Test Item	Harmonic	Test Date	2017/2/6
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz

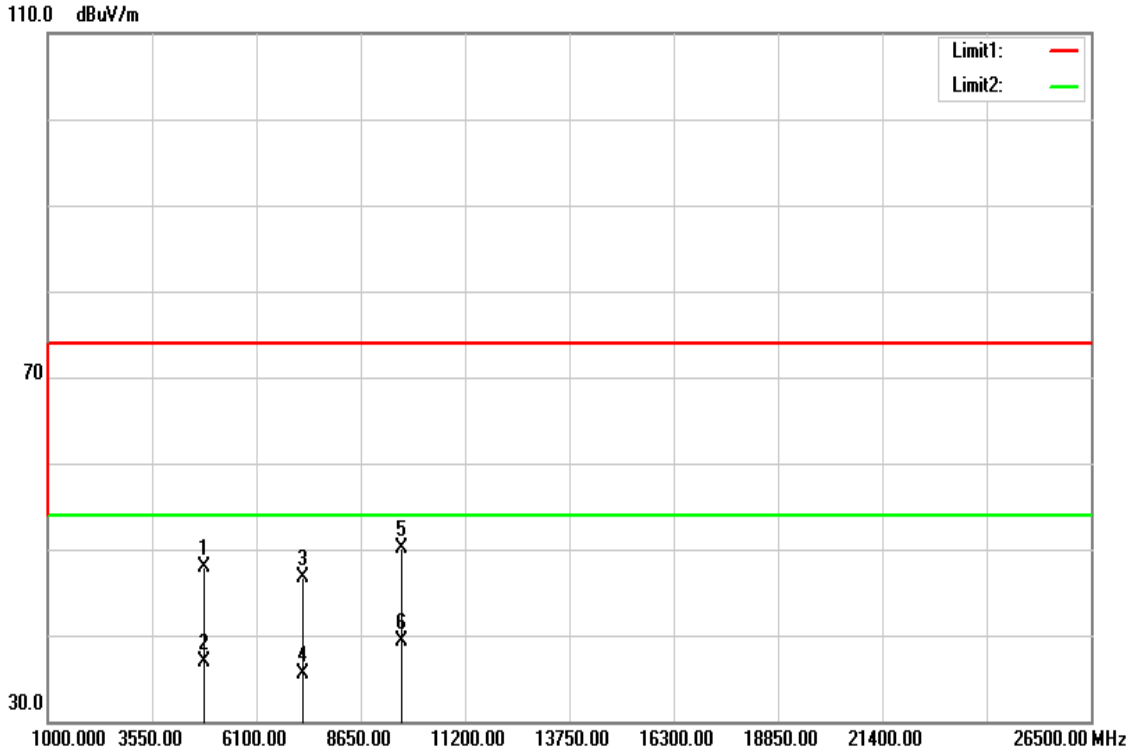


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB	Remark
4925.000	39.65	5.37	45.02	74.00	-28.98	peak
4925.000	28.81	5.37	34.18	54.00	-19.82	AVG
7386.000	33.94	13.17	47.11	74.00	-26.89	peak
7386.000	23.67	13.17	36.84	54.00	-17.16	AVG
9848.000	31.55	17.60	49.15	74.00	-24.85	peak
9848.000	21.02	17.60	38.62	54.00	-15.38	AVG

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	27(℃)/ 53%RH
Test Item	Harmonic	Test Date	2017/2/6
Polarize	Vertical	Test Engineer	ED Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz

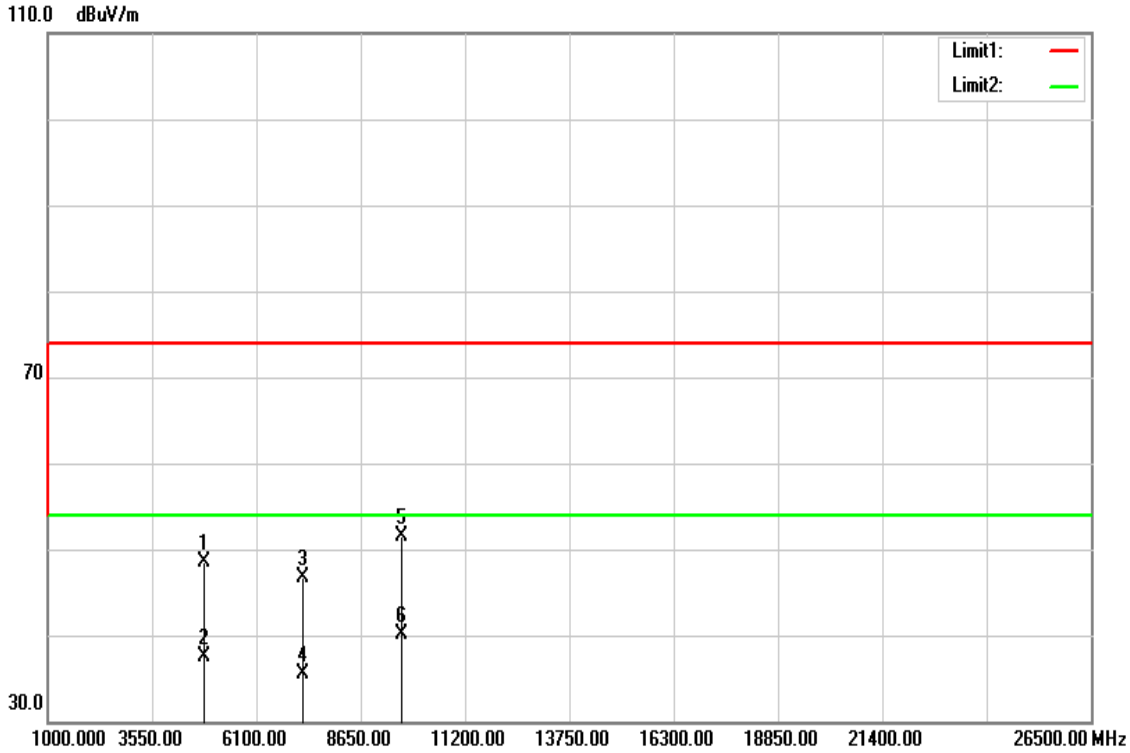


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	R mark
4820.000	42.82	5.09	47.91	74.00	-26.09	peak
4820.000	31.73	5.09	36.82	54.00	-17.18	AVG
7236.000	33.94	12.71	46.65	74.00	-27.35	peak
7236.000	22.75	12.71	35.46	54.00	-18.54	AVG
9648.000	32.58	17.60	50.18	74.00	-23.82	peak
9648.000	21.74	17.60	39.34	54.00	-14.66	AVG

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	27(℃)/ 53%RH
Test Item	Harmonic	Test Date	2017/2/6
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz

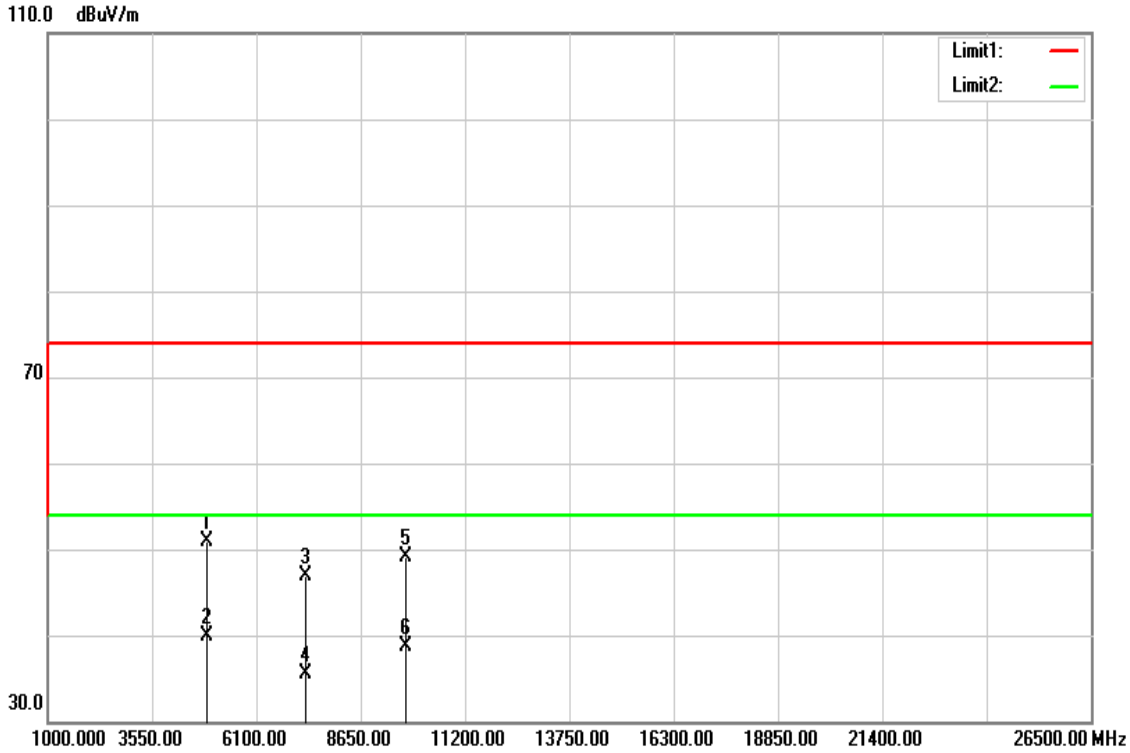


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4827.000	43.47	5.11	48.58	74.00	-25.42	peak
4827.000	32.35	5.11	37.46	54.00	-16.54	AVG
7236.000	33.98	12.71	46.69	74.00	-27.31	peak
7236.000	22.71	12.71	35.42	54.00	-18.58	AVG
9648.000	33.86	17.60	51.46	74.00	-22.54	peak
9648.000	22.55	17.60	40.15	54.00	-13.85	AVG

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	27(℃)/ 53%RH
Test Item	Harmonic	Test Date	2017/2/6
Polarize	Vertical	Test Engineer	ED Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz

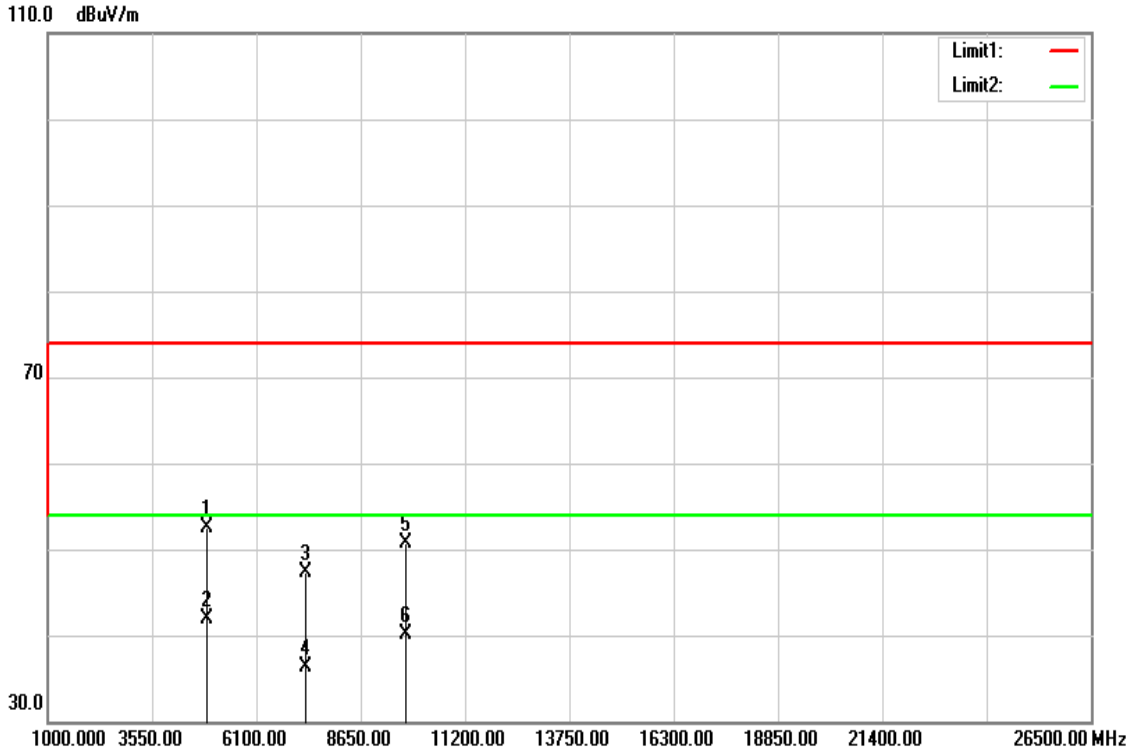


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	R mark
4876.000	45.71	5.24	50.95	74.00	-23.05	peak
4876.000	34.59	5.24	39.83	54.00	-14.17	AVG
7311.000	33.98	12.94	46.92	74.00	-27.08	peak
7311.000	22.48	12.94	35.42	54.00	-18.58	AVG
9748.000	31.49	17.60	49.09	74.00	-24.91	peak
9748.000	21.11	17.60	38.71	54.00	-15.29	AVG

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	27(℃)/ 53%RH
Test Item	Harmonic	Test Date	2017/2/6
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz

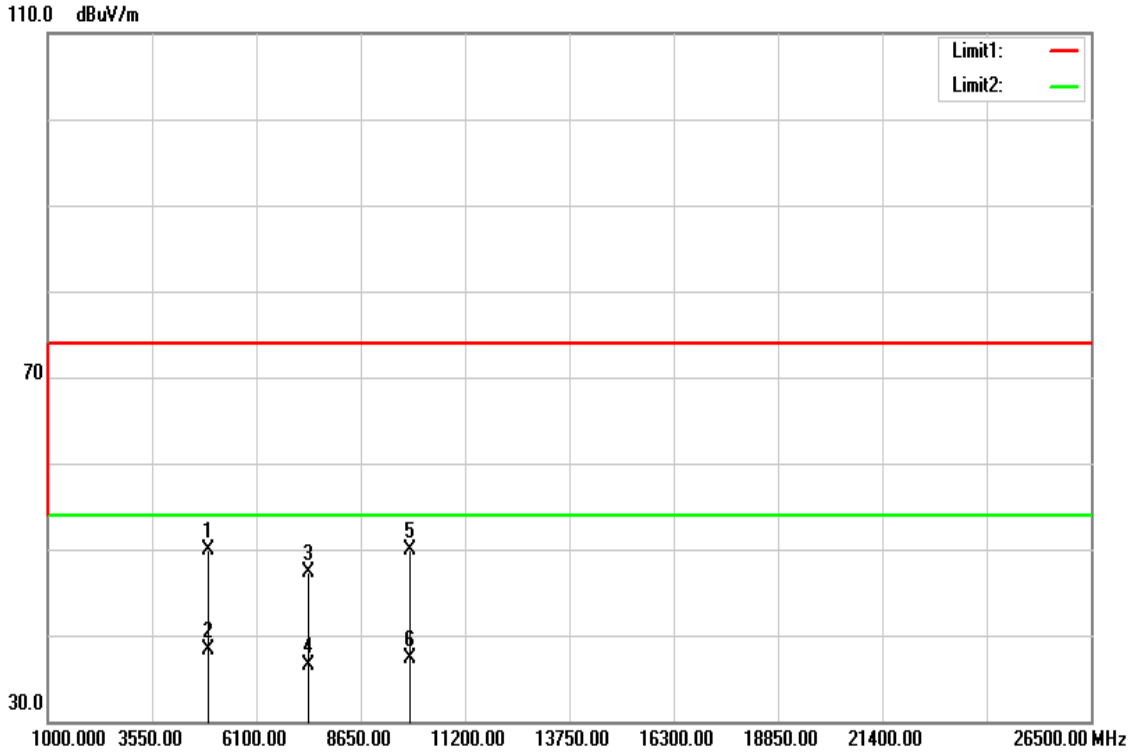


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4876.000	47.21	5.24	52.45	74.00	-21.55	peak
4876.000	36.59	5.24	41.83	54.00	-12.17	AVG
7311.000	34.45	12.94	47.39	74.00	-26.61	peak
7311.000	23.30	12.94	36.24	54.00	-17.76	AVG
9748.000	33.07	17.60	50.67	74.00	-23.33	peak
9748.000	22.59	17.60	40.19	54.00	-13.81	AVG

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	27(℃)/ 53%RH
Test Item	Harmonic	Test Date	2017/2/6
Polarize	Vertical	Test Engineer	ED Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz

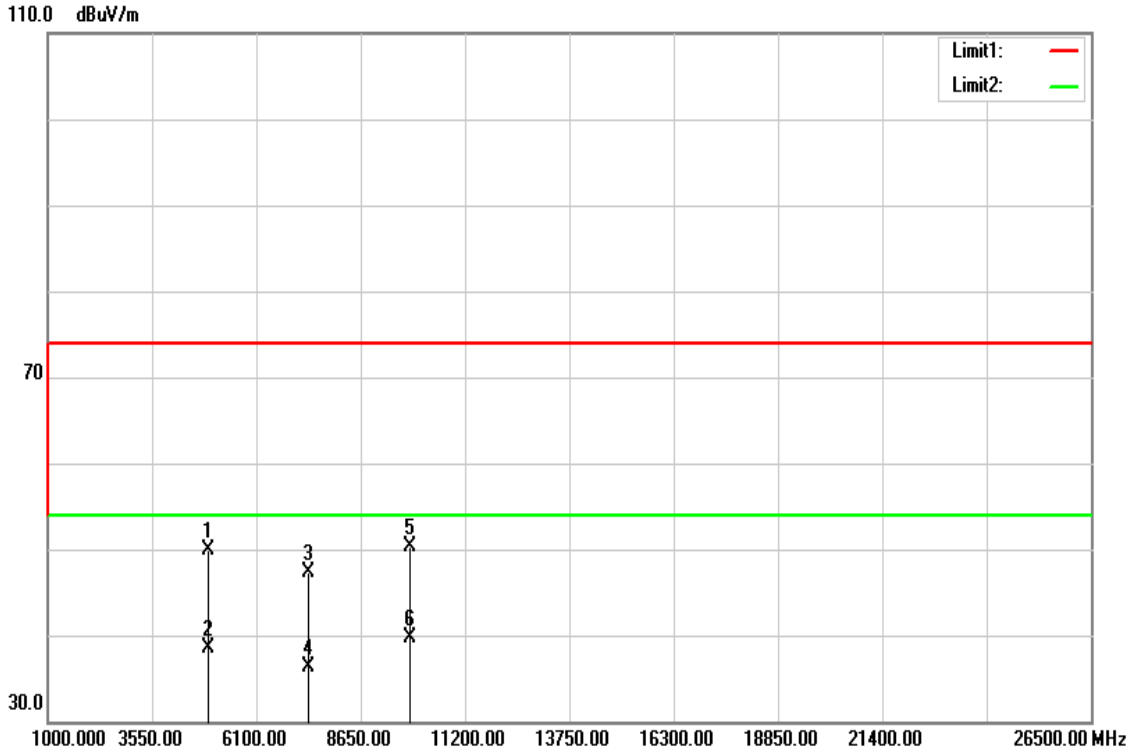


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4932.000	44.45	5.39	49.84	74.00	-24.16	peak
4932.000	32.95	5.39	38.34	54.00	-15.66	AVG
7386.000	34.13	13.17	47.30	74.00	-26.70	peak
7386.000	23.35	13.17	36.52	54.00	-17.48	AVG
9848.000	32.24	17.60	49.84	74.00	-24.16	peak
9848.000	19.61	17.60	37.21	54.00	-16.79	AVG

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	27(℃)/ 53%RH
Test Item	Harmonic	Test Date	2017/2/6
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz

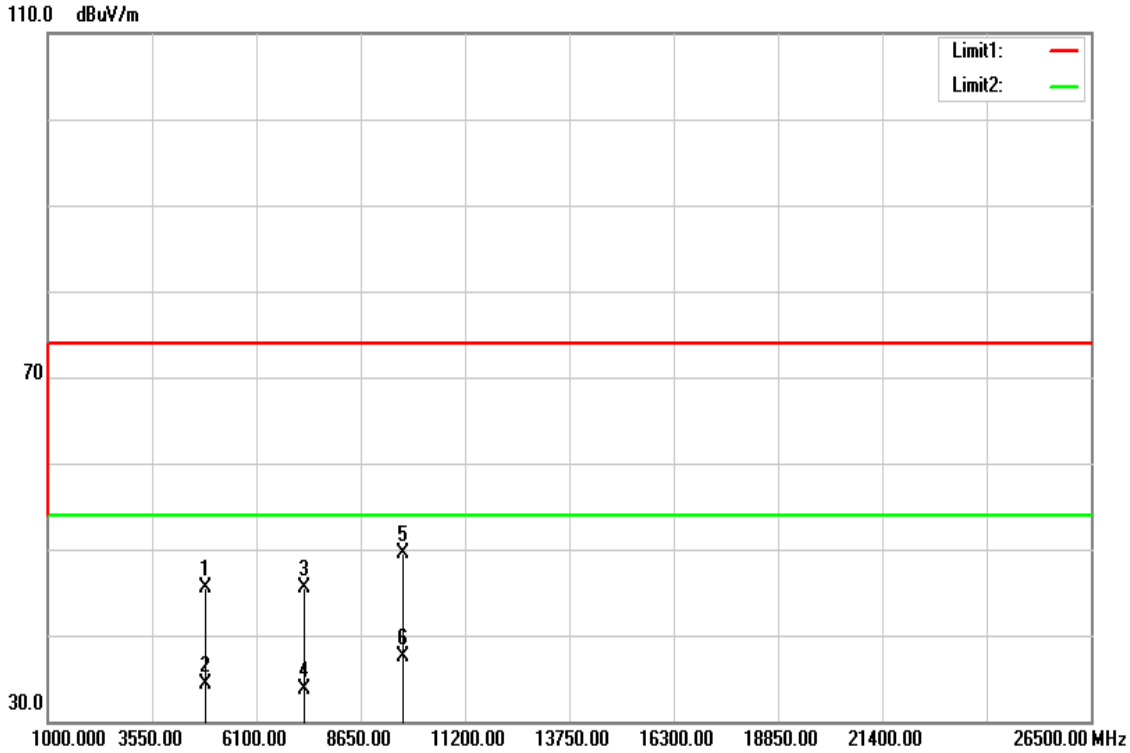


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4918.000	44.51	5.35	49.86	74.00	-24.14	peak
4918.000	33.17	5.35	38.52	54.00	-15.48	AVG
7386.000	34.22	13.17	47.39	74.00	-26.61	peak
7386.000	23.05	13.17	36.22	54.00	-17.78	AVG
9848.000	32.73	17.60	50.33	74.00	-23.67	peak
9848.000	22.14	17.60	39.74	54.00	-14.26	AVG

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	27(℃)/ 53%RH
Test Item	Harmonic	Test Date	2017/2/6
Polarize	Vertical	Test Engineer	ED Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz

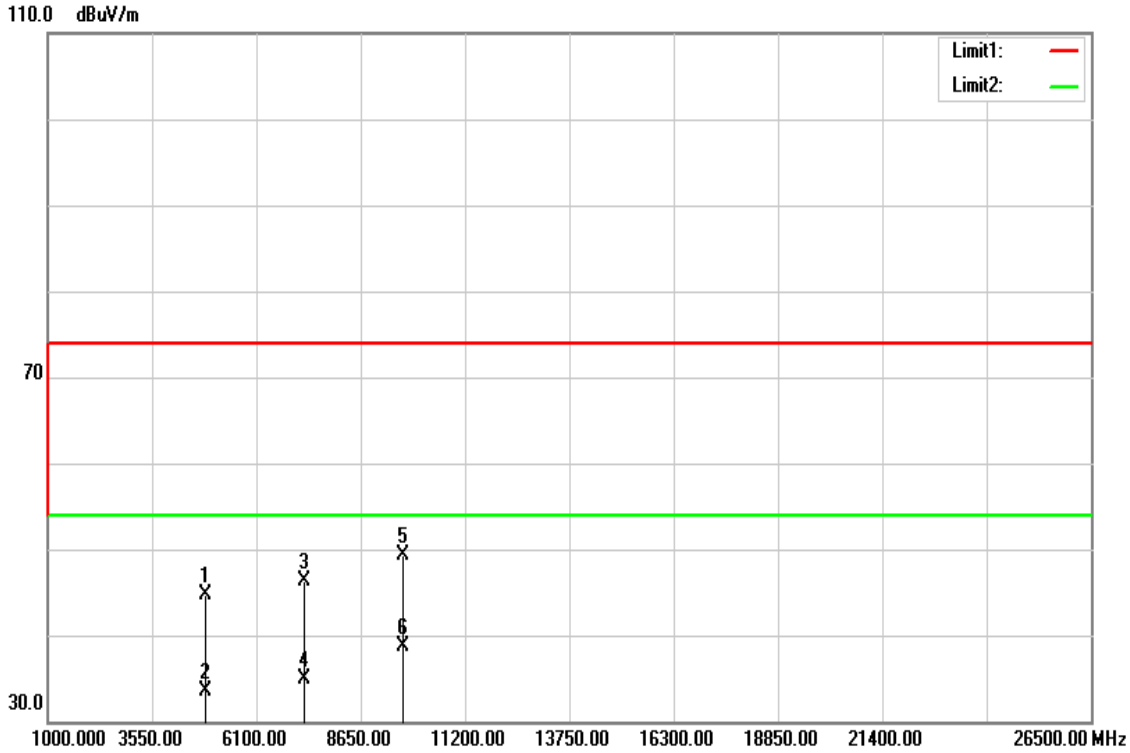


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4848.000	40.39	5.16	45.55	74.00	-28.45	peak
4848.000	29.05	5.16	34.21	54.00	-19.79	AVG
7266.000	32.68	12.80	45.48	74.00	-28.52	peak
7266.000	20.82	12.80	33.62	54.00	-20.38	AVG
9688.000	31.81	17.60	49.41	74.00	-24.59	peak
9688.000	19.97	17.60	37.57	54.00	-16.43	AVG

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	27(℃)/ 53%RH
Test Item	Harmonic	Test Date	2017/2/6
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz

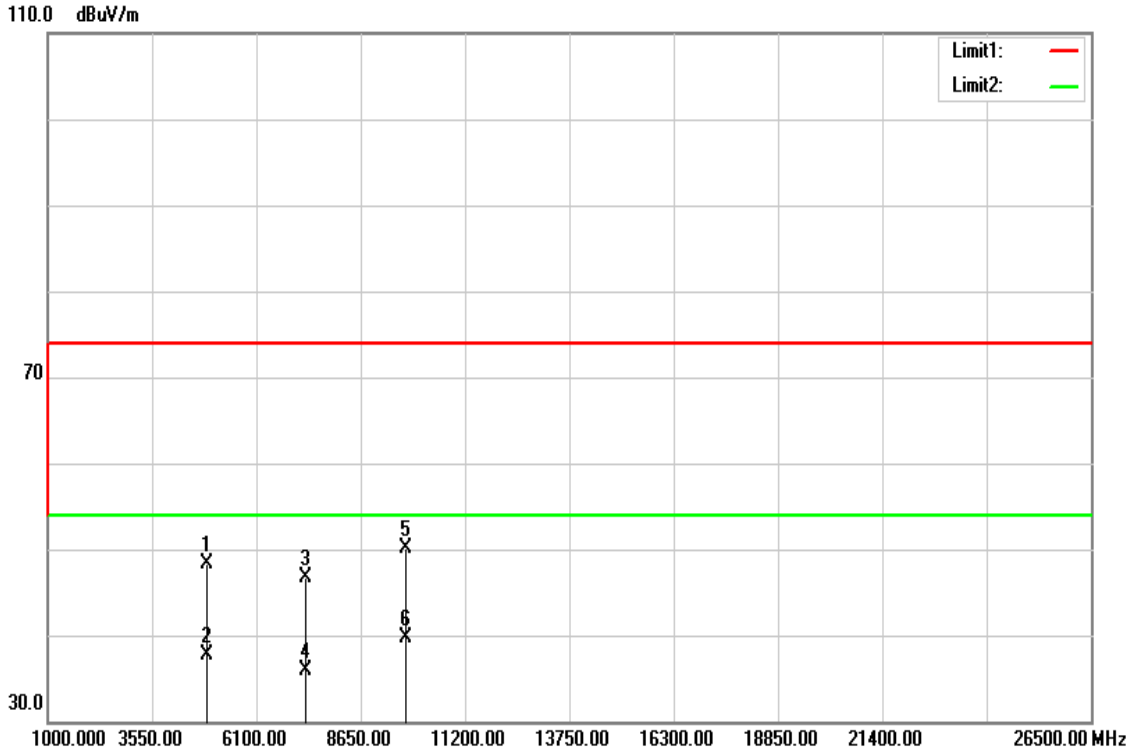


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4848.000	39.59	5.16	44.75	74.00	-29.25	peak
4848.000	28.36	5.16	33.52	54.00	-20.48	AVG
7266.000	33.42	12.80	46.22	74.00	-27.78	peak
7266.000	22.12	12.80	34.92	54.00	-19.08	AVG
9688.000	31.69	17.60	49.29	74.00	-24.71	peak
9688.000	21.11	17.60	38.71	54.00	-15.29	AVG

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	27(℃)/ 53%RH
Test Item	Harmonic	Test Date	2017/2/6
Polarize	Vertical	Test Engineer	ED Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz

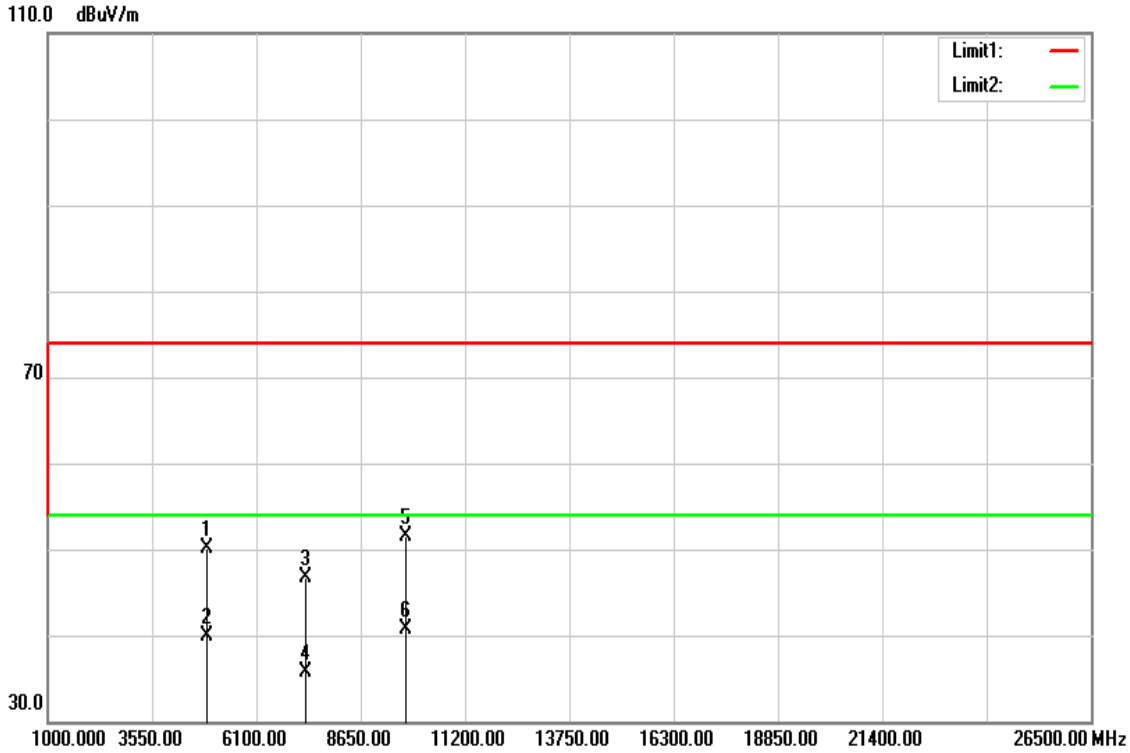


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4876.000	43.16	5.24	48.40	74.00	-25.60	peak
4876.000	32.44	5.24	37.68	54.00	-16.32	AVG
7311.000	33.76	12.94	46.70	74.00	-27.30	peak
7311.000	22.90	12.94	35.84	54.00	-18.16	AVG
9748.000	32.44	17.60	50.04	74.00	-23.96	peak
9748.000	22.09	17.60	39.69	54.00	-14.31	AVG

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	27(℃)/ 53%RH
Test Item	Harmonic	Test Date	2017/2/6
Polarize	Horizontal	Test Engineer	ED Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz

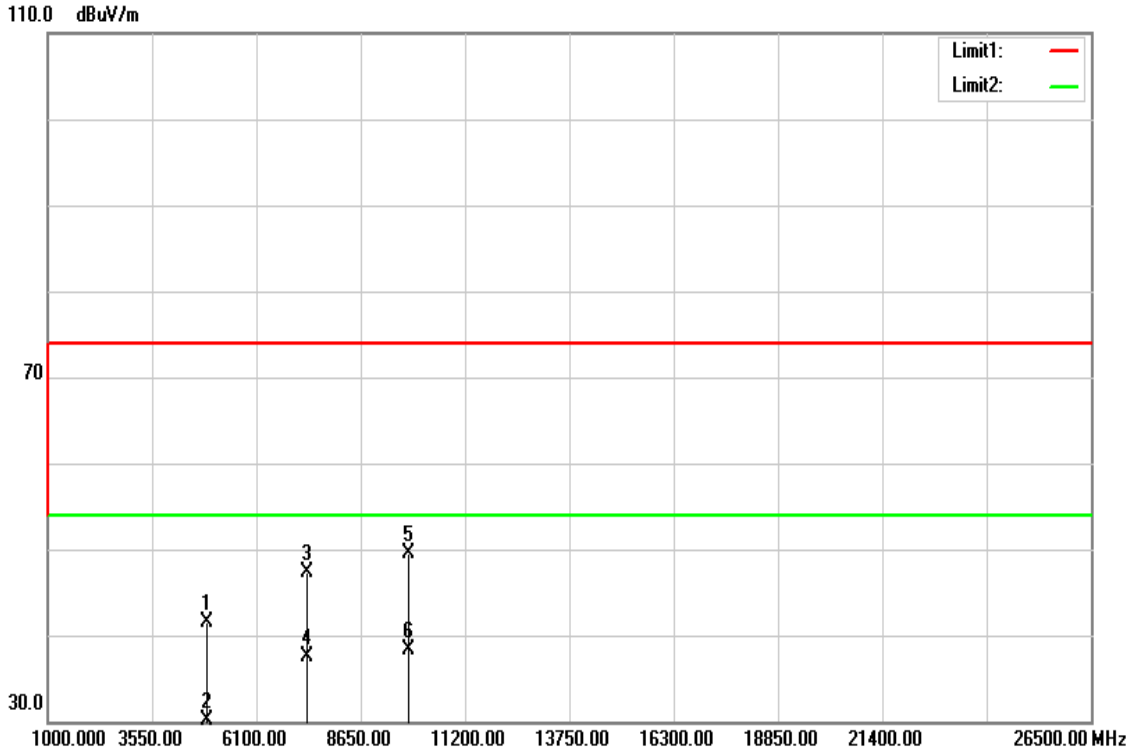


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4883.000	44.79	5.26	50.05	74.00	-23.95	peak
4883.000	34.58	5.26	39.84	54.00	-14.16	AVG
7311.000	33.75	12.94	46.69	74.00	-27.31	peak
7311.000	22.69	12.94	35.63	54.00	-18.37	AVG
9748.000	33.83	17.60	51.43	74.00	-22.57	peak
9748.000	23.19	17.60	40.79	54.00	-13.21	AVG

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	27(℃)/ 53%RH
Test Item	Harmonic	Test Date	2017/2/6
Polarize	Vertical	Test Engineer	ED Chiang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz

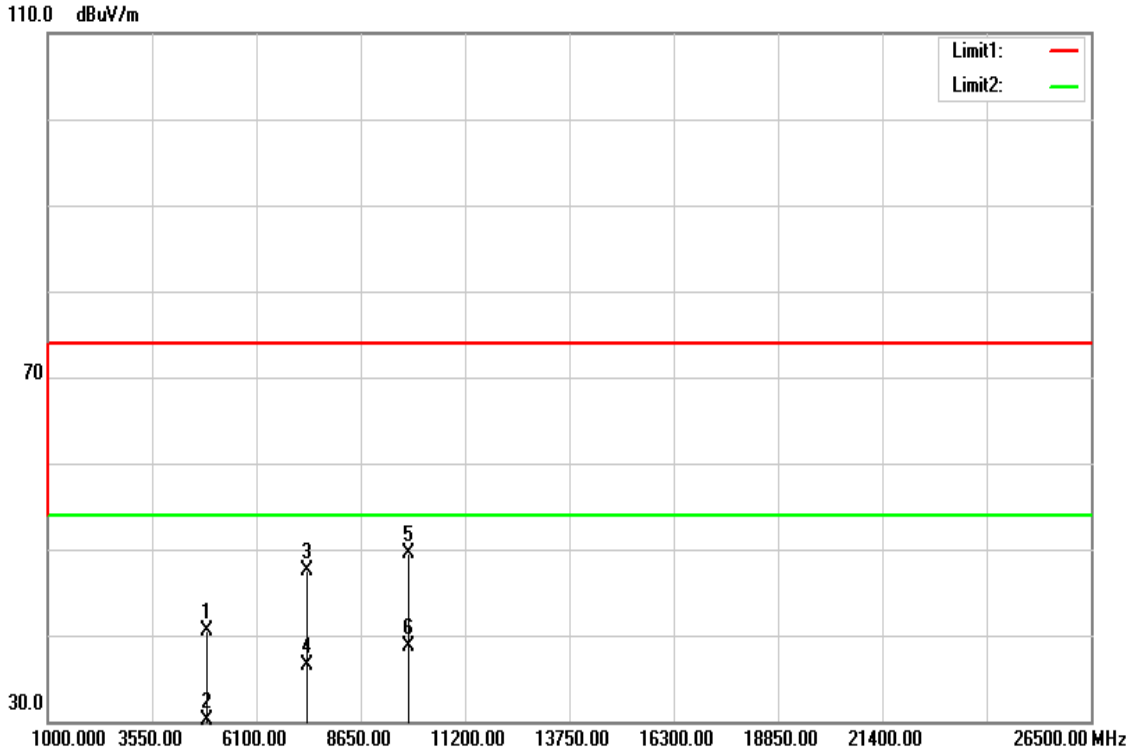


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4904.000	36.28	5.31	41.59	74.00	-32.41	peak
4904.000	24.85	5.31	30.16	54.00	-23.84	AVG
7356.000	34.12	13.08	47.20	74.00	-26.80	peak
7356.000	24.46	13.08	37.54	54.00	-16.46	AVG
9808.000	31.93	17.60	49.53	74.00	-24.47	peak
9808.000	20.67	17.60	38.27	54.00	-15.73	AVG

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	27(℃)/ 53%RH
Test Item	Harmonic	Test Date	2017/2/6
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	35.24	5.31	40.55	74.00	-33.45	peak
4904.000	24.81	5.31	30.12	54.00	-23.88	AVG
7356.000	34.34	13.08	47.42	74.00	-26.58	peak
7356.000	23.34	13.08	36.42	54.00	-17.58	AVG
9808.000	31.93	17.60	49.53	74.00	-24.47	peak
9808.000	21.11	17.60	38.71	54.00	-15.29	AVG

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*