FCC RADIO TEST REPORT
FCC 47 CFR PART 15 SUBPART C

Test Standard	**FCC Part 15.247**
FCC ID	**SKX-RF2**
Brand name	**APPRO**
Product name	**802.11bgn WLAN module**
Model No.	**AP-WM2017AA**
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)

Testing Laboratory
1309

Approved by:

Sam Chuang
Manager

Tested by:

Jerry Chuang
Engineer

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Revision History

Rev.	Issue Date	Revisions	Revised By
00	November 16, 2017	Initial Issue	Allison Chen
01	November 30, 2017	1. Modify section 3.2 in page 11. 2. Revised test setup photo in page 90-91.	Angel Cheng

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APPENDIX I PHOTOGRAPHS OF EUT

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1. GENERAL INFORMATION

1.1 EUT INFORMATION

Applicant	APPRO Technology Inc. 13F, No. 66, Zhongzheng Rd., Xinzhuang Dist., New Taipei City, Taiwan.
Manufacturer	APPRO Technology Inc. 13F, No. 66, Zhongzheng Rd., Xinzhuang Dist., New Taipei City, Taiwan.
Equipment	802.11bgn WLAN module
Model No.	AP-WM2017AA
Model Discrepancy	N/A
Received Date	September 28, 2017
Date of Test	November 10 ~ November 13, 2017
Output Power(W)	IEEE 802.11b mode: 0.1023 IEEE 802.11g mode: 0.1528 IEEE 802.11n HT 20 MHz mode: 0.1718 IEEE 802.11n HT 40 MHz mode: 0.1422
Power Supply	VDC from Power Adapter Model: CYSN05-050100-UL-U I/P : 100-240Vac, 50-60Hz, 0.13A O/P: 5Vdc, 1A

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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: 9 Channels

Remark:
Refer as ANSI 63.10:2013 clause 5.6.1 Table 4 for test channels

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

1.3 ANTENNA INFORMATION

Antenna Type	FPC Antenna
Antenna Gain	Gain: 1.04dBi

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1.4 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
AC Powerline Conducted Emission	+/- 1.2575
Emission bandwidth, 20dB bandwidth	+/- 1.4003
RF output power, conducted	+/- 1.1372
Power density, conducted	+/- 1.4003
3M Semi Anechoic Chamber / 30M~200M	+/- 4.0138
3M Semi Anechoic Chamber / 200M~1000M	+/- 3.9483
3M Semi Anechoic Chamber / 1G~8G	+/- 2.5975
3M Semi Anechoic Chamber / 8G~18G	+/- 2.6112
3M Semi Anechoic Chamber / 18G~26G	+/- 2.7389
3M Semi Anechoic Chamber / 26G~40G	+/- 2.9683
3M Semi Anechoic Chamber / 40G~60G	+/- 1.8509
3M Semi Anechoic Chamber / 60G~75G	+/- 1.9869
3M Semi Anechoic Chamber / 75G~110G	+/- 2.9651
3M Semi Anechoic Chamber / 110G~170G	+/- 2.7807
3M Semi Anechoic Chamber / 170G~220G	+/- 3.6437
3M Semi Anechoic Chamber / 220G~325G	+/- 4.2982

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.

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1.5 FACILITIES AND TEST LOCATION

All measurement facilities used to collect the measurement data are located at

No.11, Wugong 6th Rd., Wugu Dist., New Taipei City 24891, Taiwan. (R.O.C.)

Test site	Test Engineer	Remark
AC Conduction Room	Eric Lee	--
Radiation	Jerry Chuang	--
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	07/03/2017	07/02/2018
Power Sensor	Anritsu	MA2411B	917072	07/03/2017	07/02/2018
Spectrum Analyzer	R&S	FSV 40	101073	10/02/2017	10/01/2018

3M 966 Chamber Test Site					
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal Date**	**Cal Due**
Bilog Antenna	Sunol Sciences	JB3	A030105	06/20/2017	06/19/2018
Horn Antenna	EMCO	3117	00055165	02/20/2017	02/19/2018
Pre-Amplifier	EMCI	EMC 012635	980151	08/01/2017	07/31/2018
Pre-Amplifier	EMEC	EM330	060609	06/07/2017	06/06/2018
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
EMI Test Receiver	R&S	ESCI	100064	05/17/2017	05/16/2018

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

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1.7 SUPPORT AND EUT ACCESSORIES EQUIPMENT

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

Support Equipment					
No.	**Equipment**	**Brand**	**Model**	**Series No.**	**FCC ID**
1.	NB	HP	Compaq 511	N/A	QDS-BRCM4176

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.

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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

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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 :MCS0 IEEE 802.11n HT40 mode :MCS0
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 :1T1R IEEE 802.11n HT40 mode :1T1R

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

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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	120Vac / 60Hz
Test Mode	Mode 1:EUT power by AC adapter via power cable.
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	120Vac / 60Hz
Test Mode	Mode 1:EUT power by AC adapter via power cable.
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 Z-Plane (H-Plane)
Worst Polarity	☐ Horizontal ☒ Vertical

Radiated Emission Measurement Below 1G	
Test Condition	Radiated Emission Below 1G
Voltage/Hz	120Vac / 60Hz
Test Mode	Mode 1:EUT power by AC adapter via power cable.
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 two axis ,X,Z and two polarity, Horizontal and Vertical for radiated measurement. The worst case(Z-Plane and Vertical) were recorded in this report
3. AC power line conducted emission and For below 1G radiation emission were performed the EUT transmit at the highest output power channel as worse case.

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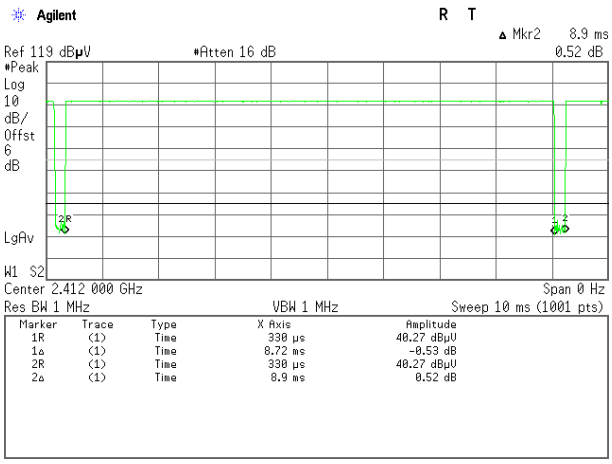
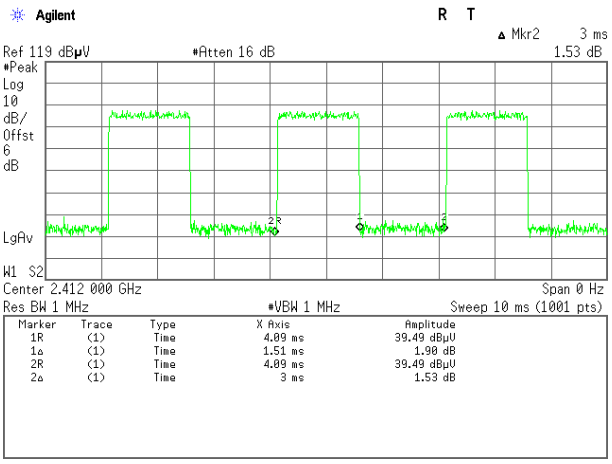
3.3 EUT DUTY CYCLE

Duty Cycle				
Configuration	TX ON (ms)	TX ALL (ms)	Duty Cycle (%)	Duty Factor(dB)
802.11b	8.7200	8.9000	97.98%	0.09
802.11g	1.5100	3.0000	50.33%	2.98
802.11n HT20	1.4000	1.5400	90.91%	0.41
802.11n HT40	0.7100	0.8500	83.53%	0.78

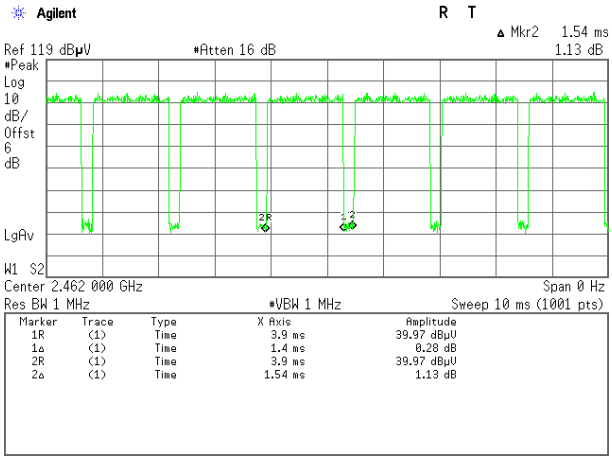
802.11b



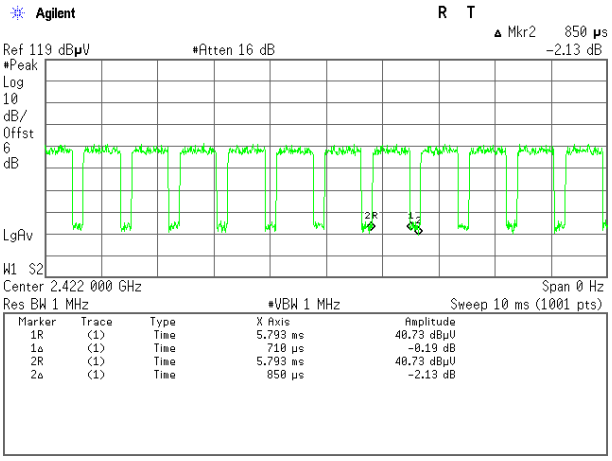
802.11g



802.11n HT20



802.11n HT40



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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

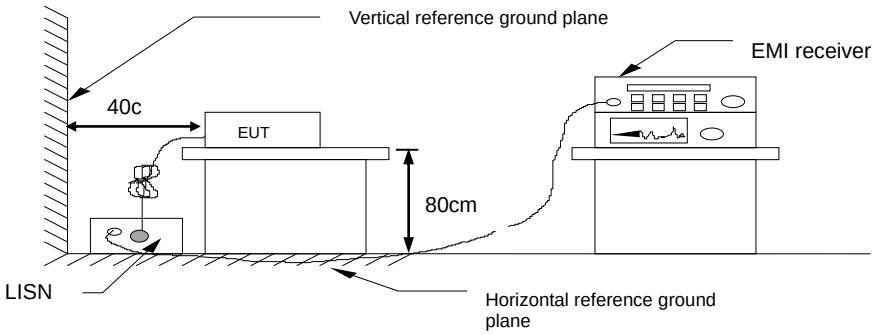
* Decreases with the logarithm of the frequency.

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

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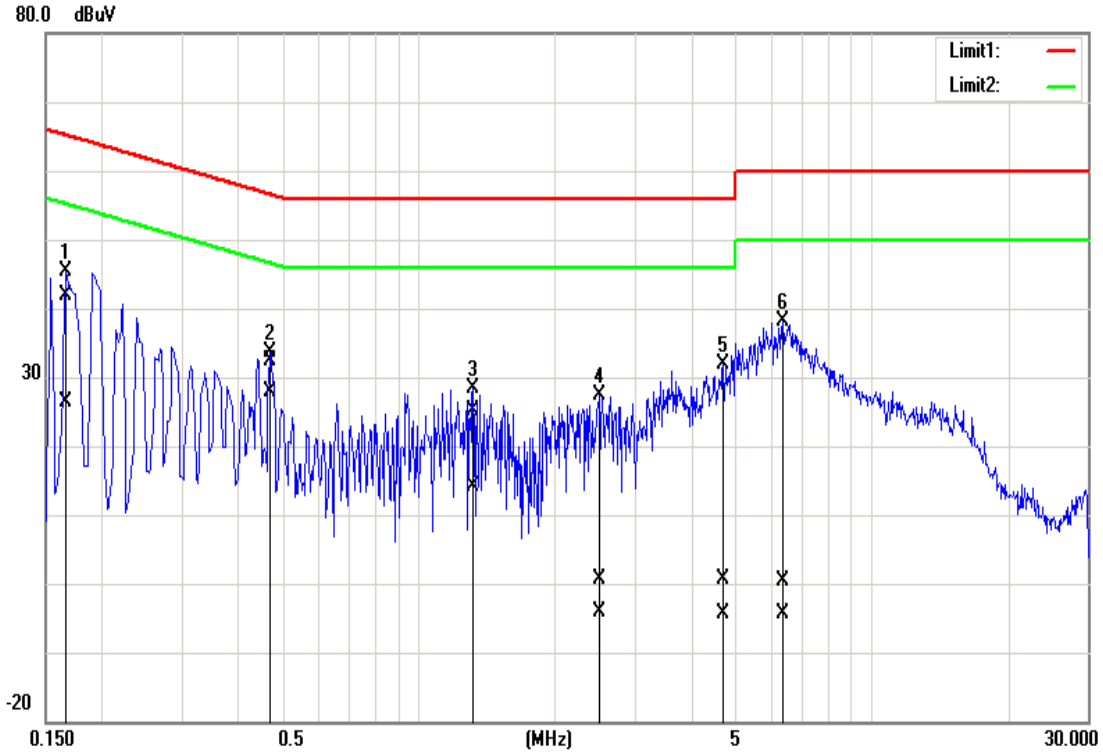
Test Data

Test Mode:	Mode 1	Temp/Hum	24(℃)/ 50%RH
Test Voltage:	120Vac / 60Hz	Test Date	2017/11/13
Phase:	Line	Test Engineer	Eric Lee



No.	Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)
1	0.1660	41.81	26.41	0.05	41.86	26.46	65.16	55.16	-23.30	-28.70
2	0.4700	32.39	27.76	0.05	32.44	27.81	56.51	46.51	-24.07	-18.70
3	1.3180	25.03	14.08	0.08	25.11	14.16	56.00	46.00	-30.89	-31.84
4	2.5060	0.56	-4.34	0.10	0.66	-4.24	56.00	46.00	-55.34	-50.24
5	4.7140	0.56	-4.37	0.10	0.66	-4.27	56.00	46.00	-55.34	-50.27
6	6.3580	0.39	-4.38	0.04	0.43	-4.34	60.00	50.00	-59.57	-54.34

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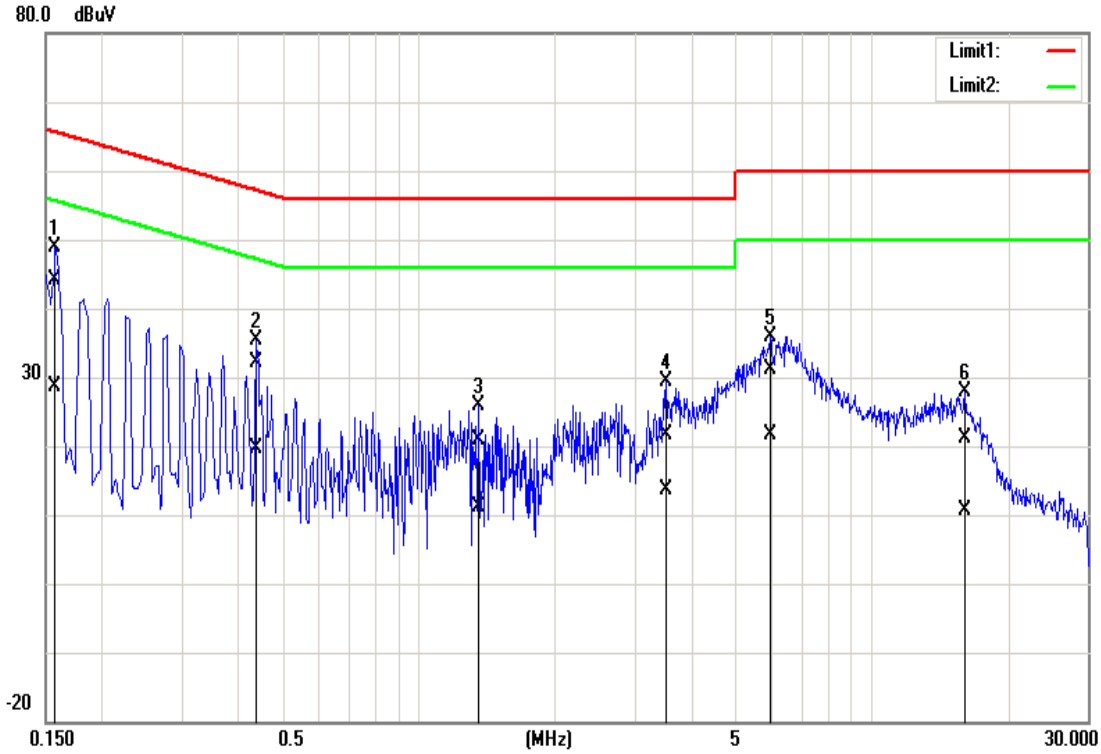
Test Mode:	Mode 1	Temp/Hum	24(℃)/ 50%RH
Test Voltage:	120Vac / 60Hz	Test Date	2017/11/13
Phase:	Neutral	Test Engineer	Eric Lee



No.	Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)
1	0.1580	44.07	28.47	0.12	44.19	28.59	65.57	55.57	-21.38	-26.98
2	0.4380	31.99	19.56	0.13	32.12	19.69	57.10	47.10	-24.98	-27.41
3	1.3580	20.75	11.08	0.16	20.91	11.24	56.00	46.00	-35.09	-34.76
4	3.5180	21.38	13.39	0.20	21.58	13.59	56.00	46.00	-34.42	-32.41
5	5.9740	30.97	21.41	0.25	31.22	21.66	60.00	50.00	-28.78	-28.34
6	16.0740	20.63	10.29	0.43	21.06	10.72	60.00	50.00	-38.94	-39.28

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4.2 6DB BANDWIDTH AND OCCUPIED BANDWIDTH(99%)

4.2.1 Test Limit

According to §15.247(a)(2)

6 dB Bandwidth ：

Limit	Shall be at least 500kHz

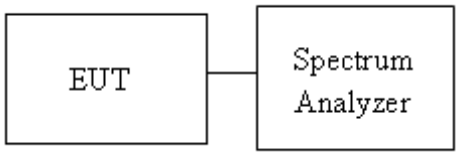
Occupied Bandwidth(99%) ： For reporting purposes only.

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 and 99% Bandwidth.
4. Measure and record the result of 6 dB Bandwidth and 99% Bandwidth. in the test report.

4.2.3 Test Setup



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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	9.1739	--	12.2431	--	≥500
Mid	2437	10.1304	--	12.3733	--	
High	2462	9.1739	--	12.5470	--	

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	16.3913	--	16.7583	--	≥500
Mid	2437	16.3913	--	16.8451	--	
High	2462	16.3913	--	16.8885	--	

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	17.0000	--	17.6266	--	≥500
Mid	2437	17.0000	--	17.8002	--	
High	2462	17.1304	--	17.8437	--	

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	35.3620	--	36.2373	--	>500
Mid	2437	35.3620	--	36.3531	--	
High	2452	35.3620	--	36.0057	--	

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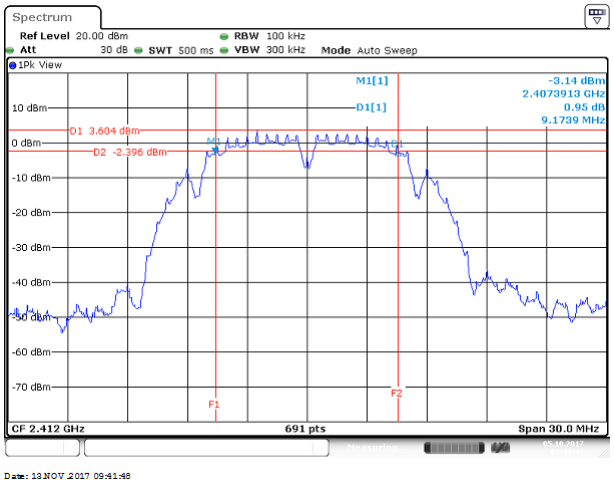
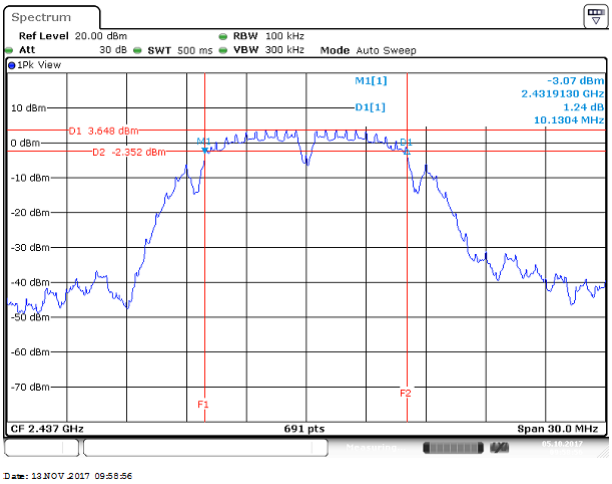
Test Data

IEEE 802.11b mode- chain 0

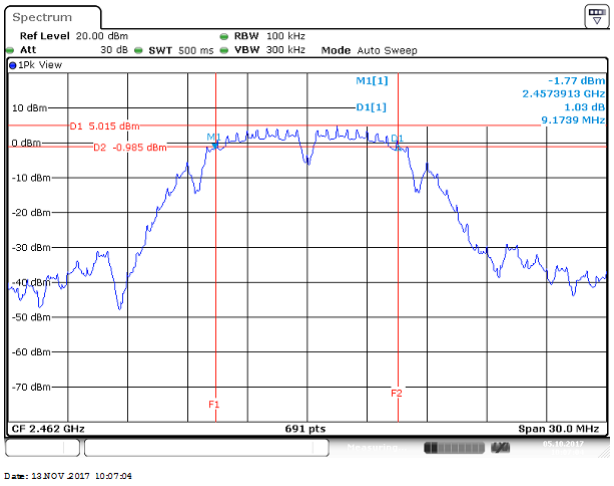
Low CH



Mid CH



High CH



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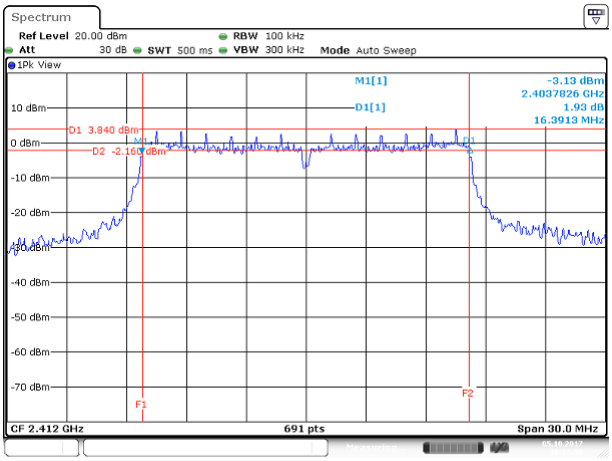
IEEE 802.11g mode- chain 0

Low CH



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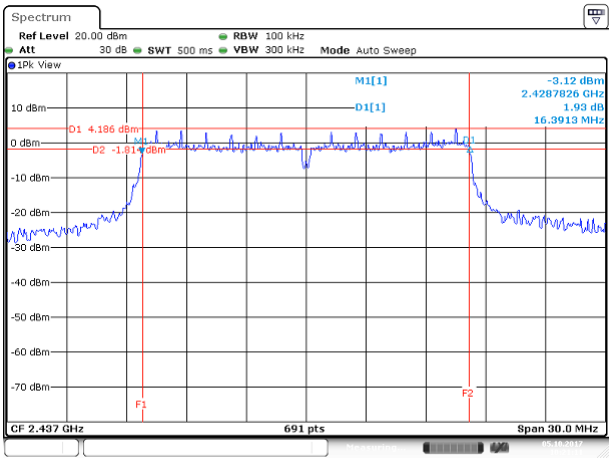
Mid CH



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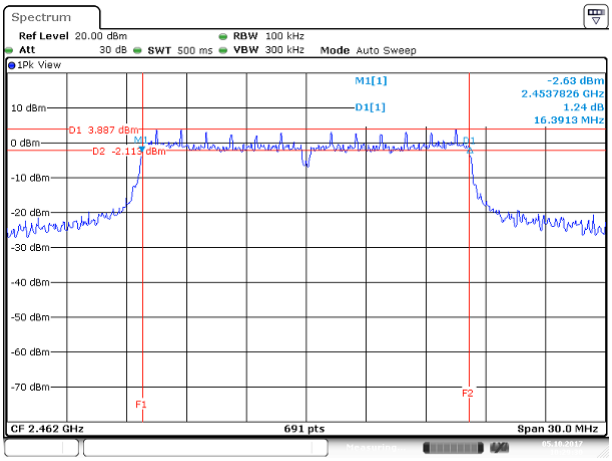
High CH



Date: 13.NOV.2017 10:29:30

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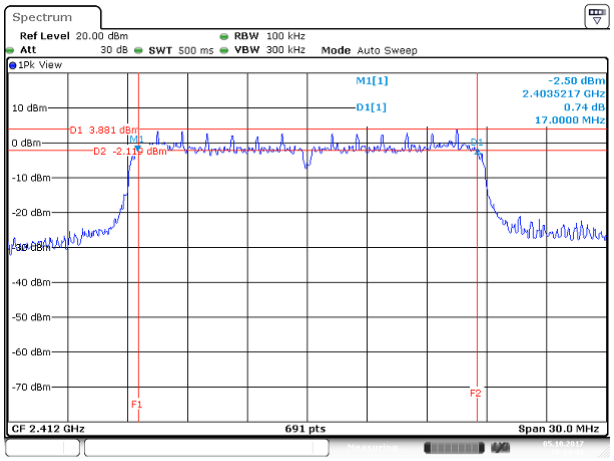
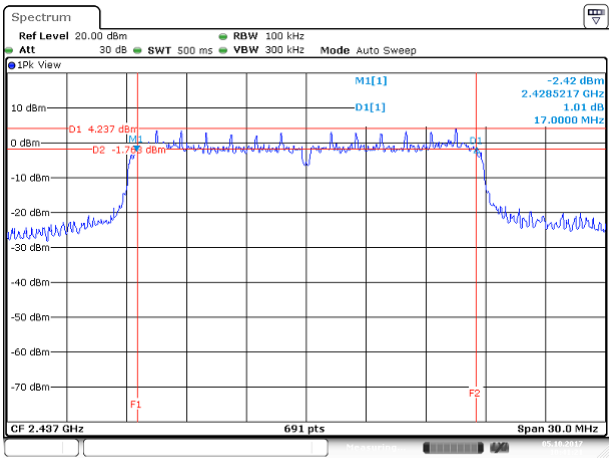
IEEE 802.11n HT20 mode- chain 0

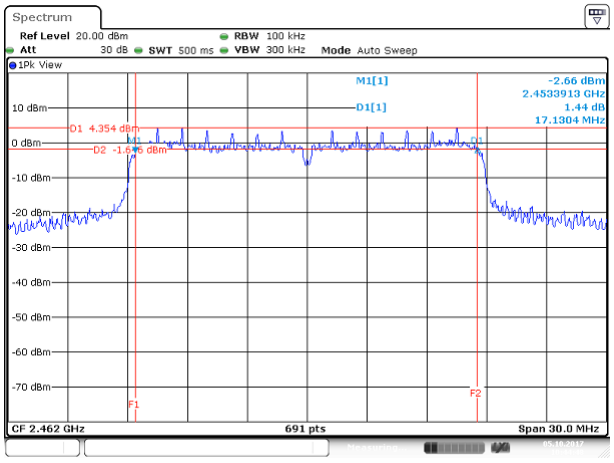
Low CH



Mid CH



High CH



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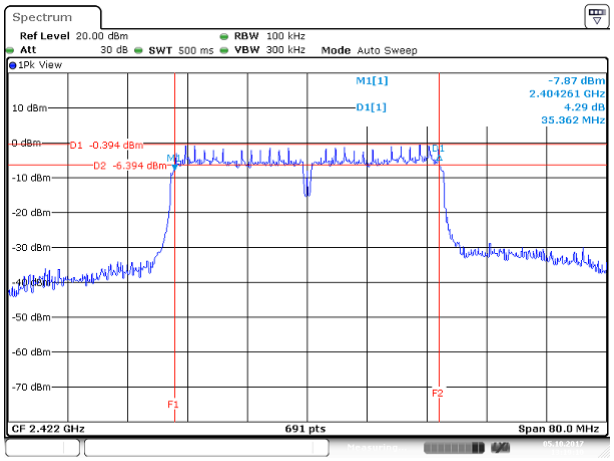
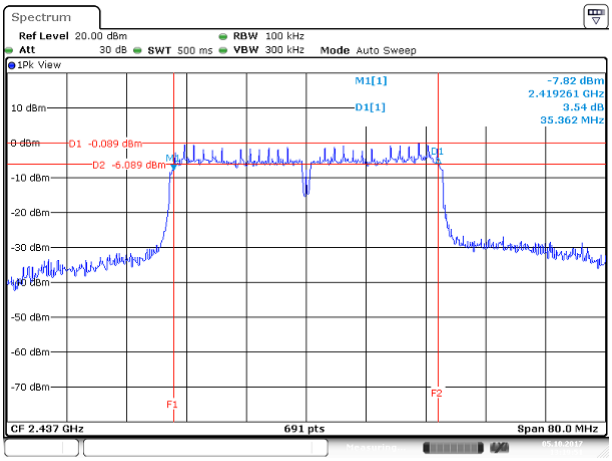
IEEE 802.11n HT40 mode- chain 0

Low CH



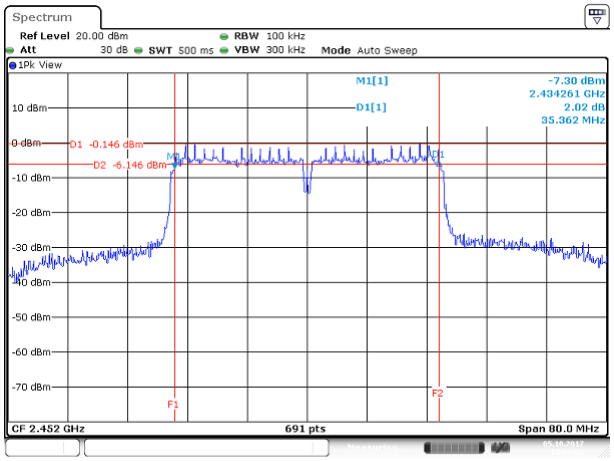
Date: 13.NOV.2017 13:19:10

Mid CH



Date: 13.NOV.2017 13:19:52

High CH



Date: 13.NOV.2017 13:25:53

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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：

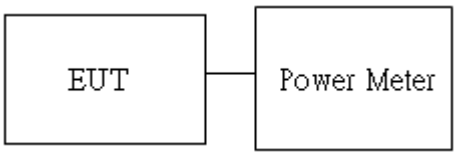
Average output power：For reporting purposes only.

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



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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	22	-	20.10	-	20.10	0.1023	30
	Mid	2437	17	-	19.32	-	19.32	0.0855	
	High	2462	18.5	-	18.69	-	18.69	0.074	
IEEE 802.11g Data rate: 6Mbps	Low	2412	15	-	20.55	-	20.55	0.1135	
	Mid	2437	15	-	21.84	-	21.84	0.1528	
	High	2462	13	-	19.50	-	19.50	0.0891	
IEEE 802.11n HT20 Data rate: MCS 0	Low	2412	13	-	22.35	-	22.35	0.1718	
	Mid	2437	13	-	22.27	-	22.27	0.1687	
	High	2462	12	-	19.51	-	19.51	0.0893	
IEEE 802.11n HT40 Data rate: MCS 0	Low	2422	11	-	20.80	-	20.80	0.1202	
	Mid	2437	11	-	21.53	-	21.53	0.1422	
	High	2452	11	-	20.30	-	20.30	0.1072	

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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	17.27	-	17.27
	Mid	2437	16.87	-	16.87
	High	2462	16.42	-	16.42
IEEE 802.11g Data rate: 6Mbps	Low	2412	14.16	-	14.16
	Mid	2437	14.25	-	14.25
	High	2462	13.59	-	13.59
IEEE 802.11n HT20 Data rate: MCS 0	Low	2412	14.42	-	14.42
	Mid	2437	14.48	-	14.48
	High	2462	13.26	-	13.26
IEEE 802.11n HT40 Data rate: MCS 0	Low	2422	15.75	-	15.75
	Mid	2437	15.93	-	15.93
	High	2452	15.82	-	15.82

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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.

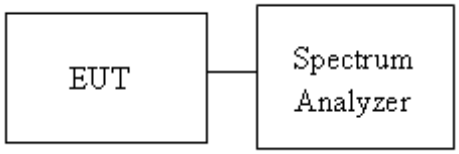
Limit	☒ Antenna not exceed 6 dBi：8dBm ☐ Antenna with DG greater than 6 dBi： [Limit = 8 – (DG – 6)] ☐ Point-to-point operation：

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



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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	-6.52	-	-6.52	8
Mid	2437	-9.75	-	-9.75	
High	2462	-9.93	-	-9.93	

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	-11.46	-	-11.46	8
Mid	2437	-9.17	-	-9.17	
High	2462	-10.56	-	-10.56	

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	-8.83	-	-8.83	8
Mid	2437	-8.57	-	-8.57	
High	2462	-10.84	-	-10.84	

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	-17.20	-	-17.20	8
Mid	2437	-7.99	-	-7.99	
High	2452	-9.35	-	-9.35	

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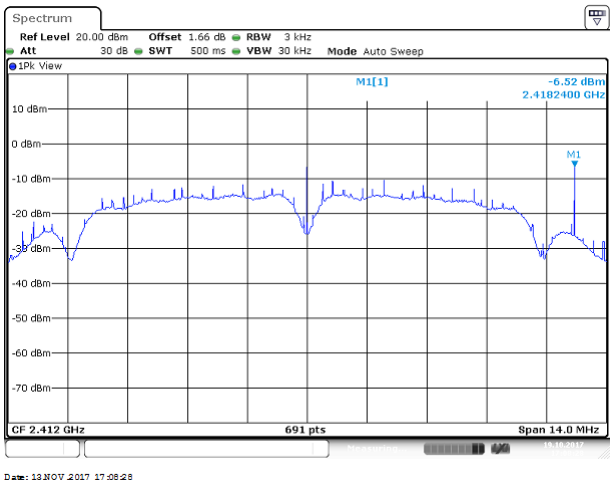
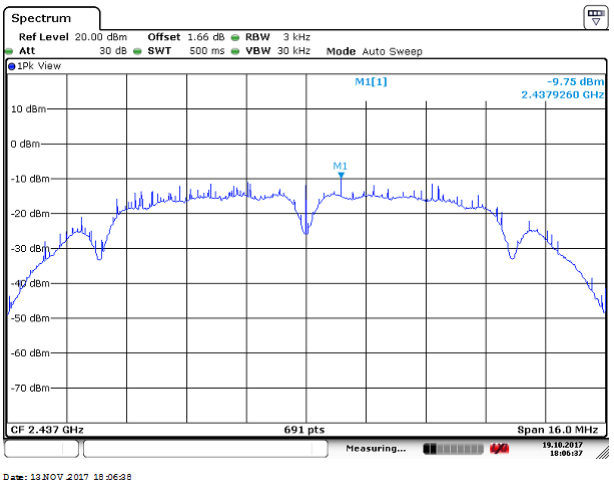
Test Data

IEEE 802.11b mode- chain 0

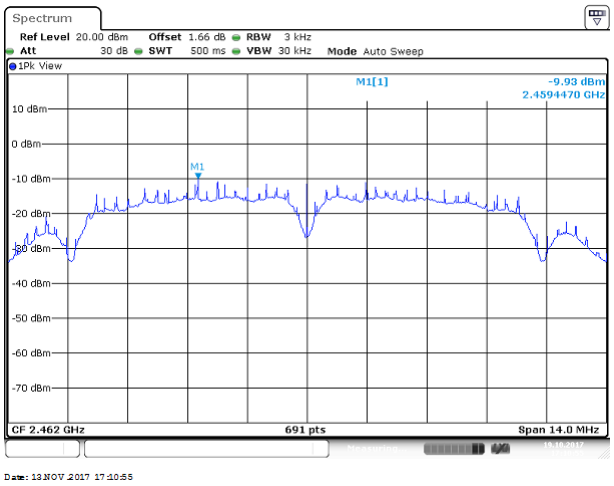
Low CH



Mid CH



High CH



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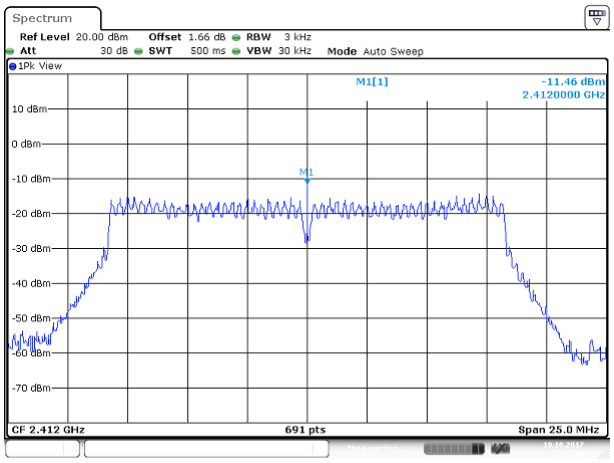
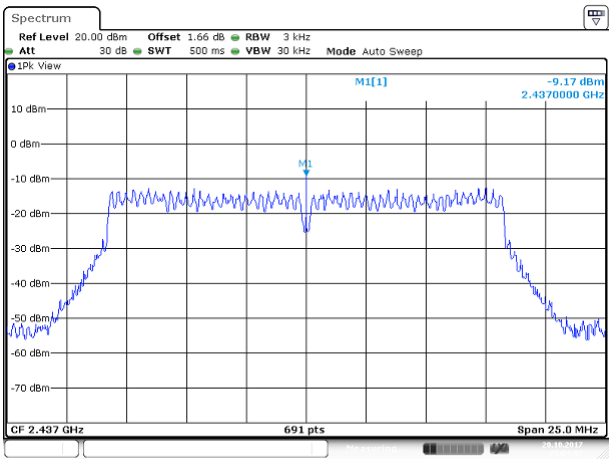
IEEE 802.11g mode- chain 0

Low CH



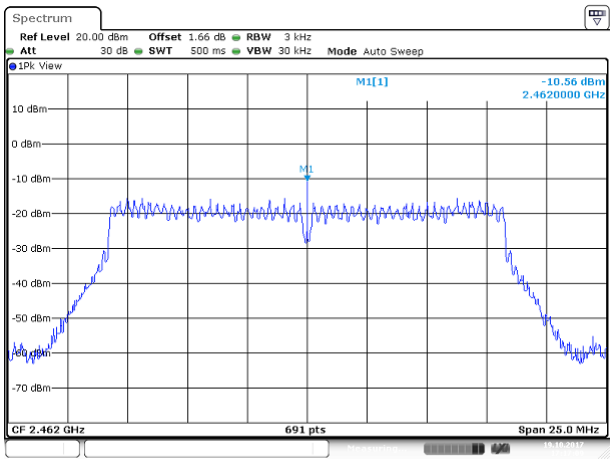
Date: 13.NOV.2017 17:15:21

Mid CH



Date: 13.NOV.2017 21:24:51

High CH



Date: 13.NOV.2017 17:17:09

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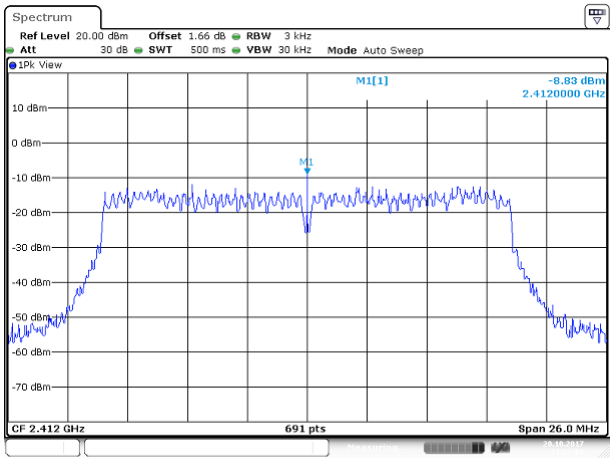
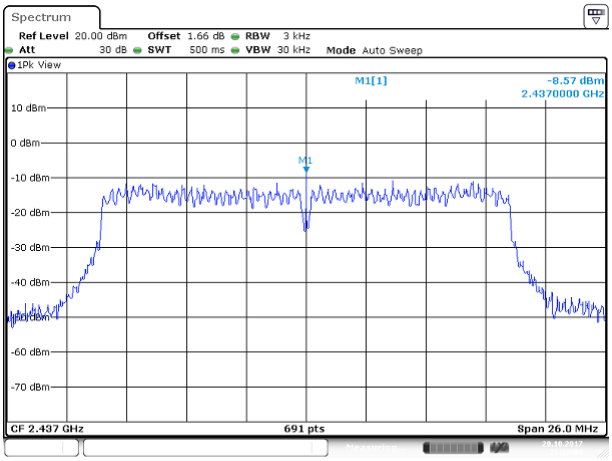
IEEE 802.11n HT20 mode- chain 0

Low CH



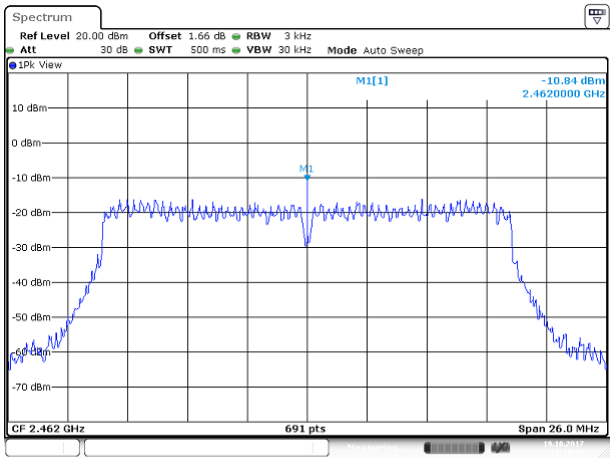
Date: 13.NOV.2017 21:27:02

Mid CH



Date: 13.NOV.2017 21:28:03

High CH



Date: 13.NOV.2017 17:19:44

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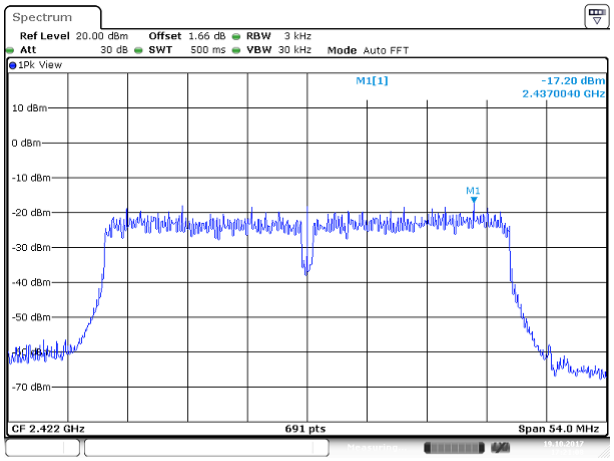
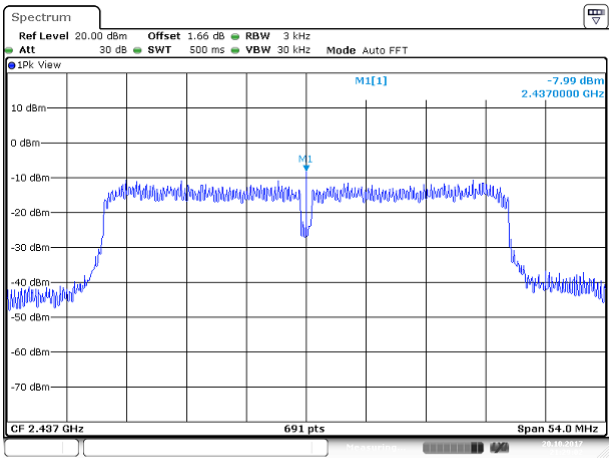
IEEE 802.11n HT40 mode-chain 0

Low CH



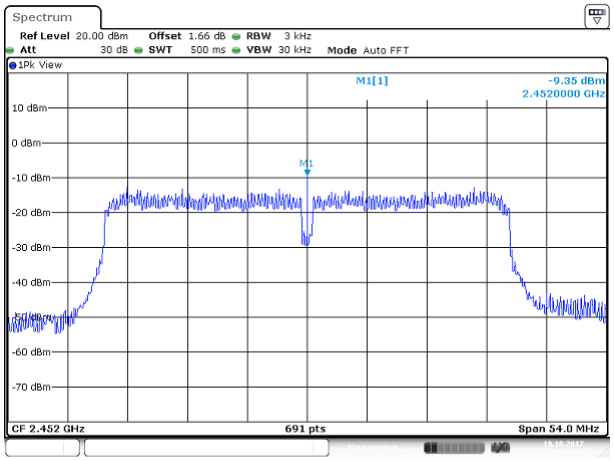
Date: 13.NOV.2017 17:21:09

Mid CH



Date: 13.NOV.2017 17 21:29:02

High CH



Date: 13.NOV.2017 17:22:58

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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

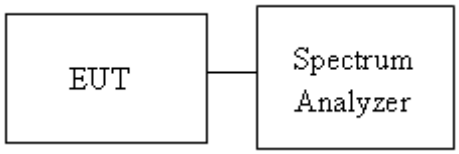
Test method Refer as KDB 558074 D01 v03r05, Section 11.

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



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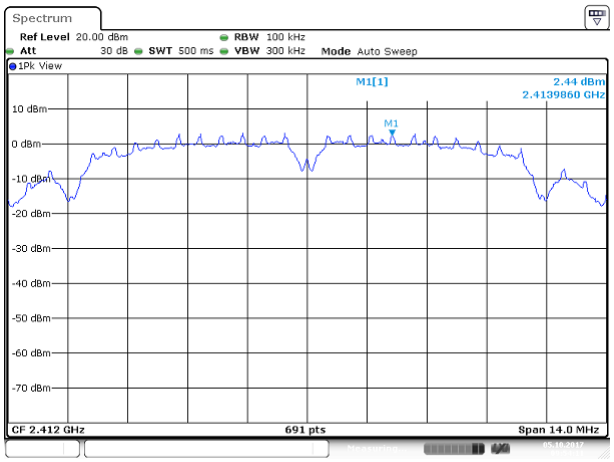
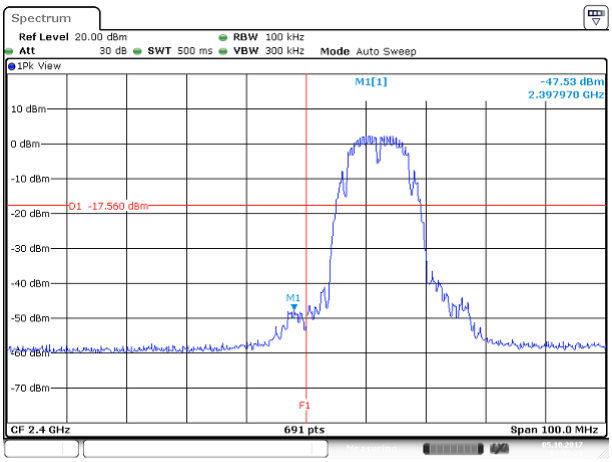
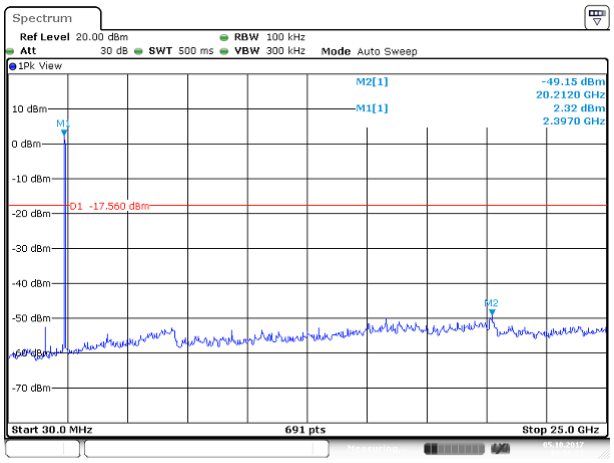
4.5.4 Test Result

Test Data

IEEE 802.11b mode Low CH chain 0	
Reference Level of PSD in 100kHz	**Band Edge**
 Date: 13.NOV.2017 09:54:12	 Date: 13.NOV.2017 09:55:21
Spurious Emission 30MHz-25GHz	
 Date: 13.NOV.2017 09:56:32	

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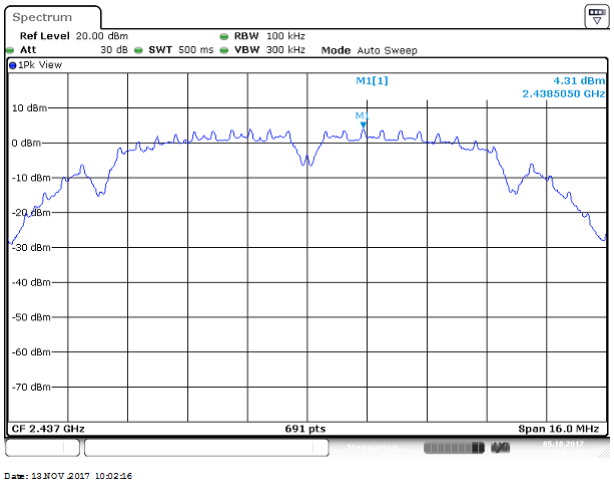
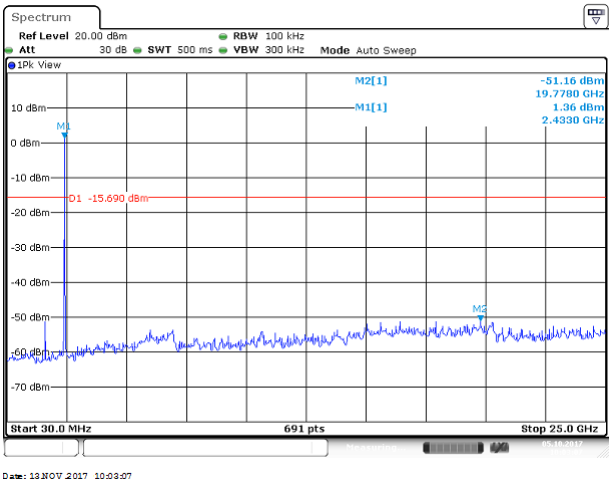
IEEE 802.11b mode Mid CH chain 0	
Reference Level of PSD in 100kHz	**Spurious Emission 30MHz-25GHz**
	

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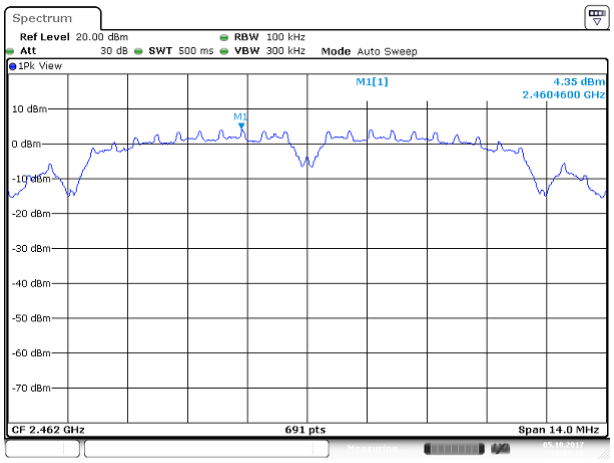
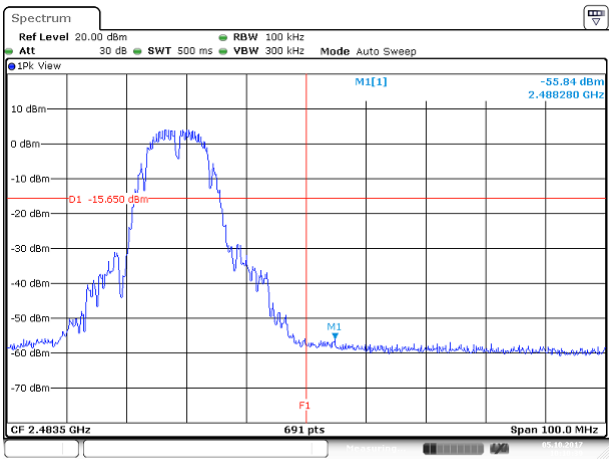
IEEE 802.11b mode High CH chain 0

Reference Level of PSD in 100kHz



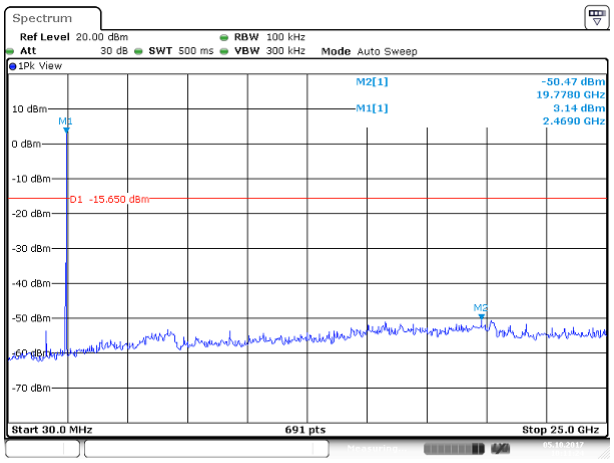
Date: 13.NOV.2017 10:09:17

Band Edge



Date: 13.NOV.2017 10:10:40

Spurious Emission 30MHz-25GHz



Date: 13.NOV.2017 10:11:24

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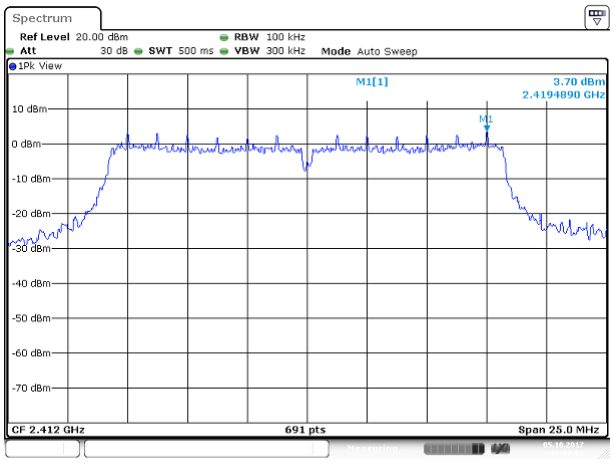
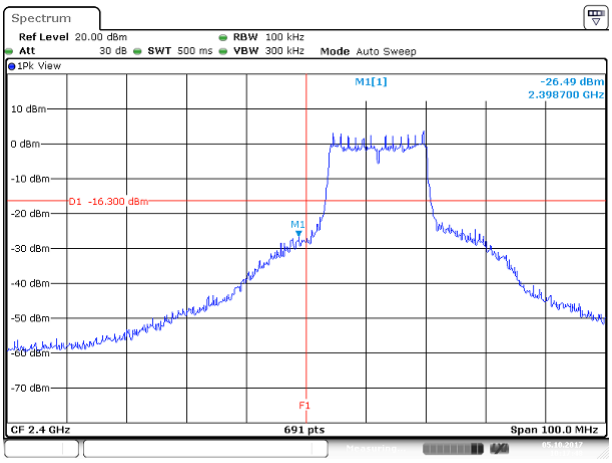
IEEE 802.11g mode Low CH chain 0

Reference Level of PSD in 100kHz



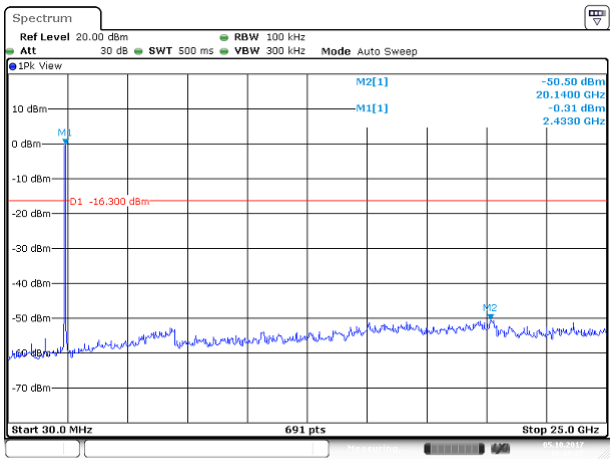
Date: 13.NOV.2017 10:17:02

Band Edge



Date: 13.NOV.2017 10:17:49

Spurious Emission 30MHz-25GHz



Date: 13.NOV.2017 10:18:28

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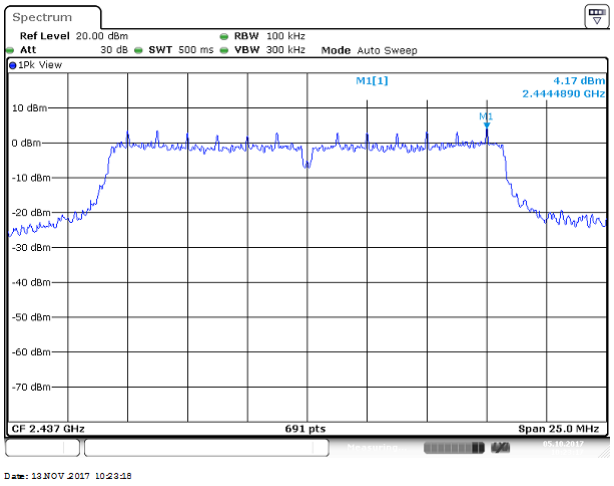
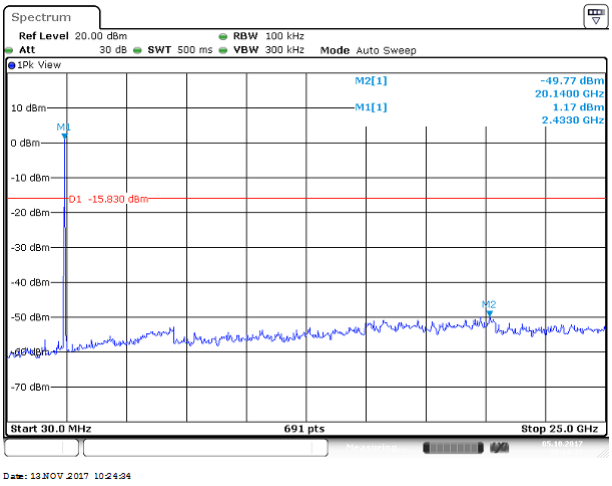
IEEE 802.11g mode Mid CH chain 0	
Reference Level of PSD in 100kHz	**Spurious Emission 30MHz-25GHz**
	

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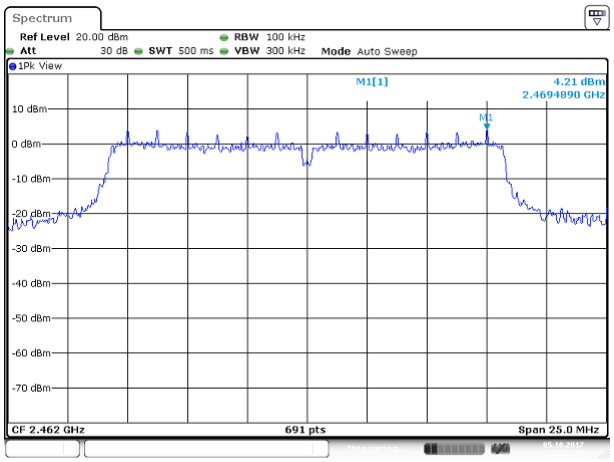
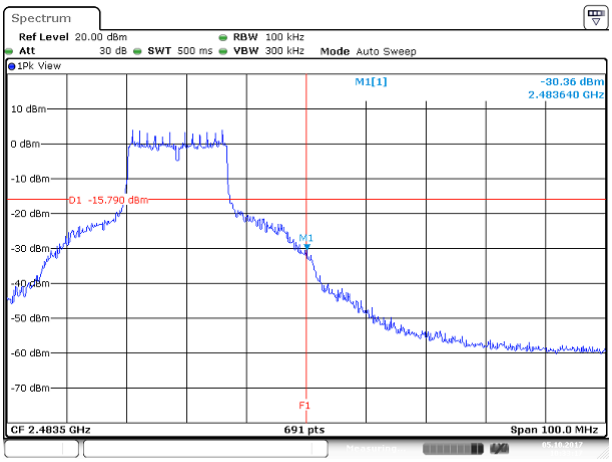
IEEE 802.11g mode High CH chain 0

Reference Level of PSD in 100kHz



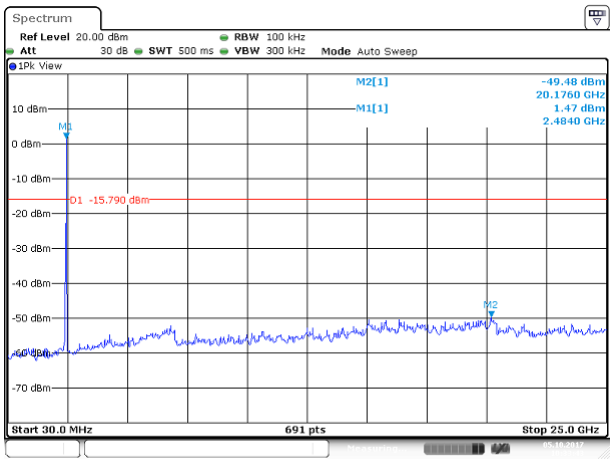
Date: 13.NOV.2017 10:32:10

Band Edge



Date: 13.NOV.2017 10:33:17

Spurious Emission 30MHz-25GHz



Date: 13.NOV.2017 10:33:43

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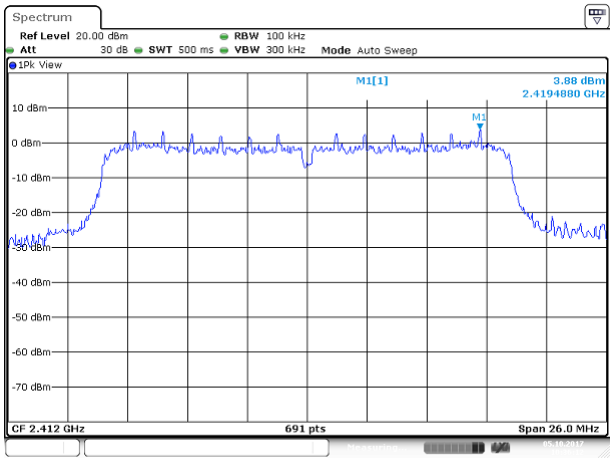
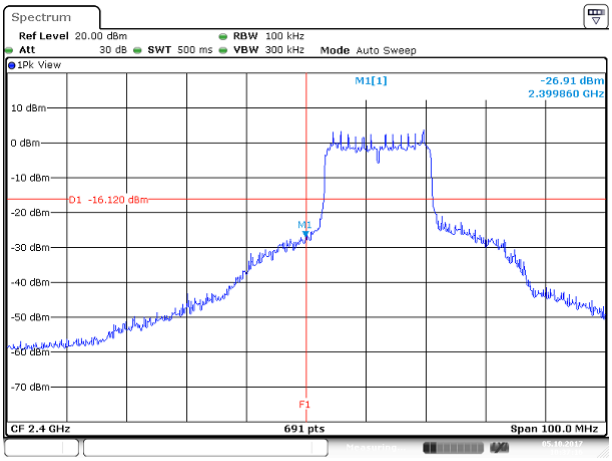
IEEE 802.11 n HT20 mode Low CH chain 0

Reference Level of PSD in 100kHz



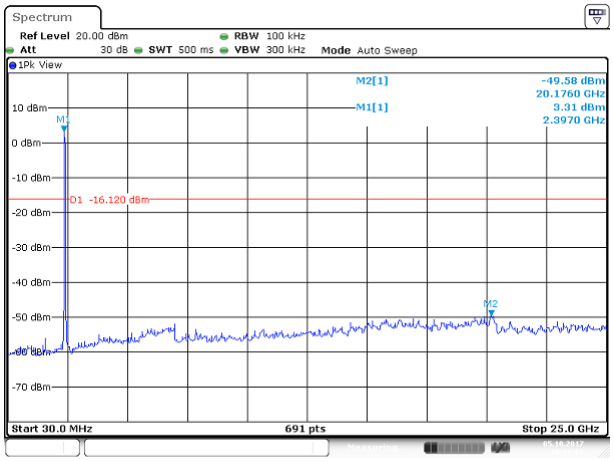
Date: 13.NOV.2017 10:36:13

Band Edge



Date: 13.NOV.2017 10:37:16

Spurious Emission 30MHz-25GHz



Date: 13.NOV.2017 10:38:05

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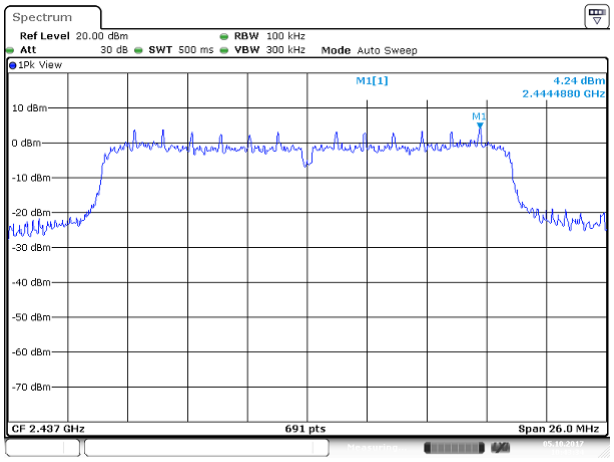
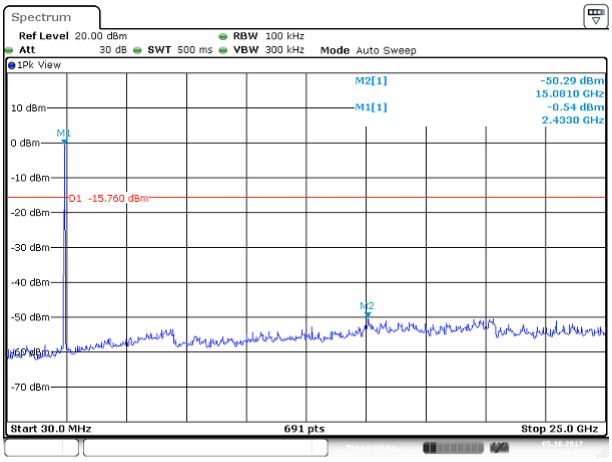
IEEE 802.11 n HT20 mode Mid CH chain 0	
Reference Level of PSD in 100kHz	**Spurious Emission 30MHz-25GHz**
	

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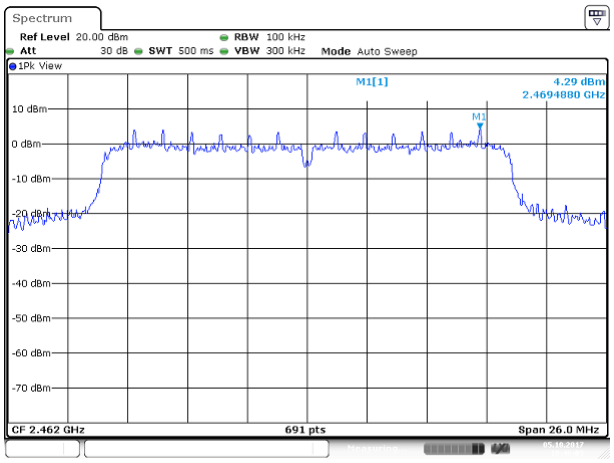
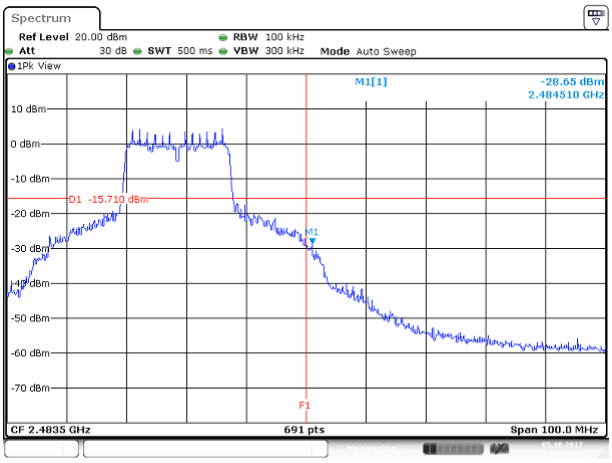
IEEE 802.11n HT20 mode High CH chain 0

Reference Level of PSD in 100kHz



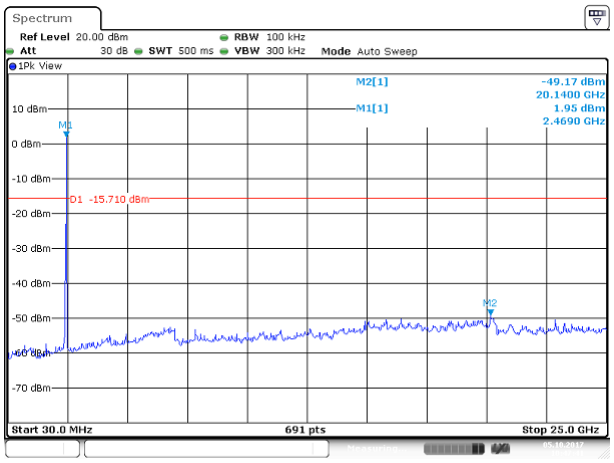
Date: 13.NOV.2017 10:46:05

Band Edge



Date: 13.NOV.2017 10:47:03

Spurious Emission 30MHz-25GHz



Date: 13.NOV.2017 10:47:41

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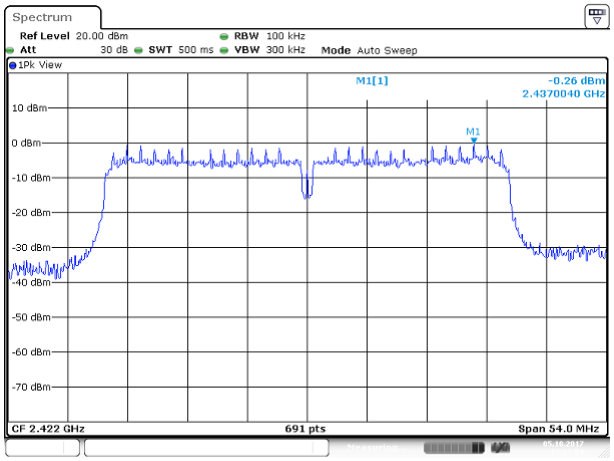
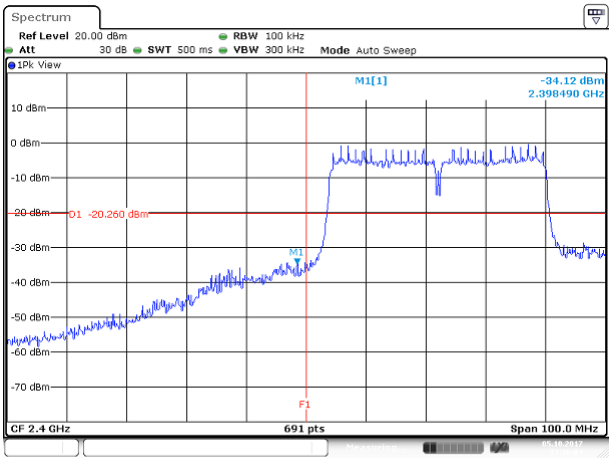
IEEE 802.11 n HT40 mode Low CH chain 0

Reference Level of PSD in 100kHz



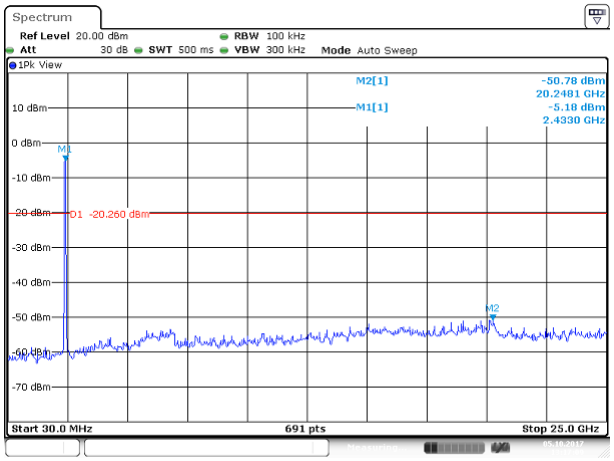
Date: 13.NOV.2017 13:13:59

Band Edge



Date: 13.NOV.2017 13:16:05

Spurious Emission 30MHz-25GHz



Date: 13.NOV.2017 13:17:10

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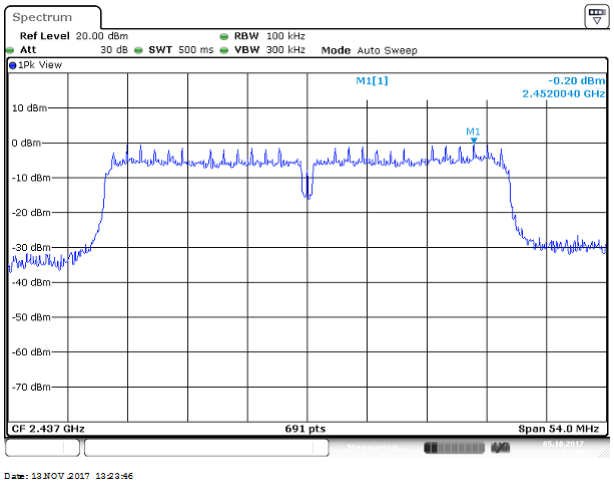
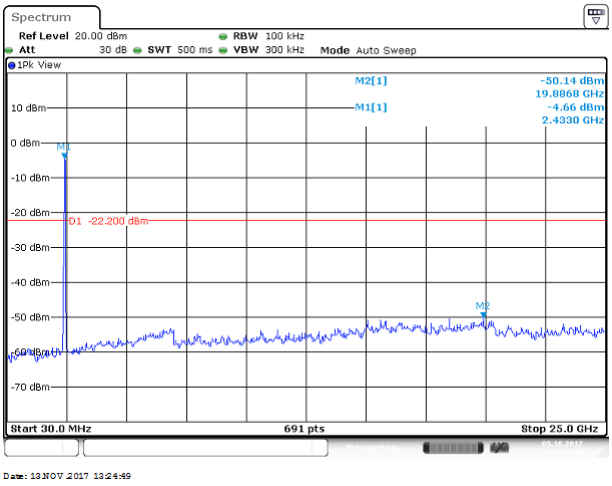
IEEE 802.11 n HT40 mode Mid CH chain 0	
Reference Level of PSD in 100kHz	**Spurious Emission 30MHz-25GHz**
	

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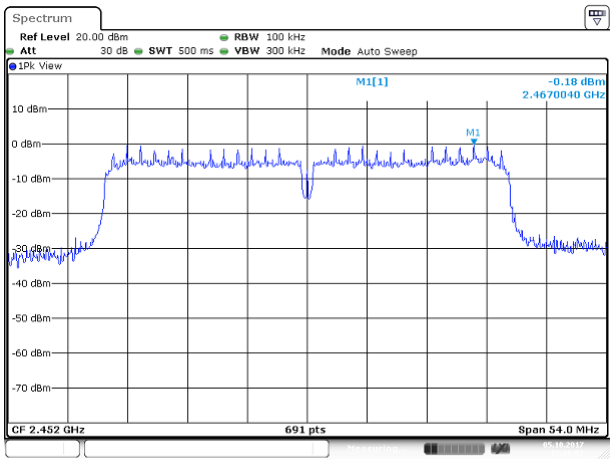
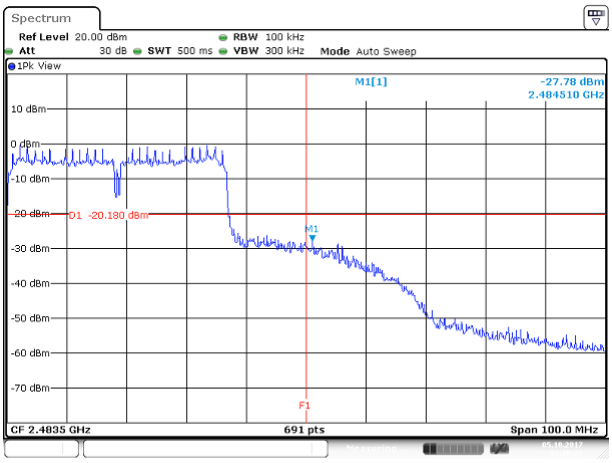
IEEE 802.11n HT40 mode High CH chain 0

Reference Level of PSD in 100kHz



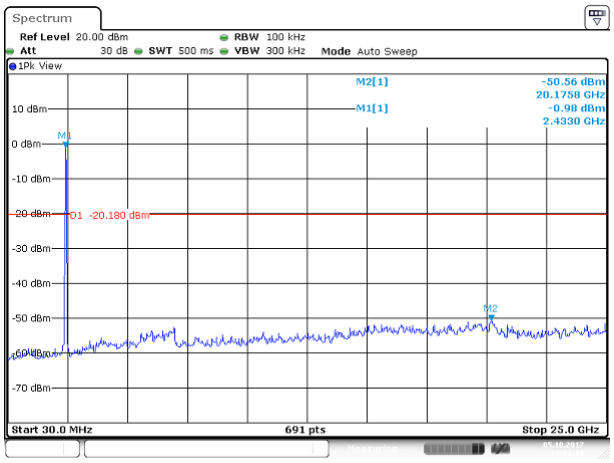
Date: 13.NOV.2017 13:28:52

Band Edge



Date: 13.NOV.2017 13:30:27

Spurious Emission 30MHz-25GHz



Date: 13.NOV.2017 13:31:11

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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

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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 (%)	T(ms)	1/T (kHz)	VBW Setting
802.11b	98%	8.7200	-	10Hz
802.11g	50%	1.5100	0.662	680Hz
802.11n HT20	91%	1.4000	0.714	750Hz
802.11n HT40	84%	0.7100	1.408	1.5KHz

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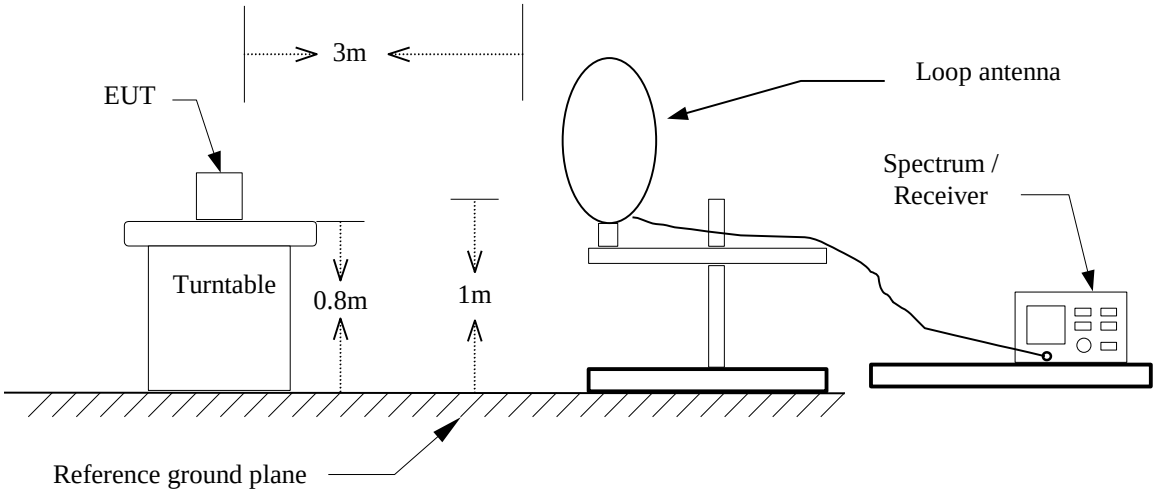
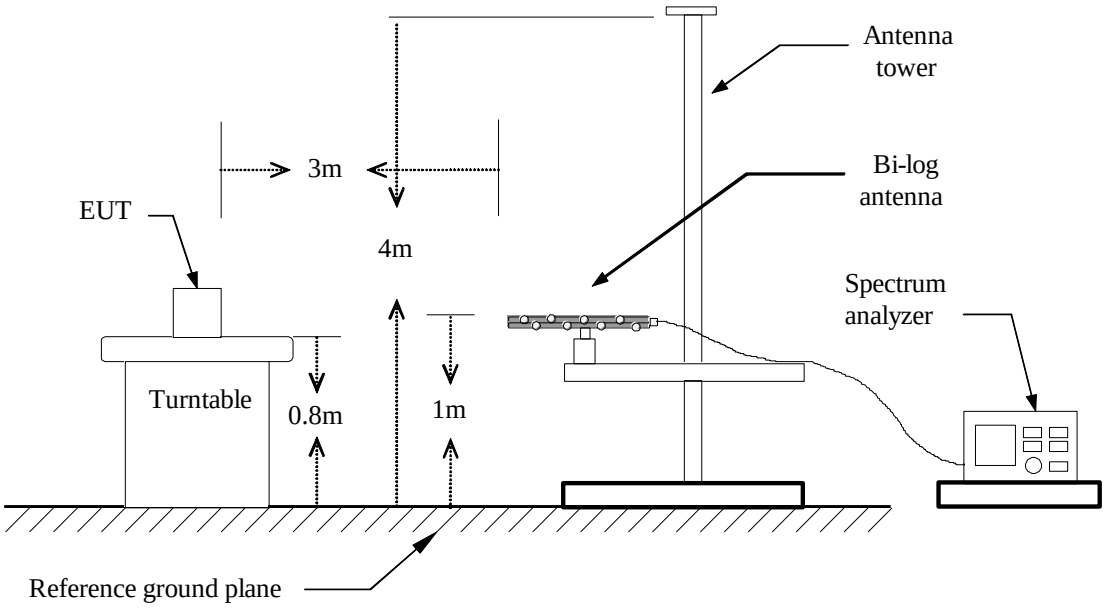
4.6.3 Test Setup

9kHz ~ 30MHz



30MHz ~ 1GHz



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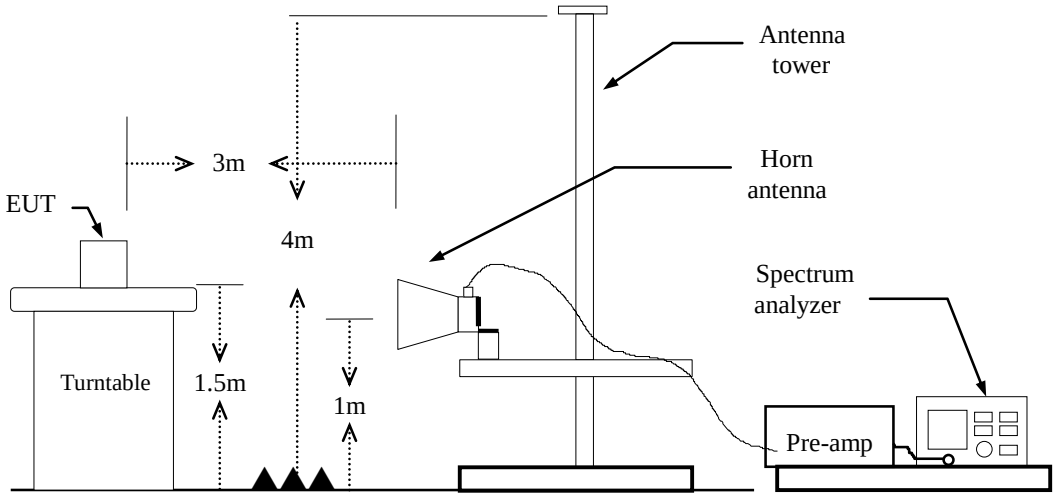
Above 1 GHz



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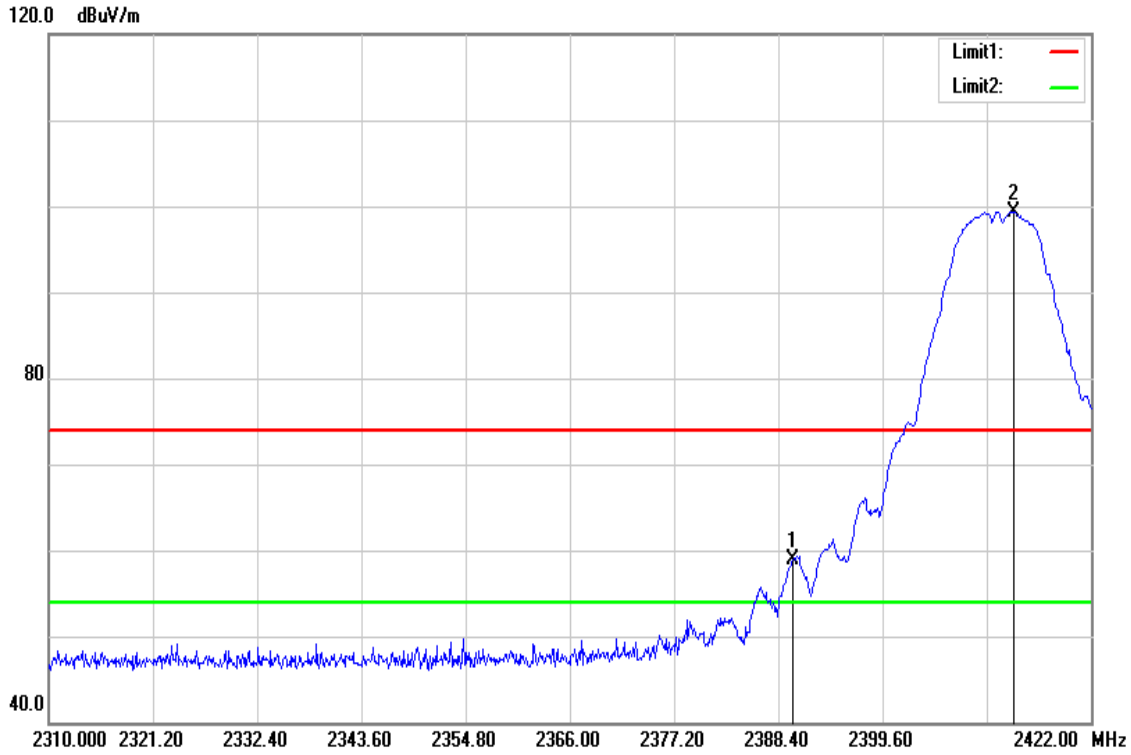
4.6.4 Test Result

Band Edge Test Data

Test Mode	IEEE 802.11b Low CH	Temp/Hum	24(℃)/ 33%RH
Test Item	Band Edge	Test Date	November 10, 2017
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2390.000	59.60	-0.60	59.00	74.00	-15.00	peak
2413.712	99.91	-0.52	99.39	-	-	peak

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Test Mode	IEEE 802.11b Low CH	Temperature:	24(℃)/ 33%RH
Test Item	Band Edge	Test Date	November 10, 2017
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Average	Test Voltage	120Vac / 60Hz

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2390.000	51.52	-0.60	50.92	54.00	-3.08	AVG
2414.720	96.22	-0.52	95.70	-	-	AVG

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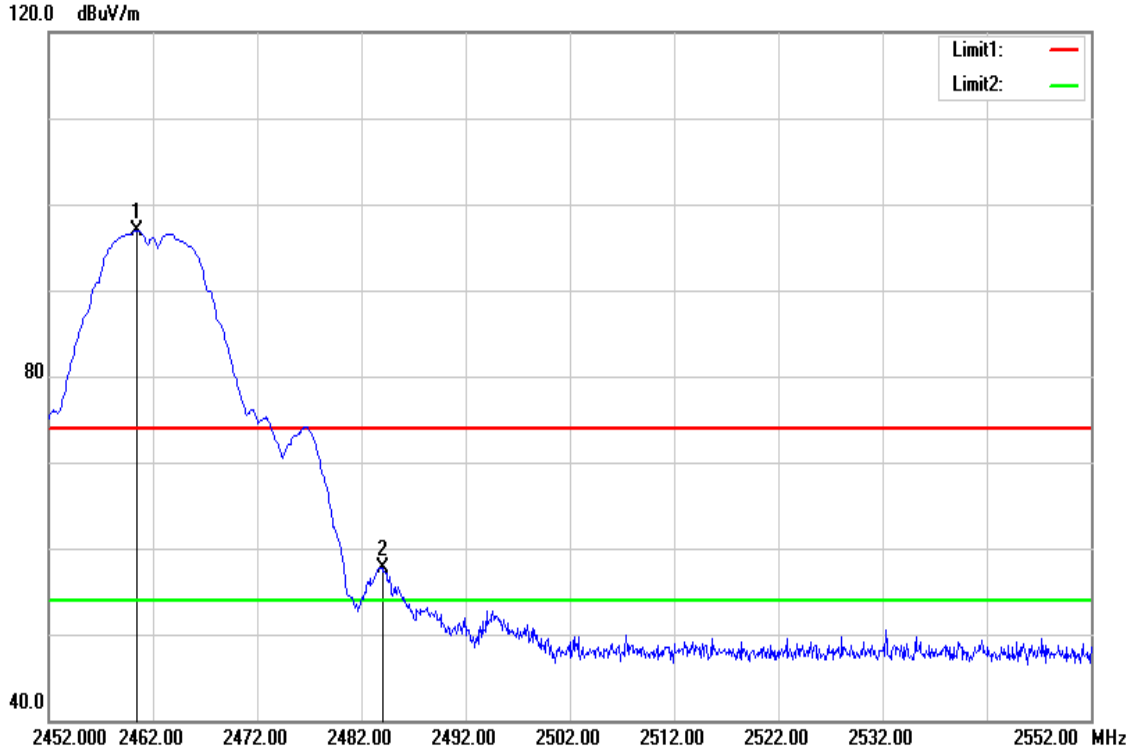
Test Mode	IEEE 802.11b High CH	Temp/Hum	24(℃)/ 33%RH
Test Item	Band Edge	Test Date	November 10, 2017
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2460.400	97.26	-0.37	96.89	-	-	peak
2484.000	58.07	-0.30	57.77	74.00	-16.23	peak

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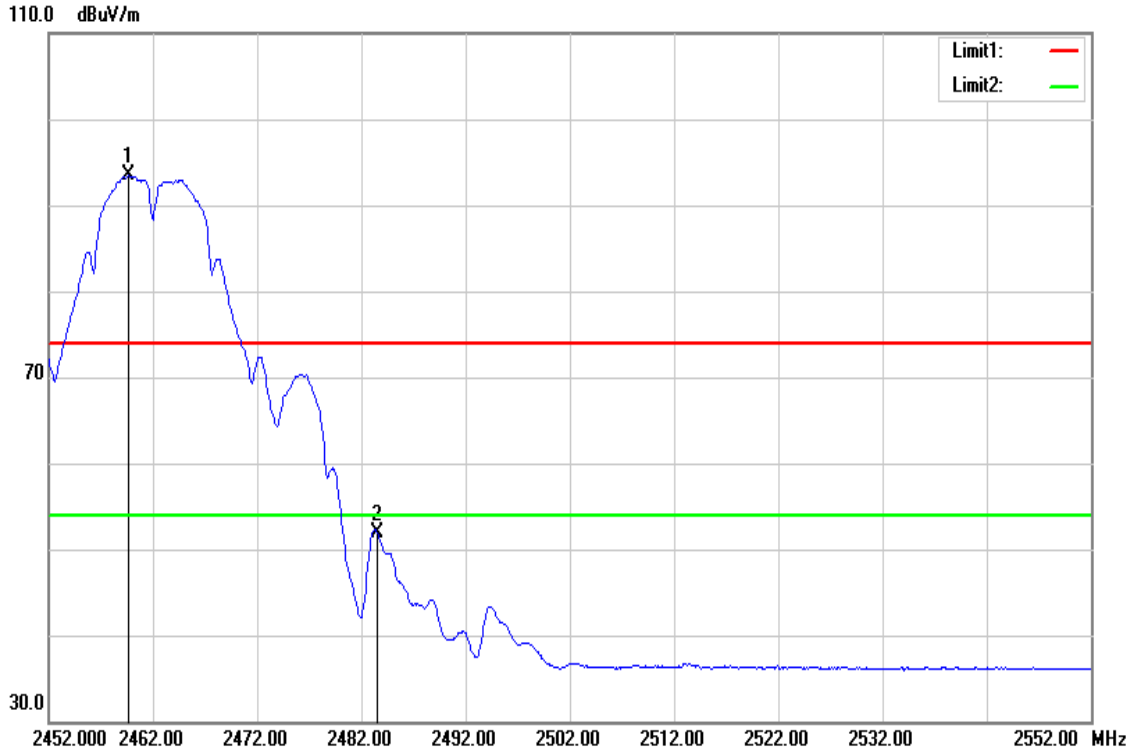
Test Mode	IEEE 802.11b High CH	Temperature:	24(℃)/ 33%RH
Test Item	Band Edge	Test Date	November 10, 2017
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Average	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2459.700	93.79	-0.37	93.42	-	-	AVG
2483.500	52.28	-0.30	51.98	54.00	-2.02	AVG

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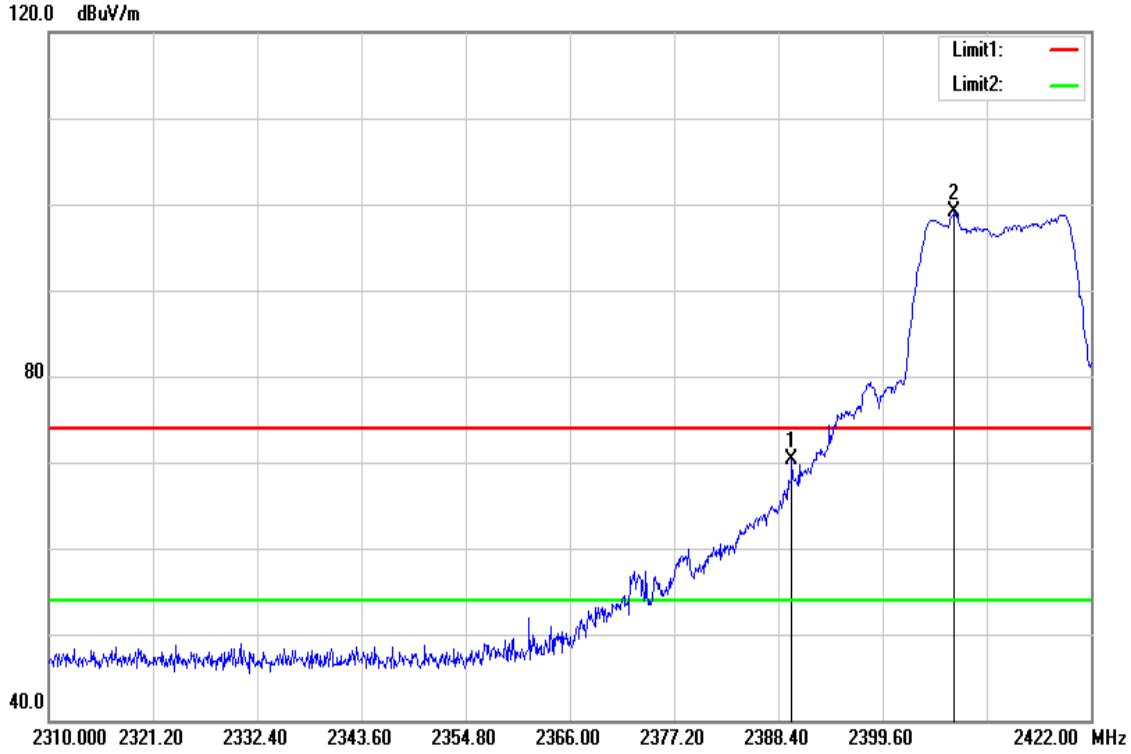
Test Mode	IEEE 802.11g Low CH	Temp/Hum	24(℃)/ 33%RH
Test Item	Band Edge	Test Date	November 10, 2017
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2389.856	70.83	-0.60	70.23	74.00	-3.77	peak
2407.328	99.59	-0.55	99.04	-	-	peak

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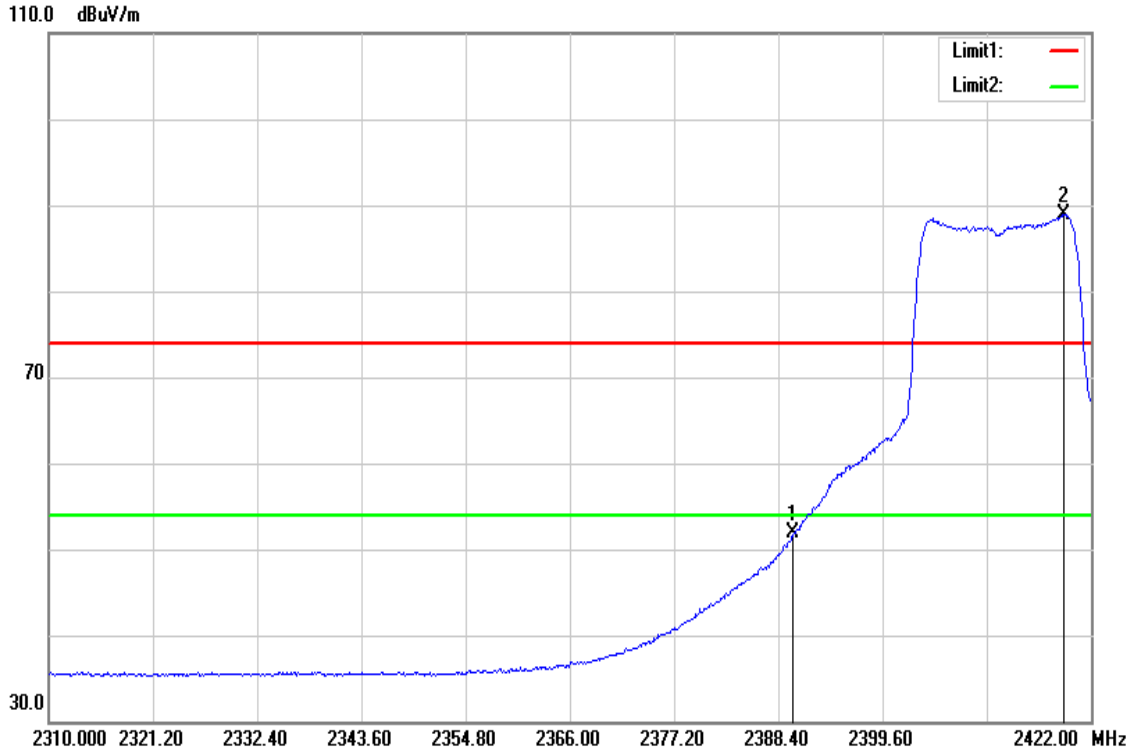
Test Mode	IEEE 802.11g Low CH	Temperature:	24(℃)/ 33%RH
Test Item	Band Edge	Test Date	November 10, 2017
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Average	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2390.000	52.47	-0.60	51.87	54.00	-2.13	AVG
2419.088	89.49	-0.51	88.98	-	-	AVG

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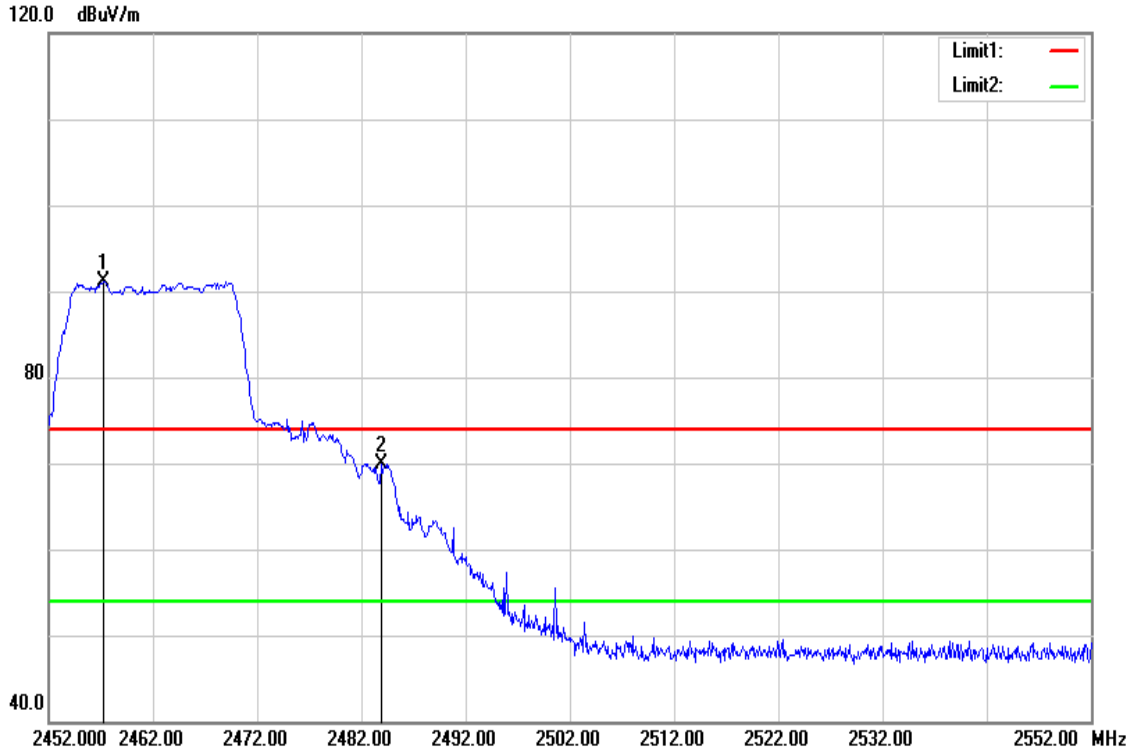
Test Mode	IEEE 802.11g High CH	Temp/Hum	24(℃)/ 33%RH
Test Item	Band Edge	Test Date	November 10, 2017
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2457.300	91.52	-0.39	91.13	-	-	peak
2483.900	70.26	-0.30	69.96	74.00	-4.04	peak

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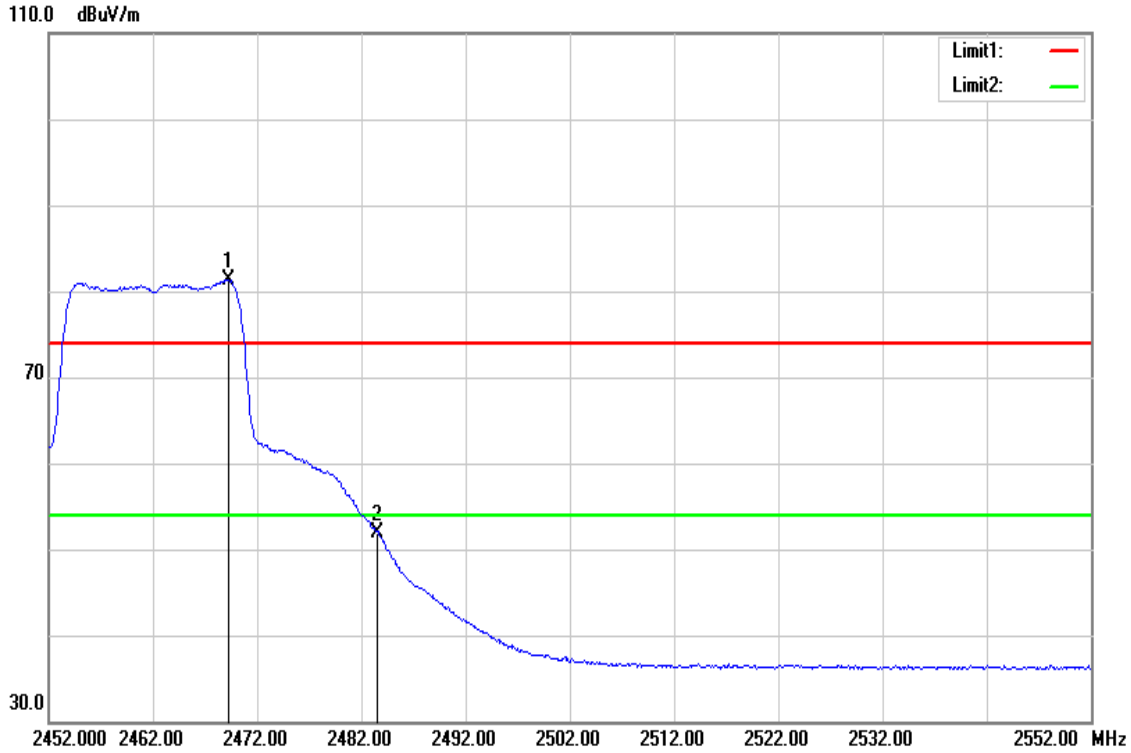
Test Mode	IEEE 802.11g High CH	Temperature:	24(℃)/ 33%RH
Test Item	Band Edge	Test Date	November 10, 2017
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Average	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2469.300	81.73	-0.34	81.39	-	-	AVG
2483.500	52.30	-0.30	52.00	54.00	-2.00	AVG

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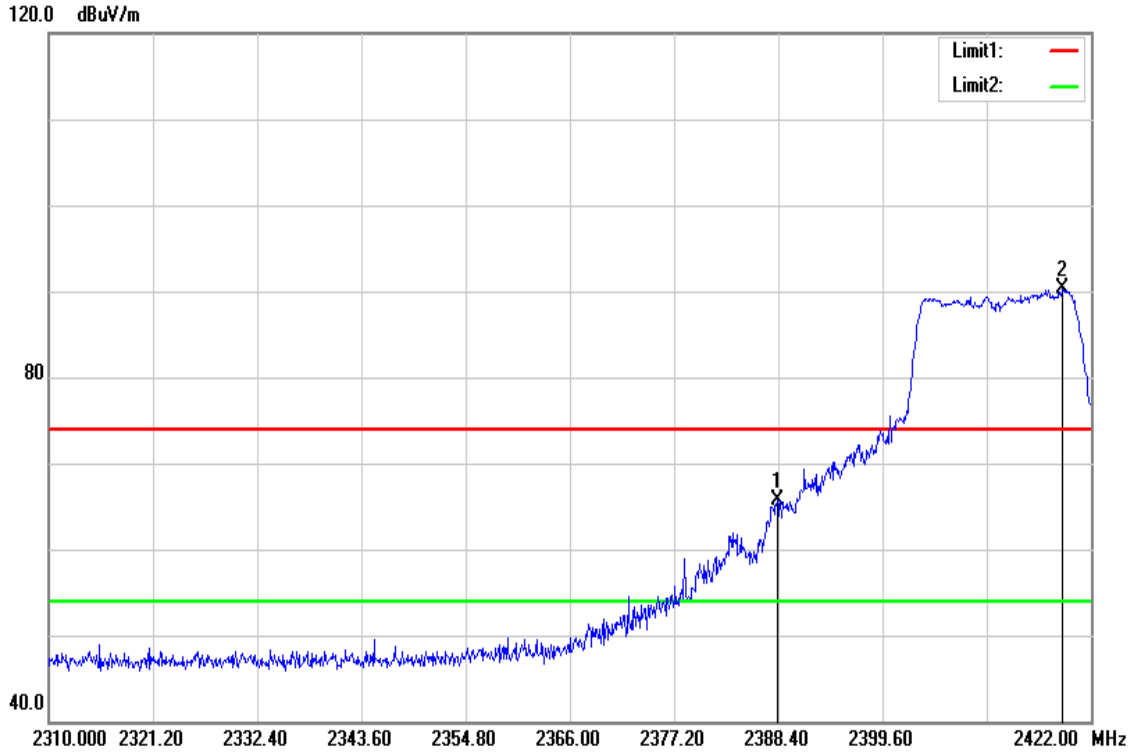
Test Mode	IEEE 802.11n HT20 Low CH	Temp/Hum	24(℃)/ 33%RH
Test Item	Band Edge	Test Date	November 10, 2017
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2388.288	66.26	-0.60	65.66	74.00	-8.34	peak
2418.976	90.76	-0.51	90.25	-	-	peak

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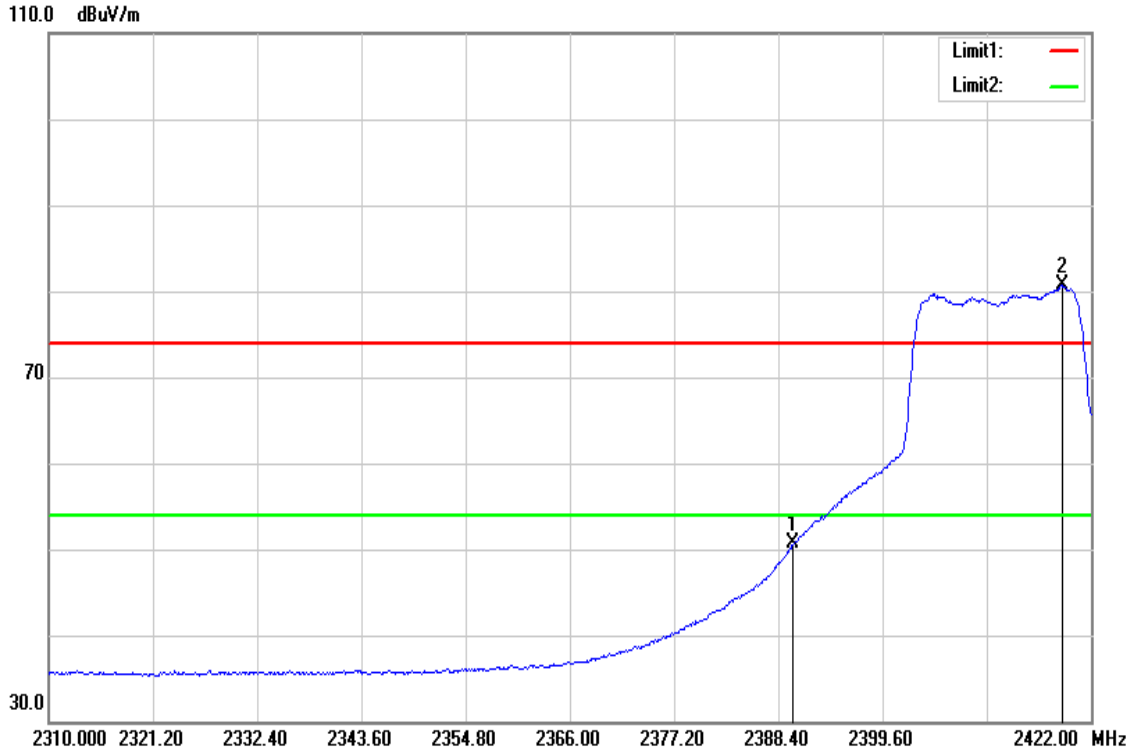
Test Mode	IEEE 802.11n HT20 Low CH	Temperature:	24(℃)/ 33%RH
Test Item	Band Edge	Test Date	November 10, 2017
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Average	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2390.000	51.25	-0.60	50.65	54.00	-3.35	AVG
2418.864	81.18	-0.51	80.67	-	-	AVG

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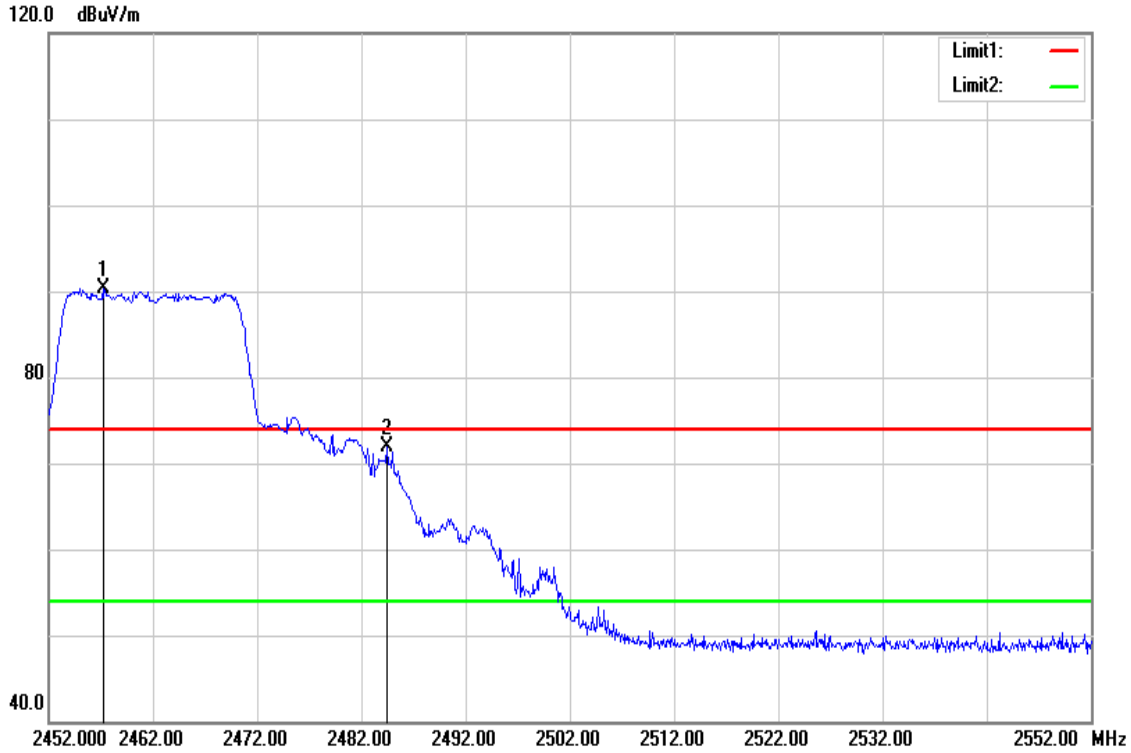
Test Mode	IEEE 802.11n HT20 High CH	Temp/Hum	24(℃)/ 33%RH
Test Item	Band Edge	Test Date	November 10, 2017
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2457.200	90.71	-0.39	90.32	-	-	peak
2484.400	72.27	-0.30	71.97	74.00	-2.03	peak

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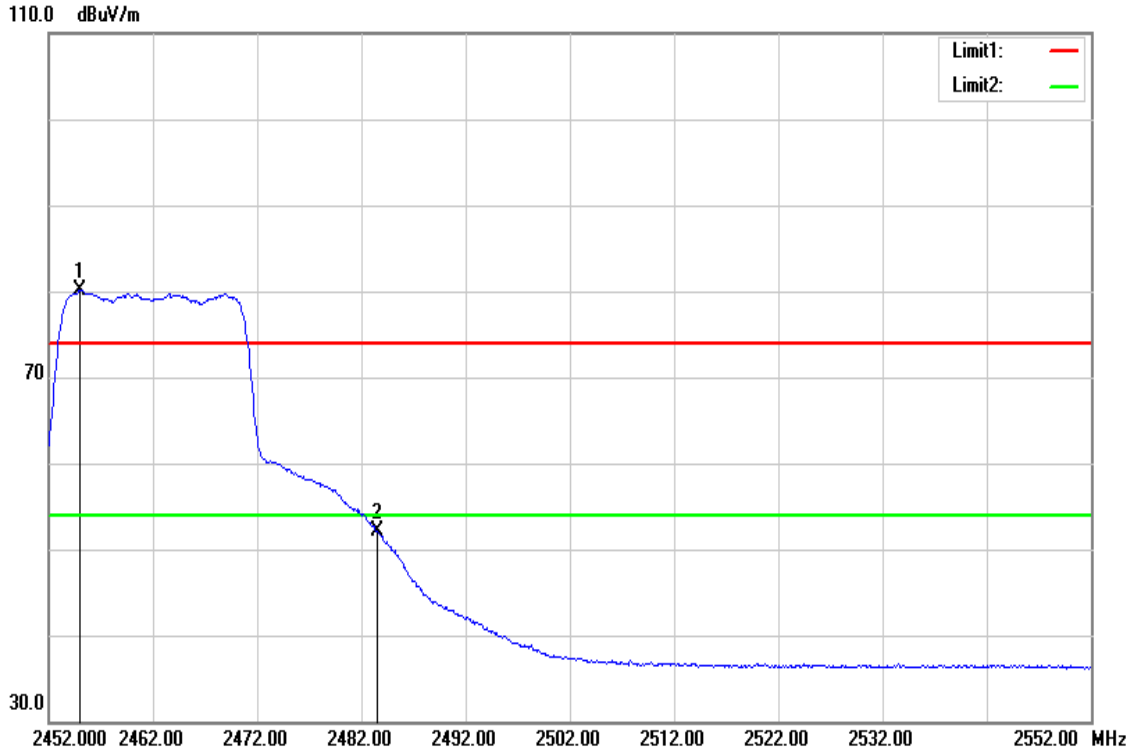
Test Mode	IEEE 802.11n HT20 High CH	Temperature:	24(℃)/ 33%RH
Test Item	Band Edge	Test Date	November 10, 2017
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Average	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2455.000	80.51	-0.39	80.12	-	-	AVG
2483.500	52.47	-0.30	52.17	54.00	-1.83	AVG

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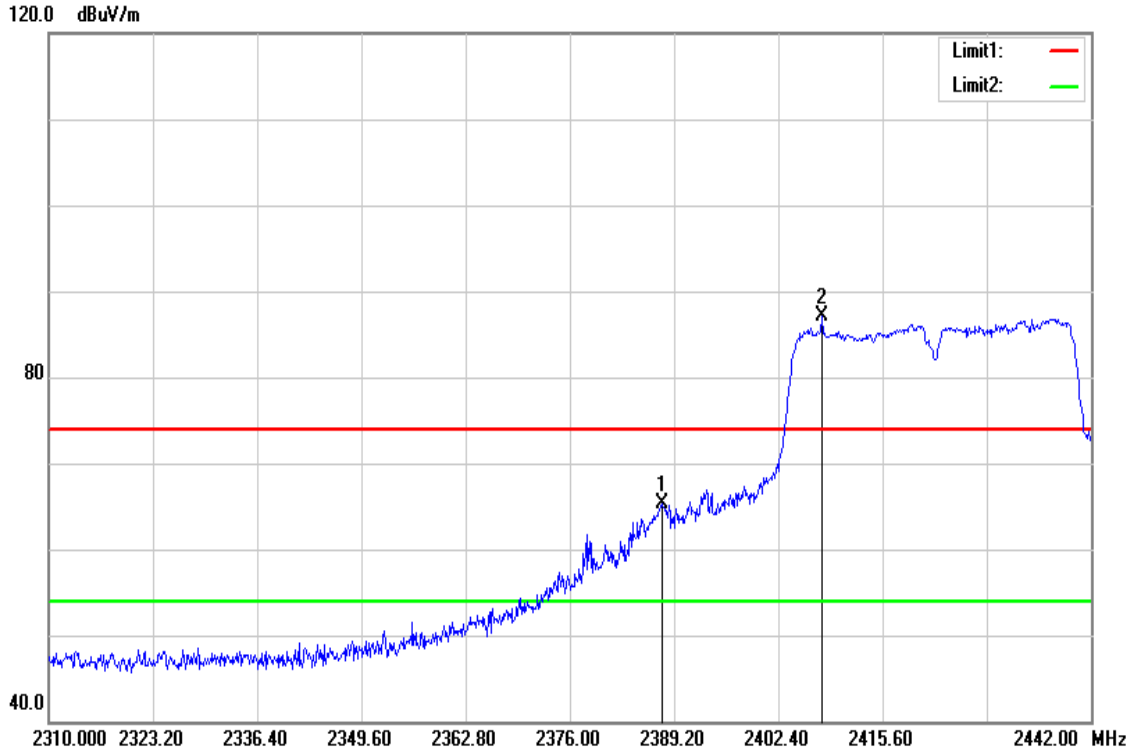
Test Mode	IEEE 802.11n HT40 Low CH	Temp/Hum	24(℃)/ 33%RH
Test Item	Band Edge	Test Date	November 10, 2017
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2387.616	65.96	-0.60	65.36	74.00	-8.64	peak
2407.944	87.68	-0.54	87.14	-	-	peak

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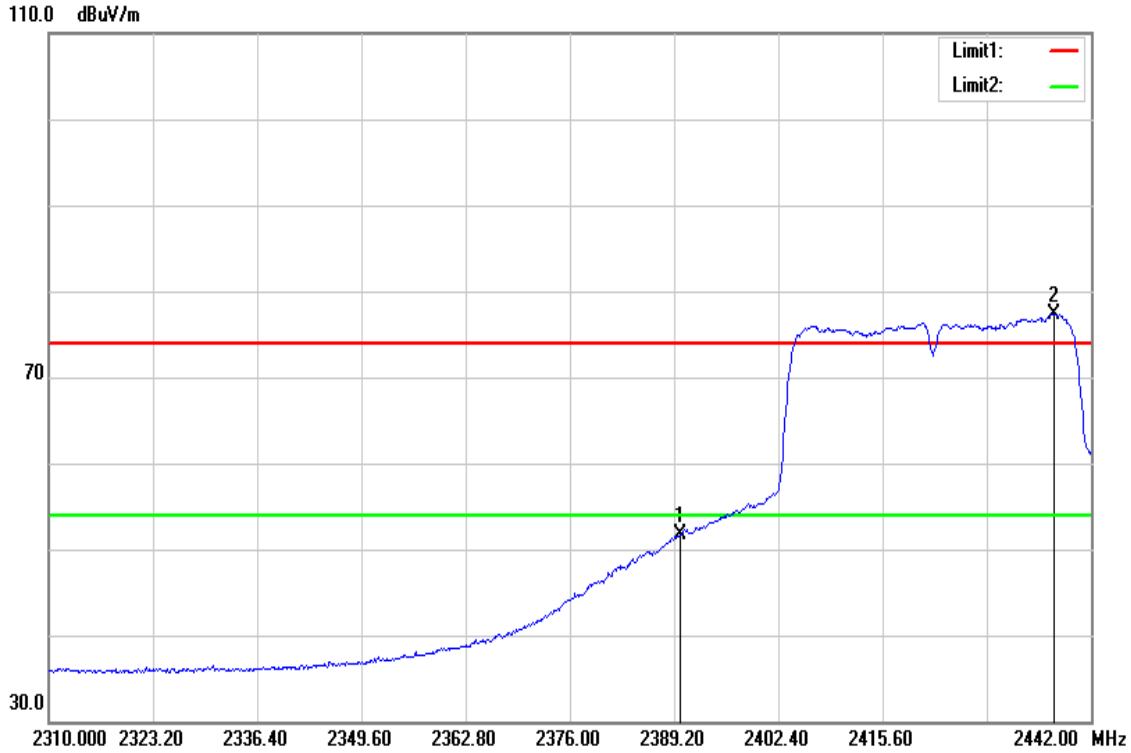
Test Mode	IEEE 802.11n HT40 Low CH	Temperature:	24(℃)/ 33%RH
Test Item	Band Edge	Test Date	November 10, 2017
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Average	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2390.000	52.37	-0.60	51.77	54.00	-2.23	AVG
2437.380	77.80	-0.46	77.34	-	-	AVG

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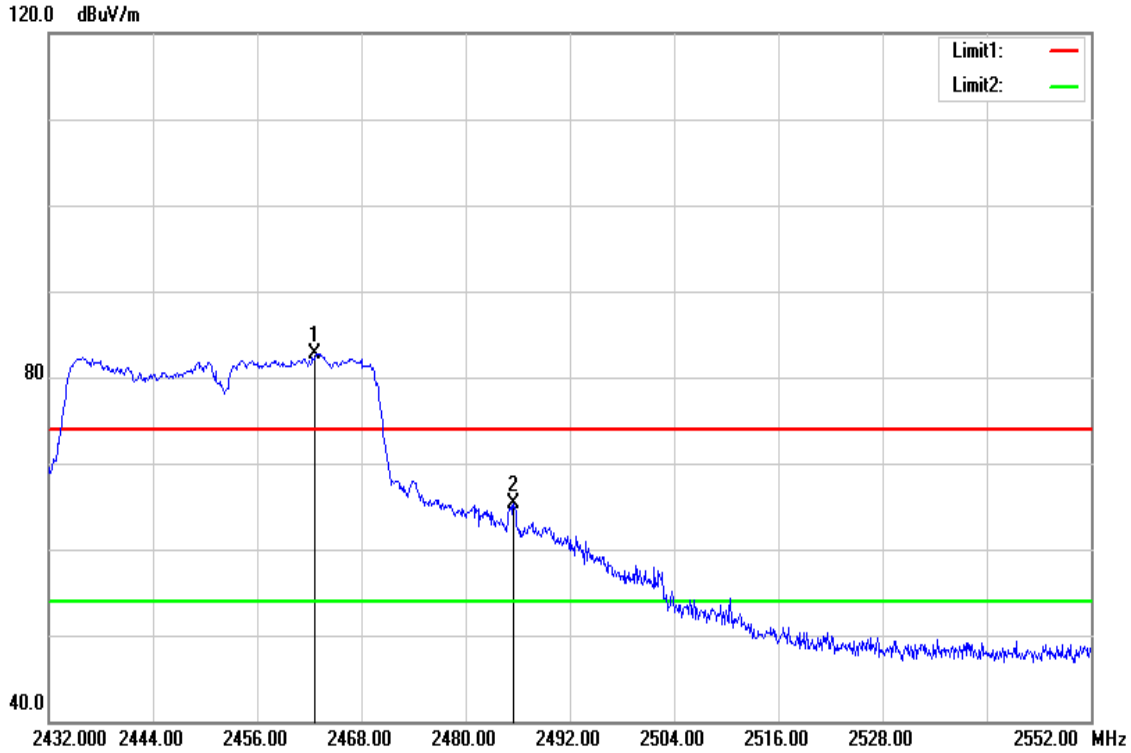
Test Mode	IEEE 802.11n HT40 High CH	Temp/Hum	24(℃)/ 33%RH
Test Item	Band Edge	Test Date	November 10, 2017
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2462.720	83.16	-0.36	82.80	-	-	peak
2485.520	65.50	-0.30	65.20	74.00	-8.80	peak

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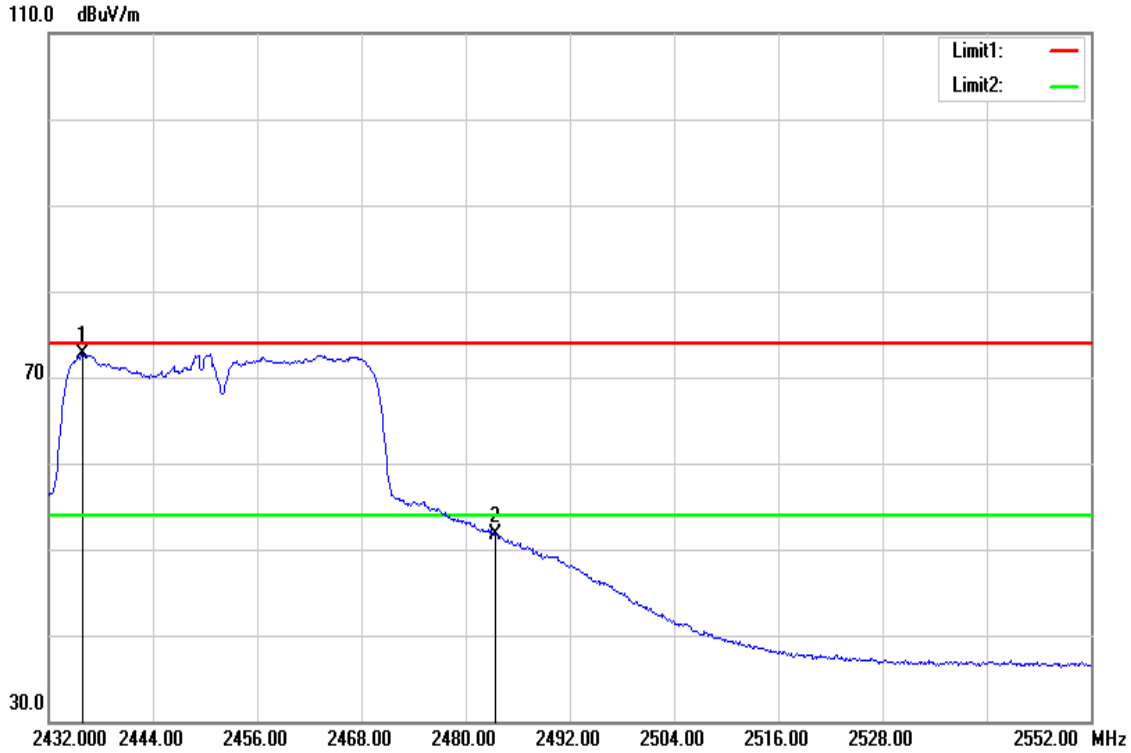
Test Mode	IEEE 802.11n HT40 High CH	Temperature:	24(℃)/ 33%RH
Test Item	Band Edge	Test Date	November 10, 2017
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Average	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2435.840	73.17	-0.46	72.71	-	-	AVG
2483.500	51.97	-0.30	51.67	54.00	-2.33	AVG

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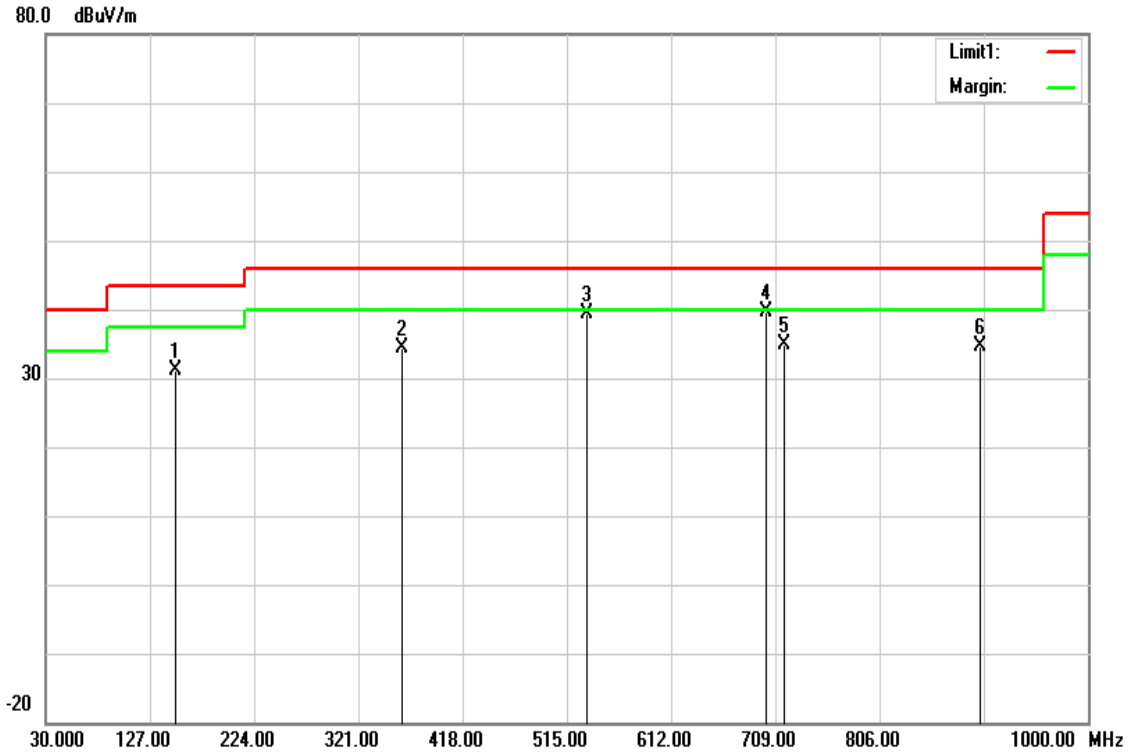
Below 1G Test Data

Test Mode	Mode 1	Temp/Hum	24(℃)/ 33%RH
Test Item	30MHz-1GHz	Test Date	November 10, 2017
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
151.2500	46.85	-15.78	31.07	43.50	-12.43	peak
361.7400	46.91	-12.60	34.31	46.00	-11.69	peak
533.4300	47.18	-7.86	39.32	46.00	-6.68	peak
700.2700	44.51	-4.89	39.62	46.00	-6.38	QP
717.7300	39.50	-4.68	34.82	46.00	-11.18	peak
900.0900	36.73	-2.01	34.72	46.00	-11.28	peak

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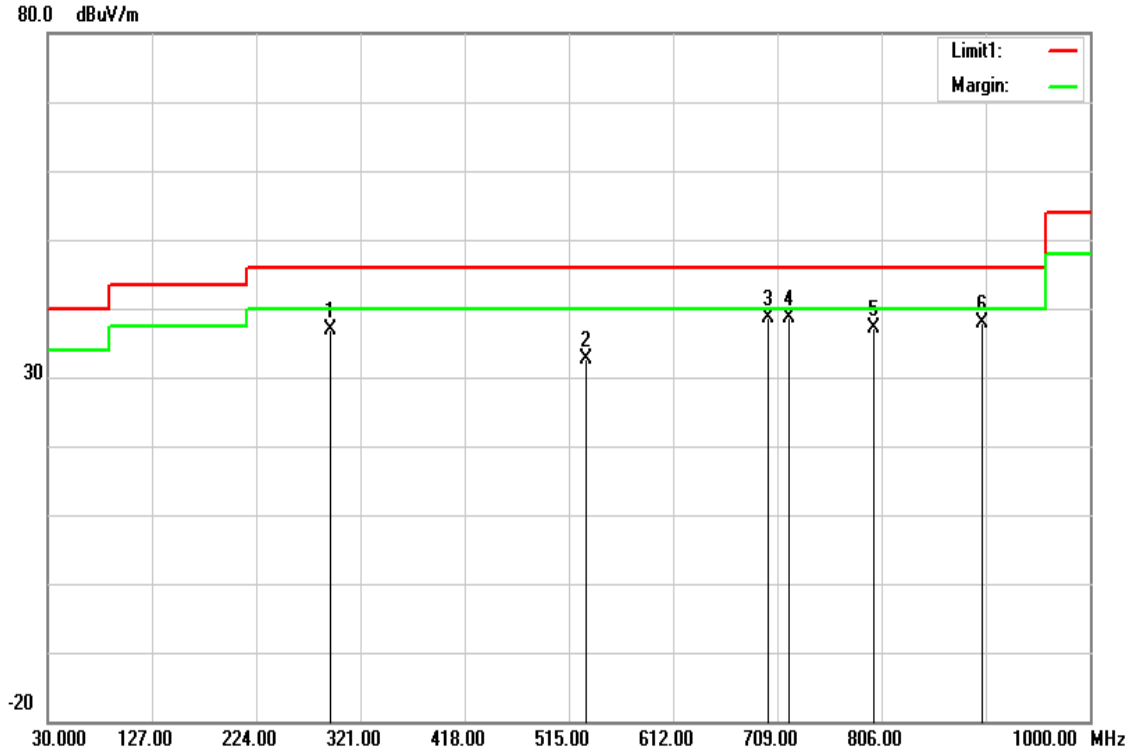
Test Mode	Mode 1	Temp/Hum	24(℃)/ 33%RH
Test Item	30MHz-1GHz	Test Date	November 10, 2017
Polarize	Horizontal	Test Engineer	Jerry Chuang
Detector	Peak	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB	Remark
292.8700	50.95	-14.14	36.81	46.00	-9.19	peak
531.4900	40.41	-7.90	32.51	46.00	-13.49	peak
700.2700	43.42	-4.89	38.53	46.00	-7.47	QP
719.6700	43.22	-4.65	38.57	46.00	-7.43	peak
799.2100	40.50	-3.39	37.11	46.00	-8.89	peak
899.1200	39.94	-2.02	37.92	46.00	-8.08	peak

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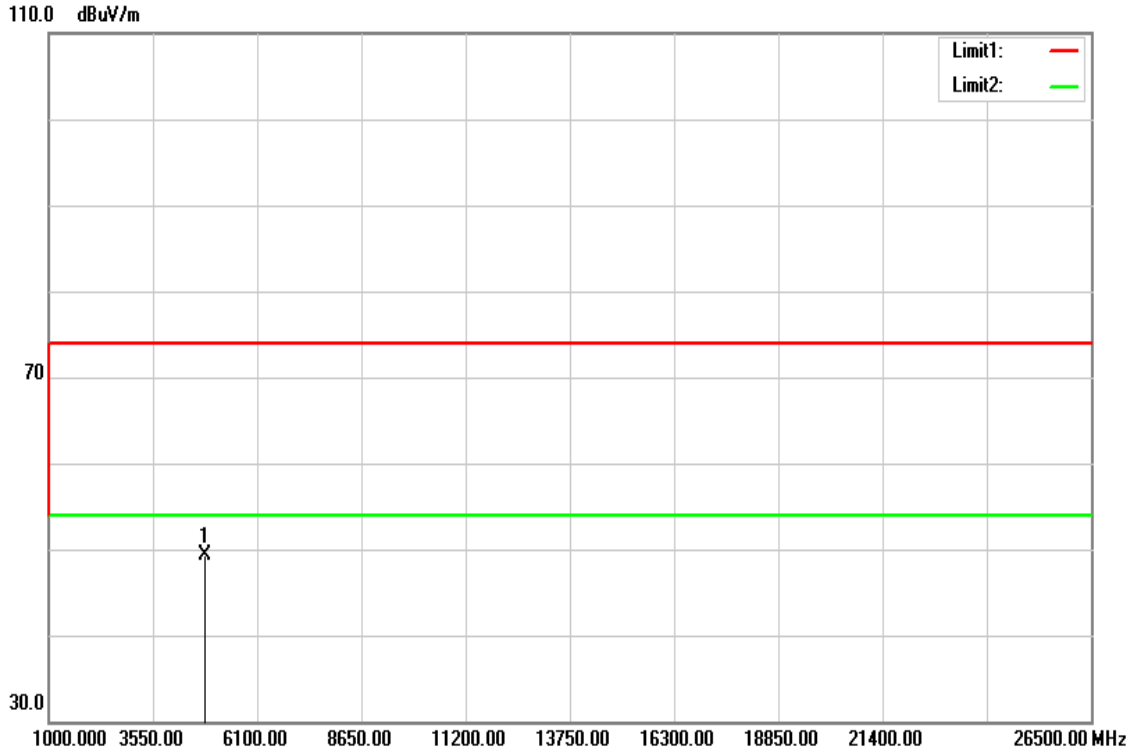
Above 1G Test Data

Test Mode	IEEE 802.11b Low CH	Temp/Hum	24(℃)/ 33%RH
Test Item	Harmonic	Test Date	November 10, 2017
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	emark
4827.000	42.49	6.84	49.33	74.00	-24.67	peak
N/A						

Remark:

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

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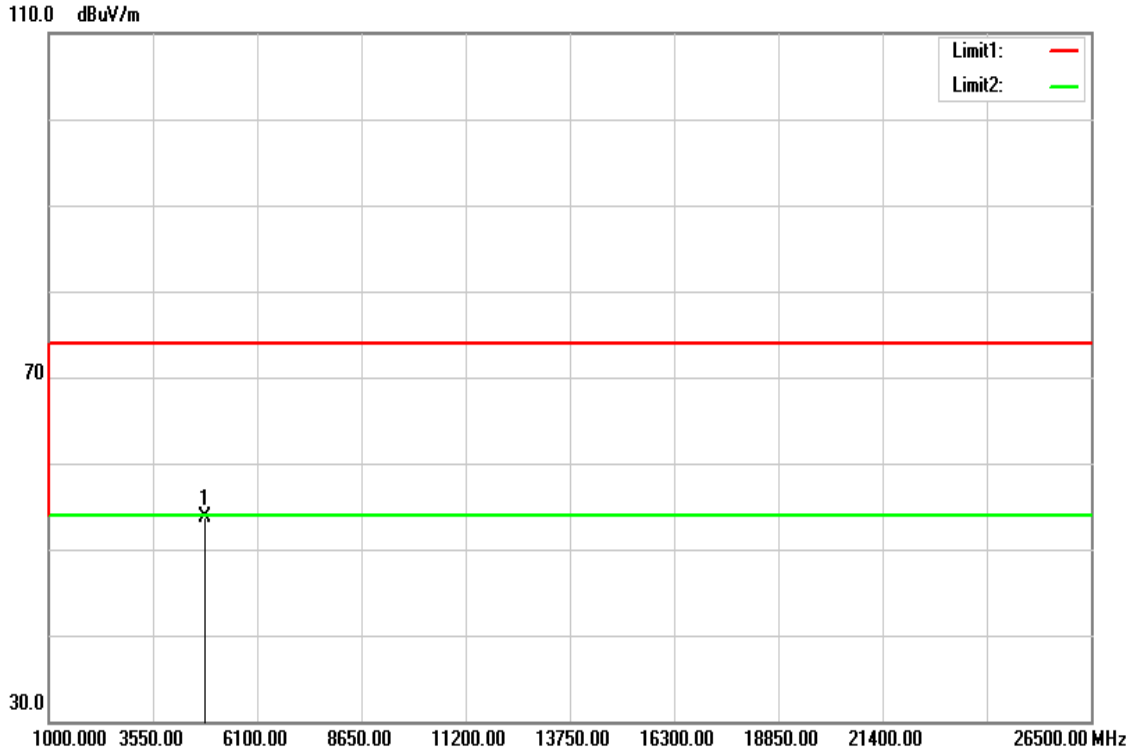
Test Mode	IEEE 802.11b Low CH	Temp/Hum	24(℃)/ 33%RH
Test Item	Harmonic	Test Date	November 10, 2017
Polarize	Horizontal	Test Engineer	Jerry Chuang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (BuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4827.000	46.93	6.84	53.77	74.00	-20.23	peak
N/A						

Remark:

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

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Test Mode	IEEE 802.11b Mid CH	Temp/Hum	24(℃)/ 33%RH
Test Item	Harmonic	Test Date	November 10, 2017
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz

Frequency (MHz)	Reading (dBu)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4876.000	44.13	6.97	51.10	74.00	-22.90	peak
N/A						

Remark:

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

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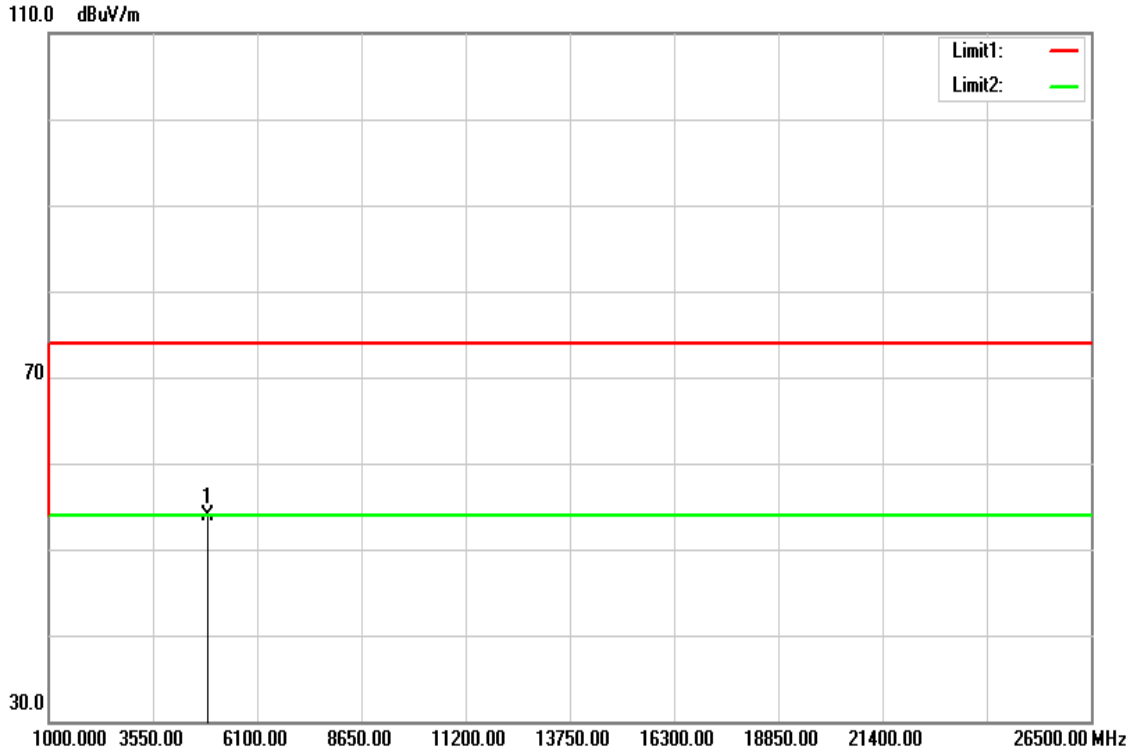
Test Mode	IEEE 802.11b Mid CH	Temp/Hum	24(℃)/ 33%RH
Test Item	Harmonic	Test Date	November 10, 2017
Polarize	Horizontal	Test Engineer	Jerry Chuang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4876.000	47.02	6.97	53.99	74.00	-20.01	peak
N/A						

Remark:

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

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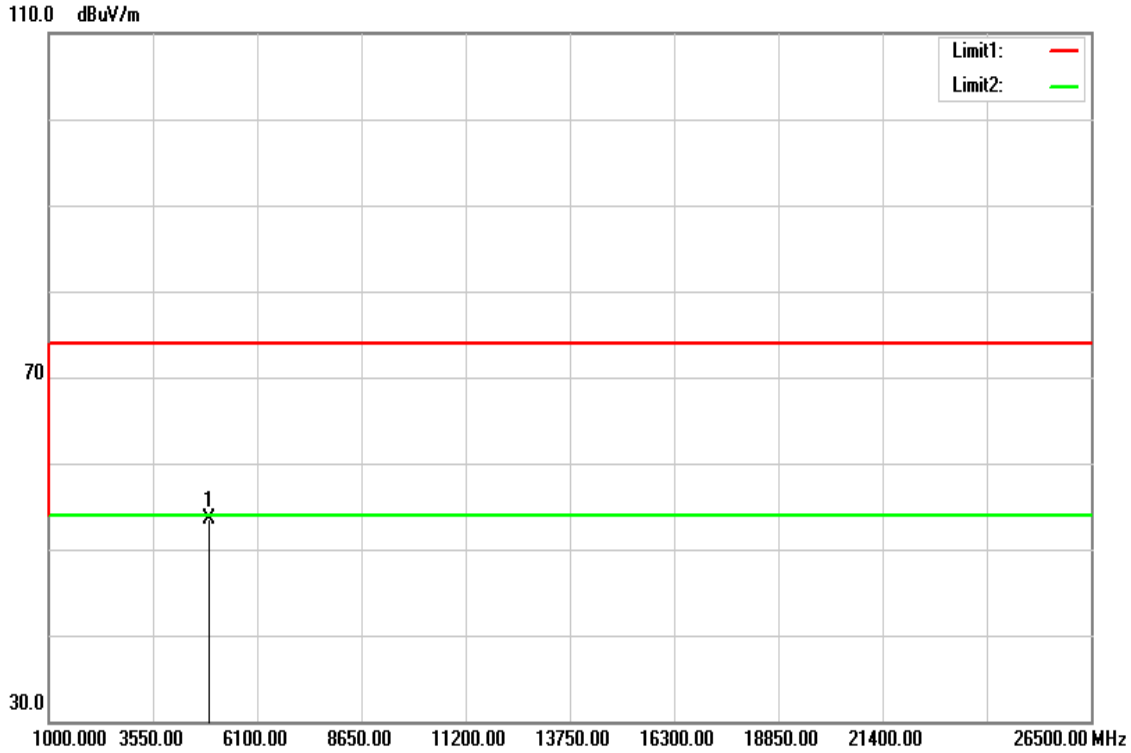
Test Mode	IEEE 802.11b High CH	Temp/Hum	24(℃)/ 33%RH
Test Item	Harmonic	Test Date	November 10, 2017
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4925.000	46.33	7.09	53.42	74.00	-20.58	peak
N/A						

Remark:

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

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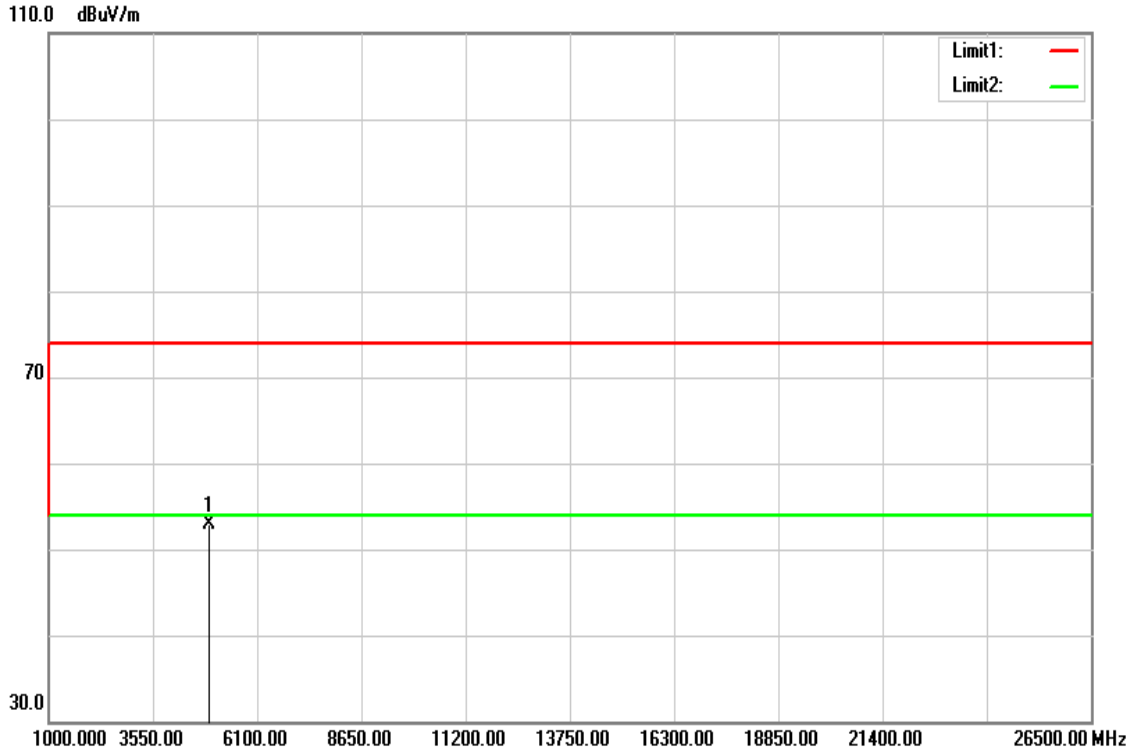
Test Mode	IEEE 802.11b High CH	Temp/Hum	24(℃)/ 33%RH
Test Item	Harmonic	Test Date	November 10, 2017
Polarize	Horizontal	Test Engineer	Jerry Chuang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB	Remark
4925.000	45.87	7.09	52.96	74.00	-21.04	peak
N/A						

Remark:

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

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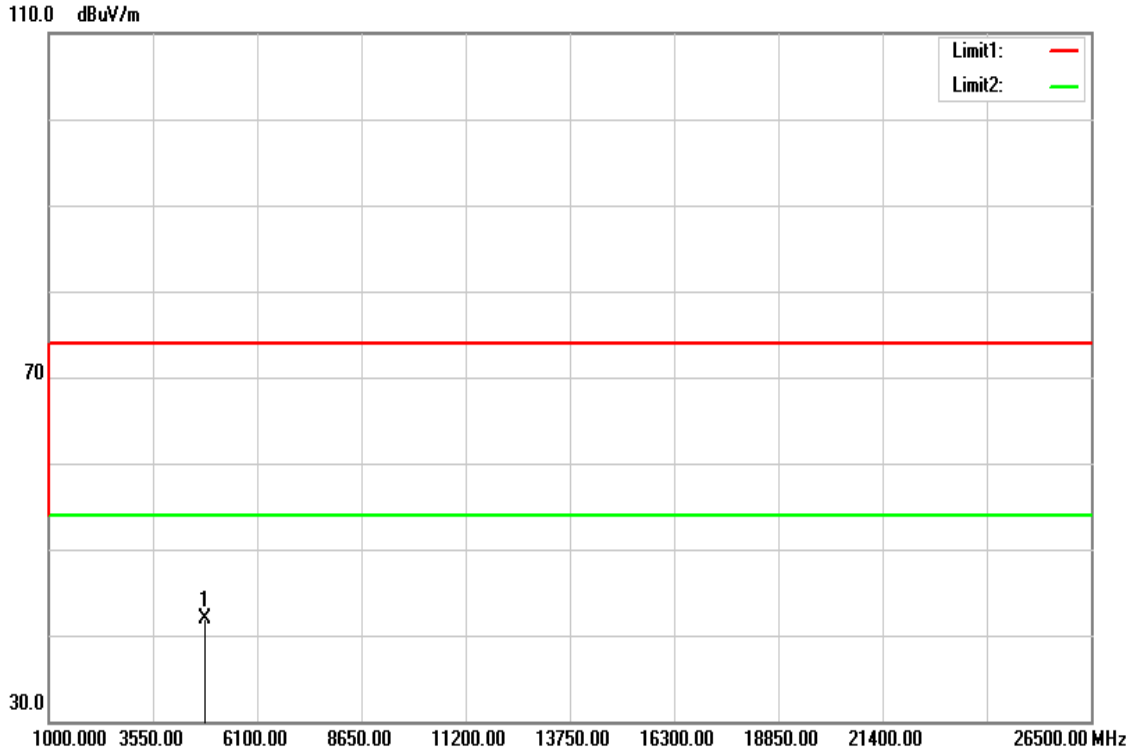
Test Mode	IEEE 802.11g Low CH	Temp/Hum	24 (℃)/ 33%RH
Test Item	Harmonic	Test Date	November 10, 2017
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4824.000	35.07	6.84	41.91	74.00	-32.09	peak
N/A						

Remark:

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

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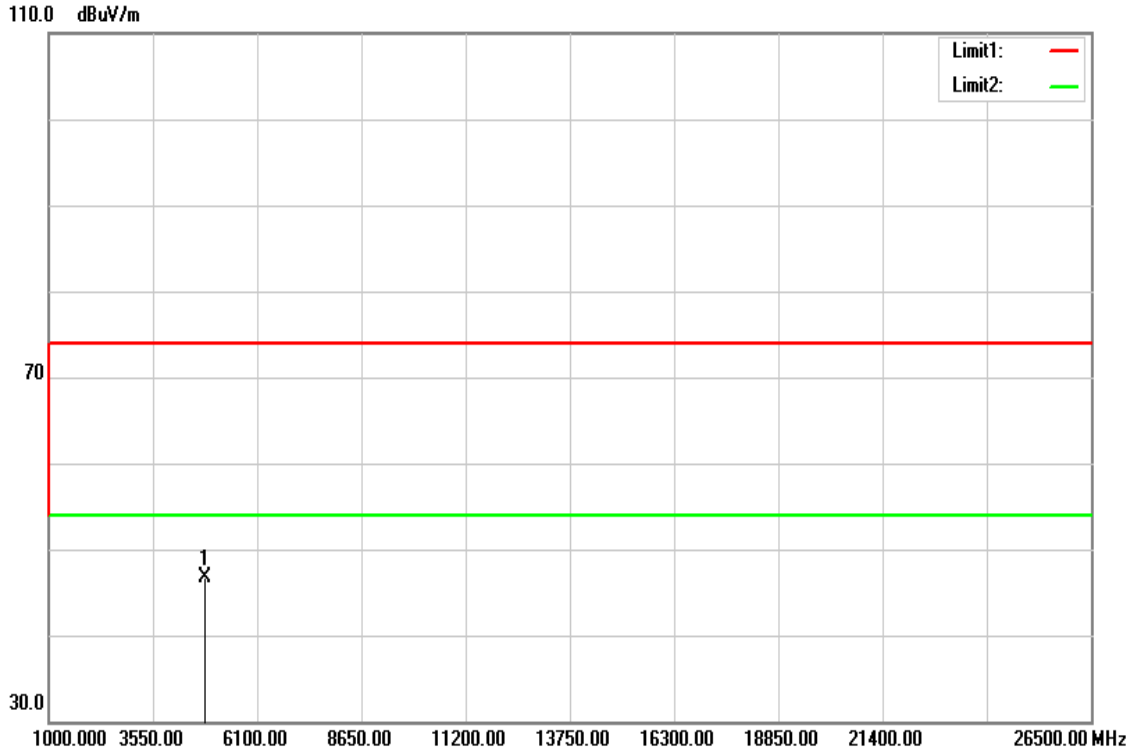
Test Mode	IEEE 802.11g Low CH	Temp/Hum	24 (℃)/ 33%RH
Test Item	Harmonic	Test Date	November 10, 2017
Polarize	Horizontal	Test Engineer	Jerry Chuang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4820.000	39.95	6.82	46.77	74.00	-27.23	peak
N/A						

Remark:

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

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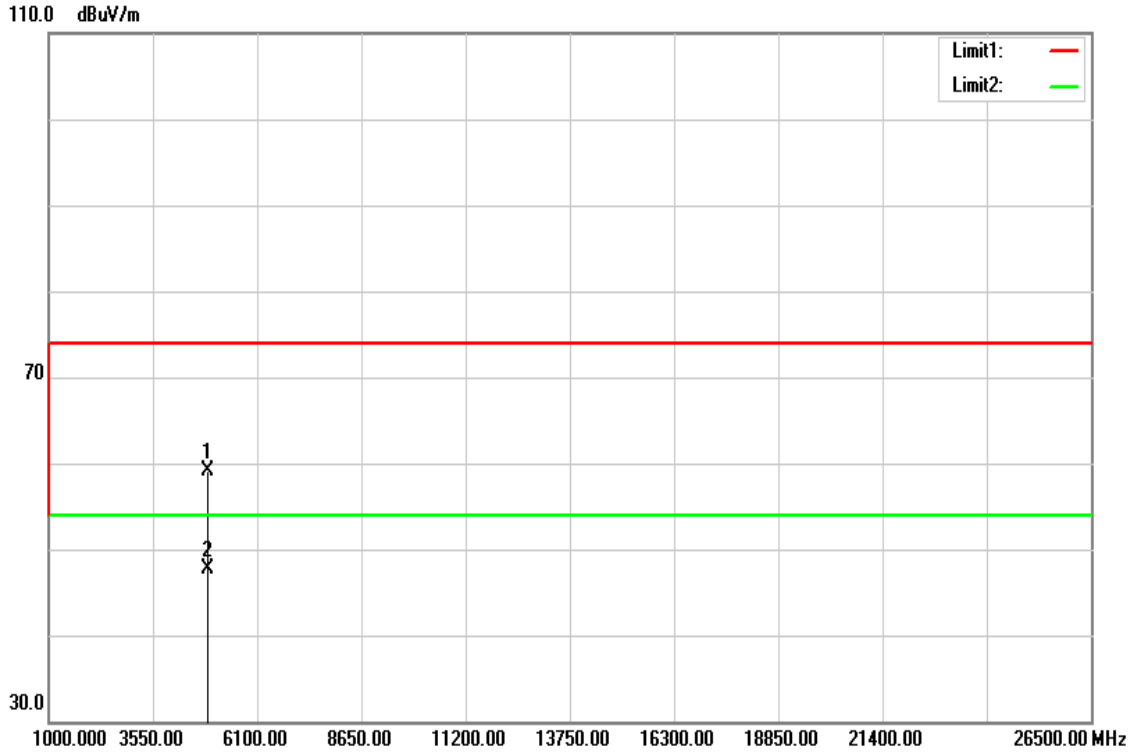
Test Mode	IEEE 802.11g Mid CH	Temp/Hum	24 (℃)/ 33%RH
Test Item	Harmonic	Test Date	November 10, 2017
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz



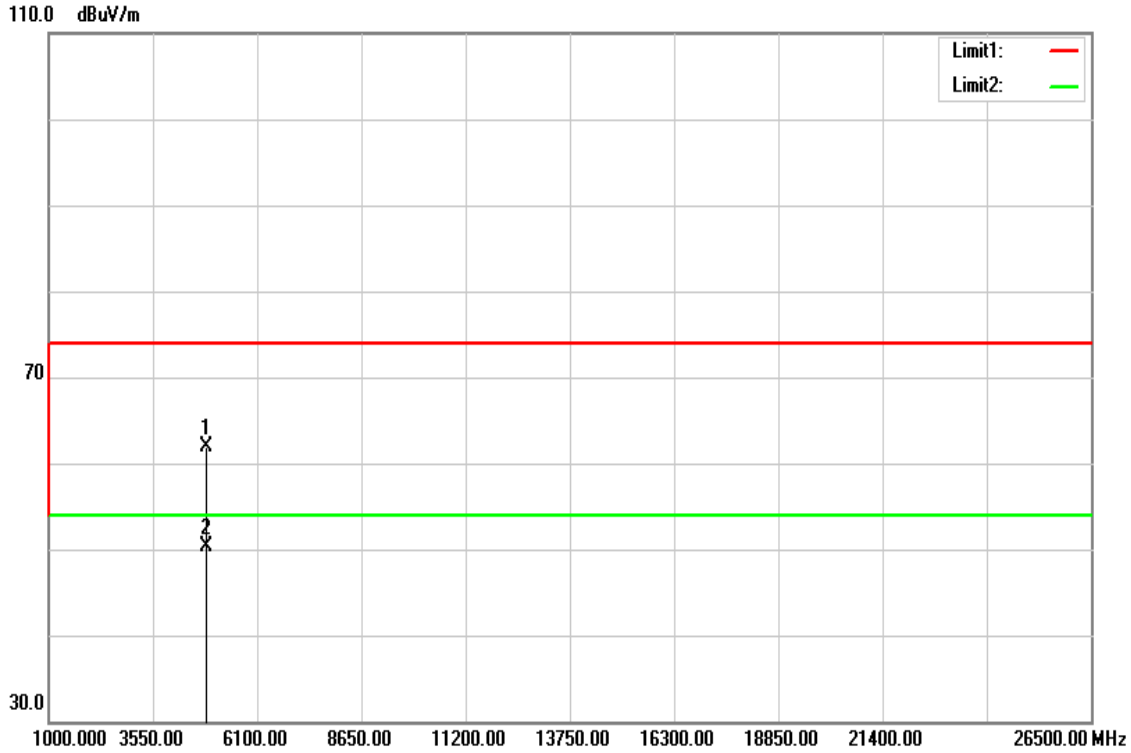
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB	Remark
4876.000	52.10	6.97	59.07	74.00	-14.93	peak
4876.000	40.65	6.97	47.62	54.00	-6.38	AVG
N/A						

Remark:

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

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

Test Mode	IEEE 802.11g Mid CH	Temp/Hum	24 (℃)/ 33%RH
Test Item	Harmonic	Test Date	November 10, 2017
Polarize	Horizontal	Test Engineer	Jerry Chuang
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
4869.000	55.00	6.95	61.95	74.00	-12.05	peak
4869.000	43.25	6.95	50.20	54.00	-3.80	AVG
N/A						

Remark:

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

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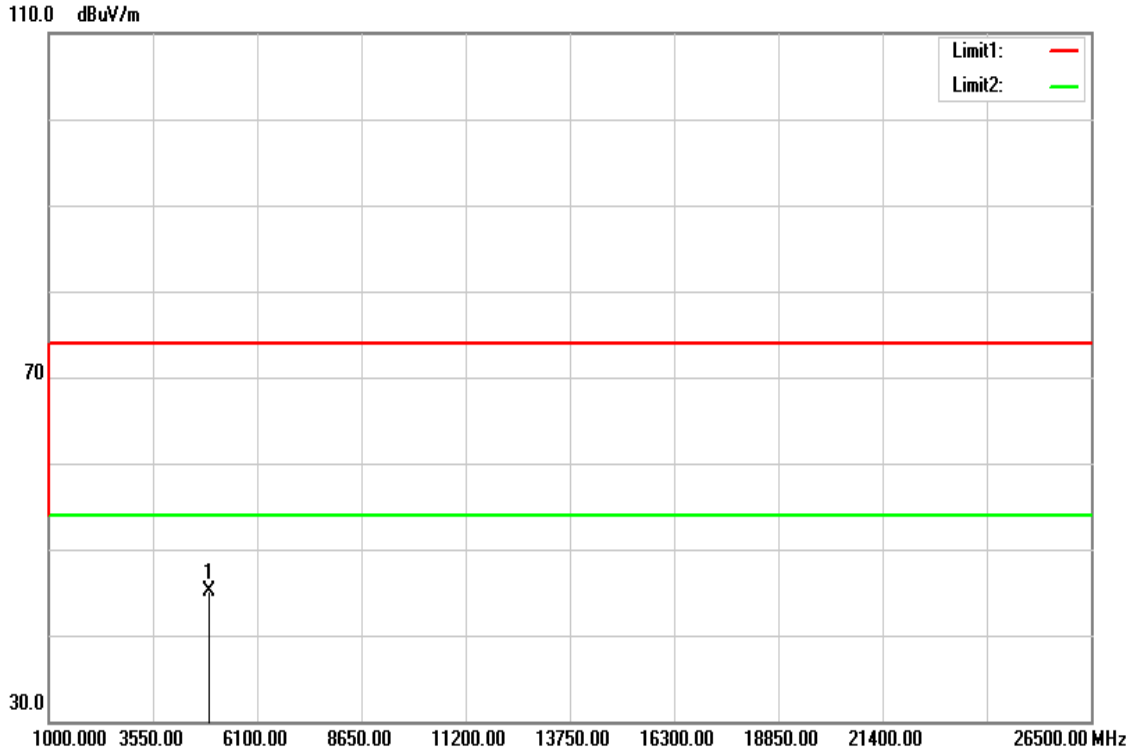
Test Mode	IEEE 802.11g High CH	Temp/Hum	24 (℃)/ 33%RH
Test Item	Harmonic	Test Date	November 10, 2017
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4925.000	37.92	7.09	45.01	74.00	-28.99	peak
N/A						

Remark:

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

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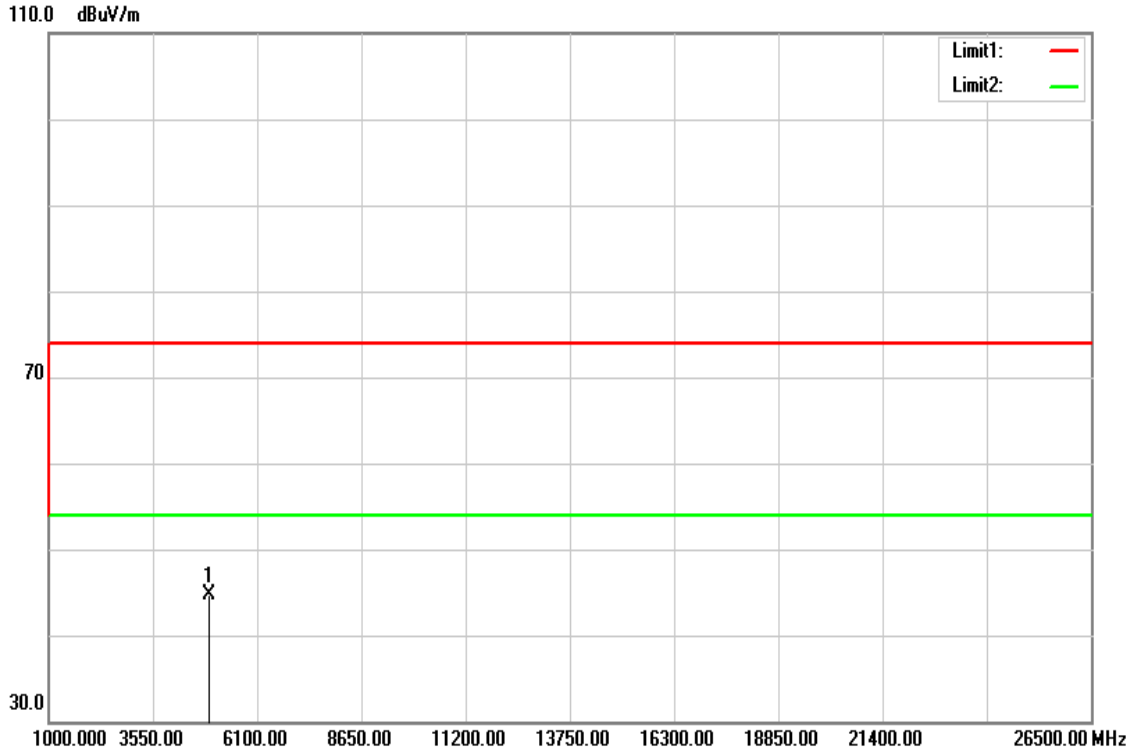
Test Mode	IEEE 802.11g High CH	Temp/Hum	24 (℃)/ 33%RH
Test Item	Harmonic	Test Date	November 10, 2017
Polarize	Horizontal	Test Engineer	Jerry Chuang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB	Remark
4918.000	37.58	7.08	44.66	74.00	-29.34	peak
N/A						

Remark:

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

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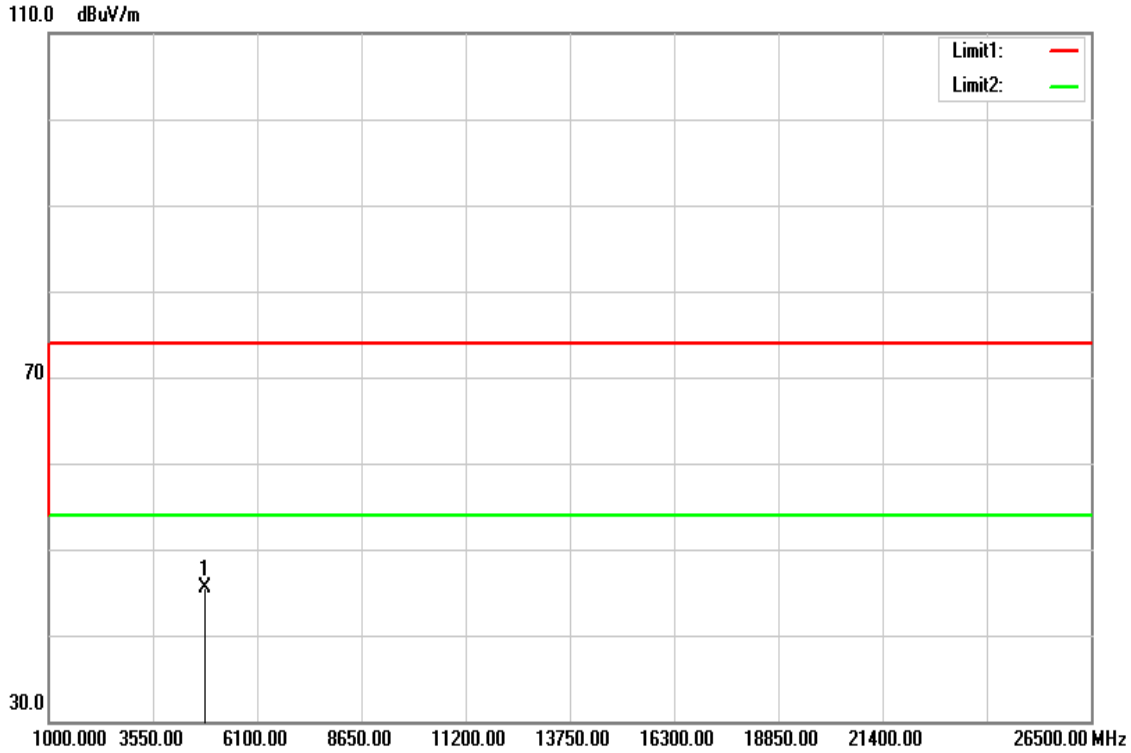
Test Mode	IEEE 802.11n HT20 Low CH	Temp/Hum	24 (℃)/ 33%RH
Test Item	Harmonic	Test Date	November 10, 2017
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz



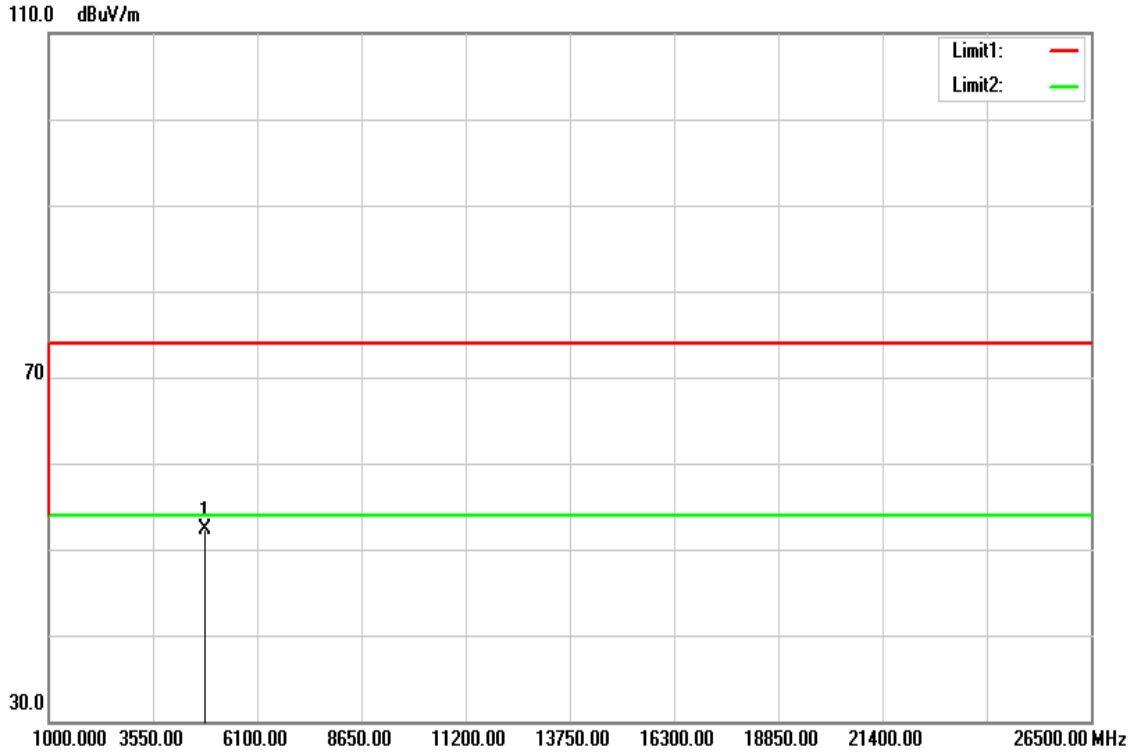
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	R mark
4824.000	38.75	6.84	45.59	74.00	-28.41	peak
N/A						

Remark:

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

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

Test Mode	IEEE 802.11n HT20 Low CH	Temp/Hum	24 (℃)/ 33%RH
Test Item	Harmonic	Test Date	November 10, 2017
Polarize	Horizontal	Test Engineer	Jerry Chuang
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	45.50	6.84	52.34	74.00	-21.66	peak
N/A						

Remark:

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

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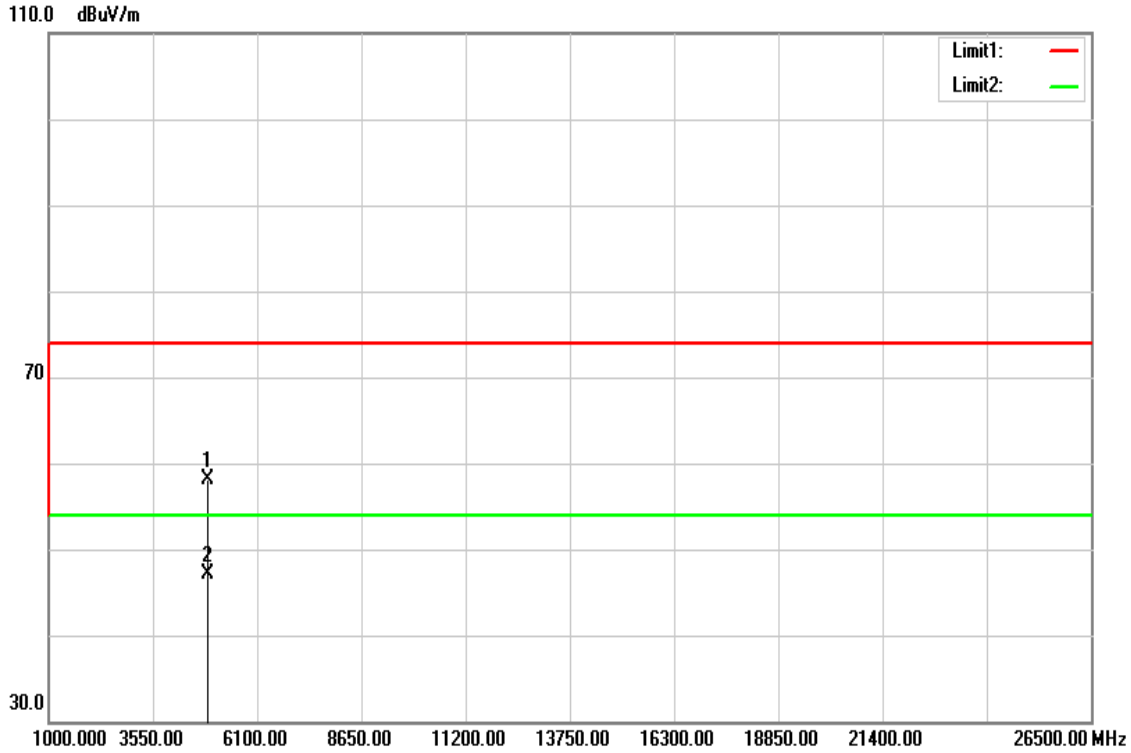
Test Mode	IEEE 802.11n HT20 Mid CH	Temp/Hum	24 (℃)/ 33%RH
Test Item	Harmonic	Test Date	November 10, 2017
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	R mark
4876.000	51.19	6.97	58.16	74.00	-15.84	peak
4876.000	40.08	6.97	47.05	54.00	-6.95	AVG
N/A						

Remark:

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

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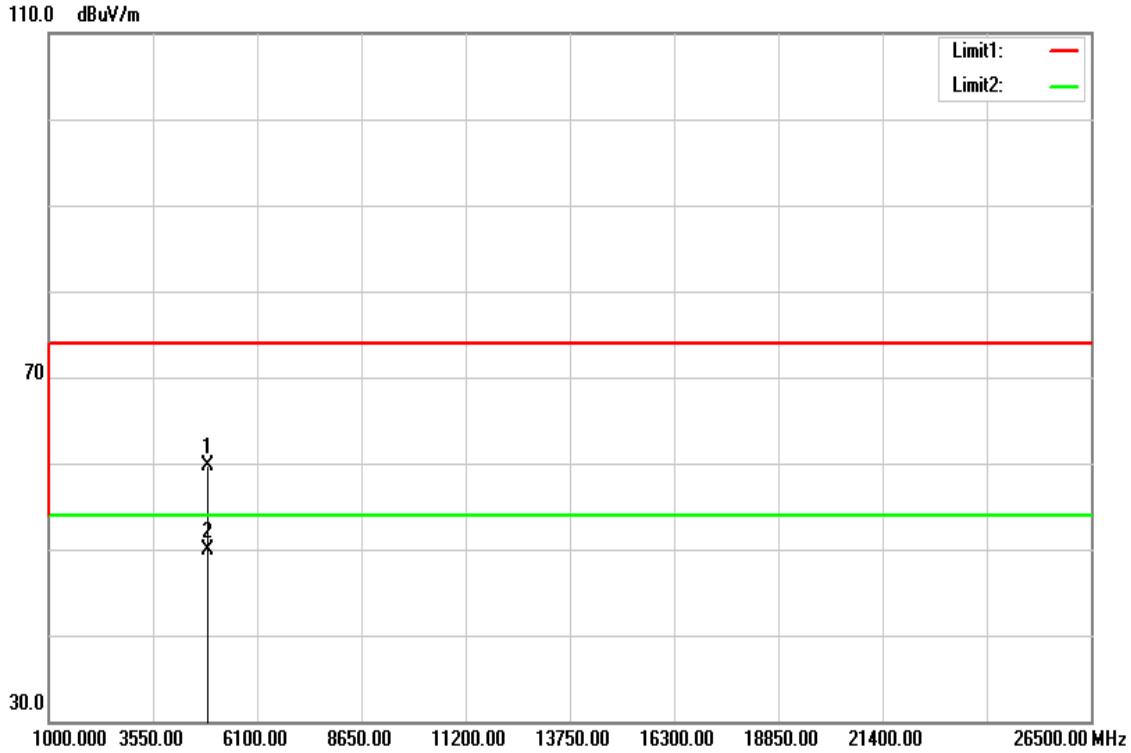
Test Mode	IEEE 802.11n HT20 Mid CH	Temp/Hum	24 (℃)/ 33%RH
Test Item	Harmonic	Test Date	November 10, 2017
Polarize	Horizontal	Test Engineer	Jerry Chuang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB	Remark
4876.000	52.71	6.97	59.68	74.00	-14.32	peak
4876.000	42.84	6.97	49.81	54.00	-4.19	AVG
N/A						

Remark:

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

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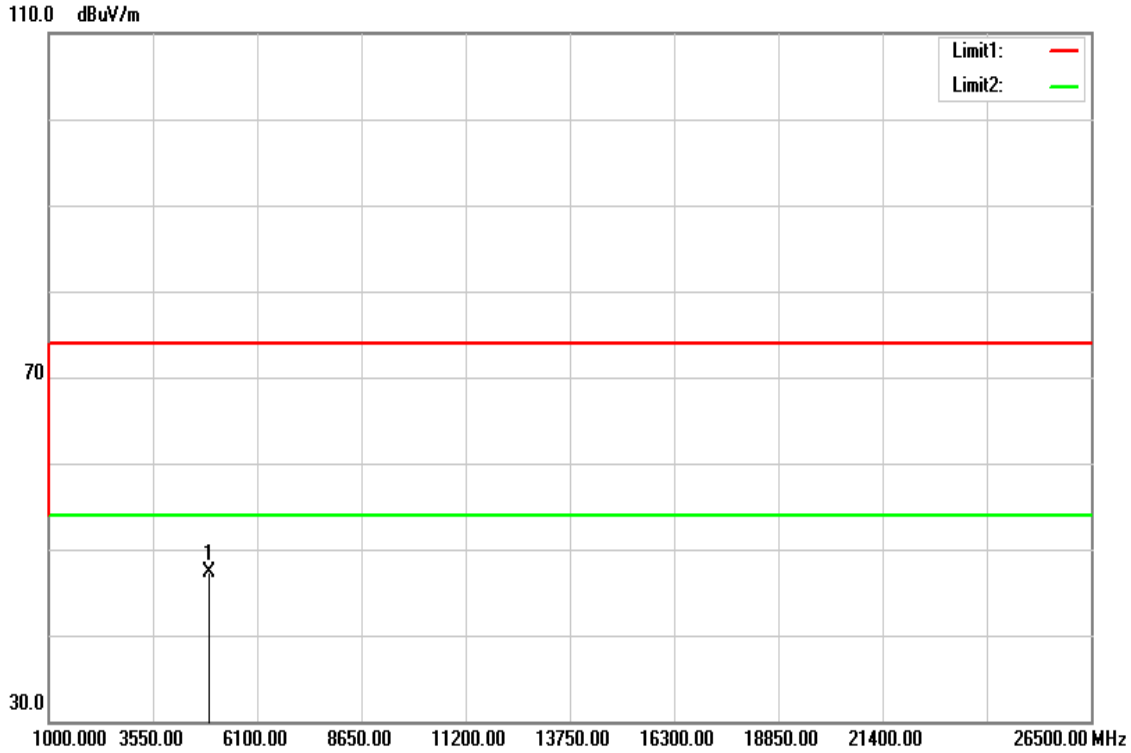
Test Mode	IEEE 802.11n HT20 High CH	Temp/Hum	24 (℃)/ 33%RH
Test Item	Harmonic	Test Date	November 10, 2017
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4925.000	40.25	7.09	47.34	74.00	-26.66	peak
N/A						

Remark:

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

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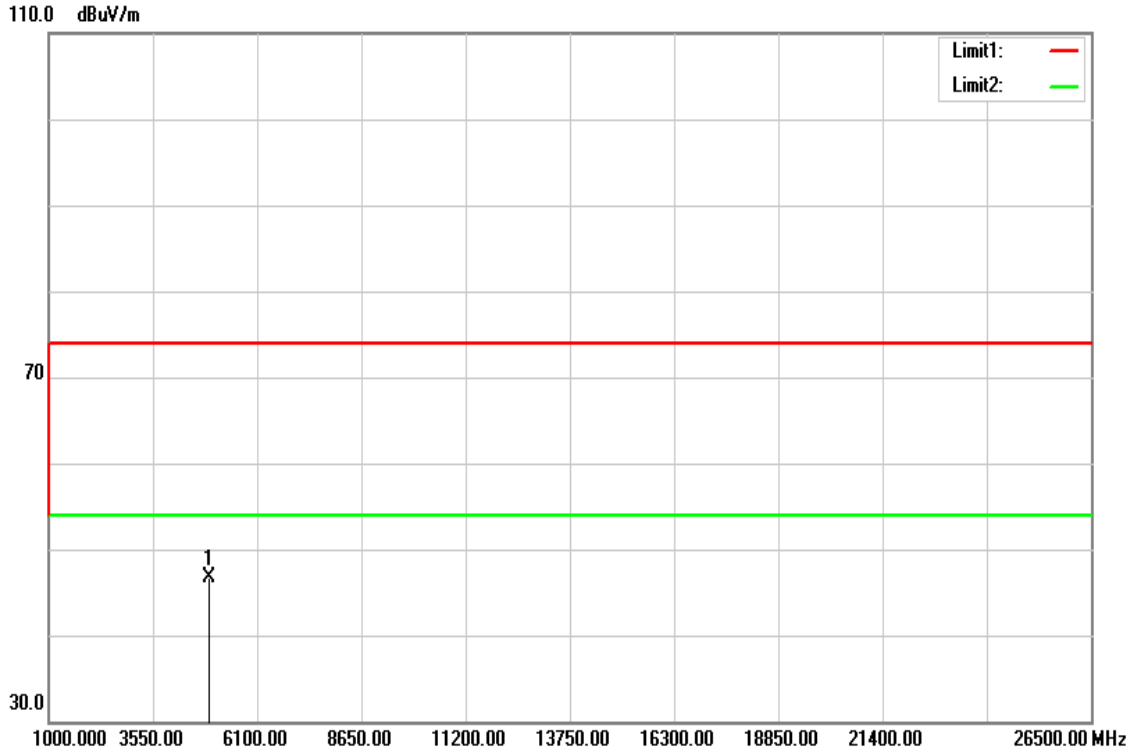
Test Mode	IEEE 802.11n HT20 High CH	Temp/Hum	24 (℃)/ 33%RH
Test Item	Harmonic	Test Date	November 10, 2017
Polarize	Horizontal	Test Engineer	Jerry Chuang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz



Frequency (MHz	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4925.000	39.68	7.09	46.77	74.00	-27.23	peak
N/A						

Remark:

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

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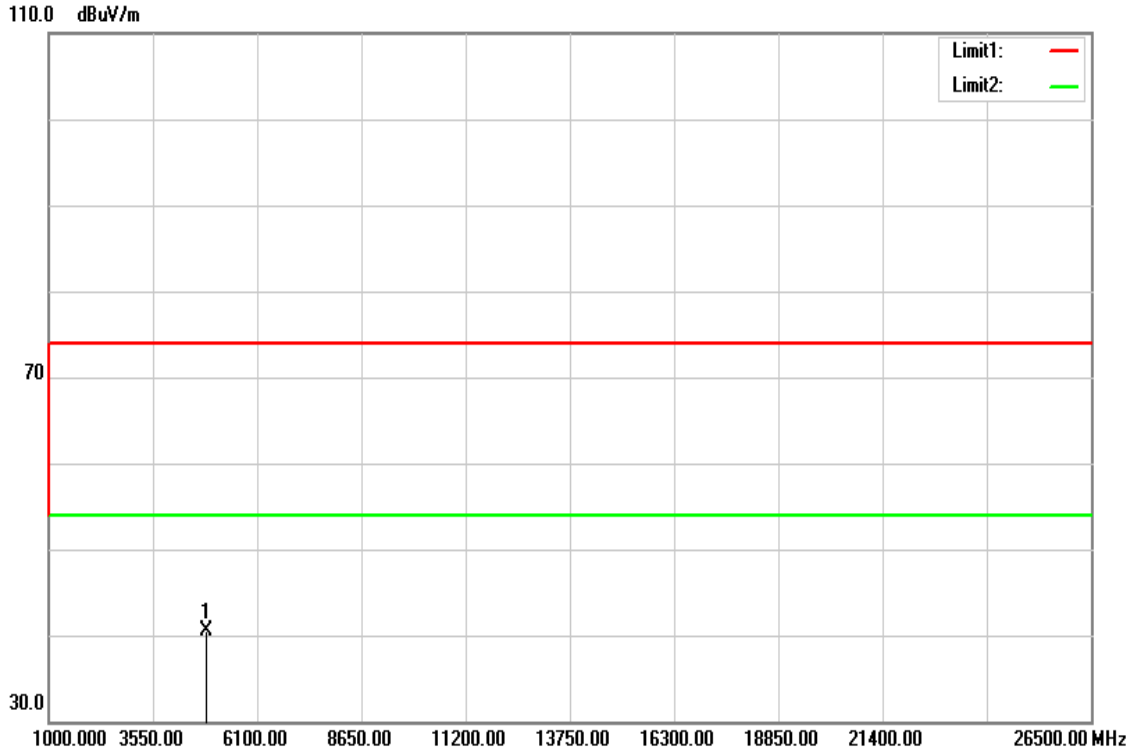
Test Mode	IEEE 802.11n HT40 Low CH	Temp/Hum	24 (℃)/ 33%RH
Test Item	Harmonic	Test Date	November 10, 2017
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4844.000	33.70	6.88	40.58	74.00	-33.42	peak
N/A						

Remark:

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

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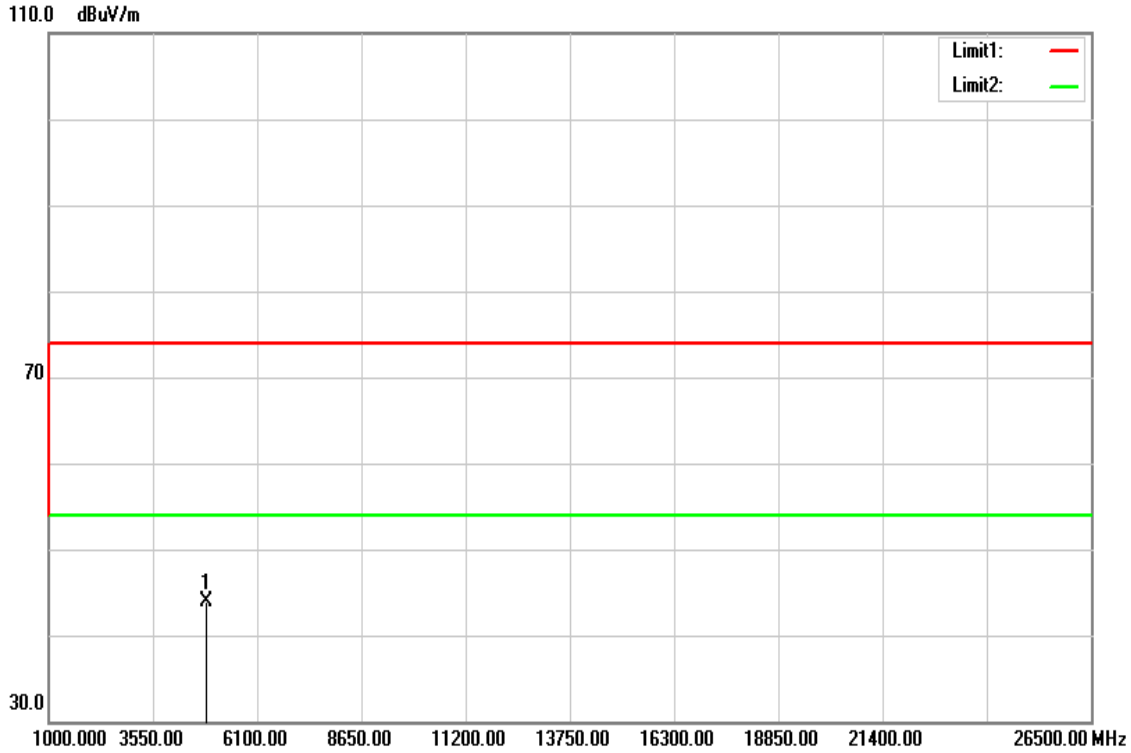
Test Mode	IEEE 802.11n HT40 Low CH	Temp/Hum	24 (℃)/ 33%RH
Test Item	Harmonic	Test Date	November 10, 2017
Polarize	Horizontal	Test Engineer	Jerry Chuang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4844.000	37.10	6.88	43.98	74.00	-30.02	peak
N/A						

Remark:

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

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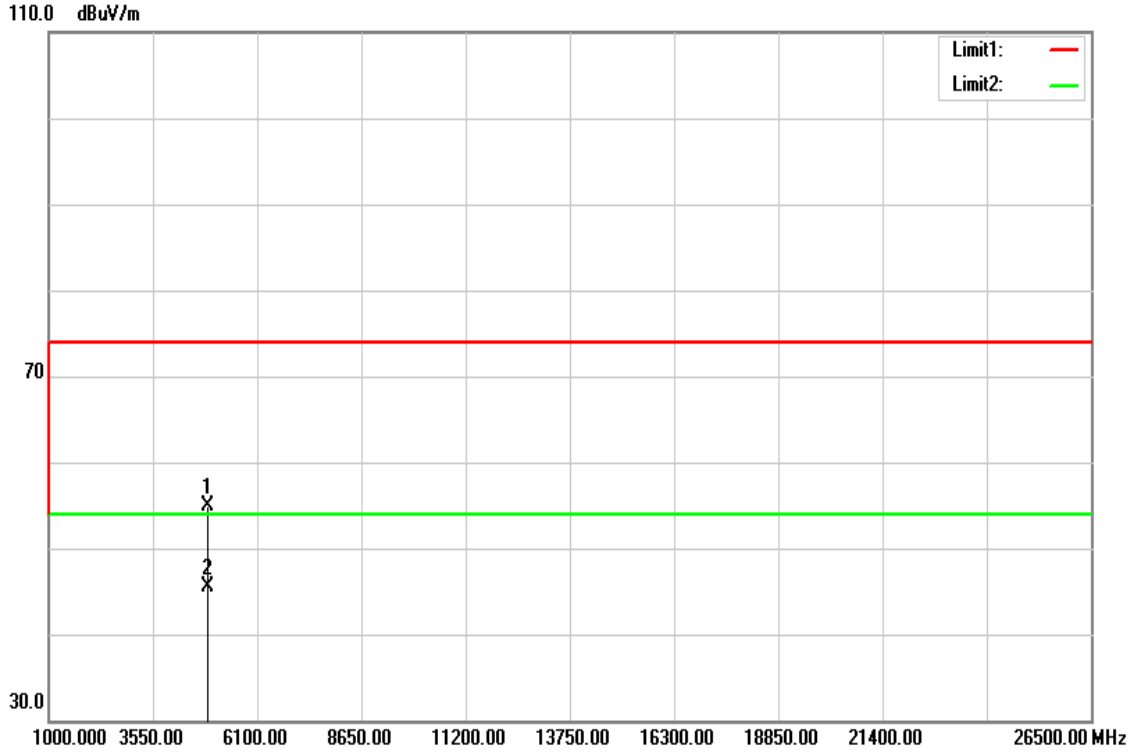
Test Mode	IEEE 802.11n HT40 Mid CH	Temp/Hum	24 (℃)/ 33%RH
Test Item	Harmonic	Test Date	November 10, 2017
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4876.000	47.89	6.97	54.86	74.00	-19.14	peak
4876.000	38.48	6.97	45.45	54.00	-8.55	AVG
N/A						

Remark:

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

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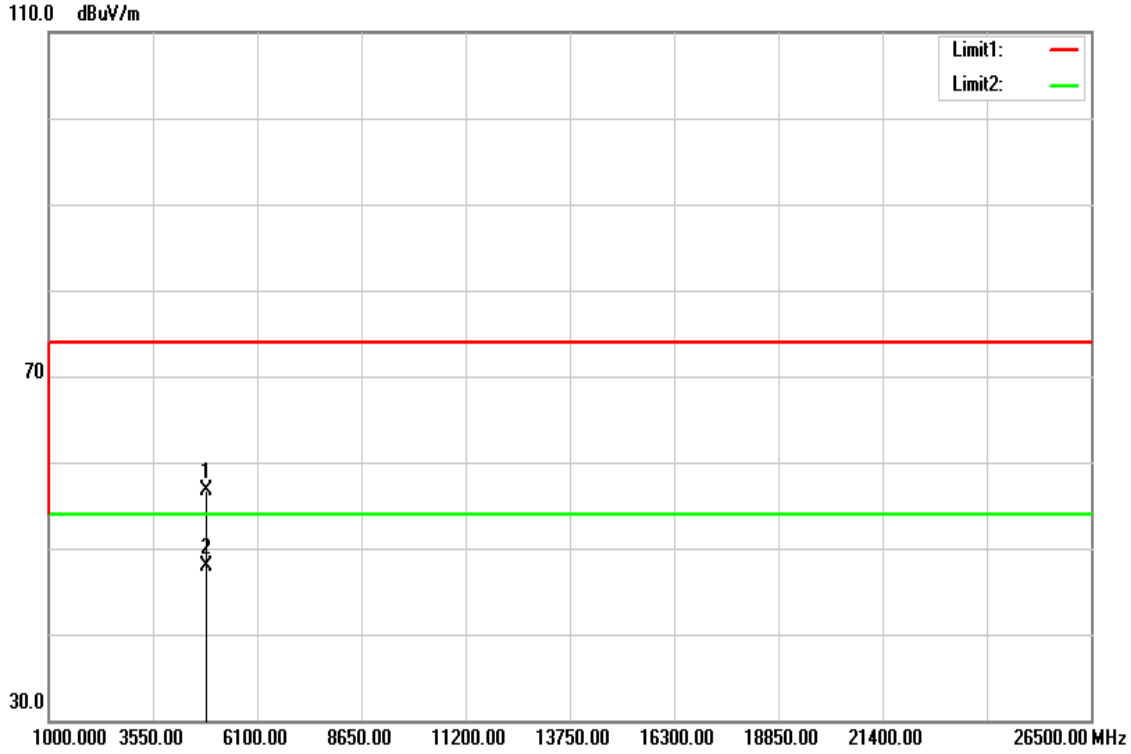
Test Mode	IEEE 802.11n HT40 Mid CH	Temp/Hum	24 (℃)/ 33%RH
Test Item	Harmonic	Test Date	November 10, 2017
Polarize	Horizontal	Test Engineer	Jerry Chuang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB	Remark
4862.000	49.84	6.93	56.77	74.00	-17.23	peak
4862.000	40.97	6.93	47.90	54.00	-6.10	AVG
N/A						

Remark:

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

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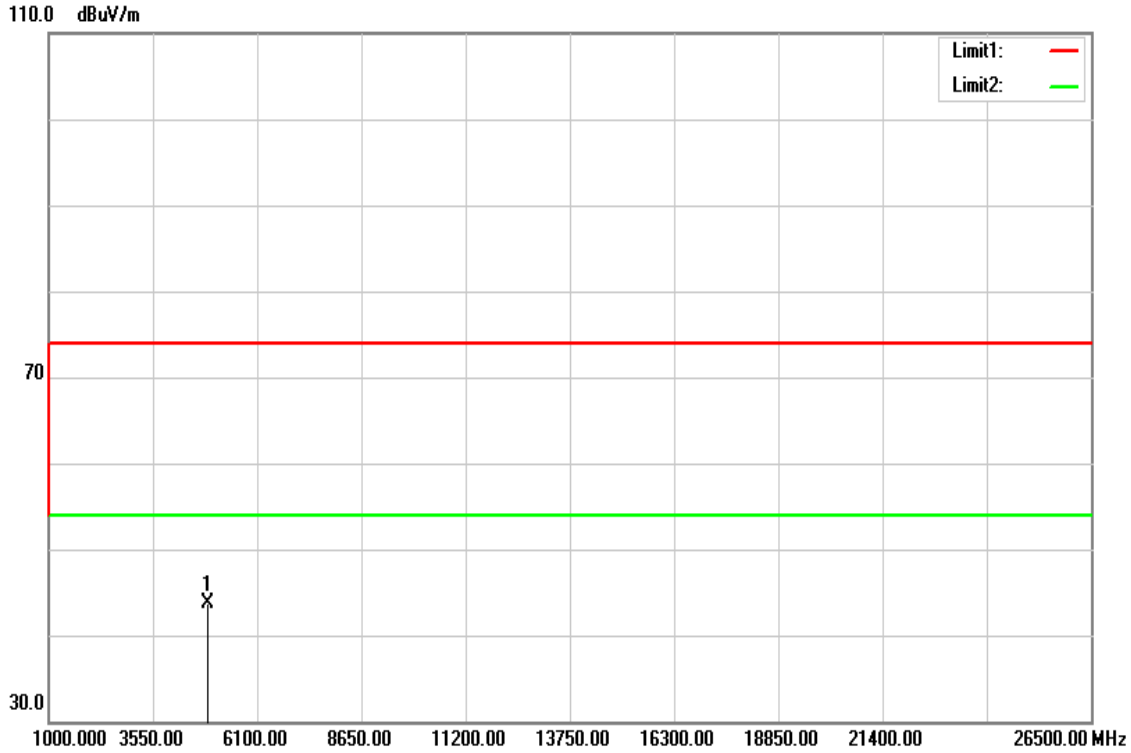
Test Mode	IEEE 802.11n HT40 High CH	Temp/Hum	24 (℃)/ 33%RH
Test Item	Harmonic	Test Date	November 10, 2017
Polarize	Vertical	Test Engineer	Jerry Chuang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4904.000	36.68	7.04	43.72	74.00	-30.28	peak
N/A						

Remark:

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

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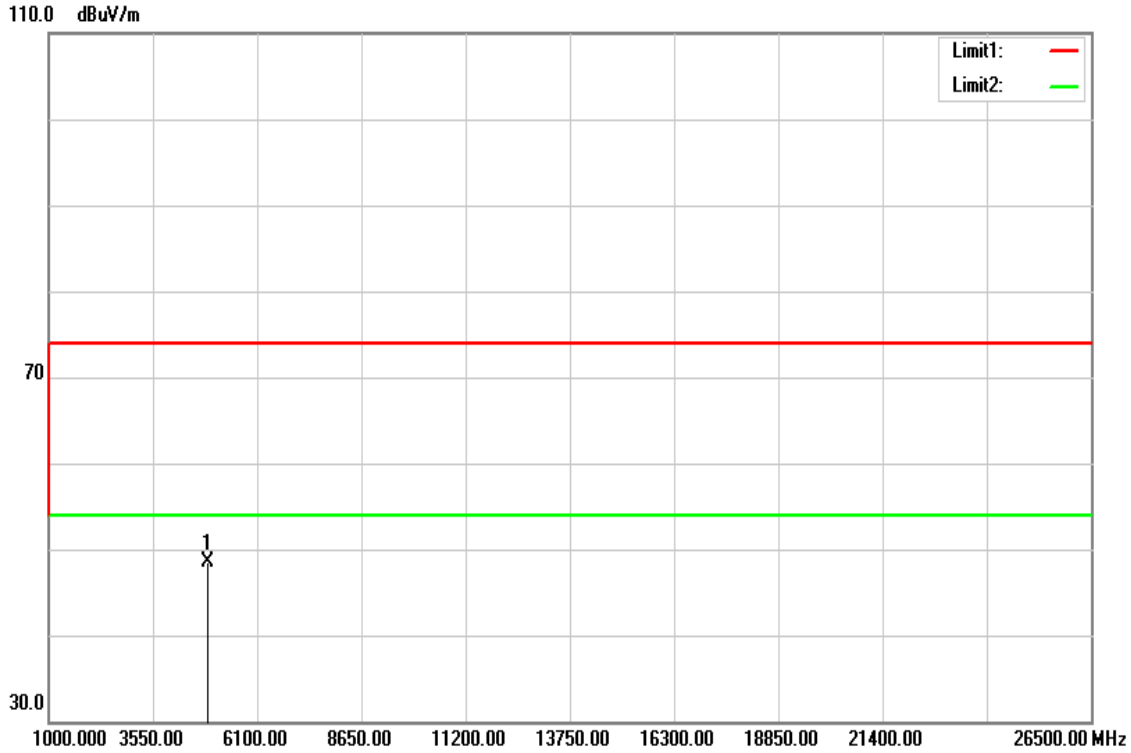
Test Mode	IEEE 802.11n HT40 High CH	Temp/Hum	24 (℃)/ 33%RH
Test Item	Harmonic	Test Date	November 10, 2017
Polarize	Horizontal	Test Engineer	Jerry Chuang
Detector	Peak and Average	Test Voltage	120Vac / 60Hz



Frequency (MHz	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4904.000	41.37	7.04	48.41	74.00	-25.59	peak
N/A						

Remark:

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

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