

FCC RADIO TEST REPORT

FCC 47 CFR PART 15 SUBPART C

Test Standard	FCC Part 15.247
FCC ID	M82-DMSSJ03
Brand name	ADVANTECH
Product name	Computer
Model No.	DMS-SJ03
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. (Hsinchu Lab)



Approved by:

Tested by:

A handwritten signature in black ink that reads "Davis Tseng".

A handwritten signature in black ink that reads "Ed Chiang".

Davis Tseng
Sr. Engineer

Ed Chiang
Assistant Engineer



Revision History

Rev.	Issue Date	Revisions	Revised By
00	September 20, 2017	Initial Issue	Allison Chen

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APPENDIX I PHOTOGRAPHS OF EUT		

1. GENERAL INFORMATION

1.1 EUT INFORMATION

Applicant	Advantech Co.Ltd. No.1, Alley 20, Lane 26, Rueiguang Road, Neihu District, Taipei 114, Taiwan, R.O.C.
Equipment	Computer
Model Name	DMS-SJ03
Model Discrepancy	N/A
Received Date	August 31, 2017
Date of Test	September 5 ~ 8 , 2017
Output Power(W)	IEEE 802.11b mode: 0.1803 IEEE 802.11g mode: 0.2541 IEEE 802.11n HT 20 MHz mode: 0.1714 IEEE 802.11n HT 40 MHz mode: 0.1230
Power Supply	Powered from host device: DC 12V

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
<input type="checkbox"/> 1 MHz or less	1	Middle
<input type="checkbox"/> 1 MHz to 10 MHz	2	1 near top and 1 near bottom
<input checked="" type="checkbox"/> More than 10 MHz	3	1 near top, 1 near middle, and 1 near bottom

1.3 ANTENNA INFORMATION

Antenna Type	<input checked="" type="checkbox"/> PIFA <input type="checkbox"/> PCB <input type="checkbox"/> Dipole <input type="checkbox"/> Coils
Antenna Gain	Gain: 2.75dBi

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, Wenshan Rd., Shangshan Village, Qionglin Township, Hsinchu County 30741, Taiwan, R.O.C

Test site	Test Engineer	Remark
AC Conduction Room	-	Not applicable, because EUT not connect to AC Main Source direct.
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	1149001	12/06/2016	12/05/2017
Power Sensor	Anritsu	MA2411B	1126148	12/06/2016	12/05/2017
Spectrum Analyzer	R&S	FSV 40	101073	10/05/2016	10/04/2017
Spectrum Analyzer	R&S	FSU 20Hz...26.5GHz	100258	07/27/2017	07/26/2018

3M 966 Chamber Test Site					
Equipment	Manufacturer	Model	S/N	Cal Date	Cal Due
Bi-Log Antenna	TESEQ	CBL 6112D	35404	08/07/2017	08/06/2018
Double Ridged BroadBand Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-285	04/25/2017	04/24/2018
Horn Antenna	COM-POWER	AH-840	03077	12/02/2016	12/01/2017
Pre-Amplifier	EMCI	EMC001625	980243	04/11/2017	04/10/2018
Pre-Amplifier	COM-POWER	PAM-118A	551043	04/11/2017	04/10/2018
PSA Series Spectrum Analyzer	Agilent	E4446A	MY48250064	04/20/2017	04/19/2018
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

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	ASUS	M5200AE	R31018	PD9WM3B2100
2	DC Power Source	Agilent	E3640A	N/A	N/A
3	NB(D)	ASUS	A8J	R31018	N/A

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.

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	-
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 :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.

3.2 THE WORST MODE OF MEASUREMENT

Radiated Emission Measurement Above 1G	
Test Condition	Band edge, Emission for Unwanted and Fundamental
Voltage/Hz	DC 12V
Test Mode	Mode 1: EUT power by DC Source via cable.
Worst Mode	<input checked="" type="checkbox"/> Mode 1 <input type="checkbox"/> Mode 2 <input type="checkbox"/> Mode 3 <input type="checkbox"/> Mode 4
Worst Position	<input type="checkbox"/> Placed in fixed position. <input type="checkbox"/> Placed in fixed position at X-Plane (E2-Plane) <input checked="" type="checkbox"/> Placed in fixed position at Y-Plane (E1-Plane) <input type="checkbox"/> Placed in fixed position at Z-Plane (H-Plane)
Worst Polarity	<input type="checkbox"/> Horizontal <input checked="" type="checkbox"/> Vertical

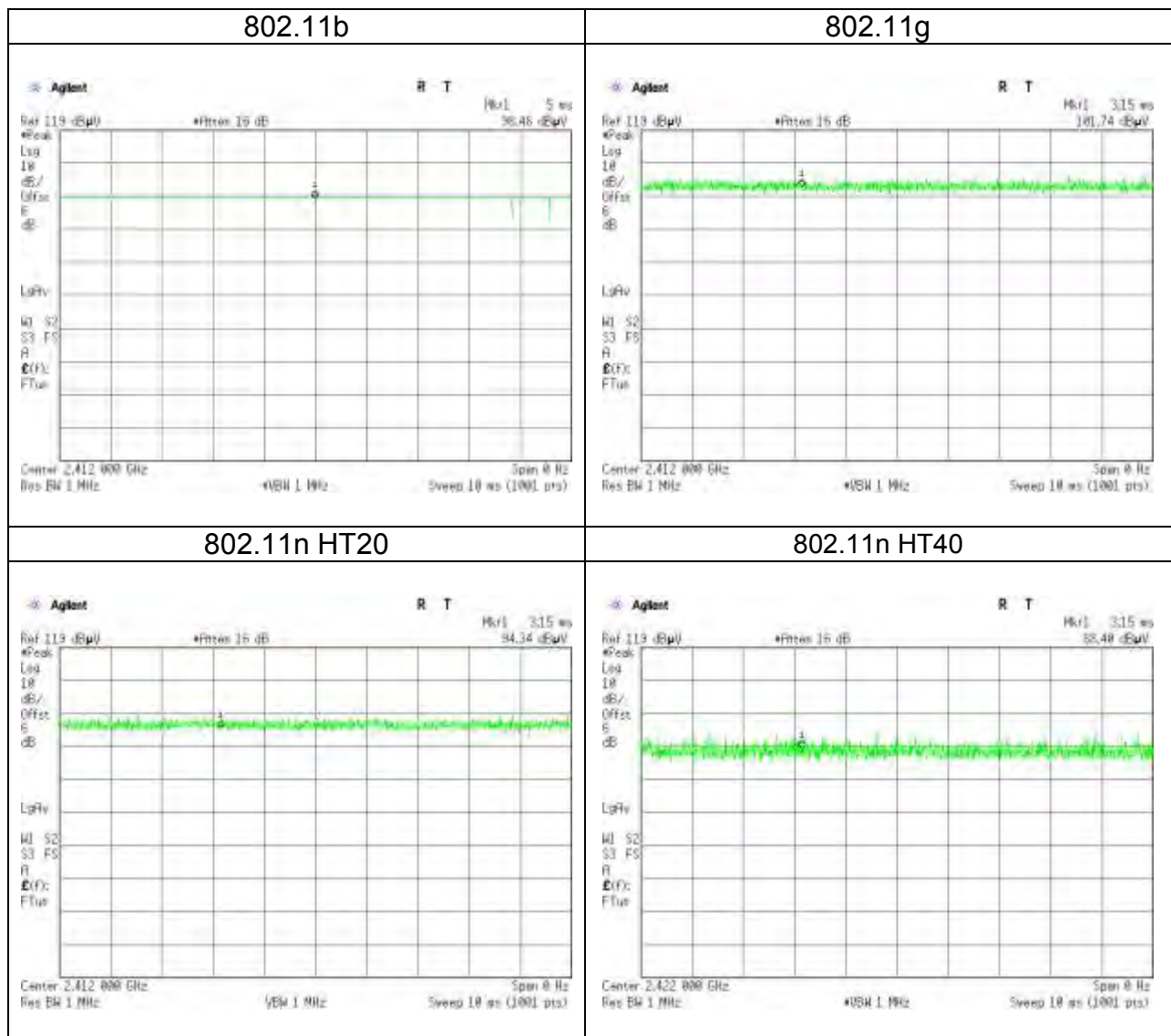
Radiated Emission Measurement Below 1G	
Test Condition	Radiated Emission Below 1G
Voltage/Hz	DC 12V
Test Mode	Mode 1: EUT power by DC Source via cable.
Worst Mode	<input checked="" type="checkbox"/> Mode 1 <input type="checkbox"/> Mode 2 <input type="checkbox"/> Mode 3 <input type="checkbox"/> Mode 4

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. For below 1G, Radiation emission is performed the EUT transmit at the highest output power channel as worse case.

3.3 EUT DUTY CYCLE

Duty Cycle				
Configuration	TX ON (ms)	TX ALL (ms)	Duty Cycle (%)	Duty Factor(dB)
802.11b	100.0000	100.0000	100.00%	0.00
802.11g	100.0000	100.0000	100.00%	0.00
802.11n HT20	100.0000	100.0000	100.00%	0.00
802.11n HT40	100.0000	100.0000	100.00%	0.00



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

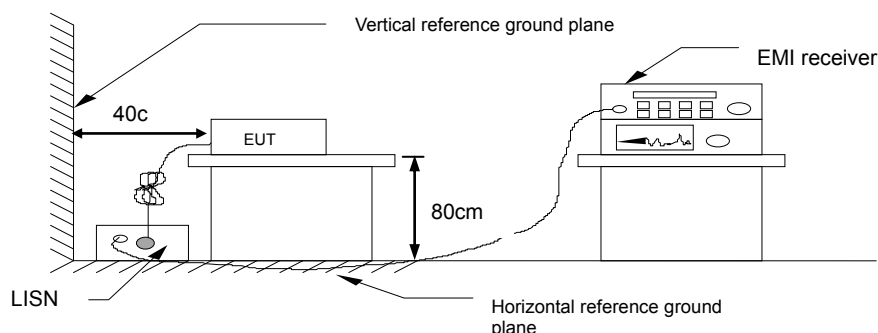
* Decreases with the logarithm of the frequency.

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

Not applicable, because EUT not connect to AC Main Source direct.

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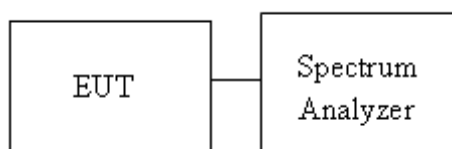
Occupied Bandwidth(99%) : For reporting purposes only.

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



4.2.4 Test Result

Test mode: IEEE 802.11b mode / 2412-2462 MHz						
Channel	Frequency (MHz)	Chain 0 OBW(99%) (MHz)	Chain 1 OBW(99%) (MHz)	Chain 0 6dB BW (MHz)	Chain 1 6dB BW (MHz)	6dB limit (kHz)
Low	2412	14.0231	--	10.1304	--	≥500
Mid	2437	14.0231	--	10.1304	--	
High	2462	14.0665	--	10.0870	--	

Test mode: IEEE 802.11g mode / 2412-2462 MHz						
Channel	Frequency (MHz)	Chain 0 OBW(99%) (MHz)	Chain 1 OBW(99%) (MHz)	Chain 0 6dB BW (MHz)	Chain 1 6dB BW (MHz)	6dB limit (kHz)
Low	2412	16.6280	--	16.6087	--	≥500
Mid	2437	16.7149	--	16.6087	--	
High	2462	16.6714	--	16.6087	--	

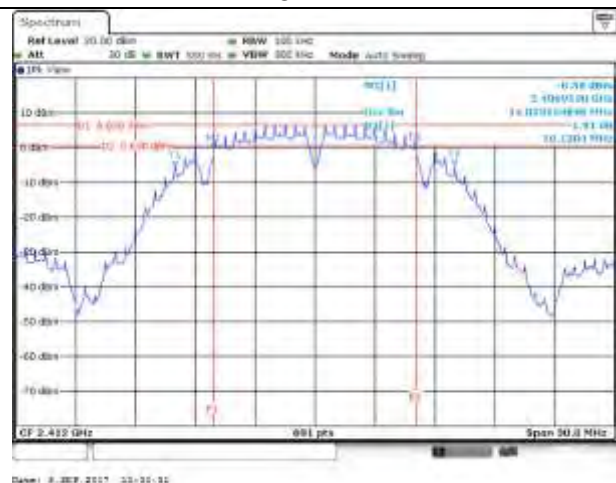
Test mode: IEEE 802.11n HT 20 MHz mode / 2412-2462 MHz						
Channel	Frequency (MHz)	Chain 0 OBW(99%) (MHz)	Chain 1 OBW(99%) (MHz)	Chain 0 6dB BW (MHz)	Chain 1 6dB BW (MHz)	6dB limit (kHz)
Low	2412	17.8437	--	17.8261	--	≥500
Mid	2437	17.8002	--	17.8261	--	
High	2462	17.8002	--	17.8696	--	

Test mode: IEEE 802.11n HT 40 MHz mode / 2422-2452 MHz						
Channel	Frequency (MHz)	Chain 0 OBW(99%) (MHz)	Chain 1 OBW(99%) (MHz)	Chain 0 6dB BW (MHz)	Chain 1 6dB BW (MHz)	6dB limit (kHz)
Low	2422	36.5846	--	36.6380	--	>500
Mid	2437	36.4688	--	36.6380	--	
High	2452	36.5846	--	36.6380	--	

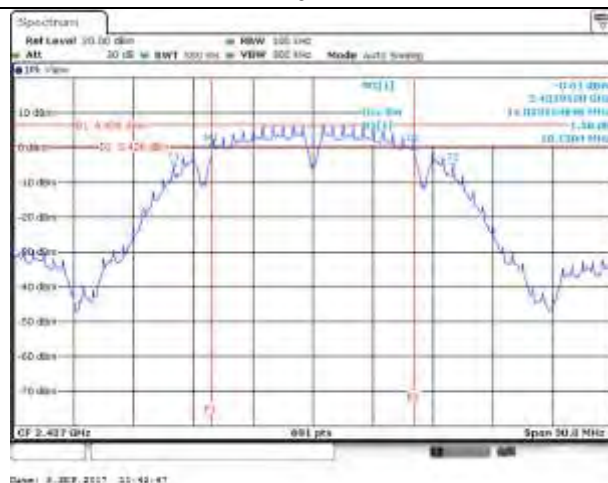
Test Data

IEEE 802.11b mode- chain 0

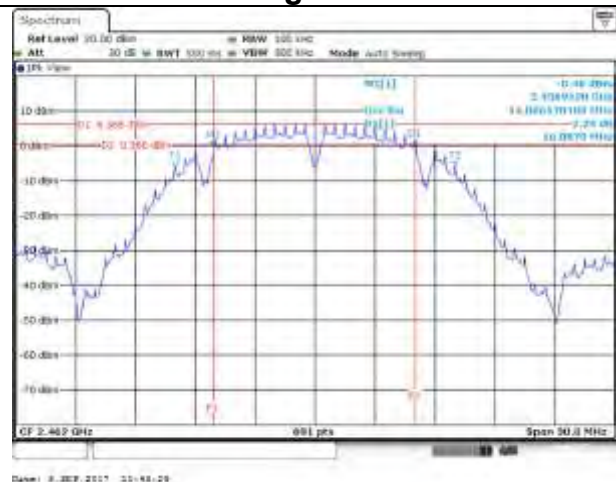
Low CH



Mid CH

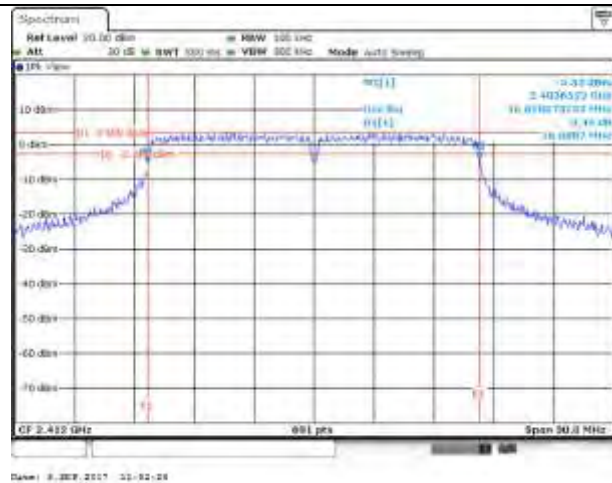


High CH

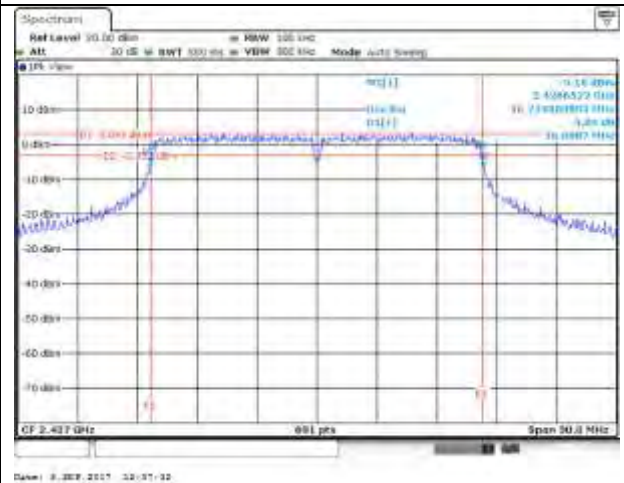


IEEE 802.11g mode- chain 0

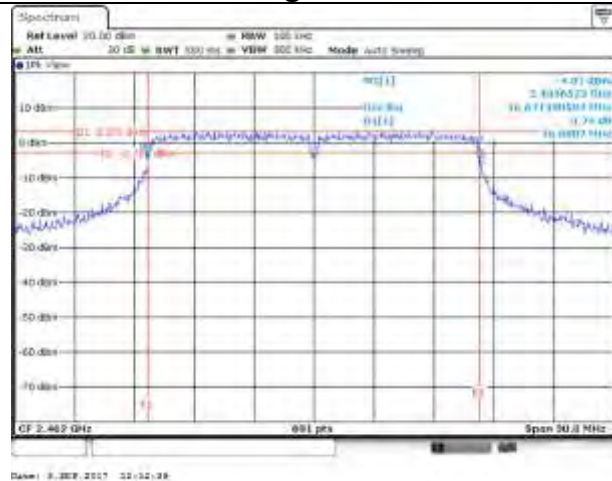
Low CH



Mid CH

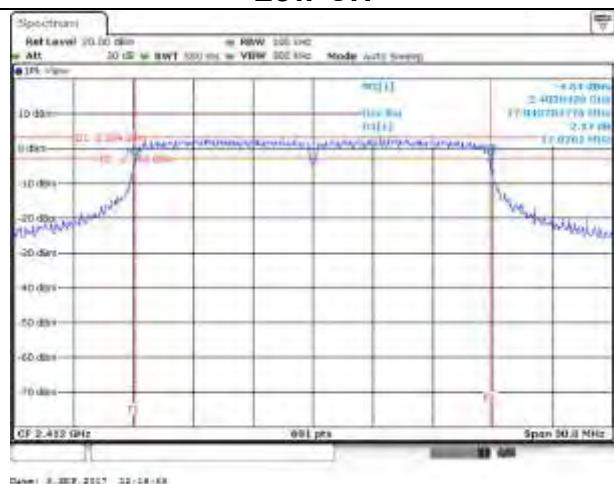


High CH

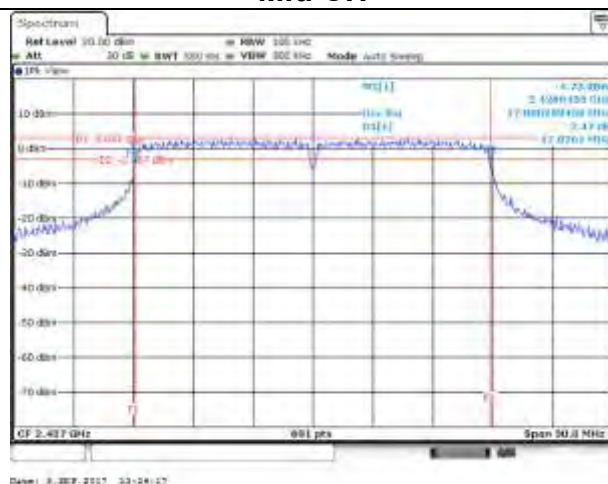


IEEE 802.11n HT20 mode- chain 0

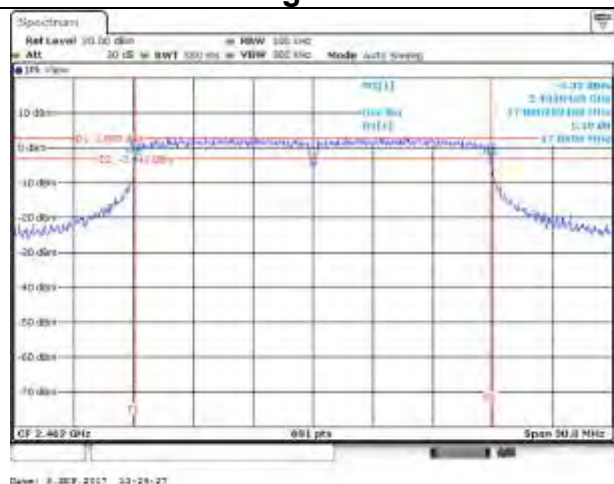
Low CH



Mid CH

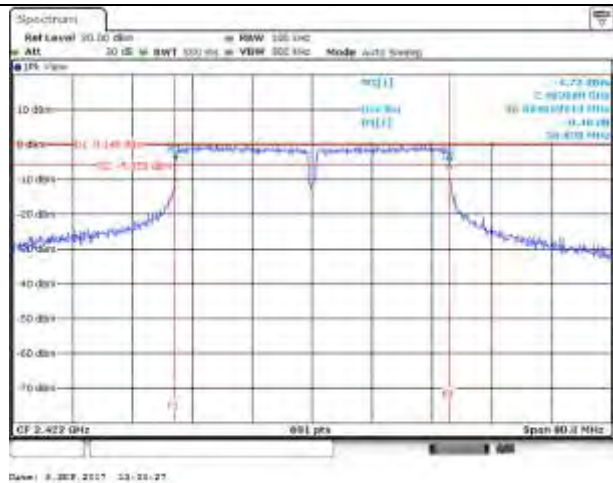


High CH

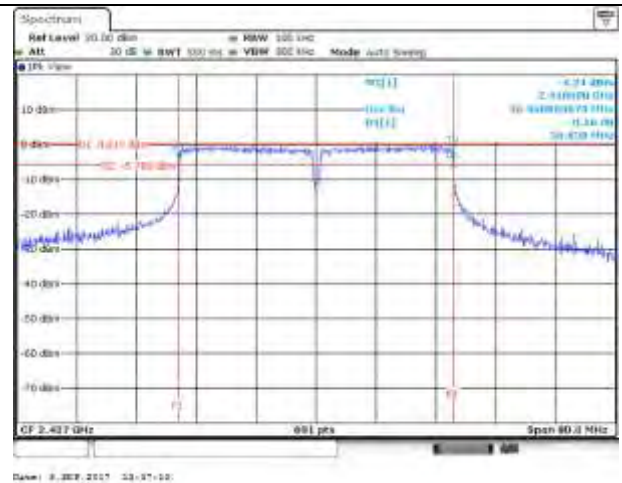


IEEE 802.11n HT40 mode- chain 0

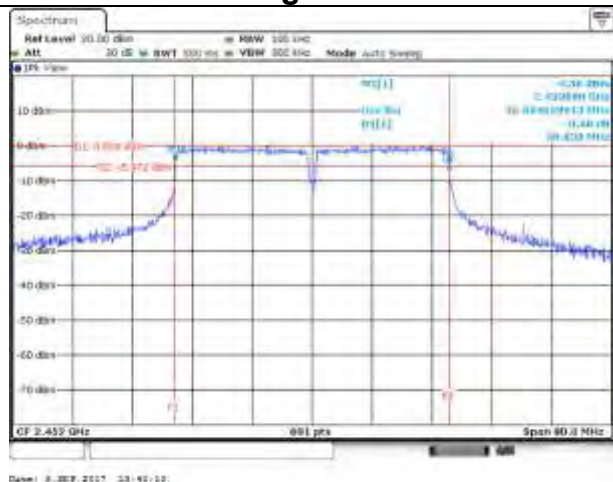
Low CH



Mid CH



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	<input checked="" type="checkbox"/> Antenna not exceed 6 dBi : 30dBm <input type="checkbox"/> Antenna with DG greater than 6 dBi : [Limit = 30 – (DG – 6)] <input type="checkbox"/> Point-to-point operation :
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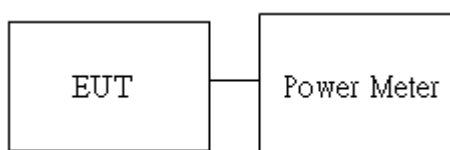
Average output power : For reporting purposes only.

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	22	-	22.56	-	22.56	0.1803	30
	Mid	2437	17	-	17.59	-	17.59	0.0574	
	High	2462	18.5	-	19.87	-	19.87	0.0971	
IEEE 802.11g Data rate: 6Mbps	Low	2412	15	-	24.05	-	24.05	0.2541	
	Mid	2437	15	-	23.67	-	23.67	0.2328	
	High	2462	13	-	22.57	-	22.57	0.1807	
IEEE 802.11n HT20 Data rate: MCS 0	Low	2412	13	-	21.74	-	21.74	0.1493	
	Mid	2437	13	-	22.34	-	22.34	0.1714	
	High	2462	12	-	21.49	-	21.49	0.1409	
IEEE 802.11n HT40 Data rate: MCS 0	Low	2422	11	-	20.9	-	20.9	0.123	
	Mid	2437	11	-	19.64	-	19.64	0.092	
	High	2452	11	-	19.78	-	19.78	0.0951	

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	21.24	-	21.24
	Mid	2437	16.63	-	16.63
	High	2462	18.39	-	18.39
IEEE 802.11g Data rate: 6Mbps	Low	2412	15.55	-	15.55
	Mid	2437	15.52	-	15.52
	High	2462	13.4	-	13.4
IEEE 802.11n HT20 Data rate: MCS 0	Low	2412	12.82	-	12.82
	Mid	2437	13.26	-	13.26
	High	2462	12.57	-	12.57
IEEE 802.11n HT40 Data rate: MCS 0	Low	2422	11.28	-	11.28
	Mid	2437	11.5	-	11.5
	High	2452	11.28	-	11.28

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	<input checked="" type="checkbox"/> Antenna not exceed 6 dBi : 8dBm <input type="checkbox"/> Antenna with DG greater than 6 dBi : [Limit = 8 – (DG – 6)] <input type="checkbox"/> Point-to-point operation :
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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 PPSSD (dBm)	Chain 1 PPSSD (dBm)	Total PPSSD (dBm)	Limit (dBm)
Low	2412	-2.23	-	-2.23	8
Mid	2437	-8.10	-	-8.10	
High	2462	-4.74	-	-4.74	

Test mode: IEEE 802.11g mode / 2412-2462 MHz					
Channel	Frequency (MHz)	Chain 0 PPSSD (dBm)	Chain 1 PPSSD (dBm)	Total PPSSD (dBm)	Limit (dBm)
Low	2412	-10.18	-	-10.18	8
Mid	2437	-9.61	-	-9.61	
High	2462	-12.13	-	-12.13	

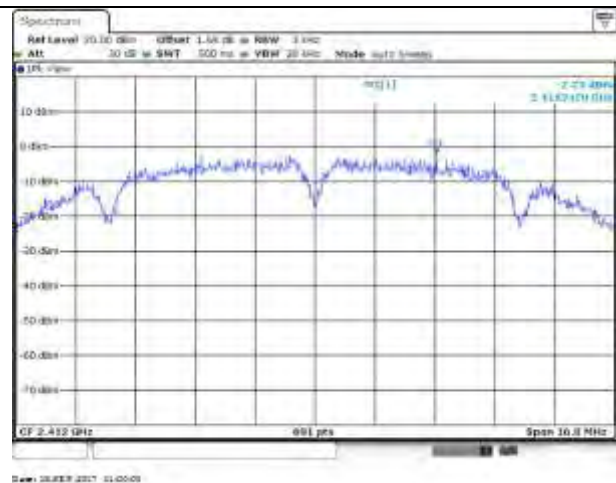
Test mode: IEEE 802.11n HT 20 MHz mode / 2412-2462 MHz					
Channel	Frequency (MHz)	Chain 0 PPSSD (dBm)	Chain 1 PPSSD (dBm)	Total PPSSD (dBm)	Limit (dBm)
Low	2412	-12.99	-	-12.99	8
Mid	2437	-13.00	-	-13.00	
High	2462	-13.23	-	-13.23	

Test mode: IEEE 802.11n HT 40 MHz mode / 2422-2452 MHz					
Channel	Frequency (MHz)	Chain 0 PPSSD (dBm)	Chain 1 PPSSD (dBm)	Total PPSSD (dBm)	Limit (dBm)
Low	2422	-15.05	-	-15.05	8
Mid	2437	-15.11	-	-15.11	
High	2452	-16.13	-	-16.13	

Test Data

IEEE 802.11b mode- chain 0

Low CH



Mid CH

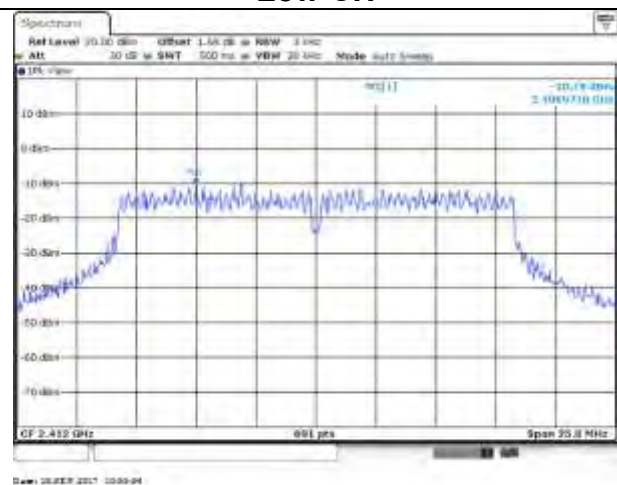


High CH

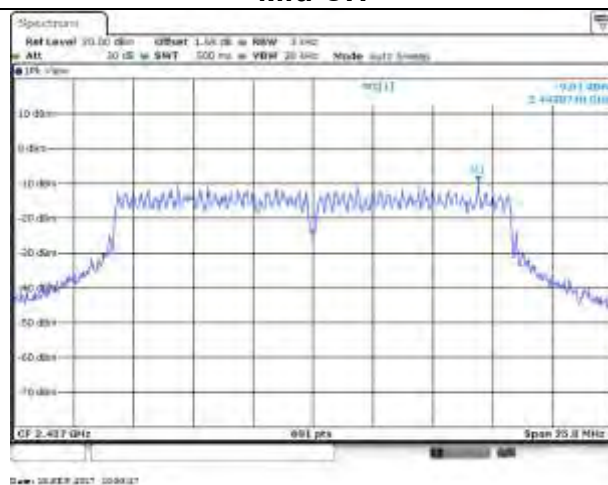


IEEE 802.11g mode- chain 0

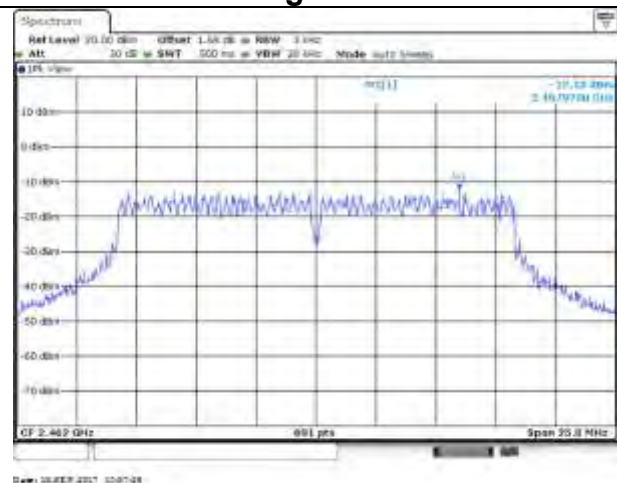
Low CH



Mid CH

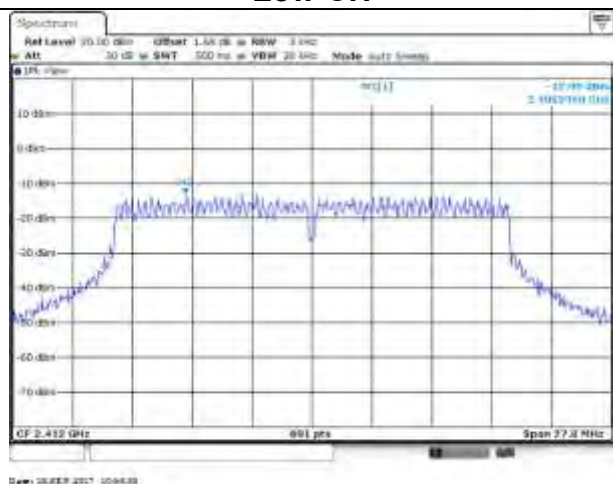


High CH

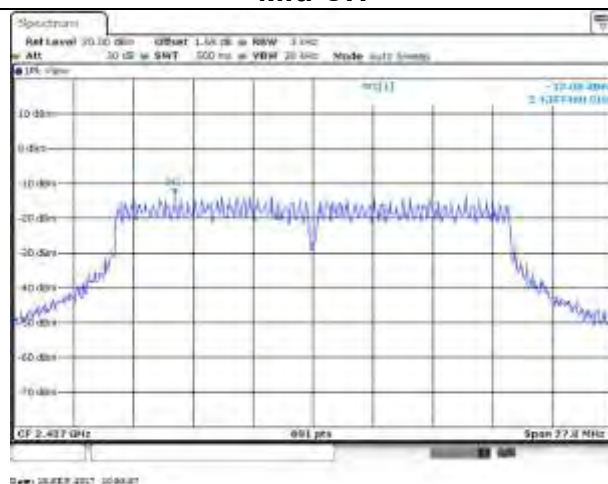


IEEE 802.11n HT20 mode- chain 0

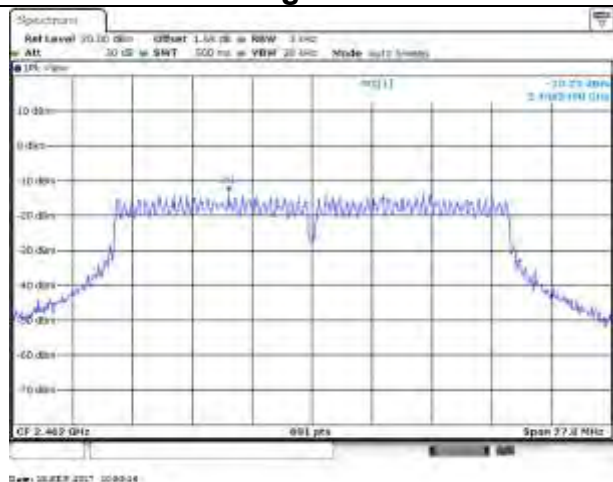
Low CH



Mid CH

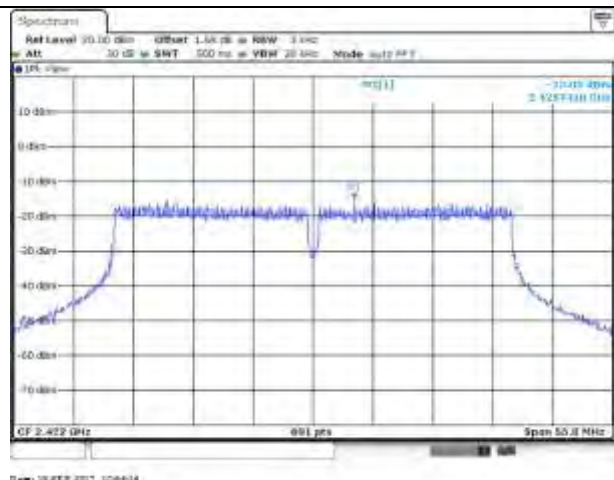


High CH

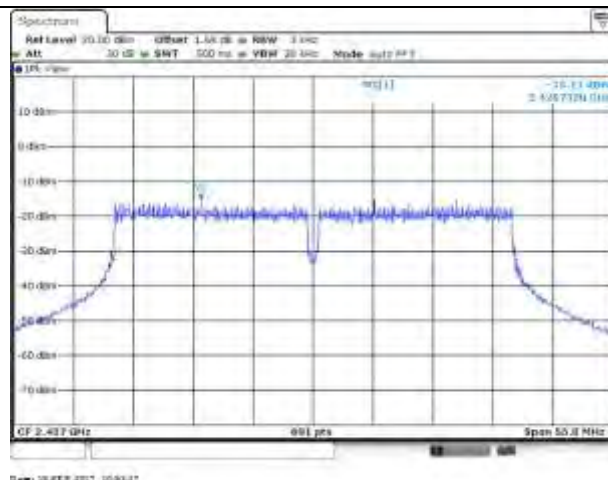


IEEE 802.11n HT40 mode-chain 0

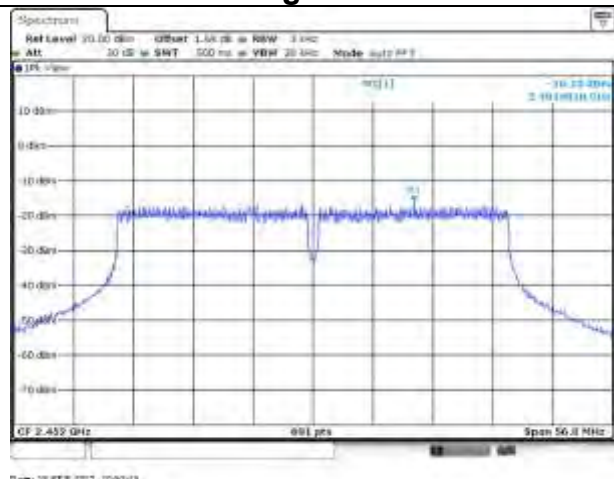
Low CH



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,

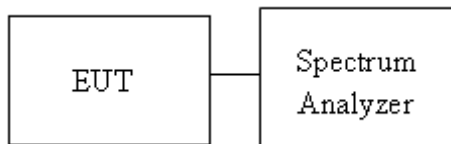
Non-restricted bands shall be attenuated at least 20 dB/30 dB relative to the maximum PSD level in 100 kHz by RF conducted or a radiated measurement which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a).

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. If 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

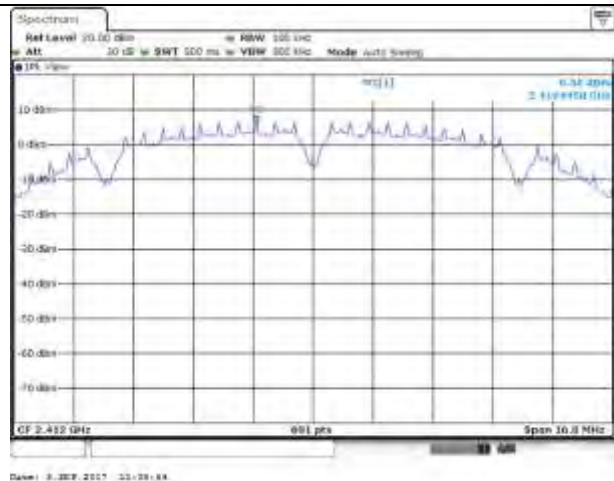


4.5.4 Test Result

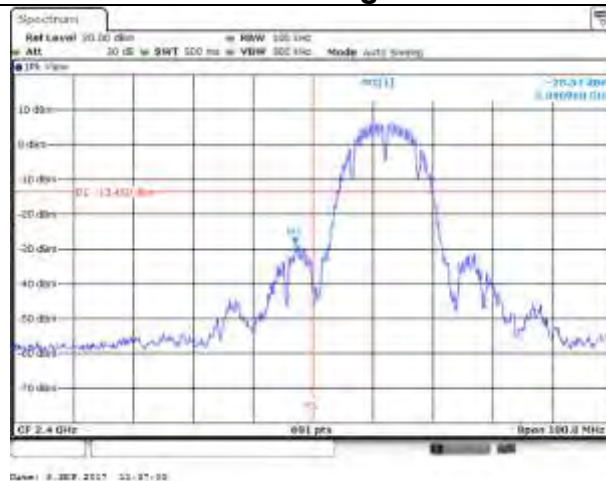
Test Data

IEEE 802.11b mode Low CH chain 0

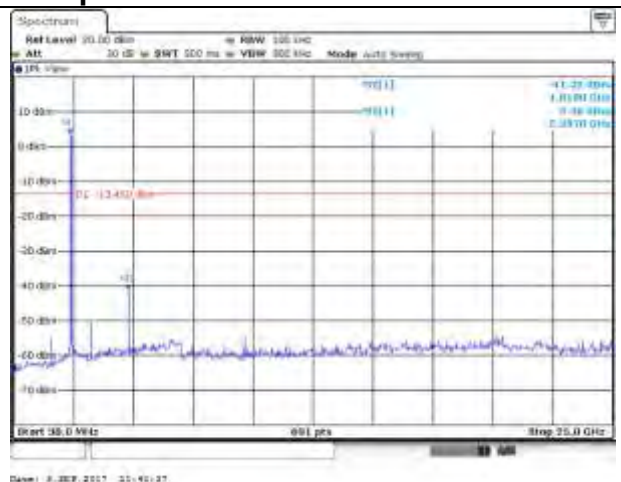
Reference Level of PSD in 100kHz



Band Edge

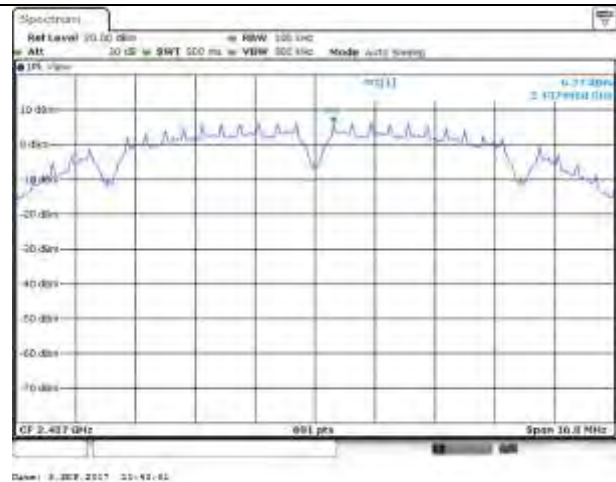


Spurious Emission 30MHz-25GHz

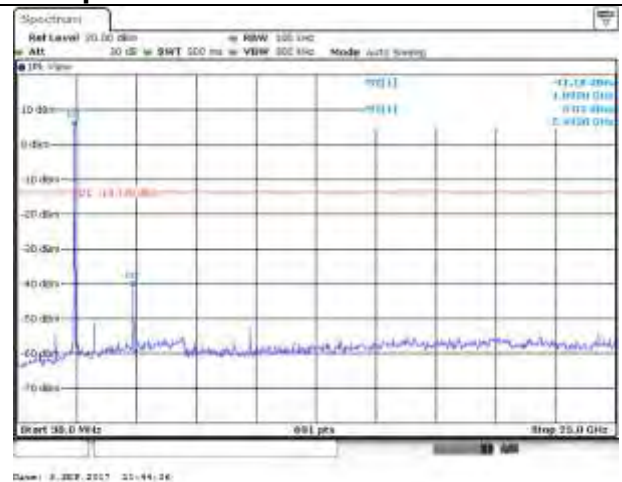


IEEE 802.11b mode Mid CH chain 0

Reference Level of PSD in 100kHz

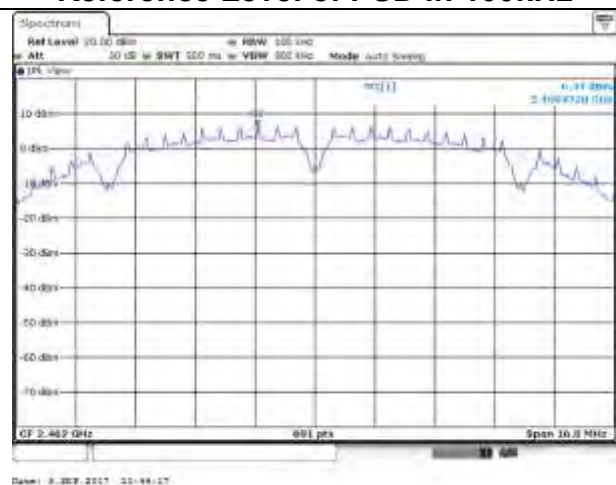


Spurious Emission 30MHz-25GHz

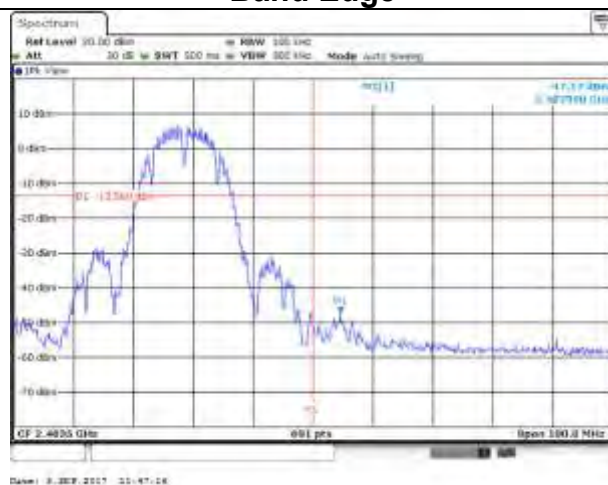


IEEE 802.11b mode High CH chain 0

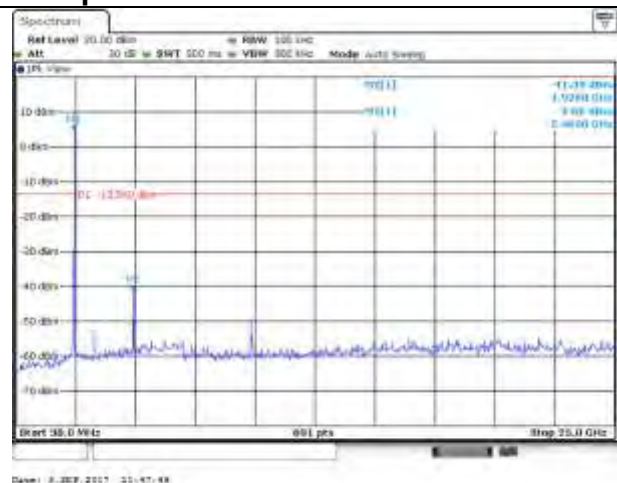
Reference Level of PSD in 100kHz



Band Edge

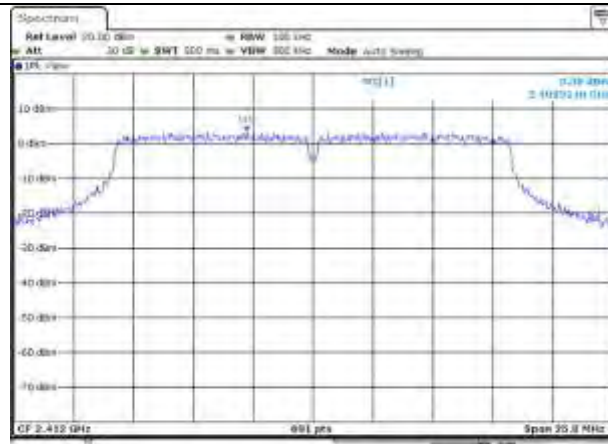


Spurious Emission 30MHz-25GHz



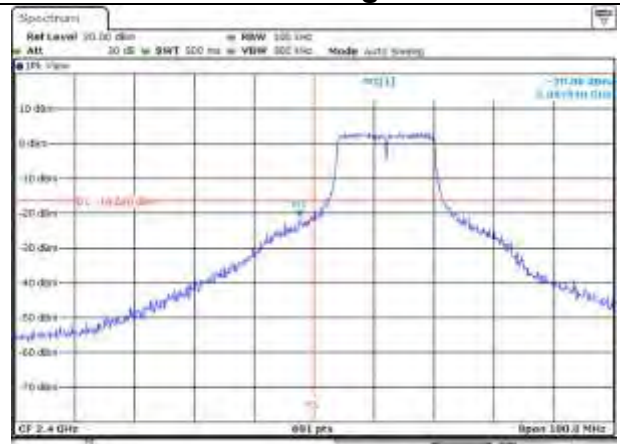
IEEE 802.11g mode Low CH chain 0

Reference Level of PSD in 100kHz



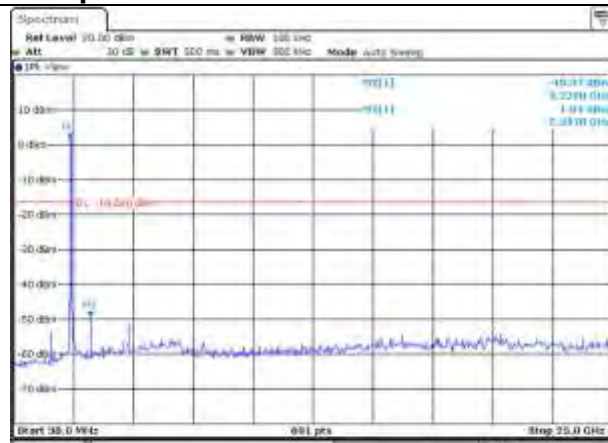
Date: 8-SEP-2017 11:30:29

Band Edge



Date: 8-SEP-2017 11:34:28

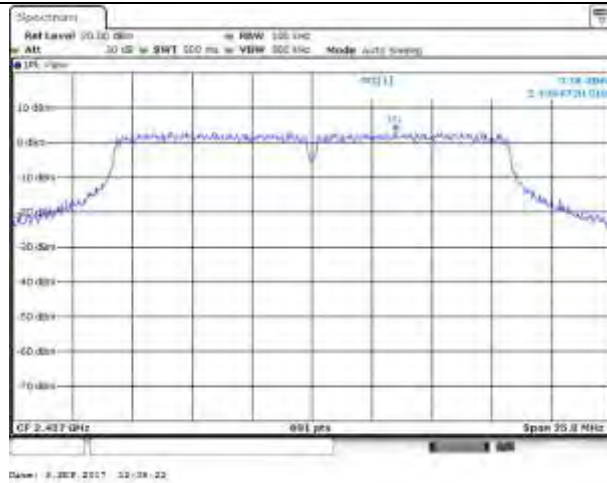
Spurious Emission 30MHz-25GHz



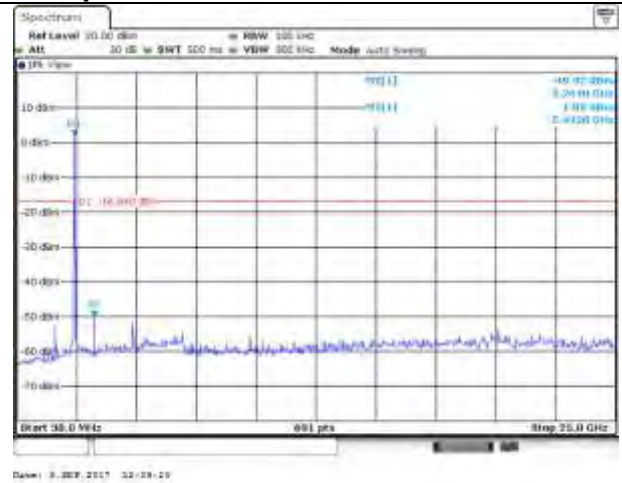
Date: 8-SEP-2017 11:38:13

IEEE 802.11g mode Mid CH chain 0

Reference Level of PSD in 100kHz

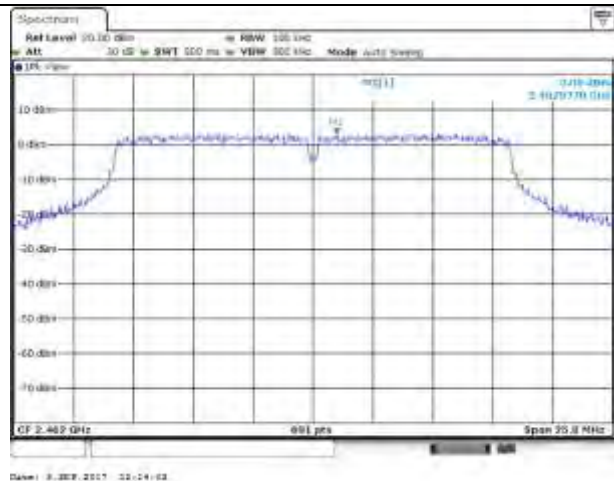


Spurious Emission 30MHz-25GHz

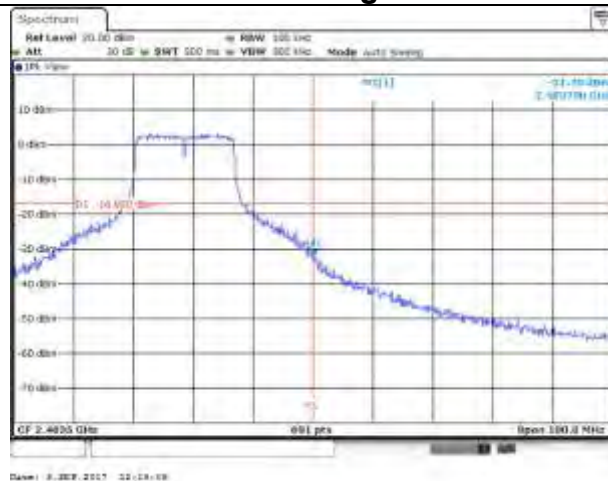


IEEE 802.11g mode High CH chain 0

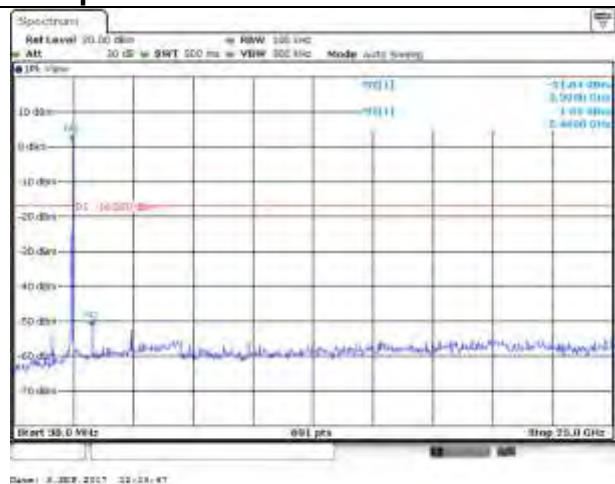
Reference Level of PSD in 100kHz



Band Edge



Spurious Emission 30MHz-25GHz

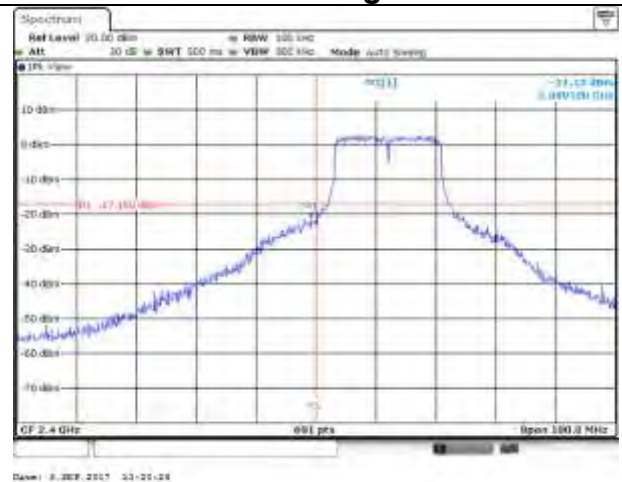


IEEE 802.11 n HT20 mode Low CH chain 0

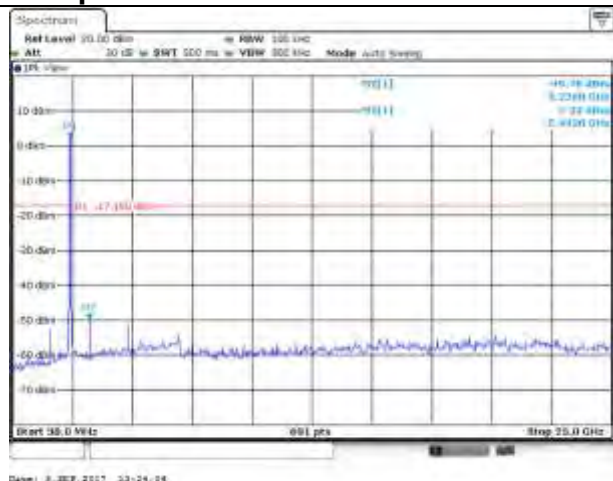
Reference Level of PSD in 100kHz



Band Edge

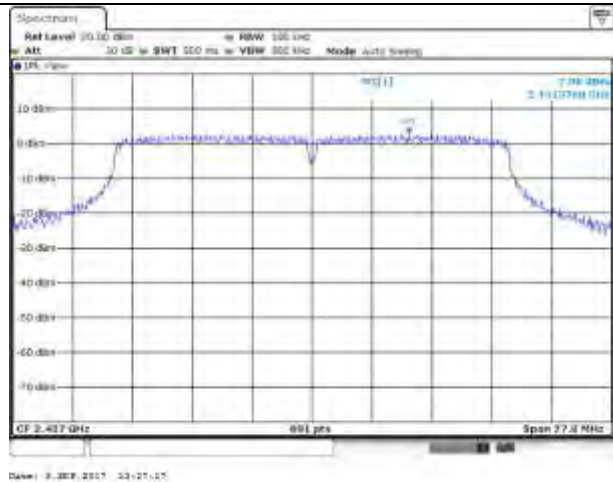


Spurious Emission 30MHz-25GHz

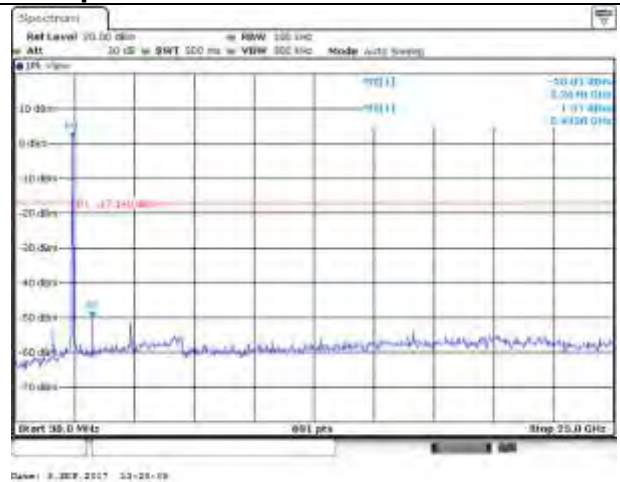


IEEE 802.11 n HT20 mode Mid CH chain 0

Reference Level of PSD in 100kHz

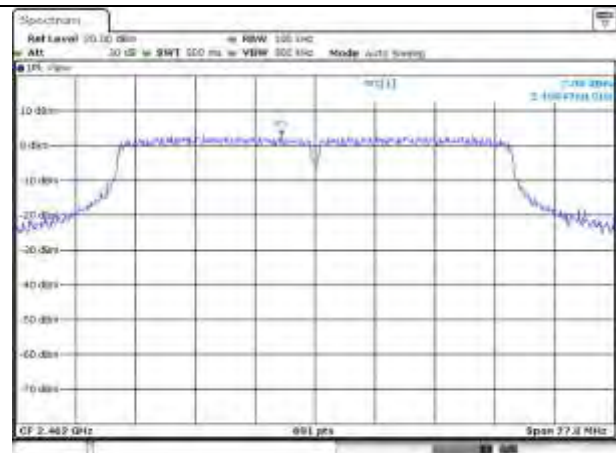


Spurious Emission 30MHz-25GHz

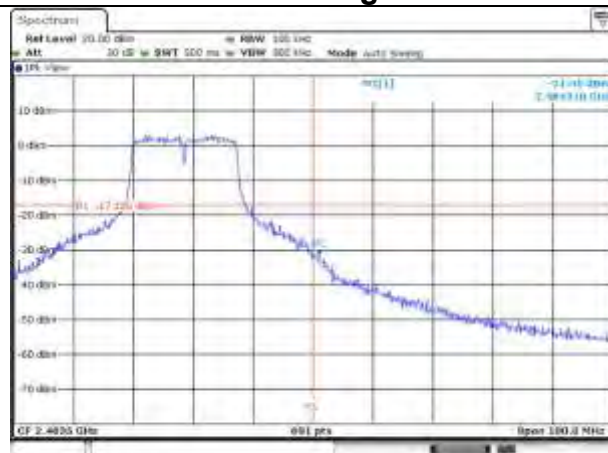


IEEE 802.11n HT20 mode High CH chain 0

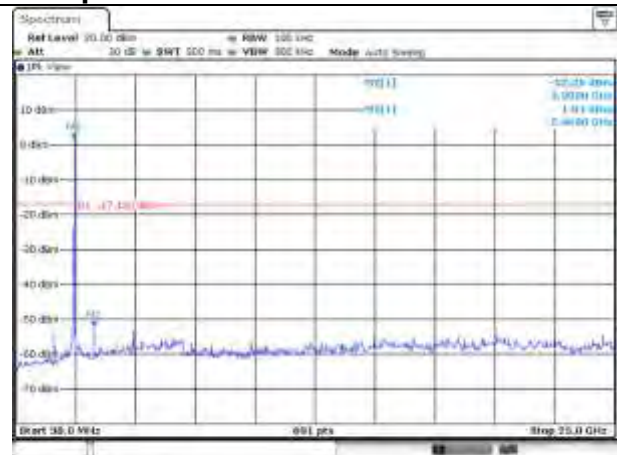
Reference Level of PSD in 100kHz



Band Edge



Spurious Emission 30MHz-25GHz

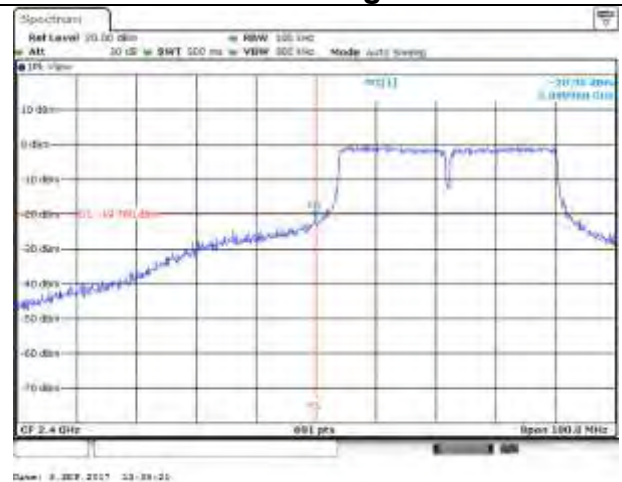


IEEE 802.11 n HT40 mode Low CH chain 0

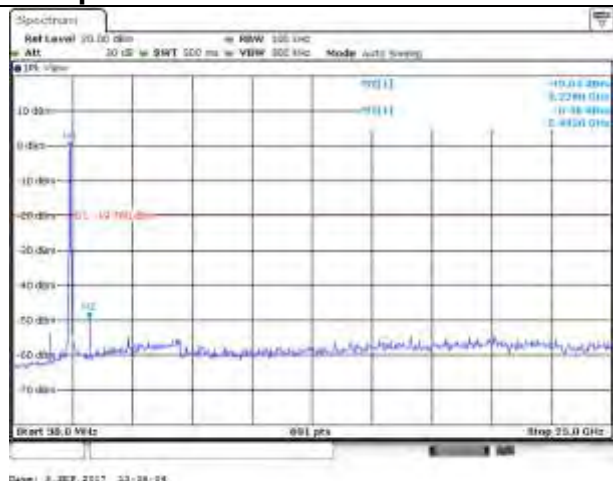
Reference Level of PSD in 100kHz



Band Edge



Spurious Emission 30MHz-25GHz

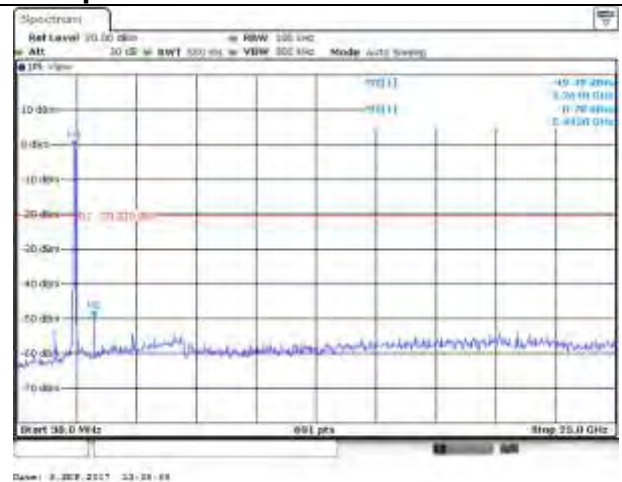


IEEE 802.11 n HT40 mode Mid CH chain 0

Reference Level of PSD in 100kHz

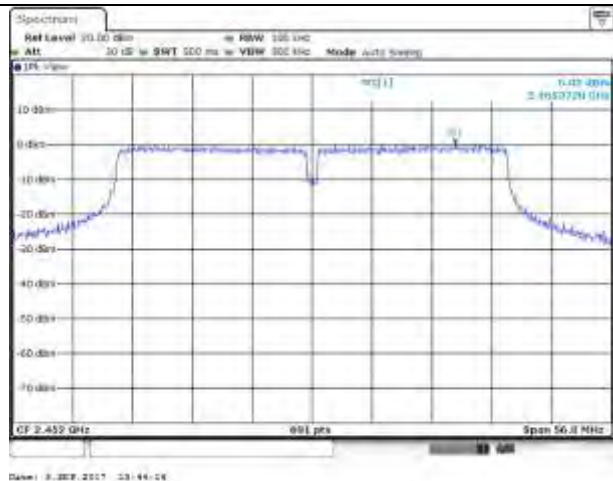


Spurious Emission 30MHz-25GHz

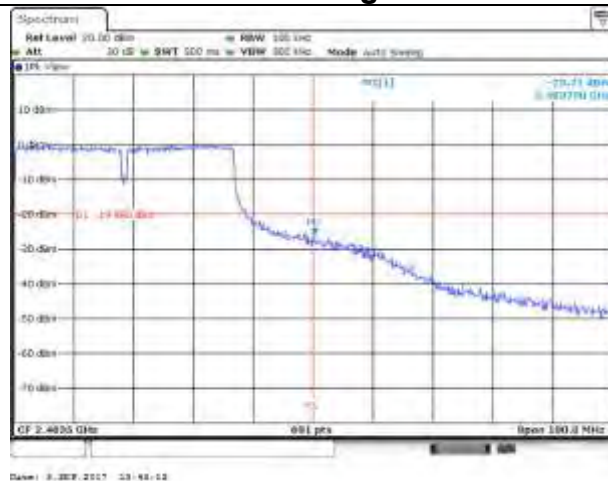


IEEE 802.11n HT40 mode High CH chain 0

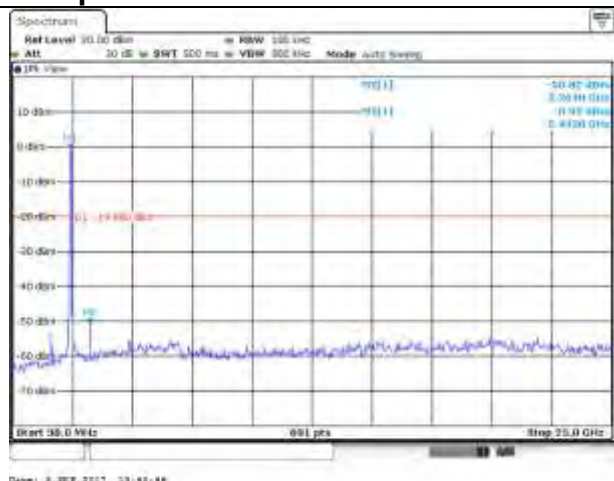
Reference Level of PSD in 100kHz



Band Edge



Spurious Emission 30MHz-25GHz



4.6 RADIATION BANDEGE 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

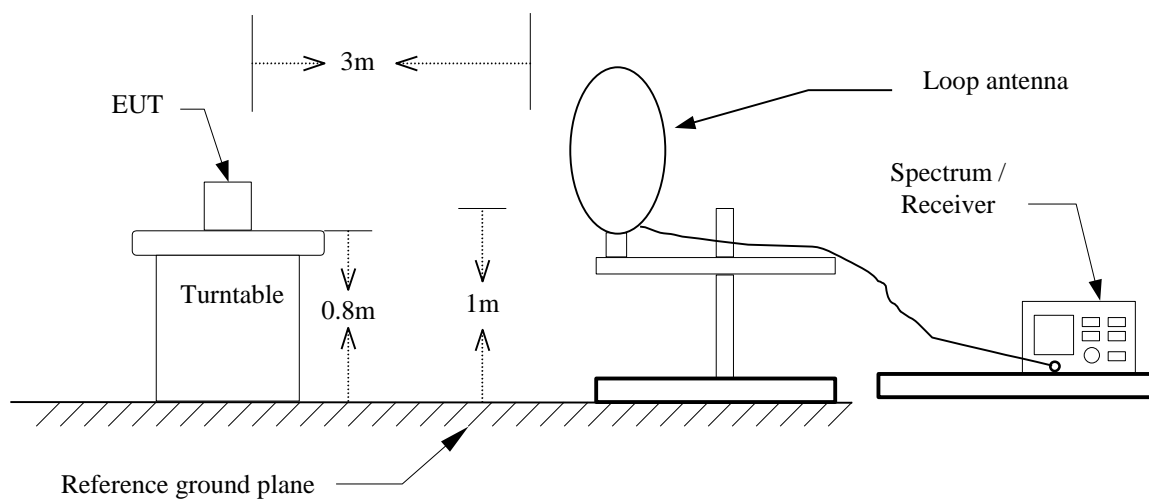
Test method Refer as KDB 558074 D01 v03r05, Section 12.1.

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 \geq 3 RBW, Sweep = Auto, Detector = Peak, Trace = Max hold.
 - (2) Above 1G :
 - (2.1) For Peak measurement : RBW = 1MHz, VBW \geq 3 RBW, Sweep = Auto, Detector = Peak, Trace = Max hold.
 - (2.2) For Average measurement : RBW = 1MHz, VBW
 - If Duty Cycle \geq 98%, VBW=10Hz.
 - If Duty Cycle < 98%, VBW=1/T.

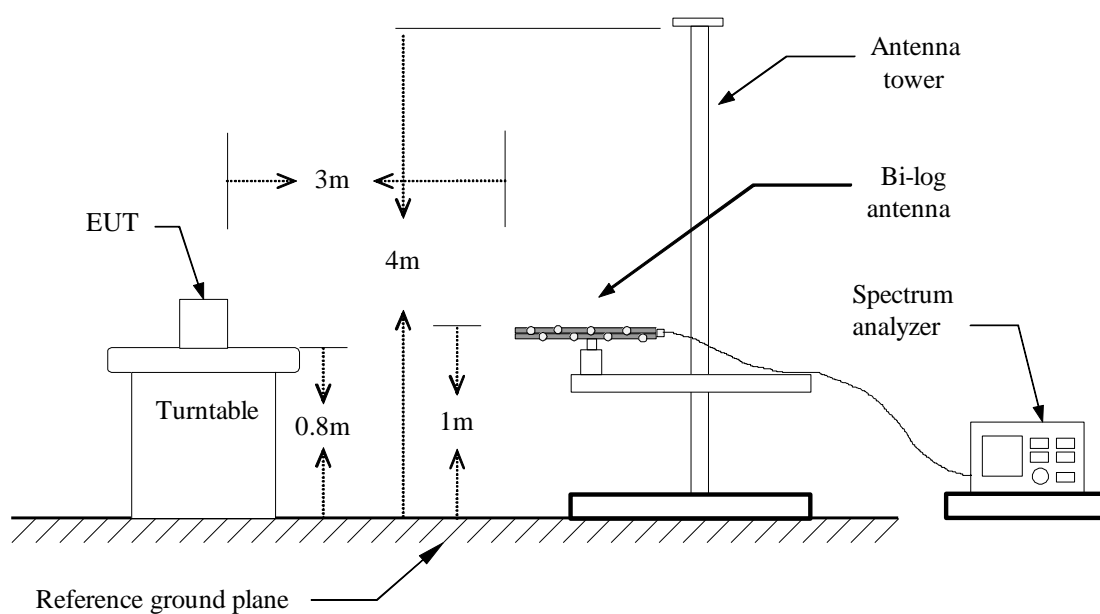
Configuration	Duty Cycle (%)	T(ms)	1/T (kHz)	VBW Setting
802.11b	100%	100.0000	-	10Hz
802.11g	100%	100.0000	-	10Hz
802.11n HT20	100%	100.0000	-	10Hz
802.11n HT40	100%	100.0000	-	10Hz

4.6.3 Test Setup

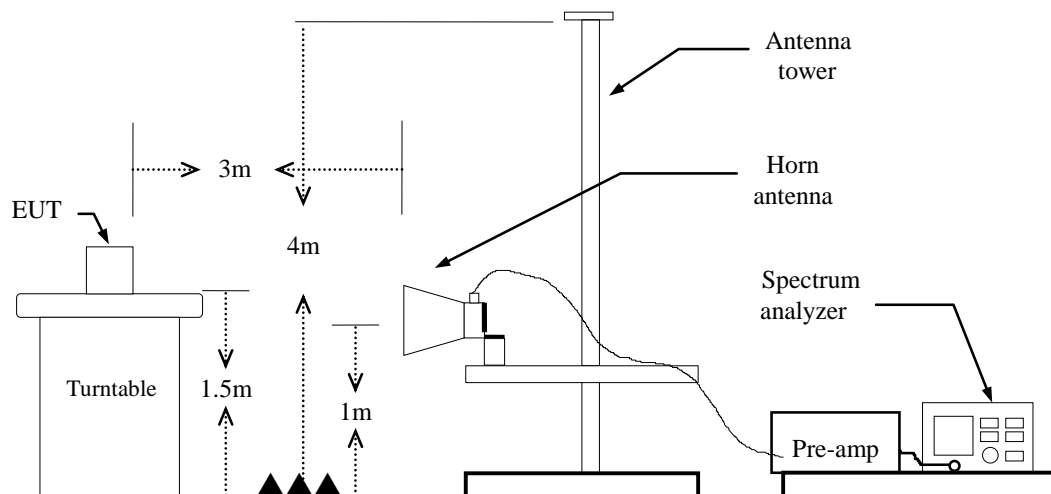
9kHz ~ 30MHz



30MHz ~ 1GHz



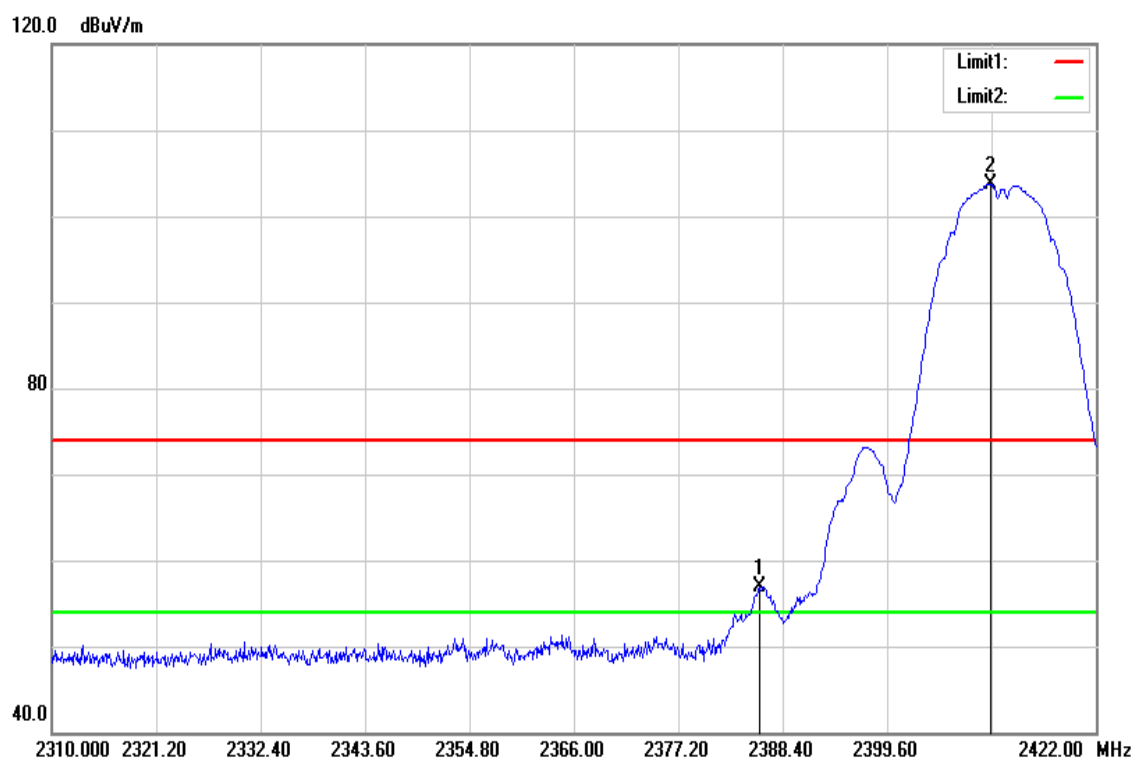
Above 1 GHz



4.6.4 Test Result

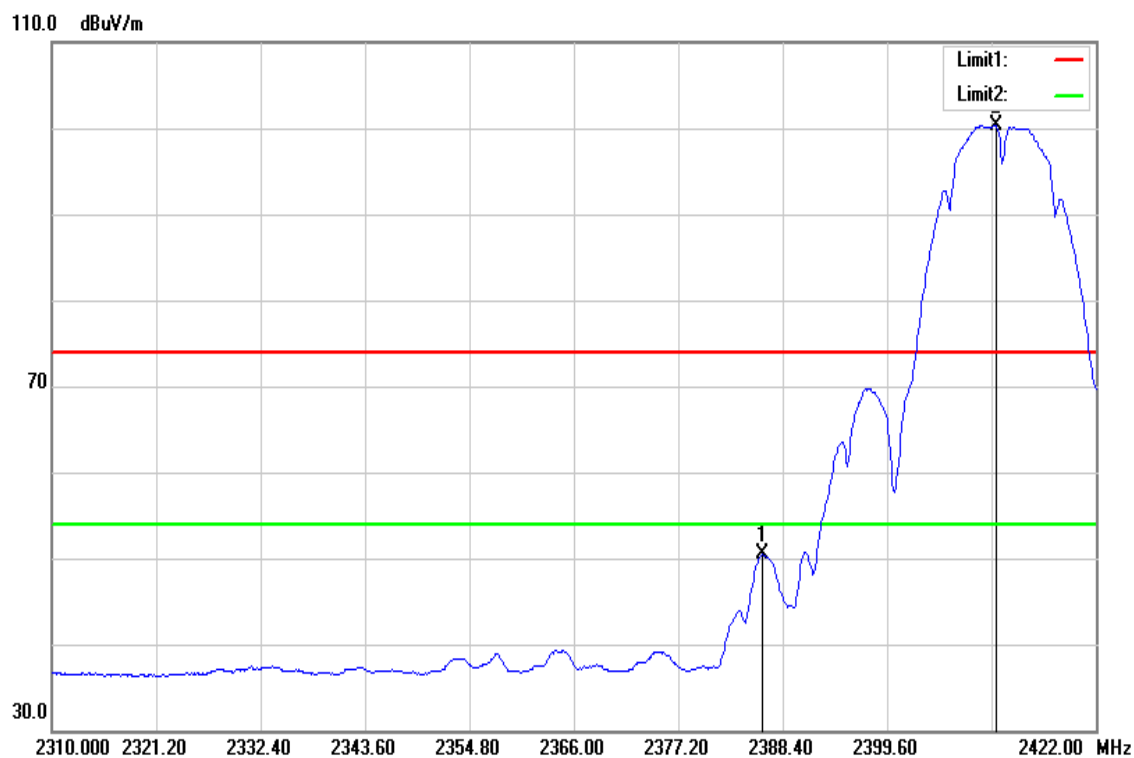
Band Edge Test Data

Test Mode	IEEE 802.11b Low CH	Temp/Hum	24(°C)/ 33%RH
Test Item	Band Edge	Test Date	September 8, 2017
Polarize	Vertical	Test Engineer	Ed Chiang
Detector	Peak	Test Voltage	DC 12V



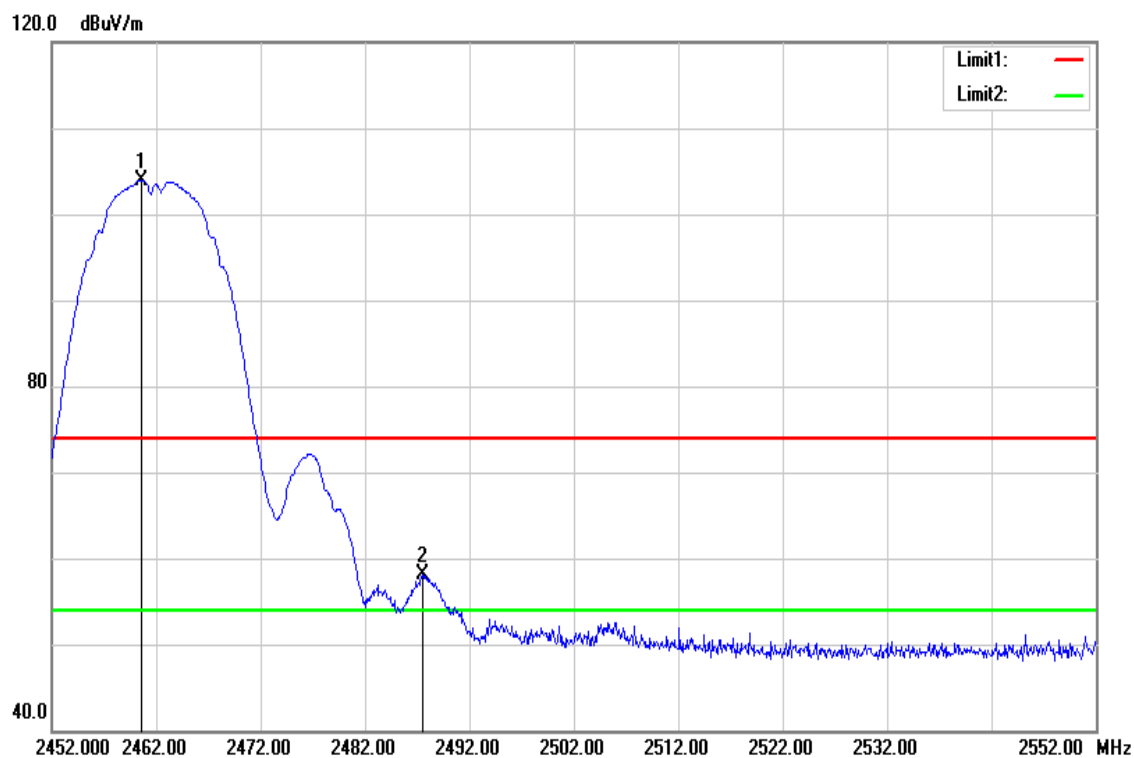
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2385.936	56.72	0.26	56.98	74.00	-17.02	peak
2410.688	103.36	0.31	103.67	-	-	peak

Test Mode	IEEE 802.11b Low CH	Temperature:	24(°C)/ 33%RH
Test Item	Band Edge	Test Date	September 8, 2017
Polarize	Vertical	Test Engineer	Ed Chiang
Detector	Average	Test Voltage	DC 12V



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2386.272	50.21	0.26	50.47	54.00	-3.53	AVG
2411.248	100.06	0.32	100.38	-	-	AVG

Test Mode	IEEE 802.11b High CH	Temp/Hum	24(°C)/ 33%RH
Test Item	Band Edge	Test Date	September 8, 2017
Polarize	Vertical	Test Engineer	Ed Chiang
Detector	Peak	Test Voltage	DC 12V



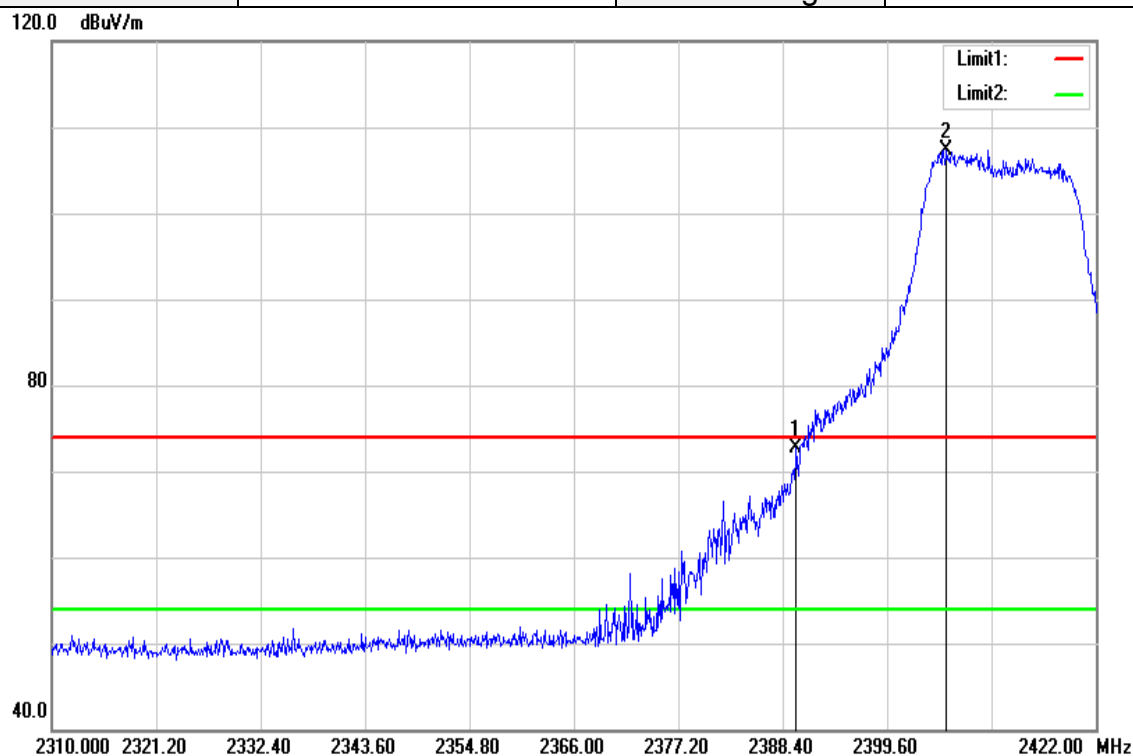
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2460.600	103.48	0.45	103.93	-	-	peak
2487.500	57.52	0.52	58.04	74.00	-15.96	peak

Test Mode	IEEE 802.11b High CH	Temperature:	24(°C)/ 33%RH
Test Item	Band Edge	Test Date	September 8, 2017
Polarize	Vertical	Test Engineer	Ed Chiang
Detector	Average	Test Voltage	DC 12V



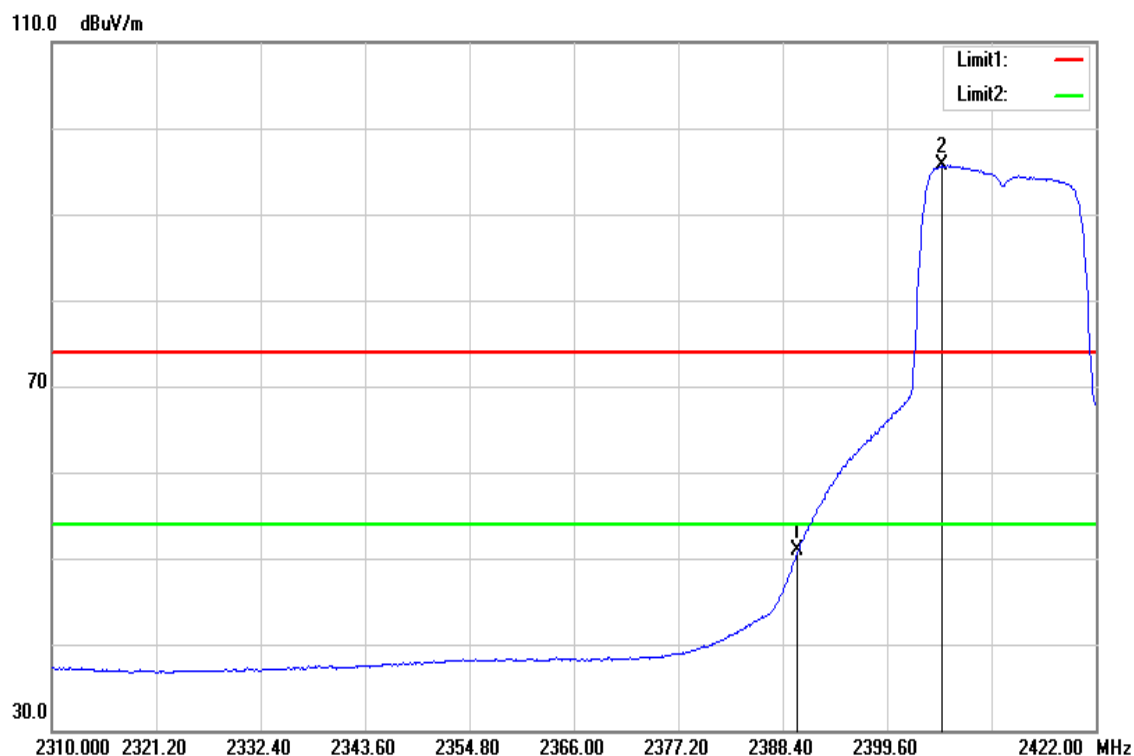
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2461.200	100.13	0.46	100.59	-	-	AVG
2487.700	51.09	0.52	51.61	54.00	-2.39	AVG

Test Mode	IEEE 802.11g Low CH	Temp/Hum	24(°C)/ 33%RH
Test Item	Band Edge	Test Date	September 8, 2017
Polarize	Vertical	Test Engineer	Ed Chiang
Detector	Peak	Test Voltage	DC 12V



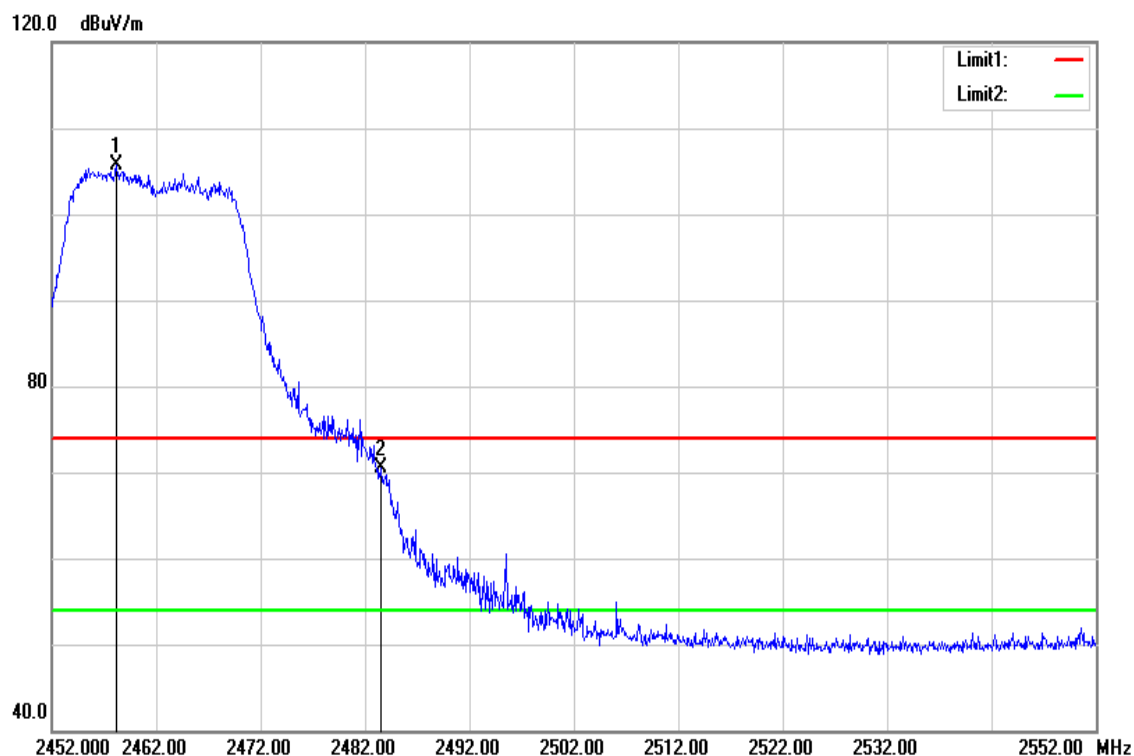
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2389.856	72.39	0.27	72.66	74.00	-1.34	peak
2405.984	107.00	0.31	107.31	-	-	peak

Test Mode	IEEE 802.11g Low CH	Temperature:	24(°C)/ 33%RH
Test Item	Band Edge	Test Date	September 8, 2017
Polarize	Vertical	Test Engineer	Ed Chiang
Detector	Average	Test Voltage	DC 12V



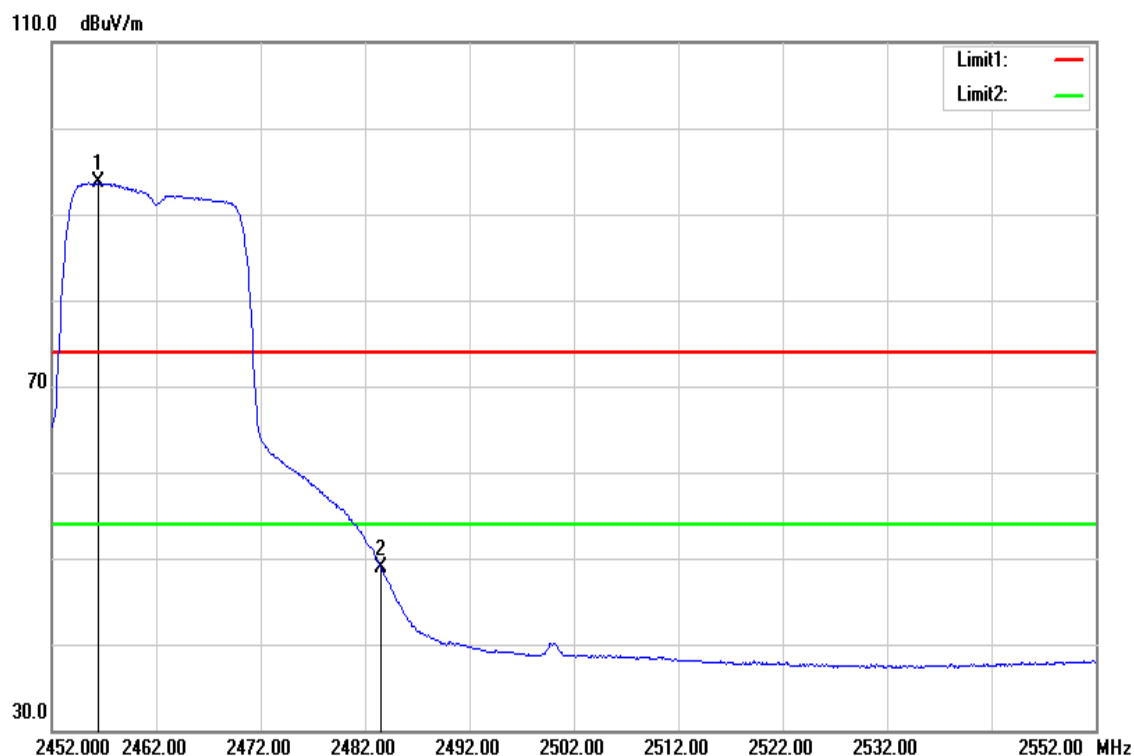
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2390.000	50.61	0.27	50.88	54.00	-3.12	AVG
2405.536	95.32	0.31	95.63	-	-	AVG

Test Mode	IEEE 802.11g High CH	Temp/Hum	24(°C)/ 33%RH
Test Item	Band Edge	Test Date	September 8, 2017
Polarize	Vertical	Test Engineer	Ed Chiang
Detector	Peak	Test Voltage	DC 12V



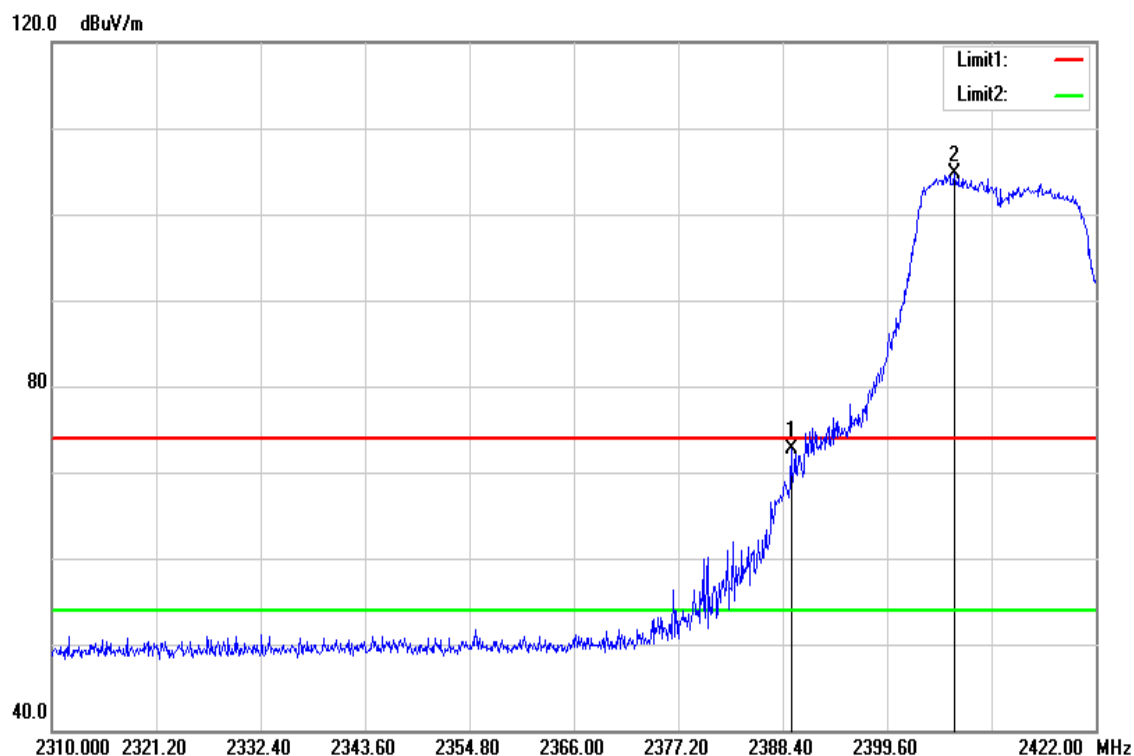
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2458.200	105.23	0.44	105.67	-	-	peak
2483.500	69.93	0.51	70.44	74.00	-3.56	peak

Test Mode	IEEE 802.11g High CH	Temperature:	24(°C)/ 33%RH
Test Item	Band Edge	Test Date	September 8, 2017
Polarize	Vertical	Test Engineer	Ed Chiang
Detector	Average	Test Voltage	DC 12V



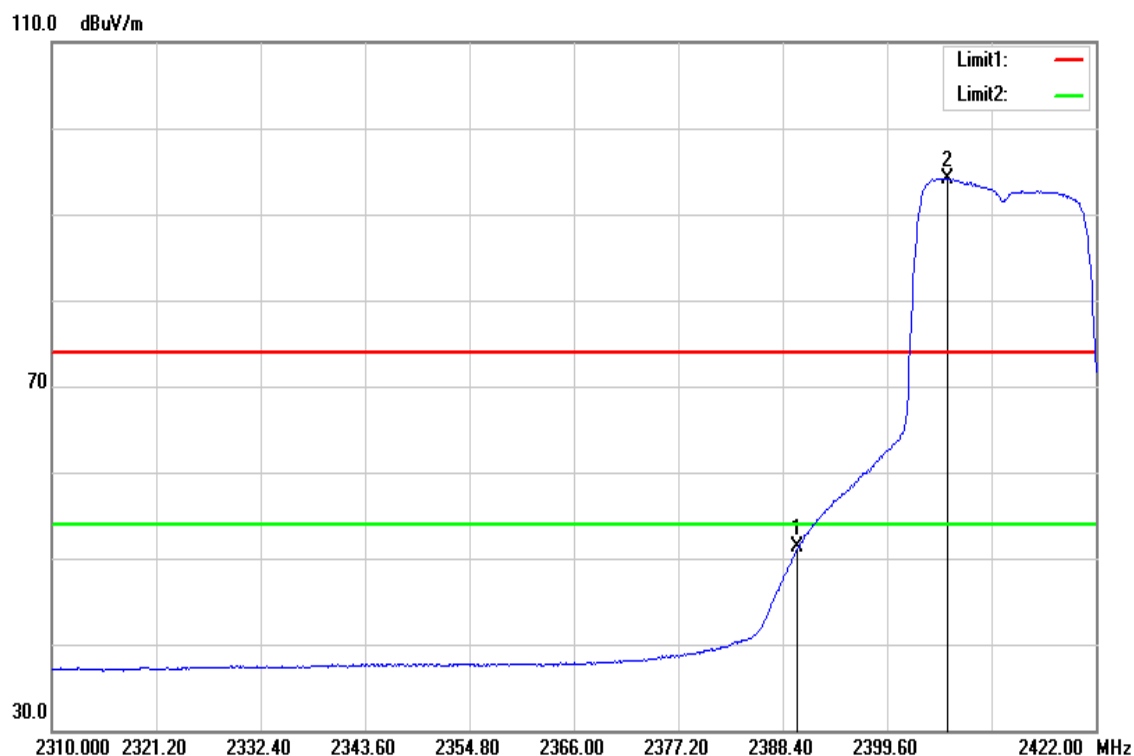
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2456.500	93.23	0.44	93.67	-	-	AVG
2483.500	48.45	0.51	48.96	54.00	-5.04	AVG

Test Mode	IEEE 802.11n HT20 Low CH	Temp/Hum	24(°C)/ 33%RH
Test Item	Band Edge	Test Date	September 8, 2017
Polarize	Vertical	Test Engineer	Ed Chiang
Detector	Peak	Test Voltage	DC 12V



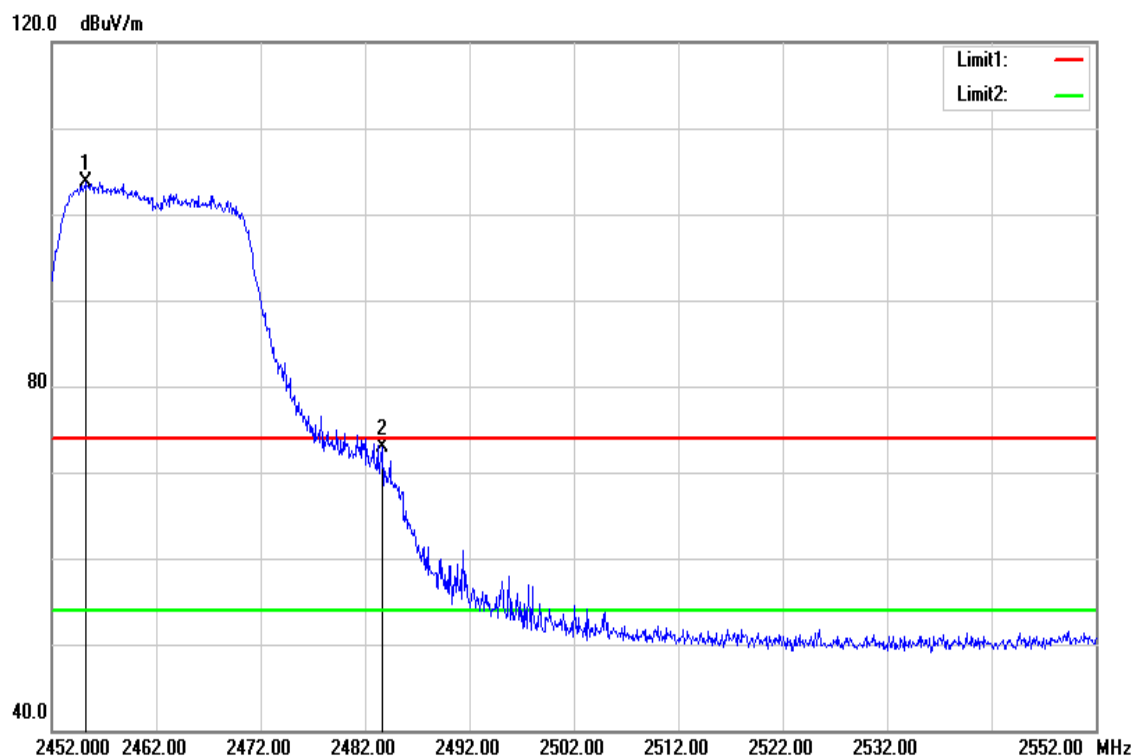
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2389.296	72.41	0.27	72.68	74.00	-1.32	peak
2406.768	104.42	0.31	104.73	-	-	peak

Test Mode	IEEE 802.11n HT20 Low CH	Temperature:	24(°C)/ 33%RH
Test Item	Band Edge	Test Date	September 8, 2017
Polarize	Vertical	Test Engineer	Ed Chiang
Detector	Average	Test Voltage	DC 12V



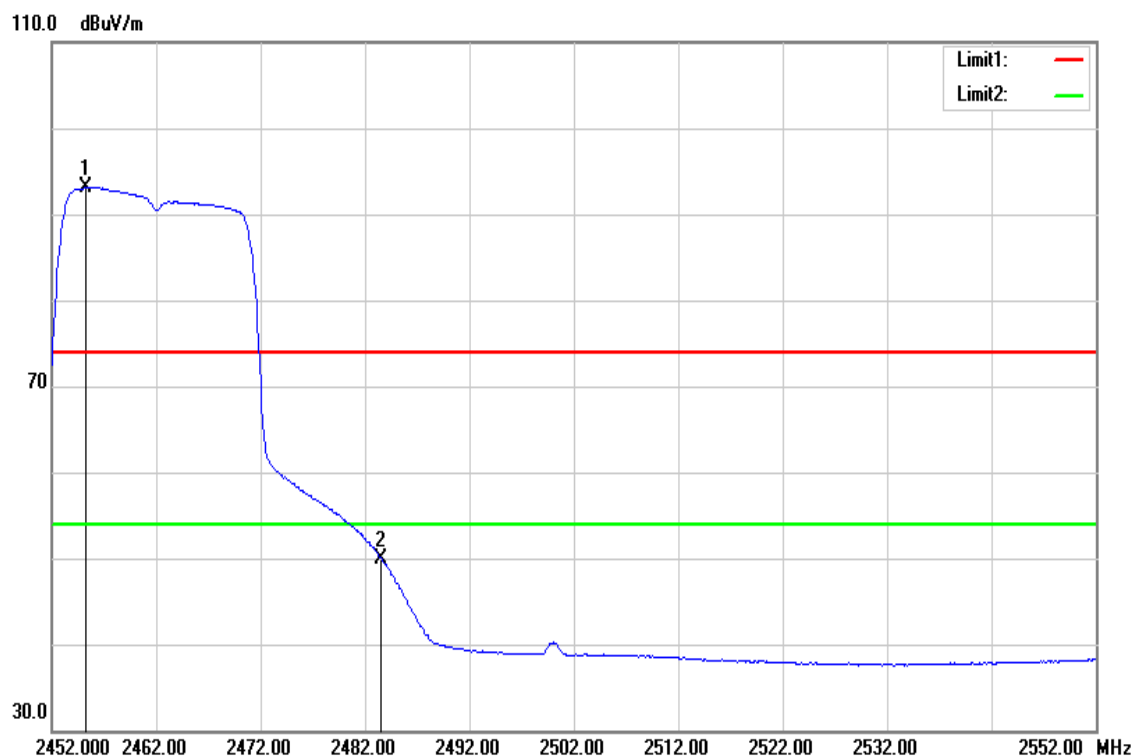
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2390.000	51.06	0.27	51.33	54.00	-2.67	AVG
2406.096	93.88	0.31	94.19	-	-	AVG

Test Mode	IEEE 802.11n HT20 High CH	Temp/Hum	24(°C)/ 33%RH
Test Item	Band Edge	Test Date	September 8, 2017
Polarize	Vertical	Test Engineer	Ed Chiang
Detector	Peak	Test Voltage	DC 12V



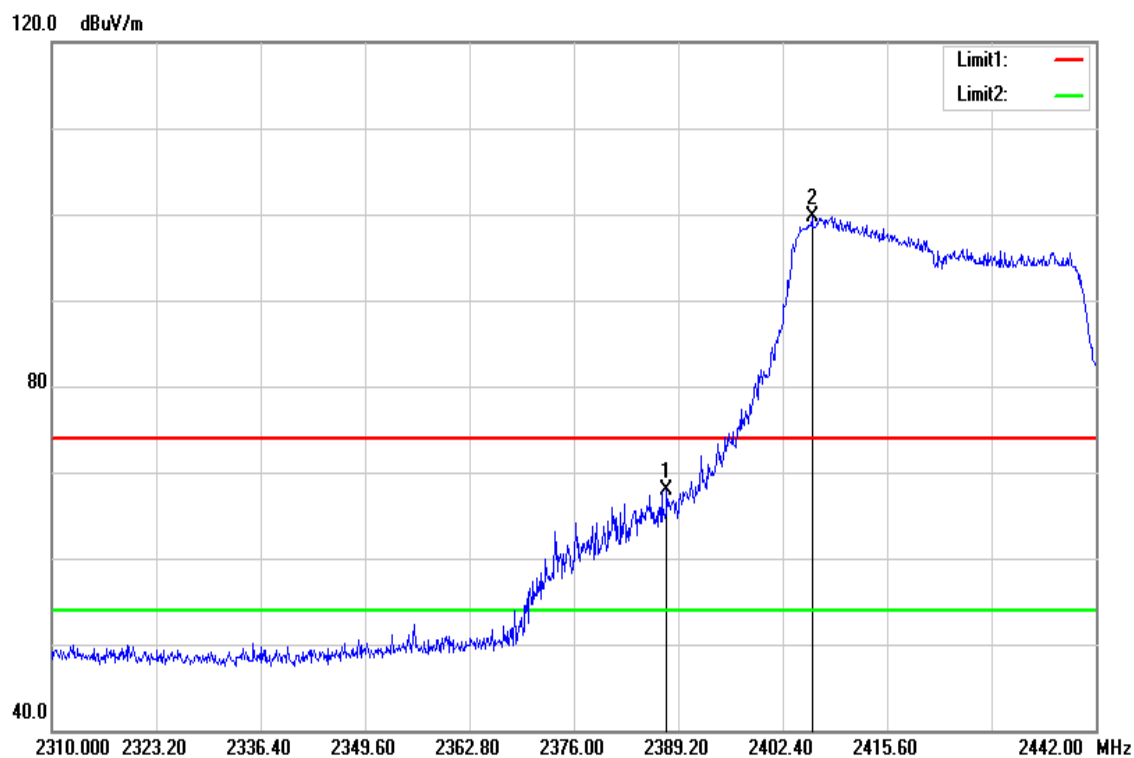
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2455.300	103.31	0.44	103.75	-	-	peak
2483.700	72.39	0.51	72.90	74.00	-1.10	peak

Test Mode	IEEE 802.11n HT20 High CH	Temperature:	24(°C)/ 33%RH
Test Item	Band Edge	Test Date	September 8, 2017
Polarize	Vertical	Test Engineer	Ed Chiang
Detector	Average	Test Voltage	DC 12V



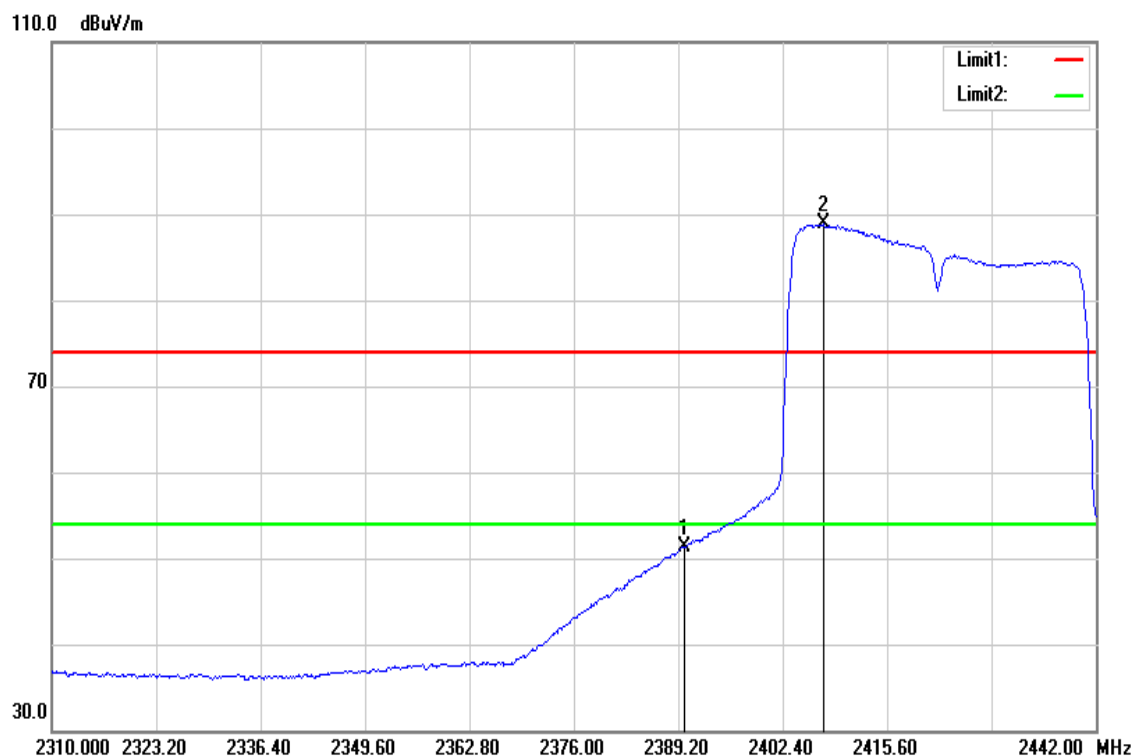
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2455.300	92.66	0.44	93.10	-	-	AVG
2483.500	49.49	0.51	50.00	54.00	-4.00	AVG

Test Mode	IEEE 802.11n HT40 Low CH	Temp/Hum	24(°C)/ 33%RH
Test Item	Band Edge	Test Date	September 8, 2017
Polarize	Vertical	Test Engineer	Ed Chiang
Detector	Peak		



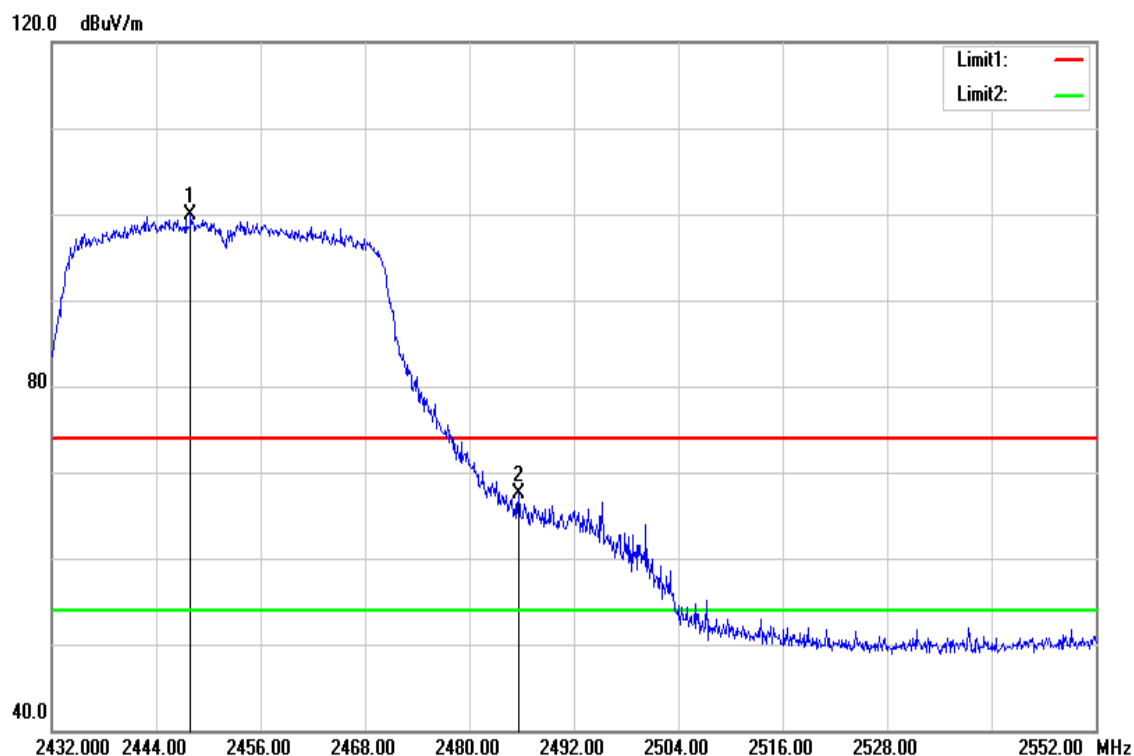
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2387.748	67.58	0.26	67.84	74.00	-6.16	peak
2406.096	99.33	0.31	99.64	-	-	peak

Test Mode	IEEE 802.11n HT40 Low CH	Temperature:	24(°C)/ 33%RH
Test Item	Band Edge	Test Date	September 8, 2017
Polarize	Vertical	Test Engineer	Ed Chiang
Detector	Average		



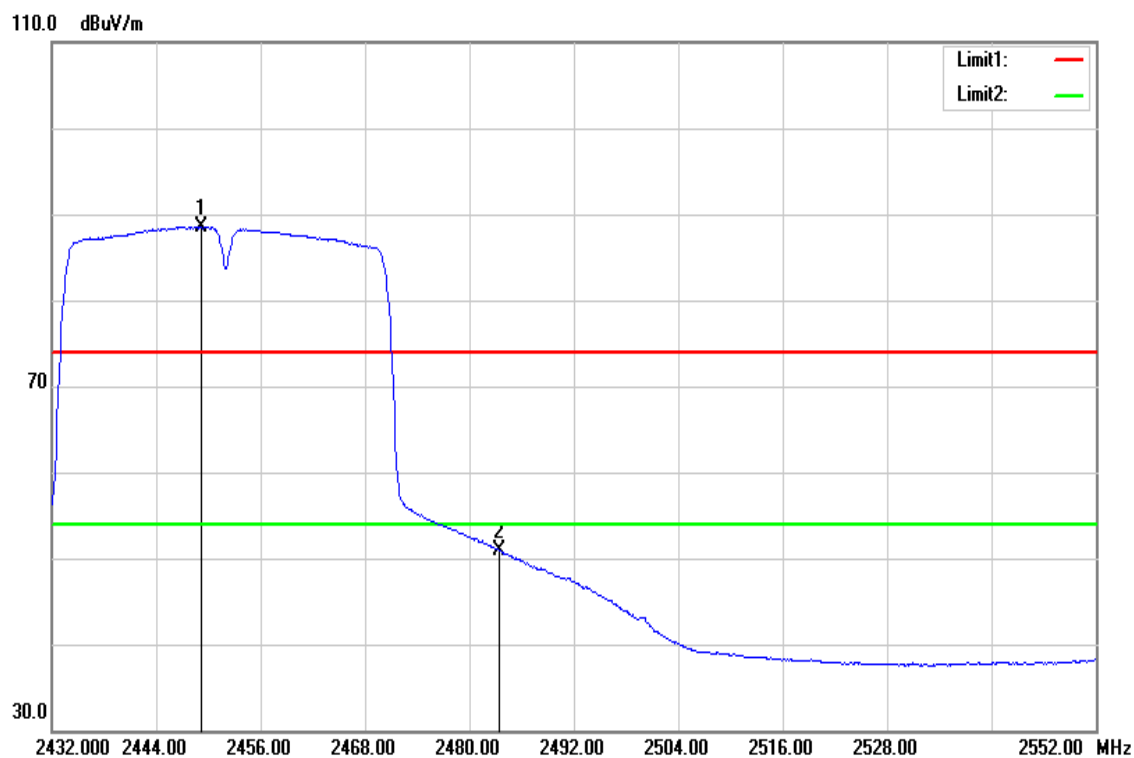
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2389.992	51.13	0.27	51.40	54.00	-2.60	AVG
2407.548	88.51	0.31	88.82	-	-	AVG

Test Mode	IEEE 802.11n HT40 High CH	Temp/Hum	24(°C)/ 33%RH
Test Item	Band Edge	Test Date	September 8, 2017
Polarize	Vertical	Test Engineer	Ed Chiang
Detector	Peak		



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2447.960	99.40	0.41	99.81	-	-	peak
2485.640	67.05	0.51	67.56	74.00	-6.44	peak

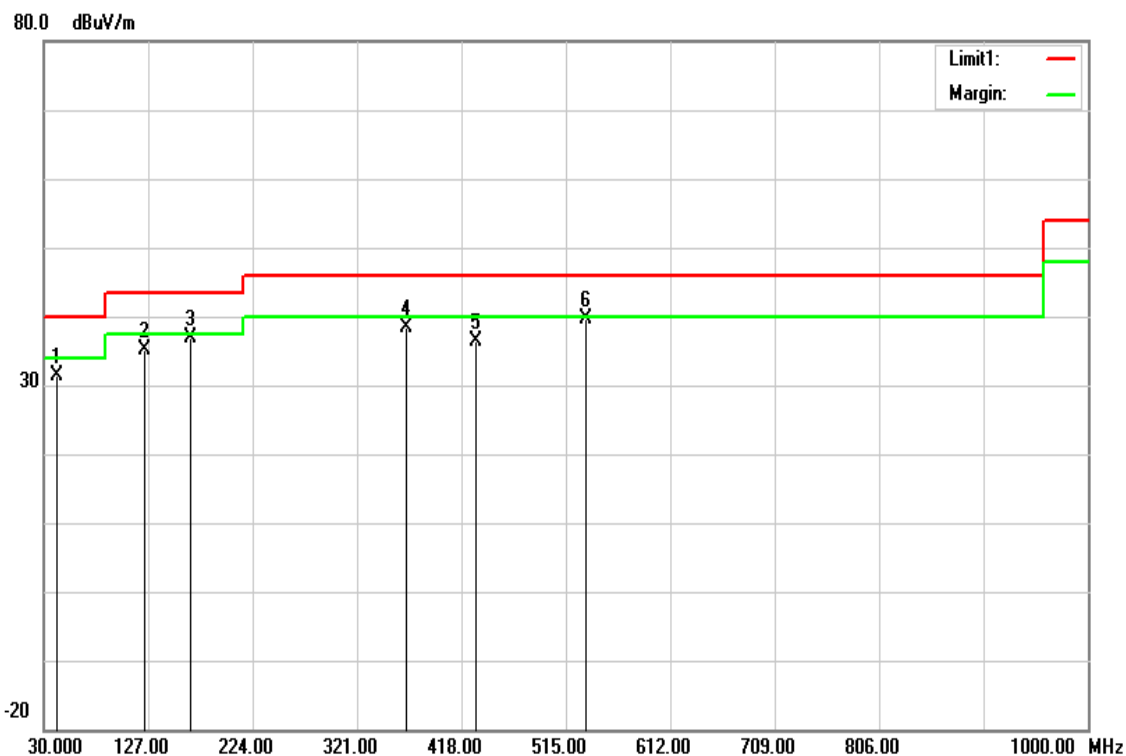
Test Mode	IEEE 802.11n HT40 High CH	Temperature:	24(°C)/ 33%RH
Test Item	Band Edge	Test Date	September 8, 2017
Polarize	Vertical	Test Engineer	Ed Chiang
Detector	Average		



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2449.160	88.07	0.42	88.49	-	-	AVG
2483.500	50.36	0.51	50.87	54.00	-3.13	AVG

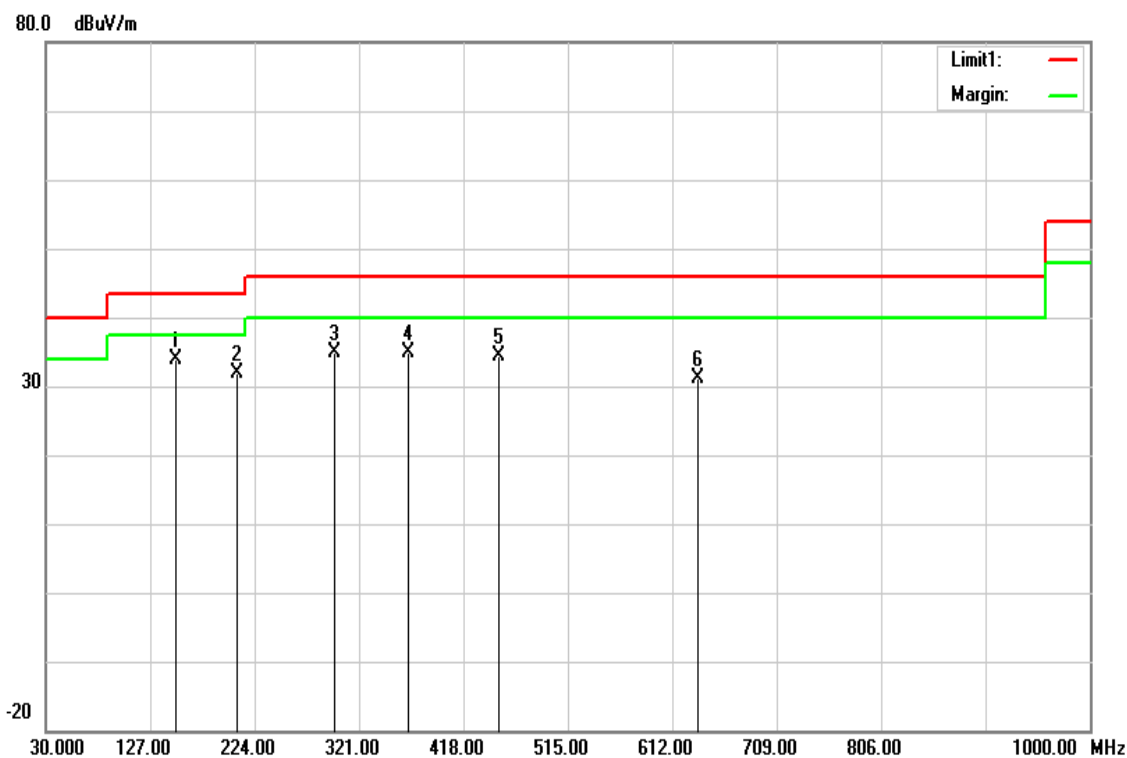
Below 1G Test Data

Test Mode	Mode 1	Temp/Hum	24(°C)/ 33%RH
Test Item	30MHz-1GHz	Test Date	September 13, 2017
Polarize	Vertical	Test Engineer	Ed Chiang
Detector	Peak		



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
41.6400	48.34	-16.89	31.45	40.00	-8.55	QP
123.1200	50.13	-15.09	35.04	43.50	-8.46	peak
165.8000	53.12	-16.31	36.81	43.50	-6.69	peak
366.5900	50.94	-12.45	38.49	46.00	-7.51	QP
431.5800	46.51	-10.25	36.26	46.00	-9.74	peak
533.4300	47.57	-7.86	39.71	46.00	-6.29	peak

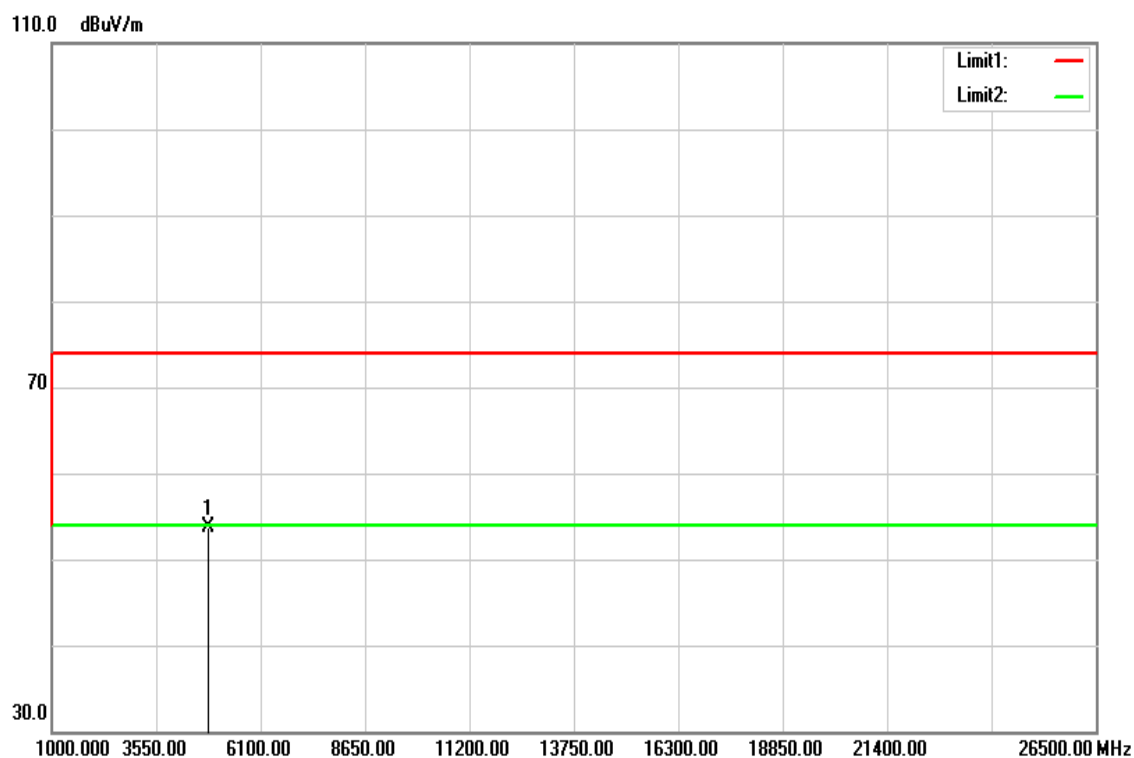
Test Mode	Mode 1	Temp/Hum	24(°C)/ 33%RH
Test Item	30MHz-1GHz	Test Date	September 13, 2017
Polarize	Horizontal	Test Engineer	Ed Chiang
Detector	Peak		



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
151.2500	49.71	-15.78	33.93	43.50	-9.57	QP
207.5100	48.01	-16.06	31.95	43.50	-11.55	QP
298.6900	48.85	-14.09	34.76	46.00	-11.24	peak
366.5900	47.32	-12.45	34.87	46.00	-11.13	peak
450.9800	43.88	-9.58	34.30	46.00	-11.70	peak
636.2500	37.15	-5.93	31.22	46.00	-14.78	peak

Above 1G Test Data

Test Mode	IEEE 802.11b Low CH	Temp/Hum	24(°C)/ 33%RH
Test Item	Harmonic	Test Date	September 8, 2017
Polarize	Vertical	Test Engineer	Ed Chiang
Detector	Peak and Average		

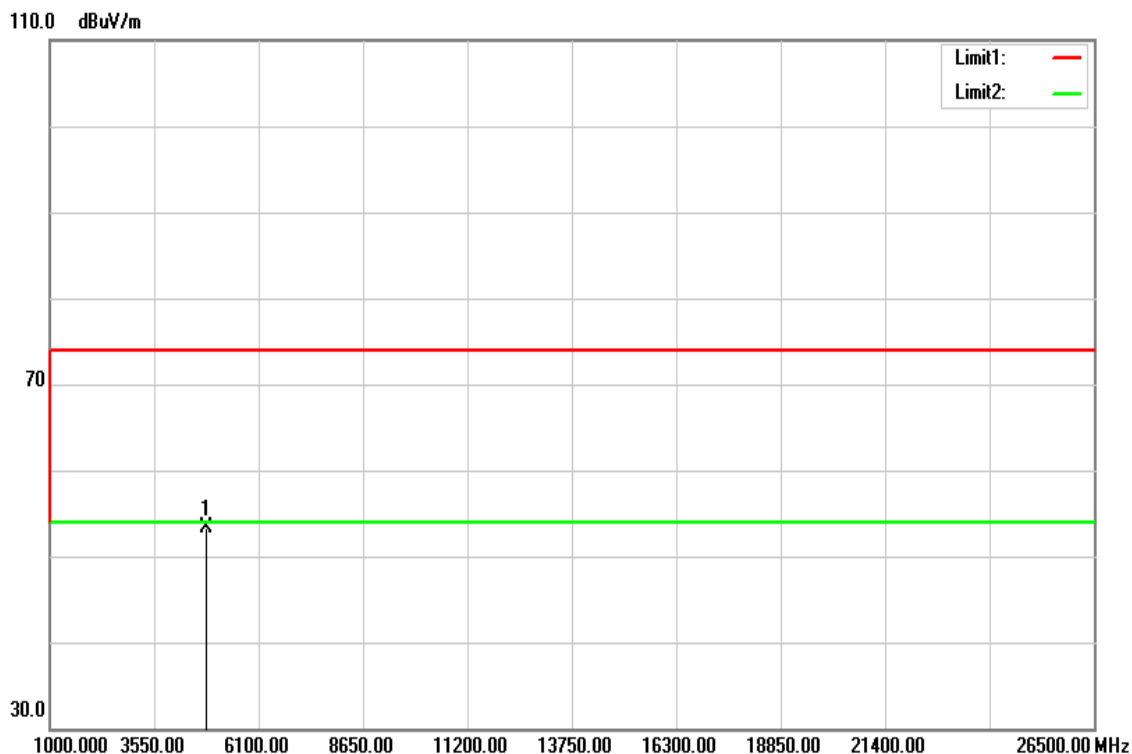


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	emark
4827.000	45.44	8.20	53.64	74.00	-20.36	peak
N/A						

Remark:

- Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- 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	24(°C)/ 33%RH
Test Item	Harmonic	Test Date	September 8, 2017
Polarize	Horizontal	Test Engineer	Ed Chiang
Detector	Peak and Average		

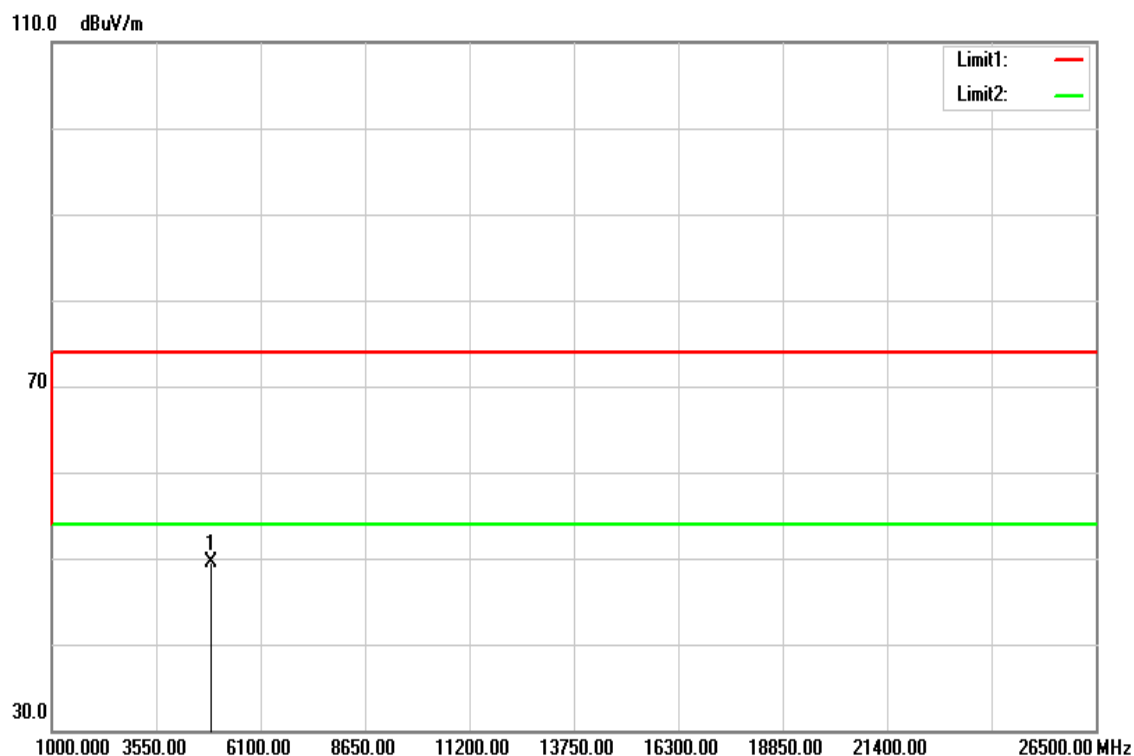


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (BuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4827.000	45.05	8.20	53.25	74.00	-20.75	peak
N/A						

Remark:

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

Test Mode	IEEE 802.11b Mid CH	Temp/Hum	24(°C)/ 33%RH
Test Item	Harmonic	Test Date	September 8, 2017
Polarize	Vertical	Test Engineer	Ed Chiang
Detector	Peak and Average		

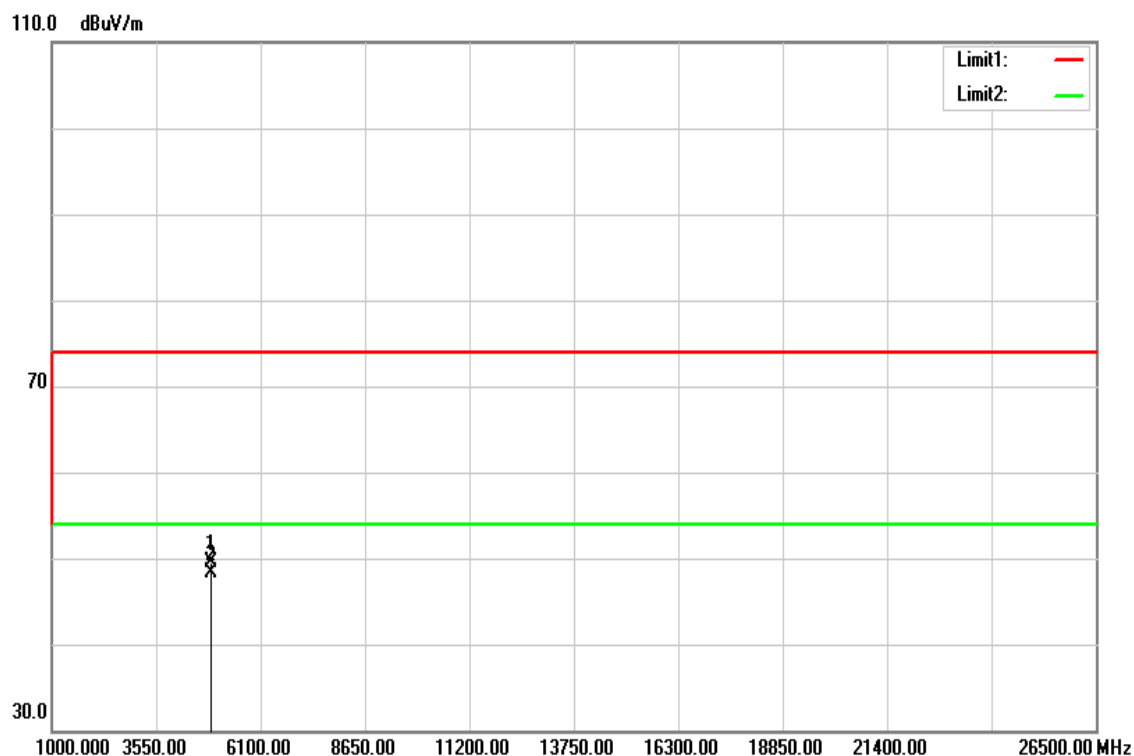


Frequency (MHz)	Reading (dBu)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4876.000	41.21	8.37	49.58	74.00	-24.42	peak
N/A						

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

Test Mode	IEEE 802.11b Mid CH	Temp/Hum	24(°C)/ 33%RH
Test Item	Harmonic	Test Date	September 8, 2017
Polarize	Horizontal	Test Engineer	Ed Chiang
Detector	Peak and Average		

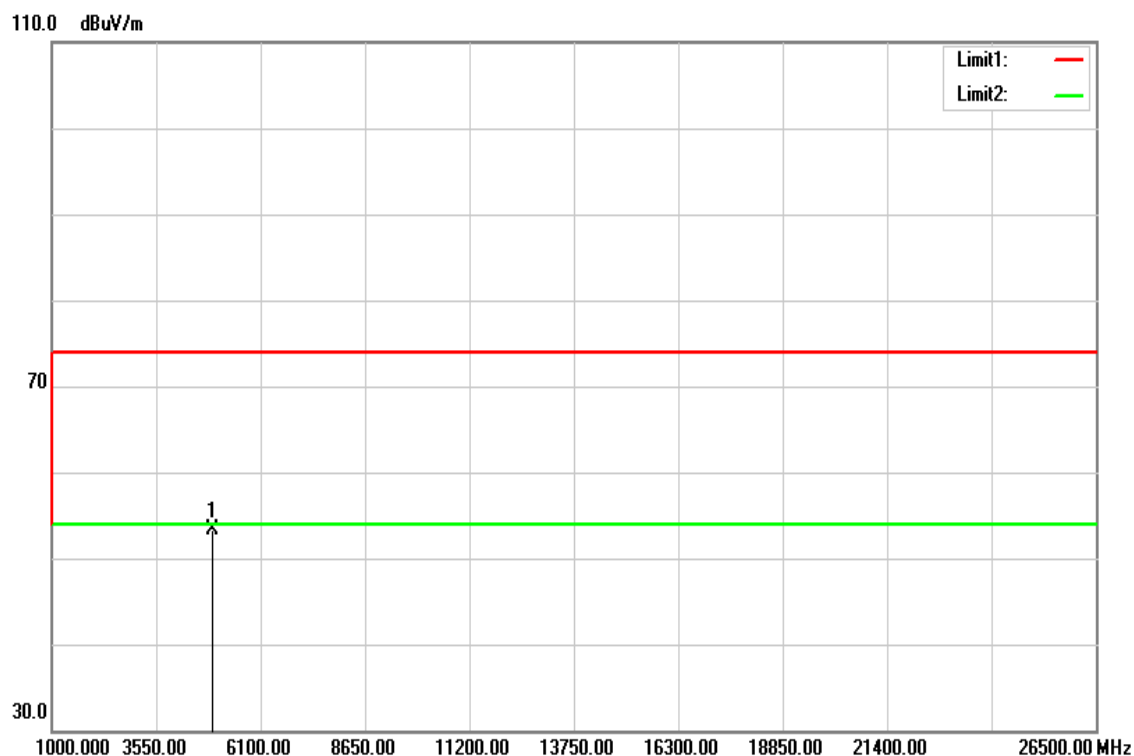


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4876.000	41.21	8.37	49.58	74.00	-24.42	peak
4876.000	39.88	8.37	48.25	54.00	-5.75	AVG
N/A						

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

Test Mode	IEEE 802.11b High CH	Temp/Hum	24(°C)/ 33%RH
Test Item	Harmonic	Test Date	September 8, 2017
Polarize	Vertical	Test Engineer	Ed Chiang
Detector	Peak and Average		

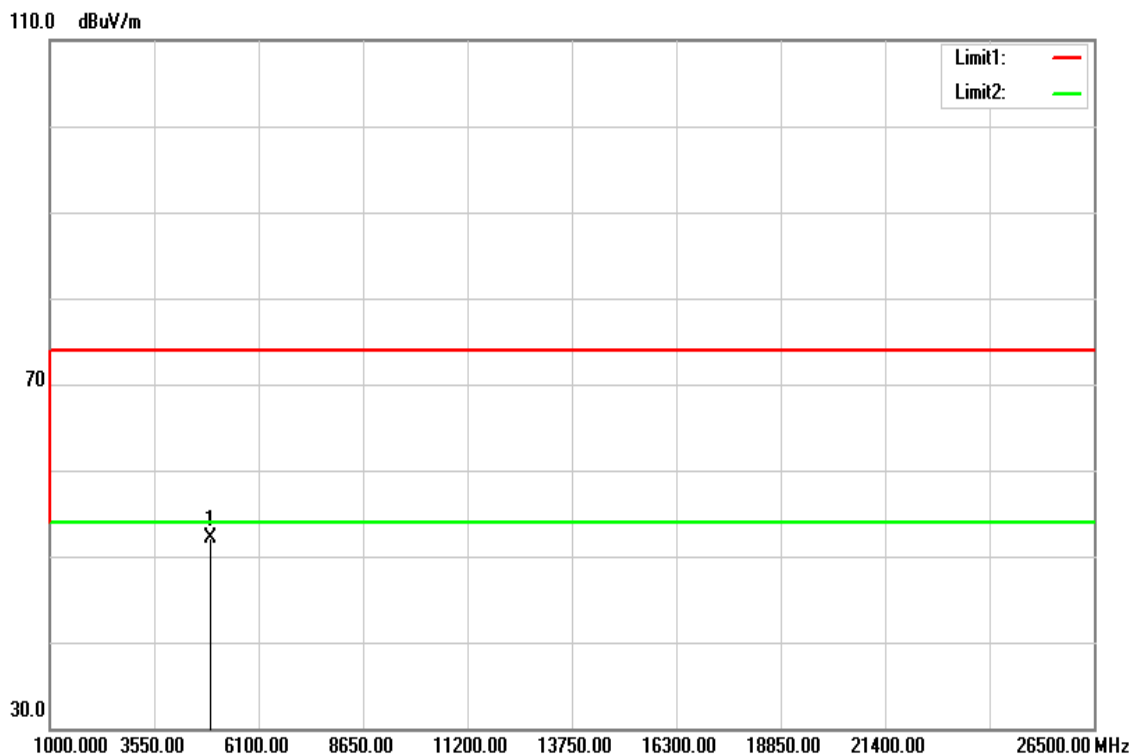


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4925.000	44.84	8.53	53.37	74.00	-20.63	peak
N/A						

Remark:

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

Test Mode	IEEE 802.11b High CH	Temp/Hum	24(°C)/ 33%RH
Test Item	Harmonic	Test Date	September 8, 2017
Polarize	Horizontal	Test Engineer	Ed Chiang
Detector	Peak and Average		

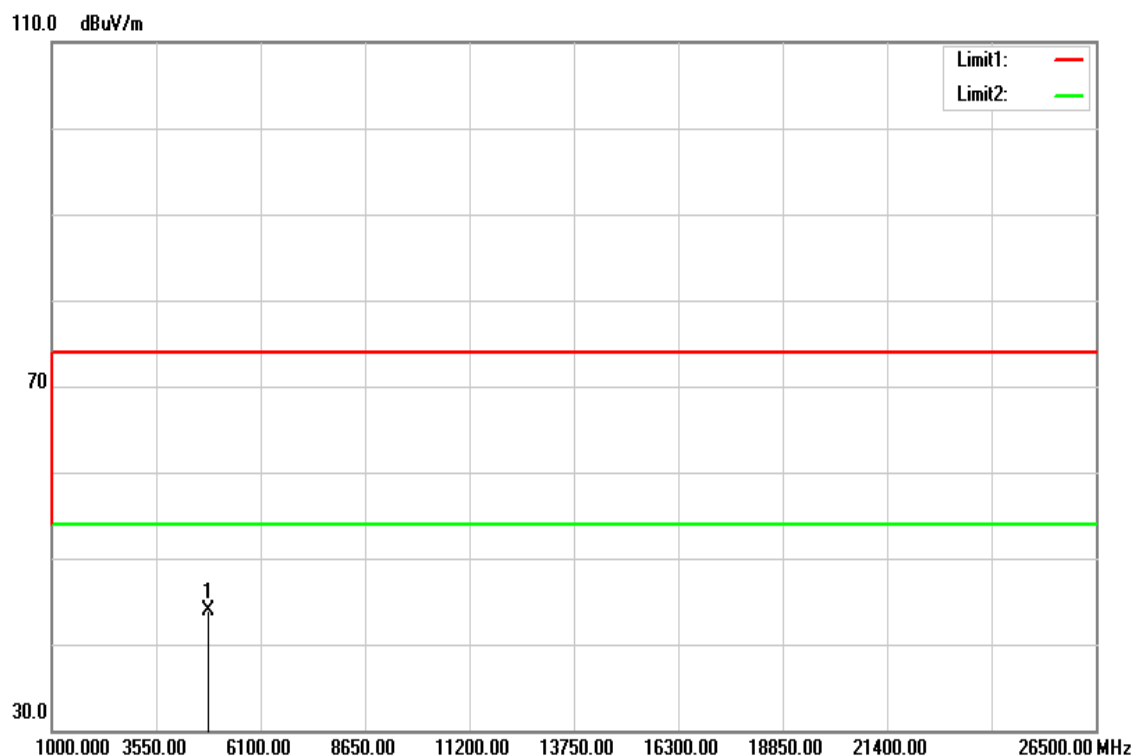


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4925.000	43.55	8.53	52.08	74.00	-21.92	peak
N/A						

Remark:

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

Test Mode	IEEE 802.11g Low CH	Temp/Hum	24 (°C)/ 33%RH
Test Item	Harmonic	Test Date	September 8, 2017
Polarize	Vertical	Test Engineer	Ed Chiang
Detector	Peak and Average		

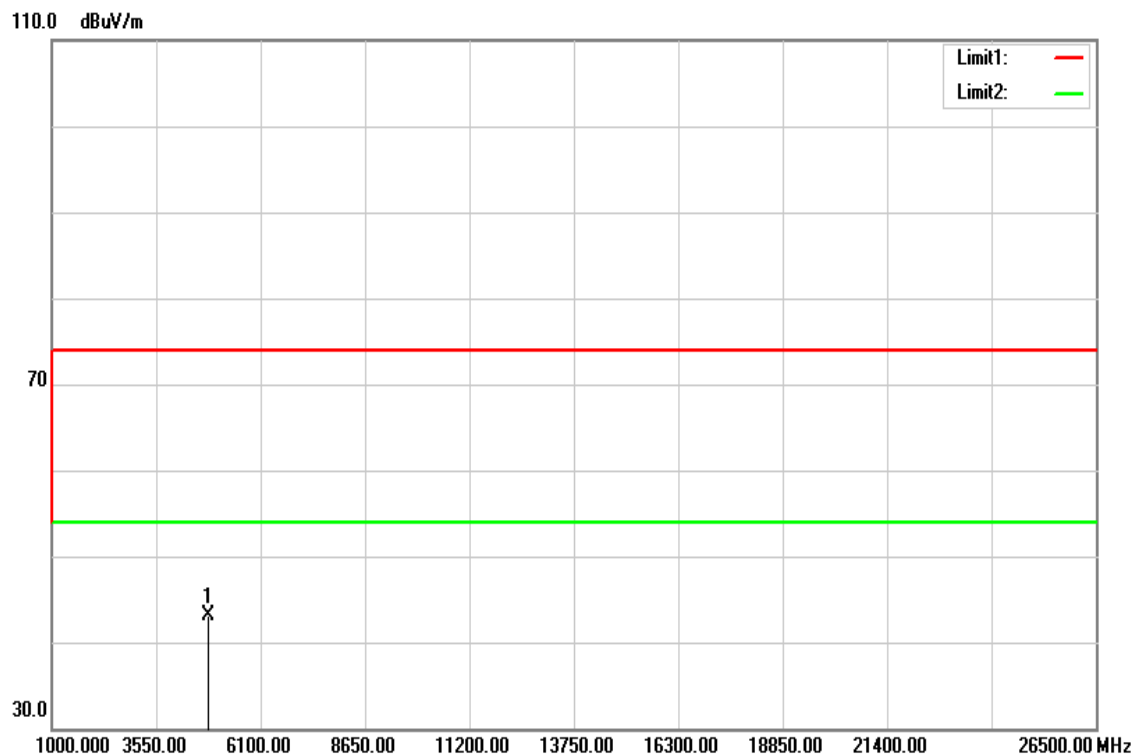


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4824.000	35.66	8.20	43.86	74.00	-30.14	peak
N/A						

Remark:

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

Test Mode	IEEE 802.11g Low CH	Temp/Hum	24 (°C)/ 33%RH
Test Item	Harmonic	Test Date	September 8, 2017
Polarize	Horizontal	Test Engineer	Ed Chiang
Detector	Peak and Average		

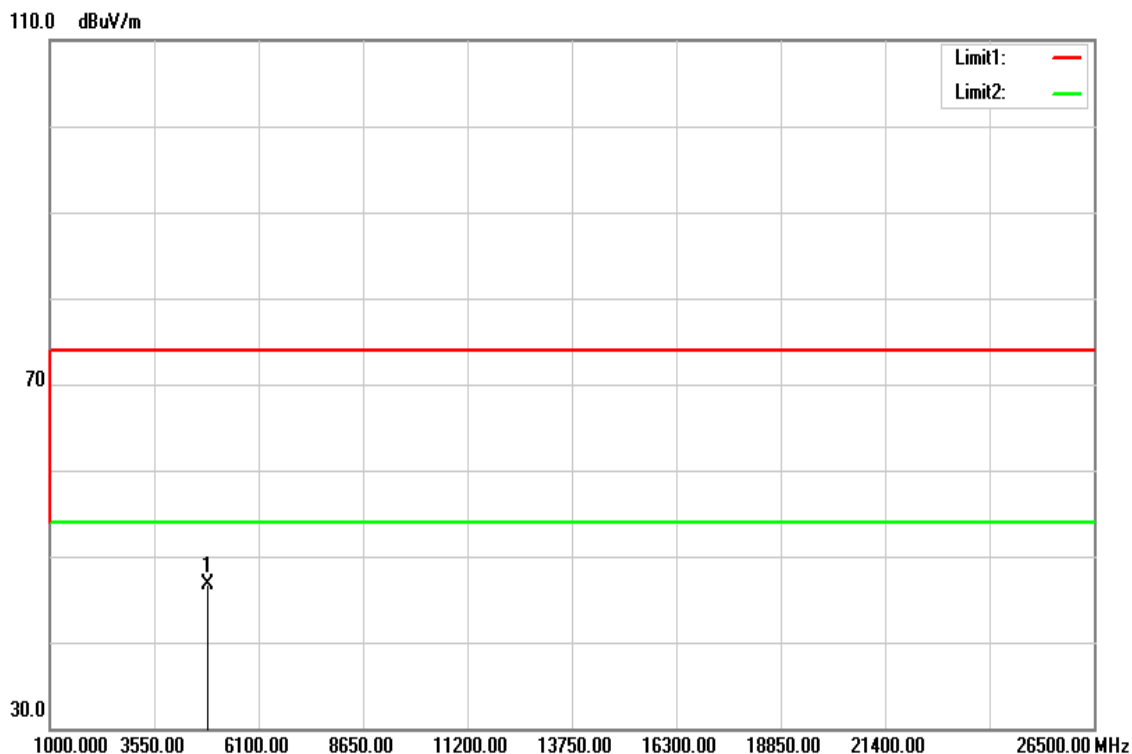


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4824.000	34.90	8.20	43.10	74.00	-30.90	peak
N/A						

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

Test Mode	IEEE 802.11g Mid CH	Temp/Hum	24 (°C)/ 33%RH
Test Item	Harmonic	Test Date	September 8, 2017
Polarize	Vertical	Test Engineer	Ed Chiang
Detector	Peak and Average		

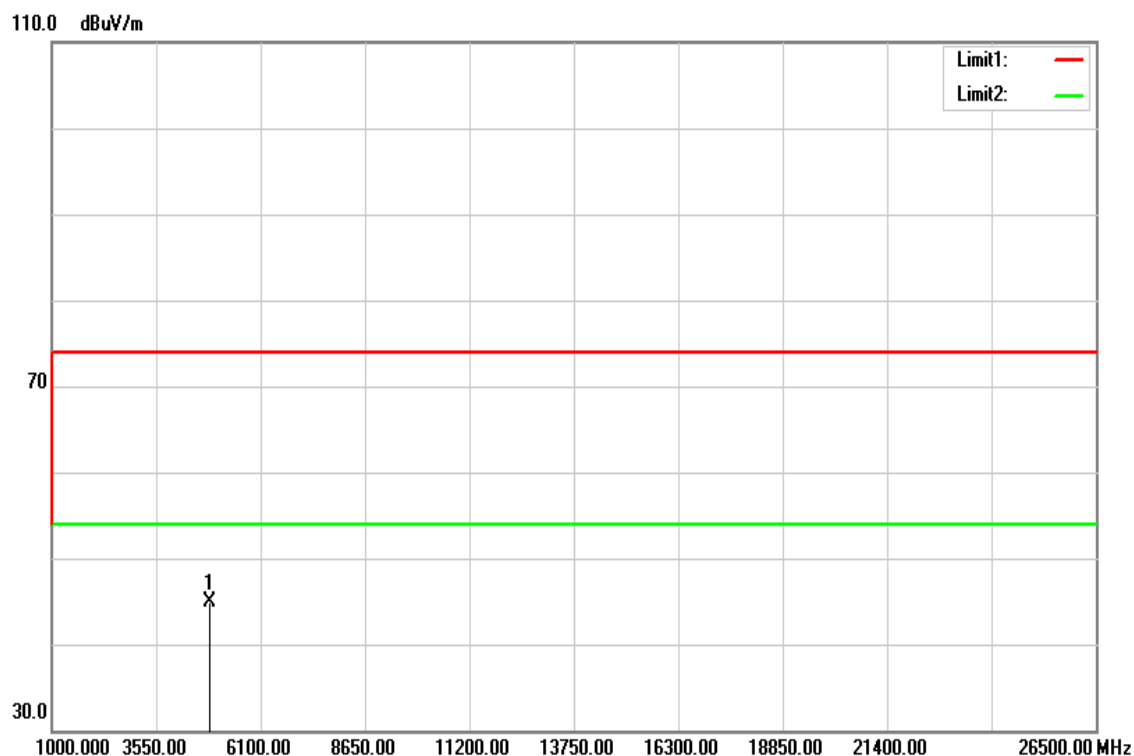


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4874.000	38.42	8.37	46.79	74.00	-27.21	peak
N/A						

Remark:

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

Test Mode	IEEE 802.11g Mid CH	Temp/Hum	24 (°C)/ 33%RH
Test Item	Harmonic	Test Date	September 8, 2017
Polarize	Horizontal	Test Engineer	Ed Chiang
Detector	Peak and Average		

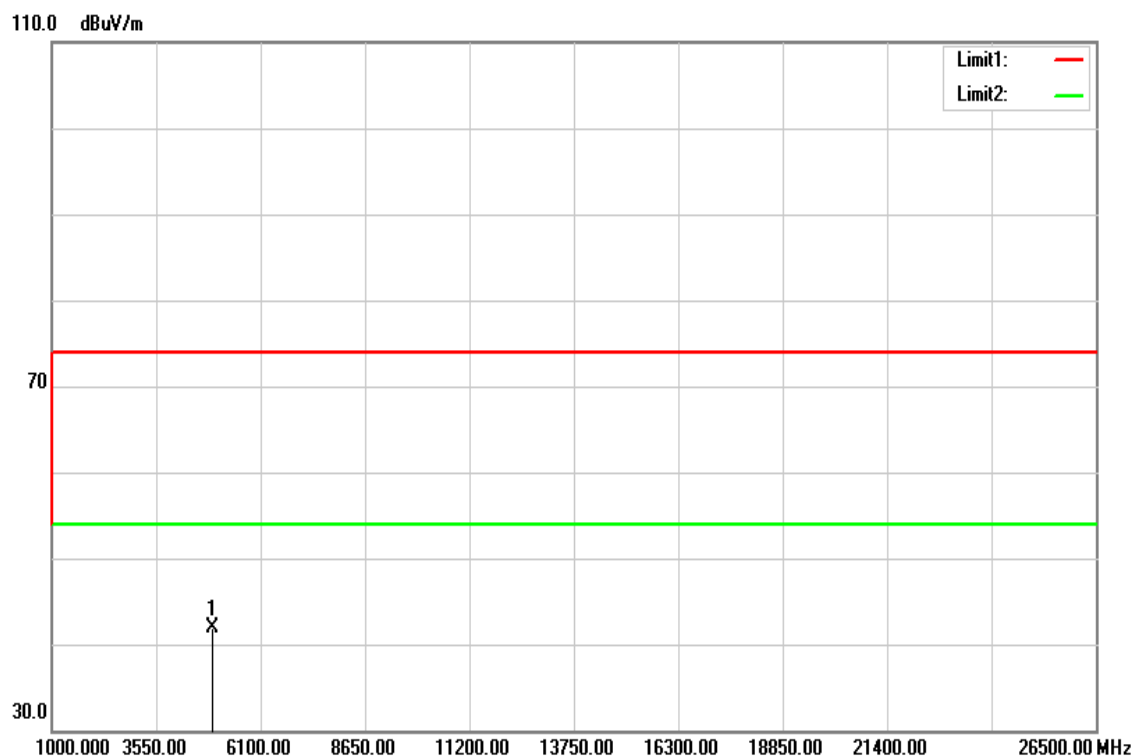


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (B)	Remark
4874.000	36.58	8.37	44.95	74.00	-29.05	peak
N/A						

Remark:

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

Test Mode	IEEE 802.11g High CH	Temp/Hum	24 (°C)/ 33%RH
Test Item	Harmonic	Test Date	September 8, 2017
Polarize	Vertical	Test Engineer	Ed Chiang
Detector	Peak and Average		

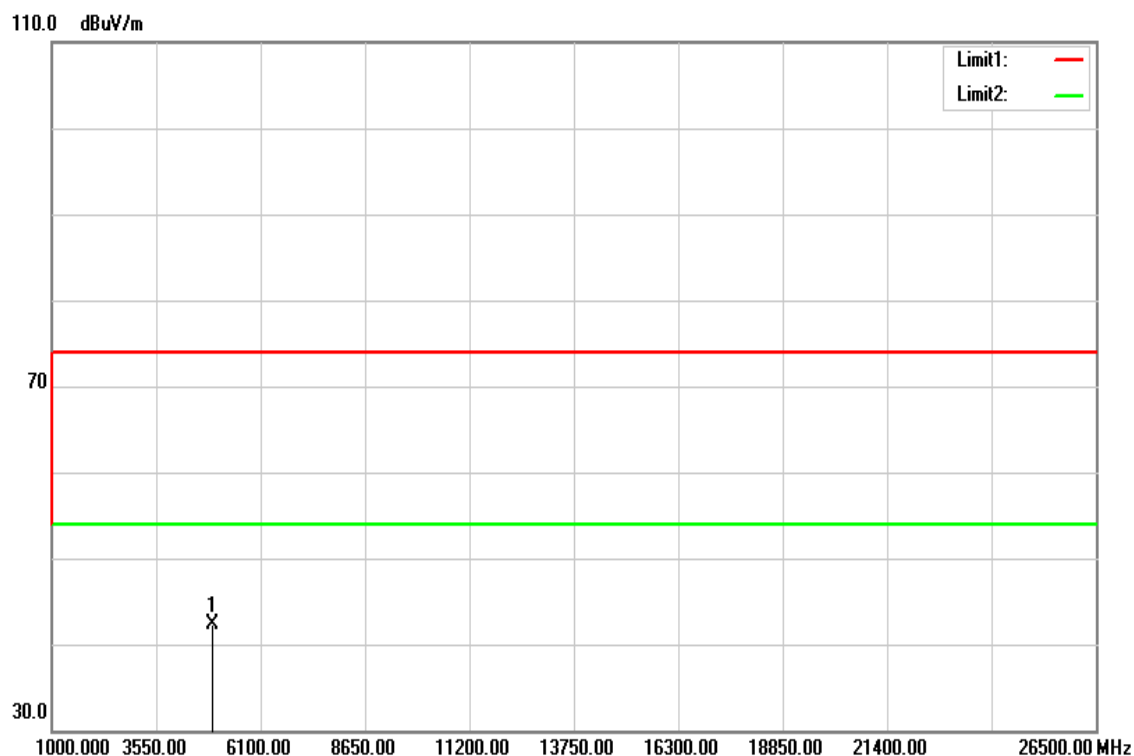


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4924.000	33.37	8.53	41.90	74.00	-32.10	peak
N/A						

Remark:

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

Test Mode	IEEE 802.11g High CH	Temp/Hum	24 (°C)/ 33%RH
Test Item	Harmonic	Test Date	September 8, 2017
Polarize	Horizontal	Test Engineer	Ed Chiang
Detector	Peak and Average		

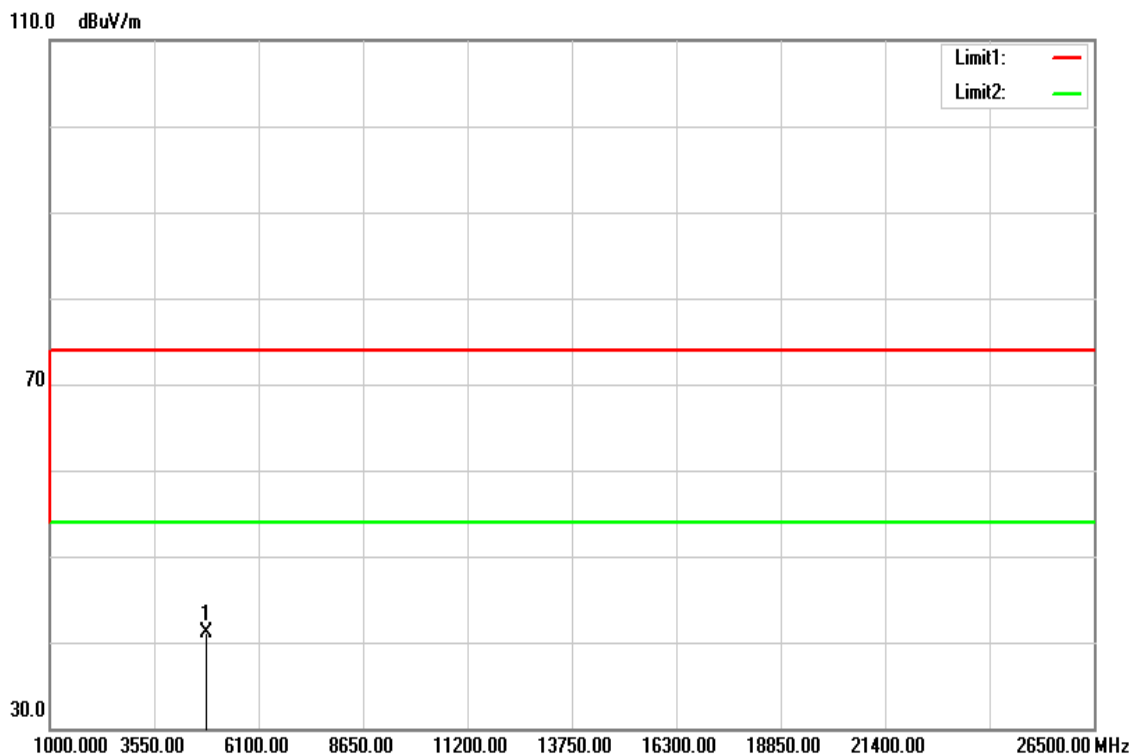


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4924.000	33.74	8.53	42.27	74.00	-31.73	peak
N/A						

Remark:

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

Test Mode	IEEE 802.11n HT20 Low CH	Temp/Hum	24 (°C)/ 33%RH
Test Item	Harmonic	Test Date	September 8, 2017
Polarize	Vertical	Test Engineer	Ed Chiang
Detector	Peak and Average		

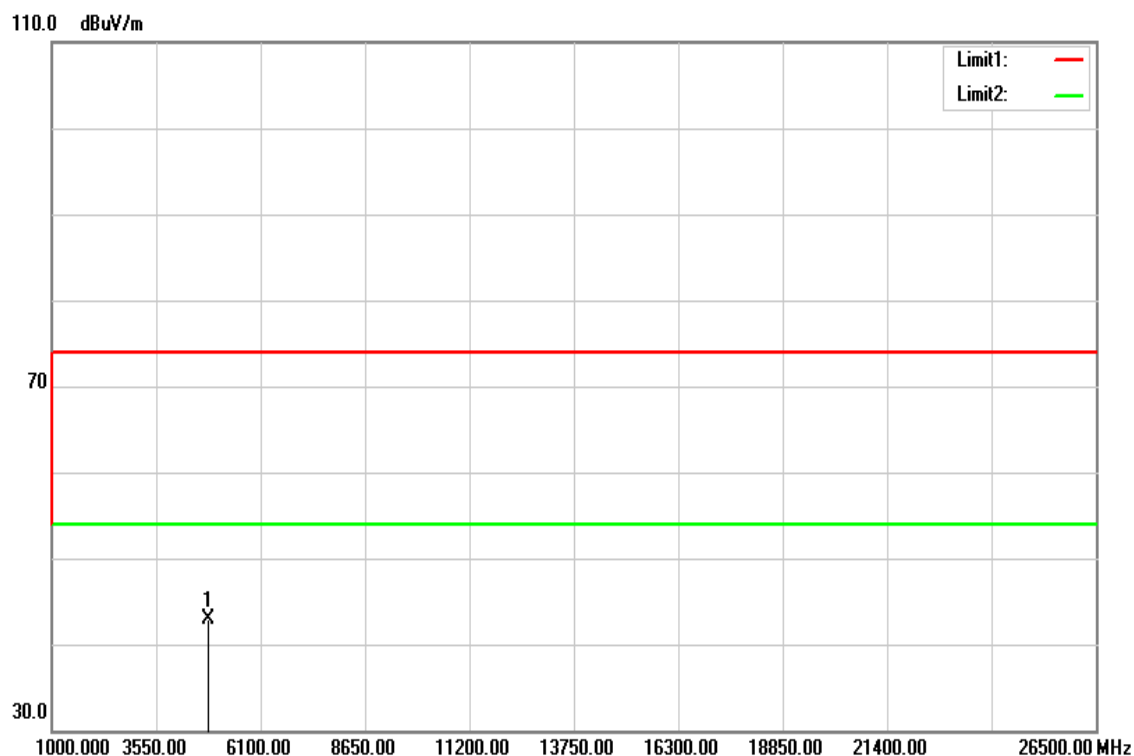


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	R mark
4824.000	32.83	8.20	41.03	74.00	-32.97	peak
N/A						

Remark:

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

Test Mode	IEEE 802.11n HT20 Low CH	Temp/Hum	24 (°C)/ 33%RH
Test Item	Harmonic	Test Date	September 8, 2017
Polarize	Horizontal	Test Engineer	Ed Chiang
Detector	Peak and Average		

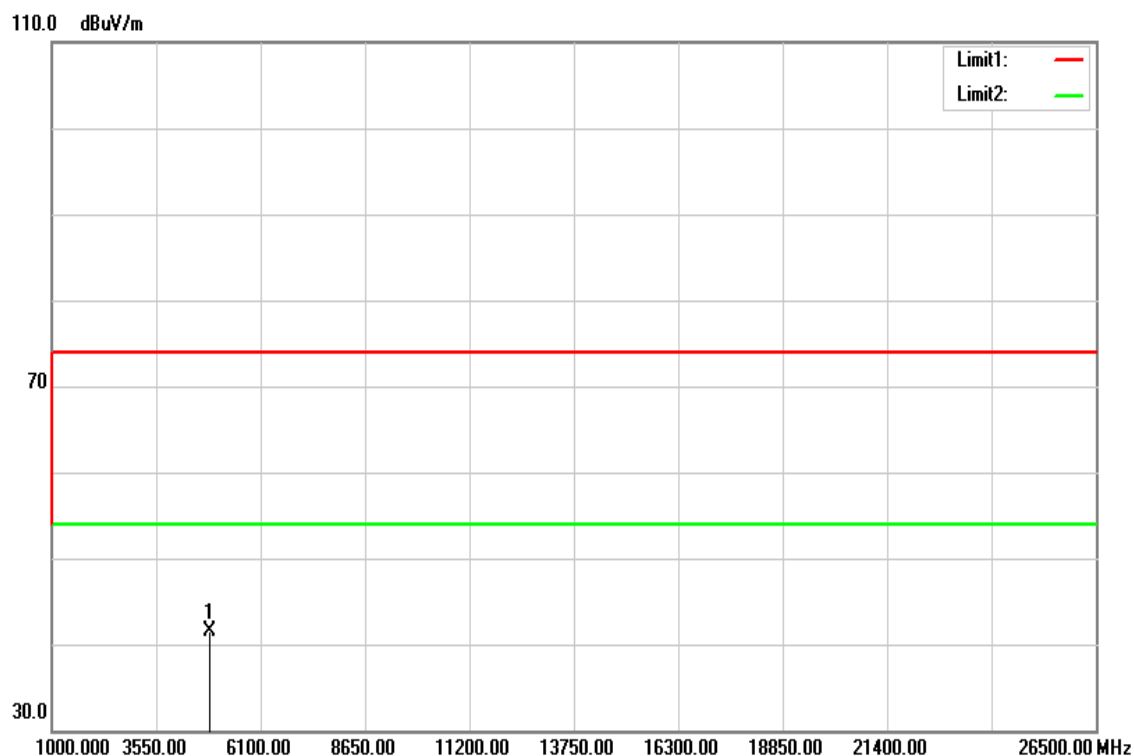


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4824.000	34.64	8.20	42.84	74.00	-31.16	peak
N/A						

Remark:

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

Test Mode	IEEE 802.11n HT20 Mid CH	Temp/Hum	24 (°C)/ 33%RH
Test Item	Harmonic	Test Date	September 8, 2017
Polarize	Vertical	Test Engineer	Ed Chiang
Detector	Peak and Average		

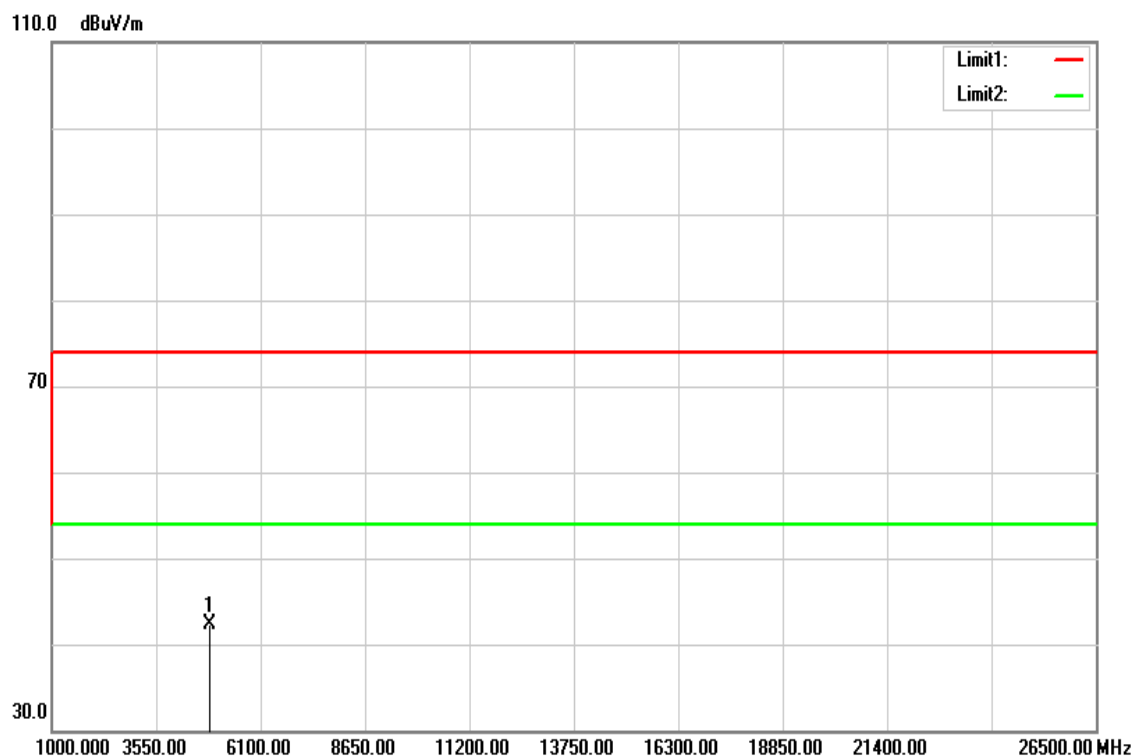


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	R mark
4874.000	33.14	8.37	41.51	74.00	-32.49	peak
N/A						

Remark:

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

Test Mode	IEEE 802.11n HT20 Mid CH	Temp/Hum	24 (°C)/ 33%RH
Test Item	Harmonic	Test Date	September 8, 2017
Polarize	Horizontal	Test Engineer	Ed Chiang
Detector	Peak and Average		

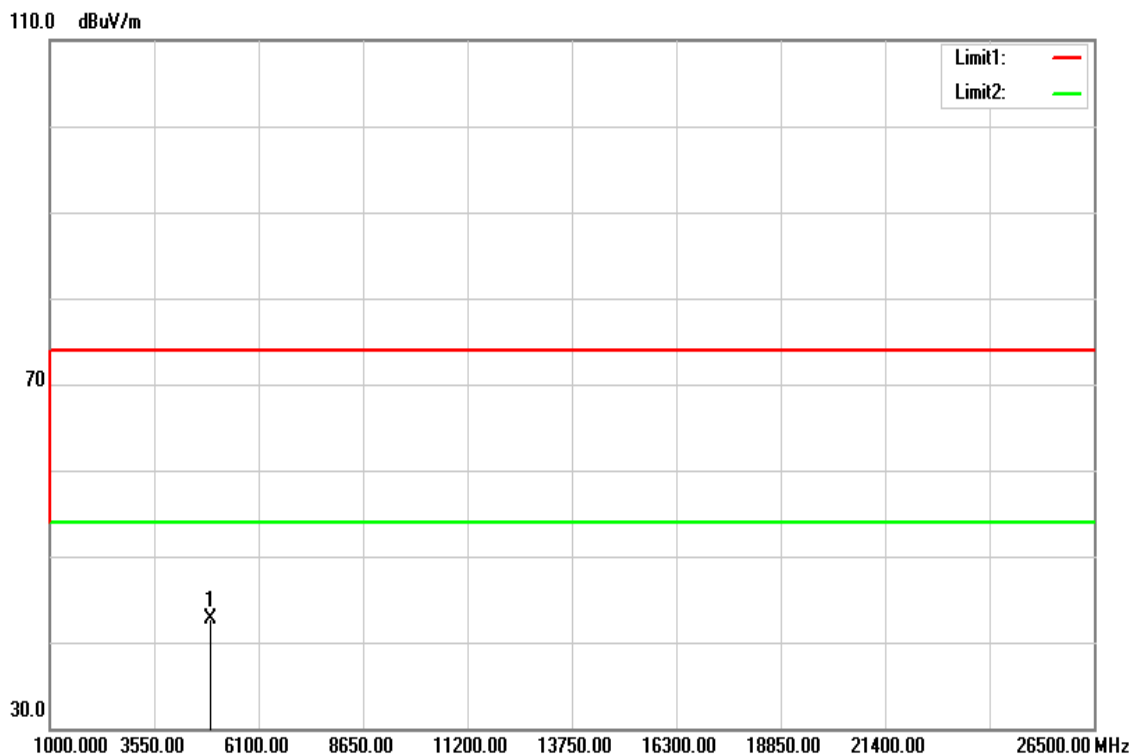


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4874.000	33.85	8.37	42.22	74.00	-31.78	peak
N/A						

Remark:

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

Test Mode	IEEE 802.11n HT20 High CH	Temp/Hum	24 (°C)/ 33%RH
Test Item	Harmonic	Test Date	September 8, 2017
Polarize	Vertical	Test Engineer	Ed Chiang
Detector	Peak and Average		

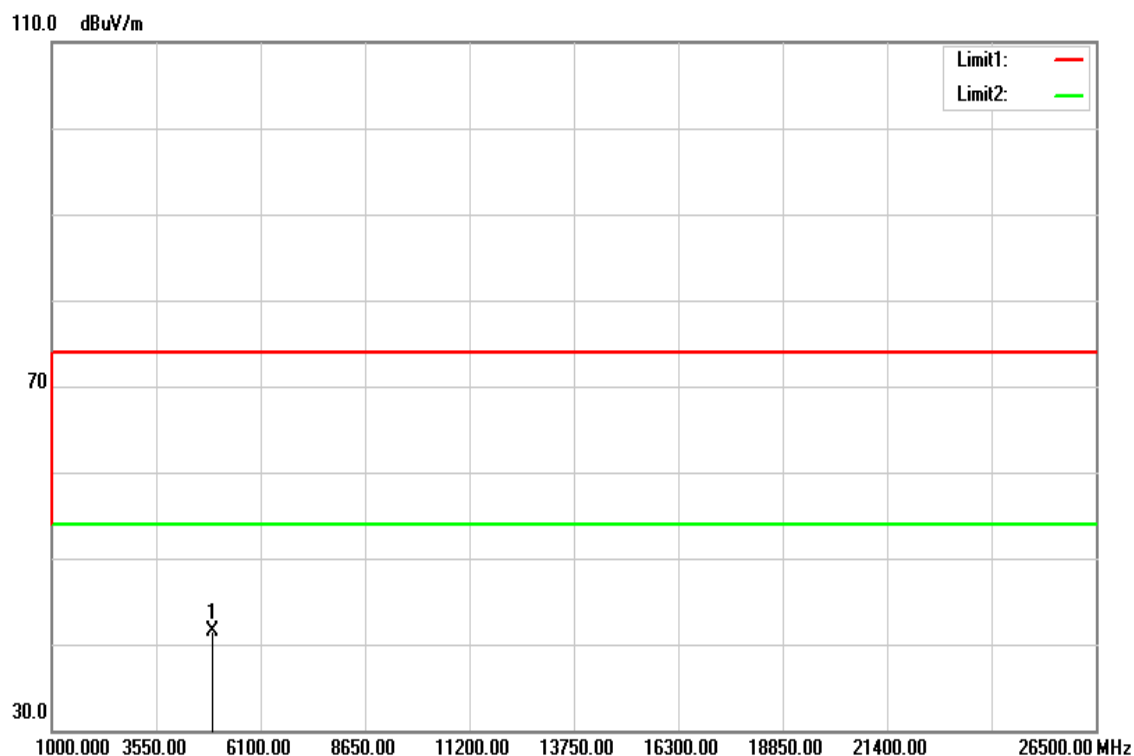


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4924.000	34.14	8.53	42.67	74.00	-31.33	peak
N/A						

Remark:

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

Test Mode	IEEE 802.11n HT20 High CH	Temp/Hum	24 (°C)/ 33%RH
Test Item	Harmonic	Test Date	September 8, 2017
Polarize	Horizontal	Test Engineer	Ed Chiang
Detector	Peak and Average		

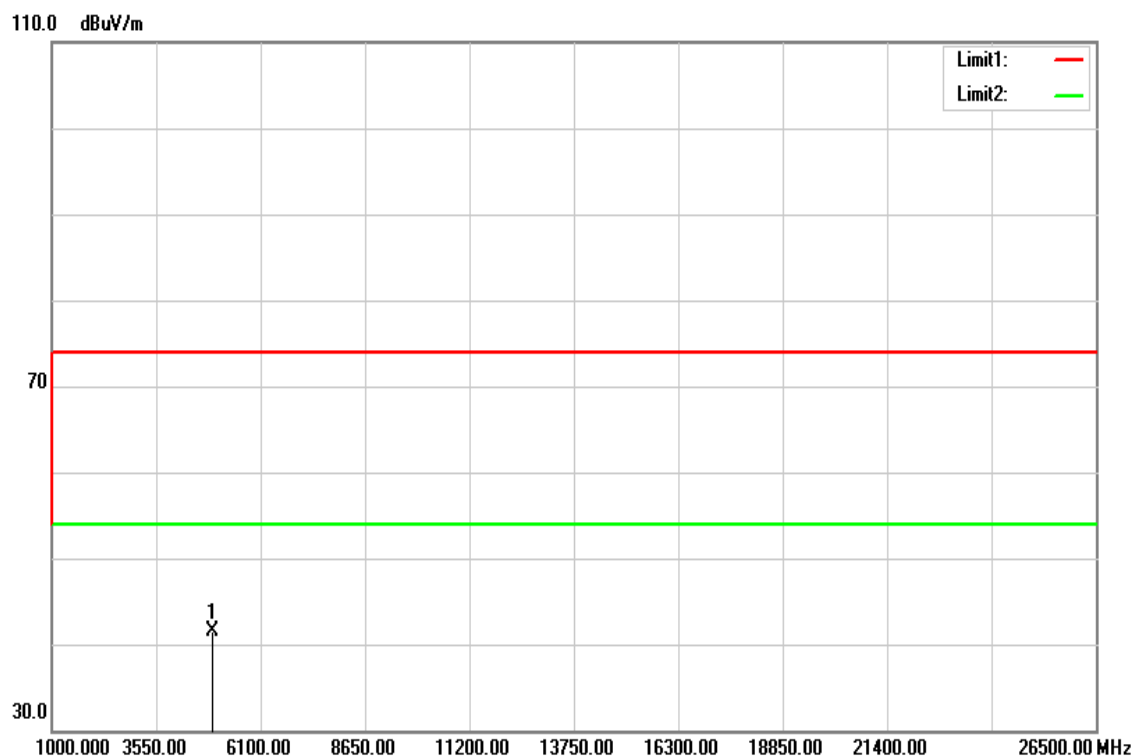


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4924.000	32.97	8.53	41.50	74.00	-32.50	peak
N/A						

Remark:

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

Test Mode	IEEE 802.11n HT40 Low CH	Temp/Hum	24 (°C)/ 33%RH
Test Item	Harmonic	Test Date	September 8, 2017
Polarize	Vertical	Test Engineer	Ed Chiang
Detector	Peak and Average		

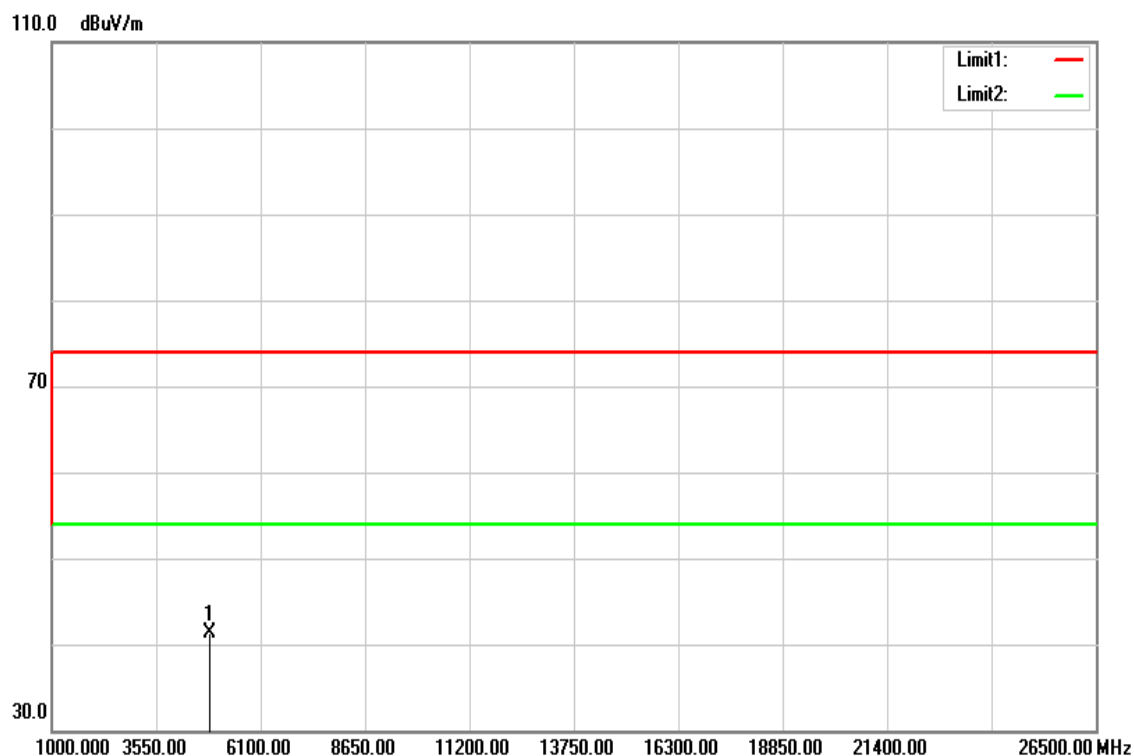


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4844.000	32.81	8.26	41.07	74.00	-32.93	peak
N/A						

Remark:

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

Test Mode	IEEE 802.11n HT40 Low CH	Temp/Hum	24 (°C)/ 33%RH
Test Item	Harmonic	Test Date	September 8, 2017
Polarize	Horizontal	Test Engineer	Ed Chiang
Detector	Peak and Average		

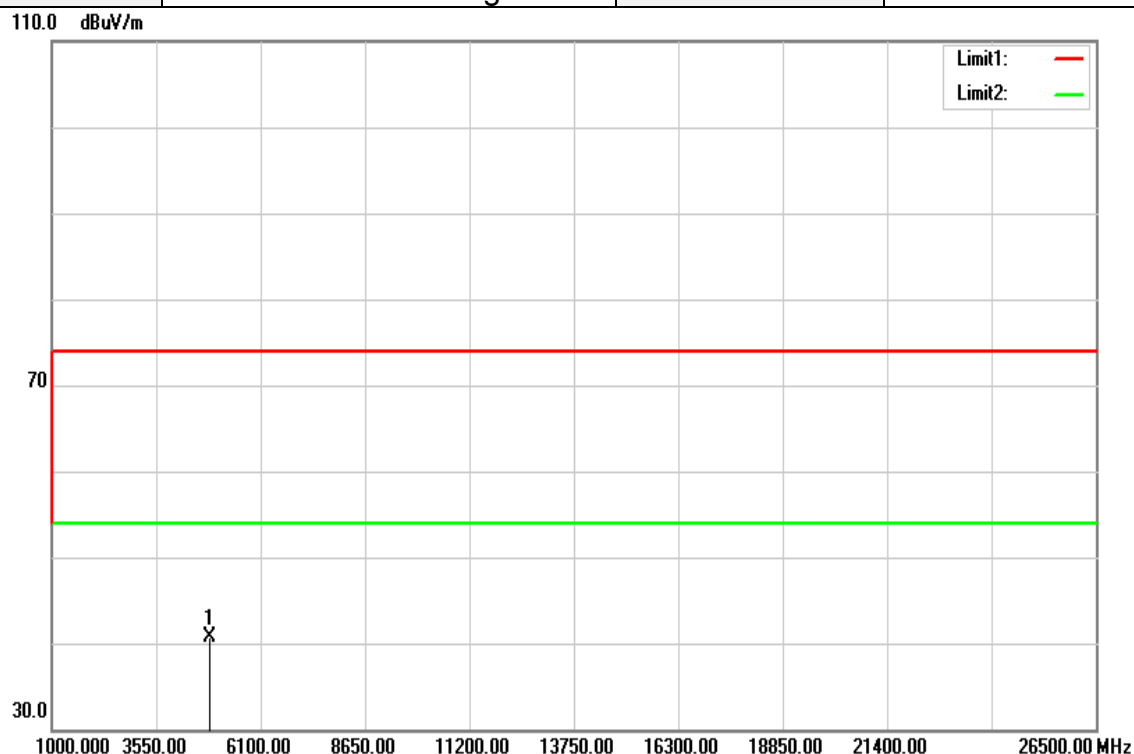


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4844.000	33.04	8.26	41.30	74.00	-32.70	peak
N/A						

Remark:

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

Test Mode	IEEE 802.11n HT40 Mid CH	Temp/Hum	24 (°C)/ 33%RH
Test Item	Harmonic	Test Date	September 8, 2017
Polarize	Vertical	Test Engineer	Ed Chiang
Detector	Peak and Average		

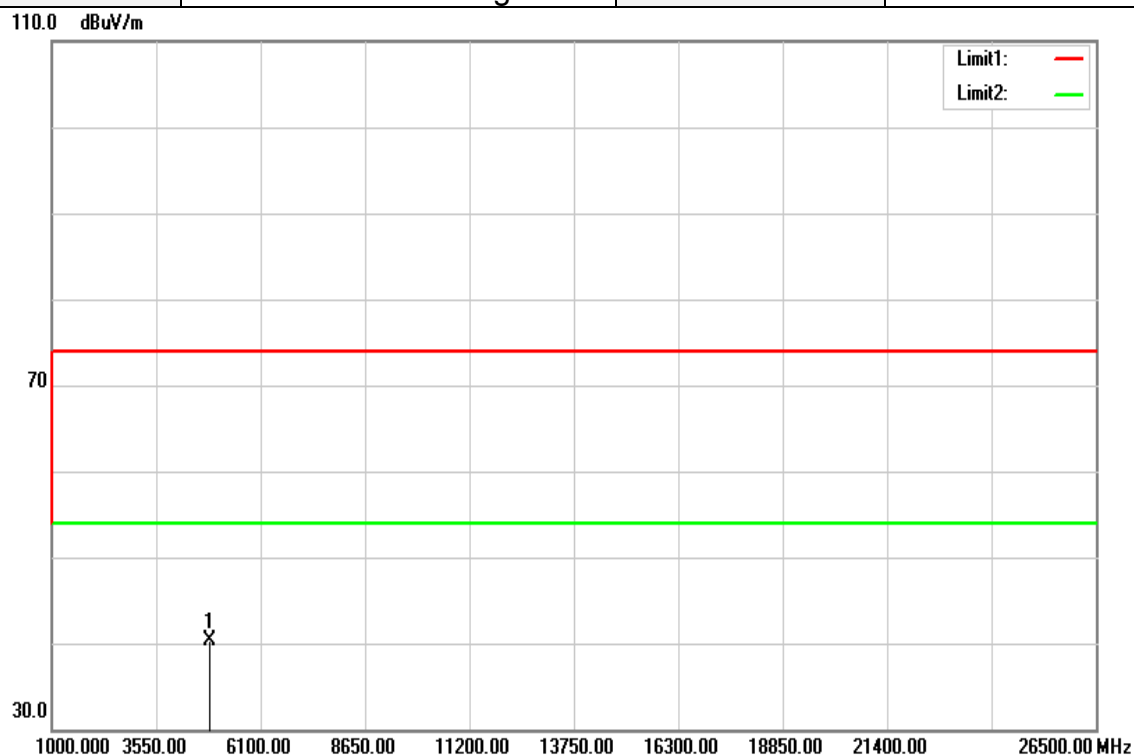


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4874.000	32.42	8.37	40.79	74.00	-33.21	peak
N/A						

Remark:

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

Test Mode	IEEE 802.11n HT40 Mid CH	Temp/Hum	24 (°C)/ 33%RH
Test Item	Harmonic	Test Date	September 8, 2017
Polarize	Horizontal	Test Engineer	Ed Chiang
Detector	Peak and Average		

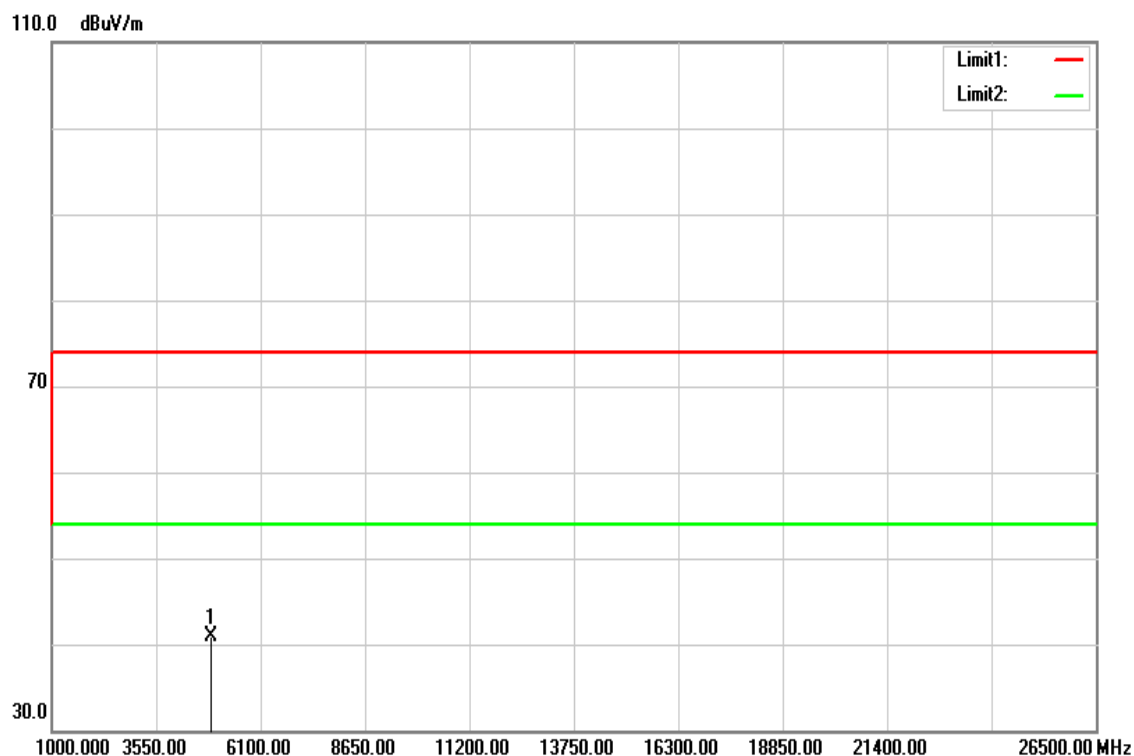


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4874.000	31.98	8.37	40.35	74.00	-33.65	peak
N/A						

Remark:

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

Test Mode	IEEE 802.11n HT40 High CH	Temp/Hum	24 (°C)/ 33%RH
Test Item	Harmonic	Test Date	September 8, 2017
Polarize	Vertical	Test Engineer	Ed Chiang
Detector	Peak and Average		

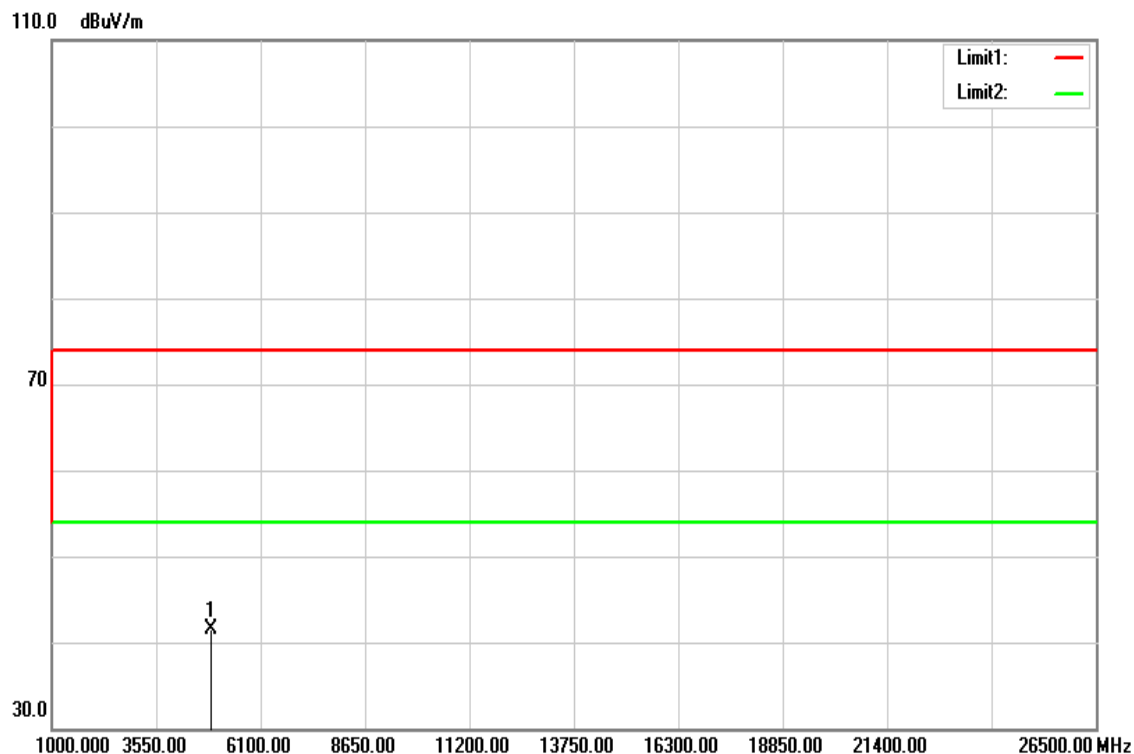


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4904.000	32.44	8.47	40.91	74.00	-33.09	peak
N/A						

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

Test Mode	IEEE 802.11n HT40 High CH	Temp/Hum	24 (°C)/ 33%RH
Test Item	Harmonic	Test Date	September 8, 2017
Polarize	Horizontal	Test Engineer	Ed Chiang
Detector	Peak and Average		



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4904.000	33.03	8.47	41.50	74.00	-32.50	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