

TEST REPORT

Reference No..... : WTX20X12093711W-2
FCC ID : 2ARO3-W626LITE
Applicant : Worldwide telecom limited
Address..... : 2F Block C; Shenfang Building, Zhen Hualu, Futian, Shenzhen.
Product Name : SmartPhone
Test Model. : W626 LITE
Standards : FCC Part 15.247
Date of Receipt sample : Dec.04, 2020
Date of Test..... : Dec.04, 2020 to Dec.17, 2020
Date of Issue : Dec.18, 2020
Test Result..... : **Pass**

Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

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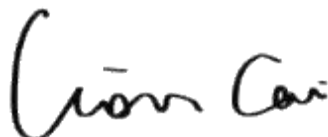
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Report version

Version No.	Date of issue	Description
Rev.00	Dec.18, 2020	Original
/	/	/

1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: Worldwide telecom limited
Address of applicant: 2F Block C; Shenfang Building, Zhen Hualu, Futian, Shenzhen.

Manufacturer: Worldwide telecom limited
Address of manufacturer: 2F Block C; Shenfang Building, Zhen Hualu, Futian, Shenzhen.

General Description of EUT	
Product Name:	SmartPhone
Trade Name:	WOLKI
Model No.:	W626 LITE
Adding Model(s):	/
Rated Voltage:	DC3.8V
Battery Capacity	2500mAh
Adapter Model:	WCH05 Input: AC100-240V, 50/60Hz, 0.15A; Output: DC5.0V,1000mA
Note: The test data is gathered from a production sample provided by the manufacturer.	

Technical Characteristics of EUT	
Support Standards:	802.11b, 802.11g, 802.11n
Frequency Range:	2412-2462MHz for 802.11b/g/n(HT20)
RF Output Power:	15.18dBm (Conducted)
Type of Modulation:	DBPSK,BPSK,DQPSK,QPSK,16QAM,64QAM
Data Rate:	1-11Mbps, 6-54Mbps, up to 72.2Mbps
Quantity of Channels:	11 for 802.11b/g/n(HT20)
Channel Separation:	5MHz
Type of Antenna:	Integral Antenna
Antenna Gain:	0.7dBi

1.2 Test Standards

The tests were performed according to following standards:

FCC Rules Part 15.247: Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.

558074 D01 15.247 Meas Guidance v05r02: Guidance for Compliance Measurements on Digital Transmission System, Frequency Hopping Spread Spectrum System, and Hybrid System Devices Operating under section 15.247 of the FCC rules.

662911 D01 Multiple Transmitter Output v02r01: Emissions Testing of Transmitters with Multiple Outputs in the Same Band.

ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission, should be checked to ensure compliance has been maintained.

1.3 Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, KDB 558074 D01 15.247 Meas Guidance v05r02, KDB 662911 D01 Multiple Transmitter Output v02r01

The equipment under test (EUT) was configured to measure its highest possible emission level. The test modes were adapted accordingly in reference to the Operating Instructions.

1.4 Test Facility

Address of the test laboratory

Laboratory: Waltek Testing Group (Shenzhen) Co., Ltd.

Address: 1/F., Room 101, Building 1, Hongwei Industrial Park, Liuxian 2nd Road, Block 70 Bao'an District, Shenzhen, Guangdong, China

FCC – Registration No.: 125990

Waltek Testing Group (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. The Designation Number is CN5010, and Test Firm Registration Number is 125990.

Industry Canada (IC) Registration No.: 11464A

The 3m Semi-anechoic chamber of Waltek Testing Group (Shenzhen) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A.

1.5 EUT Setup and Test Mode

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. All testing shall be performed under maximum output power condition, with a duty cycle equal to 100%, and to measure its highest possible emissions level, more detailed description as follows:

Test Mode List		
Test Mode	Description	Remark
TM1	802.11b	Low:2412MHz, Middle:2437MHz,High:2462MHz
TM2	802.11g	Low:2412MHz, Middle:2437MHz,High:2462MHz
TM3	802.11n-HT20	Low:2412MHz, Middle:2437MHz,High:2462MHz

Test Conditions	
Temperature:	22~25 °C
Relative Humidity:	45~55 %.
ATM Pressure:	1019 mbar

EUT Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
USB Cable	1.0	Unshielded	Without Ferrite
Earphone Cable	0.98	Unshielded	Without Ferrite

Special Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
/	/	/	/

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
Notebook	Lenovo	TianYi310-14ISK	/

1.6 Measurement Uncertainty

Measurement uncertainty		
Parameter	Conditions	Uncertainty
RF Output Power	Conducted	$\pm 0.42\text{dB}$
Occupied Bandwidth	Conducted	$\pm 1.5\%$
Power Spectral Density	Conducted	$\pm 1.8\text{dB}$
Conducted Spurious Emission	Conducted	$\pm 2.17\text{dB}$
Conducted Emissions	Conducted	9-150kHz $\pm 3.74\text{dB}$
		0.15-30MHz $\pm 3.34\text{dB}$
Transmitter Spurious Emissions	Radiated	30-200MHz $\pm 4.52\text{dB}$
		0.2-1GHz $\pm 5.56\text{dB}$
		1-6GHz $\pm 3.84\text{dB}$
		6-26GHz $\pm 3.92\text{dB}$

1.7 Test Equipment List and Details

No.	Description	Manufacturer	Model	Serial No.	Cal Date	Due Date
SEMT-1072	Spectrum Analyzer	Agilent	E4407B	MY41440400	2020-04-28	2021-04-27
SEMT-1031	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2020-04-28	2021-04-27
SEMT-1007	EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2020-04-28	2021-04-27
SEMT-1008	Amplifier	Agilent	8447F	3113A06717	2020-04-28	2021-04-27
SEMT-1043	Amplifier	C&D	PAP-1G18	2002	2020-04-28	2021-04-27
SEMT-1011	Broadband Antenna	Schwarz beck	VULB9163	9163-333	2019-05-05	2021-05-04
SEMT-1042	Horn Antenna	ETS	3117	00086197	2019-05-05	2021-05-04
SEMT-1121	Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170582	2019-05-05	2021-05-04
SEMT-1069	Loop Antenna	Schwarz beck	FMZB 1516	9773	2019-05-05	2021-05-04
SEMT-1001	EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2020-04-28	2021-04-27
SEMT-1003	L.I.S.N	Schwarz beck	NSLK8126	8126-224	2020-04-28	2021-04-27
SEMT-1002	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2020-04-28	2021-04-27
SEMT-1168	Pre-amplifier	Direction Systems Inc.	PAP-0126	14141-12838	2020-04-28	2021-04-27
SEMT-1169	Pre-amplifier	Direction Systems Inc.	PAP-2640	14145-14153	2020-04-28	2021-04-27
SEMT-1163	Spectrum Analyzer	Rohde & Schwarz	FSP40	100612	2020-04-28	2021-04-27
SEMT-1170	DRG Horn Antenna	A.H. SYSTEMS	SAS-574	571	2019-05-05	2021-05-04
SEMT-1166	Power Limiter	Agilent	N9356B	MY45450376	2020-04-28	2021-04-27
SEMT-1048	RF Limiter	ATTEN	AT-BSF-2400~2500	/	2020-04-28	2021-04-27
SEMT-1076	RF Switcher	Top Precision	RCS03-A2	/	2020-04-28	2021-04-27
SEMT-C001	Cable	Zheng DI	LL142-07-07-10M(A)	/	2020-03-17	2021-03-16
SEMT-C002	Cable	Zheng DI	ZT40-2.92J-2.92J-6M	/	2020-03-17	2021-03-16
SEMT-C003	Cable	Zheng DI	ZT40-2.92J-2.92J-2.5M	/	2020-03-17	2021-03-16
SEMT-C004	Cable	Zheng DI	2M0RFC	/	2020-03-17	2021-03-16
SEMT-C005	Cable	Zheng DI	1M0RFC	/	2020-03-17	2021-03-16
SEMT-C006	Cable	Zheng DI	1M0RFC	/	2020-03-17	2021-03-16

Software List			
Description	Manufacturer	Model	Version
EMI Test Software (Radiated Emission)*	Farad	EZ-EMC	RA-03A1
EMI Test Software (Conducted Emission)*	Farad	EZ-EMC	RA-03A1

*Remark: indicates software version used in the compliance certification testing

2. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test Item	Result
§15.203; §15.247(b)(4)(i)	Antenna Requirement	Compliant
§15.205	Restricted Band of Operation	Compliant
§15.207(a)	Conducted Emission	Compliant
§15.247(e)	Power Spectral Density	Compliant
§15.247(a)(2)	DTS Bandwidth	Compliant
§15.247(b)(3)	RF Output Power	Compliant
§15.209(a)	Radiated Emission	Compliant
§15.247(d)	Band Edge (Out of Band Emissions)	Compliant

N/A: Not applicable

3. Antenna Requirement

3.1 Standard Applicable

According to FCC Part 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

3.2 Evaluation Information

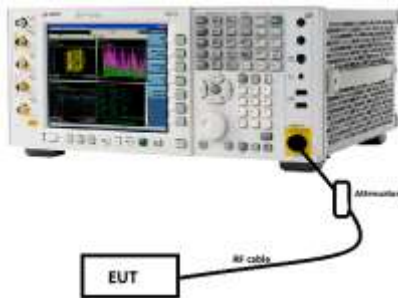
This product has an integral antenna, fulfill the requirement of this section.

4. Power Spectral Density

4.1 Standard Applicable

According to 15.247(a)(1)(iii), 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.

4.2 Test Setup Block Diagram



4.3 Test Procedure

According to the KDB 558074 D01 v05r02 Subclause 8.4 and ANSI C63.10-2013 Subclause 11.10.3, such specifications require that the same method as used to determine the conducted output power shall also be used to determine the power spectral density. The test method of power spectral density as below:

- a) Set instrument center frequency to DTS channel center frequency.
- b) Set span to at least 1.5 times the OBW.
- c) Set RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- d) Set VBW $\geq 3 \times \text{RBW}$.
- e) Detector = power averaging (RMS) or sample detector (when RMS not available).
- f) Ensure that the number of measurement points in the sweep $\geq 2 \times \text{span}/\text{RBW}$.
- g) Sweep time = auto couple.
- h) Employ trace averaging (RMS) mode over a minimum of 100 traces.
- i) Use the peak marker function to determine the maximum amplitude level.
- j) If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat (note that this may require zooming in on the emission of interest and reducing the span in order to meet the minimum measurement point requirement as the RBW is reduced).

4.4 Summary of Test Results/Plots

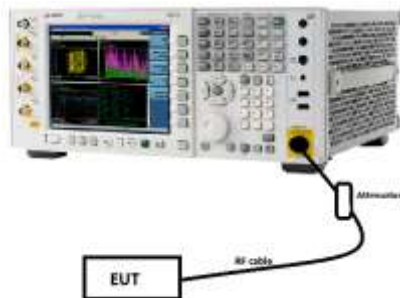
Please refer to Appendix A

5. DTS Bandwidth

5.1 Standard Applicable

According to 15.247(a)(2), systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

5.2 Test Setup Block Diagram



5.3 Test Procedure

According to the KDB 558074 D01 v05r02 Subclause 8.2 and ANSI C63.10-2013 Subclause 11.8.1, the test method of DTS Bandwidth as below:

- Set RBW = 100 kHz.
- Set the video bandwidth (VBW) $\geq 3 \times \text{RBW}$.
- Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- Allow the trace to stabilize.
- Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

5.4 Summary of Test Results/Plots

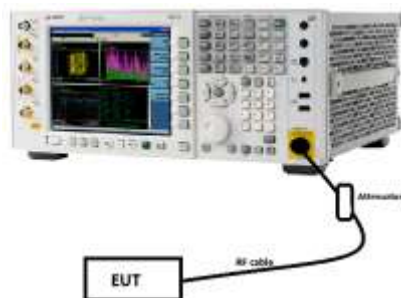
Please refer to Appendix B

6. RF Output Power

6.1 Standard Applicable

According to 15.247(b)(3), for systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt.

6.2 Test Setup Block Diagram



6.3 Test Procedure

According to the KDB-558074 D01 v05r02 Subclause 8.3.2.2 and ANSI C63.10-2013 Subclause 11.9.2.2, when this option is exercised, the measured power is to be referenced to the OBW rather than the DTS bandwidth

- Set span to at least 1.5 times the OBW.
- Set RBW = 1-5% of the OBW, not to exceed 1 MHz.
- Set VBW $\geq 3 \times$ RBW.
- Number of points in sweep $\geq 2 \times \text{span} / \text{RBW}$. (This gives bin-to-bin spacing $\leq \text{RBW}/2$, so that narrowband signals are not lost between frequency bins.)
- Sweep time = auto.
- Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.
- If transmit duty cycle < 98 %, use a sweep trigger with the level set to enable triggering only on full power pulses. The transmitter shall operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no off intervals) or at duty cycle ≥ 98 %, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to “free run” .
- Trace average at least 100 traces in power averaging (i.e., RMS) mode.
- Compute power by integrating the spectrum across the OBW of the signal using the instrument’s band power measurement function, with band limits set equal to the OBW band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.

6.4 Summary of Test Results/Plots

Please refer to Appendix C

7. Field Strength of Spurious Emissions

7.1 Standard Applicable

According to §15.247(d), in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions 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).

The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply. Spurious Radiated Emissions measurements starting below or at the lowest crystal frequency.

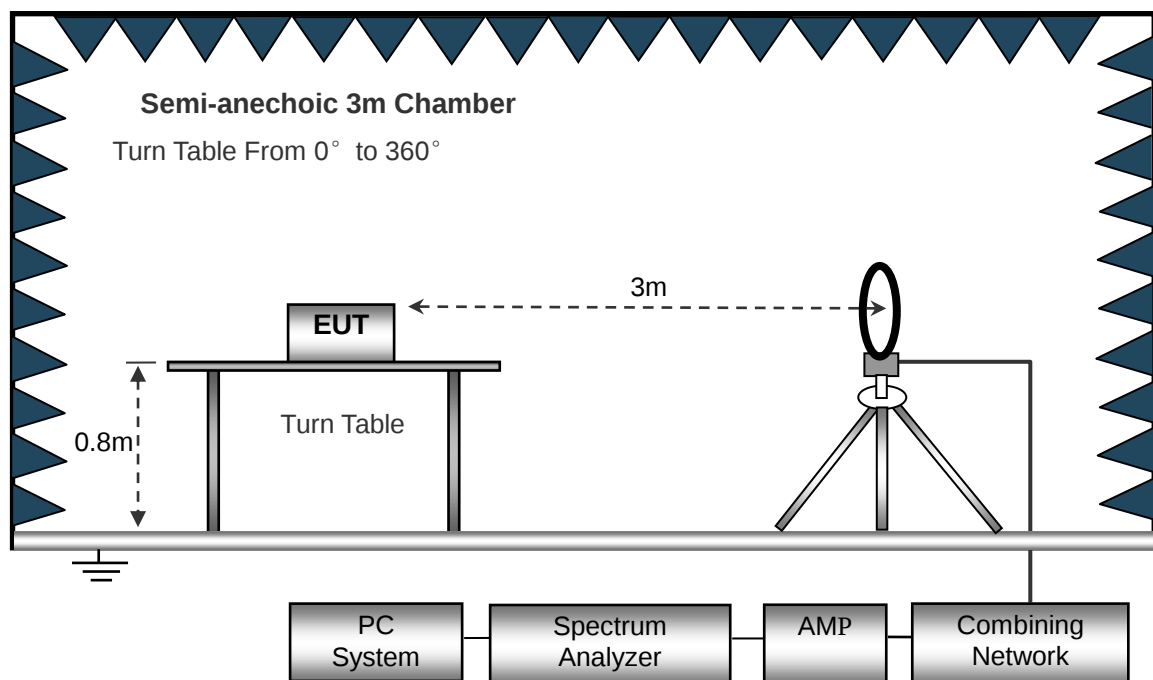
7.2 Test Procedure

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.205 15.247(a) and FCC Part 15.209 Limit.

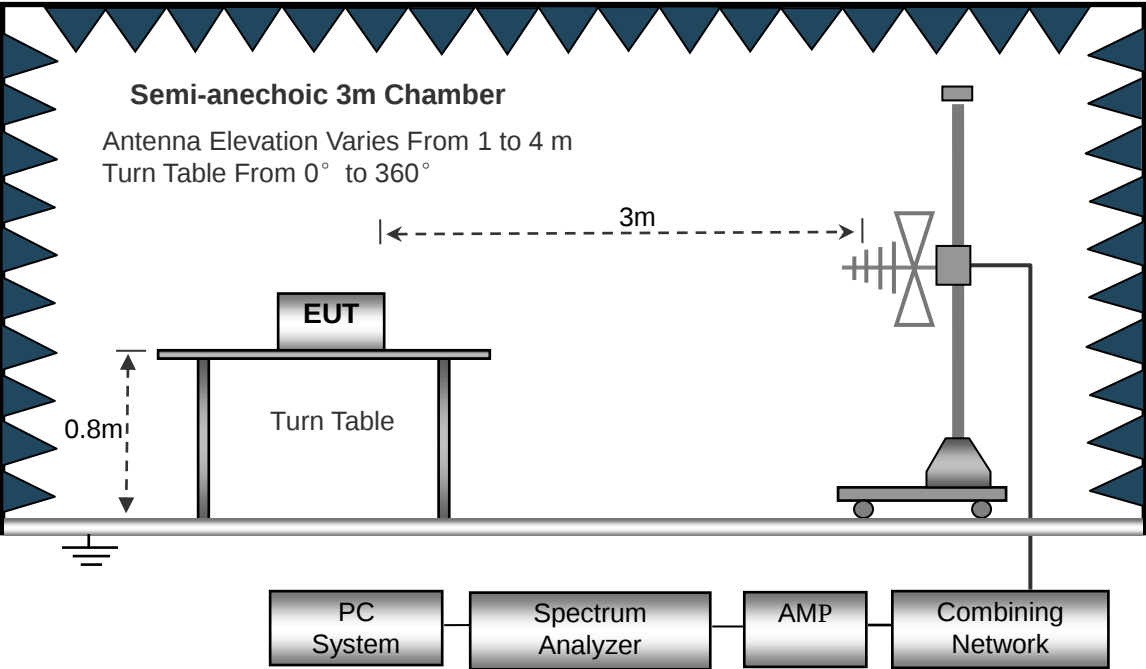
The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

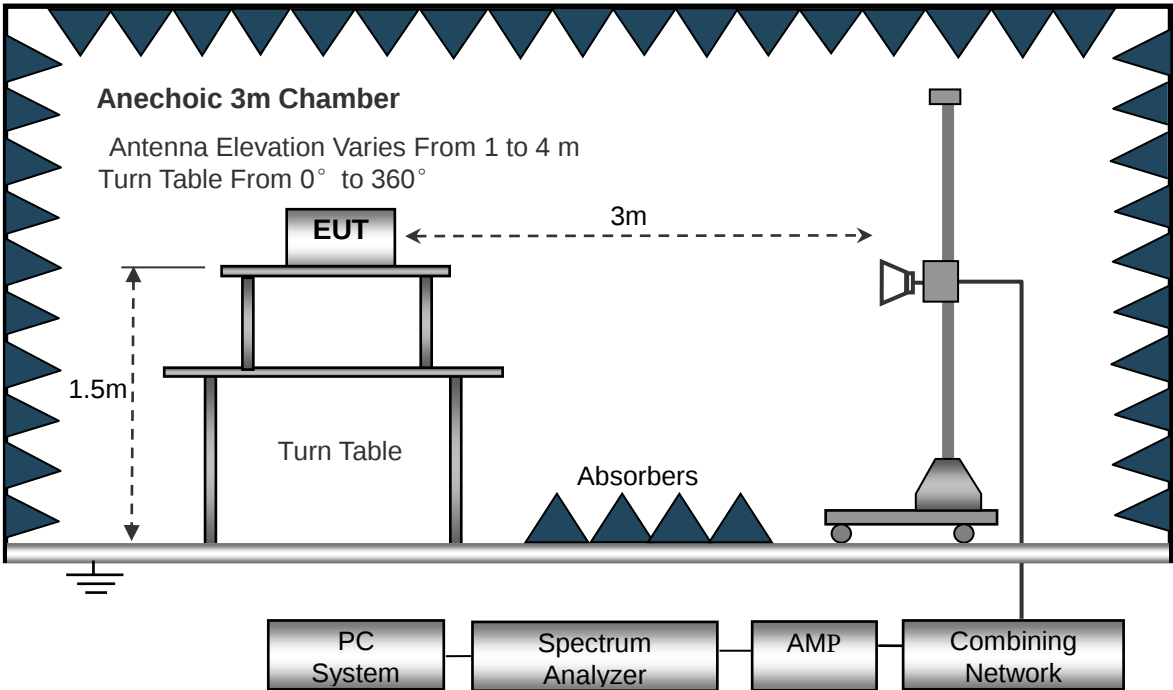
The test setup for emission measurement below 30MHz..



The test setup for emission measurement from 30 MHz to 1 GHz..



The test setup for emission measurement above 1 GHz..



Frequency :9kHz-30MHz	Frequency :30MHz-1GHz	Frequency :Above 1GHz
RBW=10KHz,	RBW=120KHz,	RBW=1MHz,
VBW =30KHz	VBW=300KHz	VBW=3MHz(Peak), 10Hz(AV)
Sweep time= Auto	Sweep time= Auto	Sweep time= Auto
Trace = max hold	Trace = max hold	Trace = max hold
Detector function = peak	Detector function = peak, QP	Detector function = peak, AV

7.3 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Ant. Factor} + \text{Cable Loss} - \text{Ampl. Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dB μ V means the emission is 6dB μ V below the maximum limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 15 Limit}$$

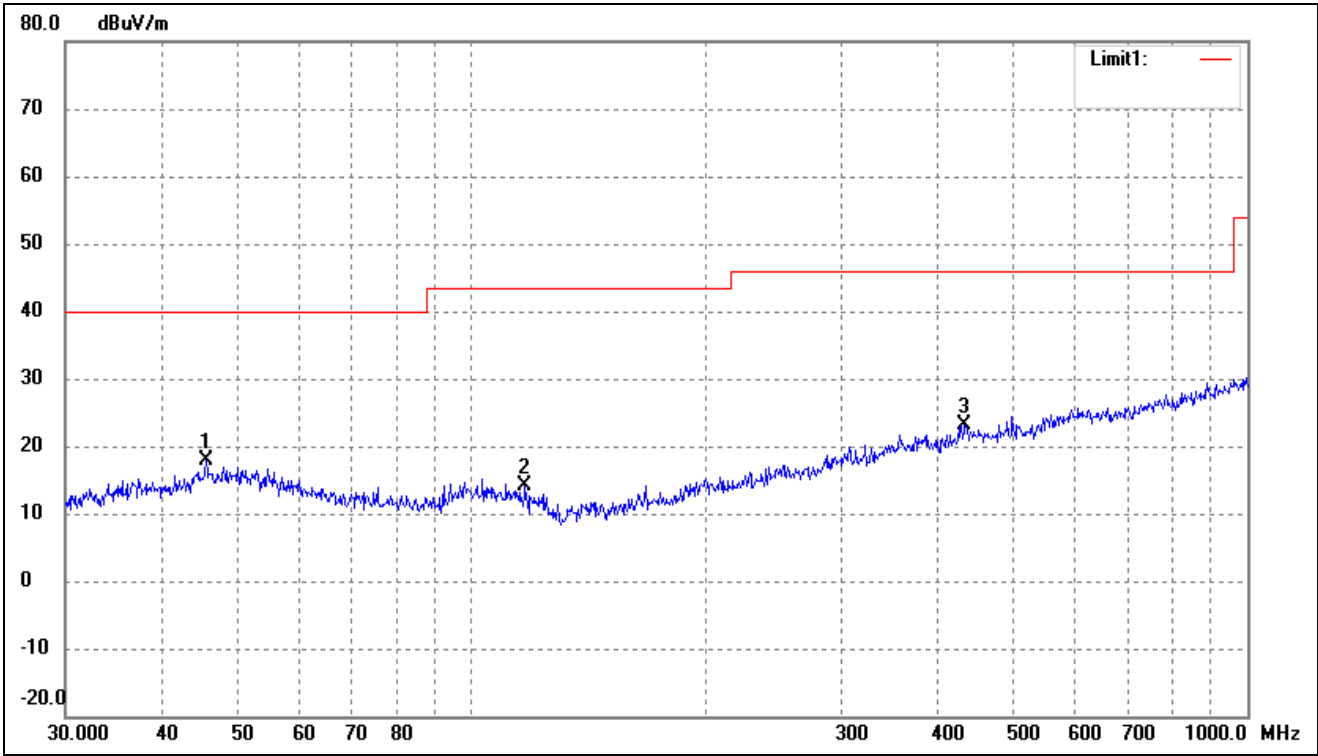
7.4 Summary of Test Results/Plots

Note: 1.This EUT was tested in 3 orthogonal positions and the worst case position data was reported.

All test modes (different data rate and different modulation) are performed, but only the worst case(802.11b_11Mbps) is recorded in this report.

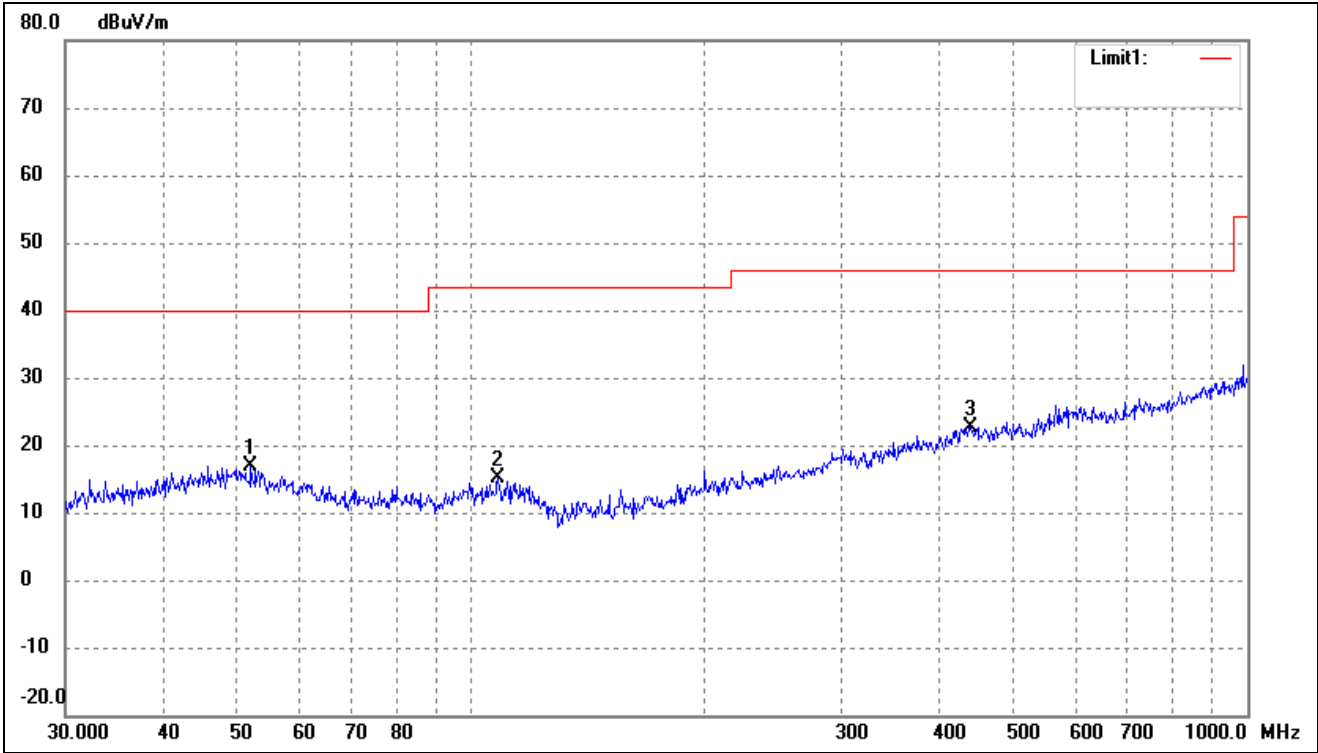
➤ Spurious Emissions Below 1GHz

802.11b_11Mbps			
Test Channel	Low	Polarity:	Horizontal



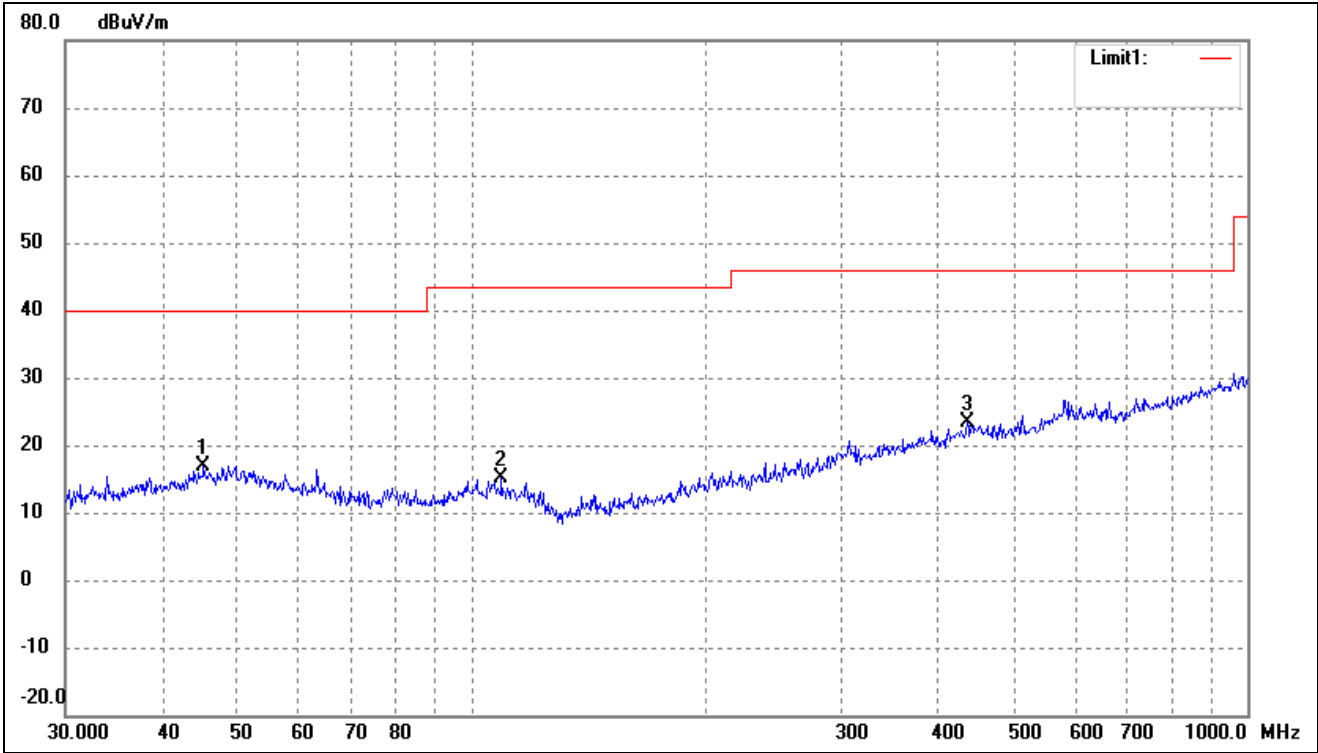
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	45.5348	28.48	-10.53	17.95	40.00	-22.05	-	-	peak
2	117.3603	26.97	-12.94	14.03	43.50	-29.47	-	-	peak
3	432.5457	27.54	-4.39	23.15	46.00	-22.85	-	-	peak

802.11b_11Mbps			
Test Channel	Low	Polarity:	Vertical



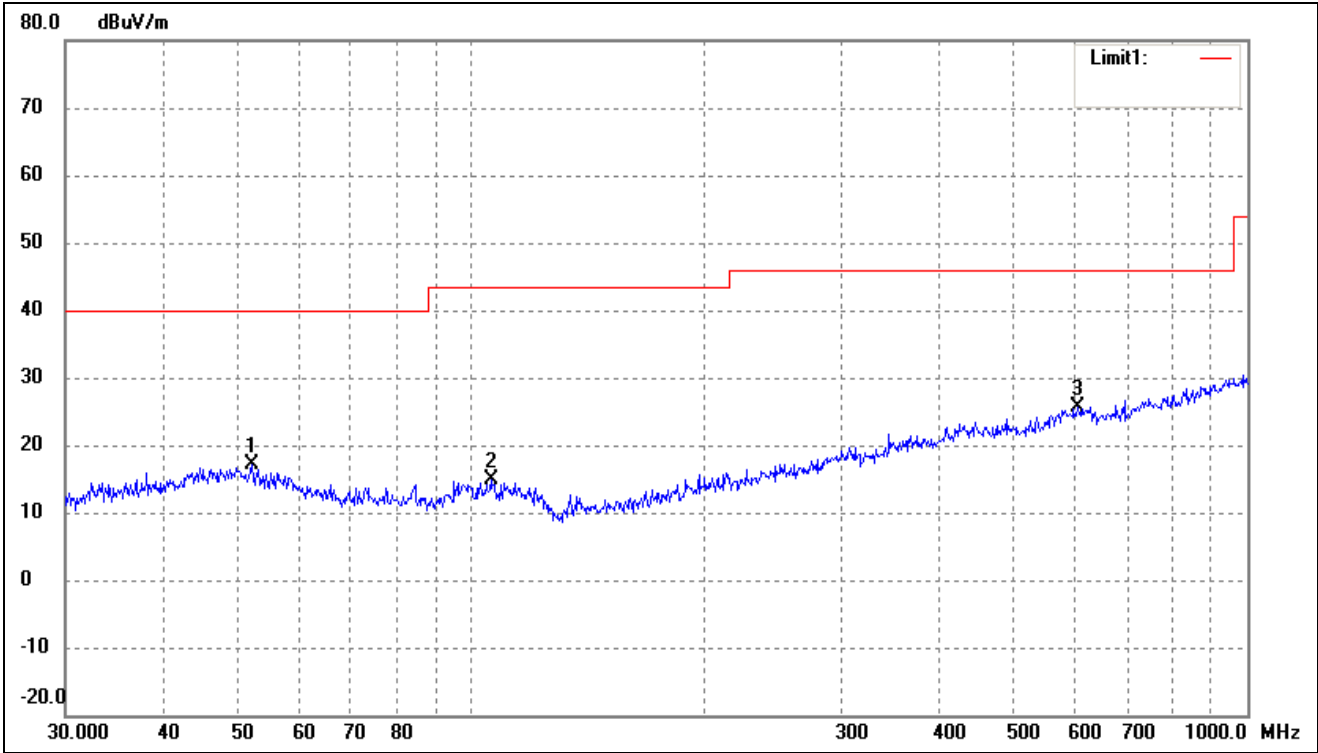
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	52.0251	27.39	-10.63	16.76	40.00	-23.24	-	-	peak
2	108.2667	27.43	-12.20	15.23	43.50	-28.27	-	-	peak
3	440.1963	27.11	-4.41	22.70	46.00	-23.30	-	-	peak

802.11b_11Mbps			
Test Channel	Middle	Polarity:	Horizontal



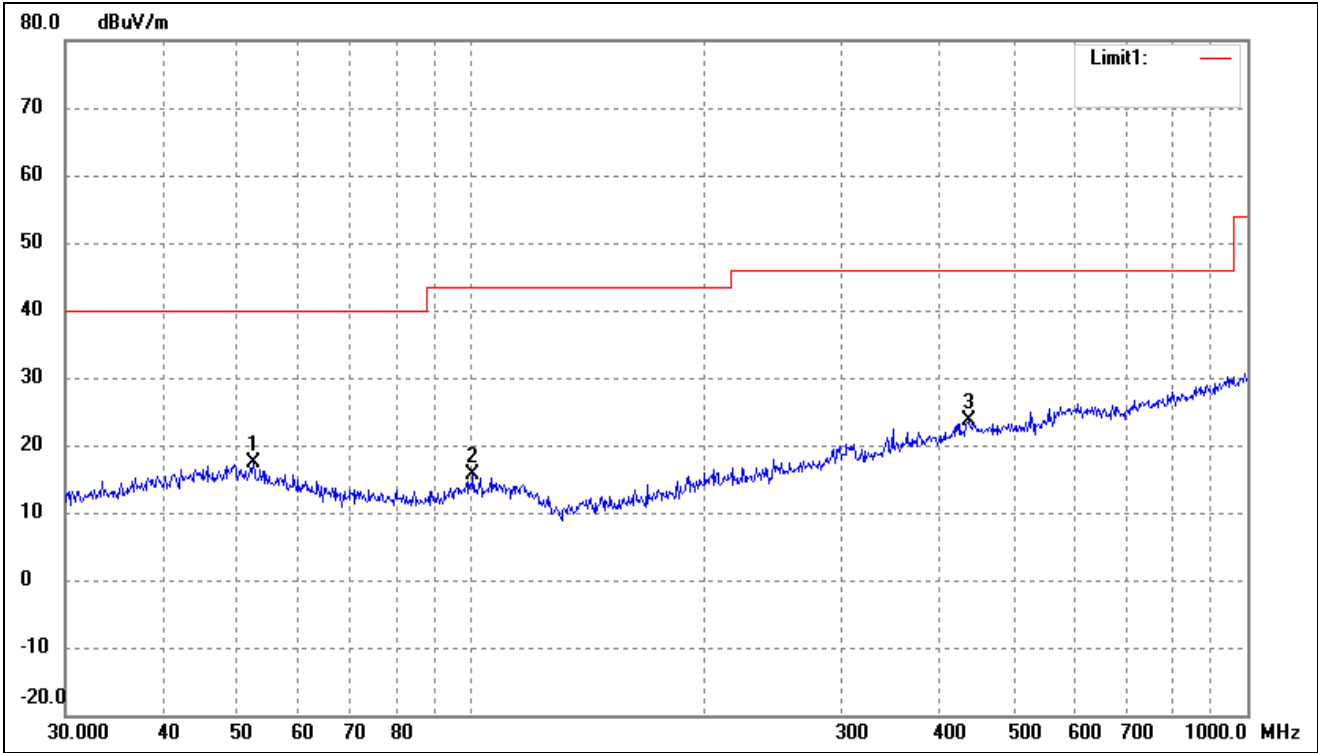
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	45.2166	27.47	-10.55	16.92	40.00	-23.08	-	-	peak
2	109.4116	27.25	-12.18	15.07	43.50	-28.43	-	-	peak
3	435.5898	27.83	-4.40	23.43	46.00	-22.57	-	-	peak

802.11b_11Mbps			
Test Channel	Middle	Polarity:	Vertical



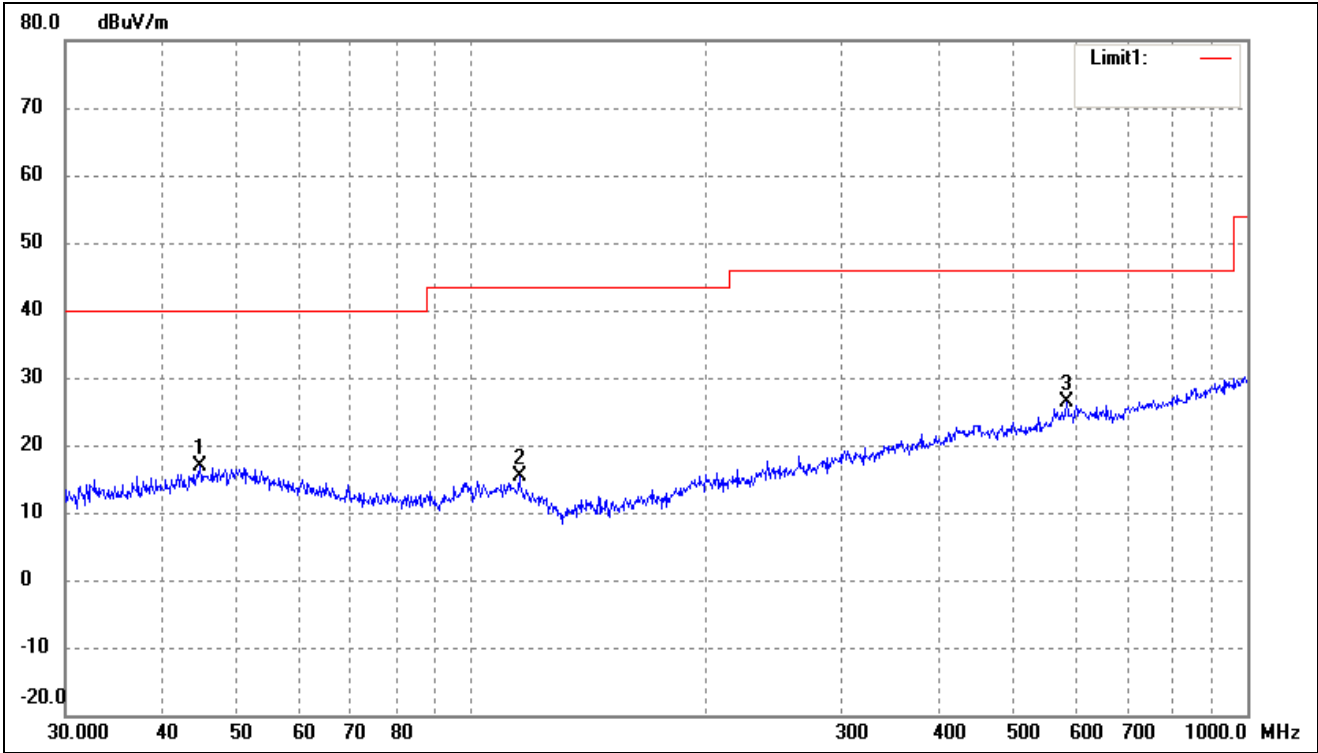
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	52.2079	27.83	-10.67	17.16	40.00	-22.84	-	-	peak
2	106.0126	27.10	-12.25	14.85	43.50	-28.65	-	-	peak
3	603.5392	27.93	-2.30	25.63	46.00	-20.37	-	-	peak

802.11b_11Mbps			
Test Channel	High	Polarity:	Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	52.3913	27.99	-10.70	17.29	40.00	-22.71	-	-	peak
2	100.5806	27.87	-12.36	15.51	43.50	-27.99	-	-	peak
3	438.6554	27.96	-4.41	23.55	46.00	-22.45	-	-	peak

802.11b_11Mbps			
Test Channel	High	Polarity:	Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	44.7434	27.43	-10.63	16.80	40.00	-23.20	-	-	peak
2	115.3205	28.17	-12.73	15.44	43.50	-28.06	-	-	peak
3	584.7895	28.73	-2.44	26.29	46.00	-19.71	-	-	peak

Remark: ‘-’Means’ the test Degree and Height are not recorded by the test software and only show the worst case in the test report.

- Spurious Emissions Above 1GHz
- Test Mode: 802.11b_11Mbps (worst case)

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel-2412MHz							
4824.000	58.29	-3.86	54.43	74	-19.57	H	PK
4824.000	42.56	-3.86	38.7	54	-15.3	H	AV
7236.000	58.95	1.1	60.05	74	-13.95	H	PK
7236.000	41.75	1.1	42.85	54	-11.15	H	AV
4824.000	55.98	-3.86	52.12	74	-21.88	V	PK
4824.000	41.64	-3.86	37.78	54	-16.22	V	AV
7236.000	55.04	1.1	56.14	74	-17.86	V	PK
7236.000	41.92	1.1	43.02	54	-10.98	V	AV
Middle Channel-2437MHz							
4874.000	60.07	-3.49	56.58	74	-17.42	H	PK
4874.000	40.25	-3.49	36.76	54	-17.24	H	AV
7311.000	60.2	-0.47	59.73	74	-14.27	H	PK
7311.000	38.28	-0.47	37.81	54	-16.19	H	AV
4874.000	59.01	-3.49	55.52	74	-18.48	V	PK
4874.000	41.78	-3.49	38.29	54	-15.71	V	AV
7311.000	61.48	-0.47	61.01	74	-12.99	V	PK
7311.000	40.81	-0.47	40.34	54	-13.66	V	AV
High Channel-2462MHz							
4924.000	61.12	-3.41	57.71	74	-16.29	H	PK
4924.000	40.84	-3.41	37.43	54	-16.57	H	AV
7386.000	59.07	-0.42	58.65	74	-15.35	H	PK
7386.000	40.31	-0.42	39.89	54	-14.11	H	AV
4924.000	59.07	-3.41	55.66	74	-18.34	V	PK
4924.000	40.4	-3.41	36.99	54	-17.01	V	AV
7386.000	58.74	-0.42	58.32	74	-15.68	V	PK
7386.000	38.66	-0.42	38.24	54	-15.76	V	AV

Note: Testing is carried out with frequency rang 9kHz to the tenth harmonics, other than listed in the table above are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

8. Out of Band Emissions

8.1 Standard Applicable

According to §15.247(d), in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions 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).

8.2 Test Procedure

According to the KDB 558074D01 v05r02 Subclause 8.4 and ANSI C63.10-2013 Subclause 11.11, the Emissions in nonrestricted frequency bands test method as follows:

- a) Set the center frequency and span to encompass frequency range to be measured.
- b) Set the RBW = 100 kHz.
- c) Set the VBW $\geq [3 \times \text{RBW}]$.
- d) Detector = peak.
- e) Sweep time = auto couple.
- f) Trace mode = max hold.
- g) Allow trace to fully stabilize.
- h) Use the peak marker function to determine the maximum amplitude level.

According to the KDB 558074 D01 v05r02 Subclause 8.5 and ANSI C63.10-2013 Subclause 11.12, the Emissions in restricted frequency bands test method as follows:

A. Radiated emission measurements:

Set span = wide enough to capture the peak level of the emission operating on the channel closest to the bandedge, as well as any modulation products which fall outside of the authorized band of operation (2310MHz to 2420MHz for low bandedge, 2460MHz to 2500MHz for the high bandedge)

RBW = 1MHz, VBW = 1MHz for peak value measured

RBW = 1MHz, VBW = 10Hz for average value measured

Sweep = auto; Detector function = peak/average; Trace = max hold

All the trace to stabilize, set the marker on the emission at the bandedge, or on the highest modulation product outside of the band, if this level is greater than that at the bandedge. Enable the marker-delta function, then use the marker-to-peak function to move the marker to the peak of the in-band emission. Those emission must comply with the 15.209 limit for fall in the restricted bands listed in section 15.205. Note that the method of measurement

KDB publication number: 913591 may be used for the radiated bandedge measurements.

B. Antenna-port conducted measurements

Peak emission levels are measured by setting the instrument as follows:

- a) RBW = as specified in Table 9.
- b) $VBW \geq [3 \times RBW]$.
- c) Detector = peak.
- d) Sweep time = auto.
- e) Trace mode = max hold.
- f) Allow sweeps to continue until the trace stabilizes. (Note that the required measurement time may be lengthened for low-duty-cycle applications.)

Table 9—RBW as a function of frequency

Frequency	RBW
9 kHz to 150 kHz	200 Hz to 300 Hz
0.15 MHz to 30 MHz	9 kHz to 10 kHz
30 MHz to 1000 MHz	100 kHz to 120 kHz
>1000 MHz	1 MHz

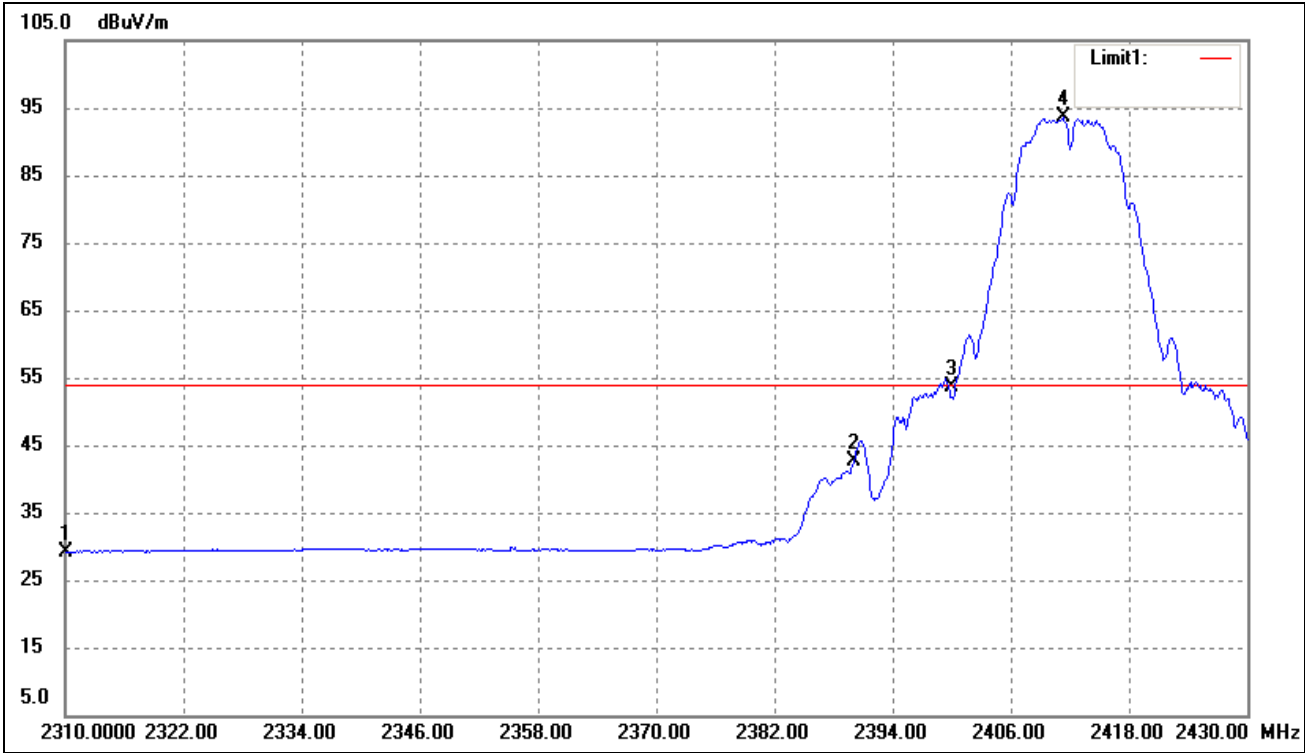
If the peak-detected amplitude can be shown to comply with the average limit, then it is not necessary to perform a separate average measurement.

Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) are attenuated by at least the minimum requirements specified in section 8.1. Report the three highest emissions relative to the limit.

8.3 Summary of Test Results/Plots

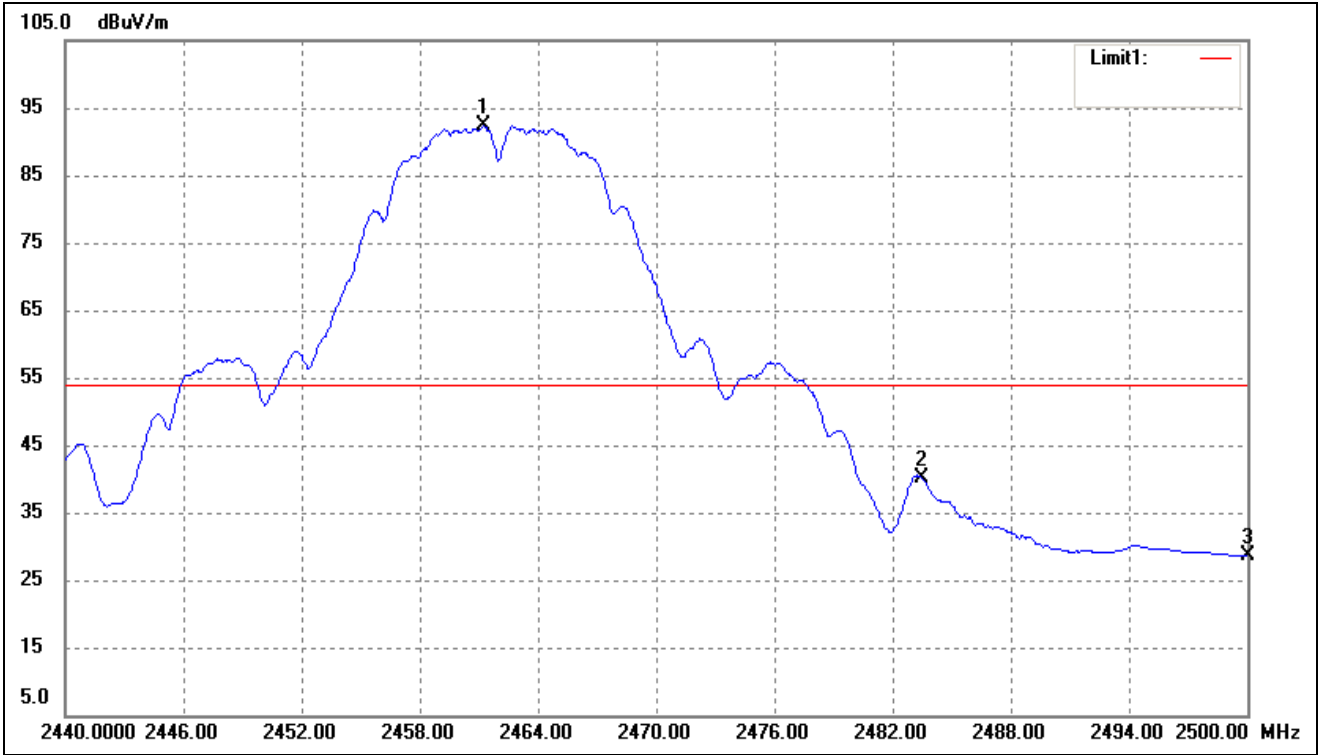
➤ Radiated test

802.11b_11Mbps			
Test Channel	Low	Polarity:	Vertical(worst case)



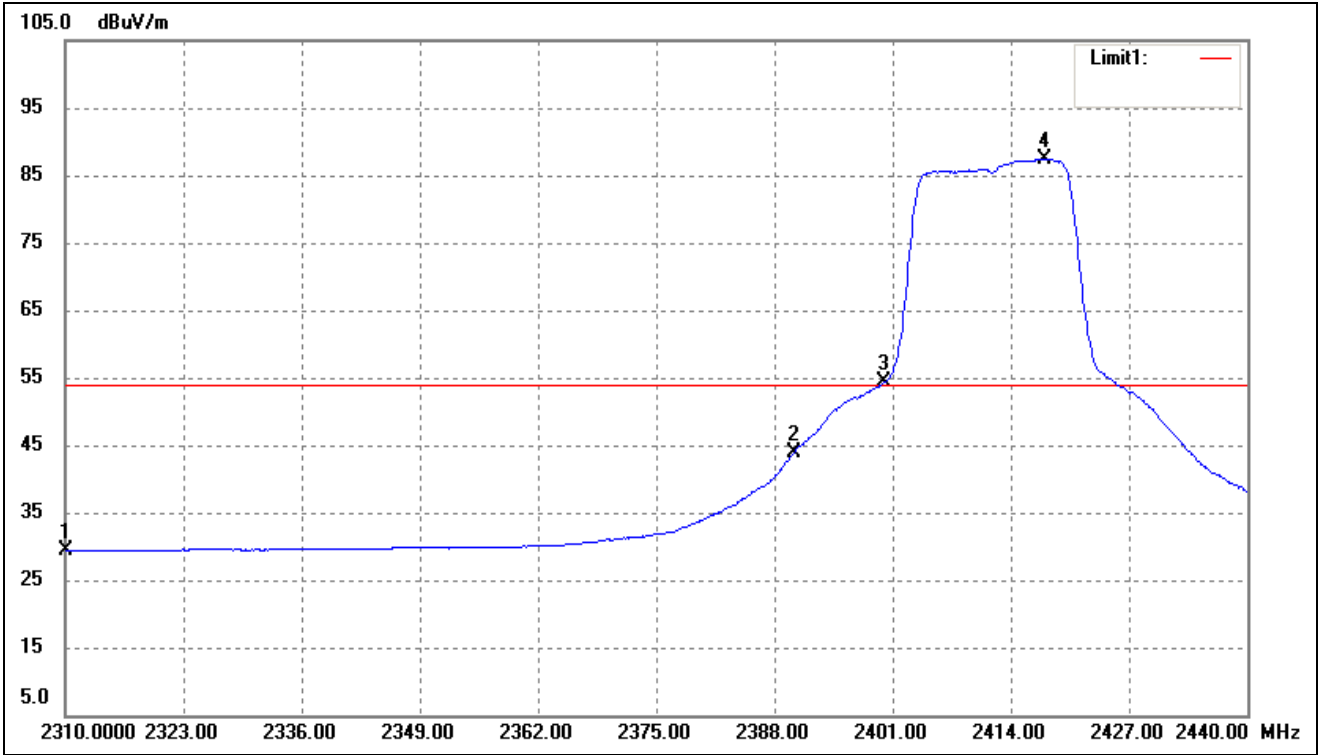
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	38.86	-9.66	29.20	54.00	-24.80	Average Detector
	2310.000	52.56	-9.66	42.90	74.00	-31.10	Peak Detector
2	2390.000	52.17	-9.50	42.67	54.00	-11.33	Average Detector
	2390.000	65.09	-9.50	55.59	74.00	-18.41	Peak Detector
3	2400.000	63.09	-9.48	53.61	Delta=39.91dBc		Average Detector
4	2411.280	102.98	-9.46	93.52			Average Detector

802.11b_11Mbps			
Test Channel	High	Polarity:	Vertical(worst case)



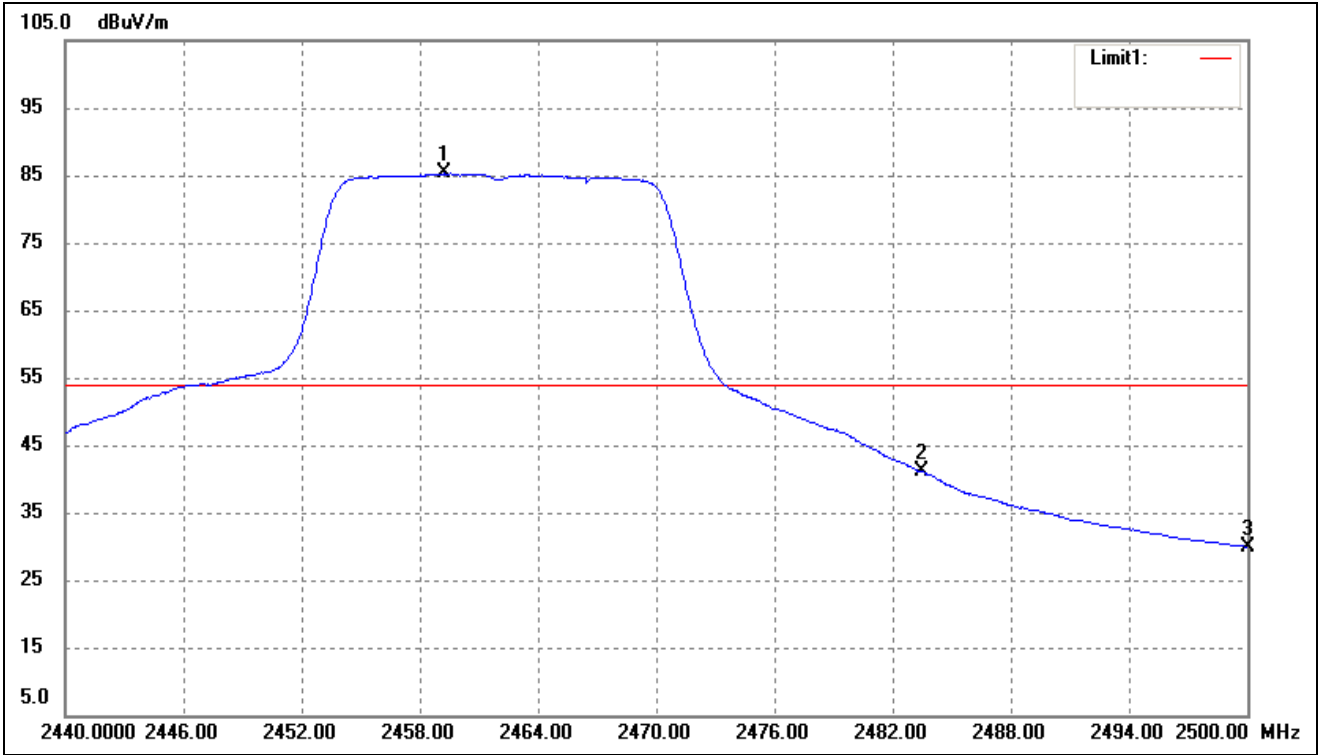
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2461.240	101.67	-9.36	92.31	/	/	Average Detector
	2463.160	107.48	-9.36	98.12	/	/	Peak Detector
2	2483.500	49.33	-9.31	40.02	54.00	-13.98	Average Detector
	2483.500	57.92	-9.31	48.61	74.00	-25.39	Peak Detector
3	2500.000	37.92	-9.28	28.64	54.00	-25.36	Average Detector
	2500.000	52.22	-9.28	42.94	74.00	-31.06	Peak Detector

802.11g_54Mbps			
Test Channel	Low	Polarity:	Vertical(worst case)



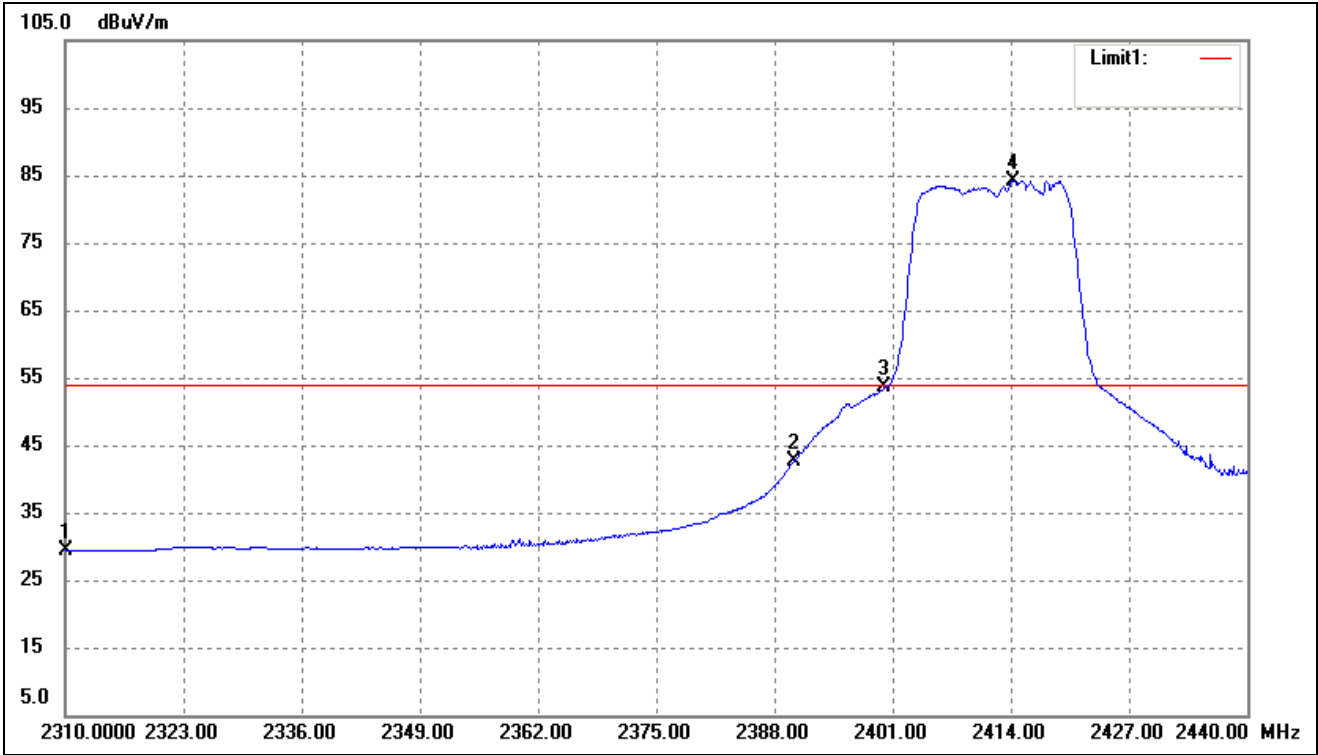
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	38.96	-9.66	29.30	54.00	-24.70	Average Detector
	2310.000	52.02	-9.66	42.36	74.00	-31.64	Peak Detector
2	2390.000	53.26	-9.50	43.76	54.00	-10.24	Average Detector
	2390.000	71.00	-9.50	61.50	74.00	-12.50	Peak Detector
3	2400.000	63.86	-9.48	54.38	Delta=33.03dBc		Average Detector
4	2417.770	96.85	-9.44	87.41			Average Detector

802.11g_54Mbps			
Test Channel	High	Polarity:	Vertical(worst case)



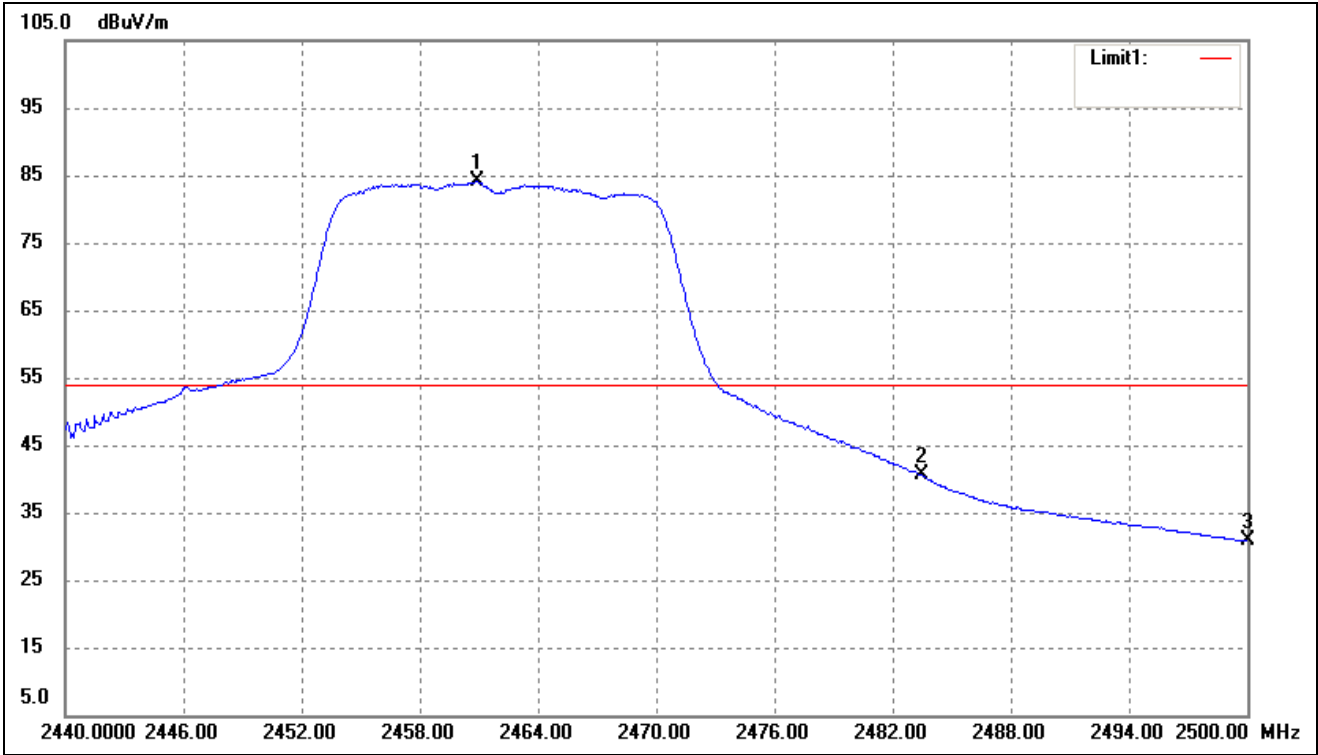
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2459.260	94.67	-9.36	85.31	/	/	Average Detector
	2457.340	106.99	-9.36	97.63	/	/	Peak Detector
2	2483.500	50.41	-9.31	41.10	54.00	-12.90	Average Detector
	2483.500	69.16	-9.31	59.85	74.00	-14.15	Peak Detector
3	2500.000	39.22	-9.28	29.94	54.00	-24.06	Average Detector
	2500.000	53.23	-9.28	43.95	74.00	-30.05	Peak Detector

802.11n-HT20_MCS7			
Test Channel	Low	Polarity:	Vertical(worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	38.99	-9.66	29.33	54.00	-24.67	Average Detector
	2310.000	51.68	-9.66	42.02	74.00	-31.98	Peak Detector
2	2390.000	52.06	-9.50	42.56	54.00	-11.44	Average Detector
	2390.000	69.37	-9.50	59.87	74.00	-14.13	Peak Detector
3	2400.000	62.99	-9.48	53.51	Delta=30.74dBc		Average Detector
4	2414.260	93.70	-9.45	84.25			Average Detector

802.11n-HT20_MCS7			
Test Channel	High	Polarity:	Vertical(worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2460.880	93.38	-9.36	84.02	/	/	Average Detector
	2464.780	108.00	-9.35	98.65	/	/	Peak Detector
2	2483.500	49.82	-9.31	40.51	54.00	-13.49	Average Detector
	2483.500	69.57	-9.31	60.26	74.00	-13.74	Peak Detector
3	2500.000	40.12	-9.28	30.84	54.00	-23.16	Average Detector
	2500.000	54.36	-9.28	45.08	74.00	-28.92	Peak Detector

➤ Conducted test

Please refer to Appendix D

9. Conducted Emissions

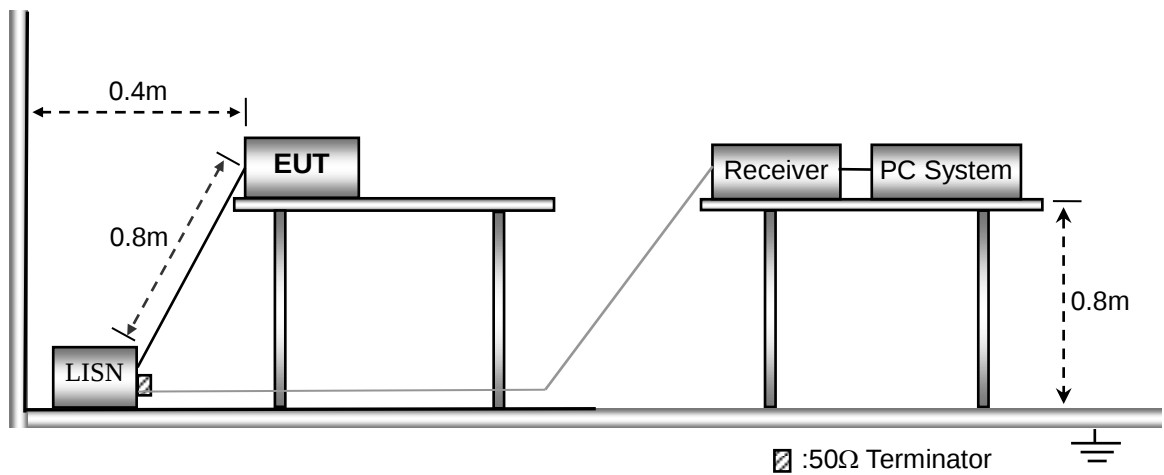
9.1 Test Procedure

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 Limit.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

9.2 Basic Test Setup Block Diagram



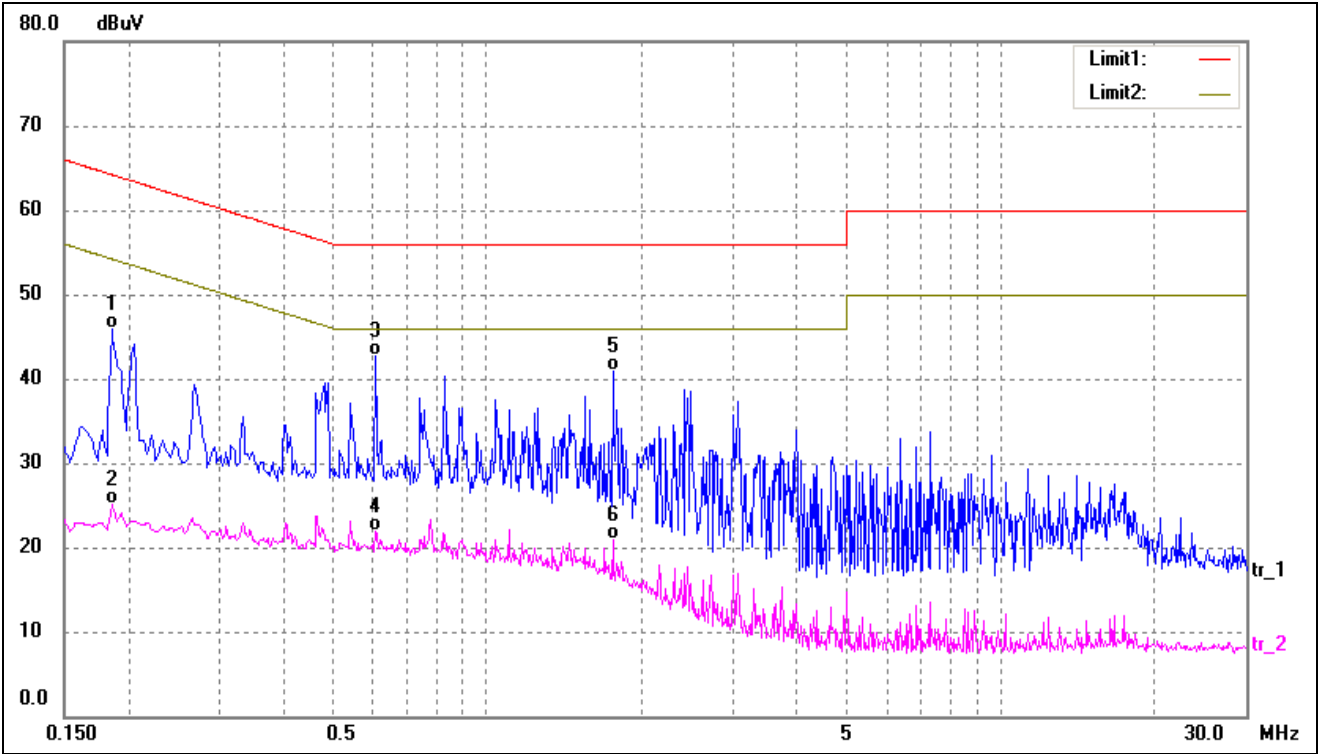
9.3 Test Receiver Setup

During the conducted emission test, the test receiver was set with the following configurations:

Start Frequency	150 kHz
Stop Frequency	30 MHz
Sweep Speed	Auto
IF Bandwidth.....	10 kHz
Quasi-Peak Adapter Bandwidth	9 kHz
Quasi-Peak Adapter Mode	Normal

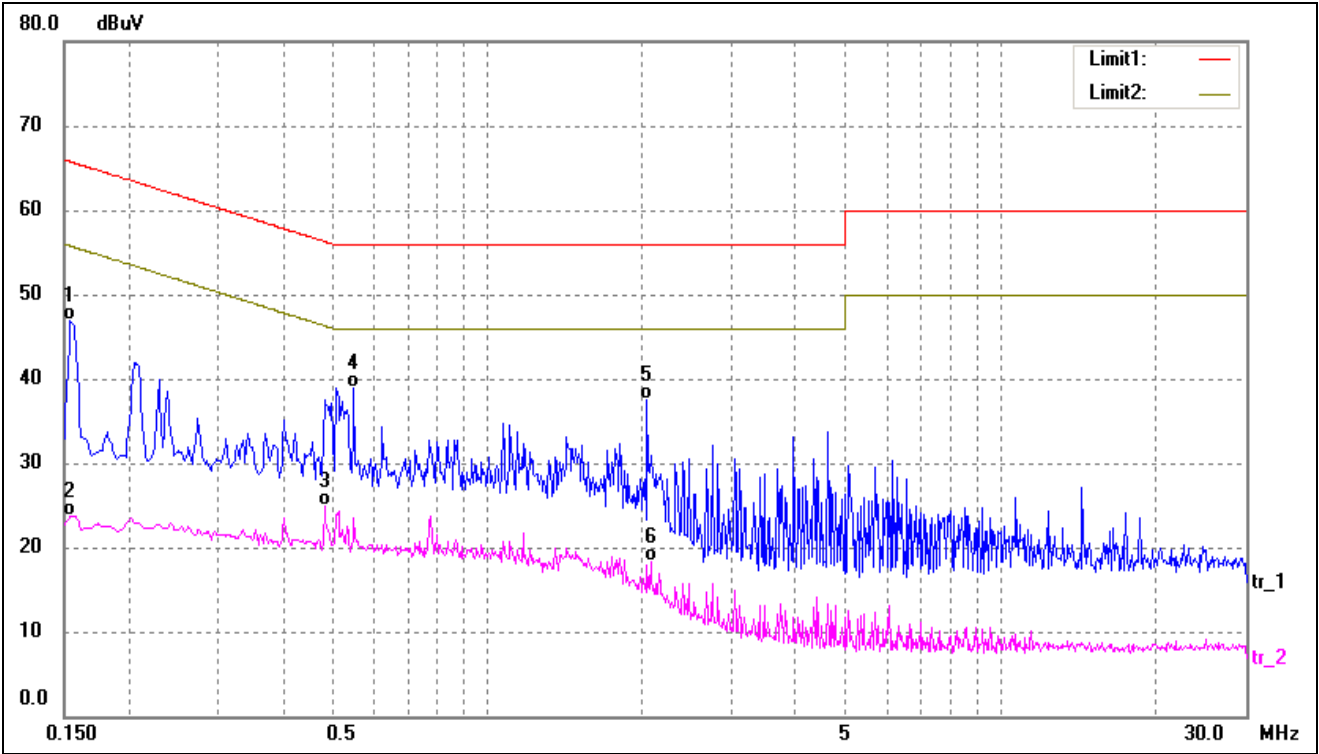
9.4 Summary of Test Results/Plots

Test Mode	Communication	AC120V 60Hz	Polarity:	Neutral
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No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1860	35.74	10.26	46.00	64.21	-18.21	QP
2	0.1860	14.81	10.26	25.07	54.21	-29.14	AVG
3*	0.6060	32.58	10.21	42.79	56.00	-13.21	QP
4	0.6060	11.69	10.21	21.90	46.00	-24.10	AVG
5	1.7540	30.74	10.26	41.00	56.00	-15.00	QP
6	1.7540	10.55	10.26	20.81	46.00	-25.19	AVG

Test Mode	Communication	AC120V 60Hz	Polarity:	Line
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No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1539	36.58	10.25	46.83	65.78	-18.95	QP
2	0.1539	13.48	10.25	23.73	55.78	-32.05	AVG
3	0.4820	14.75	10.22	24.97	46.30	-21.33	AVG
4*	0.5500	28.70	10.21	38.91	56.00	-17.09	QP
5	2.0500	27.16	10.29	37.45	56.00	-18.55	QP
6	2.0860	8.05	10.29	18.34	46.00	-27.66	AVG

APPENDIX SUMMARY

Project No.	WTX20X12093711W	Test Engineer	Shaw
Start date	2020/12/15	Finish date	2020/12/15
Temperature	24℃	Humidity	54%
RF specifications	WIFI-2.4G		

APPENDIX	Description of Test Item	Result
A	Power Spectral Density	Compliant
B	DTS Bandwidth	Compliant
C	RF Output Power	Compliant
D	Conducted Out of Band Emissions	Compliant

APPENDIX A

Power Spectral Density			
Test Mode	Test Channel MHz	Power Spectral Density dBm/3kHz	Limit dBm/3kHz
802.11b_1Mbps	2412	-18.30	8
	2437	-18.70	8
	2462	-19.46	8
802.11g_6Mbps	2412	-22.89	8
	2437	-22.25	8
	2462	-23.56	8
802.11n-HT20_MCS0	2412	-23.98	8
	2437	-23.37	8
	2462	-23.85	8

802.11b-Low	Agilent R T Ref 0 dBm Atten 10 dB Mkr1 2.41380 GHz -18.3 dBm #Avg Log 10 dB/ Offst 1 dB M1 S2 S3 FC AA Marker 2.413800000 GHz -18.3 dBm Center 2.412 GHz #Res BW 3 kHz #VBW 10 kHz Sweep 5.425 s (1001 pts) Span 30 MHz Peak Search Meas Tools ▶ Next Peak Next Pk Right Next Pk Left Min Search Pk-Pk Search More 1 of 2
802.11b-Middle	Agilent R T Ref 0 dBm Atten 10 dB Mkr1 2.43526 GHz -18.7 dBm #Avg Log 10 dB/ Offst 1 dB M1 S2 S3 FC AA Marker 2.435260000 GHz -18.7 dBm Center 2.437 GHz #Res BW 3 kHz #VBW 10 kHz Sweep 5.425 s (1001 pts) Span 30 MHz Peak Search Meas Tools ▶ Next Peak Next Pk Right Next Pk Left Min Search Pk-Pk Search More 1 of 2
802.11b-High	Agilent R T Ref 0 dBm Atten 10 dB Mkr1 2.46035 GHz -19.46 dBm #Avg Log 10 dB/ Offst 1 dB M1 S2 S3 FC AA Marker 2.460350000 GHz -19.46 dBm Center 2.462 GHz #Res BW 3 kHz #VBW 10 kHz Sweep 5.425 s (1001 pts) Span 30 MHz Peak Search Meas Tools ▶ Next Peak Next Pk Right Next Pk Left Min Search Pk-Pk Search More 1 of 2

802.11g-Low	Agilent R T Ref 0 dBm Atten 10 dB Mkr1 2.41854 GHz -22.89 dBm #Avg Log 10 dB/ Offset 1 dB M1 S2 S3 FC AA Marker 2.418540000 GHz -22.89 dBm Center 2.412 GHz #Res BW 3 kHz #VBW 10 kHz Sweep 5.425 s (1001 pts) Span 30 MHz Peak Search Meas Tools ▶ Next Peak Next Pk Right Next Pk Left Min Search Pk-Pk Search More 1 of 2
802.11g-Middle	Agilent R T Ref 0 dBm Atten 10 dB Mkr1 2.43949 GHz -22.25 dBm #Avg Log 10 dB/ Offset 1 dB M1 S2 S3 FC AA Marker 2.439490000 GHz -22.25 dBm Center 2.437 GHz #Res BW 3 kHz #VBW 10 kHz Sweep 5.425 s (1001 pts) Span 30 MHz Peak Search Meas Tools ▶ Next Peak Next Pk Right Next Pk Left Min Search Pk-Pk Search More 1 of 2
802.11g-High	Agilent R T Ref 0 dBm Atten 10 dB Mkr1 2.45852 GHz -23.56 dBm #Avg Log 10 dB/ Offset 1 dB M1 S2 S3 FC AA Marker 2.458520000 GHz -23.56 dBm Center 2.462 GHz #Res BW 3 kHz #VBW 10 kHz Sweep 5.425 s (1001 pts) Span 30 MHz Peak Search Meas Tools ▶ Next Peak Next Pk Right Next Pk Left Min Search Pk-Pk Search More 1 of 2

802.11n-HT20-Low	Agilent R T Ref 0 dBm Atten 10 dB Mkr1 2.40978 GHz 23.98 dBm #Avg Log 10 dB/ Offset 1 dB M1 S2 S3 FC AA Marker 2.409780000 GHz -23.98 dBm Center 2.412 GHz #Res BW 3 kHz #VBW 10 kHz Sweep 5.425 s (1001 pts) Span 30 MHz Peak Search Meas Tools ▶ Next Peak Next Pk Right Next Pk Left Min Search Pk-Pk Search More 1 of 2
802.11n-HT20-Middle	Agilent R T Ref 0 dBm Atten 10 dB Mkr1 2.43478 GHz 23.37 dBm #Avg Log 10 dB/ Offset 1 dB M1 S2 S3 FC AA Marker 2.434780000 GHz -23.37 dBm Center 2.437 GHz #Res BW 3 kHz #VBW 10 kHz Sweep 5.425 s (1001 pts) Span 30 MHz Peak Search Meas Tools ▶ Next Peak Next Pk Right Next Pk Left Min Search Pk-Pk Search More 1 of 2
802.11n-HT20-High	Agilent R T Ref 0 dBm Atten 10 dB Mkr1 2.45978 GHz 23.85 dBm #Avg Log 10 dB/ Offset 1 dB M1 S2 S3 FC AA Marker 2.459780000 GHz -23.85 dBm Center 2.462 GHz #Res BW 3 kHz #VBW 10 kHz Sweep 5.425 s (1001 pts) Span 30 MHz Peak Search Meas Tools ▶ Next Peak Next Pk Right Next Pk Left Min Search Pk-Pk Search More 1 of 2

APPENDIX B

DTS Bandwidth			
Test Mode	Test Channel MHz	6 dB Bandwidth MHz	Limit kHz
802.11b_1Mbps	2412	9.787	≥500
	2437	10.023	≥500
	2462	10.016	≥500
802.11g_6Mbps	2412	16.394	≥500
	2437	16.369	≥500
	2462	16.419	≥500
802.11n-HT20_MCS0	2412	17.557	≥500
	2437	17.581	≥500
	2462	18.627	≥500

Channel	Occupied Bandwidth	Center Freq	Span	Res BW	VBW	Sweep	Transmit Freq Error	x dB Bandwidth
802.11b-Low	12.2170 MHz	2.412 GHz	30 MHz	100 kHz	300 kHz	10 ms (1001 pts)	8.755 kHz	9.787 MHz
802.11b-Middle	12.2511 MHz	2.437 GHz	30 MHz	100 kHz	300 kHz	10 ms (1001 pts)	-22.453 kHz	10.023 MHz
802.11b-High	12.2497 MHz	2.462 GHz	30 MHz	100 kHz	300 kHz	10 ms (1001 pts)	-25.663 kHz	10.016 MHz

802.11g-Low	Agilent R T Ch Freq 2.412 GHz Trig Free Occupied Bandwidth Ref 20 dBm Atten 30 dB #Peak Log 10 dB/ Offset 1 dB Center 2.412 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 10 ms (1001 pts) Span 30 MHz Occupied Bandwidth 16.5667 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB Transmit Freq Error -15.625 kHz x dB Bandwidth 16.394 MHz Trace/View 1 Trace 2 3 Clear Write Max Hold Min Hold View Blank More 1 of 2
802.11g-Middle	Agilent R T Ch Freq 2.437 GHz Trig Free Occupied Bandwidth Ref 20 dBm Atten 30 dB #Peak Log 10 dB/ Offset 1 dB Center 2.437 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 10 ms (1001 pts) Span 30 MHz Occupied Bandwidth 16.5671 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB Transmit Freq Error -32.872 kHz x dB Bandwidth 16.369 MHz Trace/View 1 Trace 2 3 Clear Write Max Hold Min Hold View Blank More 1 of 2
802.11g-High	Agilent R T Ch Freq 2.462 GHz Trig Free Occupied Bandwidth Ref 20 dBm Atten 30 dB #Peak Log 10 dB/ Offset 1 dB Center 2.462 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 10 ms (1001 pts) Span 30 MHz Occupied Bandwidth 16.6112 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB Transmit Freq Error -37.745 kHz x dB Bandwidth 16.419 MHz Freq/Channel Center Freq 2.46200000 GHz Start Freq 2.44700000 GHz Stop Freq 2.47700000 GHz CF Step 3.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Scale Type Log Lin

802.11n-HT20-Low	Agilent R T Ch Freq 2.412 GHz Trig Free Occupied Bandwidth Ref 20 dBm Atten 30 dB #Peak Log 10 dB/ Offst 1 dB Center 2.412 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 10 ms (1001 pts) Span 30 MHz Occupied Bandwidth 17.6548 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB Transmit Freq Error -1.163 kHz x dB Bandwidth 17.557 MHz Freq/Channel Center Freq 2.4120000 GHz Start Freq 2.3970000 GHz Stop Freq 2.4270000 GHz CF Step 3.0000000 MHz Auto Man Freq Offset 0.0000000 Hz Signal Track On Off Scale Type Log Lin
802.11n-HT20-Middle	Agilent R T Ch Freq 2.437 GHz Trig Free Occupied Bandwidth Ref 20 dBm Atten 30 dB #Peak Log 10 dB/ Offst 1 dB Center 2.437 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 10 ms (1001 pts) Span 30 MHz Occupied Bandwidth 17.6596 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB Transmit Freq Error -25.087 kHz x dB Bandwidth 17.581 MHz Freq/Channel Center Freq 2.4370000 GHz Start Freq 2.4220000 GHz Stop Freq 2.4520000 GHz CF Step 3.0000000 MHz Auto Man Freq Offset 0.0000000 Hz Signal Track On Off Scale Type Log Lin
802.11n-HT20-High	Agilent R T Ch Freq 2.462 GHz Trig Free Occupied Bandwidth Ref 20 dBm Atten 30 dB #Peak Log 10 dB/ Offst 1 dB Center 2.462 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 10 ms (1001 pts) Span 30 MHz Occupied Bandwidth 17.6661 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB Transmit Freq Error -16.360 kHz x dB Bandwidth 17.627 MHz Freq/Channel Center Freq 2.4620000 GHz Start Freq 2.4470000 GHz Stop Freq 2.4770000 GHz CF Step 3.0000000 MHz Auto Man Freq Offset 0.0000000 Hz Signal Track On Off Scale Type Log Lin

APPENDIX C

Test Mode	Frequency MHz	Reading dBm	Limit dBm
802.11b _ 1Mbps	2412	15.06	30.00
	2437	15.08	30.00
	2462	15.18	30.00
802.11g_6Mbps	2412	12.58	30.00
	2437	12.46	30.00
	2462	12.42	30.00
802.11n HT20_MCS0	2412	11.20	30.00
	2437	11.20	30.00
	2462	11.14	30.00

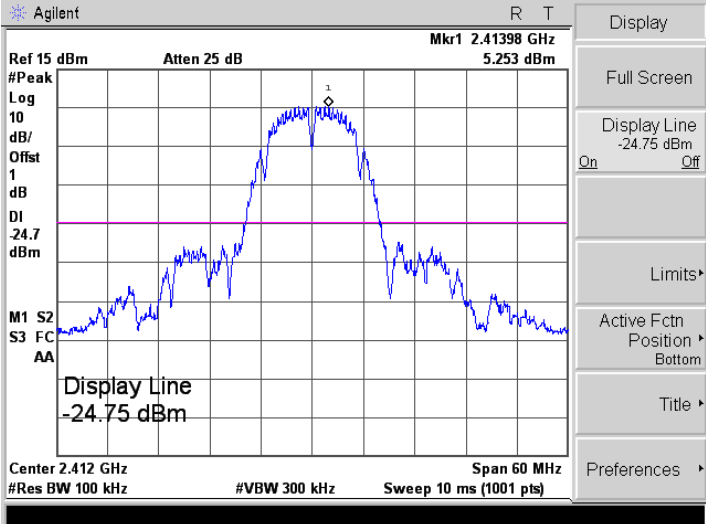
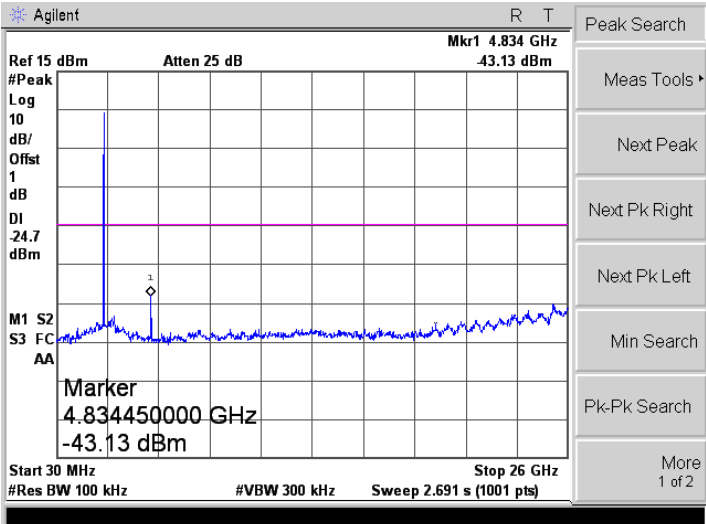
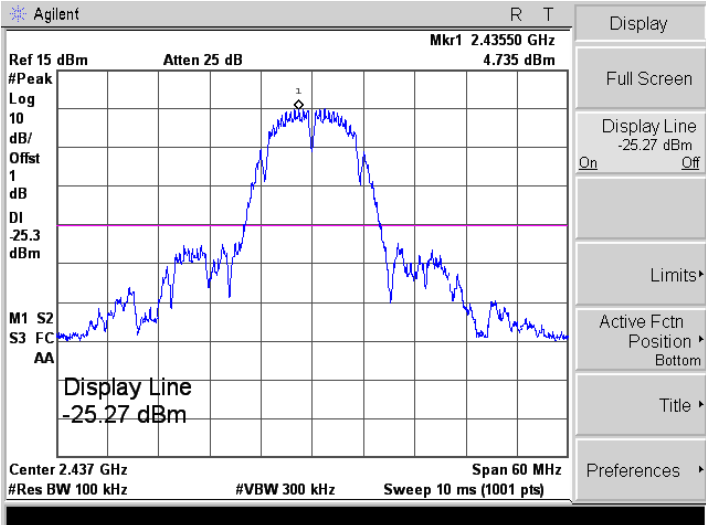
802.11b-Low	Agilent Ch Freq 2.412 GHz Trig Free Channel Power Ref 20 dBm Atten 30 dB #Avg Log 10 dB/ Offset 1 dB Center 2.412 GHz #Res BW 300 kHz #VBW 1 MHz Sweep 8 ms (401 pts) Span 30 MHz Channel Power Power Spectral Density 15.06 dBm / 20.0000 MHz -57.98 dBm/Hz Trace/View Trace 1 2 3 Clear Write Max Hold Min Hold View Blank More 1 of 2
802.11b-Middle	Agilent Ch Freq 2.437 GHz Trig Free Channel Power Ref 20 dBm Atten 30 dB #Avg Log 10 dB/ Offset 1 dB Center 2.437 GHz #Res BW 300 kHz #VBW 1 MHz Sweep 8 ms (401 pts) Span 30 MHz Channel Power Power Spectral Density 15.08 dBm / 20.0000 MHz -57.93 dBm/Hz Trace/View Trace 1 2 3 Clear Write Max Hold Min Hold View Blank More 1 of 2
802.11b-High	Agilent Ch Freq 2.462 GHz Trig Free Channel Power Ref 20 dBm Atten 30 dB #Avg Log 10 dB/ Offset 1 dB Center 2.462 GHz #Res BW 300 kHz #VBW 1 MHz Sweep 8 ms (401 pts) Span 30 MHz Channel Power Power Spectral Density 15.18 dBm / 20.0000 MHz -57.83 dBm/Hz Trace/View Trace 1 2 3 Clear Write Max Hold Min Hold View Blank More 1 of 2

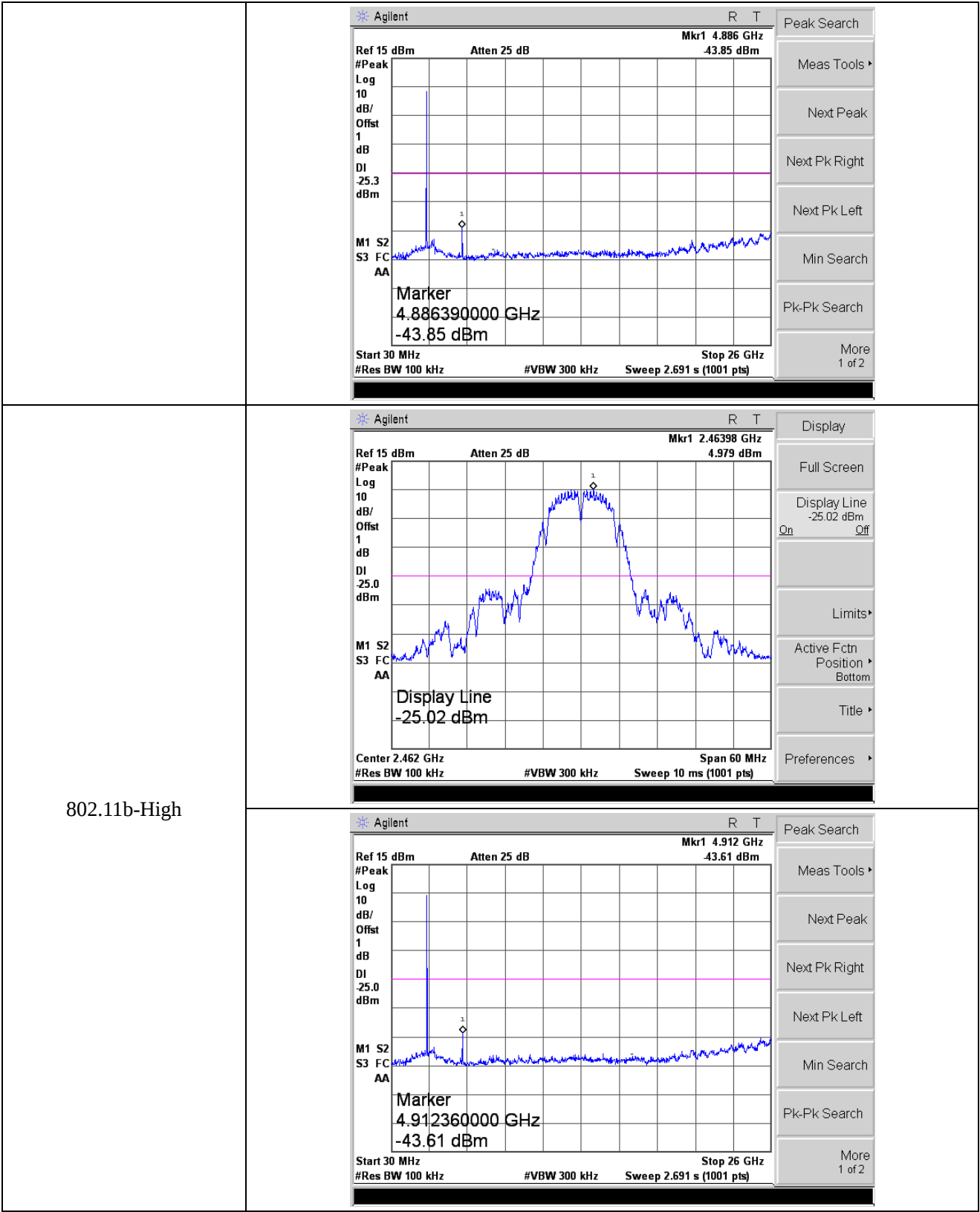
802.11g-Low	Agilent Ch Freq 2.412 GHz Trig Free Channel Power Ref 20 dBm Atten 30 dB #Avg Log 10 dB/ Offset 1 dB Center 2.412 GHz #Res BW 300 kHz #VBW 1 MHz Sweep 8 ms (401 pts) Span 30 MHz Channel Power Power Spectral Density 12.58 dBm / 20.0000 MHz -60.65 dBm/Hz Trace/View Trace 1 2 3 Clear Write Max Hold Min Hold View Blank More 1 of 2
802.11g-Middle	Agilent Ch Freq 2.437 GHz Trig Free Channel Power Ref 20 dBm Atten 30 dB #Avg Log 10 dB/ Offset 1 dB Center 2.437 GHz #Res BW 300 kHz #VBW 1 MHz Sweep 8 ms (401 pts) Span 30 MHz Channel Power Power Spectral Density 12.46 dBm / 20.0000 MHz -60.55 dBm/Hz Trace/View Trace 1 2 3 Clear Write Max Hold Min Hold View Blank More 1 of 2
802.11g-High	Agilent Ch Freq 2.462 GHz Trig Free Channel Power Ref 20 dBm Atten 30 dB #Avg Log 10 dB/ Offset 1 dB Center 2.462 GHz #Res BW 300 kHz #VBW 1 MHz Sweep 8 ms (401 pts) Span 30 MHz Channel Power Power Spectral Density 12.42 dBm / 20.0000 MHz -60.60 dBm/Hz Trace/View Trace 1 2 3 Clear Write Max Hold Min Hold View Blank More 1 of 2

802.11n-HT20-Low	Agilent Ch Freq 2.412 GHz Trig Free Channel Power Ref 20 dBm Atten 30 dB #Avg Log 10 dB/ Offset 1 dB Center 2.412 GHz #Res BW 300 kHz #VBW 1 MHz Sweep 8 ms (401 pts) Span 30 MHz Channel Power Power Spectral Density 11.20 dBm / 20.0000 MHz -61.81 dBm/Hz Trace/View Trace 1 2 3 Clear Write Max Hold Min Hold View Blank More 1 of 2
802.11n-HT20-Middle	Agilent Ch Freq 2.437 GHz Trig Free Channel Power Ref 20 dBm Atten 30 dB #Avg Log 10 dB/ Offset 1 dB Center 2.437 GHz #Res BW 300 kHz #VBW 1 MHz Sweep 8 ms (401 pts) Span 30 MHz Channel Power Power Spectral Density 11.20 dBm / 20.0000 MHz -61.81 dBm/Hz Trace/View Trace 1 2 3 Clear Write Max Hold Min Hold View Blank More 1 of 2
802.11n-HT20-High	Agilent Ch Freq 2.462 GHz Trig Free Channel Power Ref 20 dBm Atten 30 dB #Avg Log 10 dB/ Offset 1 dB Center 2.462 GHz #Res BW 300 kHz #VBW 1 MHz Sweep 8 ms (401 pts) Span 30 MHz Channel Power Power Spectral Density 11.14 dBm / 20.0000 MHz -61.87 dBm/Hz Trace/View Trace 1 2 3 Clear Write Max Hold Min Hold View Blank More 1 of 2

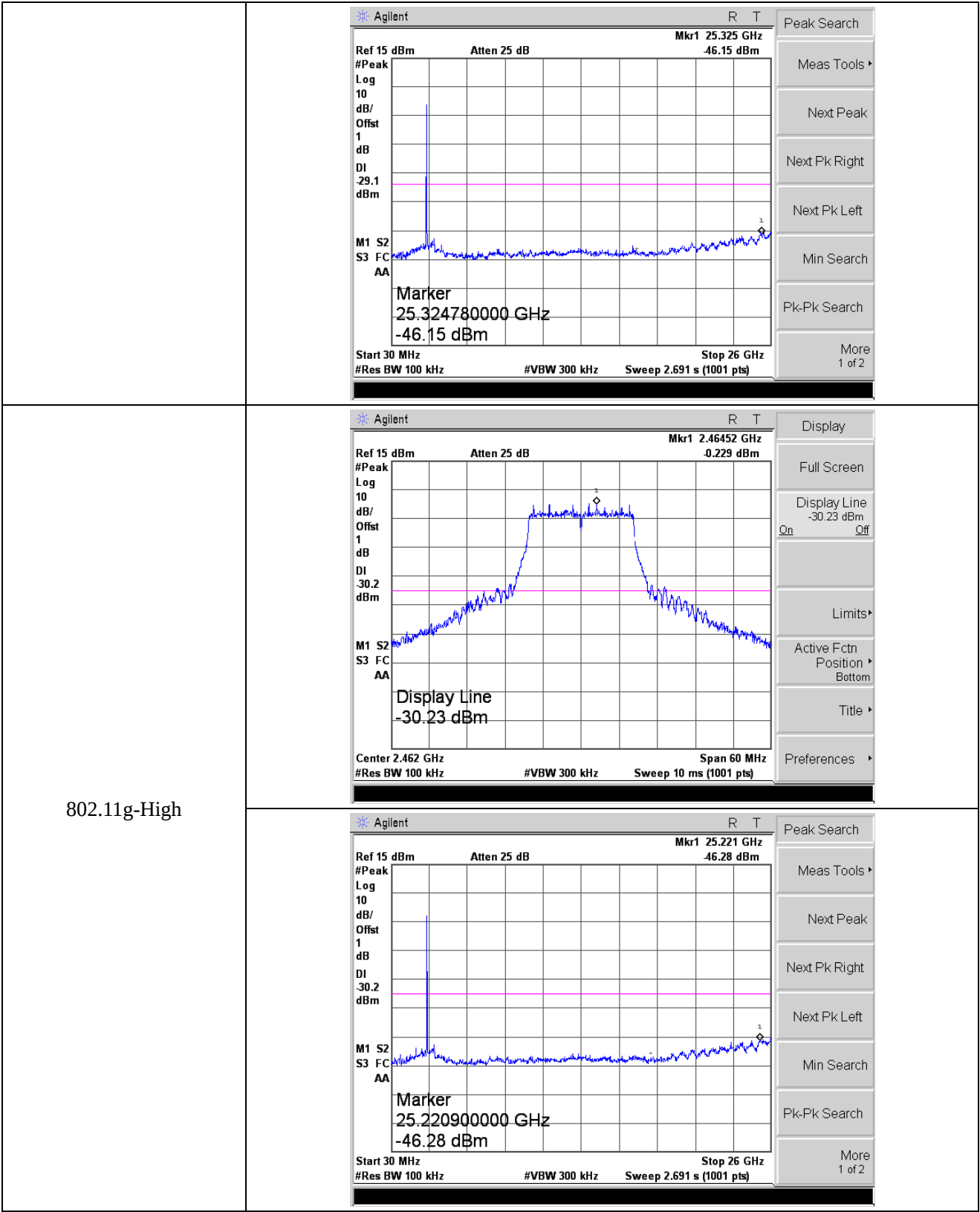
APPENDIX D

Conducted Out of Band Emissions

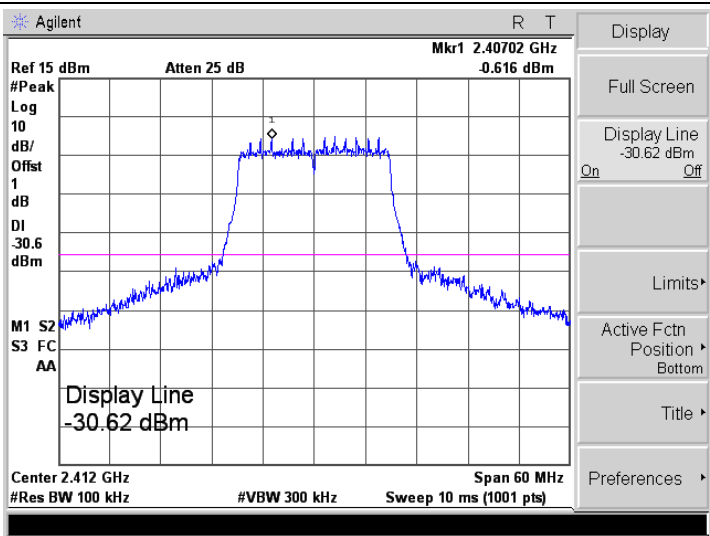
802.11b-Low	
	
802.11b-Middle	



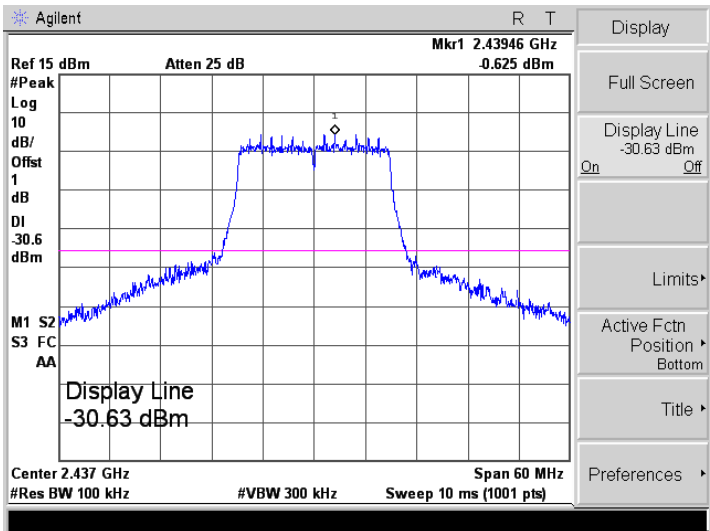
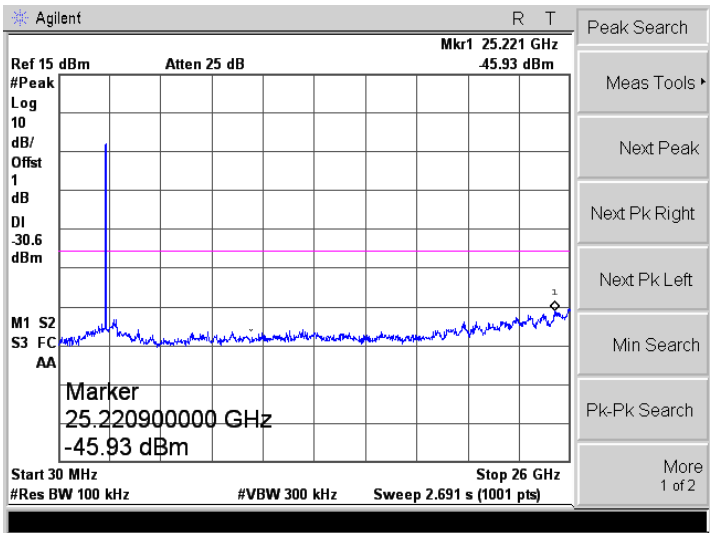
802.11g-Low	Agilent R T Ref 15 dBm Atten 25 dB Mkr1 2.41326 GHz 1.09 dBm #Peak Log 10 dB/ Offset 1 dB DI -29.0 dBm M1 S2 S3 FC AA Display Line -28.95 dBm Center 2.412 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 10 ms (1001 pts) Span 60 MHz Display Full Screen Display Line -28.95 dBm On Off Limits Active Fctn Position Bottom Title Preferences
	Agilent R T Ref 15 dBm Atten 25 dB Mkr1 25.325 GHz 45.67 dBm #Peak Log 10 dB/ Offset 1 dB DI -29.0 dBm M1 S2 S3 FC AA Marker 25.324780000 GHz -45.67 dBm Start 30 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.691 s (1001 pts) Stop 26 GHz Peak Search Meas Tools Next Peak Next Pk Right Next Pk Left Min Search Pk-Pk Search More 1 of 2
802.11g-Middle	Agilent R T Ref 15 dBm Atten 25 dB Mkr1 2.43202 GHz 0.912 dBm #Peak Log 10 dB/ Offset 1 dB DI -29.1 dBm M1 S2 S3 FC AA Display Line -29.09 dBm Center 2.437 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 10 ms (1001 pts) Span 60 MHz Display Full Screen Display Line -29.09 dBm On Off Limits Active Fctn Position Bottom Title Preferences

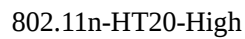


802.11n-HT20-Low



802.11n-HT20-Middle





APPENDIX PHOTOGRAPHS

Please refer to “ANNEX”

******* END OF REPORT *******