

FCC Test Report

Report No.: RFBHOU-WTW-P20110775

FCC ID: 2AAFM-20LAA9901

Test Model: 20LAA9901

Received Date: Nov. 25, 2020

Test Date: Nov. 27 to Dec. 4, 2020

Issued Date: Dec. 9, 2020

Applicant: Corsair Memory, Inc.

Address: 47100 Bayside Parkway 94538 Fremont, CA United States

Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Lin Kou Laboratories

Lab Address: No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan

**FCC Registration /
Designation Number:** 198487 / TW2021



This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification.

Table of Contents

Release Control Record	4
1 Certificate of Conformity	5
2 Summary of Test Results	6
2.1 Measurement Uncertainty.....	6
2.2 Modification Record.....	6
3 General Information	7
3.1 General Description of EUT.....	7
3.2 Description of Test Modes.....	8
3.2.1 Test Mode Applicability and Tested Channel Detail.....	9
3.3 Duty Cycle of Test Signal.....	11
3.4 Description of Support Units.....	12
3.4.1 Configuration of System under Test.....	12
3.5 General Description of Applied Standards and References.....	13
4 Test Types and Results	14
4.1 Radiated Emission and Bandedge Measurement.....	14
4.1.1 Limits of Radiated Emission and Bandedge Measurement.....	14
4.1.2 Test Instruments.....	15
4.1.3 Test Procedures.....	16
4.1.4 Deviation from Test Standard.....	16
4.1.5 Test Setup.....	17
4.1.6 EUT Operating Conditions.....	18
4.1.7 Test Results.....	19
4.2 Conducted Emission Measurement.....	30
4.2.1 Limits of Conducted Emission Measurement.....	30
4.2.2 Test Instruments.....	30
4.2.3 Test Procedures.....	31
4.2.4 Deviation from Test Standard.....	31
4.2.5 Test Setup.....	31
4.2.6 EUT Operating Conditions.....	31
4.2.7 Test Results.....	32
4.3 6dB Bandwidth Measurement.....	34
4.3.1 Limits of 6dB Bandwidth Measurement.....	34
4.3.2 Test Setup.....	34
4.3.3 Test Instruments.....	34
4.3.4 Test Procedure.....	34
4.3.5 Deviation from Test Standard.....	34
4.3.6 EUT Operating Conditions.....	34
4.3.7 Test Result.....	35
4.4 Conducted Output Power Measurement.....	37
4.4.1 Limits of Conducted Output Power Measurement.....	37
4.4.2 Test Setup.....	37
4.4.3 Test Instruments.....	37
4.4.4 Test Procedures.....	37
4.4.5 Deviation from Test Standard.....	37
4.4.6 EUT Operating Conditions.....	37
4.4.7 Test Results.....	38
4.5 Power Spectral Density Measurement.....	40
4.5.1 Limits of Power Spectral Density Measurement.....	40
4.5.2 Test Setup.....	40
4.5.3 Test Instruments.....	40
4.5.4 Test Procedure.....	40
4.5.5 Deviation from Test Standard.....	40

4.5.6 EUT Operating Condition	40
4.5.7 Test Results	41
4.6 Conducted Out of Band Emission Measurement.....	43
4.6.1 Limits of Conducted Out of Band Emission Measurement	43
4.6.2 Test Setup.....	43
4.6.3 Test Instruments	43
4.6.4 Test Procedure	43
4.6.5 Deviation from Test Standard	43
4.6.6 EUT Operating Condition	43
4.6.7 Test Results	43
Annex A- Band Edge Measurement.....	47
5 Pictures of Test Arrangements.....	50
Appendix – Information of the Testing Laboratories	51

Release Control Record

Issue No.	Description	Date Issued
RFBHOU-WTW-P20110775	Original release.	Dec. 9, 2020

1 Certificate of Conformity

Product: Elgato Light Strip

Brand: Elgato

Test Model: 20LAA9901

Sample Status: Engineering Sample

Applicant: Corsair Memory, Inc.

Test Date: Nov. 27 to Dec. 4, 2020

Standards: 47 CFR FCC Part 15, Subpart C (Section 15.247)
ANSI C63.10: 2013

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

Prepared by : Celia Chen , **Date:** Dec. 9, 2020
Celia Chen / Supervisor

Approved by : Rex Lai , **Date:** Dec. 9, 2020
Rex Lai / Associate Technical Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (Section 15.247)			
FCC Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -2.87dB at 1.24083MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -1.22dB at 2390.00MHz.
15.247(d)	Antenna Port Emission	PASS	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Conducted power	PASS	Meet the requirement of limit.
15.247(e)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	No antenna connector is used.

Note:

- Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
- For 2.4GHz band compliance with rule 15.247(d) of the band-edge items, the test plots were recorded in Annex A. Test Procedures refer to report 4.1.3.

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Expanded Uncertainty (k=2) (\pm)
Conducted Emissions at mains ports	150kHz ~ 30MHz	3.00 dB
Conducted Emissions	9kHz ~ 40GHz	2.63 dB
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	2.61 dB
	30MHz ~ 1GHz	5.43 dB
Radiated Emissions above 1 GHz	Above 1GHz	5.42 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Elgato Light Strip
Brand	Elgato
Test Model	20LAA9901
Status of EUT	Engineering Sample
Power Supply Rating	24Vdc from power adapter
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11b: 11/5.5/2/1Mbps 802.11g: 54/48/36/24/18/12/9/6Mbps 802.11n: up to 72.2Mbps
Operating Frequency	2412MHz ~ 2462MHz
Number of Channel	802.11b, 802.11g, 802.11n (20MHz): 11
Output Power	372.392mW
Antenna Type	Chip antenna with 1.5dBi gain
Antenna Connector	N/A
Accessory Device	Light Strip (1.8m or 1m); Adapter
Data Cable Supplied	N/A

Note:

- The EUT incorporates a SISO function. Physically, the EUT provides 1 completed transmitter and 1 receiver.

Modulation Mode	TX Function
802.11b	1TX
802.11g	1TX
802.11n (20MHz)	1TX

- The EUT is an Elgato Light Strip, which has two samples with length difference of light strip. After pre-tested, the Light Strip (1.8m) was the worst case and only its test data was recorded in this report.

- The EUT uses following adapter (include four AC plug type could select).

Brand	ULLPOWER
Model	ICP30A-240-1250
Input Power	100-240Vac, 50/60Hz, 0.8A
Output Power	24V, 1.25A, 30W
Power Line	Non-shielded DC (1.5m)

- The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.
- The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.

3.2 Description of Test Modes

11 channels are provided for 802.11b, 802.11g and 802.11n (20MHz):

Channel	Frequency	Channel	Frequency
1	2412MHz	7	2442MHz
2	2417MHz	8	2447MHz
3	2422MHz	9	2452MHz
4	2427MHz	10	2457MHz
5	2432MHz	11	2462MHz
6	2437MHz		

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable To				Description
	RE \geq 1G	RE $<$ 1G	PLC	APCM	
-	√	√	√	√	-

Where **RE \geq 1G**: Radiated Emission above 1GHz & Bandedge Measurement

RE $<$ 1G: Radiated Emission below 1GHz

PLC: Power Line Conducted Emission

APCM: Antenna Port Conducted Measurement

NOTE: The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Y-plane**.

Radiated Emission Test (Above 1GHz):

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
	802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	6.5

Radiated Emission Test (Below 1GHz):

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11n (20MHz)	1 to 11	11	OFDM	BPSK	6.5

Power Line Conducted Emission Test:

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11n (20MHz)	1 to 11	11	OFDM	BPSK	6.5

Antenna Port Conducted Measurement:

- This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
	802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	6.5

Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested By
RE\geq1G	23deg. C, 78%RH	120Vac, 60Hz	StarItaly Wu
RE<1G	16deg. C, 59%RH	120Vac, 60Hz	Dalen Dai
PLC	24deg. C, 71%RH	120Vac, 60Hz	Chenghan Wu
APCM	25deg. C, 60%RH	120Vac, 60Hz	StarItaly Wu

3.3 Duty Cycle of Test Signal

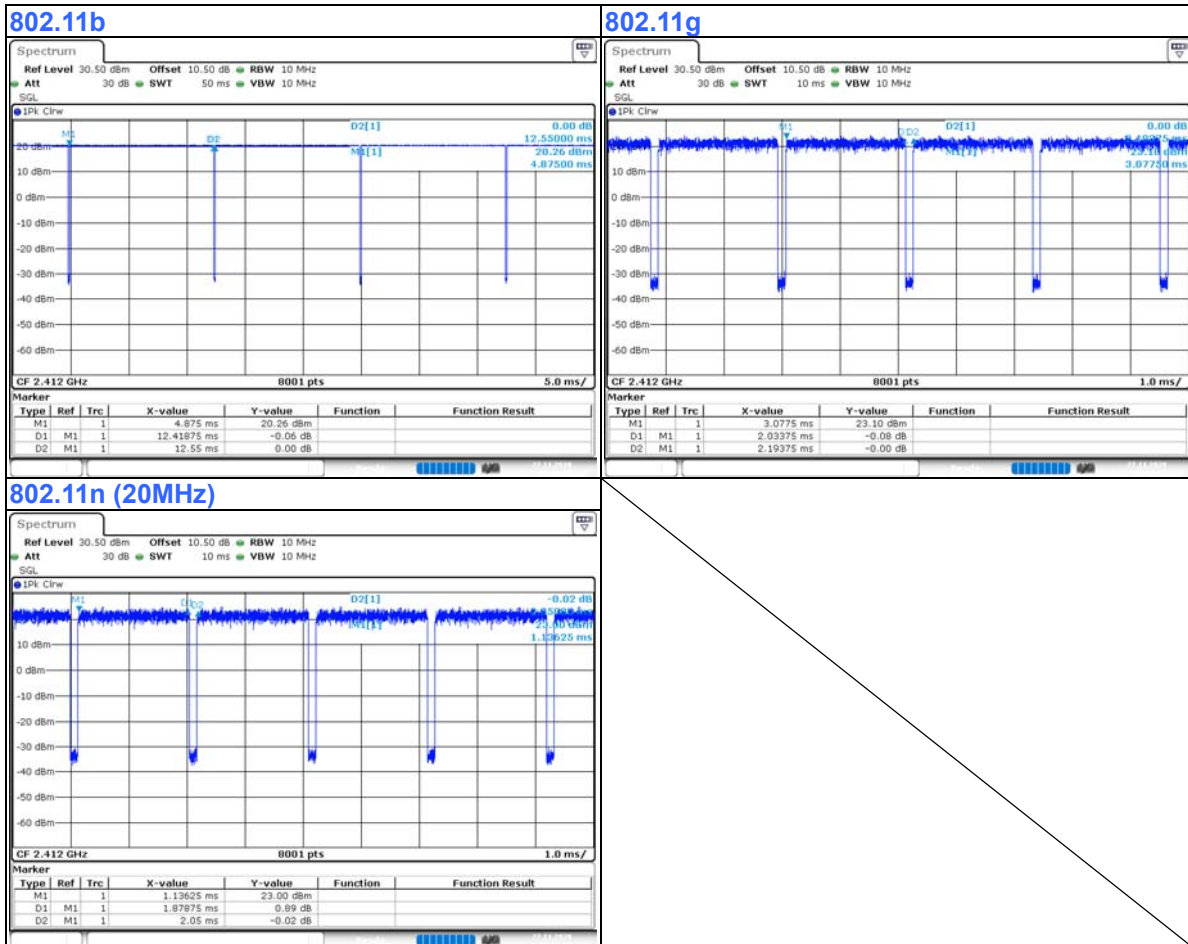
If duty cycle of test signal is $\geq 98\%$, duty factor is not required.

If duty cycle of test signal is $< 98\%$, duty factor shall be considered.

802.11b: Duty cycle = $12.41875/12.55 = 0.989$

802.11g: Duty cycle = $2.03375/2.19375 = 0.927$, Duty factor = $10 * \log(1/0.927) = 0.33$

802.11n (20MHz): Duty cycle = $1.87875/2.05 = 0.916$, Duty factor = $10 * \log(1/0.916) = 0.38$



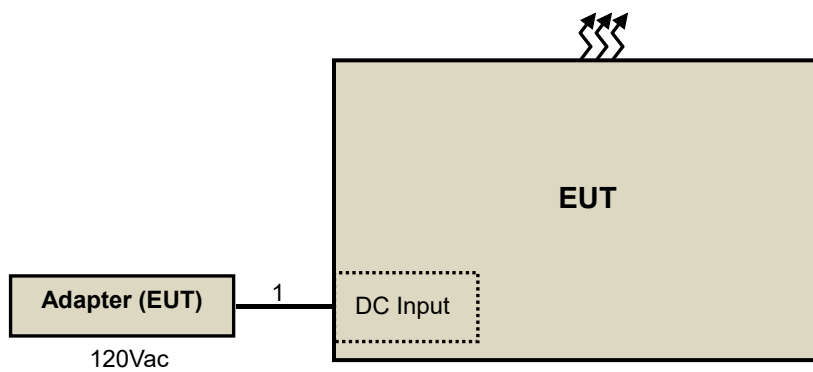
3.4 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

ID	Cable Descriptions	Qty.	Length (m)	Shielding (Yes/ No)	Cores (Qty.)	Remarks
1.	DC cable	1	1.5	N	0	Supplied by client

Note: The core(s) is(are) originally attached to the cable(s).

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standards and References

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards and references:

Test standard:

FCC Part 15, Subpart C (15.247)
ANSI C63.10-2013

All test items have been performed and recorded as per the above standards.

References Test Guidance:

KDB 558074 D01 15.247 Meas Guidance v05r02

All test items have been performed as a reference to the above KDB test guidance.

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20dB below the highest level of the desired power:

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

4.1.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
HP Preamplifier	8447D	2432A03504	Feb. 19, 2020	Feb. 18, 2021
HP Preamplifier	8449B	3008A01201	Feb. 20, 2020	Feb. 19, 2021
MITEQ Preamplifier	AMF-6F-260400-33-8P	892164	Feb. 19, 2020	Feb. 18, 2021
Agilent TEST RECEIVER	N9038A	MY51210129	Mar. 18, 2020	Mar. 17, 2021
Schwarzbeck Antenna	VULB 9168	139	Nov. 6, 2020	Nov. 5, 2021
Schwarzbeck Antenna	VHBA 9123	480	Jun. 3, 2019	Jun. 2, 2021
Schwarzbeck Horn Antenna	BBHA-9170	212	Nov. 22, 2020	Nov. 21, 2021
EMCO Horn Antenna	3115	00027024	Nov. 22, 2020	Nov. 21, 2021
ADT. Turn Table	TT100	0306	NA	NA
ADT. Tower	AT100	0306	NA	NA
Software	Radiated_V7.6.15.9.5	NA	NA	NA
SUHNER RF cable With 4dB PAD	SF102	Cable-CH6-01	Jul. 9, 2020	Jul. 8, 2021
EMEC RF cable With 3/4dB PAD	EM102-KMKM	01	Aug. 21, 2020	Aug. 20, 2021
KEYSIGHT MIMO Powermeasurement Test set	U2021XA	U2021XA-001	Jun. 16, 2020	Jun. 15, 2021
KEYSIGHT Spectrum Analyzer	N9030A	MY54490260	Jul. 22, 2020	Jul. 21, 2021
Loop Antenna EMCI	LPA600	270	Aug. 23, 2019	Aug. 22, 2021
EMCO Horn Antenna	3115	00028257	Nov. 22, 2020	Nov. 21, 2021
Highpass filter Wainwright Instruments	WHK 3.1/18G-10SS	SN 8	NA	NA
ROHDE & SCHWARZ Spectrum Analyzer	FSV40	101042	Sep. 8, 2020	Sep. 7, 2021
Anritsu Power Sensor	MA2411B	0738404	Apr. 13, 2020	Apr. 12, 2021
Anritsu Power Meter	ML2495A	0842014	Apr. 13, 2020	Apr. 12, 2021

- NOTE:**
1. The calibration interval of the above test instruments is 12/24 months. And the calibrations are traceable to NML/ROC and NIST/USA.
 2. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
 3. The test was performed in Chamber No. 6.

4.1.3 Test Procedures

For Radiated emission below 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

For Radiated emission above 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detects function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

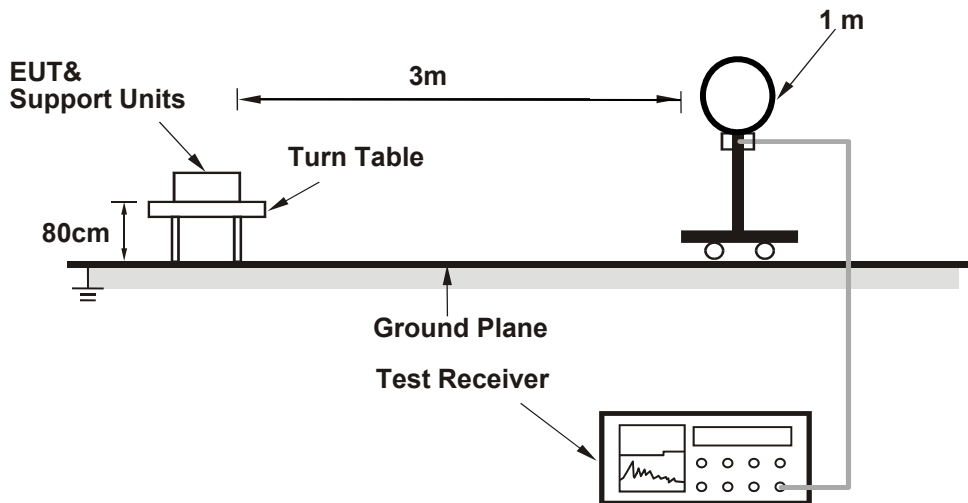
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is $\geq 1/T$ (Duty cycle < 98%) or 10Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1GHz.
(802.11b: RBW = 1MHz, VBW = 10Hz; 802.11g: RBW = 1MHz, VBW = 510Hz;
802.11n (20MHz): RBW = 1MHz, VBW = 560Hz)
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

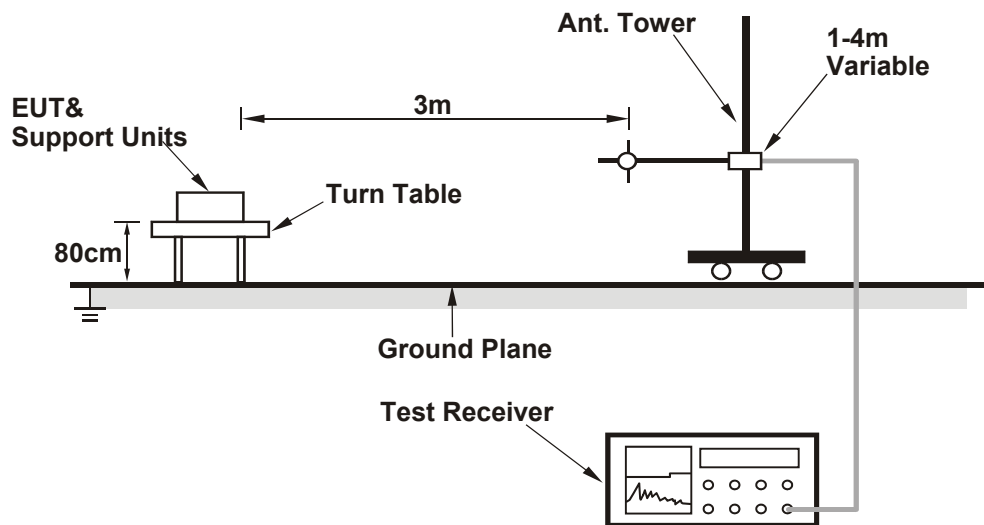
No deviation.

4.1.5 Test Setup

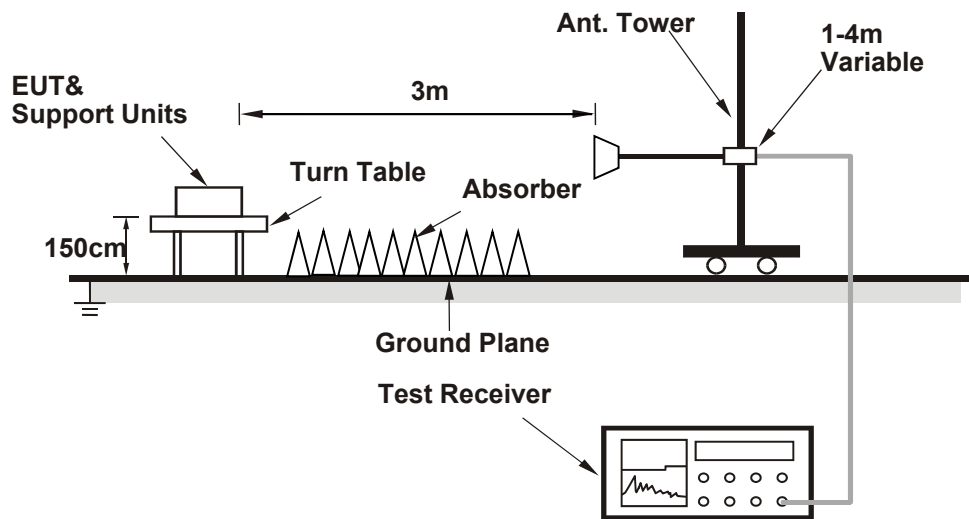
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.6 EUT Operating Conditions

Set the EUT under transmission condition continuously at specific channel frequency continuously.

4.1.7 Test Results

Above 1GHz Data

RF Mode	TX 802.11b	Channel	CH 1 : 2412 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	56.57 PK	74.00	-17.43	2.02 H	48	55.22	1.35
2	2390.00	45.68 AV	54.00	-8.32	2.02 H	48	44.33	1.35
3	*2412.00	106.71 PK			2.02 H	48	105.26	1.45
4	*2412.00	103.61 AV			2.02 H	48	102.16	1.45
5	4824.00	54.69 PK	74.00	-19.31	1.25 H	235	45.27	9.42
6	4824.00	48.72 AV	54.00	-5.28	1.25 H	235	39.30	9.42

Antenna Polarity & Test Distance : Vertical at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	55.98 PK	74.00	-18.02	1.37 V	218	54.63	1.35
2	2390.00	45.26 AV	54.00	-8.74	1.37 V	218	43.91	1.35
3	*2412.00	104.06 PK			1.37 V	218	102.61	1.45
4	*2412.00	100.94 AV			1.37 V	218	99.49	1.45
5	4824.00	55.66 PK	74.00	-18.34	1.00 V	147	46.24	9.42
6	4824.00	51.16 AV	54.00	-2.84	1.00 V	147	41.74	9.42

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

RF Mode	TX 802.11b	Channel	CH 6 : 2437 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2437.00	105.86 PK			1.98 H	50	104.33	1.53
2	*2437.00	102.81 AV			1.98 H	50	101.28	1.53
3	4874.00	50.77 PK	74.00	-23.23	1.30 H	236	41.26	9.51
4	4874.00	50.19 AV	54.00	-3.81	1.30 H	236	40.68	9.51

Antenna Polarity & Test Distance : Vertical at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2437.00	102.53 PK			1.34 V	218	101.00	1.53
2	*2437.00	99.97 AV			1.34 V	218	98.44	1.53
3	4874.00	51.73 PK	74.00	-22.27	1.05 V	150	42.22	9.51
4	4874.00	51.22 AV	54.00	-2.78	1.05 V	150	41.71	9.51

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

RF Mode	TX 802.11b	Channel	CH 11 : 2462 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	102.64 PK			1.97 H	51	100.96	1.68
2	*2462.00	99.63 AV			1.97 H	51	97.95	1.68
3	2483.50	55.98 PK	74.00	-18.02	1.97 H	51	54.15	1.83
4	2483.50	45.17 AV	54.00	-8.83	1.97 H	51	43.34	1.83
5	4924.00	51.41 PK	74.00	-22.59	1.22 H	238	41.86	9.55
6	4924.00	46.54 AV	54.00	-7.46	1.22 H	238	36.99	9.55

Antenna Polarity & Test Distance : Vertical at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	100.12 PK			1.35 V	214	98.44	1.68
2	*2462.00	96.98 AV			1.35 V	214	95.30	1.68
3	2483.50	56.39 PK	74.00	-17.61	1.35 V	214	54.56	1.83
4	2483.50	44.92 AV	54.00	-9.08	1.35 V	214	43.09	1.83
5	4924.00	52.50 PK	74.00	-21.50	1.01 V	144	42.95	9.55
6	4924.00	47.53 AV	54.00	-6.47	1.01 V	144	37.98	9.55

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

RF Mode	TX 802.11g	Channel	CH 1 : 2412 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	62.73 PK	74.00	-11.27	2.22 H	48	61.38	1.35
2	2390.00	50.35 AV	54.00	-3.65	2.22 H	48	49.00	1.35
3	*2412.00	108.10 PK			2.22 H	48	106.65	1.45
4	*2412.00	100.28 AV			2.22 H	48	98.83	1.45
5	4824.00	54.74 PK	74.00	-19.26	1.44 H	240	45.32	9.42
6	4824.00	48.89 AV	54.00	-5.11	1.44 H	240	39.47	9.42

Antenna Polarity & Test Distance : Vertical at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	60.83 PK	74.00	-13.17	1.37 V	218	59.48	1.35
2	2390.00	48.85 AV	54.00	-5.15	1.37 V	218	47.50	1.35
3	*2412.00	105.28 PK			1.37 V	218	103.83	1.45
4	*2412.00	97.38 AV			1.37 V	218	95.93	1.45
5	4824.00	53.60 PK	74.00	-20.40	1.05 V	144	44.18	9.42
6	4824.00	48.14 AV	54.00	-5.86	1.05 V	144	38.72	9.42

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

RF Mode	TX 802.11g	Channel	CH 6 : 2437 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2437.00	108.08 PK			2.01 H	43	106.55	1.53
2	*2437.00	100.27 AV			2.01 H	43	98.74	1.53
3	4874.00	51.90 PK	74.00	-22.10	1.29 H	241	42.39	9.51
4	4874.00	50.76 AV	54.00	-3.24	1.29 H	241	41.25	9.51

Antenna Polarity & Test Distance : Vertical at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2437.00	104.60 PK			1.36 V	213	103.07	1.53
2	*2437.00	96.74 AV			1.36 V	213	95.21	1.53
3	4874.00	53.03 PK	74.00	-20.97	1.06 V	144	43.52	9.51
4	4874.00	51.52 AV	54.00	-2.48	1.06 V	144	42.01	9.51

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

RF Mode	TX 802.11g	Channel	CH 11 : 2462 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	104.24 PK			2.63 H	64	102.56	1.68
2	*2462.00	96.56 AV			2.63 H	64	94.88	1.68
3	2483.50	58.60 PK	74.00	-15.40	2.63 H	64	56.77	1.83
4	2483.50	46.86 AV	54.00	-7.14	2.63 H	64	45.03	1.83
5	4924.00	53.07 PK	74.00	-20.93	2.25 H	241	43.52	9.55
6	4924.00	48.32 AV	54.00	-5.68	2.25 H	241	38.77	9.55

Antenna Polarity & Test Distance : Vertical at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	100.88 PK			1.50 V	220	99.20	1.68
2	*2462.00	93.14 AV			1.50 V	220	91.46	1.68
3	2483.50	56.32 PK	74.00	-17.68	1.50 V	220	54.49	1.83
4	2483.50	45.78 AV	54.00	-8.22	1.50 V	220	43.95	1.83
5	4924.00	53.22 PK	74.00	-20.78	1.04 V	148	43.67	9.55
6	4924.00	48.49 AV	54.00	-5.51	1.04 V	148	38.94	9.55

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

RF Mode	TX 802.11n (20MHz)	Channel	CH 1 : 2412 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	67.48 PK	74.00	-6.52	2.04 H	52	66.13	1.35
2	2390.00	52.78 AV	54.00	-1.22	2.04 H	52	51.43	1.35
3	*2412.00	107.15 PK			2.04 H	52	105.70	1.45
4	*2412.00	98.39 AV			2.04 H	52	96.94	1.45
5	4824.00	54.73 PK	74.00	-19.27	1.31 H	240	45.31	9.42
6	4824.00	48.84 AV	54.00	-5.16	1.31 H	240	39.42	9.42

Antenna Polarity & Test Distance : Vertical at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	67.01 PK	74.00	-6.99	1.22 V	215	65.66	1.35
2	2390.00	51.40 AV	54.00	-2.60	1.22 V	215	50.05	1.35
3	*2412.00	105.29 PK			1.22 V	215	103.84	1.45
4	*2412.00	96.46 AV			1.22 V	215	95.01	1.45
5	4824.00	55.61 PK	74.00	-18.39	1.10 V	142	46.19	9.42
6	4824.00	51.00 AV	54.00	-3.00	1.10 V	142	41.58	9.42

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

RF Mode	TX 802.11n (20MHz)	Channel	CH 6 : 2437 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2437.00	108.16 PK			2.01 H	52	106.63	1.53
2	*2437.00	99.41 AV			2.01 H	52	97.88	1.53
3	4874.00	52.09 PK	74.00	-21.91	1.29 H	244	42.58	9.51
4	4874.00	51.13 AV	54.00	-2.87	1.29 H	244	41.62	9.51

Antenna Polarity & Test Distance : Vertical at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2437.00	104.84 PK			1.35 V	217	103.31	1.53
2	*2437.00	96.34 AV			1.35 V	217	94.81	1.53
3	4874.00	53.36 PK	74.00	-20.64	1.06 V	147	43.85	9.51
4	4874.00	52.29 AV	54.00	-1.71	1.06 V	147	42.78	9.51

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

RF Mode	TX 802.11n (20MHz)	Channel	CH 11 : 2462 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	102.23 PK			1.36 H	215	100.55	1.68
2	*2462.00	93.51 AV			1.36 H	215	91.83	1.68
3	2483.50	62.00 PK	74.00	-12.00	1.36 H	215	60.17	1.83
4	2483.50	46.58 AV	54.00	-7.42	1.36 H	215	44.75	1.83
5	4924.00	53.91 PK	74.00	-20.09	1.12 H	143	44.36	9.55
6	4924.00	48.73 AV	54.00	-5.27	1.12 H	143	39.18	9.55

Antenna Polarity & Test Distance : Vertical at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	104.22 PK			2.64 V	48	102.54	1.68
2	*2462.00	96.69 AV			2.64 V	48	95.01	1.68
3	2483.50	63.91 PK	74.00	-10.09	2.64 V	48	62.08	1.83
4	2483.50	48.08 AV	54.00	-5.92	2.64 V	48	46.25	1.83
5	4924.00	53.40 PK	74.00	-20.60	2.23 V	235	43.85	9.55
6	4924.00	48.32 AV	54.00	-5.68	2.23 V	235	38.77	9.55

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

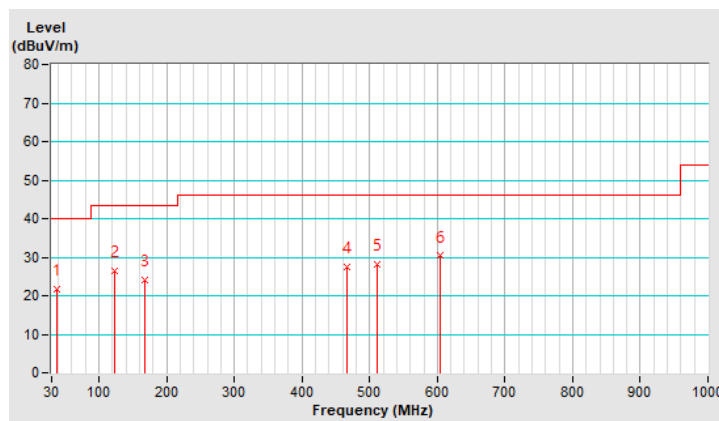
Below 1GHz Data:

RF Mode	TX 802.11n (20MHz)	Channel	CH 11 : 2462 MHz
Frequency Range	9kHz ~ 1GHz	Detector Function	Quasi-Peak (QP)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	37.76	21.64 QP	40.00	-18.36	1.84 H	52	29.75	-8.11
2	123.85	26.59 QP	43.50	-16.91	1.16 H	254	35.42	-8.83
3	168.08	23.99 QP	43.50	-19.51	1.48 H	168	30.68	-6.69
4	467.08	27.59 QP	46.00	-18.41	1.91 H	2	28.07	-0.48
5	511.17	28.23 QP	46.00	-17.77	2.29 H	175	27.99	0.24
6	603.90	30.38 QP	46.00	-15.62	1.05 H	307	28.05	2.33

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

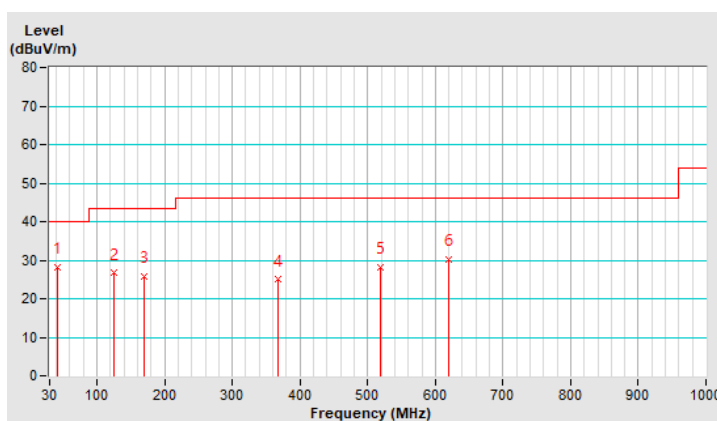


RF Mode	TX 802.11n (20MHz)	Channel	CH 11 : 2462 MHz
Frequency Range	9kHz ~ 1GHz	Detector Function	Quasi-Peak (QP)

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	41.69	28.14 QP	40.00	-11.86	1.56 V	171	35.75	-7.61
2	124.58	26.68 QP	43.50	-16.82	1.27 V	151	35.44	-8.76
3	168.90	25.75 QP	43.50	-17.75	1.83 V	146	32.41	-6.66
4	366.83	24.98 QP	46.00	-21.02	1.90 V	183	27.91	-2.93
5	518.98	28.27 QP	46.00	-17.73	2.17 V	299	27.94	0.33
6	619.95	30.32 QP	46.00	-15.68	1.55 V	146	27.62	2.70

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.



4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

Note: 1. The lower limit shall apply at the transition frequencies.

2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

4.2.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
ROHDE &SCHWARZ TEST RECEIVER	ESCS 30	100276	Apr. 16, 2020	Apr. 15, 2021
ROHDE & SCHWARZ Artificial Mains Network (For EUT)	ENV216	101195	May 15, 2020	May 14, 2021
LISN With Adapter(for EUT)	101195	N/A	May 15, 2020	May 14, 2021
EMCO L.I.S.N. (For peripherals)	3825/2	9504-2359	Jul. 28, 2020	Jul. 27, 2021
SCHWARZBECK Artificial Mains Network (For EUT)	NNLK8129	8129229	May 14, 2020	May 13, 2021
SCHWARZBECK Artificial Mains Network (for EUT)	NNLK 8121	8121-808	Apr. 10, 2020	Apr. 9, 2021
Software	Cond_V7.3.7.4	NA	NA	NA
RF cable (JYEBAO) With10dB PAD	5D-FB	Cable-C03-01	Sep. 16, 2020	Sep. 15, 2021
LYNICS Terminator (For EMCO LISN)	0900510	E1-01-300	Jan. 20, 2020	Jan. 19, 2021
LYNICS Terminator (For EMCO LISN)	0900510	E1-01-301	Jan. 20, 2020	Jan. 19, 2021

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The test was performed in Shielded Room No. 3. (Conduction 3)

3. The VCCI Site Registration No. C-10274.

4.2.3 Test Procedures

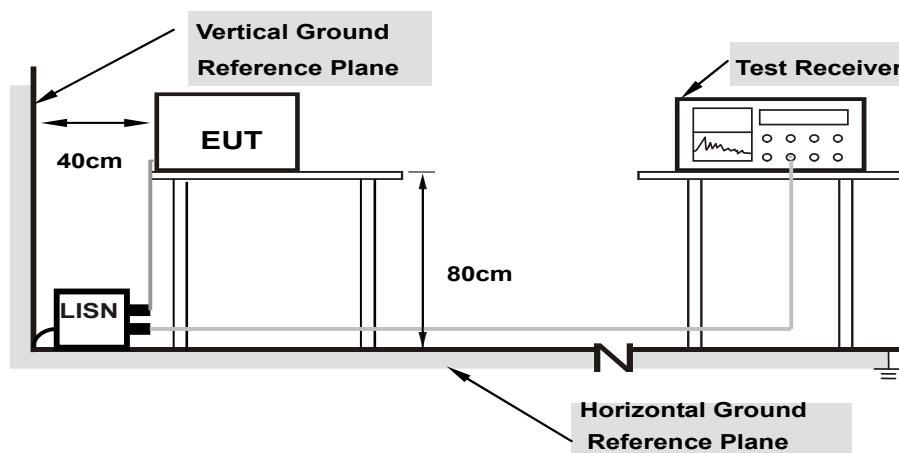
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

NOTE: The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



Note: 1.Support units were connected to second LISN.

For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.2.6 EUT Operating Conditions

Same as item 4.1.6

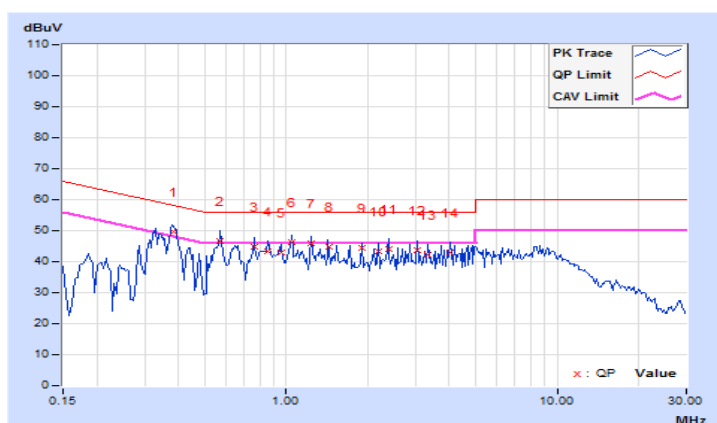
4.2.7 Test Results

RF Mode	TX 802.11n (20MHz)	Channel	CH 11 : 2462 MHz
Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.38175	9.84	39.75	33.08	49.59	42.92	58.24	48.24	-8.65	-5.32
2	0.57188	9.86	36.88	32.89	46.74	42.75	56.00	46.00	-9.26	-3.25
3	0.76328	9.88	34.87	31.53	44.75	41.41	56.00	46.00	-11.25	-4.59
4	0.85703	9.89	33.54	28.03	43.43	37.92	56.00	46.00	-12.57	-8.08
5	0.95469	9.90	32.94	28.48	42.84	38.38	56.00	46.00	-13.16	-7.62
6	1.05069	9.91	36.31	32.26	46.22	42.17	56.00	46.00	-9.78	-3.83
7	1.23976	9.92	36.13	33.12	46.05	43.04	56.00	46.00	-9.95	-2.96
8	1.43224	9.94	34.84	31.52	44.78	41.46	56.00	46.00	-11.22	-4.54
9	1.91007	9.99	34.33	31.55	44.32	41.54	56.00	46.00	-11.68	-4.46
10	2.19531	10.01	33.24	30.24	43.25	40.25	56.00	46.00	-12.75	-5.75
11	2.38672	10.02	34.19	30.86	44.21	40.88	56.00	46.00	-11.79	-5.12
12	3.05469	10.06	33.49	30.79	43.55	40.85	56.00	46.00	-12.45	-5.15
13	3.34366	10.07	32.00	28.94	42.07	39.01	56.00	46.00	-13.93	-6.99
14	4.00781	10.11	33.03	30.43	43.14	40.54	56.00	46.00	-12.86	-5.46

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

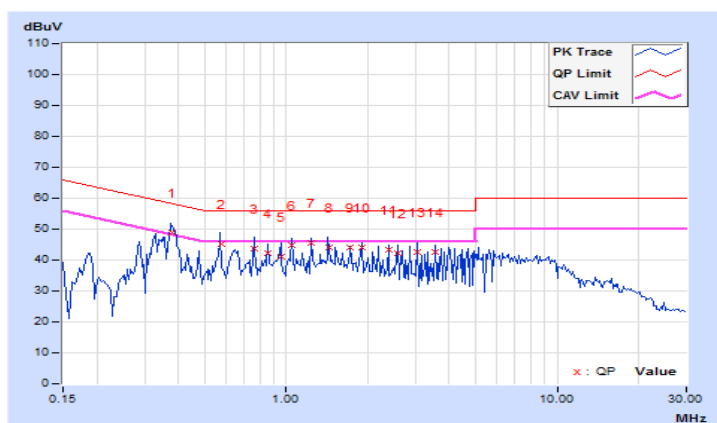


RF Mode	TX 802.11n (20MHz)	Channel	CH 11 : 2462 MHz
Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.38088	9.84	39.21	32.78	49.05	42.62	58.26	48.26	-9.21	-5.64
2	0.57315	9.86	35.37	32.63	45.23	42.49	56.00	46.00	-10.77	-3.51
3	0.76328	9.88	33.82	31.49	43.70	41.37	56.00	46.00	-12.30	-4.63
4	0.85958	9.89	32.23	27.91	42.12	37.80	56.00	46.00	-13.88	-8.20
5	0.95469	9.90	31.11	28.11	41.01	38.01	56.00	46.00	-14.99	-7.99
6	1.04943	9.91	35.02	32.22	44.93	42.13	56.00	46.00	-11.07	-3.87
7	1.24083	9.93	35.62	33.20	45.55	43.13	56.00	46.00	-10.45	-2.87
8	1.43097	9.94	33.98	31.58	43.92	41.52	56.00	46.00	-12.08	-4.48
9	1.71875	9.97	34.00	31.37	43.97	41.34	56.00	46.00	-12.03	-4.66
10	1.90879	9.98	33.97	31.55	43.95	41.53	56.00	46.00	-12.05	-4.47
11	2.38672	10.01	33.30	31.02	43.31	41.03	56.00	46.00	-12.69	-4.97
12	2.57804	10.02	32.35	29.90	42.37	39.92	56.00	46.00	-13.63	-6.08
13	3.05460	10.04	32.73	30.61	42.77	40.65	56.00	46.00	-13.23	-5.35
14	3.53243	10.06	32.44	30.43	42.50	40.49	56.00	46.00	-13.50	-5.51

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

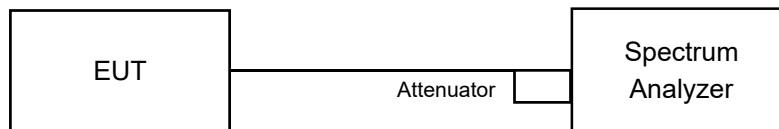


4.3 6dB Bandwidth Measurement

4.3.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 Test Setup



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

- a. Set resolution bandwidth (RBW) = 100kHz
- b. Set the video bandwidth (VBW) $\geq 3 \times$ RBW, Detector = Peak.
- c. Trace mode = max hold.
- d. Sweep = auto couple.
- e. Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Conditions

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.3.7 Test Result

802.11b

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	9.07	0.5	Pass
6	2437	9.02	0.5	Pass
11	2462	9.08	0.5	Pass

802.11g

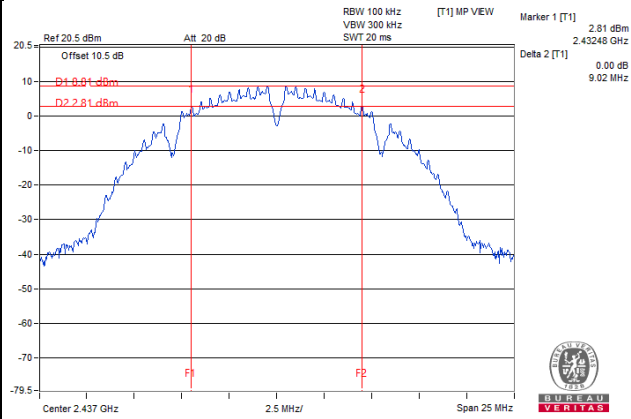
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	16.40	0.5	Pass
6	2437	16.41	0.5	Pass
11	2462	16.40	0.5	Pass

802.11n (20MHz)

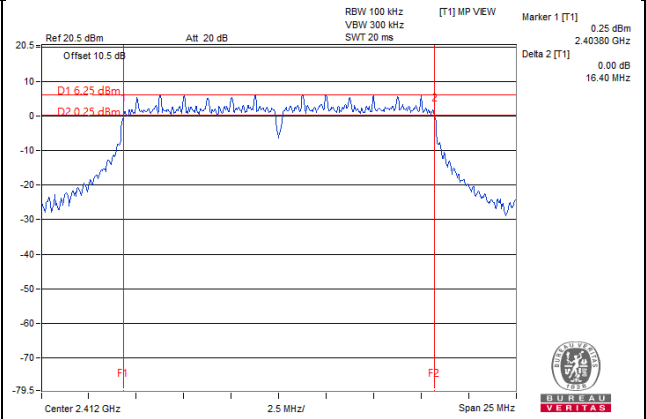
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	17.59	0.5	Pass
6	2437	17.39	0.5	Pass
11	2462	17.40	0.5	Pass

Spectrum Plot of Worst Value

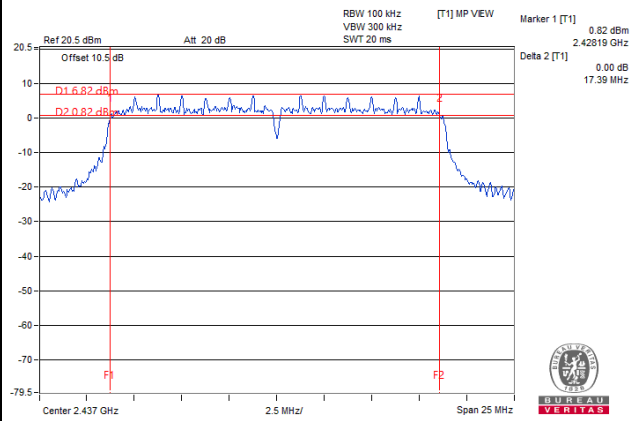
802.11b



802.11g



802.11n (20MHz)

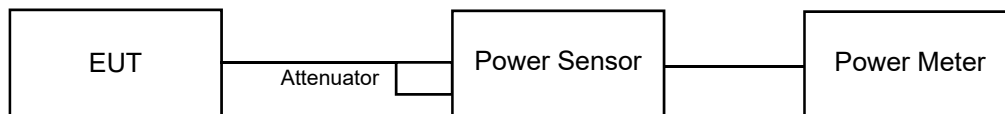


4.4 Conducted Output Power Measurement

4.4.1 Limits of Conducted Output Power Measurement

For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

4.4.2 Test Setup



4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.4 Test Procedures

A peak power sensor was used on the output port of the EUT. A power meter was used to read the response of the peak power sensor. Record the power level.

Average power sensor was used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst. Duty factor is not added to measured value.

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Conditions

Same as Item 4.3.6.

4.4.7 Test Results

FOR PEAK POWER

802.11b

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	119.95	20.79	30	Pass
6	2437	118.577	20.74	30	Pass
11	2462	122.18	20.87	30	Pass

802.11g

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	346.737	25.40	30	Pass
6	2437	348.337	25.42	30	Pass
11	2462	347.536	25.41	30	Pass

802.11n (20MHz)

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	363.915	25.61	30	Pass
6	2437	368.129	25.66	30	Pass
11	2462	372.392	25.71	30	Pass

FOR AVERAGE POWER

802.11b

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	62.661	17.97
6	2437	61.376	17.88
11	2462	63.533	18.03

802.11g

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	64.121	18.07
6	2437	63.68	18.04
11	2462	61.802	17.91

802.11n (20MHz)

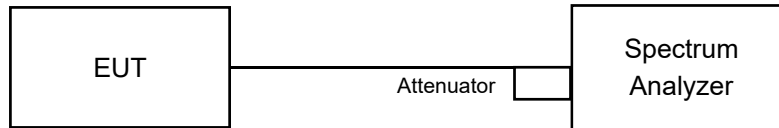
Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	63.533	18.03
6	2437	64.269	18.08
11	2462	62.806	17.98

4.5 Power Spectral Density Measurement

4.5.1 Limits of Power Spectral Density Measurement

The Maximum of Power Spectral Density Measurement is 8dBm in any 3 kHz.

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

- a. Set analyzer center frequency to DTS channel center frequency.
- b. Set the span to 1.5 times the DTS bandwidth.
- c. Set the RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- d. Set the VBW $\geq 3 \times \text{RBW}$.
- e. Detector = peak.
- f. Sweep time = auto couple.
- g. Trace mode = max hold.
- h. Allow trace to fully stabilize.
- i. Use the peak marker function to determine the maximum amplitude level within the RBW.

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

Same as Item 4.3.6

4.5.7 Test Results

802.11b

Channel	Freq. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
1	2412	-5.37	8	Pass
6	2437	-5.39	8	Pass
11	2462	-5.28	8	Pass

802.11g

Channel	Freq. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
1	2412	-7.86	8	Pass
6	2437	-8.32	8	Pass
11	2462	-8.35	8	Pass

802.11n (20MHz)

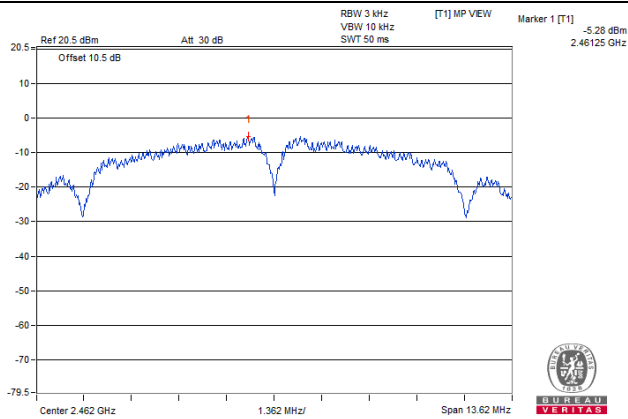
Channel	Freq. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
1	2412	-8.40	8	Pass
6	2437	-8.53	8	Pass
11	2462	-8.26	8	Pass



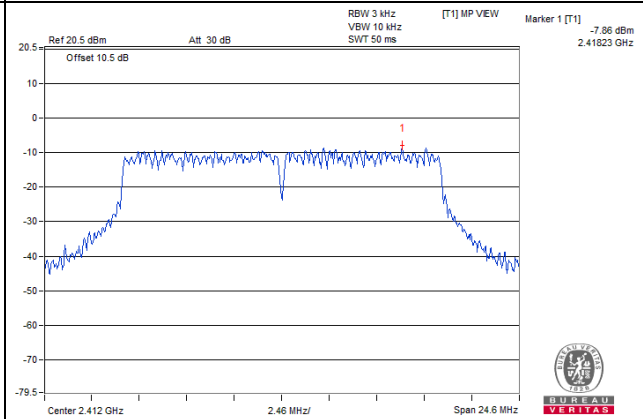
BUREAU
VERITAS

Spectrum Plot of Worst Value

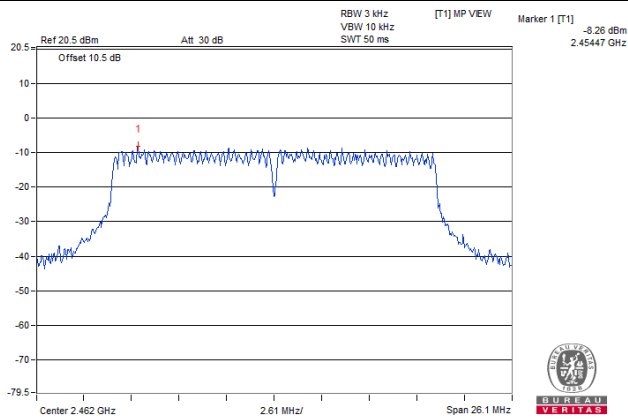
802.11b



802.11g



802.11n (20MHz)

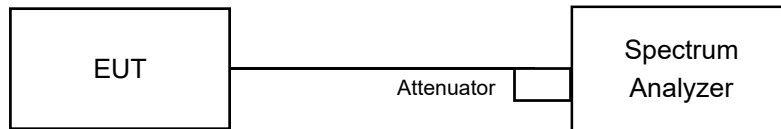


4.6 Conducted Out of Band Emission Measurement

4.6.1 Limits of Conducted Out of Band Emission Measurement

Below -20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

MEASUREMENT PROCEDURE REF

1. Set the RBW = 100 kHz.
2. Set the VBW \geq 300 kHz.
3. Detector = peak.
4. Sweep time = auto couple.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

MEASUREMENT PROCEDURE OOB

1. Set RBW = 100 kHz.
2. Set VBW \geq 300 kHz.
3. Detector = peak.
4. Sweep = auto couple.
5. Trace Mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum amplitude level.

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

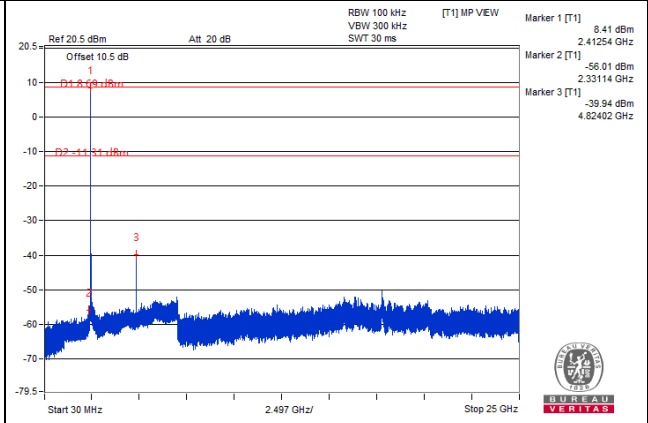
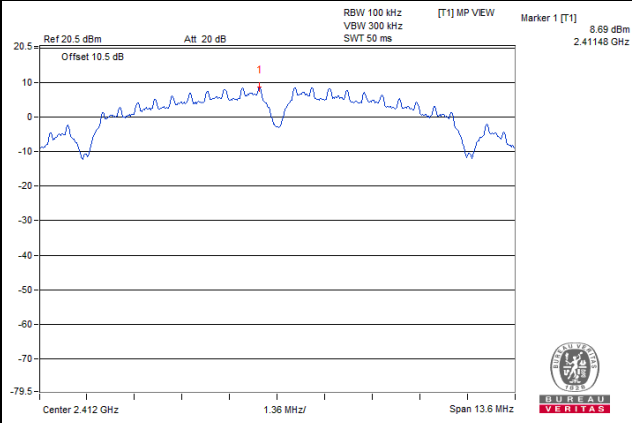
Same as Item 4.3.6

4.6.7 Test Results

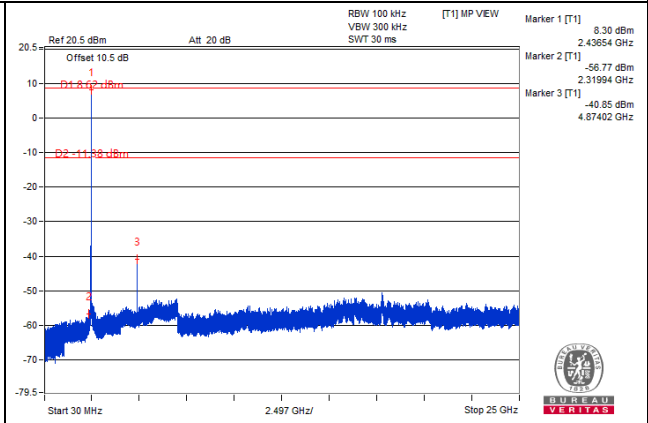
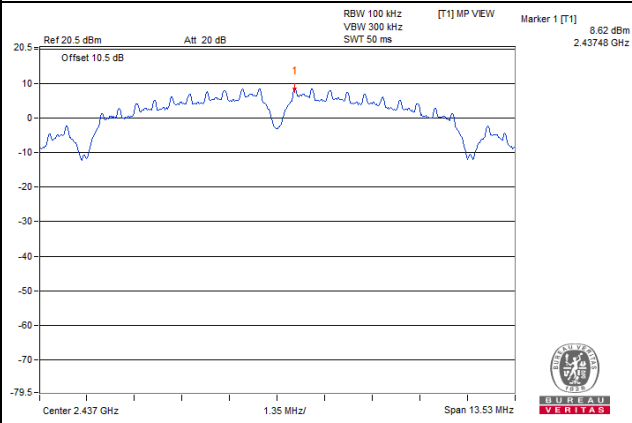
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.

802.11b

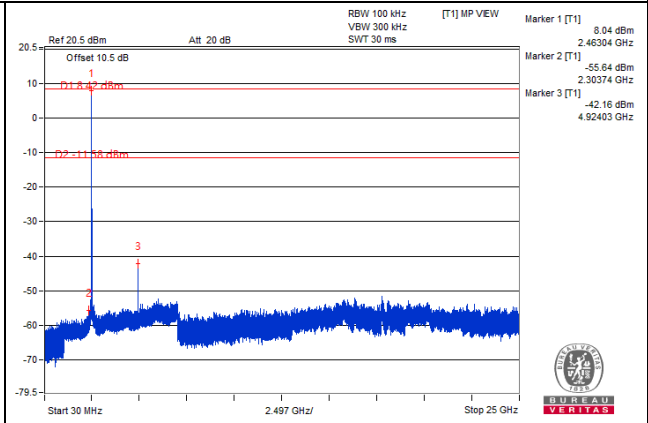
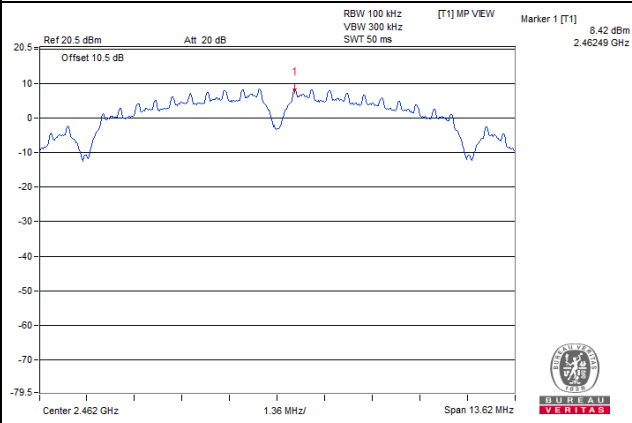
CH 1



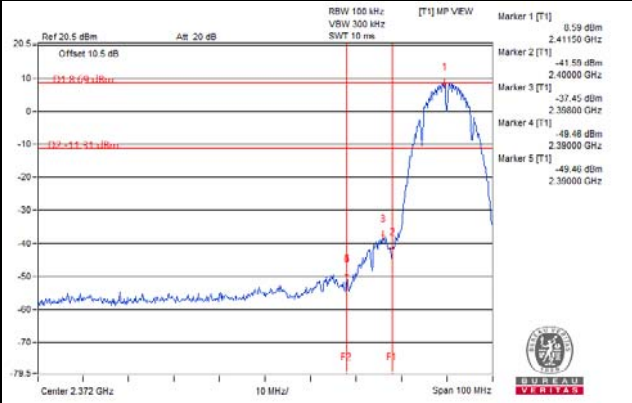
CH 6



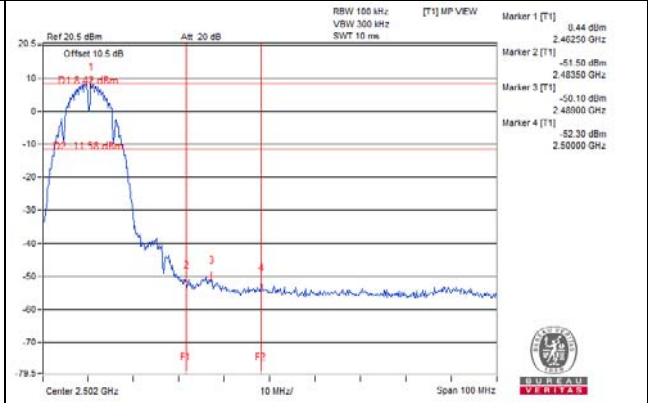
CH 11



CH 1 Band edge

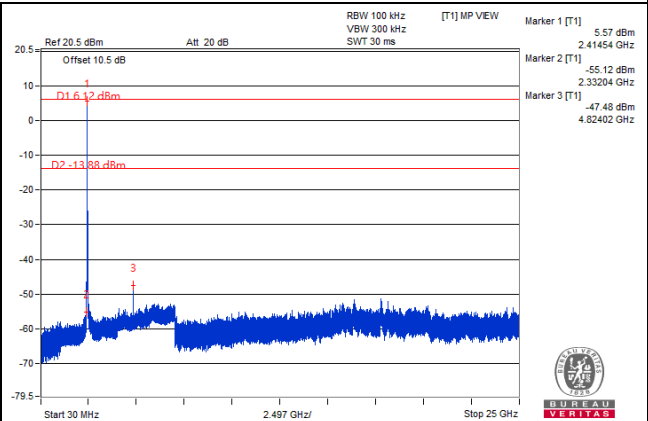
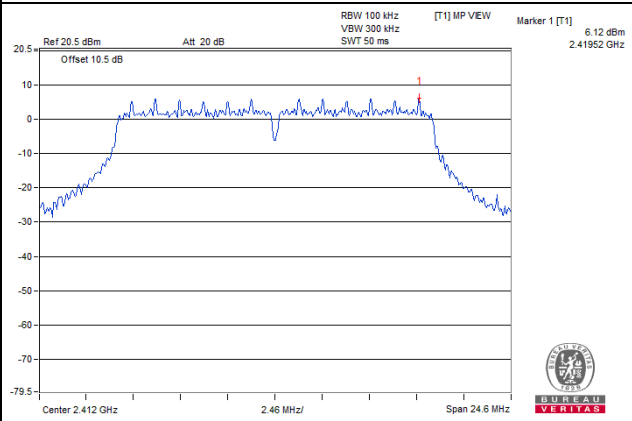


CH 11 Band edge

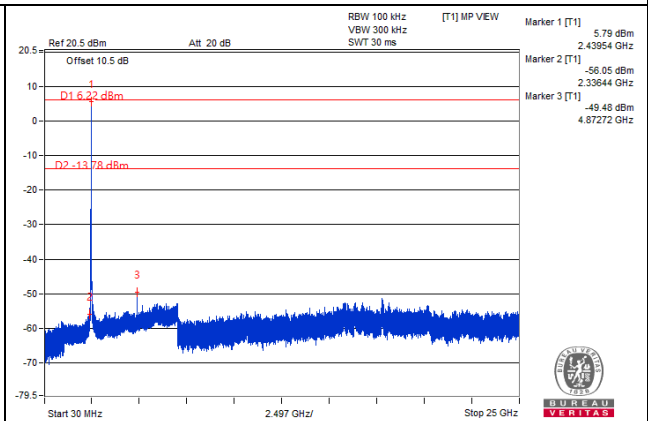
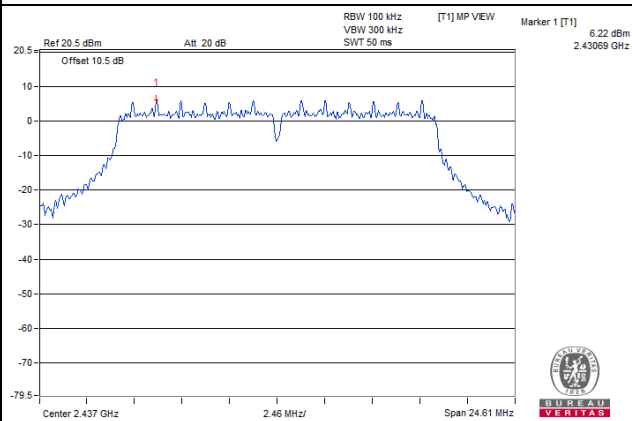


802.11g

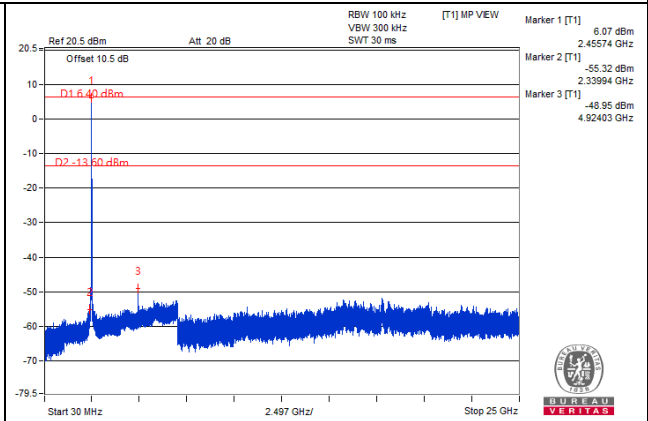
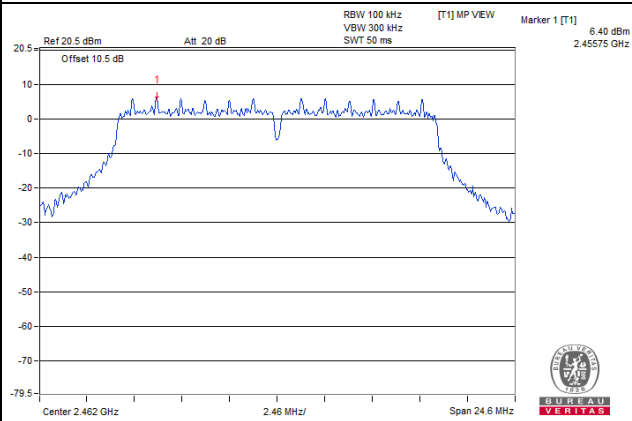
CH 1



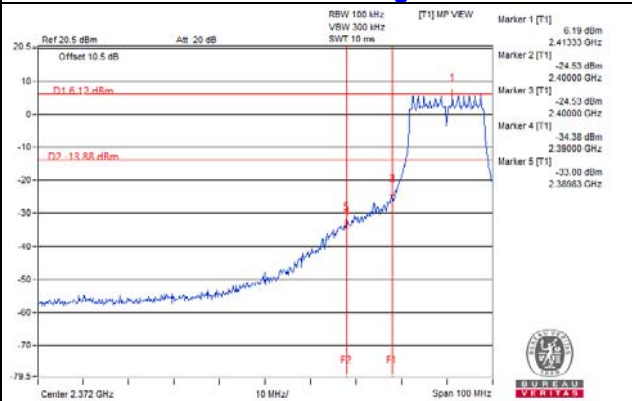
CH 6



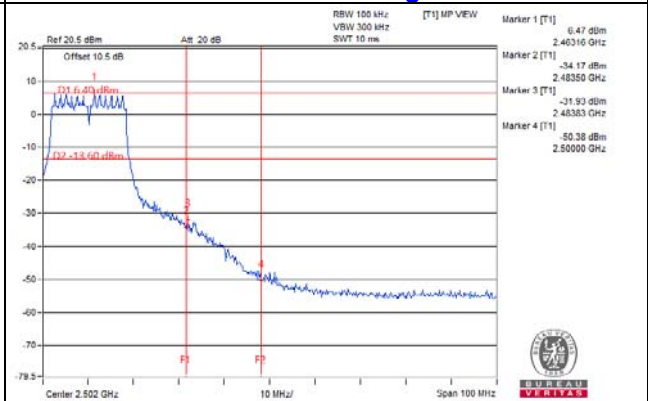
CH 11



CH 1 Band edge

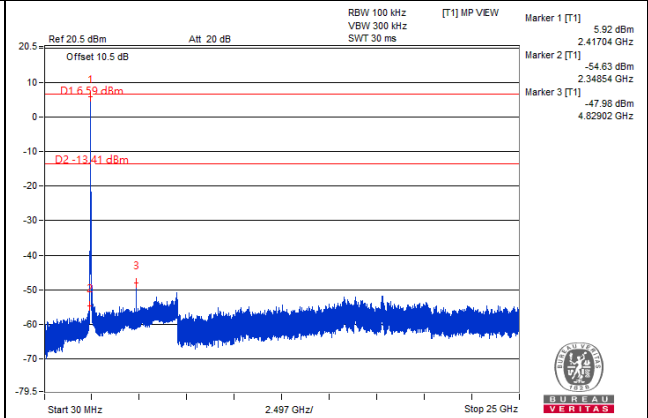
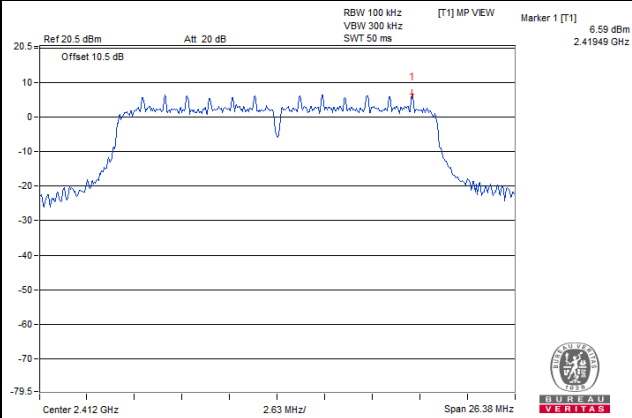


CH 11 Band edge

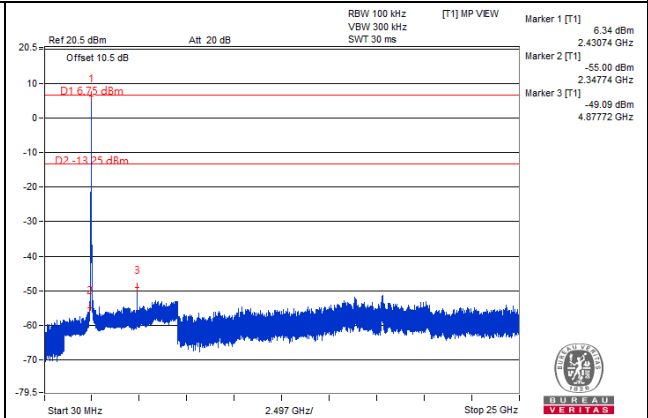
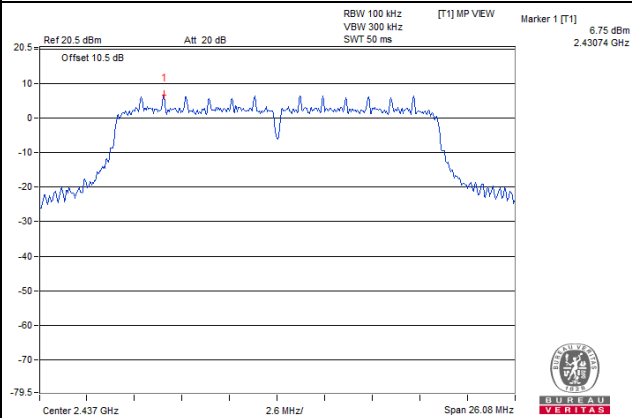


802.11n (20MHz)

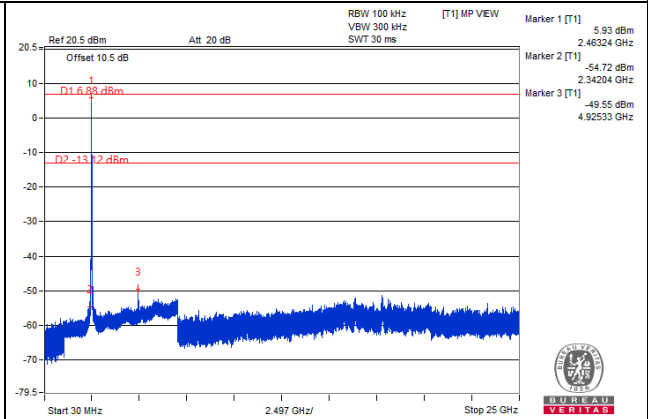
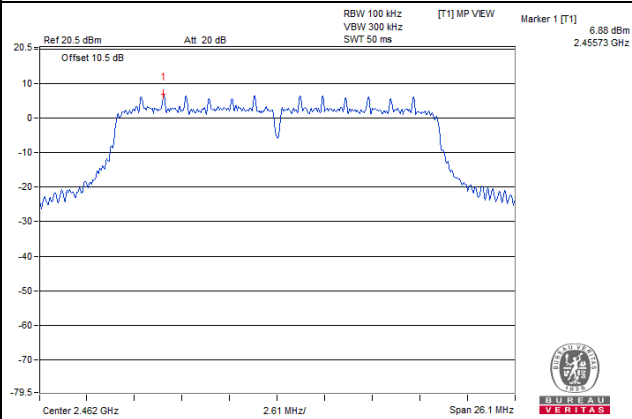
CH 1



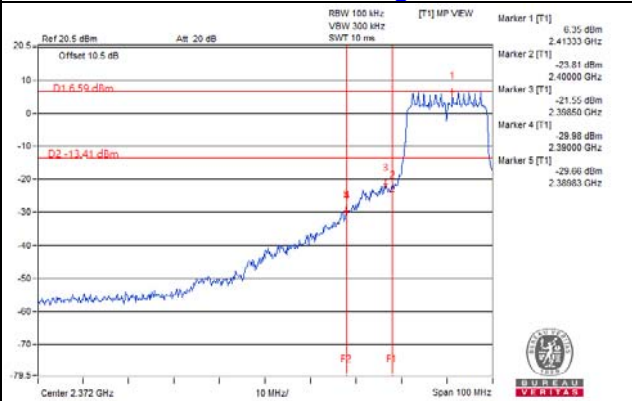
CH 6



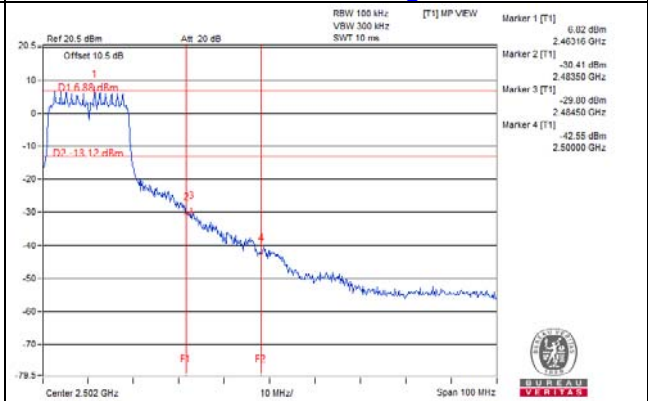
CH 11



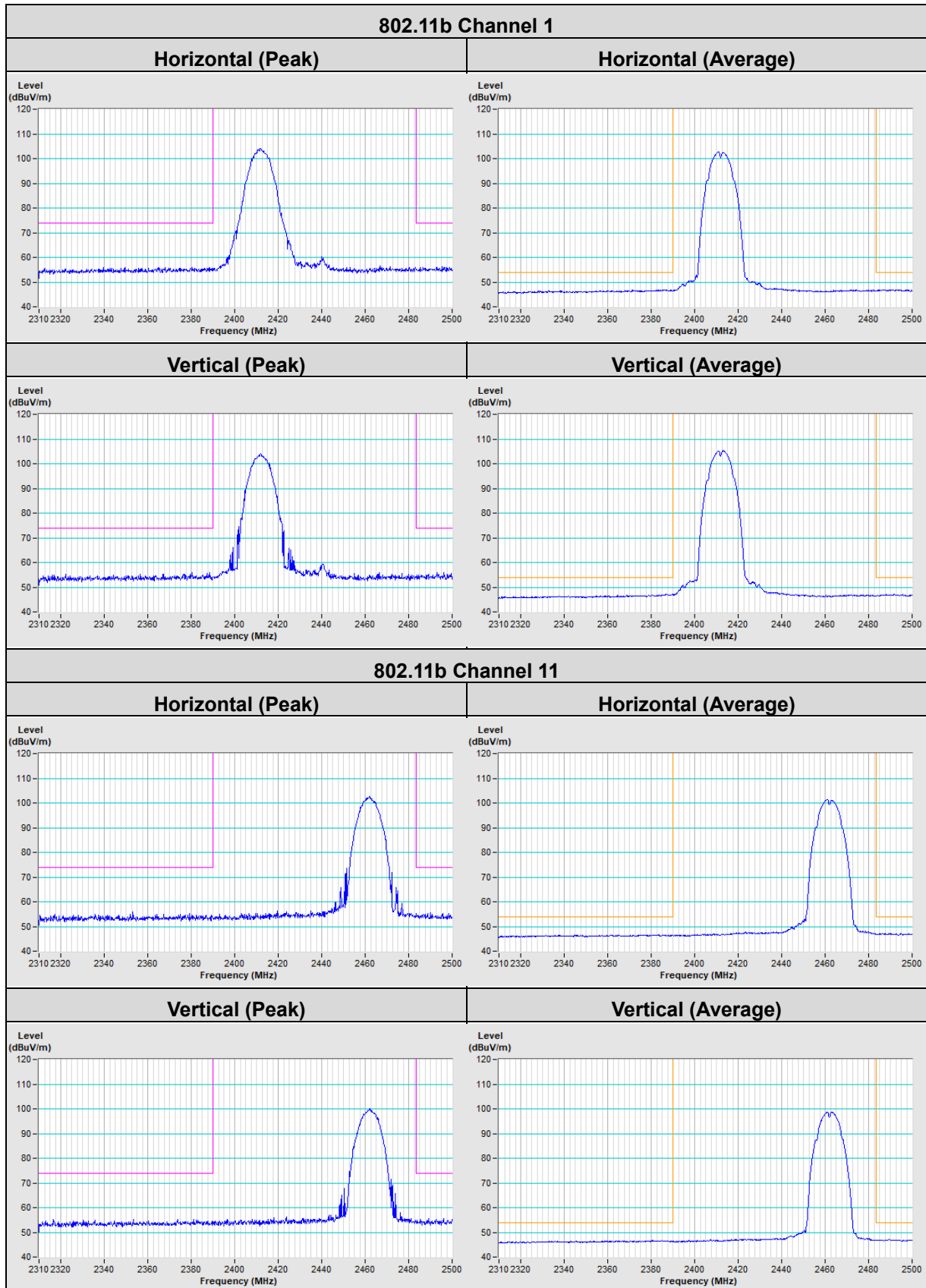
CH 1 Band edge



CH 11 Band edge

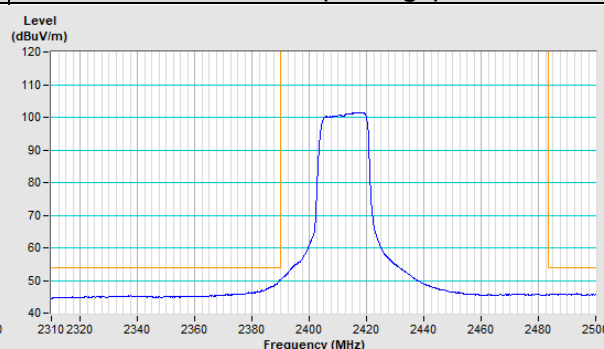
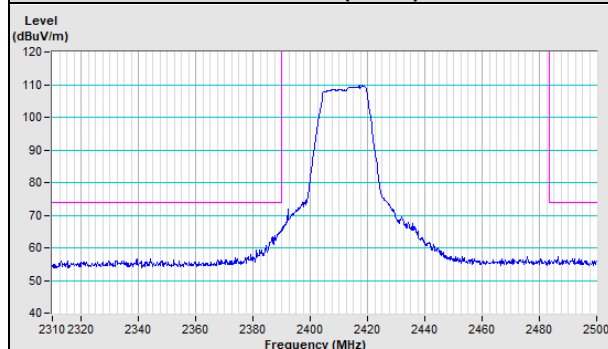


Annex A- Band Edge Measurement

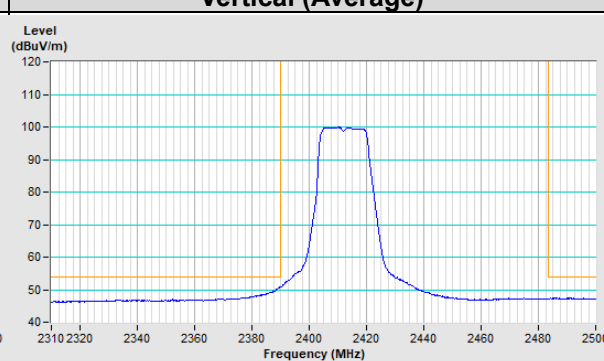
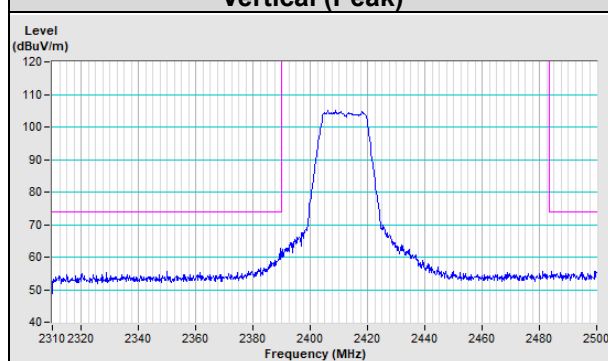


802.11g Channel 1

Horizontal (Peak)	Horizontal (Average)
--------------------------	-----------------------------

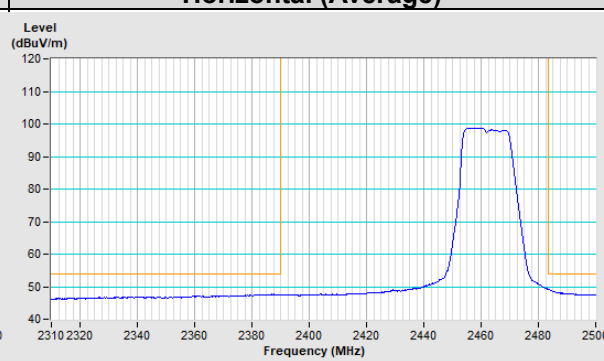
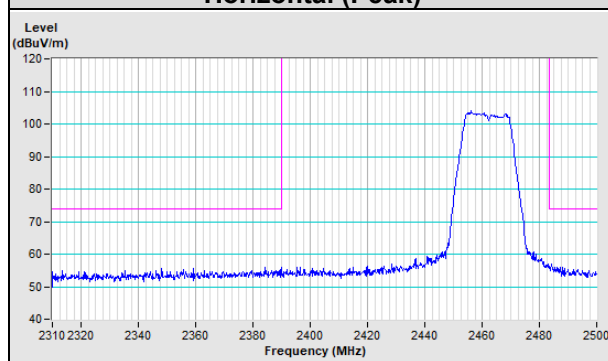


Vertical (Peak)	Vertical (Average)
------------------------	---------------------------

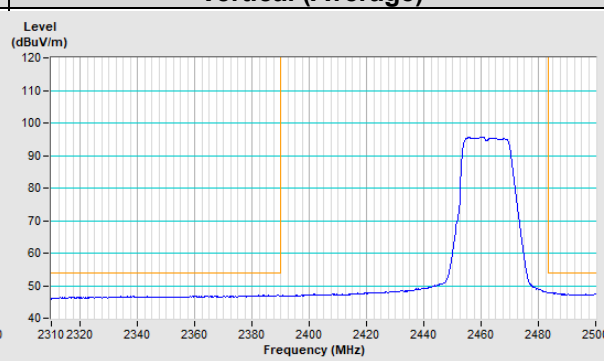
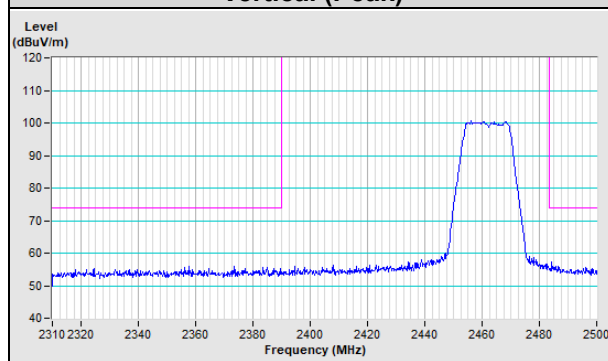


802.11g Channel 11

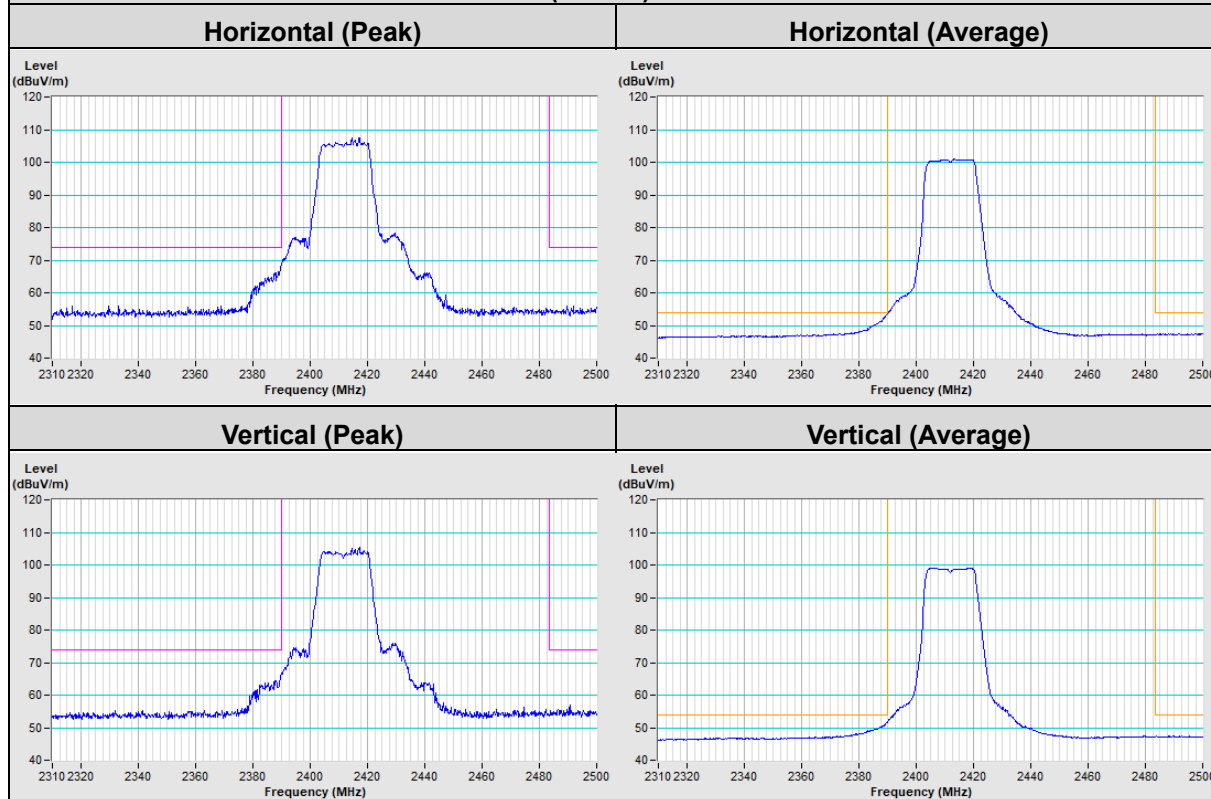
Horizontal (Peak)	Horizontal (Average)
--------------------------	-----------------------------



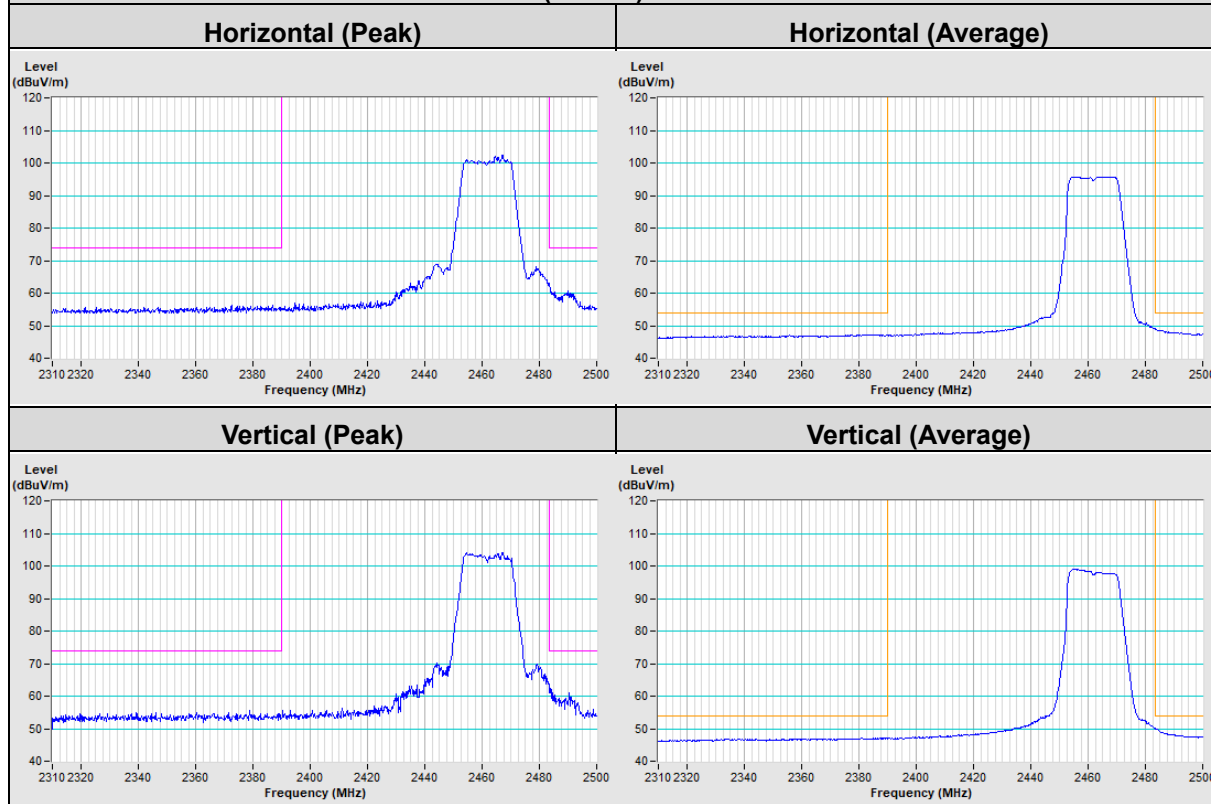
Vertical (Peak)	Vertical (Average)
------------------------	---------------------------



802.11n (20MHz) Channel 1



802.11n (20MHz) Channel 11



5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

Appendix – Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

Lin Kou EMC/RF Lab

Tel: 886-2-26052180

Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab

Tel: 886-3-6668565

Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety Lab

Tel: 886-3-3183232

Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

The address and road map of all our labs can be found in our web site also.

--- END ---