FCC Test Report

Report No.:	RF200508C22
FCC ID:	COF-AS01
Test Model:	AS-01
Received Date:	May. 08, 2020
Test Date:	May 27 ~ May 29, 2020
Issued Date:	Jun. 03, 2020
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Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Lin Kou Laboratories
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Test Location:	No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, Taiwan
FCC Registration / Designation Number:	788550 / TW0003

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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 10
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 17
4.1.5 Test Set Up 17
4.1.6 EUT Operating Conditions 18
4.1.7 Test Results 19
4.2 Conducted Emission Measurement 41
4.2.1 Limits of Conducted Emission Measurement 41
4.2.2 Test Instruments 41
4.2.3 Test Procedures 42
4.2.4 Deviation from Test Standard 42
4.2.5 Test Setup 42
4.2.6 EUT Operating Conditions 42
4.2.7 Test Results 43
4.3 6dB Bandwidth Measurement 45
4.3.1 Limits of 6dB Bandwidth Measurement 45
4.3.2 Test Setup 45
4.3.3 Test Instruments 45
4.3.4 Test Procedure 45
4.3.5 Deviation from Test Standard 45
4.3.6 EUT Operating Conditions 45
4.3.7 Test Result 46
4.4 Conducted Output Power Measurement 50
4.4.1 Limits of Conducted Output Power Measurement 50
4.4.2 Test Setup 50
4.4.3 Test Instruments 50
4.4.4 Test Procedures 50
4.4.5 Deviation from Test Standard 50
4.4.6 EUT Operating Conditions 50
4.4.7 Test Results 51
4.5 Power Spectral Density Measurement 55

4.5.1 Limits of Power Spectral Density Measurement 55
4.5.2 Test Setup 55
4.5.3 Test Instruments 55
4.5.4 Test Procedure 55
4.5.5 Deviation from Test Standard 55
4.5.6 EUT Operating Condition 55
4.5.7 Test Results 56
4.6 Conducted Out of Band Emission Measurement 60
4.6.1 Limits of Conducted Out of Band Emission Measurement 60
4.6.2 Test Setup 60
4.6.3 Test Instruments 60
4.6.4 Test Procedure 60
4.6.5 Deviation from Test Standard 60
4.6.6 EUT Operating Condition 60
4.6.7 Test Results 60

5. Pictures of Test Arrangements 67

Annex A- Band Edge Measurement 68

Appendix – Information of the Testing Laboratories 74

Release Control Record

Issue No.	Description	Date Issued
RF200508C22	Original release.	Jun. 03, 2020

1. Certificate of Conformity

Product: Azure Sphere Module

Brand: USI®

Test Model: AS-01

Sample Status: Engineering sample

Applicant: UNIVERSAL GLOBAL SCIENTIFIC INDUSTRIAL CO., LTD

Test Date: May 27 ~ May 29, 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 : Polly Chien , **Date:** Jun. 03, 2020
Polly Chien / Specialist

Approved by : Bruce Chen , **Date:** Jun. 03, 2020
Bruce Chen / Senior Project Engineer

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 -8.79 dB at 0.15000MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -2.0dB at 2483.50MHz.
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	For Dipole/ PIFA Antenna: Antenna connector is i-pex(MHF) connector not a standard connector. For PCB Antenna: No antenna connector is used.

Note:

1. For 2.4G 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. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

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) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.79 dB
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.04 dB
	30MHz ~ 200MHz	3.59 dB
	200MHz ~1000MHz	3.60 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 dB

2.2 Modification Record

There were no modifications required for compliance.

3. General Information

3.1 General Description of EUT

Product	Azure Sphere Module
Brand	USI®
Test Model	AS-01
Sample Status	Engineering sample
Power Supply Rating	3.3Vdc (Host equipment)
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	2412~2462MHz
Number of Channel	11 for 802.11b, 802.11g, 802.11n (HT20)
Output Power	Mode A: 311.889mW Mode B: 301.995mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	NA
Cable Supplied	1m shielded USB cable without core

Note:

1. The EUT provides one completed transmitter and one receiver.

Modulation Mode	TX Function
802.11b	1TX
802.11g	1TX
802.11n (HT20)	1TX

2. The following antennas were provided to the EUT.

Item	Antenna type	Connector	Gain(dBi)	
			2.4GHz	5GHz
WiFi external ANT (AUX) (Optional)	Dipole	i-pex(MHF)	3.22	3.43
WiFi onboard ANT (Main)	PCB	NA	0.19	3.27
BT ANT	PIFA	i-pex(MHF)	3	-

3. The BT could transmit simultaneously either with WLAN 2.4GHz or 5GHz at the same time.

3.2 Description of Test Modes

11 channels are provided for 802.11b, 802.11g, 802.11n (HT20):

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

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable to				Description
	RE≥1G	RE<1G	PLC	APCM	
A	√	√	√	√	EUT with WiFi onboard ANT
B	√	√	-	√	EUT with WiFi external ANT

Where RE≥1G: Radiated Emission above 1GHz & Bandedge Measurement
RE<1G: Radiated Emission below 1GHz
PLC: Power Line Conducted Emission
APCM: Antenna Port Conducted Measurement

Note:

1. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Z-plane** (Mode A) & **Y-plane** (Mode B).
2. For radiated emission (below 1GHz) and power line conducted emission test items, the worst maximum power was selected.
3. "-": Means no effect.

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)	Remark
A, B	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 (HT20)	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)	Remark
A, B	802.11g	1 to 11	1	OFDM	BPSK	6.0	-

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)	Remark
A	802.11g	1 to 11	1	OFDM	BPSK	6.0	-
B	802.11n (HT20)	1 to 11	1	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)	Remark
A	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 (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5	-

Test Condition:

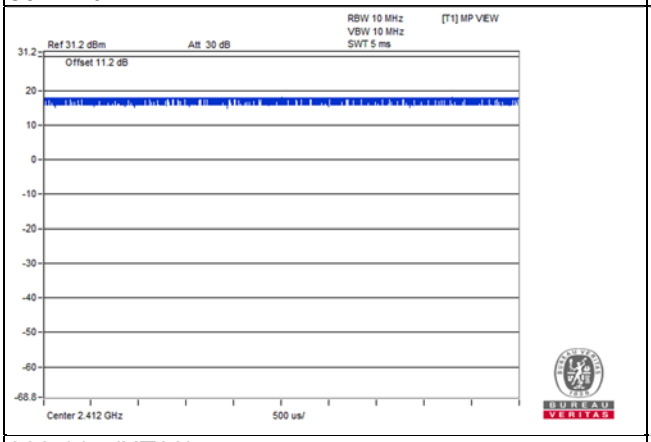
Applicable to	Environmental Conditions	Input Power (system)	Tested by
RE≥1G	22deg. C, 65%RH	120Vac, 60Hz	Greg Lin
RE<1G	22deg. C, 65%RH	120Vac, 60Hz	Greg Lin
PLC	23deg. C, 66%RH	120Vac, 60Hz	Titan Hsu
APCM	25deg. C, 60%RH	120Vac, 60Hz	Vincent Huang

3.3 Duty Cycle of Test Signal

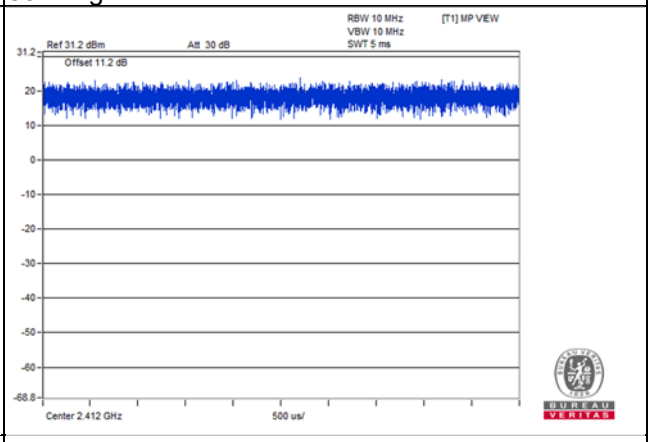
Duty cycle = 100%

Mode A

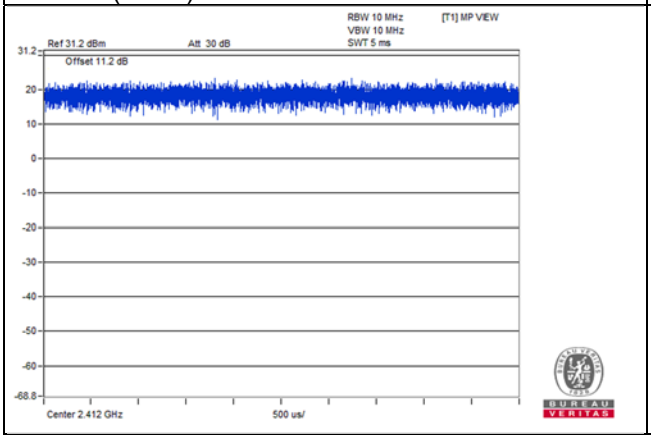
802.11b



802.11g

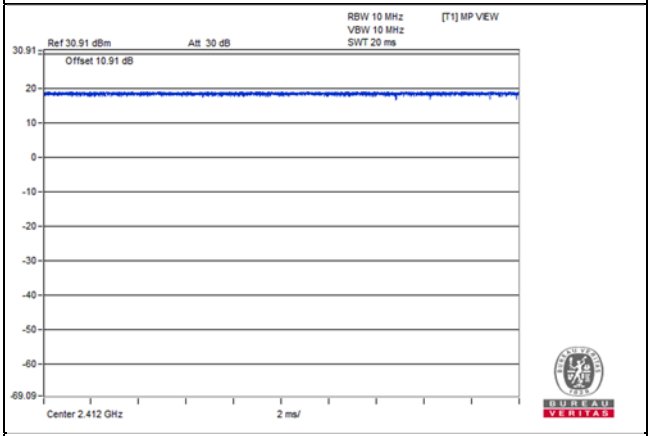


802.11n (HT20)

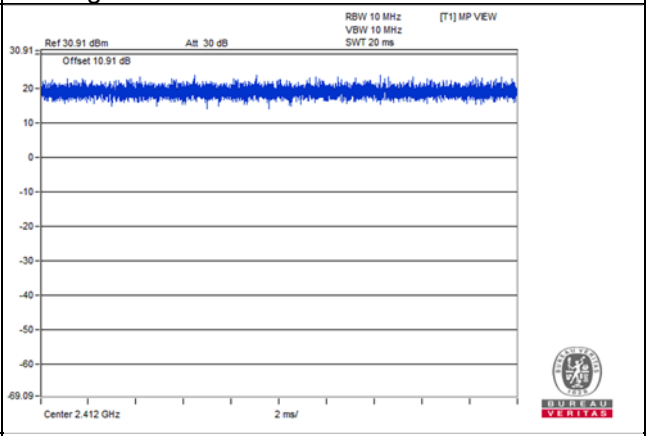


Mode B

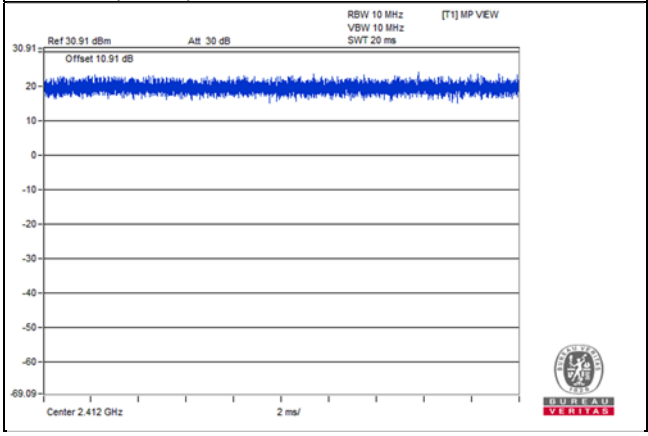
802.11b



802.11g



802.11n (HT20)



3.4 Description of Support Units

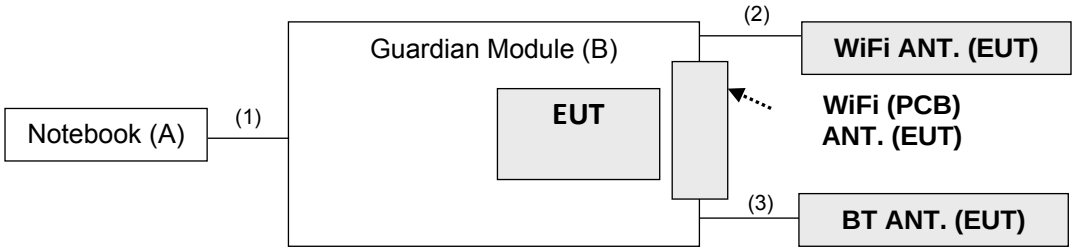
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook	HP	11-u018TU	NA	FCC DoC Approved	-
B.	Guardian Module	USI	GM-01	NA	NA	Provided by client

Note: All power cords of the above support units are non-shielded (1.8m).

ID	Cable Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	USB cable	1	1	Y	0	Accessory of EUT
2.	ANT. cable	1	0.06	Y	0	Accessory of EUT (Optional)
3.	ANT. cable	1	0.07	Y	0	Accessory of EUT

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.	Cal. Date	Cal. Due
Test Receiver KEYSIGHT	N9038A	MY55420137	Apr. 16, 2020	Apr. 15, 2021
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Jun. 12, 2019	Jun. 11, 2020
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	Nov. 07, 2019	Nov. 06, 2020
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-1169	Nov. 24, 2019	Nov. 23, 2020
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Nov. 24, 2019	Nov. 23, 2020
Preamplifier Agilent (Below 1GHz)	8447D	2944A10638	Jul. 11, 2019	Jul. 10, 2020
Preamplifier Agilent (Above 1GHz)	8449B	3008A02367	Feb. 18, 2020	Feb. 17, 2021
RF signal cable HUBER+SUHNER&EMCI	SUCOFLEX 104 & EMC104-SM-SM8000	CABLE-CH9-02 (248780+171006)	Jan. 18, 2020	Jan. 17, 2021
RF signal cable HUBER+SUHNER	SUCOFLEX 104	CABLE-CH9-(250795/4)	Jul. 11, 2019	Jul. 10, 2020
RF signal cable Woken	8D-FB	Cable-CH9-01	Jul. 30, 2019	Jul. 29, 2020
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	NA	NA	NA
Antenna Tower EMCO	2070/2080	512.835.4684	NA	NA
Turn Table EMCO	2087-2.03	NA	NA	NA
Antenna Tower &Turn BV ADT	AT100	AT93021705	NA	NA
Turn Table BV ADT	TT100	TT93021705	NA	NA
Turn Table Controller BV ADT	SC100	SC93021705	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
USB Wideband Power Sensor KEYSIGHT	U2021XA	MY55050005/MY55190 004/MY55190007/MY55 210005	Jul. 15, 2019	Jul. 14, 2020

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 HwaYa Chamber 9.

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 detect 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 ≥ 1/T (Duty cycle < 98%) or 10Hz (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1GHz.

   (RBW = 1 MHz, VBW =10Hz)

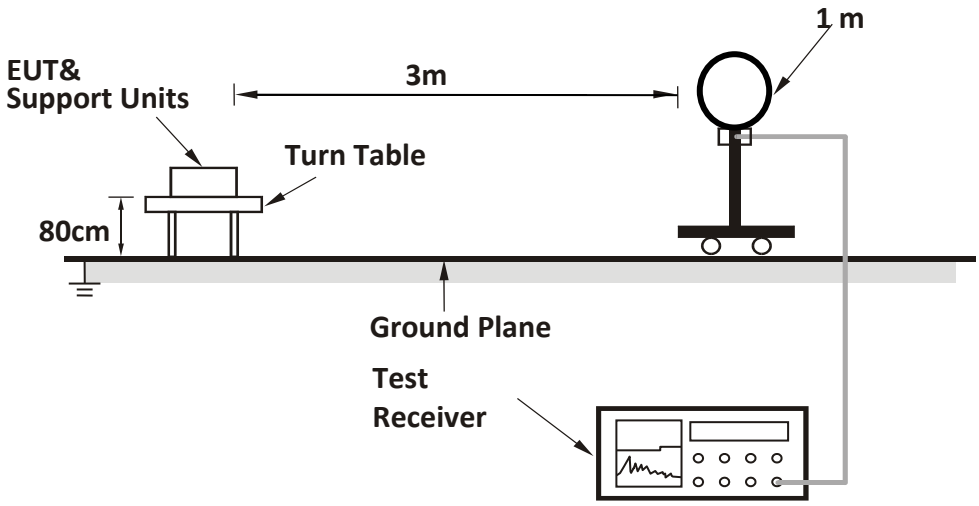
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

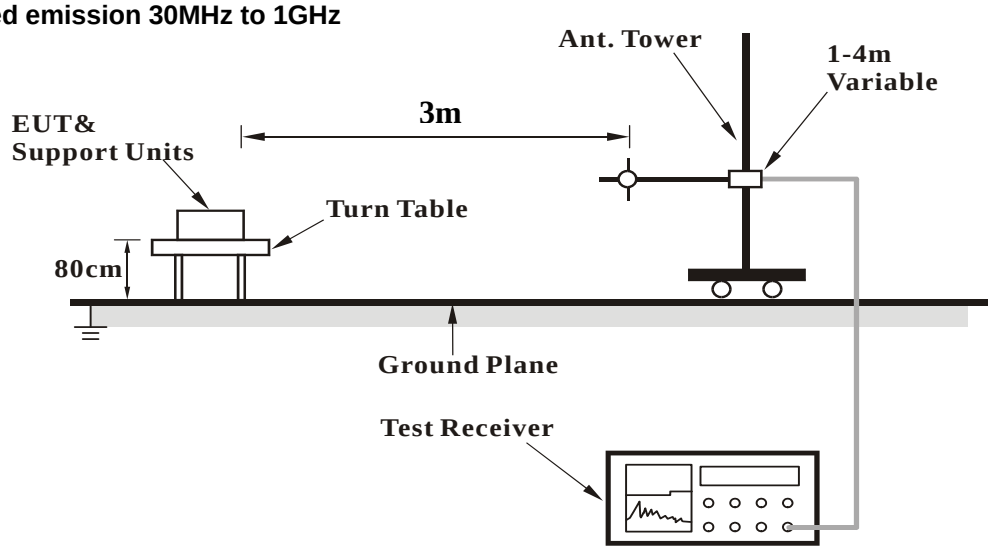
No deviation.

4.1.5 Test Set Up

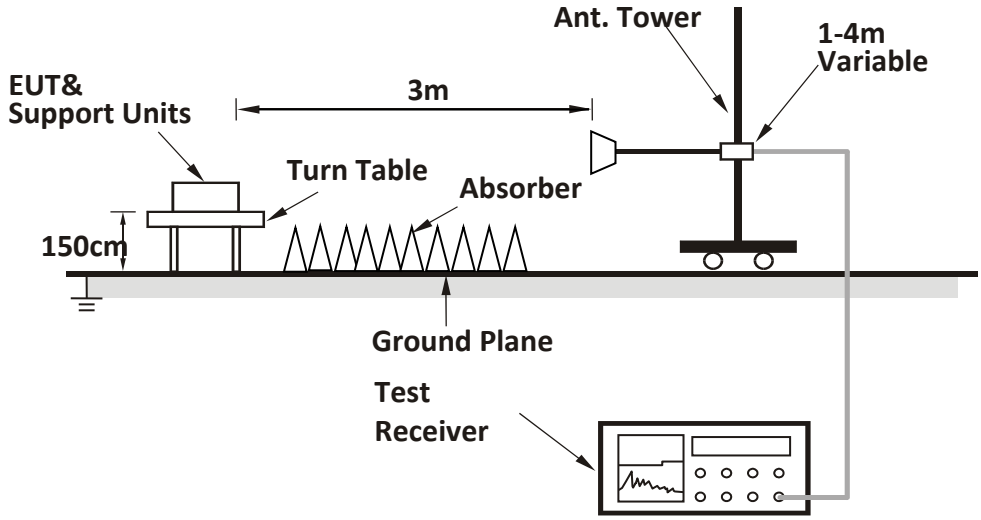
For Radiated emission below 30MHz



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

a. Placed the EUT on the testing table.
b. The EUT connected with notebook via a USB cable and ran a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.
c. The necessary accessories enable the system in full functions.

4.1.7 Test Results

Above 1GHz data:

802.11b

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz	TEST MODE	A

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (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	55.5 PK	74.0	-18.5	3.74 H	6	24.3	31.2
2	2390.00	43.6 AV	54.0	-10.4	3.74 H	6	12.4	31.2
3	*2412.00	102.9 PK			3.74 H	6	71.8	31.1
4	*2412.00	94.3 AV			3.74 H	6	63.2	31.1
5	4824.00	43.6 PK	74.0	-30.4	1.79 H	268	41.8	1.8
6	4824.00	30.5 AV	54.0	-23.5	1.79 H	268	28.7	1.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (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	56.4 PK	74.0	-17.6	1.24 V	113	25.2	31.2
2	2390.00	44.0 AV	54.0	-10.0	1.24 V	113	12.8	31.2
3	*2412.00	104.4 PK			1.24 V	113	73.3	31.1
4	*2412.00	95.8 AV			1.24 V	113	64.7	31.1
5	4824.00	44.1 PK	74.0	-29.9	1.63 V	23	42.3	1.8
6	4824.00	30.9 AV	54.0	-23.1	1.63 V	23	29.1	1.8

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz	TEST MODE	A

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (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	103.5 PK			3.73 H	7	72.4	31.1
2	*2437.00	94.8 AV			3.73 H	7	63.7	31.1
3	4874.00	44.2 PK	74.0	-29.8	1.84 H	265	42.2	2.0
4	4874.00	30.9 AV	54.0	-23.1	1.84 H	265	28.9	2.0
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (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	105.0 PK			1.29 V	108	73.9	31.1
2	*2437.00	96.3 AV			1.29 V	108	65.2	31.1
3	4874.00	44.6 PK	74.0	-29.4	1.74 V	33	42.6	2.0
4	4874.00	31.5 AV	54.0	-22.5	1.74 V	33	29.5	2.0

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz	TEST MODE	A

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (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	103.3 PK			3.82 H	4	72.2	31.1
2	*2462.00	94.7 AV			3.82 H	4	63.6	31.1
3	2483.50	55.3 PK	74.0	-18.7	3.82 H	4	24.1	31.2
4	2483.50	43.5 AV	54.0	-10.5	3.82 H	4	12.3	31.2
5	4924.00	43.9 PK	74.0	-30.1	1.75 H	264	41.8	2.1
6	4924.00	29.7 AV	54.0	-24.3	1.75 H	264	27.6	2.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (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	104.6 PK			1.30 V	94	73.5	31.1
2	*2462.00	96.1 AV			1.30 V	94	65.0	31.1
3	2483.50	56.5 PK	74.0	-17.5	1.30 V	94	25.3	31.2
4	2483.50	43.6 AV	54.0	-10.4	1.30 V	94	12.4	31.2
5	4924.00	44.3 PK	74.0	-29.7	1.52 V	37	42.2	2.1
6	4924.00	30.0 AV	54.0	-24.0	1.52 V	37	27.9	2.1

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

802.11g

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz	TEST MODE	A

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (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	60.0 PK	74.0	-14.0	3.89 H	2	28.8	31.2
2	2390.00	44.5 AV	54.0	-9.5	3.89 H	2	13.3	31.2
3	*2412.00	103.2 PK			3.89 H	2	72.1	31.1
4	*2412.00	92.3 AV			3.89 H	2	61.2	31.1
5	4824.00	43.1 PK	74.0	-30.9	1.84 H	260	41.3	1.8
6	4824.00	29.6 AV	54.0	-24.4	1.84 H	260	27.8	1.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (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	61.5 PK	74.0	-12.5	1.49 V	109	30.3	31.2
2	2390.00	44.9 AV	54.0	-9.1	1.49 V	109	13.7	31.2
3	*2412.00	104.7 PK			1.49 V	109	73.6	31.1
4	*2412.00	93.9 AV			1.49 V	109	62.8	31.1
5	4824.00	43.6 PK	74.0	-30.4	1.45 V	42	41.8	1.8
6	4824.00	30.2 AV	54.0	-23.8	1.45 V	42	28.4	1.8

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz	TEST MODE	A

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (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	103.4 PK			3.87 H	6	72.3	31.1
2	*2437.00	92.5 AV			3.87 H	6	61.4	31.1
3	4874.00	43.6 PK	74.0	-30.4	1.92 H	257	41.6	2.0
4	4874.00	29.9 AV	54.0	-24.1	1.92 H	257	27.9	2.0
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (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	104.9 PK			1.51 V	102	73.8	31.1
2	*2437.00	94.0 AV			1.51 V	102	62.9	31.1
3	4874.00	44.1 PK	74.0	-29.9	1.56 V	47	42.1	2.0
4	4874.00	30.6 AV	54.0	-23.4	1.56 V	47	28.6	2.0

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz	TEST MODE	A

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (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	104.1 PK			3.83 H	7	73.0	31.1
2	*2462.00	93.2 AV			3.83 H	7	62.1	31.1
3	2483.50	65.3 PK	74.0	-8.7	3.83 H	7	34.1	31.2
4	2483.50	46.3 AV	54.0	-7.7	3.83 H	7	15.1	31.2
5	4924.00	43.7 PK	74.0	-30.3	1.79 H	253	41.6	2.1
6	4924.00	30.2 AV	54.0	-23.8	1.79 H	253	28.1	2.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (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	105.8 PK			1.51 V	115	74.7	31.1
2	*2462.00	94.6 AV			1.51 V	115	63.5	31.1
3	2483.50	67.0 PK	74.0	-7.0	1.51 V	115	35.8	31.2
4	2483.50	47.3 AV	54.0	-6.7	1.51 V	115	16.1	31.2
5	4924.00	44.5 PK	74.0	-29.5	1.42 V	39	42.4	2.1
6	4924.00	30.8 AV	54.0	-23.2	1.42 V	39	28.7	2.1

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

802.11n (HT20)

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz	TEST MODE	A

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (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	60.8 PK	74.0	-13.2	3.91 H	3	29.6	31.2
2	2390.00	44.8 AV	54.0	-9.2	3.91 H	3	13.6	31.2
3	*2412.00	102.9 PK			3.91 H	3	71.8	31.1
4	*2412.00	92.2 AV			3.91 H	3	61.1	31.1
5	4824.00	43.0 PK	74.0	-31.0	1.78 H	248	41.2	1.8
6	4824.00	29.4 AV	54.0	-24.6	1.78 H	248	27.6	1.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (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	60.2 PK	74.0	-13.8	1.46 V	107	29.0	31.2
2	2390.00	44.5 AV	54.0	-9.5	1.46 V	107	13.3	31.2
3	*2412.00	104.3 PK			1.46 V	107	73.2	31.1
4	*2412.00	93.6 AV			1.46 V	107	62.5	31.1
5	4824.00	43.4 PK	74.0	-30.6	1.53 V	48	41.6	1.8
6	4824.00	30.1 AV	54.0	-23.9	1.53 V	48	28.3	1.8

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz	TEST MODE	A

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (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	102.7 PK			3.85 H	0	71.6	31.1
2	*2437.00	91.9 AV			3.85 H	0	60.8	31.1
3	4874.00	43.1 PK	74.0	-30.9	1.79 H	267	41.1	2.0
4	4874.00	29.4 AV	54.0	-24.6	1.79 H	267	27.4	2.0
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (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	104.2 PK			1.53 V	112	73.1	31.1
2	*2437.00	93.4 AV			1.53 V	112	62.3	31.1
3	4874.00	43.4 PK	74.0	-30.6	1.53 V	36	41.4	2.0
4	4874.00	30.1 AV	54.0	-23.9	1.53 V	36	28.1	2.0

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz	TEST MODE	A

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (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	103.7 PK			3.81 H	4	72.6	31.1
2	*2462.00	93.0 AV			3.81 H	4	61.9	31.1
3	2483.50	67.0 PK	74.0	-7.0	3.81 H	4	35.8	31.2
4	2483.50	46.5 AV	54.0	-7.5	3.81 H	4	15.3	31.2
5	4924.00	43.3 PK	74.0	-30.7	1.92 H	264	41.2	2.1
6	4924.00	29.6 AV	54.0	-24.4	1.92 H	264	27.5	2.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (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	105.6 PK			1.51 V	114	74.5	31.1
2	*2462.00	94.5 AV			1.51 V	114	63.4	31.1
3	2483.50	68.0 PK	74.0	-6.0	1.51 V	114	36.8	31.2
4	2483.50	47.1 AV	54.0	-6.9	1.51 V	114	15.9	31.2
5	4924.00	44.3 PK	74.0	-29.7	1.49 V	46	42.2	2.1
6	4924.00	30.8 AV	54.0	-23.2	1.49 V	46	28.7	2.1

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

802.11b

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz	TEST MODE	B

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (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	55.7 PK	74.0	-18.3	2.56 H	150	24.5	31.2
2	2390.00	43.7 AV	54.0	-10.3	2.56 H	150	12.5	31.2
3	*2412.00	108.3 PK			2.56 H	150	77.2	31.1
4	*2412.00	99.5 AV			2.56 H	150	68.4	31.1
5	4824.00	44.2 PK	74.0	-29.8	1.58 H	143	42.4	1.8
6	4824.00	30.5 AV	54.0	-23.5	1.58 H	143	28.7	1.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (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	55.5 PK	74.0	-18.5	3.52 V	148	24.3	31.2
2	2390.00	43.4 AV	54.0	-10.6	3.52 V	148	12.2	31.2
3	*2412.00	104.0 PK			3.52 V	148	72.9	31.1
4	*2412.00	95.2 AV			3.52 V	148	64.1	31.1
5	4824.00	43.8 PK	74.0	-30.2	1.69 V	273	42.0	1.8
6	4824.00	30.1 AV	54.0	-23.9	1.69 V	273	28.3	1.8

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz	TEST MODE	B

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (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	108.7 PK			2.51 H	146	77.6	31.1
2	*2437.00	99.9 AV			2.51 H	146	68.8	31.1
3	4874.00	44.8 PK	74.0	-29.2	2.23 H	126	42.8	2.0
4	4874.00	31.1 AV	54.0	-22.9	2.23 H	126	29.1	2.0
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (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	104.5 PK			2.67 V	144	73.4	31.1
2	*2437.00	95.6 AV			2.67 V	144	64.5	31.1
3	4874.00	45.3 PK	74.0	-28.7	1.51 V	148	43.3	2.0
4	4874.00	31.5 AV	54.0	-22.5	1.51 V	148	29.5	2.0

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz	TEST MODE	B

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (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	107.8 PK			2.69 H	154	76.7	31.1
2	*2462.00	99.2 AV			2.69 H	154	68.1	31.1
3	2483.50	56.5 PK	74.0	-17.5	2.69 H	154	25.3	31.2
4	2483.50	44.4 AV	54.0	-9.6	2.69 H	154	13.2	31.2
5	4924.00	45.7 PK	74.0	-28.3	1.64 H	153	43.6	2.1
6	4924.00	32.3 AV	54.0	-21.7	1.64 H	153	30.2	2.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (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	103.5 PK			3.43 V	139	72.4	31.1
2	*2462.00	94.9 AV			3.43 V	139	63.8	31.1
3	2483.50	55.7 PK	74.0	-18.3	3.43 V	139	24.5	31.2
4	2483.50	43.6 AV	54.0	-10.4	3.43 V	139	12.4	31.2
5	4924.00	44.5 PK	74.0	-29.5	1.83 V	288	42.4	2.1
6	4924.00	31.0 AV	54.0	-23.0	1.83 V	288	28.9	2.1

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

802.11g

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz	TEST MODE	B

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (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	68.8 PK	74.0	-5.2	2.88 H	145	37.6	31.2
2	2390.00	46.6 AV	54.0	-7.4	2.88 H	145	15.4	31.2
3	*2412.00	109.2 PK			2.88 H	145	78.1	31.1
4	*2412.00	98.0 AV			2.88 H	145	66.9	31.1
5	4824.00	42.2 PK	74.0	-31.8	2.22 H	138	40.4	1.8
6	4824.00	30.3 AV	54.0	-23.7	2.22 H	138	28.5	1.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (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	62.5 PK	74.0	-11.5	3.51 V	297	31.3	31.2
2	2390.00	45.1 AV	54.0	-8.9	3.51 V	297	13.9	31.2
3	*2412.00	105.1 PK			3.59 V	145	74.0	31.1
4	*2412.00	93.6 AV			3.59 V	145	62.5	31.1
5	4824.00	41.8 PK	74.0	-32.2	1.75 V	280	40.0	1.8
6	4824.00	29.5 AV	54.0	-24.5	1.75 V	280	27.7	1.8

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz	TEST MODE	B

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (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	109.6 PK			2.93 H	147	78.5	31.1
2	*2437.00	98.4 AV			2.93 H	147	67.3	31.1
3	4874.00	42.7 PK	74.0	-31.3	2.34 H	143	40.7	2.0
4	4874.00	30.6 AV	54.0	-23.4	2.34 H	143	28.6	2.0
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (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	105.3 PK			3.53 V	142	74.2	31.1
2	*2437.00	93.9 AV			3.53 V	142	62.8	31.1
3	4874.00	42.2 PK	74.0	-31.8	1.73 V	289	40.2	2.0
4	4874.00	29.8 AV	54.0	-24.2	1.73 V	289	27.8	2.0

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz	TEST MODE	B

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (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	108.8 PK			2.80 H	145	77.7	31.1
2	*2462.00	97.3 AV			2.80 H	145	66.2	31.1
3	**2483.50**	**72.0 PK**	**74.0**	**-2.0**	**2.80 H**	**145**	**40.8**	**31.2**
4	2483.50	49.4 AV	54.0	-4.6	2.80 H	145	18.2	31.2
5	4924.00	42.8 PK	74.0	-31.2	2.29 H	131	40.7	2.1
6	4924.00	30.8 AV	54.0	-23.2	2.29 H	131	28.7	2.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (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	104.3 PK			3.62 V	139	73.2	31.1
2	*2462.00	92.8 AV			3.62 V	139	61.7	31.1
3	2483.50	67.4 PK	74.0	-6.6	3.62 V	139	36.2	31.2
4	2483.50	47.3 AV	54.0	-6.7	3.62 V	139	16.1	31.2
5	4924.00	42.3 PK	74.0	-31.7	1.79 V	273	40.2	2.1
6	4924.00	29.6 AV	54.0	-24.4	1.79 V	273	27.5	2.1

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

802.11n (HT20)

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz	TEST MODE	B

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (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	62.9 PK	74.0	-11.1	2.80 H	151	31.7	31.2
2	2390.00	46.1 AV	54.0	-7.9	2.80 H	151	14.9	31.2
3	*2412.00	109.7 PK			2.80 H	151	78.6	31.1
4	*2412.00	97.9 AV			2.80 H	151	66.8	31.1
5	4824.00	42.4 PK	74.0	-31.6	2.29 H	127	40.6	1.8
6	4824.00	29.1 AV	54.0	-24.9	2.29 H	127	27.3	1.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (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	56.1 PK	74.0	-17.9	3.46 V	138	24.9	31.2
2	2390.00	44.3 AV	54.0	-9.7	3.46 V	138	13.1	31.2
3	*2412.00	105.4 PK			3.46 V	138	74.3	31.1
4	*2412.00	93.6 AV			3.46 V	138	62.5	31.1
5	4824.00	42.0 PK	74.0	-32.0	1.73 V	284	40.2	1.8
6	4824.00	28.6 AV	54.0	-25.4	1.73 V	284	26.8	1.8

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz	TEST MODE	B

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (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	109.4 PK			2.76 H	145	78.3	31.1
2	*2437.00	97.7 AV			2.76 H	145	66.6	31.1
3	4874.00	42.7 PK	74.0	-31.3	2.26 H	124	40.7	2.0
4	4874.00	29.5 AV	54.0	-24.5	2.26 H	124	27.5	2.0
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (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	104.9 PK			3.53 V	142	73.8	31.1
2	*2437.00	93.3 AV			3.53 V	142	62.2	31.1
3	4874.00	42.1 PK	74.0	-31.9	1.73 V	279	40.1	2.0
4	4874.00	28.5 AV	54.0	-25.5	1.73 V	279	26.5	2.0

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz	TEST MODE	B

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (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	108.8 PK			2.73 H	151	77.7	31.1
2	*2462.00	97.2 AV			2.73 H	151	66.1	31.1
3	2483.50	70.3 PK	74.0	-3.7	2.73 H	151	39.1	31.2
4	2483.50	47.9 AV	54.0	-6.1	2.73 H	151	16.7	31.2
5	4924.00	42.9 PK	74.0	-31.1	2.25 H	138	40.8	2.1
6	4924.00	29.6 AV	54.0	-24.4	2.25 H	138	27.5	2.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (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	104.7 PK			3.56 V	142	73.6	31.1
2	*2462.00	92.9 AV			3.56 V	142	61.8	31.1
3	2483.50	66.6 PK	74.0	-7.4	3.56 V	142	35.4	31.2
4	2483.50	45.5 AV	54.0	-8.5	3.56 V	142	14.3	31.2
5	4924.00	42.3 PK	74.0	-31.7	1.64 V	275	40.2	2.1
6	4924.00	28.9 AV	54.0	-25.1	1.64 V	275	26.8	2.1

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

Below 1GHz worst-case data:

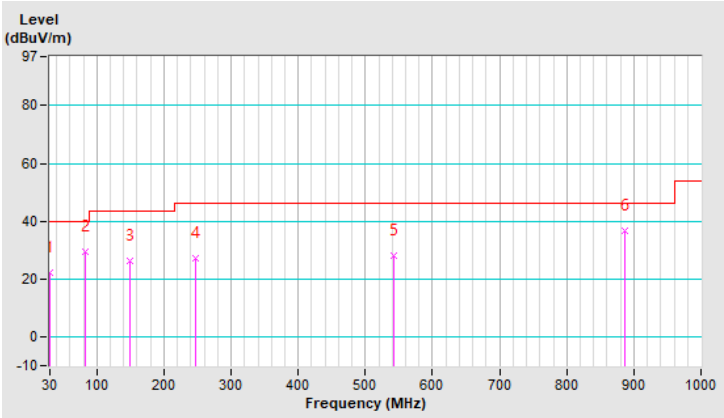
802.11g

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz	TEST MODE	A

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	30.00	22.3 QP	40.0	-17.7	1.25 H	359	33.6	-11.3
2	82.38	29.4 QP	40.0	-10.6	1.00 H	113	43.7	-14.3
3	149.31	26.4 QP	43.5	-17.1	1.25 H	100	35.6	-9.2
4	247.28	27.4 QP	46.0	-18.6	1.50 H	135	37.5	-10.1
5	543.13	28.3 QP	46.0	-17.7	1.00 H	151	31.3	-3.0
6	886.51	36.9 QP	46.0	-9.1	1.25 H	11	34.1	2.8

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. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
4. Margin value = Emission Level – Limit value
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20dB below the permissible value to be report.

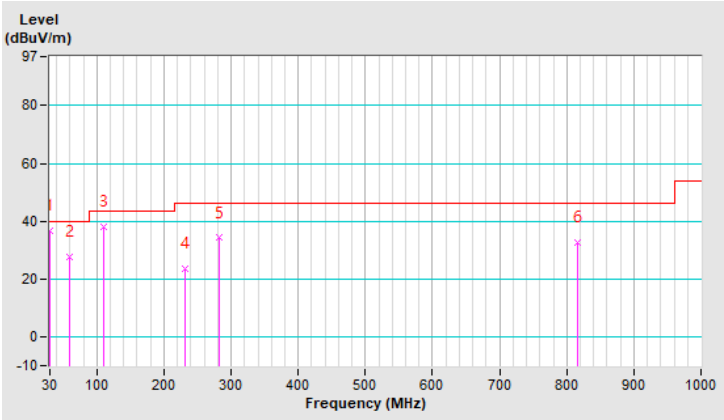


CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz	TEST MODE	A

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	30.00	36.6 QP	40.0	-3.4	1.25 V	213	47.9	-11.3
2	60.07	27.6 QP	40.0	-12.4	1.00 V	77	38.0	-10.4
3	109.54	38.1 QP	43.5	-5.4	1.50 V	255	50.6	-12.5
4	230.79	23.6 QP	46.0	-22.4	1.25 V	279	35.2	-11.6
5	283.17	34.2 QP	46.0	-11.8	1.00 V	96	42.5	-8.3
6	816.67	32.6 QP	46.0	-13.4	1.00 V	312	30.8	1.8

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. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
4. Margin value = Emission Level – Limit value
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20dB below the permissible value to be report.



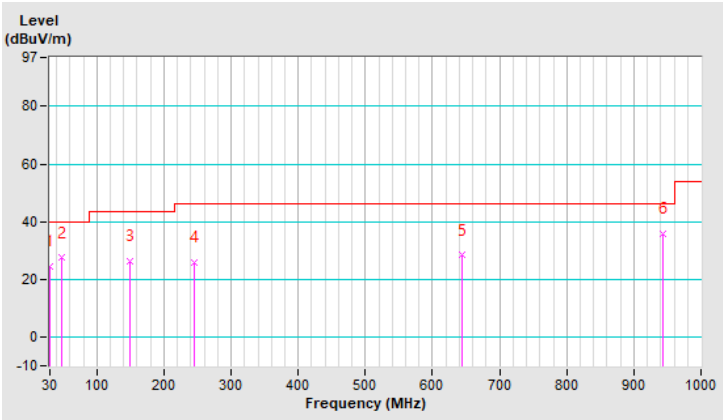
802.11n (HT20)

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz	TEST MODE	B

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	30.00	24.4 QP	40.0	-15.6	1.25 H	201	35.7	-11.3
2	48.43	27.4 QP	40.0	-12.6	1.00 H	178	37.1	-9.7
3	148.34	26.2 QP	43.5	-17.3	1.00 H	86	35.5	-9.3
4	245.34	25.7 QP	46.0	-20.3	1.50 H	146	35.8	-10.1
5	644.01	28.3 QP	46.0	-17.7	1.00 H	150	29.5	-1.2
6	943.74	35.8 QP	46.0	-10.2	1.25 H	199	31.5	4.3

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. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
4. Margin value = Emission Level – Limit value
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20dB below the permissible value to be report.

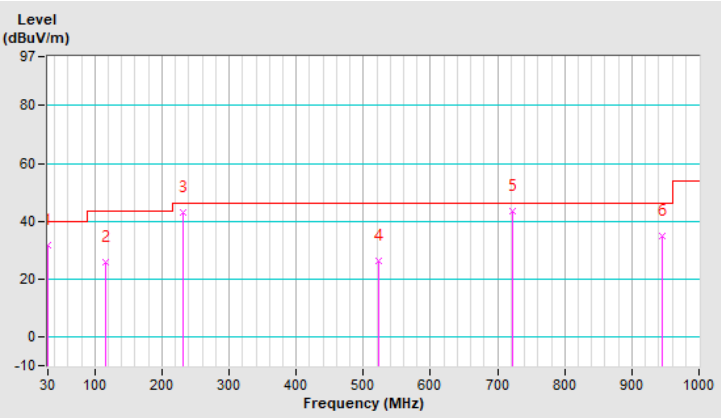


CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz	TEST MODE	B

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	30.00	31.7 QP	40.0	-8.3	1.25 V	176	43.0	-11.3
2	116.33	25.9 QP	43.5	-17.6	1.00 V	75	37.9	-12.0
3	231.76	43.1 QP	46.0	-2.9	1.00 V	61	54.6	-11.5
4	523.73	26.2 QP	46.0	-19.8	1.50 V	28	29.4	-3.2
5	721.61	43.5 QP	46.0	-2.5	1.00 V	18	43.7	-0.2
6	944.71	35.0 QP	46.0	-11.0	1.25 V	274	30.7	4.3

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. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
4. Margin value = Emission Level – Limit value
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20dB 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
Test Receiver ROHDE & SCHWARZ	ESCI	100613	Dec. 11, 2019	Dec. 10, 2020
RF signal cable Woken	5D-FB	Cable-cond1-01	Sep. 05, 2019	Sep. 04, 2020
LISN ROHDE & SCHWARZ (EUT)	ENV216	101826	Feb. 20, 2020	Feb. 19, 2021
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Aug. 22, 2019	Aug. 21, 2020
Software ADT	BV ADT_Cond_ V7.3.7.4	NA	NA	NA

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 HwaYa Shielded Room 1.
3. The VCCI Site Registration No. is C-12040.

4.2.3 Test Procedures

a. 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.

b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

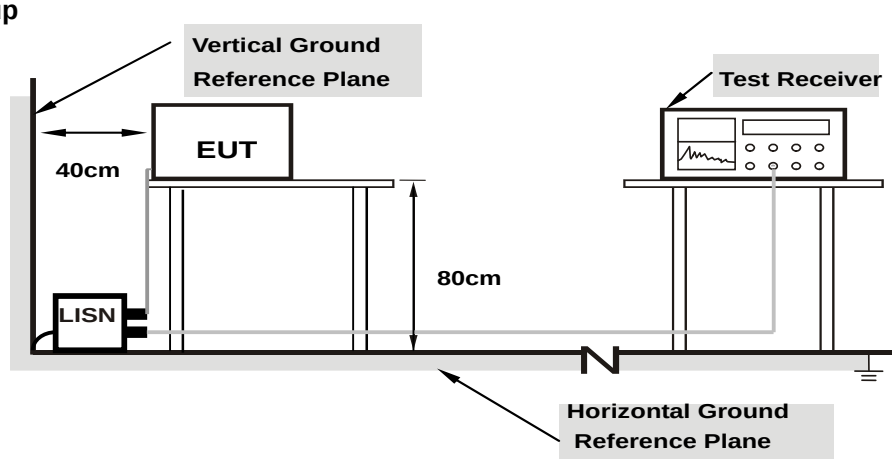
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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

Worst-case data:

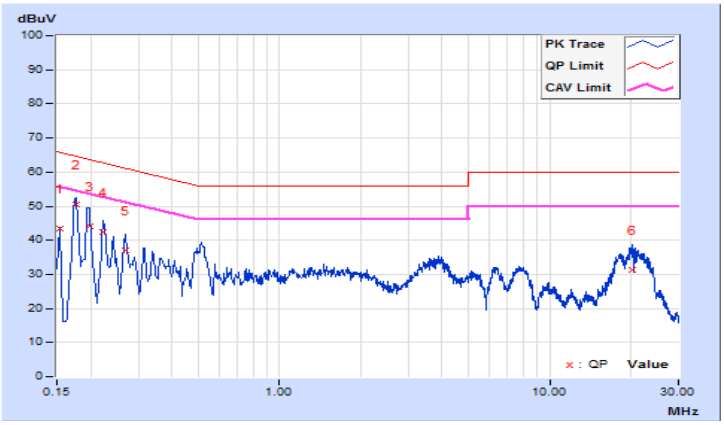
802.11g

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Channel	TX Channel 1		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15400	9.63	33.82	27.13	43.45	36.76	65.78	55.78	-22.33	-19.02
2	0.17800	9.62	40.87	27.19	50.49	36.81	64.58	54.58	-14.09	-17.77
3	0.19728	9.62	34.56	18.30	44.18	27.92	63.72	53.72	-19.54	-25.80
4	0.22200	9.62	32.83	21.09	42.45	30.71	62.74	52.74	-20.29	-22.03
5	0.26992	9.63	27.50	17.57	37.13	27.20	61.12	51.12	-23.99	-23.92
6	20.19800	9.91	21.32	11.15	31.23	21.06	60.00	50.00	-28.77	-28.94

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.

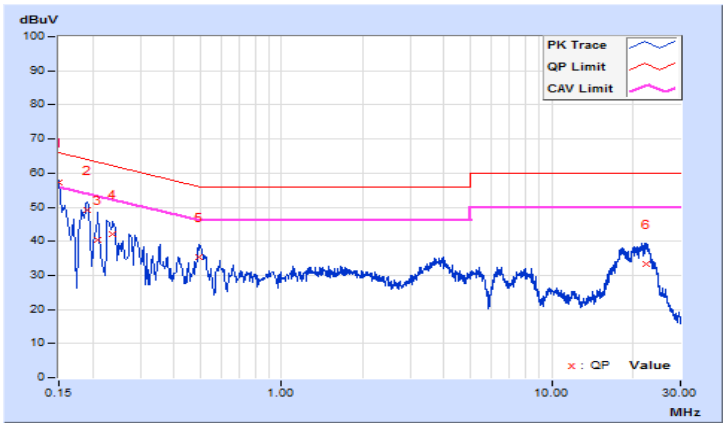


Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Channel	TX Channel 1		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	**0.15000**	**9.66**	**47.55**	**36.43**	**57.21**	**46.09**	**66.00**	**56.00**	**-8.79**	**-9.91**
2	0.19000	9.64	39.44	24.39	49.08	34.03	64.04	54.04	-14.96	-20.01
3	0.21000	9.64	30.76	15.05	40.40	24.69	63.21	53.21	-22.81	-28.52
4	0.23800	9.65	32.54	21.37	42.19	31.02	62.17	52.17	-19.98	-21.15
5	0.49800	9.67	25.71	19.60	35.38	29.27	56.03	46.03	-20.65	-16.76
6	22.32600	10.04	23.23	17.04	33.27	27.08	60.00	50.00	-26.73	-22.92

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.

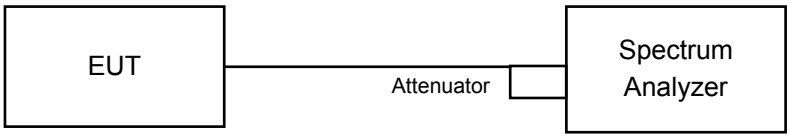


4.3 6dB Bandwidth Measurement

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) ≥ 3 x 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

Mode A

802.11b

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	8.81	0.5	Pass
6	2437	8.63	0.5	Pass
11	2462	8.32	0.5	Pass

802.11g

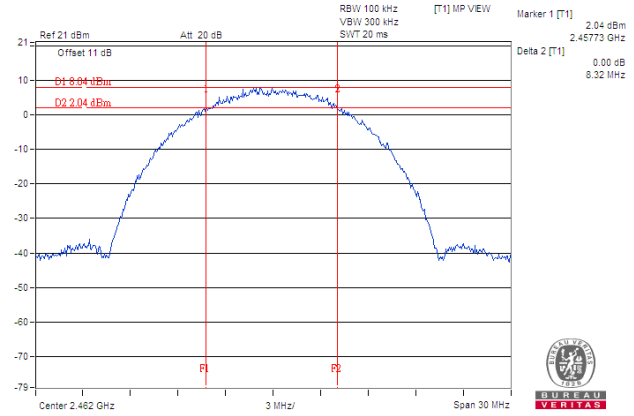
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	16.20	0.5	Pass
6	2437	16.36	0.5	Pass
11	2462	16.08	0.5	Pass

802.11n (HT20)

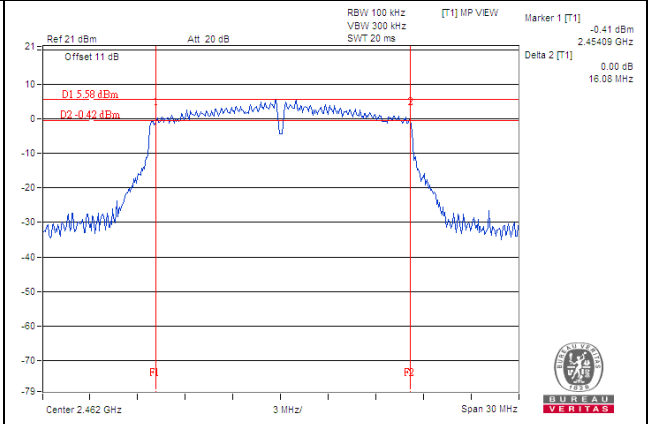
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	16.40	0.5	Pass
6	2437	16.37	0.5	Pass
11	2462	16.38	0.5	Pass

Spectrum Plot of Worst Value

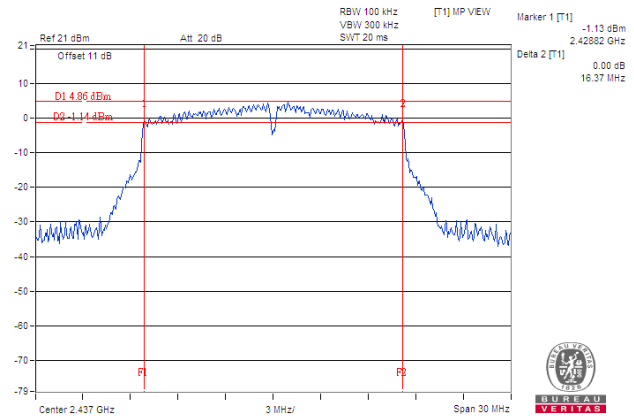
802.11b



802.11g



802.11n (HT20)



Mode B

802.11b

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	8.71	0.5	Pass
6	2437	8.90	0.5	Pass
11	2462	8.47	0.5	Pass

802.11g

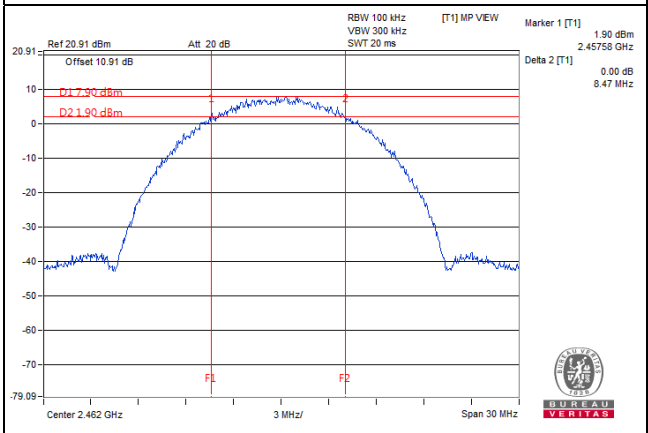
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	16.31	0.5	Pass
6	2437	16.12	0.5	Pass
11	2462	16.36	0.5	Pass

802.11n (HT20)

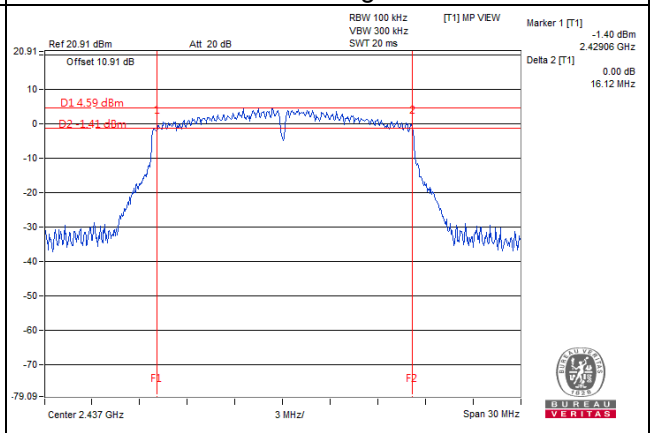
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	16.36	0.5	Pass
6	2437	16.32	0.5	Pass
11	2462	16.25	0.5	Pass

Spectrum Plot of Worst Value

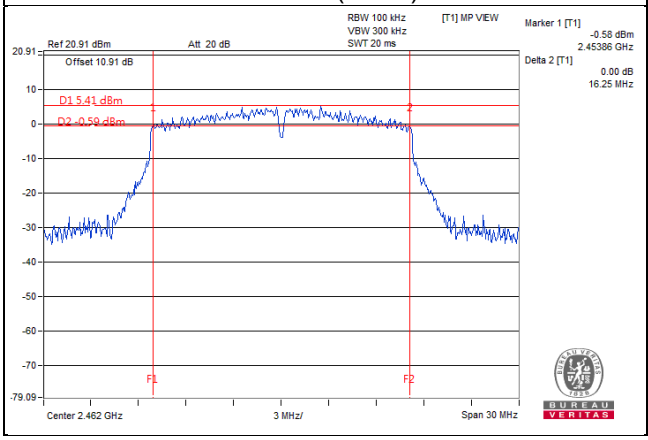
802.11b



802.11g



802.11n (HT20)

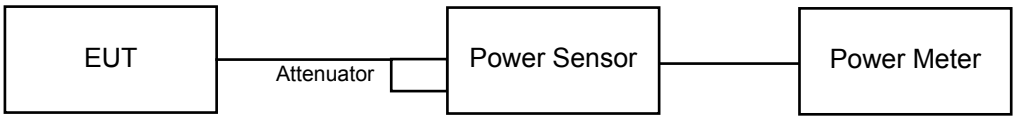


4.4 Conducted Output Power Measurement

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

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

Mode A

FOR PEAK POWER

802.11b

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	64.863	18.12	30	Pass
6	2437	67.920	18.32	30	Pass
11	2462	66.374	18.22	30	Pass

802.11g

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	**311.889**	24.94	30	Pass
6	2437	308.319	24.89	30	Pass
11	2462	297.167	24.73	30	Pass

802.11n (HT20)

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	301.995	24.80	30	Pass
6	2437	277.332	24.43	30	Pass
11	2462	279.898	24.47	30	Pass

FOR AVERAGE POWER

802.11b

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	41.020	16.13
6	2437	41.591	16.19
11	2462	41.976	16.23

802.11g

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	43.853	16.42
6	2437	43.451	16.38
11	2462	42.756	16.31

802.11n (HT20)

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	41.305	16.16
6	2437	41.020	16.13
11	2462	41.591	16.19

Mode B

FOR PEAK POWER

802.11b

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	64.121	18.07	30	Pass
6	2437	65.013	18.13	30	Pass
11	2462	65.464	18.16	30	Pass

802.11g

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	273.527	24.37	30	Pass
6	2437	266.686	24.26	30	Pass
11	2462	287.078	24.58	30	Pass

802.11n (HT20)

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	**301.995**	24.80	30	Pass
6	2437	277.332	24.43	30	Pass
11	2462	266.073	24.25	30	Pass

FOR AVERAGE POWER

802.11b

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	40.832	16.11
6	2437	41.879	16.22
11	2462	41.115	16.14

802.11g

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	41.210	16.15
6	2437	41.400	16.17
11	2462	42.073	16.24

802.11n (HT20)

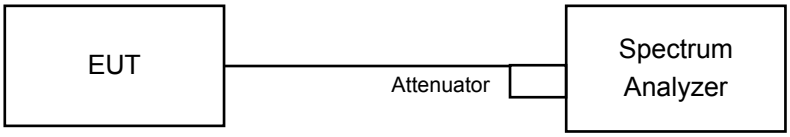
Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	41.305	16.16
6	2437	41.976	16.23
11	2462	40.551	16.08

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 kHz ≤ RBW ≤ 100 kHz.
d. Set the VBW ≥ 3 × 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

Mode A

802.11b

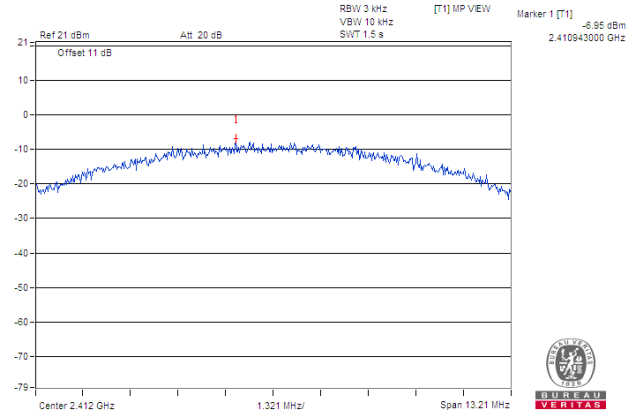
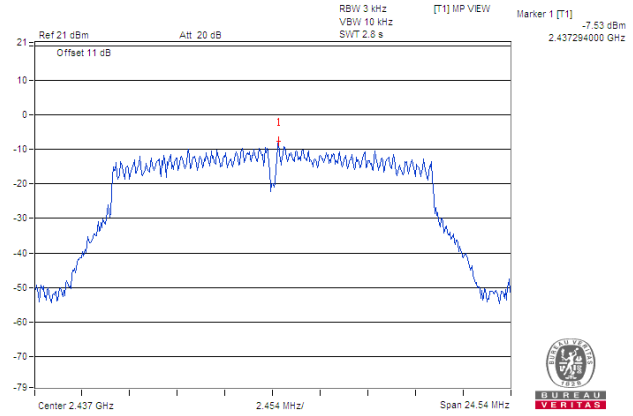
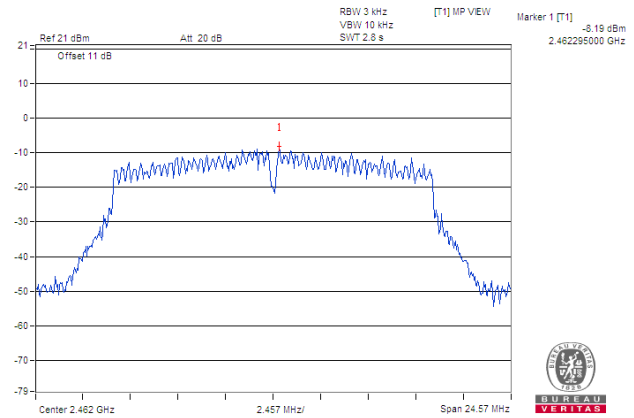
Channel	Frequency (MHz)	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
1	2412	-6.95	8.00	Pass
6	2437	-7.81	8.00	Pass
11	2462	-7.38	8.00	Pass

802.11g

Channel	Frequency (MHz)	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
1	2412	-8.48	8.00	Pass
6	2437	-7.53	8.00	Pass
11	2462	-8.40	8.00	Pass

802.11n (HT20)

Channel	Frequency (MHz)	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
1	2412	-8.21	8.00	Pass
6	2437	-9.58	8.00	Pass
11	2462	-8.19	8.00	Pass

Spectrum Plot of Worst Value	
802.11b	802.11g
	
802.11n (HT20)	
	

Mode B

802.11b

Channel	Frequency (MHz)	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
1	2412	-6.42	8.00	Pass
6	2437	-6.90	8.00	Pass
11	2462	-6.68	8.00	Pass

802.11g

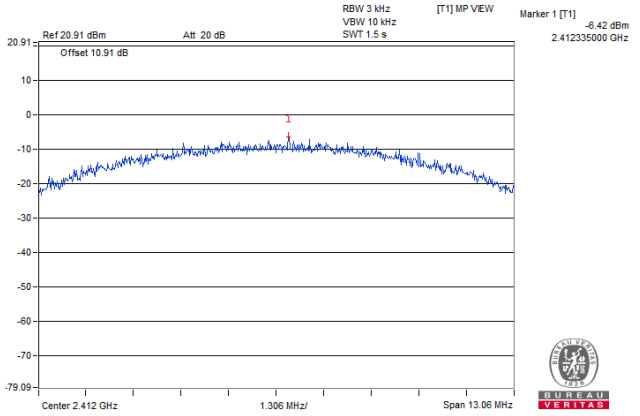
Channel	Frequency (MHz)	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
1	2412	-8.50	8.00	Pass
6	2437	-8.04	8.00	Pass
11	2462	-8.72	8.00	Pass

802.11n (HT20)

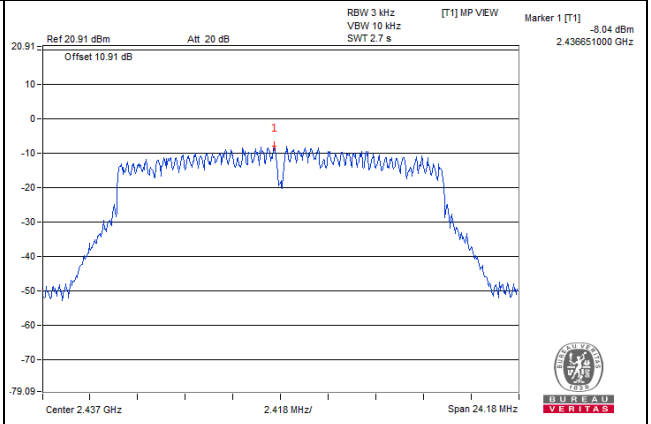
Channel	Frequency (MHz)	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
1	2412	-8.05	8.00	Pass
6	2437	-8.11	8.00	Pass
11	2462	-8.18	8.00	Pass

Spectrum Plot of Worst Value

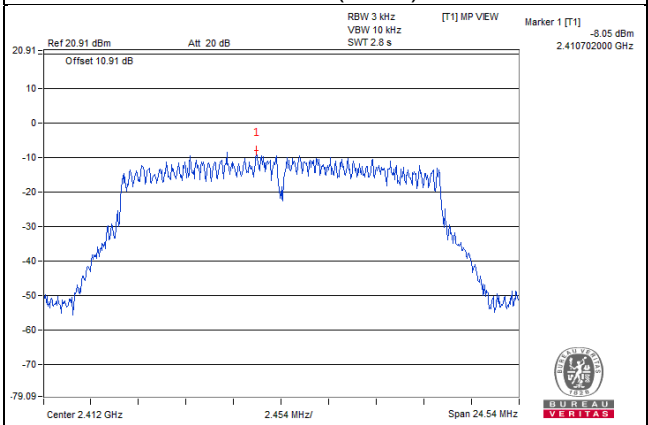
802.11b



802.11g



802.11n (HT20)

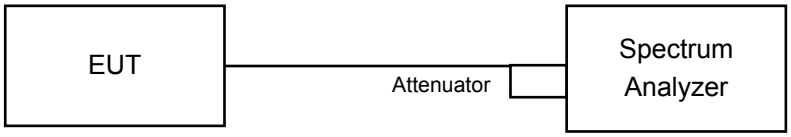


4.6 Conducted Out of Band Emission Measurement

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 ≥ 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 OOBE

1. Set RBW = 100 kHz.
2. Set VBW ≥ 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

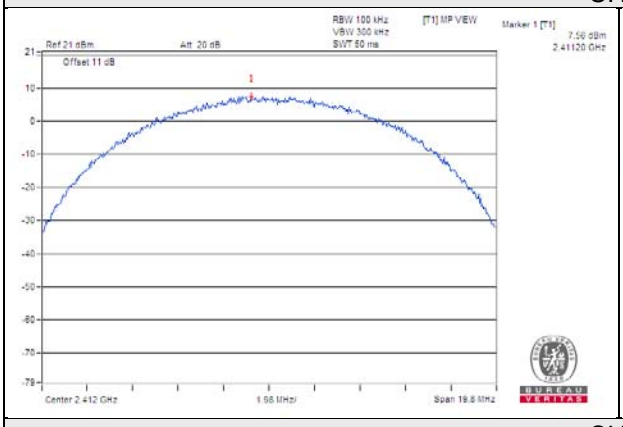
Same as item 4.3.6.

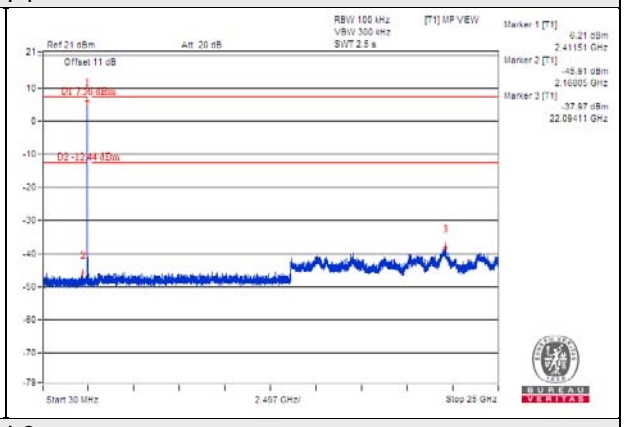
4.6.7 Test Results

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.

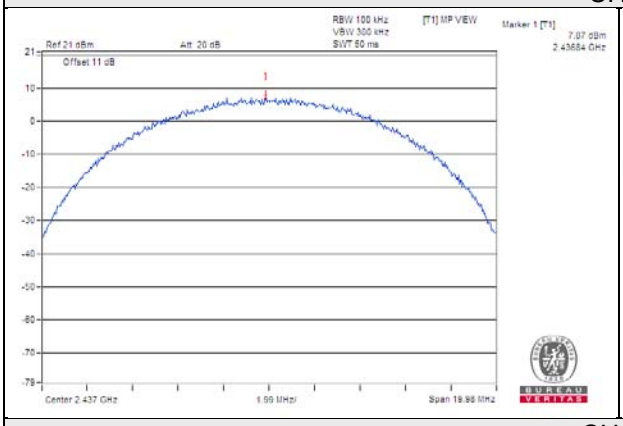
Mode A
802.11b

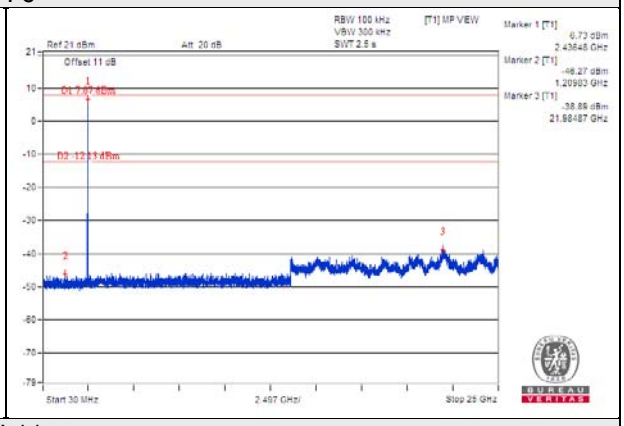
CH 1



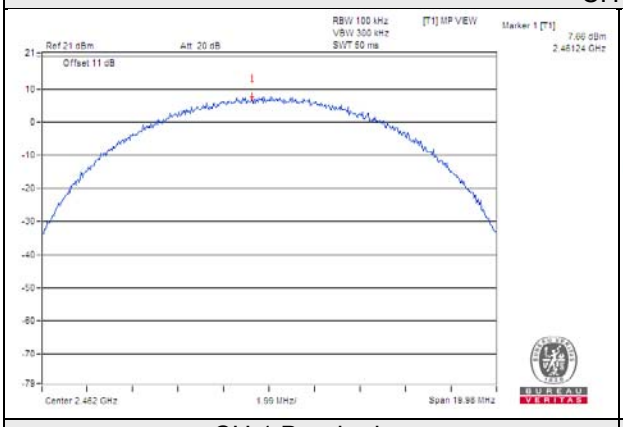


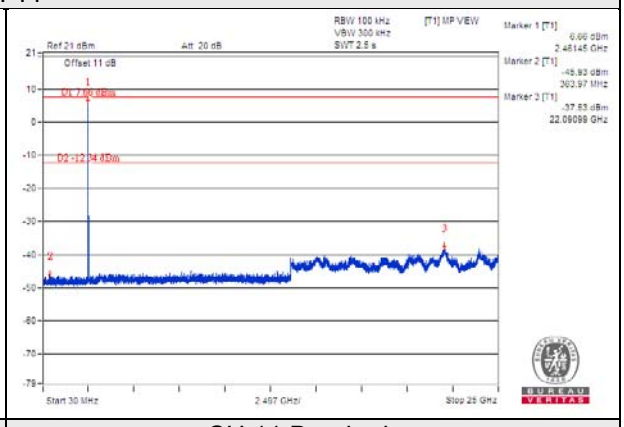
CH 6



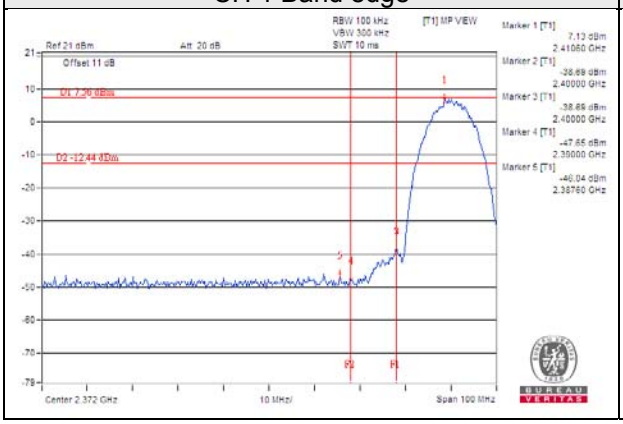


CH 11

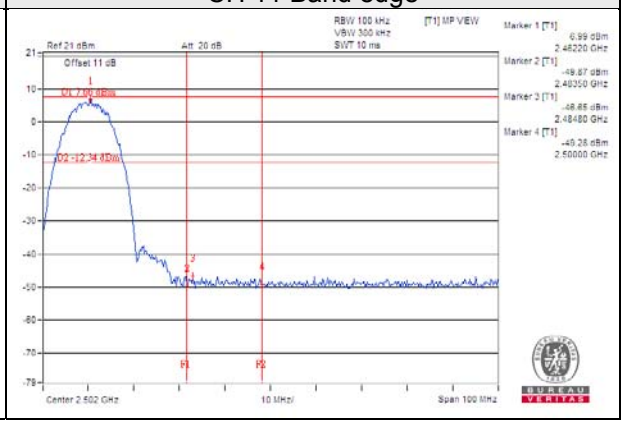




CH 1 Band edge

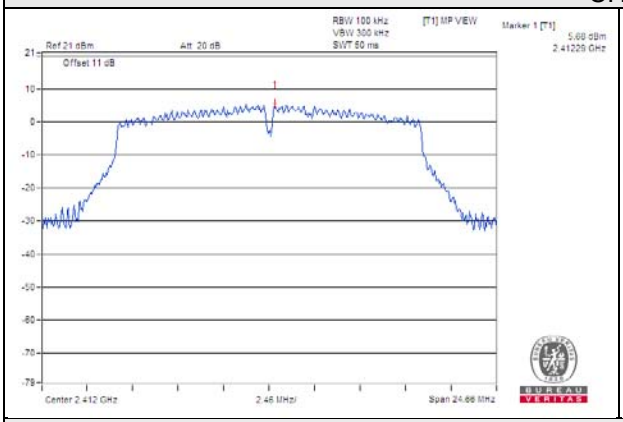


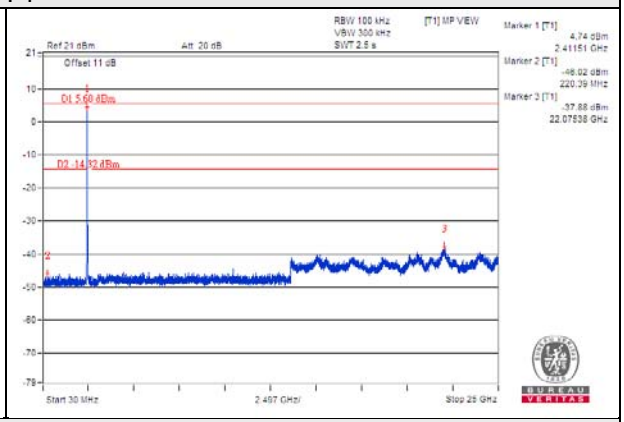
CH 11 Band edge



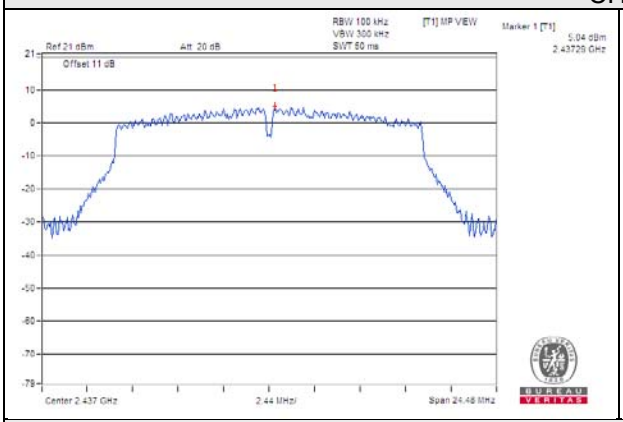
802.11g

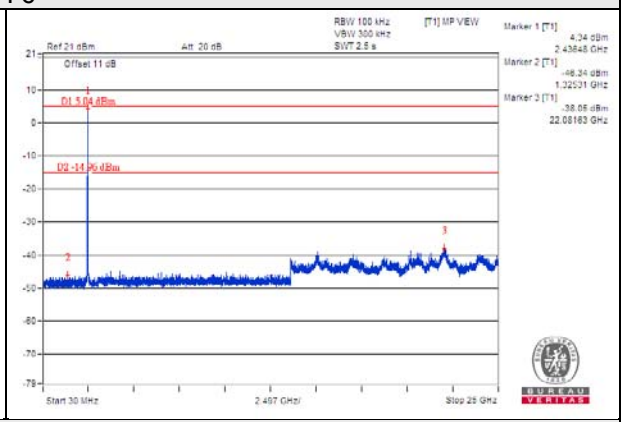
CH 1



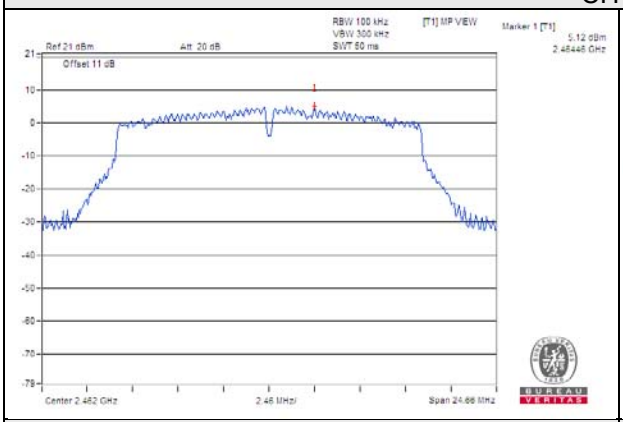


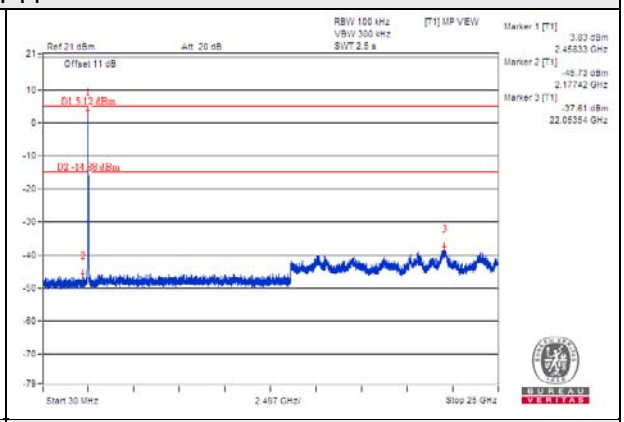
CH 6



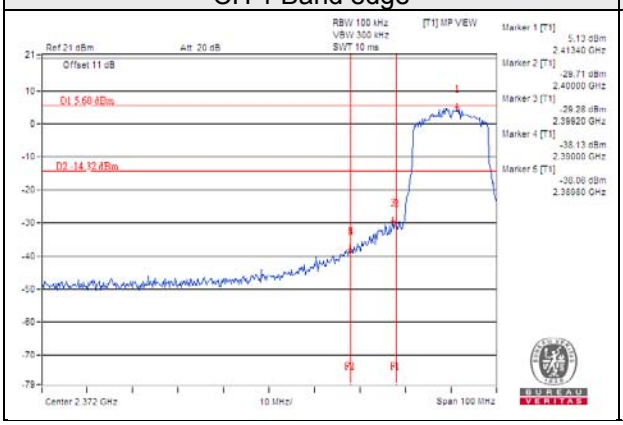


CH 11

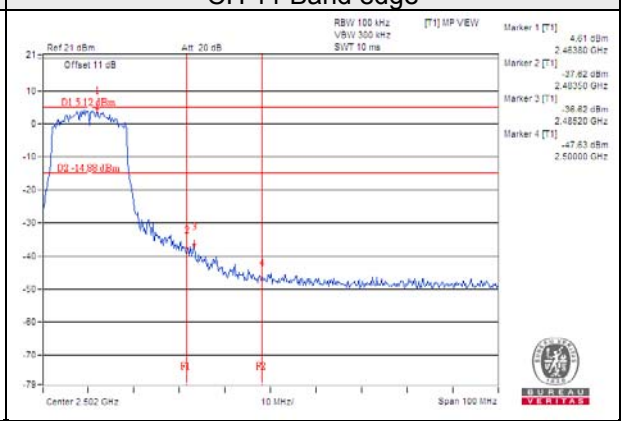




CH 1 Band edge

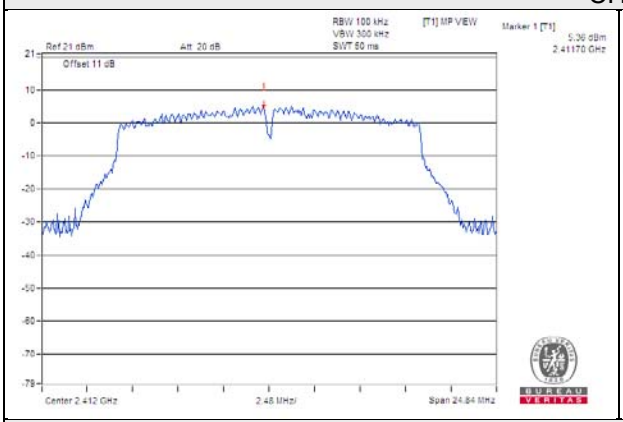


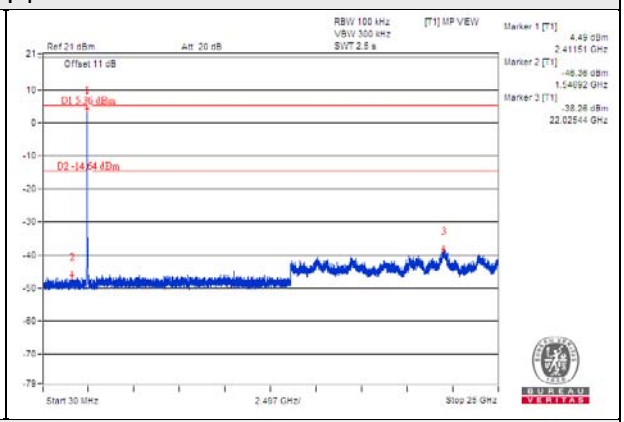
CH 11 Band edge



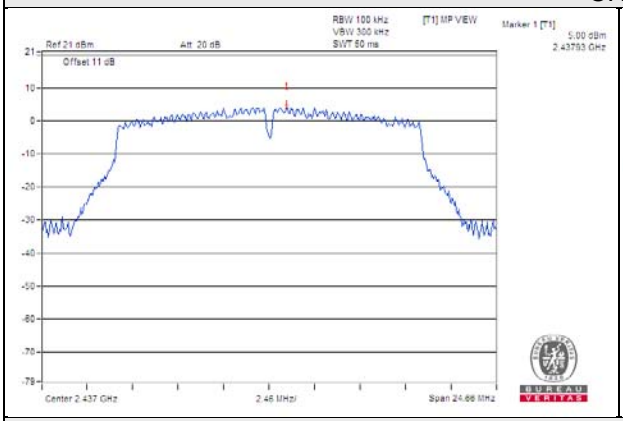
802.11n (HT20)

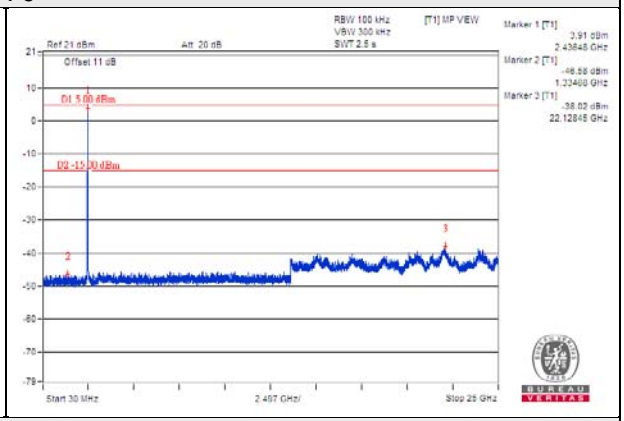
CH 1



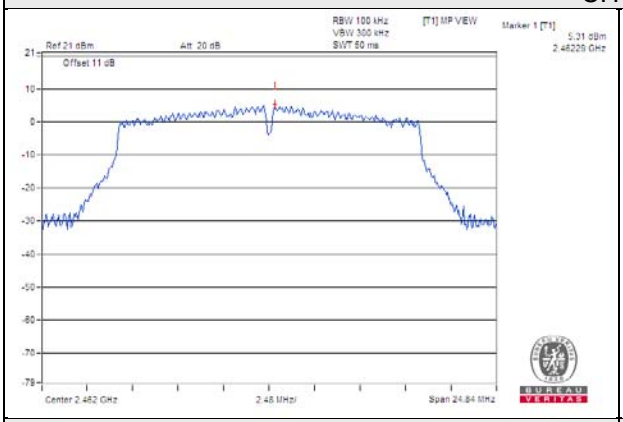


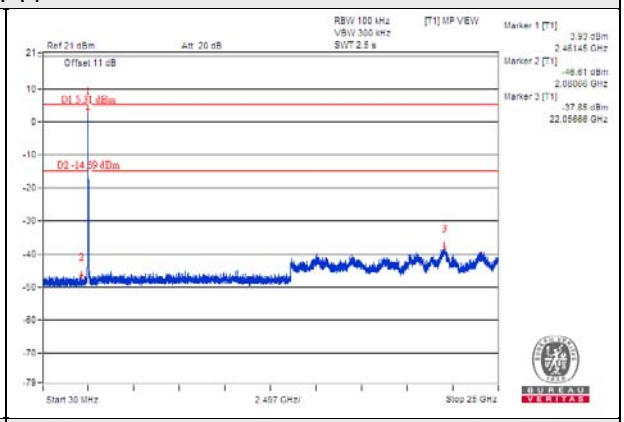
CH 6



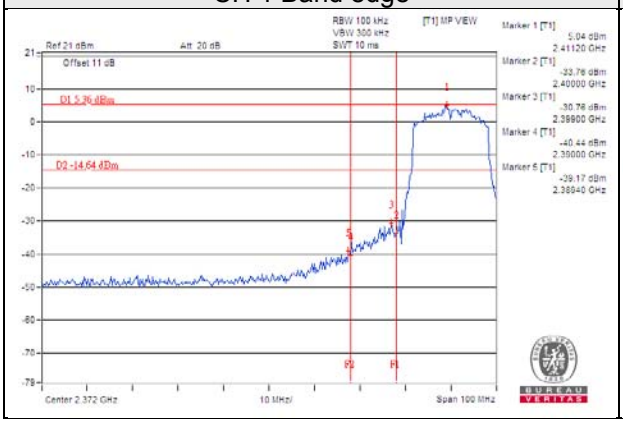


CH 11

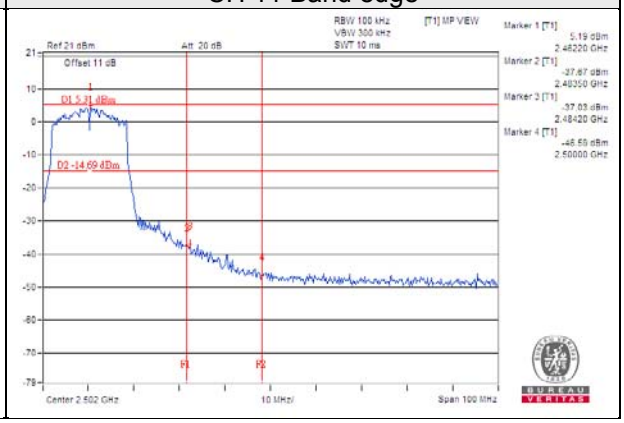




CH 1 Band edge

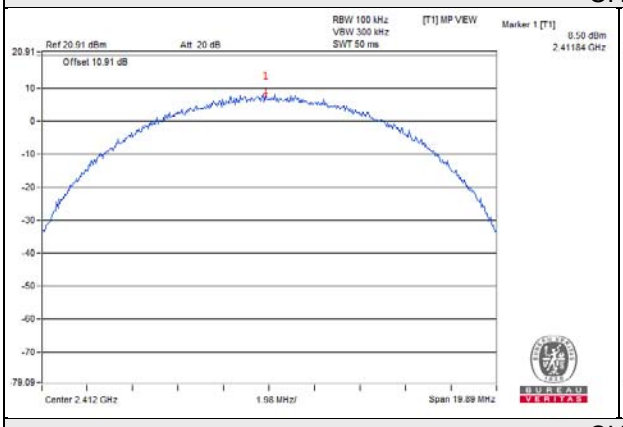


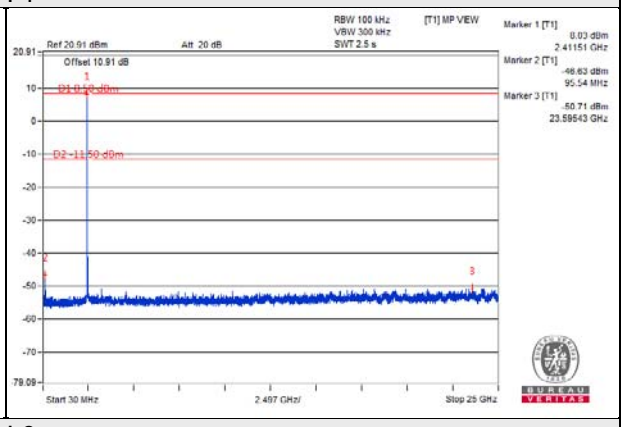
CH 11 Band edge



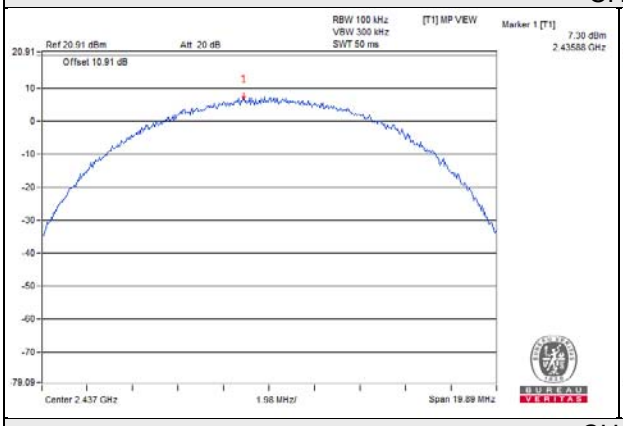
Mode B
802.11b

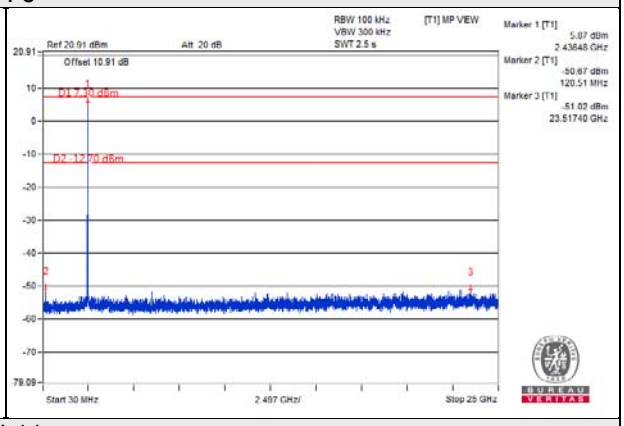
CH 1



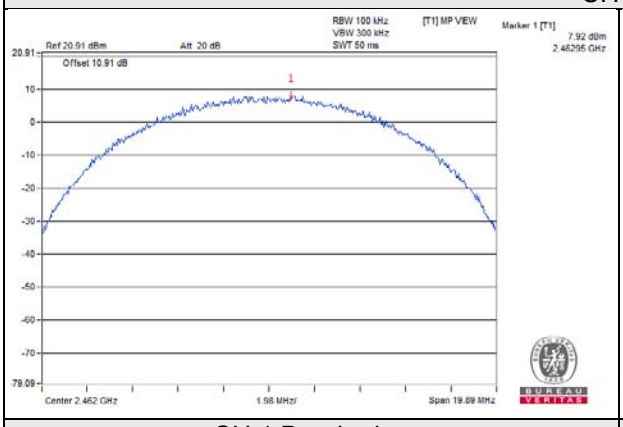


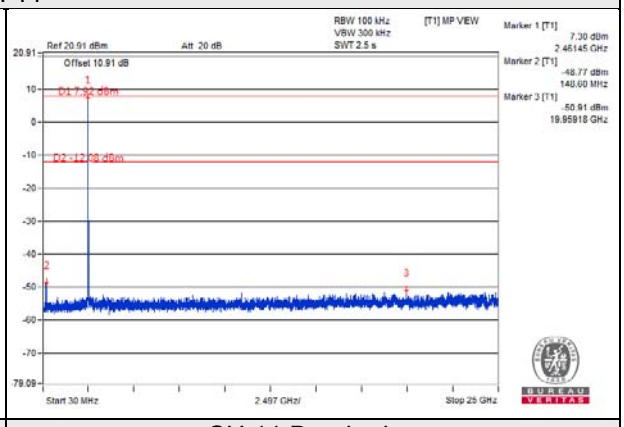
CH 6



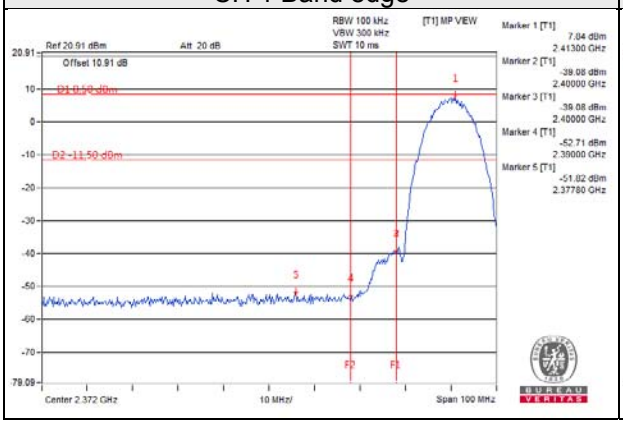


CH 11

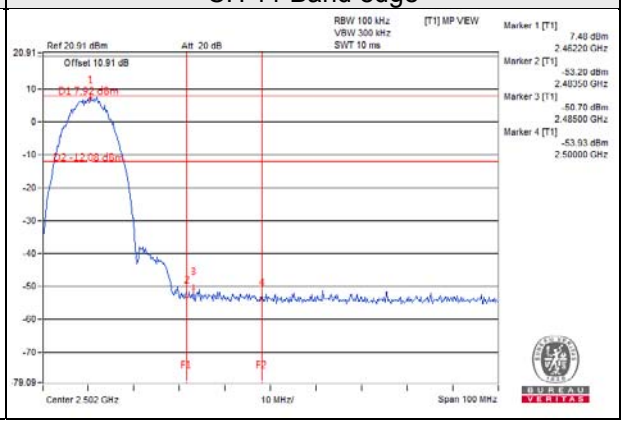




CH 1 Band edge

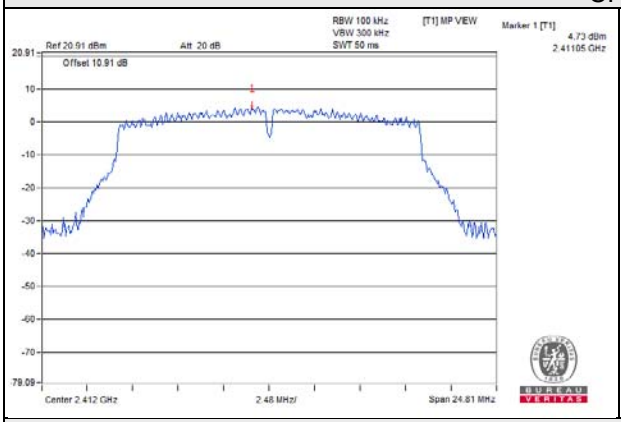


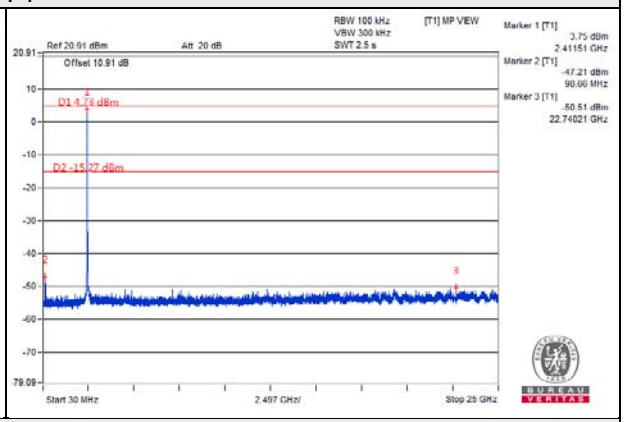
CH 11 Band edge



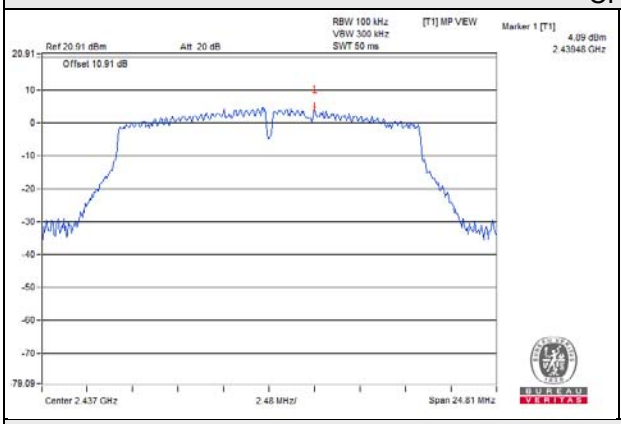
802.11g

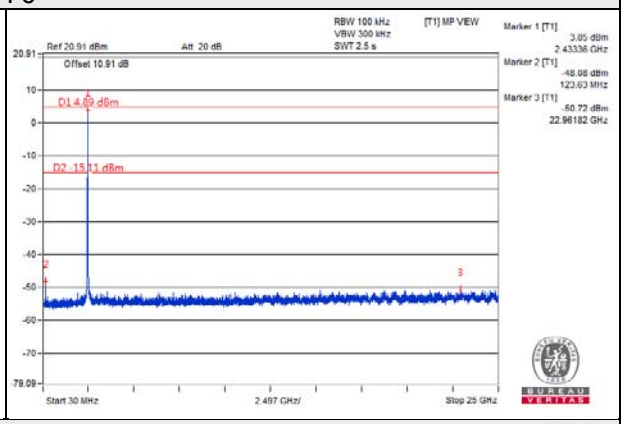
CH 1



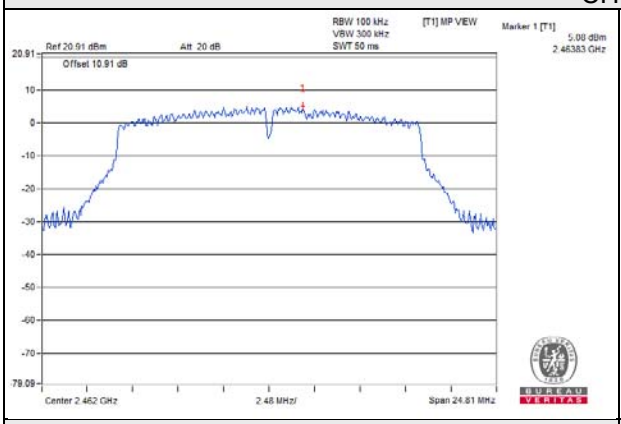


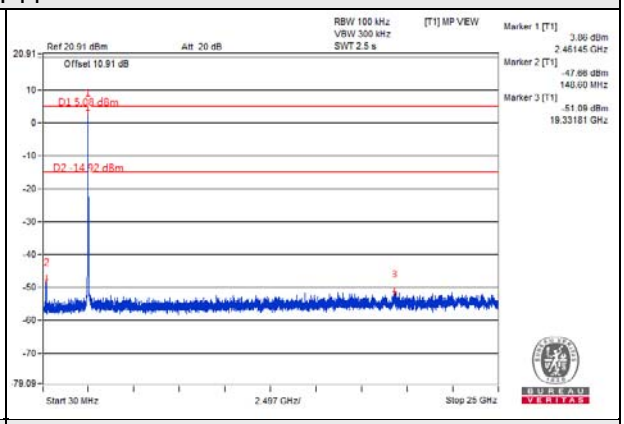
CH 6



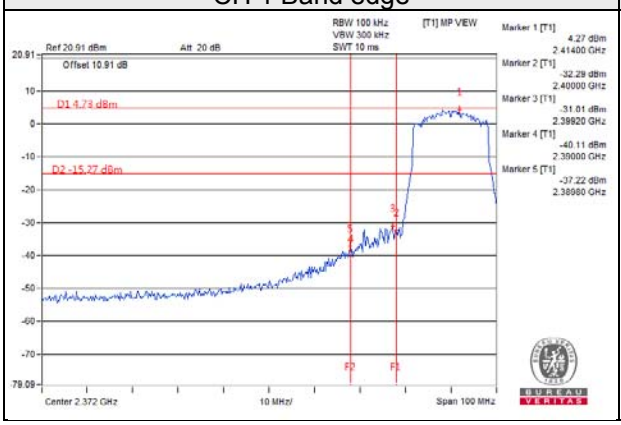


CH 11

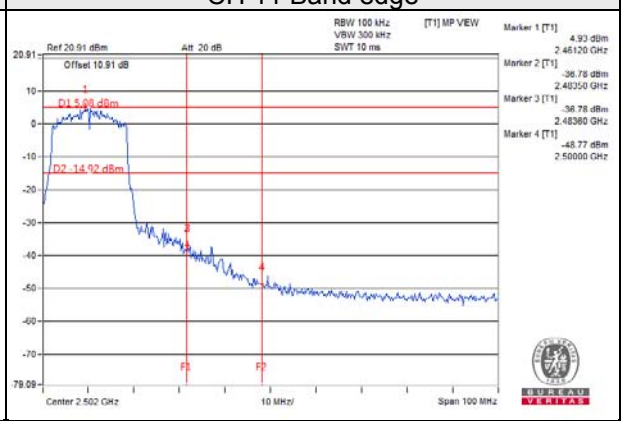




CH 1 Band edge

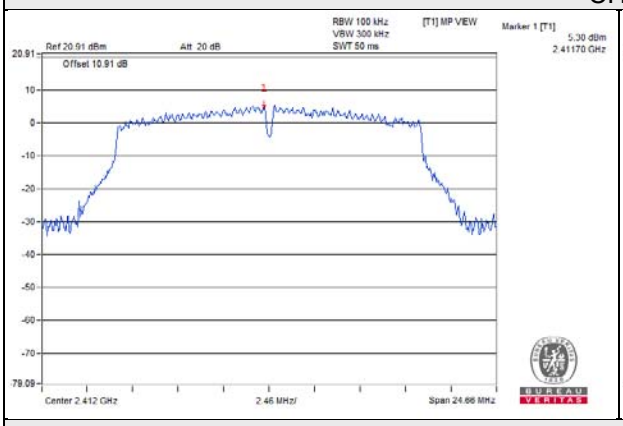


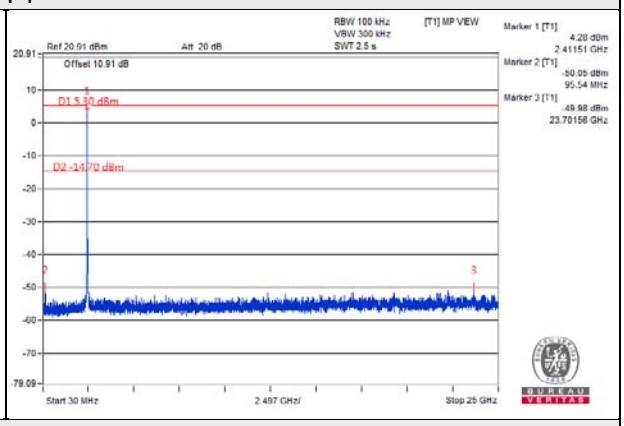
CH 11 Band edge



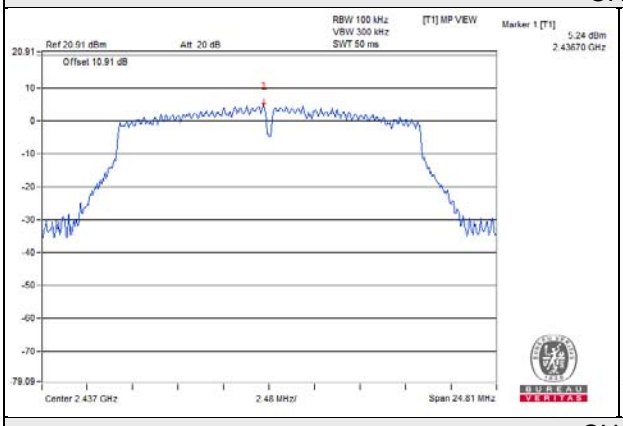
802.11n (HT20)

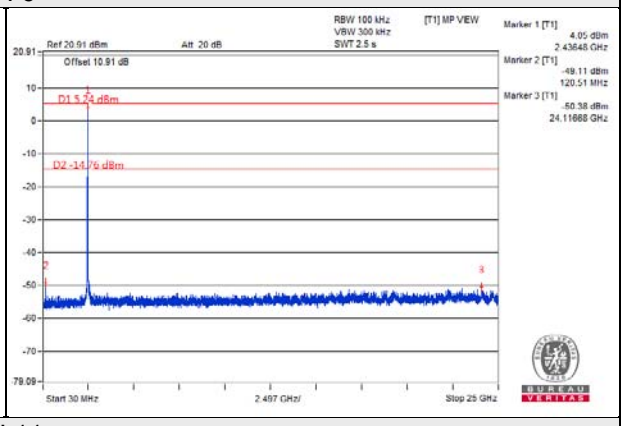
CH 1



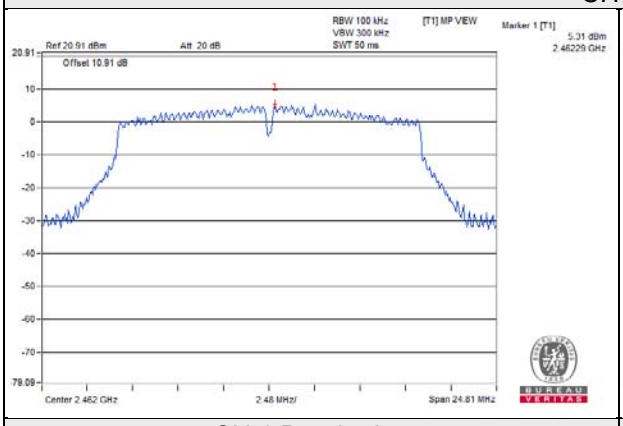


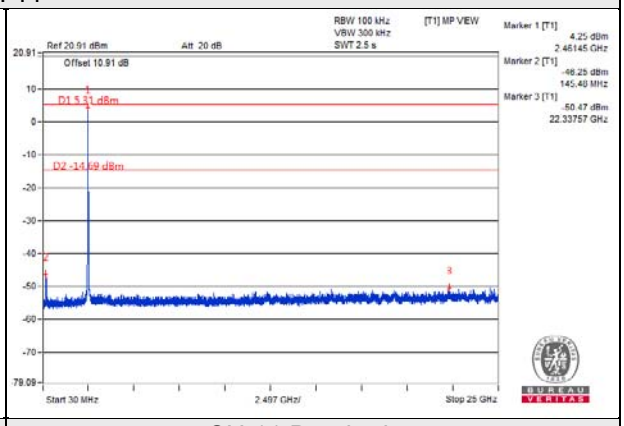
CH 6



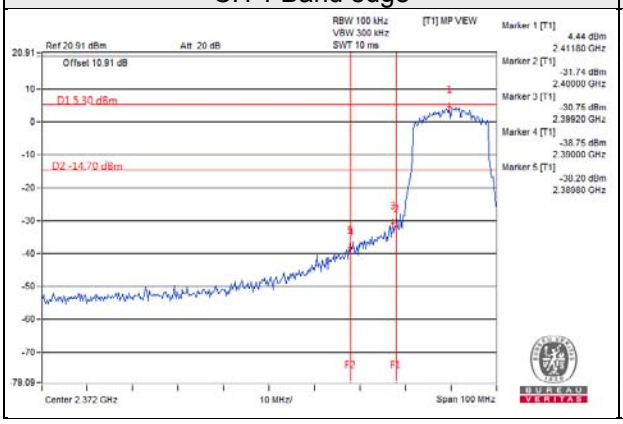


CH 11

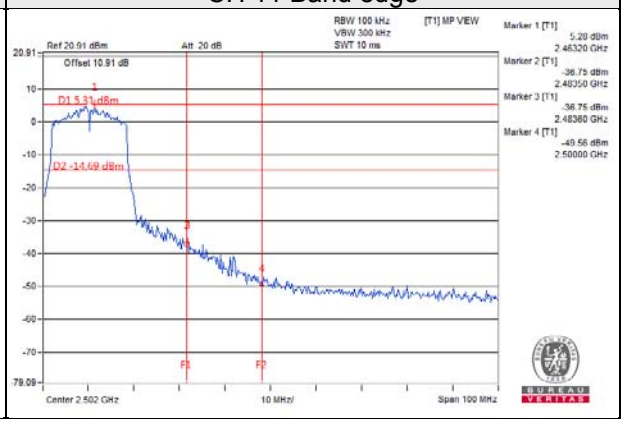




CH 1 Band edge



CH 11 Band edge



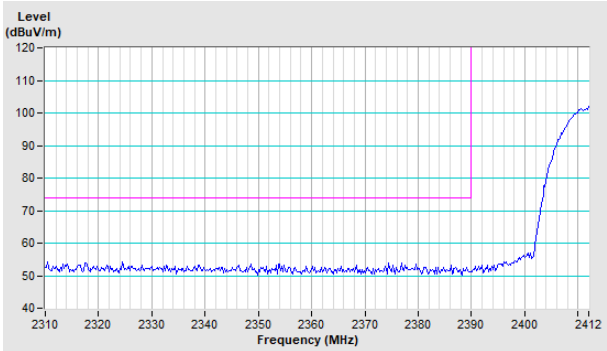
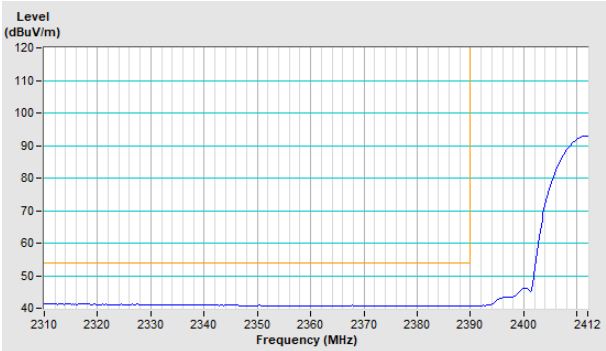
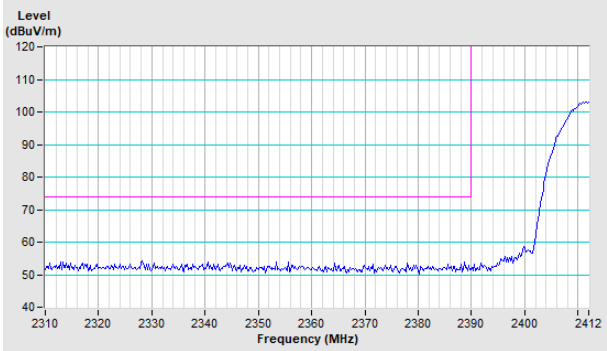
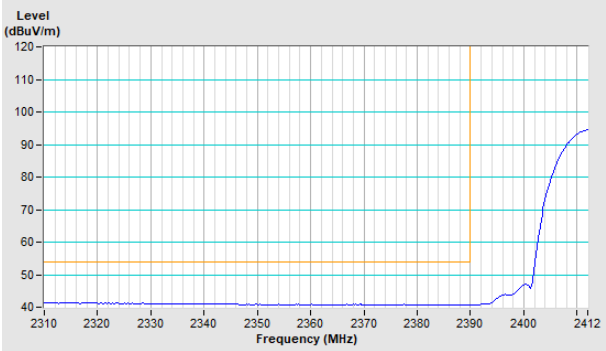
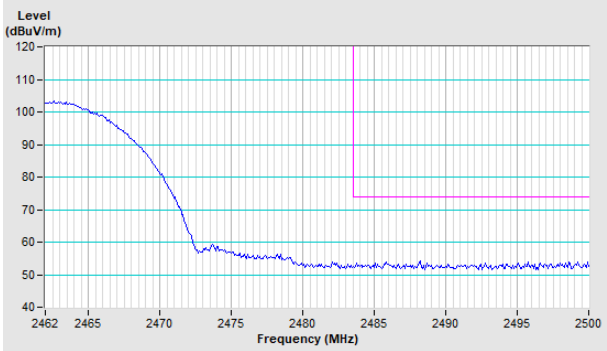
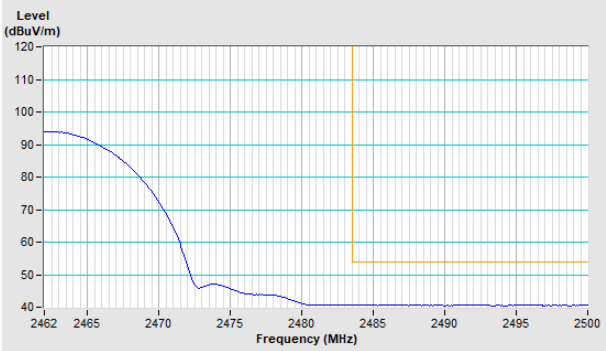
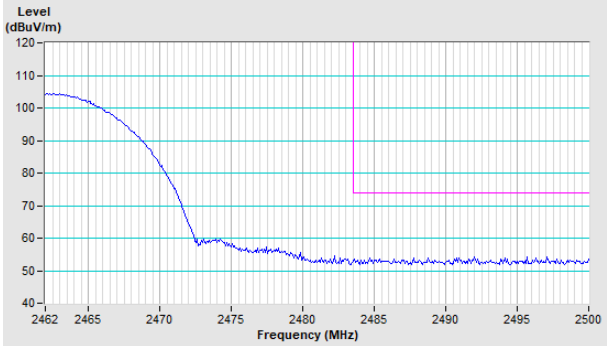
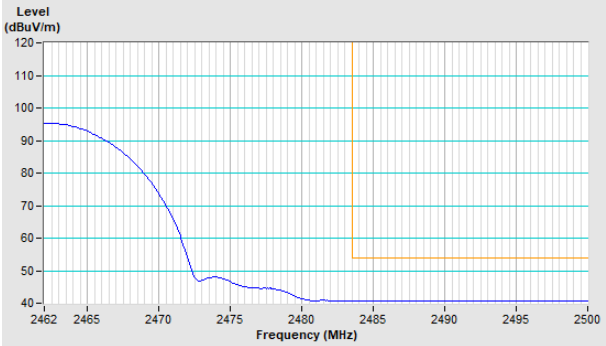
5. Pictures of Test Arrangements

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

Annex A- Band Edge Measurement

Mode A

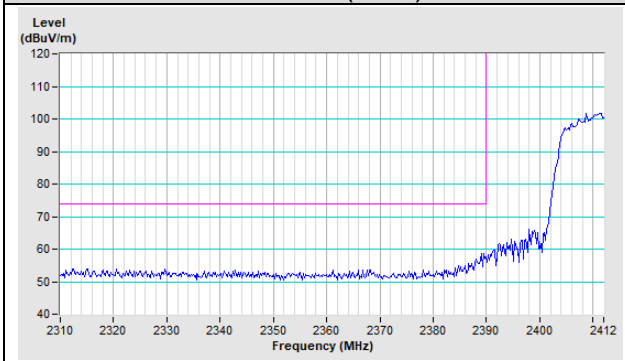
802.11b

Channel 1	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	
Channel 11	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

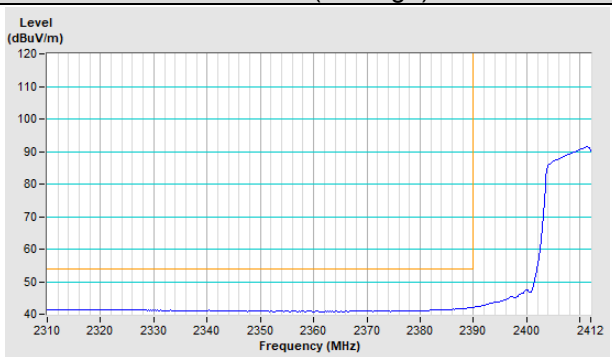
802.11g

Channel 1

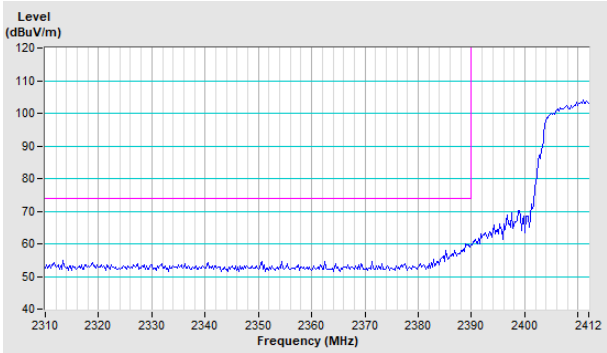
Horizontal (Peak)



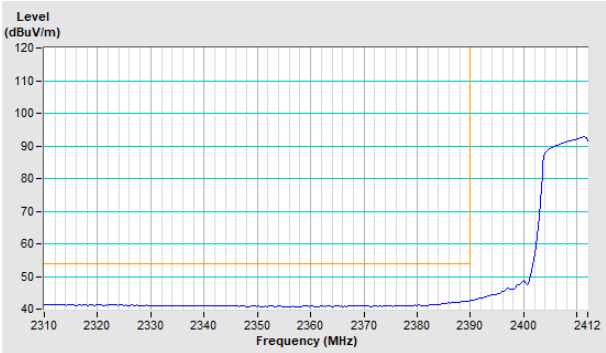
Horizontal (Average)



Vertical (Peak)

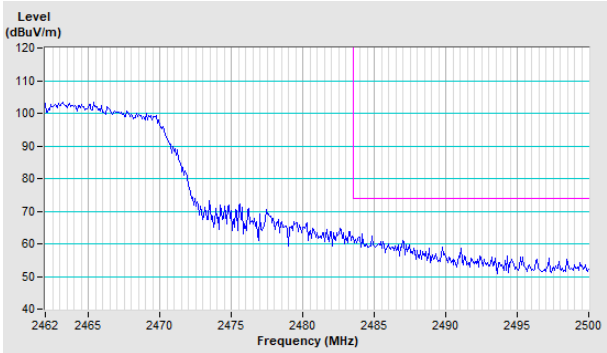


Vertical (Average)

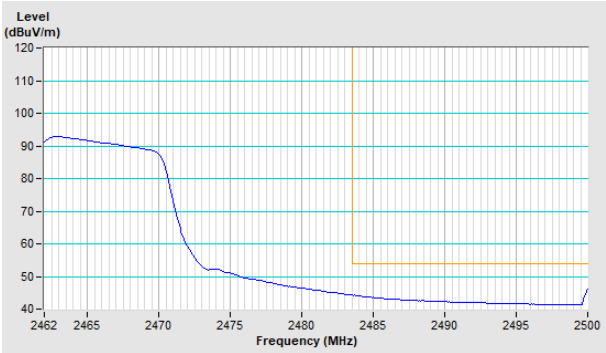


Channel 11

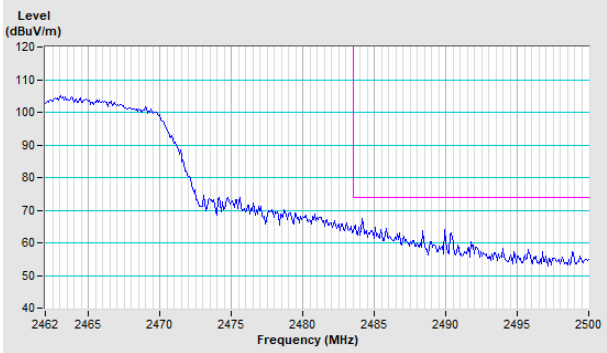
Horizontal (Peak)



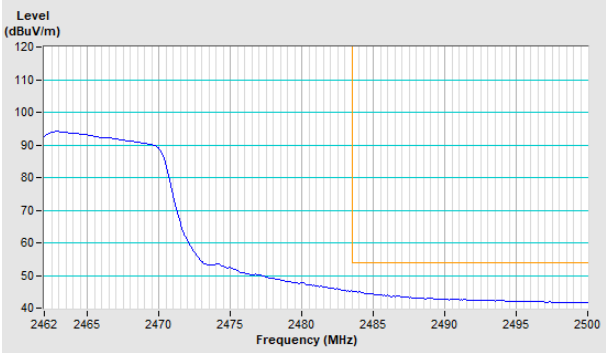
Horizontal (Average)



Vertical (Peak)



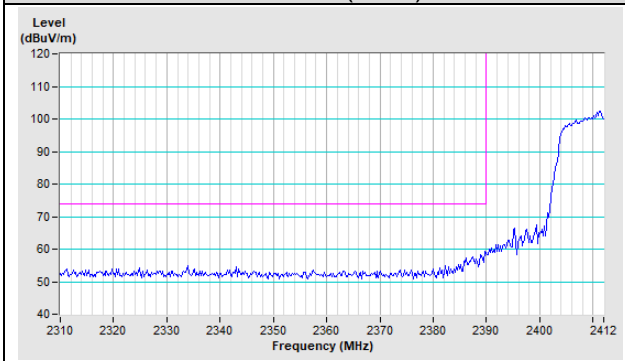
Vertical (Average)



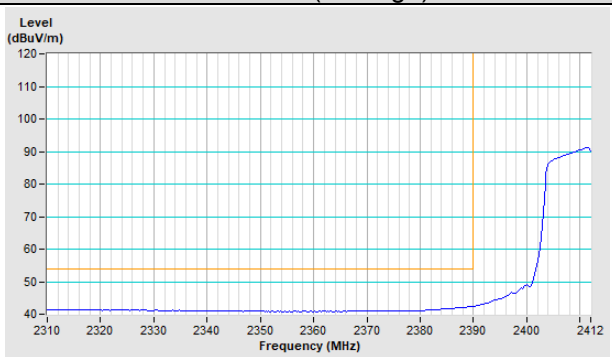
802.11n (HT20)

Channel 1

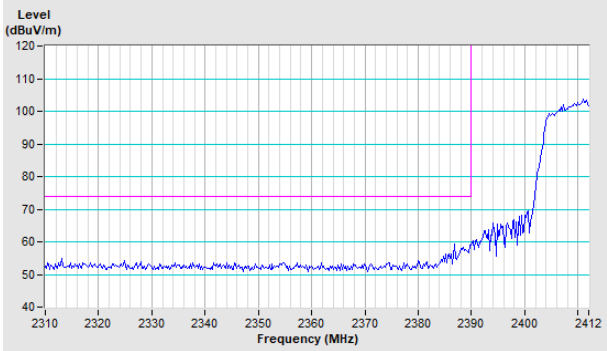
Horizontal (Peak)



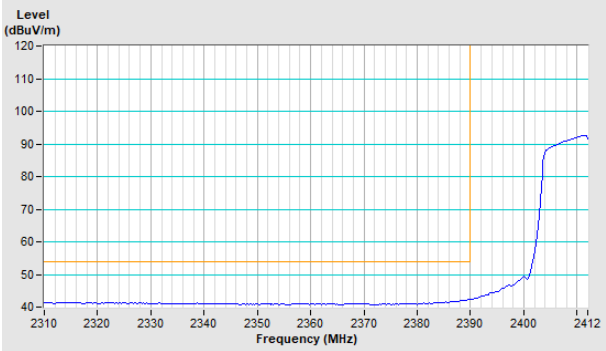
Horizontal (Average)



Vertical (Peak)

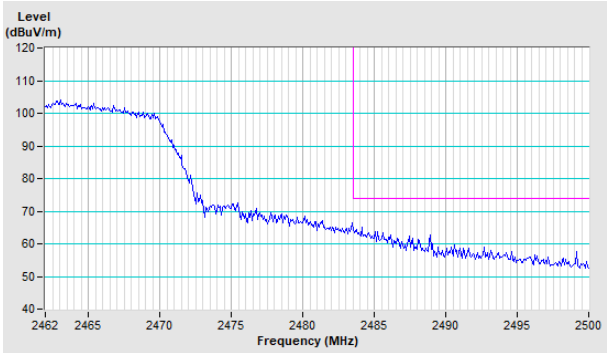


Vertical (Average)

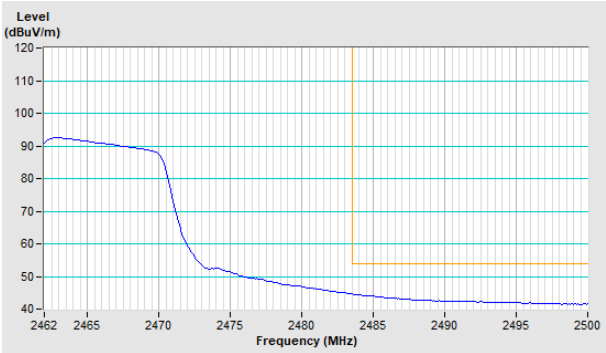


Channel 11

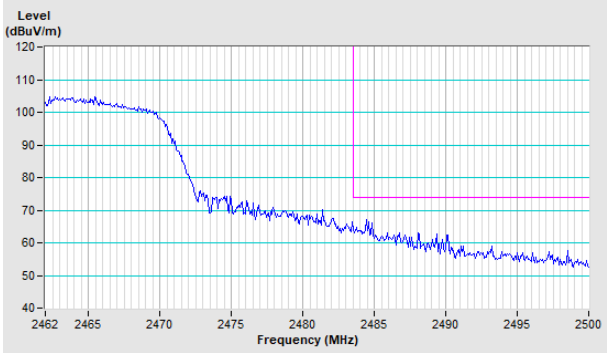
Horizontal (Peak)



Horizontal (Average)



Vertical (Peak)



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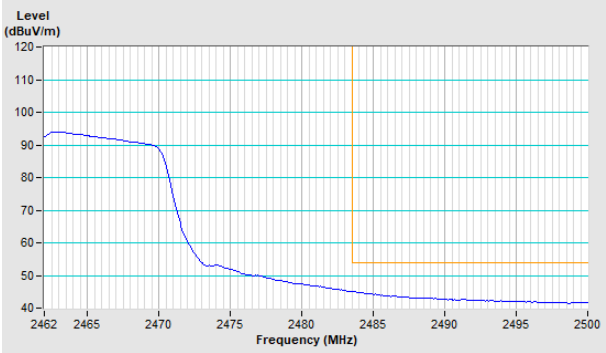
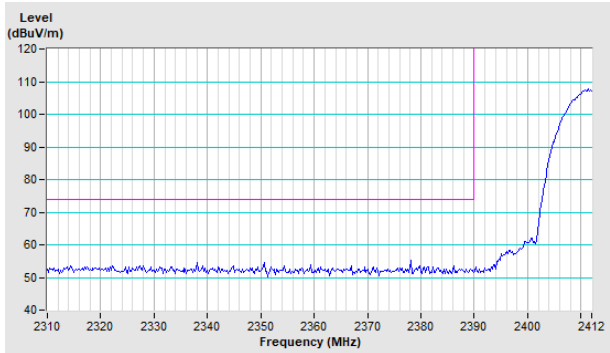
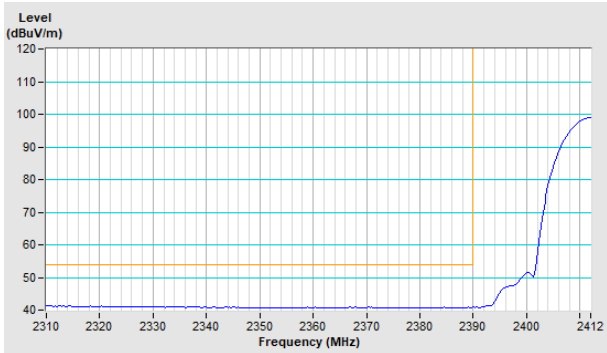
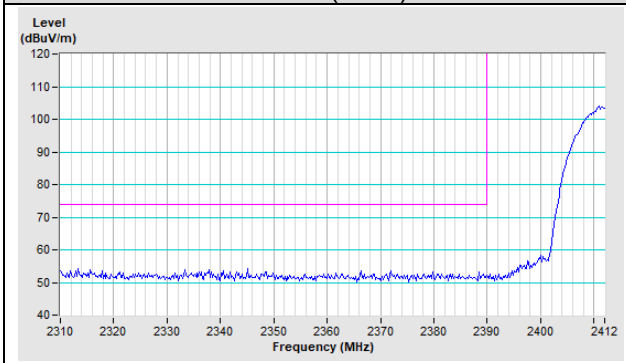
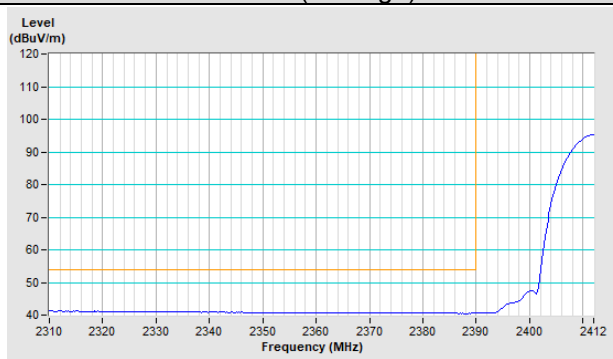
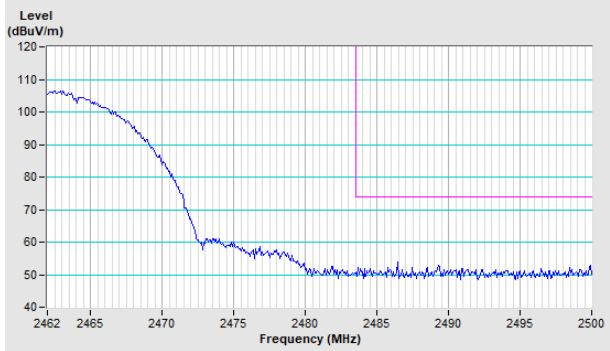
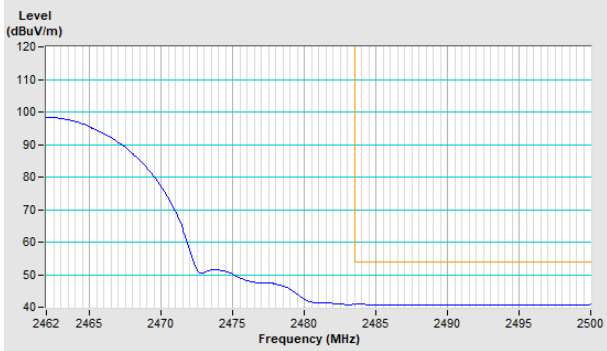
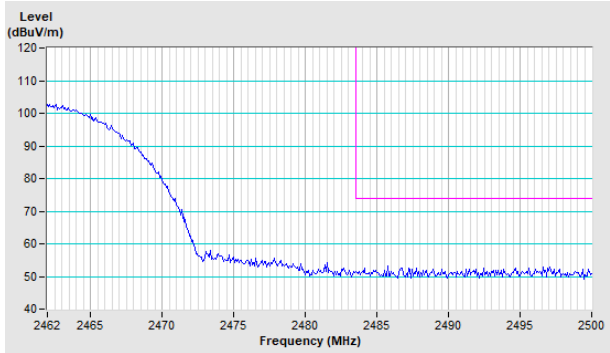
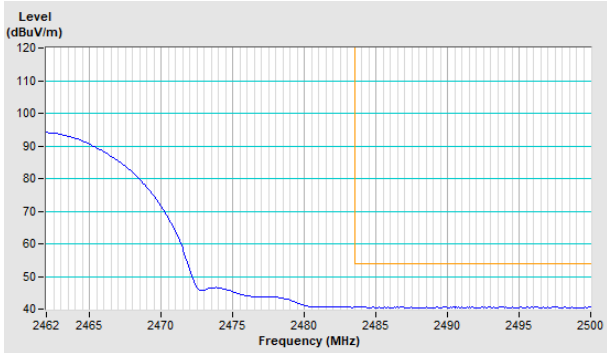


Mode B

802.11b

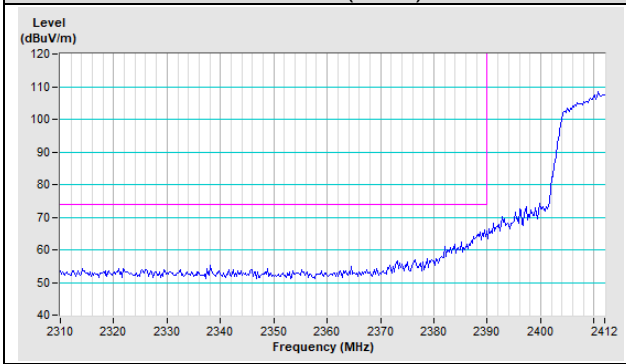
Channel 1	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

Channel 11	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

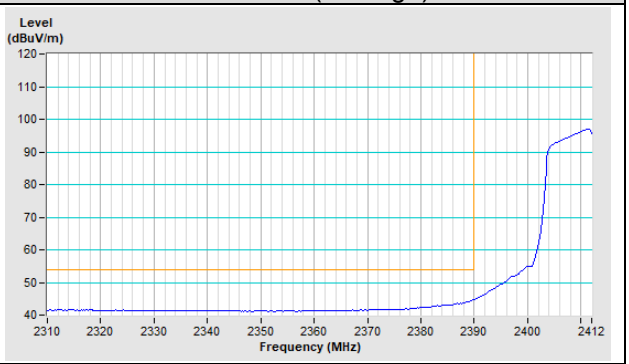
802.11g

Channel 1

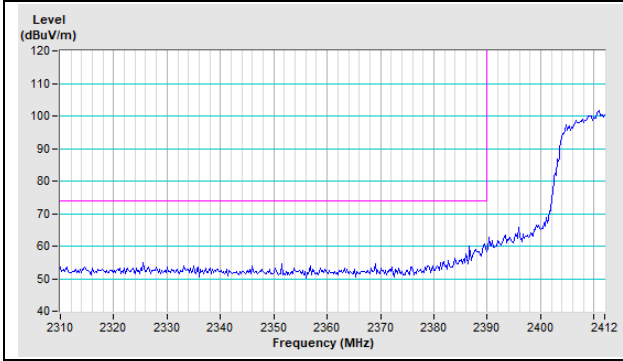
Horizontal (Peak)



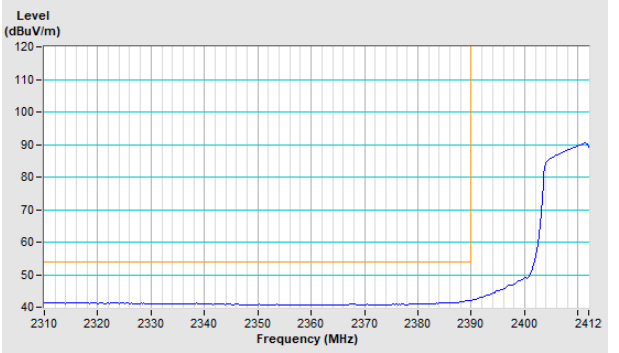
Horizontal (Average)



Vertical (Peak)

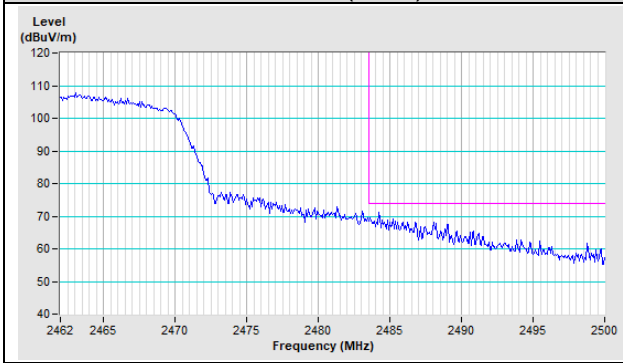


Vertical (Average)

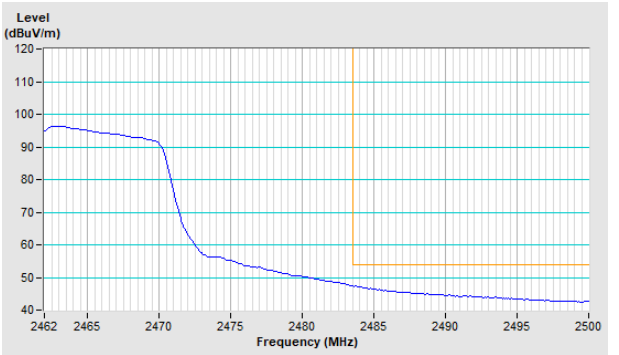


Channel 11

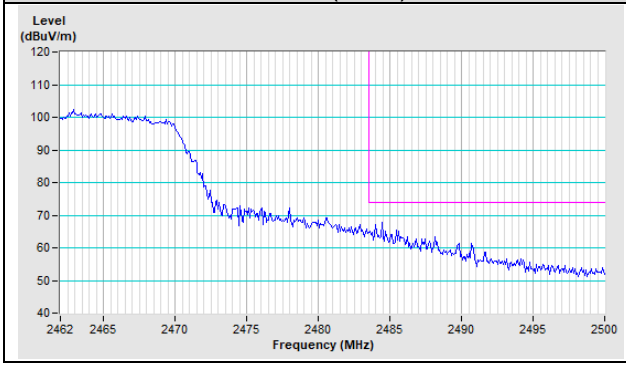
Horizontal (Peak)



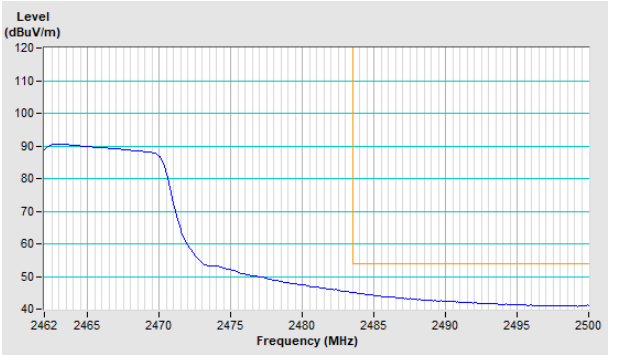
Horizontal (Average)



Vertical (Peak)



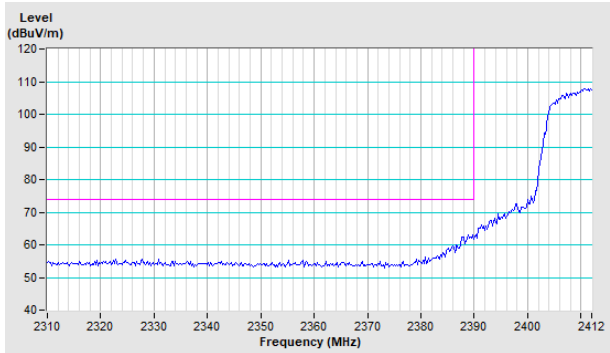
Vertical (Average)



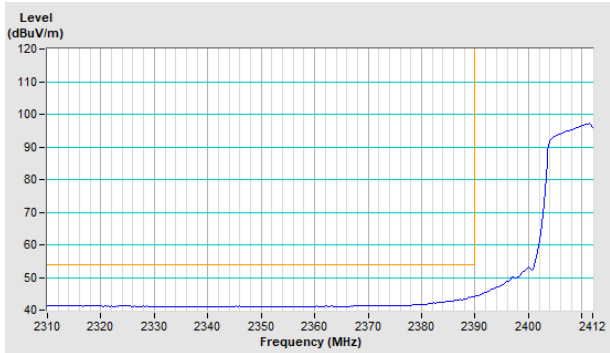
802.11n (HT20)

Channel 1

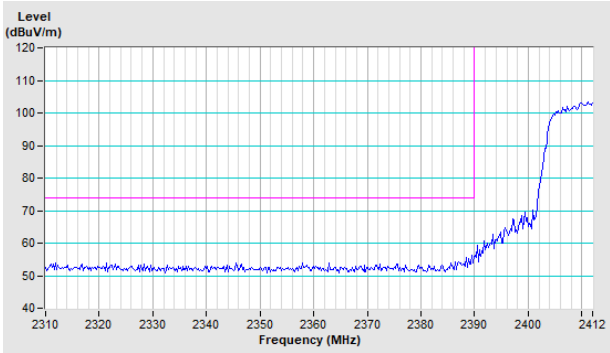
Horizontal (Peak)



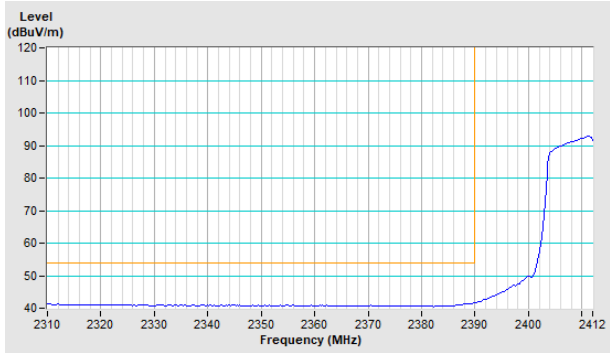
Horizontal (Average)



Vertical (Peak)

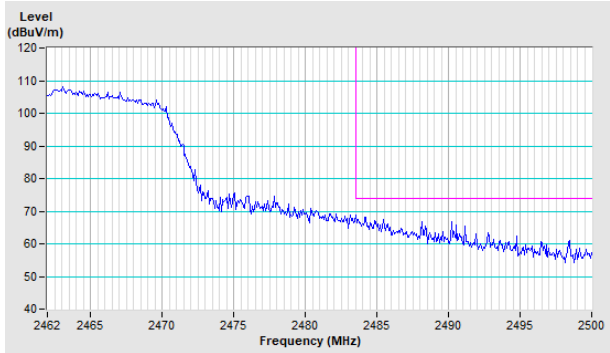


Vertical (Average)

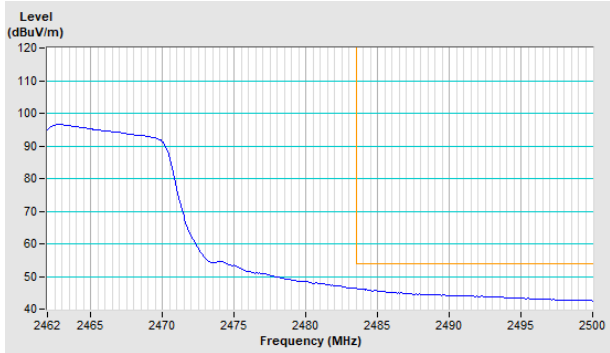


Channel 11

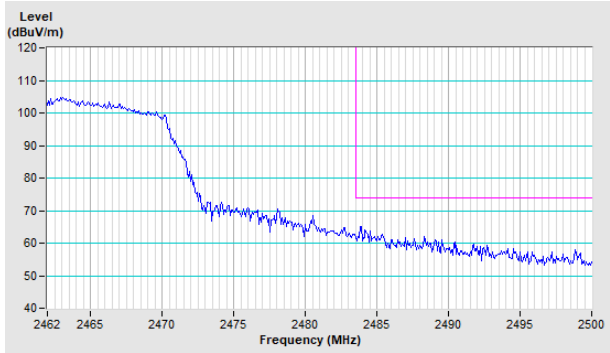
Horizontal (Peak)



Horizontal (Average)



Vertical (Peak)



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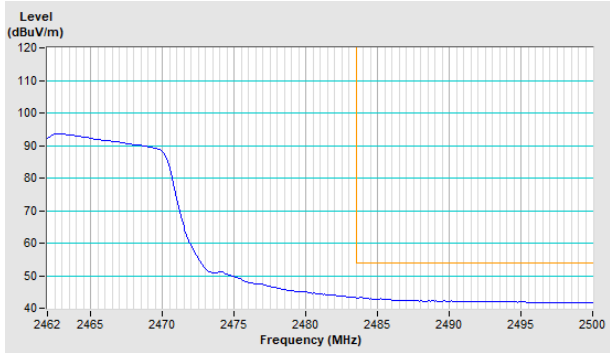

Appendix – Information of the Testing Laboratories

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 and approved according to ISO/IEC 17025.

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

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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.

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