

FCC Test Report

Report No.: RF200219D20

FCC ID: A4Z-A000A

Test Model: DrivePro 10

Series Model: TS-DP10XXXXXX

(Multiple Listing: The word "X" in the Model Number could be defined as A-Z, 0-9, -, _ , or blank for marketing differentiation)

Received Date: Feb. 19, 2020

Test Date: Feb. 26 to Mar. 11, 2020

Issued Date: Mar. 16, 2020

Applicant: Transcend Information Inc.

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

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FCC Registration /
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Release Control Record

Issue No.	Description	Date Issued
RF200219D20	Original release.	Mar. 16, 2020

1 Certificate of Conformity

Product: Dashcam

Brand: Transcend

Test Model: DrivePro 10

Series Model: TS-DP10XXXXXX
(Multiple Listing: The word "X" in the Model Number could be defined as A-Z, 0-9, -, _ , or blank for marketing differentiation)

Sample Status: Engineering sample

Applicant: Transcend Information Inc.

Test Date: Feb. 26 to Mar. 11, 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 :



Date: Mar. 16, 2020

Annie Chang / Senior Specialist

Approved by :



Date: Mar. 16, 2020

Rex Lai / Associate Technical Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (Section 15.247)			
FCC Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	N/A	Power supply is 5Vdc from Car Charger
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -1.58dB at 432.02MHz.
15.247(d)	Antenna Port Emission	PASS	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Conducted power	PASS	Meet the requirement of limit.
15.247(e)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	No antenna connector is used.

Note:

- For 2.4GHz band compliance with rule 15.247(d) of the band-edge items, the test plots were recorded in Annex A.
- 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) (±)
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	2.61 dB
	30MHz ~ 1GHz	5.43 dB
Radiated Emissions above 1 GHz	Above 1GHz	5.14 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Dashcam
Brand	Transcend
Test Model	DrivePro 10
Series Model	TS-DP10XXXXXX (Multiple Listing: The word "X" in the Model Number could be defined as A-Z, 0-9, -, _ , or blank for marketing differentiation)
Model Difference	Marketing differentiation
S/N number	F76287-0001
SW version	V0.0.9
Status of EUT	Engineering sample
Power Supply Rating	5Vdc from Car Charger
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11b: up to 11Mbps 802.11g: up to 54Mbps 802.11n: up to 150Mbps
Operating Frequency	2.412 ~ 2.462GHz
Number of Channel	11 for 802.11b, 802.11g, 802.11n (20MHz) 7 for 802.11n (40MHz)
Output Power	139.959mW
Antenna Type	Chip antenna with -2.07dBi gain
Antenna Connector	N/A
Accessory Device	Refer to note as below
Data Cable Supplied	N/A

Note:

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

Modulation Mode	TX Function
802.11b	1TX
802.11g	1TX
802.11n (20MHz)	1TX
802.11n (40MHz)	1TX

2. The EUT contains the following accessories:

Product	Brand	Model	Description
Car Charger	Transcend	TS-DPL	Input: 10-28V, 1.5A(Max) Output: 4.6-5.25V, 2A Shielded USB cable (4.0m)
Battery	Joules Miles CO. Ltd	TS02	320mAh, 3.7V (When power is off, there will be about 10 seconds of system archive time)
Hardware Power Cable	Transcend	TS-DPK	I/P: 10-28V, 1.35A (max) O/P: 5V, 2A USB cable: 3m (w/o core) DC cable: 1m (w/o core)
Micro SD Card	Transcend	TS32GUSD300S	32GB

Remark: Hardware Power Cable & Car Charger alternative shipping.

3. The EUT was pre-tested with the following modes:

- ✧ Operating (Powered from Car Charger)
- ✧ Operating (Powered from Hardware Power Cable)

The worst emission level was found when the EUT tested under **Operating (Powered from Car Charger)** therefore, only its test data was recorded in this report.

4. The power setting are list as below:

802.11b		802.11g		802.11n (20MHz)		802.11n (40MHz)	
Channel	Power setting	Channel	Power setting	Channel	Power setting	Channel	Power setting
1	Default	1	Default	1	Default	3	Default
6	Default	6	Default	6	Default	6	Default
11	Default	11	Default	11	Default	9	Default

5. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3.2 Description of Test Modes

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

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

7 channels are provided for 802.11n (40MHz):

Channel	Frequency	Channel	Frequency
3	2422MHz	7	2442MHz
4	2427MHz	8	2447MHz
5	2432MHz	9	2452MHz
6	2437MHz		

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE $\geq$ 1G	RE<1G	PLC	APCM	
-	√	√	Note 1	√	-

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

NOTE: 1. No need to concern of Conducted Emission due to the EUT is powered by DC power.
 2. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **X-plane**.

Radiated Emission Test (Above 1GHz):

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

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
-	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
-	802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
-	802.11n (40MHz)	3 to 9	3, 6, 9	OFDM	BPSK	13.5

Radiated Emission Test (Below 1GHz):

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

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11b	1 to 11	1	DSSS	DBPSK	1

Antenna Port Conducted Measurement:

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

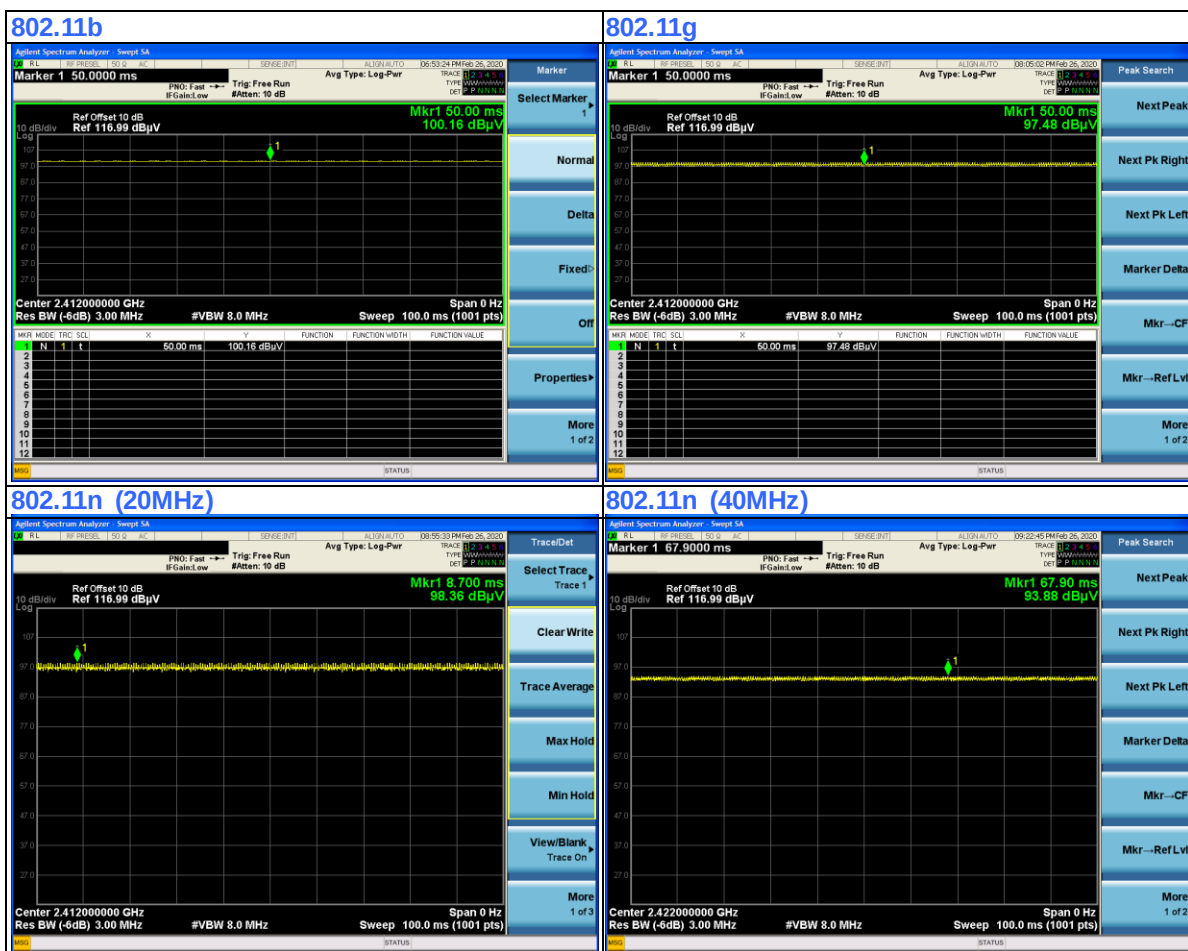
EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
-	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
-	802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
-	802.11n (40MHz)	3 to 9	3, 6, 9	OFDM	BPSK	13.5

Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested By
RE $\geq$ 1G	20deg. C, 75%RH	12Vdc	Ian Chang
RE<1G	20deg. C, 75%RH	12Vdc	Ian Chang
APCM	25deg. C, 76%RH	12Vdc	Dalen Dai

3.3 Duty Cycle of Test Signal

If duty cycle of test signal is 100 %, duty factor is not required.



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.

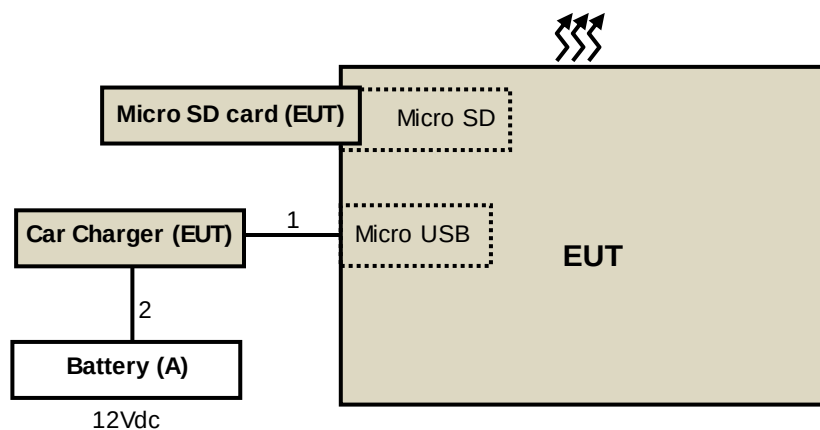
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Battery	RISING	SMF NX120-7L	N/A	N/A	Provided by Lab

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	4	Y	0	Supplied by client
2.	DC cable	1	0.5	N	0	Provided by Lab

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

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standards and references

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

Test standard:

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

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

References Test Guidance:

KDB 558074 D01 15.247 Meas Guidance v05r02

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

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

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

NOTE:

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

4.1.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
HP Preamplifier	8447D	2432A03504	Feb. 19, 2020	Feb. 18, 2021
HP Preamplifier	8449B	3008A01201	Feb. 20, 2020	Feb. 19, 2021
MITEQ Preamplifier	AMF-6F-260400-33-8P	892164	Feb. 19, 2020	Feb. 18, 2021
Agilent TEST RECEIVER	N9038A	MY51210137	Jun. 6, 2019	Jun. 5, 2020
Schwarzbeck Antenna	VULB 9168	139	Nov. 7, 2019	Nov. 6, 2020
Schwarzbeck Antenna	VHBA 9123	480	Jun. 3, 2019	Jun. 2, 2021
Schwarzbeck Horn Antenna	BBHA-9170	212	Nov. 24, 2019	Nov. 23, 2020
Schwarzbeck Horn Antenna	BBHA 9120-D1	D130	Nov. 24, 2019	Nov. 23, 2020
ADT. Turn Table	TT100	0306	NA	NA
ADT. Tower	AT100	0306	NA	NA
Software	Radiated_V7.6.15.9.5	NA	NA	NA
SUHNER RF cable With 4dB PAD	SF102	Cable-CH6-01	Jul. 10, 2019	Jul. 9, 2020
SUHNER RF cable With 3/4dB PAD	SF102	Cable-CH8-3.6m	Jul. 10, 2019	Jul. 9, 2020
KEYSIGHT MIMO Powermeasurement Test set	U2021XA	U2021XA-001	Jun. 11, 2019	Jun. 10, 2020
KEYSIGHT Spectrum Analyzer	N9030A	MY54490260	Jul. 30, 2019	Jul. 29, 2020
Loop Antenna EMCI	LPA600	270	Aug. 23, 2019	Aug. 22, 2021
EMCO Horn Antenna	3115	00028257	Nov. 24, 2019	Nov. 23, 2020
Highpass filter Wainwright Instruments	WHK 3.1/18G-10SS	SN 8	NA	NA
ROHDE & SCHWARZ Spectrum Analyzer	FSV40	101042	Sep. 23, 2019	Sep. 22, 2020
Anritsu Power Sensor	MA2411B	0738404	Apr. 16, 2019	Apr. 15, 2020
Anritsu Power Meter	ML2495A	0842014	Apr. 16, 2019	Apr. 15, 2020

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

4.1.3 Test Procedures

For Radiated emission below 30MHz

- 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.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.
- 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.
- The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

NOTE:

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

For Radiated emission above 30MHz

- 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.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- 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.
- 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.
- 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.
- The test-receiver system was set to peak and average detects function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

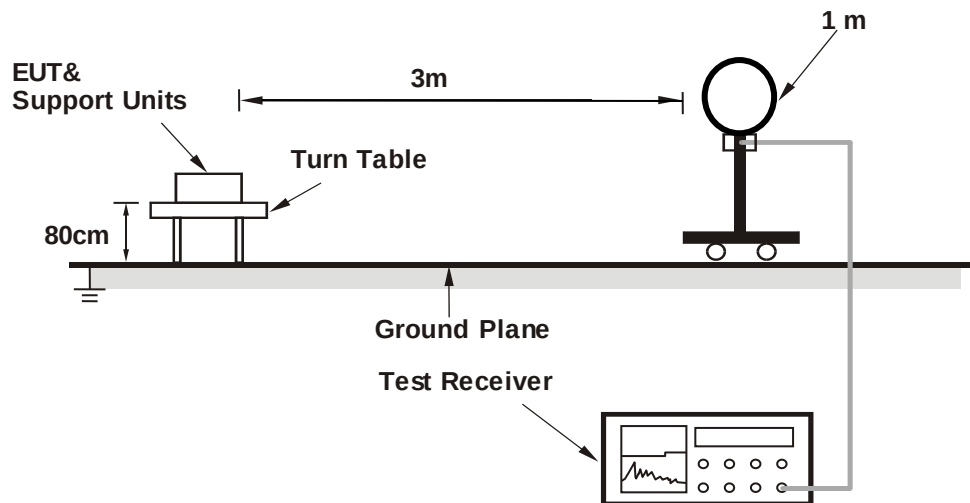
- The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
- The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
- The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is $\geq 1/T$ (Duty cycle $< 98\%$) or 10Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1GHz. (802.11b: RBW = 1MHz, VBW = 10Hz; 802.11g: RBW = 1MHz, VBW = 10Hz; 802.11n (20MHz): RBW = 1MHz, VBW = 10Hz; 802.11n (40MHz): RBW = 1MHz, VBW = 10Hz)
- All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

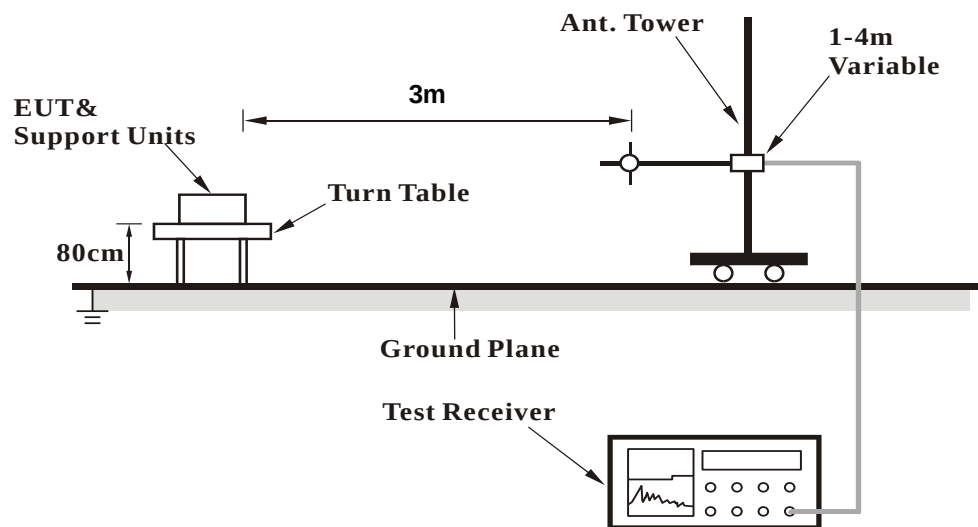
No deviation.

4.1.5 Test Setup

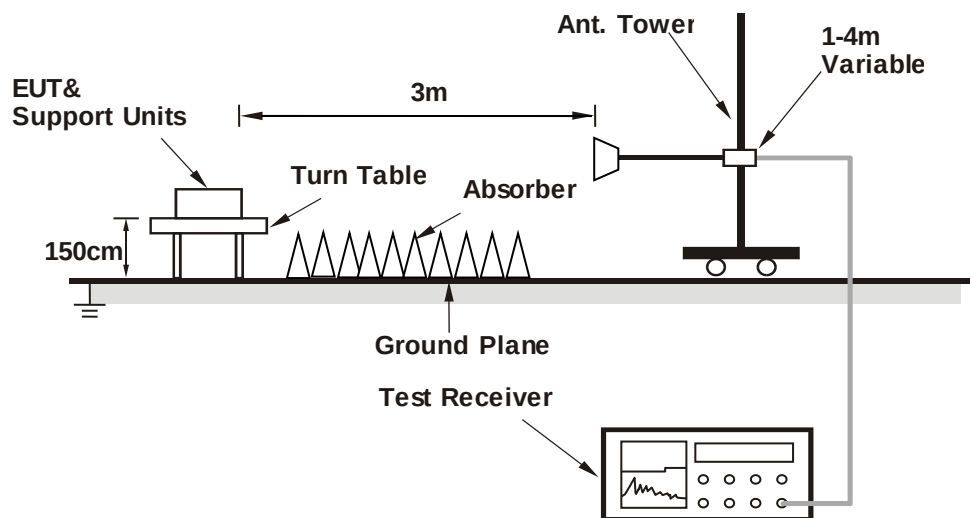
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



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

4.1.6 EUT Operating Conditions

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

4.1.7 Test Results

Above 1GHz Data :

802.11b

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

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	56.10 PK	74.00	-17.90	1.64 H	124	54.79	1.31
2	2390.00	41.72 AV	54.00	-12.28	1.64 H	124	40.41	1.31
3	*2412.00	97.21 PK			1.64 H	124	95.85	1.36
4	*2412.00	93.92 AV			1.64 H	124	92.56	1.36
5	4824.00	50.70 PK	74.00	-23.30	1.63 H	220	41.85	8.85
6	4824.00	35.68 AV	54.00	-18.32	1.63 H	220	26.83	8.85
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	55.20 PK	74.00	-18.80	3.05 V	90	53.89	1.31
2	2390.00	41.33 AV	54.00	-12.67	3.05 V	90	40.02	1.31
3	*2412.00	95.01 PK			3.05 V	90	93.65	1.36
4	*2412.00	91.94 AV			3.05 V	90	90.58	1.36
5	4824.00	49.40 PK	74.00	-24.60	1.87 V	154	40.55	8.85
6	4824.00	34.21 AV	54.00	-19.79	1.87 V	154	25.36	8.85

REMARKS:

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

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

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	95.95 PK			1.98 H	133	94.57	1.38
2	*2437.00	92.68 AV			1.98 H	133	91.30	1.38
3	4874.00	50.27 PK	74.00	-23.73	1.62 H	134	41.25	9.02
4	4874.00	35.36 AV	54.00	-18.64	1.62 H	134	26.34	9.02
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	94.27 PK			3.09 V	96	92.89	1.38
2	*2437.00	91.04 AV			3.09 V	96	89.66	1.38
3	4874.00	49.24 PK	74.00	-24.76	1.69 V	36	40.22	9.02
4	4874.00	34.36 AV	54.00	-19.64	1.69 V	36	25.34	9.02

REMARKS:

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

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

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	96.39 PK			1.97 H	132	94.94	1.45
2	*2462.00	93.22 AV			1.97 H	132	91.77	1.45
3	2483.50	55.71 PK	74.00	-18.29	1.97 H	132	54.16	1.55
4	2483.50	41.81 AV	54.00	-12.19	1.97 H	132	40.26	1.55
5	4924.00	50.61 PK	74.00	-23.39	1.62 H	321	41.52	9.09
6	4924.00	35.40 AV	54.00	-18.60	1.62 H	321	26.31	9.09
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	94.77 PK			3.05 V	92	93.32	1.45
2	*2462.00	91.61 AV			3.05 V	92	90.16	1.45
3	2483.50	55.23 PK	74.00	-18.77	3.05 V	92	53.68	1.55
4	2483.50	41.51 AV	54.00	-12.49	3.05 V	92	39.96	1.55
5	4924.00	49.61 PK	74.00	-24.39	1.57 V	142	40.52	9.09
6	4924.00	34.33 AV	54.00	-19.67	1.57 V	142	25.24	9.09

REMARKS:

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

802.11g

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

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	56.48 PK	74.00	-17.52	1.00 H	337	55.17	1.31
2	2390.00	44.07 AV	54.00	-9.93	1.00 H	337	42.76	1.31
3	*2412.00	96.19 PK			1.00 H	337	94.83	1.36
4	*2412.00	83.65 AV			1.00 H	337	82.29	1.36
5	4824.00	50.07 PK	74.00	-23.93	1.68 H	254	41.22	8.85
6	4824.00	35.48 AV	54.00	-18.52	1.68 H	254	26.63	8.85
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	55.83 PK	74.00	-18.17	3.13 V	98	54.52	1.31
2	2390.00	42.57 AV	54.00	-11.43	3.13 V	98	41.26	1.31
3	*2412.00	93.22 PK			3.13 V	98	91.86	1.36
4	*2412.00	81.25 AV			3.13 V	98	79.89	1.36
5	4824.00	49.30 PK	74.00	-24.70	1.16 V	268	40.45	8.85
6	4824.00	34.13 AV	54.00	-19.87	1.16 V	268	25.28	8.85

REMARKS:

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

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

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	95.38 PK			1.13 H	335	94.00	1.38
2	*2437.00	85.91 AV			1.13 H	335	84.53	1.38
3	4874.00	50.24 PK	74.00	-23.76	1.57 H	42	41.22	9.02
4	4874.00	35.27 AV	54.00	-18.73	1.57 H	42	26.25	9.02
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	92.61 PK			3.03 V	94	91.23	1.38
2	*2437.00	80.92 AV			3.03 V	94	79.54	1.38
3	4874.00	49.19 PK	74.00	-24.81	1.95 V	258	40.17	9.02
4	4874.00	34.33 AV	54.00	-19.67	1.95 V	258	25.31	9.02

REMARKS:

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

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

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	95.41 PK			1.11 H	337	93.96	1.45
2	*2462.00	85.90 AV			1.11 H	337	84.45	1.45
3	2483.50	56.00 PK	74.00	-18.00	1.11 H	337	54.45	1.55
4	2483.50	42.12 AV	54.00	-11.88	1.11 H	337	40.57	1.55
5	4924.00	50.40 PK	74.00	-23.60	1.81 H	234	41.32	9.08
6	4924.00	35.42 AV	54.00	-18.58	1.81 H	234	26.34	9.08
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	92.68 PK			3.09 V	89	91.23	1.45
2	*2462.00	82.70 AV			3.09 V	89	81.25	1.45
3	2483.50	54.78 PK	74.00	-19.22	3.09 V	89	53.23	1.55
4	2483.50	41.58 AV	54.00	-12.42	3.09 V	89	40.03	1.55
5	4924.00	49.34 PK	74.00	-24.66	1.65 V	234	40.25	9.09
6	4924.00	34.43 AV	54.00	-19.57	1.65 V	234	25.34	9.09

REMARKS:

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

802.11n (20MHz)

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

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	55.63 PK	74.00	-18.37	1.00 H	339	54.32	1.31
2	2390.00	44.92 AV	54.00	-9.08	1.00 H	339	43.61	1.31
3	*2412.00	96.13 PK			1.00 H	339	94.77	1.36
4	*2412.00	86.24 AV			1.00 H	339	84.88	1.36
5	4824.00	51.23 PK	74.00	-22.77	1.53 H	271	42.38	8.85
6	4824.00	35.56 AV	54.00	-18.44	1.53 H	271	26.71	8.85
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	55.25 PK	74.00	-18.75	3.06 V	92	53.94	1.31
2	2390.00	44.16 AV	54.00	-9.84	3.06 V	92	42.85	1.31
3	*2412.00	93.05 PK			3.06 V	92	91.69	1.36
4	*2412.00	83.09 AV			3.06 V	92	81.73	1.36
5	4824.00	50.69 PK	74.00	-23.31	1.94 V	247	41.84	8.85
6	4824.00	34.97 AV	54.00	-19.03	1.94 V	247	26.12	8.85

REMARKS:

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

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

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	95.06 PK			1.06 H	334	93.68	1.38
2	*2437.00	85.17 AV			1.06 H	334	83.79	1.38
3	4874.00	51.29 PK	74.00	-22.71	1.49 H	277	42.27	9.02
4	4874.00	35.67 AV	54.00	-18.33	1.49 H	277	26.65	9.02
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	93.42 PK			3.10 V	95	92.04	1.38
2	*2437.00	83.49 AV			3.10 V	95	82.11	1.38
3	4874.00	50.69 PK	74.00	-23.31	1.97 V	244	41.67	9.02
4	4874.00	34.95 AV	54.00	-19.05	1.97 V	244	25.93	9.02

REMARKS:

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

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

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	94.80 PK			1.10 H	337	93.35	1.45
2	*2462.00	84.91 AV			1.10 H	337	83.46	1.45
3	2483.50	55.67 PK	74.00	-18.33	1.10 H	337	54.12	1.55
4	2483.50	42.39 AV	54.00	-11.61	1.10 H	337	40.84	1.55
5	4924.00	51.24 PK	74.00	-22.76	1.50 H	274	42.15	9.09
6	4924.00	35.52 AV	54.00	-18.48	1.50 H	274	26.43	9.09
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	92.78 PK			3.13 V	93	91.33	1.45
2	*2462.00	83.92 AV			3.13 V	93	82.47	1.45
3	2483.50	55.33 PK	74.00	-18.67	3.13 V	93	53.78	1.55
4	2483.50	41.90 AV	54.00	-12.10	3.13 V	93	40.35	1.55
5	4924.00	50.48 PK	74.00	-23.52	1.96 V	251	41.39	9.09
6	4924.00	34.84 AV	54.00	-19.16	1.96 V	251	25.75	9.09

REMARKS:

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

802.11n (40MHz)

CHANNEL	TX Channel 3	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

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	55.89 PK	74.00	-18.11	1.00 H	14	54.58	1.31
2	2390.00	46.70 AV	54.00	-7.30	1.00 H	14	45.39	1.31
3	*2422.00	93.08 PK			1.00 H	14	91.71	1.37
4	*2422.00	83.00 AV			1.00 H	14	81.63	1.37
5	4844.00	50.77 PK	74.00	-23.23	1.61 H	284	41.86	8.91
6	4844.00	35.32 AV	54.00	-18.68	1.61 H	284	26.41	8.91
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	55.25 PK	74.00	-18.75	3.12 V	90	53.94	1.31
2	2390.00	45.57 AV	54.00	-8.43	3.12 V	90	44.26	1.31
3	*2422.00	90.48 PK			3.12 V	90	89.11	1.37
4	*2422.00	80.39 AV			3.12 V	90	79.02	1.37
5	4844.00	50.31 PK	74.00	-23.69	1.98 V	241	41.40	8.91
6	4844.00	34.80 AV	54.00	-19.20	1.98 V	241	25.89	8.91

REMARKS:

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

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

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	92.89 PK			1.06 H	22	91.51	1.38
2	*2437.00	82.75 AV			1.06 H	22	81.37	1.38
3	4874.00	50.57 PK	74.00	-23.43	1.58 H	289	41.55	9.02
4	4874.00	35.25 AV	54.00	-18.75	1.58 H	289	26.23	9.02
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	90.22 PK			3.08 V	94	88.84	1.38
2	*2437.00	80.03 AV			3.08 V	94	78.65	1.38
3	4874.00	50.30 PK	74.00	-23.70	1.96 V	245	41.28	9.02
4	4874.00	34.77 AV	54.00	-19.23	1.96 V	245	25.75	9.02

REMARKS:

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

CHANNEL	TX Channel 9	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

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	*2452.00	92.22 PK			1.02 H	27	90.82	1.40
2	*2452.00	82.14 AV			1.02 H	27	80.74	1.40
3	2483.50	56.49 PK	74.00	-17.51	1.02 H	27	54.94	1.55
4	2483.50	43.73 AV	54.00	-10.27	1.02 H	27	42.18	1.55
5	4904.00	50.45 PK	74.00	-23.55	1.53 H	280	41.34	9.11
6	4904.00	35.26 AV	54.00	-18.74	1.53 H	280	26.15	9.11
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	*2452.00	89.86 PK			3.11 V	97	88.46	1.40
2	*2452.00	79.69 AV			3.11 V	97	78.29	1.40
3	2483.50	55.93 PK	74.00	-18.07	3.11 V	97	54.38	1.55
4	2483.50	43.04 AV	54.00	-10.96	3.11 V	97	41.49	1.55
5	4904.00	50.16 PK	74.00	-23.84	1.93 V	249	41.05	9.11
6	4904.00	34.73 AV	54.00	-19.27	1.93 V	249	25.62	9.11

REMARKS:

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

Below 1GHz Data:

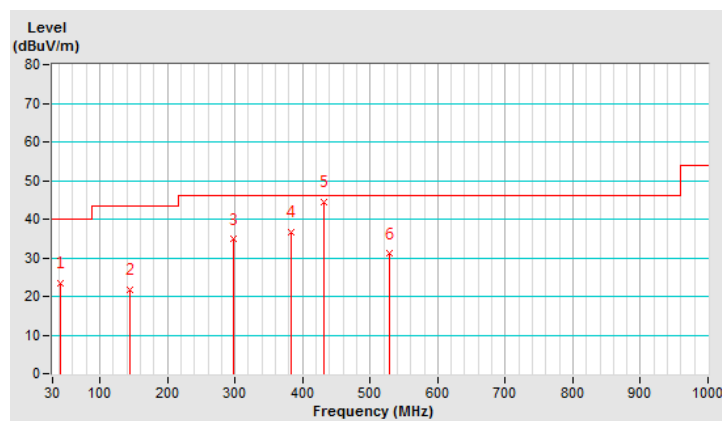
802.11b

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

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	42.46	23.47 QP	40.00	-16.53	1.53 H	185	30.88	-7.41
2	143.97	21.76 QP	43.50	-21.74	1.26 H	35	28.65	-6.89
3	296.99	34.80 QP	46.00	-11.20	1.74 H	85	39.66	-4.86
4	384.00	36.57 QP	46.00	-9.43	1.80 H	104	39.67	-3.10
5	432.02	44.42 QP	46.00	-1.58	2.09 H	346	46.19	-1.77
6	528.00	31.05 QP	46.00	-14.95	1.31 H	8	31.00	0.05

REMARKS:

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

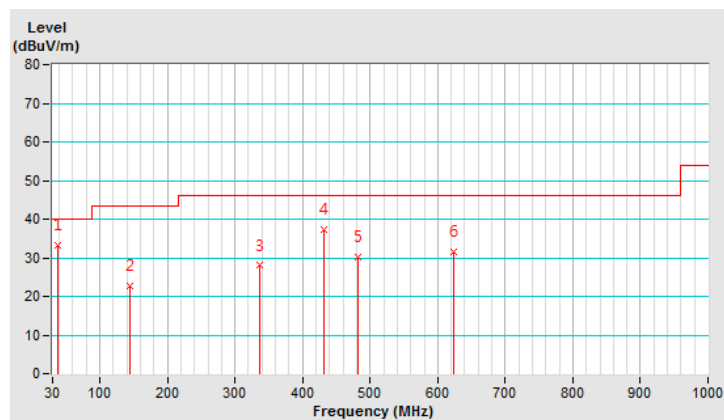


CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

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	37.13	33.27 QP	40.00	-6.73	1.94 V	146	41.34	-8.07
2	143.97	22.66 QP	43.50	-20.84	1.35 V	38	29.55	-6.89
3	335.99	28.04 QP	46.00	-17.96	1.88 V	148	32.05	-4.01
4	432.02	37.31 QP	46.00	-8.69	2.23 V	157	39.08	-1.77
5	482.60	30.32 QP	46.00	-15.68	1.61 V	162	31.10	-0.78
6	624.03	31.47 QP	46.00	-14.53	1.07 V	360	28.76	2.71

REMARKS:

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

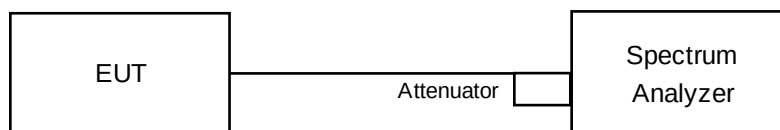


4.2 6dB Bandwidth Measurement

4.2.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.2.2 Test Setup



4.2.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.2.4 Test Procedure

- Set resolution bandwidth (RBW) = 100kHz
- Set the video bandwidth (VBW) $\geq 3 \times$ RBW, Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- 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

4.2.5 Deviation from Test Standard

No deviation.

4.2.6 EUT Operating Conditions

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

4.2.7 Test Result

802.11b

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	9.11	0.5	PASS
6	2437	9.11	0.5	PASS
11	2462	9.10	0.5	PASS

802.11g

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	16.61	0.5	PASS
6	2437	16.59	0.5	PASS
11	2462	16.60	0.5	PASS

802.11n (20MHz)

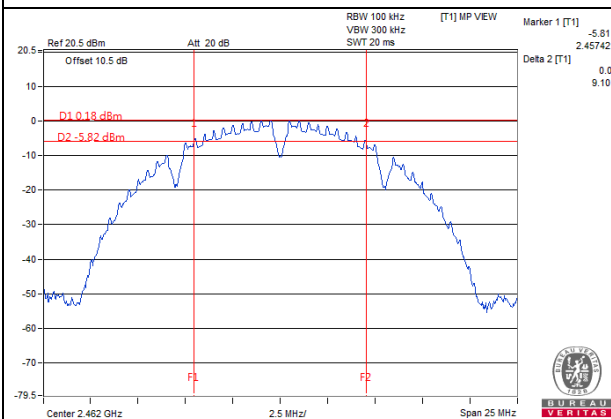
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	17.77	0.5	PASS
6	2437	17.76	0.5	PASS
11	2462	17.76	0.5	PASS

802.11n (40MHz)

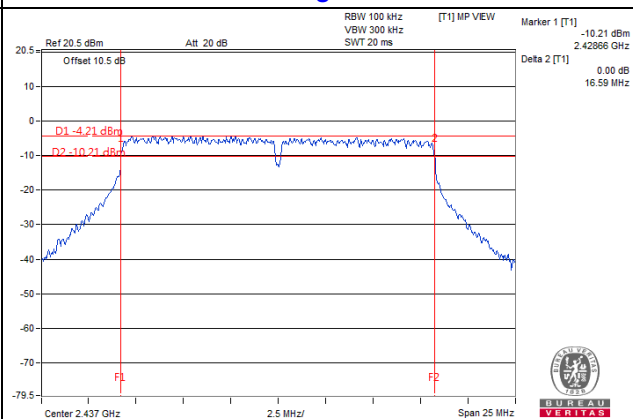
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
3	2422	36.56	0.5	PASS
6	2437	36.57	0.5	PASS
9	2452	36.55	0.5	PASS

Spectrum Plot of Worst Value

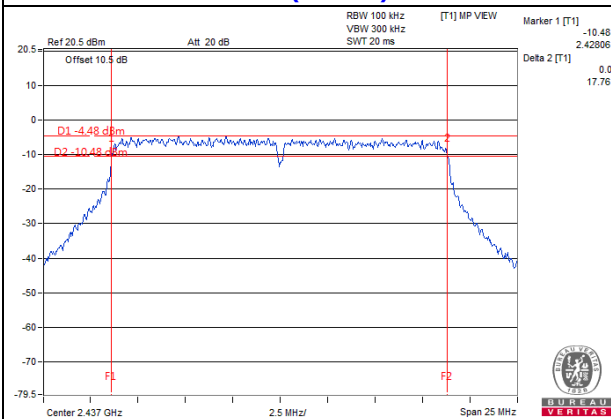
802.11b : CH11



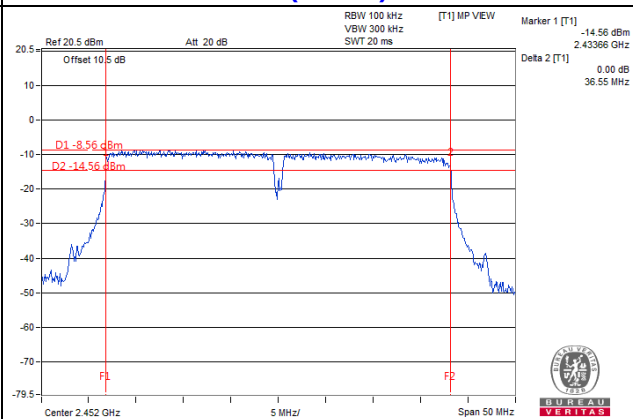
802.11g : CH6



802.11n (20MHz) : CH6



802.11n (40MHz) : CH9

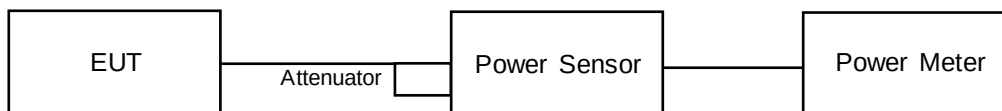


4.3 Conducted Output Power Measurement

4.3.1 Limits of Conducted Output Power Measurement

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

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 Procedures

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

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

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Conditions

Same as Item 4.3.6.

4.3.7 Test Results

FOR PEAK POWER

802.11b

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
1	2412	29.785	14.74	30	Pass
6	2437	24.378	13.87	30	Pass
11	2462	17.783	12.50	30	Pass

802.11g

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
1	2412	129.718	21.13	30	Pass
6	2437	121.060	20.83	30	Pass
11	2462	67.608	18.30	30	Pass

802.11n (20MHz)

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
1	2412	139.959	21.46	30	Pass
6	2437	93.541	19.71	30	Pass
11	2462	56.494	17.52	30	Pass

802.11n (40MHz)

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
3	2422	101.859	20.08	30	Pass
6	2437	86.099	19.35	30	Pass
9	2452	77.090	18.87	30	Pass

FOR AVERAGE POWER

802.11b

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	16.331	12.13
6	2437	13.243	11.22
11	2462	10.023	10.01

802.11g

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	22.751	13.57
6	2437	15.524	11.91
11	2462	10.593	10.25

802.11n (20MHz)

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	22.387	13.50
6	2437	14.521	11.62
11	2462	9.290	9.68

802.11n (40MHz)

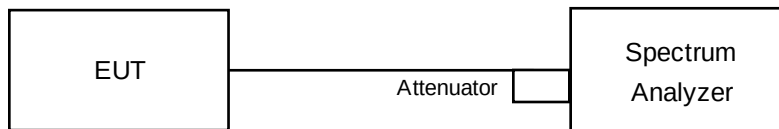
Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
3	2422	18.239	12.61
6	2437	14.125	11.50
9	2452	11.194	10.49

4.4 Power Spectral Density Measurement

4.4.1 Limits of Power Spectral Density Measurement

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

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 Procedure

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

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Condition

Same as Item 4.3.6

4.4.7 Test Results

802.11b

Channel	Freq. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
1	2412	-11.76	8	Pass
6	2437	-12.97	8	Pass
11	2462	-14.18	8	Pass

802.11g

Channel	Freq. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
1	2412	-14.88	8	Pass
6	2437	-16.21	8	Pass
11	2462	-17.82	8	Pass

802.11n (20MHz)

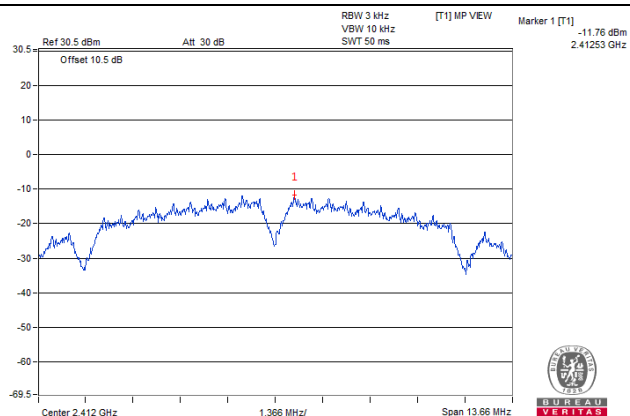
Channel	Freq. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
1	2412	-15.98	8	Pass
6	2437	-16.96	8	Pass
11	2462	-19.21	8	Pass

802.11n (40MHz)

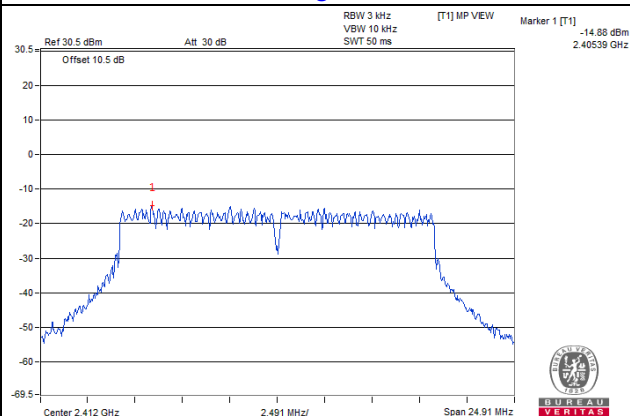
Channel	Freq. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
3	2422	-19.60	8	Pass
6	2437	-20.54	8	Pass
9	2452	-21.30	8	Pass

Spectrum Plot of Worst Value

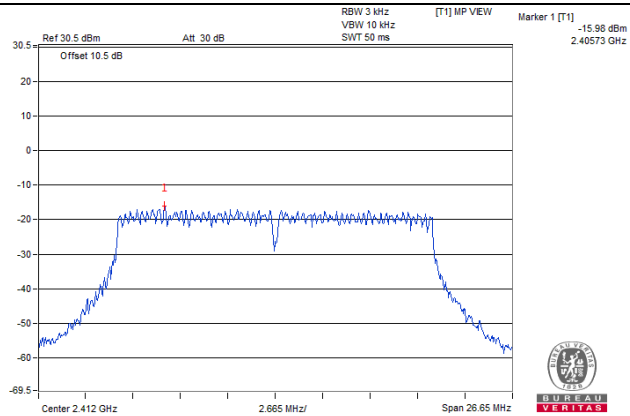
802.11b : CH1



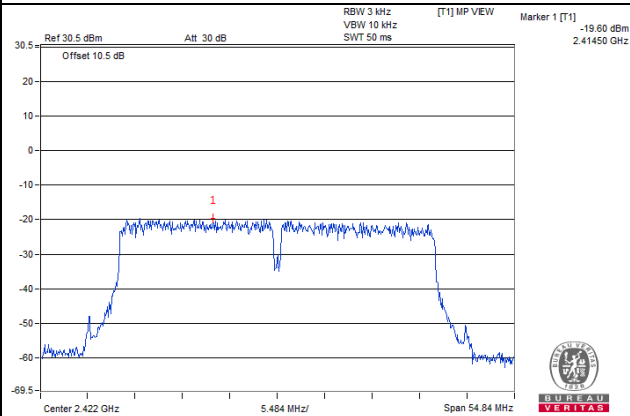
802.11g : CH1



802.11n (20MHz) : CH1



802.11n (40MHz) : CH3

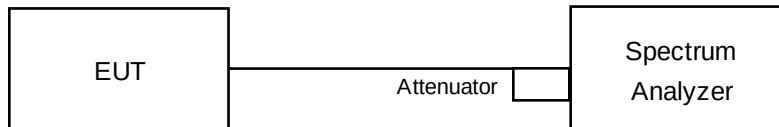


4.5 Conducted Out of Band Emission Measurement

4.5.1 Limits of Conducted Out of Band Emission Measurement

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

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

MEASUREMENT PROCEDURE REF

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

MEASUREMENT PROCEDURE OOB

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

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

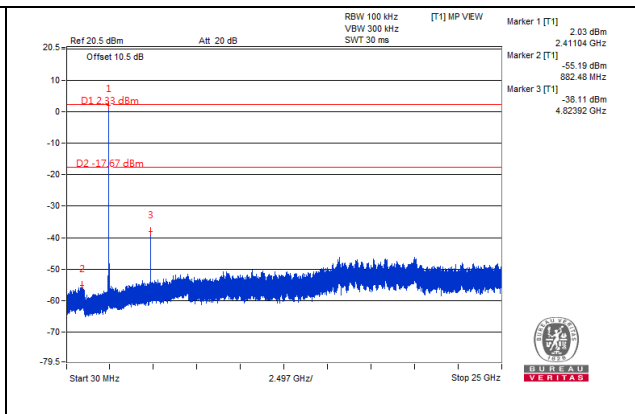
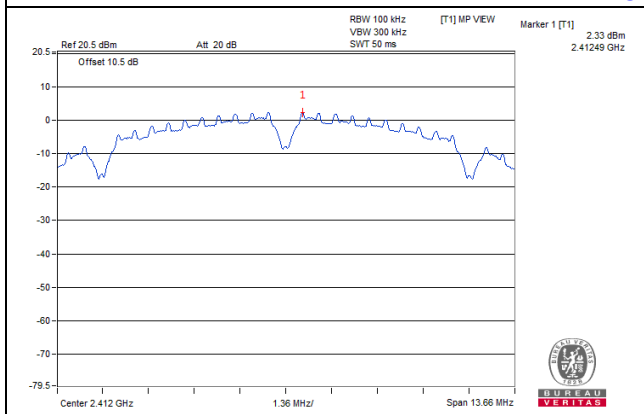
Same as Item 4.3.6

4.5.7 Test Results

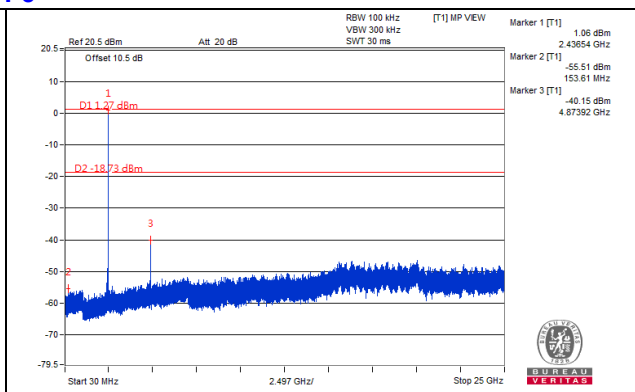
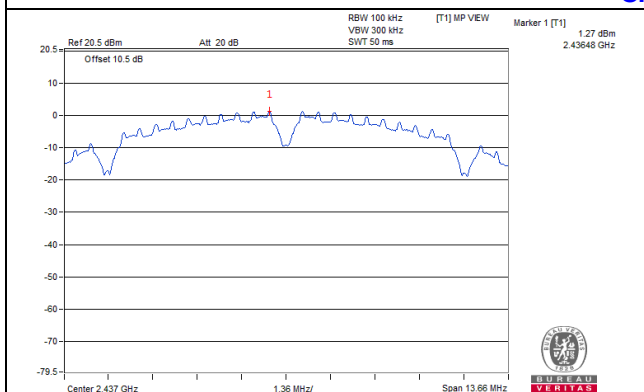
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.

802.11b

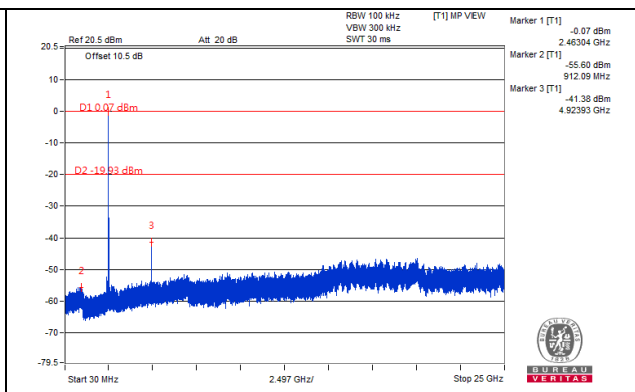
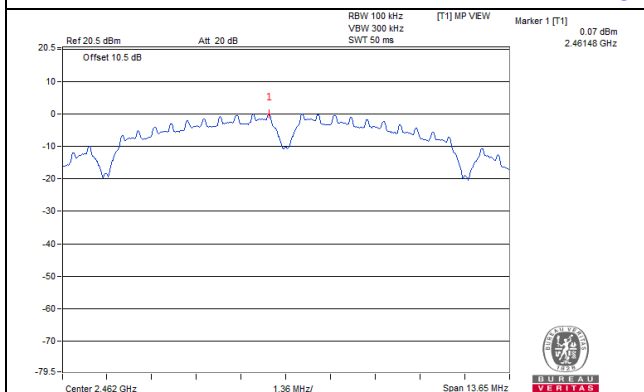
CH 1



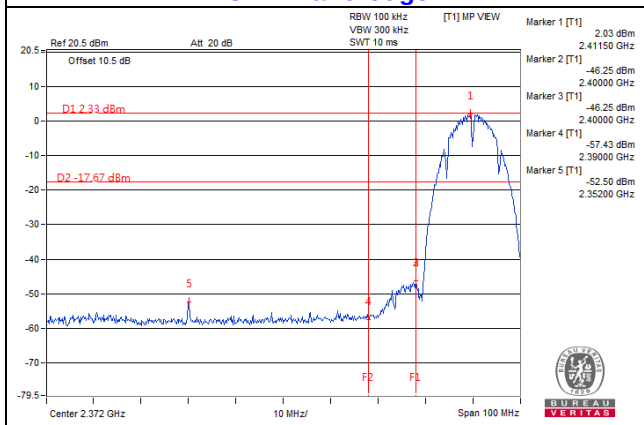
CH 6



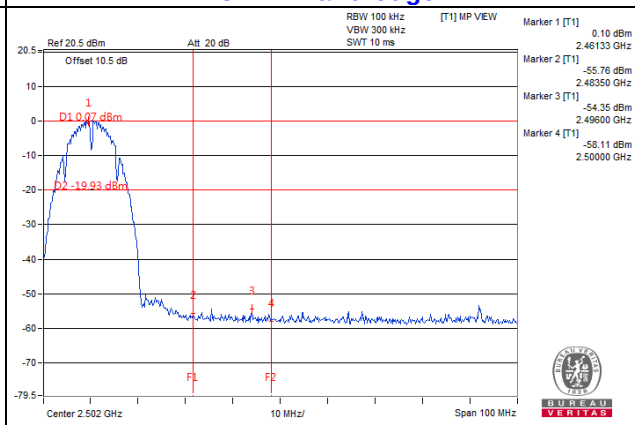
CH 11



CH 1 Band edge

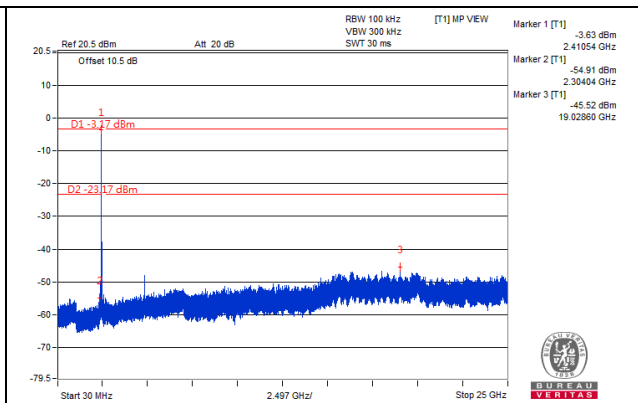
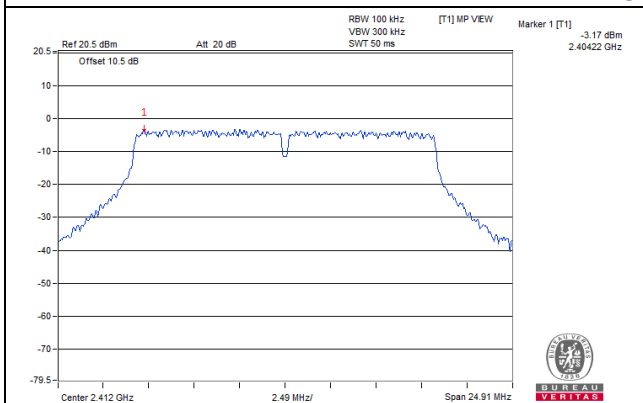


CH 11 Band edge

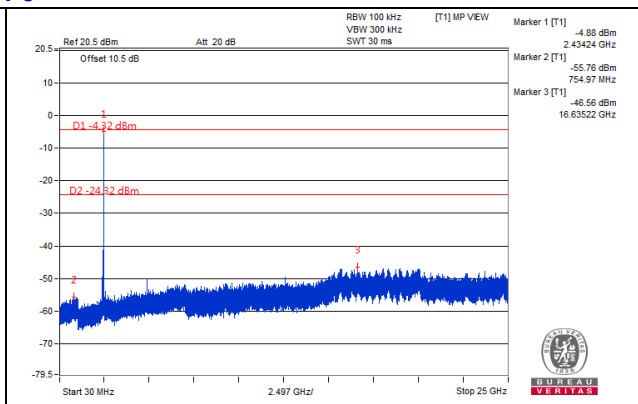
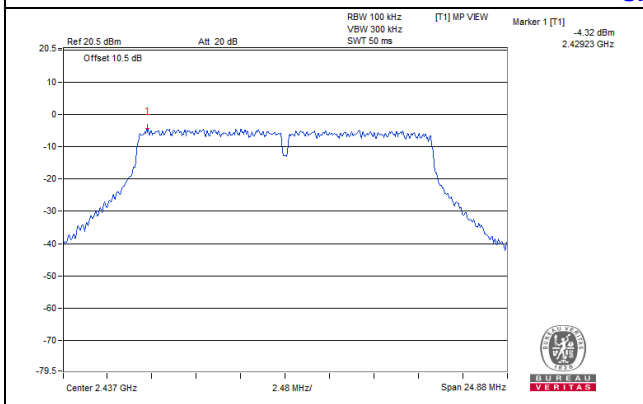


802.11g

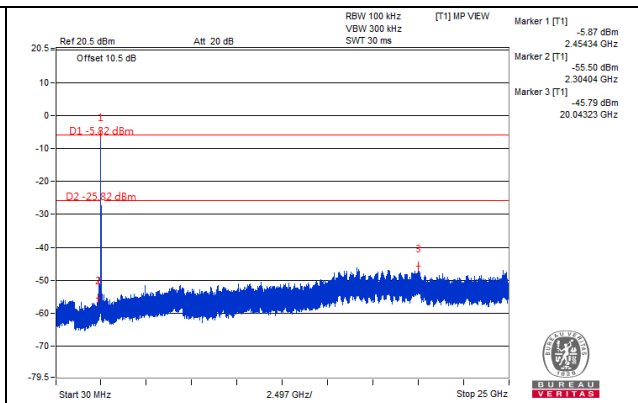
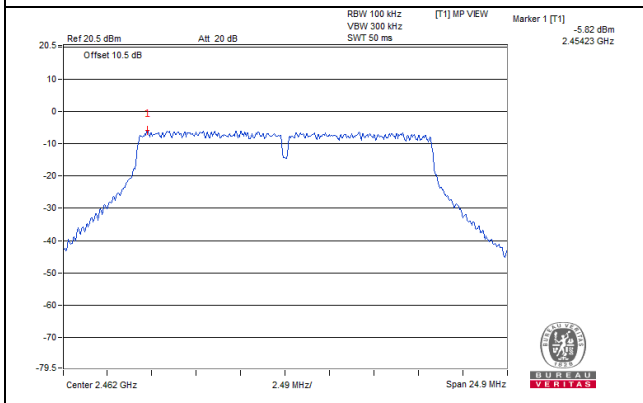
CH 1



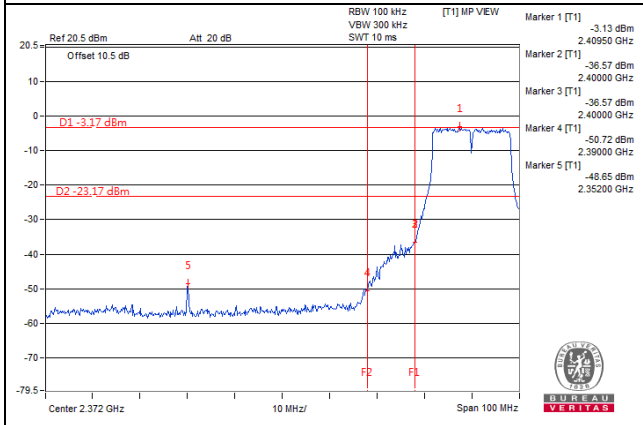
CH 6



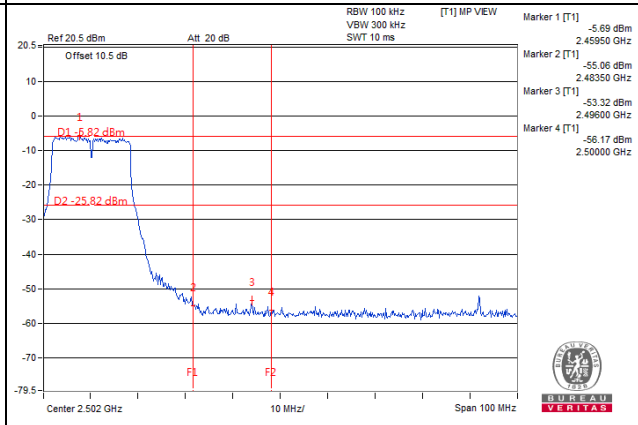
CH 11



CH 1 Band edge

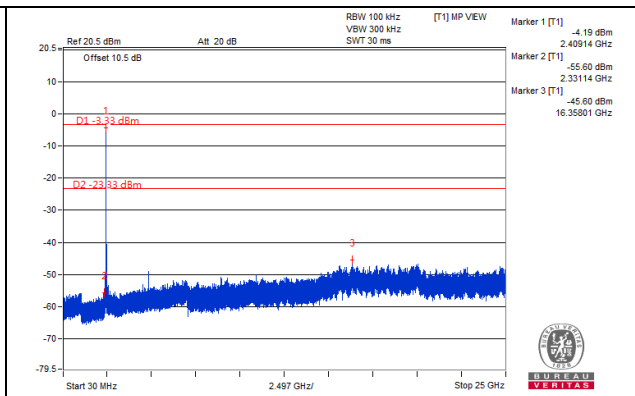
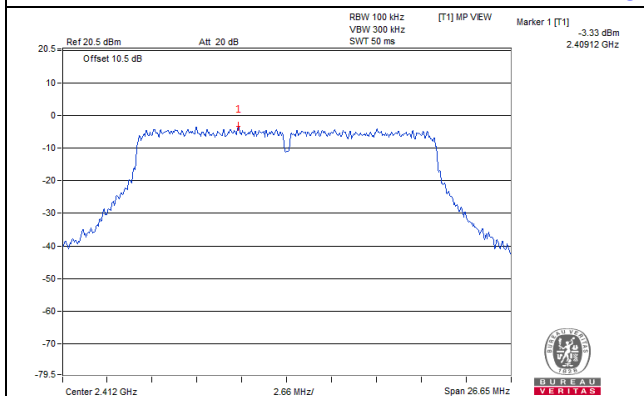


CH 11 Band edge

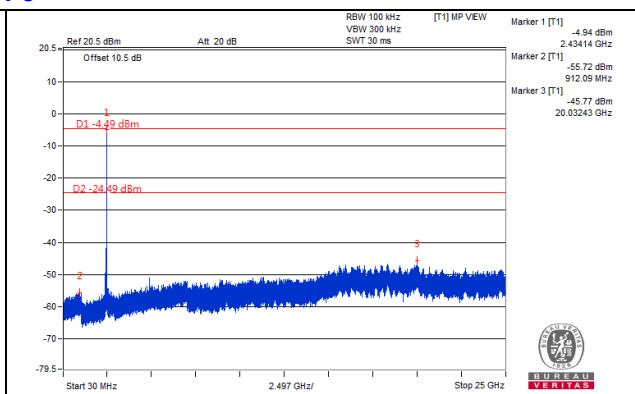
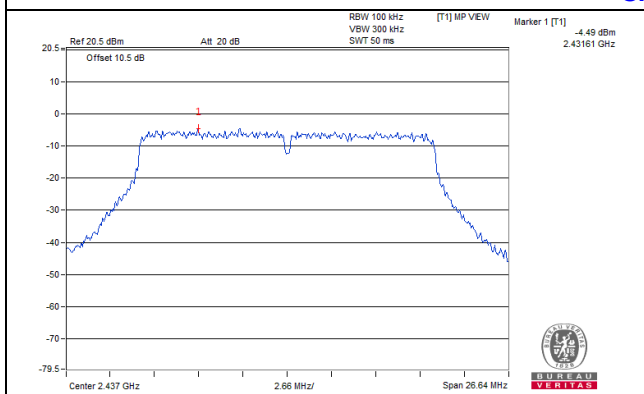


802.11n (20MHz)

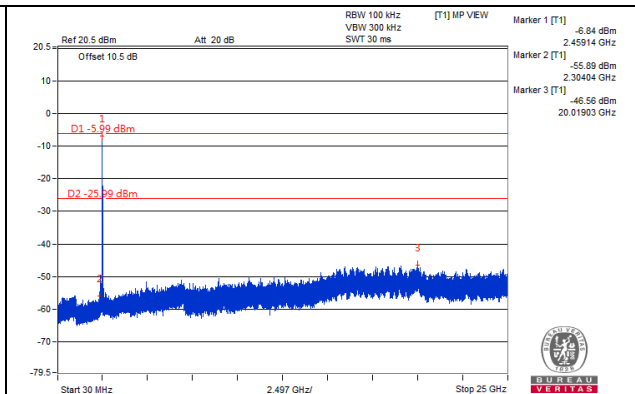
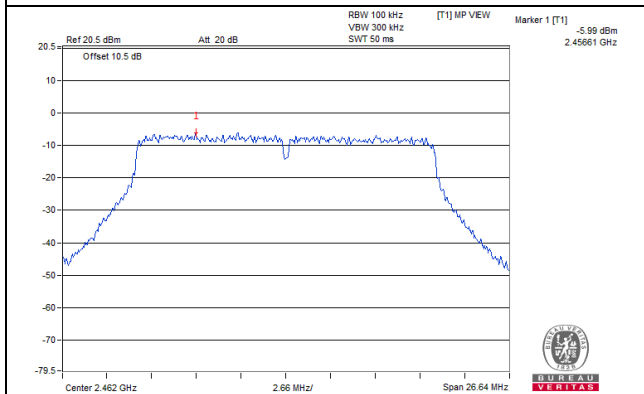
CH 1



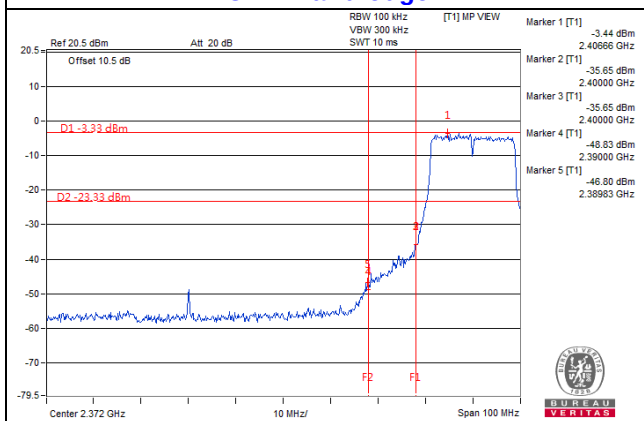
CH 6



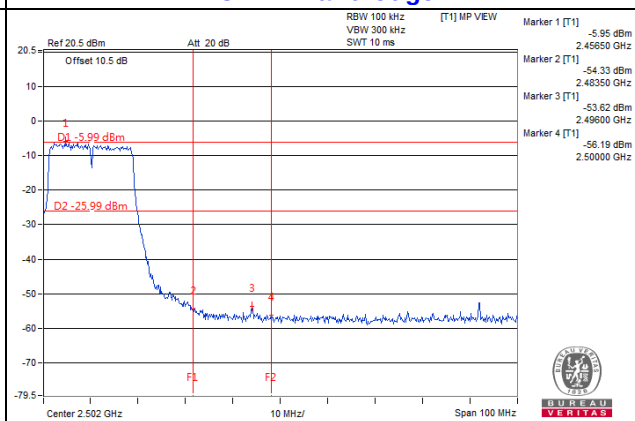
CH 11



CH 1 Band edge

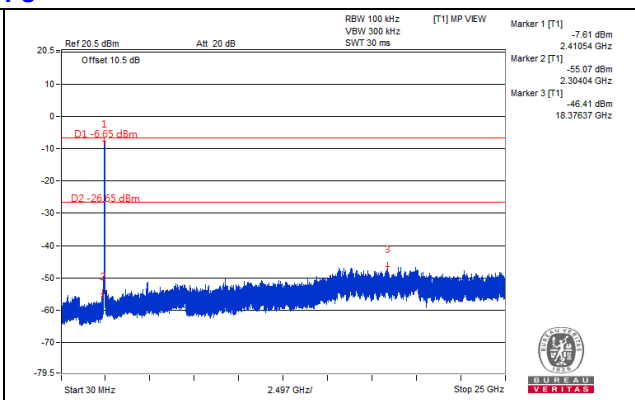
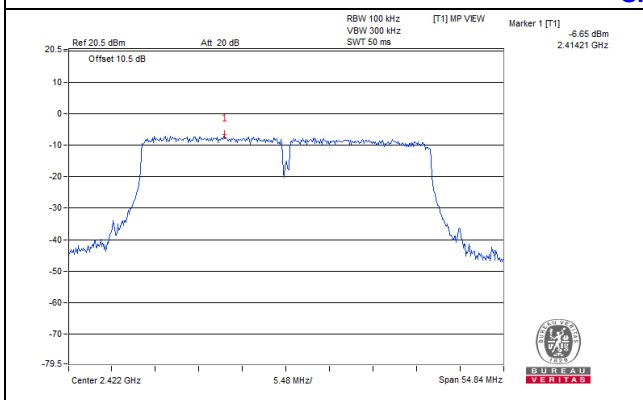


CH 11 Band edge

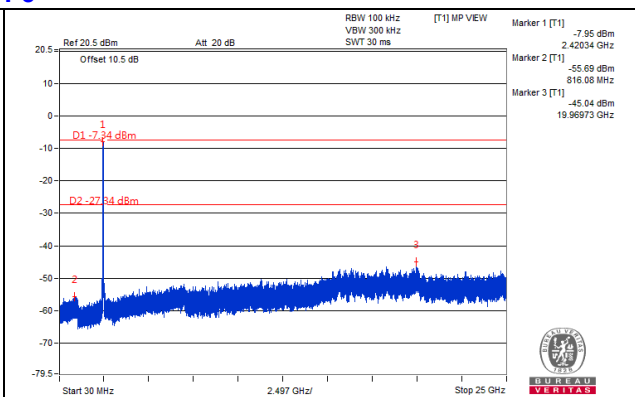
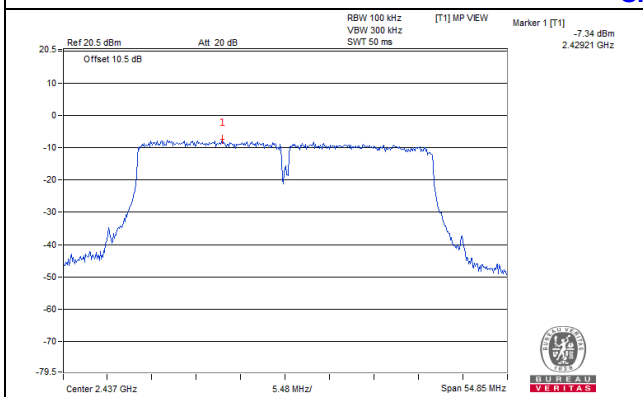


802.11n (40MHz)

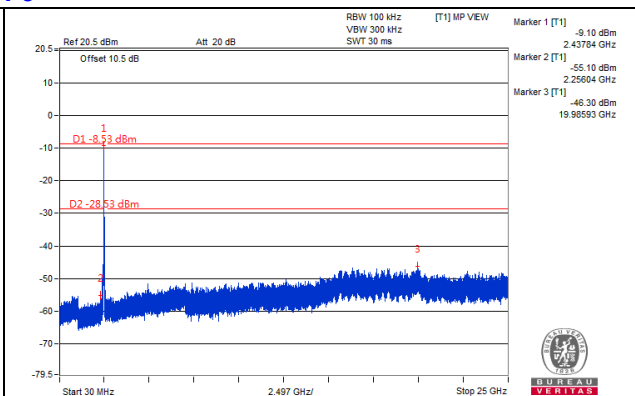
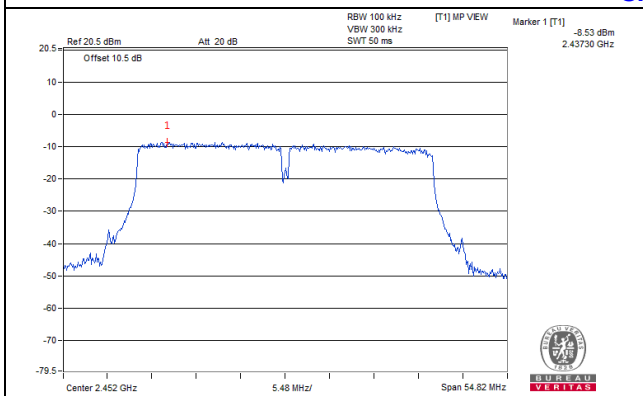
CH 3



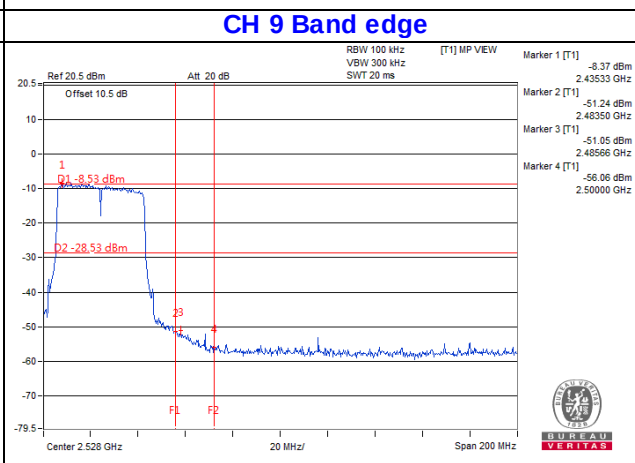
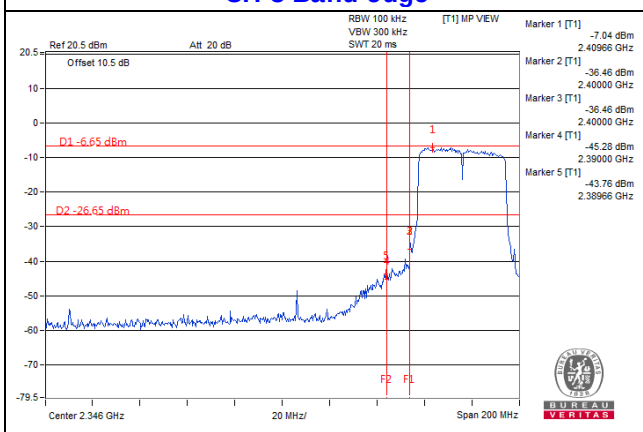
CH 6



CH 9

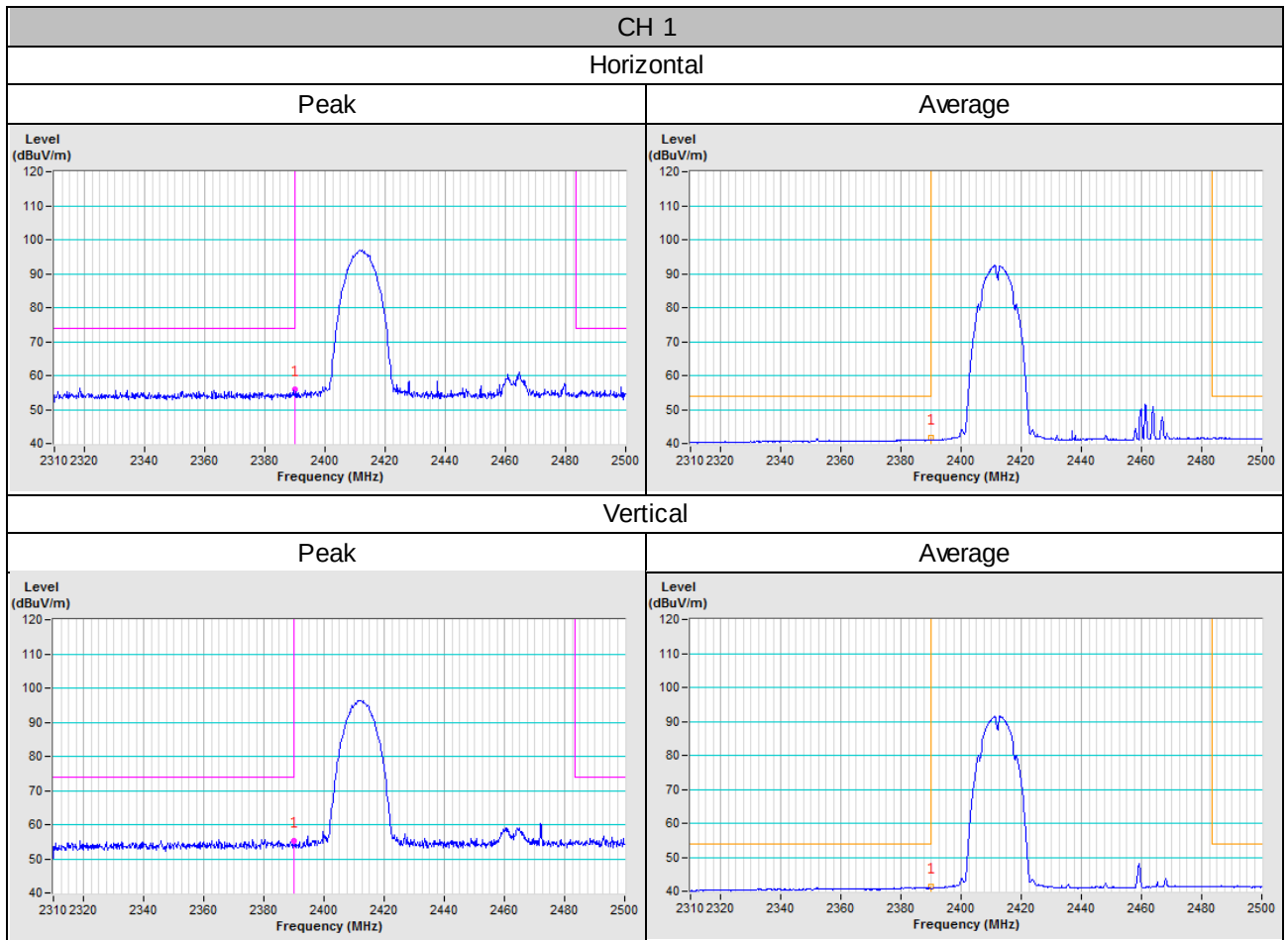


CH 3 Band edge



Annex A- Band Edge Measurement

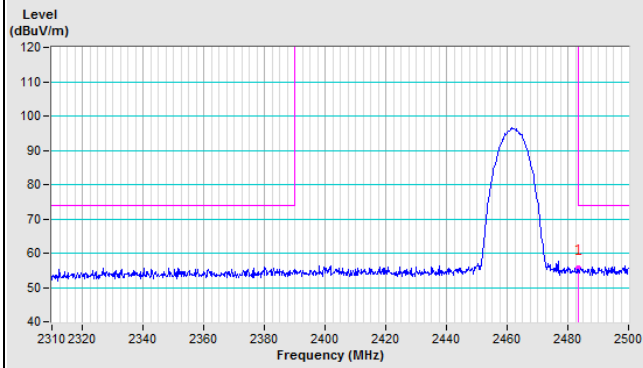
802.11b



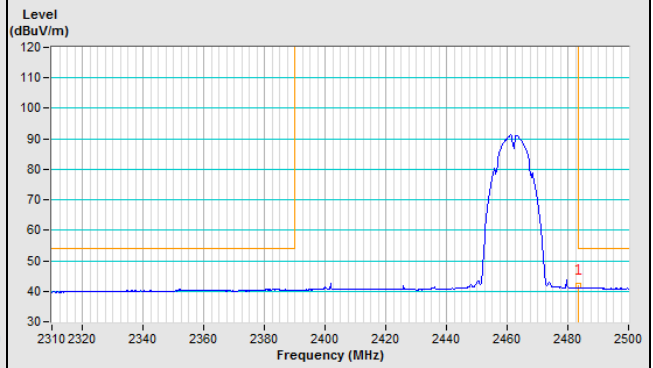
CH 11

Horizontal

Peak

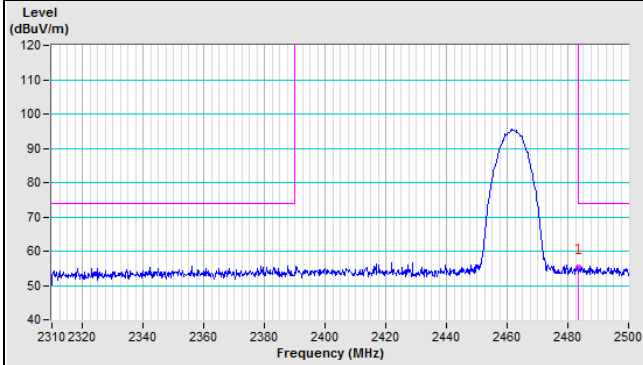


Average

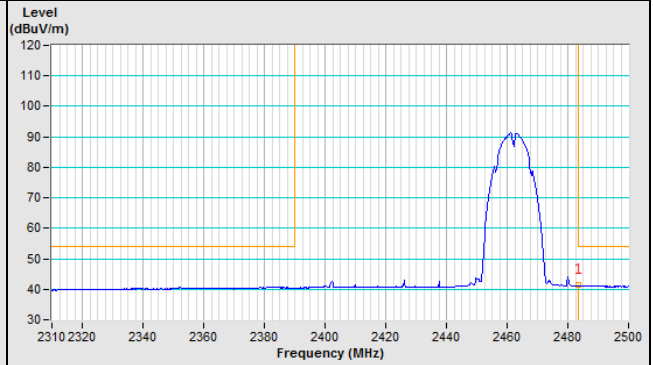


Vertical

Peak



Average

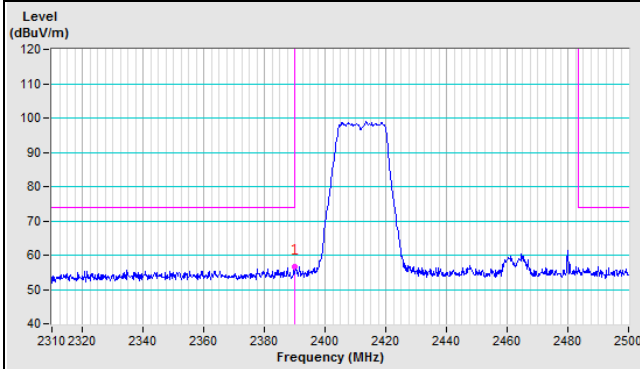


802.11g

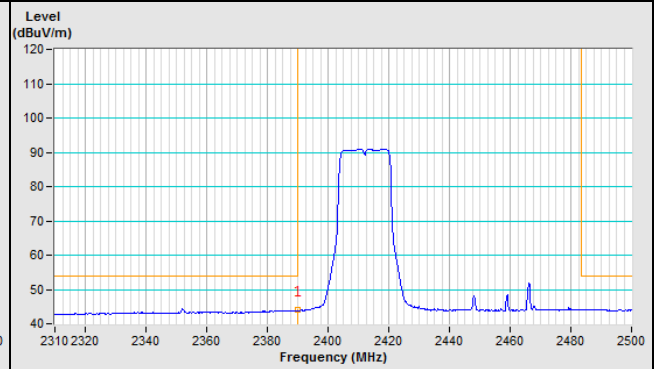
CH 1

Horizontal

Peak

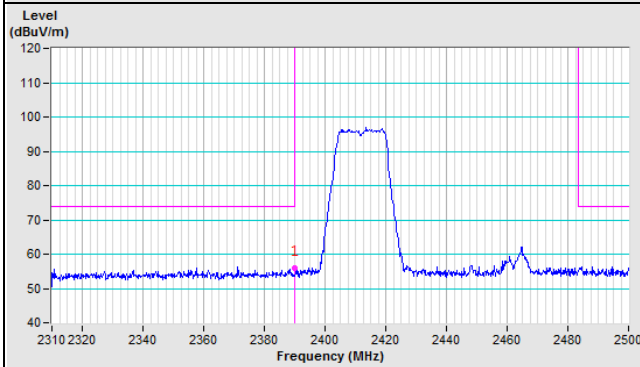


Average

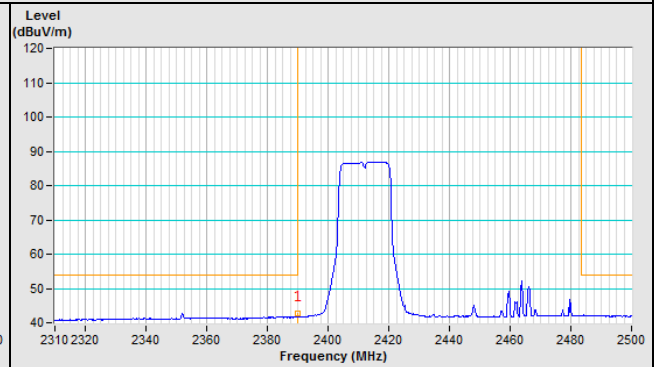


Vertical

Peak



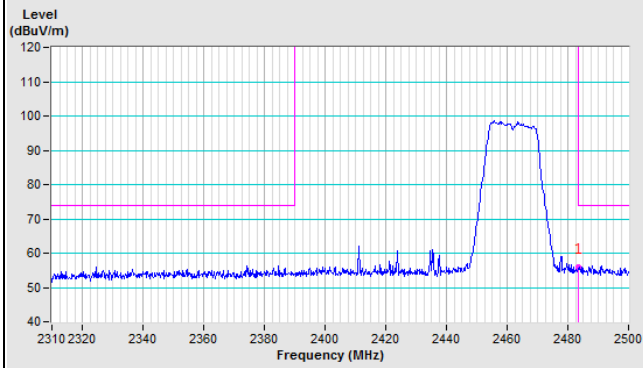
Average



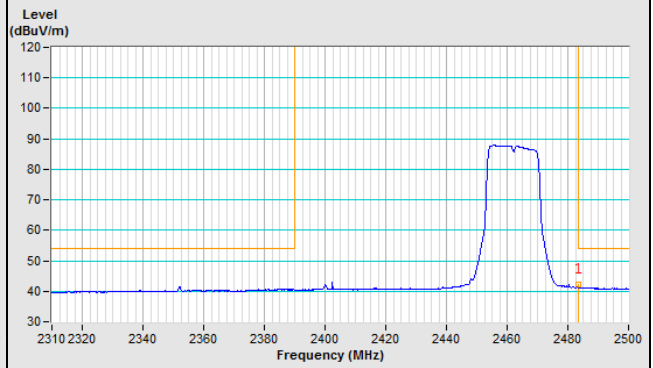
CH 11

Horizontal

Peak

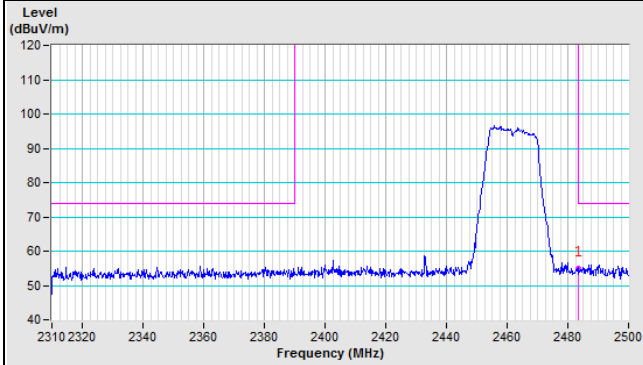


Average

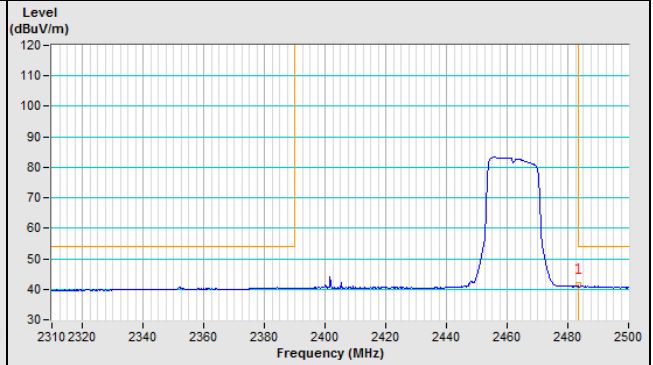


Vertical

Peak



Average

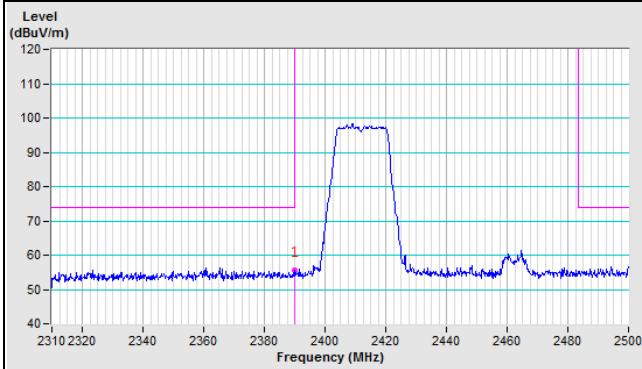


802.11n (20MHz)

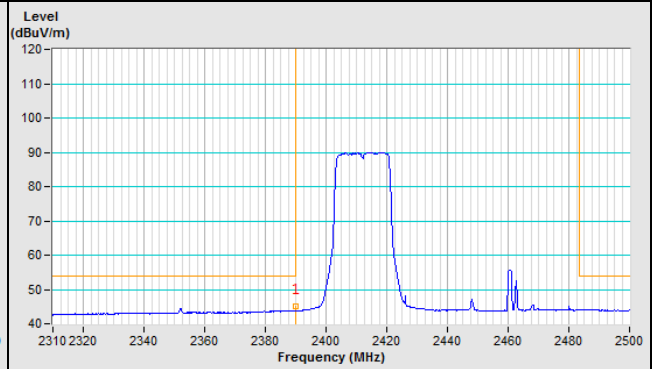
CH 1

Horizontal

Peak

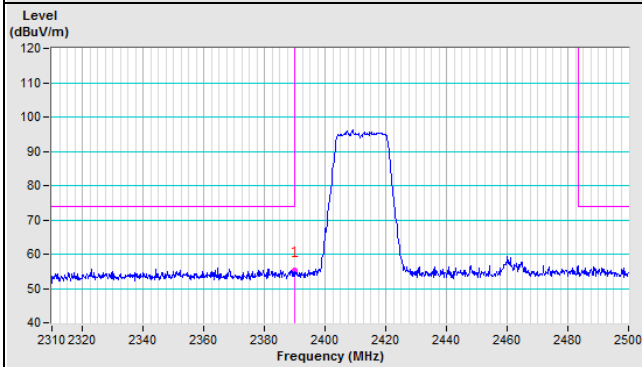


Average

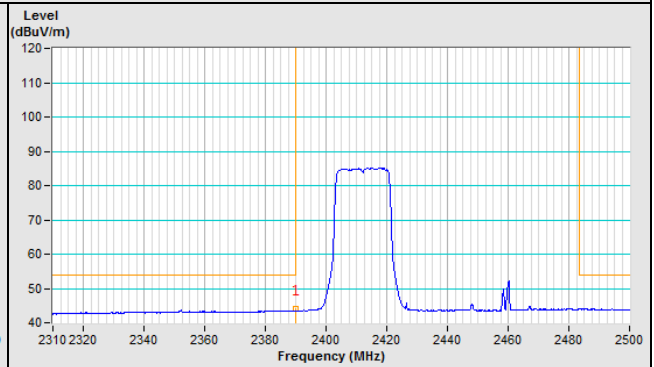


Vertical

Peak



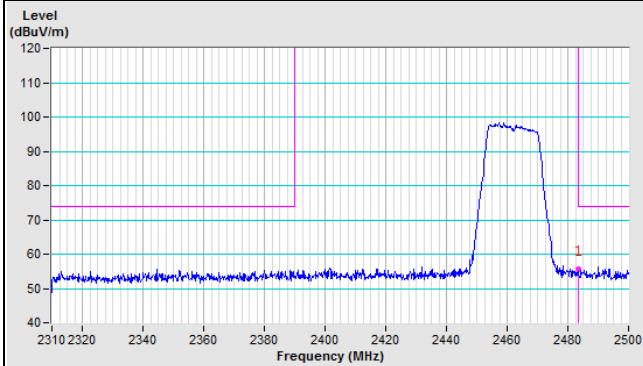
Average



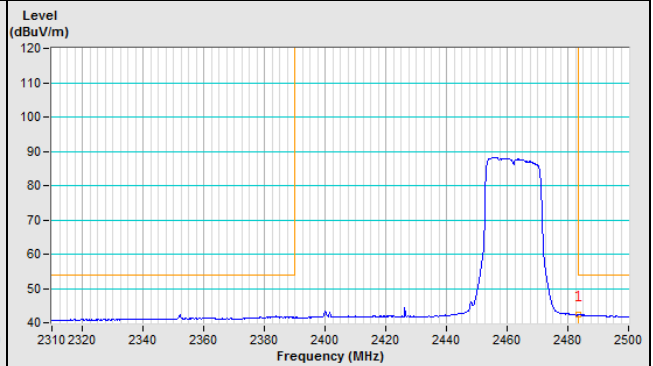
CH 11

Horizontal

Peak

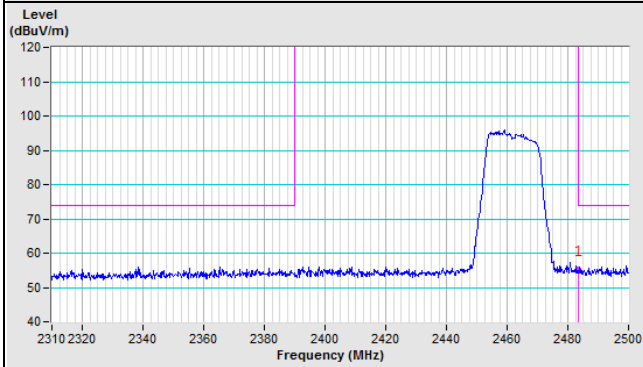


Average

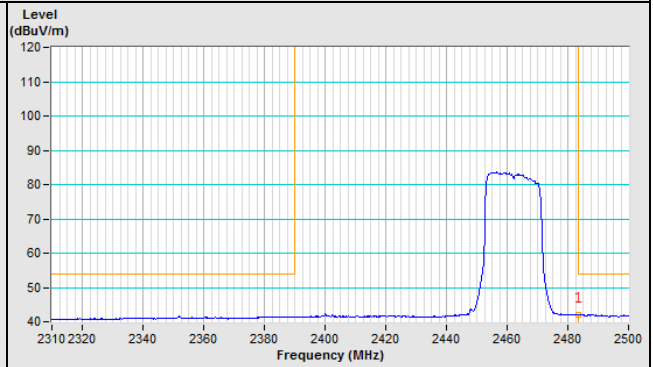


Vertical

Peak



Average

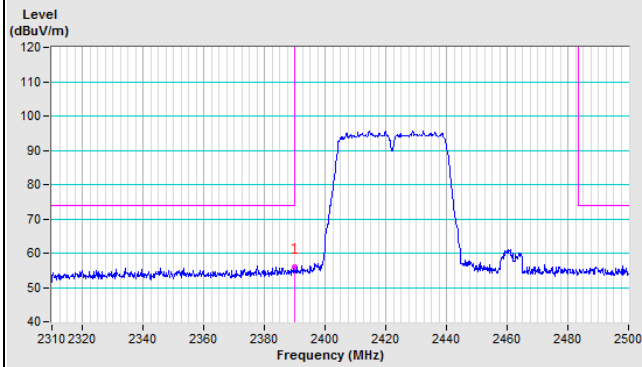


802.11n (40MHz)

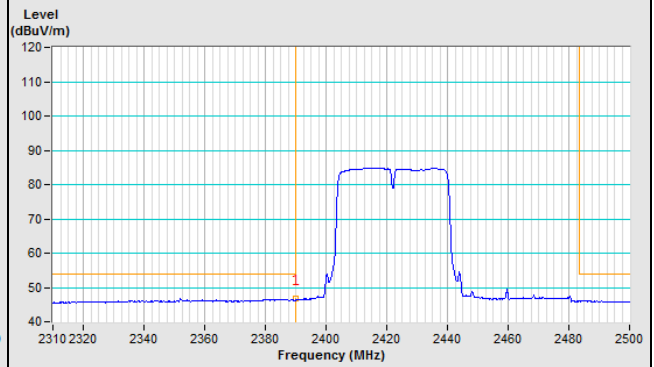
CH 3

Horizontal

Peak

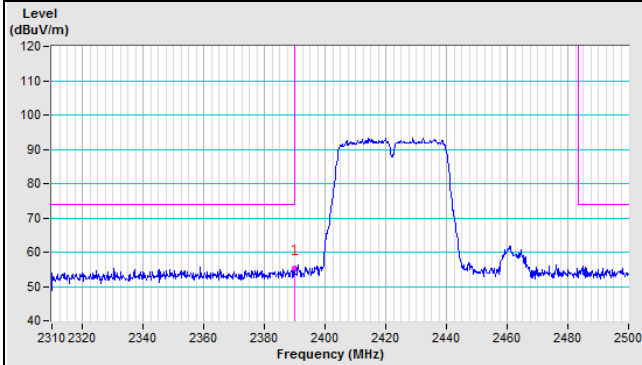


Average

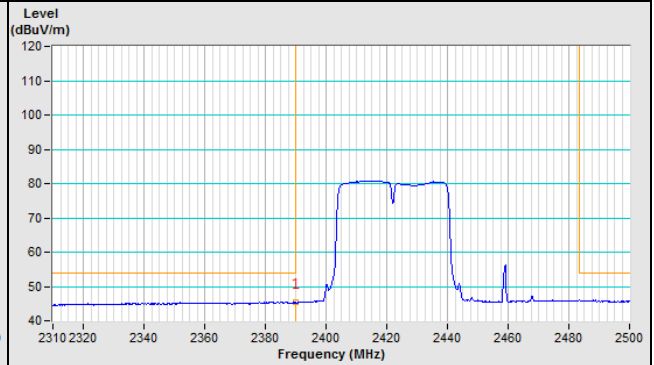


Vertical

Peak



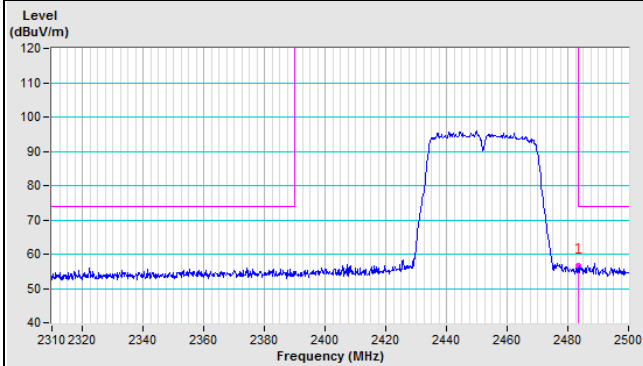
Average



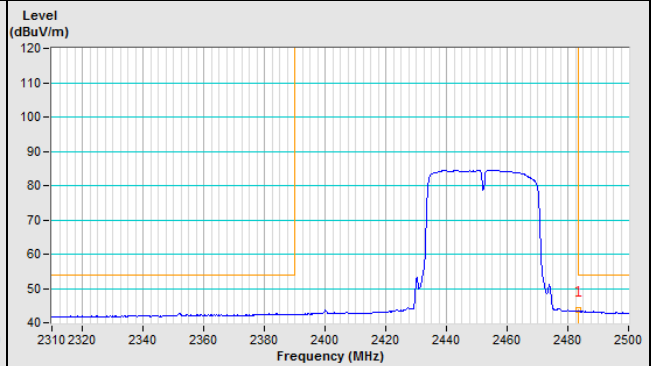
CH 9

Horizontal

Peak

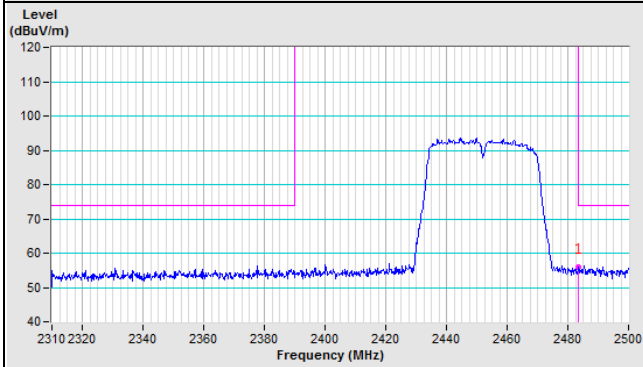


Average

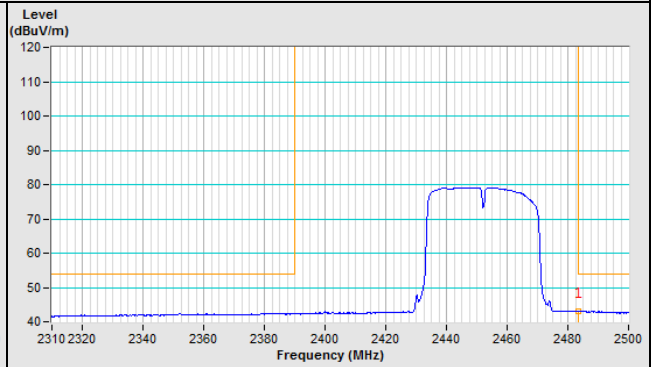


Vertical

Peak



Average



5 Pictures of Test Arrangements

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

Appendix – Information of the Testing Laboratories

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

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

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

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