

## FCC Test Report

**Report No.:** RF180719E06

**FCC ID:** 2APLE18300390

**Test Model:** VMC3030

**Received Date:** July 19, 2018

**Test Date:** Aug. 08 to 10, 2018

**Issued Date:** Sep. 06, 2018

**Applicant:** Arlo Technologies, Inc.

**Address:** 2200 Faraday Ave. Suite 150, Carlsbad, CA 92008, Unites States

**Issued By:** Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch  
Hsin Chu Laboratory

**Lab Address:** E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,  
Taiwan R.O.C.

**Test Location:** E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,  
Taiwan R.O.C.

**FCC Registration /  
Designation Number:** 723255 / TW2022



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### Release Control Record

Issue No.	Description	Date Issued
RF180719E06	Original release.	Sep. 06, 2018

## 1 Certificate of Conformity

**Product:** Arlo Camera

**Brand:** Arlo

**Test Model:** VMC3030

**Sample Status:** ENGINEERING SAMPLE

**Applicant:** Arlo Technologies, Inc.

**Test Date:** Aug. 08 to 10, 2018

**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 EMC characteristics under the conditions specified in this report.

Prepared by : Phoenix Huang , Date: Sep. 06, 2018  
Phoenix Huang / Specialist

Approved by : May Chen , Date: Sep. 06, 2018  
May Chen / 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	NA	Without AC power port of the EUT.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -0.1dB 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	No antenna connector is used.

### 2.1 Measurement Uncertainty

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

Measurement	Frequency	Expanded Uncertainty (k=2) ( $\pm$ )
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.33 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	5.10 dB
	6GHz ~ 18GHz	4.85 dB
	18GHz ~ 40GHz	5.24 dB

### 2.2 Modification Record

There were no modifications required for compliance.

### 3 General Information

#### 3.1 General Description of EUT

Product	Arlo Camera
Brand	Arlo
Test Model	VMC3030
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	6Vdc from batteries
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 72.2Mbps
Operating Frequency	2.412 ~ 2.462GHz
Number of Channel	802.11b, 802.11g, 802.11n (HT20): 11
Output Power	257.632mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	NA
Data Cable Supplied	NA

Note:

1. The antennas provided to the EUT, please refer to the following table:

Ant. No.	Brand	Model	Ant. Net Gain (dBi)	Freq. range (GHz)	Ant. Type	Connector Type
1	Magic wireless TECH.	NGC02	1.35	2.4~2.4835	Metal	NA
2	Magic wireless TECH.	NGC02	0.99	2.4~2.4835	Metal	NA

Note: The max gain was selected for the final test.

2. The EUT incorporates a SISO function.

Modulation Mode	Data Rate (MCS)	TX & RX Configuration	
802.11b	1 ~ 11Mbps	1TX (diversity)	1RX (diversity)
802.11g	6 ~ 54Mbps	1TX (diversity)	1RX (diversity)
802.11n (HT20)	MCS 0~7	1TX (diversity)	1RX (diversity)

3. 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 (HT20):

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



### 3.2.1 Test Mode Applicability and Tested Channel Detail

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

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

**PLC**: Power Line Conducted Emission **APCM**: Antenna Port Conducted Measurement

**Note:** 1. No need to concern of Conducted Emission due to the EUT is powered by battery.

2. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Z-plane** (below 1GHz) and **X-plane** (above 1GHz).

#### **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.

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 (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.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11g	1 to 11	1	OFDM	BPSK	6

#### **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.

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 (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5

**Test Condition:**

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE $\geq$ 1G	22deg. C, 64%RH	6Vdc from batteries	Frank Chuang
RE<1G	21deg. C, 65%RH	6Vdc from batteries	Frank Chuang
APCM	25deg. C, 60%RH	6Vdc from batteries	Jyunchun Lin

### 3.3 Duty Cycle of Test Signal

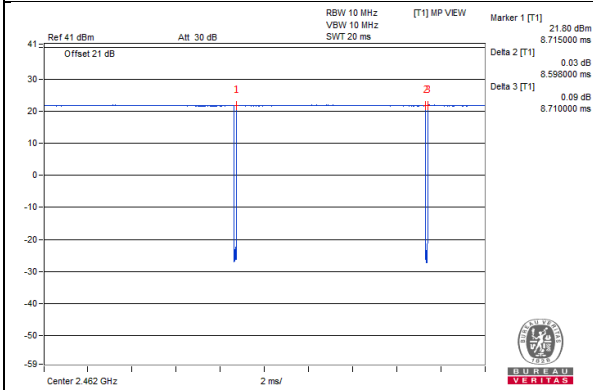
If duty cycle of test signal is  $\geq 98\%$ , duty factor is not required.  
 If duty cycle of test signal is  $< 98\%$ , duty factor shall be considered.

**802.11b:** Duty cycle =  $8.598 \text{ ms} / 8.71 \text{ ms} = 0.987$

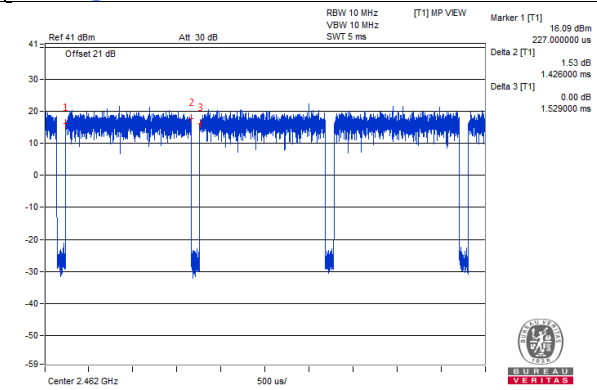
**802.11g:** Duty cycle =  $1.426 \text{ ms} / 1.529 \text{ ms} = 0.933$ , Duty factor =  $10 * \log(1/\text{Duty cycle}) = 0.3$

**802.11n (HT20):** Duty cycle =  $1.335 \text{ ms} / 1.438 \text{ ms} = 0.928$ , Duty factor =  $10 * \log(1/\text{Duty cycle}) = 0.32$

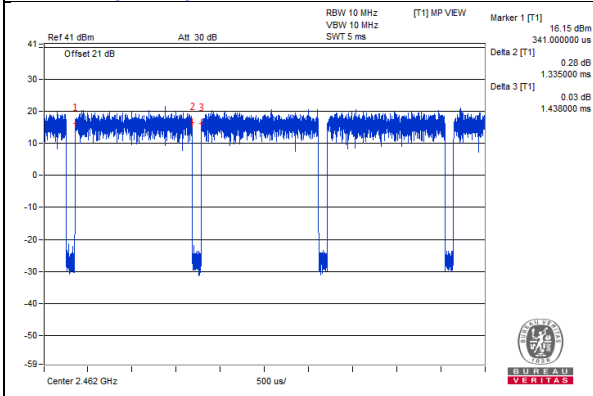
**802.11b**



**802.11g**



**802.11n (HT20)**



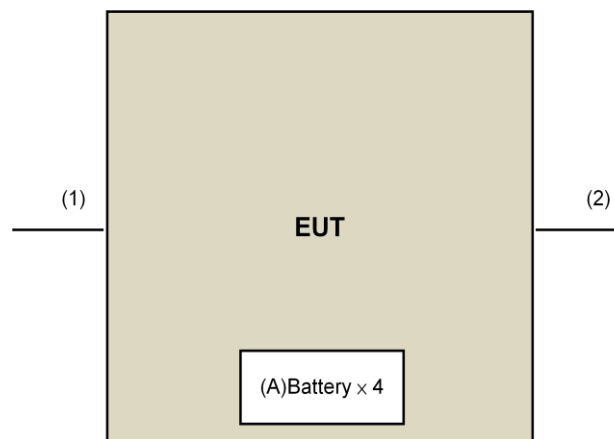
### 3.4 Description of Support Units

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.	Battery	Panasonic	CR123A	NA	NA	Supplied by client

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	USB Cable	1	0.5	Yes	0	Supplied by client(for RF Setup)
2.	Console Cable	1	0.1	No	0	Supplied by client(for RF Setup)

#### 3.4.1 Configuration of System under Test



### 3.5 General Description of Applied Standards

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

**FCC Part 15, Subpart C (15.247)**

**KDB 558074 D01 15.247 Meas Guidance v05**

**ANSI C63.10-2013**

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

## 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
Test Receiver Keysight	N9038A	MY54450088	July 05, 2018	July 04, 2019
Pre-Amplifier EMC1	EMC001340	980142	Feb. 09, 2018	Feb. 08, 2019
Loop Antenna <sup>(1)</sup> Electro-Metrics	EM-6879	264	Dec. 16, 2016	Dec. 15, 2018
RF Cable	NA	LOOPCAB-001	Jan. 15, 2018	Jan. 14, 2019
RF Cable	NA	LOOPCAB-002	Jan. 15, 2018	Jan. 14, 2019
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-01	Nov. 09, 2017	Nov. 08, 2018
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-406	Nov. 29, 2017	Nov. 28, 2018
RF Cable	8D	966-4-1	Mar. 21, 2018	Mar. 20, 2019
RF Cable	8D	966-4-2	Mar. 21, 2018	Mar. 20, 2019
RF Cable	8D	966-4-3	Mar. 21, 2018	Mar. 20, 2019
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-4-01	Oct. 03, 2017	Oct. 02, 2018
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Dec. 12, 2017	Dec. 11, 2018
Pre-Amplifier Mini-Circuits	ZVA-183-S+	AMP-ZVA-03	May 10, 2018	May 09, 2019
RF Cable	EMC104-SM-SM-1200	160923	Jan. 29, 2018	Jan. 28, 2019
RF Cable	EMC104-SM-SM-2000	150318	Jan. 29, 2018	Jan. 28, 2019
RF Cable	EMC104-SM-SM-5000	150321	Jan. 29, 2018	Jan. 28, 2019
Pre-Amplifier EMC1	EMC184045SE	980387	Jan. 29, 2018	Jan. 28, 2019
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Dec. 14, 2017	Dec. 13, 2018
RF Cable	EMC102-KM-KM-1200	160925	Jan. 29, 2018	Jan. 28, 2019
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Boresight Antenna Tower & Turn Table Max-Full	MF-7802BS	MF780208530	NA	NA
Spectrum Analyzer R&S	FSV40	100964	June 20, 2018	June 19, 2019
Power meter Anritsu	ML2495A	1014008	May 09, 2018	May 08, 2019
Power sensor Anritsu	MA2411B	0917122	May 09, 2018	May 08, 2019

**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 calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. The test was performed in 966 Chamber No. 4.
4. The CANADA Site Registration No. is 20331-2
5. Loop antenna was used for all emissions below 30 MHz.
6. Tested Date: Aug. 08 to 10, 2018

#### 4.1.3 Test Procedures

##### **For Radiated emission below 30MHz**

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

##### **Note:**

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

##### **For Radiated emission above 30MHz**

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

##### **Note:**

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

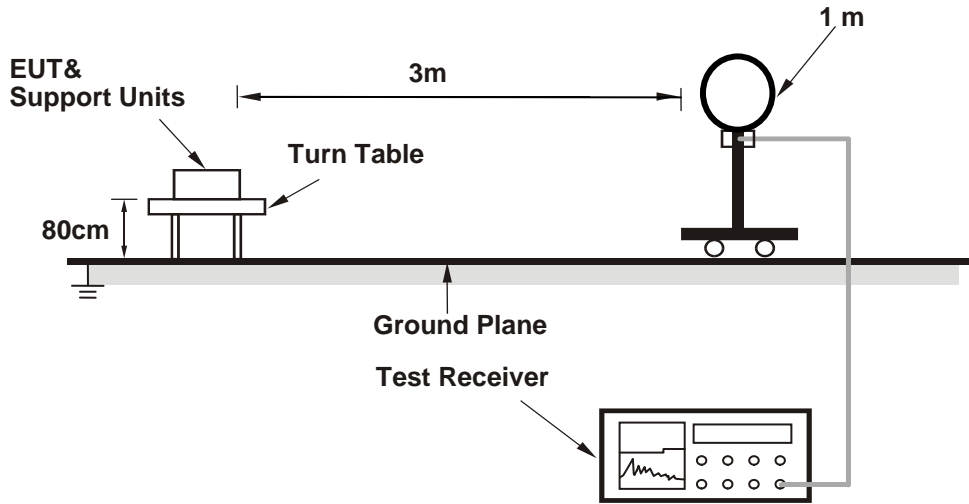
#### 4.1.4 Deviation from Test Standard

No deviation.

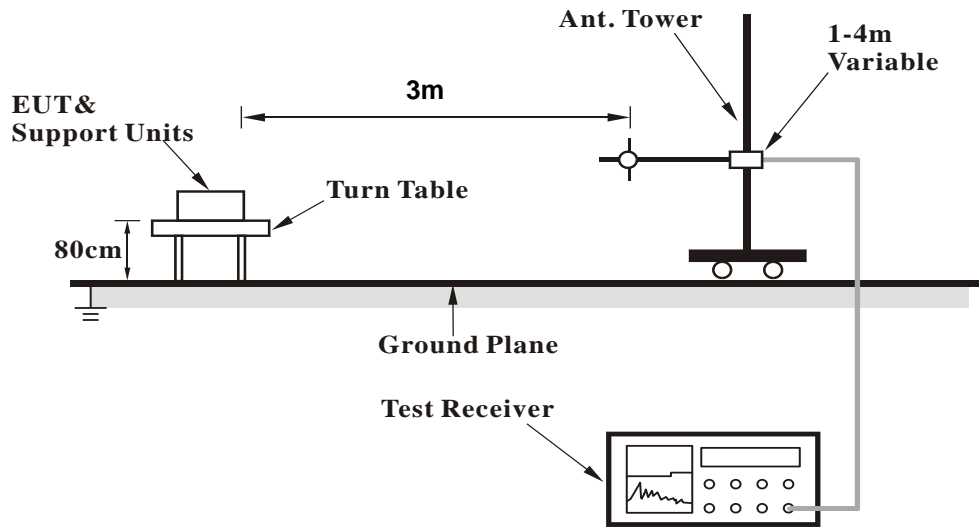


4.1.5 Test Setup

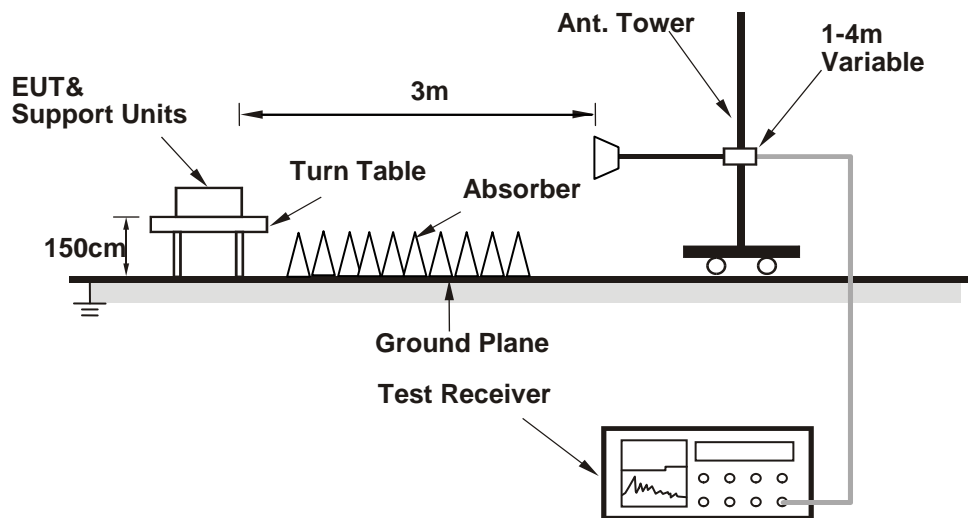
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



### For Radiated emission above 1GHz



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

#### 4.1.6 EUT Operating Conditions

- Placed the EUT on the testing table.
- Controlling software (VM\_Ubuntu) has been activated to set the EUT on specific status.

## 4.1.7 Test Results

## Above 1GHz Data:

## 802.11b

<b>CHANNEL</b>	TX Channel 1	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	61.3 PK	74.0	-12.7	1.56 H	123	63.5	-2.2
2	2390.00	49.7 AV	54.0	-4.3	1.56 H	123	51.9	-2.2
3	*2412.00	110.6 PK			1.56 H	123	113.0	-2.4
4	*2412.00	108.4 AV			1.56 H	123	110.8	-2.4
5	4824.00	48.9 PK	74.0	-25.1	2.33 H	323	47.1	1.8
6	4824.00	38.7 AV	54.0	-15.3	2.33 H	323	36.9	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	60.3 PK	74.0	-13.7	1.03 V	297	62.5	-2.2
2	2390.00	47.8 AV	54.0	-6.2	1.03 V	297	50.0	-2.2
3	*2412.00	105.5 PK			1.03 V	297	107.9	-2.4
4	*2412.00	103.4 AV			1.03 V	297	105.8	-2.4
5	4824.00	46.4 PK	74.0	-27.6	2.44 V	107	44.6	1.8
6	4824.00	35.6 AV	54.0	-18.4	2.44 V	107	33.8	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.

<b>CHANNEL</b>	TX Channel 6	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	55.1 PK	74.0	-18.9	1.63 H	124	57.3	-2.2
2	2390.00	43.6 AV	54.0	-10.4	1.63 H	124	45.8	-2.2
3	*2437.00	110.8 PK			1.63 H	124	113.4	-2.6
4	*2437.00	108.8 AV			1.63 H	124	111.4	-2.6
5	2483.50	54.3 PK	74.0	-19.7	1.63 H	124	56.7	-2.4
6	2483.50	42.5 AV	54.0	-11.5	1.63 H	124	44.9	-2.4
7	4874.00	48.8 PK	74.0	-25.2	1.56 H	335	46.8	2.0
8	4874.00	37.1 AV	54.0	-16.9	1.56 H	335	35.1	2.0
9	7311.00	55.3 PK	74.0	-18.7	2.06 H	43	46.9	8.4
10	7311.00	42.1 AV	54.0	-11.9	2.06 H	43	33.7	8.4

**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	54.9 PK	74.0	-19.1	1.00 V	283	57.1	-2.2
2	2390.00	42.6 AV	54.0	-11.4	1.00 V	283	44.8	-2.2
3	*2437.00	105.9 PK			1.00 V	283	108.5	-2.6
4	*2437.00	104.1 AV			1.00 V	283	106.7	-2.6
5	2483.50	54.2 PK	74.0	-19.8	1.00 V	283	56.6	-2.4
6	2483.50	42.1 AV	54.0	-11.9	1.00 V	283	44.5	-2.4
7	4874.00	47.5 PK	74.0	-26.5	2.49 V	113	45.5	2.0
8	4874.00	35.6 AV	54.0	-18.4	2.49 V	113	33.6	2.0
9	7311.00	53.1 PK	74.0	-20.9	3.13 V	258	44.7	8.4
10	7311.00	41.3 AV	54.0	-12.7	3.13 V	258	32.9	8.4

**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.

<b>CHANNEL</b>	TX Channel 11	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	111.7 PK			1.01 H	297	114.3	-2.6
2	*2462.00	109.3 AV			1.01 H	297	111.9	-2.6
3	2483.50	61.5 PK	74.0	-12.5	1.01 H	297	63.9	-2.4
4	2483.50	49.8 AV	54.0	-4.2	1.01 H	297	52.2	-2.4
5	4924.00	48.8 PK	74.0	-25.2	1.56 H	336	46.8	2.0
6	4924.00	36.8 AV	54.0	-17.2	1.56 H	336	34.8	2.0
7	7386.00	55.4 PK	74.0	-18.6	2.03 H	45	46.8	8.6
8	7386.00	42.2 AV	54.0	-11.8	2.03 H	45	33.6	8.6

**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	106.5 PK			1.02 V	309	109.1	-2.6
2	*2462.00	104.2 AV			1.02 V	309	106.8	-2.6
3	2483.50	60.1 PK	74.0	-13.9	1.02 V	309	62.5	-2.4
4	2483.50	47.7 AV	54.0	-6.3	1.02 V	309	50.1	-2.4
5	4924.00	47.8 PK	74.0	-26.2	2.46 V	104	45.8	2.0
6	4924.00	35.7 AV	54.0	-18.3	2.46 V	104	33.7	2.0
7	7386.00	52.6 PK	74.0	-21.4	3.18 V	254	44.0	8.6
8	7386.00	40.8 AV	54.0	-13.2	3.18 V	254	32.2	8.6

**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

<b>CHANNEL</b>	TX Channel 1	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	73.1 PK	74.0	-0.9	1.69 H	131	75.3	-2.2
2	2390.00	53.5 AV	54.0	-0.5	1.69 H	131	55.7	-2.2
3	*2412.00	108.4 PK			1.69 H	131	110.8	-2.4
4	*2412.00	96.8 AV			1.69 H	131	99.2	-2.4
5	4824.00	45.1 PK	74.0	-28.9	1.00 H	95	43.3	1.8
6	4824.00	34.2 AV	54.0	-19.8	1.00 H	95	32.4	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	68.6 PK	74.0	-5.4	1.06 V	301	70.8	-2.2
2	2390.00	48.3 AV	54.0	-5.7	1.06 V	301	50.5	-2.2
3	*2412.00	103.8 PK			1.06 V	301	106.2	-2.4
4	*2412.00	92.2 AV			1.06 V	301	94.6	-2.4
5	4824.00	44.1 PK	74.0	-29.9	2.36 V	99	42.3	1.8
6	4824.00	33.4 AV	54.0	-20.6	2.36 V	99	31.6	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.

<b>CHANNEL</b>	TX Channel 6	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	59.6 PK	74.0	-14.4	1.62 H	131	61.8	-2.2
2	2390.00	47.3 AV	54.0	-6.7	1.62 H	131	49.5	-2.2
3	*2437.00	108.1 PK			1.62 H	131	110.7	-2.6
4	*2437.00	96.2 AV			1.62 H	131	98.8	-2.6
5	2483.50	58.4 PK	74.0	-15.6	1.62 H	131	60.8	-2.4
6	2483.50	46.8 AV	54.0	-7.2	1.62 H	131	49.2	-2.4
7	4874.00	44.7 PK	74.0	-29.3	1.01 H	99	42.7	2.0
8	4874.00	33.7 AV	54.0	-20.3	1.01 H	99	31.7	2.0
9	7311.00	49.7 PK	74.0	-24.3	1.68 H	130	41.3	8.4
10	7311.00	37.2 AV	54.0	-16.8	1.68 H	130	28.8	8.4

**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	54.6 PK	74.0	-19.4	1.03 V	301	56.8	-2.2
2	2390.00	42.2 AV	54.0	-11.8	1.03 V	301	44.4	-2.2
3	*2437.00	104.2 PK			1.03 V	301	106.8	-2.6
4	*2437.00	92.7 AV			1.03 V	301	95.3	-2.6
5	2483.50	54.2 PK	74.0	-19.8	1.03 V	301	56.6	-2.4
6	2483.50	41.9 AV	54.0	-12.1	1.03 V	301	44.3	-2.4
7	4874.00	45.1 PK	74.0	-28.9	2.45 V	94	43.1	2.0
8	4874.00	34.2 AV	54.0	-19.8	2.45 V	94	32.2	2.0
9	7311.00	49.0 PK	74.0	-25.0	3.12 V	253	40.6	8.4
10	7311.00	36.5 AV	54.0	-17.5	3.12 V	253	28.1	8.4

**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.

<b>CHANNEL</b>	TX Channel 11	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	108.2 PK			1.66 H	130	110.8	-2.6
2	*2462.00	96.4 AV			1.66 H	130	99.0	-2.6
3	2483.50	73.3 PK	74.0	-0.7	1.66 H	130	75.7	-2.4
4	2483.50	52.6 AV	54.0	-1.4	1.66 H	130	55.0	-2.4
5	4924.00	44.5 PK	74.0	-29.5	1.03 H	112	42.5	2.0
6	4924.00	33.4 AV	54.0	-20.6	1.03 H	112	31.4	2.0
7	7386.00	49.0 PK	74.0	-25.0	1.67 H	130	40.4	8.6
8	7386.00	36.8 AV	54.0	-17.2	1.67 H	130	28.2	8.6

**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			1.06 V	311	106.1	-2.6
2	*2462.00	91.8 AV			1.06 V	311	94.4	-2.6
3	2483.50	68.4 PK	74.0	-5.6	1.06 V	311	70.8	-2.4
4	2483.50	48.3 AV	54.0	-5.7	1.06 V	311	50.7	-2.4
5	4924.00	44.1 PK	74.0	-29.9	2.43 V	108	42.1	2.0
6	4924.00	33.6 AV	54.0	-20.4	2.43 V	108	31.6	2.0
7	7386.00	49.6 PK	74.0	-24.4	3.19 V	244	41.0	8.6
8	7386.00	36.9 AV	54.0	-17.1	3.19 V	244	28.3	8.6

**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)

<b>CHANNEL</b>	TX Channel 1	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	73.2 PK	74.0	-0.8	1.69 H	138	75.4	-2.2
2	2390.00	53.4 AV	54.0	-0.6	1.69 H	138	55.6	-2.2
3	*2412.00	107.5 PK			1.69 H	138	109.9	-2.4
4	*2412.00	96.3 AV			1.69 H	138	98.7	-2.4
5	4824.00	44.6 PK	74.0	-29.4	1.00 H	108	42.8	1.8
6	4824.00	33.9 AV	54.0	-20.1	1.00 H	108	32.1	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	68.6 PK	74.0	-5.4	1.03 V	297	70.8	-2.2
2	2390.00	48.5 AV	54.0	-5.5	1.03 V	297	50.7	-2.2
3	*2412.00	103.8 PK			1.03 V	297	106.2	-2.4
4	*2412.00	92.0 AV			1.03 V	297	94.4	-2.4
5	4824.00	44.1 PK	74.0	-29.9	2.42 V	109	42.3	1.8
6	4824.00	33.4 AV	54.0	-20.6	2.42 V	109	31.6	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.

<b>CHANNEL</b>	TX Channel 6	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	60.0 PK	74.0	-14.0	1.70 H	124	62.2	-2.2
2	2390.00	47.6 AV	54.0	-6.4	1.70 H	124	49.8	-2.2
3	*2437.00	107.3 PK			1.70 H	124	109.9	-2.6
4	*2437.00	96.0 AV			1.70 H	124	98.6	-2.6
5	2483.50	57.8 PK	74.0	-16.2	1.70 H	124	60.2	-2.4
6	2483.50	46.3 AV	54.0	-7.7	1.70 H	124	48.7	-2.4
7	4874.00	44.6 PK	74.0	-29.4	1.05 H	88	42.6	2.0
8	4874.00	33.9 AV	54.0	-20.1	1.05 H	88	31.9	2.0
9	7311.00	49.4 PK	74.0	-24.6	1.65 H	144	41.0	8.4
10	7311.00	37.1 AV	54.0	-16.9	1.65 H	144	28.7	8.4

**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	54.7 PK	74.0	-19.3	1.07 V	316	56.9	-2.2
2	2390.00	42.6 AV	54.0	-11.4	1.07 V	316	44.8	-2.2
3	*2437.00	103.8 PK			1.07 V	316	106.4	-2.6
4	*2437.00	92.0 AV			1.07 V	316	94.6	-2.6
5	2483.50	54.1 PK	74.0	-19.9	1.07 V	316	56.5	-2.4
6	2483.50	42.3 AV	54.0	-11.7	1.07 V	316	44.7	-2.4
7	4874.00	44.4 PK	74.0	-29.6	2.45 V	104	42.4	2.0
8	4874.00	33.6 AV	54.0	-20.4	2.45 V	104	31.6	2.0
9	7311.00	49.5 PK	74.0	-24.5	3.12 V	248	41.1	8.4
10	7311.00	37.0 AV	54.0	-17.0	3.12 V	248	28.6	8.4

**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.

<b>CHANNEL</b>	TX Channel 11	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	108.1 PK			1.60 H	117	110.7	-2.6
2	*2462.00	96.8 AV			1.60 H	117	99.4	-2.6
3	2483.50	73.6 PK	74.0	-0.4	1.60 H	117	76.0	-2.4
4	<b>2483.50</b>	<b>53.9 AV</b>	<b>54.0</b>	<b>-0.1</b>	<b>1.60 H</b>	<b>117</b>	<b>56.3</b>	<b>-2.4</b>
5	4924.00	44.6 PK	74.0	-29.4	1.03 H	87	42.6	2.0
6	4924.00	34.1 AV	54.0	-19.9	1.03 H	87	32.1	2.0
7	7386.00	49.7 PK	74.0	-24.3	1.68 H	126	41.1	8.6
8	7386.00	37.2 AV	54.0	-16.8	1.68 H	126	28.6	8.6

**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	103.8 PK			1.00 V	314	106.4	-2.6
2	*2462.00	92.3 AV			1.00 V	314	94.9	-2.6
3	2483.50	69.2 PK	74.0	-4.8	1.00 V	314	71.6	-2.4
4	2483.50	48.7 AV	54.0	-5.3	1.00 V	314	51.1	-2.4
5	4924.00	44.6 PK	74.0	-29.4	2.47 V	113	42.6	2.0
6	4924.00	33.7 AV	54.0	-20.3	2.47 V	113	31.7	2.0
7	7386.00	49.2 PK	74.0	-24.8	3.10 V	243	40.6	8.6
8	7386.00	36.7 AV	54.0	-17.3	3.10 V	243	28.1	8.6

**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 Data:

802.11g

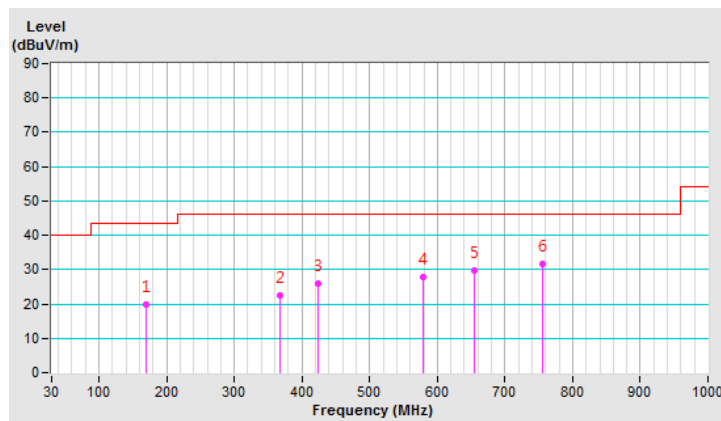
<b>CHANNEL</b>	TX Channel 1	<b>DETECTOR FUNCTION</b>	Quasi-Peak (QP)
<b>FREQUENCY RANGE</b>	9kHz ~ 1GHz		

**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	169.24	19.8 QP	43.5	-23.7	1.00 H	12	28.1	-8.3
2	367.10	22.5 QP	46.0	-23.5	2.00 H	297	27.7	-5.2
3	423.89	25.8 QP	46.0	-20.2	2.00 H	117	29.3	-3.5
4	578.80	27.9 QP	46.0	-18.1	2.00 H	171	28.0	-0.1
5	654.49	29.6 QP	46.0	-16.4	1.00 H	360	28.2	1.4
6	754.59	31.8 QP	46.0	-14.2	1.00 H	329	28.4	3.4

**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 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.



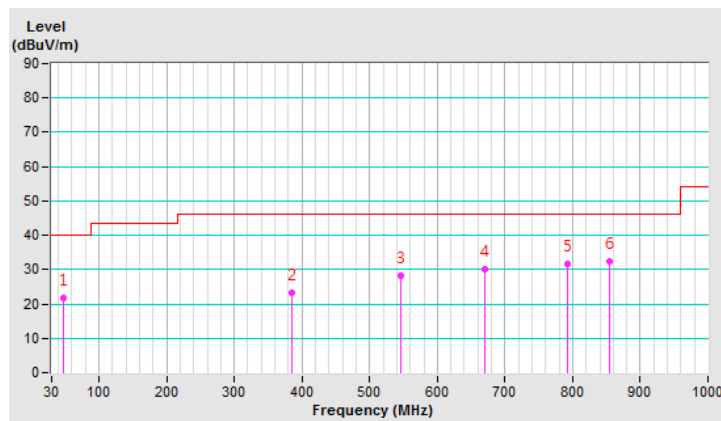
<b>CHANNEL</b>	TX Channel 1	<b>DETECTOR FUNCTION</b>	Quasi-Peak (QP)
<b>FREQUENCY RANGE</b>	9kHz ~ 1GHz		

**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	47.00	21.7 QP	40.0	-18.3	1.00 V	52	29.6	-7.9
2	385.38	23.4 QP	46.0	-22.6	1.00 V	113	28.0	-4.6
3	546.43	28.2 QP	46.0	-17.8	1.50 V	332	29.1	-0.9
4	671.02	30.2 QP	46.0	-15.8	1.00 V	201	28.6	1.6
5	792.23	31.5 QP	46.0	-14.5	2.00 V	64	27.7	3.8
6	854.57	32.2 QP	46.0	-13.8	1.50 V	14	27.6	4.6

**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 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.

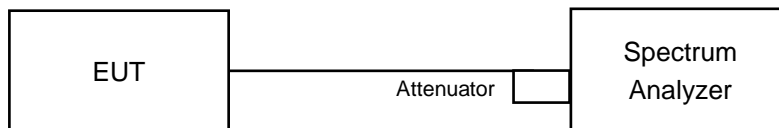


## 4.2 6dB Bandwidth Measurement

### 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

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

### 4.2.5 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	8.55	0.5	Pass
6	2437	8.07	0.5	Pass
11	2462	8.07	0.5	Pass

##### 802.11g

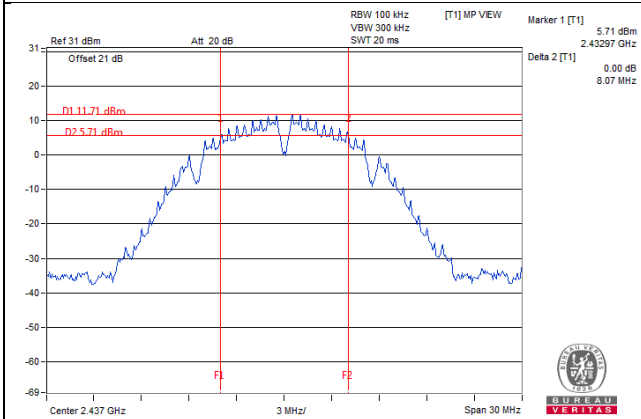
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	16.50	0.5	Pass
6	2437	16.48	0.5	Pass
11	2462	16.47	0.5	Pass

##### 802.11n (HT20)

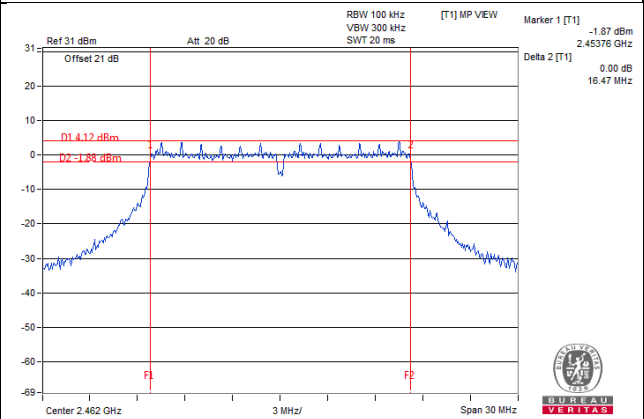
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	17.70	0.5	Pass
6	2437	17.70	0.5	Pass
11	2462	17.71	0.5	Pass

### Spectrum Plot of Worst Value

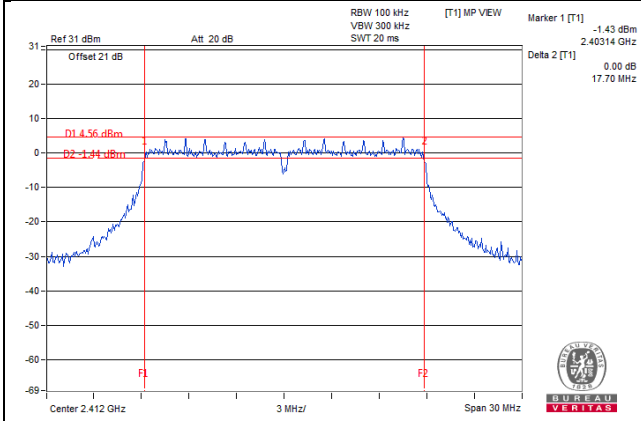
#### 802.11b / CH6



#### 802.11g / CH11



#### 802.11n (HT20) / CH1



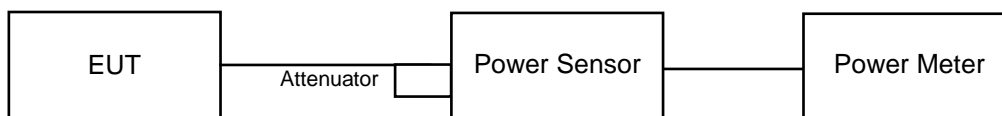


### 4.3 Conducted Output Power Measurement

#### 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 4.2.6.

#### 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	243.22	23.86	30	Pass
6	2437	244.343	23.88	30	Pass
11	2462	247.742	23.94	30	Pass

##### 802.11g

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
1	2412	257.632	24.11	30	Pass
6	2437	255.859	24.08	30	Pass
11	2462	256.448	24.09	30	Pass

##### 802.11n (HT20)

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
1	2412	254.683	24.06	30	Pass
6	2437	255.859	24.08	30	Pass
11	2462	255.27	24.07	30	Pass

## FOR AVERAGE POWER

### 802.11b

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	142.233	21.53
6	2437	143.219	21.56
11	2462	145.881	21.64

### 802.11g

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	50.35	17.02
6	2437	50.119	17.00
11	2462	50.816	17.06

### 802.11n (HT20)

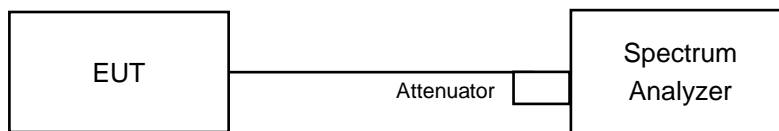
Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	49.204	16.92
6	2437	48.753	16.88
11	2462	46.881	16.71

## 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

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

### 4.4.5 Deviation from Test Standard

No deviation.

### 4.4.6 EUT Operating Condition

Same as Item 4.2.6

#### 4.4.7 Test Results

##### 802.11b

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
1	2412	-2.26	8	Pass
6	2437	-1.28	8	Pass
11	2462	-2.61	8	Pass

##### 802.11g

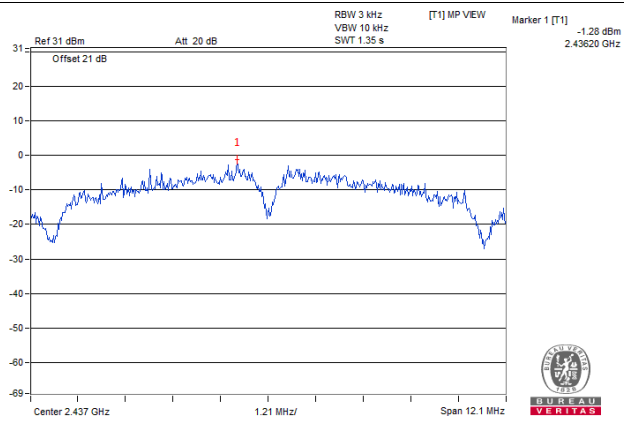
Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
1	2412	-9.67	8	Pass
6	2437	-11.14	8	Pass
11	2462	-11.27	8	Pass

##### 802.11n (HT20)

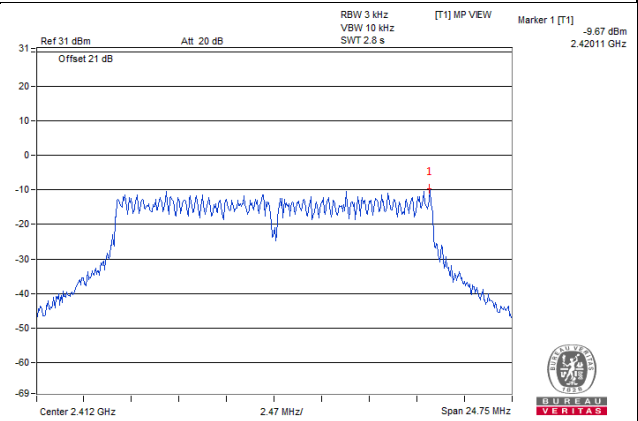
Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
1	2412	-11.05	8	Pass
6	2437	-10.61	8	Pass
11	2462	-11.02	8	Pass

### Spectrum Plot of Worst Value

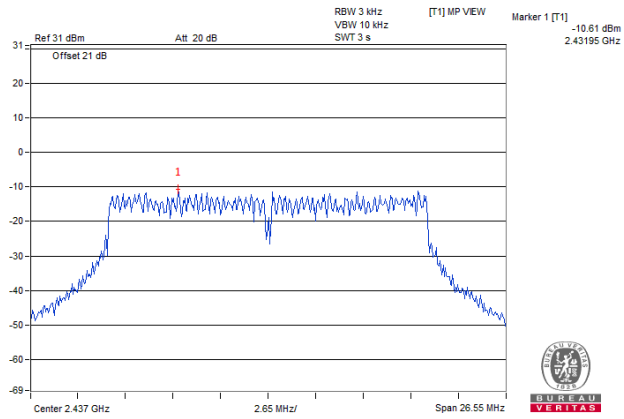
#### 802.11b / CH6



#### 802.11g / CH1



#### 802.11n (HT20) / CH6

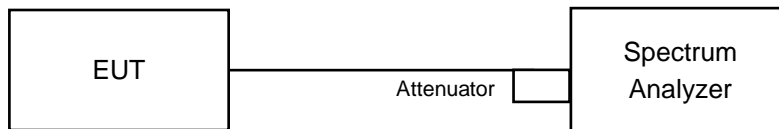


## 4.5 Conducted Out of Band Emission Measurement

### 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

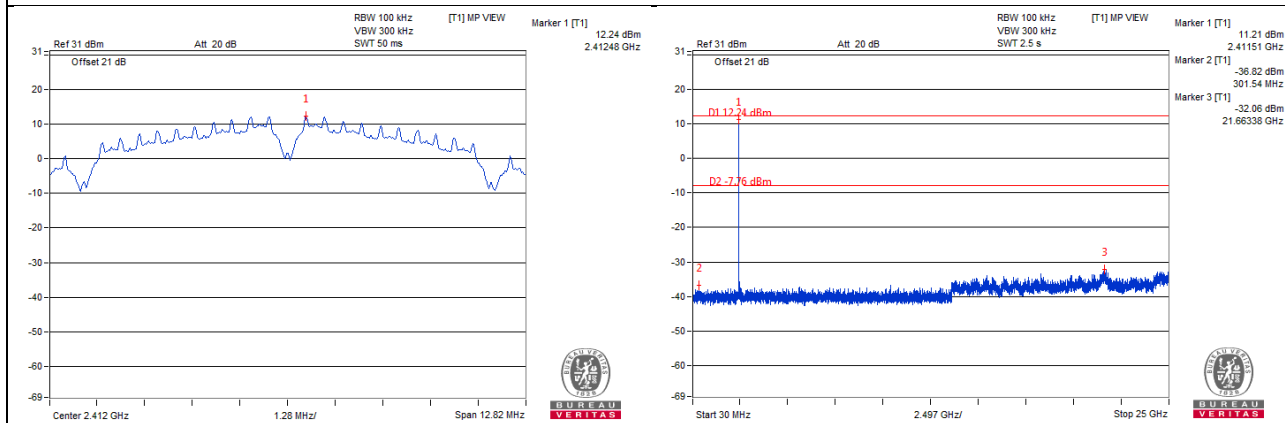
Same as Item 4.2.6

### 4.5.7 Test Results

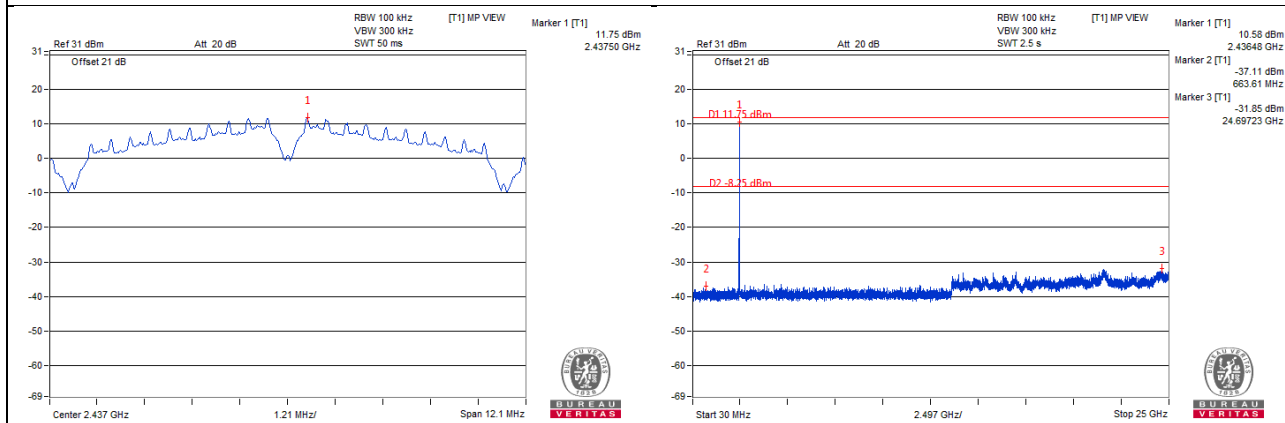
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.

# 802.11b

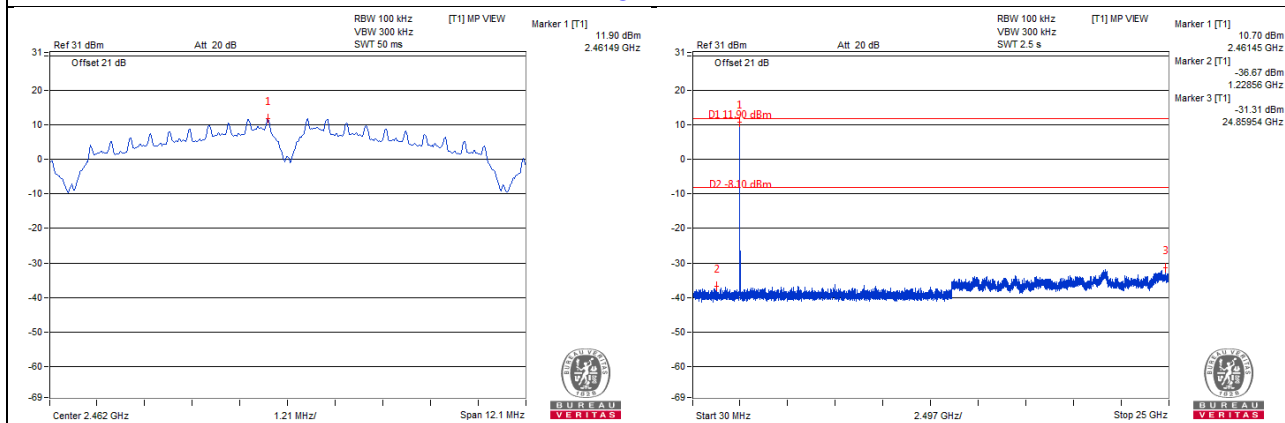
## CH 1



## CH 6

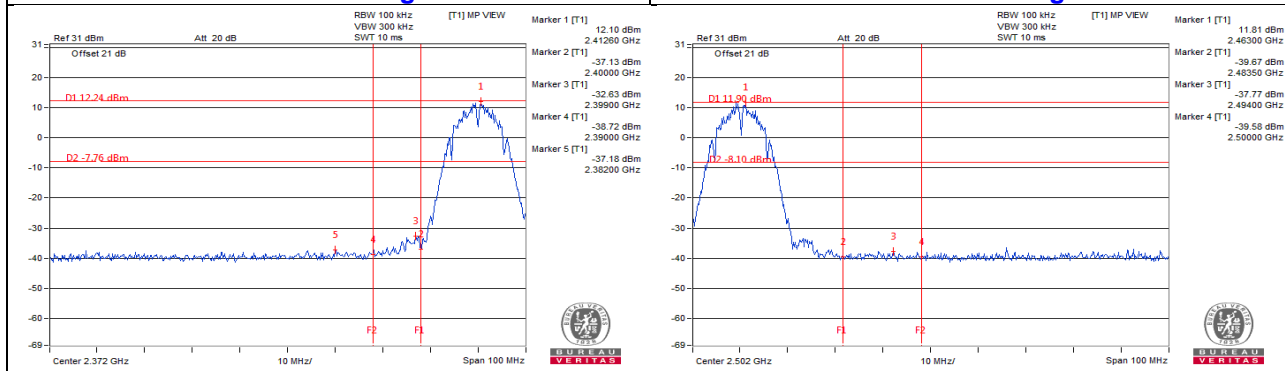


## CH 11



### CH 1 Band edge

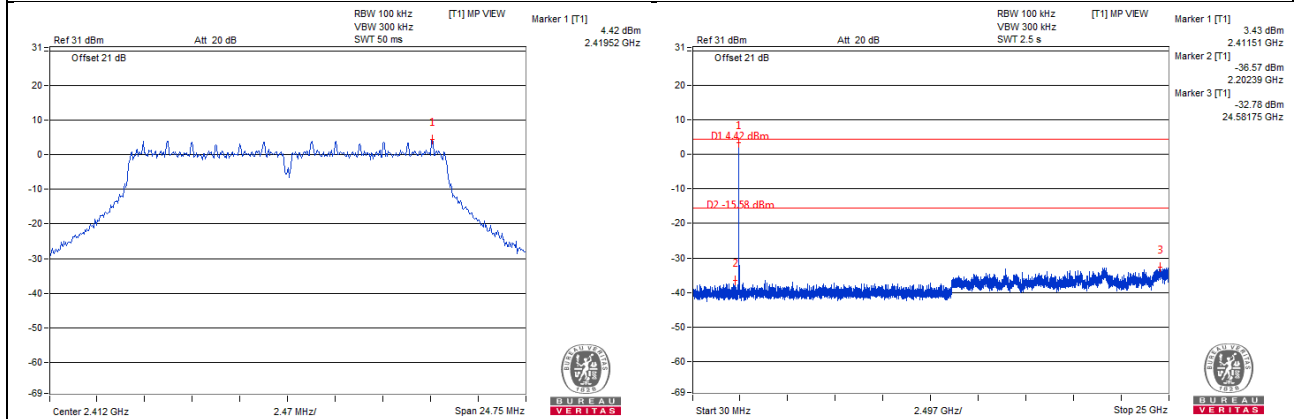
### CH 11 Band edge



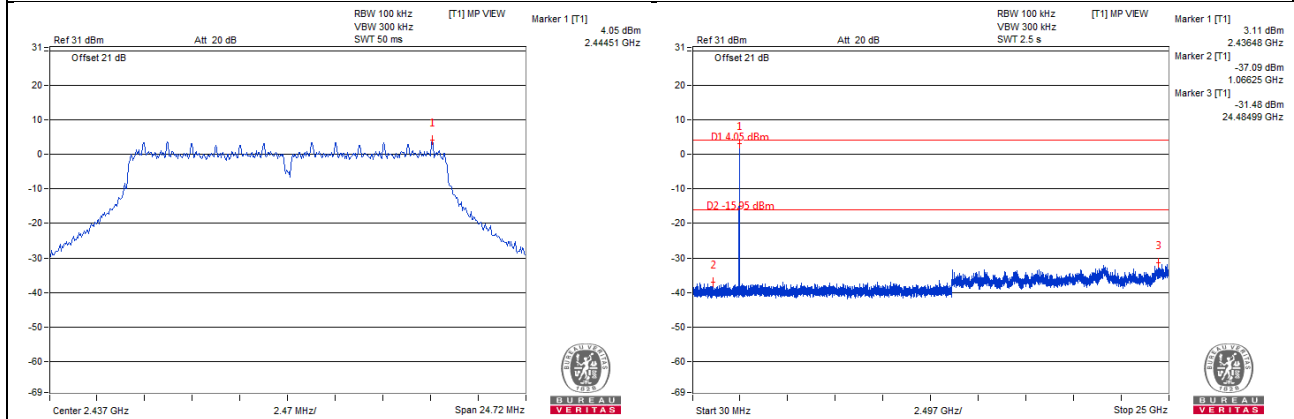


# 802.11g

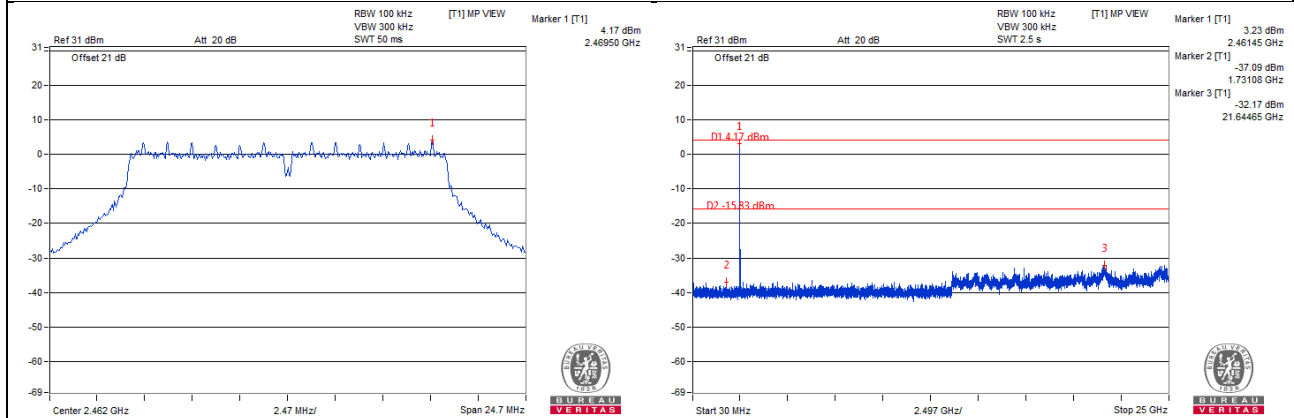
## CH 1



## CH 6

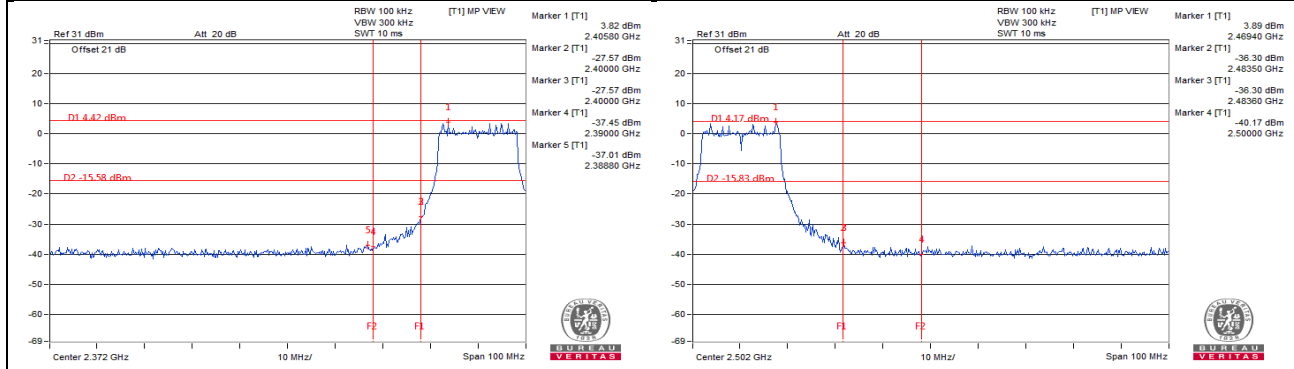


## CH 11



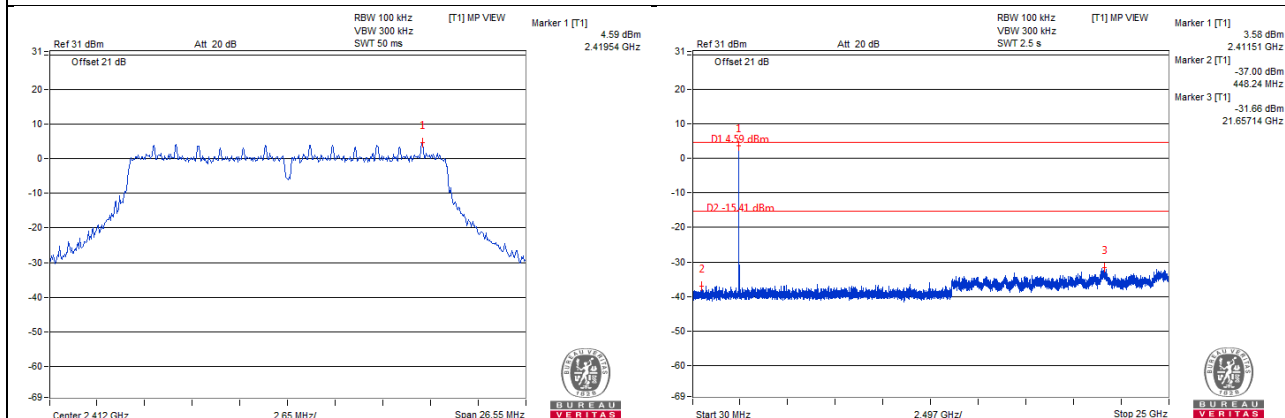
### CH 1 Band edge

### CH 11 Band edge

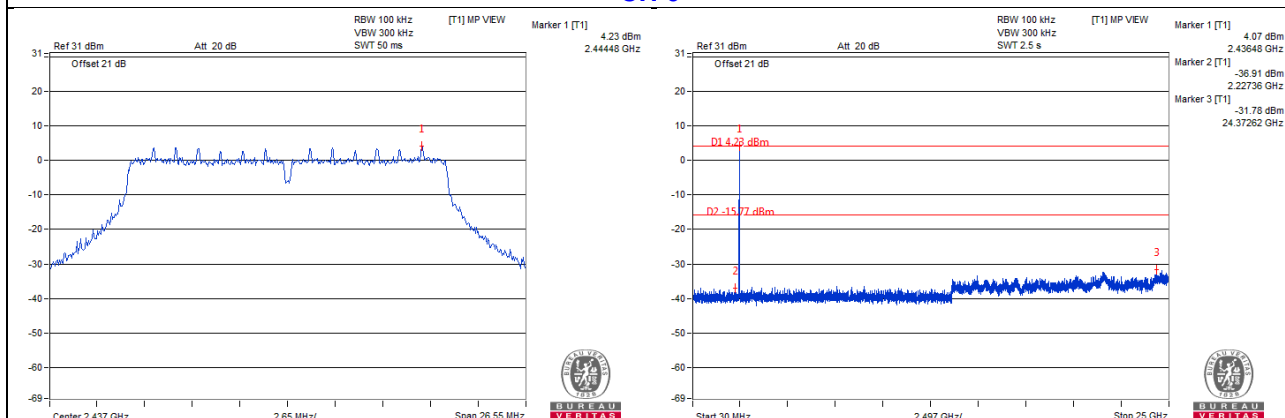


# 802.11n (HT20)

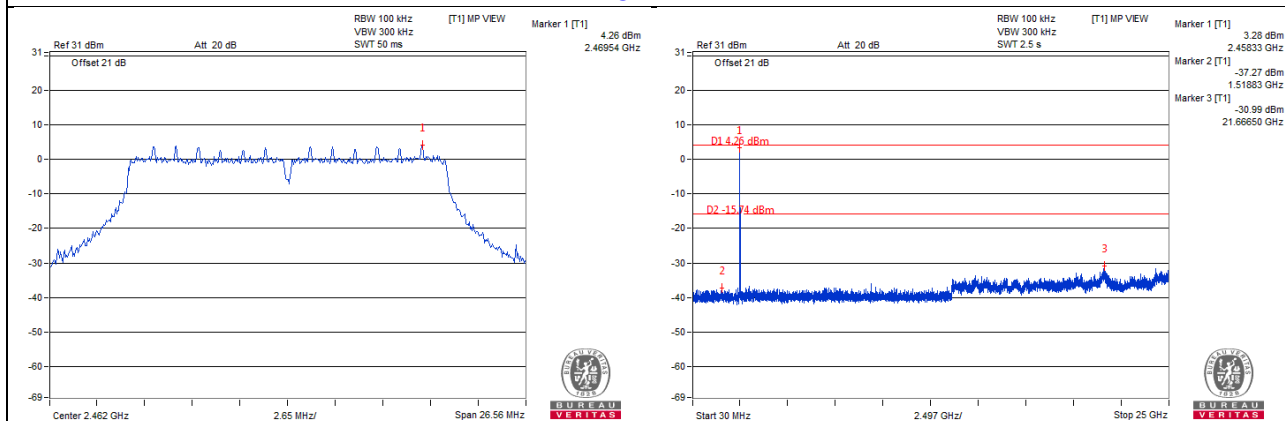
## CH 1



## CH 6

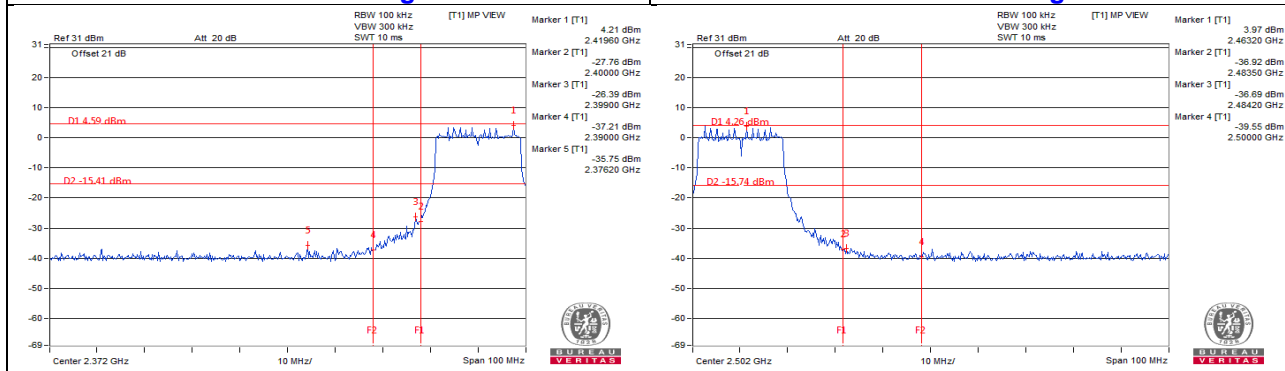


## CH 11



### CH 1 Band edge

### CH 11 Band edge



## 5 Pictures of Test Arrangements

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

## Appendix – Information on 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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