



BUREAU  
VERITAS

Test Report No.: RF161026W004-2



# FCC TEST REPORT

## (WIFI 2.4G)

**Product:** smartphone

**Model Name:** Ilium X260

**FCC ID:** ZC4X260

**Applicant:** Corporativo Lanix S.A. de C.V.

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**Manufacturer:** Water world

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**Report No.:** RF161026W004-2

**Received Date:** Oct. 26, 2016

**Test Date:** Oct. 27, 2016 ~ Nov. 03, 2016

**Issued Date:** Nov. 04, 2016

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Test Report No.: RF161026W004-2

## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF161026W004-2	Original release	Nov. 04, 2016



# 1 CERTIFICATION

**PRODUCT:** smartphone  
**BRAND NAME:** LANIX  
**MODEL NAME:** Ilium X260  
**APPLICANT:** Corporativo Lanix S.A. de C.V.  
**TESTED:** Oct. 27, 2016 ~ Nov. 03, 2016  
**TEST SAMPLE:** Identical Prototype  
**STANDARDS:** **FCC Part 15, Subpart C. Section 15.247**  
ANSI C63.10-2013

The above equipment has been tested by **Bureau Veritas Shenzhen Co., Ltd. Dongguan 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 :** Yuqiang Yin , **DATE:** Nov. 04, 2016  
( Yuqiang Yin / Engineer)

**APPROVED BY :** Bill Yao , **DATE:** Nov. 04, 2016  
( Bill Yao / Manager)



## 2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247)			
STANDARD SECTION	TEST TYPE AND LIMIT	RESULT	REMARK
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is 8.71dB at 0.496000MHz.
15.205 15.209	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -2.60dB at 2483.50MHz.
15.247(d)	Out of band Emission Measurement	PASS	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Conducted Output 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	UNCERTAINTY
Conducted emissions	9kHz~30MHz	2.66dB
Radiated emissions	9KHz ~ 30MHz	2.74dB
	30MHz ~ 1GMHz	3.55dB
	1GHz ~ 18GHz	4.84dB
	18GHz ~ 40GHz	1.94dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k = 2$ .



### 3 GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

<b>PRODUCT</b>	smartphone
<b>MODEL NAME</b>	Ilium X260
<b>NOMINAL VOLTAGE</b>	5.0Vdc (adapter or host equipment) 3.8Vdc dc (Li-ion, battery)
<b>MODULATION TECHNOLOGY</b>	DSSS, OFDM
<b>MODULATION TYPE</b>	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
<b>TRANSMISSION RATE</b>	802.11b: 11/ 5.5/ 2.0 / 1.0 Mbps 802.11g: 54/ 48/ 36 / 24 / 18 / 9/ 6 Mbps 802.11n: up to 135 Mbps
<b>OPERATING FREQUENCY</b>	2412-2462MHz for 11b/g/n(HT20)
<b>MAX. OUTPUT POWER</b>	WLAN: 28.314mW (Maximum)
<b>ANTENNA TYPE</b>	PIFA Antenna with 2.51dBi gain
<b>HW VERSION</b>	FS072-03L-SS-M
<b>SW VERSION</b>	Ilium X260_TELCEL_SW_01_V07
<b>I/O PORTS</b>	Refer to user's manual
<b>CABLE SUPPLIED</b>	USB cable: non-shielded, detachable, 0.8m Earphone cable: non-shielded, detachable, 1.2m

**NOTE:**

- For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
- The EUT incorporates a SISO function. Physically, the EUT provides one transmitter and one receiver.

MODULATION MODE	TX/RX FUNCTION
802.11b	1TX /1RX
802.11g	1TX /1RX
802.11n (20MHz)	1TX /1RX

- The EUT was powered by the following adapter:

ADAPTER	
<b>BRAND:</b>	LANIX
<b>MODEL:</b>	Ilium X260
<b>INPUT:</b>	AC 100-240V, 150mA
<b>OUTPUT:</b>	DC 5V, 500mA

- The EUT matched the following USB cable and Earphone:

USB CABLE	
<b>BRAND:</b>	NA
<b>MODEL:</b>	Ilium X260
<b>SIGNAL LINE:</b>	0.8 METER



EARPHONE	
BRAND:	NA
MODEL:	Ilium X260
SIGNAL LINE:	1.2 METER

5. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.





### 3.2 DESCRIPTION OF TEST MODES

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

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

#### 3.2.1 CONFIGURATION OF SYSTEM UNDER TEST

Please see section 5 photographs of the test configuration for reference.

#### 3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports  
 The worst case was found when positioned on Y axis for radiated emission. Following test modes were selected for the final test, and the final worst case is marked in boldface and recorded in the report:

EUT CONFIGURE MODE	APPLICABLE TO				MODE
	RE<1G	RE≥1G	PLC	APCM	
-	√	√	√	√	-

Where **RE<1G**: Radiated Emission below 1GHz      **RE≥1G**: Radiated Emission above 1GHz  
**PLC**: Power Line Conducted Emission      **APCM**: Antenna Port Conducted Measurement  
**NOTE**: No need to concern of Conducted Emission due to the EUT is powered by battery.

#### 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, XYZ axis 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	11	CCK	DBPSK	1.0



**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, XYZ axis 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	CCK	DBPSK	1.0
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
802.11n HT20	1 to 11	1, 6, 11	OFDM	BPSK	6.5

**POWER LINE CONDUCTED EMISSION TEST:**

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis 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	11	CCK	DBPSK	1.0

**BANDEDGE MEASUREMENT:**

- 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, 11	CCK	DBPSK	1.0
802.11g	1 to 11	1, 11	OFDM	BPSK	6.0
802.11n HT20	1 to 11	1, 11	OFDM	BPSK	6.5

**ANTENNA PORT CONDUCTED MEASUREMENT:**

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



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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	CCK	DBPSK	1.0
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
802.11n HT20	1 to 11	1, 6, 11	OFDM	BPSK	6.5

**TEST CONDITION:**

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	TEST VOLTAGE	TESTED BY
RE<1G	22deg. C, 54%RH	DC 5V from adaptor	Tony
RE≥1G	22deg. C, 54%RH	DC 5V from adaptor	Tony
PLC	25deg. C, 60%RH	DC 5V from adaptor	Yuqiang Yin
APCM	25deg. C, 60%RH	3.8Vdc from battery	Yuqiang Yin



### 3.3 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, Section 15.247**

**KDB 558074 D01 DTS Meas Guidance v03r05**

**ANSI C63.10-2013**

Note:

1. All test items have been performed and recorded as per the above standards.
2. The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (Certification). The test report has been issued separately.

### 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.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	DC source	LONG WEI	PS-6403D	010934269	N/A
2	PC	HP	A6608CN	3CR83825X3	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	DC Line: Unshielded, Detachable 1.0m
2	AC Line: Unshielded, Detachable 1.5m



## 4 TEST TYPES AND RESULTS

### 4.1 CONDUCTED EMISSION MEASUREMENT

#### 4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dBµV)	
	Quasi-peak	Average
0.15 ~ 0.5	66 to 56	56 to 46
0.5 ~ 5	56	46
5 ~ 30	60	50

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

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

3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

#### 4.1.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESR7	101588	Jan. 22,16	Jan. 21,17
Artificial Mains Network	Rohde&Schwarz	ENV216	101173	Mar. 04,16	Mar. 03,17
Artificial Mains Network	Rohde&Schwarz	ESH3-Z5	100317	Apr. 05,16	Apr. 04,17
Voltage probe	SCHWARZBECK	TK 9421	TK 9421-176	Jan. 08,16	Jan. 07,17
Test software	ADT	ADT_Cond_V7.3.7	N/A	N/A	N/A

**NOTE:**

1. The test was performed in shielded room 553.

2. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.



#### 4.1.3 TEST PROCEDURES

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

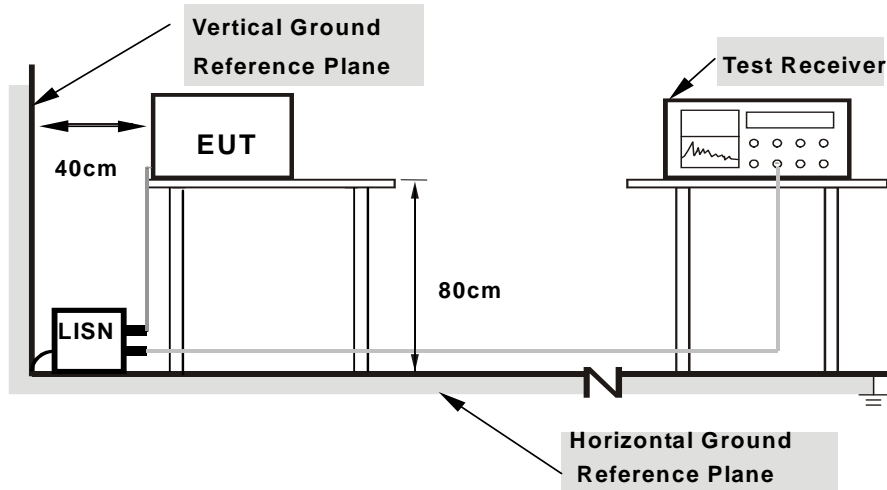
**NOTE:** All modes of operation were investigated and the worst-case emissions are reported.

#### 4.1.4 DEVIATION FROM TEST STANDARD

No deviation.



#### 4.1.5 TEST SETUP



- Note:**
- 1.Support units were connected to second LISN.
  - 2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

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

#### 4.1.6 EUT OPERATING CONDITIONS

- a. Turned on the power and connected of all equipment.
- b. EUT was operated according to the type used was description in manufacturer's specifications or the User's Manual.



**4.1.7 TEST RESULTS**

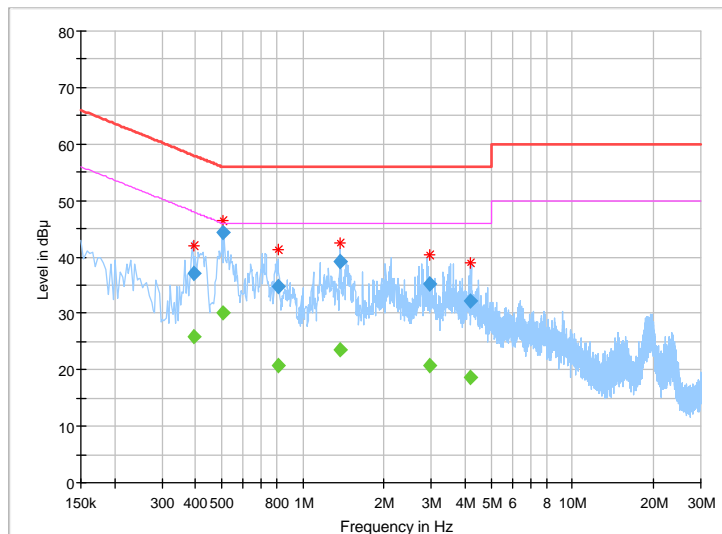
**CONDUCTED WORST-CASE DATA:**

<b>Frequency Range</b>	150KHz ~ 30MHz	<b>Detector Function &amp; Resolution Bandwidth</b>	Quasi-Peak (QP) / Average (AV), 9 kHz
<b>Input Power</b>	120Vac, 60Hz	<b>Environmental Conditions</b>	24deg. C, 55RH
<b>Tested By</b>	Eric	<b>TEST DATE</b>	2016/10/28

Frequency (MHz)	QuasiPeak (dB $\mu$ V)	CAverage (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Line	Filter	Corr. (dB)
0.396000	---	25.78	47.94	22.16	L	ON	9.7
0.396000	37.11	---	57.94	20.83	L	ON	9.7
0.504000	---	30.19	46.00	15.81	L	ON	9.7
0.504000	44.34	---	56.00	11.66	L	ON	9.7
0.808000	---	20.74	46.00	25.26	L	ON	9.7
0.808000	34.71	---	56.00	21.29	L	ON	9.7
1.368000	---	23.48	46.00	22.52	L	ON	9.7
1.368000	39.18	---	56.00	16.82	L	ON	9.7
2.950000	---	20.70	46.00	25.30	L	ON	9.7
2.950000	35.11	---	56.00	20.89	L	ON	9.7
4.168000	---	18.55	46.00	27.45	L	ON	9.7
4.168000	32.17	---	56.00	23.83	L	ON	9.7

- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value = Emission level - Limit value
  5. Correction factor = Insertion loss + Cable loss
  6. Emission Level = Correction Factor + Reading Value.

Full Spectrum





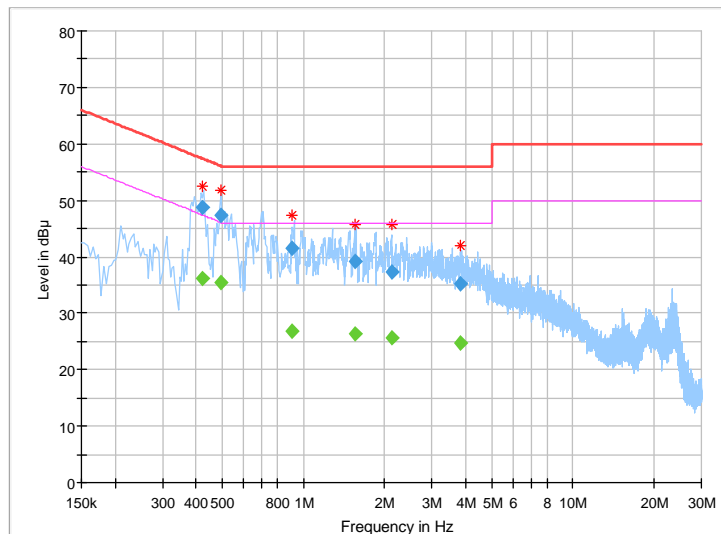


<b>Frequency Range</b>	150KHz ~ 30MHz	<b>Detector Function &amp; Resolution Bandwidth</b>	Quasi-Peak (QP) / Average (AV), 9 kHz
<b>Input Power</b>	120Vac, 60Hz	<b>Environmental Conditions</b>	24deg. C, 55RH
<b>Tested By</b>	Eric	<b>TEST DATE</b>	2016/10/28

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.420000	---	36.21	47.45	11.24	N	ON	10.1
0.420000	48.71	---	57.45	8.74	N	ON	10.1
0.496000	---	35.43	46.07	10.64	N	ON	10.1
<b>0.496000</b>	<b>47.36</b>	---	<b>56.07</b>	<b>8.71</b>	<b>N</b>	<b>ON</b>	<b>10.1</b>
0.908000	---	26.88	46.00	19.12	N	ON	9.9
0.908000	41.49	---	56.00	14.51	N	ON	9.9
1.564000	---	26.45	46.00	19.55	N	ON	9.9
1.564000	39.30	---	56.00	16.70	N	ON	9.9
2.136000	---	25.64	46.00	20.36	N	ON	9.8
2.136000	37.25	---	56.00	18.75	N	ON	9.8
3.840000	---	24.62	46.00	21.38	N	ON	9.8
3.840000	35.16	---	56.00	20.84	N	ON	9.8

- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value = Emission level - Limit value
  5. Correction factor = Insertion loss + Cable loss
  6. Emission Level = Correction Factor + Reading Value.

Full Spectrum





## 4.2 RADIATED EMISSION MEASUREMENT

### 4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

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. As shown in 15.35(b), 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.

**4.2.2 TEST INSTRUMENTS**

<b>Equipment</b>	<b>Manufacturer</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Last Cal.</b>	<b>Next Cal.</b>
EMI Test Receiver	Rohde&Schwarz	ESR7	101494	Apr. 05,16	Apr. 04,17
Signal and Spectrum Analyzer	Rohde&Schwarz	FSV7	102331	Nov. 09,15	Nov. 08,16
Bilog Antenna	Teseq	CBL 6111D	30643	Jul. 14, 16	Jul. 13, 17
Horn Antenna (1GHz -18GHz)	ETS -Lindgren	3117	00062558	May 18,16	May 17,17
GPS Generator+ Antenna	TOJOIN	GNSS-5000A	E1-010119	Aug. 02, 15	Aug. 01, 17
3m Semi-anechoic Chamber	ETS-LINDGREN	9m*6m*6m	NSEMC003	Mar. 12,16	Mar. 11,18
Test Software	ADT	ADT_Radiated_V7.6.15.9.2	N/A	N/A	N/A
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170242	Mar. 12,16	Mar. 11,17
Amplifier (9kHz-1GHz)	SONOMA	310D	186955	Mar. 04,16	Mar. 03, 17
Pre-Amplifier(1-18G)	HP	8449B	3008A00409	Apr. 25,16	Apr. 24,17
Pre-Amplifier (18GHz-40GHz)	EMCI	EMC 184045	980102	Nov. 20,15	Nov. 19,16
Test Software	ADT	ADT_Radiated_V7.6.15.9.2	N/A	N/A	N/A
BLUETOOTH TESTER	Rohde&Schwarz	CBT32	100811	Aug. 08,16	Aug. 07,17

**NOTE:**

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
2. The test was performed in 966 Chamber.
3. The FCC Site Registration No. is 502831.



### 4.2.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters (for below 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 antenna is a broadband antenna, and its height 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 Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, For battery operated equipment, the equipment tests shall be perform using fresh batteries. The turntable was rotated to maximize the emission level.

**NOTE:**

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

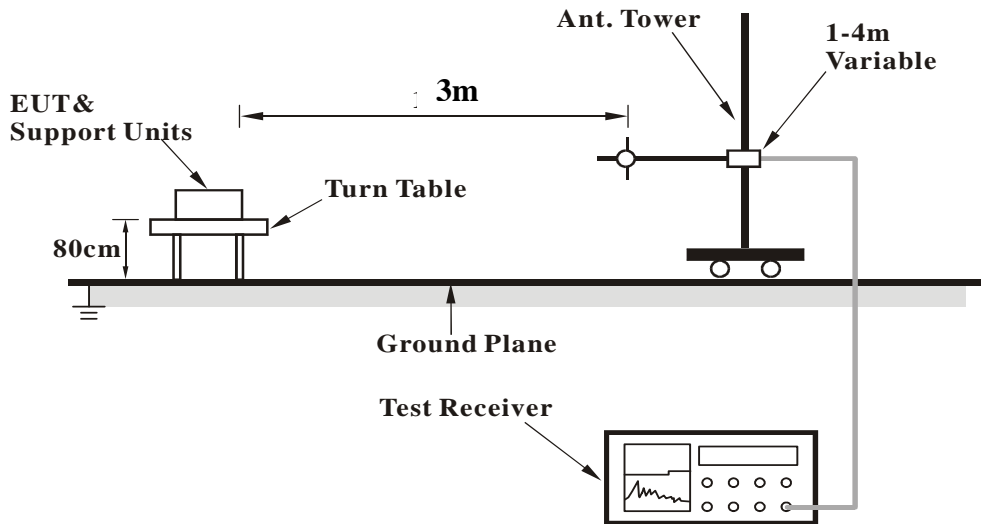
### 4.2.4 DEVIATION FROM TEST STANDARD

No deviation

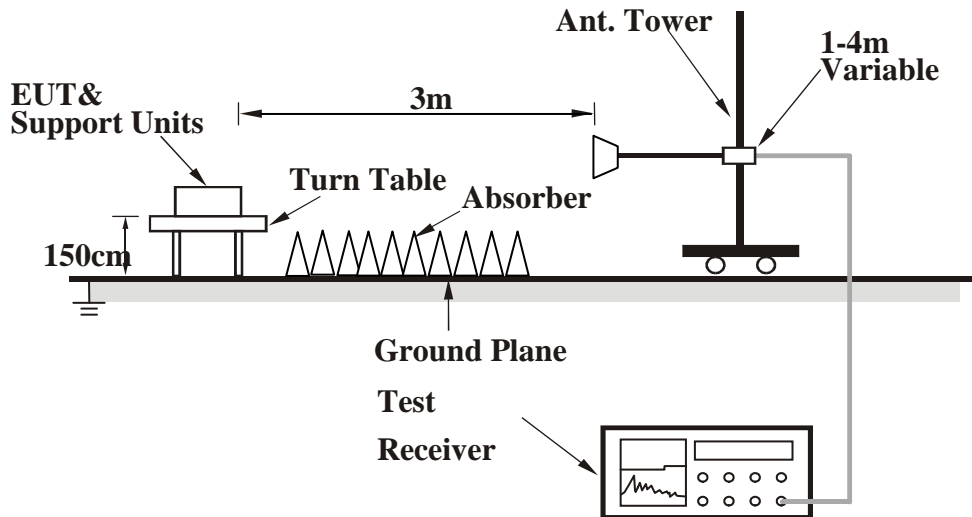


### 4.2.5 TEST SETUP

#### <Frequency Range below 1GHz>



#### <Frequency Range above 1GHz>



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



#### 4.2.6 EUT OPERATING CONDITIONS

- a. Set the EUT under full load condition and placed them on a testing table.
- b. Set the transmitter part of EUT under transmission condition continuously at specific channel frequency.
- c. The necessary accessories enable the EUT in full functions.



### 4.2.7 TEST RESULTS

#### BELOW 1GHz WORST-CASE DATA:

**9 KHz – 30 KHz data:** the amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required in the report.

**30 MHz – 1GHz data:**

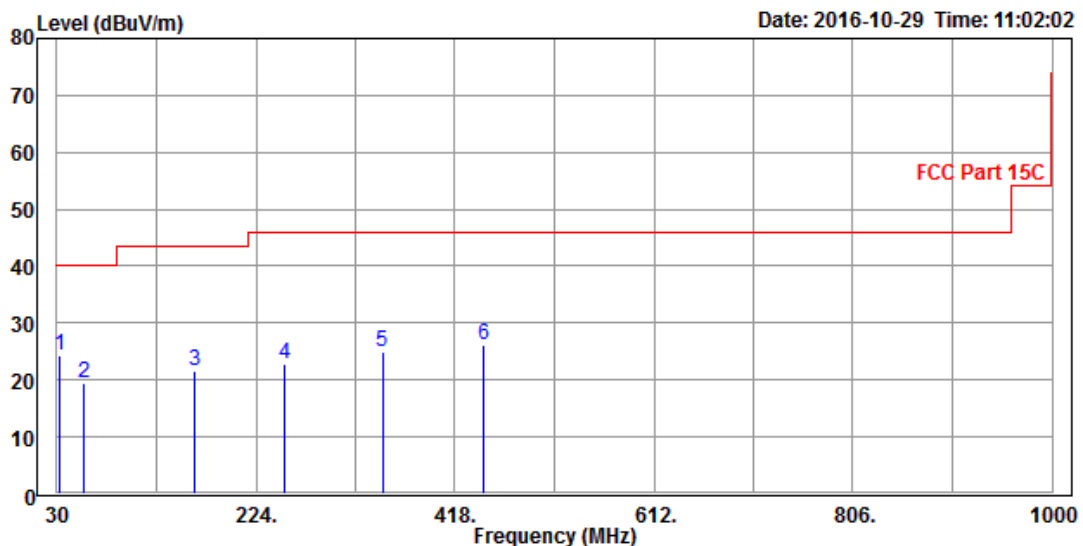
**802.11b**

<b>CHANNEL</b>	TX Channel 11	<b>DETECTOR FUNCTION</b>	Quasi-Peak (QP)
<b>FREQUENCY RANGE</b>	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
56.19	19.62	49.38	40.00	-20.38	6.44	1.14	37.34	100	24	QP
102.75	17.18	44.70	43.50	-26.32	7.90	1.56	36.98	100	48	QP
155.13	21.51	46.65	43.50	-21.99	9.71	1.91	36.76	100	80	QP
251.16	27.92	49.57	46.00	-18.08	12.41	2.46	36.52	100	150	QP
334.58	23.01	42.27	46.00	-22.99	14.45	2.87	36.58	100	265	QP
422.85	25.57	41.65	46.00	-20.43	17.47	3.22	36.77	100	280	QP

**REMARKS:**

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.



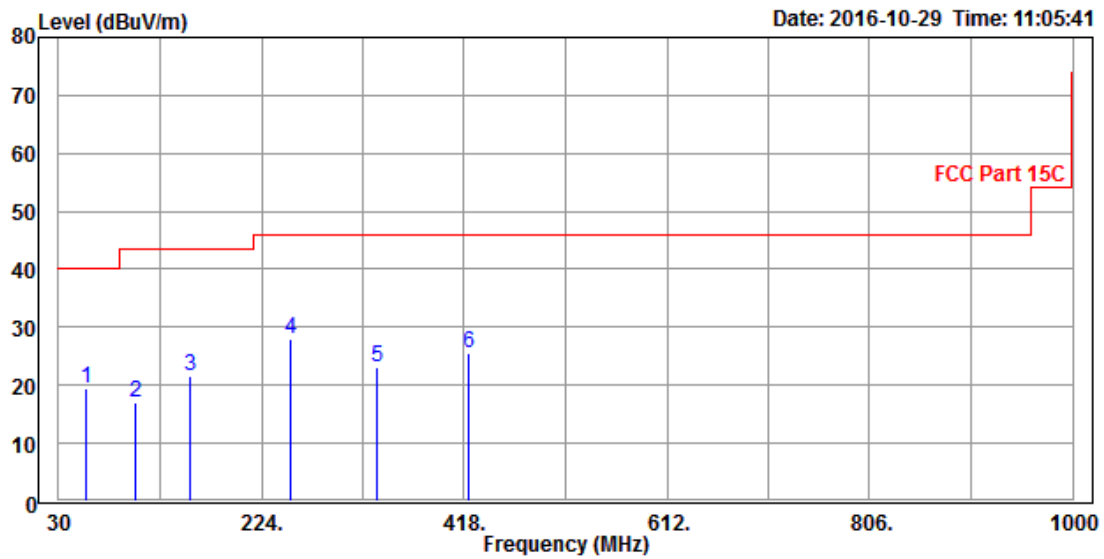


<b>CHANNEL</b>	TX Channel 11	<b>DETECTOR FUNCTION</b>	Quasi-Peak (QP)
<b>FREQUENCY RANGE</b>	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
32.91	24.44	46.05	40.00	-15.56	15.09	0.84	37.54	200	25	QP
56.19	19.44	49.20	40.00	-20.56	6.44	1.14	37.34	200	36	QP
163.86	21.65	46.28	43.50	-21.85	10.14	1.96	36.73	200	72	QP
251.16	22.76	44.41	46.00	-23.24	12.41	2.46	36.52	200	125	QP
347.19	25.03	43.73	46.00	-20.97	14.98	2.92	36.60	200	196	QP
446.13	26.02	41.81	46.00	-19.98	17.75	3.29	36.83	200	240	QP

**REMARKS:**

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.







**ABOVE 1GHz WORST-CASE 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**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	48.22	56.09	54.00	-5.78	32.29	8.15	48.31	105	20	Average
2390	53.53	61.40	74.00	-20.47	32.29	8.15	48.31	105	20	Peak
2412	98.85	106.66			32.31	8.19	48.31	105	20	Average
2412	101.18	108.99			32.31	8.19	48.31	105	20	Peak
2484	32.92	40.52	54.00	-21.08	32.38	8.32	48.30	105	20	Average
2484	44.77	52.37	74.00	-29.23	32.38	8.32	48.30	105	20	Peak

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	45.69	53.56	54.00	-8.31	32.29	8.15	48.31	100	12	Average
2390	51.87	59.74	74.00	-22.13	32.29	8.15	48.31	100	12	Peak
2412	98.37	106.18			32.31	8.19	48.31	100	12	Average
2412	100.42	108.23			32.31	8.19	48.31	100	12	Peak
2484	33.28	40.88	54.00	-20.72	32.38	8.32	48.30	100	12	Average
2484	44.45	52.05	74.00	-29.55	32.38	8.32	48.30	100	12	Peak

**REMARKS:**

- Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.
- 2412MHz: 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										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	33.63	41.50	54.00	-20.37	32.29	8.15	48.31	100	20	Average
2390	45.29	53.16	74.00	-28.71	32.29	8.15	48.31	100	20	Peak
2437	99.77	107.50			32.34	8.24	48.31	100	20	Average
2437	102.80	110.53			32.34	8.24	48.31	100	20	Peak
2483.5	33.03	40.63	54.00	-20.97	32.38	8.32	48.30	100	20	Average
2483.5	44.66	52.26	74.00	-29.34	32.38	8.32	48.30	100	20	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	33.56	41.43	54.00	-20.44	32.29	8.15	48.31	100	12	Average
2390	44.66	52.53	74.00	-29.34	32.29	8.15	48.31	100	12	Peak
2437	98.86	106.59			32.34	8.24	48.31	100	12	Average
2437	100.96	108.69			32.34	8.24	48.31	100	12	Peak
2483.5	33.81	41.41	54.00	-20.19	32.38	8.32	48.30	100	12	Average
2483.5	45.22	52.82	74.00	-28.78	32.38	8.32	48.30	100	12	Peak

**REMARKS:**

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.
2. 2437MHz: 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**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	32.99	40.86	54.00	-21.01	32.29	8.15	48.31	100	20	Average
2390	44.80	52.67	74.00	-29.20	32.29	8.15	48.31	100	20	Peak
2462	99.32	106.98			32.36	8.28	48.30	100	20	Average
2462	101.71	109.37			32.36	8.28	48.30	100	20	Peak
<b>2483.5</b>	<b>51.40</b>	<b>59.00</b>	<b>54.00</b>	<b>-2.60</b>	<b>32.38</b>	<b>8.32</b>	<b>48.30</b>	<b>100</b>	<b>20</b>	<b>Average</b>
2483.5	55.75	63.35	74.00	-18.25	32.38	8.32	48.30	100	20	Peak

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	33.25	41.12	54.00	-20.75	32.29	8.15	48.31	110	17	Average
2390	44.94	52.81	74.00	-29.06	32.29	8.15	48.31	110	17	Peak
2462	97.77	105.43			32.36	8.28	48.30	110	17	Average
2462	99.78	107.44			32.36	8.28	48.30	110	17	Peak
2483.5	49.66	57.26	54.00	-4.34	32.38	8.32	48.30	110	17	Average
2483.5	54.67	62.27	74.00	-19.33	32.38	8.32	48.30	110	17	Peak

**REMARKS:**

- Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.
- 2462MHz: 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**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	35.57	43.44	54.00	-18.43	32.29	8.15	48.31	135	20	Average
2390	48.65	56.52	74.00	-25.35	32.29	8.15	48.31	135	20	Peak
2412	86.06	93.87			32.31	8.19	48.31	135	20	Average
2412	95.85	103.66			32.31	8.19	48.31	135	20	Peak
2483.5	34.25	41.85	54.00	-19.75	32.38	8.32	48.30	135	20	Average
2483.5	45.99	53.59	74.00	-28.01	32.38	8.32	48.30	135	20	Peak

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	34.96	42.83	54.00	-19.04	32.29	8.15	48.31	100	14	Average
2390	47.58	55.45	74.00	-26.42	32.29	8.15	48.31	100	14	Peak
2412	83.98	91.79			32.31	8.19	48.31	100	14	Average
2412	93.59	101.40			32.31	8.19	48.31	100	14	Peak
2483.5	34.19	41.79	54.00	-19.81	32.38	8.32	48.30	100	14	Average
2483.5	46.76	54.36	74.00	-27.24	32.38	8.32	48.30	100	14	Peak

**REMARKS:**

- Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.
- 2412MHz: 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**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	33.81	41.68	54.00	-20.19	32.29	8.15	48.31	115	18	Average
2390	45.18	53.05	74.00	-28.82	32.29	8.15	48.31	115	18	Peak
2437	87.51	95.24			32.34	8.24	48.31	115	18	Average
2437	96.63	104.36			32.34	8.24	48.31	115	18	Peak
2483.5	34.20	41.80	54.00	-19.80	32.38	8.32	48.30	115	18	Average
2483.5	46.07	53.67	74.00	-27.93	32.38	8.32	48.30	115	18	Peak

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	33.84	41.71	54.00	-20.16	32.29	8.15	48.31	100	2	Average
2390	45.91	53.78	74.00	-28.09	32.29	8.15	48.31	100	2	Peak
2437	85.12	92.85			32.34	8.24	48.31	100	2	Average
2437	94.23	101.96			32.34	8.24	48.31	100	2	Peak
2483.5	34.16	41.76	54.00	-19.84	32.38	8.32	48.30	100	2	Average
2483.5	45.90	53.50	74.00	-28.10	32.38	8.32	48.30	100	2	Peak

**REMARKS:**

- Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.
- 2437MHz: 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**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	33.66	41.53	54.00	-20.34	32.29	8.15	48.31	100	15	Average
2390	45.67	53.54	74.00	-28.33	32.29	8.15	48.31	100	15	Peak
2462	88.30	95.96			32.36	8.28	48.30	100	15	Average
2462	97.36	105.02			32.36	8.28	48.30	100	15	Peak
2483.5	43.07	50.67	54.00	-10.93	32.38	8.32	48.30	100	15	Average
2483.5	59.63	67.23	74.00	-14.37	32.38	8.32	48.30	100	15	Peak

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	33.87	41.74	54.00	-20.13	32.29	8.15	48.31	100	28	Average
2390	45.51	53.38	74.00	-28.49	32.29	8.15	48.31	100	28	Peak
2462	85.88	93.54			32.36	8.28	48.30	100	28	Average
2462	95.24	102.9			32.36	8.28	48.30	100	28	Peak
2483.5	39.87	47.47	54.00	-14.13	32.38	8.32	48.30	100	28	Average
2483.5	56.88	64.48	74.00	-17.12	32.38	8.32	48.30	100	28	Peak

**REMARKS:**

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.
2. 2462MHz: Fundamental frequency.



**802.11n (20MHz)**

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

<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	48.34	56.21	54.00	-5.66	32.29	8.15	48.31	120	15	Average
2390	66.01	73.88	74.00	-7.99	32.29	8.15	48.31	120	15	Peak
2412	90.03	97.84			32.31	8.19	48.31	120	15	Average
2412	100.35	108.16			32.31	8.19	48.31	120	15	Peak
2483.5	33.88	41.48	54.00	-20.12	32.38	8.32	48.30	120	15	Average
2483.5	58.24	65.84	74.00	-15.76	32.38	8.32	48.30	120	15	Peak
<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	44.59	52.46	54.00	-9.41	32.29	8.15	48.31	100	13	Average
2390	63.83	71.70	74.00	-10.17	32.29	8.15	48.31	100	13	Peak
2412	87.89	95.70			32.31	8.19	48.31	100	13	Average
2412	98.34	106.15			32.31	8.19	48.31	100	13	Peak
2483.5	34.07	41.67	54.00	-19.93	32.38	8.32	48.30	100	13	Average
2483.5	57.25	64.85	74.00	-16.75	32.38	8.32	48.30	100	13	Peak

**REMARKS:**

- Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.
- 2412MHz: 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**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	35.02	42.89	54.00	-18.98	32.29	8.15	48.31	120	20	Average
2390	58.72	66.59	74.00	-15.28	32.29	8.15	48.31	120	20	Peak
2437	89.63	97.36			32.34	8.24	48.31	120	20	Average
2437	101.51	109.24			32.34	8.24	48.31	120	20	Peak
2483.5	34.03	41.63	54.00	-19.97	32.38	8.32	48.30	120	20	Average
2483.5	57.78	65.38	74.00	-16.22	32.38	8.32	48.30	120	20	Peak

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	33.61	41.48	54.00	-20.39	32.29	8.15	48.31	100	35	Average
2390	57.87	65.74	74.00	-16.13	32.29	8.15	48.31	100	35	Peak
2437	89.42	97.15			32.34	8.24	48.31	100	35	Average
2437	99.34	107.07			32.34	8.24	48.31	100	35	Peak
2483.5	33.94	41.54	54.00	-20.06	32.38	8.32	48.30	100	35	Average
2483.5	60.13	67.73	74.00	-13.87	32.38	8.32	48.30	100	35	Peak

**REMARKS:**

- Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.
- 2437MHz: 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										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	33.56	41.43	54.00	-20.44	32.29	8.15	48.31	100	12	Average
2390	45.65	53.52	74.00	-28.35	32.29	8.15	48.31	100	12	Peak
2462	89.82	97.48			32.36	8.28	48.30	100	12	Average
2462	99.84	107.50			32.36	8.28	48.30	100	12	Peak
2483.5	48.84	56.44	54.00	-5.16	32.38	8.32	48.30	100	12	Average
2483.5	68.92	76.52	74.00	-5.08	32.38	8.32	48.30	100	12	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	39.44	47.31	54.00	-14.56	32.29	8.15	48.31	100	2	Average
2390	52.17	60.04	74.00	-21.83	32.29	8.15	48.31	100	2	Peak
2462	87.45	95.11			32.36	8.28	48.30	100	2	Average
2462	97.16	104.82			32.36	8.28	48.30	100	2	Peak
2483.5	45.84	53.44	54.00	-8.16	32.38	8.32	48.30	100	2	Average
2483.5	64.48	72.08	74.00	-9.52	32.38	8.32	48.30	100	2	Peak

**REMARKS:**

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.
2. 2462MHz: Fundamental frequency.



### 4.3 6 dB BANDWIDTH MEASUREMENT

#### 4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

#### 4.3.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Power Sensor	Keysight	U2021XA	MY55060016	May 04,16	May 03,17
Power Sensor	Keysight	U2021XA	MY55060018	May 04,16	May 03,17
10dB Attenuator	JFW/USA	50HF-010-SMA	1505	Jul. 27, 16	Jul. 26, 17
Digital Multimeter	FLUKE	15B	A1220010DG	Oct. 09, 16	Oct. 08, 17
Humid & Temp Programmable Tester	Haida	HD-2257	110807201	Sep.05,16	Sep. 04,17
Oscilloscope	Agilent	DSO9254A	MY51260160	Nov. 28,15	Nov. 27,16
Signal Analyzer	Rohde & Schwarz	FSV7	102331	Nov. 09,15	Nov. 08,16
Signal Generator	Agilent	N5183A	MY50140980	Nov. 09,15	Nov. 08,16
Agile Signal Generator	Agilent	8645A	Agilent	Aug.08, 16	Aug.07, 17
ESG Vector Signal Generator	Agilent	E4438C	MY49072505	Apr. 22, 16	Apr. 21, 17
BLUETOOTH TESTER	Rohde&Schwarz	CBT32	100811	Aug.08, 16	Aug. 07, 17

**NOTE:**

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
2. The test was performed in RF Oven room.

#### 4.3.3 TEST PROCEDURE

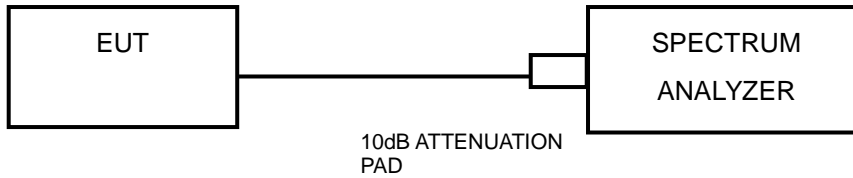
1. Set RBW = 100 kHz.
2. Set the video bandwidth (VBW) ≥ 3 RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.



#### 4.3.4 DEVIATION FROM TEST STANDARD

No deviation.

#### 4.3.5 TEST SETUP



#### 4.3.6 EUT OPERATING CONDITIONS

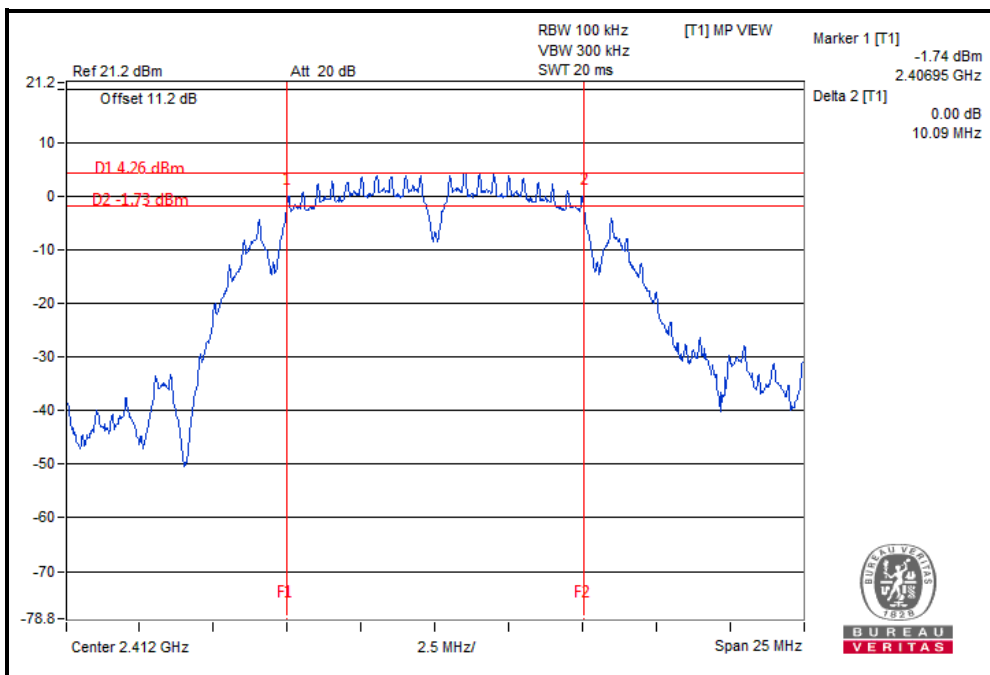
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.



### 4.3.7 TEST RESULTS

#### 802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	10.09	0.5	PASS
6	2437	10.08	0.5	PASS
11	2462	10.09	0.5	PASS



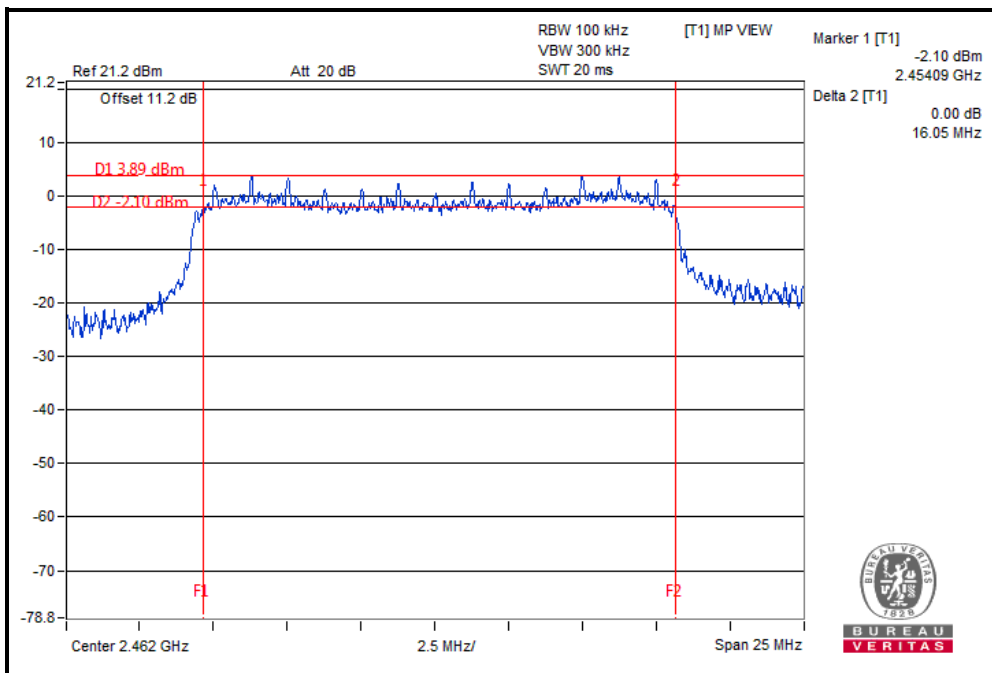


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802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	16.01	0.5	PASS
6	2437	16.03	0.5	PASS
11	2462	16.05	0.5	PASS



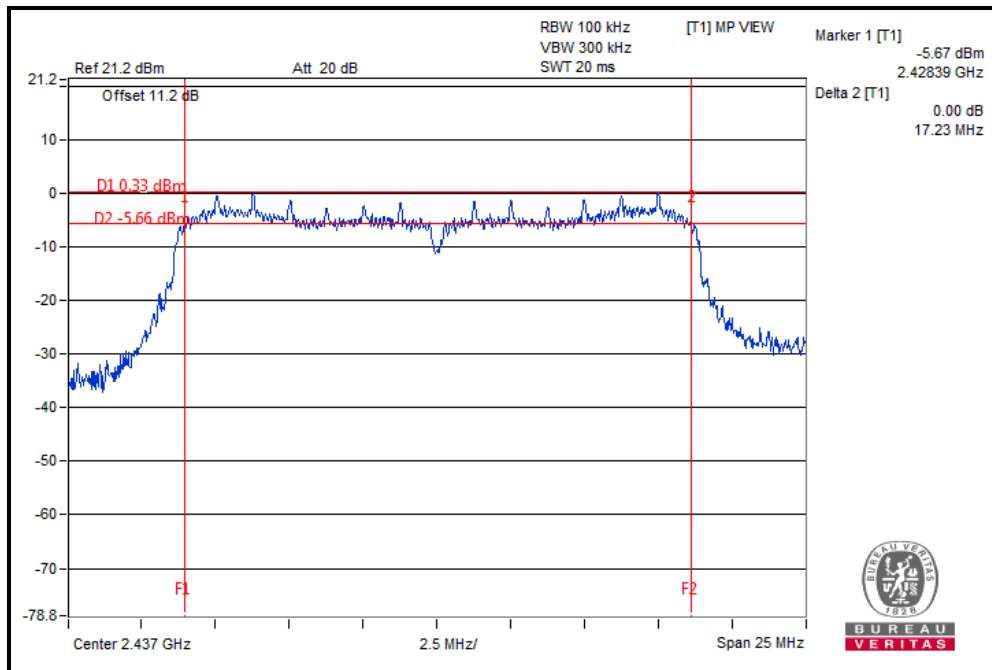


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802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	17.15	0.5	PASS
6	2437	17.23	0.5	PASS
11	2462	17.10	0.5	PASS



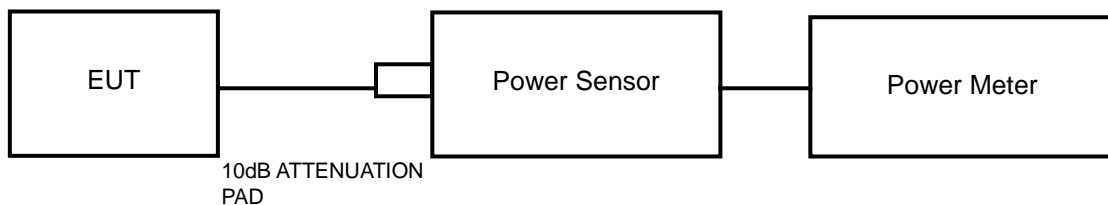


#### 4.4 CONDUCTED OUTPUT POWER

##### 4.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

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

##### 4.4.2 TEST SETUP



##### 4.4.3 TEST INSTRUMENTS

Refer to section 4.3.3 to get information of above instrument.

##### 4.4.4 TEST PROCEDURES

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

##### 4.4.5 DEVIATION FROM TEST STANDARD

No deviation.

##### 4.4.6 EUT OPERATING CONDITIONS

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



4.4.7 TEST RESULTS

4.4.7.1 MAXIMUM PEAK OUTPUT POWER

802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (dBm)	PEAK POWER (mW)	PEAK POWER LIMIT(W)	PASS/FAIL
1	2412	12.44	17.539	1	PASS
6	2437	12.49	17.742	1	PASS
11	2462	12.32	17.061	1	PASS

802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (dBm)	PEAK POWER (mW)	PEAK POWER LIMIT(W)	PASS/FAIL
1	2412	14.50	28.184	1	PASS
6	2437	14.33	27.102	1	PASS
11	2462	14.51	28.249	1	PASS

802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (dBm)	PEAK POWER (mW)	PEAK POWER LIMIT(W)	PASS/FAIL
1	2412	14.52	<b>28.314</b>	1	PASS
6	2437	14.36	27.290	1	PASS
11	2462	14.27	26.730	1	PASS





#### 4.4.7.2 AVERAGE OUTPUT POWER (FOR REFERENCE)

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

##### 802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)	PASS/FAIL
1	2412	9.43	N/A
6	2437	9.48	N/A
11	2462	9.41	N/A

##### 802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)	PASS/FAIL
1	2412	9.33	N/A
6	2437	9.28	N/A
11	2462	9.35	N/A

##### 802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)	PASS/FAIL
1	2412	9.29	N/A
6	2437	9.08	N/A
11	2462	8.95	N/A

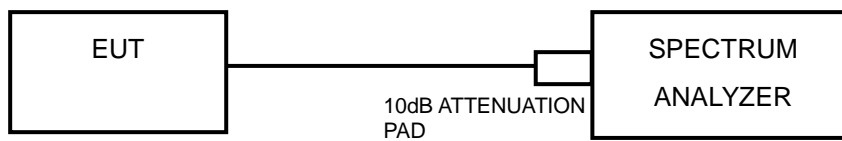


## 4.5 POWER SPECTRAL DENSITY MEASUREMENT

### 4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm/3KHz.

### 4.5.2 TEST SETUP



### 4.5.3 TEST INSTRUMENTS

Refer to section 4.3.2 to get information of above instrument.

### 4.5.4 TEST PROCEDURE

1. Set the span to 1.5 times the DTS bandwidth
2. Set the RBW = 3 kHz, VBW  $\geq$  3 x RBW, Detector = peak.
3. Sweep time = auto couple, Trace mode = max hold, allow trace to fully stabilize.
4. 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

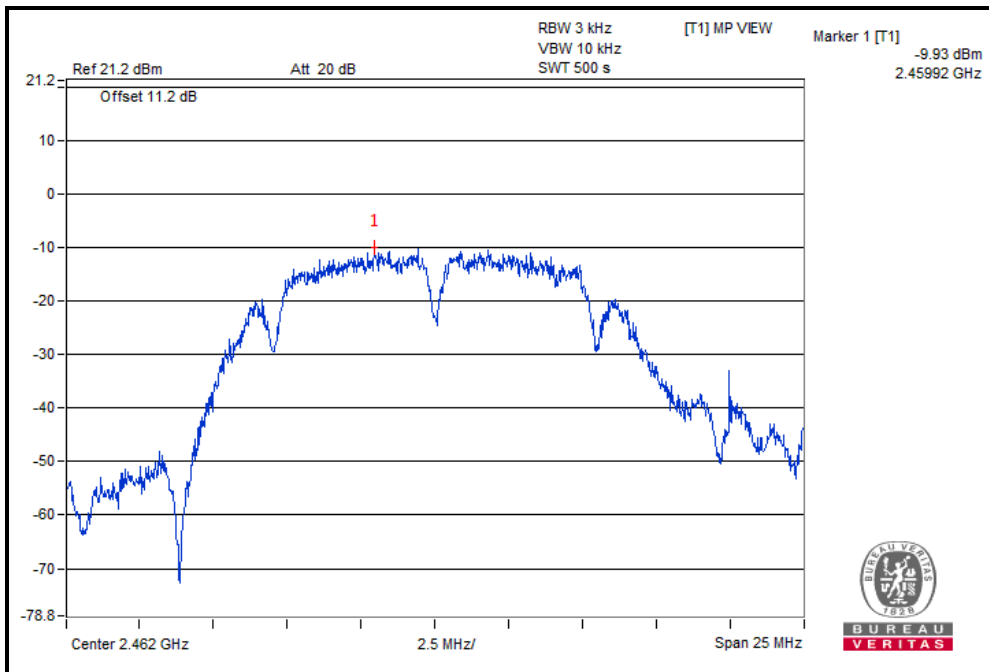
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.



### 4.5.7 TEST RESULTS

#### 802.11b

Channel	FREQ. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	-10.82	8	PASS
6	2437	-10.16	8	PASS
11	2462	-9.93	8	PASS



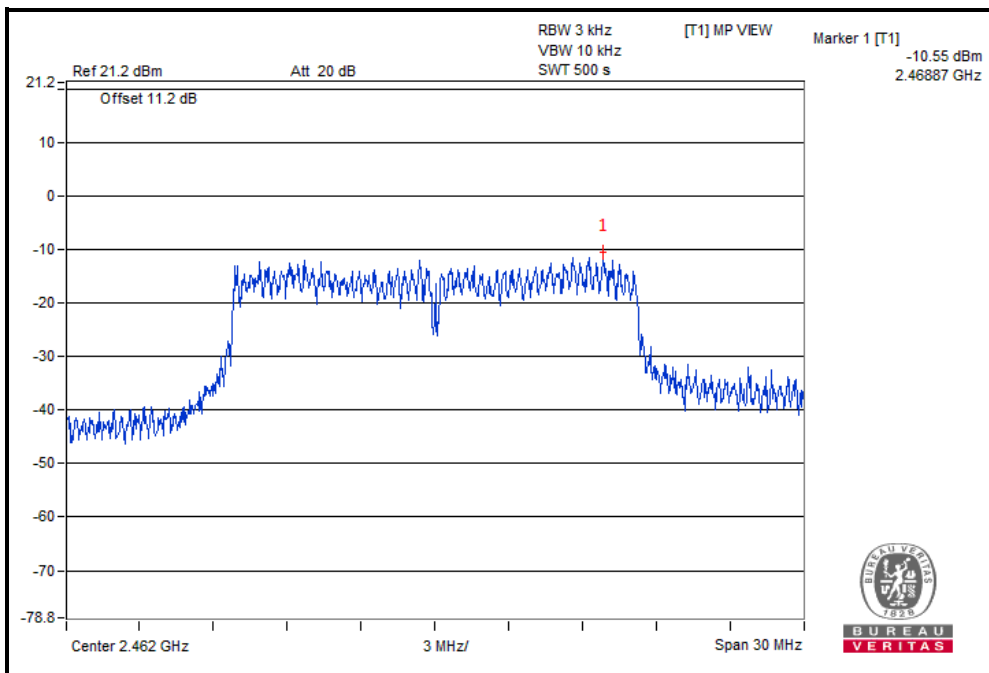


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802.11g

Channel	FREQ. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	-10.77	8	PASS
6	2437	-11.79	8	PASS
11	2462	-10.55	8	PASS



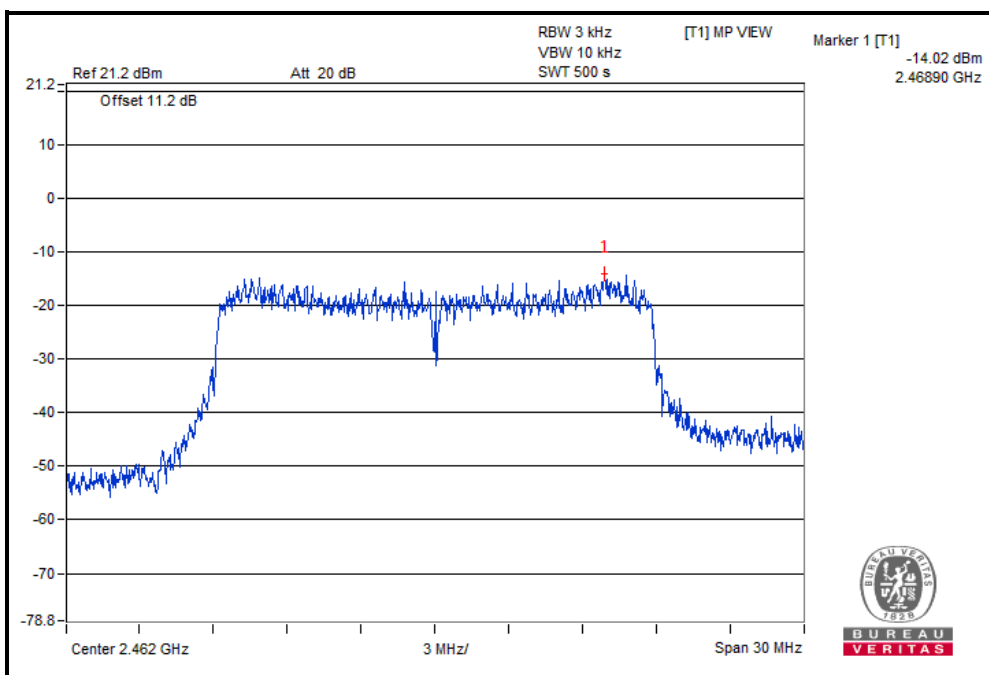


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802.11n (20MHz)

Channel	FREQ. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	-14.77	8	PASS
6	2437	-15.54	8	PASS
11	2462	-14.02	8	PASS



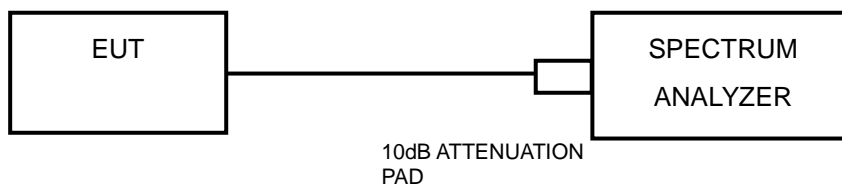


## 4.6 OUT OF BAND EMISSION MEASUREMENT

### 4.6.1 LIMITS OF OUT OF BAND EMISSION MEASUREMENT

Below  $-20\text{dB}$  of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

### 4.6.2 TEST SETUP



### 4.6.3 TEST INSTRUMENTS

Refer to section 4.3.2 to get information of above instrument.

### 4.6.4 TEST PROCEDURE

#### MEASUREMENT PROCEDURE REF

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



## MEASUREMENT PROCEDURE OOB

1. Set RBW = 100 kHz.
2. Set VBW  $\geq$  300 kHz.
3. Set span to encompass the spectrum to be examined
4. Detector = peak.
5. Trace Mode = max hold.
6. Sweep = auto couple.

### 4.6.5 DEVIATION FROM TEST STANDARD

No deviation.

### 4.6.6 EUT OPERATING CONDITION

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

### 4.6.7 TEST RESULTS

The spectrum plots are attached on the following images. D1 line indicates the highest level. D2 line indicates the 20dB offset below D1. It shows compliance to the requirement.

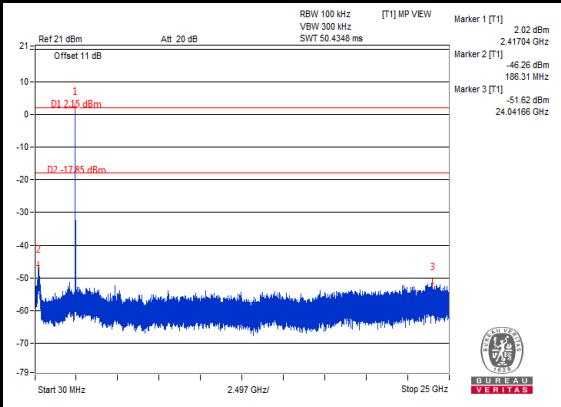
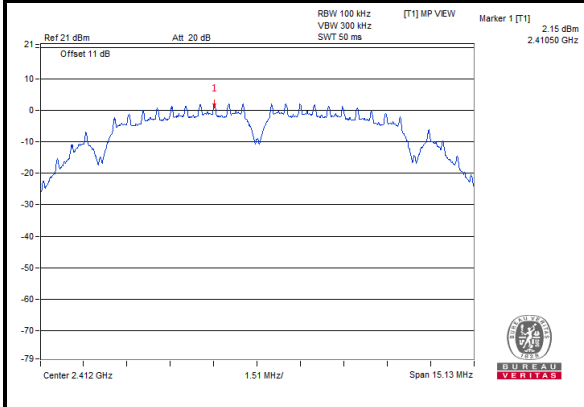


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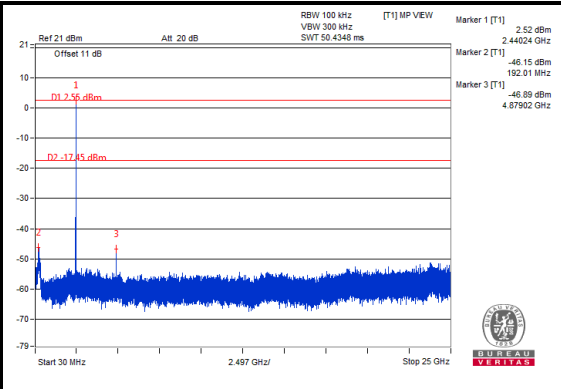
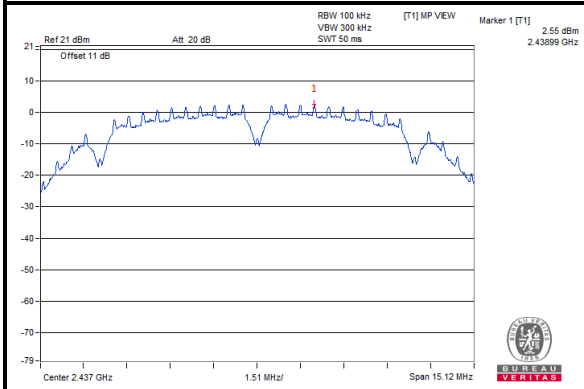
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### 802.11b

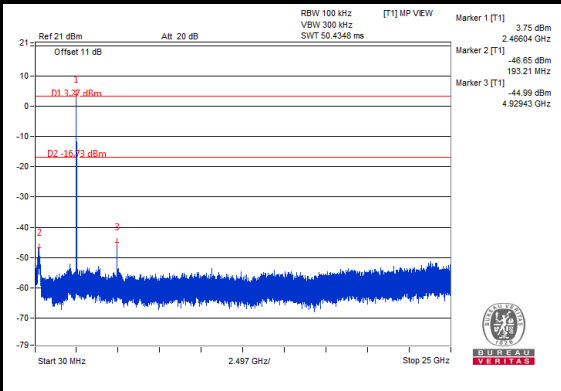
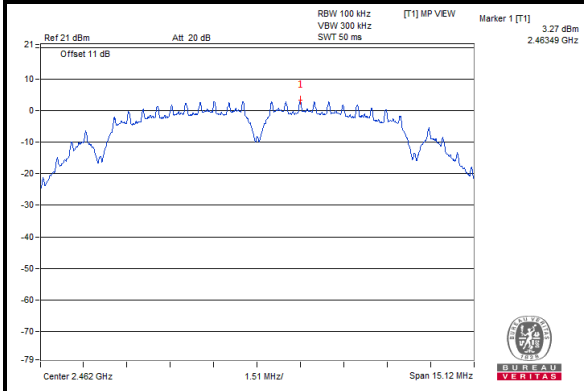
#### CH 1



#### CH 6



#### CH 11



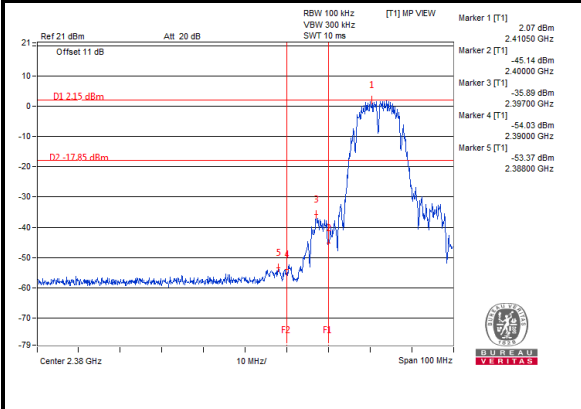




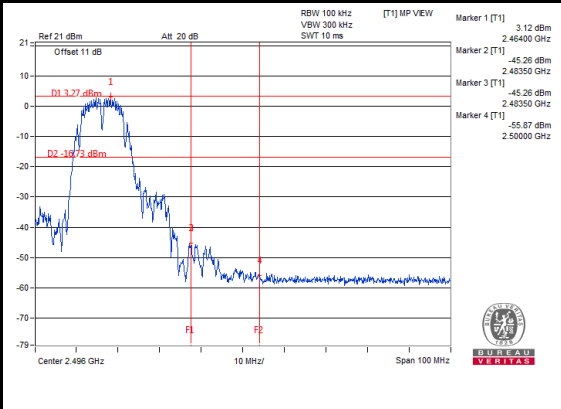
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### CH 1 Band Edge



### CH 11 Band Edge



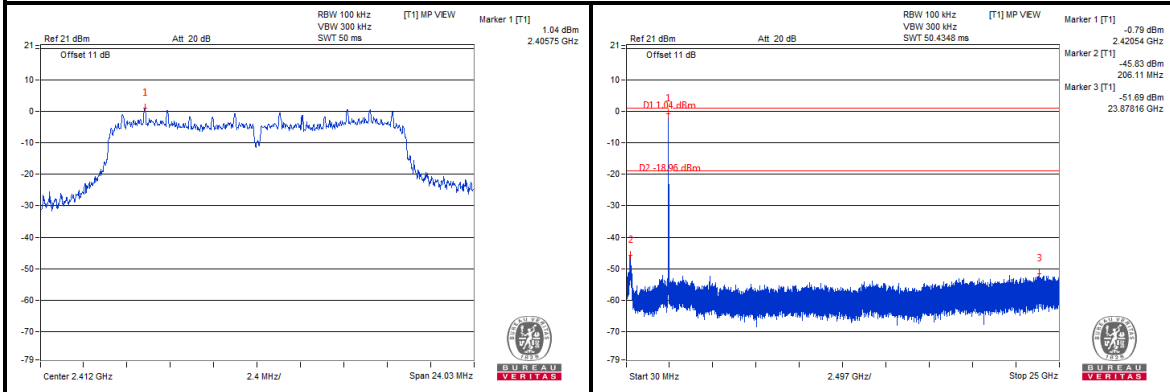


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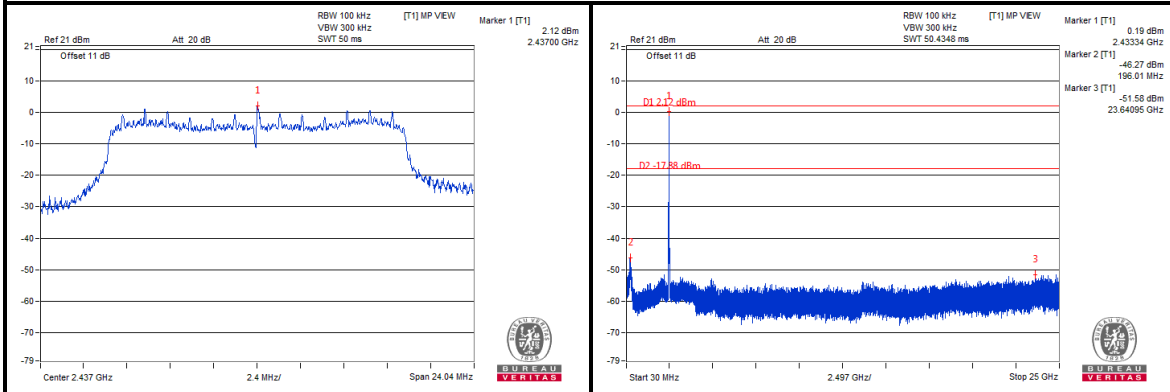
Test Report No.: RF161026W004-2

### 802.11g

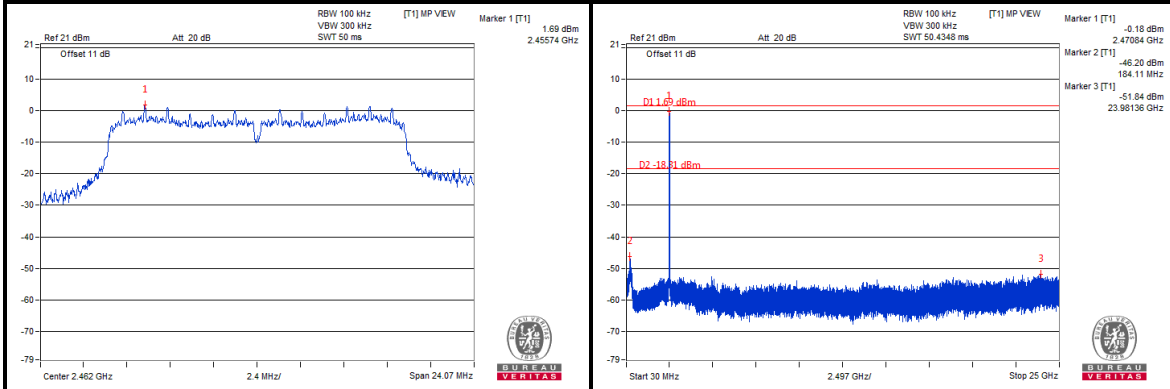
#### CH 1



#### CH 6



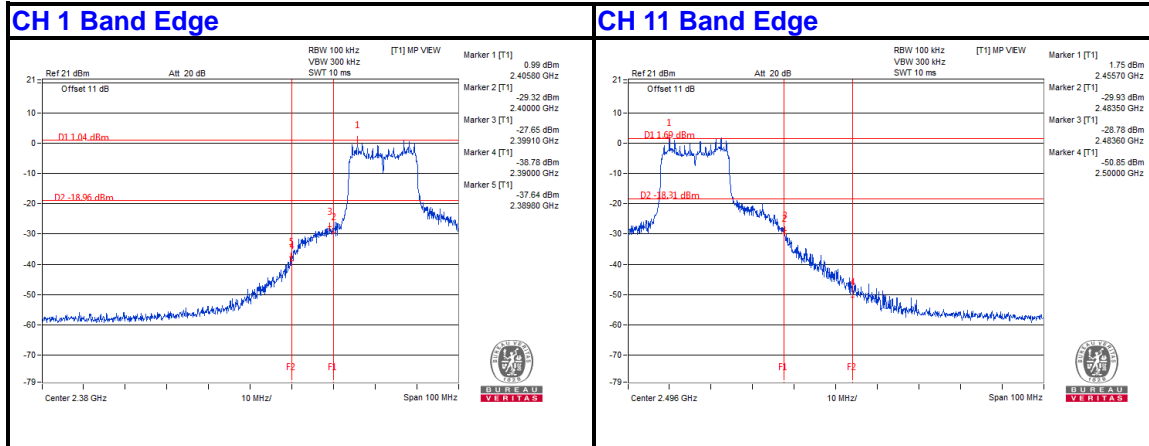
#### CH 11





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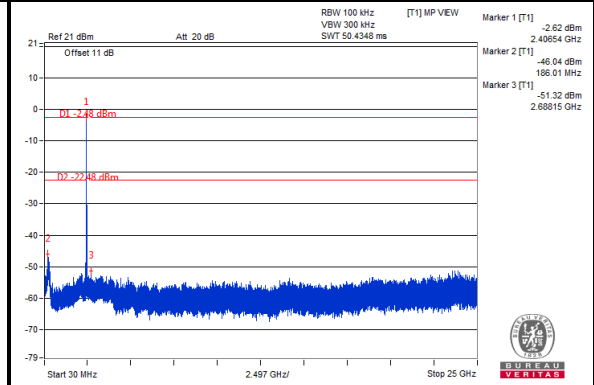
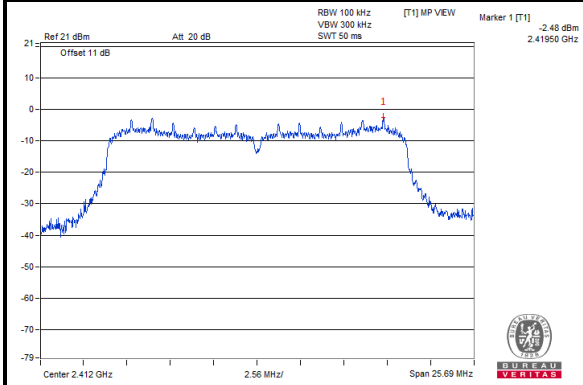


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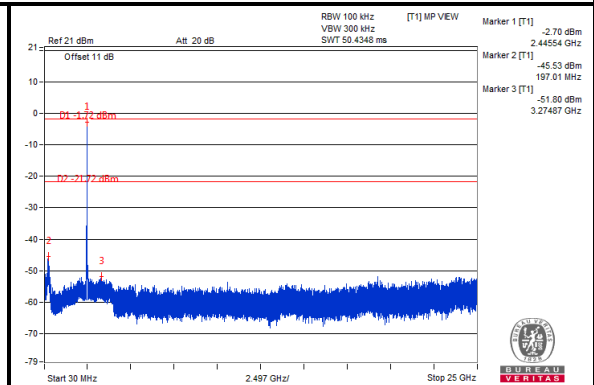
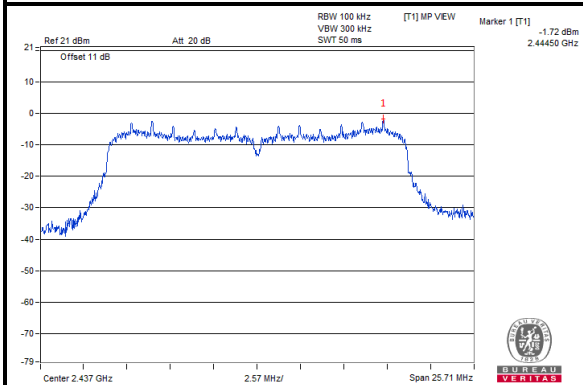
Test Report No.: RF161026W004-2

### 802.11n (20MHz)

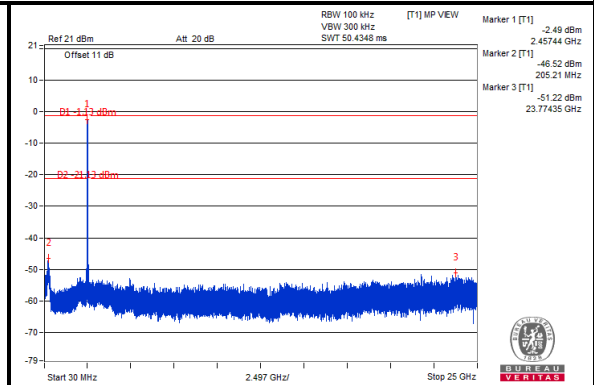
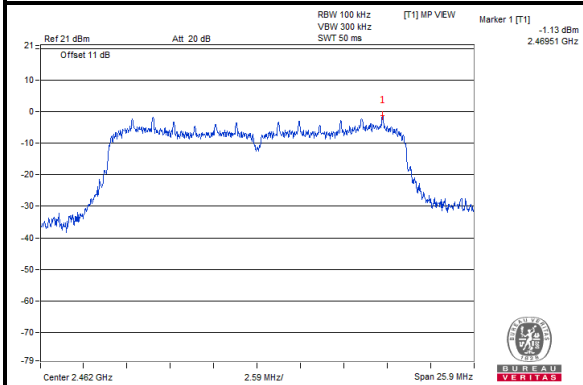
#### CH 1



#### CH 6



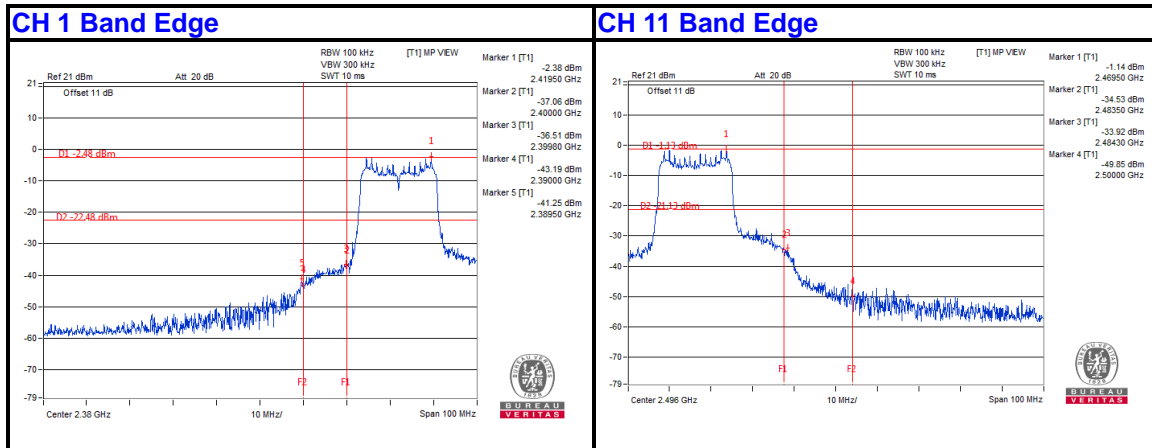
#### CH 11





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## 5 PHOTOGRAPHS OF THE TEST CONFIGURATION

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



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## **6 APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB**

No any modifications are made to the EUT by the lab during the test.

**---END---**