



BUREAU  
VERITAS

Test Report No.: RF160804W006-2



# FCC TEST REPORT

## (WIFI + BT LE)

**Product:** Laptop

**Model Name:** W1127, ELL1001

**FCC ID:** 2ACPR-W1127-ELL1001

**Applicant:** Shenzhen Bmorn Technology Co.,Ltd

**Address:** 5/F, Hengfang Verteran Industrial Park, Xingye Road, Xixiang Bao'an, Shenzhen, China

**Manufacturer:** Shenzhen Bmorn Technology Co.,Ltd

**Address:** 5/F, Hengfang Verteran Industrial Park, Xingye Road, Xixiang Bao'an, Shenzhen, China

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**Report No.:** RF160804W006-2

**Received Date:** Aug. 04, 2016

**Test Date:** Aug. 05, 2016 ~ Aug. 28, 2016

**Issued Date:** Aug. 29, 2016

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Test Report No.: RF160804W006-2

## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF160804W006-2	Original release	Aug. 29, 2016



# 1 CERTIFICATION

**PRODUCT:** Laptop  
**BRAND NAME:** BMORN  
**MODEL NAME:** W1127, ELL1001  
**APPLICANT:** Shenzhen Bmorn Technology Co.,Ltd  
**TESTED:** Aug. 05, 2016 ~ Aug. 28, 2016  
**TEST SAMPLE:** Production Unit  
**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:** Aug. 29, 2016  
( Yuqiang Yin / Engineer)

**APPROVED BY :** Bill Yao , **DATE:** Aug. 29, 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 16.89dB at 0.500000MHz.
15.205 15.209	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -2.04dB 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>	Laptop
<b>MODEL NAME</b>	W1127, ELL1001
<b>ADDITIONAL MODELS</b>	W1519, W1523, W1526, W1527, W1528, W1529, W1520, W1521, W1525
<b>NOMINAL VOLTAGE</b>	5.0Vdc (adapter or host equipment) 3.7Vdc dc (Li-ion, battery)
<b>MODULATION TECHNOLOGY</b>	DSSS, OFDM, DTS
<b>MODULATION TYPE</b>	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM BT-LE(GFSK) for DTS
<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) 2422-2452MHz for 11n(HT40) 2402-2480MHz for BT-LE(GFSK)
<b>MAX. OUTPUT POWER</b>	WLAN: 166.341mW (Maximum) BT-LE: 0.222mW (Maximum)
<b>ANTENNA TYPE</b>	PIFA Antenna with -3dBi gain
<b>I/O PORTS</b>	Refer to user's manual
<b>CABLE SUPPLIED</b>	N/A

**NOTE:**

- For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
- The EUT was powered by the following adapter:

<b>ADAPTER</b>	
<b>BRAND:</b>	Biron
<b>MODEL:</b>	BI18-050300-AdU
<b>INPUT:</b>	AC 100-240V, 800mA
<b>OUTPUT:</b>	DC 5V, 3000mA

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

<b>MODULATION MODE</b>	<b>TX/RX FUNCTION</b>
<b>802.11b</b>	1TX /1RX
<b>802.11g</b>	1TX /1RX
<b>802.11n (20MHz)</b>	1TX /1RX
<b>802.11n (40MHz)</b>	1TX /1RX



- 4. The above models are identical except the model name for marketing purpose.
- 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		

7 channels are provided for 802.11n (HT40):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
3	2422MHz	7	2442MHz
4	2427MHz	8	2447MHz
5	2432MHz	9	2452MHz
6	2437MHz		

40 channels are provided for BT-LE (GFSK):

CHANNEL	FREQ. (MHZ)	CHANNEL	FREQ. (MHZ)	CHANNEL	FREQ. (MHZ)	CHANNEL	FREQ. (MHZ)
0	2402	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	39	2480





### 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)
802.11g	1 to 11	11	CCK	DBPSK	1.0
BT-LE	0 to 39	19	DTS	GFSK	1



**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
802.11n HT40	3 to 9	3, 6, 9	OFDM	BPSK	13.5
BT-LE	0 to 39	0,19, 39	DTS	GFSK	1

**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)
BT-LE	0 to 19	19	DTS	GFSK	1

**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
802.11n HT40	3 to 9	3, 9	OFDM	BPSK	13.5
BT-LE	0 to 39	0, 39	DTS	GFSK	1



**ANTENNA PORT CONDUCTED MEASUREMENT:**

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

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
802.11n HT40	3 to 9	3,6, 9	OFDM	BPSK	13.5
BT-LE	0 to 39	0, 19, 39	DTS	GFSK	1

**TEST CONDITION:**

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	TEST VOLTAGE	TESTED BY
RE<1G	22deg. C, 54%RH	DC 5V from adaptor	Alex Chen
RE≥1G	22deg. C, 54%RH	DC 5V from adaptor	Alex Chen
PLC	25deg. C, 60%RH	DC 5V from adaptor	Yuqiang Yin
APCM	25deg. C, 60%RH	3.7Vdc 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.

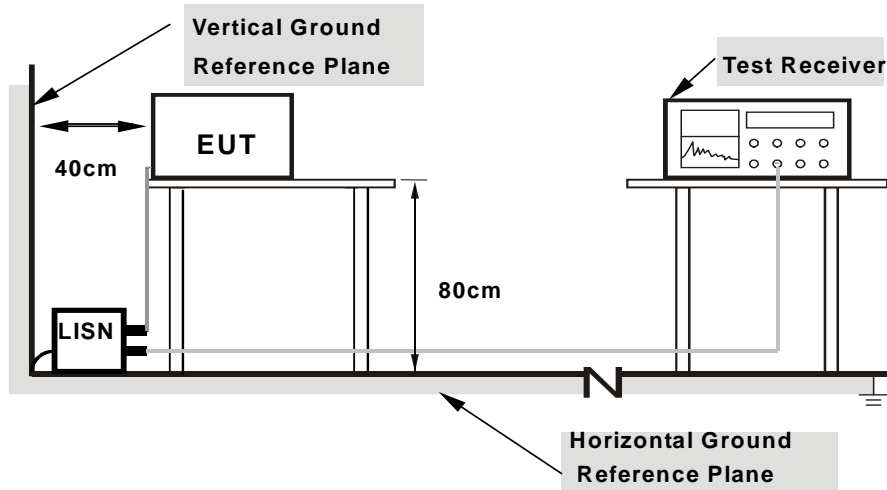
**NOTE:** All modes of operation were investigated and the worst-case emissions are reported.

#### 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

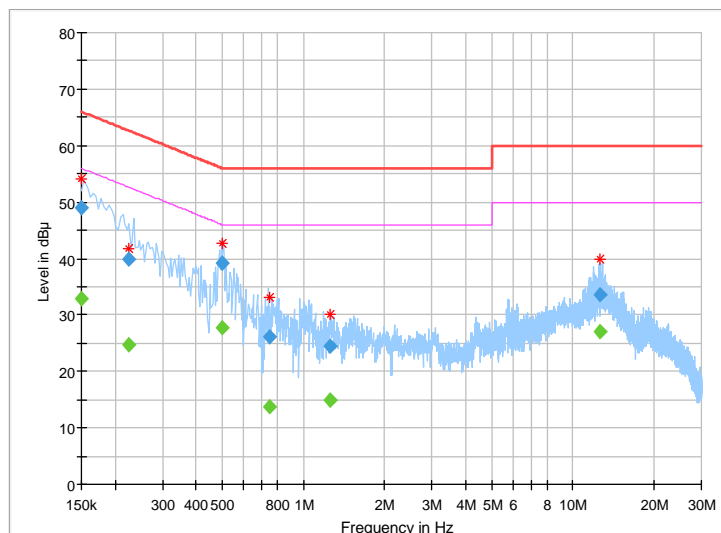
#### CONDUCTED WORST-CASE DATA:

<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>	25 deg. C, 65% RH
<b>Tested By</b>	Eric	<b>TEST DATE</b>	2016/08/08

Frequency (MHz)	QuasiPeak (dB $\mu$ V)	CAverage (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Line	Filter	Corr. (dB)
0.150000	---	32.92	56.00	23.08	L1	ON	9.6
0.150000	48.96	---	66.00	17.04	L1	ON	9.6
0.224000	---	24.66	52.67	28.01	L1	ON	9.7
0.224000	39.89	---	62.67	22.78	L1	ON	9.7
0.500000	---	27.65	46.00	18.35	L1	ON	9.7
<b>0.500000</b>	<b>39.11</b>	---	<b>56.00</b>	<b>16.89</b>	<b>L1</b>	<b>ON</b>	<b>9.7</b>
0.748000	---	13.85	46.00	32.15	L1	ON	9.7
0.748000	26.17	---	56.00	29.83	L1	ON	9.7
1.264000	---	14.84	46.00	31.16	L1	ON	9.7
1.264000	24.41	---	56.00	31.59	L1	ON	9.7
12.564000	---	27.02	50.00	22.98	L1	ON	9.9
12.564000	33.49	---	60.00	26.51	L1	ON	9.9

- 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





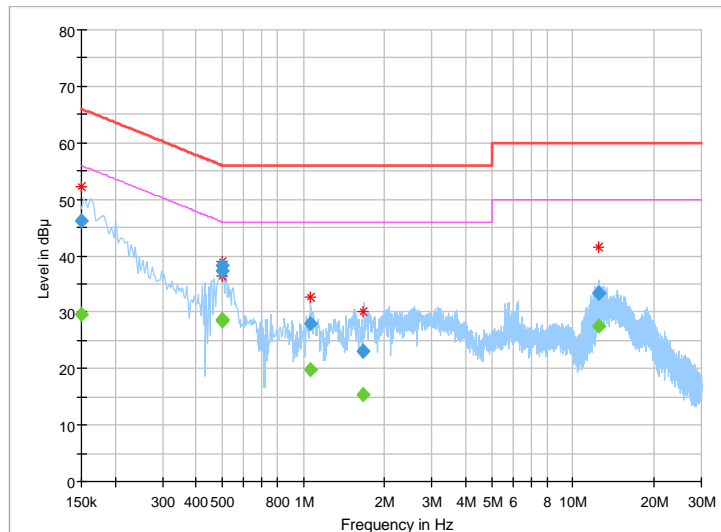


<b>Frequency Range</b>	150KHz ~ 30MHz	<b>Detector Function &amp; Resolution Bandwidth</b>	Quasi-Peak (QP) / Average (AV), 9 kHz
<b>Input Power</b>	120Vac, 60Hz	<b>Environmental Conditions</b>	25 deg. C, 65% RH
<b>Tested By</b>	Eric	<b>TEST DATE</b>	2016/08/08

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.150000	---	29.53	56.00	26.47	N	ON	9.8
0.150000	46.29	---	66.00	19.71	N	ON	9.8
0.500000	37.33	---	56.00	18.67	N	ON	10.1
0.500000	---	28.78	46.00	17.22	N	ON	10.1
0.502000	38.17	---	56.00	17.83	N	ON	10.1
0.502000	---	28.55	46.00	17.45	N	ON	10.1
1.068000	---	19.79	46.00	26.21	N	ON	9.9
1.068000	27.89	---	56.00	28.11	N	ON	9.9
1.660000	---	15.46	46.00	30.54	N	ON	9.8
1.660000	23.17	---	56.00	32.83	N	ON	9.8
12.500000	---	27.45	50.00	22.55	N	ON	9.9
12.500000	33.34	---	60.00	26.66	N	ON	9.9

- 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

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
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	Sep. 01,15	Aug. 31,16

**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.

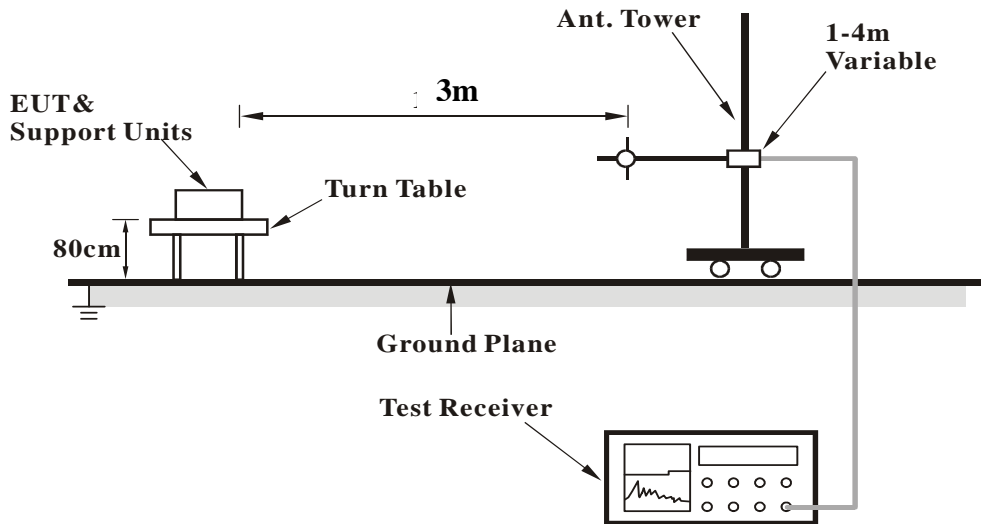
#### 4.2.4 DEVIATION FROM TEST STANDARD

No deviation

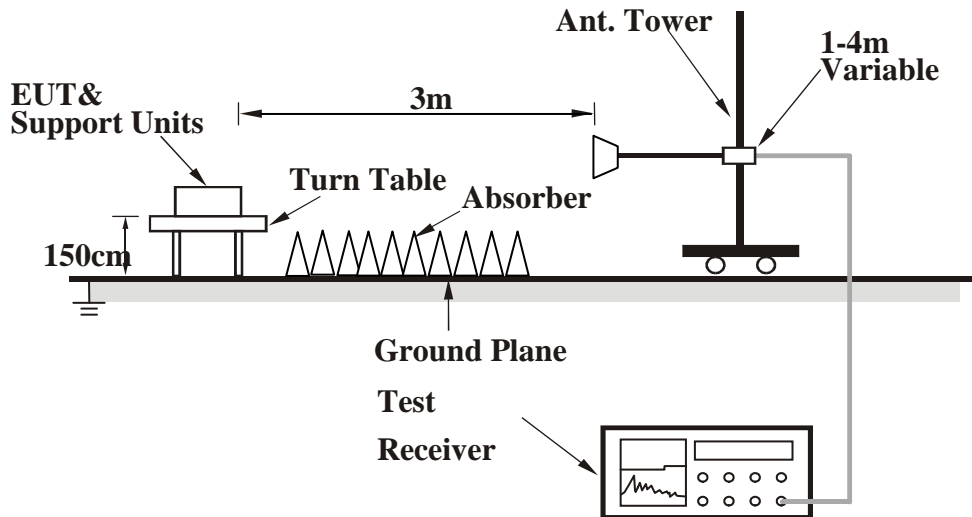


### 4.2.5 TEST SETUP

#### <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:**

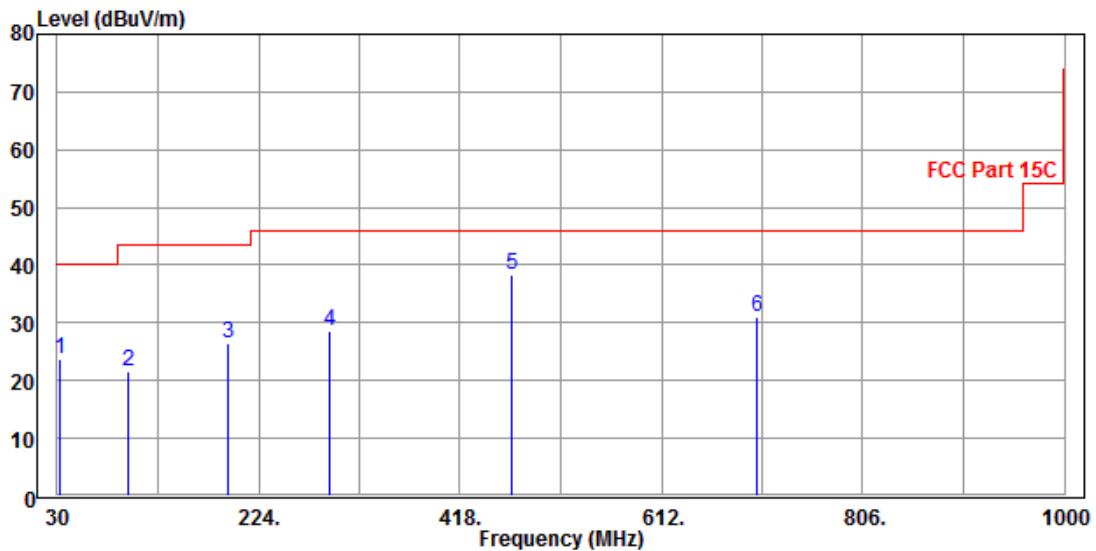
**802.11g**

<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
32.91	23.72	45.33	40.00	-16.28	15.09	0.84	37.54	100	15	QP
98.87	21.52	49.11	43.50	-21.98	7.88	1.53	37.00	100	40	QP
194.90	26.57	50.96	43.50	-16.93	10.05	2.14	36.58	100	90	QP
291.90	28.45	49.37	46.00	-17.55	12.90	2.68	36.50	100	124	QP
468.44	38.36	53.86	46.00	-7.64	18.02	3.36	36.88	100	182	QP
703.18	30.93	40.91	46.00	-15.07	23.10	4.29	37.37	100	256	QP

**REMARKS:**

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



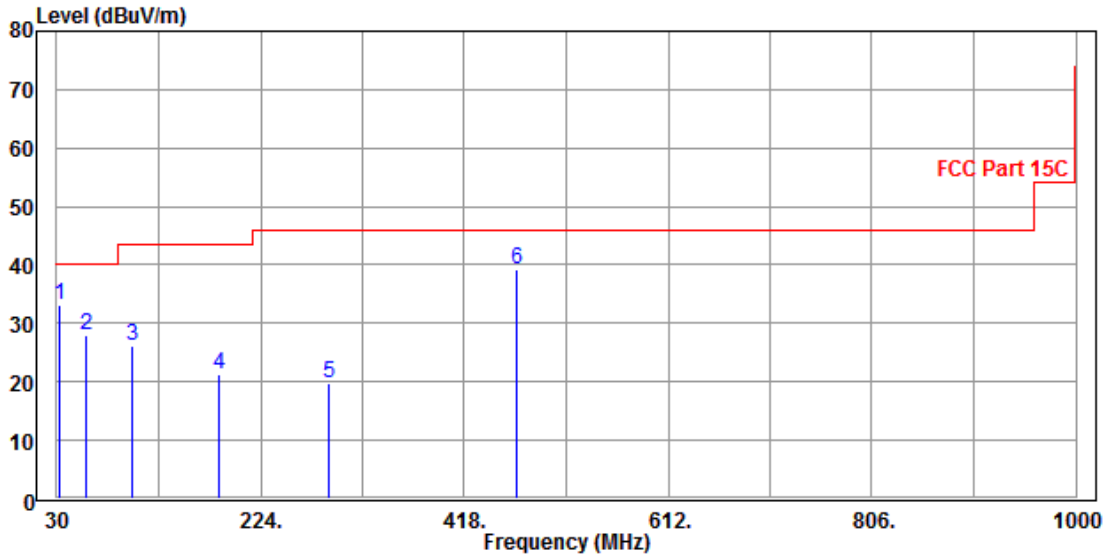


<b>CHANNEL</b>	TX Channel 11	<b>DETECTOR FUNCTION</b>	Quasi-Peak (QP)
<b>FREQUENCY RANGE</b>	30MHz ~ 1GHz		

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	33.26	54.87	40.00	-6.74	15.09	0.84	37.54	200	36	QP
57.16	28.03	57.79	40.00	-11.97	6.43	1.15	37.34	200	45	QP
101.78	26.28	53.78	43.50	-17.22	7.94	1.55	36.99	200	72	QP
185.20	21.25	45.86	43.50	-22.25	9.95	2.09	36.65	200	150	QP
288.99	19.91	40.88	46.00	-26.09	12.87	2.66	36.50	200	240	QP
468.44	39.36	54.86	46.00	-6.64	18.02	3.36	36.88	200	96	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	50.58	58.45	54.00	-3.42	32.29	8.15	48.31	110	250	Average
2390	56.05	63.92	74.00	-17.95	32.29	8.15	48.31	110	250	Peak
2412	100.84	108.65			32.31	8.19	48.31	110	250	Average
2412	103.40	111.21			32.31	8.19	48.31	110	250	Peak
2492	36.51	44.08	54.00	-17.49	32.39	8.34	48.30	110	250	Average
2492	47.30	54.87	74.00	-26.70	32.39	8.34	48.30	110	250	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
2386	39.80	47.68	54.00	-14.20	32.29	8.14	48.31	240	284	Average
2386	49.21	57.09	74.00	-24.79	32.29	8.14	48.31	240	284	Peak
2412	98.52	106.33			32.31	8.19	48.31	240	285	Average
2412	100.55	108.36			32.31	8.19	48.31	240	284	Peak
2492	35.13	42.70	54.00	-18.87	32.39	8.34	48.30	240	284	Average
2492	47.04	54.61	74.00	-26.96	32.39	8.34	48.30	240	284	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
2357	36.36	44.32	54.00	-17.64	32.26	8.09	48.31	112	252	Average
2357	48.40	56.36	74.00	-25.60	32.26	8.09	48.31	112	252	Peak
2437	100.12	107.85			32.34	8.24	48.31	112	252	Average
2437	102.27	110.00			32.34	8.24	48.31	112	252	Peak
2486	34.72	42.31	54.00	-19.28	32.39	8.32	48.30	112	252	Average
2486	47.11	54.70	74.00	-26.89	32.39	8.32	48.30	112	252	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
2323	40.29	48.36	54.00	-13.71	32.22	8.03	48.32	239	285	Average
2386	53.38	61.26	74.00	-20.62	32.29	8.14	48.31	239	285	Peak
2437	98.68	106.41			32.34	8.24	48.31	239	285	Average
2437	100.82	108.55			32.34	8.24	48.31	239	285	Peak
2487	34.76	42.34	54.00	-19.24	32.39	8.33	48.30	239	285	Average
2487	47.01	54.59	74.00	-26.99	32.39	8.33	48.30	239	285	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
2387	34.09	41.96	54.00	-19.91	32.29	8.15	48.31	105	248	Average
2387	45.21	53.08	74.00	-28.79	32.29	8.15	48.31	105	248	Peak
2462	102.16	109.82			32.36	8.28	48.30	105	248	Average
2462	104.43	112.09			32.36	8.28	48.30	105	248	Peak
2488	51.42	59.00	54.00	-2.58	32.39	8.33	48.30	105	248	Average
2488	56.72	64.30	74.00	-17.28	32.39	8.33	48.30	105	248	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
2382	34.06	41.95	54.00	-19.94	32.28	8.14	48.31	240	300	Average
2382	54.65	62.54	74.00	-19.35	32.28	8.14	48.31	240	300	Peak
2462	98.42	106.08			32.36	8.28	48.30	240	300	Average
2462	100.9	108.56			32.36	8.28	48.30	240	300	Peak
2484	40.93	48.53	54.00	-13.07	32.38	8.32	48.30	240	300	Average
2484	50.49	58.09	74.00	-23.51	32.38	8.32	48.30	240	300	Peak

**REMARKS:**

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.
2. 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	51.34	59.21	54.00	-2.66	32.29	8.15	48.31	110	250	Average
2390	67.40	75.27	74.00	-6.60	32.29	8.15	48.31	110	250	Peak
2412	94.09	101.90			32.31	8.19	48.31	110	250	Average
2412	101.72	109.53			32.31	8.19	48.31	110	250	Peak
2492	38.49	46.06	54.00	-15.51	32.39	8.34	48.30	110	250	Average
2492	48.06	55.63	74.00	-25.94	32.39	8.34	48.30	110	250	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	38.88	46.75	54.00	-15.12	32.29	8.15	48.31	238	296	Average
2390	53.40	61.27	74.00	-20.60	32.29	8.15	48.31	238	296	Peak
2412	87.63	95.44			32.31	8.19	48.31	238	296	Average
2412	95.63	103.44			32.31	8.19	48.31	238	296	Peak
2492	38.49	46.06	54.00	-15.51	32.39	8.34	48.30	238	296	Average
2492	48.35	55.92	74.00	-25.65	32.39	8.34	48.30	238	296	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
2364	36.70	44.64	54.00	-17.30	32.26	8.11	48.31	108	248	Average
2364	47.71	55.65	74.00	-26.29	32.26	8.11	48.31	108	248	Peak
2437	97.18	104.91			32.34	8.24	48.31	108	248	Average
2437	105.07	112.80			32.34	8.24	48.31	108	248	Peak
2483.5	36.53	44.13	54.00	-17.47	32.38	8.32	48.30	108	248	Average
2483.5	56.22	63.82	74.00	-17.78	32.38	8.32	48.30	108	248	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
2382	34.16	42.05	54.00	-19.84	32.28	8.14	48.31	100	296	Average
2382	51.83	59.72	74.00	-22.17	32.28	8.14	48.31	100	296	Peak
2437	92.88	100.61			32.34	8.24	48.31	100	296	Average
2437	100.66	108.39			32.34	8.24	48.31	100	296	Peak
2483.5	36.76	44.36	54.00	-17.24	32.38	8.32	48.30	100	296	Average
2483.5	48.37	55.97	74.00	-25.63	32.38	8.32	48.30	100	296	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)

<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
2354	36.30	44.27	54.00	-17.70	32.25	8.09	48.31	108	250	Average
2354	54.28	62.25	74.00	-19.72	32.25	8.09	48.31	108	250	Peak
2462	94.44	102.10			32.36	8.28	48.30	108	250	Average
2462	102.02	109.68			32.36	8.28	48.30	108	250	Peak
<b>2483.5</b>	<b>51.96</b>	<b>59.56</b>	<b>54.00</b>	<b>-2.04</b>	<b>32.38</b>	<b>8.32</b>	<b>48.30</b>	<b>108</b>	<b>250</b>	<b>Average</b>
2483.5	66.70	74.30	74.00	-7.30	32.38	8.32	48.30	108	250	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
2352	34.21	42.19	54.00	-19.79	32.25	8.08	48.31	100	298	Average
2352	46.65	54.63	74.00	-27.35	32.25	8.08	48.31	100	298	Peak
2462	89.91	97.57			32.36	8.28	48.30	100	298	Average
2462	97.56	105.22			32.36	8.28	48.30	100	298	Peak
2483.5	42.15	49.75	54.00	-11.85	32.38	8.32	48.30	100	298	Average
2483.5	56.12	63.72	74.00	-17.88	32.38	8.32	48.30	100	298	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)

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	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	51.64	59.51	54.00	-2.36	32.29	8.15	48.31	110	250	Average
2390	69.90	77.77	74.00	-4.10	32.29	8.15	48.31	110	250	Peak
2412	92.51	100.32			32.31	8.19	48.31	110	250	Average
2412	100.61	108.42			32.31	8.19	48.31	110	250	Peak
2492	39.16	46.73	54.00	-14.84	32.39	8.34	48.30	110	250	Average
2492	48.51	56.08	74.00	-25.49	32.39	8.34	48.30	110	250	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	38.59	46.46	54.00	-15.41	32.29	8.15	48.31	220	296	Average
2390	54.37	62.24	74.00	-19.63	32.29	8.15	48.31	220	296	Peak
2412	86.20	94.01			32.31	8.19	48.31	220	296	Average
2412	94.73	102.54			32.31	8.19	48.31	220	296	Peak
2492	36.00	43.57	54.00	-18.00	32.39	8.34	48.30	220	296	Average
2492	47.06	54.63	74.00	-26.94	32.39	8.34	48.30	220	296	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
2363	36.78	44.73	54.00	-17.22	32.26	8.10	48.31	108	247	Average
2363	48.23	56.18	74.00	-25.77	32.26	8.10	48.31	108	247	Peak
2437	96.14	103.87			32.34	8.24	48.31	108	247	Average
2437	103.94	111.67			32.34	8.24	48.31	108	247	Peak
2485	36.56	44.15	54.00	-17.44	32.39	8.32	48.30	108	247	Average
2485	48.07	55.66	74.00	-25.93	32.39	8.32	48.30	108	247	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
2338	34.23	42.25	54.00	-19.77	32.24	8.06	48.32	100	296	Average
2338	46.71	54.73	74.00	-27.29	32.24	8.06	48.32	100	296	Peak
2437	91.93	99.66			32.34	8.24	48.31	100	296	Average
2437	99.79	107.52			32.34	8.24	48.31	100	296	Peak
2485	36.60	44.19	54.00	-17.40	32.39	8.32	48.30	100	296	Average
2485	48.54	56.13	74.00	-25.46	32.39	8.32	48.30	100	296	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
2382	36.31	44.20	54.00	-17.69	32.28	8.14	48.31	108	255	Average
2382	47.13	55.02	74.00	-26.87	32.28	8.14	48.31	108	255	Peak
2462	92.52	100.18			32.36	8.28	48.30	108	255	Average
2462	100.22	107.88			32.36	8.28	48.30	108	255	Peak
2483.5	50.95	58.55	54.00	-3.05	32.38	8.32	48.30	108	255	Average
2483.5	66.61	74.21	74.00	-7.39	32.38	8.32	48.30	108	255	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
2343	34.36	42.37	54.00	-19.64	32.24	8.07	48.32	100	295	Average
2343	48.80	56.81	74.00	-25.20	32.24	8.07	48.32	100	295	Peak
2462	88.39	96.05			32.36	8.28	48.30	100	295	Average
2462	96.26	103.92			32.36	8.28	48.30	100	295	Peak
2483.5	40.49	48.09	54.00	-13.51	32.38	8.32	48.30	100	295	Average
2483.5	55.12	62.72	74.00	-18.88	32.38	8.32	48.30	100	295	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 (40MHz)**

<b>CHANNEL</b>	TX Channel 3	<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	51.12	58.99	54.00	-2.88	32.29	8.15	48.31	110	250	Average
2390	66.27	74.14	74.00	-7.73	32.29	8.15	48.31	110	250	Peak
2422	88.20	95.98			32.32	8.21	48.31	110	250	Average
2422	96.63	104.41			32.32	8.21	48.31	110	250	Peak
2484.7	36.01	43.61	54.00	-17.99	32.38	8.32	48.30	110	250	Average
2484.7	47.68	55.28	74.00	-26.32	32.38	8.32	48.30	110	250	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	36.99	44.86	54.00	-17.01	32.29	8.15	48.31	100	293	Average
2390	49.65	57.52	74.00	-24.35	32.29	8.15	48.31	100	293	Peak
2422	81.41	89.19			32.32	8.21	48.31	100	293	Average
2422	90.59	98.37			32.32	8.21	48.31	100	293	Peak
2484.8	35.84	43.44	54.00	-18.16	32.38	8.32	48.30	100	293	Average
2484.8	47.51	55.11	74.00	-26.49	32.38	8.32	48.30	100	293	Peak

**REMARKS:**

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.
2. 2422MHz: 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	50.68	58.55	54.00	-3.32	32.29	8.15	48.31	110	248	Average
2390	65.99	73.86	74.00	-8.01	32.29	8.15	48.31	110	248	Peak
2437	91.27	99.00			32.34	8.24	48.31	110	248	Average
2437	99.60	107.33			32.34	8.24	48.31	110	248	Peak
2483.5	49.13	56.73	54.00	-4.87	32.38	8.32	48.30	110	248	Average
2483.5	63.59	71.19	74.00	-10.41	32.38	8.32	48.30	110	248	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	42.65	50.52	54.00	-11.35	32.29	8.15	48.31	100	300	Average
2390	57.30	65.17	74.00	-16.70	32.29	8.15	48.31	100	300	Peak
2437	88.92	96.65			32.34	8.24	48.31	100	300	Average
2437	97.16	104.89			32.34	8.24	48.31	100	300	Peak
2483.5	46.72	54.32	54.00	-7.28	32.38	8.32	48.30	100	300	Average
2483.5	61.32	68.92	74.00	-12.68	32.38	8.32	48.30	100	300	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 9	<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
2371	39.64	47.56	54.00	-14.36	32.27	8.12	48.31	110	249	Average
2371	47.74	55.66	74.00	-26.26	32.27	8.12	48.31	110	249	Peak
2452	88.36	96.05			32.35	8.26	48.30	110	249	Average
2452	96.67	104.36			32.35	8.26	48.30	110	249	Peak
2483.5	50.28	57.88	54.00	-3.72	32.38	8.32	48.30	110	249	Average
2483.5	62.50	70.10	74.00	-11.50	32.38	8.32	48.30	110	249	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
2372	34.72	42.64	54.00	-19.28	32.27	8.12	48.31	100	296	Average
2372	47.48	55.40	74.00	-26.52	32.27	8.12	48.31	100	296	Peak
2452	84.53	92.22			32.35	8.26	48.30	100	296	Average
2452	92.87	100.56			32.35	8.26	48.30	100	296	Peak
2483.5	41.07	48.67	54.00	-12.93	32.38	8.32	48.30	100	296	Average
2483.5	54.41	62.01	74.00	-19.59	32.38	8.32	48.30	100	296	Peak

**REMARKS:**

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.
2. 2452MHz: Fundamental frequency.



**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:**

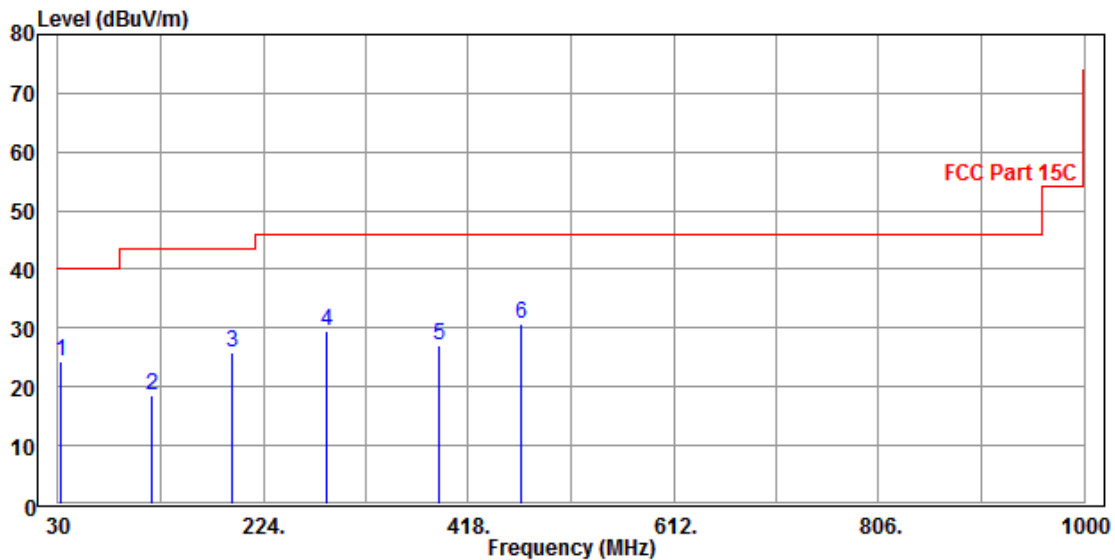
**BT-LE (GFSK)**

<b>CHANNEL</b>	TX Channel 19	<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
32.91	24.24	45.85	40.00	-15.76	15.09	0.84	37.54	100	24	QP
118.27	18.44	46.35	43.50	-25.06	7.36	1.67	36.94	100	60	QP
194.9	25.74	50.13	43.50	-17.76	10.05	2.14	36.58	100	98	QP
283.17	29.61	50.69	46.00	-16.39	12.80	2.63	36.51	100	144	QP
390.84	27.05	43.82	46.00	-18.95	16.82	3.11	36.70	100	240	QP
468.44	30.72	46.22	46.00	-15.28	18.02	3.36	36.88	100	286	QP

**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



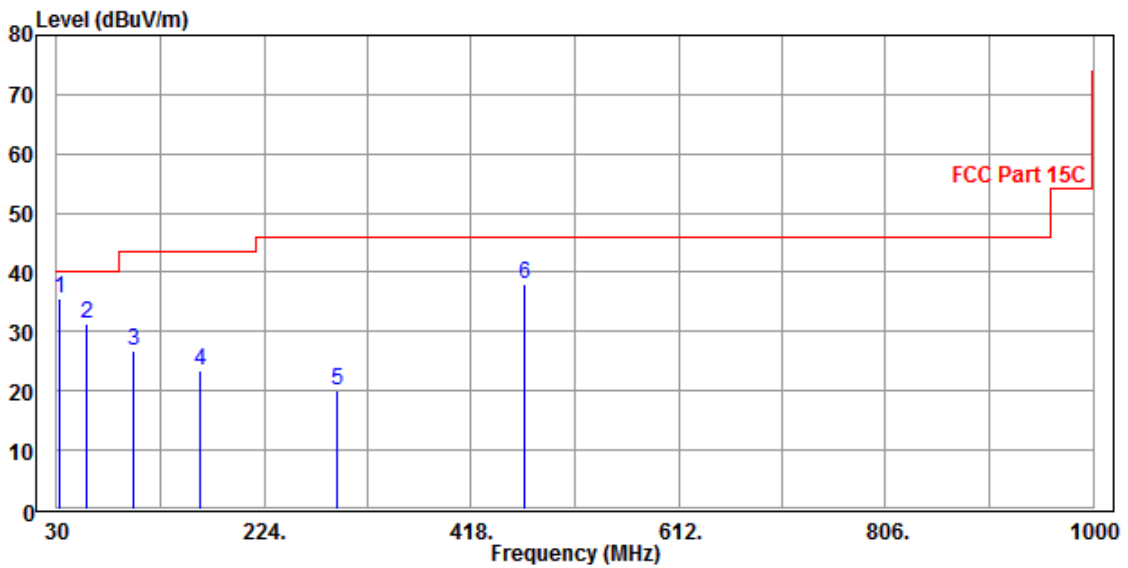


<b>CHANNEL</b>	TX Channel 19	<b>DETECTOR FUNCTION</b>	Quasi-Peak (QP)
<b>FREQUENCY RANGE</b>	30MHz ~ 1GHz		

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	35.58	57.19	40.00	-4.42	15.09	0.84	37.54	100	18	QP
57.16	31.34	61.10	40.00	-8.66	6.43	1.15	37.34	100	45	QP
101.78	26.83	54.33	43.50	-16.67	7.94	1.55	36.99	100	72	QP
164.83	23.27	47.91	43.50	-20.23	10.13	1.96	36.73	100	148	QP
292.87	20.19	41.10	46.00	-25.81	12.91	2.68	36.50	100	240	QP
468.44	38.17	53.67	46.00	-7.83	18.02	3.36	36.88	100	296	QP

**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





**BUREAU VERITAS** Test Report No.: RF160804W006-2

**ABOVE 1GHz TEST DATA:**

**BT-LE (GFSK)**

<b>CHANNEL</b>	TX Channel 0	<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
2362	40.84	48.79	54.00	-13.16	32.26	8.10	48.31	110	162	Average
2362	57.74	65.69	74.00	-16.26	32.26	8.10	48.31	110	162	Peak
2402	91.49	99.33			32.30	8.17	48.31	110	162	Average
2402	107.92	115.76			32.30	8.17	48.31	110	162	Peak
2499	38.21	45.76	54.00	-15.79	32.40	8.35	48.30	110	162	Average
2499	50.30	57.85	74.00	-23.70	32.40	8.35	48.30	110	162	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
2338	41.48	49.50	54.00	-12.52	32.24	8.06	48.32	105	290	Average
2338	53.08	61.10	74.00	-20.92	32.24	8.06	48.32	105	290	Peak
2402	84.55	92.39			32.30	8.17	48.31	105	290	Average
2402	101.12	108.96			32.30	8.17	48.31	105	290	Peak
2496	38.21	45.77	54.00	-15.79	32.40	8.34	48.30	105	290	Average
2496	50.56	58.12	74.00	-23.44	32.40	8.34	48.30	105	290	Peak

**REMARKS:**

- Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.
- 2402MHz: Fundamental frequency.



<b>CHANNEL</b>	TX Channel 19	<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
2328	45.92	53.97	54.00	-8.08	32.23	8.04	48.32	108	155	Average
2328	57.70	65.75	74.00	-16.30	32.23	8.04	48.32	108	155	Peak
2440	89.32	97.05			32.34	8.24	48.31	108	155	Average
2440	105.62	113.35			32.34	8.24	48.31	108	155	Peak
2492	38.69	46.26	54.00	-15.31	32.39	8.34	48.30	108	155	Average
2492	51.69	59.26	74.00	-22.31	32.39	8.34	48.30	108	155	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
2358	40.92	48.88	54.00	-13.08	32.26	8.09	48.31	100	291	Average
2358	58.96	66.92	74.00	-15.04	32.26	8.09	48.31	100	291	Peak
2440	84.37	92.10			32.34	8.24	48.31	100	291	Average
2440	100.81	108.54			32.34	8.24	48.31	100	291	Peak
2492	38.52	46.09	54.00	-15.48	32.39	8.34	48.30	100	291	Average
2492	50.14	57.71	74.00	-23.86	32.39	8.34	48.30	100	291	Peak

**REMARKS:**

- Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.
- 2440MHz: Fundamental frequency.





<b>CHANNEL</b>	TX Channel 39	<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
2338	39.70	47.72	54.00	-14.30	32.24	8.06	48.32	105	160	Average
2338	58.03	66.05	74.00	-15.97	32.24	8.06	48.32	105	160	Peak
2480	90.15	97.76			32.38	8.31	48.30	105	160	Average
2480	106.46	114.07			32.38	8.31	48.30	105	160	Peak
2483.5	39.02	46.62	54.00	-14.98	32.38	8.32	48.30	105	160	Average
2483.5	61.36	68.96	74.00	-12.64	32.38	8.32	48.30	105	160	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
2358	39.83	47.79	54.00	-14.17	32.26	8.09	48.31	100	305	Average
2358	56.67	64.63	74.00	-17.33	32.26	8.09	48.31	100	305	Peak
2480	84.85	92.46			32.38	8.31	48.30	100	305	Average
2480	101.05	108.66			32.38	8.31	48.30	100	305	Peak
2488	38.46	46.04	54.00	-15.54	32.39	8.33	48.30	100	305	Average
2488	56.42	64.00	74.00	-17.58	32.39	8.33	48.30	100	305	Peak

**REMARKS:**

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.
2. 2480MHz: 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
Digital Multimeter	FLUKE	15B	A1220010DG	Oct. 12, 15	Oct.11, 16
Humid & Temp Programmable Tester	Haida	HD-2257	110807201	Sep.07,15	Sep. 06,16
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
10dB Attenuator	JFW/USA	50HF-010-SMA	1505	Jul. 27, 16	Jul. 26, 17
ESG Vector Signal Generator	Agilent	E4438C	MY49072505	Apr. 22, 16	Apr. 21, 17
BLUETOOTH TESTER	Rohde&Schwarz	CBT32	100811	Oct. 01,15	Sep. 31,16

**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

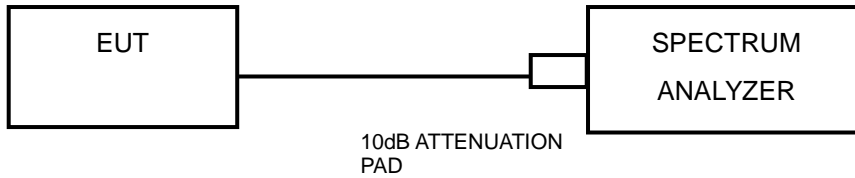
1. Set RBW = 100 kHz.
2. Set the video bandwidth (VBW) ≥ 3 RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points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

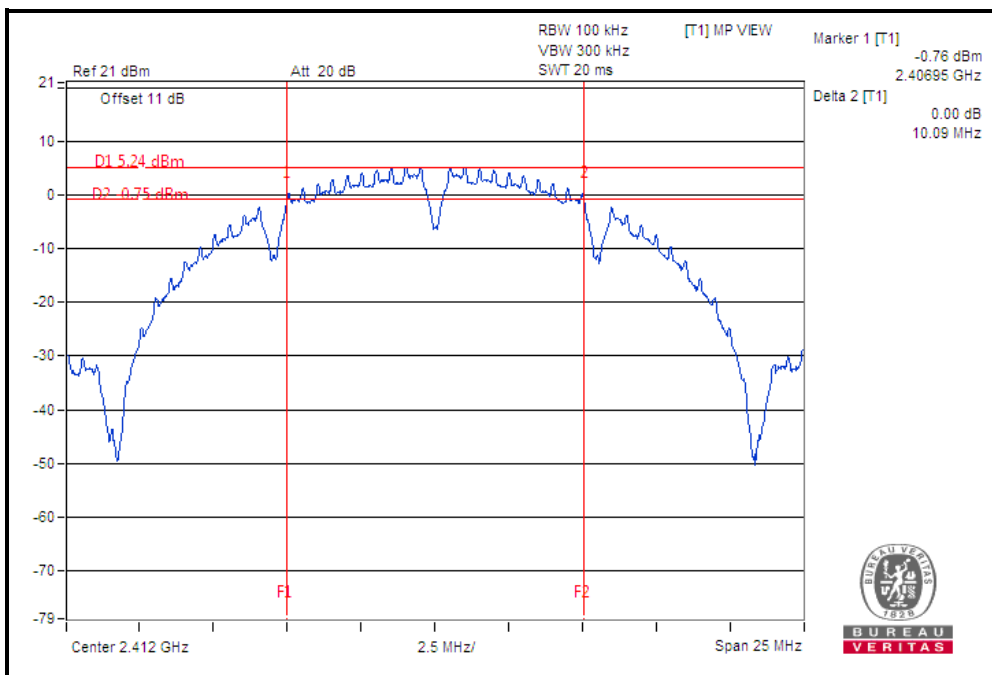
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.



### 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	10.09	0.5	PASS
11	2462	10.08	0.5	PASS



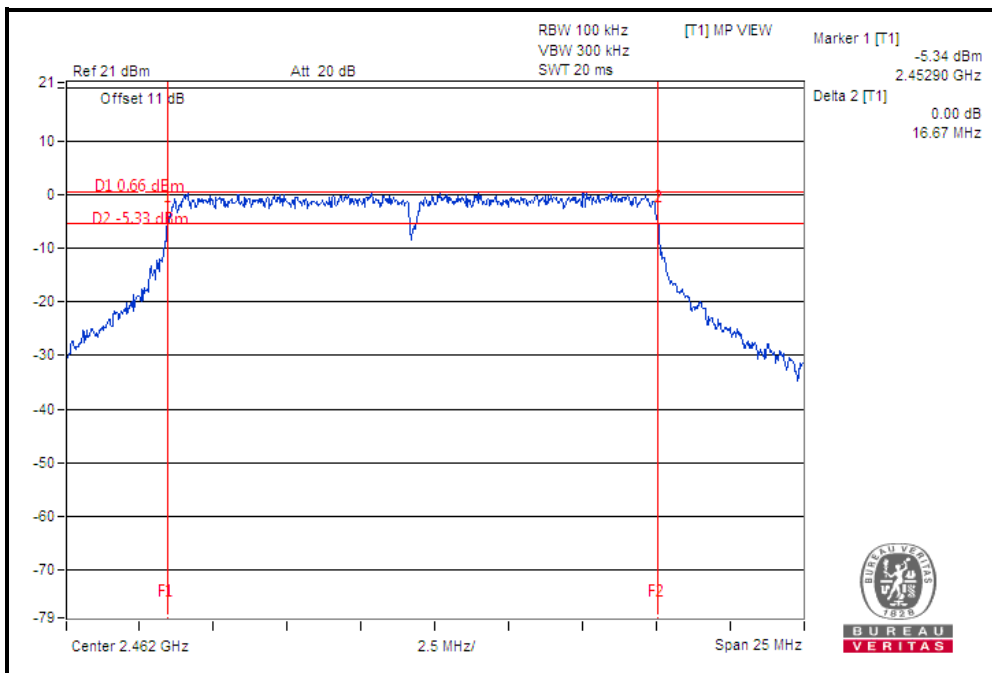


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802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	16.59	0.5	PASS
6	2437	16.59	0.5	PASS
11	2462	16.67	0.5	PASS



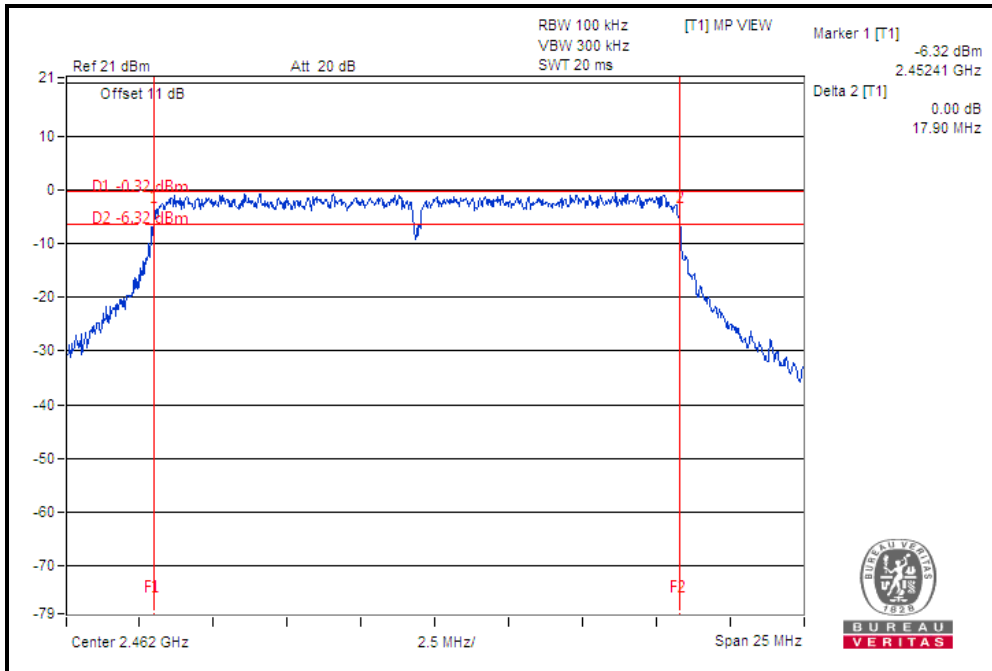


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Test Report No.: RF160804W006-2

802.11n (20MHz)

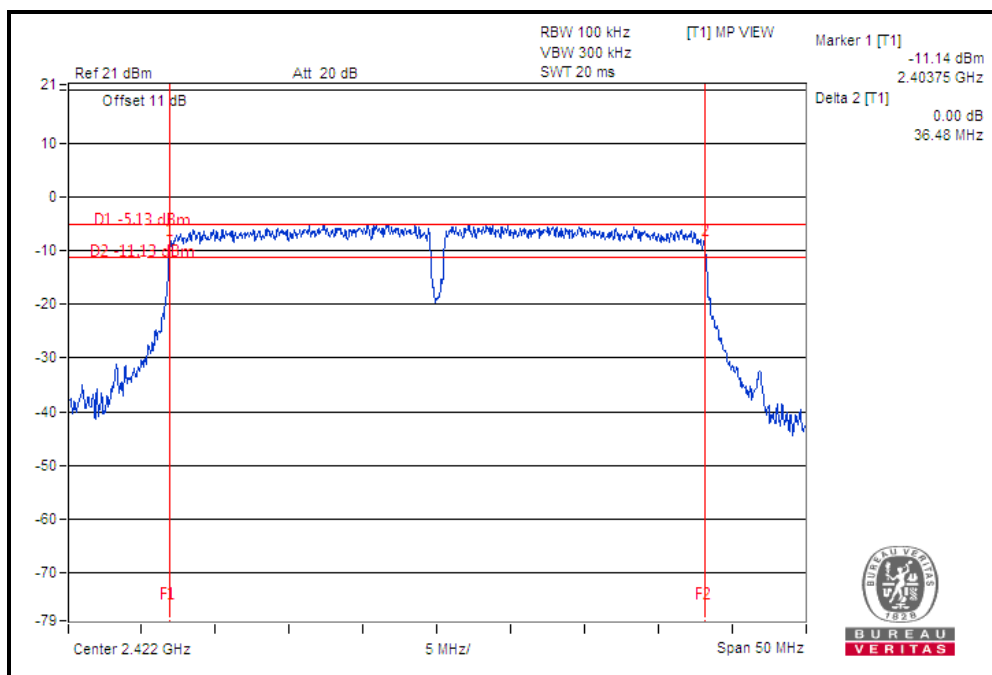
CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	17.83	0.5	PASS
6	2437	17.83	0.5	PASS
11	2462	17.90	0.5	PASS





**802.11n (40MHz)**

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
3	2422	36.48	0.5	PASS
6	2437	36.44	0.5	PASS
9	2452	36.43	0.5	PASS



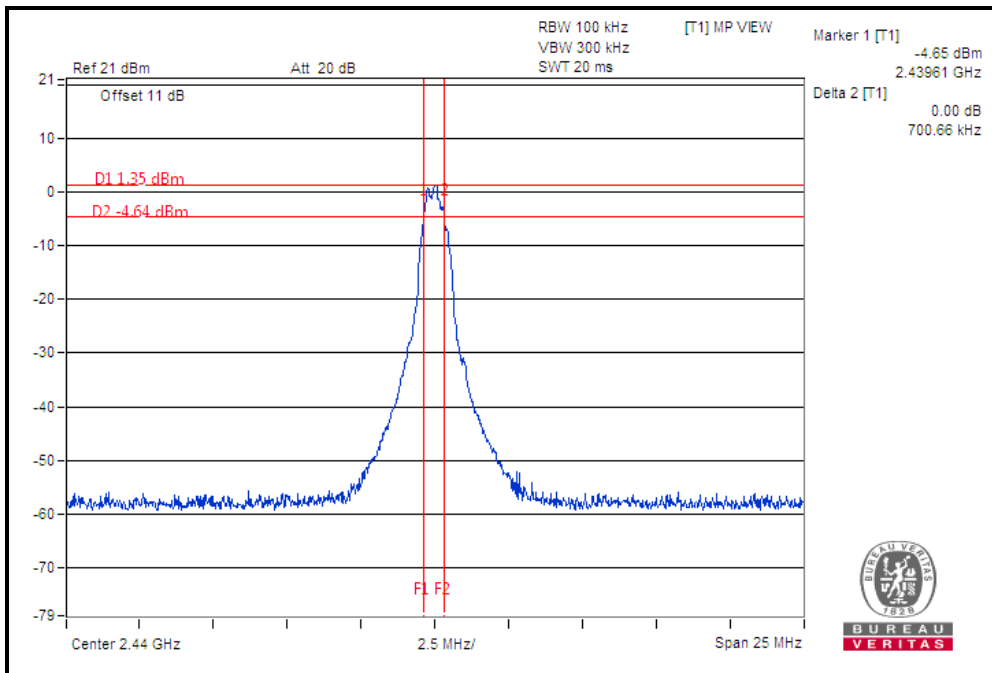


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Test Report No.: RF160804W006-2

**BT-LE (GFSK)**

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
0	2402	0.59	0.5	PASS
19	2440	0.70	0.5	PASS
39	2480	0.70	0.5	PASS





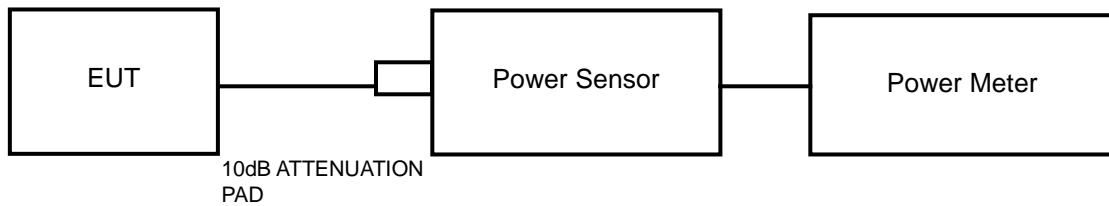


#### 4.4 CONDUCTED OUTPUT POWER

##### 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	18.26	66.988	1	PASS
6	2437	18.37	68.707	1	PASS
11	2462	18.52	71.121	1	PASS

802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (dBm)	PEAK POWER (mW)	PEAK POWER LIMIT(W)	PASS/FAIL
1	2412	20.28	106.660	1	PASS
6	2437	21.37	137.088	1	PASS
11	2462	21.50	141.254	1	PASS

802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (dBm)	PEAK POWER (mW)	PEAK POWER LIMIT(W)	PASS/FAIL
1	2412	20.52	112.720	1	PASS
6	2437	21.42	138.676	1	PASS
11	2462	22.21	<b>166.341</b>	1	PASS

802.11n (40MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (dBm)	PEAK POWER (mW)	PEAK POWER LIMIT(W)	PASS/FAIL
3	2422	21.22	132.434	1	PASS
6	2437	20.02	100.462	1	PASS
9	2452	20.83	121.060	1	PASS



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BT-LE (GFSK)

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (dBm)	PEAK POWER (mW)	PEAK POWER LIMIT(W)	PASS/FAIL
0	2402	-6.54	<b>0.222</b>	1	PASS
19	2440	-6.68	0.215	1	PASS
39	2480	-7.08	0.196	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	16.30	N/A
6	2437	16.38	N/A
11	2462	16.61	N/A

**802.11g**

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)	PASS/FAIL
1	2412	15.14	N/A
6	2437	15.43	N/A
11	2462	15.11	N/A

**802.11n (20MHz)**

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)	PASS/FAIL
1	2412	14.12	N/A
6	2437	14.46	N/A
11	2462	14.34	N/A

**802.11n (40MHz)**

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)	PASS/FAIL
3	2422	14.06	N/A
6	2437	13.77	N/A
9	2452	14.04	N/A



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**BT-LE (GFSK)**

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (dBm)	PASS/FAIL
0	2402	-6.95	N/A
19	2440	-7.22	N/A
39	2480	-7.70	N/A

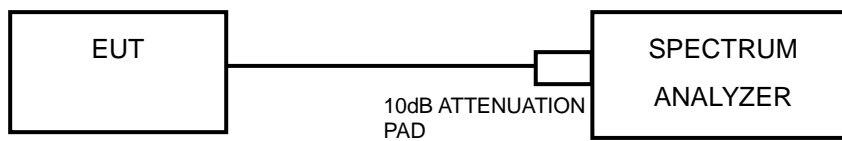


## 4.5 POWER SPECTRAL DENSITY MEASUREMENT

### 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  $\geq 3 \times$  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

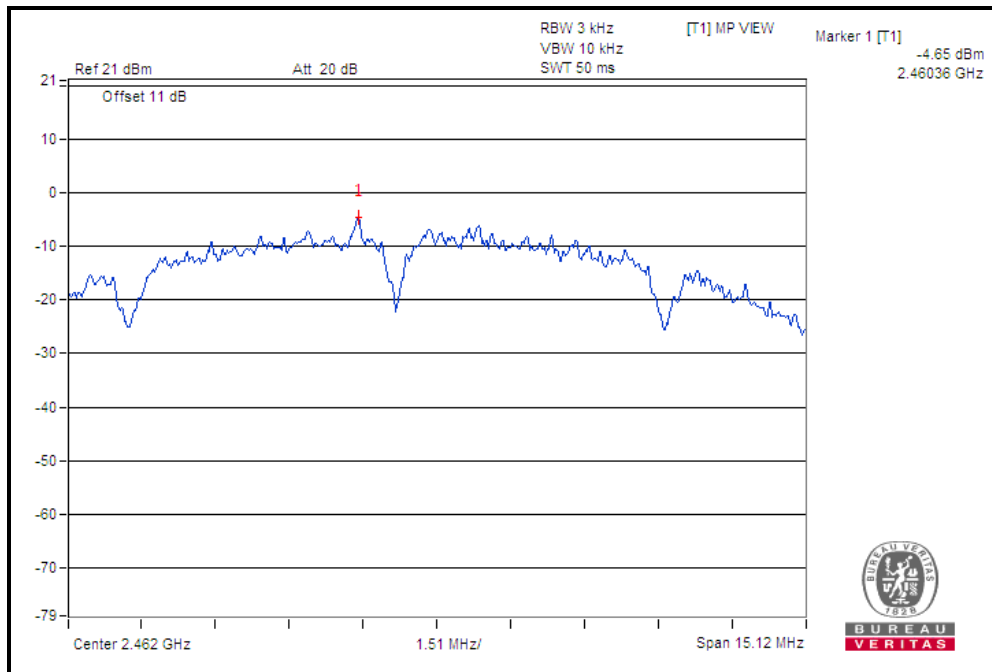
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.



### 4.5.7 TEST RESULTS

#### 802.11b

Channel	FREQ. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	-4.71	8	PASS
6	2437	-4.77	8	PASS
11	2462	-4.65	8	PASS



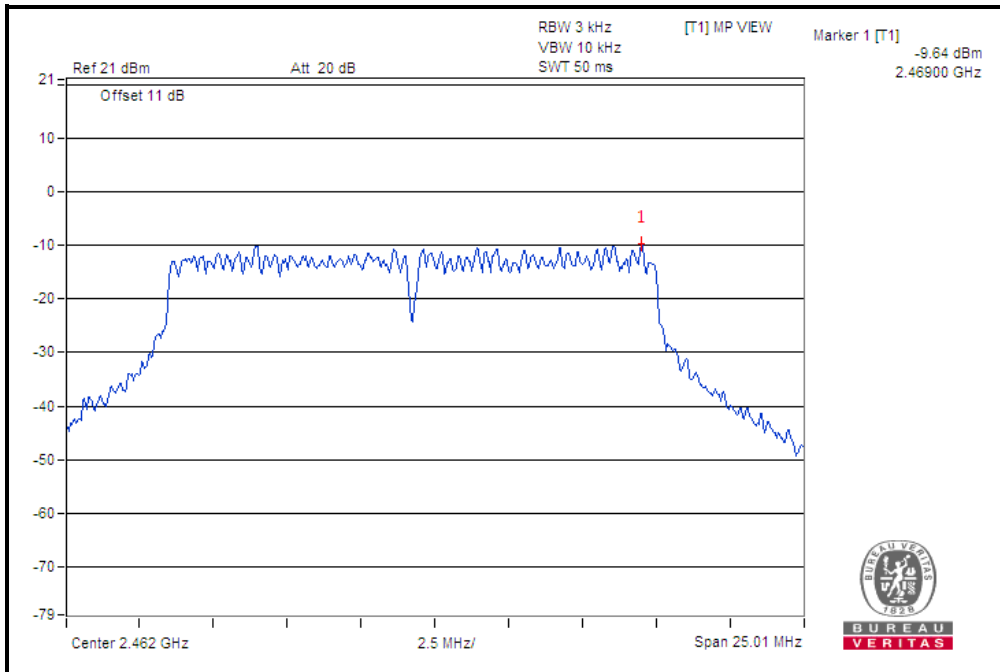


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**Test Report No.: RF160804W006-2**

**802.11g**

Channel	FREQ. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	-10.35	8	PASS
6	2437	-10.25	8	PASS
11	2462	-9.64	8	PASS





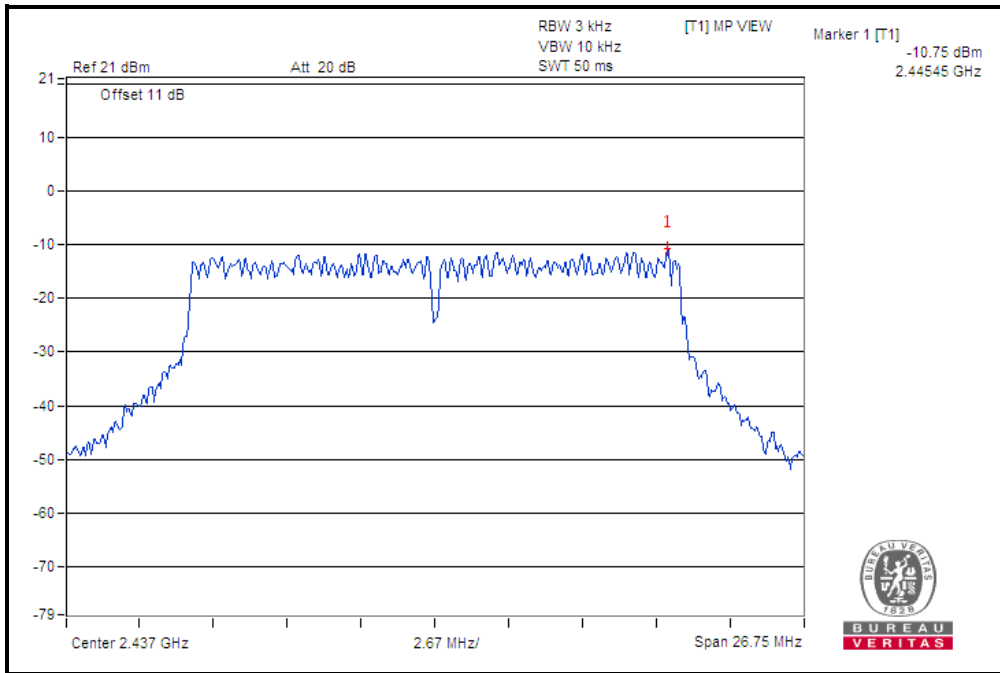


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**Test Report No.: RF160804W006-2**

**802.11n (20MHz)**

Channel	FREQ. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	-11.08	8	PASS
6	2437	-10.75	8	PASS
11	2462	-10.87	8	PASS



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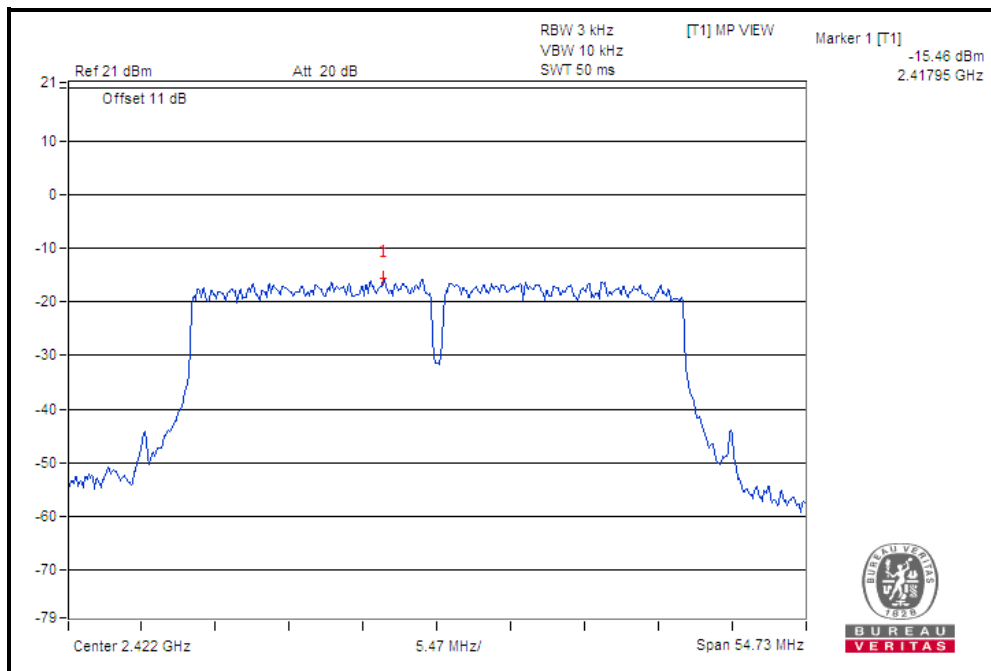


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Test Report No.: RF160804W006-2

802.11n (40MHz)

Channel	FREQ. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
3	2422	-15.46	8	PASS
6	2437	-15.85	8	PASS
9	2452	-15.87	8	PASS



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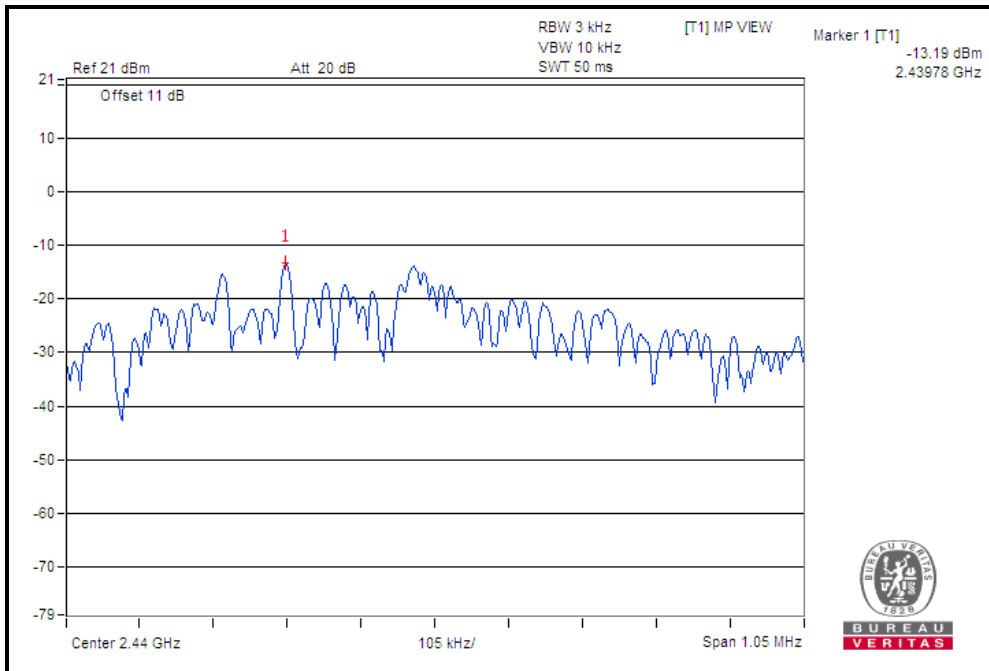


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VERITAS**

**Test Report No.: RF160804W006-2**

**BT-LE (GFSK)**

Channel	FREQ. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	2402	-14.30	8	PASS
19	2440	-13.19	8	PASS
39	2480	-13.70	8	PASS



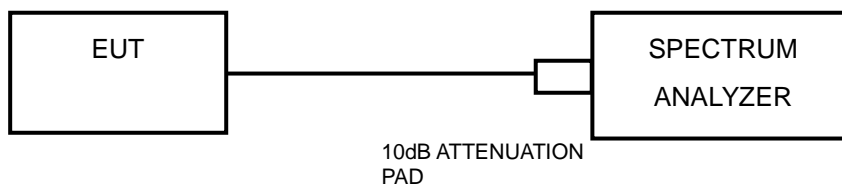


## 4.6 OUT OF BAND EMISSION MEASUREMENT

### 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.

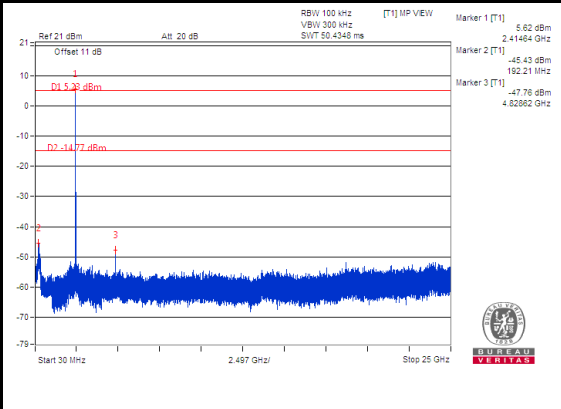
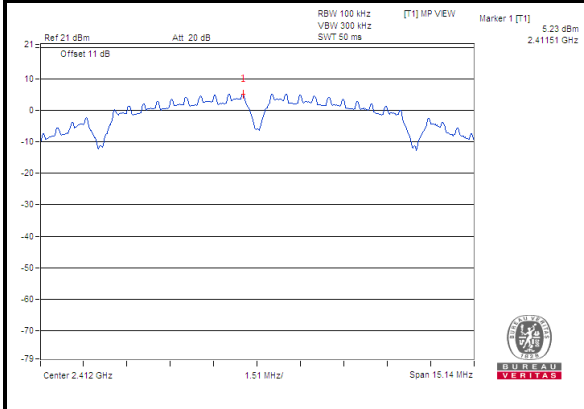


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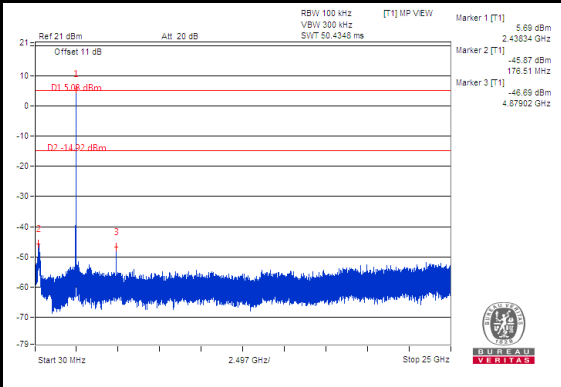
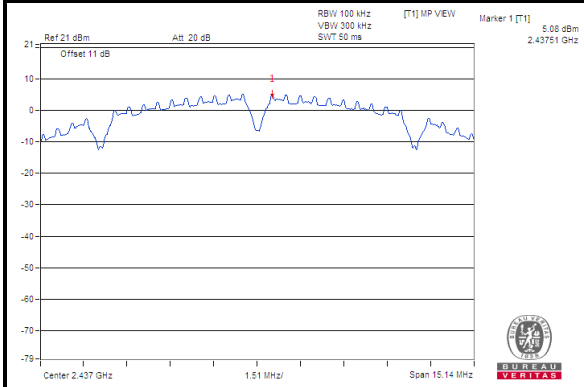
Test Report No.: RF160804W006-2

802.11b

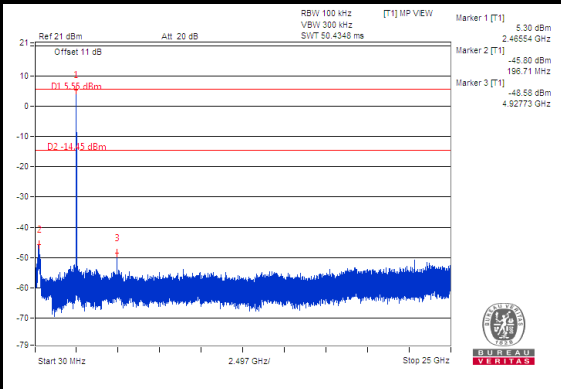
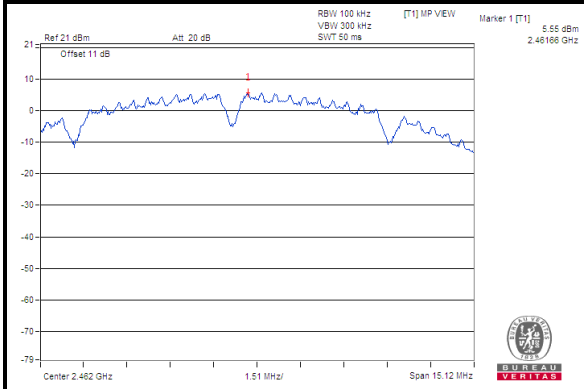
CH 1



CH 6



CH 11

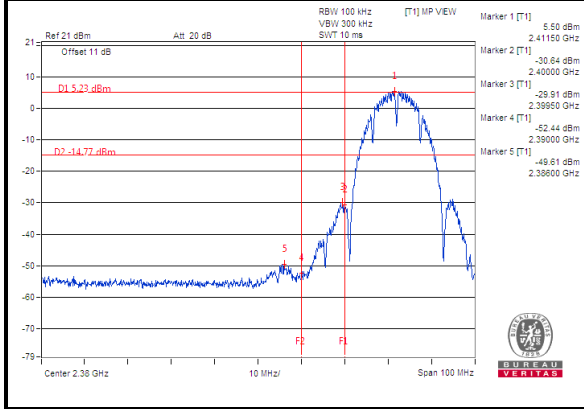




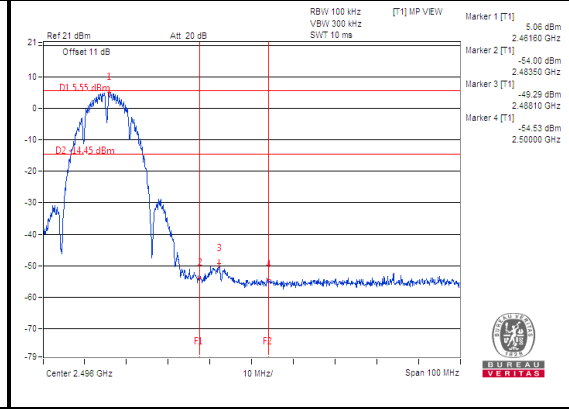
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Test Report No.: RF160804W006-2

### CH 1 Band Edge



### CH 11 Band Edge



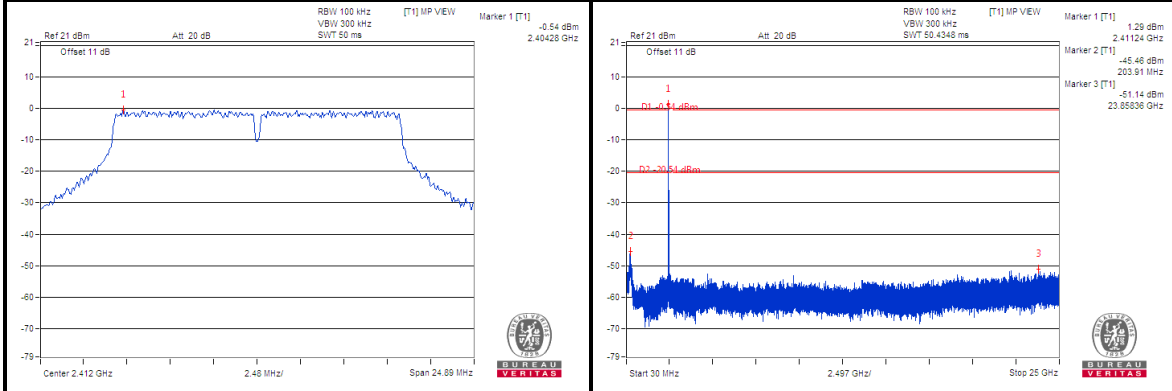


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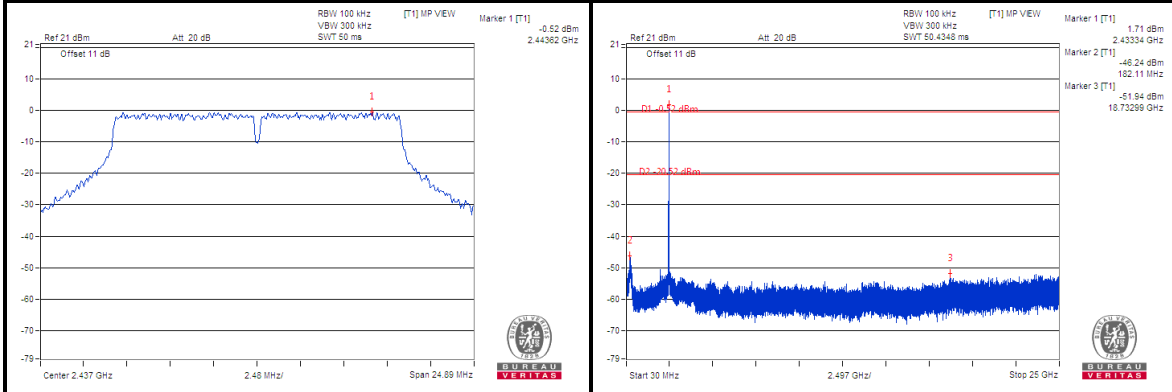
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### 802.11g

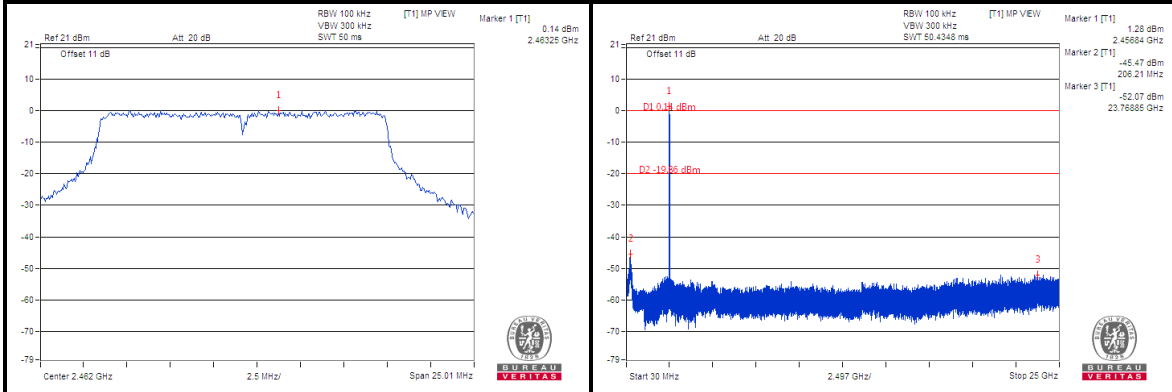
#### CH 1



#### CH 6



#### CH 11



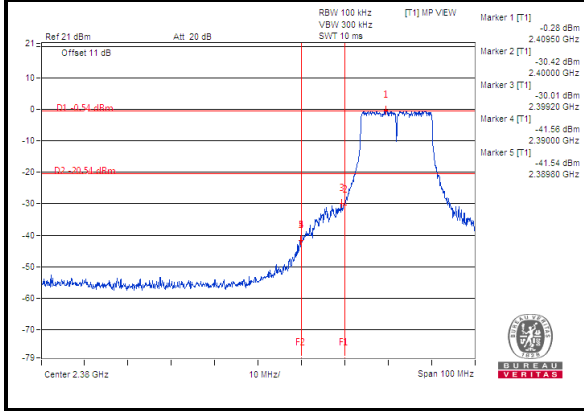




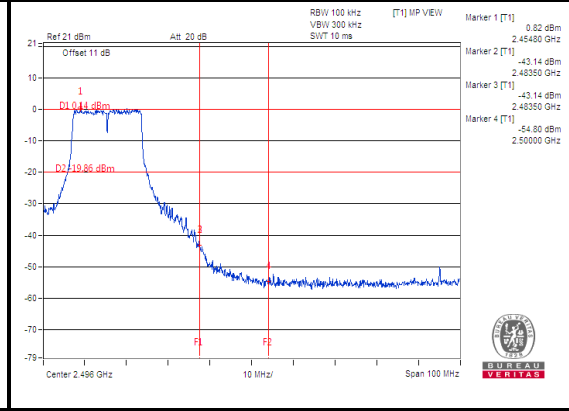
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Test Report No.: RF160804W006-2

### CH 1 Band Edge



### CH 11 Band Edge



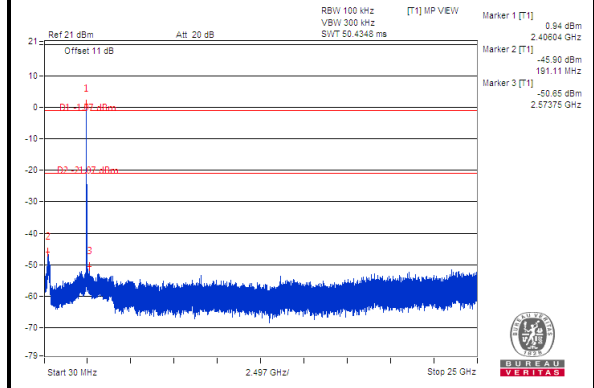
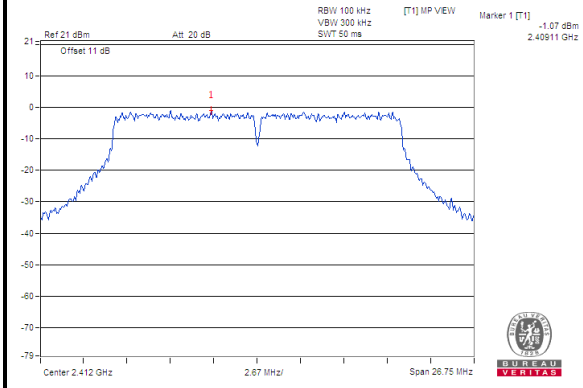


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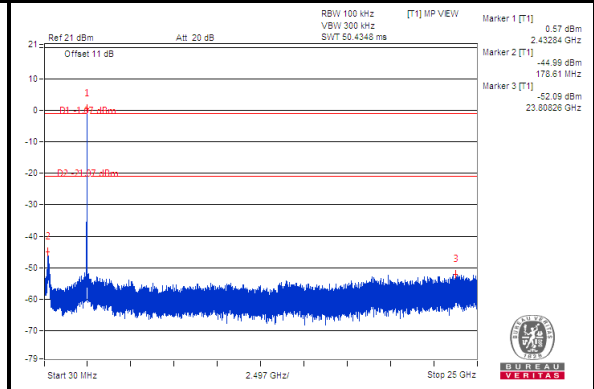
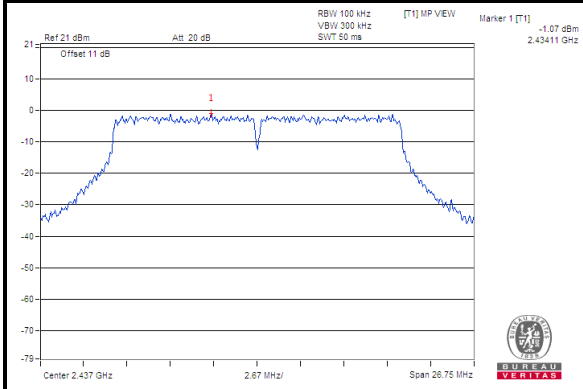
Test Report No.: RF160804W006-2

### 802.11n (20MHz)

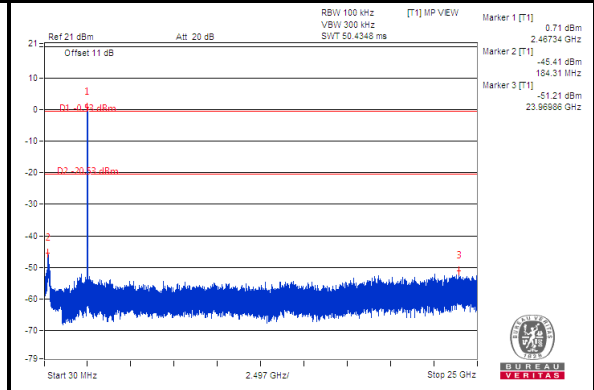
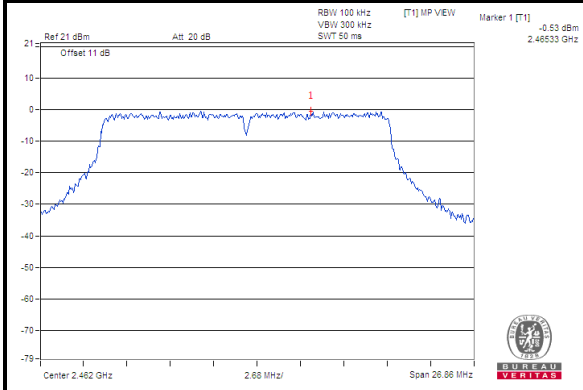
#### CH 1



#### CH 6



#### CH 11

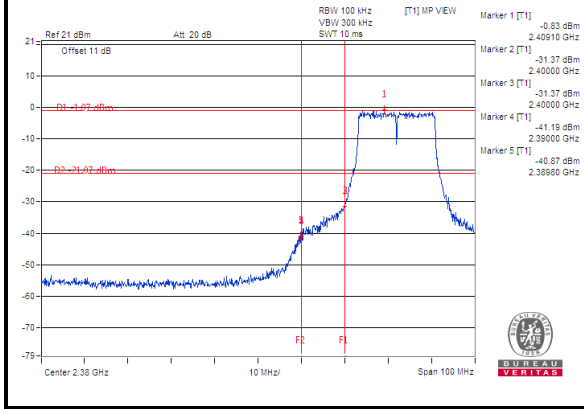




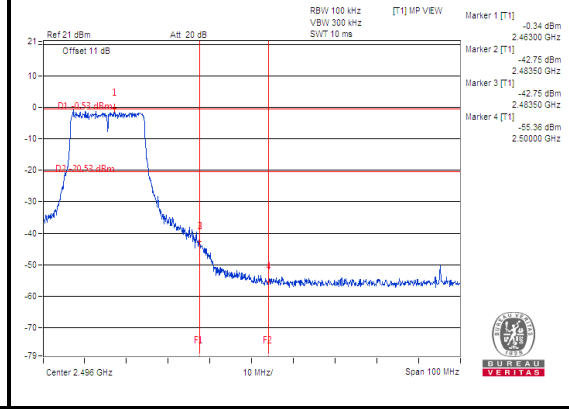
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Test Report No.: RF160804W006-2

### CH 1 Band Edge



### CH 11 Band Edge



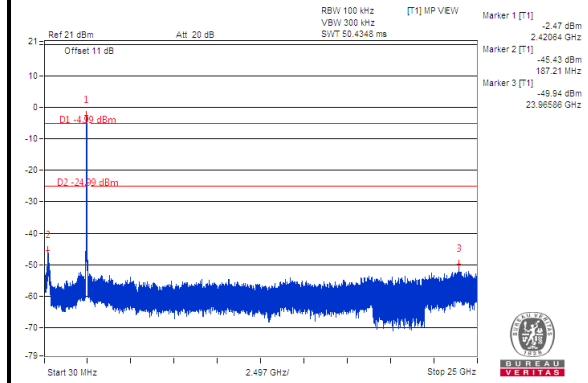
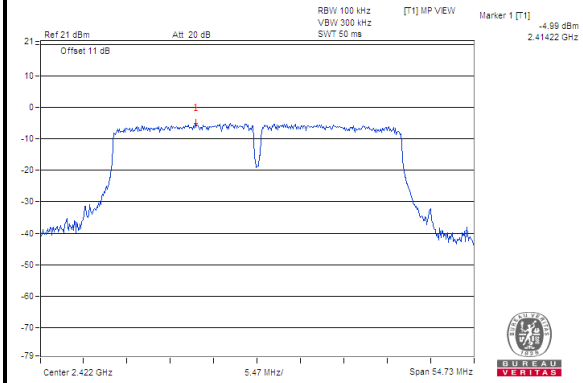


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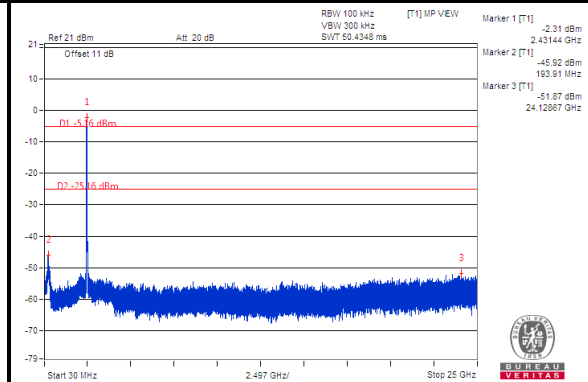
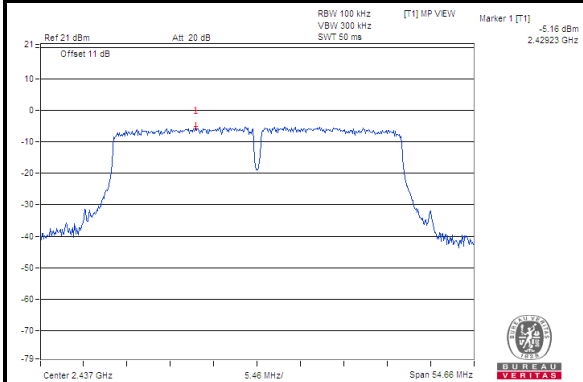
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### 802.11n (40MHz)

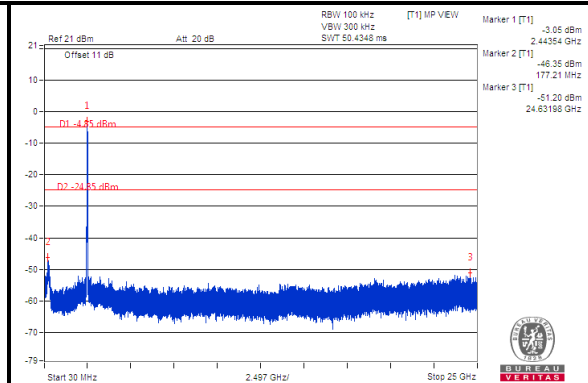
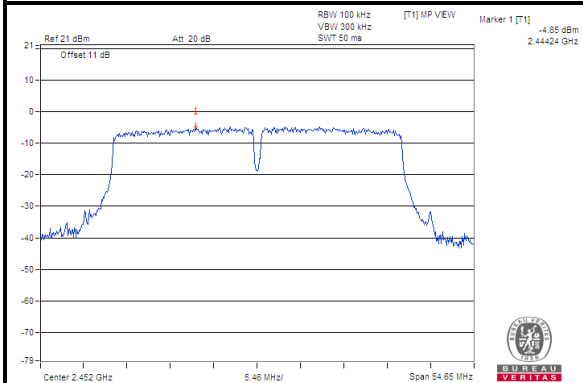
#### CH 3



#### CH 6



#### CH 9

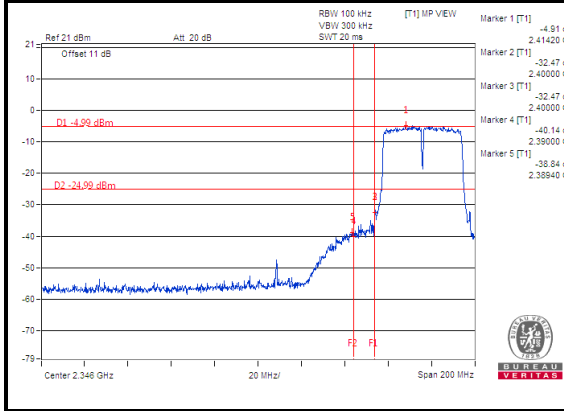




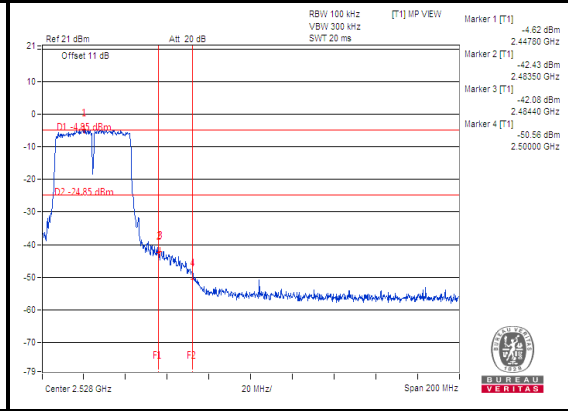
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### CH 3 Band Edge



### CH 9 Band Edge



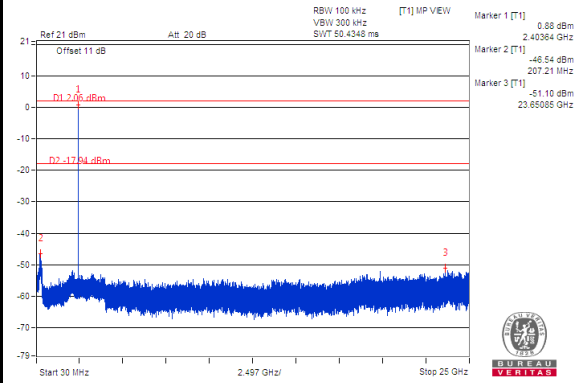
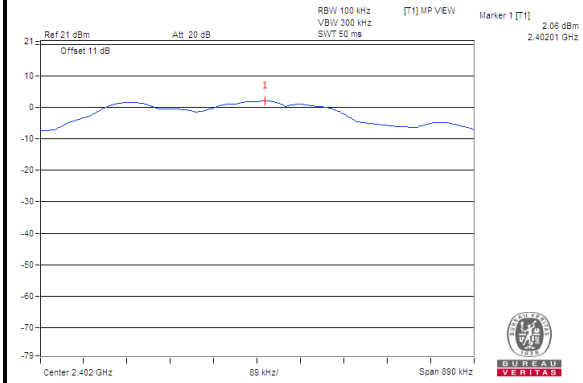


BUREAU VERITAS

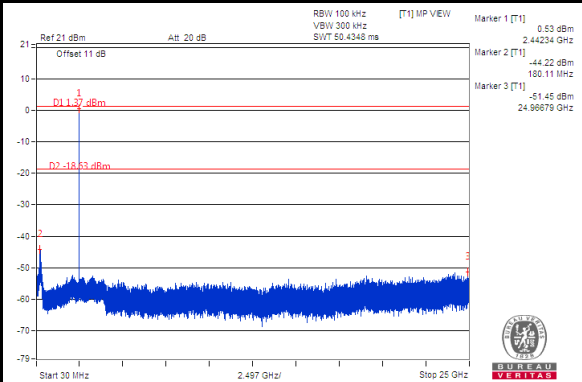
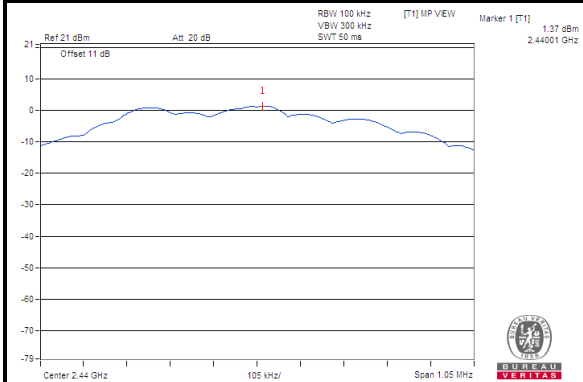
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### BT-LE (GFSK)

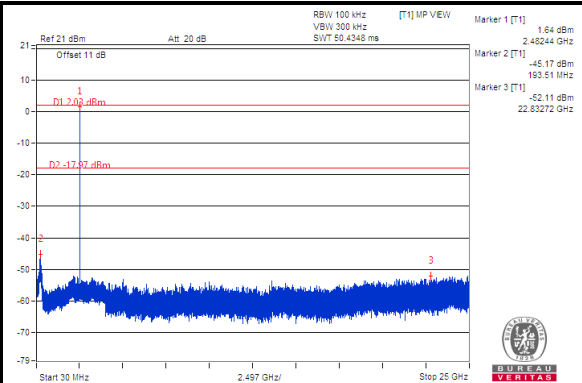
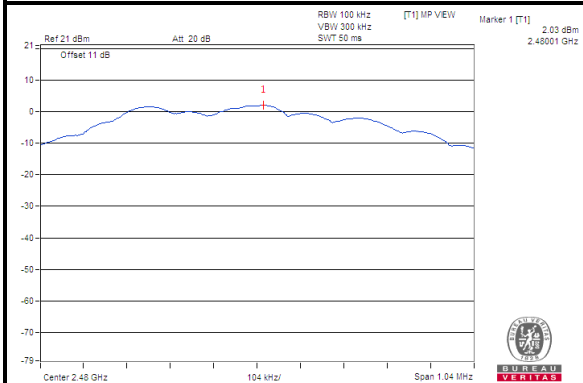
#### CH 0



#### CH 19



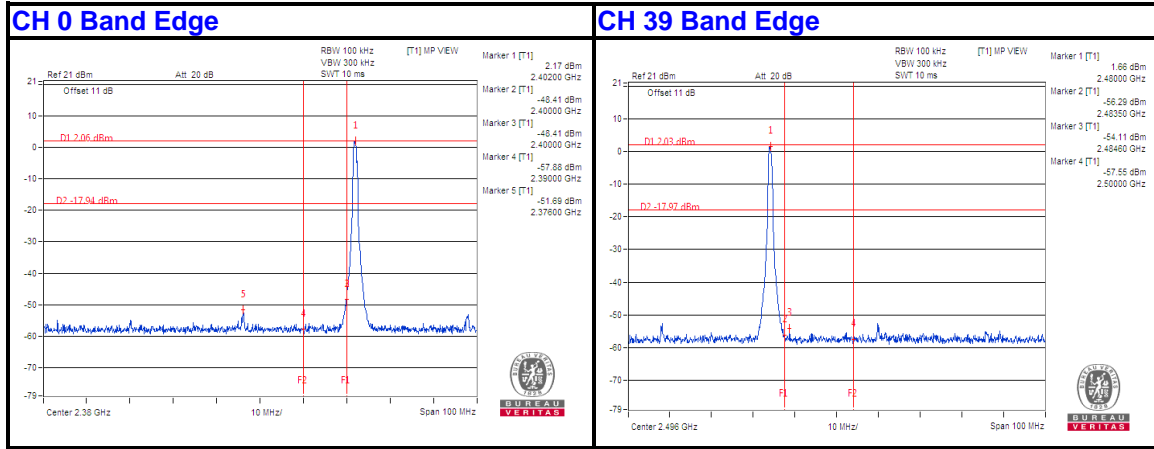
#### CH 39





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## 5 PHOTOGRAPHS OF THE TEST CONFIGURATION

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





## 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---**