

# TEST REPORT

**Reference No.**..... : WTS16S0346208-2E V1  
**FCC ID** ..... : 2AEE8LAVAIRIS758  
**Applicant**..... : LAVA INTERNATIONAL (H.K) LIMITED  
**Address**..... : UNIT L 1/F MAU LAM COMM BLDG 16-18 MAU LAM ST,  
JORDAN KL, HK  
**Manufacturer** ..... : LAVA INTERNATIONAL (H.K) LIMITED  
**Address**..... : UNIT L 1/F MAU LAM COMM BLDG 16-18 MAU LAM ST,  
JORDAN KL, HK  
**Product Name**..... : Mobile Phone  
**Model No.**..... : iris 758  
**Brand**..... : LAVA  
**Standards**..... : FCC CFR47 Part 15.247:2015  
**Date of Receipt sample** .... : Mar. 28, 2016  
**Date of Test** ..... : Mar. 29 – Apr. 12, 2016  
**Date of Issue**..... : May. 12, 2016  
**Test Result**..... : **Pass**

Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

**Prepared By:**

**Waltek Services (Shenzhen) Co., Ltd.**

Address: 1/F., Fukangtai Building, West Baima Road, Songgang Street, Baoan District, Shenzhen, Guangdong, China

Tel :+86-755-83551033

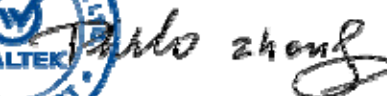
Fax:+86-755-83552400

Compiled by:



Zero Zhou / Test Engineer

Approved by:



Philo Zhong / Manager

## 2 Test Summary

Test Items	Test Requirement	Result
Radiated Spurious Emissions	15.247(d) 15.205(a) 15.209(a)	PASS
Conducted Spurious Emissions	15.247(d)	PASS
Conducted Emissions	15.207(a)	PASS
6dB Bandwidth	15.247(a)(2)	PASS
Maximum Peak Output Power	15.247(b)(3),(4)	PASS
Power Spectral Density	15.247(e)	PASS
Band Edge	15.247(d)	PASS
Antenna Requirement	15.203	PASS
Maximum Permissible Exposure (Exposure of Humans to RF Fields)	1.1307(b)(1)	PASS

### 3 Contents

	<b>Page</b>
<b>1 COVER PAGE.....</b>	<b>1</b>
<b>2 TEST SUMMARY .....</b>	<b>2</b>
<b>3 CONTENTS .....</b>	<b>3</b>
<b>4 REPORT REVISION HISTORY.....</b>	<b>5</b>
<b>5 GENERAL INFORMATION.....</b>	<b>6</b>
5.1 GENERAL DESCRIPTION OF E.U.T. ....	6
5.2 DETAILS OF E.U.T. ....	6
5.3 CHANNEL LIST .....	7
5.4 TEST MODE .....	8
5.5 TEST FACILITY.....	9
<b>6 EQUIPMENT USED DURING TEST .....</b>	<b>10</b>
6.1 EQUIPMENTS LIST .....	10
6.2 DESCRIPTION OF SUPPORT UNITS .....	11
6.3 MEASUREMENT UNCERTAINTY .....	11
6.4 TEST EQUIPMENT CALIBRATION .....	11
<b>7 CONDUCTED EMISSION .....</b>	<b>12</b>
7.1 E.U.T. OPERATION .....	12
7.2 EUT SETUP.....	12
7.3 MEASUREMENT DESCRIPTION .....	12
7.4 CONDUCTED EMISSION TEST RESULT .....	13
<b>8 RADIATED EMISSIONS.....</b>	<b>17</b>
8.1 EUT OPERATION.....	17
8.2 TEST SETUP .....	18
8.3 SPECTRUM ANALYZER SETUP .....	19
8.4 TEST PROCEDURE .....	20
8.5 CORRECTED AMPLITUDE & MARGIN CALCULATION .....	20
8.6 SUMMARY OF TEST RESULTS .....	21
<b>9 CONDUCTED SPURIOUS EMISSIONS.....</b>	<b>36</b>
2.1 TEST PROCEDURE .....	36
2.2 TEST RESULT .....	37
<b>10 BAND EDGE MEASUREMENT .....</b>	<b>45</b>
10.1 TEST PROCEDURE .....	45
10.2 TEST RESULT .....	46
<b>11 6 DB BANDWIDTH MEASUREMENT .....</b>	<b>51</b>
11.1 TEST PROCEDURE:.....	51
11.2 TEST RESULT: .....	51
<b>12 MAXIMUM PEAK OUTPUT POWER.....</b>	<b>60</b>
12.1 TEST PROCEDURE:.....	60
12.2 TEST RESULT: .....	61
<b>13 POWER SPECTRAL DENSITY .....</b>	<b>70</b>
13.1 TEST PROCEDURE:.....	70
13.2 TEST RESULT: .....	70

<b>14</b>	<b>ANTENNA REQUIREMENT .....</b>	<b>79</b>
<b>15</b>	<b>RF EXPOSURE.....</b>	<b>80</b>

## 4 Report Revision History

Report No.	Report Version	Description	Issue Date
WTS16S0346212E	NONE	Original	Apr. 13, 2016
WTS16S0346212E	V1	Version 1	May. 12, 2016

## 5 General Information

### 5.1 General Description of E.U.T.

Product Name	: Mobile Phone
Model No.	: iris 758
Model Description	: N/A
GSM Band(s)	: GSM 850/900/1800/1900MHz
GPRS/EGPRS Class	: 12
WCDMA Band(s)	: FDD Band II/V
LTE Bnad(s)	: LTE Band 2/4/7
Wi-Fi Specification	: 2.4G: 802.11b/g/n HT20 HT40
Bluetooth Version	: Bluetooth v4.0 with BLE
GPS	: Support
NFC	: N/A
Hardware Version	: V2.0
Software Version	: LAVA_iris 758_MX_S101_20160311
Storage Location	: Internal Storage

### 5.2 Details of E.U.T.

Operation Frequency	: GSM/GPRS/EDGE 850: 824~849MHz PCS/GPRS/EDGE1900: 1850~1910MHz WCDMA Band II: 1850~1910MHz WCDMA Band V: 824~849MHz LTE Band 2: 1850~1910MHz LTE Band 4: 1710~1755MHz LTE Band 7: 2500-2570MHz WiFi: 802.11b/g/n HT20: 2412~2462MHz 802.11n HT40: 2422~2452MHz Bluetooth: 2402~2480MHz
Max. RF output power	: GSM 850: 32.71dBm PCS1900:29.82dBm WCDMA Band II: 22.88dBm WCDMA Band V: 22.55dBm LTE Band 2: 22.78dBm LTE Band 4: 22.75dBm LTE Band 7: 23.63dBm WiFi(2.4G): 9.51dBm Bluetooth:5.95dBm

Type of Modulation	: GSM,GPRS: GMSK EDGE: GMSK, 8PSK WCDMA: BPSK LTE: QPSK, 16QAM WiFi: CCK, OFDM Bluetooth: GFSK, Pi/4 DQPSK,8DPSK
Antenna installation	: GSM/WCDMA/LTE: internal permanent antenna WiFi/Bluetooth: internal permanent antenna
Antenna Gain	GSM 850: 0.6dBi PCS1900: 0.7dBi WCDMA Band II: 0.7dBi WCDMA Band V: 0.6dBi LTE Band 2: 0.7dBi LTE Band 4: 0.7dBi LTE Band 7: 0.6dBi WiFi(2.4G): 1.2dBi Bluetooth: 1.2dBi
Technical Data	: Battery DC 3.8V 2000mAh DC 5V, 1A, charging from adapter (Adapter Input: 100-300V~50/60Hz 0.15A)
Adapter	: Manufacture: Shenzhen Tianyin Electronics Co.,LTD. Model No.: CLV-14

### 5.3 Channel List

#### WIFI

Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
1	2412	2	2417	3	2422	4	2427
5	2432	6	2437	7	2442	8	2447
9	2452	10	2457	11	2462	12	-

#### BT BLE

Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
0	2402	1	2404	2	2406	3	2408
4	2410	5	2412	6	2414	7	2416
8	2418	9	2420	10	2422	11	2424
12	2426	13	2428	14	2430	15	2432
16	2434	17	2436	18	2438	19	2440
20	2442	21	2444	22	2446	23	2448
24	2450	25	2452	26	2454	27	2456
28	2458	29	2460	30	2462	31	2464
32	2466	33	2468	34	2470	35	2472
36	2474	37	2476	38	2478	39	2480

## 5.4 Test Mode

Table 1 Tests Carried Out Under FCC part 15.247

Test Items	Mode	Data Rate	Channel	TX/RX
Maximum Peak Output Power	802.11b	11 Mbps	1/6/11	TX
	802.11g	54 Mbps	1/6/11	TX
	802.11n HT20	108 Mbps	1/6/11	TX
	802.11n HT40	150 Mbps	3/6/9	TX
Power Spectral Density	802.11b	11 Mbps	1/6/11	TX
	802.11g	54 Mbps	1/6/11	TX
	802.11n HT20	108 Mbps	1/6/11	TX
	802.11n HT40	150 Mbps	3/6/9	TX
6dB Bandwidth	802.11b	11 Mbps	1/6/11	TX
	802.11g	54 Mbps	1/6/11	TX
	802.11n HT20	108 Mbps	1/6/11	TX
	802.11n HT40	150 Mbps	3/6/9	TX
Band Edge	802.11b	11 Mbps	1/6/11	TX
	802.11g	54 Mbps	1/6/11	TX
	802.11n HT20	108 Mbps	1/6/11	TX
	802.11n HT40	150 Mbps	3/6/9	TX
Transmitter Spurious Emissions	802.11b	11 Mbps	1/6/11	TX
	802.11g	54 Mbps	1/6/11	TX
	802.11n HT20	108 Mbps	1/6/11	TX
	802.11n HT40	150 Mbps	3/6/9	TX

Table 2 Tests Carried Out Under FCC part 15.247

Test Items	Mode	Data Rate	Channel	TX/RX
Maximum Peak Output Power	BT BLE	1 Mbps	0/19/39	TX
Power Spectral Density	BT BLE	1 Mbps	0/19/39	TX
6dB Bandwidth	BT BLE	1 Mbps	0/19/39	TX
Band Edge	BT BLE	1 Mbps	0/19/39	TX
Transmitter Spurious Emissions	BT BLE	1 Mbps	0/19/39	TX

**Note** :Parameters set by test software during channel & power tests, the software provided by the customer was used to set the operating channels as well as the output power level. The RF output power set is the power expected by the manufacturer and is going to be fixed on the firmware of the final product .



## 5.5 Test Facility

The test facility has a test site registered with the following organizations:

- **IC – Registration No.: 7760A**

Waltek Services(Shenzhen) Co., Ltd. Has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files. Registration number 7760A, October 15, 2015.

- **FCC Test Site 1#– Registration No.: 880581**

Waltek Services(Shenzhen) Co., Ltd. EMC Laboratory `has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 880581, April 29, 2014.

- **FCC Test Site 2#– Registration No.: 328995**

Waltek Services(Shenzhen) Co., Ltd. EMC Laboratory `has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 328995, December 3, 2014.

## 6 Equipment Used during Test

### 6.1 Equipments List

Conducted Emissions at Mains Terminals Disturbance Voltage						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1.	EMI Test Receiver	R&S	ESCI	101155	Sep.15,2015	Sep.14,2016
2.	LISN	SCHWARZBECK	NSLK 8128	8128-289	Sep.15,2015	Sep.14,2016
3.	Limiter	York	MTS-IMP-136	261115-001-0024	Sep.15,2015	Sep.14,2016
4.	Cable	LARGE	RF300	-	Sep.15,2015	Sep.14,2016
3m Semi-anechoic Chamber for Radiation						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1	EMC Analyzer	Agilent	E7405A	MY45114943	Sep.15,2015	Sep.14,2016
2	Active Loop Antenna	Beijing Dazhi	ZN30900A	-	Sep.15,2015	Sep.14,2016
3	Trilog Broadband Antenna	SCHWARZBECK	VULB9163	336	Apr.18,2015	Apr.17,2016
4	Coaxial Cable (below 1GHz)	Top	TYPE16(13M)	-	Sep.15,2015	Sep.14,2016
5	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	667	Apr.18,2015	Apr.17,2016
6	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	669	Apr.18,2015	Apr.17,2016
7	Broadband Preamplifier	COMPLIANCE DIRECTION	PAP-1G18	2004	Mar.17,2016	Mar.16,2017
8	Coaxial Cable (above 1GHz)	Top	1000MHz-25GHz	EW02014-7	Apr.10,2016	Apr.09,2017
9	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9170	335	Sep.15,2015	Sep.14,2016
10	Universal Radio Communication Tester	R&S	CMU 200	112461	Apr.10,2016	Apr.09,2017
11	Signal Generator	R&S	SMR20	100046	Sep.15,2015	Sep.14,2016
RF Conducted Testing						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1.	EMC Analyzer (9k~26.5GHz)	Agilent	E7405A	MY45114943	Aug. 15,2015	Aug.14,2016
2.	Spectrum Analyzer (9k-6GHz)	R&S	FSL6	100959	Aug. 15,2015	Aug.14,2016
3.	Humidity Chamber	GF	GTH-225-40-1P	IAA061213	Aug. 15,2015	Aug.14,2016

## 6.2 Description of Support Units

Equipment	Manufacturer	Model No.	Series No.
/	/	/	/

## 6.3 Measurement Uncertainty

Parameter	Uncertainty
Radio Frequency	$\pm 1 \times 10^{-6}$
RF Power	$\pm 1.0$ dB
RF Power Density	$\pm 2.2$ dB
Radiated Spurious Emissions test	$\pm 5.03$ dB (30M~1000MHz)
	$\pm 5.47$ dB (1000M~25000MHz)
Conducted Spurious Emissions test	$\pm 3.64$ dB (AC mains 150KHz~30MHz)

## 6.4 Test Equipment Calibration

All the test equipments used are valid and calibrated by CEPREI Certification Body that address is No.110 Dongguan Zhuang RD. Guangzhou, P.R.China.

## 7 Conducted Emission

Test Requirement:	FCC CFR 47 Part 15 Section 15.207
Test Method:	ANSI C63.10:2009
Test Result:	PASS
Frequency Range:	150kHz to 30MHz
Class/Severity:	Class B
Limit:	66-56 dB $\mu$ V between 0.15MHz & 0.5MHz 56 dB $\mu$ V between 0.5MHz & 5MHz 60 dB $\mu$ V between 5MHz & 30MHz
Detector:	Peak for pre-scan (9kHz Resolution Bandwidth)

### 7.1 E.U.T. Operation

Operating Environment :

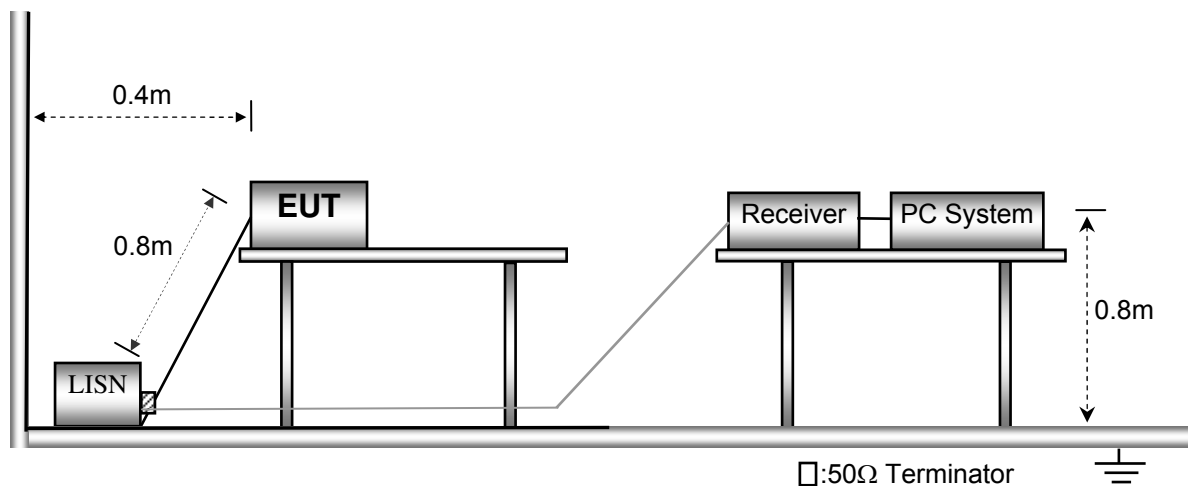
Temperature:	21.5 °C
Humidity:	51.9 % RH
Atmospheric Pressure:	101.2kPa

EUT Operation :

The test was performed in WIFI link mode, the worst data were shown in the report.

### 7.2 EUT Setup

The conducted emission tests were performed using the setup accordance with the ANSI C63.10.



### 7.3 Measurement Description

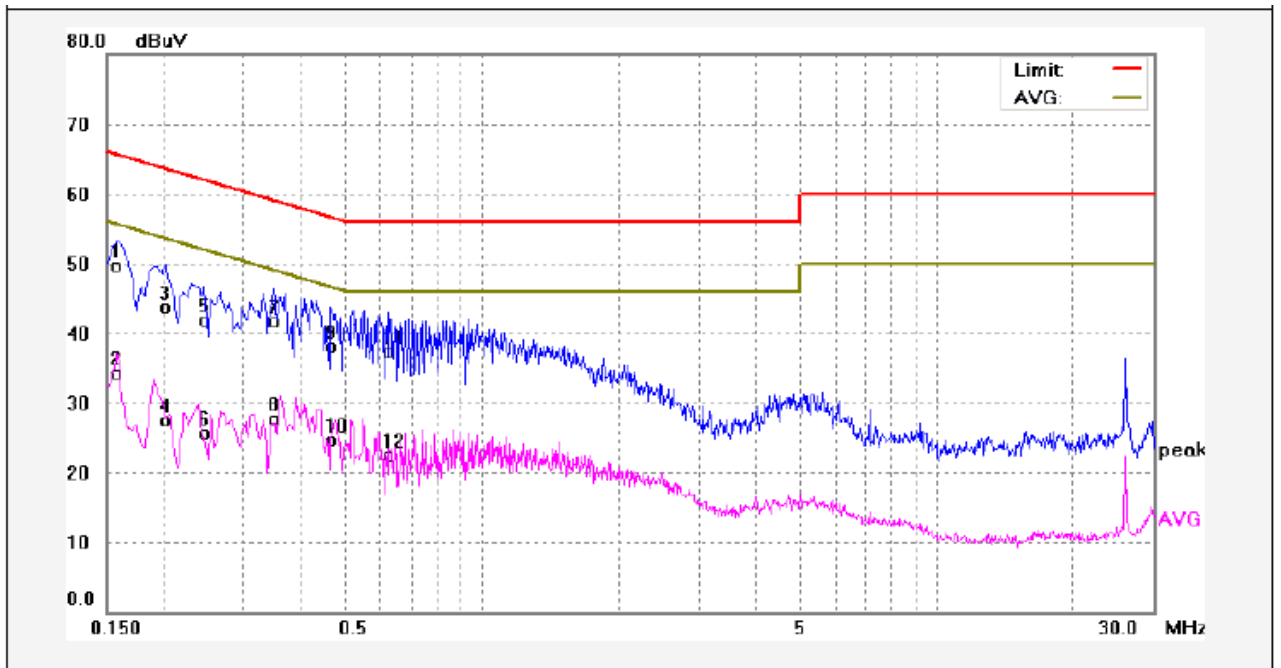
The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

## 7.4 Conducted Emission Test Result

An initial pre-scan was performed on the live and neutral lines.

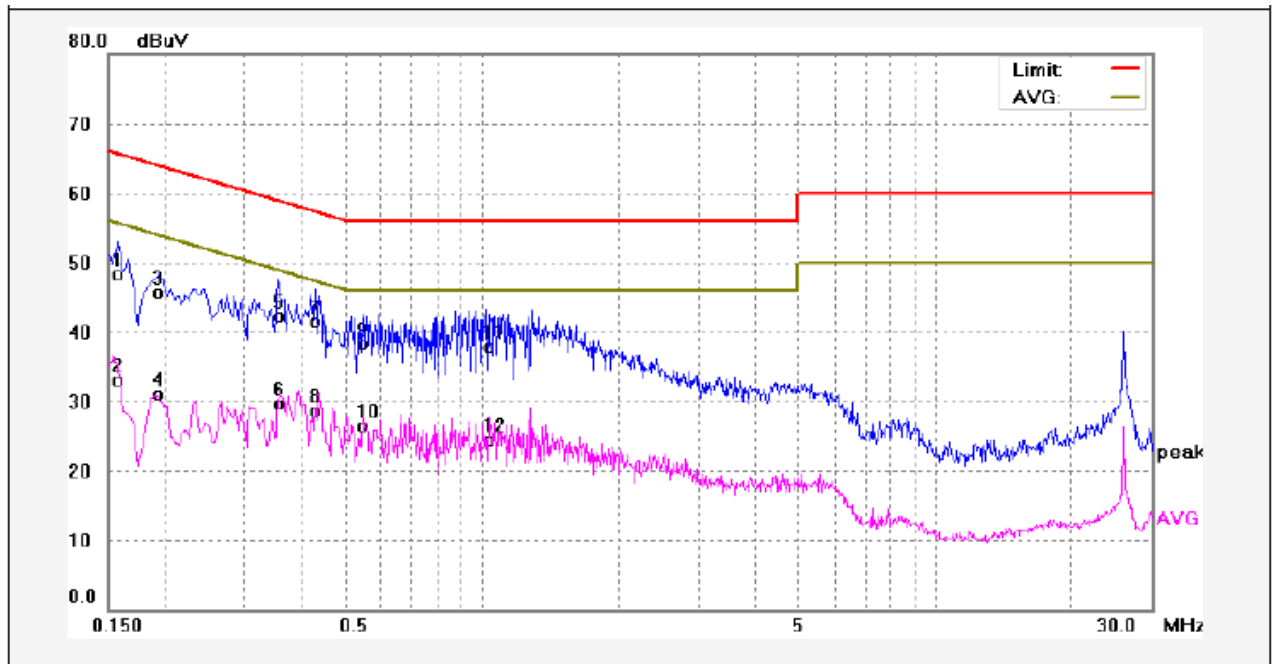
Worst Mode: WIFI mode

Live line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1580	40.05	9.75	49.80	65.56	-15.76	QP	
2	0.1580	24.57	9.75	34.32	55.56	-21.24	AVG	
3	0.2020	33.98	9.76	43.74	63.52	-19.78	QP	
4	0.2020	17.76	9.76	27.52	53.52	-26.00	AVG	
5	0.2460	32.26	9.74	42.00	61.89	-19.89	QP	
6	0.2460	15.99	9.74	25.73	51.89	-26.16	AVG	
7	0.3500	32.02	9.75	41.77	58.96	-17.19	QP	
8	0.3500	18.05	9.75	27.80	48.96	-21.16	AVG	
9	0.4660	28.36	9.76	38.12	56.58	-18.46	QP	
10	0.4660	14.86	9.76	24.62	46.58	-21.96	AVG	
11	0.6260	27.56	9.76	37.32	56.00	-18.68	QP	
12	0.6260	12.80	9.76	22.56	46.00	-23.44	AVG	

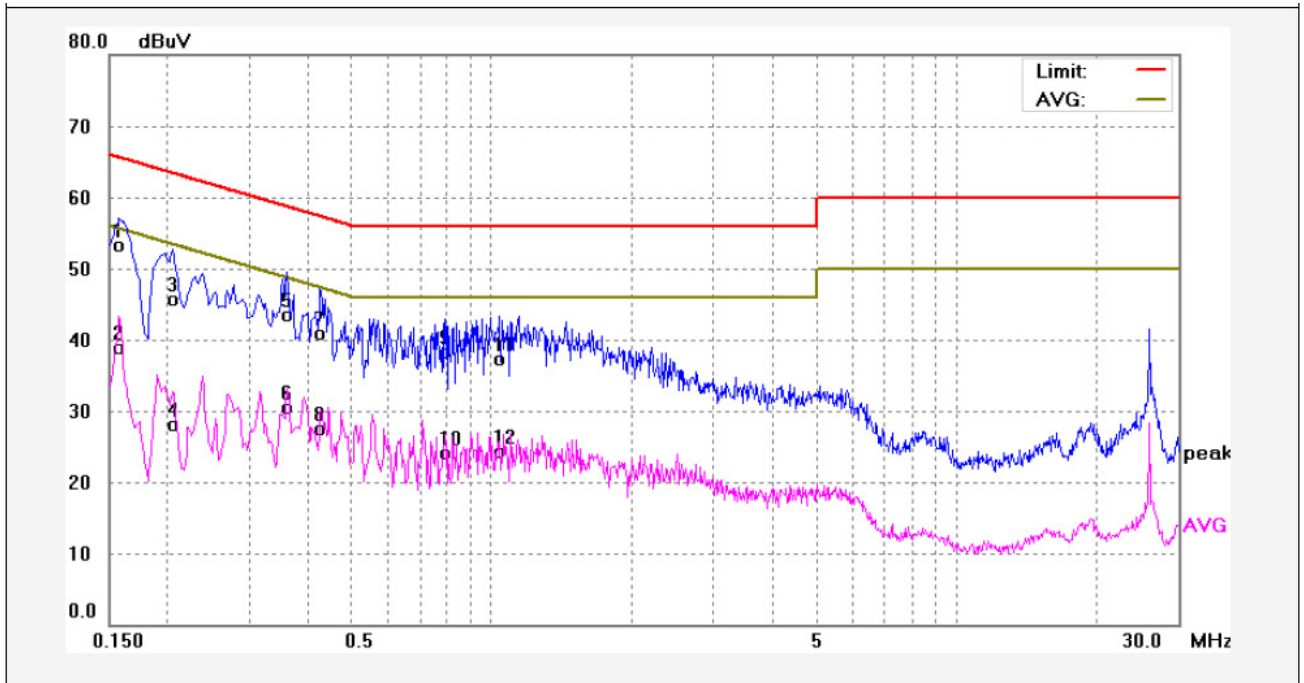
Neutral line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1580	38.63	9.75	48.38	65.56	-17.18	QP	
2	0.1580	23.40	9.75	33.15	55.56	-22.41	AVG	
3	0.1940	35.93	9.76	45.69	63.86	-18.17	QP	
4	0.1940	21.38	9.76	31.14	53.86	-22.72	AVG	
5	0.3540	32.64	9.75	42.39	58.87	-16.48	QP	
6	0.3540	19.89	9.75	29.64	48.87	-19.23	AVG	
7	0.4300	31.72	9.75	41.47	57.25	-15.78	QP	
8	0.4300	18.98	9.75	28.73	47.25	-18.52	AVG	
9	0.5460	28.59	9.76	38.35	56.00	-17.65	QP	
10	0.5460	16.79	9.76	26.55	46.00	-19.45	AVG	
11	1.0260	28.11	9.81	37.92	56.00	-18.08	QP	
12	1.0260	14.69	9.81	24.50	46.00	-21.50	AVG	

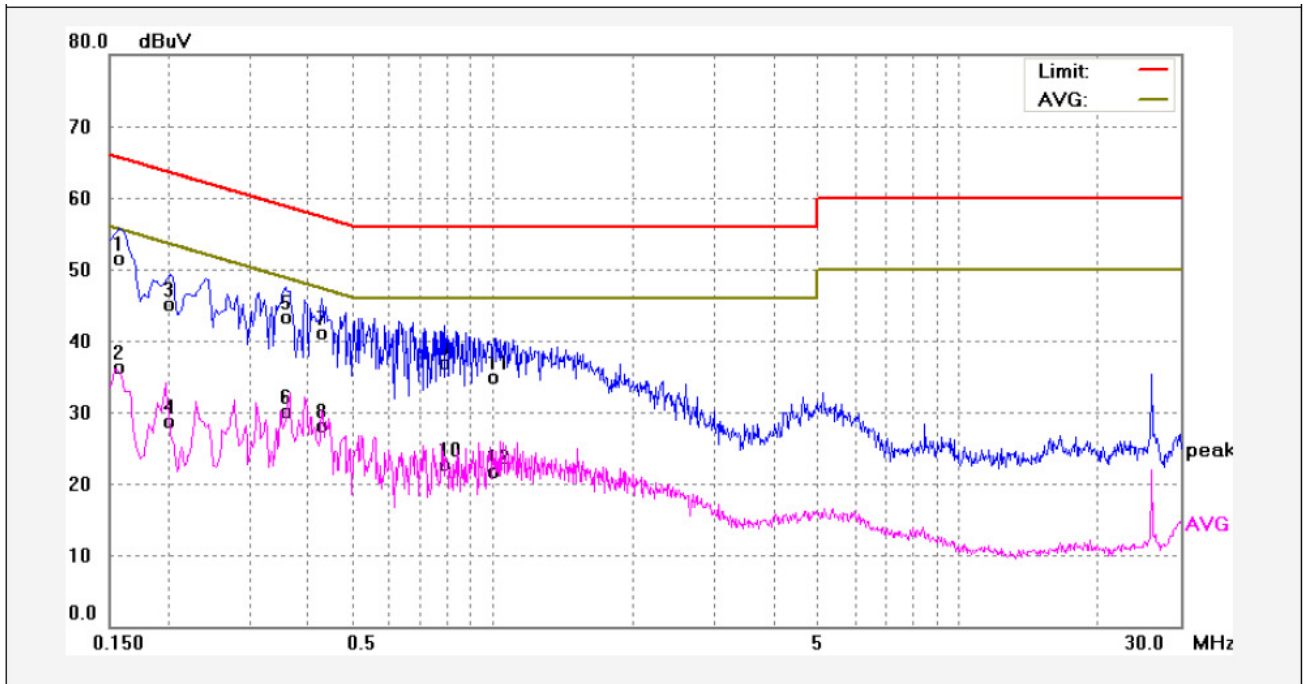
Worst Mode: BLE mode

Live line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1580	43.55	9.75	53.30	65.56	-12.26	QP	
2	0.1580	29.13	9.75	38.88	55.56	-16.68	AVG	
3	0.2060	35.97	9.76	45.73	63.36	-17.63	QP	
4	0.2060	18.29	9.76	28.05	53.36	-25.31	AVG	
5	0.3620	33.83	9.75	43.58	58.68	-15.10	QP	
6	0.3620	20.74	9.75	30.49	48.68	-18.19	AVG	
7	0.4260	31.22	9.75	40.97	57.33	-16.36	QP	
8	0.4260	17.76	9.75	27.51	47.33	-19.82	AVG	
9	0.7940	28.45	9.79	38.24	56.00	-17.76	QP	
10	0.7940	14.25	9.79	24.04	46.00	-21.96	AVG	
11	1.0420	27.45	9.81	37.26	56.00	-18.74	QP	
12	1.0420	14.43	9.81	24.24	46.00	-21.76	AVG	

Neutral line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1580	41.84	9.75	51.59	65.56	-13.97	QP	
2	0.1580	26.59	9.75	36.34	55.56	-19.22	AVG	
3	0.2020	35.28	9.76	45.04	63.52	-18.48	QP	
4	0.2020	18.99	9.76	28.75	53.52	-24.77	AVG	
5	0.3580	33.54	9.75	43.29	58.77	-15.48	QP	
6	0.3580	20.26	9.75	30.01	48.77	-18.76	AVG	
7	0.4300	31.30	9.75	41.05	57.25	-16.20	QP	
8	0.4300	18.43	9.75	28.18	47.25	-19.07	AVG	
9	0.7900	27.21	9.79	37.00	56.00	-19.00	QP	
10	0.7900	12.97	9.79	22.76	46.00	-23.24	AVG	
11	1.0060	25.08	9.81	34.89	56.00	-21.11	QP	
12	1.0060	11.96	9.81	21.77	46.00	-24.23	AVG	



## 8 Radiated Emissions

Test Requirement: FCC CFR47 Part 15 Section 15.209 & 15.247

Test Method: ANSI C63.10:2009

Test Result: PASS

Measurement Distance: 3m

Limit:

Frequency (MHz)	Field Strength		Field Strength Limit at 3m Measurement Dist	
	uV/m	Distance (m)	uV/m	dBuV/m
0.009 ~ 0.490	$2400/F(\text{kHz})$	300	$10000 * 2400/F(\text{kHz})$	$20\log^{(2400/F(\text{kHz}))} + 80$
0.490 ~ 1.705	$24000/F(\text{kHz})$	30	$100 * 24000/F(\text{kHz})$	$20\log^{(24000/F(\text{kHz}))} + 40$
1.705 ~ 30	30	30	$100 * 30$	$20\log^{(30)} + 40$
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

### 8.1 EUT Operation

Operating Environment :

Temperature: 23.5 °C

Humidity: 52.1 % RH

Atmospheric Pressure: 101.2kPa

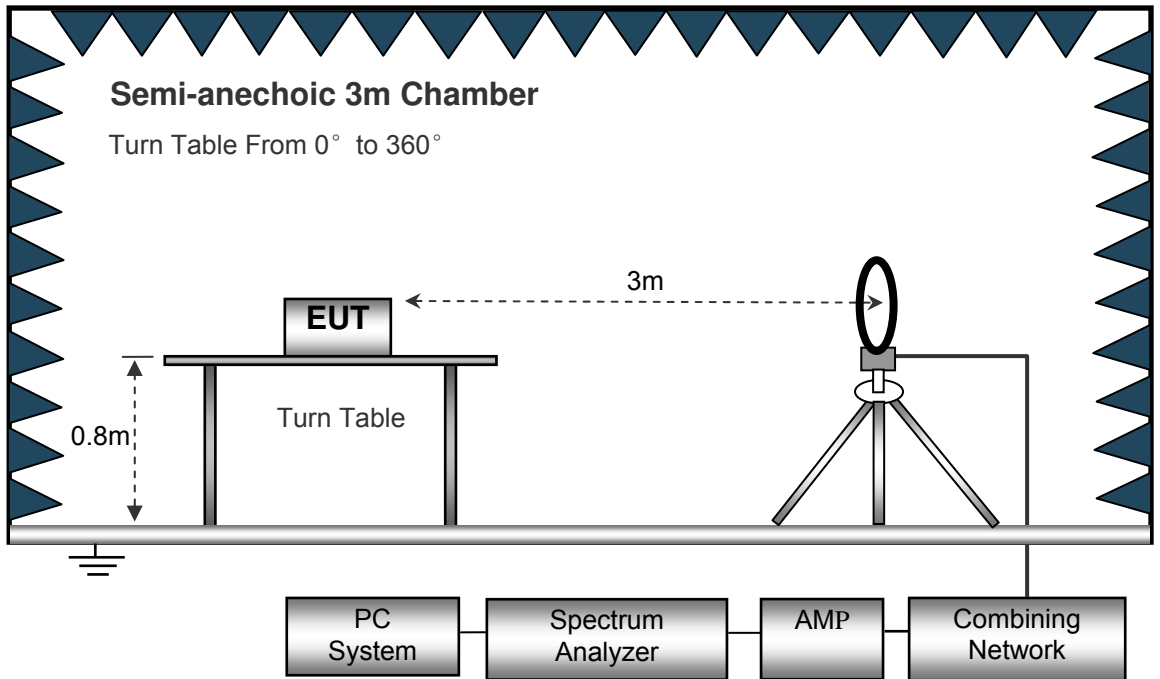
EUT Operation :

The test was performed in WIFI link mode, the test data were shown in the report.

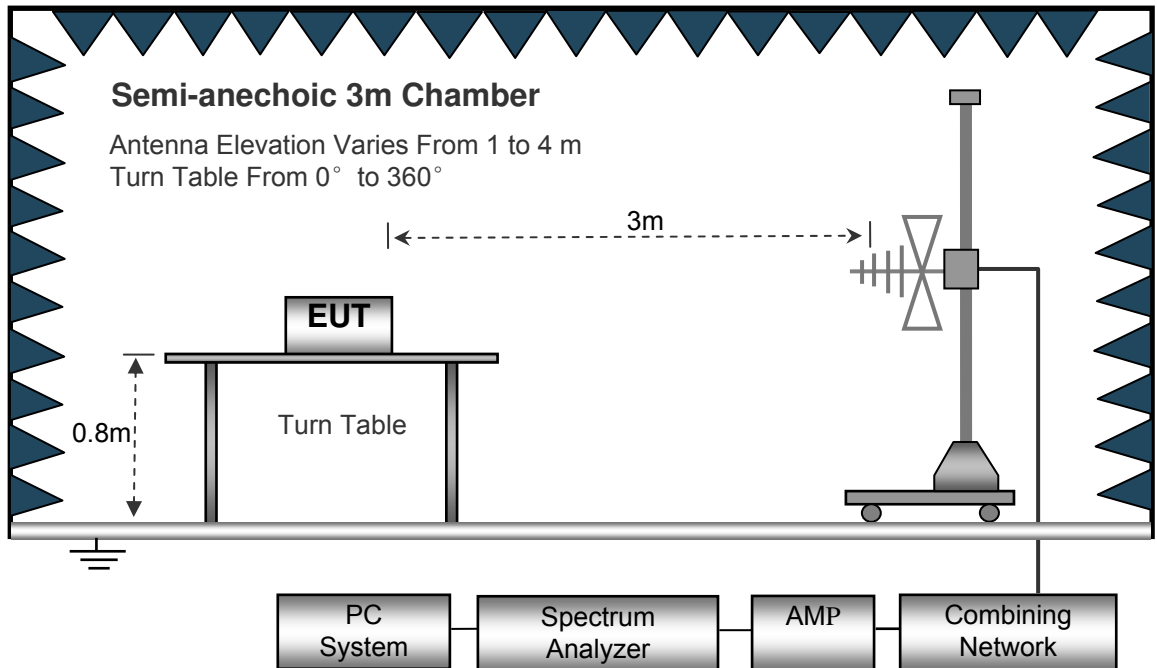
## 8.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.10.

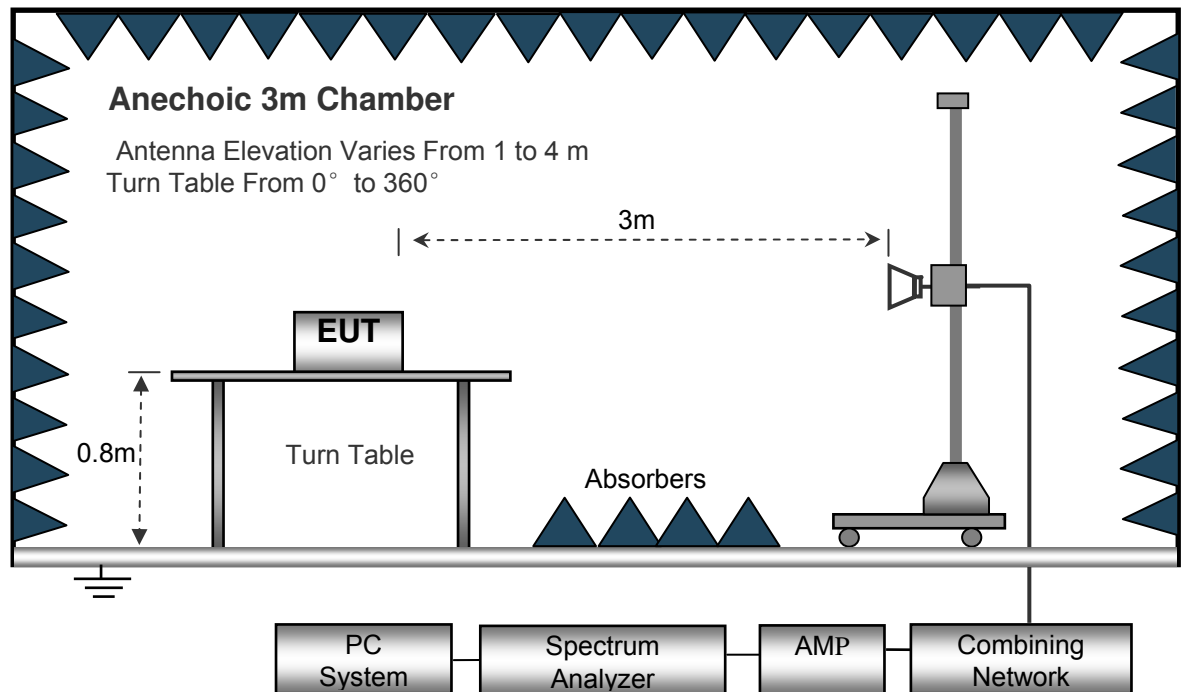
The test setup for emission measurement below 30MHz.



The test setup for emission measurement from 30 MHz to 1 GHz.



The test setup for emission measurement above 1 GHz.



### 8.3 Spectrum Analyzer Setup

Below 30MHz

Sweep Speed ..... Auto  
 IF Bandwidth..... 10kHz  
 Video Bandwidth..... 10kHz  
 Resolution Bandwidth..... 10kHz

30MHz ~ 1GHz

Sweep Speed ..... Auto  
 Detector ..... PK  
 Resolution Bandwidth..... 100kHz  
 Video Bandwidth..... 300kHz

Above 1GHz

Sweep Speed ..... Auto  
 Detector ..... PK  
 Resolution Bandwidth..... 1MHz  
 Video Bandwidth..... 3MHz  
 Detector ..... Ave.  
 Resolution Bandwidth..... 1MHz  
 Video Bandwidth..... 10Hz

## 8.4 Test Procedure

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The radiation measurements are performed in X,Y and Z axis positioning(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand),the worst condition was tested putting the eut in X axis,so the worst data were shown as follow.
8. A 2.4GHz high -pass filter is used during radiated emissions above 1GHz measurement.

## 8.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

The "Margin" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the maximum limit for Class B. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{Limit}$$

## 8.6 Summary of Test Results

Wifi:

**Test Frequency : 26MHz ~ 30MHz**

The measurements were more than 20 dB below the limit and not reported.

**Test Frequency : 30MHz ~ 18GHz**

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
11b: Low Channel 2412MHz									
223.45	39.66	QP	51	1.1	H	-11.62	28.04	46.00	-17.96
223.45	35.91	QP	320	1.9	V	-11.62	24.29	46.00	-21.71
4824.00	50.58	PK	152	1.8	V	-1.06	49.52	74.00	-24.48
4824.00	46.13	Ave	152	1.8	V	-1.06	45.07	54.00	-8.93
7236.00	41.27	PK	91	1.5	H	1.33	42.60	74.00	-31.40
7236.00	41.65	Ave	91	1.5	H	1.33	42.98	54.00	-11.02
2320.78	45.58	PK	157	1.8	V	-13.19	32.39	74.00	-41.61
2320.78	37.52	Ave	157	1.8	V	-13.19	24.33	54.00	-29.67
2370.88	44.97	PK	148	1.2	H	-13.14	31.83	74.00	-42.17
2370.88	38.34	Ave	148	1.2	H	-13.14	25.20	54.00	-28.80
2492.14	44.73	PK	123	1.9	V	-13.08	31.65	74.00	-42.35
2492.14	37.28	Ave	123	1.9	V	-13.08	24.20	54.00	-29.80

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dB $\mu$ V)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dB $\mu$ V/m)	(dB $\mu$ V/m)	(dB)
11b: Middle Channel 2437MHz									
223.45	40.53	QP	220	1.0	H	-11.62	28.91	46.00	-17.09
223.45	36.59	QP	274	1.5	V	-11.62	24.97	46.00	-21.03
4874.00	51.58	PK	48	1.3	V	-0.62	50.96	74.00	-23.04
4874.00	47.08	Ave	48	1.3	V	-0.62	46.46	54.00	-7.54
7311.00	42.26	PK	293	1.3	H	2.21	44.47	74.00	-29.53
7311.00	42.86	Ave	293	1.3	H	2.21	45.07	54.00	-8.93
2324.94	45.10	PK	345	1.8	V	-13.19	31.91	74.00	-42.09
2324.94	39.42	Ave	345	1.8	V	-13.19	26.23	54.00	-27.77
2381.29	44.23	PK	111	1.4	H	-13.14	31.09	74.00	-42.91
2381.29	37.89	Ave	111	1.4	H	-13.14	24.75	54.00	-29.25
2493.28	43.89	PK	94	1.6	V	-13.08	30.81	74.00	-43.19
2493.28	38.64	Ave	94	1.6	V	-13.08	25.56	54.00	-28.44

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dB $\mu$ V)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dB $\mu$ V/m)	(dB $\mu$ V/m)	(dB)
11b: High Channel 2462MHz									
223.45	41.16	QP	127	2.0	H	-11.62	29.54	46.00	-16.46
223.45	36.26	QP	2	1.9	V	-11.62	24.64	46.00	-21.36
4924.00	50.52	PK	44	1.1	V	-0.24	50.28	74.00	-23.72
4924.00	48.32	Ave	44	1.1	V	-0.24	48.08	54.00	-5.92
7386.00	42.24	PK	180	1.4	H	2.84	45.08	74.00	-28.92
7386.00	43.12	Ave	180	1.4	H	2.84	45.96	54.00	-8.04
2346.03	46.10	PK	191	1.4	V	-13.19	32.91	74.00	-41.09
2346.03	39.22	Ave	191	1.4	V	-13.19	26.03	54.00	-27.97
2374.13	43.39	PK	7	1.2	H	-13.14	30.25	74.00	-43.75
2374.13	37.10	Ave	7	1.2	H	-13.14	23.96	54.00	-30.04
2496.08	42.10	PK	196	1.1	V	-13.08	29.02	74.00	-44.98
2496.08	38.15	Ave	196	1.1	V	-13.08	25.07	54.00	-28.93

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dB $\mu$ V)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dB $\mu$ V/m)	(dB $\mu$ V/m)	(dB)
11g: Low Channel 2412MHz									
223.45	40.13	QP	112	1.8	H	-11.62	28.51	46.00	-17.49
223.45	34.85	QP	102	1.3	V	-11.62	23.23	46.00	-22.77
4824.00	49.71	PK	293	1.4	V	-1.06	48.65	74.00	-25.35
4824.00	47.08	Ave	293	1.4	V	-1.06	46.02	54.00	-7.98
7236.00	41.06	PK	15	1.6	H	1.33	42.39	74.00	-31.61
7236.00	42.13	Ave	15	1.6	H	1.33	43.46	54.00	-10.54
2332.08	45.65	PK	254	2.0	V	-13.19	32.46	74.00	-41.54
2332.08	39.56	Ave	254	2.0	V	-13.19	26.37	54.00	-27.63
2364.11	43.69	PK	110	1.5	H	-13.14	30.55	74.00	-43.45
2364.11	36.78	Ave	110	1.5	H	-13.14	23.64	54.00	-30.36
2483.82	44.43	PK	31	1.4	V	-13.08	31.35	74.00	-42.65
2483.82	36.41	Ave	31	1.4	V	-13.08	23.33	54.00	-30.67



Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dB $\mu$ V)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dB $\mu$ V/m)	(dB $\mu$ V/m)	(dB)
11g: Middle Channel 2437MHz									
223.45	41.33	QP	242	1.7	H	-11.62	29.71	46.00	-16.29
223.45	34.48	QP	56	1.5	V	-11.62	22.86	46.00	-23.14
4874.00	49.02	PK	336	1.8	V	-0.62	48.40	74.00	-25.60
4874.00	47.14	Ave	336	1.8	V	-0.62	46.52	54.00	-7.48
7311.00	39.82	PK	24	1.8	H	2.21	42.03	74.00	-31.97
7311.00	41.18	Ave	24	1.8	H	2.21	43.39	54.00	-10.61
2345.34	45.94	PK	131	1.9	V	-13.19	32.75	74.00	-41.25
2345.34	37.23	Ave	131	1.9	V	-13.19	24.04	54.00	-29.96
2359.70	43.76	PK	315	1.3	H	-13.14	30.62	74.00	-43.38
2359.70	36.10	Ave	315	1.3	H	-13.14	22.96	54.00	-31.04
2487.50	44.29	PK	233	1.5	V	-13.08	31.21	74.00	-42.79
2487.50	37.05	Ave	233	1.5	V	-13.08	23.97	54.00	-30.03

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dB $\mu$ V)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dB $\mu$ V/m)	(dB $\mu$ V/m)	(dB)
11g: High Channel 2462MHz									
223.45	40.33	QP	70	1.8	H	-11.62	28.71	46.00	-17.29
223.45	35.22	QP	143	1.2	V	-11.62	23.60	46.00	-22.40
4924.00	49.85	PK	333	2.0	V	-0.24	49.61	74.00	-24.39
4924.00	46.83	Ave	333	2.0	V	-0.24	46.59	54.00	-7.41
7386.00	40.36	PK	20	1.5	H	2.84	43.20	74.00	-30.80
7386.00	40.80	Ave	20	1.5	H	2.84	43.64	54.00	-10.36
2321.66	46.79	PK	223	1.1	V	-13.19	33.60	74.00	-40.40
2321.66	38.63	Ave	223	1.1	V	-13.19	25.44	54.00	-28.56
2352.91	44.87	PK	121	1.2	H	-13.14	31.73	74.00	-42.27
2352.91	37.71	Ave	121	1.2	H	-13.14	24.57	54.00	-29.43
2499.12	44.31	PK	334	1.6	V	-13.08	31.23	74.00	-42.77
2499.12	38.74	Ave	334	1.6	V	-13.08	25.66	54.00	-28.34

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dB $\mu$ V)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dB $\mu$ V/m)	(dB $\mu$ V/m)	(dB)
n20: Low Channel 2412MHz									
223.45	39.78	QP	323	1.4	H	-11.62	28.16	46.00	-17.84
223.45	36.28	QP	121	1.3	V	-11.62	24.66	46.00	-21.34
4824.00	50.92	PK	316	1.1	V	-1.06	49.86	74.00	-24.14
4824.00	45.68	Ave	316	1.1	V	-1.06	44.62	54.00	-9.38
7236.00	41.07	PK	332	1.6	H	1.33	42.40	74.00	-31.60
7236.00	41.98	Ave	332	1.6	H	1.33	43.31	54.00	-10.69
2334.80	45.58	PK	30	1.3	V	-13.19	32.39	74.00	-41.61
2334.80	37.95	Ave	30	1.3	V	-13.19	24.76	54.00	-29.24
2380.58	44.21	PK	349	1.6	H	-13.14	31.07	74.00	-42.93
2380.58	38.78	Ave	349	1.6	H	-13.14	25.64	54.00	-28.36
2494.81	42.29	PK	111	1.4	V	-13.08	29.21	74.00	-44.79
2494.81	38.51	Ave	111	1.4	V	-13.08	25.43	54.00	-28.57

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dB $\mu$ V)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dB $\mu$ V/m)	(dB $\mu$ V/m)	(dB)
n20: Middle Channel 2437MHz									
223.45	38.47	QP	8	1.1	H	-11.62	26.85	46.00	-19.15
223.45	37.13	QP	246	1.5	V	-11.62	25.51	46.00	-20.49
4874.00	52.24	PK	234	1.7	V	-0.62	51.62	74.00	-22.38
4874.00	44.56	Ave	234	1.7	V	-0.62	43.94	54.00	-10.06
7311.00	40.21	PK	293	1.7	H	2.21	42.42	74.00	-31.58
7311.00	41.24	Ave	293	1.7	H	2.21	43.45	54.00	-10.55
2342.28	46.52	PK	186	1.3	V	-13.19	33.33	74.00	-40.67
2342.28	37.22	Ave	186	1.3	V	-13.19	24.03	54.00	-29.97
2376.54	43.37	PK	106	1.5	H	-13.14	30.23	74.00	-43.77
2376.54	36.08	Ave	106	1.5	H	-13.14	22.94	54.00	-31.06
2494.59	44.08	PK	94	1.3	V	-13.08	31.00	74.00	-43.00
2494.59	36.14	Ave	94	1.3	V	-13.08	23.06	54.00	-30.94

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dB $\mu$ V)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dB $\mu$ V/m)	(dB $\mu$ V/m)	(dB)
n20: High Channel 2462MHz									
223.45	37.96	QP	252	1.6	H	-11.62	26.34	46.00	-19.66
223.45	37.80	QP	171	1.6	V	-11.62	26.18	46.00	-19.82
4924.00	53.54	PK	119	1.5	V	-0.24	53.30	74.00	-20.70
4924.00	45.99	Ave	119	1.5	V	-0.24	45.75	54.00	-8.25
7386.00	40.79	PK	223	1.6	H	2.84	43.63	74.00	-30.37
7386.00	40.26	Ave	223	1.6	H	2.84	43.10	54.00	-10.90
2330.71	46.22	PK	134	1.7	V	-13.19	33.03	74.00	-40.97
2330.71	39.83	Ave	134	1.7	V	-13.19	26.64	54.00	-27.36
2374.53	44.67	PK	108	1.7	H	-13.14	31.53	74.00	-42.47
2374.53	36.58	Ave	108	1.7	H	-13.14	23.44	54.00	-30.56
2487.77	43.44	PK	67	1.4	V	-13.08	30.36	74.00	-43.64
2487.77	37.46	Ave	67	1.4	V	-13.08	24.38	54.00	-29.62

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dB $\mu$ V)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dB $\mu$ V/m)	(dB $\mu$ V/m)	(dB)
802.11n(HT40) low channel 2422MHz									
223.45	39.95	QP	97	1.6	H	-11.62	28.33	46.00	-17.67
223.45	38.79	QP	130	1.1	V	-11.62	27.17	46.00	-18.83
4844.00	42.12	PK	273	2.0	V	-1.06	41.06	74.00	-32.94
4844.00	41.55	Ave	273	2.0	V	-1.06	40.49	54.00	-13.51
7266.00	40.66	PK	259	1.5	H	1.33	41.99	74.00	-32.01
7266.00	42.15	Ave	259	1.5	H	1.33	43.48	54.00	-10.52
2324.66	45.60	PK	11	1.9	V	-13.19	32.41	74.00	-41.59
2324.66	37.76	Ave	11	1.9	V	-13.19	24.57	54.00	-29.43
2378.80	44.42	PK	152	1.4	H	-13.14	31.28	74.00	-42.72
2378.80	37.82	Ave	152	1.4	H	-13.14	24.68	54.00	-29.32
2486.65	44.11	PK	66	1.4	V	-13.08	31.03	74.00	-42.97
2486.65	38.76	Ave	66	1.4	V	-13.08	25.68	54.00	-28.32

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
802.11n(HT40) middle channel 2437MHz									
223.45	39.01	QP	286	1.3	H	-11.62	27.39	46.00	-18.61
223.45	31.09	QP	309	1.6	V	-11.62	19.47	46.00	-26.53
4874.00	48.89	PK	175	1.8	V	-0.62	48.27	74.00	-25.73
4874.00	45.01	Ave	175	1.8	V	-0.62	44.39	54.00	-9.61
7311.00	40.68	PK	349	1.0	H	2.21	42.89	74.00	-31.11
7311.00	43.28	Ave	349	1.0	H	2.21	45.49	54.00	-8.51
2314.60	46.20	PK	186	1.0	V	-13.19	33.01	74.00	-40.99
2314.60	38.59	Ave	186	1.0	V	-13.19	25.40	54.00	-28.60
2389.14	43.94	PK	140	1.3	H	-13.14	30.80	74.00	-43.20
2389.14	37.95	Ave	140	1.3	H	-13.14	24.81	54.00	-29.19
2484.47	44.95	PK	325	1.0	V	-13.08	31.87	74.00	-42.13
2484.47	37.66	Ave	325	1.0	V	-13.08	24.58	54.00	-29.42

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dB $\mu$ V)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dB $\mu$ V/m)	(dB $\mu$ V/m)	(dB)
802.11n(HT40) High channel 2452MHz									
223.45	44.47	QP	175	1.0	H	-11.62	32.85	46.00	-13.15
223.45	32.36	QP	14	1.7	V	-11.62	20.74	46.00	-25.26
4904.00	46.41	PK	106	1.8	V	-0.24	46.17	74.00	-27.83
4904.00	45.97	Ave	106	1.8	V	-0.24	45.73	54.00	-8.27
7356.00	37.64	PK	264	1.4	H	2.84	40.48	74.00	-33.52
7356.00	39.13	Ave	264	1.4	H	2.84	41.97	54.00	-12.03
2326.92	45.16	PK	267	1.6	V	-13.19	31.97	74.00	-42.03
2326.92	38.46	Ave	267	1.6	V	-13.19	25.27	54.00	-28.73
2386.53	44.63	PK	199	1.9	H	-13.14	31.49	74.00	-42.51
2386.53	36.73	Ave	199	1.9	H	-13.14	23.59	54.00	-30.41
2499.01	42.59	PK	312	1.7	V	-13.08	29.51	74.00	-44.49
2499.01	36.23	Ave	312	1.7	V	-13.08	23.15	54.00	-30.85

**Test Frequency: 18GHz~25GHz**

The measurements were more than 20 dB below the limit and not reported.



**BT BLE:****Test Frequency : 26MHz ~ 30MHz**

The measurements were more than 20 dB below the limit and not reported.

**Test Frequency : 30MHz ~ 18GHz**

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	Limit	Margin
				Height	Polar				
(MHz)	(dB $\mu$ V)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dB $\mu$ V/m)	(dB $\mu$ V/m)	(dB)
Low Channel 2402MHz									
268.37	36.12	QP	347	1.7	H	-13.35	22.77	46.00	-23.23
268.37	41.63	QP	158	1.8	V	-13.35	28.28	46.00	-17.72
4804.00	46.45	PK	305	1.3	V	-1.06	45.39	74.00	-28.61
4804.00	43.52	Ave	305	1.3	V	-1.06	42.46	54.00	-11.54
7206.00	40.62	PK	31	1.9	H	1.33	41.95	74.00	-32.05
7206.00	35.37	Ave	31	1.9	H	1.33	36.70	54.00	-17.30
2332.44	46.56	PK	127	1.2	V	-13.19	33.37	74.00	-40.63
2332.44	38.62	Ave	127	1.2	V	-13.19	25.43	54.00	-28.57
2351.91	44.73	PK	286	1.1	H	-13.14	31.59	74.00	-42.41
2351.91	36.96	Ave	286	1.1	H	-13.14	23.82	54.00	-30.18
2489.67	44.59	PK	266	1.3	V	-13.08	31.51	74.00	-42.49
2489.67	37.17	Ave	266	1.3	V	-13.08	24.09	54.00	-29.91

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	Limit	Margin
				Height	Polar				
(MHz)	(dB $\mu$ V)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dB $\mu$ V/m)	(dB $\mu$ V/m)	(dB)
Middle Channel 2440MHz									
268.37	36.59	QP	104	1.3	H	-13.35	23.24	46.00	-22.76
268.37	43.13	QP	219	1.8	V	-13.35	29.78	46.00	-16.22
4880.00	46.90	PK	108	2.0	V	-0.62	46.28	74.00	-27.72
4880.00	44.35	Ave	108	2.0	V	-0.62	43.73	54.00	-10.27
7320.00	40.76	PK	313	1.1	H	2.21	42.97	74.00	-31.03
7320.00	35.61	Ave	313	1.1	H	2.21	37.82	54.00	-16.18
2316.79	45.02	PK	234	1.0	V	-13.19	31.83	74.00	-42.17
2316.79	38.38	Ave	234	1.0	V	-13.19	25.19	54.00	-28.81
2382.35	44.71	PK	207	1.8	H	-13.14	31.57	74.00	-42.43
2382.35	36.67	Ave	207	1.8	H	-13.14	23.53	54.00	-30.47
2497.01	43.75	PK	100	1.9	V	-13.08	30.67	74.00	-43.33
2497.01	37.28	Ave	100	1.9	V	-13.08	24.20	54.00	-29.80

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	Limit	Margin
				Height	Polar				
(MHz)	(dB $\mu$ V)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dB $\mu$ V/m)	(dB $\mu$ V/m)	(dB)
High Channel 2480MHz									
268.37	37.56	QP	60	1.1	H	-13.35	24.21	46.00	-21.79
268.37	43.94	QP	181	1.0	V	-13.35	30.59	46.00	-15.41
4960.00	46.83	PK	242	1.9	V	-0.24	46.59	74.00	-27.41
4960.00	43.76	Ave	242	1.9	V	-0.24	43.52	54.00	-10.48
7440.00	39.89	PK	284	1.7	H	2.84	42.73	74.00	-31.27
7440.00	36.36	Ave	284	1.7	H	2.84	39.20	54.00	-14.80
2348.00	46.56	PK	340	1.9	V	-13.19	33.37	74.00	-40.63
2348.00	37.97	Ave	340	1.9	V	-13.19	24.78	54.00	-29.22
2372.63	42.33	PK	281	1.6	H	-13.14	29.19	74.00	-44.81
2372.63	38.82	Ave	281	1.6	H	-13.14	25.68	54.00	-28.32
2484.18	42.68	PK	333	1.3	V	-13.08	29.60	74.00	-44.40
2484.18	36.60	Ave	333	1.3	V	-13.08	23.52	54.00	-30.48

## 9 Conducted Spurious Emissions

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: KDB 558074 D01 DTS Meas Guidance v03r04 January 7, 2016

Test Result: PASS

Limit:

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, 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) (see Section 15.205(c)).

### 2.1 Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer:  
RBW = 100kHz, VBW = 300kHz, Sweep = auto  
Detector function = peak, Trace = max hold

## 2.2 Test Result

802.11b

Low Channel

Fundamental



Middle Channel

Fundamental



### High Channel

Fundamental



802.11g

### Low Channel

Fundamental



### Middle Channel

Fundamental



### High Channel

Fundamental



802.11n HT20

Low Channel

Fundamental



Middle Channel

Fundamental





### High Channel

Fundamental



### 802.11n HT40

### Low Channel

Fundamental



### Middle Channel

Fundamental



### High Channel

Fundamental



BLE

Low Channel

Fundamental



Middle Channel

Fundamental



High Channel

Fundamental



## 10 Band Edge Measurement

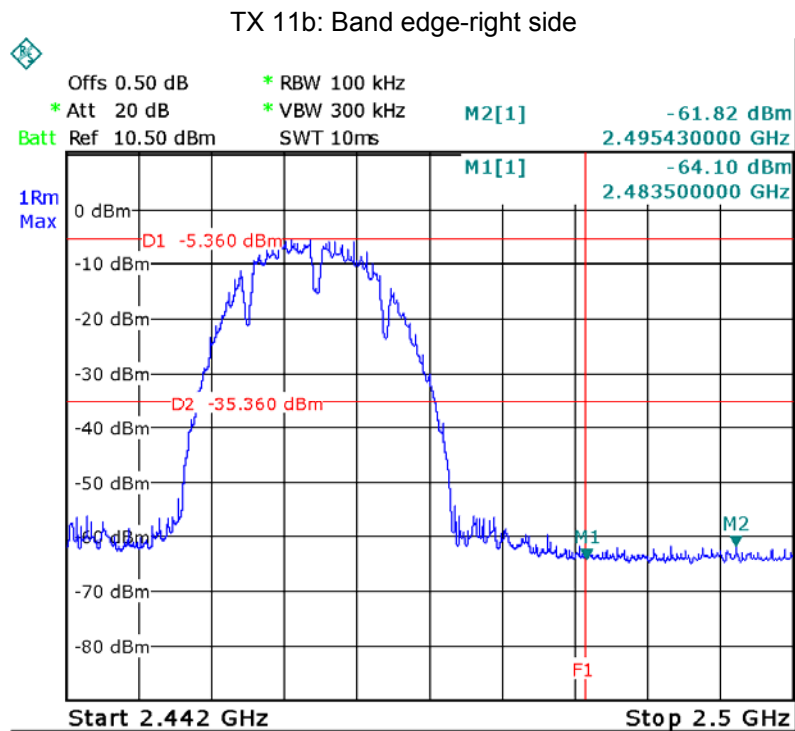
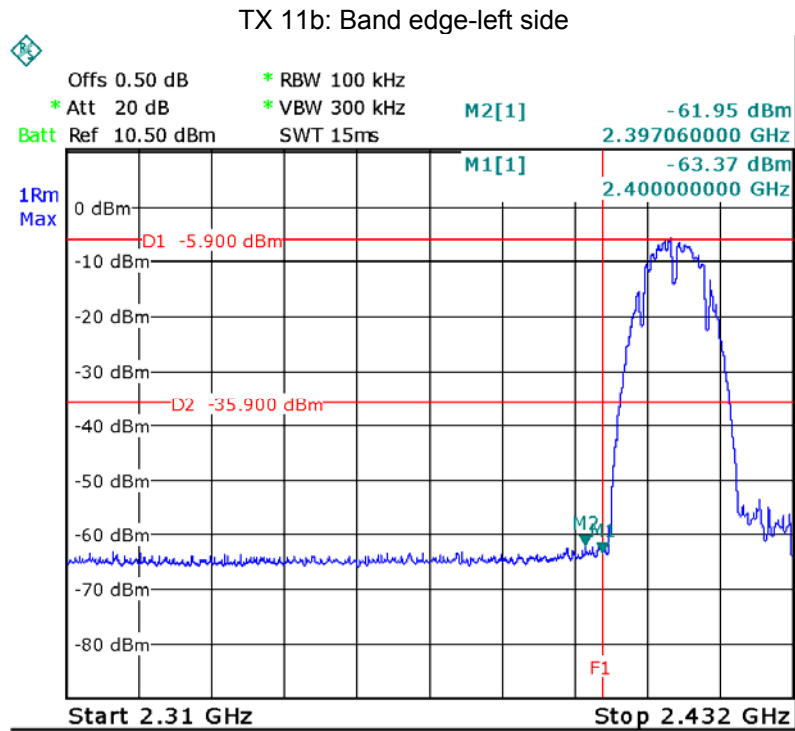
Test Requirement:	FCC CFR47 Part 15 Section 15.247
Test Method:	KDB 558074 D01 DTS Meas Guidance v03r04 January 7, 2016
Test Limit:	Regulation 15.247 (d), In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).
Test Mode:	Transmitting

### 10.1 Test Produce

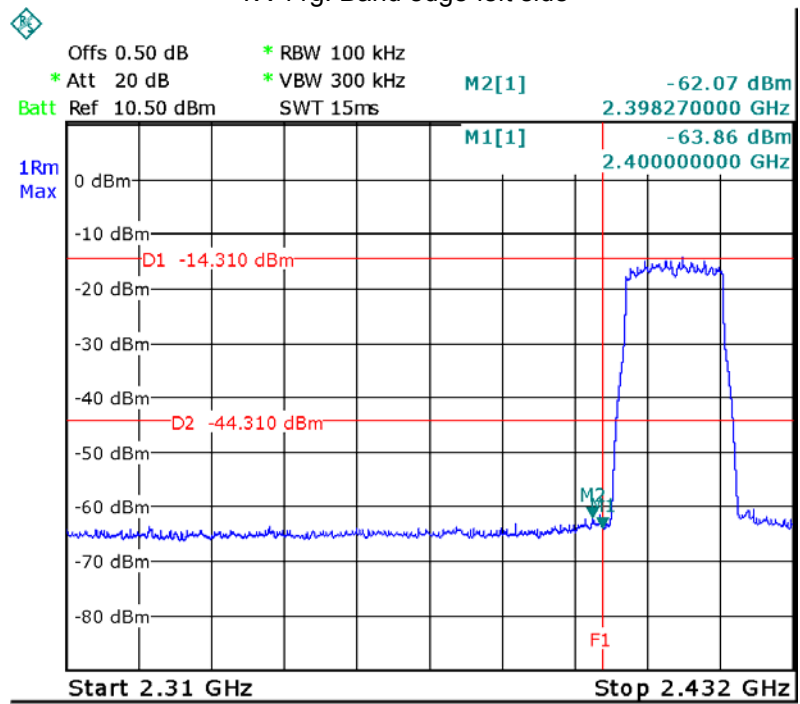
1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

### 10.2 Test Result

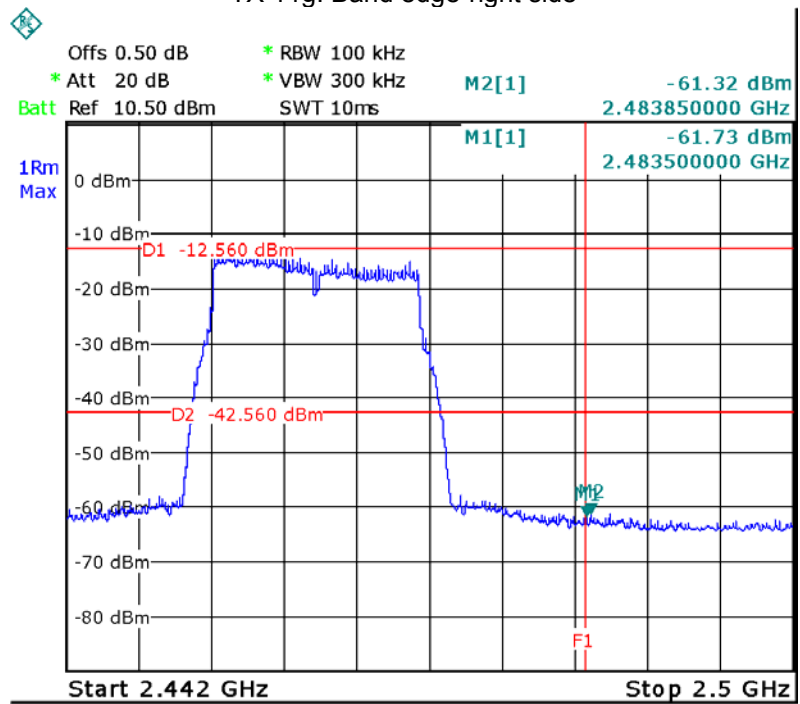
Test result plots shown as follows:



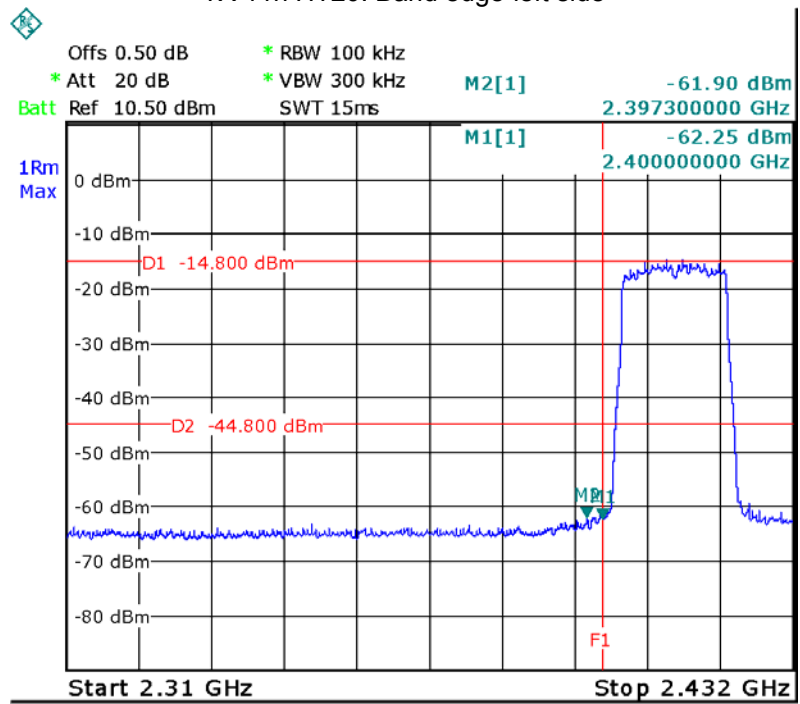
TX 11g: Band edge-left side



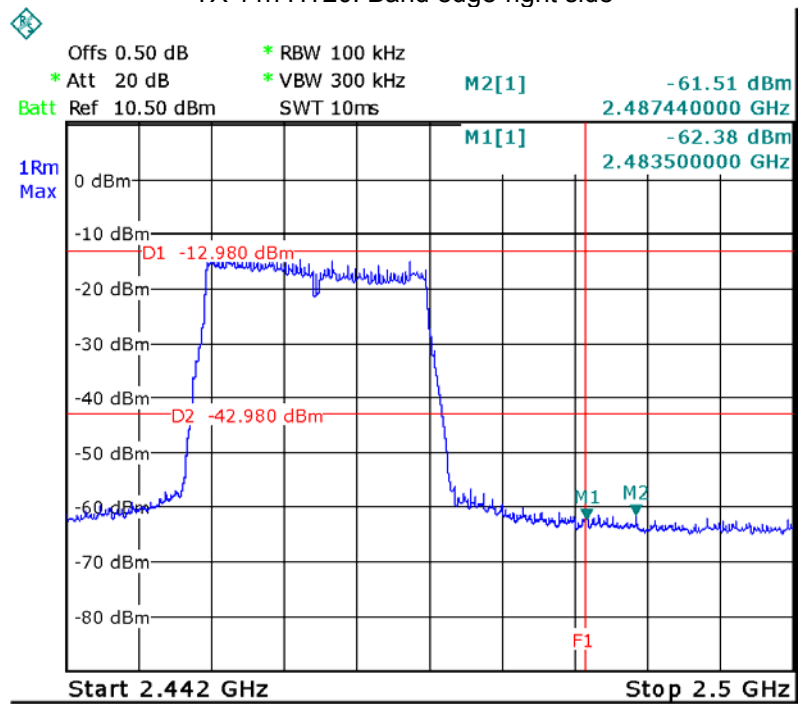
TX 11g: Band edge-right side



TX 11n HT20: Band edge-left side

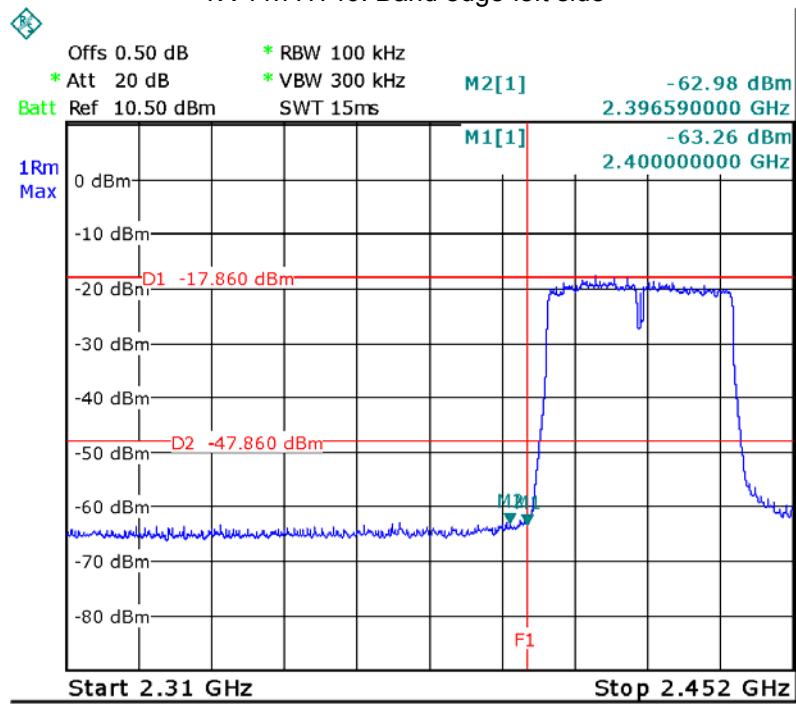


TX 11n HT20: Band edge-right side

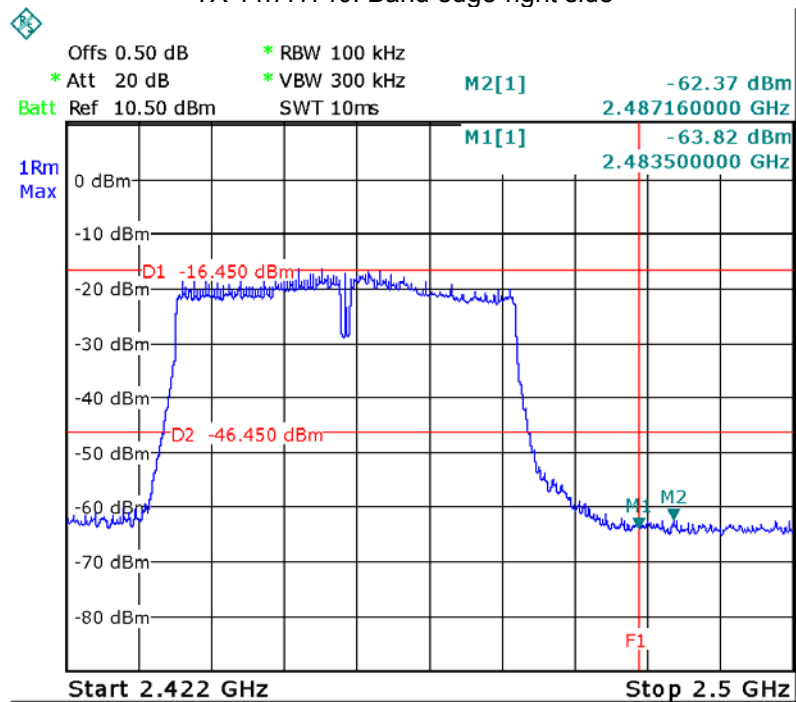




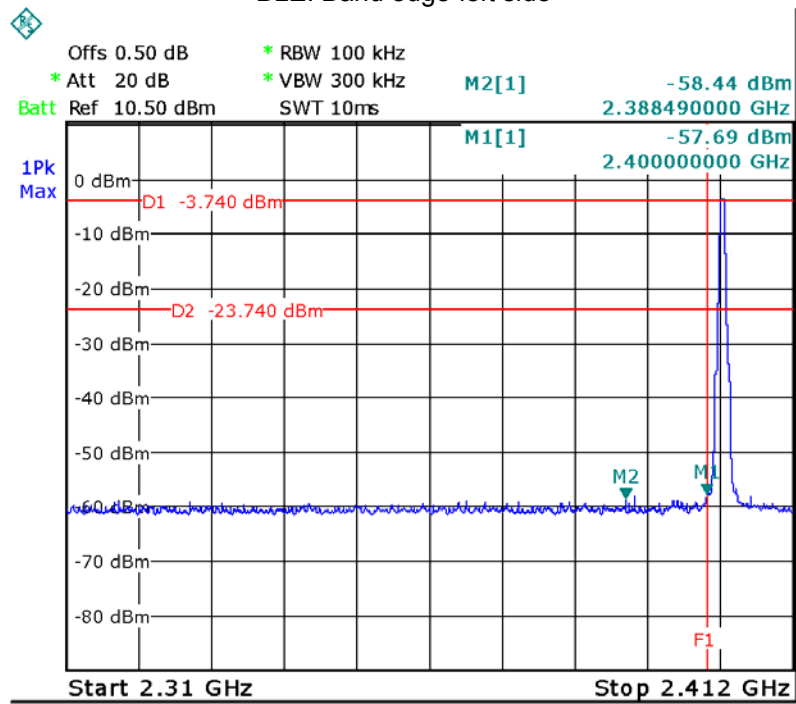
TX 11n HT40: Band edge-left side



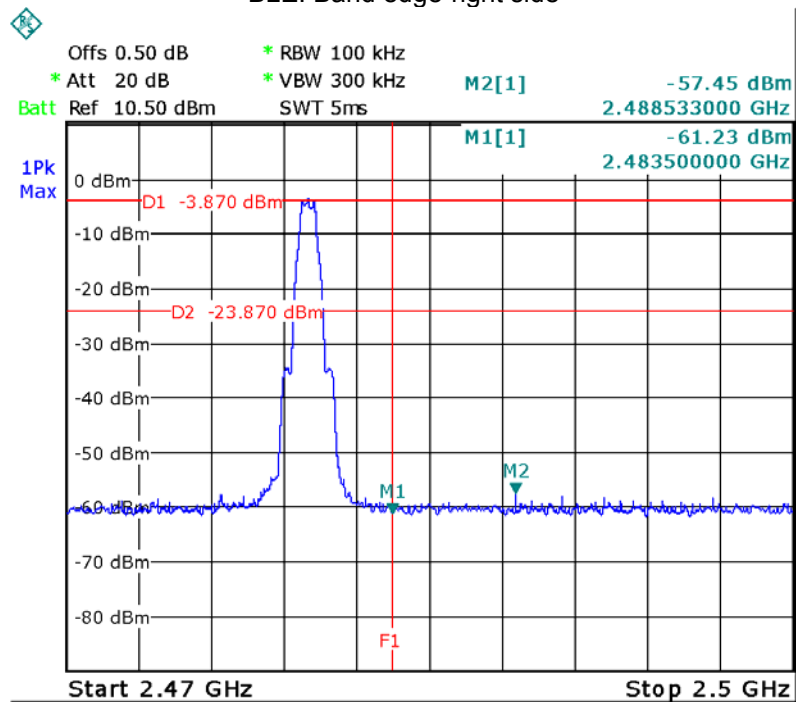
TX 11n HT40: Band edge-right side



BLE: Band edge-left side



BLE: Band edge-right side



## 11 6 dB Bandwidth Measurement

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: KDB 558074 D01 DTS Meas Guidance v03r04 January 7, 2016

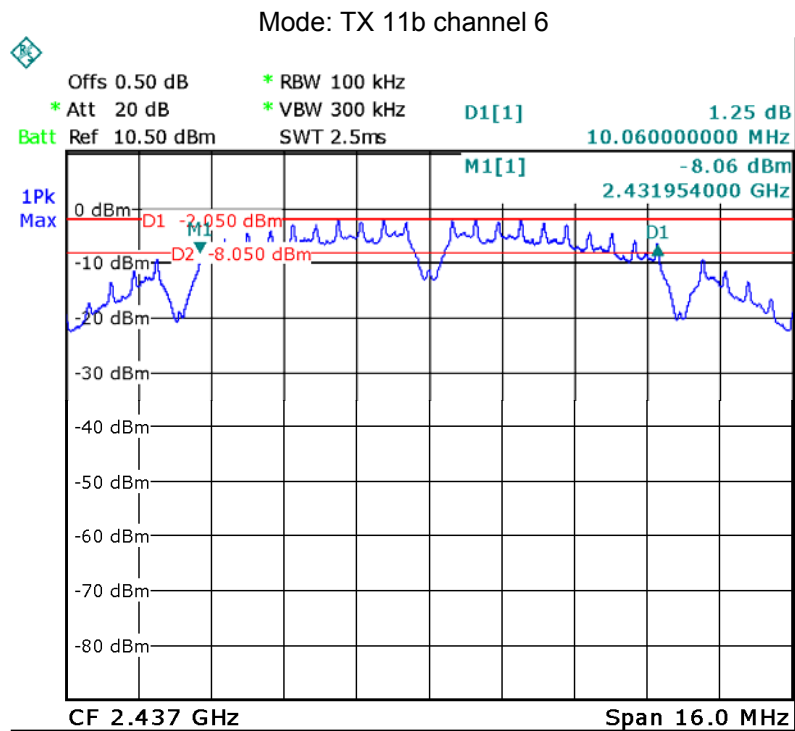
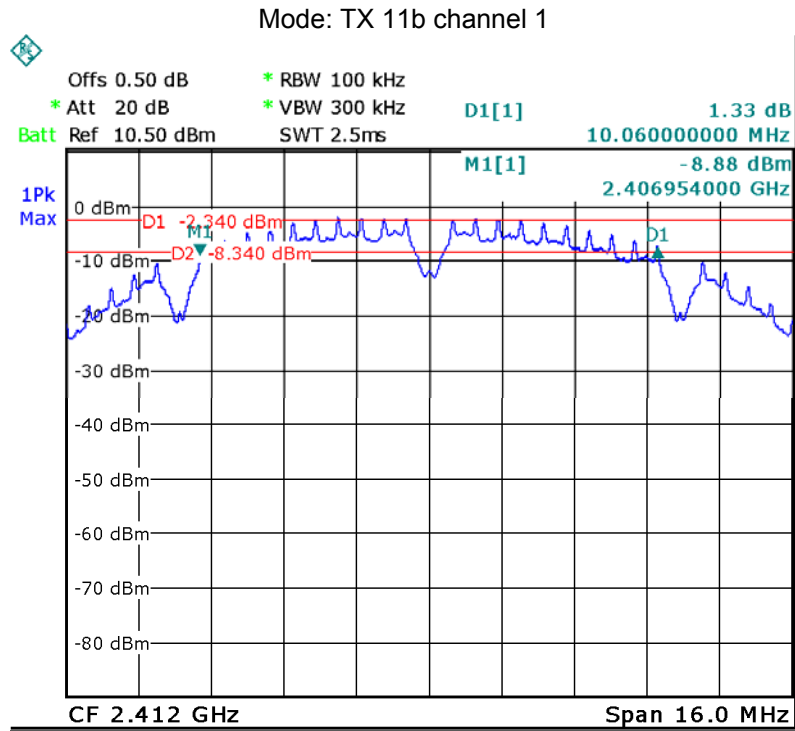
### 11.1 Test Procedure:

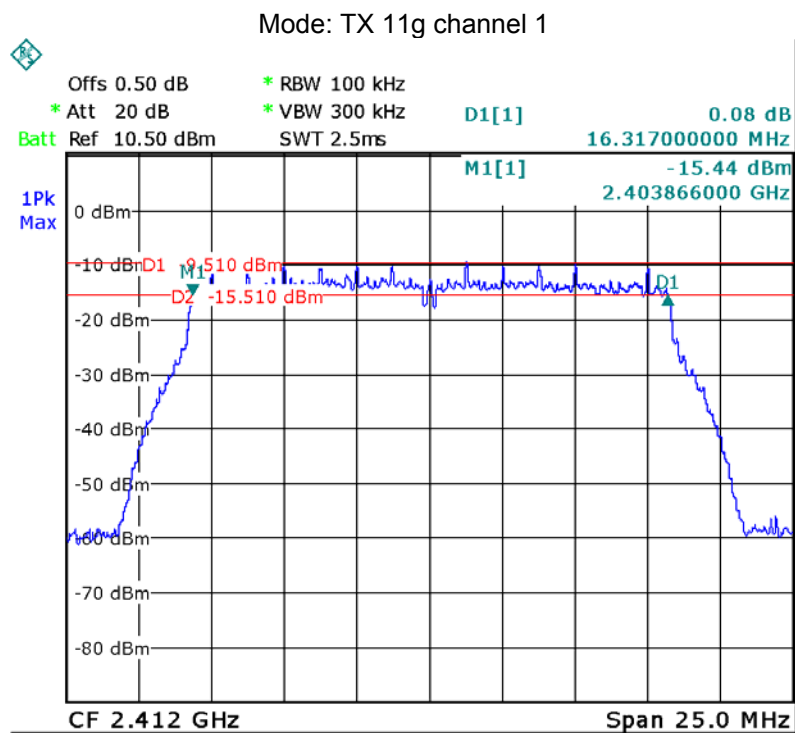
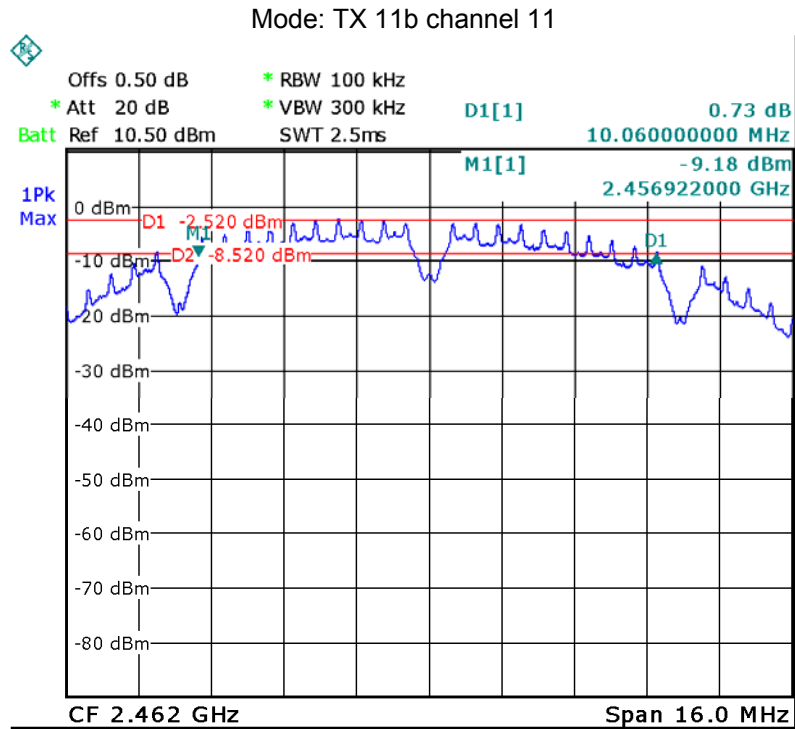
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 100kHz, VBW = 300kHz

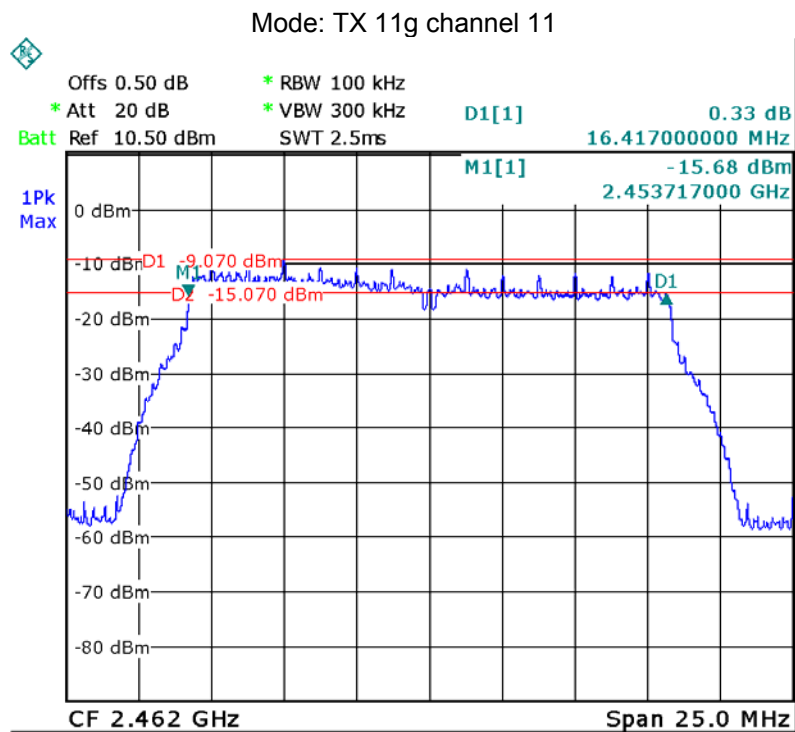
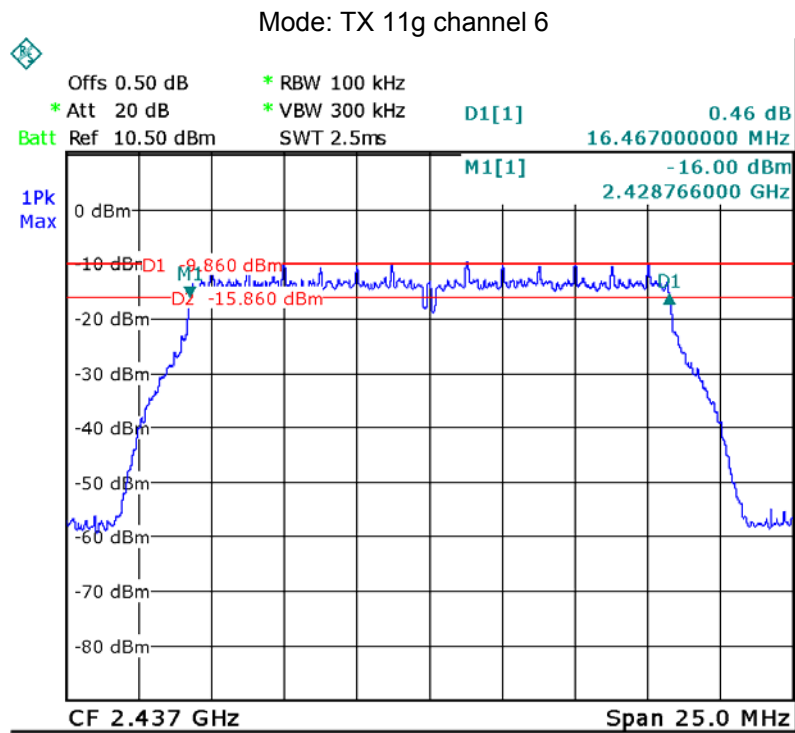
### 11.2 Test Result:

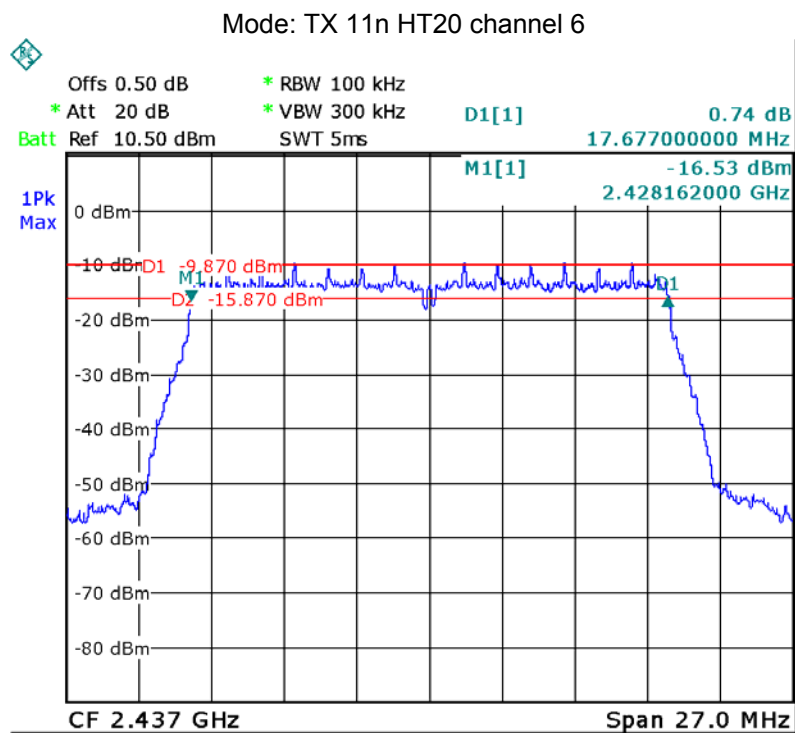
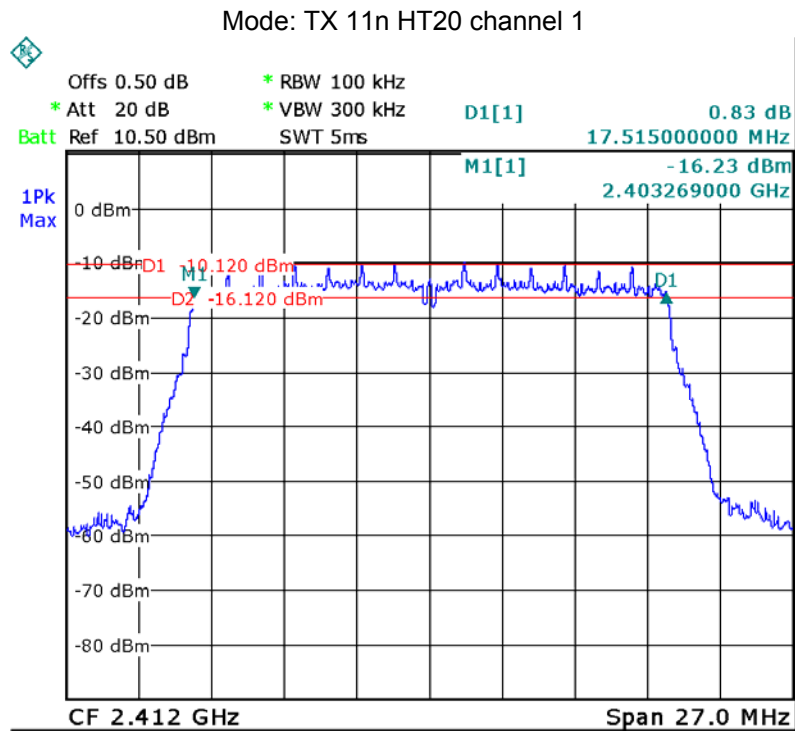
Operation mode	Bandwidth (MHz)		
	Channel 1	Channel 6	Channel 11
TX 11b	Channel 1	Channel 6	Channel 11
	10.060	10.060	10.060
TX 11g	Channel 1	Channel 6	Channel 11
	16.317	16.467	16.417
TX 11n HT20	Channel 1	Channel 6	Channel 11
	17.515	17.677	17.623
TX 11n HT40	Channel 3	Channel 6	Channel 9
	35.680	36.010	35.570
BLE	Channel 0	Channel 19	Channel 39
	0.707	0.707	0.707

Test result plot as follows:

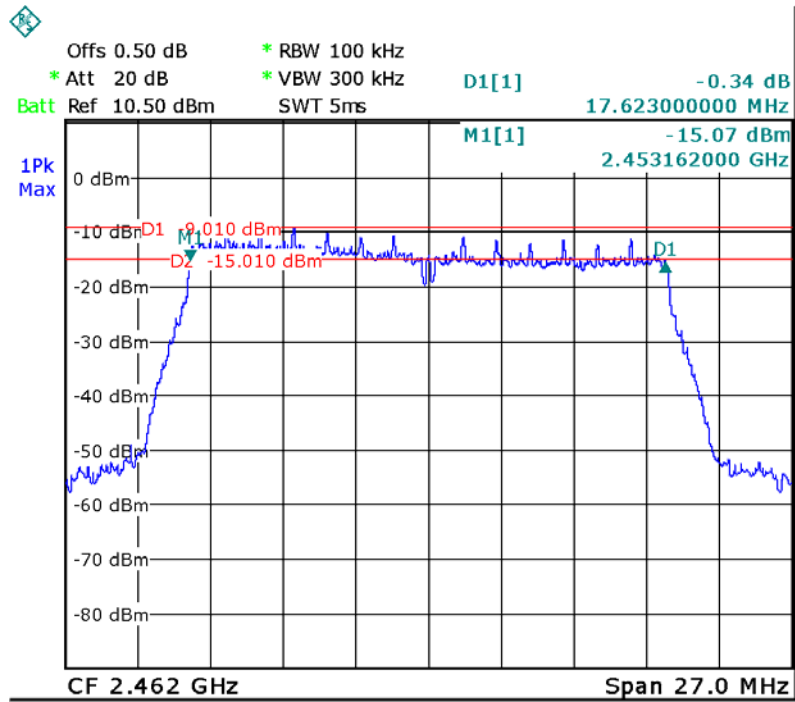




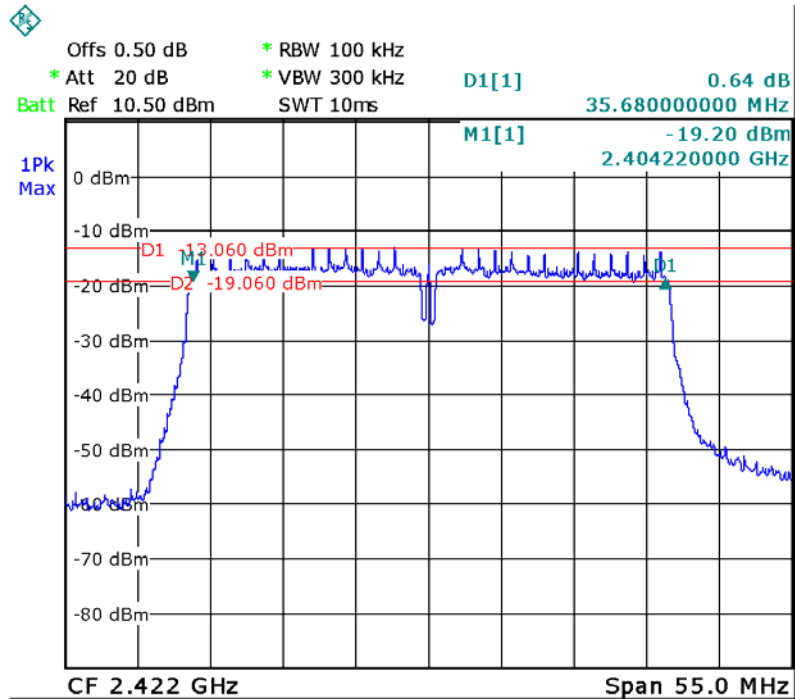




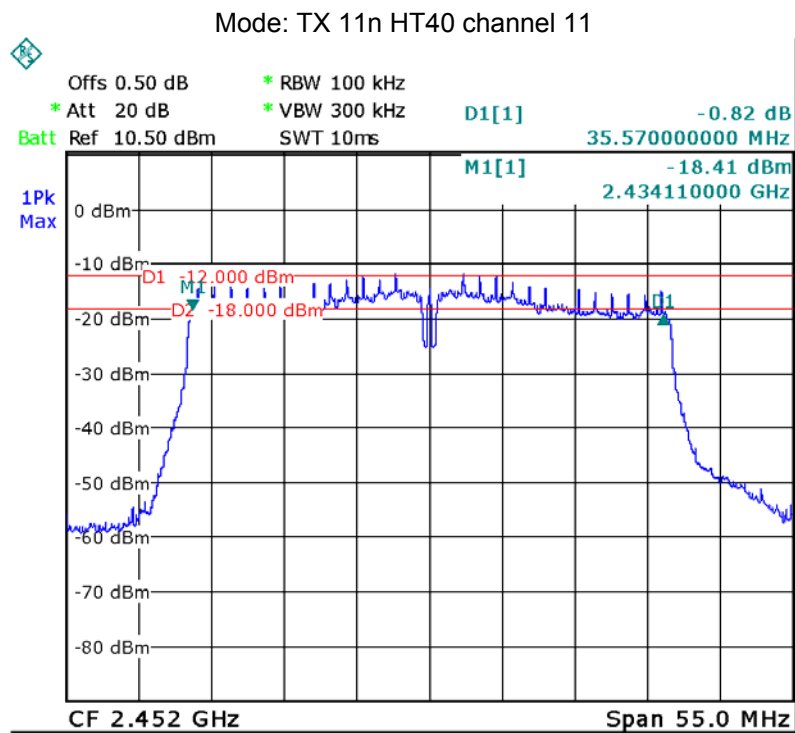
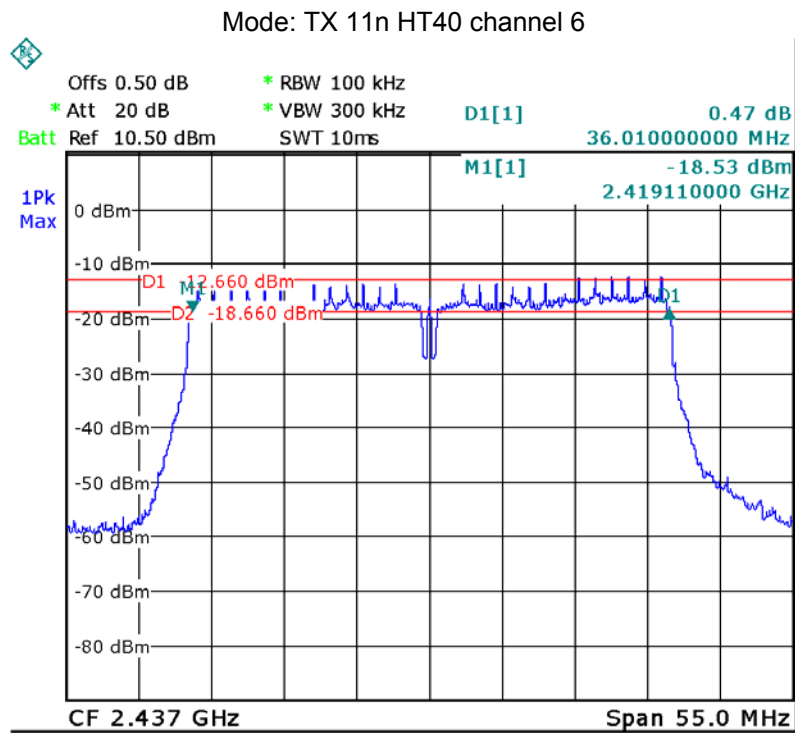
Mode: TX 11n HT20 channel 11



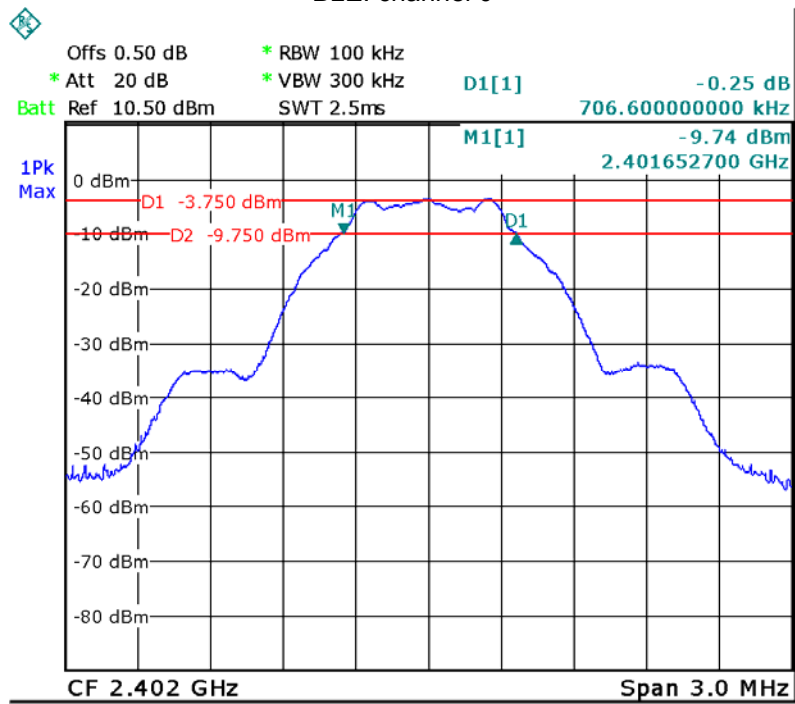
Mode: TX 11n HT40 channel 1



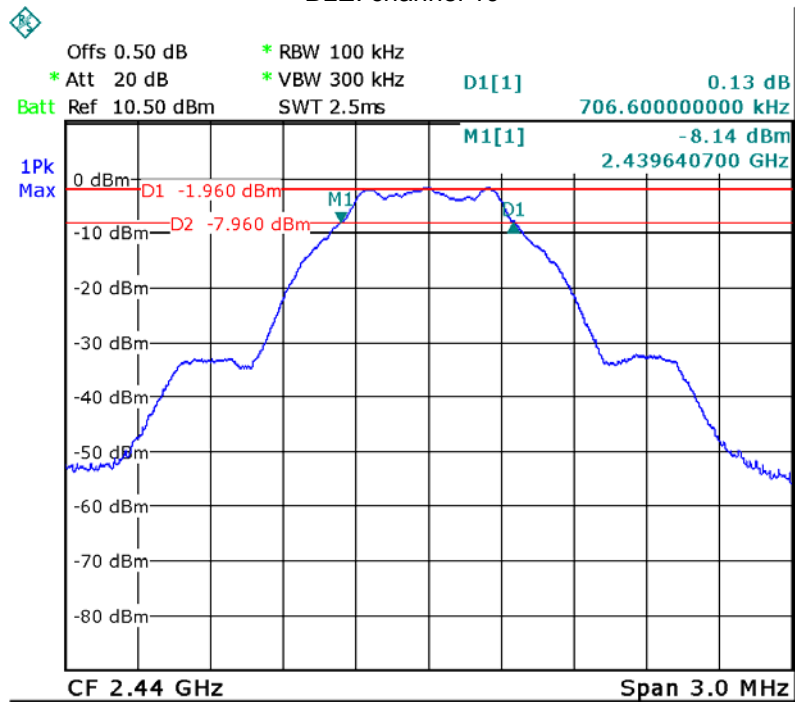


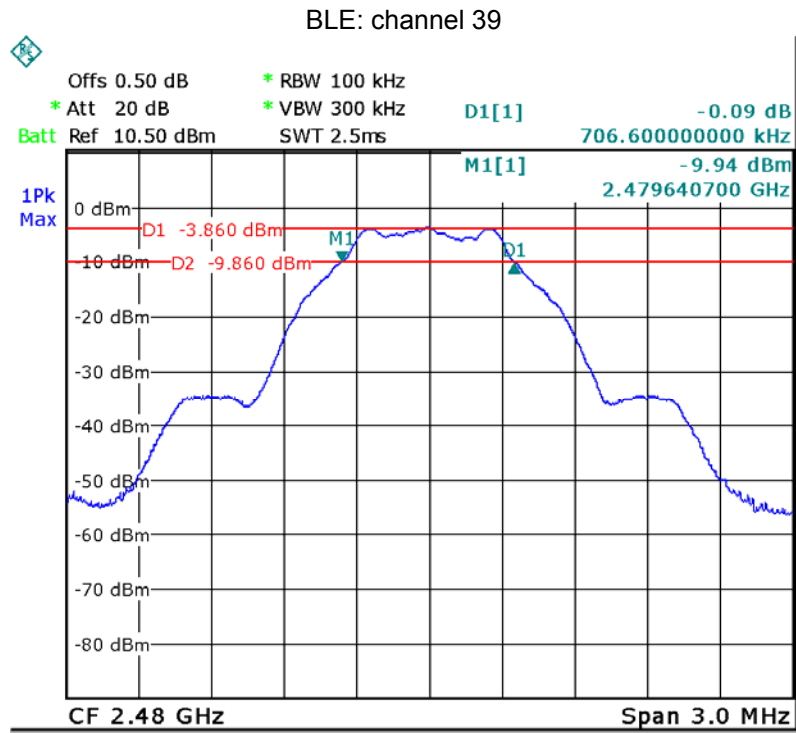


BLE: channel 0



BLE: channel 19





## 12 Maximum Peak Output Power

Test Requirement:

FCC CFR47 Part 15 Section 15.247

Test Method:

KDB 558074 D01 DTS Meas Guidance v03r04 January 7, 2016

### 12.1 Test Procedure:

KDB 558074 D01 DTS Meas Guidance v03r04 January 7, 2016

section 9.1.1 (For BLE)

This procedure shall be used when the measurement instrument has available a resolution bandwidth that is greater than the DTS bandwidth.

- a) Set the  $RBW \geq$  DTS bandwidth.
- b) Set  $VBW \geq 3 \times RBW$ .
- c) Set  $span \geq 3 \times RBW$
- d) Sweep time = auto couple.
- e) Detector = peak.
- f) Trace mode = max hold.
- g) Allow trace to fully stabilize.
- h) Use peak marker function to determine the peak amplitude level.

section 9.1.2 (For WIFI)

This procedure may be used when the maximum available RBW of the measurement instrument is less than the DTS bandwidth.

- a) Set the  $RBW = 1$  MHz.
- b) Set the  $VBW \geq 3 \times RBW$
- c) Set the  $span \geq 1.5 \times$  DTS bandwidth.
- d) Detector = peak.
- e) Sweep time = auto couple.
- f) Trace mode = max hold.
- g) Allow trace to fully stabilize.
- h) Use the instrument's band/channel power measurement function with the band limits set equal to the DTS bandwidth edges (for some instruments, this may require a manual override to select peak detector). If the instrument does not have a band power function, sum the spectrum levels (in linear power units) at intervals equal to the RBW extending across the DTS bandwidth.

**12.2 Test Result:**

Test mode :TX 11b		
Maximum Peak Output Power (dBm)		
2412MHz	2437MHz	2462MHz
9.43	9.16	9.24
Limit: 1W/30dBm		

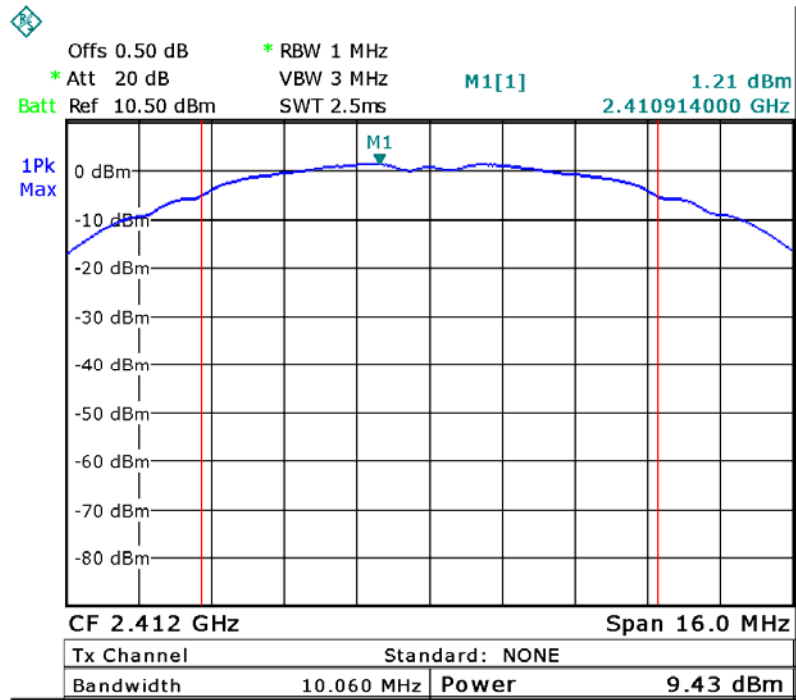
Test mode :TX 11g		
Maximum Peak Output Power (dBm)		
2412MHz	2437MHz	2462MHz
9.41	9.46	9.34
Limit: 1W/30dBm		

Test mode :TX 11n HT20		
Maximum Peak Output Power (dBm)		
2412MHz	2437MHz	2462MHz
9.25	9.49	9.51
Limit: 1W/30dBm		

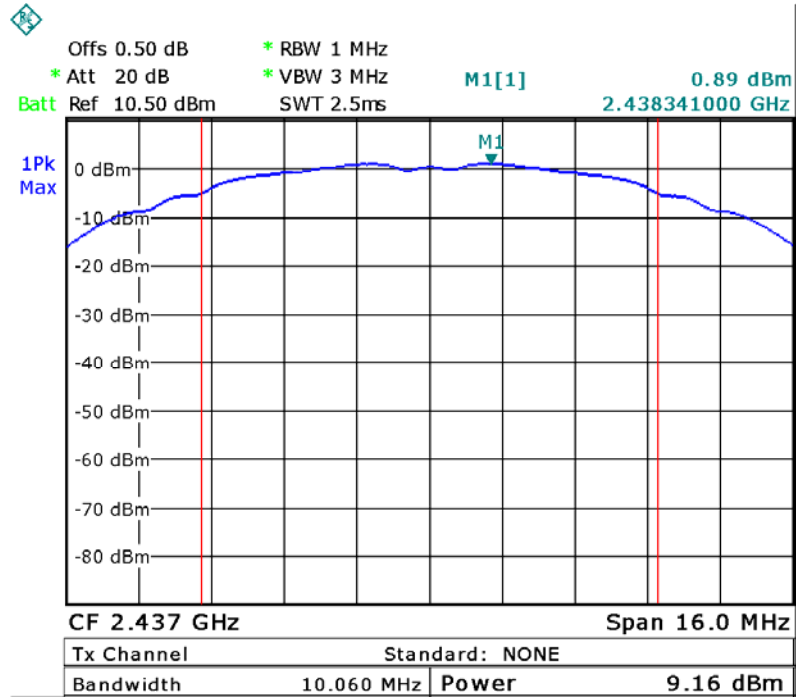
Test mode :TX 11n HT40		
Maximum Peak Output Power (dBm)		
2422MHz	2437MHz	2452MHz
9.45	9.41	9.43
Limit: 1W/30dBm		

BLE		
Maximum Peak Output Power (dBm)		
2402MHz	2440MHz	2480MHz
-2.82	-1.85	-3.44
Limit: 1W/30dBm		

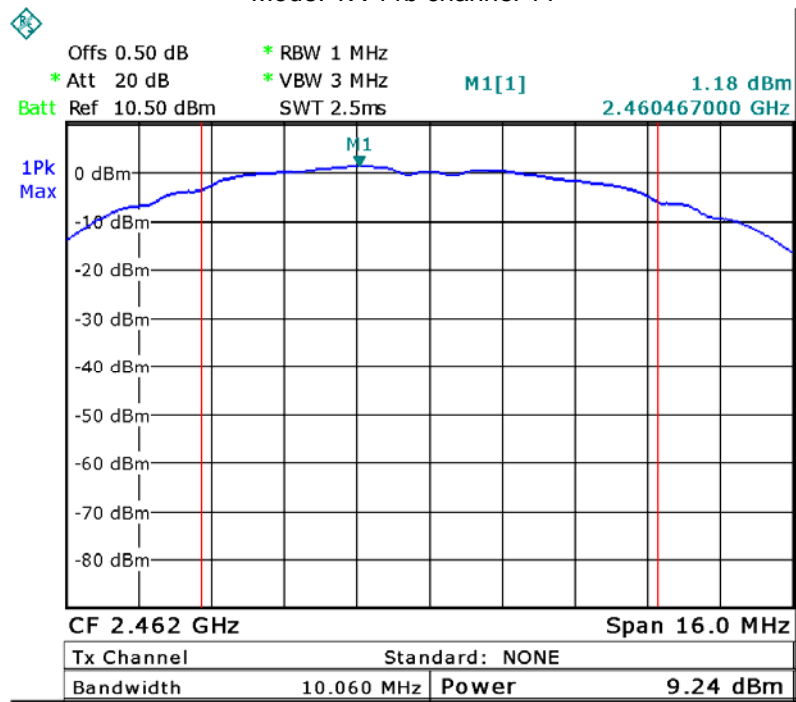
Mode: TX 11b channel 1



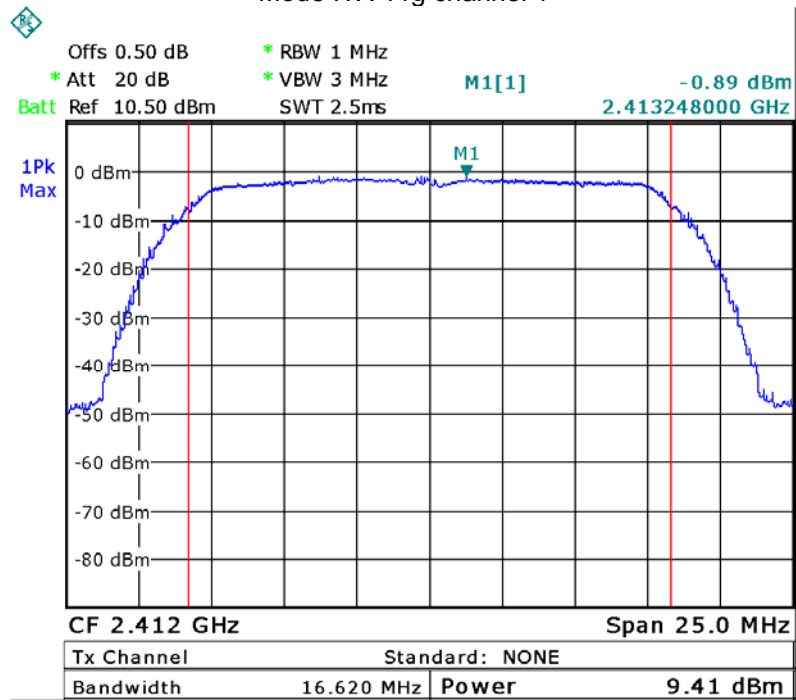
Mode: TX 11b channel 6

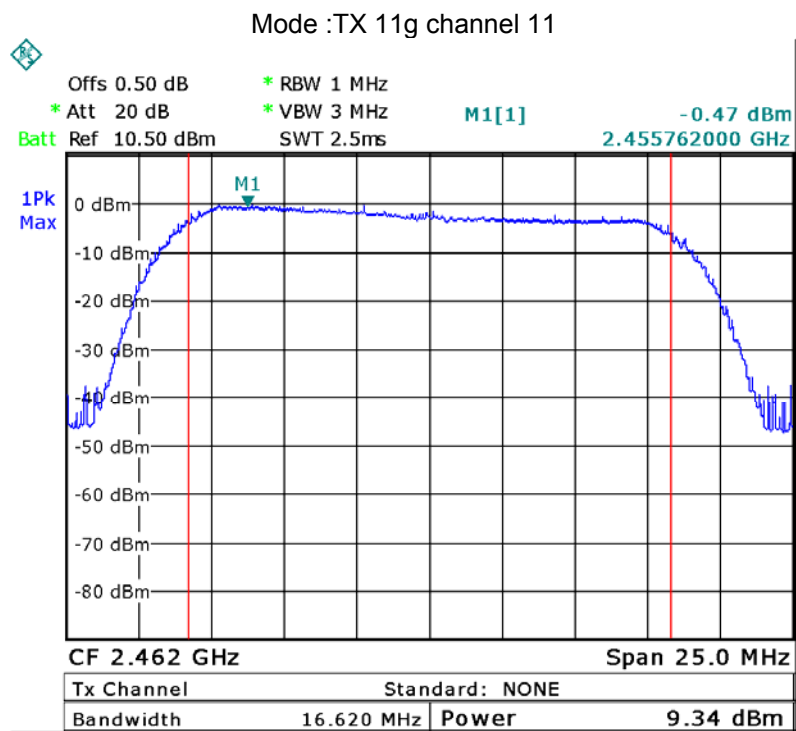
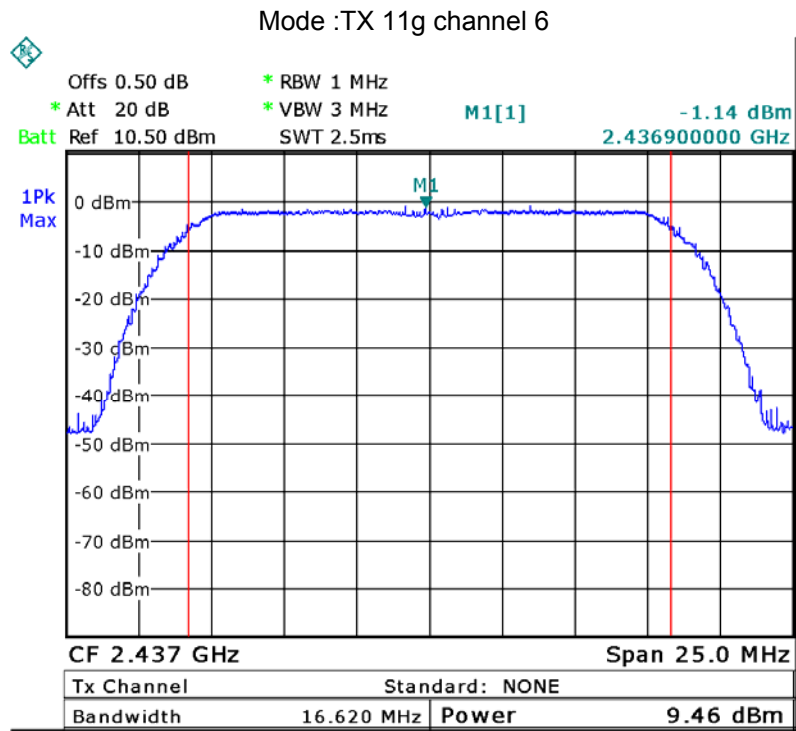


Mode: TX 11b channel 11



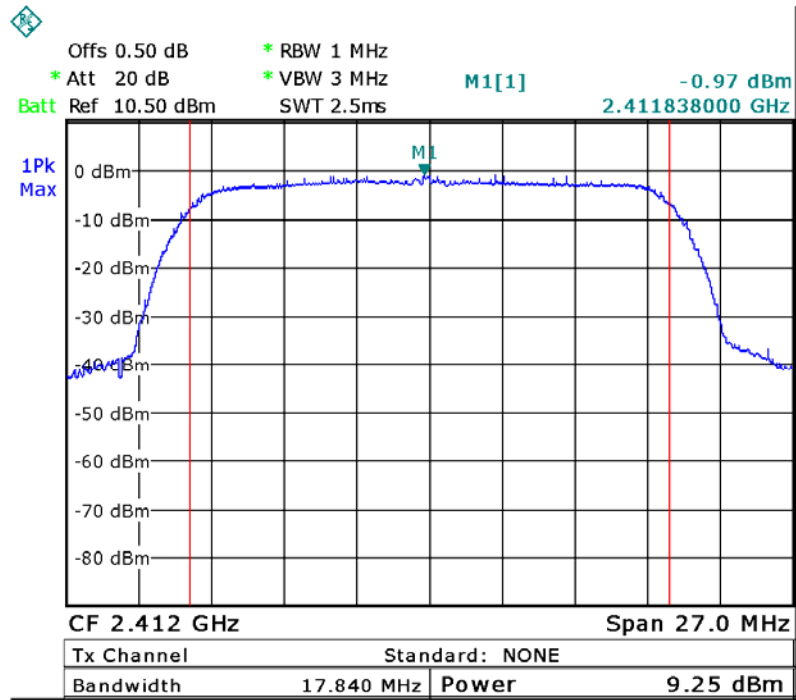
Mode :TX 11g channel 1



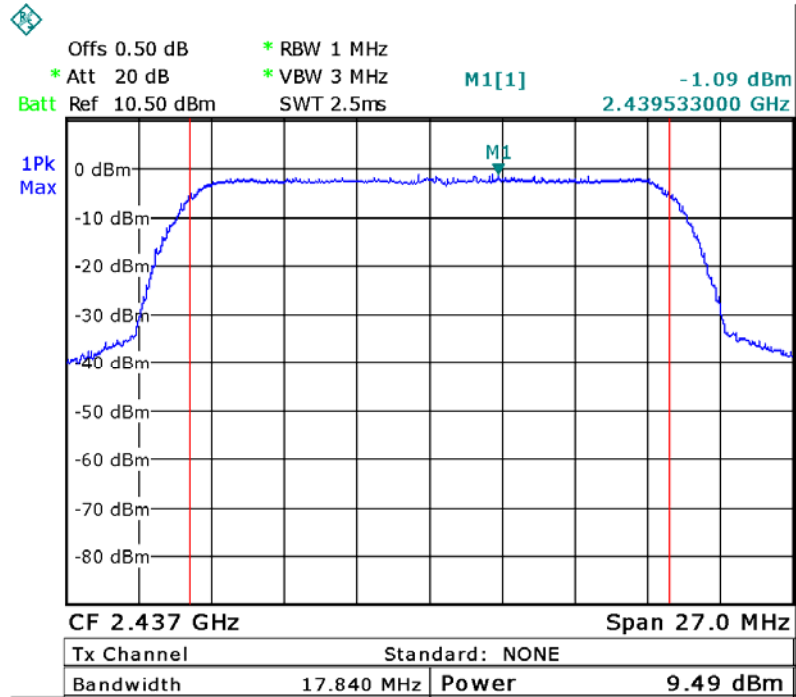




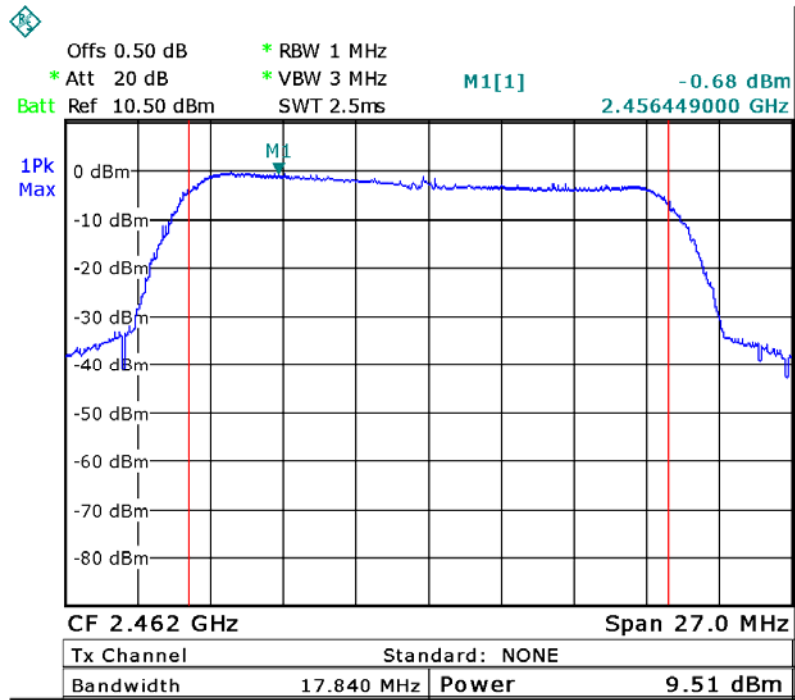
Mode: TX 11n HT20 channel 1



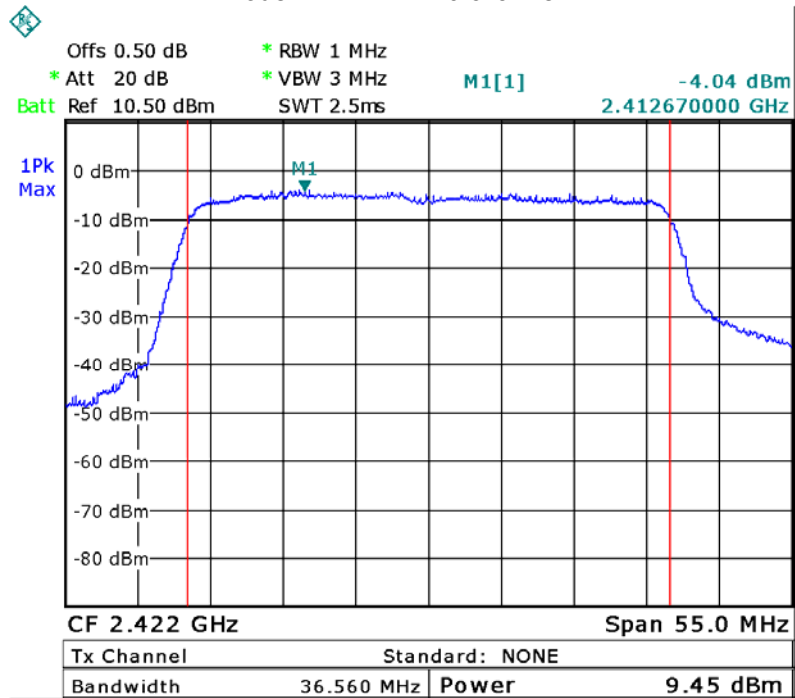
Mode: TX 11n HT20 channel 6



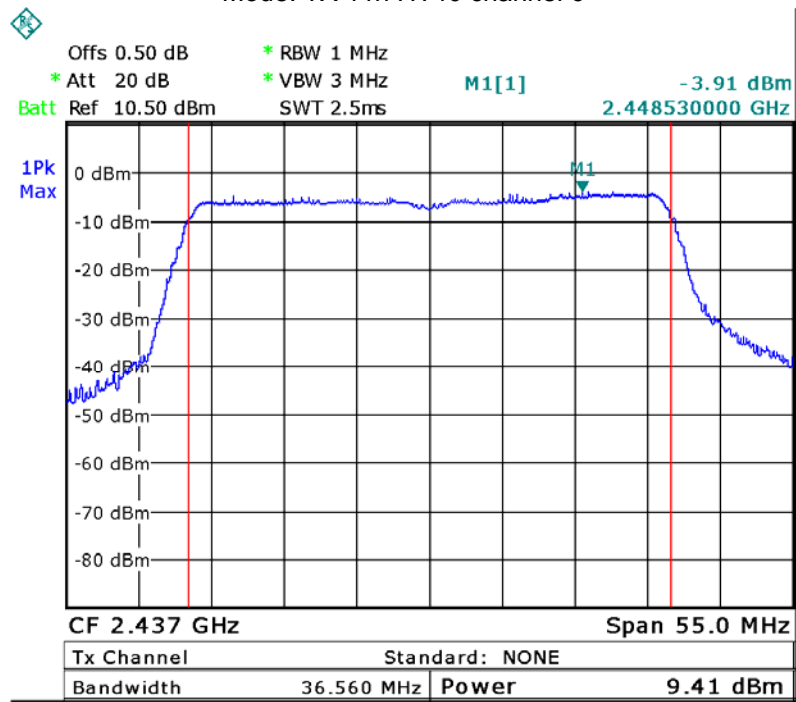
Mode: TX 11n HT20 channel 11



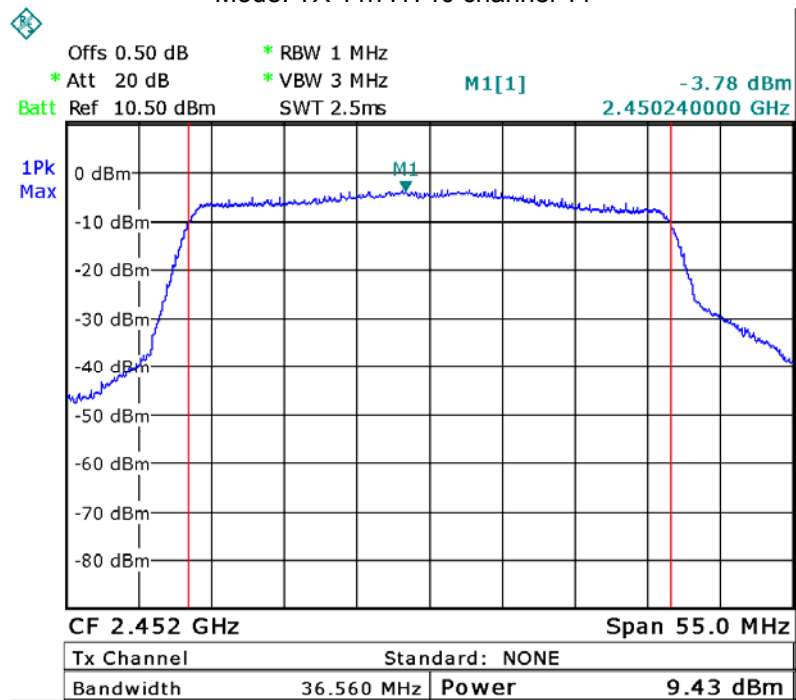
Mode: TX 11n HT40 channel 1



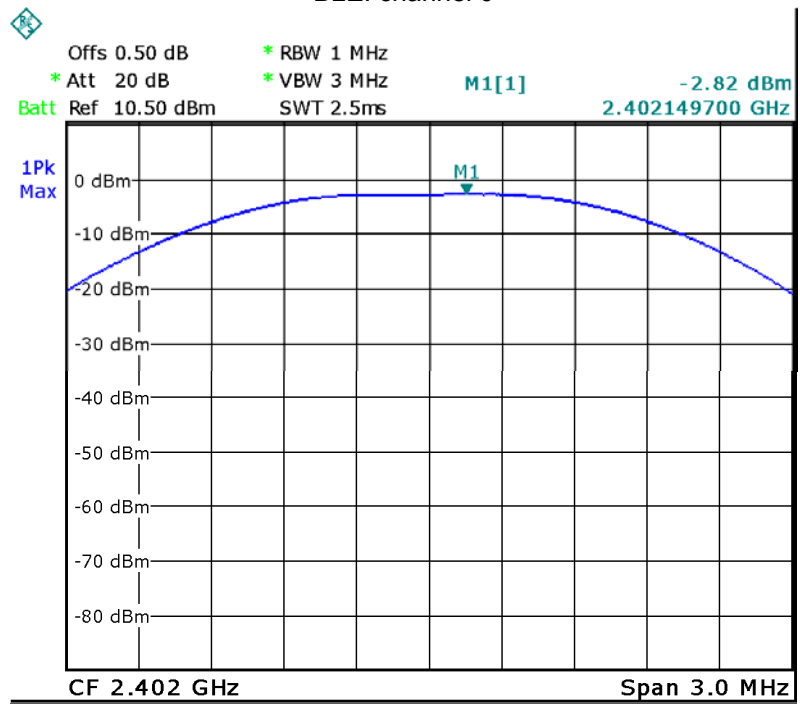
Mode: TX 11n HT40 channel 6



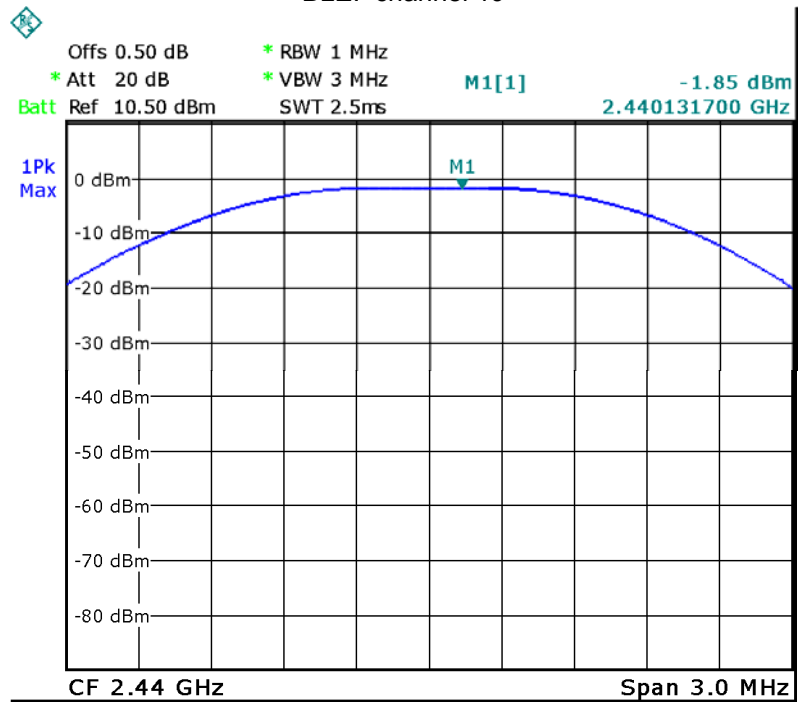
Mode: TX 11n HT40 channel 11

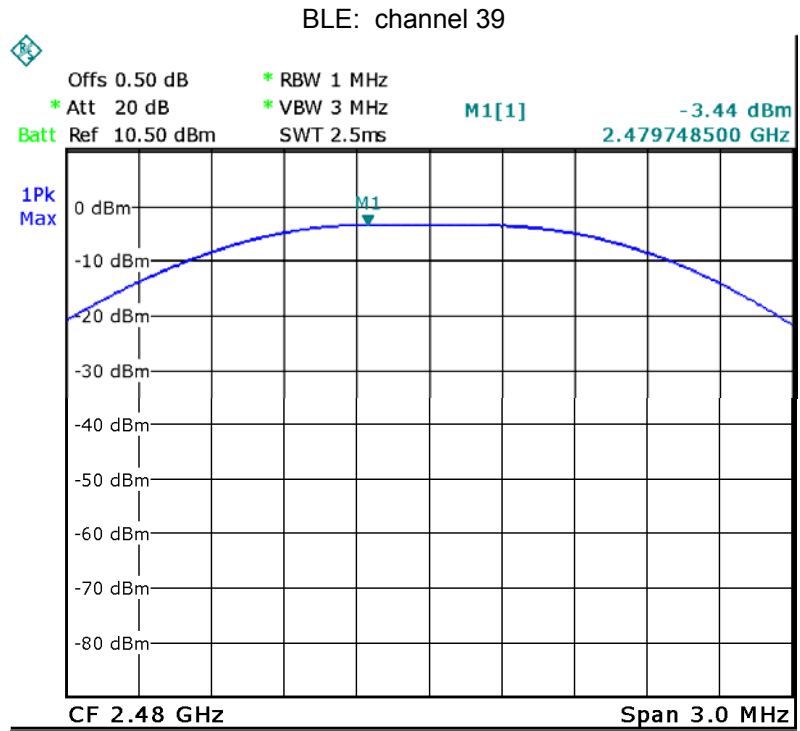


BLE: channel 0



BLE: channel 19





## 13 Power Spectral density

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: KDB 558074 D01 DTS Meas Guidance v03r04 January 7, 2016

### 13.1 Test Procedure:

KDB 558074 D01 DTS Meas Guidance v03r04 January 7, 2016 section 10.2

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 3kHz. VBW = 10kHz , Span = 1.5 times the DTS channel bandwidth(6 dB bandwidth). Sweep = auto; Detector Function = Peak. Trace = Max hold.
3. Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section Submit this plot.

### 13.2 Test Result:

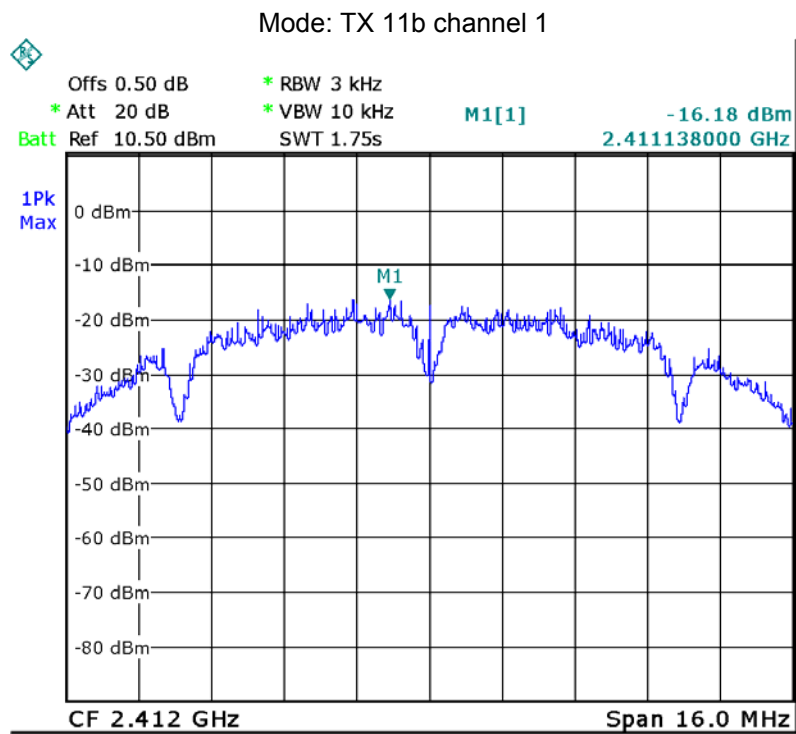
Test mode :TX 11b		
Power Spectral (dBm per 3kHz)		
2412MHz	2437MHz	2462MHz
-16.18	-16.52	-17.51
Limit: 8dBm per 3kHz		

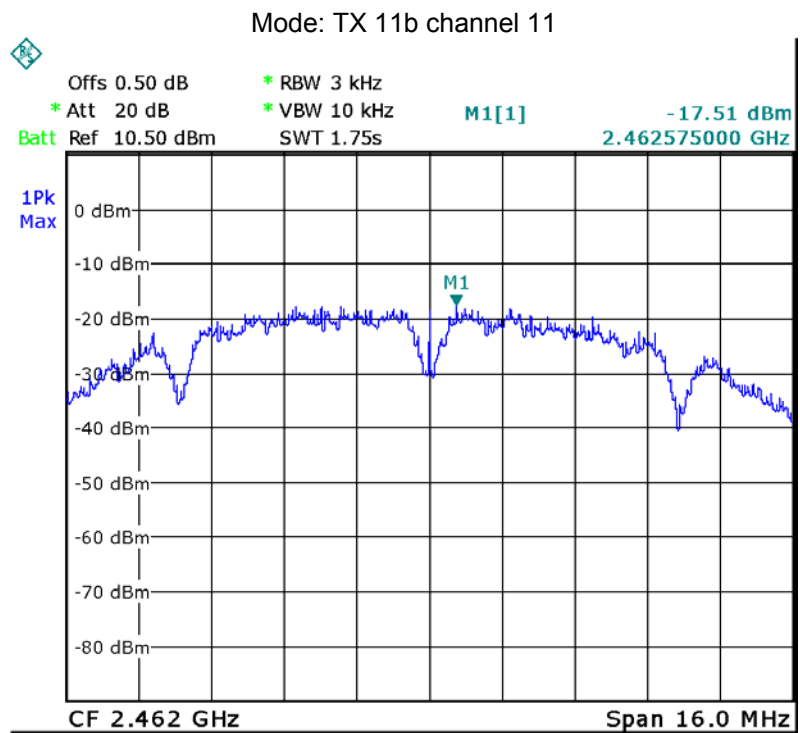
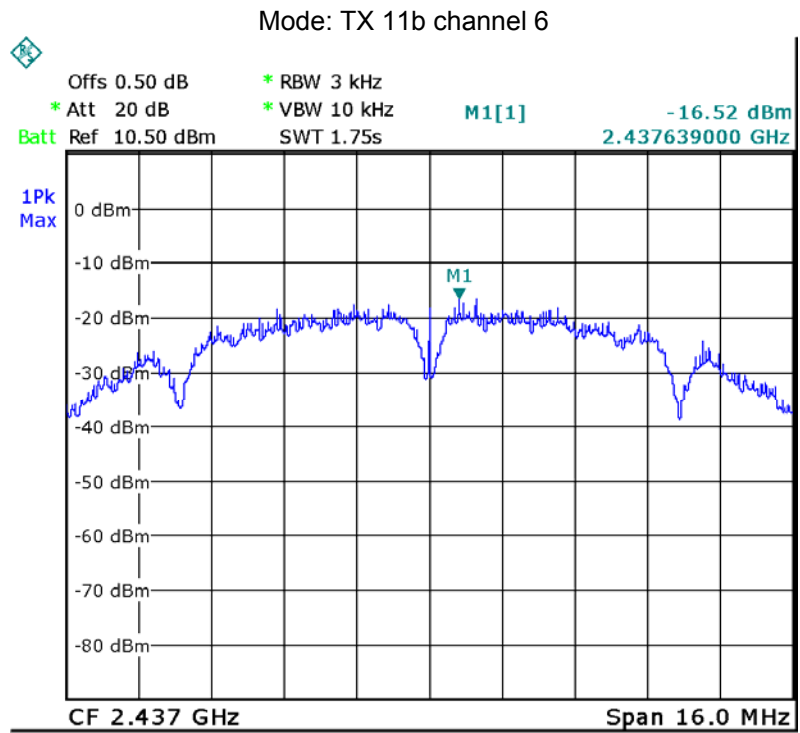
Test mode :TX 11g		
Power Spectral (dBm per 3kHz)		
2412MHz	2437MHz	2462MHz
-16.67	-18.17	-18.78
Limit: 8dBm per 3kHz		

Test mode :TX 11n HT20		
Power Spectral (dBm per 3kHz)		
2412MHz	2437MHz	2462MHz
-17.34	-18.53	-18.41
Limit: 8dBm per 3kHz		

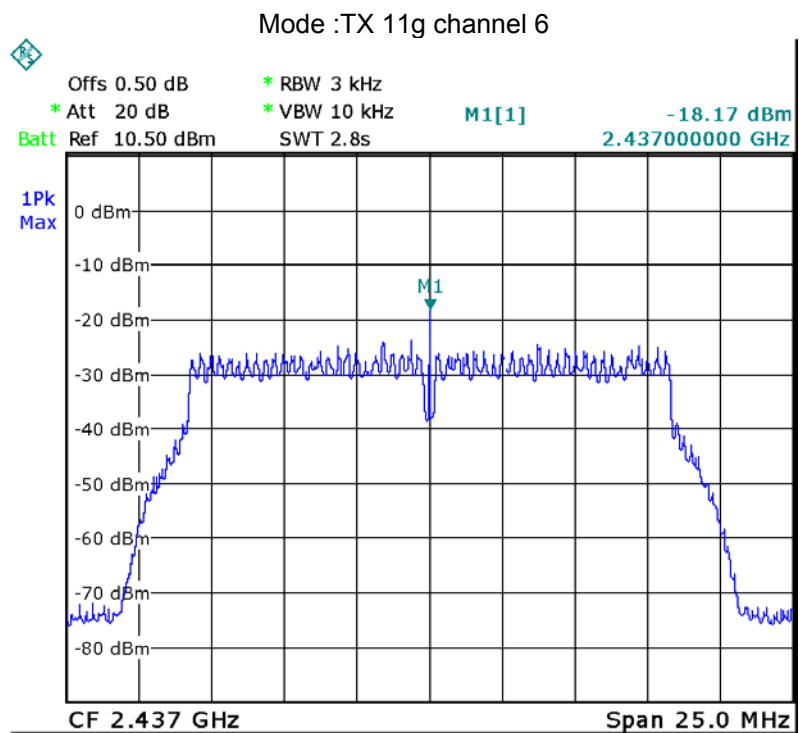
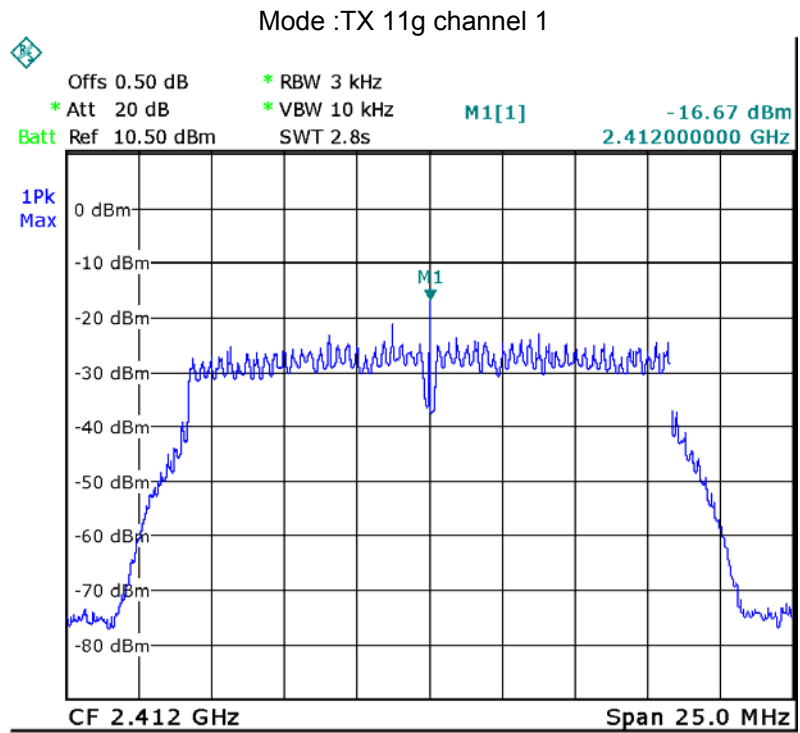
Test mode :TX 11n HT40		
Power Spectral (dBm per 3kHz)		
2422MHz	2437MHz	2452MHz
-18.07	-19.52	-16.30
Limit: 8dBm per 3kHz		

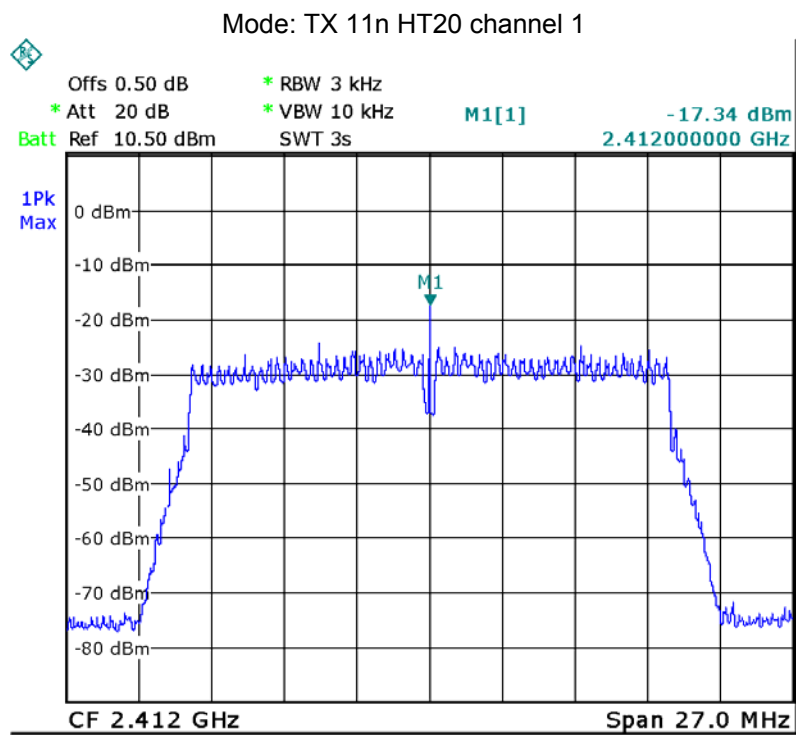
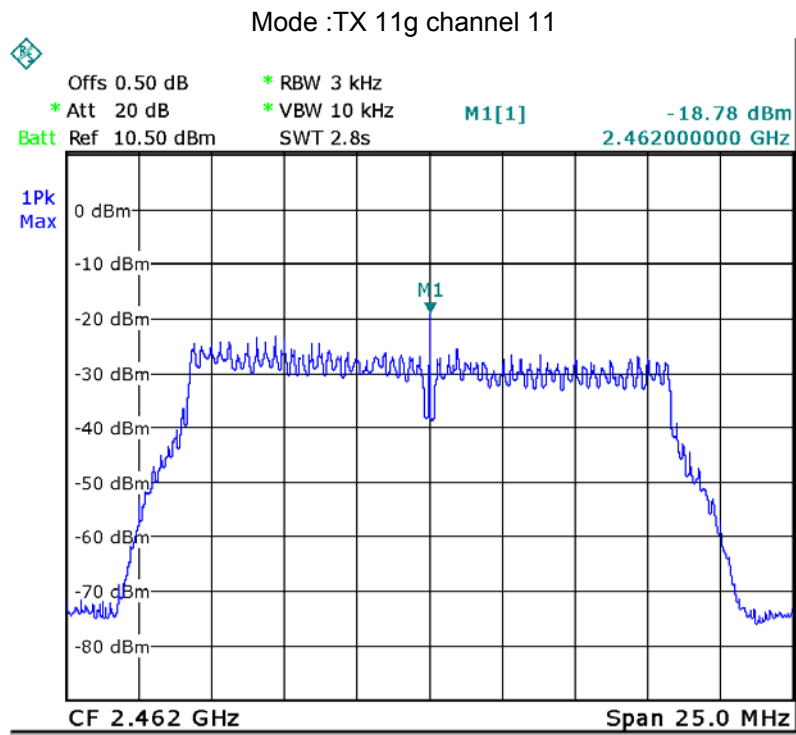
BLE		
Power Spectral (dBm per 3kHz)		
2402MHz	2440MHz	2480MHz
-18.48	-16.68	-18.51
Limit: 8dBm per 3kHz		



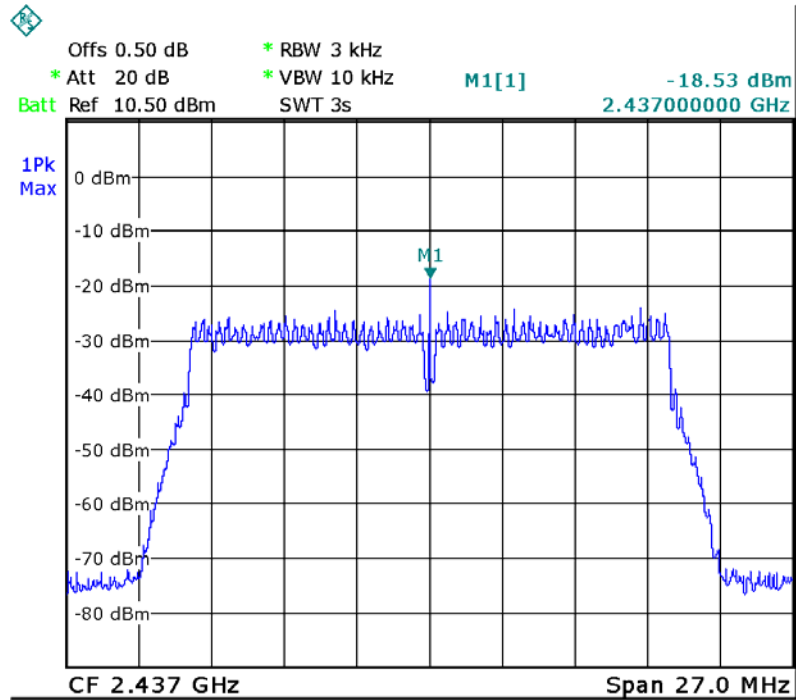




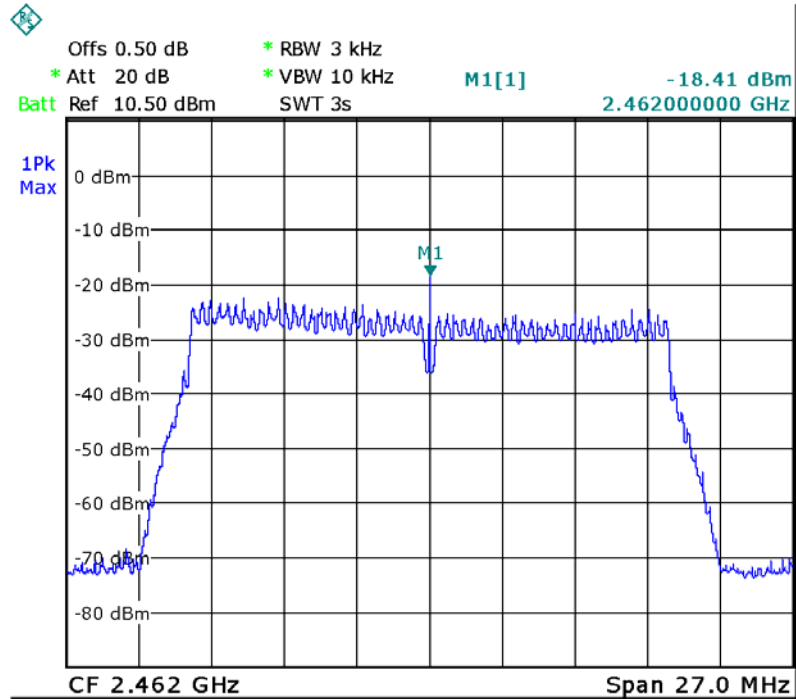


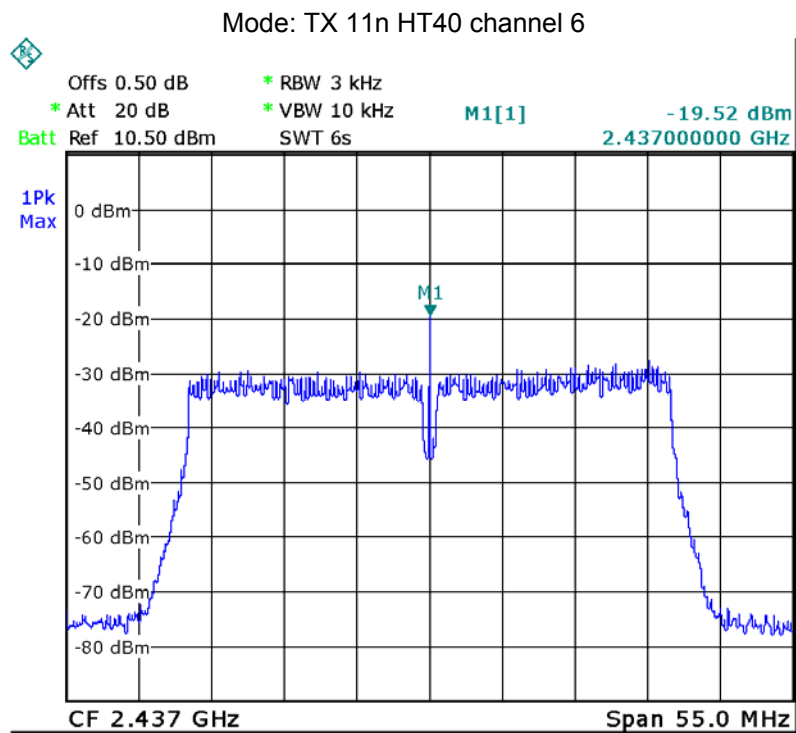
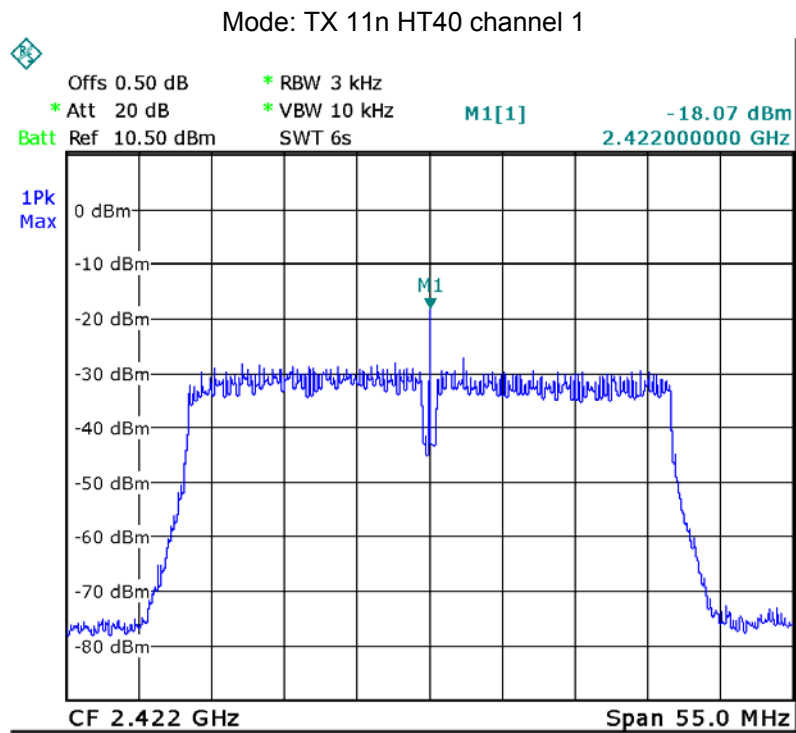


Mode: TX 11n HT20 channel 6

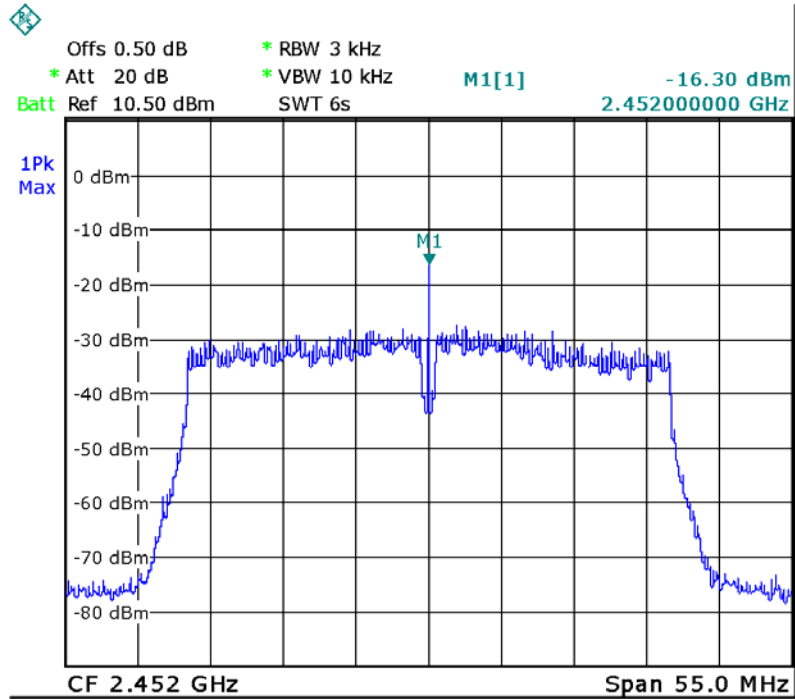


Mode: TX 11n HT20 channel 11

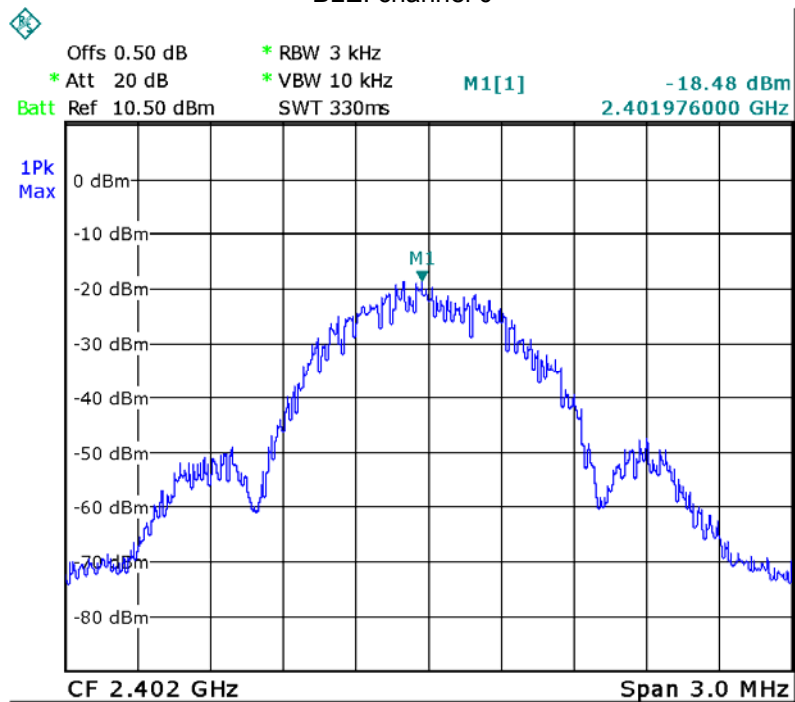




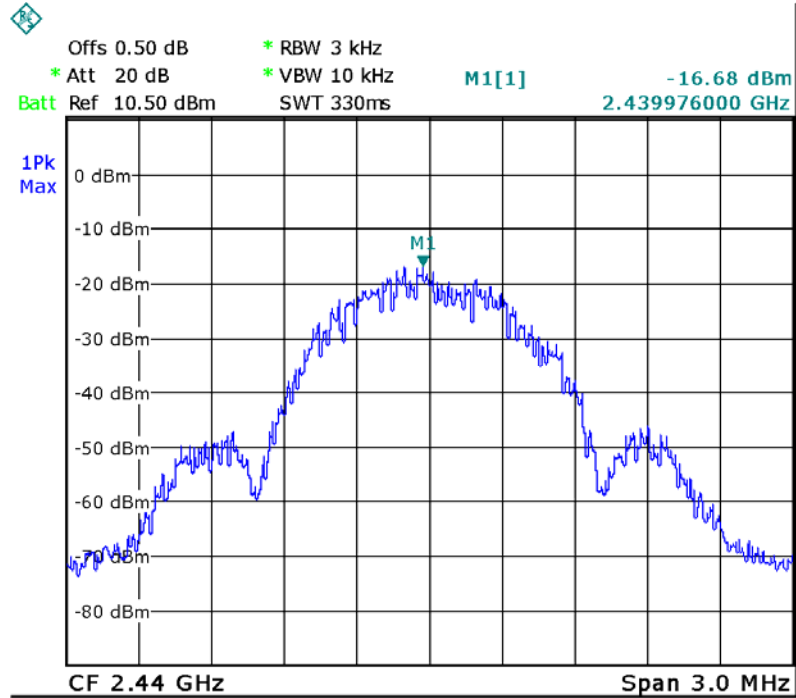
Mode: TX 11n HT40 channel 11



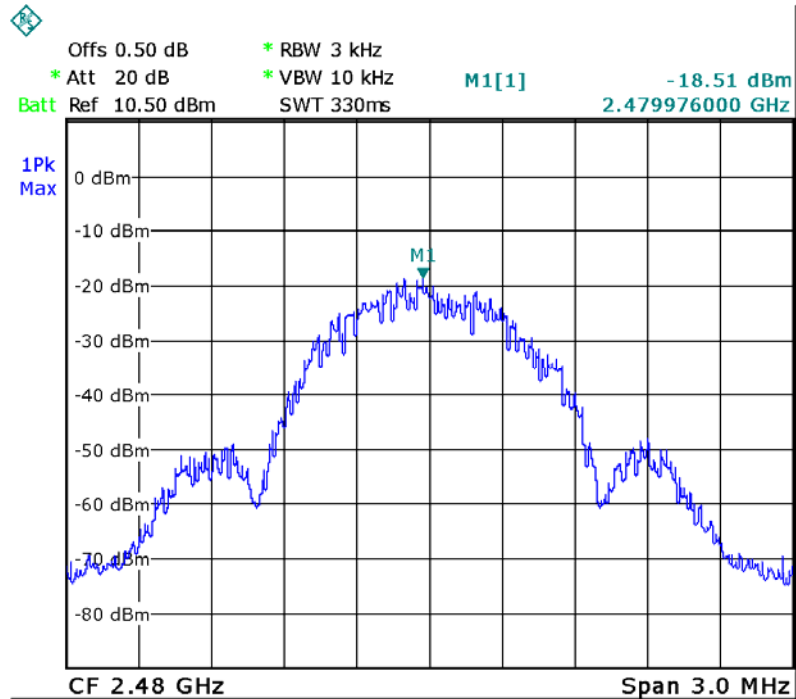
BLE: channel 0



BLE: channel 19



BLE: channel 39



## **14 Antenna Requirement**

According to the FCC Part 15 Paragraph 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. This product has an integrated antenna fulfill the requirement of this section.

## 15 RF Exposure

Remark: refer to SAR test report: WTS16S0346199E

=====End of Report=====