TEST REPORT

Reference No.	:	WTS14S0514572E
FCC ID.....	:	2ACEVS8
Applicant	:	IED CONEXION VIRTUAL S.A DE C.V
Address	:	Rio Tiber # 103 Int 502 Colonia DF CP: 06500 Cuauhtemoc Mexico
Manufacturer	:	Shenzhen Kente Science & Technology Co.,Ltd.
Address	:	Rm ABC, 15F, B Tower, Xuesong Building, Tairan 6th Rd, Tairan Industrial & Trading Park, Futian, Shenzhen, China
Product Name	:	4.5 inch smartphone
Model No.	:	QUANTUM S8
Standards.....	:	FCC CFR47 Part 15 C Section 15.247:2012
Date of Receipt sample.....	:	May 30, 2014
Date of Test.....	:	May 09~Jun.23, 2014
Date of Issue	:	Jun.30, 2014
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
Testing location: 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 / Project Engineer

Approved by:

Philo Zhong / Manager

2 Test Summary

Test Items	Test Requirement	Result
Radiated Emissions	15.247 15.205(a) 15.209(a)	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

4 General Information

4.1 General Description of E.U.T.

Product Name	: 4.5 inch smartphone
Model No.	: QUANTUM S8
Model Difference	: N/A
GSM Band(s)	: GSM 850/1900MHz
GPRS Class	: 12
WCDMA Band(s)	: FDD Band II/V
Wi-Fi Specification	: 802.11b/g/n HT20/n HT40
Bluetooth Version	: Bluetooth v4.0 with BLE
GPS	: Support
NFC	: N/A

4.2 Details of E.U.T.

Operation Frequency	: GSM/GPRS 850: 824~849MHz PCS/GPRS 1900: 1850~1910MHz WCDMA/UPA/DPA Band V: 824~849MHz WCDMA/UPA/DPA Band II: 1850~1910MHz WiFi: 802.11b/g/n HT20:2412-2462MHz 802.11n HT40:2422-2452MHz Bluetooth: 2402-2480MHz GPS:1.57GHz
Max. RF output power	: GSM 850: 33.22dBm PCS 1900: 30.47dBm WCDMA Band V:22.61dBm WCDMA Band II:22.88dBm WiFi:8.87dBm Bluetooth:3.97dBm
Type of Modulation	: GSM,GPRS:GMSK WCDMA: QPSK WiFi: CCK, OFDM Bluetooth: GFSK, Pi/4 DQPSK,8DPSK
Antenna installation	: GSM/WCDMA:Monopole antenna WiFi/Bluetooth: Monopole antenna

Antenna Gain	: GSM 850: 0dBi PCS 1900: 0dBi WCDMA Band II: 0dBi WCDMA Band V: 0dBi WiFi: 0dBi Bluetooth: 0dBi
Technical Data	: (1)DC 5V, 1000mA by Adapter (Adapter Input: AC 100-240V, 50/60Hz, 0.15A) (2)DC 3.7V by Battery(Capacity: 1550mAh) (3)DC 5V for USB charging
Adapter	: M/N: F2S8C01

4.3 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

4.4 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	108 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	108 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	108 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	108 Mbps	3/6/9	TX
Frequency Range	802.11b	11 Mbps	1/11	TX
	802.11g	54 Mbps	1/11	TX
	802.11n HT20	108 Mbps	1/11	TX
	802.11n HT40	108 Mbps	3/9	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	108 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	1/19/39	TX
Power Spectral Density	BT BLE	1 Mbps	1/19/39	TX
6dB Bandwidth	BT BLE	1 Mbps	1/19/39	TX
Band Edge	BT BLE	1 Mbps	1/19/39	TX
Frequency Range	BT BLE	1 Mbps	1/19/39	TX
Transmitter Spurious Emissions	BT BLE	1 Mbps	1/19/39	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 .

Table 3 Tests Carried Out Under FCC part 15.207 & FCC part 15.209

Test Item	Test Mode
Conduction Emission, 0.15MHz to 30MHz	Communication(Wifi & BT BLE)

4.5 Test Facility

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

- **IC – Registration No.: 7760A-1**

  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-1,July 12, 2012.

- **FCC – 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.

5 Equipment Used during Test

5.1 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.18,2013	Sep.17,2014
2.	LISN	SCHWARZBECK	NSLK 8128	8128-289	Sep.18,2013	Sep.17,2014
3.	Limiter	York	MTS-IMP-136	261115-001-0024	Sep.18,2013	Sep.17,2014
4.	Cable	LARGE	RF300	-	Sep.18,2013	Sep.17,2014
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.18,2013	Sep.17,2014
2	Active Loop Antenna	Beijing Dazhi	ZN30900A	-	Sep.18,2013	Sep.17,2014
3	Trilog Broadband Antenna	SCHWARZBECK	VULB9163	336	Apr.19,2014	Apr.18,2015
4	Coaxial Cable (below 1GHz)	Top	TYPE16(13M)	-	Sep.18,2013	Sep.17,2014
5	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	667	Apr.19,2014	Apr.18,2015
6	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9170	335	Apr.19,2014	Apr.18,2015
7	Broadband Preamplifier	COMPLIANCE DIRECTION	PAP-1G18	2004	Mar.17,2014	Mar.16,2015
8	Coaxial Cable (above 1GHz)	Top	1GHz-25GHz	EW02014-7	Apr.10,2014	Apr.09,2015
RF Conducted Testing						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1.	EMC Analyzer	R&S	ESCI	101155	Sep.18,2013	Sep.17,2014
2.	Humidity Chamber	GF	GTH-225-40-1P	IAA061213	May 16,2014	May 15,2015
3.	DC Power Supply	EVERFINE	WY305	1004002	Apr.11,2014	Apr.10,2015

5.2 Description of Support Units

Equipment	**Manufacturer**	**Model No.**	**Series No.**
Headphone	Qisheng	S-325	N/A

5.3 Measurement Uncertainty

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

5.4 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.

6 Conducted Emission

Test Requirement:	FCC CFR 47 Part 15 Section 15.207
Test Method:	ANSI C63.4:2003
Test Result:	PASS
Frequency Range:	150kHz to 30MHz
Class/Severity:	Class B
Limit:	66-56 dBμV between 0.15MHz & 0.5MHz
	56 dBμV between 0.5MHz & 5MHz
	60 dBμV between 5MHz & 30MHz
Detector:	Peak for pre-scan (9kHz Resolution Bandwidth)

6.1 E.U.T. Operation

Operating Environment **:**

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

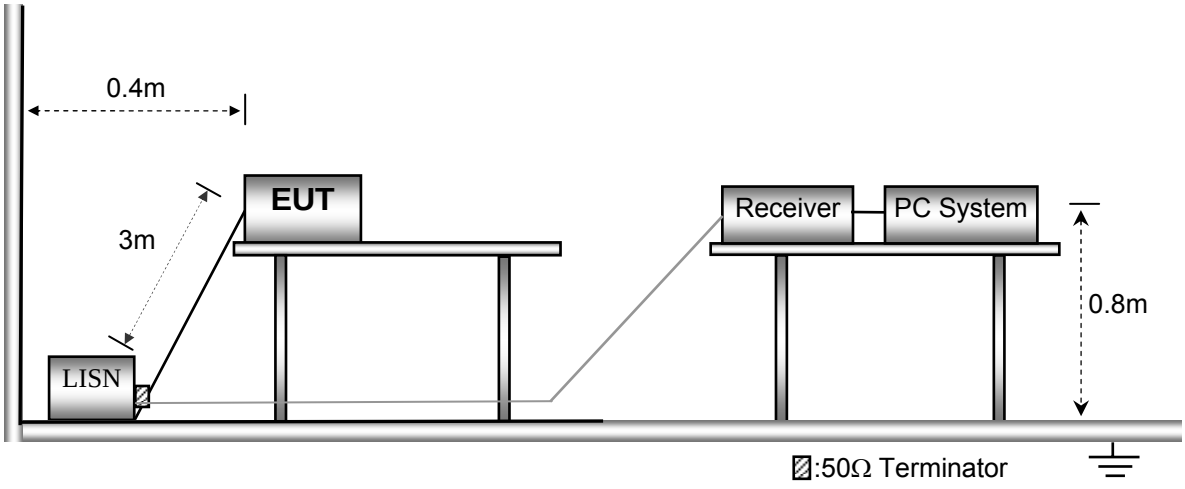
EUT Operation **:**

The test was performed in transmitting mode(Wifi /BT BLE), the worst data were shown in the report.

6.2 EUT Setup

The conducted emission tests were performed using the setup accordance with the

ANSI C63.4:2003.



6.3 Measurement Description

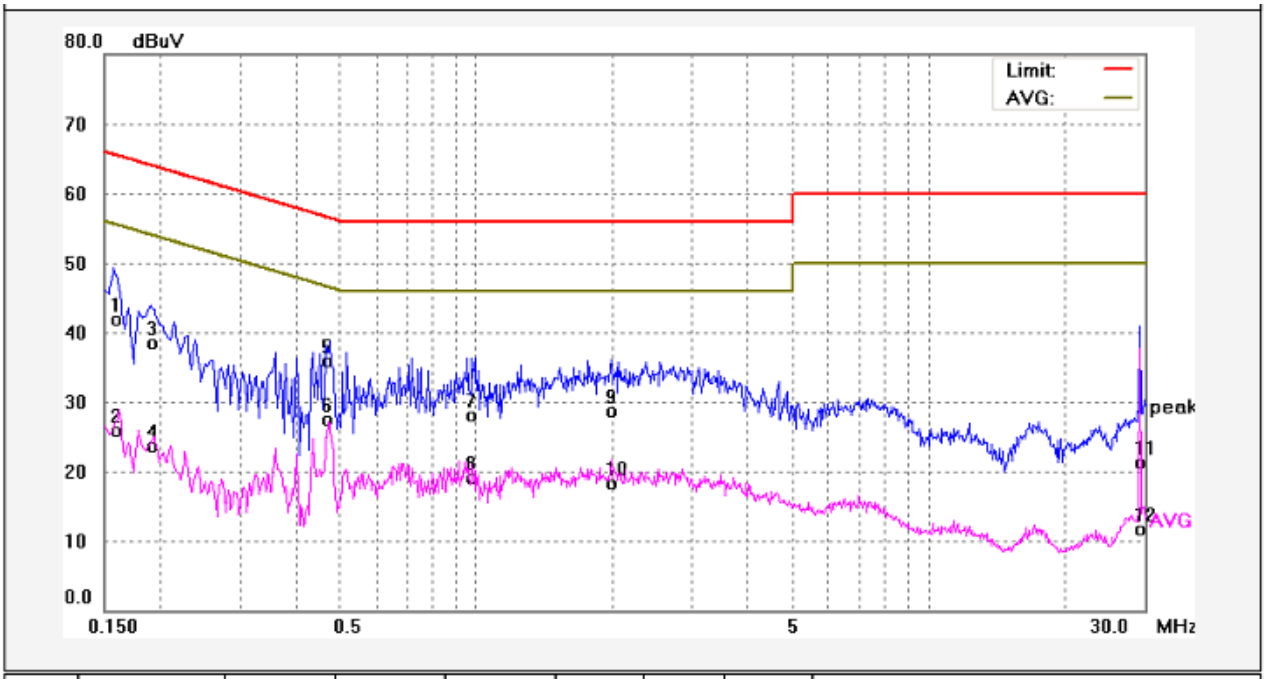
The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

6.4 Conducted Emission Test Result

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

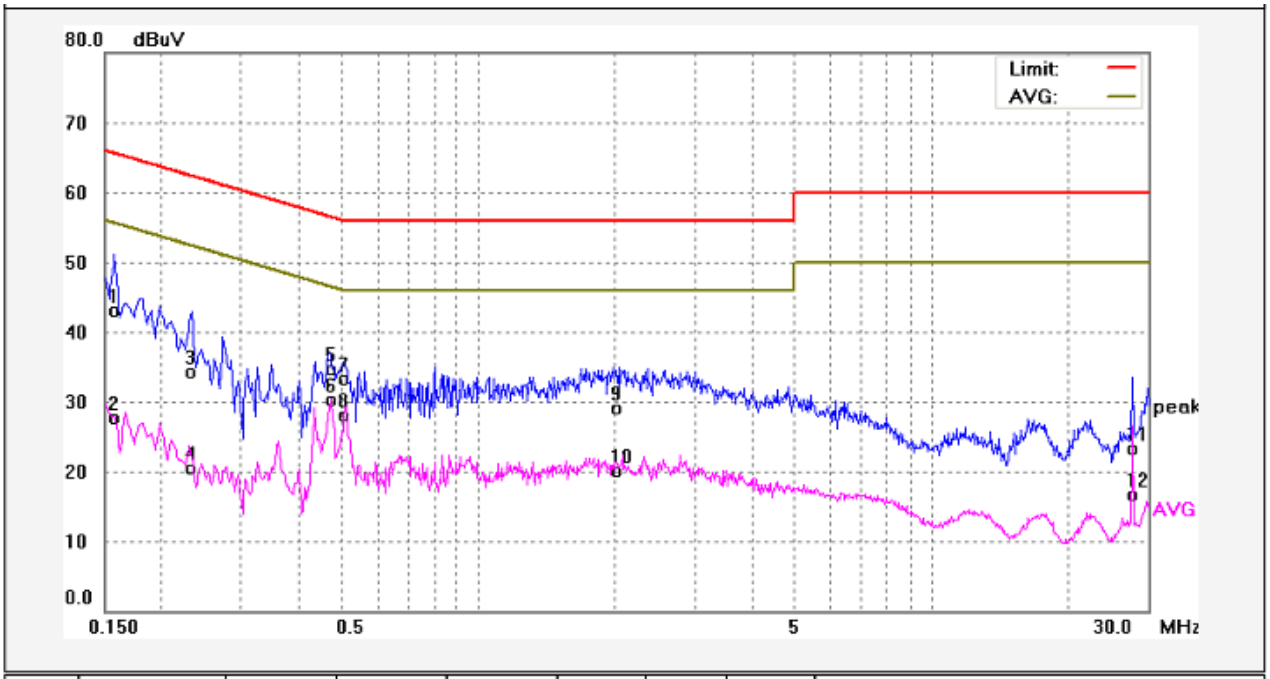
Worst Mode: transmitting mode (Wifi)

Live line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1580	31.48	10.48	41.96	65.56	-23.60	QP	
2	0.1580	15.49	10.48	25.97	55.56	-29.59	AVG	
3	0.1900	28.07	10.48	38.55	64.03	-25.48	QP	
4	0.1900	13.20	10.48	23.68	54.03	-30.35	AVG	
5	0.4700	25.32	10.49	35.81	56.51	-20.70	QP	
6	0.4700	17.04	10.49	27.53	46.51	-18.98	AVG	
7	0.9900	17.46	10.61	28.07	56.00	-27.93	QP	
8	0.9900	8.47	10.61	19.08	46.00	-26.92	AVG	
9	1.9900	18.14	10.63	28.77	56.00	-27.23	QP	
10	1.9900	7.71	10.63	18.34	46.00	-27.66	AVG	
11	29.3340	9.36	11.94	21.30	60.00	-38.70	QP	
12	29.3340	-0.21	11.94	11.73	50.00	-38.27	AVG	

Neutral line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1580	32.56	10.48	43.04	65.56	-22.52	QP	
2	0.1580	17.13	10.48	27.61	55.56	-27.95	AVG	
3	0.2340	23.80	10.48	34.28	62.30	-28.02	QP	
4	0.2340	10.09	10.48	20.57	52.30	-31.73	AVG	
5	0.4700	24.25	10.49	34.74	56.51	-21.77	QP	
6	0.4700	19.76	10.49	30.25	46.51	-16.26	AVG	
7	0.5100	22.79	10.50	33.29	56.00	-22.71	QP	
8	0.5100	17.58	10.50	28.08	46.00	-17.92	AVG	
9	2.0420	18.43	10.63	29.06	56.00	-26.94	QP	
10	2.0420	9.55	10.63	20.18	46.00	-25.82	AVG	
11	27.7100	11.52	11.85	23.37	60.00	-36.63	QP	
12	27.7100	4.95	11.85	16.80	50.00	-33.20	AVG	

7 Radiated Emissions

Test Requirement: FCC CFR47 Part 15 Section 15.209 & 15.247

Test Method: ANSI C63.4:2003

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(kHz)	300	10000 * 2400/F(kHz)	$20\log^{(2400/F(kHz))} + 80$
0.490 ~ 1.705	24000/F(kHz)	30	100 * 24000/F(kHz)	$20\log^{(24000/F(kHz))} + 40$
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	$20\log^{(500)}$

7.1 EUT Operation

Operating Environment **:**

Temperature: 23.5 °C

Humidity: 52.1 % RH

Atmospheric Pressure: 101.2kPa

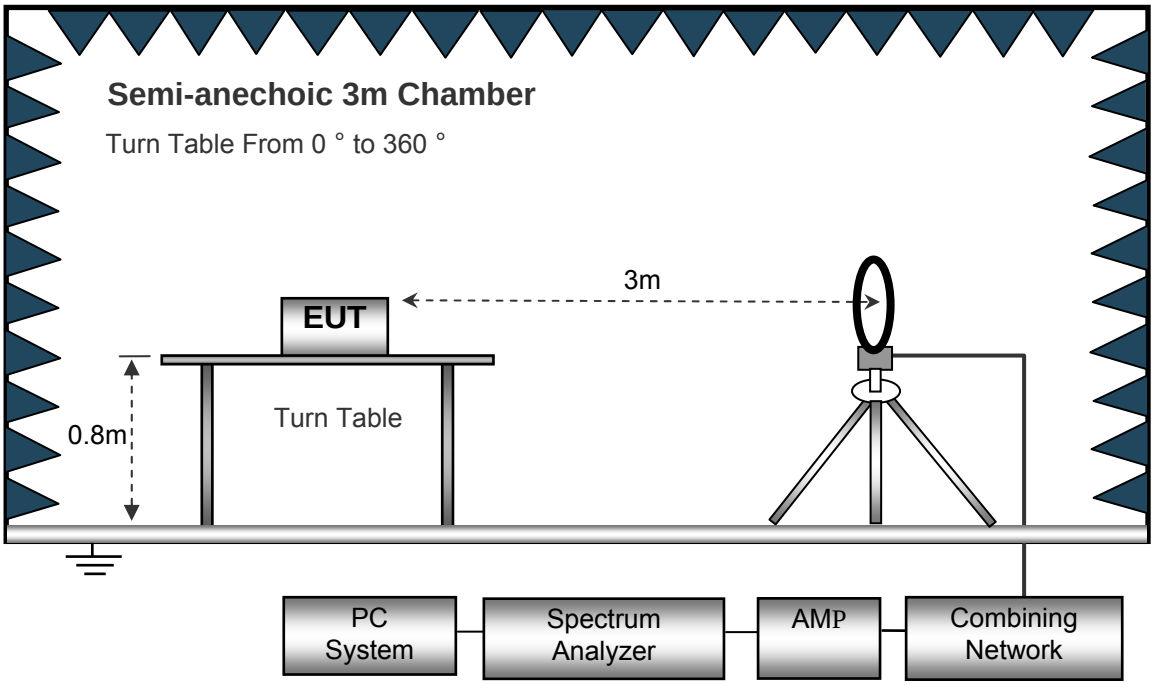
EUT Operation **:**

The test was performed in transmitting mode(Wifi /BT BLE), the test data were shown in the report.

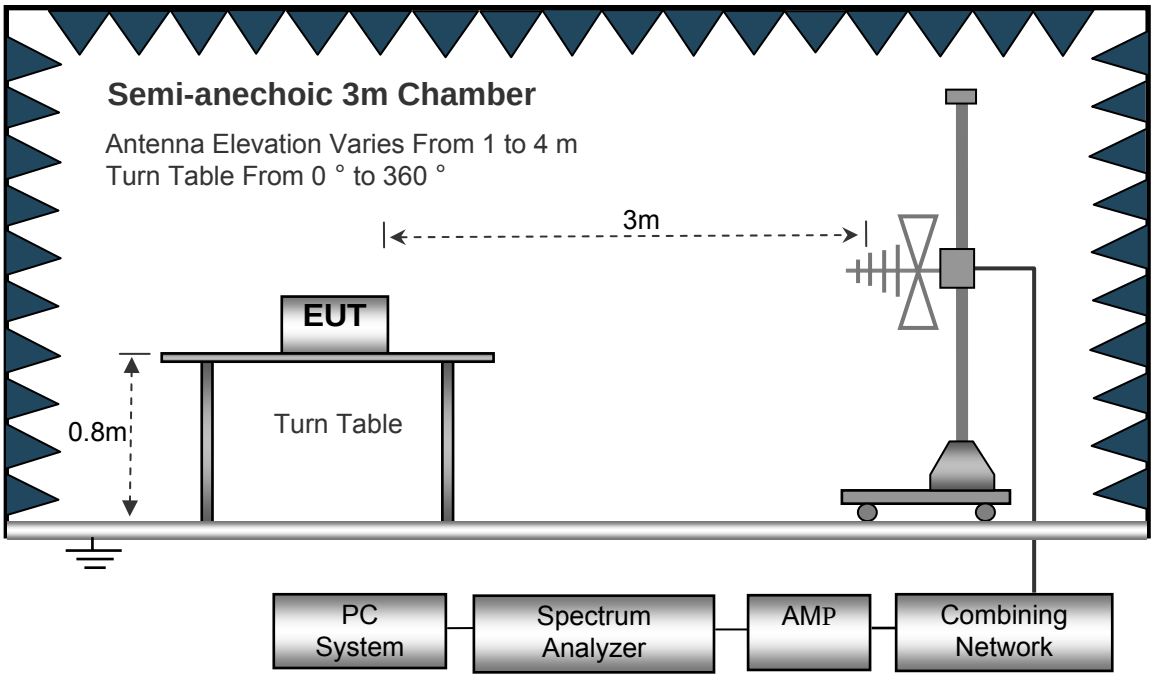
7.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.4: 2003.

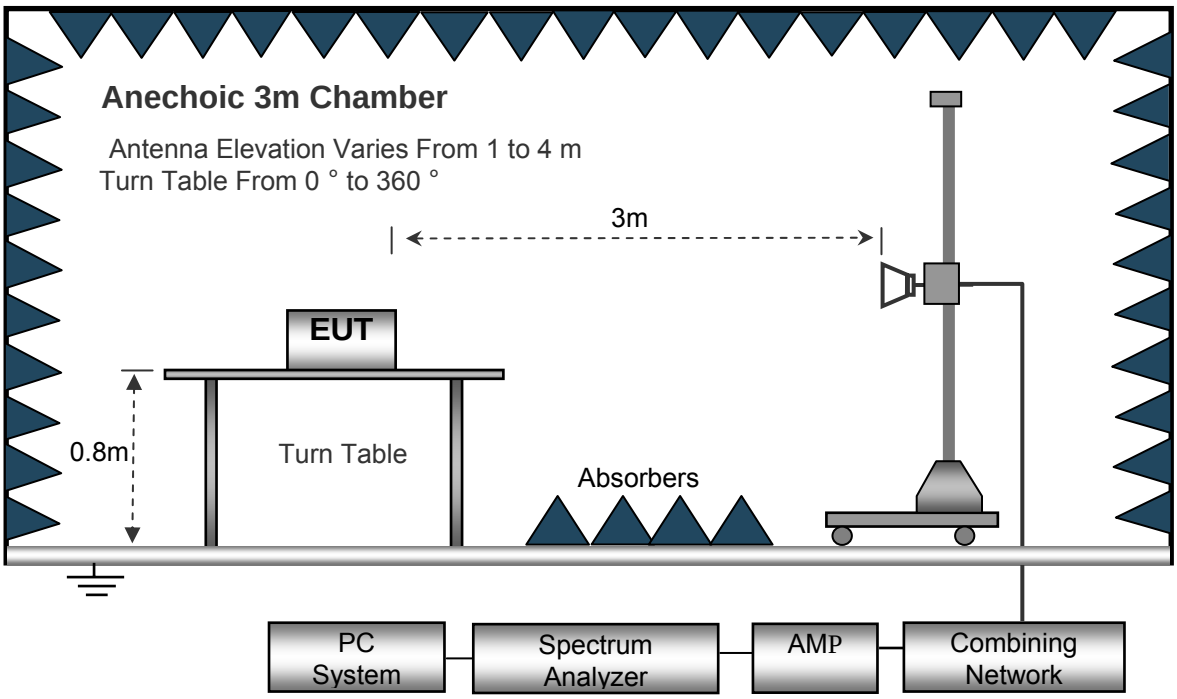
The test setup for emission measurement below 30MHz.



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



The test setup for emission measurement above 1 GHz.



7.3 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

7.4 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 druing radiated emissions above 1GHz measurement.

7.5 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:

Corr. Ampl. = Indicated Reading + Antenna Factor + Cable Factor - 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:

Margin = Corr. Ampl. – Limit

7.6 Summary of Test Results

Wifi:

Test Frequency : 32.768kHz ~ 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									
200.86	20.95	QP	84	1.3	H	11.26	32.21	40	-7.79
200.86	19.68	QP	52	1.6	V	11.26	30.94	40	-9.06
4824	53.29	PK	196	1.5	V	-1.06	52.23	74	-21.77
4824	43.66	Ave	349	1.5	V	-1.06	42.6	54	-11.4
7236	42.18	PK	265	1.5	H	1.33	43.51	74	-30.49
7236	37.52	Ave	295	1.6	H	1.33	38.85	54	-15.15
2310.7	42.98	PK	149	2.0	V	-13.19	29.79	74	-44.21
2310.7	28.33	Ave	19	1.8	V	-13.19	15.14	54	-38.86
2383.04	42.16	PK	355	1.5	H	-13.14	29.02	74	-44.98
2383.04	36.21	Ave	61	1.2	H	-13.14	23.07	54	-30.93
2492.85	42.33	PK	80	2.0	V	-13.08	29.25	74	-44.75
2492.85	37.18	Ave	236	1.1	V	-13.08	24.1	54	-29.9

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: Middle Channel 2437MHz									
200.86	21.62	QP	244	1.6	H	11.26	32.88	40	-7.12
200.86	19.66	QP	229	1.2	V	11.26	30.92	40	-9.08
4874	53.96	PK	8	1.9	V	-0.62	53.34	74	-20.66
4874	43.68	Ave	253	1.9	V	-0.62	43.06	54	-10.94
7311	43.62	PK	325	1.2	H	2.21	45.83	74	-28.17
7311	37.62	Ave	250	1.1	H	2.21	39.83	54	-14.17
2341.83	45.38	PK	283	1.2	V	-13.19	32.19	74	-41.81
2341.83	37.81	Ave	8	1.1	V	-13.19	24.62	54	-29.38
2367.68	42.2	PK	94	1.8	H	-13.14	29.06	74	-44.94
2367.68	37.16	Ave	238	1.7	H	-13.14	24.02	54	-29.98
2495.06	44.7	PK	225	1.6	V	-13.08	31.62	74	-42.38
2495.06	37.38	Ave	344	1.4	V	-13.08	24.3	54	-29.7

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: High Channel 2462MHz									
200.86	21.03	QP	235	1.7	H	11.26	32.29	40	-7.71
200.86	18.67	QP	135	1.0	V	11.26	29.93	40	-10.07
4924	53.38	PK	165	1.3	V	-0.24	53.14	74	-20.86
4924	43.92	Ave	345	1.2	V	-0.24	43.68	54	-10.32
7386	42.18	PK	287	1.2	H	2.84	45.02	74	-28.98
7386	37.33	Ave	70	1.5	H	2.84	40.17	54	-13.83
2313.86	46.27	PK	138	1.4	V	-13.19	33.08	74	-40.92
2313.86	36.85	Ave	242	1.5	V	-13.19	23.66	54	-30.34
2383.55	43.95	PK	31	1.6	H	-13.14	30.81	74	-43.19
2383.55	36.83	Ave	318	1.6	H	-13.14	23.69	54	-30.31
2497.84	43.96	PK	44	1.2	V	-13.08	30.88	74	-43.12
2497.84	37.29	Ave	326	1.8	V	-13.08	24.21	54	-29.79

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)
11g: Low Channel 2412MHz									
200.86	20.36	QP	41	1.2	H	11.26	31.62	40	-8.38
200.86	19.08	QP	343	1.5	V	11.26	30.34	40	-9.66
4824	52.26	PK	33	1.7	V	-1.06	51.2	74	-22.8
4824	43.86	Ave	49	1.8	V	-1.06	42.8	54	-11.2
7236	42.11	PK	124	1.8	H	1.33	43.44	74	-30.56
7236	37.32	Ave	295	1.4	H	1.33	38.65	54	-15.35
2329.57	45.26	PK	284	1.2	V	-13.19	32.07	74	-41.93
2329.57	37.32	Ave	321	1.2	V	-13.19	24.13	54	-29.87
2387.64	42.36	PK	158	1.4	H	-13.14	29.22	74	-44.78
2387.64	37.13	Ave	93	2.0	H	-13.14	23.99	54	-30.01
2493.18	42.93	PK	129	1.0	V	-13.08	29.85	74	-44.15
2493.18	36.94	Ave	291	1.6	V	-13.08	23.86	54	-30.14

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)
11g: Middle Channel 2437MHz									
200.86	21.08	QP	78	1.7	H	11.26	32.34	40	-7.66
200.86	19.83	QP	71	1.7	V	11.26	31.09	40	-8.91
4874	53.28	PK	129	1.3	V	-0.62	52.66	74	-21.34
4874	46.76	Ave	10	1.1	V	-0.62	46.14	54	-7.86
7311	43.62	PK	296	1.4	H	2.21	45.83	74	-28.17
7311	37.45	Ave	62	1.1	H	2.21	39.66	54	-14.34
2316.32	46.46	PK	130	1.1	V	-13.19	33.27	74	-40.73
2316.32	36.29	Ave	297	1.6	V	-13.19	23.1	54	-30.9
2374.31	42.61	PK	90	1.3	H	-13.14	29.47	74	-44.53
2374.31	37.51	Ave	116	1.3	H	-13.14	24.37	54	-29.63
2496.69	44.4	PK	22	1.5	V	-13.08	31.32	74	-42.68
2496.69	36.13	Ave	33	1.9	V	-13.08	23.05	54	-30.95

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)
11g: High Channel 2462MHz									
200.86	21.55	QP	86	1.6	H	11.26	32.81	40	-7.19
200.86	19.63	QP	67	1.4	V	11.26	30.89	40	-9.11
4924	53.66	PK	302	1.6	V	-0.24	53.42	74	-20.58
4924	45.81	Ave	19	1.7	V	-0.24	45.57	54	-8.43
7386	42.37	PK	155	1.5	H	2.84	45.21	74	-28.79
7386	37.26	Ave	125	1.9	H	2.84	40.1	54	-13.9
2310.6	45.83	PK	117	1.2	V	-13.19	32.64	74	-41.36
2310.6	37.69	Ave	216	1.0	V	-13.19	24.5	54	-29.5
2352.87	42.76	PK	108	1.3	H	-13.14	29.62	74	-44.38
2352.87	36.2	Ave	22	1.2	H	-13.14	23.06	54	-30.94
2490.28	44.4	PK	38	1.0	V	-13.08	31.32	74	-42.68
2490.28	36.54	Ave	102	1.3	V	-13.08	23.46	54	-30.54

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)
n20: Low Channel 2412MHz									
200.86	21.27	QP	25	1.2	H	11.26	32.53	40	-7.47
200.86	19.23	QP	185	1.9	V	11.26	30.49	40	-9.51
4824	52.28	PK	220	1.5	V	-1.06	51.22	74	-22.78
4824	46.37	Ave	203	1.7	V	-1.06	45.31	54	-8.69
7236	40.69	PK	280	1.9	H	1.33	42.02	74	-31.98
7236	36.18	Ave	346	2.0	H	1.33	37.51	54	-16.49
2332.77	45.73	PK	273	1.1	V	-13.19	32.54	74	-41.46
2332.77	36.42	Ave	353	1.0	V	-13.19	23.23	54	-30.77
2378.39	43.97	PK	1	2.0	H	-13.14	30.83	74	-43.17
2378.39	37.27	Ave	69	1.1	H	-13.14	24.13	54	-29.87
2498.01	43.63	PK	7	1.7	V	-13.08	30.55	74	-43.45
2498.01	36.09	Ave	258	1.2	V	-13.08	23.01	54	-30.99

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)
n20: Middle Channel 2437MHz									
200.86	21.42	QP	299	1.9	H	11.26	32.68	40	-7.32
200.86	19.56	QP	120	1.1	V	11.26	30.82	40	-9.18
4874	53.48	PK	117	1.7	V	-0.62	52.86	74	-21.14
4874	45.67	Ave	26	1.3	V	-0.62	45.05	54	-8.95
7311	43.56	PK	229	1.3	H	2.21	45.77	74	-28.23
7311	38.94	Ave	134	1.8	H	2.21	41.15	54	-12.85
2338.94	45.68	PK	189	1.8	V	-13.19	32.49	74	-41.51
2338.94	38.62	Ave	99	1.3	V	-13.19	25.43	54	-28.57
2370.47	43.96	PK	305	1.7	H	-13.14	30.82	74	-43.18
2370.47	36.82	Ave	342	1.1	H	-13.14	23.68	54	-30.32
2497.66	42.65	PK	207	1.9	V	-13.08	29.57	74	-44.43
2497.66	36.83	Ave	55	1.8	V	-13.08	23.75	54	-30.25

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)
n20: High Channel 2462MHz									
200.86	21.66	QP	218	1.7	H	11.26	32.92	40	-7.08
200.86	18.56	QP	53	1.7	V	11.26	29.82	40	-10.18
4924	53.63	PK	226	1.9	V	-0.24	53.39	74	-20.61
4924	44.69	Ave	225	1.6	V	-0.24	44.45	54	-9.55
7386	41.54	PK	241	1.5	H	2.84	44.38	74	-29.62
7386	36.82	Ave	195	1.6	H	2.84	39.66	54	-14.34
2314.51	47.86	PK	287	1.1	V	-13.19	34.67	74	-39.33
2314.51	37.98	Ave	330	1.3	V	-13.19	24.79	54	-29.21
2358.53	42.71	PK	270	1.5	H	-13.14	29.57	74	-44.43
2358.53	37.68	Ave	115	1.3	H	-13.14	24.54	54	-29.46
2491.53	43.96	PK	261	1.4	V	-13.08	30.88	74	-43.12
2491.53	36.78	Ave	261	1.6	V	-13.08	23.7	54	-30.3

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)
n40: Low Channel 2422MHz									
200.86	21.65	QP	331	1.5	H	11.26	32.91	40	-7.09
200.86	19.93	QP	116	1.7	V	11.26	31.19	40	-8.81
4844	52.62	PK	175	1.5	V	-1.06	51.56	74	-22.44
4844	47.15	Ave	60	1.2	V	-1.06	46.09	54	-7.91
7266	42.24	PK	6	1.3	H	1.33	43.57	74	-30.43
7266	37.36	Ave	220	1.4	H	1.33	38.69	54	-15.31
2344.2	45.93	PK	18	1.4	V	-13.19	32.74	74	-41.26
2344.2	36.85	Ave	98	1.8	V	-13.19	23.66	54	-30.34
2376.81	43.58	PK	148	1.2	H	-13.14	30.44	74	-43.56
2376.81	36.89	Ave	214	1.2	H	-13.14	23.75	54	-30.25
2496.28	43.87	PK	71	1.3	V	-13.08	30.79	74	-43.21
2496.28	37.23	Ave	270	1.6	V	-13.08	24.15	54	-29.85

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)
n40: Middle Channel 2437MHz									
200.86	21.66	QP	3	1.8	H	11.26	32.92	40	-7.08
200.86	19.26	QP	222	1.3	V	11.26	30.52	40	-9.48
4874	53.62	PK	11	1.0	V	-0.62	53	74	-21
4874	46.09	Ave	8	1.3	V	-0.62	45.47	54	-8.53
7311	40.99	PK	38	1.9	H	2.21	43.2	74	-30.8
7311	36.9	Ave	53	2.0	H	2.21	39.11	54	-14.89
2328.5	45.82	PK	321	1.0	V	-13.19	32.63	74	-41.37
2328.5	37.33	Ave	258	1.8	V	-13.19	24.14	54	-29.86
2386.54	44.23	PK	217	1.9	H	-13.14	31.09	74	-42.91
2386.54	37.19	Ave	131	1.3	H	-13.14	24.05	54	-29.95
2492.58	44.67	PK	87	2.0	V	-13.08	31.59	74	-42.41
2492.58	36.36	Ave	336	1.3	V	-13.08	23.28	54	-30.72

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)
n40: High Channel 2452MHz									
200.86	21.21	QP	79	1.1	H	11.26	32.47	40	-7.53
200.86	20.67	QP	194	1.8	V	11.26	31.93	40	-8.07
4904	52.98	PK	181	2.0	V	-0.24	52.74	74	-21.26
4904	46.03	Ave	240	1.1	V	-0.24	45.79	54	-8.21
7356	41.4	PK	221	1.3	H	2.84	44.24	74	-29.76
7356	36.82	Ave	8	1.6	H	2.84	39.66	54	-14.34
2332.18	46.29	PK	263	1.0	V	-13.19	33.1	74	-40.9
2332.18	36.62	Ave	213	1.5	V	-13.19	23.43	54	-30.57
2370	41.99	PK	303	1.8	H	-13.14	28.85	74	-45.15
2370	36.85	Ave	288	1.9	H	-13.14	23.71	54	-30.29
2484.56	44.09	PK	349	1.0	V	-13.08	31.01	74	-42.99
2484.56	37.2	Ave	110	1.6	V	-13.08	24.12	54	-29.88

Test Frequency: 18GHz~25GHz

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

BT BLE:

Test Frequency : 32.768kHz ~ 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)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
Low Channel 2402MHz									
130.82	26.38	PK	105	1.0	H	11.49	37.87	46	-8.13
130.82	25.47	PK	189	1.6	V	11.49	36.96	46	-9.04
4804	50.38	PK	21	1.0	V	-1.06	49.32	74	-24.68
4804	41.29	Ave	22	1.3	V	-1.06	40.23	54	-13.77
7206	49.56	PK	311	1.2	V	1.33	50.89	74	-23.11
7206	40.68	Ave	261	1.4	V	1.33	42.01	54	-11.99

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	Limit	Margin
				Height	Polar				
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
Middle Channel 2440MHz									
130.82	26.18	PK	278	1.9	H	11.49	37.67	46	-8.33
130.82	25.37	PK	299	1.7	V	11.49	36.86	46	-9.14
4880	50.32	PK	181	1.7	V	-0.62	49.7	74	-24.3
4880	41.58	Ave	0	1.3	V	-0.62	40.96	54	-13.04
7320	51.32	PK	130	1.2	V	2.21	53.53	74	-20.47
7320	40.68	Ave	192	1.2	V	2.21	42.89	54	-11.11

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	Limit	Margin
				Height	Polar				
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
High Channel 2480MHz									
130.82	26.18	PK	291	1.6	H	11.49	37.67	46	-8.33
130.82	25.38	PK	269	1.2	V	11.49	36.87	46	-9.13
4960	50.38	PK	0	1.8	V	-0.24	50.14	74	-23.86
4960	41.29	Ave	98	1.9	V	-0.24	41.05	54	-12.95
7440	50.15	PK	88	1.8	V	2.84	52.99	74	-21.01
7440	40.37	Ave	21	1.2	V	2.84	43.21	54	-10.79

Test Frequency: 18GHz~25GHz

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

8 Band Edge Measurement

Test Requirement:	FCC CFR47 Part 15 Section 15.247
Test Method:	KDB 558074 D01 v03r02 06/05/2014
Test Mode:	Transmitting

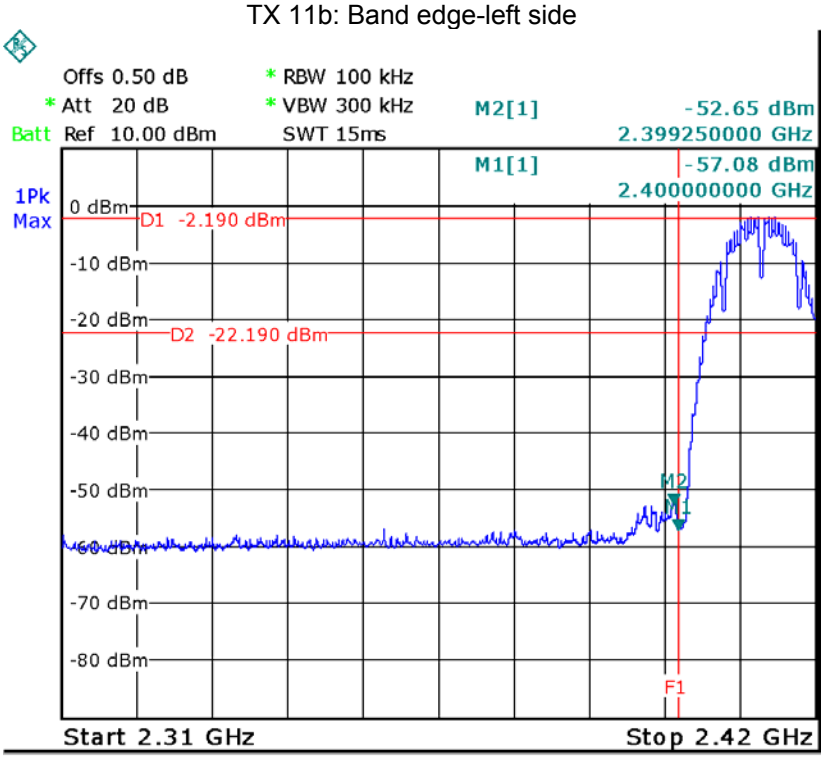
8.1 Test Produce

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.

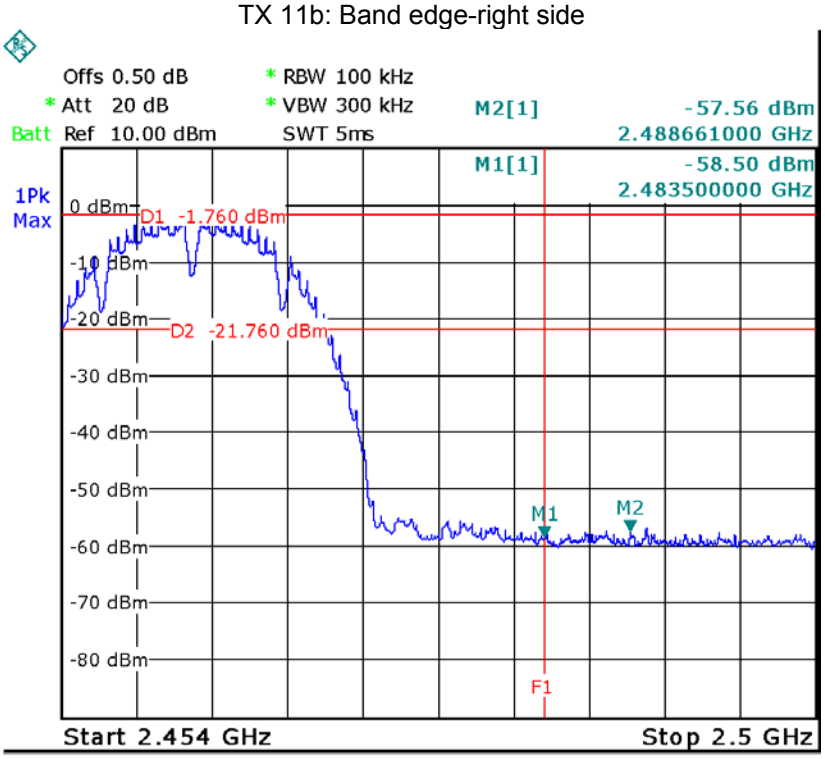
8.2 Test Result

Test result plots shown as follows:

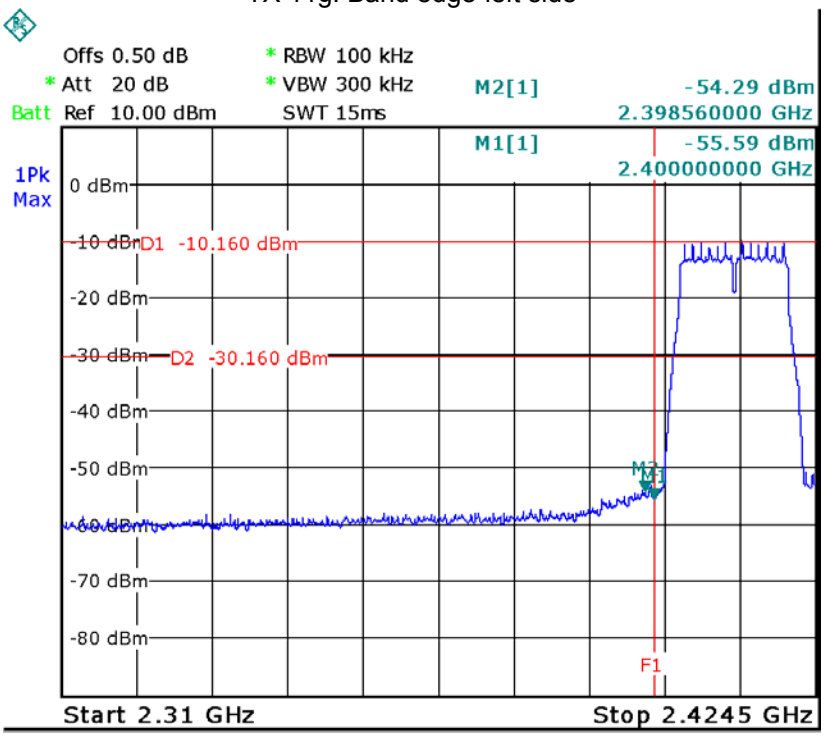
TX 11b: Band edge-left side



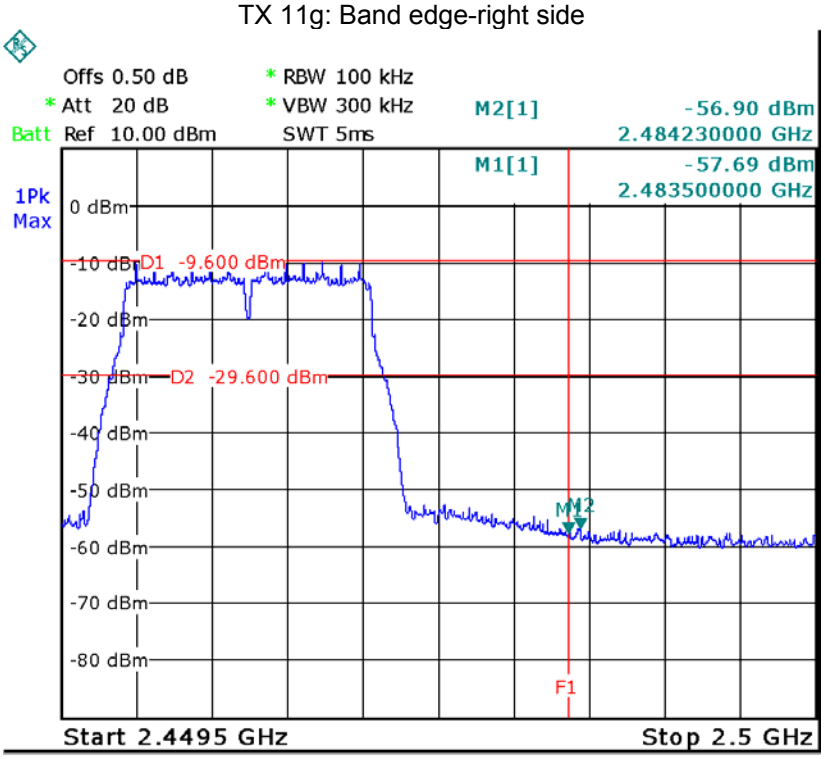
TX 11b: Band edge-right side



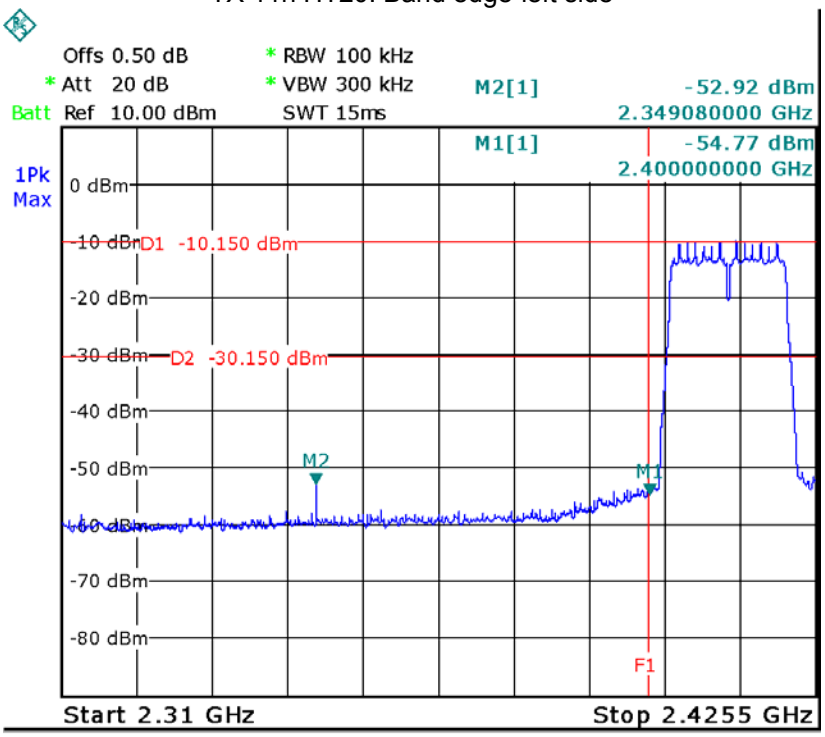
TX 11g: Band edge-left side



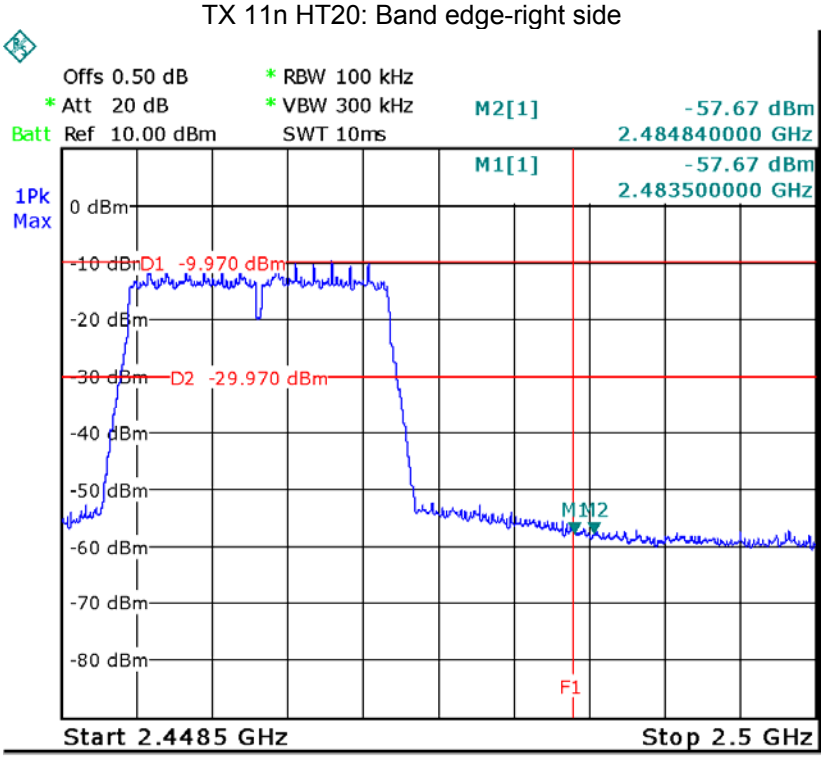
TX 11g: Band edge-right side



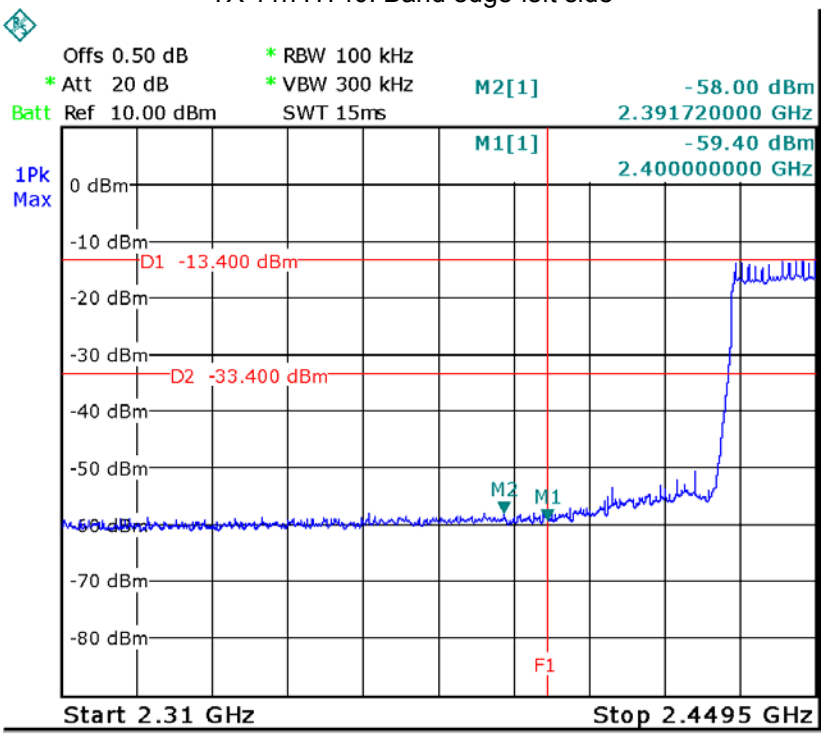
TX 11n HT20: Band edge-left side



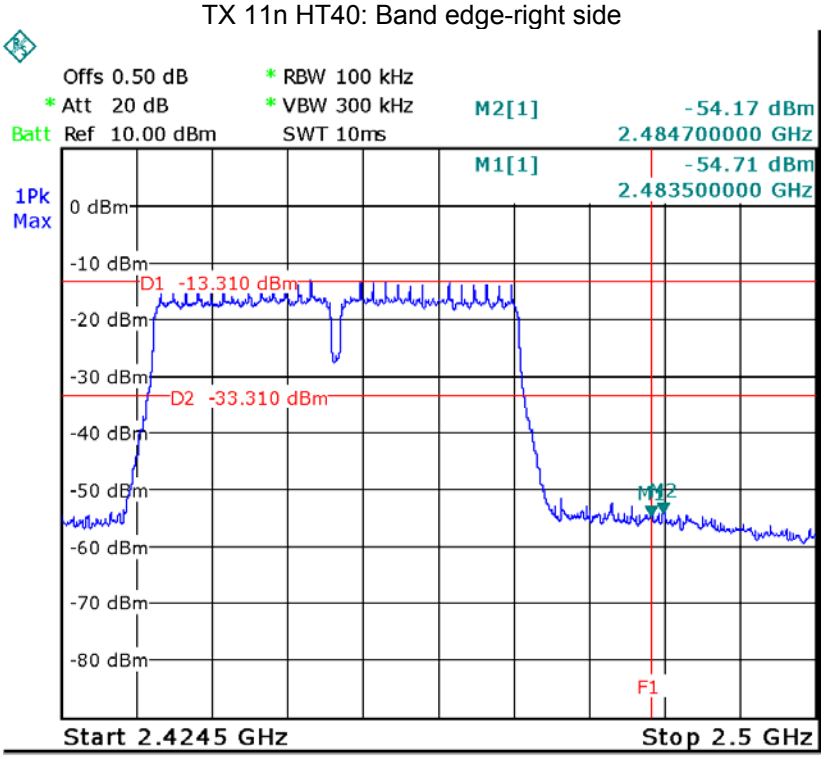
TX 11n HT20: Band edge-right side



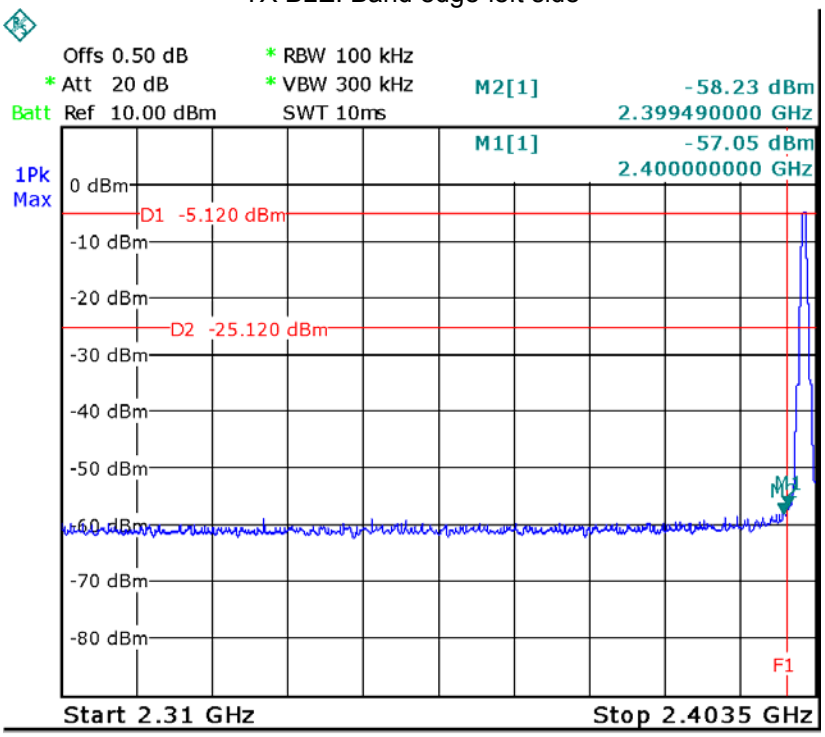
TX 11n HT40: Band edge-left side



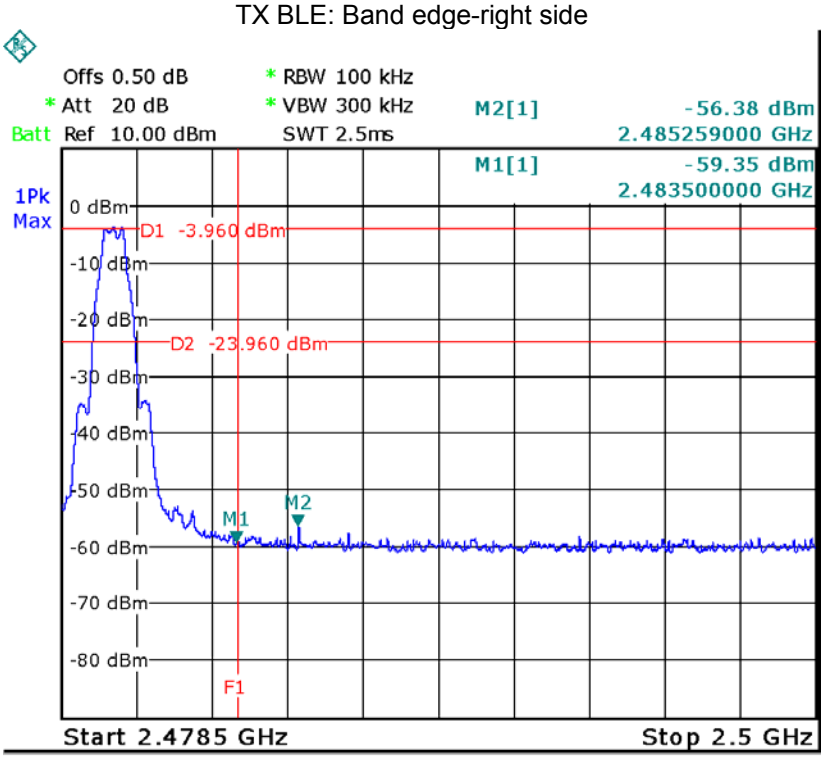
TX 11n HT40: Band edge-right side



TX BLE: Band edge-left side



TX BLE: Band edge-right side



9 6 dB Bandwidth Measurement

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: KDB 558074 D01 v03r02 06/05/2014

9.1 Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;

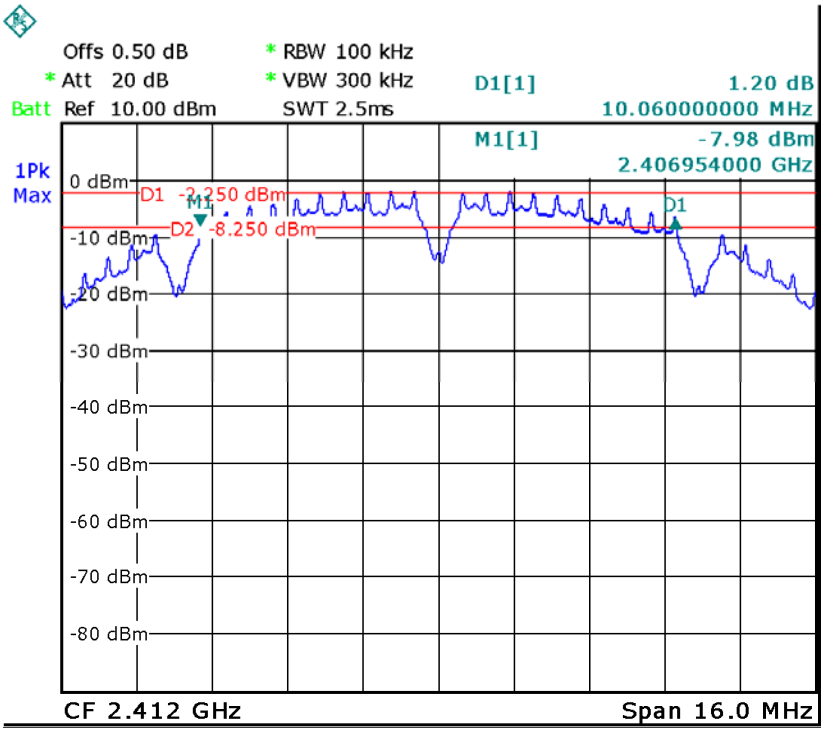
2. Set the spectrum analyzer: RBW = 100kHz, VBW = 300kHz

9.2 Test Result:

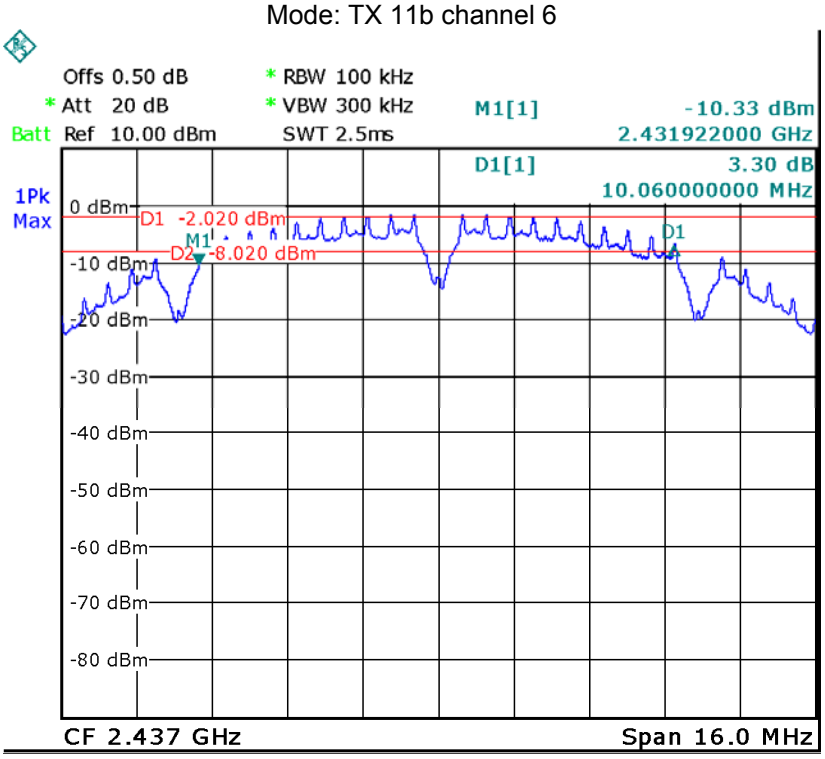
Operation mode	Bandwidth (MHz)		
TX 11b	Channel 1	Channel 6	Channel 11
	10.06	10.06	10.06
TX 11g	Channel 1	Channel 6	Channel 11
	16.517	16.517	16.517
TX 11n HT20	Channel 1	Channel 6	Channel 11
	17.784	17.784	17.784
TX 11n HT40	Channel 3	Channel 6	Channel 9
	36.34	36.34	36.34
BT BLE	Channel 1	Channel 19	Channel 39
	0.659	0.659	0.659

Test result plot as follows:

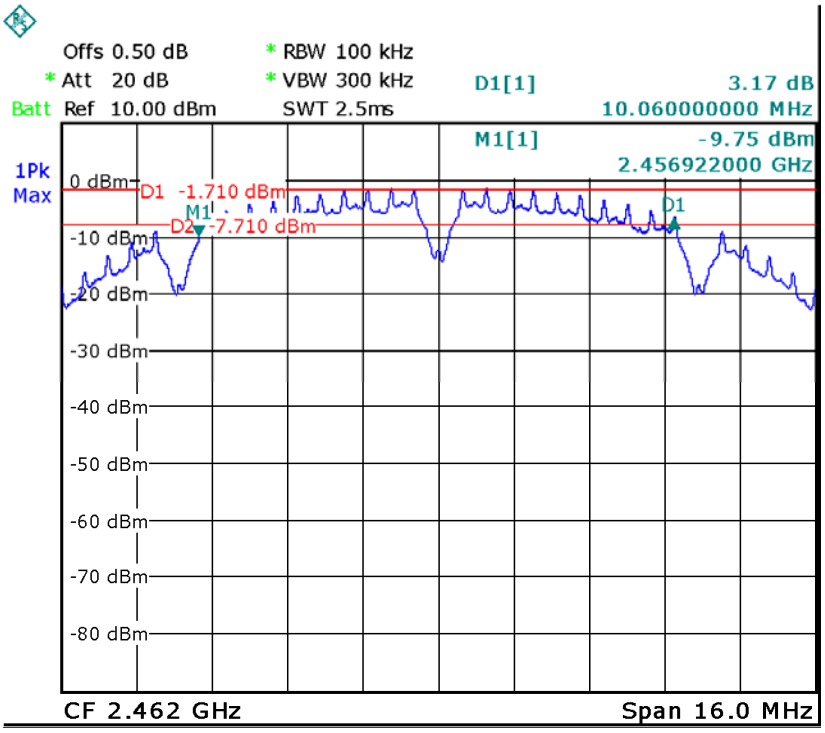
Mode: TX 11b channel 1



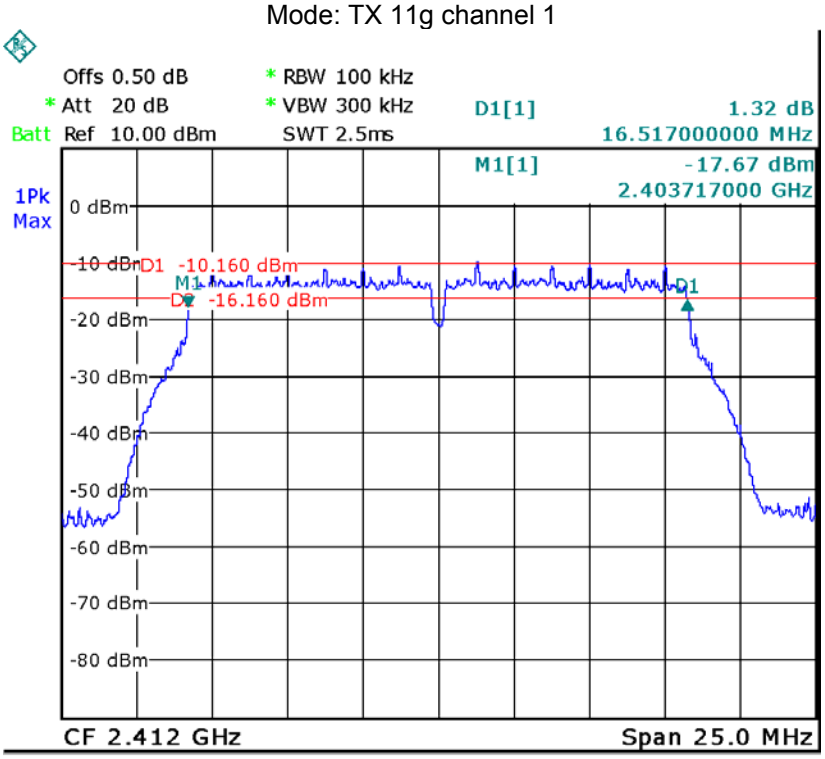
Mode: TX 11b channel 6



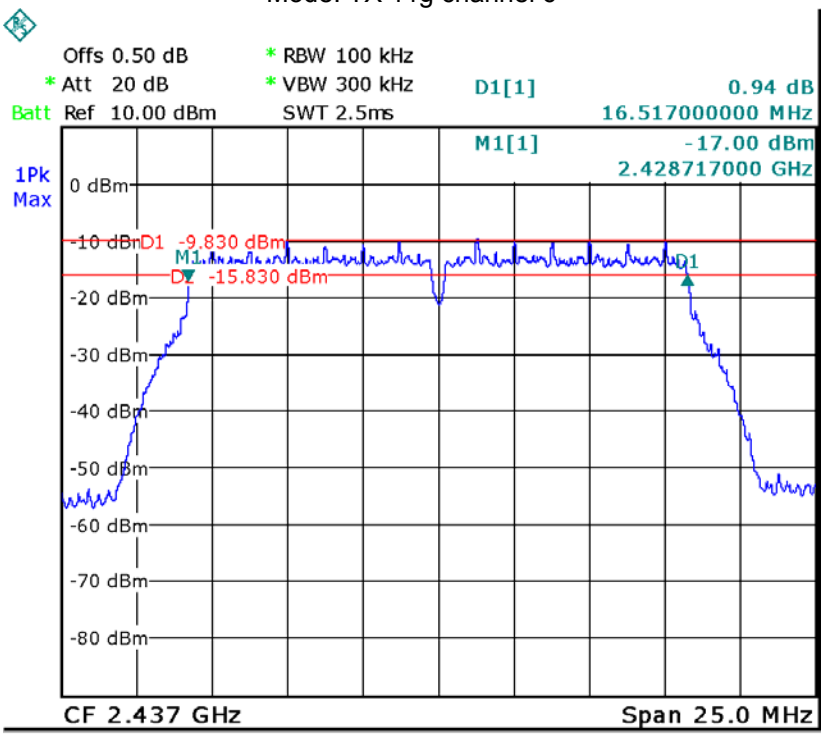
Mode: TX 11b channel 11



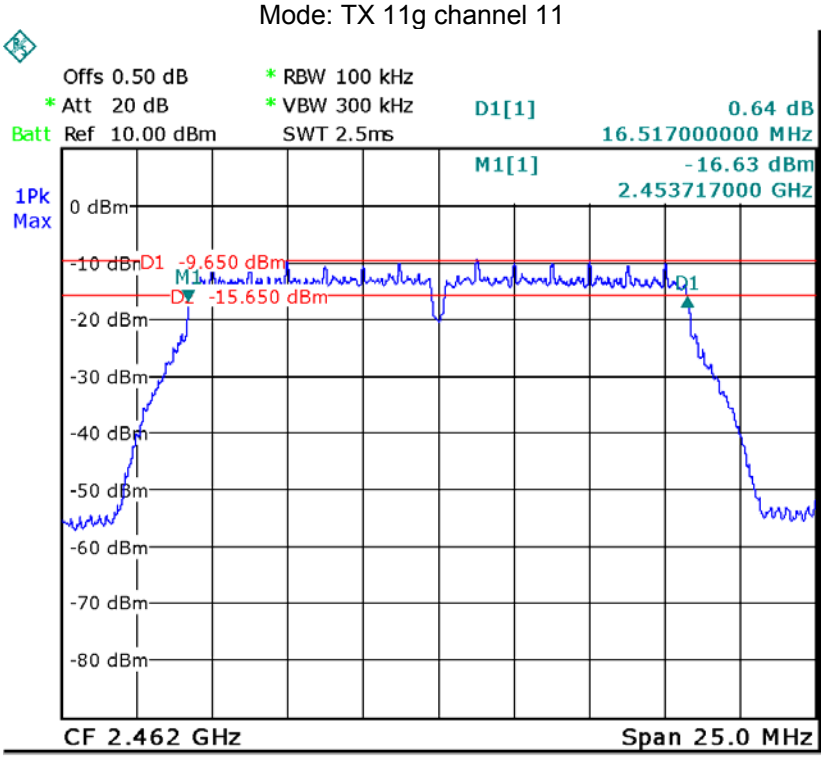
Mode: TX 11g channel 1



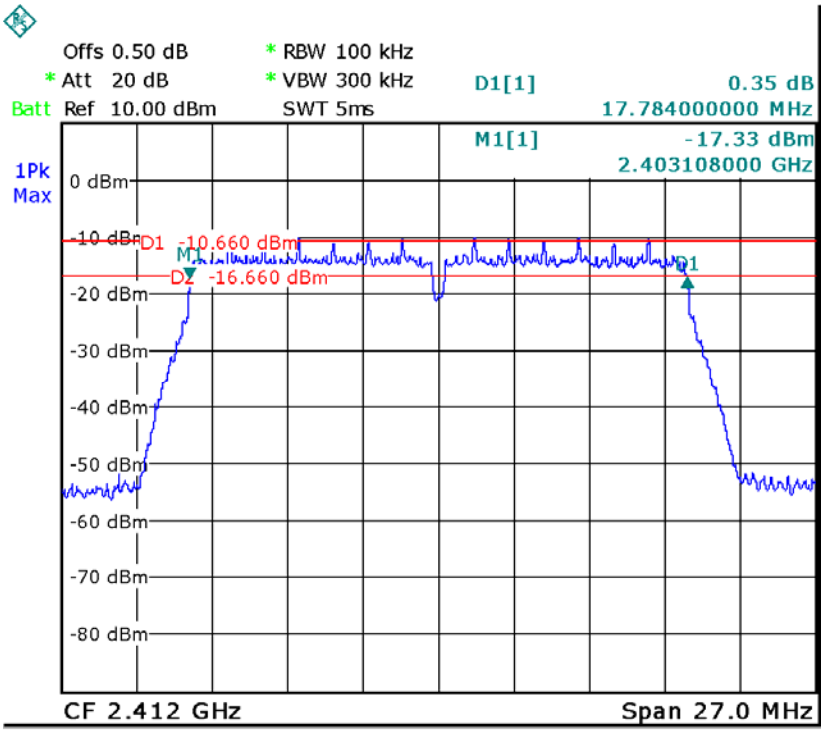
Mode: TX 11g channel 6



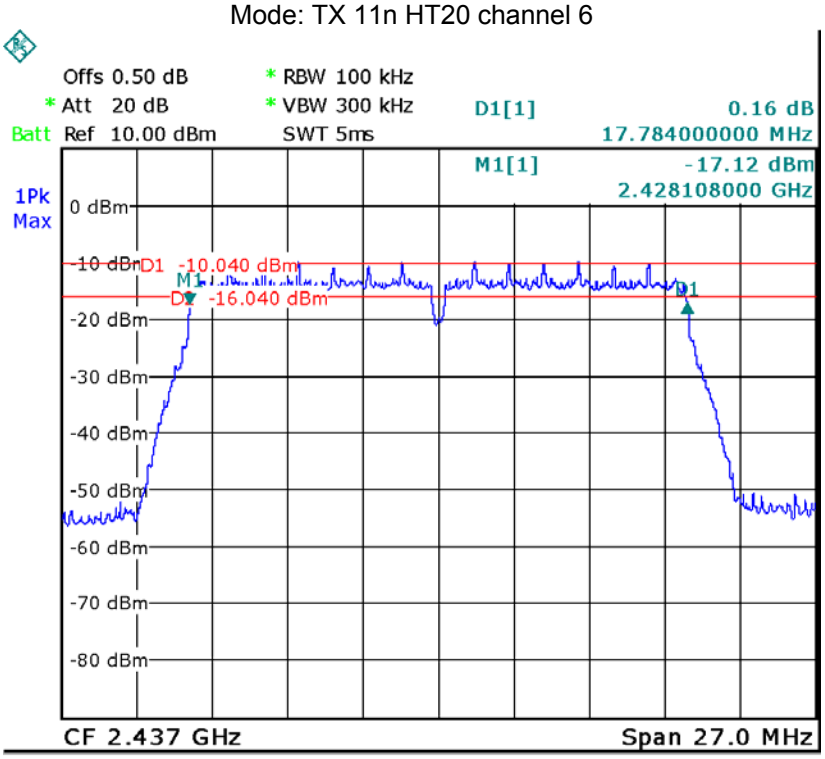
Mode: TX 11g channel 11



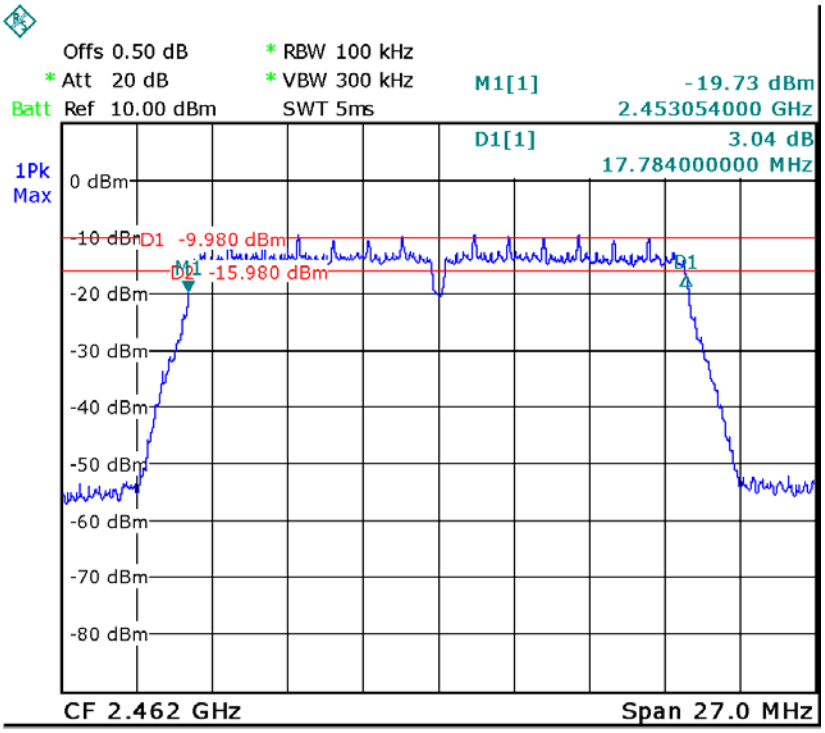
Mode: TX 11n HT20 channel 1



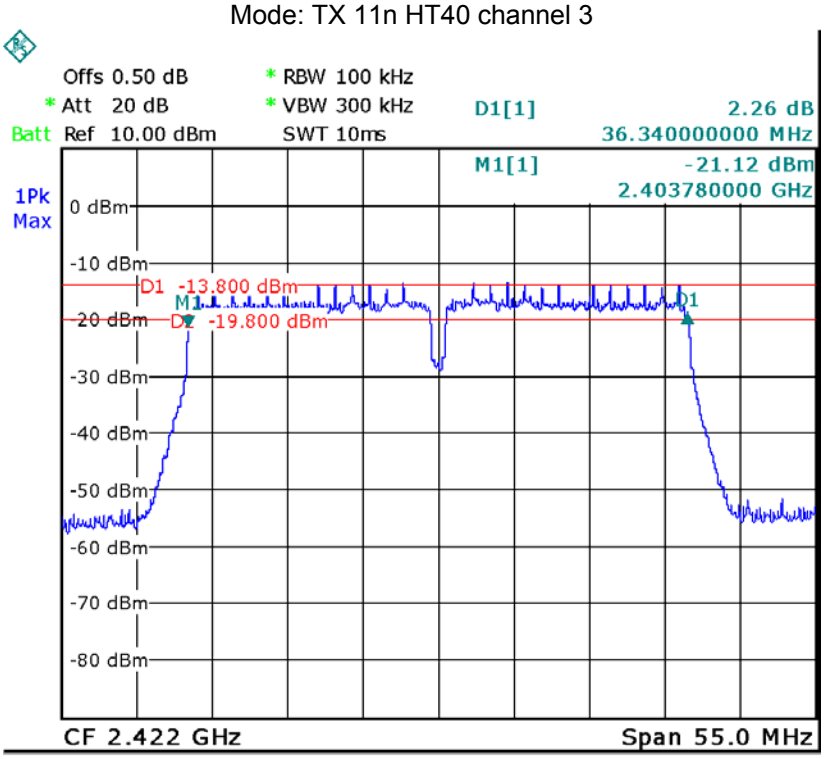
Mode: TX 11n HT20 channel 6



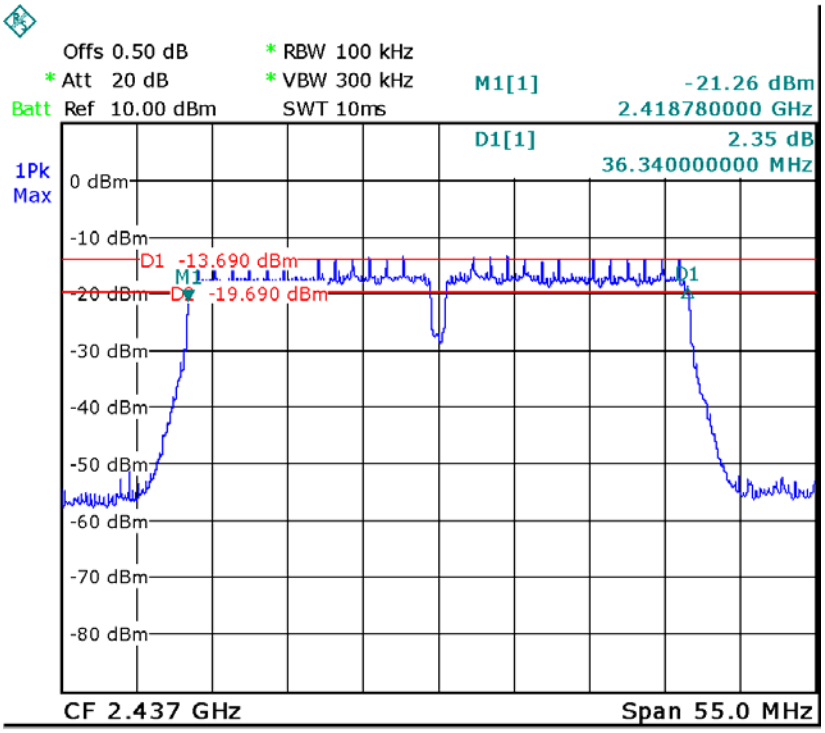
Mode: TX 11n HT20 channel 11



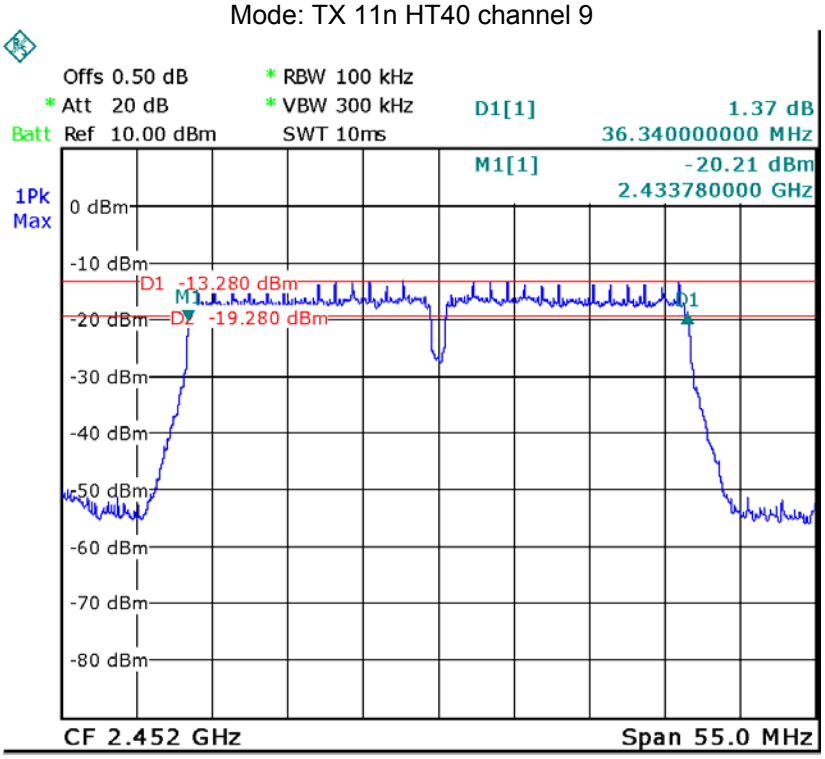
Mode: TX 11n HT40 channel 3



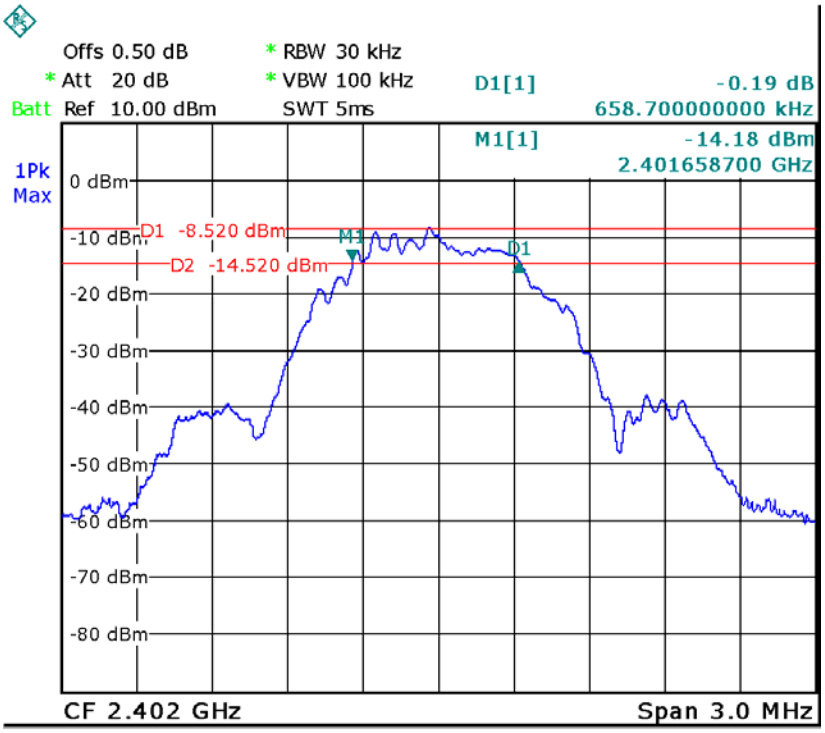
Mode: TX 11n HT40 channel 6



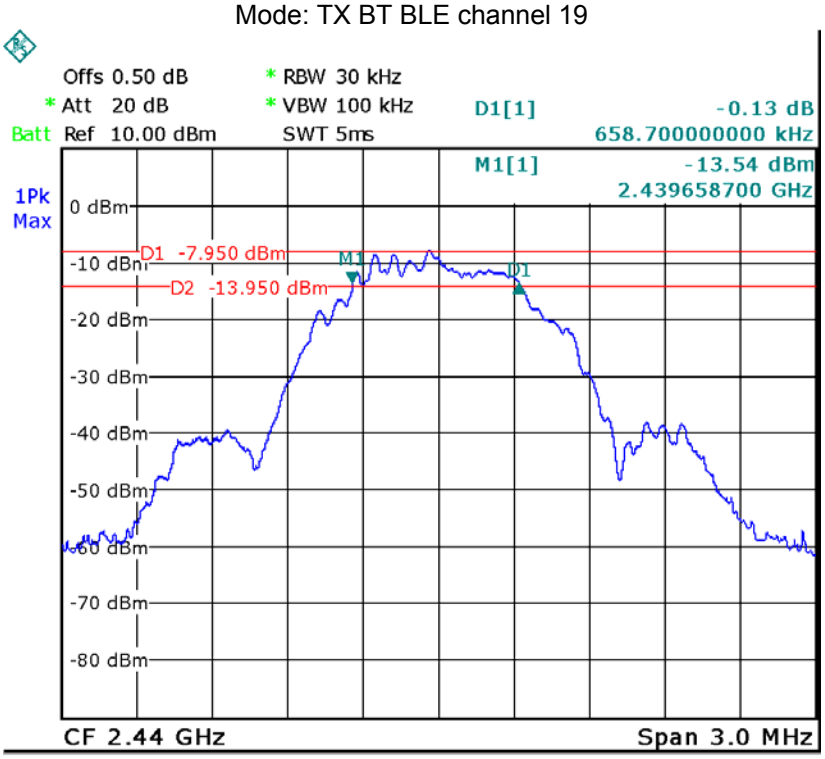
Mode: TX 11n HT40 channel 9



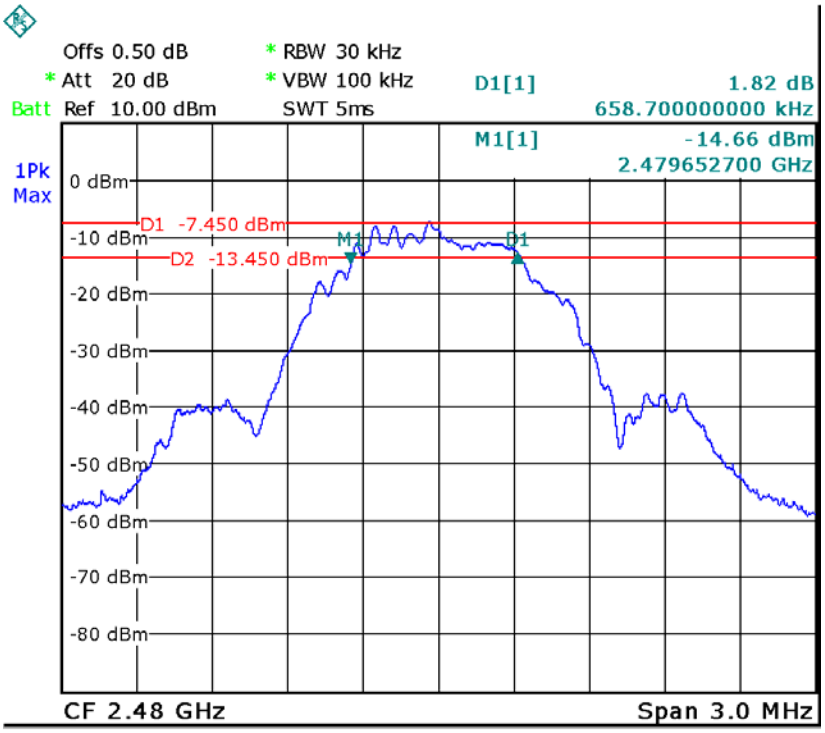
Mode: TX BT BLE channel 1



Mode: TX BT BLE channel 19



Mode: TX BT BLE channel 39



10 Maximum Peak Output Power

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: KDB 558074 D01 v03r02 06/05/2014

10.1 Test Procedure:

KDB 558074 D01 v03r02 06/05/2014

section 9.1.1

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 ≥ DTS bandwidth.

b)Set VBW ≥ 3 RBW.

c)Set span ≥ 3 x 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

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 ≥ 3 RBW

c)Set the span ≥ 1.5 x 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.

10.2 Test Result:

Test mode :TX 11b		
10 Maximum Peak Output Power (dBm)		
2412MHz	2437MHz	2462MHz
8.66	8.72	8.87
Limit: 1W/30dBm		
1W/30dBm		

Test mode :TX 11g		
10 Maximum Peak Output Power (dBm)		
2412MHz	2437MHz	2462MHz
8.22	8.57	8.77
Limit		
1W/30dBm		

Test mode :TX 11n HT20		
10 Maximum Peak Output Power (dBm)		
2412MHz	2437MHz	2462MHz
8.33	8.60	8.76
Limit		
1W/30dBm		

Test mode : TX 11n HT40		
10 Maximum Peak Output Power (dBm)		
2422MHz	2437MHz	2452MHz
8.46	8.55	8.69
Limit		
1W/30dBm		

Test mode : TX BT BLE		
10 Maximum Peak Output Power (dBm)		
2402MHz	2440MHz	2480MHz
-3.70	-3.13	-2.72
Limit		
1W/30dBm		

11 Power Spectral density

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: KDB 558074 D01 v03r02 06/05/2014

11.1 Test Procedure:

KDB 558074 D01 v03r02 06/05/2014 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.

11.2 Test Result:

Test mode :TX 11b		
Power Spectral (dBm per 3kHz)		
2412MHz	2437MHz	2462MHz
-16.10	-16.21	-15.73
Limit: 1W/30dBm		
8dBm per 3kHz		

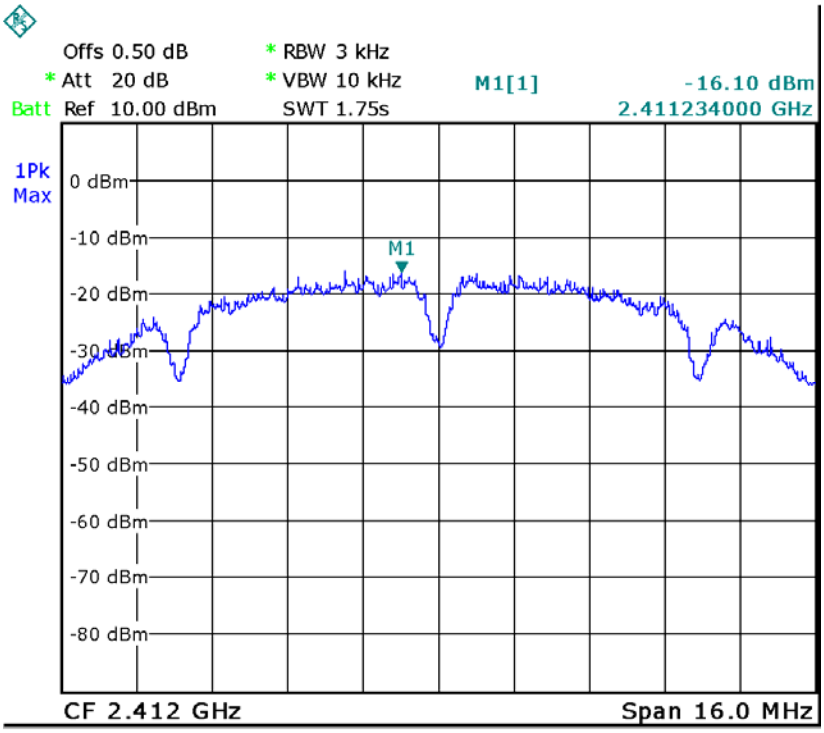
Test mode :TX 11g		
Power Spectral (dBm per 3kHz)		
2412MHz	2437MHz	2462MHz
-24.30	-24.90	-24.34
Limit		
8dBm per 3kHz		

Test mode :TX 11n HT20		
Power Spectral (dBm per 3kHz)		
2412MHz	2437MHz	2462MHz
-23.18	-24.06	-24.34
Limit		
8dBm per 3kHz		

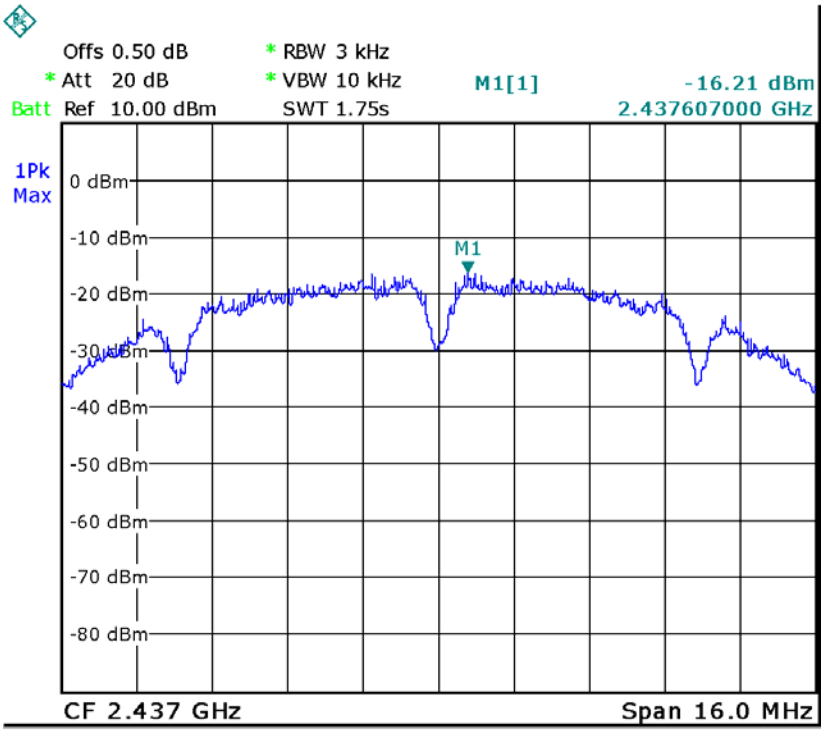
Test mode : TX 11n HT40		
Power Spectral (dBm per 3kHz)		
2422MHz	2437MHz	2452MHz
-28.06	-28.39	-27.62
Limit		
8dBm per 3kHz		

Test mode : TX BT BLE		
Power Spectral (dBm per 3kHz)		
2402MHz	2440MHz	2480MHz
-19.35	-18.72	-18.31
Limit		
8dBm per 3kHz		

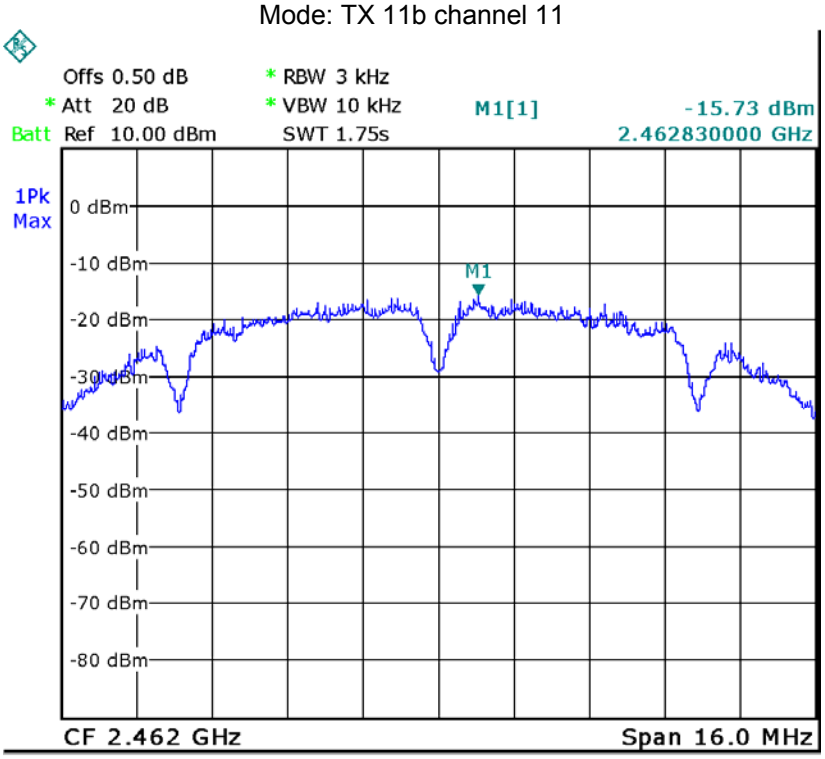
Mode: TX 11b channel 1



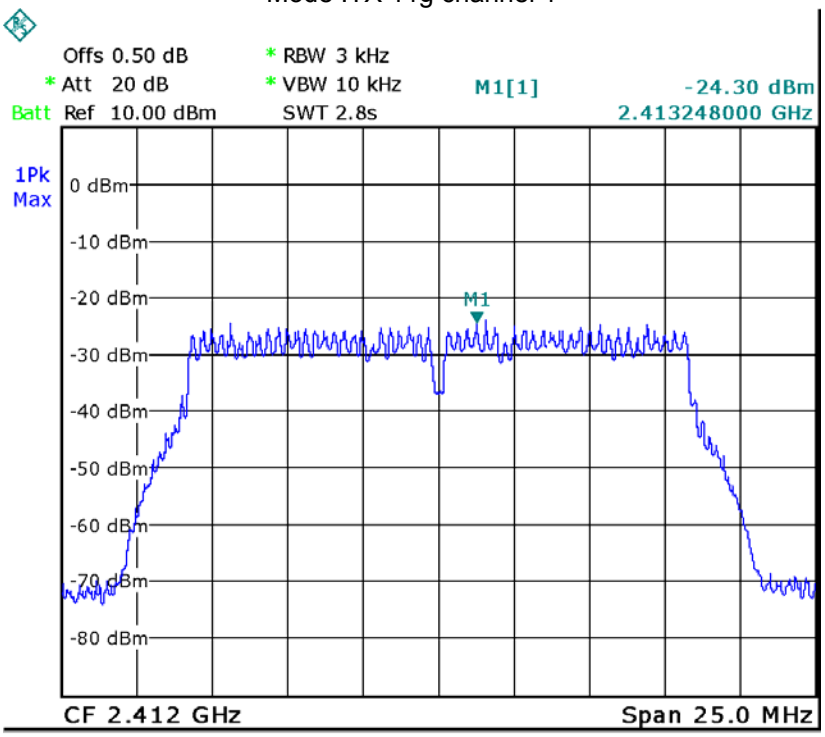
Mode: TX 11b channel 6



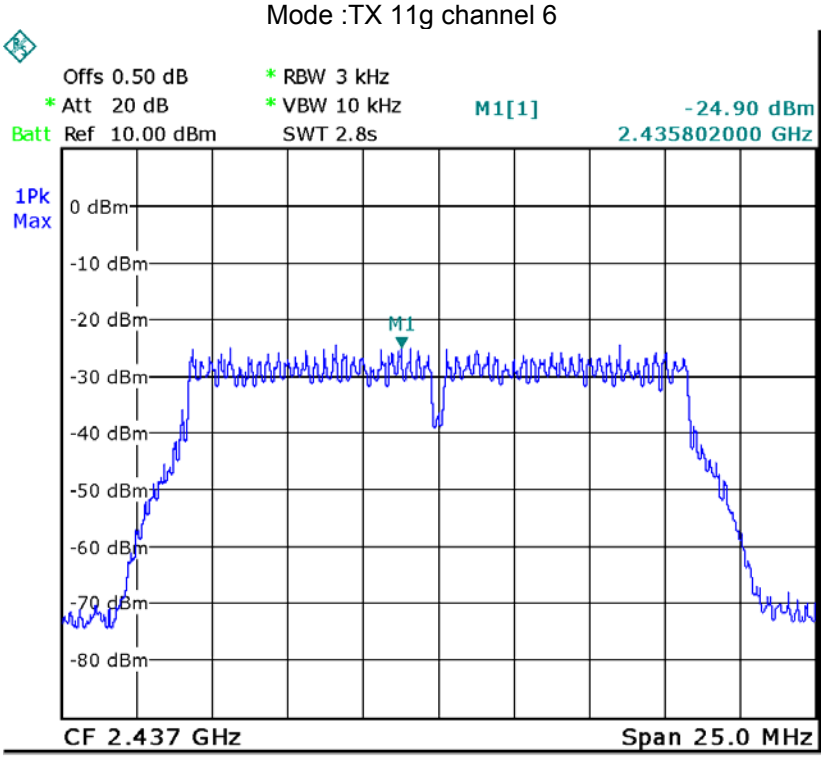
Mode: TX 11b channel 11



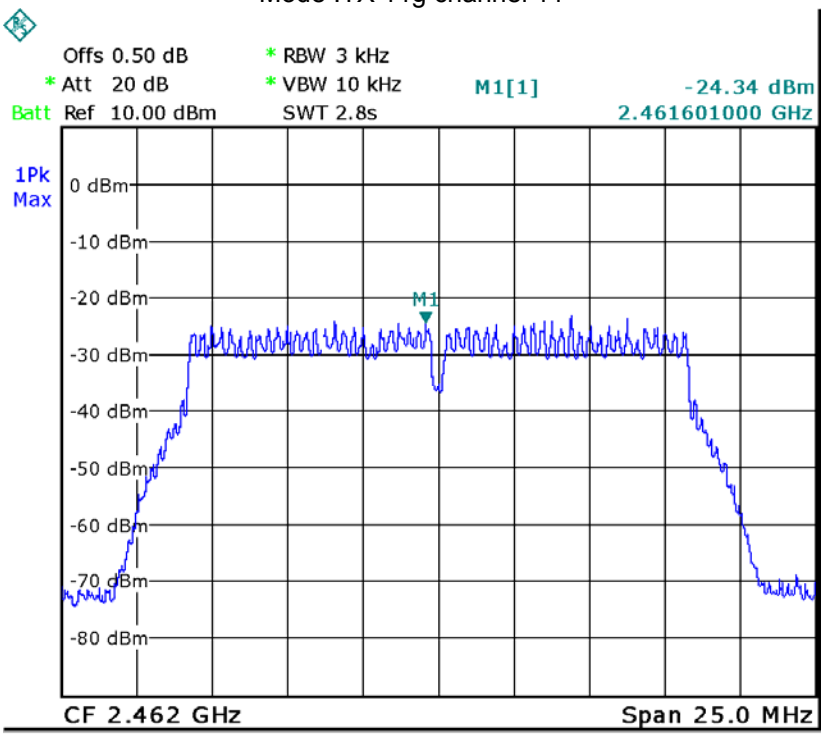
Mode :TX 11g channel 1



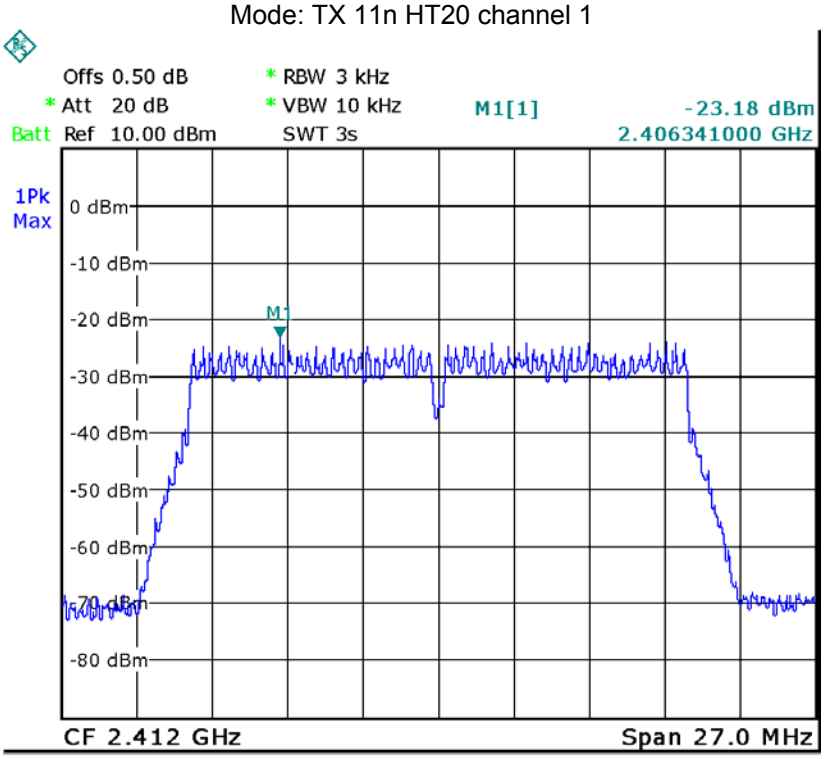
Mode :TX 11g channel 6



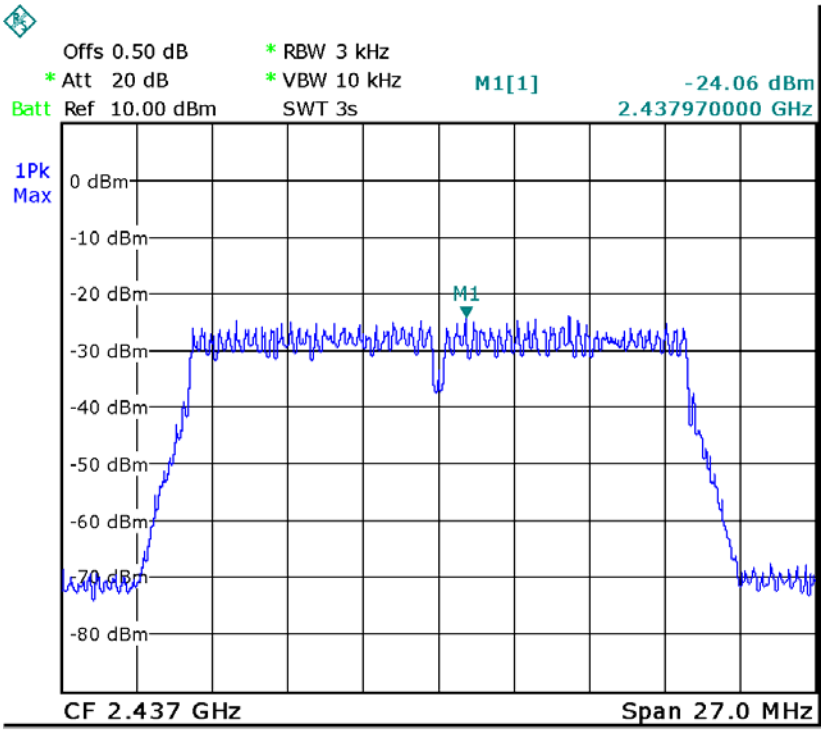
Mode :TX 11g channel 11



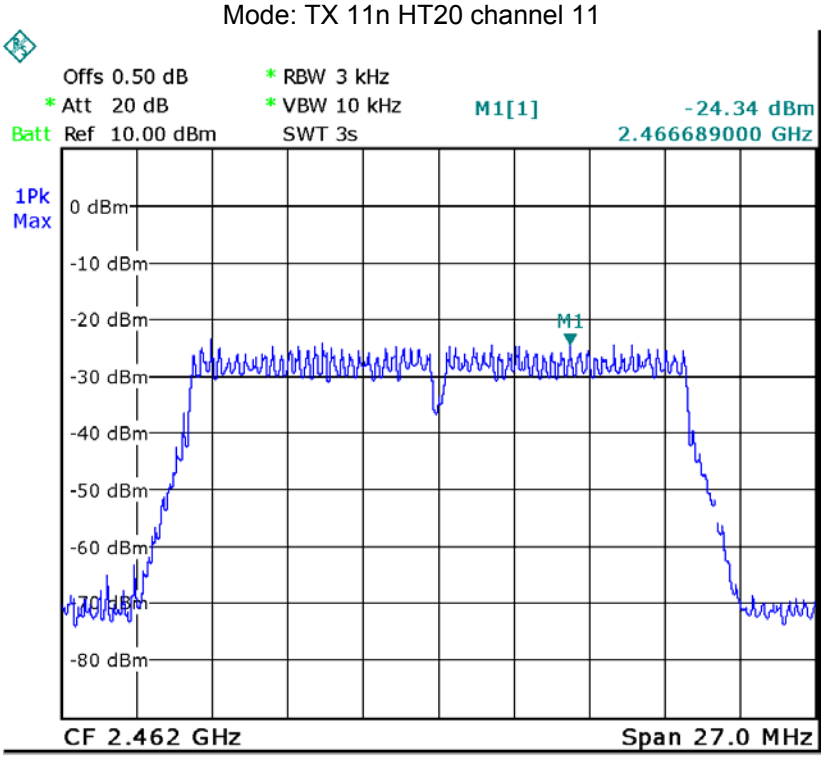
Mode: TX 11n HT20 channel 1



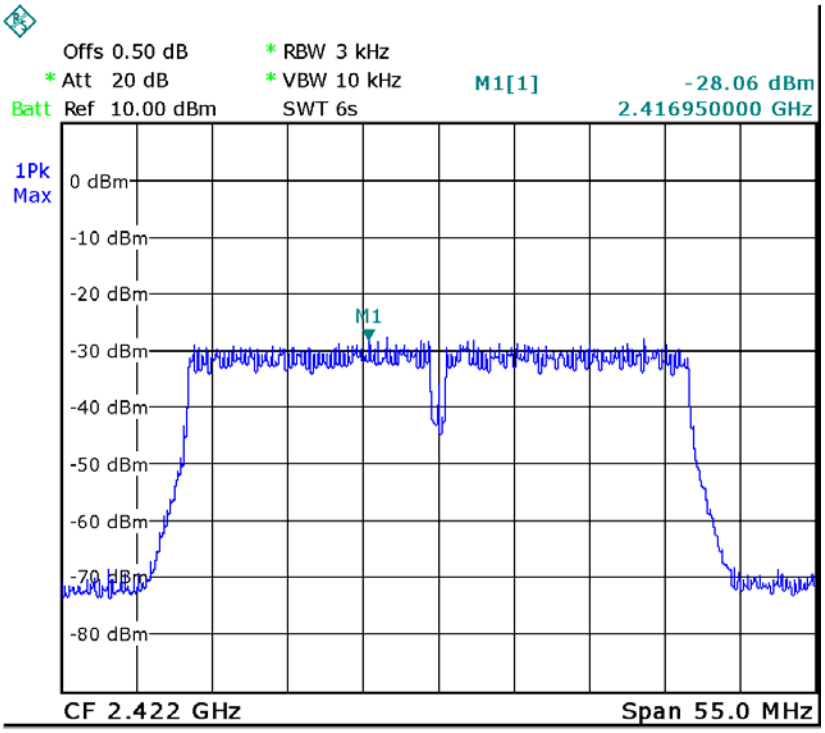
Mode: TX 11n HT20 channel 6



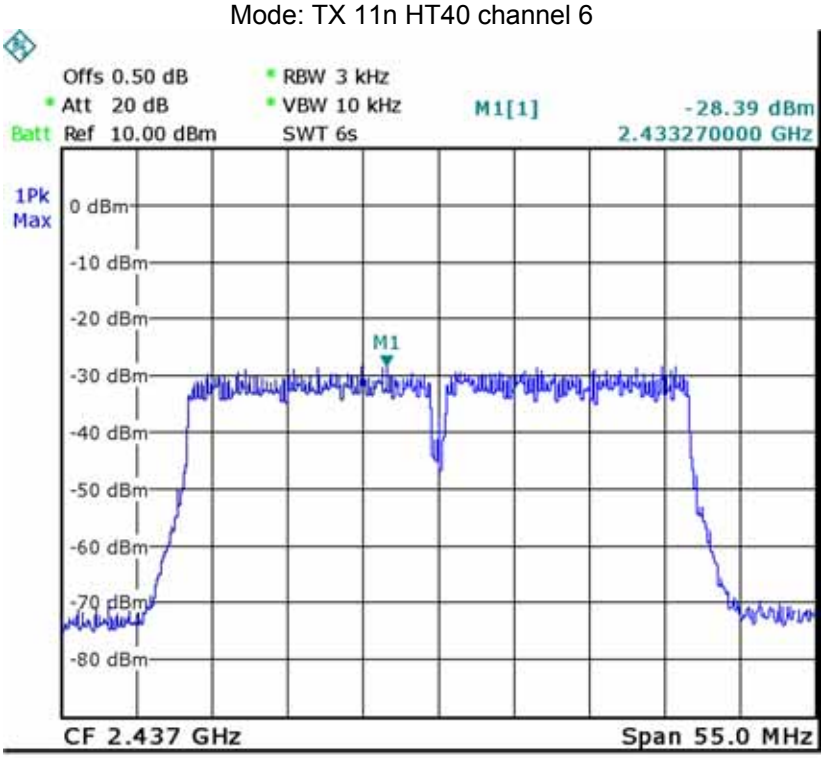
Mode: TX 11n HT20 channel 11



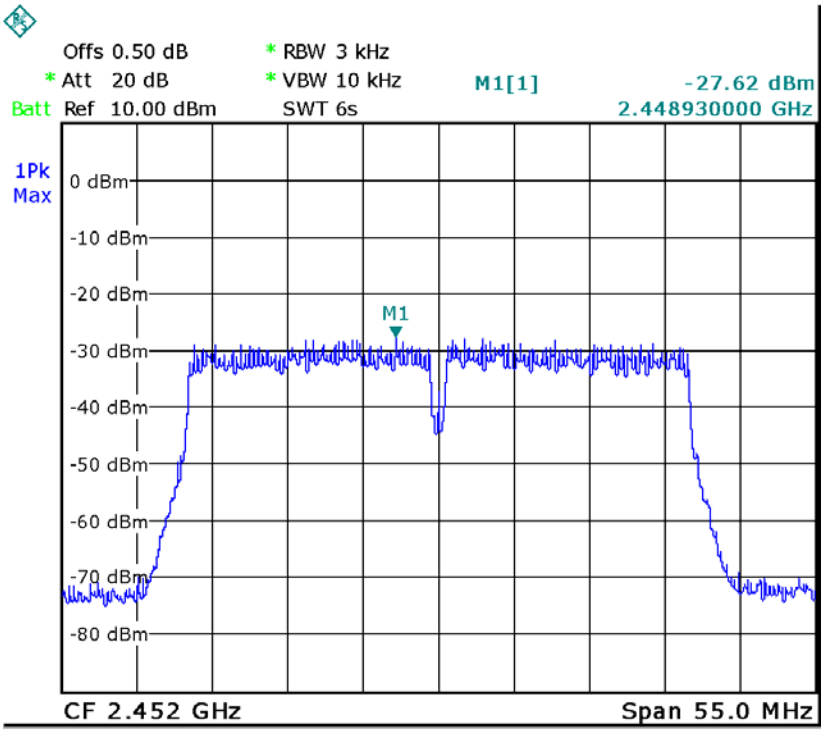
Mode: TX 11n HT40 channel 3



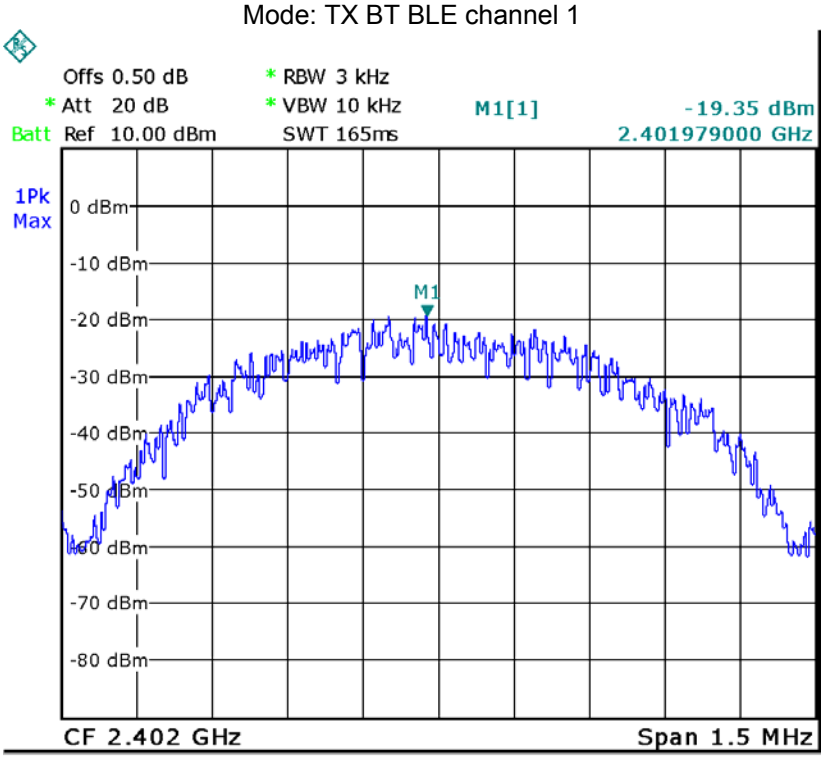
Mode: TX 11n HT40 channel 6



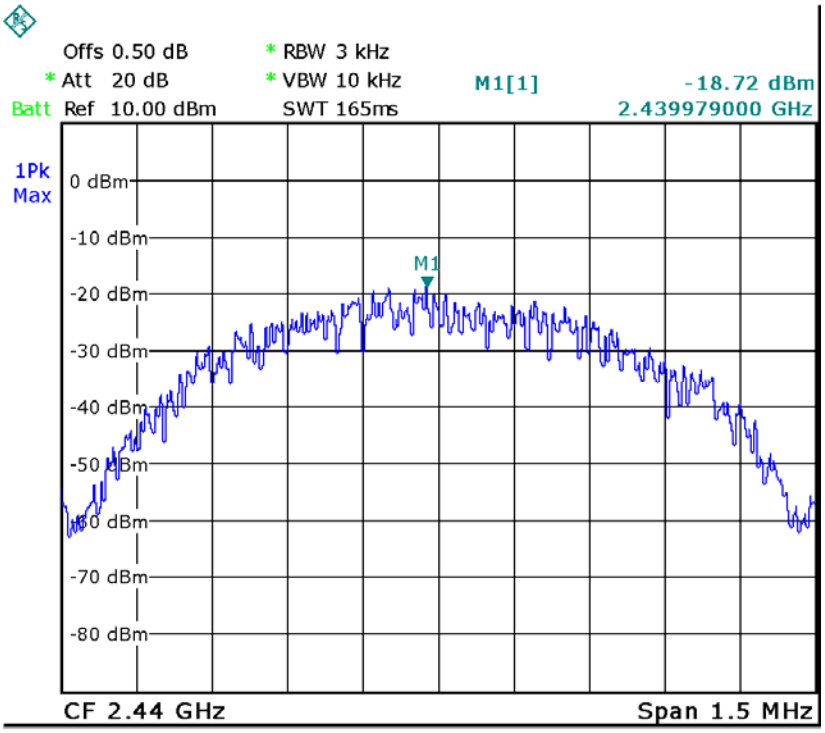
Mode: TX 11n HT40 channel 9



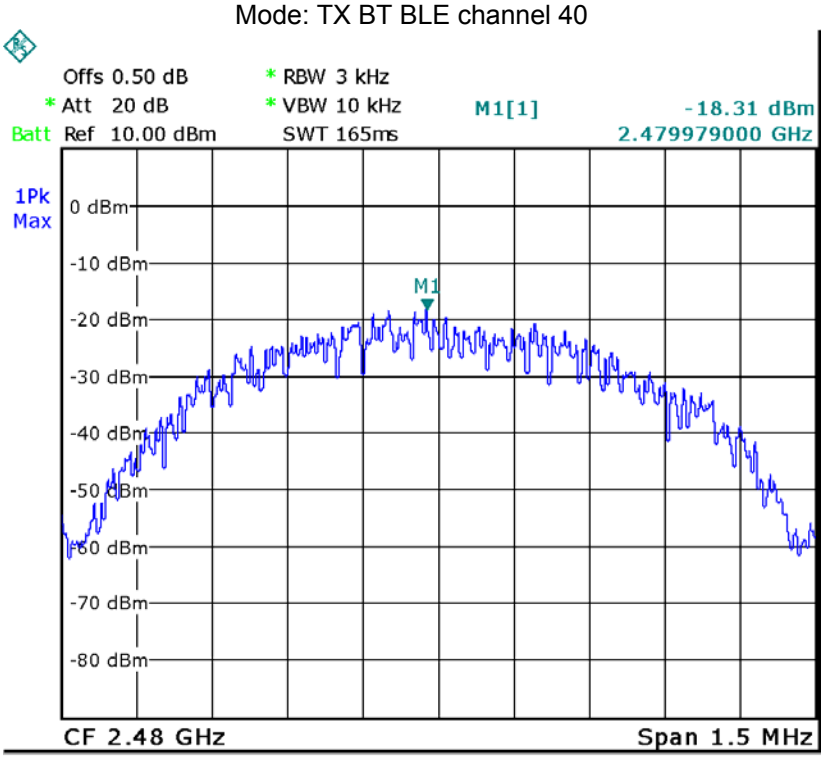
Mode: TX BT BLE channel 1



Mode: TX BT BLE channel 20



Mode: TX BT BLE channel 40



12 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 a monopole antenna fulfill the requirement of this section.

13 RF Exposure

Test Requirement: FCC Part 1.1307

Evaluation Method KDB 447498 D01 v05r02 General RF Exposure Guidance v05

13.1 Requirements

1) The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤50 mm are determined by:

[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] · [$\sqrt{}$ f(GHz)] ≤3.0 for 1-g SAR and ≤7.5 for 10-g extremity SAR where

1. f(GHz) is the RF channel transmit frequency in GHz
2. Power and distance are rounded to the nearest mW and mm before calculation
3. The result is rounded to one decimal place for comparison

The test exclusions are applicable only when the minimum test separation distance is ≤50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

13.2 The procedures / limit

Modulation	Conducted Peak power(dBm)	Conducted Peak power(mW)	Source-based time-averaged maximum conducted output power(mW)	Minimum test separation distance required for the exposure conditions (mm)	SAR Test Exclusion Thresholds(mW)
Wifi	8.87	7.709	7.709	5	10
BT BLE	-2.72	0.535	0.535	5	10

Remark: Max. duty factor is 100%

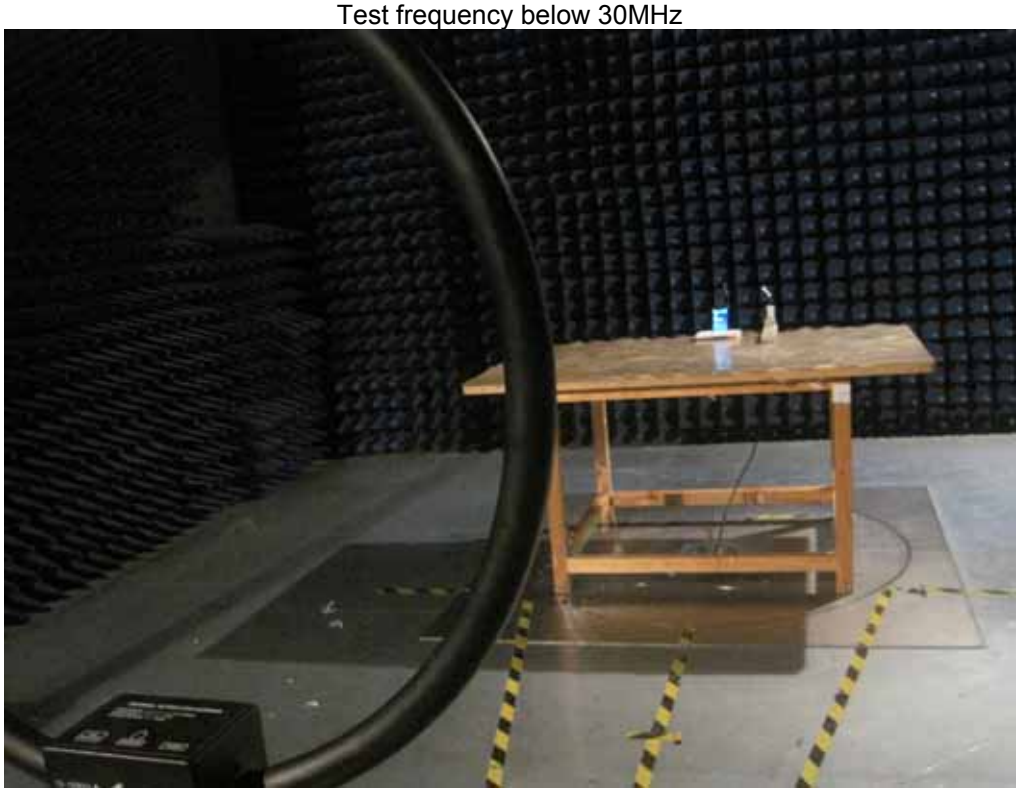
Calculation formula: Source-based time-averaged maximum conducted output power(mW) =Conducted peak power(mW)*Duty factor

14 Photographs – Model QUANTUM S8 Test Setup

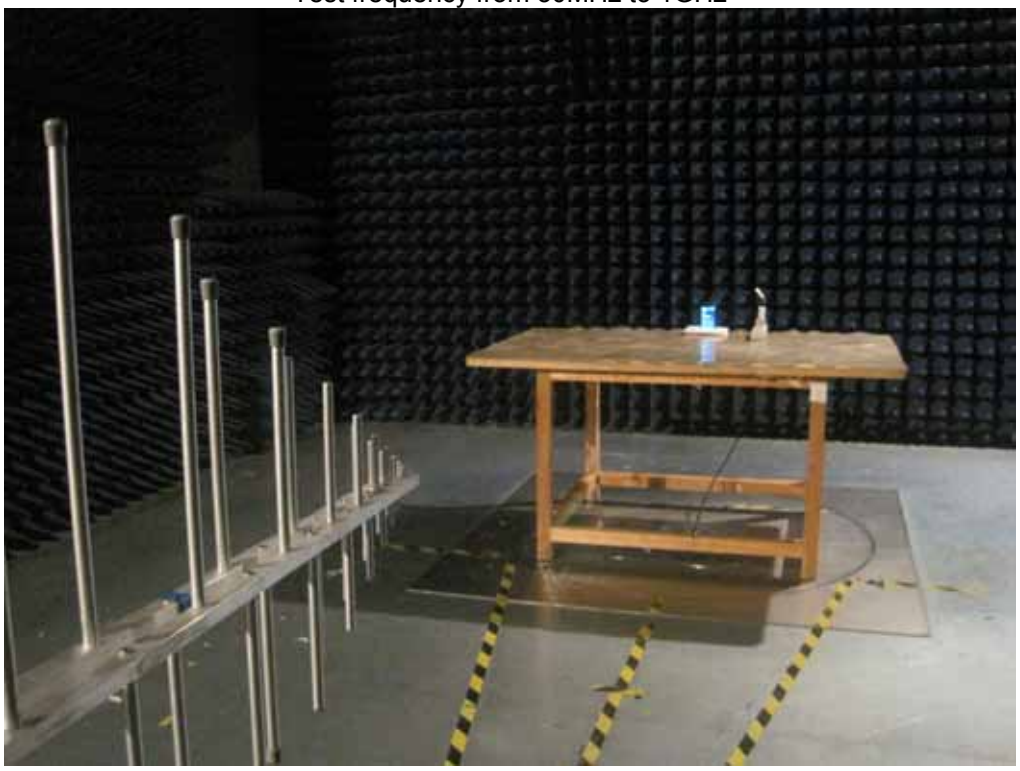
14.1 Conducted Emission

14.2 Radiated Emission

Test frequency below 30MHz



Test frequency from 30MHz to 1GHz

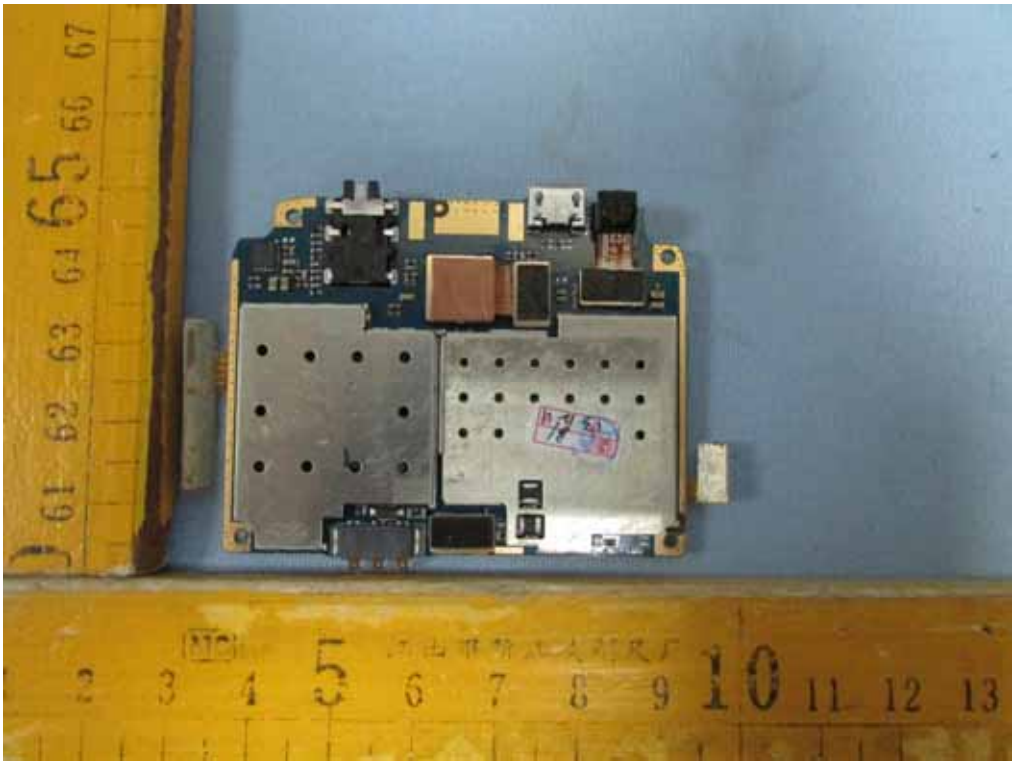


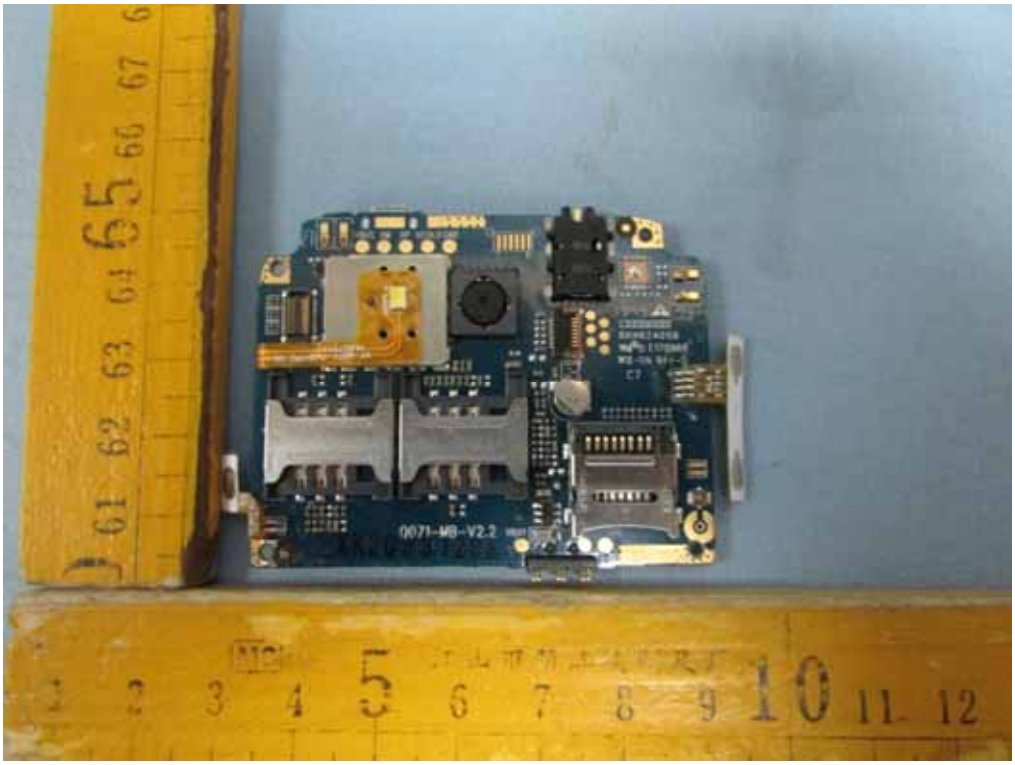
Test frequency above 1GHz

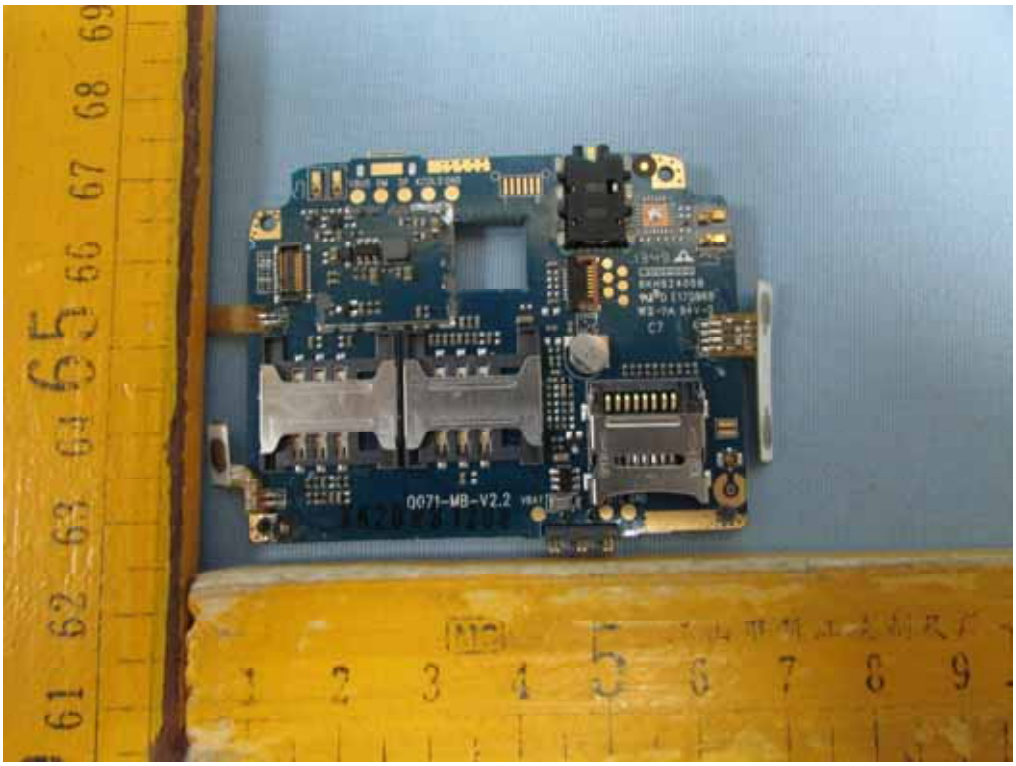
15 Photographs - Constructional Details

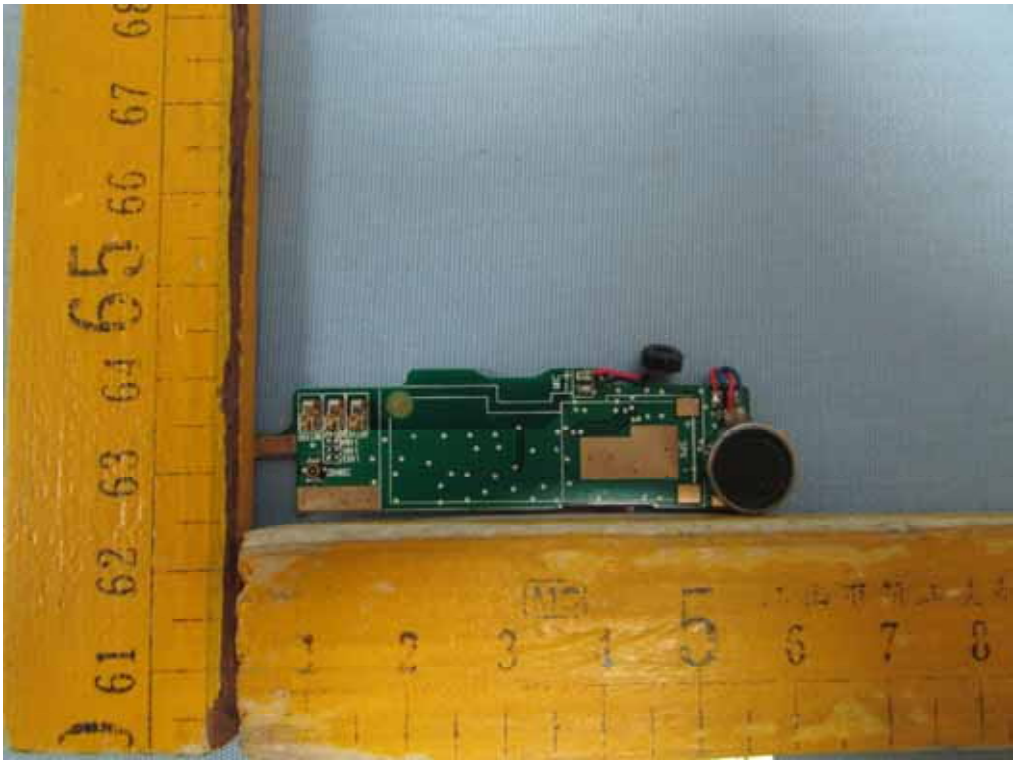
15.1 Model QUANTUM S8 –External View

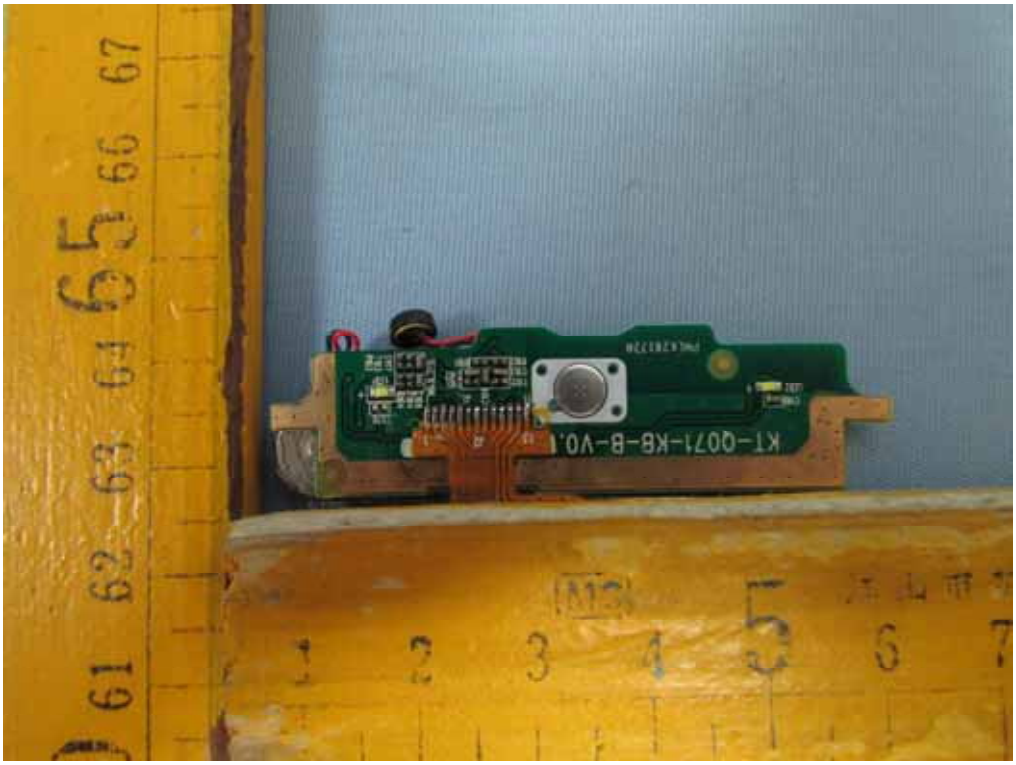
15.2 Model QUANTUM S8 – Internal View




0071-MB-V2.2


0071-MB-V2.2




KT-0071-KB-B-V0.

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