

TEST REPORT

Reference No. : WTN17S0681739-2E
FCC ID..... : 2AE2WT0702W
Applicant..... : Chunghsin Technology Group CO.,LTD
Address : NO.618-2 GONGREN WEST ROAD, JIAOJIANG AREA, TAIZHOU CITY, ZHEJIANG, China
Manufacturer : Chunghsin Technology Group CO.,LTD
Address : NO.618-2 GONGREN WEST ROAD, JIAOJIANG AREA, TAIZHOU CITY, ZHEJIANG
Product Name : 7" tablet
Model No. : HT0702W08, VT0702A08, KORAL 7W2, Rhyme 7A
Brand : HYUNDAI, VULCAN
Standards..... : FCC CFR47 Part 15 C Section 15.247:2016
Date of Receipt sample..... : Jun. 12, 2017
Date of Test..... : Jun. 12 – 25, 2017
Date of Issue : Jun. 26, 2017
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.

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2 Contents

	Page
1 COVER PAGE.....	1
2 CONTENTS	2
3 REPORT REVISION HISTORY	4
4 GENERAL INFORMATION.....	5
4.1 GENERAL DESCRIPTION OF E.U.T.	5
4.2 DETAILS OF E.U.T.	5
4.3 CHANNEL LIST	5
4.4 TEST MODE	6
4.5 TEST FACILITY	6
5 EQUIPMENT USED DURING TEST	7
5.1 EQUIPMENTS LIST	7
5.2 MEASUREMENT UNCERTAINTY	8
5.3 TEST EQUIPMENT CALIBRATION	8
6 TEST SUMMARY	9
7 CONDUCTED EMISSION	10
7.1 E.U.T. OPERATION	10
7.2 EUT SETUP.....	10
7.3 MEASUREMENT DESCRIPTION	10
7.4 CONDUCTED EMISSION TEST RESULT	11
8 RADIATED EMISSIONS.....	13
8.1 EUT OPERATION.....	13
8.2 TEST SETUP	14
8.3 SPECTRUM ANALYZER SETUP	15
8.4 TEST PROCEDURE	16
8.5 CORRECTED AMPLITUDE & MARGIN CALCULATION	16
8.6 SUMMARY OF TEST RESULTS	17
9 BAND EDGE MEASUREMENT	29
9.1 TEST PRODUCE.....	29
9.2 TEST RESULT	30
10 BANDWIDTH MEASUREMENT.....	34
10.1 TEST PROCEDURE:.....	34
10.2 TEST RESULT:	34
11 MAXIMUM PEAK OUTPUT POWER	41
11.1 TEST PROCEDURE:.....	41
11.2 TEST RESULT:	41
12 POWER SPECTRAL DENSITY	42
12.1 TEST PROCEDURE:.....	42
12.2 TEST RESULT:	42
13 ANTENNA REQUIREMENT	49
14 SAR EVALUATION.....	50
14.1 REQUIREMENTS.....	50
14.2 TEST RESULT	50
15 PHOTOGRAPHS – MODEL HT0702W08 TEST SETUP PHOTOS.....	51
15.1 RADIATED EMISSION	51
15.2 CONDUCTED EMISSION	53

16 **PHOTOGRAPHS - CONSTRUCTIONAL DETAILS**54

3 Report Revision History

Test report No.	Date of Receipt sample	Date of Test	Date of Issue	Purpose	Comment	Approved
WTN17S0681739-2E	Jun. 12, 2017	Jun. 12 – 25, 2017	Jun. 26, 2017	Original	-	Valid

4 General Information

4.1 General Description of E.U.T.

Product Name:	7" tablet
Model No.:	: HT0702W08, VT0702A08, KORAL 7W2, Rhyme 7A
Model Difference:	:Only the Brand and model names is different, the brand of model HT0702W08 and KORAL 7W2 is HYUNDAI, the brand of model VT0702A08 and Rhyme 7A is VULCAN
Operation Frequency:	802.11b/g/n HT20: 2412MHz ~ 2462MHz, 802.11n HT40: 2422MHz~2452MHz
The Lowest Oscillator:	32.768kHz
Antenna Gain:	0dBi
Type of modulation:	IEEE 802.11b (CCK/QPSK/BPSK,11Mbps max.) IEEE 802.11g (BPSK/QPSK/16QAM/64QAM,54Mbps max.) IEEE 802.11n (BPSK/QPSK/16QAM/64QAM,HT20:72Mbps max., HT40:150Mbps max.)

4.2 Details of E.U.T.

Technical Data:	DC 3.7V, 2500mAh, power by battery (Adapter: Input:100-240~50/60 Hz, 0.2A Output:5.0V  1.5A)
Adapter	Model: BSY01J3050150U U1

4.3 Channel List

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	-

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	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
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	150 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	150 Mbps	3/6/9	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 .

4.5 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 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.

5 Equipment Used during Test

5.1 Equipments List

Conducted Emissions Test Site 1#						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1.	EMI Test Receiver	R&S	ESCI	100947	Sep.12, 2016	Sep.11, 2017
2.	LISN	R&S	ENV216	101215	Sep.12, 2016	Sep.11, 2017
3.	Cable	Top	TYPE16(3.5M)	-	Sep.12, 2016	Sep.11, 2017
Conducted Emissions Test Site 2#						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1.	EMI Test Receiver	R&S	ESCI	101155	Sep.12, 2016	Sep.11, 2017
2.	LISN	SCHWARZBECK	NSLK 8128	8128-289	Sep.12, 2016	Sep.11, 2017
3.	Limiter	York	MTS-IMP-136	261115-001-0024	Sep.12, 2016	Sep.11, 2017
4.	Cable	LARGE	RF300	-	Sep.12, 2016	Sep.11, 2017
3m Semi-anechoic Chamber for Radiation Emissions Test site 1#						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1	EMC Analyzer	Agilent	E7405A	MY45114943	Sep.15,2016	Sep.14,2017
2	Active Loop Antenna	Beijing Dazhi	ZN30900A	-	Oct.17, 2015	Oct.16, 2016
3	Trilog Broadband Antenna	SCHWARZBECK	VULB9163	336	Apr.07, 2017	Apr.06, 2018
4	Coaxial Cable (below 1GHz)	Top	TYPE16(13M)	-	Sep.12, 2016	Sep.11, 2017
5	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	667	Apr.07, 2017	Apr.06, 2018
6	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9170	335	Apr.09, 2017	Apr.08, 2018
7	Broadband Preamplifier	COMPLIANCE DIRECTION	PAP-1G18	2004	Apr.07, 2017	Apr.06, 2018
8	Coaxial Cable (above 1GHz)	Top	1GHz-25GHz	EW02014-7	Apr.07, 2017	Apr.06, 2018
3m Semi-anechoic Chamber for Radiation Emissions Test site 2#						
Item	Equipment	Manufacturer	Model No.	Serial No	Last Calibration Date	Calibration Due Date
1	Test Receiver	R&S	ESCI	101296	Apr.06, 2017	Apr.07, 2018
2	Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3325	Apr.07, 2017	Apr.06, 2018
3	Amplifier	Compliance pirection systems inc	PAP-0203	22024	Apr.13, 2017	Apr.12, 2018
4	Cable	HUBER+SUHNER	CBL2	525178	Apr.07, 2017	Apr.06, 2018

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	Sep.15,2016	Sep.14,2017
2.	Spectrum Analyzer (9k~6GHz)	R&S	FSL6	100959	Sep.15,2016	Sep.14,2017
3.	Signal Analyzer (9k~26.5GHz)	Agilent	N9010A	MY50520207	Sep.15,2016	Sep.14,2017

5.2 Measurement Uncertainty

Parameter	Uncertainty
Radio Frequency	$\pm 1 \times 10^{-6}$
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)

5.3 Test Equipment Calibration

All the test equipments used are valid and calibrated by GUANG ZHOU GRG METROLOGY & TEST CO., LTD. address is No.163, Pingyun Rd. West of Huangpu Ave, Tianhe District, Guangzhou, Guangdong, China.

6 Test Summary

Test Items	Test Requirement	Result
Radiated Emissions	15.247 15.205(a) 15.209(a)	C
Conducted Emissions	15.207(a)	C
Bandwidth	15.247(a)(2)	C
Maximum Peak Output Power	15.247(b)(3),(4)	C
Power Spectral Density	15.247(e)	C
Band Edge	15.247(d)	C
Antenna Requirement	15.203	C
Maximum Permissible Exposure (Exposure of Humans to RF Fields)	1.1307(b)(1)	C
Note: C=Compliance; NC=Not Compliance; NT=Not Tested; N/A=Not Applicable.		

7 Conducted Emission

Test Requirement:	FCC CFR 47 Part 15 Section 15.207
Test Method:	ANSI C63.10:2013,ANSI C63.4:2014
Test Result:	PASS
Frequency Range:	150kHz to 30MHz
Class/Severity:	Class B
Limit:	66-56 dB μ V between 0.15MHz & 0.5MHz 56 dB μ V between 0.5MHz & 5MHz 60 dB μ V between 5MHz & 30MHz
Detector:	Peak for pre-scan (9kHz Resolution Bandwidth)

7.1 E.U.T. Operation

Operating Environment :

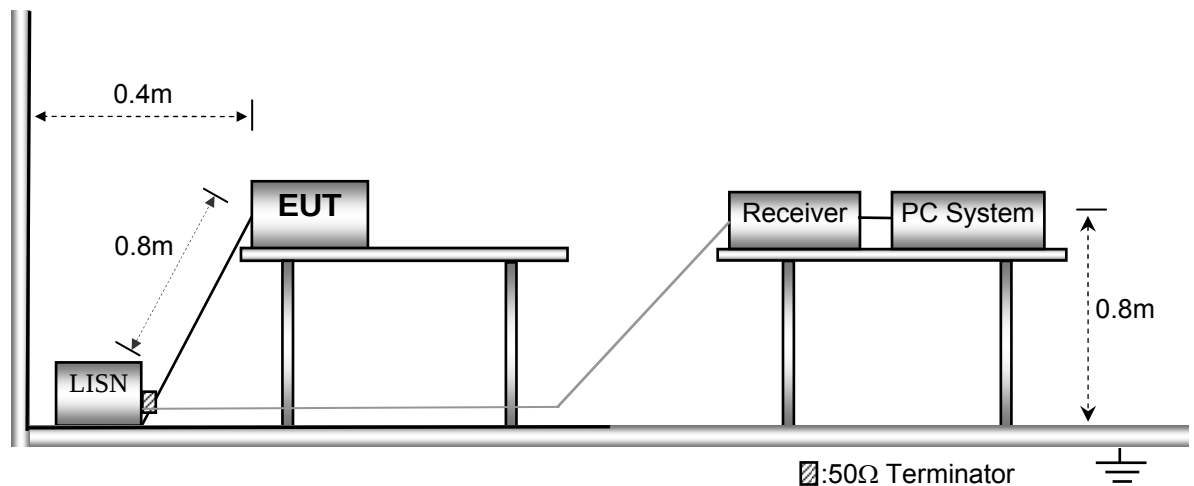
Temperature:	21.5 °C
Humidity:	51.9 % RH
Atmospheric Pressure:	101.2kPa

EUT Operation :

The test was performed in Transmitting mode, the test 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.



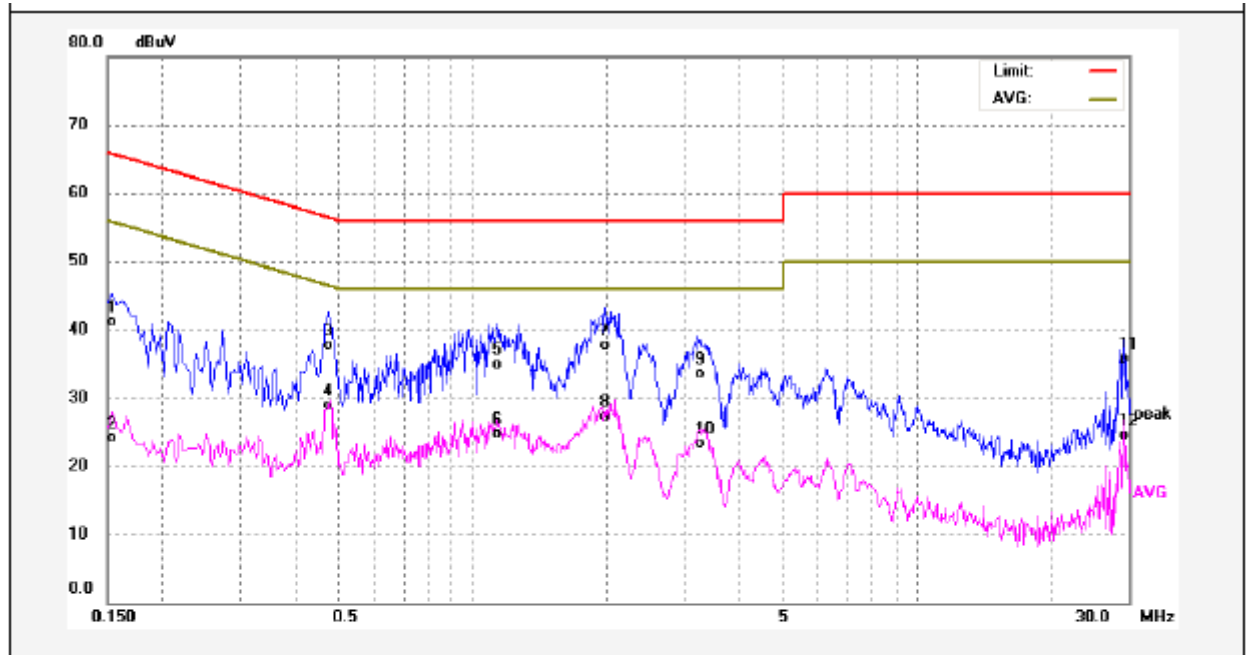
7.3 Measurement Description

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

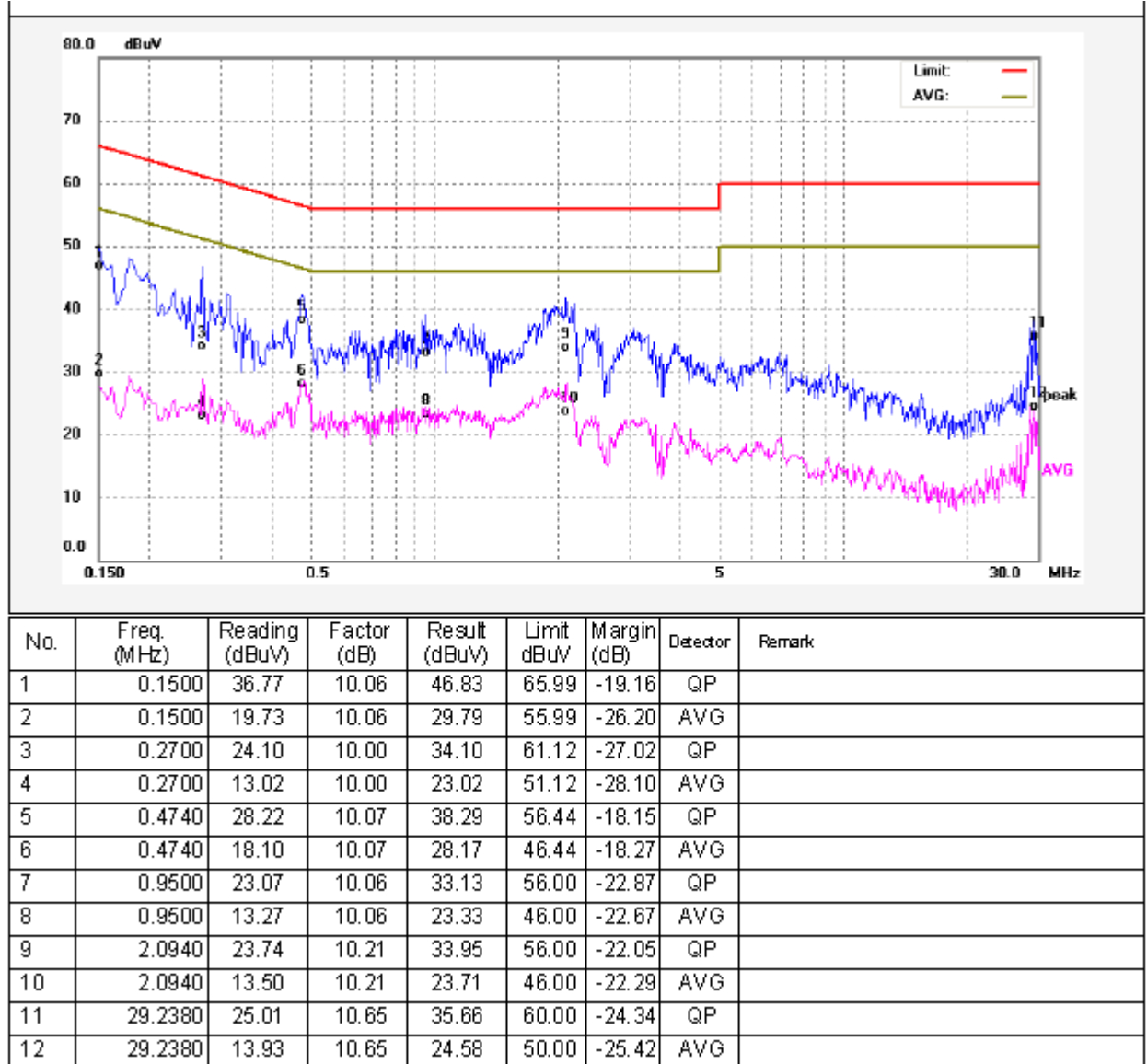
An initial pre-scan was performed on the live and neutral lines.

Live line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1539	31.05	10.02	41.07	65.78	-24.71	QP	
2	0.1539	14.10	10.02	24.12	55.78	-31.66	AVG	
3	0.4740	27.72	10.07	37.79	56.44	-18.65	QP	
4	0.4740	18.76	10.07	28.83	46.44	-17.61	AVG	
5	1.1380	24.52	10.31	34.83	56.00	-21.17	QP	
6	1.1380	14.35	10.31	24.66	46.00	-21.34	AVG	
7	1.9860	27.50	10.20	37.70	56.00	-18.30	QP	
8	1.9860	17.11	10.20	27.31	46.00	-18.69	AVG	
9	3.2220	23.26	10.25	33.51	56.00	-22.49	QP	
10	3.2220	13.10	10.25	23.35	46.00	-22.65	AVG	
11	29.2380	24.98	10.65	35.63	60.00	-24.37	QP	
12	29.2380	13.93	10.65	24.58	50.00	-25.42	AVG	

Neutral line:



8 Radiated Emissions

Test Requirement: FCC CFR47 Part 15 Section 15.209 & 15.247

Test Method: ANSI C63.10:2013, ANSI C63.4:2014

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

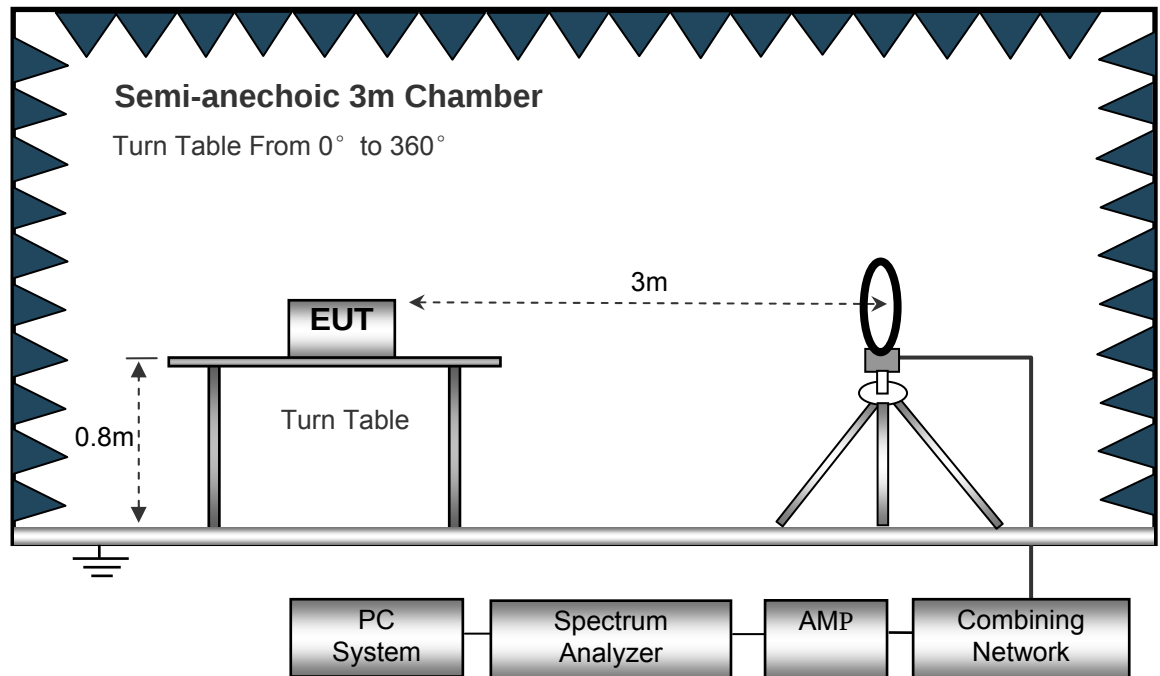
EUT Operation :

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

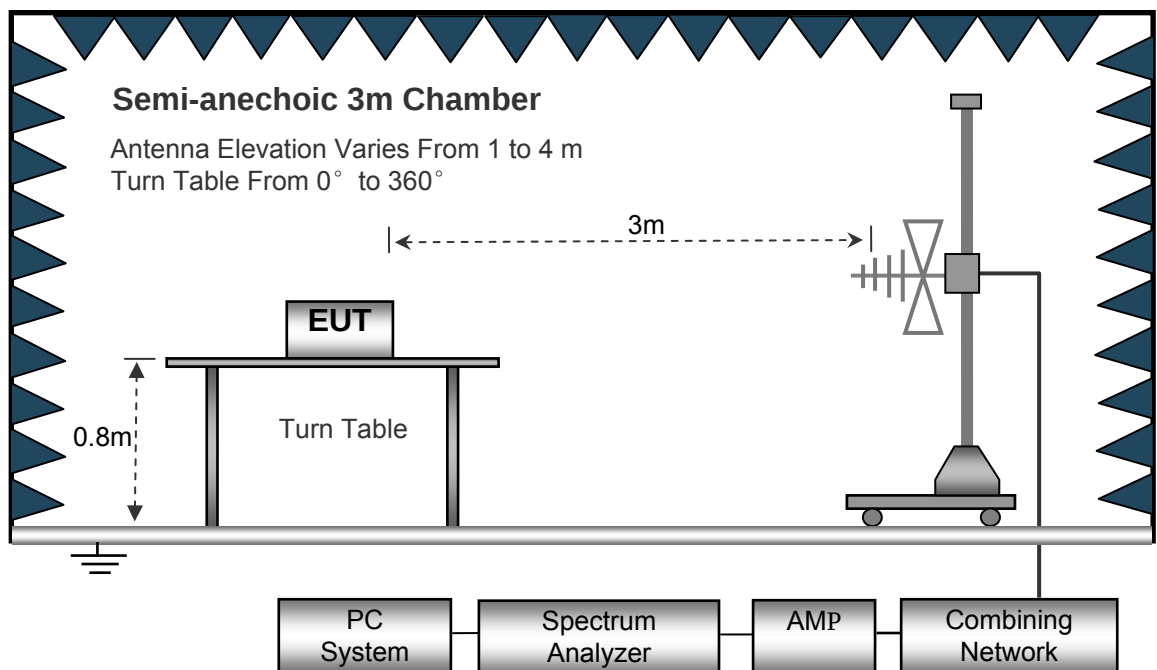
8.2 Test Setup

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

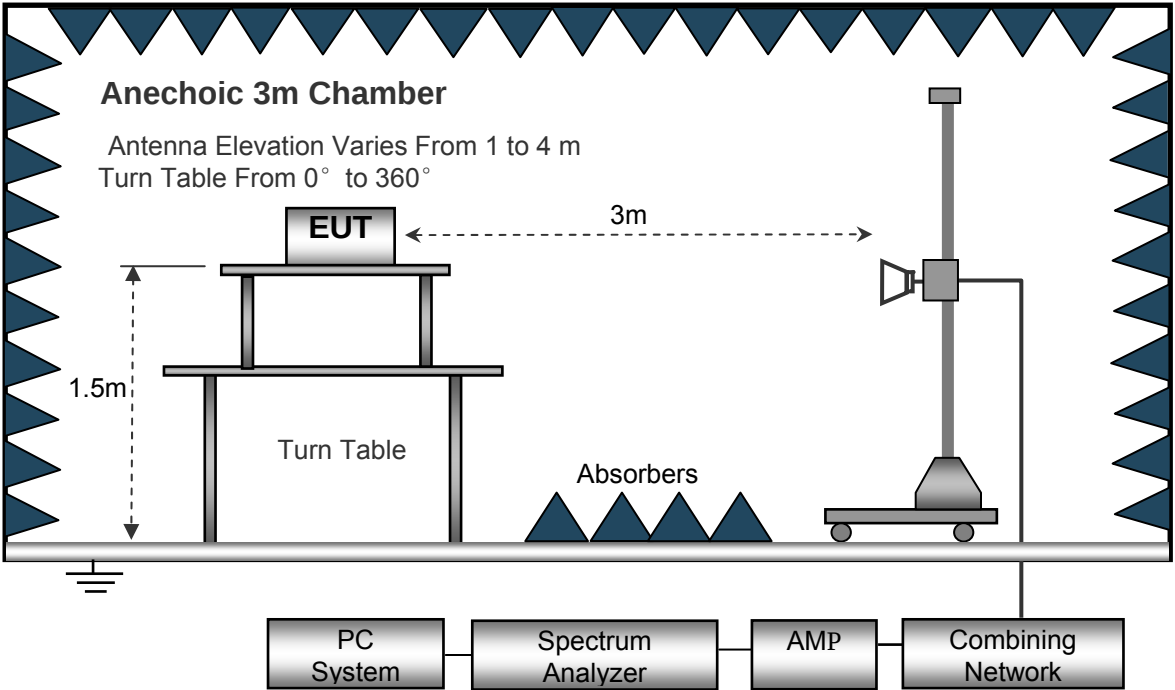
The test setup for emission measurement below 30MHz.



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
- DetectorPK
- Resolution Bandwidth.....100kHz
- Video Bandwidth.....300kHz

Above 1GHz

- Sweep Speed Auto
- DetectorPK
- Resolution Bandwidth.....1MHz
- Video Bandwidth.....3MHz
- DetectorAve.
- Resolution Bandwidth.....1MHz
- Video Bandwidth.....10Hz

8.4 Test Procedure

1. The EUT is placed on a turntable. For below 1GHz, the EUT is 0.8m above ground plane;
For above 1GHz, the EUT is 1.5m 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

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									
223.60	42.15	QP	133.99	1.61	H	11.09	31.06	46.00	-14.94
223.96	36.26	QP	42.76	1.97	V	11.58	24.68	46.00	-21.32
4824.00	50.18	PK	119.71	1.67	V	1.03	49.15	74.00	-24.85
4824.00	46.23	Ave	119.71	1.67	V	1.00	45.23	54.00	-8.77
7236.00	40.28	PK	180.23	1.75	H	1.33	41.61	74.00	-32.39
7236.00	40.17	Ave	180.23	1.75	H	1.33	41.50	54.00	-12.50
2346.19	46.83	PK	203.80	1.82	V	13.26	33.57	74.00	-40.43
2346.19	39.91	Ave	203.80	1.82	V	13.20	26.71	54.00	-27.29
2371.45	43.27	PK	276.99	1.53	H	13.23	30.04	74.00	-43.96
2371.45	38.08	Ave	276.99	1.53	H	12.25	25.83	54.00	-28.17
2486.16	42.55	PK	7.87	1.80	V	13.20	29.35	74.00	-44.65
2486.16	37.12	Ave	7.87	1.80	V	13.22	23.90	54.00	-30.10

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									
223.60	42.29	QP	17.07	1.84	H	11.09	31.20	46.00	-14.80
223.60	37.39	QP	277.91	1.48	V	11.58	25.81	46.00	-20.19
4874.00	50.59	PK	225.19	1.40	V	1.03	49.56	74.00	-24.44
4874.00	47.26	Ave	225.19	1.40	V	1.00	46.26	54.00	-7.74
7311.00	40.44	PK	18.32	1.01	H	2.21	42.65	74.00	-31.35
7311.00	40.15	Ave	18.32	1.01	H	2.21	42.36	54.00	-11.64
2319.89	45.41	PK	256.96	1.66	V	13.26	32.15	74.00	-41.85
2319.89	38.86	Ave	256.96	1.66	V	13.20	25.66	54.00	-28.34
2362.45	43.90	PK	26.31	1.19	H	13.23	30.67	74.00	-43.33
2362.45	36.43	Ave	26.31	1.19	H	12.25	24.18	54.00	-29.82
2495.11	44.52	PK	331.76	1.85	V	13.20	31.32	74.00	-42.68
2495.11	38.25	Ave	331.76	1.85	V	13.22	25.03	54.00	-28.97

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									
223.60	41.24	QP	122.05	1.90	H	11.09	30.15	46.00	-15.85
223.60	37.48	QP	167.03	1.15	V	11.58	25.90	46.00	-20.10
4924.00	51.72	PK	350.59	1.61	V	1.03	50.69	74.00	-23.31
4924.00	48.36	Ave	350.59	1.61	V	1.00	47.36	54.00	-6.64
7386.00	41.63	PK	159.94	1.63	H	2.84	44.47	74.00	-29.53
7386.00	40.01	Ave	159.94	1.63	H	2.84	42.85	54.00	-11.15
2340.52	46.83	PK	139.51	1.27	V	13.26	33.57	74.00	-40.43
2340.52	38.97	Ave	139.51	1.27	V	13.20	25.77	54.00	-28.23
2352.88	44.76	PK	193.83	1.11	H	13.23	31.53	74.00	-42.47
2352.88	38.61	Ave	193.83	1.11	H	12.25	26.36	54.00	-27.64
2498.79	44.58	PK	233.34	1.94	V	13.20	31.38	74.00	-42.62
2498.79	38.70	Ave	233.34	1.94	V	13.22	25.48	54.00	-28.52

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									
223.60	41.12	QP	197.18	1.23	H	11.09	30.03	46.00	-15.97
223.60	38.29	QP	74.63	1.15	V	11.58	26.71	46.00	-19.29
4824.00	50.84	PK	289.74	1.68	V	1.03	49.81	74.00	-24.19
4824.00	49.44	Ave	289.74	1.68	V	1.00	48.44	54.00	-5.56
7236.00	40.67	PK	81.48	1.00	H	1.33	42.00	74.00	-32.00
7236.00	41.22	Ave	81.48	1.00	H	1.33	42.55	54.00	-11.45
2318.80	45.30	PK	63.79	1.26	V	13.26	32.04	74.00	-41.96
2318.80	37.02	Ave	63.79	1.26	V	13.20	23.82	54.00	-30.18
2360.09	42.86	PK	184.32	1.51	H	13.23	29.63	74.00	-44.37
2360.09	37.86	Ave	184.32	1.51	H	12.25	25.61	54.00	-28.39
2494.70	42.44	PK	295.92	1.01	V	13.20	29.24	74.00	-44.76
2494.70	38.58	Ave	295.92	1.01	V	13.22	25.36	54.00	-28.64

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									
223.60	41.49	QP	284.53	1.52	H	11.09	30.40	46.00	-15.60
223.60	37.88	QP	144.24	1.13	V	11.58	26.30	46.00	-19.70
4874.00	49.98	PK	249.13	1.43	V	1.03	48.95	74.00	-25.05
4874.00	49.29	Ave	249.13	1.43	V	1.00	48.29	54.00	-5.71
7311.00	39.97	PK	336.69	1.79	H	2.21	42.18	74.00	-31.82
7311.00	41.68	Ave	336.69	1.79	H	2.21	43.89	54.00	-10.11
2348.73	46.97	PK	177.53	1.63	V	13.26	33.71	74.00	-40.29
2348.73	39.59	Ave	177.53	1.63	V	13.20	26.39	54.00	-27.61
2385.46	44.00	PK	138.98	1.50	H	13.23	30.77	74.00	-43.23
2385.46	36.65	Ave	138.98	1.50	H	12.25	24.40	54.00	-29.60
2486.71	43.47	PK	7.37	1.28	V	13.20	30.27	74.00	-43.73
2486.71	36.09	Ave	7.37	1.28	V	13.22	22.87	54.00	-31.13

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									
223.60	42.00	QP	4.66	1.14	H	11.09	30.91	46.00	-15.09
223.60	37.72	QP	164.59	1.45	V	11.58	26.14	46.00	-19.86
4924.00	50.19	PK	60.14	1.98	V	1.03	49.16	74.00	-24.84
4924.00	49.77	Ave	60.14	1.98	V	1.00	48.77	54.00	-5.23
7386.00	39.16	PK	35.56	1.45	H	2.84	42.00	74.00	-32.00
7386.00	40.96	Ave	35.56	1.45	H	2.84	43.80	54.00	-10.20
2335.11	45.11	PK	301.05	1.29	V	13.26	31.85	74.00	-42.15
2335.11	37.58	Ave	301.05	1.29	V	13.20	24.38	54.00	-29.62
2369.69	44.53	PK	133.52	1.37	H	13.23	31.30	74.00	-42.70
2369.69	37.21	Ave	133.52	1.37	H	12.25	24.96	54.00	-29.04
2496.19	44.73	PK	65.37	1.50	V	13.20	31.53	74.00	-42.47
2496.19	37.23	Ave	65.37	1.50	V	13.22	24.01	54.00	-29.99

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: Low Channel 2412MHz									
223.60	41.13	QP	232.40	1.44	H	11.09	30.04	46.00	-15.96
223.60	37.91	QP	341.85	1.93	V	11.58	26.33	46.00	-19.67
4824.00	49.99	PK	233.65	1.88	V	1.03	48.96	74.00	-25.04
4824.00	48.36	Ave	233.65	1.88	V	1.00	47.36	54.00	-6.64
7236.00	40.64	PK	236.71	1.67	H	1.33	41.97	74.00	-32.03
7236.00	40.77	Ave	236.71	1.67	H	1.33	42.10	54.00	-11.90
2320.32	45.85	PK	30.72	1.32	V	13.26	32.59	74.00	-41.41
2320.32	38.20	Ave	30.72	1.32	V	13.20	25.00	54.00	-29.00
2385.22	42.95	PK	110.82	1.17	H	13.23	29.72	74.00	-44.28
2385.22	38.96	Ave	110.82	1.17	H	12.25	26.71	54.00	-27.29
2493.64	44.10	PK	259.22	1.50	V	13.20	30.90	74.00	-43.10
2493.64	36.22	Ave	259.22	1.50	V	13.22	23.00	54.00	-31.00

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									
223.60	41.81	QP	108.66	1.36	H	11.09	30.72	46.00	-15.28
223.60	36.66	QP	355.29	1.19	V	11.58	25.08	46.00	-20.92
4874.00	49.69	PK	51.31	1.31	V	1.03	48.66	74.00	-25.34
4874.00	48.79	Ave	51.31	1.31	V	1.00	47.79	54.00	-6.21
7311.00	41.14	PK	114.67	1.04	H	2.21	43.35	74.00	-30.65
7311.00	41.03	Ave	114.67	1.04	H	2.21	43.24	54.00	-10.76
2341.28	46.51	PK	146.73	1.63	V	13.26	33.25	74.00	-40.75
2341.28	37.28	Ave	146.73	1.63	V	13.20	24.08	54.00	-29.92
2376.31	43.26	PK	147.68	1.08	H	13.23	30.03	74.00	-43.97
2376.31	37.18	Ave	147.68	1.08	H	12.25	24.93	54.00	-29.07
2487.85	43.69	PK	203.88	1.02	V	13.20	30.49	74.00	-43.51
2487.85	37.18	Ave	203.88	1.02	V	13.22	23.96	54.00	-30.04

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									
223.60	41.58	QP	3.34	1.18	H	11.09	30.49	46.00	-15.51
223.60	36.90	QP	104.04	1.22	V	11.58	25.32	46.00	-20.68
4924.00	49.66	PK	13.77	1.91	V	1.03	48.63	74.00	-25.37
4924.00	49.78	Ave	13.77	1.91	V	1.00	48.78	54.00	-5.22
7386.00	41.15	PK	172.35	1.29	H	2.84	43.99	74.00	-30.01
7386.00	42.33	Ave	172.35	1.29	H	2.84	45.17	54.00	-8.83
2343.13	46.58	PK	168.74	1.43	V	13.26	33.32	74.00	-40.68
2343.13	39.93	Ave	168.74	1.43	V	13.20	26.73	54.00	-27.27
2375.22	44.94	PK	289.90	1.53	H	13.23	31.71	74.00	-42.29
2375.22	38.46	Ave	289.90	1.53	H	12.25	26.21	54.00	-27.79
2490.75	43.88	PK	163.63	1.01	V	13.20	30.68	74.00	-43.32
2490.75	37.11	Ave	163.63	1.01	V	13.22	23.89	54.00	-30.11

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									
223.60	41.79	QP	266.76	1.50	H	11.09	30.70	46.00	-15.30
223.60	36.46	QP	352.46	1.31	V	11.58	24.88	46.00	-21.12
4844.00	47.11	PK	270.87	1.79	V	1.03	46.08	74.00	-27.92
4844.00	47.11	Ave	270.87	1.79	V	1.00	46.11	54.00	-7.89
7266.00	38.64	PK	28.13	1.55	H	1.33	39.97	74.00	-34.03
7266.00	40.97	Ave	28.13	1.55	H	1.33	42.30	54.00	-11.70
2338.64	45.90	PK	217.31	1.84	V	13.26	32.64	74.00	-41.36
2338.64	38.71	Ave	217.31	1.84	V	13.20	25.51	54.00	-28.49
2387.82	43.46	PK	252.60	1.66	H	13.23	30.23	74.00	-43.77
2387.82	36.24	Ave	252.60	1.66	H	12.25	23.99	54.00	-30.01
2484.93	42.41	PK	5.14	1.47	V	13.20	29.21	74.00	-44.79
2484.93	37.41	Ave	5.14	1.47	V	13.22	24.19	54.00	-29.81

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									
223.60	41.56	QP	10.19	1.11	H	11.09	30.47	46.00	-15.53
223.60	36.37	QP	43.93	1.79	V	11.58	24.79	46.00	-21.21
4874.00	47.80	PK	127.93	1.25	V	1.03	46.77	74.00	-27.23
4874.00	46.32	Ave	127.93	1.25	V	1.00	45.32	54.00	-8.68
7311.00	38.79	PK	213.17	1.65	H	2.21	41.00	74.00	-33.00
7311.00	41.24	Ave	213.17	1.65	H	2.21	43.45	54.00	-10.55
2339.22	46.55	PK	56.31	1.56	V	13.26	33.29	74.00	-40.71
2339.22	39.63	Ave	56.31	1.56	V	13.20	26.43	54.00	-27.57
2389.83	43.89	PK	155.14	1.52	H	13.23	30.66	74.00	-43.34
2389.83	38.44	Ave	155.14	1.52	H	12.25	26.19	54.00	-27.81
2487.21	43.27	PK	142.36	1.84	V	13.20	30.07	74.00	-43.93
2487.21	37.32	Ave	142.36	1.84	V	13.22	24.10	54.00	-29.90

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									
223.60	41.41	QP	197.15	1.25	H	11.09	30.32	46.00	-15.68
223.60	35.98	QP	19.51	1.95	V	11.58	24.40	46.00	-21.60
4904.00	47.39	PK	4.74	1.47	V	1.03	46.36	74.00	-27.64
4904.00	46.86	Ave	4.74	1.47	V	1.00	45.86	54.00	-8.14
7356.00	37.95	PK	35.50	1.50	H	2.84	40.79	74.00	-33.21
7356.00	41.31	Ave	35.50	1.50	H	2.84	44.15	54.00	-9.85
2334.21	46.55	PK	4.74	1.39	V	13.26	33.29	74.00	-40.71
2334.21	37.56	Ave	4.74	1.39	V	13.20	24.36	54.00	-29.64
2367.85	42.96	PK	201.41	1.23	H	13.23	29.73	74.00	-44.27
2367.85	37.35	Ave	201.41	1.23	H	12.25	25.10	54.00	-28.90
2499.00	44.56	PK	104.42	1.03	V	13.20	31.36	74.00	-42.64
2499.00	38.65	Ave	104.42	1.03	V	13.22	25.43	54.00	-28.57

Test Frequency: 18GHz~25GHz

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

9 Band Edge Measurement

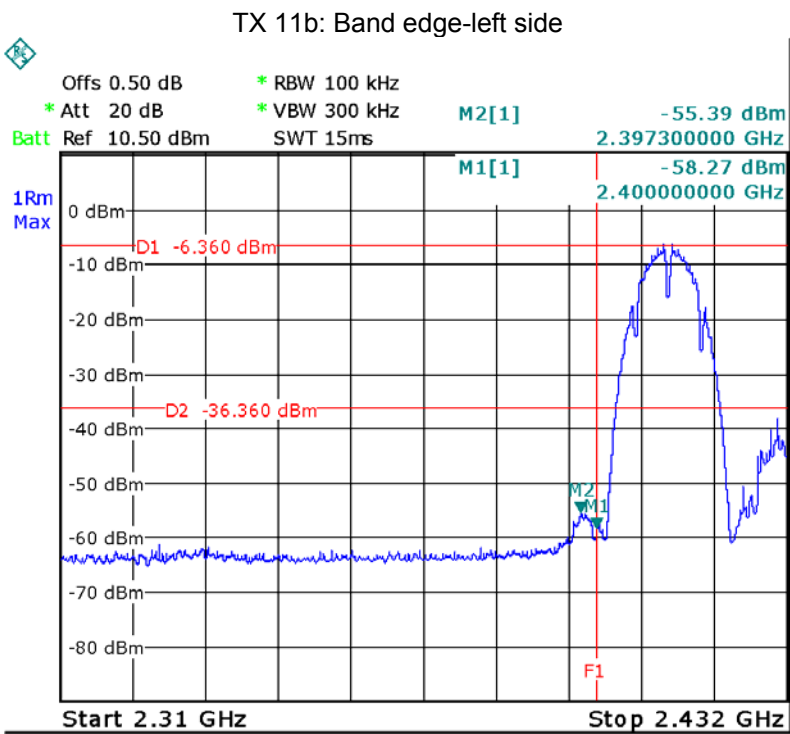
Test Requirement:	FCC CFR47 Part 15 Section 15.247
Test Method:	558074 D01 DTS Meas Guidance V04
Test Limit:	Regulation 15.247 (d), In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that 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

9.1 Test Produce

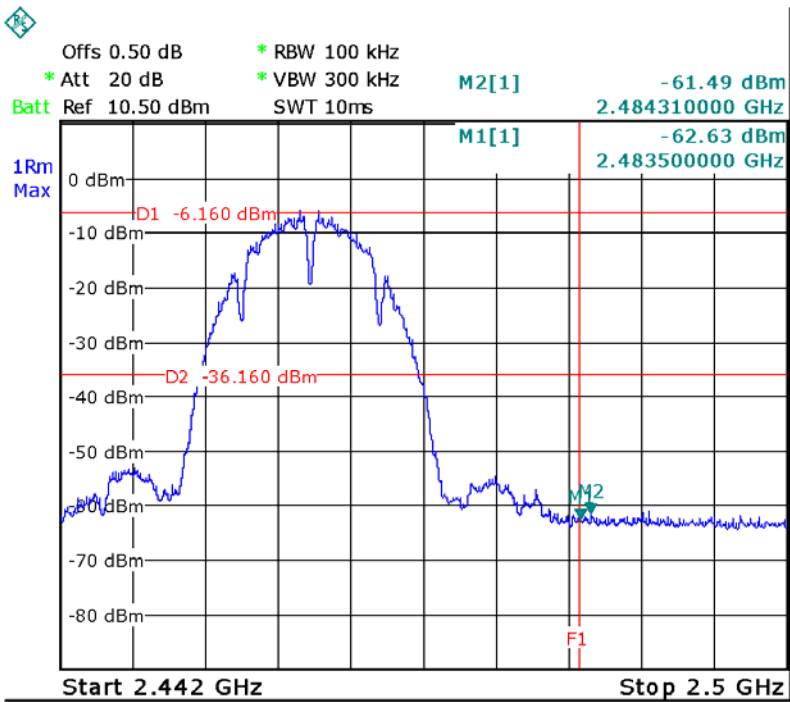
1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then 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.

9.2 Test Result

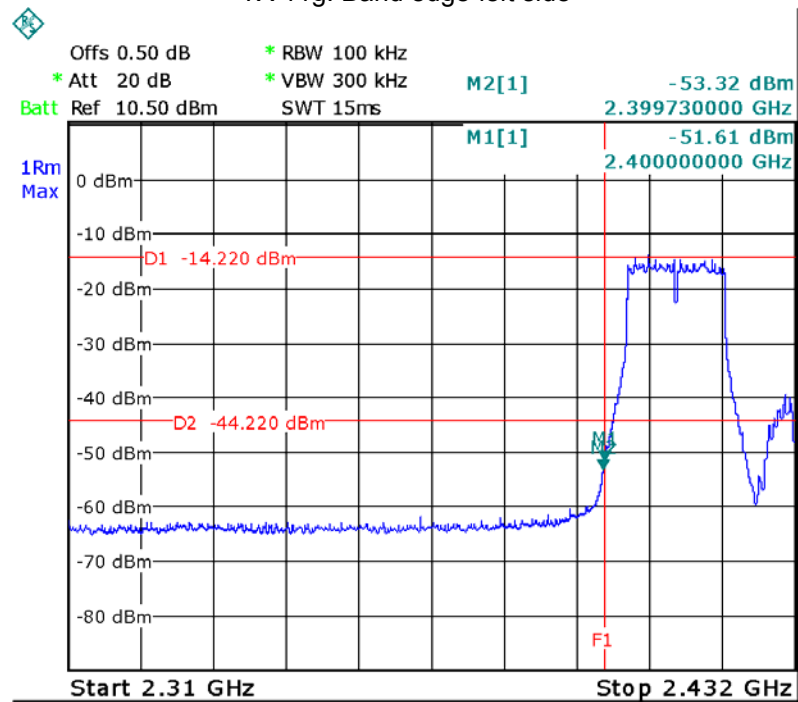
Test result plots shown as follows:



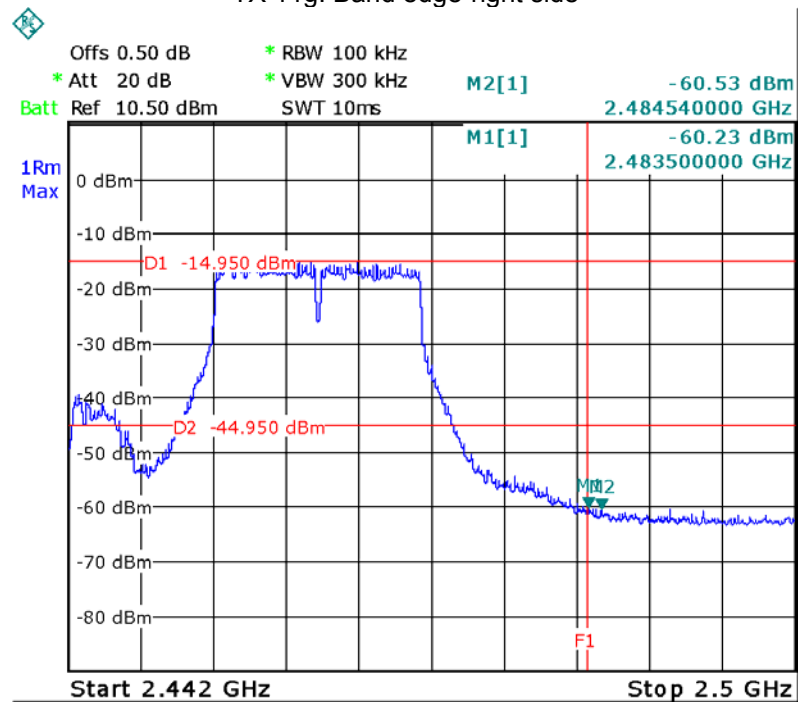
TX 11b: Band edge-right side

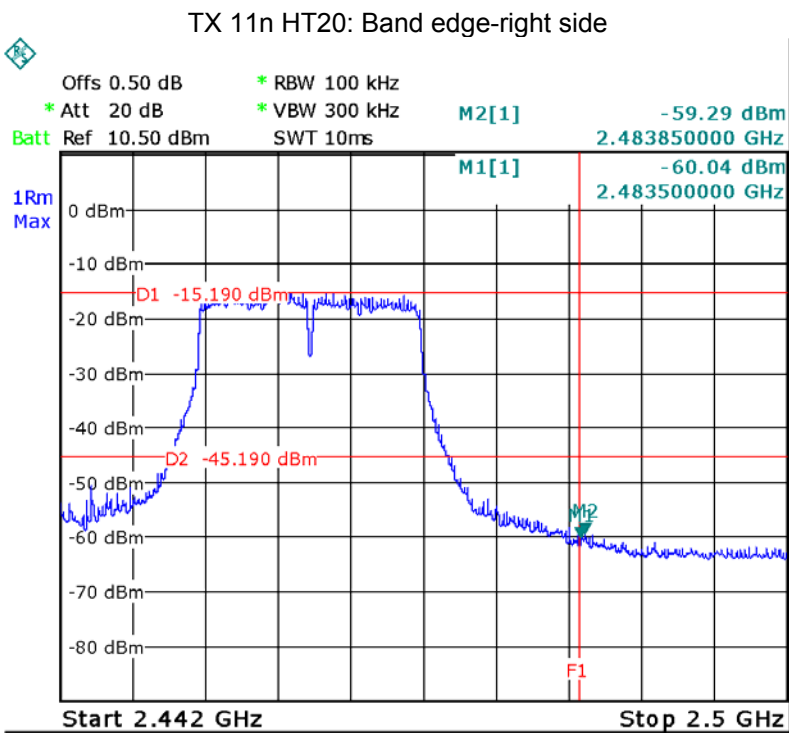
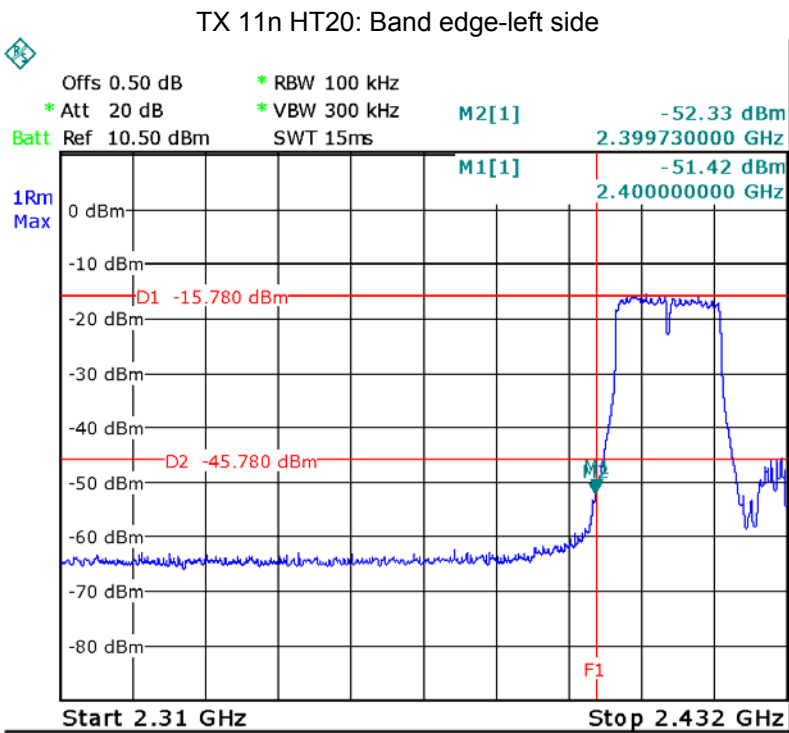


TX 11g: Band edge-left side

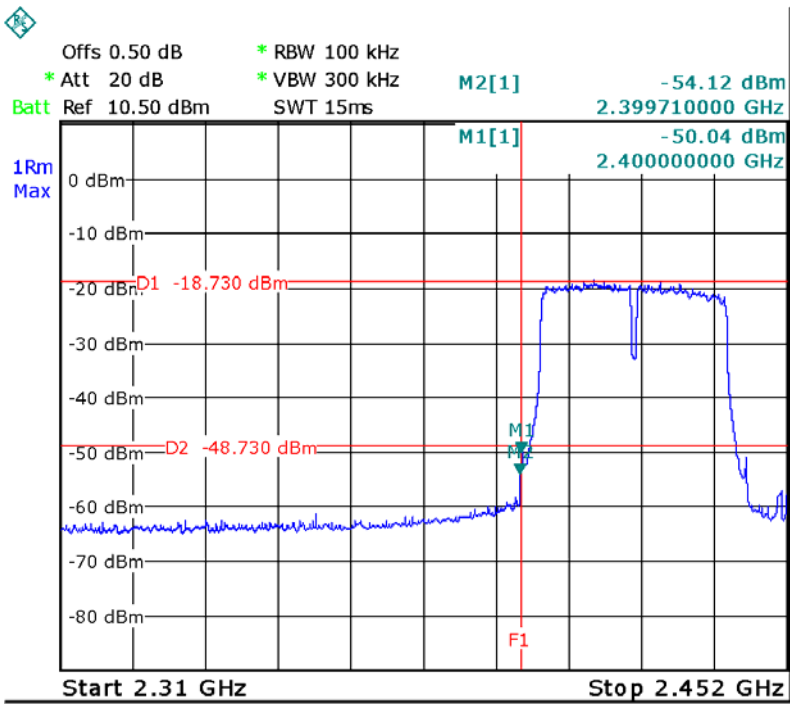


TX 11g: Band edge-right side

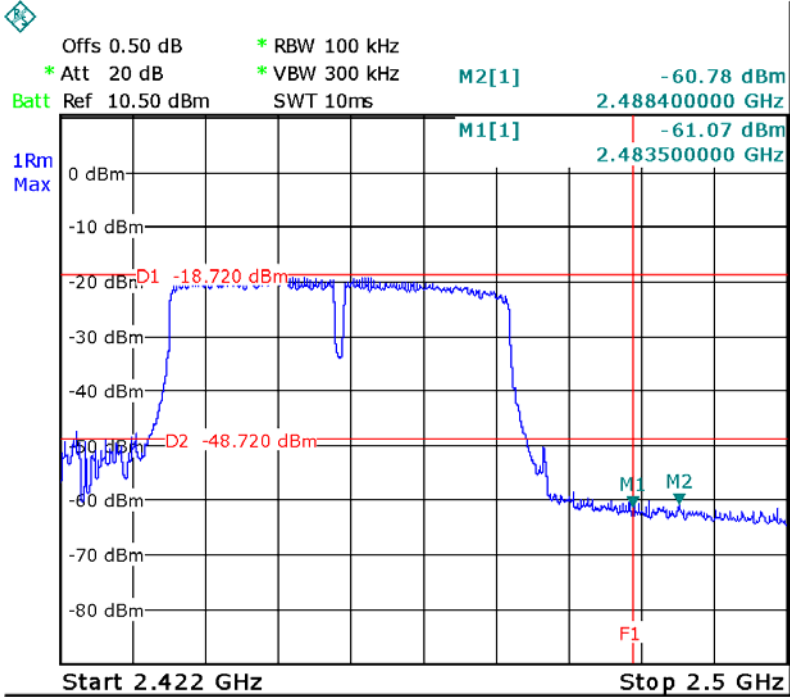




TX 11n HT40: Band edge-left side



TX 11n HT40: Band edge-right side



10 Bandwidth Measurement

Test Requirement:

FCC CFR47 Part 15 Section 15.247

Test Method:

558074 D01 DTS Meas Guidance V04

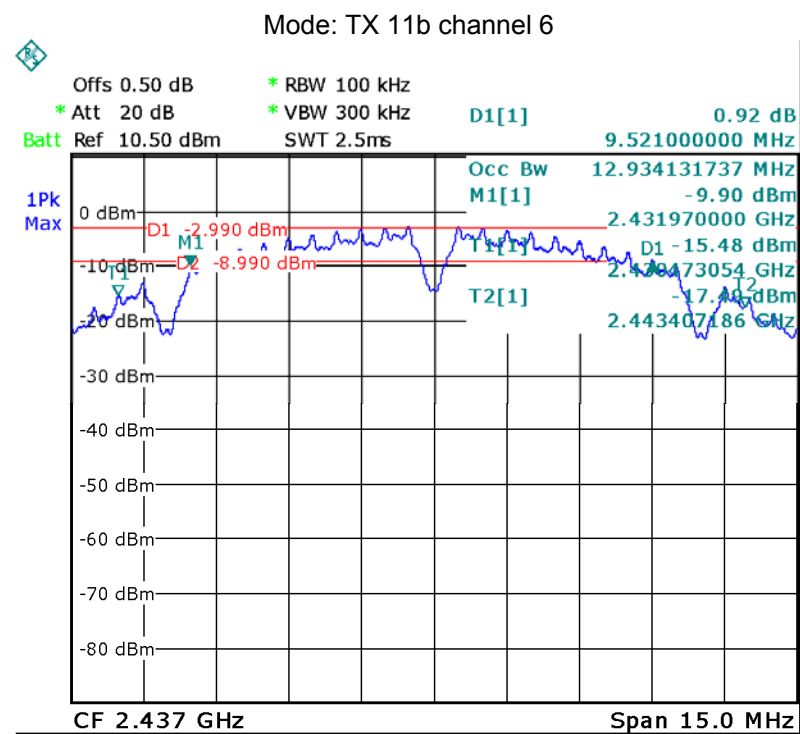
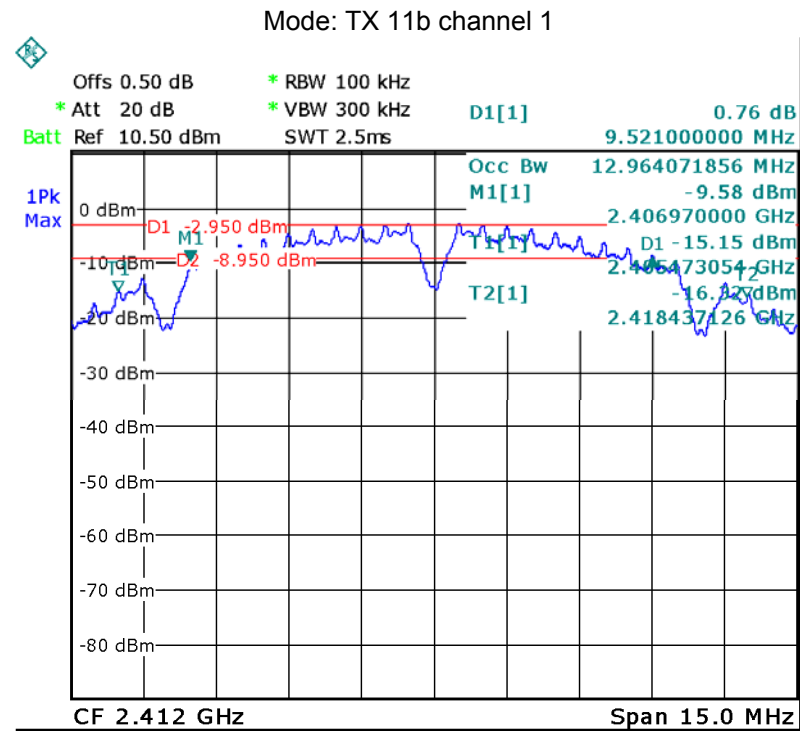
10.1 Test Procedure:

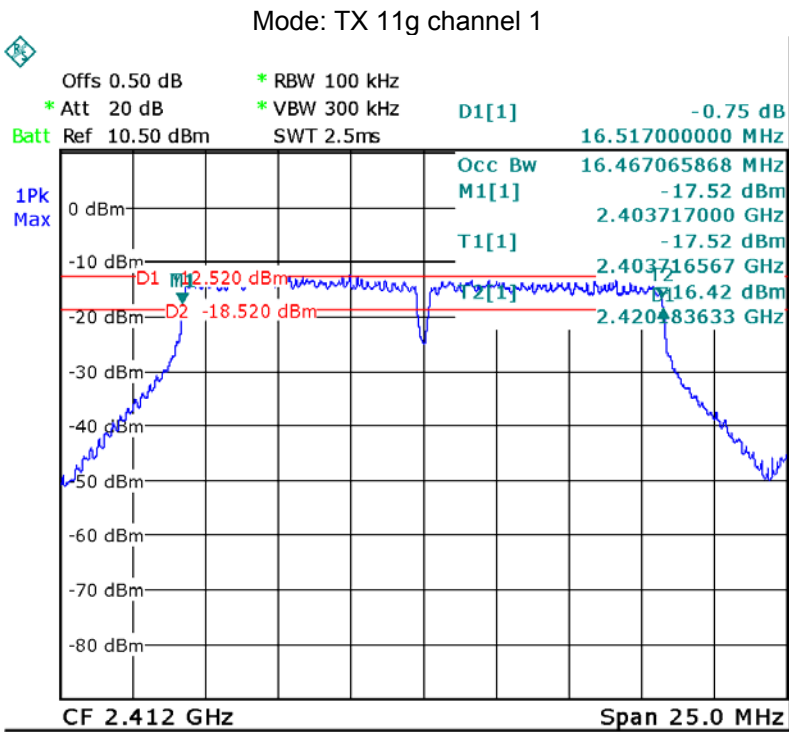
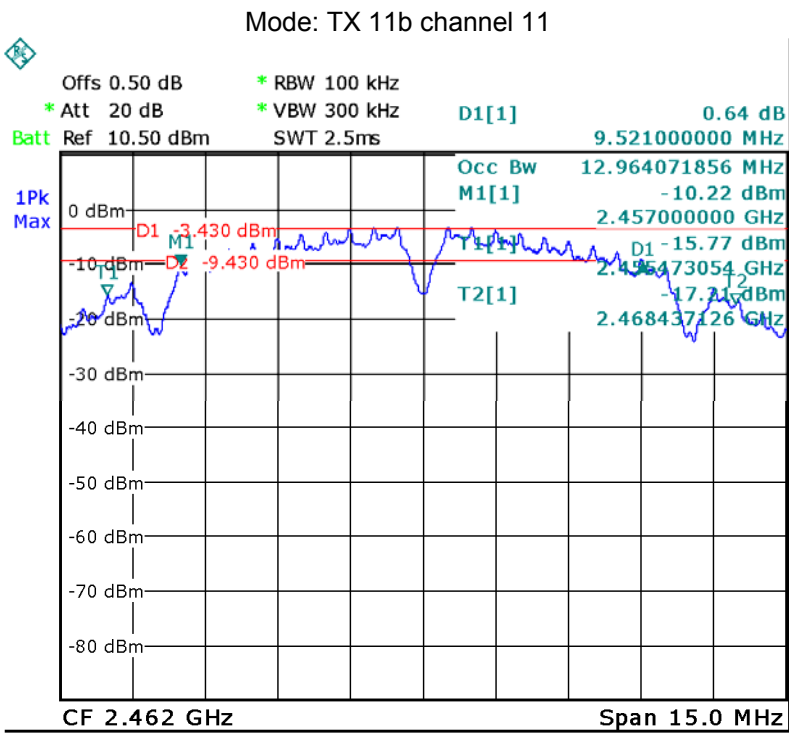
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 100kHz, VBW = 300kHz

10.2 Test Result:

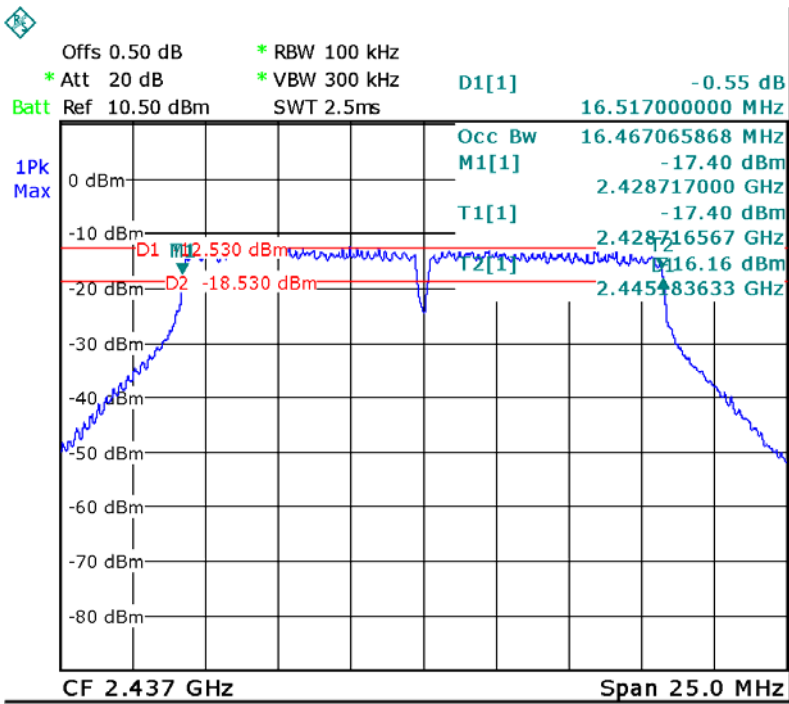
Operation mode	6dB Bandwidth (MHz)			99% Bandwidth (MHz)		
TX 11b	Channel 1	Channel 6	Channel 11	Channel 1	Channel 6	Channel 11
	9.521	9.521	9.521	12.964	12.934	12.964
TX 11g	Channel 1	Channel 6	Channel 11	Channel 1	Channel 6	Channel 11
	16.517	16.517	16.517	16.467	16.467	16.467
TX 11n HT20	Channel 1	Channel 6	Channel 11	Channel 1	Channel 6	Channel 11
	17.731	17.731	17.731	17.623	17.623	17.677
TX 11n HT40	Channel 3	Channel 6	Channel 9	Channel 3	Channel 6	Channel 9
	36.450	36.450	36.450	36.008	36.007	36.007

Test result plot as follows:

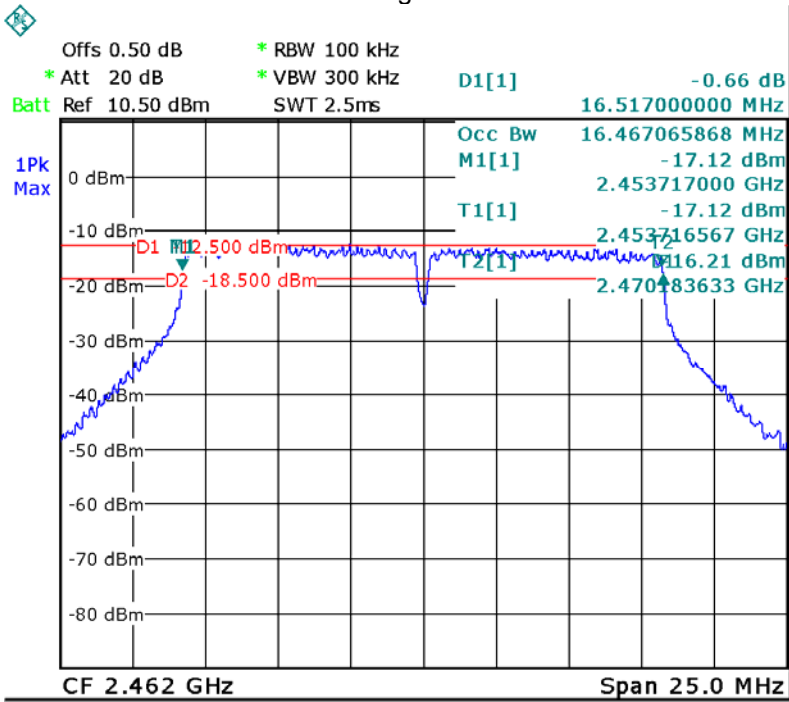




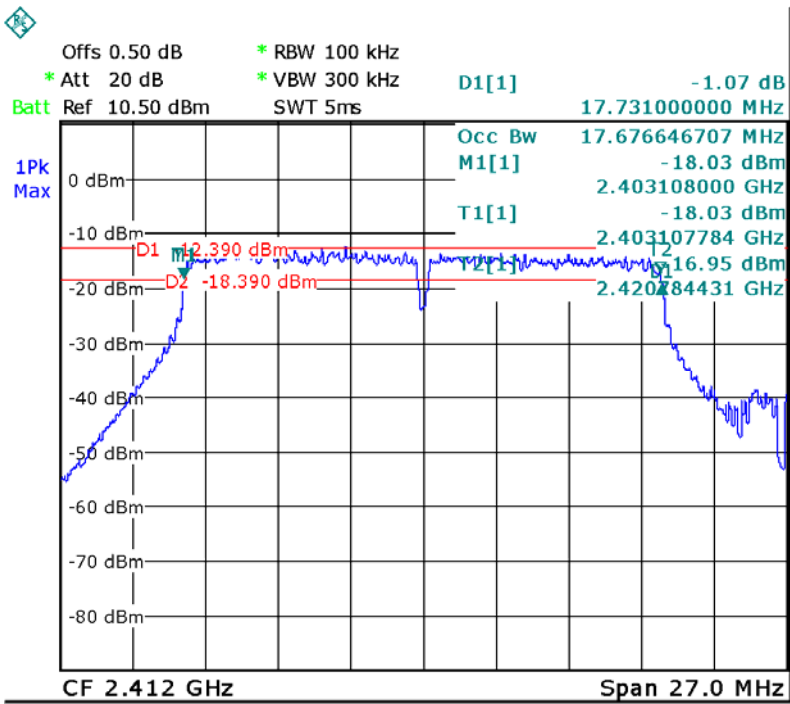
Mode: TX 11g channel 6



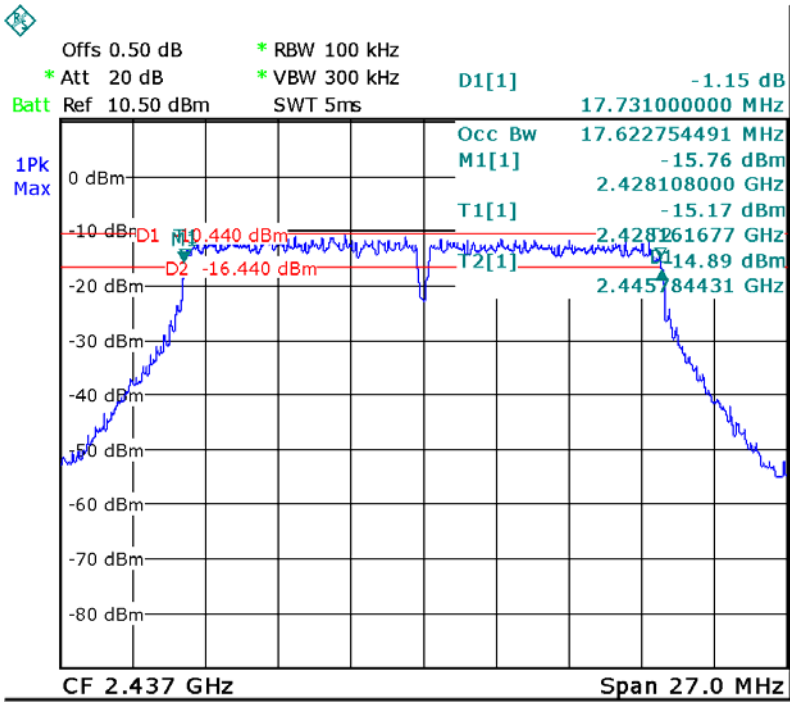
Mode: TX 11g channel 11



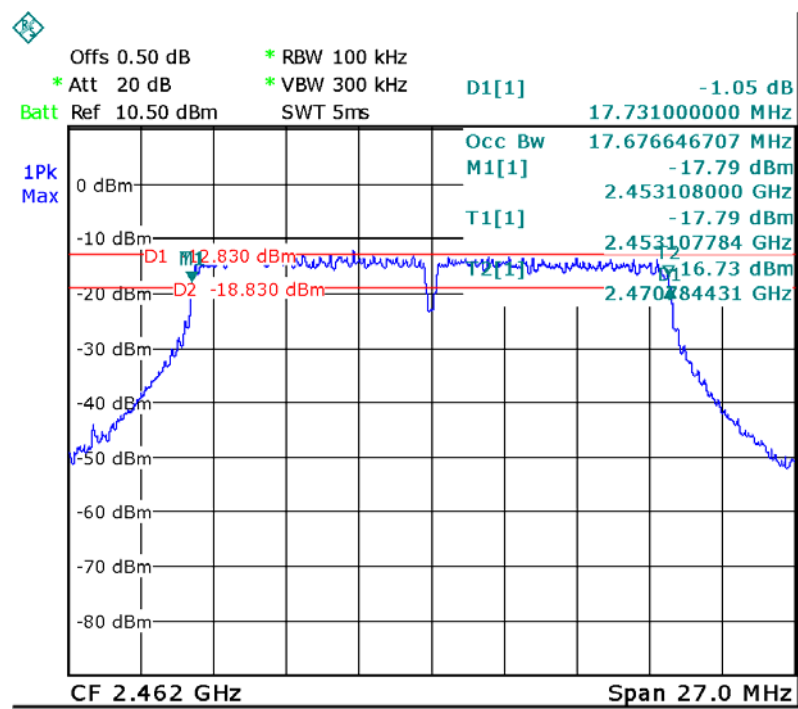
Mode: TX 11n HT20 channel 1



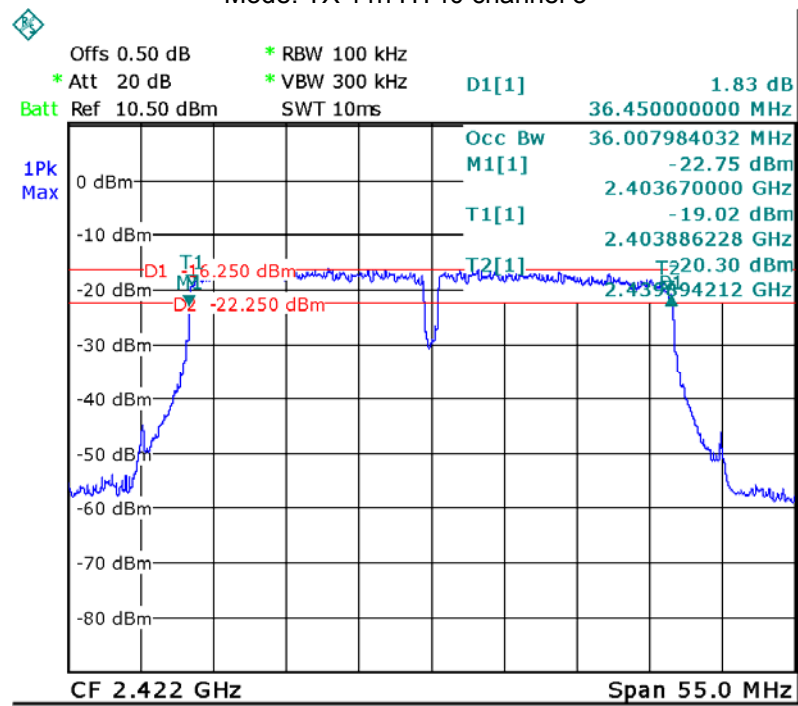
Mode: TX 11n HT20 channel 6



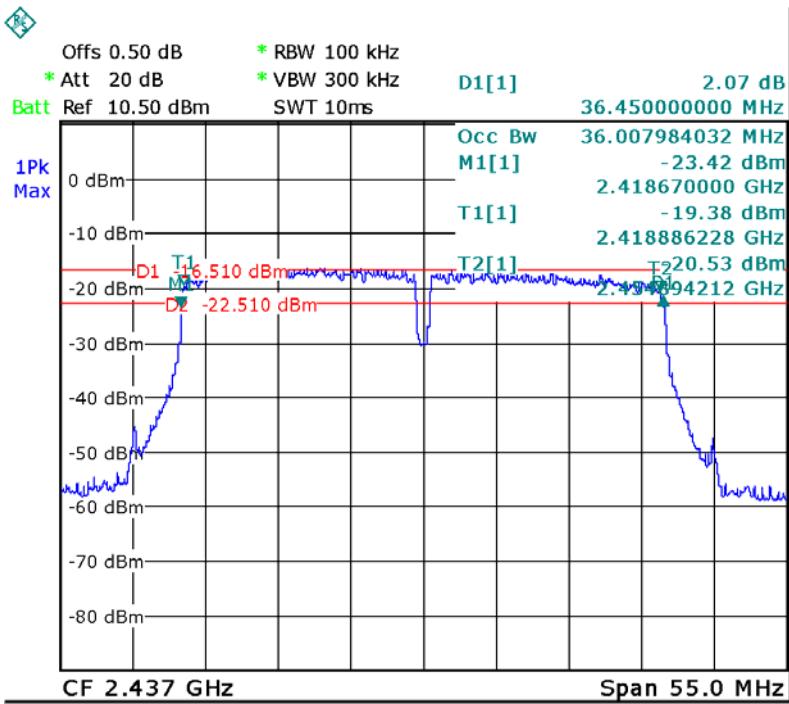
Mode: TX 11n HT20 channel 11



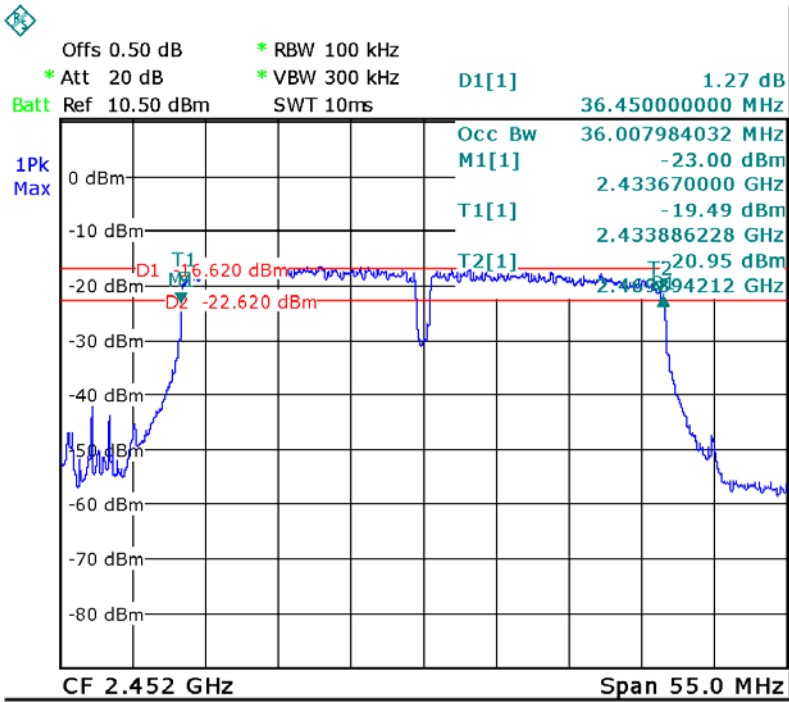
Mode: TX 11n HT40 channel 3



Mode: TX 11n HT40 channel 6



Mode: TX 11n HT40 channel 9



11 Maximum Peak Output Power

Test Requirement:

FCC CFR47 Part 15 Section 15.247

Test Method:

558074 D01 DTS Meas Guidance V04

11.1 Test Procedure:

558074 D01 DTS Meas Guidance V04

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 = 1 MHz. VBW = 3 MHz. Sweep = auto; Detector Function = Peak, Set the span to fully encompass the DTS bandwidth.
3. Keep the EUT in transmitting at lowest, medium and highest channel individually. Record the max value.

11.2 Test Result:

Test mode :TX 11b		
Maximum Peak Output Power (dBm)		
2412MHz	2437MHz	2462MHz
9.60	9.45	9.10
Limit: 1W/30dBm		

Test mode :TX 11g		
Maximum Peak Output Power (dBm)		
2412MHz	2437MHz	2462MHz
9.60	9.37	9.38
Limit: 1W/30dBm		

Test mode :TX 11n HT20		
Maximum Peak Output Power (dBm)		
2412MHz	2437MHz	2462MHz
9.25	9.42	9.13
Limit: 1W/30dBm		

Test mode : TX 11n HT40		
Maximum Peak Output Power (dBm)		
2422MHz	2437MHz	2452MHz
9.31	9.07	8.98
Limit: 1W/30dBm		

12 Power Spectral density

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: 558074 D01 DTS Meas Guidance V04

12.1 Test Procedure:

558074 D01 DTS Meas Guidance V04

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.

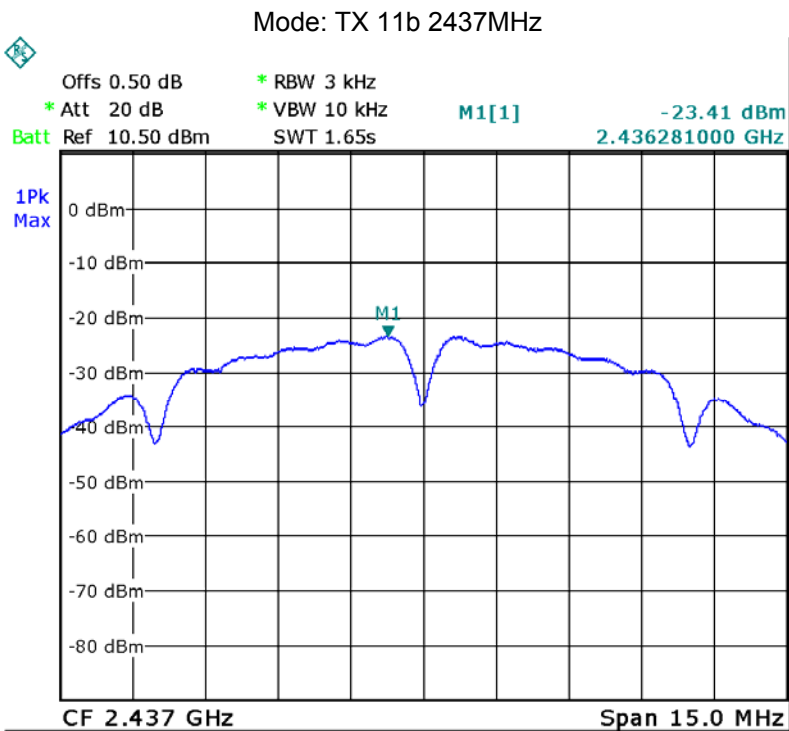
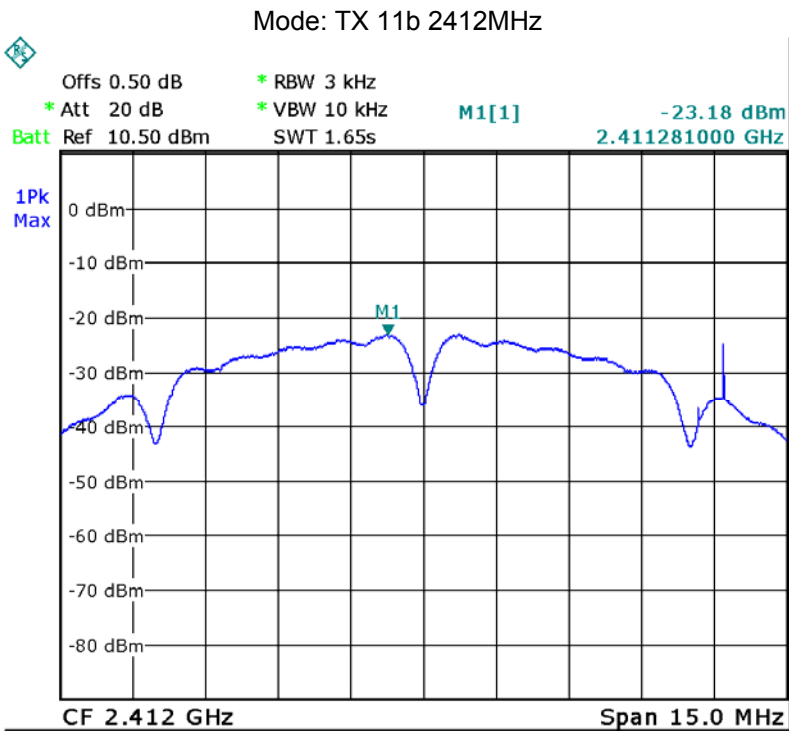
12.2 Test Result:

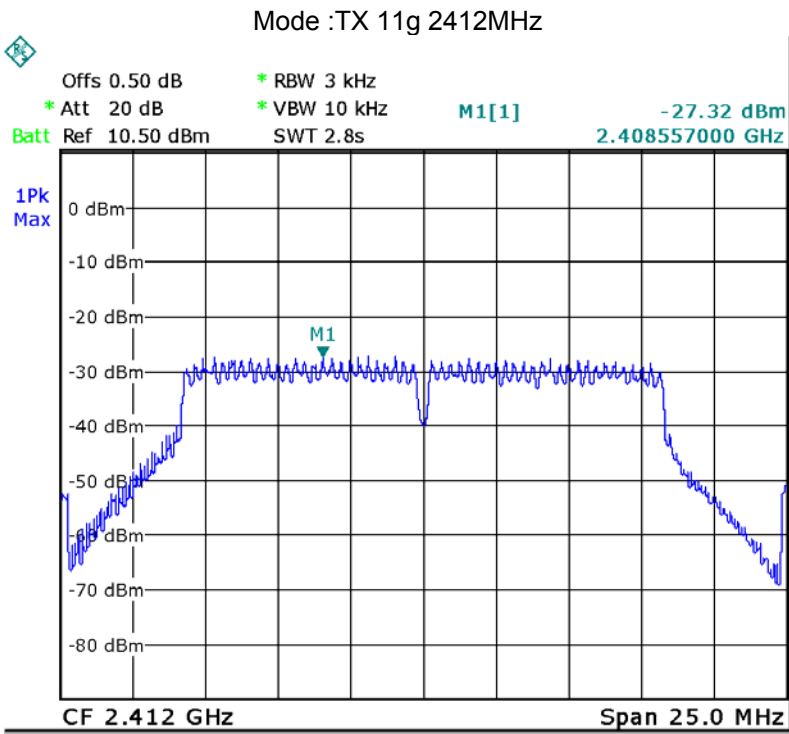
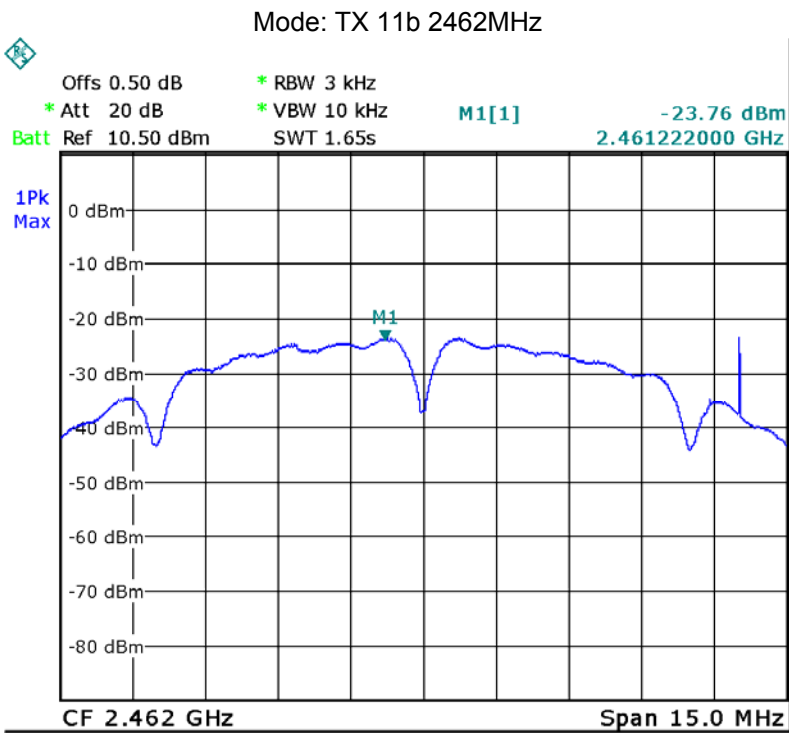
Test mode :TX 11b		
Power Spectral (dBm per 3kHz)		
2412MHz	2437MHz	2462MHz
-23.18	-23.41	-23.76
Limit: 8dBm per 3kHz		

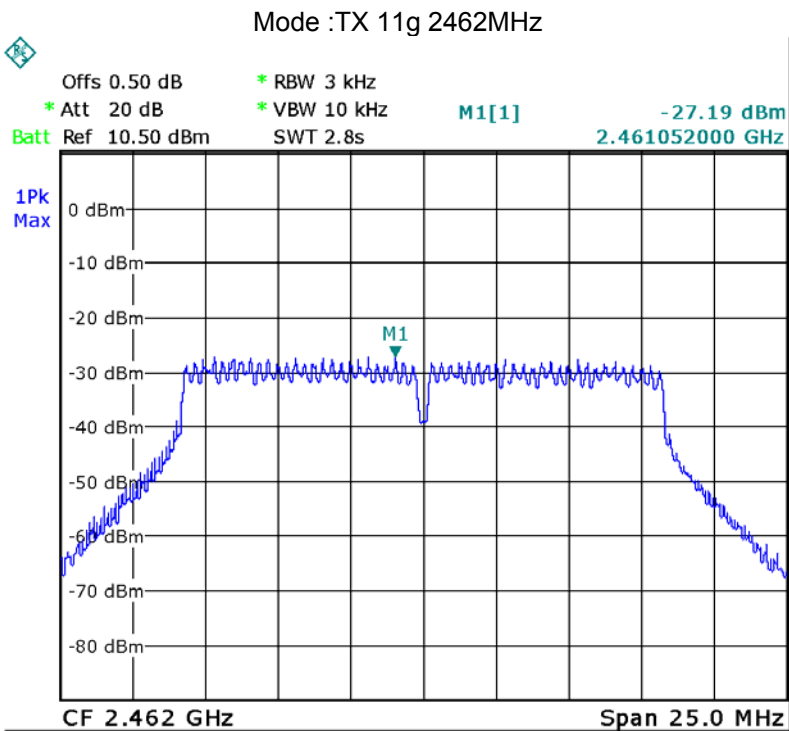
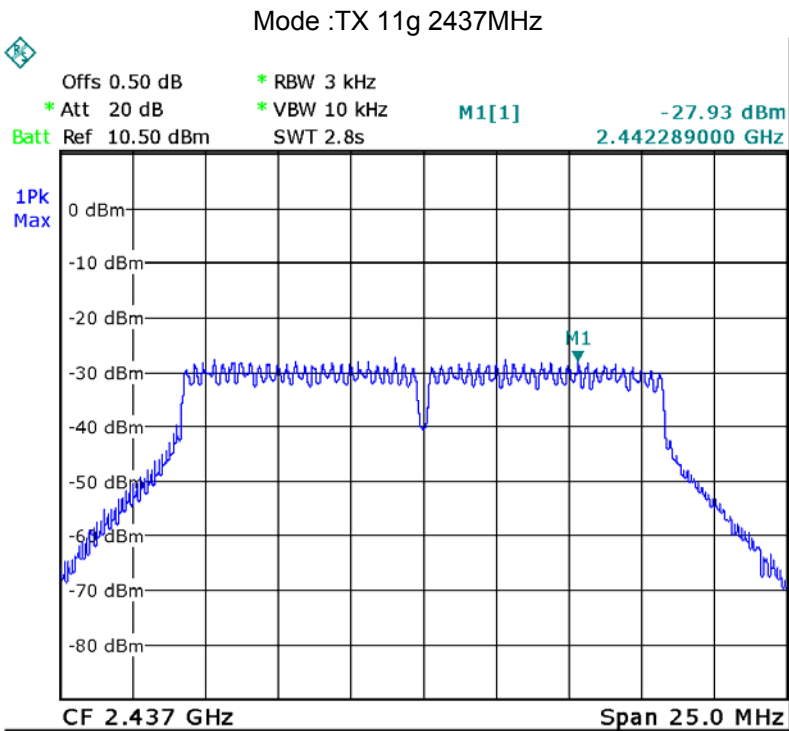
Test mode :TX 11g		
Power Spectral (dBm per 3kHz)		
2412MHz	2437MHz	2462MHz
-27.32	-27.93	-27.19
Limit: 8dBm per 3kHz		

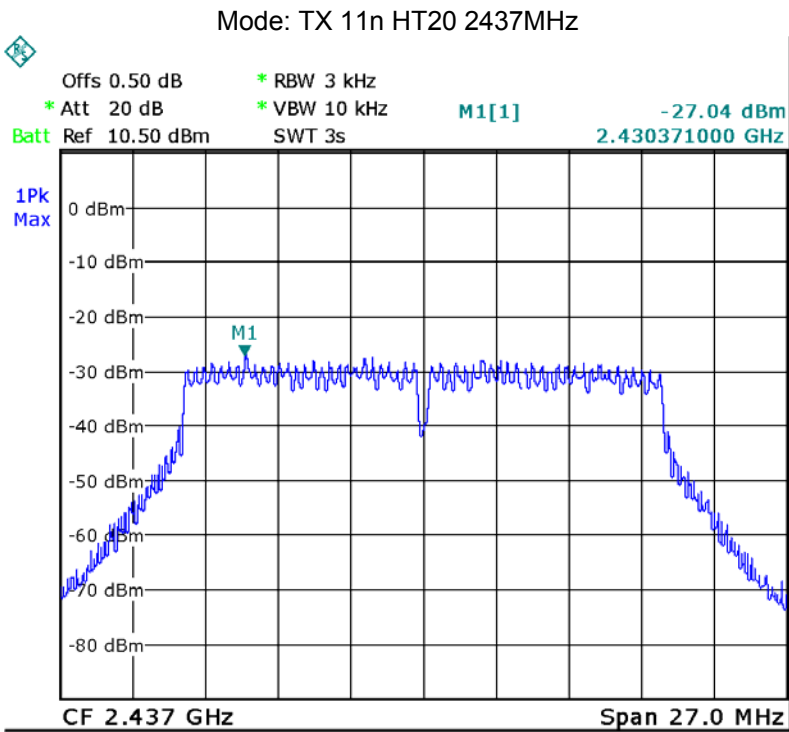
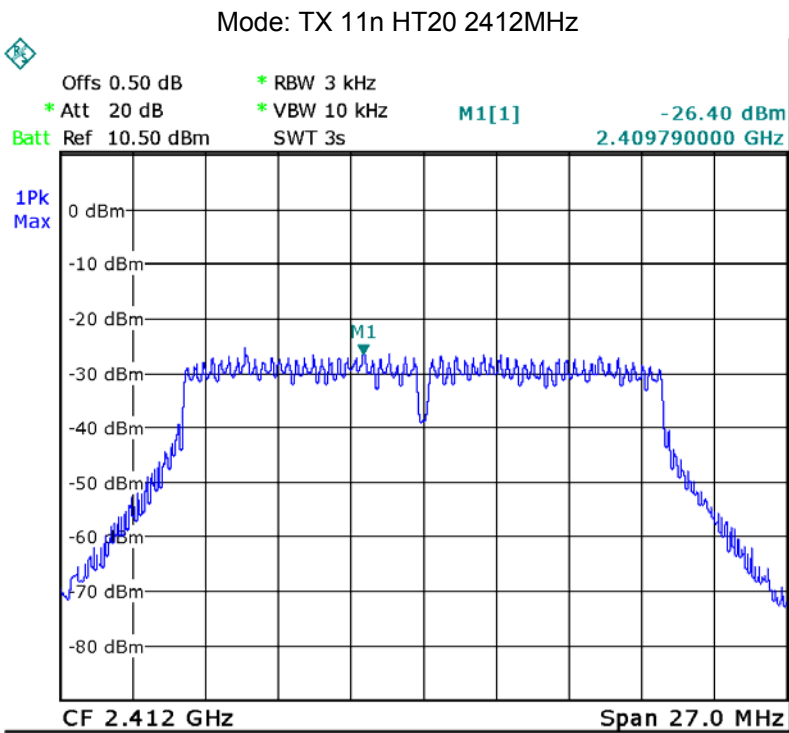
Test mode :TX 11n HT20		
Power Spectral (dBm per 3kHz)		
2412MHz	2437MHz	2462MHz
-26.40	-27.04	-26.17
Limit: 8dBm per 3kHz		

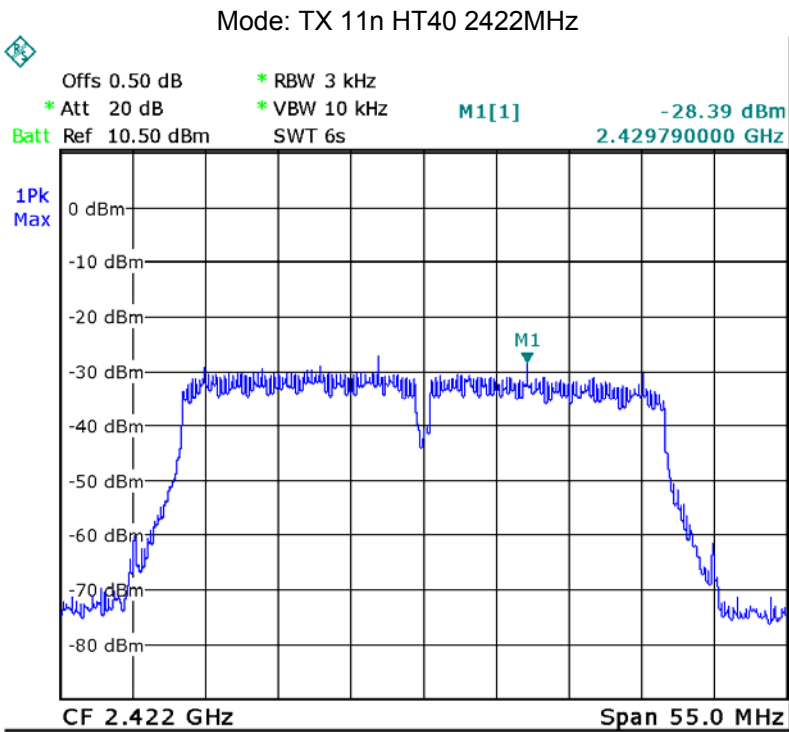
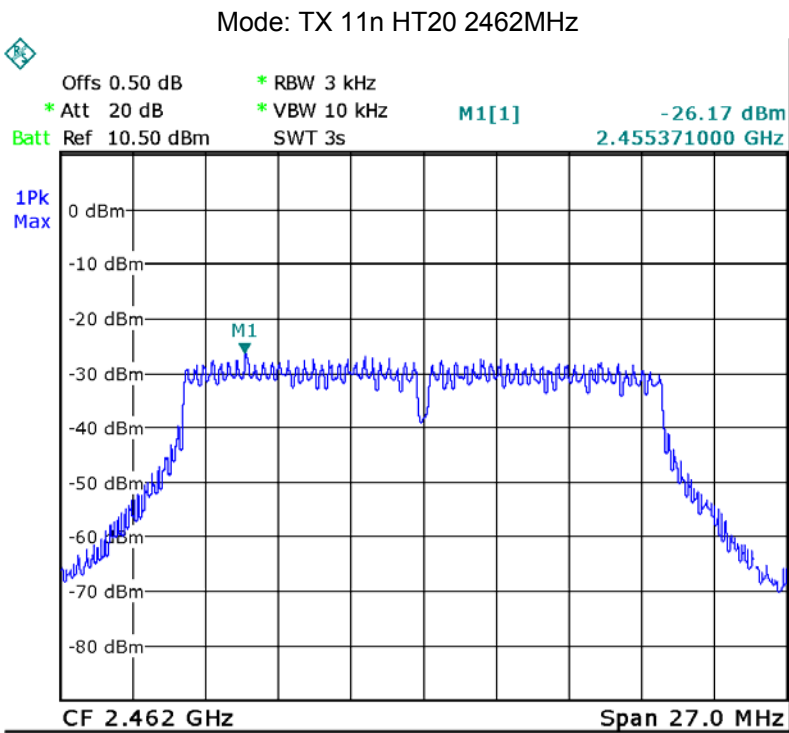
Test mode : TX 11n HT40		
Power Spectral (dBm per 3kHz)		
2422MHz	2437MHz	2452MHz
-28.39	-28.91	-28.36
Limit: 8dBm per 3kHz		

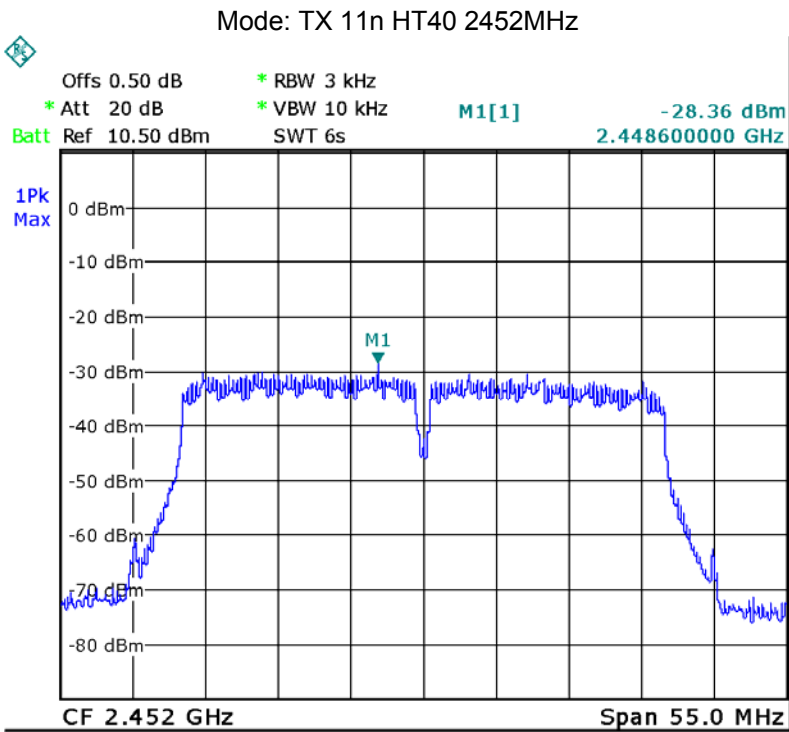
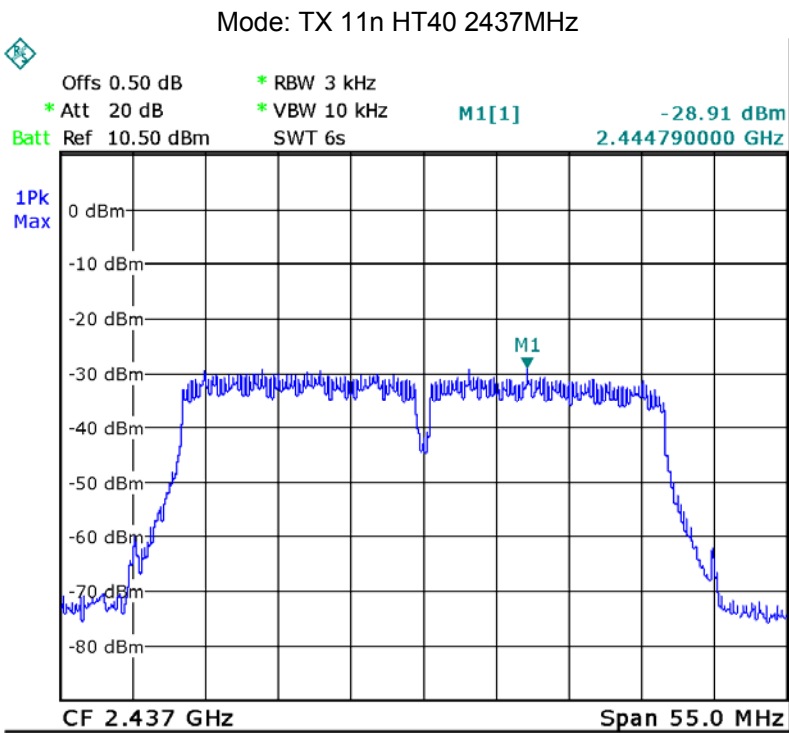












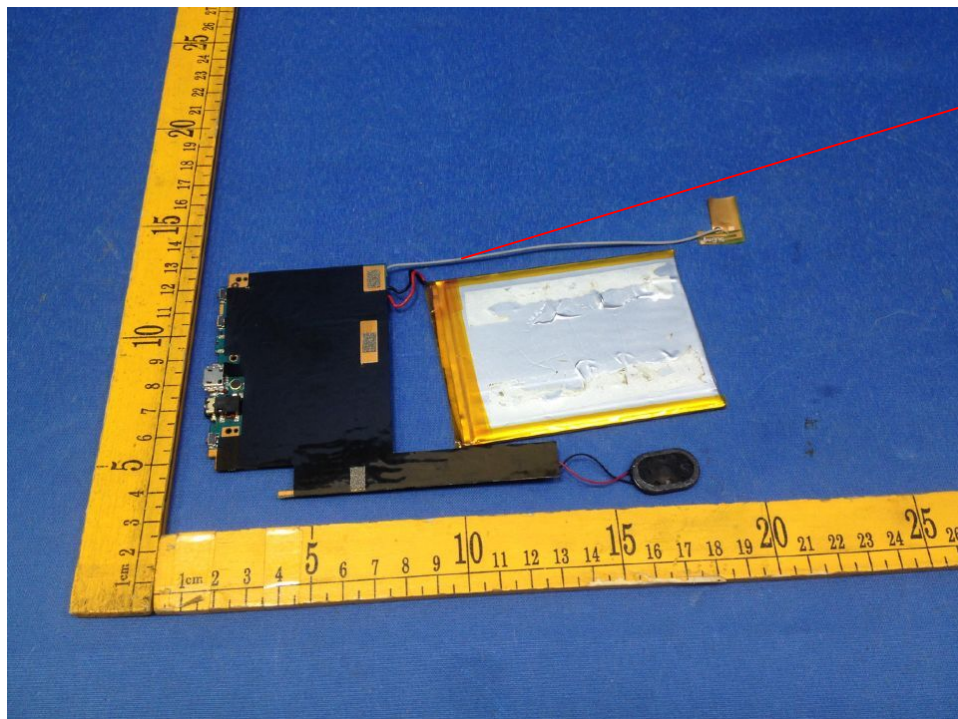
13 Antenna Requirement

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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

For intentional device, according to FCC 47 CFR Section 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.

Result:

The EUT has one Integrated Antenna, the gain is 0dBi. meets the requirements of FCC 15.203.



14 SAR Evaluation

Test Requirement: FCC Part 1.1307

Evaluation Method: FCC Part 2.1093 & KDB 447498 D01 General RF Exposure Guidance v06

14.1 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:

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

1. $f(\text{GHz})$ 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.

14.2 Test result

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)	Result
9.60	9.12	9.12	5	10	Compliance
Note: No SAR measurement is required.					

Remark: Max. duty factor is 100%

Calculation formula: Source-based time-averaged maximum conducted output power (mW)

=Conducted peak power (mW)*Duty factor

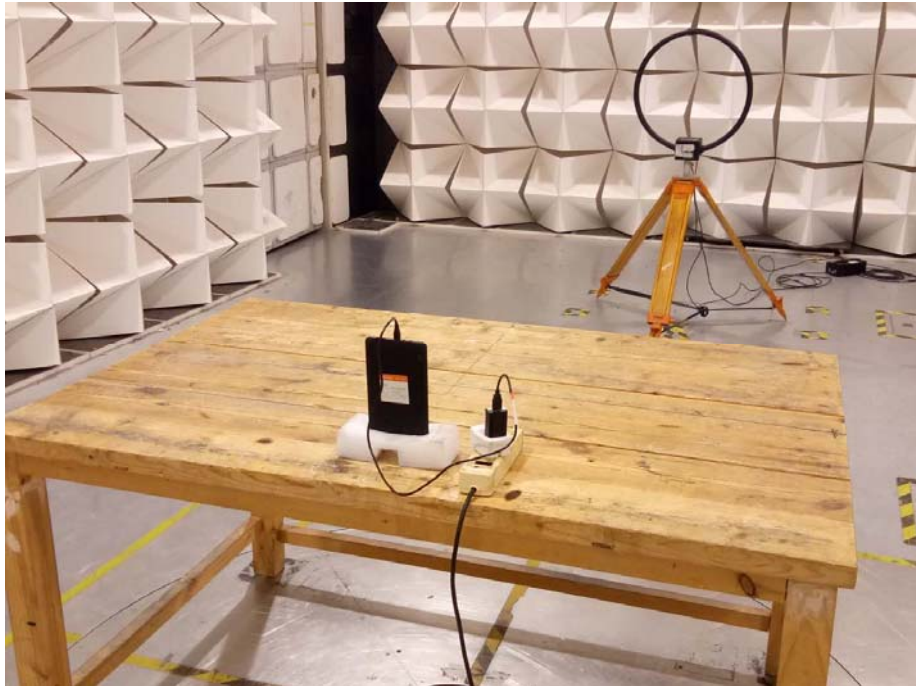
For frequency in 2.402GHz: SAR Test Exclusion Thresholds $\leq 3.0 / [\sqrt{f(\text{GHz})}] \cdot (\text{min. test separation distance, mm}) = 3.0 / (\sqrt{2.402}) \cdot 5 = 9.679 \text{ mW} \approx 10 \text{ mW}$

For frequency in 2.480GHz: SAR Test Exclusion Thresholds $\leq 3.0 / [\sqrt{f(\text{GHz})}] \cdot (\text{min. test separation distance, mm}) = 3.0 / (\sqrt{2.480}) \cdot 5 = 9.525 \text{ mW} \approx 10 \text{ mW}$

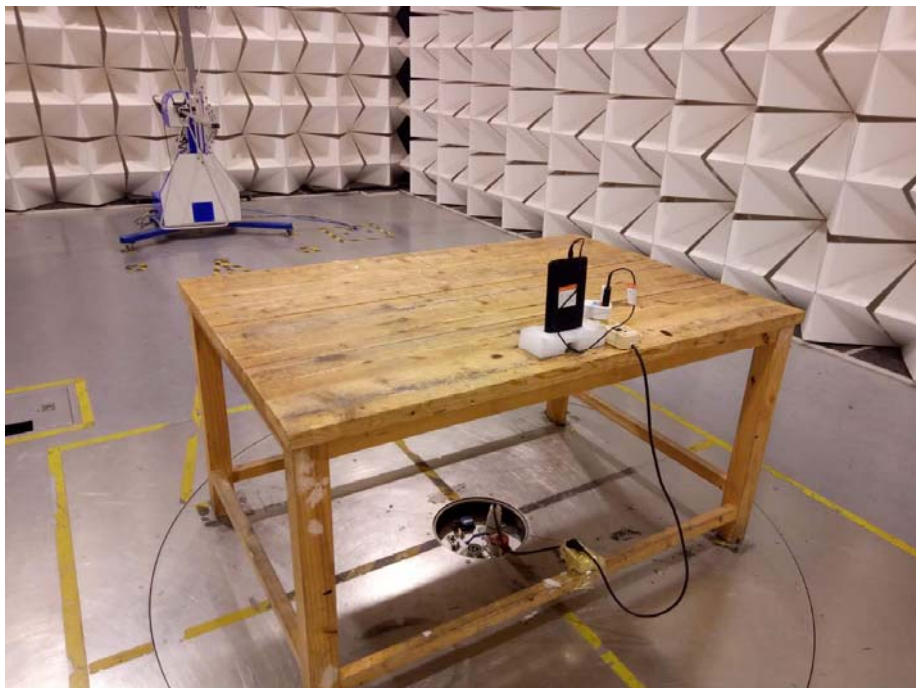
15 Photographs – Model HT0702W08 Test Setup Photos

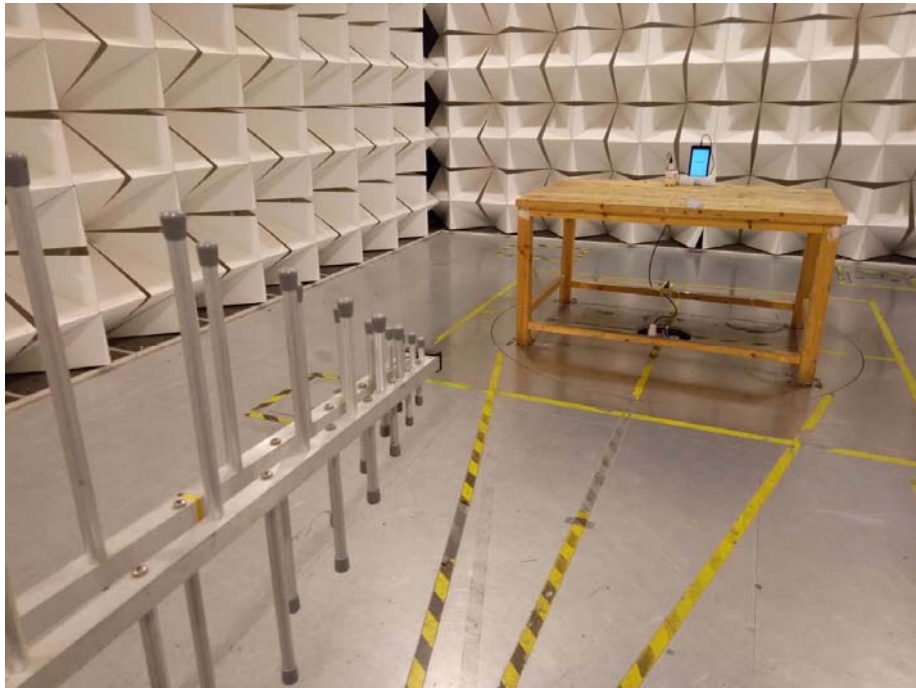
15.1 Radiated Emission

Test frequency 32.768kHz to 30MHz



Test frequency from 30MHz to 1GHz





Test frequency above 1GHz



15.2 Conducted Emission



16 Photographs - Constructional Details

Refer to Annex WTN17S0681739E-Photo.

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