TEST REPORT

Reference No......	:	WTS15S1035642E
FCC ID.....	:	2AGDA-0000
Applicant.....	:	XING CONNECTED CORP
Address.....	:	Rm-505, Bldg-C, Sanlian Ind Park, Shiyan, Baoan, Shenzhen, Guangdong, China
Manufacturer	:	The same as above
Address.....	:	The same as above
Product Name.....	:	Smart Wi-Fi Thermostat
Model No.....	:	TJ-610B, TJ-610
Brand……	:	Vine, XING
Standards.....	:	FCC CFR47 Part 15 C Section 15.247:2015
Date of Receipt sample.....	:	Oct. 21, 2015
Date of Test.....	:	Oct. 22, 2015 – Aug. 05, 2016
Date of Issue.....	:	Aug. 06, 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.

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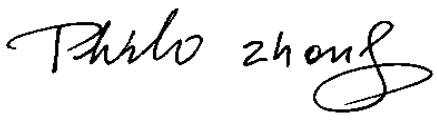
Approved by:



Philo Zhong / Manager

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3 Revision History

Test report No.	Date of Receipt sample	Date of Test	Date of Issue	Purpose	Comment	Approved
WTS15S1035642E	Oct. 21, 2015	Oct. 22, 2015 – Aug. 05, 2016	Aug. 06, 2016	original	-	Valid

4 General Information

4.1 General Description of E.U.T.

Product Name:	: Smart Wi-Fi Thermostat
Model No.:	: TJ-610B, TJ-610
Model Difference:	: Both models are same in all respects and there are only different for product appearance color, model name.
Operation Frequency:	: 2412MHz ~ 2462MHz
The Lowest Oscillator:	:32.768 KHz
Antenna Gain:	:3.0dBi
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: AC 20-28V

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
Band Edge	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-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, 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.

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.15,2015	Sep.14,2016
2.	LISN	R&S	ENV216	101215	Sep.15,2015	Sep.14,2016
3.	Cable	Top	TYPE16(3.5M)	-	Sep.15,2015	Sep.14,2016
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.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 Emissions Test site 1#						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1	EMC Analyzer	Agilent	E7405A	MY45114943	Sep.15,2015	Sep.14,2016
2	Active Loop Antenna	Beijing Dazhi	ZN30900A	-	Sep.15,2015	Sep.14,2016
3	Trilog Broadband Antenna	SCHWARZBECK	VULB9163	336	Sep.15,2015	Sep.14,2016
4	Coaxial Cable (below 1GHz)	Top	TYPE16(13M)	-	Sep.15,2015	Sep.14,2016
5	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	667	Sep.15,2015	Sep.14,2016
6	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9170	335	Sep.15,2015	Sep.14,2016
7	Broadband Preamplifier	COMPLIANCE DIRECTION	PAP-1G18	2004	Sep.15,2015	Sep.14,2016
8	Coaxial Cable (above 1GHz)	Top	1GHz-25GHz	EW02014-7	Sep.15,2015	Sep.14,2016
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	Sep.15,2015	Sep.14,2016
2	Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3325	Sep.15,2015	Sep.14,2016
3	Amplifier	Compliance pirection systems inc	PAP-0203	22024	Sep.15,2015	Sep.14,2016
4	Cable	HUBER+SUHNER	CBL2	525178	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	Sep.15,2015	Sep.14,2016
2.	Spectrum Analyzer (9k-6GHz)	R&S	FSL6	100959	Sep.15,2015	Sep.14,2016
3.	Signal Analyzer (9k~26.5GHz)	Agilent	N9010A	MY50520207	Sep.15,2015	Sep.14,2016

5.2 Description of Support Units

Equipment	Manufacturer	Model No.
AC Adapter	SADESTRON	AC 24V

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 Test Summary

Test Items	Test Requirement	Result
Radiated Emissions	15.247 15.205(a) 15.209(a)	C
Conducted Emissions	15.207(a)	C
6dB 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 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)

7.1 E.U.T. Operation

Operating Environment **:**

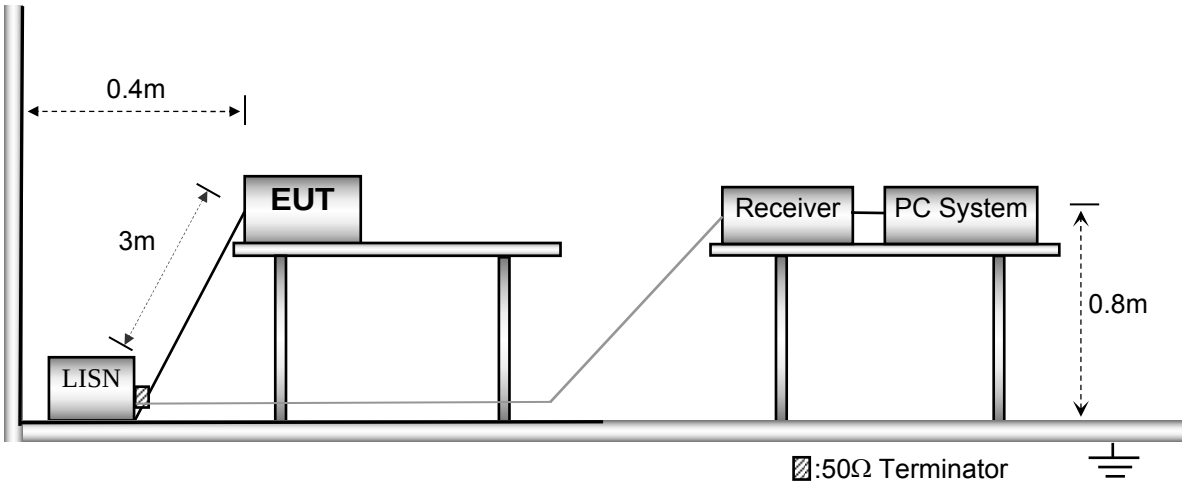
Temperature:	21.5 °C
Humidity:	51.9 % RH
Atmospheric Pressure:	101.2kPa

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 C63.10:2013.



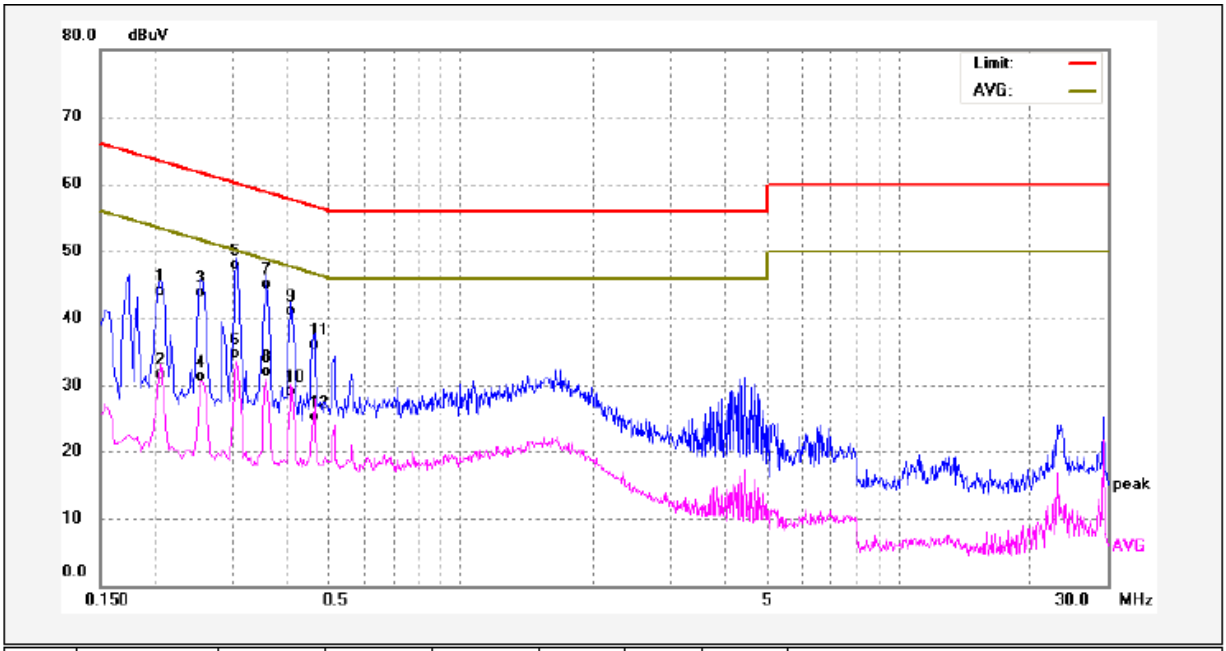
7.3 Measurement Description

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

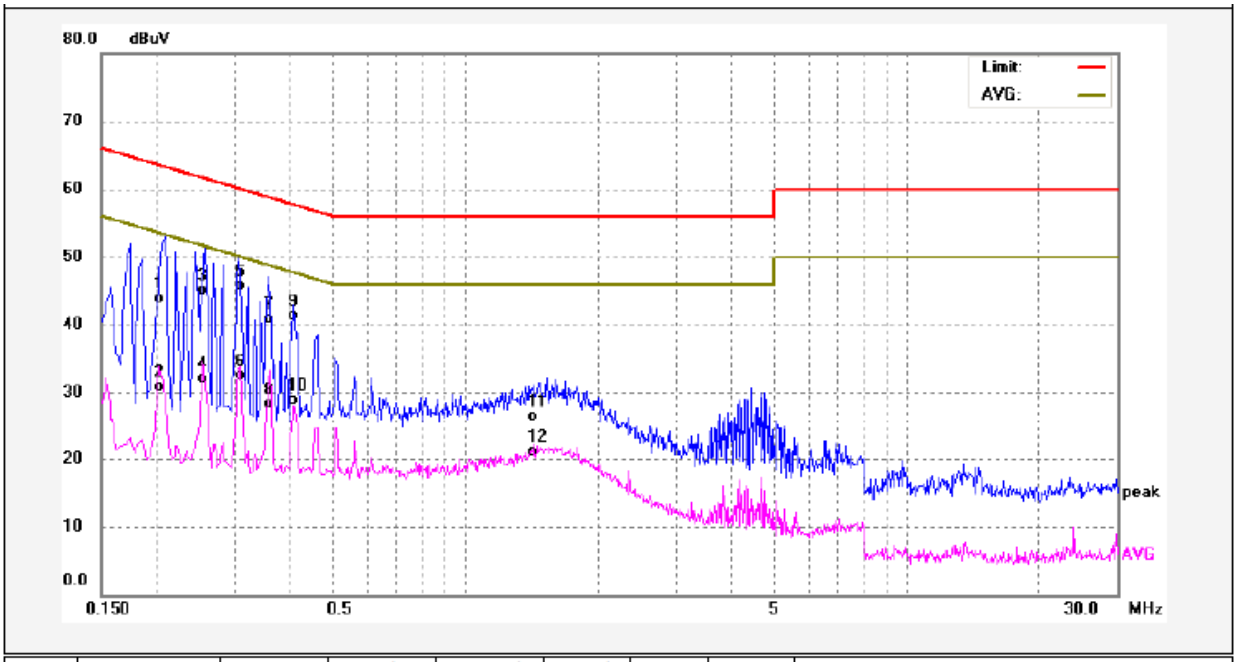
An initial pre-scan was performed on the live and neutral lines.

Live line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.2060	33.78	10.26	44.04	63.36	-19.32	QP	
2	0.2060	21.45	10.26	31.71	53.36	-21.65	AVG	
3	0.2540	33.57	10.26	43.83	61.62	-17.79	QP	
4	0.2540	21.14	10.26	31.40	51.62	-20.22	AVG	
5	0.3060	37.70	10.28	47.98	60.08	-12.10	QP	
6	0.3060	24.52	10.28	34.80	50.08	-15.28	AVG	
7	0.3580	34.85	10.29	45.14	58.77	-13.63	QP	
8	0.3580	21.74	10.29	32.03	48.77	-16.74	AVG	
9	0.4100	30.82	10.27	41.09	57.65	-16.56	QP	
10	0.4100	18.75	10.27	29.02	47.65	-18.63	AVG	
11	0.4620	25.76	10.26	36.02	56.66	-20.64	QP	
12	0.4620	14.99	10.26	25.25	46.66	-21.41	AVG	

Neutral line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.2020	33.68	10.26	43.94	63.52	-19.58	QP	
2	0.2020	20.71	10.26	30.97	53.52	-22.55	AVG	
3	0.2540	34.82	10.26	45.08	61.62	-16.54	QP	
4	0.2540	21.85	10.26	32.11	51.62	-19.51	AVG	
5	0.3100	35.46	10.28	45.74	59.97	-14.23	QP	
6	0.3100	22.29	10.28	32.57	49.97	-17.40	AVG	
7	0.3620	30.67	10.28	40.95	58.68	-17.73	QP	
8	0.3620	17.98	10.28	28.26	48.68	-20.42	AVG	
9	0.4100	31.07	10.27	41.34	57.65	-16.31	QP	
10	0.4100	18.63	10.27	28.90	47.65	-18.75	AVG	
11	1.4260	16.07	10.42	26.49	56.00	-29.51	QP	
12	1.4260	10.69	10.42	21.11	46.00	-24.89	AVG	

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(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	$20\log^{(500)}$

8.1 EUT Operation

Operating Environment **:**

Temperature: 23.5 °C

Humidity: 52.1 % RH

Atmospheric Pressure: 101.2kPa

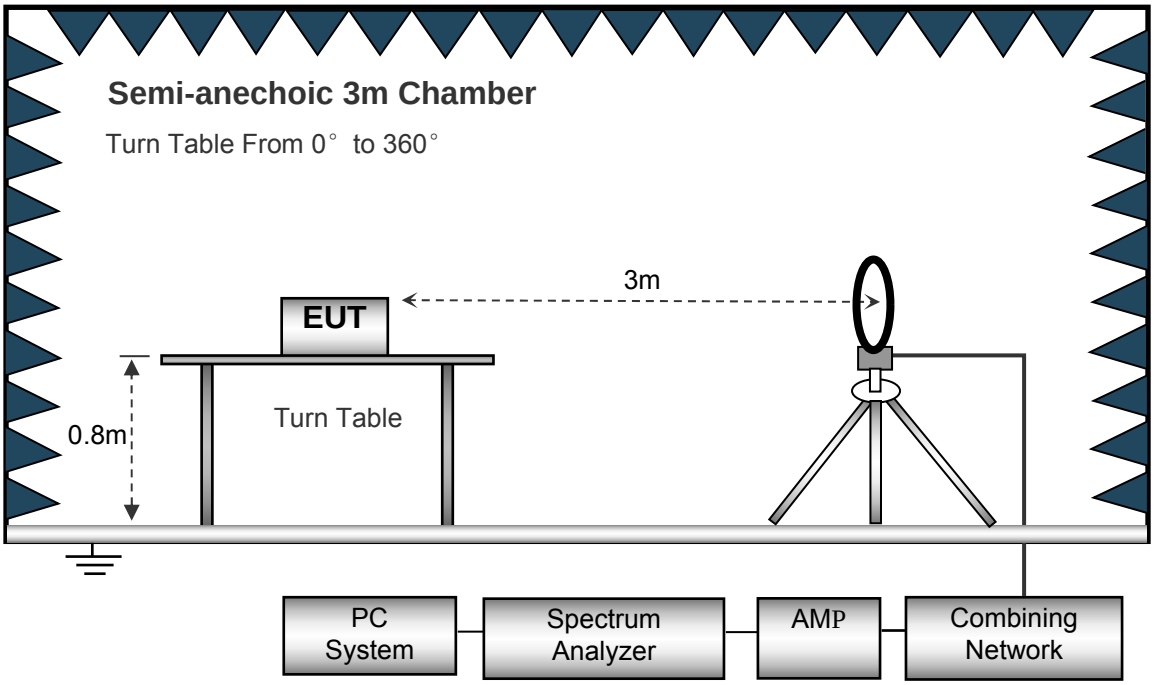
EUT Operation **:**

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

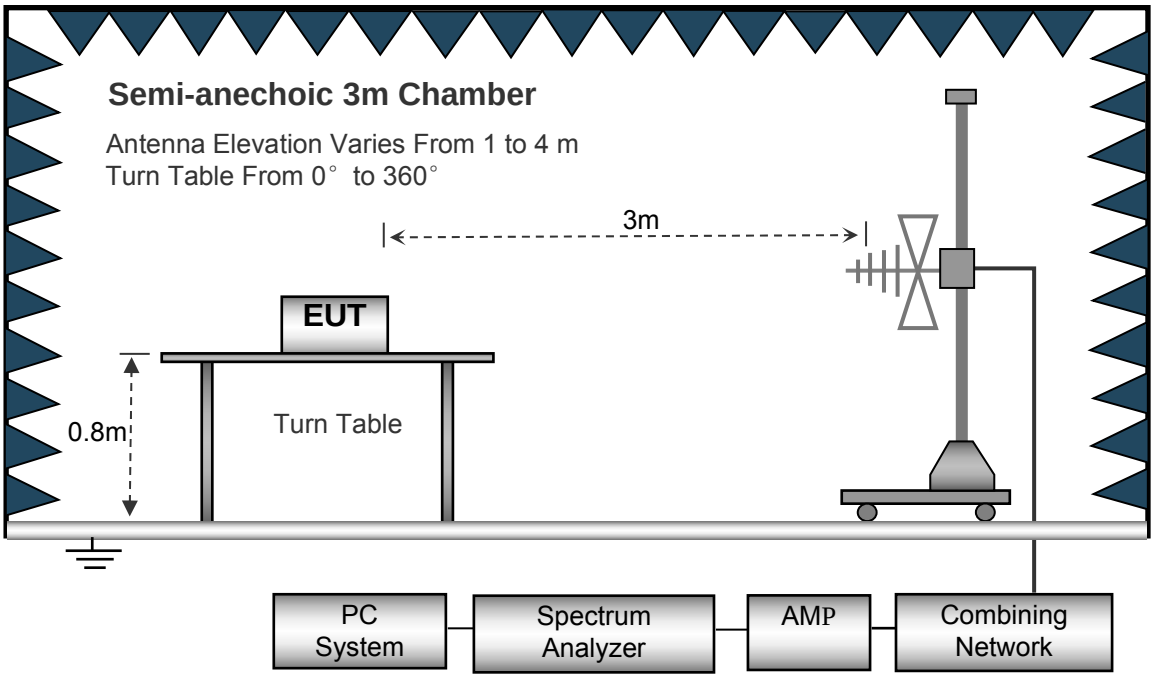
8.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.10: 2013.

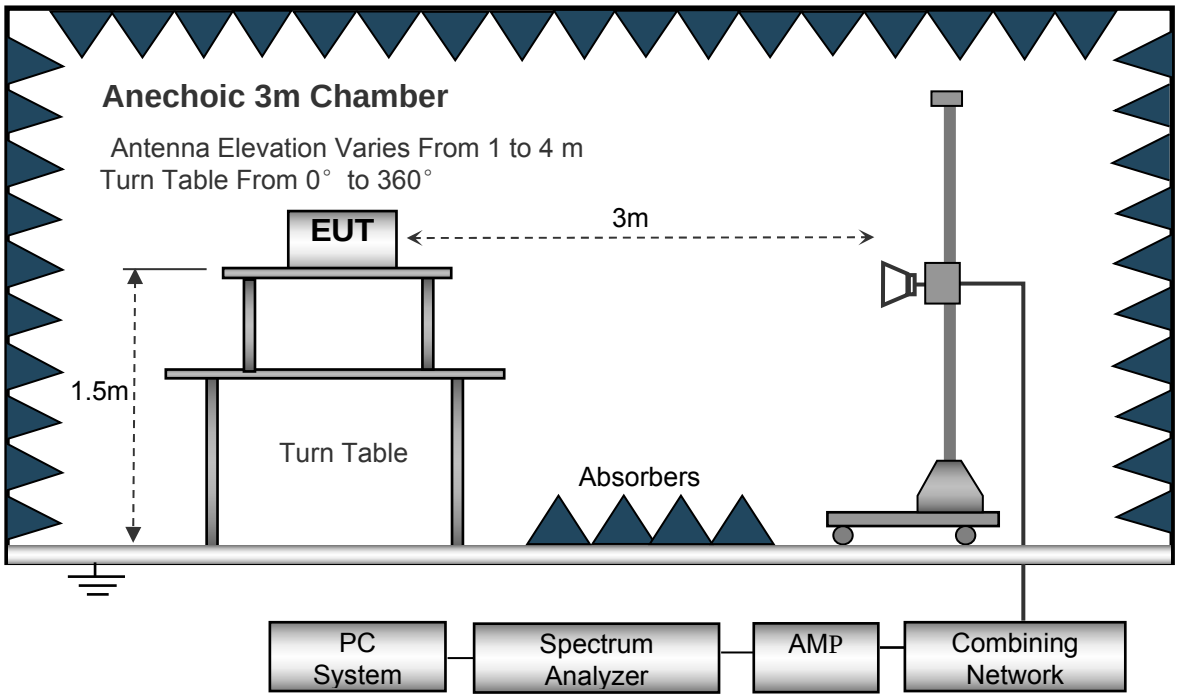
The test setup for emission measurement below 30MHz.



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. For below 1GHz, the EUT is 0.8m above ground plane; For above1GHz, 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. The spectrum was investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

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 tested under 3-axes(X,Y,Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand), After pre-test, It was found that the worse radiation emission was get at the X position. So the data shown was the X position only.

8.5 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									
223.75	41.98	QP	65	1.5	H	-11.62	30.36	46.00	-15.64
223.75	35.48	QP	218	1.5	V	-11.62	23.86	46.00	-22.14
4824.00	53.32	PK	102	1.4	V	-1.06	52.26	74.00	-21.74
4824.00	46.52	Ave	102	1.4	V	-1.06	45.46	54.00	-8.54
7236.00	40.27	PK	314	1.5	H	1.33	41.60	74.00	-32.40
7236.00	42.75	Ave	314	1.5	H	1.33	44.08	54.00	-9.92
2329.54	46.27	PK	242	1.7	V	-13.19	33.08	74.00	-40.92
2329.54	37.08	Ave	242	1.7	V	-13.19	23.89	54.00	-30.11
2382.19	44.10	PK	18	1.3	H	-13.14	30.96	74.00	-43.04
2382.19	36.04	Ave	18	1.3	H	-13.14	22.90	54.00	-31.10
2496.07	42.73	PK	92	2.0	V	-13.08	29.65	74.00	-44.35
2496.07	36.81	Ave	92	2.0	V	-13.08	23.73	54.00	-30.27

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									
223.75	42.23	QP	250	1.9	H	-11.62	30.61	46.00	-15.39
223.75	35.55	QP	2	2.0	V	-11.62	23.93	46.00	-22.07
4874.00	52.43	PK	19	1.7	V	-0.62	51.81	74.00	-22.19
4874.00	45.96	Ave	19	1.7	V	-0.62	45.34	54.00	-8.66
7311.00	39.27	PK	97	2.0	H	2.21	41.48	74.00	-32.52
7311.00	43.02	Ave	97	2.0	H	2.21	45.23	54.00	-8.77
2324.30	46.94	PK	38	1.3	V	-13.19	33.75	74.00	-40.25
2324.30	37.33	Ave	38	1.3	V	-13.19	24.14	54.00	-29.86
2356.06	43.88	PK	101	1.4	H	-13.14	30.74	74.00	-43.26
2356.06	36.86	Ave	101	1.4	H	-13.14	23.72	54.00	-30.28
2486.29	42.64	PK	32	1.4	V	-13.08	29.56	74.00	-44.44
2486.29	36.96	Ave	32	1.4	V	-13.08	23.88	54.00	-30.12

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									
223.75	41.64	QP	0	1.0	H	-11.62	30.02	46.00	-15.98
223.75	36.92	QP	299	1.3	V	-11.62	25.30	46.00	-20.70
4924.00	53.48	PK	223	1.7	V	-0.24	53.24	74.00	-20.76
4924.00	45.21	Ave	223	1.7	V	-0.24	44.97	54.00	-9.03
7386.00	38.69	PK	258	1.4	H	2.84	41.53	74.00	-32.47
7386.00	42.29	Ave	258	1.4	H	2.84	45.13	54.00	-8.87
2337.66	46.06	PK	240	2.0	V	-13.19	32.87	74.00	-41.13
2337.66	39.90	Ave	240	2.0	V	-13.19	26.71	54.00	-27.29
2360.65	43.42	PK	325	1.6	H	-13.14	30.28	74.00	-43.72
2360.65	36.78	Ave	325	1.6	H	-13.14	23.64	54.00	-30.36
2484.08	44.80	PK	128	1.7	V	-13.08	31.72	74.00	-42.28
2484.08	37.97	Ave	128	1.7	V	-13.08	24.89	54.00	-29.11

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)
11g: Low Channel 2412MHz									
223.75	42.72	QP	26	1.6	H	-11.62	31.10	46.00	-14.90
223.75	38.39	QP	344	1.3	V	-11.62	26.77	46.00	-19.23
4824.00	53.54	PK	314	1.7	V	-1.06	52.48	74.00	-21.52
4824.00	46.54	Ave	314	1.7	V	-1.06	45.48	54.00	-8.52
7236.00	40.16	PK	288	1.6	H	1.33	41.49	74.00	-32.51
7236.00	42.01	Ave	288	1.6	H	1.33	43.34	54.00	-10.66
2340.39	45.70	PK	126	1.5	V	-13.19	32.51	74.00	-41.49
2340.39	39.07	Ave	126	1.5	V	-13.19	25.88	54.00	-28.12
2351.40	43.86	PK	97	1.3	H	-13.14	30.72	74.00	-43.28
2351.40	38.25	Ave	97	1.3	H	-13.14	25.11	54.00	-28.89
2496.21	42.44	PK	240	1.4	V	-13.08	29.36	74.00	-44.64
2496.21	38.16	Ave	240	1.4	V	-13.08	25.08	54.00	-28.92

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									
223.75	44.21	QP	68	1.1	H	-11.62	32.59	46.00	-13.41
223.75	39.03	QP	166	1.6	V	-11.62	27.41	46.00	-18.59
4874.00	53.78	PK	179	1.4	V	-0.62	53.16	74.00	-20.84
4874.00	46.47	Ave	179	1.4	V	-0.62	45.85	54.00	-8.15
7311.00	41.52	PK	153	1.7	H	2.21	43.73	74.00	-30.27
7311.00	43.07	Ave	153	1.7	H	2.21	45.28	54.00	-8.72
2325.86	46.35	PK	326	2.0	V	-13.19	33.16	74.00	-40.84
2325.86	37.04	Ave	326	2.0	V	-13.19	23.85	54.00	-30.15
2375.76	44.46	PK	295	1.3	H	-13.14	31.32	74.00	-42.68
2375.76	36.61	Ave	295	1.3	H	-13.14	23.47	54.00	-30.53
2487.98	42.45	PK	315	1.5	V	-13.08	29.37	74.00	-44.63
2487.98	37.02	Ave	315	1.5	V	-13.08	23.94	54.00	-30.06

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									
223.75	43.28	QP	260	1.1	H	-11.62	31.66	46.00	-14.34
223.75	39.55	QP	37	1.9	V	-11.62	27.93	46.00	-18.07
4924.00	54.89	PK	48	1.3	V	-0.24	54.65	74.00	-19.35
4924.00	45.83	Ave	48	1.3	V	-0.24	45.59	54.00	-8.41
7386.00	42.50	PK	219	1.1	H	2.84	45.34	74.00	-28.66
7386.00	44.11	Ave	219	1.1	H	2.84	46.95	54.00	-7.05
2336.62	46.16	PK	148	1.7	V	-13.19	32.97	74.00	-41.03
2336.62	38.77	Ave	148	1.7	V	-13.19	25.58	54.00	-28.42
2355.18	44.86	PK	90	1.9	H	-13.14	31.72	74.00	-42.28
2355.18	38.02	Ave	90	1.9	H	-13.14	24.88	54.00	-29.12
2489.25	44.44	PK	175	1.2	V	-13.08	31.36	74.00	-42.64
2489.25	38.84	Ave	175	1.2	V	-13.08	25.76	54.00	-28.24

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									
223.75	42.07	QP	295	1.1	H	-11.62	30.45	46.00	-15.55
223.75	39.86	QP	66	1.7	V	-11.62	28.24	46.00	-17.76
4824.00	54.90	PK	316	1.8	V	-1.06	53.84	74.00	-20.16
4824.00	46.05	Ave	316	1.8	V	-1.06	44.99	54.00	-9.01
7236.00	43.93	PK	323	1.2	H	1.33	45.26	74.00	-28.74
7236.00	43.86	Ave	323	1.2	H	1.33	45.19	54.00	-8.81
2326.66	45.10	PK	113	1.1	V	-13.19	31.91	74.00	-42.09
2326.66	37.22	Ave	113	1.1	V	-13.19	24.03	54.00	-29.97
2357.01	44.16	PK	253	1.4	H	-13.14	31.02	74.00	-42.98
2357.01	37.53	Ave	253	1.4	H	-13.14	24.39	54.00	-29.61
2498.19	42.40	PK	286	1.4	V	-13.08	29.32	74.00	-44.68
2498.19	36.20	Ave	286	1.4	V	-13.08	23.12	54.00	-30.88

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									
223.75	43.55	QP	179	1.1	H	-11.62	31.93	46.00	-14.07
223.75	40.59	QP	257	1.8	V	-11.62	28.97	46.00	-17.03
4874.00	54.91	PK	152	1.0	V	-0.62	54.29	74.00	-19.71
4874.00	45.51	Ave	152	1.0	V	-0.62	44.89	54.00	-9.11
7311.00	44.14	PK	28	1.0	H	2.21	46.35	74.00	-27.65
7311.00	44.84	Ave	28	1.0	H	2.21	47.05	54.00	-6.95
2313.59	46.75	PK	279	1.4	V	-13.19	33.56	74.00	-40.44
2313.59	37.09	Ave	279	1.4	V	-13.19	23.90	54.00	-30.10
2388.30	43.53	PK	136	1.2	H	-13.14	30.39	74.00	-43.61
2388.30	36.17	Ave	136	1.2	H	-13.14	23.03	54.00	-30.97
2492.30	44.08	PK	299	1.4	V	-13.08	31.00	74.00	-43.00
2492.30	37.78	Ave	299	1.4	V	-13.08	24.70	54.00	-29.30

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									
223.75	44.74	QP	51	1.2	H	-11.62	33.12	46.00	-12.88
223.75	39.91	QP	304	1.8	V	-11.62	28.29	46.00	-17.71
4924.00	53.59	PK	289	1.7	V	-0.24	53.35	74.00	-20.65
4924.00	46.76	Ave	289	1.7	V	-0.24	46.52	54.00	-7.48
7386.00	45.14	PK	34	1.9	H	2.84	47.98	74.00	-26.02
7386.00	45.16	Ave	34	1.9	H	2.84	48.00	54.00	-6.00
2318.89	46.03	PK	341	1.8	V	-13.19	32.84	74.00	-41.16
2318.89	39.16	Ave	341	1.8	V	-13.19	25.97	54.00	-28.03
2373.61	43.49	PK	171	1.0	H	-13.14	30.35	74.00	-43.65
2373.61	36.12	Ave	171	1.0	H	-13.14	22.98	54.00	-31.02
2493.00	43.44	PK	227	1.1	V	-13.08	30.36	74.00	-43.64
2493.00	36.49	Ave	227	1.1	V	-13.08	23.41	54.00	-30.59

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									
223.75	44.86	QP	179	1.1	H	-11.62	33.24	46.00	-12.76
223.75	40.23	QP	174	1.3	V	-11.62	28.61	46.00	-17.39
4844.00	51.82	PK	44	1.7	V	-1.06	50.76	74.00	-23.24
4844.00	45.49	Ave	44	1.7	V	-1.06	44.43	54.00	-9.57
7266.00	43.60	PK	64	1.8	H	1.33	44.93	74.00	-29.07
7266.00	42.20	Ave	64	1.8	H	1.33	43.53	54.00	-10.47
2344.28	46.70	PK	354	1.9	V	-13.19	33.51	74.00	-40.49
2344.28	37.28	Ave	354	1.9	V	-13.19	24.09	54.00	-29.91
2358.50	44.86	PK	201	1.2	H	-13.14	31.72	74.00	-42.28
2358.50	36.44	Ave	201	1.2	H	-13.14	23.30	54.00	-30.70
2494.40	42.81	PK	131	1.9	V	-13.08	29.73	74.00	-44.27
2494.40	38.88	Ave	131	1.9	V	-13.08	25.80	54.00	-28.20

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									
223.75	45.07	QP	7	1.9	H	-11.62	33.45	46.00	-12.55
223.75	41.06	QP	310	1.1	V	-11.62	29.44	46.00	-16.56
4874.00	51.88	PK	319	1.0	V	-0.62	51.26	74.00	-22.74
4874.00	46.36	Ave	319	1.0	V	-0.62	45.74	54.00	-8.26
7311.00	43.87	PK	71	1.1	H	2.21	46.08	74.00	-27.92
7311.00	41.87	Ave	71	1.1	H	2.21	44.08	54.00	-9.92
2336.56	46.32	PK	267	1.8	V	-13.19	33.13	74.00	-40.87
2336.56	37.56	Ave	267	1.8	V	-13.19	24.37	54.00	-29.63
2356.84	42.63	PK	313	1.6	H	-13.14	29.49	74.00	-44.51
2356.84	37.85	Ave	313	1.6	H	-13.14	24.71	54.00	-29.29
2489.92	42.67	PK	230	1.9	V	-13.08	29.59	74.00	-44.41
2489.92	38.65	Ave	230	1.9	V	-13.08	25.57	54.00	-28.43

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									
223.75	45.91	QP	114	1.6	H	-11.62	34.29	46.00	-11.71
223.75	40.46	QP	319	1.0	V	-11.62	28.84	46.00	-17.16
4904.00	51.38	PK	8	1.6	V	-0.24	51.14	74.00	-22.86
4904.00	46.62	Ave	8	1.6	V	-0.24	46.38	54.00	-7.62
7356.00	43.61	PK	280	1.3	H	2.84	46.45	74.00	-27.55
7356.00	42.34	Ave	280	1.3	H	2.84	45.18	54.00	-8.82
2318.14	46.26	PK	285	2.0	V	-13.19	33.07	74.00	-40.93
2318.14	39.64	Ave	285	2.0	V	-13.19	26.45	54.00	-27.55
2379.32	44.24	PK	63	1.7	H	-13.14	31.10	74.00	-42.90
2379.32	37.67	Ave	63	1.7	H	-13.14	24.53	54.00	-29.47
2488.81	42.60	PK	21	1.9	V	-13.08	29.52	74.00	-44.48
2488.81	37.18	Ave	21	1.9	V	-13.08	24.10	54.00	-29.90

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 v03r05
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

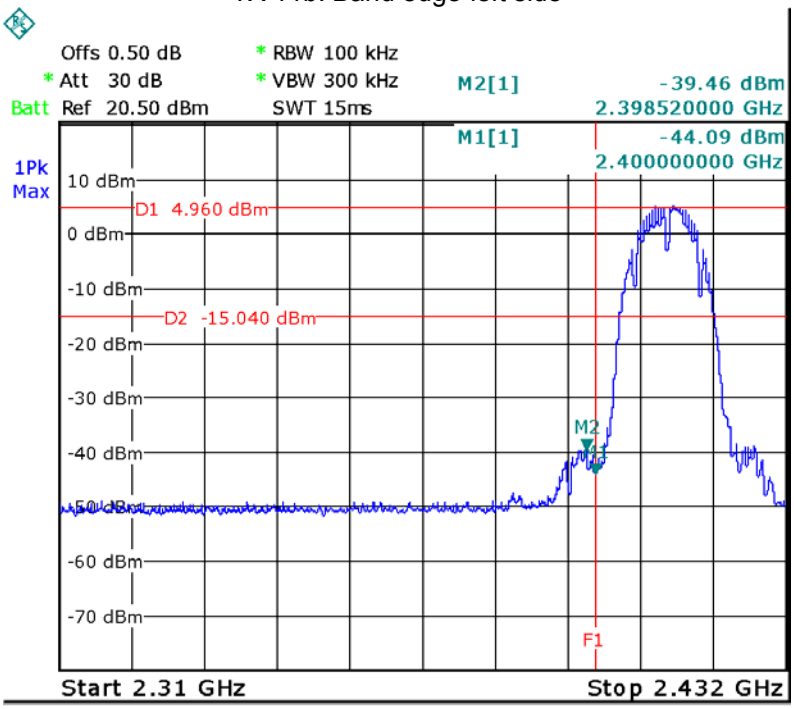
9.1 Test Produce

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.

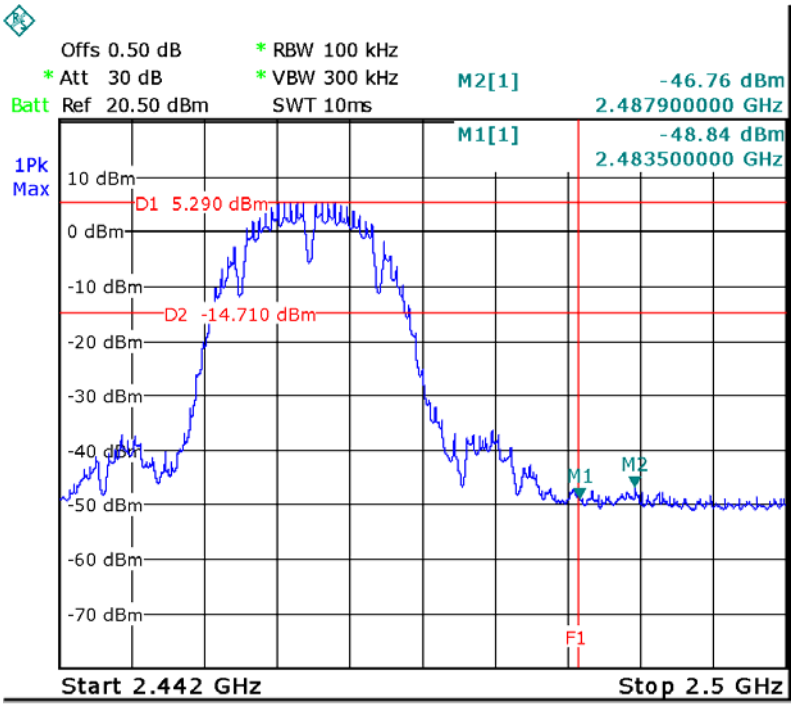
9.2 Test Result

Test result plots shown as follows:

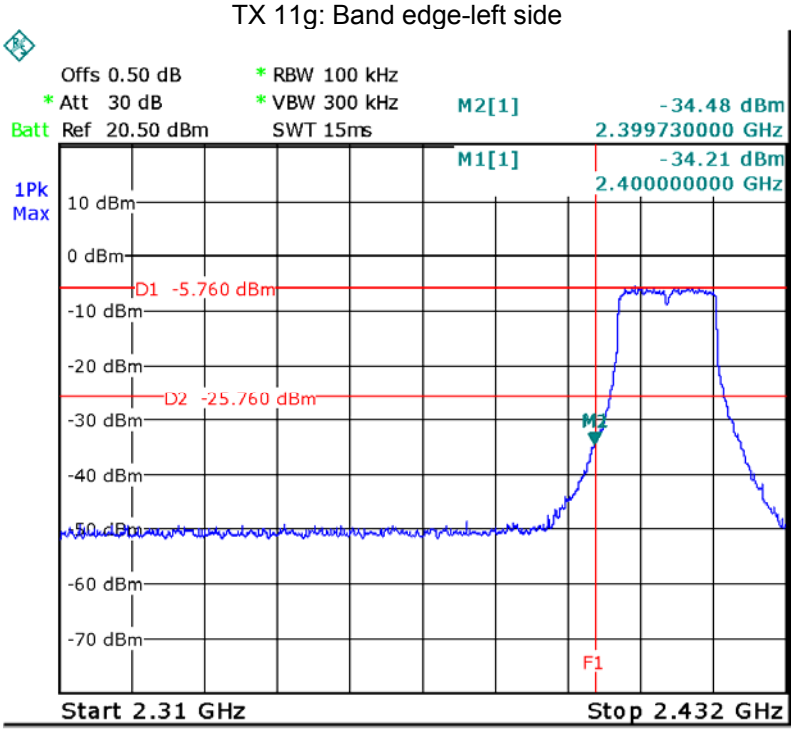
TX 11b: Band edge-left side



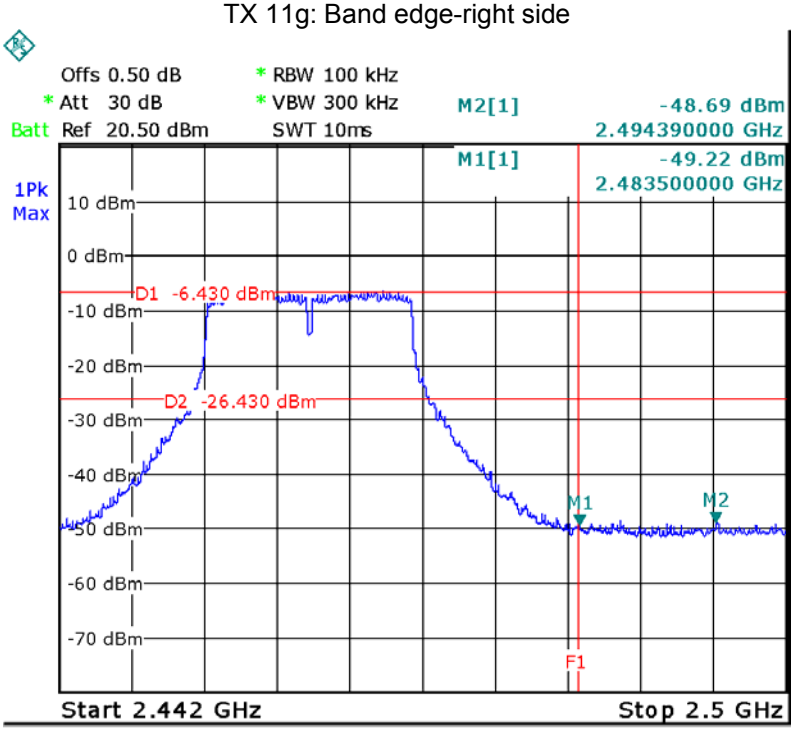
TX 11b: Band edge-right side



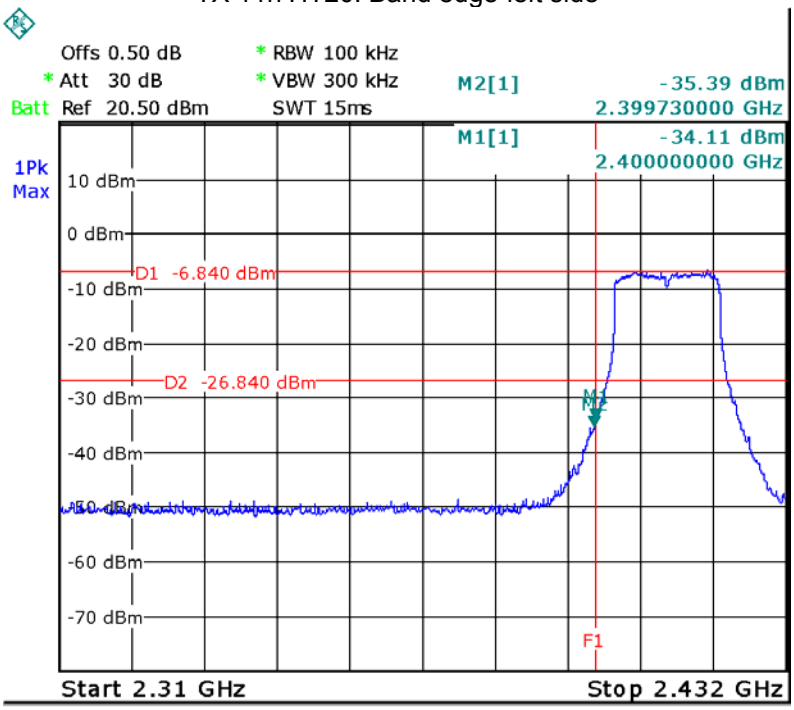
TX 11g: Band edge-left side



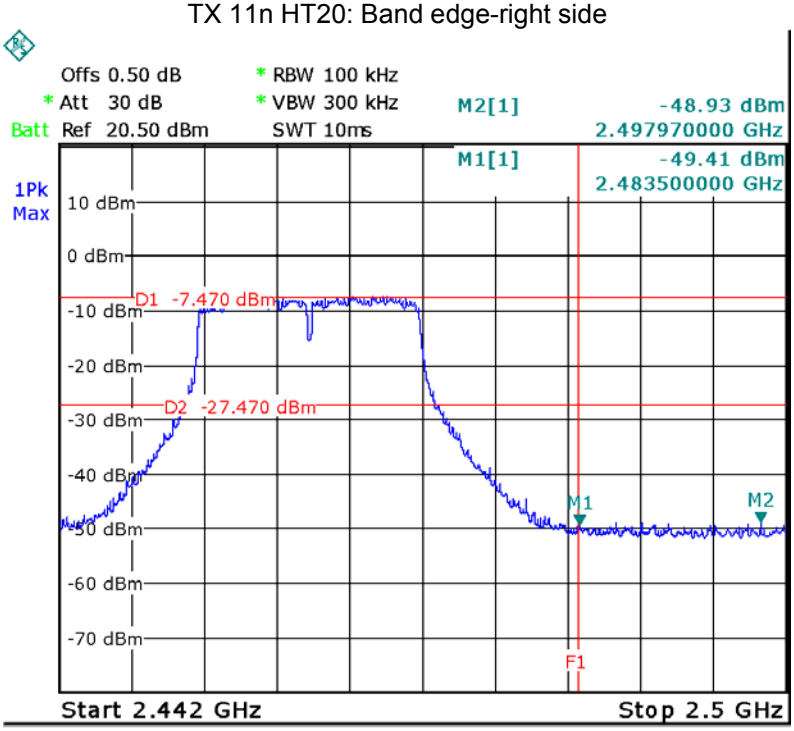
TX 11g: Band edge-right side



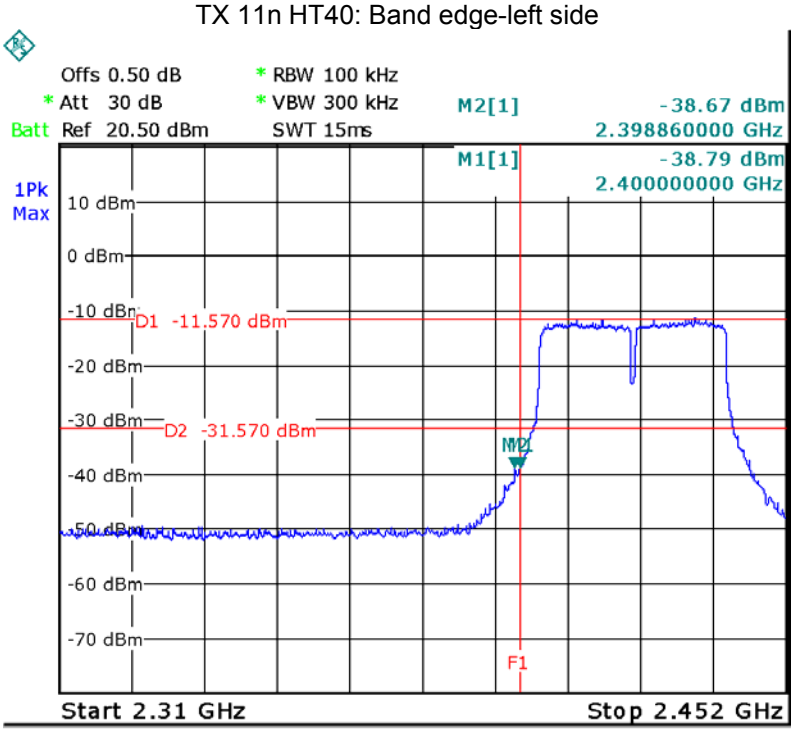
TX 11n HT20: Band edge-left side



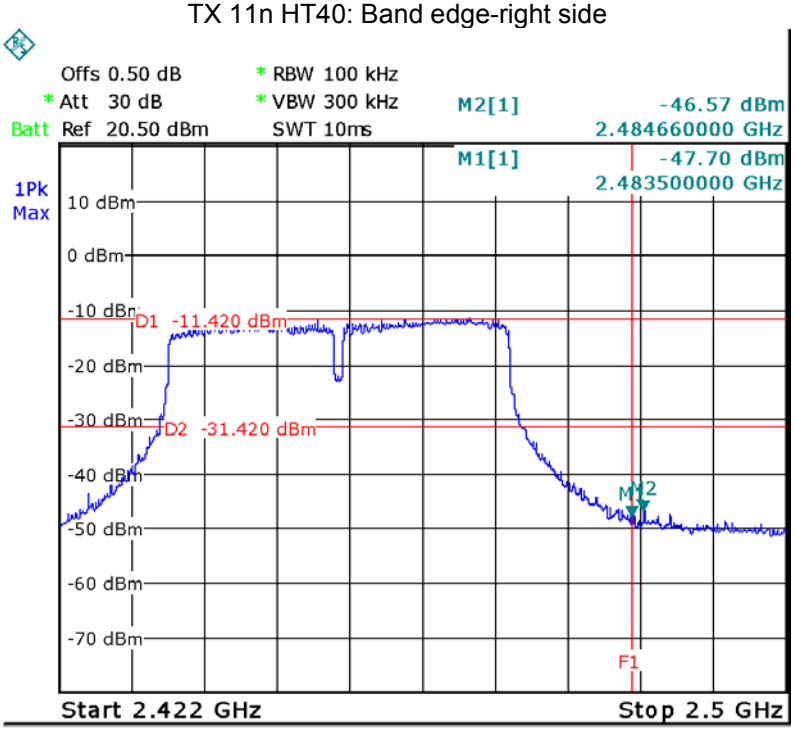
TX 11n HT20: Band edge-right side



TX 11n HT40: Band edge-left side



TX 11n HT40: Band edge-right side



10 6 dB Bandwidth Measurement

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: 558074 D01 DTS Meas Guidance v03r05

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;

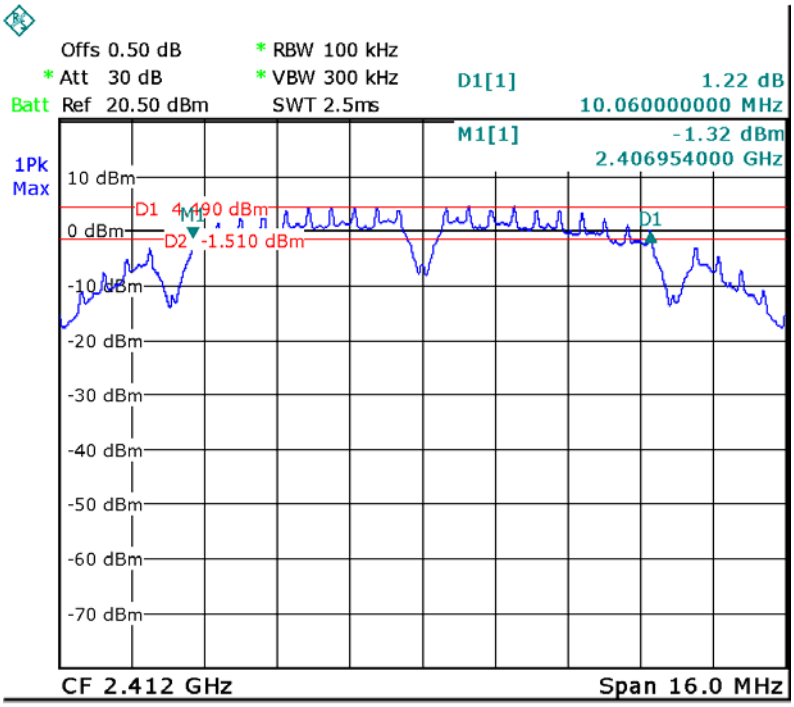
2. Set the spectrum analyzer: RBW = 100kHz, VBW = 300kHz

10.2 Test Result:

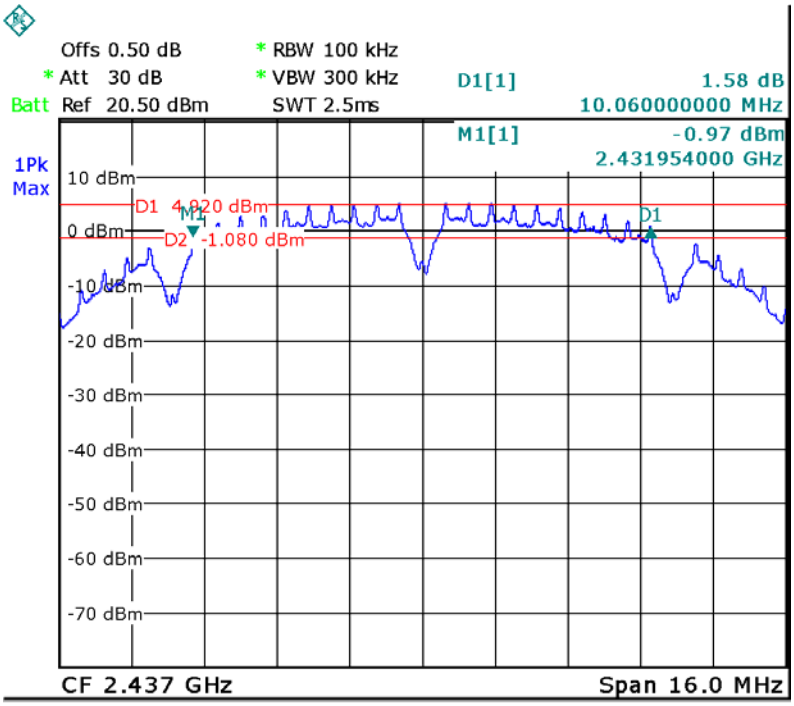
Operation mode	Bandwidth (MHz)		
TX 11b	Channel 1	Channel 6	Channel 11
	10.060	10.060	10.060
TX 11g	Channel 1	Channel 6	Channel 11
	16. 567	16. 567	16.567
TX 11n HT20	Channel 1	Channel 6	Channel 11
	17.838	17.838	17.784
TX 11n HT40	Channel 3	Channel 6	Channel 9
	36.560	36.560	36.560

Test result plot as follows:

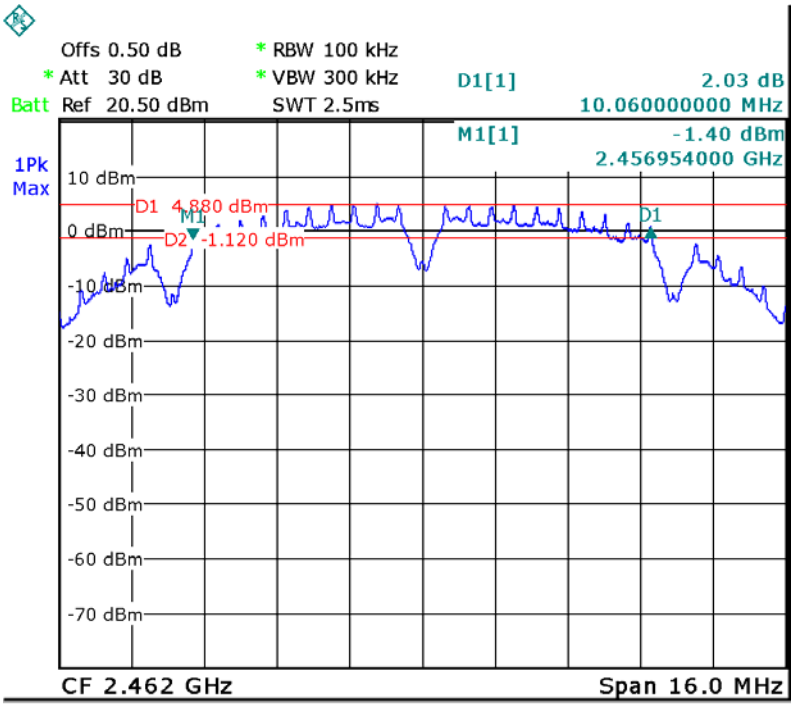
Mode: TX 11b channel 1



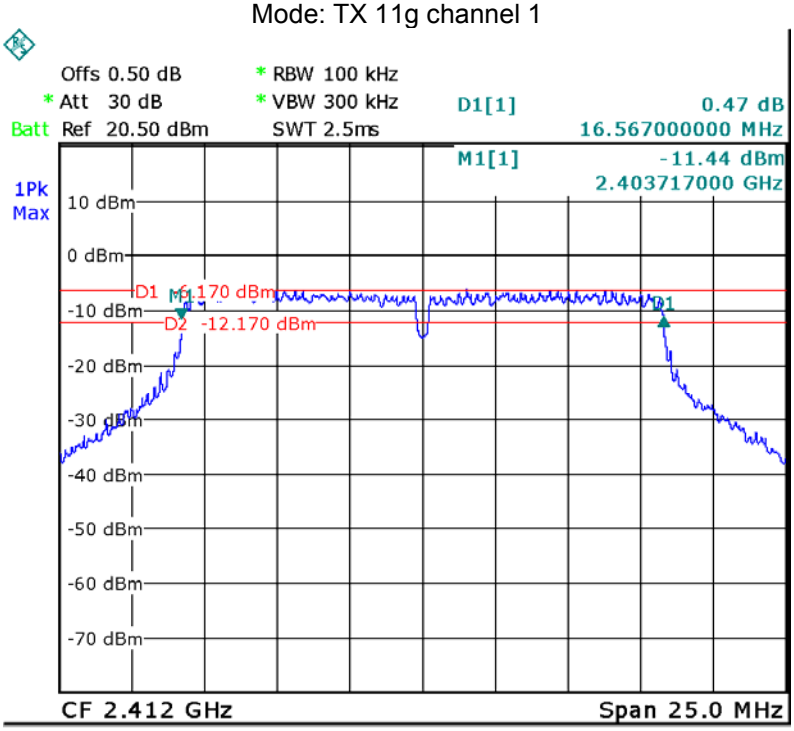
Mode: TX 11b channel 6



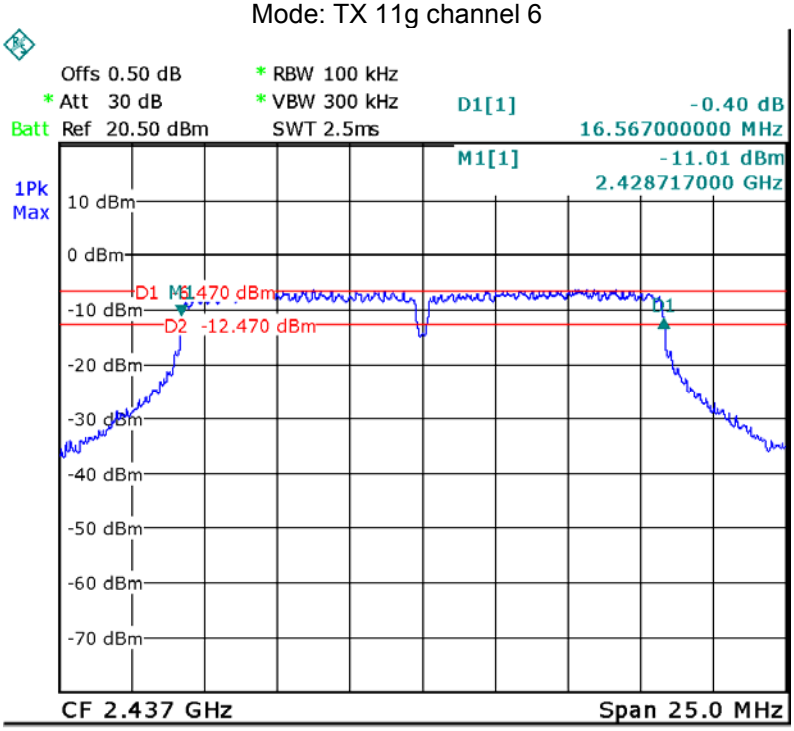
Mode: TX 11b channel 11



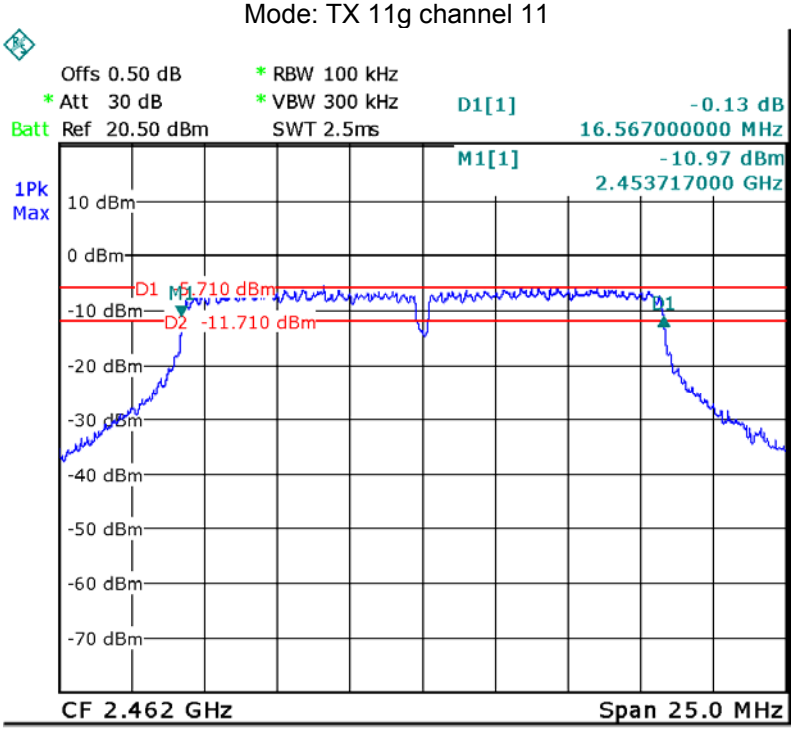
Mode: TX 11g channel 1



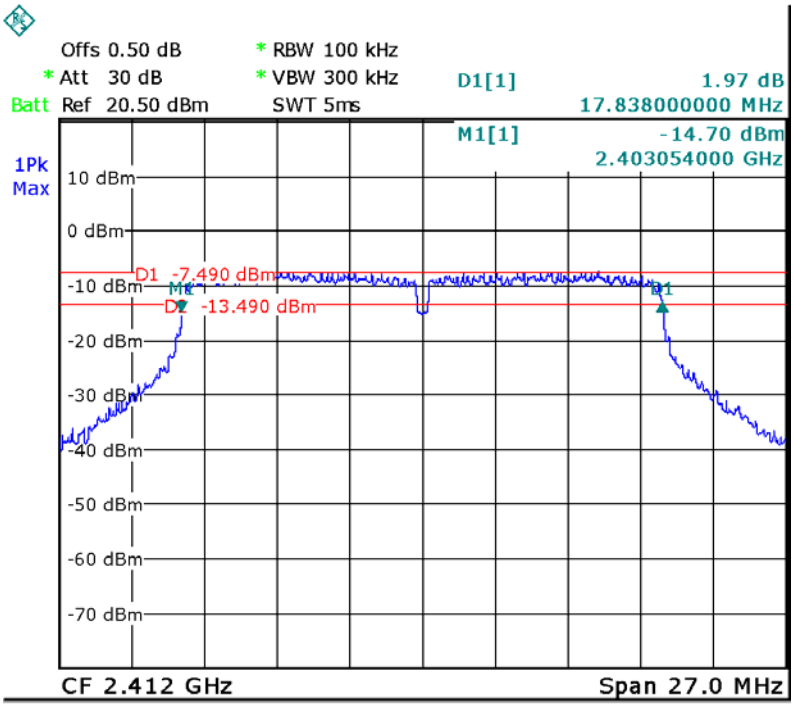
Mode: TX 11g channel 6



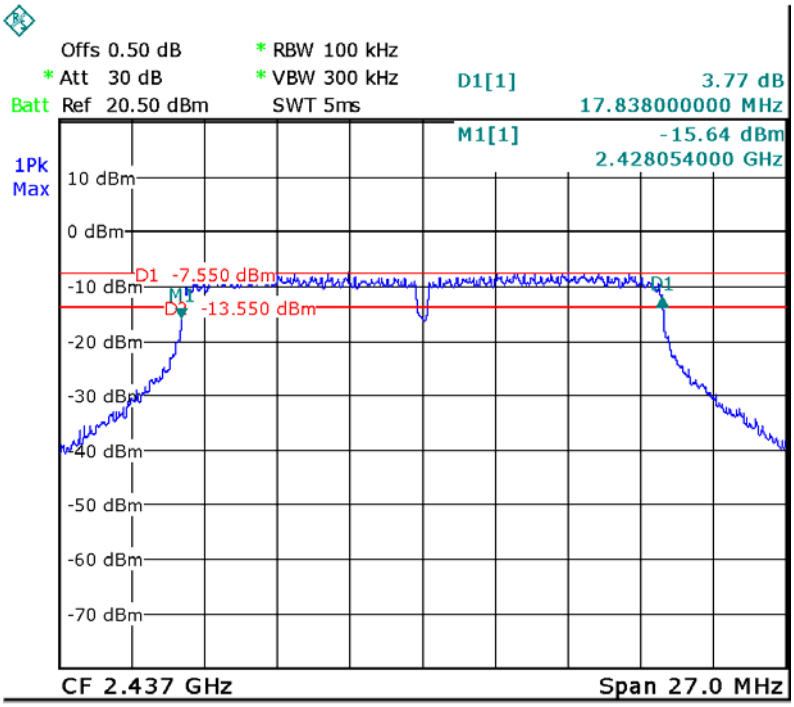
Mode: TX 11g channel 11



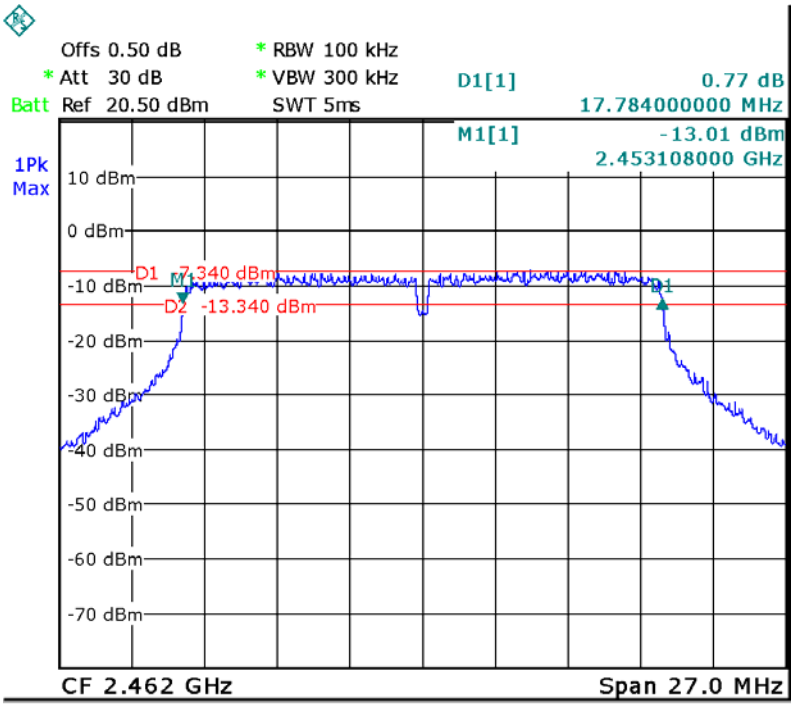
Mode: TX 11n HT20 channel 1



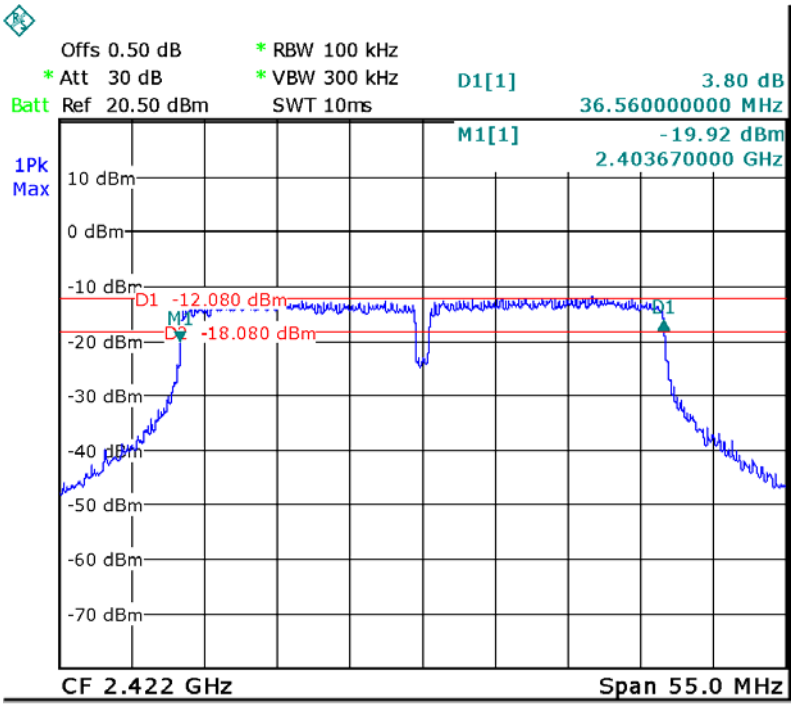
Mode: TX 11n HT20 channel 6



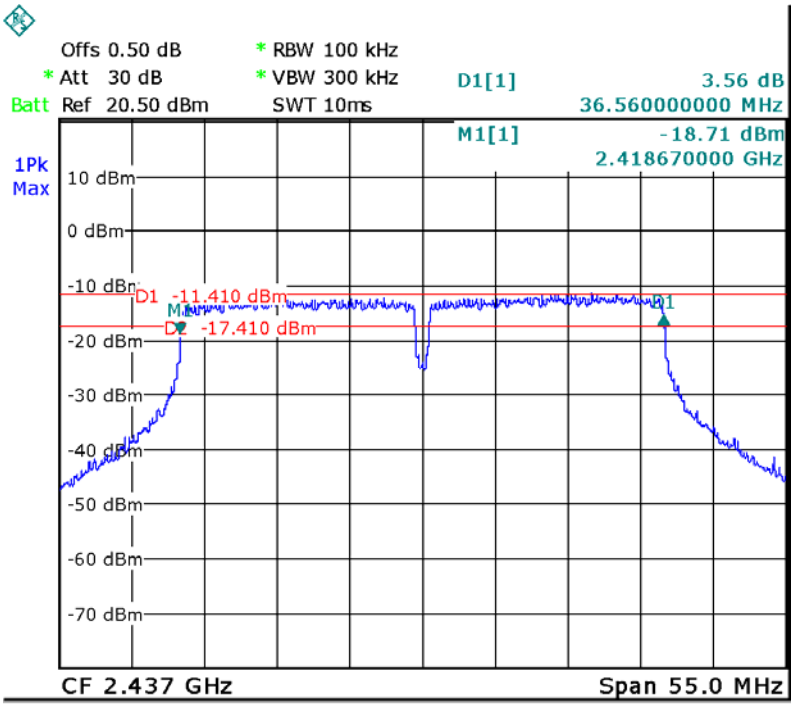
Mode: TX 11n HT20 channel 11



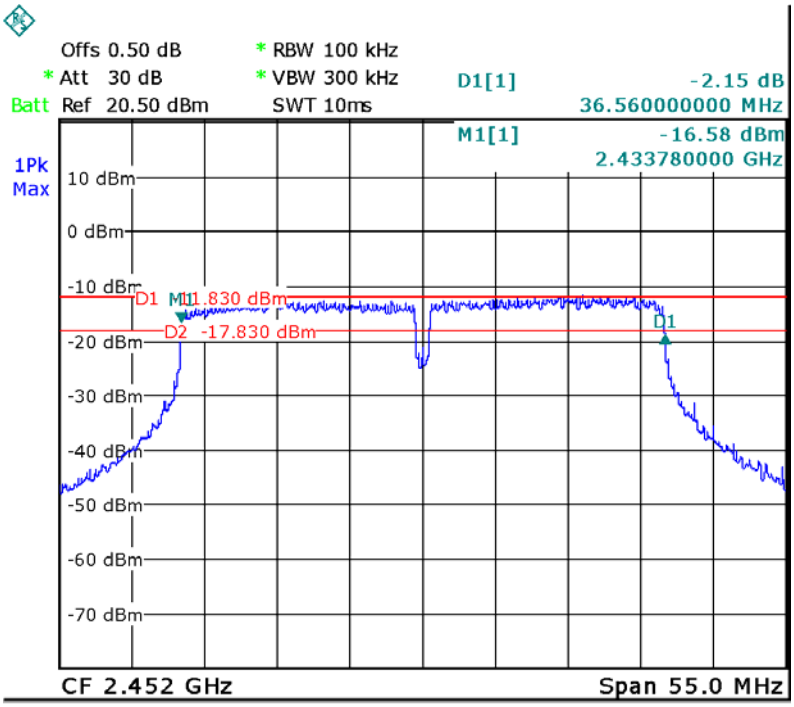
Mode: TX 11n HT40 channel 3



Mode: TX 11n HT40 channel 6



Mode: TX 11n HT40 channel 9



11 Maximum Peak Output Power

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: 558074 D01 DTS Meas Guidance v03r05

11.1 Test Procedure:

KDB558074 D01 v03r05

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:

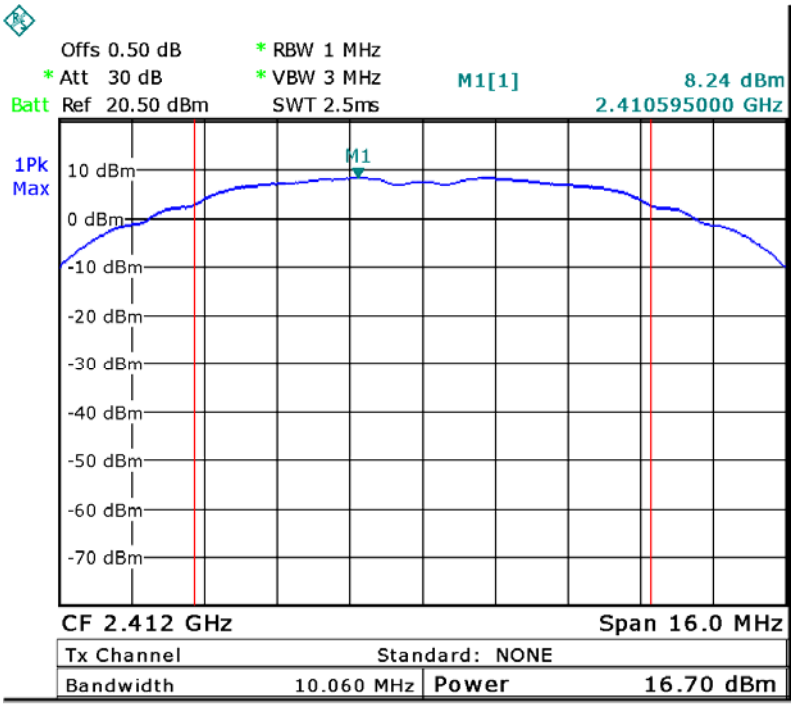
Test mode :TX 11b		
10 Maximum Peak Output Power (dBm)		
2412MHz	2437MHz	2462MHz
16.70	16.89	16.93
Limit: 1W/30dBm		

Test mode :TX 11g		
10 Maximum Peak Output Power (dBm)		
2412MHz	2437MHz	2462MHz
15.83	15.80	15.89
Limit: 1W/30dBm		

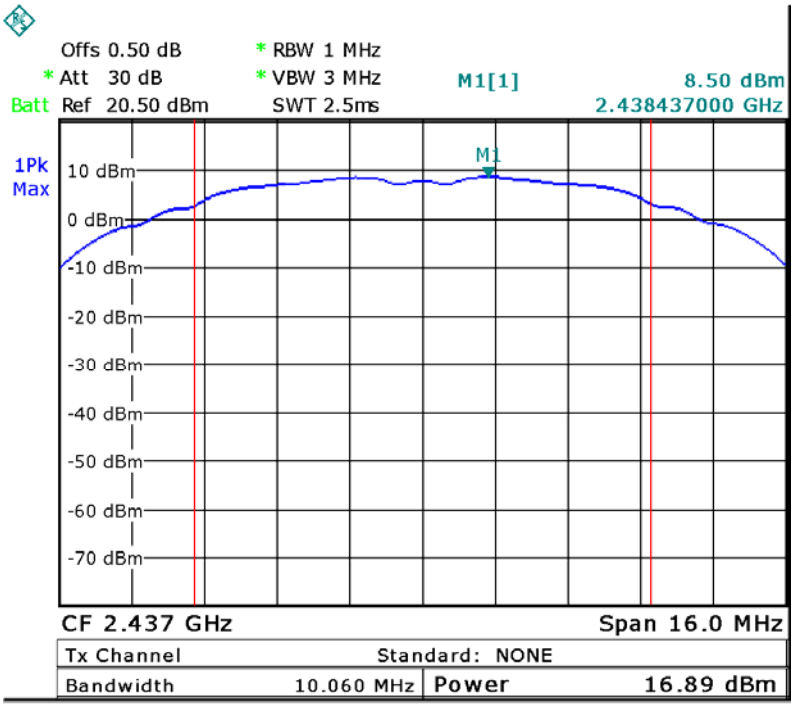
Test mode :TX 11n HT20		
10 Maximum Peak Output Power (dBm)		
2412MHz	2437MHz	2462MHz
14.80	14.72	14.88
Limit: 1W/30dBm		

Test mode : TX 11n HT40		
10 Maximum Peak Output Power (dBm)		
2422MHz	2437MHz	2452MHz
13.75	13.70	13.89
Limit: 1W/30dBm		

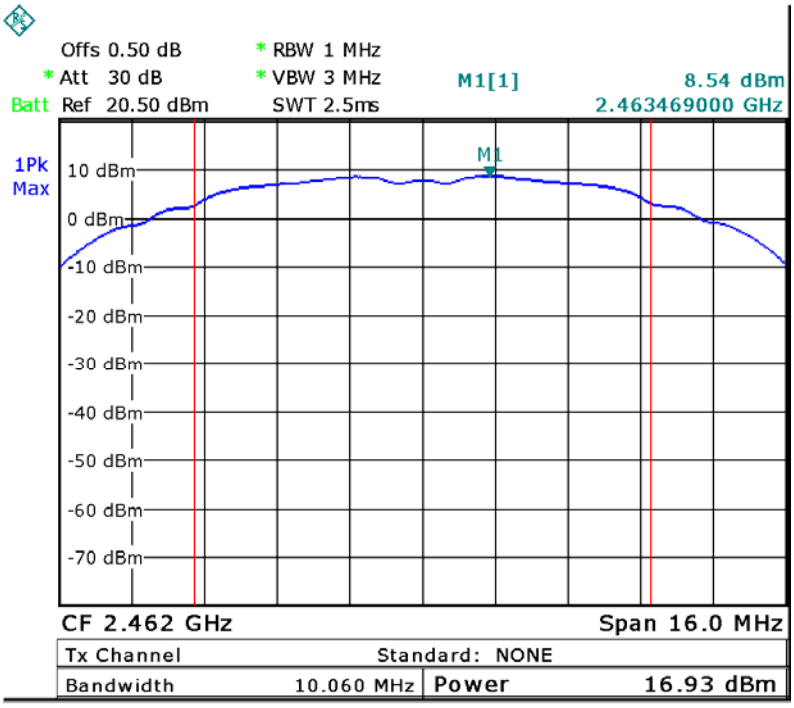
Mode: TX 11b channel 1



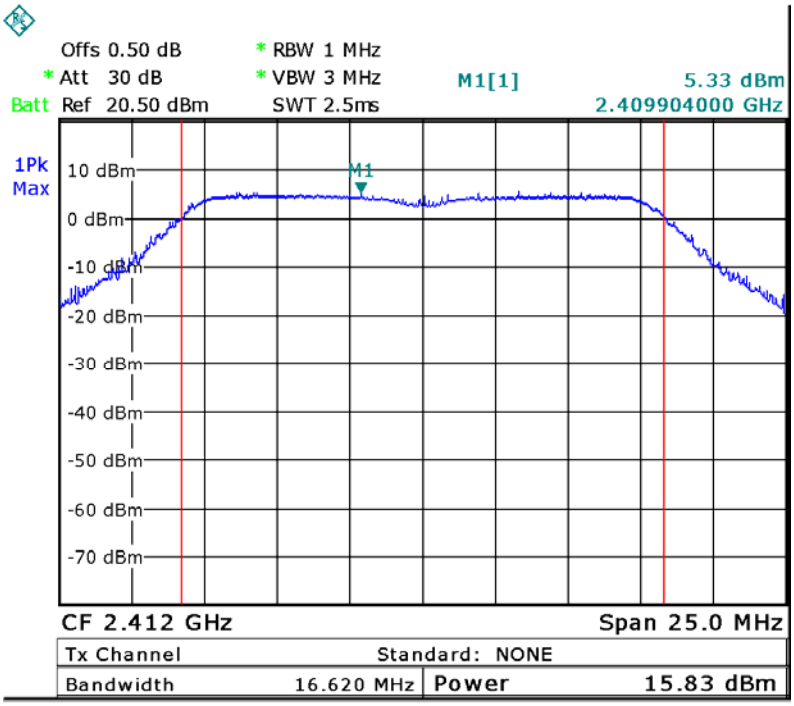
Mode: TX 11b channel 6



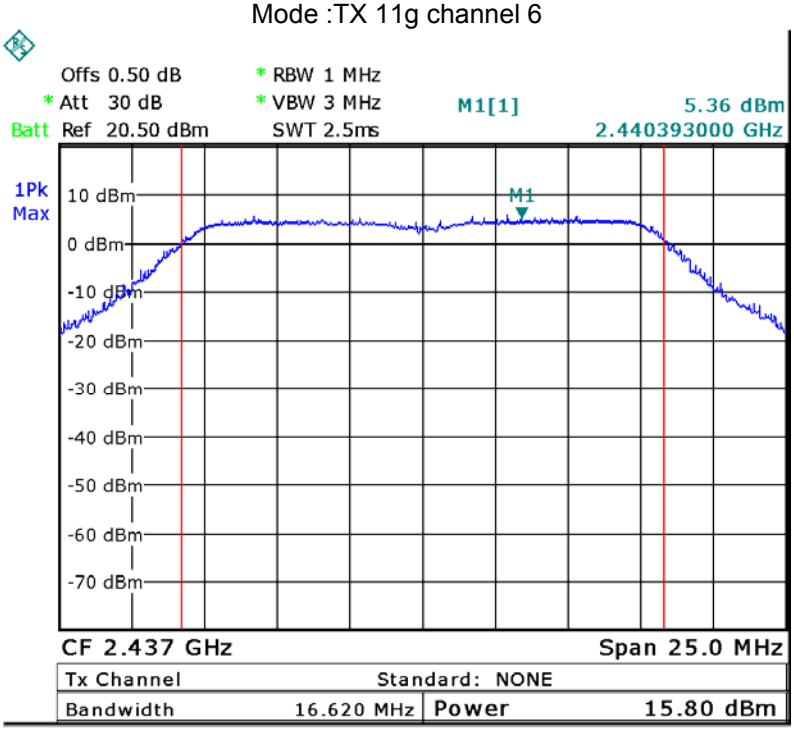
Mode: TX 11b channel 11



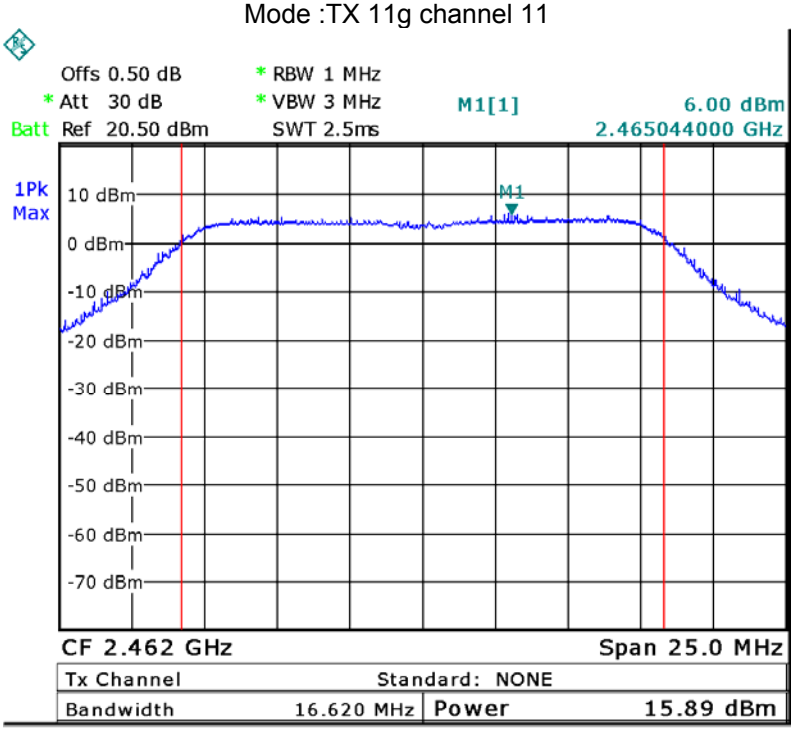
Mode :TX 11g channel 1



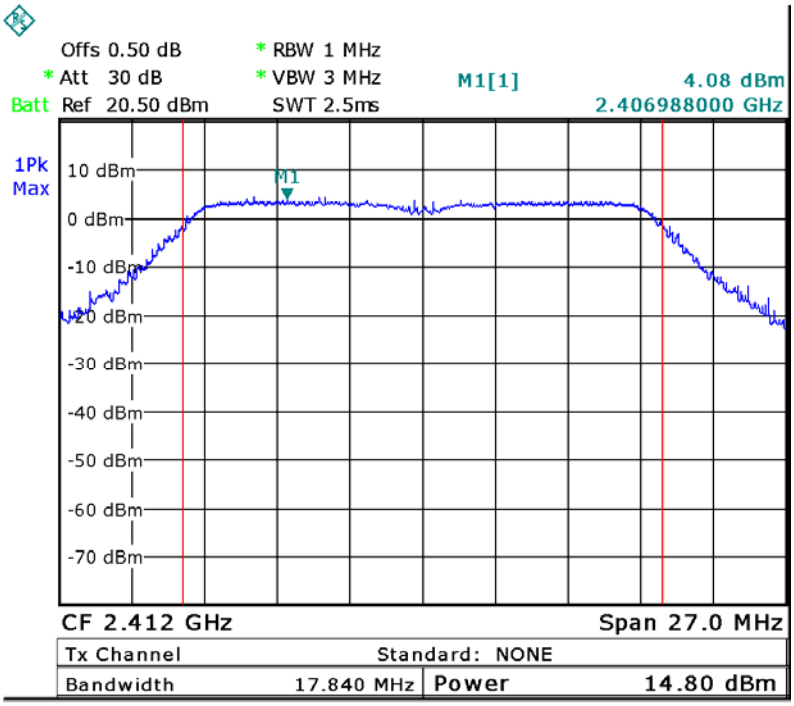
Mode :TX 11g channel 6



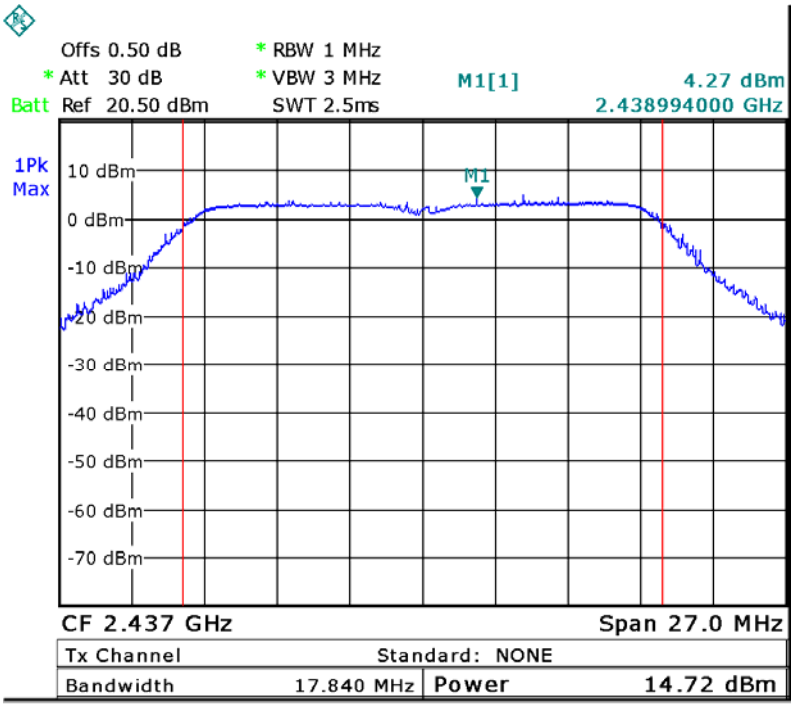
Mode :TX 11g channel 11



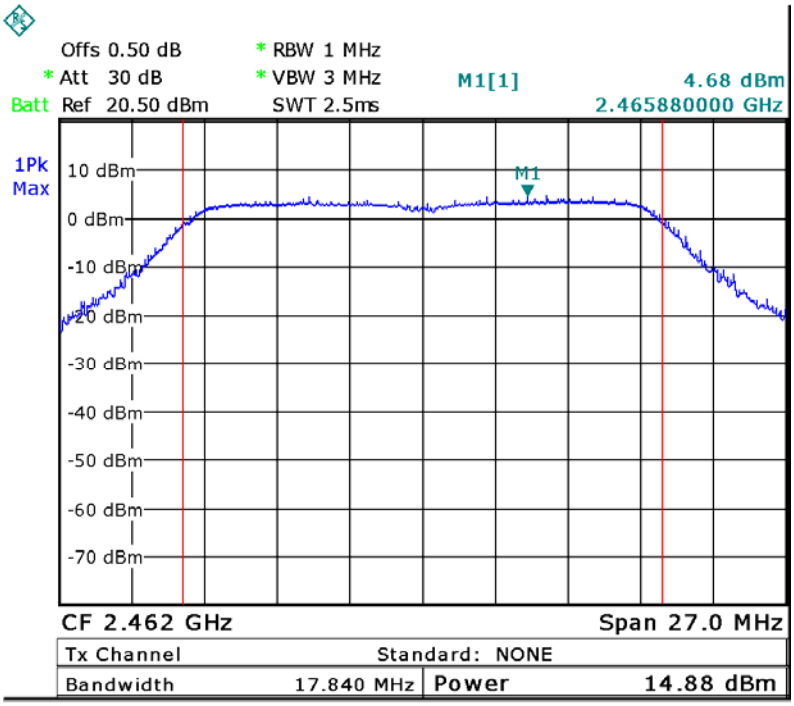
Mode: TX 11n HT20 channel 1



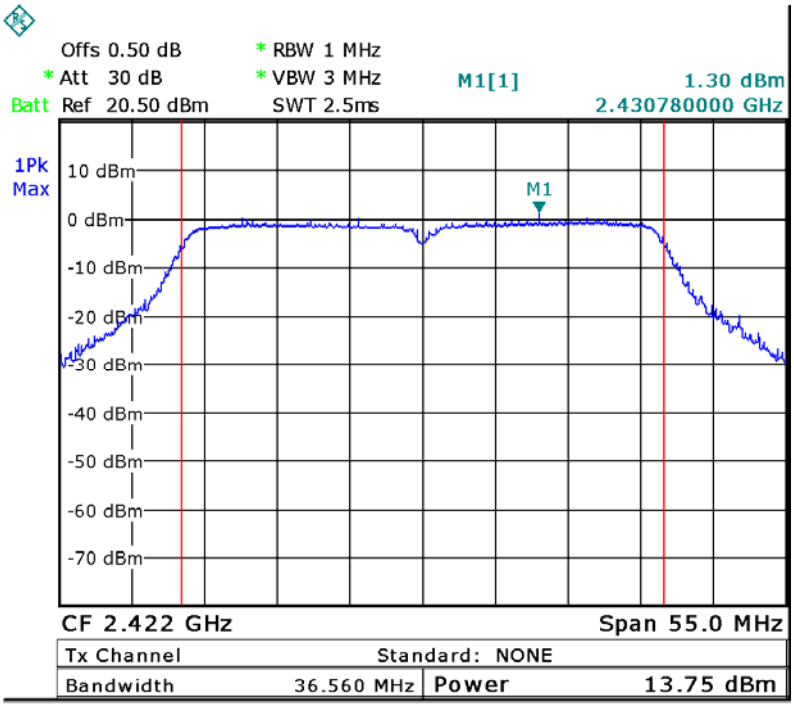
Mode: TX 11n HT20 channel 6



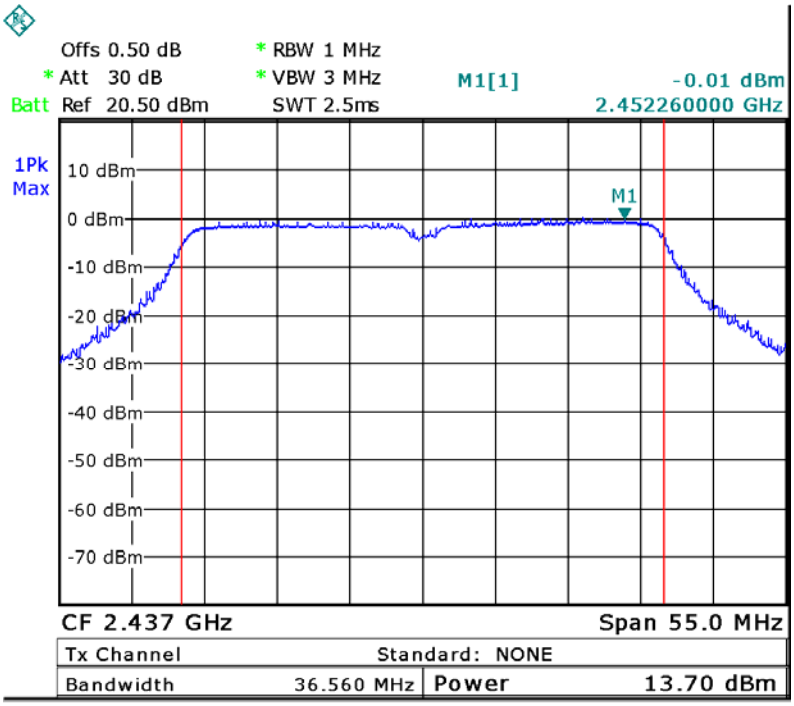
Mode: TX 11n HT20 channel 11



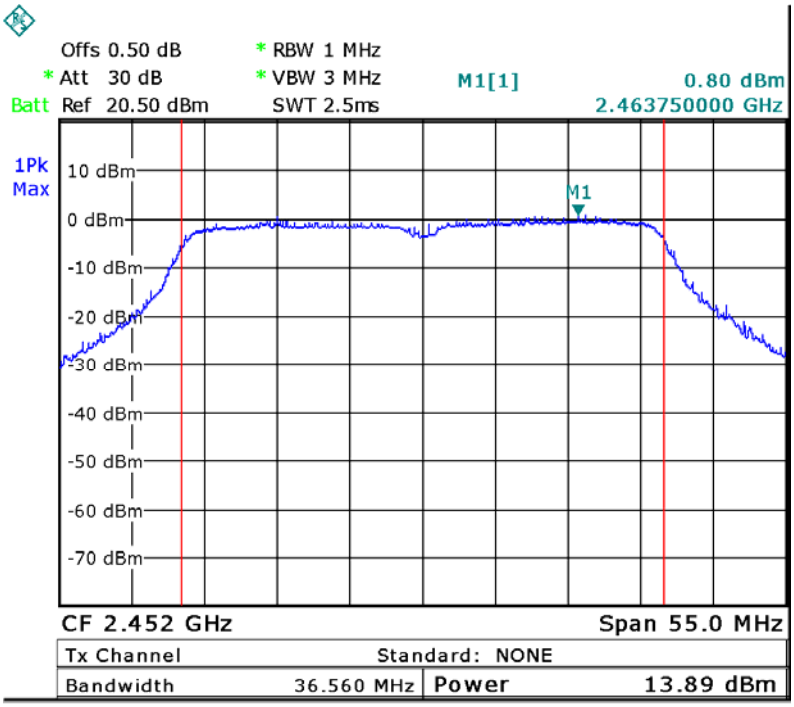
Mode: TX 11n HT40 channel 3



Mode: TX 11n HT40 channel 6



Mode: TX 11n HT40 channel 9



12 Power Spectral density

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: 558074 D01 DTS Meas Guidance v03r05

12.1 Test Procedure:

KDB558074 D01 v03r05

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:

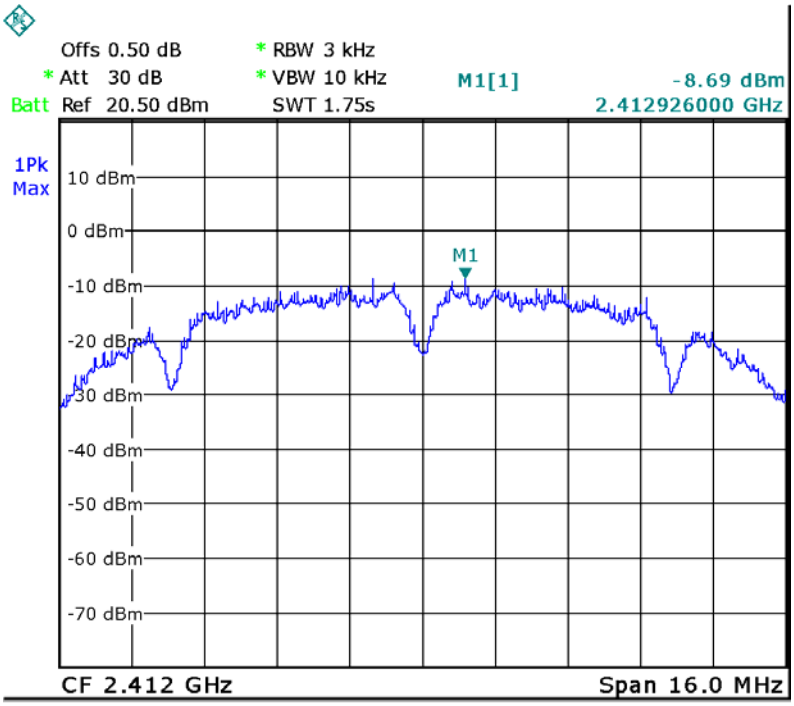
Test mode :TX 11b		
Power Spectral (dBm per 3kHz)		
2412MHz	2437MHz	2462MHz
-8.69	-8.68	-8.83
Limit: 8dBm per 3kHz		

Test mode :TX 11g		
Power Spectral (dBm per 3kHz)		
2412MHz	2437MHz	2462MHz
-17.29	-16.85	-17.87
Limit: 8dBm per 3kHz		

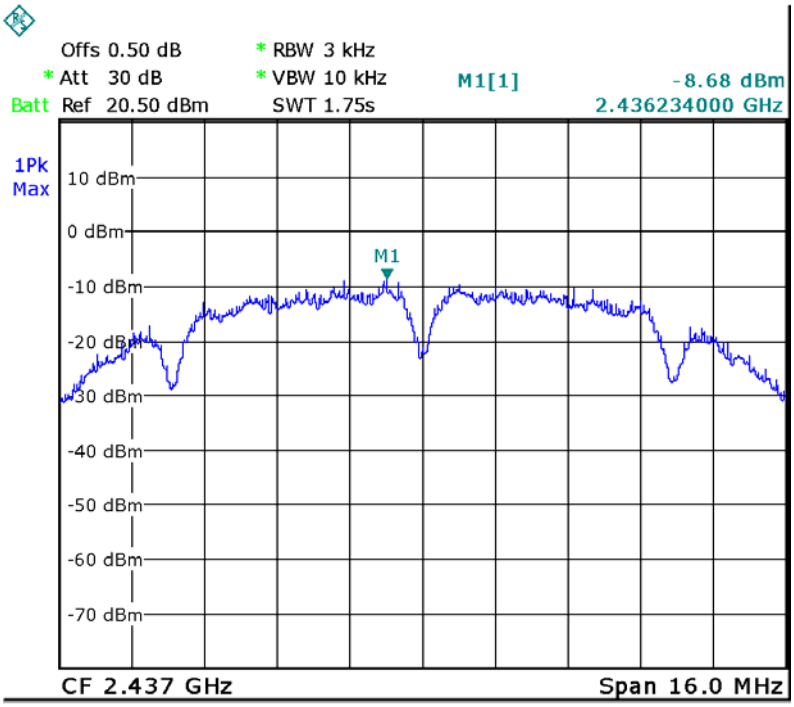
Test mode :TX 11n HT20		
Power Spectral (dBm per 3kHz)		
2412MHz	2437MHz	2462MHz
-18.30	-19.19	-18.18
Limit: 8dBm per 3kHz		

Test mode : TX 11n HT40		
Power Spectral (dBm per 3kHz)		
2422MHz	2437MHz	2452MHz
-23.00	-23.16	-21.70
Limit: 8dBm per 3kHz		

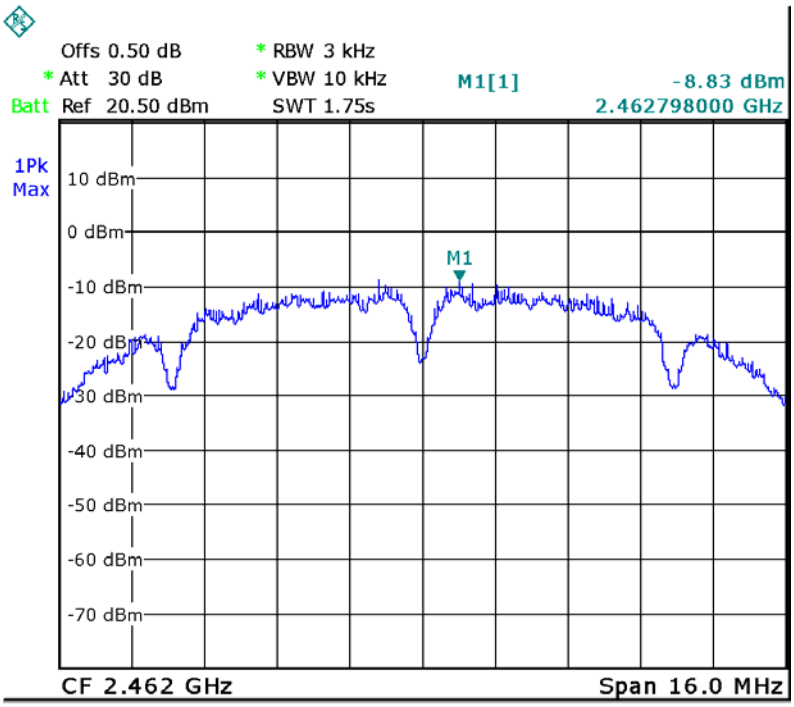
Mode: TX 11b channel 1



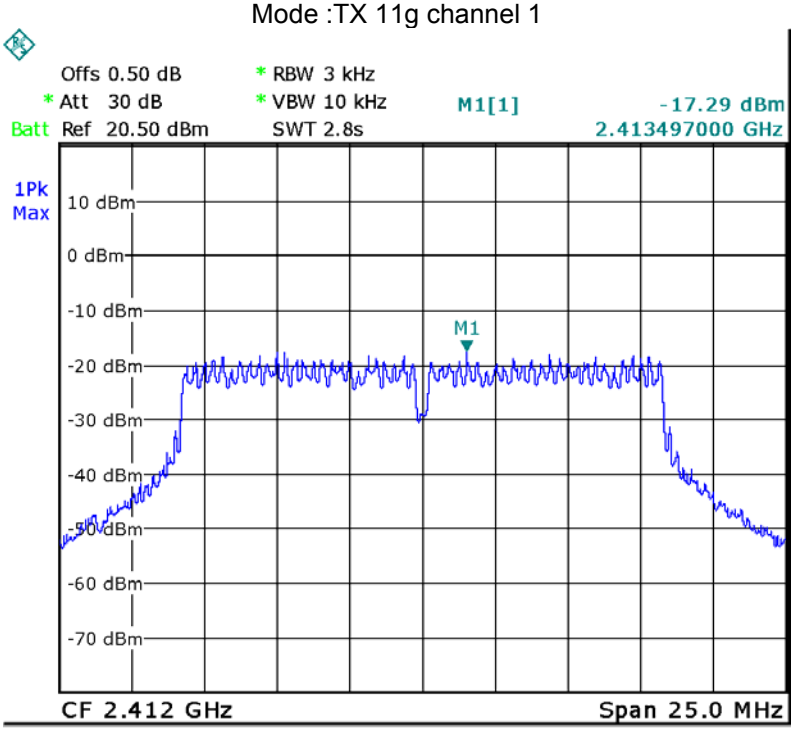
Mode: TX 11b channel 6



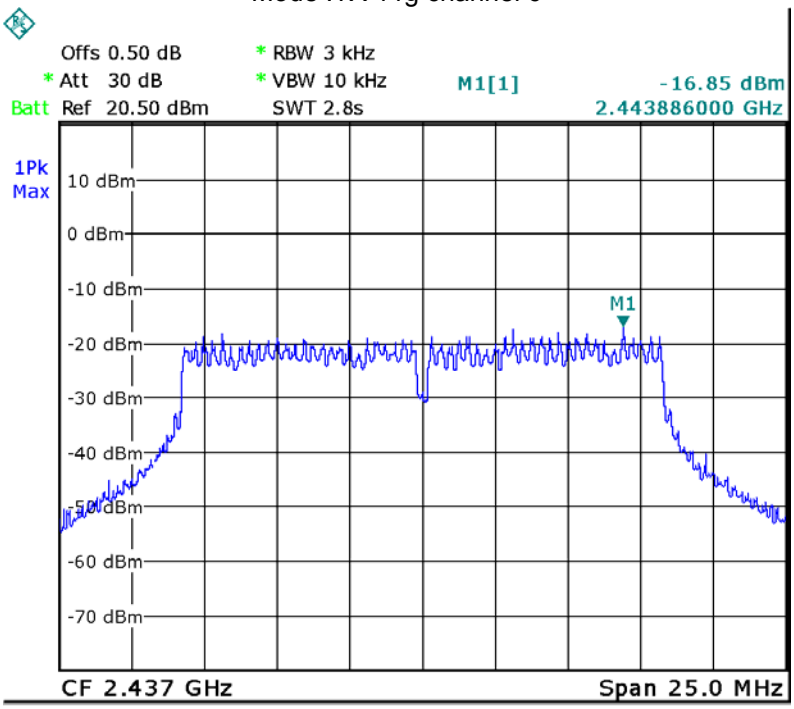
Mode: TX 11b channel 11



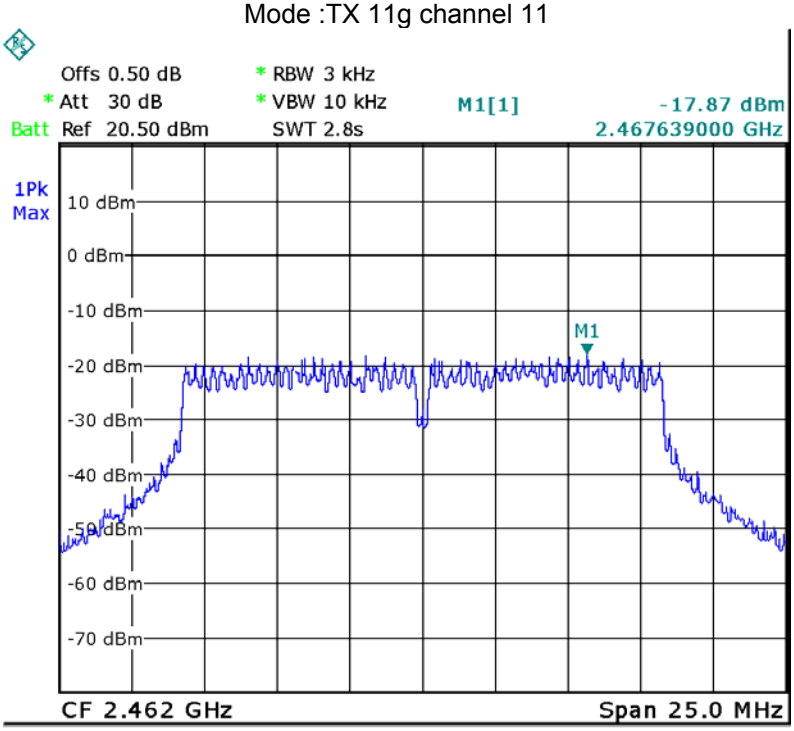
Mode :TX 11g channel 1



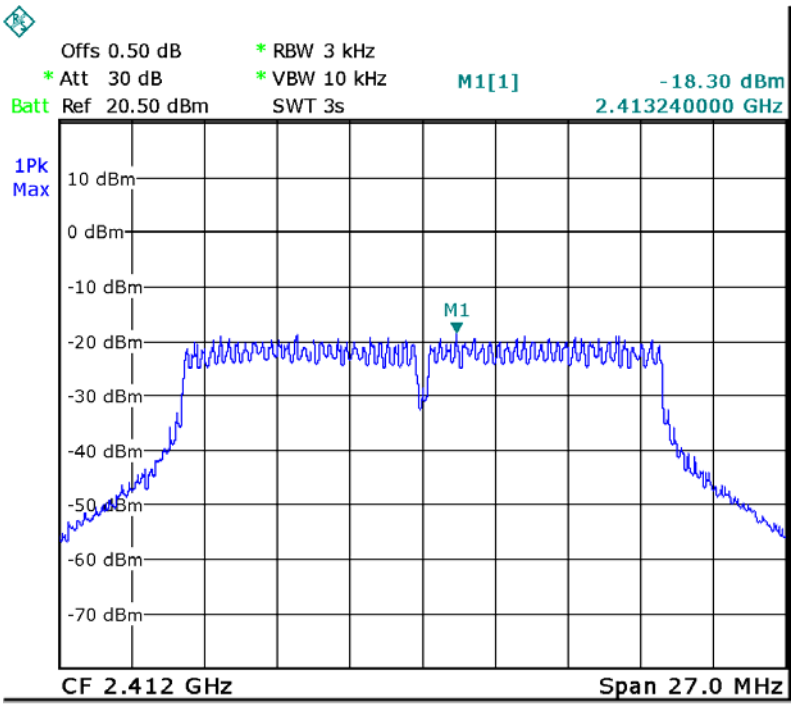
Mode :TX 11g channel 6



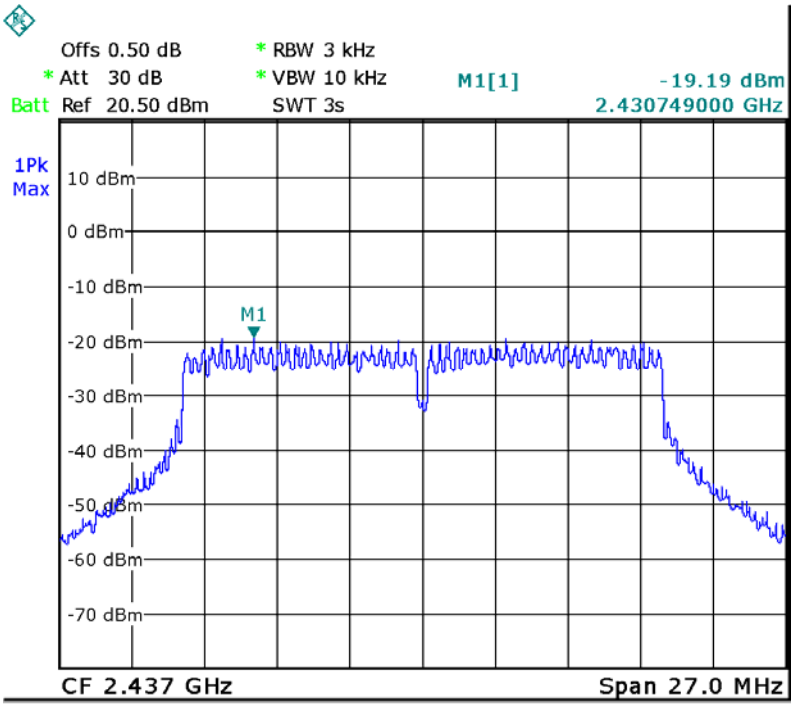
Mode :TX 11g channel 11



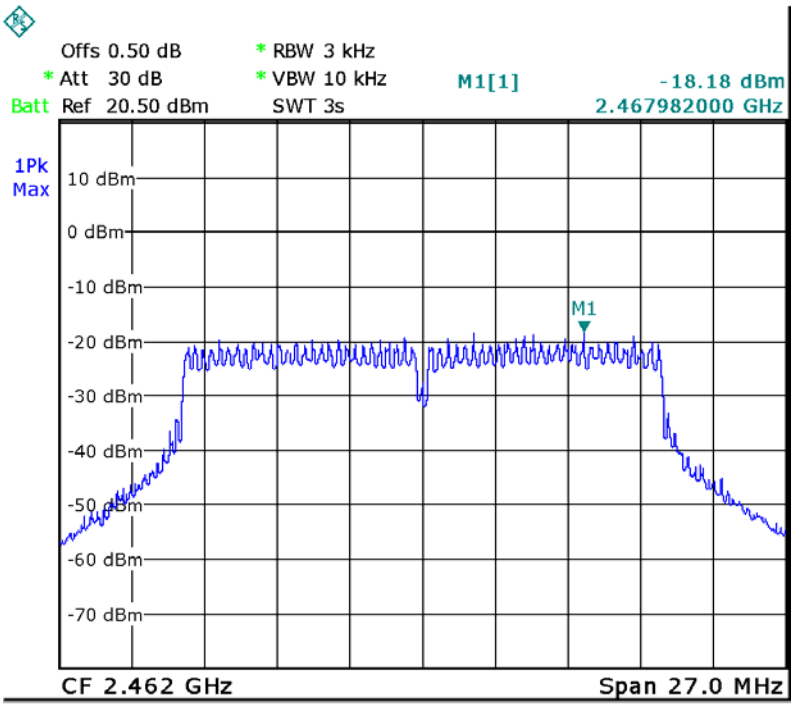
Mode: TX 11n HT20 channel 1



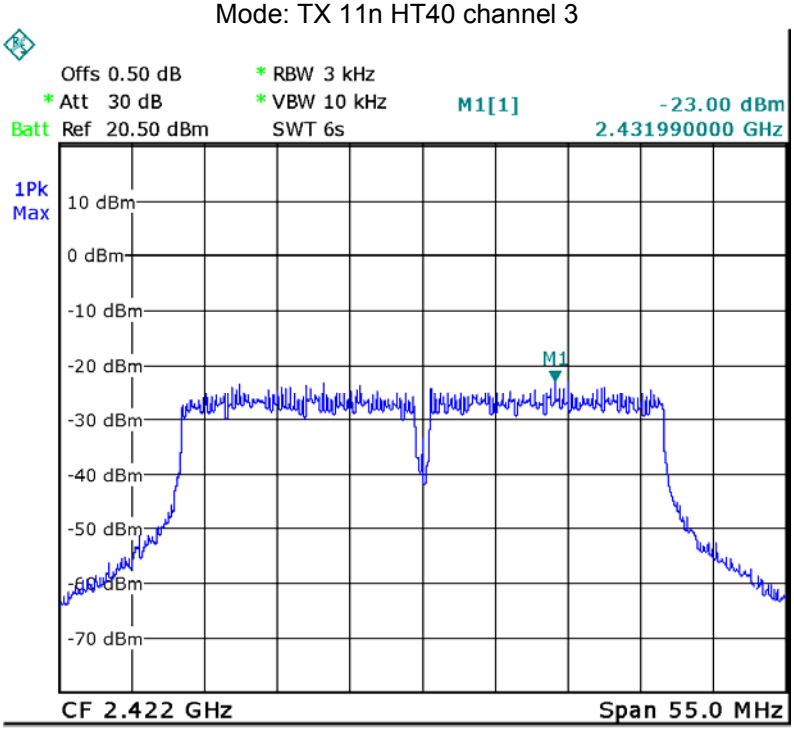
Mode: TX 11n HT20 channel 6



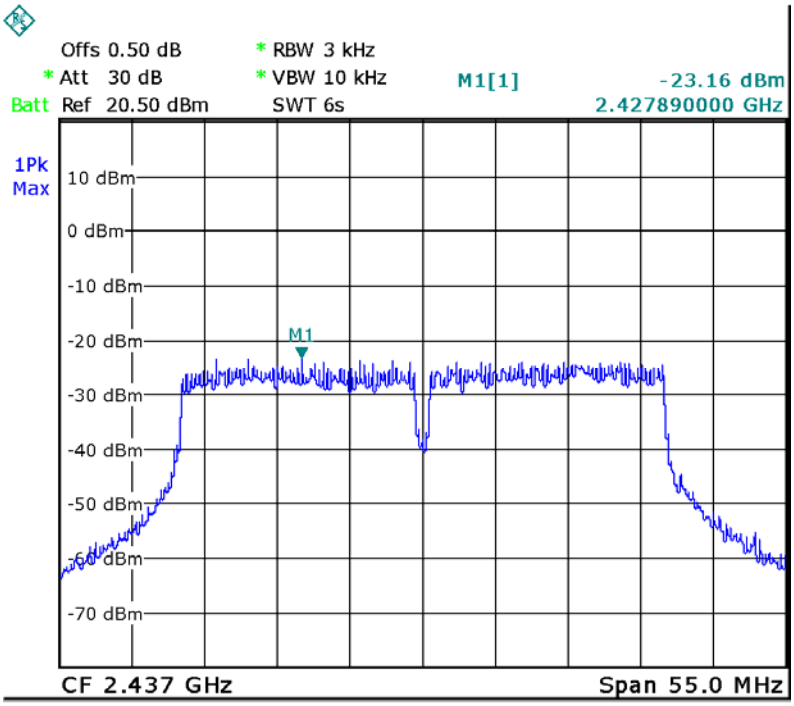
Mode: TX 11n HT20 channel 11



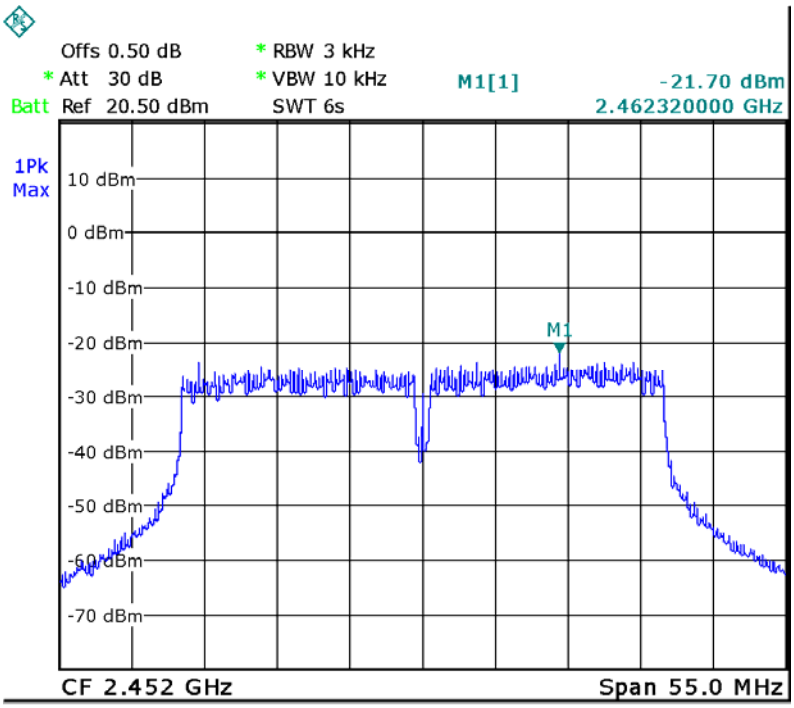
Mode: TX 11n HT40 channel 3



Mode: TX 11n HT40 channel 6



Mode: TX 11n HT40 channel 9



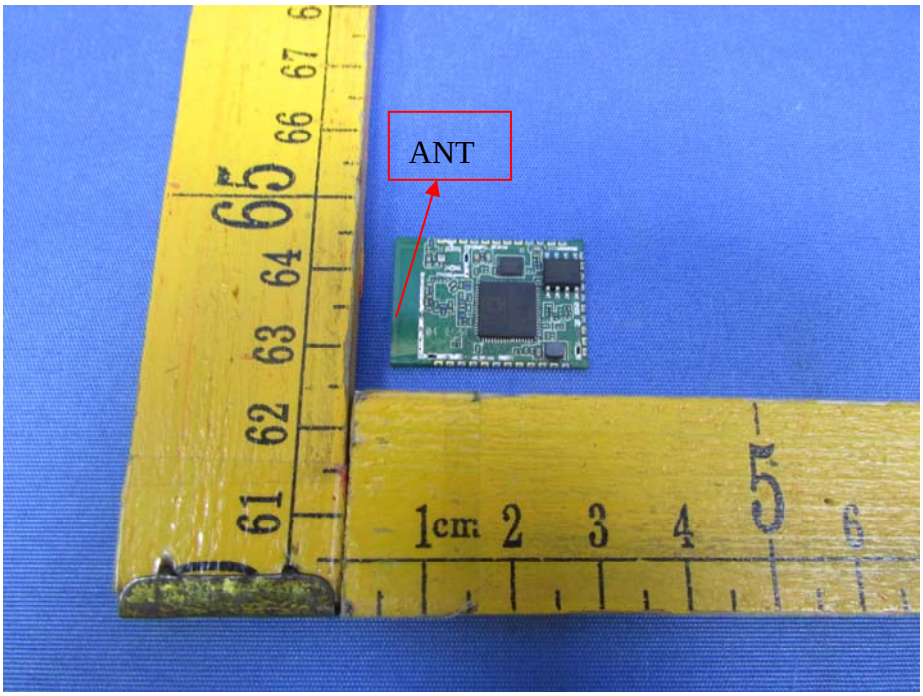
13 Antenna Requirement

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 3dBi. meets the requirements of FCC 15.203.



14 RF Exposure

Test Requirement: FCC Part 1.1307

Evaluation Method: FCC Part 2.1091& 447498 D01 General RF Exposure Guidance v06

14.1 Requirements

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2 m normally can be maintained between the user and the device.

14.2 The procedures / limit

(A) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm^2)	Averaging Time $\|E\|^2$,$\|H\|^2$or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842 / f	4.89 / f	(900 / f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-100,000			5	6

(B) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm^2)	Averaging Time $\|E\|^2$,$\|H\|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30

Note: f = frequency in MHz ; *Plane-wave equivalent power density

14.3 MPE Calculation Method

S = PG* Duty factor / 4πR²

P = Peak Power Input to antenna (Watts)

G = Antenna Gain (numeric)

R = distance to the center of radiation of antenna (in meter) = 0.20 m

Note:

1) P (Watts)=(10 ^ (dBm /10))/1000

2) G (Antenna gain in numeric) = 10^ (Antenna gain in dBi /10)

3) Duty factor

4) π=3.142

From the peak EUT RF output power, the minimum mobile separation distance, R=0.2m, as well as the gain of the used antenna, the RF power density can be obtained

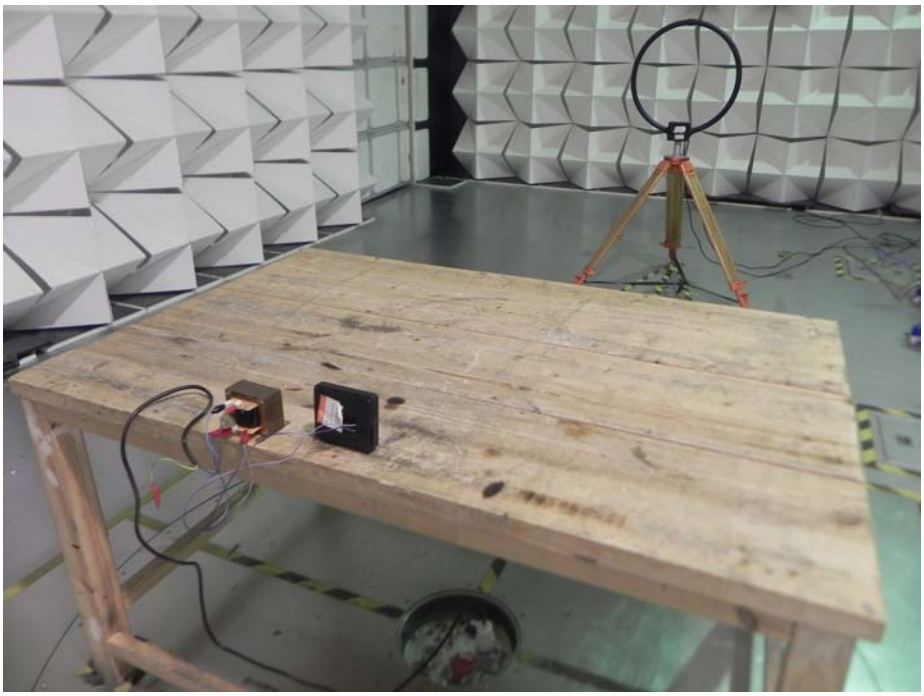
Antenna Gain (numeric)	Max. Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (mW/cm2)	Limit of Power Density (mW/cm2)	Result
1.995	16.93	49.317	0.0196	1	Compliance

15 Photographs – Model TJ-610B Test Setup

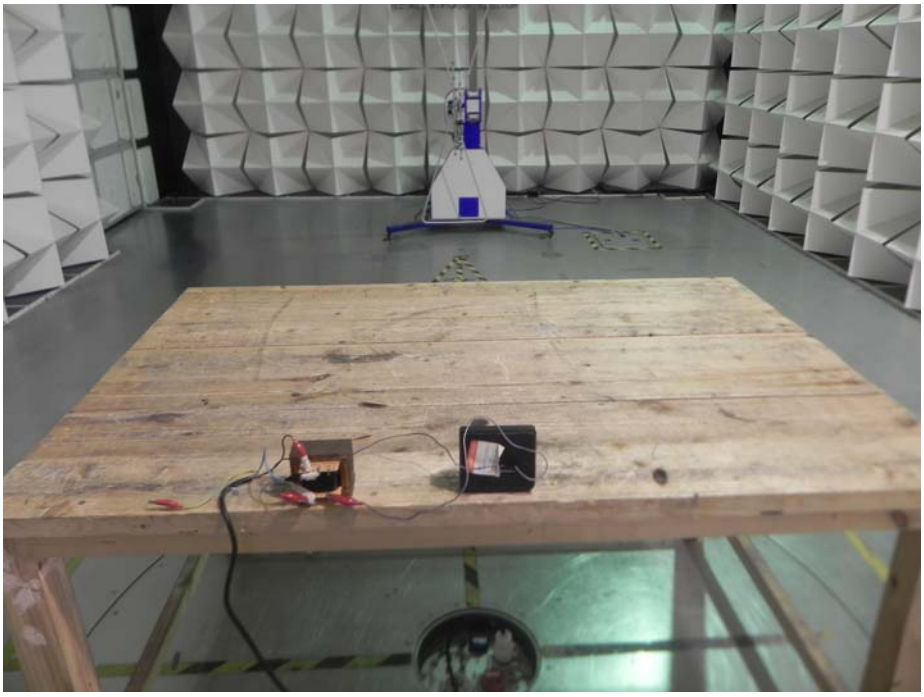
15.1 Conducted Emission at Test Site 2#

15.2 Radiated Emission

Test frequency 32.768KHz to 30MHz at Test Site 2#



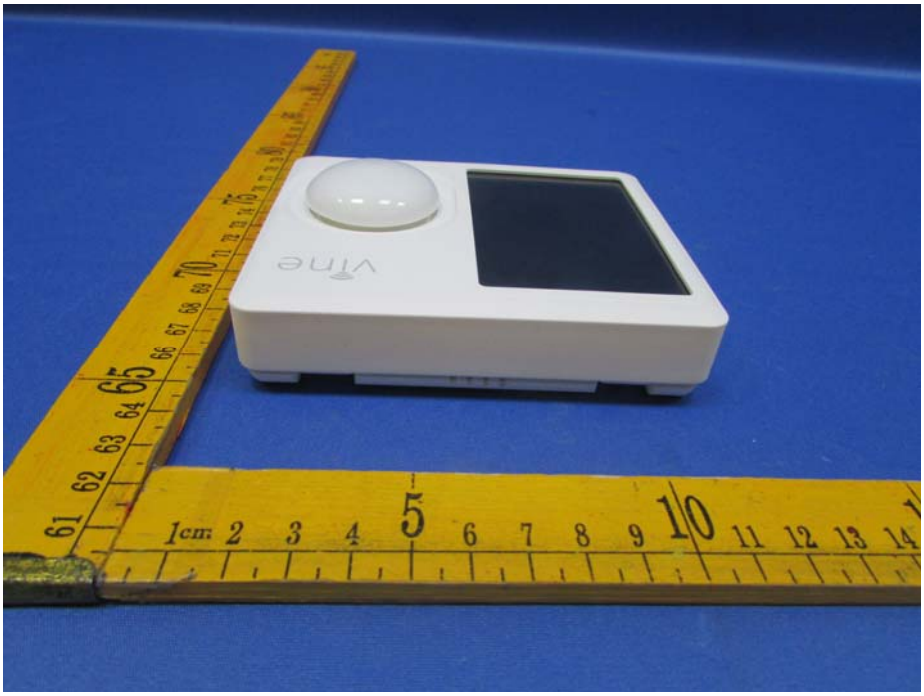
Test frequency from 30MHz to 1GHz at Test Site 2#



Test frequency above 1GHz at Test Site 1#

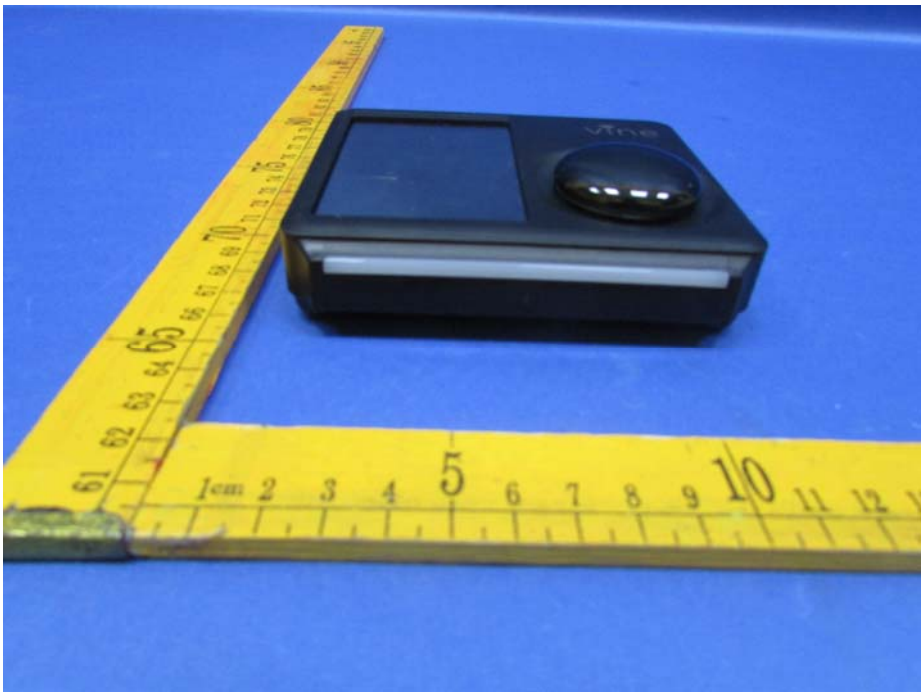
16 Photographs - Constructional Details

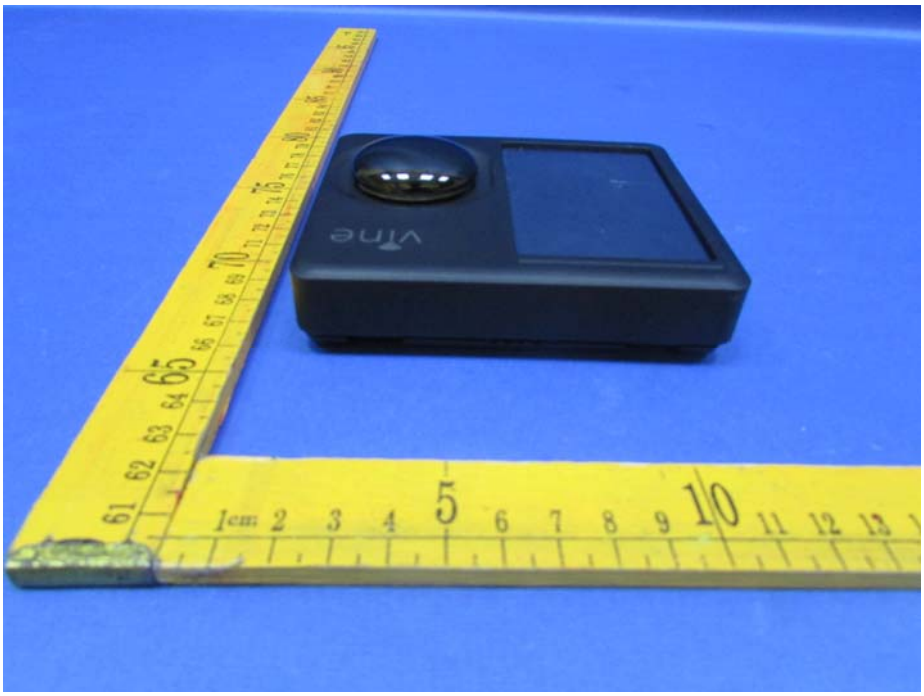
16.1 Model TJ-610B–External Photos


vine
1cm 2 3 4 5 6 7 8 9 10 11 12 13 14
61 62 63 64 65 66 67 68 69 70

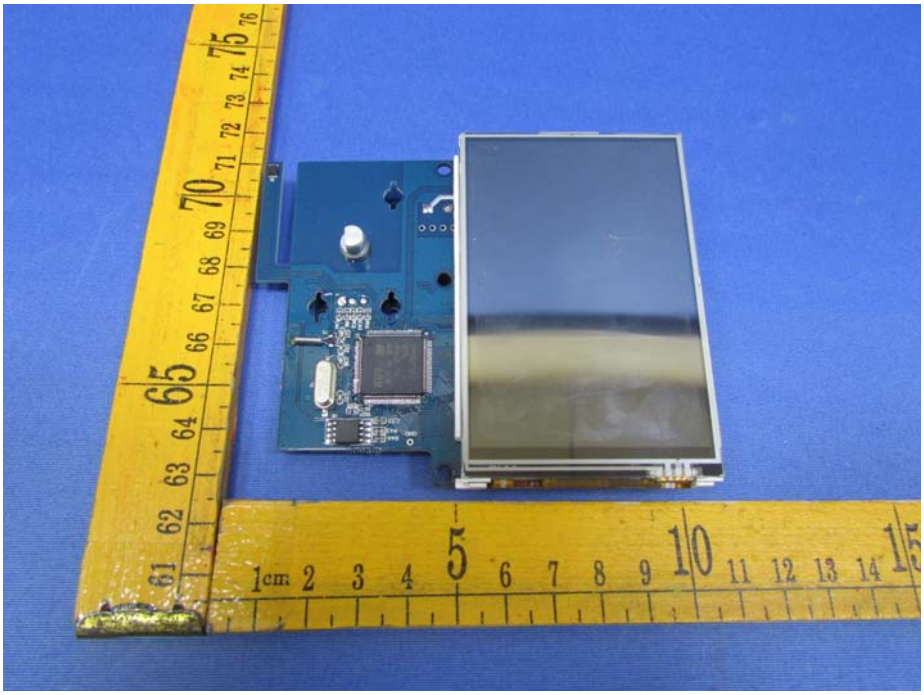

vine
1cm 2 3 4 5 6 7 8 9 10 11 12 13
61 62 63 64 65 66 67 68 69 70

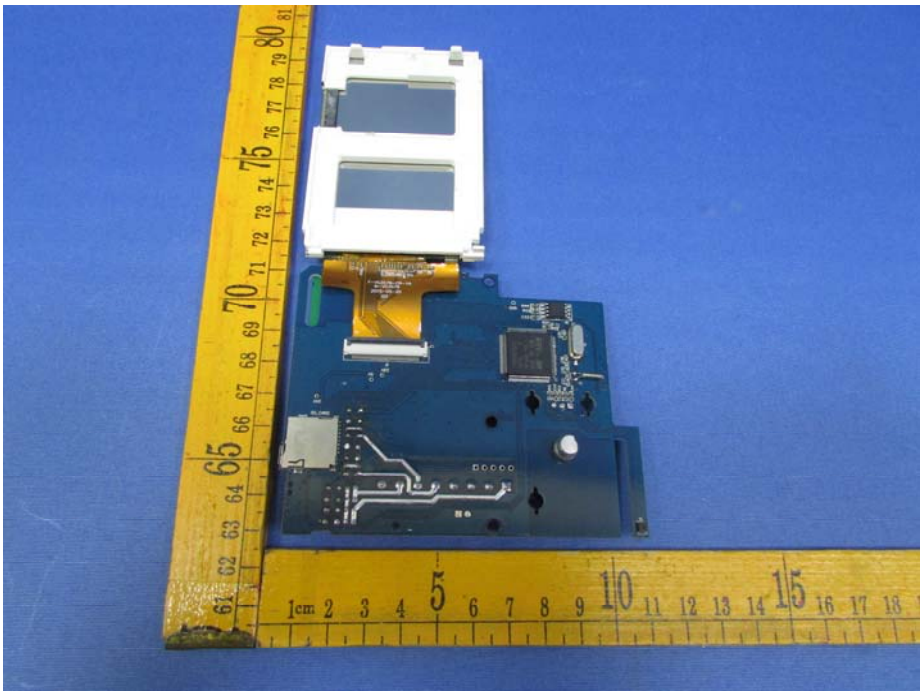

vine

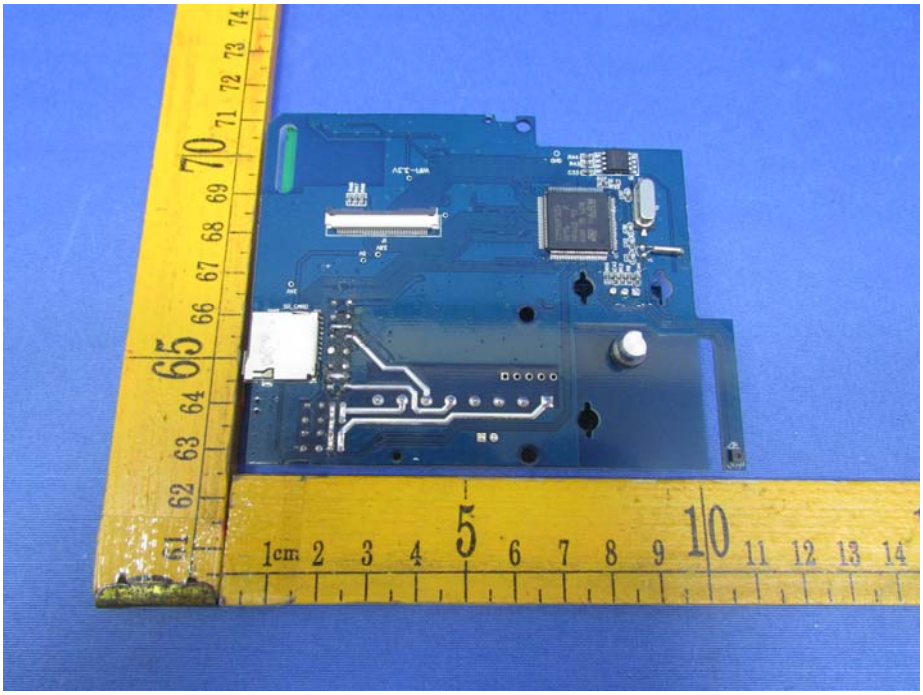


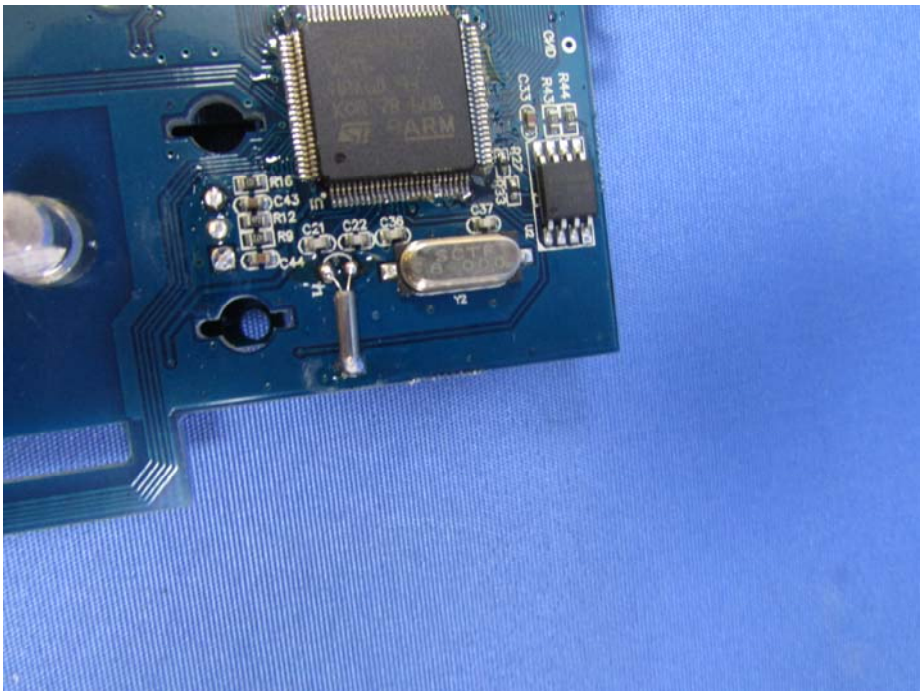


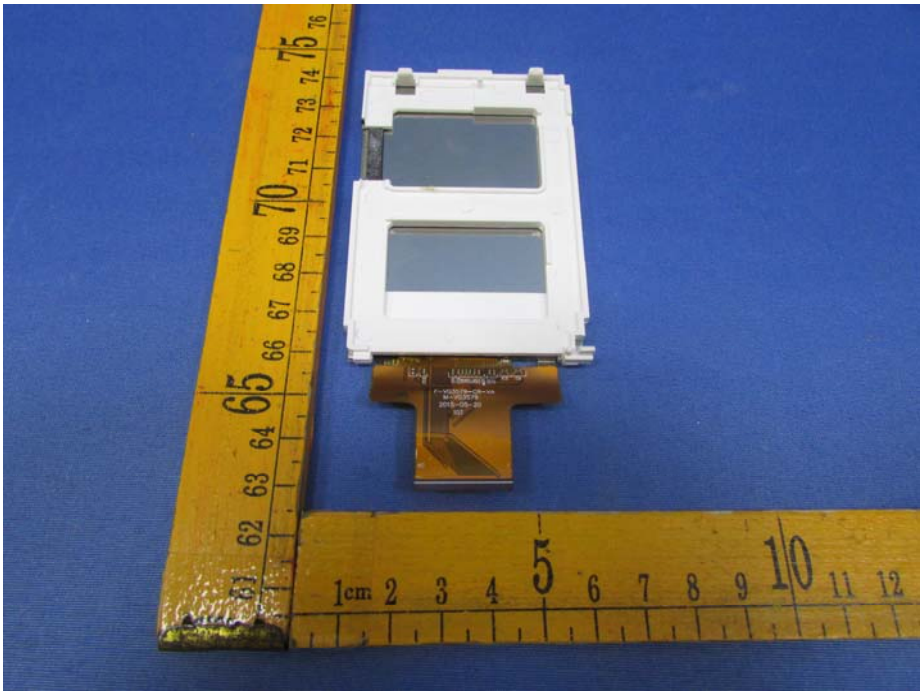
16.2 Model TJ-610B– Internal Photos

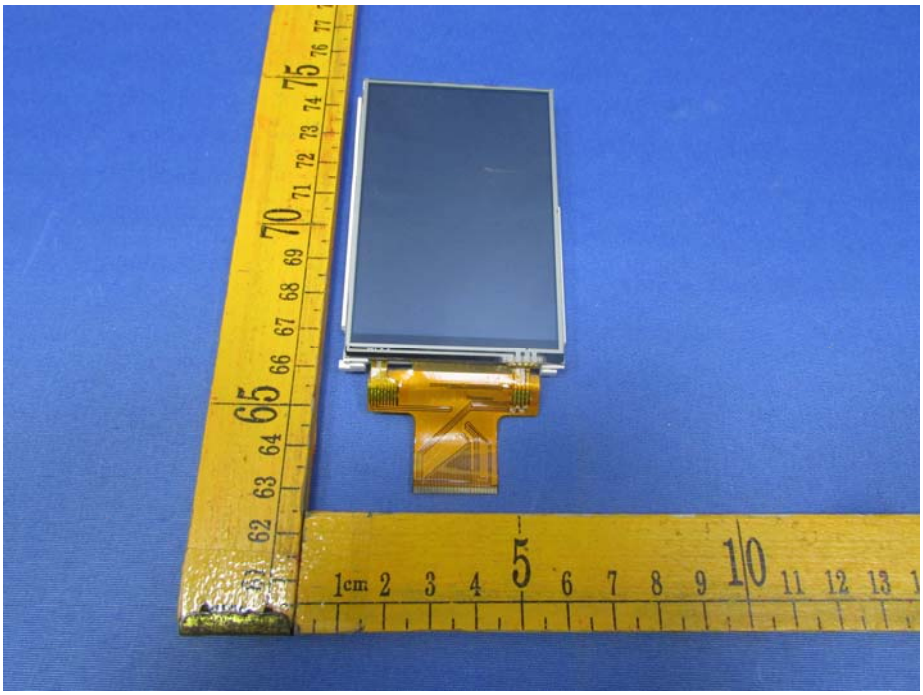


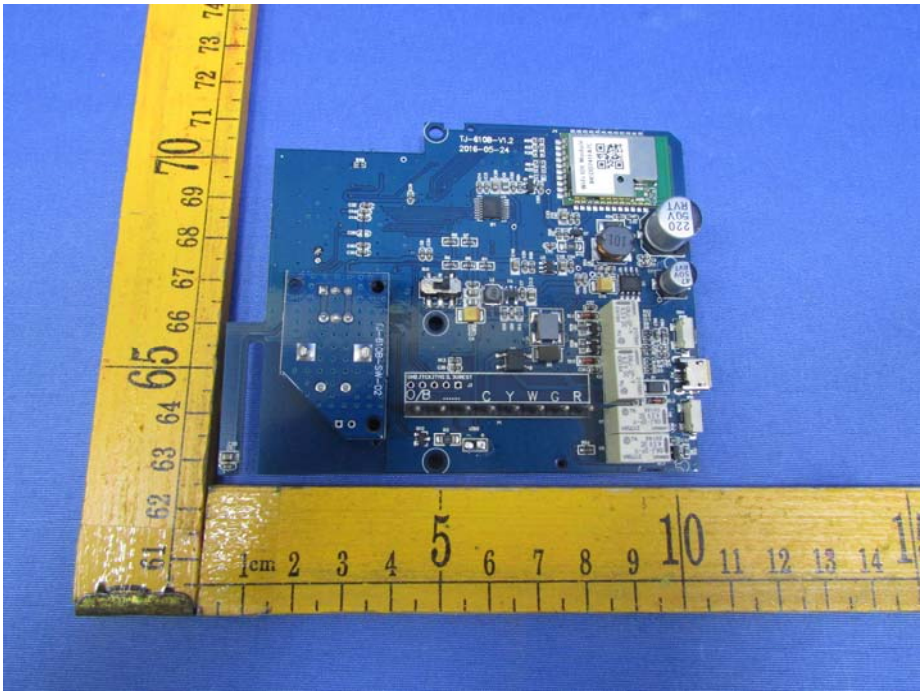


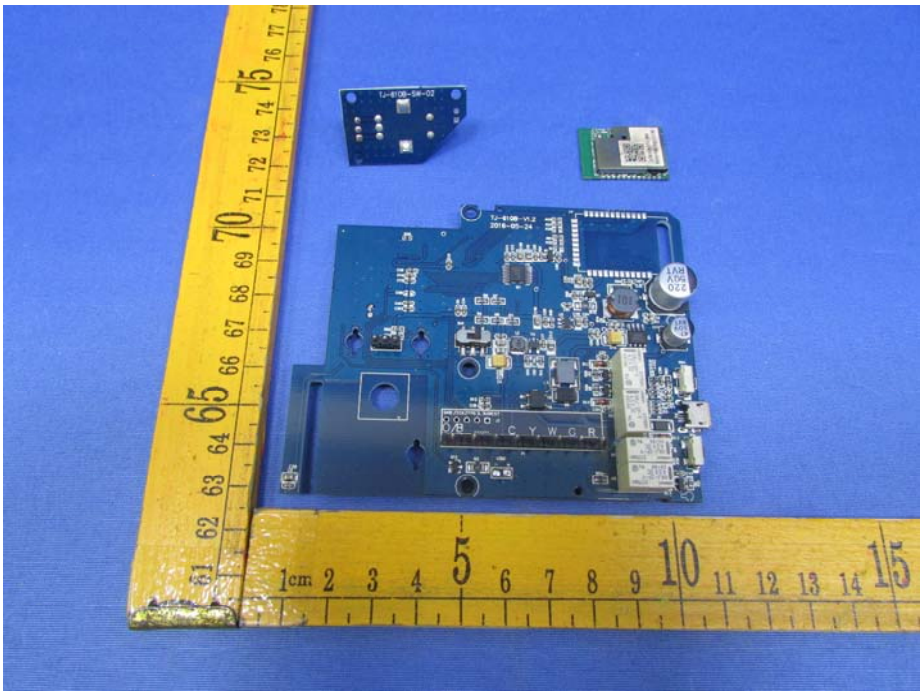


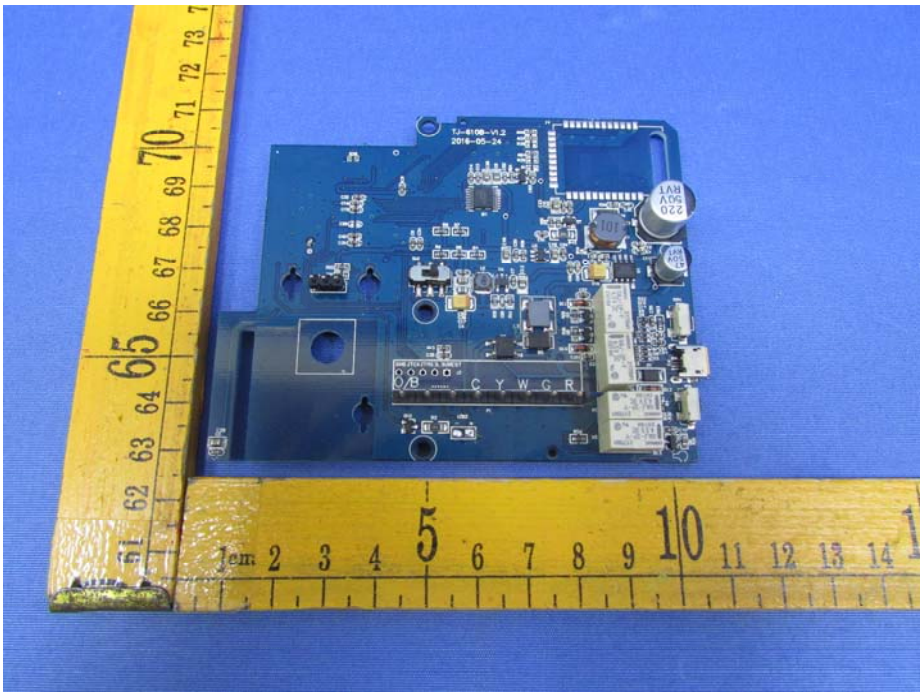


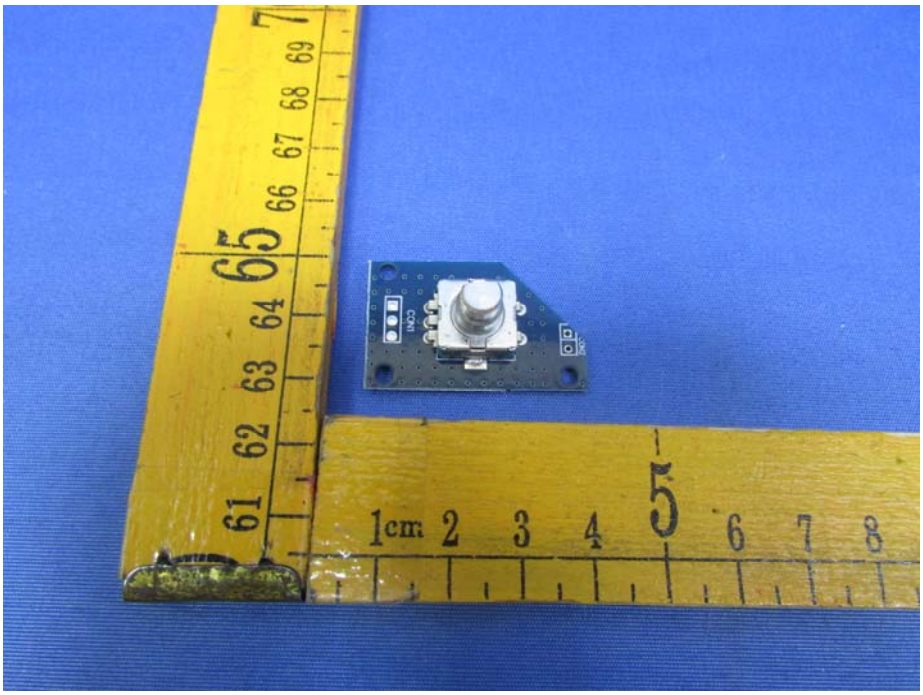


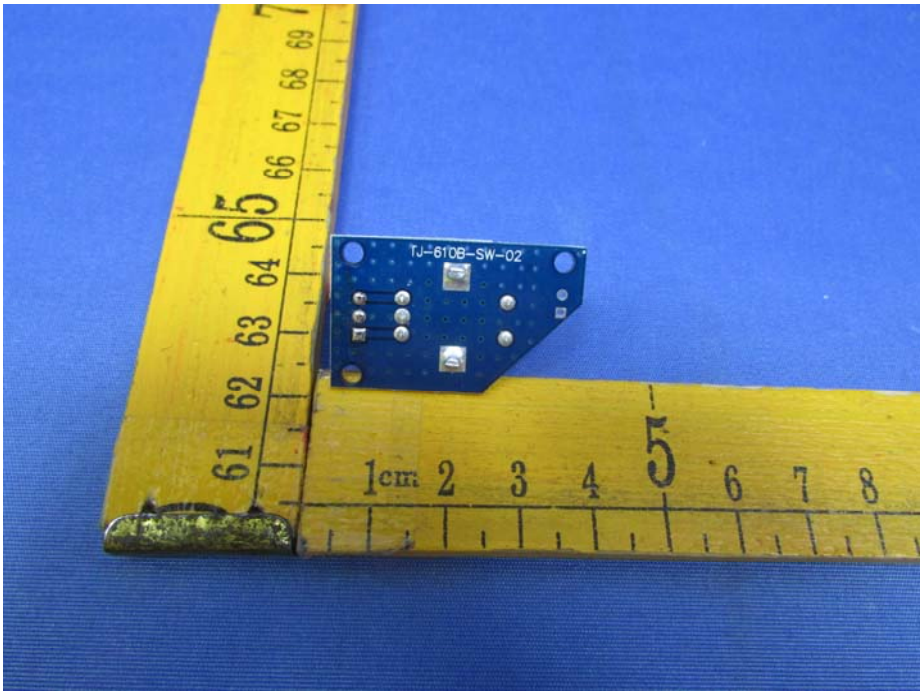


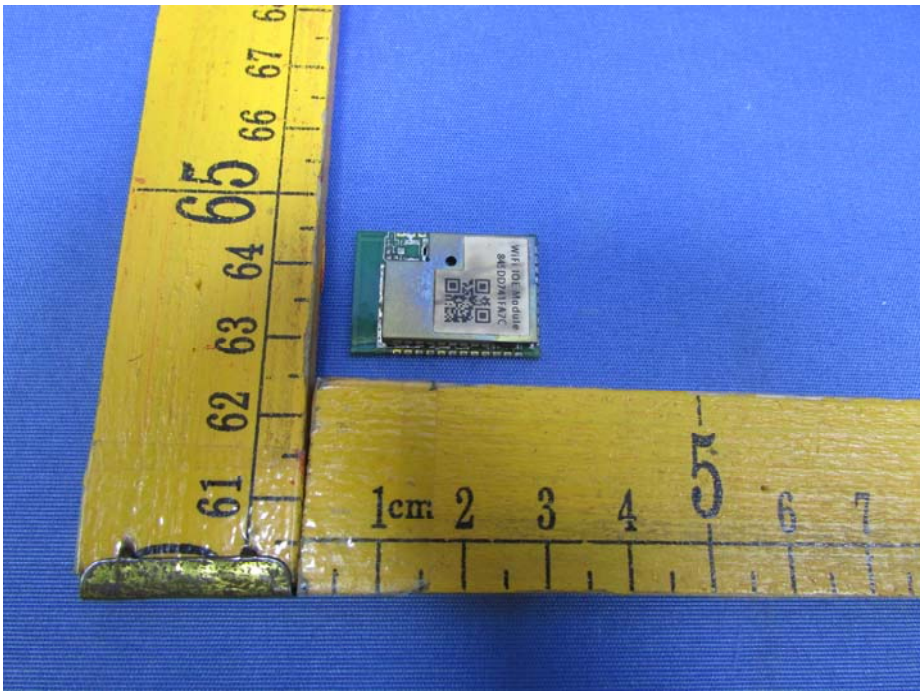


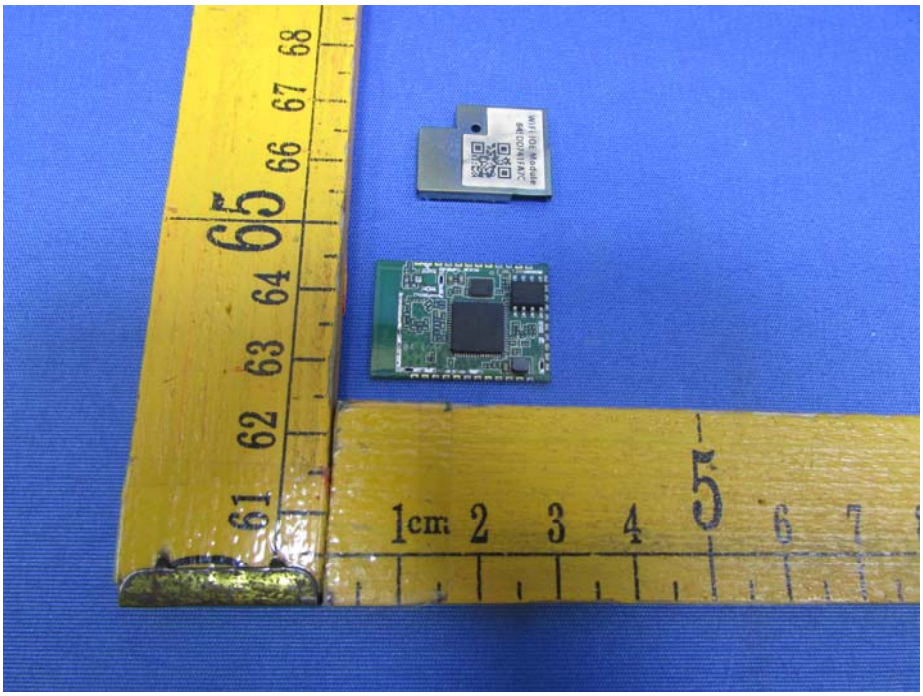





1cm 2 3 4 5 6 7 8


TJ-6108-SW-02
1cm 2 3 4 5 6 7 8


65
66
67
64
63
62
61
1cm
2
3
4
5
6
7


65
66
67
68
64
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1cm
2
3
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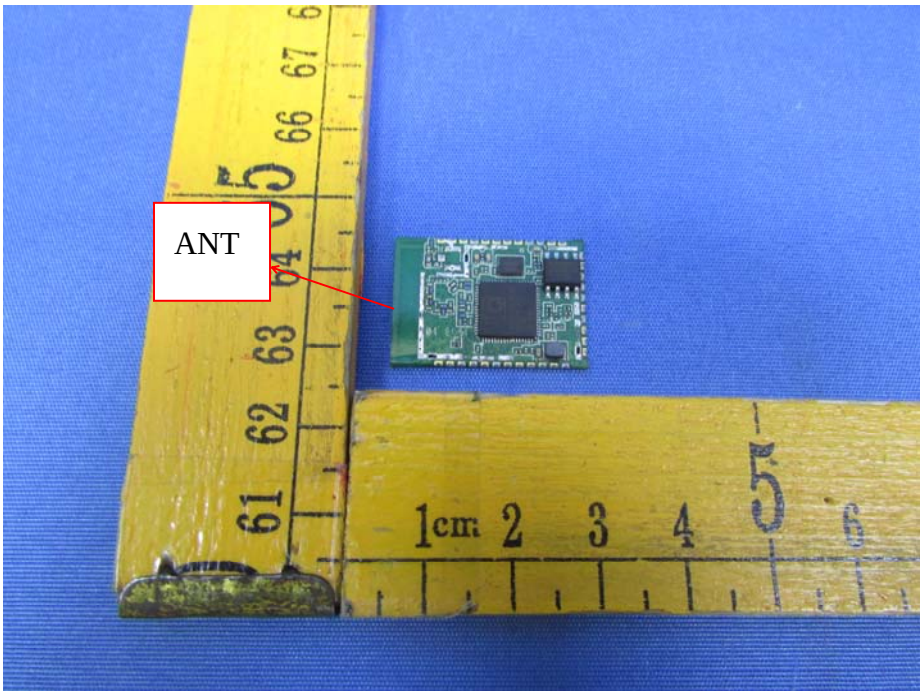

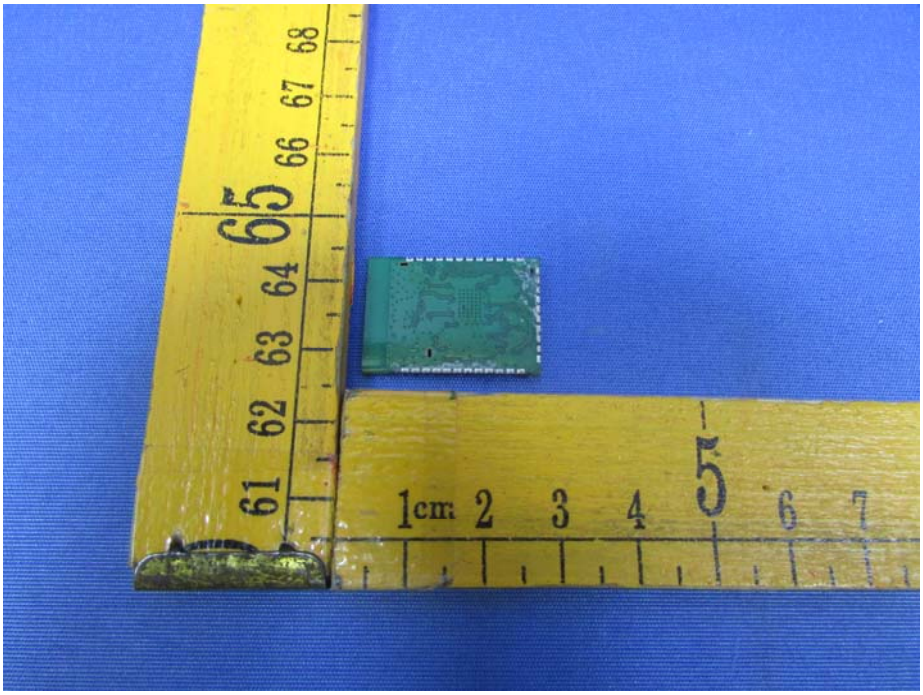

======End of Report======