

TEST REPORT

Reference No. : WTS15S1240381E
FCC ID..... : 2AG9H-BNKCAM01
Applicant : Bunker360 LLC
Address : 80 SW 8th Street Suite 2000 Miami FL 33130, USA
Manufacturer : Quanzhou Karassn Security Protection Electronics Co., Ltd.
Address : No. 5 Chongwen Street, Qingmeng Industrial District, Quanzhou City, Fujian, China.
Product Name : CamKit
Model No. : BNK-CAM01
Standards : FCC CFR47 Part 15 C Section 15.247:2015
Date of Receipt sample..... : Dec. 24, 2015
Date of Test..... : Dec. 25, 2015 - Jan. 15, 2016
Date of Issue : Jan. 28, 2016
Test Result : **Pass**

Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company.

The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

Prepared By:

Waltek Services (Shenzhen) Co., Ltd.

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

Tel :+86-755-83551033

Fax:+86-755-83552400

Compiled by:

Lake Xie

Lake Xie / Test Engineer

Approved by:



Philo Zhong

Philo Zhong / Manager

2 Test Summary

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

3 Contents

	Page
1 COVER PAGE.....	1
2 TEST SUMMARY	2
3 CONTENTS	3
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	5
4.5 TEST FACILITY	7
5 EQUIPMENT USED DURING TEST	8
5.1 EQUIPMENTS LIST	8
5.2 DESCRIPTION OF SUPPORT UNITS	9
5.3 MEASUREMENT UNCERTAINTY	9
5.4 TEST EQUIPMENT CALIBRATION	9
6 CONDUCTED EMISSION	10
6.1 E.U.T. OPERATION	10
6.2 EUT SETUP	10
6.3 MEASUREMENT DESCRIPTION	10
6.4 CONDUCTED EMISSION TEST RESULT	11
7 RADIATED EMISSIONS.....	13
7.1 EUT OPERATION.....	13
7.2 TEST SETUP	14
7.3 SPECTRUM ANALYZER SETUP	15
7.4 TEST PROCEDURE	15
7.5 CORRECTED AMPLITUDE & MARGIN CALCULATION	16
7.6 SUMMARY OF TEST RESULTS	17
8 BAND EDGE MEASUREMENT	29
8.1 TEST PRODUCE	29
8.2 TEST RESULT	30
9 6 DB BANDWIDTH MEASUREMENT	34
9.1 TEST PROCEDURE:	34
9.2 TEST RESULT:	34
10 MAXIMUM PEAK OUTPUT POWER	41
10.1 TEST PROCEDURE:	41
10.2 TEST RESULT:	41
11 POWER SPECTRAL DENSITY	48
11.1 TEST PROCEDURE:	48
11.2 TEST RESULT:	48
12 ANTENNA REQUIREMENT	55
13 RF EXPOSURE.....	56
13.1 REQUIREMENTS.....	56
13.2 THE PROCEDURES / LIMIT	56
13.3 MPE CALCULATION METHOD	57
14 PHOTOGRAPHS – MODEL BNK-CAM01 TEST SETUP	58
14.1 CONDUCTED EMISSION AT TEST SITE 1#.....	58
14.2 RADIATED EMISSION	58

15 PHOTOGRAPHS - CONSTRUCTIONAL DETAILS60

15.1 MODEL BNK-CAM01 –EXTERNAL VIEW60

15.2 MODEL C8130E – INTERNAL VIEW65

4 General Information

4.1 General Description of E.U.T.

Product Name:	CamKit
Model No.:	BNK-CAM01
Model Difference:	N/A
Operation Frequency:	802.11 b/g/n HT20:2412MHz ~ 2462MHz, 802.11 n HT40:2422MHz~2452MHz
The Lowest Oscillator:	24MHz
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 5V, 1.5A by adapter Input:100-240V~50/60Hz 0.3A Max Output: 5V 1500mA
-----------------	--

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 .

Table 2 Tests Carried Out Under FCC part 15.207 & FCC part 15.209

Test Item	Test Mode
Conduction Emission, 0.15MHz to 30MHz	Communication

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.14,2015	Sep.13,2016
2.	LISN	R&S	ENV216	101215	Sep.14,2015	Sep.13,2016
3.	Cable	Top	TYPE16(3.5M)	-	Sep.14,2015	Sep.13,2016
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.14,2015	Sep.13,2016
2.	LISN	SCHWARZBECK	NSLK 8128	8128-289	Sep.14,2015	Sep.13,2016
3.	Limiter	York	MTS-IMP-136	261115-001-0024	Sep.14,2015	Sep.13,2016
4.	Cable	LARGE	RF300	-	Sep.14,2015	Sep.13,2016
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.14,2015	Sep.13,2016
2	Active Loop Antenna	Beijing Dazhi	ZN30900A	-	Sep.14,2015	Sep.13,2016
3	Trilog Broadband Antenna	SCHWARZBECK	VULB9163	336	Apr.18,2015	Apr.17,2016
4	Coaxial Cable (below 1GHz)	Top	TYPE16(13M)	-	Sep.14,2015	Sep.13,2016
5	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	667	Apr.18,2015	Apr.17,2016
6	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9170	335	Apr.18,2015	Apr.17,2016
7	Broadband Preamplifier	COMPLIANCE DIRECTION	PAP-1G18	2004	Mar.16,2015	Mar.15,2016
8	Coaxial Cable (above 1GHz)	Top	1GHz-25GHz	EW02014-7	Apr.09,2015	Apr.08,2016
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.14,2015	Sep.13,2016
2	Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3325	Sep.14,2015	Sep.13,2016
3	Amplifier	Compliance pirection systems inc	PAP-0203	22024	Sep.14,2015	Sep.13,2016
4	Cable	HUBER+SUHNER	CBL2	525178	Sep.14,2015	Sep.13,2016

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.14,2015	Sep.13,2016
2.	Spectrum Analyzer (9k-6GHz)	R&S	FSL6	100959	Sep.14,2015	Sep.13,2016
3.	Signal Analyzer (9k~26.5GHz)	Agilent	N9010A	MY50520207	Sep.14,2015	Sep.13,2016

5.2 Description of Support Units

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

5.3 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)

5.4 Test Equipment Calibration

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

6 Conducted Emission

Test Requirement:	FCC CFR 47 Part 15 Section 15.207
Test Method:	ANSI C63.4:2009
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)

6.1 E.U.T. Operation

Operating Environment :

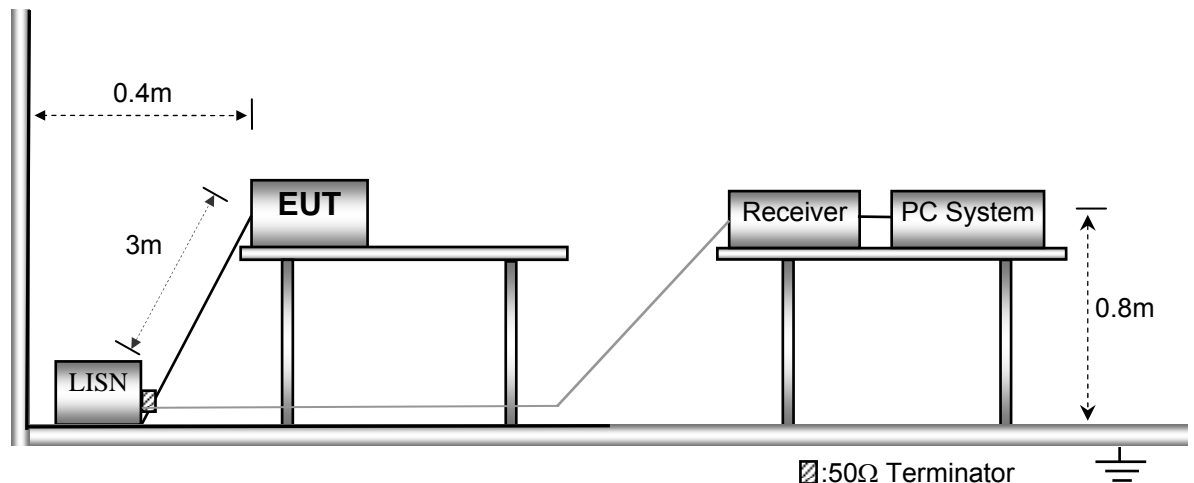
Temperature:	21.5 °C
Humidity:	51.9 % RH
Atmospheric Pressure:	101.2kPa

EUT Operation :

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

6.2 EUT Setup

The conducted emission tests were performed using the setup accordance with the ANSI C63.4.



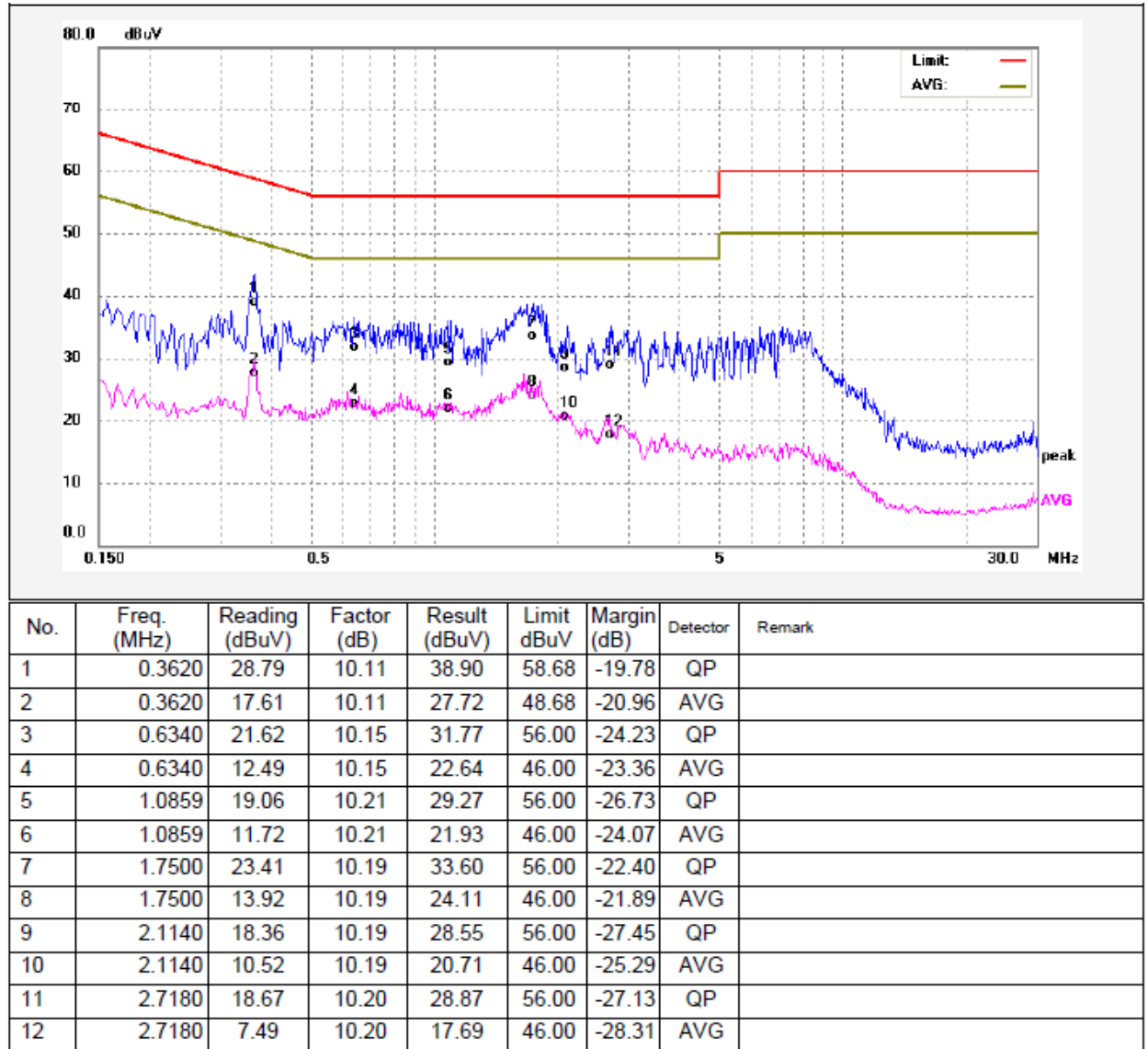
6.3 Measurement Description

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

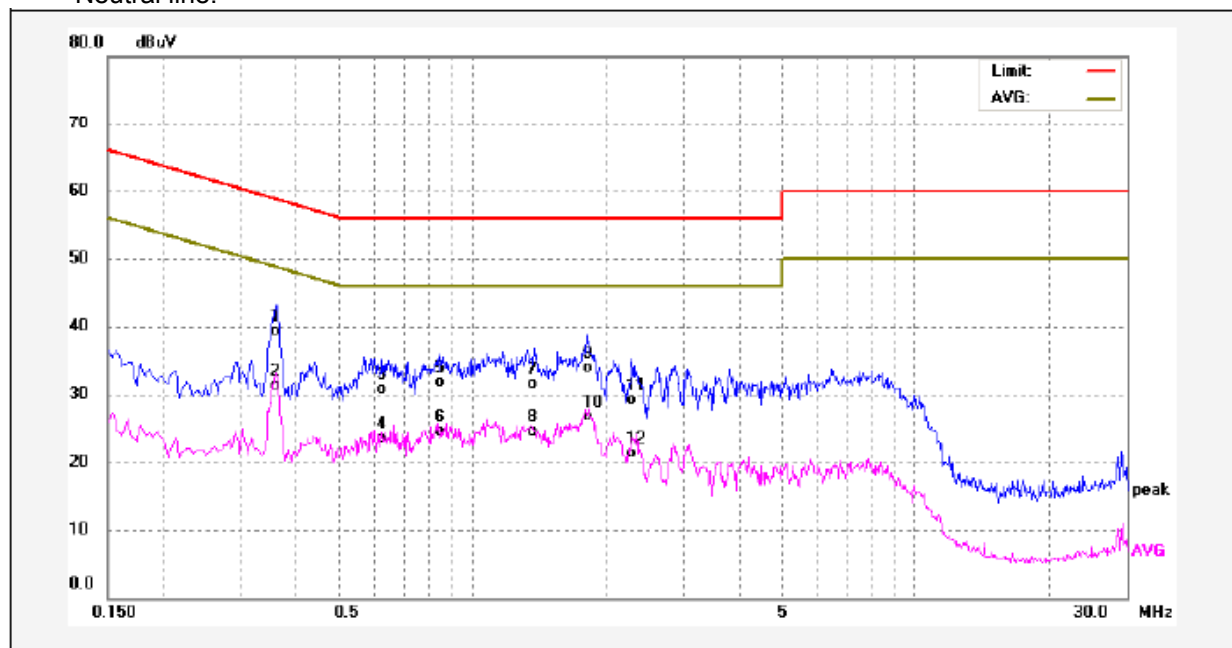
6.4 Conducted Emission Test Result

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

Live line:



Neutral line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.3620	29.20	10.11	39.31	58.68	-19.37	QP	
2	0.3620	21.21	10.11	31.32	48.68	-17.36	AVG	
3	0.6260	20.53	10.15	30.68	56.00	-25.32	QP	
4	0.6260	13.34	10.15	23.49	46.00	-22.51	AVG	
5	0.8460	21.53	10.19	31.72	56.00	-24.28	QP	
6	0.8460	14.37	10.19	24.56	46.00	-21.44	AVG	
7	1.3779	21.37	10.20	31.57	56.00	-24.43	QP	
8	1.3779	14.36	10.20	24.56	46.00	-21.44	AVG	
9	1.8140	23.65	10.19	33.84	56.00	-22.16	QP	
10	1.8140	16.45	10.19	26.64	46.00	-19.36	AVG	
11	2.2940	18.89	10.20	29.09	56.00	-26.91	QP	
12	2.2940	11.14	10.20	21.34	46.00	-24.66	AVG	

7 Radiated Emissions

Test Requirement: FCC CFR47 Part 15 Section 15.209 & 15.247

Test Method: ANSI C63.4:2009

Test Result: PASS

Measurement Distance: 3m

Limit:

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

7.1 EUT Operation

Operating Environment :

Temperature: 23.5 °C

Humidity: 52.1 % RH

Atmospheric Pressure: 101.2kPa

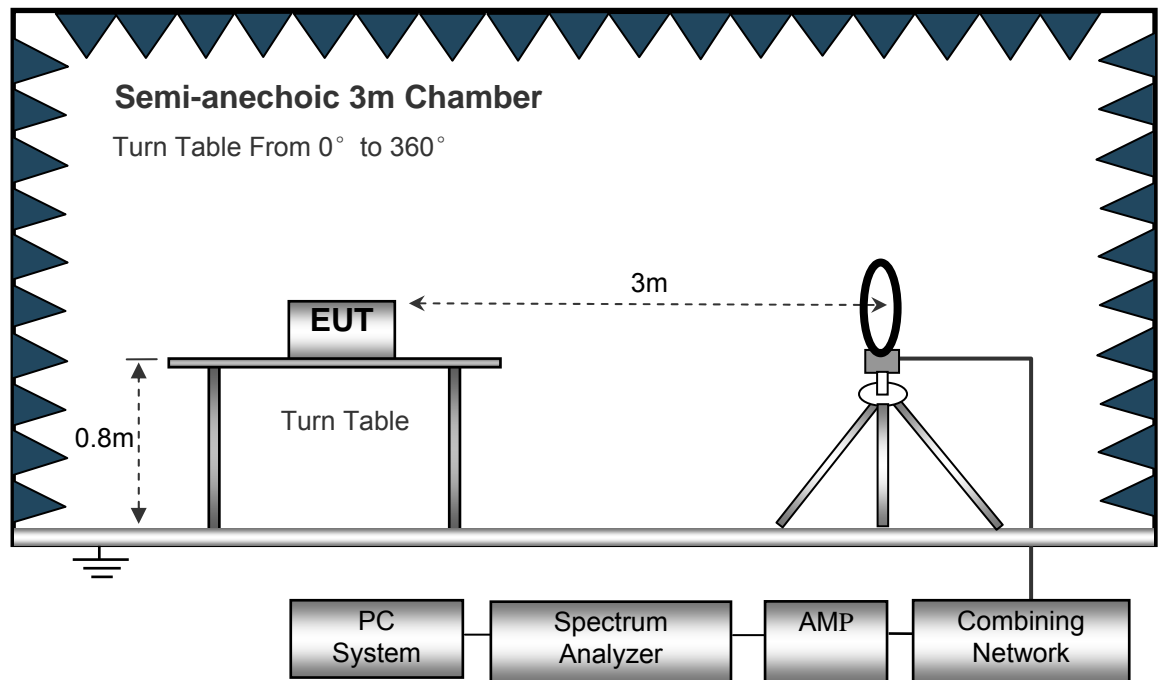
EUT Operation :

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

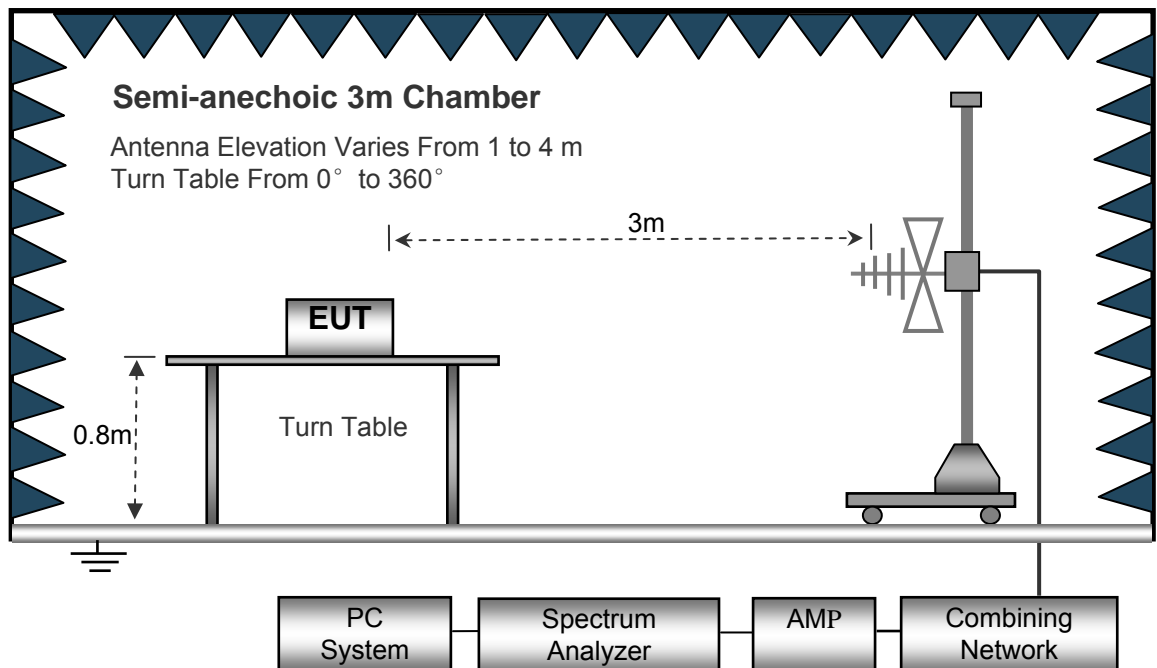
7.2 Test Setup

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

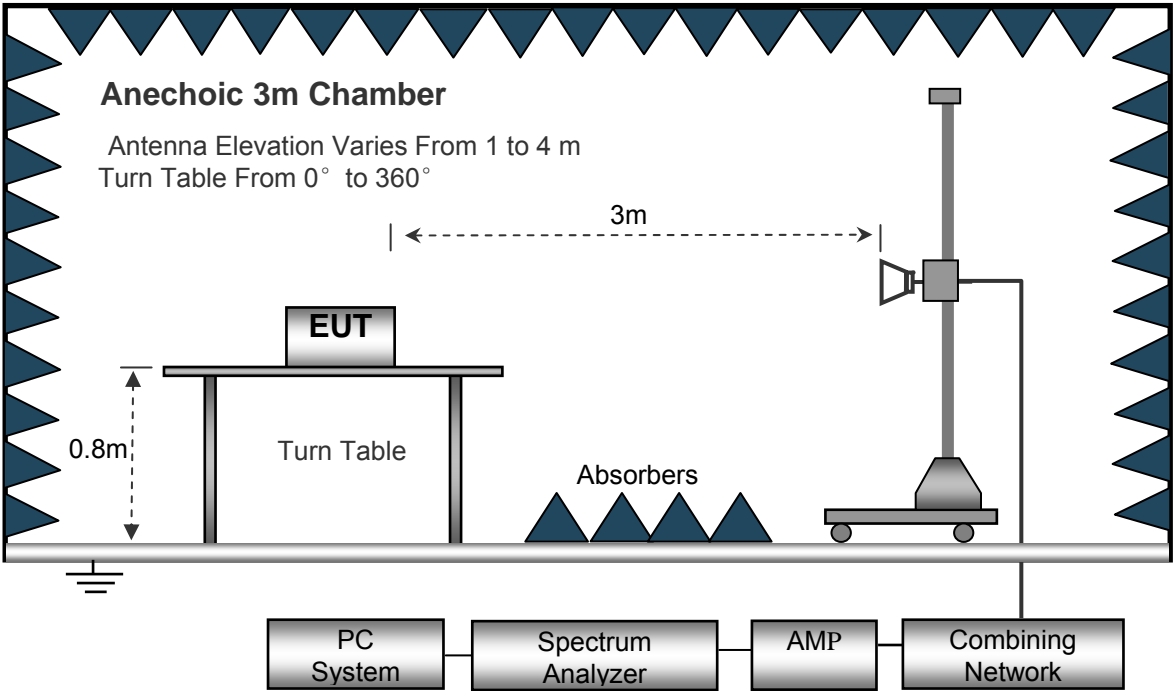
The test setup for emission measurement below 30MHz.



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



The test setup for emission measurement above 1 GHz.



7.3 Spectrum Analyzer Setup

Below 30MHz

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

30MHz ~ 1GHz

Sweep Speed Auto
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

7.4 Test Procedure

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.

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

7.5 Corrected Amplitude & Margin Calculation

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

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

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:

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

7.6 Summary of Test Results

Test Frequency : 24MHz ~ 30MHz

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

Test Frequency : 30MHz ~ 18GHz

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	FCC Part 15.247/209/205	
				Height	Polar			Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
11b: Low Channel 2412MHz									
223.45	41.29	QP	69	1.6	H	-11.62	29.67	46.00	-16.33
223.45	37.52	QP	351	1.4	V	-11.62	25.90	46.00	-20.10
4824.00	48.48	PK	215	1.9	V	-1.06	47.42	74.00	-26.58
4824.00	47.57	Ave	215	1.9	V	-1.06	46.51	54.00	-7.49
7236.00	40.71	PK	38	1.1	H	1.33	42.04	74.00	-31.96
7236.00	41.97	Ave	38	1.1	H	1.33	43.30	54.00	-10.70
2335.97	45.27	PK	102	1.7	V	-13.19	32.08	74.00	-41.92
2335.97	37.37	Ave	102	1.7	V	-13.19	24.18	54.00	-29.82
2380.34	42.20	PK	36	1.1	H	-13.14	29.06	74.00	-44.94
2380.34	36.83	Ave	36	1.1	H	-13.14	23.69	54.00	-30.31
2491.92	42.45	PK	242	1.5	V	-13.08	29.37	74.00	-44.63
2491.92	38.55	Ave	242	1.5	V	-13.08	25.47	54.00	-28.53

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									
223.45	42.32	QP	302	1.4	H	-11.62	30.70	46.00	-15.30
223.45	37.50	QP	300	1.4	V	-11.62	25.88	46.00	-20.12
4874.00	47.38	PK	259	1.8	V	-0.62	46.76	74.00	-27.24
4874.00	47.32	Ave	259	1.8	V	-0.62	46.70	54.00	-7.30
7311.00	40.76	PK	210	1.4	H	2.21	42.97	74.00	-31.03
7311.00	42.06	Ave	210	1.4	H	2.21	44.27	54.00	-9.73
2324.31	45.51	PK	229	1.2	V	-13.19	32.32	74.00	-41.68
2324.31	39.61	Ave	229	1.2	V	-13.19	26.42	54.00	-27.58
2375.33	44.89	PK	340	1.5	H	-13.14	31.75	74.00	-42.25
2375.33	36.30	Ave	340	1.5	H	-13.14	23.16	54.00	-30.84
2499.58	42.29	PK	163	2.0	V	-13.08	29.21	74.00	-44.79
2499.58	38.84	Ave	163	2.0	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)
11b: High Channel 2462MHz									
223.45	41.11	QP	358	1.8	H	-11.62	29.49	46.00	-16.51
223.45	37.28	QP	291	1.6	V	-11.62	25.66	46.00	-20.34
4924.00	48.53	PK	223	1.8	V	-0.24	48.29	74.00	-25.71
4924.00	48.18	Ave	223	1.8	V	-0.24	47.94	54.00	-6.06
7386.00	41.63	PK	47	1.8	H	2.84	44.47	74.00	-29.53
7386.00	41.95	Ave	47	1.8	H	2.84	44.79	54.00	-9.21
2343.09	46.77	PK	225	1.4	V	-13.19	33.58	74.00	-40.42
2343.09	39.64	Ave	225	1.4	V	-13.19	26.45	54.00	-27.55
2382.43	44.49	PK	178	1.8	H	-13.14	31.35	74.00	-42.65
2382.43	36.08	Ave	178	1.8	H	-13.14	22.94	54.00	-31.06
2486.89	43.89	PK	298	1.0	V	-13.08	30.81	74.00	-43.19
2486.89	37.25	Ave	298	1.0	V	-13.08	24.17	54.00	-29.83

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									
223.45	42.49	QP	122	1.8	H	-11.62	30.87	46.00	-15.13
223.45	36.59	QP	130	1.5	V	-11.62	24.97	46.00	-21.03
4824.00	48.97	PK	351	1.1	V	-1.06	47.91	74.00	-26.09
4824.00	49.41	Ave	351	1.1	V	-1.06	48.35	54.00	-5.65
7236.00	41.40	PK	184	1.7	H	1.33	42.73	74.00	-31.27
7236.00	42.39	Ave	184	1.7	H	1.33	43.72	54.00	-10.28
2324.37	46.78	PK	239	1.9	V	-13.19	33.59	74.00	-40.41
2324.37	37.28	Ave	239	1.9	V	-13.19	24.09	54.00	-29.91
2365.88	42.59	PK	320	1.2	H	-13.14	29.45	74.00	-44.55
2365.88	36.69	Ave	320	1.2	H	-13.14	23.55	54.00	-30.45
2483.88	44.89	PK	117	1.0	V	-13.08	31.81	74.00	-42.19
2483.88	36.89	Ave	117	1.0	V	-13.08	23.81	54.00	-30.19

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									
223.45	43.93	QP	345	1.9	H	-11.62	32.31	46.00	-13.69
223.45	37.97	QP	294	1.5	V	-11.62	26.35	46.00	-19.65
4874.00	49.79	PK	178	1.3	V	-0.62	49.17	74.00	-24.83
4874.00	49.63	Ave	178	1.3	V	-0.62	49.01	54.00	-4.99
7311.00	40.32	PK	316	1.8	H	2.21	42.53	74.00	-31.47
7311.00	43.69	Ave	316	1.8	H	2.21	45.90	54.00	-8.10
2342.27	46.81	PK	282	1.2	V	-13.19	33.62	74.00	-40.38
2342.27	38.54	Ave	282	1.2	V	-13.19	25.35	54.00	-28.65
2355.53	43.47	PK	65	1.3	H	-13.14	30.33	74.00	-43.67
2355.53	38.51	Ave	65	1.3	H	-13.14	25.37	54.00	-28.63
2492.02	42.29	PK	3	1.7	V	-13.08	29.21	74.00	-44.79
2492.02	36.10	Ave	3	1.7	V	-13.08	23.02	54.00	-30.98

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									
223.45	43.86	QP	13	2.0	H	-11.62	32.24	46.00	-13.76
223.45	39.04	QP	75	1.2	V	-11.62	27.42	46.00	-18.58
4924.00	49.13	PK	279	1.9	V	-0.24	48.89	74.00	-25.11
4924.00	48.56	Ave	279	1.9	V	-0.24	48.32	54.00	-5.68
7386.00	39.95	PK	66	1.6	H	2.84	42.79	74.00	-31.21
7386.00	42.36	Ave	66	1.6	H	2.84	45.20	54.00	-8.80
2348.53	46.67	PK	93	1.2	V	-13.19	33.48	74.00	-40.52
2348.53	39.19	Ave	93	1.2	V	-13.19	26.00	54.00	-28.00
2377.46	43.31	PK	164	1.3	H	-13.14	30.17	74.00	-43.83
2377.46	38.39	Ave	164	1.3	H	-13.14	25.25	54.00	-28.75
2494.34	42.80	PK	278	1.3	V	-13.08	29.72	74.00	-44.28
2494.34	38.09	Ave	278	1.3	V	-13.08	25.01	54.00	-28.99

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									
223.45	43.13	QP	252	1.8	H	-11.62	31.51	46.00	-14.49
223.45	39.10	QP	349	1.4	V	-11.62	27.48	46.00	-18.52
4824.00	48.35	PK	210	1.5	V	-1.06	47.29	74.00	-26.71
4824.00	47.93	Ave	210	1.5	V	-1.06	46.87	54.00	-7.13
7236.00	39.74	PK	238	1.1	H	1.33	41.07	74.00	-32.93
7236.00	43.22	Ave	238	1.1	H	1.33	44.55	54.00	-9.45
2323.19	46.58	PK	216	1.9	V	-13.19	33.39	74.00	-40.61
2323.19	38.13	Ave	216	1.9	V	-13.19	24.94	54.00	-29.06
2352.13	44.82	PK	229	1.7	H	-13.14	31.68	74.00	-42.32
2352.13	36.37	Ave	229	1.7	H	-13.14	23.23	54.00	-30.77
2486.87	42.44	PK	6	1.8	V	-13.08	29.36	74.00	-44.64
2486.87	38.35	Ave	6	1.8	V	-13.08	25.27	54.00	-28.73

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									
223.45	44.04	QP	266	1.3	H	-11.62	32.42	46.00	-13.58
223.45	39.67	QP	63	2.0	V	-11.62	28.05	46.00	-17.95
4874.00	48.46	PK	26	1.2	V	-0.62	47.84	74.00	-26.16
4874.00	47.18	Ave	26	1.2	V	-0.62	46.56	54.00	-7.44
7311.00	38.24	PK	69	1.2	H	2.21	40.45	74.00	-33.55
7311.00	43.27	Ave	69	1.2	H	2.21	45.48	54.00	-8.52
2330.73	46.78	PK	263	1.7	V	-13.19	33.59	74.00	-40.41
2330.73	38.11	Ave	263	1.7	V	-13.19	24.92	54.00	-29.08
2379.51	44.35	PK	316	1.4	H	-13.14	31.21	74.00	-42.79
2379.51	38.19	Ave	316	1.4	H	-13.14	25.05	54.00	-28.95
2492.07	43.50	PK	283	1.4	V	-13.08	30.42	74.00	-43.58
2492.07	38.98	Ave	283	1.4	V	-13.08	25.90	54.00	-28.10

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)
n20: High Channel 2462MHz									
223.45	44.27	QP	244	1.9	H	-11.62	32.65	46.00	-13.35
223.45	40.52	QP	102	1.7	V	-11.62	28.90	46.00	-17.10
4924.00	49.10	PK	213	1.0	V	-0.24	48.86	74.00	-25.14
4924.00	48.25	Ave	213	1.0	V	-0.24	48.01	54.00	-5.99
7386.00	37.67	PK	304	1.9	H	2.84	40.51	74.00	-33.49
7386.00	43.15	Ave	304	1.9	H	2.84	45.99	54.00	-8.01
2330.90	46.23	PK	165	1.4	V	-13.19	33.04	74.00	-40.96
2330.90	37.48	Ave	165	1.4	V	-13.19	24.29	54.00	-29.71
2370.51	42.18	PK	318	1.6	H	-13.14	29.04	74.00	-44.96
2370.51	38.87	Ave	318	1.6	H	-13.14	25.73	54.00	-28.27
2493.25	43.83	PK	217	1.1	V	-13.08	30.75	74.00	-43.25
2493.25	37.70	Ave	217	1.1	V	-13.08	24.62	54.00	-29.38

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									
223.45	43.05	QP	344	1.3	H	-11.62	31.43	46.00	-14.57
223.45	39.81	QP	166	1.3	V	-11.62	28.19	46.00	-17.81
4844.00	46.56	PK	127	1.8	V	-1.06	45.50	74.00	-28.50
4844.00	45.31	Ave	127	1.8	V	-1.06	44.25	54.00	-9.75
7266.00	36.39	PK	37	1.9	H	1.33	37.72	74.00	-36.28
7266.00	40.37	Ave	37	1.9	H	1.33	41.70	54.00	-12.30
2338.40	45.20	PK	33	1.1	V	-13.19	32.01	74.00	-41.99
2338.40	37.84	Ave	33	1.1	V	-13.19	24.65	54.00	-29.35
2358.58	42.75	PK	134	1.2	H	-13.14	29.61	74.00	-44.39
2358.58	38.49	Ave	134	1.2	H	-13.14	25.35	54.00	-28.65
2493.33	42.32	PK	335	1.9	V	-13.08	29.24	74.00	-44.76
2493.33	38.17	Ave	335	1.9	V	-13.08	25.09	54.00	-28.91

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									
223.45	42.65	QP	4	1.7	H	-11.62	31.03	46.00	-14.97
223.45	40.17	QP	253	1.3	V	-11.62	28.55	46.00	-17.45
4874.00	47.55	PK	109	1.3	V	-0.62	46.93	74.00	-27.07
4874.00	45.17	Ave	109	1.3	V	-0.62	44.55	54.00	-9.45
7311.00	36.01	PK	91	1.4	H	2.21	38.22	74.00	-35.78
7311.00	40.90	Ave	91	1.4	H	2.21	43.11	54.00	-10.89
2323.55	46.69	PK	17	1.9	V	-13.19	33.50	74.00	-40.50
2323.55	39.91	Ave	17	1.9	V	-13.19	26.72	54.00	-27.28
2362.56	42.34	PK	183	1.2	H	-13.14	29.20	74.00	-44.80
2362.56	36.46	Ave	183	1.2	H	-13.14	23.32	54.00	-30.68
2490.63	44.54	PK	211	1.5	V	-13.08	31.46	74.00	-42.54
2490.63	36.61	Ave	211	1.5	V	-13.08	23.53	54.00	-30.47

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									
223.45	42.24	QP	294	2.0	H	-11.62	30.62	46.00	-15.38
223.45	40.43	QP	177	1.1	V	-11.62	28.81	46.00	-17.19
4904.00	47.44	PK	139	1.3	V	-0.24	47.20	74.00	-26.80
4904.00	45.85	Ave	139	1.3	V	-0.24	45.61	54.00	-8.39
7356.00	35.77	PK	97	1.9	H	2.84	38.61	74.00	-35.39
7356.00	39.93	Ave	97	1.9	H	2.84	42.77	54.00	-11.23
2332.38	45.95	PK	191	1.1	V	-13.19	32.76	74.00	-41.24
2332.38	39.21	Ave	191	1.1	V	-13.19	26.02	54.00	-27.98
2386.60	42.89	PK	241	1.1	H	-13.14	29.75	74.00	-44.25
2386.60	38.21	Ave	241	1.1	H	-13.14	25.07	54.00	-28.93
2483.77	42.74	PK	316	1.3	V	-13.08	29.66	74.00	-44.34
2483.77	38.52	Ave	316	1.3	V	-13.08	25.44	54.00	-28.56

Test Frequency: 18GHz~25GHz

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

8 Band Edge Measurement

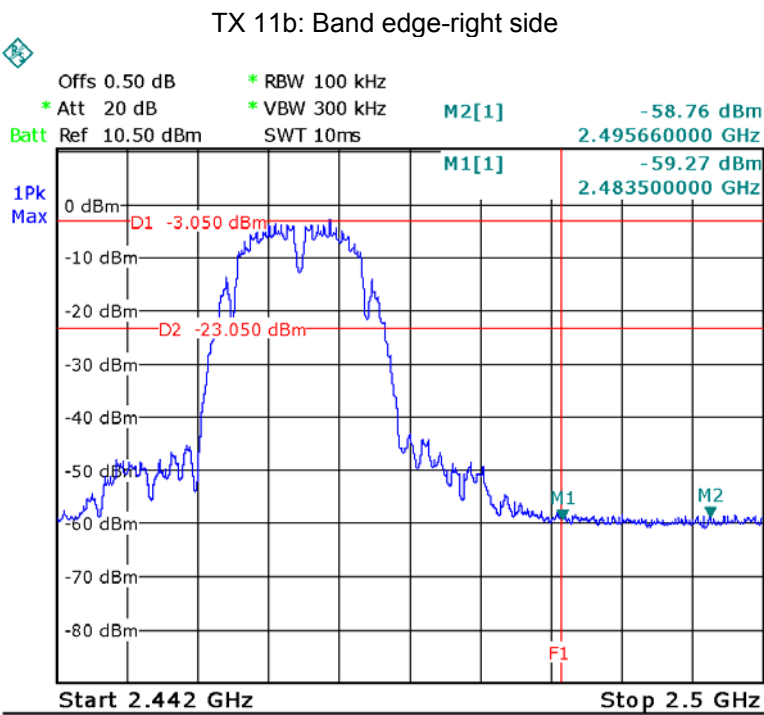
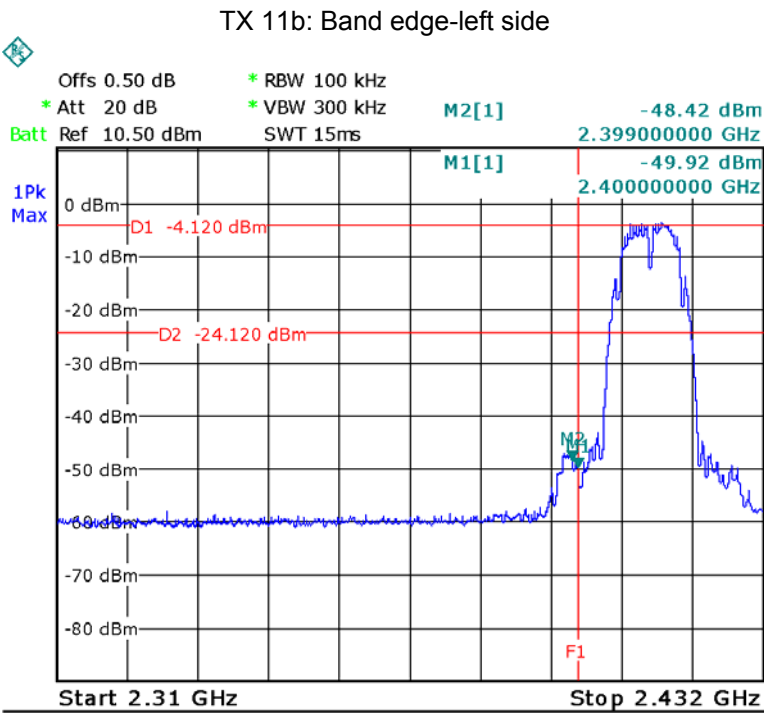
Test Requirement:	FCC CFR47 Part 15 Section 15.247
Test Method:	558074 D01 DTS Meas Guidance v03r04
Test Limit:	Regulation 15.247 (d), In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that 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

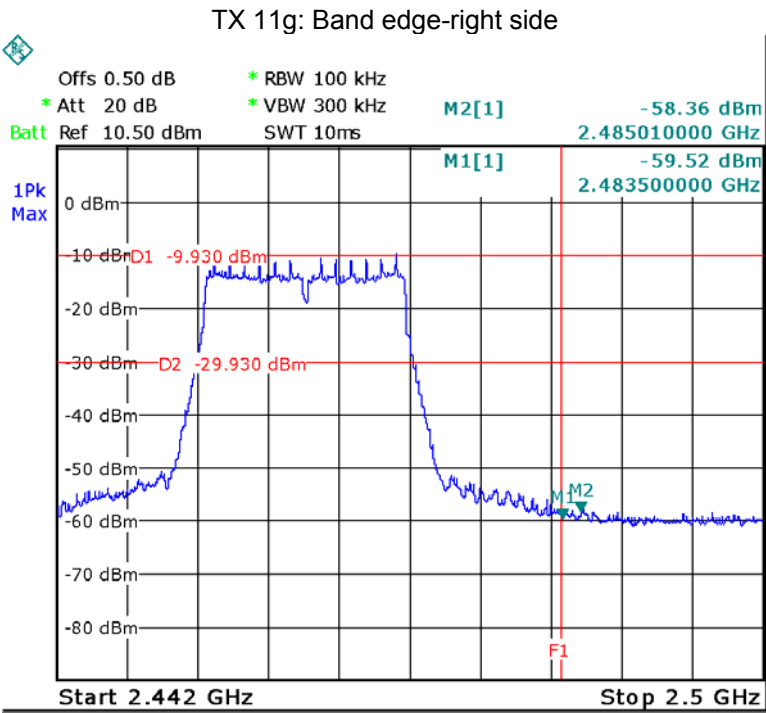
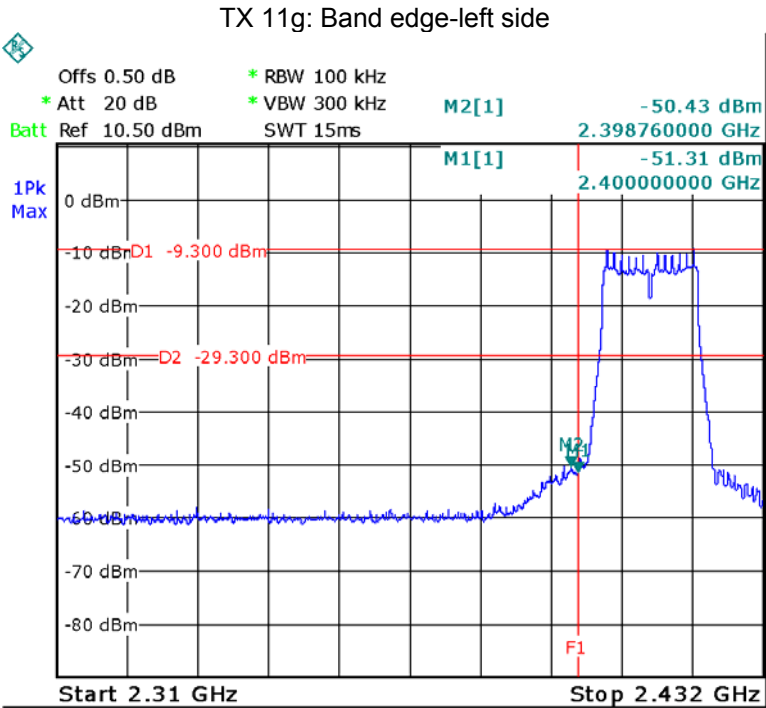
8.1 Test Produce

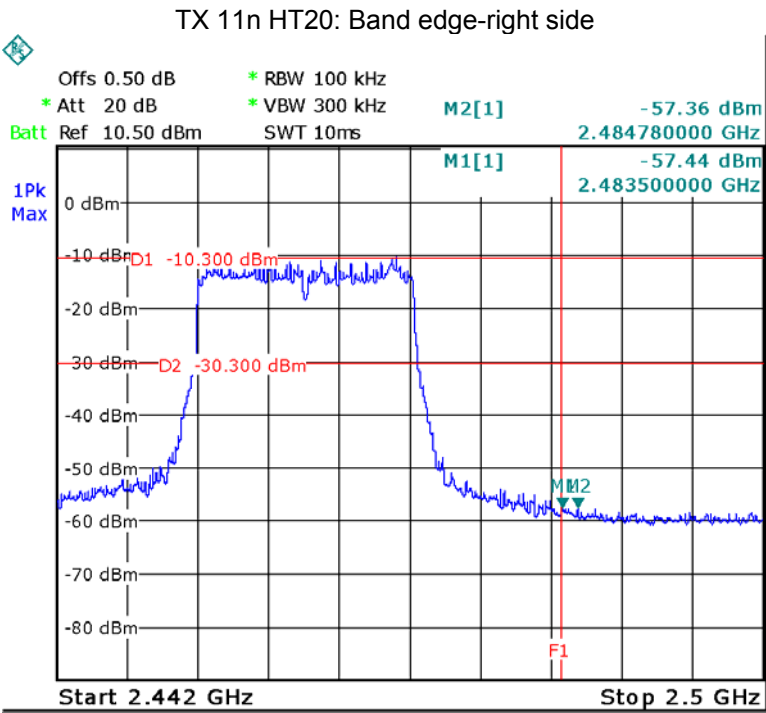
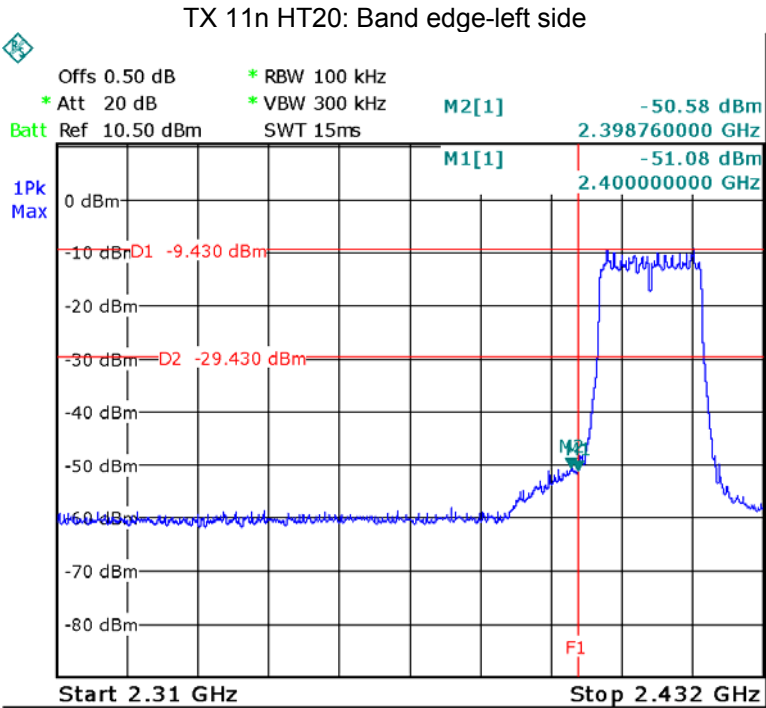
1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then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

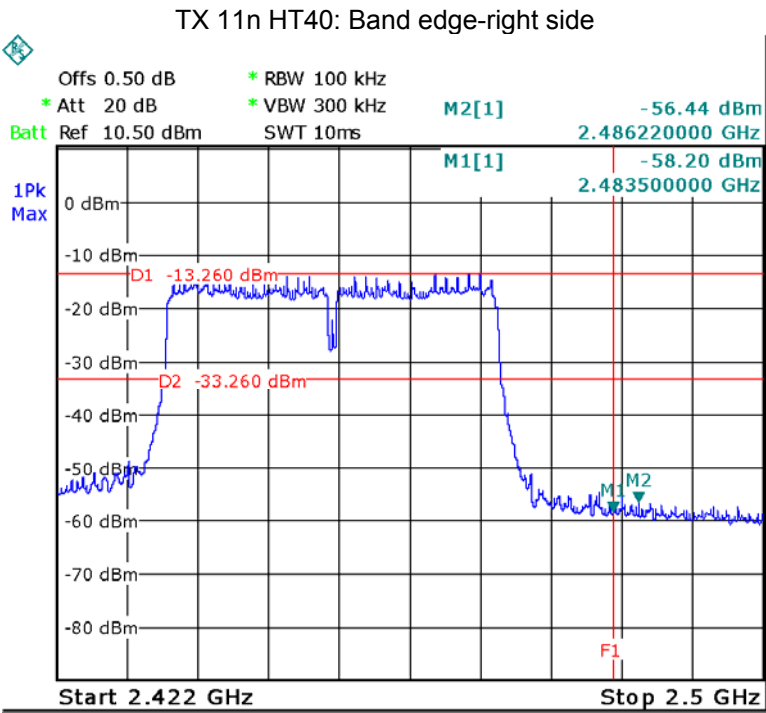
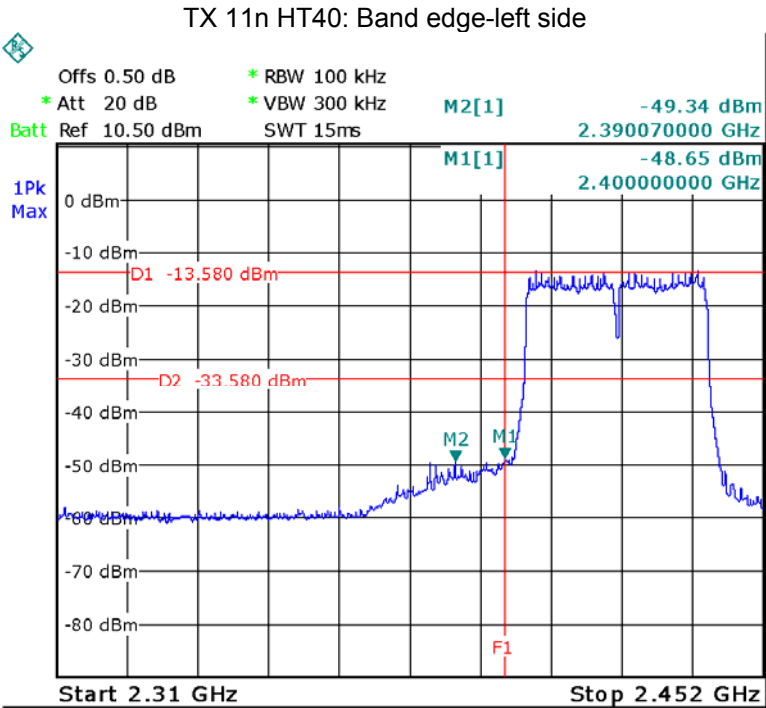
8.2 Test Result

Test result plots shown as follows:









9 6 dB Bandwidth Measurement

Test Requirement:

FCC CFR47 Part 15 Section 15.247

Test Method:

558074 D01 DTS Meas Guidance v03r04

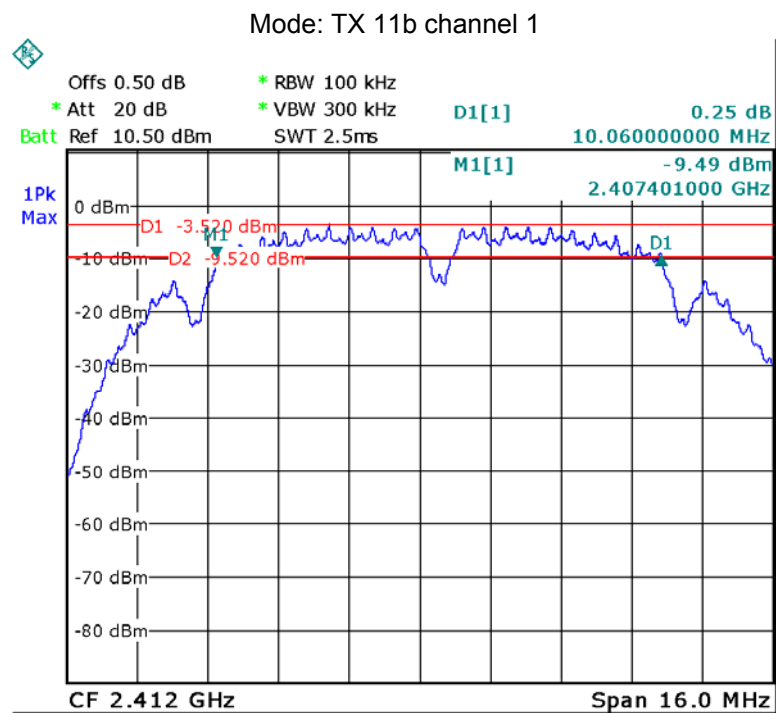
9.1 Test Procedure:

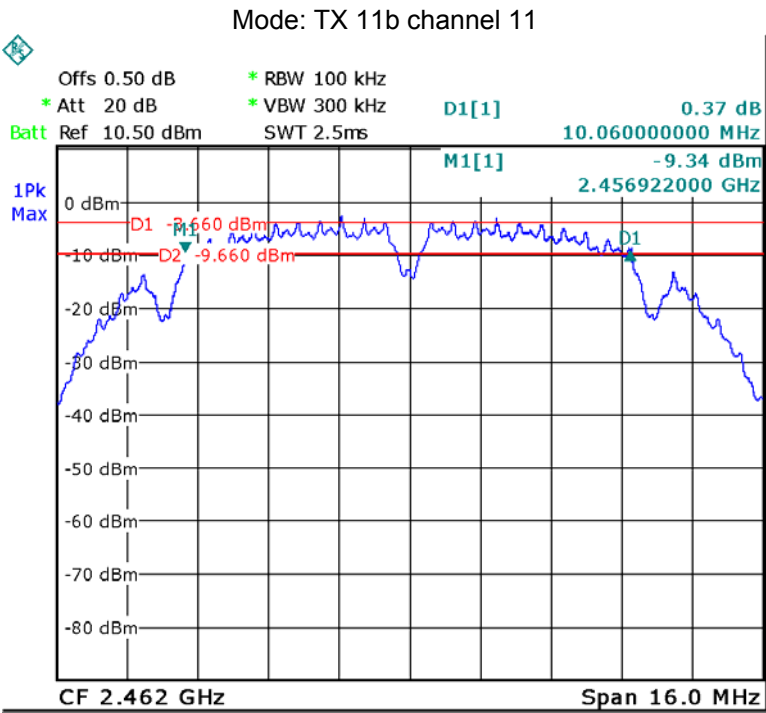
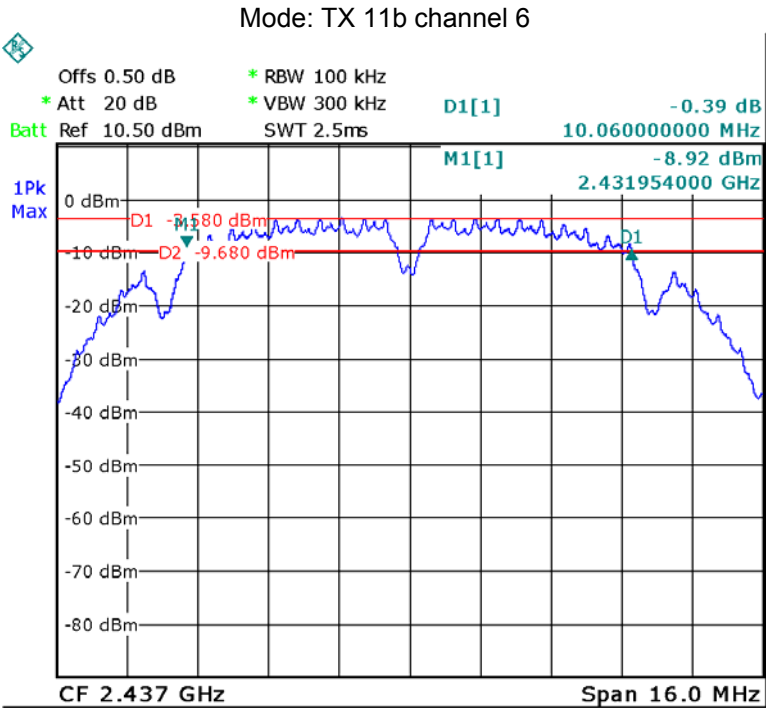
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 100kHz, VBW = 300kHz

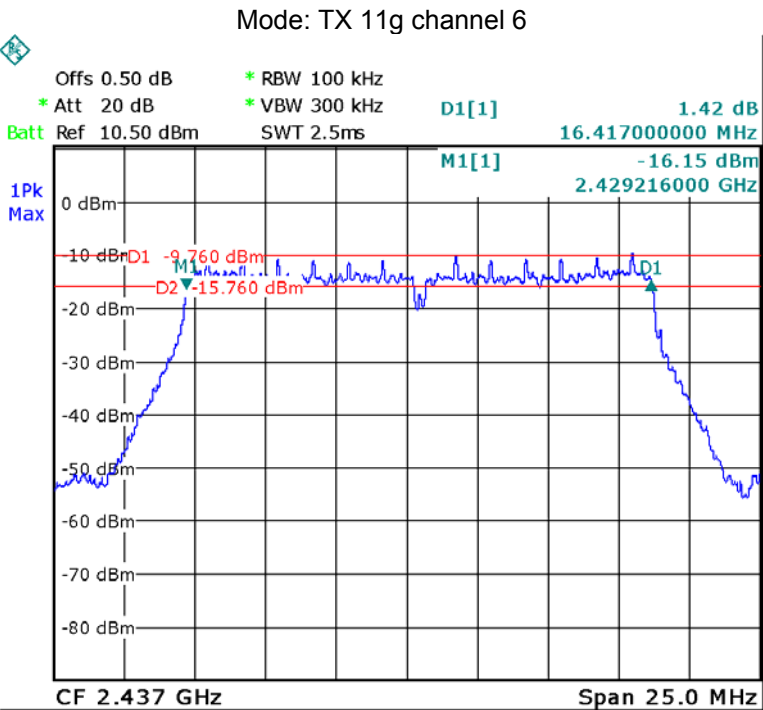
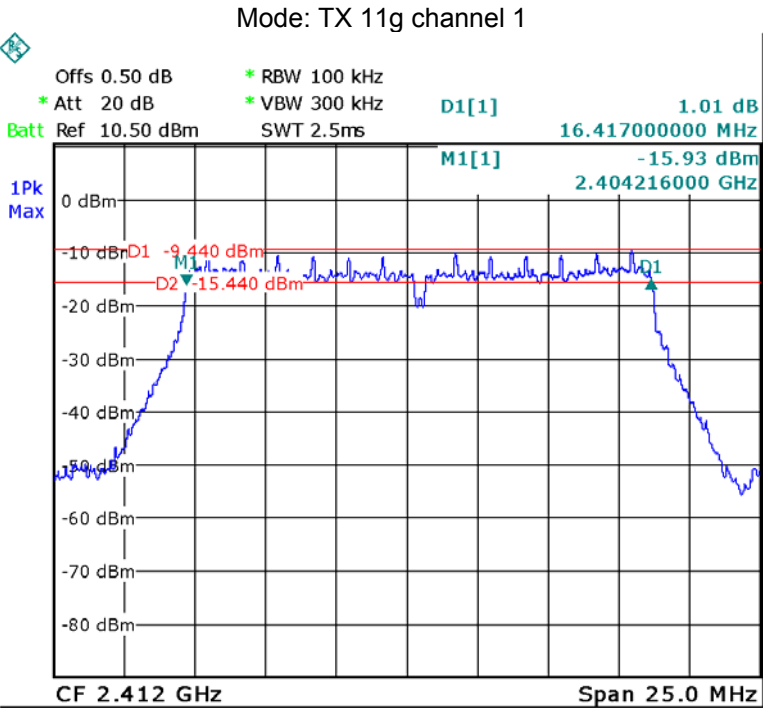
9.2 Test Result:

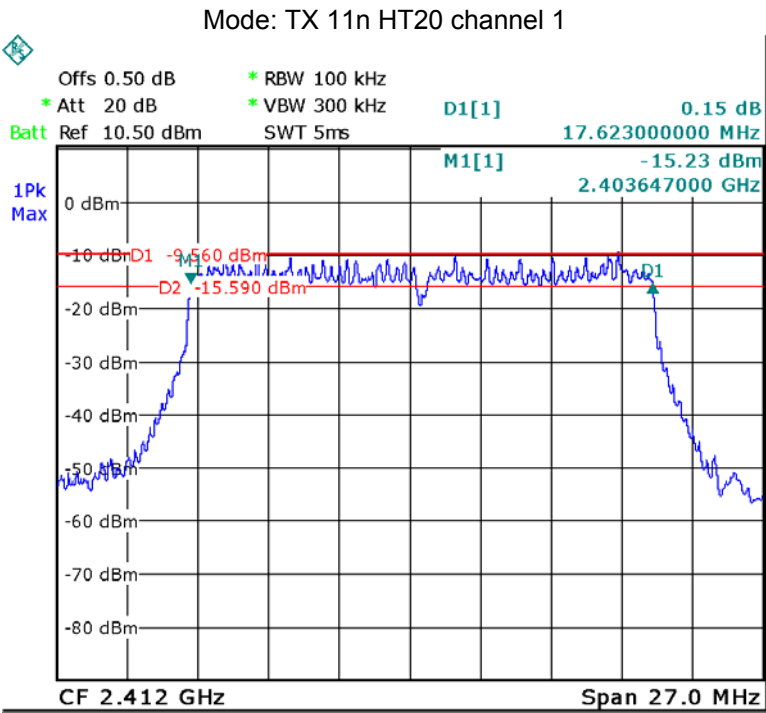
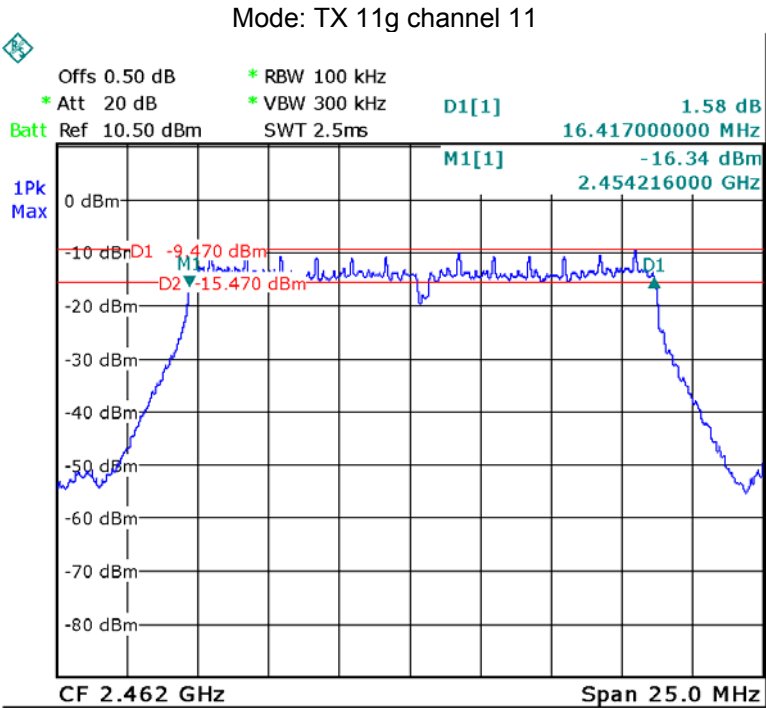
Operation mode	Bandwidth (MHz)		
TX 11b	Channel 1	Channel 6	Channel 11
	10.060	10.060	10.060
TX 11g	Channel 1	Channel 6	Channel 11
	16.417	16.417	16.417
TX 11n HT20	Channel 1	Channel 6	Channel 11
	17.541	17.541	17.623
TX 11n HT40	Channel 3	Channel 6	Channel 9
	36.340	36.340	36.340

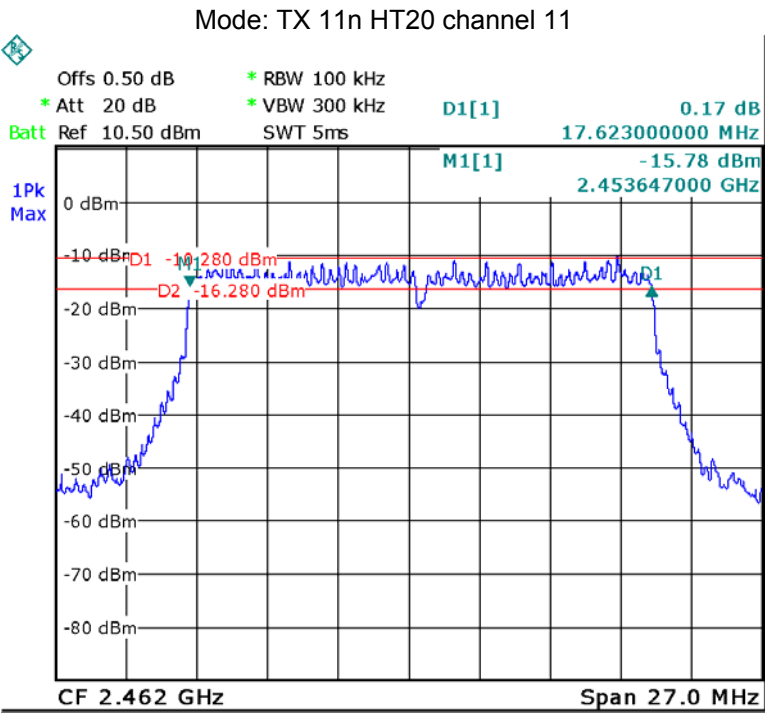
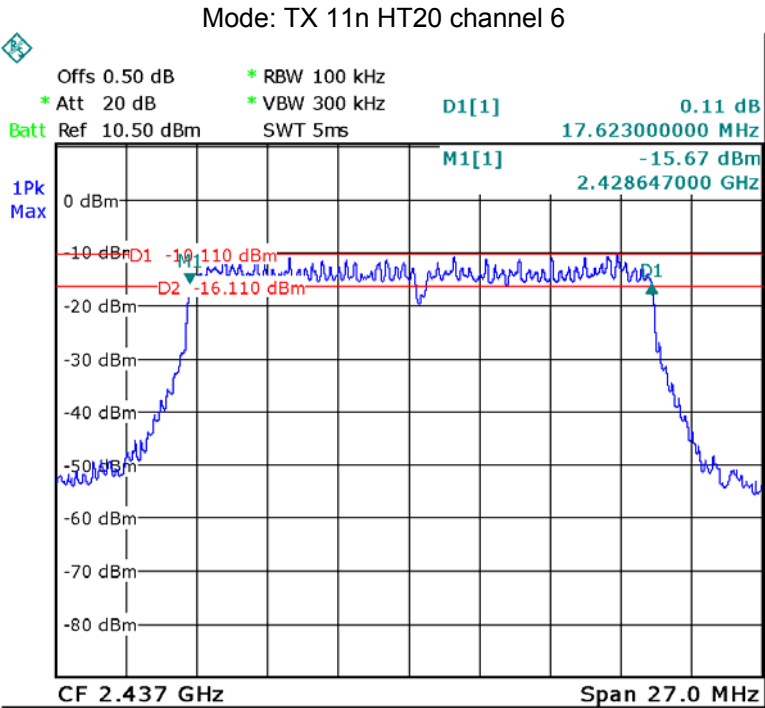
Test result plot as follows:

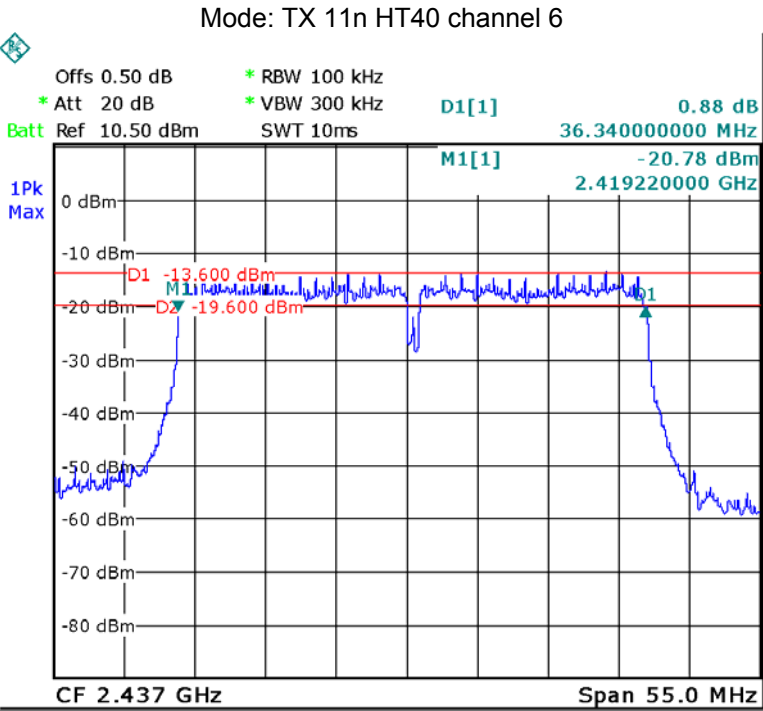
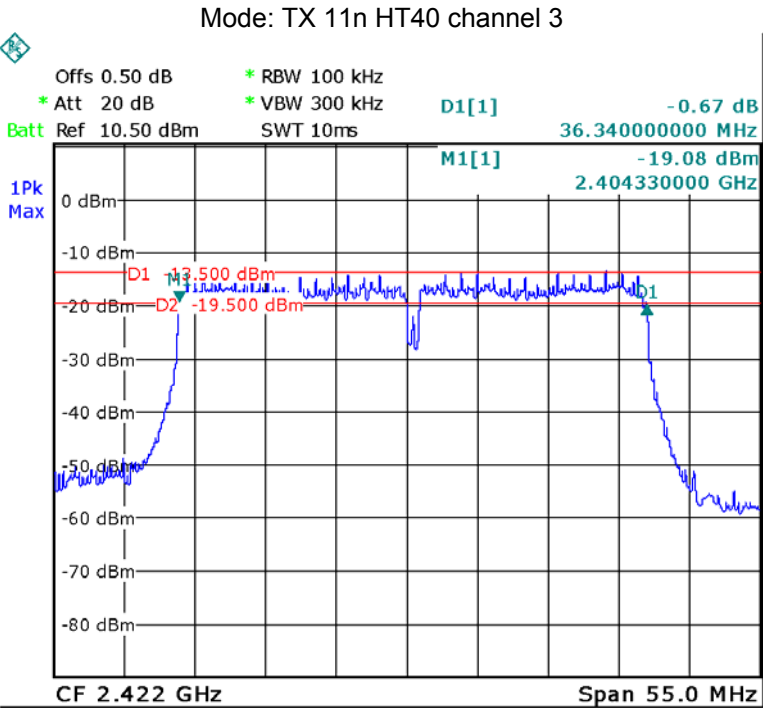


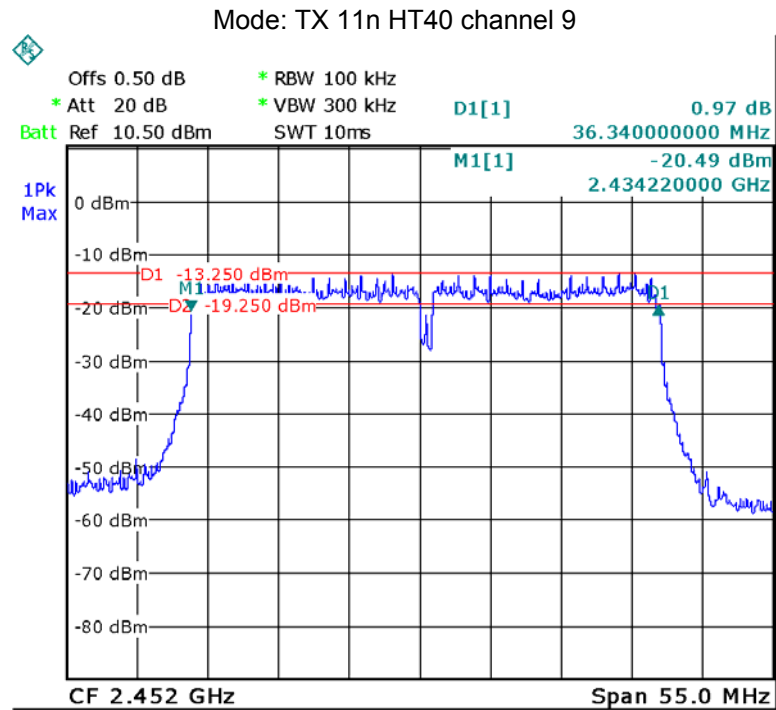












10 Maximum Peak Output Power

Test Requirement:

FCC CFR47 Part 15 Section 15.247

Test Method:

558074 D01 DTS Meas Guidance v03r04

10.1 Test Procedure:

KDB558074 section 9.1.2

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 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.

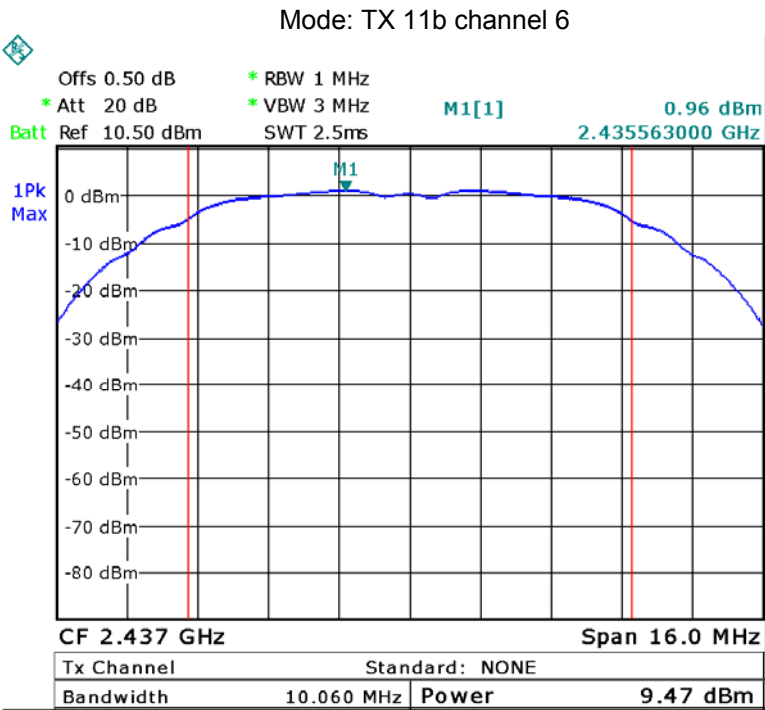
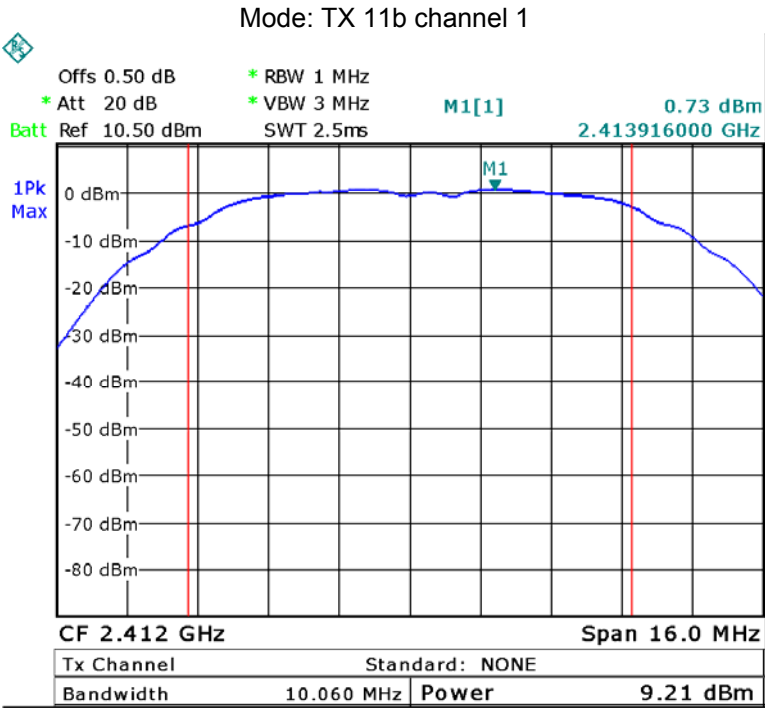
10.2 Test Result:

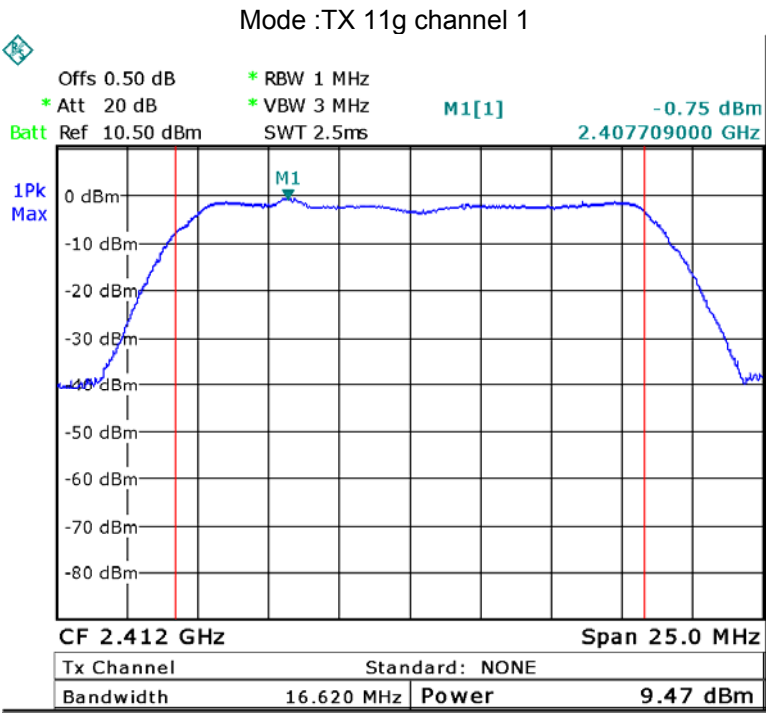
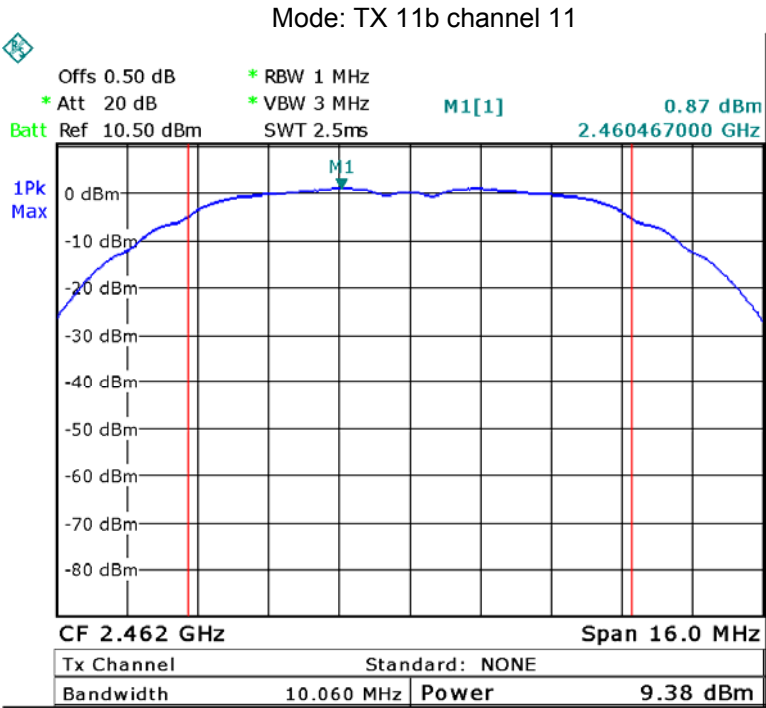
Test mode :TX 11b		
10 Maximum Peak Output Power (dBm)		
2412MHz	2437MHz	2462MHz
9.21	9.47	9.38
Limit:		
1W/30dBm		

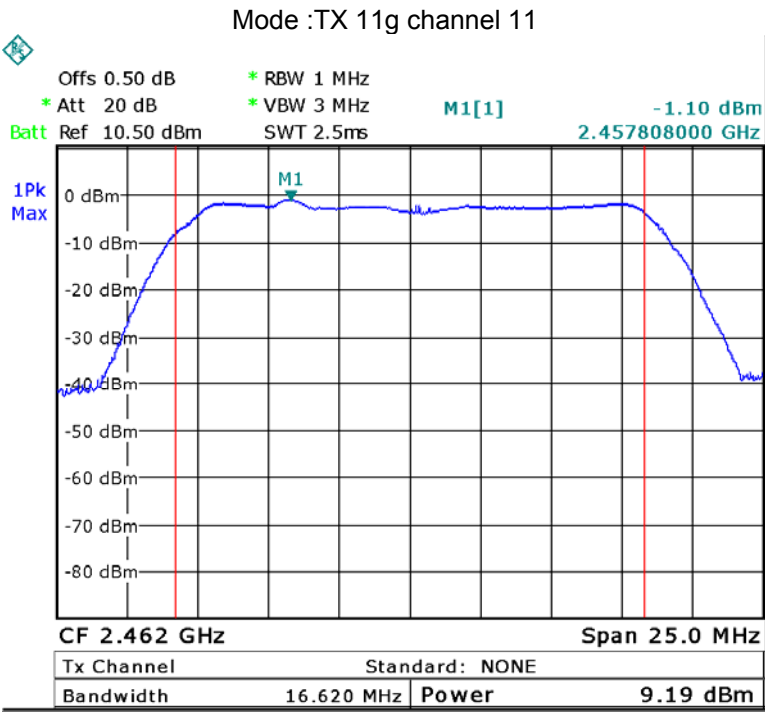
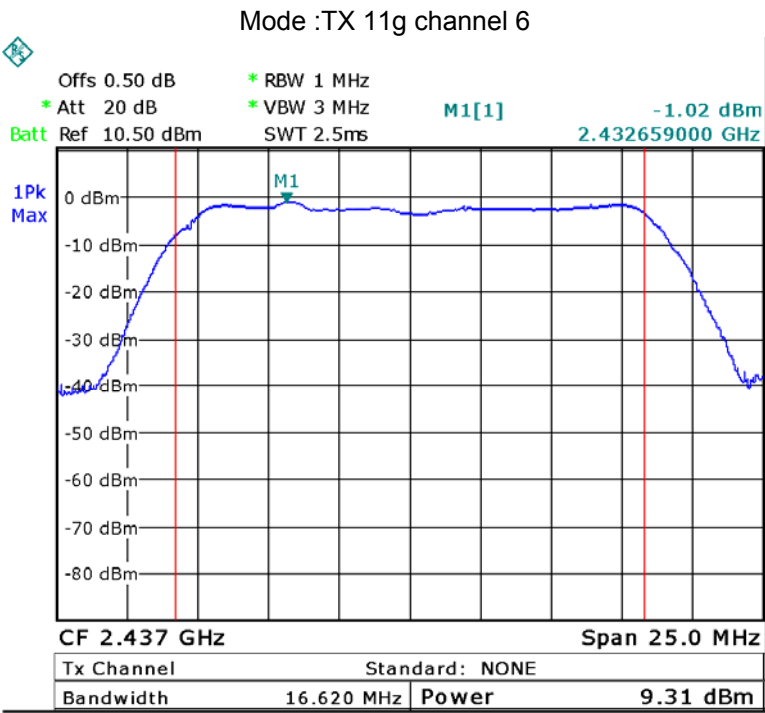
Test mode :TX 11g		
10 Maximum Peak Output Power (dBm)		
2412MHz	2437MHz	2462MHz
9.47	9.31	9.19
Limit		
1W/30dBm		

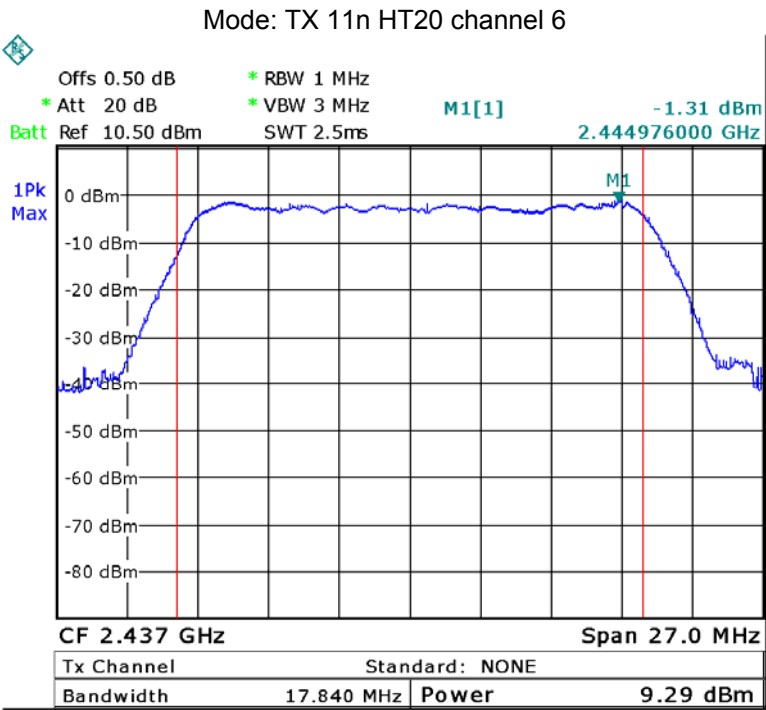
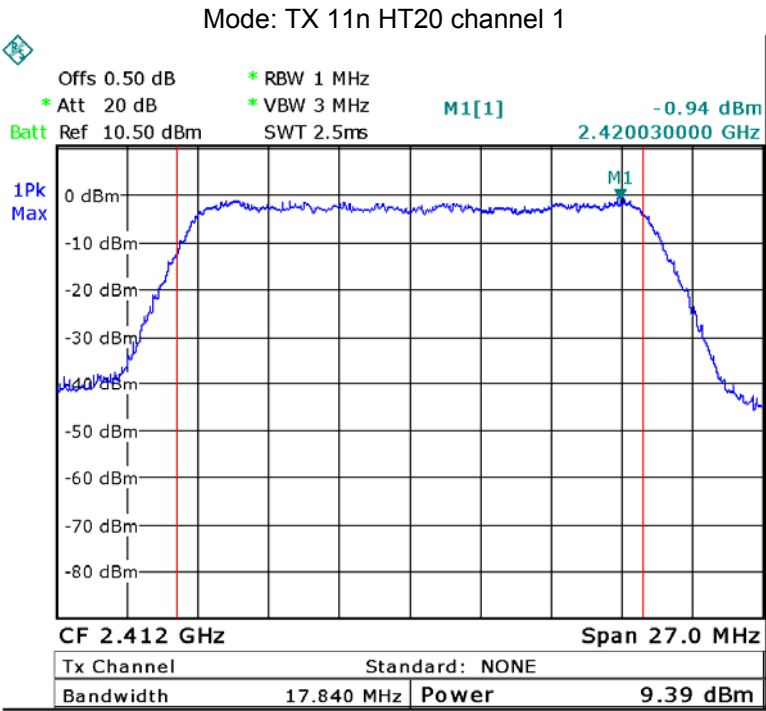
Test mode :TX 11n HT20		
10 Maximum Peak Output Power (dBm)		
2412MHz	2437MHz	2462MHz
9.39	9.29	9.20
Limit		
1W/30dBm		

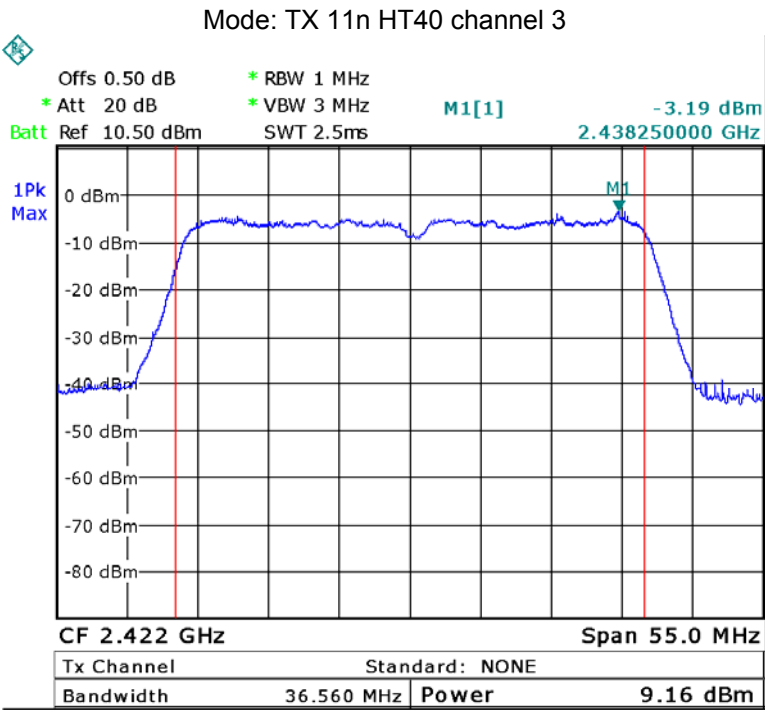
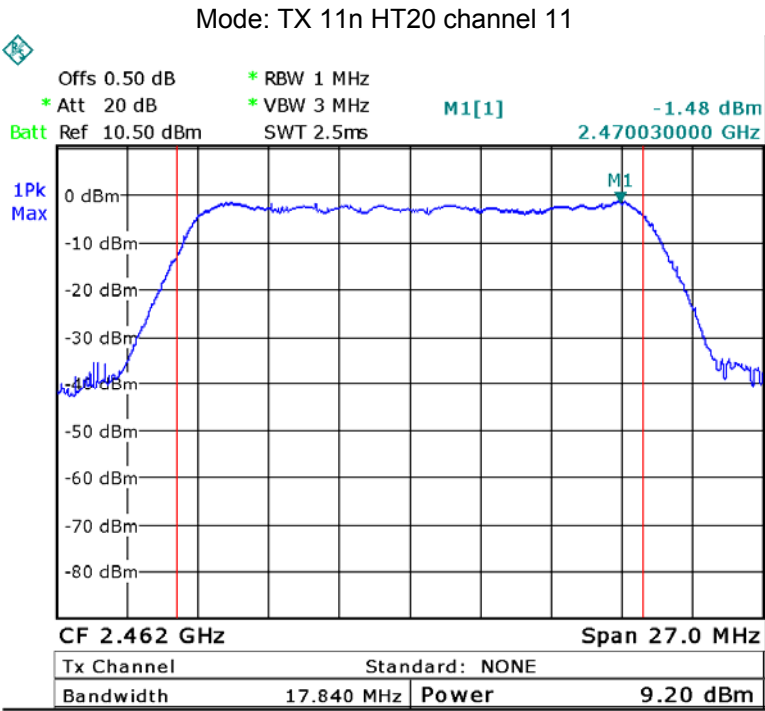
Test mode : TX 11n HT40		
10 Maximum Peak Output Power (dBm)		
2422MHz	2437MHz	2452MHz
9.16	9.24	9.25
Limit		
1W/30dBm		

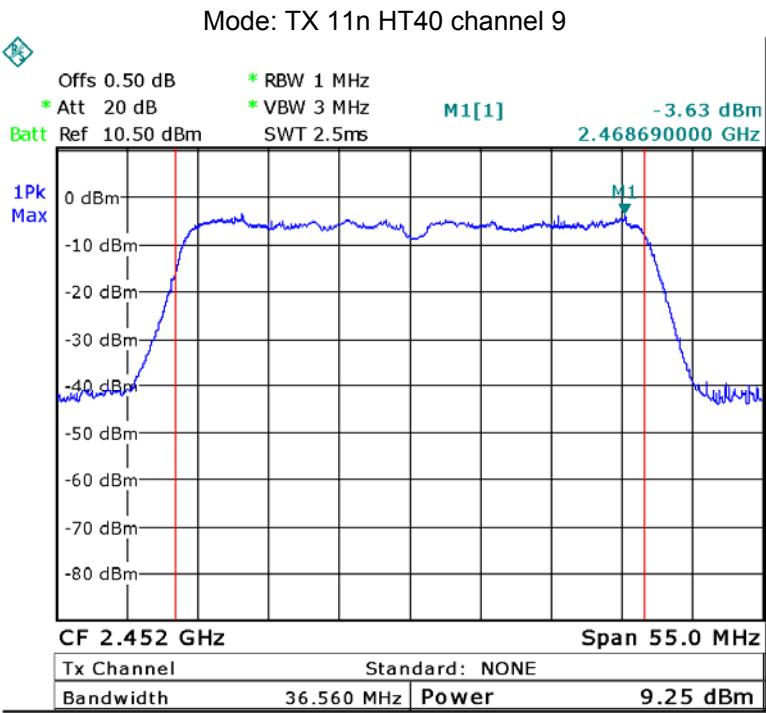
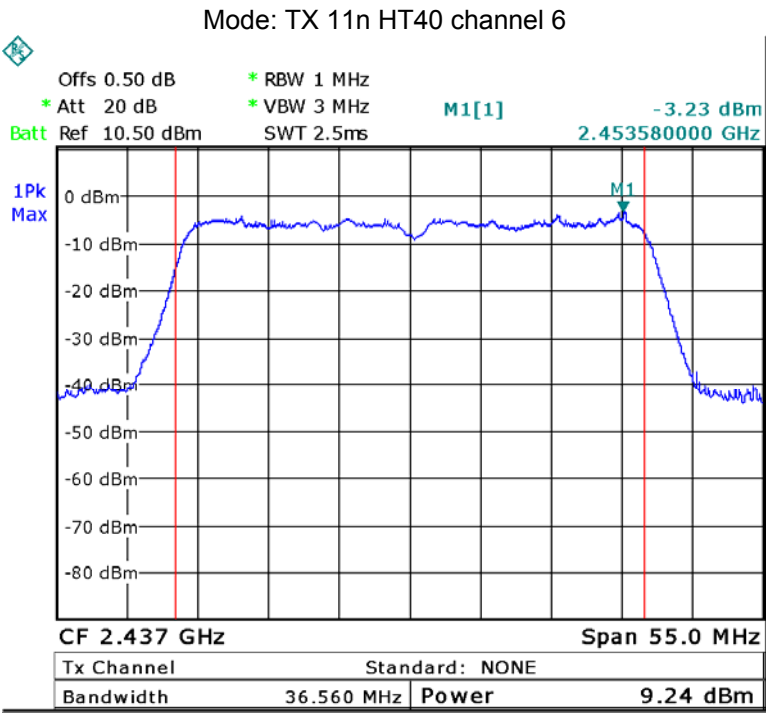












11 Power Spectral density

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: 558074 D01 DTS Meas Guidance v03r04

11.1 Test Procedure:

KDB558074 section 10.2

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

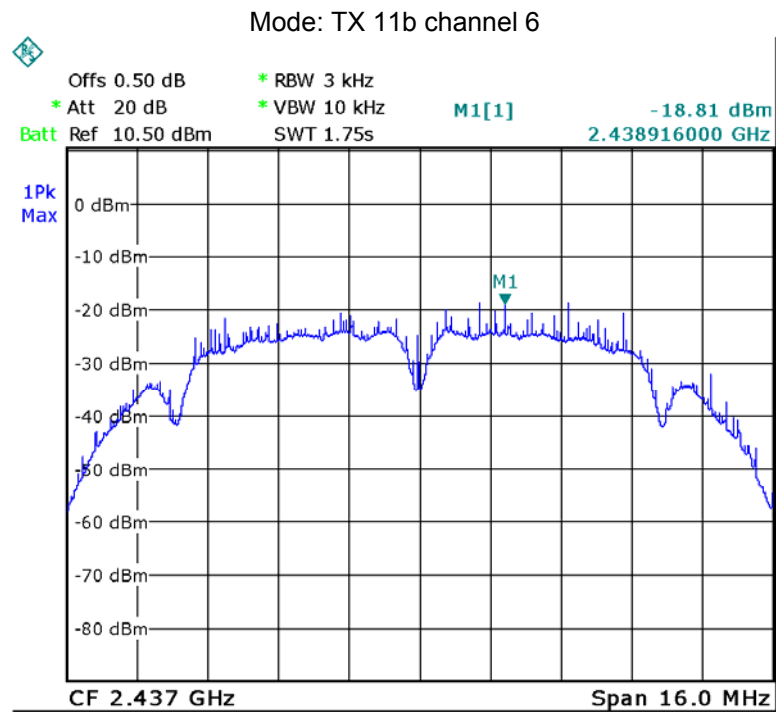
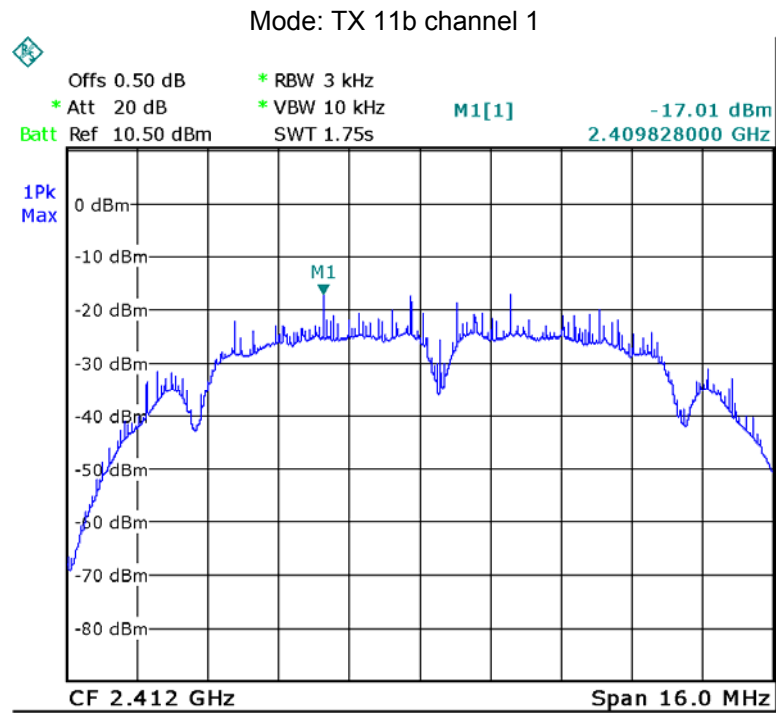
11.2 Test Result:

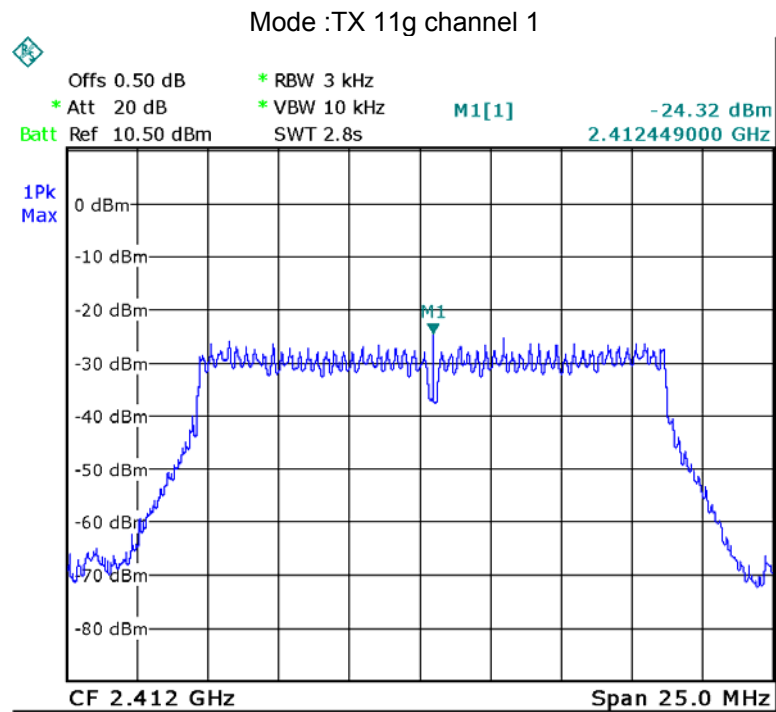
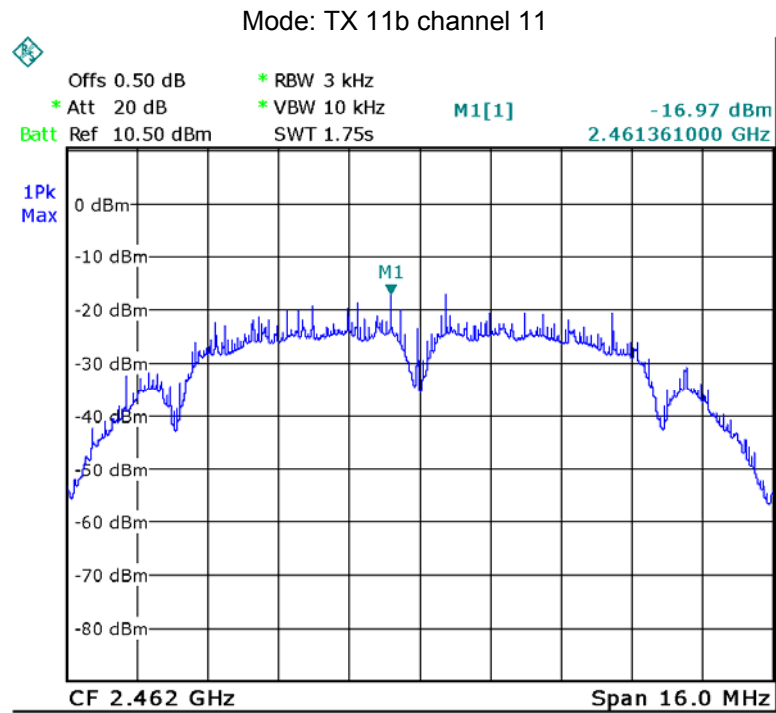
Test mode :TX 11b		
Power Spectral (dBm per 3kHz)		
2412MHz	2437MHz	2462MHz
-17.01	-18.81	-16.97
Limit:		
8dBm per 3kHz		

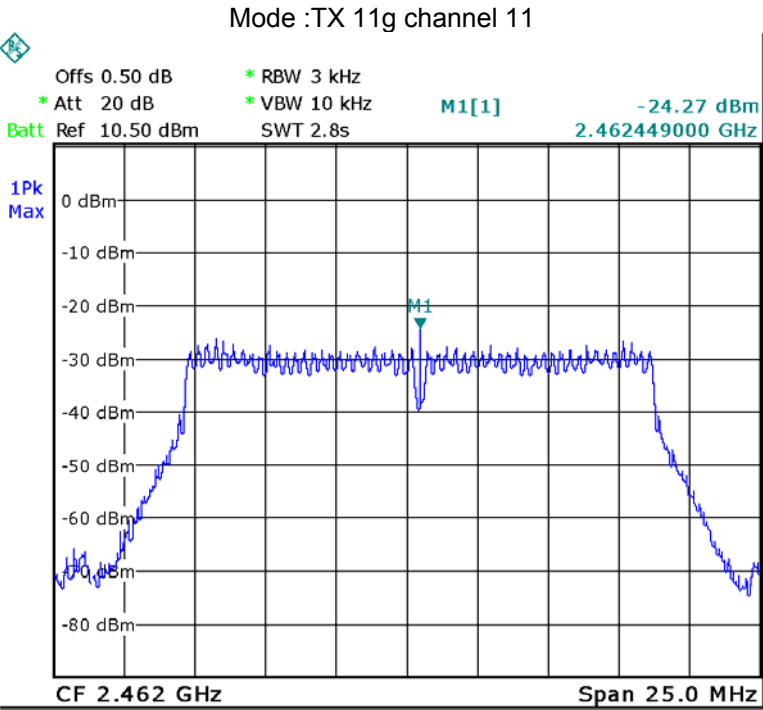
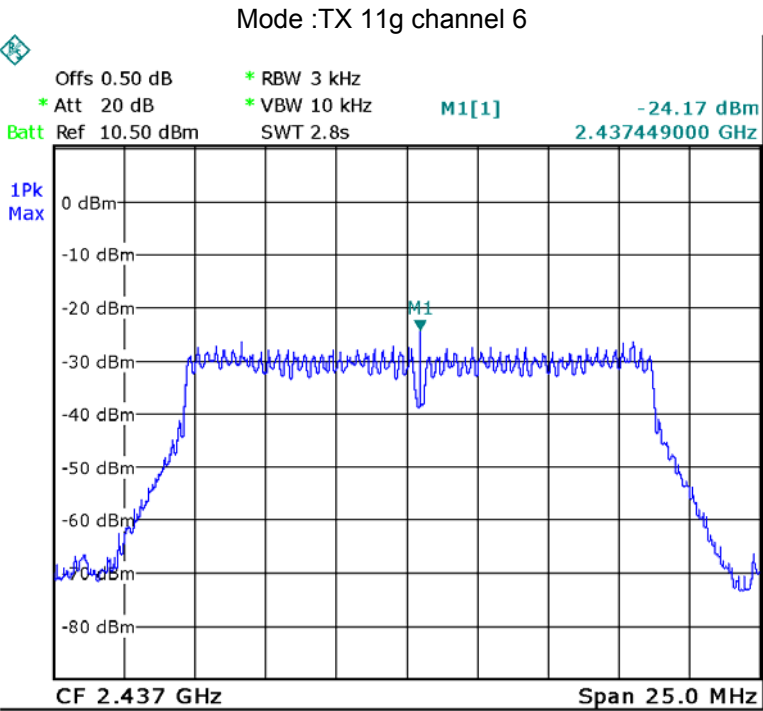
Test mode :TX 11g		
Power Spectral (dBm per 3kHz)		
2412MHz	2437MHz	2462MHz
-24.32	-24.17	-24.27
Limit		
8dBm per 3kHz		

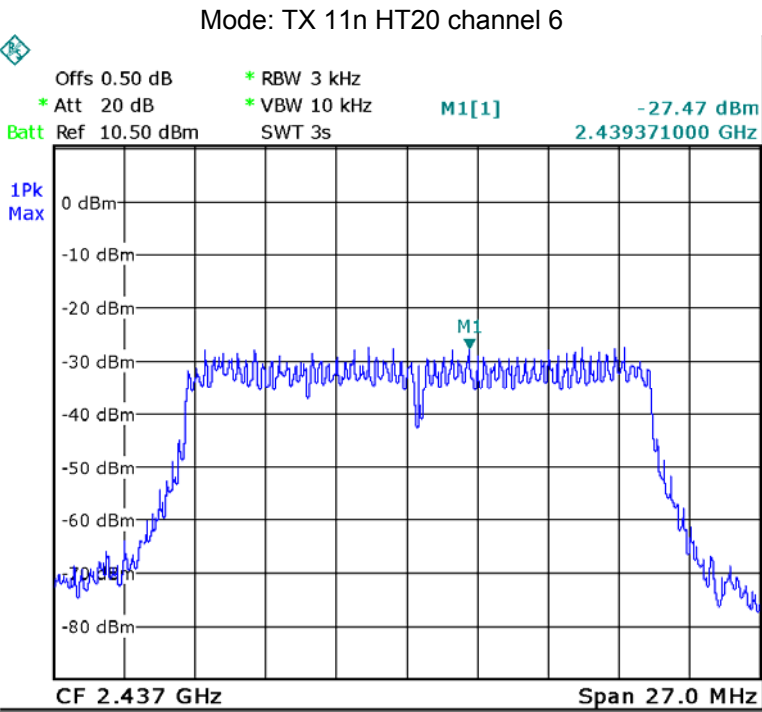
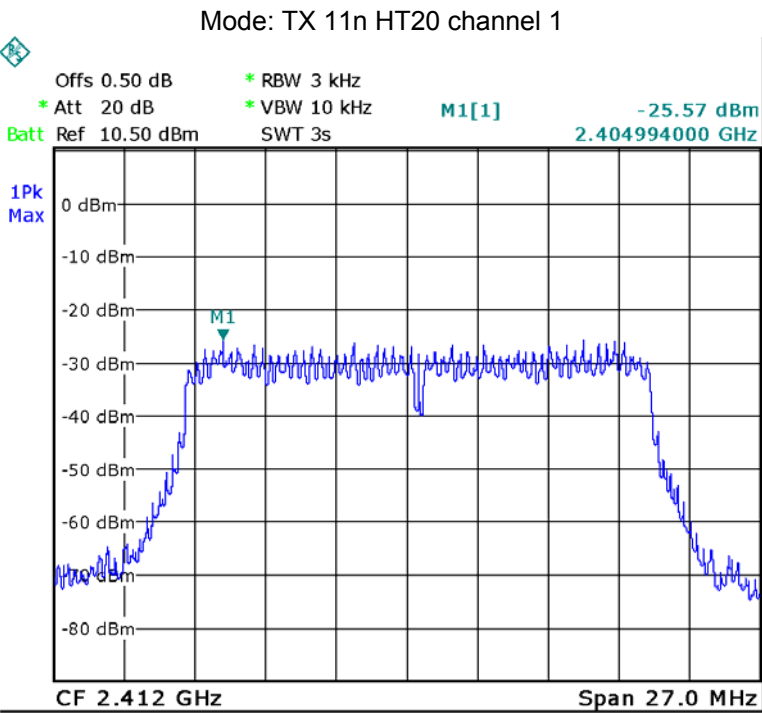
Test mode :TX 11n HT20		
Power Spectral (dBm per 3kHz)		
2412MHz	2437MHz	2462MHz
-25.57	-27.47	-27.18
Limit		
8dBm per 3kHz		

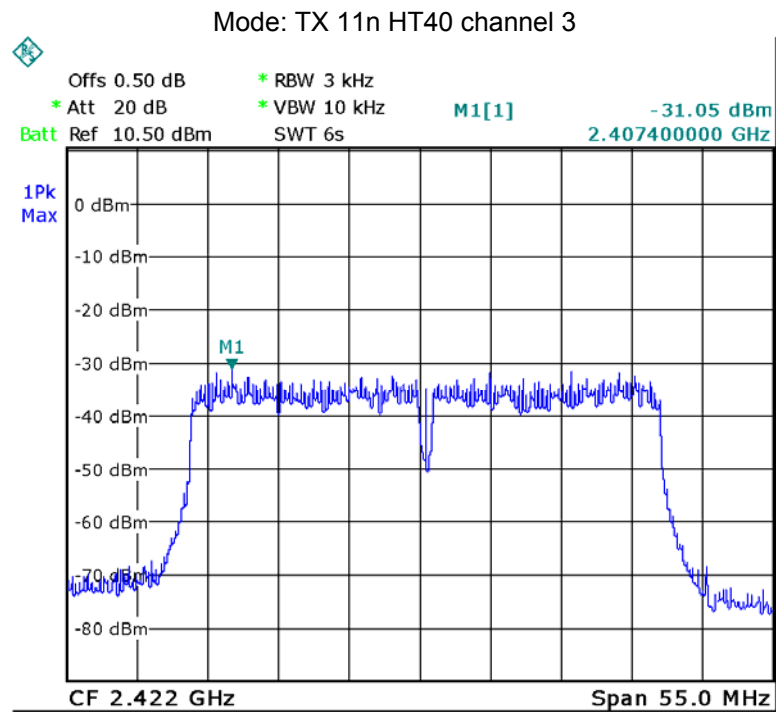
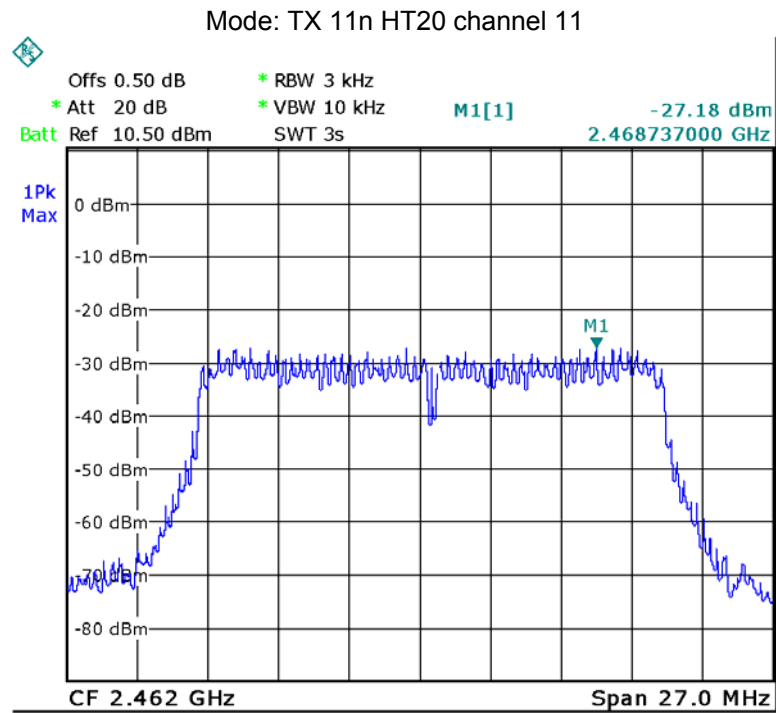
Test mode : TX 11n HT40		
Power Spectral (dBm per 3kHz)		
2422MHz	2437MHz	2452MHz
-31.05	-31.37	-32.46
Limit		
8dBm per 3kHz		

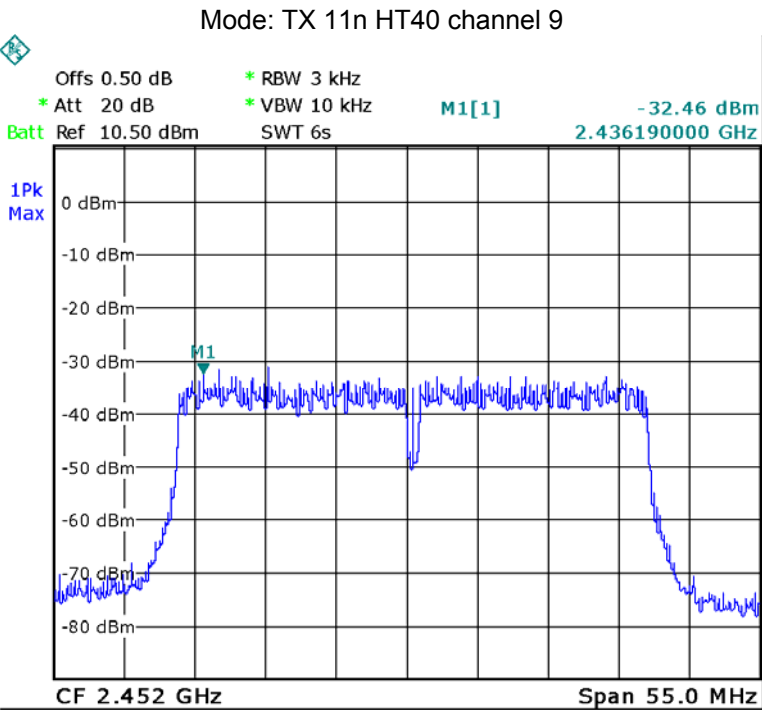
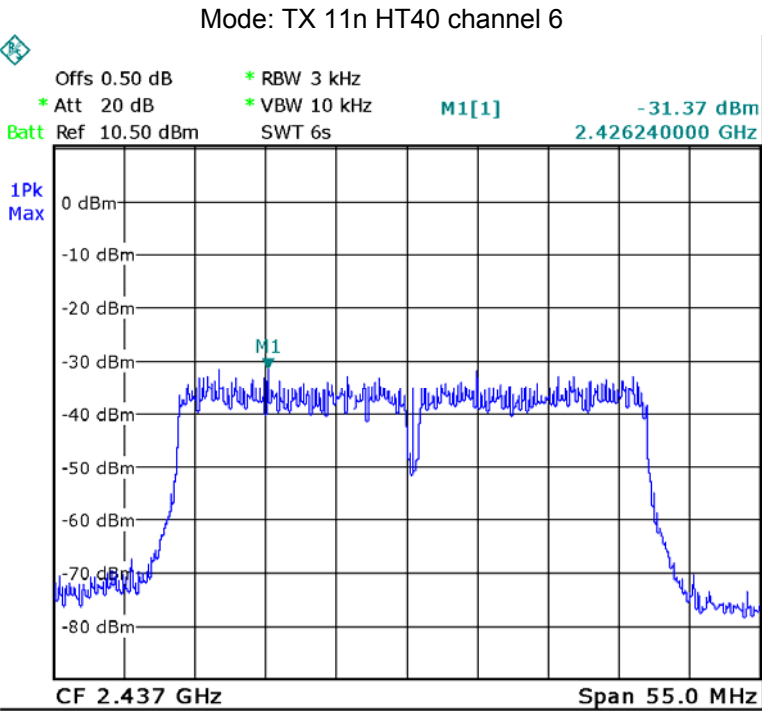












12 Antenna Requirement

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

13 RF Exposure

Test Requirement: FCC Part 1.1307

Evaluation Method: FCC Part 2.1091

13.1 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.

13.2 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

13.3 MPE Calculation Method

$$E \text{ (V/m)} = \frac{\sqrt{30 \times P \times G}}{d} \quad \text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

E = Electric field (V/m)

P = Peak RF output power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

$$Pd = \frac{30 \times P \times G}{377 \times d^2}$$

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

Antenna Gain (dBi)	Antenna Gain (numeric)	Max. Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (mW/cm ²)	Limit of Power Density (mW/cm ²)
0.00	1.000	9.47	8.85	0.001761	1

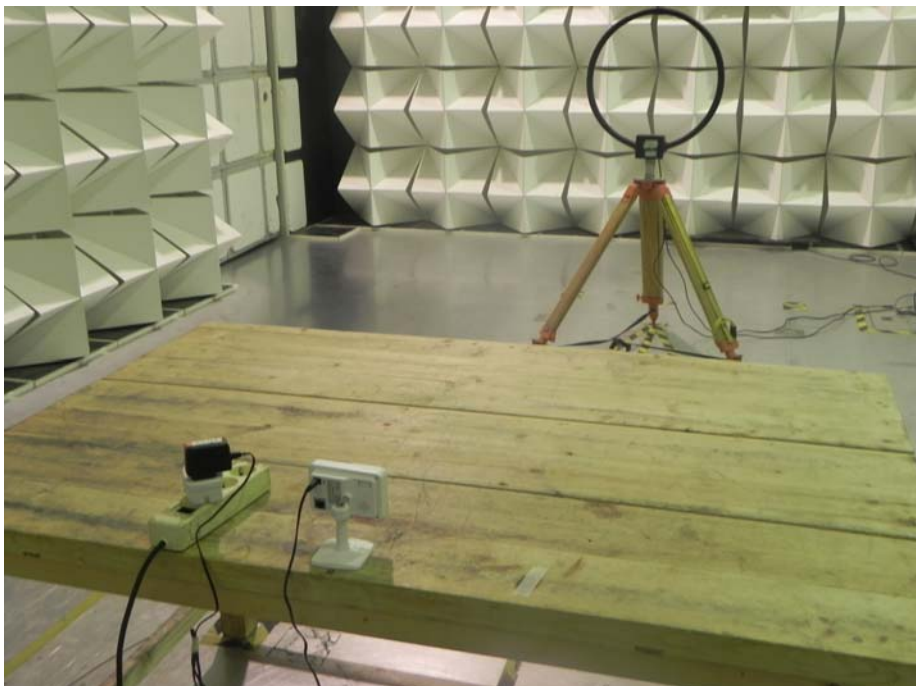
14 Photographs – Model BNK-CAM01 Test Setup

14.1 Conducted Emission at Test Site 1#

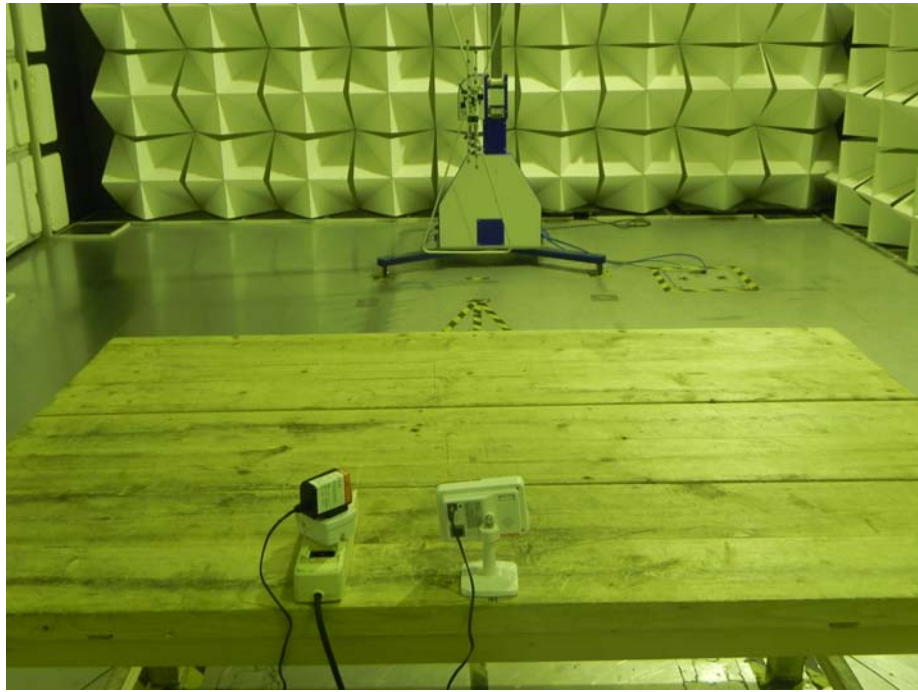


14.2 Radiated Emission

Test frequency below 30MHz at Test Site 2#



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



Test frequency above 1GHz at Test Site 1#



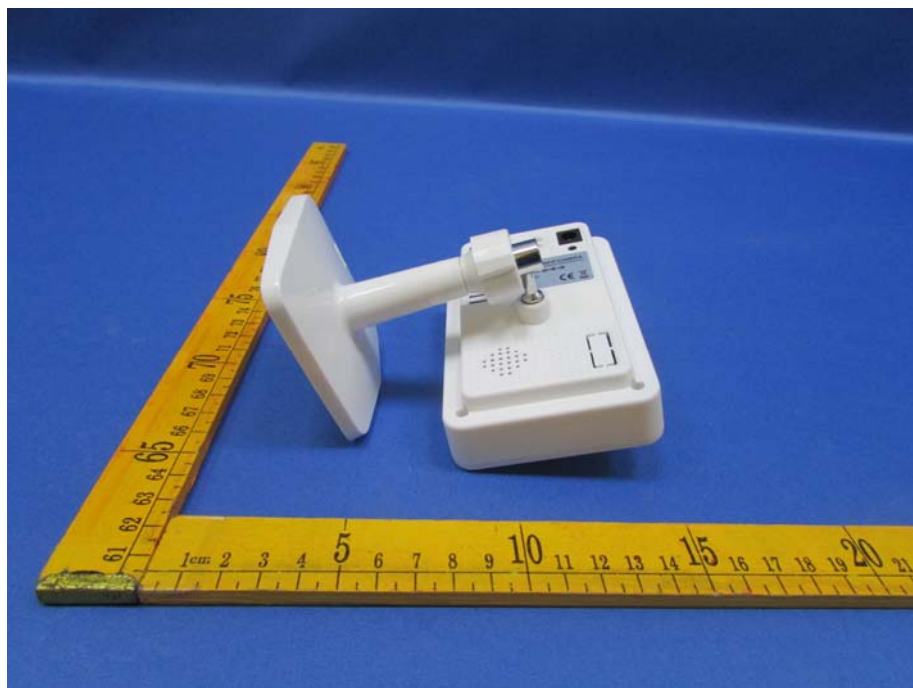
15 Photographs - Constructional Details

15.1 Model BNK-CAM01 –External View



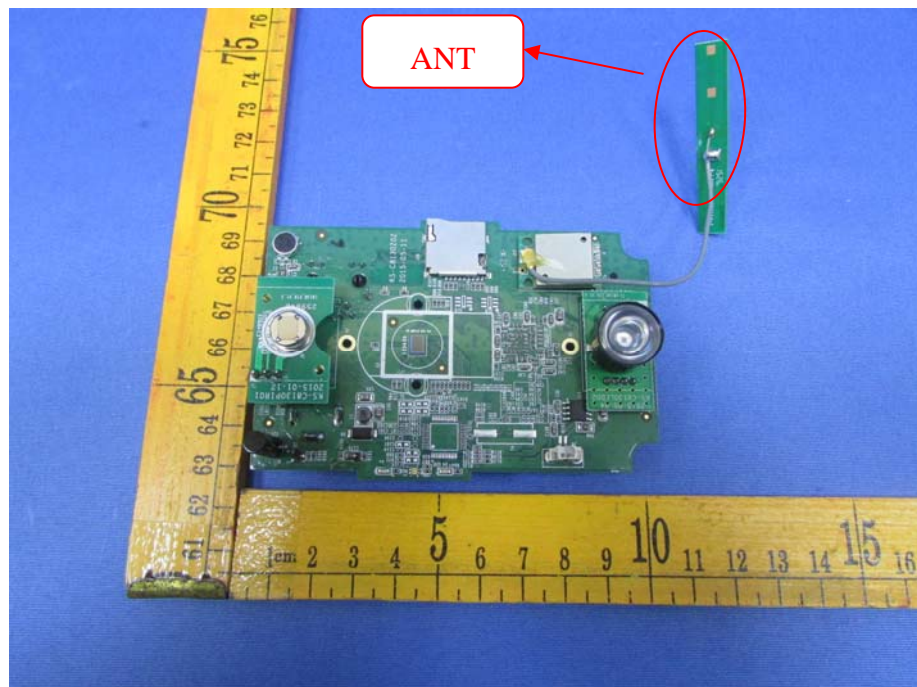


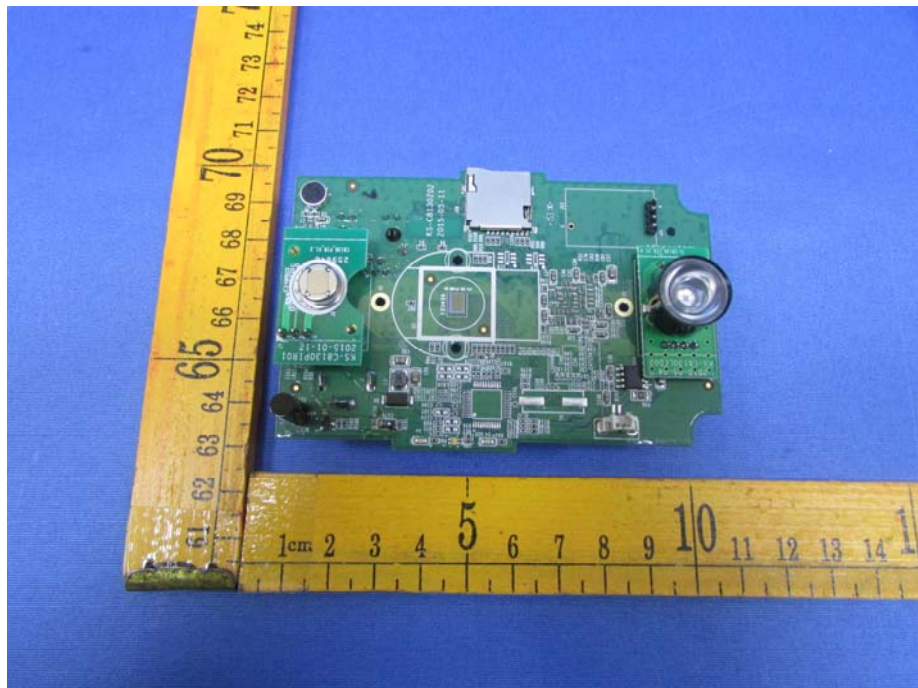
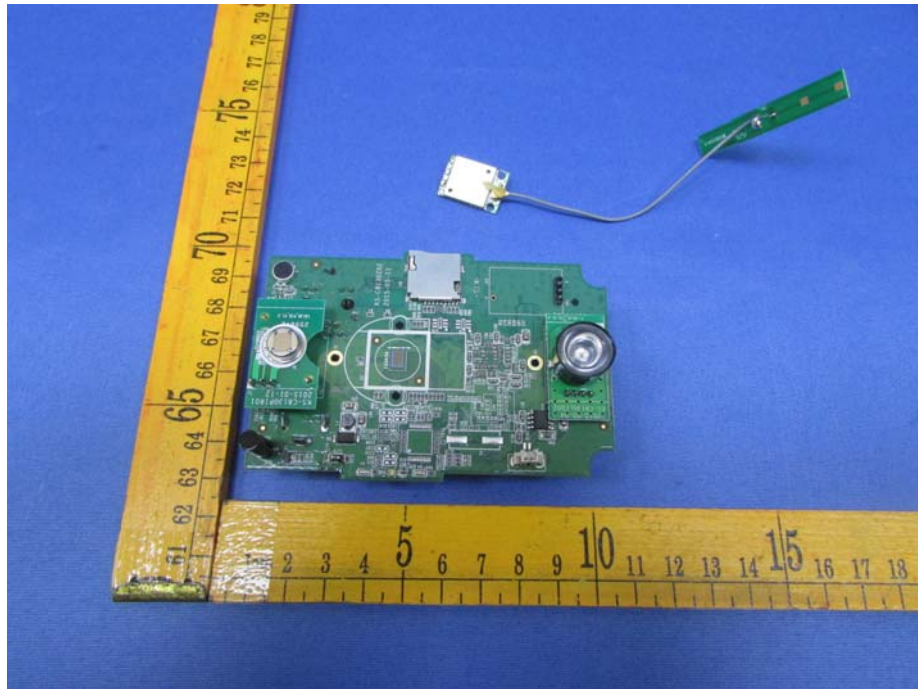


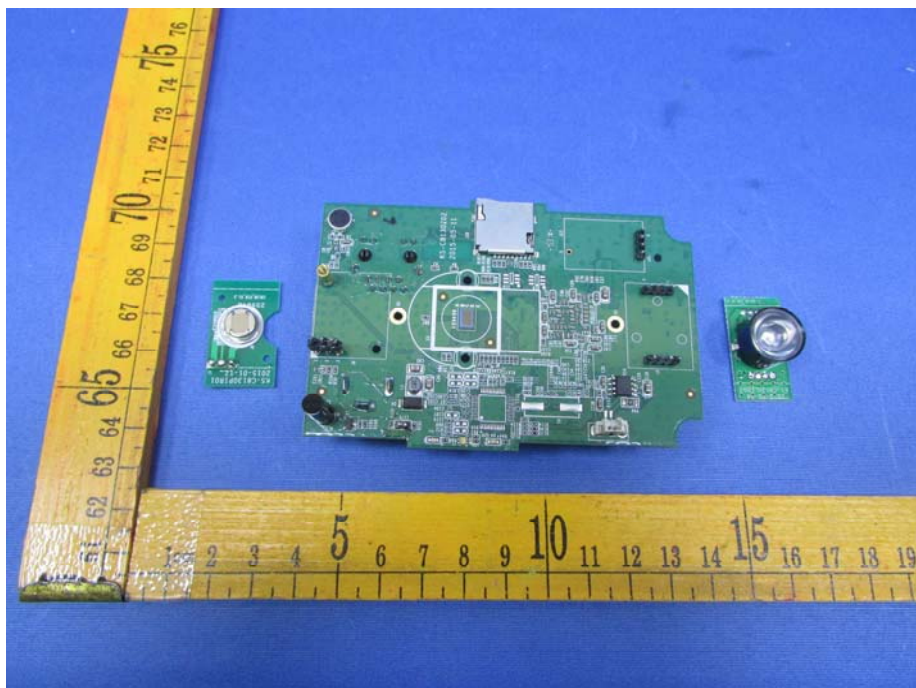
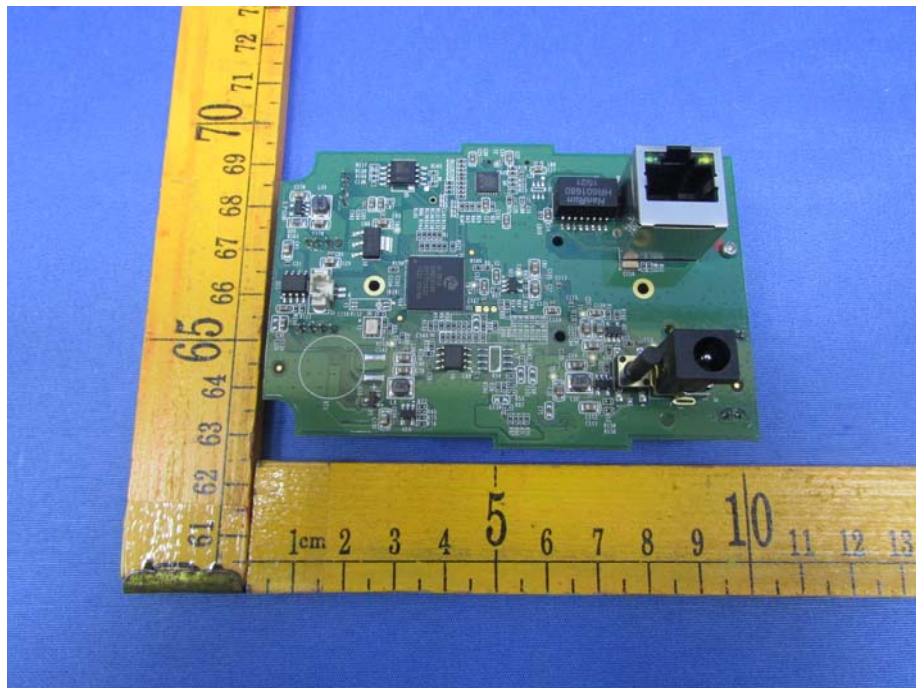




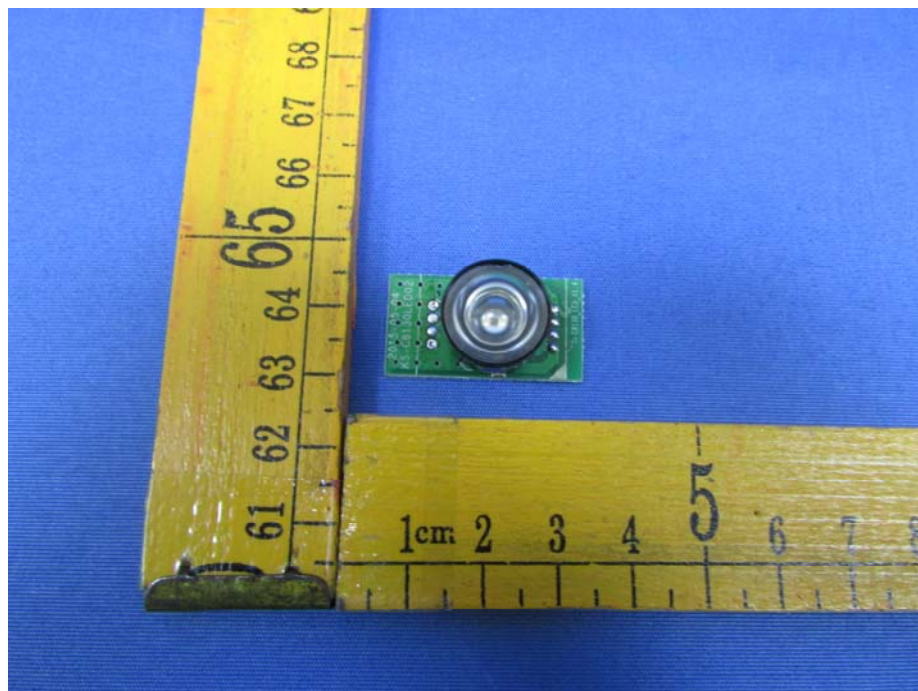
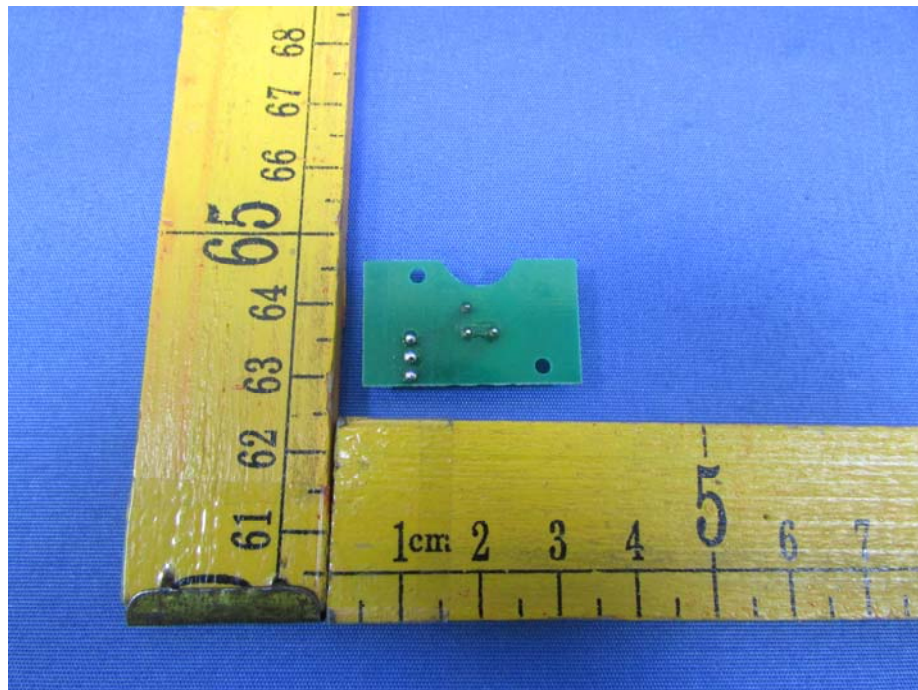
15.2 Model BNK-CAM01 – Internal View

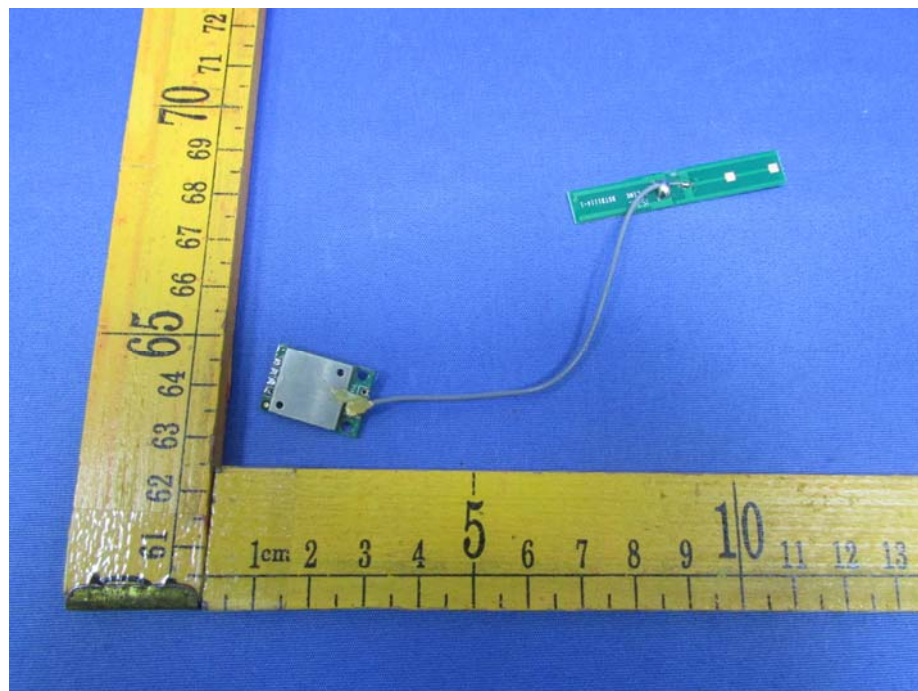
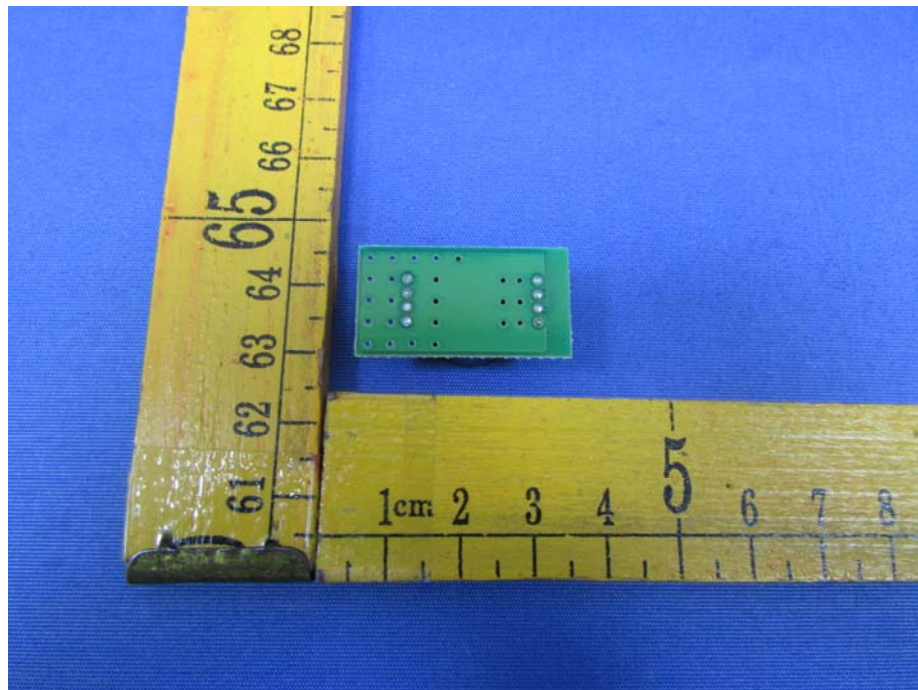


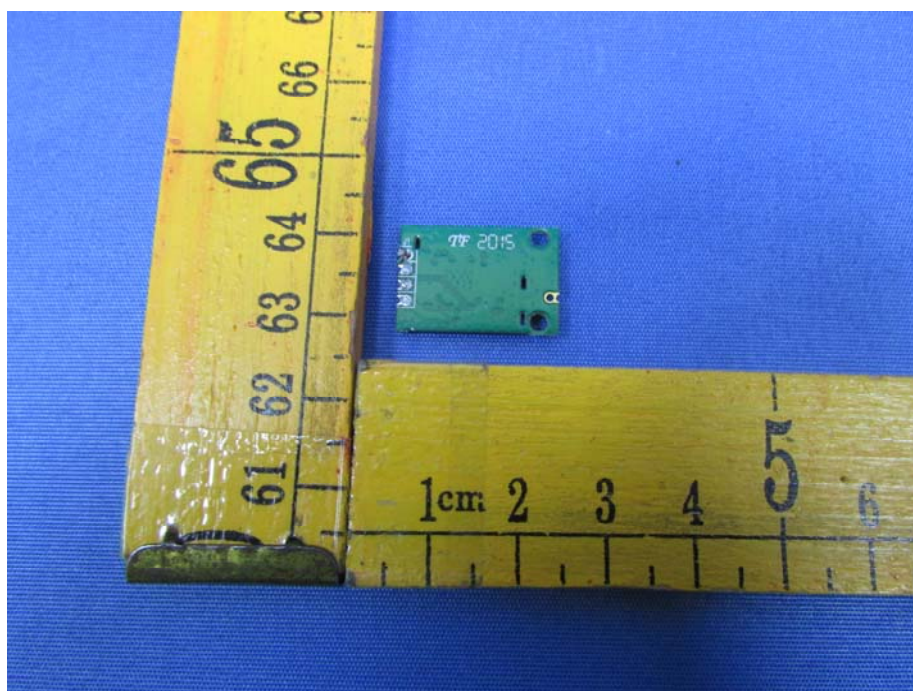
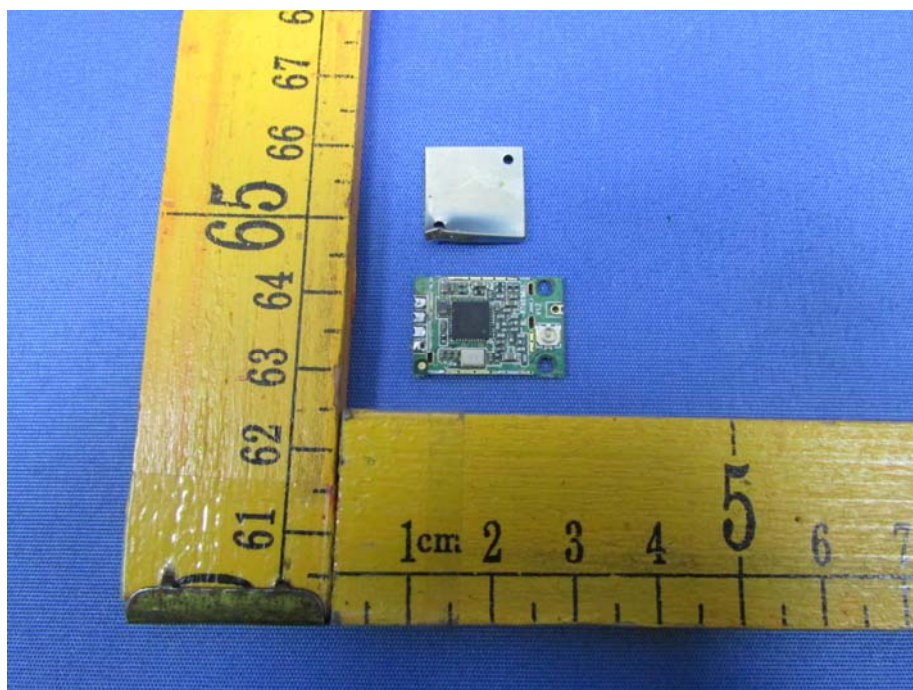


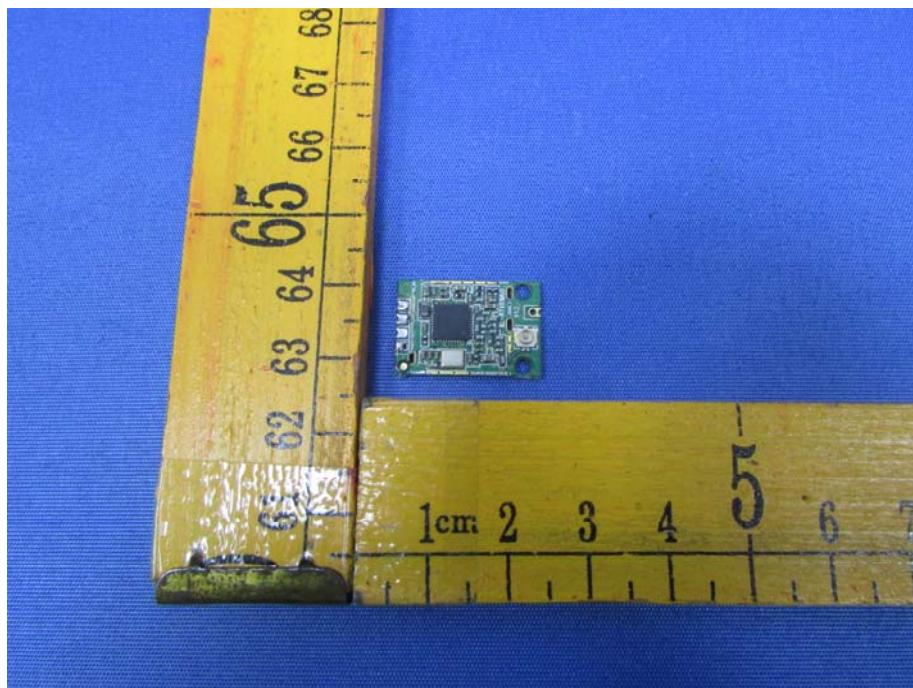












====End of Report====