Shenzhen GTI Technology Co., Ltd.

1F,2 Block, Jiaquan Building, Guanlan High-tech Park Baoan District,
Shenzhen, Guangdong, China.
Tel: +86-755-27559792
Fax: +86-755-86116468

TEST REPORT

Product Name ..... **:** Action Camera

Trademark ..... **:** EI∃

Model/Type reference ..... **:** Explorer

Listed Model(s) ..... **:** \

FCC ID ..... **:** **2AGUA-EXPLORER**

Test Standards ..... **:** **FCC Part 15.247: Operation within the bands 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz**

Applicant ..... **:** HK ELEPHONE COMMUNICATION TECH CO.,LIMITED

Address of applicant ..... **:** UNIT 04,7/F BRIGHT WAY TOWER NO.33 MONG KOK RD KL, Hong Kong

Date of Receipt ..... **:** Nov. 30, 2015

Date of Test Date ..... **:** Dec. 03, 2015 - Dec. 08, 2015

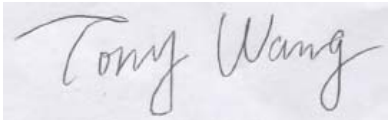
Data of issue. ..... **:** Dec. 09, 2015

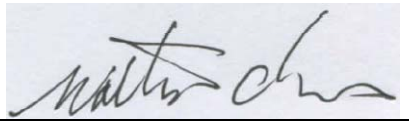
Test result	**Pass ***

* In the configuration tested, the EUT complied with the standards specified above

GENERAL DESCRIPTION OF EUT	
Equipment:	Action Camera
Model Name:	Explorer
Manufacturer:	HK ELEPHONE COMMUNICATION TECH CO.,LIMITED
Manufacturer Address:	UNIT 04,7/F BRIGHT WAY TOWER NO.33 MONG KOK RD KL, Hong Kong
Power Rating:	DC 3.7V form 1050mAh by rechargeable battery or DC 5.0V⎓1A form USB Cable

Compiled By: 
(Thomas Morgan)

Reviewed By: 
(Tony Wang)

Approved By: 
(Walter Chen)

This test report consists of 53 pages in total. It may be duplicated completely for legal use with the approval of the applicant. It should not be reproduced except in full, without the written approval of our laboratory. The client should not use it to claim product endorsement by GTI. The test results in the report only apply to the tested sample. The test report shall be invalid without all the signatures of compiler, reviewer and approver. Any objections must be raised to GTI within 15 days since the date when the report is received. It will not be taken into consideration beyond this limit.

Table of Contents Page

1. SUMMARY 4

1.1. TEST STANDARDS 4
1.2. TEST DESCRIPTION 4
1.3. TEST FACILITY 5
1.4. MEASUREMENT UNCERTAINTY 5

2. GENERAL INFORMATION 6

2.1. ENVIRONMENTAL CONDITIONS 6
2.2. GENERAL DESCRIPTION OF EUT 6
2.3. DESCRIPTION OF TEST MODES 7
2.4. MEASUREMENT INSTRUMENTS LIST 8

3. TEST CONDITIONS AND RESULTS 9

3.1. CONDUCTED EMISSION (AC MAIN) 9
3.2. RADIATED EMISSION 12
3.3. MAXIMUM CONDUCTED (AVERAGE) OUTPUT POWER 19
3.4. POWER SPECTRAL DENSITY 20
3.5. 6DB BANDWIDTH 24
3.6. BAND EDGE COMPLIANCE OF RF EMISSION 27
3.7. SPURIOUS RF CONDUCTED EMISSION 32
3.8. ANTENNA REQUIREMENT 45

4. EUT TEST PHOTO 46

5. PHOTOGRAPHS OF EUT CONSTRUCTIONAL 47

1. SUMMARY

1.1. Test Standards

The tests were performed according to following standards:

FCC Rules Part 15.247: Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz

ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices

KDB558074 D01 V03r03: Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247

1.2. Test Description

FCC PART 15 15.247		
FCC Part 15.207	AC Power Conducted Emission	PASS
FCC Part 15.247(a)(2)	6dB Bandwidth	PASS
FCC Part 15.247(d)	Spurious RF Conducted Emission	PASS
FCC Part 15.247(b)	Maximum Conducted Output Power	PASS
FCC Part 15.247(e)	Power Spectral Density	PASS
FCC Part 15.109/ 15.205/ 15.209	Radiated Emissions	PASS
FCC Part 15.247(d)	Band Edge	PASS
FCC Part 15.203/15.247 (b)	Antenna Requirement	PASS

Remark: The measurement uncertainty is not included in the test result.

1.3. Test Facility

1.3.1 Address of the test laboratory

Shenzhen General Testing & Inspection Technology Co., Ltd.

Add: 1F, 2 Block,Jiaquan Building, Guanlan High-tech Park Baoan District, Shenzhen, Guangdong,China

1.3.2 Laboratory accreditation

The test facility is recognized, certified, or accredited by the following organizations:

IC Registration No.: 9783A

The 3m alternate test site of Shenzhen GTI Technology Co., Ltd.EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.: 9783A on Aug, 2011.

FCC-Registration No.: 214666

Shenzhen GTI Technology 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 214666, Sep 19, 2011

1.4. Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements and is documented in the Shenzhen General Testing & Inspection Technology Co., Ltd quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for General Testing & Inspection laboratory is reported:

Test Items	Measurement Uncertainty	Notes
Transmitter power conducted	0.57 dB	(1)
Transmitter power Radiated	2.20 dB	(1)
Conducted spurious emission 9KHz-40 GHz	1.60 dB	(1)
Radiated spurious emission 9KHz-40 GHz	2.20 dB	(1)
Conducted Emission 9KHz-30MHz	3.39 dB	(1)
Radiated Emission 30~1000MHz	4.24 dB	(1)
Radiated Emission 1~18GHz	5.16 dB	(1)
Radiated Emission 18-40GHz	5.54 dB	(1)
Occupied Bandwidth	---------	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

2. GENERAL INFORMATION

2.1. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15~35°C
Relative Humidity:	30~60 %
Air Pressure:	950~1050mba

2.2. General Description of EUT

Product Name:	Action Camera
Model/Type reference:	Explorer
Listed model:	\
Power supply:	DC 3.7V form 1050mAh by rechargeable battery or DC 5.0V⎓1A form USB Cable
Hardware version:	iT_X1_V2.3
Software version:	20151116V1.0
WIFI :	
Supported type:	802.11b/802.11g/802.11n(H20)/802.11n(H40)
Modulation:	802.11b: DSSS 802.11g/802.11n(H20)/802.11n(H40): OFDM
Operation frequency:	802.11b/802.11g/802.11n(H20): 2412MHz~2462MHz 802.11n(H40): 2422MHz~2452MHz
Channel number:	802.11b/802.11g/802.11n(H20): 11 802.11n(H40): 7
Channel separation:	5MHz
Antenna type:	PCB Antenna
Antenna gain:	1.86dBi

Note: For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

2.3. Description of Test Modes

Peripherals Devices:

OUTSIDE SUPPORT EQUIPMENT						
No.	Equipment	Model	Serial No.	Manufacture	Trade name	Remark
1.	PC	p7-1005cx	4CV125C 15J	Hewlett-Packard	HP	FCC DOC
2.	LCD Monitor	HSTND-299 1-F	3CQ1022 0WT	Hewlett-Packard	HP	FCC DOC
3.	Printer	LaserJet P1007	VNFN663 791	Hewlett-Packard	HP	FCC DOC
4.	Mouse	MOEUUOA	44H5597	Lenovo	Lenovo	FCC DOC
5.	Keyboard	KB212-B	ON291F	Dell Inc.	Dell	FCC DOC

Note: All the above equipment /cable were placed in worse case position to maximize emission signals during emission test. New battery is used during the test.

WIFI Operation Frequency

The Applicant provides communication tools software to control the EUT for staying in continuous transmitting (Duty Cycle more than 98%) mode for testing.

Channel	Frequency(MHz)	Channel	Frequency(MHz)
1	**2412**	8	2447
2	2417	**9**	**2452**
3	**2422**	10	2457
4	2427	**11**	**2462**
5	2432		
6	**2437**		
7	2442		

Data Rate Used:

Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Mode	Data Rate	Channel
Maximum Peak Conducted Output Power Power Spectral Density 6dB Bandwidth Spurious RF conducted emission Radiated Emission 9kHz~1GHz& Radiated Emission 1GHz~10th Harmonic	11b/DSSS	1 Mbps	1/6/11
	11g/OFDM	6 Mbps	1/6/11
	11n(20MHz)/OFDM	6.5Mbps	1/6/11
	11n(40MHz)/OFDM	13.5 Mbps	3/6/9
Band Edge	11b/DSSS	1 Mbps	1/11
	11g/OFDM	6 Mbps	1/11
	11n(20MHz)/OFDM	6.5Mbps	1/11
	11n(40MHz)/OFDM	13.5 Mbps	3/9

2.4. Measurement Instruments List

Maximum conducted (average) output power					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	Power Meter	Anritsu	ML2487B	110553	July 10,2016
2	Power Sensor	Anritsu	MA2411B	100345	July 10,2016

Power Spectral Density / 6dB Bandwidth / Band Edge Compliance of RF Emission / Spurious RF Conducted Emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSU26	100105	Jan 07,2016

Conducted Emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrate until
1	LISN	R&S	ENV216	101112	Jan. 07, 2016
2	LISN	R&S	ENV216	101113	Jan. 07, 2016
3	EMI Test Receiver	R&S	ESCI	100920	Jan. 07, 2016
4	Cable	Schwarzbeck	AK9515E	33156	Jan. 07, 2016

Radiated Emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	EMI Test Receiver	R&S	ESCI	100658	Jan 07,2016
2	High pass filter	micro-tranics	HPM50111	34202	Jan 07,2016
3	Log-Bicon Antenna	Schwarzbeck	CBL6141A	4180	Jan 07,2016
4	Ultra-Broadband Antenna	ShwarzBeck	BBHA9170	25841	Jan. 10,2016
5	Loop Antenna	LAPLAC	RF300	9138	Jan. 10,2016
6	Spectrum Analyzer	Rohde & Schwarz	FSU	100105	Jan 07,2016
7	Horn Antenna	Schwarzbeck	BBHA 9120D	647	Jan 14,2016
8	Pre-Amplifier	HP	8447D	1937A03050	Jan. 07,2016
9	Pre-Amplifier	EMCI	EMC051835	980075	Jan. 07,2016
10	Antenna Mast	UC	UC3000	N/A	N/A
11	Turn Table	UC	UC3000	N/A	N/A
12	Cable Below 1GHz	Schwarzbeck	AK9515E	33155	Jan. 07,2016
13	Cable Above 1GHz	Hubersuhner	SUCOFLEX102	DA1580	Jan. 07,2016

Note: 1. The Cal.Interval was one year.
2. The cable loss has calculated in test result which connection between each test instruments.

3. TEST CONDITIONS AND RESULTS

3.1. Conducted Emission (AC Main)

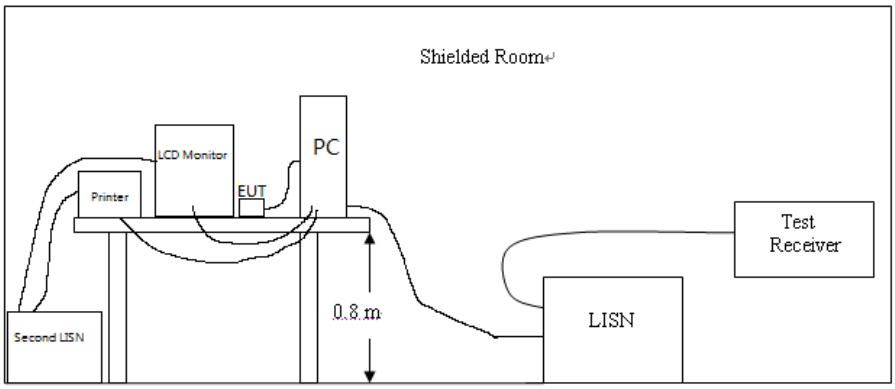
LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.207

Frequency range (MHz)	Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

TEST CONFIGURATION



TEST PROCEDURE

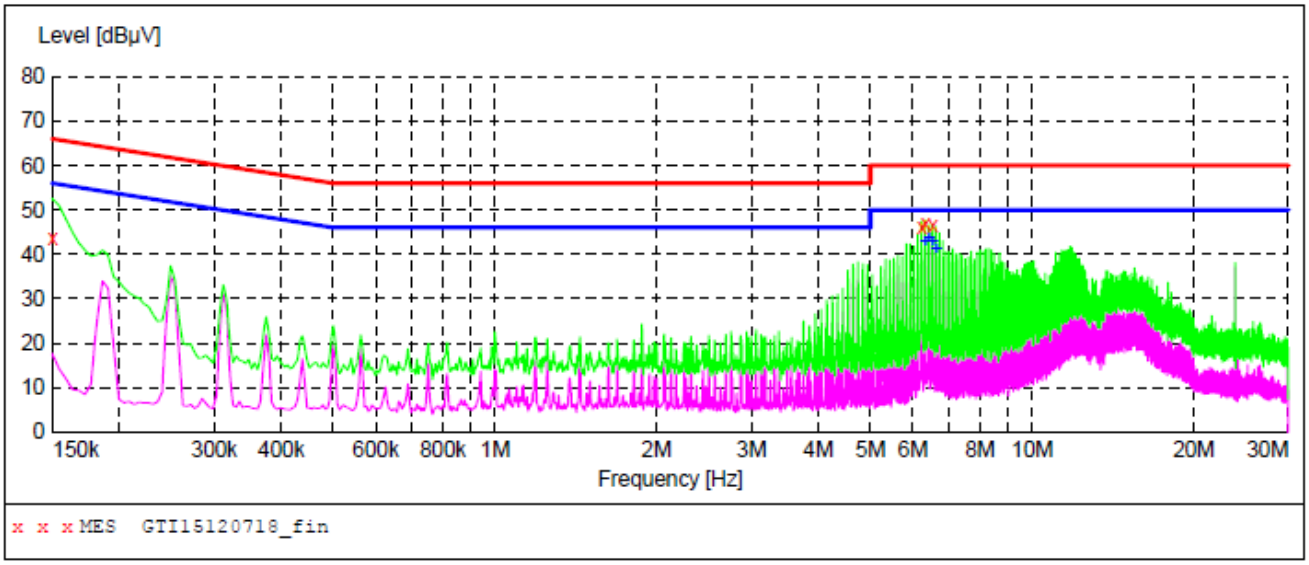
1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system; a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10:2013.
2. Support equipment, if needed, was placed as per ANSI C63.10:2013
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10:2013
4. The EUT received DC5V power from the PC, the PC received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5. All support equipments received AC power from a second LISN, if any.
6. The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7. Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.
8. During the above scans, the emissions were maximized by cable manipulation.

TEST RESULTS

Note: We tested all modes, recorded the worst case at wifi 802.11b mid channel

LINE	L

SCAN TABLE: "Vol(9K-30M)FIN-N"
Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "GTI15120718_fin"

12/7/2015 1:50PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150000	43.80	9.8	66	22.2	QP	L1	GND
6.230000	46.10	10.4	60	13.9	QP	L1	GND
6.332000	47.10	10.4	60	12.9	QP	L1	GND
6.530000	46.40	10.4	60	13.6	QP	L1	GND

MEASUREMENT RESULT: "GTI15120718_fin2"

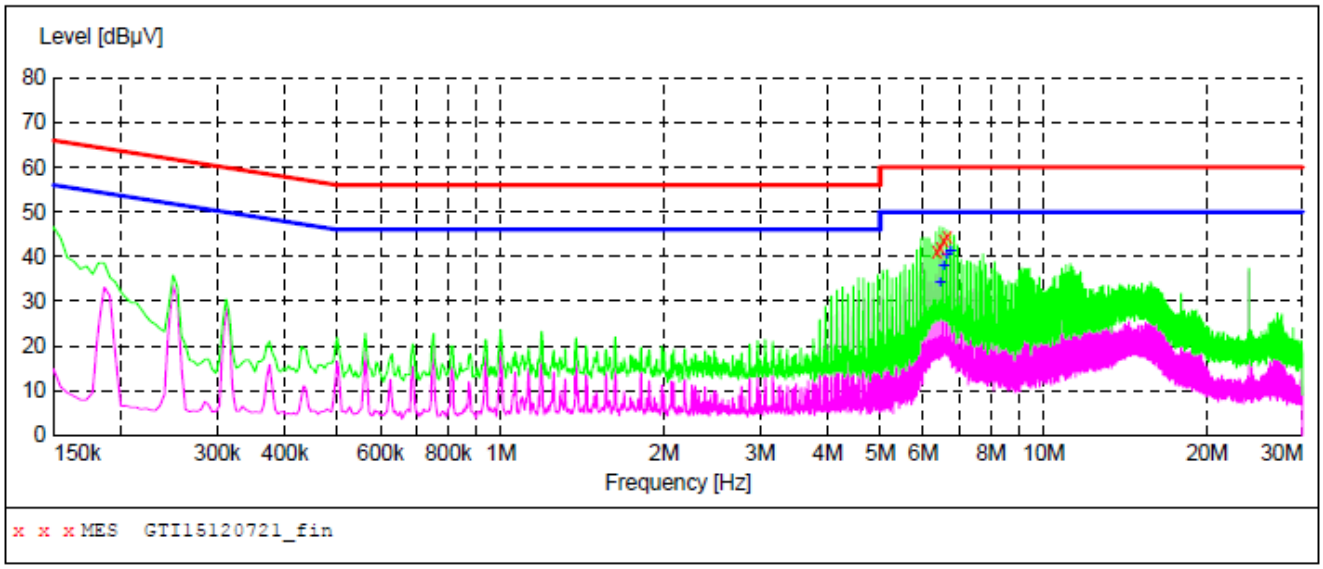
12/7/2015 1:50PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
6.332000	42.80	10.4	50	7.2	AV	L1	GND
6.428000	43.50	10.4	50	6.5	AV	L1	GND
6.530000	42.70	10.4	50	7.3	AV	L1	GND
6.626000	41.10	10.5	50	8.9	AV	L1	GND

LINE	N

SCAN TABLE: "Vol(9K-30M)FIN-N"

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "GTI15120721_fin"

12/7/2015 2:03PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
6.345500	41.30	10.2	60	18.7	QP	N	GND
6.444500	41.80	10.2	60	18.2	QP	N	GND
6.543500	43.70	10.2	60	16.3	QP	N	GND
6.642500	44.40	10.2	60	15.6	QP	N	GND

MEASUREMENT RESULT: "GTI15120721_fin2"

12/7/2015 2:03PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
6.444500	34.20	10.2	50	15.8	AV	N	GND
6.543500	37.90	10.2	50	12.1	AV	N	GND
6.642500	40.40	10.2	50	9.6	AV	N	GND
6.741500	41.00	10.2	50	9.0	AV	N	GND

3.2. Radiated Emission

Limit

For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emission from intentional radiators at a distance of 3 meters shall not exceed the following table. According to § 15.247(d), in any 100kHz bandwidth outside the frequency band in which the EUT is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the100kHz bandwidth within the band that contains the highest level of desired power.

The frequency spectrum above 1 GHz for Transmitter was investigated. All emission not reported are much lower than the prescribed limits. Set the RBW=1MHz, VBW=3MHz for Peak Detector while the RBW=1MHz, VBW=10Hz for Average Detector, Readings are both peak and average values. The pre-test have done for the EUT in three axes and found the worst emission at position shown in test setup photos.

Frequency (MHz)	Distance (Meters)	Radiated (dBuV/m)	Radiated (μV/m)
0.009-0.49	3	20log(2400/F(KHz))+40log(300/3)	2400/F(KHz)
0.49-1.705	3	20log(24000/F(KHz))+ 40log(30/3)	24000/F(KHz)
1.705-30	3	20log(30)+ 40log(30/3)	30
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

Test Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane..
2. Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0℃ to 360℃ to acquire the highest emissions from EUT
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measurements have been completed.

Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CL – AG

Where	FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
	RA = Reading Amplitude	AG = Amplifier Gain
	AF = Antenna Factor	

For example

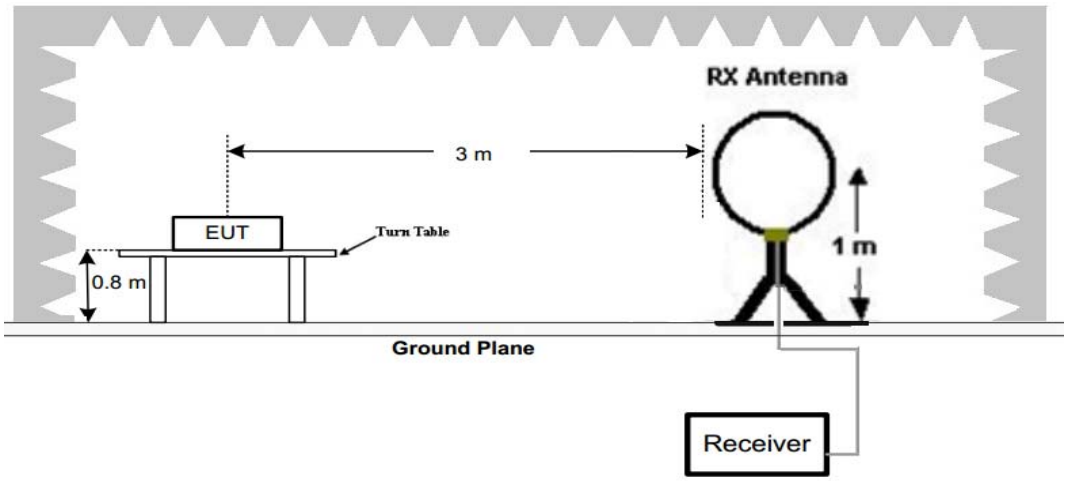
Frequency (MHz)	FS (dBμV/m)	RA (dBμV/m)	AF (dB)	CL (dB)	AG (dB)	Transd (dB)
150.00	40	58.1	12.2	1.6	31.90	-18.1

Transd=AF +CL-AG

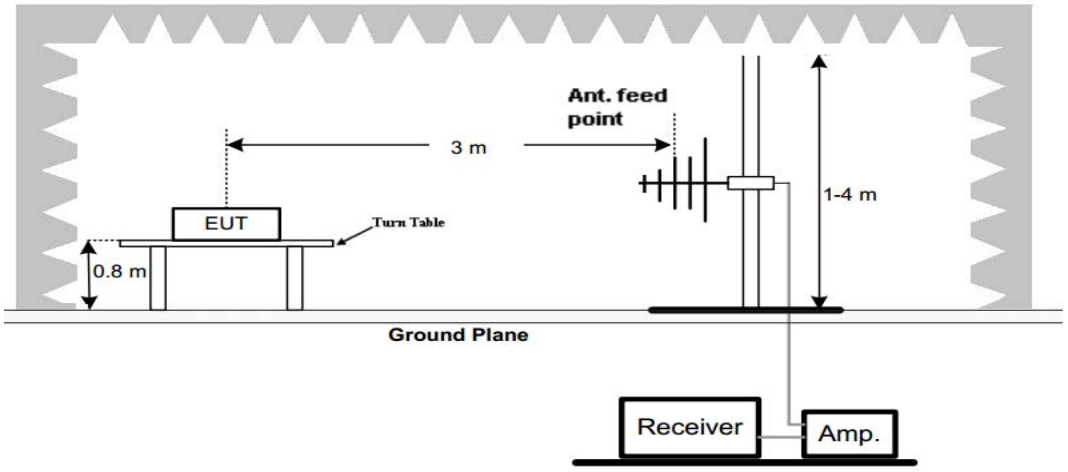
Test Configuration

For the actual test configuration, please refer to the related Item –EUT Test Photos.

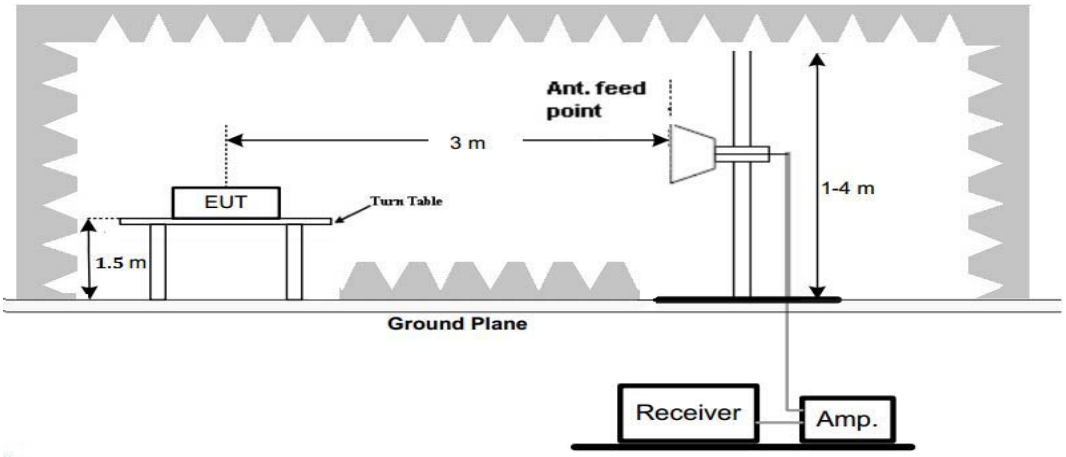
Frequency range 9 KHz – 30MHz



Frequency range 30MHz – 1000MHz



Frequency range above 1GHz-25GHz



Test Results

Remark:

1. We tested three channels for each mode and recorded worst case at low channel of 802.11b Mode below 1GHz

For 9 KHz-30MHz

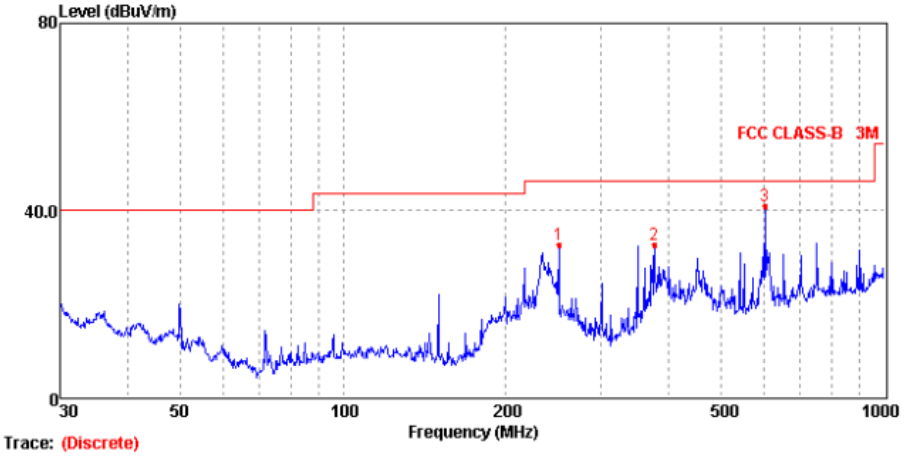
For 802.11B Low Channel

Frequency (MHz)	Corrected Reading (dBuV/m)@3m	FCC Limit (dBuV/m) @3m	Margin (dB)	Detector	Result
0.33	54.85	97.23	42.38	Peak	PASS
1.46	48.14	64.32	16.18	QP	PASS
15.38	31.26	69.54	38.28	QP	PASS
24.54	46.23	69.54	23.31	QP	PASS

For 30MHz-1GHz

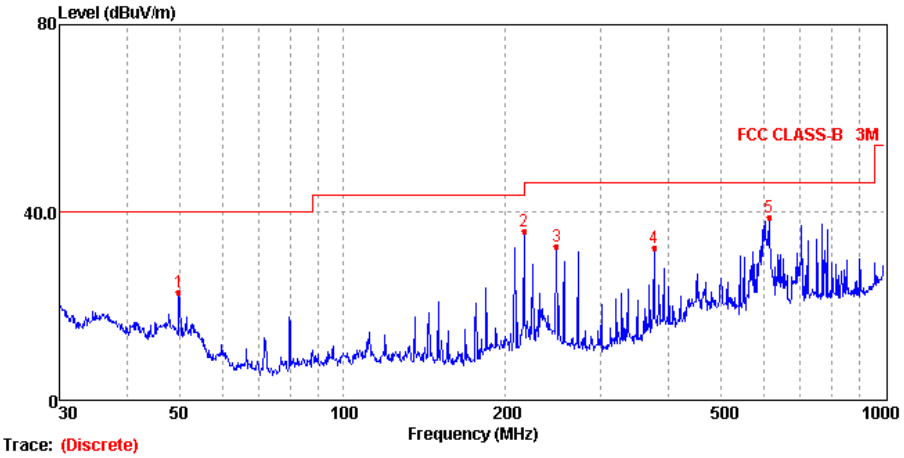
For 802.11B Low Channel

Horizontal



Mark	Frequency MHz	Level dBuV/m	Factor dB/m	Reading dBuV	Limit dBuV/m	Margin dB	Polarization	Detector
1	250.30	32.27	-17.59	49.86	46.00	13.73	HORIZONTAL	Peak
2	375.94	32.29	-14.17	46.46	46.00	13.71	HORIZONTAL	Peak
3	601.43	40.70	-10.10	50.80	46.00	5.30	HORIZONTAL	Peak

Vertical



Mark	Frequency MHz	Level dBuV/m	Factor dB/m	Reading dBuV	Limit dBuV/m	Margin dB	Polarization	Detector
1	49.88	22.46	-15.12	37.58	40.00	17.54	VERTICAL	Peak
2	216.02	35.74	-17.77	53.51	46.00	10.26	VERTICAL	Peak
3	248.55	32.48	-17.59	50.07	46.00	13.52	VERTICAL	Peak
4	375.94	32.15	-14.17	46.32	46.00	13.85	VERTICAL	Peak
5	612.06	38.57	-10.02	48.59	46.00	7.43	VERTICAL	Peak

For 1GHz to 25GHz

802.11b Mode (above 1GHz)

Frequency(MHz):				2412			Polarity:			HORIZONTAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4824	53.79	PK	74.00	20.21	1.00	72.00	51.69	31.60	7.00	36.50	2.10
1	4824	48.75	AV	54.00	5.25	1.00	72.00	46.65	31.60	7.00	36.50	2.10
2	7236	46.88	PK	74.00	27.12	1.00	72.00	35.95	37.33	8.90	35.30	10.93
2	7236	40.72	AV	54.00	13.28	1.00	72.00	29.79	37.33	8.90	35.30	10.93

Frequency(MHz):				2412			Polarity:			VERTICAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4824	54.49	PK	74.00	19.51	1.00	162.00	52.39	31.60	7.00	36.50	2.10
1	4824	48.59	AV	54.00	5.41	1.00	162.00	46.49	31.60	7.00	36.50	2.10
2	7236	45.41	PK	74.00	28.59	1.00	162.00	34.48	37.33	8.90	35.30	10.93
2	7236	40.81	AV	54.00	13.19	1.00	162.00	29.88	37.33	8.90	35.30	10.93

Frequency(MHz):				2437			Polarity:			HORIZONTAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4874.00	54.14	PK	74.00	19.86	1.00	66.00	52.02	31.02	7.60	36.50	2.12
1	4874.00	48.01	AV	54.00	5.99	1.00	66.00	45.89	31.02	7.60	36.50	2.12
2	7311.00	47.88	PK	74.00	26.12	1.00	66.00	36.80	37.28	8.60	34.80	11.08
2	7311.00	40.82	AV	54.00	13.18	1.00	66.00	29.74	37.28	8.60	34.80	11.08

Frequency(MHz):				2437			Polarity:			VERTICAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4874.00	53.63	PK	74.00	20.37	1.00	172.00	51.51	31.02	7.60	36.50	2.12
1	4874.00	47.59	AV	54.00	6.41	1.00	172.00	45.47	31.02	7.60	36.50	2.12
2	7311.00	47.85	PK	74.00	26.15	1.00	172.00	36.77	37.28	8.60	34.80	11.08
2	7311.00	40.58	AV	54.00	13.42	1.00	172.00	29.50	37.28	8.60	34.80	11.08

Frequency(MHz):				2462			Polarity:			HORIZONTAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4924.00	54.83	PK	74.00	19.17	1.00	84.00	51.63	31.58	7.82	36.20	3.20
1	4924.00	47.71	AV	54.00	6.29	1.00	84.00	44.51	31.58	7.82	36.20	3.20
2	7386.00	47.71	PK	74.00	26.29	1.00	84.00	35.77	38.51	8.73	35.30	11.94
2	7386.00	40.91	AV	54.00	13.09	1.00	84.00	28.97	38.51	8.73	35.30	11.94

Frequency(MHz):				2462			Polarity:			VERTICAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4924.00	55.05	PK	74.00	18.95	1.00	158.00	51.85	31.58	7.82	36.20	3.20
1	4924.00	48.73	AV	54.00	5.27	1.00	158.00	45.53	31.58	7.82	36.20	3.20
2	7386.00	46.65	PK	74.00	27.35	1.00	158.00	34.71	38.51	8.73	35.30	11.94
2	7386.00	40.79	AV	54.00	13.21	1.00	158.00	28.85	38.51	8.73	35.30	11.94

802.11g Mode (above 1GHz)

Frequency(MHz):				2412			Polarity:			HORIZONTAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4824	52.04	PK	74.00	21.96	1.00	72.00	49.94	31.60	7.00	36.50	2.10
1	4824	46.62	AV	54.00	7.38	1.00	72.00	44.52	31.60	7.00	36.50	2.10
2	7236	46.40	PK	74.00	27.60	1.00	72.00	35.47	37.33	8.90	35.30	10.93
2	7236	37.33	AV	54.00	16.67	1.00	72.00	26.40	37.33	8.90	35.30	10.93

Frequency(MHz):				2412			Polarity:			VERTICAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4824	54.32	PK	74.00	19.68	1.00	162.00	52.22	31.60	7.00	36.50	2.10
1	4824	45.23	AV	54.00	8.77	1.00	162.00	43.13	31.60	7.00	36.50	2.10
2	7236	48.52	PK	74.00	25.48	1.00	162.00	37.59	37.33	8.90	35.30	10.93
2	7236	40.76	AV	54.00	13.24	1.00	162.00	29.83	37.33	8.90	35.30	10.93

Frequency(MHz):				2437			Polarity:			HORIZONTAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4874.00	53.76	PK	74.00	20.24	1.00	66.00	51.64	31.02	7.60	36.50	2.12
1	4874.00	44.30	AV	54.00	9.70	1.00	66.00	42.18	31.02	7.60	36.50	2.12
2	7311.00	46.88	PK	74.00	27.12	1.00	66.00	35.80	37.28	8.60	34.80	11.08
2	7311.00	36.81	AV	54.00	17.19	1.00	66.00	25.73	37.28	8.60	34.80	11.08

Frequency(MHz):				2437			Polarity:			VERTICAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4874.00	52.85	PK	74.00	21.15	1.00	172.00	50.73	31.02	7.60	36.50	2.12
1	4874.00	43.83	AV	54.00	10.17	1.00	172.00	41.71	31.02	7.60	36.50	2.12
2	7311.00	47.65	PK	74.00	26.35	1.00	172.00	36.57	37.28	8.60	34.80	11.08
2	7311.00	39.63	AV	54.00	14.37	1.00	172.00	28.55	37.28	8.60	34.80	11.08

Frequency(MHz):				2462			Polarity:			HORIZONTAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4924.00	52.78	PK	74.00	21.22	1.00	172.00	49.58	31.58	7.82	36.20	3.20
1	4924.00	45.18	AV	54.00	8.82	1.00	172.00	41.98	31.58	7.82	36.20	3.20
2	7386.00	47.59	PK	74.00	26.41	1.00	172.00	35.65	38.51	8.73	35.30	11.94
2	7386.00	38.74	AV	54.00	15.26	1.00	172.00	26.80	38.51	8.73	35.30	11.94

Frequency(MHz):				2462			Polarity:			VERTICAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4924.00	53.66	PK	74.00	20.34	1.00	158.00	50.46	31.58	7.82	36.20	3.20
1	4924.00	44.86	AV	54.00	9.14	1.00	158.00	41.66	31.58	7.82	36.20	3.20
2	7386.00	48.84	PK	74.00	25.16	1.00	158.00	36.90	38.51	8.73	35.30	11.94
2	7386.00	39.28	AV	54.00	14.72	1.00	158.00	27.34	38.51	8.73	35.30	11.94

802.11n20 Mode (above 1GHz)

Frequency(MHz):				2412			Polarity:			HORIZONTAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4824	52.79	PK	74.00	21.21	1.00	60.00	50.69	31.60	7.00	36.50	2.10
1	4824	44.06	AV	54.00	9.94	1.00	60.00	41.96	31.60	7.00	36.50	2.10
2	7236	45.82	PK	74.00	28.18	1.00	60.00	34.89	37.33	8.90	35.30	10.93
2	7236	36.15	AV	54.00	17.85	1.00	60.00	25.22	37.33	8.90	35.30	10.93

Frequency(MHz):				2412			Polarity:			VERTICAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4824	52.26	PK	74.00	21.74	1.00	147.00	50.16	31.60	7.00	36.50	2.10
1	4824	43.46	AV	54.00	10.54	1.00	147.00	41.36	31.60	7.00	36.50	2.10
2	7236	47.61	PK	74.00	26.39	1.00	147.00	36.68	37.33	8.90	35.30	10.93
2	7236	38.70	AV	54.00	15.30	1.00	147.00	27.77	37.33	8.90	35.30	10.93

Frequency(MHz):				2437			Polarity:			HORIZONTAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4874.00	52.03	PK	74.00	21.97	1.00	60.00	49.91	31.02	7.60	36.50	2.12
1	4874.00	44.89	AV	54.00	9.11	1.00	60.00	42.77	31.02	7.60	36.50	2.12
2	7311.00	47.32	PK	74.00	26.68	1.00	60.00	36.24	37.28	8.60	34.80	11.08
2	7311.00	36.82	AV	54.00	17.18	1.00	60.00	25.74	37.28	8.60	34.80	11.08

Frequency(MHz):				2437			Polarity:			VERTICAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4874.00	52.73	PK	74.00	21.27	1.00	177.00	50.61	31.02	7.60	36.50	2.12
1	4874.00	43.08	AV	54.00	10.92	1.00	177.00	40.96	31.02	7.60	36.50	2.12
2	7311.00	45.34	PK	74.00	28.66	1.00	177.00	34.26	37.28	8.60	34.80	11.08
2	7311.00	37.29	AV	54.00	16.71	1.00	177.00	26.21	37.28	8.60	34.80	11.08

Frequency(MHz):				2462			Polarity:			HORIZONTAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4924.00	51.99	PK	74.00	22.01	1.00	182.00	48.79	31.58	7.82	36.20	3.20
1	4924.00	44.77	AV	54.00	9.23	1.00	182.00	41.57	31.58	7.82	36.20	3.20
2	7386.00	46.77	PK	74.00	27.23	1.00	182.00	34.83	38.51	8.73	35.30	11.94
2	7386.00	38.74	AV	54.00	15.26	1.00	182.00	26.80	38.51	8.73	35.30	11.94

Frequency(MHz):				2462			Polarity:			VERTICAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4924.00	54.73	PK	74.00	19.27	1.00	152.00	51.53	31.58	7.82	36.20	3.20
1	4924.00	44.08	AV	54.00	9.92	1.00	152.00	40.88	31.58	7.82	36.20	3.20
2	7386.00	48.69	PK	74.00	25.31	1.00	152.00	36.75	38.51	8.73	35.30	11.94
2	7386.00	38.07	AV	54.00	15.93	1.00	152.00	26.13	38.51	8.73	35.30	11.94

802.11n40 Mode (above 1GHz)

Frequency(MHz):				2422			Polarity:			HORIZONTAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4844.00	50.95	PK	74.00	23.05	1.00	82.00	48.85	31.60	7.00	36.50	2.10
1	4844.00	42.33	AV	54.00	11.67	1.00	82.00	40.23	31.60	7.00	36.50	2.10
2	7266.00	44.65	PK	74.00	29.35	1.00	82.00	33.72	37.33	8.90	35.30	10.93
2	7266.00	36.44	AV	54.00	8.93	1.00	82.00	34.14	37.33	8.90	35.30	10.93

Frequency(MHz):				2422			Polarity:			VERTICAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4844.00	50.75	PK	74.00	23.25	1.00	167.00	48.65	31.60	7.00	36.50	2.10
1	4844.00	41.40	AV	54.00	12.60	1.00	167.00	39.30	31.60	7.00	36.50	2.10
2	7266.00	46.38	PK	74.00	27.62	1.00	167.00	35.45	37.33	8.90	35.30	10.93
2	7266.00	38.72	AV	54.00	15.28	1.00	167.00	27.79	37.33	8.90	35.30	10.93

Frequency(MHz):				2437			Polarity:			HORIZONTAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4874.00	51.21	PK	74.00	22.79	1.00	62.00	49.09	31.02	7.60	36.50	2.12
1	4874.00	42.74	AV	54.00	11.26	1.00	62.00	40.62	31.02	7.60	36.50	2.12
2	7311.00	46.22	PK	74.00	27.78	1.00	62.00	35.14	37.28	8.60	34.80	11.08
2	7311.00	37.90	AV	54.00	16.10	1.00	62.00	26.82	37.28	8.60	34.80	11.08

Frequency(MHz):				2437			Polarity:			VERTICAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4874.00	51.15	PK	74.00	22.85	1.00	187.00	49.03	31.02	7.60	36.50	2.12
1	4874.00	43.52	AV	54.00	10.48	1.00	187.00	41.40	31.02	7.60	36.50	2.12
2	7311.00	47.07	PK	74.00	26.93	1.00	187.00	35.99	37.28	8.60	34.80	11.08
2	7311.00	38.66	AV	54.00	15.34	1.00	187.00	27.58	37.28	8.60	34.80	11.08

Frequency(MHz):				2452			Polarity:			HORIZONTAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4904.00	51.39	PK	74.00	22.61	1.00	172.00	48.19	31.58	7.82	36.20	3.20
1	4904.00	42.08	AV	54.00	11.92	1.00	172.00	38.88	31.58	7.82	36.20	3.20
2	7356.00	45.77	PK	74.00	28.23	1.00	172.00	33.83	38.51	8.73	35.30	11.94
2	7356.00	36.27	AV	54.00	17.73	1.00	172.00	24.33	38.51	8.73	35.30	11.94

Frequency(MHz):				2452			Polarity:			VERTICAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4904.00	51.33	PK	74.00	22.67	1.00	158.00	48.13	31.58	7.82	36.20	3.20
1	4904.00	43.40	AV	54.00	10.60	1.00	158.00	40.20	31.58	7.82	36.20	3.20
2	7356.00	48.42	PK	74.00	25.58	1.00	158.00	36.48	38.51	8.73	35.30	11.94
2	7356.00	37.49	AV	54.00	16.51	1.00	158.00	25.55	38.51	8.73	35.30	11.94

3.3. Maximum Conducted (average) Output Power

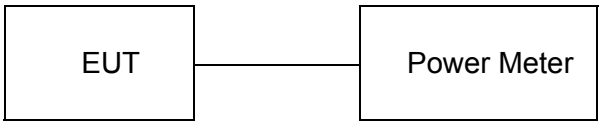
Limit

30dBm for digital modulation systems.

Test Procedure

- Measurement using a RF average power meter
  1. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the Power Meter.
  2. Ensure EUT transmitting with a duty cycle ≥ 98 %.
  3. Record the value of Power Meter.

Test Configuration



Test Results

WIFI

Type	Channel	Output power AV(dBm)	Limit (dBm)	Result
802.11b	01	8.10	30.00	Pass
	06	8.56		
	11	8.27		
802.11g	01	8.50	30.00	Pass
	06	8.47		
	11	8.48		
802.11n(H20)	01	7.81	30.00	Pass
	06	7.93		
	11	7.60		
802.11n(H40)	03	7.48	30.00	Pass
	06	7.56		
	09	7.46		

Note: 1.The test results including the cable lose.

3.4. Power Spectral Density

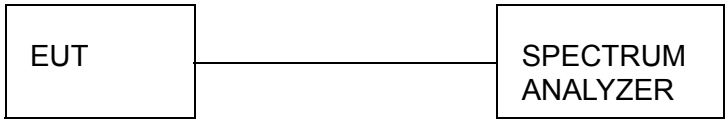
Limit

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

Test Procedure

- Use this procedure when the maximum (average) conducted output power was used to demonstrate compliance to the output power limit.
  1. Set analyzer center frequency to DTS channel center frequency.
  2. Set span to at least 1.5 times the OBW
  3. RBW: 3 kHz ≤ RBW ≤ 100 kHz.
  4. VBW: ≥3 x RBW.
  5. Detector: power averaging (RMS)
  6. Sweep time: Auto couple.
  7. Swoop points: ≥ 8001.
  8. Trace mode = Average (100 traces)
  9. Use the peak marker function to determine the maximum power level.
  10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.
      Note: The OBW test data please see the section 3.5

Test Configuration



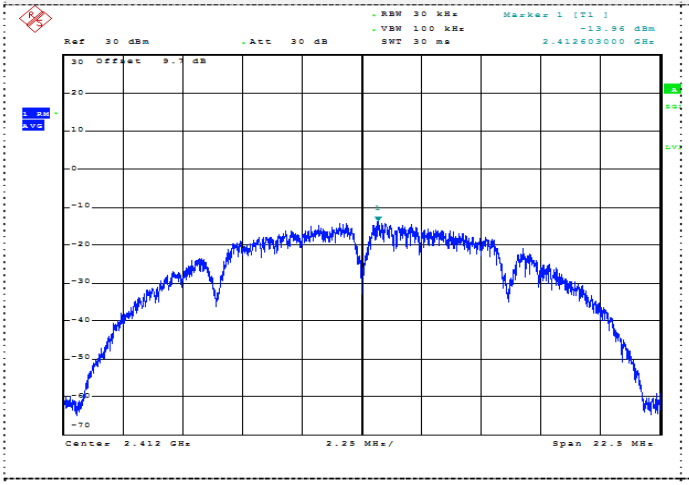
Test Results

WIFI

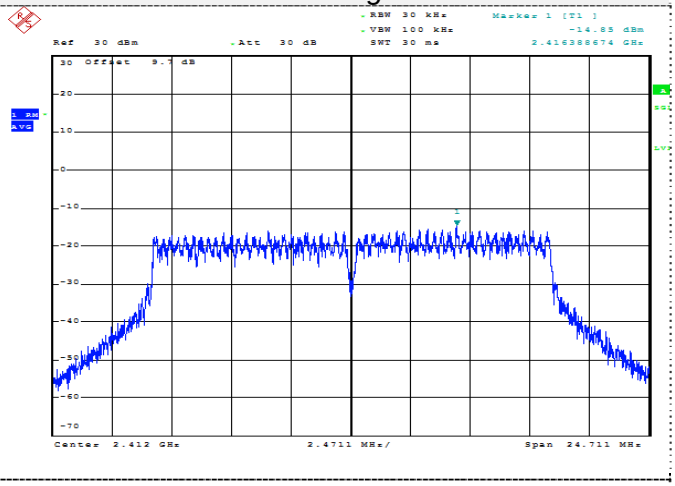
Type	Channel	Power Spectral Density (dBm/30KHz)	Limit (dBm/3KHz)	Result
802.11b	01	-13.960	8.00	Pass
	06	-13.840		
	11	-13.770		
802.11g	01	-14.850	8.00	Pass
	06	-15.110		
	11	-15.980		
802.11n(HT20)	01	-16.770	8.00	Pass
	06	-16.290		
	11	-15.940		
802.11n(HT40)	03	-19.140	8.00	Pass
	06	-20.170		
	09	-19.520		

Test plot as follows:

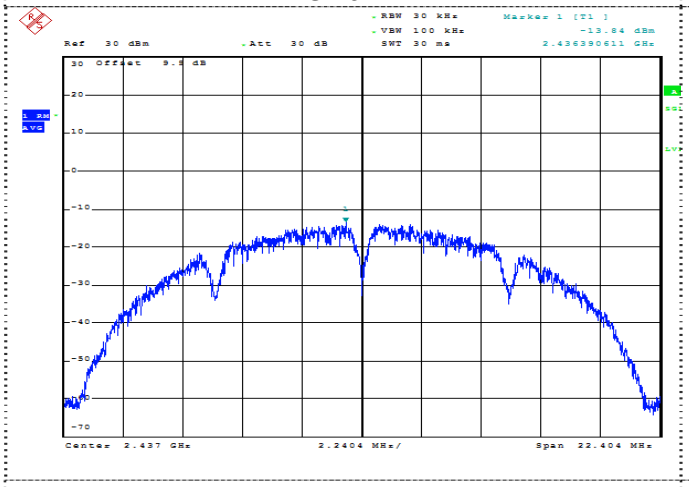
802.11b



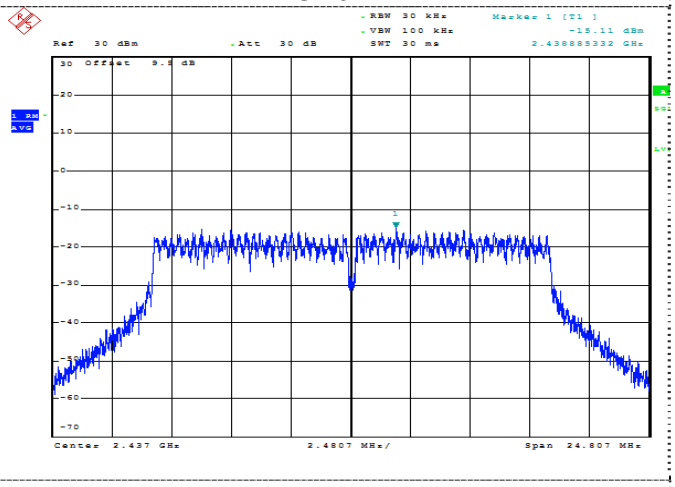
802.11g



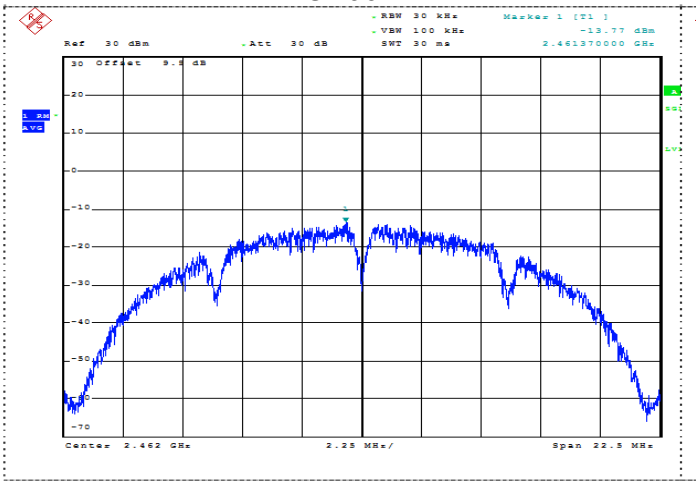
CH01



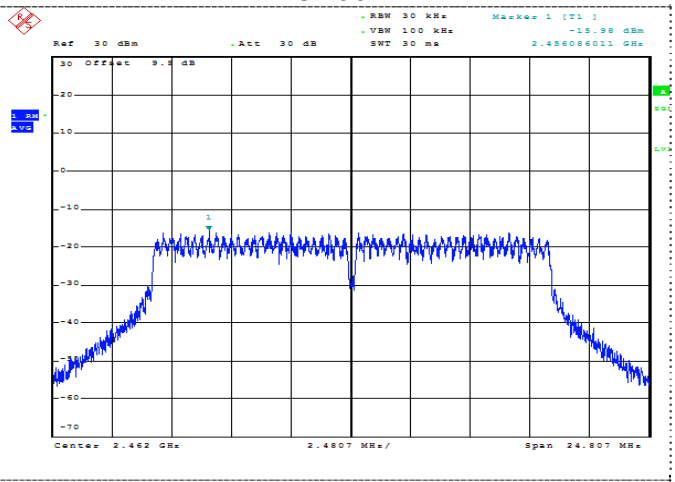
CH01



CH06



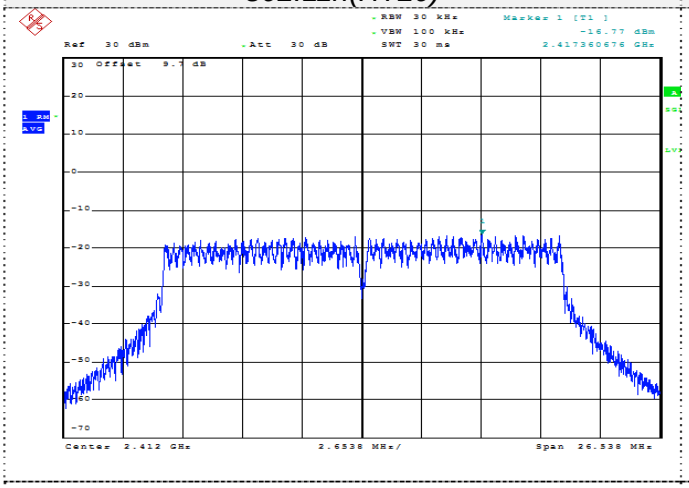
CH06



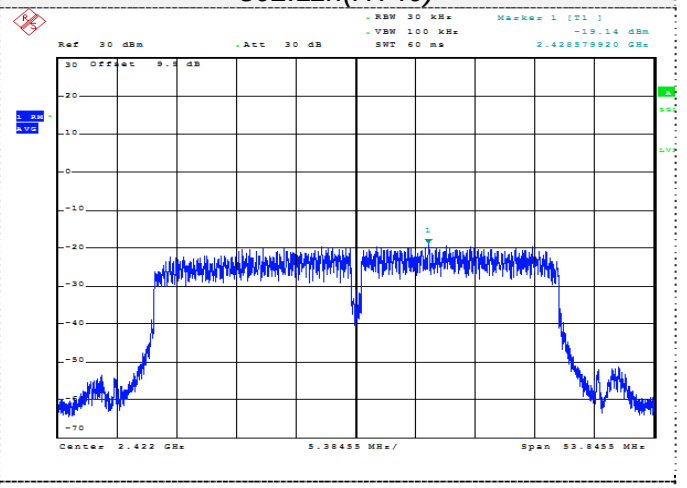
CH11

CH11

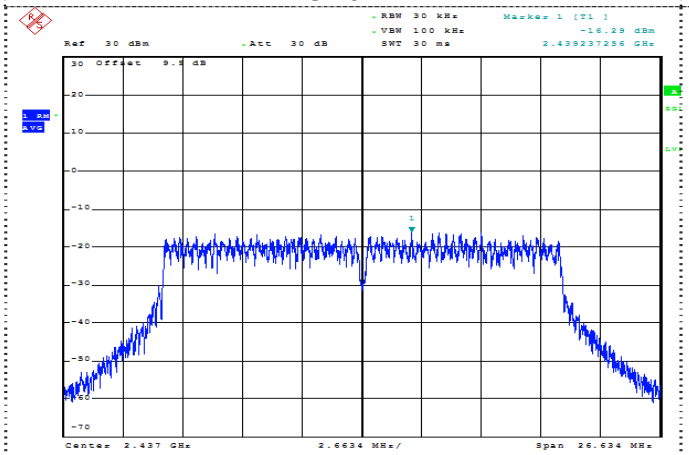
802.11n(HT20)



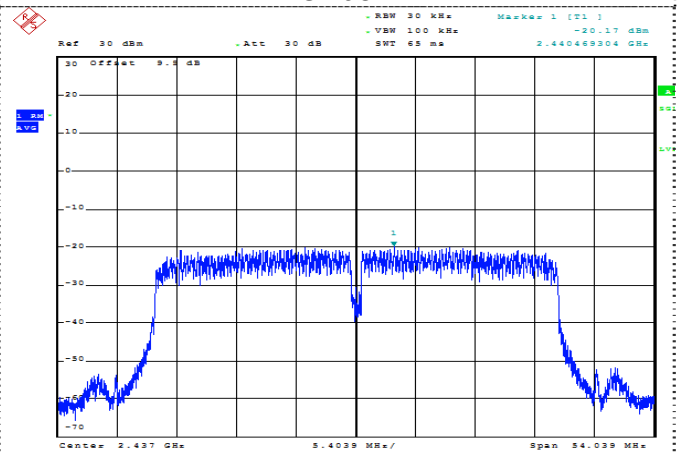
802.11n(HT40)



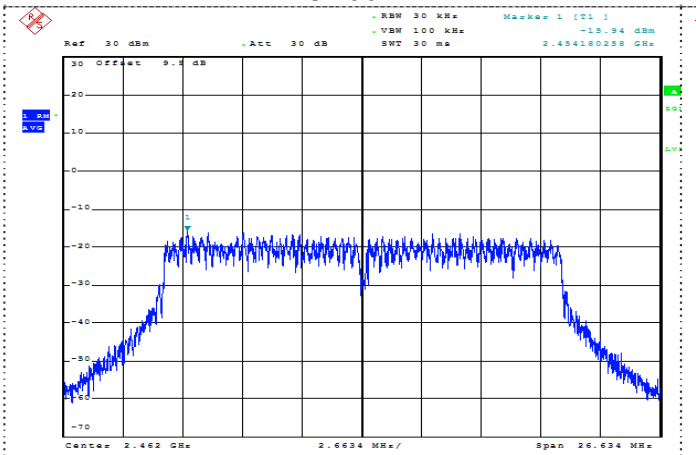
CH01



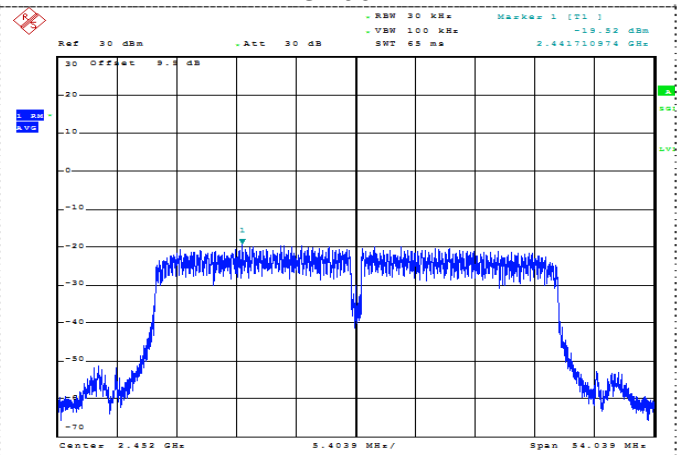
CH03



CH06



CH06



CH11

CH09

3.5. 6dB Bandwidth

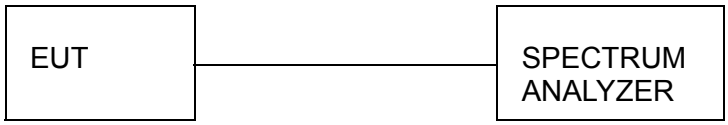
Limit

For digital modulation systems, the minimum 6 dB bandwidth shall be at least 500 kHz

Test Procedure

1. The transmitter output was connected to the spectrum analyzer.
2. Set SA as follow:
   a) RBW: 100 kHz.
   b) VBW: ≥ 3 × RBW.
   c) Detector: Peak.
   d) Trace mode: max hold.
   e) Sweep: auto couple.
3. Allow the trace to stabilize.
4. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Test Configuration



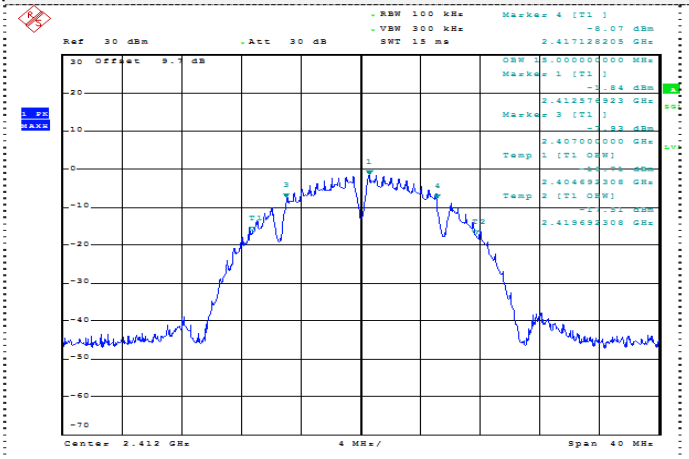
Test Results

WIFI

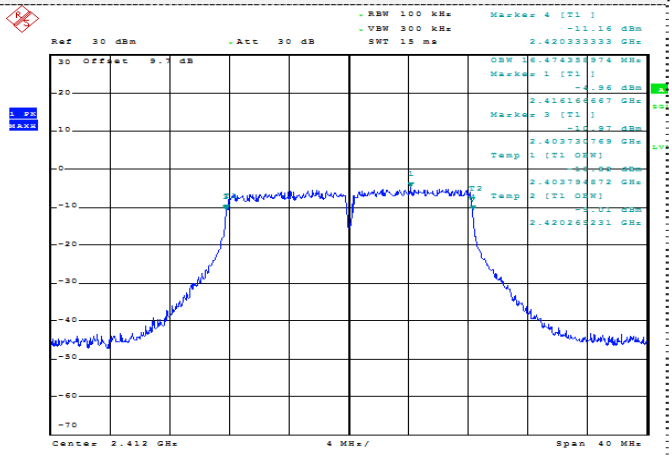
Type	Channel	6dB Bandwidth (MHz)	99% OBW (MHz)	Limit (KHz)	Result
802.11b	01	10.128	15.000	≥500	Pass
	06	10.192	14.936		
	11	10.256	15.000		
802.11g	01	16.603	16.474	≥500	Pass
	06	16.731	16.538		
	11	16.731	16.538		
802.11n(HT20)	01	17.885	17.692	≥500	Pass
	06	17.949	17.756		
	11	17.885	17.756		
802.11n(HT40)	03	36.154	35.897	≥500	Pass
	06	36.538	36.026		
	09	36.667	36.026		

Test plot as follows:

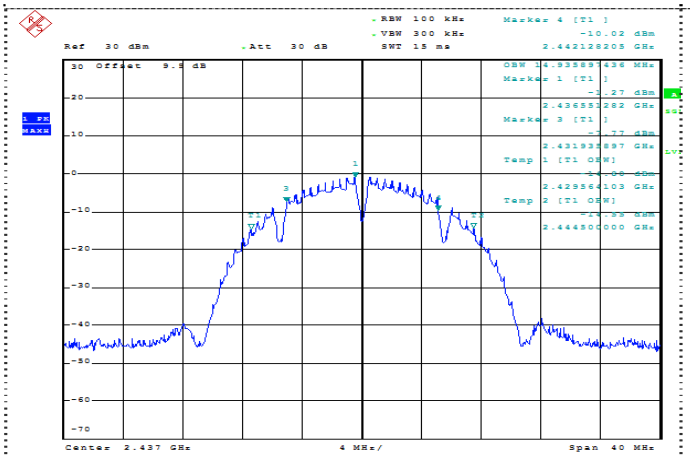
802.11b



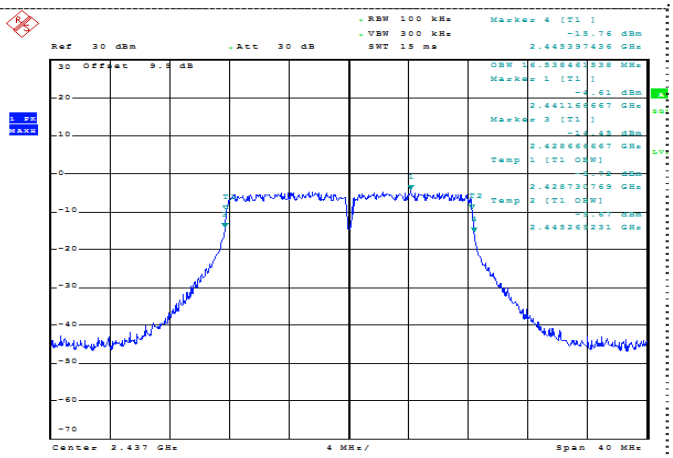
802.11g



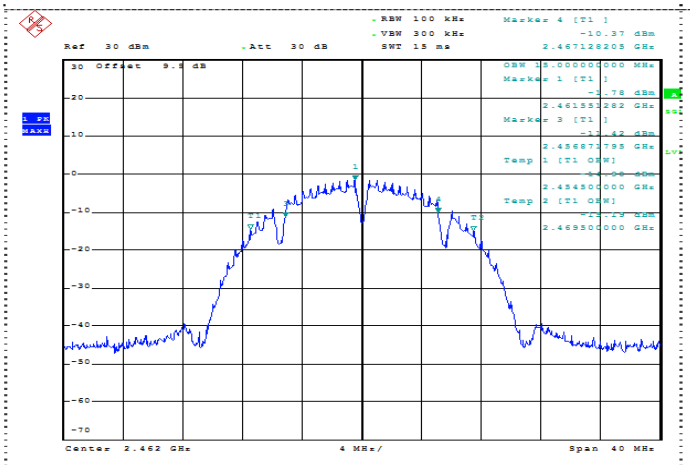
CH01



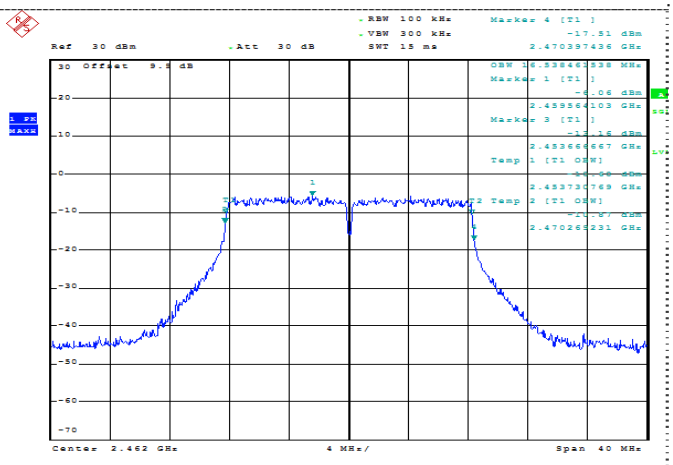
CH01



CH06



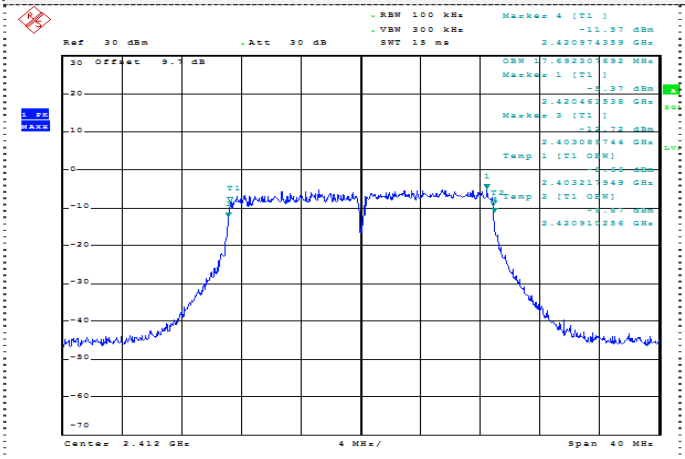
CH06



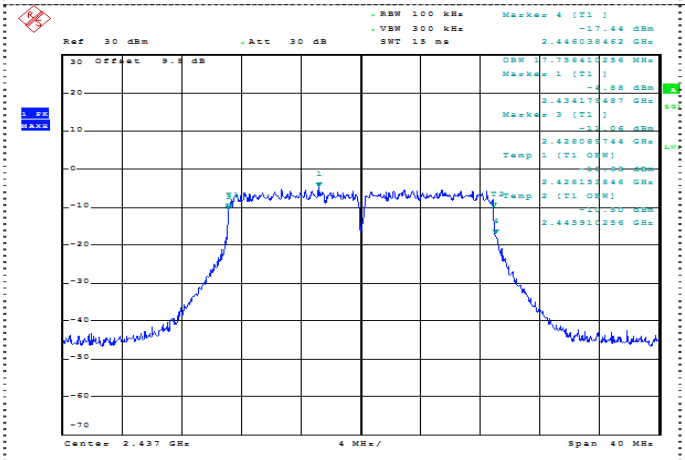
CH11

CH11

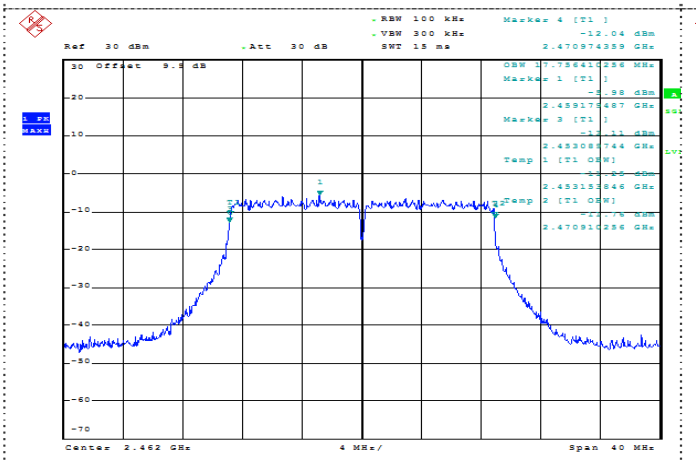
802.11n(HT20)



CH01

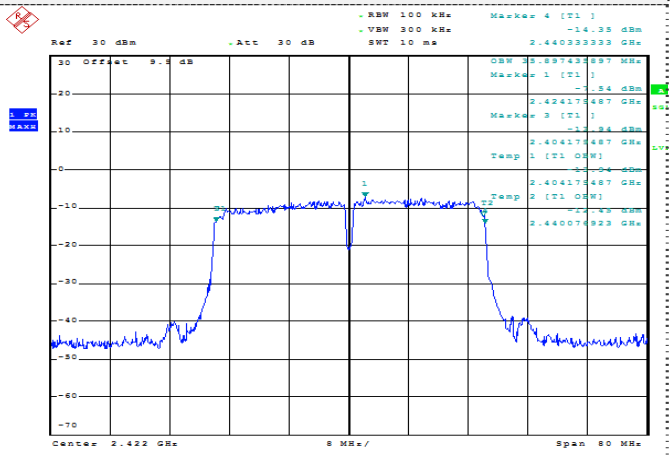


CH06

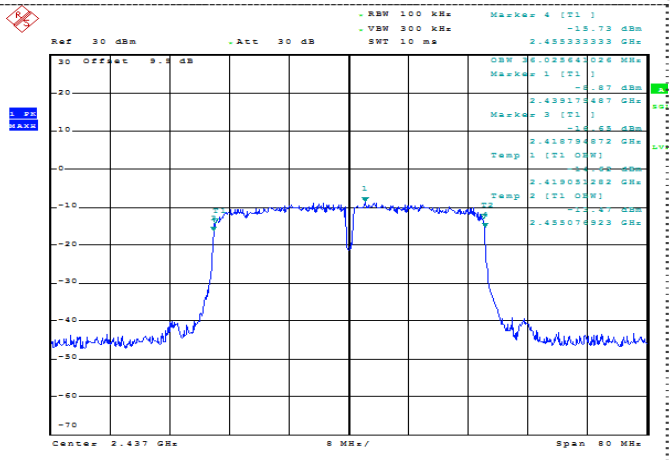


CH11

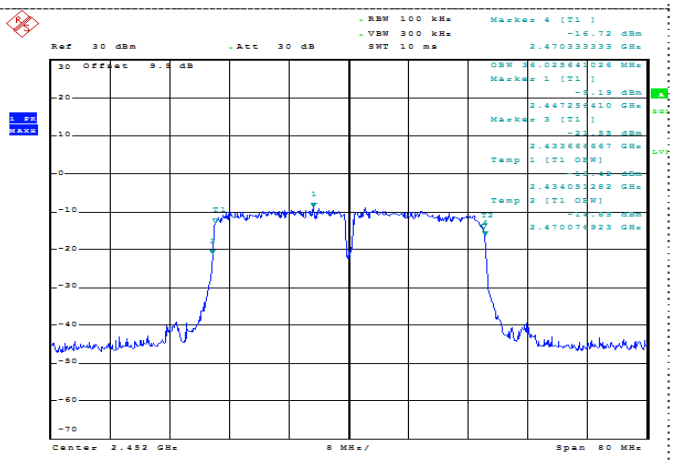
802.11n(HT40)



CH03



CH06



CH09

3.6. Band Edge Compliance of RF Emission

Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §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)).

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)

Test Procedure

Test Procedure tor conducted method

- Use this procedure when the maximum (average) conducted output power was used to demonstrate compliance to the output power limit.
  1. Remove the antenna from the EUT and then connect to a low loss RF cable from the antenna port to a spectrum analyzer
  2. Turn on the EUT and make it operate in transmitting mode. Then set it to Low Channel and High Channel within its operating range, and make sure the instrument is operated in its linear range.
  3. Set spectrum analyzer RBW =100 kHz, VBW=300 kHz, Detector=RMS, Sweep point=≥8001, Sweep time=Auto, trace= Average(100 traces)
  4. Marker the highest point which fall into restricted frequency bands
  5. Repeat above procedures until all measured frequencies were complete.

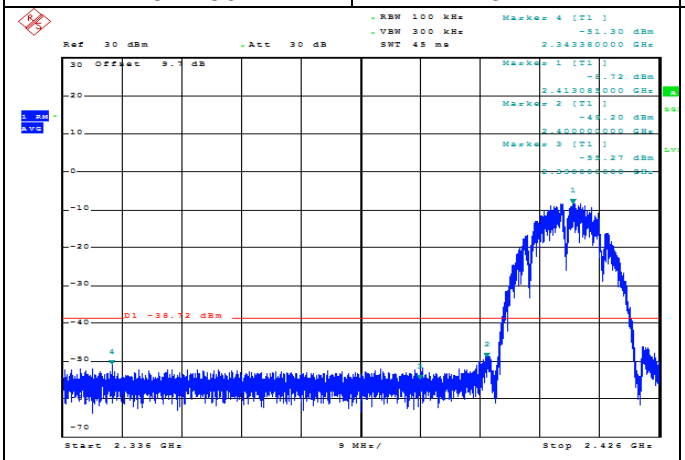
Test Procedure tor radiated method

1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. Place a marker at the end of the restricted band closest to the transmit frequency to show compliance. Also measure any emissions in the restricted bands. Save the spectrum analyzer plot. Repeat for each power and modulation for lowest and highest channel
7. Test the EUT in the lowest channel, the highest channel
8. The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, only the test worst case mode is recorded in the report.
9. Repeat above procedures until all frequencies measured was complete.

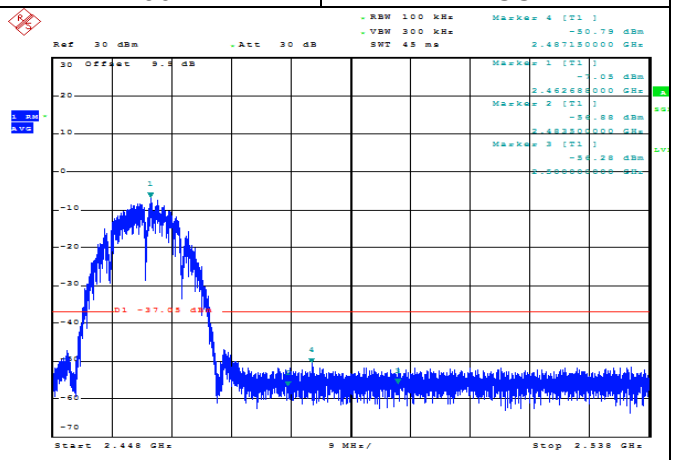
Test Results

A. Conducted measurements

802.11b			
Frequency (MHz)	Delta Peak to Band emission (dBc)	Limit (dBc)	Verdict
2343.380	42.580	30	PASS
2487.150	43.744	30	PASS

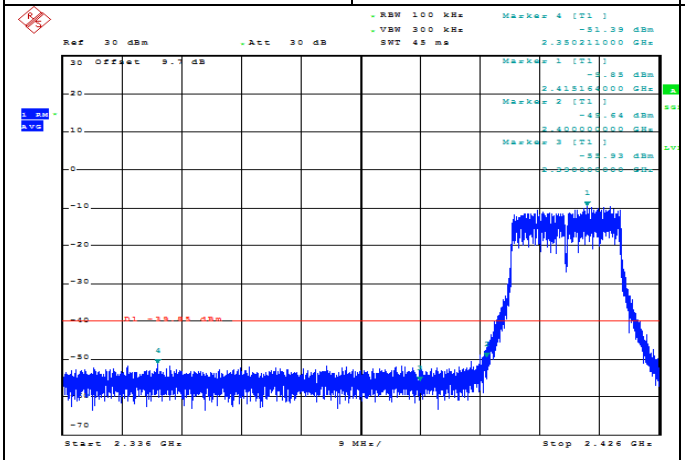


2412

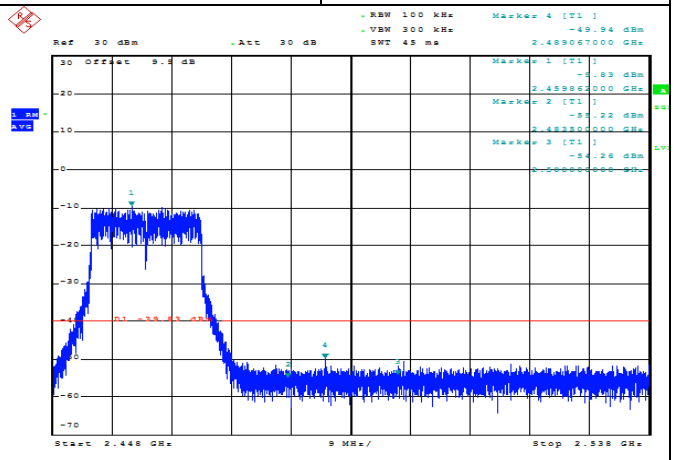


2462

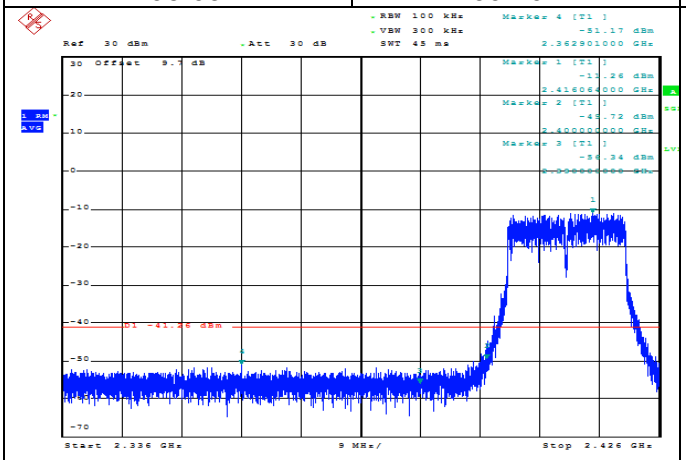
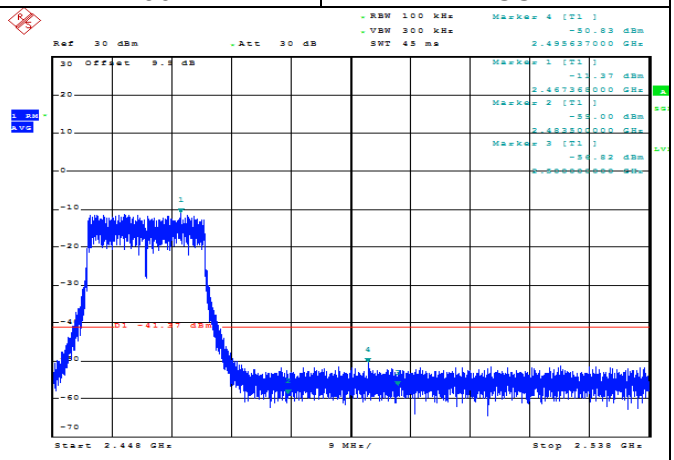
802.11g			
Frequency (MHz)	Delta Peak to Band emission (dBc)	Limit (dBc)	Verdict
2350.211	41.539	30	PASS
2489.067	40.112	30	PASS

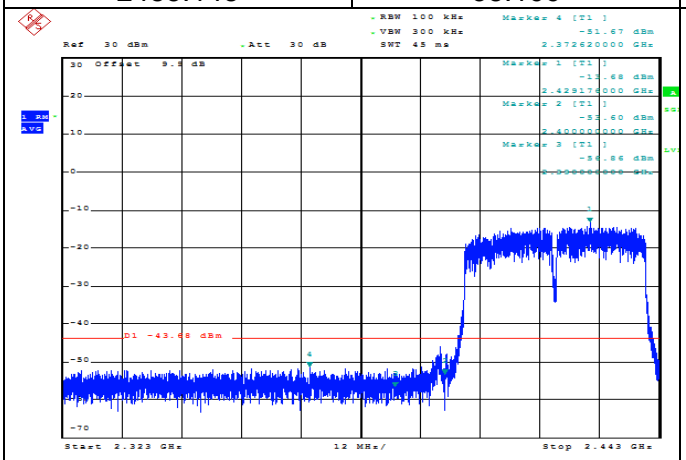
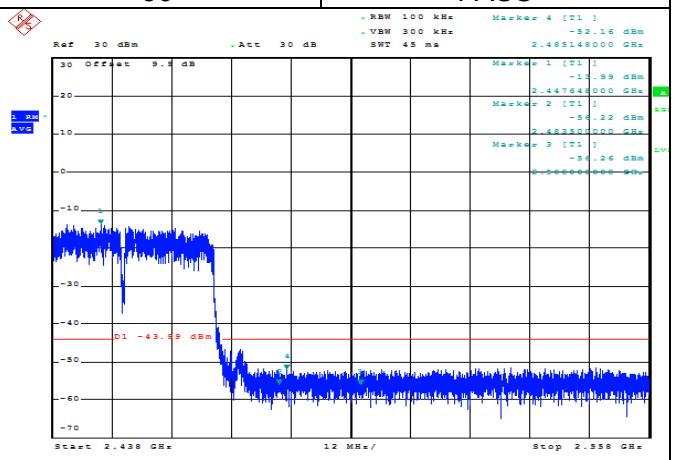


2412



2462

802.11n20			
Frequency (MHz)	Delta Peak to Band emission (dBc)	Limit (dBc)	Verdict
2362.901	39.908	30	PASS
2495.637	39.464	30	PASS
			
2412		2462	

802.11n40			
Frequency (MHz)	Delta Peak to Band emission (dBc)	Limit (dBc)	Verdict
2372.620	37.990	30	PASS
2485.148	38.166	30	PASS
			
2422		2452	

B. **Radiated measurements**

802.11b

Frequency(MHz):			2412			Polarity:			HORIZONTAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2390.00	53.89	PK	74.00	20.11	1.00	59	59.20	27.49	3.32	36.12	-5.31
2390.00	45.27	AV	54.00	8.73	1.00	59	50.58	27.49	3.32	36.12	-5.31
Frequency(MHz):			**2412**			**Polarity:**			**VERTICAL**		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2390.00	53.26	PK	74.00	20.74	1.00	213	58.57	27.49	3.32	36.12	-5.31
2390.00	41.09	AV	54.00	12.91	1.00	213	46.40	27.49	3.32	36.12	-5.31
Frequency(MHz):			**2462**			**Polarity:**			**HORIZONTAL**		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2483.50	52.99	PK	74.00	21.01	1.00	64	58.71	27.45	3.38	36.55	-5.72
2483.50	43.66	AV	54.00	10.34	1.00	64	49.38	27.45	3.38	36.55	-5.72
Frequency(MHz):			**2462**			**Polarity:**			**VERTICAL**		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2483.50	51.91	PK	74.00	22.09	1.00	203	57.63	27.45	3.38	36.55	-5.72
2483.50	42.94	AV	54.00	11.06	1.00	203	48.66	27.45	3.38	36.55	-5.72

802.11g

Frequency(MHz):			2412			Polarity:			HORIZONTAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2390.00	52.20	PK	74.00	21.80	1.00	54	57.51	27.49	3.32	36.12	-5.31
2390.00	42.68	AV	54.00	11.32	1.00	54	47.99	27.49	3.32	36.12	-5.31
Frequency(MHz):			**2412**			**Polarity:**			**VERTICAL**		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2390.00	51.98	PK	74.00	22.02	1.00	208	57.29	27.49	3.32	36.12	-5.31
2390.00	43.46	AV	54.00	10.54	1.00	208	48.77	27.49	3.32	36.12	-5.31
Frequency(MHz):			**2462**			**Polarity:**			**HORIZONTAL**		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2483.50	53.36	PK	74.00	20.64	1.00	64	59.08	27.45	3.38	36.55	-5.72
2483.50	42.71	AV	54.00	11.29	1.00	64	48.43	27.45	3.38	36.55	-5.72
Frequency(MHz):			**2462**			**Polarity:**			**VERTICAL**		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2483.50	52.01	PK	74.00	21.99	1.00	223	57.73	27.45	3.38	36.55	-5.72
2483.50	42.02	AV	54.00	11.98	1.00	223	47.74	27.45	3.38	36.55	-5.72

802.11n20

Frequency(MHz):			2412			Polarity:			HORIZONTAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2390.00	53.49	PK	74.00	20.51	1.00	79	58.80	27.49	3.32	36.12	-5.31
2390.00	44.05	AV	54.00	9.95	1.00	79	49.36	27.49	3.32	36.12	-5.31
Frequency(MHz):			**2412**			**Polarity:**			**VERTICAL**		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2390.00	51.34	PK	74.00	22.66	1.00	225	56.65	27.49	3.32	36.12	-5.31
2390.00	42.81	AV	54.00	11.19	1.00	225	48.12	27.49	3.32	36.12	-5.31
Frequency(MHz):			**2462**			**Polarity:**			**HORIZONTAL**		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2483.50	51.84	PK	74.00	22.16	1.00	74	57.56	27.45	3.38	36.55	-5.72
2483.50	43.91	AV	54.00	10.09	1.00	74	49.63	27.45	3.38	36.55	-5.72
Frequency(MHz):			**2462**			**Polarity:**			**VERTICAL**		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2483.50	53.13	PK	74.00	20.87	1.00	233	58.85	27.45	3.38	36.55	-5.72
2483.50	41.92	AV	54.00	12.08	1.00	233	47.64	27.45	3.38	36.55	-5.72

802.11n40

Frequency(MHz):			2422			Polarity:			HORIZONTAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2390.00	52.37	PK	74.00	21.63	1.00	79	57.68	27.49	3.32	36.12	-5.31
2390.00	41.96	AV	54.00	12.04	1.00	79	47.27	27.49	3.32	36.12	-5.31
Frequency(MHz):			**2422**			**Polarity:**			**VERTICAL**		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2390.00	51.26	PK	74.00	22.74	1.00	225	56.57	27.49	3.32	36.12	-5.31
2390.00	40.48	AV	54.00	13.52	1.00	225	45.79	27.49	3.32	36.12	-5.31
Frequency(MHz):			**2452**			**Polarity:**			**HORIZONTAL**		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2483.50	50.83	PK	74.00	23.17	1.00	74	56.55	27.45	3.38	36.55	-5.72
2483.50	38.76	AV	54.00	15.24	1.00	74	44.48	27.45	3.38	36.55	-5.72
Frequency(MHz):			**2452**			**Polarity:**			**VERTICAL**		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2483.50	50.82	PK	74.00	23.18	1.00	233	56.54	27.45	3.38	36.55	-5.72
2483.50	39.97	AV	54.00	14.03	1.00	233	45.69	27.45	3.38	36.55	-5.72

3.7. Spurious RF Conducted Emission

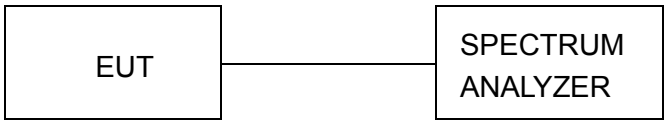
Limit

1. Below -20dB of the highest emission level in operating band.
2. Fall in the restricted bands listed in section 15.205. The maximum permitted average field strength is listed in section 15.209.

Test Procedure

The Spurious RF conducted emissions compliance of RF radiated emission should be measured by following the guidance in ANSI C63.10:2013 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization etc. Set RBW=100 kHz and VBM= 300 KHz to measure the peak field strength, and measured frequency range from 30MHz to 26.5GHz.

Test Configuration

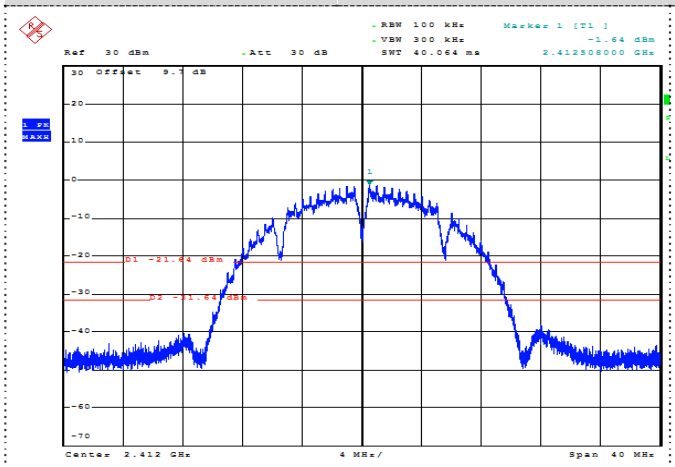


Test Results

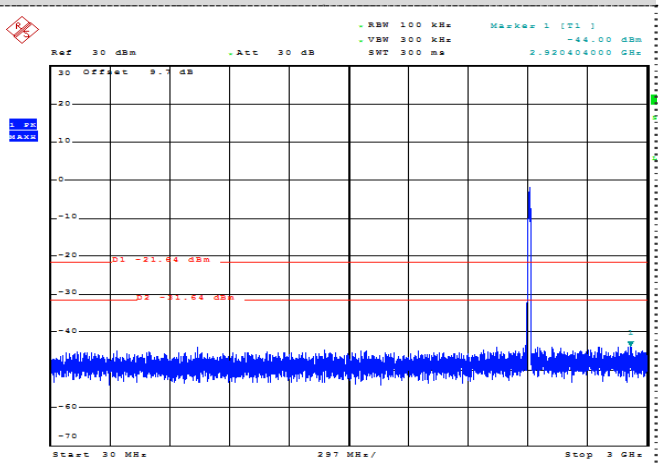
Remark: The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the spurious emissions and bandage measurement data.

Test plot as follows:

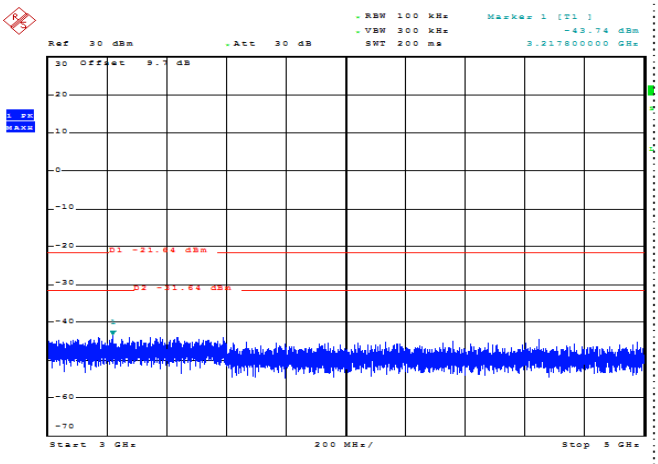
Test Mode:	802.11b	Test channel :	01



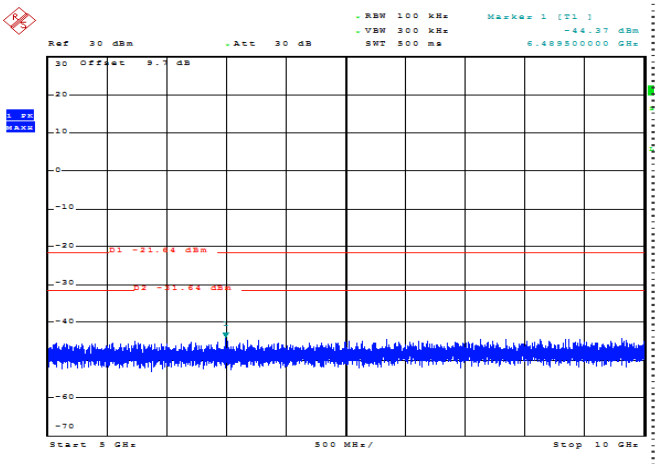
Reference level



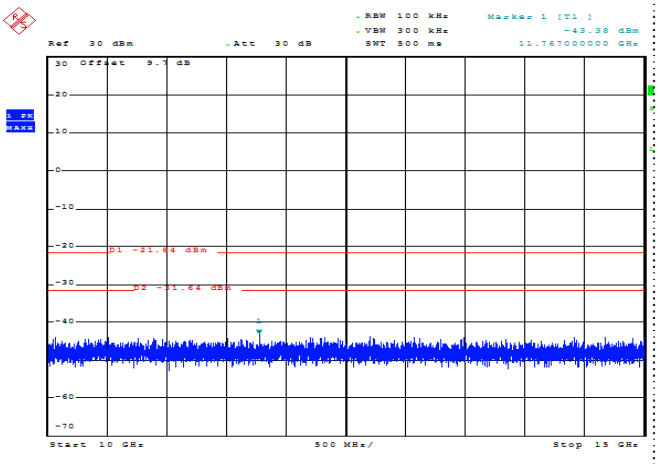
30MHz-3GHz



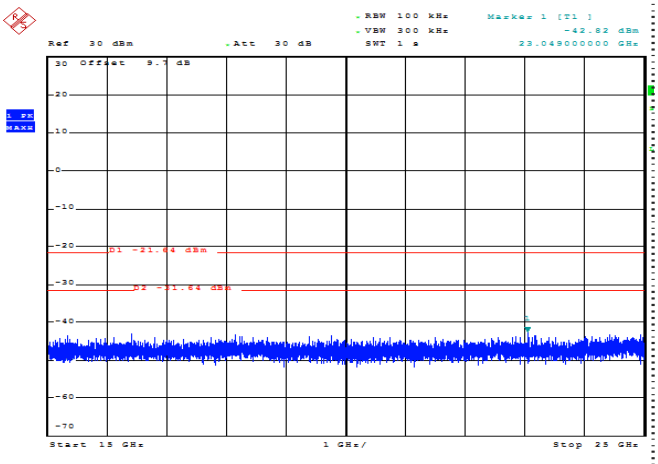
3GHz-5GHz



5GHz-10GHz

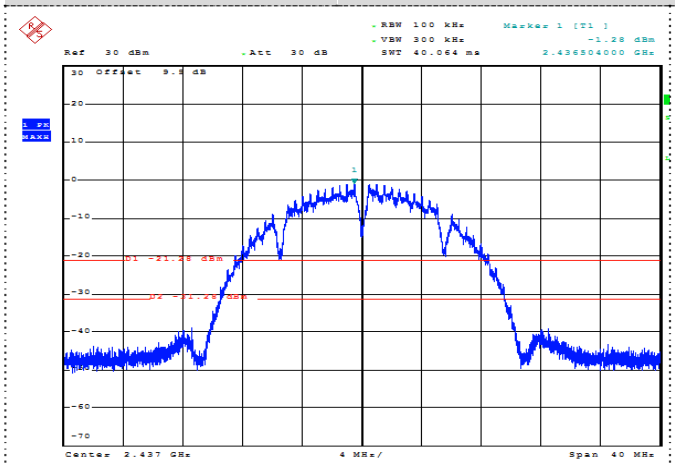


10GHz-15GHz

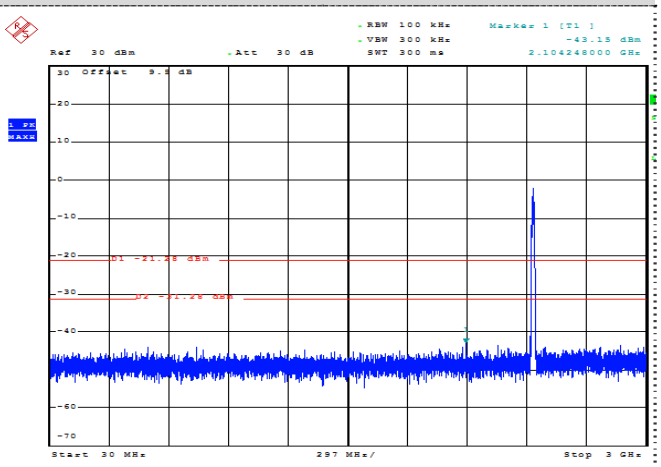


15GHz-25GHz

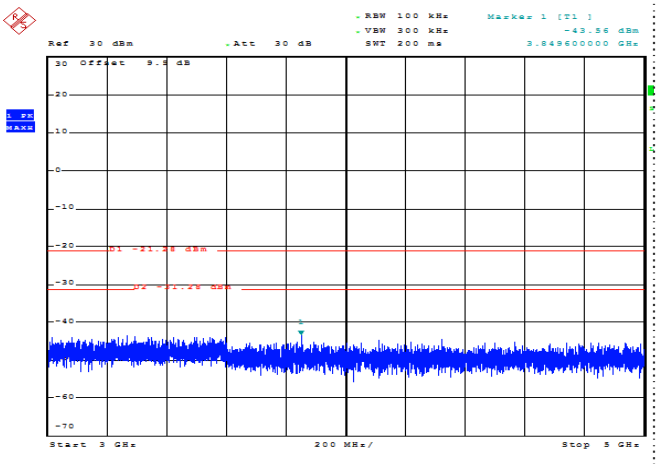
Test Mode:	802.11b	Test channel :	06



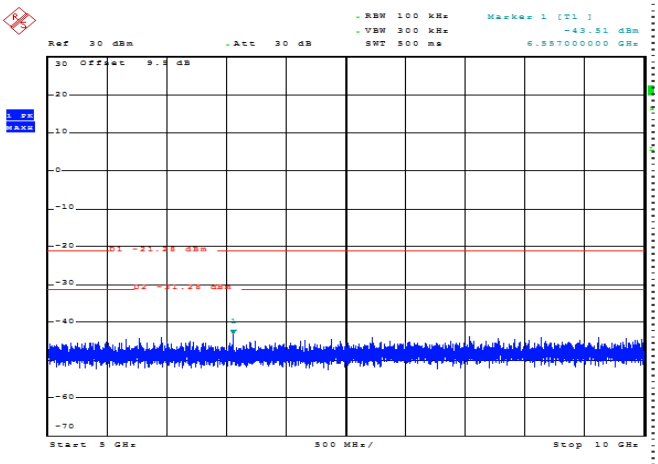
Reference level



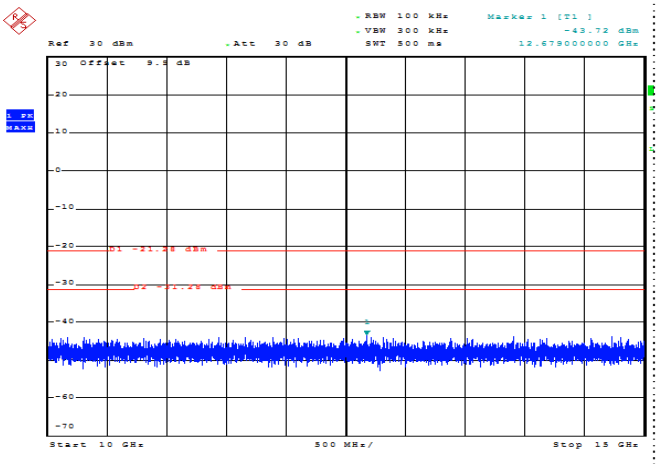
30MHz-3GHz



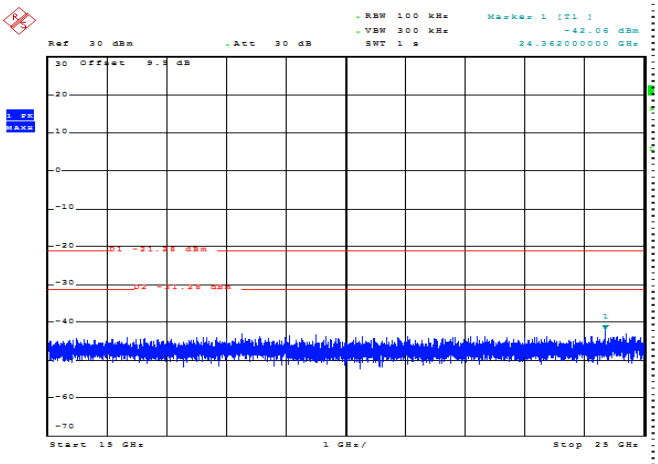
3GHz-5GHz



5GHz-10GHz

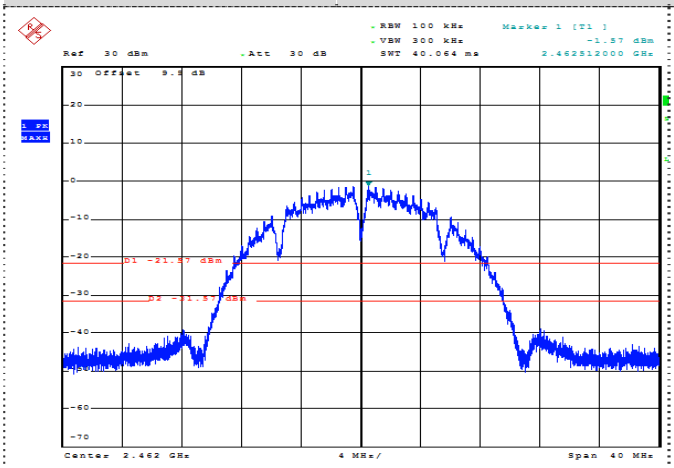


10GHz-15GHz

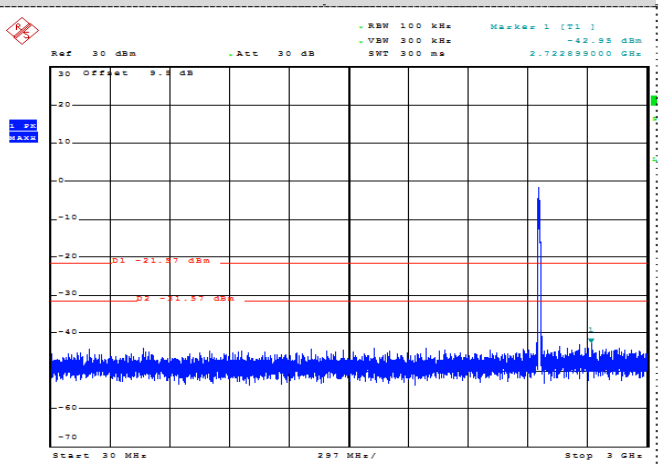


15GHz-25GHz

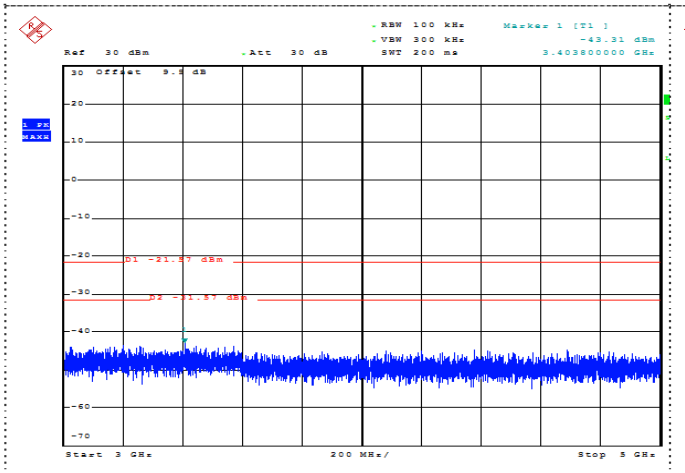
Test Mode:	802.11b	Test channel :	11



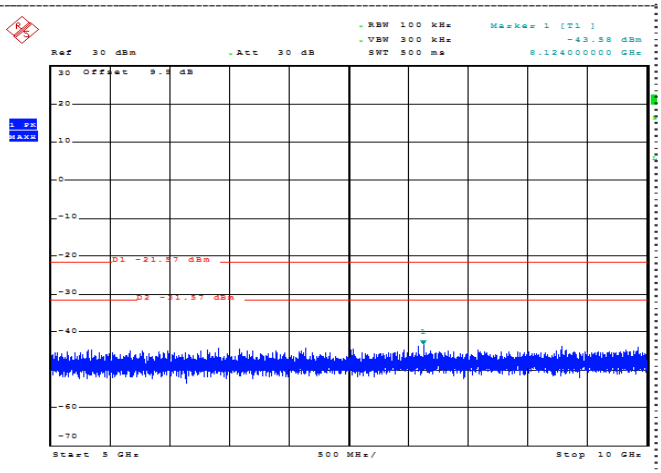
Reference level



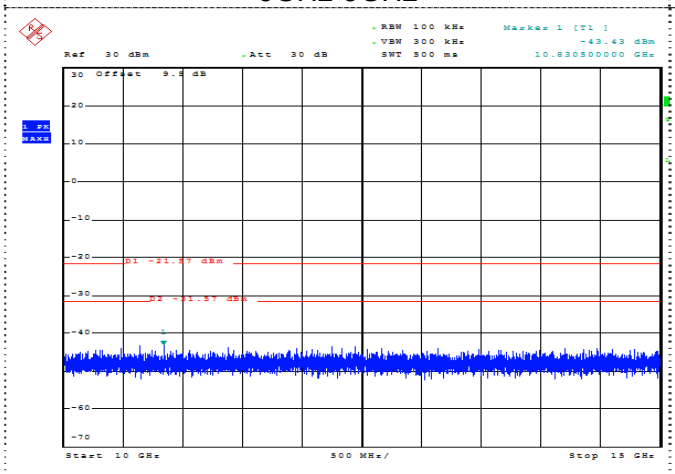
30MHz-3GHz



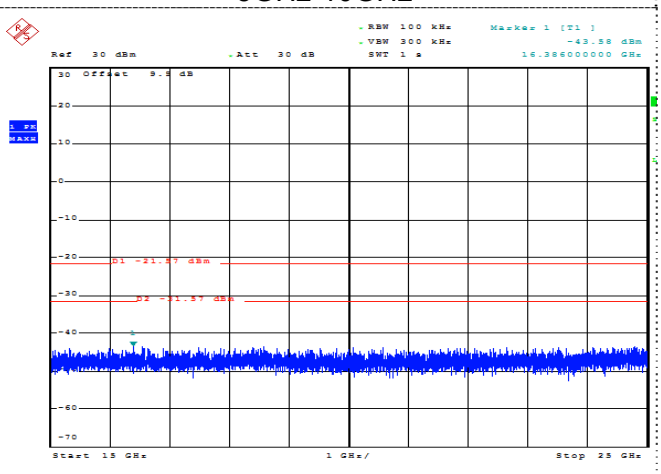
3GHz-5GHz



5GHz-10GHz

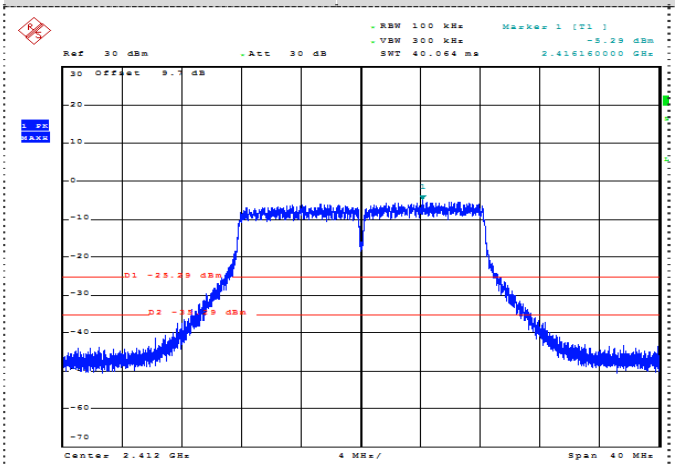


10GHz-15GHz

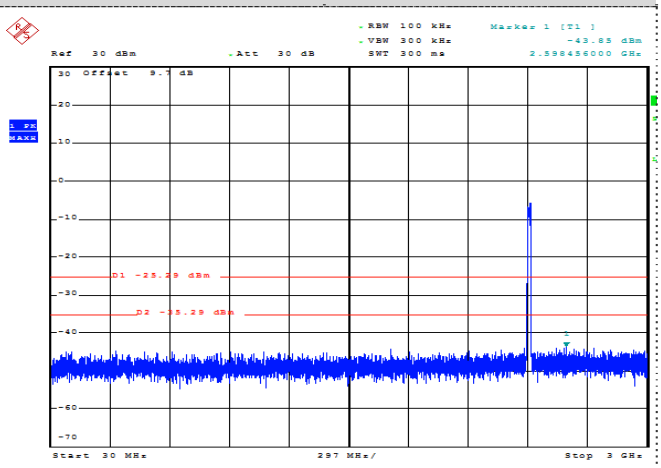


15GHz-25GHz

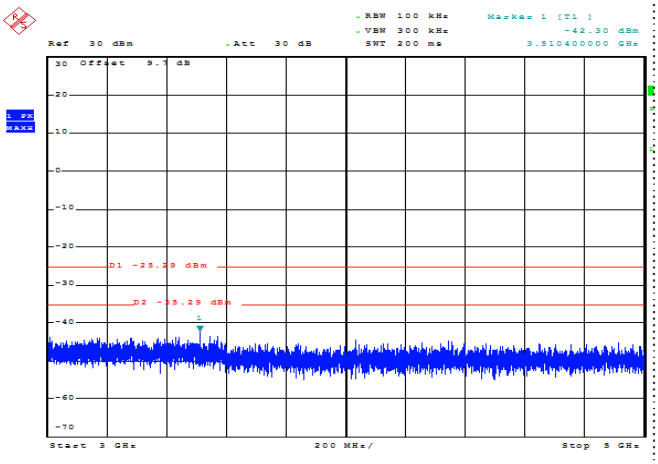
Test Mode:	802.11g	Test channel :	01



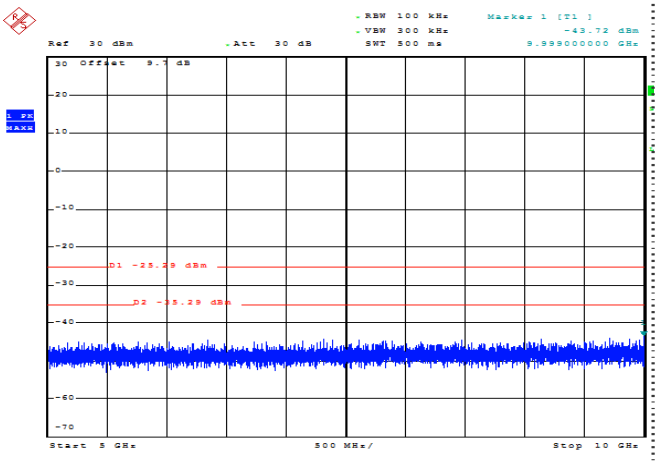
Reference level



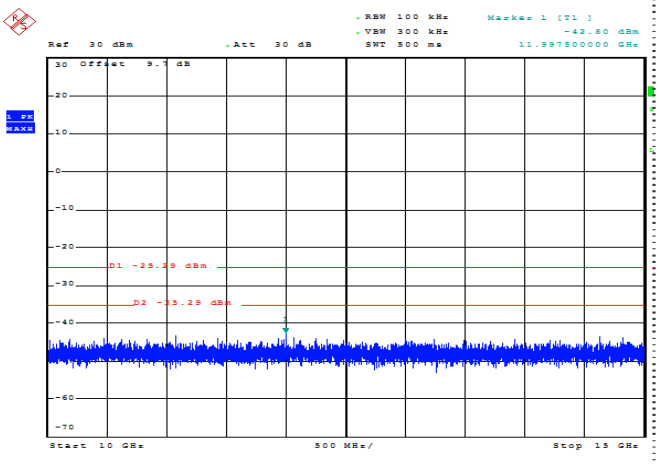
30MHz-3GHz



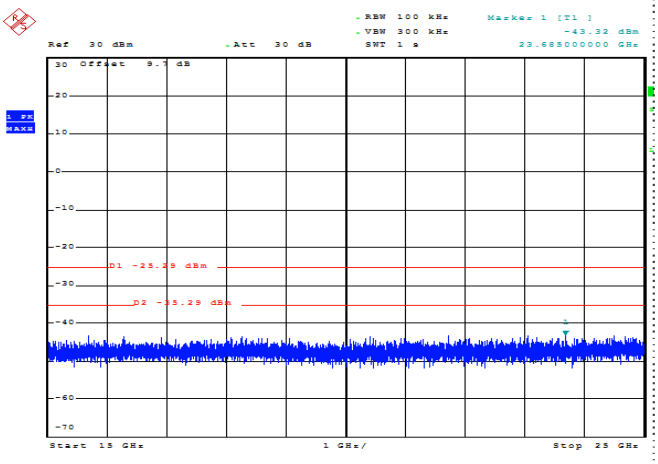
3GHz-5GHz



5GHz-10GHz

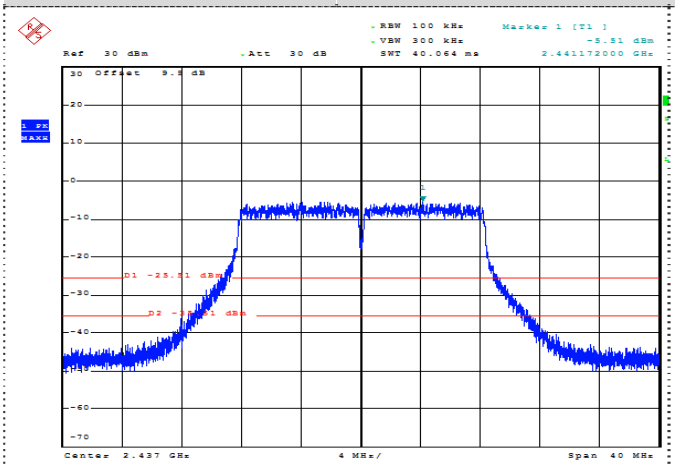


10GHz-15GHz

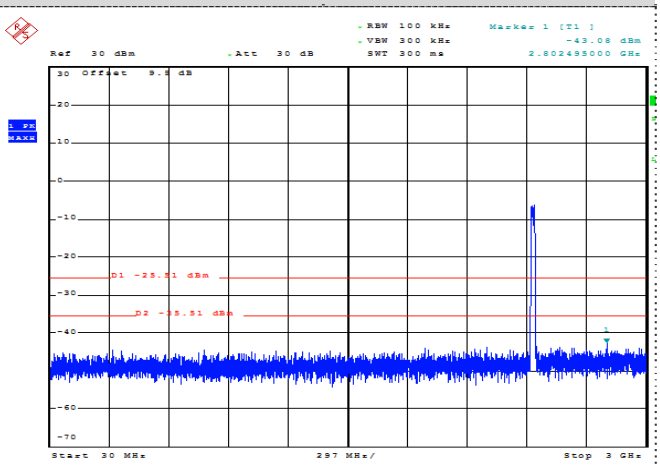


15GHz-25GHz

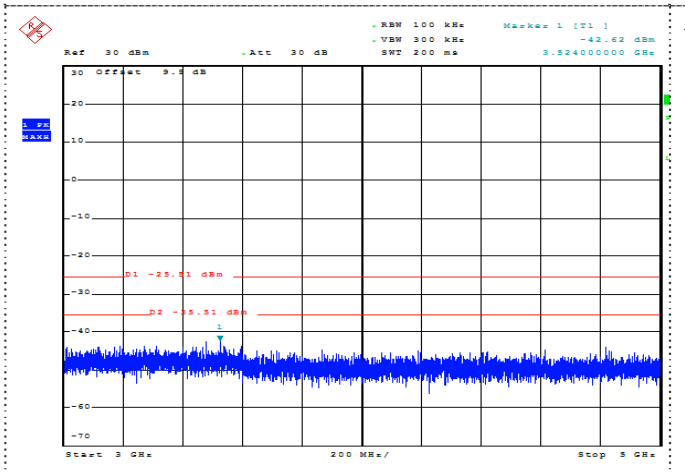
Test Mode:	802.11g	Test channel :	06



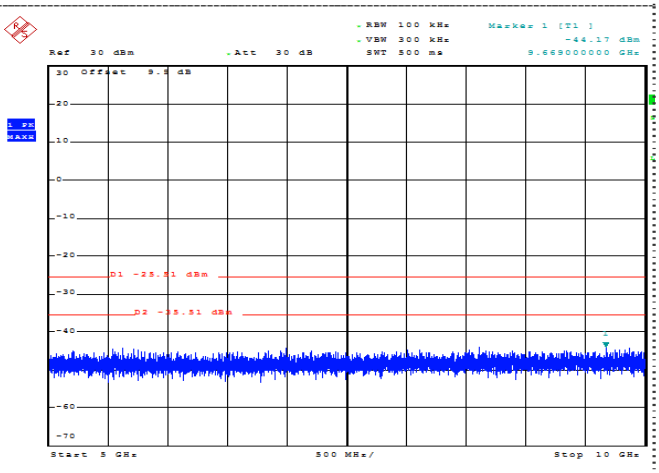
Reference level



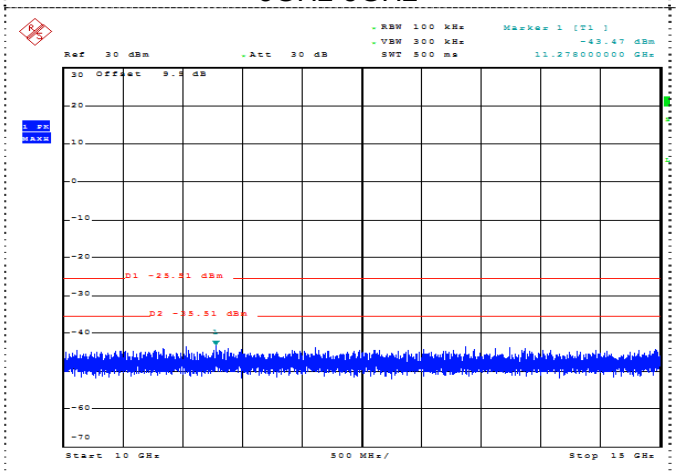
30MHz-3GHz



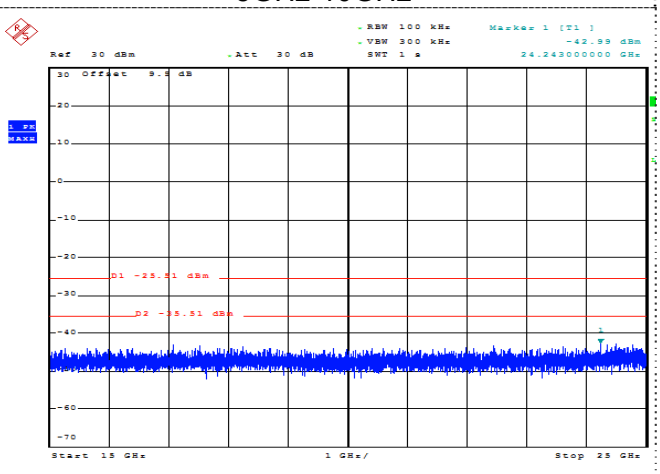
3GHz-5GHz



5GHz-10GHz

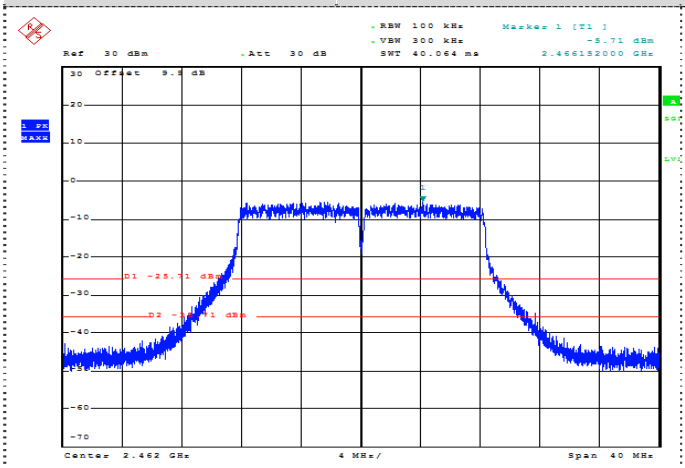


10GHz-15GHz

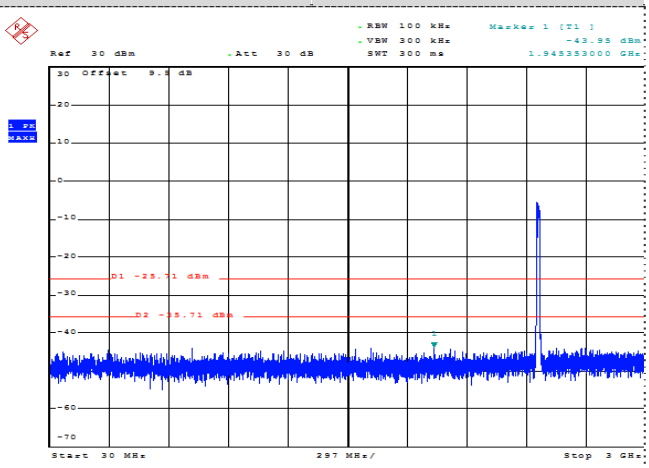


15GHz-25GHz

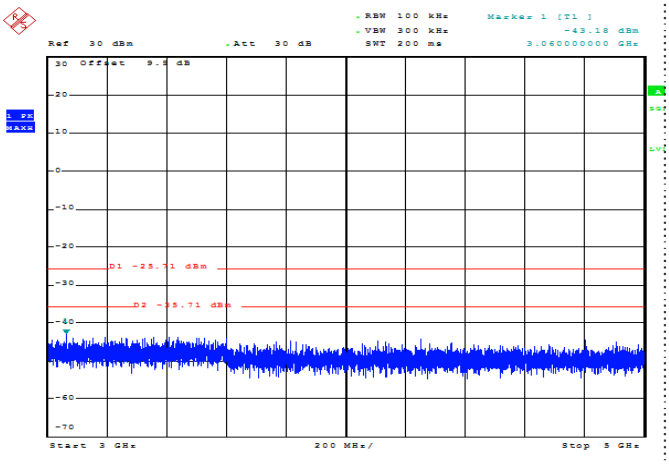
Test Mode:	802.11g	Test channel :	11



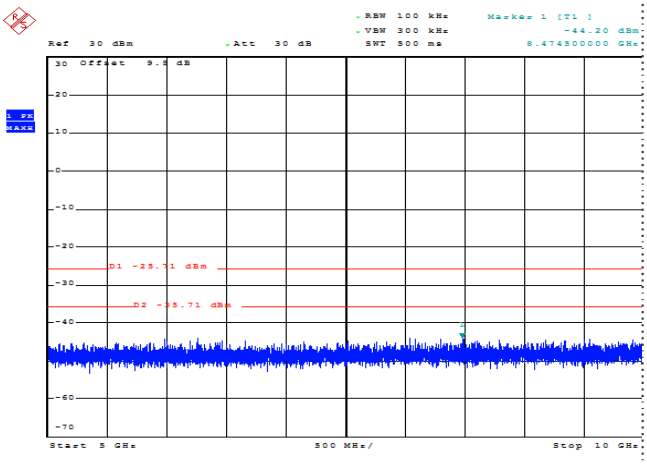
Reference level



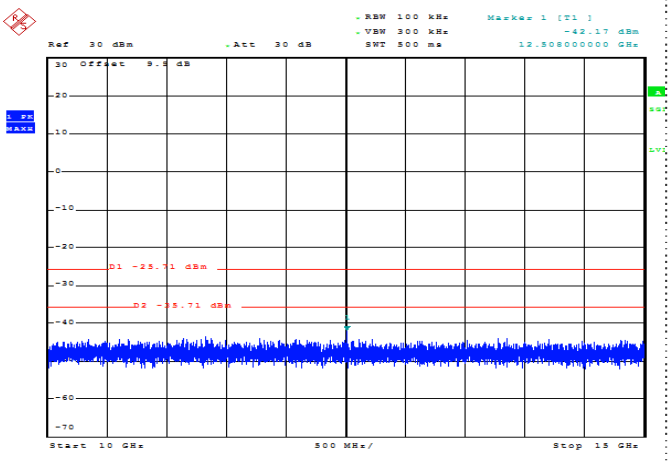
30MHz-3GHz



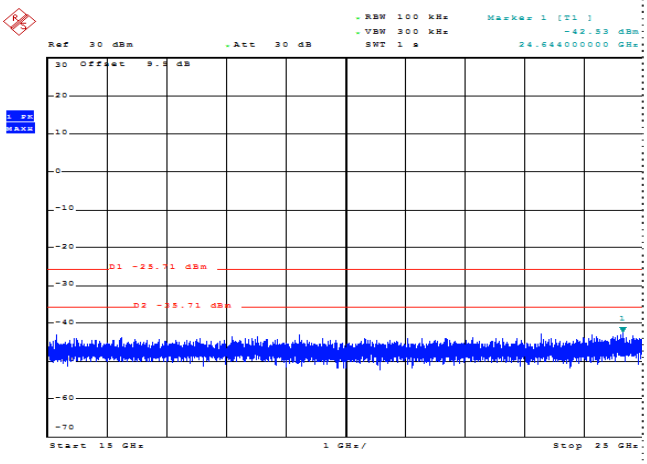
3GHz-5GHz



5GHz-10GHz

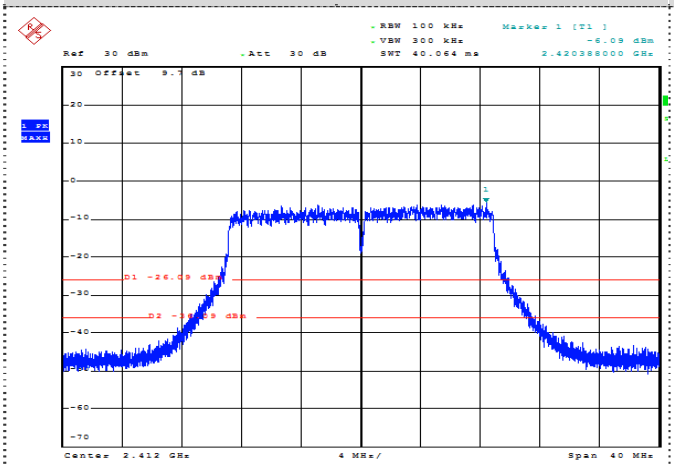


10GHz-15GHz

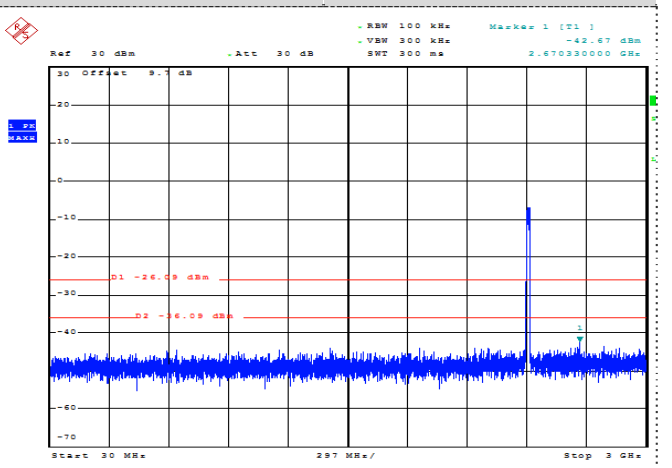


15GHz-25GHz

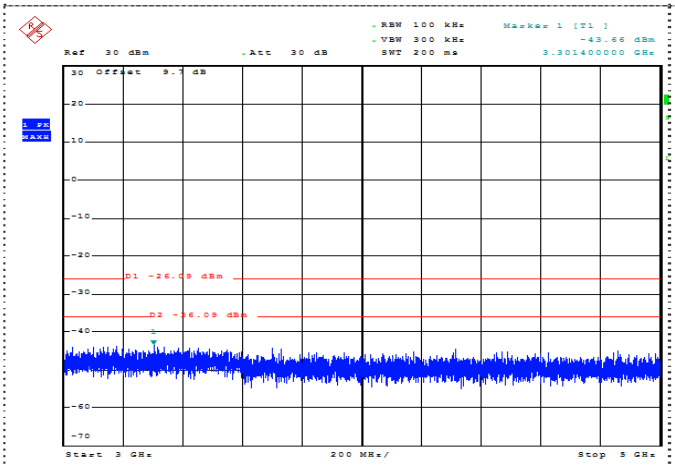
Test Mode:	802.11n(HT20)	Test channel :	01



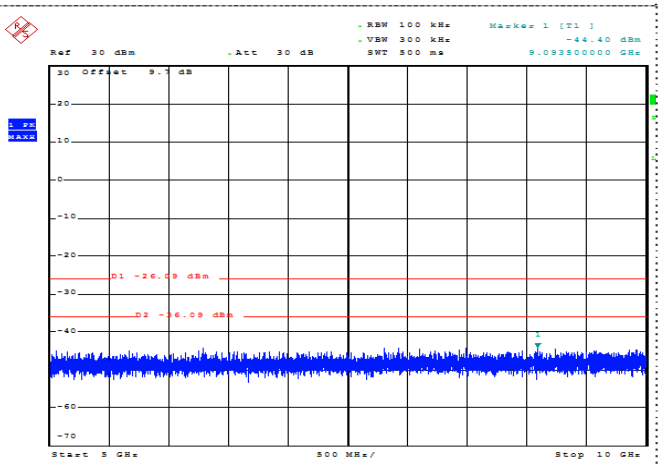
Reference level



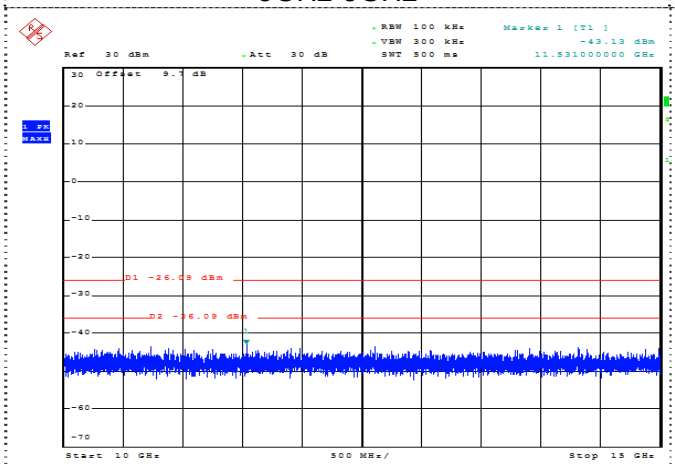
30MHz-3GHz



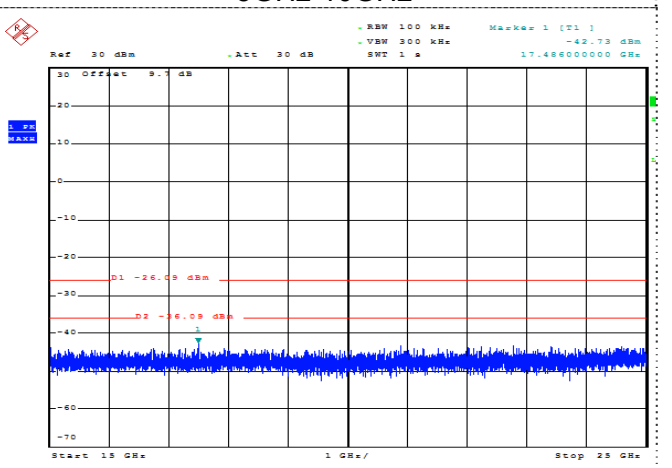
3GHz-5GHz



5GHz-10GHz

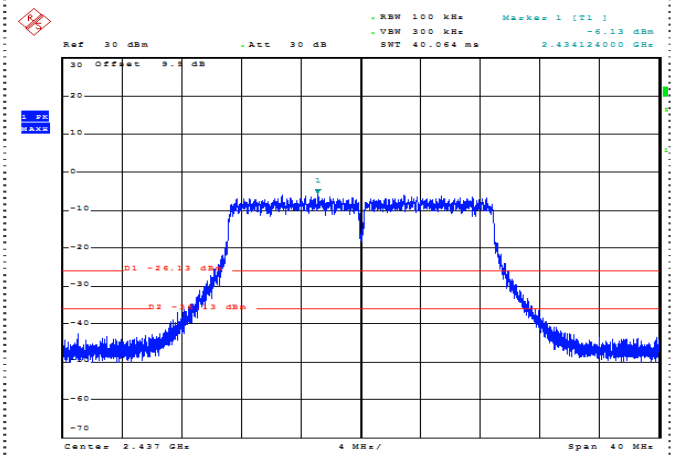


10GHz-15GHz

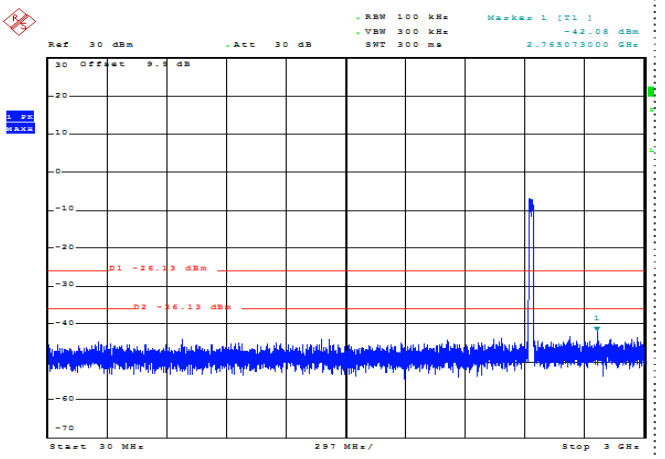


15GHz-25GHz

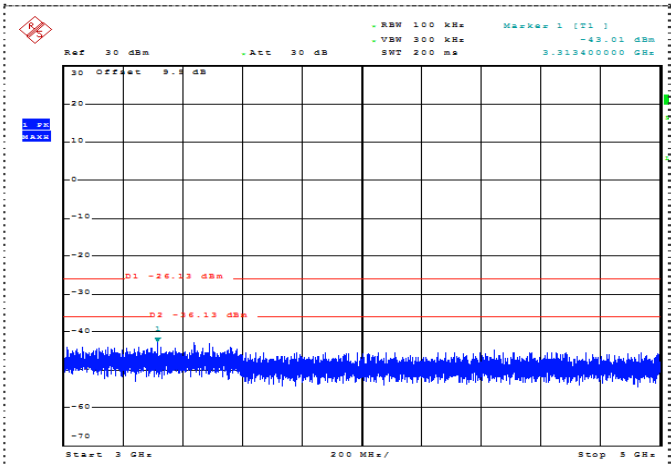
Test Mode:	802.11n(HT20)	Test channel :	06



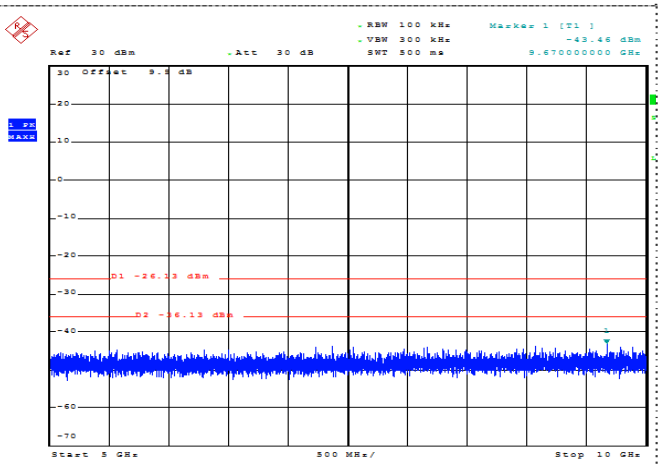
Reference level



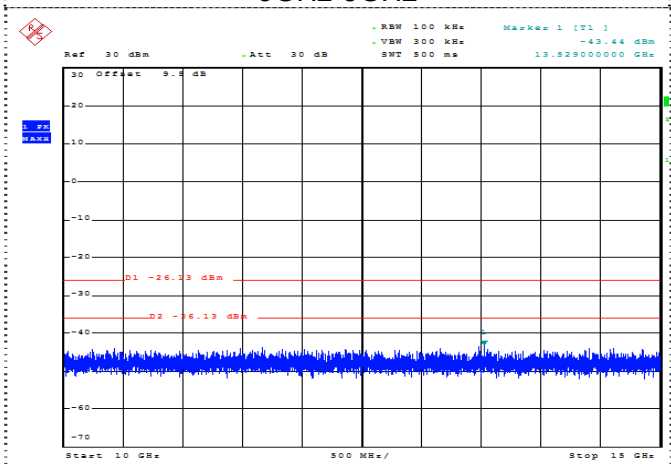
30MHz-3GHz



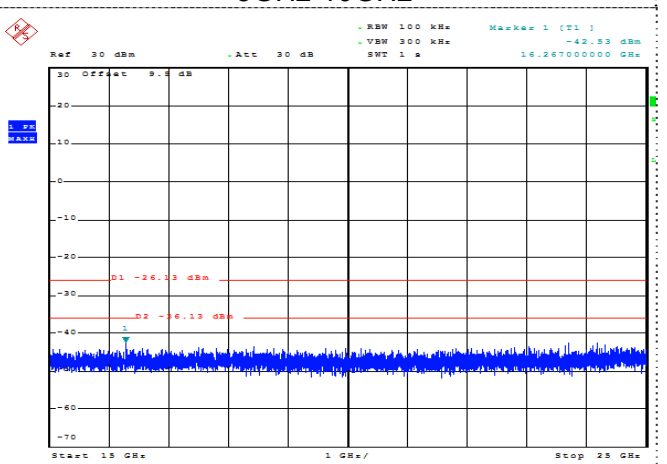
3GHz-5GHz



5GHz-10GHz

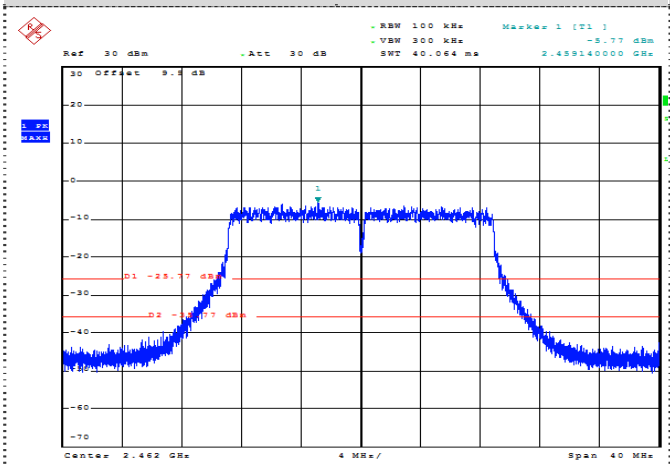


10GHz-15GHz

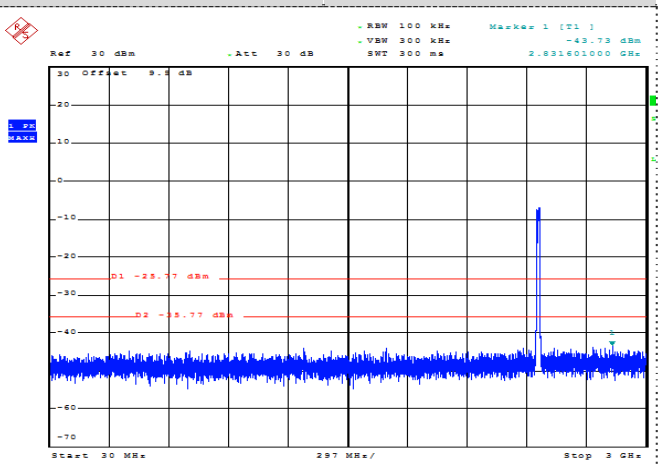


15GHz-25GHz

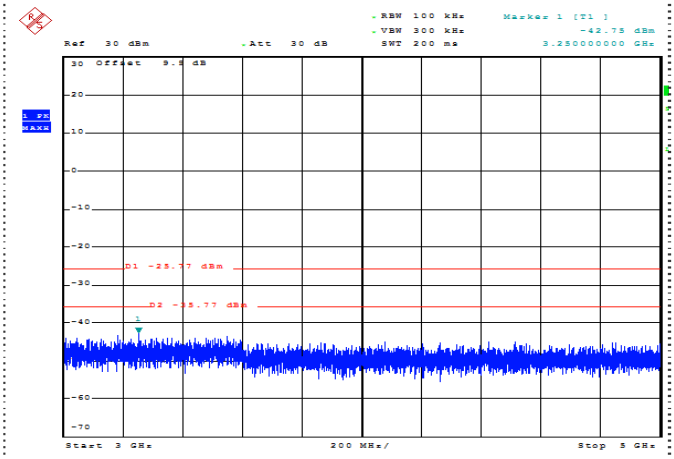
Test Mode:	802.11n(HT20)	Test channel :	11



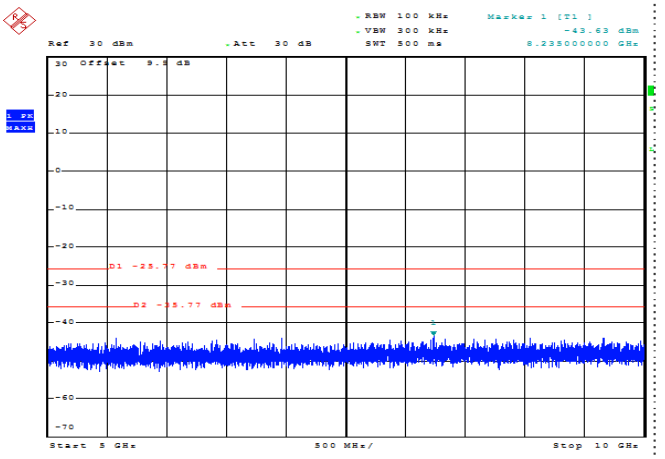
Reference level



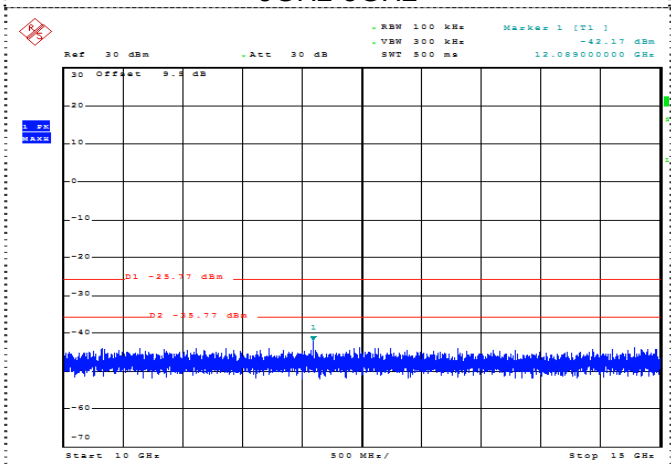
30MHz-3GHz



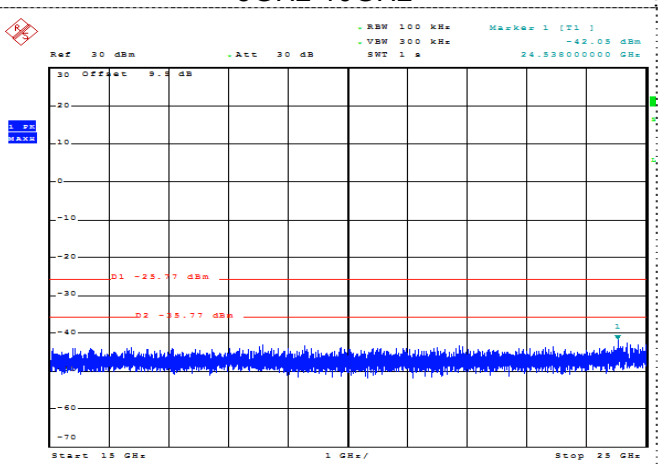
3GHz-5GHz



5GHz-10GHz

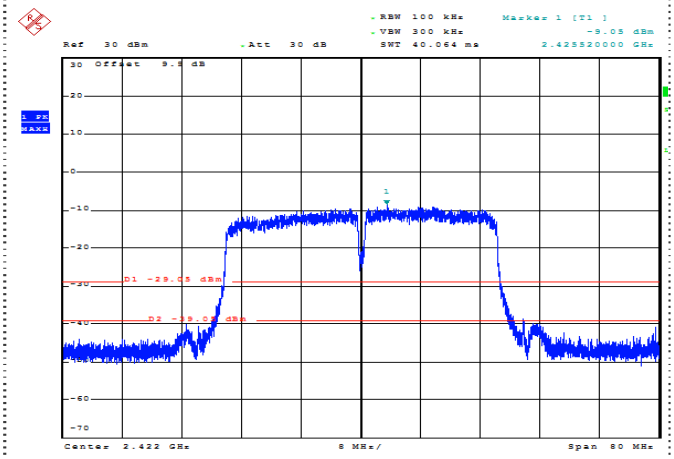


10GHz-15GHz

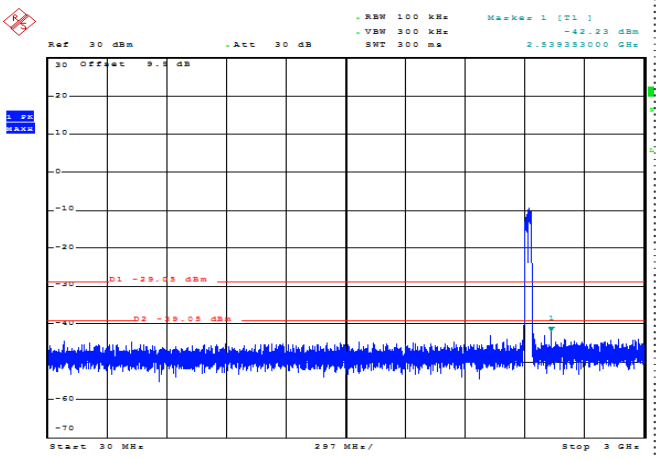


15GHz-25GHz

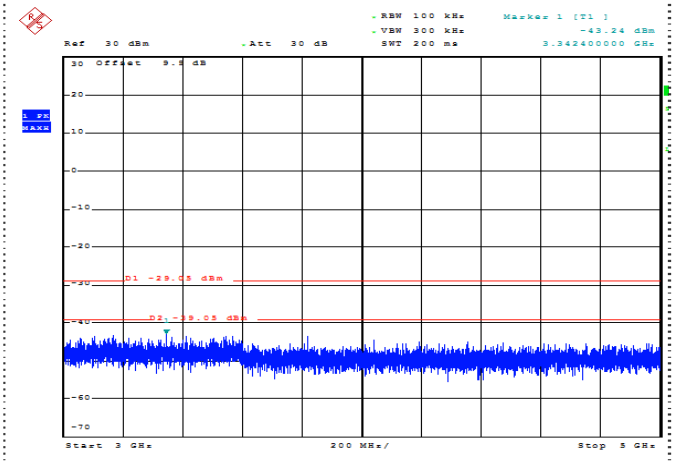
Test Mode:	802.11n(HT40)	Test channel :	03



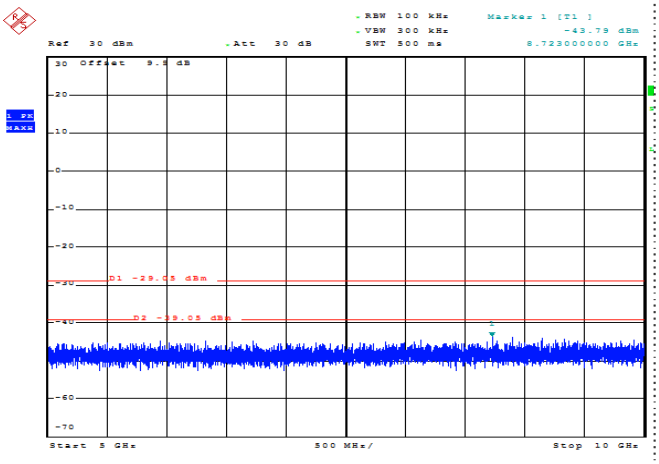
Reference level



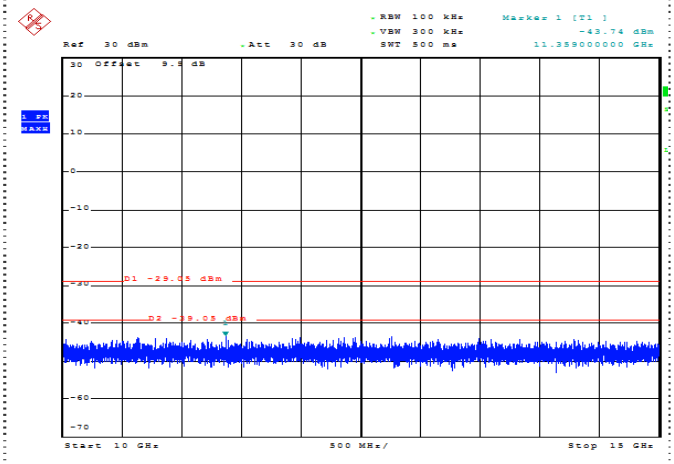
30MHz-3GHz



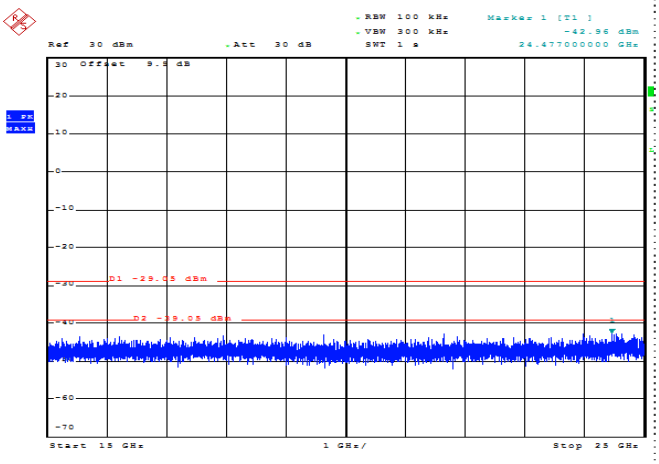
3GHz-5GHz



5GHz-10GHz

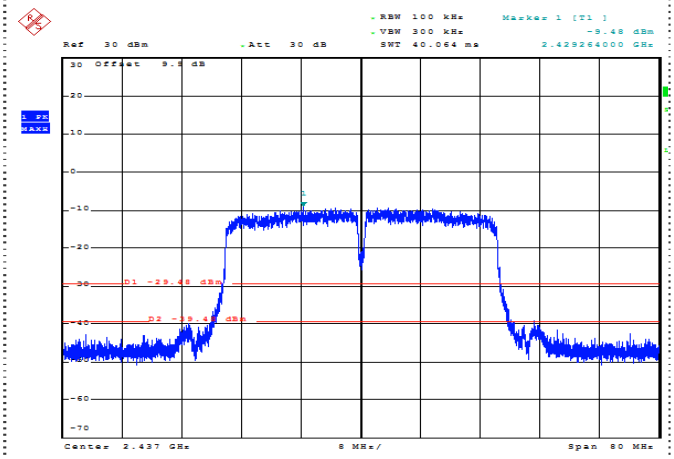


10GHz-15GHz

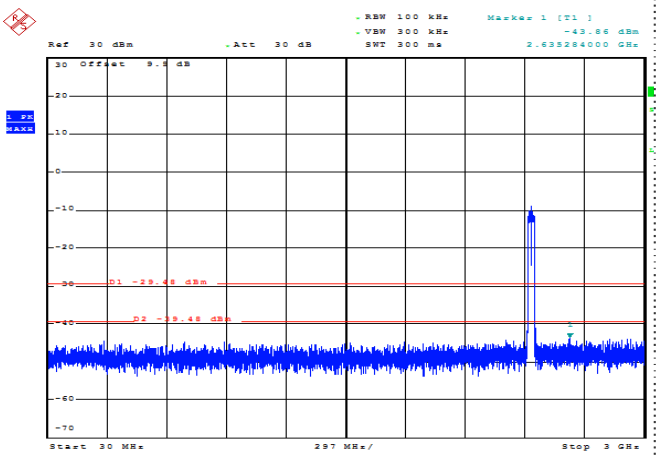


15GHz-25GHz

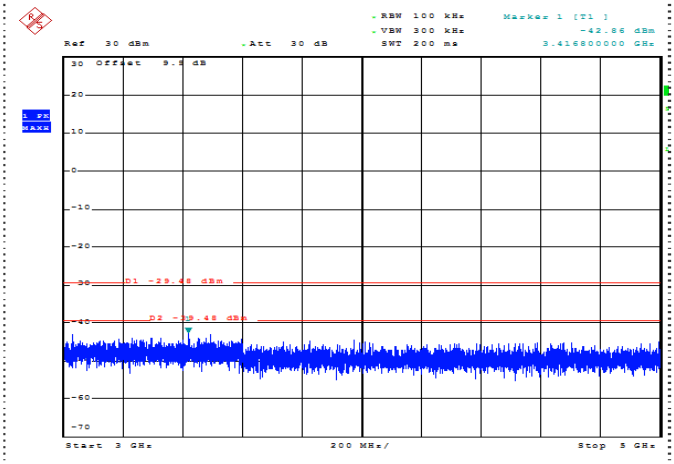
Test Mode:	802.11n(HT40)	Test channel :	06



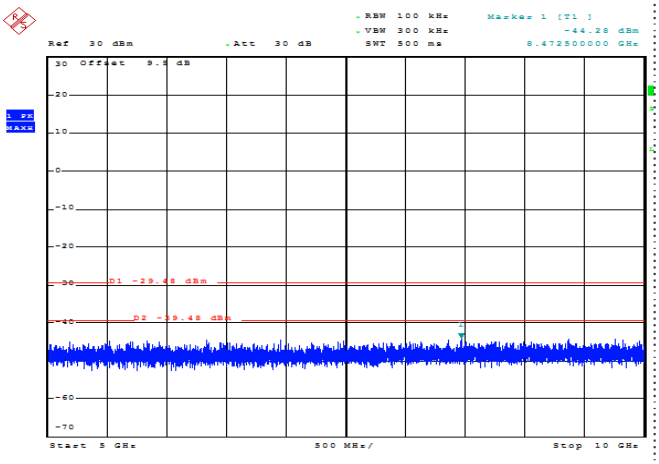
Reference level



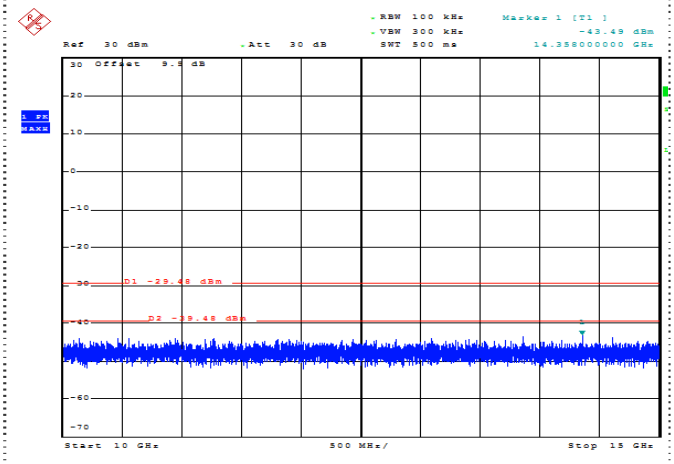
30MHz-3GHz



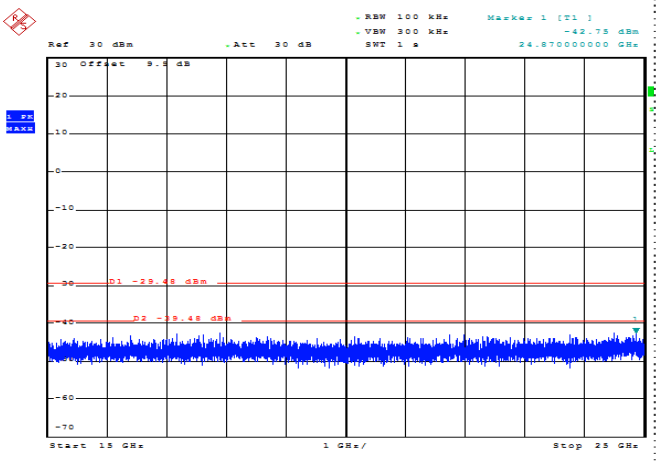
3GHz-5GHz



5GHz-10GHz

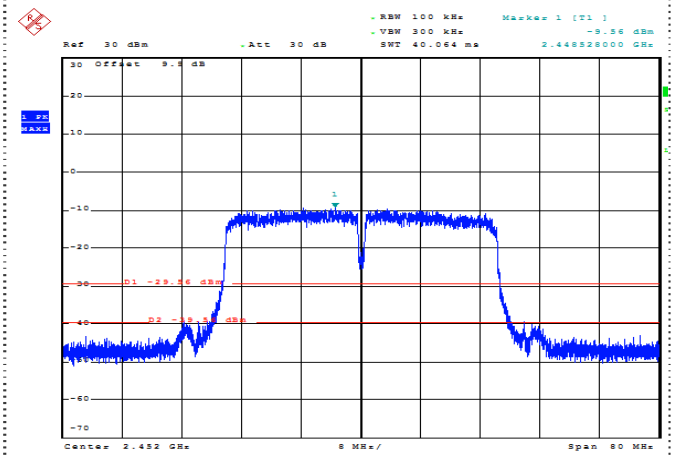


10GHz-15GHz

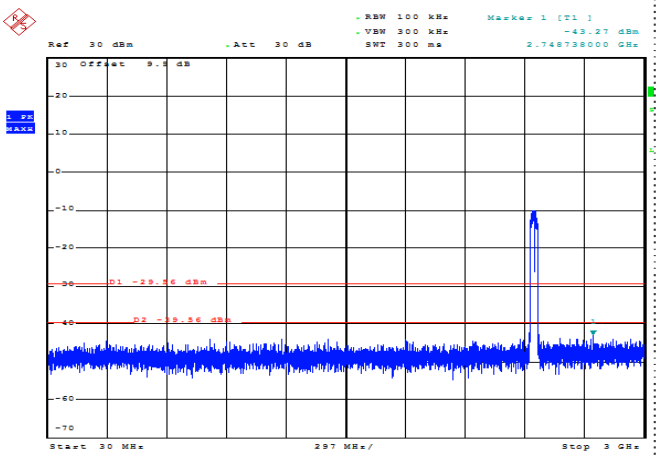


15GHz-25GHz

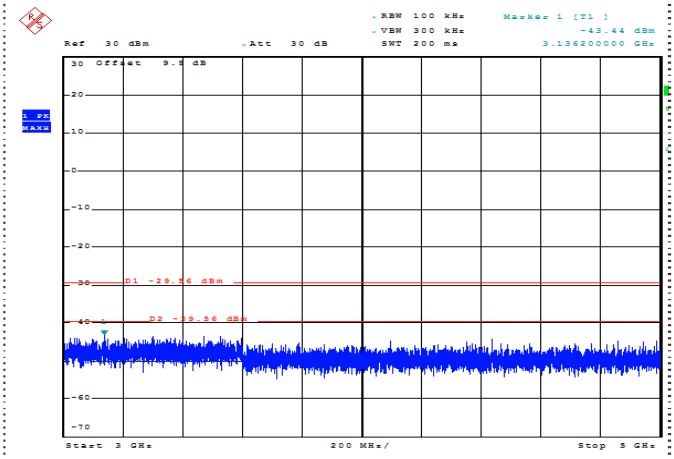
Test Mode:	802.11n(HT40)	Test channel :	09



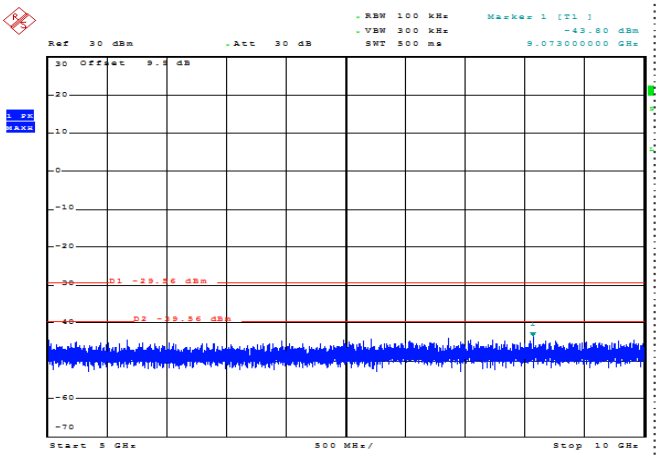
Reference level



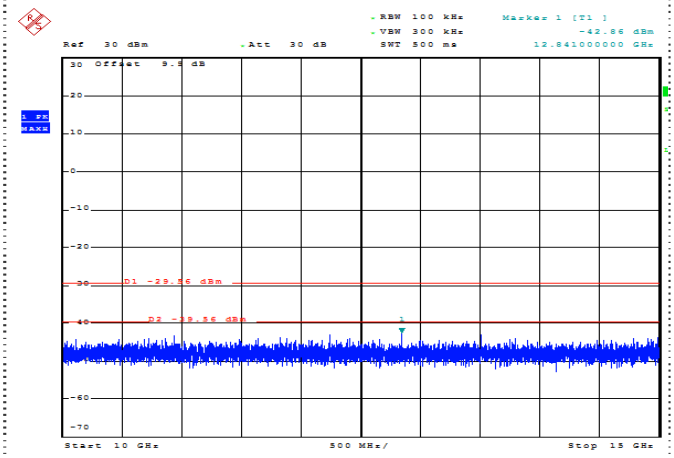
30MHz-3GHz



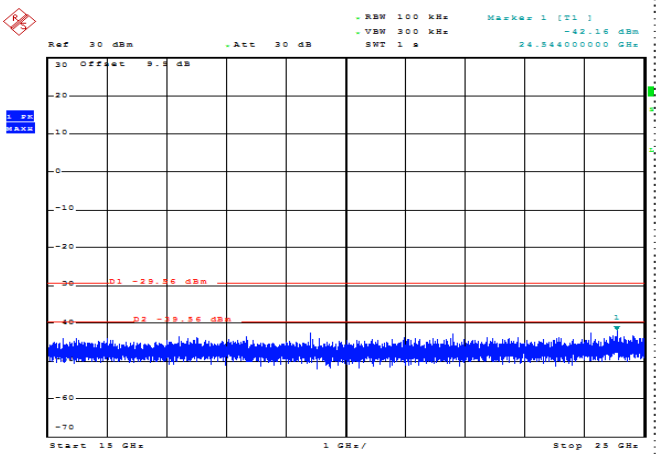
3GHz-5GHz



5GHz-10GHz



10GHz-15GHz



15GHz-25GHz

3.8. Antenna Requirement

Standard Applicable

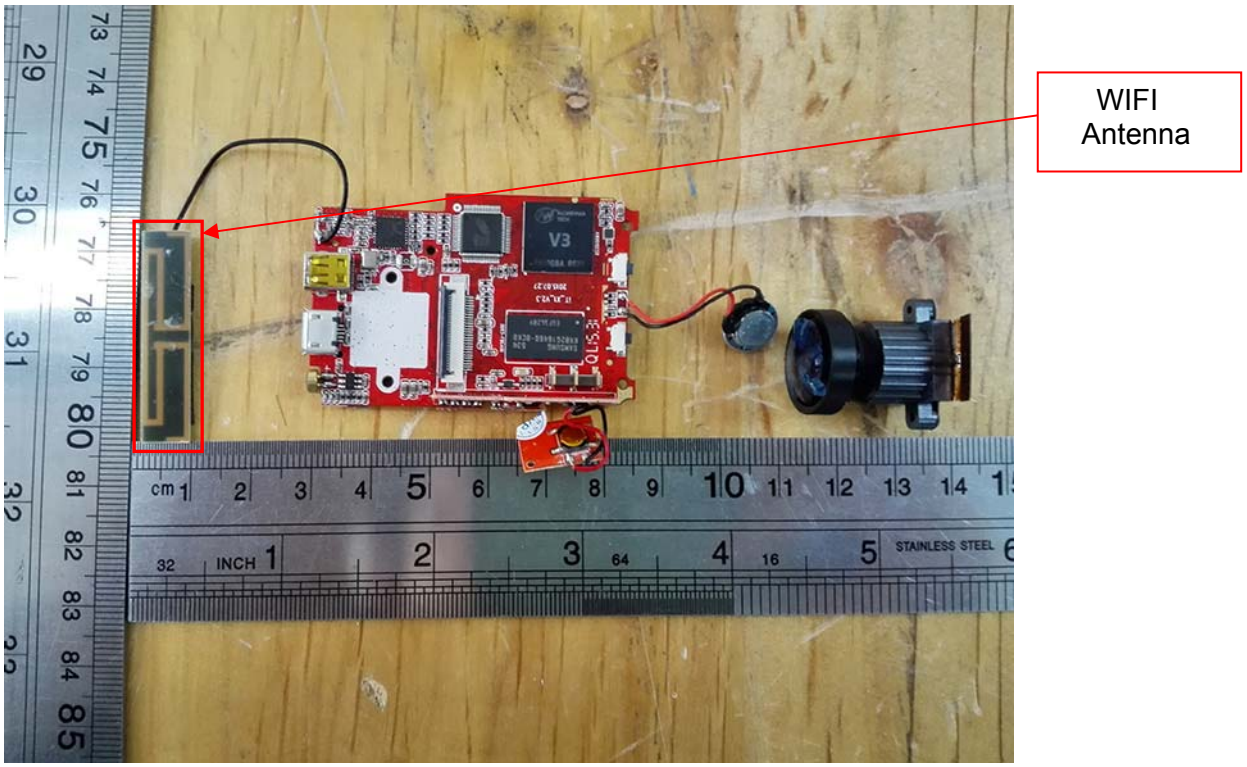
For intentional device, according to FCC 47 CFR Section 15.203:

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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, 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

FCC CFR Title 47 Part 15 Subpart C Section 15.247(c) (1) (I):

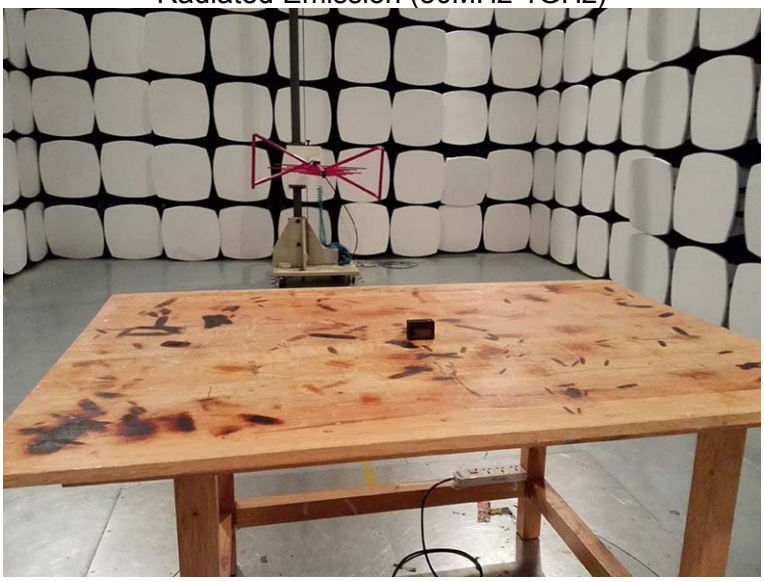
(i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

Test Result:
The maximum gain of WiFi antenna was 1.86dBi.

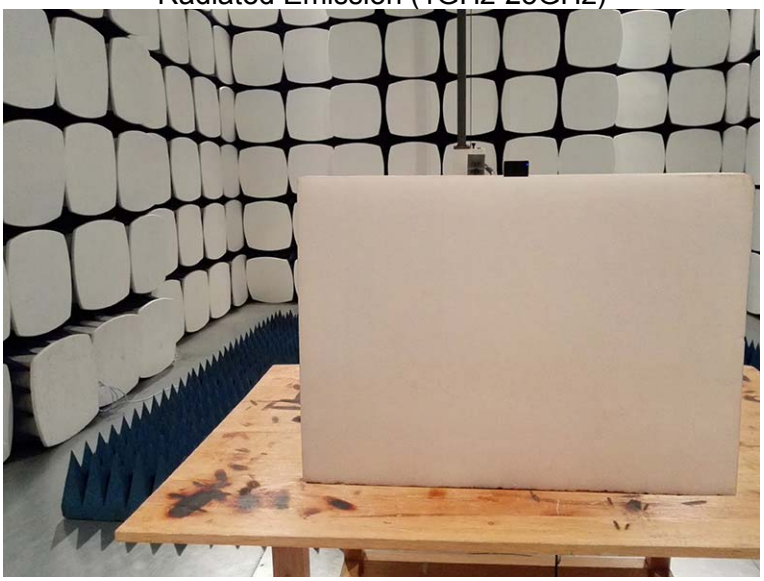


4. EUT TEST PHOTO

Radiated Emission (30MHz-1GHz)



Radiated Emission (1GHz-25GHz)



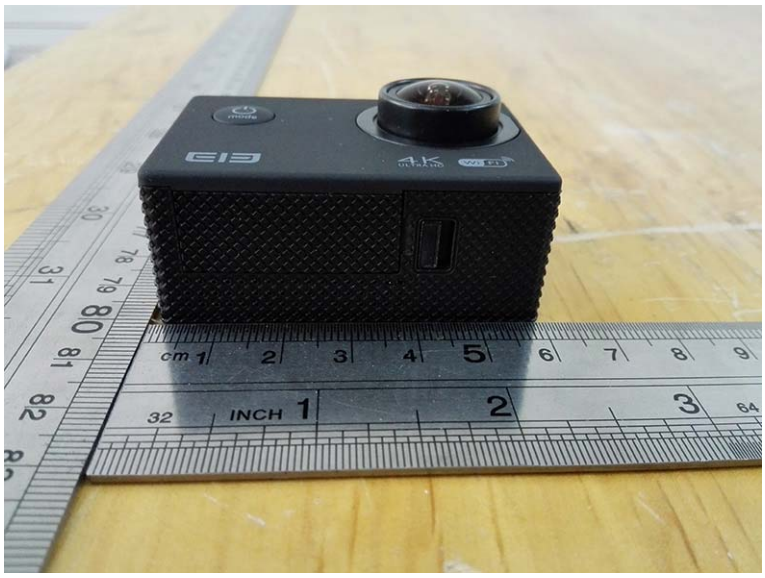
Conducted Emission

5. PHOTOGRAPHS OF EUT CONSTRUCTIONAL

External Photos of EUT

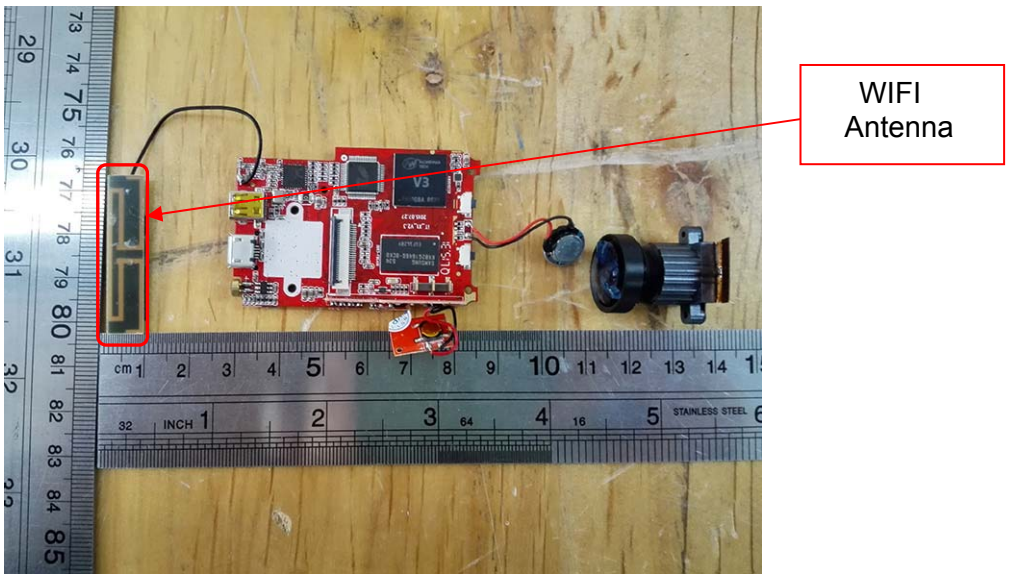

HDMI
MICRO SD

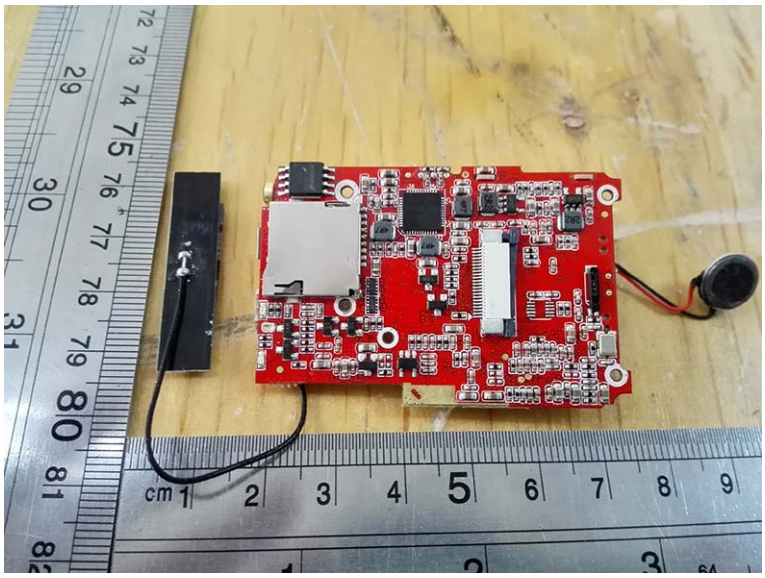

OK

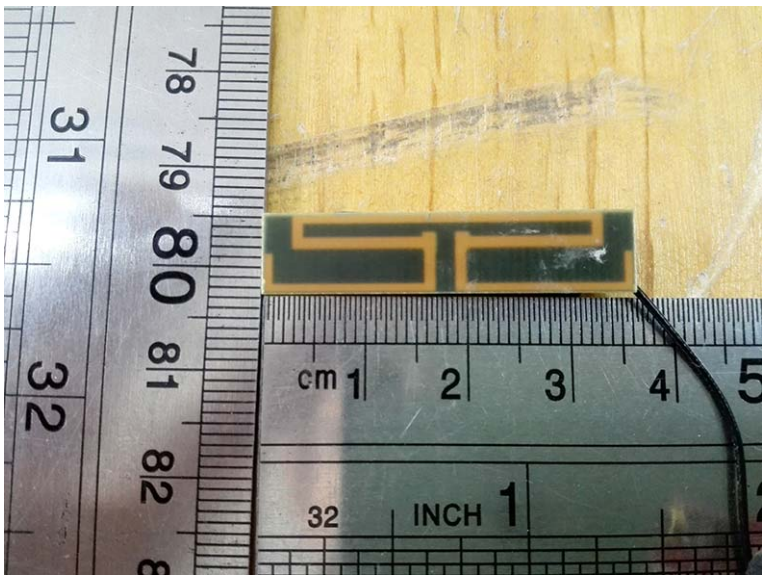


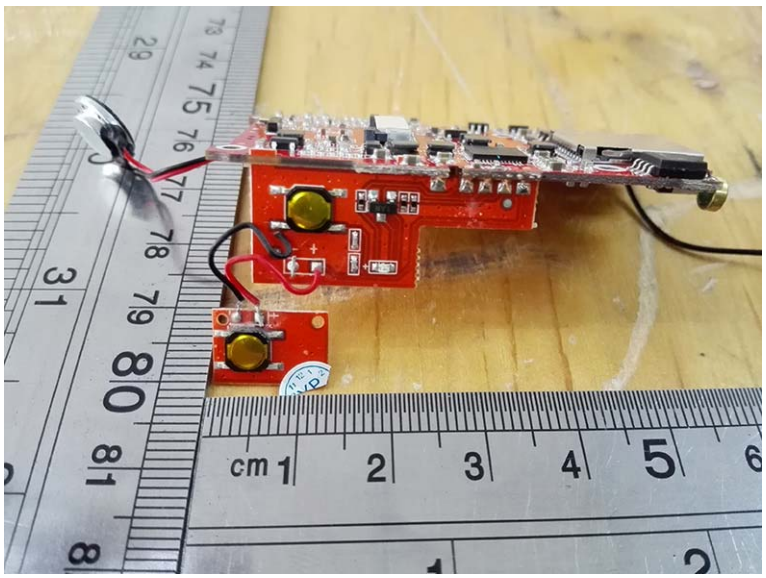
Internal Photos of EUT

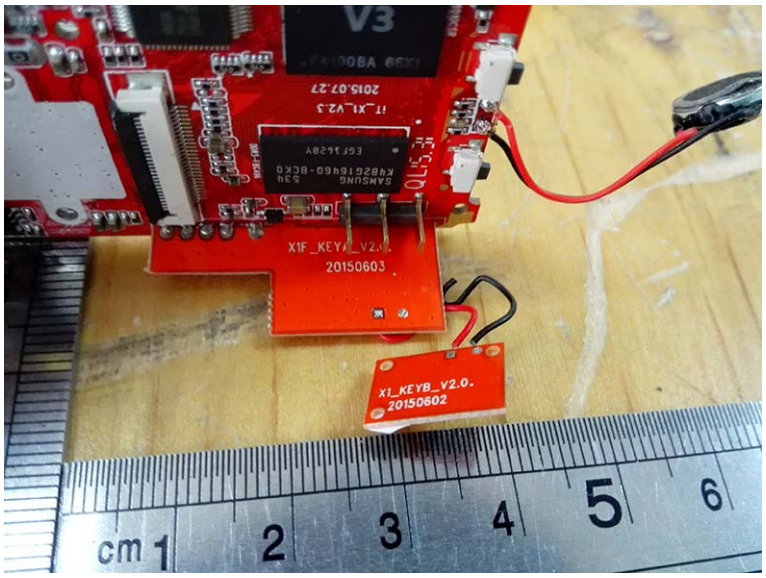

3. 7V Li-ion Battery 1050mAh 3. 885Wh
WARNING
Use specified charger only.
Must be disposed of properly.
Do not disassemble.
Crush puncture short external contacts.
May explode if damaged or disposed of in fire or water.

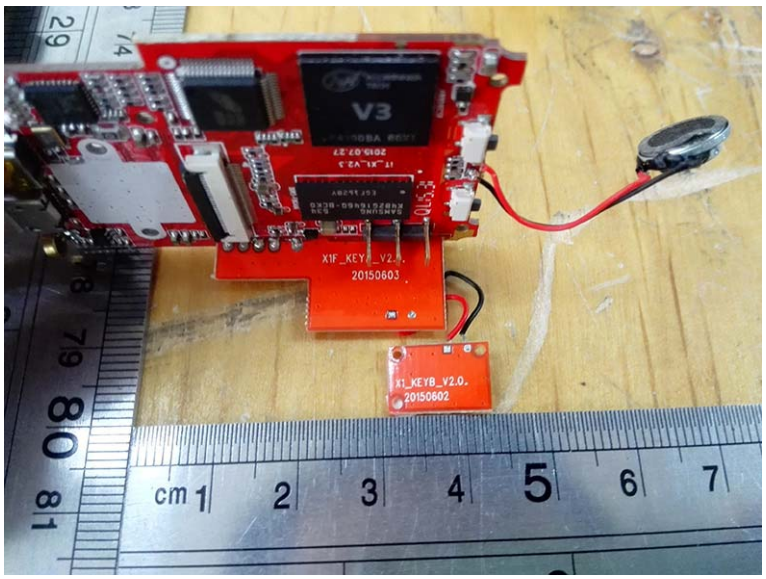

WIFI
Antenna

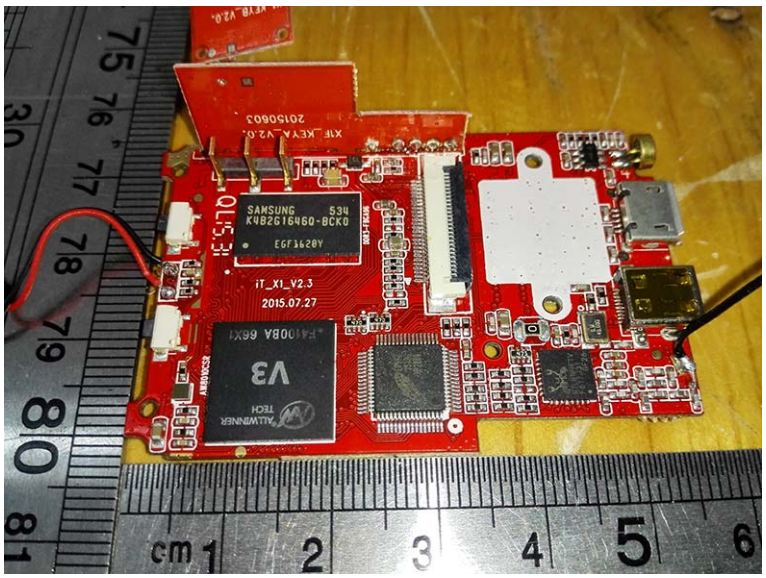







V3
20150603
X1_KEYB_V2.0.
20150602


V3
20150603
X1_KEYB_V2.0.
20150602


SAMSUNG
K4B2G1646Q-BCK0
iT_X1_V2.3
2015.07.27
V3
ALLWINNER
cm 1 2 3 4 5 6

**********THE END**********