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

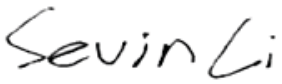
TEST REPORT

Product Name	:	150Mbps Wireless N USB Adapter With High Gain Antenna
Trademark	:	Panda Wireless
Model/Type reference	:	PAU08
Listed Model(s)	:	--
FCC ID	:	2ADUTLGPAU08
Test Standards	:	**FCC Pa rt 1 5.247: Operation w ithin the bands 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz**
Applicant	:	Panda Wireless, Inc
Address of applicant	:	15559 Union Ave, Suite 300, Los Gatos, CA 95032
Date of Receipt	:	Jun.17 , 2015
Date of Test Date	:	Jun. 20, 2015 - Jul. 09, 2015
Data of issue.	:	Aug. 10, 2015

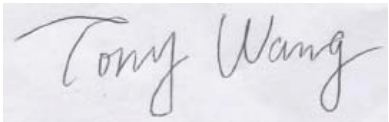
Test result	**Pass ***

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

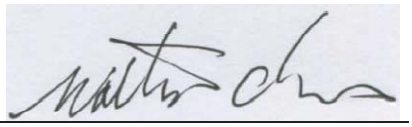
GENERAL DESCRIPTION OF EUT	
Equipment:	150Mbps Wireless N USB Adapter With High Gain Antenna
Model Name:	PAU08
Manufacturer:	Panda Wireless, Inc
Manufacturer Address:	15559 Union Ave, Suite 300, Los Gatos, CA 95032
Power Rating:	DC 5V via PC USB

Compiled By: 

(Sevin Li)

Reviewed By: 

(Tony Wang)

Approved By: 

(Walter Chen)

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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 C63.4:2009: American National Standard for Testing Unlicensed Wireless Devices

KDB558074 D01 V03r02: 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

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:	150Mbps Wireless N USB Adapter With High Gain Antenna
Model/Type reference:	PAU08
Listed model:	--
Power supply:	DC 5V via PC USB
Hardware version:	1490M_MM1_V1.0
Software version:	V3.2.9.0
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:	Integral Antenna
Antenna gain:	5dBi

Note1: The EUT owns two antenna ports, but only one antenna port is used, the other is disabled without hardware connection

Note2: For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

2.3. Description of Test Configuration

The Applicant provides communication tools (QA_RT3x7x_V1.5.8.2) software to control the EUT for staying in continuous transmitting (Duty Cycle more than 98%) and receiving mode for testing.

WIFI Operation Frequency：

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

Support Equipment

Peripherals Devices:

OUTSIDE SUPPORT EQUIPMENT							
No.	Equipment	Model	Serial No.	FCC ID / DOC/ BSMI ID	Trade name	Data Cable	Power Cord
1.	PC	TPN-Q113	N/A	DOC	Lenovo	N/A	Unshielded 1.5m
2.	Display	19PFL3120/T3	N/A	DOC	DELL	N/A	Unshielded1.5m
3.	Keyboard	LXH-JME2209U	N/A	DOC	DELL	Unshielded 1.8m	N/A
4.	Mouse	MS111-L	N/A	DOC	DELL	Unshielded 1.8m	N/A
5.	Printer	LaserJet P1007	N/A	DOC	HP	Unshielded 1.8m	Unshielded 1.5m

2.4. Measurement Instruments List

Maximum Peak Output Power					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSU26	100105	Jan 07,2016

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)

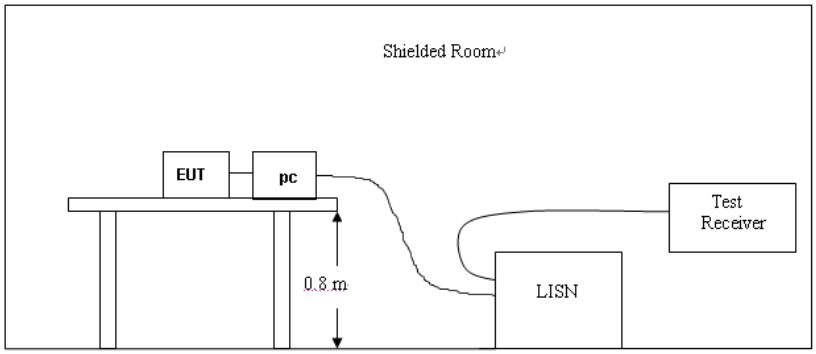
LIMIT

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

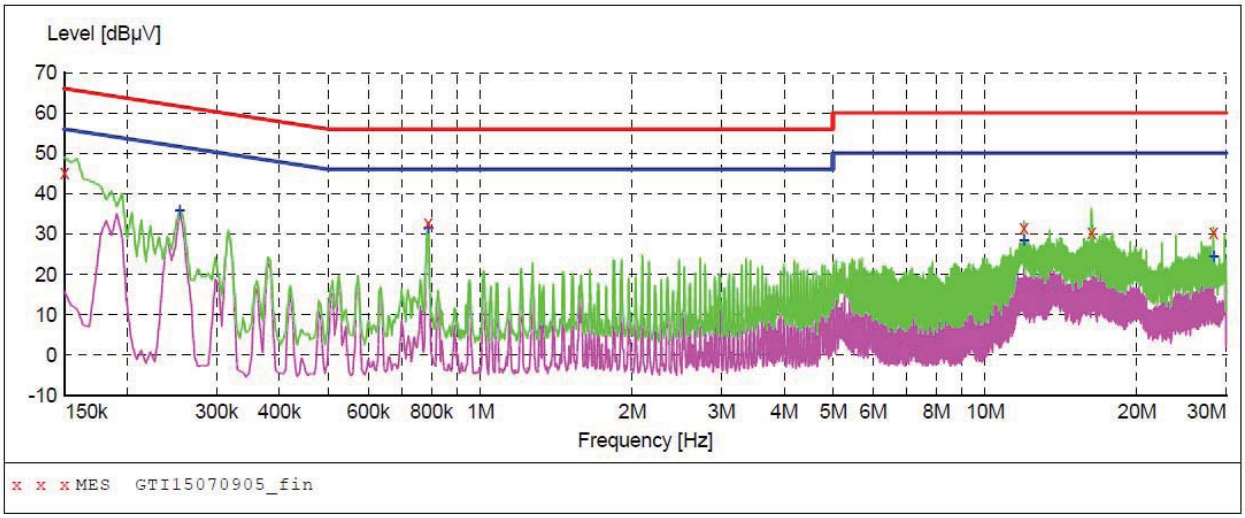
1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system; a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4:2009.
2. Support equipment, if needed, was placed as per ANSI C63.4:2009
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4:2009
4. The EUT received DC5V power from the PC USB port, 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 low channel mode

LINE	L

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



MEASUREMENT RESULT: "GTI15070905_fin"

7/9/2015 9:46AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150000	45.20	9.9	66	20.8	QP	L1	GND
0.788000	32.60	10.0	56	23.4	QP	L1	GND
11.936000	31.60	10.7	60	28.4	QP	L1	GND
16.262000	30.30	10.7	60	29.7	QP	L1	GND
28.358000	30.30	11.1	60	29.7	QP	L1	GND

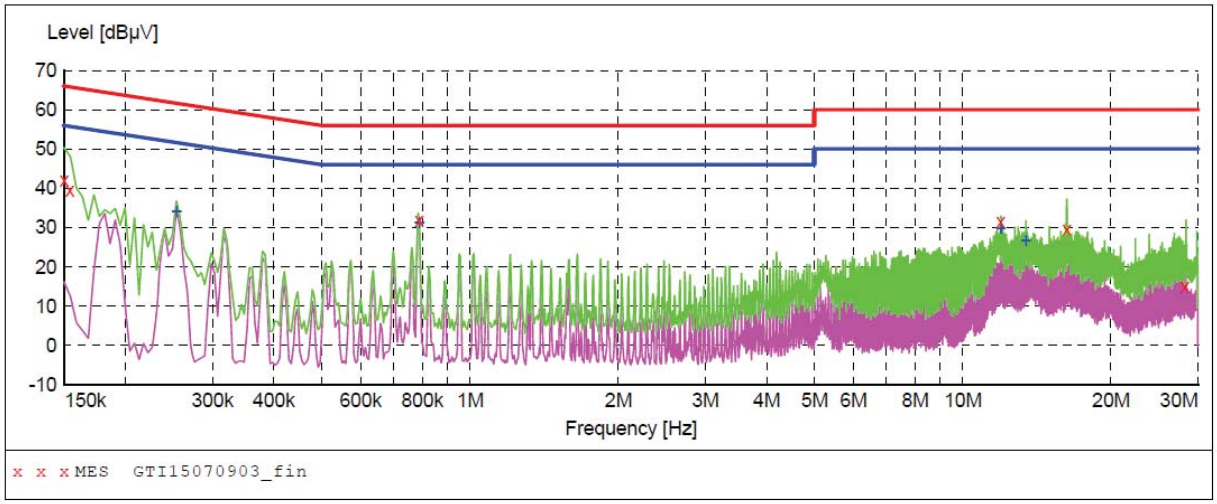
MEASUREMENT RESULT: "GTI15070905_fin2"

7/9/2015 9:46AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.254000	35.70	9.9	52	15.9	AV	L1	GND
0.788000	31.60	10.0	46	14.4	AV	L1	GND
11.942000	28.30	10.7	50	21.7	AV	L1	GND
28.352000	24.30	11.1	50	25.7	AV	L1	GND

LINE	N

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



MEASUREMENT RESULT: "GTI15070903_fin"

7/9/2015 9:38AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150000	42.20	9.9	66	23.8	QP	N	GND
0.154000	39.40	9.9	66	26.4	QP	N	GND
0.788000	31.90	10.0	56	24.1	QP	N	GND
11.948000	31.40	10.7	60	28.6	QP	N	GND
16.268000	29.40	10.7	60	30.6	QP	N	GND
28.274000	15.00	11.1	60	45.0	QP	N	GND

MEASUREMENT RESULT: "GTI15070903_fin2"

7/9/2015 9:38AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.254000	34.10	9.9	52	17.5	AV	N	GND
0.788000	31.30	10.0	46	14.7	AV	N	GND
11.948000	29.90	10.7	50	20.1	AV	N	GND
13.442000	26.80	10.7	50	23.2	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 Peak detector for PK value and RMS detector for AV value, 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

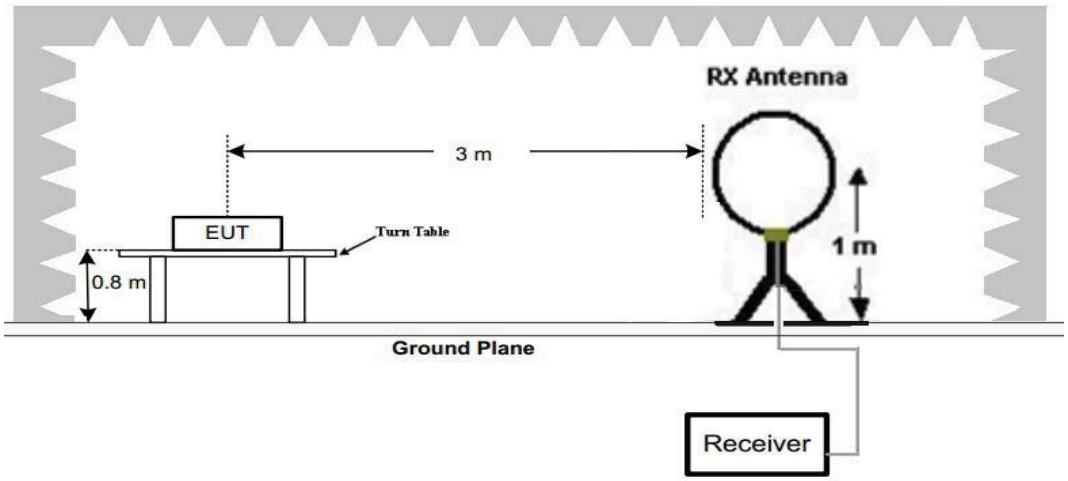
Frequency (MHz)	FS (dBμV/m)	RA (dBμV/m)	AF (dB)	CL (dB)	AG (dB)	Transd (dB)
150.00	40	58.1	12.2	1.6	31.90	-18.1

Transd=AF +CL-AG

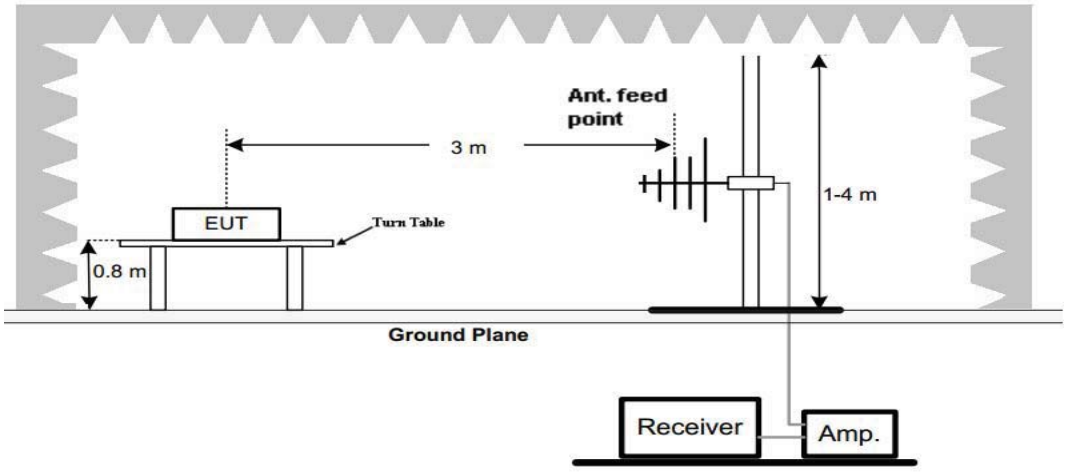
Test Configuration

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

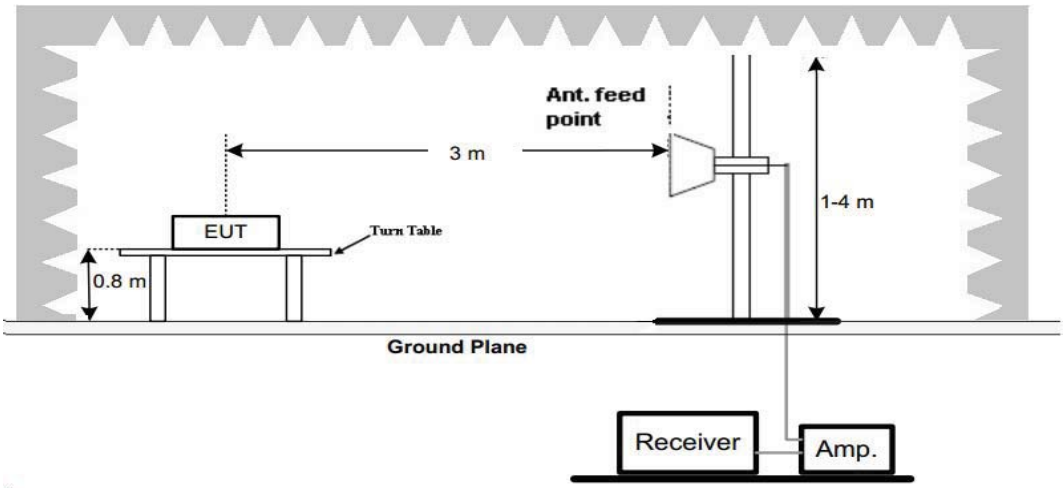
Frequency range 9 KHz – 30MHz



Frequency range 30MHz – 1000MHz



Frequency range above 1GHz-25GHz



Test Results

Remark:

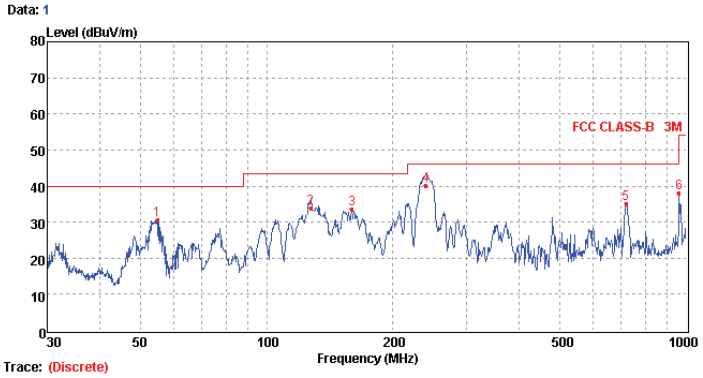
1. We tested three channels for each mode and recorded worst case at low channel of 802.11b Low Channel Mode below 1GHz

For 9 KHz-30MHz

Frequency (MHz)	Corrected Reading (dBuV/m)@3m	FCC Limit (dBuV/m) @3m	Margin (dB)	Detector	Result
0.15	54.21	104.08	49.87	PK	PASS
1.48	46.34	64.20	17.86	QP	PASS
14.21	28.29	69.54	41.25	QP	PASS
25.03	46.55	69.54	22.99	QP	PASS

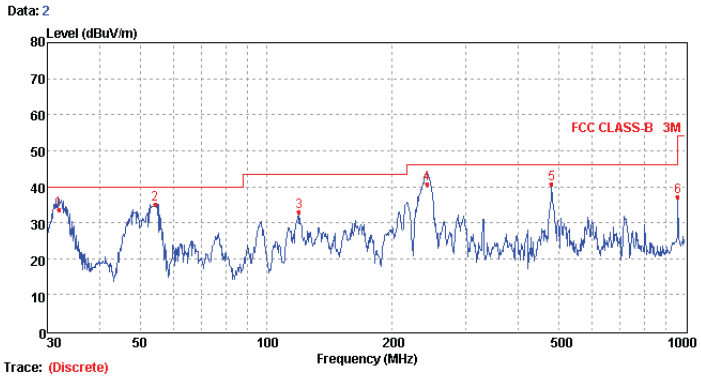
For 30MHz-1GHz

Horizontal



Mark	Frequency MHz	Level dBuV/m	Factor dB/m	Reading dBuV	Limit dBuV/m	Margin dB	Polarization	Detector
1	54.83	30.70	-17.33	48.03	40.00	9.30	HORIZONTAL	Peak
2	127.22	33.80	-18.76	52.56	43.50	9.70	HORIZONTAL	QP
3	159.78	33.70	-20.77	54.47	43.50	9.80	HORIZONTAL	Peak
4	239.99	40.20	-17.65	57.85	46.00	5.80	HORIZONTAL	QP
5	719.20	35.22	-9.00	44.22	46.00	10.78	HORIZONTAL	Peak
6	962.16	38.01	-4.50	43.51	54.00	15.99	HORIZONTAL	Peak

Vertical



Mark	Frequency MHz	Level dBuV/m	Factor dB/m	Reading dBuV	Limit dBuV/m	Margin dB	Polarization	Detector
1	31.95	33.50	-9.29	42.79	40.00	6.50	VERTICAL	QP
2	54.26	35.15	-16.94	52.09	40.00	4.85	VERTICAL	Peak
3	119.86	33.04	-18.67	51.71	43.50	10.46	VERTICAL	Peak
4	241.68	40.60	-17.63	58.23	46.00	5.40	VERTICAL	QP
5	480.53	40.84	-11.87	52.71	46.00	5.16	VERTICAL	Peak
6	962.16	37.31	-4.50	41.81	54.00	16.69	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	57.66	PK	74.00	16.34	1.00	48	55.56	31.6	7.00	36.5	2.10
1	4824	49.58	AV	54.00	4.42	1.00	48	47.48	31.6	7.00	36.5	2.10
2	7236	50.40	PK	74.00	23.60	1.00	48	39.47	37.33	8.90	35.3	10.93
2	7236	41.89	AV	54.00	12.11	1.00	48	30.96	37.33	8.90	35.3	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	58.55	PK	74.00	15.45	1.00	220	56.45	31.60	7.00	36.50	2.10
1	4824	49.59	AV	54.00	4.41	1.00	220	47.49	31.60	7.00	36.50	2.10
2	7236	50.74	PK	74.00	23.26	1.00	220	39.81	37.33	8.90	35.30	10.93
2	7236	43.32	AV	54.00	10.68	1.00	220	32.39	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	57.09	PK	74.00	16.91	1.00	42	54.97	31.02	7.60	36.5	2.12
1	4874.00	50.49	AV	54.00	3.51	1.00	42	48.37	31.02	7.60	36.5	2.12
2	7311.00	50.16	PK	74.00	23.84	1.00	42	39.08	37.28	8.60	34.8	11.08
2	7311.00	41.17	AV	54.00	12.83	1.00	42	30.09	37.28	8.60	34.8	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	57.52	PK	74.00	16.48	1.00	230	55.40	31.02	7.60	36.5	2.12
1	4874.00	50.55	AV	54.00	3.45	1.00	230	48.43	31.02	7.60	36.5	2.12
2	7311.00	52.58	PK	74.00	21.42	1.00	230	41.50	37.28	8.60	34.8	11.08
2	7311.00	42.80	AV	54.00	11.20	1.00	230	31.72	37.28	8.60	34.8	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	56.51	PK	74.00	17.49	1.00	60	53.31	31.58	7.82	36.2	3.20
1	4924.00	49.39	AV	54.00	4.61	1.00	60	46.19	31.58	7.82	36.2	3.20
2	7386.00	51.83	PK	74.00	22.17	1.00	60	39.89	38.51	8.73	35.3	11.94
2	7386.00	40.73	AV	54.00	13.27	1.00	60	28.79	38.51	8.73	35.3	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	59.85	PK	74.00	14.15	1.00	216	56.65	31.58	7.82	36.2	3.20
1	4924.00	50.19	AV	54.00	3.81	1.00	216	46.99	31.58	7.82	36.2	3.20
2	7386.00	52.46	PK	74.00	21.54	1.00	216	40.52	38.51	8.73	35.3	11.94
2	7386.00	42.20	AV	54.00	11.80	1.00	216	30.26	38.51	8.73	35.3	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	56.98	PK	74.00	17.02	1.00	52	54.88	31.6	7.00	36.5	2.10
1	4824	45.59	AV	54.00	8.41	1.00	52	43.49	31.6	7.00	36.5	2.10
2	7236	50.55	PK	74.00	23.45	1.00	52	39.62	37.33	8.90	35.3	10.93
2	7236	38.48	AV	54.00	15.52	1.00	52	27.55	37.33	8.90	35.3	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	58.30	PK	74.00	15.70	1.00	212	56.20	31.60	7.00	36.50	2.10
1	4824	44.78	AV	54.00	9.22	1.00	212	42.68	31.60	7.00	36.50	2.10
2	7236	51.11	PK	74.00	22.89	1.00	212	40.18	37.33	8.90	35.30	10.93
2	7236	39.28	AV	54.00	14.72	1.00	212	28.35	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	56.54	PK	74.00	17.46	1.00	46	54.42	31.02	7.60	36.5	2.12
1	4874.00	44.62	AV	54.00	9.38	1.00	46	42.50	31.02	7.60	36.5	2.12
2	7311.00	51.22	PK	74.00	22.78	1.00	46	40.14	37.28	8.60	34.8	11.08
2	7311.00	39.30	AV	54.00	14.70	1.00	46	28.22	37.28	8.60	34.8	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	58.59	PK	74.00	15.41	1.00	222	56.47	31.02	7.60	36.5	2.12
1	4874.00	46.18	AV	54.00	7.82	1.00	222	44.06	31.02	7.60	36.5	2.12
2	7311.00	50.59	PK	74.00	23.41	1.00	222	39.51	37.28	8.60	34.8	11.08
2	7311.00	40.20	AV	54.00	13.80	1.00	222	29.12	37.28	8.60	34.8	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	57.67	PK	74.00	16.33	1.00	64	54.47	31.58	7.82	36.2	3.20
1	4924.00	44.21	AV	54.00	9.79	1.00	64	41.01	31.58	7.82	36.2	3.20
2	7386.00	51.08	PK	74.00	22.92	1.00	64	39.14	38.51	8.73	35.3	11.94
2	7386.00	39.71	AV	54.00	14.29	1.00	64	27.77	38.51	8.73	35.3	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	57.65	PK	74.00	16.35	1.00	208	54.45	31.58	7.82	36.2	3.20
1	4924.00	43.25	AV	54.00	10.75	1.00	208	40.05	31.58	7.82	36.2	3.20
2	7386.00	51.44	PK	74.00	22.56	1.00	208	39.50	31.58	8.73	35.3	11.94
2	7386.00	38.86	AV	54.00	15.14	1.00	208	26.92	31.58	8.73	35.3	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	55.30	PK	74.00	18.70	1.00	60	53.20	31.6	7.00	36.5	2.10
1	4824	43.68	AV	54.00	10.32	1.00	60	41.58	31.6	7.00	36.5	2.10
2	7236	48.09	PK	74.00	25.91	1.00	60	37.16	37.33	8.90	35.3	10.93
2	7236	36.68	AV	54.00	17.32	1.00	60	25.75	37.33	8.90	35.3	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	55.60	PK	74.00	18.40	1.00	200	53.50	31.60	7.00	36.50	2.10
1	4824	43.04	AV	54.00	10.96	1.00	200	40.94	31.60	7.00	36.50	2.10
2	7236	49.09	PK	74.00	24.91	1.00	200	38.16	37.33	8.90	35.30	10.93
2	7236	38.67	AV	54.00	15.33	1.00	200	27.74	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	55.86	PK	74.00	18.14	1.00	210	53.74	31.02	7.60	36.5	2.12
1	4874.00	44.56	AV	54.00	9.44	1.00	210	42.44	31.02	7.60	36.5	2.12
2	7311.00	48.89	PK	74.00	25.11	1.00	210	37.81	37.28	8.60	34.8	11.08
2	7311.00	36.74	AV	54.00	17.26	1.00	210	25.66	37.28	8.60	34.8	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	55.81	PK	74.00	18.19	1.00	95	65.67	31.02	7.60	36.5	2.12
1	4874.00	46.81	AV	54.00	7.19	1.00	95	46.38	31.02	7.60	36.5	2.12
2	7311.00	49.58	PK	74.00	24.42	1.00	70	38.50	37.28	8.60	34.8	11.08
2	7311.00	40.81	AV	54.00	13.19	1.00	70	30.31	37.28	8.60	34.8	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	56.02	PK	74.00	17.98	1.00	210	52.82	31.58	7.82	36.2	3.20
1	4924.00	43.78	AV	54.00	10.22	1.00	210	40.58	31.58	7.82	36.2	3.20
2	7386.00	48.42	PK	74.00	25.58	1.00	210	36.48	38.51	8.73	35.3	11.94
2	7386.00	37.61	AV	54.00	16.39	1.00	210	25.67	38.51	8.73	35.3	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	57.28	PK	74.00	16.72	1.00	196	54.08	31.58	7.82	36.2	3.20
1	4924.00	41.82	AV	54.00	12.18	1.00	196	38.62	31.58	7.82	36.2	3.20
2	7386.00	49.46	PK	74.00	24.54	1.00	196	37.52	38.51	8.73	35.3	11.94
2	7386.00	39.02	AV	54.00	14.98	1.00	196	27.08	38.51	8.73	35.3	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	49.26	PK	74.00	24.74	1.00	60	47.16	31.60	7.00	36.5	2.10
1	4844.00	38.93	AV	54.00	15.07	1.00	60	36.83	31.60	7.00	36.5	2.10
2	7266.00	44.70	PK	74.00	29.30	1.00	60	33.77	37.33	8.90	35.3	10.93
2	7266.00	30.98	AV	54.00	23.02	1.00	60	20.05	37.33	8.90	35.3	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	50.97	PK	74.00	23.03	1.00	200	48.87	31.60	7.00	36.50	2.10
1	4844.00	39.56	AV	54.00	14.44	1.00	200	37.46	31.60	7.00	36.50	2.10
2	7266.00	45.06	PK	74.00	28.94	1.00	200	34.13	37.33	8.90	35.30	10.93
2	7266.00	32.90	AV	54.00	21.10	1.00	200	21.97	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	4844.00	49.87	PK	74.00	24.13	1.00	54	47.75	31.02	7.60	36.5	2.12
1	4844.00	37.50	AV	54.00	16.50	1.00	54	35.38	31.02	7.60	36.5	2.12
2	7266.00	43.21	PK	74.00	30.79	1.00	54	32.13	37.28	8.60	34.8	11.08
2	7266.00	32.72	AV	54.00	21.28	1.00	54	21.64	37.28	8.60	34.8	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	51.06	PK	74.00	22.94	1.00	210	48.94	31.02	7.60	36.5	2.12
1	4874.00	39.01	AV	54.00	14.99	1.00	210	36.89	31.02	7.60	36.5	2.12
2	7311.00	44.45	PK	74.00	29.55	1.00	210	33.37	37.28	8.60	34.8	11.08
2	7311.00	34.05	AV	54.00	19.95	1.00	210	22.97	37.28	8.60	34.8	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	4924.00	49.28	PK	74.00	24.72	1.00	210	46.08	31.58	7.82	36.2	3.20
1	4924.00	40.00	AV	54.00	14.00	1.00	210	36.80	31.58	7.82	36.2	3.20
2	7386.00	45.18	PK	74.00	28.82	1.00	210	33.24	38.51	8.73	35.3	11.94
2	7386.00	34.65	AV	54.00	19.35	1.00	210	22.71	38.51	8.73	35.3	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	4924.00	50.59	PK	74.00	23.41	1.00	196	47.39	31.58	7.82	36.2	3.20
1	4924.00	40.03	AV	54.00	13.97	1.00	196	36.83	31.58	7.82	36.2	3.20
2	7386.00	45.58	PK	74.00	28.42	1.00	196	33.64	38.51	8.73	35.3	11.94
2	7386.00	32.98	AV	54.00	21.02	1.00	196	21.04	38.51	8.73	35.3	11.94

3.3. Maximum Conducted Output Power

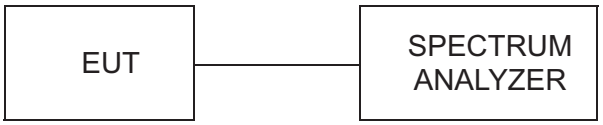
Limit

30dBm for digital modulation systems.

Test Procedure

- For Maximum conducted (average) output power
  1. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the SPECTRUM.
  2. Ensure EUT transmitting with a duty cycle ≥ 98 %.
  3. Set SA as fellow:
     a) Center frequency: frequency to be tested.
     b) Span: ≥1.5 times the OBW.
     c) RBW:= 1-5% of the OBW, not to exceed 1 MHz.
     d) VBW: ≥ 3 x RBW.
     e) Sweep points: 8001
     f) Sweep time: auto
     g) Detector: RMS
     h) Trace: Average(100 traces)
  4. Allow trace to fully stabilize
  5. Use instrument's band power measurement function to integrate power in this band across a bandwidth OBW.
     Note: OBW test data please see the section 3.6

Test Configuration



Test Results

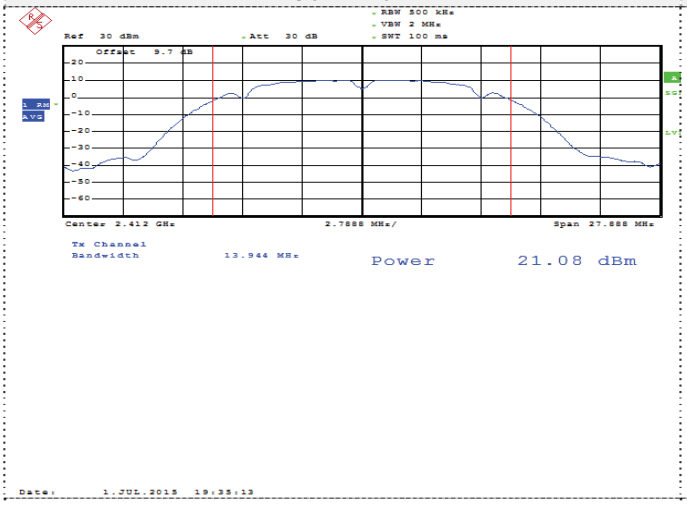
WIFI

Type	Channel	Output power AV(dBm)	Limit (dBm)	Result
802.11b	01	21.08	30.00	Pass
	06	20.66		
	11	20.87		
802.11g	01	13.63	30.00	Pass
	06	13.88		
	11	13.47		
802.11n(H20)	01	13.94	30.00	Pass
	06	14.06		
	11	13.40		
802.11n(H40)	03	14.16	30.00	Pass
	06	14.01		
	09	13.52		

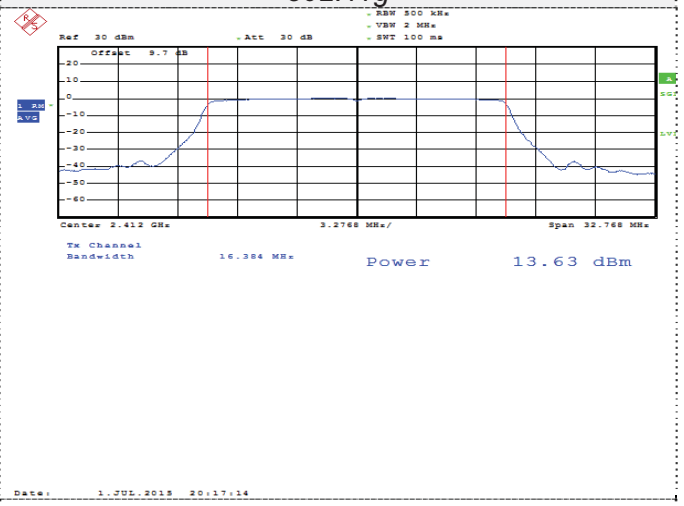
Note: 1.The test results including the cable lose.

Test plot as follows:

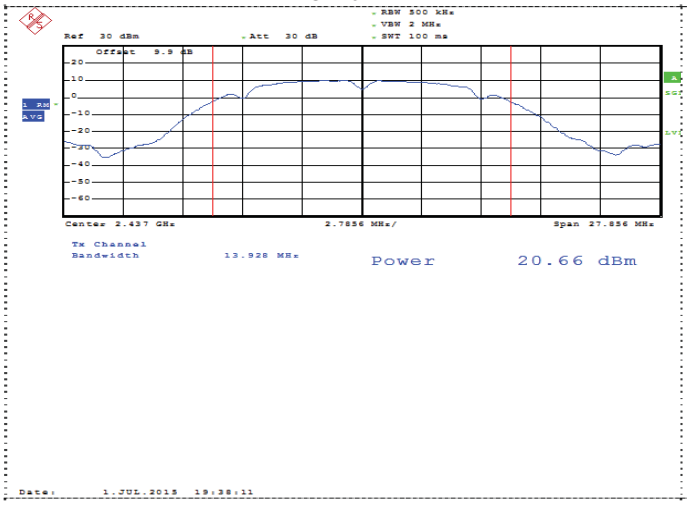
802.11b



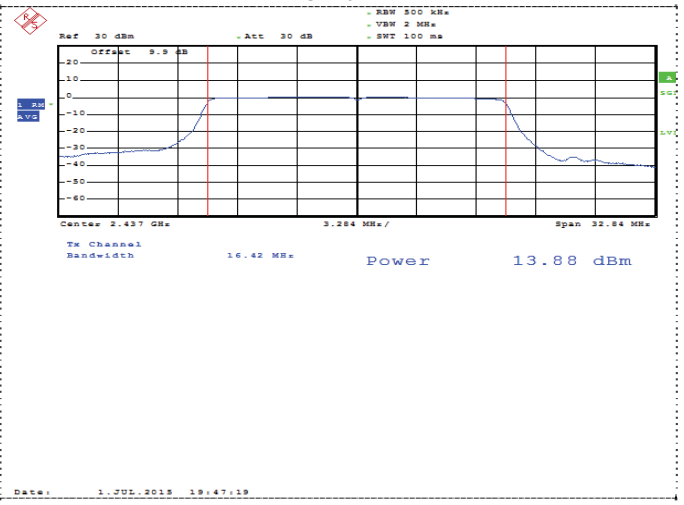
802.11g



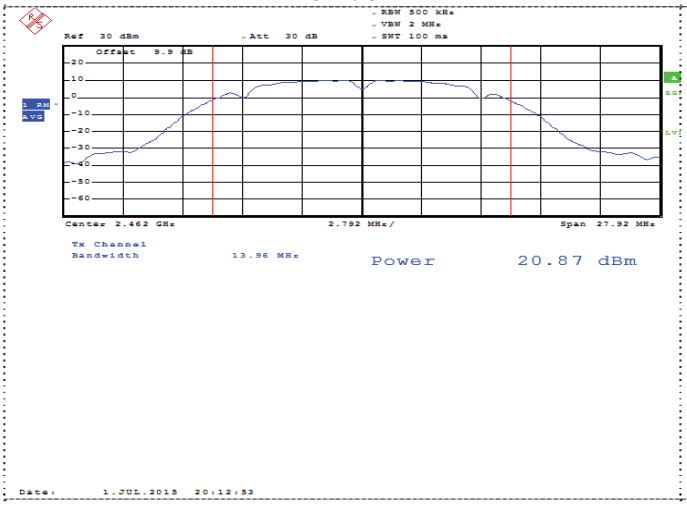
CH01



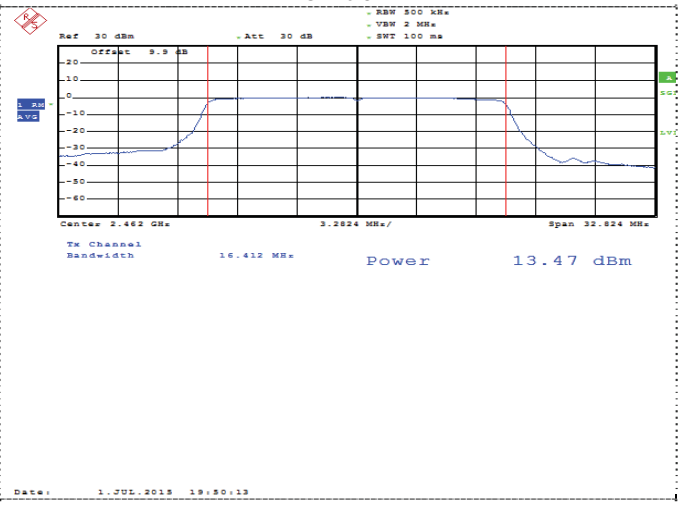
CH01



CH06



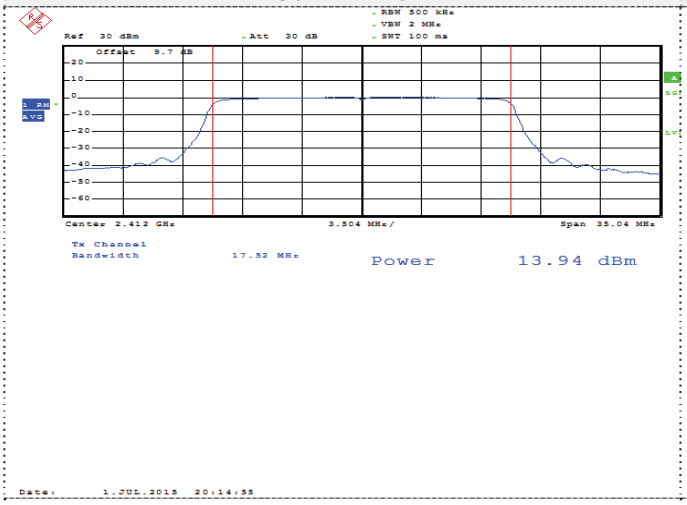
CH06



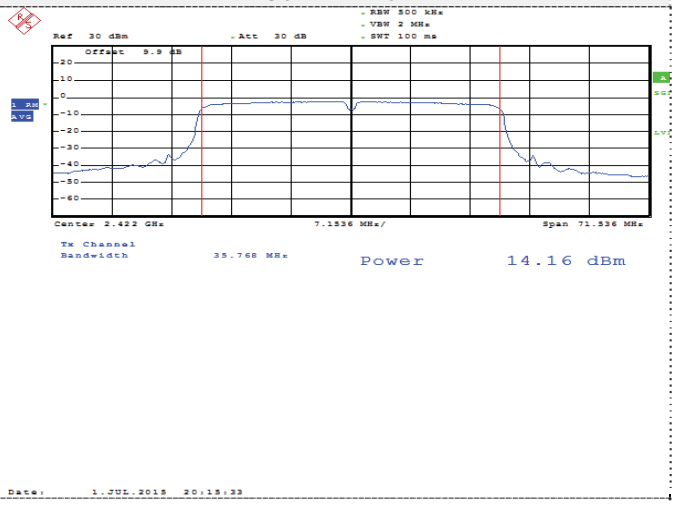
CH11

CH11

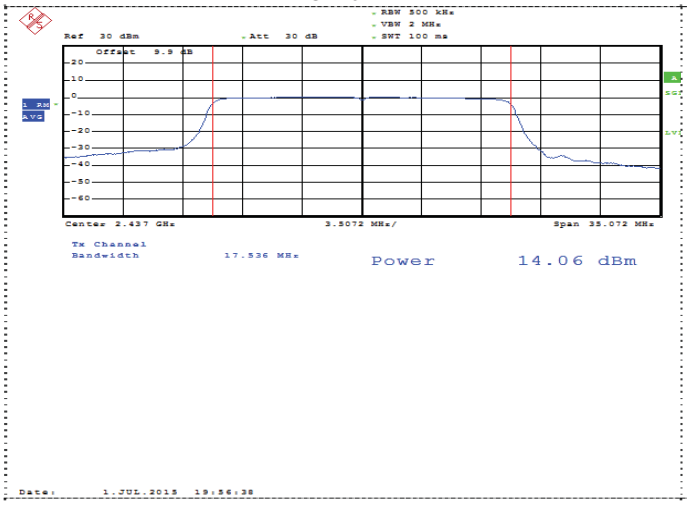
802.11n20



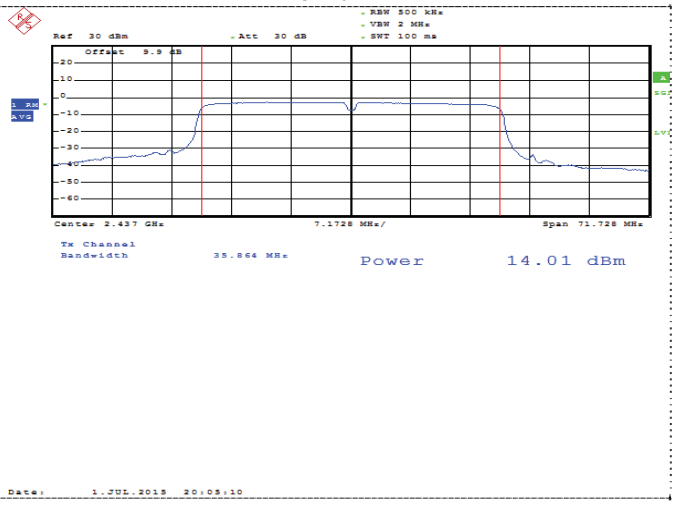
802.11n40



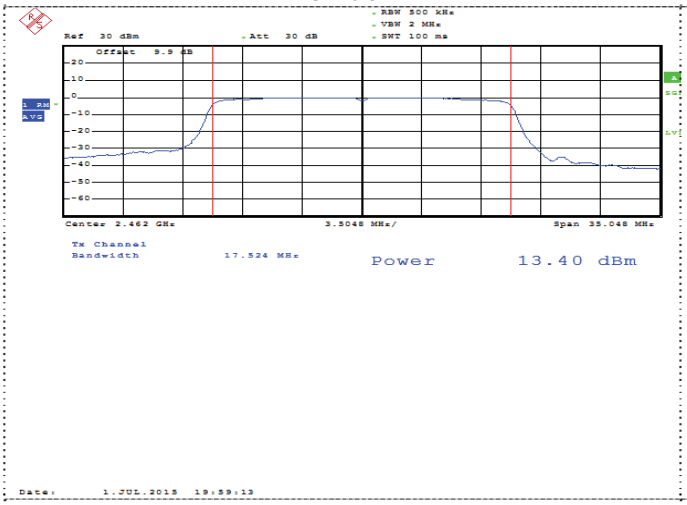
CH01



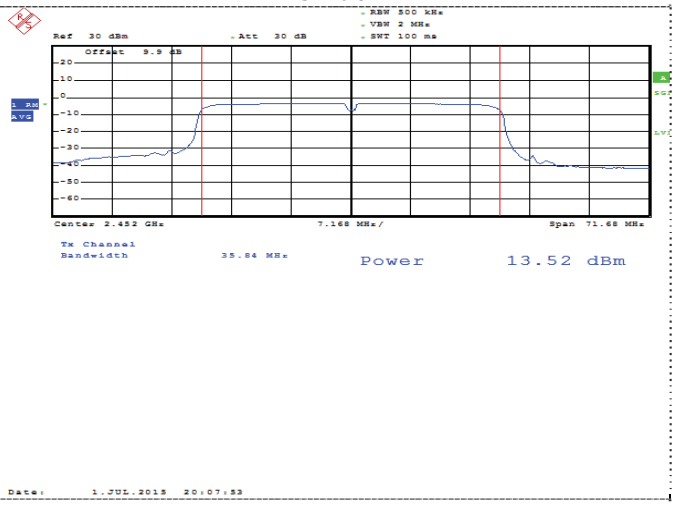
CH01



CH06



CH06



CH11

CH11

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

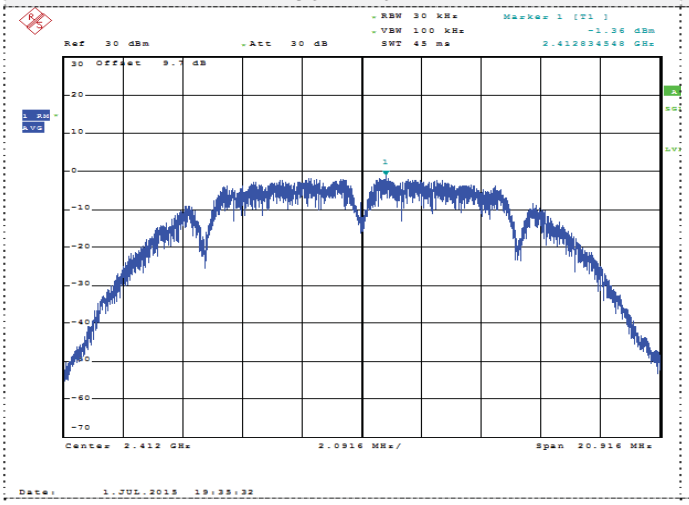
Test Results

WIFI

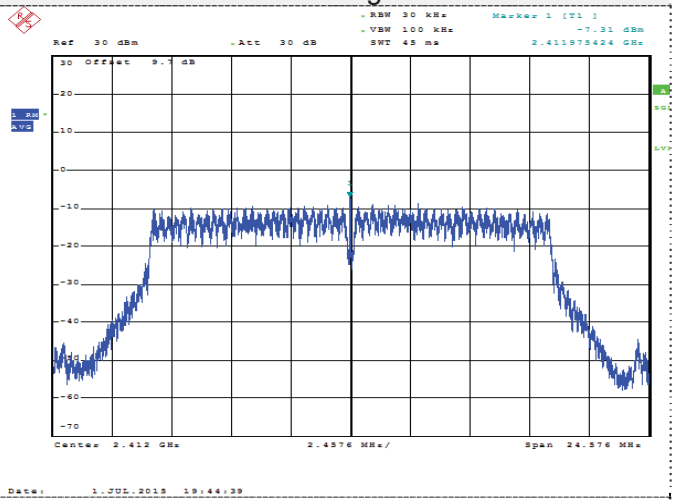
Type	Channel	Power Spectral Density (dBm/30KHz)	Limit (dBm/3KHz)	Result
802.11b	01	-1.36	8.00	Pass
	06	-2.26		
	11	-3.11		
802.11g	01	-7.31	8.00	Pass
	06	-9.40		
	11	-9.43		
802.11n(HT20)	01	-6.34	8.00	Pass
	06	-8.71		
	11	-9.25		
802.11n(HT40)	03	-7.04	8.00	Pass
	06	-9.28		
	09	-9.01		

Test plot as follows:

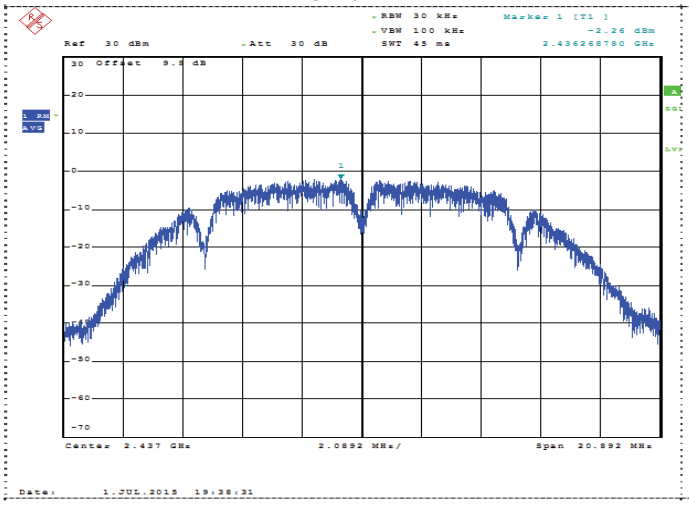
802.11b



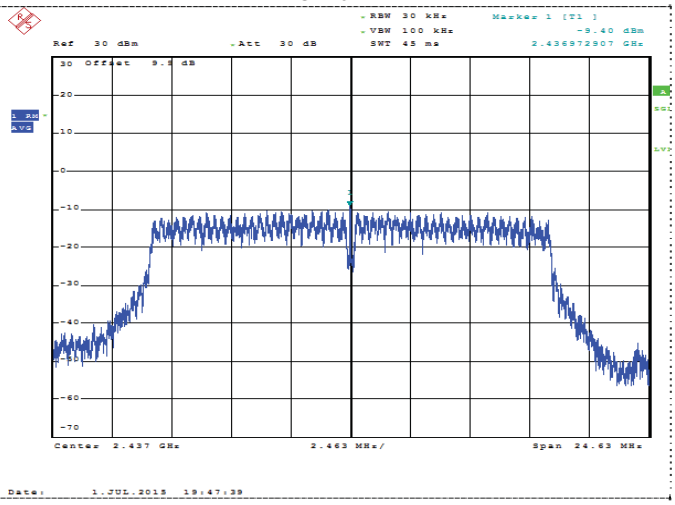
802.11g



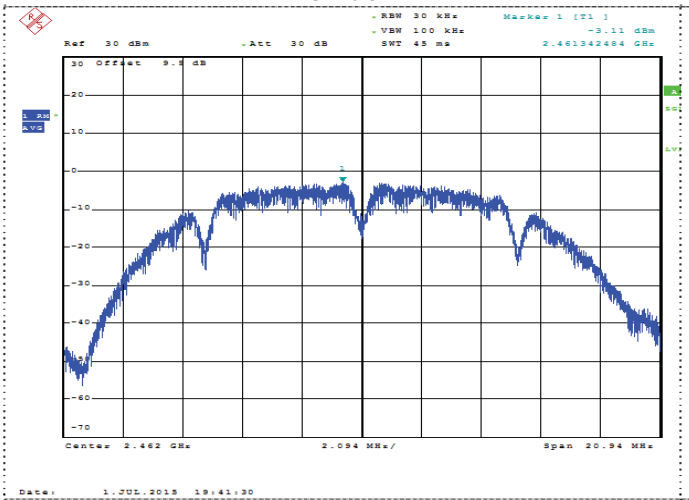
CH01



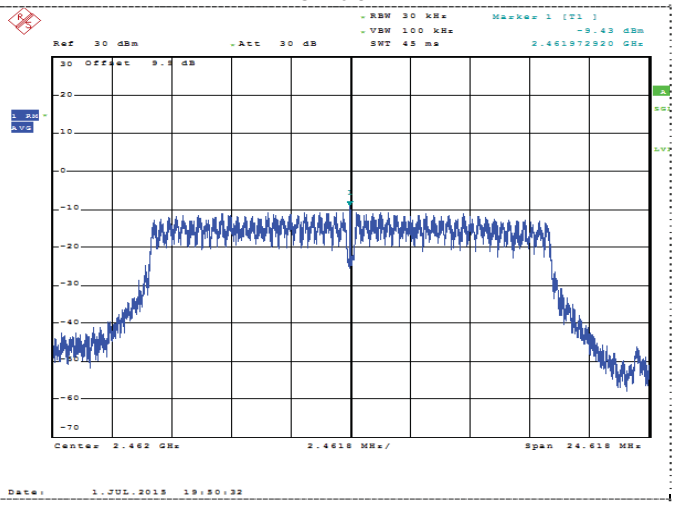
CH01



CH06



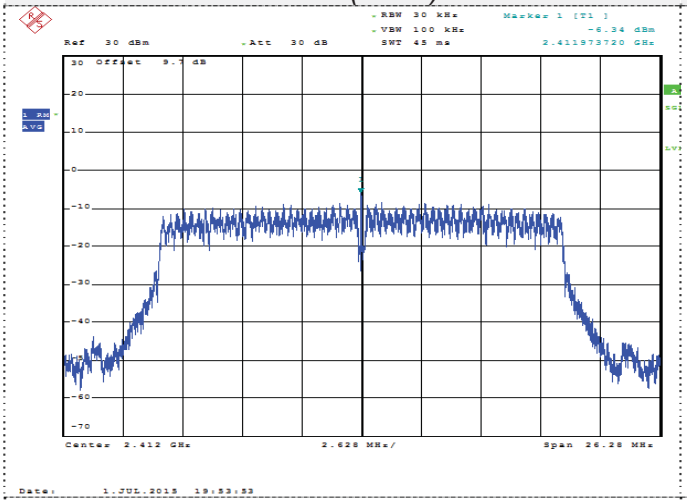
CH06



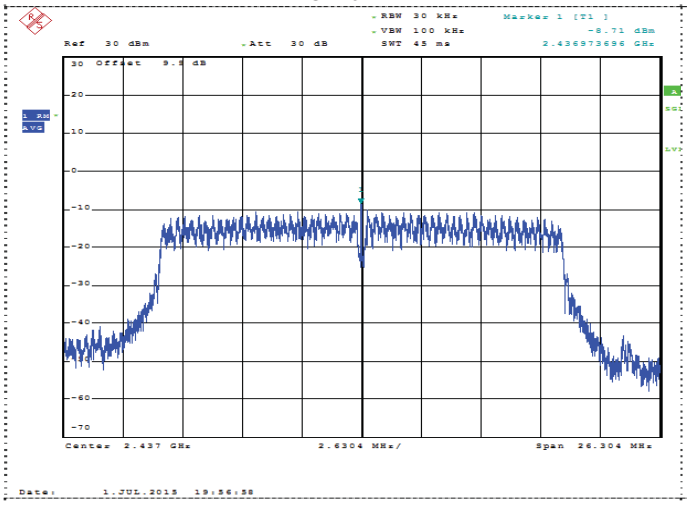
CH11

CH11

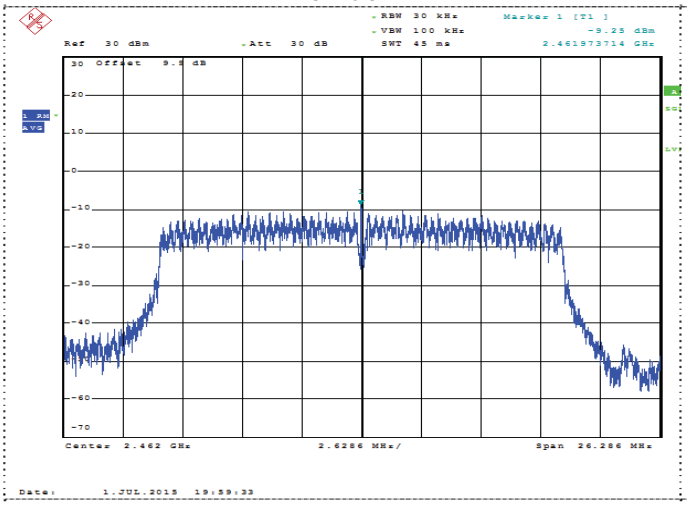
802.11n(HT20)



CH01

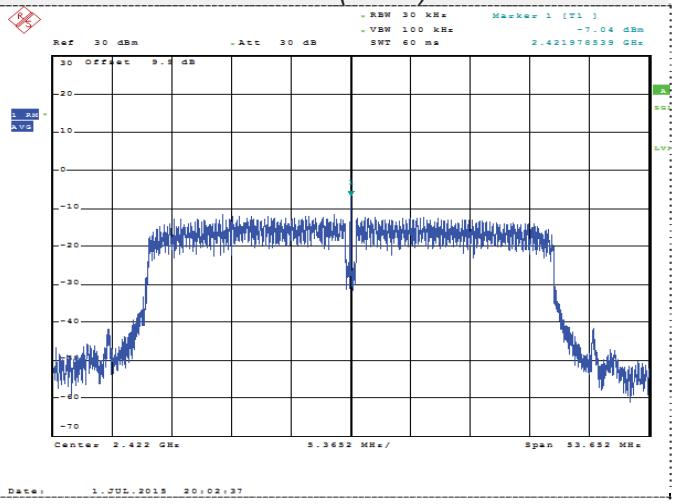


CH06

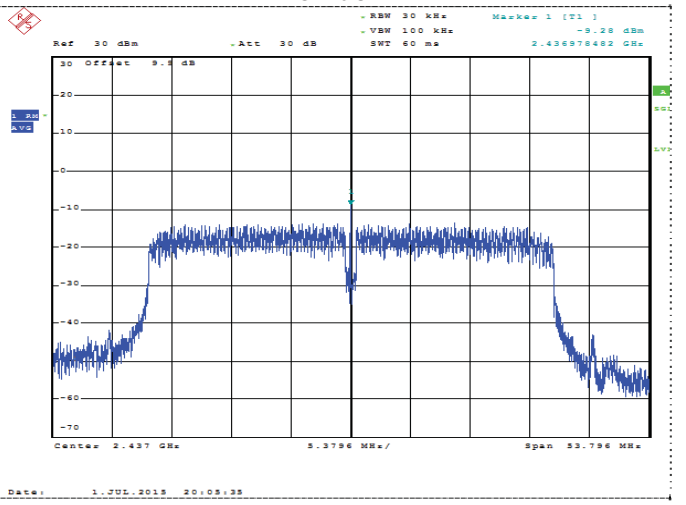


CH11

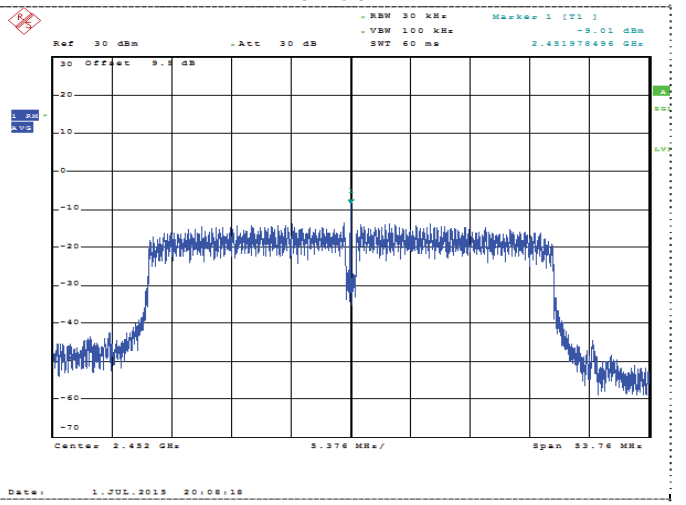
802.11n(HT40)



CH03



CH06



CH09

3.5. 6dB Bandwidth

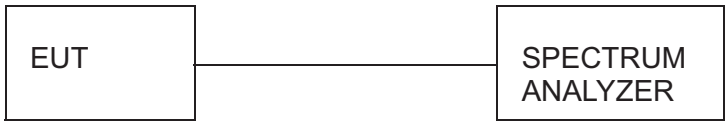
Limit

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



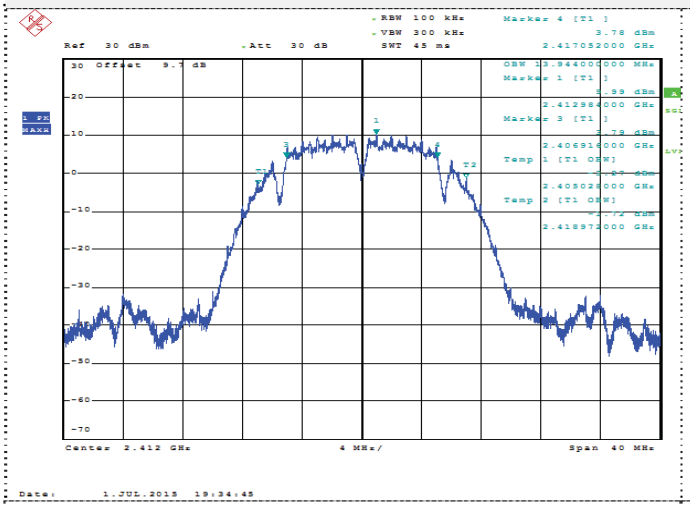
Test Results

WIFI

Type	Channel	6dB Bandwidth (MHz)	99% OBW (MHz)	Limit (KHz)	Result
802.11b	01	10.136	13.944	≥500	Pass
	06	10.132	13.928		
	11	10.136	13.960		
802.11g	01	16.476	16.384	≥500	Pass
	06	16.484	16.420		
	11	16.472	16.412		
802.11n(HT20)	01	17.588	17.520	≥500	Pass
	06	17.580	17.536		
	11	17.572	17.524		
802.11n(HT40)	03	36.288	35.768	≥500	Pass
	06	36.328	35.864		
	09	36.272	35.840		

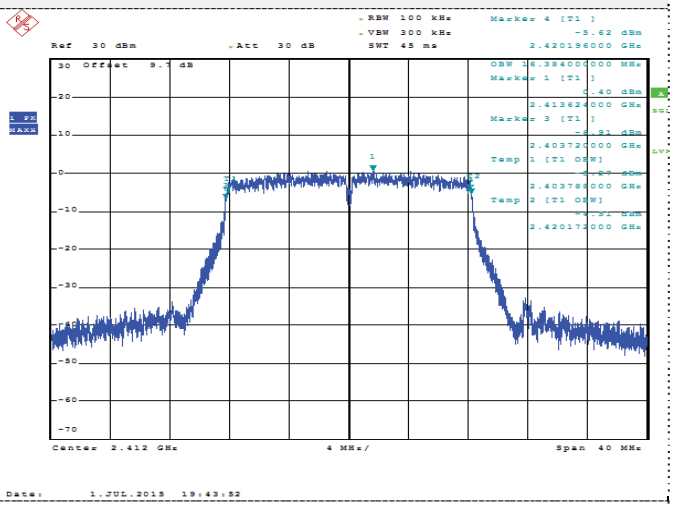
Test plot as follows:

802.11b

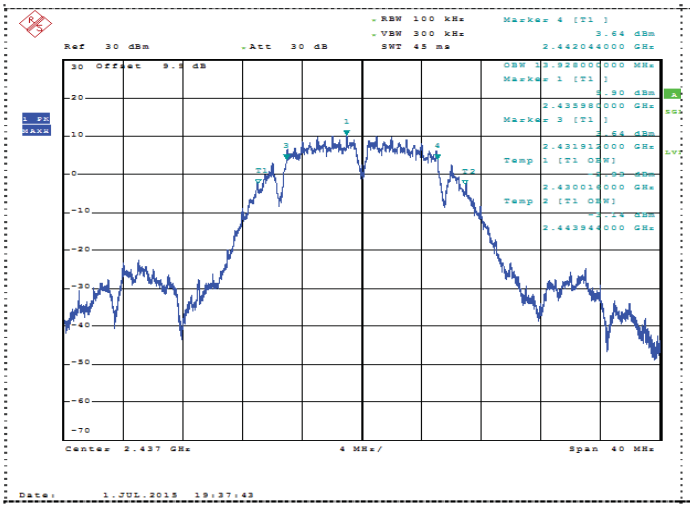


CH01

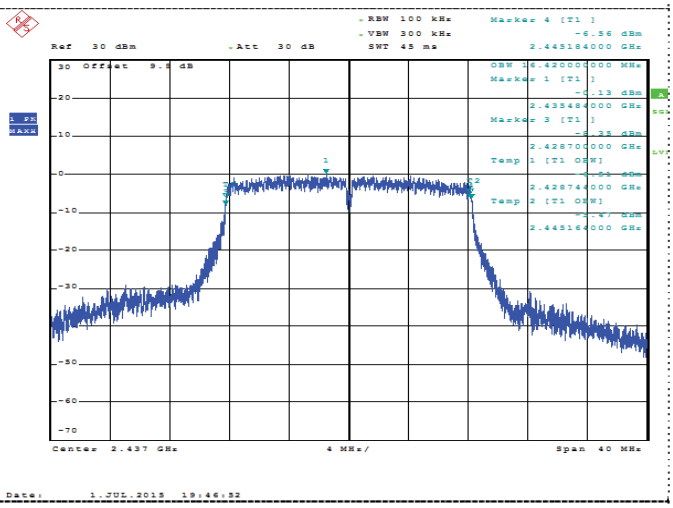
802.11g



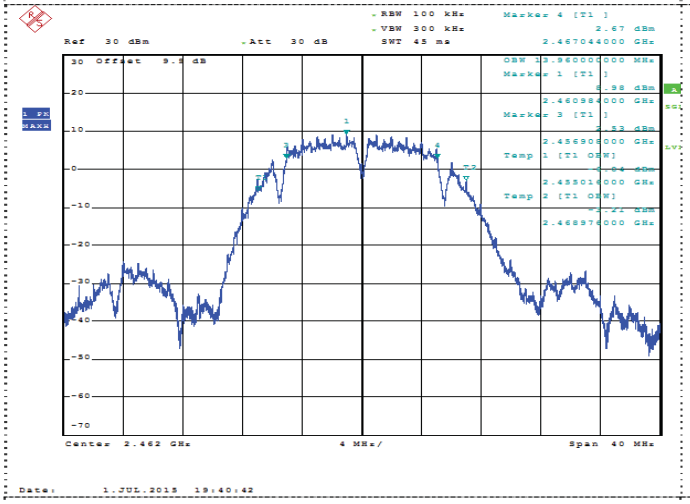
CH01



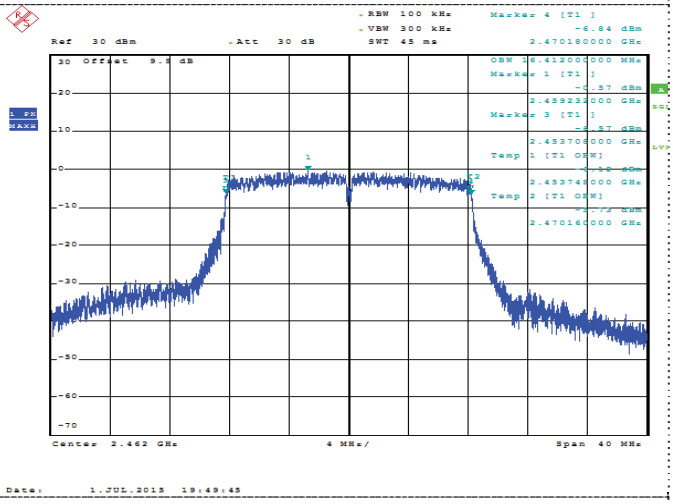
CH06



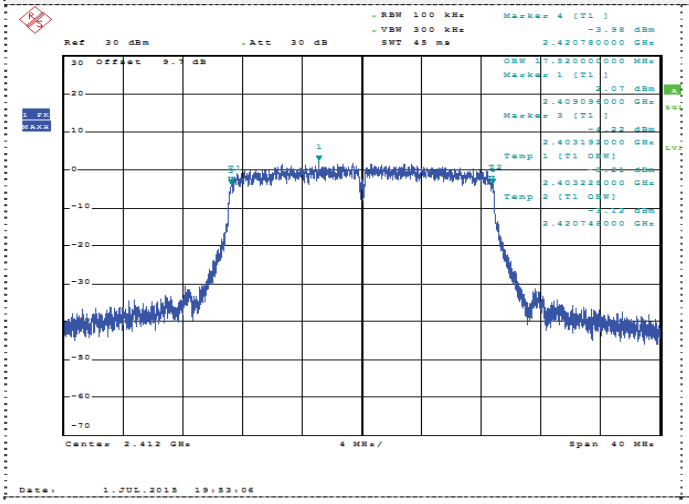
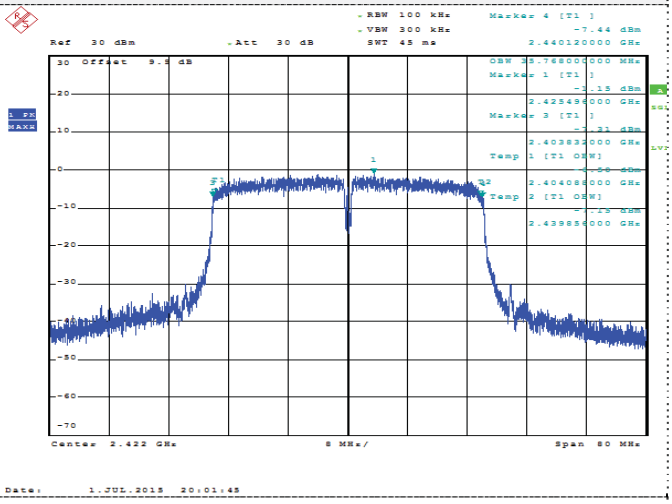
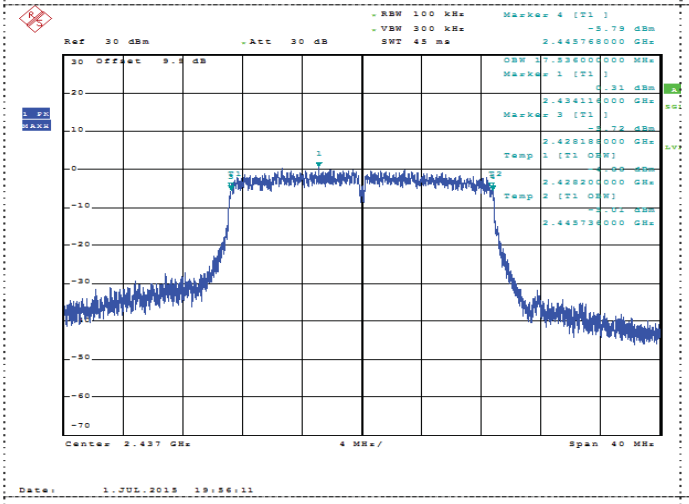
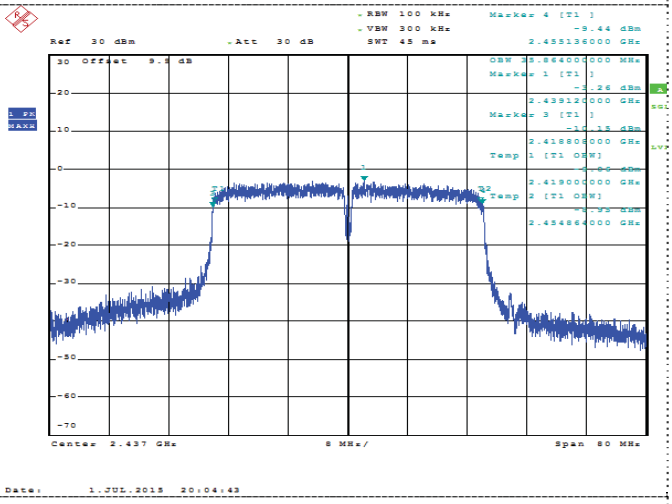
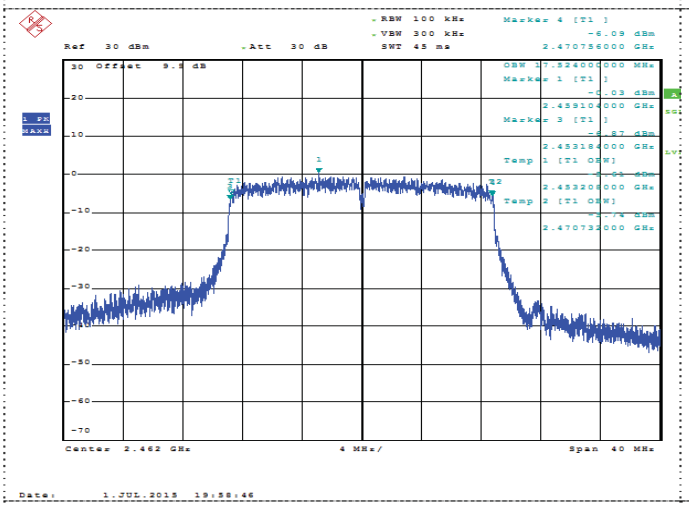
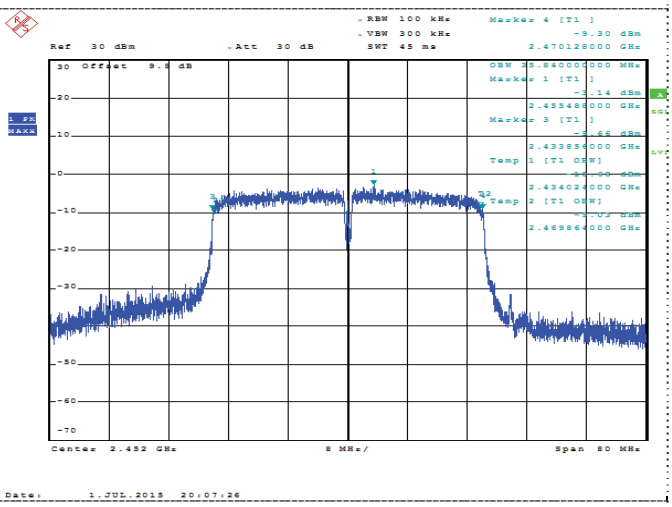
CH06



CH11



CH11

802.11n(HT20)	802.11n(HT40)
	
CH01	CH00
	
CH06	CH06
	
CH11	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

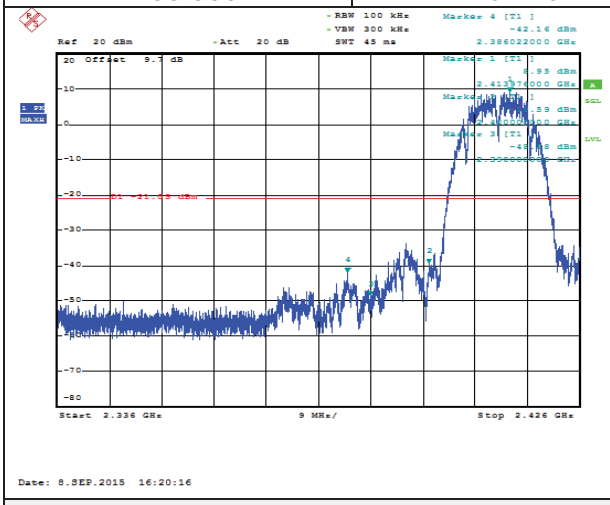
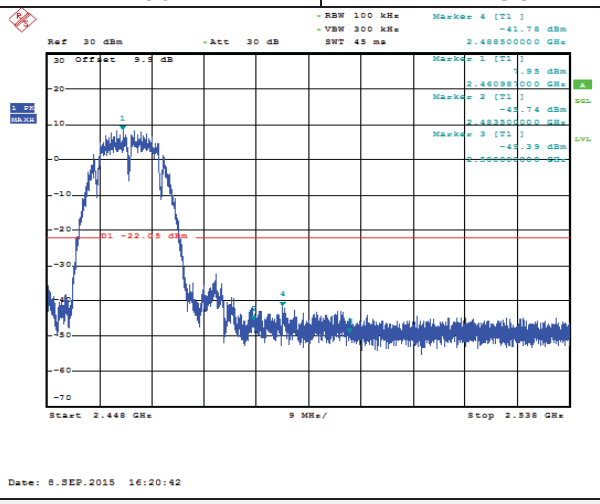
- Use this procedure when the maximum (average) conducted output power was used to demonstrate compliance to the output power limit.
  1. Remove the antenna from the EUT and then connect to a low loss RF cable from the antenna port to a spectrum analyzer
  2. Turn on the EUT and make it operate in transmitting 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.

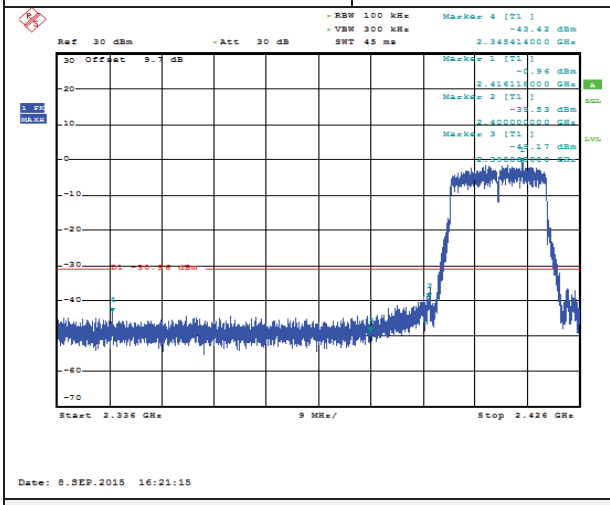
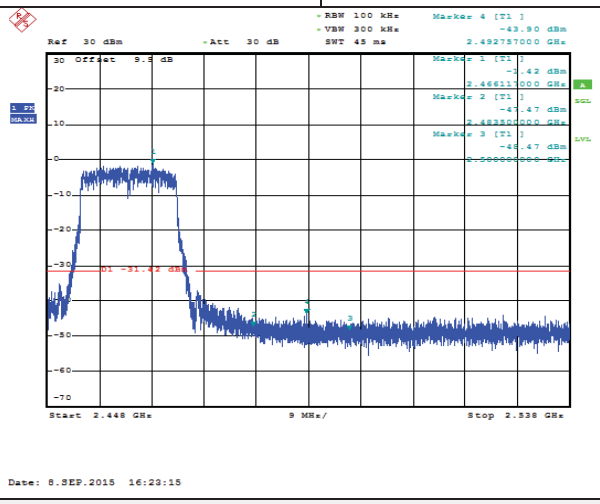
Test Procedure tor radiated method

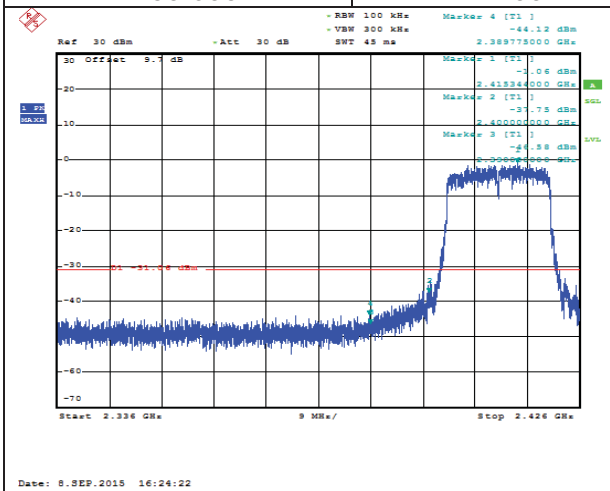
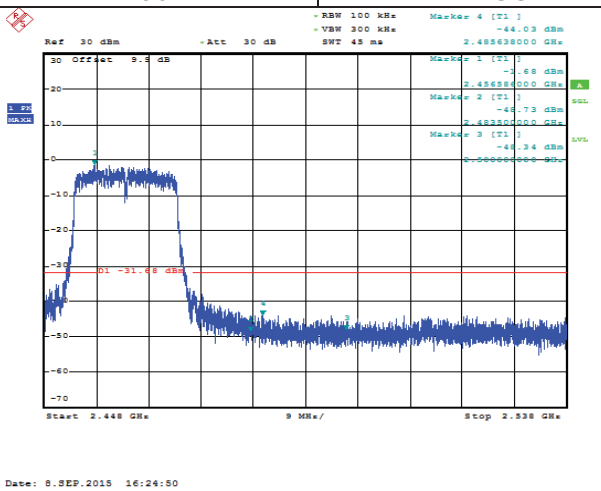
1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference receiving antenna, which was mounted on the top of 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.

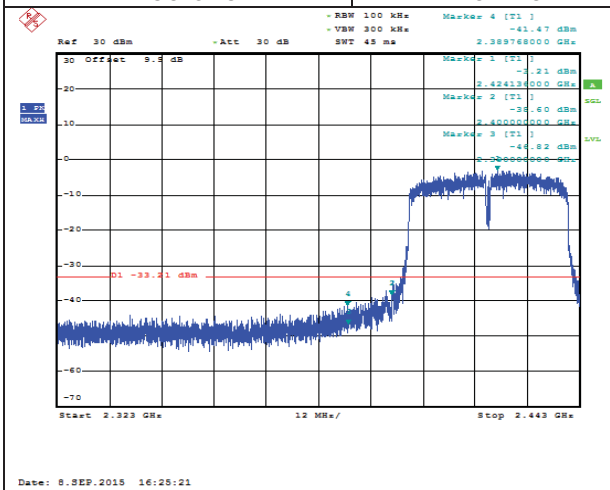
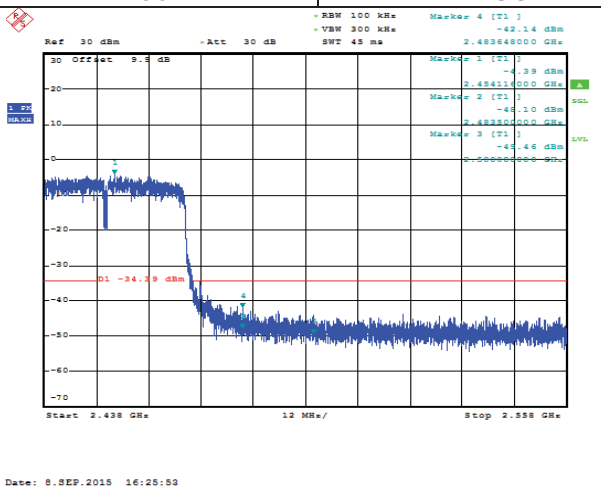
Test Results

A. Conducted measurements

802.11b			
Frequency (MHz)	**Delta Peak to Band emission (dBc)**	**Limit (dBc)**	**Verdict**
2386.022	51.112	30	PASS
2488.500	49.726	30	PASS
			
2412		2462	

802.11g			
Frequency (MHz)	**Delta Peak to Band emission (dBc)**	**Limit (dBc)**	**Verdict**
2345.414	42.457	30	PASS
2492.757	42.476	30	PASS
			
2412		**2462**	

802.11n20			
Frequency (MHz)	Delta Peak to Band emission (dBc)	Limit (dBc)	Verdict
2389.775	43.058	30	PASS
2485.638	42.354	30	PASS
			
2412		2462	

802.11n40			
Frequency (MHz)	Delta Peak to Band emission (dBc)	Limit (dBc)	Verdict
2389.768	38.256	30	PASS
2483.648	37.751	30	PASS
			
2412		**2462**	

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	62.89	PK	74.00	11.11	1.00	150	68.20	27.49	3.32	36.12	-5.31
2390.00	43.79	AV	54.00	10.21	1.00	150	49.10	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	60.15	PK	74.00	13.85	1.00	124	65.46	27.49	3.32	36.12	-5.31
2390.00	43.14	AV	54.00	10.86	1.00	124	48.45	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	59.73	PK	74.00	14.27	1.00	251	65.45	27.45	3.38	36.55	-5.72
2483.50	42.83	AV	54.00	11.17	1.00	251	48.55	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	56.85	PK	74.00	17.15	1.00	152	62.57	27.45	3.38	36.55	-5.72
2483.50	42.65	AV	54.00	11.35	1.00	152	48.37	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	65.87	PK	74.00	8.13	1.00	150	71.18	27.49	3.32	36.12	-5.31
2390.00	48.49	AV	54.00	5.51	1.00	150	53.80	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	63.86	PK	74.00	10.14	1.00	124	69.17	27.49	3.32	36.12	-5.31
2390.00	47.89	AV	54.00	6.11	1.00	124	53.20	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	62.99	PK	74.00	11.01	1.00	251	68.71	27.45	3.38	36.55	-5.72
2483.50	47.04	AV	54.00	6.96	1.00	251	52.76	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	61.17	PK	74.00	12.83	1.00	152	66.89	27.45	3.38	36.55	-5.72
2483.50	45.43	AV	54.00	8.57	1.00	152	51.15	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	66.24	PK	74.00	7.76	1.00	150	71.55	27.49	3.32	36.12	-5.31
2390.00	49.23	AV	54.00	4.77	1.00	150	54.54	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	63.65	PK	74.00	10.35	1.00	124	68.96	27.49	3.32	36.12	-5.31
2390.00	47.37	AV	54.00	6.63	1.00	124	52.68	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	62.72	PK	74.00	11.28	1.00	251	68.44	27.45	3.38	36.55	-5.72
2483.50	47.58	AV	54.00	6.42	1.00	251	53.30	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	62.19	PK	74.00	11.81	1.00	152	67.91	27.45	3.38	36.55	-5.72
2483.50	47.33	AV	54.00	6.67	1.00	152	53.05	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	63.11	PK	74.00	10.89	1.00	150	68.42	27.49	3.32	36.12	-5.31
2390.00	46.18	AV	54.00	7.82	1.00	150	51.49	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	60.42	PK	74.00	13.58	1.00	124	65.73	27.49	3.32	36.12	-5.31
2390.00	44.25	AV	54.00	9.75	1.00	124	49.56	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	59.72	PK	74.00	14.28	1.00	251	65.44	27.45	3.38	36.55	-5.72
2483.50	44.49	AV	54.00	9.51	1.00	251	50.21	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	57.25	PK	74.00	16.75	1.00	152	62.97	27.45	3.38	36.55	-5.72
2483.50	42.61	AV	54.00	11.39	1.00	152	48.33	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 C63.4:2009 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.

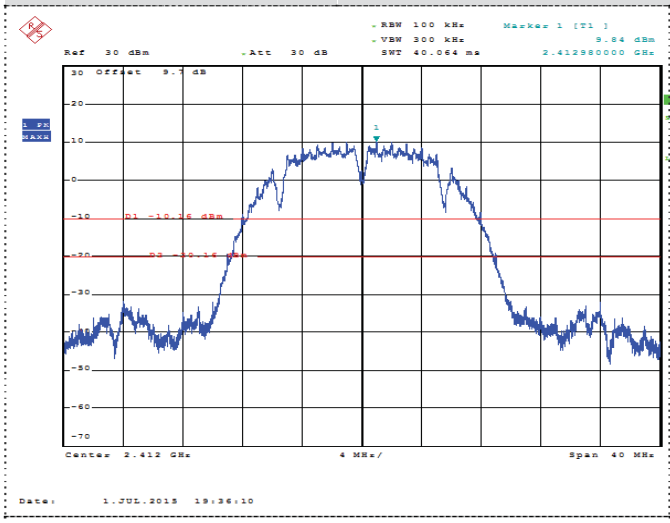
Test Configuration

Test Results

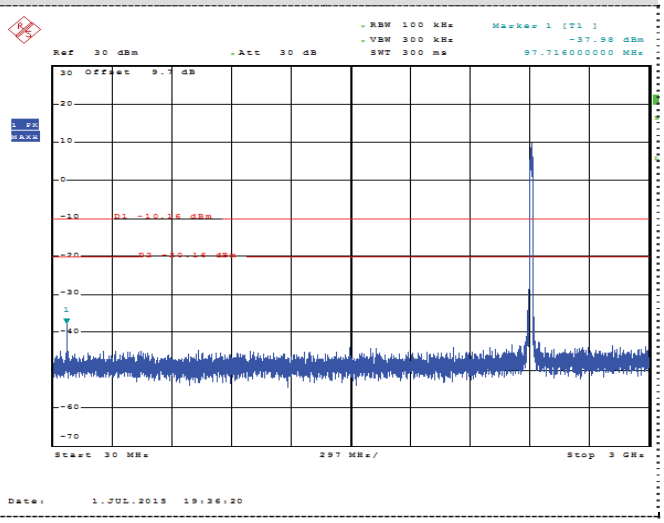
Remark: The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the spurious emissions and bandage measurement data.

Test plot as follows:

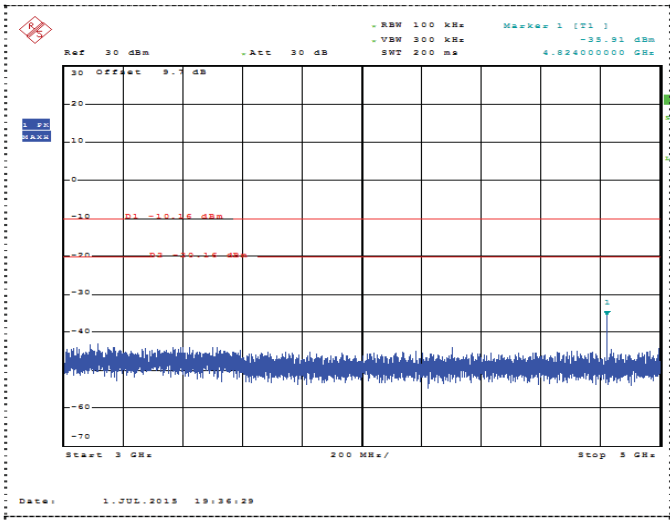
Test Mode:	802.11b	Test channel :	01



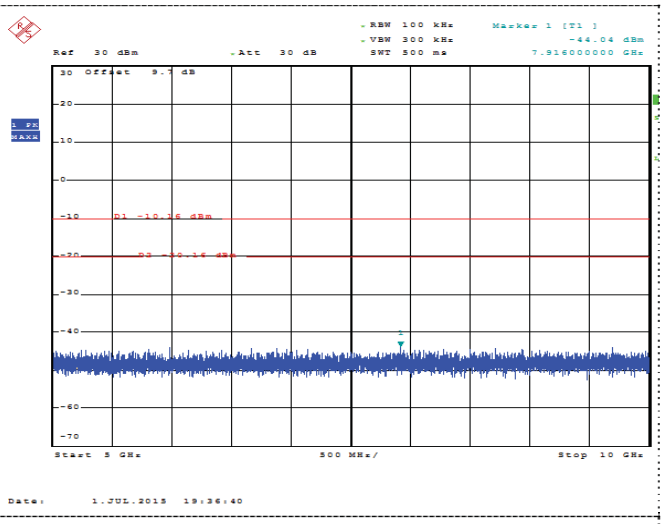
Reference level



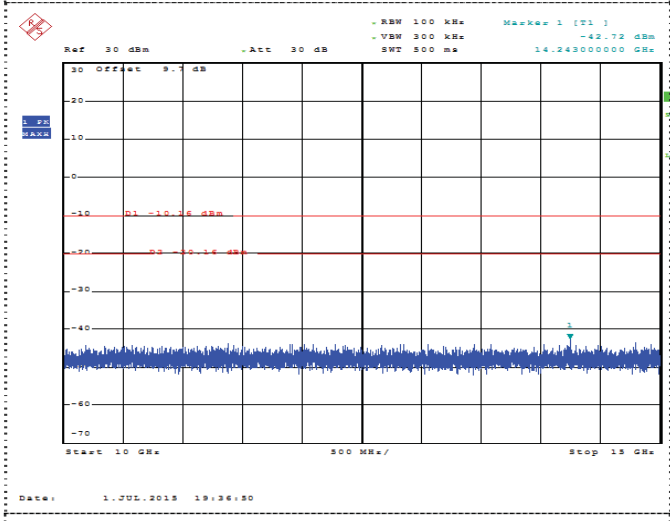
30MHz-1GHz



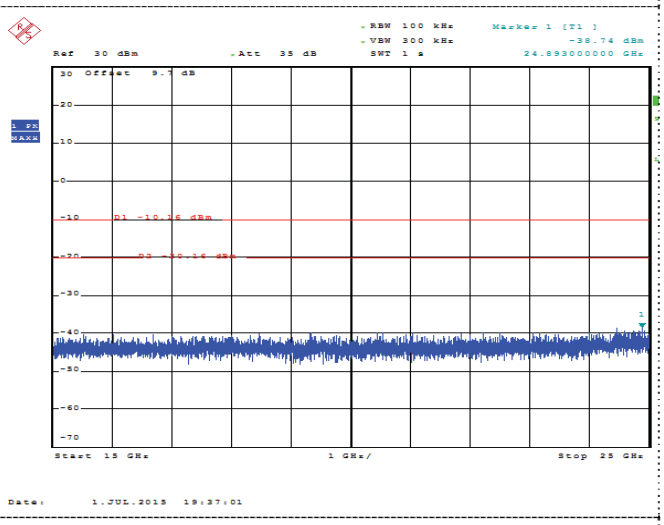
1GHz-5GHz



5GHz-10GHz

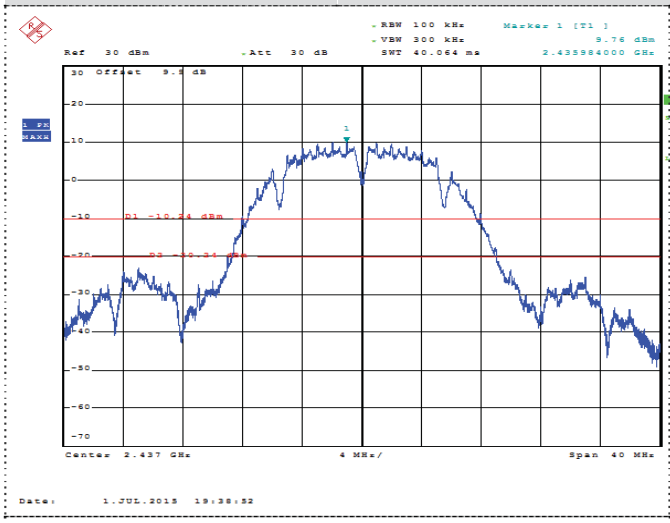


10GHz-15GHz

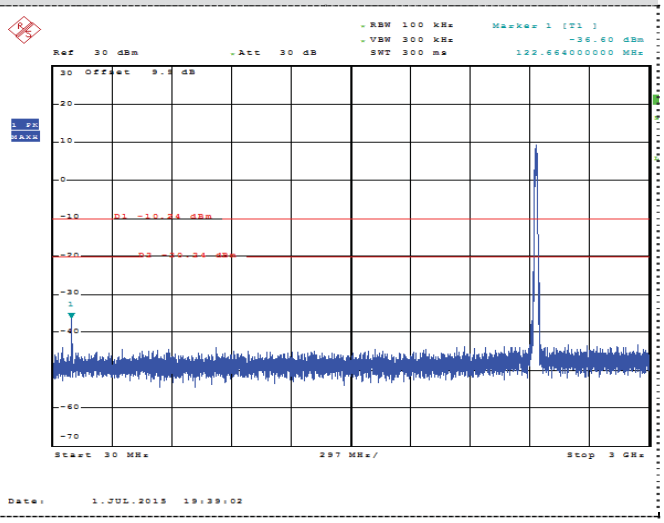


15GHz-25GHz

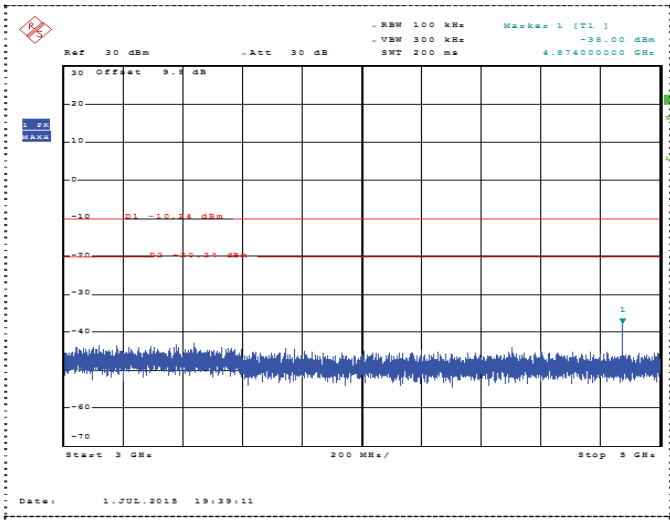
Test Mode:	802.11b	Test channel :	06



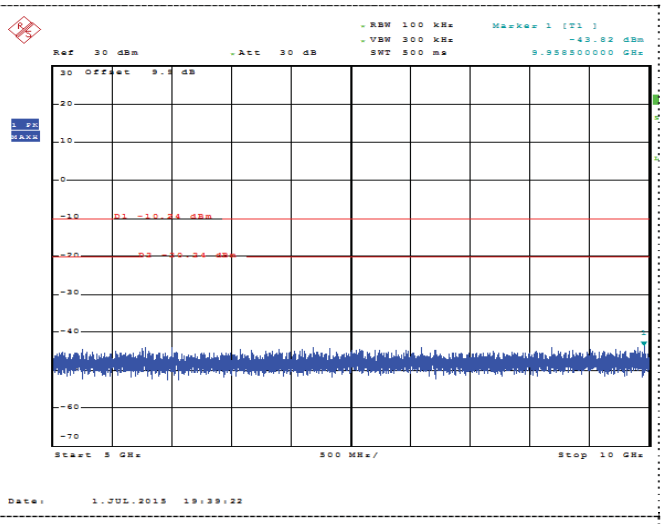
Reference level



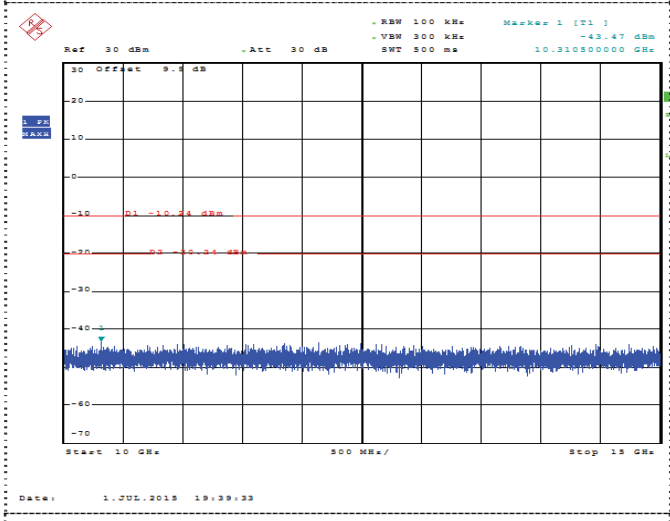
30MHz-1GHz



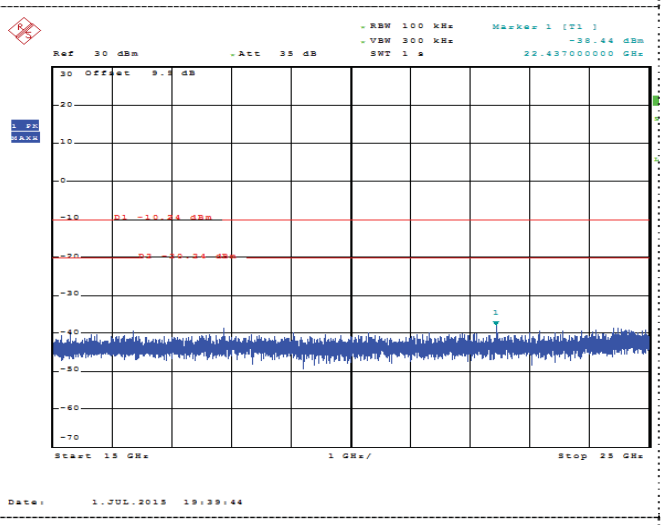
1GHz-5GHz



5GHz-10GHz

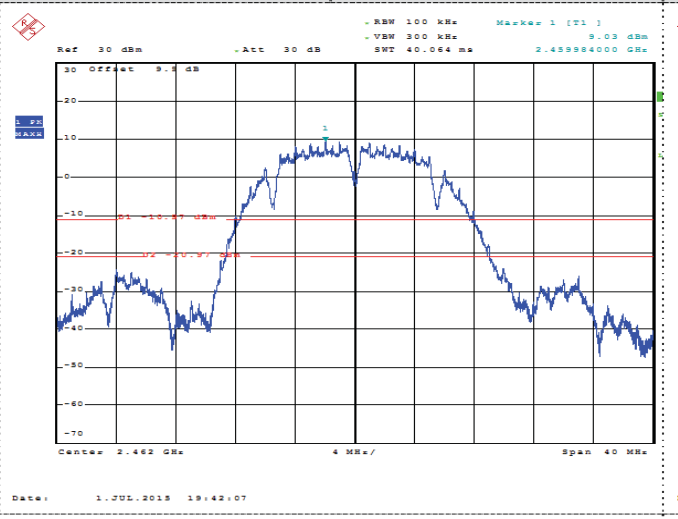


10GHz-15GHz

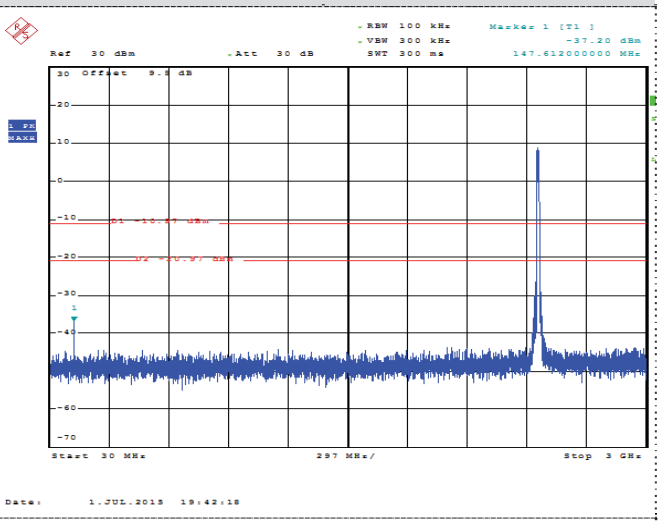


15GHz-25GHz

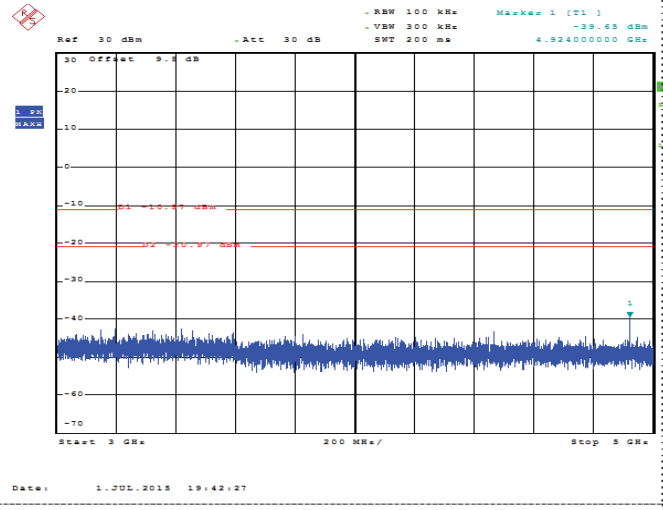
Test Mode:	802.11b	Test channel :	11



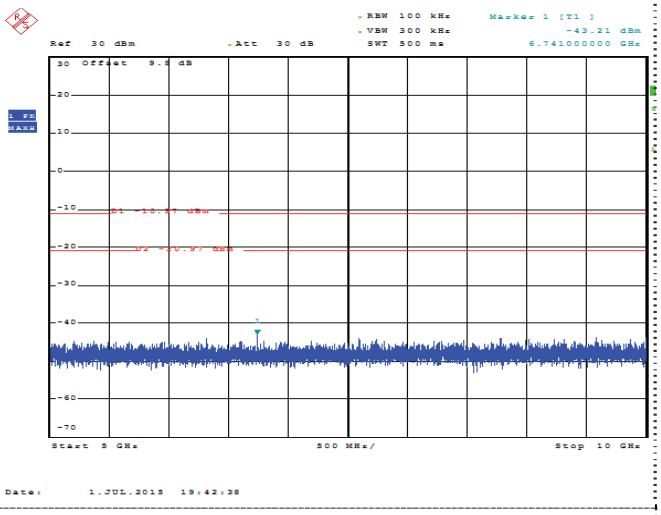
Reference level



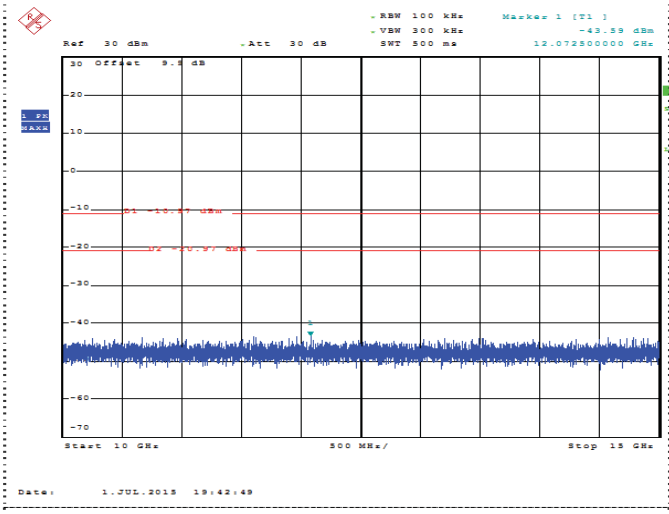
30MHz-1GHz



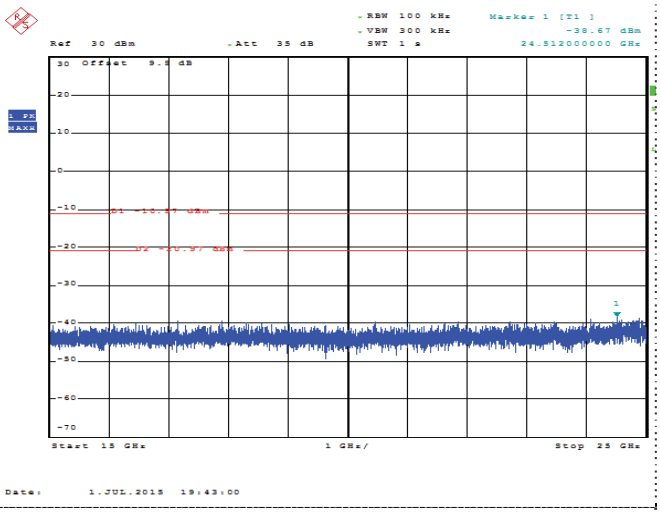
1GHz-5GHz



5GHz-10GHz

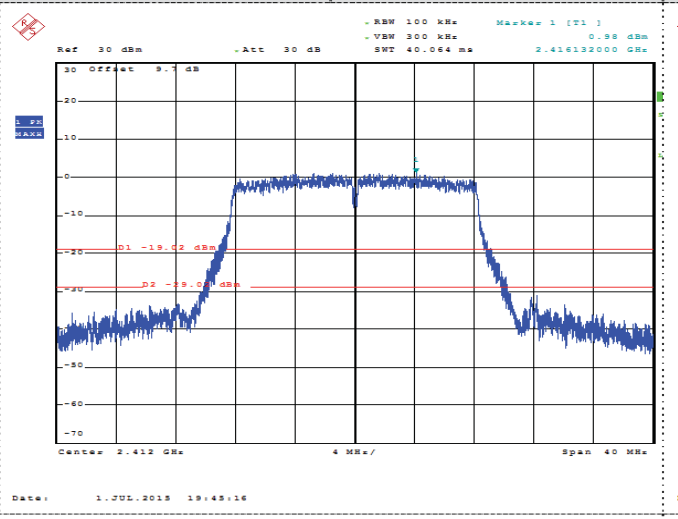


10GHz-15GHz

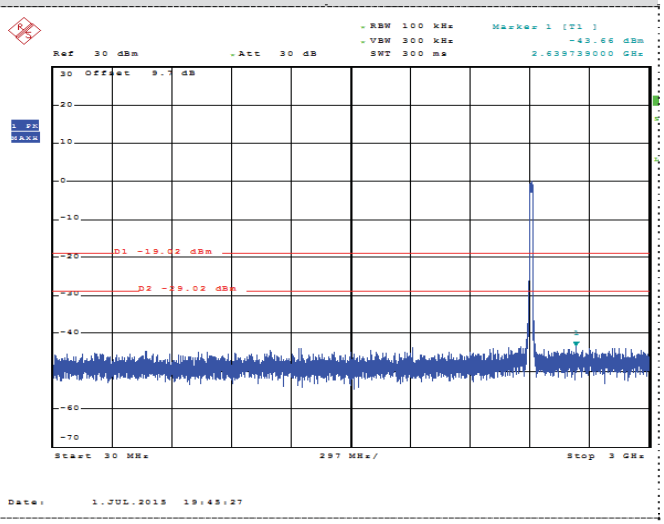


15GHz-25GHz

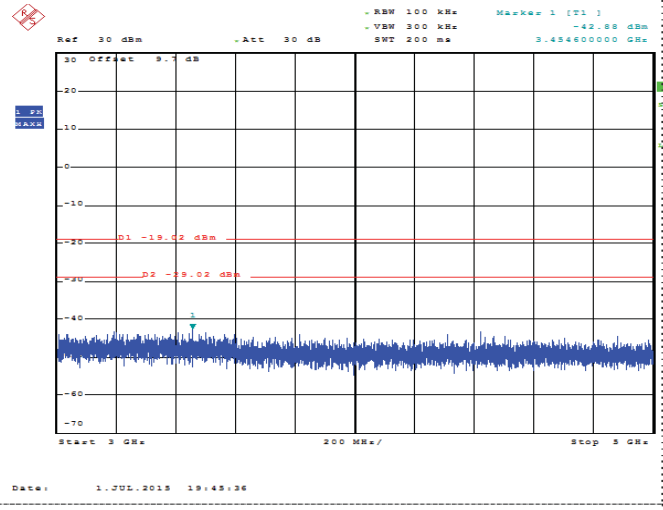
Test Mode:	802.11g	Test channel :	01



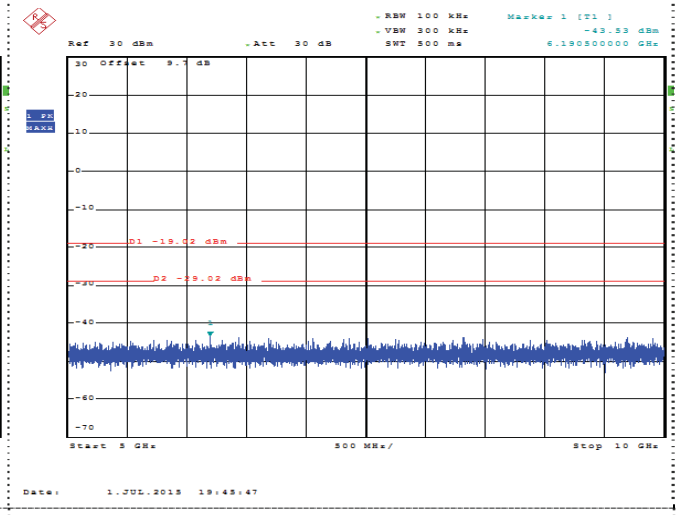
Reference level



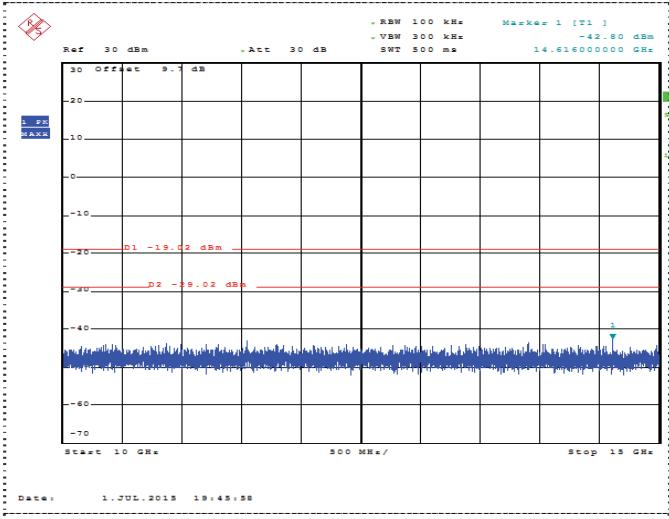
30MHz-1GHz



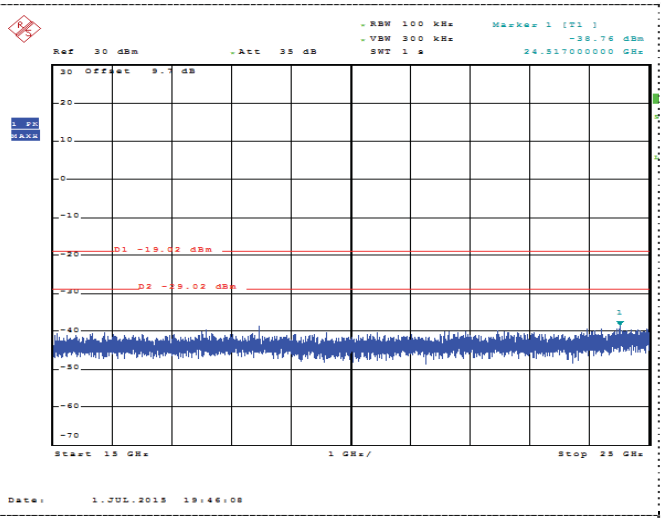
1GHz-5GHz



5GHz-10GHz

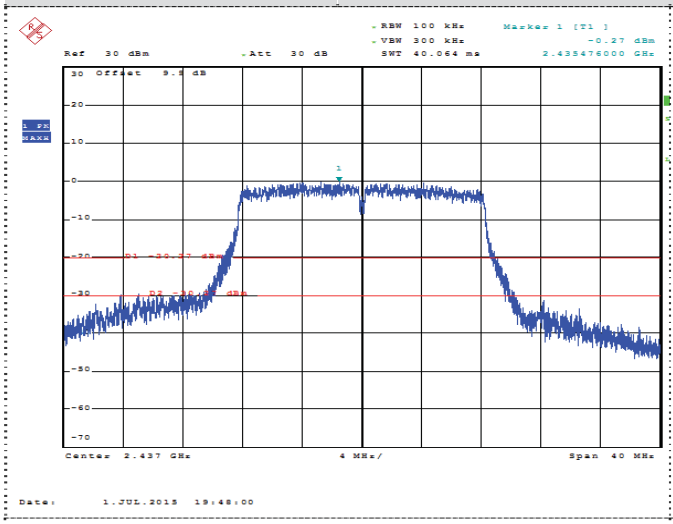


10GHz-15GHz

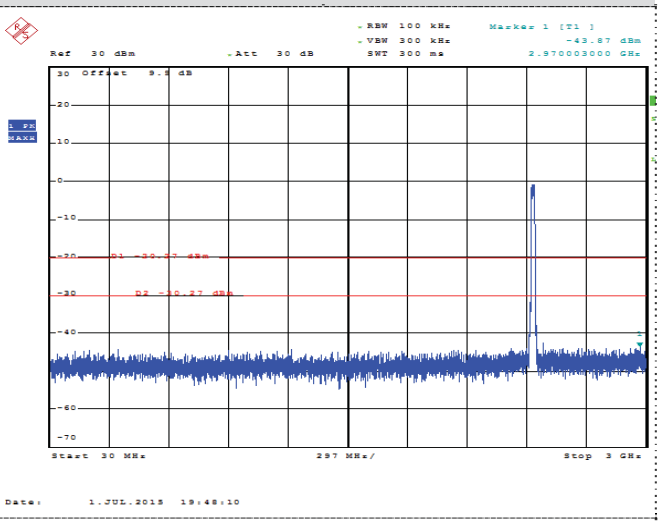


15GHz-25GHz

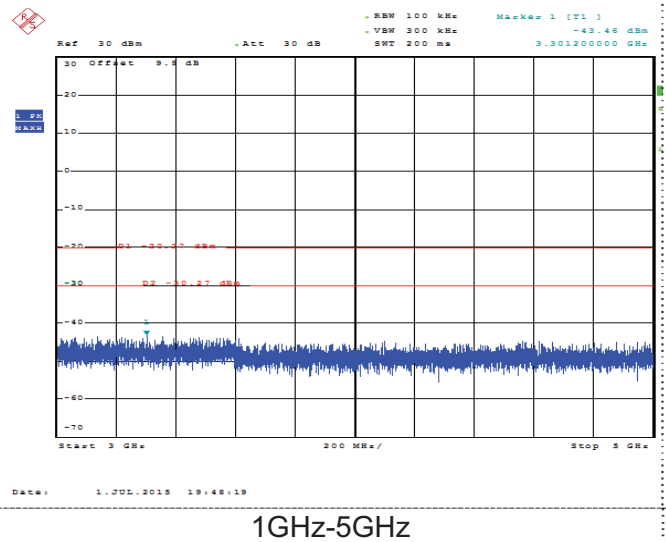
Test Mode:	802.11g	Test channel :	06



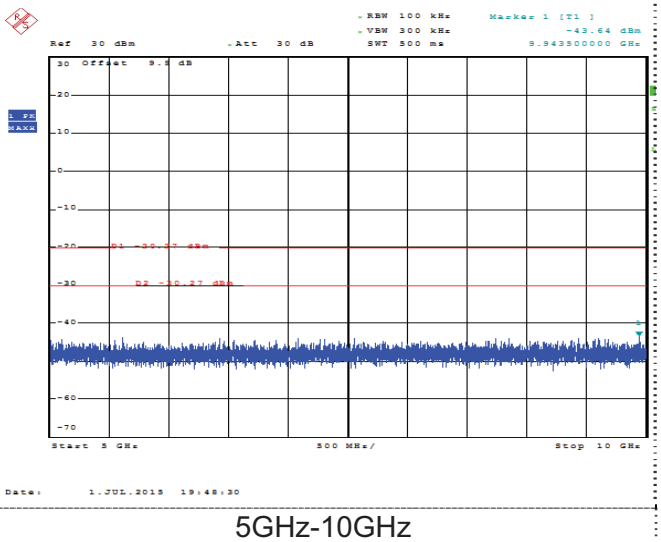
Reference level



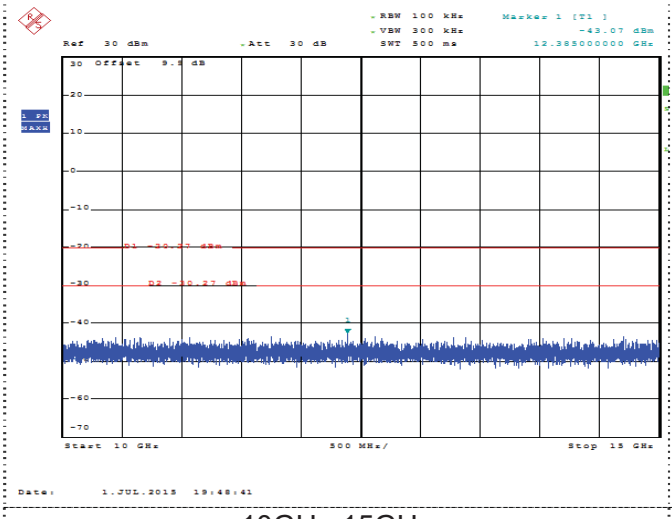
30MHz-1GHz



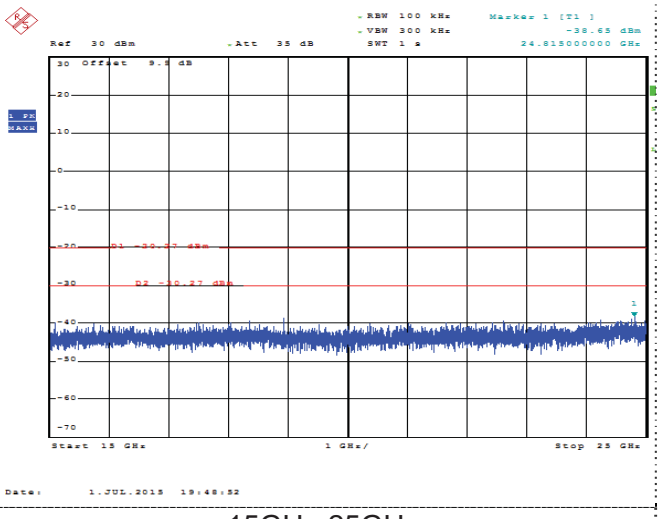
1GHz-5GHz



5GHz-10GHz

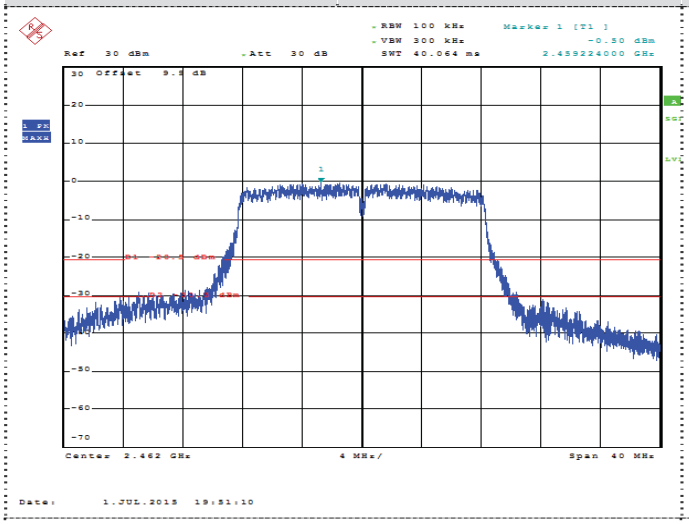


10GHz-15GHz

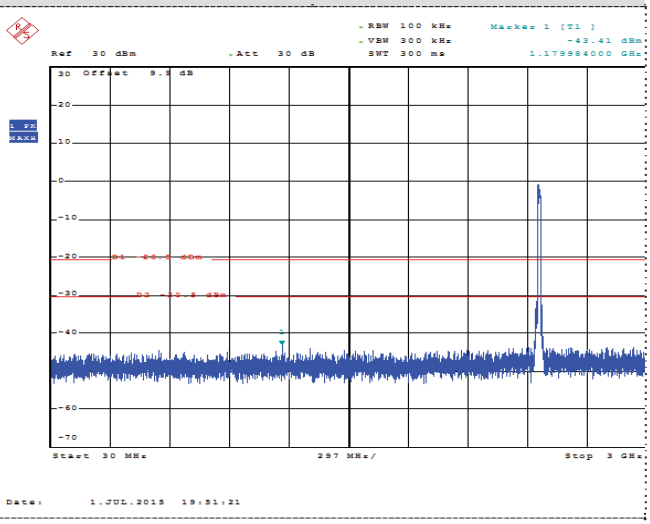


15GHz-25GHz

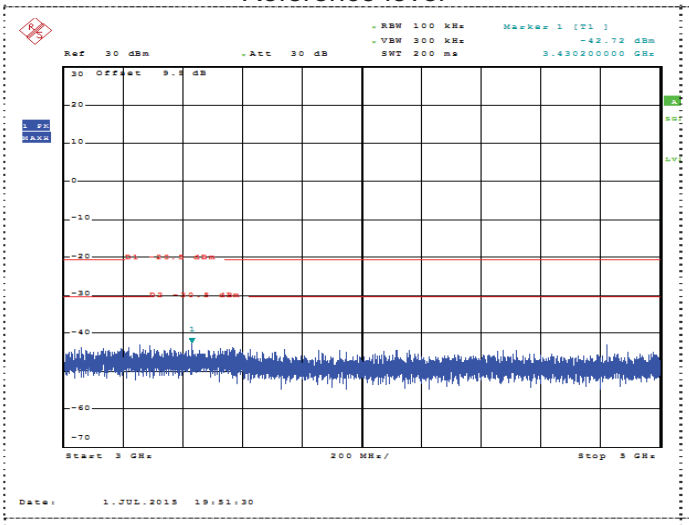
Test Mode:	802.11g	Test channel :	11



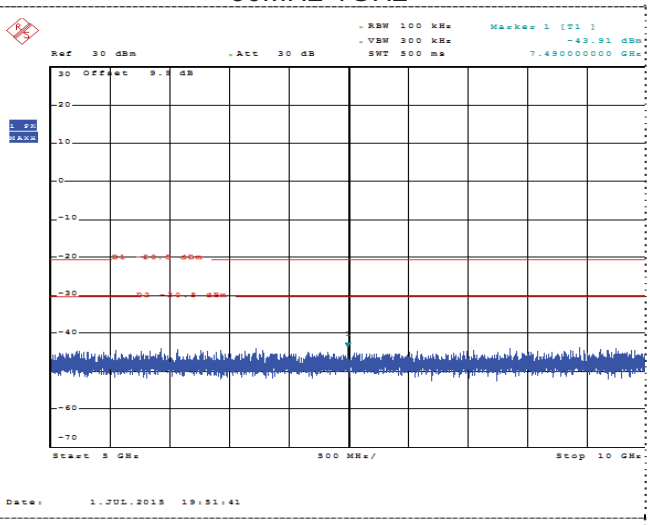
Reference level



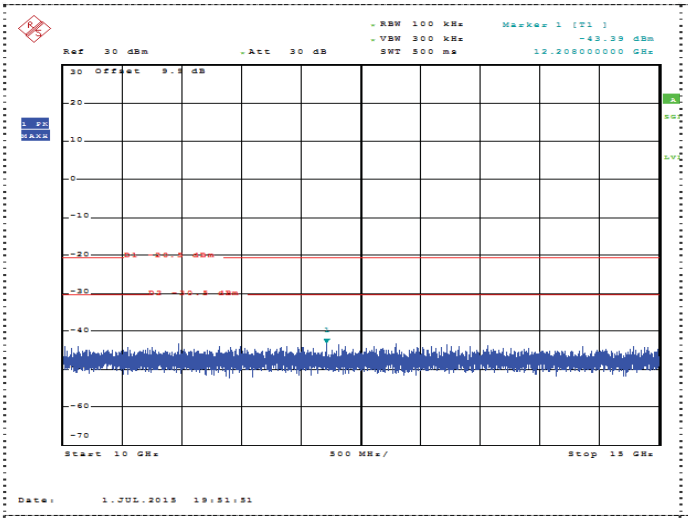
30MHz-1GHz



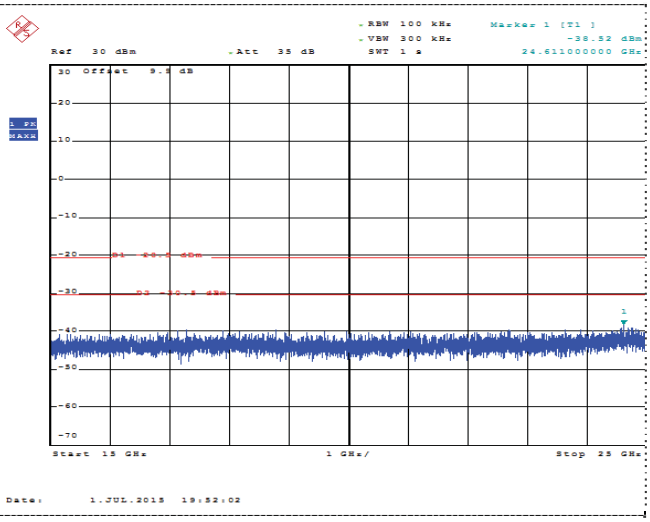
1GHz-5GHz



5GHz-10GHz

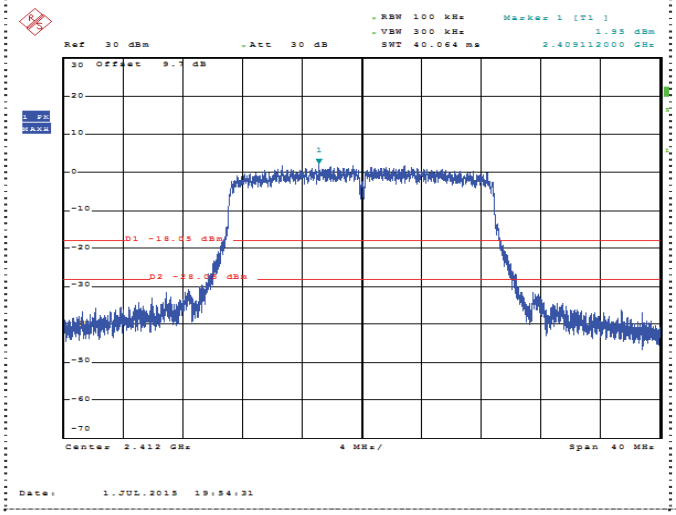


10GHz-15GHz

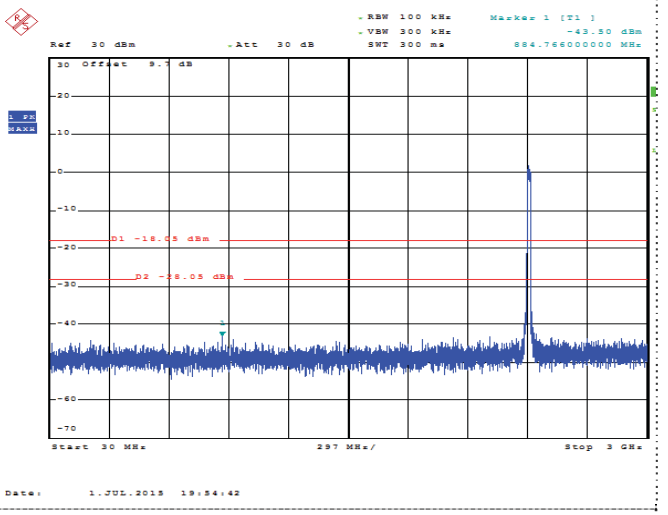


15GHz-25GHz

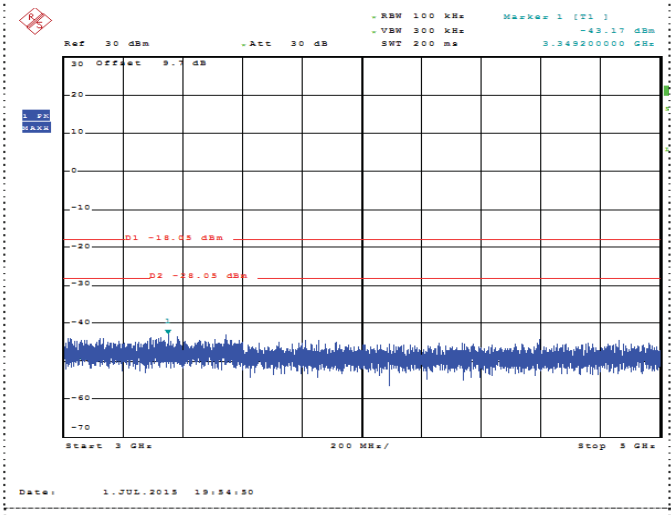
Test Mode:	802.11n(HT20)	Test channel :	01



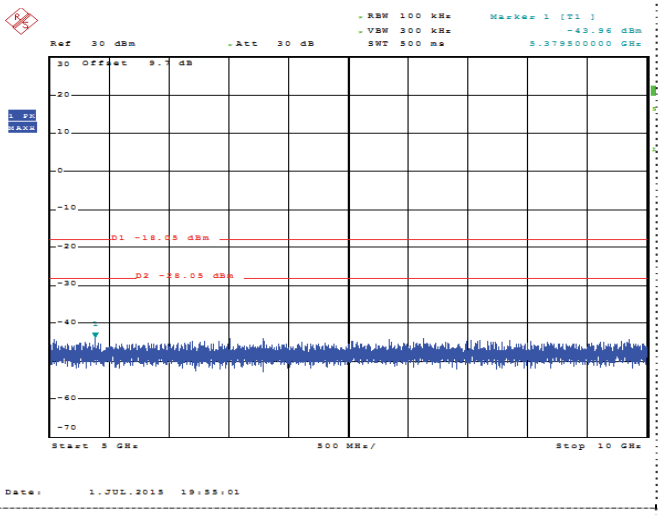
Reference level



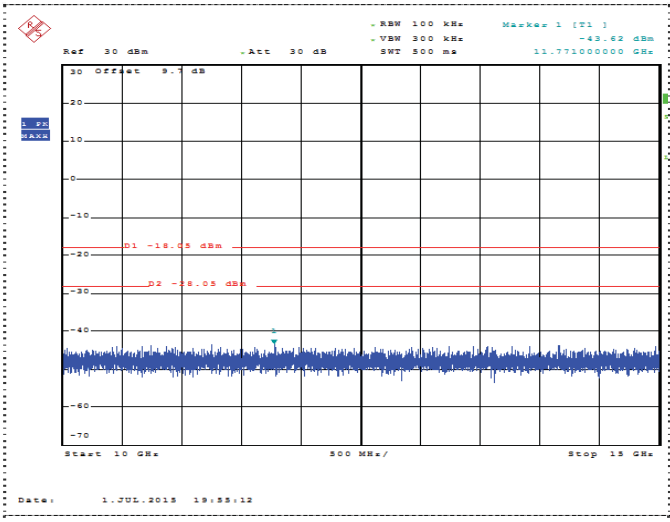
30MHz-1GHz



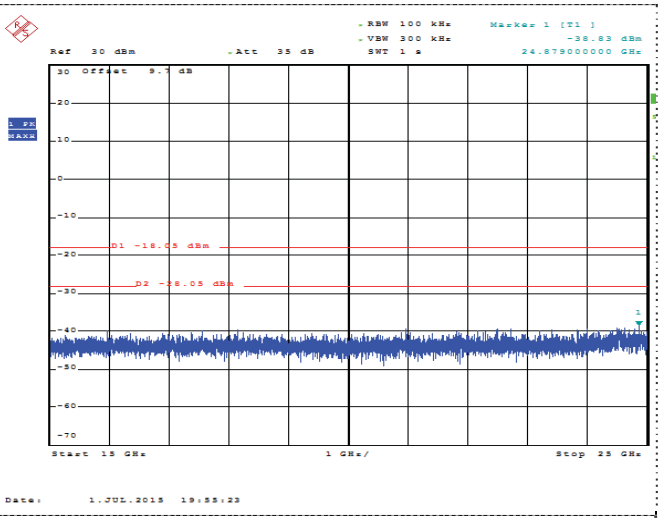
1GHz-5GHz



5GHz-10GHz

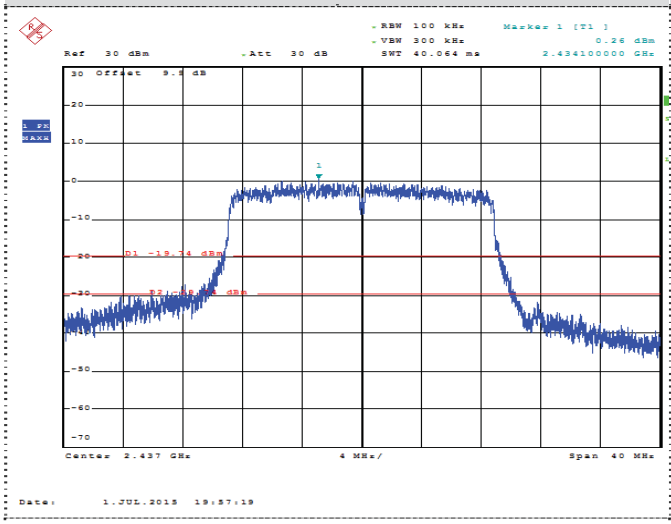


10GHz-15GHz

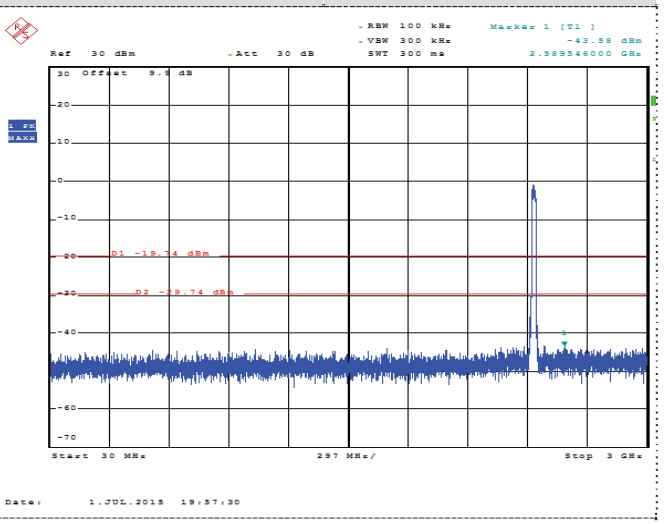


15GHz-25GHz

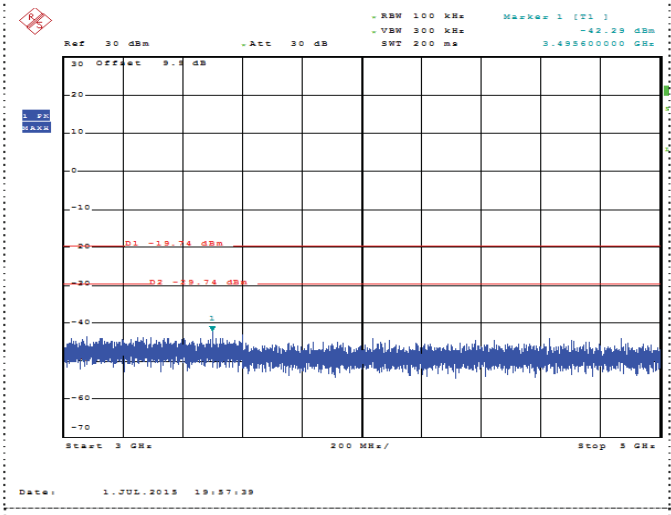
Test Mode:	802.11n(HT20)	Test channel :	06



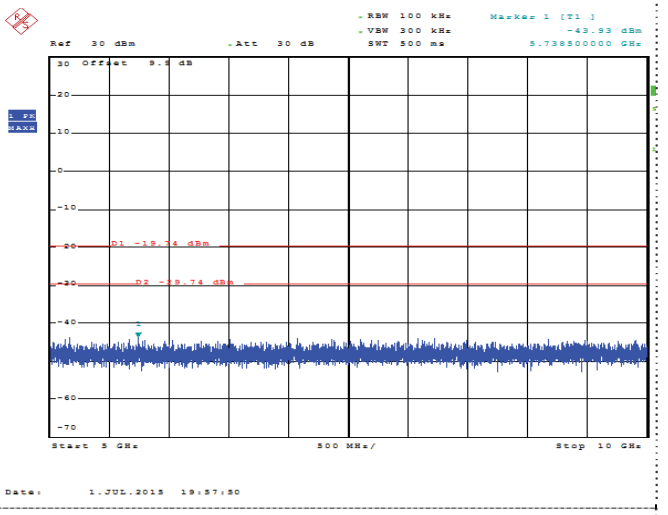
Reference level



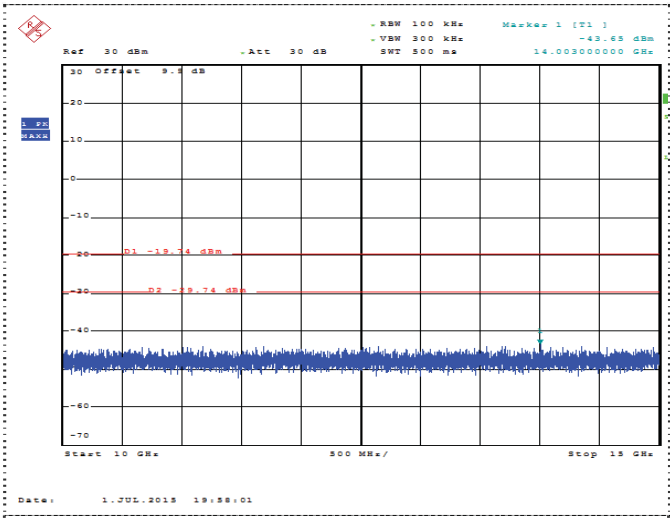
30MHz-1GHz



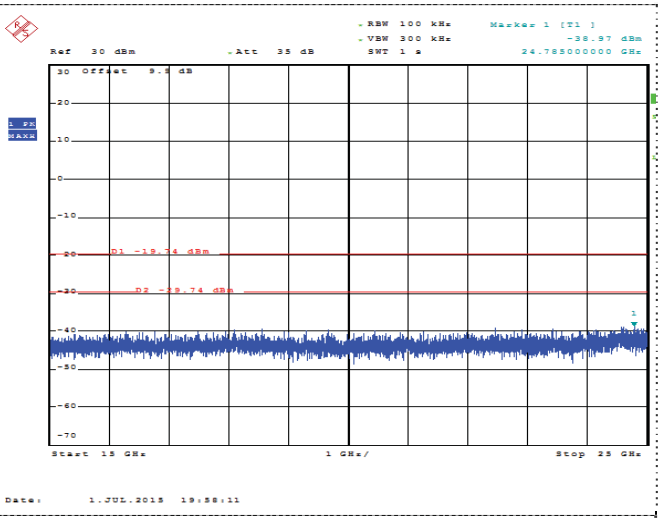
1GHz-5GHz



5GHz-10GHz

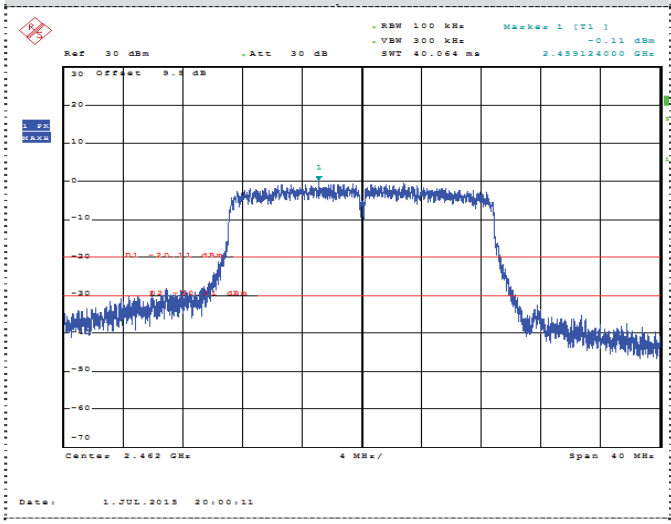


10GHz-15GHz

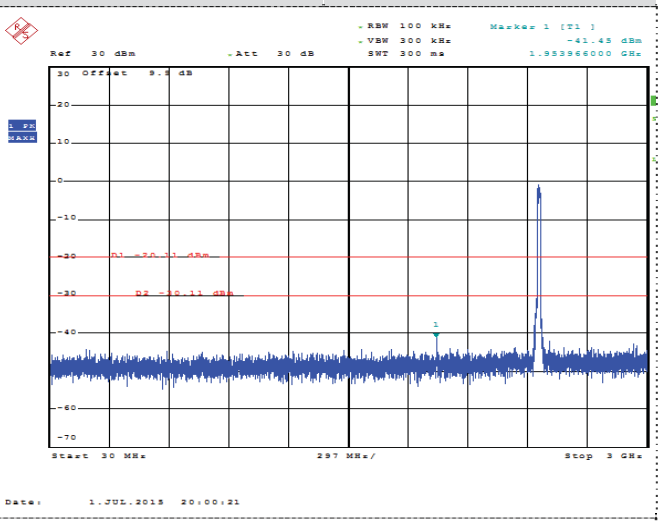


15GHz-25GHz

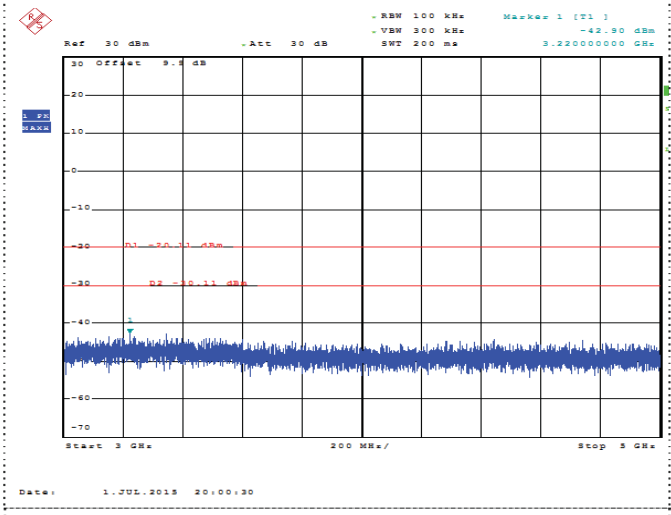
Test Mode:	802.11n(HT20)	Test channel :	11



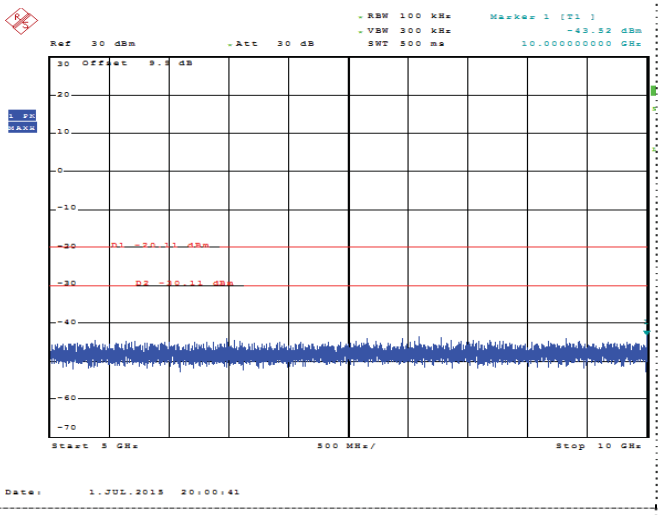
Reference level



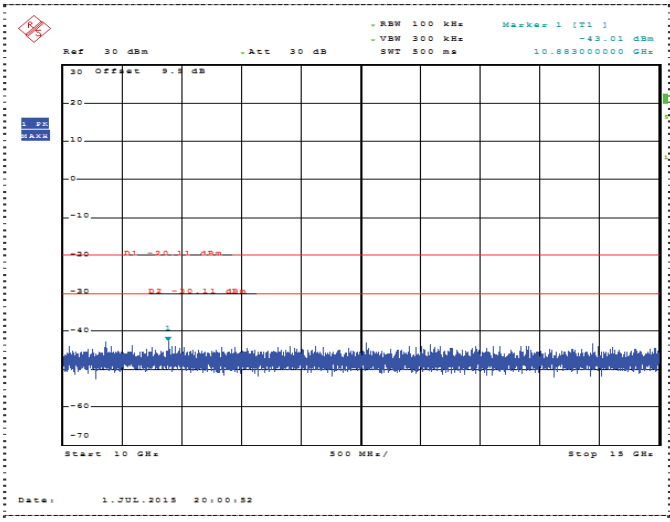
30MHz-1GHz



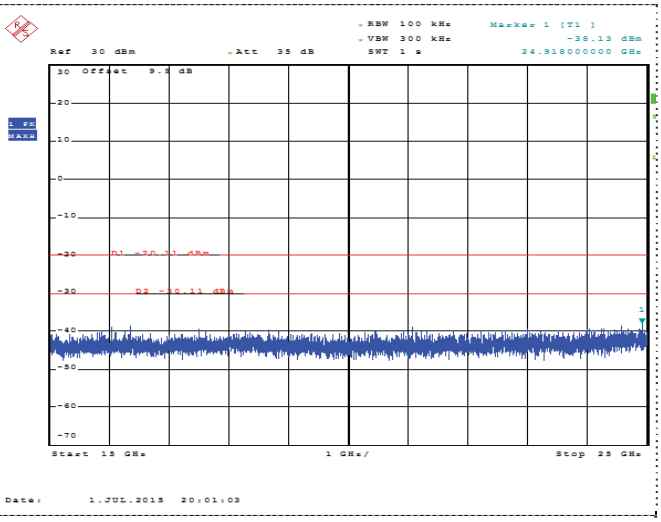
1GHz-5GHz



5GHz-10GHz

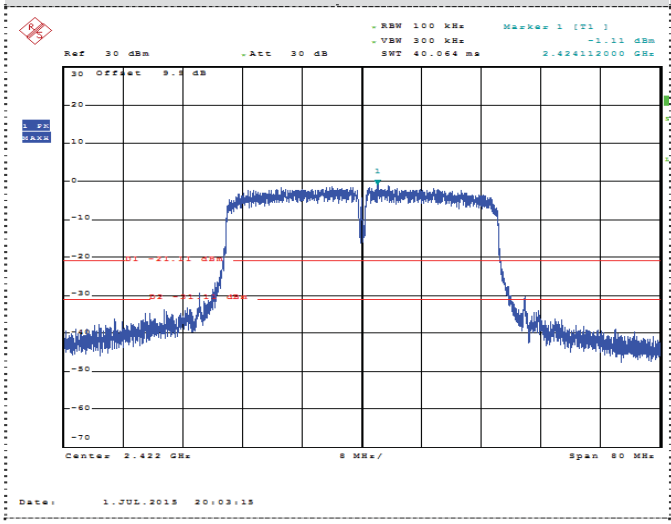


10GHz-15GHz

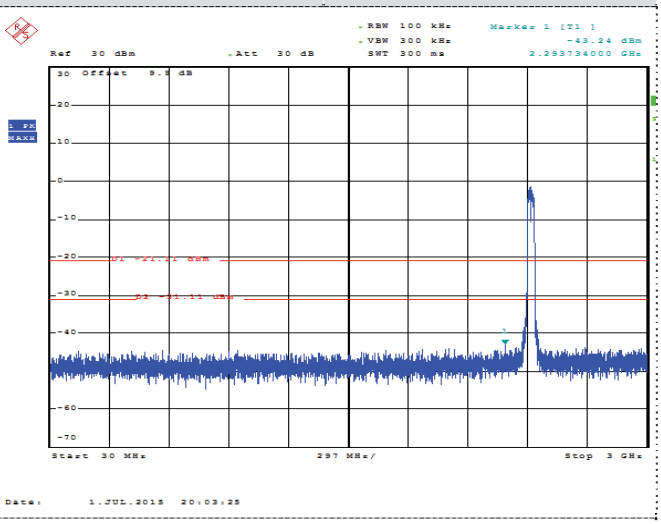


15GHz-25GHz

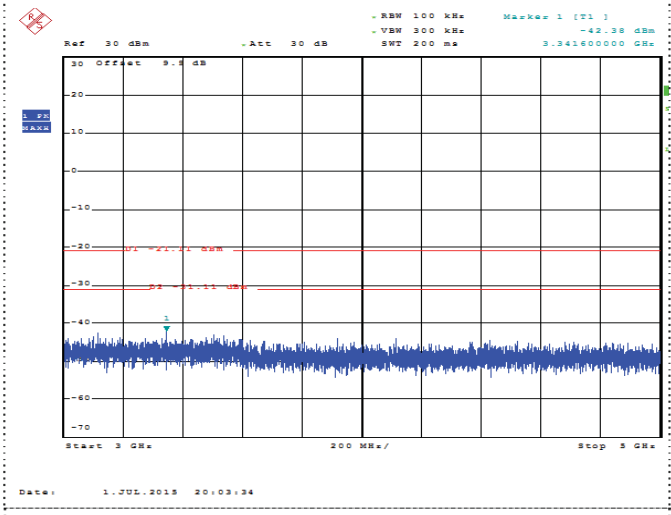
Test Mode:	802.11n(HT40)	Test channel :	03



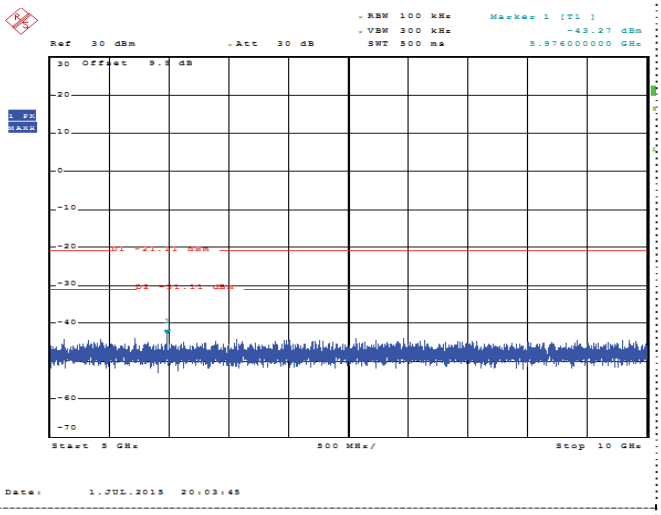
Reference level



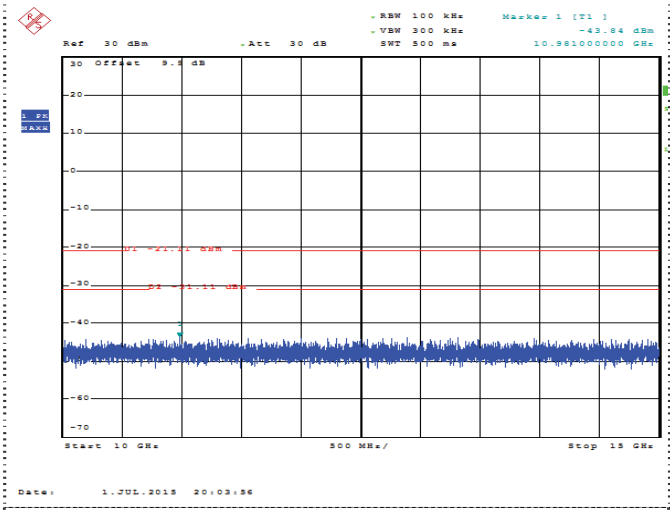
30MHz-1GHz



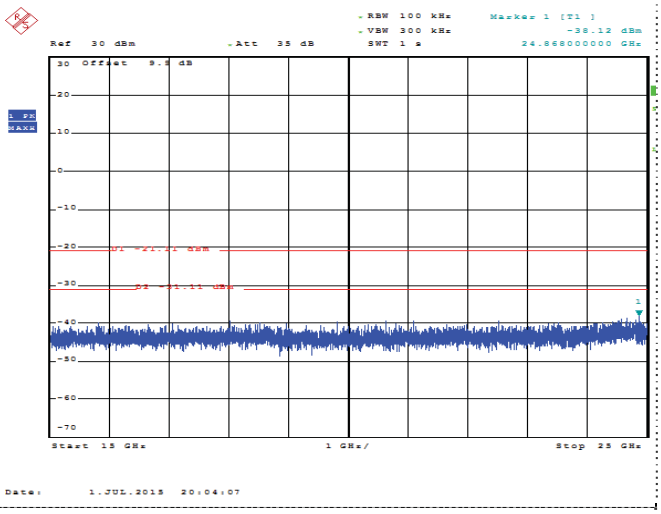
1GHz-5GHz



5GHz-10GHz

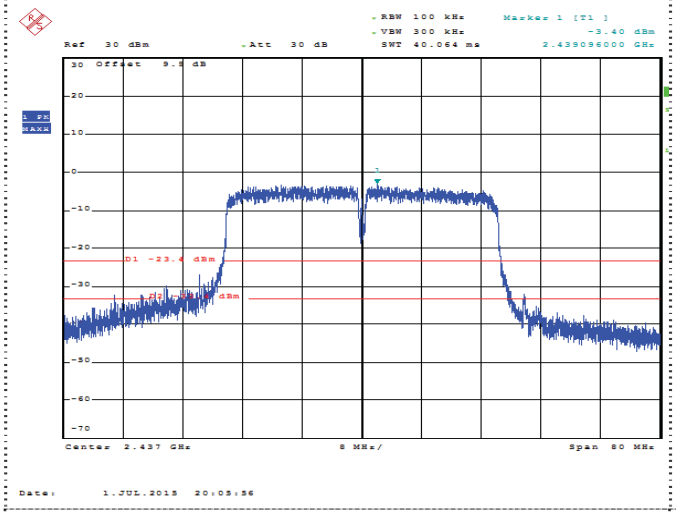


10GHz-15GHz

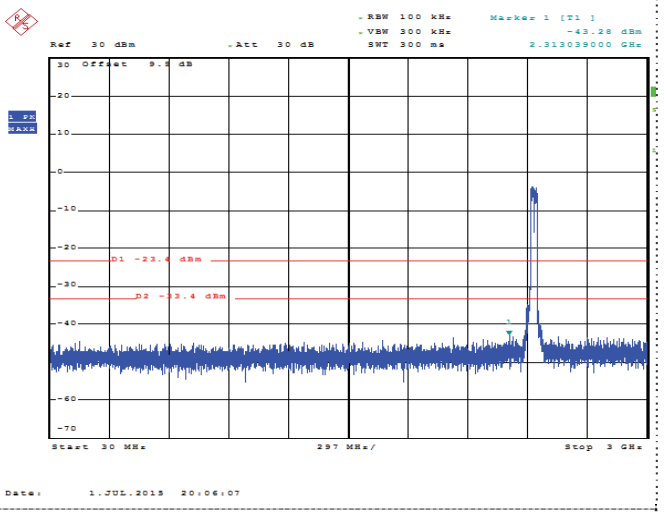


15GHz-25GHz

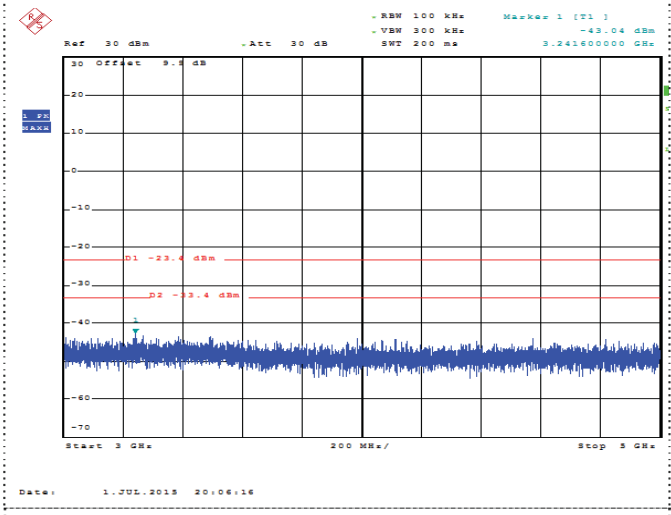
Test Mode:	802.11n(HT40)	Test channel :	06



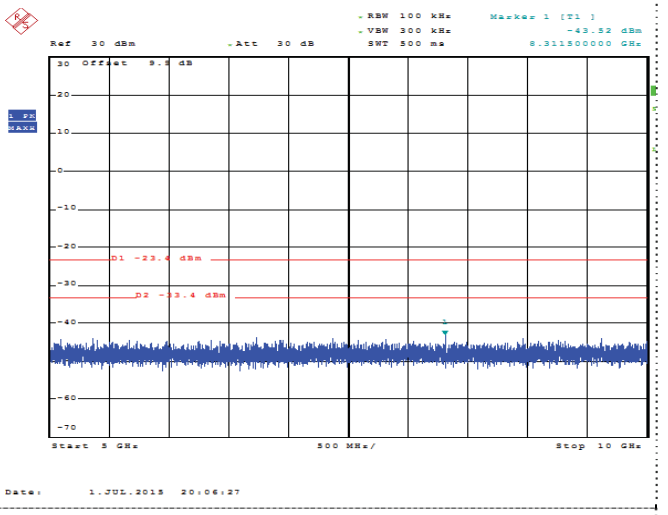
Reference level



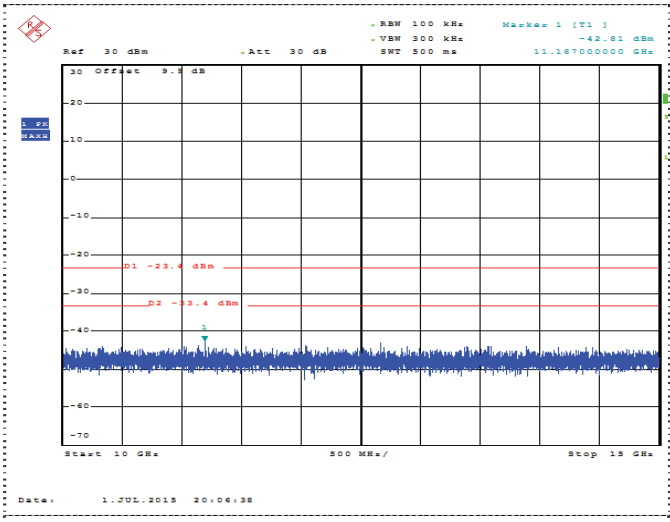
30MHz-1GHz



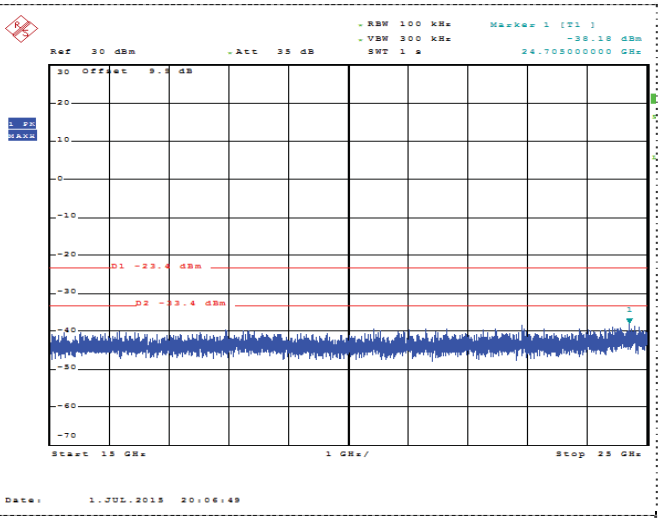
1GHz-5GHz



5GHz-10GHz

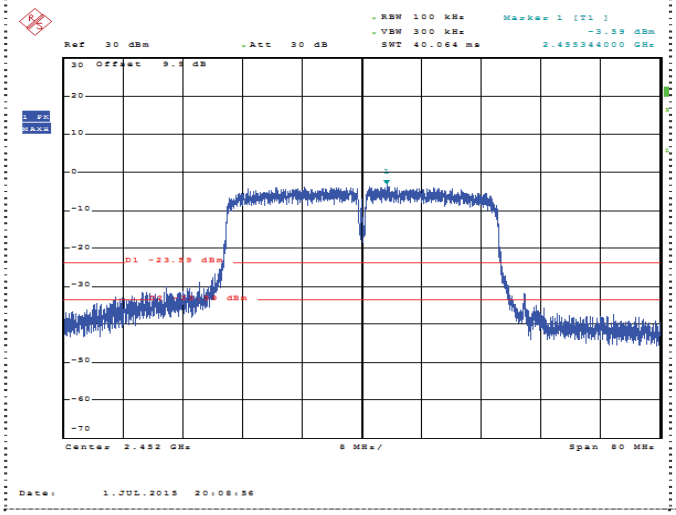


10GHz-15GHz

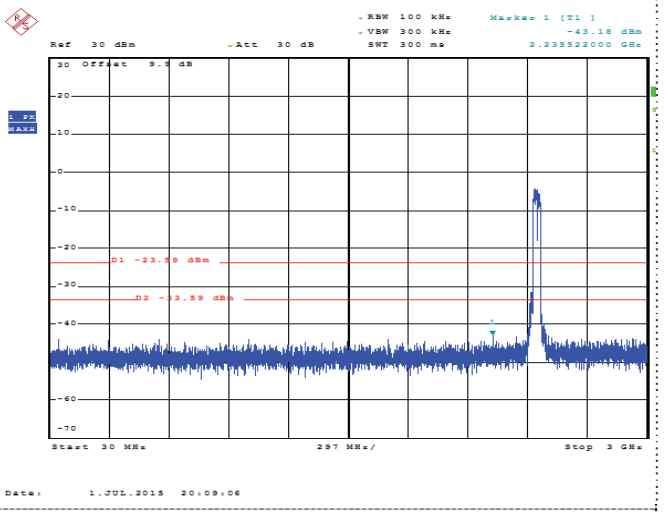


15GHz-25GHz

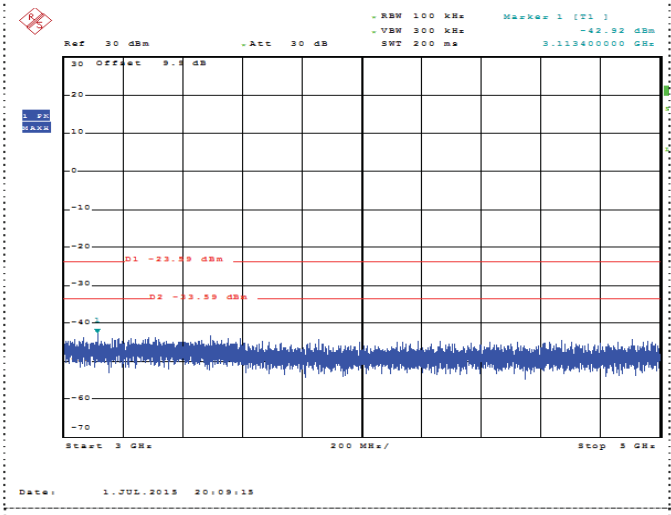
Test Mode:	802.11n(HT40)	Test channel :	09



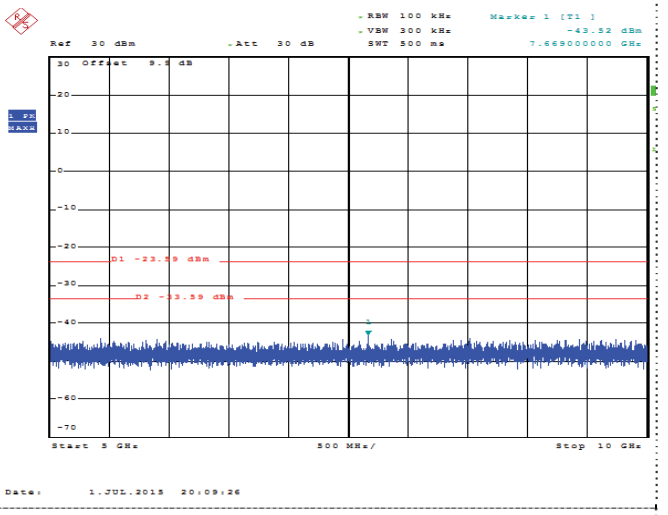
Reference level



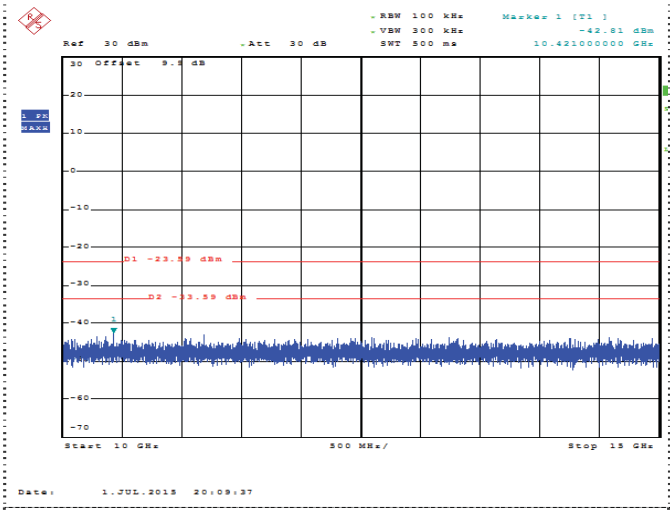
30MHz-1GHz



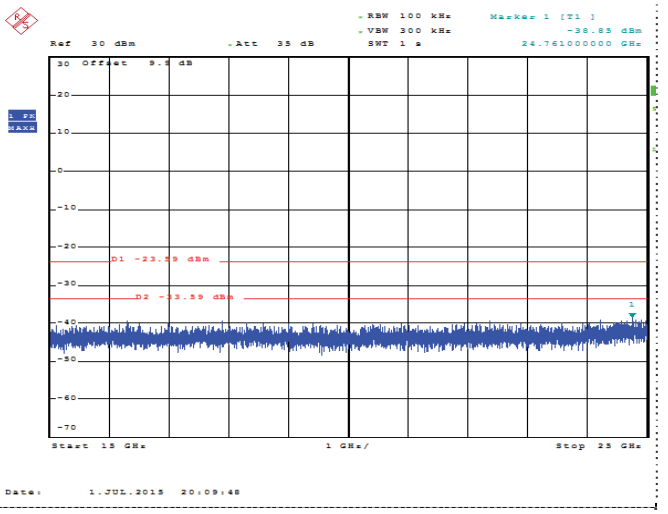
1GHz-5GHz



5GHz-10GHz



10GHz-15GHz



15GHz-25GHz

3.8. Antenna Requirement

Standard Applicable

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

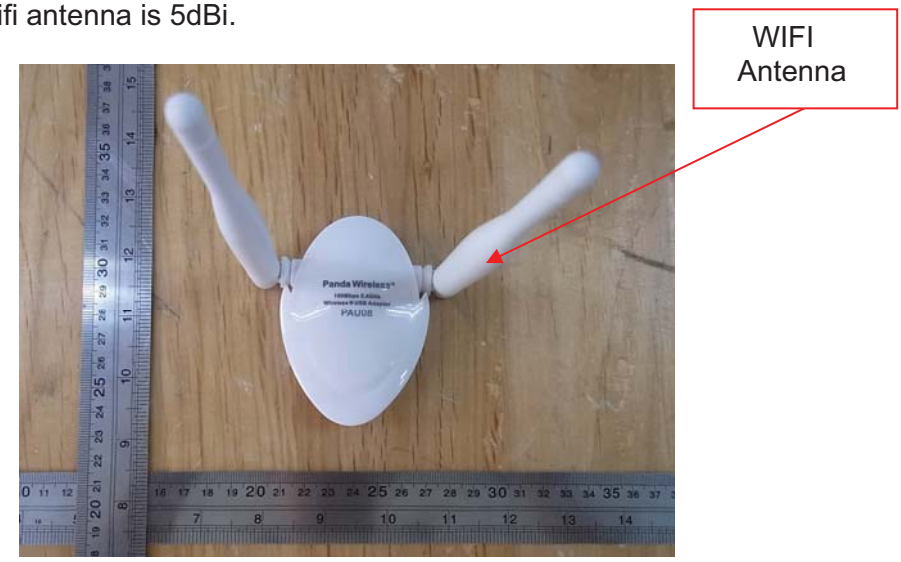
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit 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:

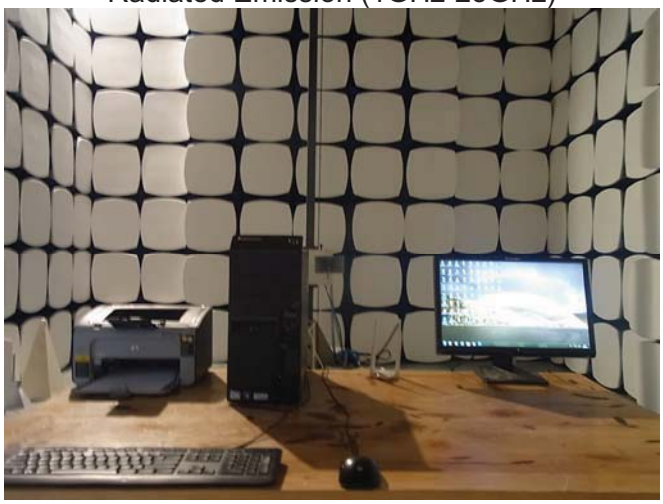
The maximum gain of wifi antenna is 5dBi.



4. EUT TEST PHOTO

Radiated Emission (30MHz-1GHz)

Radiated Emission (1GHz-25GHz)

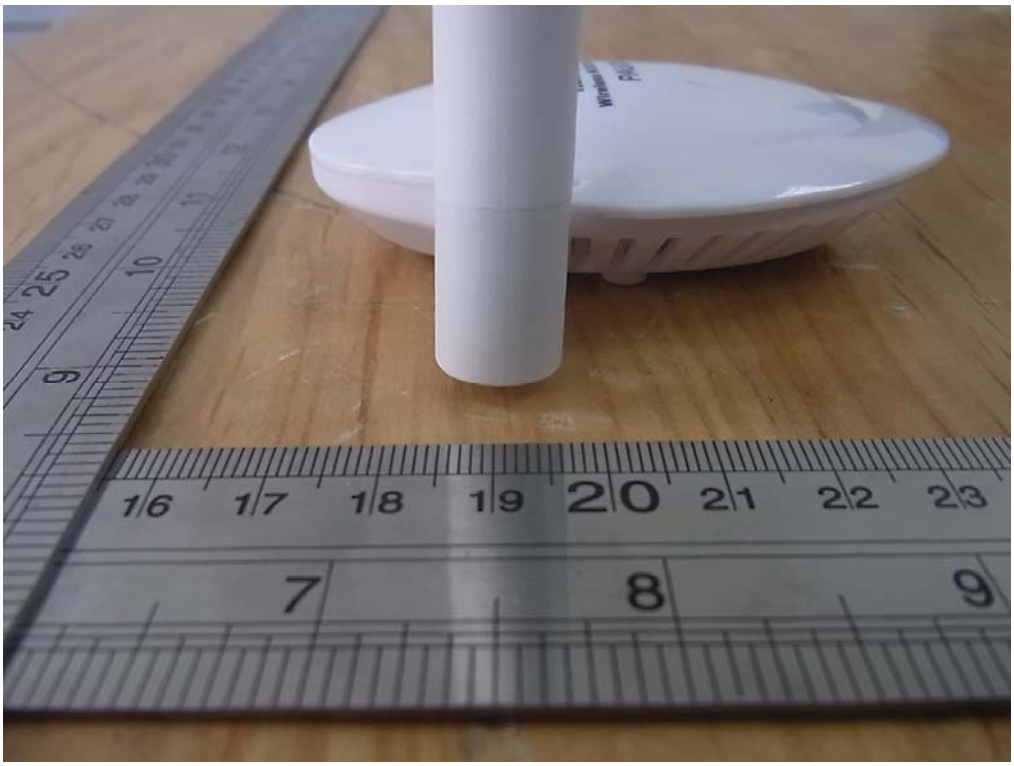


Conducted Emission

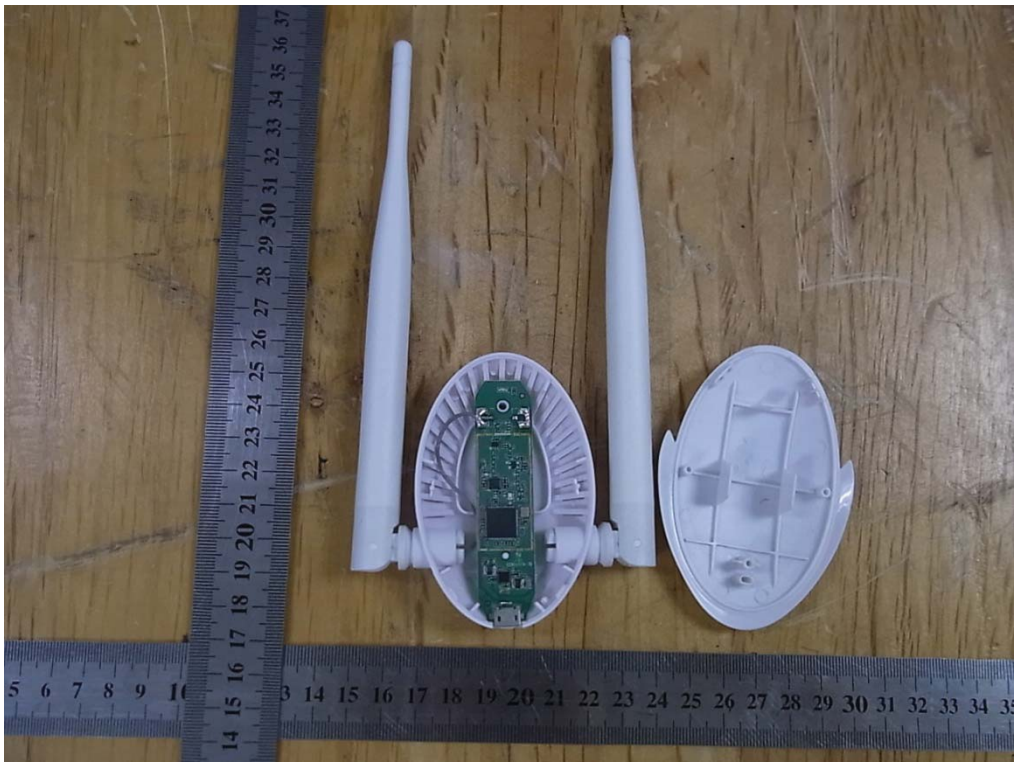
5. PHOTOGRAPHS OF EUT CONSTRUCTIONAL

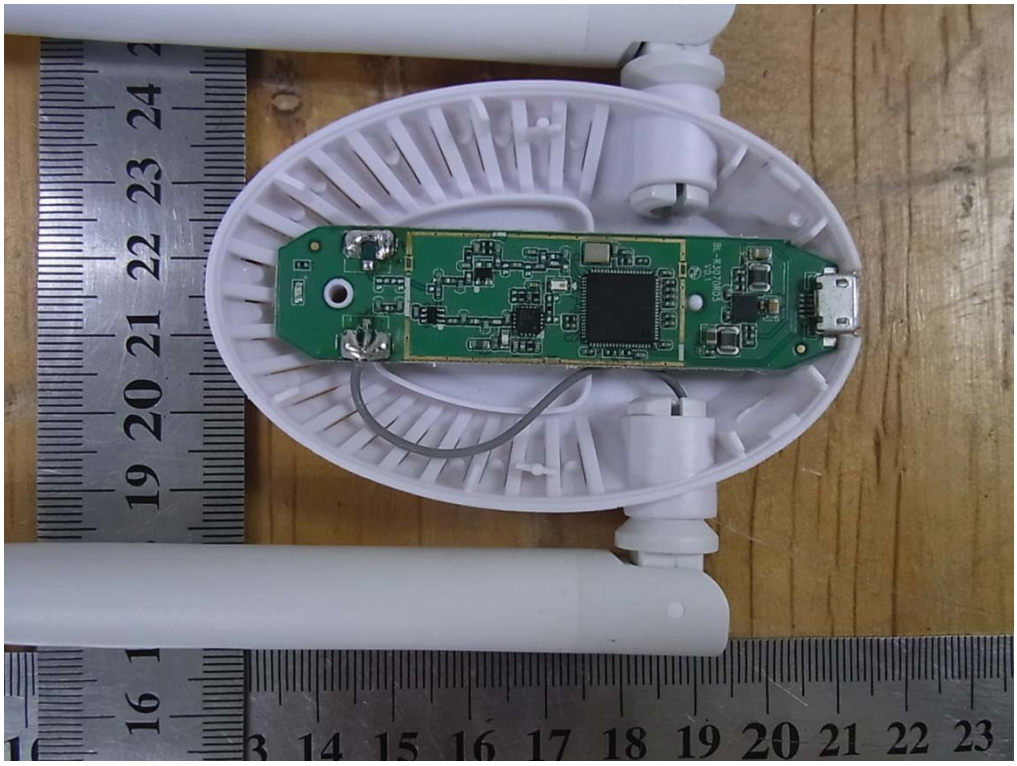
External Photo

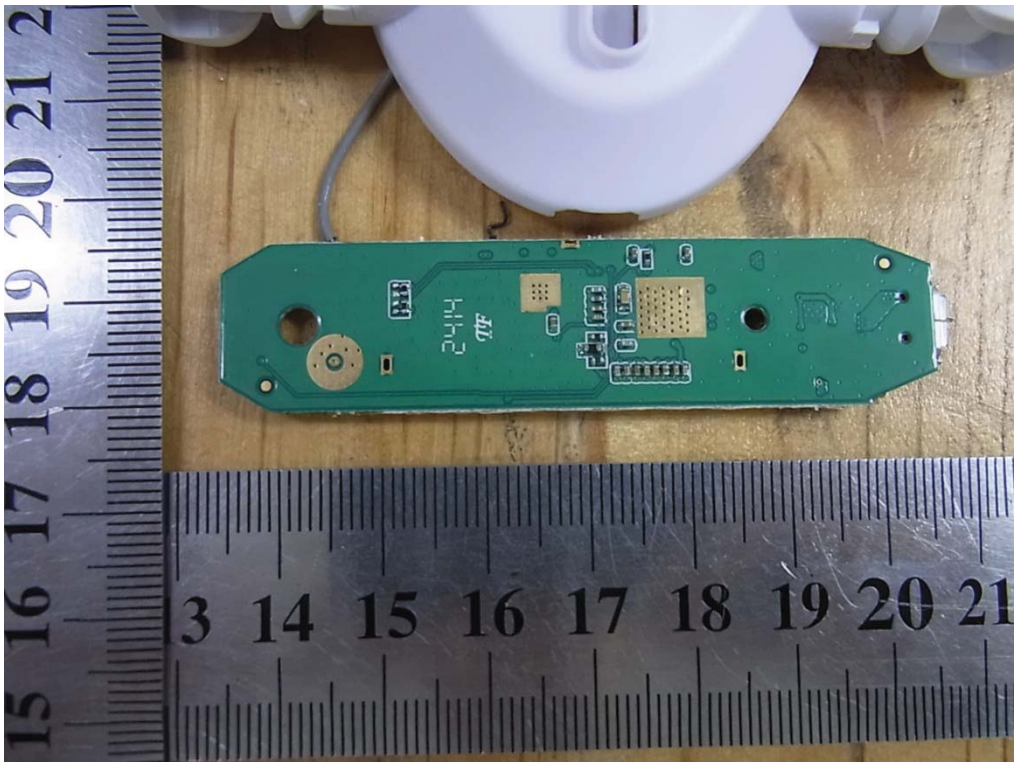

Panda Wireless



Internal Photo







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