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Report No.: CQASZ160501323E-03  
Report Version: V01

# MEASUREMENT REPORT

## FCC Test Report

**Applicant:** Guangzhou Chenle Information Technology Co., LTD

**Address of Applicant:** 1005A room , No. 89, Yanling Road, Tianhe District, Guangzhou, China

**Manufacturer:** Guangzhou Chenle Information Technology Co., LTD

**Address of Manufacturer:** 1005A room , No. 89, Yanling Road, Tianhe District, Guangzhou, China

**Equipment Under Test (EUT):**

**Product:** Tablet PC

**Model No.:** V701S, V80, V96, V80 SE, V820W DUAL OS, OBOOK10 SE, V891W CH, V80Plus, OBOOK10 DualOS, OBOOK10 Pro, OBOOK10 plus, OBOOK11 Plus, OBOOK11 Pro, OBOOK12, V801S, V820W CH DUALOS, V919AIR CH DUALOS, V975S, OBOOK11 DUALOS, OBOOK11.

**Test Model No.:** OBOOK10 DualOS

**Brand Name:** ONDA

**FCC ID:** 2AIXEOBOOK10

**Standards:** 47 CFR Part 15, Subpart C

**Date of Test:** 2016-06-02 to 2016-06-07

**Date of Issue:** 2016-06-07

**Test Result :** PASS\*

**Reviewed By:**

(Aaron Ma)

**Approved By:**

(Owen Zhou)



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

## 2 Version

### Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ160501323E-03	Rev.01	Initial report	2016-06-07

### 3 Test Summary

Test Item	Test Requirement	Test method	Result
Antenna Requirement	47 CFR Part 15, Subpart C Section 15.203/15.247 (c)	ANSI C63.10 2013	PASS
AC Power Line Conducted Emission	47 CFR Part 15, Subpart C Section 15.207	ANSI C63.10 2013	PASS
Maximum Peak Output Power	47 CFR Part 15, Subpart C Section 15.247 (b)(3)	KDB558074 D01 v03r05	PASS
6dB Occupied Bandwidth	47 CFR Part 15, Subpart C Section 15.247 (a)(2)	KDB558074 D01 v03r05	PASS
Power Spectral Density	47 CFR Part 15, Subpart C Section 15.247 (e)	KDB558074 D01 v03r05	PASS
Band-edge for RF Conducted Emissions	47 CFR Part 15, Subpart C Section 15.247(d)	KDB558074 D01 v03r05	PASS
RF Conducted Spurious Emissions	47 CFR Part 15, Subpart C Section 15.247(d)	KDB558074 D01 v03r05	PASS
Radiated Spurious Emissions	47 CFR Part 15, Subpart C Section 15.205/15.209	ANSI C63.10 2013	PASS
Restricted bands around fundamental frequency (Radiated Emission)	47 CFR Part 15, Subpart C Section 15.205/15.209	ANSI C63.10 2013	PASS

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## 5 General Information

### 5.1 Client Information

Applicant:	Guangzhou Chenle Information Technology Co., LTD
Address of Applicant:	1005A room , No. 89, Yanling Road, Tianhe District, Guangzhou, China
Manufacturer:	Guangzhou Chenle Information Technology Co., LTD
Address of Manufacturer:	1005A room , No. 89, Yanling Road, Tianhe District, Guangzhou, China

### 5.2 General Description of EUT

Product Name:	Tablet PC	
Model No.:	V701S, V80, V96, V80 SE, V820W DUAL OS, OBOOK10 SE, V891W CH, V80Plus, OBOOK10 DualOS, OBOOK10 Pro, OBOOK10 plus, OBOOK11 Plus, OBOOK11 Pro, OBOOK12, V801S, V820W CH DUALOS, V919AIR CH DUALOS, V975S, OBOOK11 DUALOS, OBOOK11.	
Test Model No.:	OBOOK10 DualOS	
Trade Mark:	ONDA	
Hardware version:	V02	
Software version:	V1.0	
Operation Frequency:	IEEE 802.11b/g/n(HT20): 2412MHz to 2462MHz	
Channel Numbers:	IEEE 802.11b/g, IEEE 802.11n HT20: 11 Channels	
Channel Separation:	5MHz	
Type of Modulation:	IEEE for 802.11b: DSSS(CCK,DQPSK,DBPSK) IEEE for 802.11g : OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE for 802.11n(HT20) : OFDM (64QAM, 16QAM, QPSK,BPSK)	
Sample Type:	portable production	
Test Software of EUT:	RF test tool (manufacturer declare )	
Antenna Type:	Integral	
Antenna Gain:	1.2dBi	
Power Supply:	Adapter:	Mode : TPA-915200CU Input: AC100-240V 50/60Hz 0.4A Output: DC5.0V 2.0A
	EUT Power Supply:	DC5.0V
	Rechargeable li-ion battery	DC3.8V, 6000 mAh

Note:

1. Model No.: V701S, V80, V96, V80 SE, V820W DUAL OS, OBOOK10 SE, V891W CH, V80Plus, OBOOK10 DualOS, OBOOK10 Pro, OBOOK10 plus, OBOOK11 Plus, OBOOK11 Pro, OBOOK12, V801S, V820W CH DUALOS, V919AIR CH DUALOS, V975S, OBOOK11 DUALOS, OBOOK11.

Only the model OBOOK10 DualOS was tested, since the electrical circuit design, layout, components used and internal wiring were identical for the above models, with difference being color of appearance, pack and model name.

2. The fully-charged li-ion battery is used for testing.

Operation Frequency each of channel(802.11b/g/n HT20)							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2412MHz	4	2427MHz	7	2442MHz	10	2457MHz
2	2417MHz	5	2432MHz	8	2447MHz	11	2462MHz
3	2422MHz	6	2437MHz	9	2452MHz		

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

For 802.11b/g/n (HT20):

Channel	Frequency
The Lowest channel	2412MHz
The Middle channel	2437MHz
The Highest channel	2462MHz

The output power setting of EUT is set in the factory and followed the max. peak level in below.

802.11b	8dBm $\pm$ 1dB
802.11g	7dBm $\pm$ 1dB
802.11n(HT20)	7dBm $\pm$ 1dB

Note:

1. Software (RF test tool) provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

### 5.3 Test Environment and Mode

Operating Environment:	
Temperature:	24.0 °C
Humidity:	52 % RH
Atmospheric Pressure:	1008 mbar
Test mode:	
Transmitting mode:	Keep the EUT in transmitting mode with all kind of modulation and all kind of data rate.
Operated Mode for Worst Duty Cycle:	
Test Signal Duty Cycle(x)	Average correction factor(dB)
100% - IEEE802.11b	0
100% - IEEE802.11g	0
100% - IEEE802.11n (HT20)	0

### 5.4 Description of Support Units

The EUT has been tested with associated equipment below.

Description	Manufacturer	Model No.
Adapter	TIANYIN	TPA-915200CU
Notebook	Lenovo	Lenovo ideapad 100-14IBY

### 5.5 Test Location

All tests were performed at:

Shenzhen CTL Testing Technology Co., Ltd., Shenzhen EMC Laboratory,  
1/F.-A, Baisha Technology Park, No.3011, Shahexi Road, Nanshan District, Shenzhen, Guangdong,  
China

## 5.6 Test Facility

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

### FCC – Registration No.: 970318

Shenzhen CTL Testing Technology Co., Ltd. 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 970318

## 5.7 Statement of the 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 CTL Testing 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 CTL laboratory is reported:

Test	Range	Uncertainty	Notes
Radiated Emission	30~1000MHz	4.10dB	(1)
Radiated Emission	1~12.75GHz	4.32dB	(1)
Radiated Emission	12.75GHz-25GHz	4.68dB	(1)
Conducted Disturbance	0.15~30MHz	3.20dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

## 5.8 Deviation from Standards

None.

## 5.9 Abnormalities from Standard Conditions

None.

## 5.10 Other Information Requested by the Customer

None.



## 5.11 Equipment List


Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Due Date
1	Bilog Antenna	Sunol Sciences Corp.	JB1	A061713	2017/06/01
2	EMI Test Receiver	ROHDE & SCHWARZ	ESCI3	103710	2017/06/01
3	Spectrum Analyzer	Agilent	E4407B	MY45108355	2017/05/20
4	Controller	EM Electronics	Controller EM 1000	N/A	2017/05/20
5	Horn Antenna	Sunol Sciences Corp.	DRH-118	A062013	2017/05/18
6	Ultra-Broadband Antenna	ShwarzBeck	BBHA9170	25841	2017/05/18
7	Active Loop Antenna	Daze	ZN30900A	N/A	2017/05/18
8	Spectrum Analyzer	R&S	FSU	MY41440676	2017/05/18
9	LISN	R&S	ENV216	101316	2017/06/01
10	LISN	SCHWARZBECK	NSLK8127	8127687	2017/06/01
11	Power Sensor	Anritsu	MA2411B	100345	2017/05/18
12	Microwave Preamplifier	HP	8349B	3155A00882	2017/05/18
13	Preamplifier	HP	8447D	3113A07663	2017/05/18
14	Transient Limiter	Com-Power	LIT-153	532226	2017/06/01
15	Temperature/Humidity Meter	Gangxing	CTH-608	02	2017/05/19
16	Wideband Peak Power Meter	Anritsu	ML2495A	220.23.35	2017/05/19
17	Climate Chamber	ESPEC	EL-10KA	A20120523	2017/05/19
18	High-Pass Filter	K&L	9SH10- 2700/X12750- O/O	N/A	2017/05/19
19	High-Pass Filter	K&L	41SH10- 1375/U12750- O/O	N/A	2017/05/19
20	RF Cable(0-1GHz)	HUBER+SUHNER	RG174	N/A	2017/05/19
21	RF Cable(1-25GHz)	HUBER+SUHNER	RG214	N/A	2017/05/19
22	The temporary antenna Connector	MMCX-SMA	1547	23657478	2017/05/19

Note:

The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.

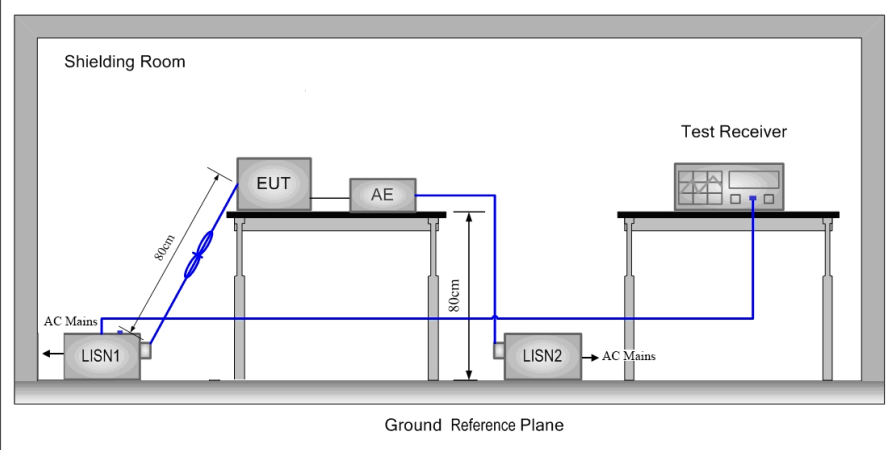
## 6 Test results and Measurement Data

### 6.1 Antenna Requirement

<b>Standard requirement:</b>	47 CFR Part 15C Section 15.203 /247(c)
<p>15.203 requirement:</p> <p>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.</p> <p>15.247(b) (4) requirement:</p> <p>The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.</p>	
<b>EUT Antenna:</b>	
	<p>The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 1.2dBi.</p>

## 6.2 Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.207		
Test Method:	ANSI C63.10: 2013		
Test Frequency Range:	150kHz to 30MHz		
Limit:	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 Procedure:	<ol style="list-style-type: none"> <li>1) The mains terminal disturbance voltage test was conducted in a shielded room.</li> <li>2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a <math>50\Omega/50\mu\text{H} + 5\Omega</math> linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.</li> <li>3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,</li> <li>4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.</li> <li>5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement.</li> </ol>		

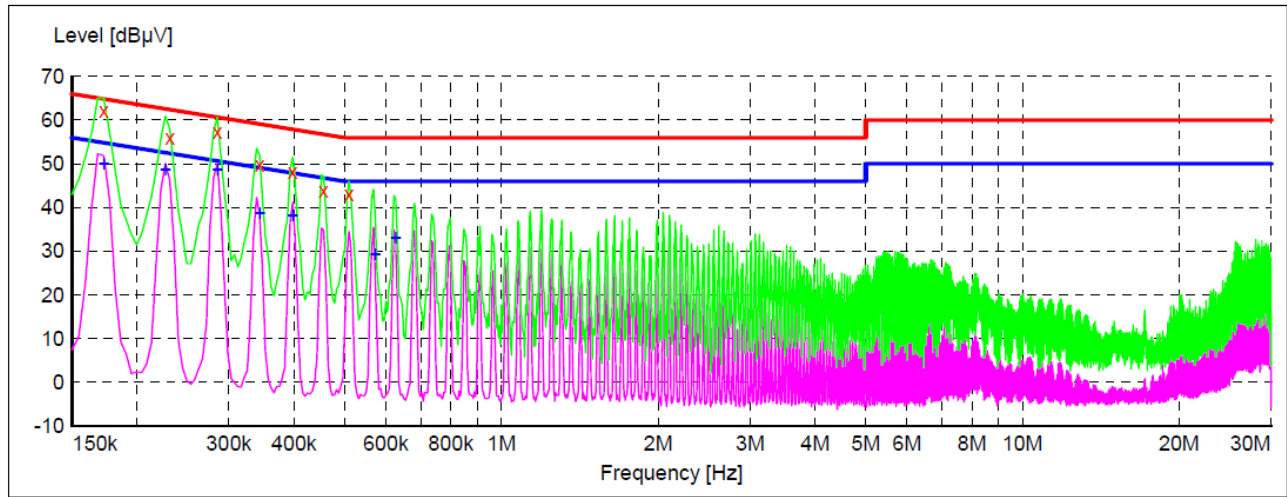
Test Setup:	
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates at lowest, middle and highest channel. Charge + Transmitting mode.
Final Test Mode:	Through Pre-scan, find the 1Mbps of rate of 802.11b at lowest channel is the worst case. Charge + Transmitting mode. Only the worst case is recorded in the report.
Instruments Used:	Refer to section 5.10 for details
Test Voltage:	AC120V/60Hz
Test Results:	Pass

### Measurement Data

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

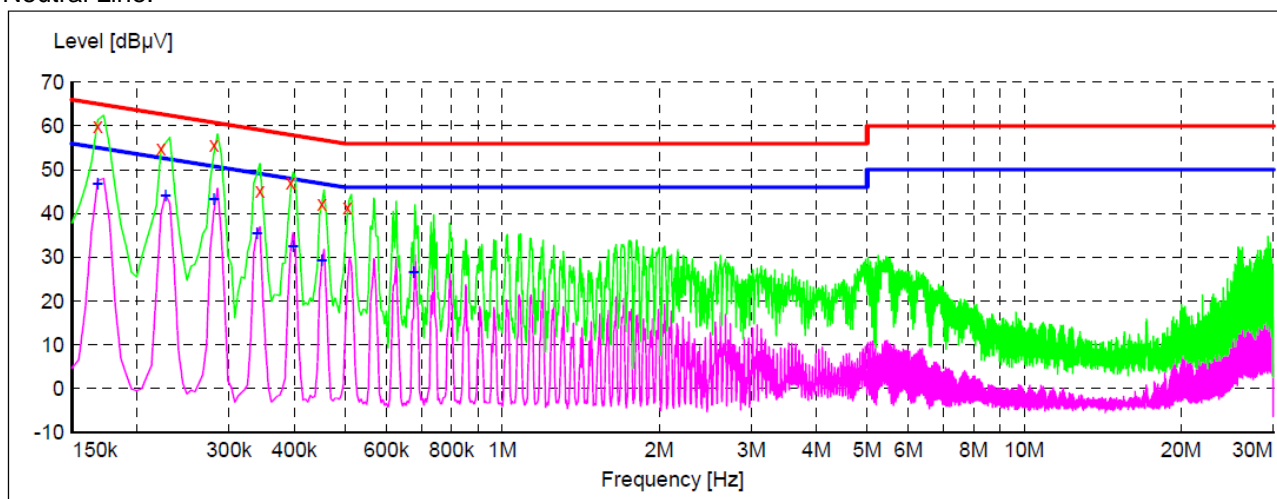
Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

Live Line:



Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.172500	62.10	10.2	65	2.7	QP	L1	GND
0.231000	56.00	10.2	62	6.4	QP	L1	GND
0.285000	57.20	10.2	61	3.5	QP	L1	GND
0.343500	49.90	10.2	59	9.2	QP	L1	GND
0.397500	48.10	10.2	58	9.8	QP	L1	GND
0.456000	43.80	10.2	57	13.0	QP	L1	GND
0.510000	42.90	10.2	56	13.1	QP	L1	GND
Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.172500	50.00	10.2	55	4.8	AV	L1	GND
0.226500	48.70	10.2	53	3.9	AV	L1	GND
0.285000	48.60	10.2	51	2.1	AV	L1	GND
0.343500	38.70	10.2	49	10.4	AV	L1	GND
0.397500	38.20	10.2	48	9.7	AV	L1	GND
0.573000	29.20	10.2	46	16.8	AV	L1	GND
0.627000	33.00	10.2	46	13.0	AV	L1	GND

### Neutral Line:

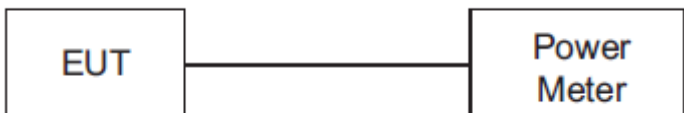


Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.168000	59.90	10.2	65	5.2	QP	N	GND
0.222000	54.90	10.2	63	7.8	QP	N	GND
0.280500	55.70	10.2	61	5.1	QP	N	GND
0.343500	45.20	10.2	59	13.9	QP	N	GND
0.393000	47.00	10.2	58	11.0	QP	N	GND
0.451500	42.20	10.2	57	14.6	QP	N	GND
0.505500	41.40	10.2	56	14.6	QP	N	GND
Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.168000	46.90	10.2	55	8.2	AV	N	GND
0.226500	44.10	10.2	53	8.5	AV	N	GND
0.280500	43.30	10.2	51	7.5	AV	N	GND
0.339000	35.60	10.2	49	13.6	AV	N	GND
0.397500	32.50	10.2	48	15.4	AV	N	GND
0.451500	29.40	10.2	47	17.4	AV	N	GND
0.676500	26.60	10.2	46	19.4	AV	N	GND

### Notes:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.

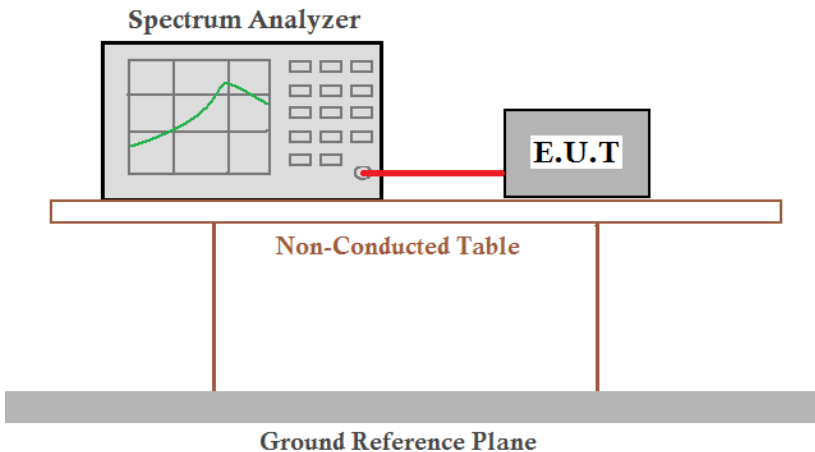
### 6.3 Maximum Peak Output Power

Test Requirement:	47 CFR Part 15C Section 15.247 (b)(3)
Test Method:	KDB558074 D01 v03r05
Test Setup:	
Test Instruments:	Refer to section 5.10 for details
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g ; 6.5Mbps of rate is the worst case of 802.11n(HT20) Only the worst case is recorded in the report.
Limit:	30dBm
Test Results:	Pass

#### Measurement Data

802.11b mode				
Test channel	Peak Output Power (dBm)	Average Output Power (dBm)	Limit (dBm)	Result
Lowest	8.09	6.63	30.00	Pass
Middle	8.15	6.69	30.00	Pass
Highest	8.07	6.61	30.00	Pass
802.11g mode				
Test channel	Peak Output Power (dBm)	Average Output Power (dBm)	Limit (dBm)	Result
Lowest	7.43	6.03	30.00	Pass
Middle	7.51	6.14	30.00	Pass
Highest	7.40	6.01	30.00	Pass
802.11n(HT20)mode				
Test channel	Peak Output Power (dBm)	Average Output Power (dBm)	Limit (dBm)	Result
Lowest	7.24	5.89	30.00	Pass
Middle	7.28	5.94	30.00	Pass
Highest	7.23	5.88	30.00	Pass

## 6.4 6dB Occupy Bandwidth

Test Requirement:	47 CFR Part 15C Section 15.247 (a)(2)
Test Method:	KDB558074 D01 v03r05
Test Setup:	 <p>The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and the E.U.T. are placed on a Non-Conducted Table. The table is supported by a Ground Reference Plane.</p>
Instruments Used:	Refer to section 5.10 for details
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g ; 6.5Mbps of rate is the worst case of 802.11n(HT20)
Limit:	$\geq 500$ kHz
Test Results:	Pass

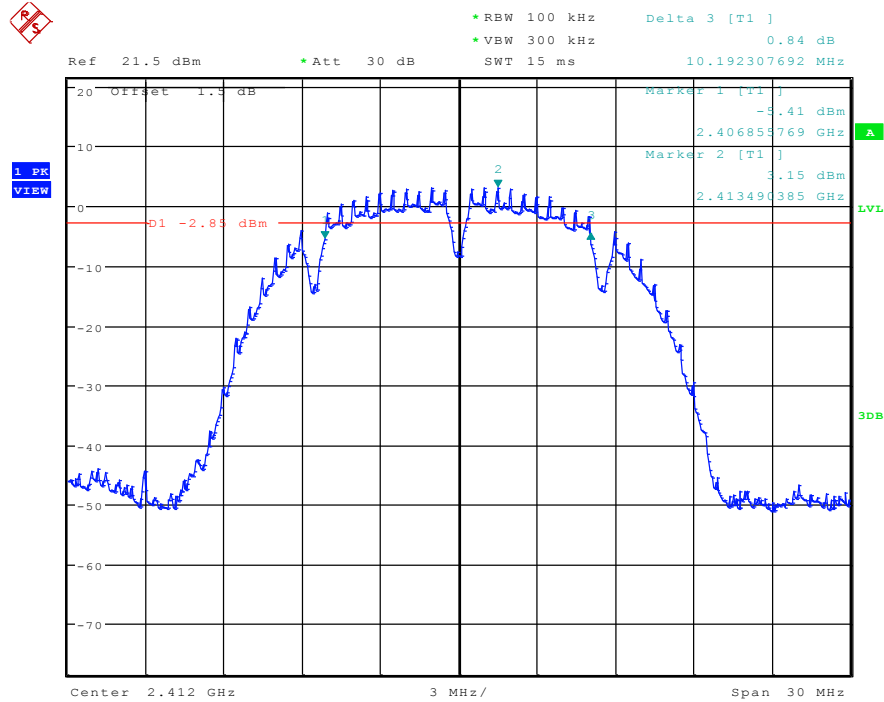


**Measurement Data**

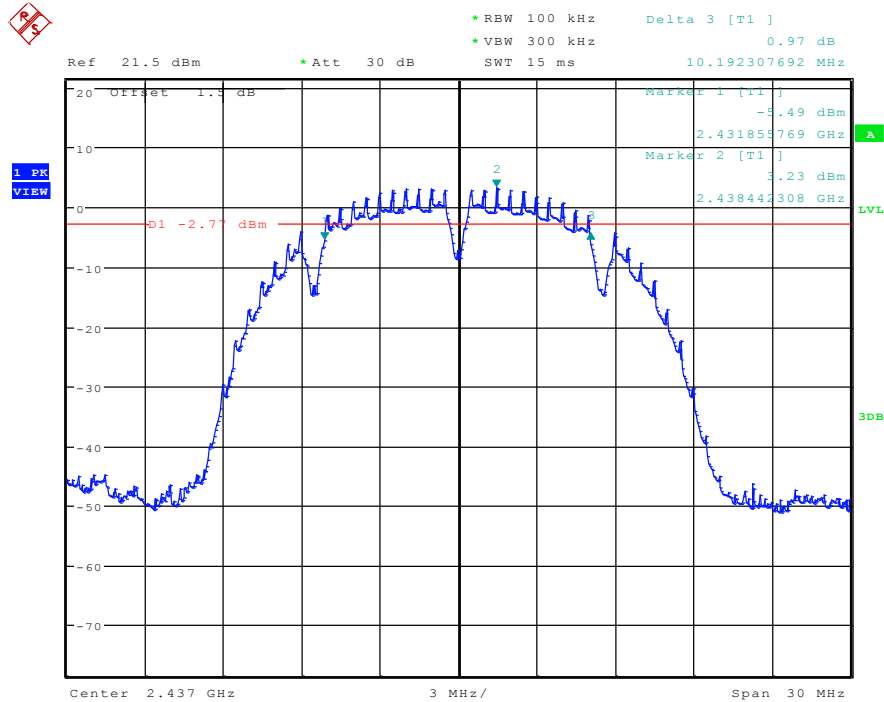
802.11b mode			
Test channel	6dB Occupy Bandwidth (MHz)	Limit (kHz)	Result
Lowest	10.1923	≥500	Pass
Middle	10.1923	≥500	Pass
Highest	10.1923	≥500	Pass
802.11g mode			
Test channel	6dB Occupy Bandwidth (MHz)	Limit (kHz)	Result
Lowest	16.6346	≥500	Pass
Middle	16.6346	≥500	Pass
Highest	16.5385	≥500	Pass
802.11n(HT20) mode			
Test channel	6dB Occupy Bandwidth (MHz)	Limit (kHz)	Result
Lowest	17.9327	≥500	Pass
Middle	17.9327	≥500	Pass
Highest	17.9327	≥500	Pass

**Test plot as follows:**

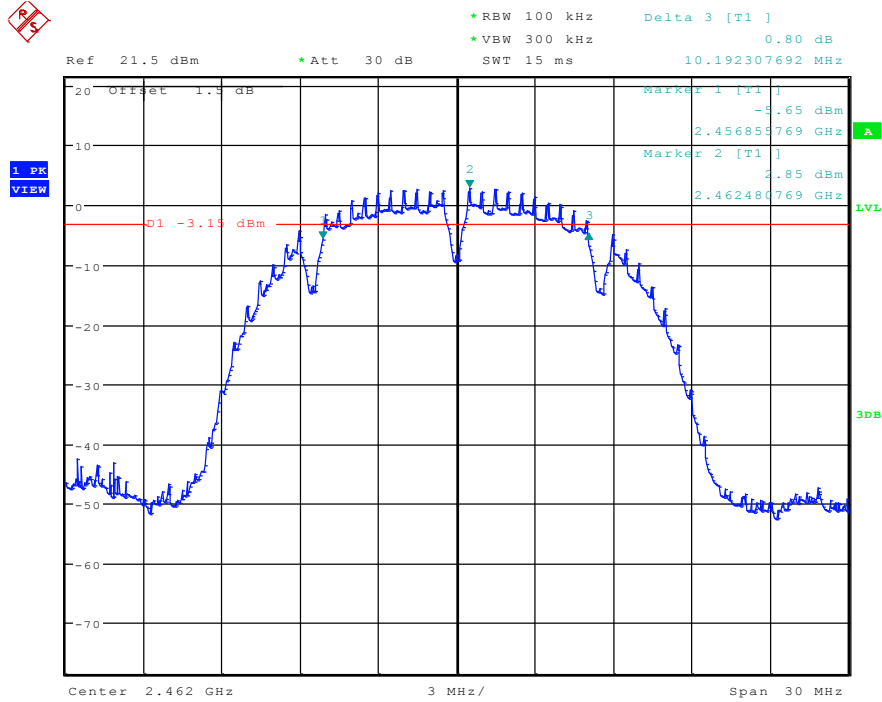
Test mode:	802.11b	Test channel:	Lowest
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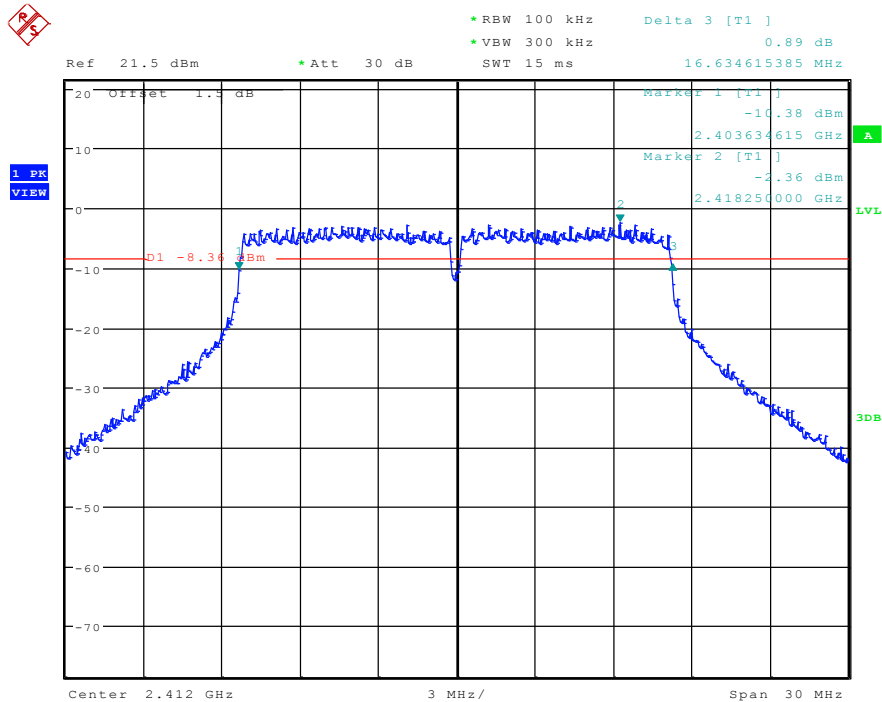
Test mode:	802.11b	Test channel:	Middle
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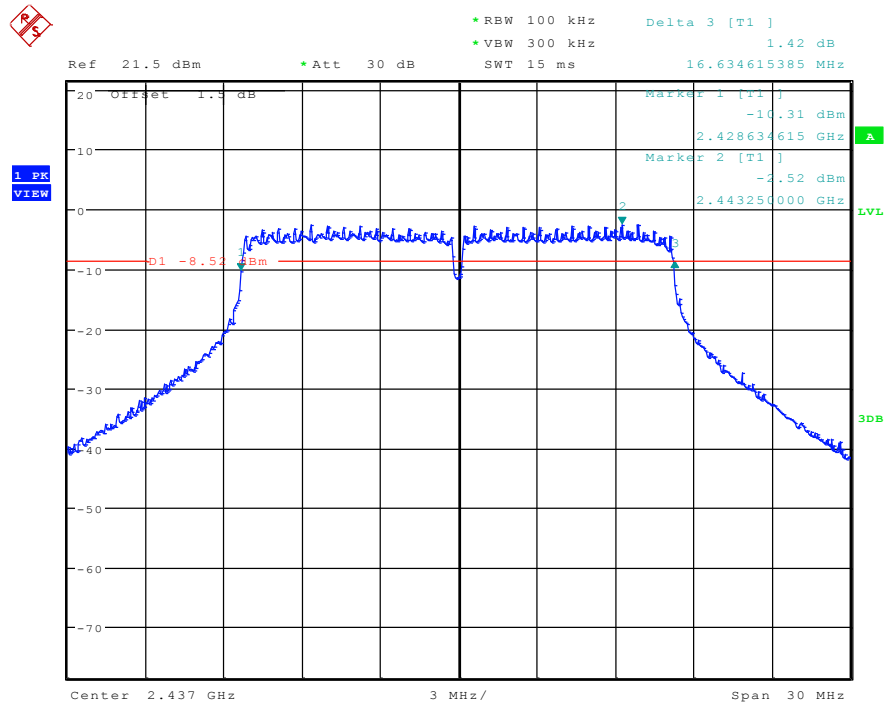
Test mode:	802.11b	Test channel:	Highest
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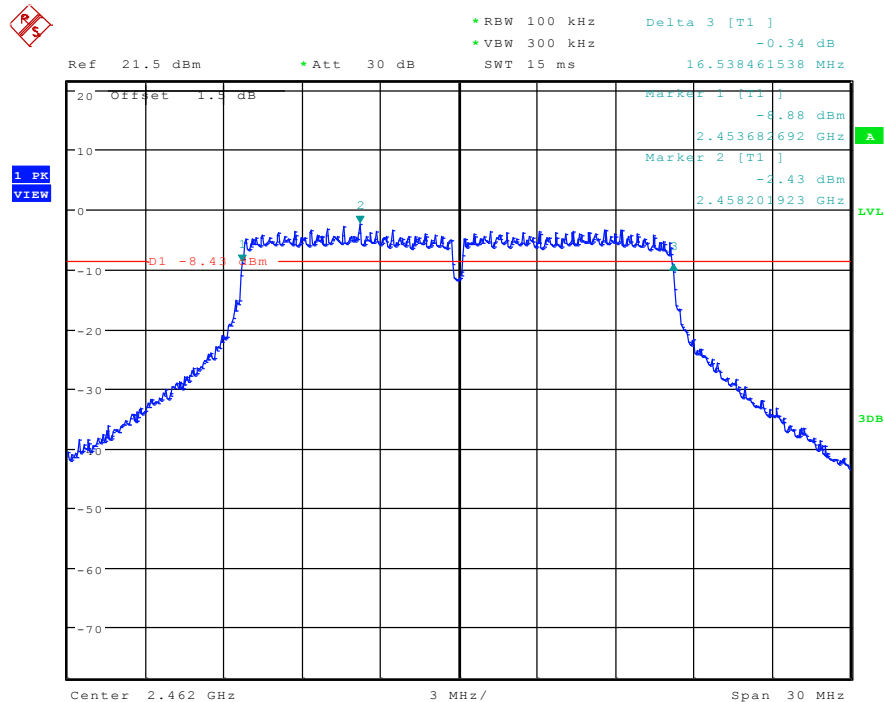
Test mode:	802.11g	Test channel:	Lowest
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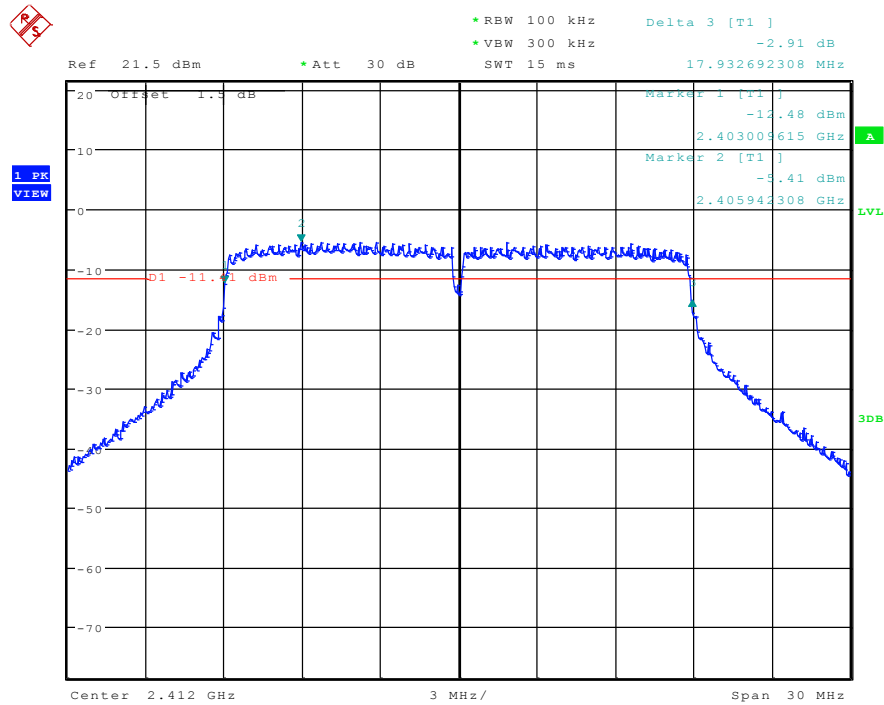
Test mode:	802.11g	Test channel:	Middle
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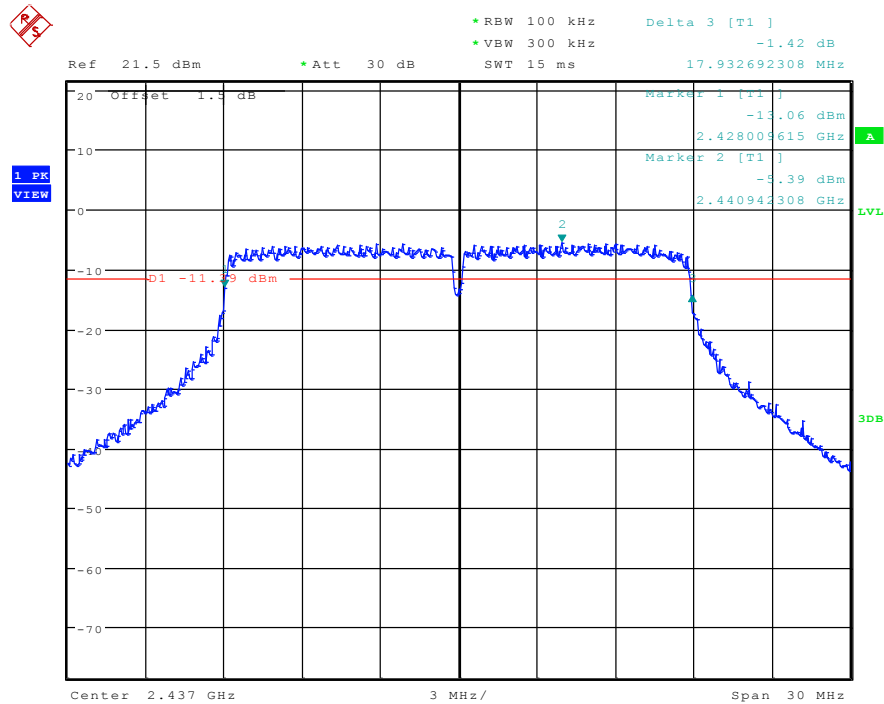
Test mode:	802.11g	Test channel:	Highest
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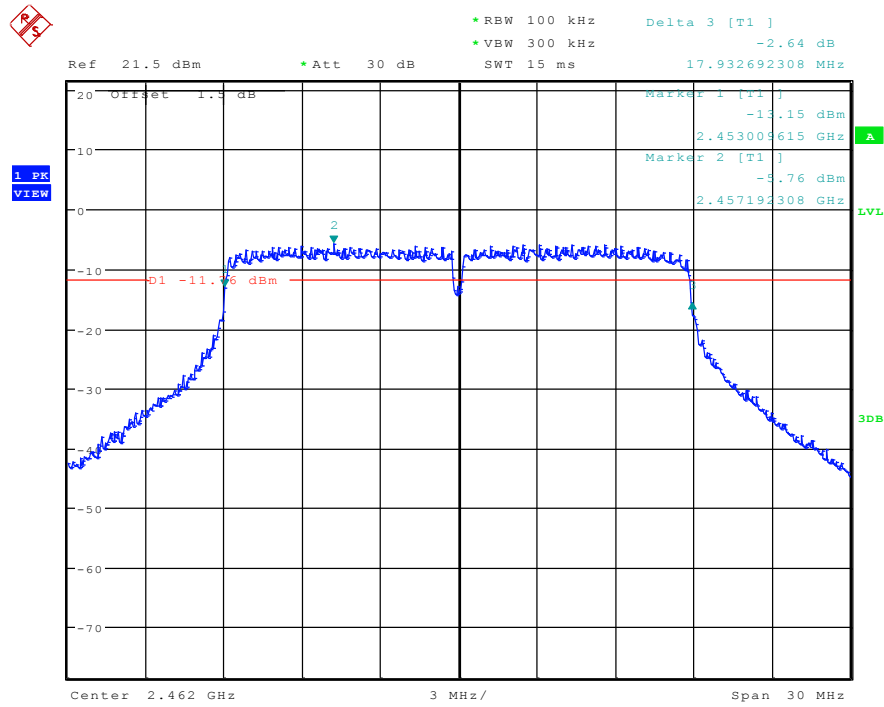
Test mode:	802.11n(HT20)	Test channel:	Lowest
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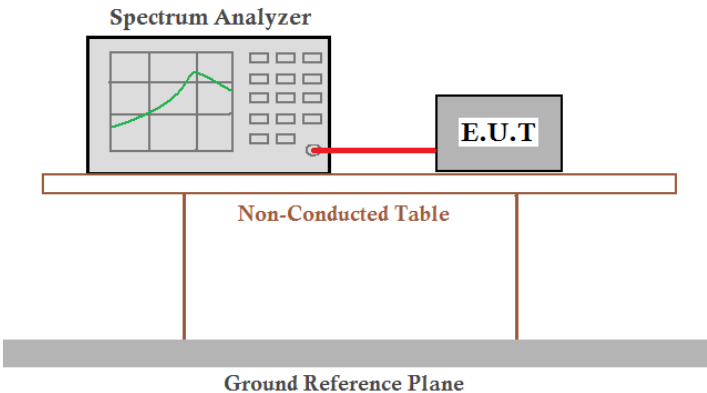
Test mode:	802.11n(HT20)	Test channel:	Middle
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Test mode:	802.11n(HT20)	Test channel:	Highest
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## 6.5 Power Spectral Density

Test Requirement:	47 CFR Part 15C Section 15.247 (e)
Test Method:	KDB558074 D01 v03r05
Test Setup:	 <p><i>Remark:</i> Offset the High-Frequency cable loss 1.5dB in the spectrum analyzer.</p>
Test Instruments:	Refer to section 5.10 for details
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g ; 6.5Mbps of rate is the worst case of 802.11n(HT20)
Limit:	$\leq 8.00\text{dBm}/3\text{kHz}$
Test Results:	Pass

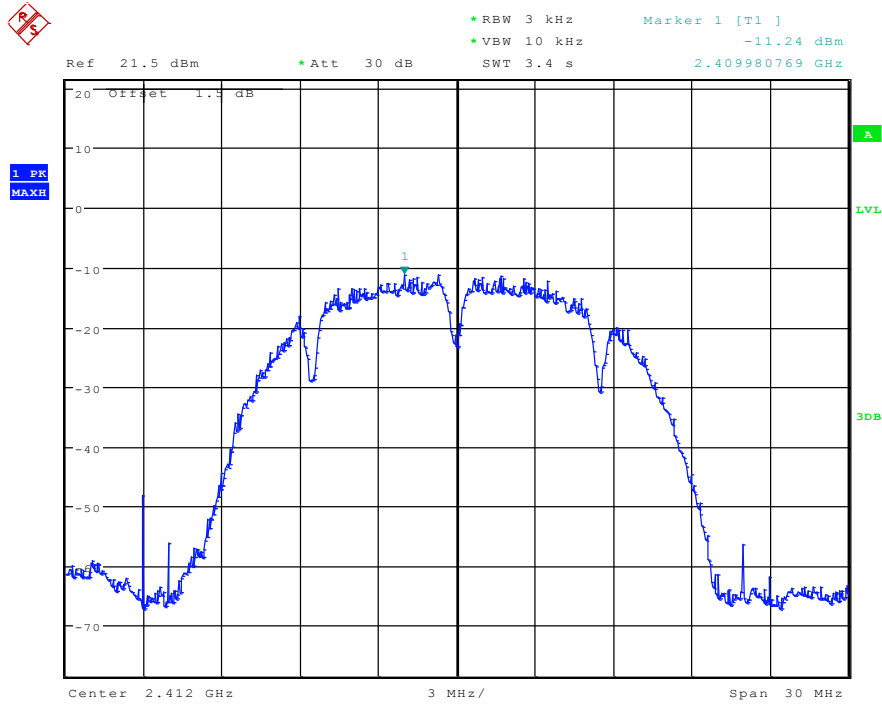
**Measurement Data**

802.11b mode			
Test channel	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
Lowest	-11.24	≤8.00	Pass
Middle	-10.78	≤8.00	Pass
Highest	-11.96	≤8.00	Pass
802.11g mode			
Test channel	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
Lowest	-14.43	≤8.00	Pass
Middle	-14.64	≤8.00	Pass
Highest	-13.62	≤8.00	Pass
802.11n(HT20) mode			
Test channel	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
Lowest	-16.69	≤8.00	Pass
Middle	-16.76	≤8.00	Pass
Highest	-16.84	≤8.00	Pass

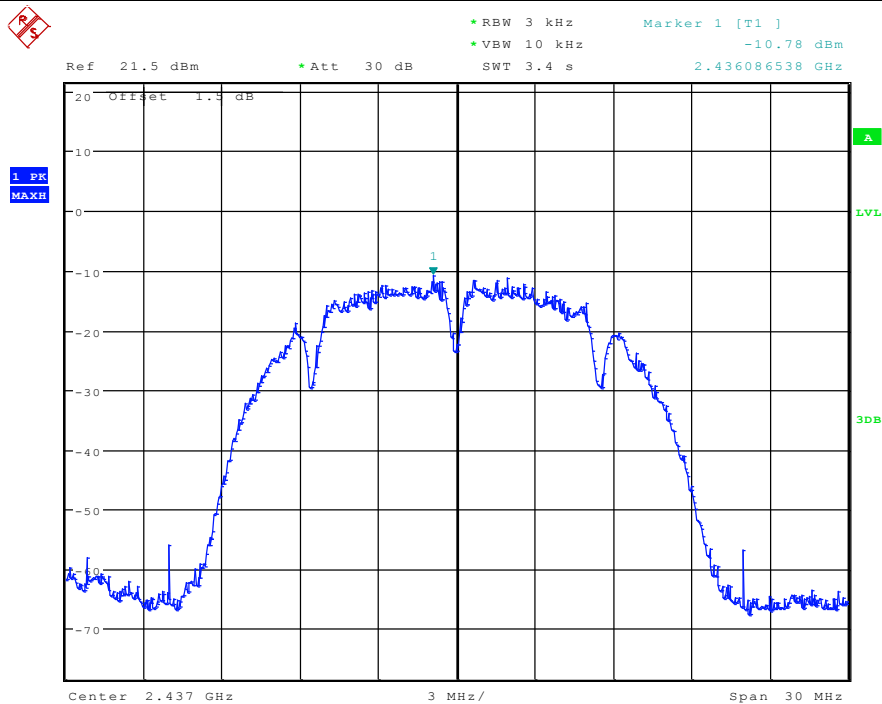


### Test plot as follows:

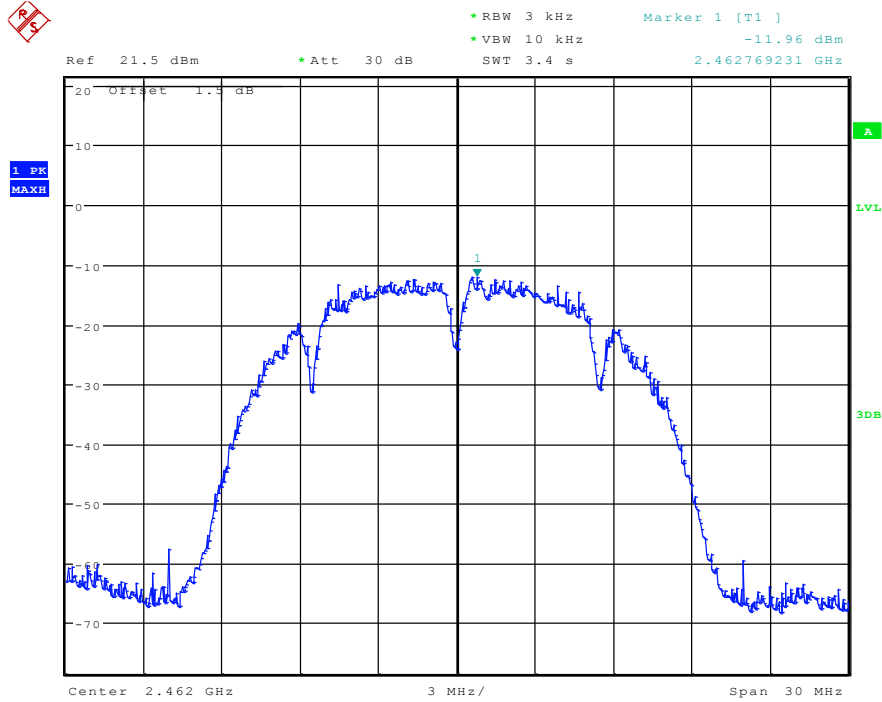
Test mode:	802.11b	Test channel:	Lowest
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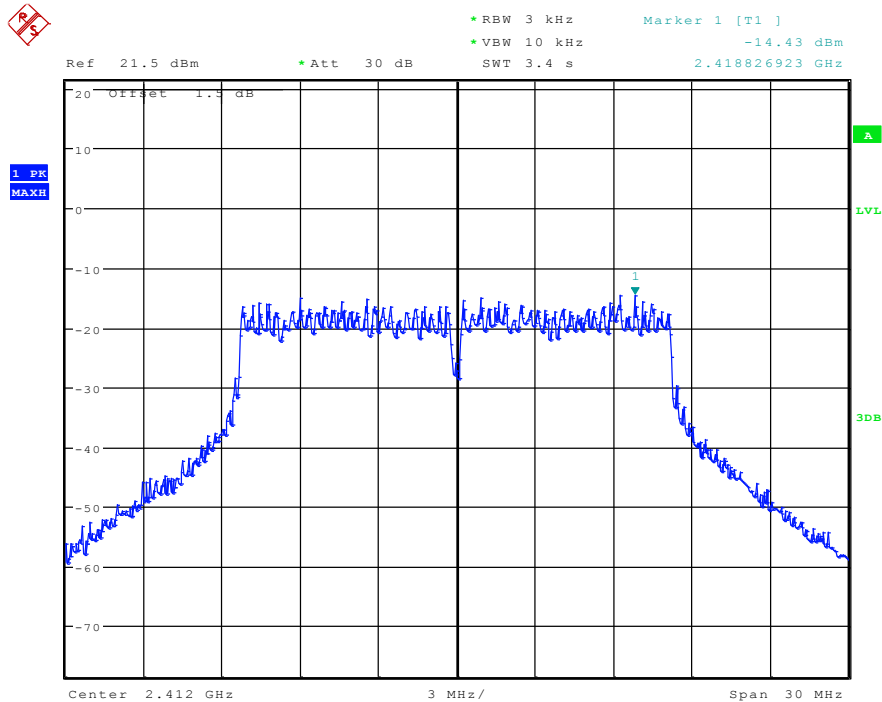
Test mode:	802.11b	Test channel:	Middle
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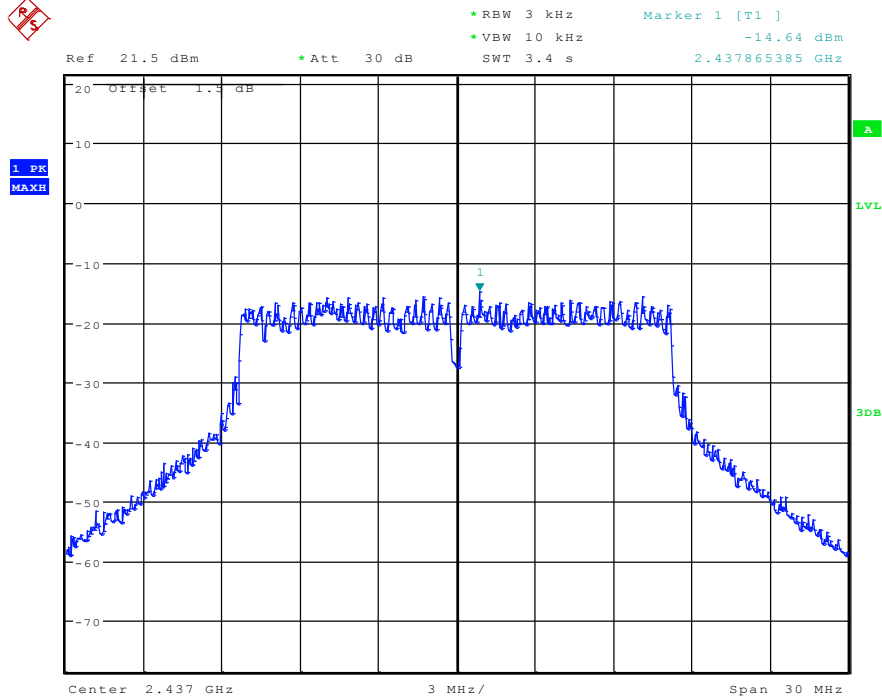
Test mode:	802.11b	Test channel:	Highest
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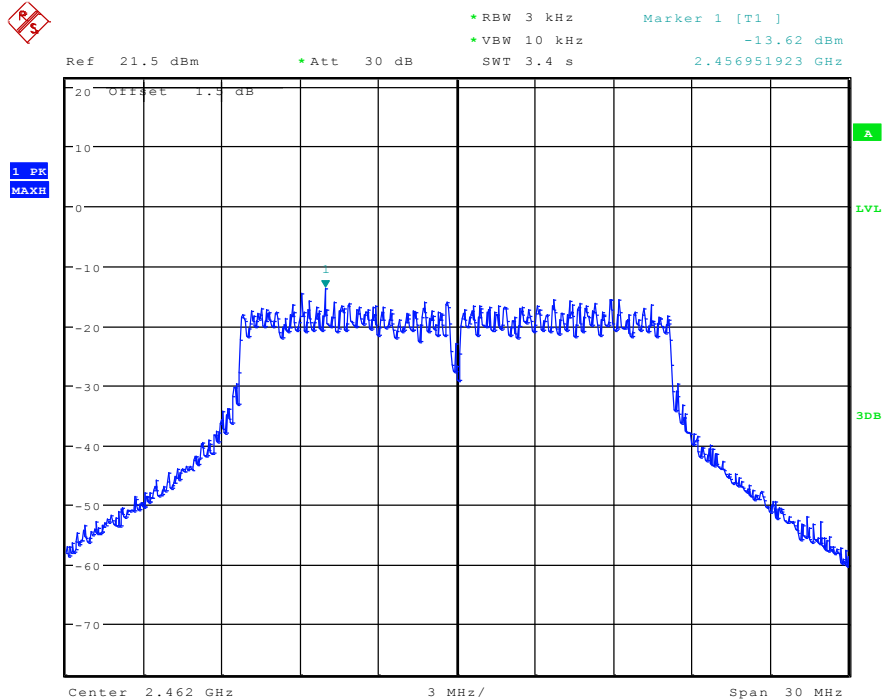
Test mode:	802.11g	Test channel:	Lowest
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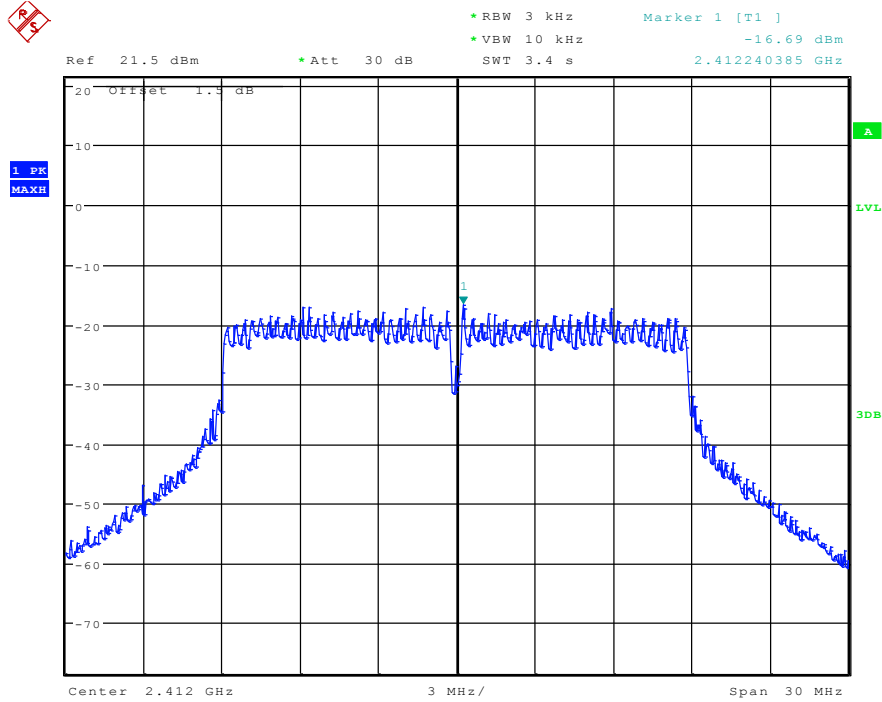
Test mode:	802.11g	Test channel:	Middle
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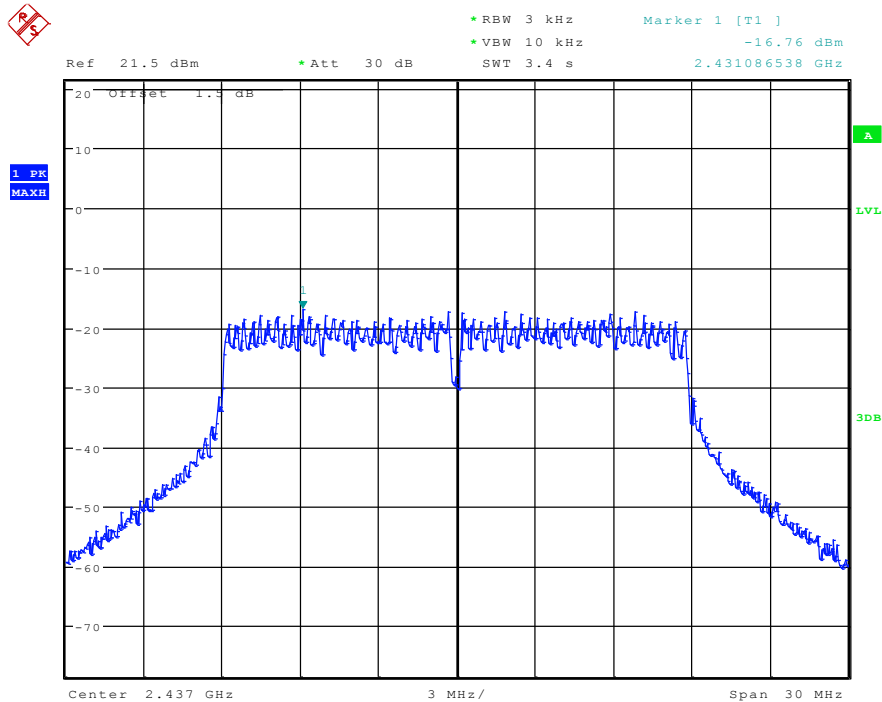
Test mode:	802.11g	Test channel:	Highest
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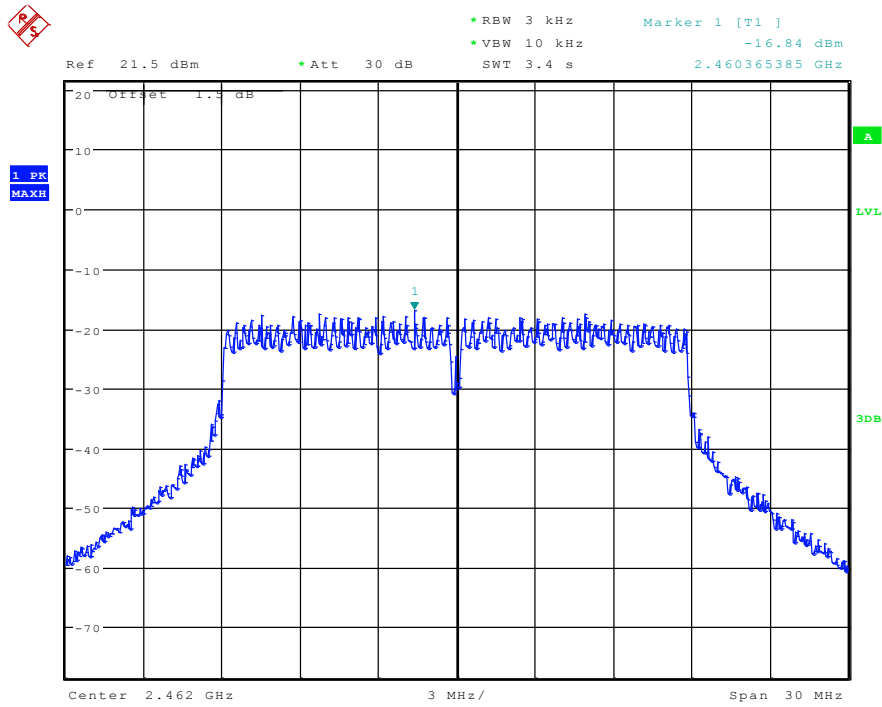
Test mode:	802.11n(HT20)	Test channel:	Lowest
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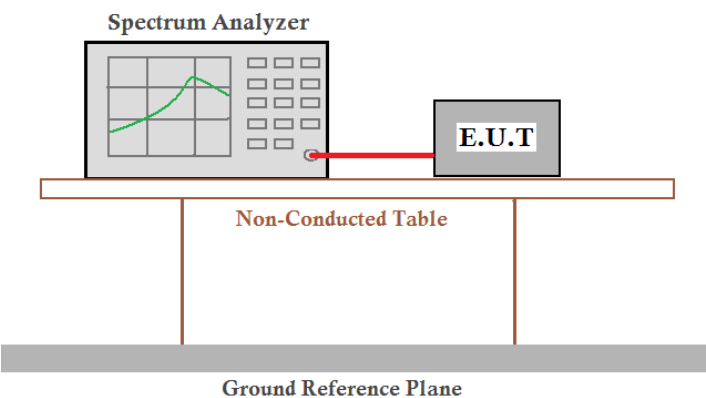
Test mode:	802.11n(HT20)	Test channel:	Middle
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Test mode:	802.11n(HT20)	Test channel:	Highest
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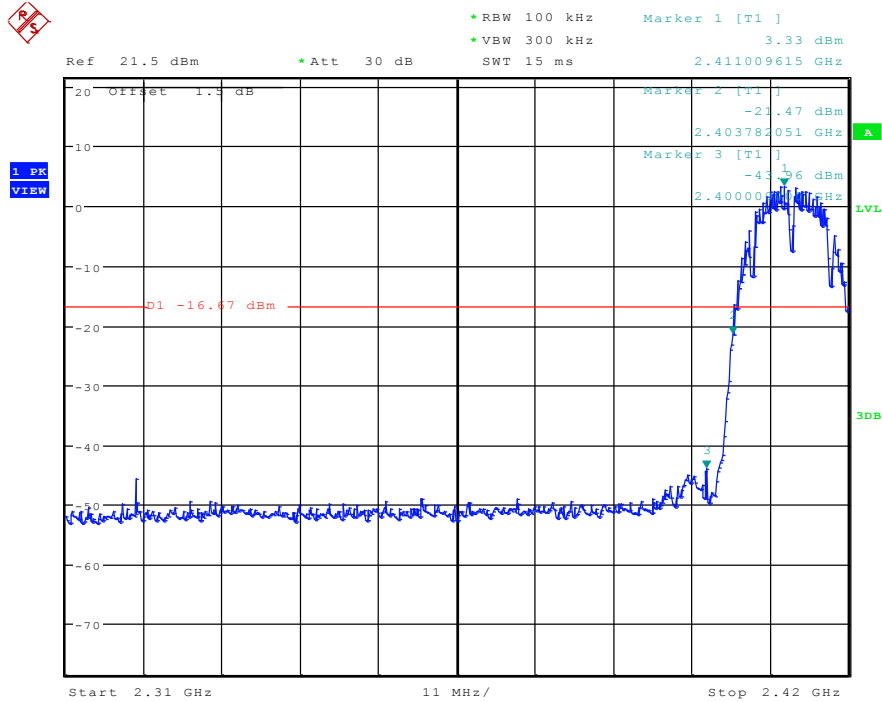


## 6.6 Band-edge for RF Conducted Emissions

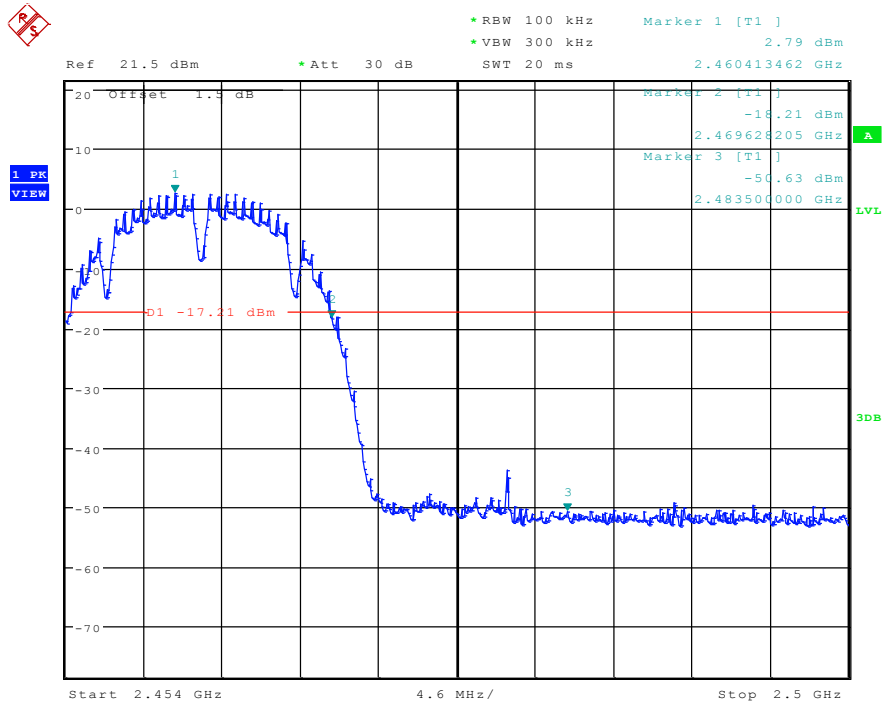
Test Requirement:	47 CFR Part 15C Section 15.247 (d)
Test Method:	KDB558074 D01 v03r05
Test Setup:	 <p><i>Remark:</i> Offset the High-Frequency cable loss 1.5dB in the spectrum analyzer.</p>
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g ; 6.5Mbps of rate is the worst case of 802.11n(HT20)
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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.
Instruments Used:	Refer to section 5.10 for details
Test Results:	Pass

**Test plot as follows:**

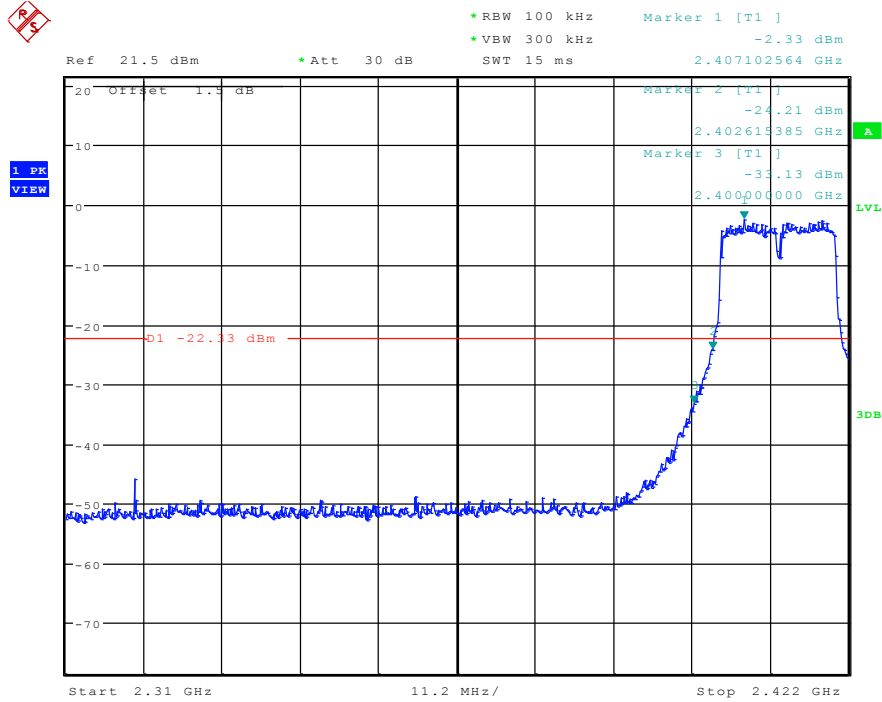
Test mode:	802.11b	Test channel:	Lowest
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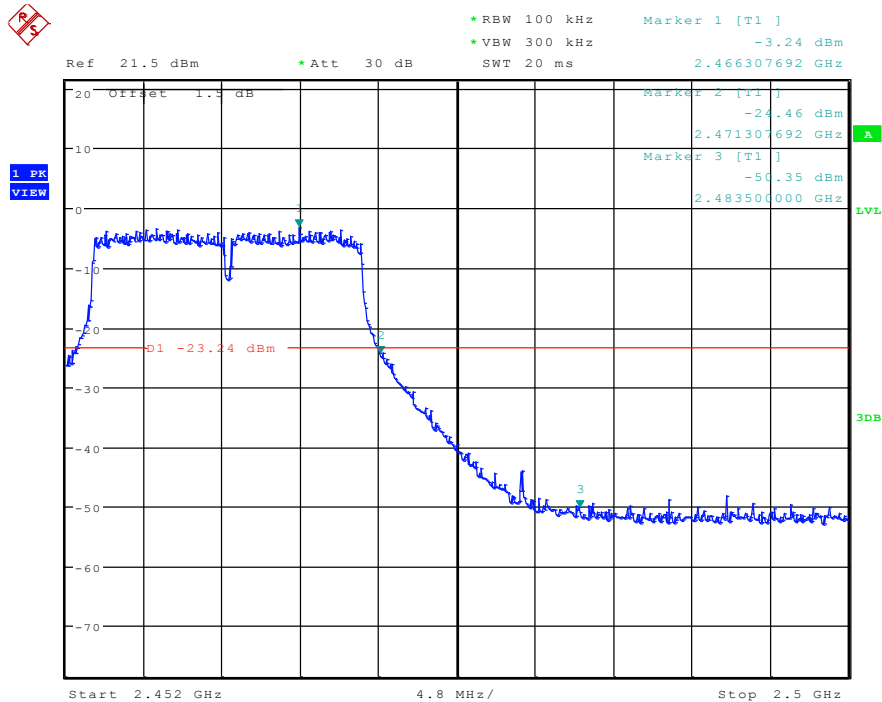
Test mode:	802.11b	Test channel:	Highest
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Test mode:	802.11g	Test channel:	Lowest
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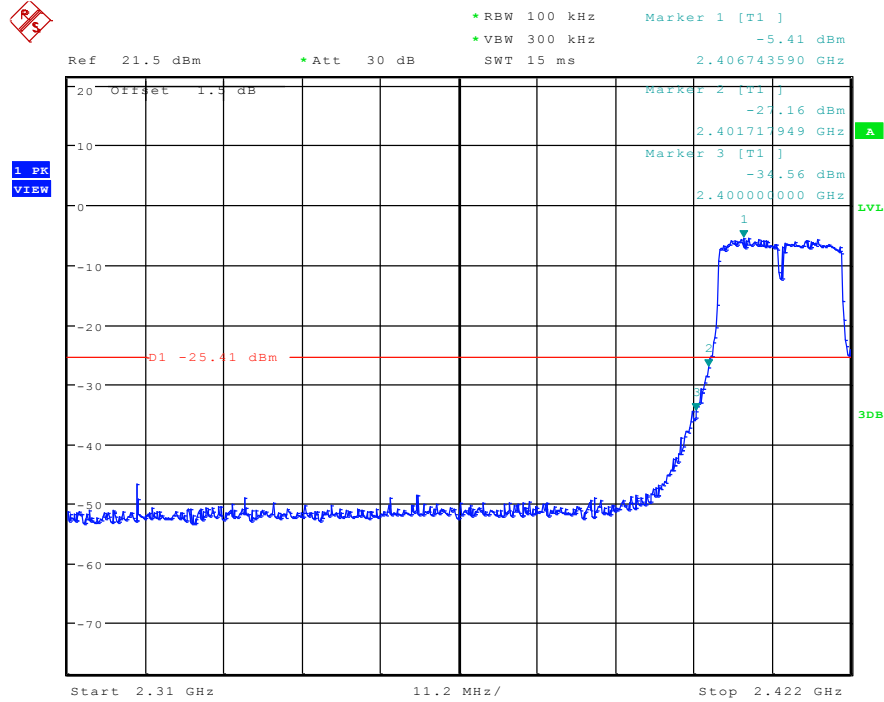


Test mode:	802.11g	Test channel:	Highest
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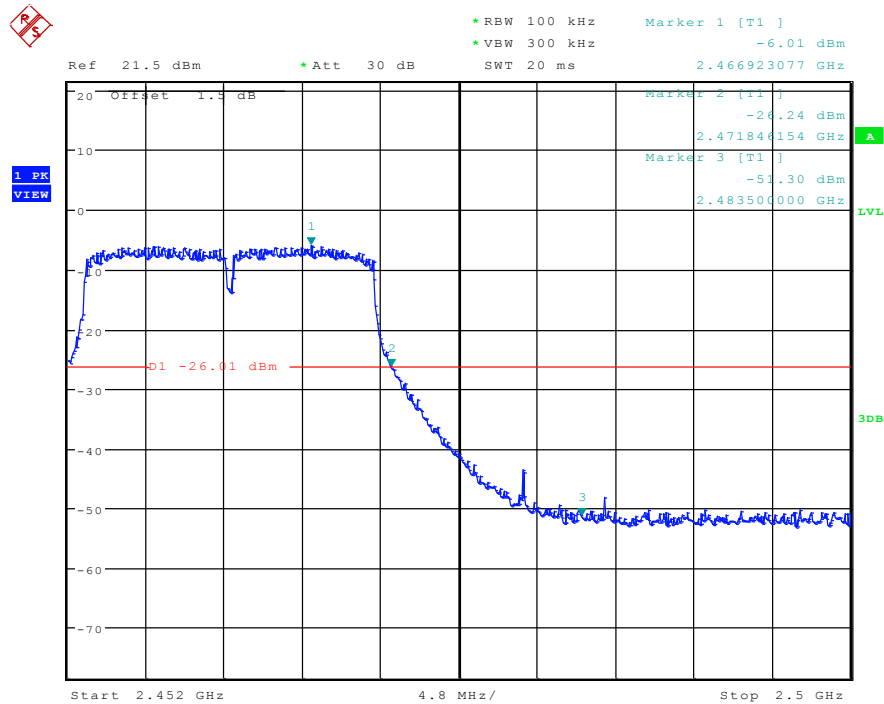




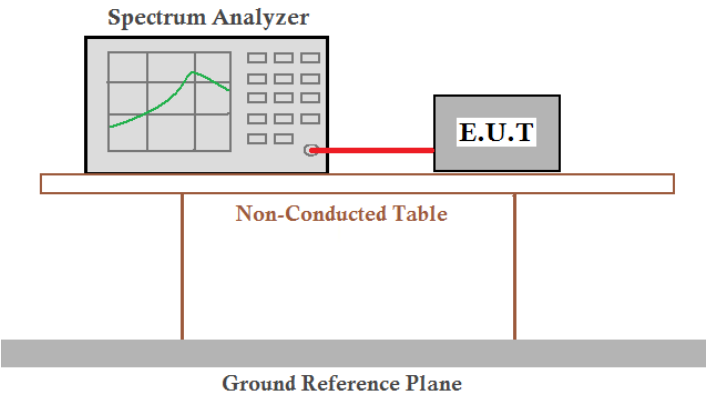
Test mode:	802.11n(HT20)	Test channel:	Lowest
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Test mode:	802.11n(HT20)	Test channel:	Highest
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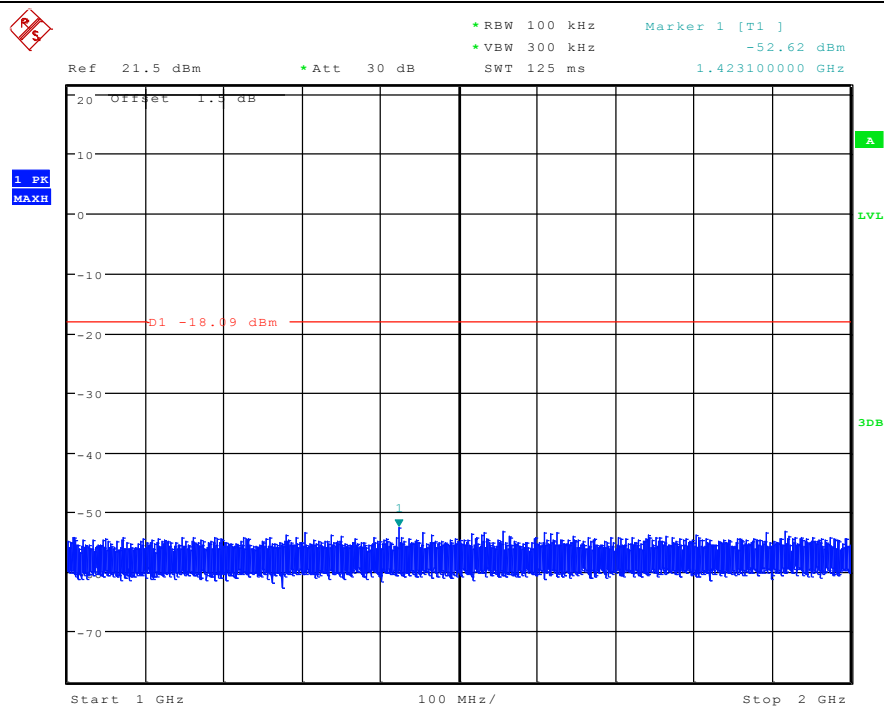
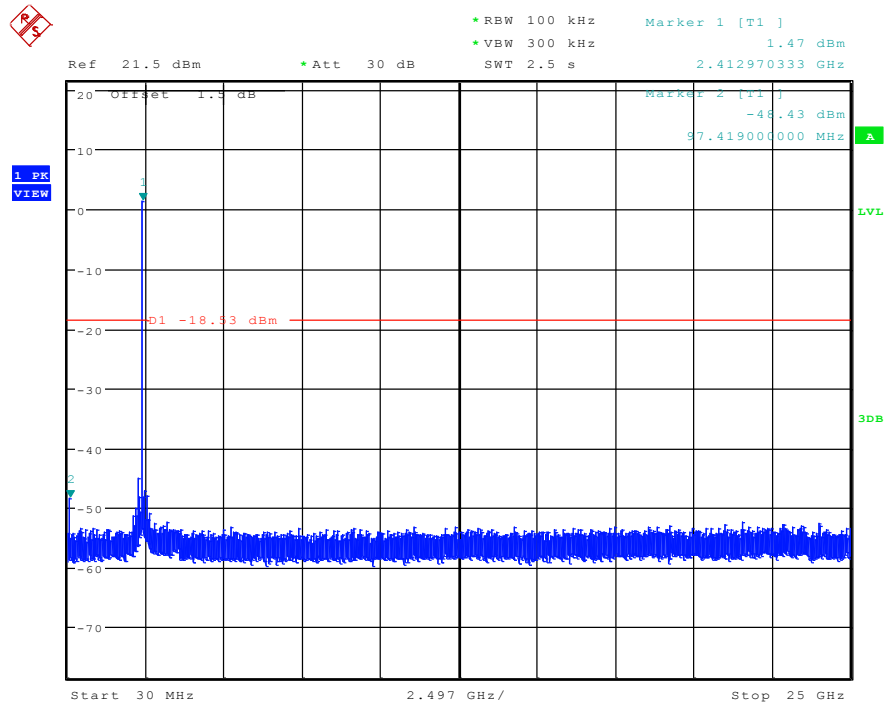


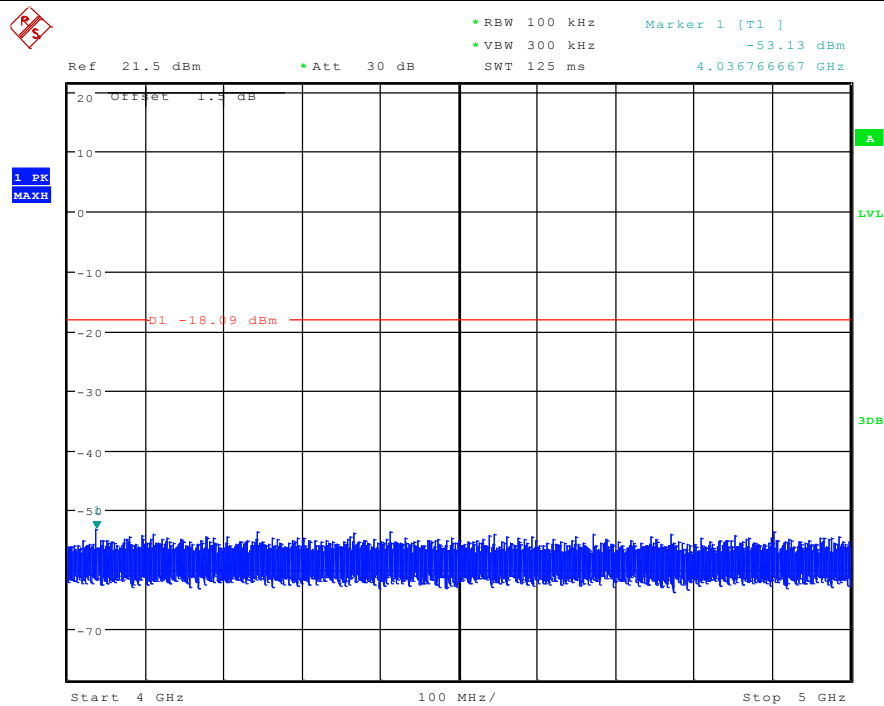
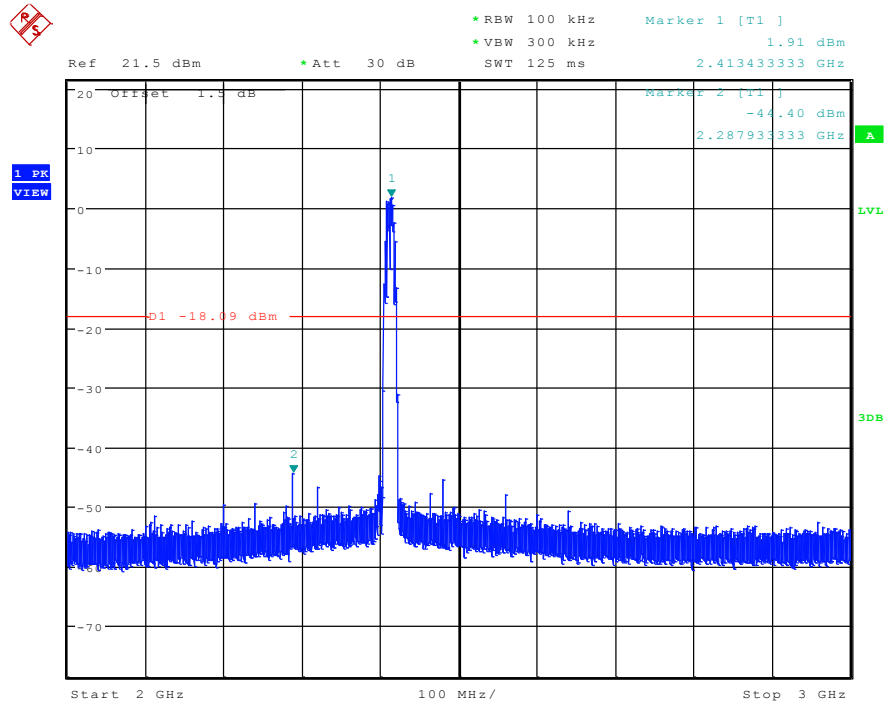
## 6.7 RF Conducted Spurious Emissions

Test Requirement:	47 CFR Part 15C Section 15.247 (d)
Test Method:	KDB558074 D01 v03r05
Test Setup:	 <p><i>Remark:</i> Offset the High-Frequency cable loss 1.5dB in the spectrum analyzer.</p>
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g ; 6.5Mbps of rate is the worst case of 802.11n(HT20)
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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.
Instruments Used:	Refer to section 5.10 for details
Test Results:	Pass

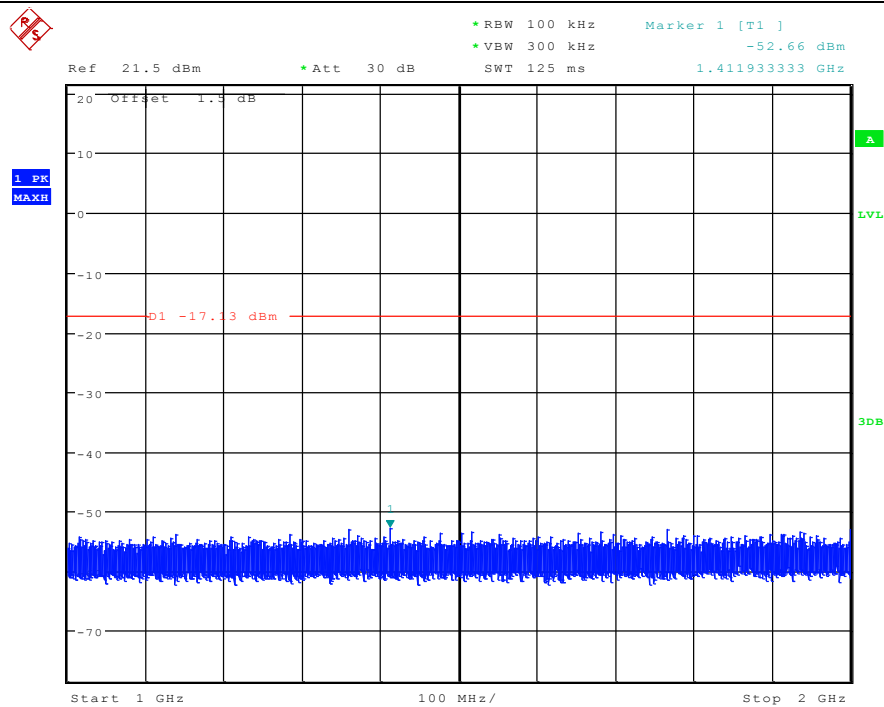
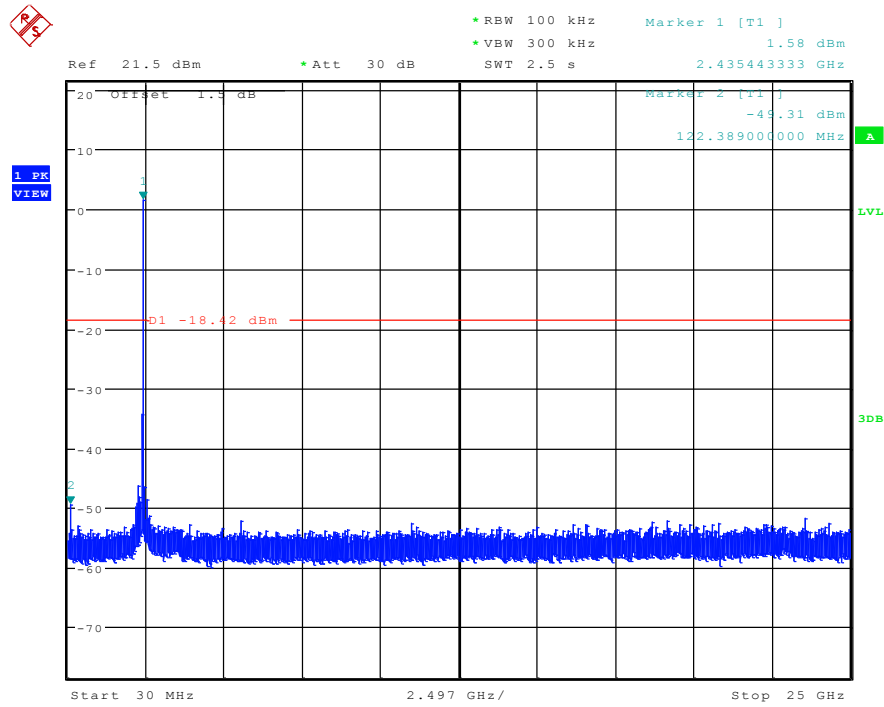
### Test plot as follows:

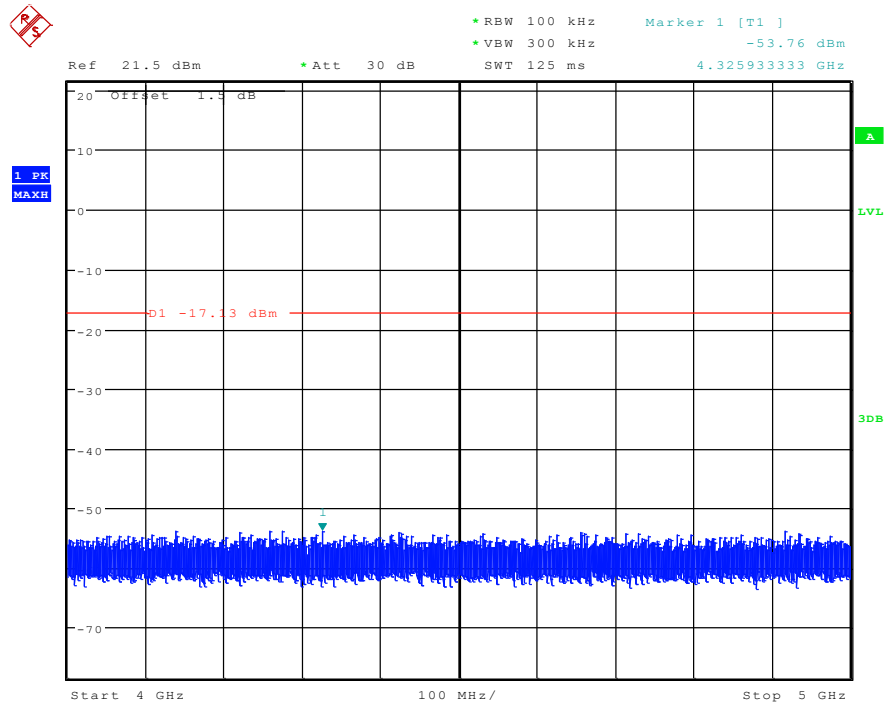
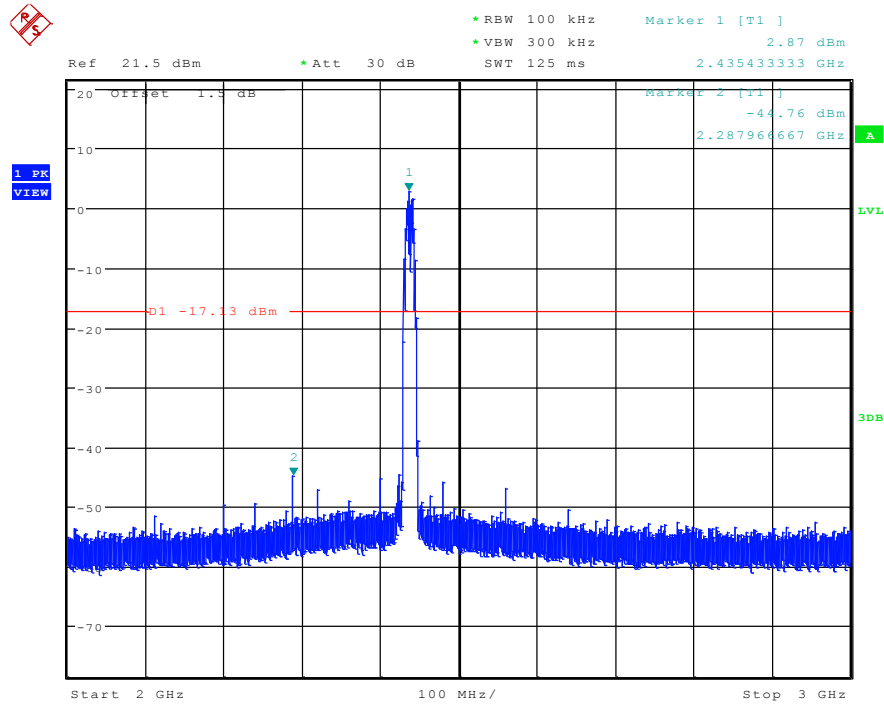
Test mode:	802.11b	Test channel:	Lowest
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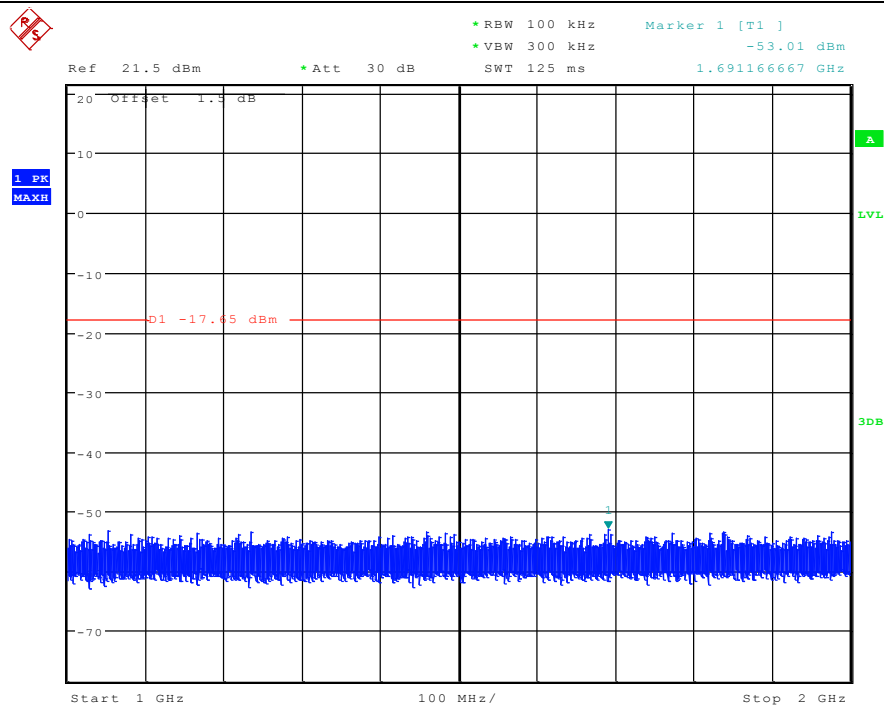
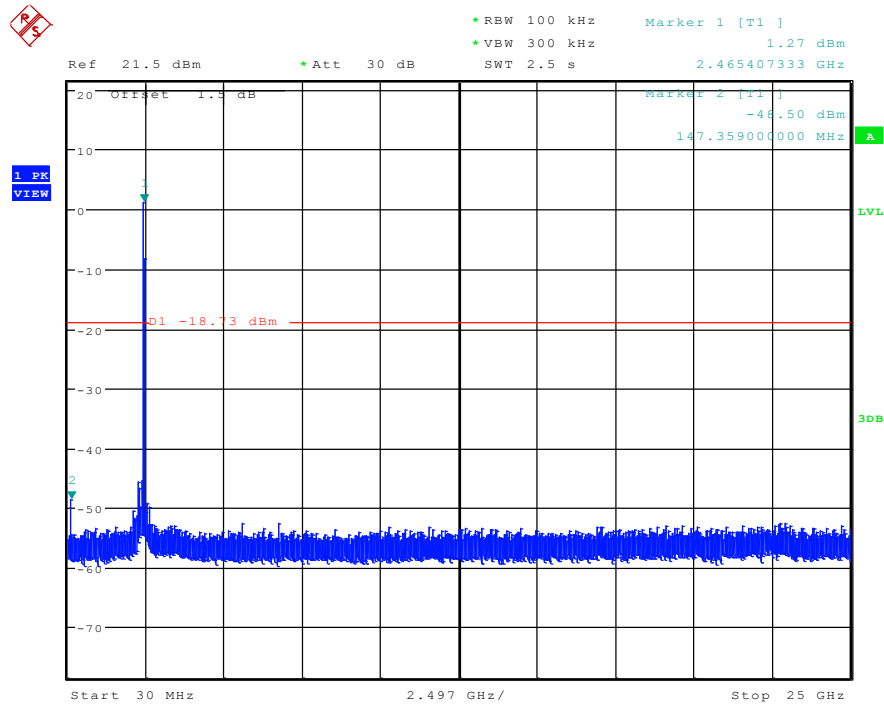


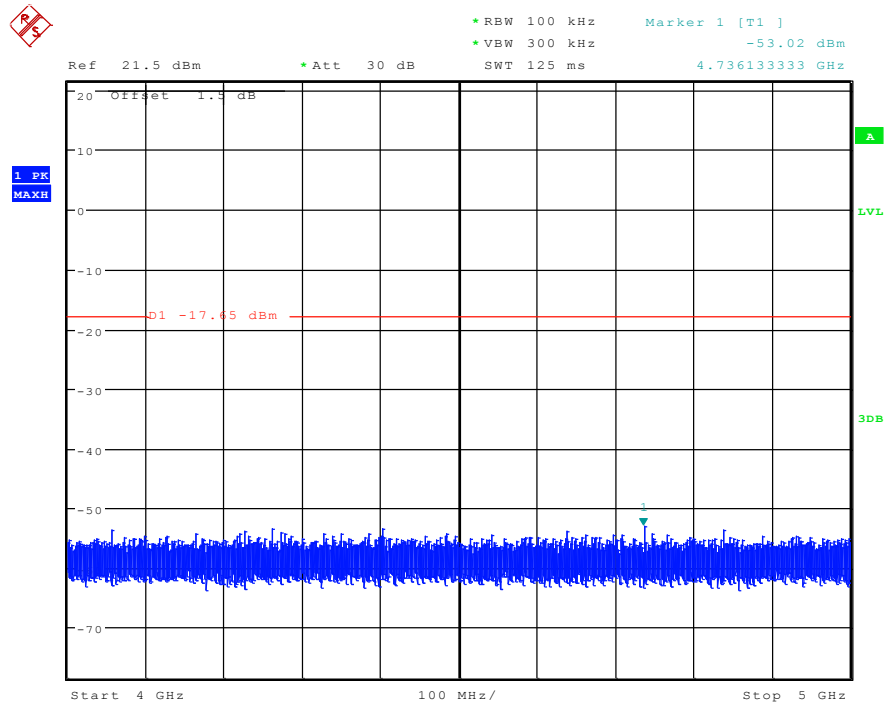
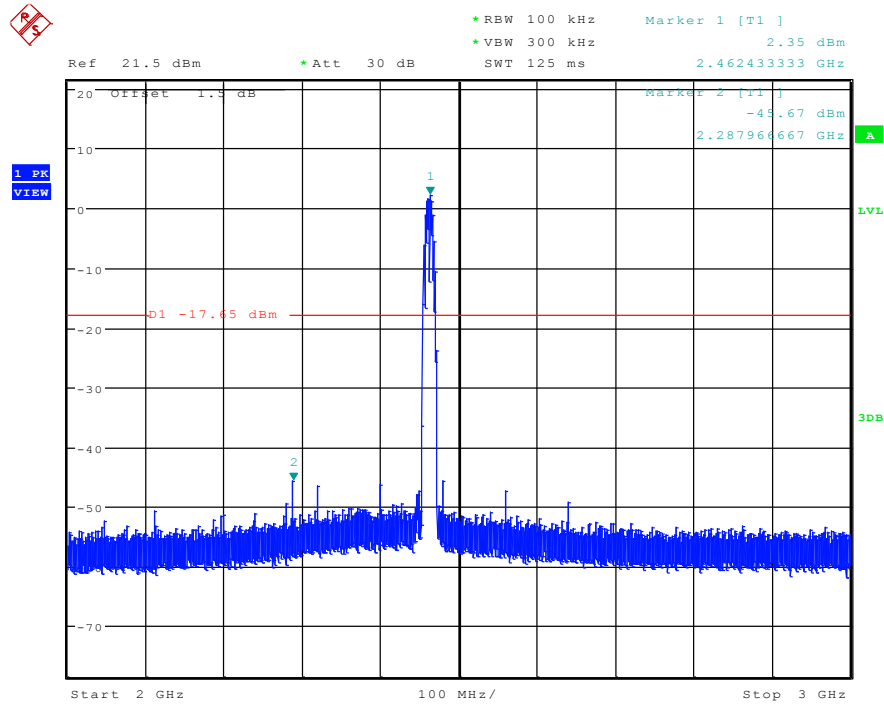
Test mode:	802.11b	Test channel:	Middle
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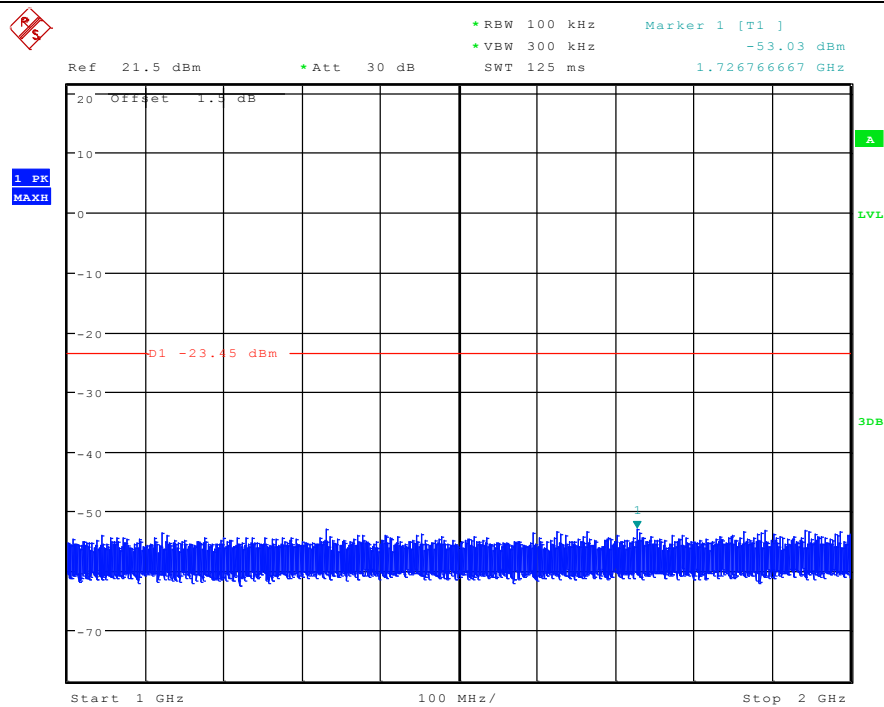
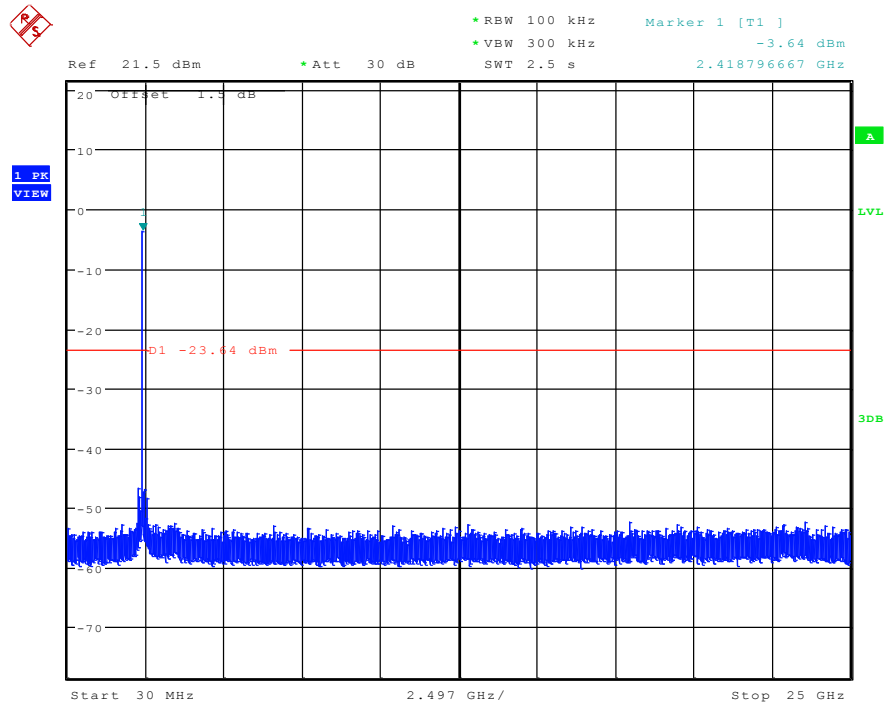
Test mode:	802.11b	Test channel:	Highest
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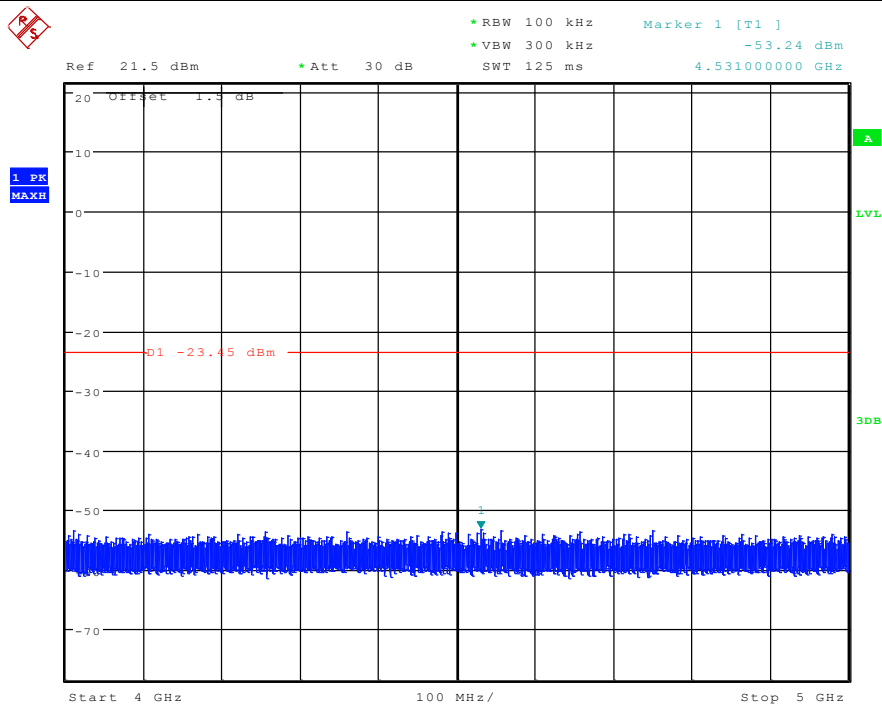
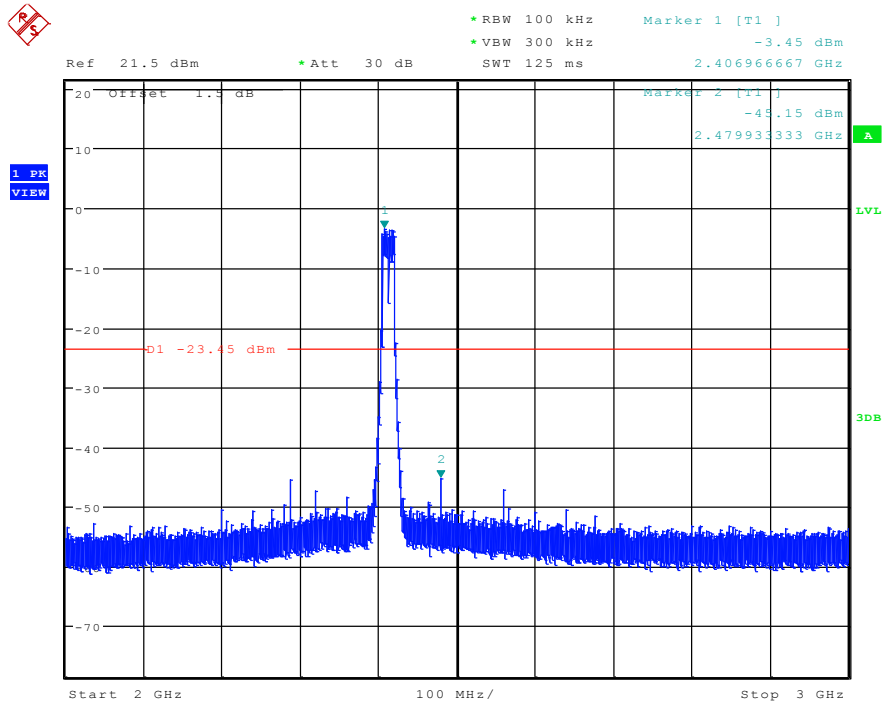




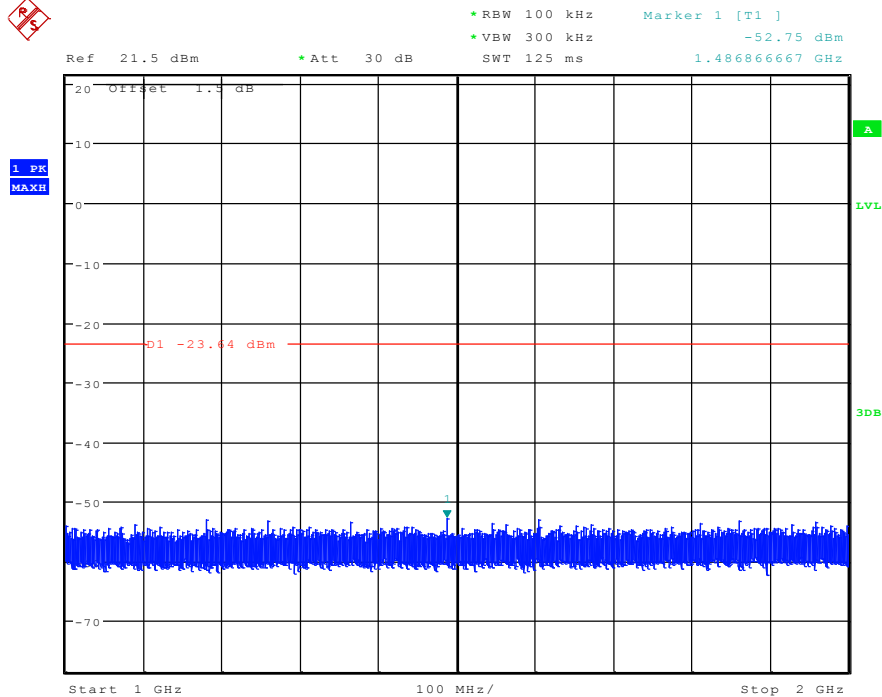
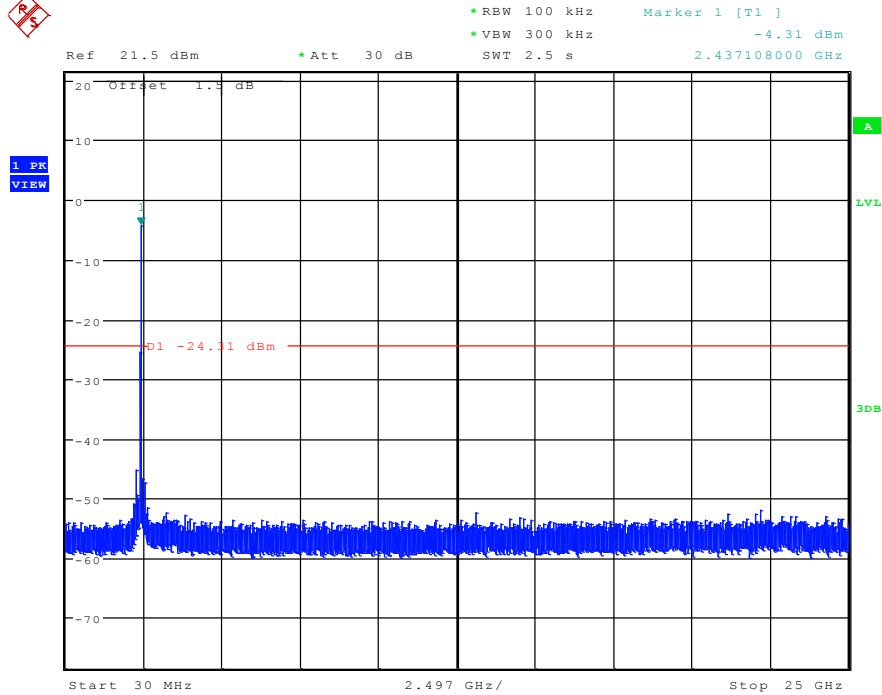


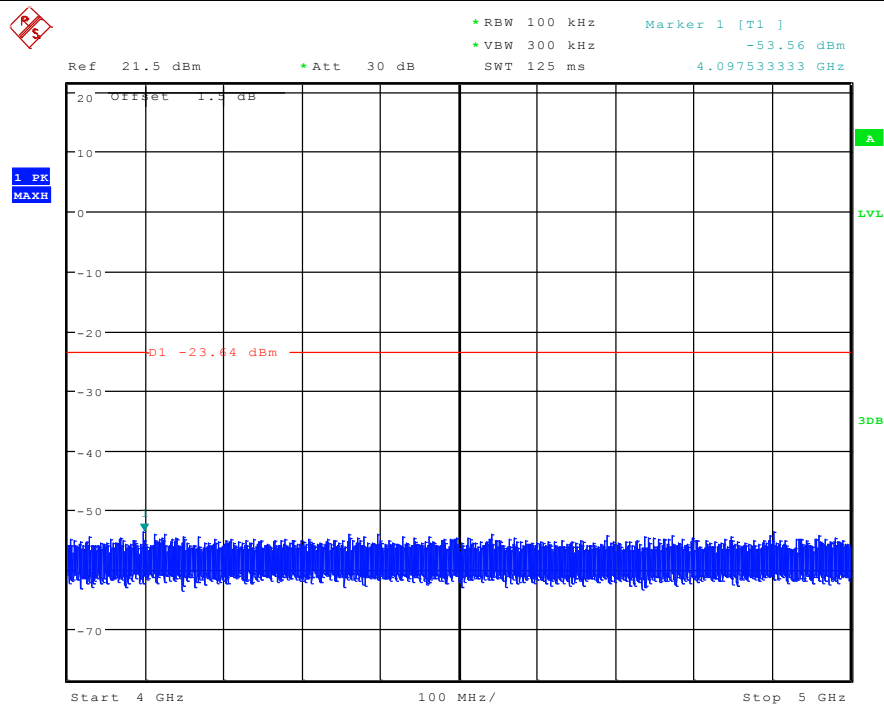
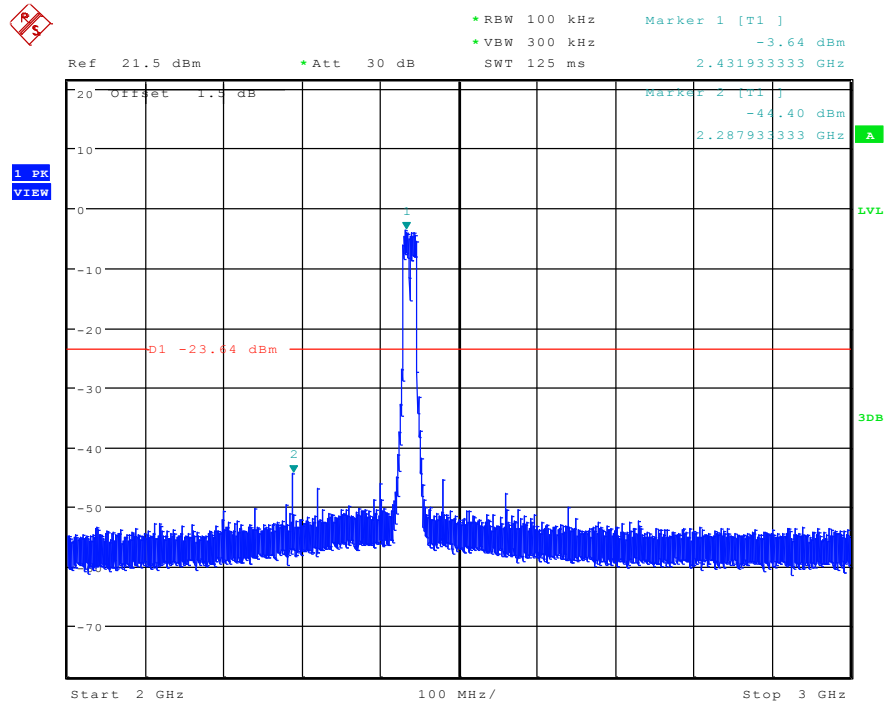
Test mode:	802.11g	Test channel:	Lowest
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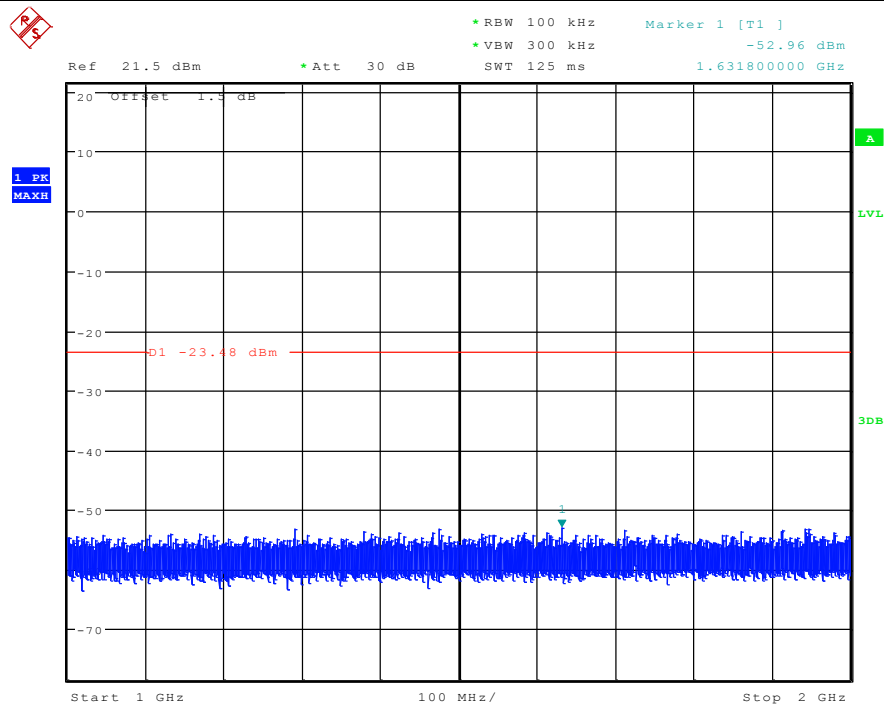
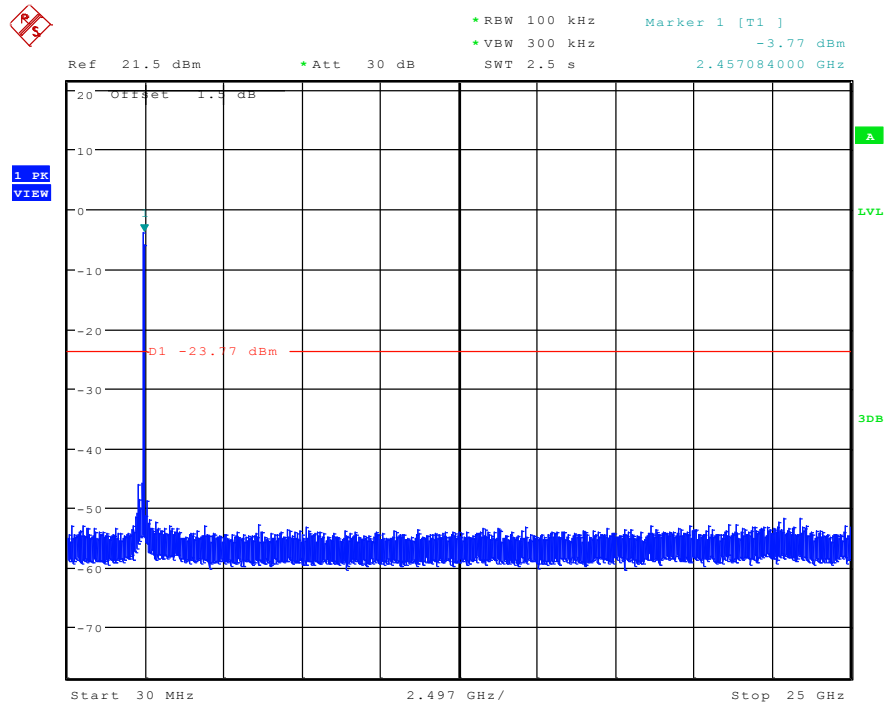


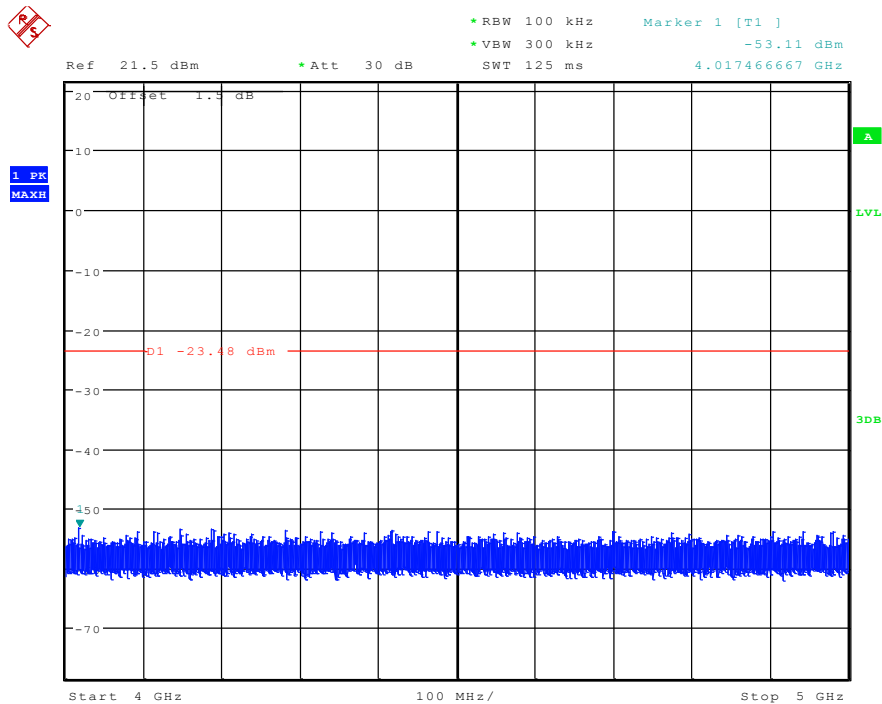
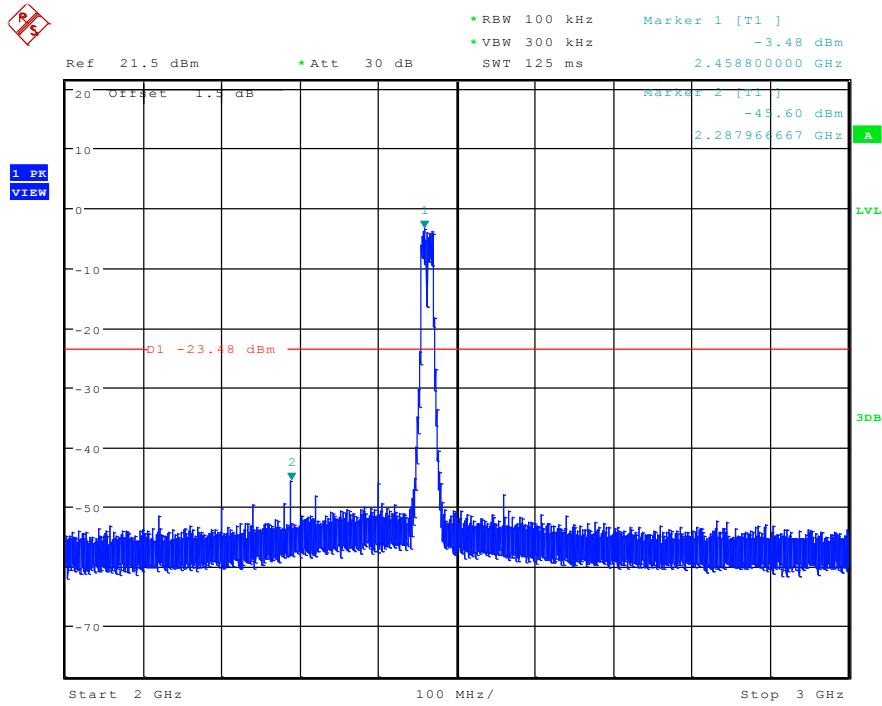
Test mode:	802.11g	Test channel:	Middle
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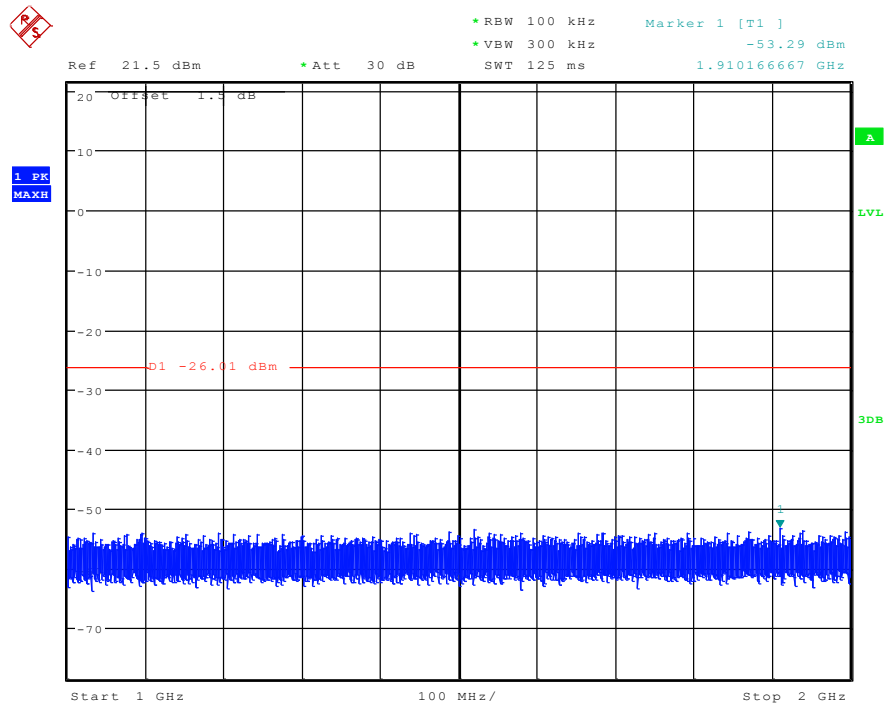
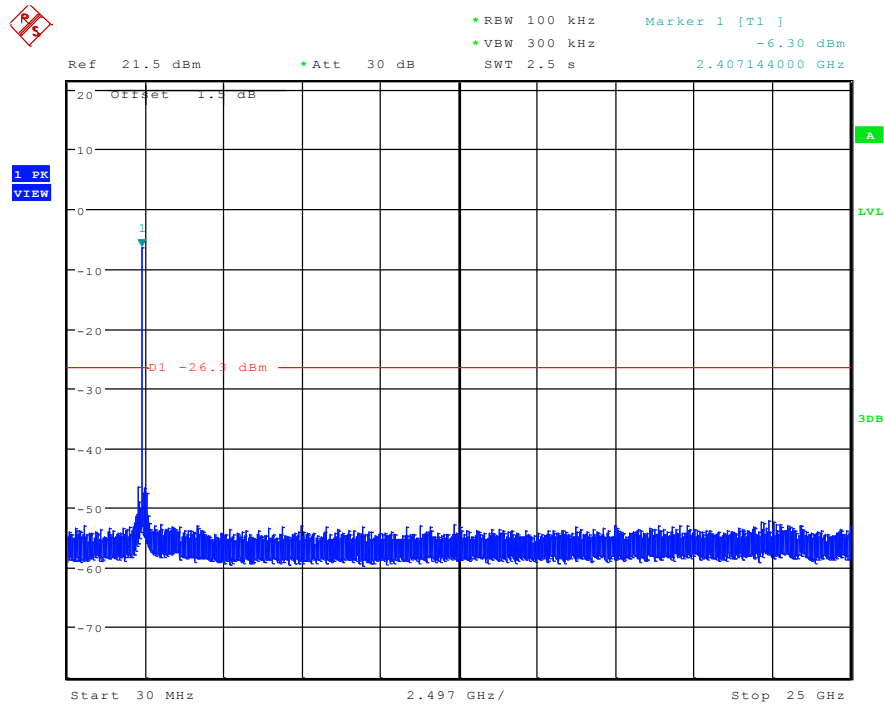


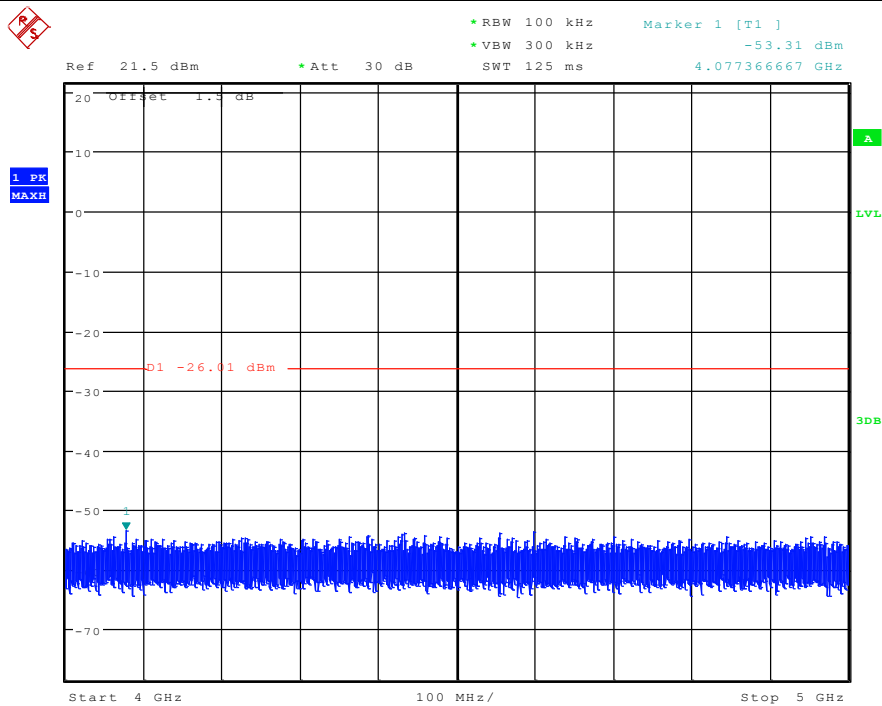
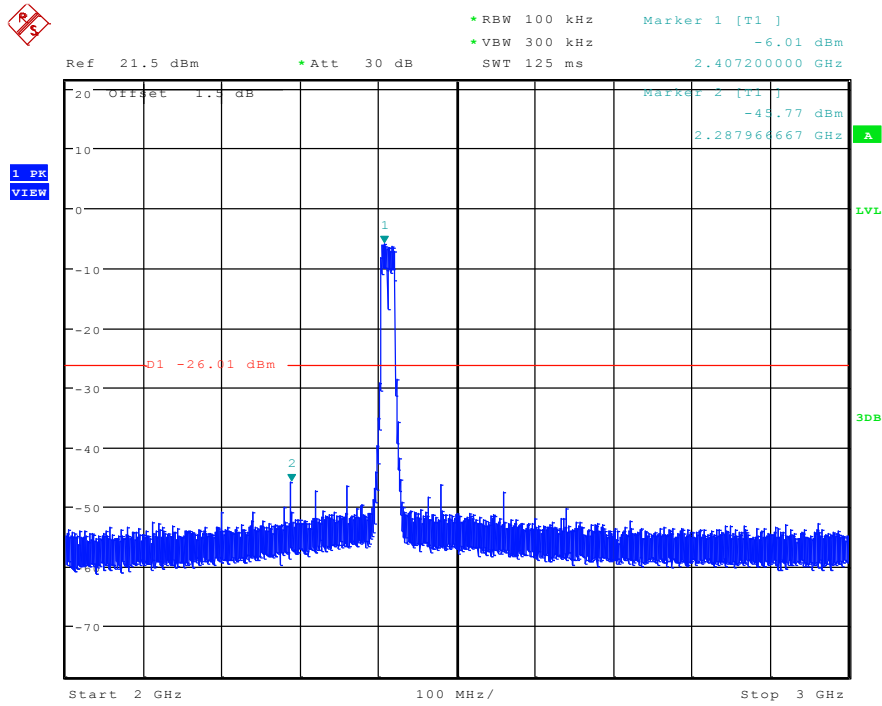
Test mode:	802.11g	Test channel:	Highest
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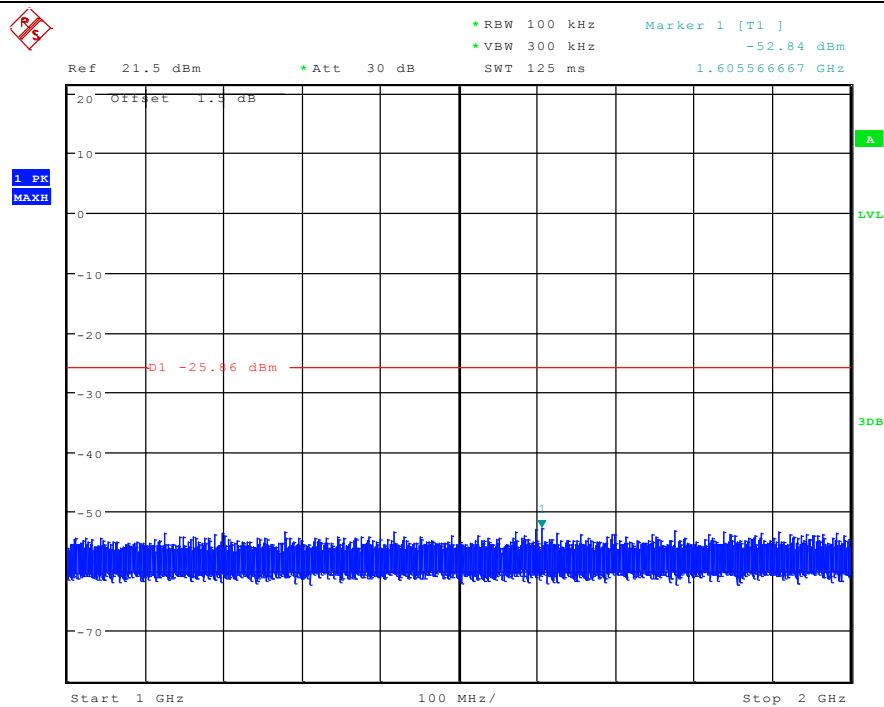
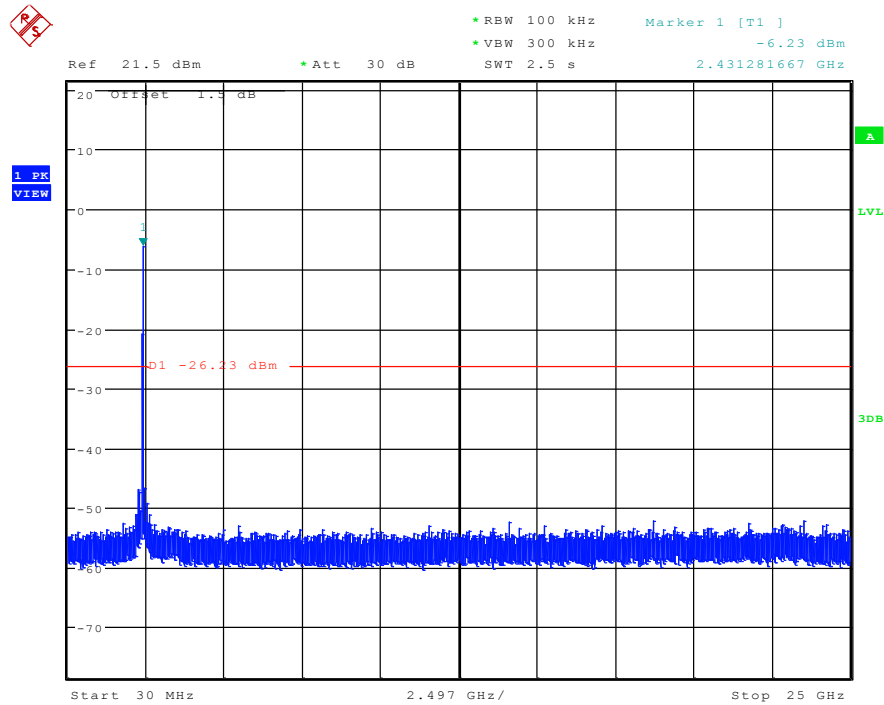
Test mode:	802.11n(HT20)	Test channel:	Lowest
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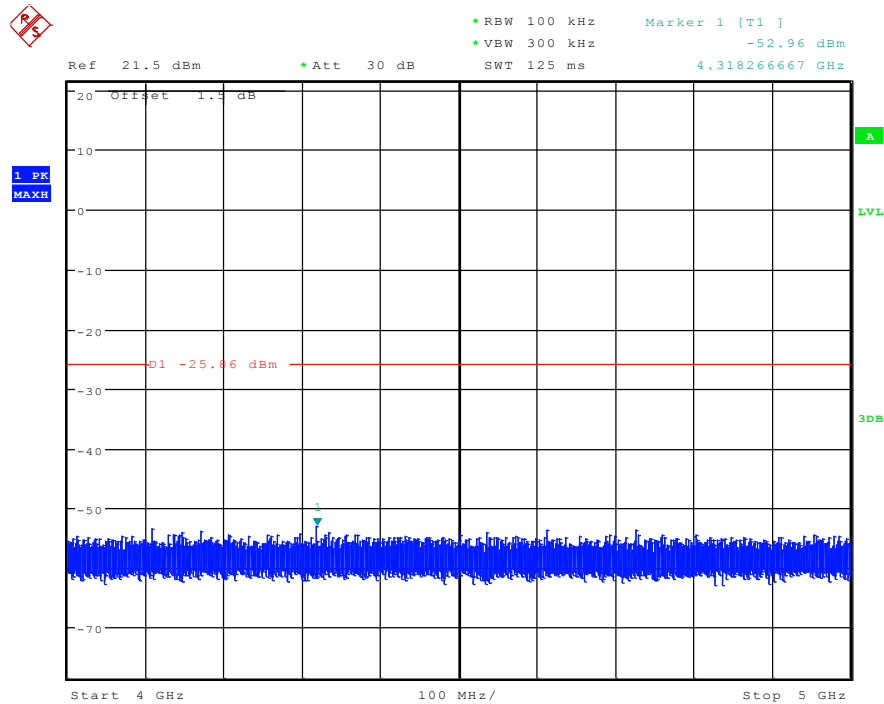
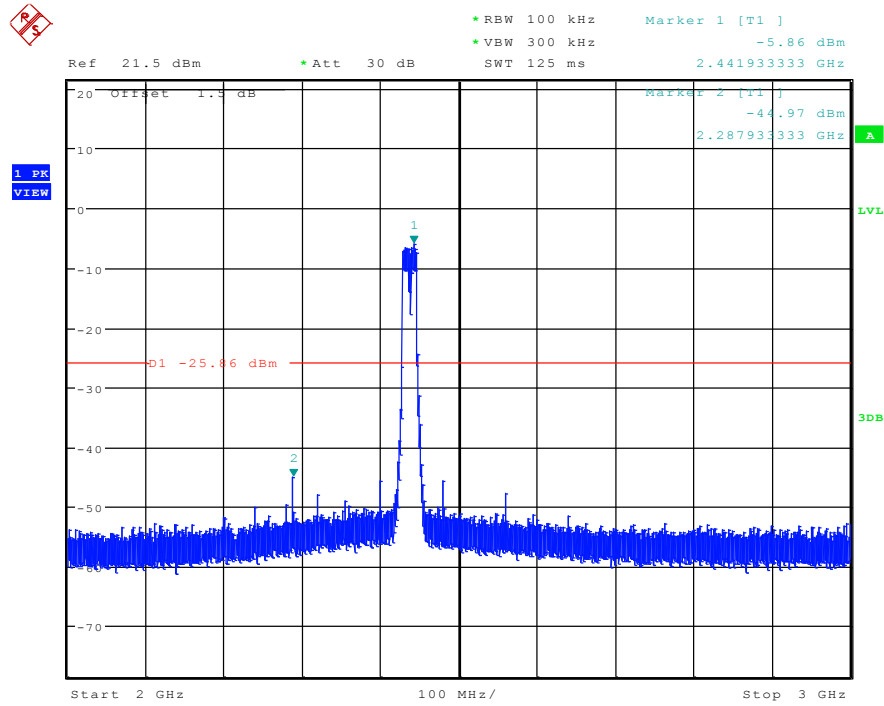




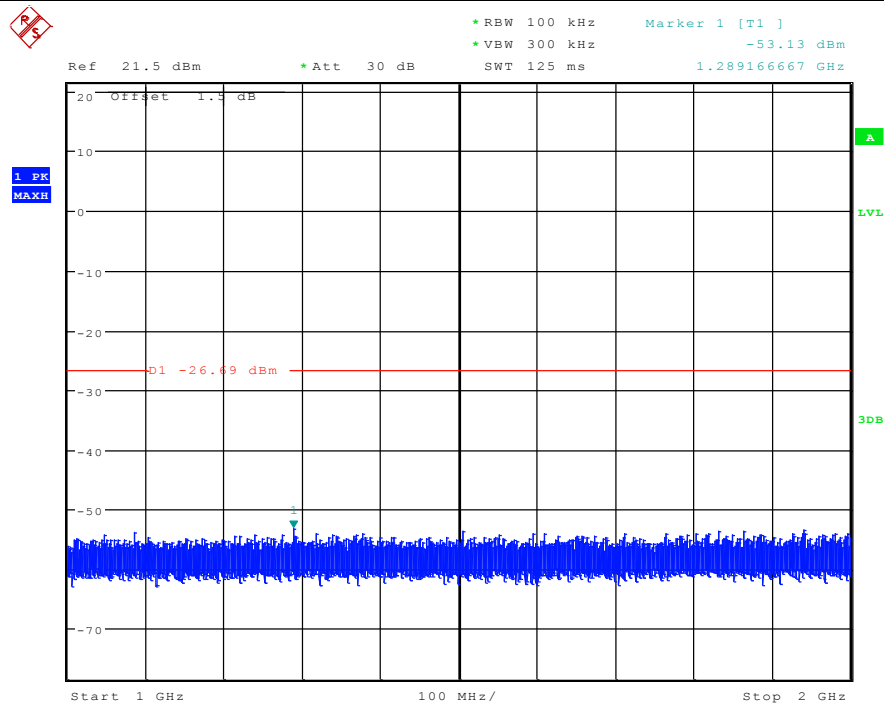
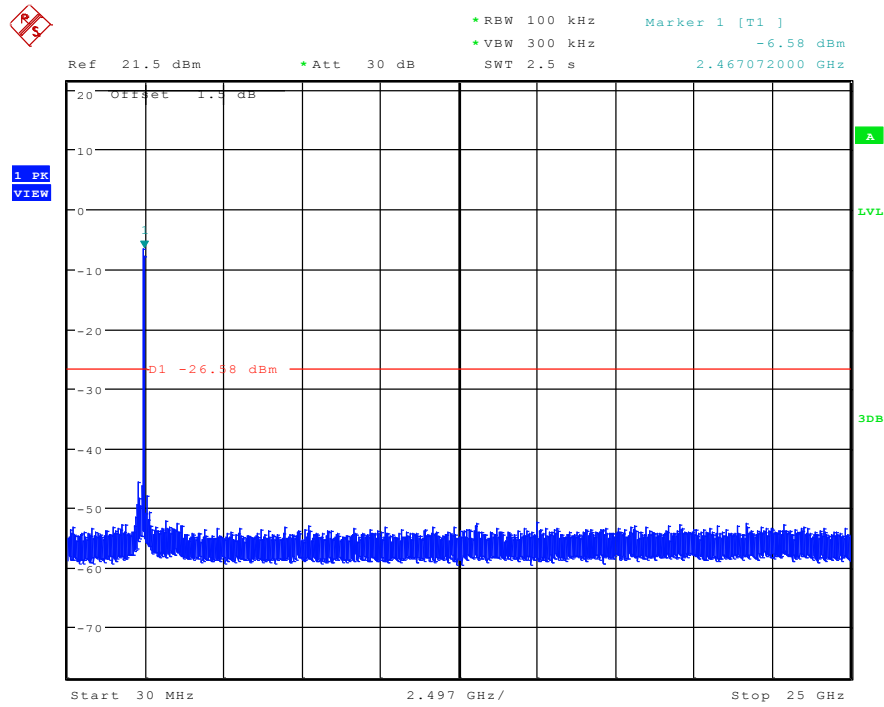


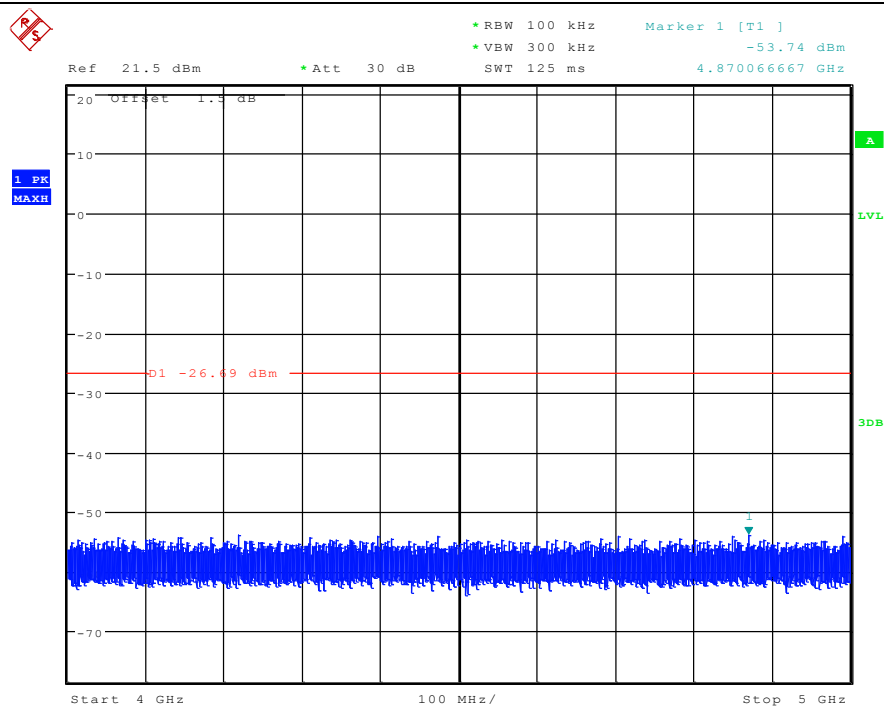
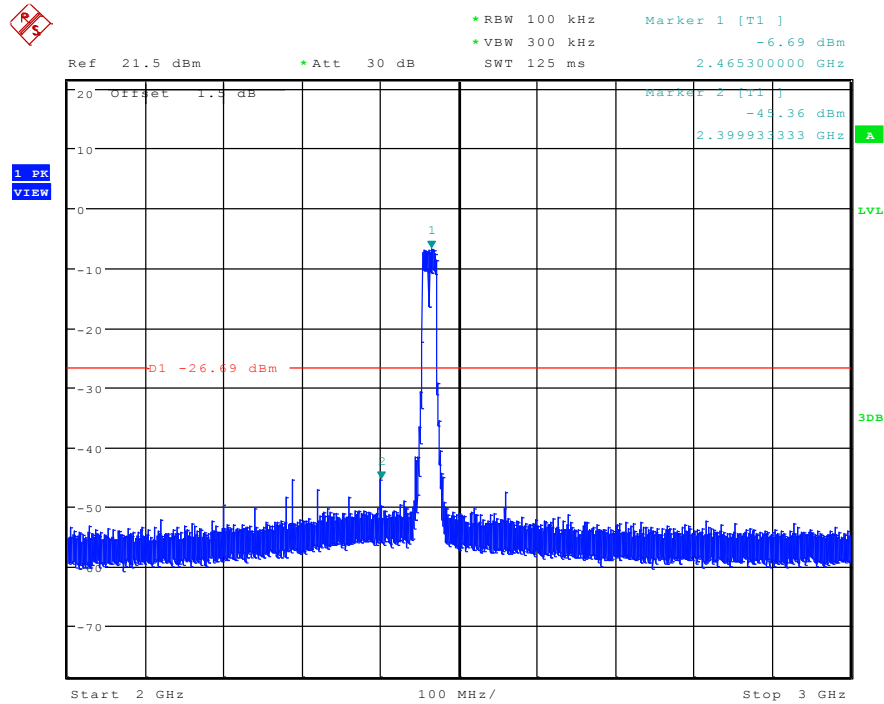
Test mode:	802.11n(HT20)	Test channel:	Middle
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Test mode:	802.11n(HT20)	Test channel:	Highest
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#### Remark:

Pretest 9kHz to 25GHz, find the highest point when testing, so only the worst data were shown in the test report. Per FCC Part 15.33 (a) and 15.31 (o) ,The amplitude of spurious emissions from intentional radiators which are attenuated more than 20 dB below the permissible value need not be reported unless specifically required elsewhere in this part.

## 6.8 Radiated Spurious Emissions

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205				
Test Method:	ANSI C63.10 2013				
Test Site:	Measurement Distance: 3m (Semi-Anechoic Chamber)				
Receiver Setup:	Frequency	Detector	RBW	VBW	Remark
	0.009MHz-0.090MHz	Peak	10kHz	30kHz	Peak
	0.009MHz-0.090MHz	Average	10kHz	30kHz	Average
	0.090MHz-0.110MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
	0.110MHz-0.490MHz	Peak	10kHz	30kHz	Peak
	0.110MHz-0.490MHz	Average	10kHz	30kHz	Average
	0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
	30MHz-1GHz	Quasi-peak	100 kHz	300kHz	Quasi-peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
		Peak	1MHz	10Hz	Average
Limit:	Frequency	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
	0.009MHz-0.490MHz	2400/F(kHz)	-	-	300
	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
	1.705MHz-30MHz	30	-	-	30
	30MHz-88MHz	100	40.0	Quasi-peak	3
	88MHz-216MHz	150	43.5	Quasi-peak	3
	216MHz-960MHz	200	46.0	Quasi-peak	3
	960MHz-1GHz	500	54.0	Quasi-peak	3
	Above 1GHz	500	54.0	Average	3
	Note: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.				

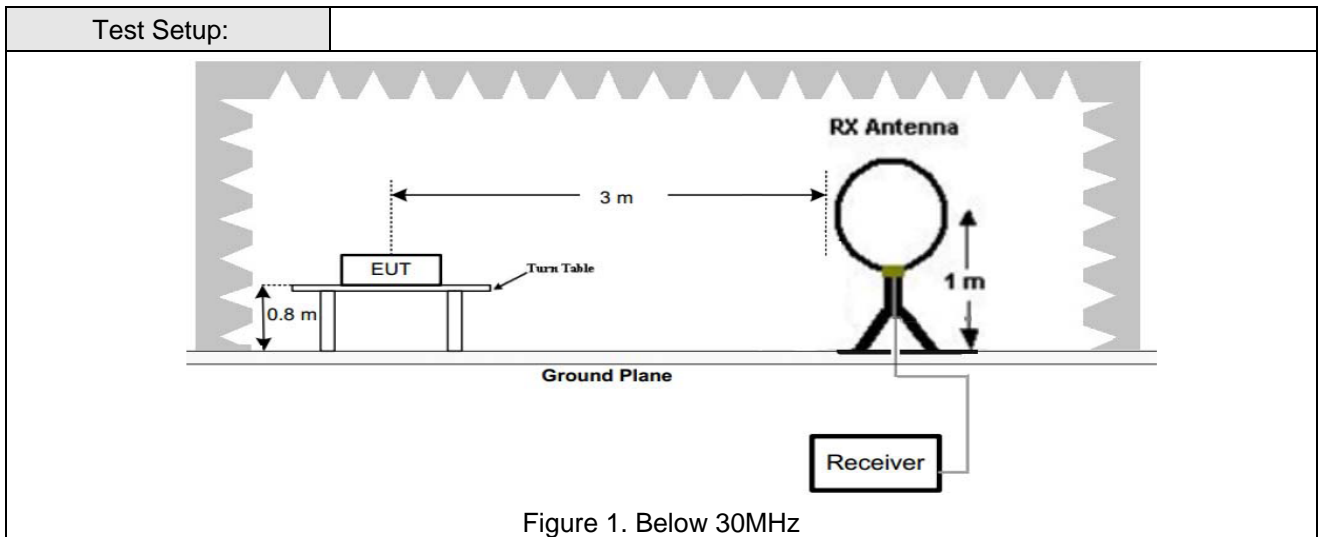


Figure 1. Below 30MHz

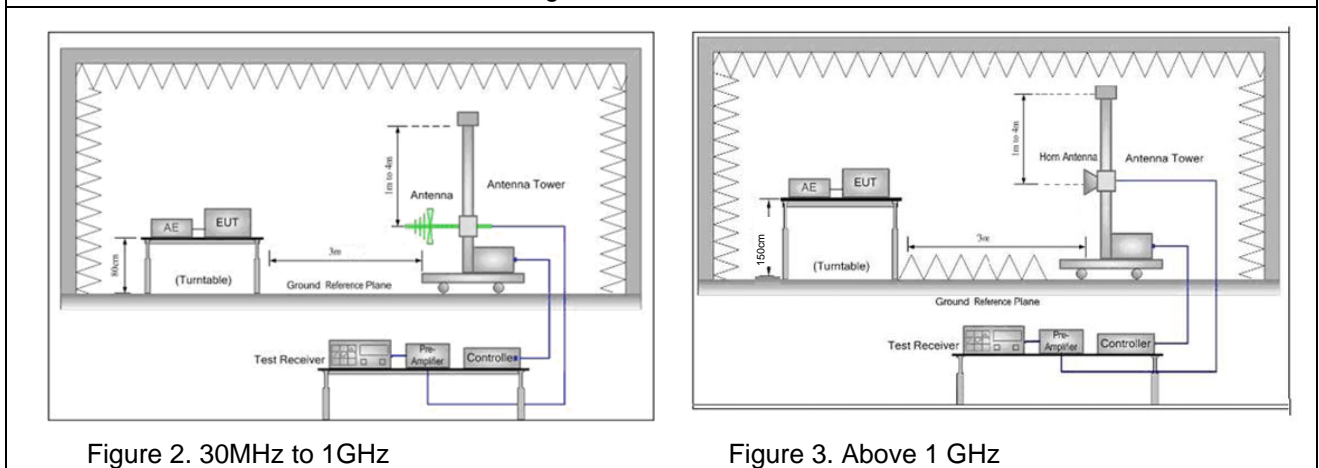


Figure 2. 30MHz to 1GHz

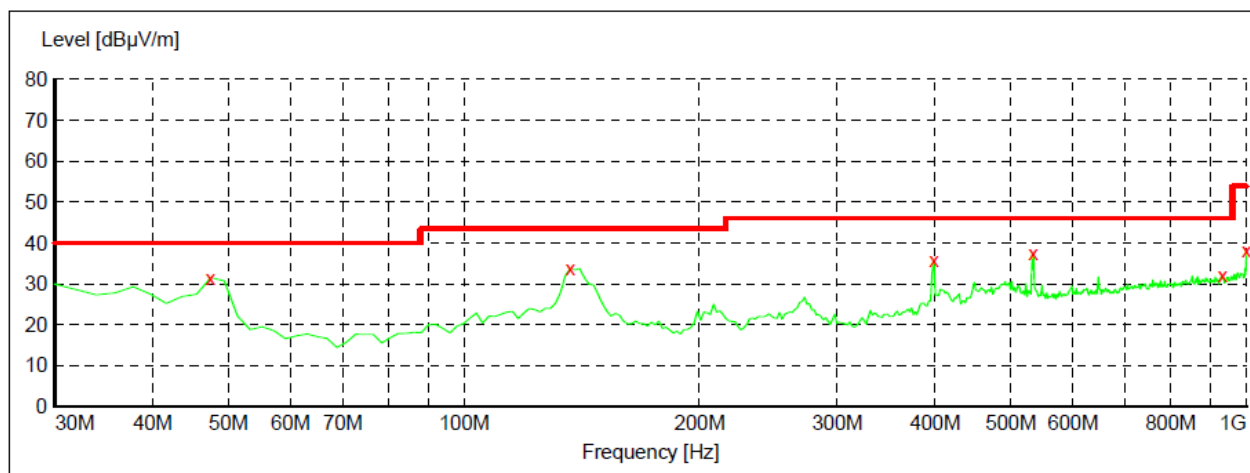
Figure 3. Above 1 GHz

<b>Test Procedure:</b>	<ol style="list-style-type: none"> <li>a. 1) Below 1G: The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.</li> <li style="padding-left: 20px;">2) Above 1G: The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.</li> <li style="padding-left: 20px;">Note: For the radiated emission test above 1GHz: Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.</li> <li>b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</li> <li>c. 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.</li> </ol>
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	<p>d. 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 (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.</p> <p>e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</p> <p>f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.</p> <p>g. Test the EUT in the lowest channel, the middle channel, the Highest channel</p> <p>h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.</p> <p>i. Repeat above procedures until all frequencies measured was complete.</p>
Exploratory Test Mode:	<p>Transmitting with all kind of modulations, data rates.</p> <p>Transmitting mode, Charge + Transmitting mode.</p>
Final Test Mode:	<p>Pretest the EUT at Transmitting mode, found the Transmitting mode which it is worse case</p> <p>Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g; 6.5Mbps of rate is the worst case of 802.11n(HT20).</p> <p>For below 1GHz, through Pre-scan, find the 1Mbps of rate of 802.11b at lowest channel is the worst case.</p> <p>Only the worst case is recorded in the report.</p>
Instruments Used:	Refer to section 5.10 for details
Test voltage	DC3.8V
Test Results:	Pass

### 6.8.1 Radiated emission below 1GHz

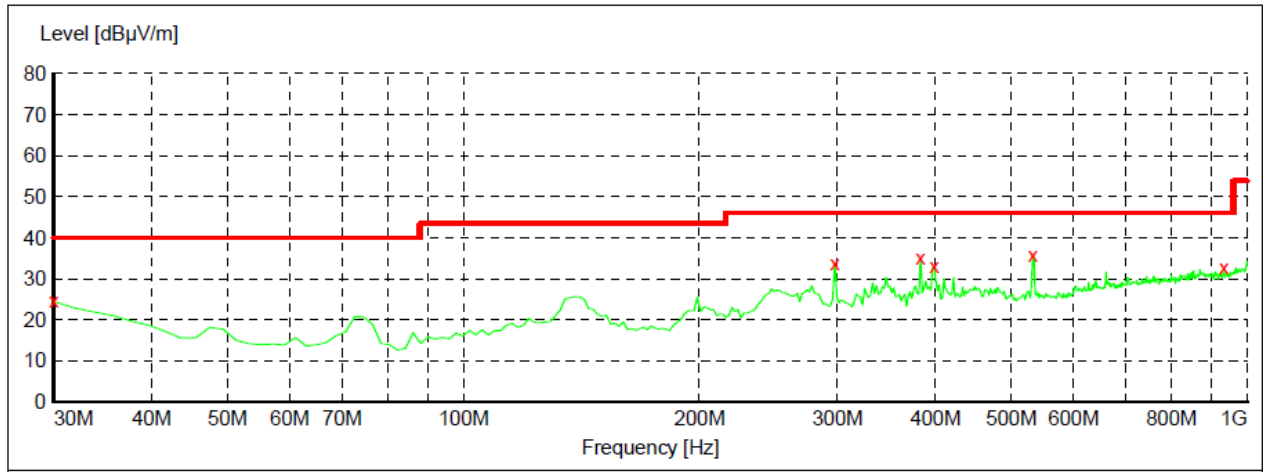
30MHz~1GHz (QP)		
Test mode:	Transmitting,802.11b(1Mbps), lowest channel	Vertical



Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB
47.460000	31.50	8.7	40.0	8.5
136.700000	33.70	14.4	43.5	9.8
398.600000	35.80	17.9	46.0	10.2
534.400000	37.60	20.5	46.0	8.4
932.100000	32.00	26.3	46.0	14.0
1000.000000	38.00	27.2	53.9	15.9



Test mode:	Transmitting,802.11b(1Mbps), lowest channel	Horizontal
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Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB
30.000000	24.50	20.8	40.0	15.5
297.720000	33.60	15.2	46.0	12.4
383.080000	35.10	17.7	46.0	10.9
398.600000	33.20	17.9	46.0	12.8
532.460000	35.90	20.5	46.0	10.1
934.040000	32.60	26.3	46.0	13.4

## 6.8.2 Transmitter emission above 1GHz

Test mode:		802.11b(1Mbps)		Test channel:		Lowest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
4824.101	50.83	-5.18	45.65	74	-28.35	peak	H
4824.101	36.79	-5.18	31.61	54	-22.39	AVG	H
7236.242	51.97	-6.45	45.52	74	-28.48	peak	H
7236.242	37.60	-6.45	31.15	54	-22.85	AVG	H
4824.012	54.07	-5.18	48.89	74	-25.11	peak	V
4824.012	38.46	-5.18	33.28	54	-20.72	AVG	V
7236.590	56.09	-6.45	49.64	74	-24.36	peak	V
7236.590	41.96	-6.45	35.51	54	-18.49	AVG	V

Test mode:		802.11b(1Mbps)		Test channel:		Middle	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
4874.017	49.71	-5.19	44.52	74	-29.48	peak	H
4874.017	36.51	-5.19	31.32	54	-22.68	AVG	H
7311.086	49.42	-6.47	42.95	74	-31.05	peak	H
7311.086	36.40	-6.47	29.93	54	-24.07	AVG	H
4874.365	49.95	-5.19	44.76	74	-29.24	peak	V
4874.365	37.54	-5.19	32.35	54	-21.65	AVG	V
7311.017	48.89	-6.47	42.42	74	-31.58	peak	V
7311.017	36.26	-6.47	29.79	54	-24.21	AVG	V

Test mode:		802.11b(1Mbps)		Test channel:		Highest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
4924.108	49.34	-5.2	44.14	74	-29.86	peak	H
4924.108	37.99	-5.2	32.79	54	-21.21	AVG	H
7386.436	50.03	-6.47	43.56	74	-30.44	peak	H
7386.436	37.97	-6.47	31.50	54	-22.50	AVG	H
4924.100	50.45	-5.2	45.25	74	-28.75	peak	V
4924.100	37.75	-5.2	32.55	54	-21.45	AVG	V
7386.214	49.78	-6.47	43.31	74	-30.69	peak	V
7386.214	37.28	-6.47	30.81	54	-23.19	AVG	V

Remark:

- 1) The 1Mbps of rate of 802.11b is the worst case.
- 2) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:  
Final Test Level =Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor
- 3) Scan from 9kHz to 25GHz,The disturbance above 13GHz and below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

## 6.9 Restricted bands around fundamental frequency

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205		
Test Method:	ANSI C63.10 2013		
Test Site:	Measurement Distance: 3m (Semi-Anechoic Chamber)		
Limit:	Frequency	Limit (dBuV/m @3m)	Remark
	30MHz-88MHz	40.0	Quasi-peak Value
	88MHz-216MHz	43.5	Quasi-peak Value
	216MHz-960MHz	46.0	Quasi-peak Value
	960MHz-1GHz	54.0	Quasi-peak Value
	Above 1GHz	54.0	Average Value
		74.0	Peak Value
Test Setup:			

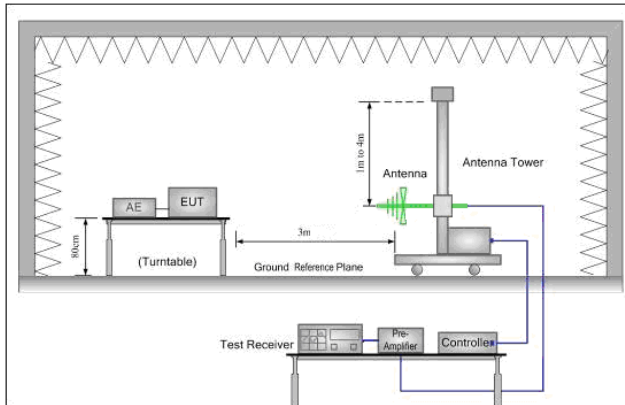


Figure 1. 30MHz to 1GHz

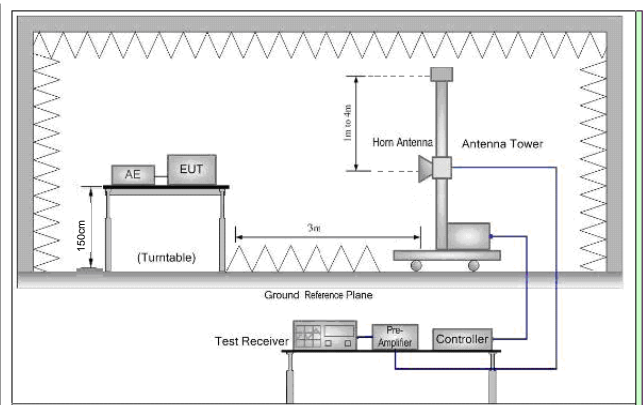


Figure 2. Above 1 GHz

### Test Procedure:

- Below 1G: The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
  - Above 1G: The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- Note: For the radiated emission test above 1GHz:  
Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
  - 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

	<p>measurement.</p> <p>d. 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.</p> <p>e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</p> <p>f. 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</p> <p>g. Test the EUT in the lowest channel , the Highest channel</p> <p>h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.</p> <p>i. Repeat above procedures until all frequencies measured was complete.</p>
Exploratory Mode:	<p>Test Transmitting with all kind of modulations, data rates.</p> <p>Transmitting mode, Charge + Transmitting mode.</p>
Final Test Mode:	<p>Pretest the EUT at Transmitting mode, found the Transmitting mode which it is worse case</p> <p>Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g ; 6.5Mbps of rate is the worst case of 802.11n(HT20).</p> <p>Only the worst case is recorded in the report.</p>
Instruments Used:	Refer to section 5.10 for details
Test Results:	Pass

**Test data:**

Worse case mode:		802.11b(1Mbps)		Test channel:		Lowest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
2390.000	49.07	-4.36	44.71	74	-29.29	peak	H
2390.000	35.78	-4.36	31.42	54	-22.58	AVG	H
2412.128	101.34	-4.37	96.97	74	22.97	peak	H
2412.128	88.22	-4.37	83.85	54	29.85	AVG	H
2390.000	48.79	-4.36	44.43	74	-29.57	peak	V
2390.000	34.66	-4.36	30.30	54	-23.70	AVG	V
2412.327	103.03	-4.37	98.66	74	24.66	peak	V
2413.327	86.08	-4.37	81.71	54	27.71	AVG	V

Worse case mode:		802.11b(1Mbps)		Test channel:		Highest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
2462.740	100.25	-4.19	96.06	74	22.06	peak	H
2462.740	86.35	-4.19	82.16	54	28.16	AVG	H
2483.500	52.41	-4.22	48.19	74	-25.81	peak	H
2483.500	36.26	-4.22	32.04	54	-21.96	AVG	H
2462.452	103.48	-4.19	99.29	74	25.29	peak	V
2462.452	86.54	-4.19	82.35	54	28.35	AVG	V
2483.500	51.54	-4.22	47.32	74	-26.68	peak	V
2483.500	37.73	-4.22	33.51	54	-20.49	AVG	V

Worse case mode:		802.11g(6Mbps)		Test channel:		Lowest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
2390.000	48.36	-4.36	44.00	74	-30.00	peak	H
2390.000	35.42	-4.36	31.06	54	-22.94	AVG	H
2412.893	99.93	-4.37	95.56	74	21.56	peak	H
2412.893	88.42	-4.37	84.05	54	30.05	AVG	H
2390.000	49.64	-4.36	45.28	74	-28.72	peak	V
2390.000	34.37	-4.36	30.01	54	-23.99	AVG	V
2413.192	102.05	-4.37	97.68	74	23.68	peak	V
2413.192	86.05	-4.37	81.68	54	27.68	AVG	V

Worse case mode:		802.11g(6Mbps)		Test channel:		Highest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
2461.781	99.93	-4.19	95.74	74	21.74	peak	H
2461.781	86.05	-4.19	81.86	54	27.86	AVG	H
2483.500	51.69	-4.22	47.47	74	-26.53	peak	H
2483.500	36.13	-4.22	31.91	54	-22.09	AVG	H
2462.023	102.32	-4.19	98.13	74	24.13	peak	V
2462.023	86.71	-4.19	82.52	54	28.52	AVG	V
2483.500	51.19	-4.22	46.97	74	-27.03	peak	V
2483.500	37.53	-4.22	33.31	54	-20.69	AVG	V

Worse case mode:		802.11n(HT20)(6.5Mbps)		Test channel:		Lowest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
2390.000	48.56	-4.36	44.20	74	-29.80	peak	H
2390.000	35.13	-4.36	30.77	54	-23.23	AVG	H
2412.523	99.00	-4.37	94.63	74	20.63	peak	H
2412.523	87.80	-4.37	83.43	54	29.43	AVG	H
2390.000	49.53	-4.36	45.17	74	-28.83	peak	V
2390.000	34.35	-4.36	29.99	54	-24.01	AVG	V
2412.426	101.95	-4.37	97.58	74	23.58	peak	V
2412.426	85.95	-4.37	81.58	54	27.58	AVG	V

Worse case mode:		802.11n(HT20)(6.5Mbps)		Test channel:		Highest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
2461.822	98.98	-4.19	94.79	74	20.79	peak	H
2461.822	86.25	-4.19	82.06	54	28.06	AVG	H
2483.500	51.97	-4.22	47.75	74	-26.25	peak	H
2483.500	35.47	-4.22	31.25	54	-22.75	AVG	H
2462.034	102.40	-4.19	98.21	74	24.21	peak	V
2462.034	85.95	-4.19	81.76	54	27.76	AVG	V
2483.500	51.41	-4.22	47.19	74	-26.81	peak	V
2483.500	37.13	-4.22	32.91	54	-21.09	AVG	V

Note:

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

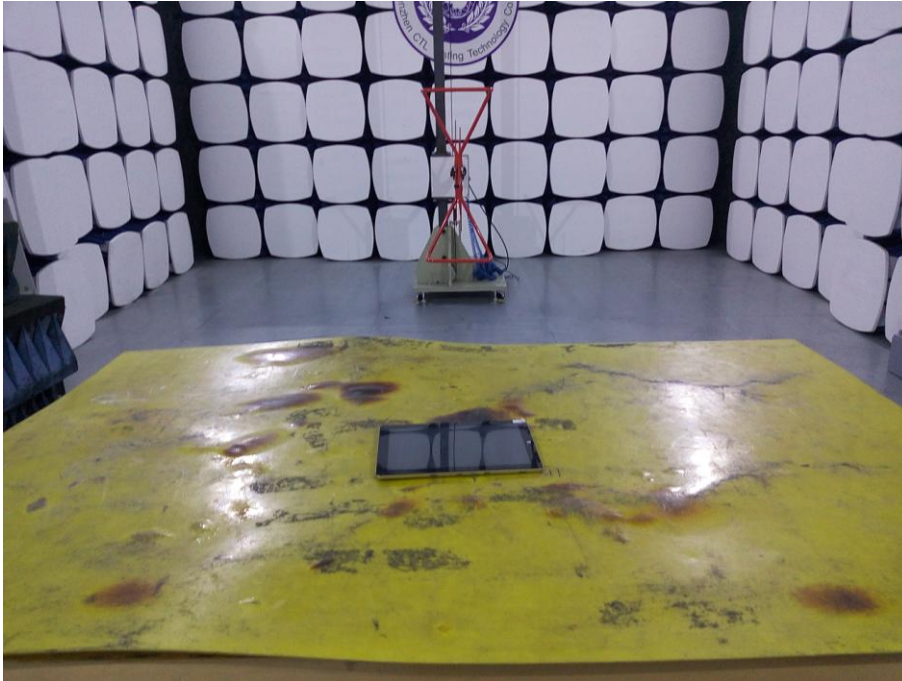
*Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor*



## 7 Photographs - EUT Test Setup

Test model No.: OBOOK10 DualOS

### 7.1 Radiated Spurious Emission



Below 1GHz: The EUT is placed in the 0.8 m high test table



Above 1GHz: Test height 1.5m, the styrofoam block placed in the 0.8 m high test table

## 7.2 Conducted Emission



## 8 Photographs - EUT Constructional Details

Refer to Photographs of EUT Constructional Details of CQASZ160501323E-01.