FCC 47 CFR PART 15 SUBPART C

TEST REPORT

For

Product Name: RoomCast
Brand Name: N/A
Model No.: TA-2400
Series Model.:N/A
FCC ID: 2ALWS-7CA2DH
Test Report Number:
C170411E01-RPW

Issued for

TeleAdapt UK Ltd

Axis 5, Rhodes Way Watford, Hertfordshire WD24 4YW, UK

Issued by

Compliance Certification Services Inc.

Kun shan Laboratory

No.10 Weiye Rd., Innovation park, Eco&Tec,
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TESTING CERT #2541.01

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Revision History

Rev.	Issue Date	Report NO.	Effect Page	Contents
00	May 27, 2017	C170411E01-RPW	ALL	N/A
01	June 21,2017	C170411E01-RPW	P8	Section 3.6 to explain the device meet the requirements of FCC section 15.203.

1. TEST RESULT CERTIFICATION

Product Name:	RoomCast
Trade Name:	N/A
Model Name.:	TA-2400
Series Model:	N/A
Applicant Discrepancy:	Initial
Device Category:	Mobile unit
Date of Test:	April 24, 2017 ~ May 26, 2017
Applicant:	**TeleAdapt UK Ltd** Axis 5, Rhodes Way Watford, Hertfordshire WD24 4YW, UK
Manufacturer:	**TeleAdapt UK Ltd** Axis 5, Rhodes Way Watford, Hertfordshire WD24 4YW, UK
Application Type:	Certification

APPLICABLE STANDARDS	
STANDARD	**TEST RESULT**
FCC 47 CFR Part 15 Subpart C	No non-compliance noted

We hereby certify that:

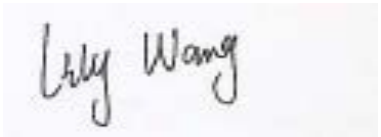
The above equipment was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10: 2013 and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 15.207, 15.209, 15.247.

The test results of this report relate only to the tested sample EUT identified in this report.

Approved by:

Jeff.Fang
RF Manager
Compliance Certification Service Inc.

Tested by:



Lily.Wang
Test Engineer
Compliance Certification Service Inc.

2. EUT DESCRIPTION

Product Name:	RoomCast
Brand Name:	N/A
Model Name:	TA-2400
Series Model:	N/A
Model Discrepancy:	N/A
Power Adapter:	Adapter 1: Model: CGSW30-120-2000II INPUT:100-240V~50/60Hz 0.8A OUTPUT:12V⎓2000mA Adapter 2: Model: SUN-1200200 INPUT:100-240V~50/60Hz 0.6A OUTPUT:12V⎓2.0A Adapter 3: Model: FJ-SW20181202000D INPUT:100-240V-50/60Hz 1.5A MAX OUTPUT:12V⎓2000mA
Frequency Range:	IEEE 802.11b/g: 2412MHz to 2462 MHz IEEE 802.11n HT20: 2412MHz to 2462 MHz
Average Transmit Power:	IEEE 802.11b mode: 18.48dBm IEEE 802.11g mode: 24.14 dBm IEEE 802.11n HT20 mode: 23.47dBm
Modulation Technique:	IEEE802.11b mode: DSSS (1,2,5.5 and 11 Mbps) IEEE802.11g mode: DSSS /OFDM (6,9,12,18,24,36,48 and 54 Mbps) IEEE802.11n HT20 mode: OFDM (MCS0~MCS7)
Number of Channels:	IEEE 802.11b/g mode: 11 Channels IEEE 802.11n HT20 : 11 Channels
Antenna Specification:	PIFA Antenna Gain: 2.0 dBi

Remark:

1.The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.

2.This submittal(s) (test report) is intended for ***FCC ID: 2ALWS-7CA2DH*** filing to comply with Section 15.207, 15.209 and 15.247 of the FCC Part 15, Subpart C Rules.

3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10 2013 and FCC CFR 47 15.207, 15.209 and 15.247.

3.1. EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

3.2. EUT EXERCISE

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.

According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.247 under the FCC Rules Part 15 Subpart C.

3.3. GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.10 2013 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

Radiated Emissions

Under 1GHz

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.10:2013.

Above 1GHz

The EUT is placed on a turn table, which is 1.5 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.10:2013.

3.4.FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS

Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	([2])
13.36 - 13.41			

[1] Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

[2] Above 38.6

Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

3.5.DESCRIPTION OF TEST MODES

The worst-case data rates:
IEEE802.11b mode:

Channel Low (2412MHz)

Channel Mid (2437MHz)

Channel High (2462MHz) with 1Mbps data rate was chosen for full testing.

IEEE802.11g mode:

Channel Low (2412MHz)

Channel Mid (2437MHz)

Channel High (2462MHz) with 6Mbps data rate was chosen for full testing.

IEEE 802.11n HT20 MHz Channel mode:

Channel Low (2412MHz)

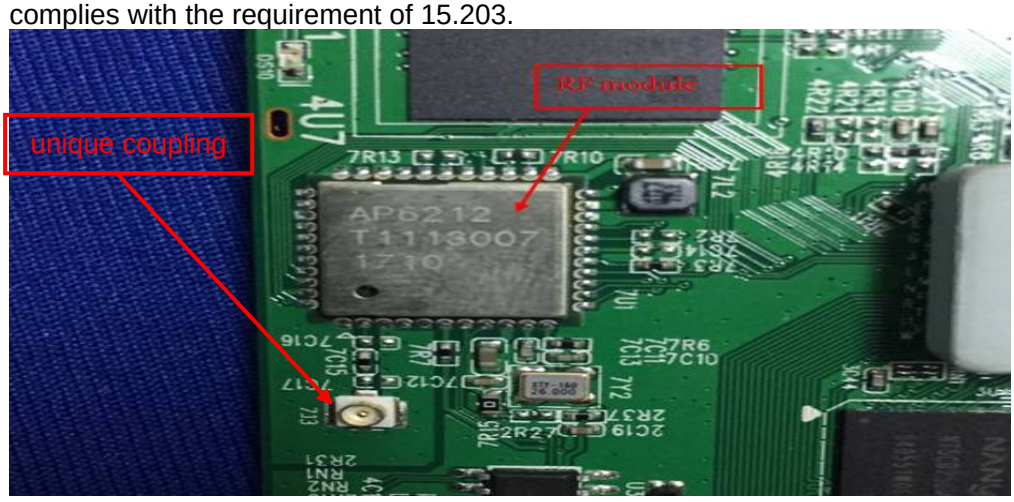
Channel Mid (2437MHz)

Channel High (2462MHz) with MCS0 data rate was chosen for full testing.

Note : After the preliminary san the EUT with Adapter 1 was the worst mode, which mode data was recorded.

3.6.ANTENNA DESCRIPTION

According to FCC 47 CFR 15.203
“an intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached or an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section”
As the photo below, the EUT use a unique coupling to the intentional radiator attached antenna, so the EUT complies with the requirement of 15.203.



4. INSTRUMENT CALIBRATION

4.1.MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

Equipment Used for Emissions Measurement

Conducted Emissions Test Site					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
Spectrum Analyzer	Agilent	E4446A	MY44020154	2016-9-10	2017-9-9
Spectrum Analyzer	RS	FSU26	200789	2016-7-21	2017-7-20
Power meter	Anritsu	ML2495A	1445010	2017-4-26	2018-4-25
Power sensor	Anritsu	MA2411B	1339220	2017-4-26	2018-4-25
Power SPLITTER	Mini-Circuits	ZN2PD-9G	SF078500430	N.C.R	N.C.R
DC Power Supply	AGILENT	E3632A	MY50340053	N.C.R	N.C.R
Temp. / Humidity Gauge	Anymetre	TH603	CCS007	2016-11-1	2017-10-31
Test Software			EZ-EMC		

977 Chamber					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
Spectrum Analyzer	Agilent	E4446A	MY44020154	2016-9-10	2017-9-9
Spectrum Analyzer	RS	FSU26	200789	2016-7-21	2017-7-20
EMI Test Receiver	R&S	ESCI	101378	2017-1-5	2018-1-4
Pre-Amplfier	MINI	ZFL-1000VH2	070306	2017-1-5	2018-1-4
Pre-Amplfier	Miteq	JS41-00101800-32-10P	1675713	2016-7-21	2017-7-20
Bilog Antenna	Sunol	JB1	A062604	2016-5-29	2017-5-28
Bilog Antenna	Sunol	JB1	A110204-1	2016-5-29	2017-5-28
Loop Antenna	SCHWARZBECK	HXYZ9170	9170-108	2017-3-4	2018-3-3
Horn-antenna	SCHWARZBECK	9120D	D:266	2017-3-5	2018-3-4
Horn-antenna	SCHWARZBECK	9120D	D:267	2016-11-10	2017-11-9
Turn Table	CT	CT123	4165	N.C.R	N.C.R
Antenna Tower	CT	CTERG23	3256	N.C.R	N.C.R
Controller	CT	CT1OO	95637	N.C.R	N.C.R
Test Software			EZ-EMC		

Conducted Emission					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
EMI TEST RECEIVER	R&S	ESCI	100781	2017-2-28	2018-2-27
V (V-LISN)	SCHWARZBECK	NNLK 8129	8129-143	2016-11-1	2017-10-31
TWO-LINE V-NETWORK	R&S	ENV216	101604	2016-11-1	2017-10-31
Pulse LIMITER	R&S	ESH3-Z2	100524	2017-1-5	2018-1-4
Test Software			EZ-EMC		

Remark: *The measurement uncertainty is less than +/- 2.81dB, which is evaluated as per the NAMAS NIS 81 and CISPR/A/291/CDV.*

Expanded Uncertainty (95% CONFIDENCE INTERVAL): K=2

5. FACILITIES AND ACCREDITATIONS

5.1. FACILITIES

All measurement facilities used to collect the measurement data are located at
CCS China Kunshan Lab at 10#Weiye Rd, Innovation Park Eco. & Tec. Development Zone

Kunshan city JiangSu, (215300), CHINA.

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.10 2013 and CISPR Publication 22.

5.2. EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, “Radio Interference Measuring Apparatus and Measurement Methods.”

5.3. LABORATORY ACCREDITATIONS AND LISTING

The test facilities used to perform radiated and conducted emissions tests are accredited by American Association for Laboratory Accreditation Program for the specific scope accreditation under Lab Code: 200581-0 to perform Electromagnetic Interference tests according to FCC Part 15 and CISPR 22 requirements. In addition, the test facilities are listed with USA, Certification and Engineering Bureau, 424105 for 10m chamber, 238958 for 3m chamber.

5.4.TABLE OF ACCREDITATIONS AND LISTINGS

Country	Agency	Scope of Accreditation	Logo
USA	A2LA	47 CFR FCC Part 15/18 (using ANSI C63.10 :2013)；VCCI V3; CNS 13438; CNS 13439; CNS 13803; CISPR 11; EN 55011; CISPR 13; EN 55013; CISPR 22:2005; CISPR 22:1997 +A1 :2000+A2 :2002；EN 55022:2006; EN55022 :1998 +A1 :2001+A2 :2003；EN 61000-6-3 (excluding discontinuous interference); EN 61000-6-4; AS/NZS CISPR 22； CAN/CSA-CEI/IEC CISPR 22；EN 61000-3-2；EN 61000-3-3；EN550024； EN 61000-4-2； EN 61000-4-3；EN61000-4-4；EN 61000-4-5； EN 61000-4-6；IEC 61000-4-8；EN 61000-4-11； IEC61000-3-2；IEC61000-3-3；IEC 61000-4-2； IEC 61000-4-3；IEC 61000-4-4； IEC 61000-4-5；IEC 61000-4-6；IEC 61000-4-8；IEC 61000-4-11； EN 300 220-3; EN 300 328; EN 300 330-2; EN 300 440-1; EN 300-440-2; EN 300 893; EN 301 489-01; EN 301 489-3; EN 301 489-07; EN 301 489-17；47 CFR FCC Part 15, 22, 24	A2LA ACCREDITED TESTING CERT #2541.01
USA	FCC	3/10 meter Sites to perform FCC Part 15/18 measurements	93105, 90471
Japan	VCCI	3/10 meter Sites and conducted test sites to perform radiated/conducted measurements	VCCI R-1600 C-1707 G-216

** No part of this report may be used to claim or imply product endorsement by A2LA or any agency of the US Government.*

6. SETUP OF EQUIPMENT UNDER TEST

6.1.SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

6.2.SUPPORT EQUIPMENT

No.	Device Type	Brand	Model	Series No.	FCC ID
1.	Flat Panel Monitor	DELL	U2913WMt	CN-05YD8C-74445-5CB-390L	N/A

Remark:

2. *All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.*
3. *Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.*

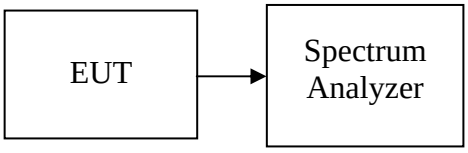
7. FCC PART 15.247 REQUIREMENTS

7.1.6DB BANDWIDTH

LIMIT

According to §15.247(a)(2), systems using digital modulation techniques may operate in the 902 - 928 MHz, and 2400 - 2483.5 MHz bands, and 5725 - 5850 MHz bands. The minimum 6dB bandwidth shall be at least 500kHz.

Test Configuration



TEST PROCEDURE

Set the spectrum analyzer as RBW = 100 kHz, VBW = 300 kHz, Sweep = auto couple.

TEST RESULTS

No non-compliance noted

Test Data

IEEE 802.11b mode

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	10.000	>500	PASS
Mid	2437	10.048		PASS
High	2462	10.048		PASS

IEEE 802.11g mode

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	16.298	>500	PASS
Mid	2437	16.346		PASS
High	2462	16.346		PASS

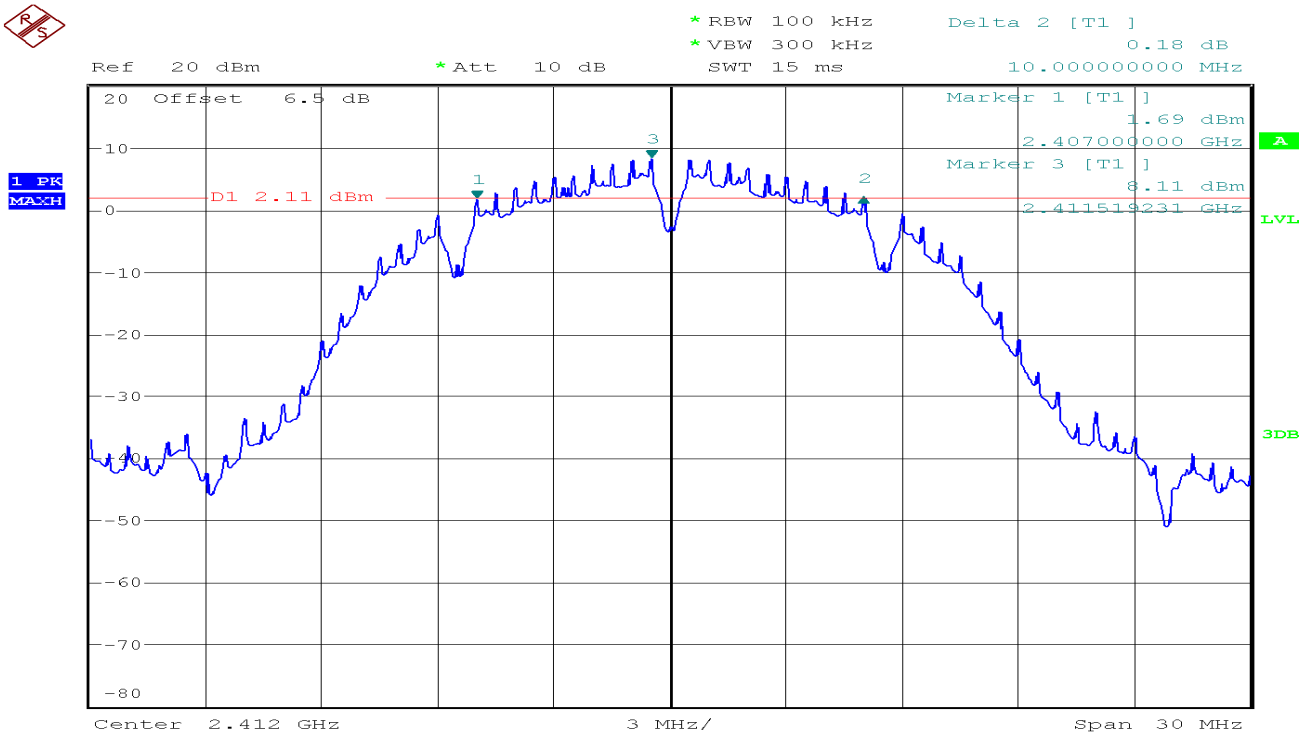
IEEE 802.11n HT20 mode

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	17.596	>500	PASS
Mid	2437	17.548		PASS
High	2462	17.596		PASS

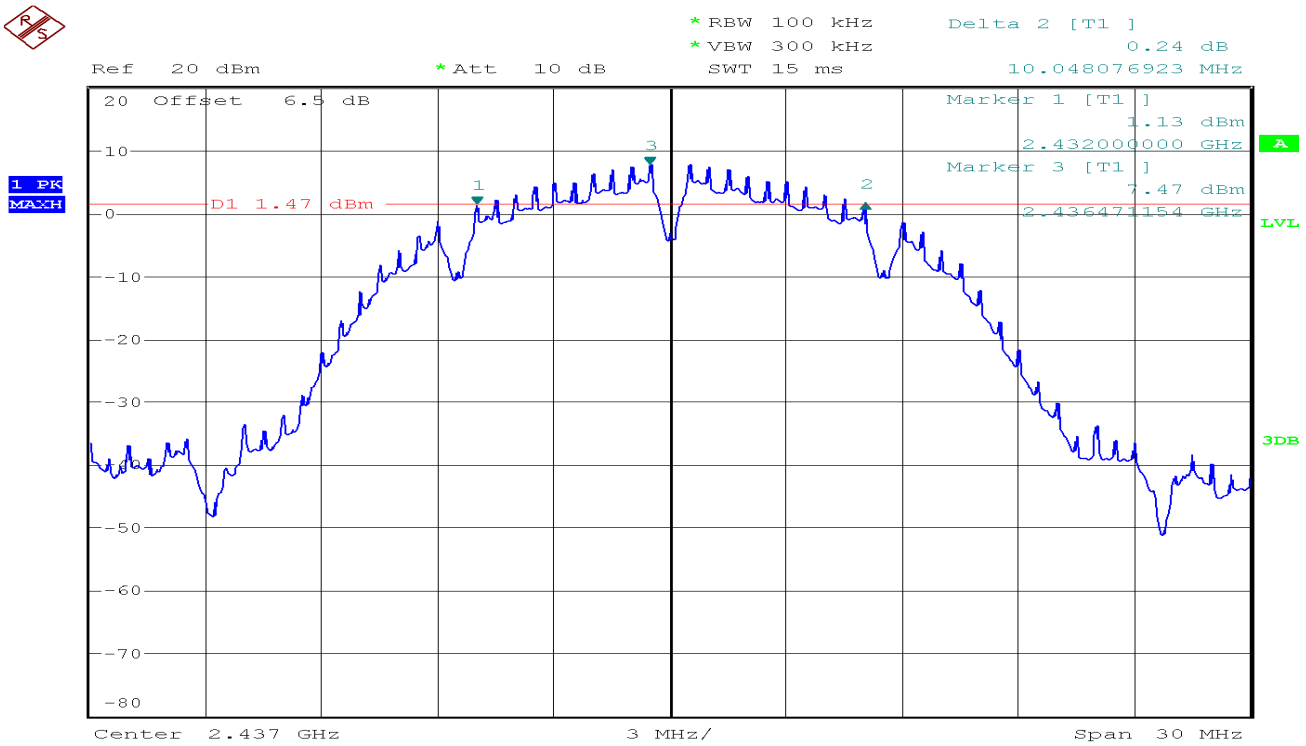
Test Plot

IEEE 802.11b MODE

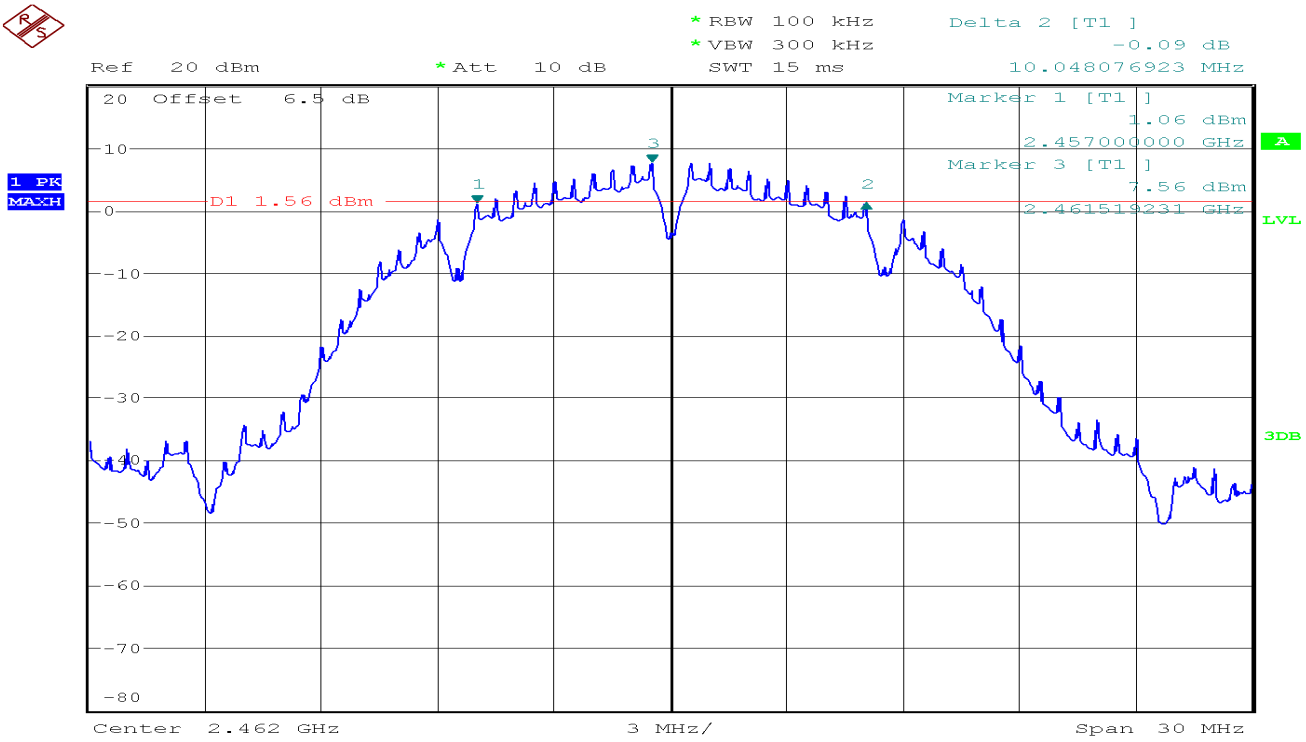
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)

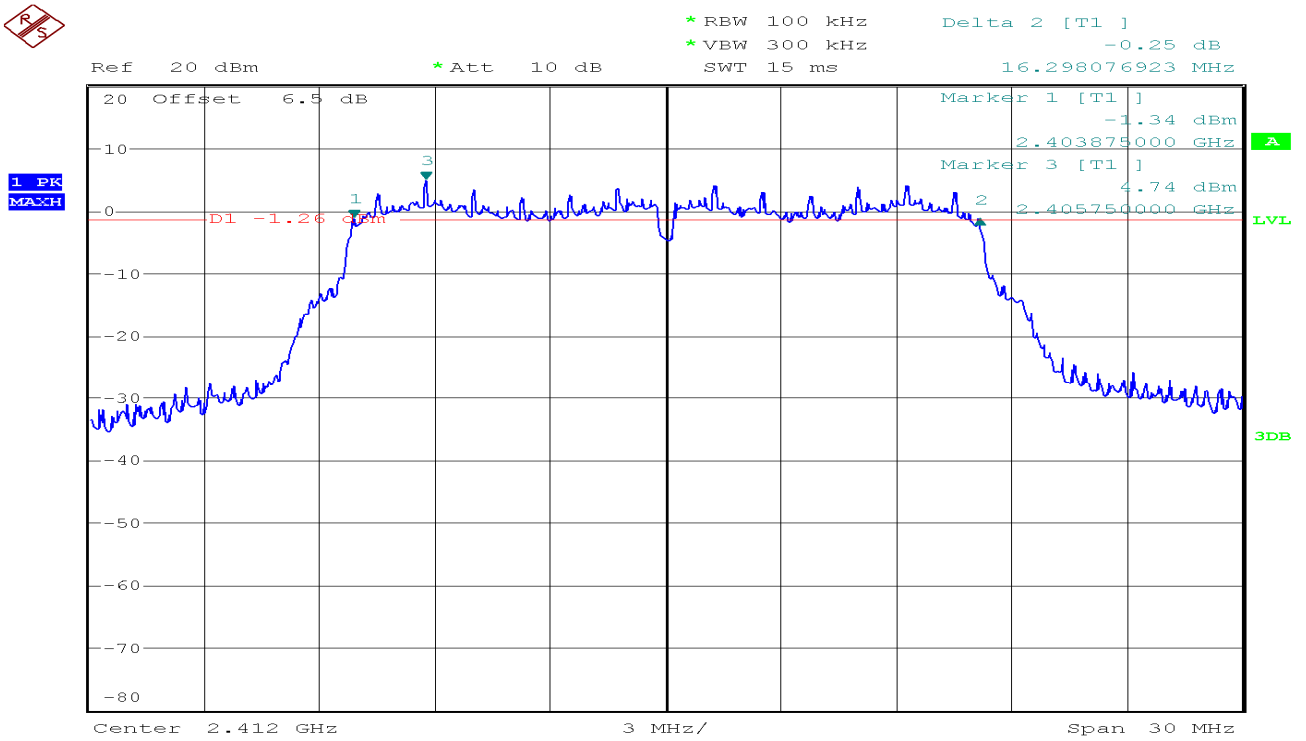


6dB Bandwidth (CH High)

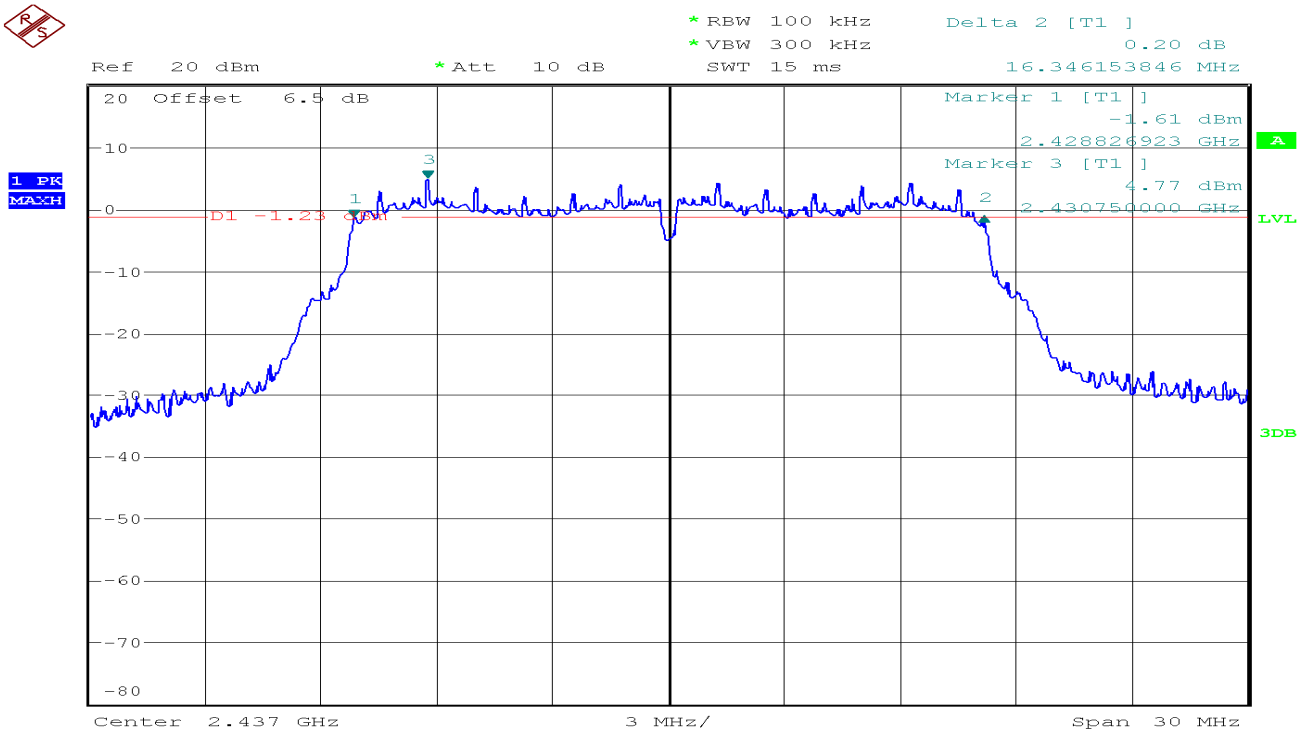


IEEE 802.11g MODE

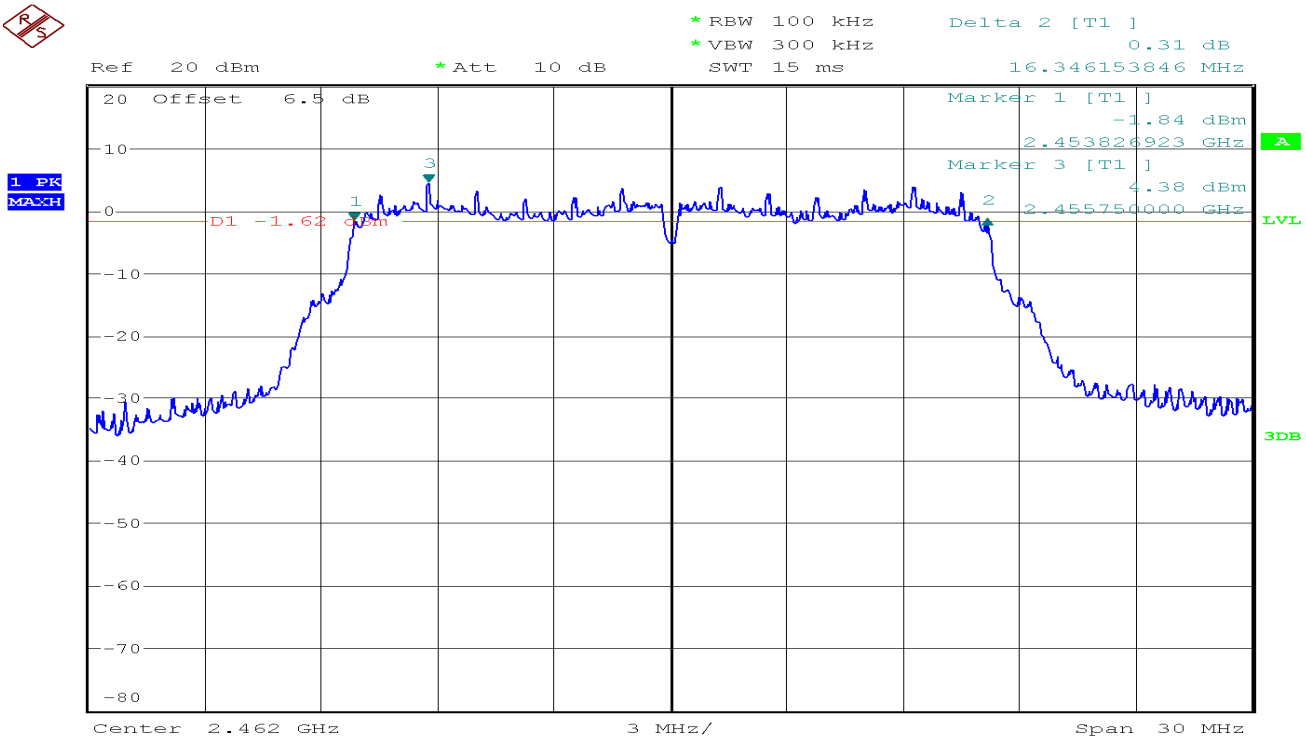
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)

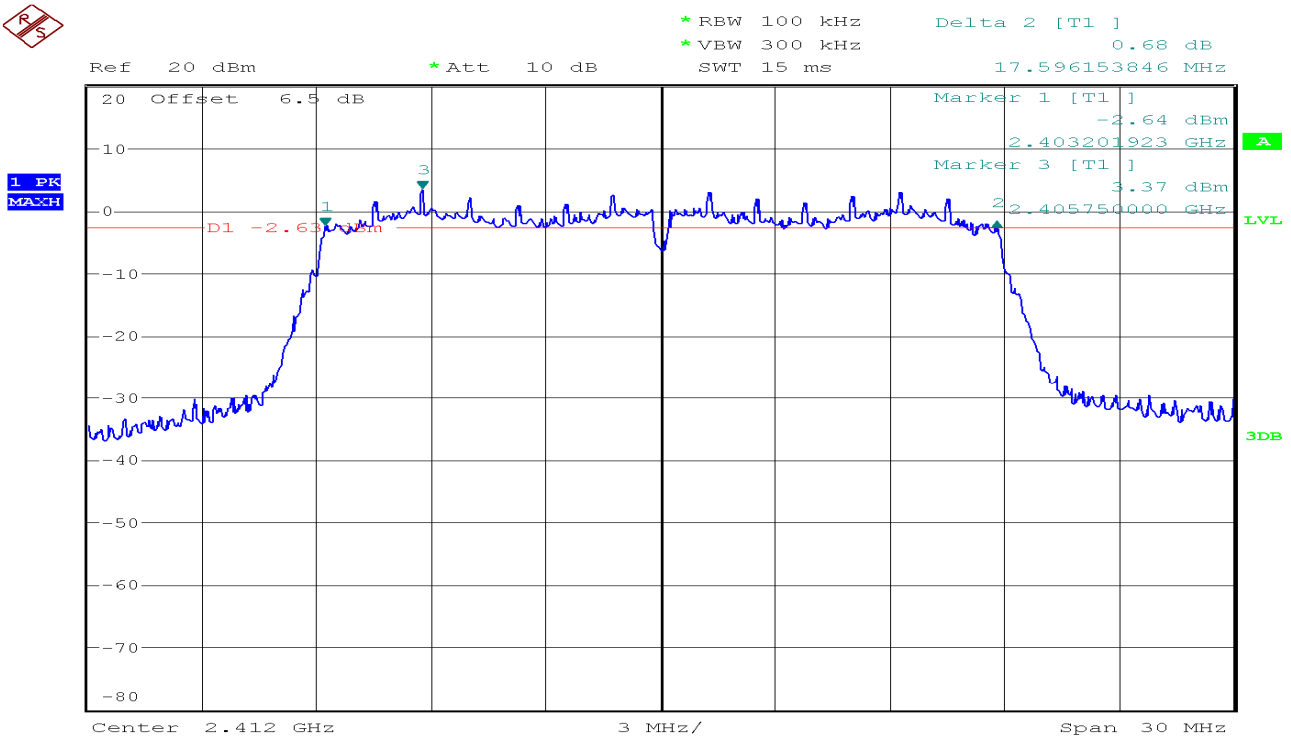


6dB Bandwidth (CH High)

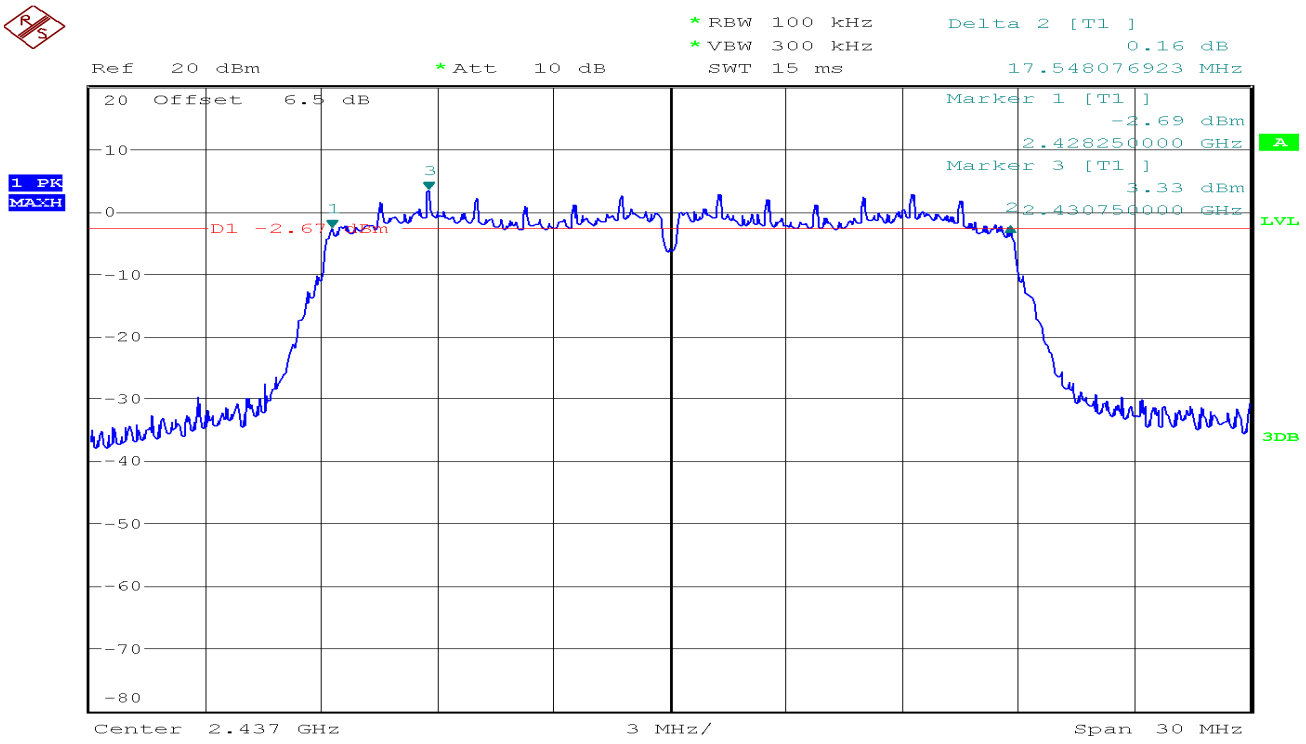


IEEE 802.11n HT20 mode

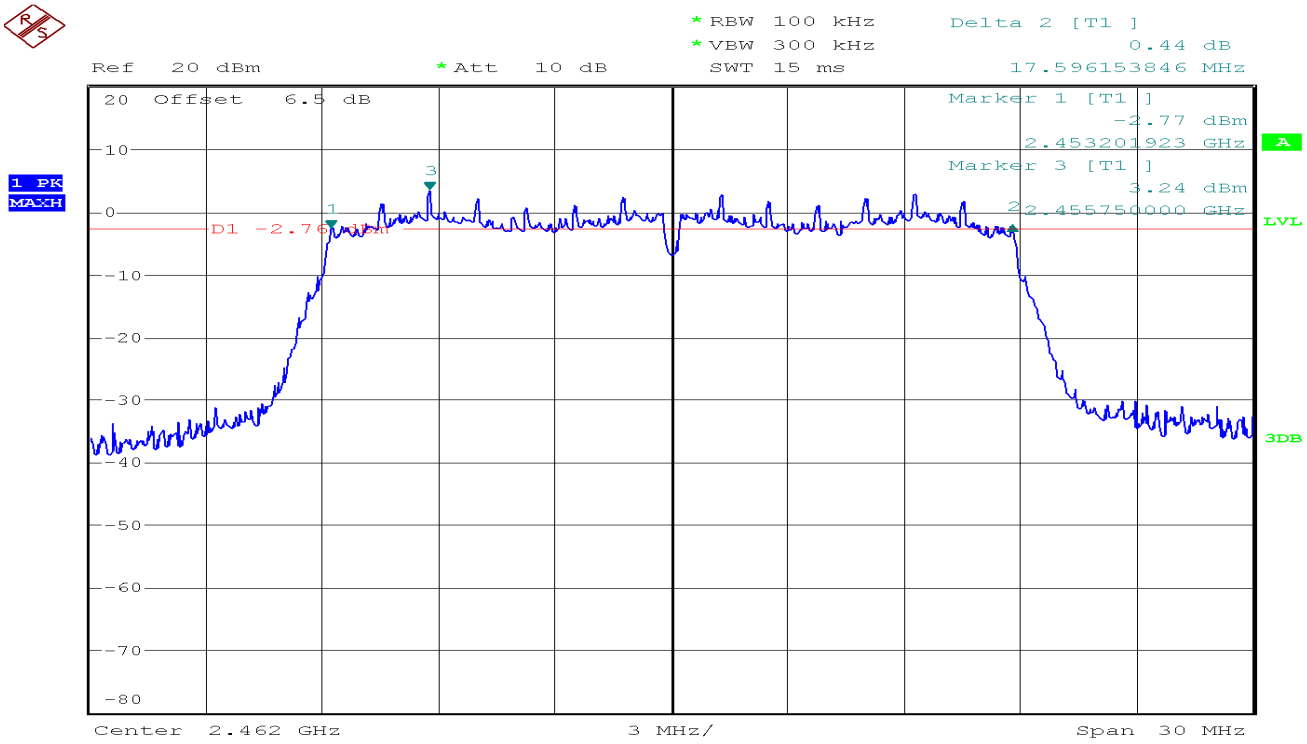
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)



6dB Bandwidth (CH High)



7.2.PEAK POWER

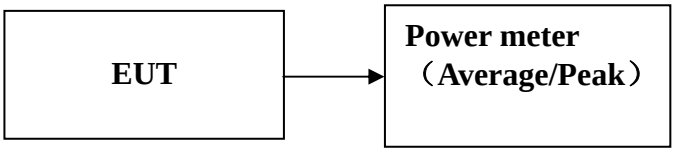
LIMIT

The maximum peak output power of the intentional radiator shall not exceed the following:

1.According to §15.247(b)(3), for systems using digital modulation in the bands of 902-928 MHz, and 2400-2483.5 MHz: 1 Watt.

2.According to §15.247(b)(4), 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.

Test Configuration



TEST PROCEDURE

1. The EUT transmitter output is connected to the Power meter.
   The Power meter is set to the peak power detection.
2. The testing follows the Measurement Procedure FCC KDB No. 558074 D01 DTS Meas. Guidance v04. 9.1.3 PKPM1 Peak-reading power meter method.

TEST RESULTS

No non-compliance noted

Test Data

Test mode: IEEE 802.11b mode

Channel	Frequency (MHz)	Peak Output Power (dBm)	Limit (dBm)
Low	2412	18.33	30.00
Mid	2437	18.48	30.00
High	2462	18.36	30.00

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	Peak Output Power (dBm)	Limit (dBm)
Low	2412	24.07	30.00
Mid	2437	24.14	30.00
High	2462	24.11	30.00

Test mode: IEEE 802.11n HT20 mode

Channel	Frequency (MHz)	Peak Output Power (dBm)	Limit (dBm)
Low	2412	23.36	30.00
Mid	2437	23.47	30.00
High	2462	23.46	30.00

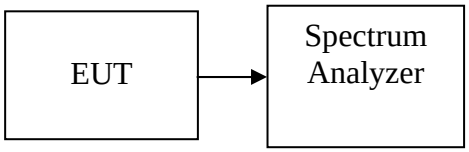
7.3.PEAK POWER SPECTRAL DENSITY

LIMIT

1.According to §15.247(e), 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.

2.According to §15.247(f), the digital modulation operation of the hybrid system, with the frequency hopping turned off, shall comply with the power density requirements of paragraph (d) of this section.

Test Configuration



TEST PROCEDURE

1.Place the EUT on the table and set it in transmitting mode.
Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

2.Set the spectrum analyzer as RBW = 3 kHz, VBW = 10 kHz, Span = 1.5 times the DTS bandwidth, Sweep = auto

3.Record the max reading.

4.Repeat the above procedure until the measurements for all frequencies are completed.

TEST RESULTS

No non-compliance noted

Test Data

Test mode: IEEE 802.11b mode

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-6.64	8.00	PASS
Mid	2437	-7.19	8.00	PASS
High	2462	-6.39	8.00	PASS

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-10.40	8.00	PASS
Mid	2437	-9.54	8.00	PASS
High	2462	-9.43	8.00	PASS

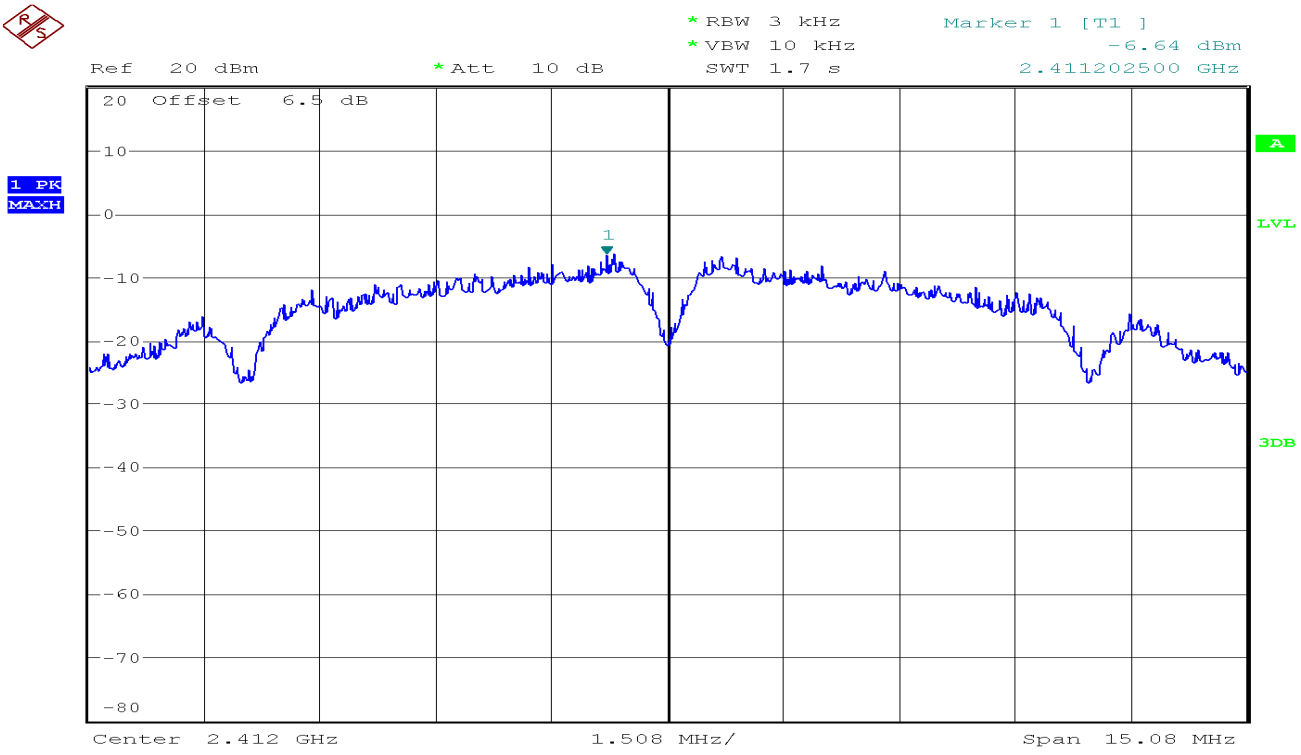
Test mode: IEEE 802.11n HT20 mode

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-11.46	8.00	PASS
Mid	2437	-11.71	8.00	PASS
High	2462	-10.58	8.00	PASS

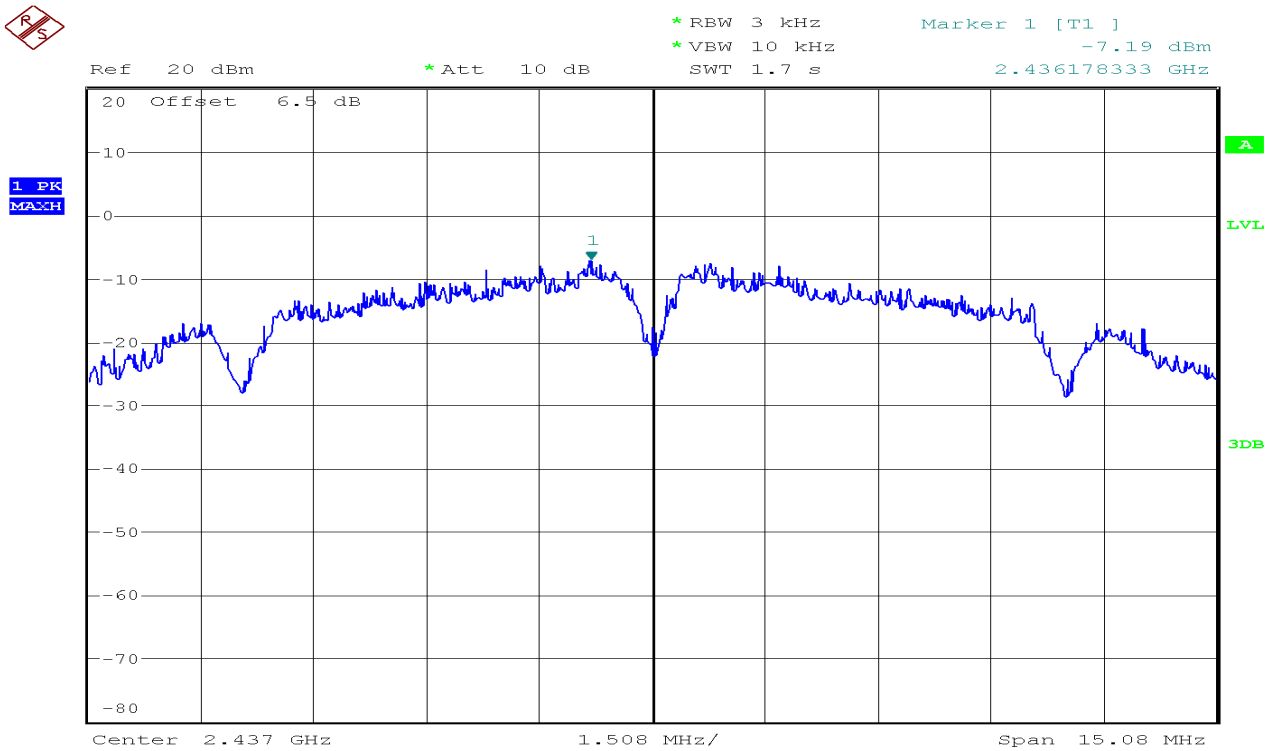
Test Plot

IEEE 802.11b mode

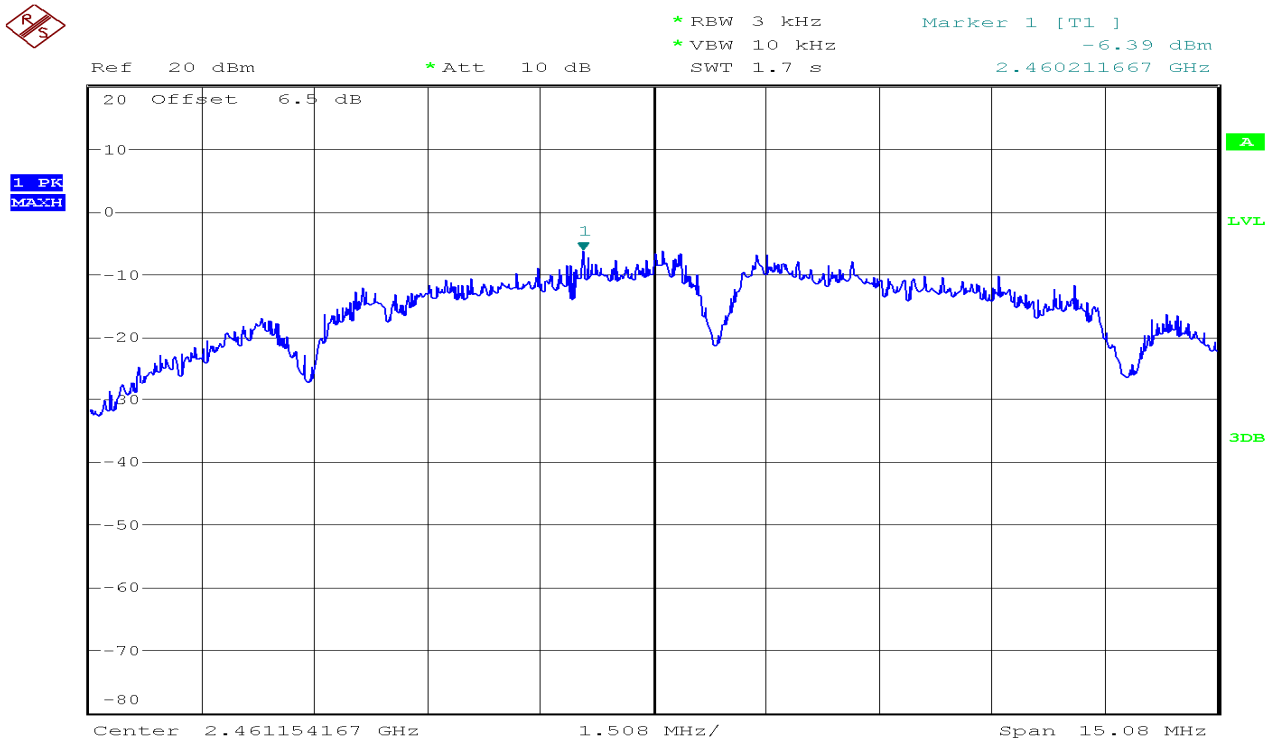
PPSD (CH Low)



PPSD(CH Mid)

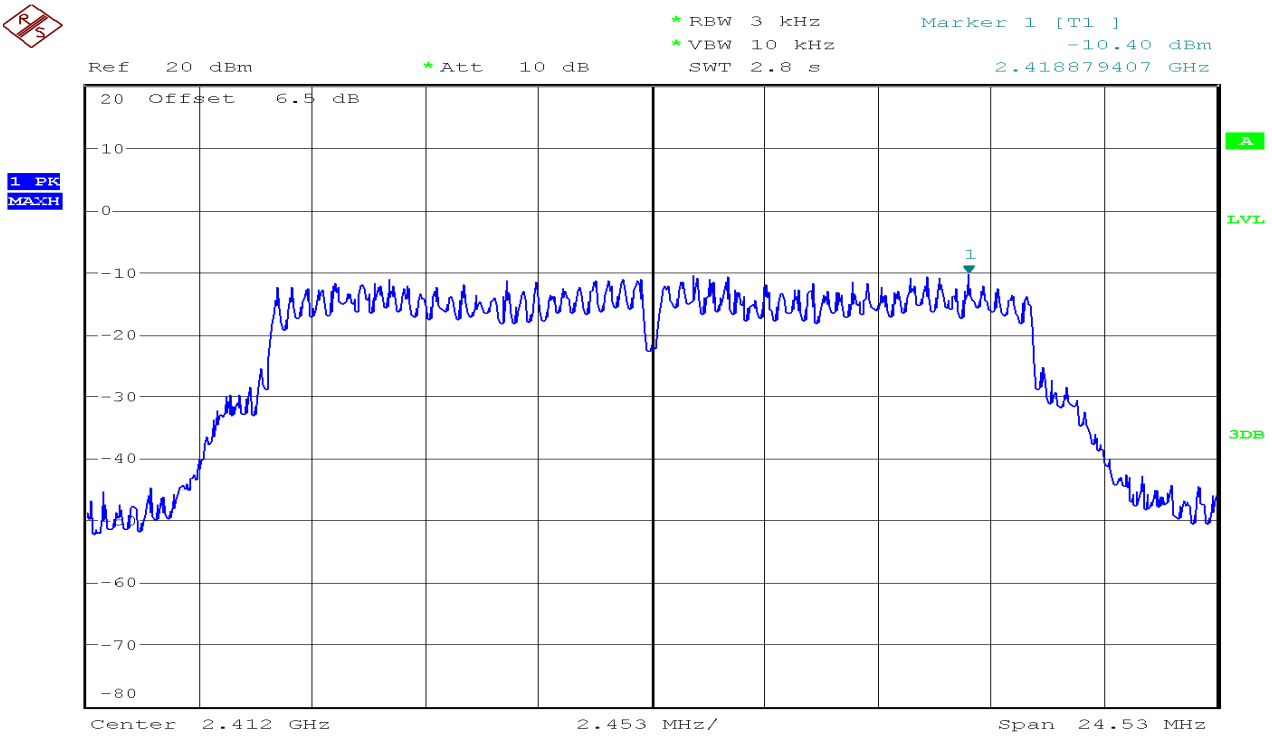


PPSD (CH High)

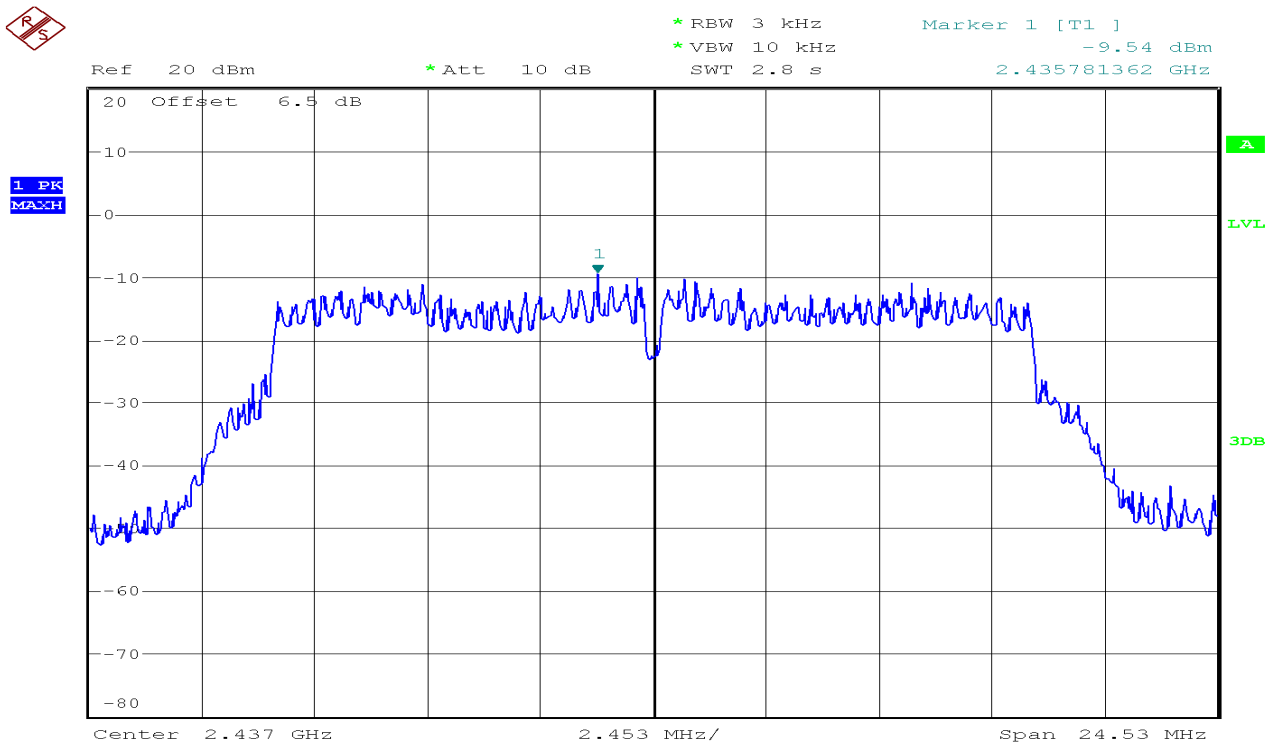


IEEE 802.11g mode

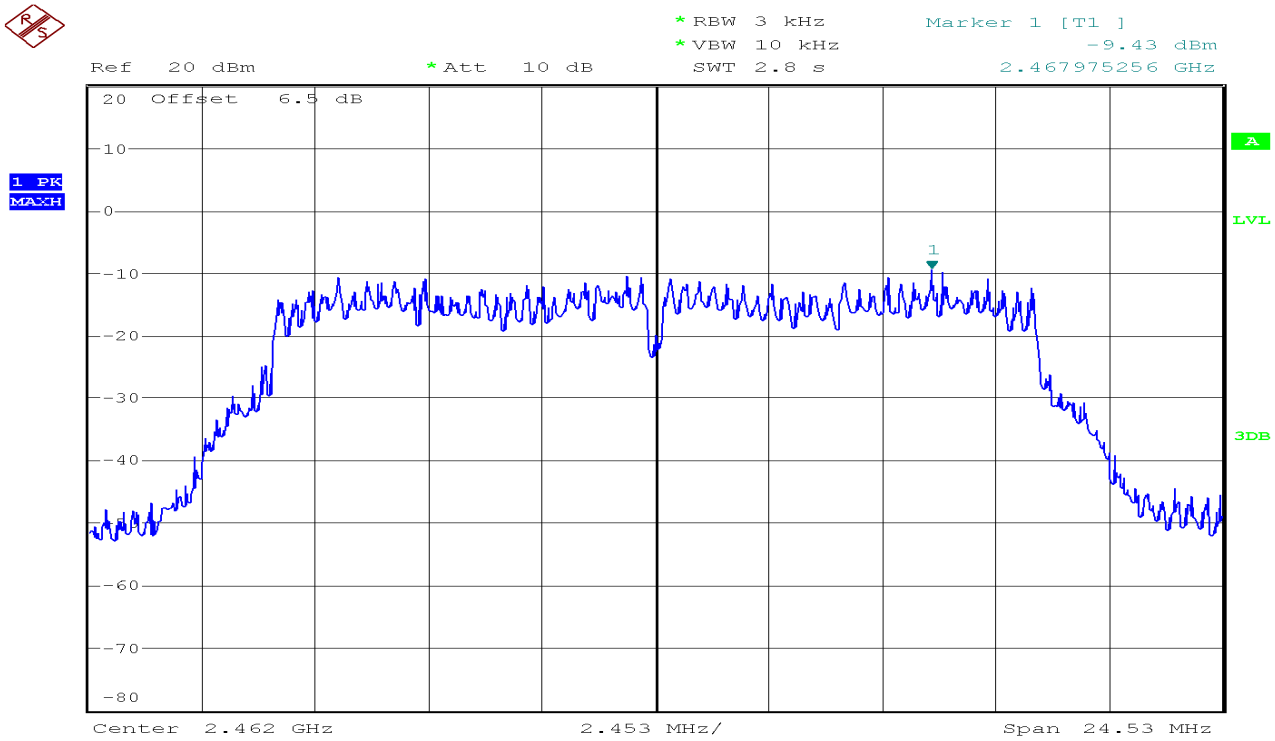
PPSD (CH Low)



PPSD (CH Mid)

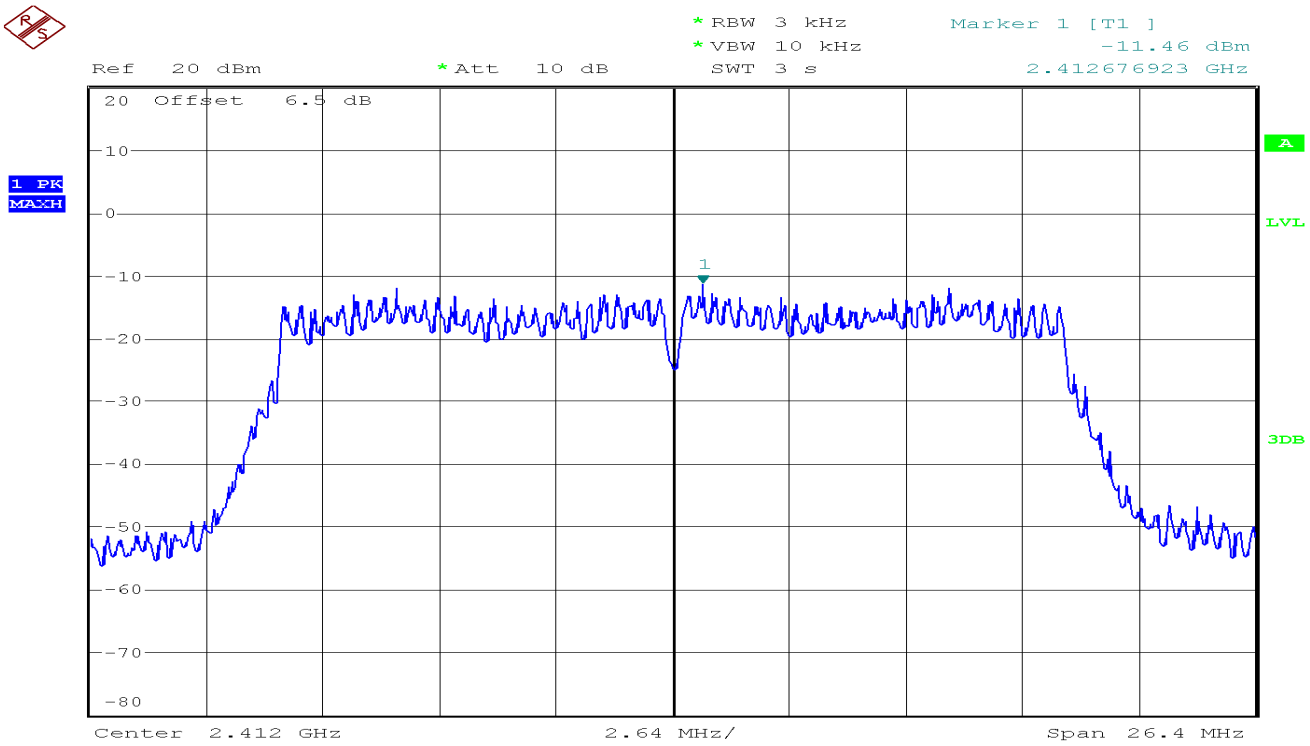


PPSD (CH High)

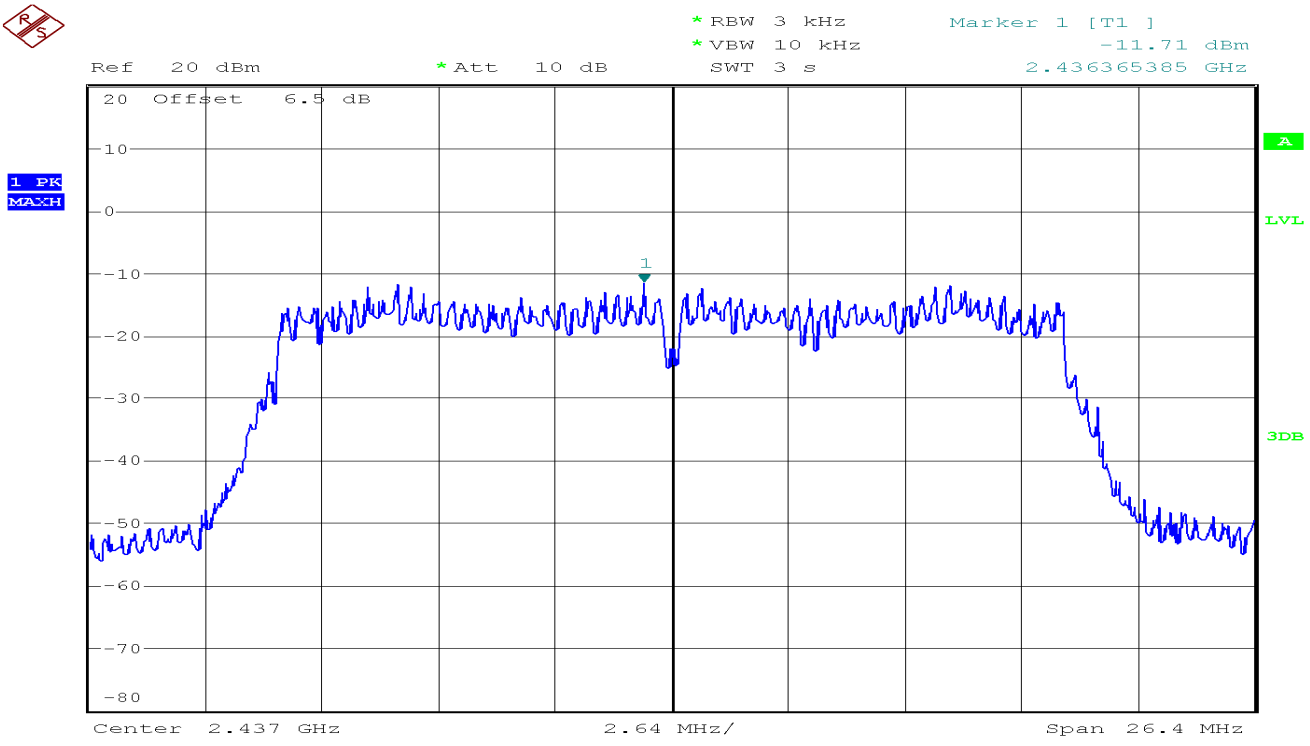


IEEE 802.11n HT20 mode

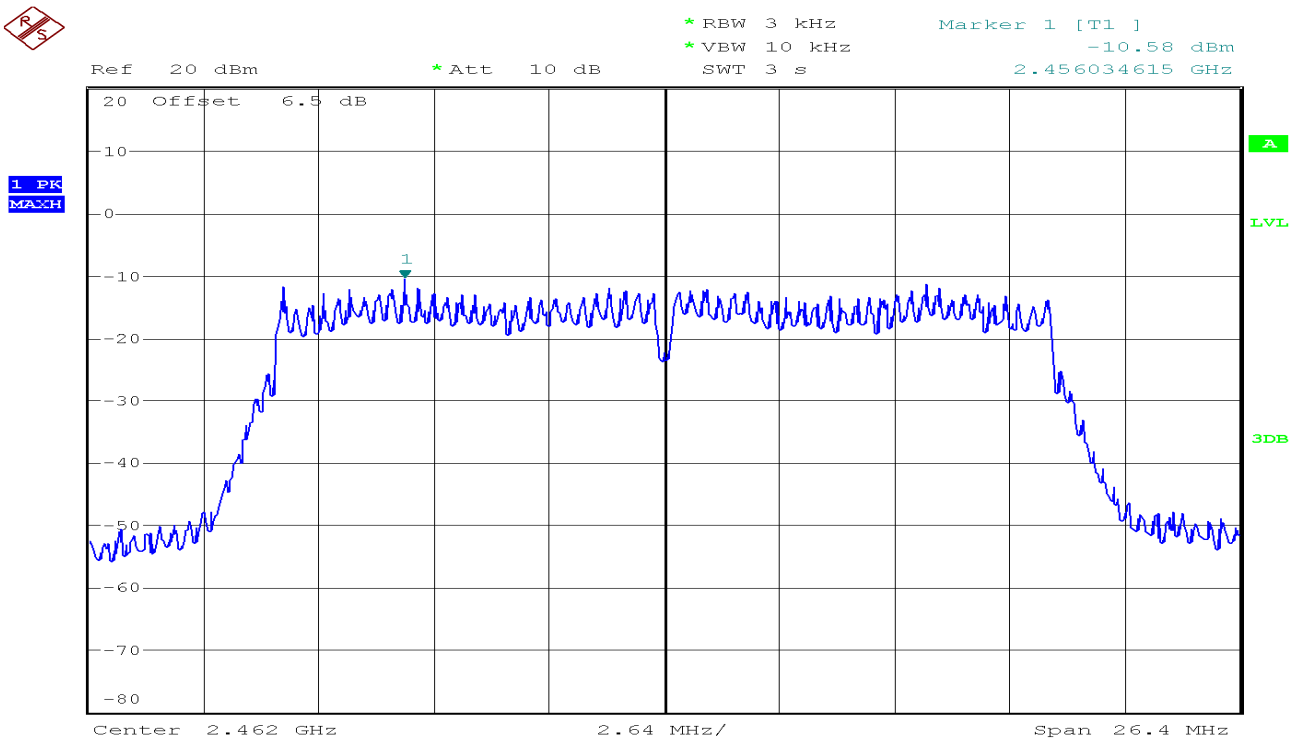
PPSD (CH Low)



PPSD (CH Mid)



PPSD (CH High)


* RBW 3 kHz
* VBW 10 kHz
SWT 3 s
Marker 1 [T1]
-10.58 dBm
2.456034615 GHz
Ref 20 dBm
* Att 10 dB
20 Offset 6.5 dB
1 PK
MAXH
A
LVL
3DB
Center 2.462 GHz
2.64 MHz/
Span 26.4 MHz

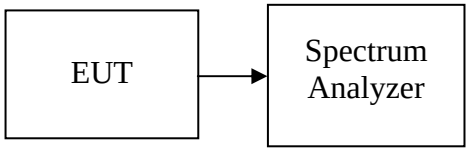
7.4.SPURIOUS EMISSIONS

Conducted Measurement

LIMIT

According to §15.247(d), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in 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. 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 Section 15.205(c)).

Test Configuration



TEST PROCEDURE

Conducted RF measurements of the transmitter output were made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

Measurements are made over the 30MHz to 40GHz range with the transmitter set to the lowest, middle, and highest channels.

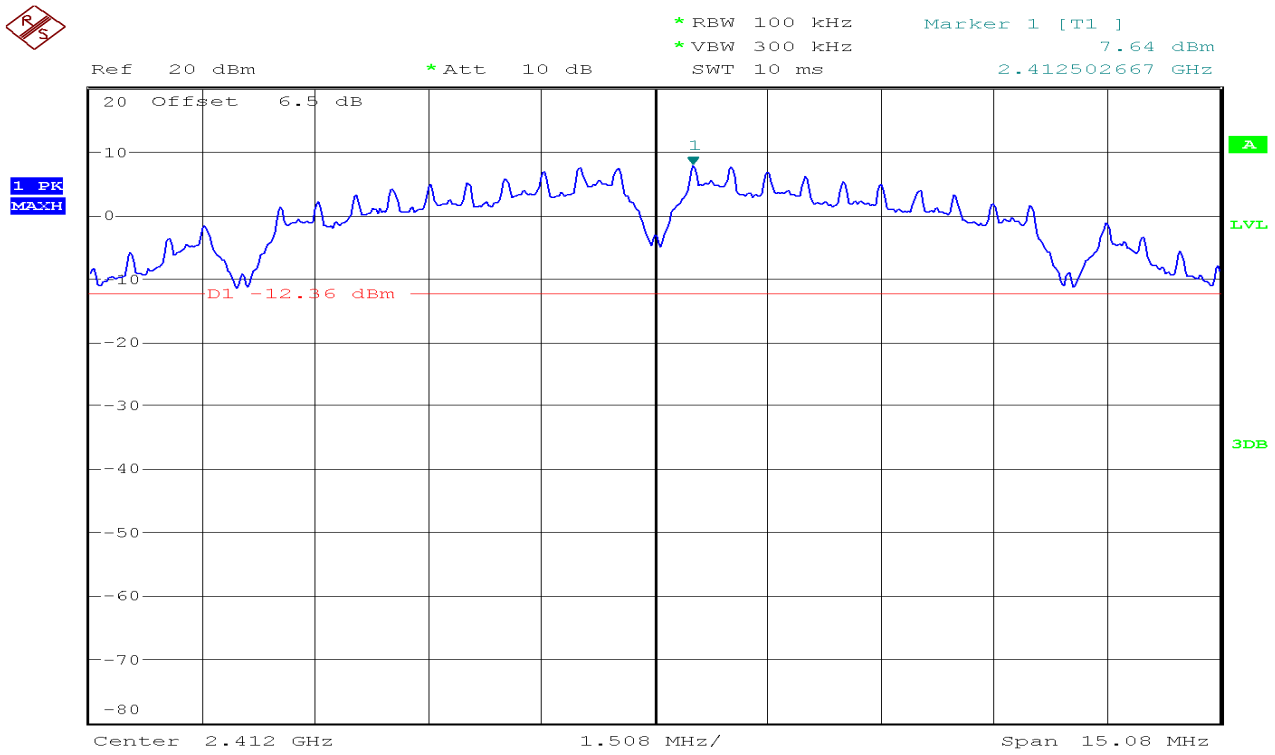
TEST RESULTS

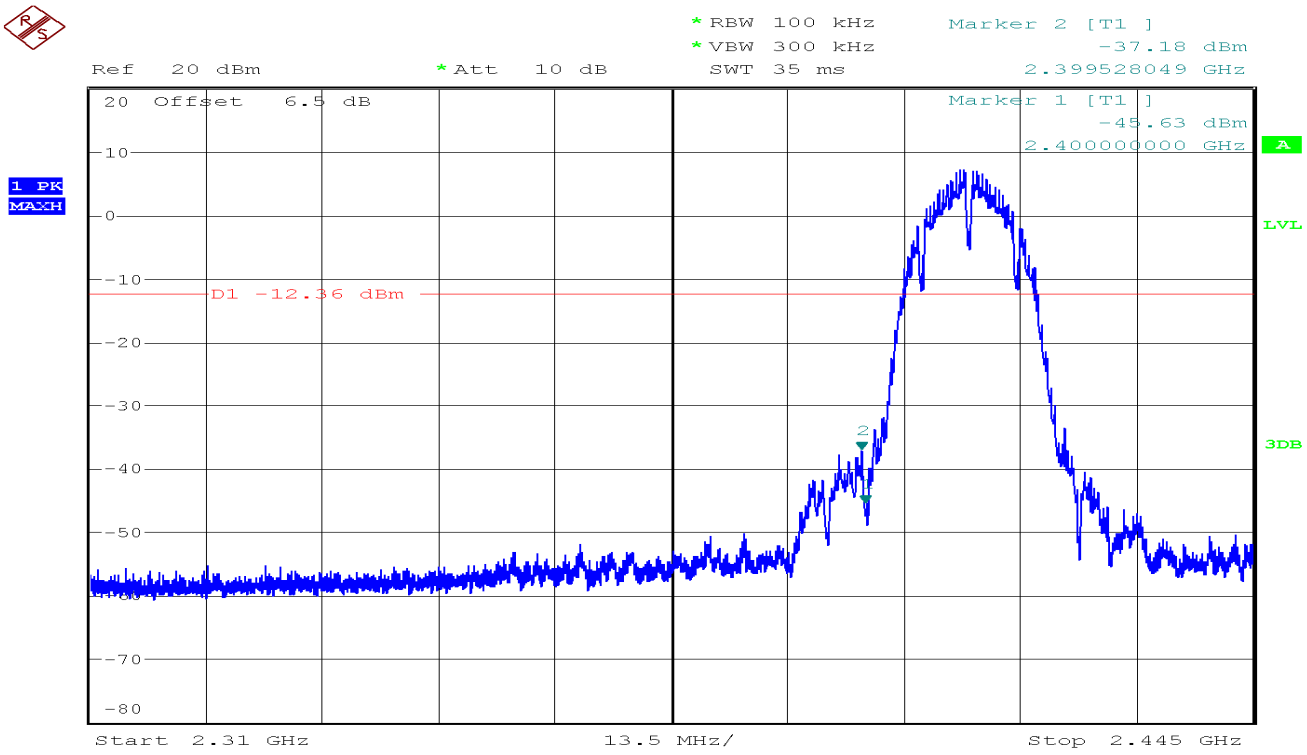
No non-compliance noted

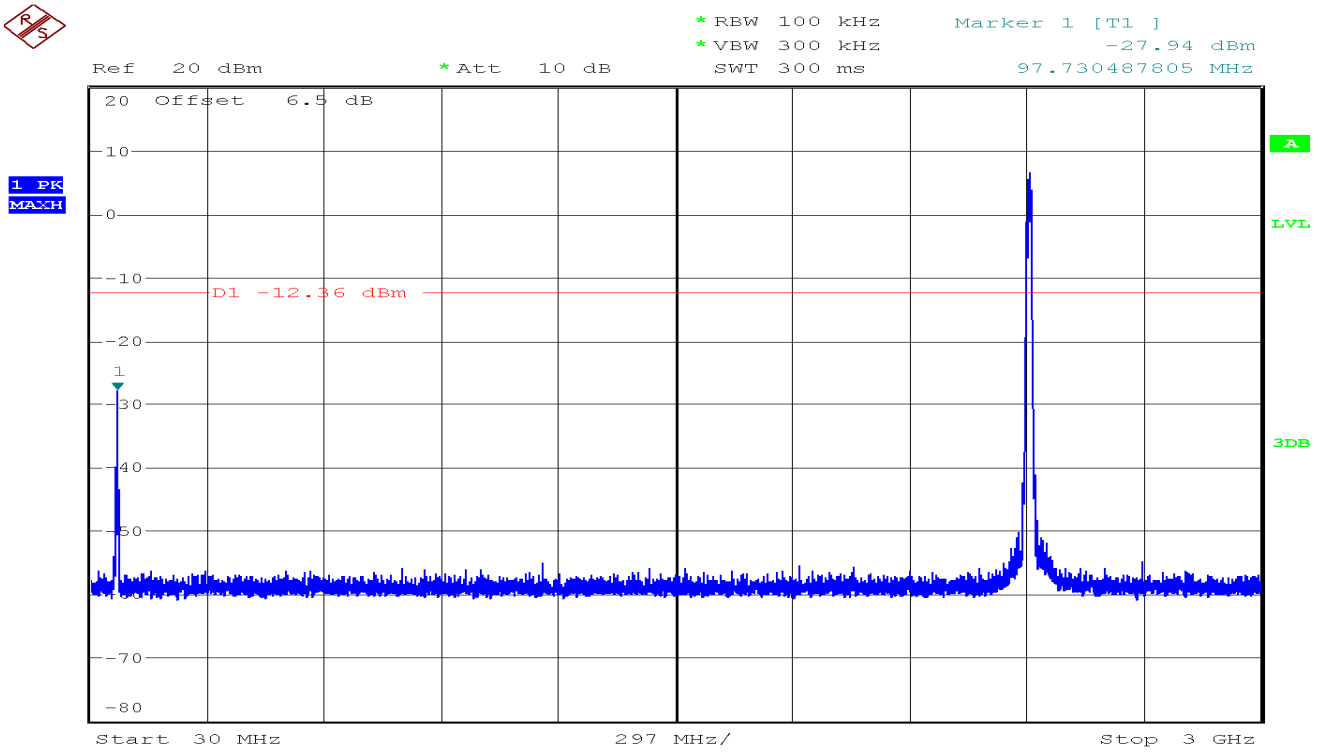
Test Plot
OUT-OF-BAND SPURIOUS EMISSIONS-CONDUCTED MEASUREMENT

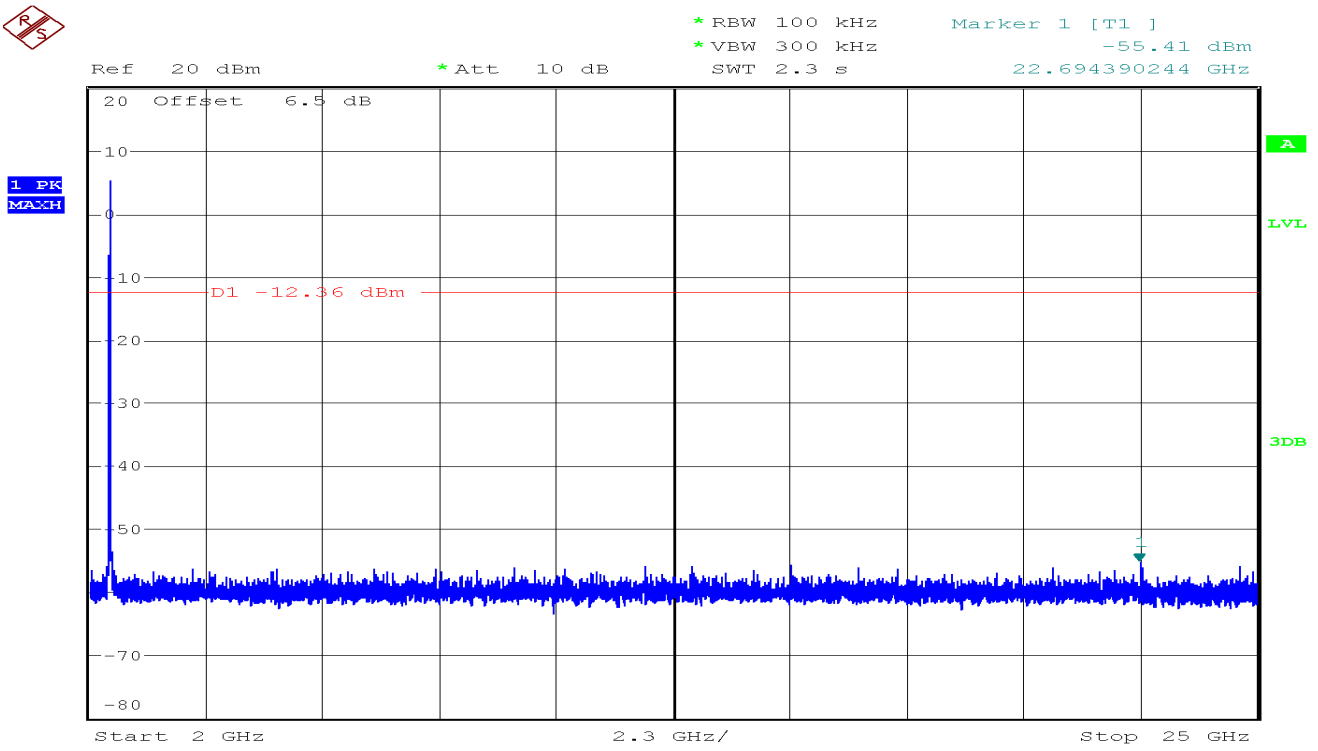
IEEE 802.11b mode

CH Low

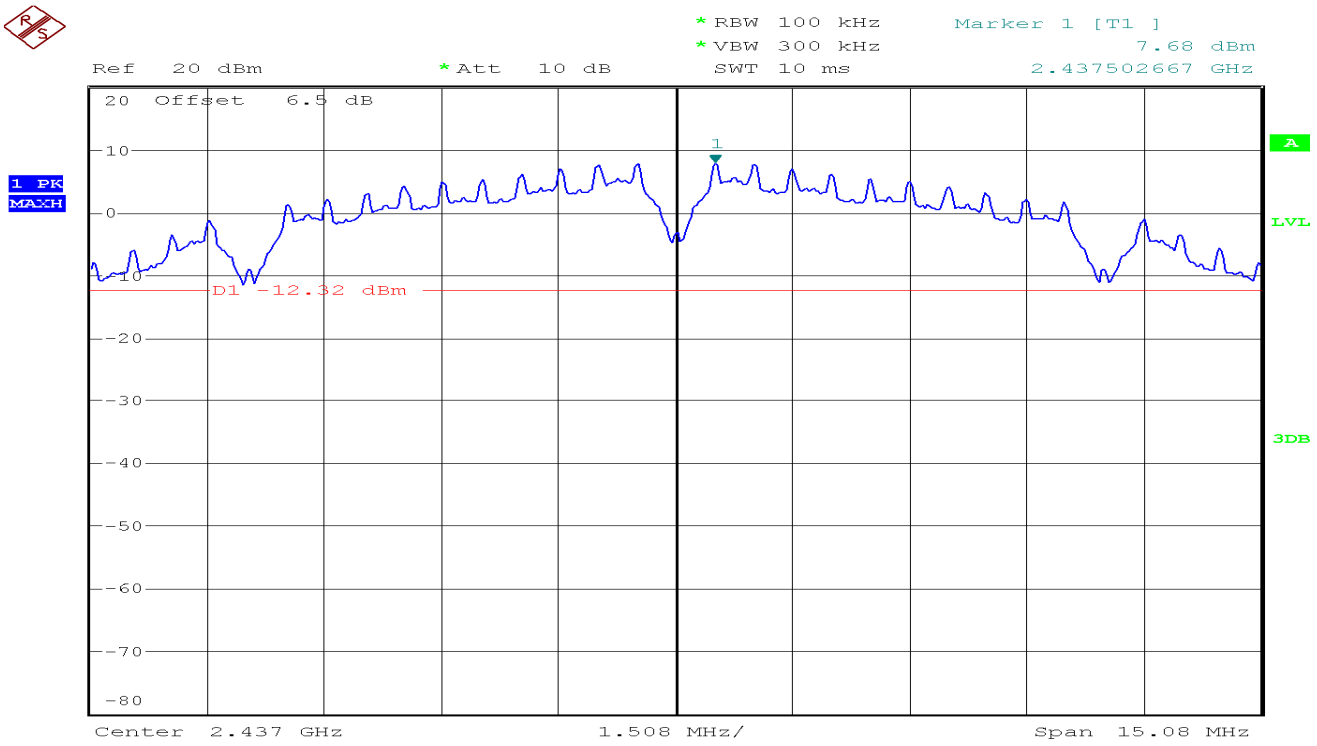


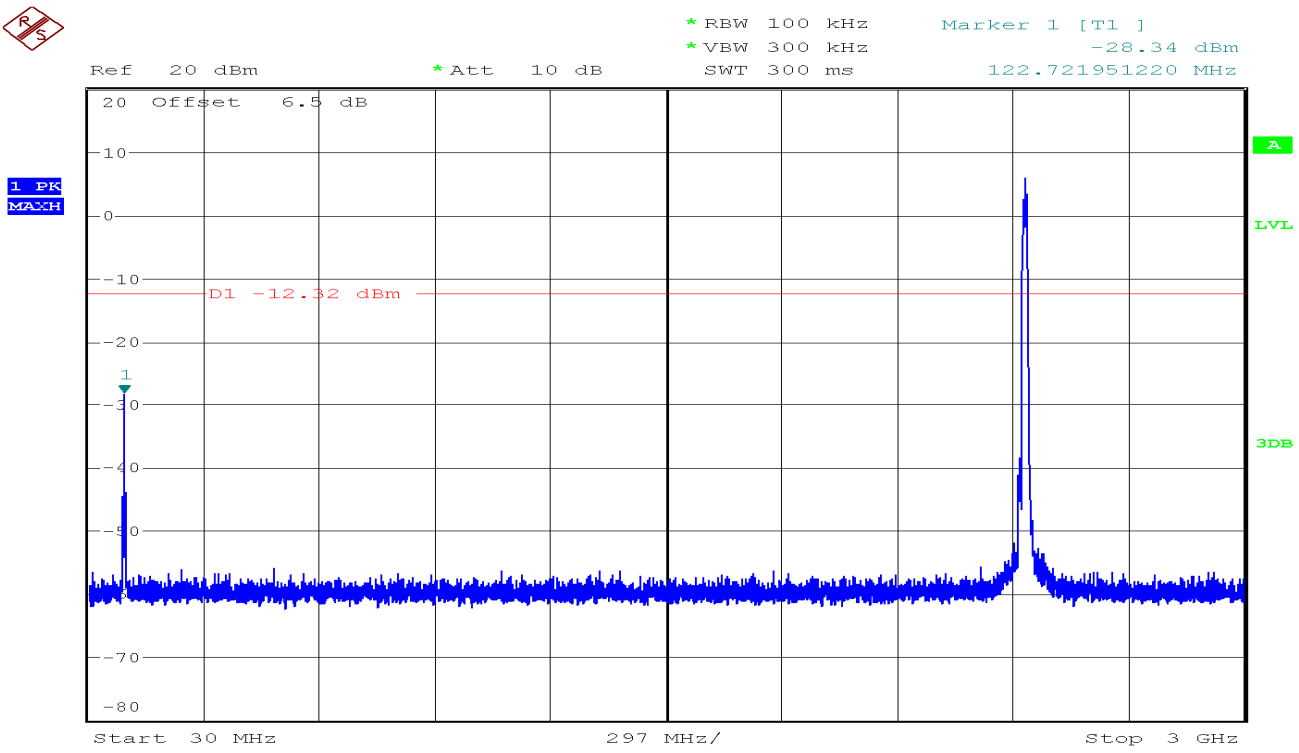


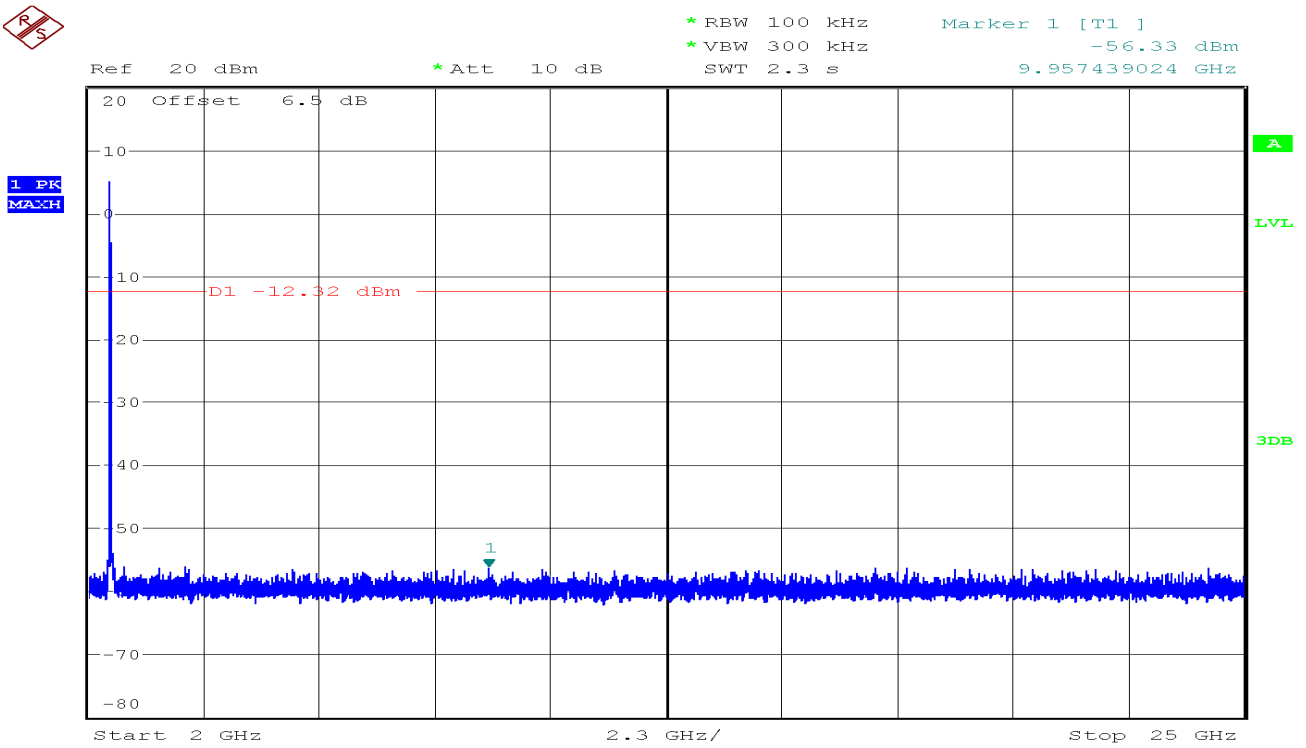

* RBW 100 kHz
* VBW 300 kHz
SWT 300 ms
Marker 1 [T1]
-27.94 dBm
97.730487805 MHz
Ref 20 dBm
* Att 10 dB
20 Offset 6.5 dB
1 PK MAXH
D1 -12.36 dBm
A
LVL
3DB
Start 30 MHz
297 MHz/
Stop 3 GHz


* RBW 100 kHz
* VBW 300 kHz
SWT 2.3 s
Marker 1 [T1]
-55.41 dBm
22.694390244 GHz
Ref 20 dBm
* Att 10 dB
20 Offset 6.5 dB
1 PK MAXH
D1 -12.36 dBm
A
LVL
3DB
Start 2 GHz
2.3 GHz/
Stop 25 GHz

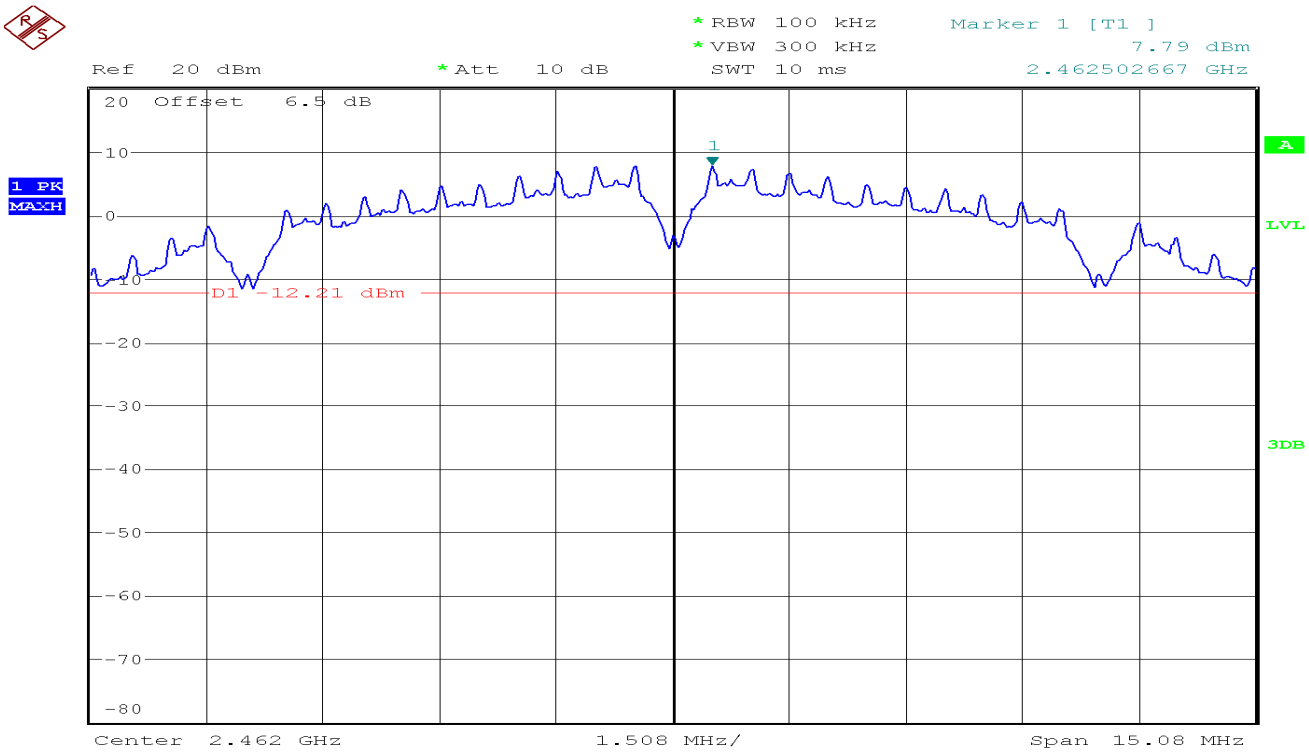
CH Mid

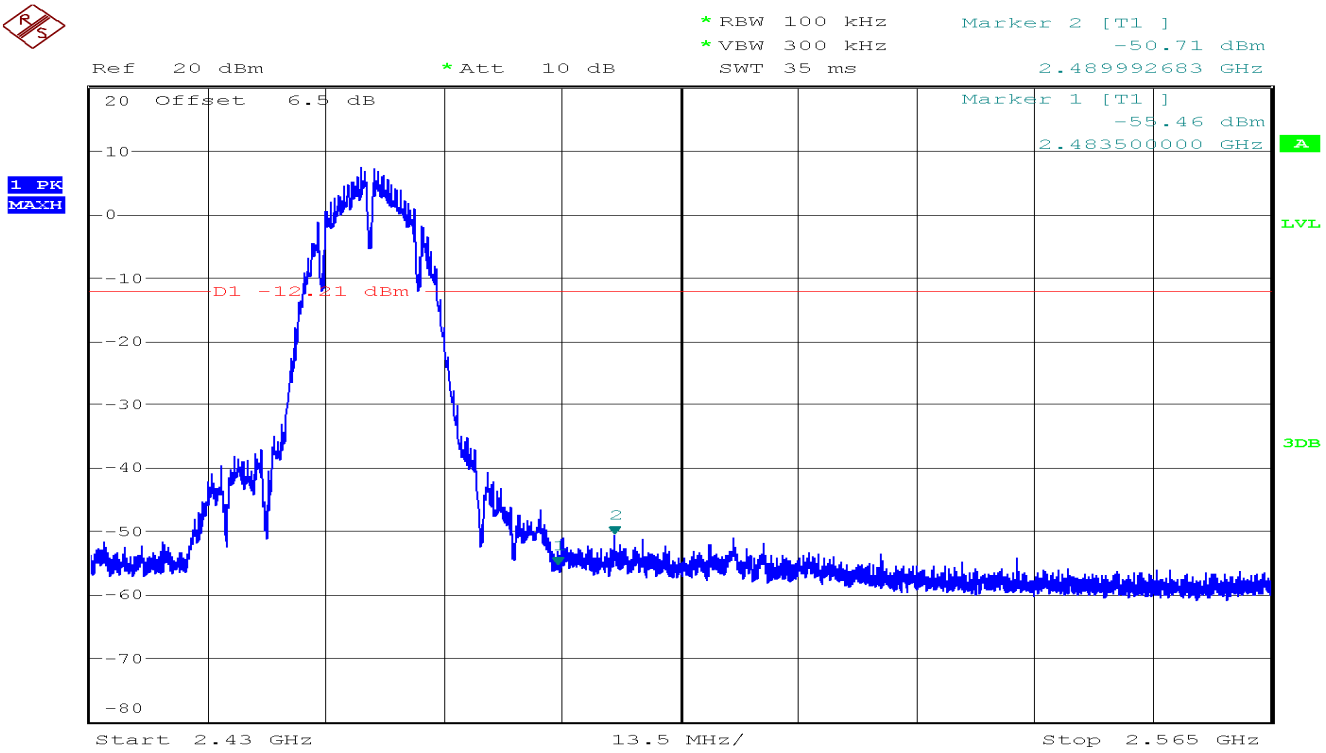

* RBW 100 kHz
* VBW 300 kHz
SWT 10 ms
Marker 1 [T1]
7.68 dBm
2.437502667 GHz
Ref 20 dBm
* Att 10 dB
20 Offset 6.5 dB
1 PK MAXH
A
LVL
3DB
D1 -12.32 dBm
Center 2.437 GHz
1.508 MHz/
Span 15.08 MHz

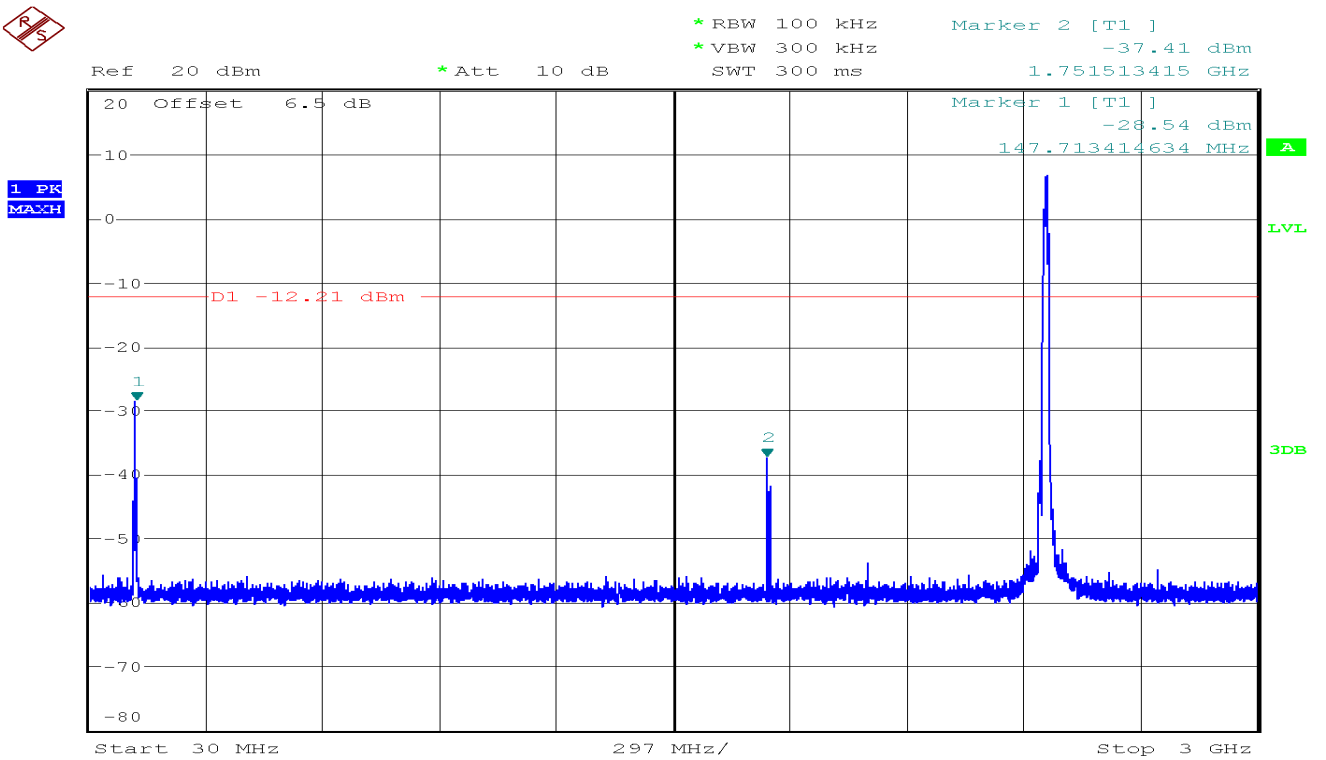

* RBW 100 kHz
* VBW 300 kHz
SWT 300 ms
Marker 1 [T1]
-28.34 dBm
122.721951220 MHz
Ref 20 dBm
* Att 10 dB
20 Offset 6.5 dB
1 PK MAXH
A
LVL
3DB
D1 -12.32 dBm
Start 30 MHz
297 MHz/
Stop 3 GHz

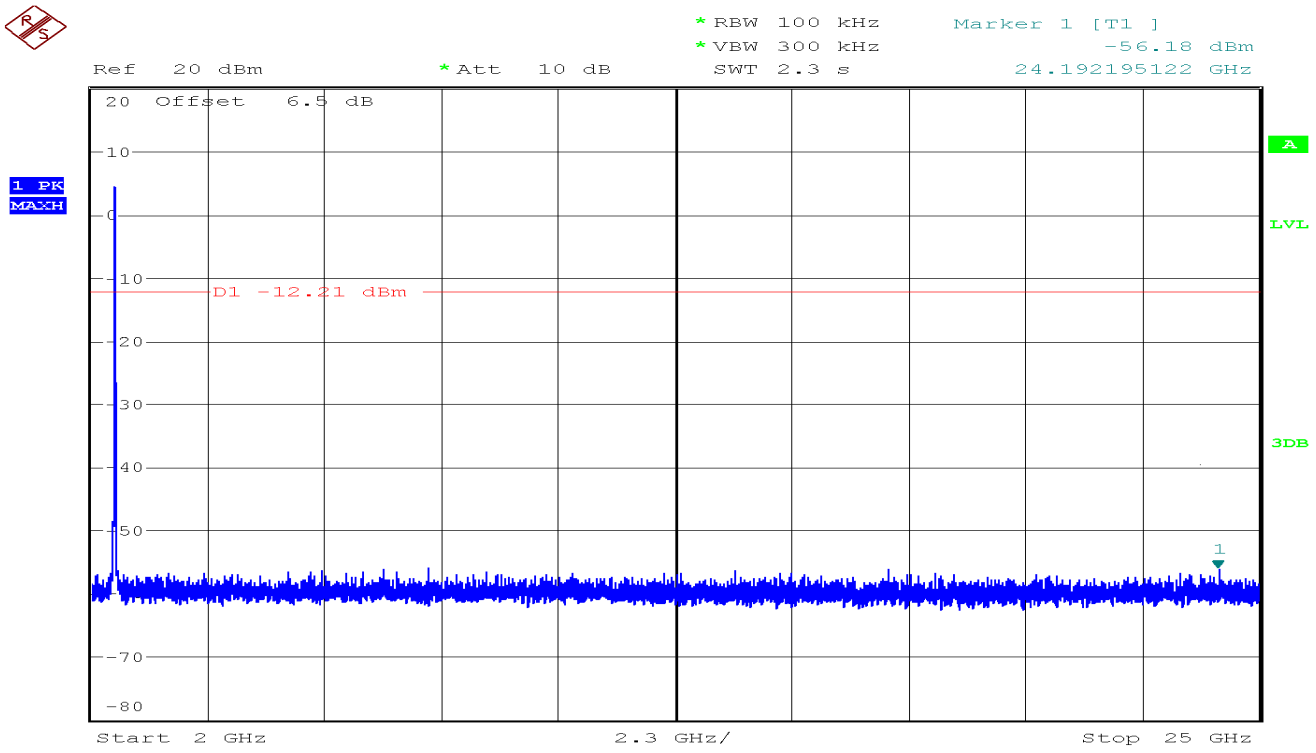

* RBW 100 kHz
* VBW 300 kHz
SWT 2.3 s
Marker 1 [T1]
-56.33 dBm
9.957439024 GHz
Ref 20 dBm
* Att 10 dB
20 Offset 6.5 dB
1 PK
MAXH
D1 -12.32 dBm
A
LVL
3DB
Start 2 GHz
2.3 GHz/
Stop 25 GHz

CH High


* RBW 100 kHz
* VBW 300 kHz
SWT 10 ms
Marker 1 [T1]
7.79 dBm
2.462502667 GHz
Ref 20 dBm
* Att 10 dB
20 Offset 6.5 dB
1 PK
MAXH
D1 -12.21 dBm
A
LVL
3DB
Center 2.462 GHz
1.508 MHz/
Span 15.08 MHz

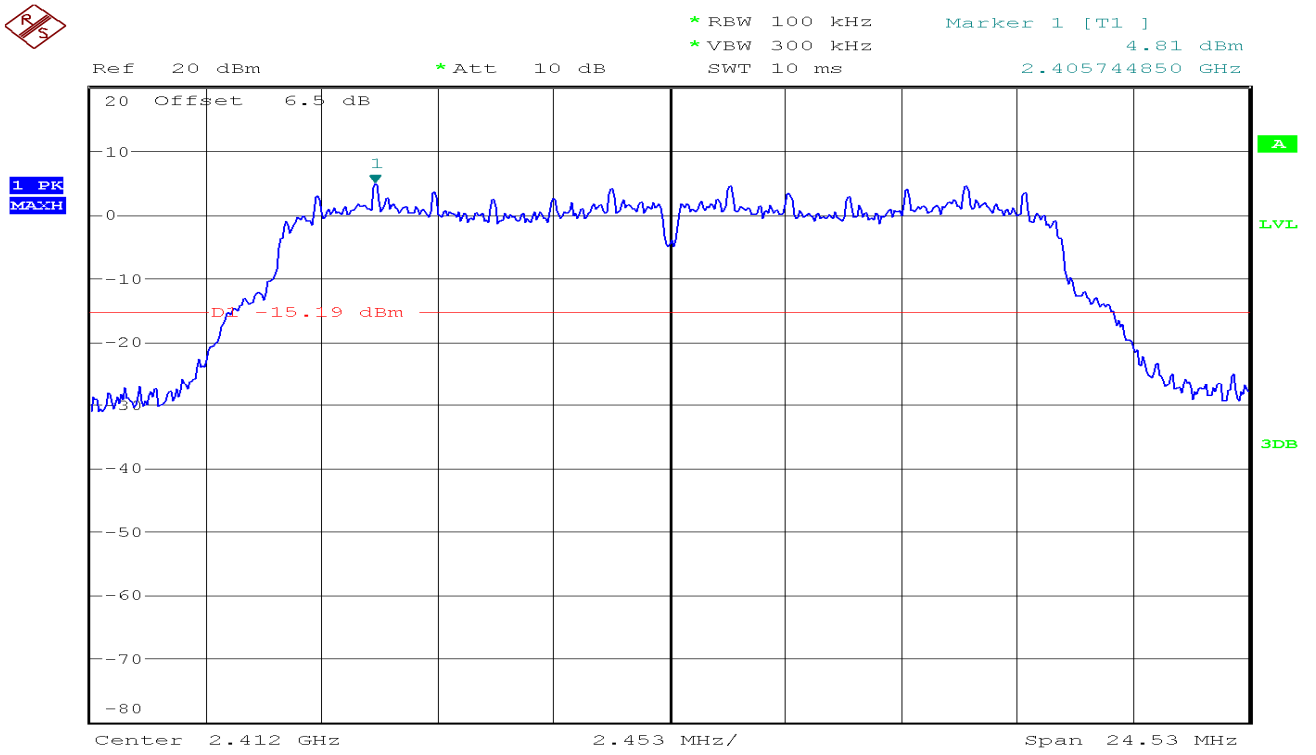

* RBW 100 kHz
* VBW 300 kHz
SWT 35 ms
Marker 2 [T1]
-50.71 dBm
2.489992683 GHz
Ref 20 dBm
* Att 10 dB
20 Offset 6.5 dB
Marker 1 [T1]
-55.46 dBm
2.483500000 GHz
1 PK MAXH
A
LVL
3DB
D1 -12.21 dBm
Start 2.43 GHz
13.5 MHz/
Stop 2.565 GHz

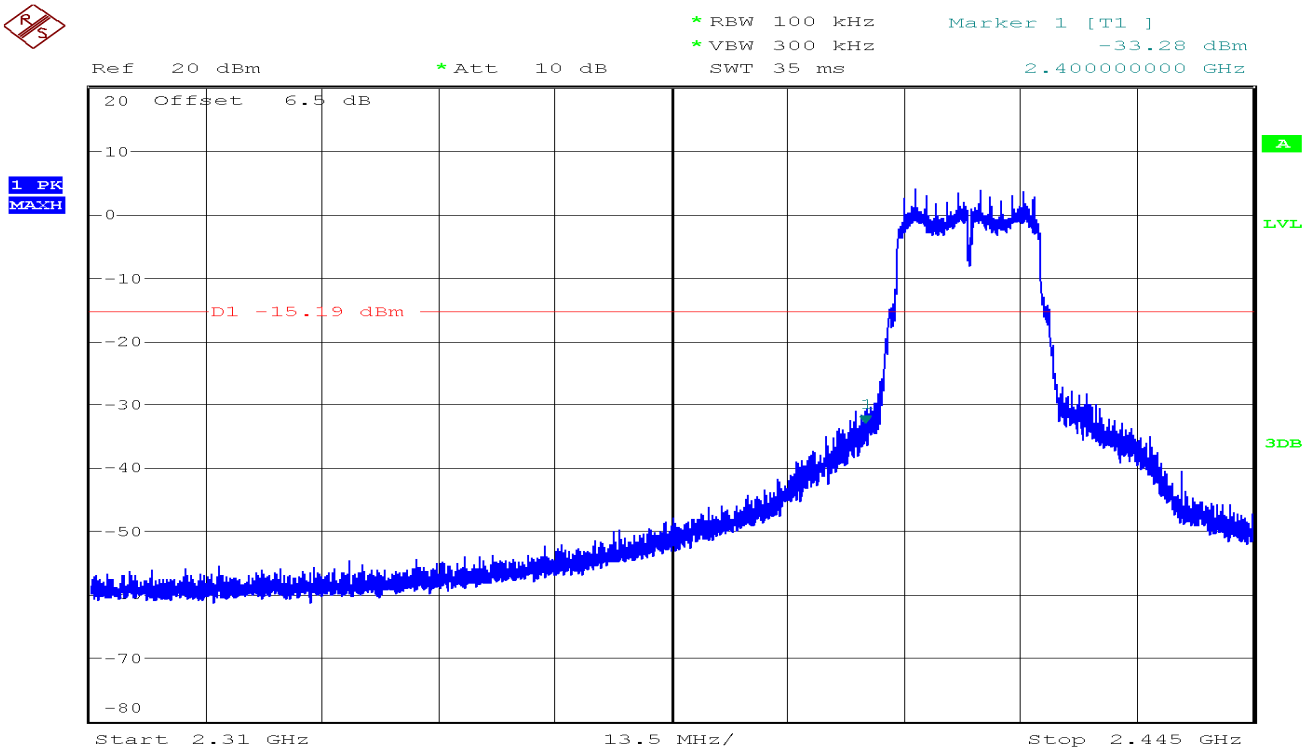

* RBW 100 kHz
* VBW 300 kHz
SWT 300 ms
Marker 2 [T1]
-37.41 dBm
1.751513415 GHz
Ref 20 dBm
* Att 10 dB
20 Offset 6.5 dB
Marker 1 [T1]
-28.54 dBm
147.713414634 MHz
1 PK MAXH
A
LVL
3DB
D1 -12.21 dBm
Start 30 MHz
297 MHz/
Stop 3 GHz

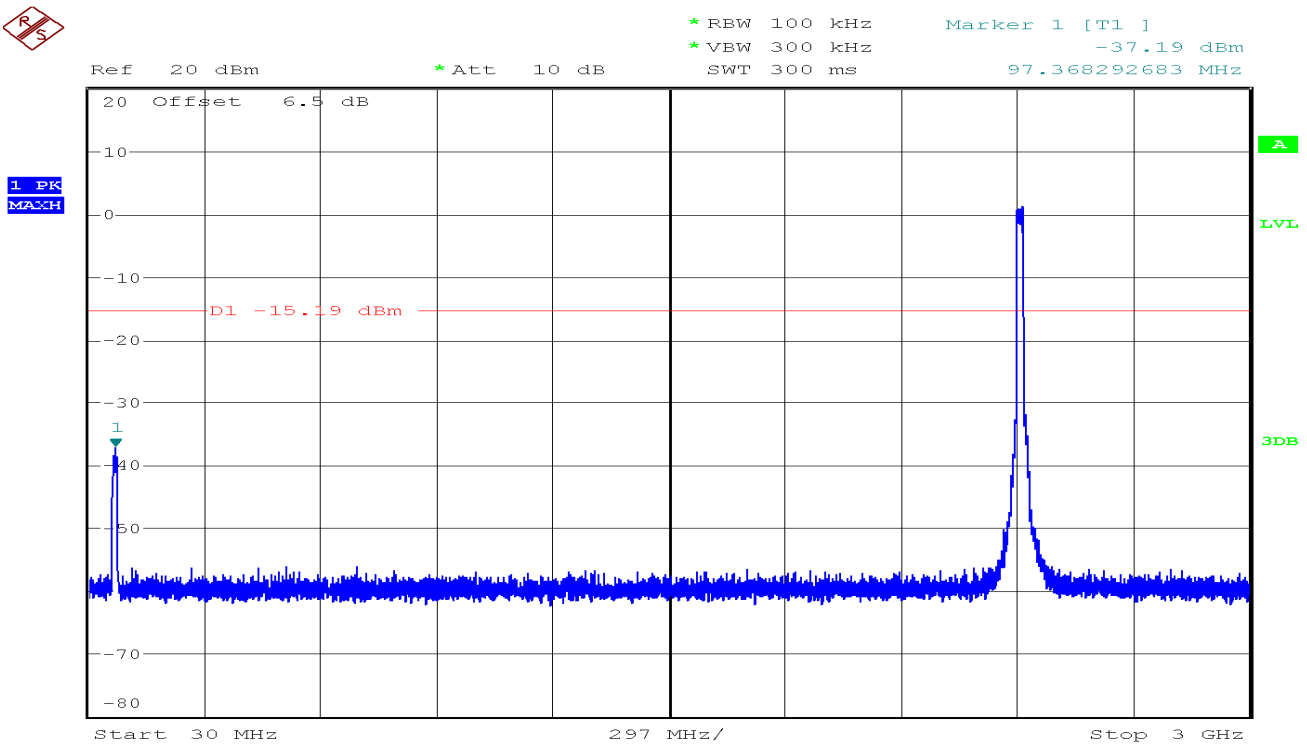


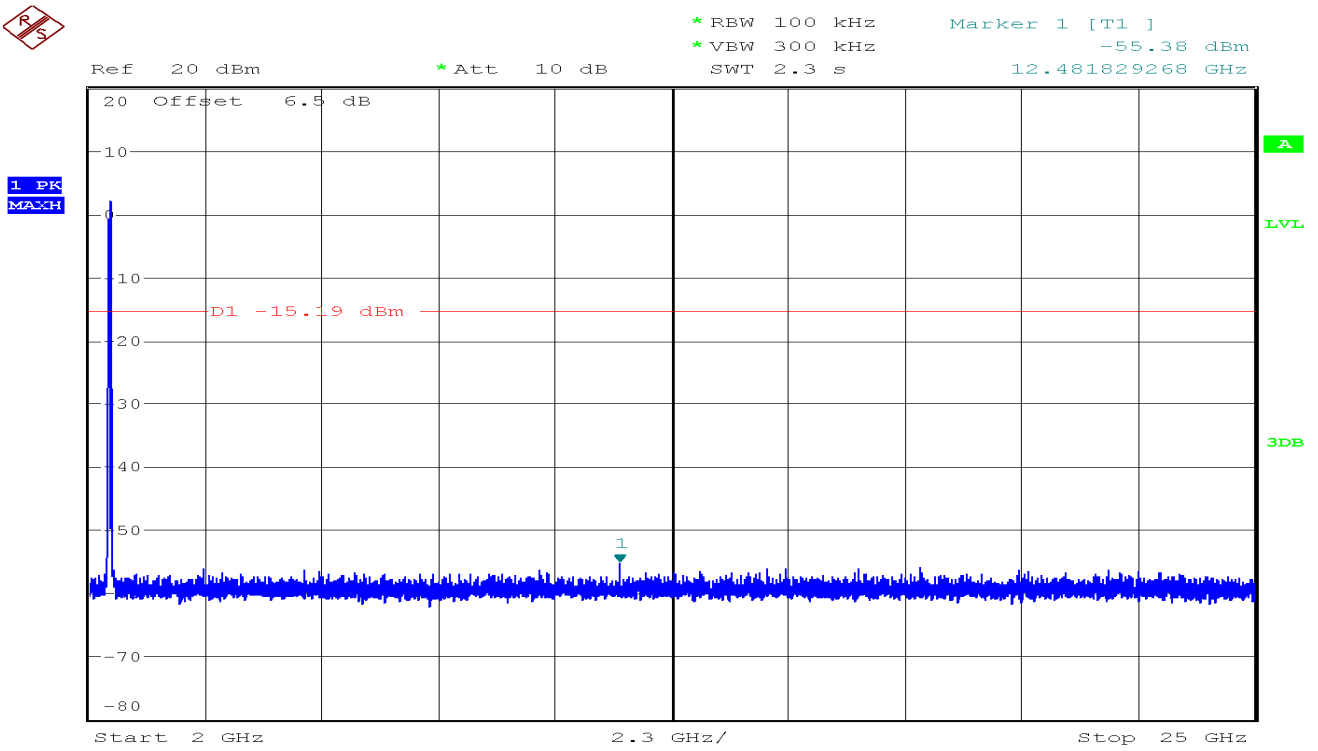
IEEE 802.11g mode

CH Low

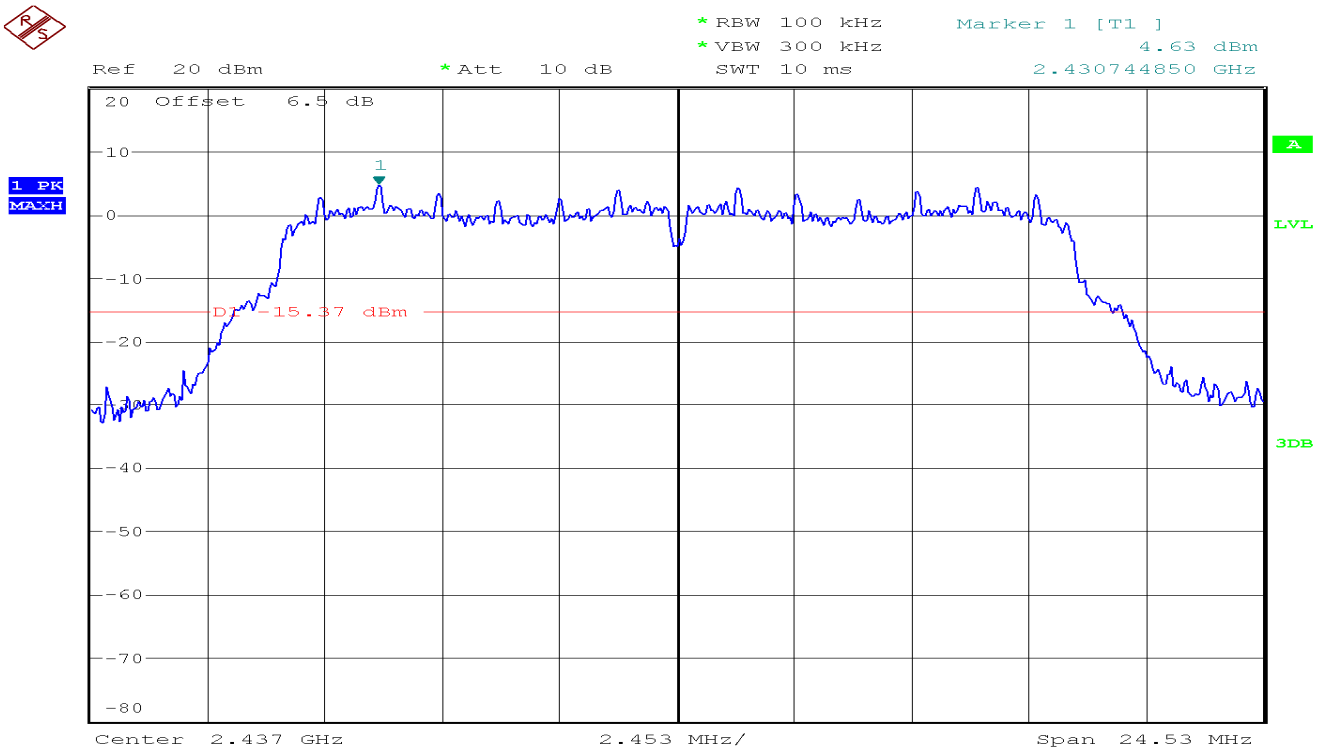


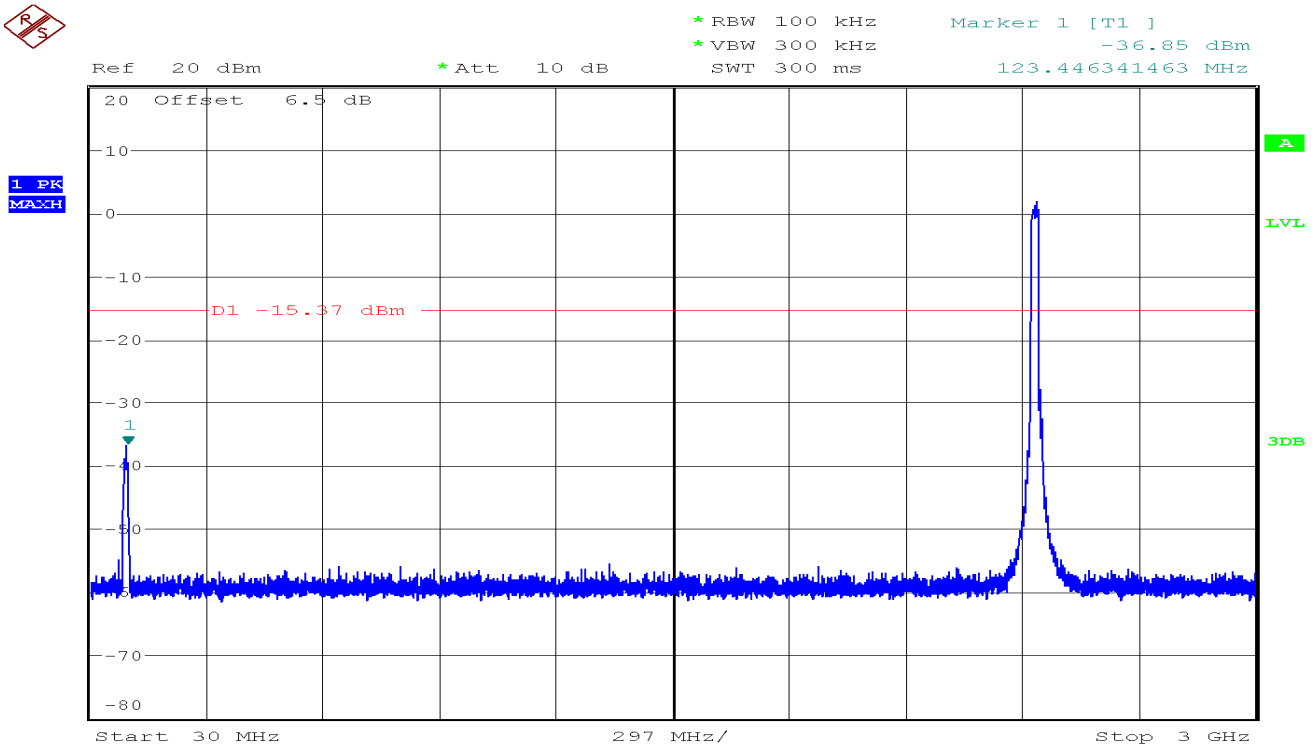

* RBW 100 kHz
* VBW 300 kHz
SWT 35 ms
Marker 1 [T1]
-33.28 dBm
2.400000000 GHz
Ref 20 dBm
* Att 10 dB
20 Offset 6.5 dB
1 PK
MAXH
D1 -15.19 dBm
A
LVL
3DB
Start 2.31 GHz
13.5 MHz/
Stop 2.445 GHz

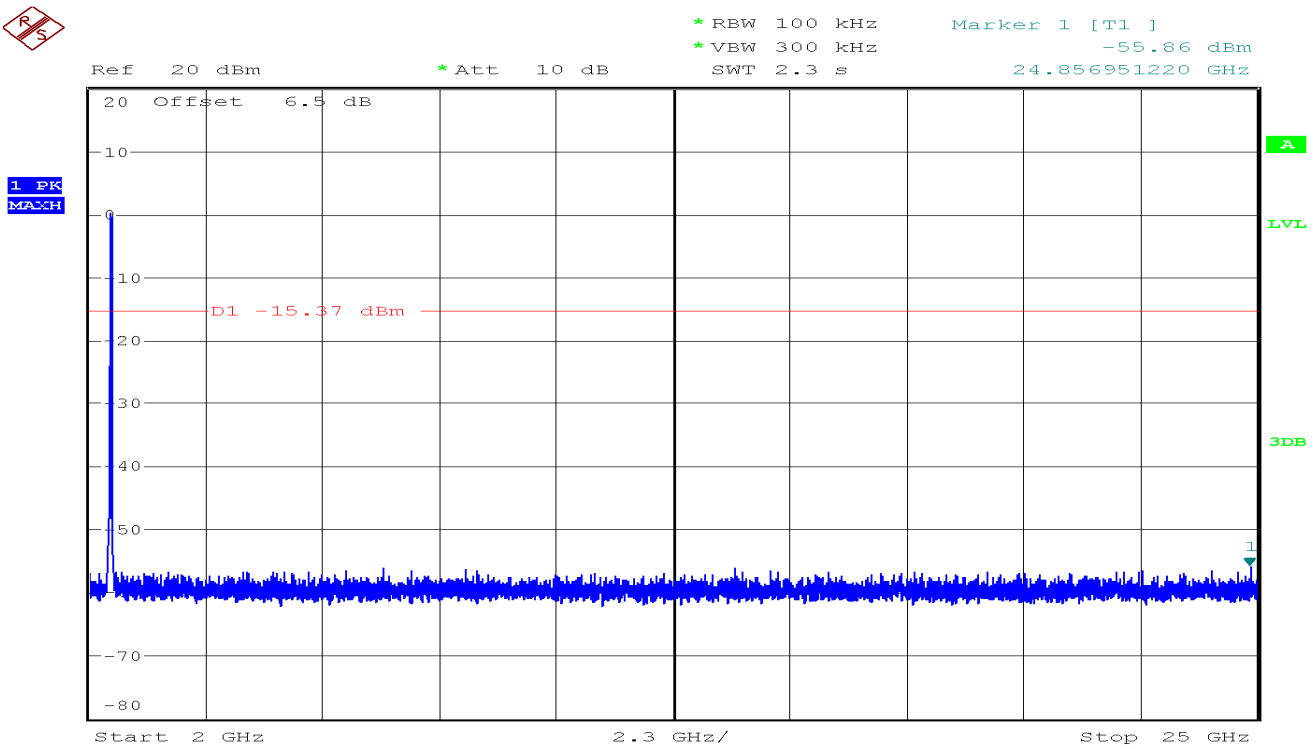

* RBW 100 kHz
* VBW 300 kHz
SWT 300 ms
Marker 1 [T1]
-37.19 dBm
97.368292683 MHz
Ref 20 dBm
* Att 10 dB
20 Offset 6.5 dB
1 PK
MAXH
D1 -15.19 dBm
A
LVL
3DB
Start 30 MHz
297 MHz/
Stop 3 GHz


* RBW 100 kHz
* VBW 300 kHz
SWT 2.3 s
Marker 1 [T1]
-55.38 dBm
12.481829268 GHz
Ref 20 dBm
* Att 10 dB
20 Offset 6.5 dB
1 PK
MAXH
D1 -15.19 dBm
A
LVL
3DB
Start 2 GHz
2.3 GHz/
Stop 25 GHz

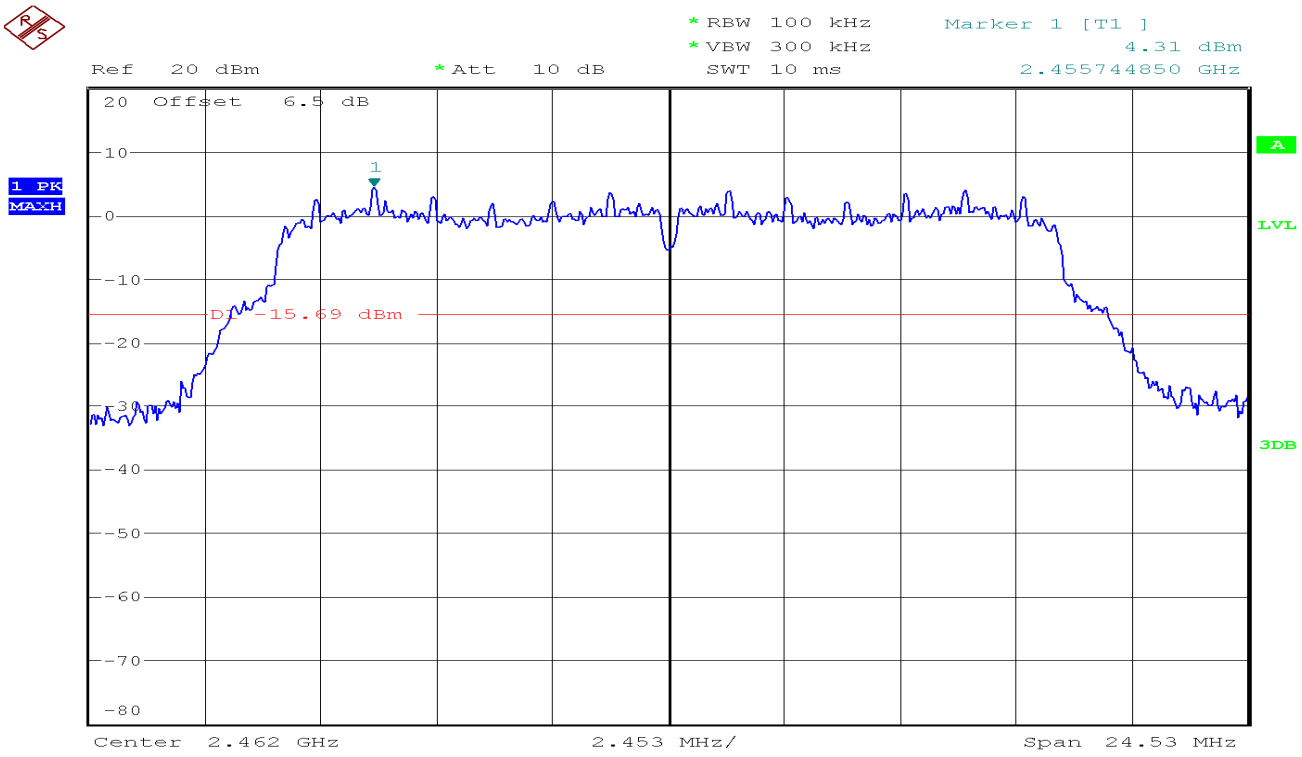
CH Mid

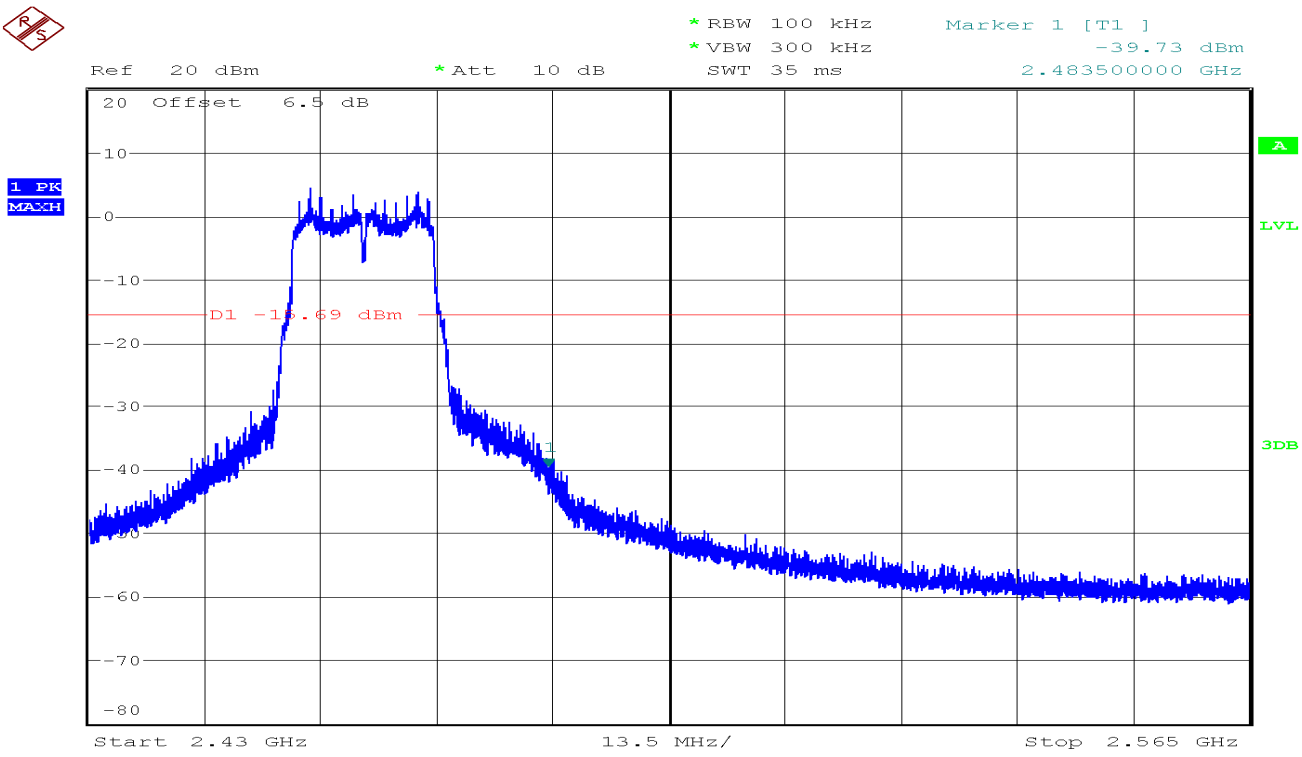

* RBW 100 kHz
* VBW 300 kHz
SWT 10 ms
Marker 1 [T1]
4.63 dBm
2.430744850 GHz
Ref 20 dBm
* Att 10 dB
20 Offset 6.5 dB
1 PK
MAXH
D1 -15.37 dBm
A
LVL
3DB
Center 2.437 GHz
2.453 MHz/
Span 24.53 MHz

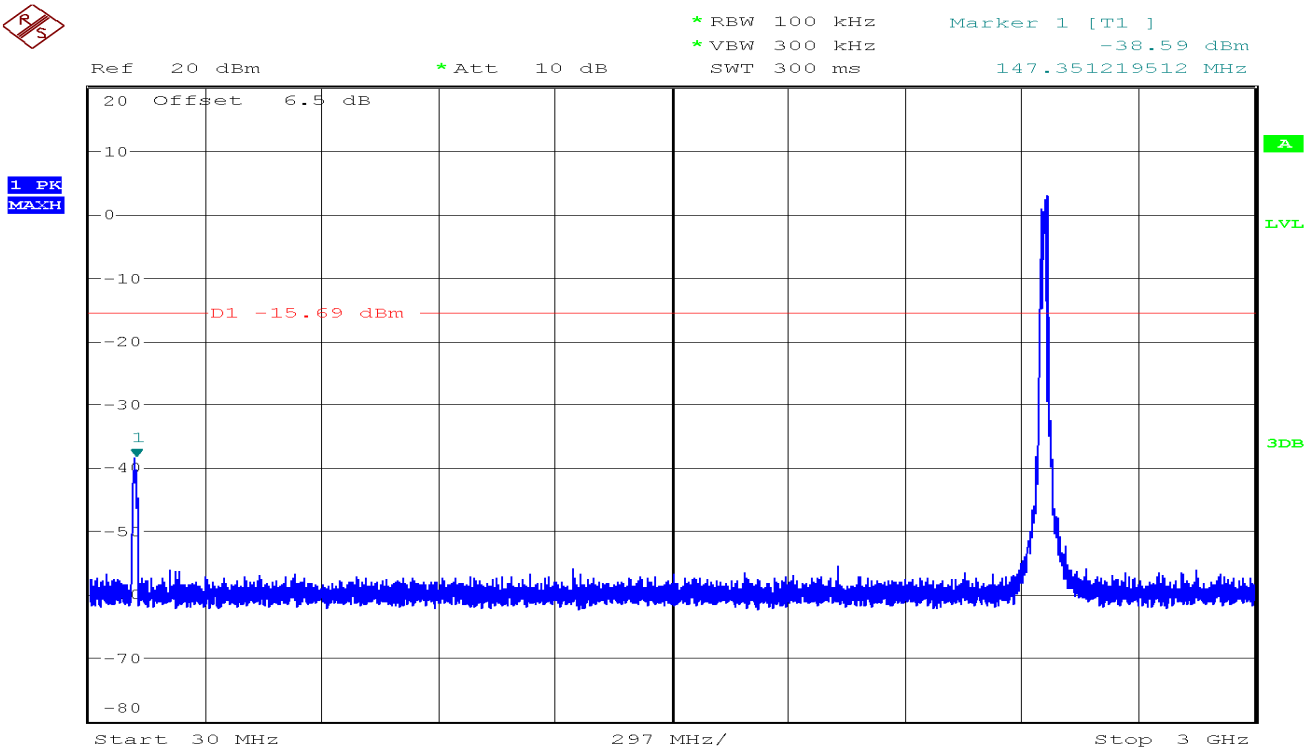

* RBW 100 kHz
* VBW 300 kHz
SWT 300 ms
Marker 1 [T1]
-36.85 dBm
123.446341463 MHz
Ref 20 dBm
* Att 10 dB
20 Offset 6.5 dB
1 PK MAXH
D1 -15.37 dBm
A
LVL
3DB
Start 30 MHz
297 MHz/
Stop 3 GHz

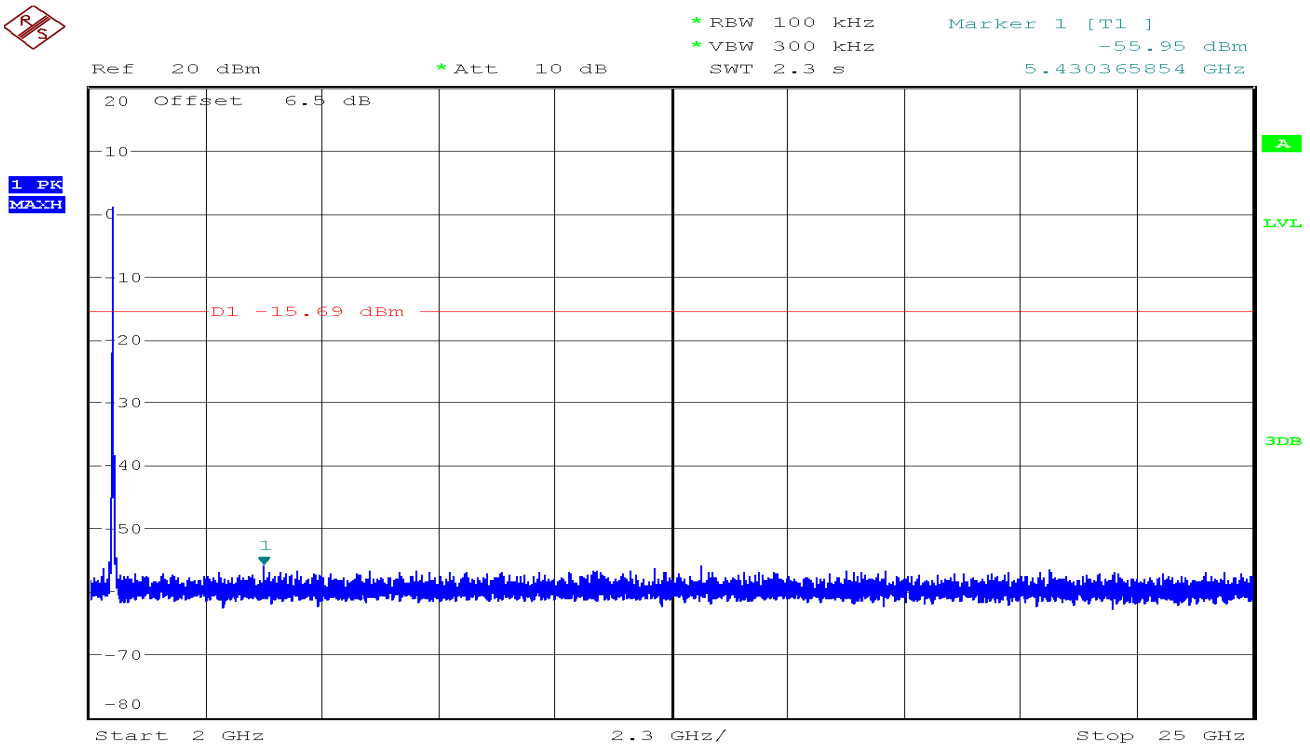

* RBW 100 kHz
* VBW 300 kHz
SWT 2.3 s
Marker 1 [T1]
-55.86 dBm
24.856951220 GHz
Ref 20 dBm
* Att 10 dB
20 Offset 6.5 dB
1 PK MAXH
D1 -15.37 dBm
A
LVL
3DB
Start 2 GHz
2.3 GHz/
Stop 25 GHz

CH High


RBW 100 kHz
VBW 300 kHz
SWT 10 ms
Marker 1 [T1]
4.31 dBm
2.455744850 GHz
Ref 20 dBm
Att 10 dB
Offset 6.5 dB
1 PK
MAXH
D1 -15.69 dBm
A
LVL
3DB
Center 2.462 GHz
2.453 MHz/
Span 24.53 MHz

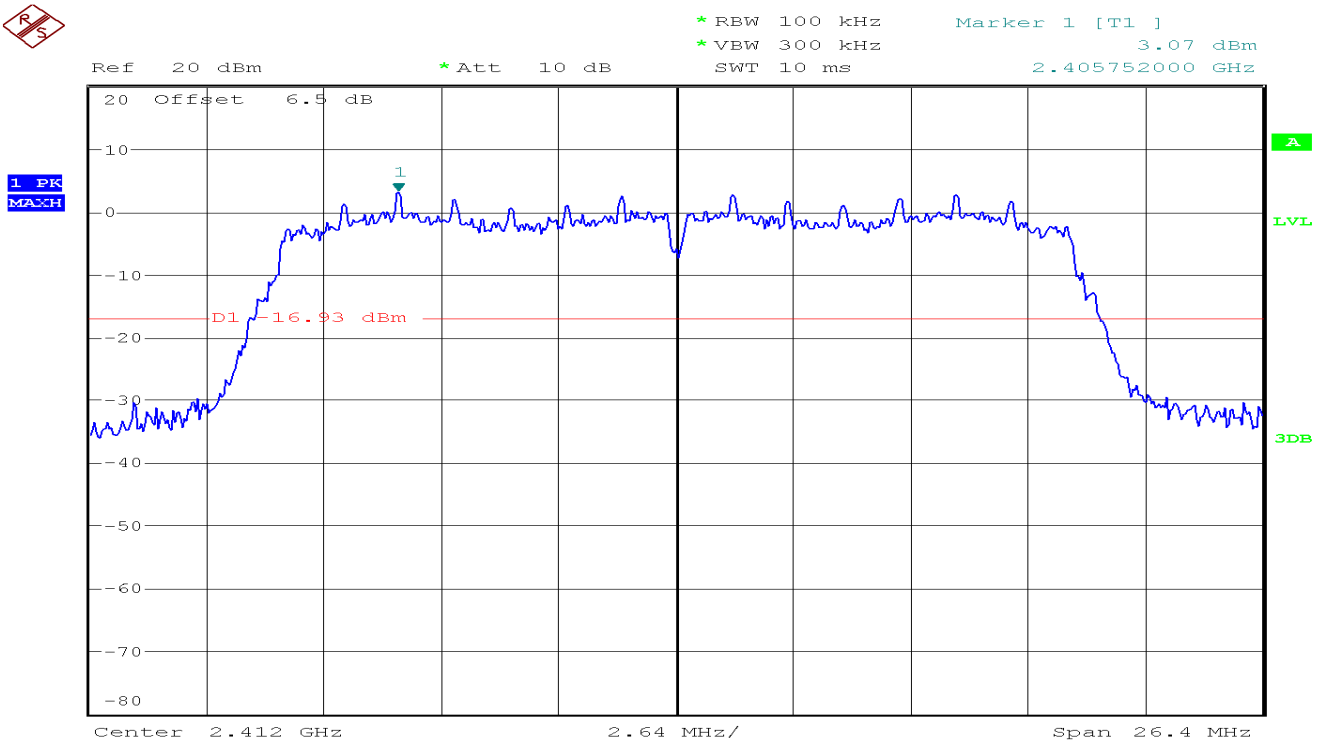

RBW 100 kHz
VBW 300 kHz
SWT 35 ms
Marker 1 [T1]
-39.73 dBm
2.483500000 GHz
Ref 20 dBm
Att 10 dB
Offset 6.5 dB
1 PK
MAXH
D1 -15.69 dBm
A
LVL
3DB
Start 2.43 GHz
13.5 MHz/
Stop 2.565 GHz

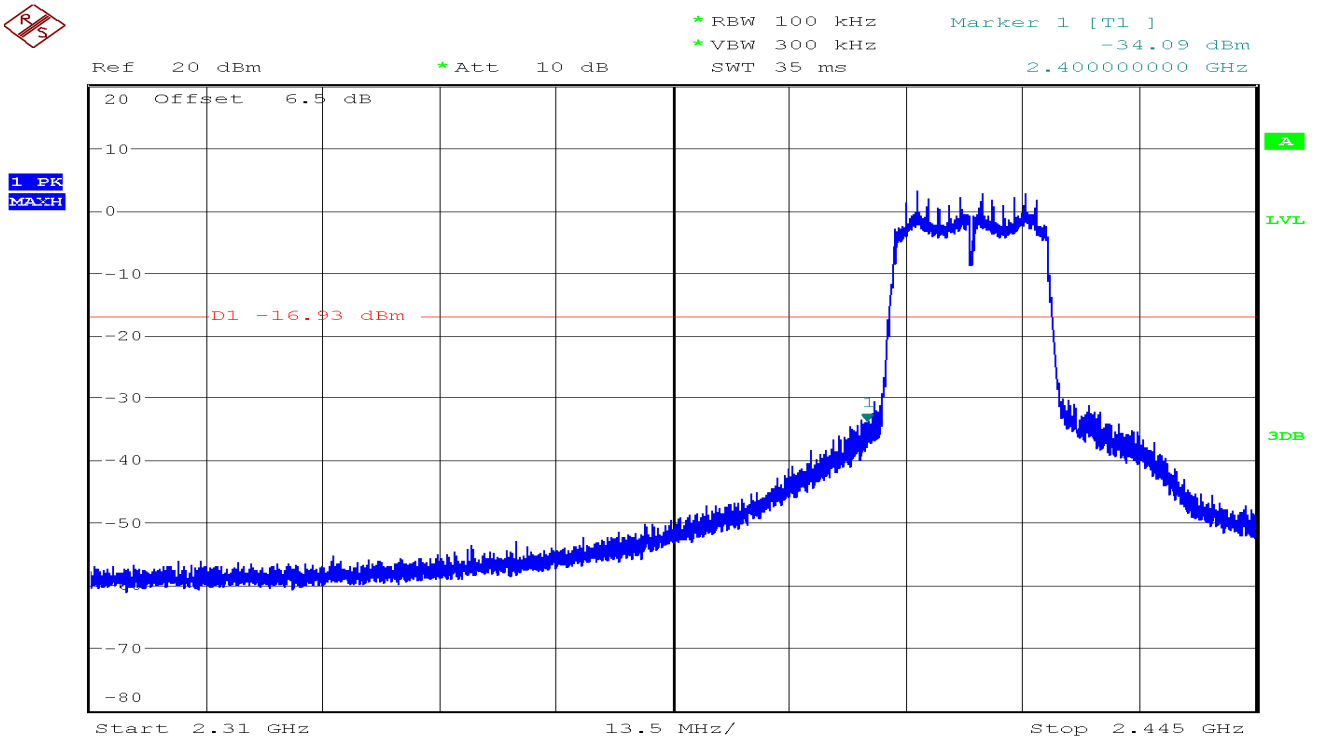

* RBW 100 kHz
* VBW 300 kHz
SWT 300 ms
Marker 1 [T1]
-38.59 dBm
147.351219512 MHz
Ref 20 dBm
* Att 10 dB
20 Offset 6.5 dB
1 PK
MAXH
D1 -15.69 dBm
A
LVL
3DB
Start 30 MHz
297 MHz/
Stop 3 GHz

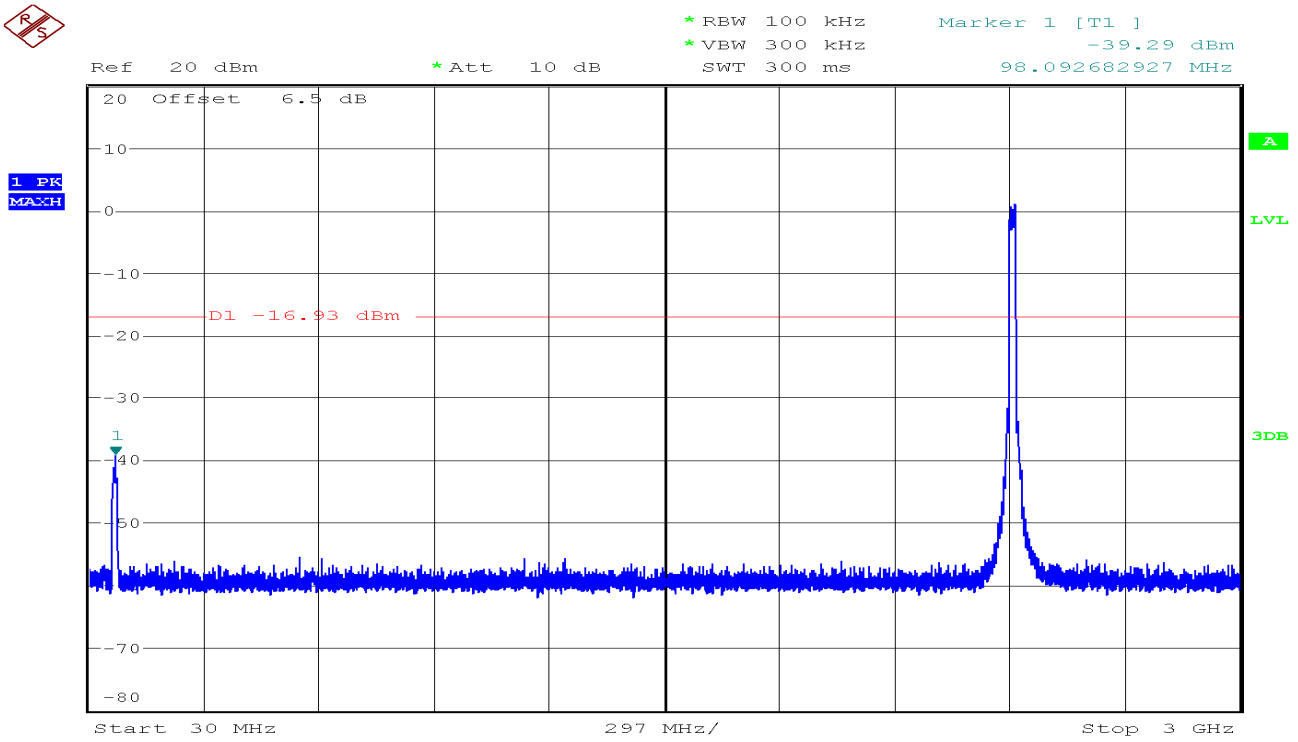

* RBW 100 kHz
* VBW 300 kHz
SWT 2.3 s
Marker 1 [T1]
-55.95 dBm
5.430365854 GHz
Ref 20 dBm
* Att 10 dB
20 Offset 6.5 dB
1 PK
MAXH
D1 -15.69 dBm
A
LVL
3DB
Start 2 GHz
2.3 GHz/
Stop 25 GHz

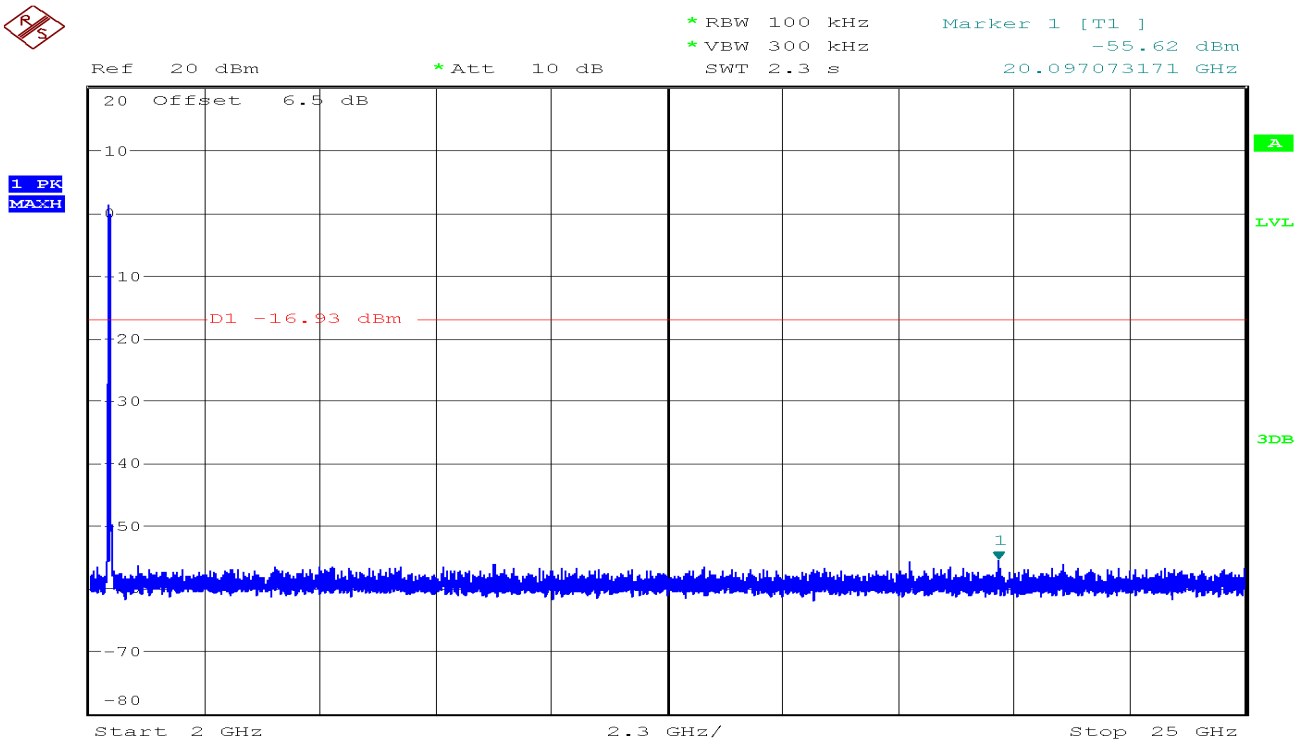
IEEE 802.11n HT20 mode

CH Low

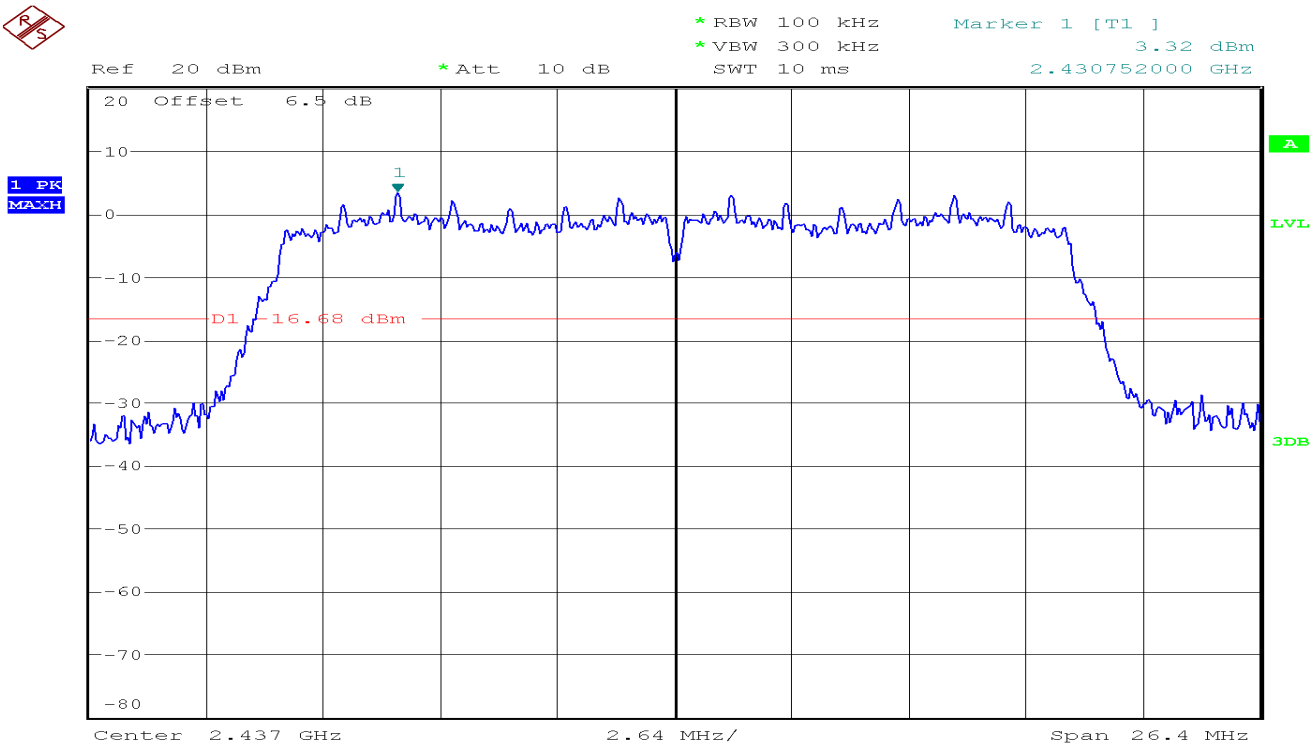


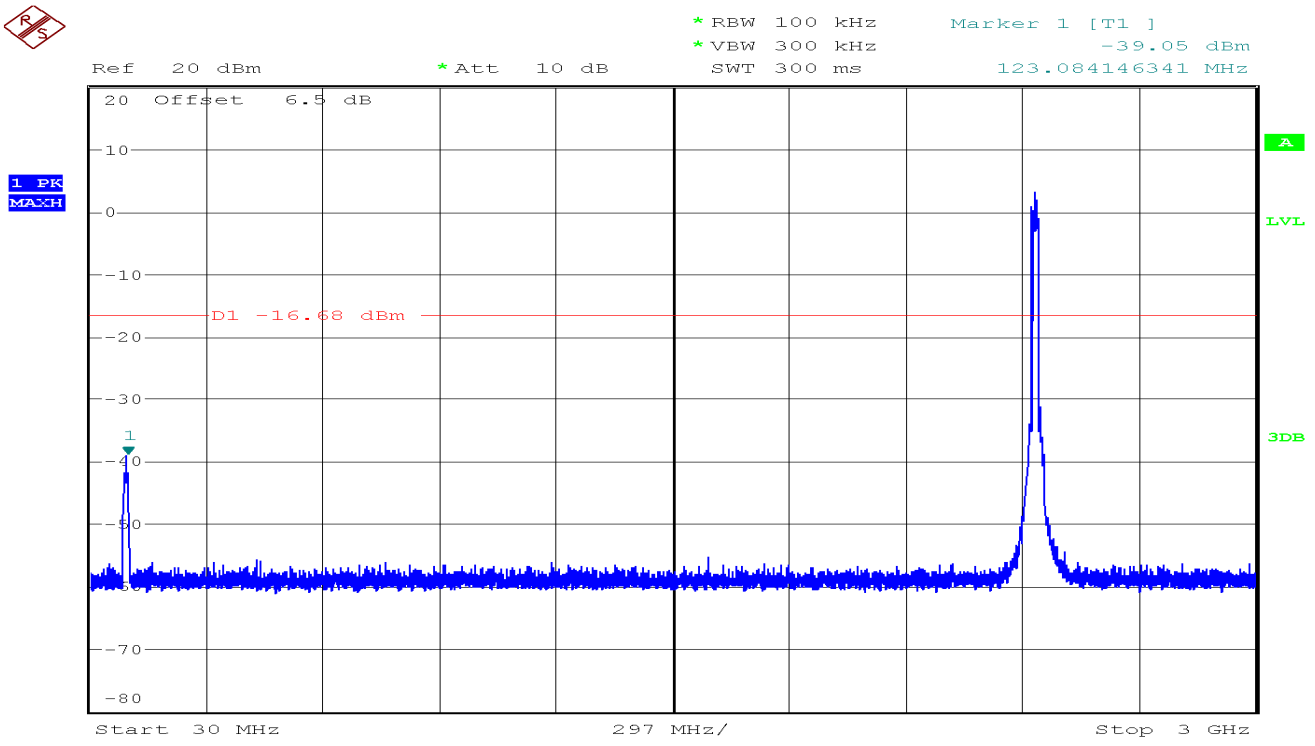


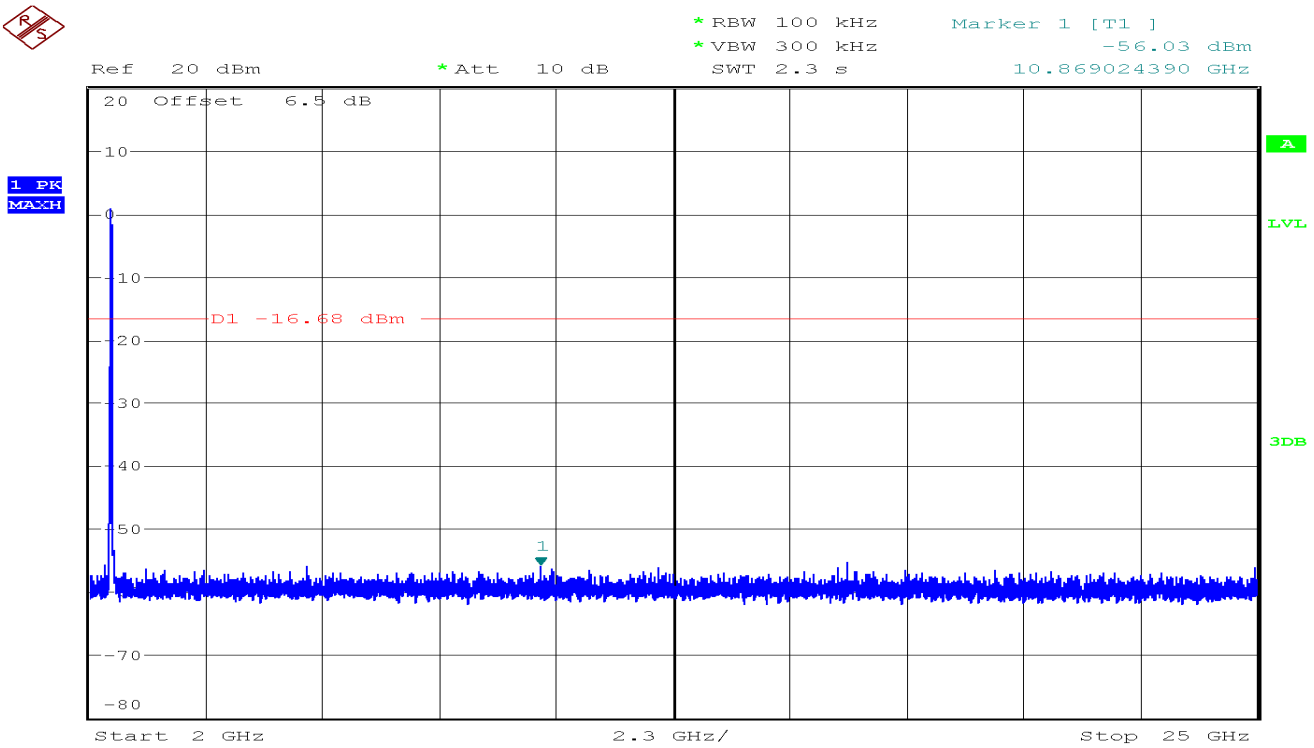

* RBW 100 kHz
* VBW 300 kHz
SWT 300 ms
Marker 1 [T1]
-39.29 dBm
98.092682927 MHz
Ref 20 dBm
* Att 10 dB
20 Offset 6.5 dB
1 PK MAXH
A
LVL
3DB
D1 -16.93 dBm
Start 30 MHz
297 MHz/
Stop 3 GHz


* RBW 100 kHz
* VBW 300 kHz
SWT 2.3 s
Marker 1 [T1]
-55.62 dBm
20.097073171 GHz
Ref 20 dBm
* Att 10 dB
20 Offset 6.5 dB
1 PK MAXH
A
LVL
3DB
D1 -16.93 dBm
Start 2 GHz
2.3 GHz/
Stop 25 GHz

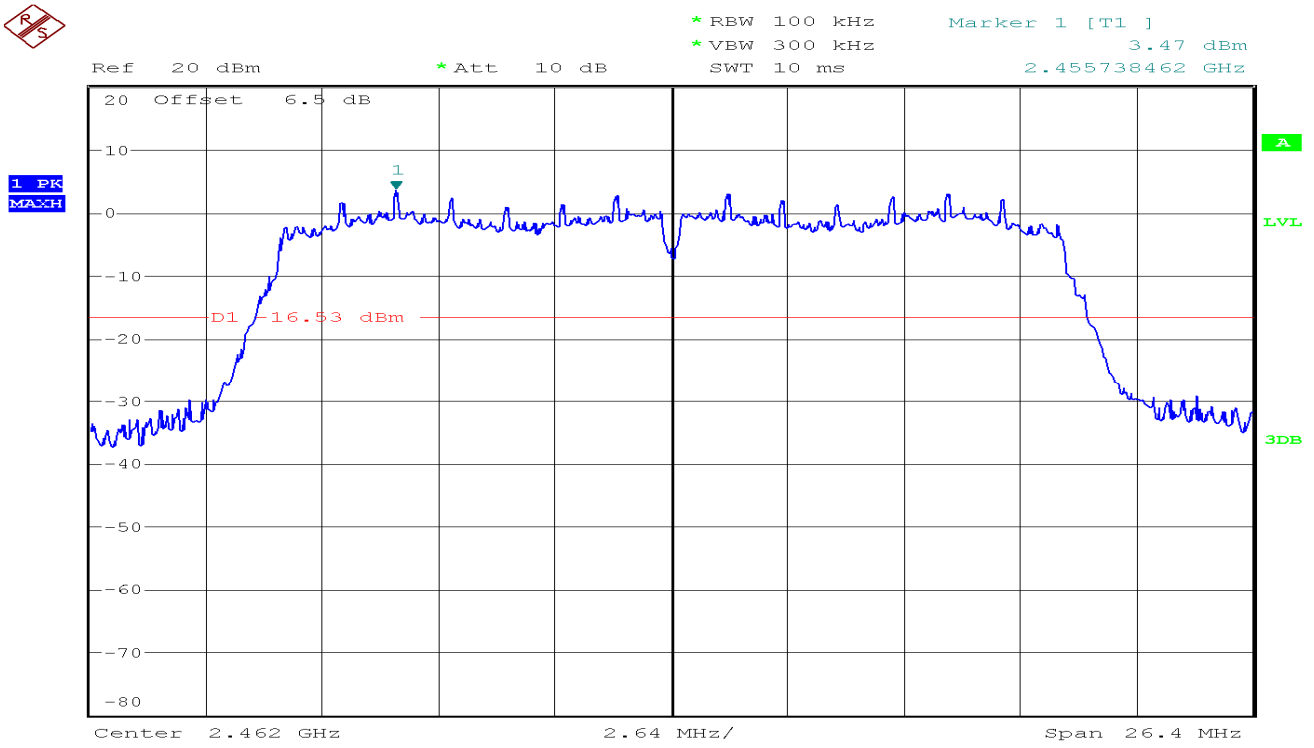
CH Mid

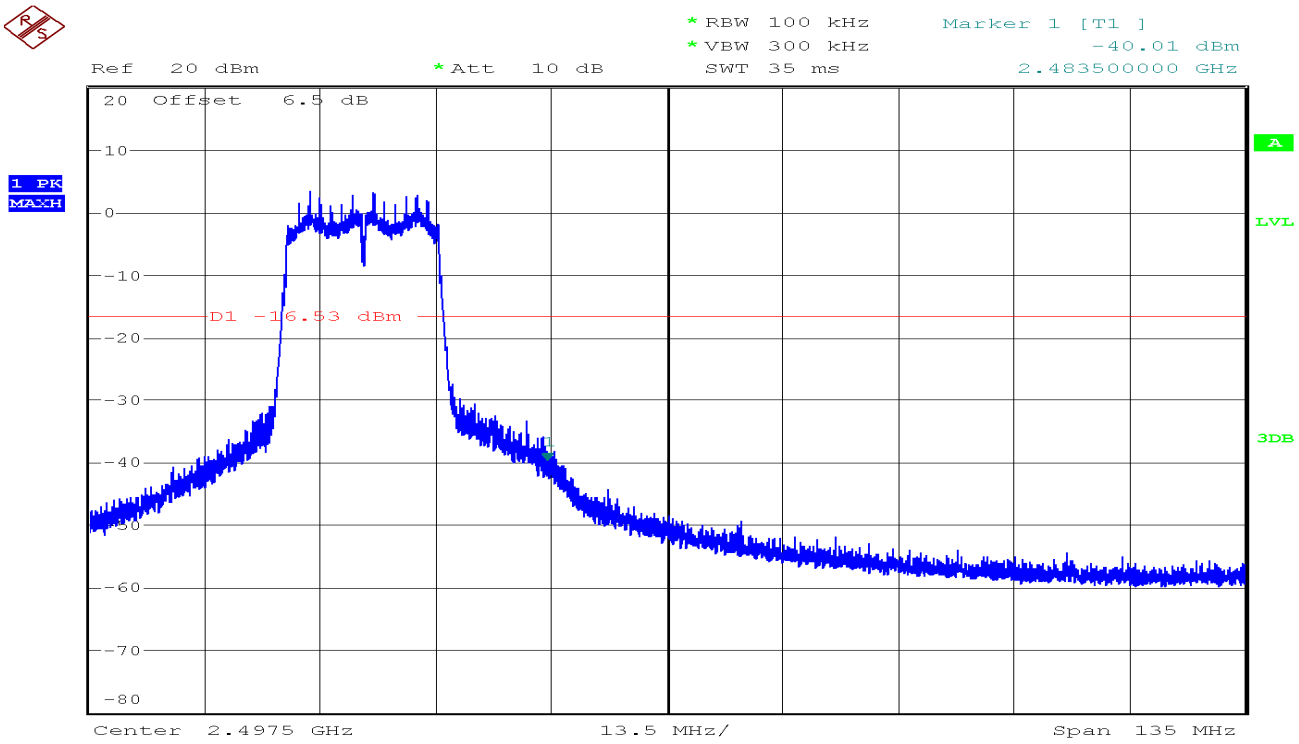

* RBW 100 kHz
* VBW 300 kHz
SWT 10 ms
Marker 1 [T1]
3.32 dBm
2.430752000 GHz
Ref 20 dBm
* Att 10 dB
20 Offset 6.5 dB
1 PK MAXH
A
LVL
3DB
D1 -16.68 dBm
Center 2.437 GHz
2.64 MHz/
Span 26.4 MHz

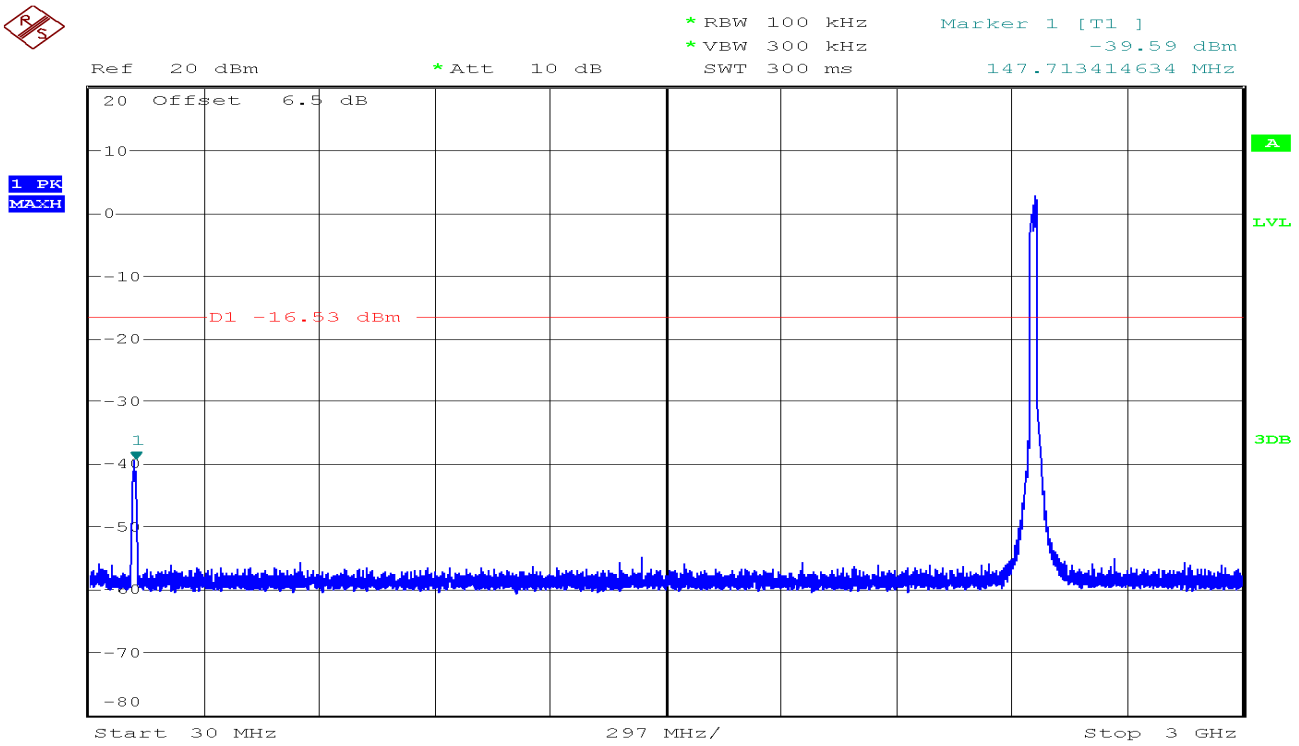

* RBW 100 kHz
* VBW 300 kHz
SWT 300 ms
Marker 1 [T1]
-39.05 dBm
123.084146341 MHz
Ref 20 dBm
* Att 10 dB
20 Offset 6.5 dB
1 PK MAXH
A
LVL
3DB
D1 -16.68 dBm
Start 30 MHz
297 MHz/
Stop 3 GHz

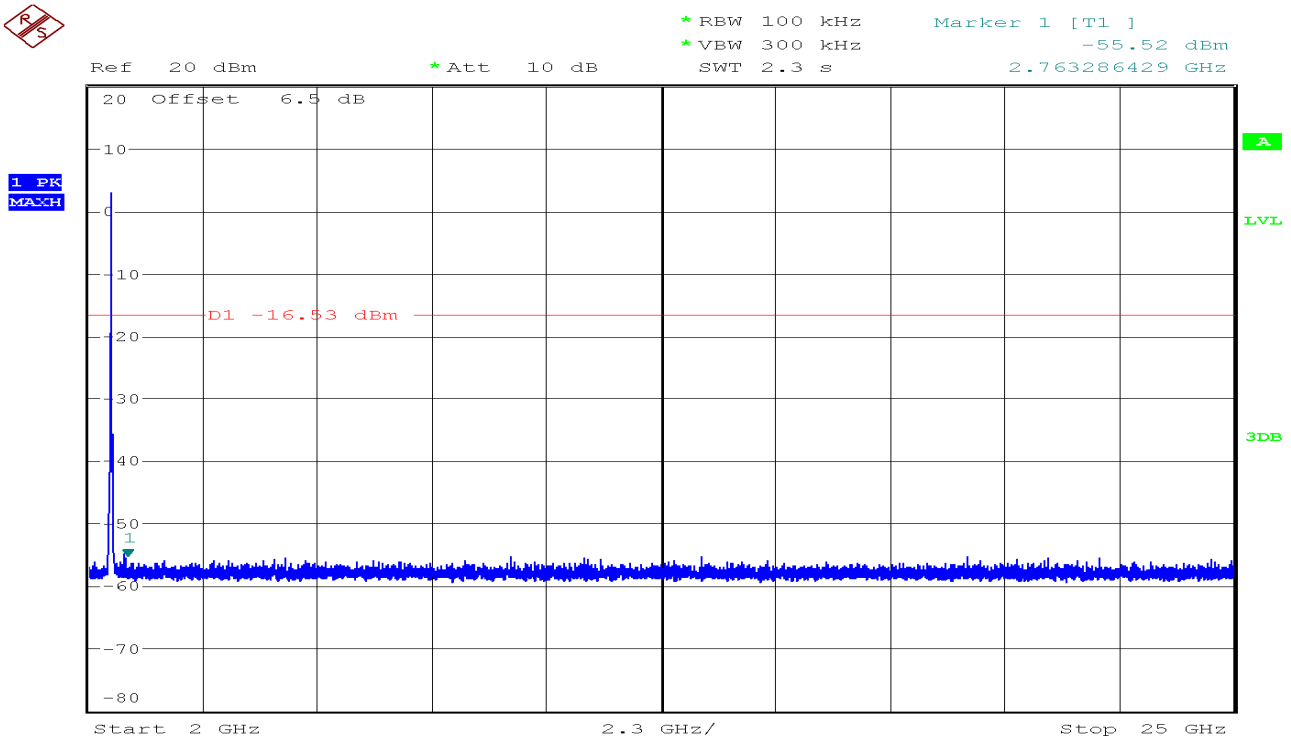

RBW 100 kHz
VBW 300 kHz
SWT 2.3 s
Marker 1 [T1]
-56.03 dBm
10.869024390 GHz
Ref 20 dBm
Att 10 dB
Offset 6.5 dB
1 PK
MAXH
D1 -16.68 dBm
A
LVL
3DB
Start 2 GHz
2.3 GHz/
Stop 25 GHz

CH High


RBW 100 kHz
VBW 300 kHz
SWT 10 ms
Marker 1 [T1]
3.47 dBm
2.455738462 GHz
Ref 20 dBm
Att 10 dB
Offset 6.5 dB
1 PK
MAXH
D1 -16.53 dBm
A
LVL
3DB
Center 2.462 GHz
2.64 MHz/
Span 26.4 MHz


* RBW 100 kHz
* VBW 300 kHz
SWT 35 ms
Marker 1 [T1]
-40.01 dBm
2.483500000 GHz
Ref 20 dBm
* Att 10 dB
20 Offset 6.5 dB
1 PK MAXH
D1 -16.53 dBm
A
LVL
3DB
Center 2.4975 GHz
13.5 MHz/
Span 135 MHz


* RBW 100 kHz
* VBW 300 kHz
SWT 300 ms
Marker 1 [T1]
-39.59 dBm
147.713414634 MHz
Ref 20 dBm
* Att 10 dB
20 Offset 6.5 dB
1 PK MAXH
D1 -16.53 dBm
A
LVL
3DB
Start 30 MHz
297 MHz/
Stop 3 GHz


* RBW 100 kHz
* VBW 300 kHz
SWT 2.3 s
Marker 1 [T1]
-55.52 dBm
2.763286429 GHz
Ref 20 dBm
* Att 10 dB
20 Offset 6.5 dB
1 PK
MAXH
A
LVL
3DB
D1 -16.53 dBm
Start 2 GHz
2.3 GHz/
Stop 25 GHz

7.5.RADIATED EMISSIONS

LIMIT

Radiated emissions from 9 kHz to 25 GHz were measured according to the methods defines in ANSI C63.10-2013. The EUT was placed above the ground plane, 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz. The interface cables and equipment positions were varied within limits of reasonable applications to determine the positions producing maximum radiated emissions

1. According to §15.209(a), except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

FREQUENCIES(MHz)	FIELD STRENGTH (microvolts/meter)	MEASUREMENT DISTANCE(meters)
0.009~0.490	2400/F(kHz)	300
0.490~1.705	24000/F(kHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

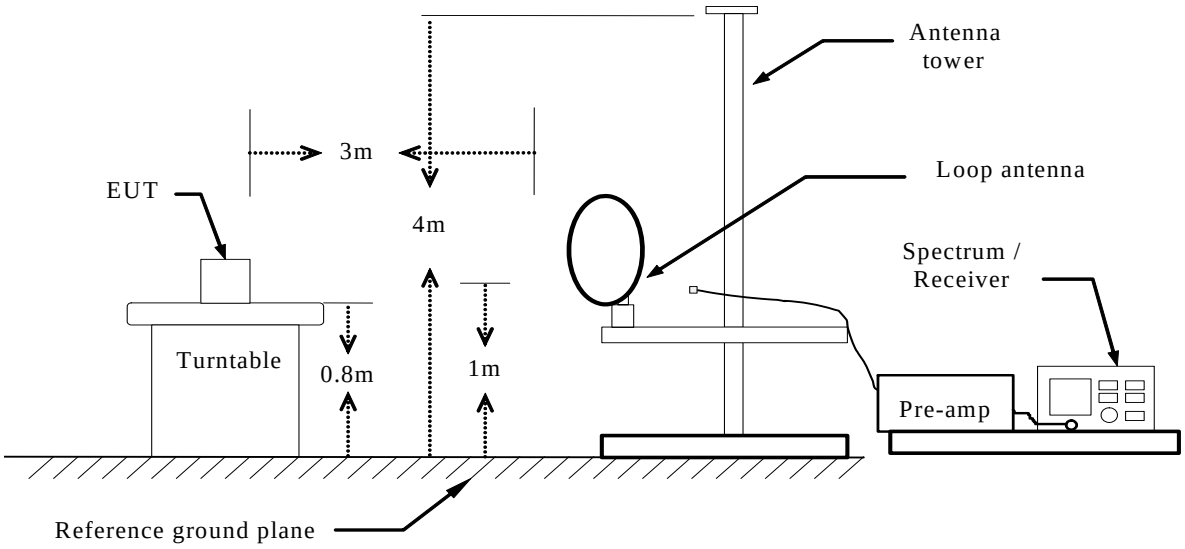
Remark: *Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.*

2.In the emission table above, the tighter limit applies at the band edges.

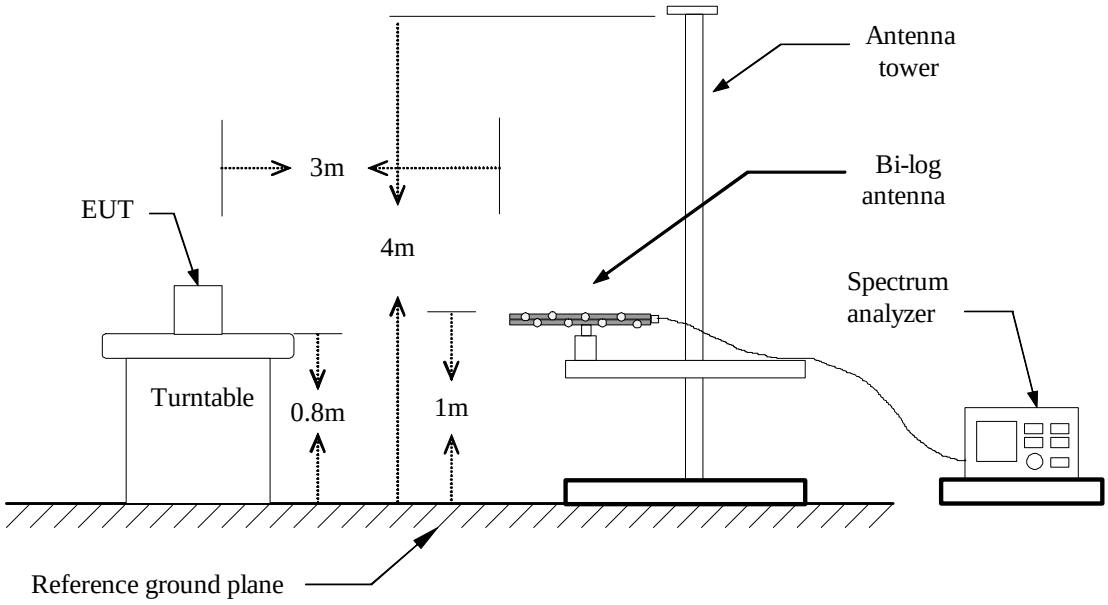
Frequency (MHz)	Field Strength (μV/m at 3-meter)	Field Strength (dBμV/m at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

Test Configuration

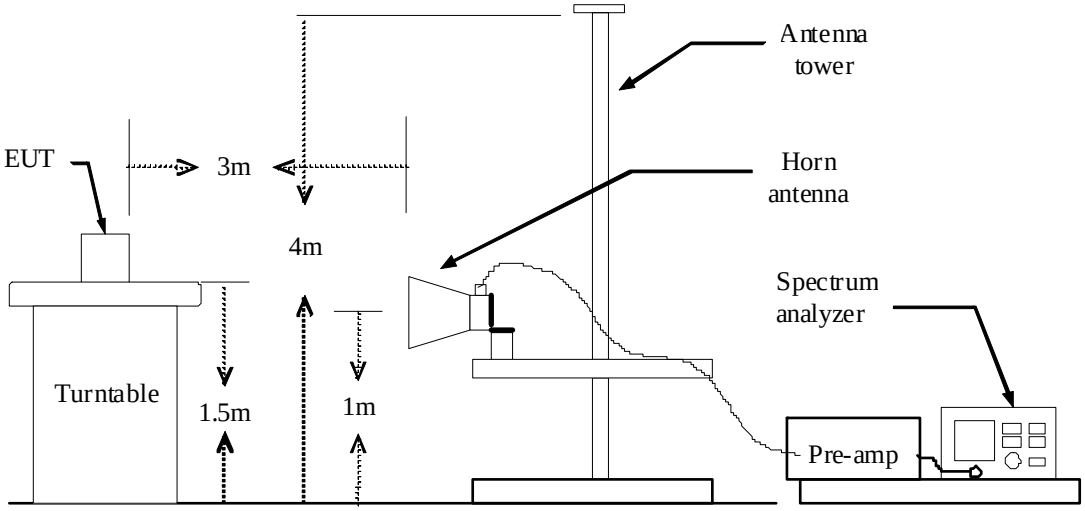
Below 30MHz



Below 1 GHz



Above 1 GHz



TEST PROCEDURE

1. The EUT is placed on a turntable above ground plane, which is 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Set the spectrum analyzer in the following setting as:

   Below 1GHz:

   RBW=100kHz / VBW=300kHz / Sweep=AUTO

   Above 1GHz:

   PEAK: RBW=VBW=1MHz / Sweep=AUTO

   AVERAGE: RBW=1MHz / Sweep=AUTO

   VBW=10Hz,when duty cycle is no less than 98 percent.

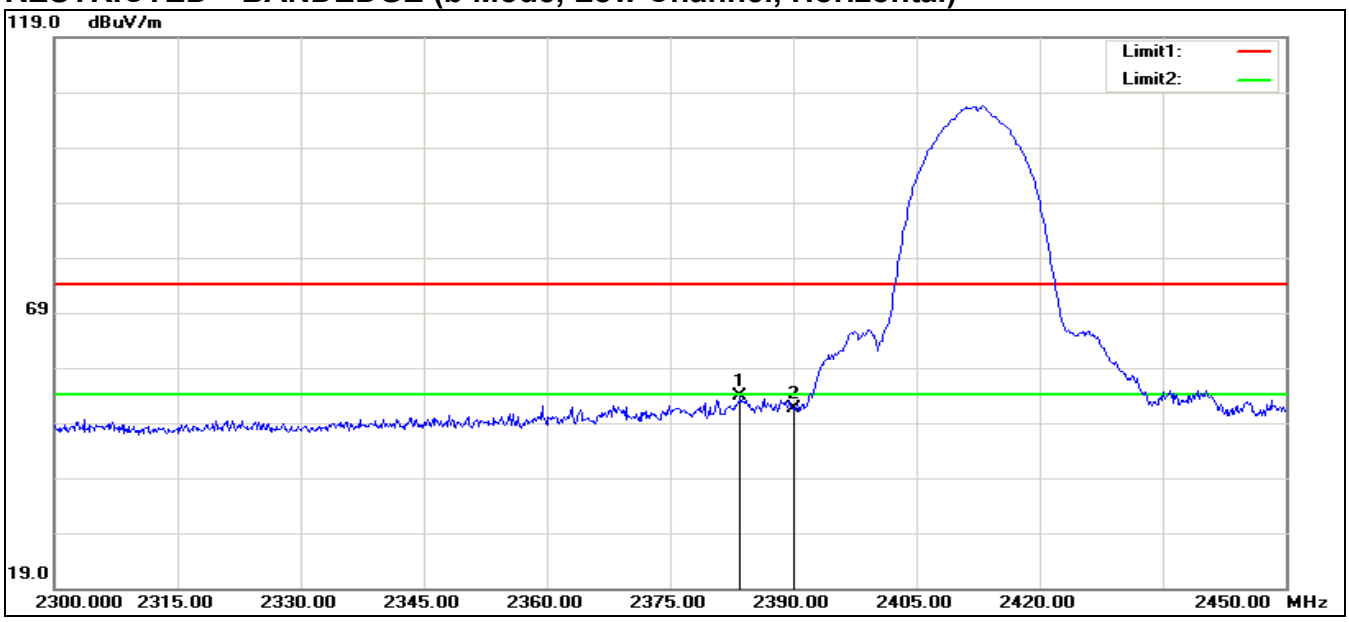
   VBW≧1/T,when duty cycle is less than 98 percent,where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximun power control level for the tested mode of operation.

Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
IEEE 802.11 b	99.5	--	--	10Hz
IEEE 802.11 g	96.6	1.4	0.7	1KHz
IEEE 802.11n HT20	97.4	1.3	0.7	1KHz

7. Repeat above procedures until the measurements for all frequencies are complete.

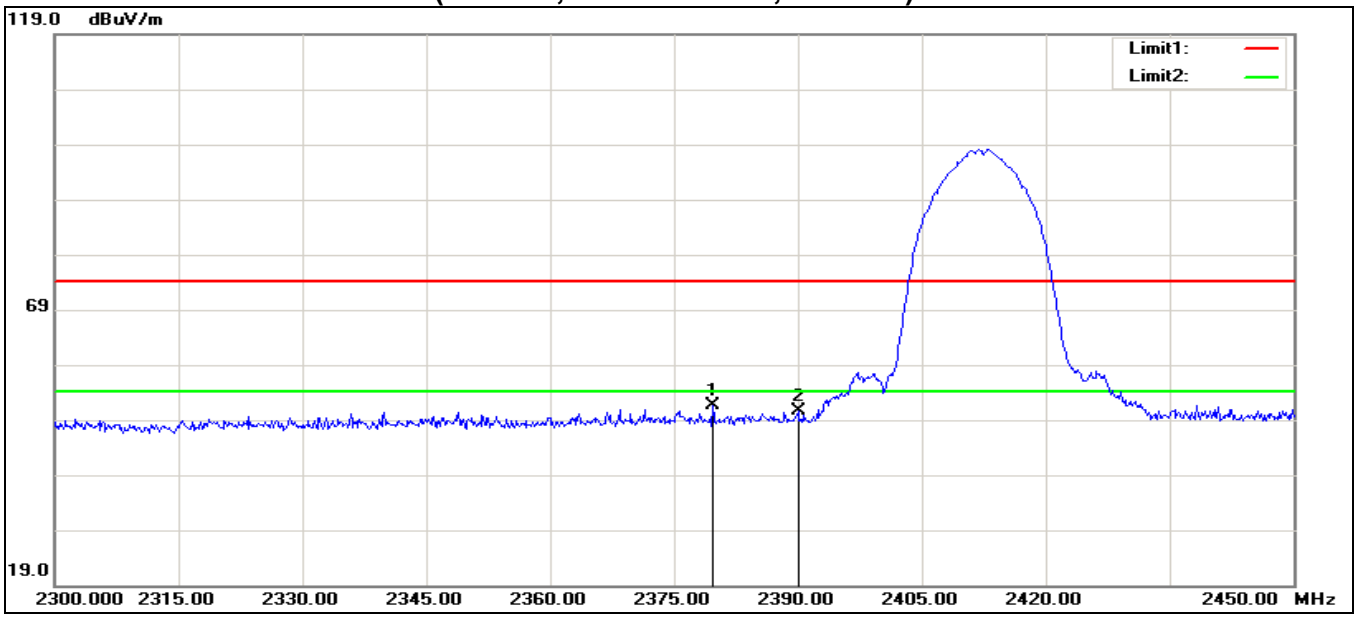
TEST RESULTS

RESTRICTED BANDEDGE (b Mode, Low Channel, Horizontal)



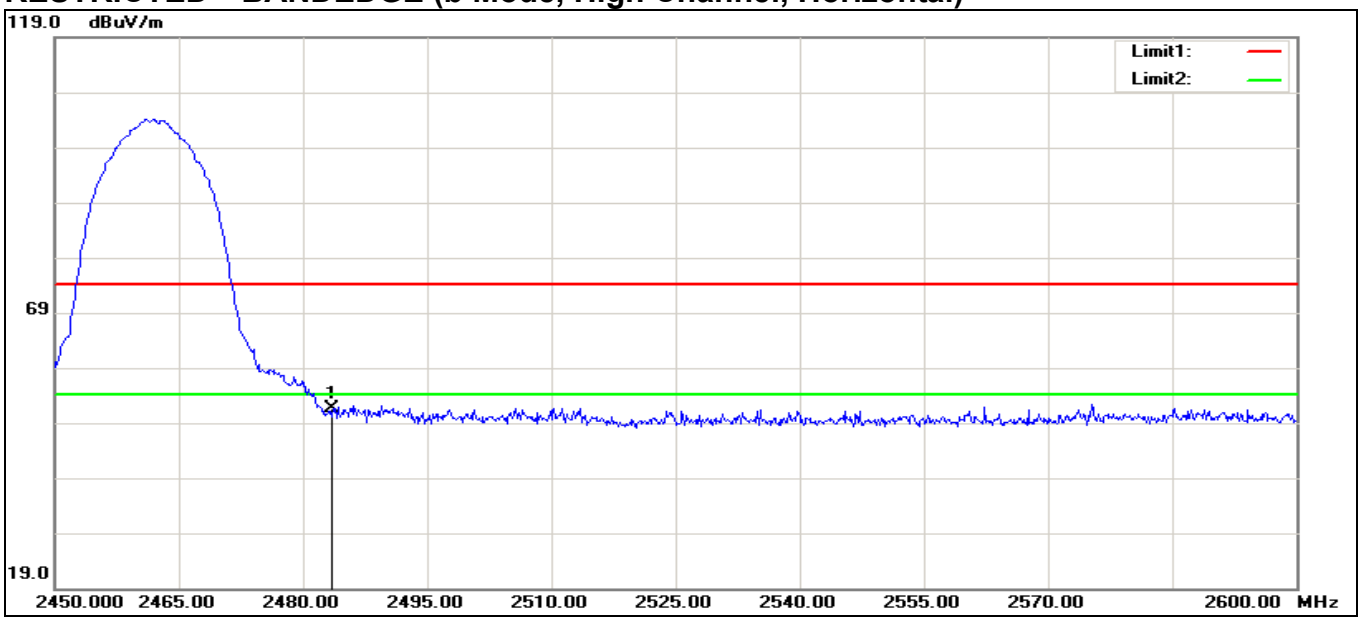
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	2383.550	61.20	-7.37	53.83	74.00	-20.17	100	185	peak
2	2390.000	58.90	-7.31	51.59	74.00	-22.41	100	172	peak

RESTRICTED BANDEDGE (b Mode, Low Channel, Vertical)



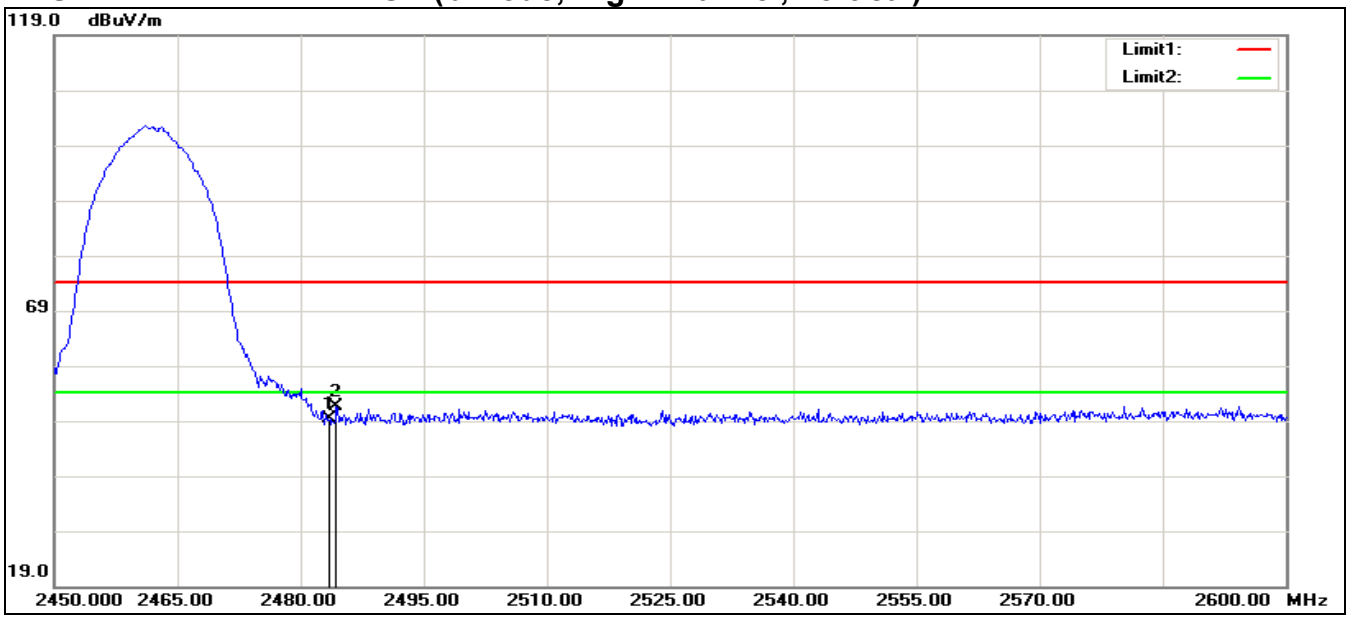
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	2379.650	59.01	-7.41	51.60	74.00	-22.40	200	73	peak
2	2390.000	58.01	-7.31	50.70	74.00	-23.30	200	103	peak

RESTRICTED BANDEDGE (b Mode, High Channel, Horizontal)



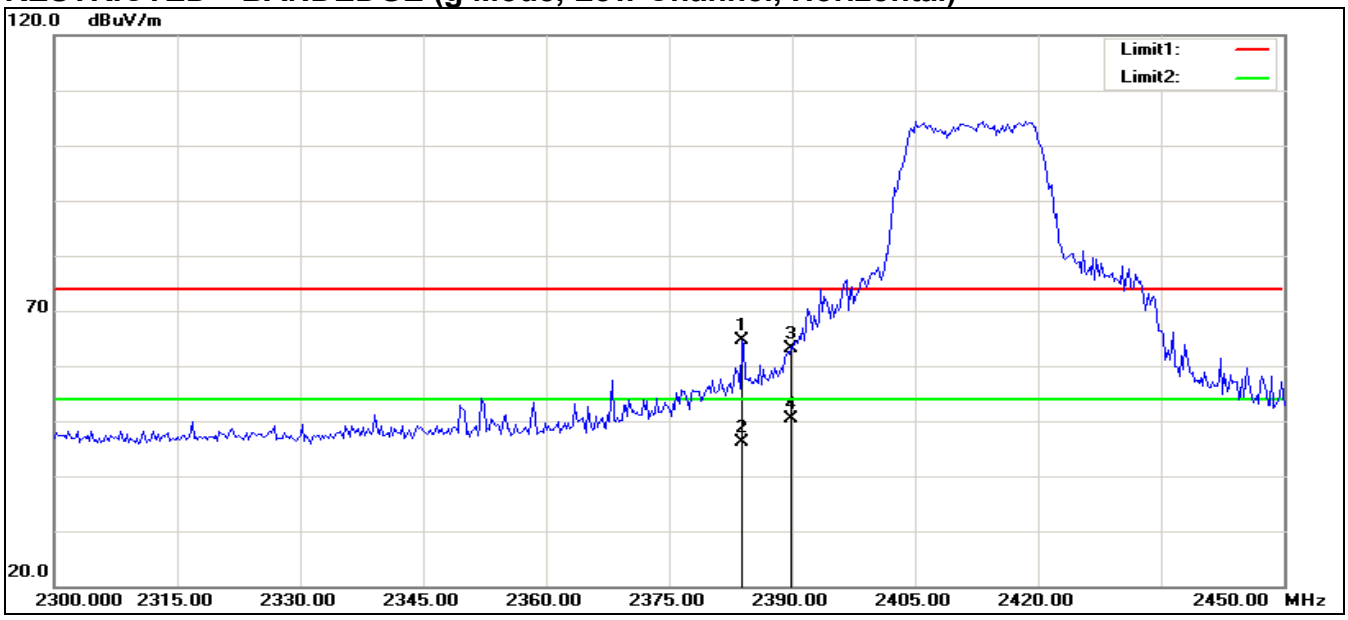
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	2483.500	58.01	-6.44	51.57	74.00	-22.43	100	175	peak

RESTRICTED BANDEDGE (b Mode, High Channel, Vertical)



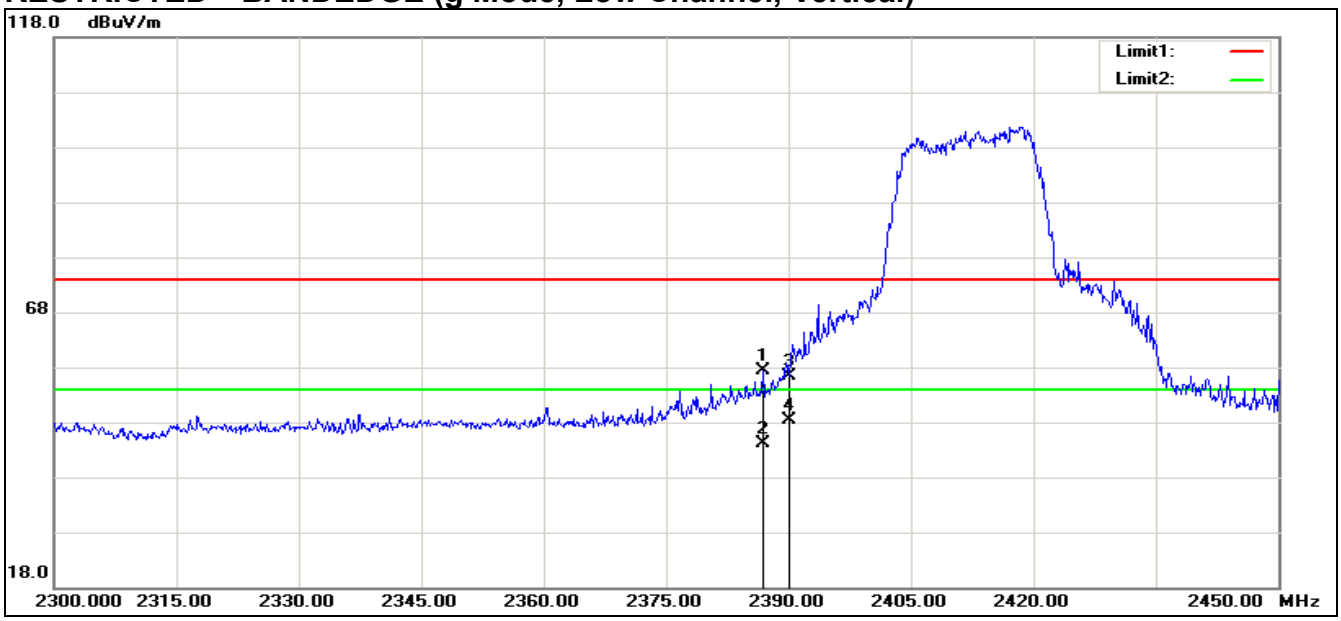
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	2483.500	55.82	-6.44	49.38	74.00	-24.62	200	244	peak
2	2484.350	58.05	-6.44	51.61	74.00	-22.39	200	244	peak

RESTRICTED BANDEDGE (g Mode, Low Channel, Horizontal)



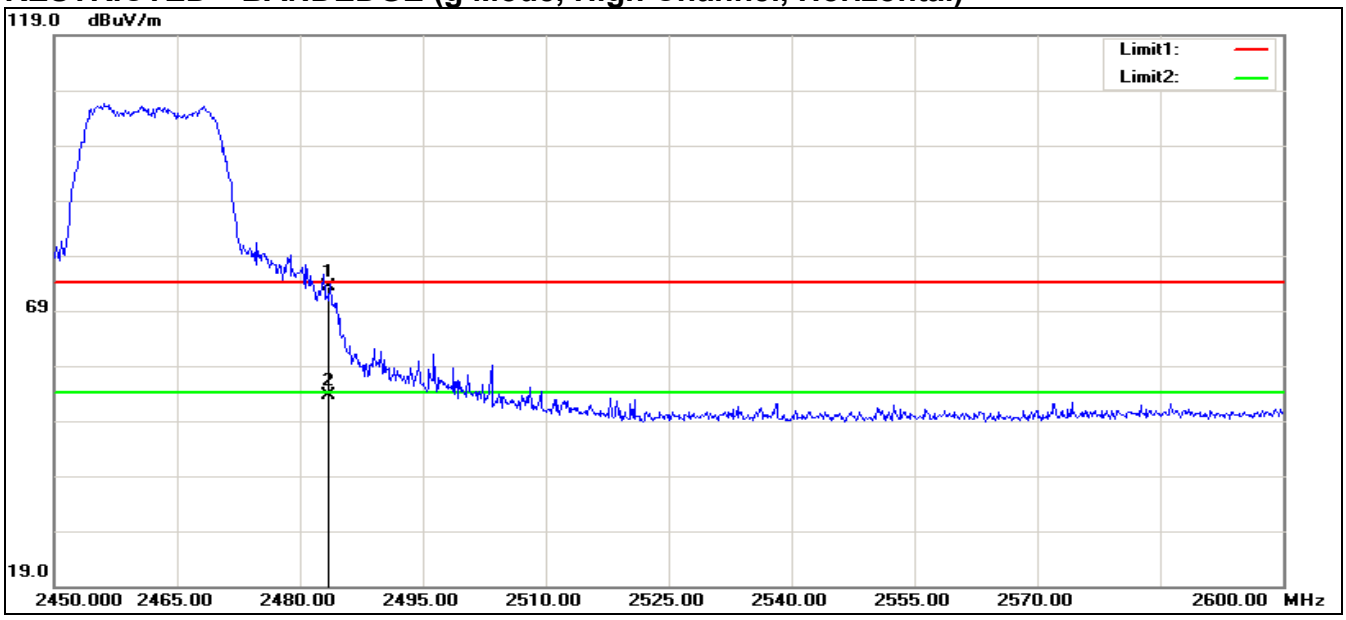
No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	2383.894	71.97	-7.37	64.60	74.00	-9.40	100	240	peak
2	2383.894	53.55	-7.37	46.18	54.00	-7.82	100	245	AVG
3	2390.000	70.40	-7.31	63.09	74.00	-10.91	100	124	peak
4	2390.000	57.64	-7.31	50.33	54.00	-3.67	100	0	AVG

RESTRICTED BANDEDGE (g Mode, Low Channel, Vertical)



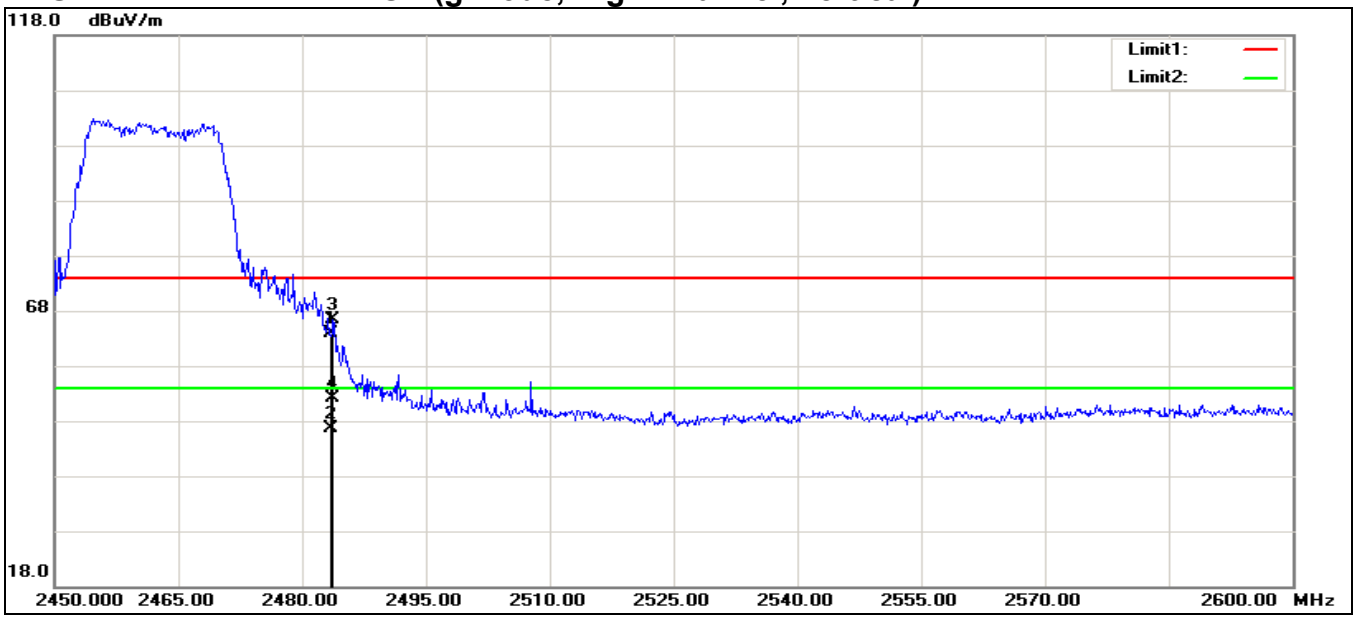
No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	2386.850	64.60	-7.34	57.26	74.00	-16.74	200	64	peak
2	2386.850	51.57	-7.34	44.23	54.00	-9.77	200	52	AVG
3	2390.000	63.65	-7.31	56.34	74.00	-17.66	200	132	peak
4	2390.000	55.81	-7.31	48.50	54.00	-5.50	200	142	AVG

RESTRICTED BANDEDGE (g Mode, High Channel, Horizontal)



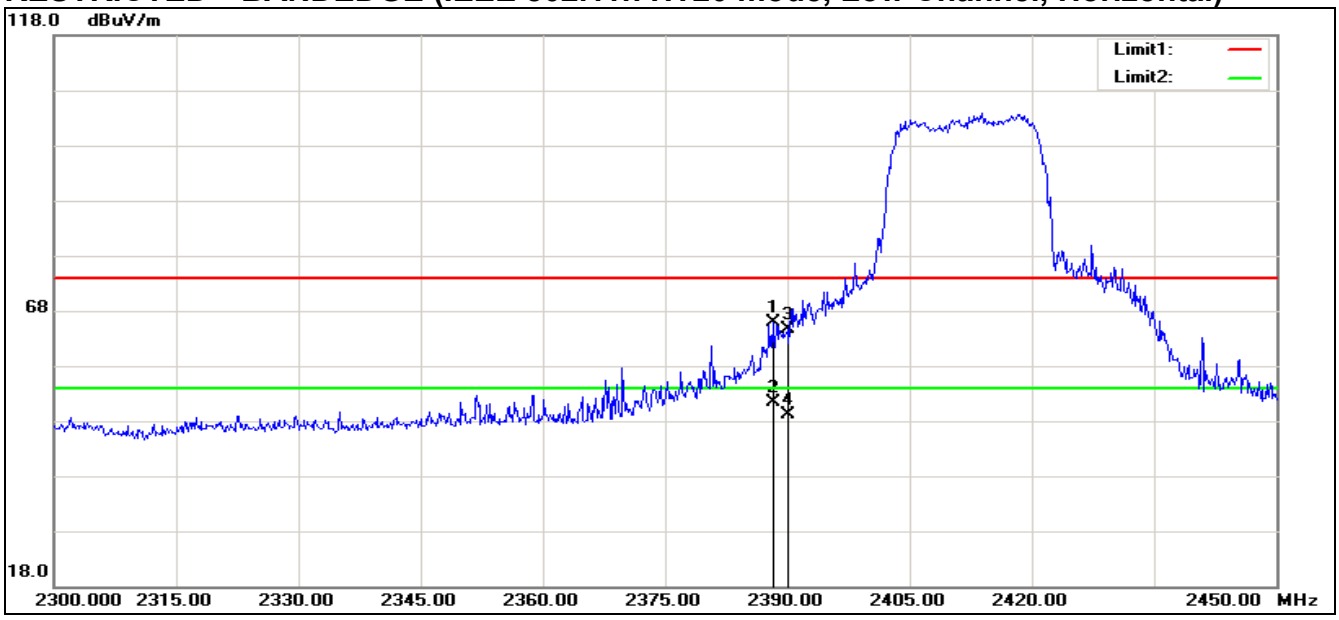
No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	2483.500	79.82	-6.44	73.38	74.00	-0.62	200	12	peak
2	2483.500	59.95	-6.44	53.51	54.00	-0.49	200	12	AVG

RESTRICTED BANDEDGE (g Mode, High Channel, Vertical)



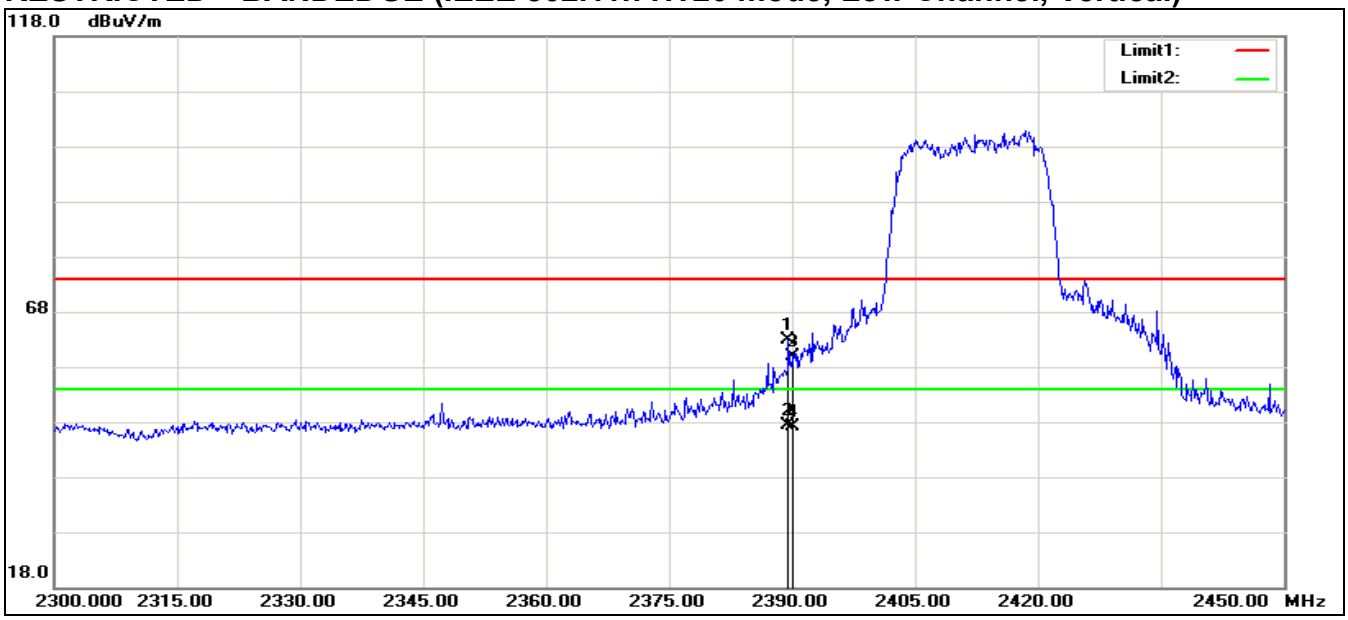
No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	2483.500	70.25	-6.44	63.81	74.00	-10.19	100	285	peak
2	2483.500	53.16	-6.44	46.72	54.00	-7.28	100	292	AVG
3	2483.750	72.79	-6.44	66.35	74.00	-7.65	100	285	peak
4	2483.750	58.55	-6.44	52.11	54.00	-1.89	100	202	AVG

RESTRICTED BANDEDGE (IEEE 802.11n HT20 mode, Low Channel, Horizontal)



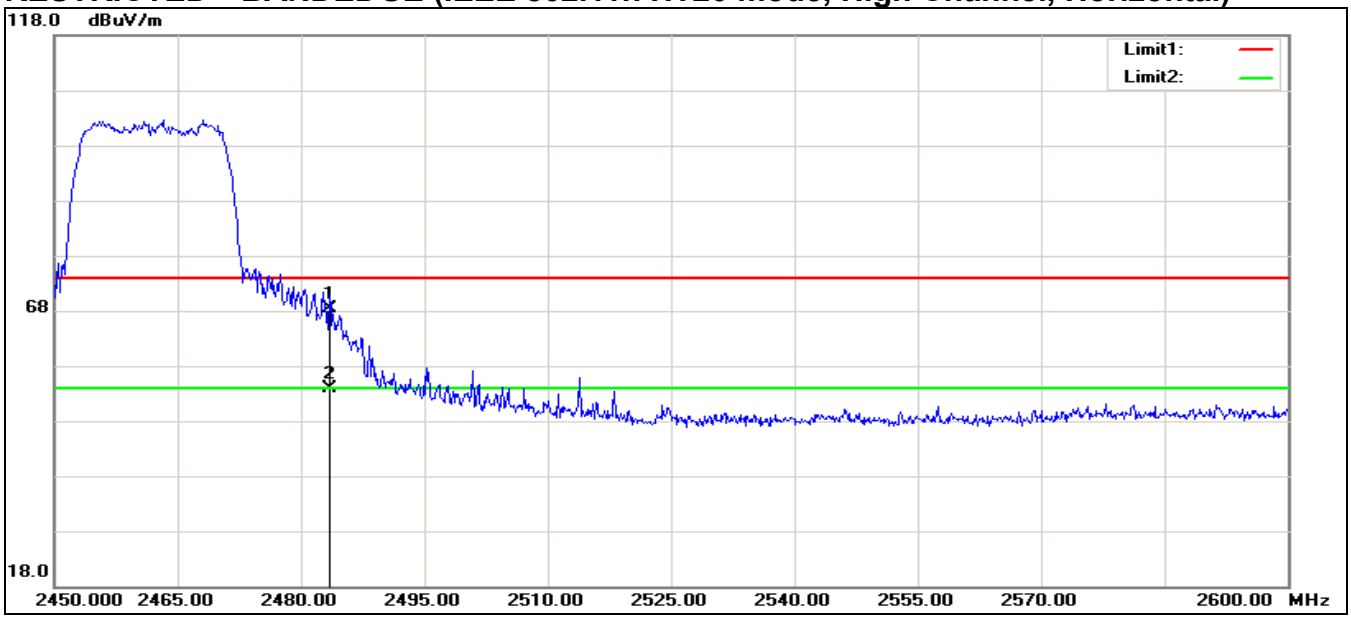
No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	2388.200	73.14	-7.33	65.81	74.00	-8.19	200	181	peak
2	2388.200	58.82	-7.33	51.49	54.00	-2.51	200	180	AVG
3	2390.000	72.02	-7.31	64.71	74.00	-9.29	200	238	peak
4	2390.000	56.43	-7.31	49.12	54.00	-4.88	200	333	AVG

RESTRICTED BANDEDGE (IEEE 802.11n HT20 mode, Low Channel, Vertical)



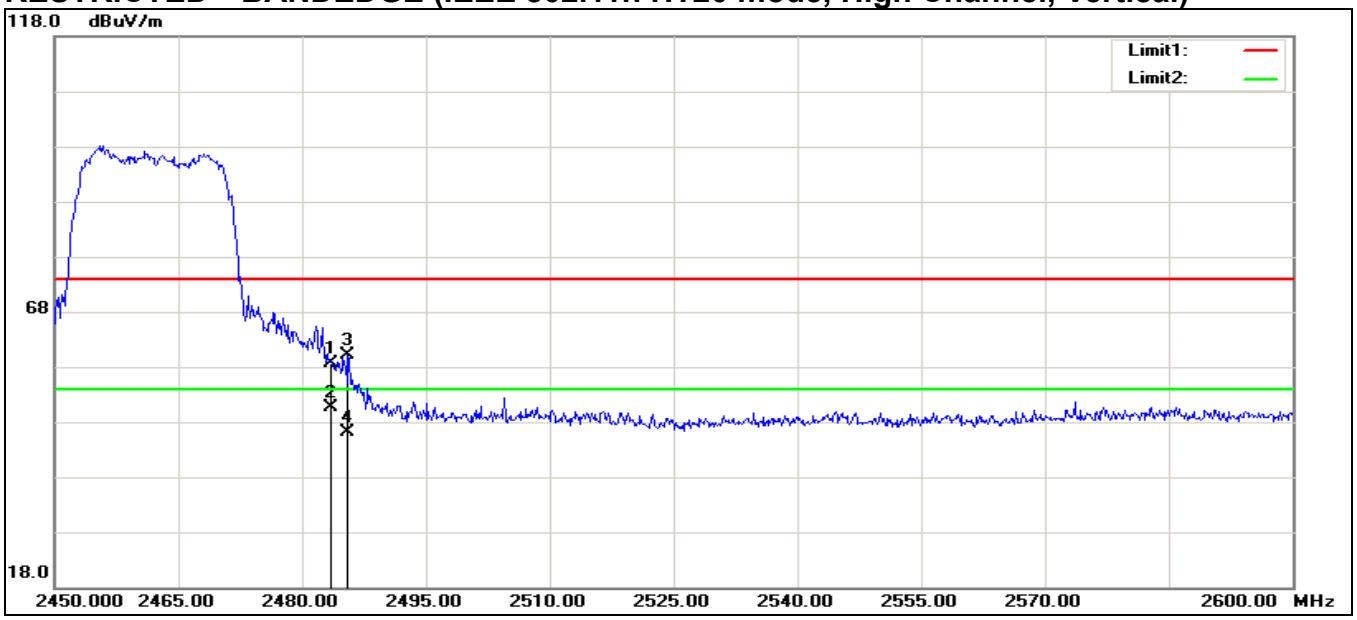
No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	2389.550	70.30	-7.31	62.99	74.00	-11.01	100	63	peak
2	2389.550	54.77	-7.31	47.46	54.00	-6.54	100	63	AVG
3	2390.000	67.25	-7.31	59.94	74.00	-14.06	200	125	peak
4	2390.000	54.54	-7.31	47.23	54.00	-6.77	200	138	AVG

RESTRICTED BANDEDGE (IEEE 802.11n HT20 mode, High Channel, Horizontal)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	2483.500	74.73	-6.44	68.29	74.00	-5.71	100	169	peak
2	2483.500	60.38	-6.44	53.94	54.00	-0.06	100	181	AVG

RESTRICTED BANDEDGE (IEEE 802.11n HT20 mode, High Channel, Vertical)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	2483.500	65.16	-6.44	58.72	74.00	-15.28	200	201	peak
2	2483.500	57.13	-6.44	50.69	54.00	-3.31	200	344	AVG
3	2485.550	66.44	-6.42	60.02	74.00	-13.98	100	64	peak
4	2485.550	52.46	-6.42	46.04	54.00	-7.96	100	56	AVG

Test Result of Radiated Emission

Below 30MHz

The interference of the frequency value is lower than the limit below 20 db, measured as the background noise values and will not be recorded.

30MHz-1GHz

Operation Mode:	Normal Link	**Test Date:**	2017-4-25
Temperature:	25°C	**Tested by:**	Lily.Wang
Humidity:	48% RH	**Polarity:**	Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
42.5750	V	21.15	15.62	36.77	40.00	-3.23	QP
234.2200	V	20.82	16.42	37.24	46.00	-8.76	QP
307.6000	V	19.50	16.79	36.29	46.00	-9.71	QP
397.7930	V	22.02	20.41	42.43	46.00	-3.57	QP
474.3800	V	6.08	21.76	27.84	46.00	-18.16	QP
549.6200	V	14.30	22.54	36.84	46.00	-9.16	QP
229.3910	H	16.68	16.41	33.09	46.00	-12.91	QP
321.0210	H	10.58	17.33	27.91	46.00	-18.09	QP
397.7900	H	22.46	20.41	42.87	46.00	-3.13	QP
593.9790	H	17.00	22.85	39.85	46.00	-6.15	QP
742.4780	H	18.03	25.34	43.37	46.00	-2.63	QP
863.8110	H	5.14	26.09	31.23	46.00	-14.77	QP

Remark:

1. *Measuring frequencies from 30 MHz to the 1GHz (No emission found between lowest internal used/generated frequency to 30 MHz).*
2. *Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using peak/quasi-peak detector mode.*
3. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
4. *Margin (dB) = Result (dBuV/m) – Limit (dBuV/m).*

Above 1 GHz

Operation Mode: TX / IEEE 802.11b / CH Low **Test Date:** 2017-4-27

Temperature: 24°C **Tested by:** Lily.Wang

Humidity: 48 % RH **Polarity:** Ver. / Hor.

Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	4895.833	51.47	-5.19	46.28	74.00	-27.72	100	266	peak
2	7402.244	43.29	6.47	49.76	74.00	-24.24	100	144	peak
N/A									

Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	4841.346	43.08	-5.24	37.84	74.00	-36.16	100	39	peak
2	7293.269	43.30	6.37	49.67	74.00	-24.33	100	33	peak
N/A									

Operation Mode: TX / IEEE 802.11b / CH Mid **Test Date:** 2017-4-27

Temperature: 24°C **Tested by:** Lily.Wang

Humidity: 48 % RH **Polarity:** Ver. / Hor.

Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	5195.513	44.02	-4.18	39.84	74.00	-34.16	100	320	peak
2	7129.808	43.85	6.23	50.08	74.00	-23.92	100	52	peak
N/A									

Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	5195.513	46.57	-4.18	42.39	74.00	-31.61	100	111	peak
2	7211.538	43.93	6.30	50.23	74.00	-23.77	100	164	peak
N/A									

Operation Mode: TX / IEEE 802.11b / CH High **Test Date:** 2017-4-27

Temperature: 24°C **Tested by:** Lily.Wang

Humidity: 48 % RH **Polarity:** Ver. / Hor.

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	4895.833	50.29	-5.19	45.10	74.00	-28.90	100	214	peak
2	7565.705	43.35	6.62	49.97	74.00	-24.03	100	199	peak
N/A									

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	5195.513	46.20	-4.18	42.02	74.00	-31.98	100	117	peak
2	7511.218	43.50	6.57	50.07	74.00	-23.93	100	226	peak
N/A									

Operation Mode: TX / IEEE 802.11g / CH Low **Test Date:** 2017-4-27

Temperature: 24°C **Tested by:** Lily.Wang

Humidity: 48 % RH **Polarity:** Ver. / Hor.

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	4895.833	49.64	-5.19	44.45	74.00	-29.55	100	170	peak
2	7266.026	42.77	6.35	49.12	74.00	-24.88	100	177	peak
N/A									

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	4841.346	43.68	-5.24	38.44	74.00	-35.56	100	282	peak
2	7429.487	43.18	6.50	49.68	74.00	-24.32	100	317	peak
N/A									

Operation Mode: TX / IEEE 802.11g / CH Mid **Test Date:** 2017-4-27

Temperature: 24°C **Tested by:** Lily.Wang

Humidity: 48 % RH **Polarity:** Ver. / Hor.

Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	5195.513	43.31	-4.18	39.13	74.00	-34.87	100	314	peak
2	7347.756	43.85	6.42	50.27	74.00	-23.73	100	201	peak
N/A									

Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	5195.513	47.20	-4.18	43.02	74.00	-30.98	100	108	peak
2	7266.026	43.11	6.35	49.46	74.00	-24.54	100	18	peak
N/A									

Operation Mode: TX / IEEE 802.11g / CH High **Test Date:** 2017-4-27

Temperature: 24°C **Tested by:** Lily.Wang

Humidity: 48 % RH **Polarity:** Ver. / Hor.

Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	4923.077	46.94	-5.17	41.77	74.00	-32.23	100	210	peak
2	7429.487	43.28	6.50	49.78	74.00	-24.22	100	59	peak
N/A									

Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	5032.051	44.65	-4.96	39.69	74.00	-34.31	100	122	peak
2	7511.218	43.27	6.57	49.84	74.00	-24.16	100	166	peak
N/A									

Operation Mode: TX / IEEE 802.11n HT20 mode / CH Low **Test Date:** 2017-4-27

Temperature: 24°C **Tested by:** Lily.Wang

Humidity: 48 % RH **Polarity:** Ver. / Hor.

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	4895.833	44.49	-5.19	39.30	74.00	-34.70	100	101	peak
2	7129.808	43.64	6.23	49.87	74.00	-24.13	100	333	peak
N/A									

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	4841.346	43.14	-5.24	37.90	74.00	-36.10	100	0	peak
2	7129.808	43.80	6.23	50.03	74.00	-23.97	100	355	peak
N/A									

Operation Mode: TX / IEEE 802.11n HT20 mode / CH Mid **Test Date:** 2017-4-27

Temperature: 24°C **Tested by:** Lily.Wang

Humidity: 48 % RH **Polarity:** Ver. / Hor.

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	5059.295	43.41	-4.83	38.58	74.00	-35.42	100	219	peak
2	7456.731	43.33	6.52	49.85	74.00	-24.15	100	205	peak
N/A									

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	5195.513	44.81	-4.18	40.63	74.00	-33.37	100	105	peak
2	7429.487	43.32	6.50	49.82	74.00	-24.18	100	155	peak
N/A									

Operation Mode: TX / IEEE 802.11n HT20 mode / CH High **Test Date:** 2017-4-27

Temperature: 24°C **Tested by:** Lily.Wang

Humidity: 48 % RH **Polarity:** Ver. / Hor.

Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	4923.077	44.21	-5.17	39.04	74.00	-34.96	100	190	peak
2	7429.487	43.28	6.50	49.78	74.00	-24.22	100	184	peak
N/A									

Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	4895.833	49.74	-5.19	44.55	74.00	-29.45	100	84	peak
2	7565.705	44.20	6.62	50.82	74.00	-23.18	100	75	peak
N/A									

7.6.POWERLINE CONDUCTED EMISSIONS

LIMIT

According to §15.207(a), except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency Range (MHz)	Limits (dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50

** Decreases with the logarithm of the frequency.*

Test Configuration

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

TEST PROCEDURE

1.The EUT was placed on a table, which is 0.8m above ground plane.

2.Maximum procedure was performed on the six highest emissions to ensure EUT compliance.

3.Repeat above procedures until all frequency measured were complete.

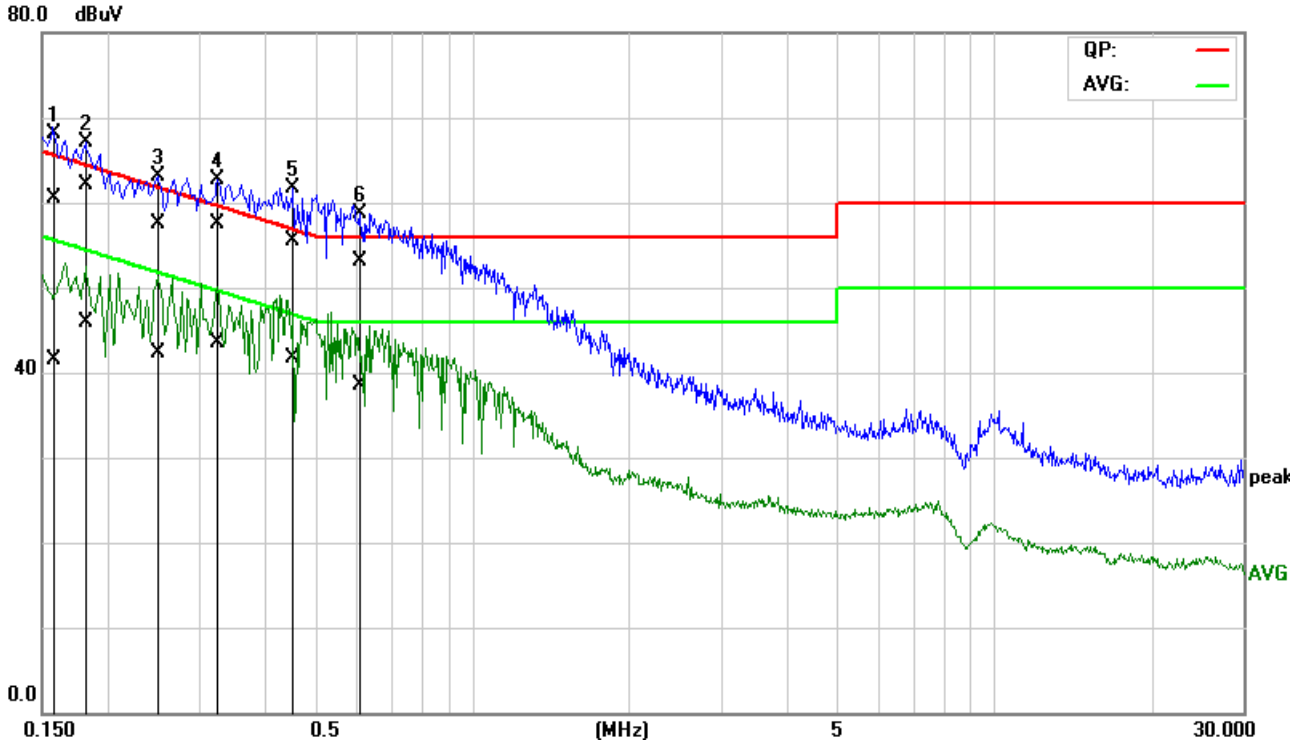
TEST RESULTS

The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. Significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

TEST DATA

Job No.:	C170411E01	Date:	2017-5-22
Model No.:	TA-2400	Time:	AM 10:16:45
Standard:	FCC Class B	Temp.(C)/Hum.(%):	22(C)/48%
Test item:	Conduction test	Test By:	Lily.Wang
Line:	L1	Test Voltage:	AC 120V/60Hz
Model:		Description:	

L1

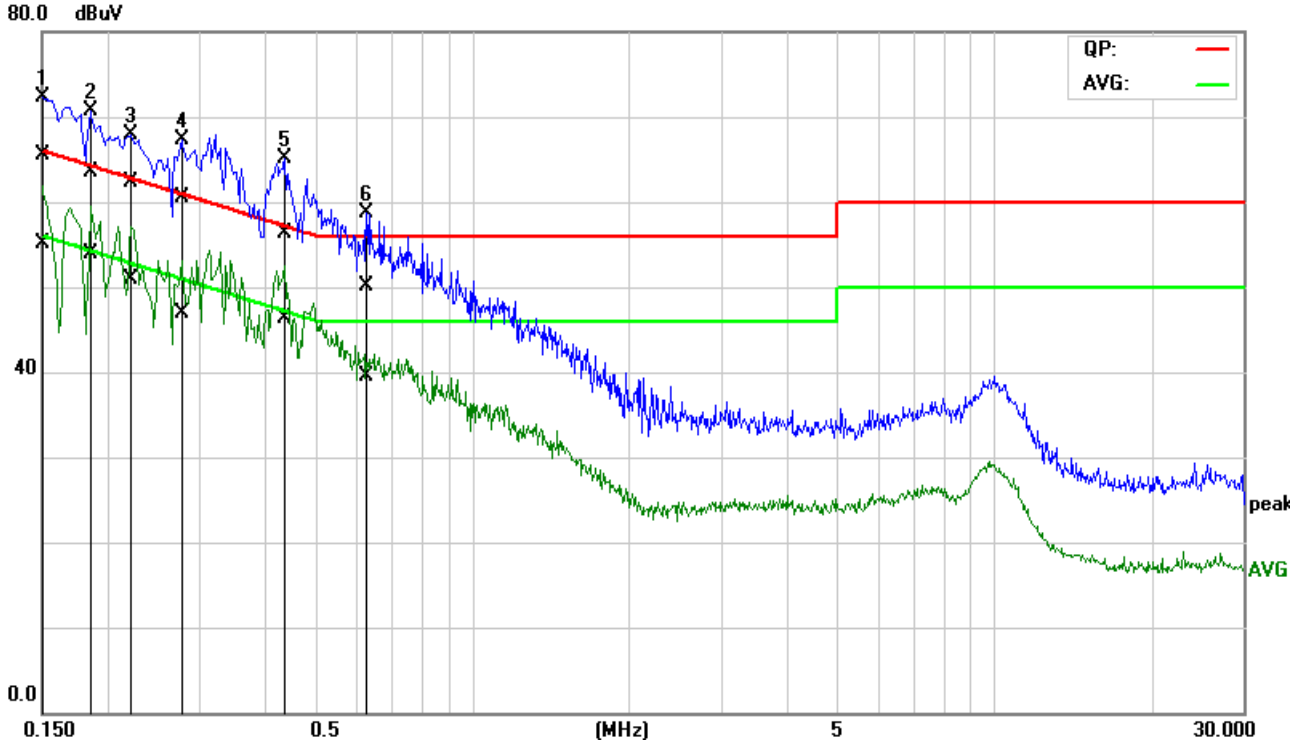


No.	Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin	Remark
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
1	0.1595	39.89	21.01	20.58	60.47	41.59	65.48	55.49	-5.01	-13.90	Pass
2	0.1795	41.63	25.32	20.55	62.18	45.87	64.50	54.51	-2.32	-8.64	Pass
3	0.2516	37.08	21.84	20.44	57.52	42.28	61.70	51.70	-4.18	-9.42	Pass
4	0.3250	36.89	22.96	20.56	57.45	43.52	59.58	49.58	-2.13	-6.06	Pass
5*	0.4548	35.03	21.14	20.49	55.52	41.63	56.79	46.79	-1.27	-5.16	Pass
6	0.6119	32.68	17.93	20.50	53.18	38.43	56.00	46.00	-2.82	-7.57	Pass

Note: 1. L1 = Line One (Live Line) / L2 = Line Two (Neutral Line).

Job No.:	C170411E01	Date:	2017-5-22
Model No.:	TA-2400	Time:	AM 10:09:32
Standard:	FCC Class B	Temp.(C)/Hum.(%):	22(C)/48%
Test item:	Conduction test	Test By:	Lily.Wang
Line:	L2	Test Voltage:	AC 120V/60Hz
Model:		Description:	

L2

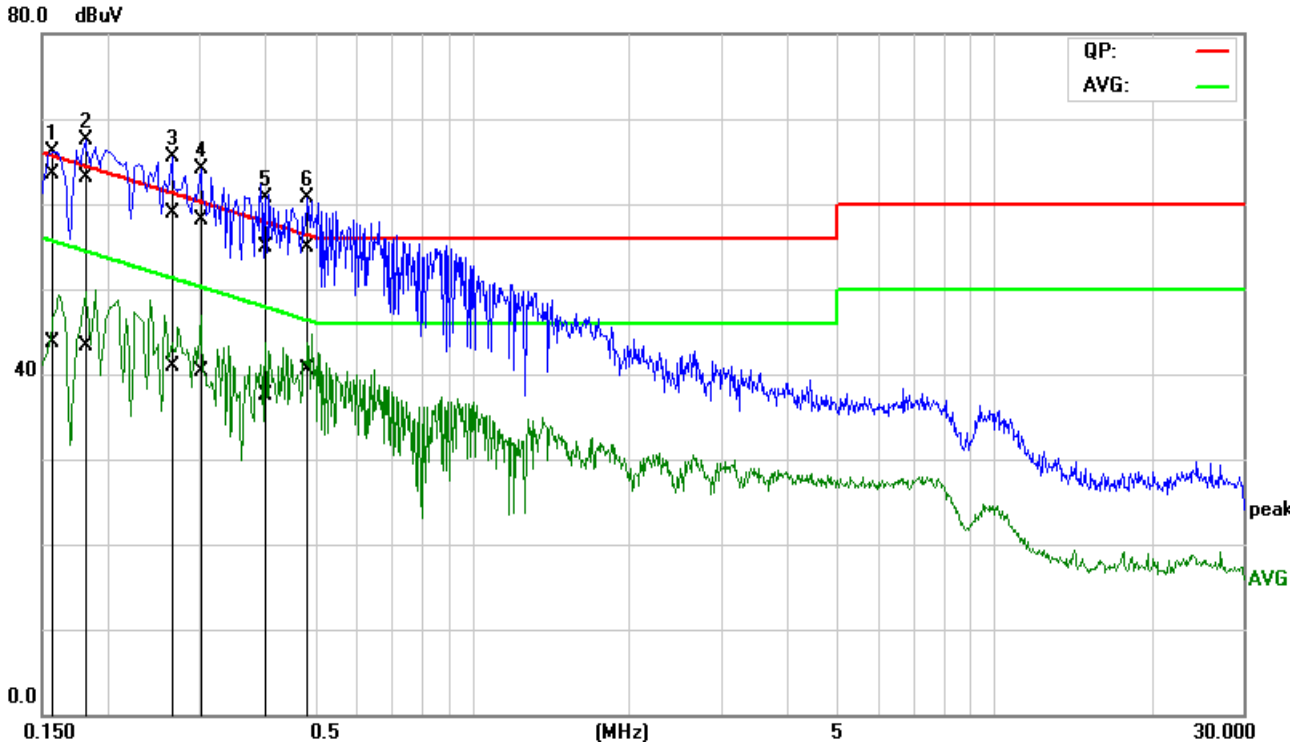


No.	Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin	Remark
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
1	0.1508	45.09	34.67	20.36	65.45	55.03	65.95	55.96	-0.50	-0.93	Pass
2	0.1832	43.03	33.47	20.39	63.42	53.86	64.33	54.34	-0.91	-0.48	Pass
3	0.2200	41.94	30.46	20.42	62.36	50.88	62.82	52.82	-0.46	-1.94	Pass
4*	0.2795	40.06	26.47	20.45	60.51	46.92	60.83	50.83	-0.32	-3.91	Pass
5	0.4397	35.78	25.94	20.45	56.23	46.39	57.07	47.07	-0.84	-0.68	Pass
6	0.6262	29.74	19.02	20.46	50.20	39.48	56.00	46.00	-5.80	-6.52	Pass

Note: 1. L1 = Line One (Live Line) / L2 = Line Two (Neutral Line).

Job No.:	C170411E01	Date:	2017-5-22
Model No.:	TA-2400	Time:	AM 10:22:57
Standard:	FCC Class B	Temp.(C)/Hum.(%):	22(C)/48%
Test item:	Conduction test	Test By:	Lily.Wang
Line:	L1	Test Voltage:	AC 240V/60Hz
Model:		Description:	

L1

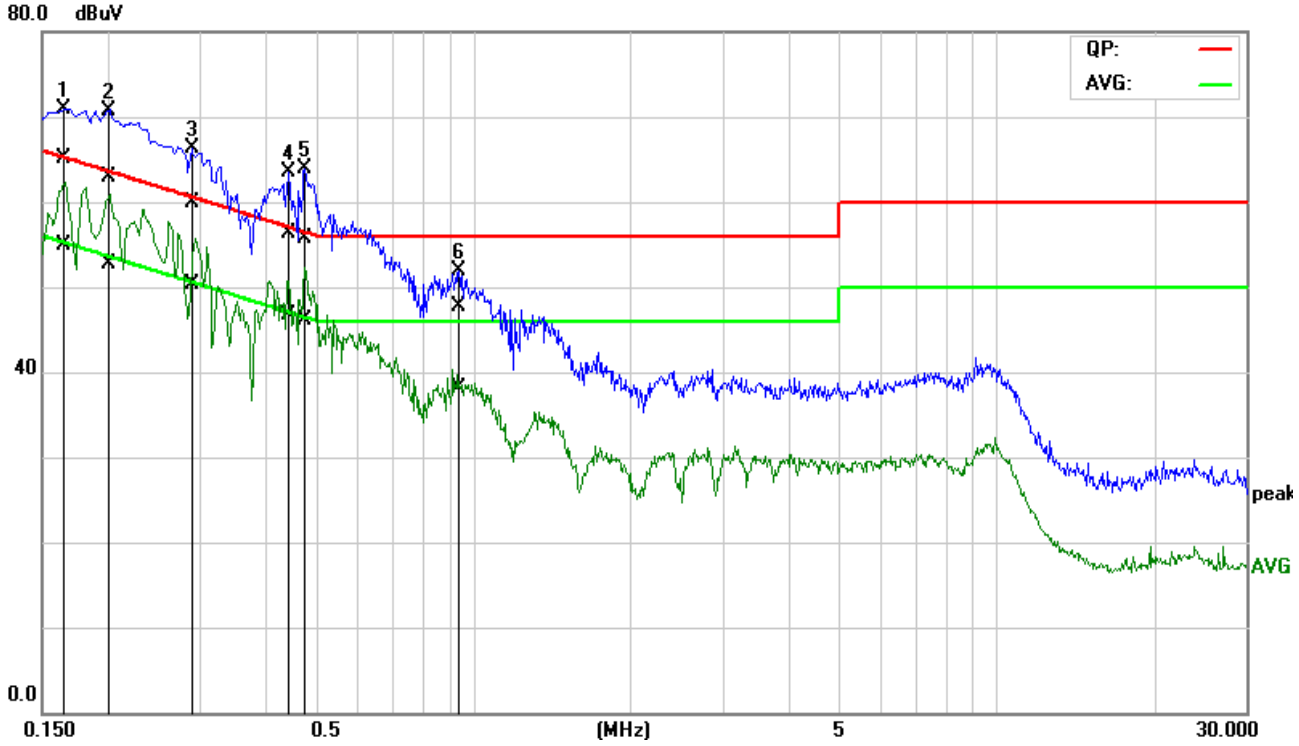


No.	Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin	Remark
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
1	0.1575	42.87	23.05	20.58	63.45	43.63	65.59	55.59	-2.14	-11.96	Pass
2	0.1827	42.49	22.80	20.54	63.03	43.34	64.36	54.36	-1.33	-11.02	Pass
3	0.2652	38.46	20.43	20.46	58.92	40.89	61.26	51.27	-2.34	-10.38	Pass
4	0.3030	37.63	19.74	20.52	58.15	40.26	60.16	50.16	-2.01	-9.90	Pass
5	0.3988	34.45	16.91	20.55	55.00	37.46	57.88	47.88	-2.88	-10.42	Pass
6*	0.4854	34.48	20.07	20.49	54.97	40.56	56.25	46.25	-1.28	-5.69	Pass

Note: 1. L1 = Line One (Live Line) / L2 = Line Two (Neutral Line).

Job No.:	C170411E01	Date:	2017-5-22
Model No.:	TA-2400	Time:	AM 10:29:35
Standard:	FCC Class B	Temp.(C)/Hum.(%):	22(C)/48%
Test item:	Conduction test	Test By:	Lily.Wang
Line:	L2	Test Voltage:	AC 240V/60Hz
Model:		Description:	

L2



No.	Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin	Remark
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
1*	0.1631	44.74	34.45	20.37	65.11	54.82	65.30	55.30	-0.19	-0.48	Pass
2	0.1983	42.44	32.39	20.40	62.84	52.79	63.68	53.68	-0.84	-0.89	Pass
3	0.2917	39.44	29.76	20.45	59.89	50.21	60.47	50.48	-0.58	-0.27	Pass
4	0.4425	35.79	26.34	20.45	56.24	46.79	57.01	47.01	-0.77	-0.22	Pass
5	0.4774	35.33	25.73	20.45	55.78	46.18	56.38	46.38	-0.60	-0.20	Pass
6	0.9305	27.23	17.61	20.47	47.70	38.08	56.00	46.00	-8.30	-7.92	Pass

Note: 1. L1 = Line One (Live Line) / L2 = Line Two (Neutral Line).

*Re*mark:

1.The measuring frequencies range between 0.15 MHz and 30 MHz.

2.The emissions measured in the frequency range between 0.15 MHz and 30MHz were made with an instrument using Quasi-peak detector and Average detector.

3."---" denotes the emission level was or more than 2dB below the Average limit, and no re-check was made.

4.The IF bandwidth of SPA between 0.15MHz and 30MHz was 10KHz. The IF bandwidth of Test Receiver between 0.15MHz and 30MHz was 9kHz.

END OF REPORT