

# FCC 47 CFR PART 15 SUBPART C Canada RSS-247 Issue2 Canada RSS-Gen Issue4 TEST REPORT

For

Product Name: YI Horizon VR180 Camera

Brand Name: YI

Model No.: YVR.1117

Series Model.: N/A

FCC ID: 2AFIB-YVR1117

IC: 20436-YVR1117

Test Report Number:

C171023R02-RPW

Issued for

Shanghai Xiaoyi Technology Co., Ltd.

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Issued by

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### Revision History

Rev.	Issue Date	Report NO.	Effect Page	Contents
00	April 2, 2018	C171023R02-RPW	ALL	N/A
01	May 25, 2018	C171023R02-RPW	P4; P5; P6; P8; P10-12; P19; P41-43; P54; P89; P109	Modify Antenna gain and EIRP; Add the ISED standard in section 3 and all section of test items; Put the plots of duty cycle.
02	June 1, 2018	C171023R02-RPW	P5	Delete the ant gain of 5GHz

## 1. TEST RESULT CERTIFICATION

<b>Product Name:</b>	YI Horizon VR180 Camera
<b>Trade Name:</b>	YI
<b>Model Name.:</b>	YVR.1117
<b>Series Model:</b>	N/A
<b>Applicant Discrepancy:</b>	Initial
<b>Device Category:</b>	Mobile unit
<b>Date of Test:</b>	March 1, 2018~March 30, 2018
<b>Applicant:</b>	<b>Shanghai Xiaoyi Technology Co., Ltd.</b> 16F, Building 1, No. 515, Huanke Road, Shanghai, China
<b>Manufacturer:</b>	<b>Shanghai Xiaoyi Technology Co., Ltd.</b> 16F, Building 1, No. 515, Huanke Road, Shanghai, China
<b>Application Type:</b>	Certification

APPLICABLE STANDARDS	
STANDARD	TEST RESULT
FCC 47 CFR Part 15 Subpart C	No non-compliance noted
Canada RSS-247 Issue 2	No non-compliance noted
Canada RSS-Gen Issue 4	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 and IC Rules RSS-247 Issue2, RSS-Gen Issue4.

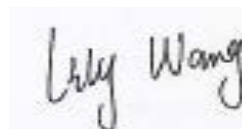
The test results of this report relate only to the tested sample EUT identified in this report.

**Approved by:**



Jeff.Fang  
RF Manager  
Compliance Certification Service Inc.

**Tested by:**



Lily.Wang  
Test Engineer  
Compliance Certification Service Inc.

## 2. EUT DESCRIPTION

<b>Product Name:</b>	YI Horizon VR180 Camera	
<b>Brand Name:</b>	YI	
<b>Model Name:</b>	YVR.1117	
<b>Series Model:</b>	N/A	
<b>Model Discrepancy:</b>	N/A	
<b>Power Adapter:</b>	DC 5V Battery: Model: U344378P(1ICP4/43/78) 3.85V --- 1800mAh 6.93Wh Charging Limit Voltage: 4.4V	
<b>Frequency Range:</b>	IEEE 802.11b/g: 2412MHz to 2462 MHz IEEE 802.11n HT20: 2412MHz to 2462 MHz	
<b>Peak output Power:</b>	IEEE 802.11b mode: 16.43dBm IEEE 802.11g mode: 20.16dBm IEEE 802.11n HT20 mode: 20.42dBm	
<b>Peak e.i.r.p:</b>	IEEE 802.11b mode: 19.20dBm IEEE 802.11g mode: 22.93dBm IEEE 802.11n HT20 mode: 23.19dBm	
<b>Average output Power:</b>	IEEE 802.11b mode: 13.16dBm IEEE 802.11g mode: 13.44dBm IEEE 802.11n HT20 mode: 13.21dBm	
<b>Average e.i.r.p:</b>	IEEE 802.11b mode: 15.93dBm IEEE 802.11g mode: 16.21dBm IEEE 802.11n HT20 mode: 15.98dBm	
<b>Modulation Technique:</b>	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)	
<b>Number of Channels:</b>	IEEE 802.11b/g mode: 11 Channels IEEE 802.11n HT20: 11 Channels	
<b>Antenna Specification:</b>	FPC Antenna	
<b>Antenna Specification:</b>		Gain(dBi)
		2.4G
	Antenna 1	2.77
	Antenna 2	1.22

### 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: 2AFIB-YVR1117** filing to comply with Section 15.207, 15.209 and 15.247 of the FCC Part 15, Subpart C Rules.
- 3.This submittal(s) (test report) is intended for **IC : 20436-YVR1117** filing to comply with IC rules RSS-247 Issue2, RSS-Gen Issue4.

### 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 and IC RSS-247 Issue2, RSS-Gen Issue4.

#### 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 and RSS-247 Issue2, RSS-Gen Issue4 under the IC Rules.

#### 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 6.2 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 6.4 & 6.5 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 6.6 of ANSI C63.10:2013.

### 3.4.RESTRICTED BANDS OF OPERATIONS

#### FCC

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
10.495 - 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	( <sup>2</sup> )
13.36 - 13.41			

<sup>1</sup> Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

<sup>2</sup> 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.

**IC**

Except as shown RSS-Gen 8.10, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	GHz
0.090-0.110	74.8-75.2	9.0-9.2
2.1735-2.1905	108-138	9.3-9.5
3.020-3.026	156.52475-156.52525	10.6-12.7
4.125-4.128	156.7-156.9	13.25-13.4
4.17725-4.17775	240-285	14.47-14.5
4.20725-4.20775	322-335.4	15.35-16.2
5.677-5.683	399.9-410	17.7-21.4
6.215-6.218	608-614	22.01-23.12
6.26775-6.26825	960-1427	23.6-24.0
6.31175-6.31225	1435-1626.5	31.2-31.8
8.291-8.294	1645.5-1646.5	36.43-36.5
8.362-8.366	1660-1710	Above 38.6
8.37625-8.38675	1718.8-1722.2	
8.41425-8.41475	2200-2300	
12.29-12.293	2310-2390	
12.51975-12.52025	2655-2900	
12.57675-12.57725	3260-3267	
13.36-13.41	3332-3339	
16.42-16.423	3345.8-3358	
16.69475-16.69525	3500-4400	
16.80425-16.80475	4500-5150	
25.5-25.67	5350-5460	
37.5-38.25	7250-7750	
73-74.6	8025-8500	

\* Certain frequency bands listed in Table 6 and in bands above 38.6 GHz are designated for licence-exempt applications. These frequency bands and the requirements that apply to the devices are set out in the 200- and 300-series of RSSs, such as RSS-210 and RSS-310, which contain the requirements that apply to licence-exempt radio apparatus.



### 3.5.DESCRPTION OF TEST MODES

Test Mode	Antenna 1	Antenna 2	Antenna 1+2
802.11b	✓	✓	x
802.11g	✓	✓	x
802.11n HT20	✓	✓	✓

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)

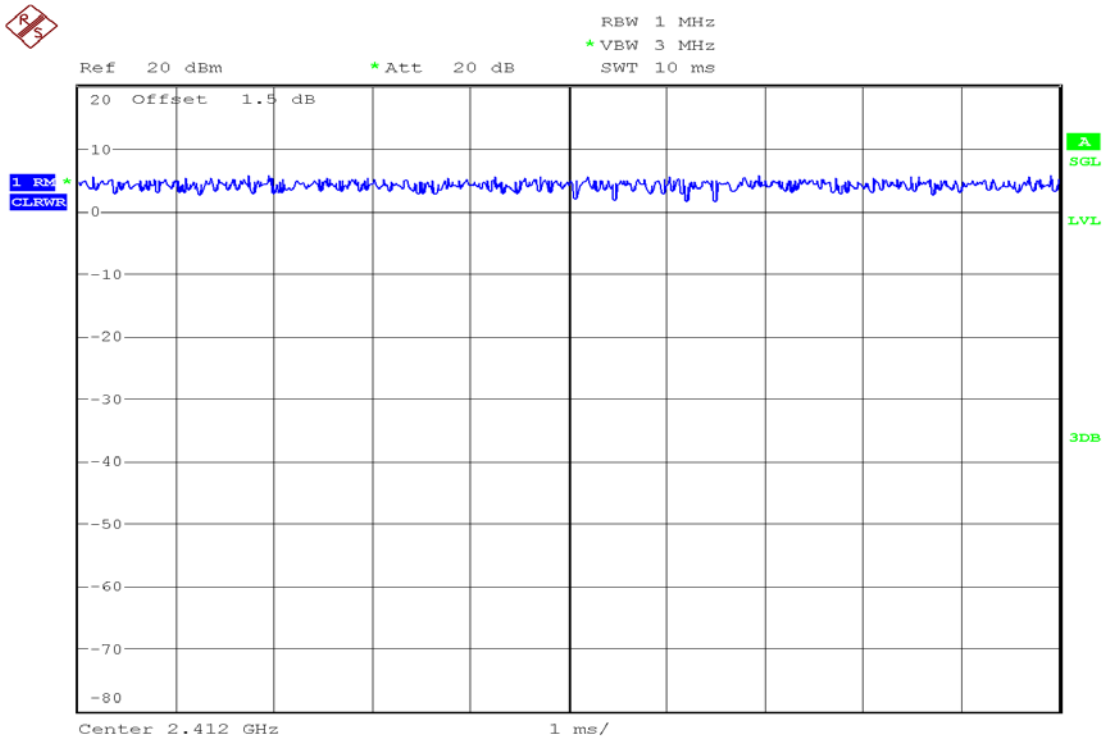
Channel Mid (2437MHz)

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

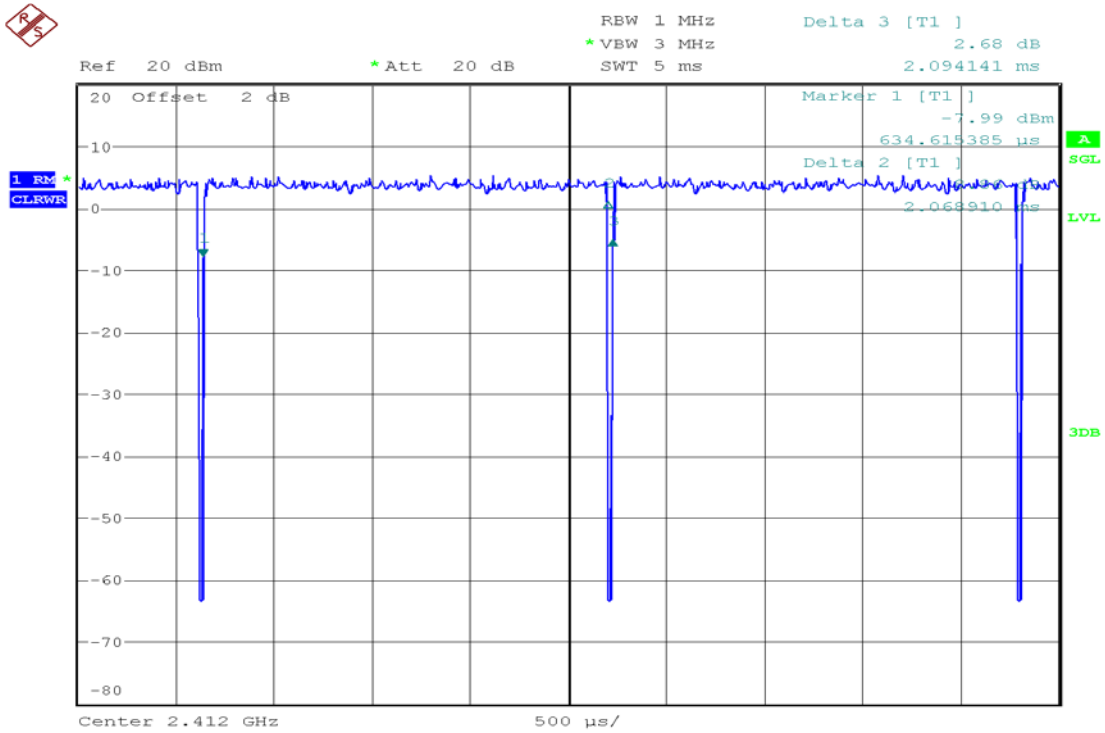
### 3.6.DUTY CYCLE

Band	Duty Cycle(%)	T(s)	1/T(kHz)	VBW Setting
IEEE 802.11 b	100	-	-	10Hz
IEEE 802.11 g	98.80	-	-	10Hz
IEEE 802.11n HT20	98.97	-	-	10Hz

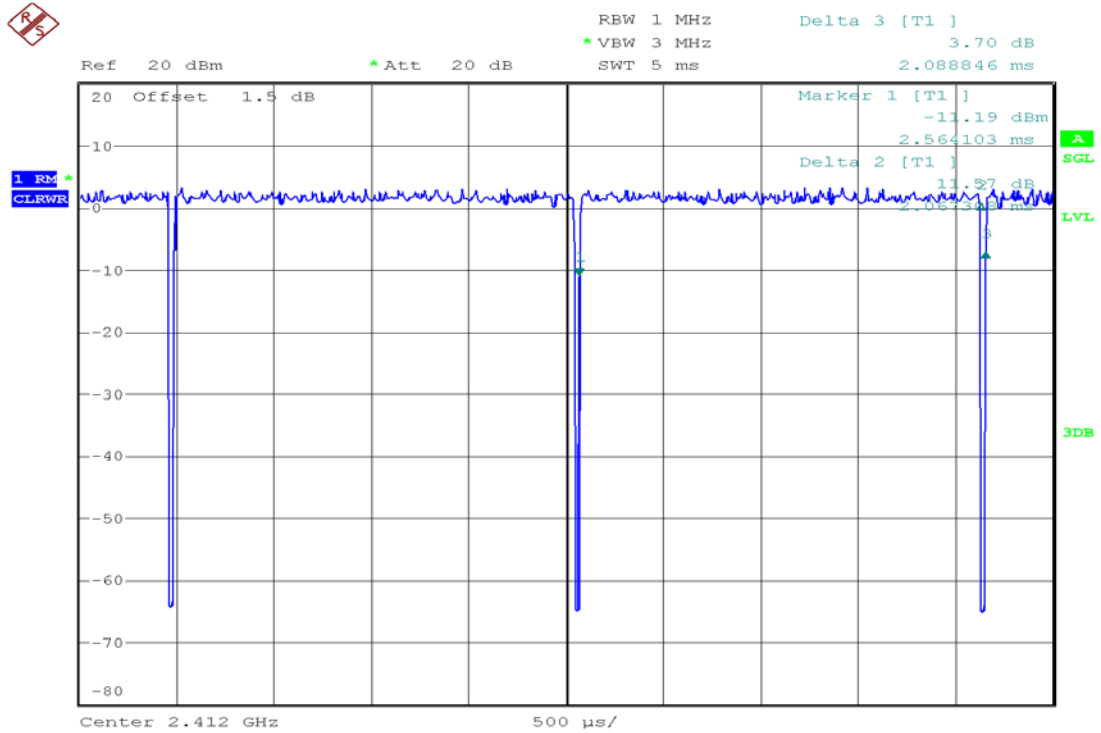
#### IEEE 802.11 b



## IEEE 802.11 g



## IEEE 802.11n HT20

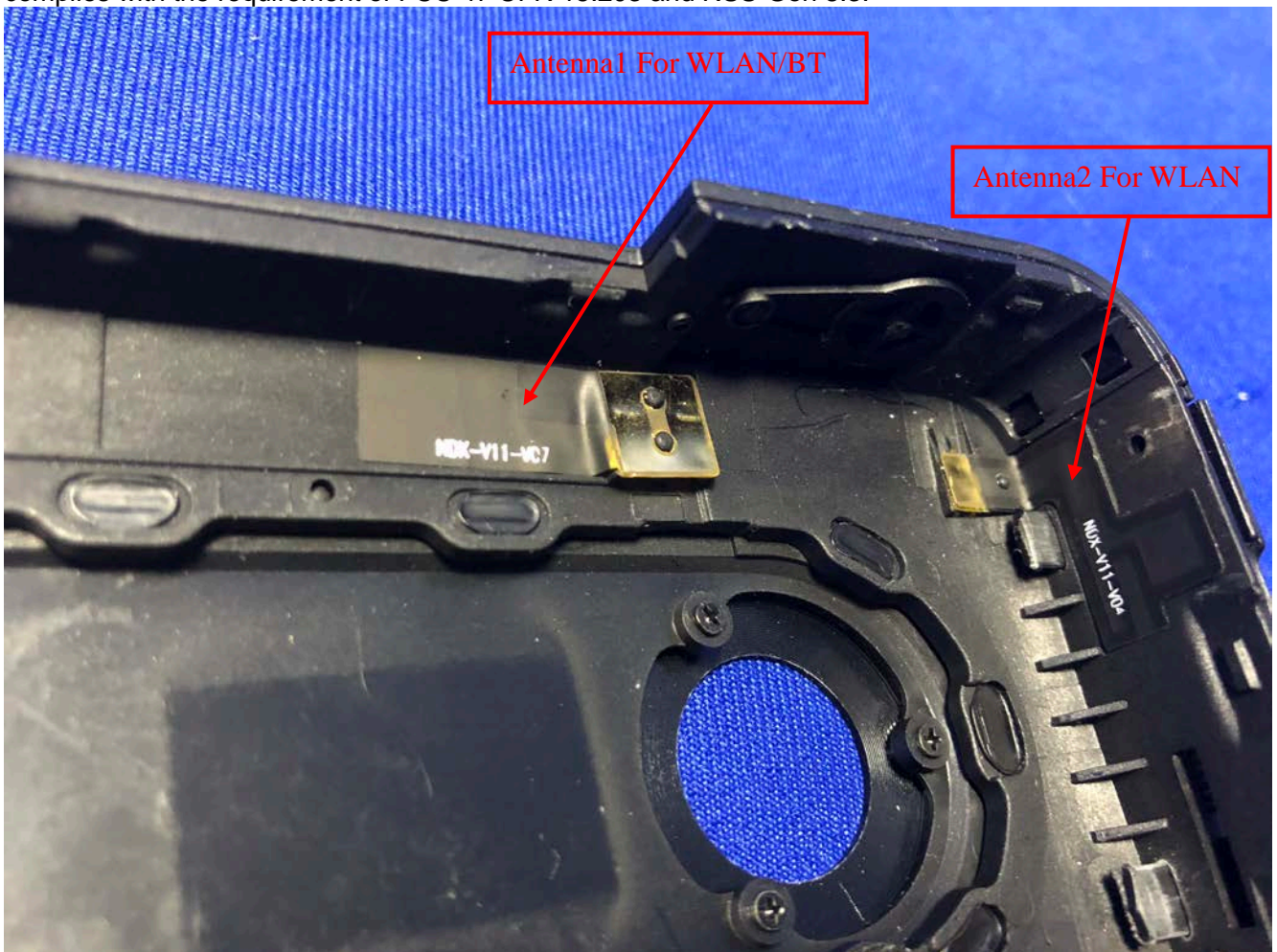


### 3.7.ANTENNA DESCRIPTION

According to FCC 47 CFR 15.203 and RSS-Gen 8.3

“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 FCC 47 CFR 15.203 and RSS-Gen 8.3.



## 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 Data	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY44020154	2017-9-4	2018-9-3
Spectrum Analyzer	RS	FSU26	200789	2017-7-20	2018-7-19
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
Cable	N/A	Cable-05	N/A	2017-4-26	2018-4-25
Cable	N/A	Cable-06	N/A	2017-4-26	2018-4-25
6dB Attenuator	N/A	N/A	N/A	2017-4-26	2018-4-25
Temp. / Humidity Gauge	Anymetre	TH603	CCS007	2017-10-24	2018-10-23
Test Software			EZ-EMC		

Conducted Emission					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
EMI TEST RECEIVER	R&S	ESCI	100781	2018-2-26	2019-2-25
V (V-LISN)	SCHWARZBECK	NNLK 8129	8129-143	2017-10-29	2018-10-28
TWO-LINE V-NETWORK	R&S	ENV216	101604	2017-10-29	2018-10-28
Pulse LIMITER	R&S	ESH3-Z2	100524	2017-12-27	2018-12-26
Cable	Thermax	Cable-02	14	2017-12-27	2018-12-26
Test Software			EZ-EMC		

977 Chamber					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Data	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY44020154	2017-9-4	2018-9-3
Spectrum Analyzer	RS	FSU26	200789	2017-7-20	2018-7-19
EMI Test Receiver	R&S	ESCI	101378	2017-12-26	2018-12-25
Amplifier	COM-POWER	PAM-840A	461332	2017-11-29	2018-11-28
Amplifier	MITEQ	JS41-00101800-32-10P	1675713	2017-7-20	2018-7-19
Broad-Band Horn Antenna	SCHWARZBECK	BBHA 9170	9170-515	2018-2-26	2019-2-25
Bilog Antenna	Sunol	JB1	A062604	2017-5-27	2018-5-26
Bilog Antenna	Sunol	JB1	A110204-1	2017-5-27	2018-5-26
Loop Antenna	Hengweiyi	39501C	2014012	2018-1-4	2019-1-3
Horn-antenna	SCHWARZBECK	9120D	D:266	2018-2-26	2019-2-25
Horn-antenna	SCHWARZBECK	9120D	D:267	2017-11-5	2018-11-4
Turn Table	CT	CT123	4165	N.C.R	N.C.R
Antenna Tower	CT	CTERG23	3256	N.C.R	N.C.R
Controller	CT	CT100	95637	N.C.R	N.C.R
Cable	REBES MICROWAVE	Cable-93	N/A	2017-10-29	2018-10-28
Cable	REBES MICROWAVE	Cable-94	N/A	2017-10-29	2018-10-28
Cable	REBES MICROWAVE	Cable-95	N/A	2017-10-29	2018-10-28
Cable	N/A	Cable-03	N/A	2017-4-26	2018-4-25
Cable	N/A	Cable-04	N/A	2017-4-26	2018-4-25
2.4G Filter	N/A	N/A	N/A	2017-4-26	2018-4-25
Filter 5150MHz-5350MHz	N/A	N/A	N/A	2017-4-26	2018-4-25
Filter 5725MHz-5850MHz	N/A	N/A	N/A	2017-4-26	2018-4-25
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

FCC –Designation Number: CN1172.

Compliance Certification Services Inc. Kun shan Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files and the Designation Number: CN1172.


Also the test facilities are listed with Industry Canada, Laboratory Division, 2324E-1 for 10m chamber, 2324E-2 for 3m chamber.



### 5.4.TABLE OF ACCREDITATIONS AND LISTINGS

Country	Agency	Scope of Accreditation	Logo
USA	A2LA	<p>47 CFR FCC, Part 15,Subpart B (using ANSI 63.4 :2009 and ANSI C63.4:2014);ICES-003; 47 CFR FCC, Part 18(using MP-5:1986);ICES-001;VCCI - V3; VCCI-CISPR-32(up to 6GHz);VCCI 32-1;CNS 13438(up to 6GHz); CNS 13439; CNS 13803; CISPR 11; EN 55011; CISPR 13; EN 55013; CISPR 22; EN 55022; AS/NZS CISPR 22;CISPR32;EN55032; AS/NZS CISPR 32;EN55014-1(excluding clicks);CISPR 14-1(excluding clicks);EN55015;CISPR 15;</p> <p>IEC 61000-3-2; EN 61000-3-2; AS/NZS 61000.3.2 IEC 61000-3-3; EN 61000-3-3; AS/NZS 61000.3.3 IEC 61000-4-2; EN 61000-4-2; AS/NZS 61000.4.2 IEC 61000-4-3; EN 61000-4-3; AS/NZS 61000.4.3 IEC 61000-4-4; EN 61000-4-4; AS/NZS 61000.4.4 IEC 61000-4-5; EN 61000-4-5; AS/NZS 61000.4.5 IEC 61000-4-6; EN 61000-4-6; AS/NZS 61000.4.6 IEC 61000-4-8; EN 61000-4-8; AS/NZS 61000.4.8 IEC 61000-4-11; EN 61000-4-11; AS/NZS 61000.4.11 EN 61000-6-1; EN 61000-6-2; EN 61000-6-3 (excluding discontinuous interference); EN 61000-6-4; IEC 61000-6-1; IEC 61000-6-2; IEC 61000-6-3 (excluding discontinuous interference); IEC 61000-6-4; AS/NZS 61000.6.1; AS/NZS 61000.6.2; AS/NZS 61000.6.3 (excluding discontinuous interference); AS/NZS 61000.6.4;</p> <p>EN 55024; CISPR 24; AS/NZS CISPR 24; EN 61547; IEC 61547; EN 60601-1-2; IEC 60601-1-2; EN 50130-4; EN 55014-2; CISPR 14-2; EN 62040-2; IEC 62040-2; EN 61204-3; IEC 61204-3; EN 50121-1; EN 50121-3-2; EN 50121-4; EN 50121-5; EN 50155 (clauses 5.4 and 5.5); EN 61326-1; IEC 61326-1; EN 50083-2; EN 300 386; EN 301 489-1 (excluding Section 9.6); EN 301 489-3; EN 301 489-7; EN 301 489-17; EN 301 489-19; EN 301 489-24; EN 301 489-25; EN 301 489-34 FCC Part 15, Subparts 15C, 15E (KDB 905462 D03 (v01r02))(using ANSI C63.4:2009, ANSI C63.4:2014 and ANSI C63.10:2013) FCC Parts 22E, 24E (using ANSI/TIA-603-D) RSS-132; RSS-133; RSS-210; RSS-247 (excluding DFS testing) EN 300 220-1; EN 300 220-2; EN 300 328; EN 300 330-1; EN 300 330-2; EN 300 440-1; EN 300 440-2; EN 301 893 (excluding DFS testing); EN 301 511(clauses 4.2.12 to 4.2.19, and 5.2.12 to 5.2.19); EN 301 908-1 (clauses 4.2.2, 4.2.3, 5.3.1, and 5.3.2);</p>	



		EN 301 908-2 (clauses 4.2.4, 4.2.10, 5.3.3, and 5.3.9) AS/NZS 4268 IEEE Std 1528:2013; EN 50360; EN 50566; EN 62479; EN 50383; EN 50385; EN 62311; IEC 62209-1; EN 62209-1; IEC 62209-2; EN 62209-2; CNS 14958-1; CNS 14959; RSS-102; ACMA Radio Communications (Electromagnetic Radiation – Human Exposure) Standard 2014	
USA	FCC	3/10 meter Sites to perform FCC Part 15/18 measurements	 CN1172
Japan	VCCI	3/10 meter Sites and conducted test sites to perform radiated/conducted measurements	<b>VCCI</b> 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 Setup photo for the actual connections between EUT and support equipment.

### 6.2.SUPPORT EQUIPMENT

No.	Device Type	Brand	Model	Series No.	FCC ID
N/A	N/A	N/A	N/A	N/A	N/A

**Remark:**

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

## 7. FCC PART 15.247 REQUIREMENTS

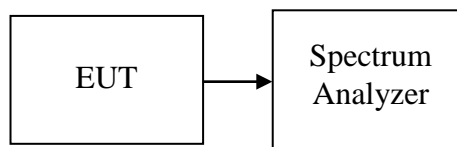
### 7.1.6DB BANDWIDTH

#### 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.

According to RSS-247 section 5.2, DTSs include systems that employ digital modulation techniques resulting in spectral characteristics similar to direct sequence systems. The following applies to the bands 902-928 MHz and 2400-2483.5 MHz: The minimum 6 dB bandwidth shall be 500 kHz

#### 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 /Chain 0

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	8.646	>500	PASS
Mid	2437	8.632		PASS
High	2462	9.110		PASS

##### IEEE 802.11b mode /Chain 1

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	9.163	>500	PASS
Mid	2437	9.121		PASS
High	2462	9.130		PASS

##### IEEE 802.11g mode /Chain 0

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	16.426	>500	PASS
Mid	2437	16.404		PASS
High	2462	16.387		PASS

**IEEE 802.11g mode /Chain 1**

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	16.422	>500	PASS
Mid	2437	16.399		PASS
High	2462	16.411		PASS

**IEEE 802.11n HT20 mode / Chain 0**

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	17.601	>500	PASS
Mid	2437	17.643		PASS
High	2462	17.610		PASS

**IEEE 802.11n HT20 mode / Chain 1**

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	17.680	>500	PASS
Mid	2437	17.676		PASS
High	2462	17.691		PASS

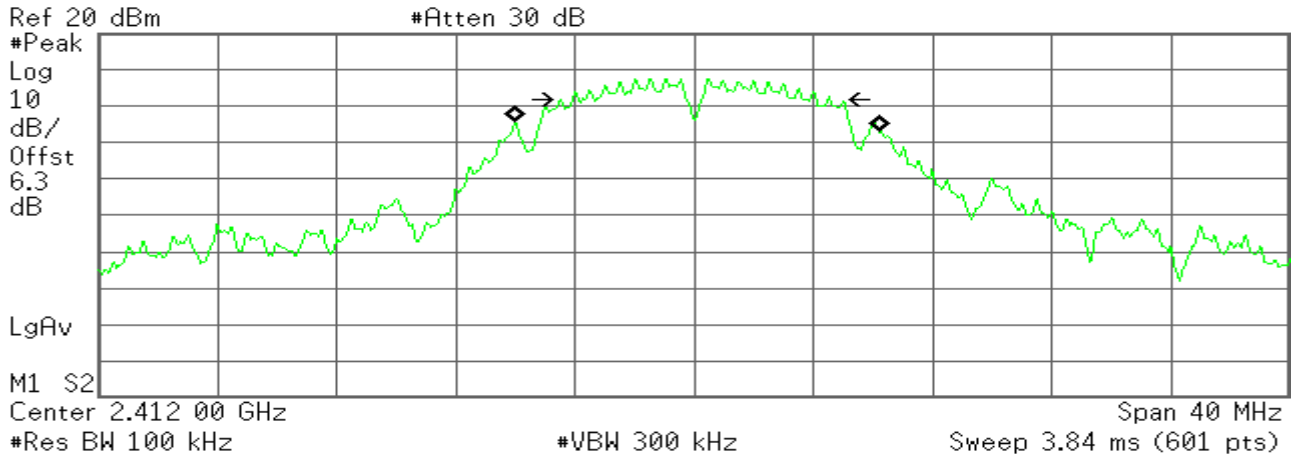
## Test Plot

### IEEE 802.11b MODE /Chain 0

#### 6dB Bandwidth (CH Low)

Agilent

R T



**Occupied Bandwidth**  
**12.1513 MHz**

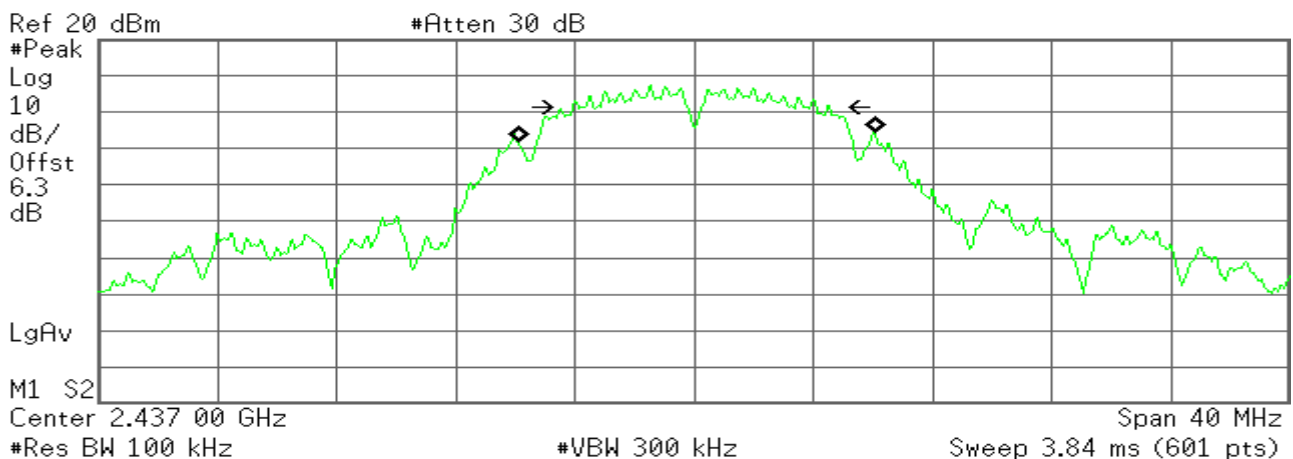
**Occ BW % Pwr** 99.00 %  
**x dB** -6.00 dB

**Transmit Freq Error** 102.813 kHz  
**x dB Bandwidth** 8.646 MHz

#### 6dB Bandwidth (CH Mid)

Agilent

R T



**Occupied Bandwidth**  
**11.9331 MHz**

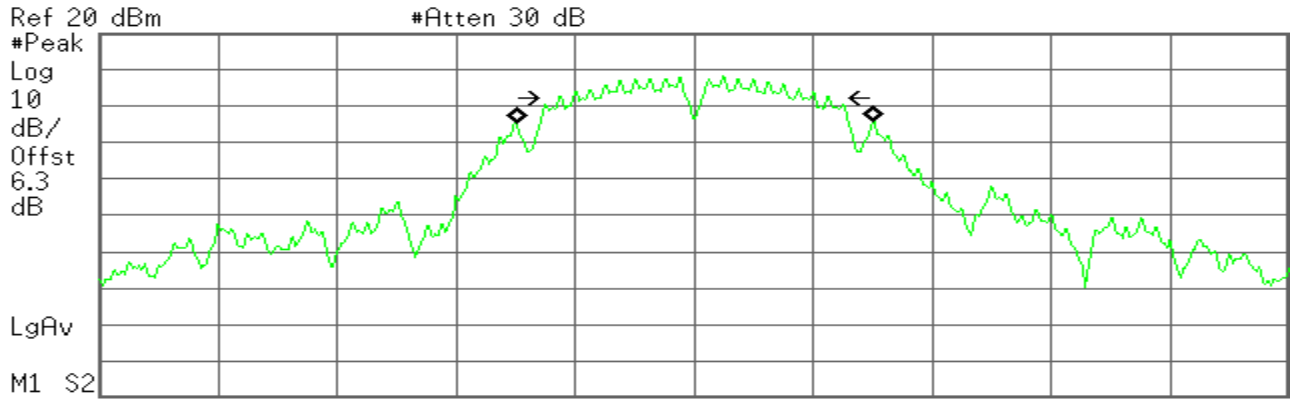
**Occ BW % Pwr** 99.00 %  
**x dB** -6.00 dB

**Transmit Freq Error** 67.776 kHz  
**x dB Bandwidth** 8.632 MHz

## 6dB Bandwidth (CH High)

Agilent

R T



Center 2.462 00 GHz Span 40 MHz  
#Res BW 100 kHz #VBW 300 kHz Sweep 3.84 ms (601 pts)

**Occupied Bandwidth**  
11.9971 MHz

**Occ BW % Pwr** 99.00 %  
**x dB** -6.00 dB

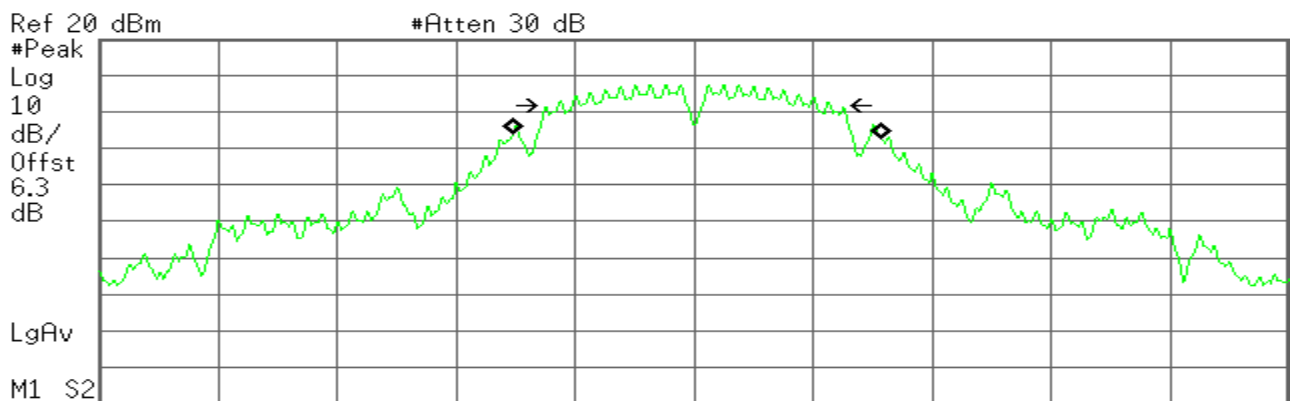
**Transmit Freq Error** 32.721 kHz  
**x dB Bandwidth** 9.110 MHz

## IEEE 802.11b MODE /Chain 1

### 6dB Bandwidth (CH Low)

Agilent

R T



Center 2.412 00 GHz Span 40 MHz  
#Res BW 100 kHz #VBW 300 kHz Sweep 3.84 ms (601 pts)

**Occupied Bandwidth**  
12.3226 MHz

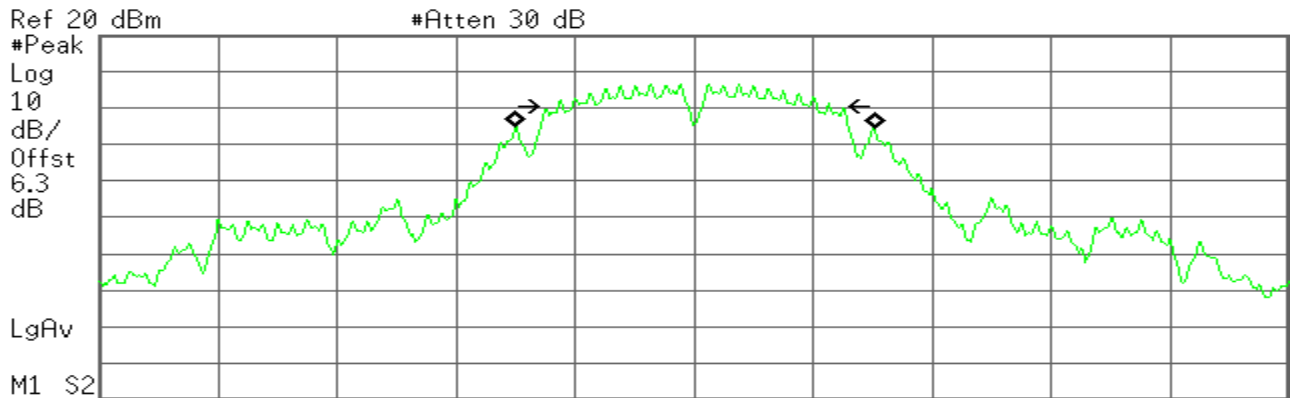
**Occ BW % Pwr** 99.00 %  
**x dB** -6.00 dB

**Transmit Freq Error** 84.980 kHz  
**x dB Bandwidth** 9.163 MHz

## 6dB Bandwidth (CH Mid)

Agilent

R T



Center 2.437 00 GHz Span 40 MHz  
#Res BW 100 kHz #VBW 300 kHz Sweep 3.84 ms (601 pts)

**Occupied Bandwidth**  
**12.0304 MHz**

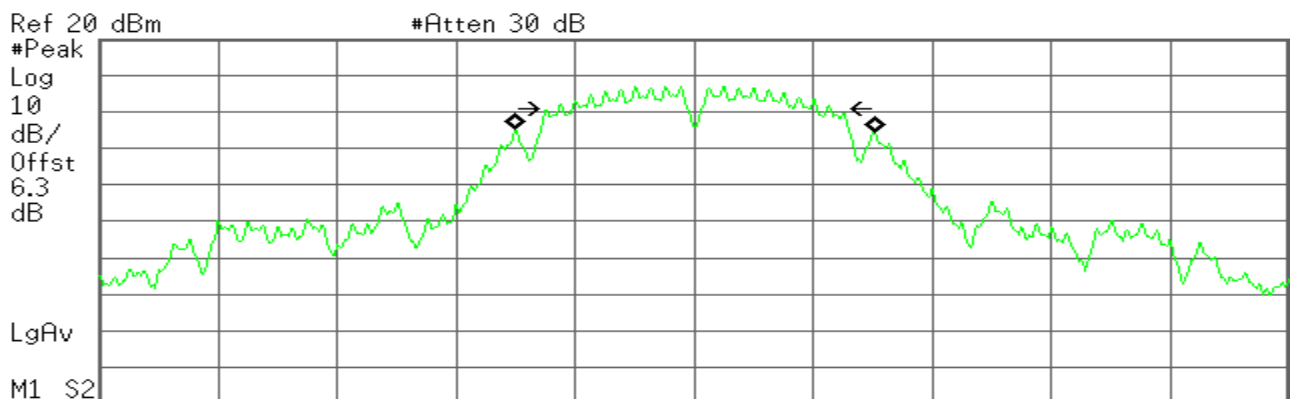
**Occ BW % Pwr** 99.00 %  
**x dB** -6.00 dB

**Transmit Freq Error** 36.222 kHz  
**x dB Bandwidth** 9.121 MHz

## 6dB Bandwidth (CH High)

Agilent

R T



Center 2.462 00 GHz Span 40 MHz  
#Res BW 100 kHz #VBW 300 kHz Sweep 3.84 ms (601 pts)

**Occupied Bandwidth**  
**12.0176 MHz**

**Occ BW % Pwr** 99.00 %  
**x dB** -6.00 dB

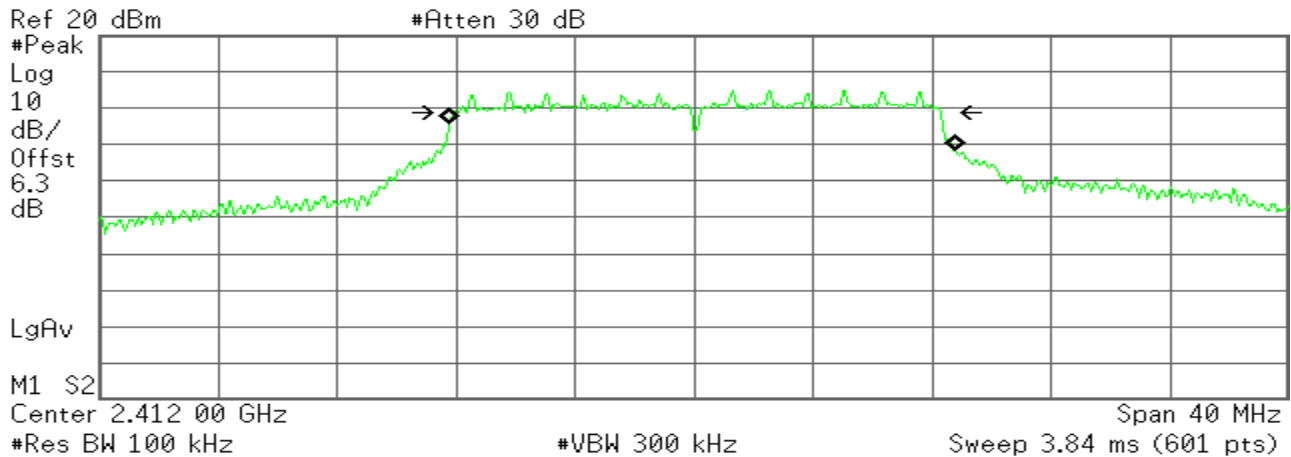
**Transmit Freq Error** 40.861 kHz  
**x dB Bandwidth** 9.130 MHz

## IEEE 802.11g MODE /Chain 0

### 6dB Bandwidth (CH Low)

Agilent

R T



**Occupied Bandwidth**  
17.0724 MHz

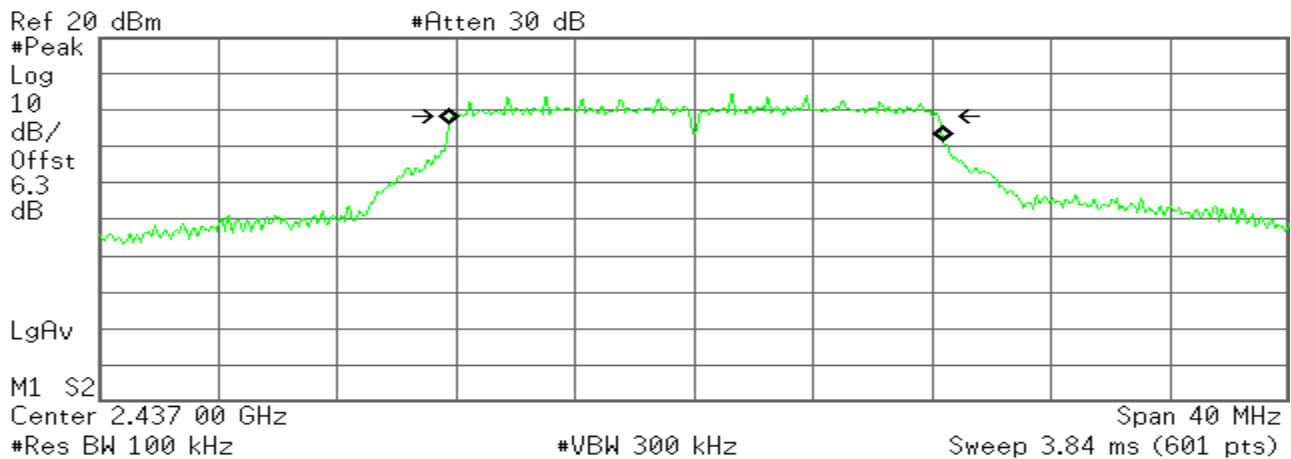
**Occ BW % Pwr** 99.00 %  
**x dB** -6.00 dB

**Transmit Freq Error** 283.708 kHz  
**x dB Bandwidth** 16.426 MHz

### 6dB Bandwidth (CH Mid)

Agilent

R T



**Occupied Bandwidth**  
16.6608 MHz

**Occ BW % Pwr** 99.00 %  
**x dB** -6.00 dB

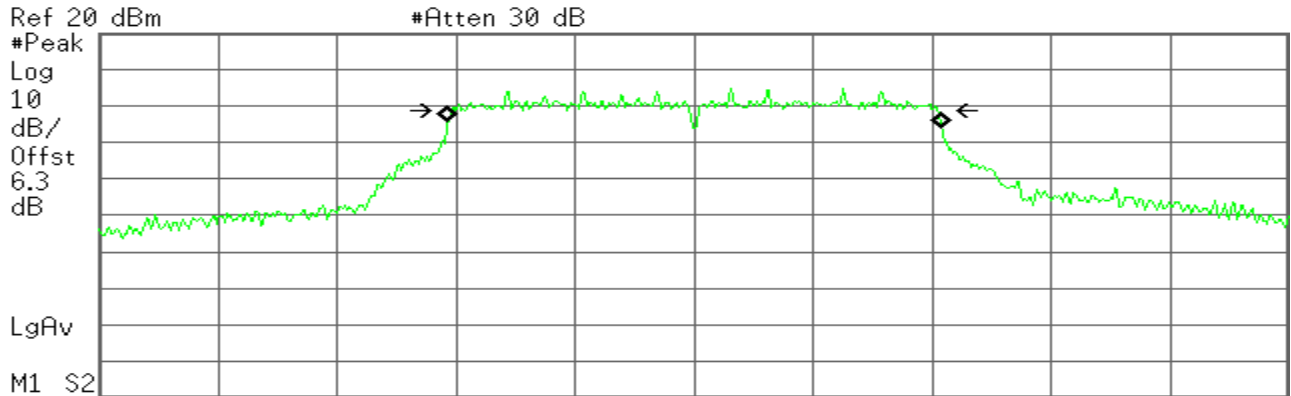
**Transmit Freq Error** 63.686 kHz  
**x dB Bandwidth** 16.404 MHz



## 6dB Bandwidth (CH High)

Agilent

R T



Ref 20 dBm #Atten 30 dB  
M1 S2 Center 2.462 00 GHz Span 40 MHz  
#Res BW 100 kHz #VBW 300 kHz Sweep 3.84 ms (601 pts)

**Occupied Bandwidth**  
**16.6655 MHz**

**Occ BW % Pwr** 99.00 %  
**x dB** -6.00 dB

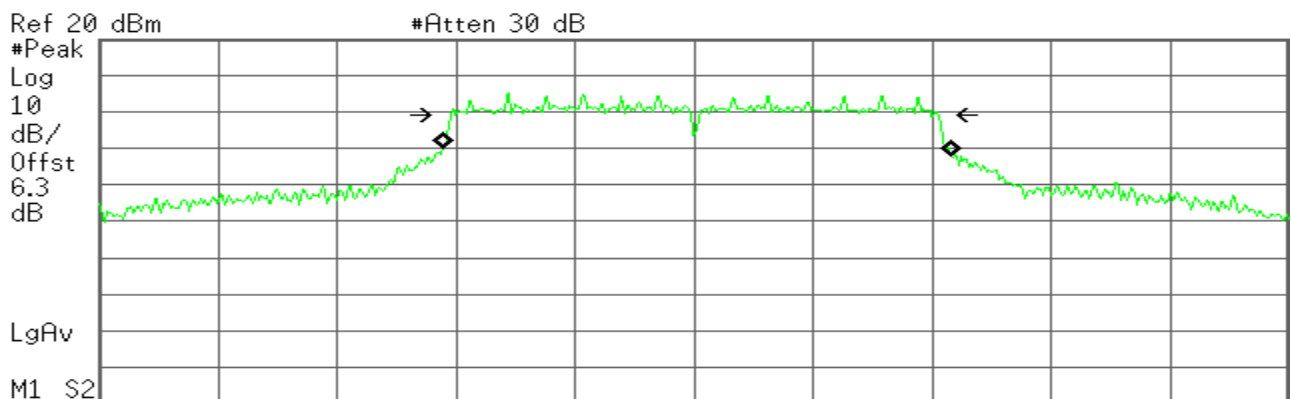
**Transmit Freq Error** 31.123 kHz  
**x dB Bandwidth** 16.387 MHz

## IEEE 802.11g MODE /Chain 1

### 6dB Bandwidth (CH Low)

Agilent

R T



Ref 20 dBm #Atten 30 dB  
M1 S2 Center 2.412 00 GHz Span 40 MHz  
#Res BW 100 kHz #VBW 300 kHz Sweep 3.84 ms (601 pts)

**Occupied Bandwidth**  
**17.1504 MHz**

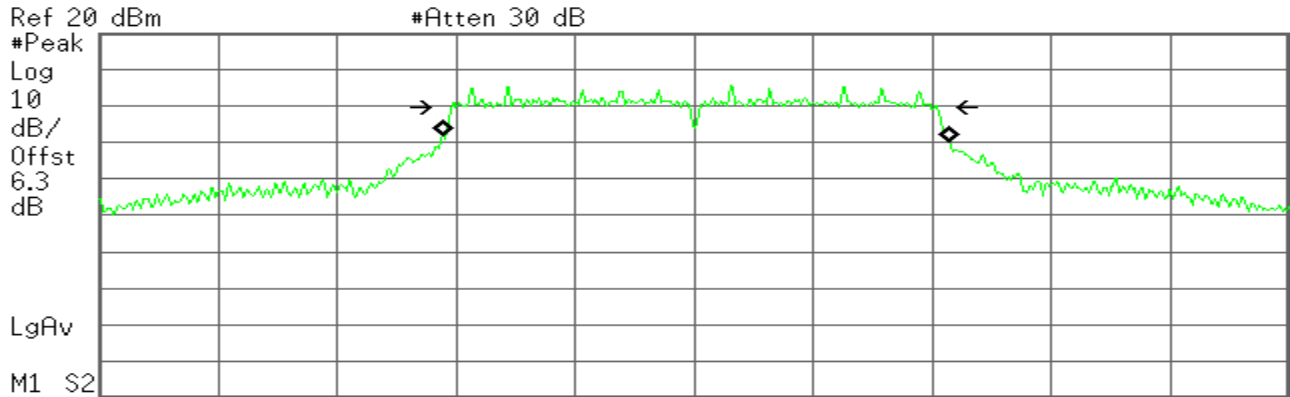
**Occ BW % Pwr** 99.00 %  
**x dB** -6.00 dB

**Transmit Freq Error** 98.145 kHz  
**x dB Bandwidth** 16.422 MHz

## 6dB Bandwidth (CH Mid)

Agilent

R T



**Occupied Bandwidth**  
17.1124 MHz

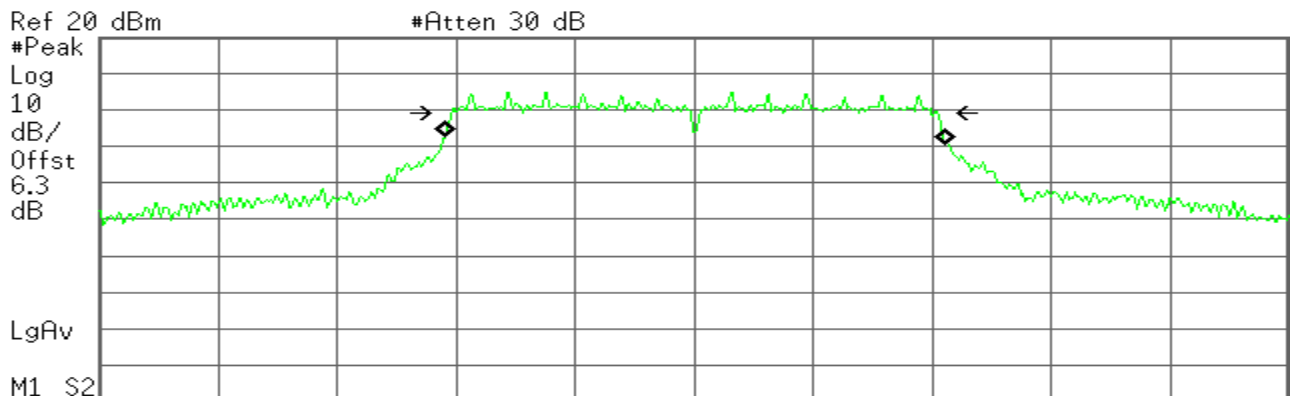
**Occ BW % Pwr** 99.00 %  
**x dB** -6.00 dB

**Transmit Freq Error** 60.764 kHz  
**x dB Bandwidth** 16.399 MHz

## 6dB Bandwidth (CH High)

Agilent

R T



**Occupied Bandwidth**  
16.8525 MHz

**Occ BW % Pwr** 99.00 %  
**x dB** -6.00 dB

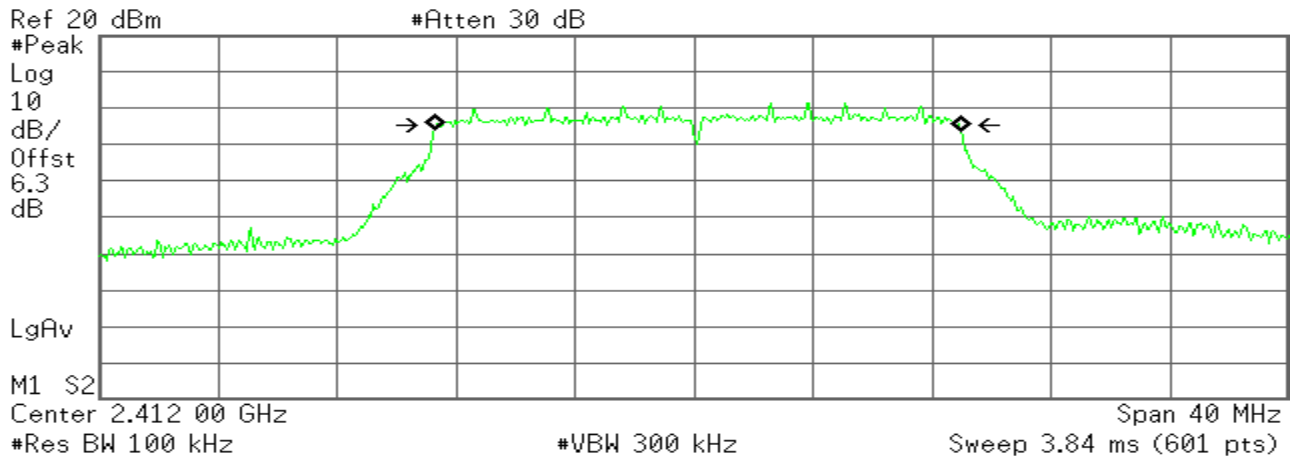
**Transmit Freq Error** 38.265 kHz  
**x dB Bandwidth** 16.411 MHz

## IEEE 802.11n HT20 mode / Chain 0

### 6dB Bandwidth (CH Low)

Agilent

R T



Occupied Bandwidth  
17.7739 MHz

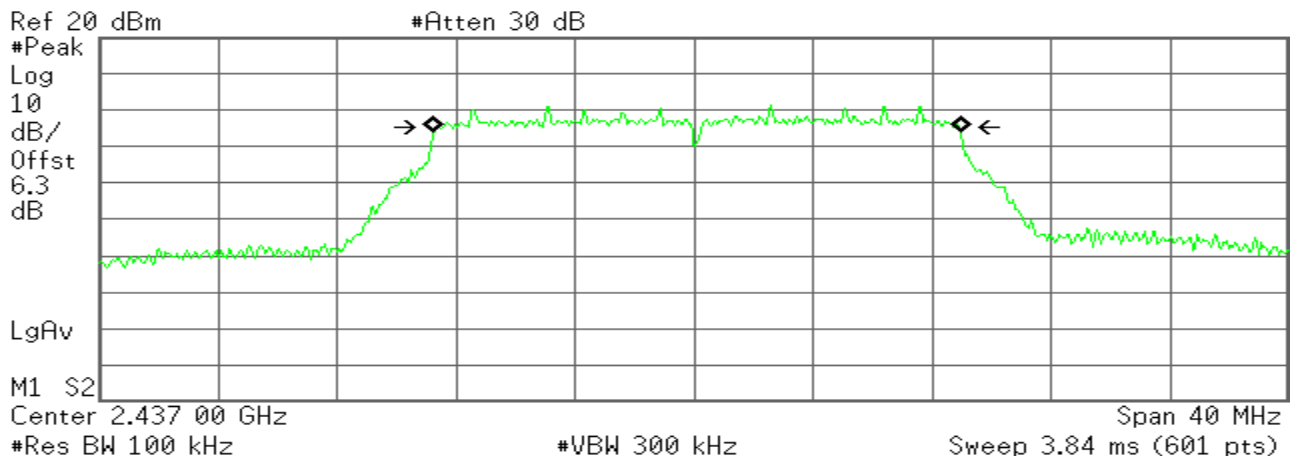
Occ BW % Pwr 99.00 %  
x dB -6.00 dB

Transmit Freq Error 126.869 kHz  
x dB Bandwidth 17.601 MHz

### 6dB Bandwidth (CH Mid)

Agilent

R T



Occupied Bandwidth  
17.7643 MHz

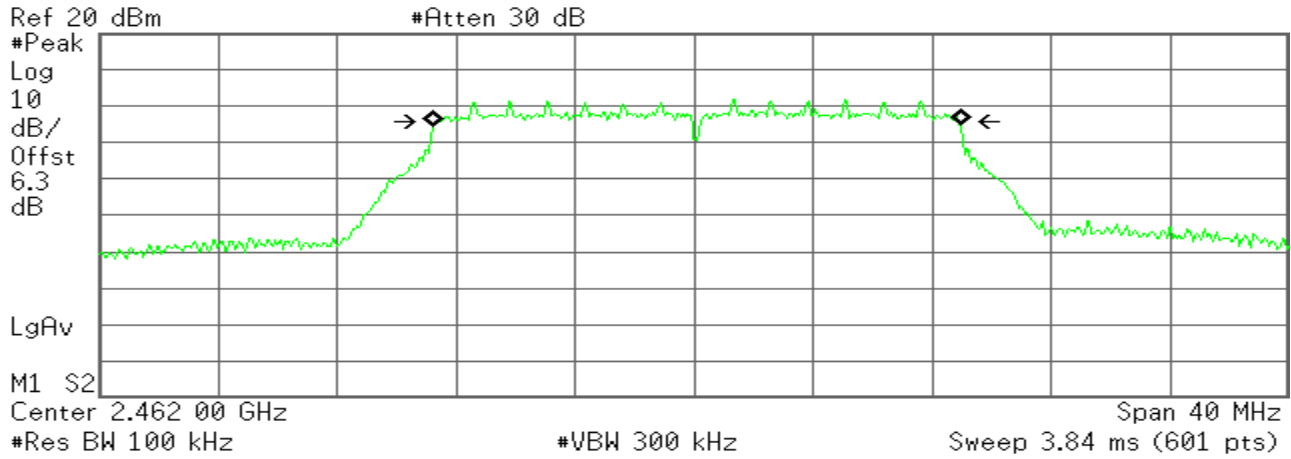
Occ BW % Pwr 99.00 %  
x dB -6.00 dB

Transmit Freq Error 115.176 kHz  
x dB Bandwidth 17.643 MHz

## 6dB Bandwidth (CH High)

Agilent

R T



Occupied Bandwidth  
17.7665 MHz

Occ BW % Pwr 99.00 %  
x dB -6.00 dB

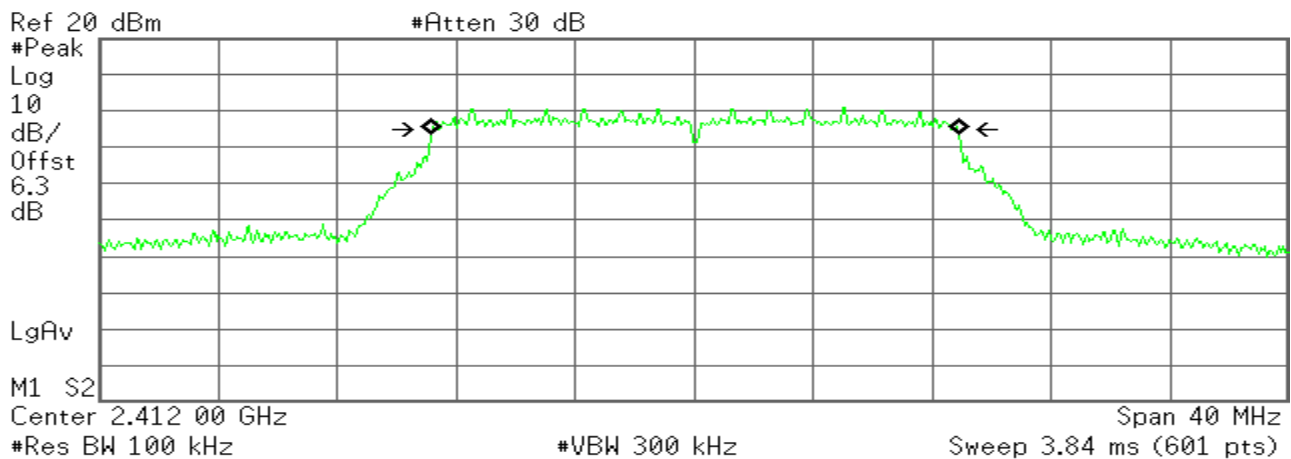
Transmit Freq Error 97.858 kHz  
x dB Bandwidth 17.610 MHz

## IEEE 802.11n HT20 mode / Chain 1

### 6dB Bandwidth (CH Low)

Agilent

R T



Occupied Bandwidth  
17.7640 MHz

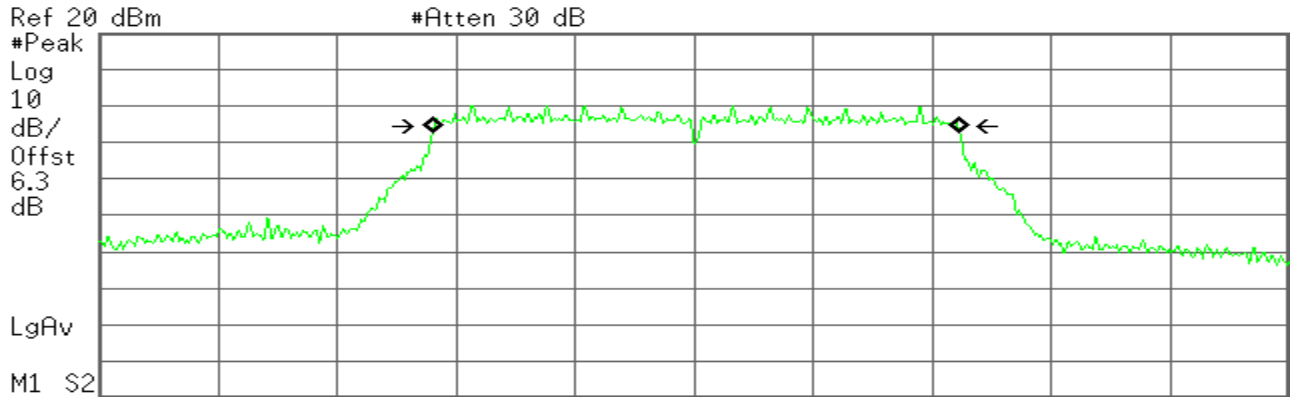
Occ BW % Pwr 99.00 %  
x dB -6.00 dB

Transmit Freq Error 37.311 kHz  
x dB Bandwidth 17.680 MHz

## 6dB Bandwidth (CH Mid)

Agilent

R T



Ref 20 dBm #Atten 30 dB  
#Peak Log 10 dB/Offst 6.3 dB  
LgAv  
M1 S2  
Center 2.437 00 GHz Span 40 MHz  
#Res BW 100 kHz #VBW 300 kHz Sweep 3.84 ms (601 pts)

**Occupied Bandwidth**  
**17.7471 MHz**

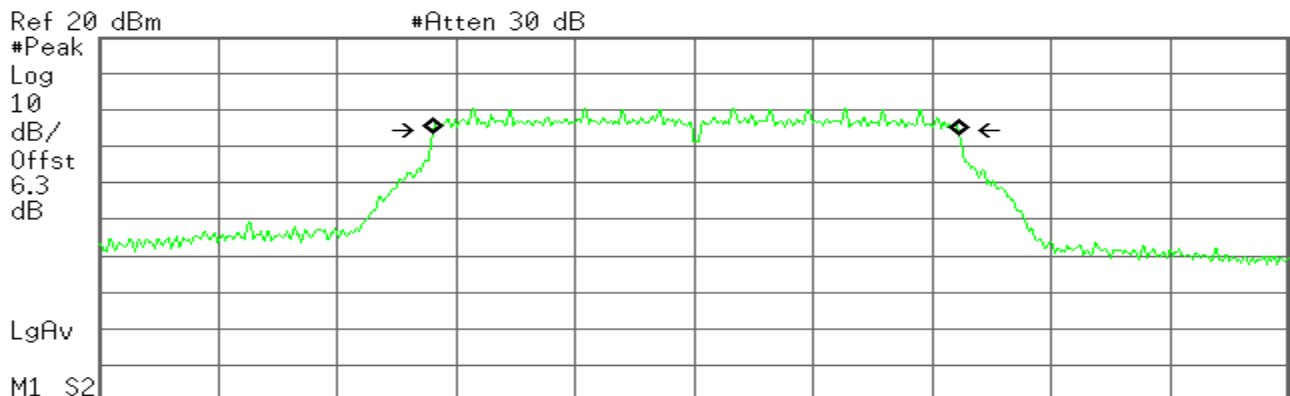
**Occ BW % Pwr** 99.00 %  
**x dB** -6.00 dB

**Transmit Freq Error** 58.688 kHz  
**x dB Bandwidth** 17.676 MHz

## 6dB Bandwidth (CH High)

Agilent

R T



Ref 20 dBm #Atten 30 dB  
#Peak Log 10 dB/Offst 6.3 dB  
LgAv  
M1 S2  
Center 2.462 00 GHz Span 40 MHz  
#Res BW 100 kHz #VBW 300 kHz Sweep 3.84 ms (601 pts)

**Occupied Bandwidth**  
**17.7302 MHz**

**Occ BW % Pwr** 99.00 %  
**x dB** -6.00 dB

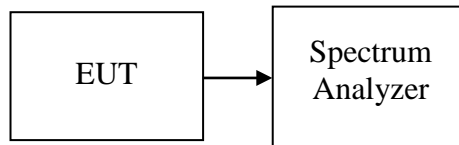
**Transmit Freq Error** 66.233 kHz  
**x dB Bandwidth** 17.691 MHz

## 7.2.99% BANDWIDTH MEASUREMENT

### LIMIT

None; for reporting purposes only  
RSS-Gen 6.6

### Test Configuration



### TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The RBW shall be in the range of 1% to 5% of the occupied bandwidth and VBW shall be approximately 3x RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

### TEST RESULTS

*No non-compliance noted*

**Test Data**

**IEEE 802.11b mode/Chain 0**

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	2412	12.266
Mid	2437	11.969
High	2462	11.983

**IEEE 802.11b mode/Chain 1**

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	2412	12.363
Mid	2437	12.165
High	2462	12.017

**IEEE 802.11g mode/Chain 0**

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	2412	17.601
Mid	2437	17.292
High	2462	17.325

**IEEE 802.11g mode/Chain 1**

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	2412	18.016
Mid	2437	17.668
High	2462	17.535

**IEEE 802.11n HT20 mode/Chain 0**

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	2412	18.169
Mid	2437	18.175
High	2462	18.156

**IEEE 802.11n HT20 mode/Chain 1**

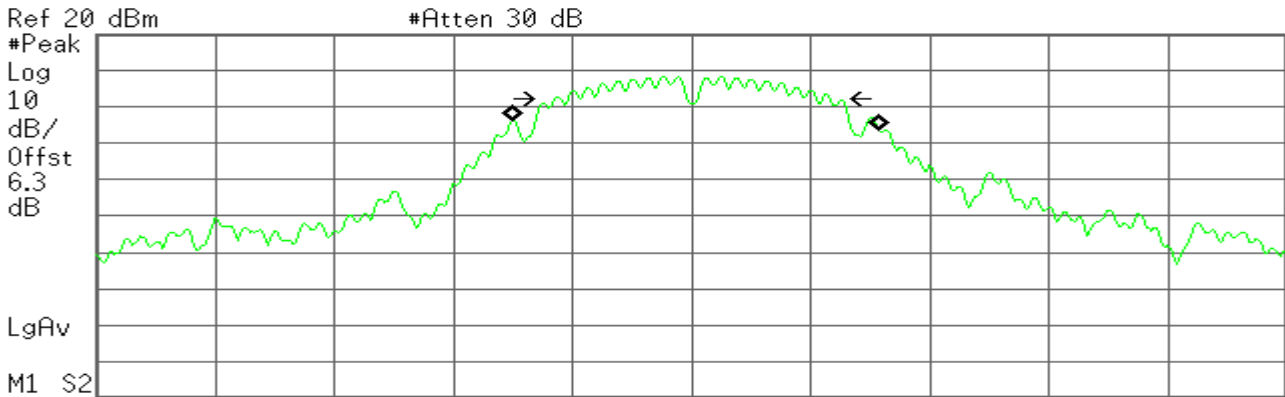
Channel	Frequency (MHz)	Bandwidth (MHz)
Low	2412	18.037
Mid	2437	17.974
High	2462	18.048

## IEEE 802.11b MODE/Chain 0

### 99% Bandwidth (CH Low)

Agilent

R T



Center 2.412 00 GHz Span 40 MHz  
#Res BW 300 kHz #VBW 1 MHz Sweep 1 ms (601 pts)

**Occupied Bandwidth**  
12.2662 MHz

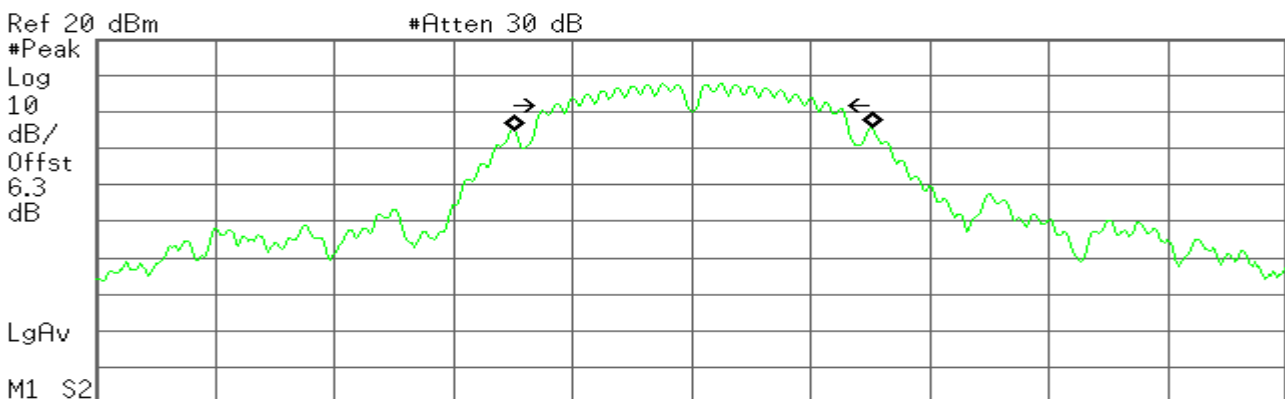
**Occ BW % Pwr** 99.00 %  
**x dB** -6.00 dB

**Transmit Freq Error** 135.964 kHz  
**x dB Bandwidth** 9.244 MHz

### 99% Bandwidth (CH Mid)

Agilent

R T



Center 2.437 00 GHz Span 40 MHz  
#Res BW 300 kHz #VBW 1 MHz Sweep 1 ms (601 pts)

**Occupied Bandwidth**  
11.9693 MHz

**Occ BW % Pwr** 99.00 %  
**x dB** -6.00 dB

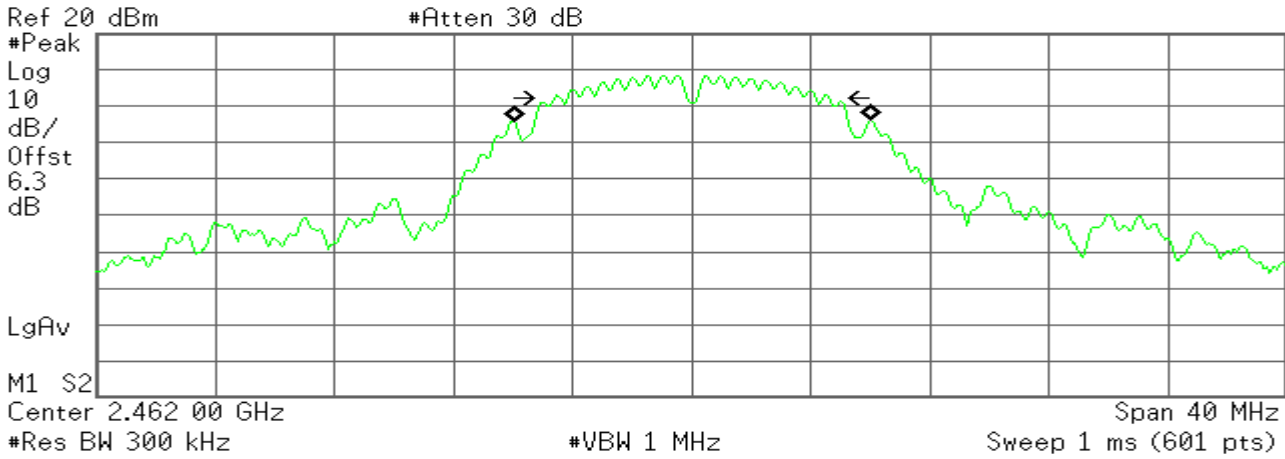
**Transmit Freq Error** 57.151 kHz  
**x dB Bandwidth** 9.222 MHz



### 99% Bandwidth (CH High)

Agilent

R T



**Occupied Bandwidth**  
11.9832 MHz

**Occ BW % Pwr** 99.00 %  
**x dB** -6.00 dB

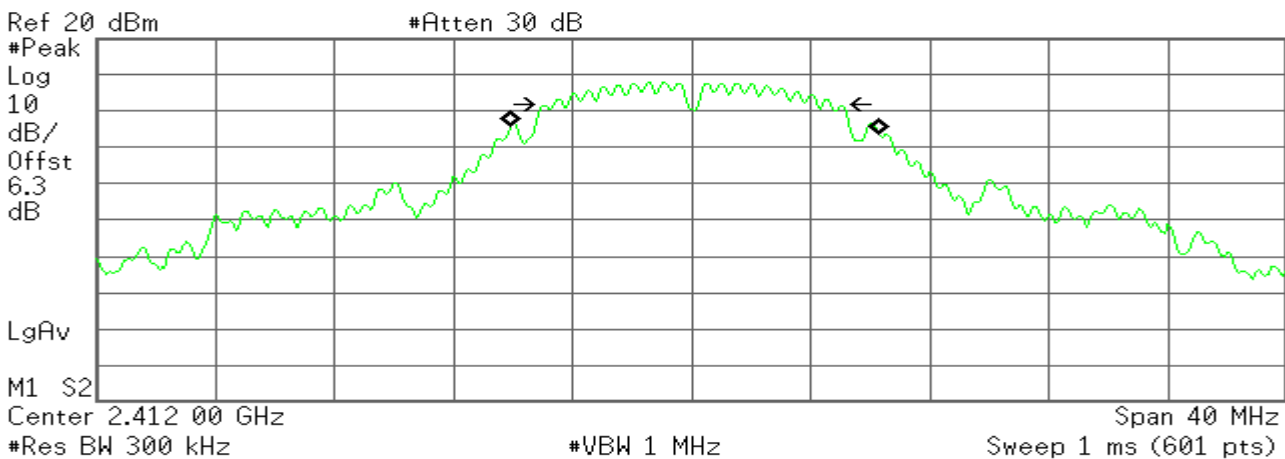
**Transmit Freq Error** 38.891 kHz  
**x dB Bandwidth** 9.227 MHz

### IEEE 802.11b MODE/Chain 1

### 99% Bandwidth (CH Low)

Agilent

R T



**Occupied Bandwidth**  
12.3629 MHz

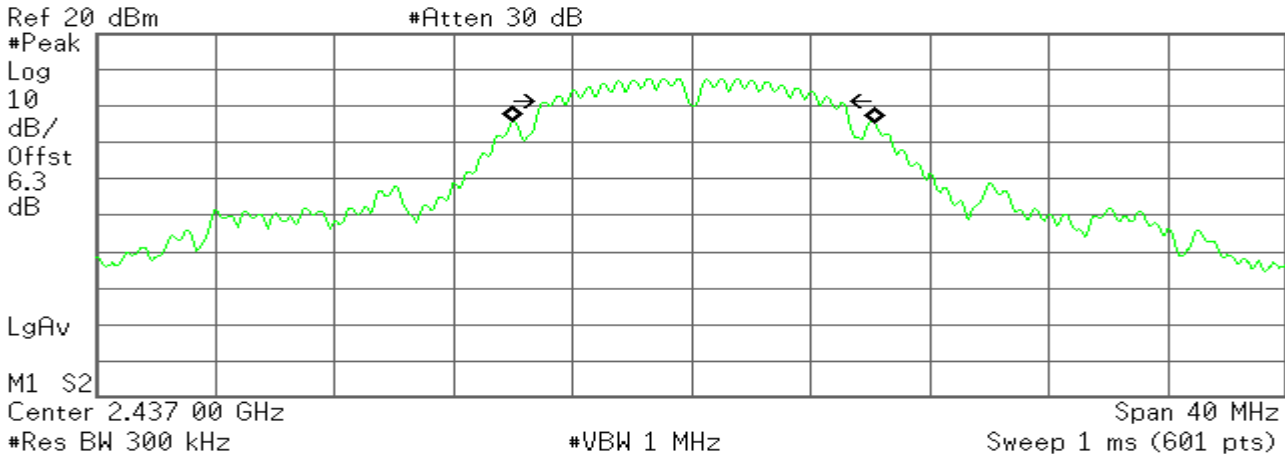
**Occ BW % Pwr** 99.00 %  
**x dB** -6.00 dB

**Transmit Freq Error** 112.772 kHz  
**x dB Bandwidth** 9.306 MHz

## 99% Bandwidth (CH Mid)

Agilent

R T



**Occupied Bandwidth**  
12.1645 MHz

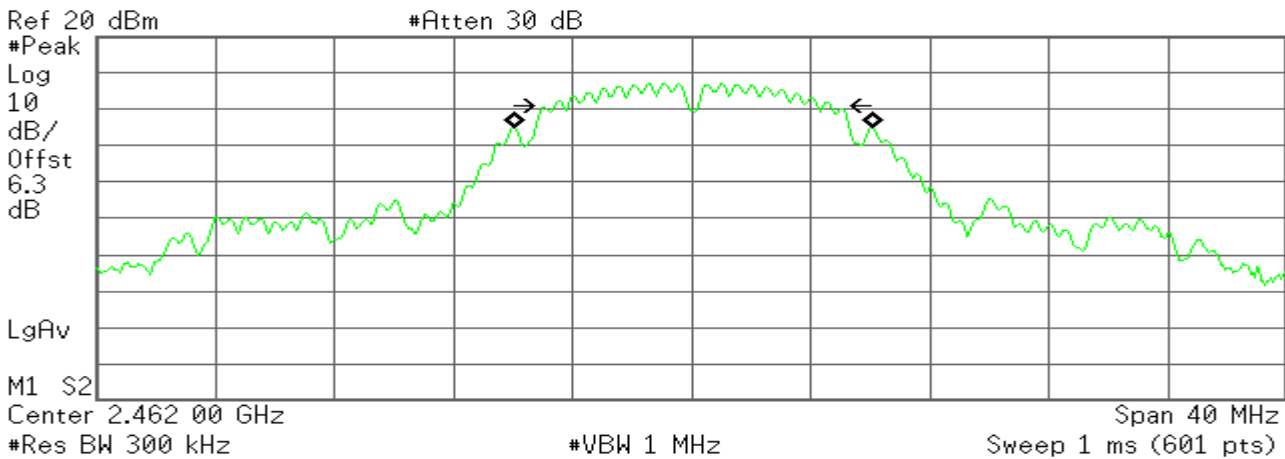
**Occ BW % Pwr** 99.00 %  
**x dB** -6.00 dB

**Transmit Freq Error** 73.252 kHz  
**x dB Bandwidth** 9.283 MHz

## 99% Bandwidth (CH High)

Agilent

R T



**Occupied Bandwidth**  
12.0173 MHz

**Occ BW % Pwr** 99.00 %  
**x dB** -6.00 dB

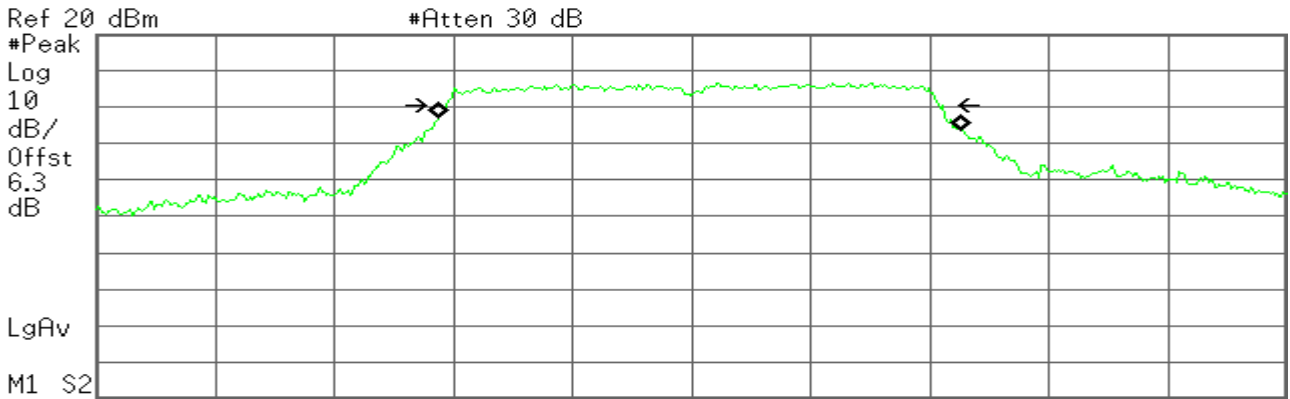
**Transmit Freq Error** 70.684 kHz  
**x dB Bandwidth** 9.270 MHz

## IEEE 802.11g MODE/Chain 0

### 99% Bandwidth (CH Low)

Agilent

R T



M1 S2  
Center 2.412 00 GHz Span 40 MHz  
#Res BW 300 kHz #VBW 1 MHz Sweep 1 ms (601 pts)

**Occupied Bandwidth**  
**17.6008 MHz**

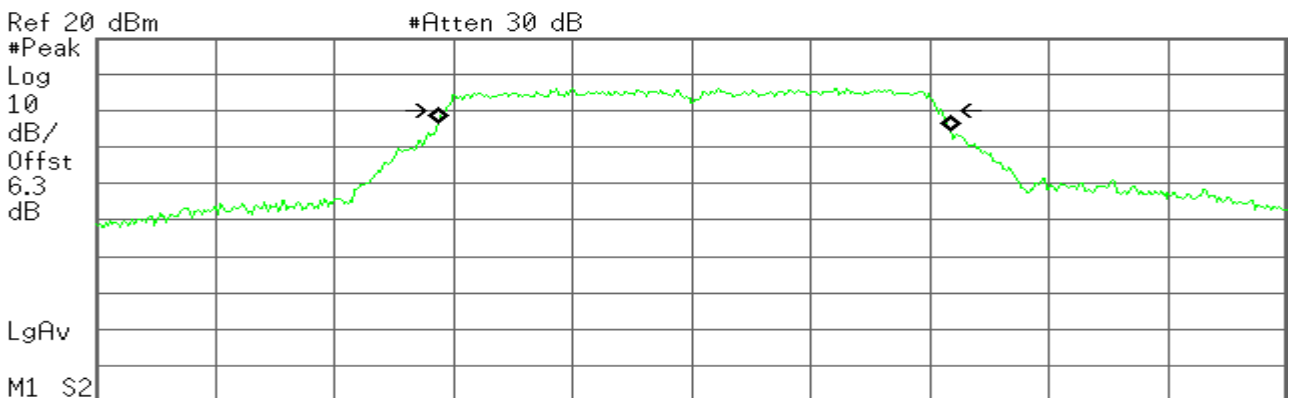
**Occ BW % Pwr** 99.00 %  
**x dB** -6.00 dB

**Transmit Freq Error** 251.859 kHz  
**x dB Bandwidth** 16.595 MHz

### 99% Bandwidth (CH Mid)

Agilent

R T



M1 S2  
Center 2.437 00 GHz Span 40 MHz  
#Res BW 300 kHz #VBW 1 MHz Sweep 1 ms (601 pts)

**Occupied Bandwidth**  
**17.2915 MHz**

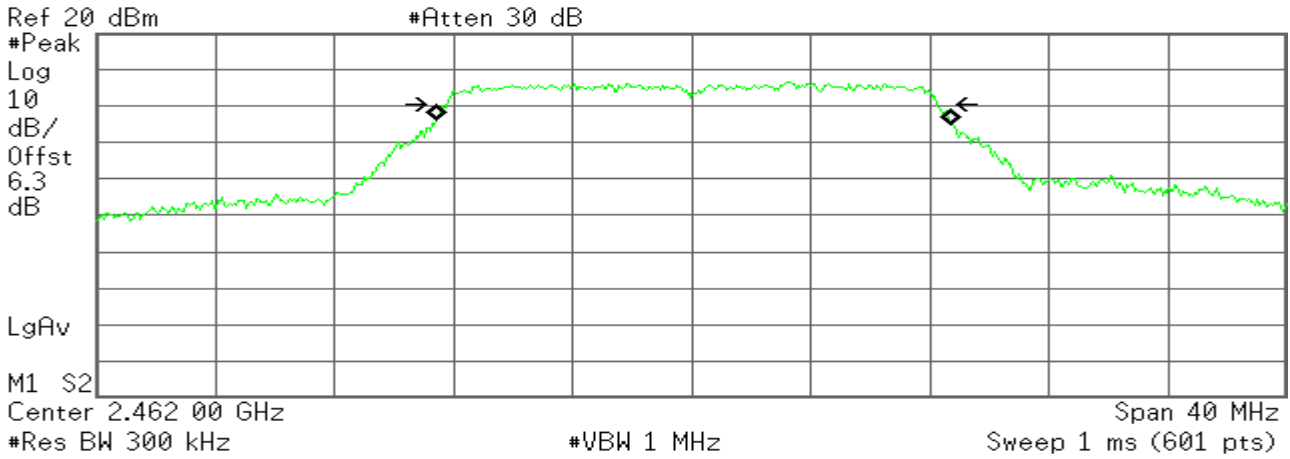
**Occ BW % Pwr** 99.00 %  
**x dB** -6.00 dB

**Transmit Freq Error** 112.776 kHz  
**x dB Bandwidth** 16.714 MHz

### 99% Bandwidth (CH High)

Agilent

R T



**Occupied Bandwidth**  
17.3250 MHz

**Occ BW % Pwr** 99.00 %  
**x dB** -6.00 dB

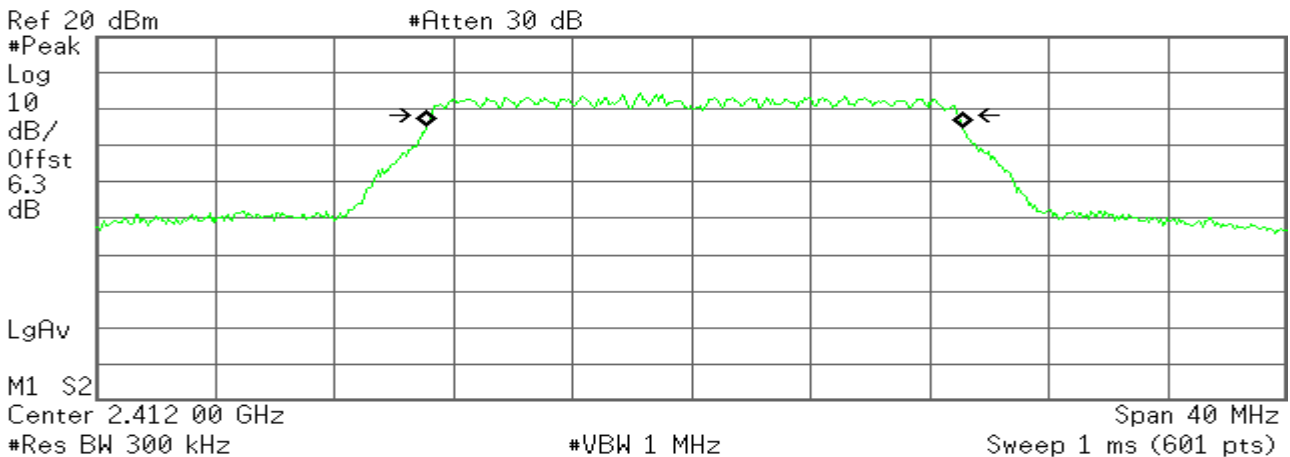
**Transmit Freq Error** 65.355 kHz  
**x dB Bandwidth** 16.508 MHz

### IEEE 802.11g MODE/Chain 1

#### 99% Bandwidth (CH Low)

Agilent

R T



**Occupied Bandwidth**  
18.0163 MHz

**Occ BW % Pwr** 99.00 %  
**x dB** -6.00 dB

**Transmit Freq Error** 97.926 kHz  
**x dB Bandwidth** 17.787 MHz

## 99% Bandwidth (CH Mid)

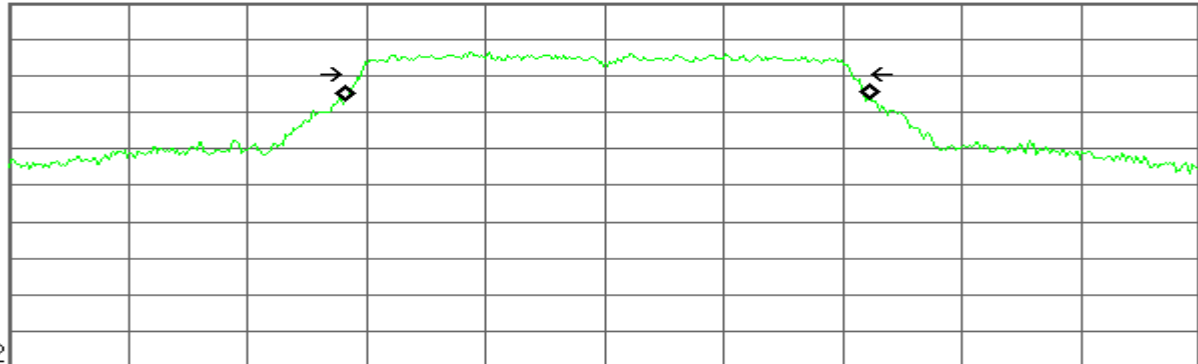
Agilent

R T

Ref 20 dBm

#Atten 30 dB

#Peak  
Log  
10  
dB/  
Offst  
6.3  
dB



LgAv

M1 S2

Center 2.437 00 GHz

Span 40 MHz

#Res BW 300 kHz

#VBW 1 MHz

Sweep 1 ms (601 pts)

**Occupied Bandwidth**  
**17.6684 MHz**

**Occ BW % Pwr** 99.00 %  
**x dB** -6.00 dB

**Transmit Freq Error** 72.866 kHz  
**x dB Bandwidth** 16.527 MHz

## 99% Bandwidth (CH High)

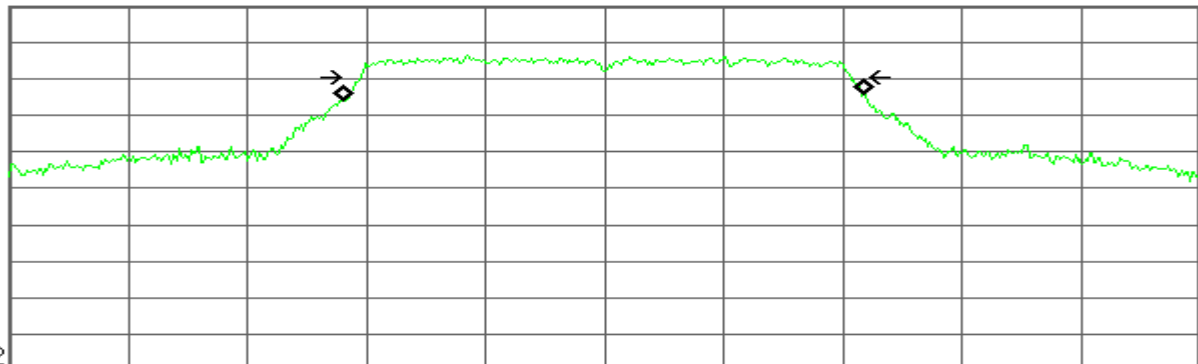
Agilent

R T

Ref 20 dBm

#Atten 30 dB

#Peak  
Log  
10  
dB/  
Offst  
6.3  
dB



LgAv

M1 S2

Center 2.462 00 GHz

Span 40 MHz

#Res BW 300 kHz

#VBW 1 MHz

Sweep 1 ms (601 pts)

**Occupied Bandwidth**  
**17.5351 MHz**

**Occ BW % Pwr** 99.00 %  
**x dB** -6.00 dB

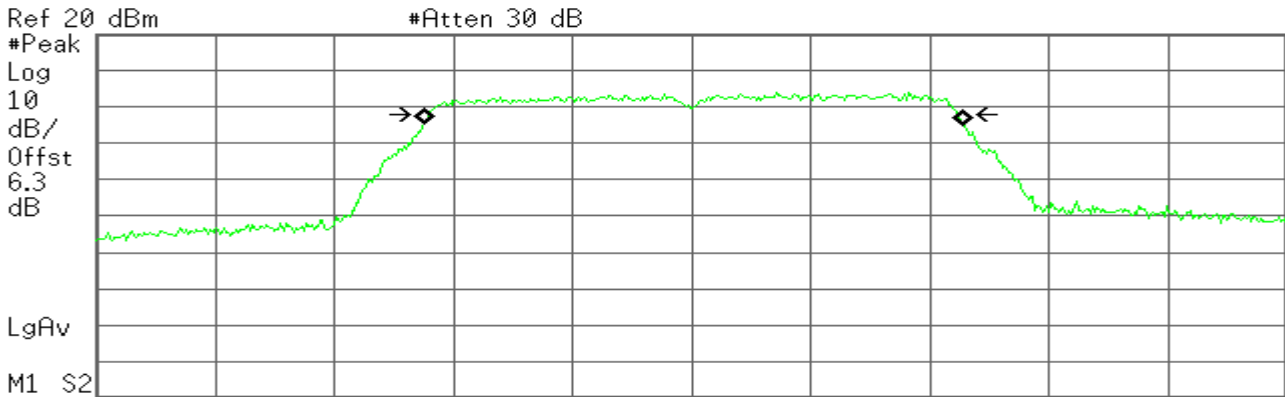
**Transmit Freq Error** -5.268 kHz  
**x dB Bandwidth** 16.515 MHz

## IEEE 802.11n20 MODE/Chain 0

### 99% Bandwidth (CH Low)

Agilent

R T



Ref 20 dBm #Atten 30 dB  
#Peak Log 10 dB/Offst 6.3 dB  
LgAv  
M1 S2  
Center 2.412 00 GHz Span 40 MHz  
#Res BW 300 kHz #VBW 1 MHz Sweep 1 ms (601 pts)

**Occupied Bandwidth**  
**18.1686 MHz**

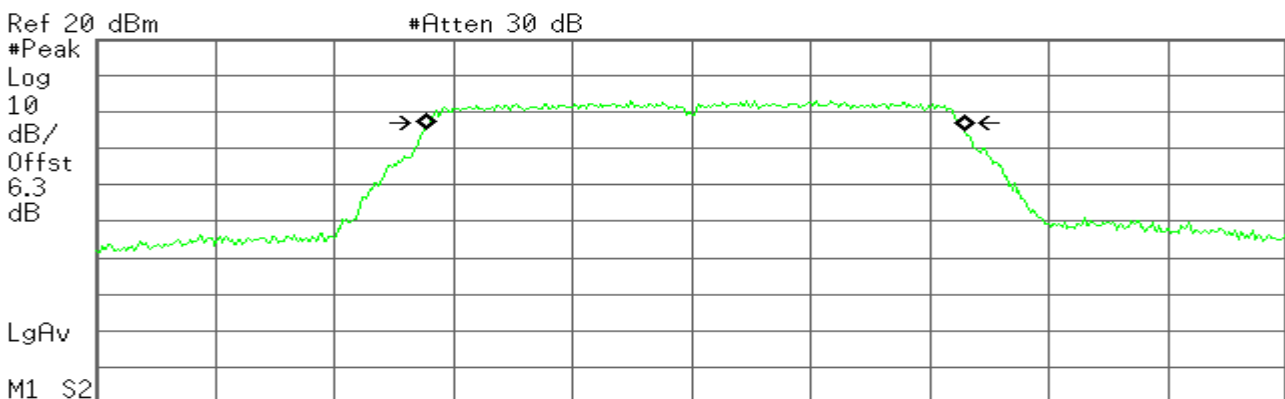
**Occ BW % Pwr** 99.00 %  
**x dB** -6.00 dB

**Transmit Freq Error** 75.485 kHz  
**x dB Bandwidth** 17.775 MHz

### 99% Bandwidth (CH Mid)

Agilent

R T



Ref 20 dBm #Atten 30 dB  
#Peak Log 10 dB/Offst 6.3 dB  
LgAv  
M1 S2  
Center 2.437 00 GHz Span 40 MHz  
#Res BW 300 kHz #VBW 1 MHz Sweep 1 ms (601 pts)

**Occupied Bandwidth**  
**18.1751 MHz**

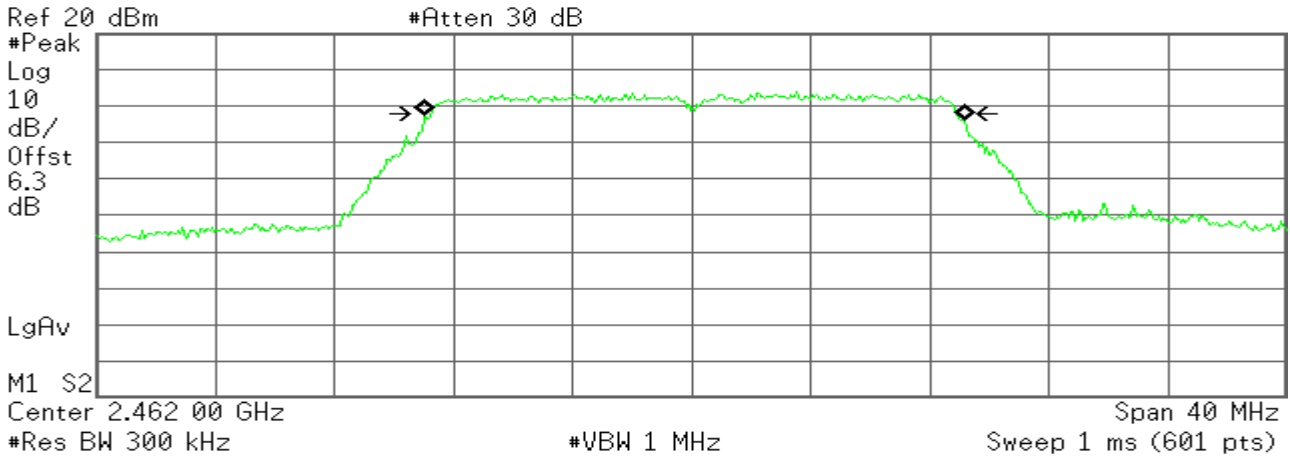
**Occ BW % Pwr** 99.00 %  
**x dB** -6.00 dB

**Transmit Freq Error** 121.548 kHz  
**x dB Bandwidth** 17.757 MHz

## 99% Bandwidth (CH High)

Agilent

R T



**Occupied Bandwidth**  
18.1562 MHz

**Occ BW % Pwr** 99.00 %  
**x dB** -6.00 dB

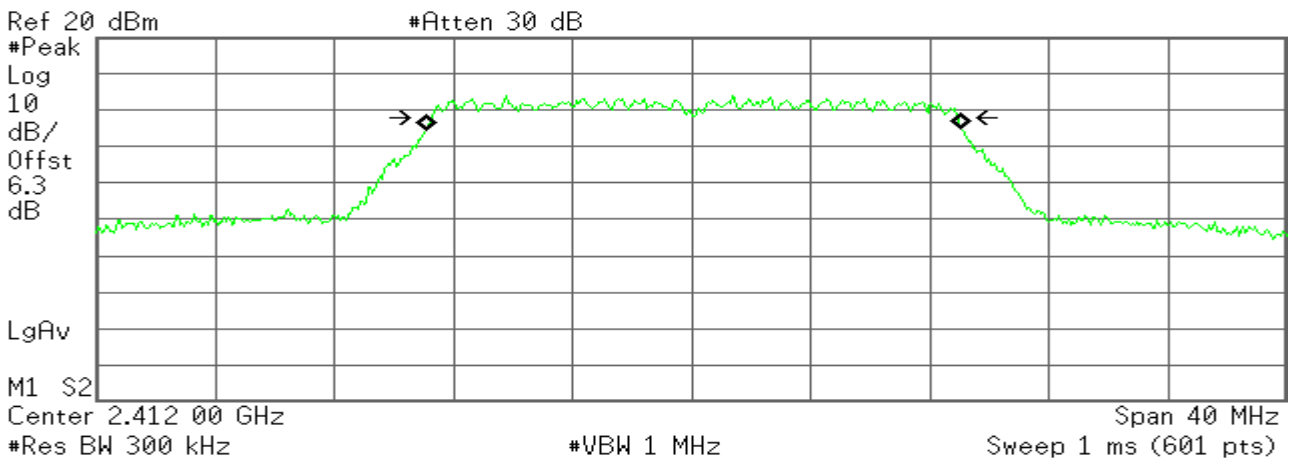
**Transmit Freq Error** 93.825 kHz  
**x dB Bandwidth** 17.738 MHz

## IEEE 802.11n20 MODE/Chain 1

### 99% Bandwidth (CH Low)

Agilent

R T



**Occupied Bandwidth**  
18.0368 MHz

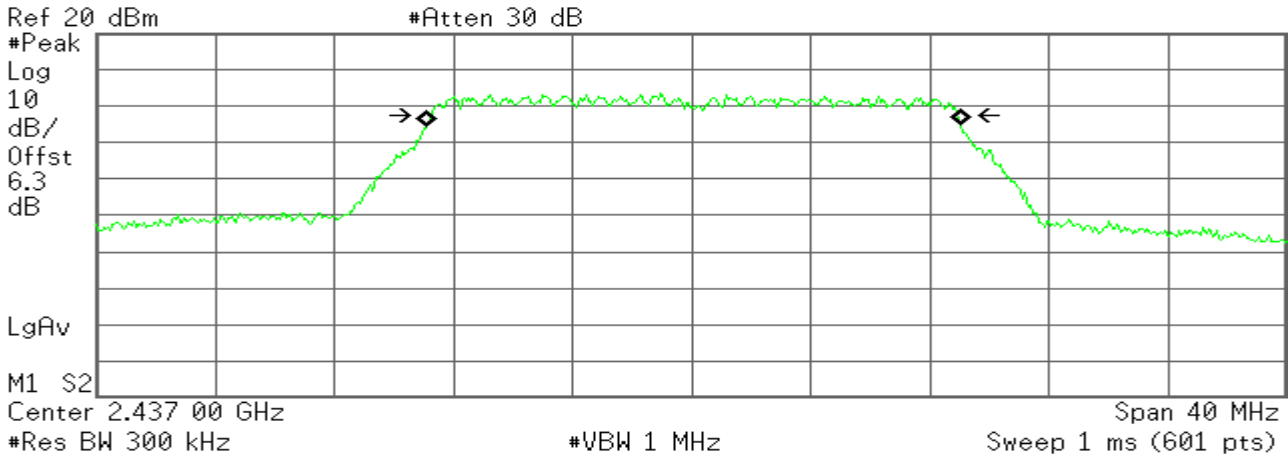
**Occ BW % Pwr** 99.00 %  
**x dB** -6.00 dB

**Transmit Freq Error** 73.631 kHz  
**x dB Bandwidth** 17.706 MHz

## 99% Bandwidth (CH Mid)

Agilent

R T



**Occupied Bandwidth**  
17.9740 MHz

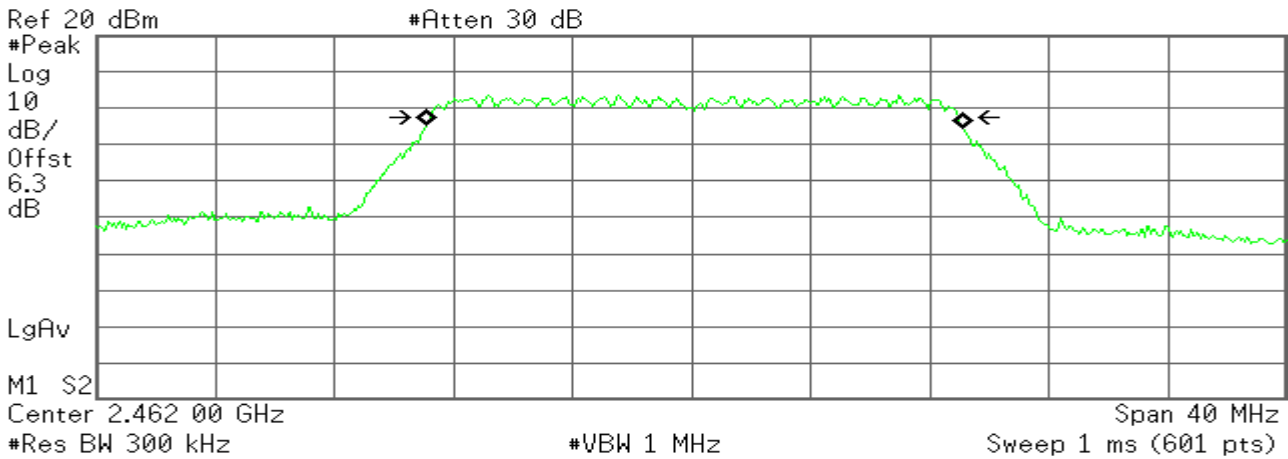
**Occ BW % Pwr** 99.00 %  
**x dB** -6.00 dB

**Transmit Freq Error** 67.531 kHz  
**x dB Bandwidth** 17.755 MHz

## 99% Bandwidth (CH High)

Agilent

R T



**Occupied Bandwidth**  
18.0481 MHz

**Occ BW % Pwr** 99.00 %  
**x dB** -6.00 dB

**Transmit Freq Error** 84.638 kHz  
**x dB Bandwidth** 17.777 MHz



## 7.3. PEAK POWER

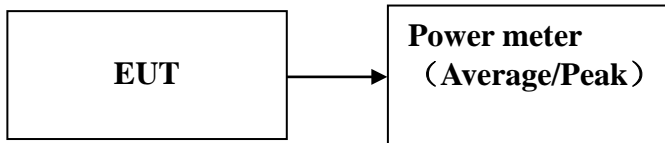
### LIMIT

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 6dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6dBi 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 6dBi.
3. According to RSS-247 section 5.4, For DTSs employing digital modulation techniques operating in the bands 902-928 MHz and 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1W. The e.i.r.p. shall not exceed 4 W, except as provided in section 5.4(e)

Directional Gain =  $G_{ANT} + \text{Array Gain} = 2.77\text{dBi} + 0\text{dBi} = 2.77\text{dBi} < 6\text{dBi}$

### 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)	Chain 0 peak Output Power (dBm)	Chain 1 peak Output Power (dBm)	Limit (dBm)	Chain 0 peak e.i.r.p (dBm)	Chain 1 peak e.i.r.p (dBm)	Limit (dBm)
Low	2412	16.09	15.88	30.00	18.86	18.65	36.02
Mid	2437	15.52	16.26	30.00	18.29	19.03	36.02
High	2462	16.14	16.43	30.00	18.91	19.20	36.02

Channel	Frequency (MHz)	Chain 0 Average Output Power (dBm)	Chain 1 Average Output Power (dBm)	Chain 0 Average e.i.r.p (dBm)	Chain 1 Average e.i.r.p (dBm)
Low	2412	13.16	12.49	15.93	15.26
Mid	2437	12.62	12.58	15.39	15.35
High	2462	13.06	12.81	15.83	15.58

**Test mode: IEEE 802.11g mode**

Channel	Frequency (MHz)	Chain 0 peak Output Power (dBm)	Chain 1 peak Output Power (dBm)	Limit (dBm)	Chain 0 peak e.i.r.p (dBm)	Chain 1 peak e.i.r.p (dBm)	Limit (dBm)
Low	2412	19.94	19.51	30.00	22.71	22.28	36.02
Mid	2437	19.65	19.75	30.00	22.42	22.52	36.02
High	2462	20.16	19.96	30.00	22.93	22.73	36.02

Channel	Frequency (MHz)	Chain 0 Average Output Power (dBm)	Chain 1 Average Output Power (dBm)	Chain 0 Average e.i.r.p (dBm)	Chain 1 Average e.i.r.p (dBm)
Low	2412	13.44	12.66	16.21	15.43
Mid	2437	12.95	12.86	15.72	15.63
High	2462	13.41	13.01	16.18	15.78

**Test mode: IEEE 802.11n HT20 mode**

Channel	Frequency (MHz)	Chain 0 peak Output Power (dBm)	Chain 1 peak Output Power (dBm)	Total peak Output Power (dBm)	Limit (dBm)	Total peak e.i.r.p (dBm)	Limit (dBm)
Low	2412	18.15	16.51	20.42	30.00	23.19	36.02
Mid	2437	18.13	16.00	20.20	30.00	22.97	36.02
High	2462	17.60	15.80	19.80	30.00	22.57	36.02

Channel	Frequency (MHz)	Chain 0 Average Output Power (dBm)	Chain 1 Average Output Power (dBm)	Total Average Output Power (dBm)	Total Average e.i.r.p (dBm)
Low	2412	10.83	9.24	13.12	15.89
Mid	2437	11.10	9.07	13.21	15.98
High	2462	10.21	8.65	12.51	15.28

**Remark:** 1.Total Output Power (dBm) =  $10 \cdot \text{LOG}(10^{(\text{Chain 0 Output Power} / 10)} + 10^{(\text{Chain 1 Output Power} / 10)})$

2.Duty factor has been offsetted with cableloss

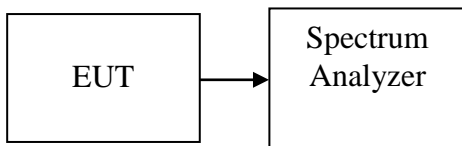
## 7.4. PEAK POWER SPECTRAL DENSITY

### 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.
3. According to RSS-247 section 5.2, The transmitter power spectral density conducted from the transmitter to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.

Directional Gain =  $G_{ANT} + \text{Array Gain} = 2.77 \text{ dBi} + 10\log(2/1) \text{ dB} = 5.78 \text{ dBi} < 6 \text{ dBi}$

### 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)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	Limit (dBm)	Result
Low	2412	-6.06	-6.29	8.00	PASS
Mid	2437	-5.51	-6.87	8.00	PASS
High	2462	-5.91	-7.41	8.00	PASS

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	Limit (dBm)	Result
Low	2412	-9.69	-9.13	8.00	PASS
Mid	2437	-9.58	-8.40	8.00	PASS
High	2462	-9.02	-9.10	8.00	PASS

Test mode: IEEE 802.11n HT20 mode

Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	Total PPSD (dBm)	Limit (dBm)	Result
Low	2412	-12.78	-14.02	-10.35	8.00	PASS
Mid	2437	-12.06	-14.04	-9.93	8.00	PASS
High	2462	-12.83	-14.20	-10.45	8.00	PASS

**Remark:** 1. Total PPSD(dBm) =  $10 \cdot \text{LOG}(10^{\text{Chain 0 PPSD}/10} + 10^{\text{Chain 1 PPSD}/10})$

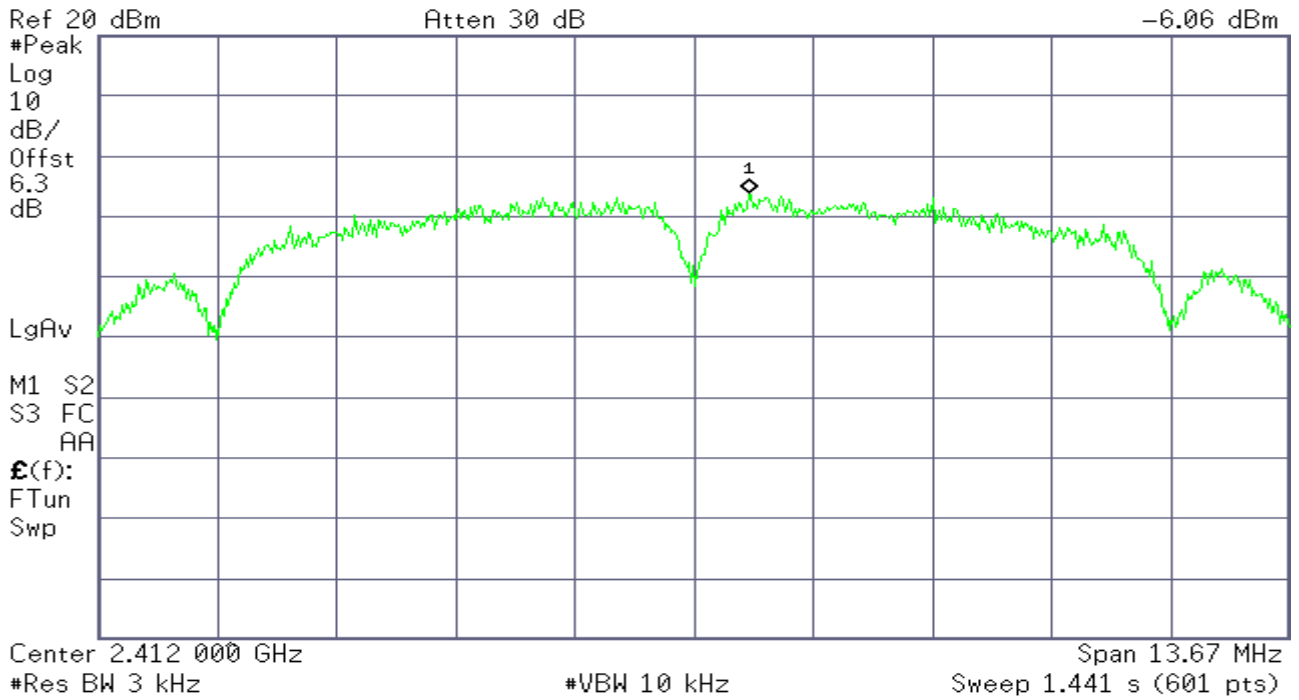
## Test Plot

### IEEE 802.11b mode/Chain 0

### PPSD (CH Low)

Agilent

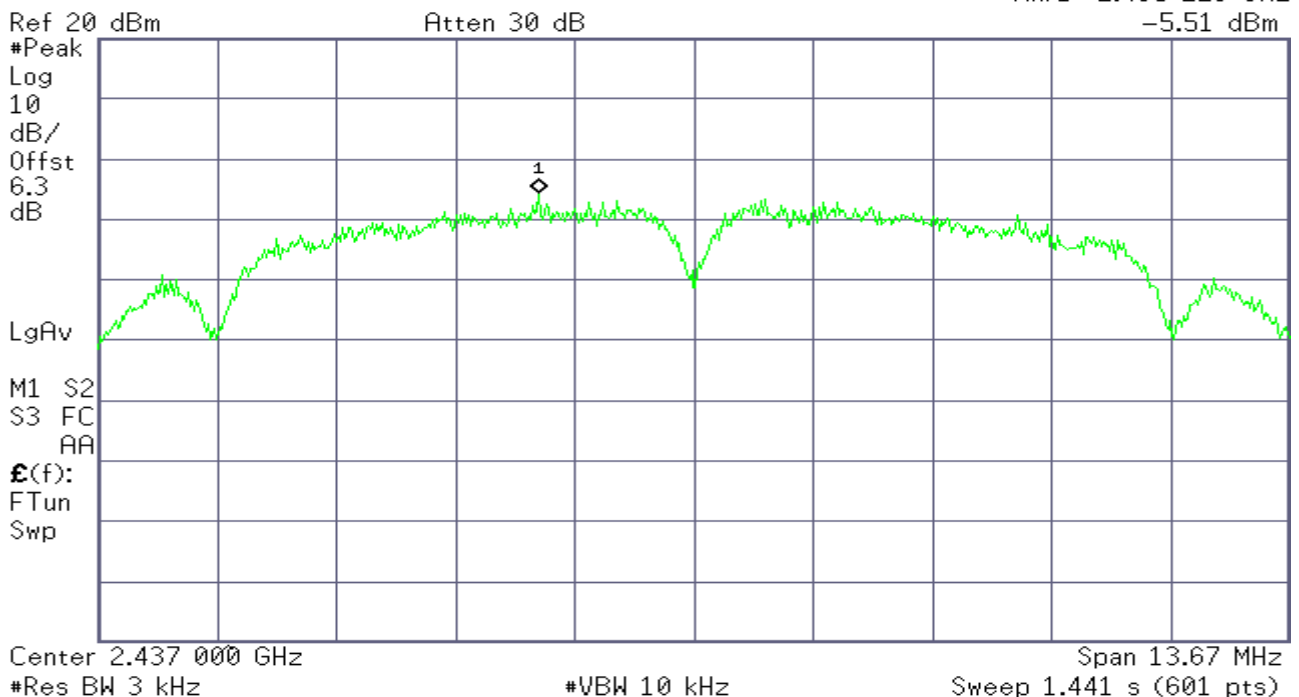
R T



### PPSD(CH Mid)

Agilent

R T



## PPSD (CH High)

Agilent

R T

Mkr1 2.461 476 GHz  
-5.91 dBm

Ref 20 dBm

Atten 30 dB

#Peak

Log

10

dB/

Offst

6.3

dB

LgAv

M1 S2

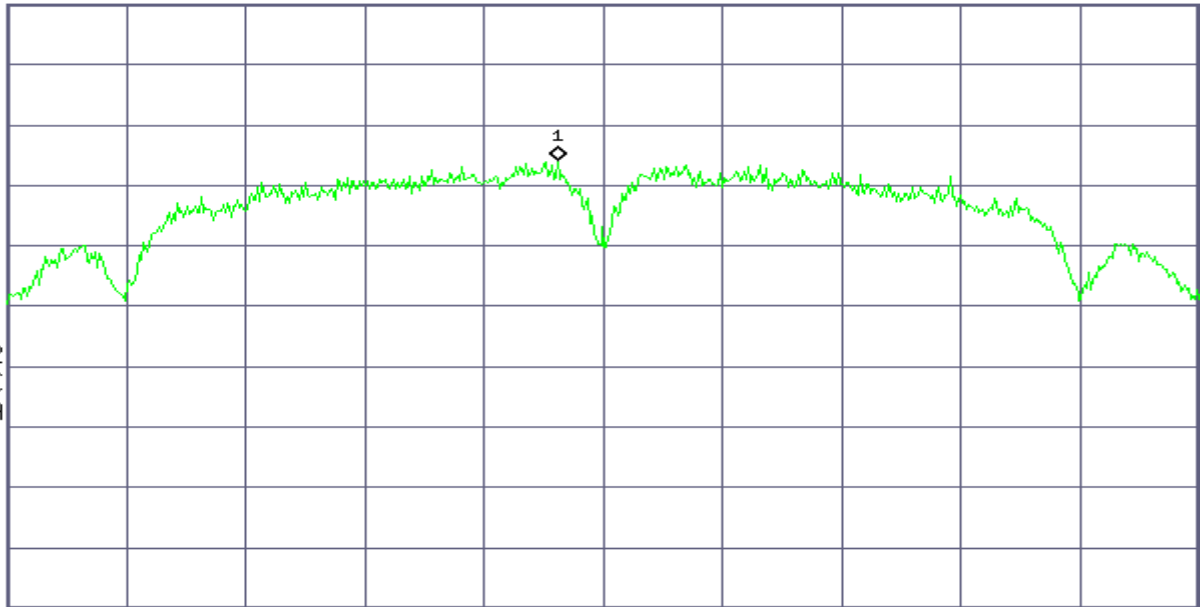
S3 FC

RA

$\mathcal{E}(f)$ :

FTun

Swp



Center 2.462 000 GHz

#Res BW 3 kHz

#VBW 10 kHz

Span 13.67 MHz

Sweep 1.441 s (601 pts)

## IEEE 802.11b mode/Chain 1

### PPSD (CH Low)

Agilent

R T

Mkr1 2.411 335 9 GHz  
-6.29 dBm

Ref 20 dBm

Atten 30 dB

#Peak

Log

10

dB/

Offst

6.3

dB

LgAv

M1 S2

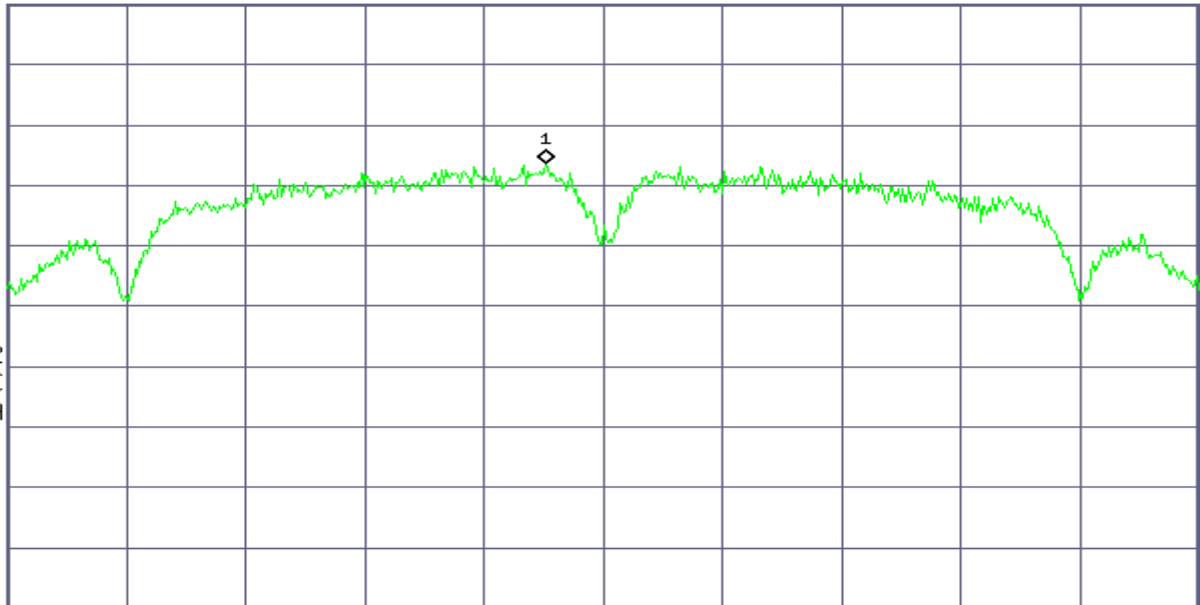
S3 FC

RA

$\mathcal{E}(f)$ :

FTun

Swp



Center 2.412 000 0 GHz

#Res BW 3 kHz

#VBW 10 kHz

Span 13.74 MHz

Sweep 1.449 s (601 pts)

## PPSD(CH Mid)

Agilent

R T

Mkr1 2.436 335 9 GHz  
-6.87 dBm

Ref 20 dBm

Atten 30 dB

#Peak

Log

10

dB/

Offst

6.3

dB

LgAv

M1 S2

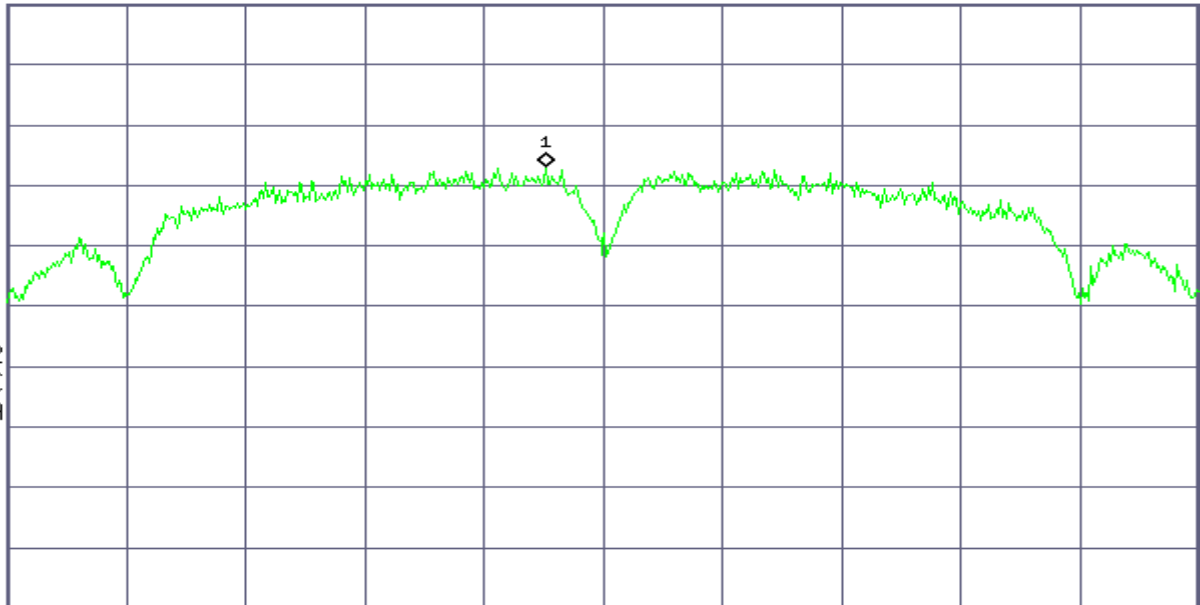
S3 FC

AA

$\mathcal{E}(f)$ :

FTun

Swp



Center 2.437 000 0 GHz

#Res BW 3 kHz

#VBW 10 kHz

Span 13.74 MHz

Sweep 1.449 s (601 pts)

## PPSD (CH High)

Agilent

R T

Mkr1 2.463 511 4 GHz  
-7.41 dBm

Ref 20 dBm

Atten 30 dB

#Peak

Log

10

dB/

Offst

6.3

dB

LgAv

M1 S2

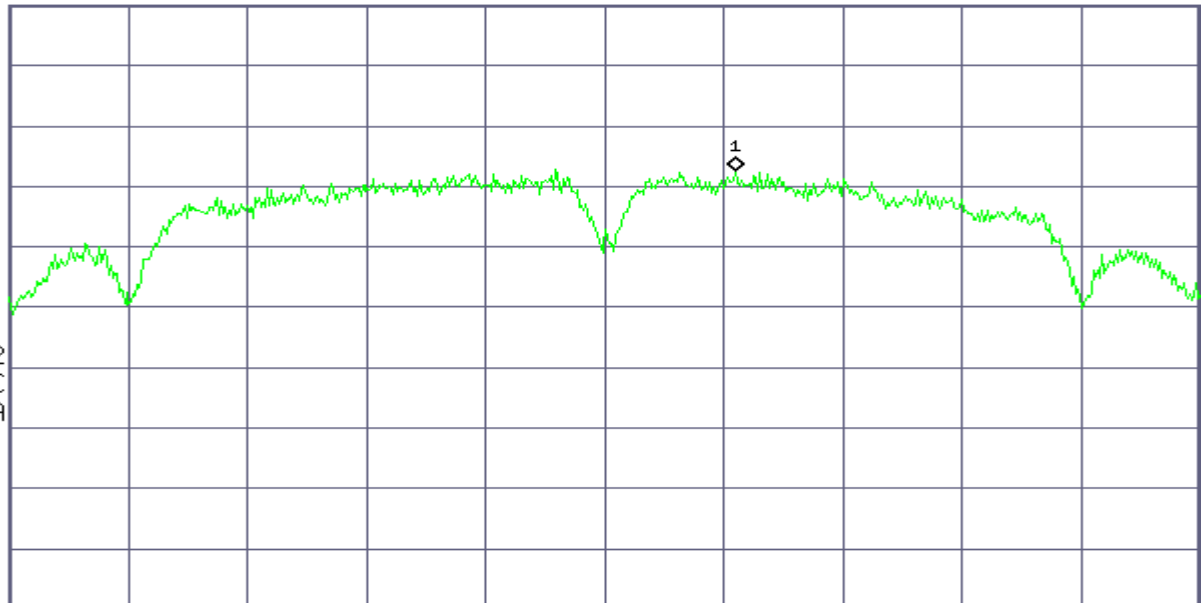
S3 FC

AA

$\mathcal{E}(f)$ :

FTun

Swp



Center 2.462 000 0 GHz

#Res BW 3 kHz

#VBW 10 kHz

Span 13.74 MHz

Sweep 1.449 s (601 pts)

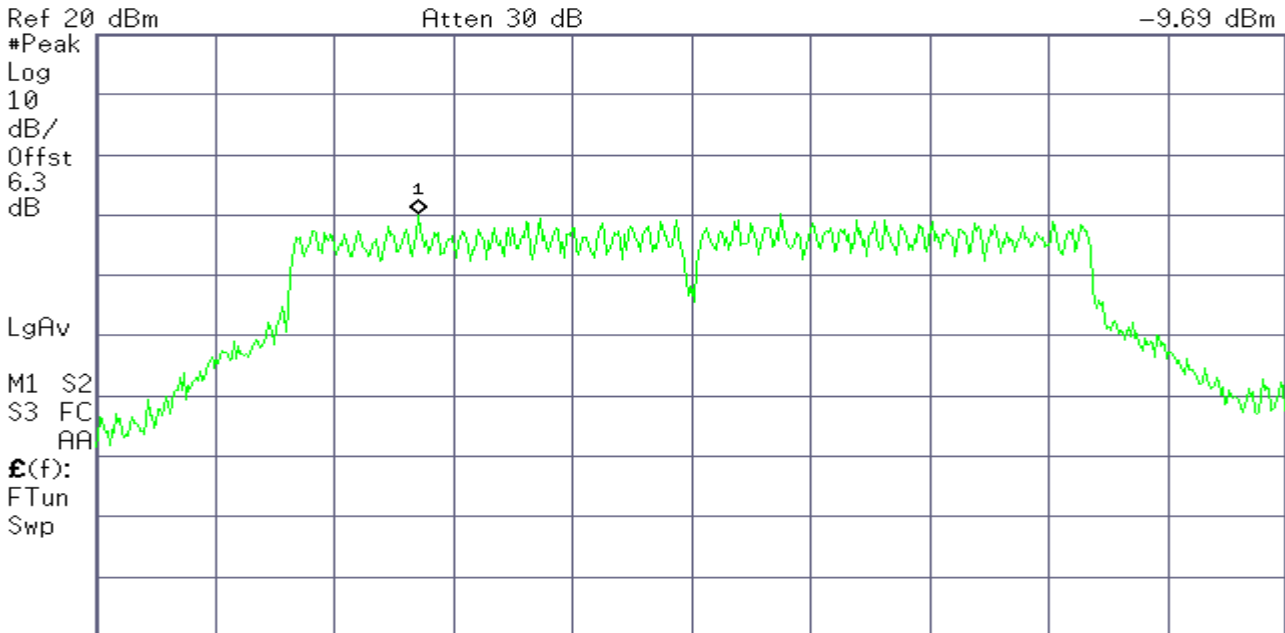
## IEEE 802.11g mode/Chain 0

### PPSD (CH Low)

Agilent

R T

Mkr1 2.406 33 GHz  
-9.69 dBm



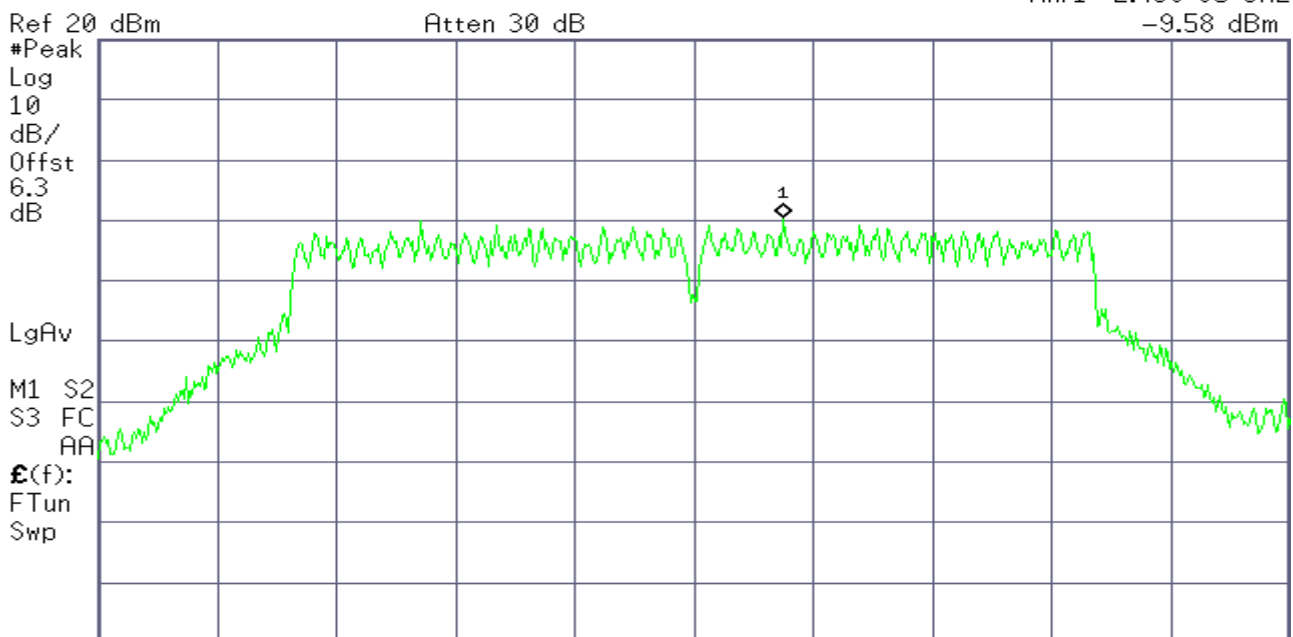
Center 2.412 00 GHz Span 24.64 MHz  
#Res BW 3 kHz #VBW 10 kHz Sweep 2.598 s (601 pts)

### PPSD (CH Mid)

Agilent

R T

Mkr1 2.438 85 GHz  
-9.58 dBm



Center 2.437 00 GHz Span 24.64 MHz  
#Res BW 3 kHz #VBW 10 kHz Sweep 2.598 s (601 pts)



## PPSD (CH High)

Agilent

R T

Mkr1 2.463 85 GHz  
-9.02 dBm

Ref 20 dBm

Atten 30 dB

#Peak

Log

10

dB/

Offst

6.3

dB

LgAv

M1 S2

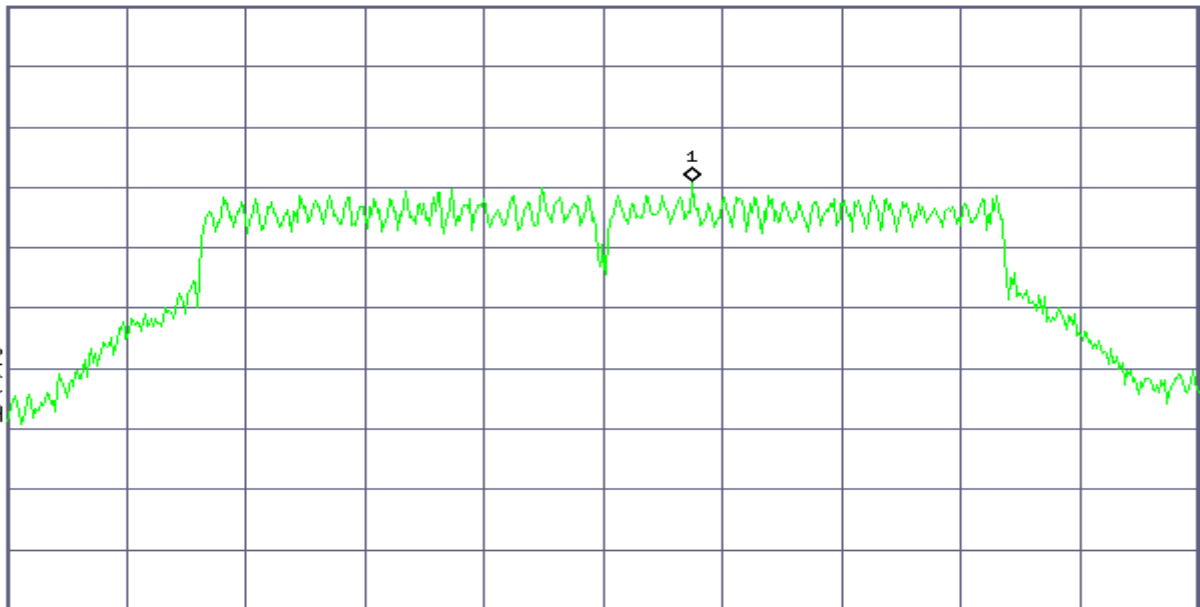
S3 FC

AA

$\mathcal{E}(f)$ :

FTun

Swp



Center 2.462 00 GHz

#Res BW 3 kHz

#VBW 10 kHz

Span 24.64 MHz

Sweep 2.598 s (601 pts)

## IEEE 802.11g mode/Chain 1

## PPSD (CH Low)

Agilent

R T

Mkr1 2.413 93 GHz  
-9.13 dBm

Ref 20 dBm

Atten 30 dB

#Peak

Log

10

dB/

Offst

6.3

dB

LgAv

M1 S2

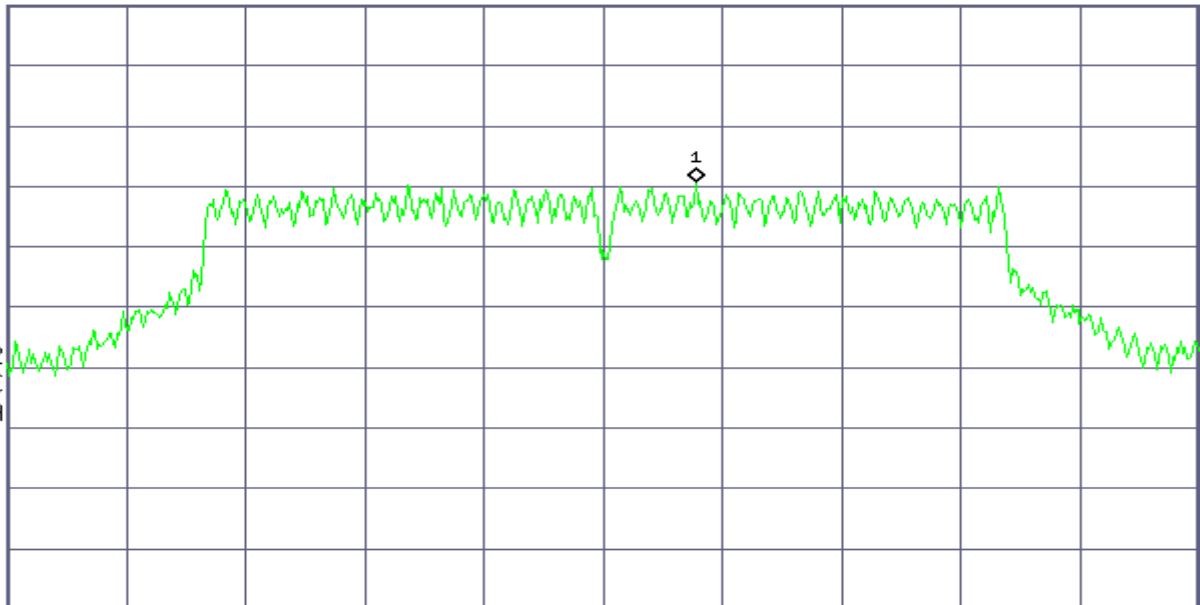
S3 FC

AA

$\mathcal{E}(f)$ :

FTun

Swp



Center 2.412 00 GHz

#Res BW 3 kHz

#VBW 10 kHz

Span 24.63 MHz

Sweep 2.597 s (601 pts)

## PPSD (CH Mid)

Agilent

R T

Mkr1 2.431 38 GHz  
-8.40 dBm

Ref 20 dBm

Atten 30 dB

#Peak

Log

10

dB/

Offst

6.3

dB

LgAv

M1 S2

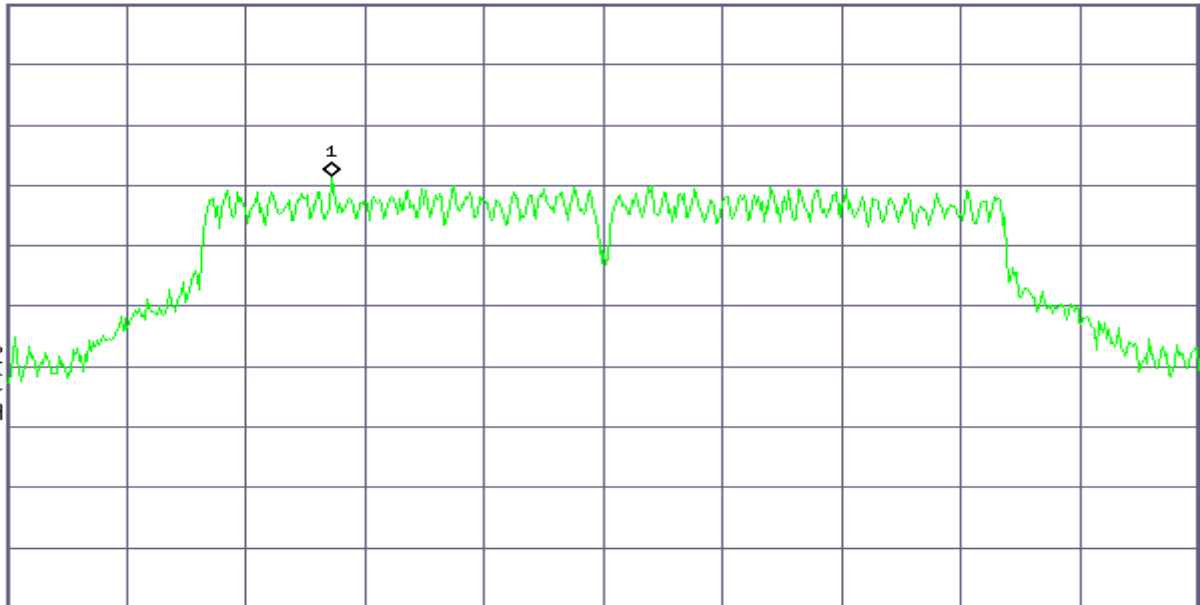
S3 FC

AA

$\mathcal{E}(f)$ :

FTun

Swp



Center 2.437 00 GHz

#Res BW 3 kHz

#VBW 10 kHz

Span 24.63 MHz

Sweep 2.597 s (601 pts)

## PPSD (CH High)

Agilent

R T

Mkr1 2.456 38 GHz  
-9.10 dBm

Ref 20 dBm

Atten 30 dB

#Peak

Log

10

dB/

Offst

6.3

dB

LgAv

M1 S2

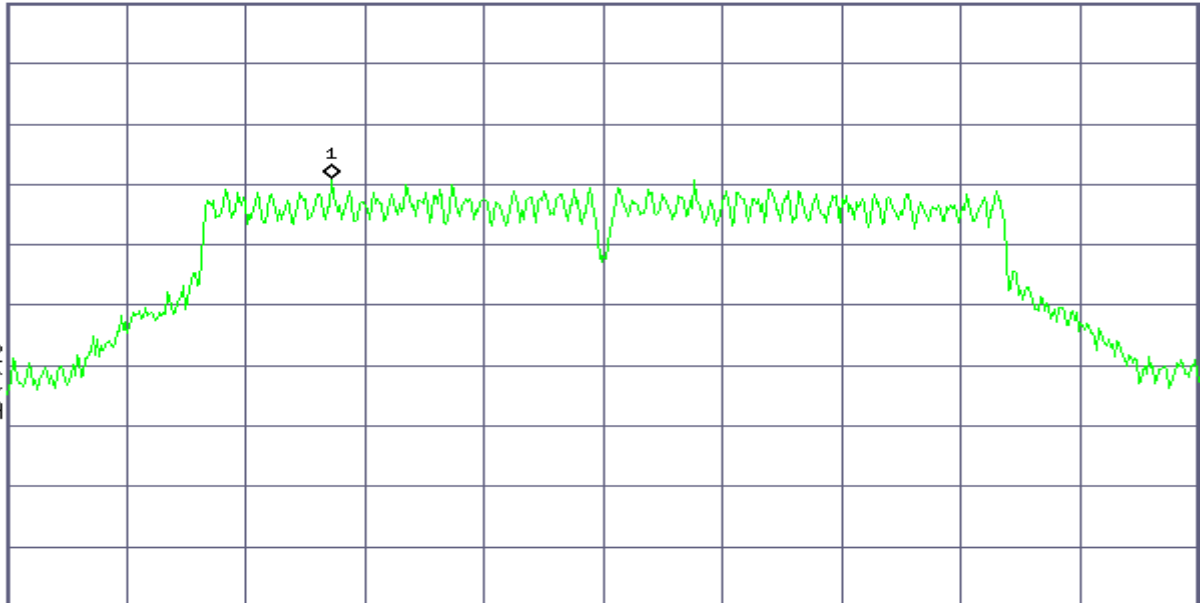
S3 FC

AA

$\mathcal{E}(f)$ :

FTun

Swp



Start 2.449 68 GHz

#Res BW 3 kHz

#VBW 10 kHz

Stop 2.474 31 GHz

Sweep 2.597 s (601 pts)

## IEEE 802.11n HT20 mode/Chain 0

### PPSD (CH Low)

Agilent

R T

Mkr1 2.419 188 3 GHz  
-12.78 dBm

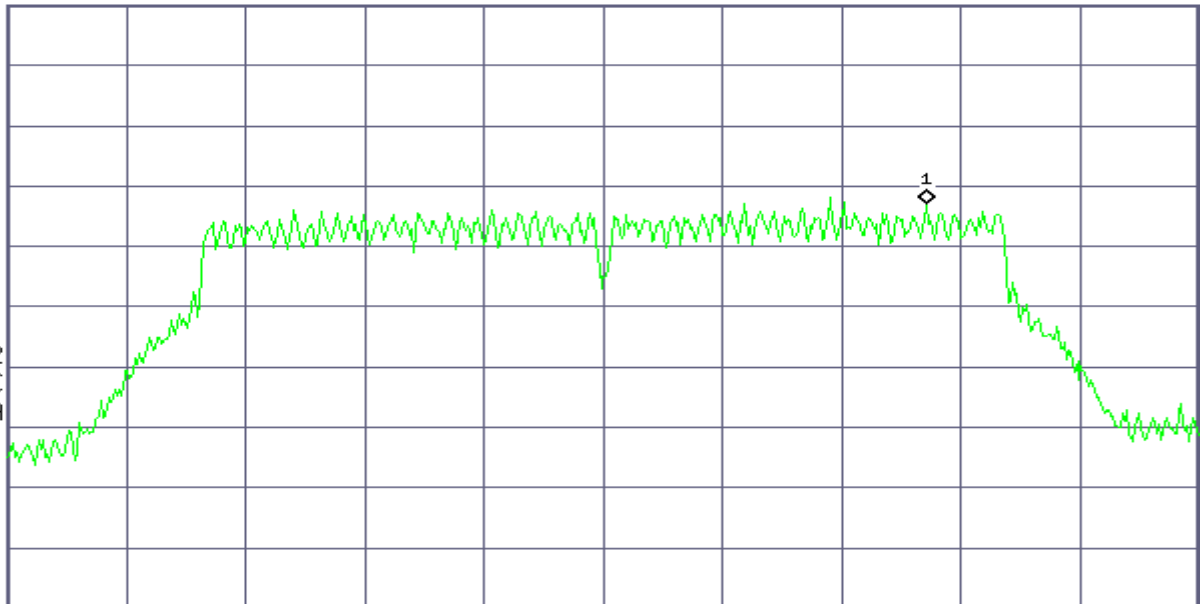
Ref 20 dBm Atten 30 dB

#Peak  
Log  
10  
dB/  
Offst  
6.3  
dB

LgAv

M1 S2  
S3 FC  
AA

£(f):  
FTun  
Swp



Center 2.412 000 0 GHz

#Res BW 3 kHz

#VBW 10 kHz

Span 26.46 MHz

Sweep 2.79 s (601 pts)

### PPSD (CH Mid)

Agilent

R T

Mkr1 2.443 306 3 GHz  
-12.06 dBm

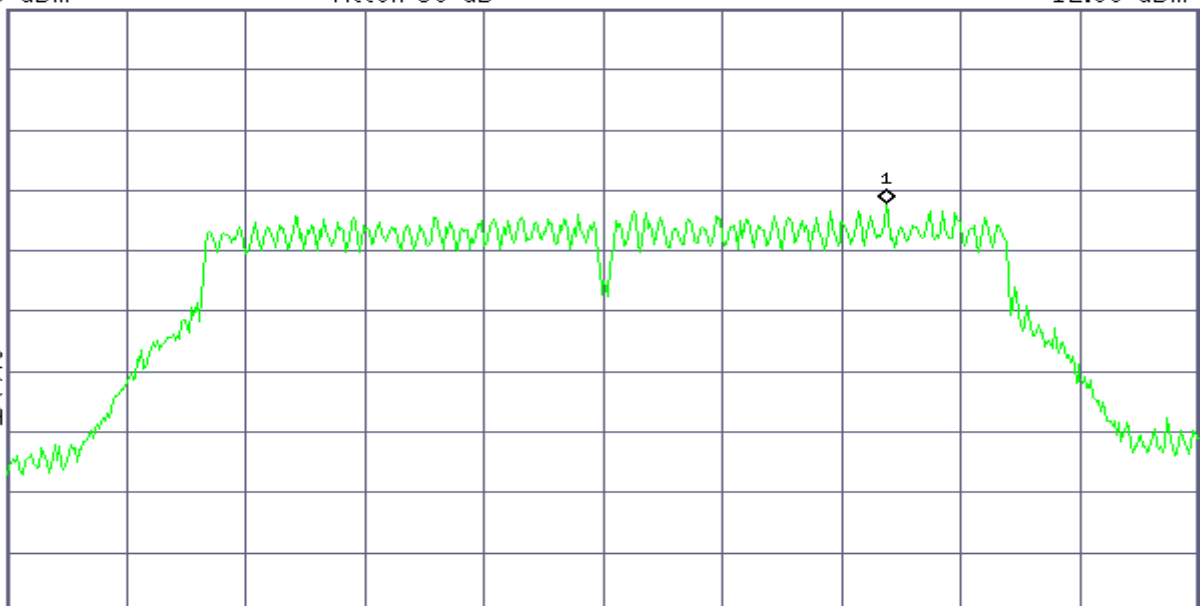
Ref 20 dBm Atten 30 dB

#Peak  
Log  
10  
dB/  
Offst  
6.3  
dB

LgAv

M1 S2  
S3 FC  
AA

£(f):  
FTun  
Swp



Center 2.437 000 0 GHz

#Res BW 3 kHz

#VBW 10 kHz

Span 26.46 MHz

Sweep 2.79 s (601 pts)

## PPSD (CH High)

Agilent

R T

Mkr1 2.463 940 4 GHz  
-12.83 dBm

Ref 20 dBm

Atten 30 dB

#Peak

Log

10

dB/

Offst

6.3

dB

LgAv

M1 S2

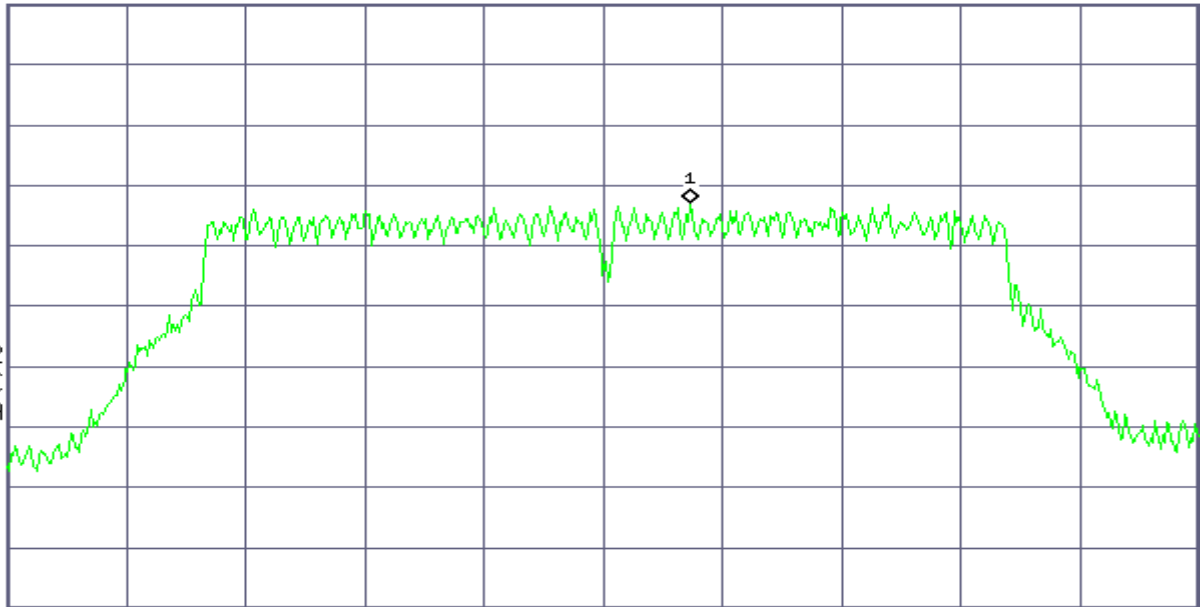
S3 FC

AA

$\mathcal{E}(f)$ :

FTun

Swp



Center 2.462 000 0 GHz

Span 26.46 MHz

#Res BW 3 kHz

#VBW 10 kHz

Sweep 2.79 s (601 pts)

## IEEE 802.11n HT20 mode/Chain 1

### PPSD (CH Low)

Agilent

R T

Mkr1 2.414 88 GHz  
-14.02 dBm

Ref 20 dBm

Atten 30 dB

#Peak

Log

10

dB/

Offst

6.3

dB

LgAv

M1 S2

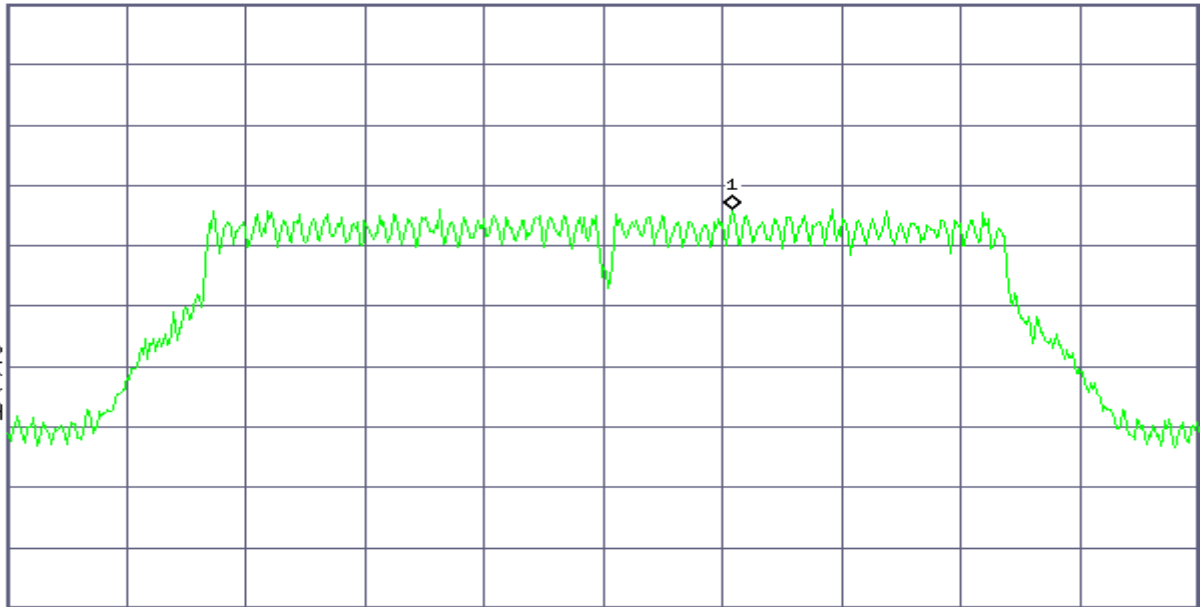
S3 FC

AA

$\mathcal{E}(f)$ :

FTun

Swp



Center 2.412 00 GHz

Span 26.54 MHz

#Res BW 3 kHz

#VBW 10 kHz

Sweep 2.798 s (601 pts)

## PPSD (CH Mid)

Agilent

R T

Mkr1 2.438 02 GHz  
-14.04 dBm

Ref 20 dBm

Atten 30 dB

#Peak

Log

10

dB/

Offst

6.3

dB

LgAv

M1 S2

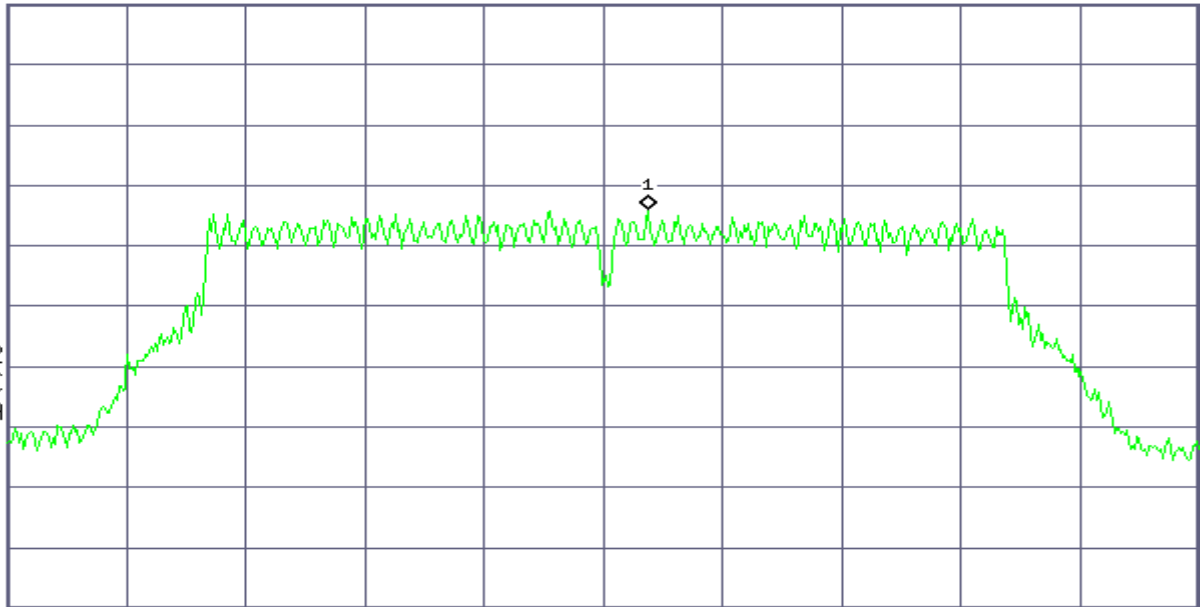
S3 FC

AA

$\mathcal{E}(f)$ :

FTun

Swp



Center 2.437 00 GHz

#Res BW 3 kHz

#VBW 10 kHz

Span 26.54 MHz

Sweep 2.798 s (601 pts)

## PPSD (CH High)

Agilent

R T

Mkr1 2.467 09 GHz  
-14.20 dBm

Ref 20 dBm

Atten 30 dB

#Peak

Log

10

dB/

Offst

6.3

dB

LgAv

M1 S2

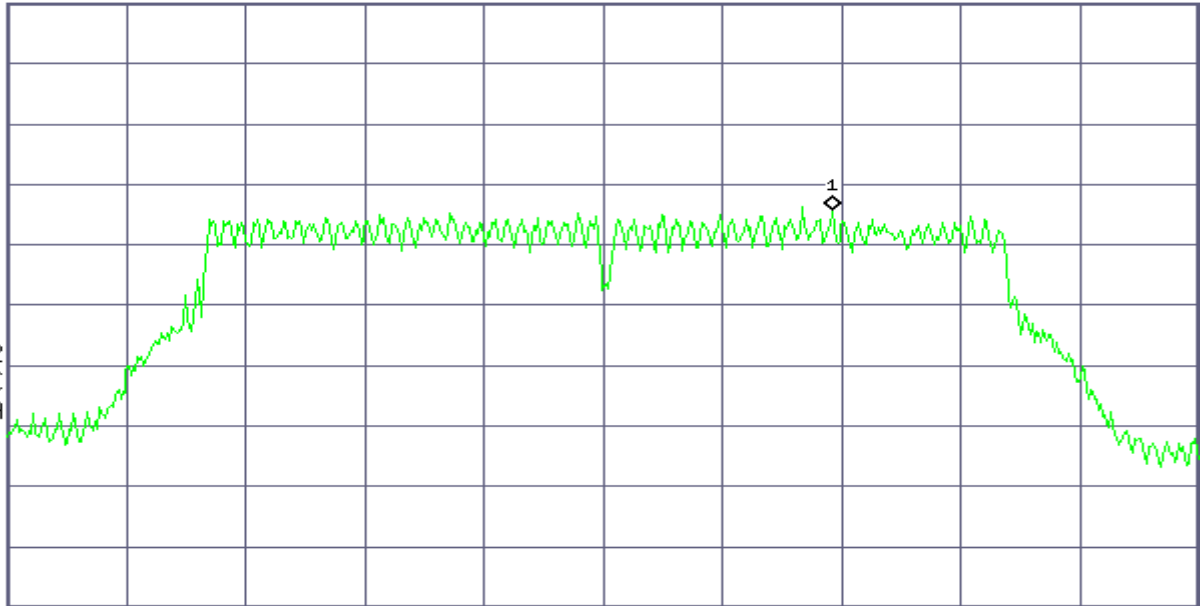
S3 FC

AA

$\mathcal{E}(f)$ :

FTun

Swp



Center 2.462 00 GHz

#Res BW 3 kHz

#VBW 10 kHz

Span 26.54 MHz

Sweep 2.798 s (601 pts)

## 7.5.SPURIOUS EMISSIONS

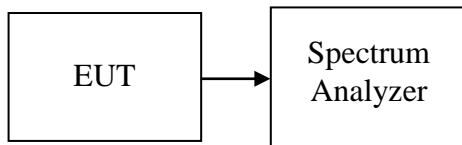
### Conducted Measurement

#### LIMIT

According to §15.247(d), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. 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)).

According to RSS-247 section 5.5, In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced 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 that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under section 5.4(d), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

#### 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**

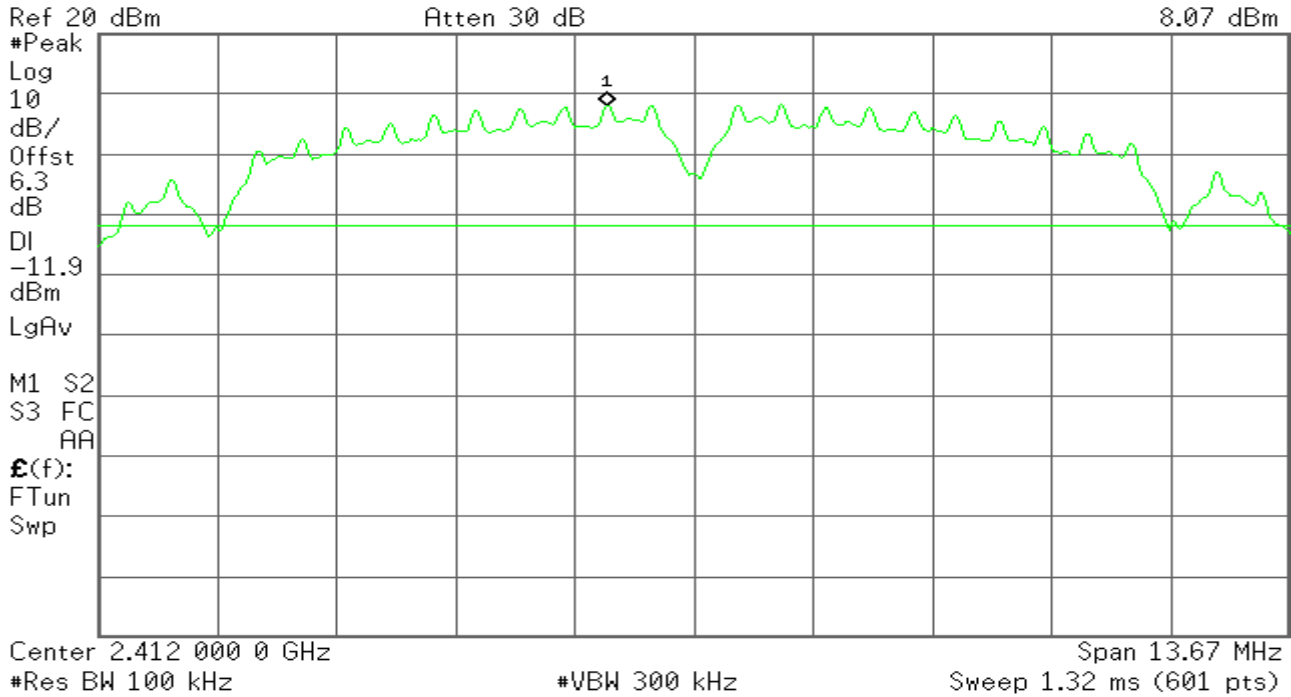
**IEEE 802.11b mode/Chain 0**

**CH Low**

Agilent

R T

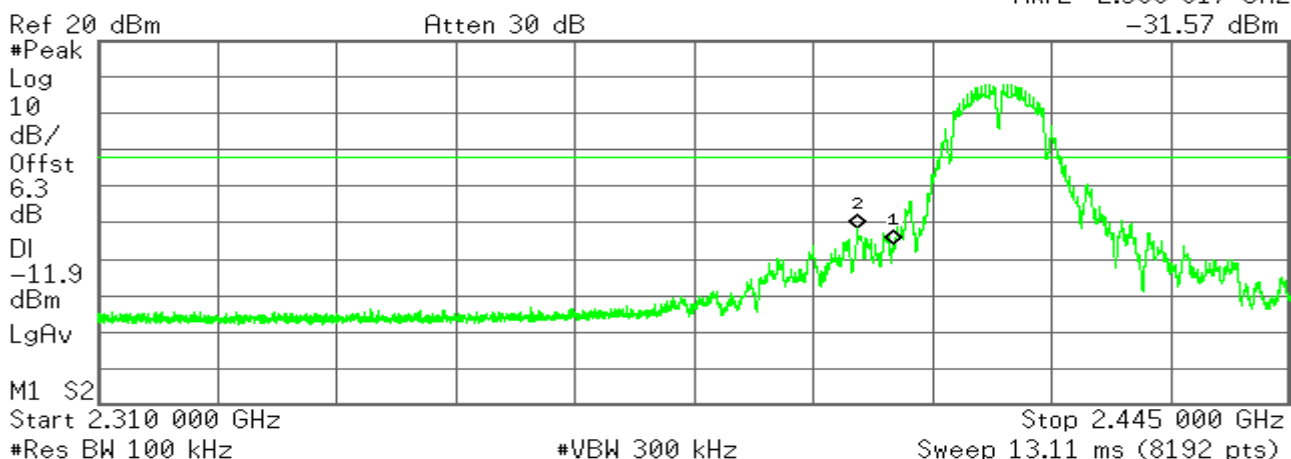
Mkr1 2.410 998 GHz  
8.07 dBm



Agilent

R T

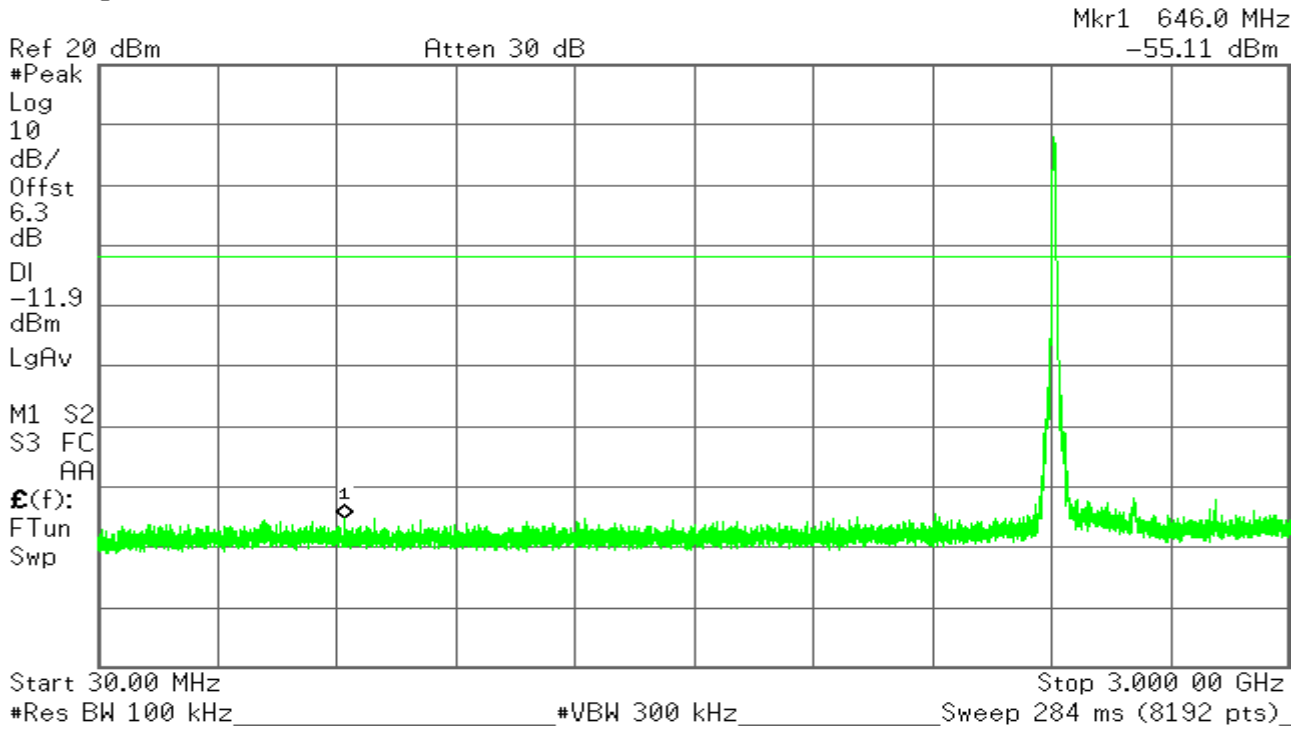
Mkr2 2.396 017 GHz  
-31.57 dBm



Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.400 000 GHz	-35.98 dBm
2	(1)	Freq	2.396 017 GHz	-31.57 dBm

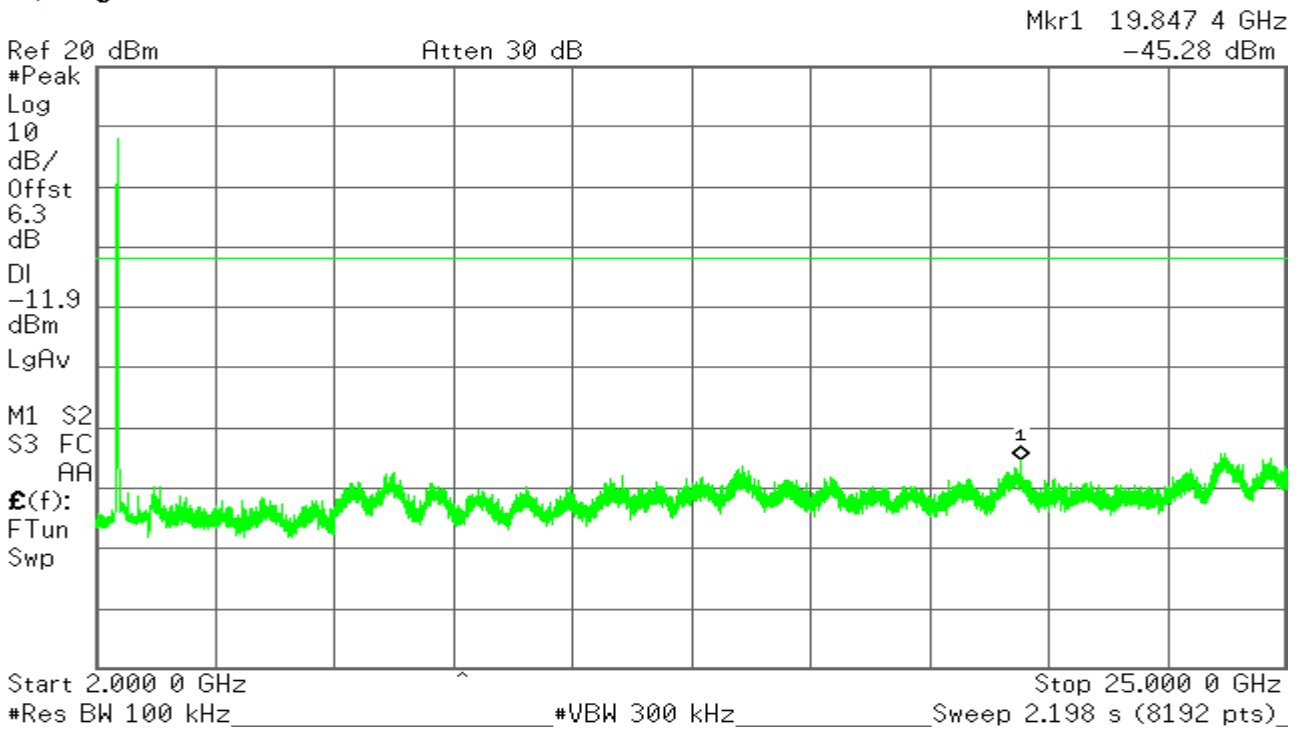
Agilent

R T



Agilent

R T





## CH Mid

Agilent

R T

Mkr1 2.438 002 GHz  
7.75 dBm

Ref 20 dBm

Atten 30 dB

#Peak

Log

10

dB/

Offst

6.3

dB

DI

-12.2

dBm

LgAv

M1 S2

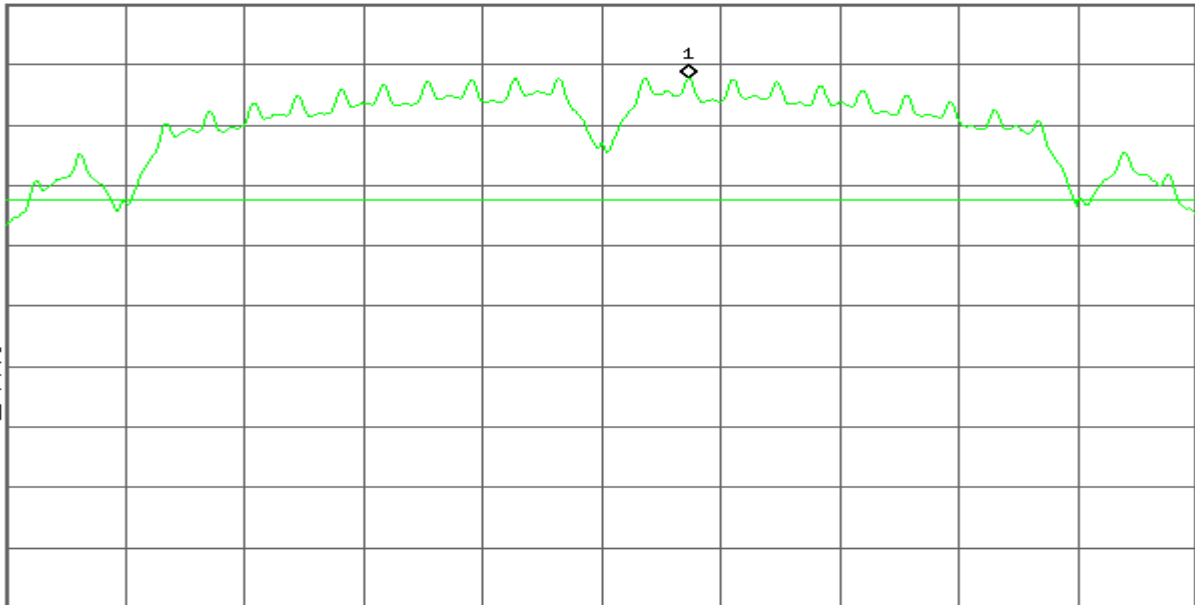
S3 FC

AA

£(f):

FTun

Swp



Center 2.437 000 GHz

Span 13.67 MHz

#Res BW 100 kHz

#VBW 300 kHz

Sweep 1.32 ms (601 pts)

Agilent

R T

Mkr1 457.1 MHz  
-54.70 dBm

Ref 20 dBm

Atten 30 dB

#Peak

Log

10

dB/

Offst

6.3

dB

DI

-12.2

dBm

LgAv

M1 S2

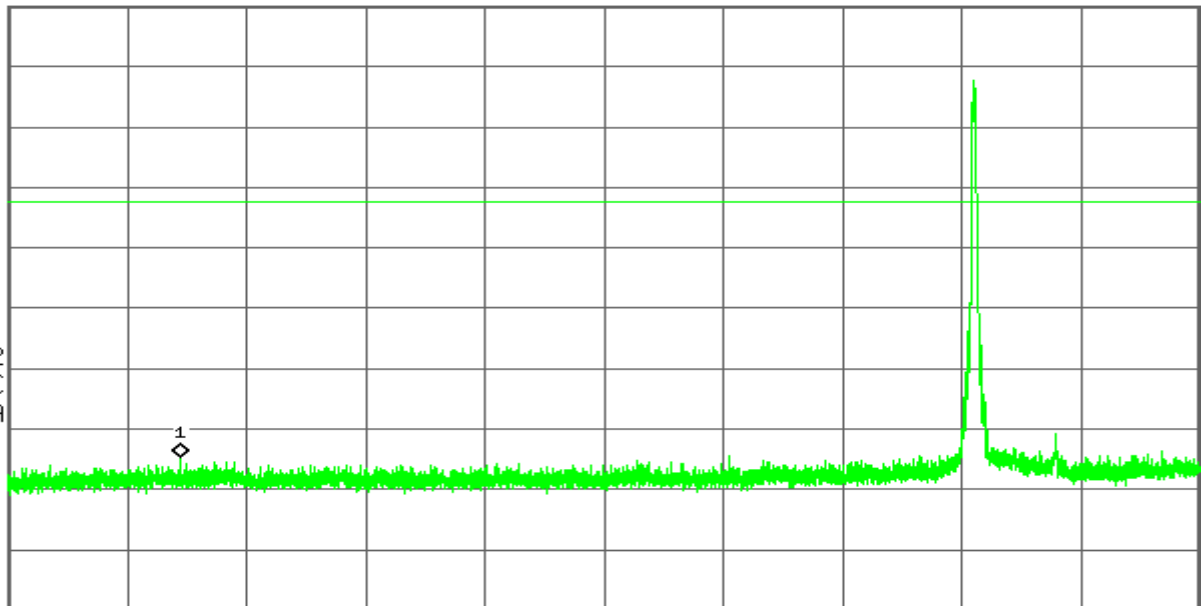
S3 FC

AA

£(f):

FTun

Swp



Start 30.0 MHz

Stop 3.000 0 GHz

#Res BW 100 kHz

#VBW 300 kHz

Sweep 284 ms (8192 pts)

Agilent

R T

Mkr1 23.815 0 GHz  
-44.39 dBm

Ref 20 dBm

Atten 30 dB

#Peak

Log

10

dB/

Offst

6.3

dB

DI

-12.2

dBm

LgAv

M1 S2

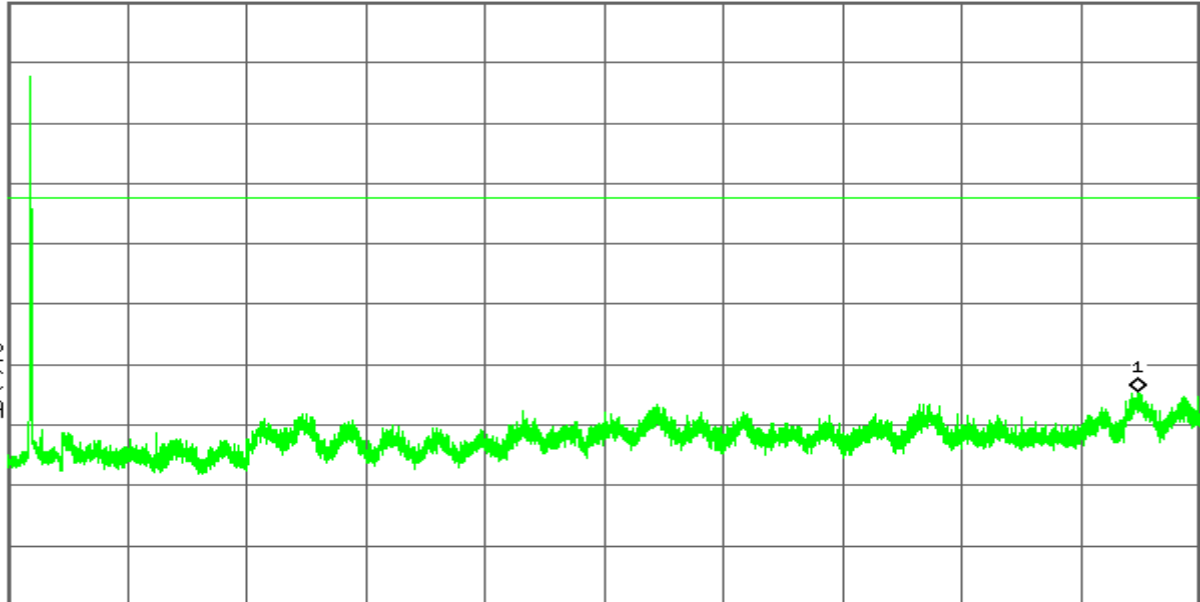
S3 FC

AA

£(f):

FTun

Swp



Start 2.000 0 GHz

Stop 25.000 0 GHz

#Res BW 100 kHz

#VBW 300 kHz

Sweep 2.198 s (8192 pts)

## CH High

Agilent

R T

Mkr1 2.460 998 GHz  
8.19 dBm

Ref 20 dBm

Atten 30 dB

#Peak

Log

10

dB/

Offst

6.3

dB

DI

-11.8

dBm

LgAv

M1 S2

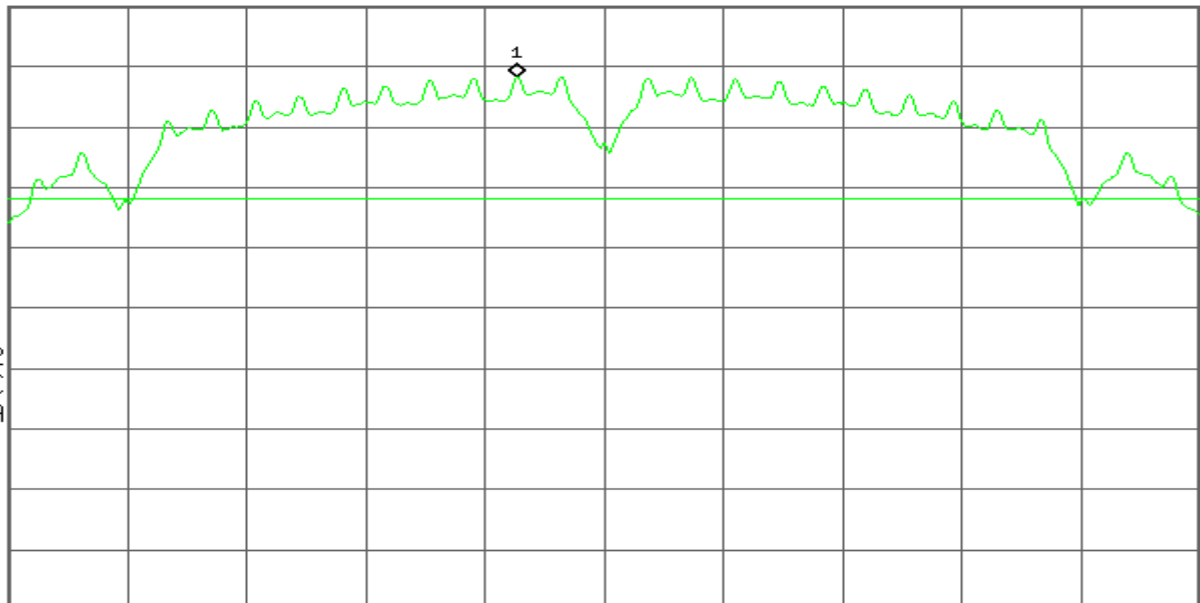
S3 FC

AA

£(f):

FTun

Swp



Center 2.462 000 0 GHz

Span 13.67 MHz

#Res BW 100 kHz

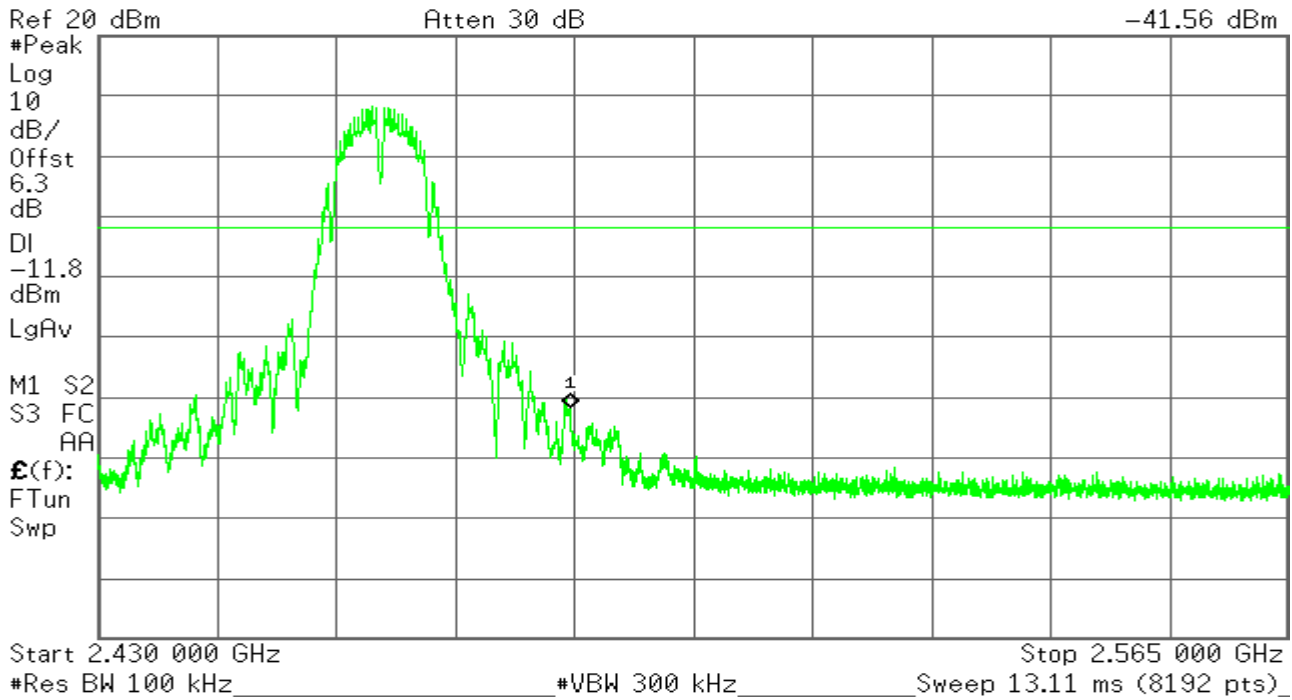
#VBW 300 kHz

Sweep 1.32 ms (601 pts)

Agilent

R T

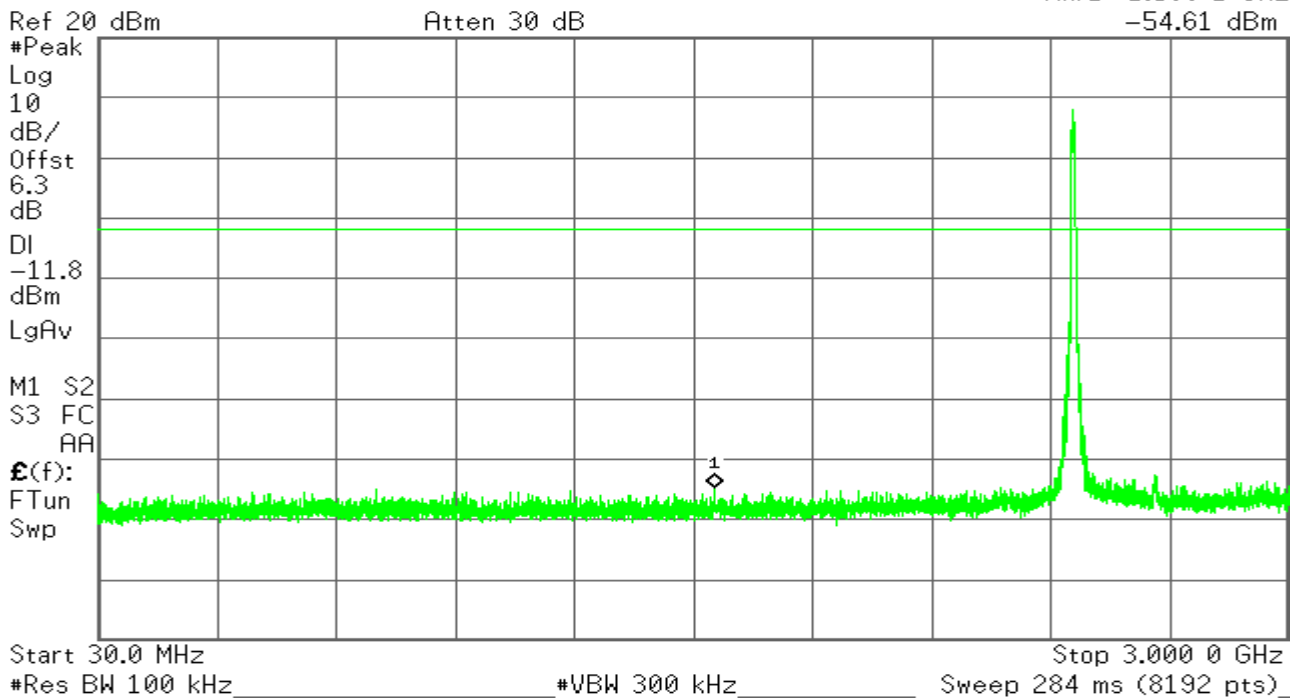
Mkr1 2.483 500 GHz  
-41.56 dBm



Agilent

R T

Mkr1 1.568 1 GHz  
-54.61 dBm

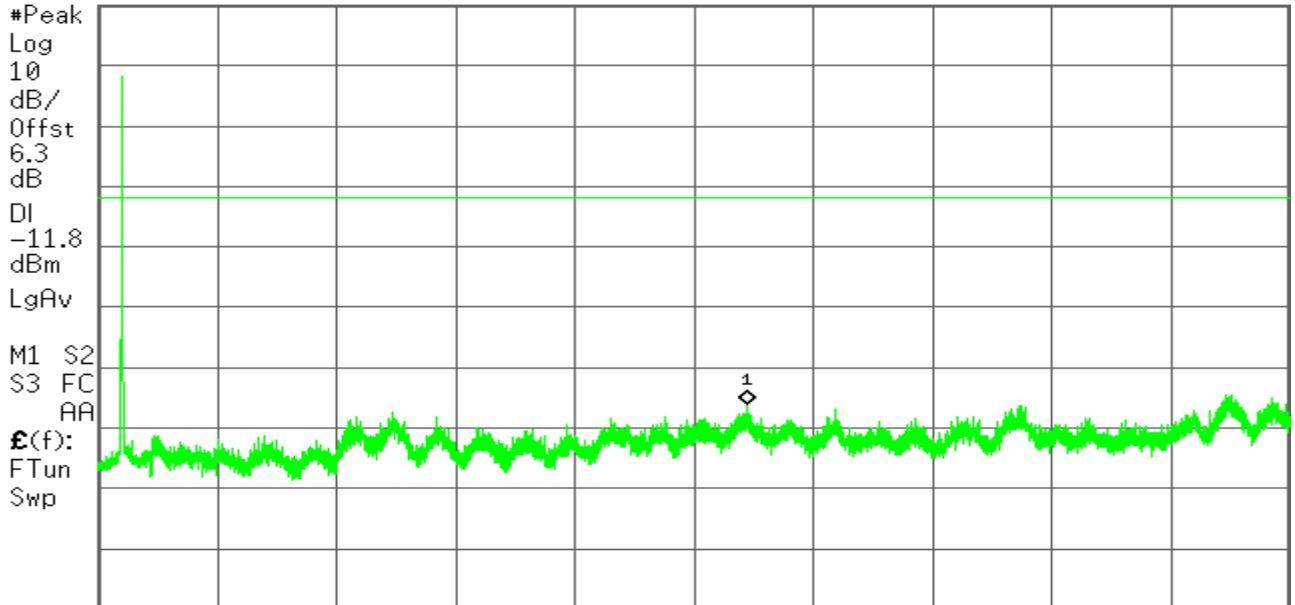


Agilent

R T

Mkr1 14.520 7 GHz  
-46.13 dBm

Ref 20 dBm Atten 30 dB



Start 2.000 0 GHz Stop 25.000 0 GHz  
#Res BW 100 kHz #VBW 300 kHz Sweep 2.198 s (8192 pts)

## IEEE 802.11b mode/Chain 1

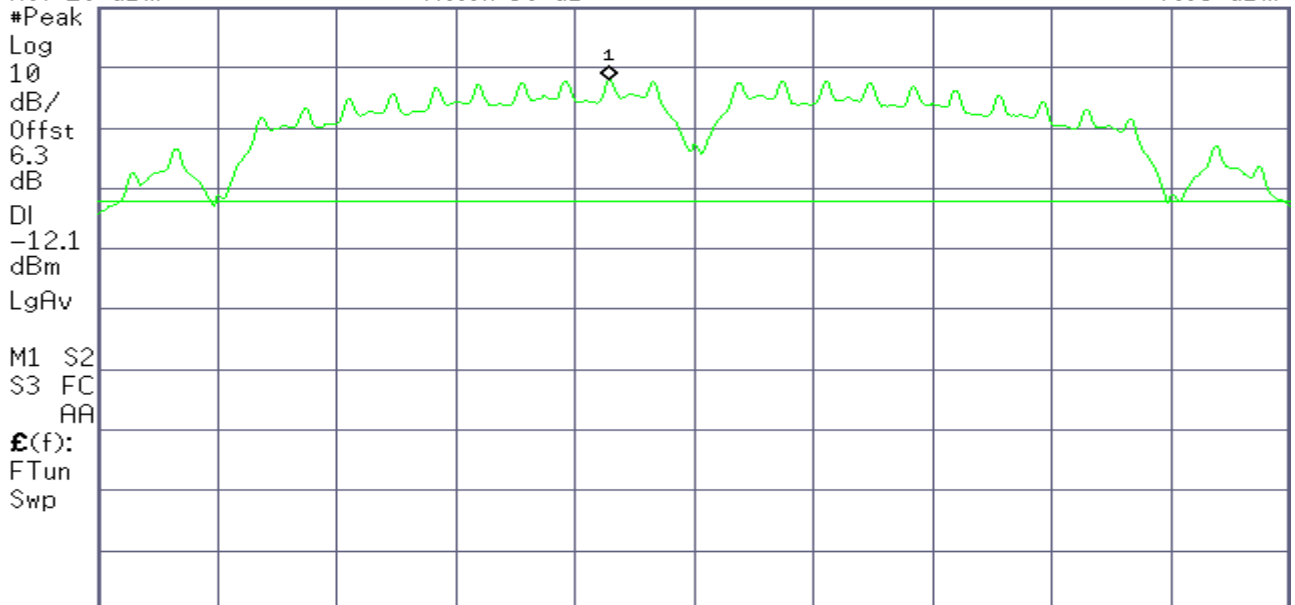
### CH Low

Agilent

R T

Mkr1 2.411 015 3 GHz  
7.93 dBm

Ref 20 dBm Atten 30 dB

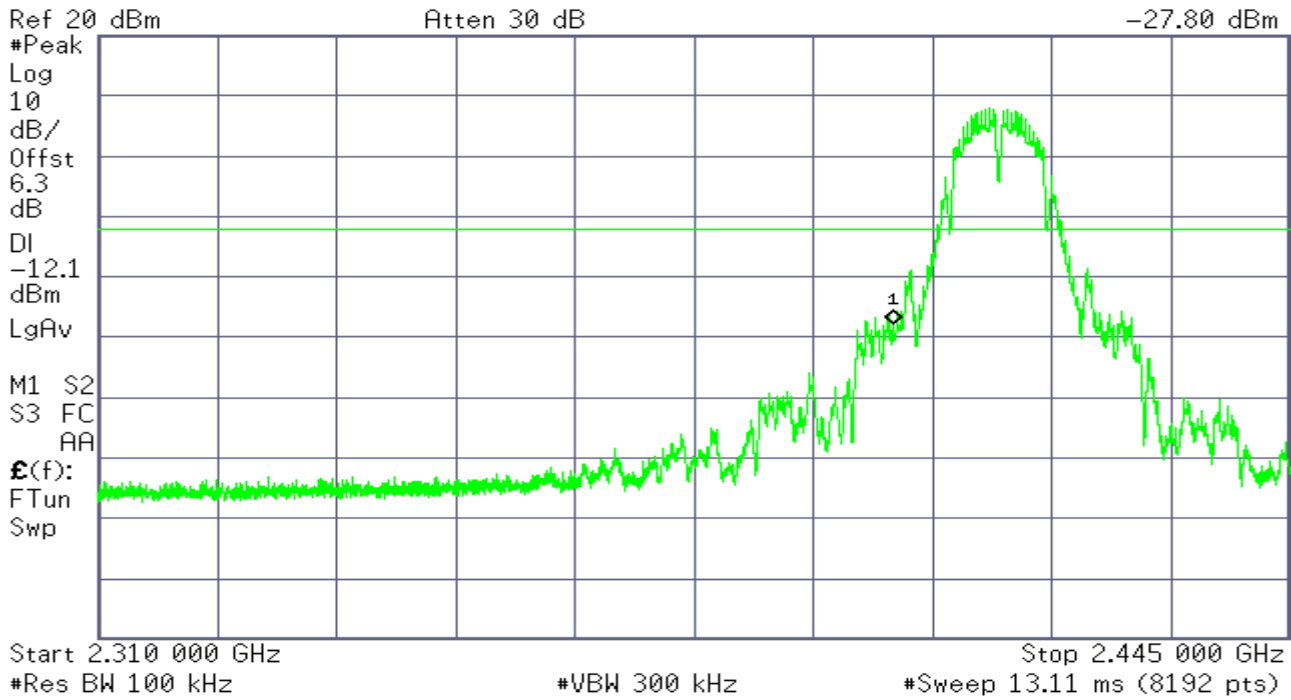


Center 2.412 000 0 GHz Span 13.74 MHz  
#Res BW 100 kHz #VBW 300 kHz Sweep 1.32 ms (601 pts)

Agilent

R T

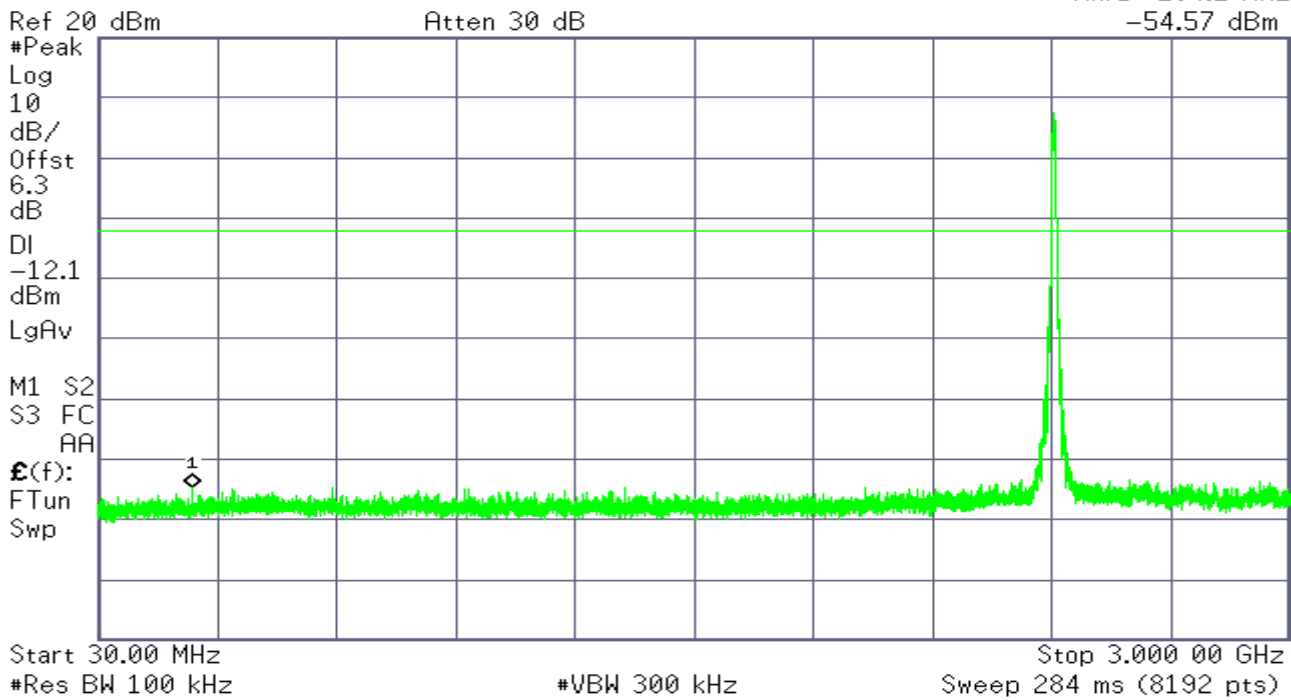
Mkr1 2.400 000 GHz  
-27.80 dBm



Agilent

R T

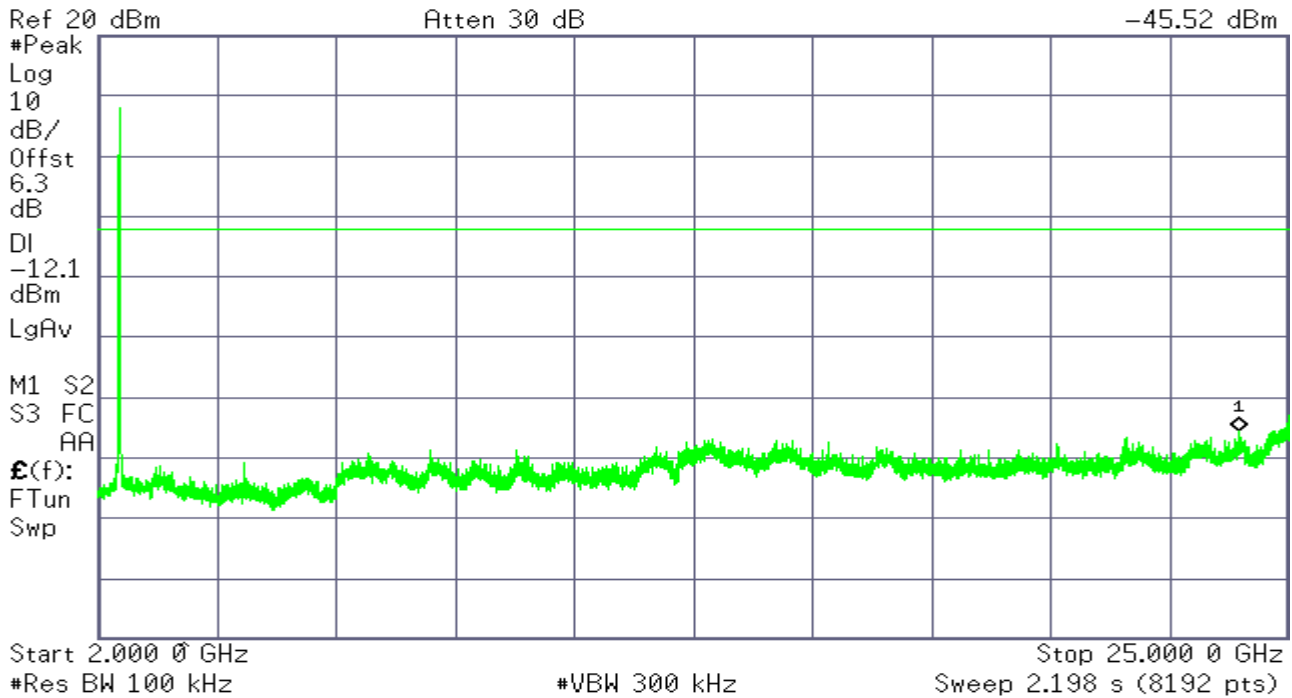
Mkr1 264.2 MHz  
-54.57 dBm



Agilent

R T

Mkr1 24.048 1 GHz  
-45.52 dBm

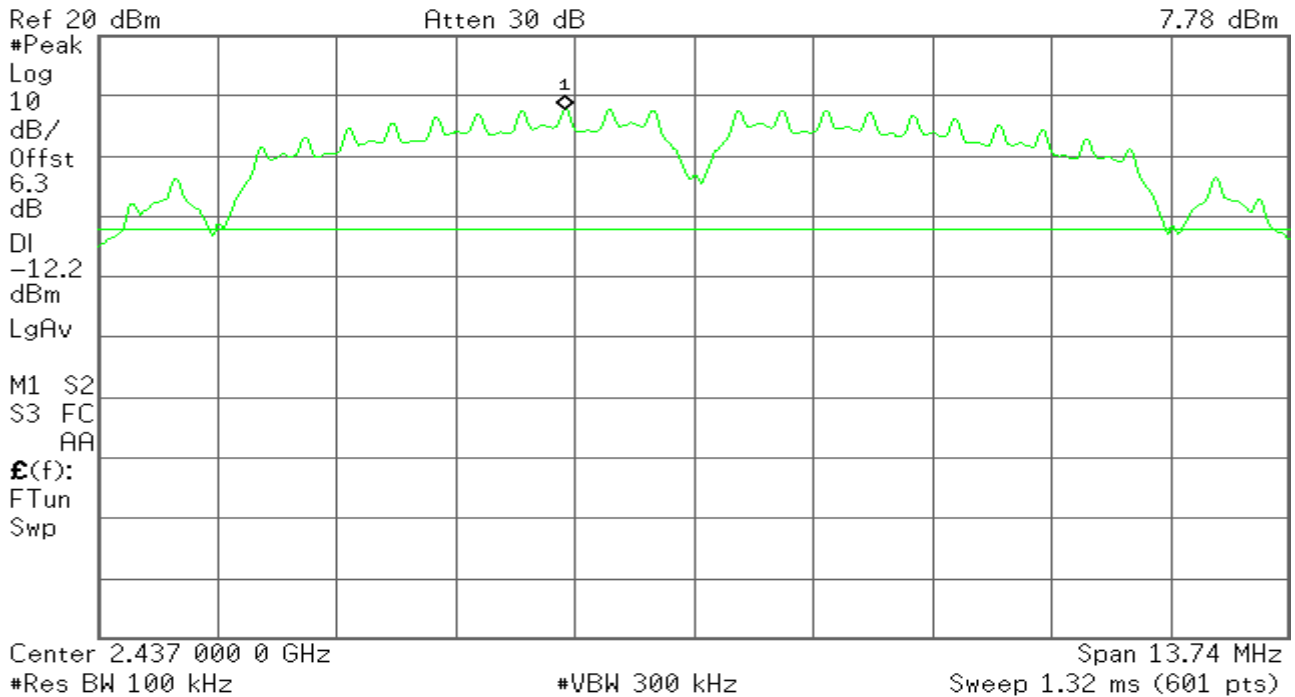


## CH Mid

Agilent

R T

Mkr1 2.435 511 5 GHz  
7.78 dBm



Agilent

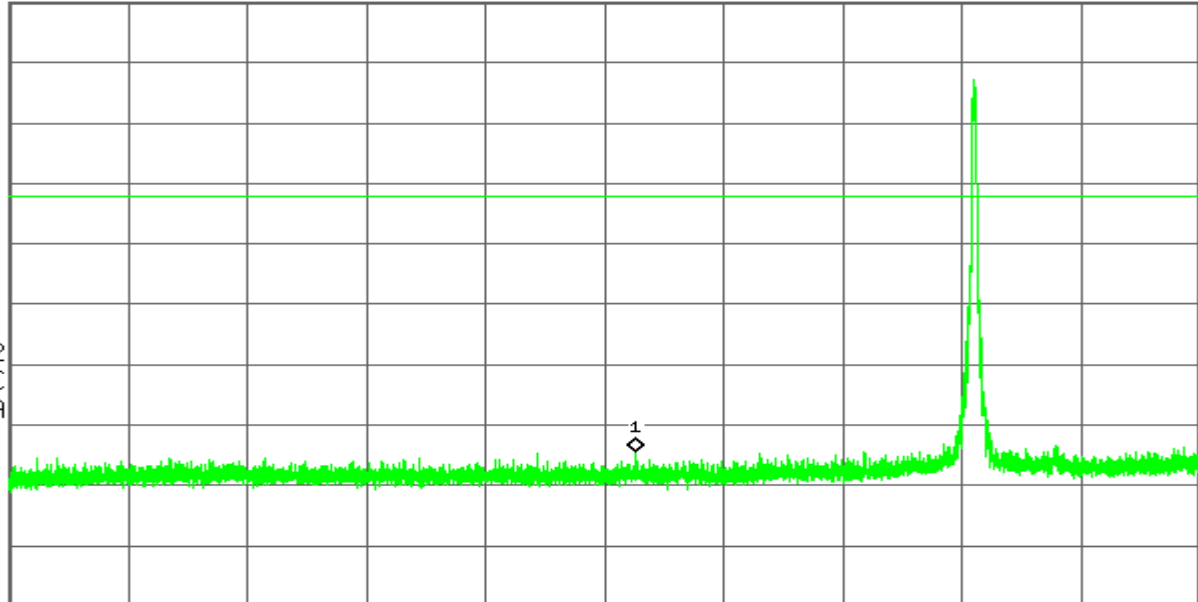
R T

Mkr1 1.594 6 GHz  
-54.33 dBm

Ref 20 dBm

Atten 30 dB

#Peak  
Log  
10  
dB/  
Offst  
6.3  
dB  
DI  
-12.2  
dBm  
LgAv  
M1 S2  
S3 FC  
AA  
£(f):  
FTun  
Swp



Start 30.0 MHz  
#Res BW 100 kHz

#VBW 300 kHz

Stop 3.000 0 GHz  
Sweep 284 ms (8192 pts)

Agilent

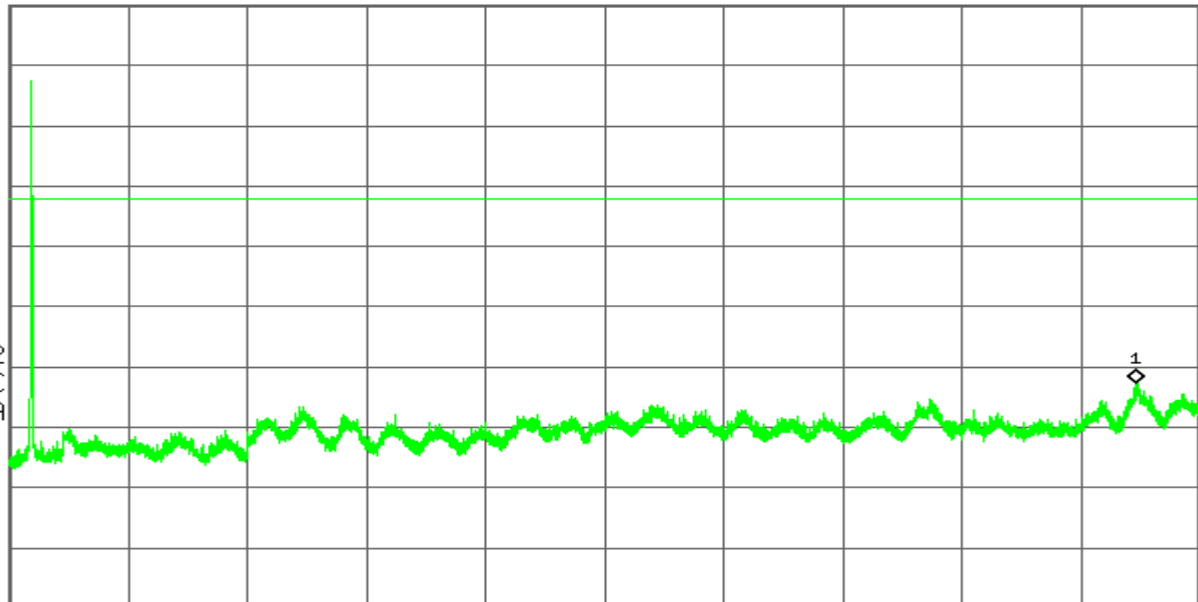
R T

Mkr1 23.767 3 GHz  
-42.57 dBm

Ref 20 dBm

Atten 30 dB

#Peak  
Log  
10  
dB/  
Offst  
6.3  
dB  
DI  
-12.2  
dBm  
LgAv  
M1 S2  
S3 FC  
AA  
£(f):  
FTun  
Swp



Start 2.000 0 GHz  
#Res BW 100 kHz

#VBW 300 kHz

Stop 25.000 0 GHz  
Sweep 2.198 s (8192 pts)

## CH High

Agilent

R T

Mkr1 2.460 511 5 GHz  
7.27 dBm

Ref 20 dBm

Atten 30 dB

#Peak

Log

10

dB/

Offst

6.3

dB

DI

-12.7

dBm

LgAv

M1 S2

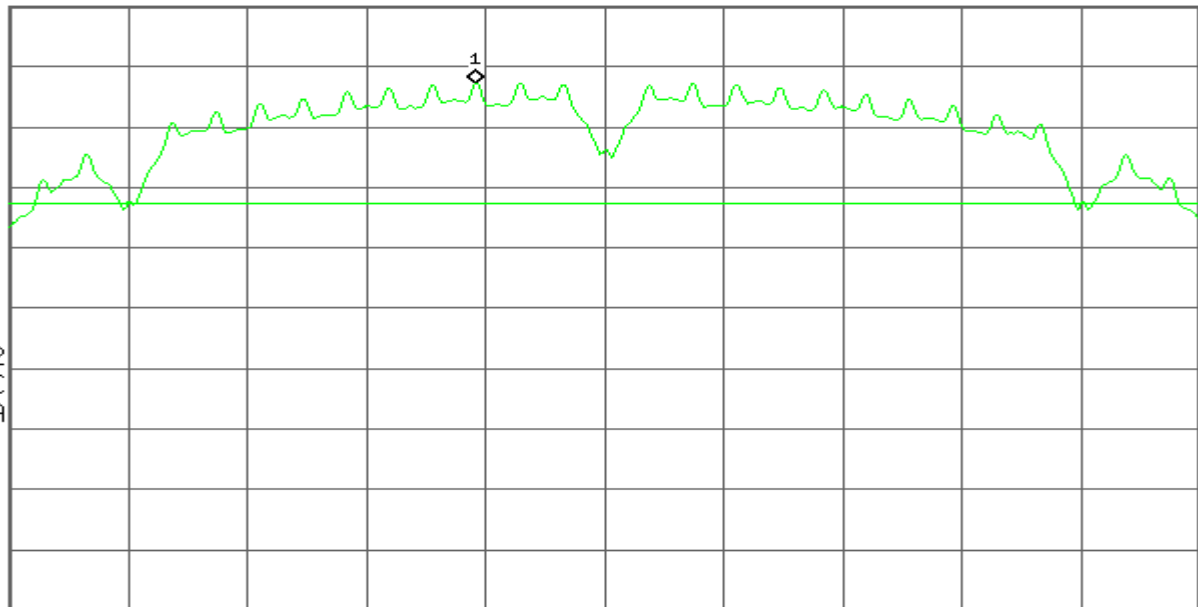
S3 FC

AA

£(f):

FTun

Swp



Center 2.462 000 0 GHz

Span 13.74 MHz

#Res BW 100 kHz

#VBW 300 kHz

Sweep 1.32 ms (601 pts)

Agilent

R T

Mkr1 2.483 500 GHz  
-41.36 dBm

Ref 20 dBm

Atten 30 dB

#Peak

Log

10

dB/

Offst

6.3

dB

DI

-12.7

dBm

LgAv

M1 S2

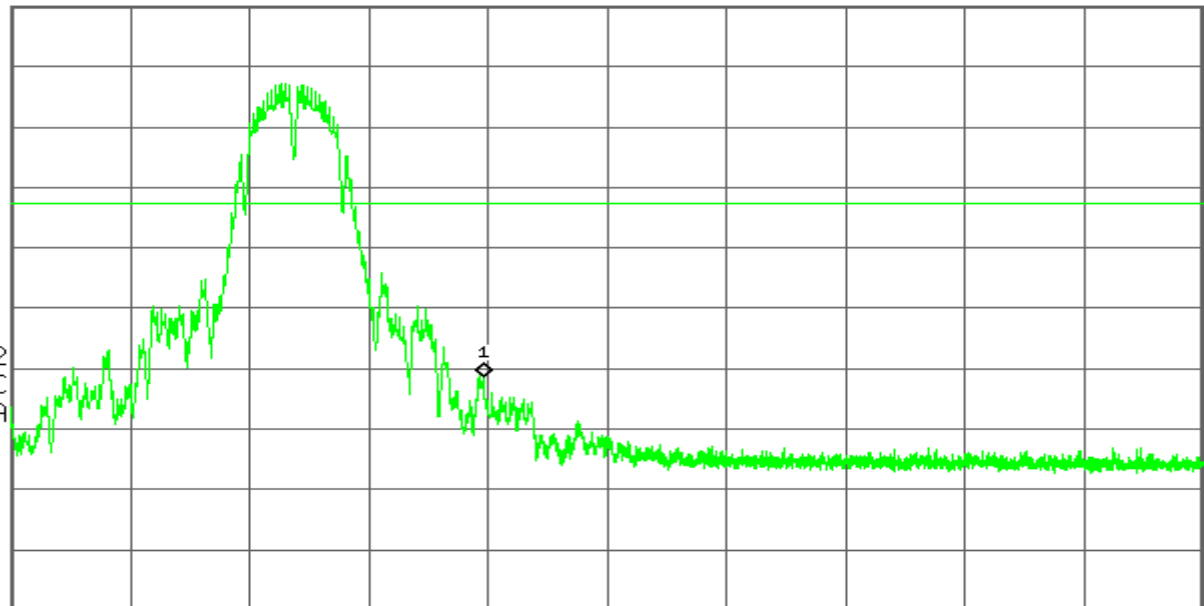
S3 FC

AA

£(f):

FTun

Swp



Start 2.430 000 GHz

Stop 2.565 000 GHz

#Res BW 100 kHz

#VBW 300 kHz

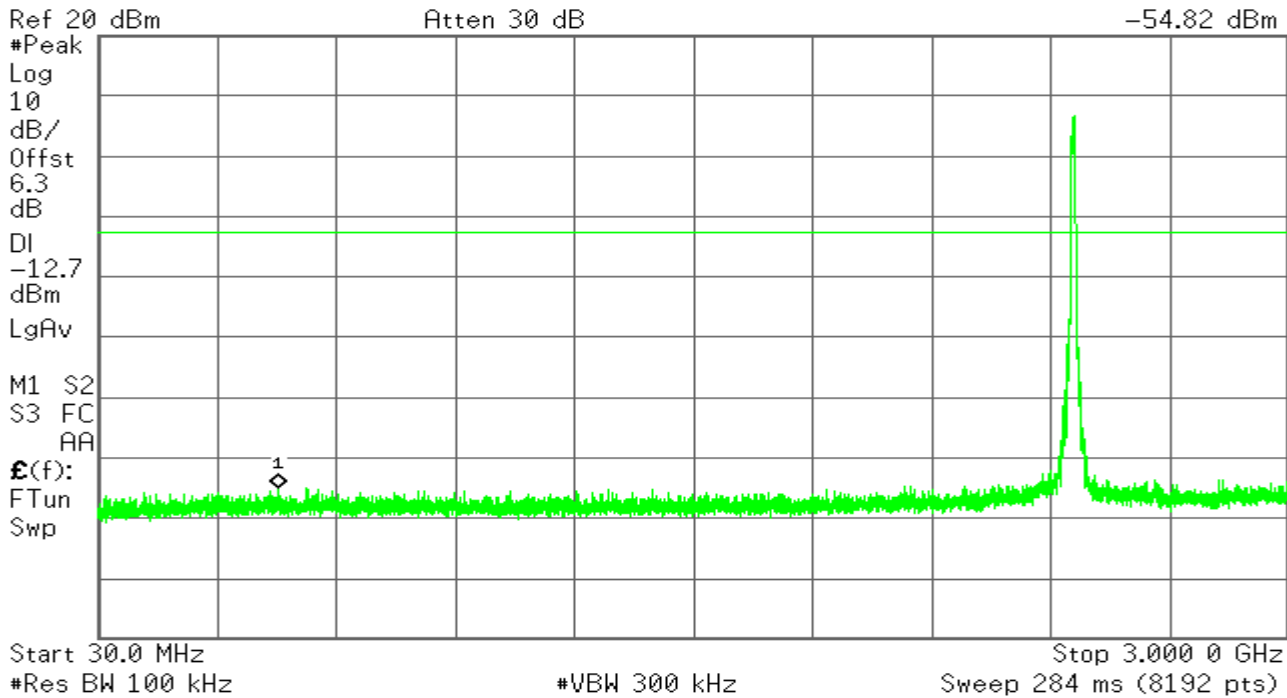
Sweep 13.11 ms (8192 pts)



Agilent

R T

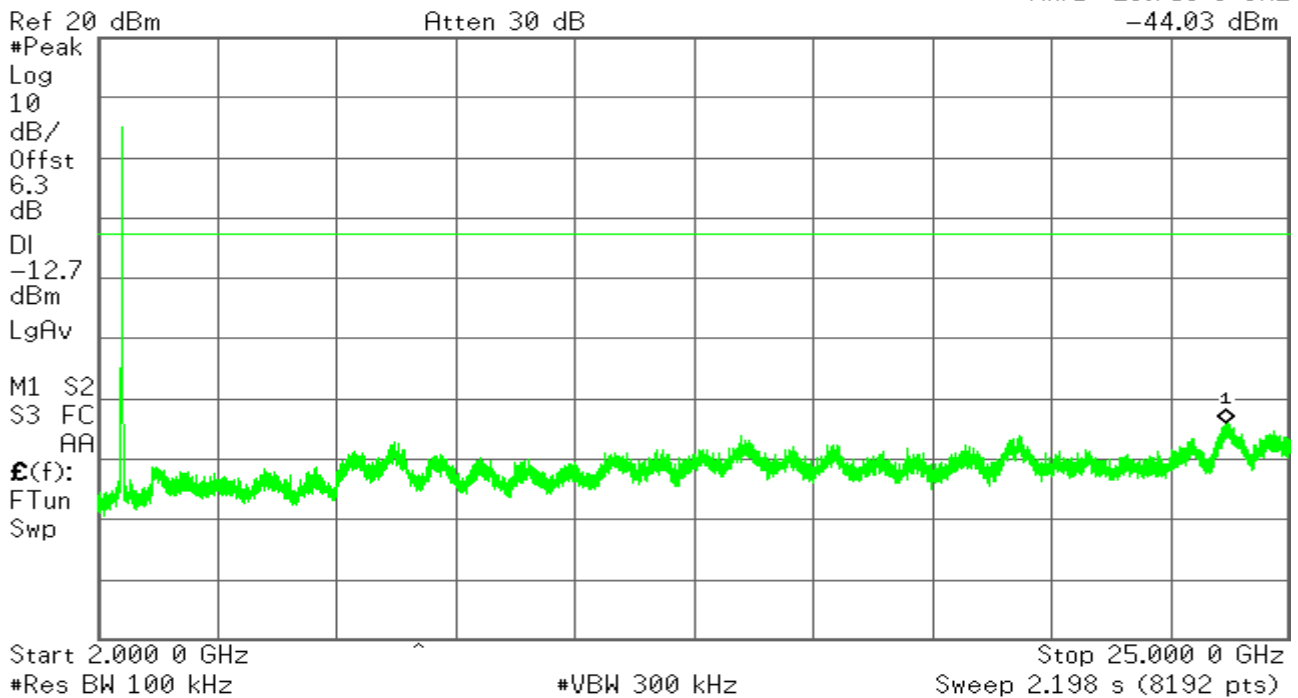
Mkr1 480.3 MHz  
-54.82 dBm



Agilent

R T

Mkr1 23.753 3 GHz  
-44.03 dBm



## IEEE 802.11g mode/Chain 0

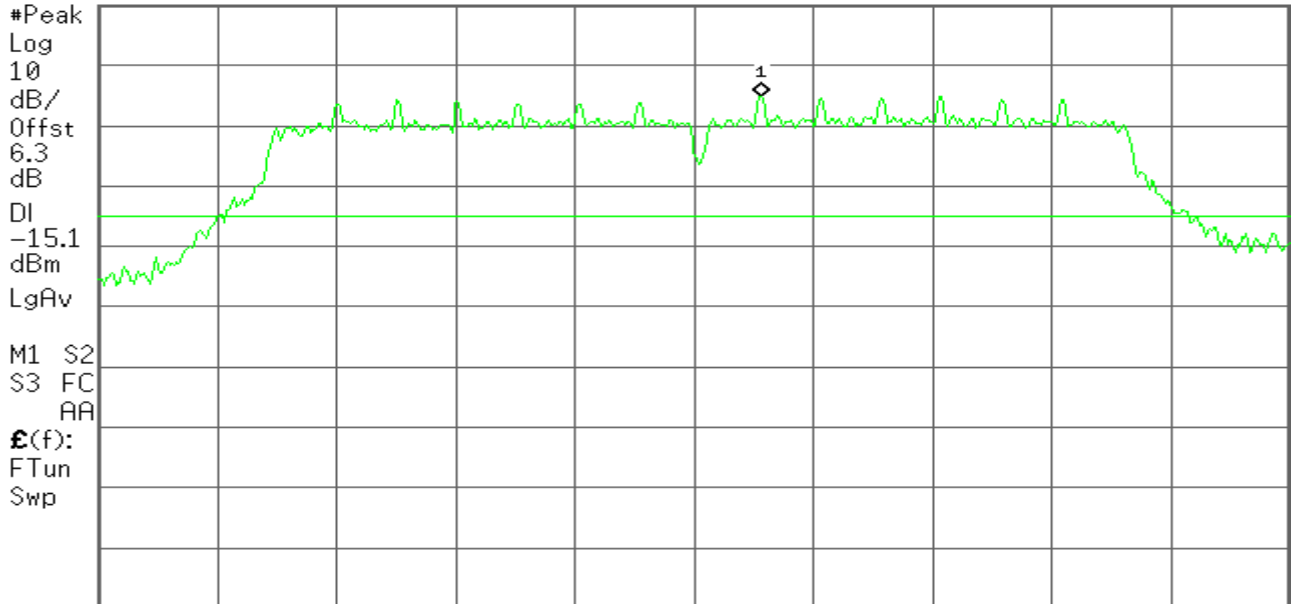
### CH Low

Agilent

R T

Mkr1 2.413 40 GHz  
4.94 dBm

Ref 20 dBm Atten 30 dB



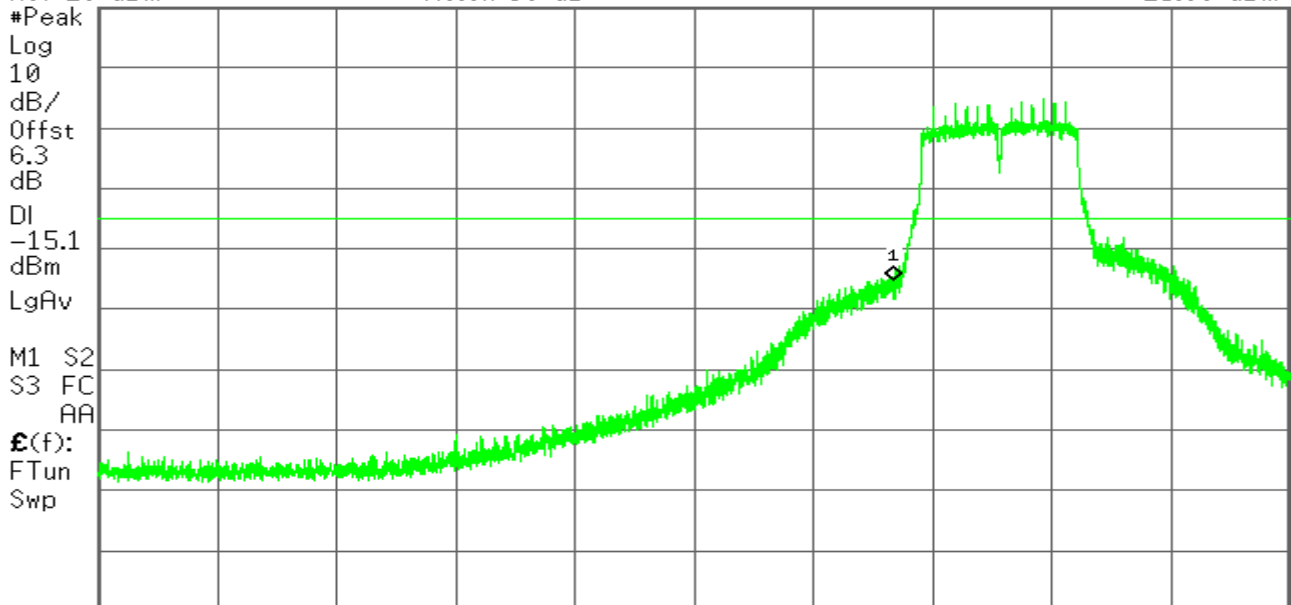
Center 2.412 000 GHz Span 24.64 MHz  
#Res BW 100 kHz #VBW 300 kHz Sweep 2.36 ms (601 pts)

Agilent

R T

Mkr1 2.400 000 GHz  
-25.06 dBm

Ref 20 dBm Atten 30 dB



Start 2.310 000 GHz Stop 2.445 000 GHz  
#Res BW 100 kHz #VBW 300 kHz Sweep 13.11 ms (8192 pts)

Agilent

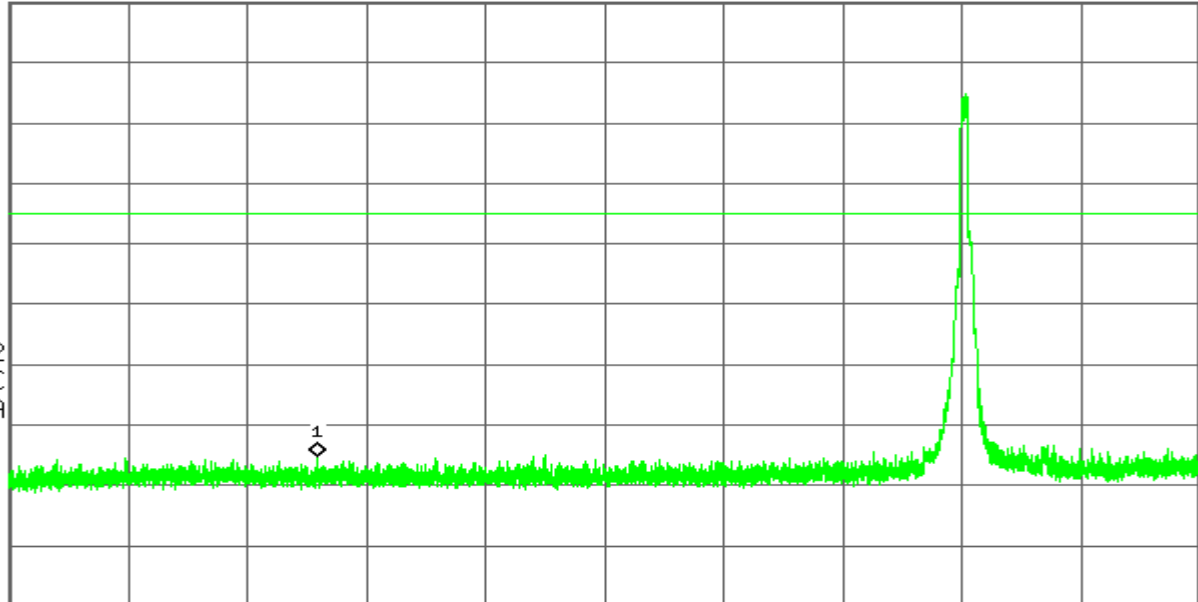
R T

Mkr1 800.5 MHz  
-55.09 dBm

Ref 20 dBm

Atten 30 dB

#Peak  
Log  
10  
dB/  
Offst  
6.3  
dB  
DI  
-15.1  
dBm  
LgAv  
M1 S2  
S3 FC  
AA  
£(f):  
FTun  
Swp



Start 30.0 MHz  
#Res BW 100 kHz

#VBW 300 kHz

Stop 3.000 0 GHz  
Sweep 284 ms (8192 pts)

Agilent

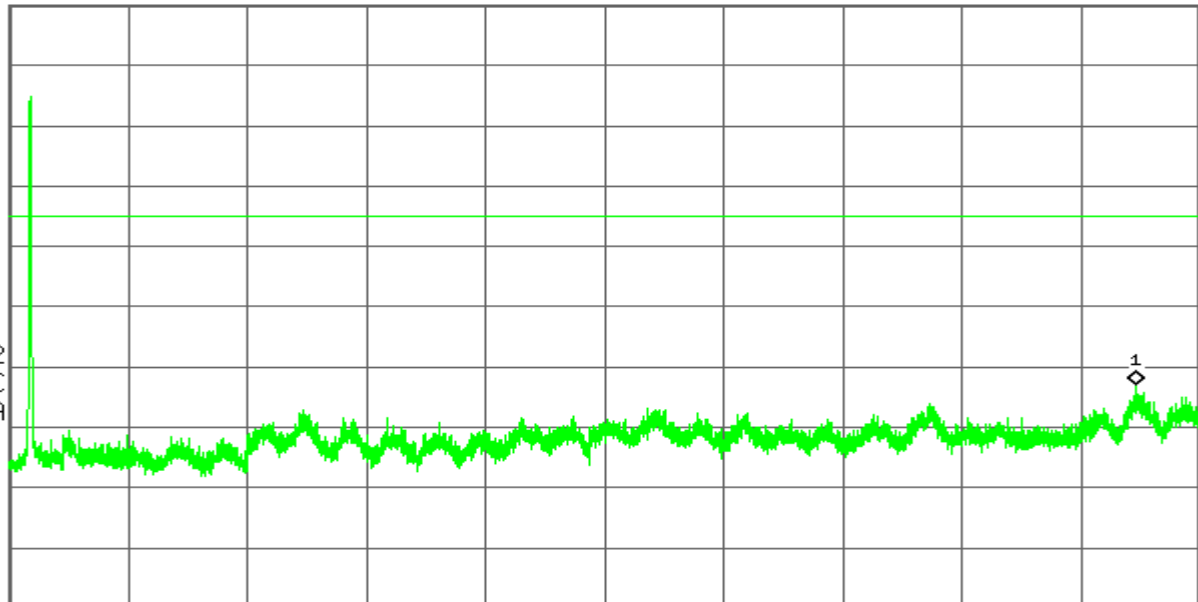
R T

Mkr1 23.778 5 GHz  
-42.95 dBm

Ref 20 dBm

Atten 30 dB

#Peak  
Log  
10  
dB/  
Offst  
6.3  
dB  
DI  
-15.1  
dBm  
LgAv  
M1 S2  
S3 FC  
AA  
£(f):  
FTun  
Swp



Start 2.000 0 GHz  
#Res BW 100 kHz

#VBW 300 kHz

Stop 25.000 0 GHz  
Sweep 2.198 s (8192 pts)

## CH Mid

Agilent

R T

Mkr1 2.438 27 GHz  
4.54 dBm

Ref 20 dBm

Atten 30 dB

#Peak

Log

10

dB/

Offst

6.3

dB

DI

-15.5

dBm

LgAv

M1 S2

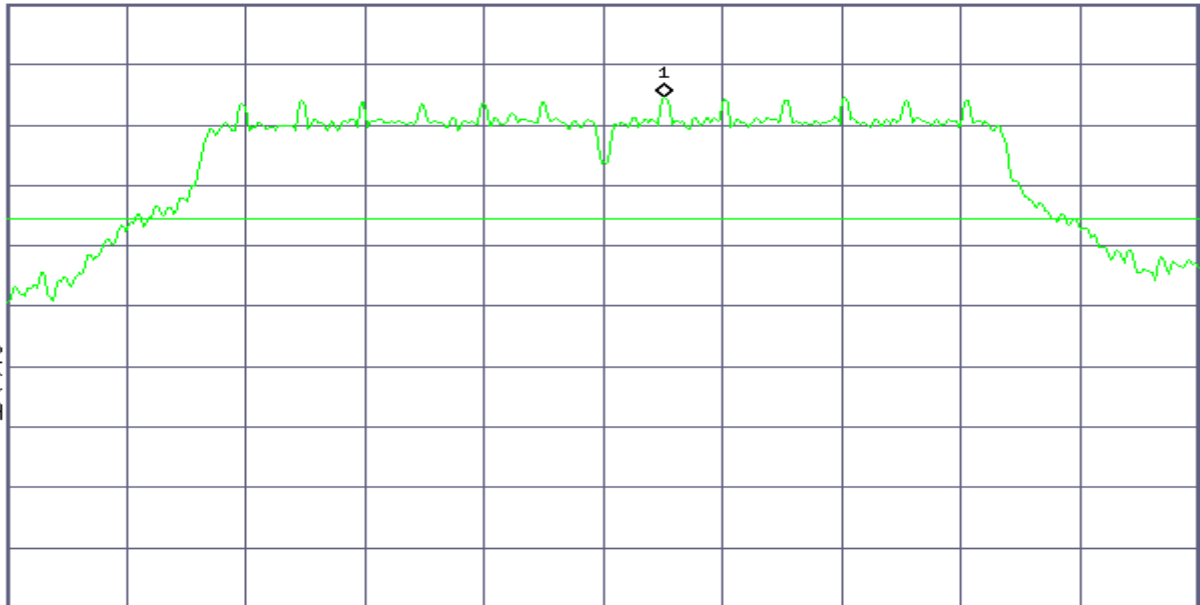
S3 FC

RA

$\mathcal{E}(f)$ :

FTun

Swp



Center 2.437 000 GHz

#Res BW 100 kHz

#VBW 300 kHz

Span 24.64 MHz

Sweep 2.36 ms (601 pts)

Agilent

R T

Mkr1 1.112 7 GHz  
-55.24 dBm

Ref 20 dBm

Atten 30 dB

#Peak

Log

10

dB/

Offst

6.3

dB

DI

-15.5

dBm

LgAv

M1 S2

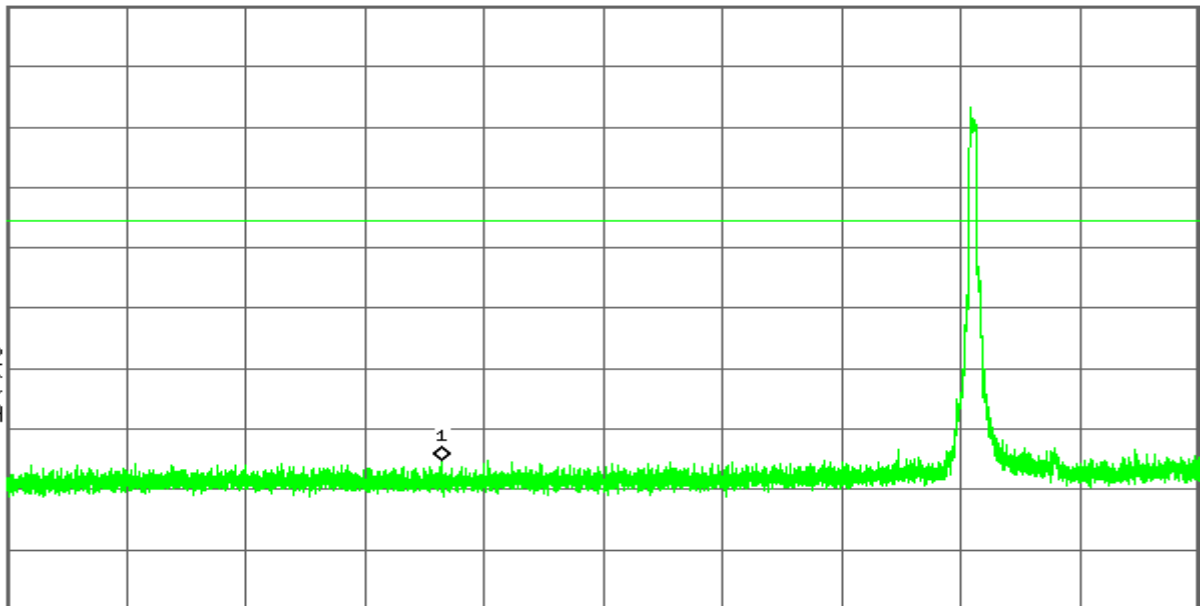
S3 FC

RA

$\mathcal{E}(f)$ :

FTun

Swp



Start 30.00 MHz

#Res BW 100 kHz

#VBW 300 kHz

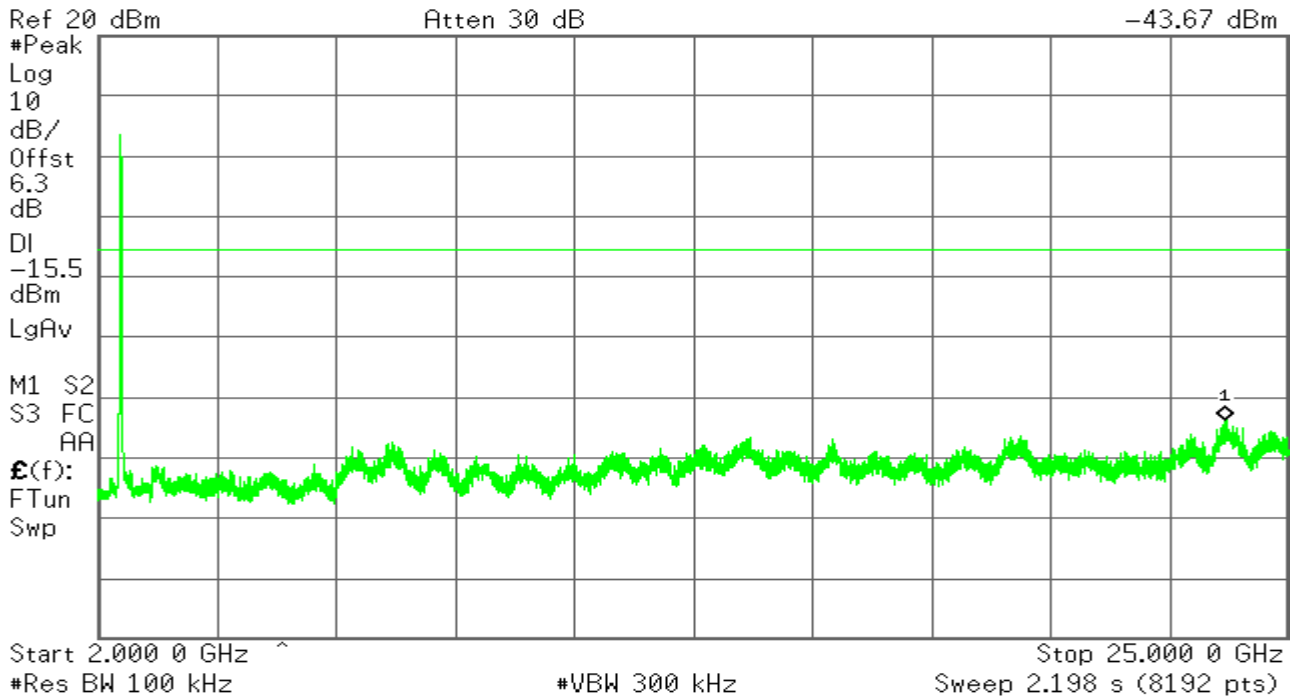
Stop 3.000 00 GHz

Sweep 284 ms (8192 pts)

Agilent

R T

Mkr1 23.775 7 GHz  
-43.67 dBm

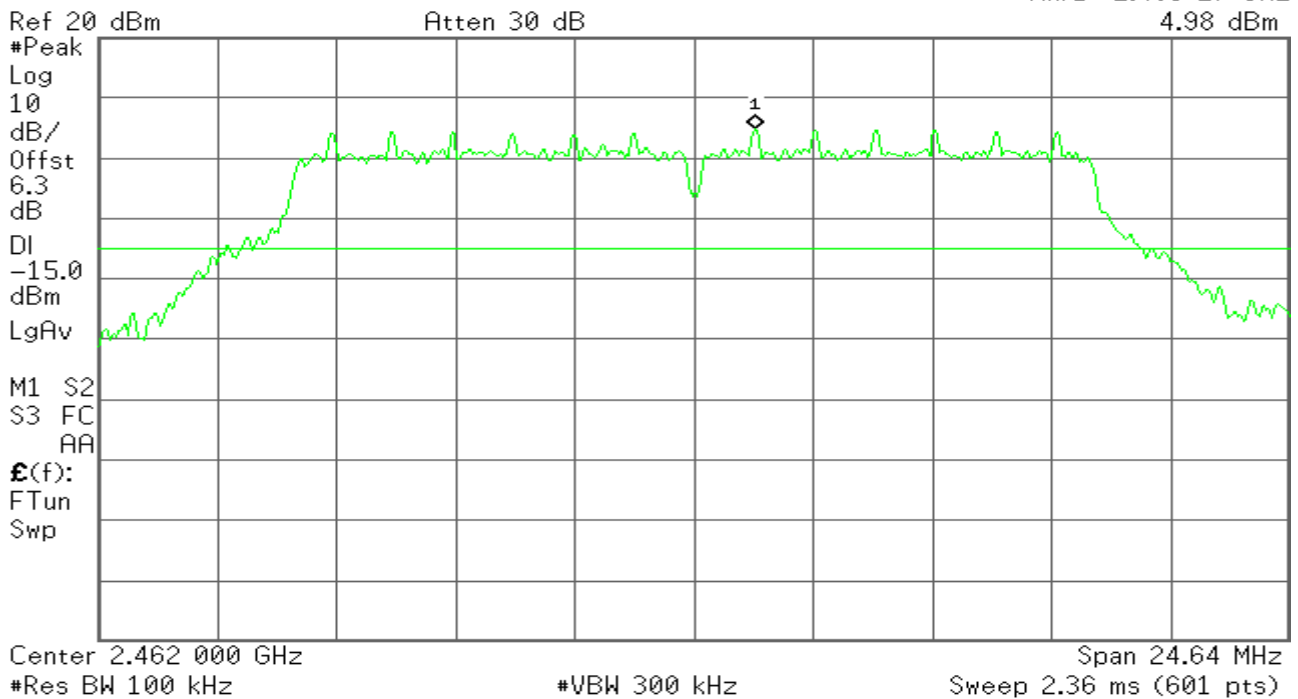


## CH High

Agilent

R T

Mkr1 2.463 27 GHz  
4.98 dBm



Agilent

R T

Mkr1 2.483 500 GHz  
-34.39 dBm

Ref 20 dBm

Atten 30 dB

#Peak

Log

10

dB/

Offst

6.3

dB

DI

-15.0

dBm

LgAv

M1 S2

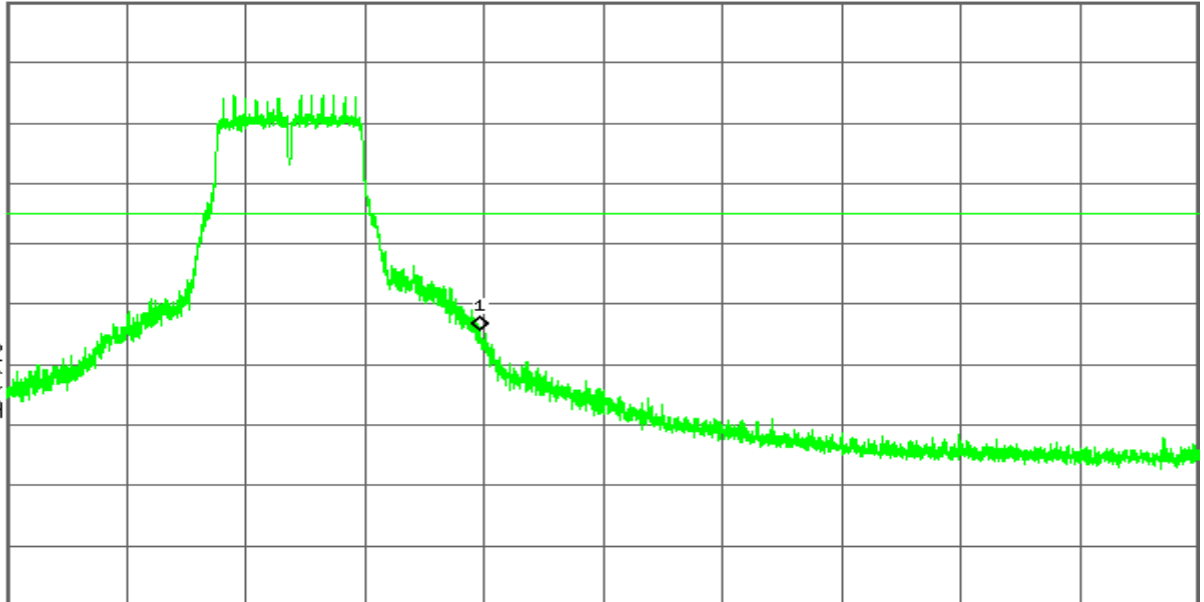
S3 FC

AA

£(f):

FTun

Swp



Start 2.430 000 GHz

Stop 2.565 000 GHz

#Res BW 100 kHz

#VBW 300 kHz

Sweep 13.11 ms (8192 pts)

Agilent

R T

Mkr1 1.856 4 GHz  
-54.25 dBm

Ref 20 dBm

Atten 30 dB

#Peak

Log

10

dB/

Offst

6.3

dB

DI

-15.0

dBm

LgAv

M1 S2

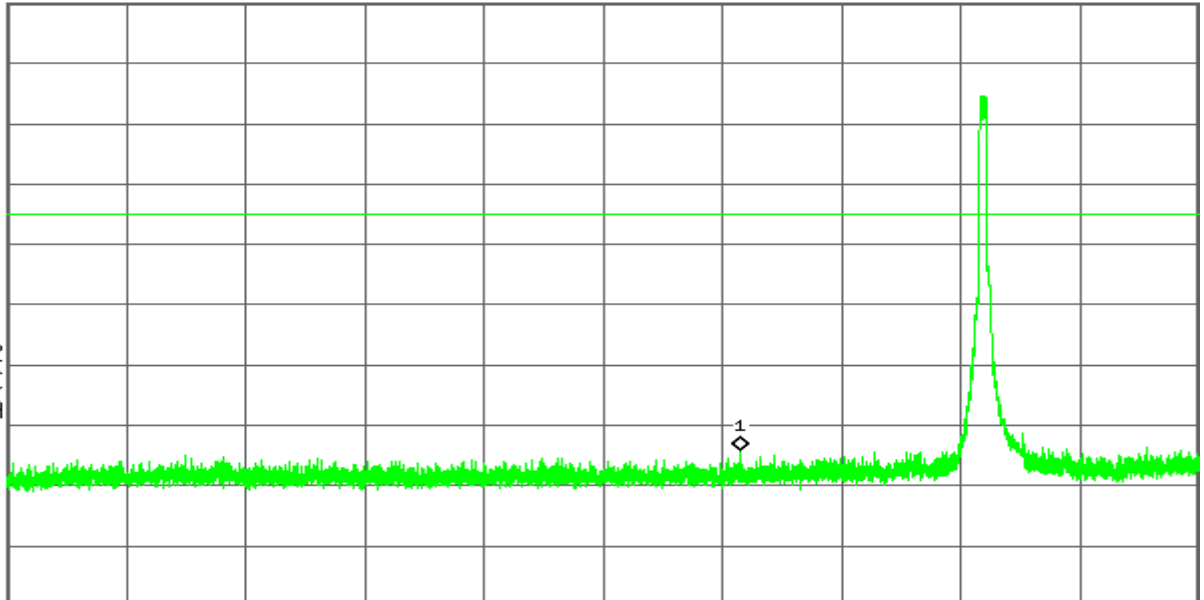
S3 FC

AA

£(f):

FTun

Swp



Start 30.0 MHz

Stop 3.000 0 GHz

#Res BW 100 kHz

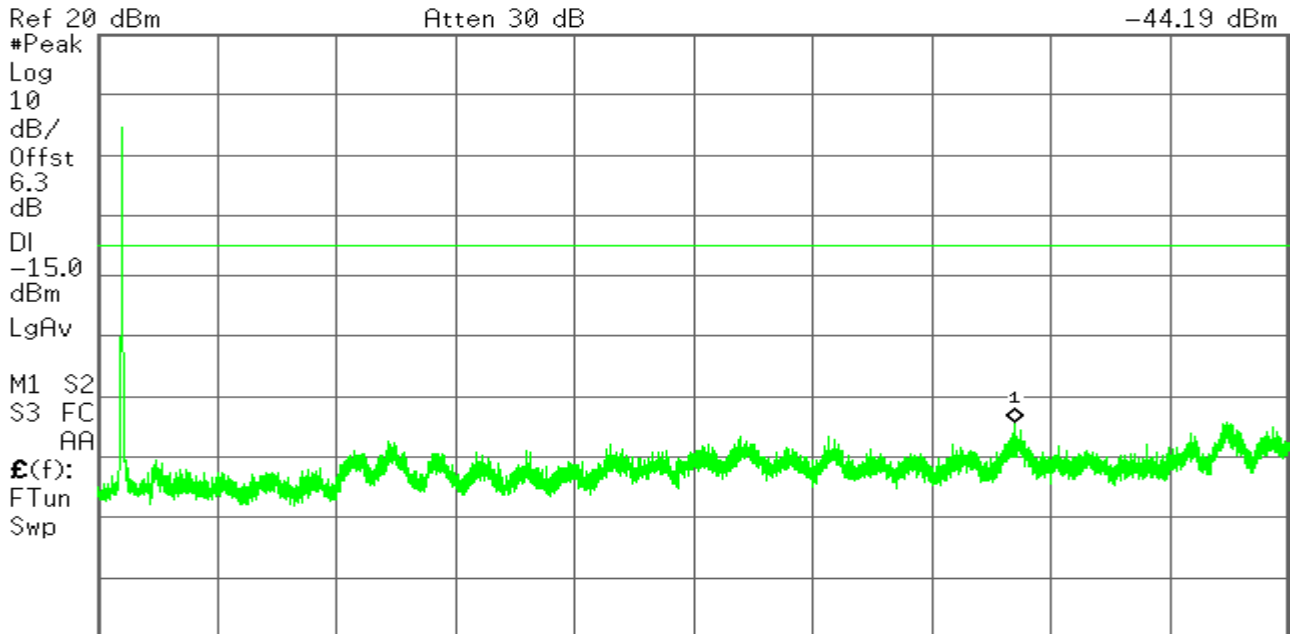
#VBW 300 kHz

Sweep 284 ms (8192 pts)

Agilent

R T

Mkr1 19.715 4 GHz  
-44.19 dBm



Start 2.000 0 GHz      Stop 25.000 0 GHz  
#Res BW 100 kHz      #VBW 300 kHz      Sweep 2.198 s (8192 pts)

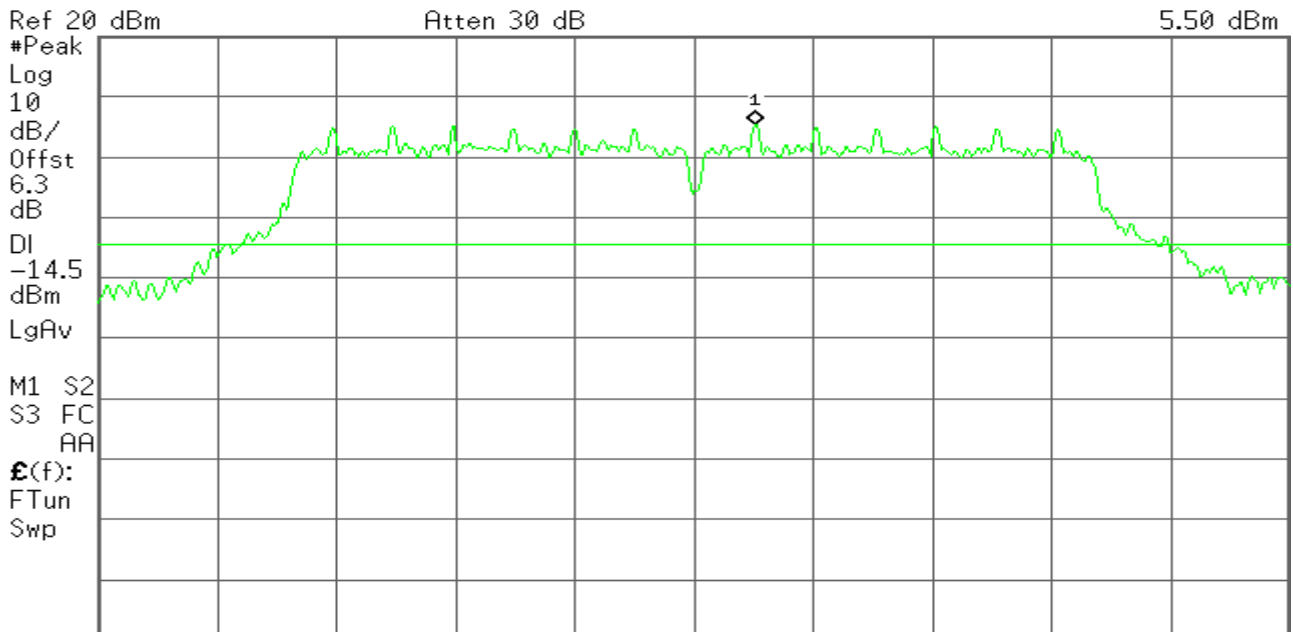
## IEEE 802.11g mode/Chain 1

### CH Low

Agilent

R T

Mkr1 2.413 27 GHz  
5.50 dBm



Center 2.412 000 GHz      Span 24.63 MHz  
#Res BW 100 kHz      #VBW 300 kHz      Sweep 2.36 ms (601 pts)

Agilent

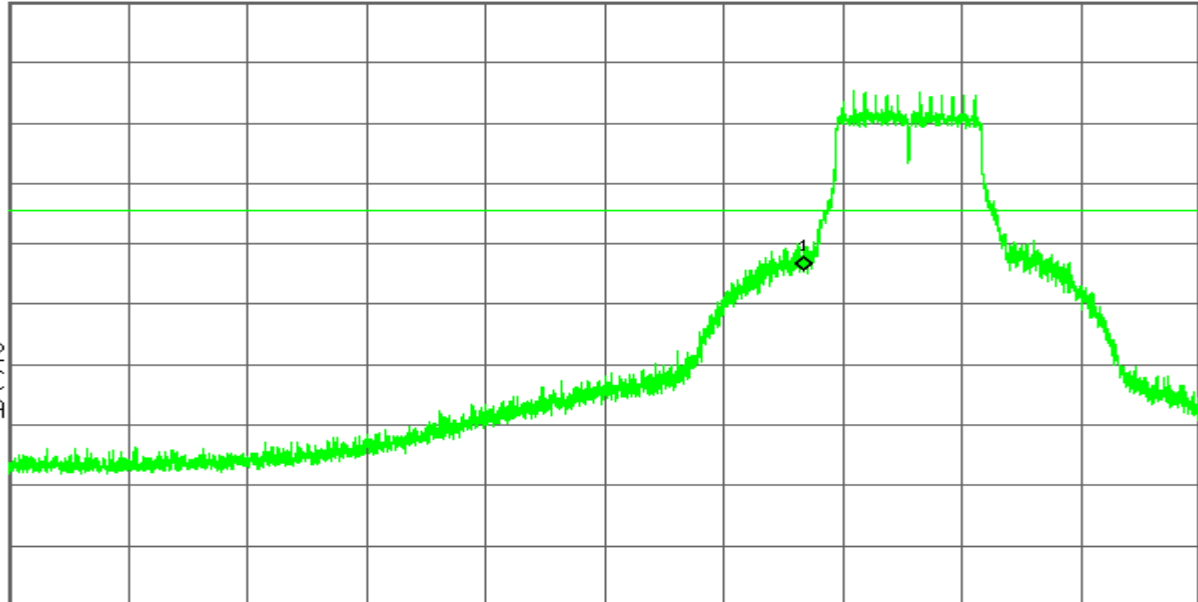
R T

Mkr1 2.400 000 GHz  
-24.39 dBm

Ref 20 dBm

Atten 30 dB

#Peak  
Log  
10  
dB/  
Offst  
6.3  
dB  
DI  
-14.5  
dBm  
LgAv  
M1 S2  
S3 FC  
AA  
E(f):  
FTun  
Swp



Start 2.310 000 GHz

Stop 2.445 000 GHz

#Res BW 100 kHz

#VBW 300 kHz

Sweep 13.11 ms (8192 pts)

Agilent

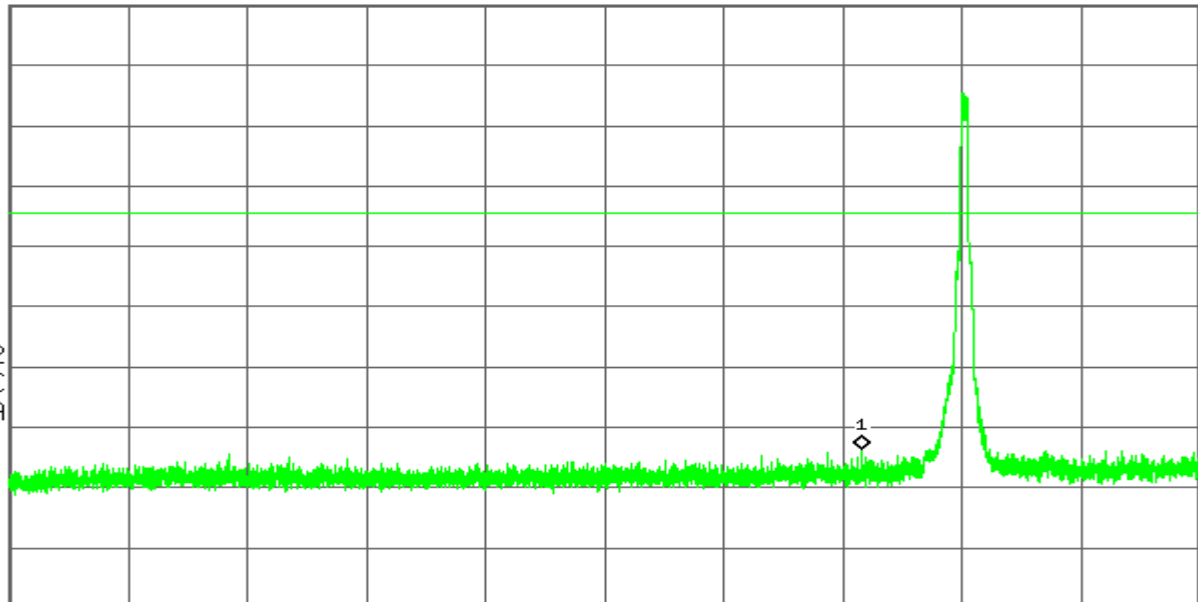
R T

Mkr1 2.157 7 GHz  
-53.68 dBm

Ref 20 dBm

Atten 30 dB

#Peak  
Log  
10  
dB/  
Offst  
6.3  
dB  
DI  
-14.5  
dBm  
LgAv  
M1 S2  
S3 FC  
AA  
E(f):  
FTun  
Swp



Start 30.0 MHz

Stop 3.000 0 GHz

#Res BW 100 kHz

#VBW 300 kHz

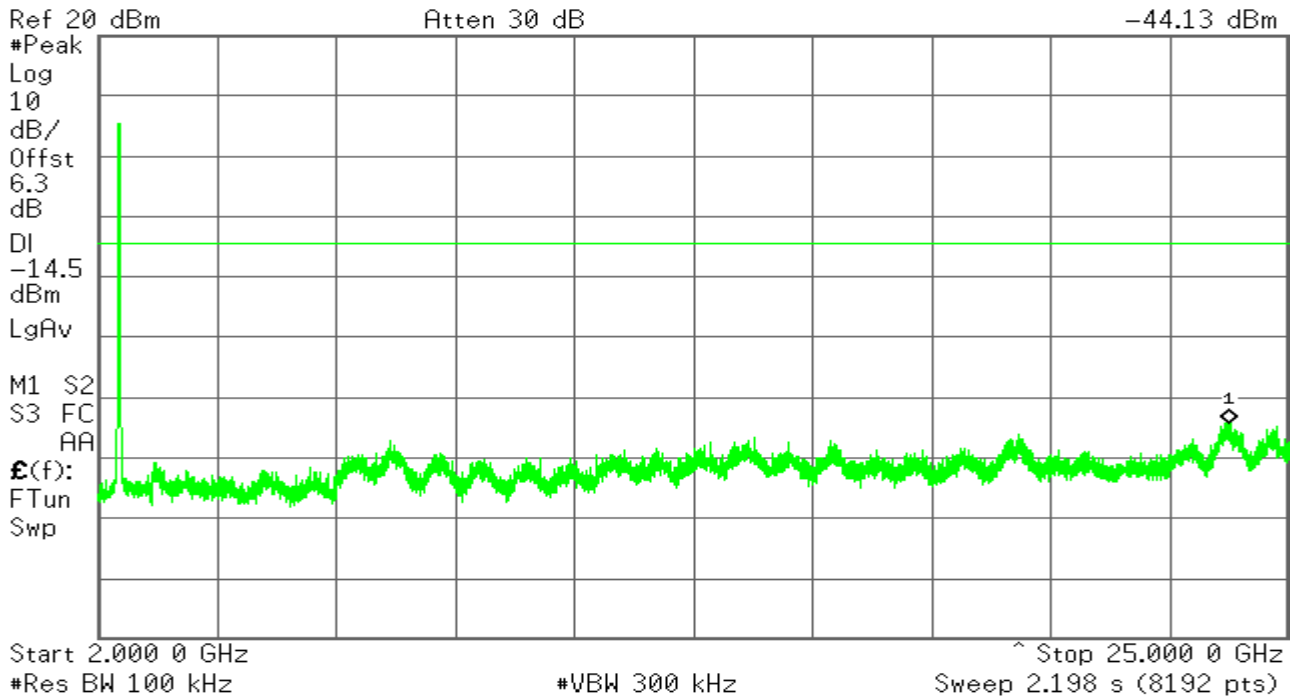
Sweep 284 ms (8192 pts)



Agilent

R T

Mkr1 23.826 3 GHz  
-44.13 dBm

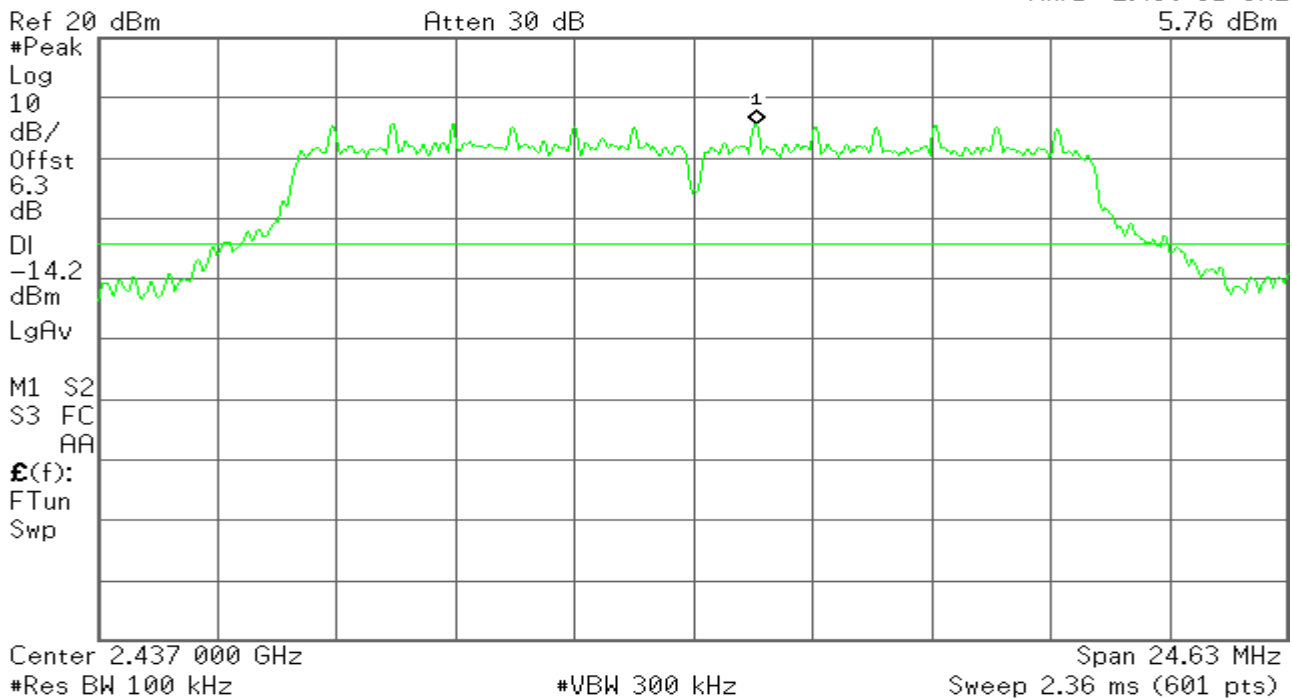


## CH Mid

Agilent

R T

Mkr1 2.438 31 GHz  
5.76 dBm



Agilent

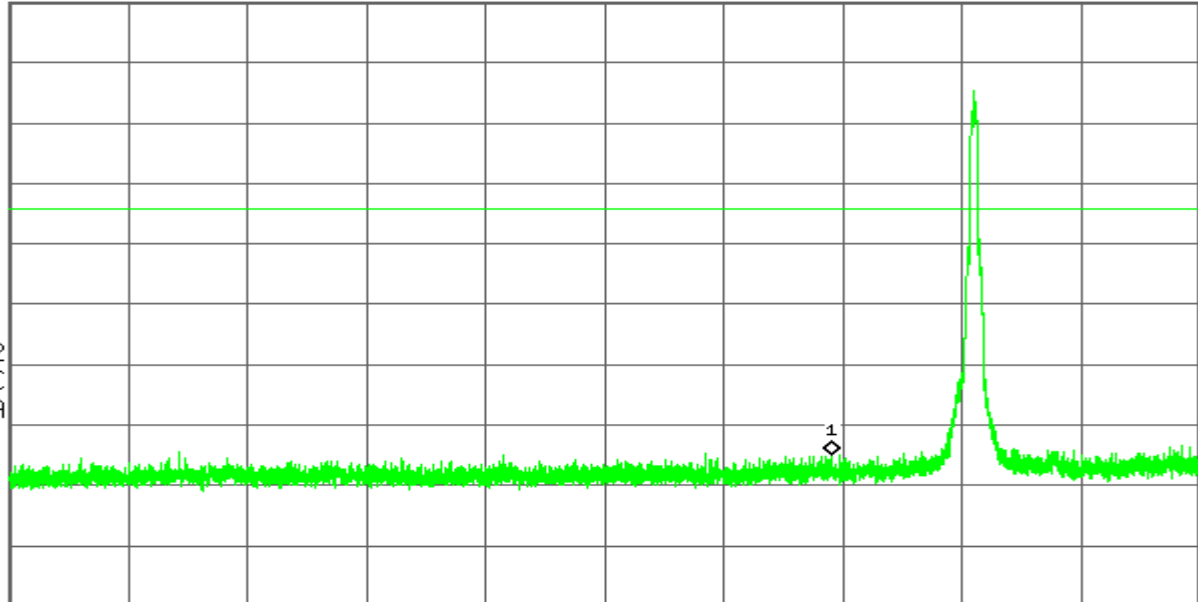
R T

Mkr1 2.082 6 GHz  
-54.92 dBm

Ref 20 dBm

Atten 30 dB

#Peak  
Log  
10  
dB/  
Offst  
6.3  
dB  
DI  
-14.2  
dBm  
LgAv  
M1 S2  
S3 FC  
AA  
£(f):  
FTun  
Swp



Start 30.0 MHz  
#Res BW 100 kHz

#VBW 300 kHz

Stop 3.000 0 GHz  
Sweep 284 ms (8192 pts)

Agilent

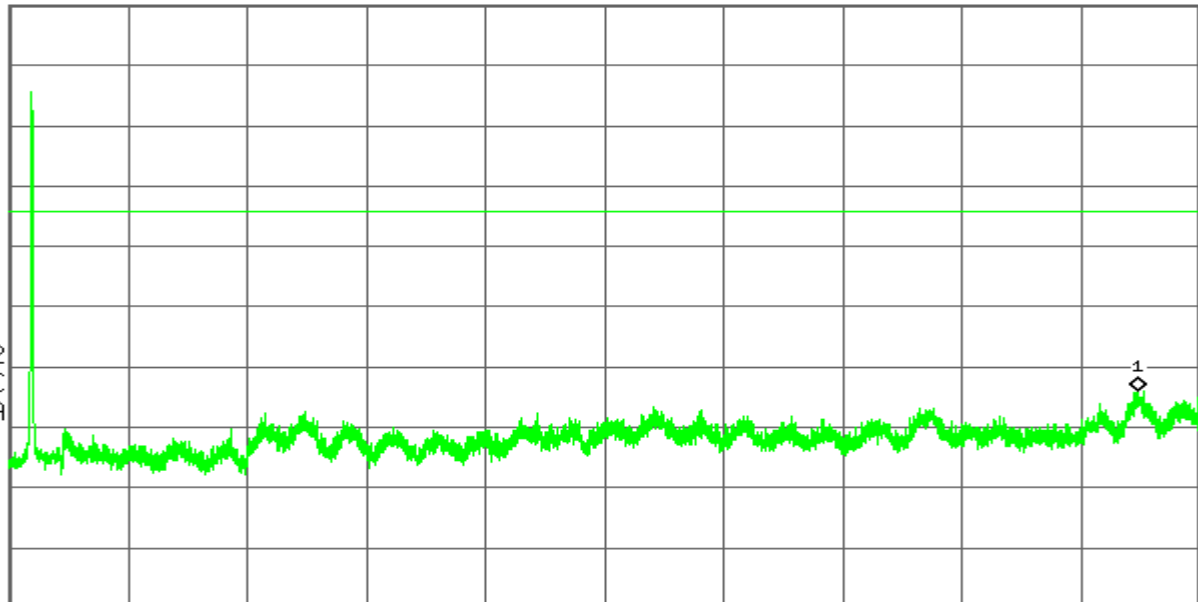
R T

Mkr1 23.815 0 GHz  
-43.94 dBm

Ref 20 dBm

Atten 30 dB

#Peak  
Log  
10  
dB/  
Offst  
6.3  
dB  
DI  
-14.2  
dBm  
LgAv  
M1 S2  
S3 FC  
AA  
£(f):  
FTun  
Swp



Start 2.000 0 GHz  
#Res BW 100 kHz

#VBW 300 kHz

Stop 25.000 0 GHz  
Sweep 2.198 s (8192 pts)

## CH High

Agilent

R T

Mkr1 2.463 27 GHz  
5.01 dBm

Ref 20 dBm

Atten 30 dB

#Peak

Log

10

dB/

Offst

6.3

dB

DI

-15.0

dBm

LgAv

M1 S2

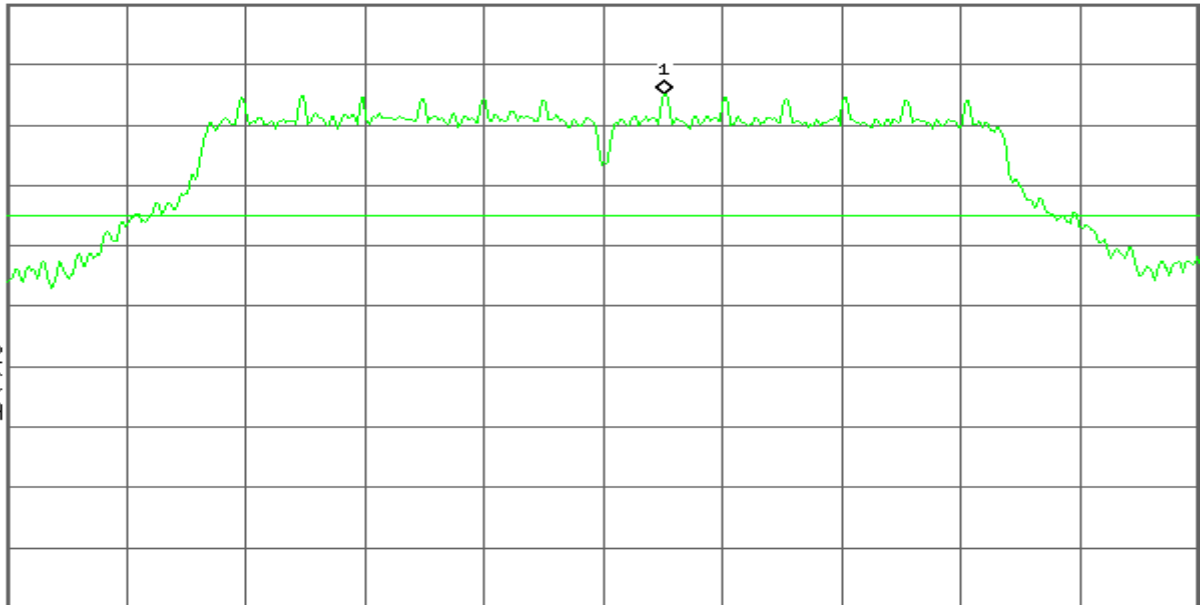
S3 FC

RA

$\mathcal{E}(f)$ :

FTun

Swp



Center 2.462 000 GHz

#Res BW 100 kHz

#VBW 300 kHz

Span 24.63 MHz

Sweep 2.36 ms (601 pts)

Agilent

R T

Mkr1 2.483 500 GHz  
-34.45 dBm

Ref 20 dBm

Atten 30 dB

#Peak

Log

10

dB/

Offst

6.3

dB

DI

-15.0

dBm

LgAv

M1 S2

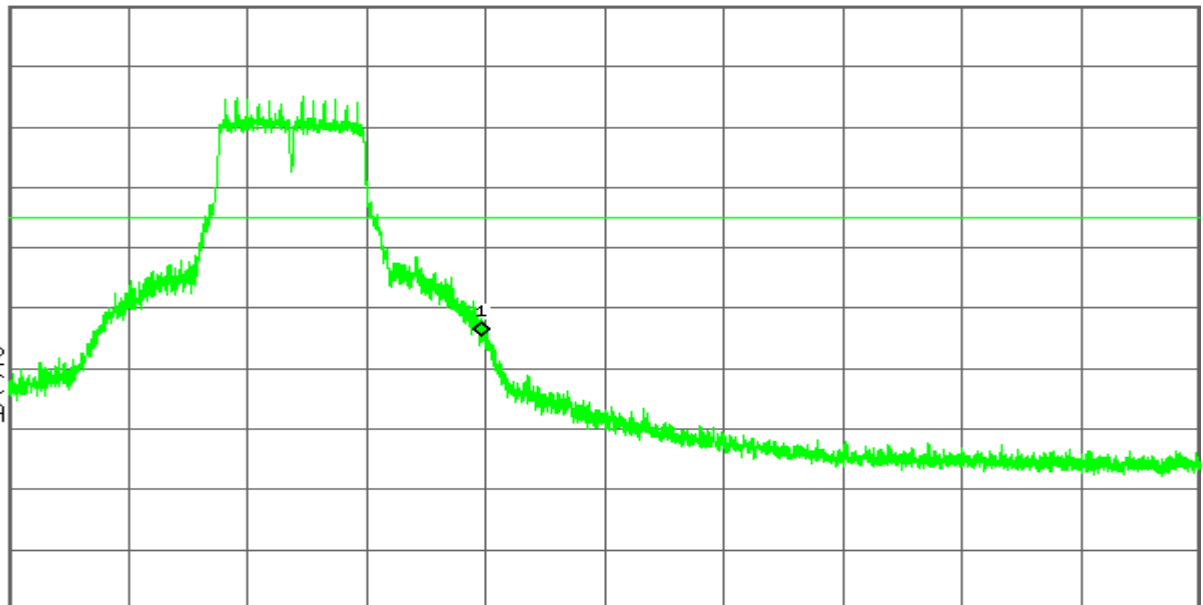
S3 FC

RA

$\mathcal{E}(f)$ :

FTun

Swp



Start 2.430 000 GHz

#Res BW 100 kHz

#VBW 300 kHz

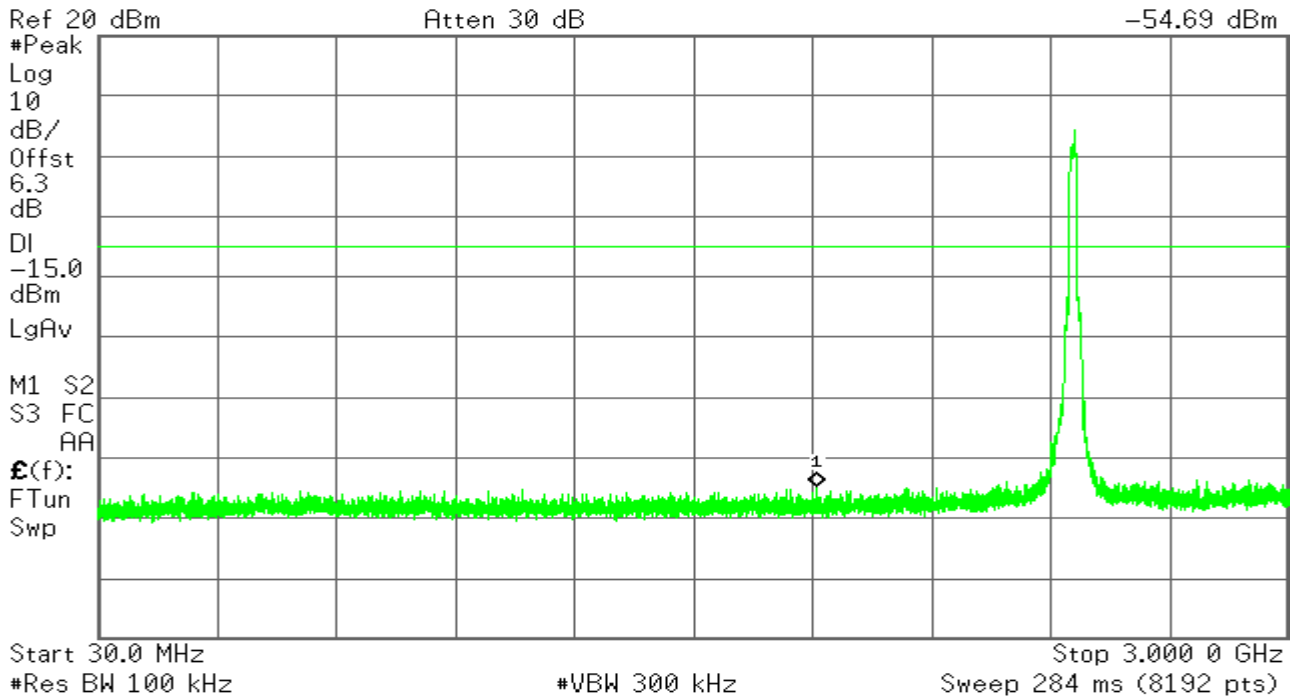
Stop 2.565 000 GHz

Sweep 13.11 ms (8192 pts)

Agilent

R T

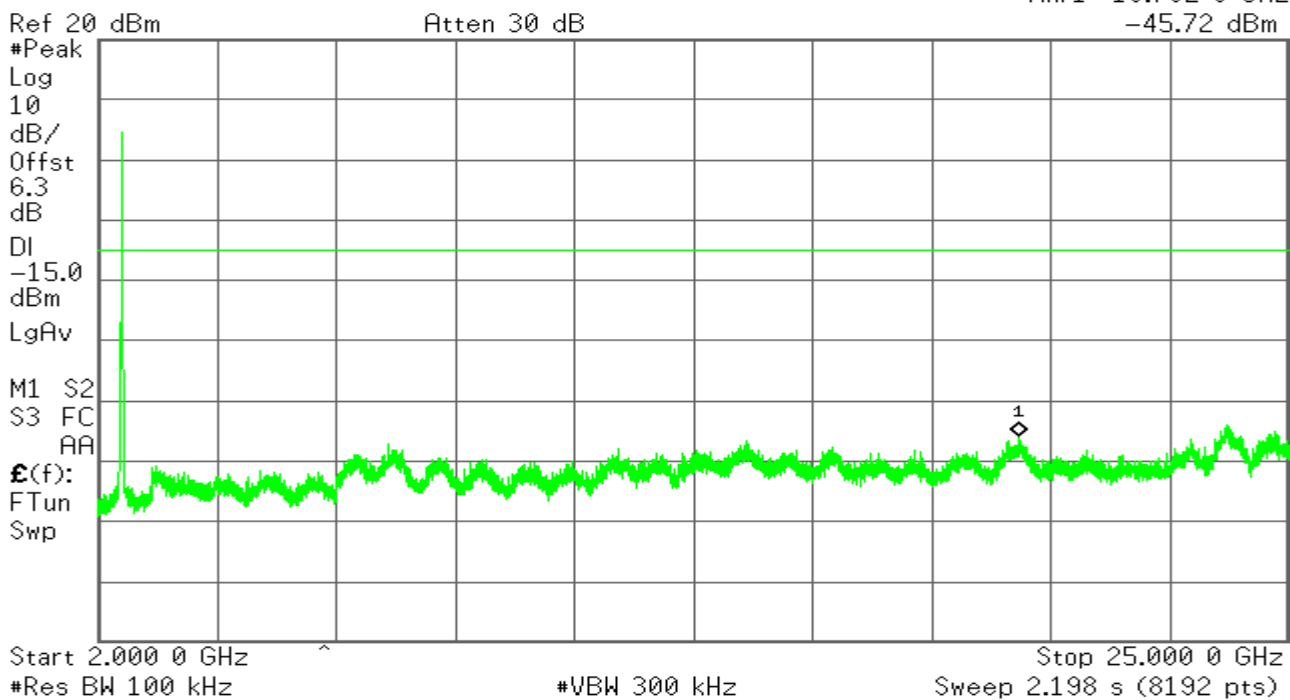
Mkr1 1.821 9 GHz  
-54.69 dBm



Agilent

R T

Mkr1 19.782 8 GHz  
-45.72 dBm



## IEEE 802.11n HT20 mode/Chain 0

### CH Low

Agilent

R T

Mkr1 2.413 367 1 GHz  
2.02 dBm

Ref 20 dBm

Atten 30 dB

#Peak

Log

10

dB/

Offst

6.3

dB

DI

-18.0

dBm

LgAv

M1 S2

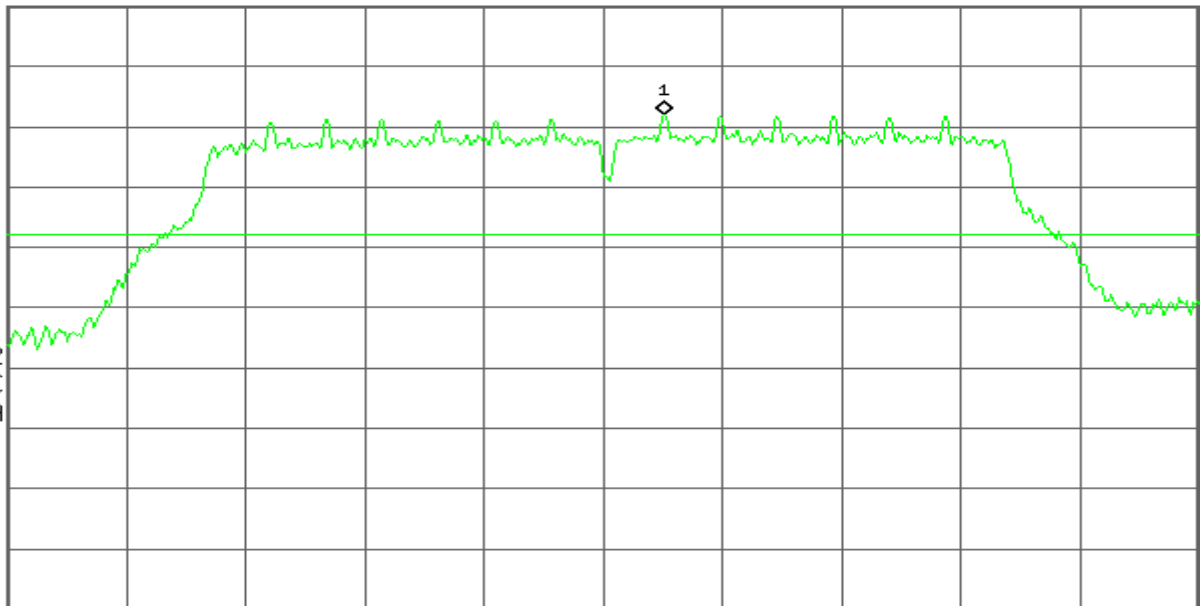
S3 FC

AA

f(f):

FTun

Swp



Center 2.412 000 GHz

Span 26.46 MHz

#Res BW 100 kHz

#VBW 300 kHz

Sweep 2.56 ms (601 pts)

Agilent

R T

Mkr1 2.400 000 GHz  
-36.12 dBm

Ref 20 dBm

Atten 30 dB

#Peak

Log

10

dB/

Offst

6.3

dB

DI

-18.0

dBm

LgAv

M1 S2

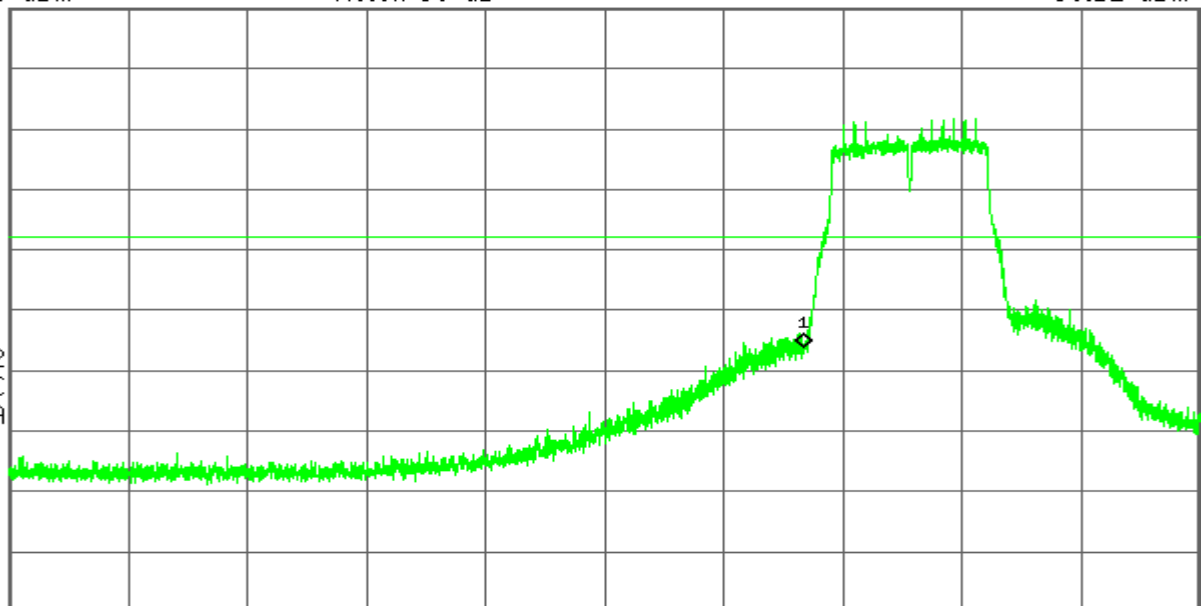
S3 FC

AA

f(f):

FTun

Swp



Start 2.310 000 GHz

Stop 2.445 000 GHz

#Res BW 100 kHz

#VBW 300 kHz

Sweep 13.11 ms (8192 pts)

Agilent

R T

Mkr1 1.730 9 GHz  
-55.49 dBm

Ref 20 dBm

Atten 30 dB

#Peak

Log

10

dB/

Offst

6.3

dB

DI

-18.0

dBm

LgAv

M1 S2

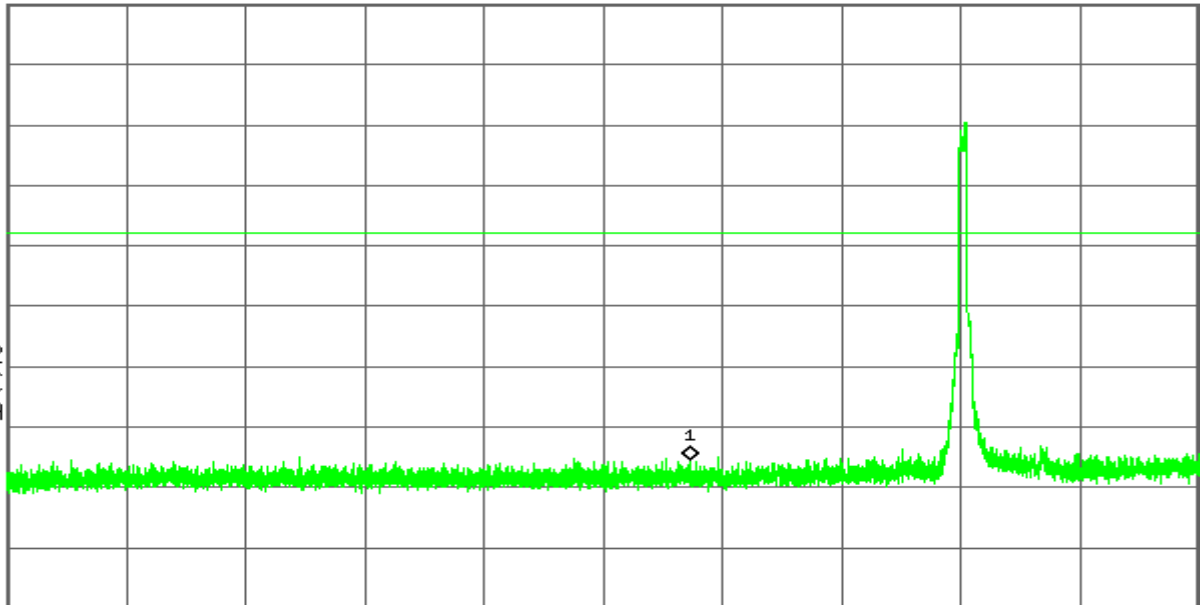
S3 FC

AA

$\mathcal{E}(f)$ :

FTun

Swp



Start 30.00 MHz

#Res BW 100 kHz

#VBW 300 kHz

Stop 3.000 00 GHz

Sweep 284 ms (8192 pts)

Agilent

R T

Mkr1 23.845 9 GHz  
-43.66 dBm

Ref 20 dBm

Atten 30 dB

#Peak

Log

10

dB/

Offst

6.3

dB

DI

-18.0

dBm

LgAv

M1 S2

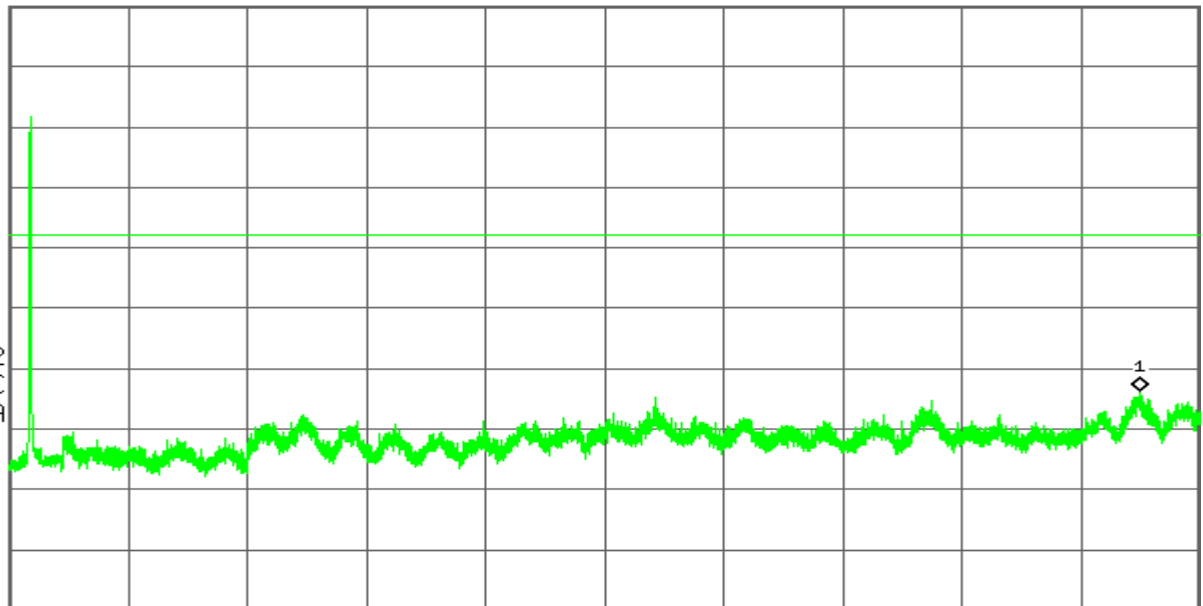
S3 FC

AA

$\mathcal{E}(f)$ :

FTun

Swp



Start 2.000 0 GHz

#Res BW 100 kHz

#VBW 300 kHz

Stop 25.000 0 GHz

Sweep 2.198 s (8192 pts)

## CH Mid

Agilent

R T

Mkr1 2.442 071 5 GHz  
1.38 dBm

Ref 20 dBm

Atten 30 dB

#Peak

Log

10

dB/

Offst

6.3

dB

DI

-18.6

dBm

LgAv

M1 S2

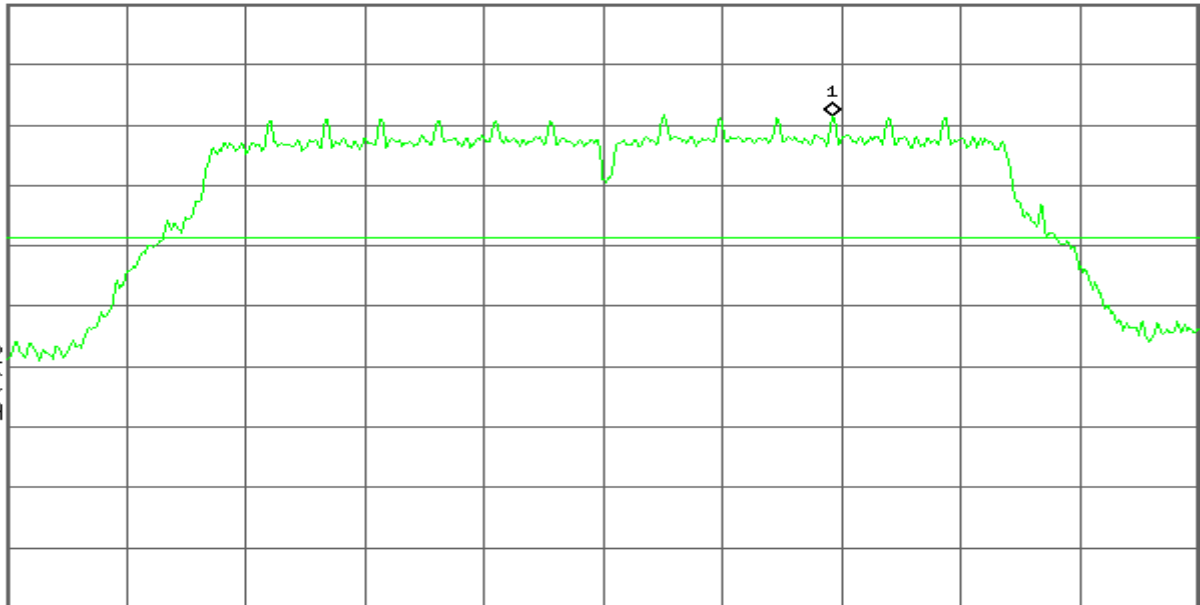
S3 FC

RA

$\mathcal{E}(f)$ :

FTun

Swp



Center 2.437 000 GHz

Span 26.46 MHz

#Res BW 100 kHz

#VBW 300 kHz

Sweep 2.56 ms (601 pts)

Agilent

R T

Mkr1 1.933 3 GHz  
-54.44 dBm

Ref 20 dBm

Atten 30 dB

#Peak

Log

10

dB/

Offst

6.3

dB

DI

-18.6

dBm

LgAv

M1 S2

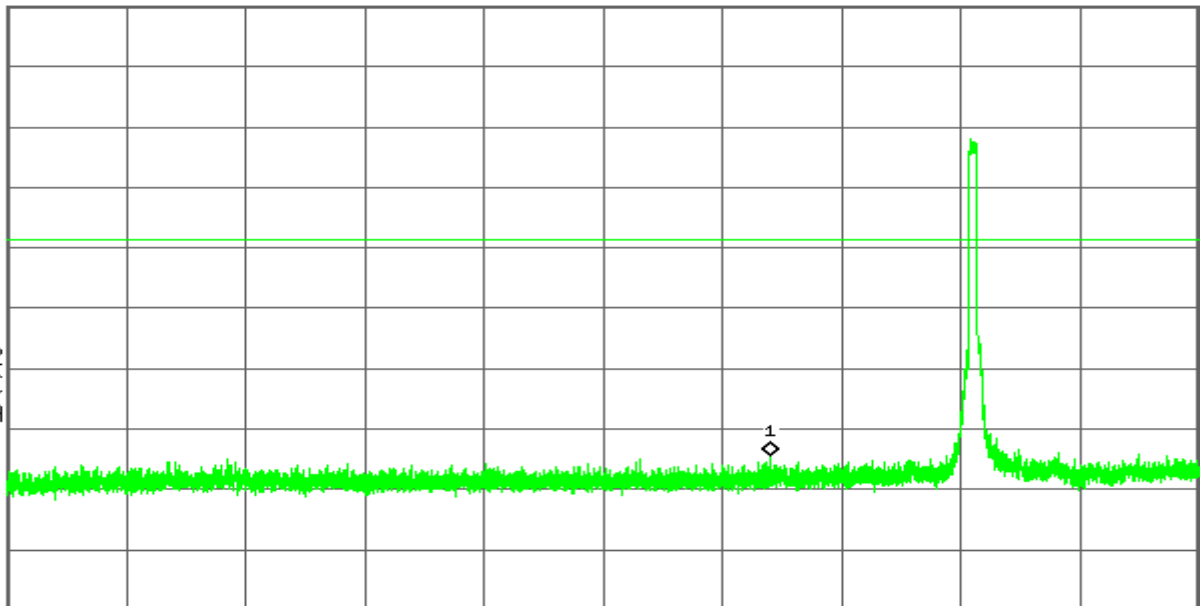
S3 FC

RA

$\mathcal{E}(f)$ :

FTun

Swp



Start 30.00 MHz

Stop 3.000 00 GHz

#Res BW 100 kHz

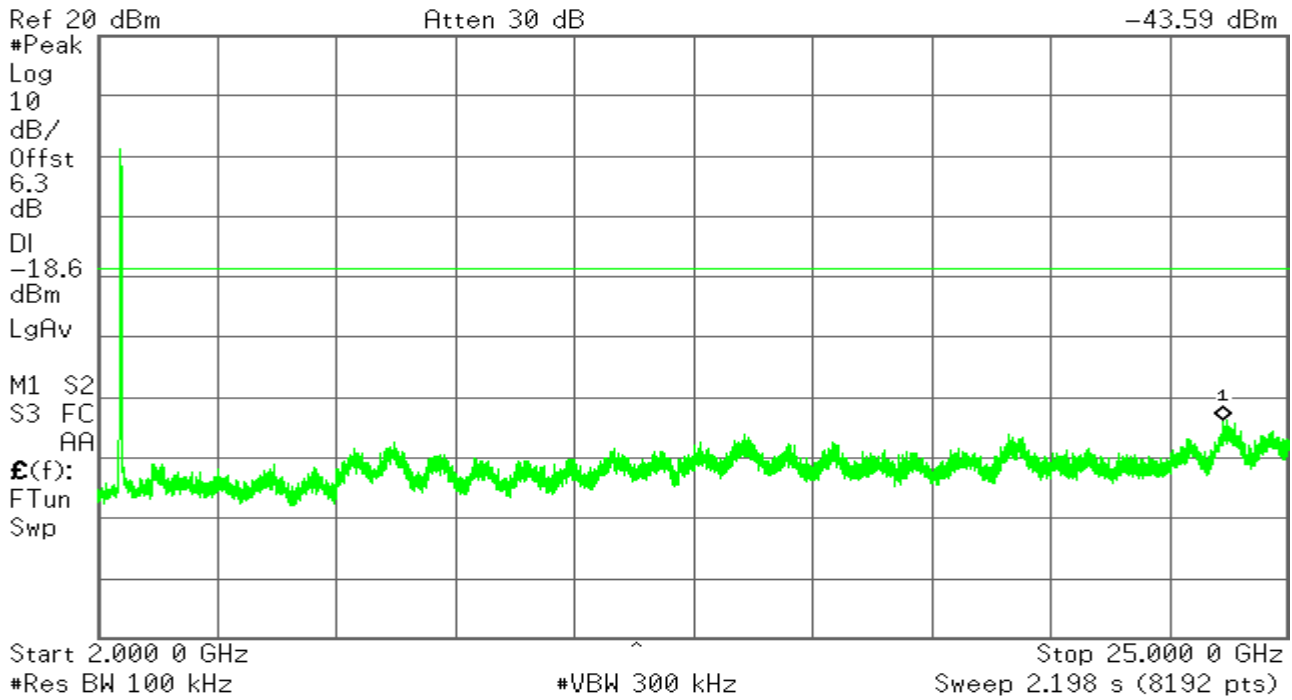
#VBW 300 kHz

Sweep 284 ms (8192 pts)

Agilent

R T

Mkr1 23.728 0 GHz  
-43.59 dBm

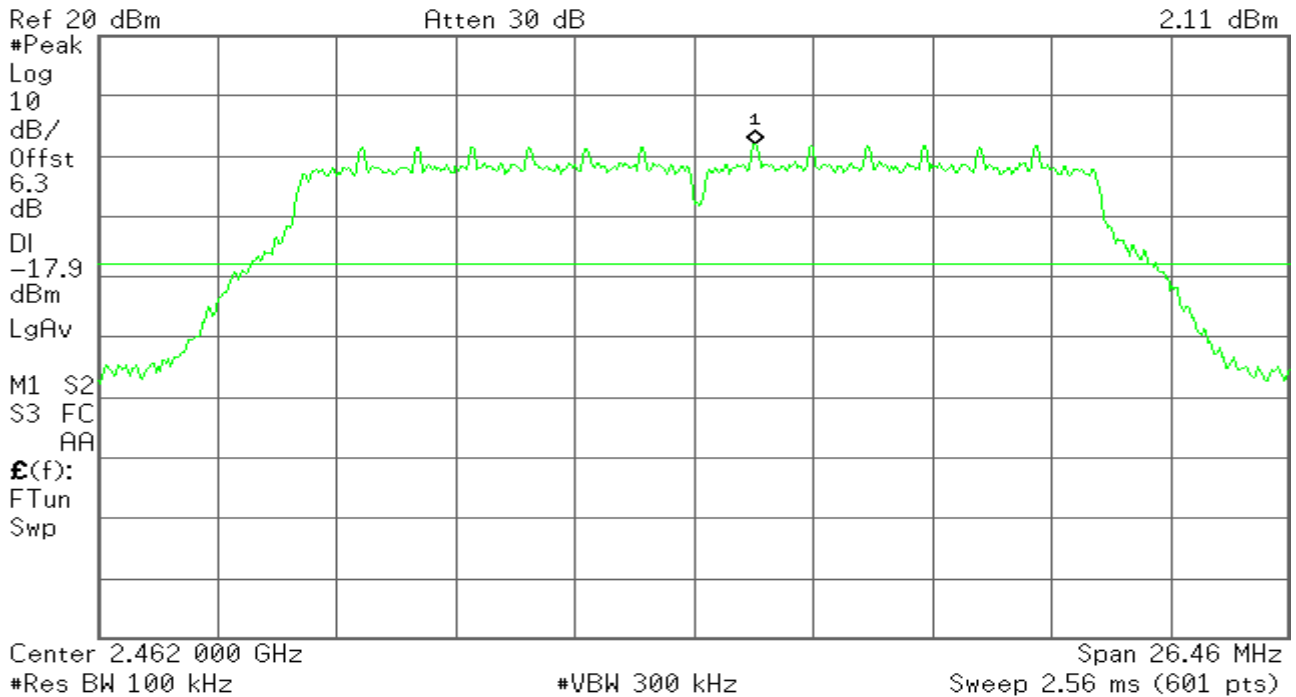


## CH High

Agilent

R T

Mkr1 2.463 367 1 GHz  
2.11 dBm

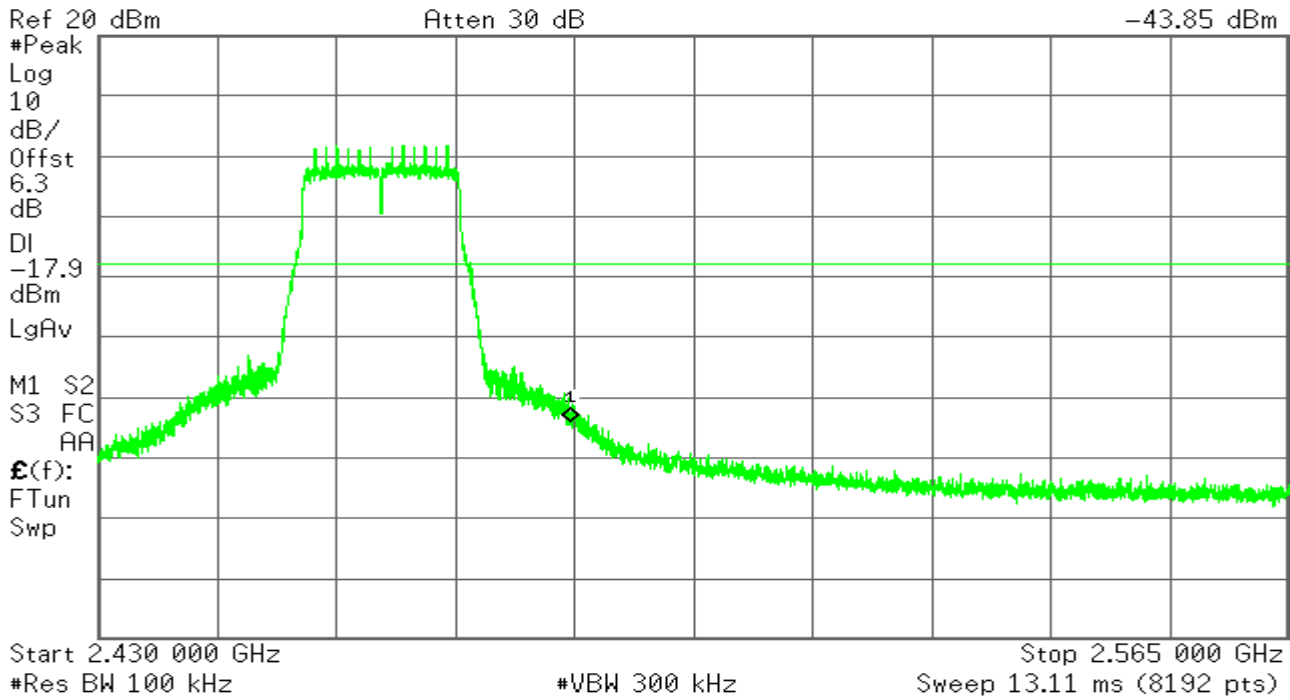




Agilent

R T

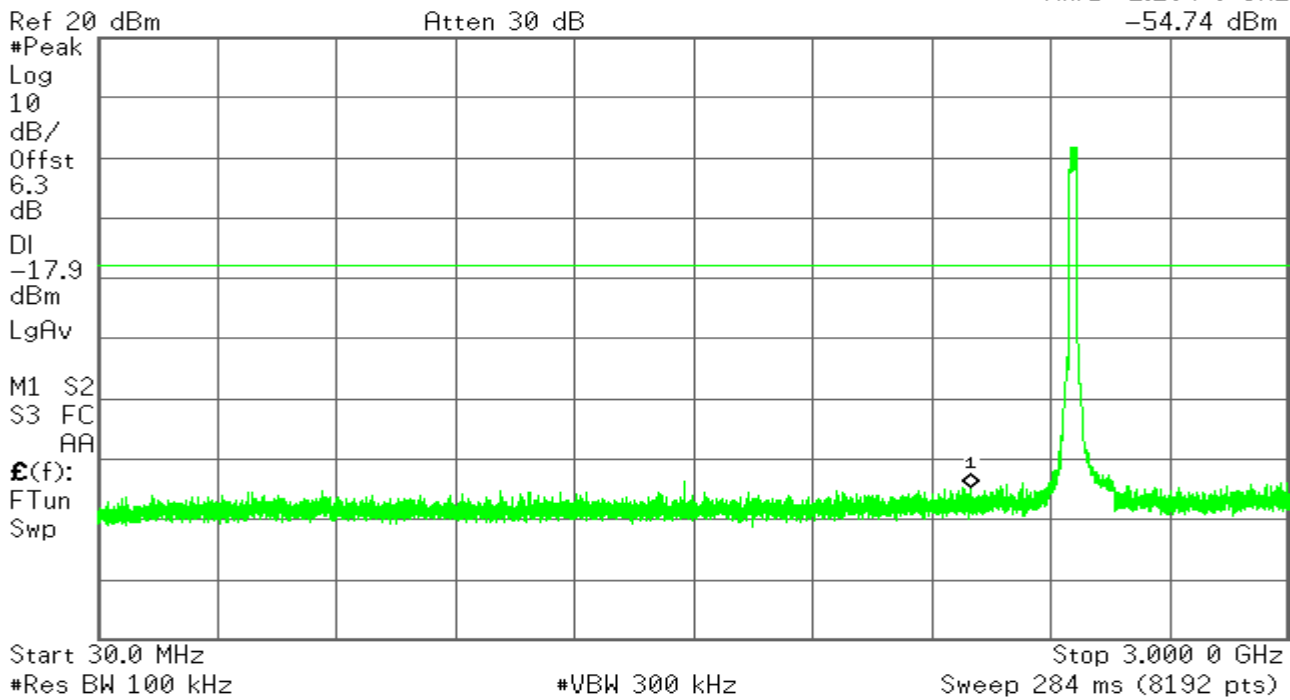
Mkr1 2.483 500 GHz  
-43.85 dBm



Agilent

R T

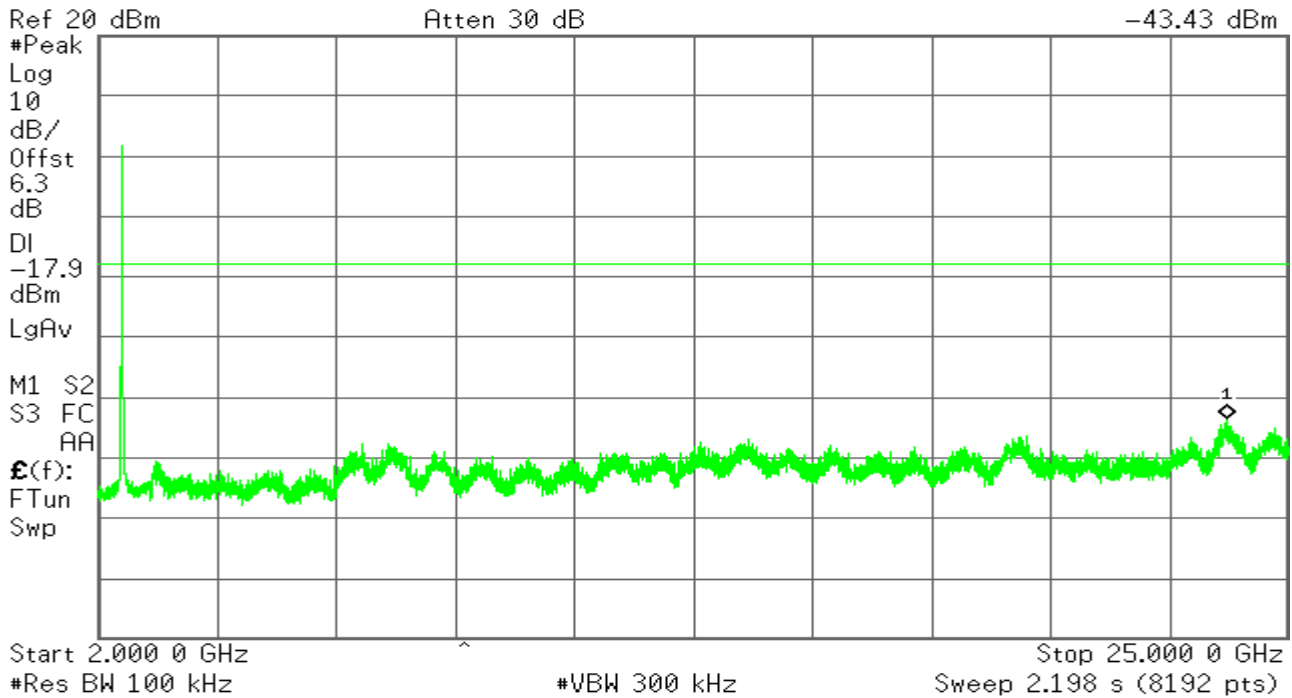
Mkr1 2.204 8 GHz  
-54.74 dBm



Agilent

R T

Mkr1 23.789 8 GHz  
-43.43 dBm



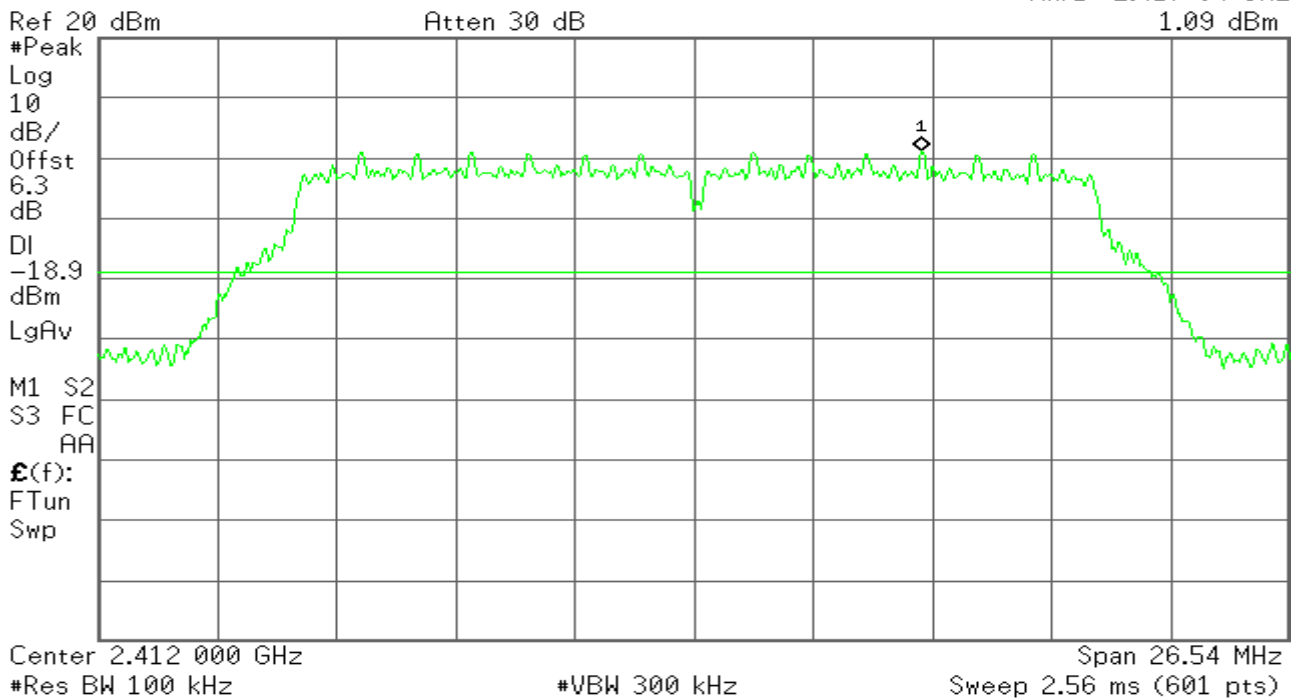
## IEEE 802.11n HT20 mode/Chain 1

### CH Low

Agilent

R T

Mkr1 2.417 04 GHz  
1.09 dBm



Agilent

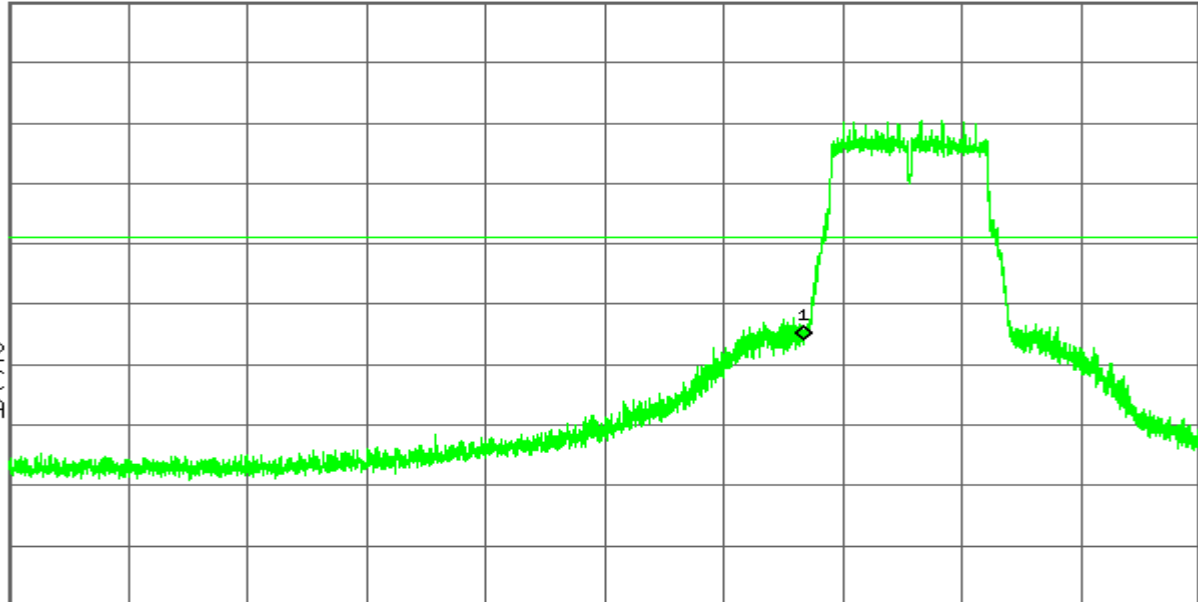
R T

Mkr1 2.400 000 GHz  
-35.88 dBm

Ref 20 dBm

Atten 30 dB

#Peak  
Log  
10  
dB/  
Offst  
6.3  
dB  
DI  
-18.9  
dBm  
LgAv  
M1 S2  
S3 FC  
AA  
E(f):  
FTun  
Swp



Start 2.310 000 GHz

Stop 2.445 000 GHz

#Res BW 100 kHz

#VBW 300 kHz

Sweep 13.11 ms (8192 pts)

Agilent

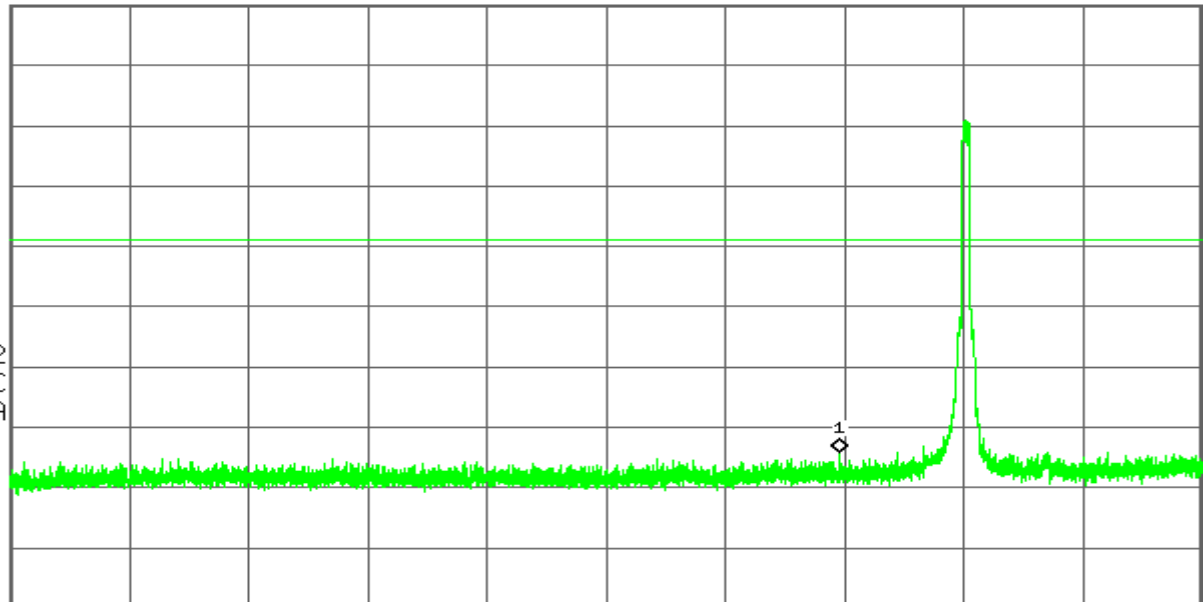
R T

Mkr1 2.096 1 GHz  
-54.16 dBm

Ref 20 dBm

Atten 30 dB

#Peak  
Log  
10  
dB/  
Offst  
6.3  
dB  
DI  
-18.9  
dBm  
LgAv  
M1 S2  
S3 FC  
AA  
E(f):  
FTun  
Swp



Start 30.0 MHz

Stop 3.000 0 GHz

#Res BW 100 kHz

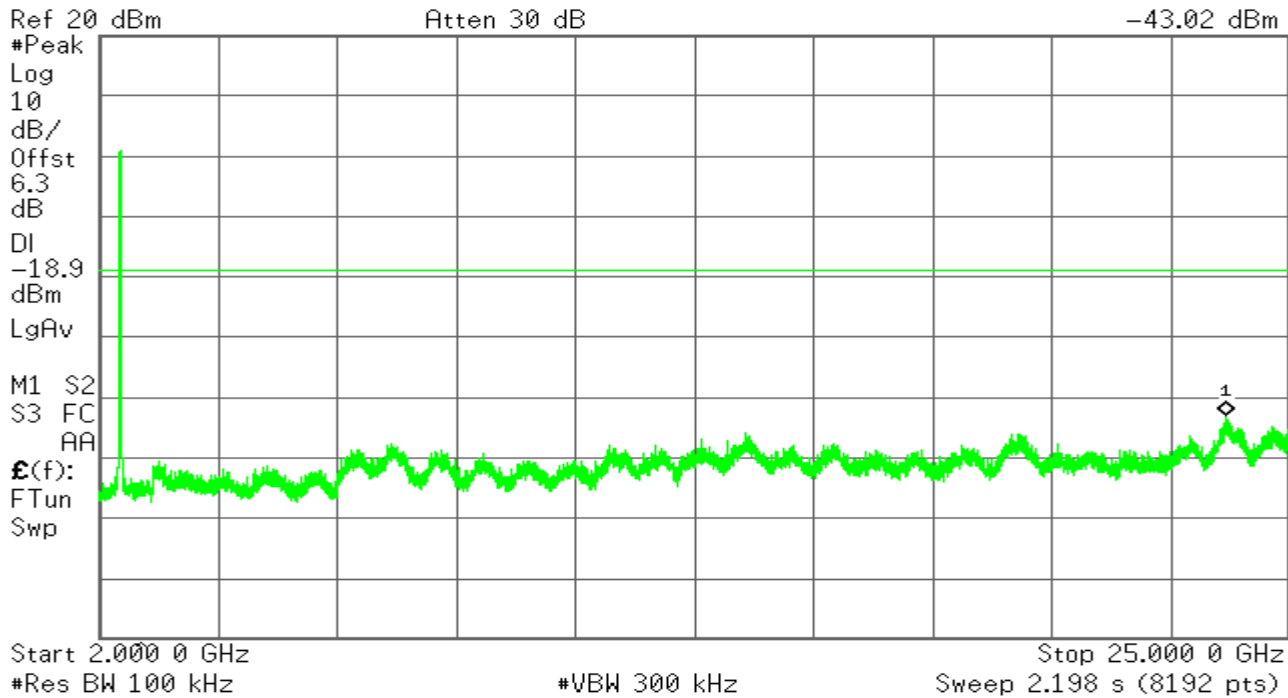
#VBW 300 kHz

Sweep 284 ms (8192 pts)

Agilent

R T

Mkr1 23.781 3 GHz  
-43.02 dBm

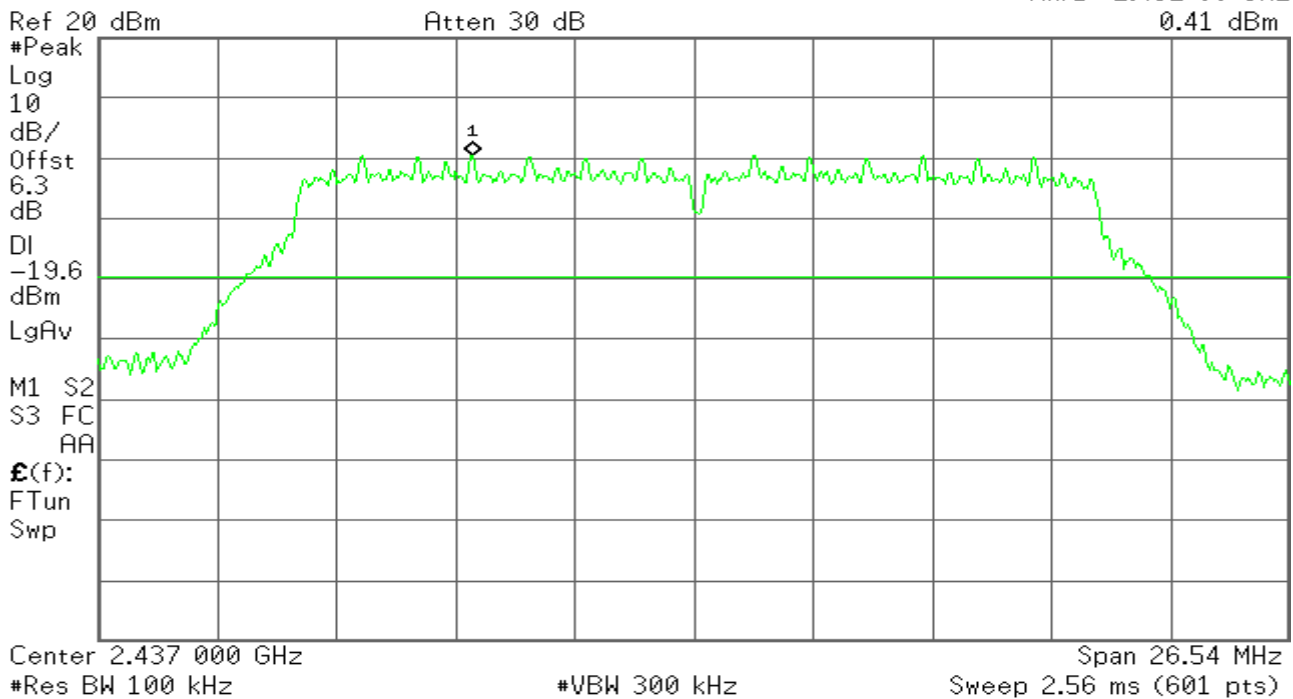


## CH Mid

Agilent

R T

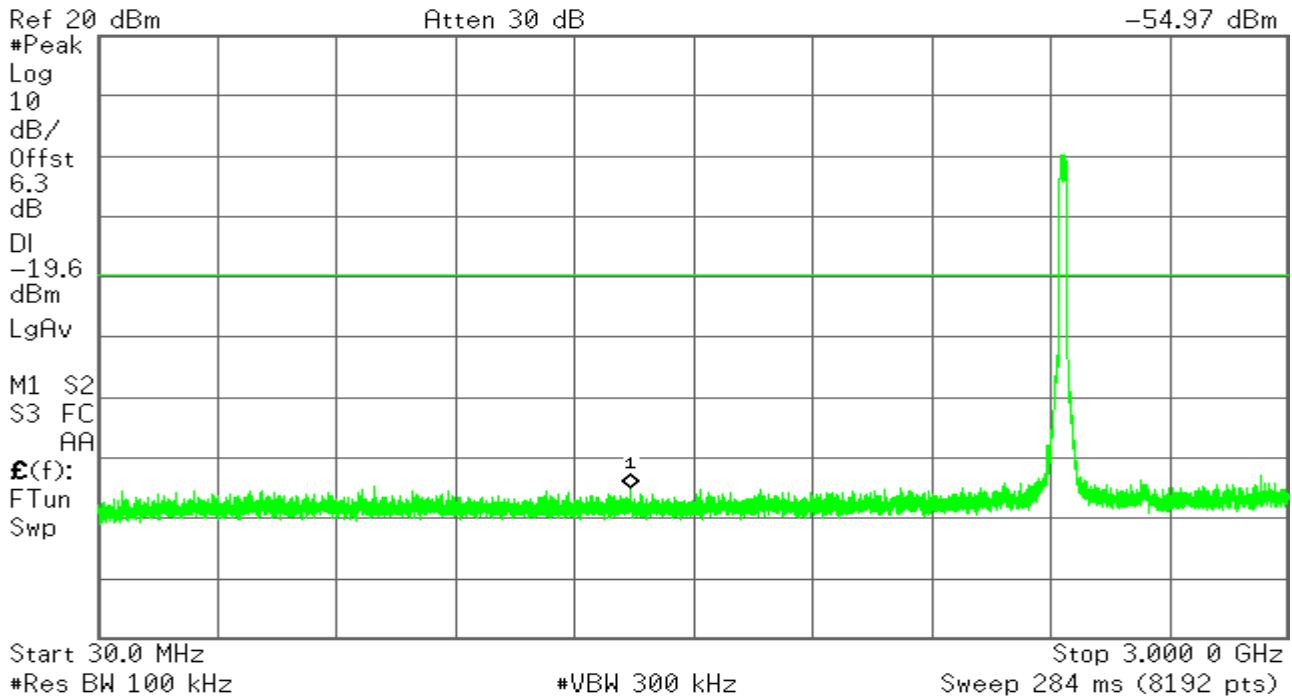
Mkr1 2.432 09 GHz  
0.41 dBm



Agilent

R T

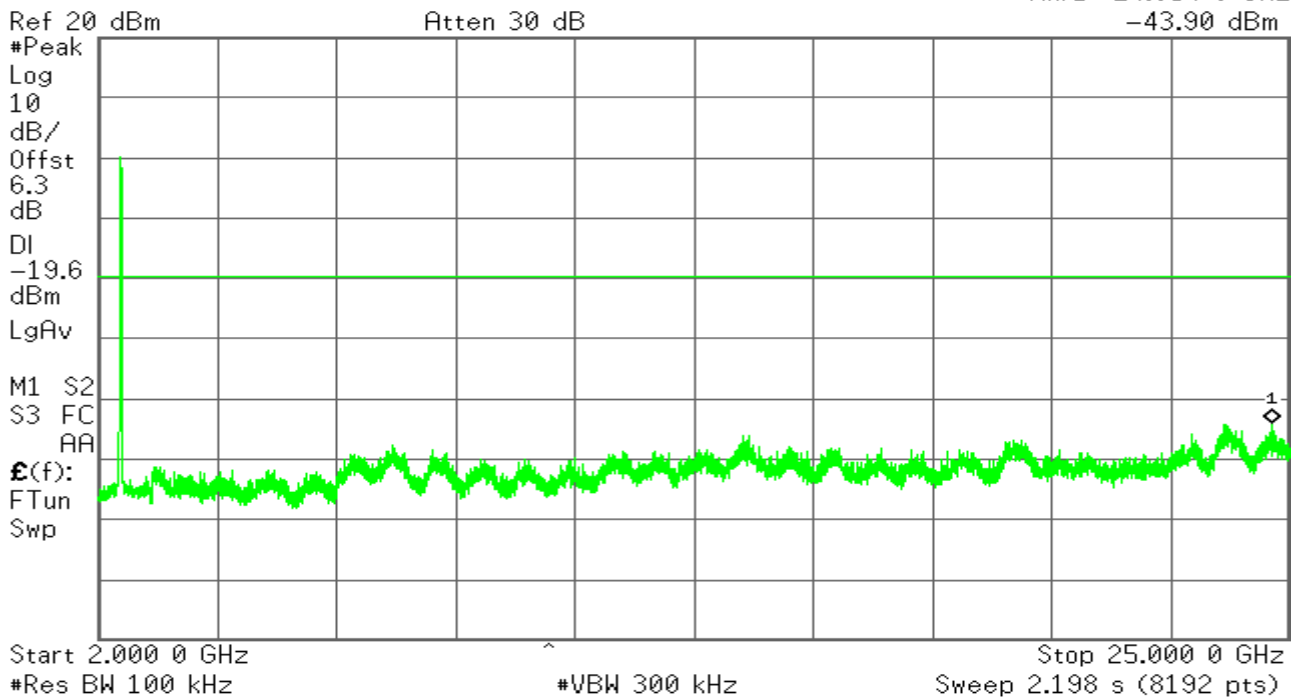
Mkr1 1.356 4 GHz  
-54.97 dBm



Agilent

R T

Mkr1 24.654 6 GHz  
-43.90 dBm



## CH High

Agilent

R T

Mkr1 2.457 09 GHz  
0.45 dBm

Ref 20 dBm

Atten 30 dB

#Peak

Log

10

dB/

Offst

6.3

dB

DI

-19.5

dBm

LgAv

M1 S2

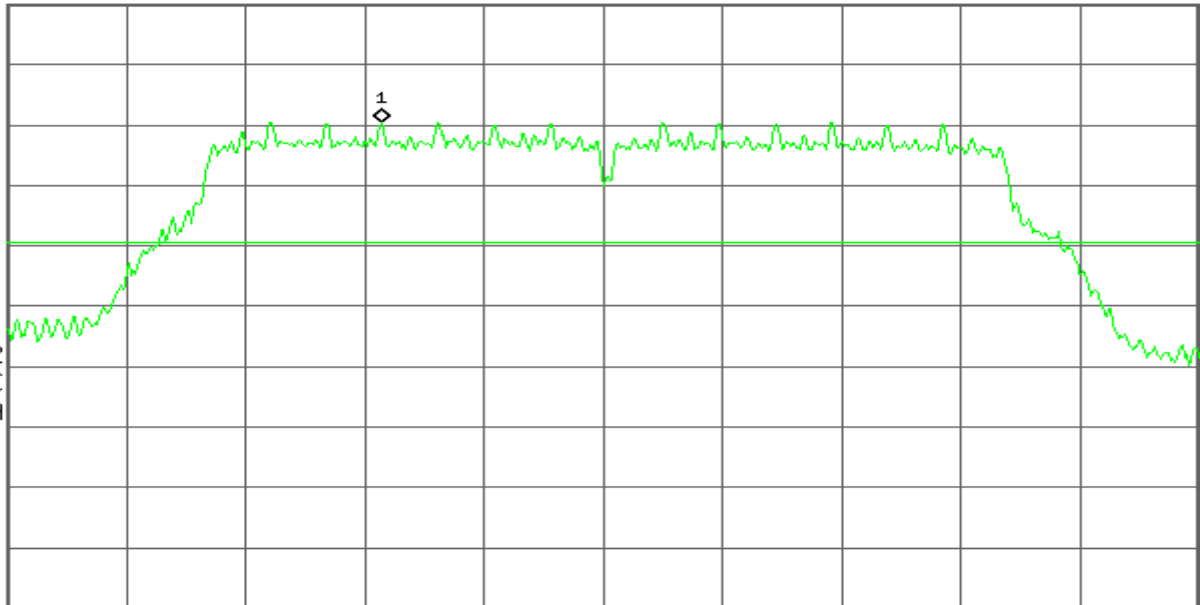
S3 FC

RA

$\mathcal{E}(f)$ :

FTun

Swp



Center 2.462 000 GHz

#Res BW 100 kHz

#VBW 300 kHz

Span 26.54 MHz

Sweep 2.56 ms (601 pts)

Agilent

R T

Mkr1 2.483 000 GHz  
-40.62 dBm

Ref 20 dBm

Atten 30 dB

#Peak

Log

10

dB/

Offst

6.3

dB

DI

-19.5

dBm

LgAv

M1 S2

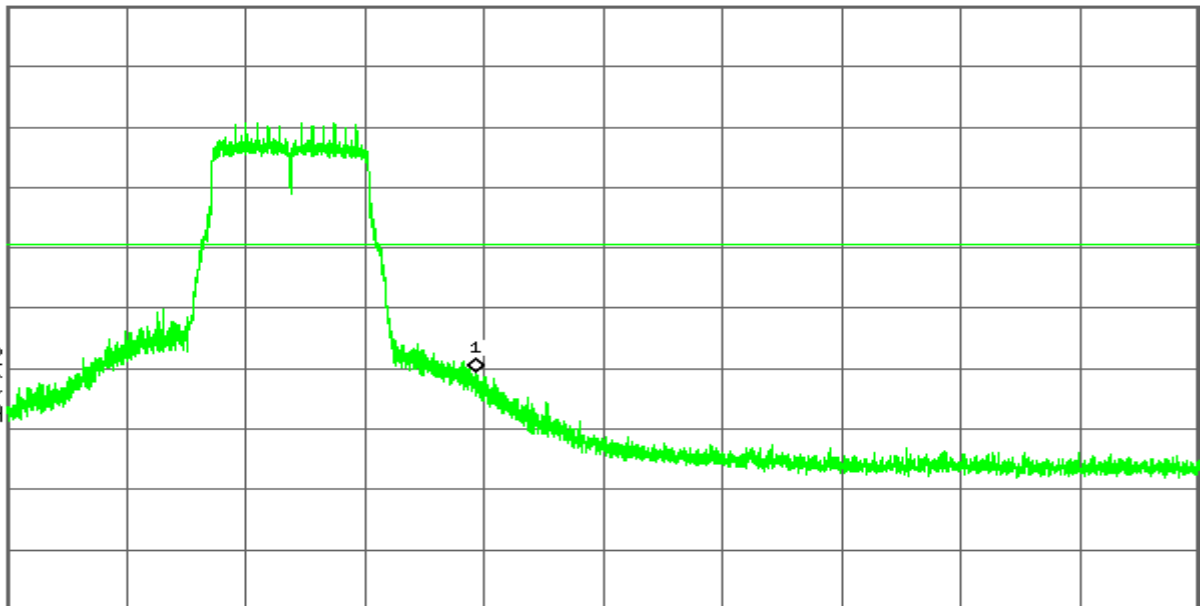
S3 FC

RA

$\mathcal{E}(f)$ :

FTun

Swp



Start 2.430 000 GHz

#Res BW 100 kHz

#VBW 300 kHz

Stop 2.565 000 GHz

Sweep 13.11 ms (8192 pts)

Agilent

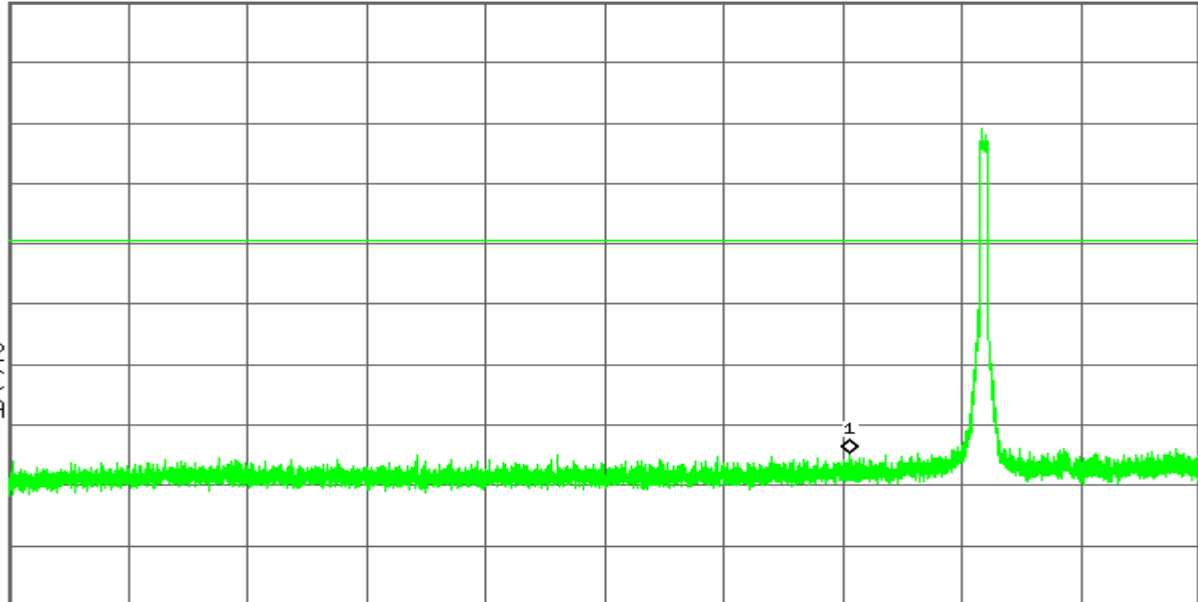
R T

Mkr1 2.124 7 GHz  
-54.71 dBm

Ref 20 dBm

Atten 30 dB

#Peak  
Log  
10  
dB/  
Offst  
6.3  
dB  
DI  
-19.5  
dBm  
LgAv  
M1 S2  
S3 FC  
AA  
£(f):  
FTun  
Swp



Start 30.0 MHz  
#Res BW 100 kHz

#VBW 300 kHz

Stop 3.000 0 GHz  
Sweep 284 ms (8192 pts)

Agilent

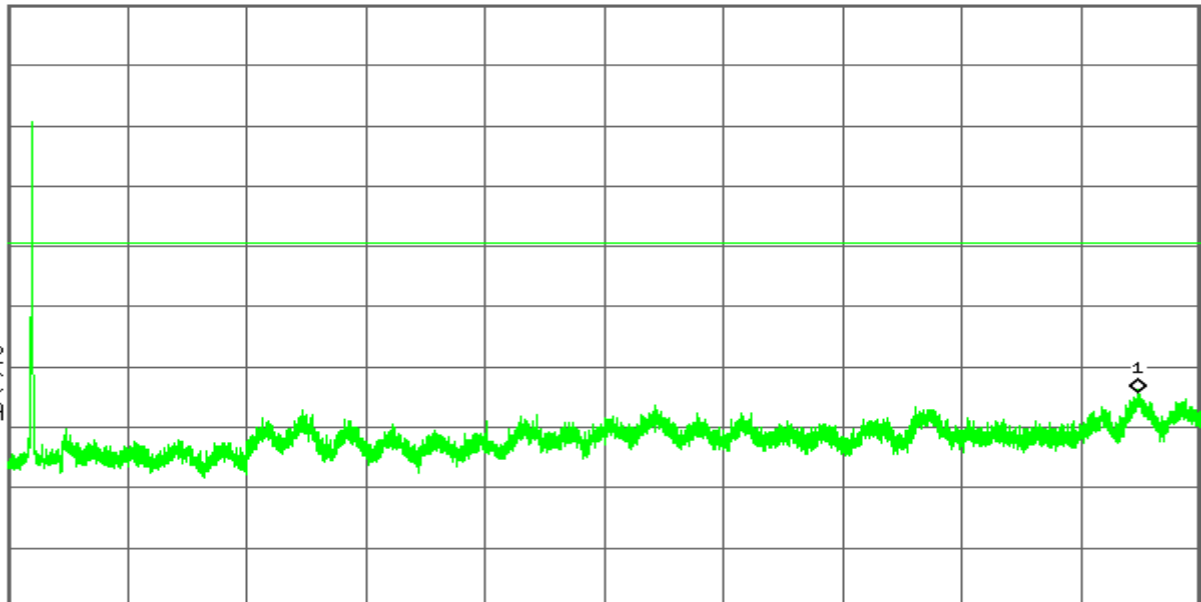
R T

Mkr1 23.795 4 GHz  
-44.14 dBm

Ref 20 dBm

Atten 30 dB

#Peak  
Log  
10  
dB/  
Offst  
6.3  
dB  
DI  
-19.5  
dBm  
LgAv  
M1 S2  
S3 FC  
AA  
£(f):  
FTun  
Swp



Start 2.000 0 GHz  
#Res BW 100 kHz

#VBW 300 kHz

Stop 25.000 0 GHz  
Sweep 2.198 s (8192 pts)

## 7.6. 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 ( $\mu$ V/m at 3-meter)	Field Strength (dB $\mu$ V/m at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54



3. According to RSS-Gen section 8.9, Except when the requirements applicable to a given device state otherwise, emissions from licence-exempt transmitters shall comply with the field strength limits shown in Table below. Additionally, the level of any transmitter emission shall not exceed the level of the transmitter's fundamental emission.

Frequency	Electric Field Strength ( $\mu\text{V/m}$ )	Magnetic Field Strength (H-Field) ( $\mu\text{A/m}$ )	Measurement Distance (metres)
9-490 kHz	2,400/F (F in kHz)	2,400/377F (F in kHz)	300
490-1,705 kHz	24,000/F (F in kHz)	24,000/377F (F in kHz)	30
1,705-30 MHz	30	N/A	30

**Note:** The emission limits for the bands 9-90 kHz and 110-490 kHz are based on measurements employing a linear average detector. Transmitting devices are not permitted in restricted frequency bands unless stated otherwise in the relevant RSS. 2. In the emission table above, the tighter limit applies at the band edges.

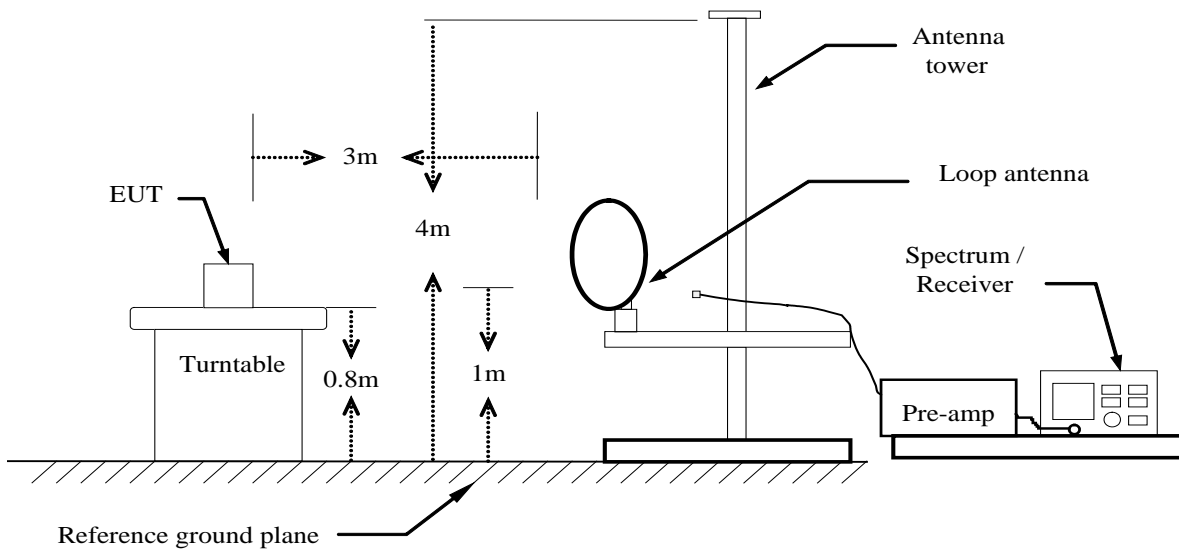
Frequency (MHz)	Field Strength ( $\mu\text{V/m}$ at 3 metres)
30-88	100
88-216	150
216-960	200
Above 960*	500

\* Unless otherwise specified, for all frequencies greater than 1 GHz, the radiated emission limits for licence-exempt radio apparatus stated in applicable RSSs (including RSS-Gen) are based on measurements using a linear average detector function having a minimum resolution bandwidth of 1 MHz. If an average limit is specified for the EUT, then the peak emission shall also be measured with instrumentation properly adjusted for such factors as pulse desensitization to ensure the peak emission is less than 20 dB above the average limit.

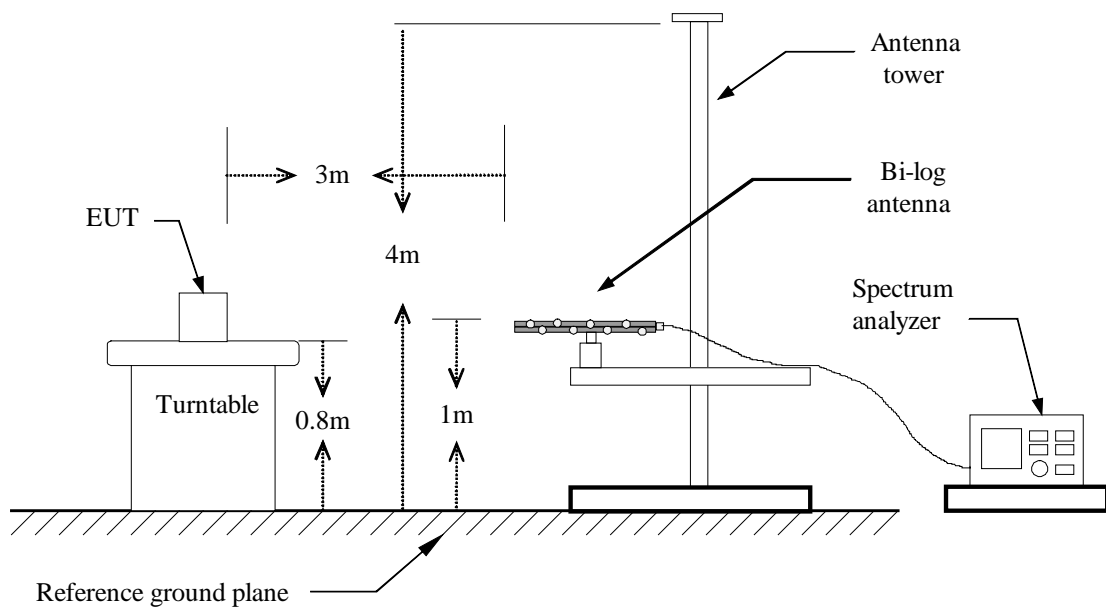
**Note:** Transmitting devices are not permitted in restricted frequency bands unless stated otherwise in the specific RSS.

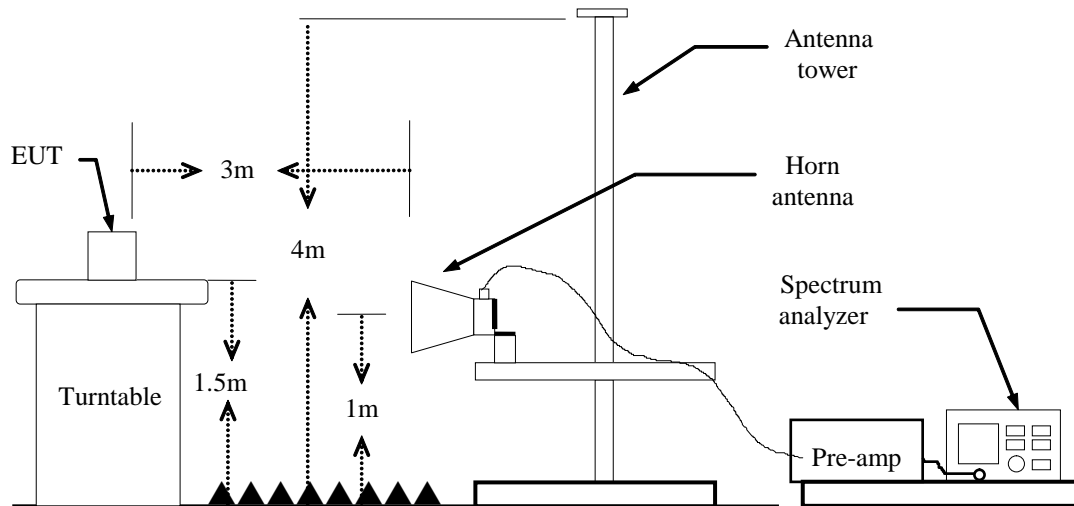
**Test Configuration**

**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

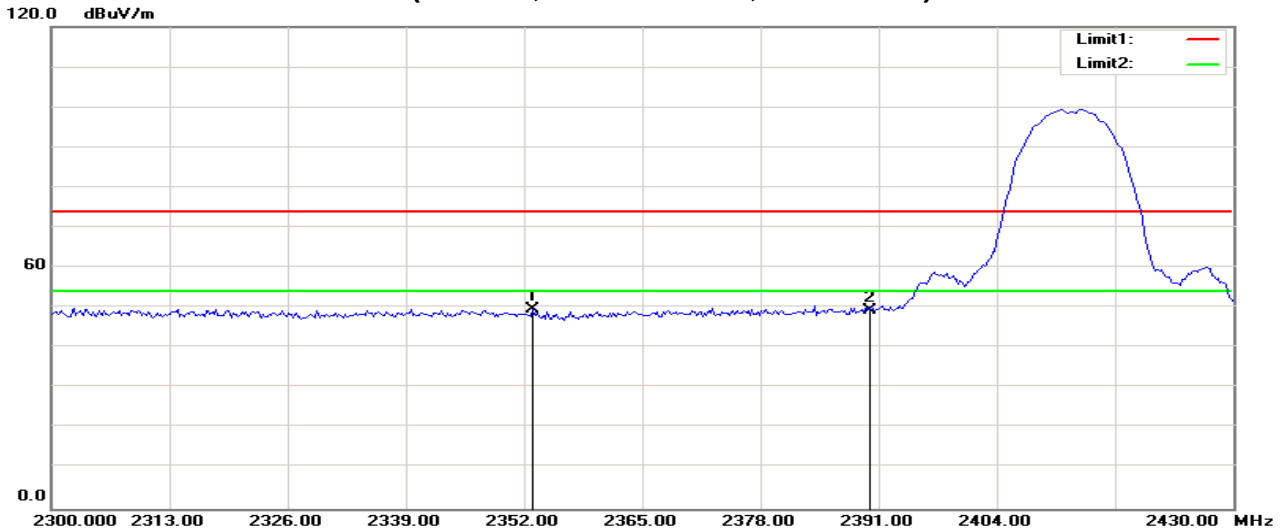
VBW=10Hz, when duty cycle is no less than 98 percent.

VBW  $\geq 1/T$ , 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 maximum power control level for the tested mode of operation.

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

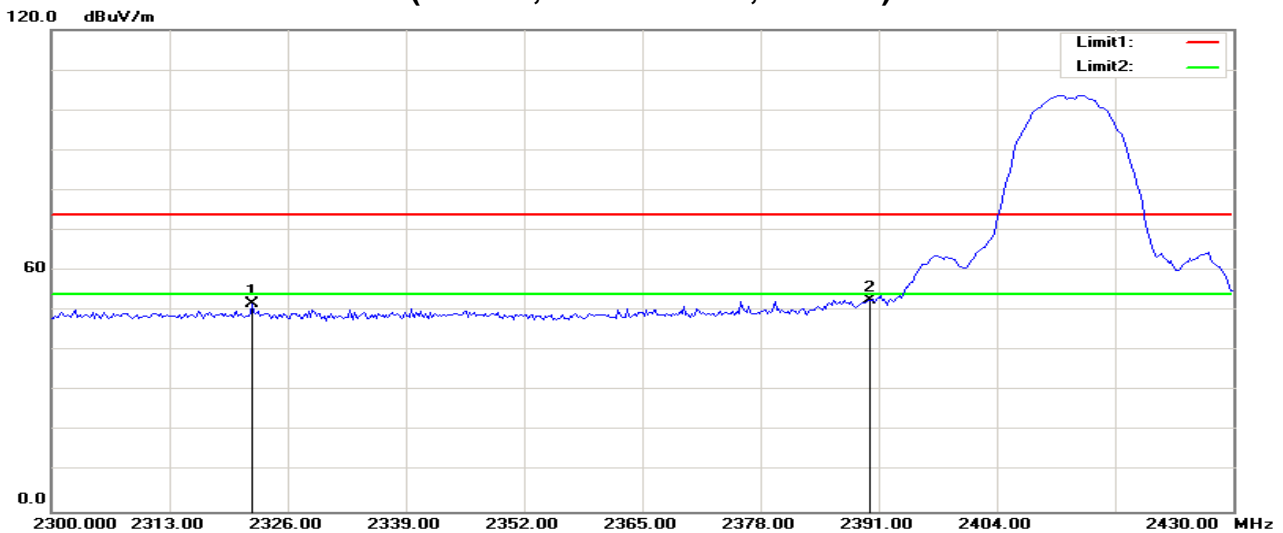
**TEST RESULTS**

### RESTRICTED BANDEDGE (b Mode, Low Channel, Horizontal)



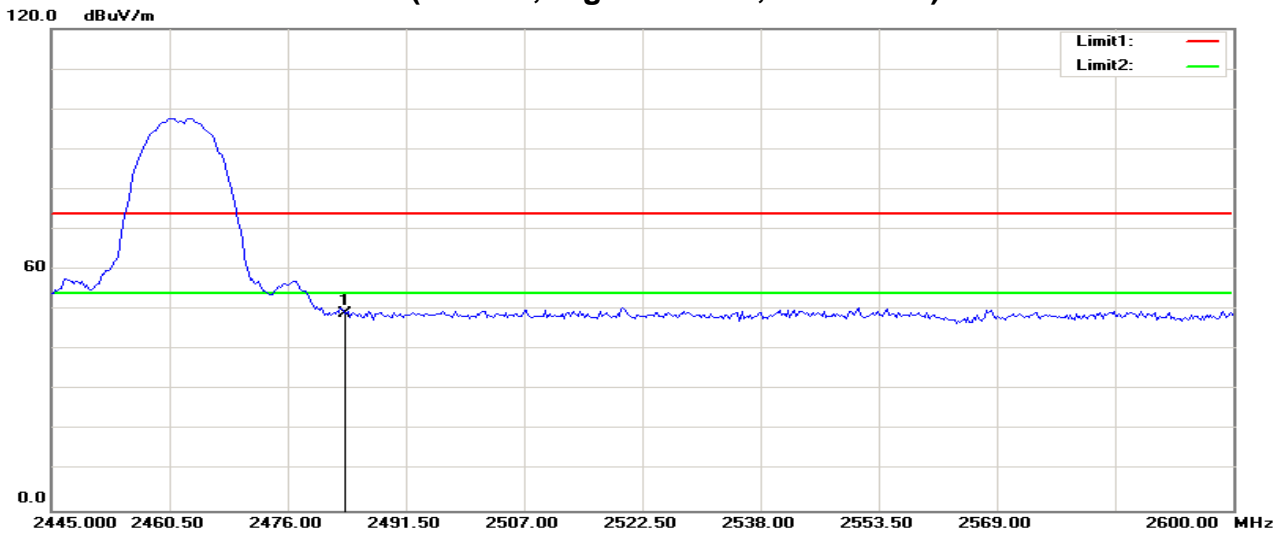
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	2352.917	57.41	-7.70	49.71	74.00	-24.29	100	179	peak
2	2390.000	57.05	-7.57	49.48	74.00	-24.52	100	117	peak

### RESTRICTED BANDEDGE (b Mode, Low Channel, Vertical)



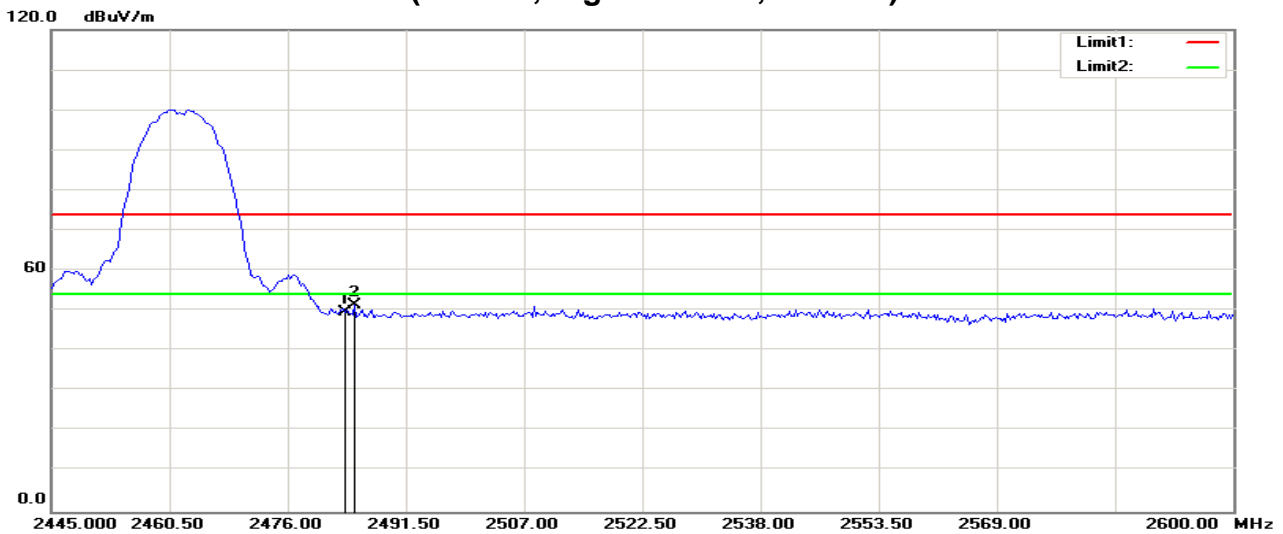
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	2322.083	59.56	-7.80	51.76	74.00	-22.24	200	173	peak
2	2390.000	60.12	-7.57	52.55	74.00	-21.45	100	181	peak

### RESTRICTED BANDEDGE (b Mode, High Channel, Horizontal)



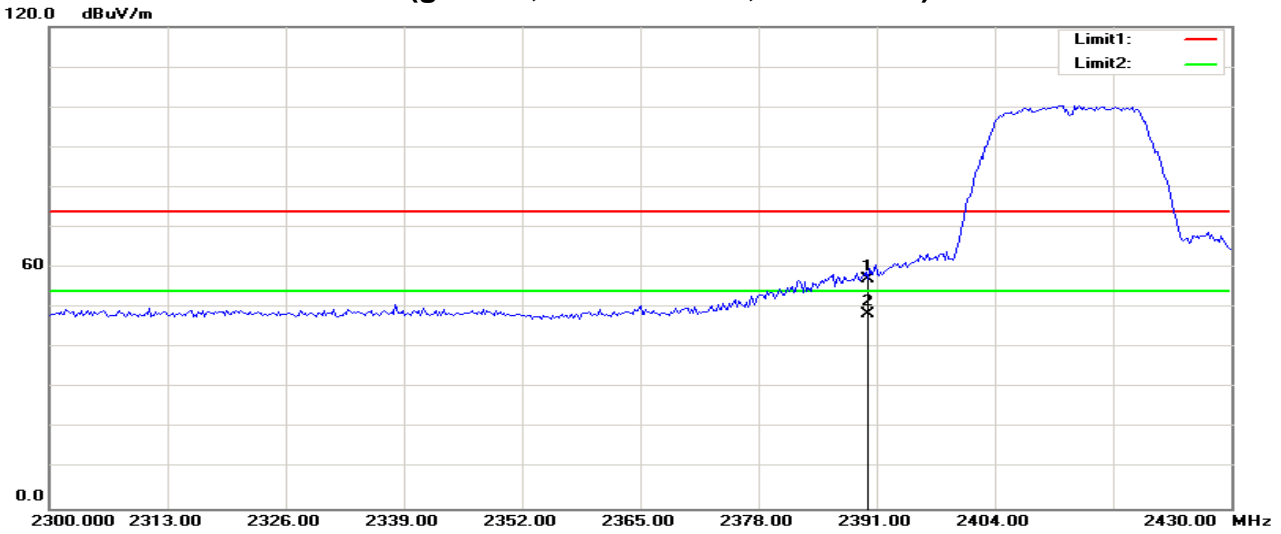
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	2483.500	56.32	-7.26	49.06	74.00	-24.94	100	136	peak

### RESTRICTED BANDEDGE (b Mode, High Channel, Vertical)



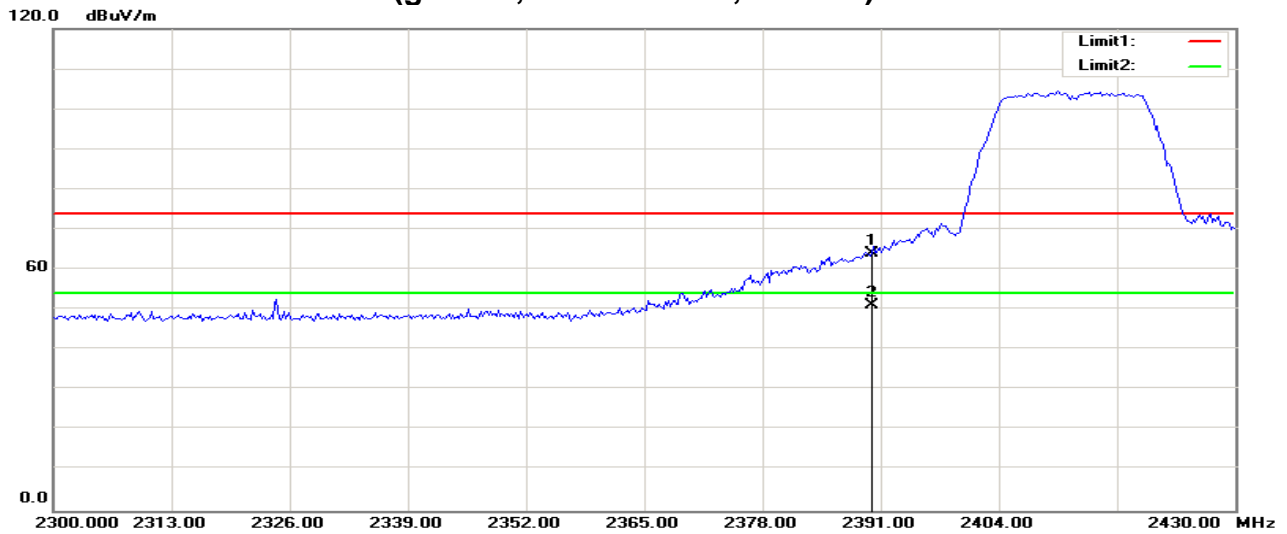
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	2483.500	56.82	-7.26	49.56	74.00	-24.44	100	207	peak
2	2484.744	58.81	-7.26	51.55	74.00	-22.45	100	195	peak

### RESTRICTED BANDEDGE (g Mode, Low Channel, Horizontal)



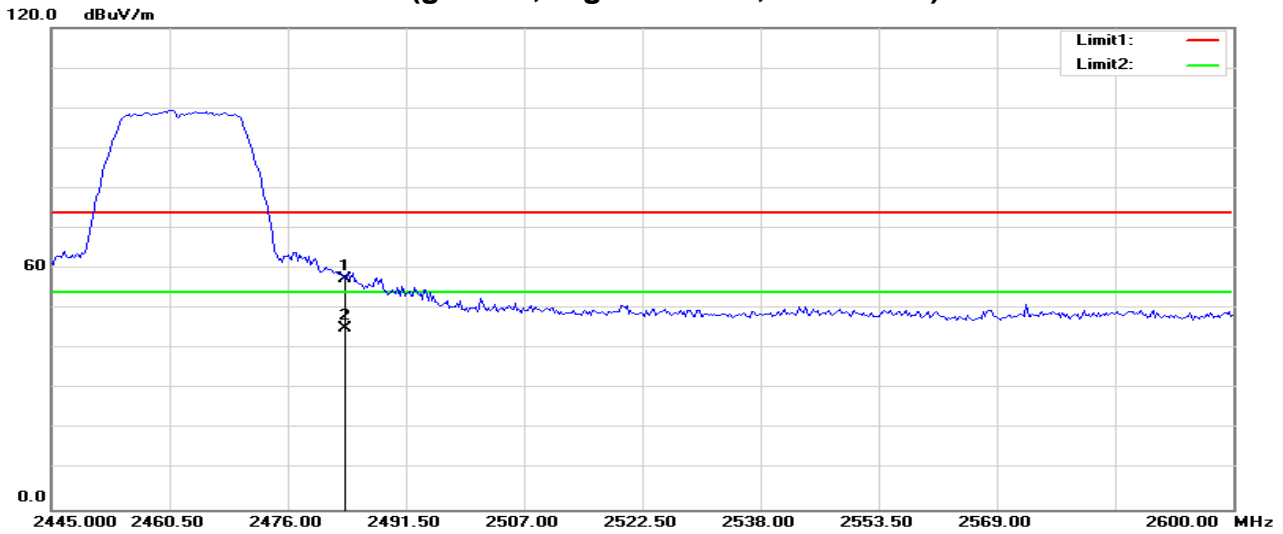
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	2390.000	64.82	-7.57	57.25	74.00	-16.75	100	128	peak
2	2390.000	56.15	-7.57	48.58	54.00	-5.42	100	28	AVG

### RESTRICTED BANDEDGE (g Mode, Low Channel, Vertical)



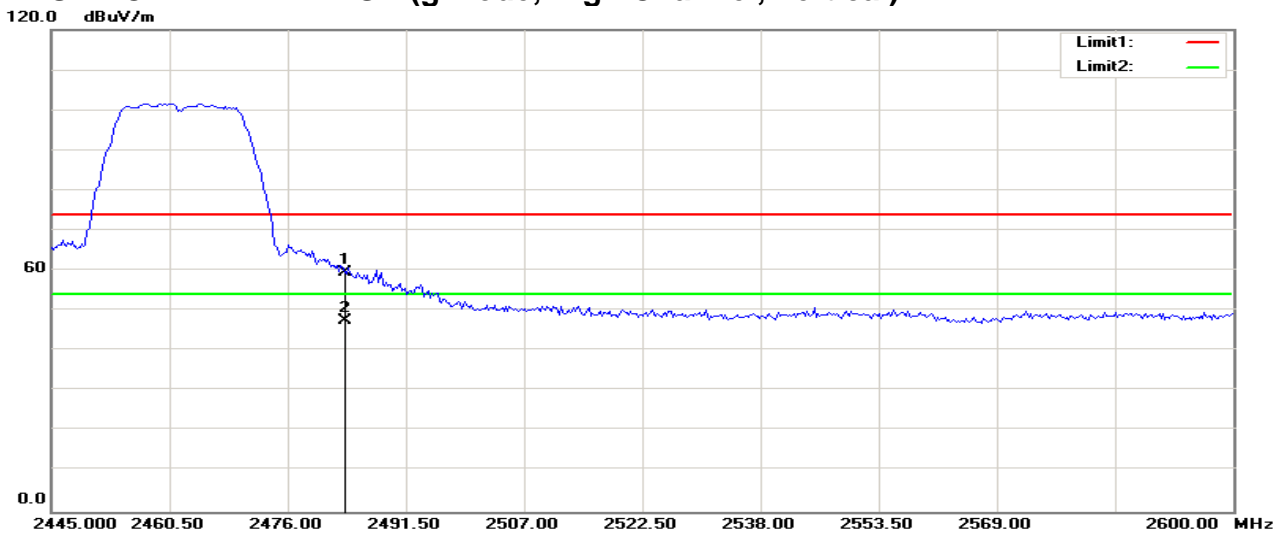
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	2390.000	71.65	-7.57	64.08	74.00	-9.92	100	175	peak
2	2390.000	58.80	-7.57	51.23	54.00	-2.77	100	172	AVG

### RESTRICTED BANDEDGE (g Mode, High Channel, Horizontal)



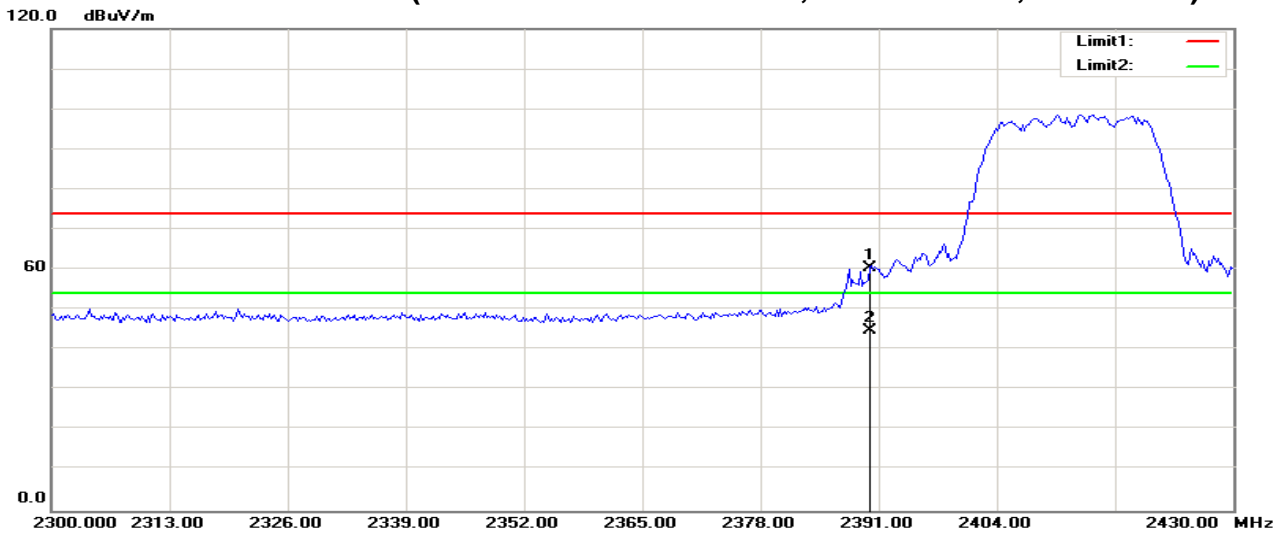
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	2483.500	64.61	-7.26	57.35	74.00	-16.65	100	110	peak
2	2483.500	52.44	-7.26	45.18	54.00	-8.82	100	166	AVG

### RESTRICTED BANDEDGE (g Mode, High Channel, Vertical)



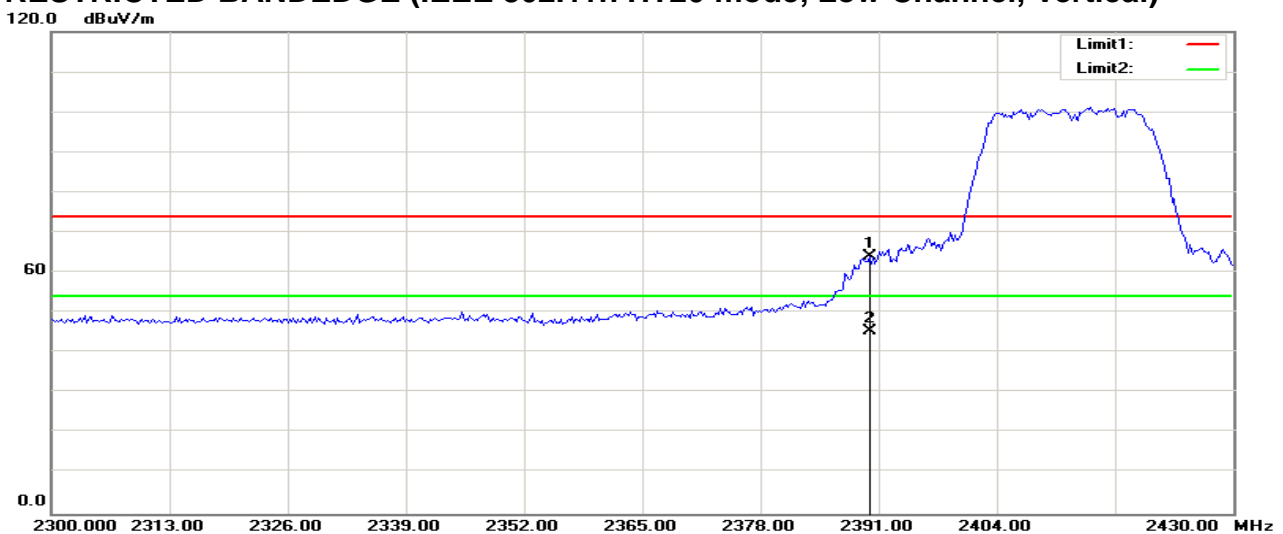
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	2483.500	66.93	-7.26	59.67	74.00	-14.33	100	177	peak
2	2483.500	54.88	-7.26	47.62	54.00	-6.38	100	171	AVG

### RESTRICTED BANDEDGE (IEEE 802.11n HT20 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	2390.000	67.90	-7.57	60.33	74.00	-13.67	100	349	peak
2	2390.000	52.44	-7.57	44.87	54.00	-9.13	100	350	AVG

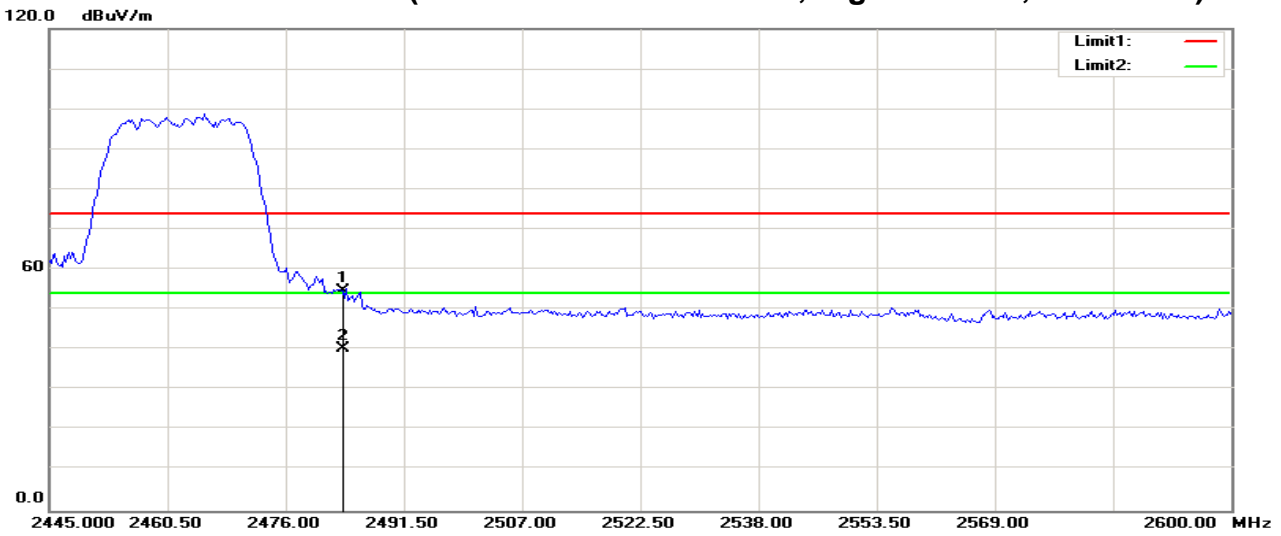
### RESTRICTED BANDEDGE (IEEE 802.11n HT20 mode, Low Channel, Vertical)



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	2390.000	71.58	-7.57	64.01	74.00	-9.99	100	201	peak
2	2390.000	52.96	-7.57	45.39	54.00	-8.61	100	204	AVG

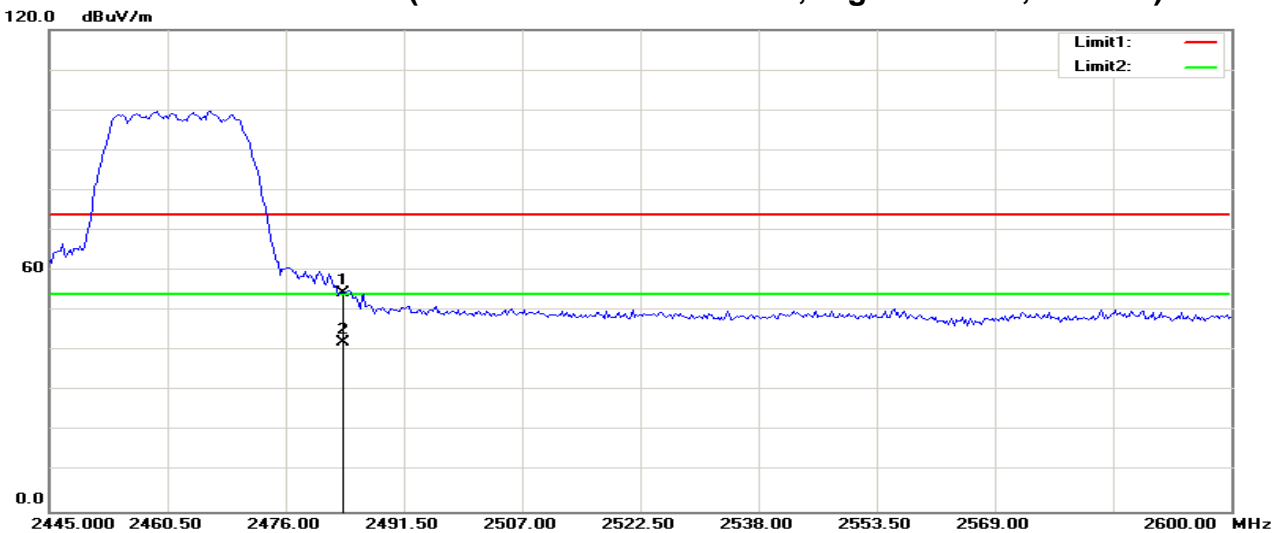


### RESTRICTED BANDEDGE (IEEE 802.11n HT20 mode, High Channel, Horizontal)



N o.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	2483.500	61.87	-7.26	54.61	74.00	-19.39	100	127	peak
2	2483.500	47.71	-7.26	40.45	54.00	-13.55	100	159	AVG

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



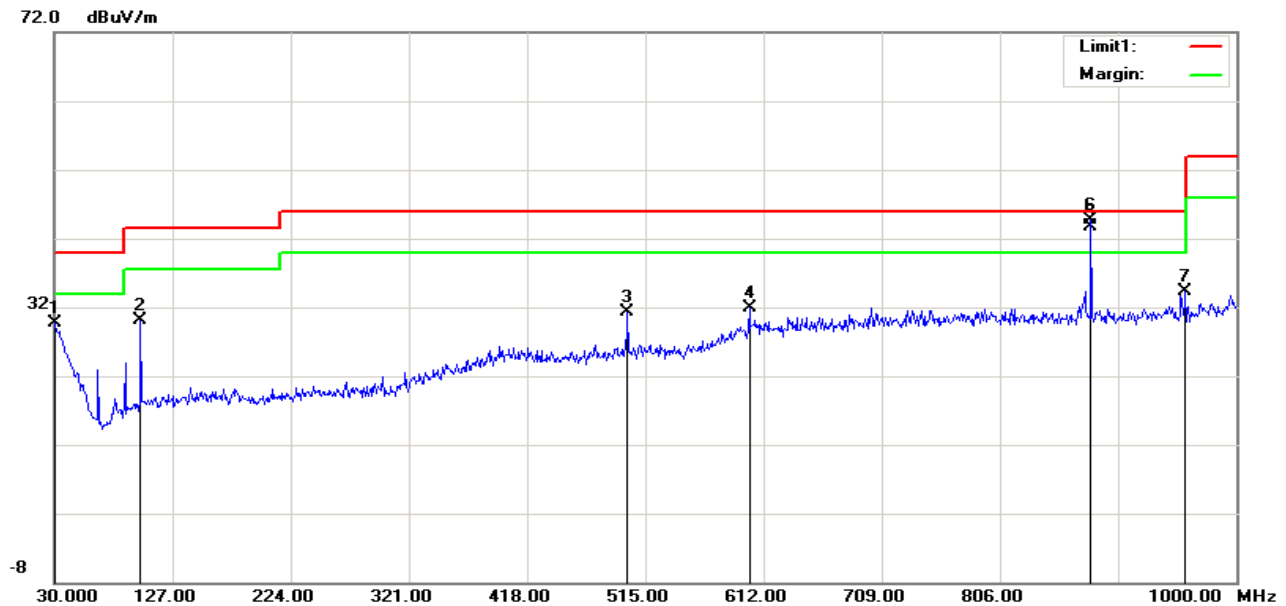
No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	2483.500	61.79	-7.26	54.53	74.00	-19.47	100	193	peak
2	2483.500	49.47	-7.26	42.21	54.00	-11.79	100	191	AVG

### Test Result of Radiated Emission

Below 30MHz and above 18GHz. The measured value have enough margin over 20dB than the limit, therefore they are not reported.

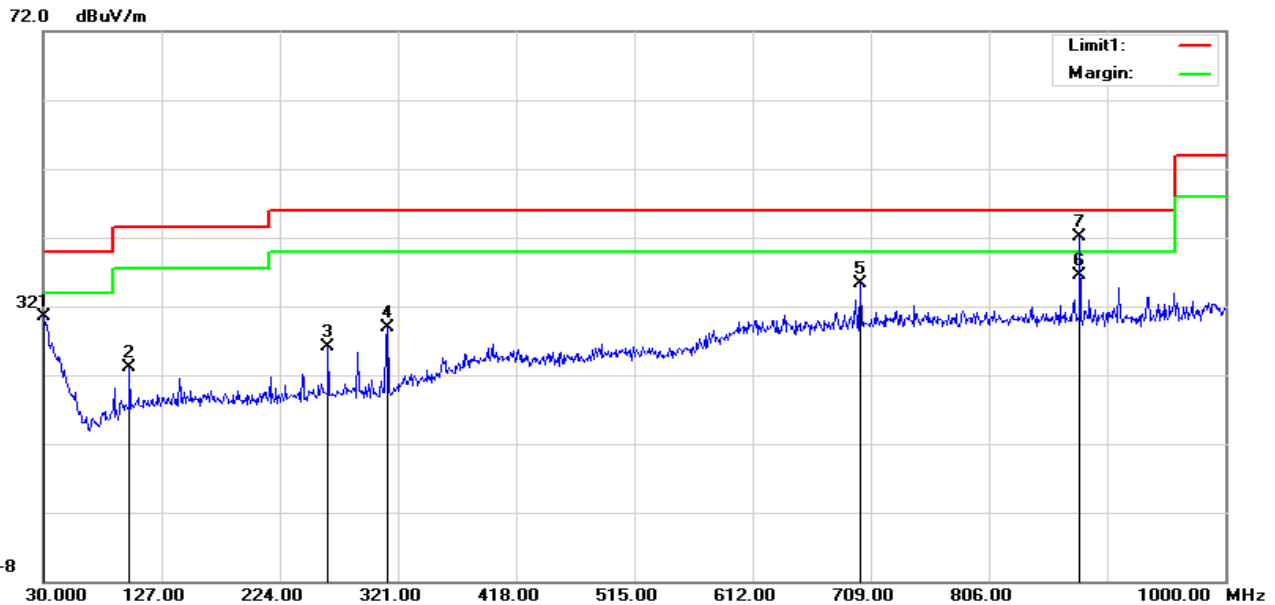
### 30MHz-1GHz

<b>Operation Mode:</b>	Normal Link	<b>Test Date:</b>	2018-3-19
<b>Temperature:</b>	25°C	<b>Tested by:</b>	Lily.Wang
<b>Humidity:</b>	48% RH	<b>Polarity:</b>	Hor.



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	30.9700	6.25	23.45	29.70	40.00	-10.30	100	340	peak
2	100.8100	16.63	13.54	30.17	43.50	-13.33	100	142	peak
3	500.4500	9.59	21.80	31.39	46.00	-14.61	100	227	peak
4	600.3600	7.28	24.67	31.95	46.00	-14.05	100	111	peak
5	879.8980	17.31	26.35	43.66	46.00	-2.34	100	237	QP
6	880.6900	18.41	26.35	44.76	46.00	-1.24	100	326	peak
7	958.2900	7.36	26.86	34.22	46.00	-11.78	100	325	peak

<b>Operation Mode:</b>	Normal Link	<b>Test Date:</b>	2018-3-19
<b>Temperature:</b>	25°C	<b>Tested by:</b>	Lily.Wang
<b>Humidity:</b>	48% RH	<b>Polarity:</b>	Ver.



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	30.9700	7.00	23.45	30.45	40.00	-9.55	100	87	peak
2	100.8100	9.58	13.54	23.12	43.50	-20.38	200	337	peak
3	263.7700	10.63	15.48	26.11	46.00	-19.89	100	48	peak
4	312.2700	12.36	16.62	28.98	46.00	-17.02	100	95	peak
5	700.2700	9.88	25.52	35.40	46.00	-10.60	100	48	peak
6	879.8630	10.10	26.35	36.45	46.00	-9.55	100	5	QP
7	880.6900	15.67	26.35	42.02	46.00	-3.98	100	56	peak

**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: 2018-3-19

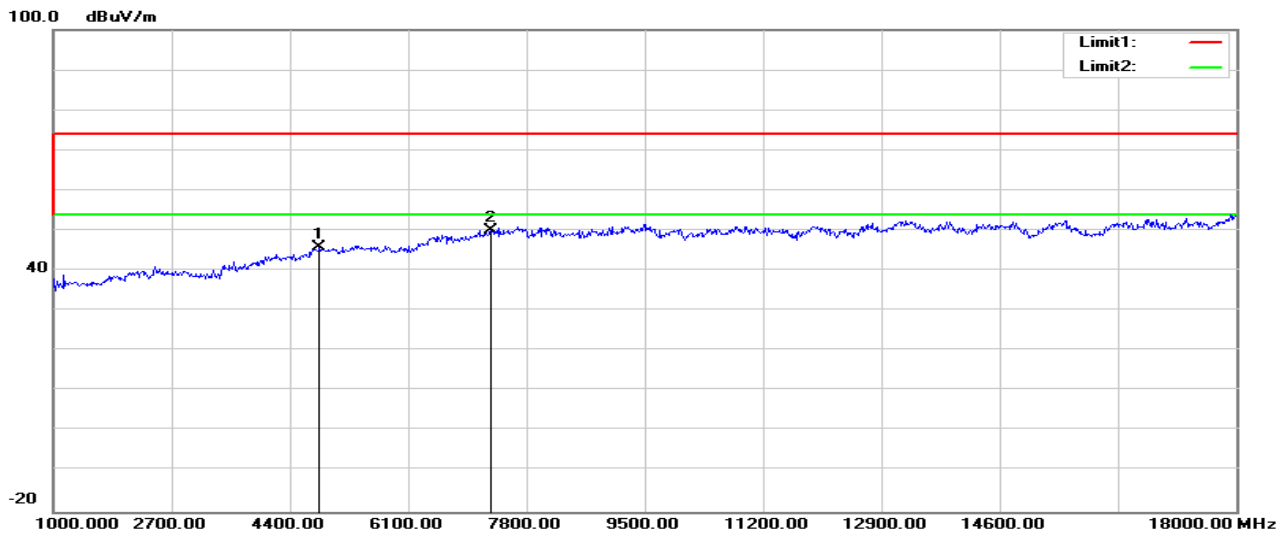
Temperature: 24°C

Tested by: Lily.Wang

Humidity: 48 % RH

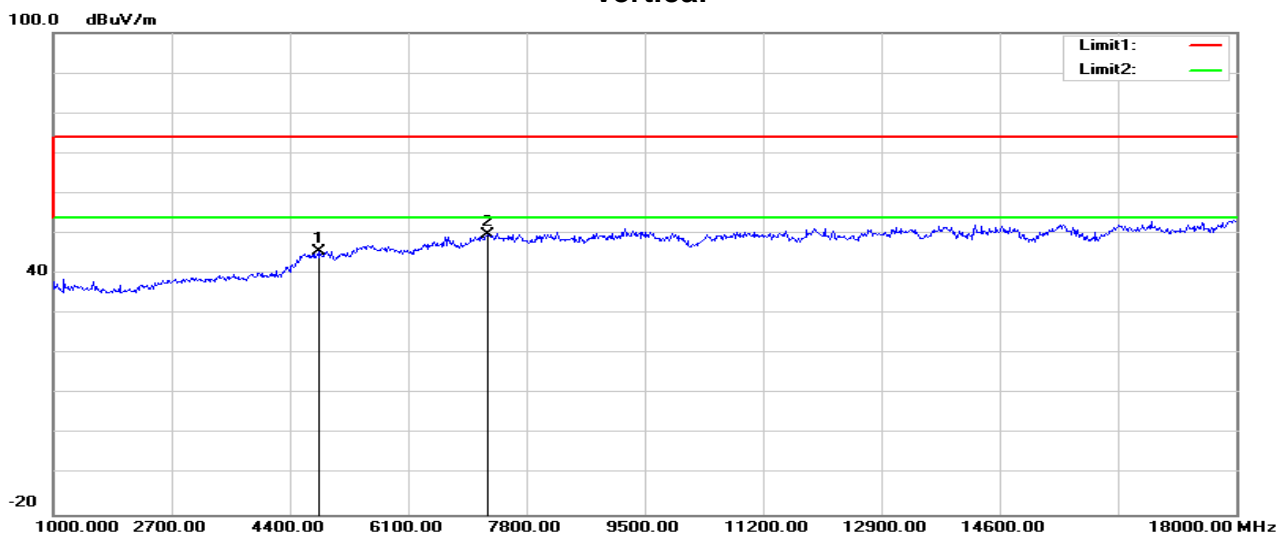
Polarity: Ver. / Hor.

### Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	4825.000	46.25	-0.28	45.97	74.00	-28.03	100	102	peak
2	7290.000	44.84	5.34	50.18	74.00	-23.82	100	161	peak

### Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	4825.000	45.93	-0.28	45.65	74.00	-28.35	100	174	peak
2	7239.000	44.55	5.16	49.71	74.00	-24.29	100	283	peak

**Operation Mode:** TX / IEEE 802.11b / CH Mid

**Test Date:** 2018-3-19

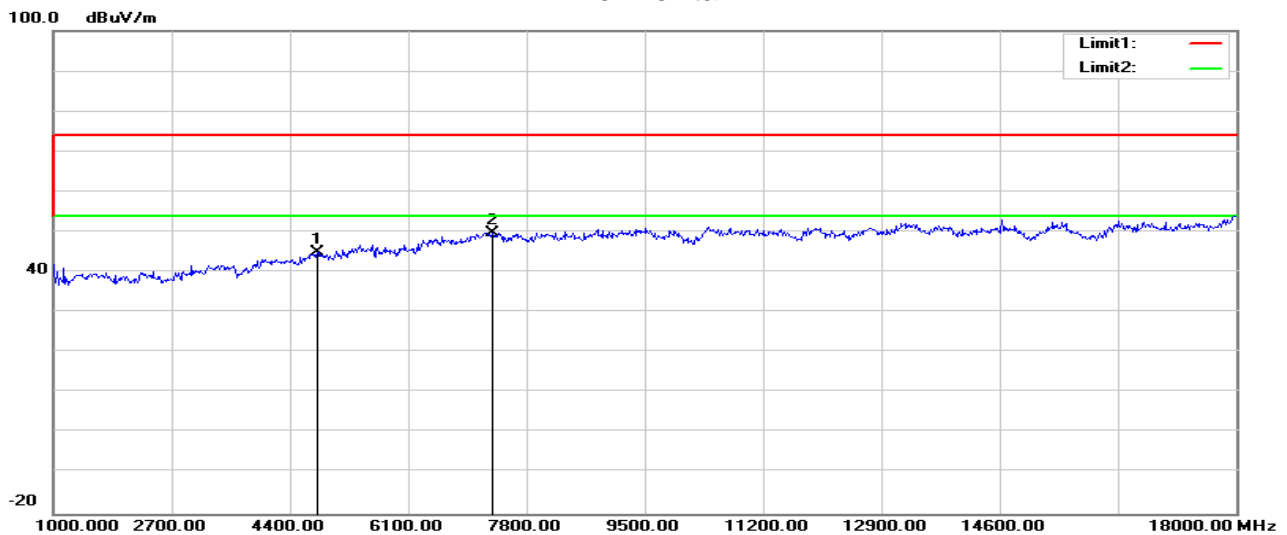
**Temperature:** 24°C

**Tested by:** Lily.Wang

**Humidity:** 48 % RH

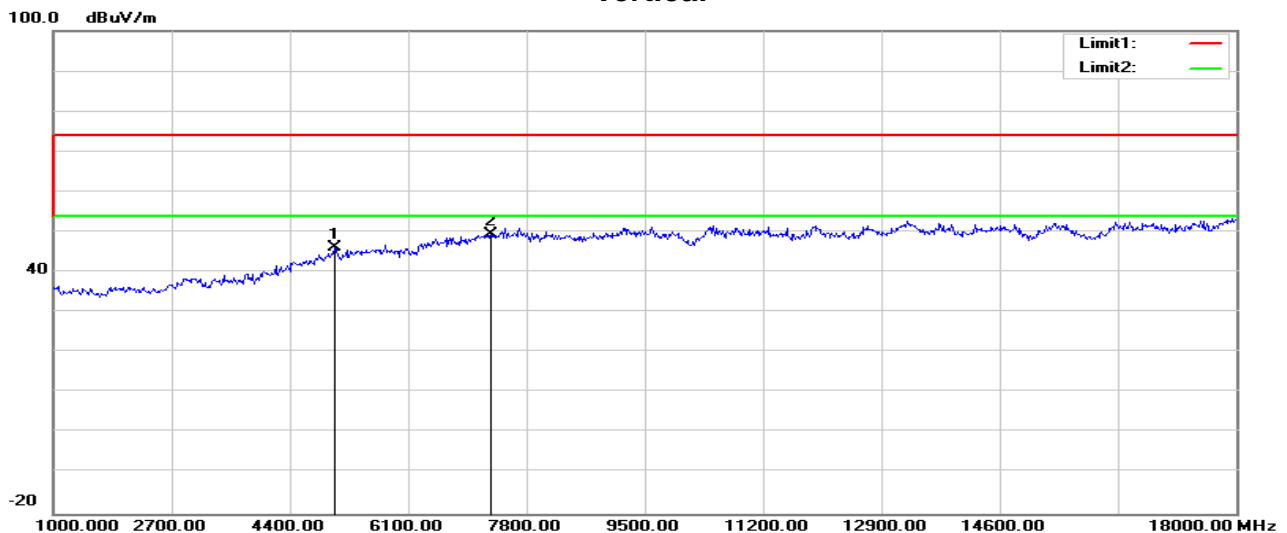
**Polarity:** Ver. / Hor.

### Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	4791.000	45.31	-0.41	44.90	74.00	-29.10	100	136	peak
2	7307.000	44.32	5.40	49.72	74.00	-24.28	100	33	peak

### Vertical

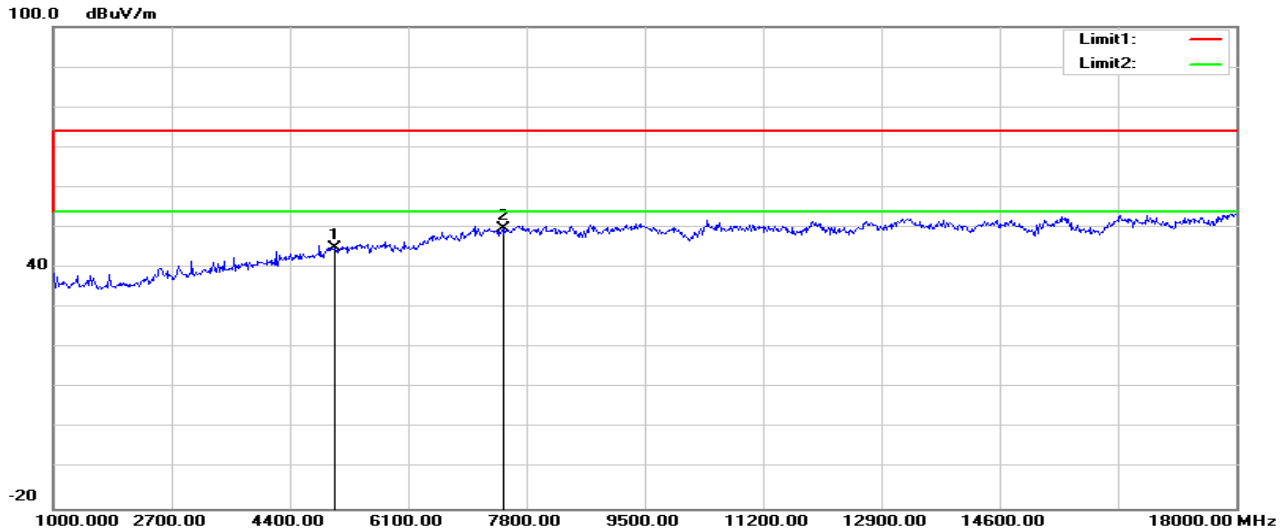


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	5046.000	45.91	0.36	46.27	74.00	-27.73	100	0	peak
2	7290.000	44.17	5.34	49.51	74.00	-24.49	100	44	peak

**Operation Mode:** TX / IEEE 802.11b / CH High  
**Temperature:** 24°C  
**Humidity:** 48 % RH

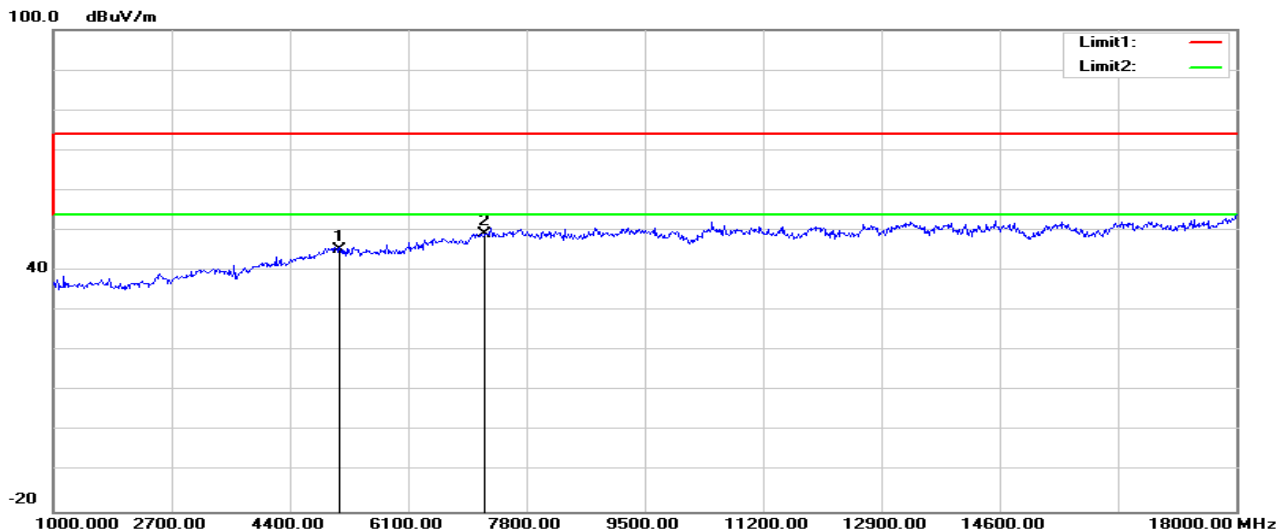
**Test Date:** 2018-3-19  
**Tested by:** Lily.Wang  
**Polarity:** Ver. / Hor.

### Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	5046.000	44.55	0.36	44.91	74.00	-29.09	100	75	peak
2	7460.000	43.82	5.95	49.77	74.00	-24.23	100	15	peak

### Vertical

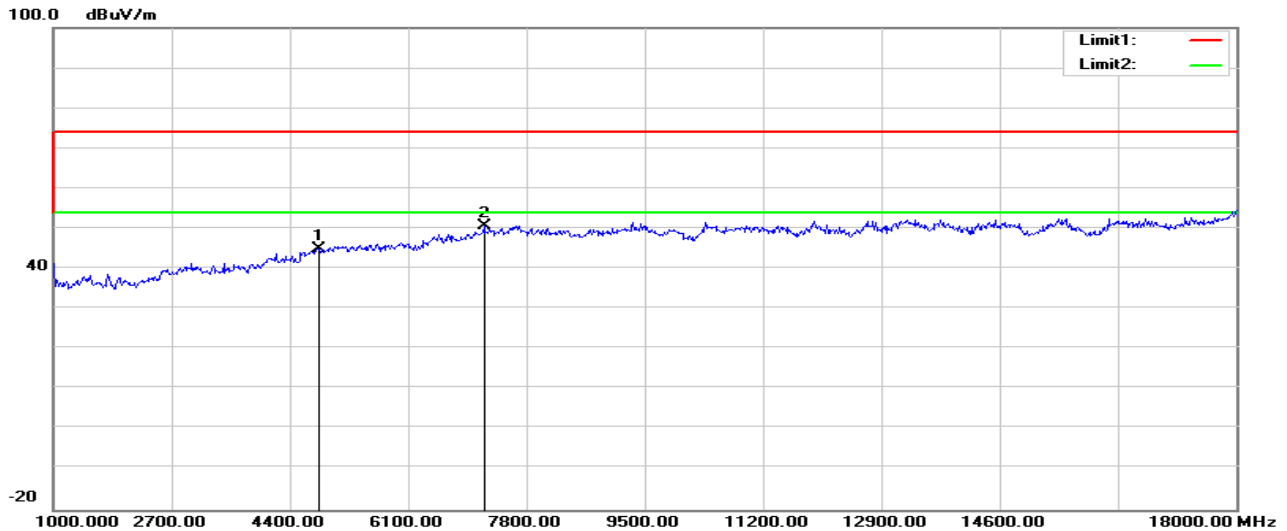


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	5114.000	45.00	0.33	45.33	74.00	-28.67	100	143	peak
2	7205.000	44.13	5.04	49.17	74.00	-24.83	100	88	peak

**Operation Mode:** TX / IEEE 802.11g / CH Low  
**Temperature:** 24°C  
**Humidity:** 48 % RH

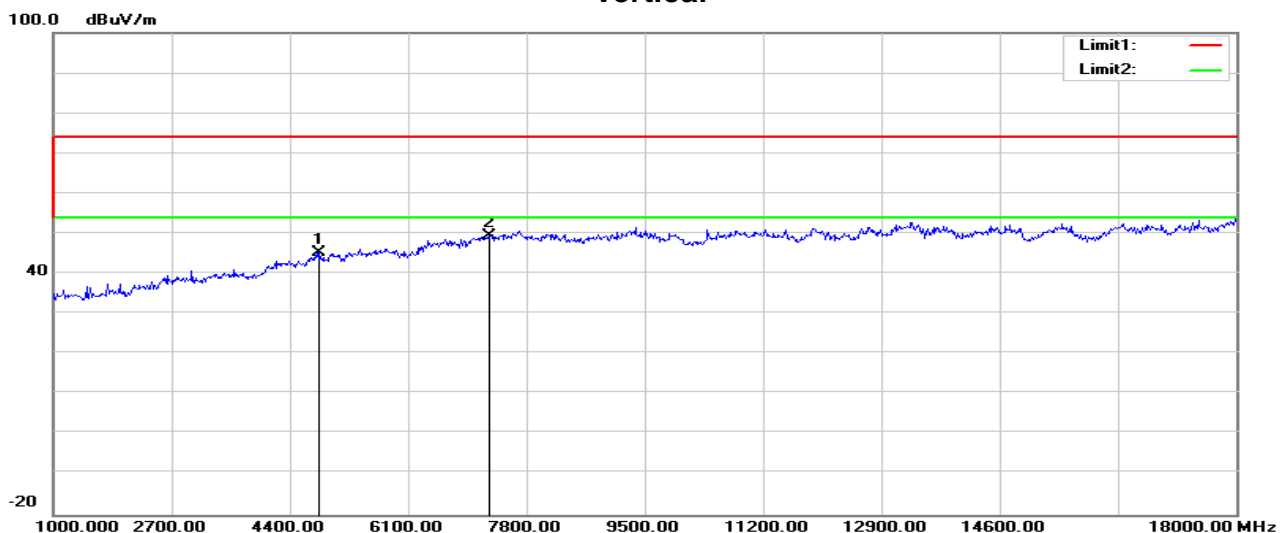
**Test Date:** 2018-3-19  
**Tested by:** Lily.Wang  
**Polarity:** Ver. / Hor.

### Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	4825.000	45.27	-0.28	44.99	74.00	-29.01	100	214	peak
2	7188.000	45.53	4.98	50.51	74.00	-23.49	100	235	peak

### Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	4825.000	45.67	-0.28	45.39	74.00	-28.61	100	200	peak
2	7256.000	44.14	5.22	49.36	74.00	-24.64	100	170	peak

**Operation Mode:** TX / IEEE 802.11g / CH Mid

**Test Date:** 2018-3-19

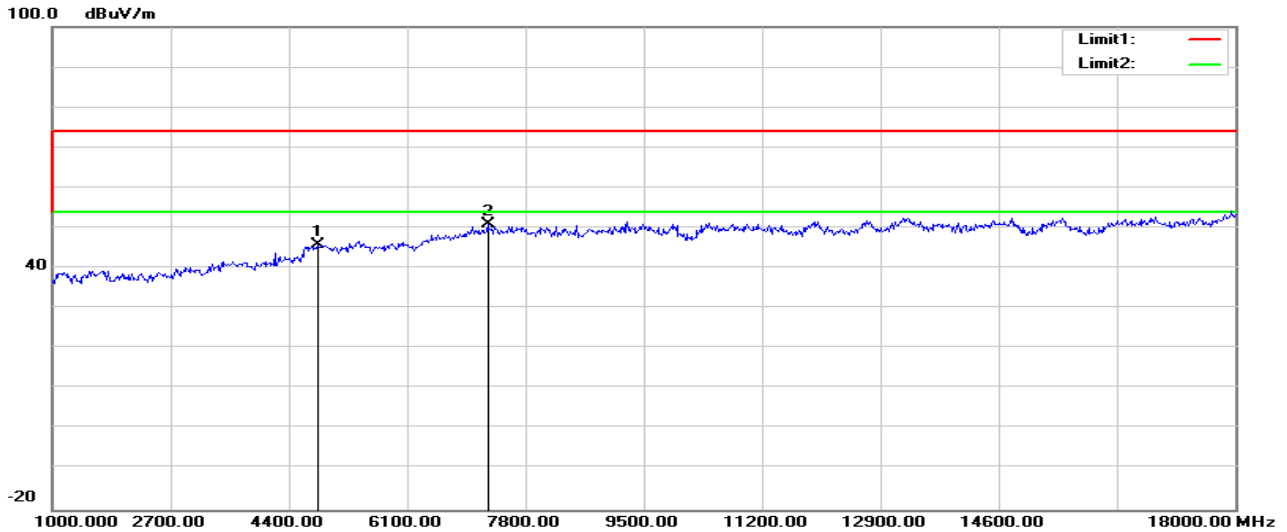
**Temperature:** 24°C

**Tested by:** Lily.Wang

**Humidity:** 48 % RH

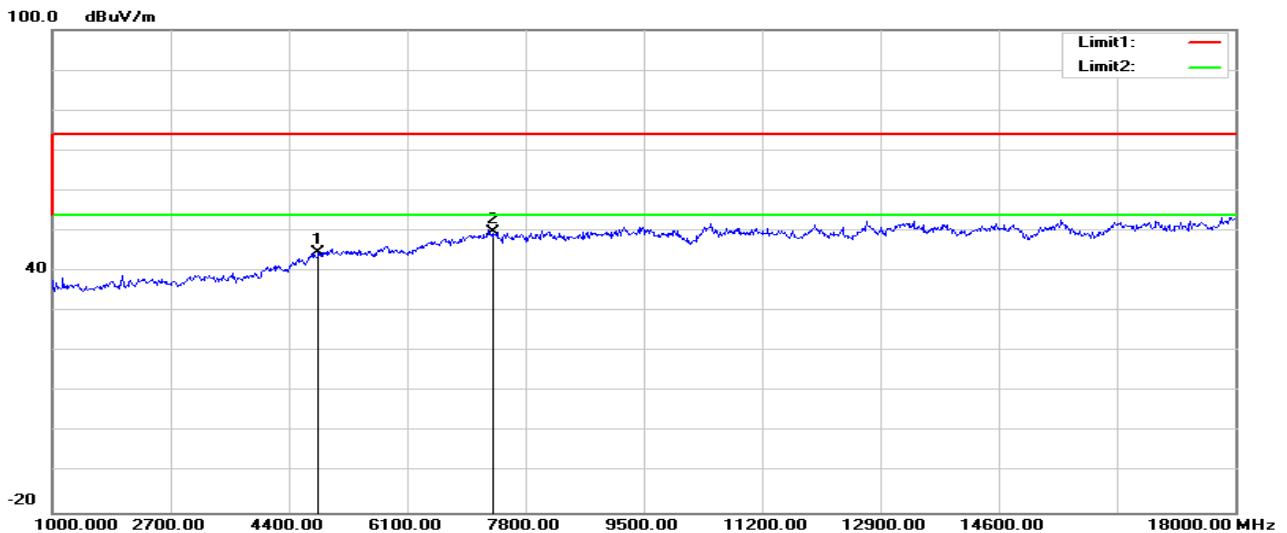
**Polarity:** Ver. / Hor.

### Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	4825.000	46.00	-0.28	45.72	74.00	-28.28	100	251	peak
2	7256.000	45.67	5.22	50.89	74.00	-23.11	100	62	peak

### Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	4825.000	44.93	-0.28	44.65	74.00	-29.35	100	235	peak
2	7324.000	44.14	5.46	49.60	74.00	-24.40	100	313	peak



**Operation Mode:** TX / IEEE 802.11g / CH High

**Test Date:** 2018-3-19

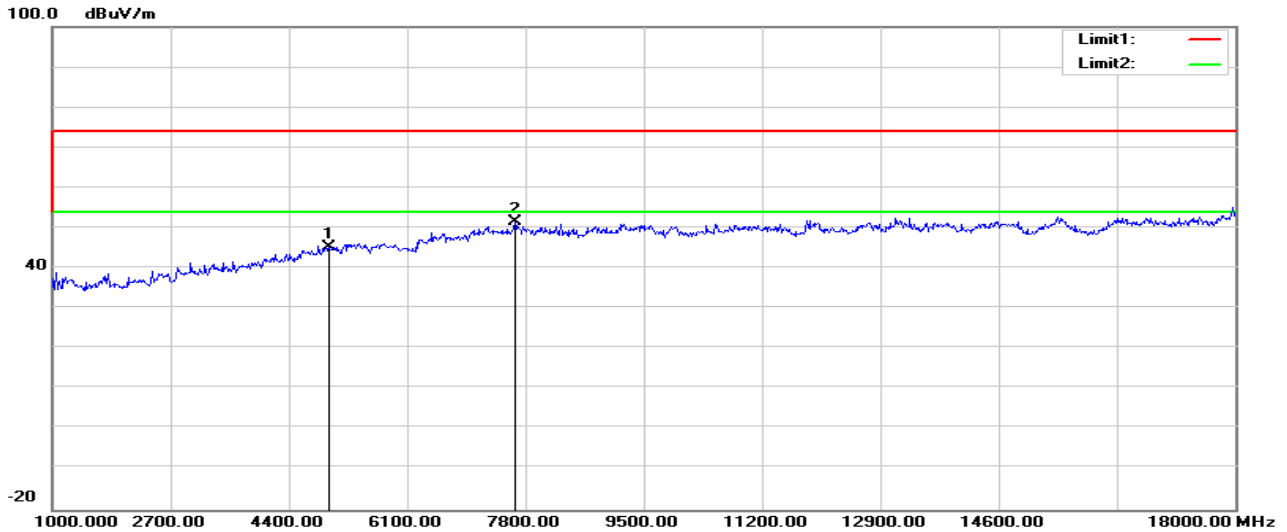
**Temperature:** 24°C

**Tested by:** Lily.Wang

**Humidity:** 48 % RH

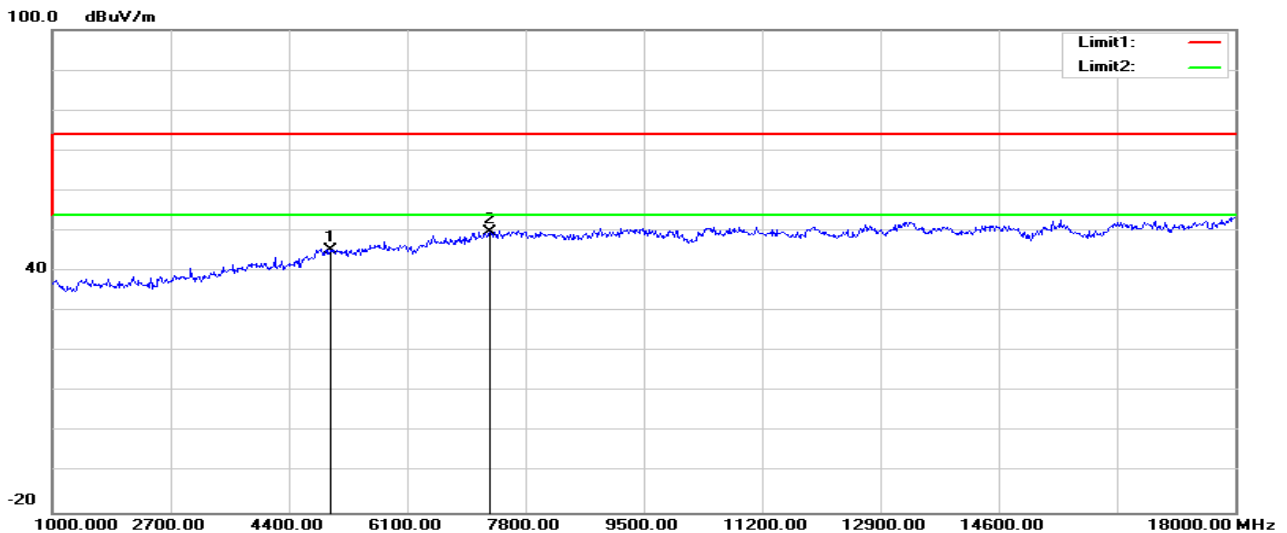
**Polarity:** Ver. / Hor.

### Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	4978.000	45.06	0.29	45.35	74.00	-28.65	100	92	peak
2	7647.000	45.48	6.00	51.48	74.00	-22.52	100	327	peak

### Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	4995.000	45.01	0.35	45.36	74.00	-28.64	100	226	peak
2	7290.000	44.37	5.34	49.71	74.00	-24.29	100	230	peak

**Operation Mode:** TX / IEEE 802.11n HT20 mode / CH Low

**Test Date:** 2018-3-19

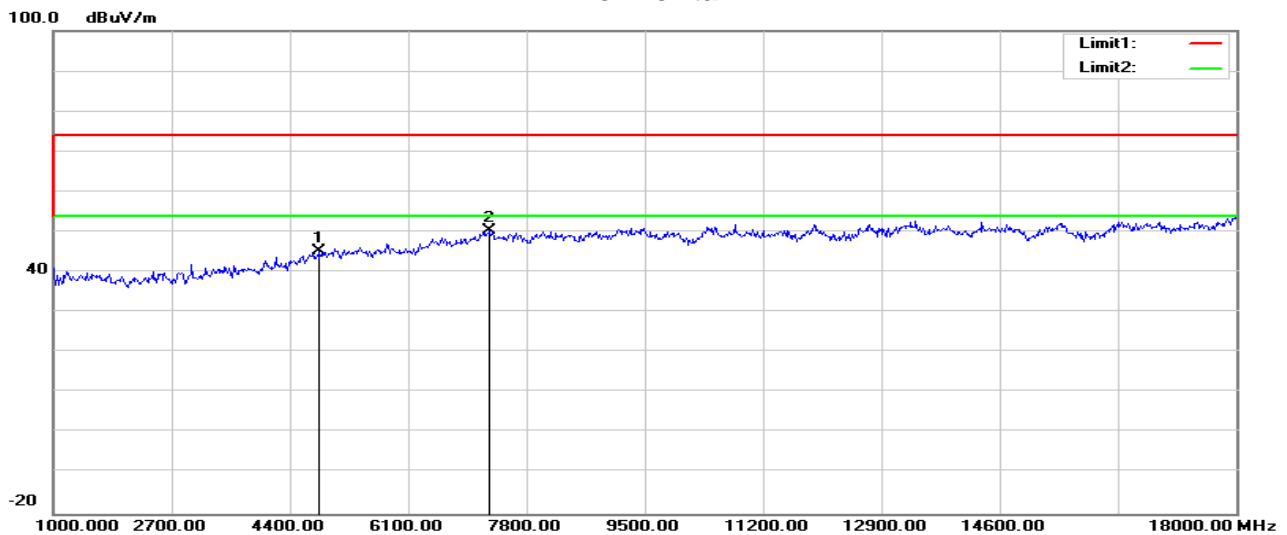
**Temperature:** 24°C

**Tested by:** Lily.Wang

**Humidity:** 48 % RH

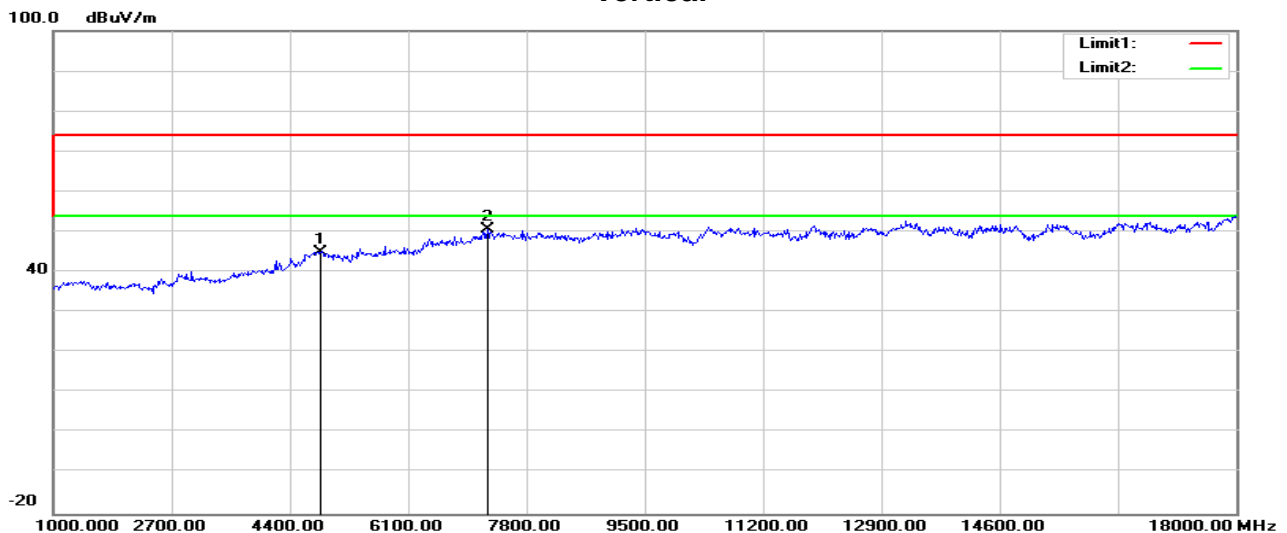
**Polarity:** Ver. / Hor.

### Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	4825.000	45.43	-0.28	45.15	74.00	-28.85	100	157	peak
2	7273.000	45.06	5.28	50.34	74.00	-23.66	100	114	peak

### Vertical

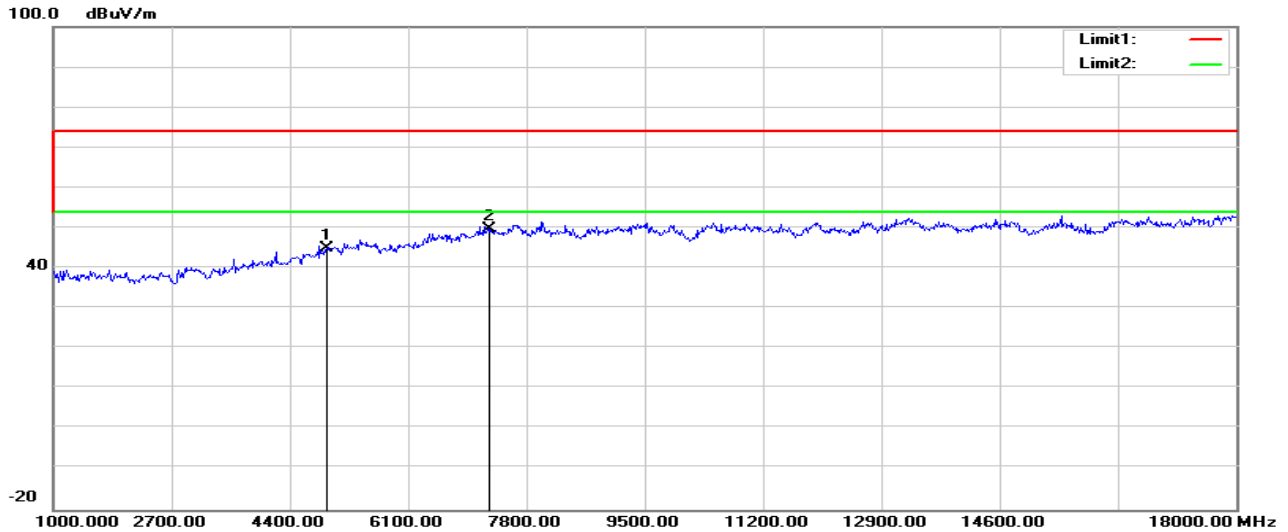


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	4842.000	45.22	-0.22	45.00	74.00	-29.00	100	154	peak
2	7239.000	45.53	5.16	50.69	74.00	-23.31	100	45	peak

**Operation Mode:** TX / IEEE 802.11n HT20 mode / CH Mid  
**Temperature:** 24°C  
**Humidity:** 48 % RH

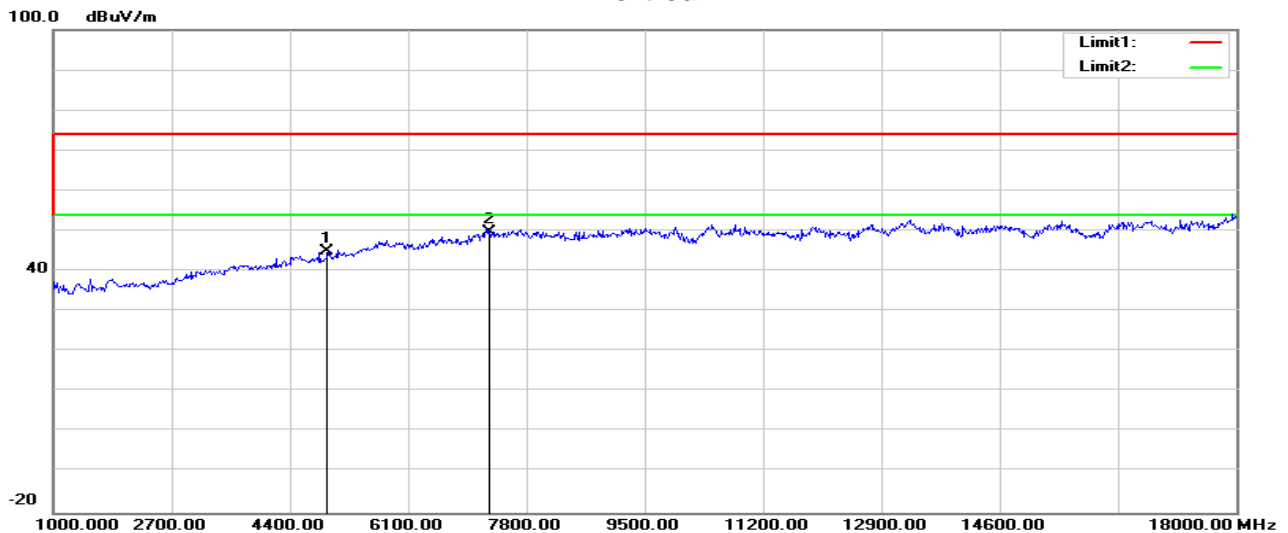
**Test Date:** 2018-3-19  
**Tested by:** Lily.Wang  
**Polarity:** Ver. / Hor.

### Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	4927.000	44.71	0.10	44.81	74.00	-29.19	100	164	peak
2	7273.000	44.43	5.28	49.71	74.00	-24.29	100	342	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	4927.000	44.72	0.10	44.82	74.00	-29.18	100	113	peak
2	7273.000	44.62	5.28	49.90	74.00	-24.10	100	277	peak

**Operation Mode:** TX / IEEE 802.11n HT20 mode / CH High **Test Date:** 2018-3-19

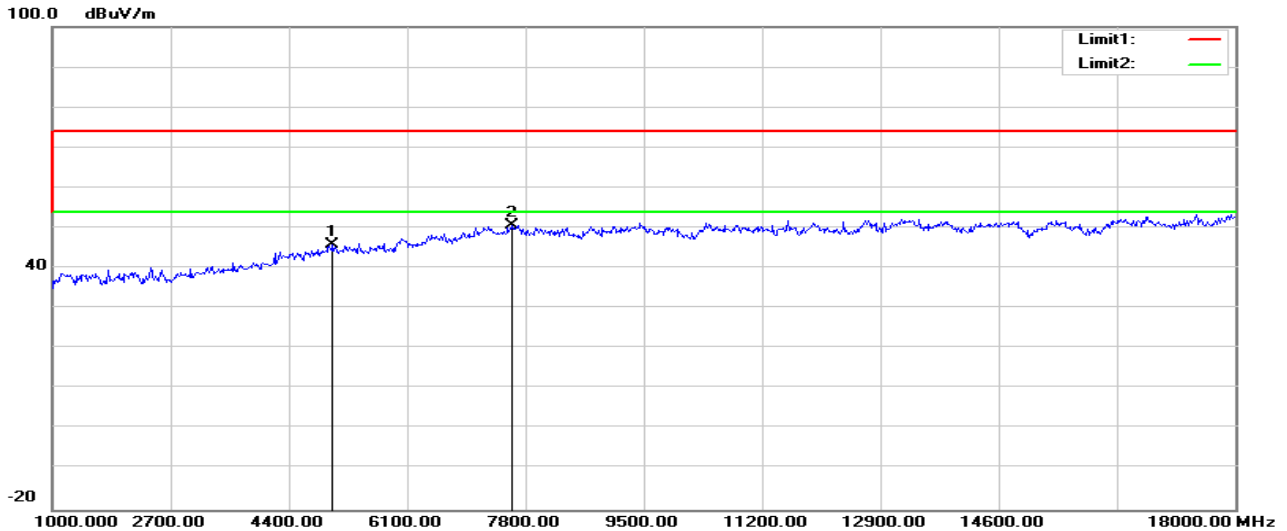
**Temperature:** 24°C

**Tested by:** Lily.Wang

**Humidity:** 48 % RH

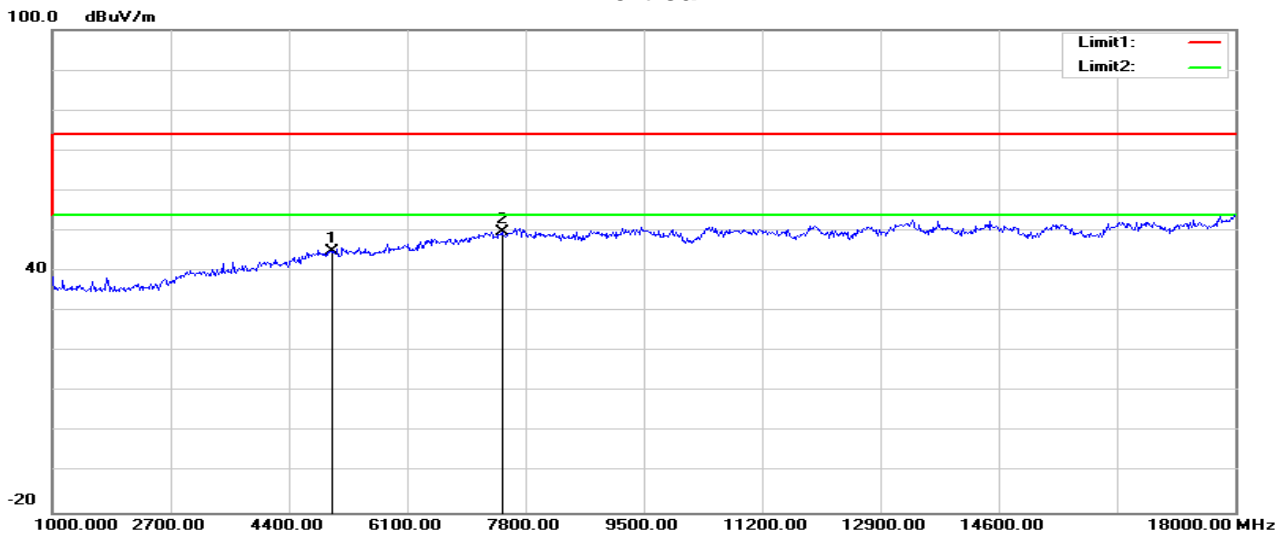
**Polarity:** Ver. / Hor.

### Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	5029.000	45.39	0.36	45.75	74.00	-28.25	100	139	peak
2	7613.000	44.68	6.02	50.70	74.00	-23.30	100	71	peak

### Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	5029.000	44.69	0.36	45.05	74.00	-28.95	100	283	peak
2	7460.000	43.80	5.95	49.75	74.00	-24.25	100	122	peak

## 7.7.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  $\mu$ H/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 (dB $\mu$ V)	
	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.

According to RSS-Gen 8.8, a radio apparatus that is designed to be connected to the public utility (AC) power line shall ensure that the radio frequency voltage, which is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz-30 MHz, shall not exceed the limits in Table below.

Frequency (MHz)	Conducted limit (dB $\mu$ V)	
	Quasi-Peak	Average**
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

\* The level decreases linearly with the logarithm of the frequency.

\*\* A linear average detector is required.

### Test Configuration

See test photographs attached in Setup photo for the actual connections between EUT and support equipment.

### TEST PROCEDURE

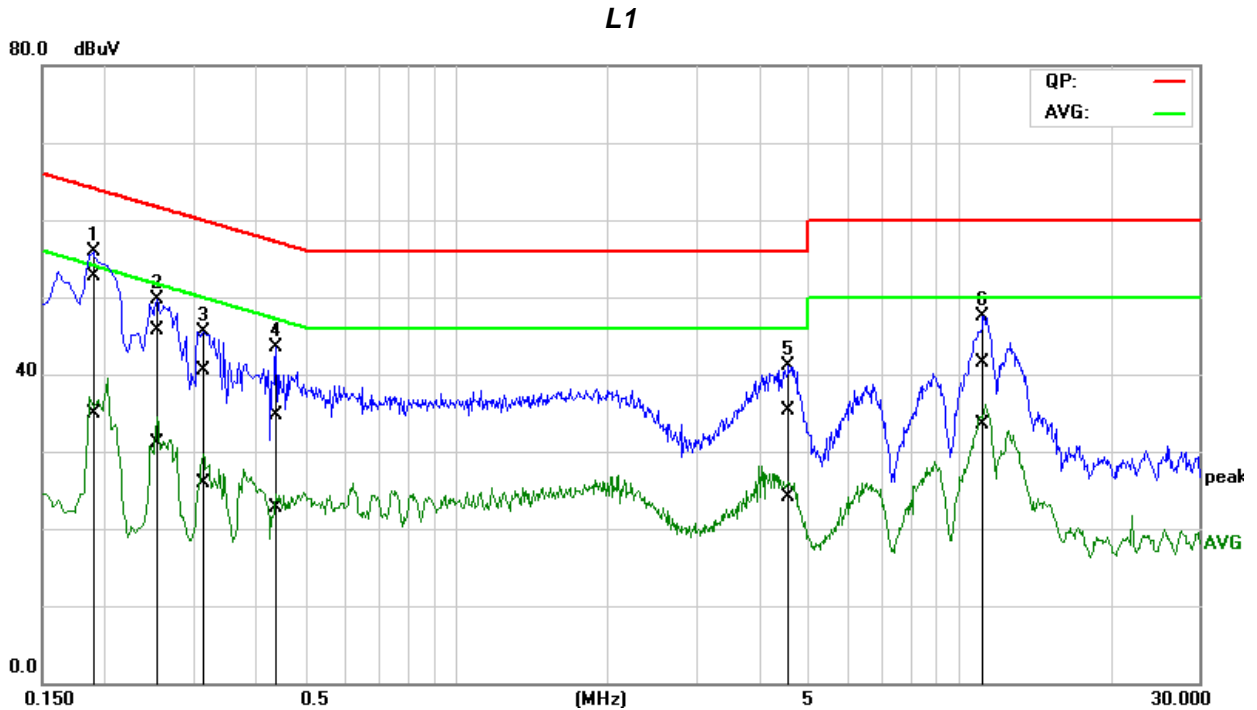
- 1.The EUT was placed on a table, which is 0.8m above ground plane.
- 2.Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 3.Repeat above procedures until all frequency measured were complete.

### 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

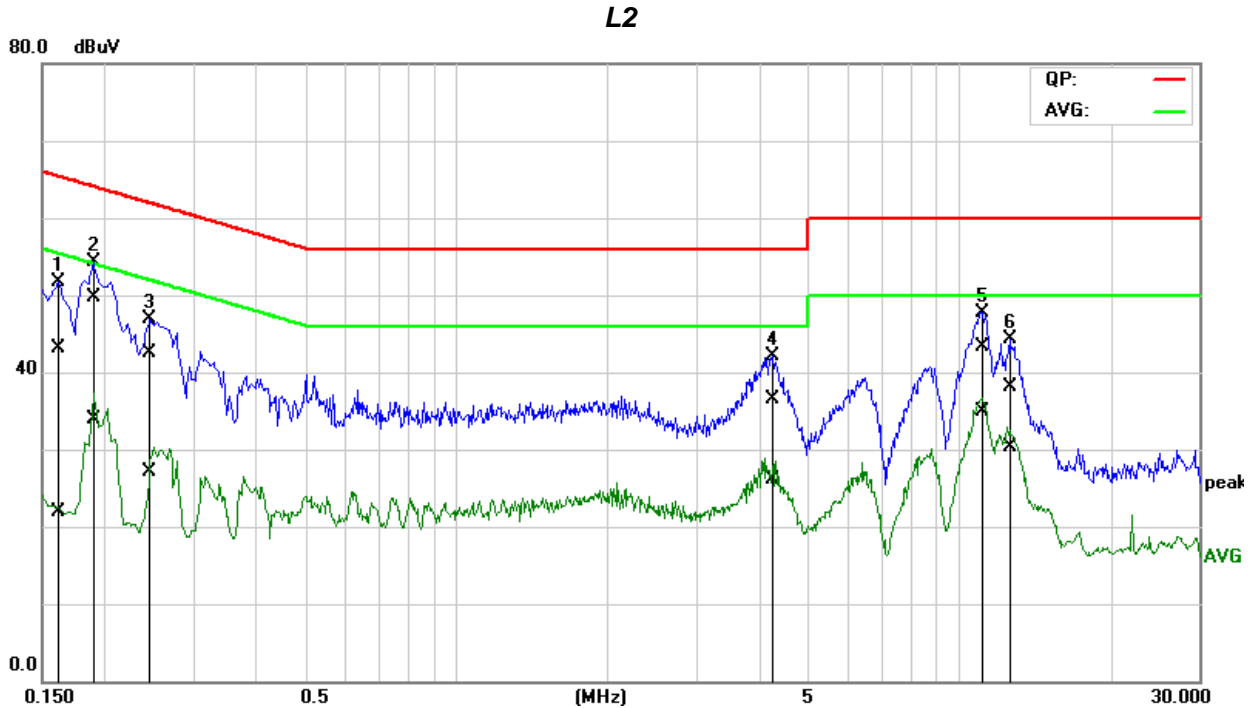
Job No.:	C171023R02	Date:	2018/3/1
Model No.:	YVR.1117	Time:	9:20:13
Standard:	FCC Class B	Temp.(C)/Hum.(%):	22(C)/48%
Test item:	Conduction test	Test By:	Lily.Wang
Line:	L1	Test Voltage:	AC 120V/60Hz
Model:		Description:	



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1*	0.1868	32.61	14.79	20.09	52.70	34.88	64.18	54.18	-11.48	-19.30	Pass
2	0.2514	25.63	11.04	20.14	45.77	31.18	61.71	51.71	-15.94	-20.53	Pass
3	0.3114	20.29	5.86	20.14	40.43	26.00	59.93	49.93	-19.50	-23.93	Pass
4	0.4340	14.48	2.56	20.15	34.63	22.71	57.18	47.18	-22.55	-24.47	Pass
5	4.5565	14.96	3.81	20.38	35.34	24.19	56.00	46.00	-20.66	-21.81	Pass
6	11.1748	20.62	12.77	20.80	41.42	33.57	60.00	50.00	-18.58	-16.43	Pass

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

Job No.:	C171023R02	Date:	2018/3/1
Model No.:	YVR.1117	Time:	9:26:04
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:	



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1*	0.1607	22.97	1.88	20.07	43.04	21.95	65.43	55.43	-22.39	-33.48	Pass
2	0.1887	29.57	13.77	20.09	49.66	33.86	64.09	54.09	-14.43	-20.23	Pass
3	0.2460	22.44	6.92	20.13	42.57	27.05	61.89	51.89	-19.32	-24.84	Pass
4	4.2656	16.22	5.75	20.33	36.55	26.08	56.00	46.00	-19.45	-19.92	Pass
5	11.0549	22.54	14.18	20.76	43.30	34.94	60.00	50.00	-16.70	-15.06	Pass
6	12.6476	17.25	9.52	20.77	38.02	30.29	60.00	50.00	-21.98	-19.71	Pass

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

Remark:

- The measuring frequencies range between 0.15 MHz and 30 MHz.
- 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.
- "---" denotes the emission level was or more than 2dB below the Average limit, and no re-check was made.
- 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**