FCC 47 CFR PART 15 SUBPART C 15.247

TEST REPORT

FOR

STM Sport DV

Model : STM

Trade Name：Topmore

Issued to

Topmore Technology Inc.
No.1-1, Taiyuan 2nd St., Zhubei City, Hsinchu County 302, Taiwan (R.O.C.)

Issued by

WH Technology Corp.

Open Site		**No.120, Ln. 5, Hudong St., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)**
EMC Test Site	**Xizhi Office and Lab**	**7F., No.262, Sec. 3, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)**
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APPENDIX 1 PHOTOS OF TEST CONFIGURATION
PHOTOS OF EUT

1. General Information

Applicant	:	**Topmore Technology Inc.**
Address	:	**No.1-1, Taiyuan 2nd St., Zhubei City, Hsinchu County 302, Taiwan (R.O.C.)**
Manufacturer	:	**Topmore Technology Inc.**
Address	:	**No.1-1, Taiyuan 2nd St., Zhubei City, Hsinchu County 302, Taiwan (R.O.C.)**
EUT	:	**STM Sport DV**
Model Name	:	**STM**
Model Differences	:	**N/A**

Is here with confirmed to comply with the requirements set out in the FCC Rules and Regulations Part 15 Subpart C and the measurement procedures were according to ANSI C63.4-2014. The said equipment in the configuration described in this report shows the maximum emission levels emanating

FCC part 15 subpart C

Receipt Date : 10/02/2017 Final Test Date : 10/30/2017

Tested By:		**Reviewed by:**	
Nov. 02, 2017	Bell	Nov. 02, 2017	Mike
Date	Bell Wei/ Engineer	**Date**	Mike Lee / Manager Designation Number: TW1083

2. Report of Measurements and Examinations

2.1 List of Measurements and Examinations

FCC Rule	. Description of Test	Result
15.203	. Antenna Requirement	Pass
15.207	. Conducted Emission	Pass
15.209 15.247(d)	. Radiated Emission	Pass
15.247(a)(2)	. 6dB Bandwidth	Pass
15.247(b)	. Maximum Peak Output Power	Pass
15.247(d)	. 100kHz Bandwidth of Frequency Band Edges	Pass
15.247(e)	. Power Spectral Density	Pass
1.1307 1.1310 2.1091 2.1093	. RF Exposure Compliance	Pass

3. Test Configuration of Equipment under Test

3.1 Description of the tested samples

EUT Name	:	STM Sport DV
Model Number	:	STM
FCCID	:	2ANH6-SPORTDV
Receipt Date	:	10/02/2017
Input Voltage	:	5Vdc
Power From	:	☐Inside ☐Outside ☐Adaptor ☐Battery ☐AC Power Source ☑DC Power Source ☐Support Unit PC
Operate Frequency	:	Refer to the channel list as described below (2.412 ~2.462 GHz)
Modulation Technique	:	802.11b：11 Mbps 802.11g ：6 Mbps 802.11n HT20：6.5 Mbps 802.11n HT40：13.5 Mbps
Number of Channels	:	802.11b, 802.11g, 802.11n, HT20：13 802.11n, HT40：9
Channel spacing	:	☐N/A ☑ 5 MHz
Operating Mode	:	☐Simplex ☑ Half Duplex
Antenna Type	:	Chip Antenna
Channel bandwidth	:	5 MHz
Antenna gain		4.97 dBi

3.2 Carrier Frequency of Channels

802.11b, 802.11g, 802.11n HT 20 (2412MHz~2462MHz)

Channel	Frequency(MHz)	Channel	Frequency(MHz)
01	2412	07	2442
02	2417	08	2447
03	2422	09	2452
04	2427	10	2457
05	2432	11	2462
06	2437	---	---

802.11n, HT 40 (2422MHz~2452MHz)

Channel	Frequency(MHz)	Channel	Frequency(MHz)
03	2422	07	2442
04	2427	08	2447
05	2432	09	2452
06	2437	---	---

3.3 Test Mode and Test Software

a. During testing, the interface cables and equipment positions were varied according to ANSI C63.4.
b. The complete test system included Notebook and EUT for RF test.
c. An executive “QATEST” under XP was executed to keep transmitting and receiving data via Wireless.
d. The following test modes were performed for test:
   - 802.11b/g/n HT20: CH01: 2412MHz, CH06: 2437MHz, CH11: 2462MHz
   - 802.11n HT40: CH03: 2422MHz, CH06: 2437MHz, CH09: 2452MHz

3.4 TEST Methodology & General Test Procedures

All testing as described bellowed were performed in accordance with ANSI C63.4:2014 and FCC CFR 47 Part 15 Subpart C.

Conducted Emissions

The EUT is placed on a wood table, which is at 0.8 m above ground plane acceding to clause 15.207 and requirements of ANSI C63.4:2014. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz are using CISPR Quasi-Peak / Average detectors.

Radiated Emissions

The EUT is a placed on a turn table, which is 0.8 m above ground plane. The turntable was rotated through 360 degrees to determine the position of maximum emission level. The EUT is placed at 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

1) Putting the EUT on the platform and turning on the EUT (on/off button on the bottom of the EUT).
2) Setting test channel described as “Channel setting and operating condition”, and testing channel by channel.
3) For the maximum output power measurement, we followed the method of measurement KDB558074 D01.
4) For the spurious emission test based on ANSI(2014), at the frequency where below 1GHz
used quasi-peak detector mode; where above 1GHz used the peak and average detector mode. IF the peak value may be under average limit, the average mode will not be performed.

3.5 Measurement Uncertainty

Measurement Item	Uncertainty
Radiated emission	±4.11dB
Peak Output Power(conducted)	±1.38dB
Peak Output Power(Radiated)	±1.70dB
Power Spectral Density	±1.39dB
Radiated emission(3m)	±4.11dB
Radiated emission(10m)	±3.89dB

3.6 Description of the Support Equipments

Setup Diagram

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

Support Equipment

Peripherals Devices:

OUTSIDE SUPPORT EQUIPMENT							
No.	Equipment	Model	Serial No.	FCC ID/ BSMI ID	Trade name	Data Cable	Power Cord
1.	PC	D13M	FZHBW02	R33002	DELL	N/A	Unshielded 1.8m
2.	Monitor	UZ2315Hf	CN-0NJ1C5-72872-473-AF2SREVA02	R43002	DELL	Shielded 1.8m	Unshielded 1.8m
3.	Printer	D4360	N/A	R33001	HP	Shielded 1.8m / USB	Unshielded 1.8m
4.	USB 3.0	32G	AUC350-32G-CGD	D33A23	ADATA	Shielded 1m / USB	N/A
5.	Mouse	MS111-L	CN-09RRC7-48729-43M-070D	T41126	DELL	Shielded 1.8m / USB	N/A
6.	Keyboard	D13M	2P4BR12	R41108	DELL	Shielded 1.8m / USB	N/A
7.	Phone	A1524	N/A	BCG-E2817A	N/A	N/A	N/A
INSIDE SUPPORT EQUIPMENT							
No.	Equipment	Model	Serial No.	FCC ID/ BSMI ID	Trade name	Data Cable	Power Cord
1.	TF	N/A	N/A	N/A	N/A	N/A	N/A

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

Grounding: Grounding was in accordance with the manufacturer's requirement and conditions for the intended use.

4. Test and measurement equipment

4.1 calibration

The measuring equipment utilized to perform the tests documented in the report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2 equipment

The following list contains measurement equipment used for testing. The equipment conforms to the requirement of CISPR 16-1, ANSI C63.2 and. Other required standards.

Calibration of all test and measurement, including any accessories that may effect such calibration, is checked frequently to ensure the accuracy. Adjustments are made and correction factors are applied in accordance with the instructions contained in the respective.

TABLELIST OF TEST AND MEASUREMENT EQUIPMENT

Test Site	Instrument	Manufacturer	Model No.	S/N	Next Cal. Date
Conduction	Spectrum (9K--3GHz)	R&S	FSP3	833387/010	2018/09/20
	EMI Receiver	R&S	ESHS10	830223/008	2018/06/06
	LISN	Rolf Heine Hochfrequenztechnik	NNB-2/16z	98062	2018/06/11
	ISN	Schwarzbeck	8-Wire ISN CAT5	CAT5-8158-0094	2018/09/21
	RF Cable	N/A	N/A	EMI-3	2018/10/19
Radiation	Bilog antenna(30M-1G)	ETC	MCTD2786B	BLB16M04004/JB-5-004	2018/05/18
	Double Ridged Guide Horn antenna(1G-18G)	ETC	MCTD 1209	DRH15N02009	2017/11/23
	Horn antenna (18G-26G)	com-power	AH-826	81000	2018/08/16
	LOOP Antenna (Below 30M)	com-power	AL-130	17117	2018/10/04
	Pre amplifier (30M-1G)	EMC INSTRUMENT	EMC9135	980334	2018/05/03
	Microwave Preamplifier (1G-18G)	EMC INSTRUMENT	EMC051845	980108&AT-18001	2018/10/23
	Pre amplifier (18G~26G)	MITEQ	JS4-18002600-30-5A	808329	2018/08/09
	EMI Test	R&S	ESVS30	826006/002	2017/11/28

	Receiver		(20M-1000MHz)		
	RF Cable (open site)	EMCI	N male on end of both sides (EMI4)	30m	2018/10/19
	RF CABLE (1~26G)	HARBOUT INDUSTRIES	LL142MI(4M+4M)	NA	2018/04/17
	RF CABLE (1~26G)	HARBOUR INDUSTRIES	LL142MI(7M)	NA	2018/08/09
	Spectrum (9K--7GHz)	R&S	FSP7	830180/006	2018/04/14
	Spectrum (9K--40GHz)	AGILENT	8564EC	4046A0032	2018/03/01
Software	e3	AUDIX	N/A	N/A	N/A
SG	SINGAL GENTERATOR (100k-1GHz)	HP	8648A	3619U00426	N/A

***CALIBRATION INTERVAL OF INSTRUMENTS LISTED ABOVE IS ONE YEAR**

5. Antenna Requirements

5.1 Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

5.2 Antenna Construction and Directional Gain

802.11b/g/n:
Antenna Type: Chip Antenna
Antenna Gain: 4.97 dBi

6. Test of Conducted Emission

6.1 Test Limit

Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 KHz on the 120 VAC power and return leads of the EUT according to the methods defined in ANSI C63.4-2014 Section 3.1. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane as shown in section 2.2. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position produced maximum conducted emissions.

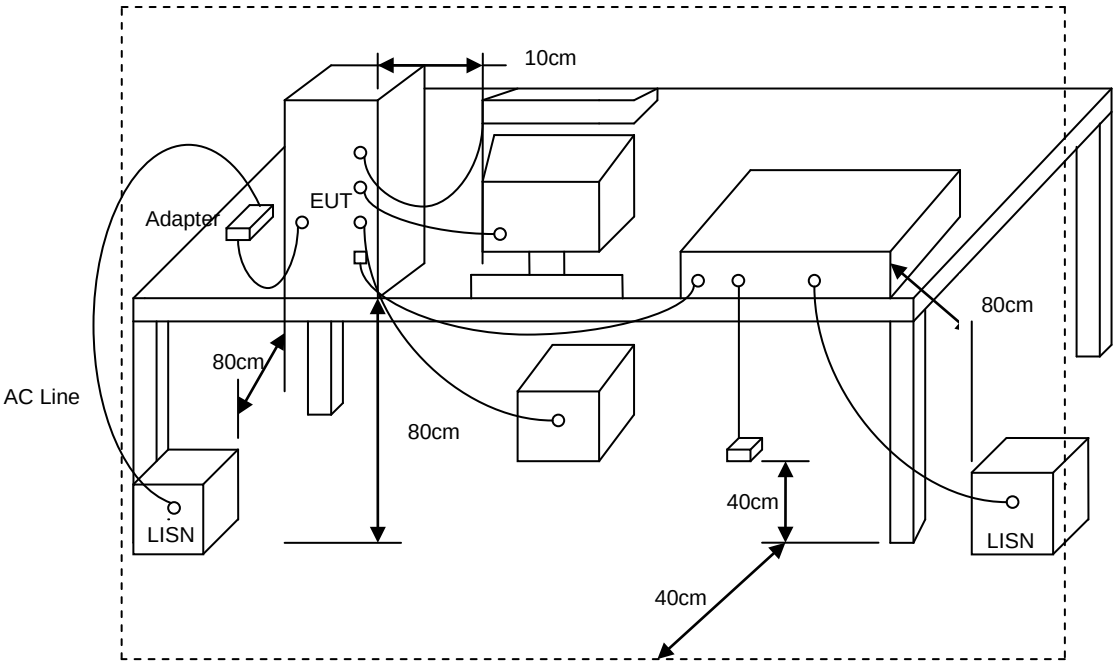
Frequency (MHz)	Quasi Peak (dB μ V)	Average (dB μ V)
0.15 – 0.5	66-56*	56-46*
0.5 – 5.0	56	46
5.0 – 30.0	60	50

*Decreases with the logarithm of the frequency.

6.2 Test Procedures

a. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
b. Connect EUT to the power mains through a line impedance stabilization network (LISN).
c. All the support units are connecting to the other LISN.
d. The LISN provides 50 ohm coupling impedance for the measuring instrument.
e. The FCC states that a 50 ohm, 50 micro-Henry LISN should be used.
f. Both sides of AC line were checked for maximum conducted interference.
g. The frequency range from 150 kHz to 30 MHz was searched.
h. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

6.3 Typical Test Setup



6.4 Test Result and Data

NOT AVAILABLE, BECAUSE THE EUT DOESN'T CONNECT WITH THE AC POWER SOURCE DIRECTLY

7. Test of Radiated Emission

7.1 Test Limit

In any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. If the transmitter measurement is based on the maximum conducted output power, the attenuation required under this paragraph shall be 30dB instead of 20dB. In addition, radiated emissions which fall in section 15.205(a) the restricted bands must also comply with the radiated emission limit specified in section 15.209(a).

Frequency (MHz)	Field Strength (microvolt/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

7.2 Test Procedures

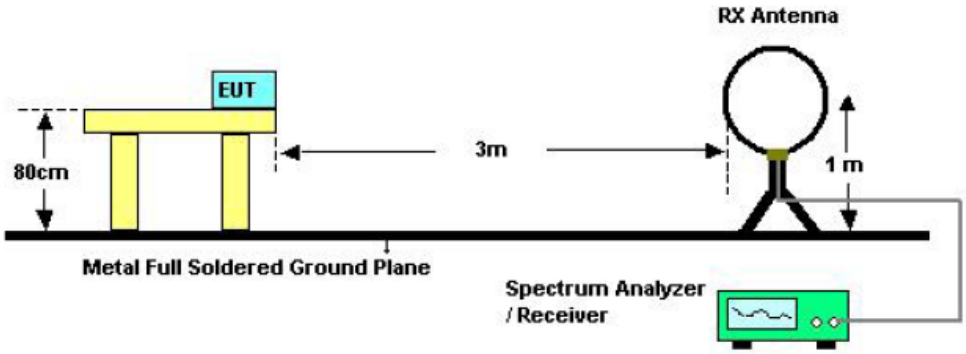
a. The EUT was placed on a rotatable table top 0.8 meter above ground.
b. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
c. The table was rotated 360 degrees to determine the position of the highest radiation.
d. The antenna is a broadband antenna and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.
e. For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.
f. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function and specified bandwidth with Maximum Hold Mode.
g. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method and reported.
h. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than

average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

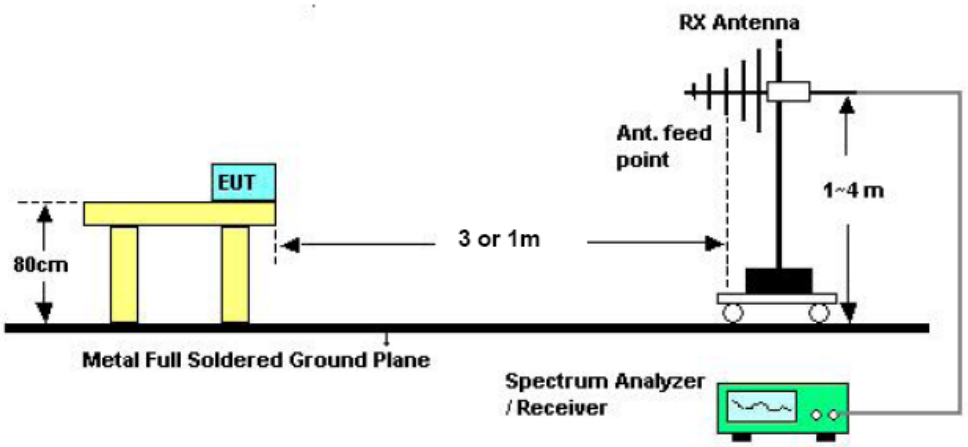
i. “Cone of radiation” has been considered to be 3dB bandwidth of the measurement antenna.

7.3 Typical Test Setup

For radiated emissions below 30MHz



For radiated emissions above 30MHz



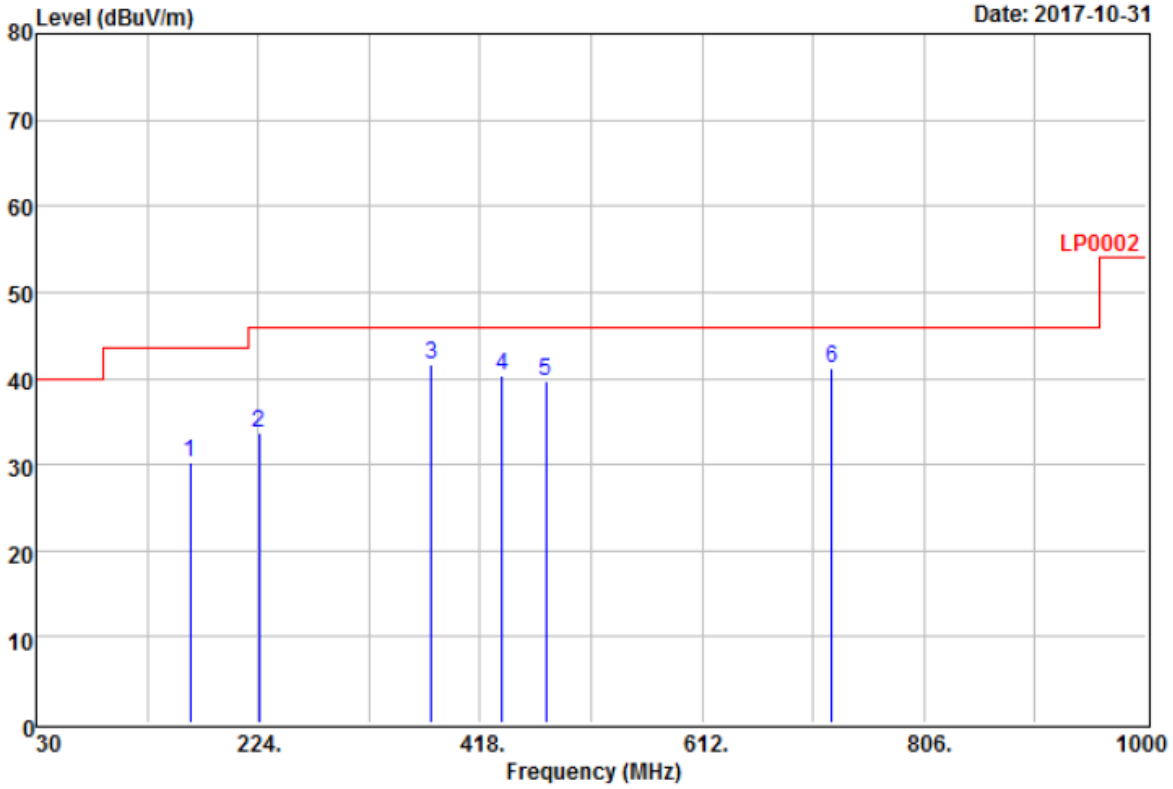
Above 10 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from 3m to 1m.
Distance extrapolation factor = 20 log (specific distance [3m] / test distance [1m]) (dB);
Limit line = specific limits (dBuV) + distance extrapolation factor [9.54 dB].

7.4 Test Result and Data (9kHz ~ 30MHz)

The 9kHz - 30MHz spurious emission is under limit 20dB more.

7.5 Test Result and Data (30MHz ~ 1GHz, worst emissions found)

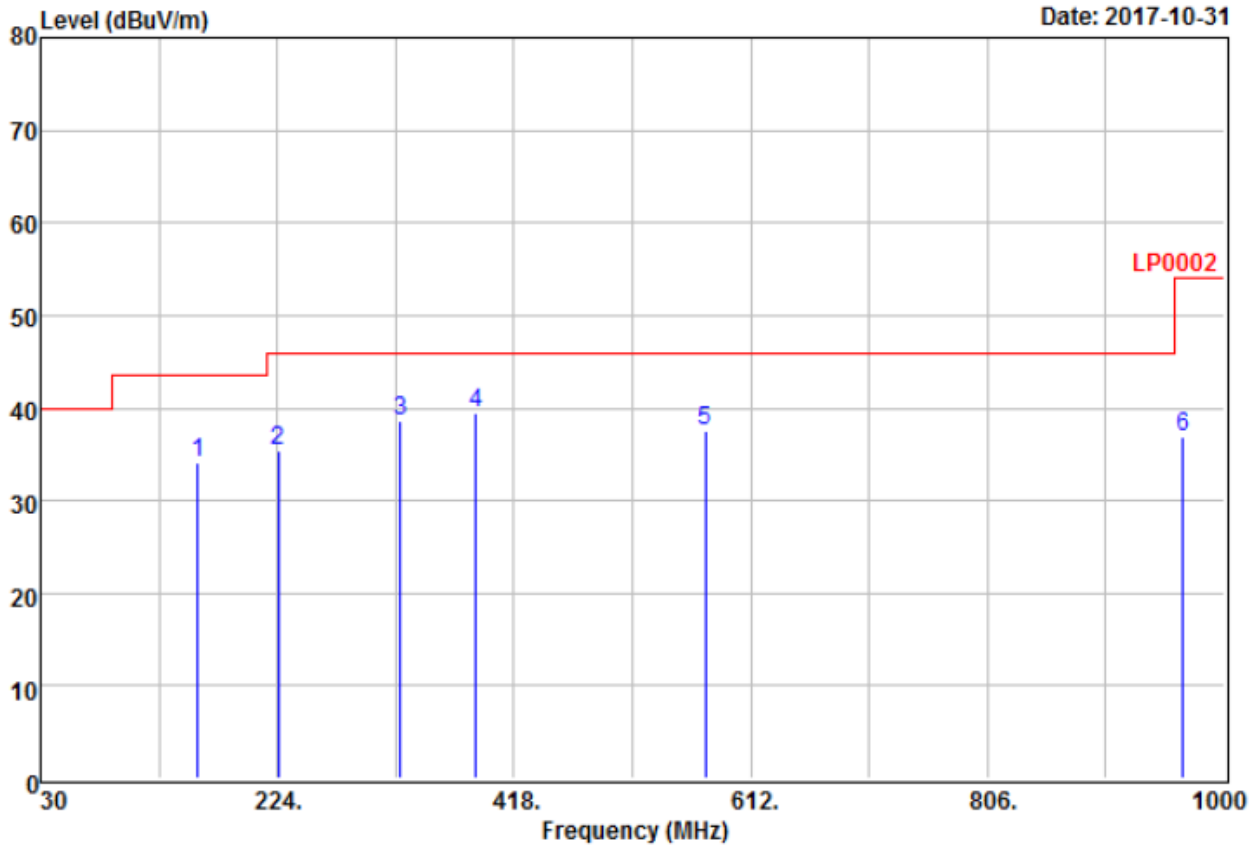
Power	:	DC 5V	Pol/Phase	:	HORIZONTAL
Test Mode 1	:	TX b CH11 2462MHz	Temperature	:	23 ˚C
Memo	:		Humidity	:	64 %



Remarks: **: 1.Result=Read Value+Factor**
: 2.Factor=Antenna Factor+Cable loss-
: Amplifier Factor

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1	164.830	48.02	-17.73	30.29	43.50	-13.21	QP
2	224.970	51.19	-17.61	33.58	46.00	-12.42	QP
3 @	375.320	53.30	-11.62	41.68	46.00	-4.32	QP
4	437.400	50.72	-10.45	40.27	46.00	-5.73	QP
5	475.230	49.47	-9.83	39.64	46.00	-6.36	QP
6	725.490	47.79	-6.64	41.15	46.00	-4.85	QP

Power	:	DC 5V	Pol/Phase	:	VERTICAL
Test Mode 1	:	TX b CH11 2462MHz	Temperature	:	23 ˚C
Memo	:		Humidity	:	64 %

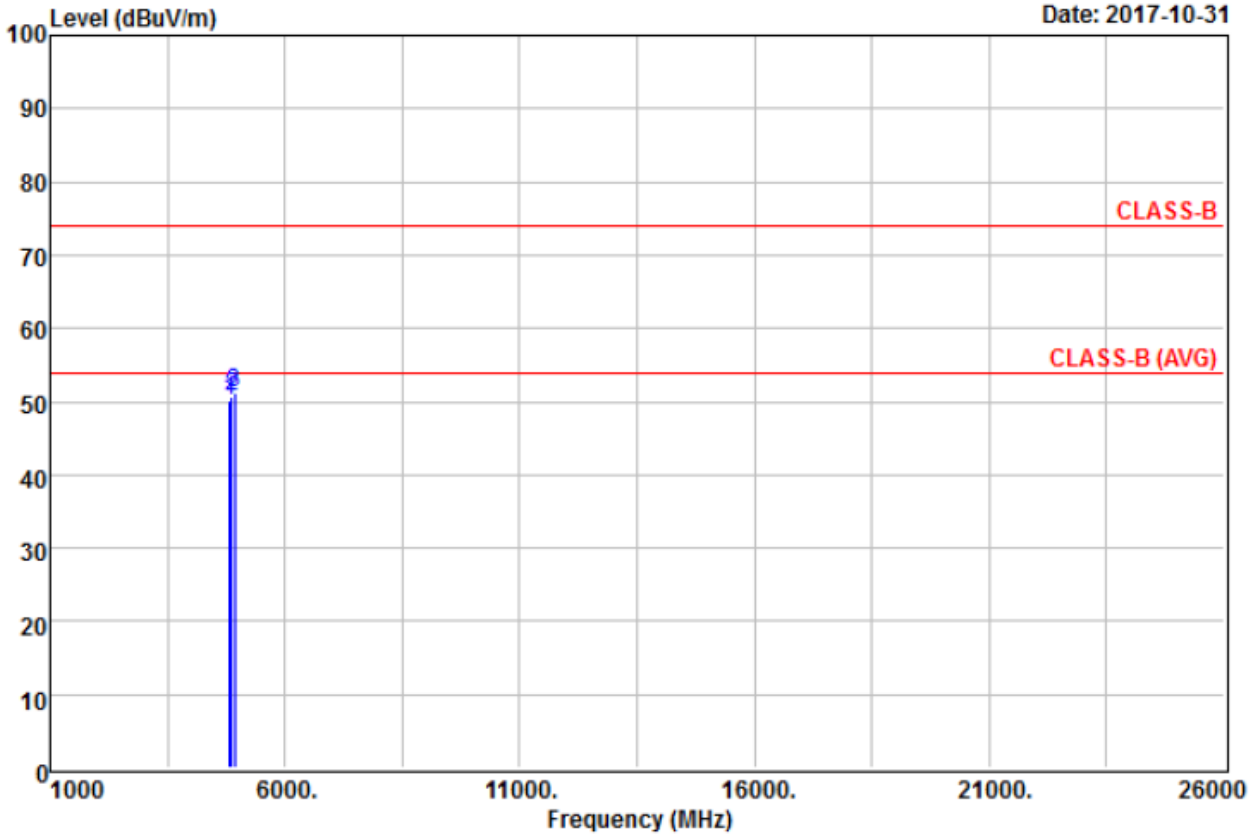


Remarks: **: 1.Result=Read Value+Factor**
: 2.Factor=Antenna Factor+Cable loss-
: Amplifier Factor

		Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1		159.010	51.16	-17.03	34.13	43.50	-9.37	QP
2		224.970	53.09	-17.61	35.48	46.00	-10.52	QP
3		324.880	51.71	-13.02	38.69	46.00	-7.31	QP
4	@	386.960	50.72	-11.27	39.45	46.00	-6.55	QP
5		575.140	46.35	-8.76	37.59	46.00	-8.41	QP
6		966.050	38.26	-1.44	36.82	54.00	-17.18	QP

7.6 Test Result and Data (Above 1GHz)

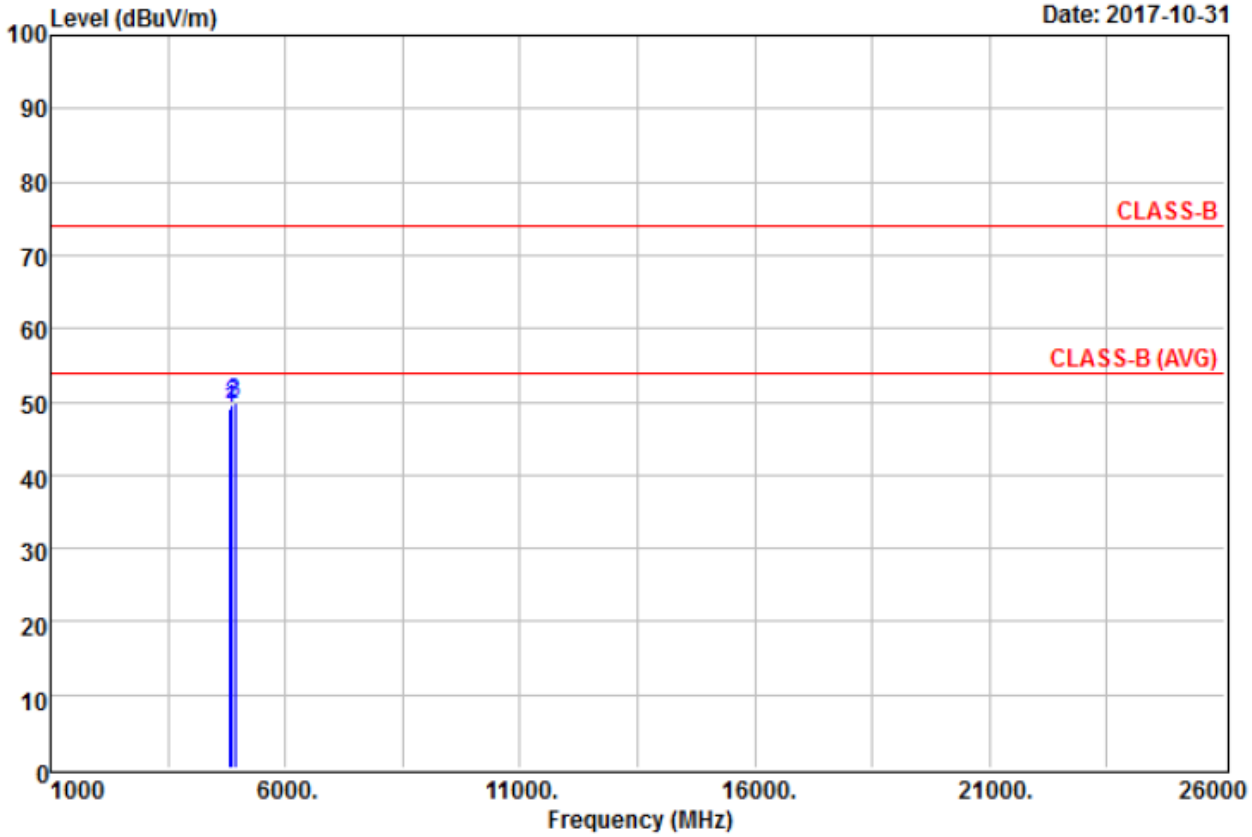
Power	:	DC 5V	Pol/Phase	:	HORIZONTAL
Test Mode 1	:	b - CH1 - CH6 - CH11	Temperature	:	23 ˚C
Memo	:		Humidity	:	64 %



Remarks: **: 1.Result=Read Value+Factor**
: 2.Factor=Antenna Factor+Cable loss-
: Amplifier Factor

		Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1		4824.000	56.48	-6.32	50.16	74.00	-23.84	Peak
2		4874.000	56.96	-6.18	50.78	74.00	-23.22	Peak
3	@	4924.000	57.17	-6.04	51.13	74.00	-22.87	Peak

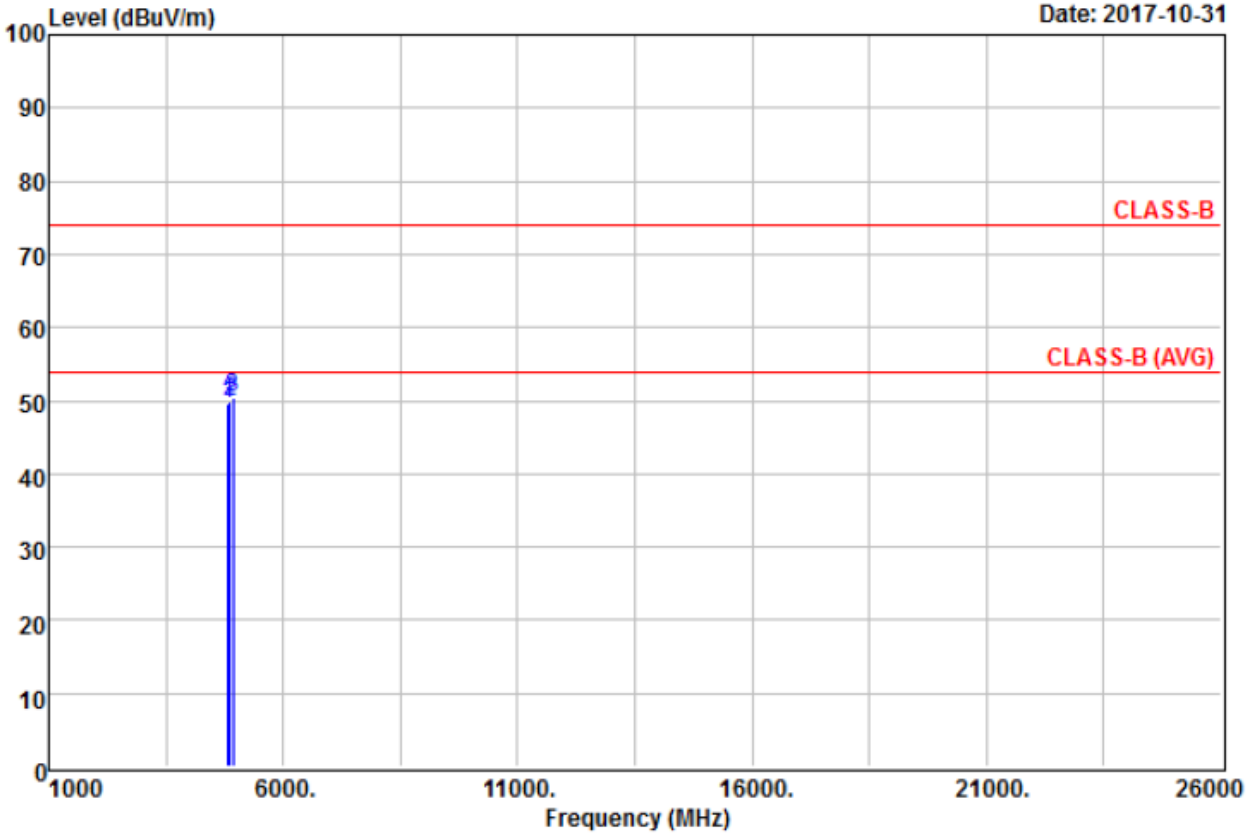
Power	:	DC 5V	Pol/Phase	:	VERTICAL
Test Mode 1	:	b - CH1 - CH6 - CH11	Temperature	:	23 ˚C
Memo	:		Humidity	:	64 %



Remarks: **: 1.Result=Read Value+Factor**
: 2.Factor=Antenna Factor+Cable loss-
: Amplifier Factor

		Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1		4824.000	55.39	-6.32	49.07	74.00	-24.93	Peak
2		4874.000	55.82	-6.18	49.64	74.00	-24.36	Peak
3	@	4924.000	55.92	-6.04	49.88	74.00	-24.12	Peak

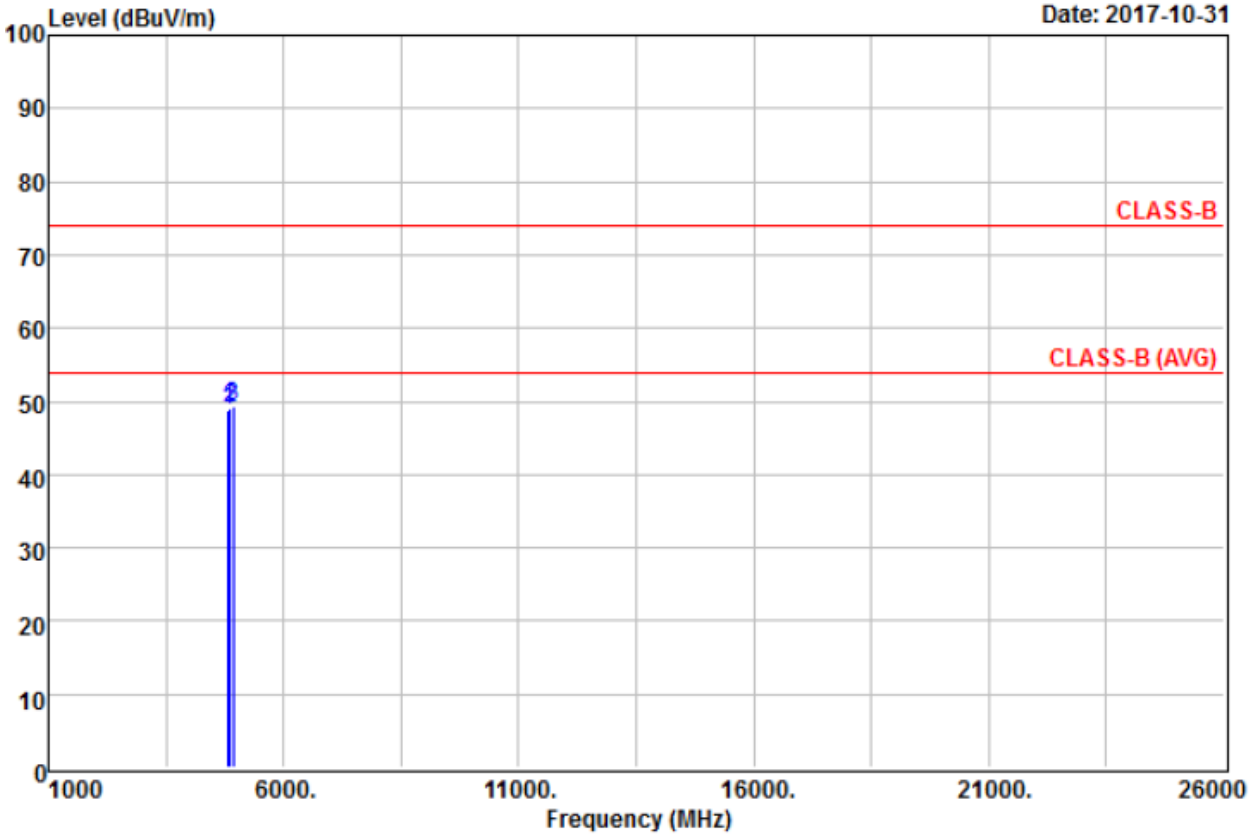
Power	:	DC 5V	Pol/Phase	:	HORIZONTAL
Test Mode 1	:	g - CH1 - CH6 - CH11	Temperature	:	23 ˚C
Memo	:		Humidity	:	64 %



Remarks: **: 1.Result=Read Value+Factor**
: 2.Factor=Antenna Factor+Cable loss-
: Amplifier Factor

		Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1		4824.000	55.93	-6.32	49.61	74.00	-24.39	Peak
2		4874.000	56.11	-6.18	49.93	74.00	-24.07	Peak
3	@	4924.000	56.38	-6.04	50.34	74.00	-23.66	Peak

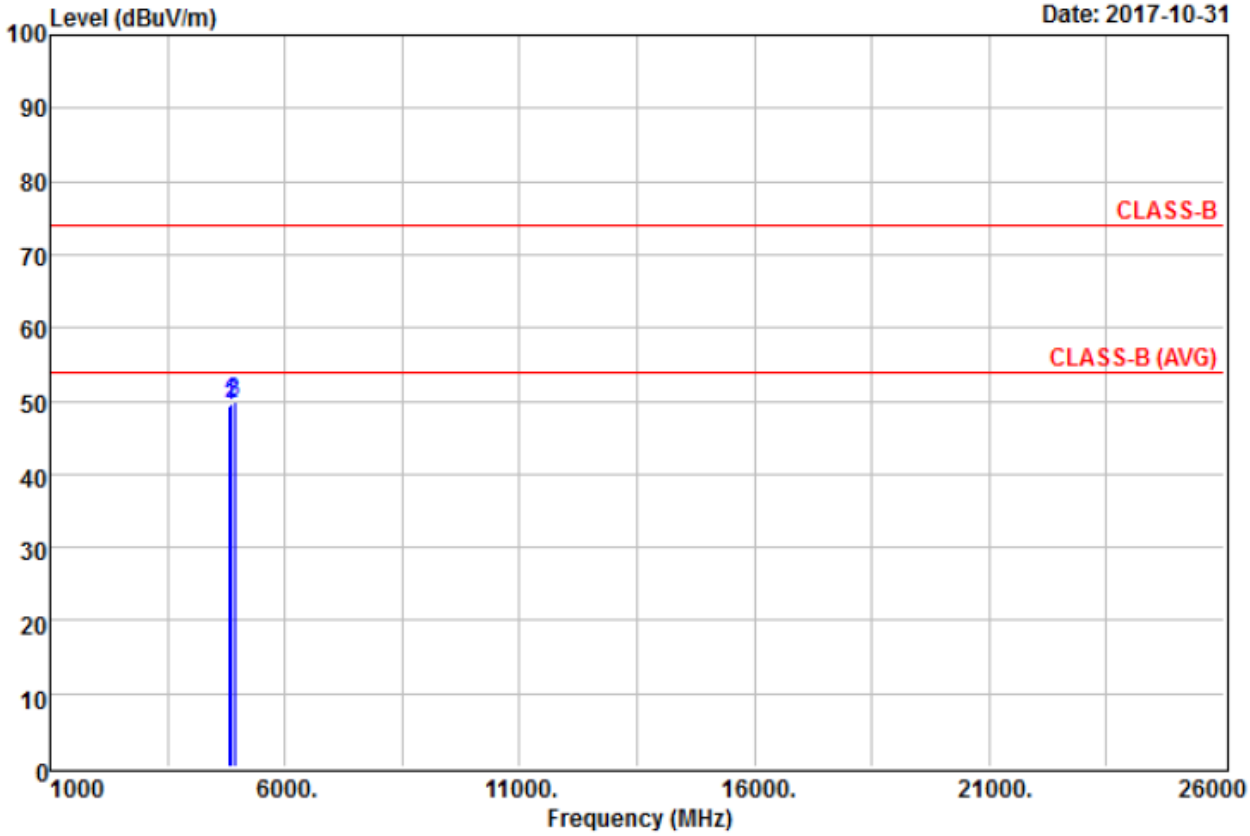
Power	:	DC 5V	Pol/Phase	:	VERTICAL
Test Mode 1	:	g - CH1 - CH6 - CH11	Temperature	:	23 ˚C
Memo	:		Humidity	:	64 %



Remarks: **: 1.Result=Read Value+Factor**
: 2.Factor=Antenna Factor+Cable loss-
: Amplifier Factor

		Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1		4824.000	54.99	-6.32	48.67	74.00	-25.33	Peak
2		4874.000	55.20	-6.18	49.02	74.00	-24.98	Peak
3	@	4924.000	55.39	-6.04	49.35	74.00	-24.65	Peak

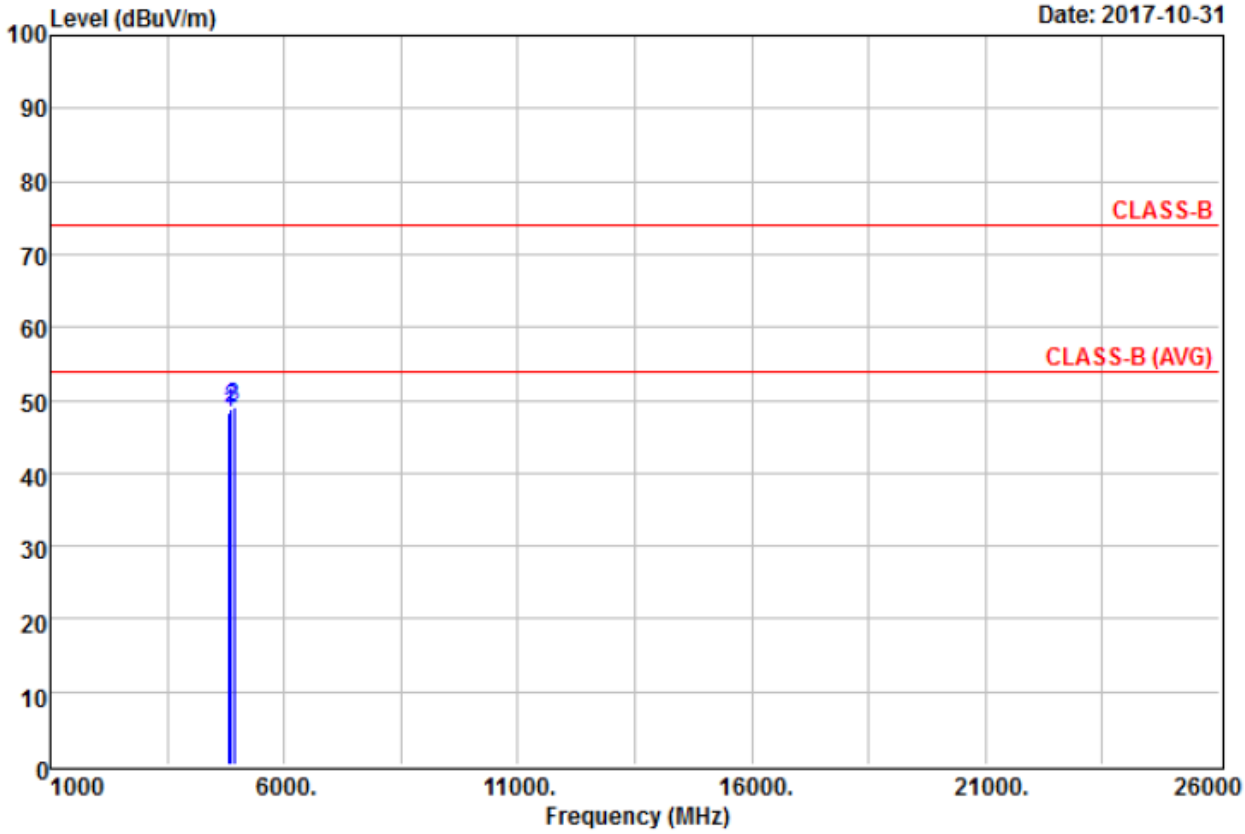
Power	:	DC 5V	Pol/Phase	:	HORIZONTAL
Test Mode 1	:	HT20 - CH1 - CH6 - CH11	Temperature	:	23 ˚C
Memo	:		Humidity	:	64 %



Remarks: **: 1.Result=Read Value+Factor**
: 2.Factor=Antenna Factor+Cable loss-
: Amplifier Factor

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1	4824.000	55.69	-6.32	49.37	74.00	-24.63	Peak
2	4874.000	55.80	-6.18	49.62	74.00	-24.38	Peak
3 @	4924.000	55.92	-6.04	49.88	74.00	-24.12	Peak

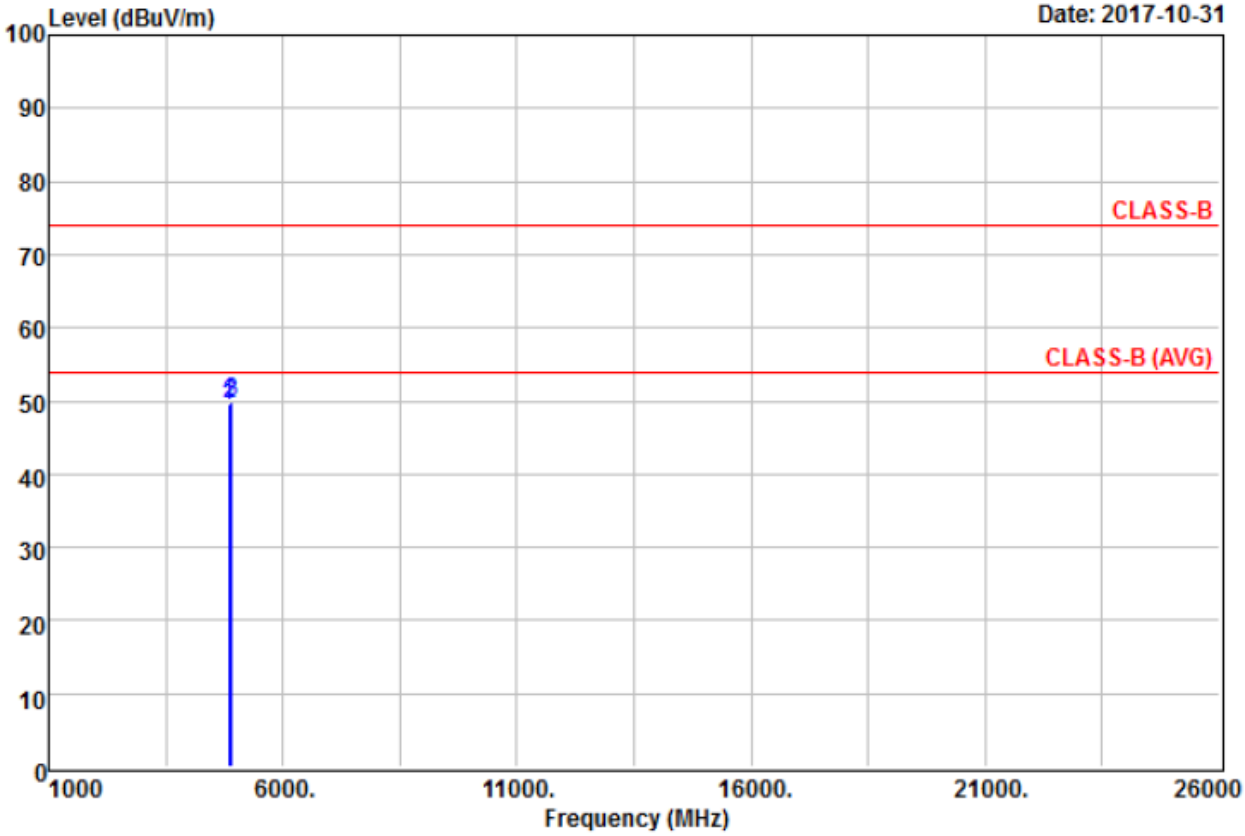
Power	:	DC 5V	Pol/Phase	:	VERTICAL
Test Mode 1	:	HT20 - CH1 - CH6 - CH11	Temperature	:	23 ˚C
Memo	:		Humidity	:	64 %



Remarks: **: 1.Result=Read Value+Factor**
: 2.Factor=Antenna Factor+Cable loss-
: Amplifier Factor

		Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1		4824.000	54.66	-6.32	48.34	74.00	-25.66	Peak
2		4874.000	54.93	-6.18	48.75	74.00	-25.25	Peak
3	@	4924.000	55.06	-6.04	49.02	74.00	-24.98	Peak

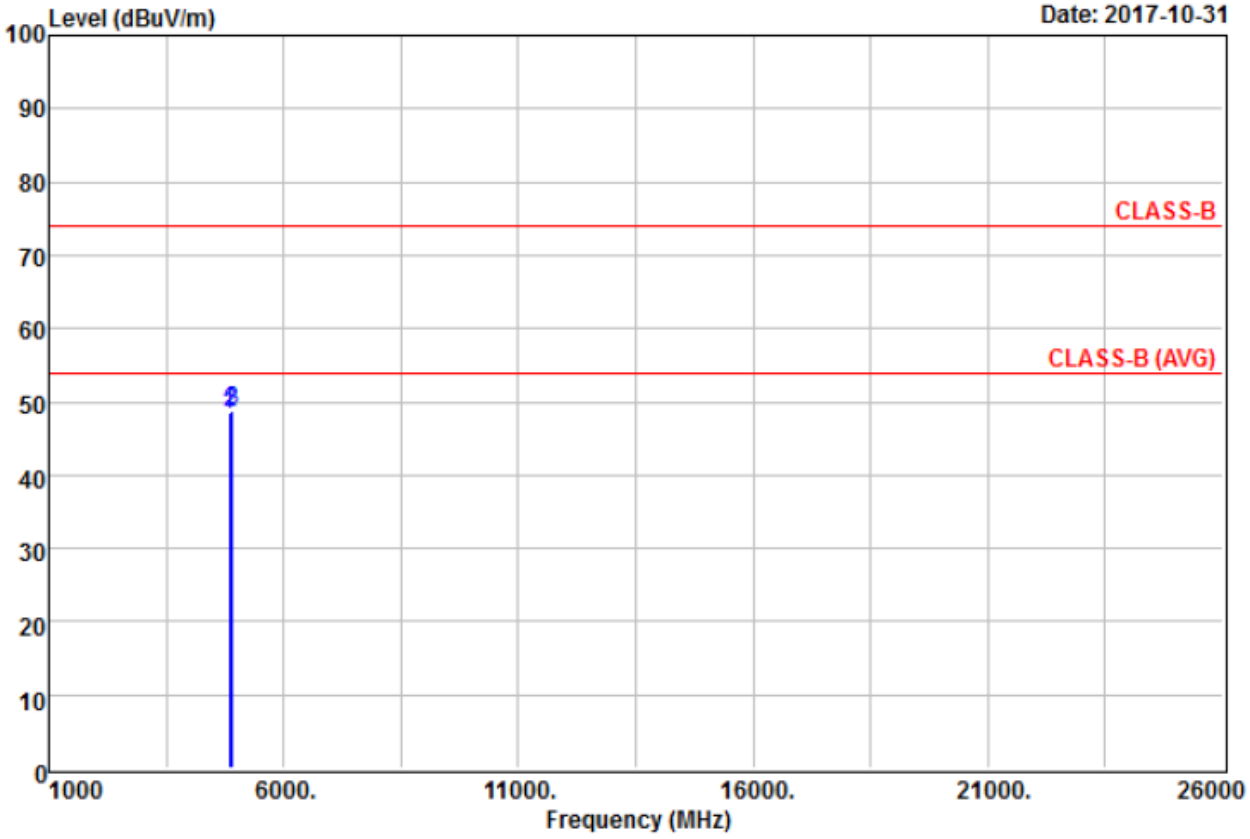
Power	:	DC 5V	Pol/Phase	:	HORIZONTAL
Test Mode 1	:	HT40 – CH3 - CH6 – CH9	Temperature	:	23 ˚C
Memo	:		Humidity	:	64 %



Remarks: **: 1.Result=Read Value+Factor**
: 2.Factor=Antenna Factor+Cable loss-
: Amplifier Factor

		Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1		4844.000	55.48	-6.26	49.22	74.00	-24.78	Peak
2		4874.000	55.87	-6.18	49.69	74.00	-24.31	Peak
3	@	4904.000	55.90	-6.10	49.80	74.00	-24.20	Peak

Power	:	DC 5V	Pol/Phase	:	VERTICAL
Test Mode 1	:	HT40 – CH3 - CH6 – CH9	Temperature	:	23 ˚C
Memo	:		Humidity	:	64 %



Remarks: **: 1.Result=Read Value+Factor**
: 2.Factor=Antenna Factor+Cable loss-
: Amplifier Factor

		Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1		4844.000	54.46	-6.26	48.20	74.00	-25.80	Peak
2		4874.000	54.70	-6.18	48.52	74.00	-25.48	Peak
3	@	4904.000	54.81	-6.10	48.71	74.00	-25.29	Peak

8. 6dB Bandwidth Measurement Data

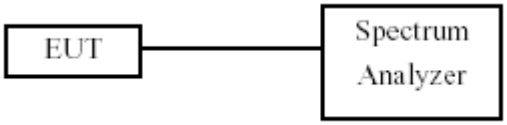
8.1 Test Limit

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

8.2 Test Procedures

a. The transmitter output was connected to the spectrum analyzer.
b. Set RBW of spectrum analyzer to 1~5% of the emission bandwidth and VBW ≥ 3x RBW.
c. The 6 dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6 dB.
d. The 6dB Bandwidth was measured and recorded.

8.3 Test Setup Layout



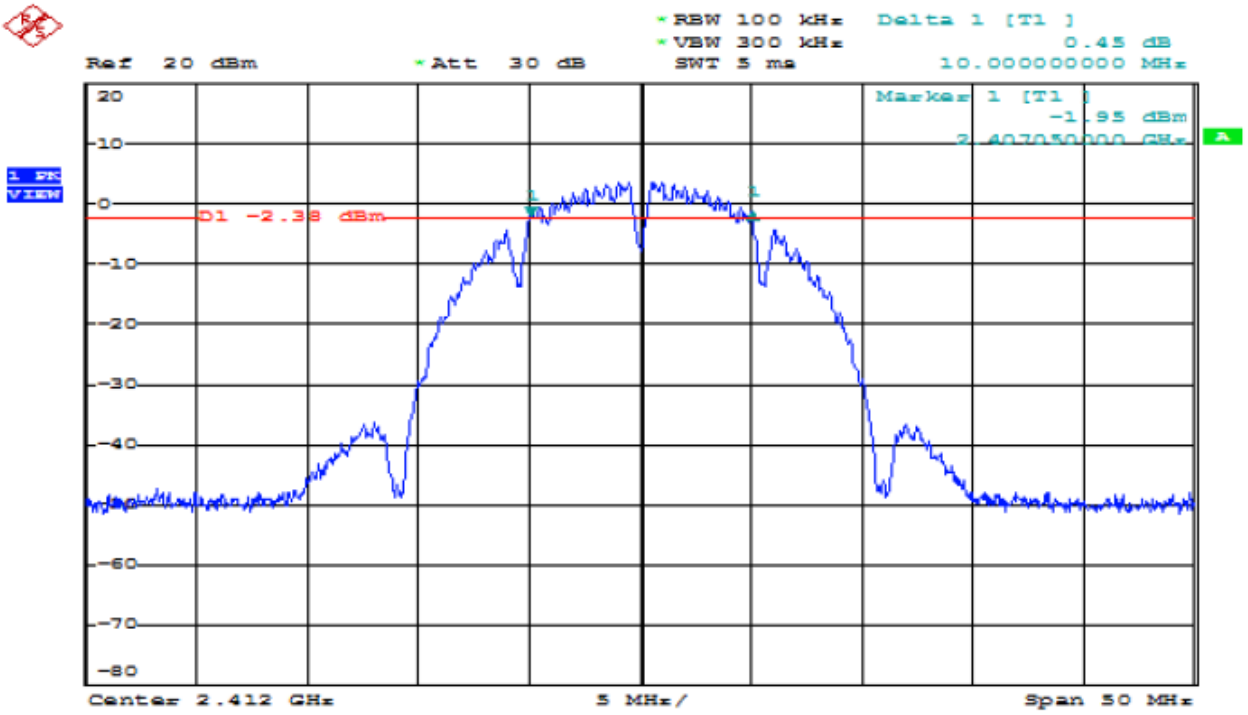
8.4 Test Result and Data

Test Date: Oct. 30, 2017 Temperature: 24℃

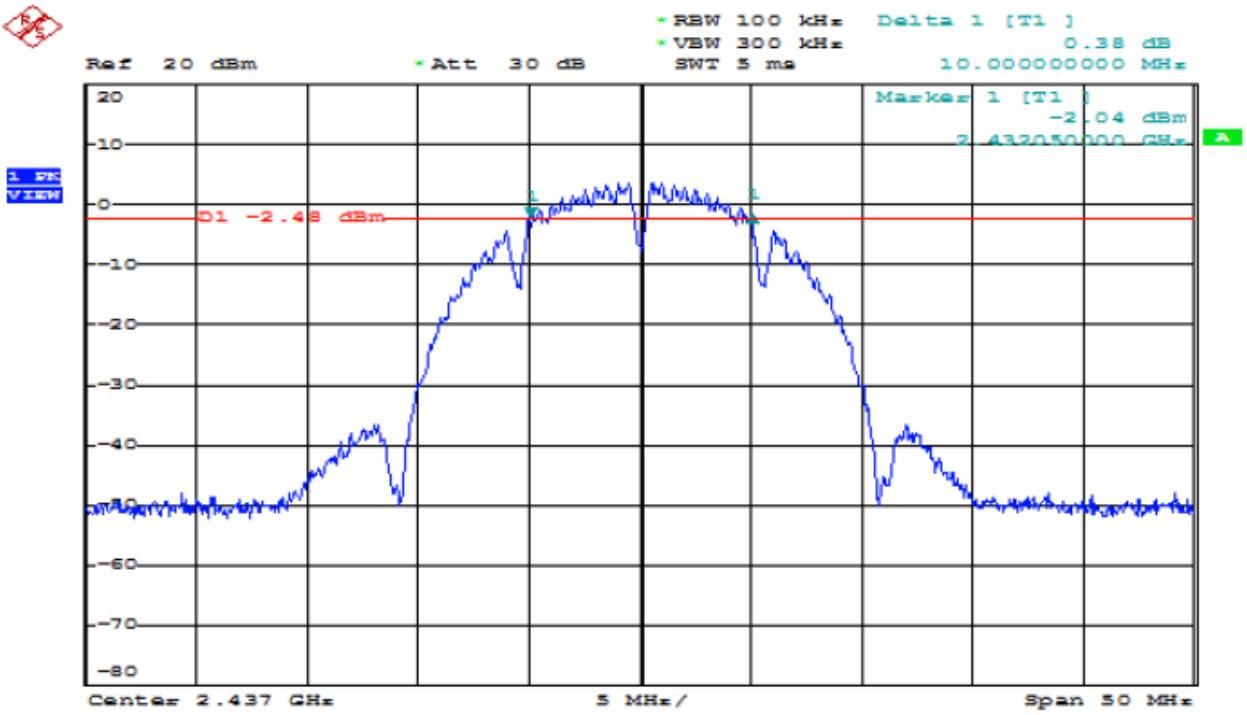
Atmospheric pressure: 1007 pha Humidity: 58%

Modulation Standard	Channel	Frequency (MHz)	6dB Bandwidth (MHz)
802.11b (11Mbps)	01	2412	10
	06	2437	10
	11	2462	10
802.11g (6Mbps)	01	2412	16.5
	06	2437	16.5
	11	2462	16.5
802.11n HT20 (6.5Mbps)	01	2412	17.7
	06	2437	17.7
	11	2462	17.7
802.11n HT40 (13.5Mbps)	03	2422	36.32
	06	2437	36.32
	09	2452	36.32

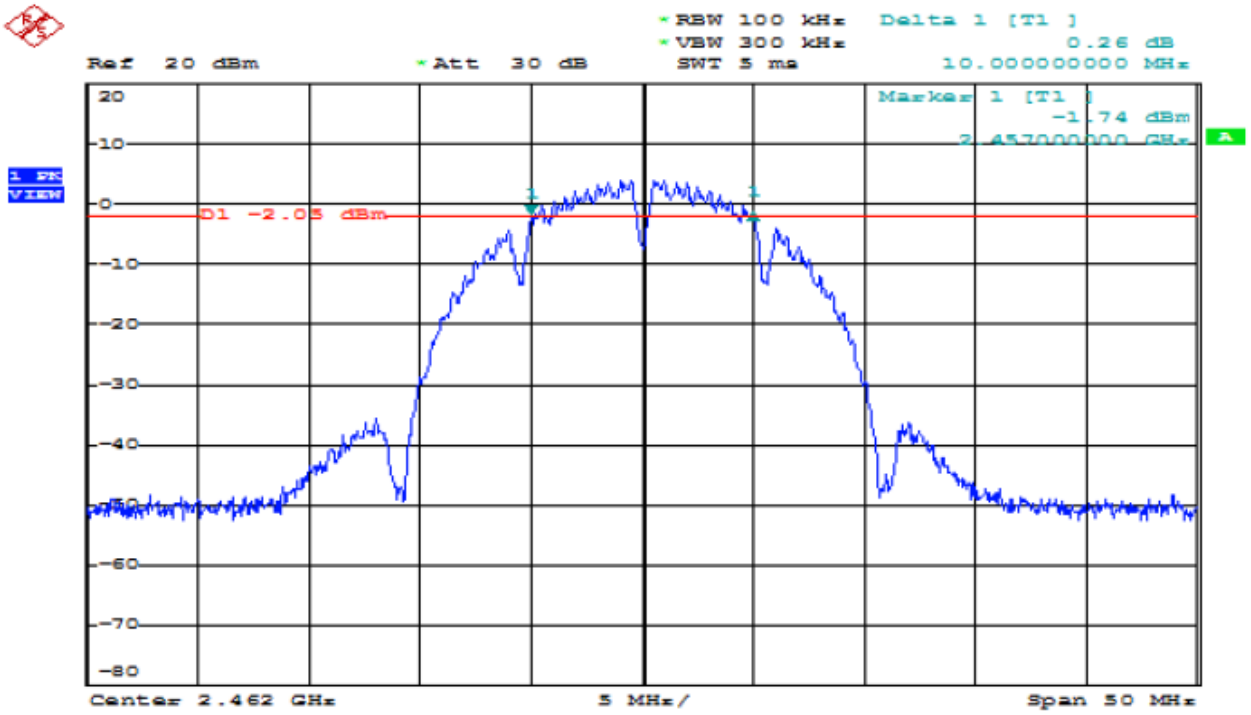
Modulation Standard: 802.11b (11Mbps)
Channel: 01



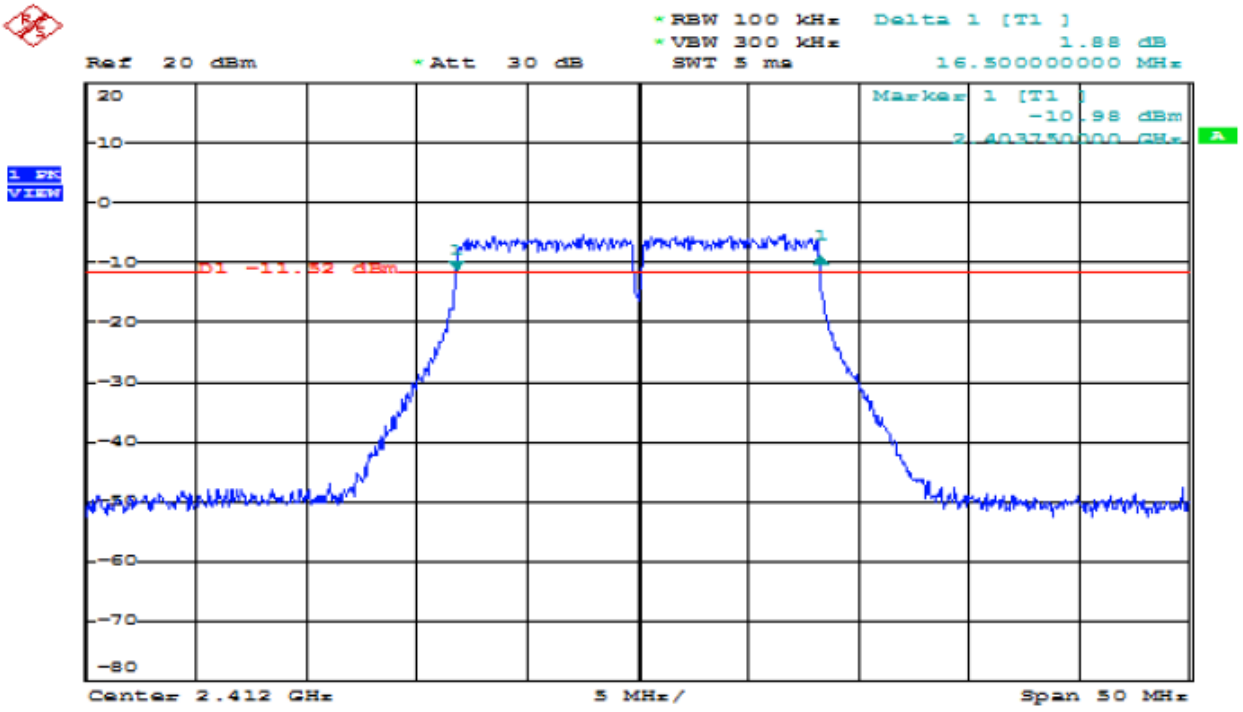
Modulation Standard: 802.11b (11Mbps)
Channel: 06



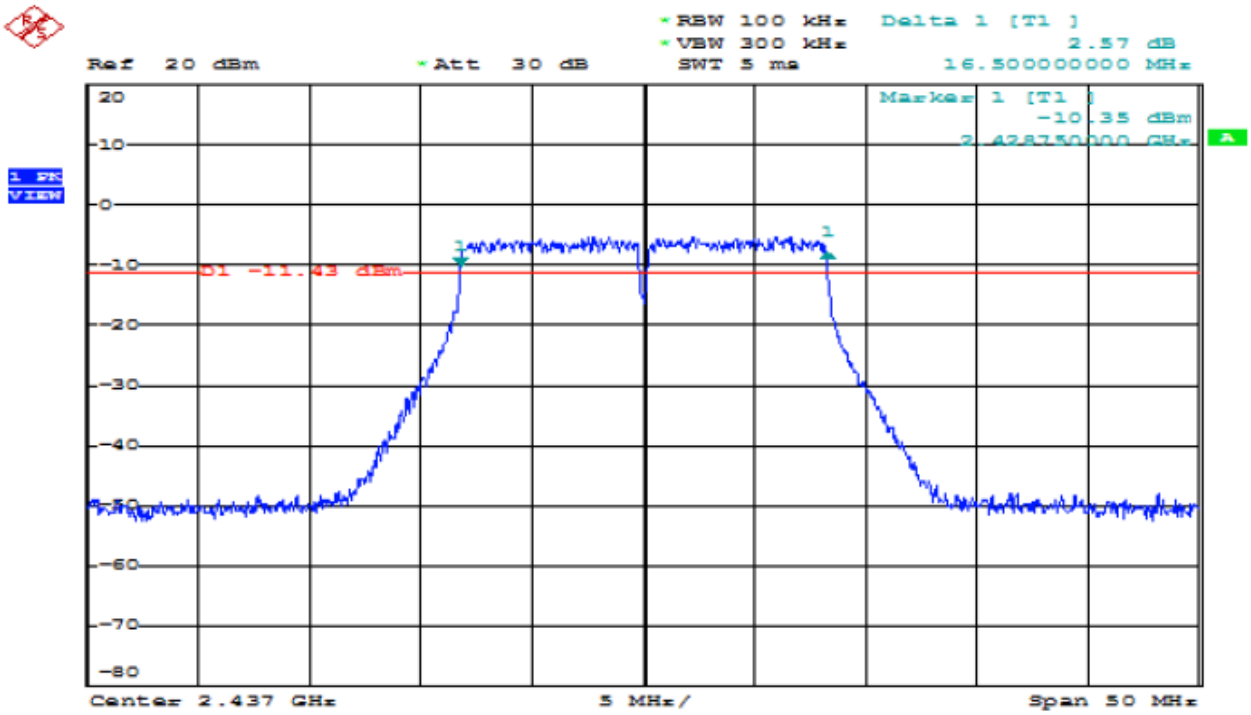
Modulation Standard: 802.11b (11Mbps)
Channel: 11



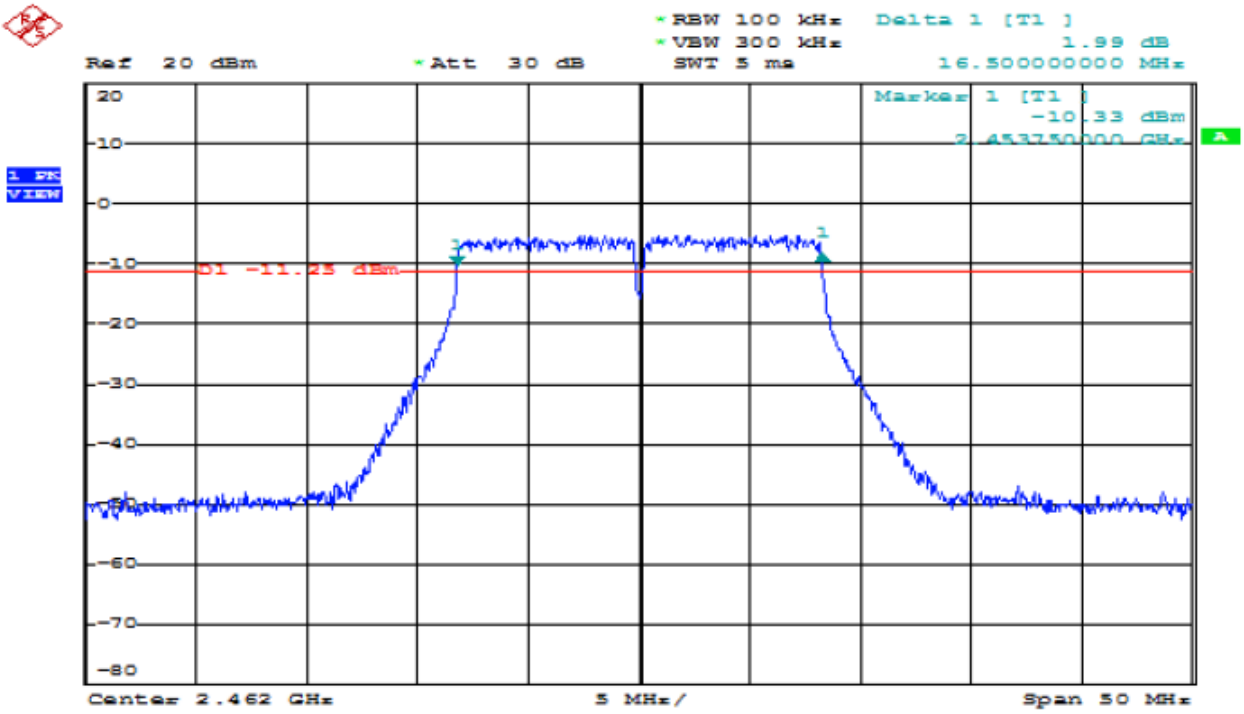
Modulation Standard: 802.11g (6Mbps)
Channel: 01



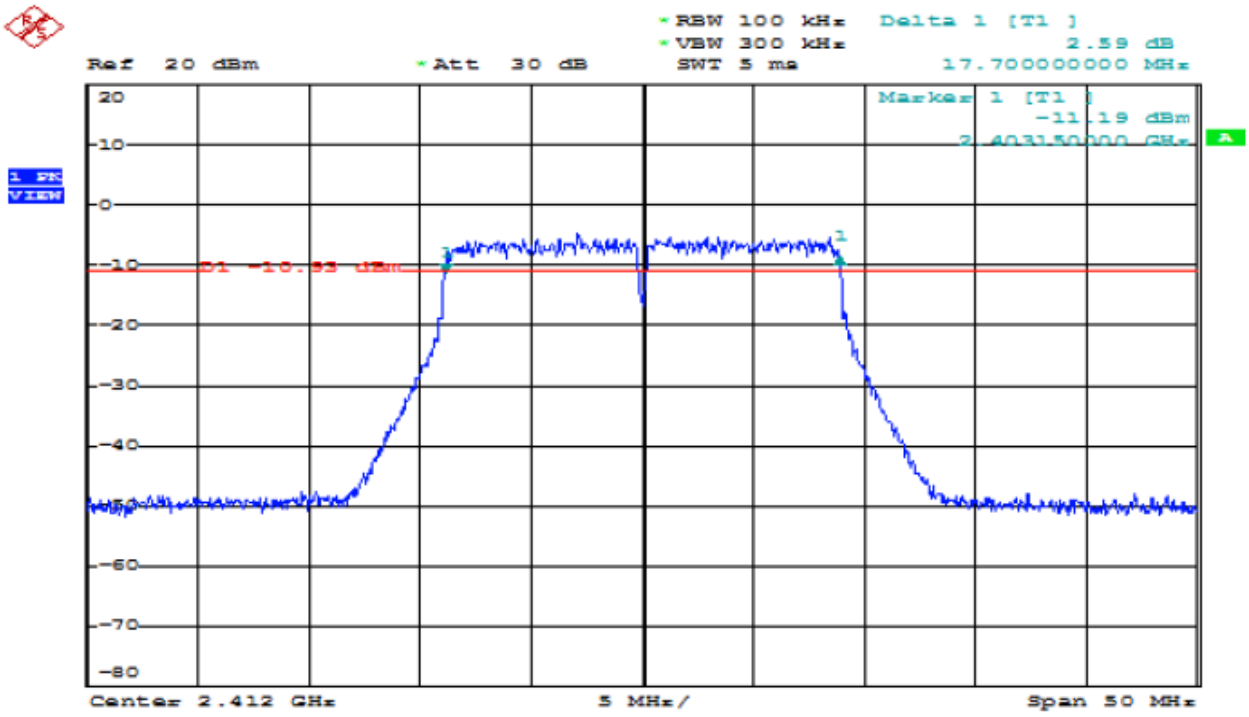
Modulation Standard: 802.11g (6Mbps)
Channel: 06



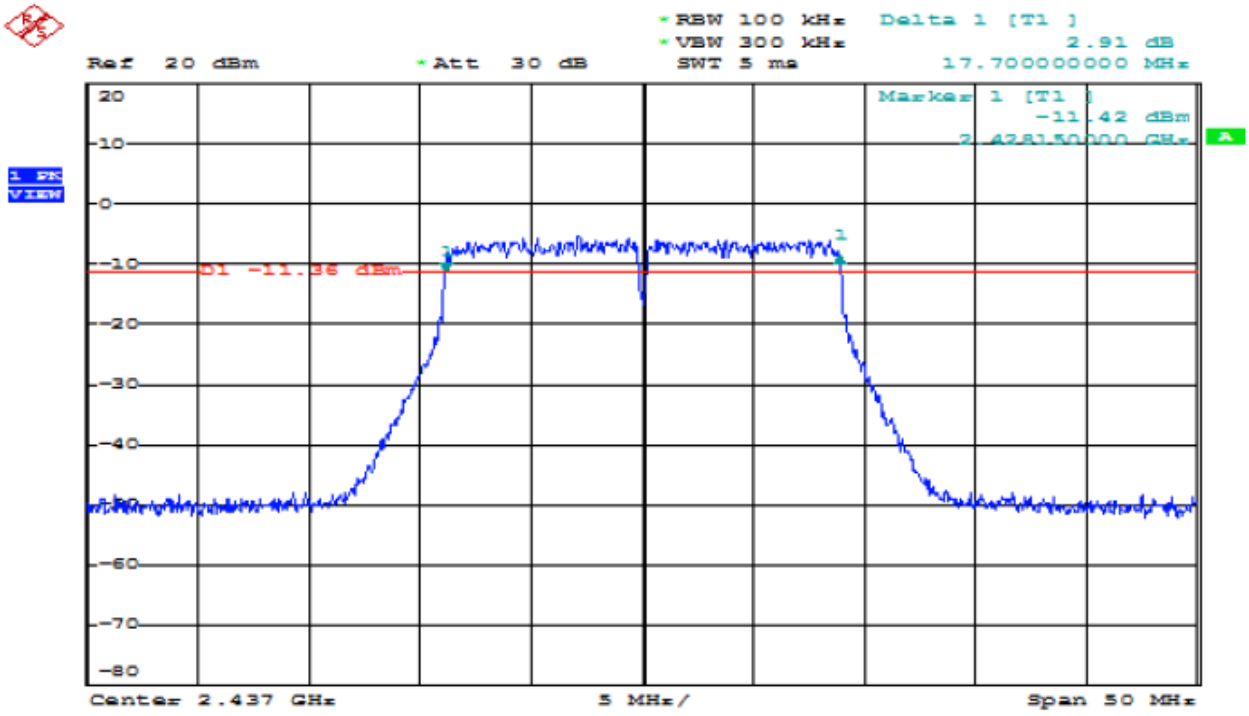
Modulation Standard: 802.11g (6Mbps)
Channel: 11



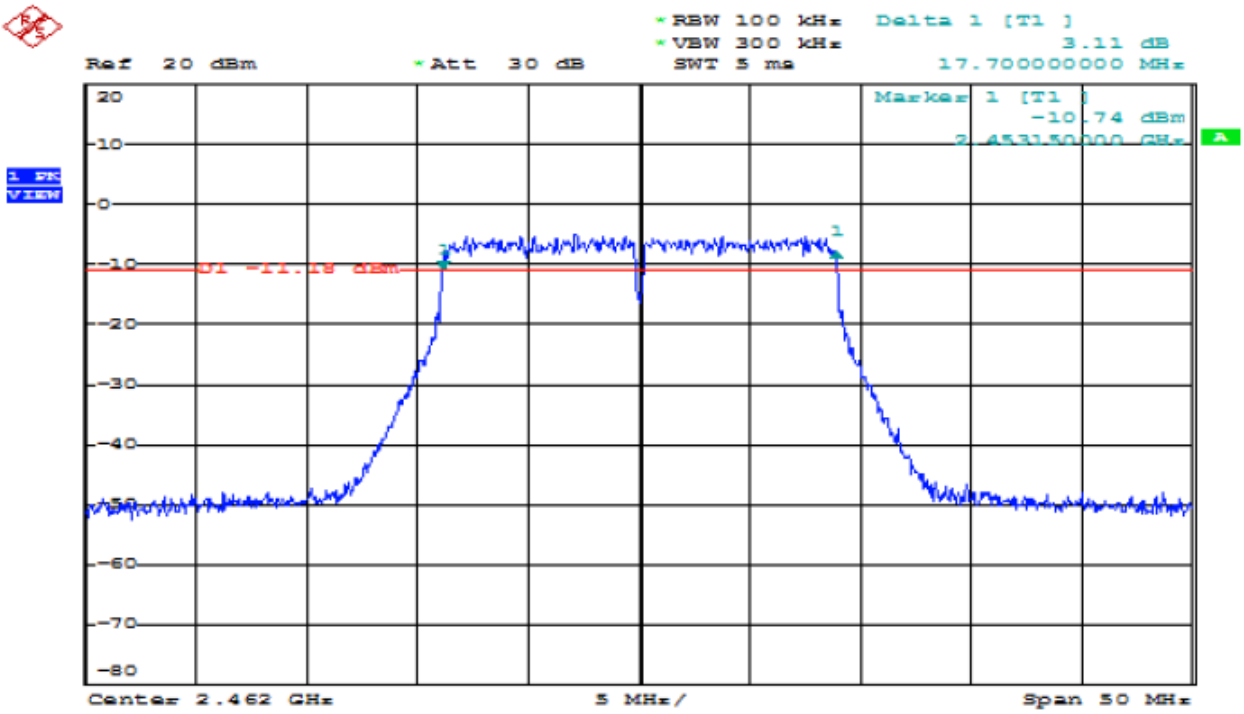
Modulation Standard: 802.11n HT20 (6.5Mbps)
Channel: 01



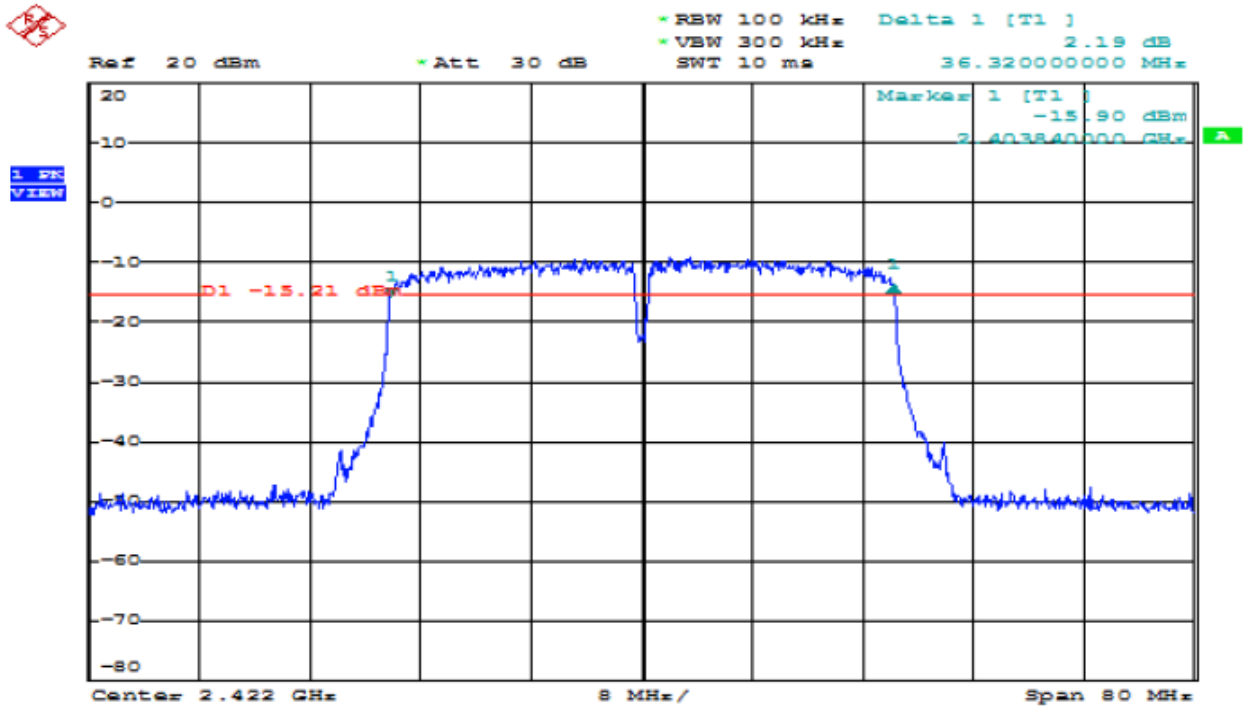
Modulation Standard: 802.11n HT20 (6.5Mbps)
Channel: 06



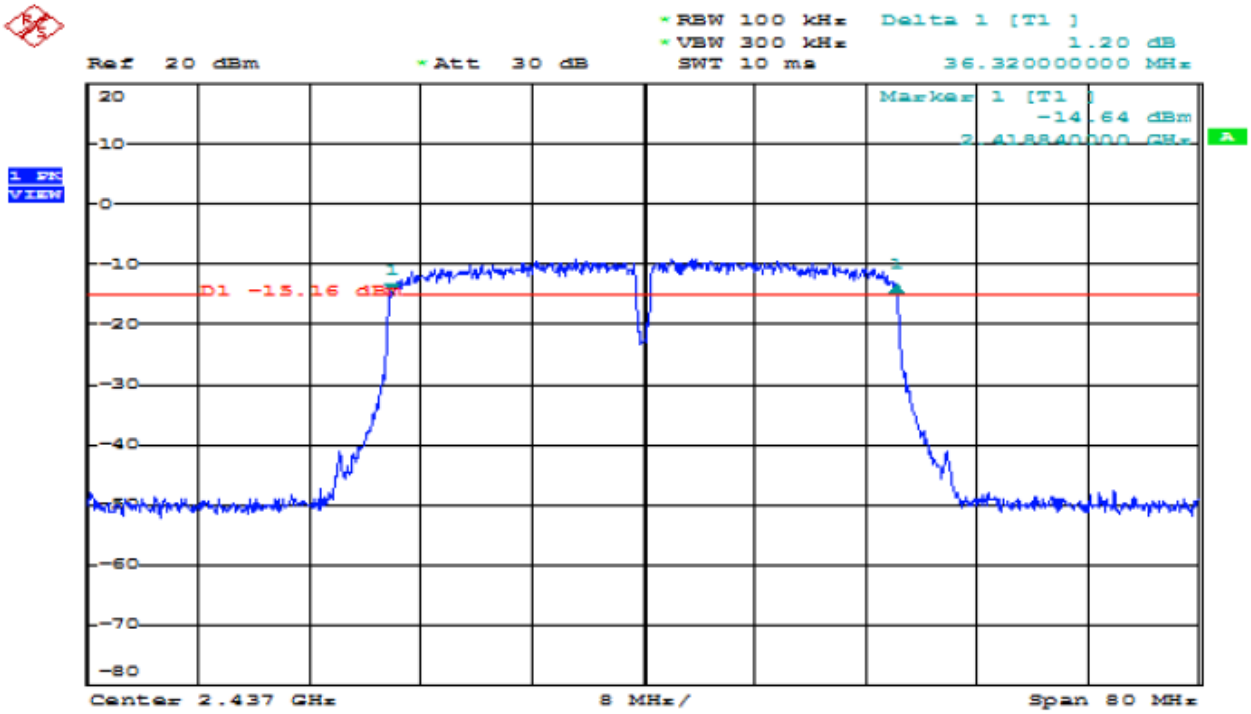
Modulation Standard: 802.11n HT20 (6.5Mbps)
Channel: 11



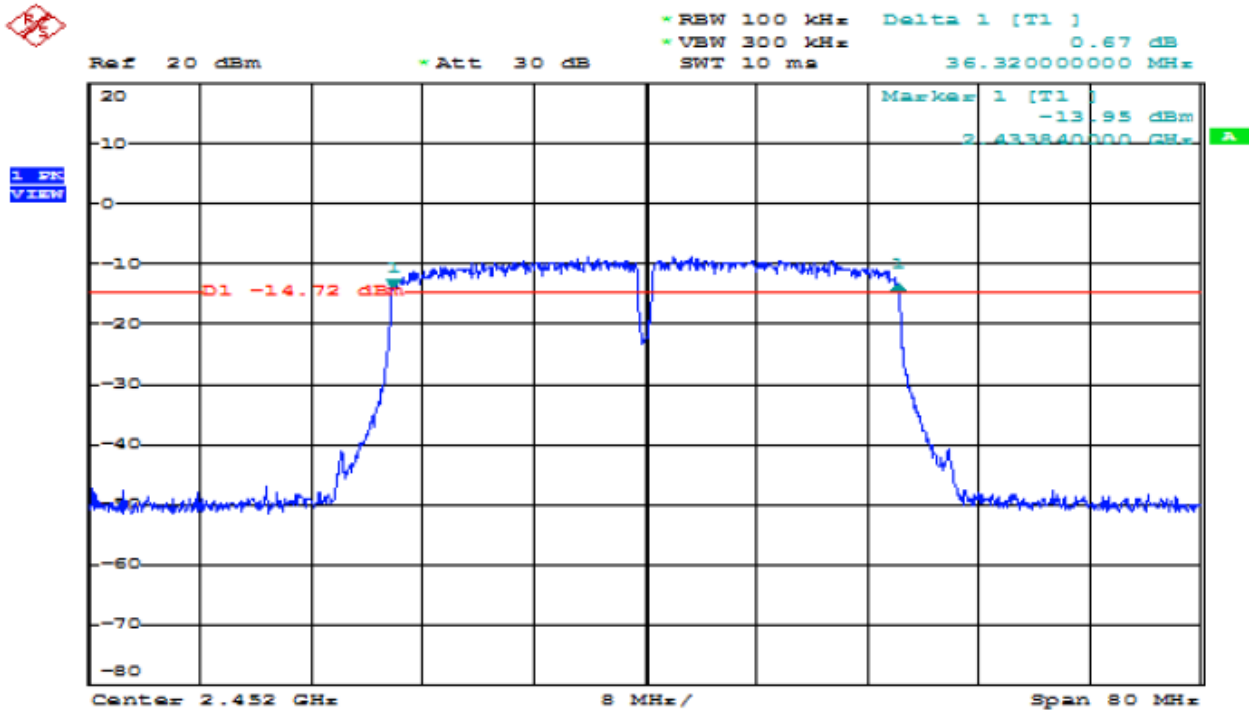
Modulation Standard: 802.11n HT40 (13.5Mbps)
Channel: 03



Modulation Standard: 802.11n HT40 (13.5Mbps)
Channel: 06



Modulation Standard: 802.11n HT40 (13.5Mbps)
Channel: 09



9. Maximum Peak Output Power

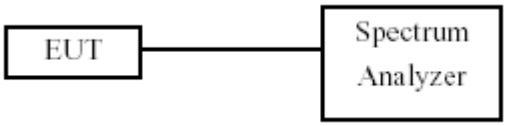
9.1 Test Limit

The Maximum Peak Output Power Measurement is 30dBm.

9.2 Test Procedures

a. The transmitter output was connected to spectrum analyzer.
b. The spectrum analyzer's resolution bandwidth were set at 1MHz RBW and 3MHz VBW as that of the fundamental frequency. Set the sweep time=auto couple.
c. Use the spectrum analyzer's band/channel power measurement function with the band limits set equal to the DTS bandwidth edges (for some analyzers, this may require a manual override to ensure use of peak detector).
d. Employ trace averaging in power averaging (RMS) mode over a minimum of 100 traces.
e. Use the spectrum analyzer's band power measurement function with band limits set equal to the EBW band edges.
f. The peak and average output power was measured and recorded.

9.3 Test Setup Layout



9.4 Test Result and Data

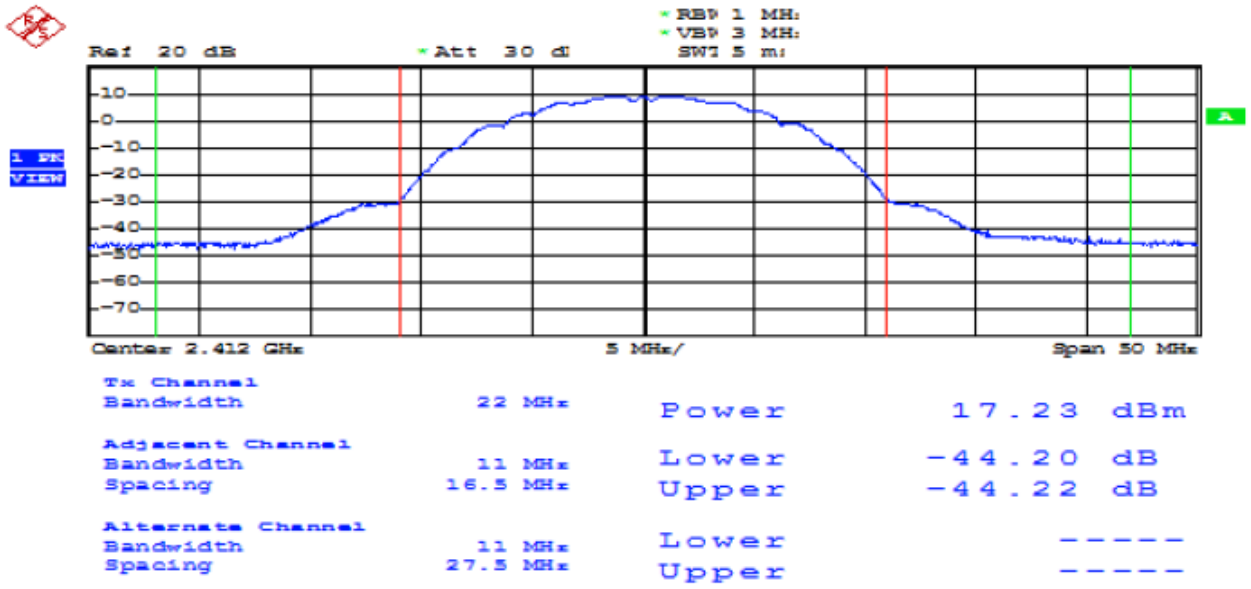
Test Date: Oct. 30, 2017 Temperature: 24℃

Atmospheric pressure: 1007 pha Humidity: 58%

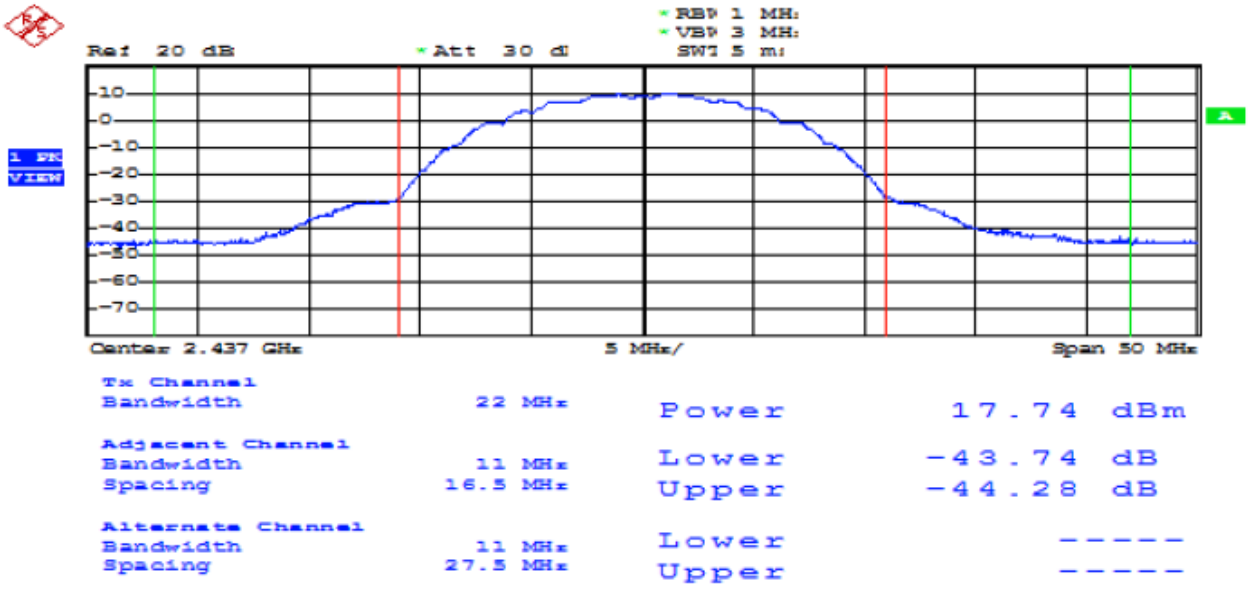
Modulation Standard	Channel	Frequency (MHz)	Peak Power Output (dBm)	Peak Power Output (mW)
802.11b (11Mbps)	01	2412	17.23	52.803
	06	2437	17.74	59.416
	11	2462	18.09	64.473
802.11g (6Mbps)	01	2412	16.31	42.793
	06	2437	16.76	47.441
	11	2462	17.20	52.584

Modulation Standard	Channel	Frequency (MHz)	Peak Power Output (dBm)	Peak Power Output (mW)
802.11n HT20 (6.5Mbps)	01	2412	16.65	46.217
	06	2437	17.01	50.250
	11	2462	17.36	54.456
802.11n HT40 (13.5Mbps)	03	2422	15.83	38.249
	06	2437	16.19	41.625
	09	2452	16.44	44.022

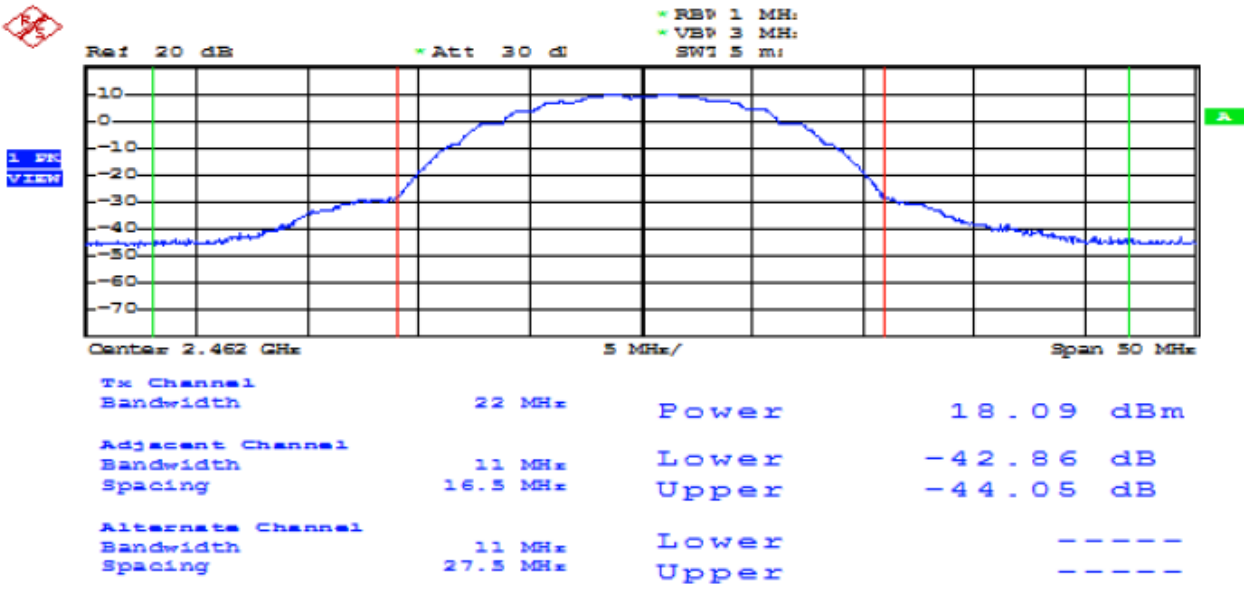
Modulation Standard: 802.11b (11Mbps)
Channel: 01



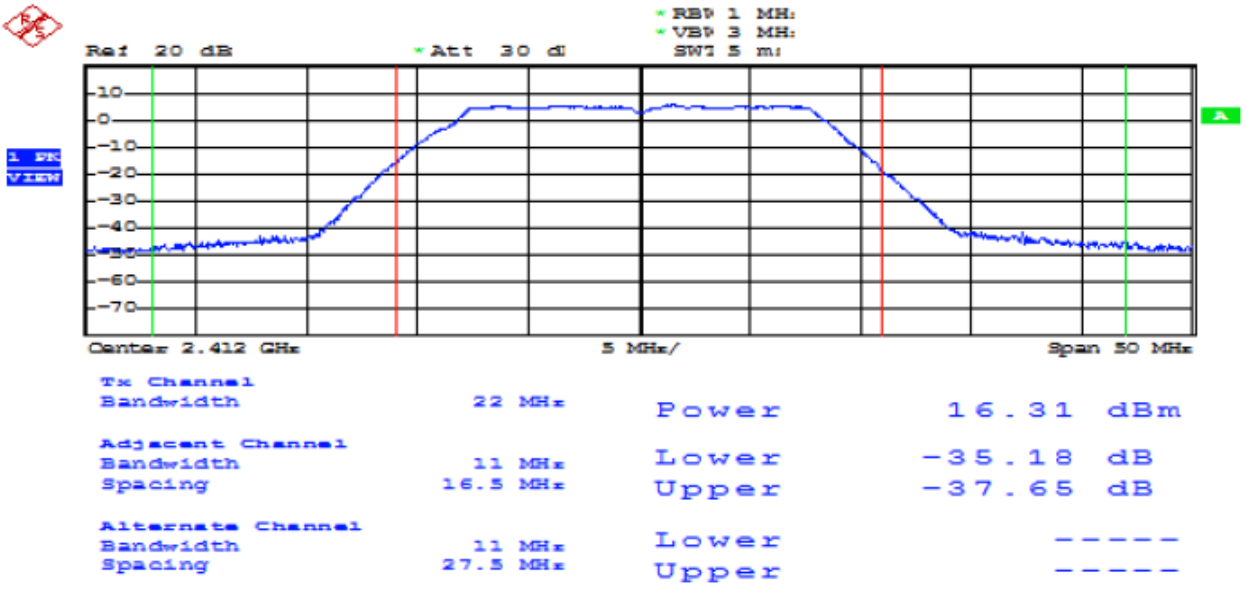
Modulation Standard: 802.11b (11Mbps)
Channel: 06



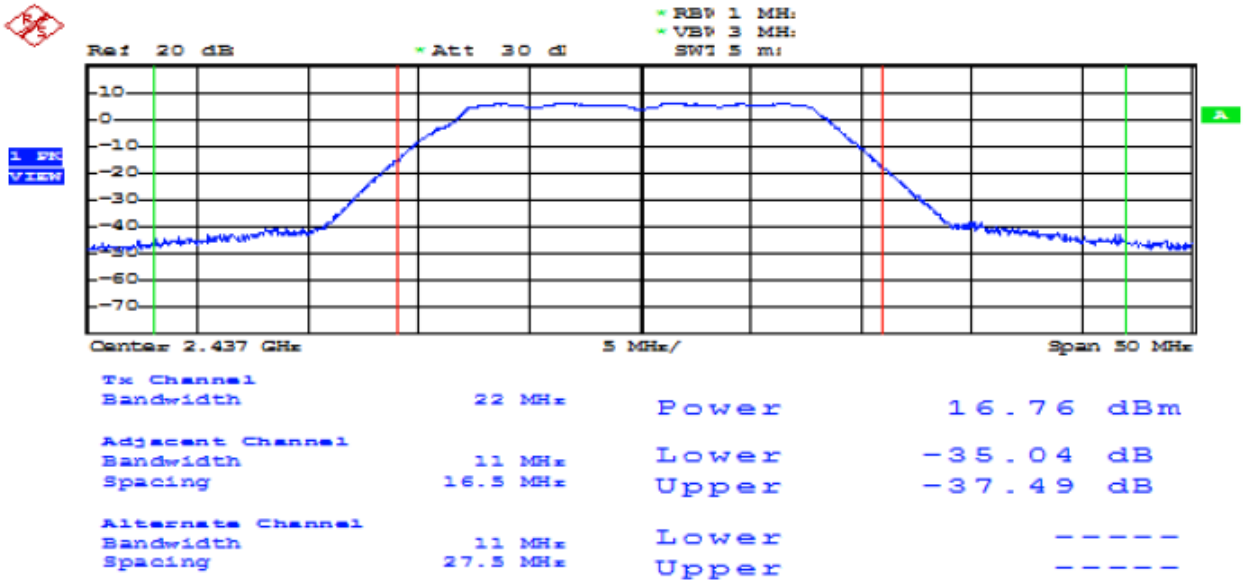
Modulation Standard: 802.11b (11Mbps)
Channel: 11



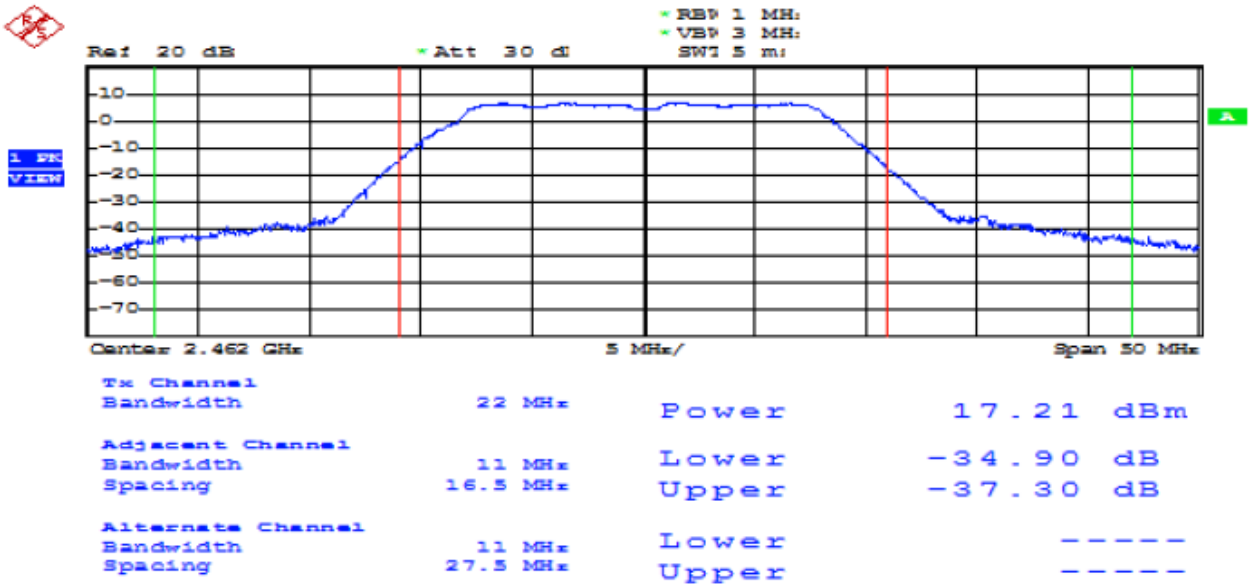
Modulation Standard: 802.11g (6Mbps)
Channel: 01



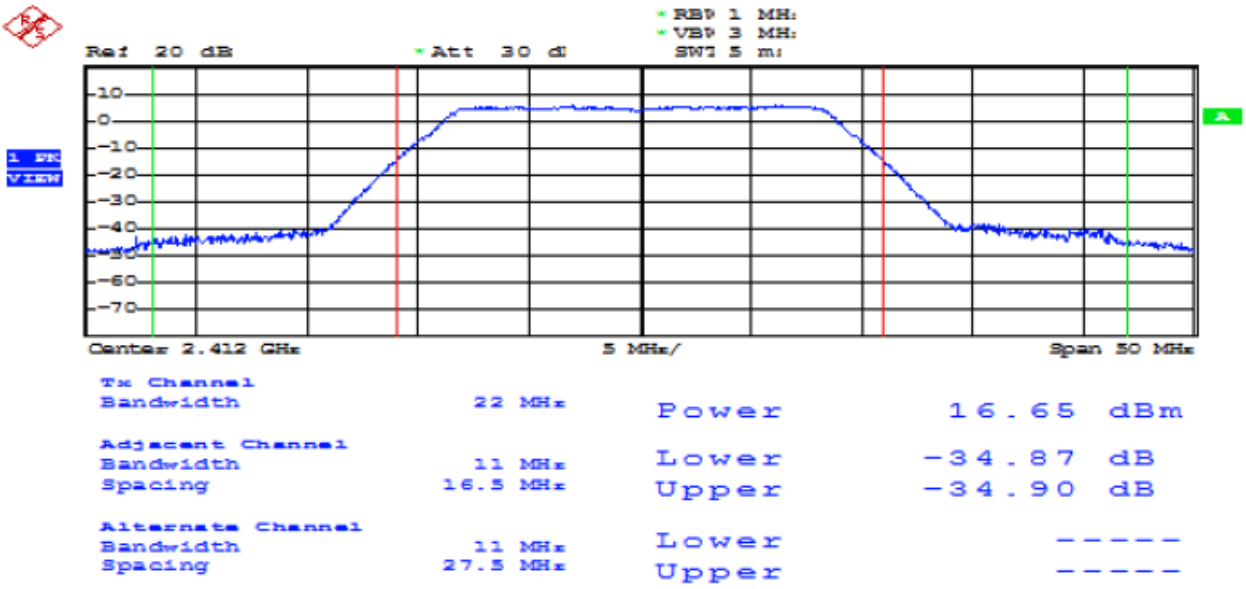
Modulation Standard: 802.11g (6Mbps)
Channel: 06



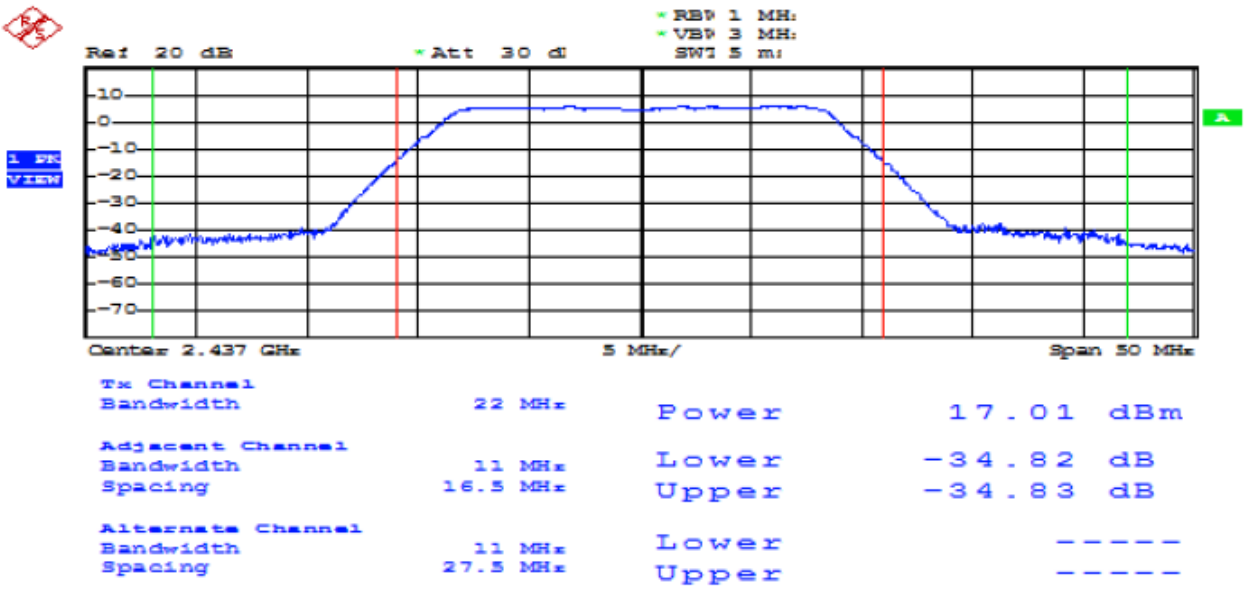
Modulation Standard: 802.11g (6Mbps)
Channel: 11



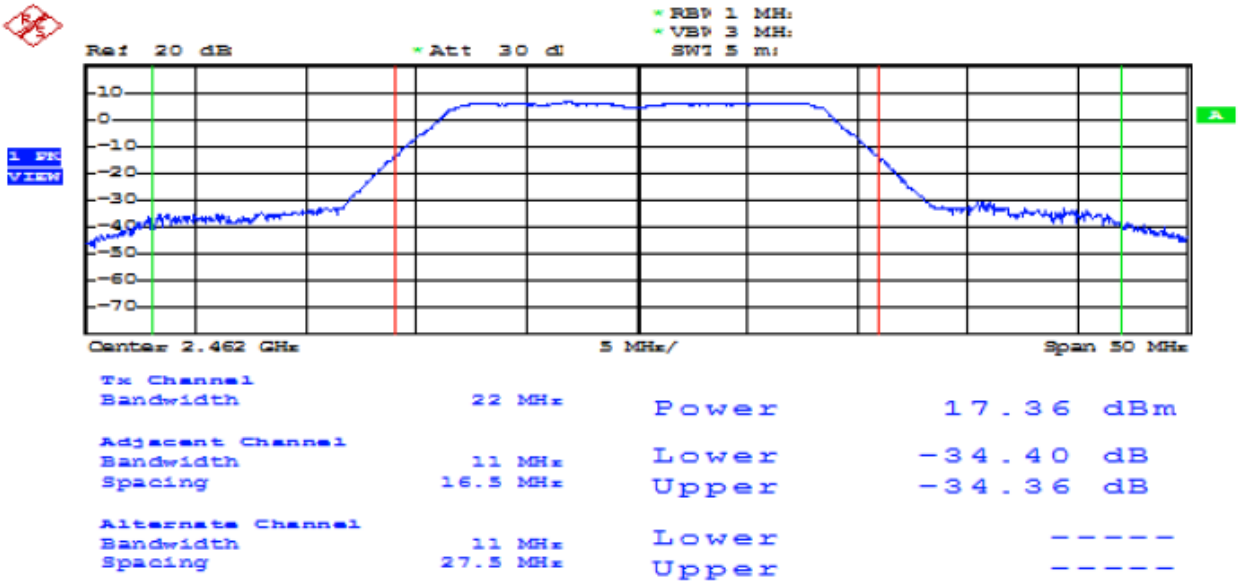
Modulation Standard: 802.11n HT20 (6.5Mbps)
Channel: 01



Modulation Standard: 802.11n HT20 (6.5Mbps)
Channel: 06

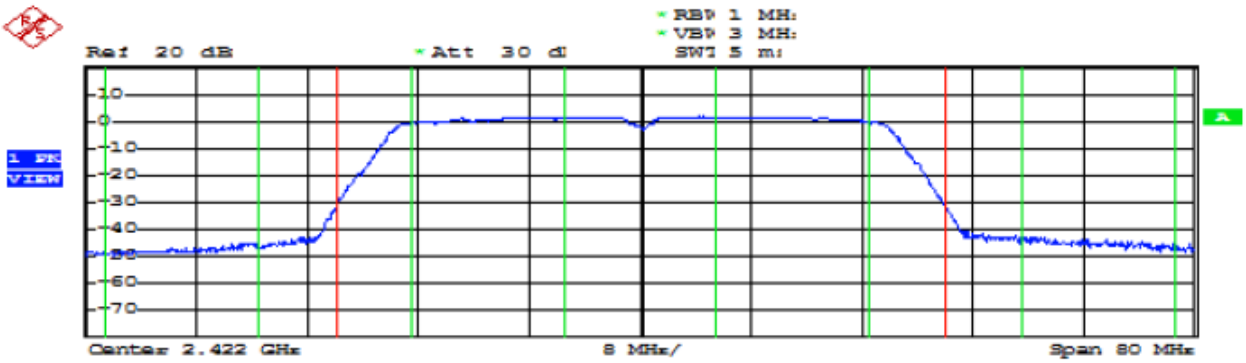


Modulation Standard: 802.11n HT20 (6.5Mbps)
Channel: 11



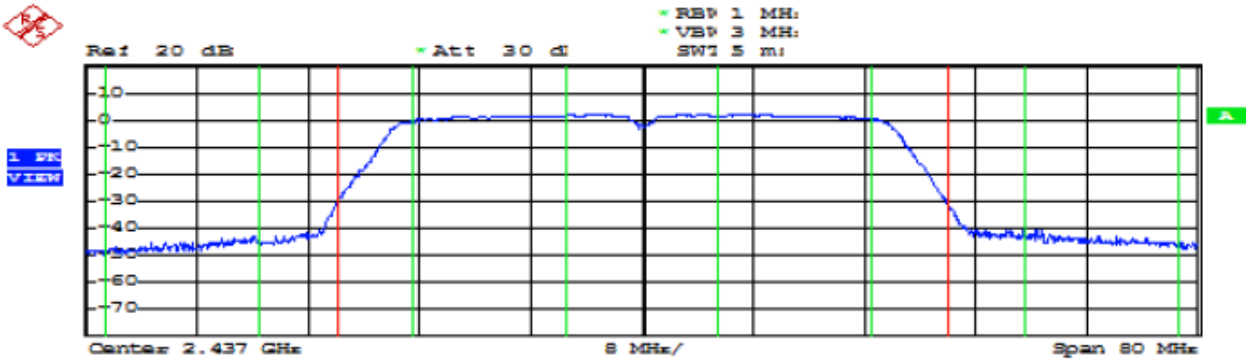
Tx Channel Bandwidth	22 MHz	Power	17.36 dBm
Adjacent Channel Bandwidth	11 MHz	Lower	-34.40 dB
Spacing	16.5 MHz	Upper	-34.36 dB
Alternate Channel Bandwidth	11 MHz	Lower	-----
Spacing	27.5 MHz	Upper	-----

Modulation Standard: 802.11n HT40 (13.5Mbps)
Channel: 03



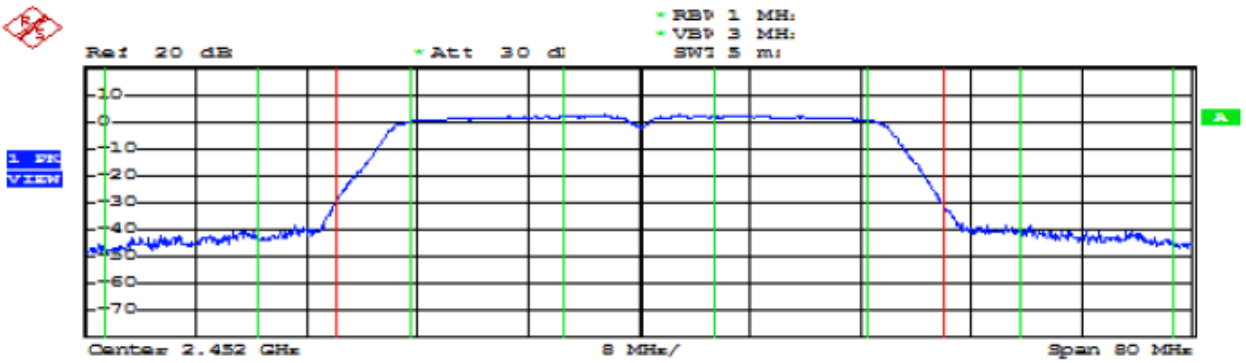
Tx Channel Bandwidth	44 MHz	Power	15.83 dBm
Adjacent Channel Bandwidth	22 MHz	Lower	-5.05 dB
Spacing	16.5 MHz	Upper	-4.42 dB
Alternate Channel Bandwidth	22 MHz	Lower	-15.70 dB
Spacing	27.5 MHz	Upper	-14.42 dB

Modulation Standard: 802.11n HT40 (13.5Mbps)
Channel: 06



Tx Channel Bandwidth	44 MHz	Power	16.19 dBm
Adjacent Channel Bandwidth	22 MHz	Lower	-5.02 dB
Adjacent Channel Spacing	16.5 MHz	Upper	-4.45 dB
Alternate Channel Bandwidth	22 MHz	Lower	-15.63 dB
Alternate Channel Spacing	27.5 MHz	Upper	-14.55 dB

Modulation Standard: 802.11n HT40 (13.5Mbps)
Channel: 09



Tx Channel Bandwidth	44 MHz	Power	16.44 dBm
Adjacent Channel Bandwidth	22 MHz	Lower	-4.94 dB
Adjacent Channel Spacing	16.5 MHz	Upper	-4.52 dB
Alternate Channel Bandwidth	22 MHz	Lower	-15.56 dB
Alternate Channel Spacing	27.5 MHz	Upper	-14.59 dB

10. Power Spectral Density

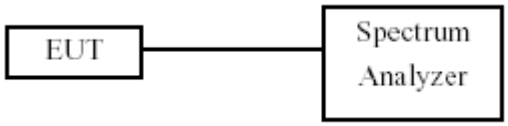
10.1 Test Limit

The Maximum of Power Spectral Density Measurement is 8dBm

10.2 Test Procedures

g. The transmitter output was connected to spectrum analyzer.
h. The spectrum analyzer's resolution bandwidth were set at 3KHz RBW and 30KHz VBW as that of the fundamental frequency. Set the sweep time=auto couple.
i. The power spectral density was measured and recorded.

10.3 Test Setup Layout



10.4 Test Result and Data

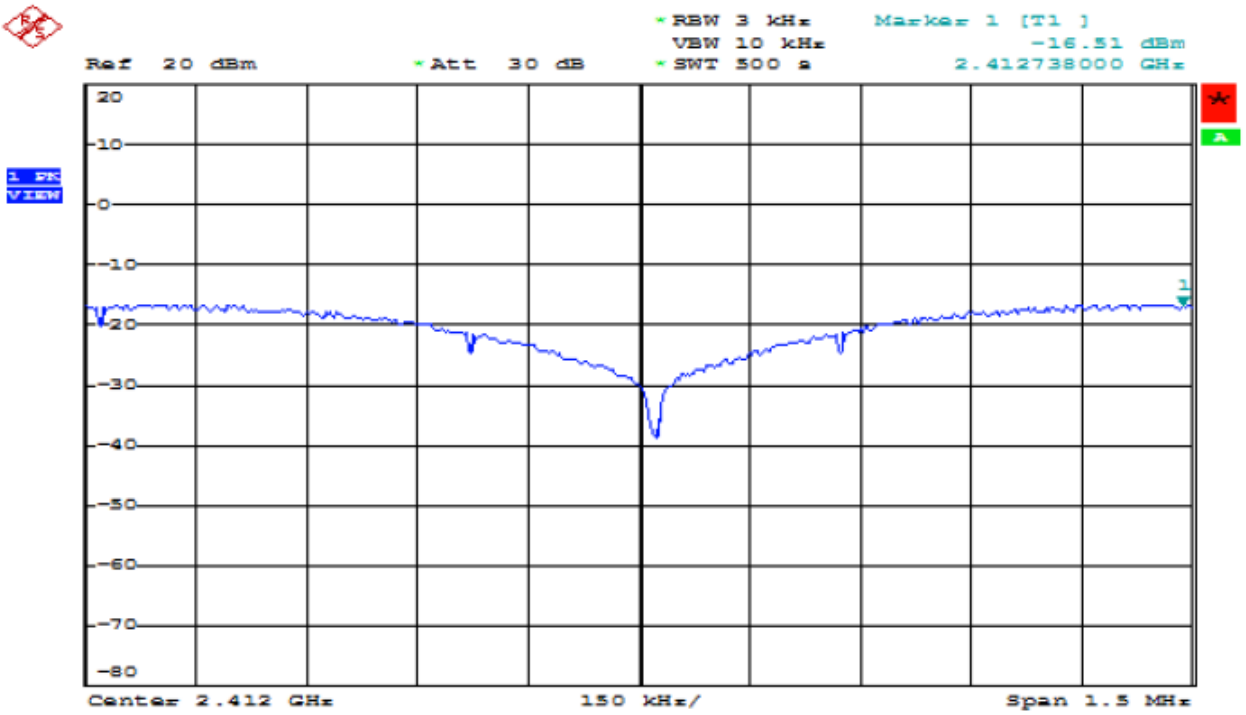
Test Date: Oct. 30, 2017 Temperature: 24℃

Atmospheric pressure: 1007 pha Humidity: 58%

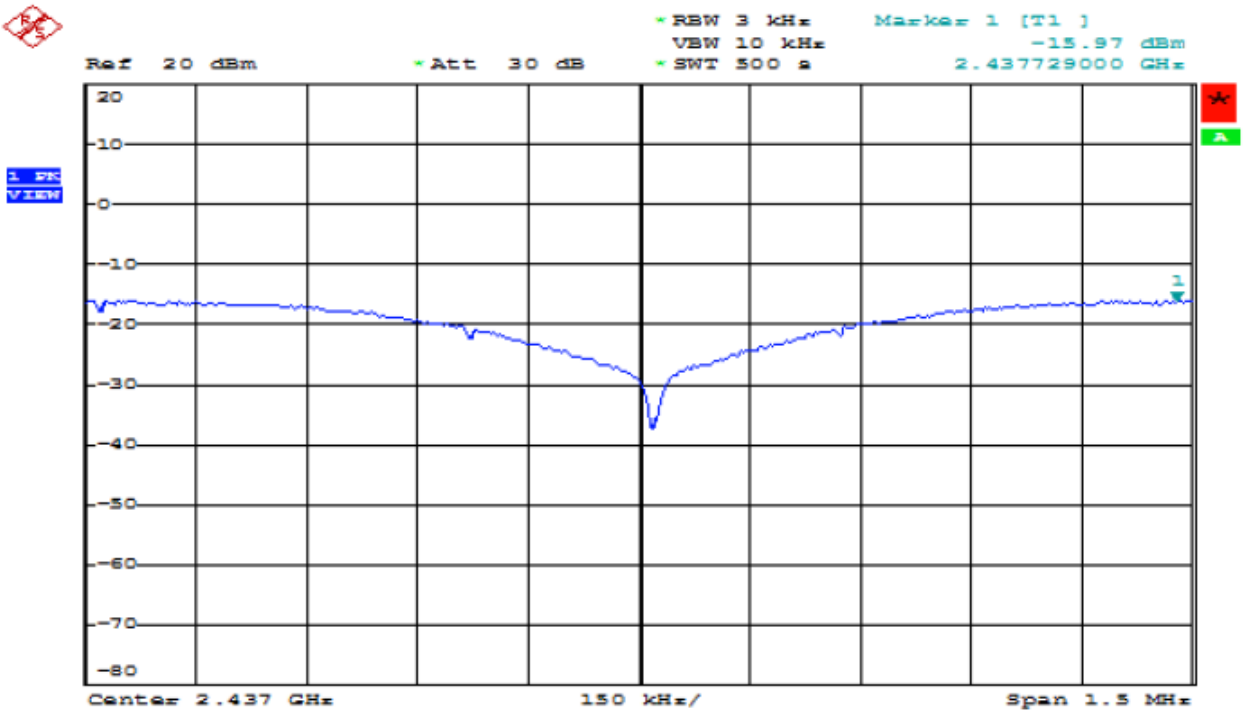
Modulation Standard	Channel	Frequency (MHz)	Measured Power Density (dBm)
802.11b (11Mbps)	01	2412	-16.51
	06	2437	-15.97
	11	2462	-15.43
802.11g (6Mbps)	01	2412	-21.10
	06	2437	-20.70
	11	2462	-20.30

Modulation Standard	Channel	Frequency (MHz)	Measured Power Density (dBm)
802.11n HT20 (6.5Mbps)	01	2412	-20.47
	06	2437	-20.09
	11	2462	-19.55
802.11n HT40 (13.5Mbps)	03	2422	-23.97
	06	2437	-23.60
	09	2452	-23.26

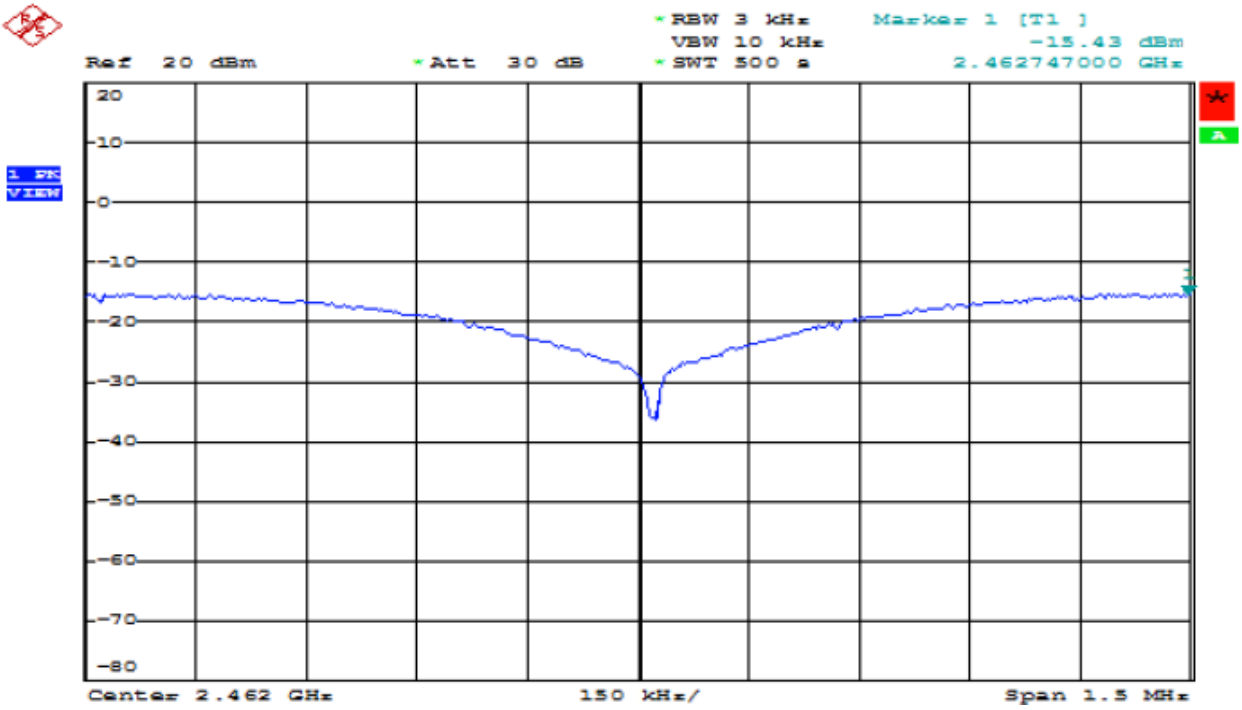
Modulation Standard: 802.11b (11Mbps)
Channel: 01



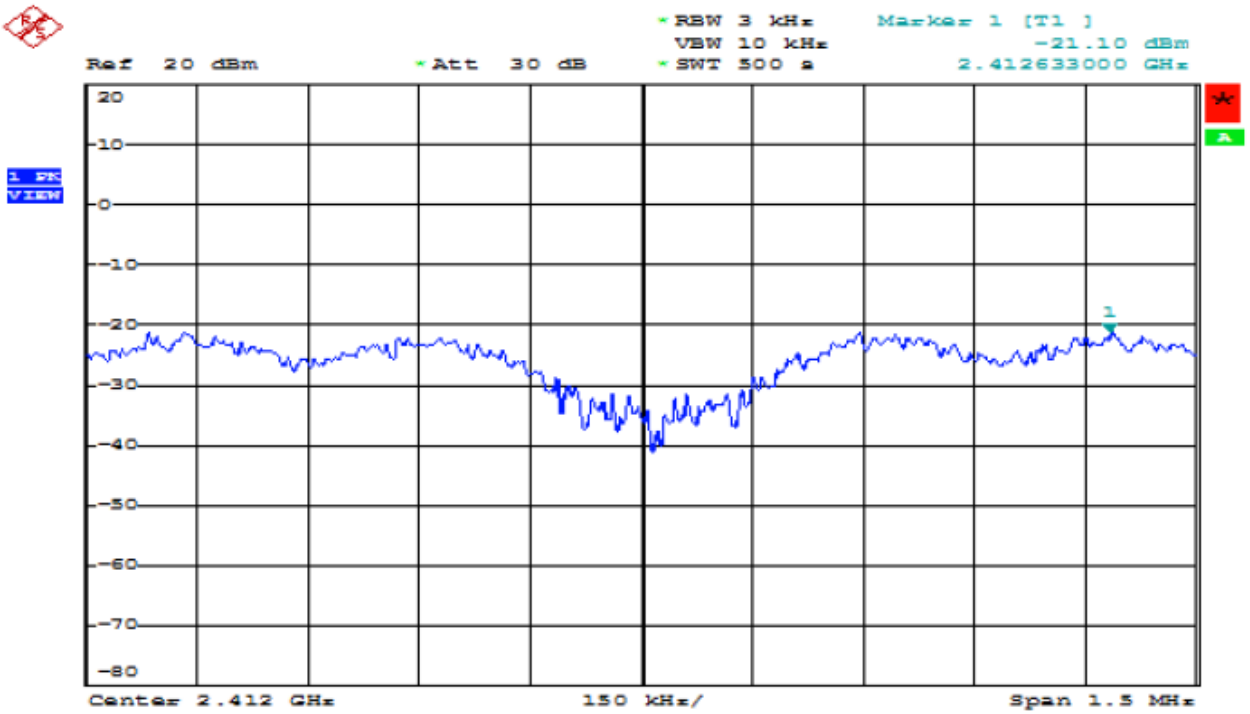
Modulation Standard: 802.11b (11Mbps)
Channel: 06



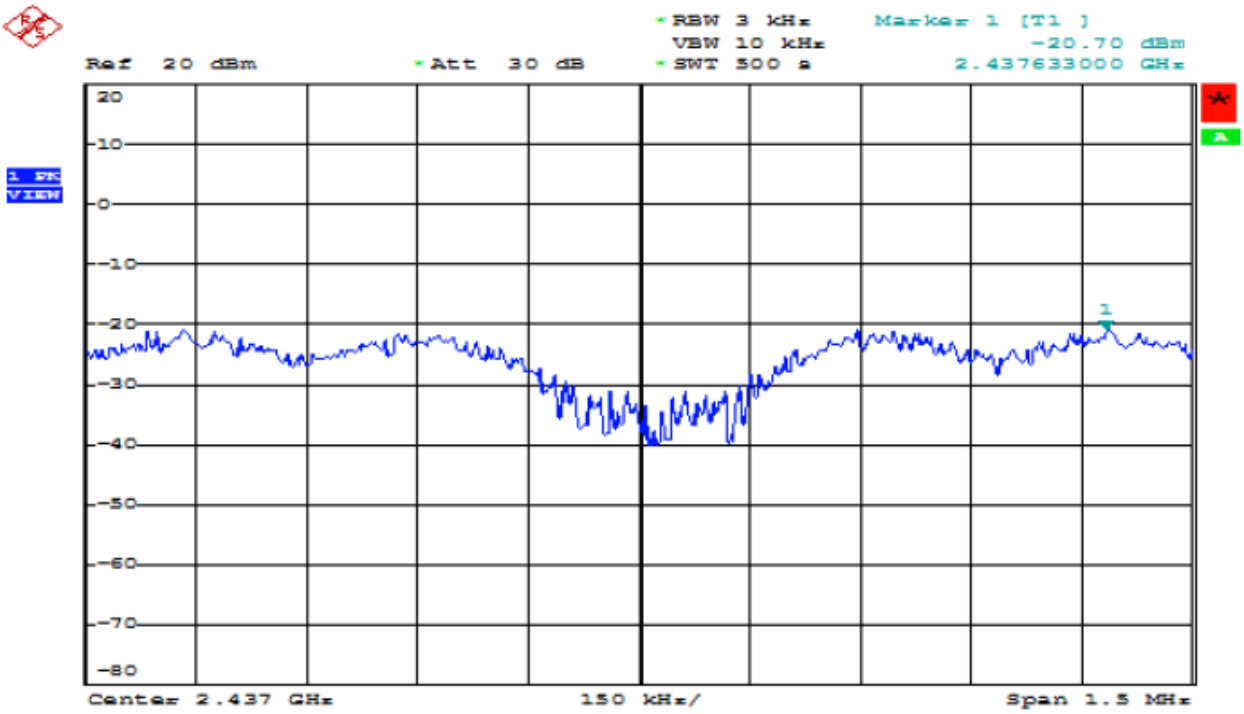
Modulation Standard: 802.11b (11Mbps)
Channel: 11



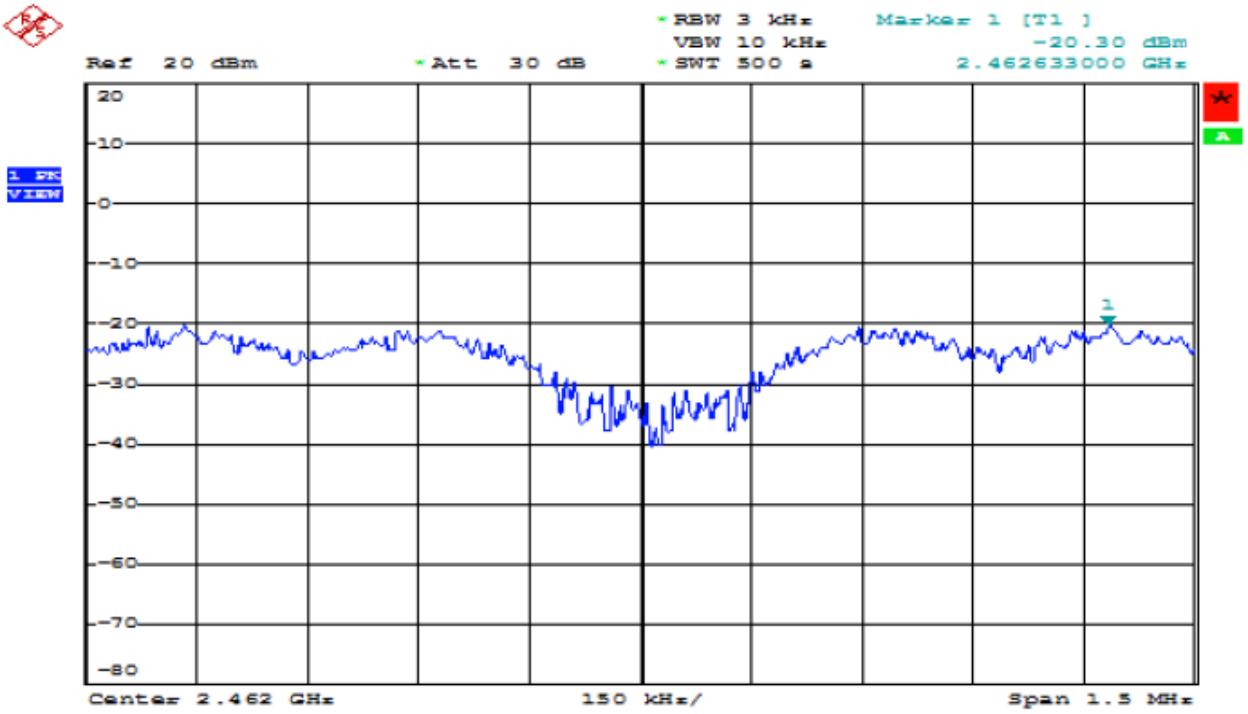
Modulation Standard: 802.11g (6Mbps)
Channel: 01



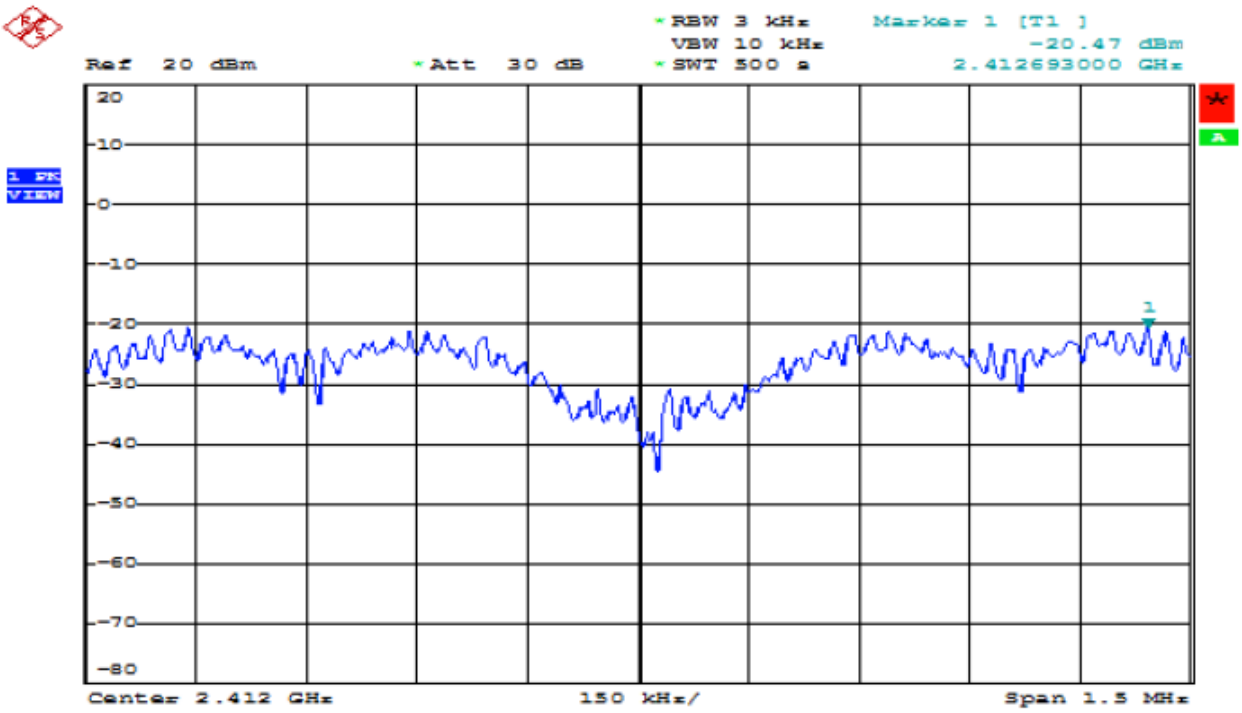
Modulation Standard: 802.11g (6Mbps)
Channel: 06



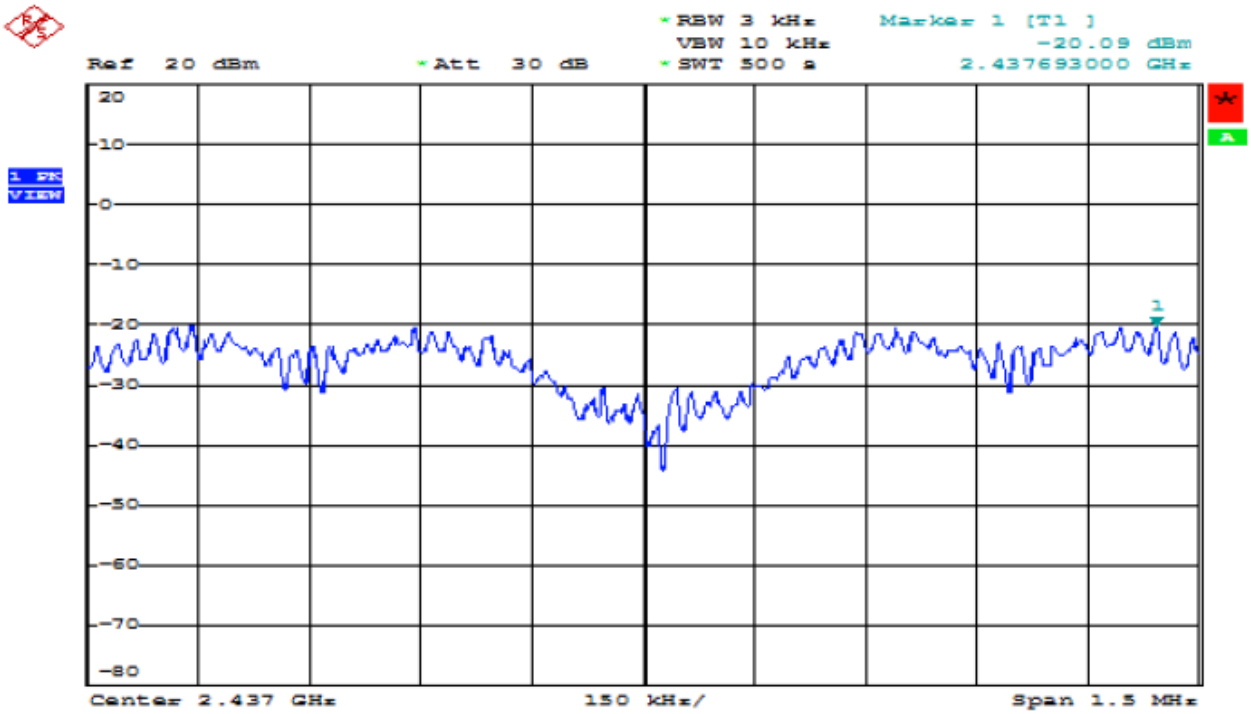
Modulation Standard: 802.11g (6Mbps)
Channel: 11



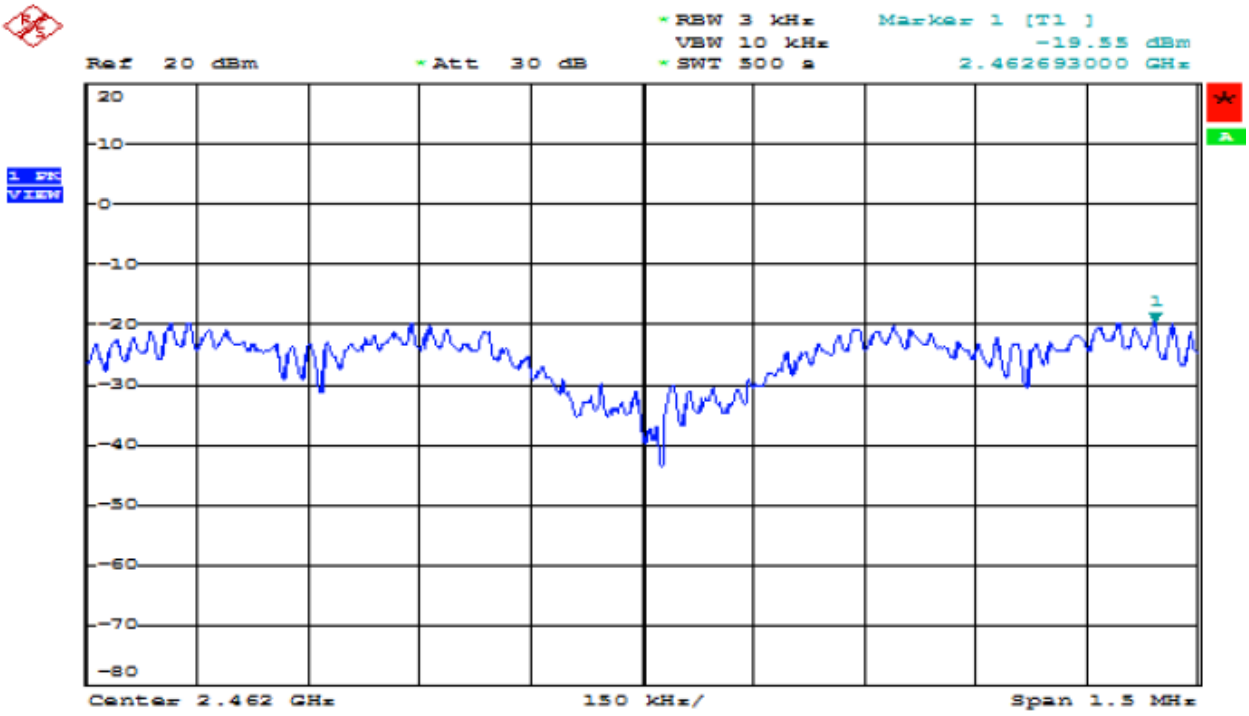
Modulation Standard: 802.11n HT20 (6.5Mbps)
Channel: 01



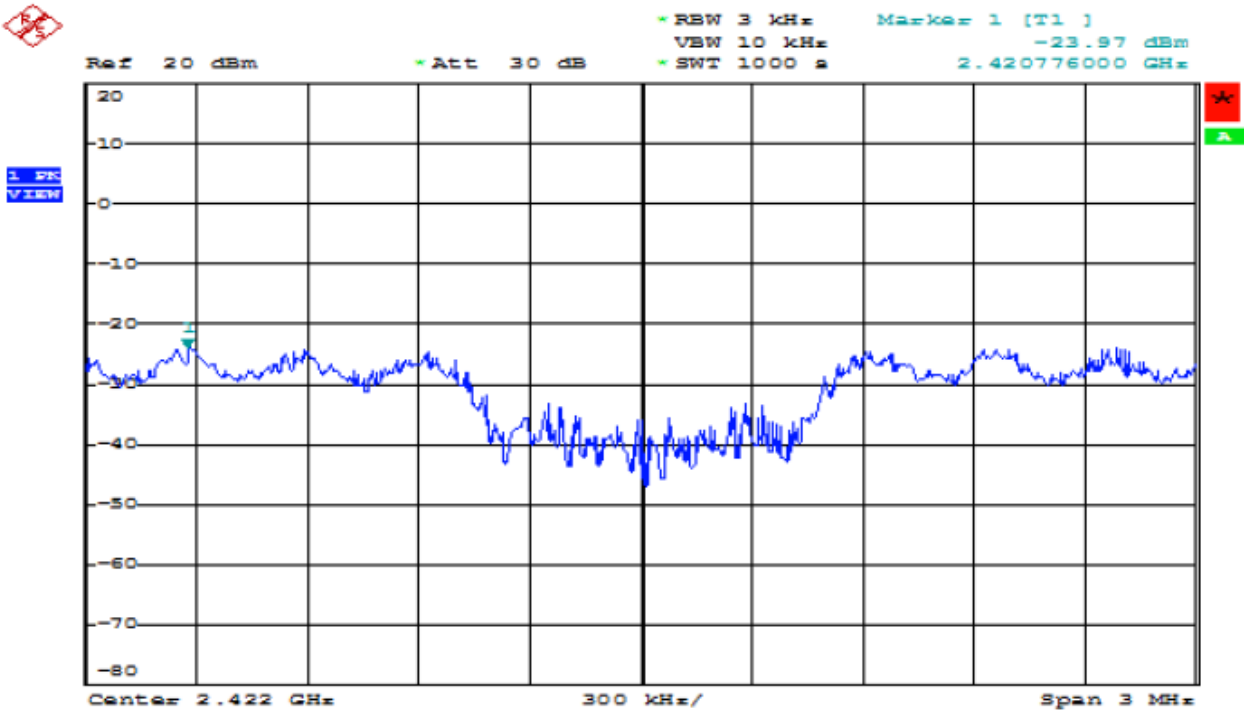
Modulation Standard: 802.11n HT20 (6.5Mbps)
Channel: 06



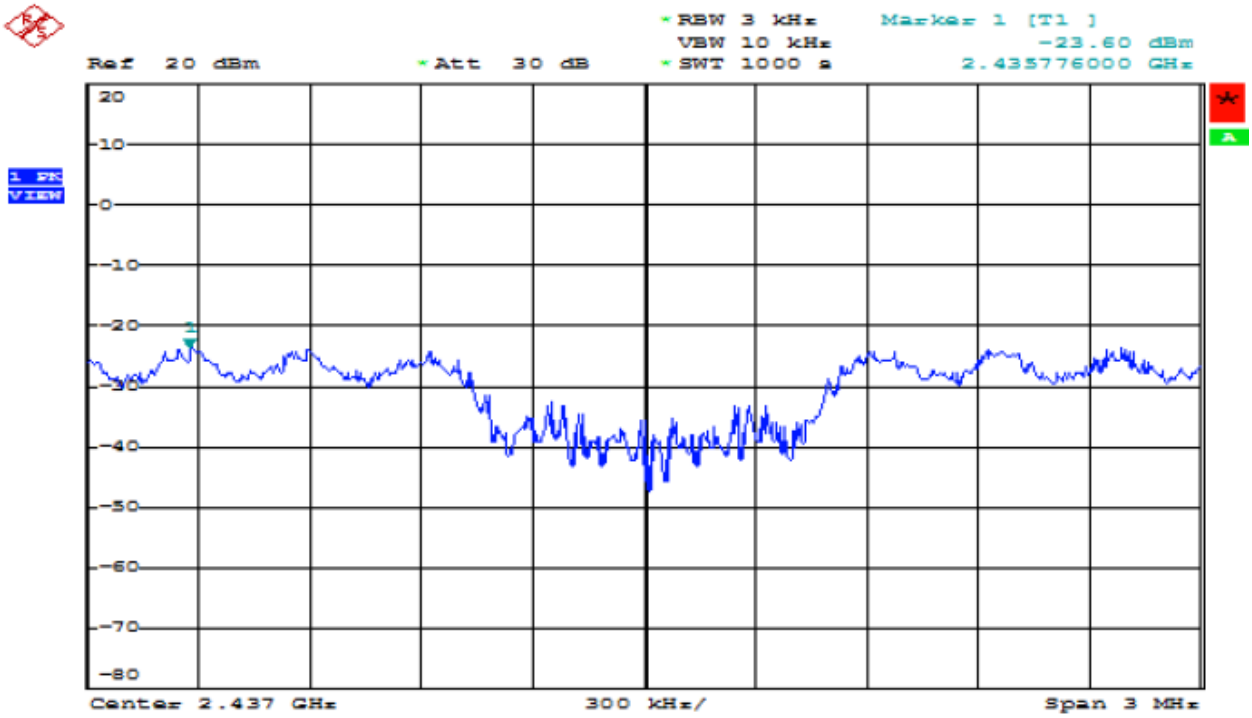
Modulation Standard: 802.11n HT20 (6.5Mbps)
Channel: 11



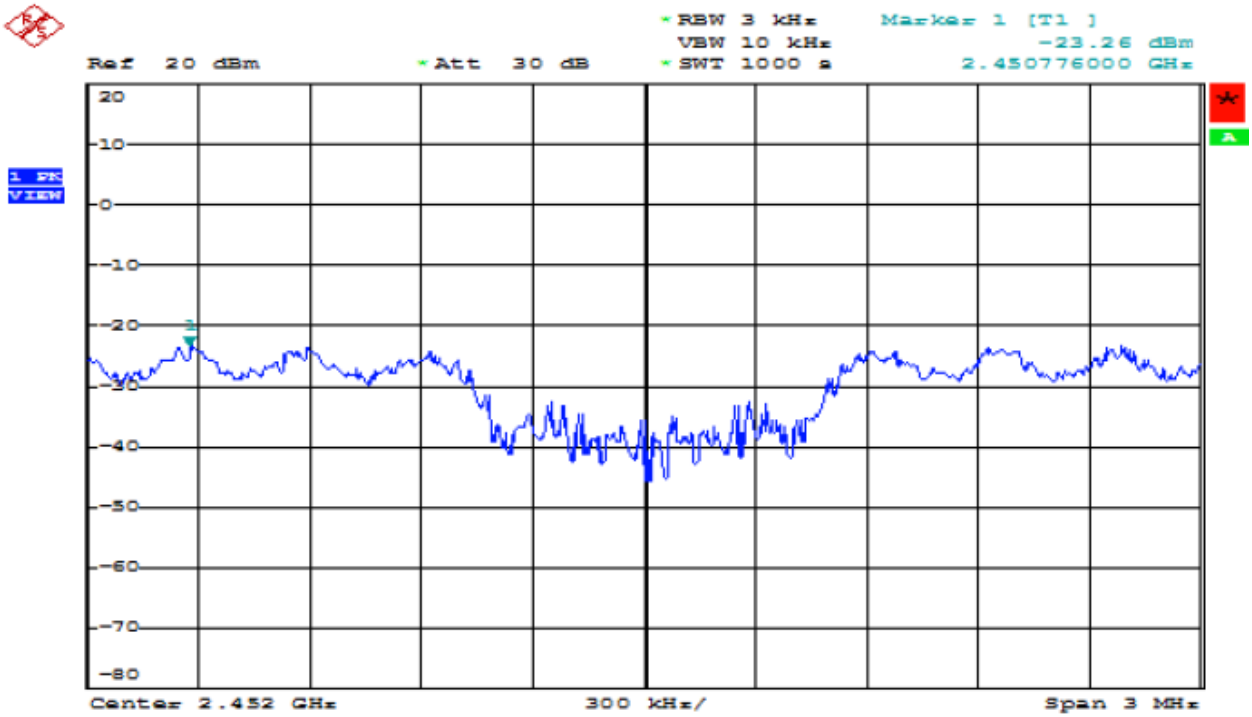
Modulation Standard: 802.11n HT40 (13.5Mbps)
Channel: 03



Modulation Standard: 802.11n HT40 (13.5Mbps)
Channel: 06



Modulation Standard: 802.11n HT40 (13.5Mbps)
Channel: 09



11. Band Edges Measurement

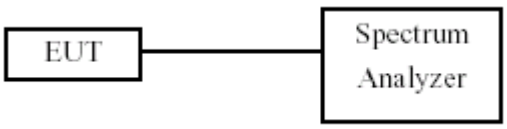
11.1 Test Limit

Below –20dB of the highest emission level of operating band (In 100 kHz Resolution Bandwidth)

11.2 Test Procedure

a. The transmitter output was connected to the spectrum analyzer via a low lose cable.
b. Set RBW of spectrum analyzer to 100 KHz and VBW of spectrum analyzer to 300 KHz with convenient frequency span including 100 KHz bandwidth from band edge.
c. Peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 20dB relative to the maximum measured in-band peak PSD level.
d. The band edges was measured and recorded.

11.3 Test Setup Layout



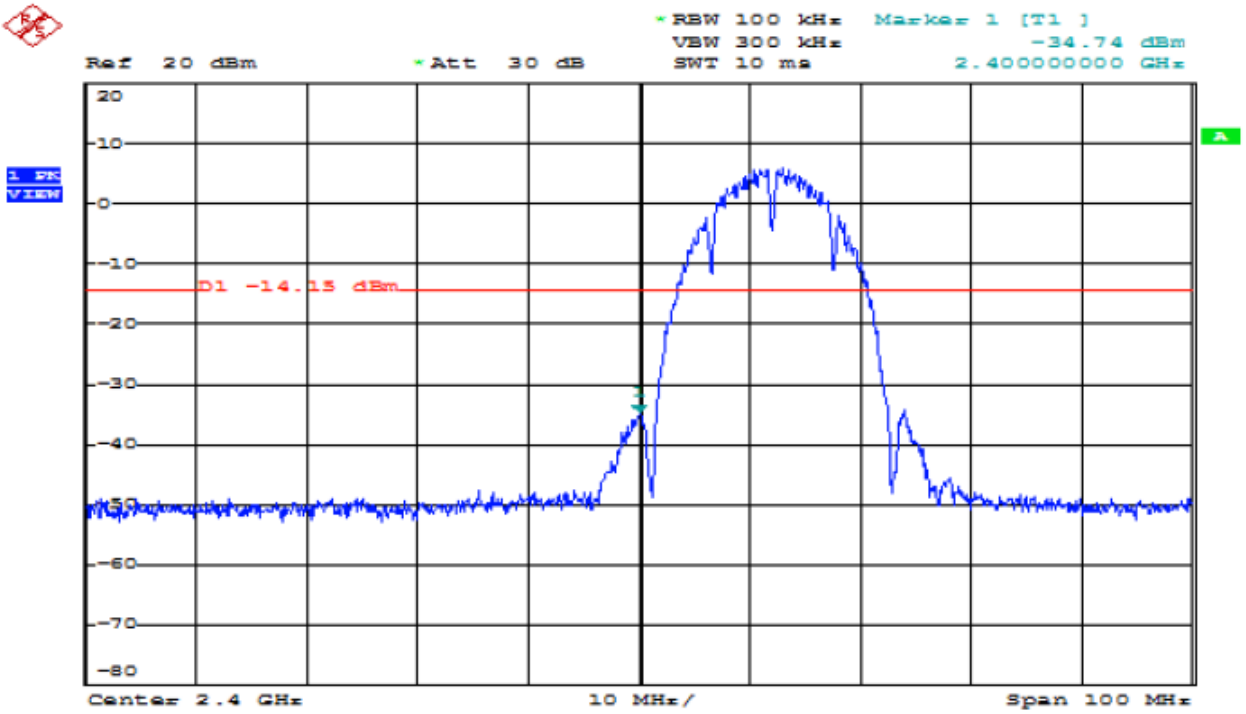
11.4 Test Result and Data

Test Date: Oct. 30, 2017 Temperature: 24℃

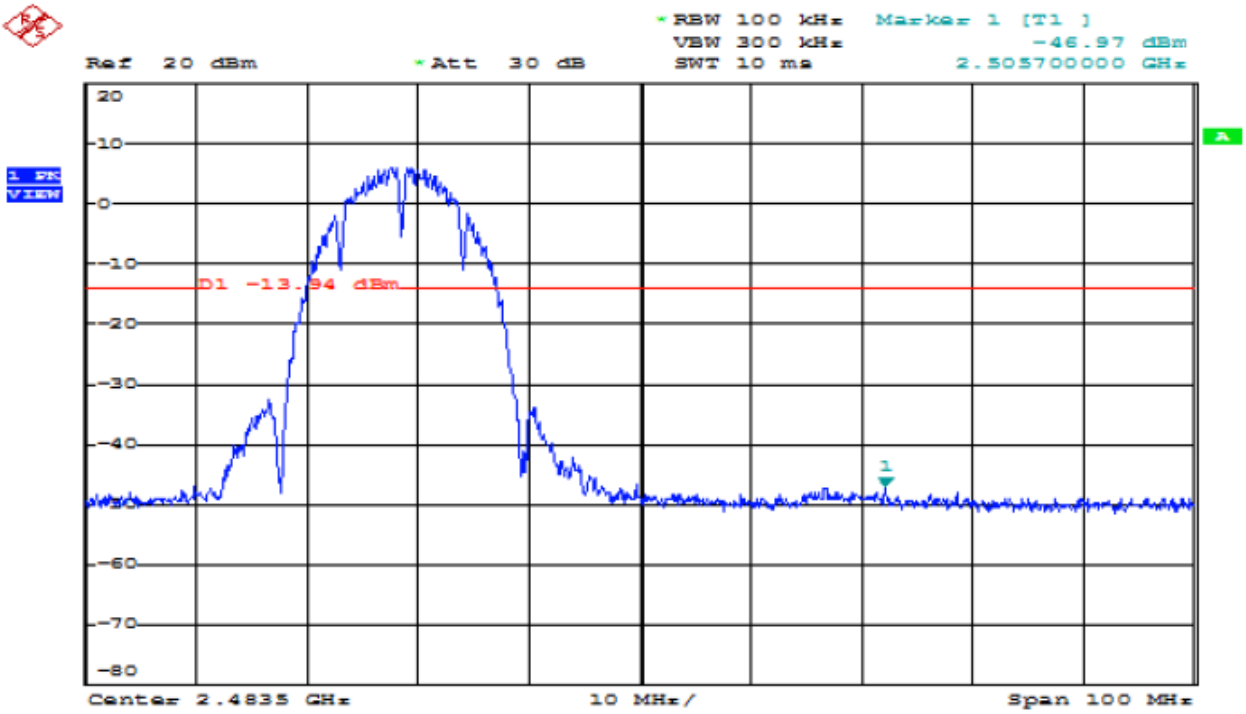
Atmospheric pressure: 1007 pha Humidity: 58%

Modulation Standard	Channel	Frequency (MHz)	maximum value in frequency (MHz)	maximum value (dBm)
802.11b (11Mbps)	01	2412	2400.0	-34.74
	11	2462	2505.7	-46.97
802.11g (6Mbps)	01	2412	2400.0	-43.30
	11	2462	2483.6	-47.72
802.11n HT20 (6.5Mbps)	01	2412	2400.0	-42.68
	11	2462	2499.4	-46.57
802.11n HT40 (13.5Mbps)	03	2422	2400.0	-43.60
	09	2452	2500.7	-47.64

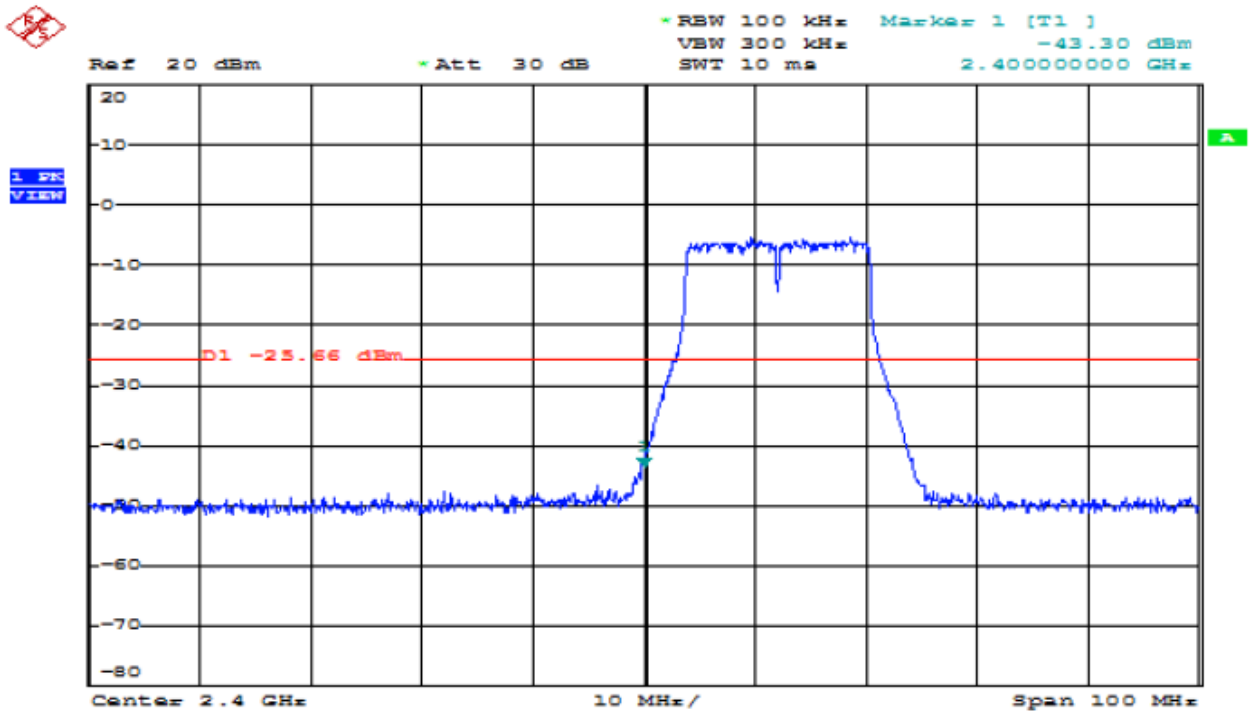
Modulation Standard: 802.11b (11Mbps)
Channel: 01



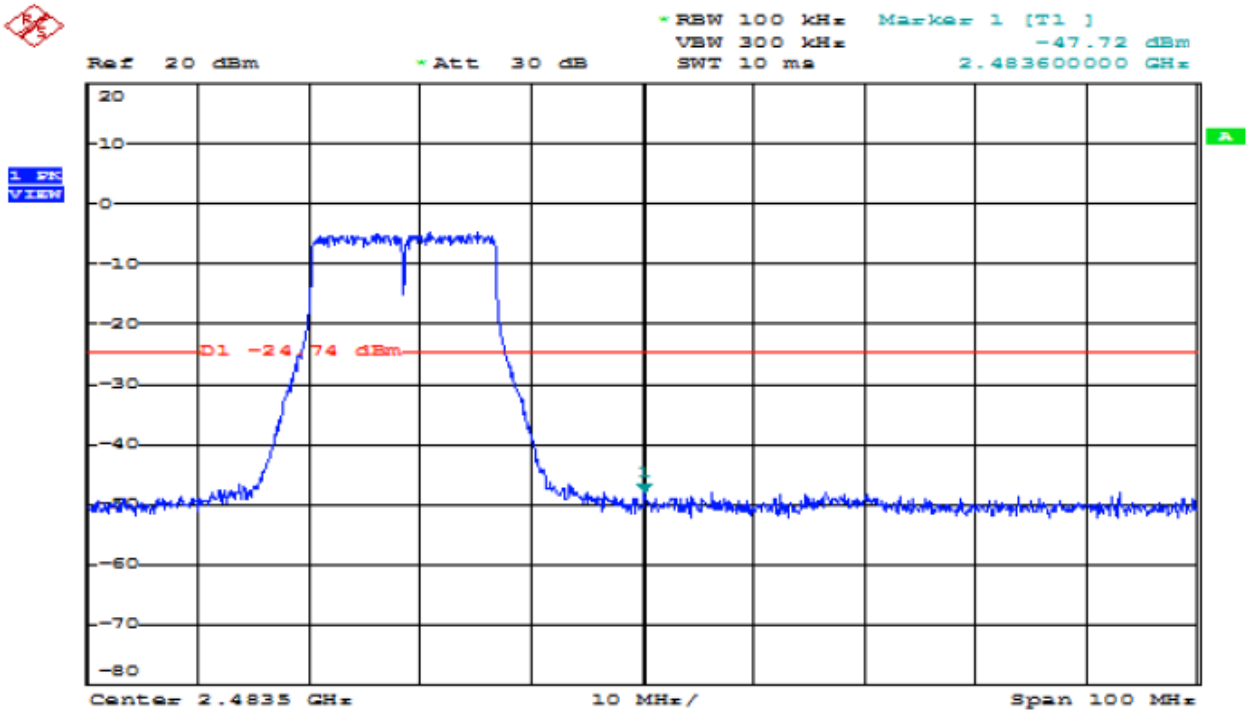
Modulation Standard: 802.11b (11Mbps)
Channel: 11



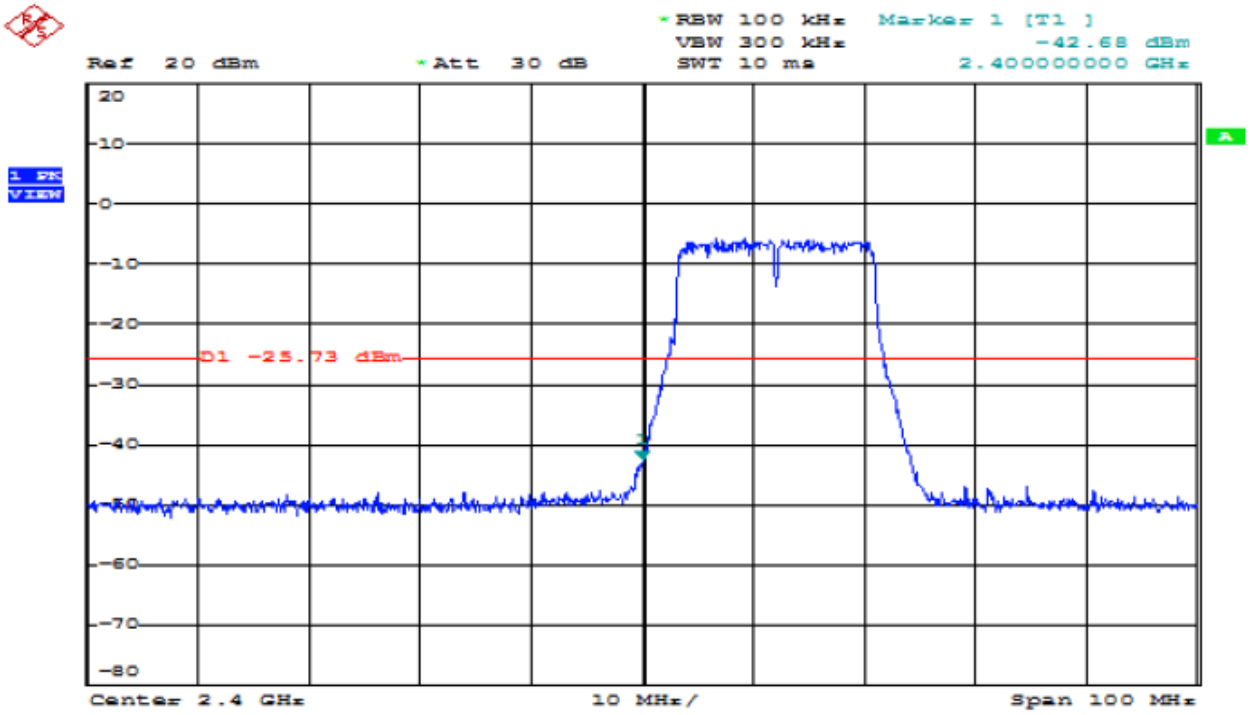
Modulation Standard: 802.11g (6Mbps)
Channel: 01



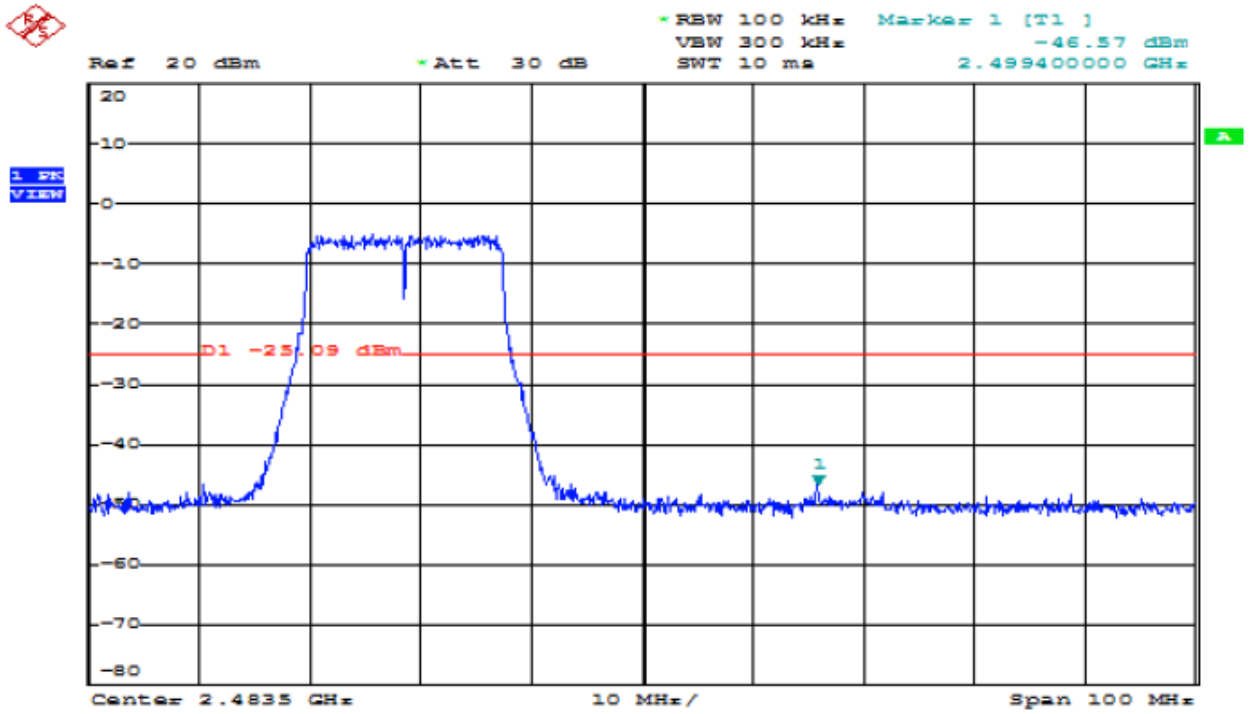
Modulation Standard: 802.11g (6Mbps)
Channel: 11



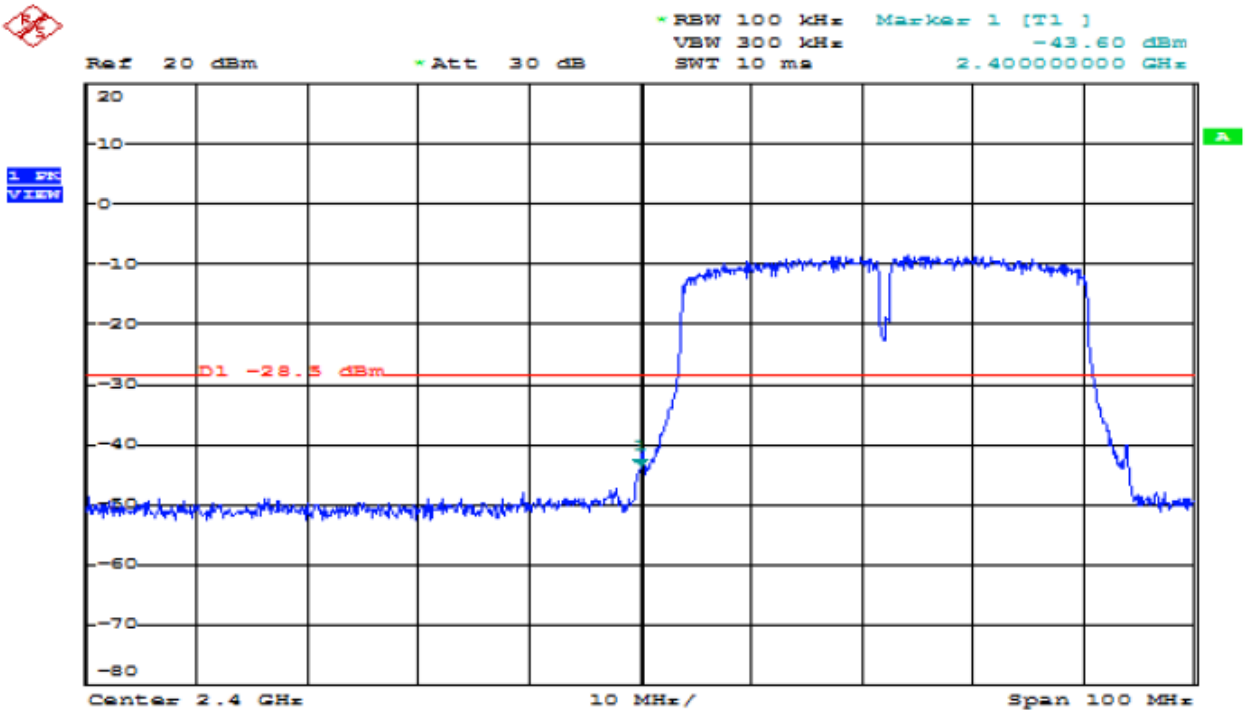
Modulation Standard: 802.11n HT20 (6.5Mbps)
Channel: 01



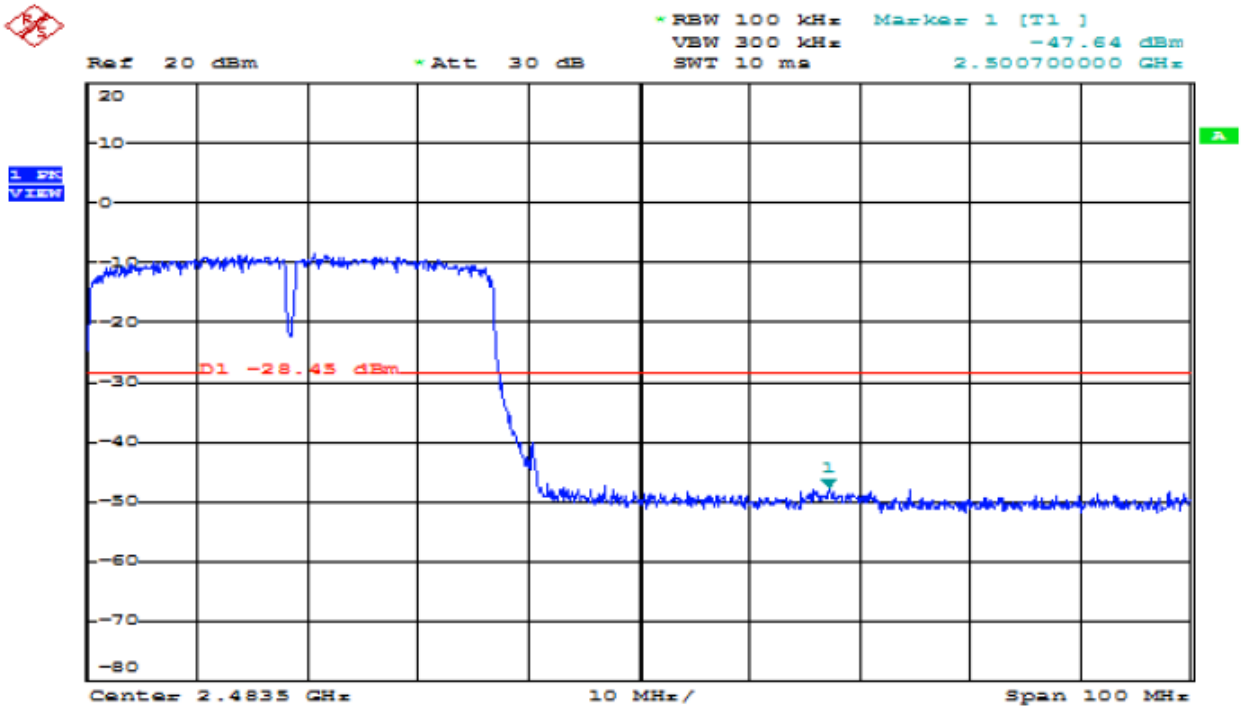
Modulation Standard: 802.11n HT20 (6.5Mbps)
Channel: 11



Modulation Standard: 802.11n HT40 (13.5Mbps)
Channel: 03

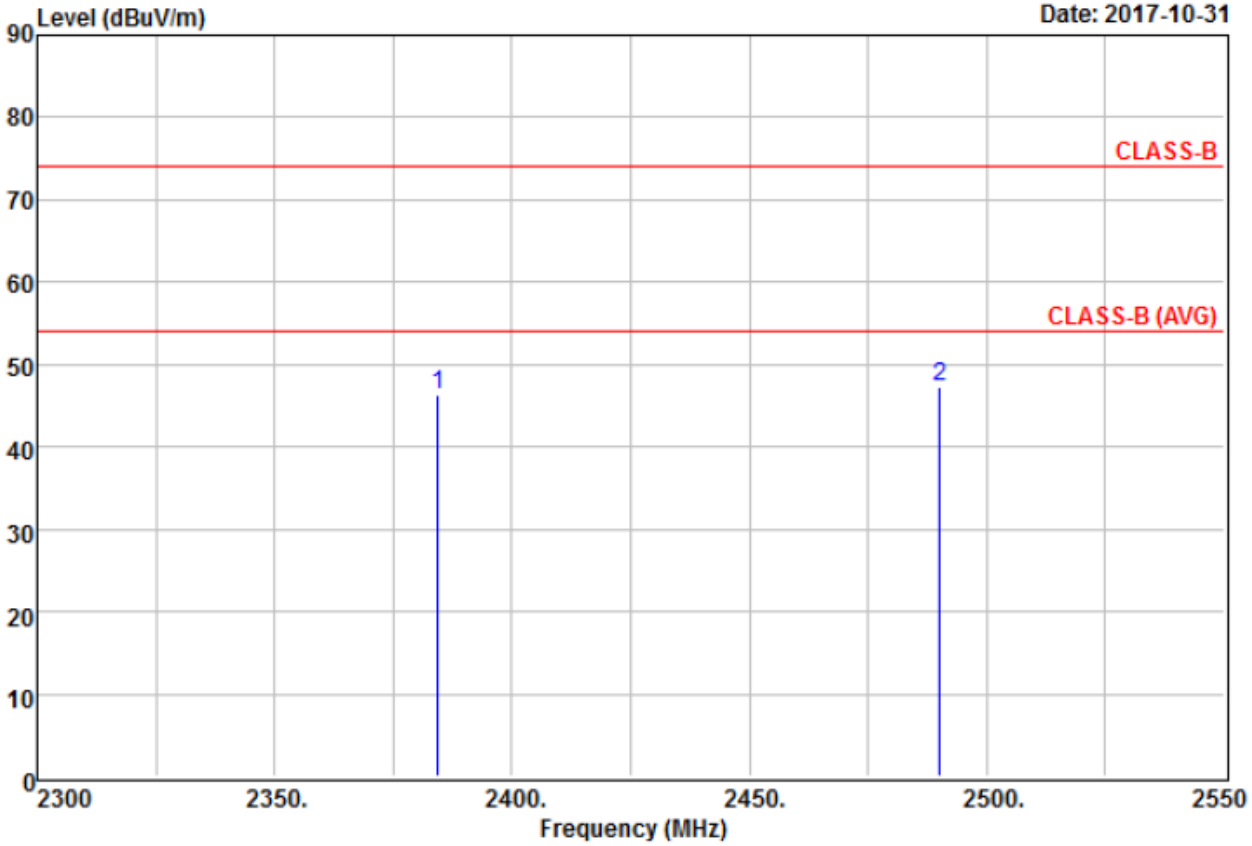


Modulation Standard: 802.11n HT40 (13.5Mbps)
Channel: 09



11.5 Restrict Band Emission Measurement Data

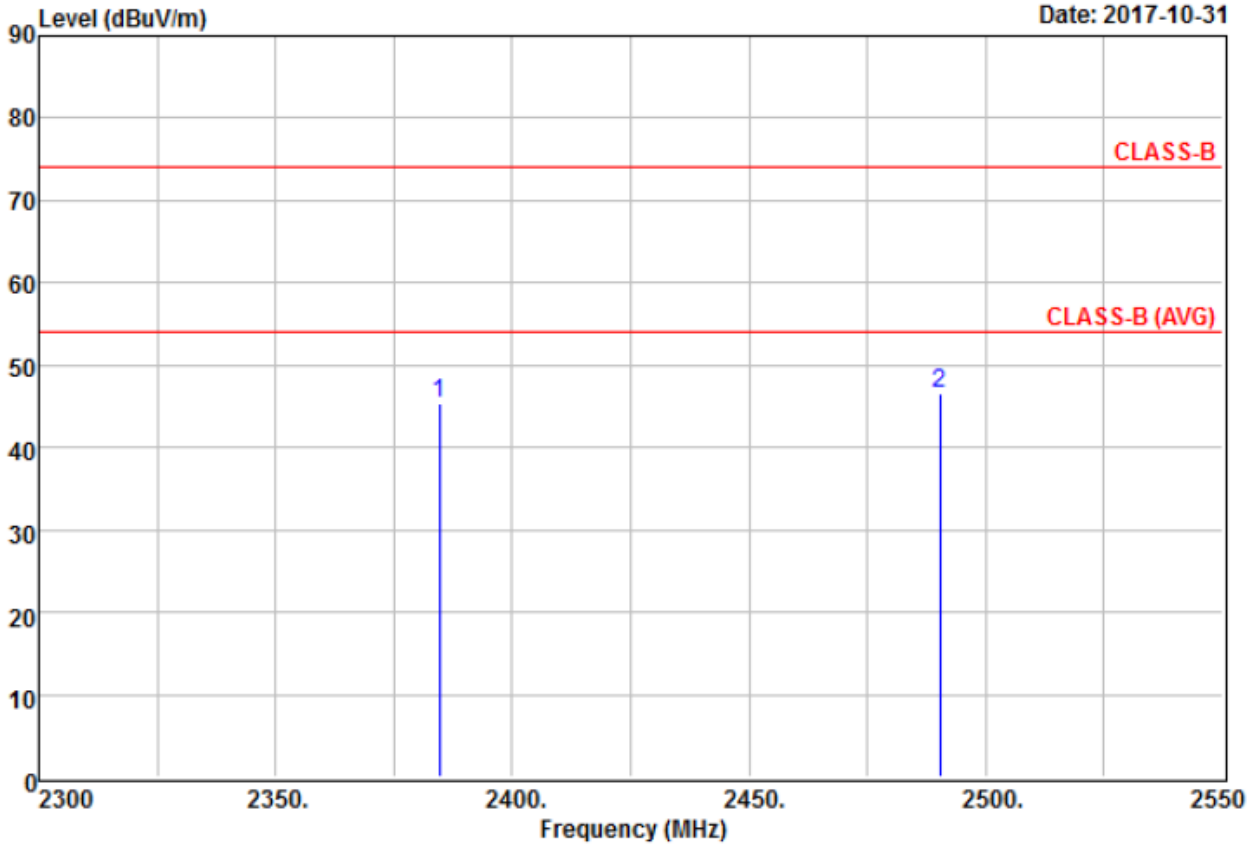
Power	:	DC 5V	Pol/Phase	:	HORIZONTAL
Test Mode 1	:	b - CH1 - CH11	Temperature	:	23 ˚C
Memo	:		Humidity	:	64 %



Remarks: **: 1.Result=Read Value+Factor**
: 2.Factor=Antenna Factor+Cable loss-
: Amplifier Factor

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1	2384.500	60.33	-14.06	46.27	74.00	-27.73	Peak
2 @	2490.200	61.03	-13.81	47.22	74.00	-26.78	Peak

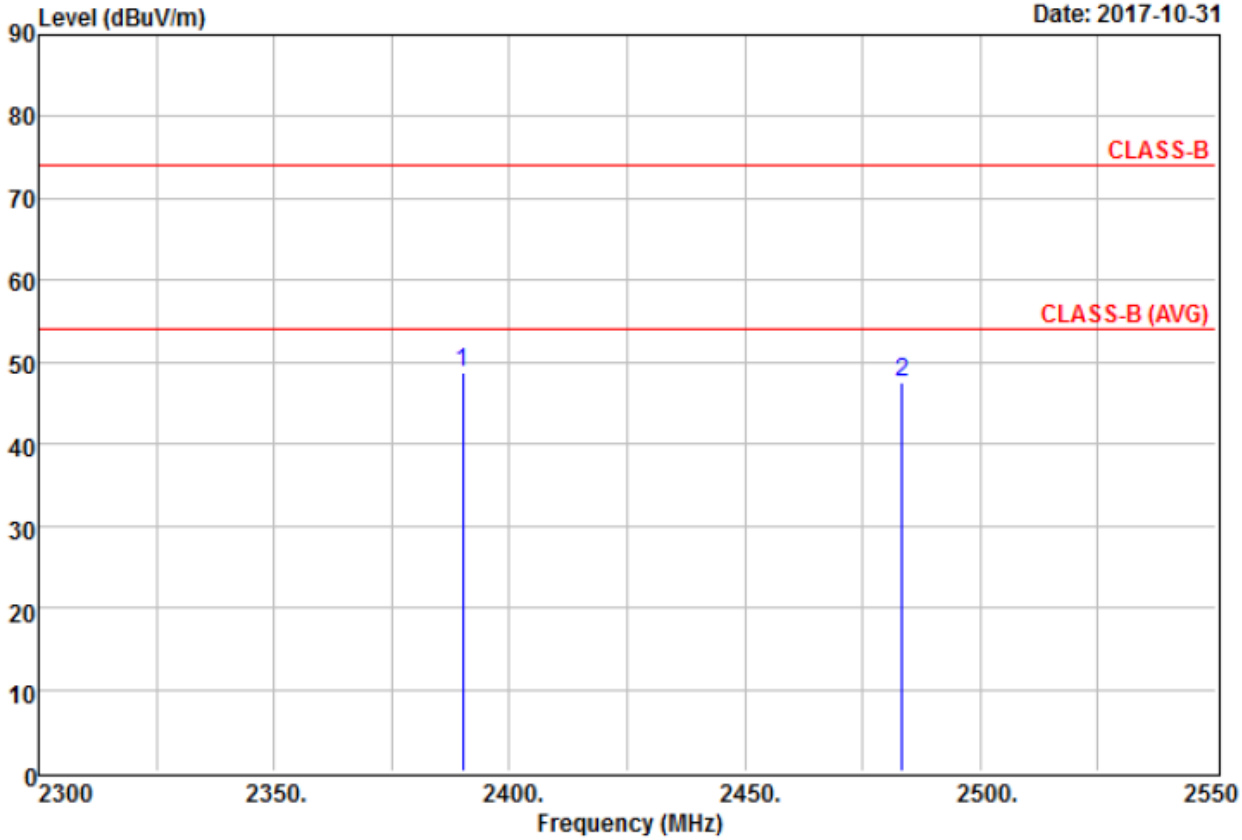
Power	:	DC 5V	Pol/Phase	:	VERTICAL
Test Mode 1	:	b - CH1 - CH11	Temperature	:	23 ˚C
Memo	:		Humidity	:	64 %



Remarks: **: 1.Result=Read Value+Factor**
: 2.Factor=Antenna Factor+Cable loss-
: Amplifier Factor

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1	2384.600	59.44	-14.06	45.38	74.00	-28.62	Peak
2 @	2490.300	60.26	-13.81	46.45	74.00	-27.55	Peak

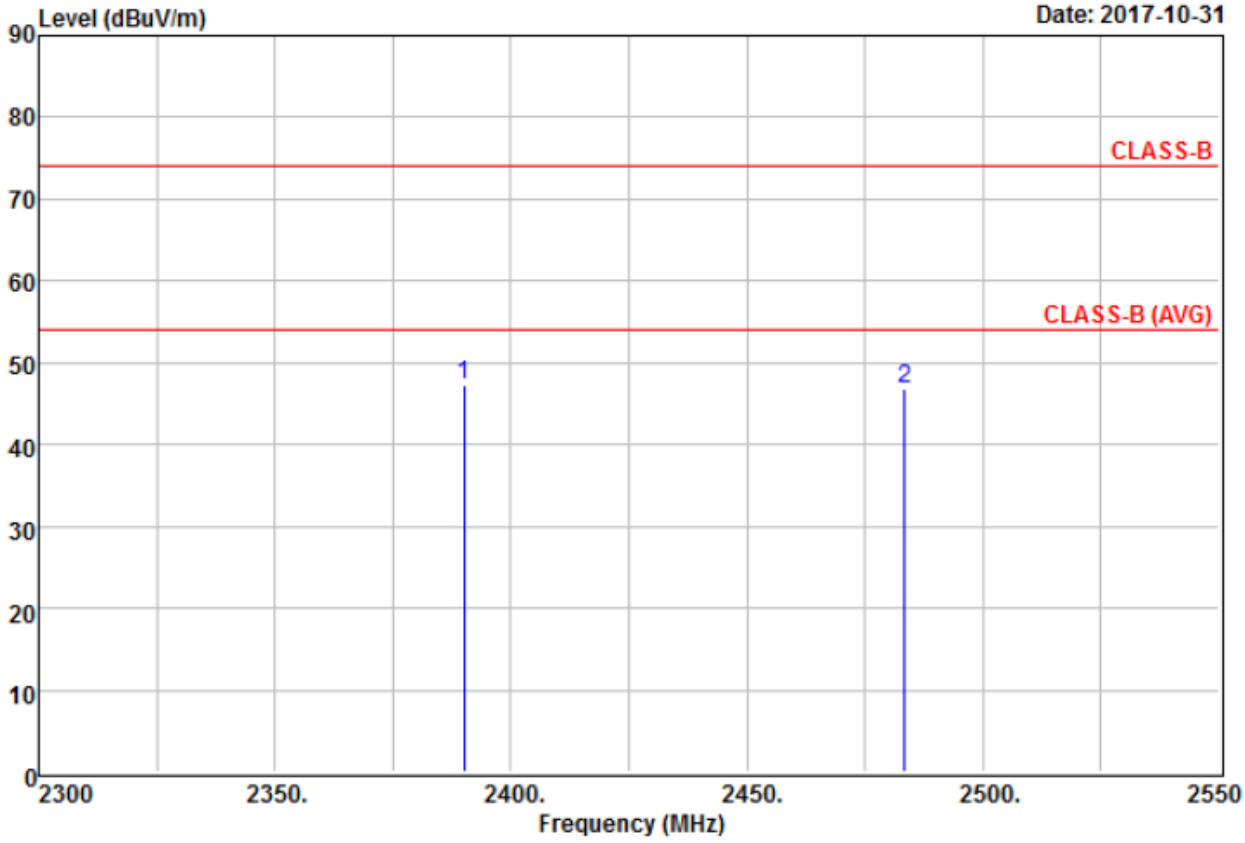
Power	:	DC 5V	Pol/Phase	:	HORIZONTAL
Test Mode 1	:	g - CH1 - CH11	Temperature	:	23 ˚C
Memo	:		Humidity	:	64 %



Remarks: **: 1.Result=Read Value+Factor**
: 2.Factor=Antenna Factor+Cable loss-
: Amplifier Factor

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1 @	2390.000	62.69	-14.05	48.64	74.00	-25.36	Peak
2	2483.500	61.35	-13.83	47.52	74.00	-26.48	Peak

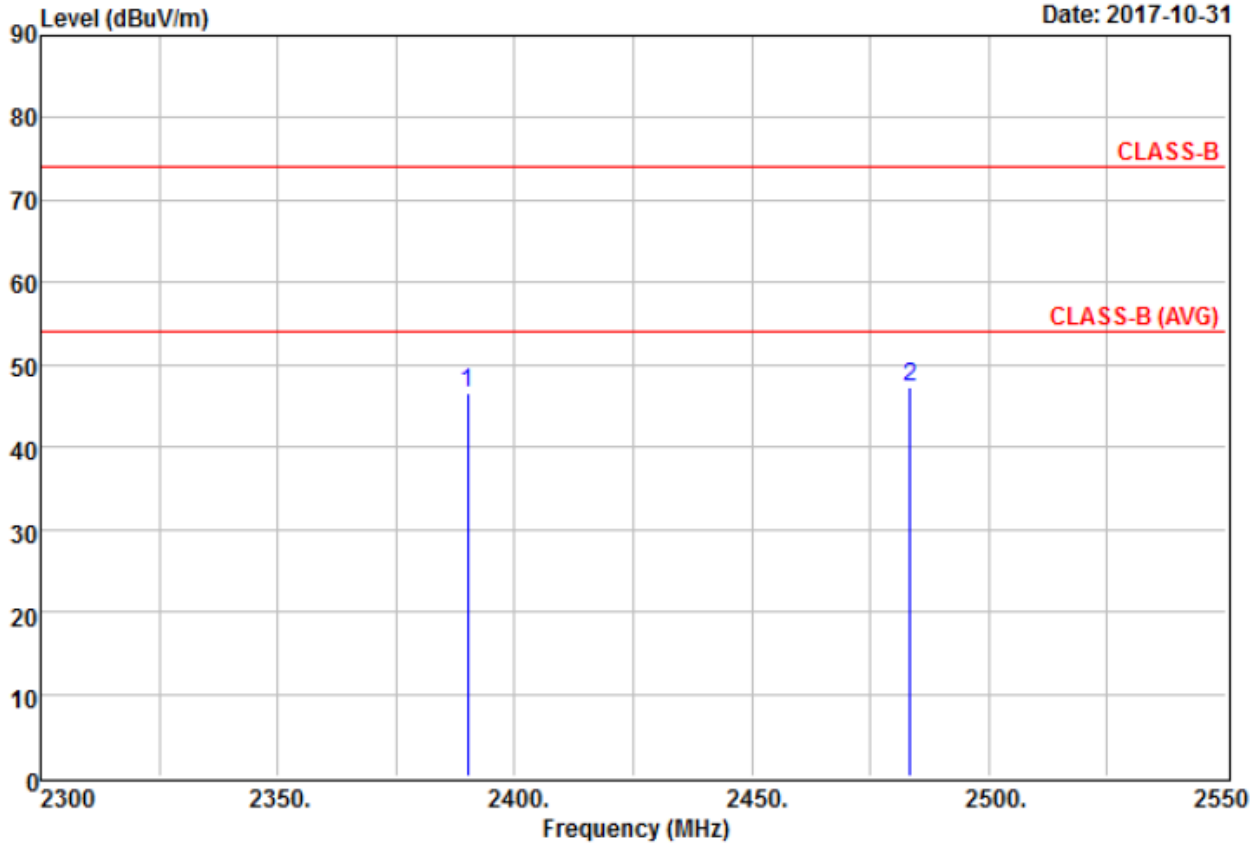
Power	:	DC 5V	Pol/Phase	:	VERTICAL
Test Mode 1	:	g - CH1 - CH11	Temperature	:	23 ˚C
Memo	:		Humidity	:	64 %



Remarks: **: 1.Result=Read Value+Factor**
: 2.Factor=Antenna Factor+Cable loss-
: Amplifier Factor

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1 @	2390.000	61.25	-14.05	47.20	74.00	-26.80	Peak
2	2483.500	60.59	-13.83	46.76	74.00	-27.24	Peak

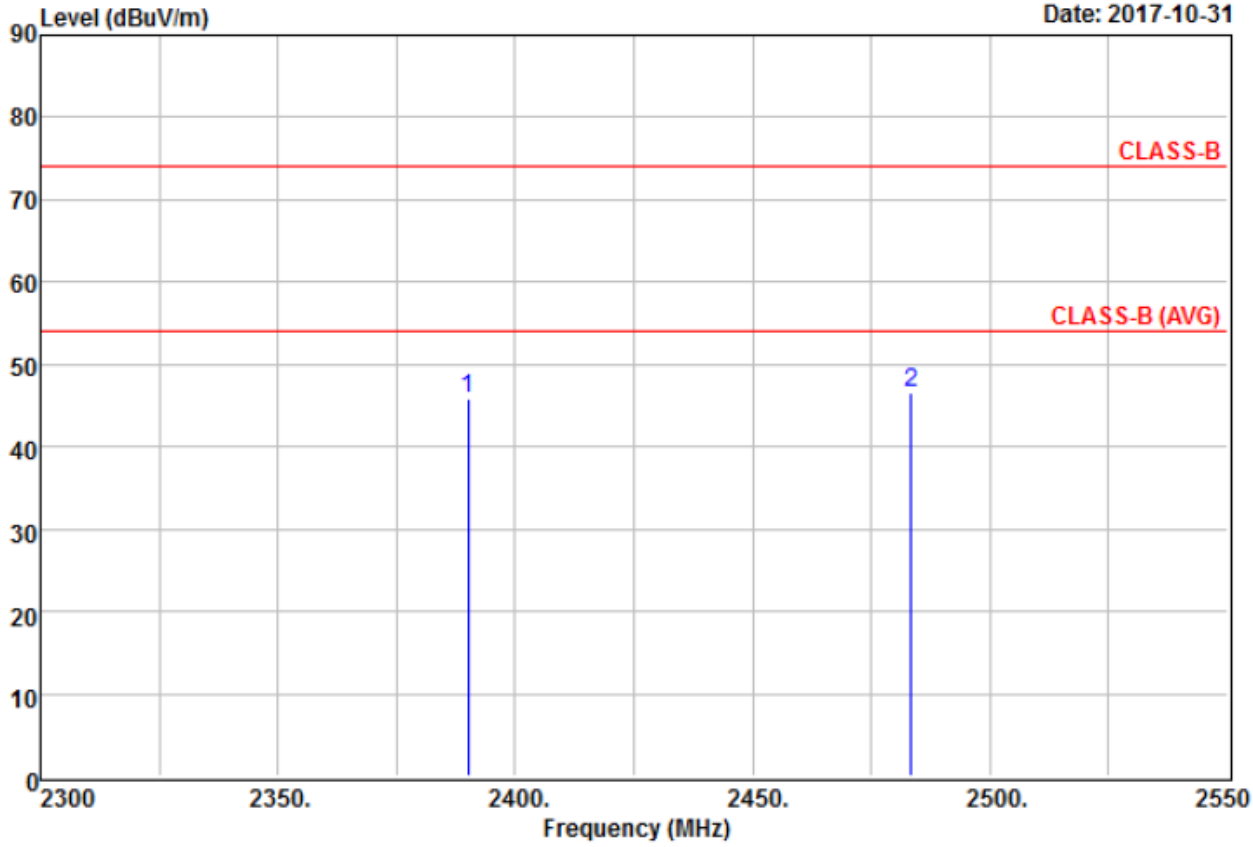
Power	:	DC 5V	Pol/Phase	:	HORIZONTAL
Test Mode 1	:	HT20 - CH1 - CH11	Temperature	:	23 ˚C
Memo	:		Humidity	:	64 %



Remarks: **: 1.Result=Read Value+Factor**
: 2.Factor=Antenna Factor+Cable loss-
: Amplifier Factor

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1	2390.000	60.68	-14.05	46.63	74.00	-27.37	Peak
2 @	2483.500	61.21	-13.83	47.38	74.00	-26.62	Peak

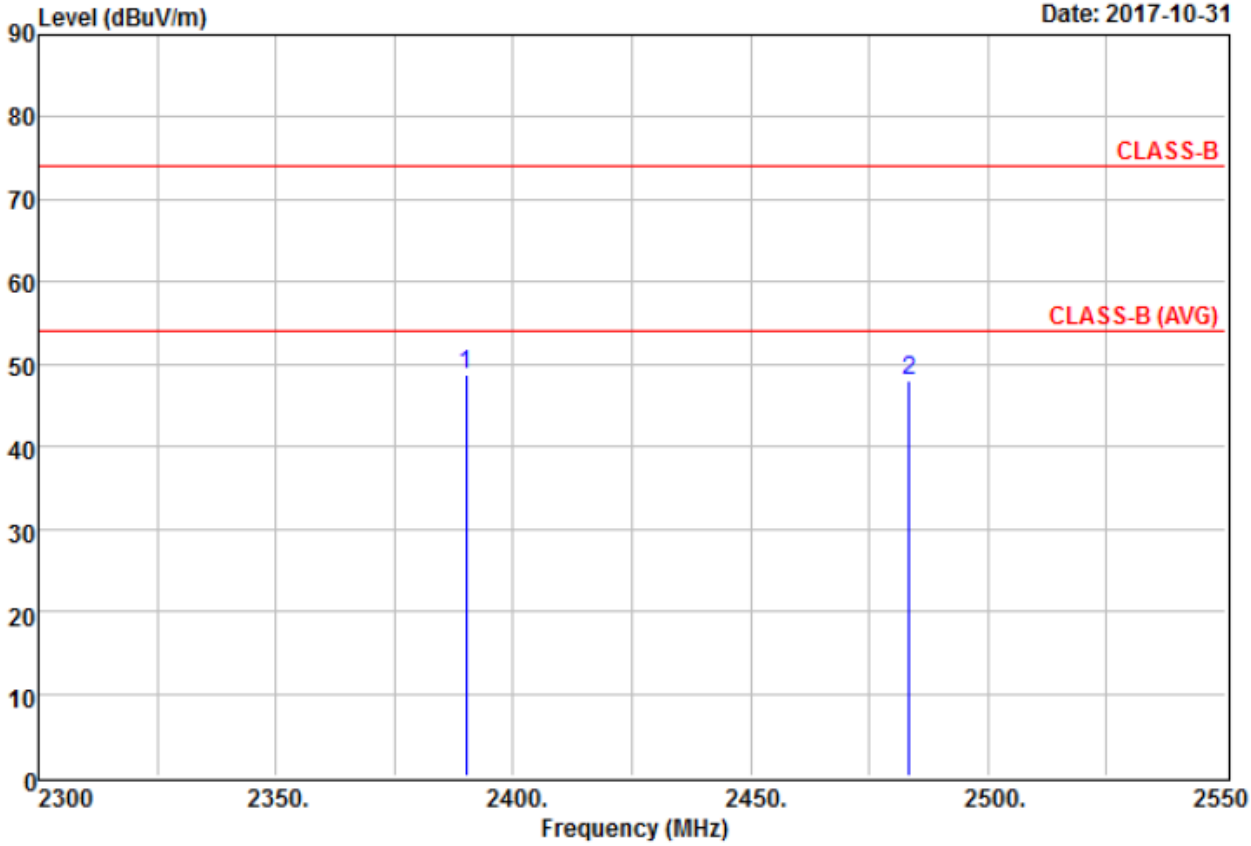
Power	:	DC 5V	Pol/Phase	:	VERTICAL
Test Mode 1	:	HT20 - CH1 - CH11	Temperature	:	23 ˚C
Memo	:		Humidity	:	64 %



Remarks: **: 1.Result=Read Value+Factor**
: 2.Factor=Antenna Factor+Cable loss-
: Amplifier Factor

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1	2390.000	59.97	-14.05	45.92	74.00	-28.08	Peak
2 @	2483.500	60.31	-13.83	46.48	74.00	-27.52	Peak

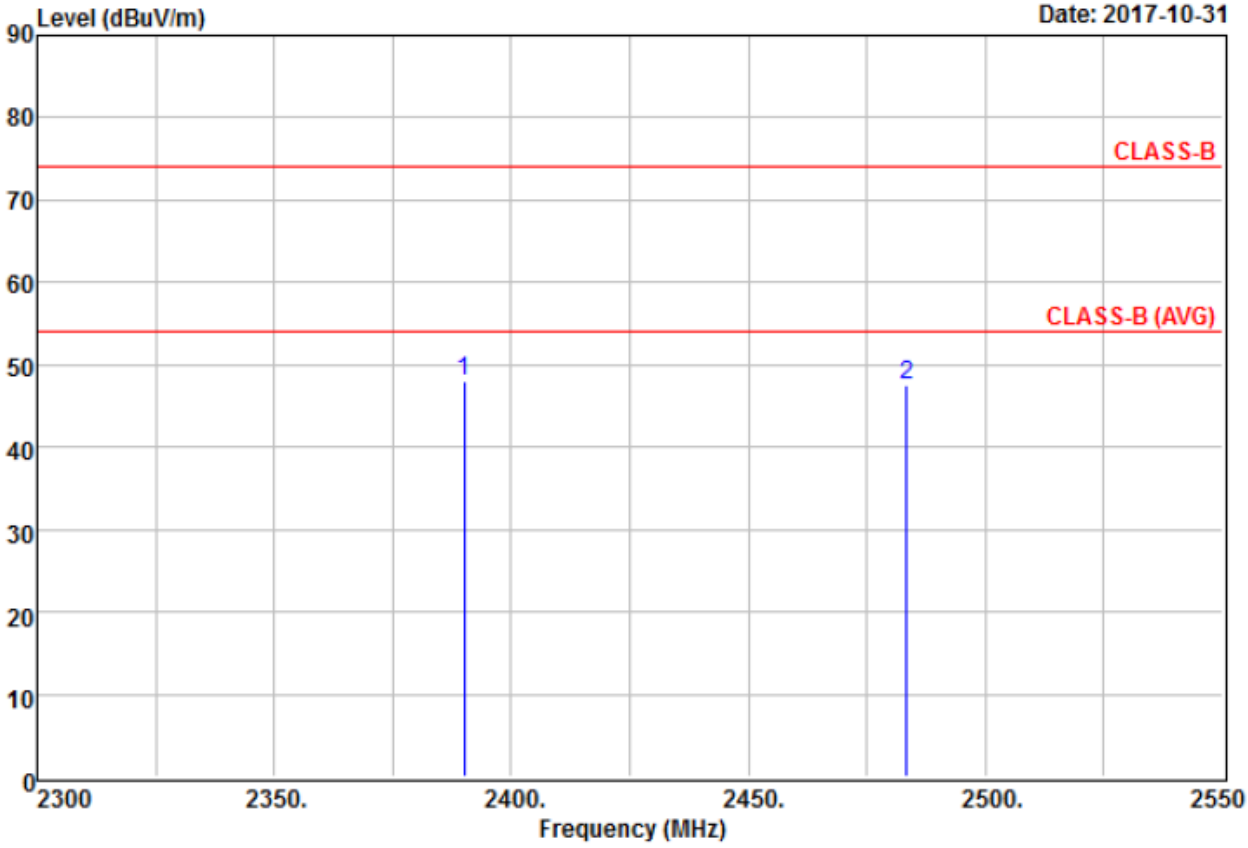
Power	:	DC 5V	Pol/Phase	:	HORIZONTAL
Test Mode 1	:	HT40 – CH3 - CH9	Temperature	:	23 ˚C
Memo	:		Humidity	:	64 %



Remarks: **: 1.Result=Read Value+Factor**
: 2.Factor=Antenna Factor+Cable loss-
: Amplifier Factor

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1 @	2390.000	62.71	-14.05	48.66	74.00	-25.34	Peak
2	2483.500	61.95	-13.83	48.12	74.00	-25.88	Peak

Power	:	DC 5V	Pol/Phase	:	VERTICAL
Test Mode 1	:	HT40 – CH3 - CH9	Temperature	:	23 ˚C
Memo	:		Humidity	:	64 %



Remarks: **: 1.Result=Read Value+Factor**
: 2.Factor=Antenna Factor+Cable loss-
: Amplifier Factor

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1 @	2390.000	61.98	-14.05	47.93	74.00	-26.07	Peak
2	2483.500	61.41	-13.83	47.58	74.00	-26.42	Peak

Note:

1. Emission level = Reading level + Correction factor
2. Correction factor : Antenna factor, Cable loss, Pre-Amp, etc.
3. All emissions as described above were determining by rotating the EUT through three orthogonal axes to maximizing the emissions if the EUT belongs to hand-held or body-worn devices.
4. Measurements above 1000 MHz, Peak detector setting:
   1 MHz RBW with 1 MHz VBW (Peak Detector).
5. Measurements above 1000 MHz, Average detector setting:
   1 MHz RBW with 10Hz VBW (RMS Detector).
6. Peak detector measurement data will represent the worst case results.
7. Where limits are specified for both average and peak detector functions, if the peak measured value complies with the average limit, it is unnecessary to perform an average measurement.

12. Restricted Bands of Operation

Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.09000 – 0.11000	16.42000 – 16.42300	399.9 – 410.0	4.500 – 5.150
0.49500 – 0.505**	16.69475 – 16.69525	608.0 – 614.0	5.350 – 5.460
2.17350 – 2.19050	16.80425 – 16.80475	960.0 – 1240.0	7.250 – 7.750
4.12500 – 4.12800	25.50000 – 25.67000	1300.0 – 1427.0	8.025 – 8.500
4.17725 – 4.17775	37.50000 – 38.25000	1435.0 – 1626.5	9.000 – 9.200
4.20725 – 4.20775	73.00000 – 74.60000	1645.5 – 1646.5	9.300 – 9.500
6.21500 – 6.21800	74.80000 – 75.20000	1660.0 – 1710.0	10.600 – 12.700
6.26775 – 6.26825	108.00000 – 121.94000	1718.8 – 1722.2	13.250 – 13.400
6.31175 – 6.31225	123.00000 – 138.00000	2200.0 – 2300.0	14.470 – 14.500
8.29100 – 8.29400	149.90000 – 150.05000	2310.0 – 2390.0	15.350 – 16.200
8.36200 – 8.36600	156.52475 – 156.52525	2483.5 – 2500.0	17.700 – 21.400
8.37625 – 8.38675	156.70000 – 156.90000	2655.0 – 2900.0	22.010 – 23.120
8.41425 – 8.41475	162.01250 – 167.17000	3260.0 – 3267.0	23.600 – 24.000
12.29000 – 12.29300	167.72000 – 173.20000	3332.0 – 3339.0	31.200 – 31.800
12.51975 – 12.52025	240.00000 – 285.00000	3345.8 – 3358.0	36.430 – 36.500
12.57675 – 12.57725	322.00000 – 335.40000	3600.0 – 4400.0	Above 38.6
13.36000 – 13.41000			

**: Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz

12.1 Labeling Requirement

The device shall bear the following statement in a conspicuous location on the device:
This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.