



## TEST REPORT

**Application No.:** GZCR2112021504AT  
**Applicant:** Winegard Company  
**Address of Applicant:** 3000 Kirkwood Street, Burlington, Iowa 52601, United States  
**Manufacturer:** Winegard Company  
**Address of Manufacturer:** 3000 Kirkwood Street, Burlington, Iowa 52601, United States  
**Factory:**  
1. Aztech Communication Device (DG) Ltd  
2. IOT Manufacturing SDN.BHD.  
**Address of Factory:**  
1. Jiu Jiang Shui Village, Chang Ping Town, Dong Guan City, Guang Dong Province, China  
2. No. 8 & 10, Setia Business Park, Jalan Laman Setia 7/4, Taman Laman Setia, 81550 Gelang Patah, Johor Bahru, Malaysia

**Equipment Under Test (EUT):**

**EUT Name:** Outdoor Wifi Access Point/Extender with Bridge Mode 2.4/5Ghz  
**Model No.:** WG02  
**Trade Mark:** Winegard  
**Standard(s) :** 47 CFR Part 15, Subpart C 15.247  
**Date of Receipt:** 2021-11-24  
**Date of Test:** 2021-12-02 to 2021-12-20  
**Date of Issue:** 2021-12-21

<b>Test Result:</b>	<b>Pass*</b>
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\* In the configuration tested, the EUT complied with the standards specified above.

Kobe Jian

EMC Laboratory Manager



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Guangzhou Branch Testing/Inspection EMC Laboratory. 中国·广州·经济技术开发区科学城科珠路198号 邮编: 510663 t (86-20) 82155555 f (86-20) 82075058 sgs.china@sgs.com

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2021-12-21		Original

Authorized for issue by:				
				
		Curry Wu/Project Engineer		
				
		Ricky Liu/Reviewer		

## 2 Test Summary

Radio Spectrum Technical Requirement				
Item	Standard	Method	Requirement	Result
Antenna Requirement	47 CFR Part 15, Subpart C 15.247	N/A	47 CFR Part 15, Subpart C 15.203 & 15.247(b)(4)	Pass

Radio Spectrum Matter Part				
Item	Standard	Method	Requirement	Result
Conducted Emissions at AC Power Line (150kHz-30MHz)	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.2	47 CFR Part 15, Subpart C 15.207	Pass
Duty Cycle		ANSI C63.10 (2013) Section 11.6	KDB 558074 D01 v05r02 section 6	Pass
Conducted Peak Output Power		ANSI C63.10 (2013) Section 11.9.1.3	47 CFR Part 15, Subpart C 15.247(b)(3)	Pass
Minimum 6dB Bandwidth		ANSI C63.10 (2013) Section 11.8.1	47 CFR Part 15, Subpart C 15.247a(2)	Pass
Power Spectrum Density		ANSI C63.10 (2013) Section 11.10.2	47 CFR Part 15, Subpart C 15.247(e)	Pass
Conducted Band Edges Measurement		ANSI C63.10 (2013) Section 11.13.3.2	47 CFR Part 15, Subpart C 15.247(d)	Pass
Conducted Spurious Emissions		ANSI C63.10 (2013) Section 11.11	47 CFR Part 15, Subpart C 15.247(d)	Pass
Radiated Emissions which fall in the restricted bands		ANSI C63.10 (2013) Section 6.10.5	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass
Radiated Spurious Emissions (Below 1GHz)		ANSI C63.10 (2013) Section 6.4,6.5,6.6	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass
Radiated Spurious Emissions (Above 1GHz)		ANSI C63.10 (2013) Section 6.4,6.5,6.6	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass

**Note:**

E.U.T./EUT means Equipment Under Test.

Pass means the test result passed the test standard requirement, please find the detailed decision rule in the report relative section.



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This report is prepared for FCC class II permissive change.

The Original grant approval by TCB, FCC ID: C3D-AZ1333300, Granted on 06/19/2021.

Review this report and original report, this report just adding channel 12(2467MHz), channel 13(2472MHz) of 802.11b/g/n HT20, adding channel 10(2457MHz), channel 12(2462MHz) of 802.11n HT40 via software.

According to the declaration from the applicant, the model in this report and the model in original report is identical in electrical circuit design, layout, components used, antenna type, antenna gain and internal wiring, with only difference on channel number of 802.11b/g/n.

Therefore in this report all test items were fully retested on model WG02.



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## 4 General Information

### 4.1 Details of E.U.T. for WG02

Power supply:	POE Adapter Model: WM024SP-240-A REV 1MM Input: AC 100-240V, 50/60Hz, 0.8A Output: DC 24V, 1.0A 10/100/1000Mbps
Internal source:	More than 108MHz
Type of Modulation:	802.11b: DSSS (CCK, DQPSK, DBPSK) 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK) 802.11n (HT20/HT40): OFDM (64QAM, 16QAM, QPSK, BPSK)
Operating Frequency:	802.11b/g/n(HT20): 2412MHz to 2472MHz 802.11n(HT40): 2422MHz to 2462MHz
Channel Number:	802.11b/g/11n(HT20): 13 Channels 802.11n(HT40): 9 Channels
Channels Step:	Channels with 5MHz step
Sample Type:	Fixed devices
Antenna Type:	PCB antenna
Antenna Gain:	Antenna1/Antenna2/Antenna3: 3.2dBi Note: Three antennas can simultaneous transmission.

### 4.2 Description of Support Units for WG02

Description	Manufacturer	Model No.	Serial No.
Cable	RJ45 Cable (1.2m length)	/	/

#### 4.3 Measurement Uncertainty

Test Item	Measurement Uncertainty
Conducted Emissions at AC Power Line (150kHz-30MHz)	±3.12dB
Duty Cycle	± 0.37%
Conducted Peak Output Power	± 0.75dB
Minimum 6dB Bandwidth	± 3%
Power Spectrum Density	± 2.84dB
Conducted Band Edges Measurement	± 0.75dB
Conducted Spurious Emissions	± 0.75dB
Radiated Emissions which fall in the restricted bands	±5.08dB (1GHz-6GHz);±5.14dB(above 6GHz)
Radiated Spurious Emissions (Below 1GHz)	±5.06dB (3m); ±4.46dB (10m)
Radiated Spurious Emissions (Above 1GHz)	±5.08dB (1GHz-6GHz);±5.14dB(above 6GHz)

#### 4.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou Branch EMC Laboratory,  
198 Kezhu Road, Sciencetech Park, Guangzhou Economic & Technology Development District,  
Guangzhou, China 510663

Tel: +86 20 82155555

Fax: +86 20 82075059

No tests were sub-contracted.



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## 4.5 Test Facility

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

- **NVLAP (Lab Code: 200611-0)**

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

- **ACMA**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian/New Zealand Regulatory Compliance Mark (RCM).

- **SGS UK(Certificate No.: 32), SGS-TUV SAARLAND and SGS-FIMKO**

Have approved SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory as a supplier of EMC TESTING SERVICES and SAFETY TESTING SERVICES.

- **CNAS (Lab Code: L0167)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been assessed and in compliance with CNAS-CL01:2018 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2017 General Requirements) for the Competence of Testing Laboratories.

- **FCC Recognized Accredited Test Firm(Registration No.: 486818)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been accredited and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Designation Number: CN5016, Test Firm Registration Number: 486818.

- **ISED (Registration No.: 4620B, CAB identifier: CN0052)**

SGS-CSTC Standards Technical Services Co., Ltd., has been registered by Innovation Science and Economic Development Canada for Wireless Device Testing laboratories to test to Canadian radio equipment requirements. Registration No. 4620B, CAB identifier: CN0052.

- **VCCI (Registration No.: R-12460, C-12584, G-20107 and T-11179)**

The 10m Semi-anechoic chamber, 966 Anechoic Chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. Have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-12460, C-12584, G-20107 and T-11179 respectively.

- **CBTL (Lab Code: TL129)**

SGS-CSTC Standards Technical Services Co., Ltd., E&E Laboratory has been assessed and fully comply with the requirements of ISO/IEC 17025:2017, the Basic Rules, IECEE 01 and Rules of procedure IECEE 02, and the relevant IECEE CB-Scheme Operational documents.

## 4.6 Deviation from Standards

None

## 4.7 Abnormalities from Standard Conditions

None



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## 5 Equipment List

Conducted Emissions at AC Power Line (150kHz-30MHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Shielding Room	ChangZhou ZhongYu	8m x 3m x 3.8m	EMC0306	N/A	N/A
Two-Line V-Network	Rohde & Schwarz	ENV216	EMC0118	2021-01-08	2022-01-06
Two-Line V-Network-GZ	Rohde & Schwarz	ENV216	EMC2135	2021-09-24	2022-09-23
Coaxial Cable	HangTianXing	2m	EMC0107	2020-09-09	2022-09-08
Test Software E3c	Audix	Ver. 5.4.1221b	GZE100-62	N/A	N/A
EMI Test Receiver(9kHz-3.6GHz)	Rohde & Schwarz	ESR4	EMC2221	2021-06-01	2022-05-31

Duty Cycle					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EXA Signal Analyzer(10Hz-44GHz)	Agilent Technologies	N9010A	EMC2138	2021-09-16	2022-09-15
6dB Attenuator	HP	8491A	EMC2062	2020-04-15	2022-04-14
MI CABLE	SGS-EMC	0.8M	EMC2136	2021-11-01	2023-11-01
Test Software	TST	V2.0	GZE100-78	N/A	N/A

Conducted Peak Output Power					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Power Meter (U2021XA_Ch2)	Agilent Technologies	U2021XA_Ch2	SEM009-02	2021-05-19	2022-05-18
6dB Attenuator	HP	8491A	EMC2062	2020-04-15	2022-04-14
MI CABLE	SGS-EMC	0.8M	EMC2136	2021-11-01	2023-11-01
Test Software	TST	V2.0	GZE100-78	N/A	N/A

Minimum 6dB Bandwidth					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EXA Signal Analyzer(10Hz-44GHz)	Agilent Technologies	N9010A	EMC2138	2021-09-16	2022-09-15
6dB Attenuator	HP	8491A	EMC2062	2020-04-15	2022-04-14
MI CABLE	SGS-EMC	0.8M	EMC2136	2021-11-01	2023-11-01
Test Software	TST	V2.0	GZE100-78	N/A	N/A



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中国·广州·经济技术开发区科学城科珠路198号 邮编: 510663 t (86-20) 82155555 f (86-20) 82075058 sgs.china@sgs.com

**Power Spectrum Density**

Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EXA Signal Analyzer(10Hz-44GHz)	Agilent Technologies	N9010A	EMC2138	2021-09-16	2022-09-15
6dB Attenuator	HP	8491A	EMC2062	2020-04-15	2022-04-14
MI CABLE	SGS-EMC	0.8M	EMC2136	2021-11-01	2023-11-01
Test Software	TST	V2.0	GZE100-78	N/A	N/A

**Conducted Band Edges Measurement**

Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EXA Signal Analyzer(10Hz-44GHz)	Agilent Technologies	N9010A	EMC2138	2021-09-16	2022-09-15
6dB Attenuator	HP	8491A	EMC2062	2020-04-15	2022-04-14
MI CABLE	SGS-EMC	0.8M	EMC2136	2021-11-01	2023-11-01
Test Software	TST	V2.0	GZE100-78	N/A	N/A

**Conducted Spurious Emissions**

Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EXA Signal Analyzer(10Hz-44GHz)	Agilent Technologies	N9010A	EMC2138	2021-09-16	2022-09-15
6dB Attenuator	HP	8491A	EMC2062	2020-04-15	2022-04-14
MI CABLE	SGS-EMC	0.8M	EMC2136	2021-11-01	2023-11-01
Test Software	TST	V2.0	GZE100-78	N/A	N/A

**Radiated Emissions which fall in the restricted bands**

Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EMI Test Receiver(20Hz-26.5GHz)	Rohde & Schwarz	ESIB26	EMC0522	2021-01-08	2022-01-07
Chamber cable(Above 1GHz)	Scoflex	KMKM-8.0m	EMC0545	2020-09-09	2022-09-08
Horn Antenna(1GHz-18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120D	EMC2026	2019-09-25	2022-09-24
1GHz-26.5 GHz Pre-Amplifier	Agilent	8449B	EMC0521	2021-01-08	2022-01-07
2.4GHz Filter	Micro-Tronics	BRM 50702	EMC2069	2021-01-08	2022-01-07
966 Anechoic Chamber	C.R.T	9m x 6m x 6m	EMC2142	2020-12-20	2023-12-19
MXE EMI Receiver(10Hz-8.4GHz)	Keysight	N9038A	EMC2139	2021-11-01	2022-10-31
EXA Signal Analyzer(10Hz-44GHz)	Keysight	N9010A	EMC2138	2021-09-16	2022-09-15
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A



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Notch Filter (5150-5880)	Mico-Tronics	BRM50716	EMC2168	2021-07-29	2022-07-28
Horn Antenna(14-40GHz)	SCHWARZBECK	BBHA 9170	EMC2041	2020-06-28	2023-06-27
Microwave Broadband Preamplifier (18-40GHz)	SCHWARZBECK	BBV 9721	EMC2172	2021-08-30	2022-08-29

Radiated Spurious Emissions (Below 1GHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Chamber cable	HangTianXing	N/A	EMC0542	2020-09-09	2022-09-08
Trilog Broadband Antenna(25MHz-1GHz)-Lab	SCHWARZBECK MESS-ELEKTRONIK	VULB 9168	SEM003-18	2019-02-22	2022-02-22
Amplifier(9kHz-1.3GHz)	HP	8447F	EMC2065	2021-05-19	2022-05-18
Active Loop Antenna-RED	ETS-Lindgren	6502	EMC2190	2019-12-27	2021-12-26
10m Semi-Anechoic Chamber	ETS	N/A	EMC0530	2019-10-20	2022-10-19
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A
EMI Test Receiver(1Hz-8GHz)	Rohde & Schwarz	ESW8	EMC2220	2021-05-26	2022-05-25

Radiated Spurious Emissions (Above 1GHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EMI Test Receiver(20Hz-26.5GHz)	Rohde & Schwarz	ESIB26	EMC0522	2021-01-08	2022-01-07
Chamber cable(Above 1GHz)	Scoflex	KMKM-8.0m	EMC0545	2020-09-09	2022-09-08
Horn Antenna(1GHz-18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120D	EMC2026	2019-09-25	2022-09-24
1GHz-26.5 GHz Pre-Amplifier	Agilent	8449B	EMC0521	2021-01-08	2022-01-07
2.4GHz Filter	Micro-Tronics	BRM 50702	EMC2069	2021-01-08	2022-01-07
966 Anechoic Chamber	C.R.T	9m x 6m x 6m	EMC2142	2020-12-20	2023-12-19
MXE EMI Receiver(10Hz-8.4GHz)	Keysight	N9038A	EMC2139	2021-11-01	2022-10-31
EXA Signal Analyzer(10Hz-44GHz)	Keysight	N9010A	EMC2138	2021-09-16	2022-09-15
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A
Notch Filter (5150-5880)	Mico-Tronics	BRM50716	EMC2168	2021-07-29	2022-07-28



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中国·广州·经济技术开发区科学城科珠路198号 邮编: 510663 t (86-20) 82155555 f (86-20) 82075058 sgs.china@sgs.com

Horn Antenna(14-40GHz)	SCHWARZBECK	BBHA 9170	EMC2041	2020-06-28	2023-06-27
Microwave Broadband Preamplifier (18-40GHz)	SCHWARZBECK	BBV 9721	EMC2172	2021-08-30	2022-08-29

General used equipment					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
DMM	Fluke	73	EMC0006	2021-07-05	2022-07-05
DMM	Fluke	73	EMC0007	2021-07-05	2022-07-05



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## 6 Radio Spectrum Technical Requirement

### 6.1 Antenna Requirement

#### 6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203 & 15.247(b)(4)

#### 6.1.2 Conclusion

15.203 Requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of 15.211, 15.213, 15.217, 15.219, 15.221, or 15.236. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

15.247(b) (4) requirement:

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

EUT Antenna:

The antenna connector is a IPEX type that comply with Part15.203, the best case gain of the antenna1/antenna2/antenna3 is 3.2dBi.

Antenna location: Refer to internal photo.

## 7 Radio Spectrum Matter Test Results

### 7.1 Conducted Emissions at AC Power Line (150kHz-30MHz)

Test Requirement 47 CFR Part 15, Subpart C 15.207

Test Method: ANSI C63.10 (2013) Section 6.2

Limit:

Frequency of emission(MHz)	Conducted limit(dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

\*Decreases with the logarithm of the frequency.

#### 7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 22.3 °C

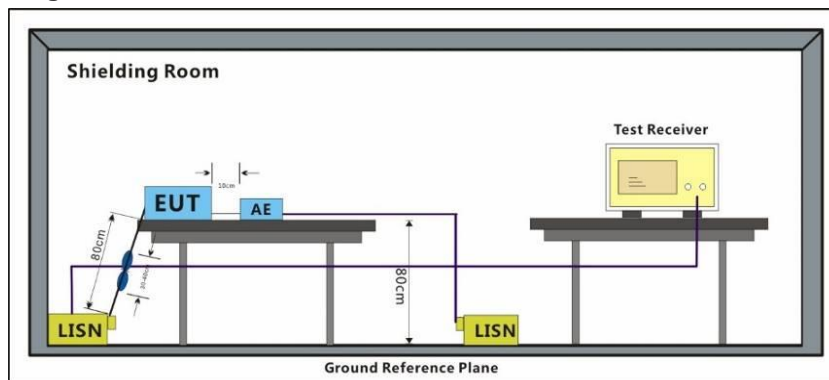
Humidity: 53.6 % RH

Atmospheric Pressure: 1020 mbar

#### 7.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	01	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40). Only the data of worst case is recorded in the report.

#### 7.1.3 Test Setup Diagram

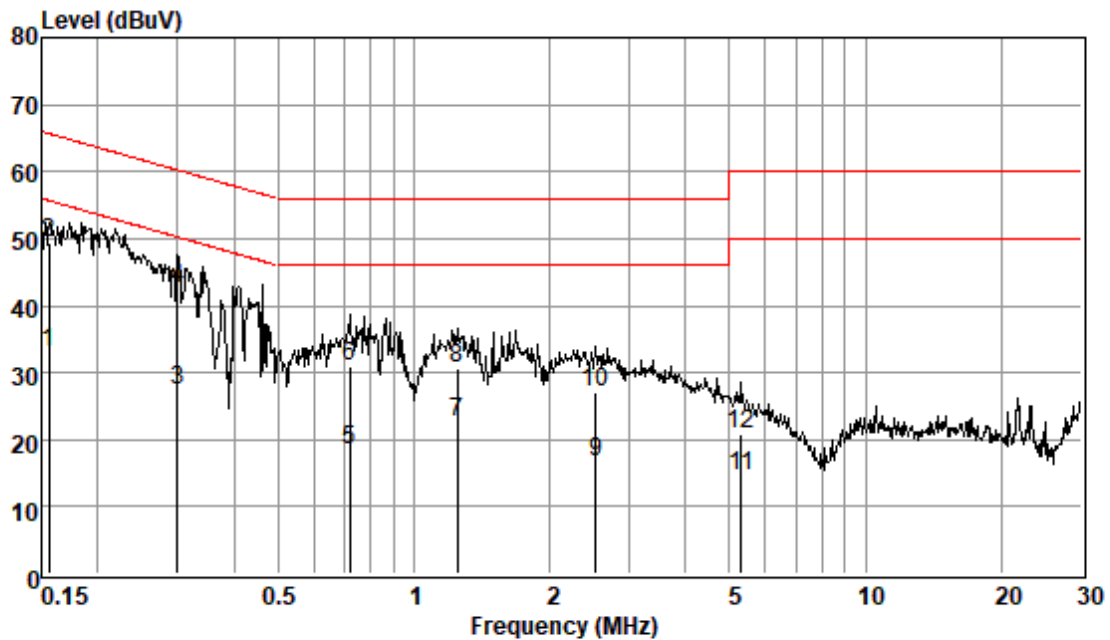


#### 7.1.4 Measurement Procedure and Data

- 1) The mains terminal disturbance voltage test was conducted in a shielded room.
- 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50ohm/50μH + 5ohm linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
- 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane.
- 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
- 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.

Remark: LISN=Read Level+ Cable Loss+ LISN Factor

Test Mode: 01; Line: Live line

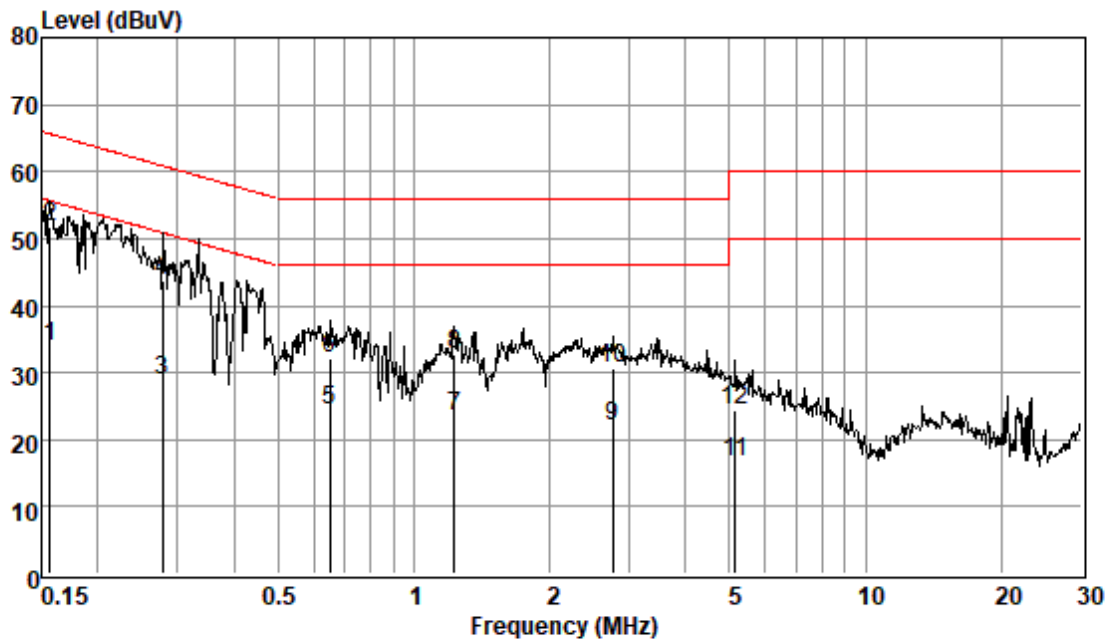


Pol : LINE  
Mode :  
Model :

Frequency MHz	Read Level dBuV	Cable Loss dB	LISN Factor dB	Measured Level dBuV	Limit Line dBuV	Over Limit dB	Remark
0.16	23.45	0.06	9.62	33.13	55.69	-22.56	Average
0.16	39.82	0.06	9.62	49.50	65.69	-16.19	QP
0.30	17.68	0.06	9.62	27.36	50.24	-22.88	Average
0.30	32.80	0.06	9.62	42.48	60.24	-17.76	QP
0.72	8.79	0.07	9.63	18.49	46.00	-27.51	Average
0.72	21.12	0.07	9.63	30.82	56.00	-25.18	QP
1.25	12.77	0.09	9.61	22.47	46.00	-23.53	Average
1.25	20.89	0.09	9.61	30.59	56.00	-25.41	QP
2.53	6.89	0.13	9.62	16.64	46.00	-29.36	Average
2.53	17.38	0.13	9.62	27.13	56.00	-28.87	QP
5.30	4.73	0.19	9.66	14.58	50.00	-35.42	Average
5.30	11.04	0.19	9.66	20.89	60.00	-39.11	QP



Test Mode: 01; Line: Neutral Line



Pol : NEUTRAL  
Mode :  
Model :

Frequency MHz	Read Level dBuV	Cable Loss dB	LISN Factor dB	Measured Level dBuV	Limit Line dBuV	Over Limit dB	Remark
0.16	24.18	0.06	9.55	33.79	55.65	-21.86	Average
0.16	42.00	0.06	9.55	51.61	65.65	-14.04	QP
0.28	19.20	0.06	9.54	28.80	50.90	-22.10	Average
0.28	34.22	0.06	9.54	43.82	60.90	-17.08	QP
0.65	14.67	0.07	9.55	24.29	46.00	-21.71	Average
0.65	22.52	0.07	9.55	32.14	56.00	-23.86	QP
1.23	13.85	0.08	9.55	23.48	46.00	-22.52	Average
1.23	23.08	0.08	9.55	32.71	56.00	-23.29	QP
2.75	12.40	0.14	9.55	22.09	46.00	-23.91	Average
2.75	20.95	0.14	9.55	30.64	56.00	-25.36	QP
5.14	6.83	0.18	9.56	16.57	50.00	-33.43	Average
5.14	14.66	0.18	9.56	24.40	60.00	-35.60	QP



### 7.2 Duty Cycle

Test Requirement KDB 558074 D01 v05r02 section 6  
Test Method: ANSI C63.10 (2013) Section 11.6

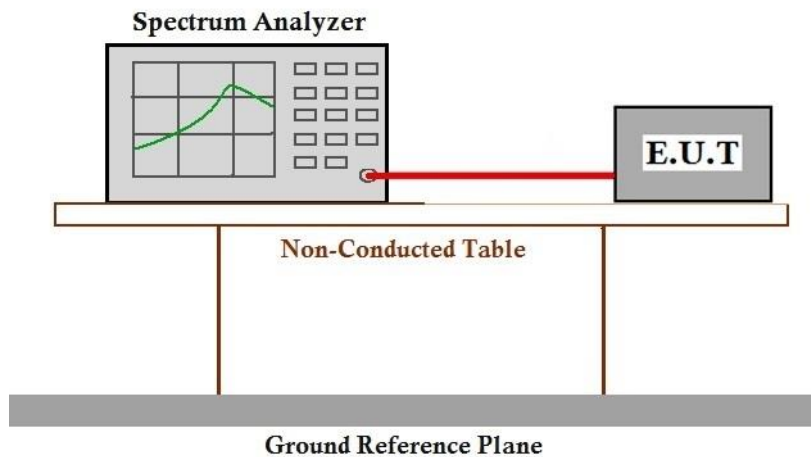
#### 7.2.1 E.U.T. Operation

Operating Environment:  
Temperature: 21.5 °C Humidity: 44.6 % RH Atmospheric Pressure: 1020 mbar

#### 7.2.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	01	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40). Only the data of worst case is recorded in the report.

#### 7.2.3 Test Setup Diagram



#### 7.2.4 Measurement Procedure and Data

cable loss=0.9dB

Please Refer to Appendix for Details

### 7.3 Conducted Peak Output Power

Test Requirement 47 CFR Part 15, Subpart C 15.247(b)(3)

Test Method: ANSI C63.10 (2013) Section 11.9.1.3

Limit:

Frequency range(MHz)	Output power of the intentional radiator(watt)
902-928	1 for $\geq 50$ hopping channels
	0.25 for $25 \leq$ hopping channels $< 50$
	1 for digital modulation
2400-2483.5	1 for $\geq 75$ non-overlapping hopping channels
	0.125 for all other frequency hopping systems
	1 for digital modulation
5725-5850	1 for frequency hopping systems and digital modulation

#### 7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 21.5 °C

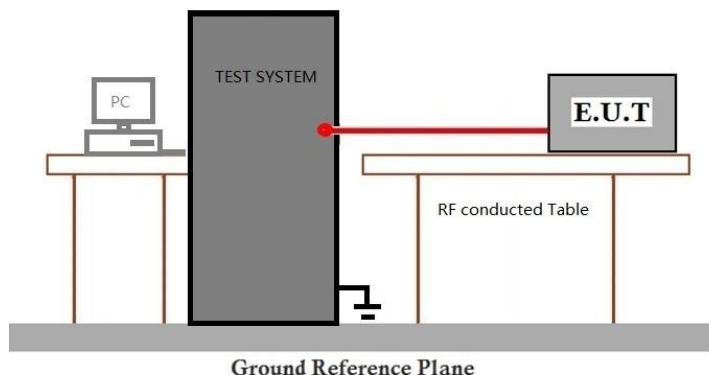
Humidity: 44.6 % RH

Atmospheric Pressure: 1020 mbar

#### 7.3.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	01	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40). Only the data of worst case is recorded in the report.

#### 7.3.3 Test Setup Diagram



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#### 7.3.4 Measurement Procedure and Data

cable loss=0.9dB

Please Refer to Appendix for Details

### 7.4 Minimum 6dB Bandwidth

Test Requirement 47 CFR Part 15, Subpart C 15.247a(2)  
Test Method: ANSI C63.10 (2013) Section 11.8.1  
Limit:  $\geq 500$  kHz

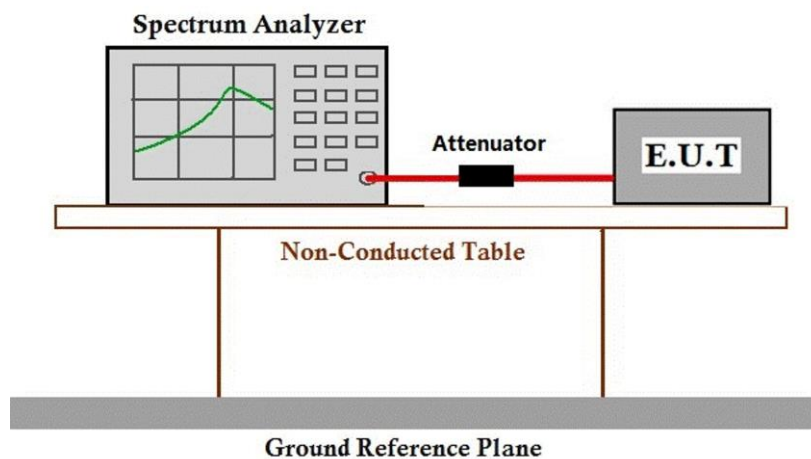
#### 7.4.1 E.U.T. Operation

Operating Environment:  
Temperature: 21.5 °C Humidity: 44.6 % RH Atmospheric Pressure: 1020 mbar

#### 7.4.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	01	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40). Only the data of worst case is recorded in the report.

#### 7.4.3 Test Setup Diagram



#### 7.4.4 Measurement Procedure and Data

cable loss=0.9dB

Please Refer to Appendix for Details



## 7.5 Power Spectrum Density

Test Requirement 47 CFR Part 15, Subpart C 15.247(e)

Test Method: ANSI C63.10 (2013) Section 11.10.2

Limit:

≤8dBm in any 3 kHz band during any time interval of continuous transmission

### 7.5.1 E.U.T. Operation

Operating Environment:

Temperature: 21.5 °C

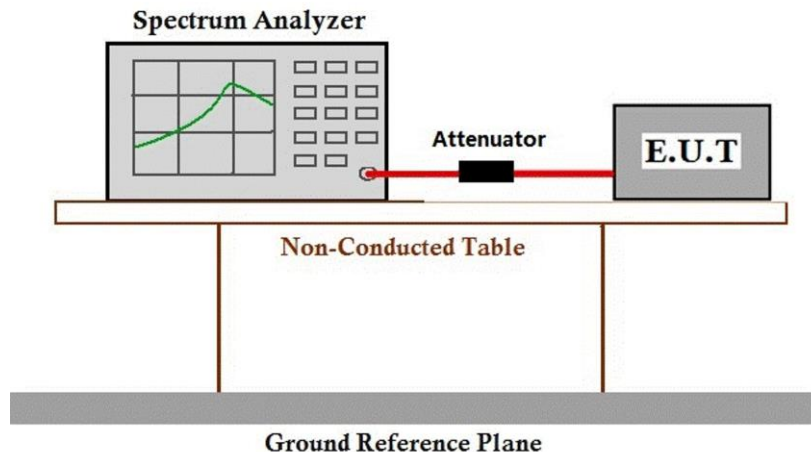
Humidity: 44.6 % RH

Atmospheric Pressure: 1020 mbar

### 7.5.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	01	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40). Only the data of worst case is recorded in the report.

### 7.5.3 Test Setup Diagram



### 7.5.4 Measurement Procedure and Data

cable loss=0.9dB

Please Refer to Appendix for Details



### 7.6 Conducted Band Edges Measurement

Test Requirement 47 CFR Part 15, Subpart C 15.247(d)  
Test Method: ANSI C63.10 (2013) Section 11.13.3.2  
Limit:

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

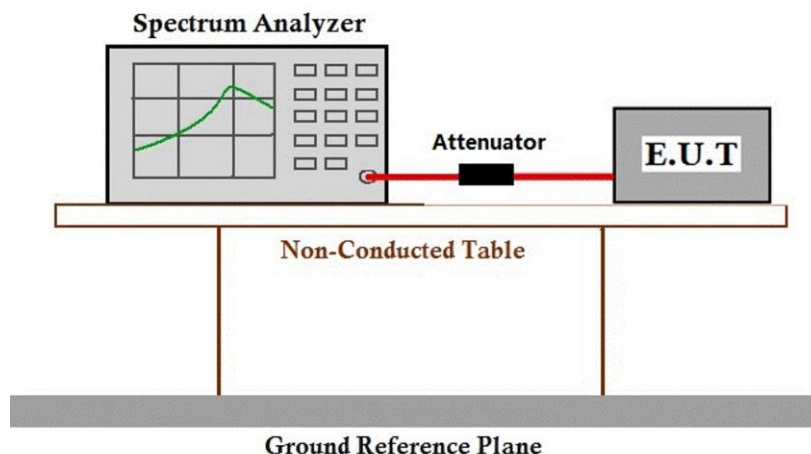
#### 7.6.1 E.U.T. Operation

Operating Environment:  
Temperature: 21.5 °C Humidity: 44.6 % RH Atmospheric Pressure: 1020 mbar

#### 7.6.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	01	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40). Only the data of worst case is recorded in the report.

#### 7.6.3 Test Setup Diagram



#### 7.6.4 Measurement Procedure and Data

cable loss=0.9dB

Please Refer to Appendix for Details

## 7.7 Conducted Spurious Emissions

Test Requirement 47 CFR Part 15, Subpart C 15.247(d)

Test Method: ANSI C63.10 (2013) Section 11.11

Limit:

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

### 7.7.1 E.U.T. Operation

Operating Environment:

Temperature: 21.5 °C

Humidity: 44.6 % RH

Atmospheric Pressure: 1020 mbar

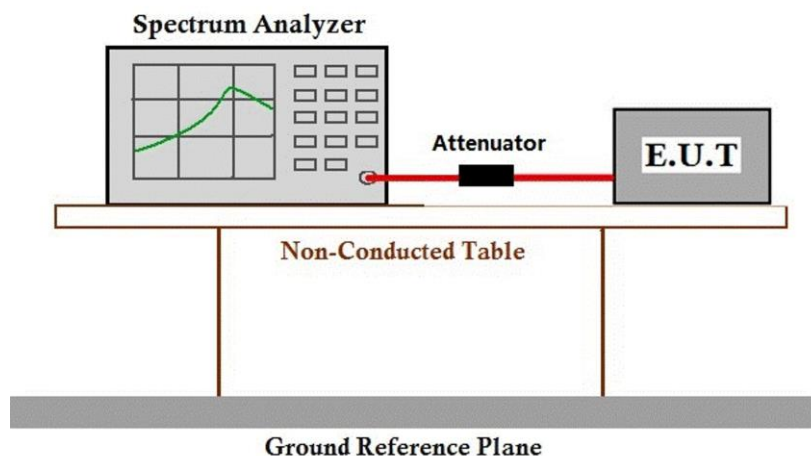
### 7.7.2 Test Mode Description

Pre-scan /	Mode	Description
Final test	Code	

Final test	01	
------------	----	--

TX mode\_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40). Only the data of worst case is recorded in the report.

### 7.7.3 Test Setup Diagram



#### 7.7.4 Measurement Procedure and Data

cable loss=0.9dB

Please Refer to Appendix for Details



**7.8 Radiated Emissions which fall in the restricted bands**

Test Requirement 47 CFR Part 15, Subpart C 15.205 &amp; 15.209

Test Method: ANSI C63.10 (2013) Section 6.10.5

Measurement Distance: 3m

Limit:

Frequency(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: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

**7.8.1 E.U.T. Operation**

Operating Environment:

Temperature: 22.1 °C

Humidity: 56.3 % RH

Atmospheric Pressure: 1020 mbar

**7.8.2 Test Mode Description**

**Pre-scan /** Mode  
**Final test** Code Description

**Final test** 01 TX mode\_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40). Only the data of worst case is recorded in the report.

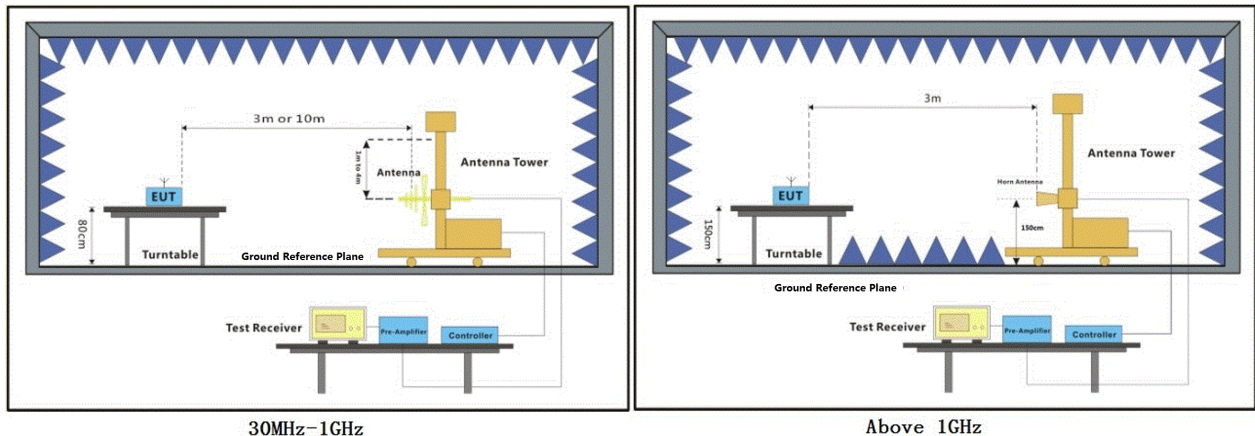


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### 7.8.3 Test Setup Diagram



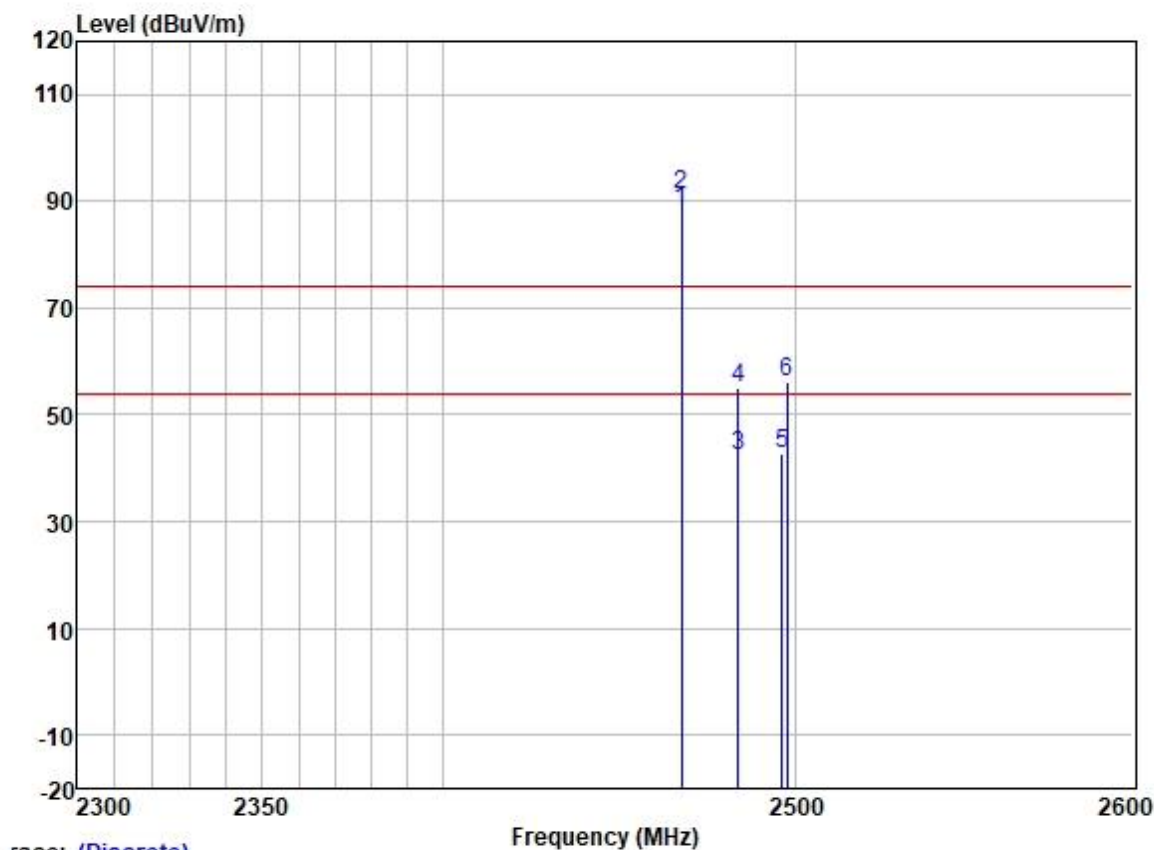
### 7.8.4 Measurement Procedure and Data

- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- h. Test the EUT in the lowest channel, the Highest channel.
- i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- j. Repeat above procedures until all frequencies measured was complete.

Remark 1: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

Remark 2: For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.

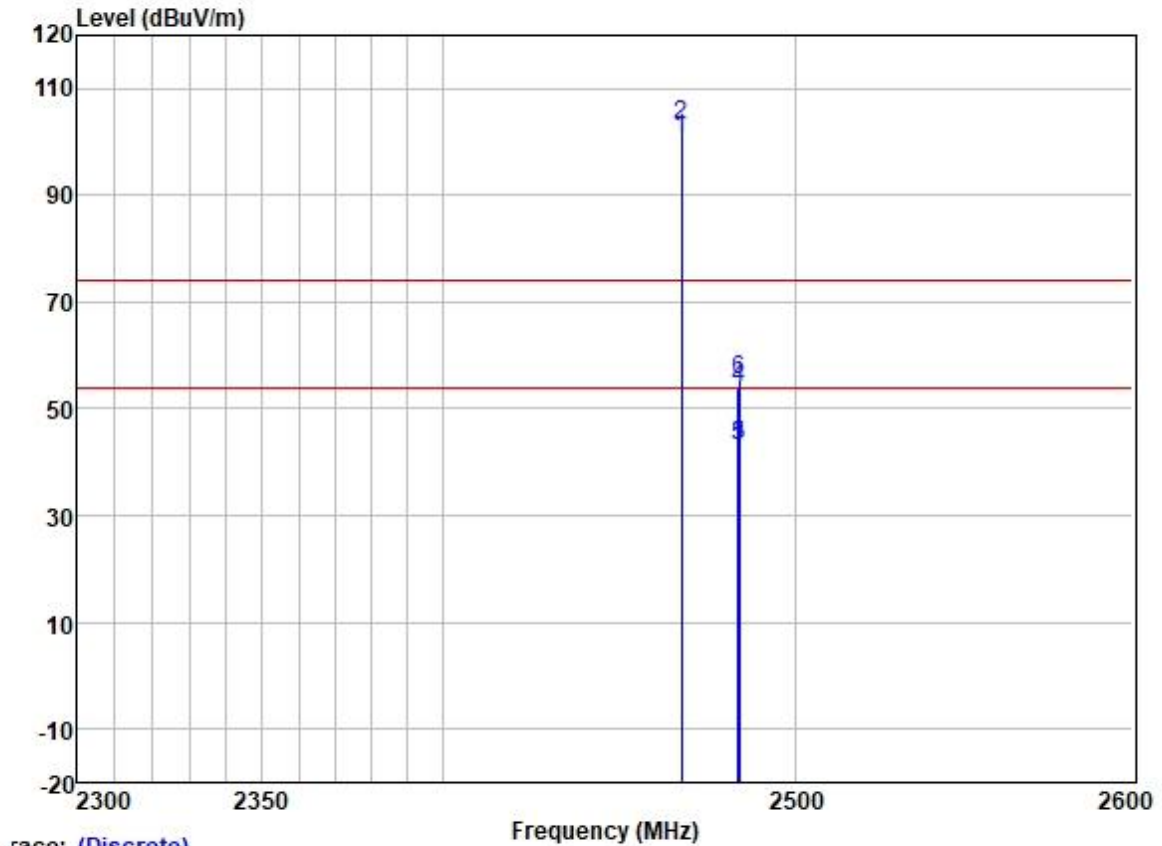
Test Mode: 01; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:12



Trace: (Discrete)

		ReadAntenna		Cable	Preamp		Limit	Over		
	Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1 *	2467.000	94.72	27.45	3.50	37.57	88.10	54.00	34.10	HORIZONTAL	Average
2 *	2467.000	97.98	27.45	3.50	37.57	91.36	74.00	17.36	HORIZONTAL	Peak
3	2483.500	48.88	27.48	3.53	37.57	42.32	54.00	-11.68	HORIZONTAL	Average
4	2483.500	61.52	27.48	3.53	37.57	54.96	74.00	-19.04	HORIZONTAL	Peak
5	2496.013	49.19	27.49	3.47	37.56	42.59	54.00	-11.41	HORIZONTAL	Average
6	2497.627	62.68	27.50	3.40	37.56	56.02	74.00	-17.98	HORIZONTAL	Peak

Test Mode: 01; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:12

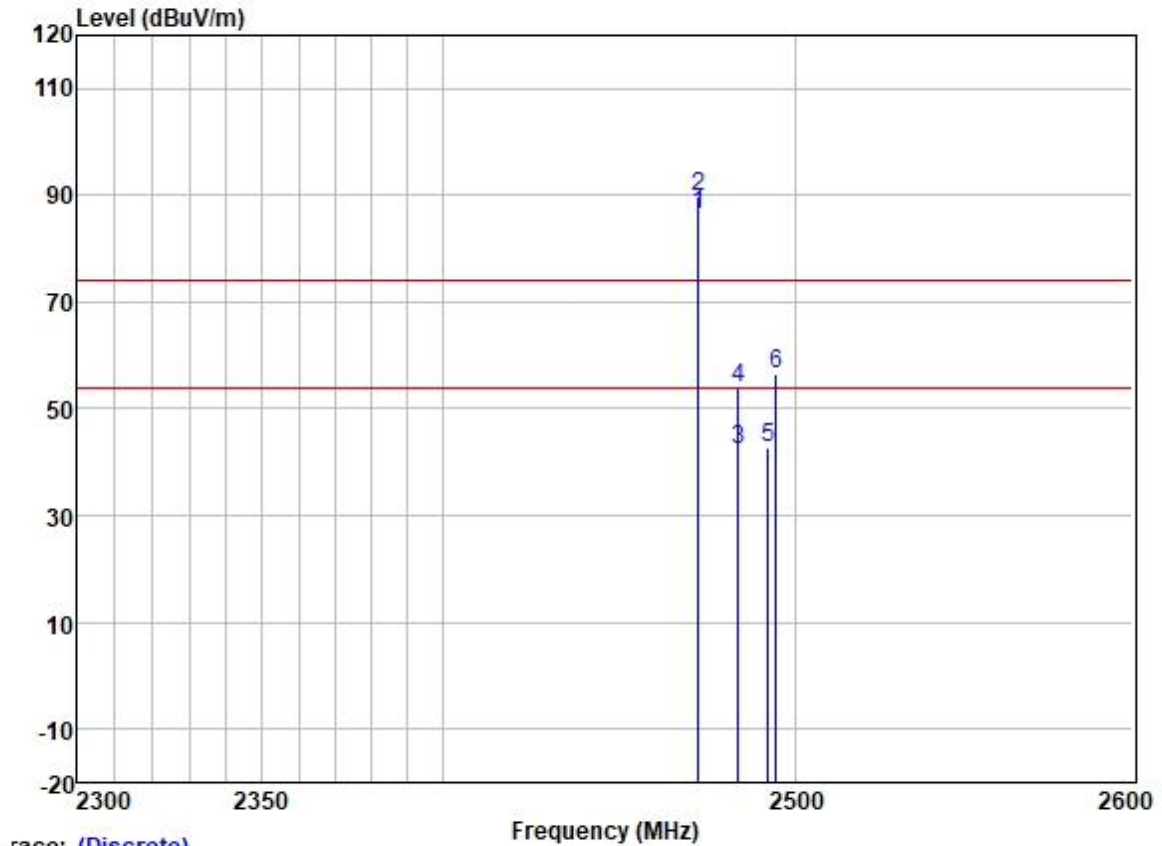


race: (Discrete)

		Freq	ReadAntenna Level Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark	
		MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	*	2467.000	107.26	27.45	3.50	37.57	100.64	54.00	46.64	VERTICAL	Average
2	*	2467.000	109.95	27.45	3.50	37.57	103.33	74.00	29.33	VERTICAL	Peak
3		2483.500	49.47	27.48	3.53	37.57	42.91	54.00	-11.09	VERTICAL	Average
4		2483.500	60.65	27.48	3.53	37.57	54.09	74.00	-19.91	VERTICAL	Peak
5		2483.790	49.81	27.48	3.53	37.57	43.25	54.00	-10.75	VERTICAL	Average
6		2483.790	62.10	27.48	3.53	37.57	55.54	74.00	-18.46	VERTICAL	Peak



Test Mode: 01; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:13

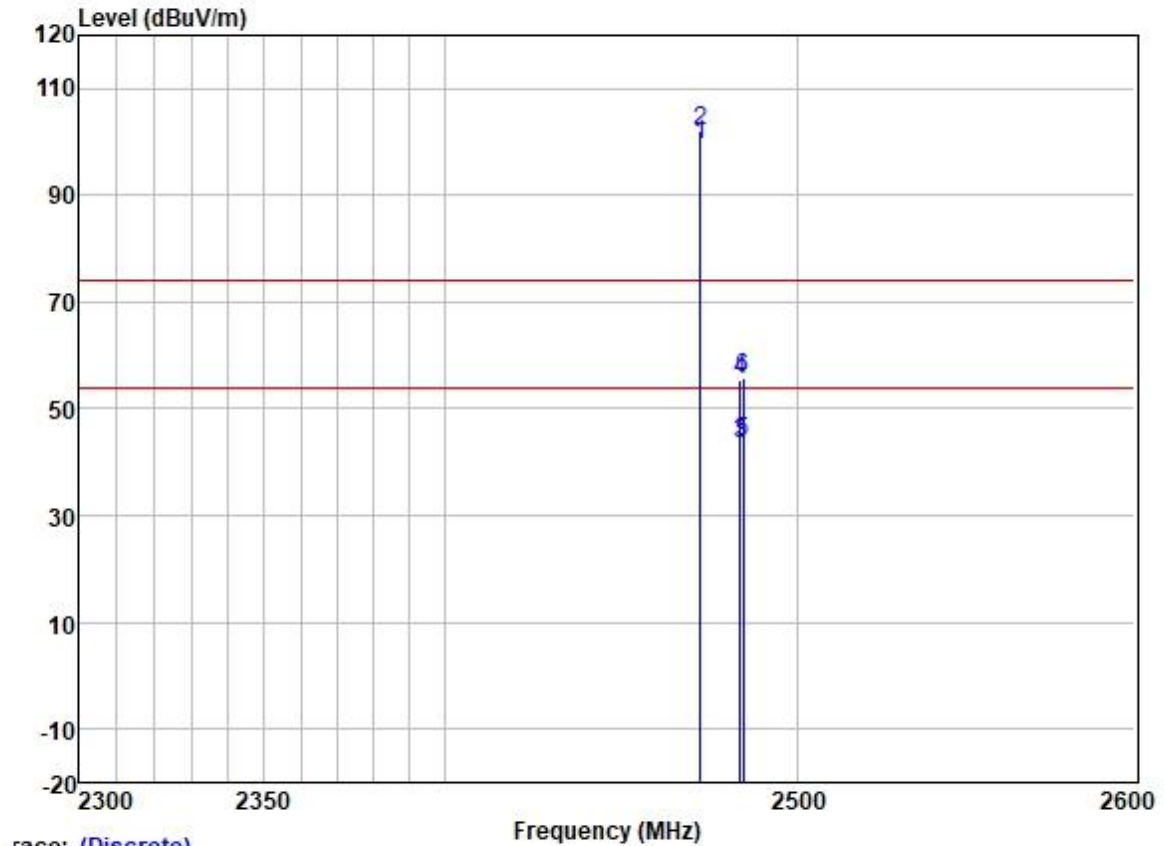


race: (Discrete)

		ReadAntenna		Cable	Preamp		Limit	Over		
	Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1 *	2472.000	92.90	27.46	3.55	37.57	86.34	54.00	32.34	HORIZONTAL	Average
2 *	2472.000	96.23	27.46	3.55	37.57	89.67	74.00	15.67	HORIZONTAL	Peak
3	2483.500	48.76	27.48	3.53	37.57	42.20	54.00	-11.80	HORIZONTAL	Average
4	2483.500	60.36	27.48	3.53	37.57	53.80	74.00	-20.20	HORIZONTAL	Peak
5	2492.184	49.14	27.49	3.47	37.56	42.54	54.00	-11.46	HORIZONTAL	Average
6	2494.450	63.22	27.49	3.47	37.56	56.62	74.00	-17.38	HORIZONTAL	Peak



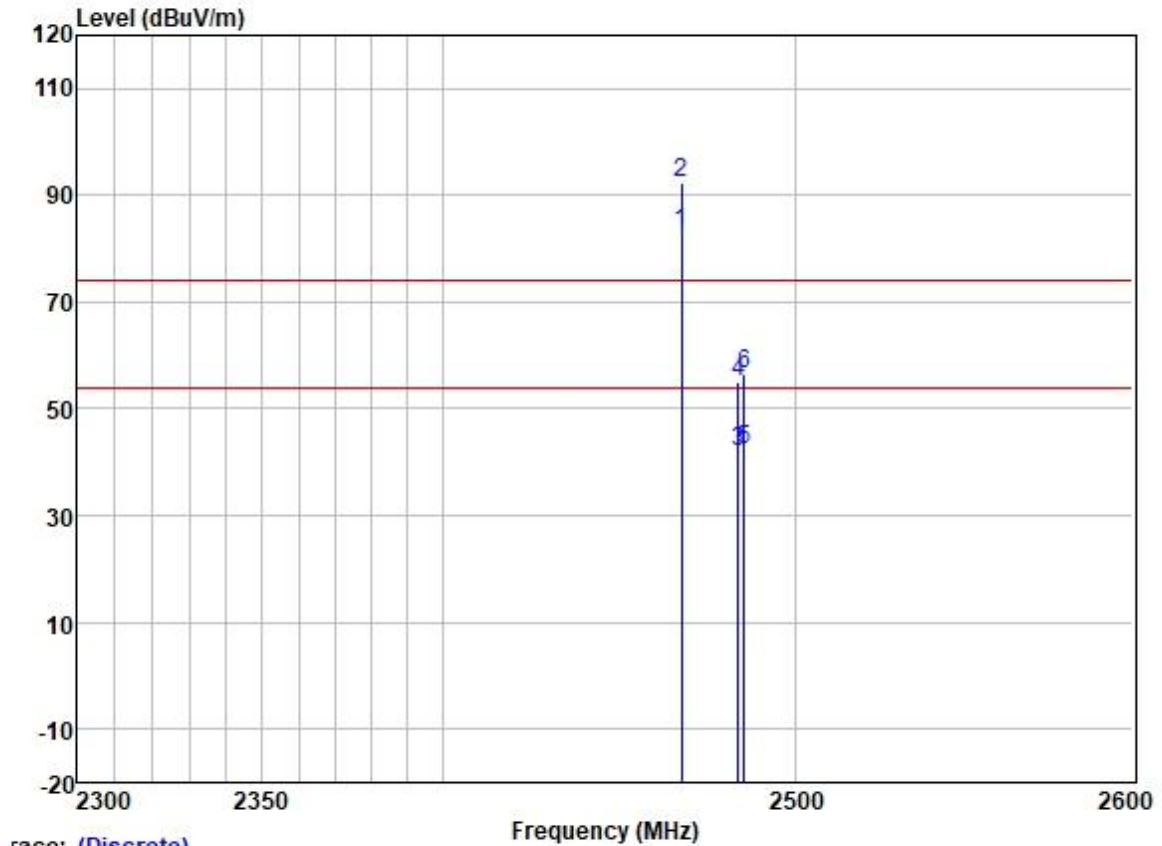
Test Mode: 01; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:13



Trace: (Discrete)

		ReadAntenna		Cable	Preamp		Limit	Over		
	Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1 *	2472.000	106.15	27.46	3.55	37.57	99.59	54.00	45.59	VERTICAL	Average
2 *	2472.000	108.76	27.46	3.55	37.57	102.20	74.00	28.20	VERTICAL	Peak
3	2483.500	50.07	27.48	3.53	37.57	43.51	54.00	-10.49	VERTICAL	Average
4	2483.500	62.06	27.48	3.53	37.57	55.50	74.00	-18.50	VERTICAL	Peak
5	2484.442	50.40	27.48	3.53	37.57	43.84	54.00	-10.16	VERTICAL	Average
6	2484.442	62.17	27.48	3.53	37.57	55.61	74.00	-18.39	VERTICAL	Peak

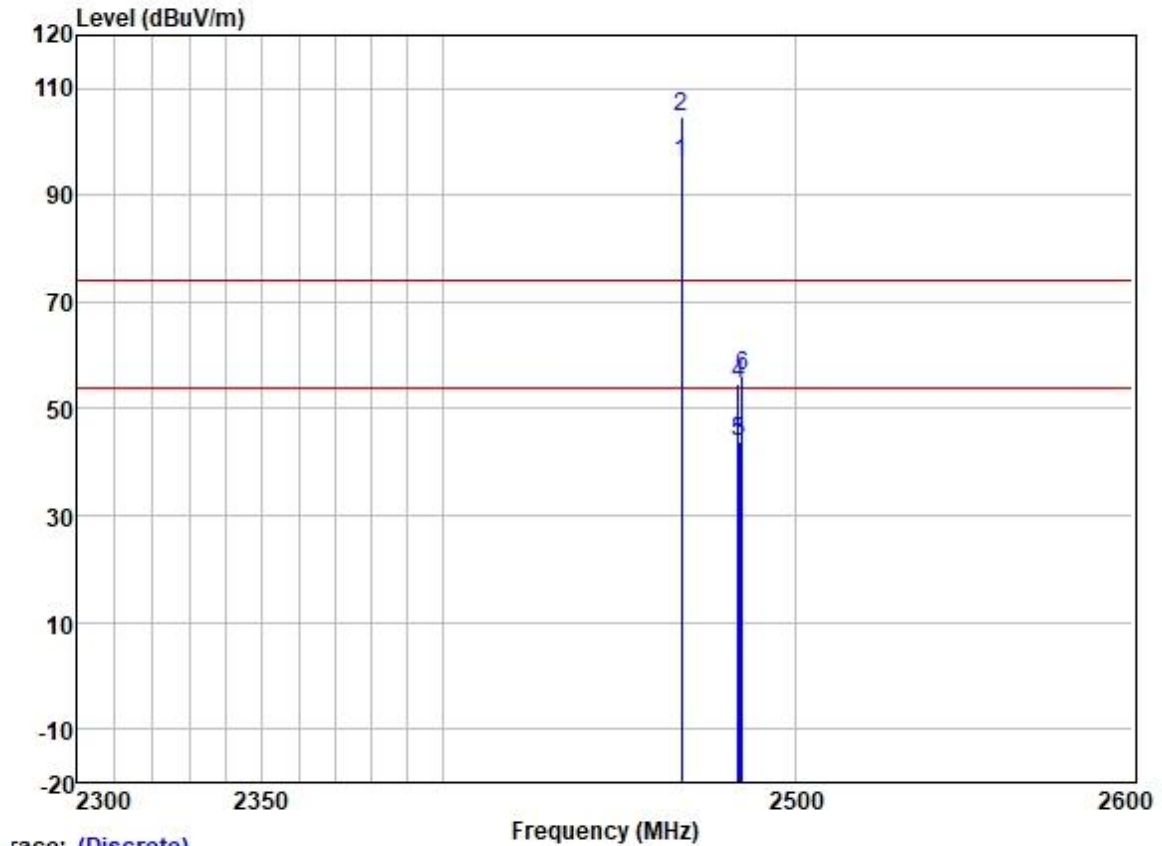
Test Mode: 01; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:12



Trace: (Discrete)

	Freq	Read	Antenna	Cable	Preamp	Limit	Over		
	MHz	Level	Factor	Loss	Factor	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1 *	2467.000	89.50	27.45	3.50	37.57	82.88	54.00	28.88	HORIZONTAL Average
2 *	2467.000	99.06	27.45	3.50	37.57	92.44	74.00	18.44	HORIZONTAL Peak
3	2483.500	48.59	27.48	3.53	37.57	42.03	54.00	-11.97	HORIZONTAL Average
4	2483.500	61.55	27.48	3.53	37.57	54.99	74.00	-19.01	HORIZONTAL Peak
5	2485.295	48.94	27.48	3.53	37.57	42.38	54.00	-11.62	HORIZONTAL Average
6	2485.295	63.05	27.48	3.53	37.57	56.49	74.00	-17.51	HORIZONTAL Peak

Test Mode: 01; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:12

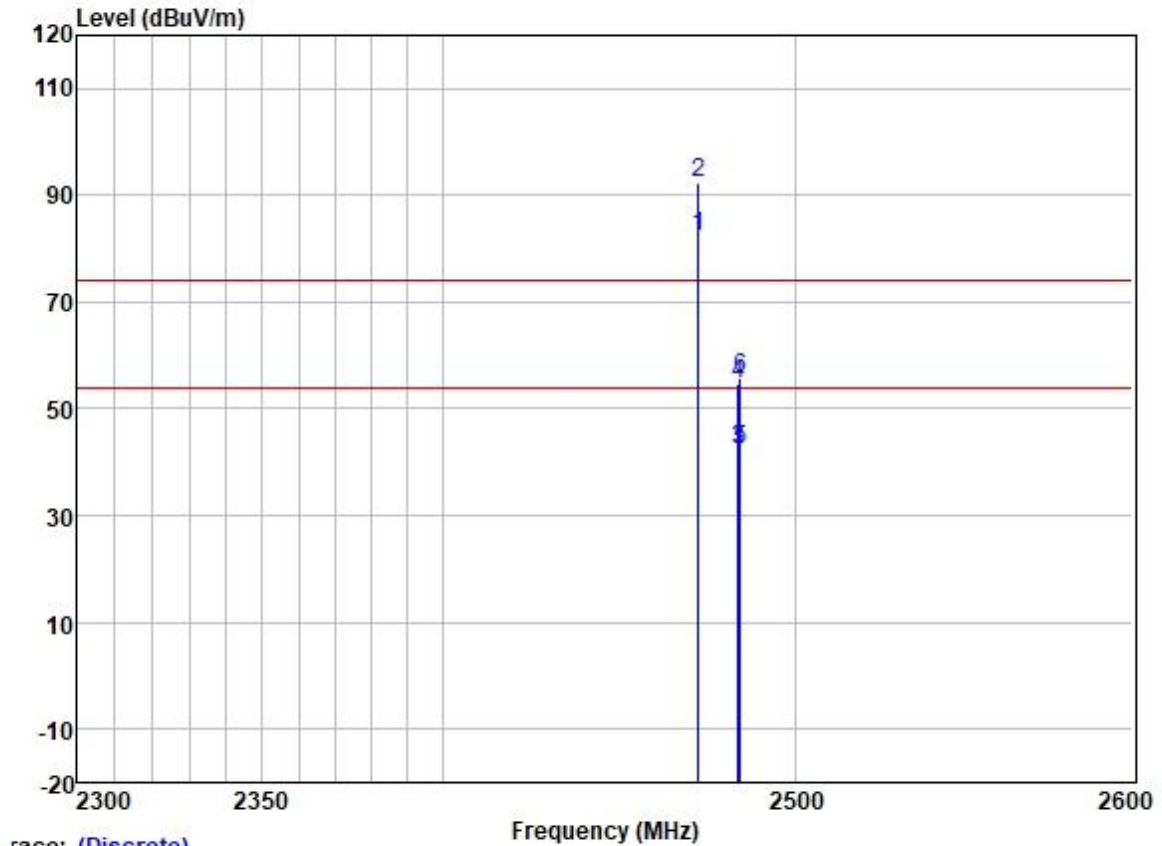


Trace: (Discrete)

		Freq	ReadAntenna Level Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark	
		MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	*	2467.000	102.57	27.45	3.50	37.57	95.95	54.00	41.95	VERTICAL	Average
2	*	2467.000	111.28	27.45	3.50	37.57	104.66	74.00	30.66	VERTICAL	Peak
3		2483.500	50.50	27.48	3.53	37.57	43.94	54.00	-10.06	VERTICAL	Average
4		2483.500	61.30	27.48	3.53	37.57	54.74	74.00	-19.26	VERTICAL	Peak
5		2483.790	50.29	27.48	3.53	37.57	43.73	54.00	-10.27	VERTICAL	Average
6		2484.492	62.80	27.48	3.53	37.57	56.24	74.00	-17.76	VERTICAL	Peak



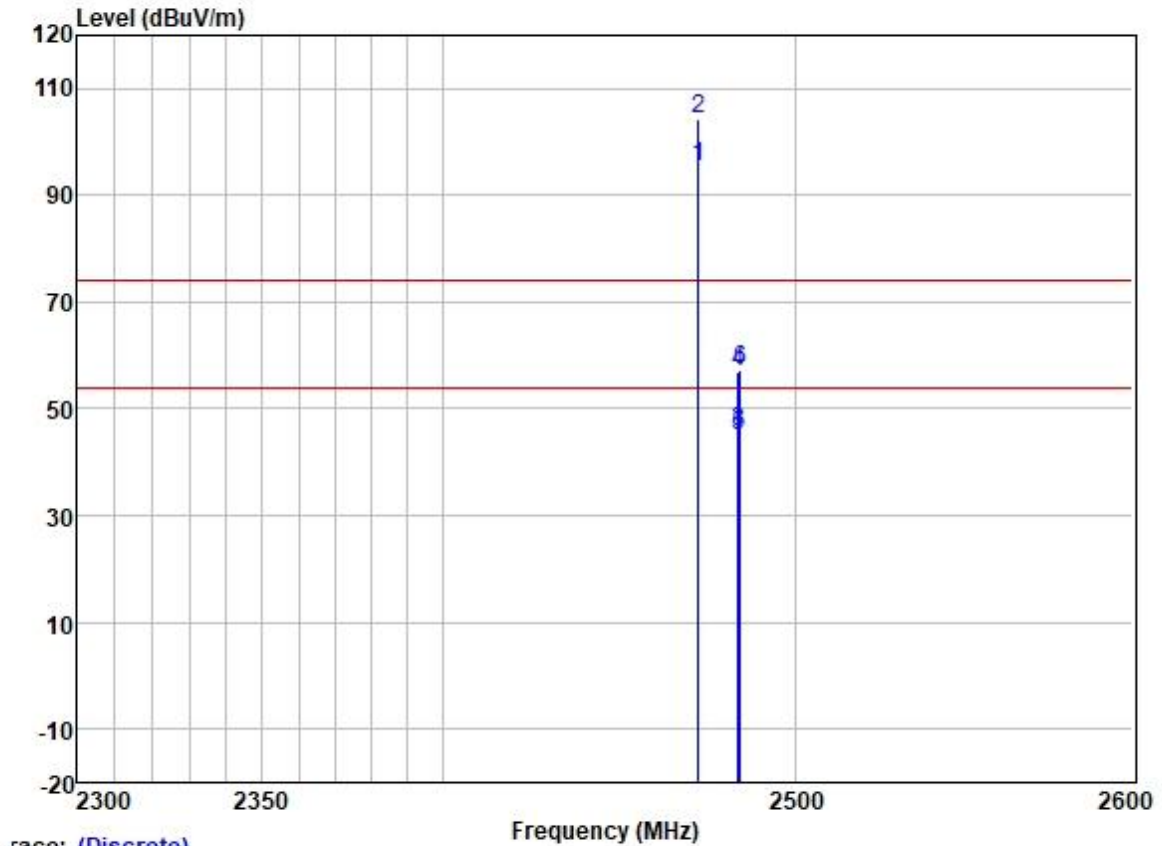
Test Mode: 01; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:13



		ReadAntenna		Cable	Preamp		Limit	Over		
	Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1 *	2472.000	88.71	27.46	3.55	37.57	82.15	54.00	28.15	HORIZONTAL	Average
2 *	2472.000	98.90	27.46	3.55	37.57	92.34	74.00	18.34	HORIZONTAL	Peak
3	2483.500	48.79	27.48	3.53	37.57	42.23	54.00	-11.77	HORIZONTAL	Average
4	2483.500	61.33	27.48	3.53	37.57	54.77	74.00	-19.23	HORIZONTAL	Peak
5	2484.041	48.96	27.48	3.53	37.57	42.40	54.00	-11.60	HORIZONTAL	Average
6	2484.041	62.23	27.48	3.53	37.57	55.67	74.00	-18.33	HORIZONTAL	Peak



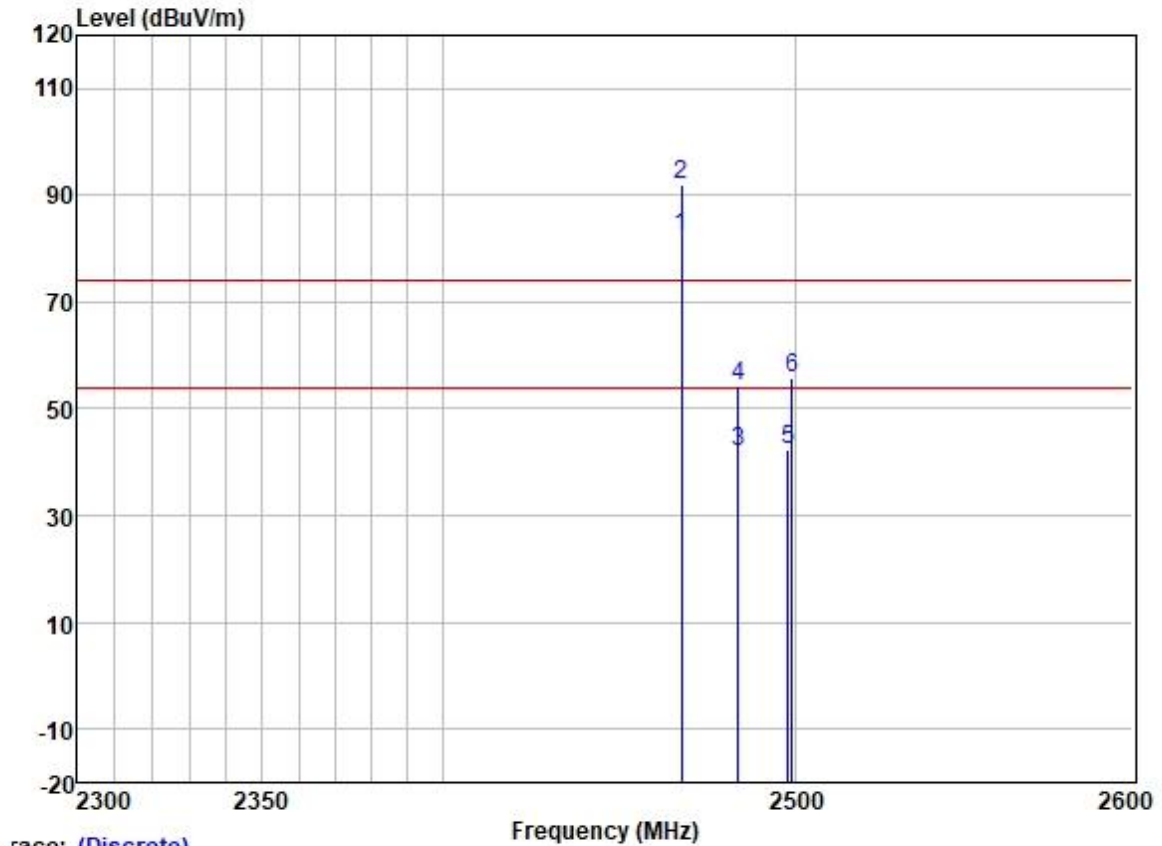
Test Mode: 01; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:13



Trace: (Discrete)

		ReadAntenna		Cable	Preamp		Limit	Over		
	Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1 *	2472.000	101.86	27.46	3.55	37.57	95.30	54.00	41.30	VERTICAL	Average
2 *	2472.000	110.86	27.46	3.55	37.57	104.30	74.00	30.30	VERTICAL	Peak
3	2483.500	52.19	27.48	3.53	37.57	45.63	54.00	-8.37	VERTICAL	Average
4	2483.500	63.35	27.48	3.53	37.57	56.79	74.00	-17.21	VERTICAL	Peak
5	2483.840	51.68	27.48	3.53	37.57	45.12	54.00	-8.88	VERTICAL	Average
6	2483.940	64.02	27.48	3.53	37.57	57.46	74.00	-16.54	VERTICAL	Peak

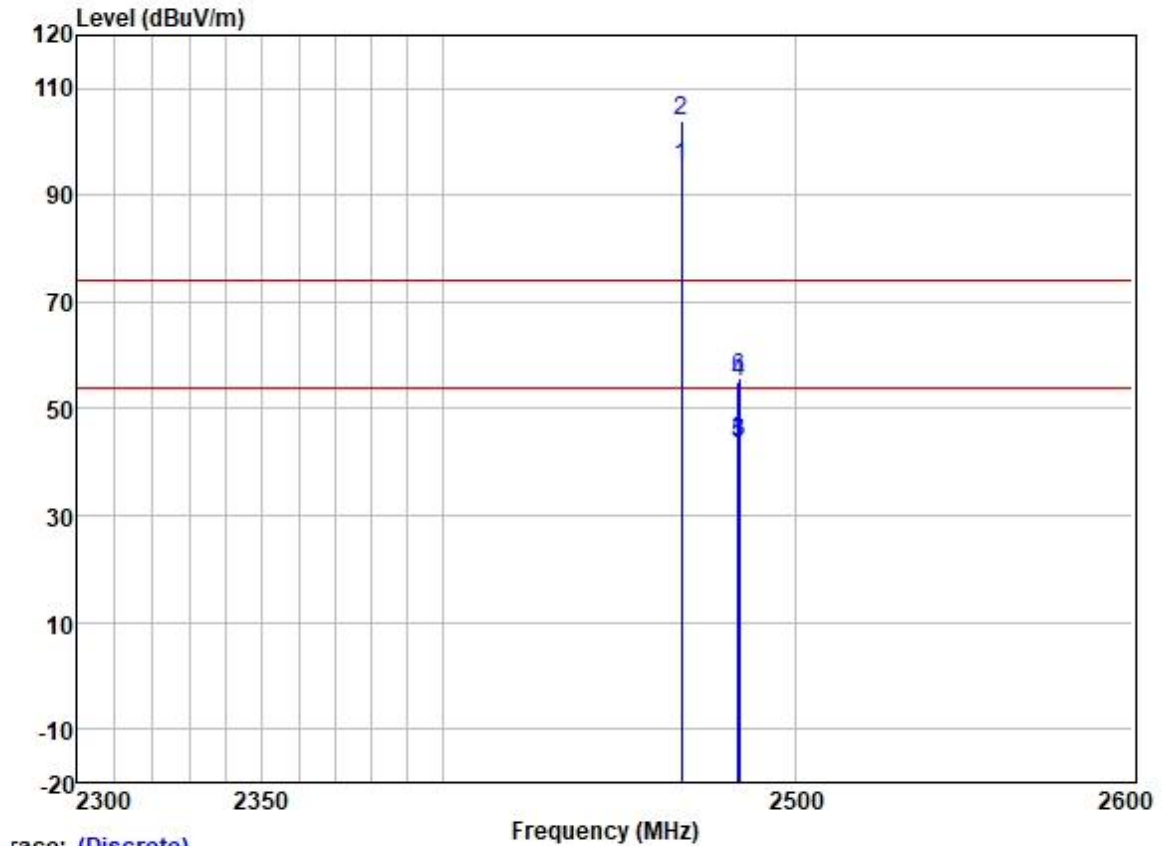
Test Mode: 01; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:12



race: (Discrete)

		ReadAntenna		Cable	Preamp		Limit	Over		
	Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1 *	2467.000	88.78	27.45	3.50	37.57	82.16	54.00	28.16	HORIZONTAL	Average
2 *	2467.000	98.65	27.45	3.50	37.57	92.03	74.00	18.03	HORIZONTAL	Peak
3	2483.500	48.59	27.48	3.53	37.57	42.03	54.00	-11.97	HORIZONTAL	Average
4	2483.500	60.85	27.48	3.53	37.57	54.29	74.00	-19.71	HORIZONTAL	Peak
5	2497.779	49.07	27.50	3.40	37.56	42.41	54.00	-11.59	HORIZONTAL	Average
6	2499.091	62.48	27.50	3.40	37.56	55.82	74.00	-18.18	HORIZONTAL	Peak

Test Mode: 01; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:12

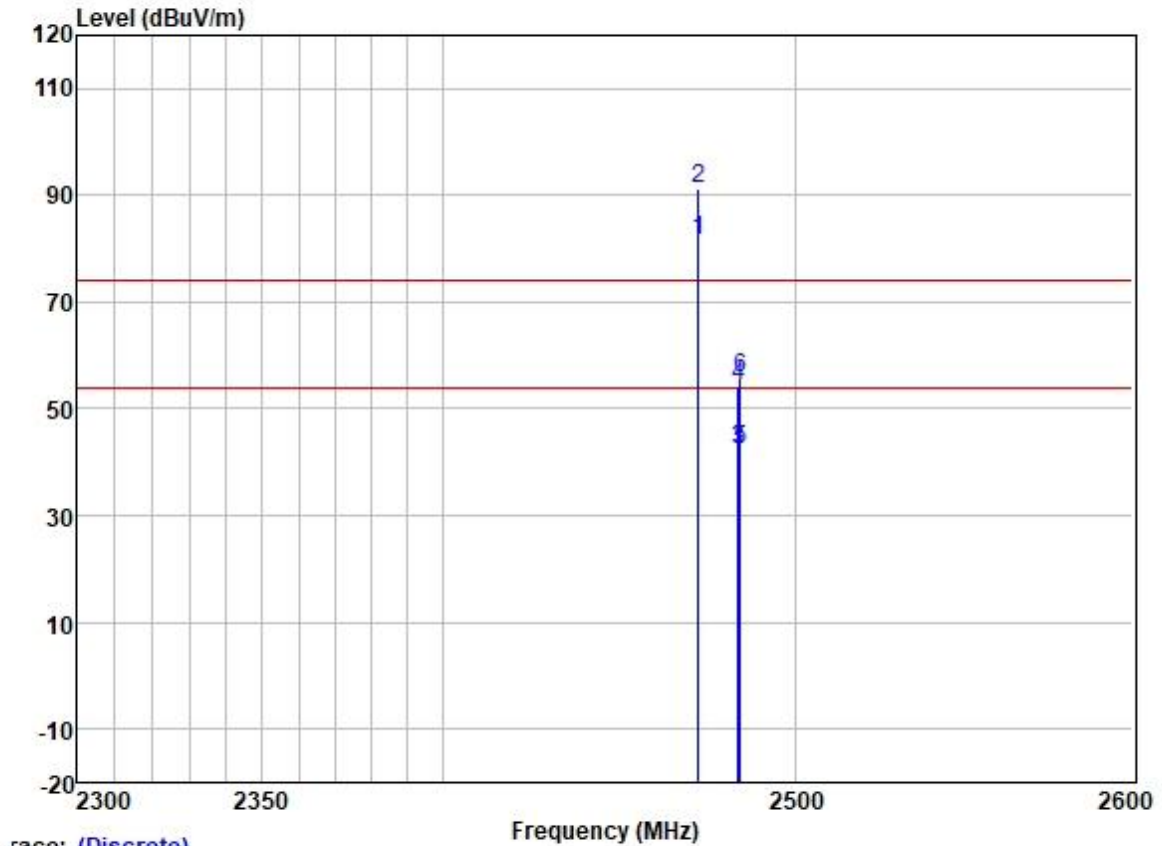


Trace: (Discrete)

		ReadAntenna		Cable	Preamp		Limit	Over		
	Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1 *	2467.000	101.80	27.45	3.50	37.57	95.18	54.00	41.18	VERTICAL	Average
2 *	2467.000	110.60	27.45	3.50	37.57	103.98	74.00	29.98	VERTICAL	Peak
3	2483.500	50.48	27.48	3.53	37.57	43.92	54.00	-10.08	VERTICAL	Average
4	2483.500	61.59	27.48	3.53	37.57	55.03	74.00	-18.97	VERTICAL	Peak
5	2483.790	50.00	27.48	3.53	37.57	43.44	54.00	-10.56	VERTICAL	Average
6	2483.790	62.29	27.48	3.53	37.57	55.73	74.00	-18.27	VERTICAL	Peak



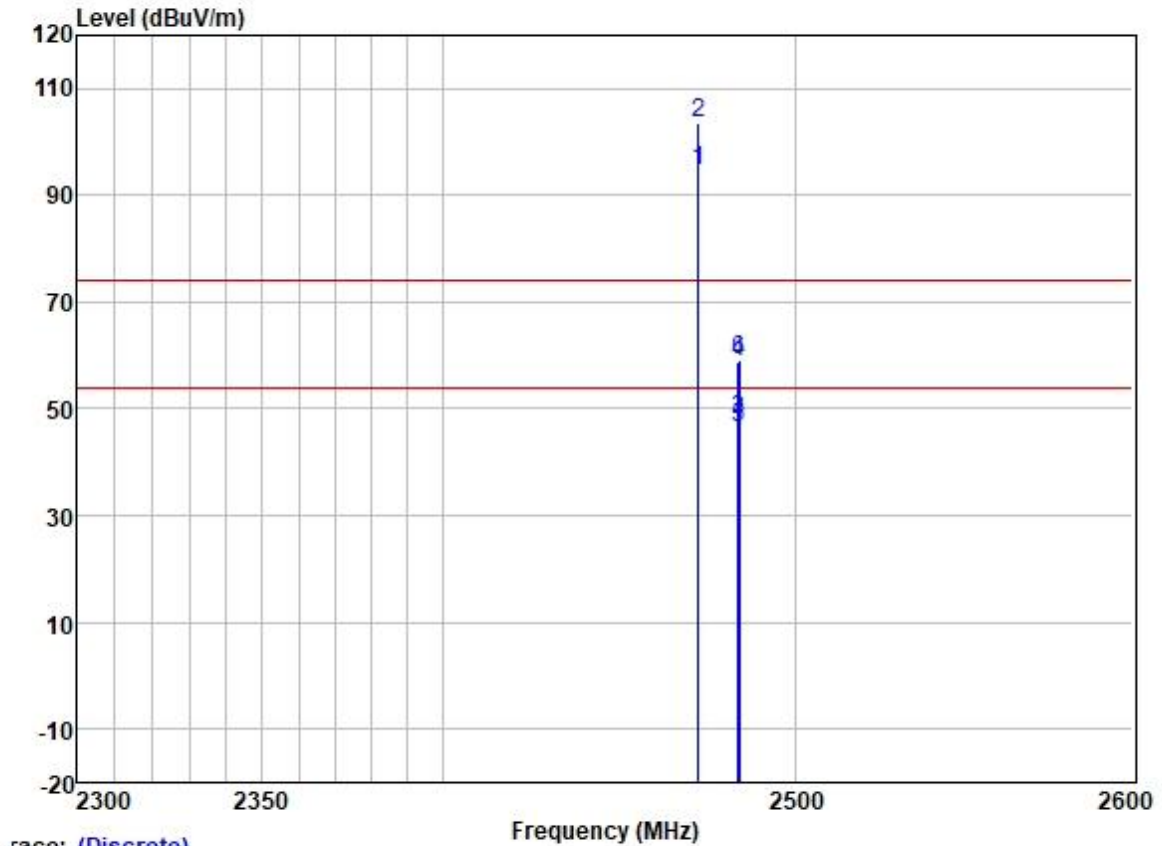
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		Freq	ReadAntenna Level Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
		MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	*	2472.000	88.21	27.46	3.55	37.57	81.65	54.00	27.65	HORIZONTAL Average
2	*	2472.000	97.93	27.46	3.55	37.57	91.37	74.00	17.37	HORIZONTAL Peak
3		2483.500	49.02	27.48	3.53	37.57	42.46	54.00	-11.54	HORIZONTAL Average
4		2483.500	60.99	27.48	3.53	37.57	54.43	74.00	-19.57	HORIZONTAL Peak
5		2483.990	48.96	27.48	3.53	37.57	42.40	54.00	-11.60	HORIZONTAL Average
6		2483.990	62.18	27.48	3.53	37.57	55.62	74.00	-18.38	HORIZONTAL Peak



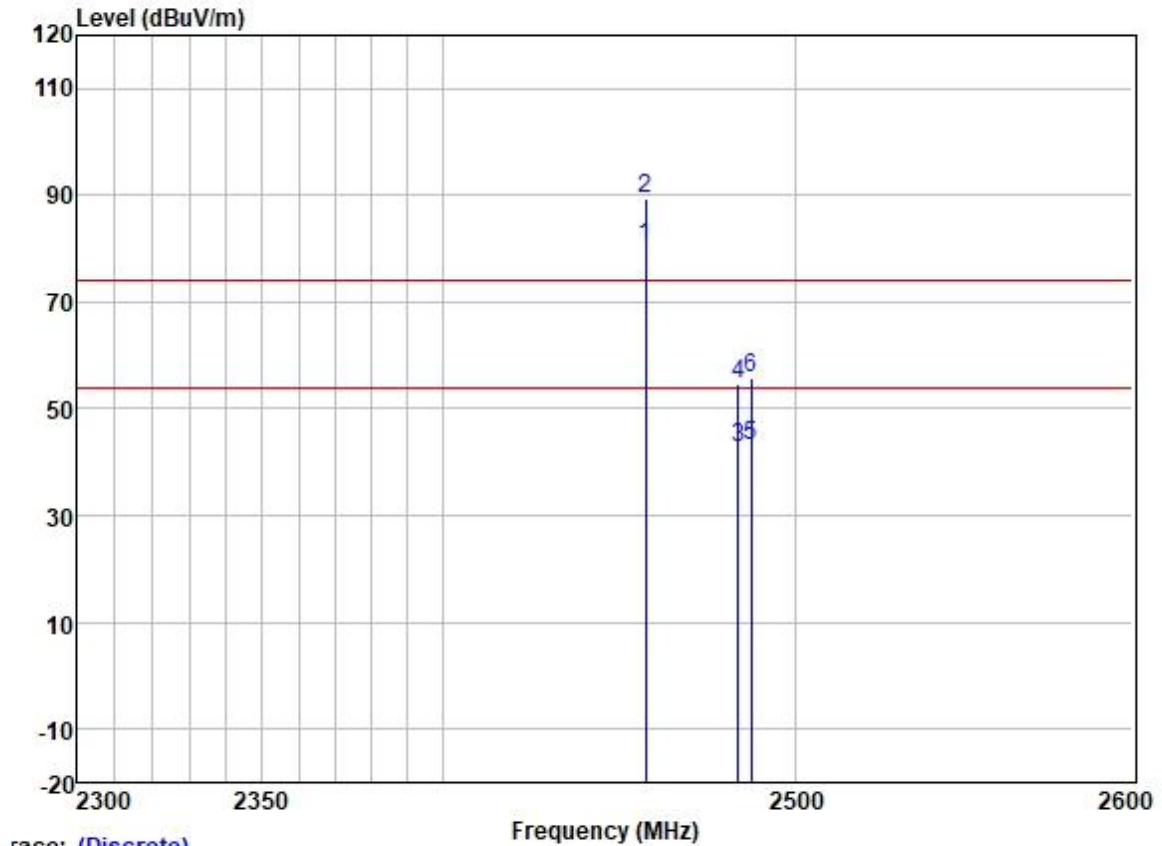
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Trace: (Discrete)

		ReadAntenna		Cable	Preamp		Limit	Over		
	Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1 *	2472.000	101.34	27.46	3.55	37.57	94.78	54.00	40.78	VERTICAL	Average
2 *	2472.000	109.95	27.46	3.55	37.57	103.39	74.00	29.39	VERTICAL	Peak
3	2483.500	54.35	27.48	3.53	37.57	47.79	54.00	-6.21	VERTICAL	Average
4	2483.500	65.22	27.48	3.53	37.57	58.66	74.00	-15.34	VERTICAL	Peak
5	2483.790	53.08	27.48	3.53	37.57	46.52	54.00	-7.48	VERTICAL	Average
6	2483.790	65.85	27.48	3.53	37.57	59.29	74.00	-14.71	VERTICAL	Peak

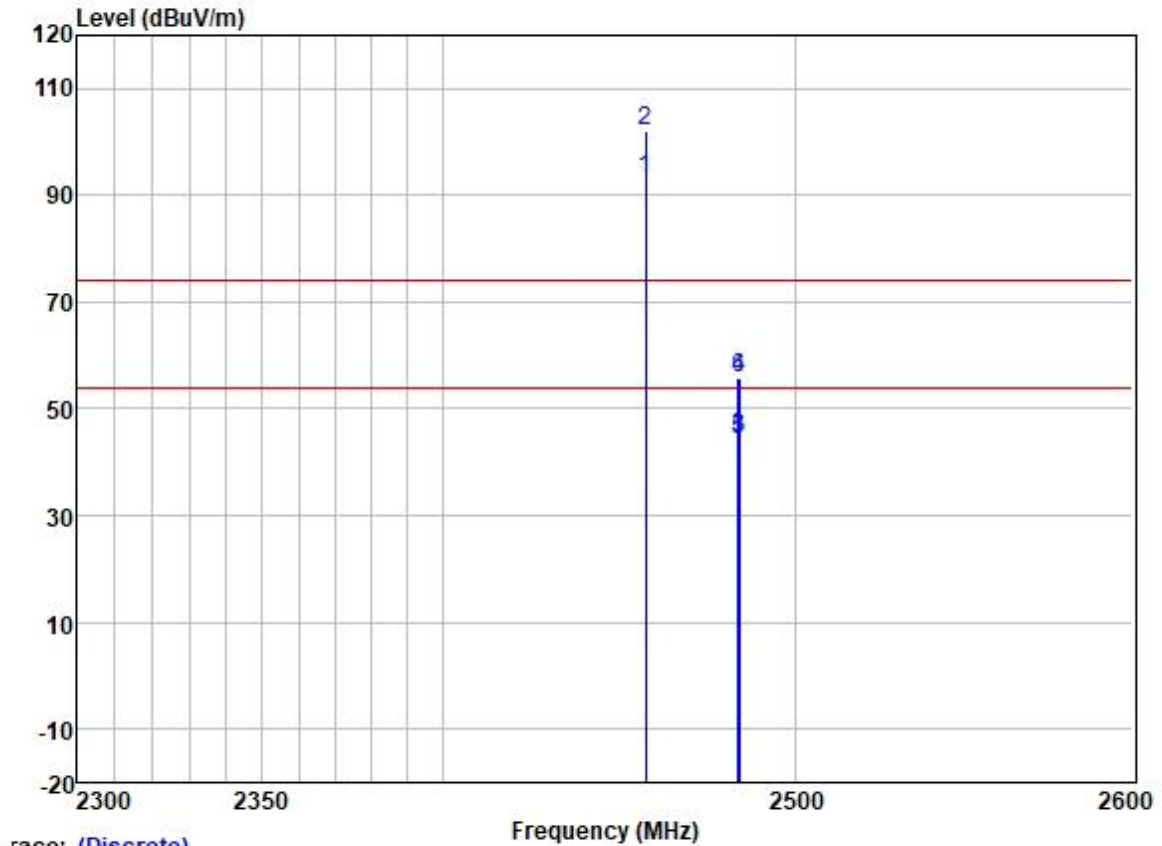
Test Mode: 01; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:10



Trace: (Discrete)

		Freq	ReadAntenna Level Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
		MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	*	2457.000	86.96	27.44	3.45	37.58	80.27	54.00	26.27	HORIZONTAL Average
2	*	2457.000	96.08	27.44	3.45	37.58	89.39	74.00	15.39	HORIZONTAL Peak
3		2483.500	49.27	27.48	3.53	37.57	42.71	54.00	-11.29	HORIZONTAL Average
4		2483.500	61.26	27.48	3.53	37.57	54.70	74.00	-19.30	HORIZONTAL Peak
5		2487.323	49.68	27.48	3.53	37.57	43.12	54.00	-10.88	HORIZONTAL Average
6		2487.323	62.45	27.48	3.53	37.57	55.89	74.00	-18.11	HORIZONTAL Peak

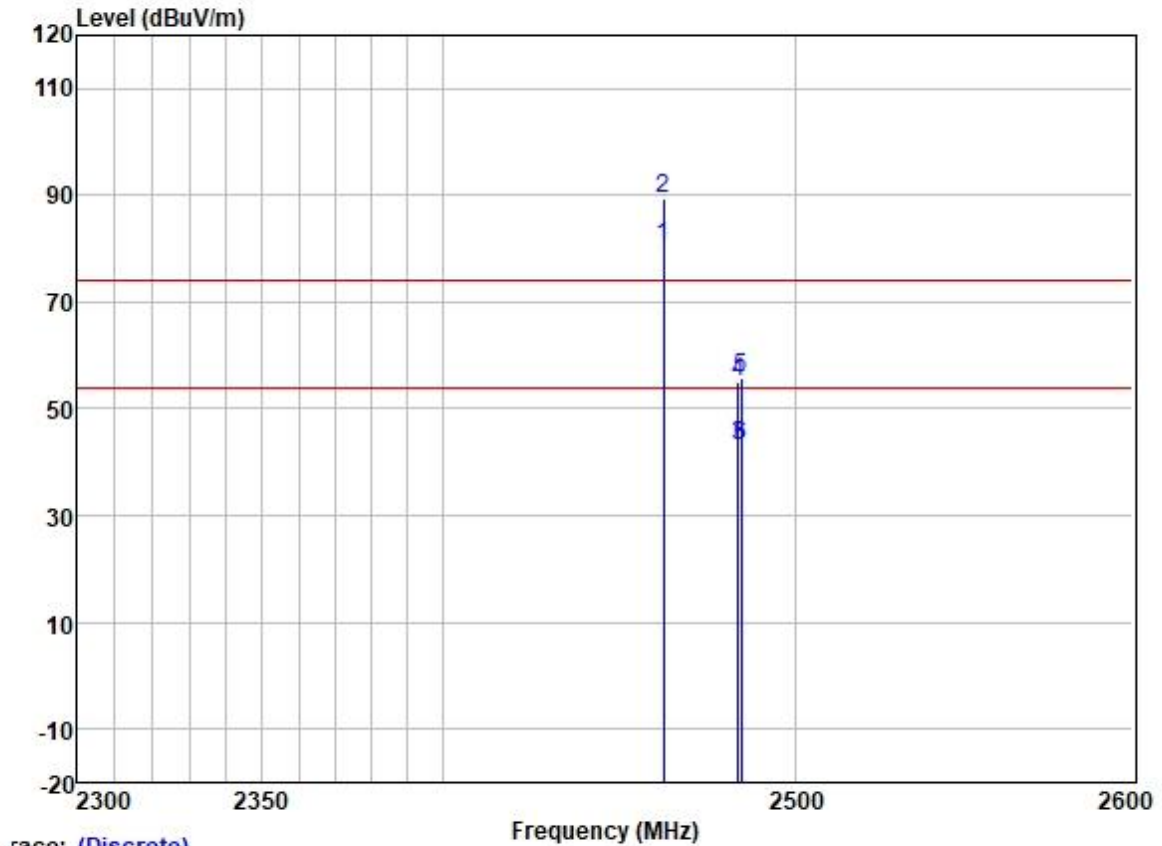
Test Mode: 01; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:10



		Freq	ReadAntenna Level Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark	
		MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	*	2457.000	99.71	27.44	3.45	37.58	93.02	54.00	39.02	VERTICAL	Average
2	*	2457.000	108.71	27.44	3.45	37.58	102.02	74.00	28.02	VERTICAL	Peak
3		2483.500	51.00	27.48	3.53	37.57	44.44	54.00	-9.56	VERTICAL	Average
4		2483.500	62.27	27.48	3.53	37.57	55.71	74.00	-18.29	VERTICAL	Peak
5		2483.865	50.77	27.48	3.53	37.57	44.21	54.00	-9.79	VERTICAL	Average
6		2483.865	62.31	27.48	3.53	37.57	55.75	74.00	-18.25	VERTICAL	Peak



Test Mode: 01; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:11

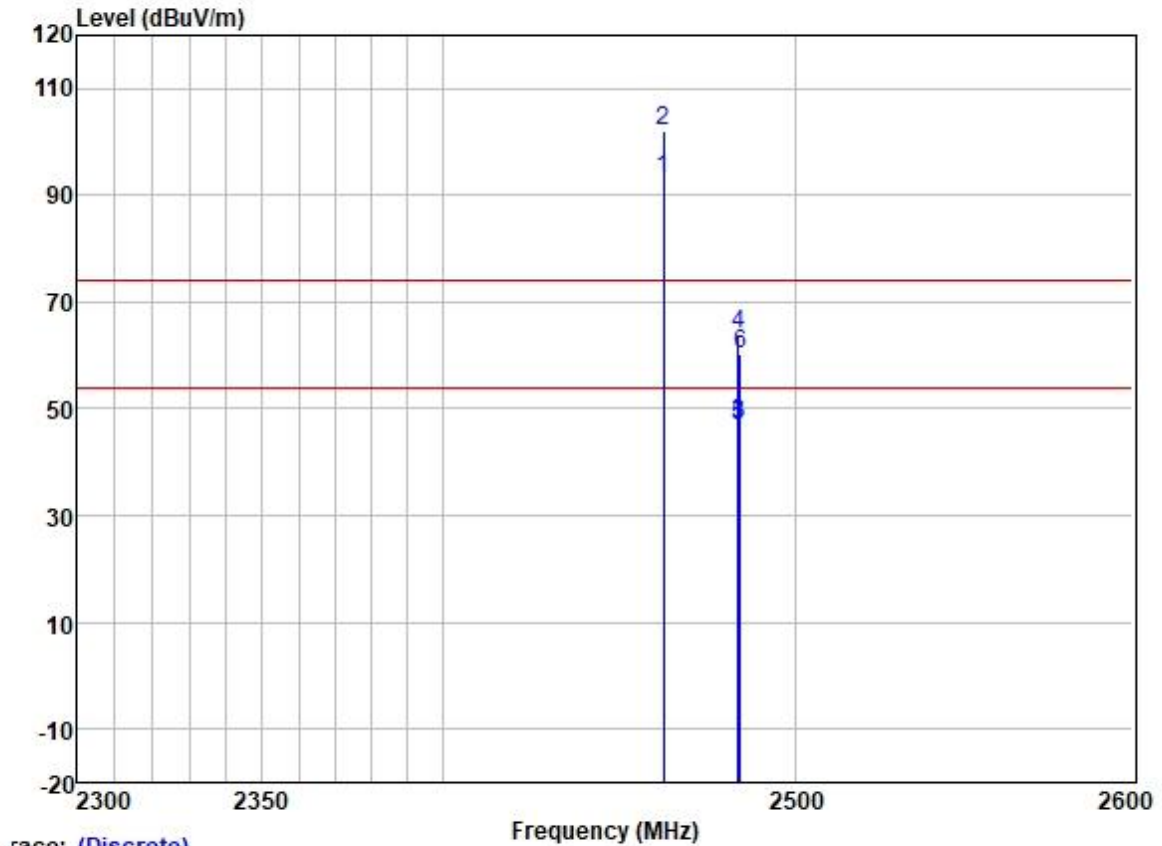


Trace: (Discrete)

		ReadAntenna		Cable	Preamp		Limit	Over		
	Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1 *	2462.000	87.13	27.45	3.50	37.58	80.50	54.00	26.50	HORIZONTAL	Average
2 *	2462.000	96.16	27.45	3.50	37.58	89.53	74.00	15.53	HORIZONTAL	Peak
3	2483.500	49.72	27.48	3.53	37.57	43.16	54.00	-10.84	HORIZONTAL	Average
4	2483.500	61.44	27.48	3.53	37.57	54.88	74.00	-19.12	HORIZONTAL	Peak
5	2484.397	62.18	27.48	3.53	37.57	55.62	74.00	-18.38	HORIZONTAL	Peak
6	2484.429	49.64	27.48	3.53	37.57	43.08	54.00	-10.92	HORIZONTAL	Average



Test Mode: 01; Polarity: Vertical; Modulation: 802.11n; Bandwidth: 40MHz; Channel: 11



Trace: (Discrete)

		Freq	ReadAntenna Level Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark	
		MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	*	2462.000	99.92	27.45	3.50	37.58	93.29	54.00	39.29	VERTICAL	Average
2	*	2462.000	108.81	27.45	3.50	37.58	102.18	74.00	28.18	VERTICAL	Peak
3		2483.500	53.61	27.48	3.53	37.57	47.05	54.00	-6.95	VERTICAL	Average
4		2483.500	70.40	27.48	3.53	37.57	63.84	74.00	-10.16	VERTICAL	Peak
5		2483.865	53.52	27.48	3.53	37.57	46.96	54.00	-7.04	VERTICAL	Average
6		2483.935	67.00	27.48	3.53	37.57	60.44	74.00	-13.56	VERTICAL	Peak

### 7.9 Radiated Spurious Emissions (Below 1GHz)

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209

Test Method: ANSI C63.10 (2013) Section 6.4,6.5,6.6

Limit:

Frequency(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: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

#### 7.9.1 E.U.T. Operation

Operating Environment:

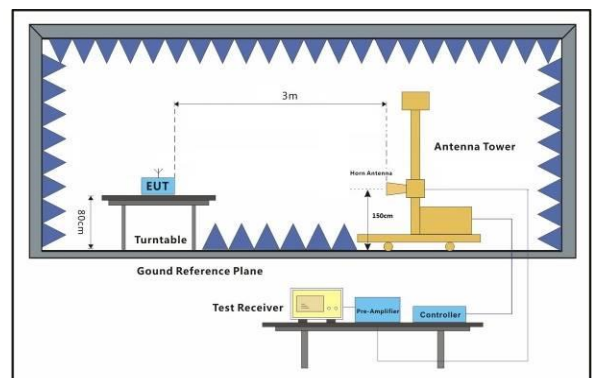
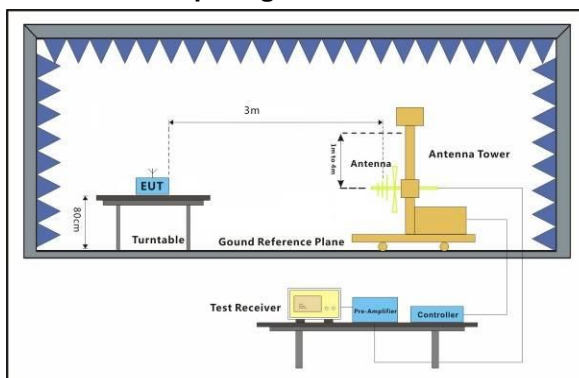
Temperature: 22.2 °C Humidity: 47.5 % RH Atmospheric Pressure: 1020 mbar

#### 7.9.2 Test Mode Description

**Pre-scan /** Mode  
**Final test** Code Description

**Final test** 01 TX mode\_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40). Only the data of worst case is recorded in the report.

#### 7.9.3 Test Setup Diagram



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#### 7.9.4 Measurement Procedure and Data

- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- g. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- i. Repeat above procedures until all frequencies measured was complete.

#### Remark:

1) Through pre-scan found the worst case is the lowest channel. Only the worst case is recorded in the report.

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

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor - Preamplifier Factor

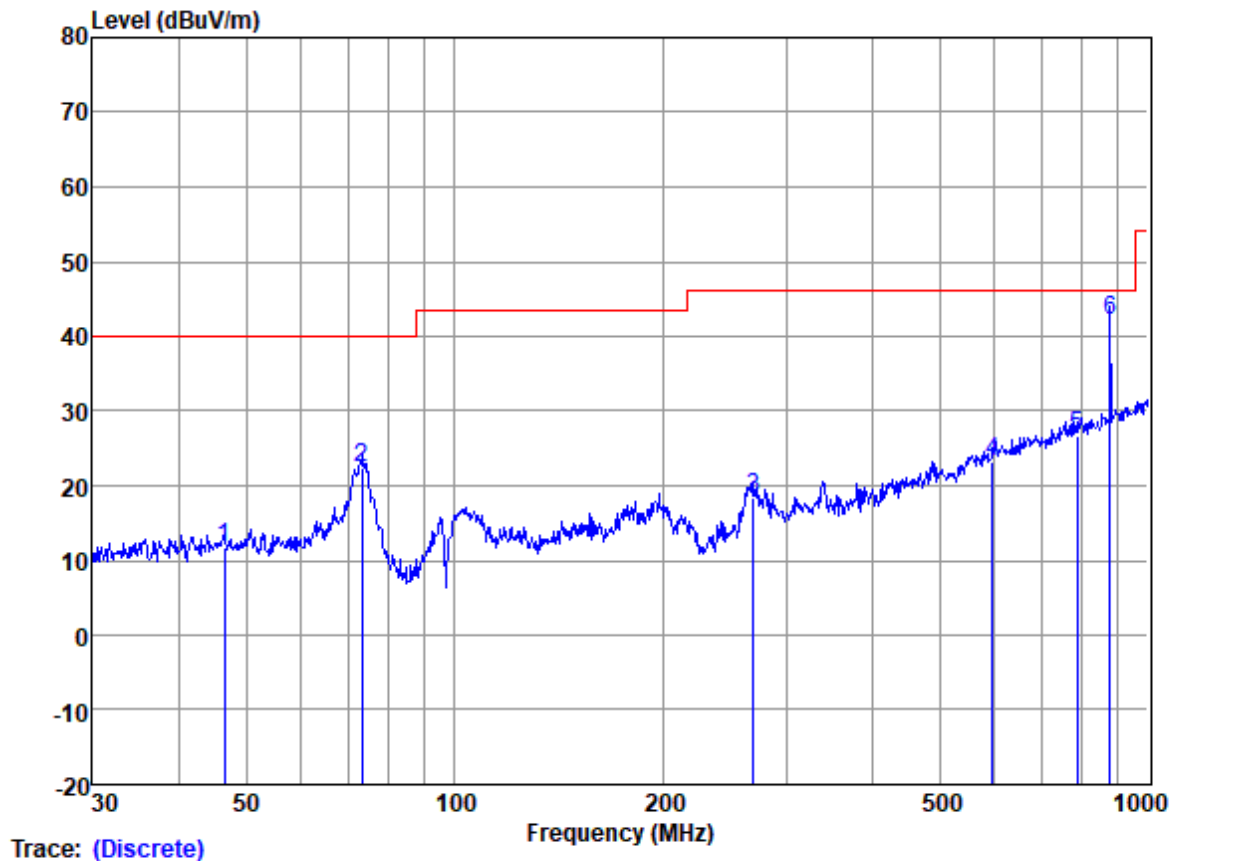
3) Scan from 9kHz to 1 GHz, the disturbance below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.



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Test Mode: 01; Polarity: Horizontal; Modulation: 802.11b; Bandwidth: 20MHz; Channel: 12

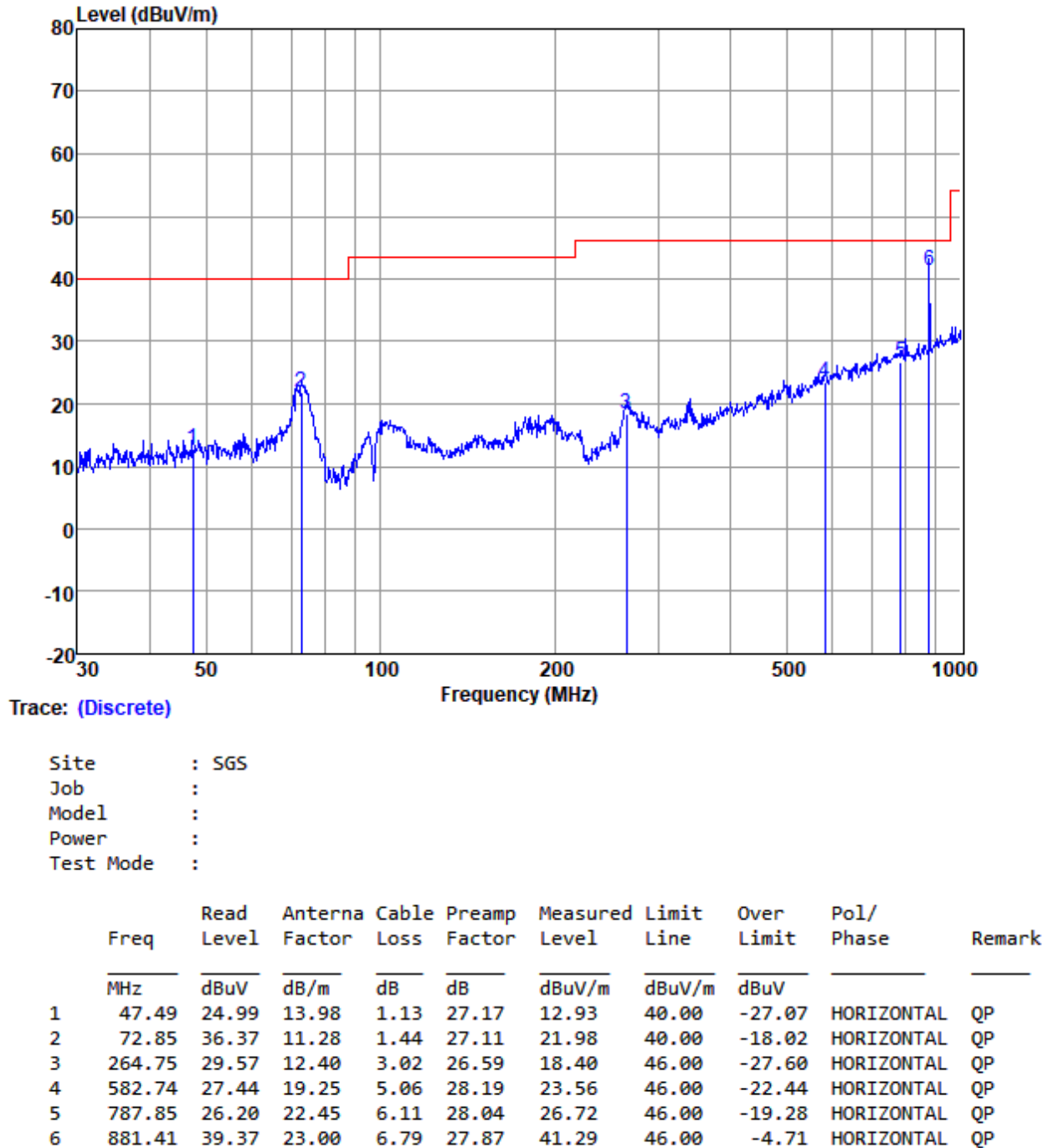


Site : SGS  
Job :  
Model :  
Power :  
Test Mode :

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Measured Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dBuV		
1	46.50	23.88	13.92	1.13	27.17	11.76	40.00	-28.24	HORIZONTAL	QP
2	73.36	37.10	11.09	1.44	27.11	22.52	40.00	-17.48	HORIZONTAL	QP
3	269.43	29.36	12.65	3.04	26.58	18.47	46.00	-27.53	HORIZONTAL	QP
4	595.13	26.70	19.70	5.10	28.20	23.30	46.00	-22.70	HORIZONTAL	QP
5	790.62	26.19	22.50	6.14	28.04	26.79	46.00	-19.21	HORIZONTAL	QP
6	881.41	40.14	23.00	6.79	27.87	42.06	46.00	-3.94	HORIZONTAL	QP



Test Mode: 01; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:12



**7.10 Radiated Spurious Emissions (Above 1GHz)**

Test Requirement 47 CFR Part 15, Subpart C 15.205 &amp; 15.209

Test Method: ANSI C63.10 (2013) Section 6.4,6.5,6.6

Measurement Distance: 3m

Limit:

Frequency(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: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

**7.10.1 E.U.T. Operation**

Operating Environment:

Temperature: 22.1 °C

Humidity: 56.3 % RH

Atmospheric Pressure: 1020 mbar

**7.10.2 Test Mode Description**

**Pre-scan /** Mode  
**Final test** Code Description

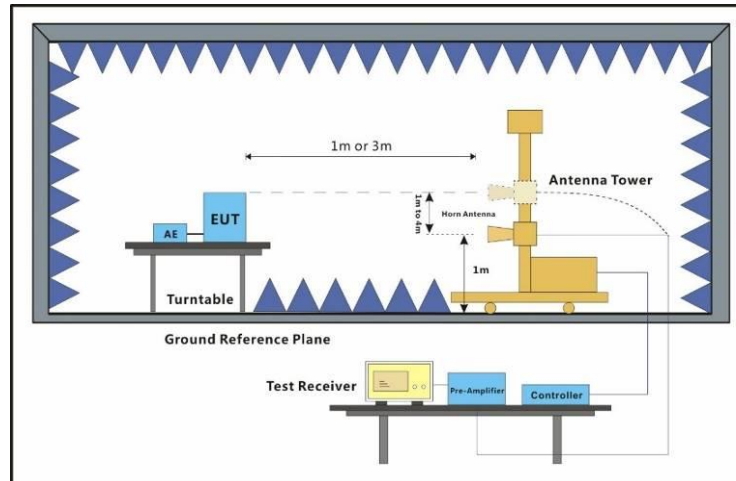
**Final test** 01 TX mode\_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40). Only the data of worst case is recorded in the report.



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### 7.10.3 Test Setup Diagram



#### 7.10.4 Measurement Procedure and Data

- a. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- g. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- i. Repeat above procedures until all frequencies measured was complete.

#### Remark:

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

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor - Preamplifier Factor

2) Scan from 1GHz to 25GHz, the disturbance above 18GHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

3) The field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.



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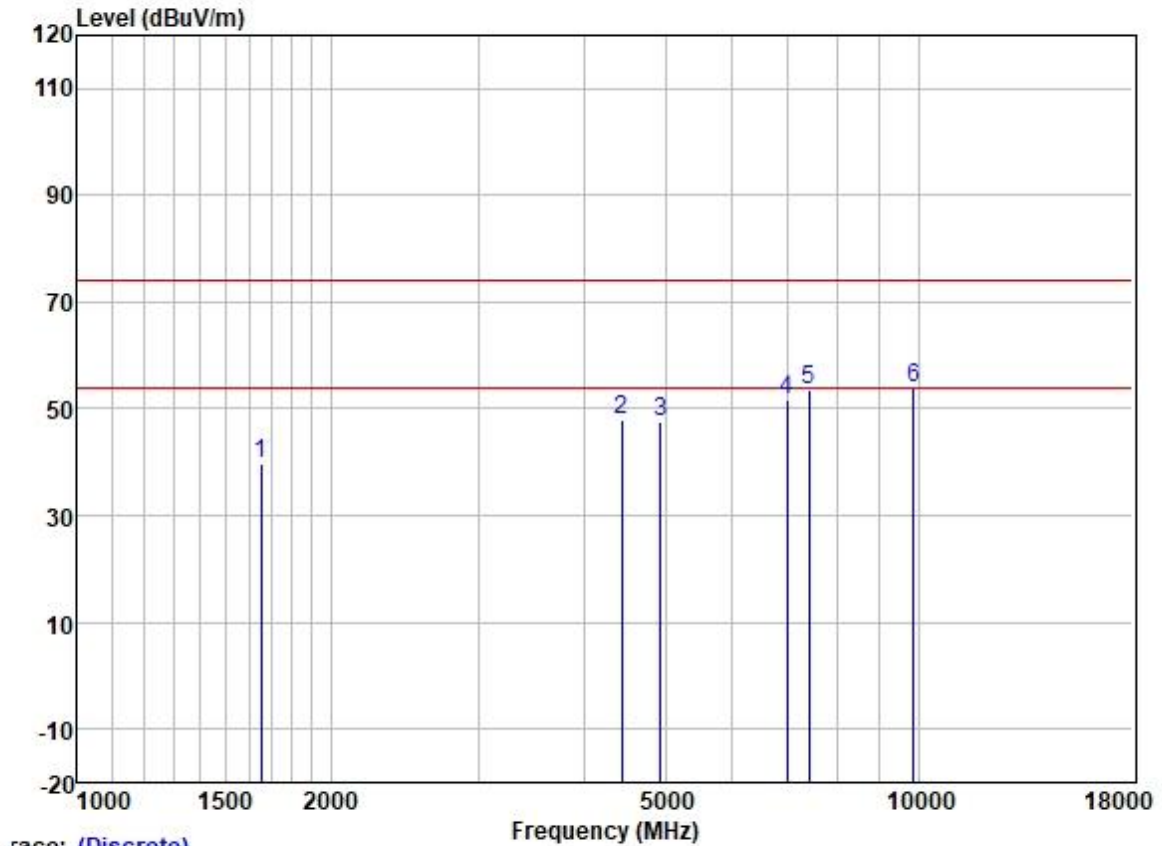
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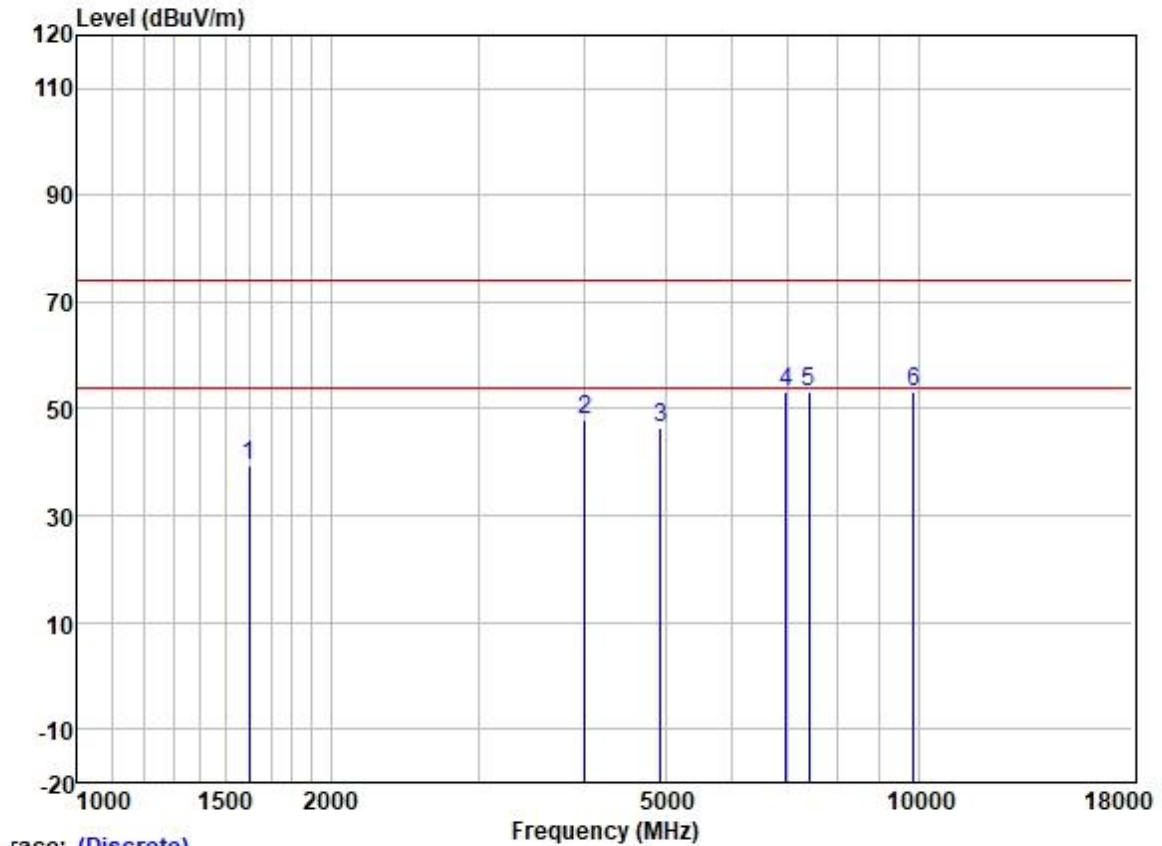
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race: (Discrete)

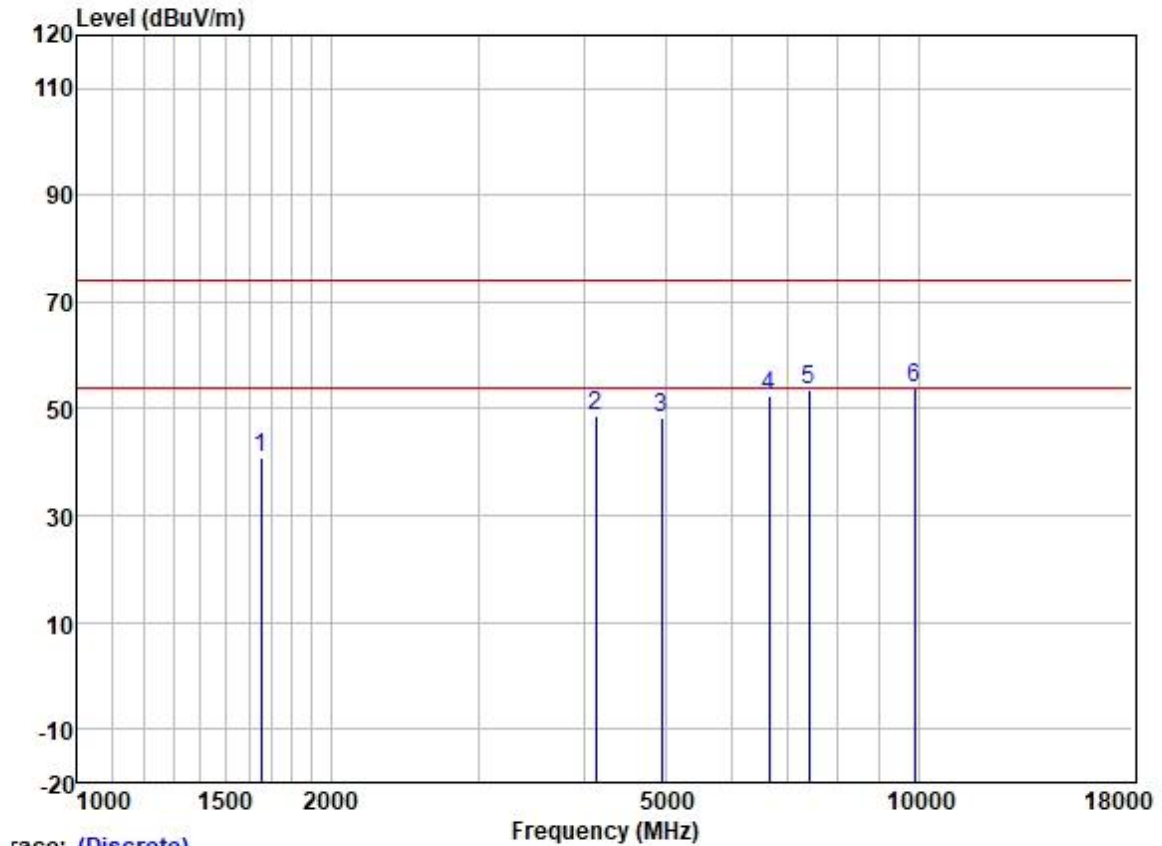
	Freq	ReadAntenna	Cable	Preamp		Limit	Over			
	MHz	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1653.550	49.23	25.64	2.80	37.93	39.74	74.00	-34.26	HORIZONTAL	Peak
2	4443.453	49.34	30.73	4.83	36.81	48.09	74.00	-25.91	HORIZONTAL	Peak
3	4934.000	47.36	31.62	5.60	36.84	47.74	74.00	-26.26	HORIZONTAL	Peak
4	6974.982	48.29	34.97	5.81	37.23	51.84	74.00	-22.16	HORIZONTAL	Peak
5	7401.000	48.72	36.22	6.20	37.46	53.68	74.00	-20.32	HORIZONTAL	Peak
6	9868.000	45.64	38.60	6.98	37.41	53.81	74.00	-20.19	HORIZONTAL	Peak

Test Mode: 01; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:12



		ReadAntenna		Cable	Preamp		Limit	Over		
	Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1601.804	49.06	25.58	2.80	37.98	39.46	74.00	-34.54	VERTICAL	Peak
2	4015.929	50.24	29.82	4.60	36.80	47.86	74.00	-26.14	VERTICAL	Peak
3	4934.000	46.08	31.62	5.60	36.84	46.46	74.00	-27.54	VERTICAL	Peak
4	6954.852	49.57	34.95	5.81	37.21	53.12	74.00	-20.88	VERTICAL	Peak
5	7401.000	48.21	36.22	6.20	37.46	53.17	74.00	-20.83	VERTICAL	Peak
6	9868.000	44.92	38.60	6.98	37.41	53.09	74.00	-20.91	VERTICAL	Peak

Test Mode: 01; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:13

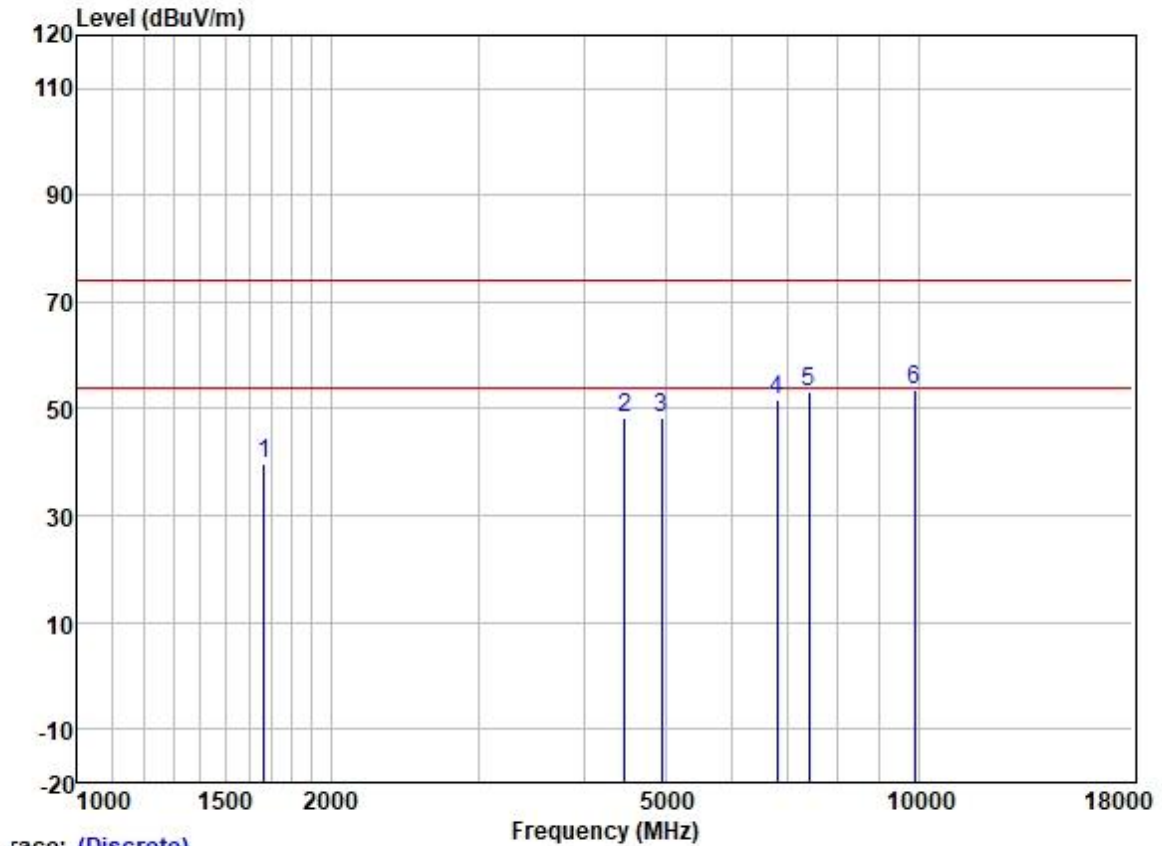


race: (Discrete)

	Freq	ReadAntenna	Cable	Preamp		Limit	Over			
	MHz	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1653.550	50.17	25.64	2.80	37.93	40.68	74.00	-33.32	HORIZONTAL	Peak
2	4133.699	50.79	30.01	4.60	36.80	48.60	74.00	-25.40	HORIZONTAL	Peak
3	4944.000	47.89	31.64	5.62	36.84	48.31	74.00	-25.69	HORIZONTAL	Peak
4	6640.542	49.31	34.24	5.83	37.06	52.32	74.00	-21.68	HORIZONTAL	Peak
5	7416.000	48.53	36.22	6.20	37.47	53.48	74.00	-20.52	HORIZONTAL	Peak
6	9888.000	45.74	38.63	6.97	37.41	53.93	74.00	-20.07	HORIZONTAL	Peak



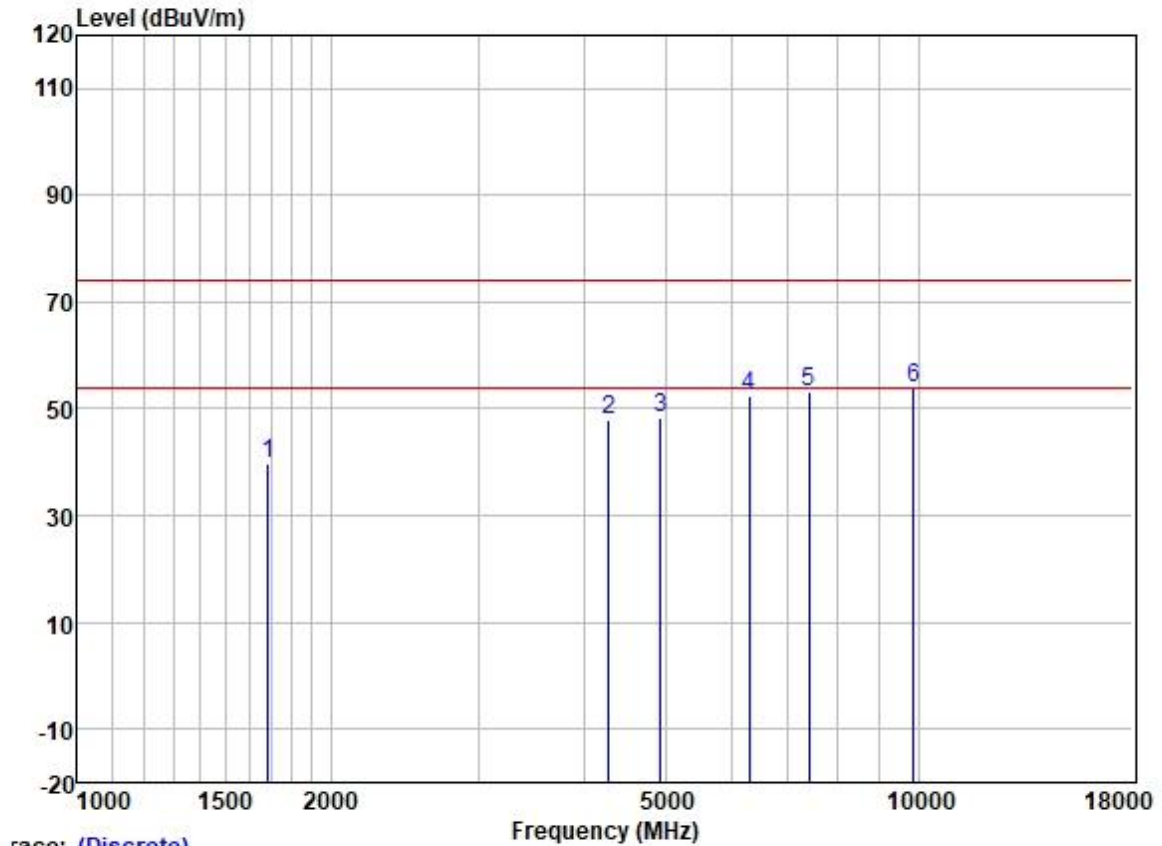
Test Mode: 01; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:13



	Freq	ReadAntenna	Cable	Preamp		Limit	Over			
	MHz	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1667.951	49.32	25.66	2.80	37.91	39.87	74.00	-34.13	VERTICAL	Peak
2	4469.214	49.56	30.77	4.93	36.81	48.45	74.00	-25.55	VERTICAL	Peak
3	4944.000	47.92	31.64	5.62	36.84	48.34	74.00	-25.66	VERTICAL	Peak
4	6795.879	48.48	34.66	5.82	37.12	51.84	74.00	-22.16	VERTICAL	Peak
5	7416.000	48.10	36.22	6.20	37.47	53.05	74.00	-20.95	VERTICAL	Peak
6	9888.000	45.46	38.63	6.97	37.41	53.65	74.00	-20.35	VERTICAL	Peak



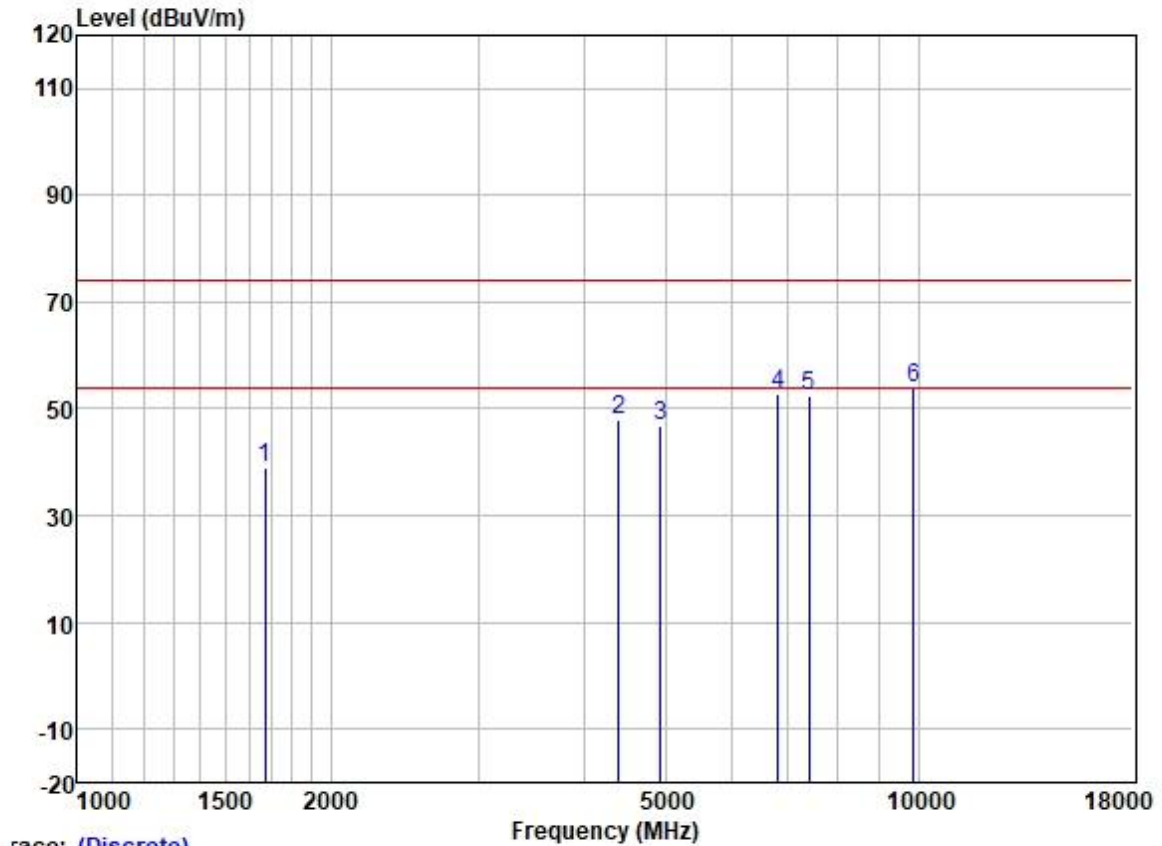
Test Mode: 01; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:12



race: (Discrete)

	Freq	ReadAntenna	Cable	Preamp		Limit	Over			
	MHz	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1687.347	49.22	25.69	2.80	37.91	39.80	74.00	-34.20	HORIZONTAL	Peak
2	4279.589	49.87	30.42	4.63	36.81	48.11	74.00	-25.89	HORIZONTAL	Peak
3	4934.000	47.93	31.62	5.60	36.84	48.31	74.00	-25.69	HORIZONTAL	Peak
4	6285.695	50.07	33.37	5.98	36.95	52.47	74.00	-21.53	HORIZONTAL	Peak
5	7401.000	48.27	36.22	6.20	37.46	53.23	74.00	-20.77	HORIZONTAL	Peak
6	9868.000	45.81	38.60	6.98	37.41	53.98	74.00	-20.02	HORIZONTAL	Peak

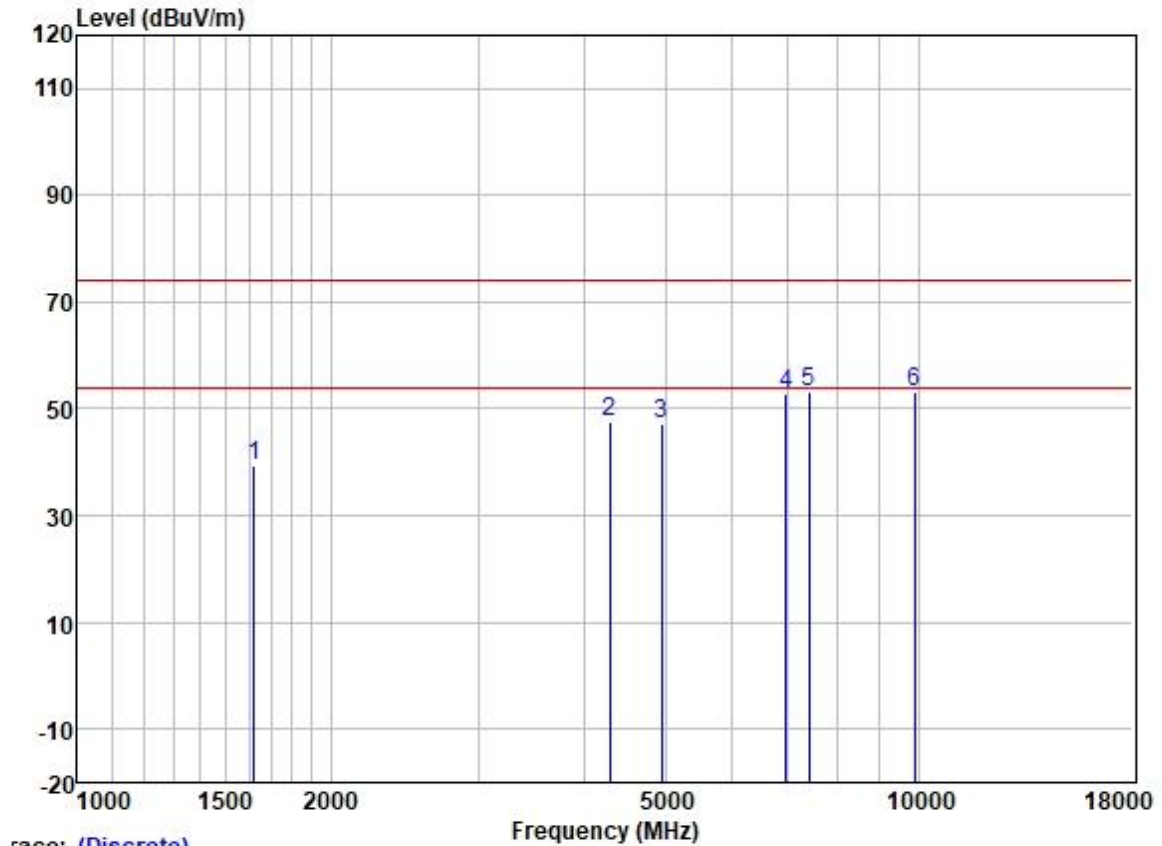
Test Mode: 01; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:12



race: (Discrete)

	Freq	ReadAntenna	Cable	Preamp		Limit	Over			
	MHz	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1672.779	48.57	25.67	2.80	37.91	39.13	74.00	-34.87	VERTICAL	Peak
2	4405.090	49.19	30.68	4.70	36.81	47.76	74.00	-26.24	VERTICAL	Peak
3	4934.000	46.48	31.62	5.60	36.84	46.86	74.00	-27.14	VERTICAL	Peak
4	6815.551	49.52	34.70	5.82	37.13	52.91	74.00	-21.09	VERTICAL	Peak
5	7401.000	47.59	36.22	6.20	37.46	52.55	74.00	-21.45	VERTICAL	Peak
6	9868.000	45.59	38.60	6.98	37.41	53.76	74.00	-20.24	VERTICAL	Peak

Test Mode: 01; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:13

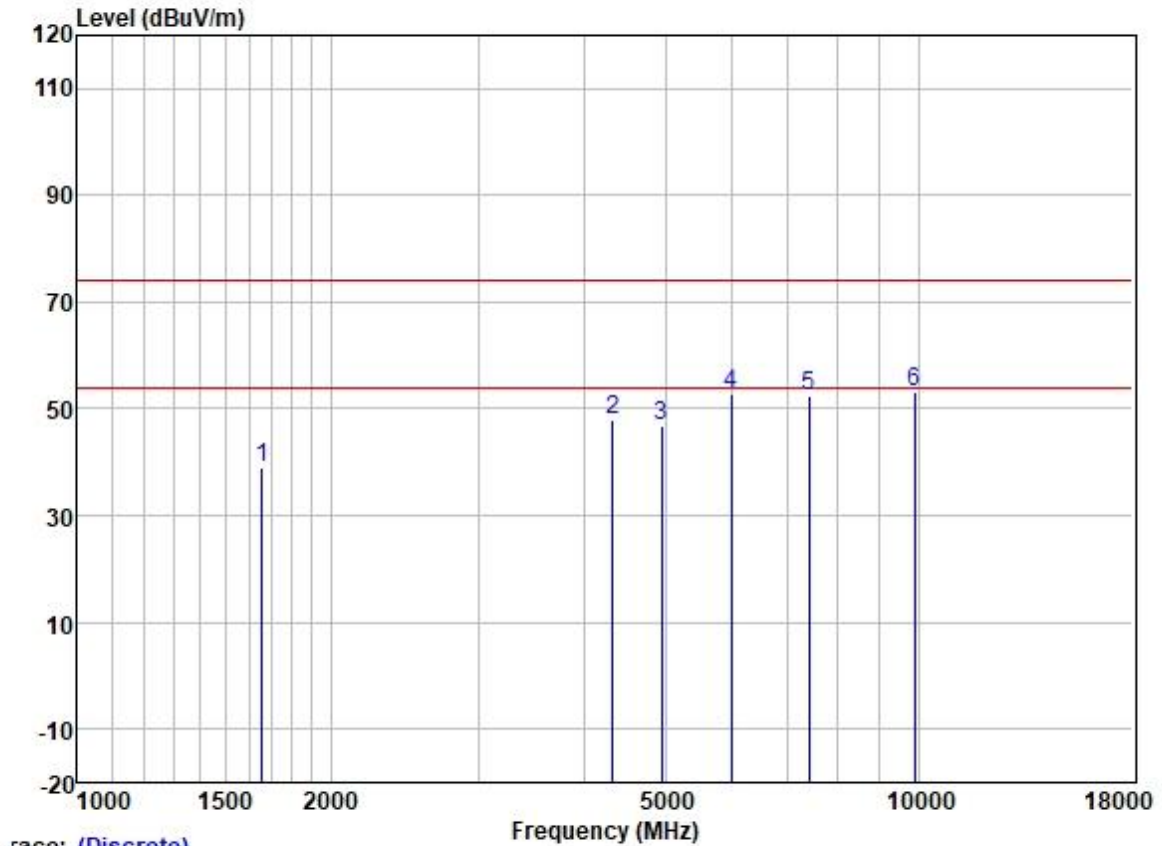


race: (Discrete)

	Freq	Read	Antenna	Cable	Preamp	Limit	Over		
	MHz	Level	Factor	Loss	Factor	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1620.431	48.80	25.60	2.80	37.95	39.25	74.00	-34.75	HORIZONTAL Peak
2	4291.977	49.21	30.45	4.64	36.81	47.49	74.00	-26.51	HORIZONTAL Peak
3	4944.000	46.82	31.64	5.62	36.84	47.24	74.00	-26.76	HORIZONTAL Peak
4	6954.852	49.14	34.95	5.81	37.21	52.69	74.00	-21.31	HORIZONTAL Peak
5	7416.000	48.08	36.22	6.20	37.47	53.03	74.00	-20.97	HORIZONTAL Peak
6	9888.000	45.09	38.63	6.97	37.41	53.28	74.00	-20.72	HORIZONTAL Peak



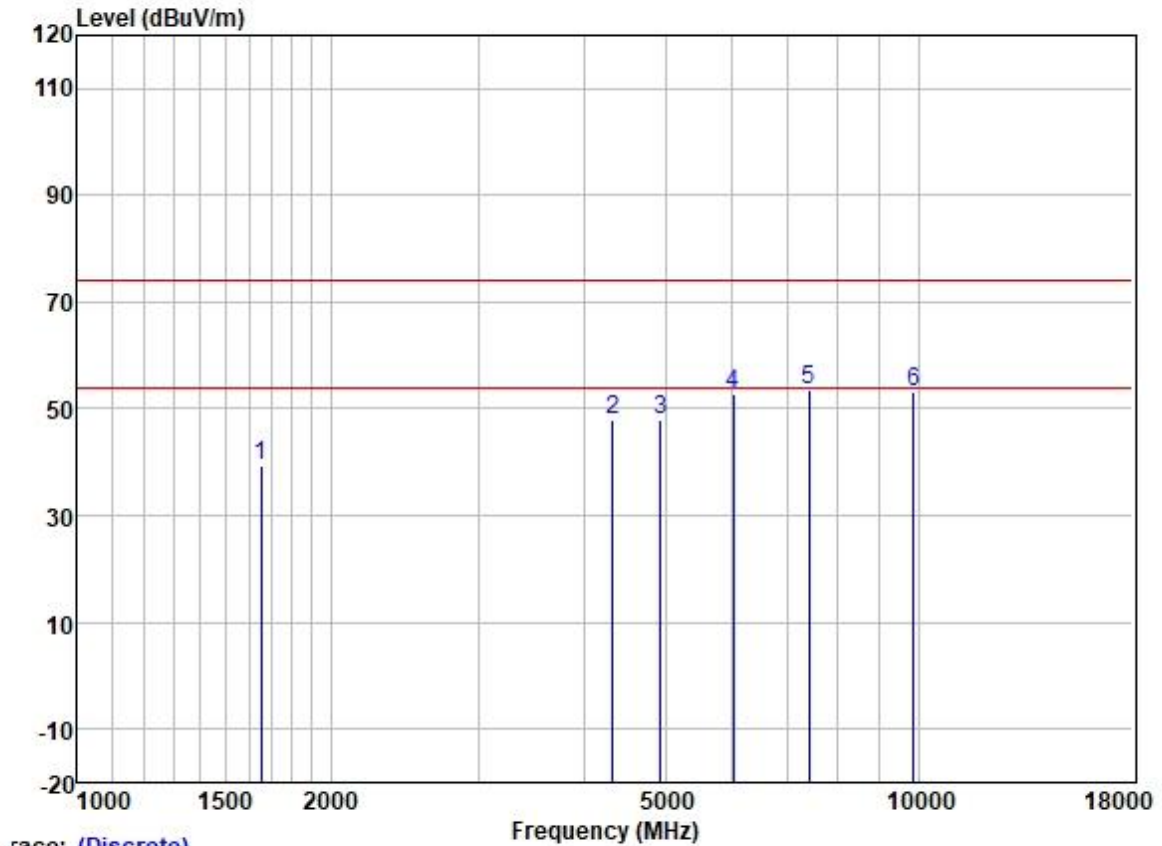
Test Mode: 01; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:13



	Freq	ReadAntenna	Cable	Preamp		Limit	Over			
		Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1658.337	48.36	25.65	2.80	37.93	38.88	74.00	-35.12	VERTICAL	Peak
2	4329.354	49.40	30.54	4.67	36.81	47.80	74.00	-26.20	VERTICAL	Peak
3	4944.000	46.40	31.64	5.62	36.84	46.82	74.00	-27.18	VERTICAL	Peak
4	5984.305	51.13	32.39	6.15	36.90	52.77	74.00	-21.23	VERTICAL	Peak
5	7416.000	47.51	36.22	6.20	37.47	52.46	74.00	-21.54	VERTICAL	Peak
6	9888.000	45.15	38.63	6.97	37.41	53.34	74.00	-20.66	VERTICAL	Peak

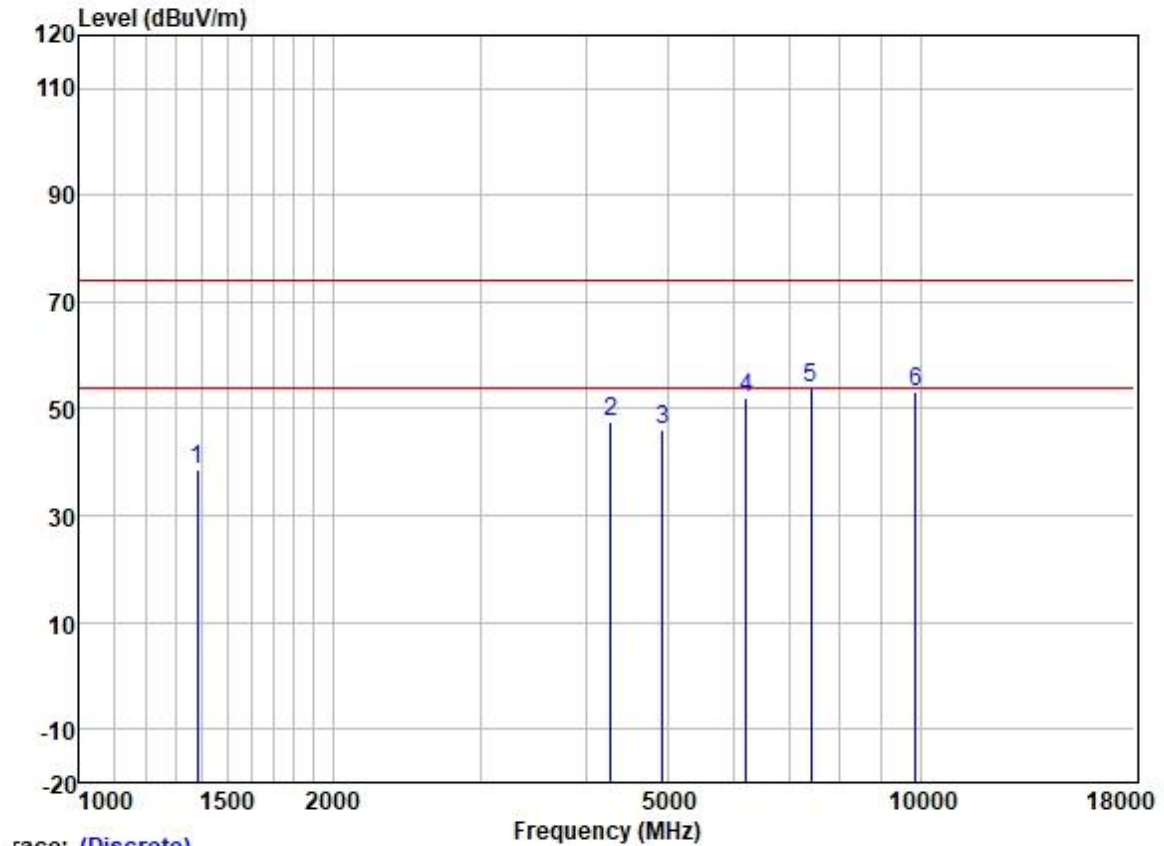


Test Mode: 01; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:12



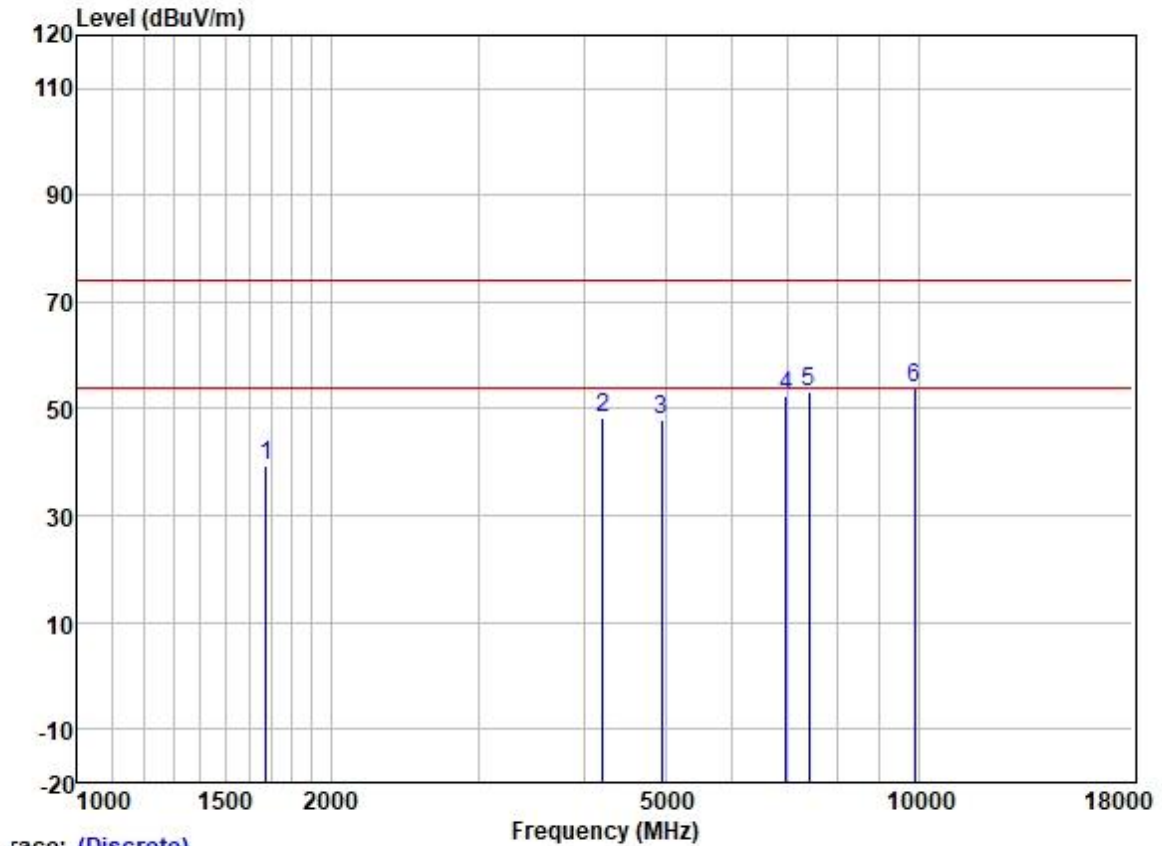
	Freq	ReadAntenna	Cable	Preamp		Limit	Over			
	MHz	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1653.550	49.00	25.64	2.80	37.93	39.51	74.00	-34.49	HORIZONTAL	Peak
2	4329.354	49.69	30.54	4.67	36.81	48.09	74.00	-25.91	HORIZONTAL	Peak
3	4934.000	47.70	31.62	5.60	36.84	48.08	74.00	-25.92	HORIZONTAL	Peak
4	6018.999	51.07	32.44	6.19	36.90	52.80	74.00	-21.20	HORIZONTAL	Peak
5	7401.000	48.49	36.22	6.20	37.46	53.45	74.00	-20.55	HORIZONTAL	Peak
6	9868.000	45.16	38.60	6.98	37.41	53.33	74.00	-20.67	HORIZONTAL	Peak

Test Mode: 01; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:12



	Freq	Read	Antenna	Cable	Preamp	Limit	Over		
	MHz	Level	Factor	Loss	Factor	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1382.262	48.83	25.37	2.60	38.25	38.55	74.00	-35.45	VERTICAL Peak
2	4279.589	49.39	30.42	4.63	36.81	47.63	74.00	-26.37	VERTICAL Peak
3	4934.000	45.84	31.62	5.60	36.84	46.22	74.00	-27.78	VERTICAL Peak
4	6213.441	49.84	33.03	6.06	36.94	51.99	74.00	-22.01	VERTICAL Peak
5	7401.000	48.81	36.22	6.20	37.46	53.77	74.00	-20.23	VERTICAL Peak
6	9868.000	44.92	38.60	6.98	37.41	53.09	74.00	-20.91	VERTICAL Peak

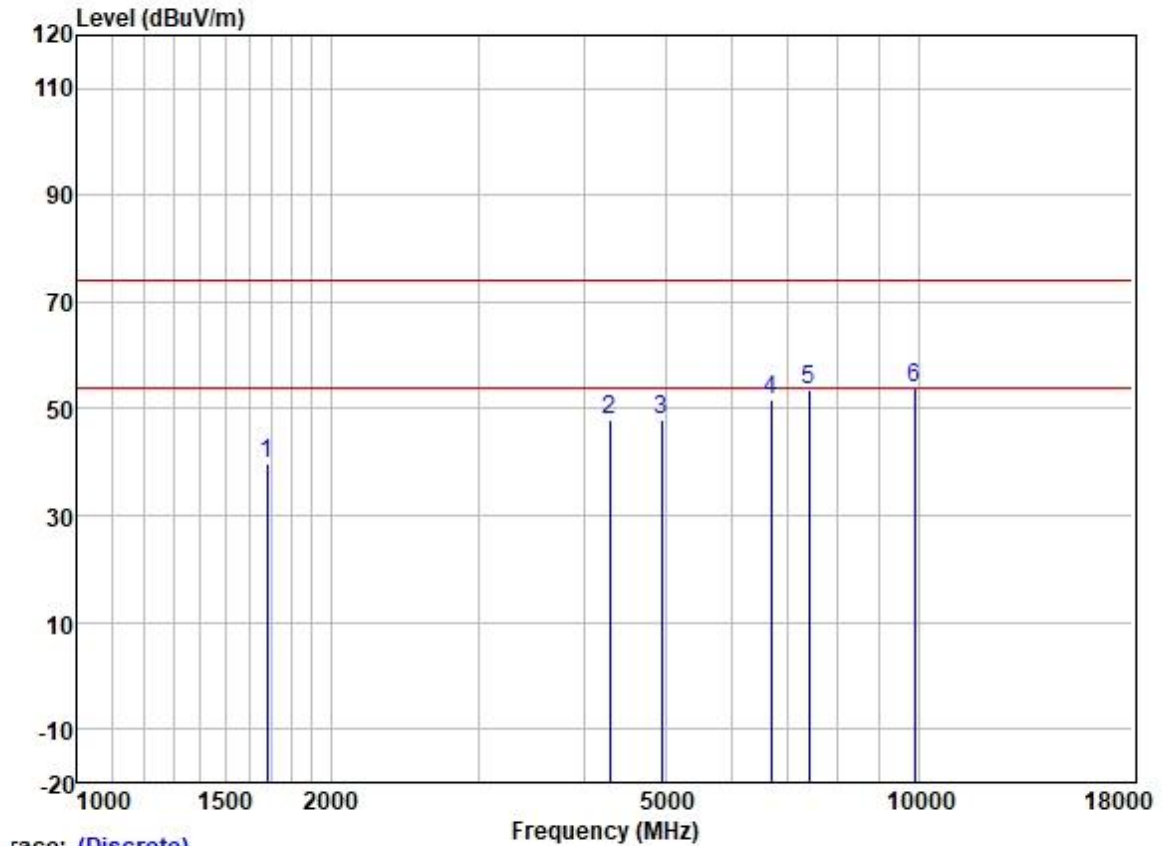
Test Mode: 01; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:13



	Freq	ReadAntenna	Cable	Preamp		Limit	Over			
	MHz	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1677.621	48.87	25.68	2.80	37.91	39.44	74.00	-34.56	HORIZONTAL	Peak
2	4218.186	50.33	30.22	4.60	36.81	48.34	74.00	-25.66	HORIZONTAL	Peak
3	4944.000	47.61	31.64	5.62	36.84	48.03	74.00	-25.97	HORIZONTAL	Peak
4	6954.852	48.70	34.95	5.81	37.21	52.25	74.00	-21.75	HORIZONTAL	Peak
5	7416.000	48.39	36.22	6.20	37.47	53.34	74.00	-20.66	HORIZONTAL	Peak
6	9888.000	45.65	38.63	6.97	37.41	53.84	74.00	-20.16	HORIZONTAL	Peak



Test Mode: 01; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:13

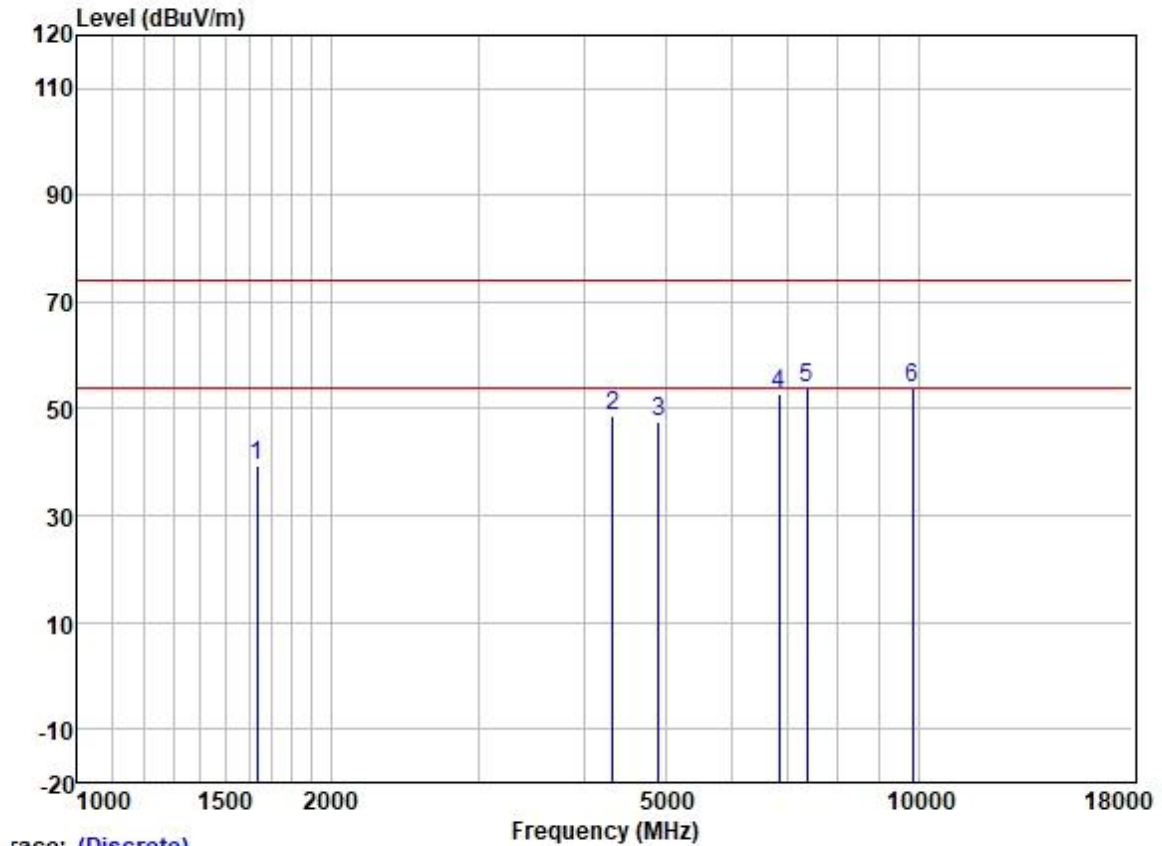


race: (Discrete)

	Freq	Read	Antenna	Cable	Preamp	Limit	Over		
	MHz	Level	Factor	Loss	Factor	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1682.477	49.04	25.68	2.80	37.91	39.61	74.00	-34.39	VERTICAL Peak
2	4291.977	49.63	30.45	4.64	36.81	47.91	74.00	-26.09	VERTICAL Peak
3	4944.000	47.64	31.64	5.62	36.84	48.06	74.00	-25.94	VERTICAL Peak
4	6679.040	48.77	34.33	5.83	37.07	51.86	74.00	-22.14	VERTICAL Peak
5	7416.000	48.43	36.22	6.20	37.47	53.38	74.00	-20.62	VERTICAL Peak
6	9888.000	45.69	38.63	6.97	37.41	53.88	74.00	-20.12	VERTICAL Peak



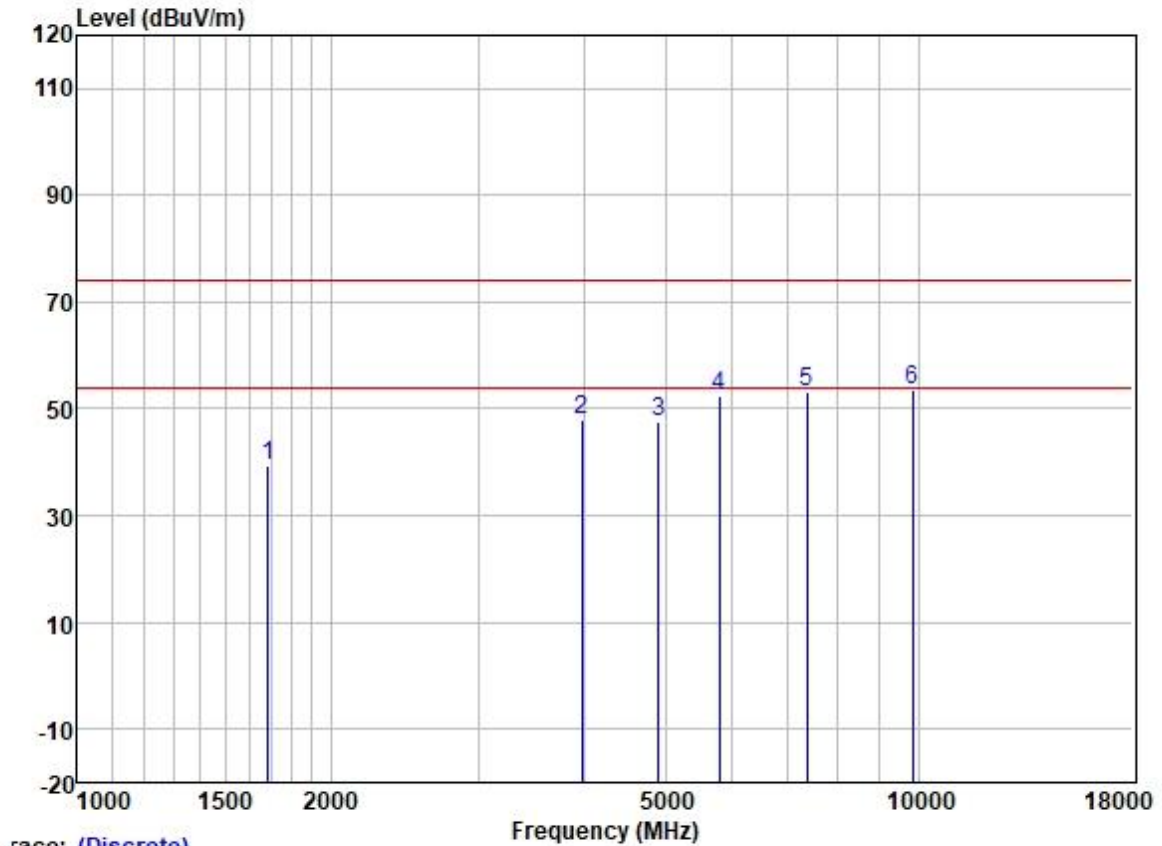
Test Mode: 01; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:10



race: (Discrete)

	Freq	ReadAntenna	Cable	Preamp		Limit	Over			
	MHz	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1634.543	49.01	25.62	2.80	37.95	39.48	74.00	-34.52	HORIZONTAL	Peak
2	4329.354	50.21	30.54	4.67	36.81	48.61	74.00	-25.39	HORIZONTAL	Peak
3	4914.000	47.31	31.60	5.58	36.84	47.65	74.00	-26.35	HORIZONTAL	Peak
4	6835.278	49.23	34.74	5.82	37.13	52.66	74.00	-21.34	HORIZONTAL	Peak
5	7371.000	49.04	36.12	6.17	37.45	53.88	74.00	-20.12	HORIZONTAL	Peak
6	9828.000	45.70	38.58	6.99	37.41	53.86	74.00	-20.14	HORIZONTAL	Peak

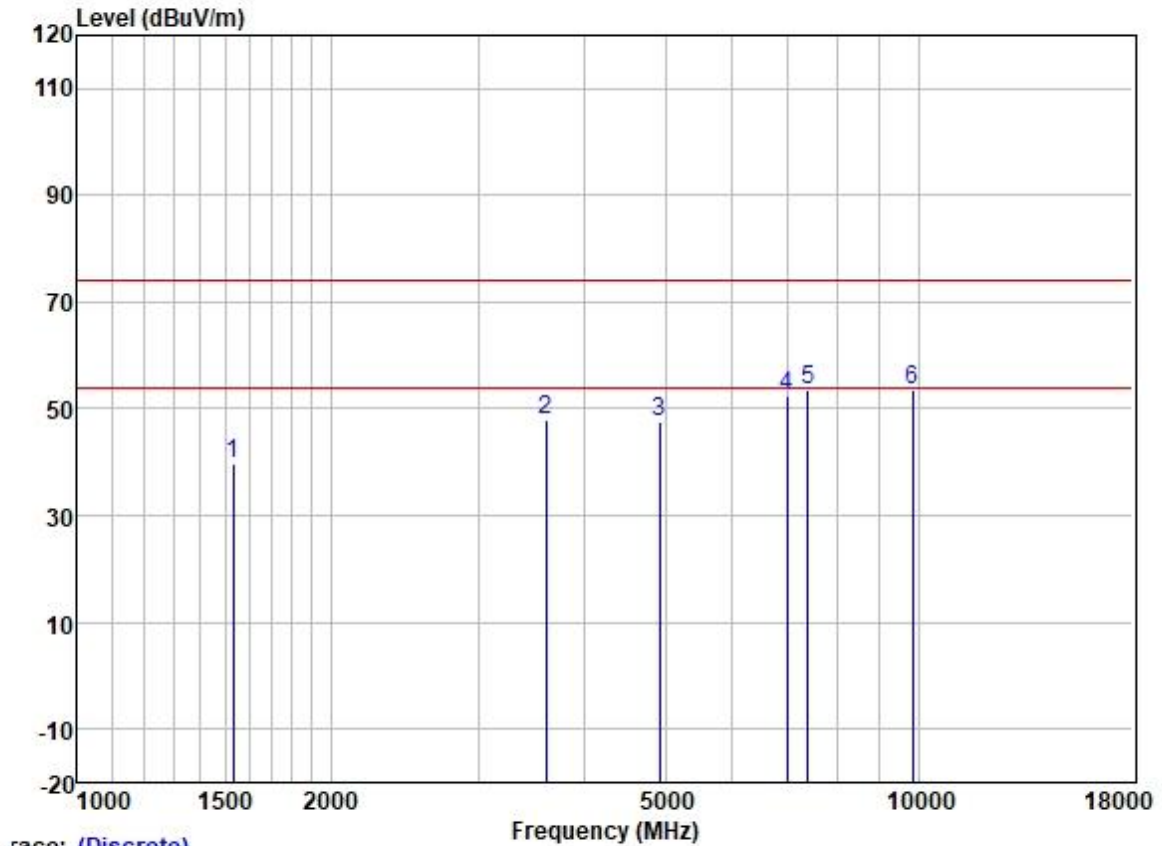
Test Mode: 01; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:10



race: (Discrete)

	Freq	ReadAntenna	Cable	Preamp		Limit	Over			
	MHz	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1687.347	48.88	25.69	2.80	37.91	39.46	74.00	-34.54	VERTICAL	Peak
2	3981.257	50.19	29.78	4.60	36.81	47.76	74.00	-26.24	VERTICAL	Peak
3	4914.000	47.17	31.60	5.58	36.84	47.51	74.00	-26.49	VERTICAL	Peak
4	5797.032	50.85	32.19	6.10	36.89	52.25	74.00	-21.75	VERTICAL	Peak
5	7371.000	48.30	36.12	6.17	37.45	53.14	74.00	-20.86	VERTICAL	Peak
6	9828.000	45.33	38.58	6.99	37.41	53.49	74.00	-20.51	VERTICAL	Peak

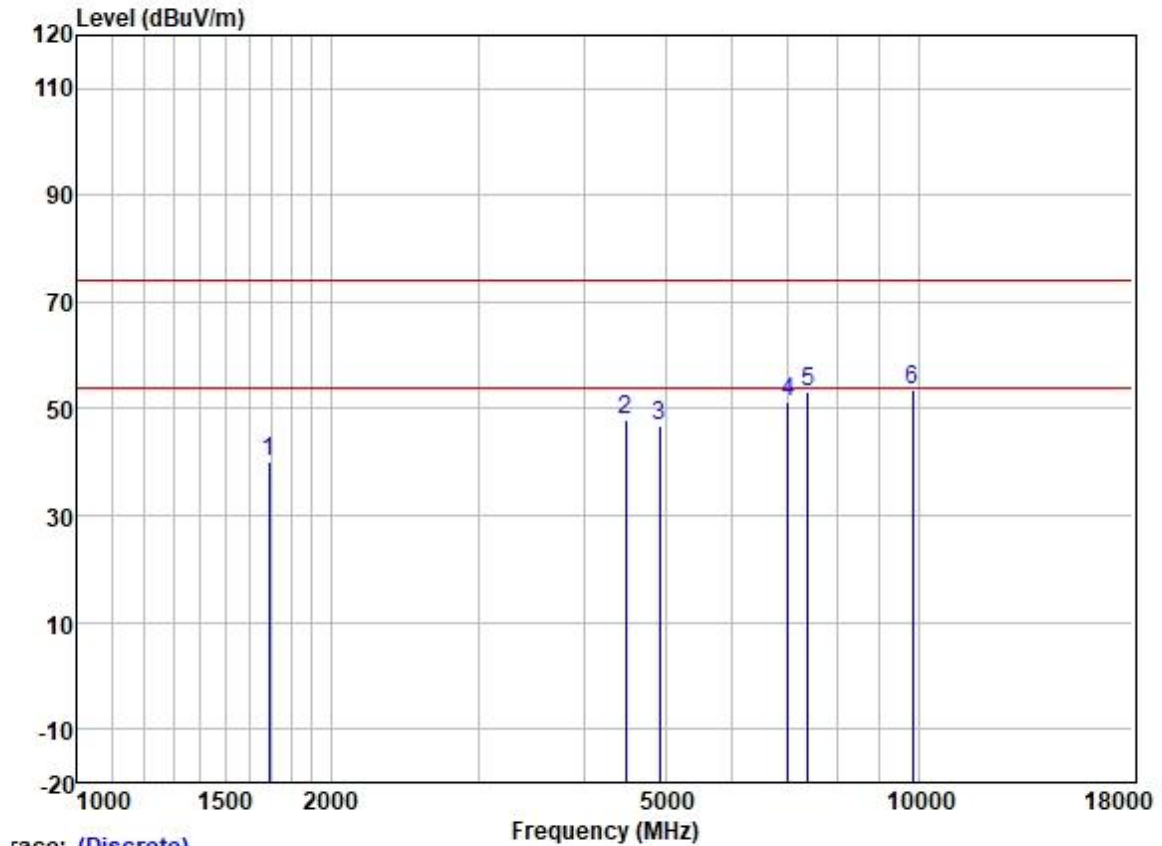
Test Mode: 01; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:11



	Freq	ReadAntenna	Cable	Preamp	Limit	Over			
	MHz	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1533.841	49.32	25.52	2.80	38.07	39.57	74.00	-34.43	HORIZONTAL Peak
2	3608.619	51.25	29.05	4.50	36.91	47.89	74.00	-26.11	HORIZONTAL Peak
3	4924.000	47.37	31.62	5.60	36.84	47.75	74.00	-26.25	HORIZONTAL Peak
4	6974.982	48.98	34.97	5.81	37.23	52.53	74.00	-21.47	HORIZONTAL Peak
5	7386.000	48.49	36.17	6.19	37.45	53.40	74.00	-20.60	HORIZONTAL Peak
6	9848.000	45.24	38.58	6.99	37.41	53.40	74.00	-20.60	HORIZONTAL Peak



Test Mode: 01; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:11



race: (Discrete)

	Freq	ReadAntenna	Cable	Preamp		Limit	Over			
	MHz	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1692.231	49.39	25.70	2.80	37.89	40.00	74.00	-34.00	VERTICAL	Peak
2	4482.150	48.91	30.78	4.99	36.81	47.87	74.00	-26.13	VERTICAL	Peak
3	4924.000	46.38	31.62	5.60	36.84	46.76	74.00	-27.24	VERTICAL	Peak
4	6995.172	47.93	35.00	5.81	37.25	51.49	74.00	-22.51	VERTICAL	Peak
5	7386.000	48.11	36.17	6.19	37.45	53.02	74.00	-20.98	VERTICAL	Peak
6	9848.000	45.30	38.58	6.99	37.41	53.46	74.00	-20.54	VERTICAL	Peak



## 8 Test Setup Photo

Refer to Appendix – Test Setup Photos for GZCR2112021504AT

## 9 Appendix

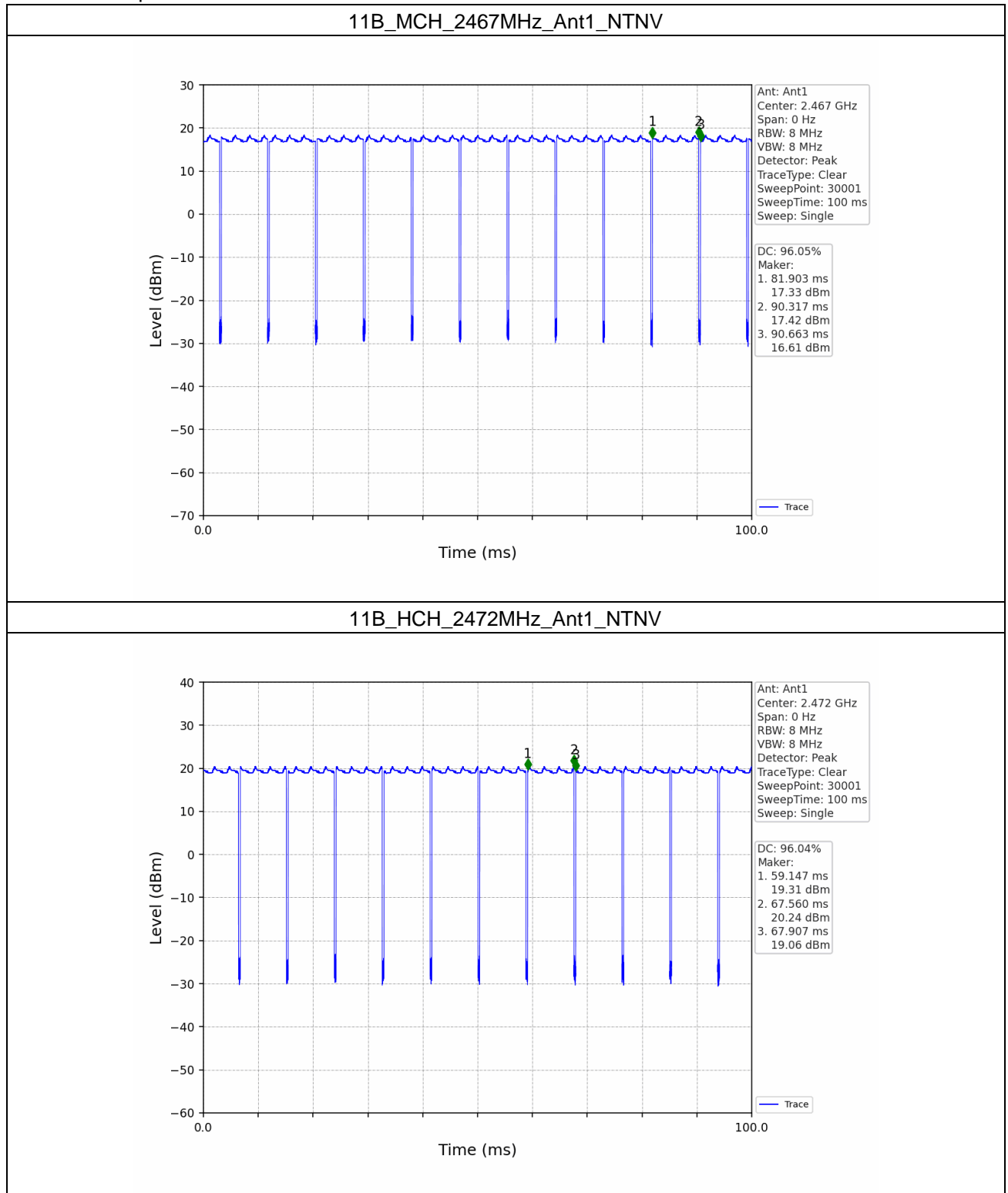
### 1. Duty Cycle

#### 1.1 Ant1

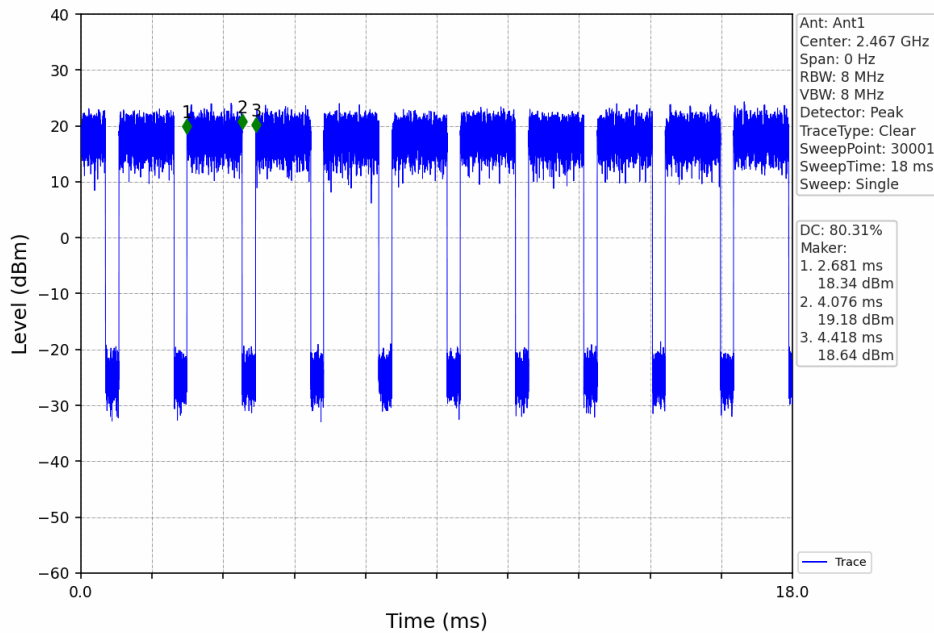
##### 1.1.1 Test Result

Ant1							
Mode	TX Type	Frequency (MHz)	T_on (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	Max. DC Variation (%)
11B	SISO	2467	8.414	8.760	96.05	0.18	0.33
		2472	8.413	8.760	96.04	0.18	0.33
11G	SISO	2467	1.395	1.737	80.31	0.95	0.84
		2472	1.395	1.728	80.73	0.93	0.85
11N20	MIMO	2467	0.460	0.819	56.17	2.51	2.56
		2472	0.460	0.801	57.43	2.41	0.66
11N40	MIMO	2457	0.240	0.580	41.38	3.83	2.02
		2462	0.240	0.581	41.31	3.84	0.69

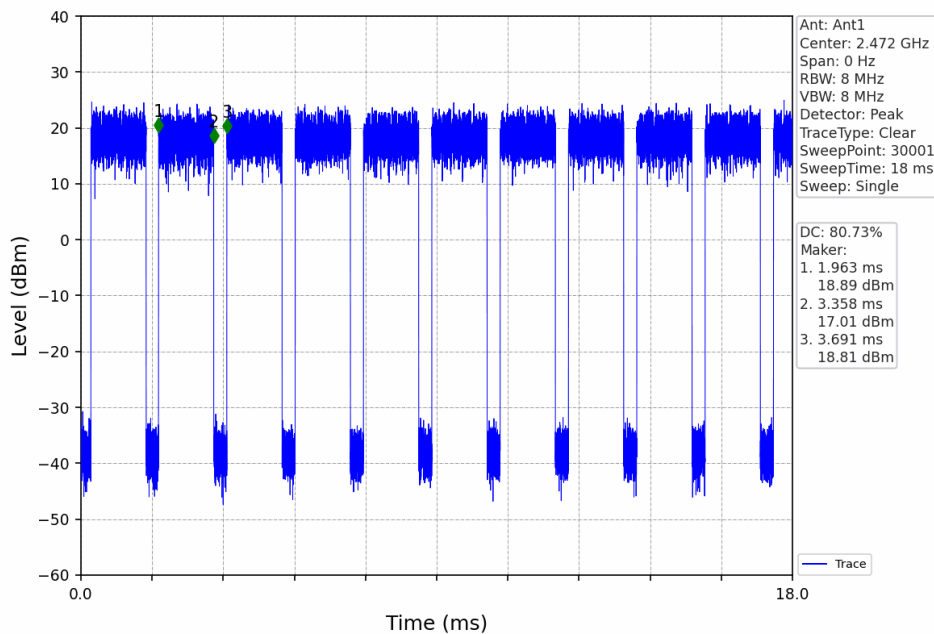
### 1.1.2 Test Graph



### 11G\_MCH\_2467MHz\_Ant1\_NTNV



### 11G\_HCH\_2472MHz\_Ant1\_NTNV

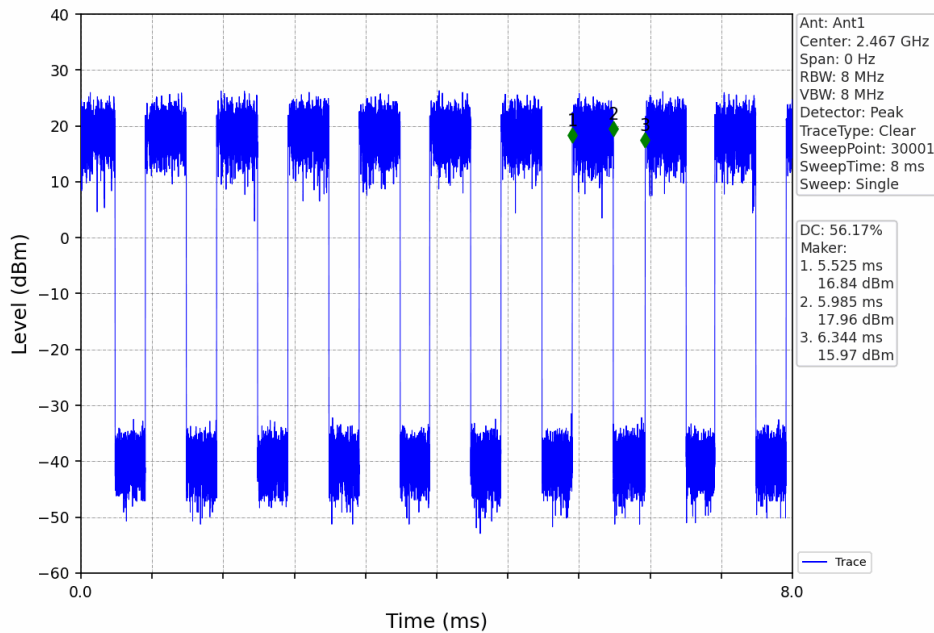


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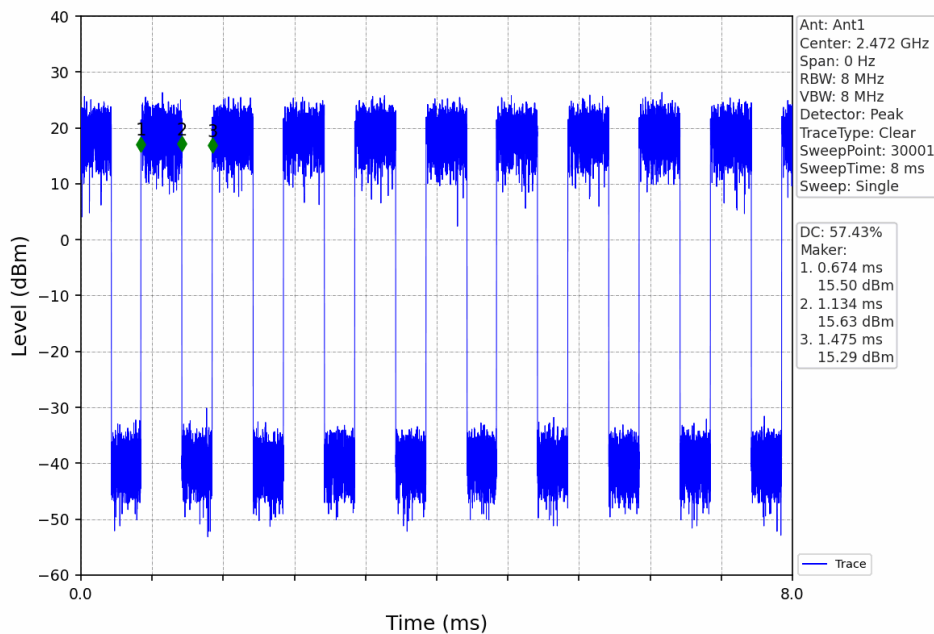
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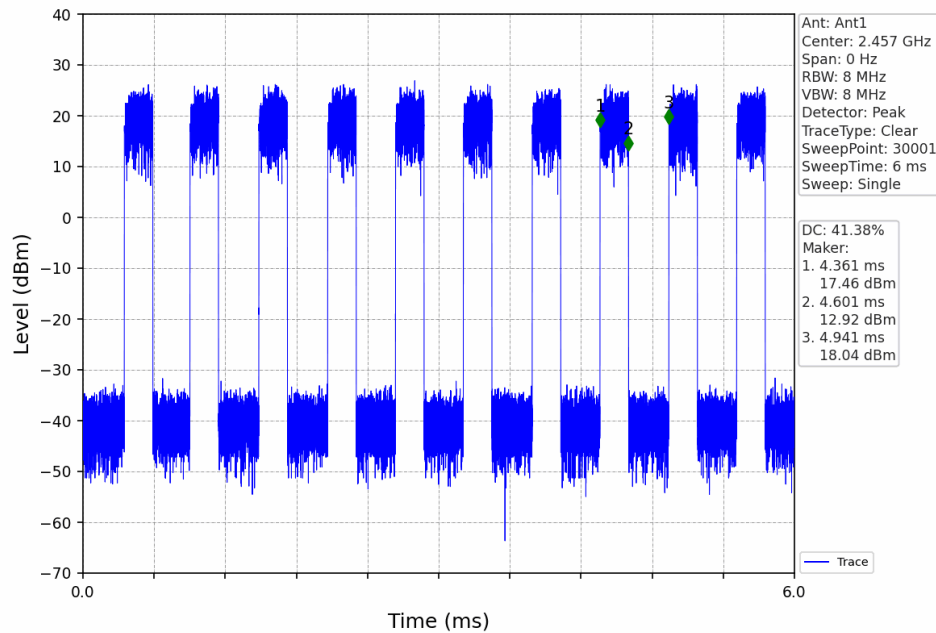
11N20\_MCH\_2467MHz\_Ant1\_NTNV



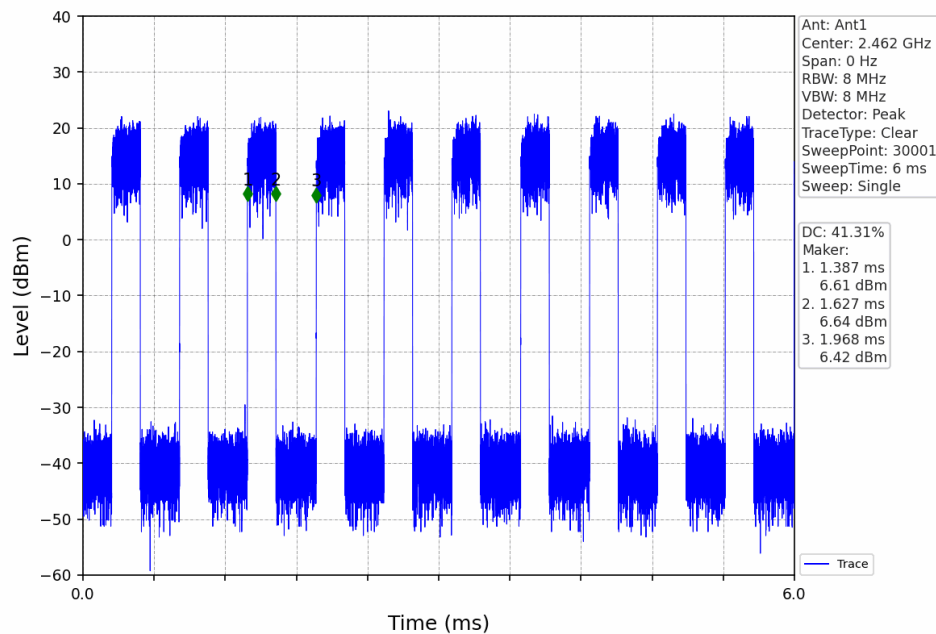
11N20\_HCH\_2472MHz\_Ant1\_NTNV



11N40\_MCH\_2457MHz\_Ant1\_NTNV



11N40\_HCH\_2462MHz\_Ant1\_NTNV



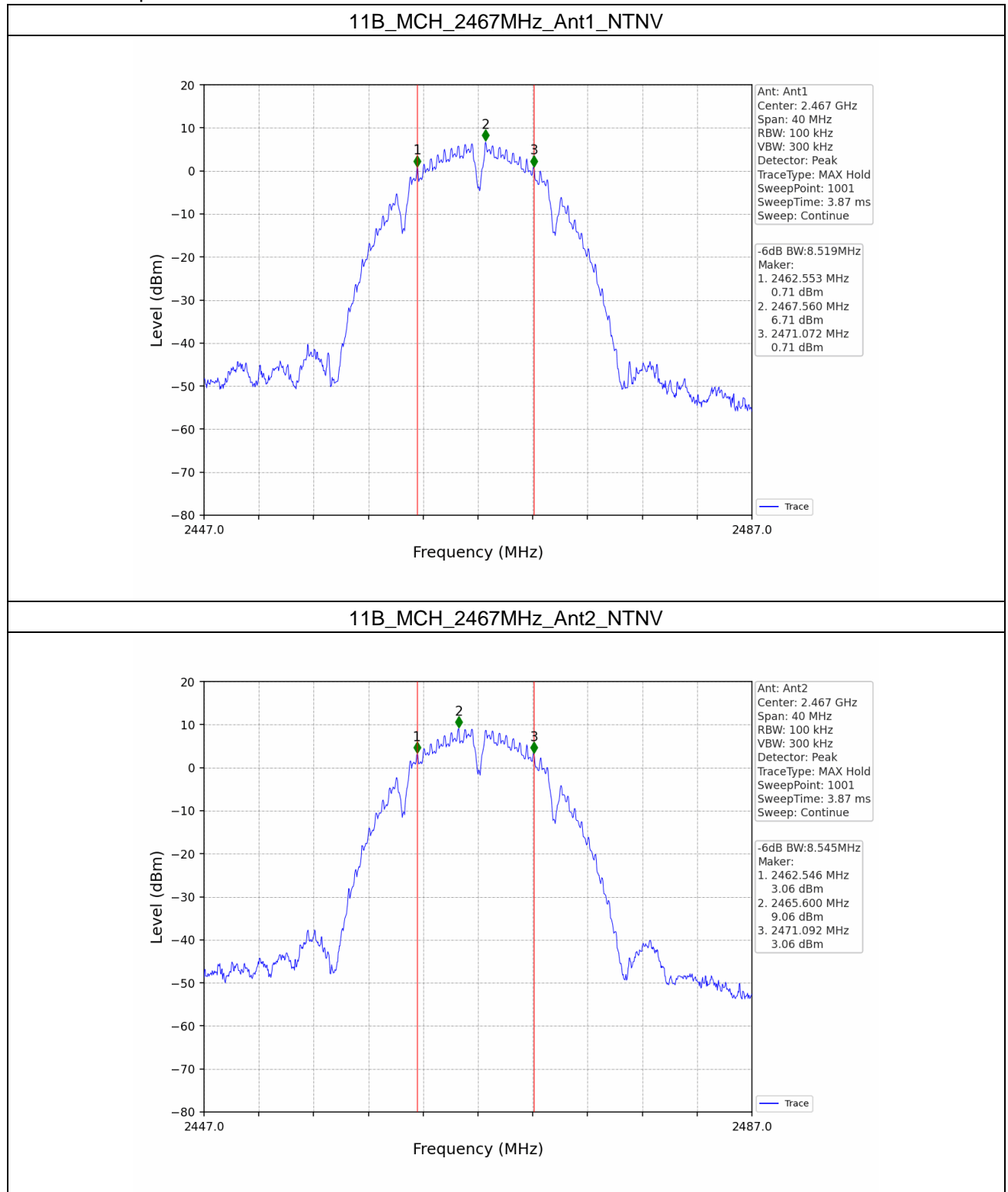
## 2. Bandwidth

## 2.1 6dB BW

## 2.1.1 Test Result

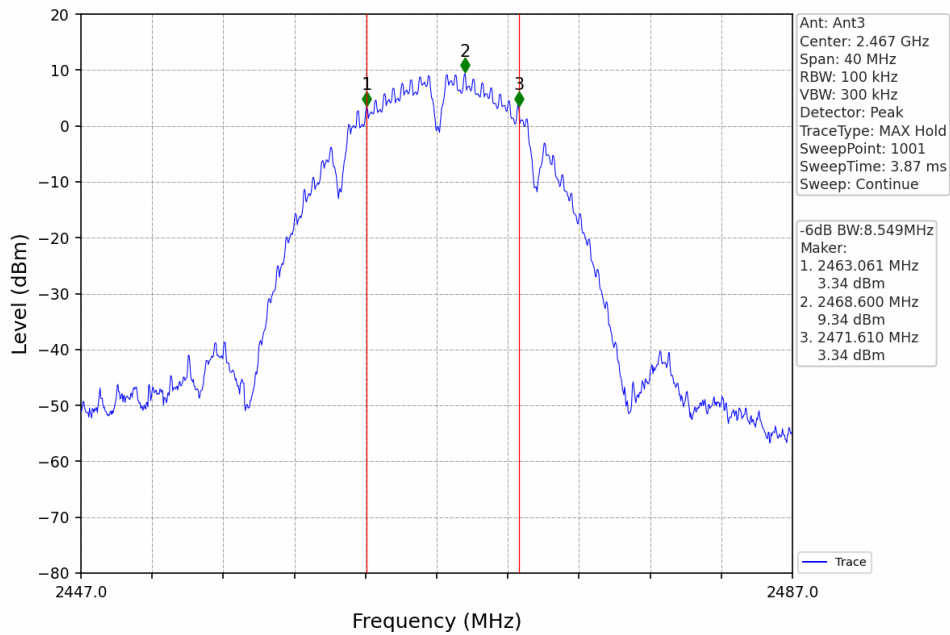
Mode	TX Type	Frequency (MHz)	Ant	6dB Bandwidth (MHz)		Verdict
				Result	Limit	
11B	SISO	2467	1	8.519	$\geq 0.5$	Pass
			2	8.545	$\geq 0.5$	Pass
			3	8.549	$\geq 0.5$	Pass
		2472	1	9.058	$\geq 0.5$	Pass
			2	8.055	$\geq 0.5$	Pass
			3	7.115	$\geq 0.5$	Pass
11G	SISO	2467	1	15.713	$\geq 0.5$	Pass
			2	15.478	$\geq 0.5$	Pass
			3	15.125	$\geq 0.5$	Pass
		2472	1	15.146	$\geq 0.5$	Pass
			2	15.135	$\geq 0.5$	Pass
			3	13.800	$\geq 0.5$	Pass
11N20	MIMO	2467	1	15.717	$\geq 0.5$	Pass
			2	15.713	$\geq 0.5$	Pass
			3	15.130	$\geq 0.5$	Pass
		2472	1	15.143	$\geq 0.5$	Pass
			2	15.156	$\geq 0.5$	Pass
			3	13.833	$\geq 0.5$	Pass
11N40	MIMO	2457	1	30.069	$\geq 0.5$	Pass
			2	28.824	$\geq 0.5$	Pass
			3	35.160	$\geq 0.5$	Pass
		2462	1	32.600	$\geq 0.5$	Pass
			2	30.090	$\geq 0.5$	Pass
			3	33.877	$\geq 0.5$	Pass

## 2.1.2 Test Graph

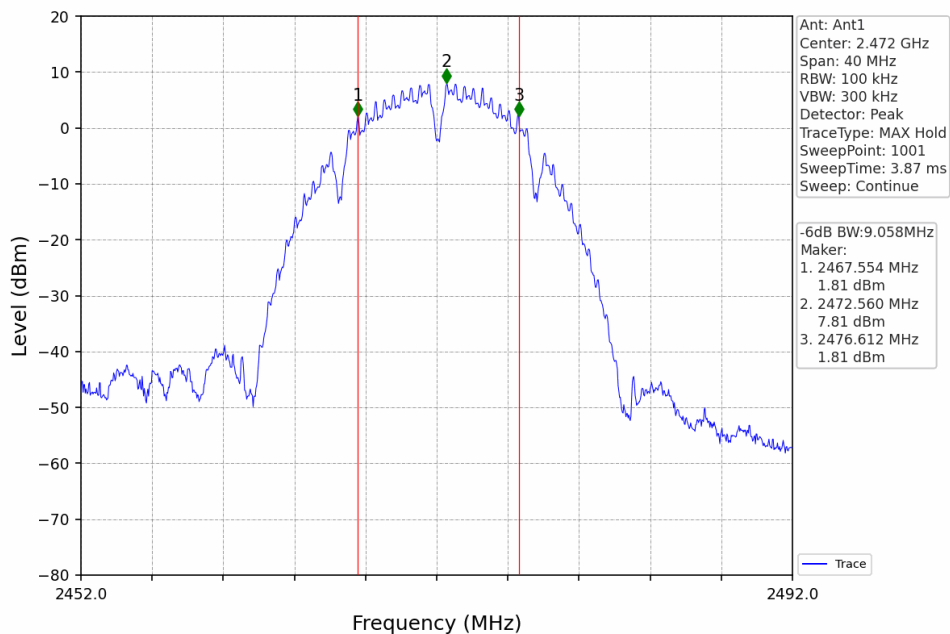




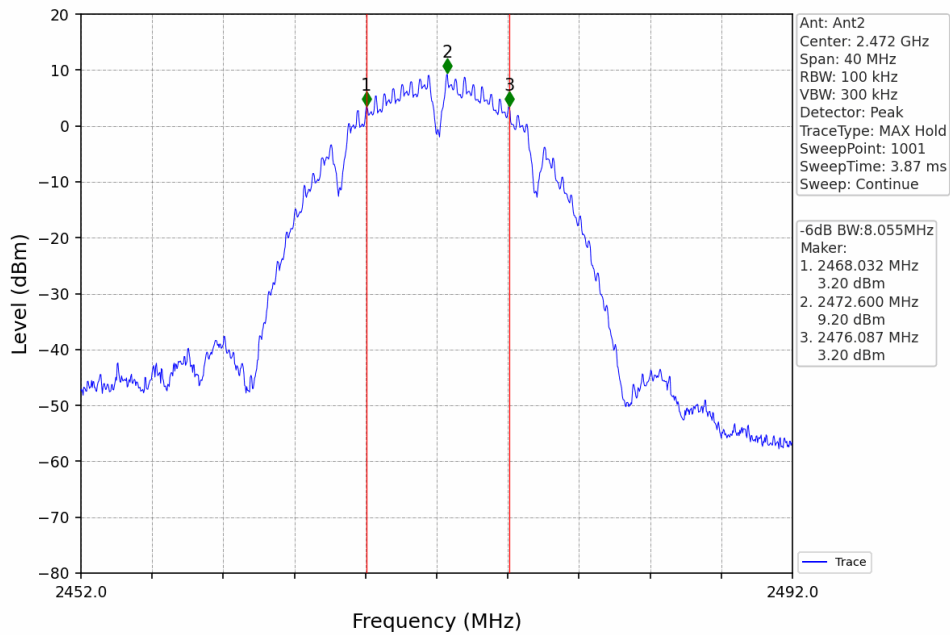
11B\_MCH\_2467MHz\_Ant3\_NTNV



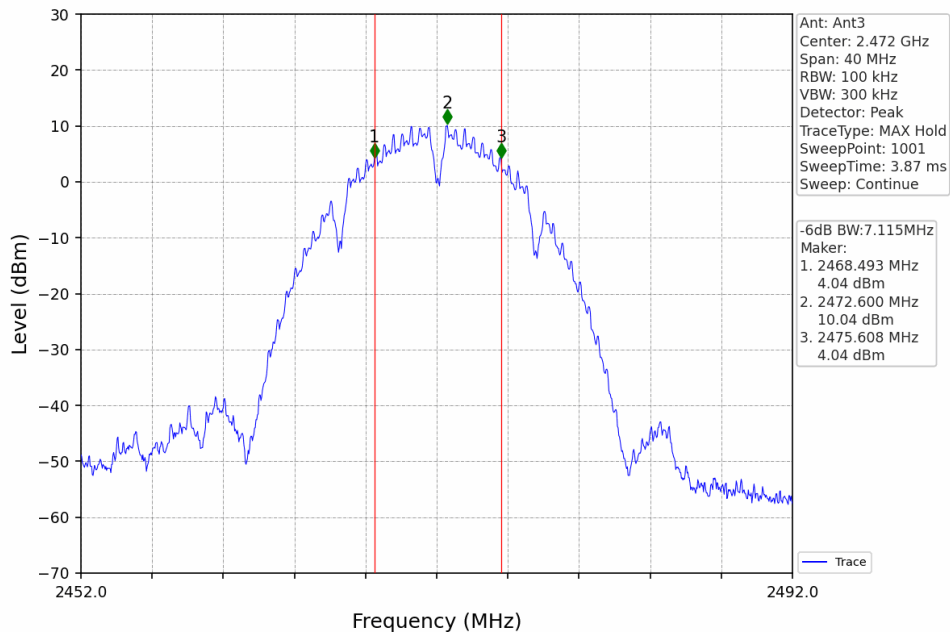
11B\_HCH\_2472MHz\_Ant1\_NTNV



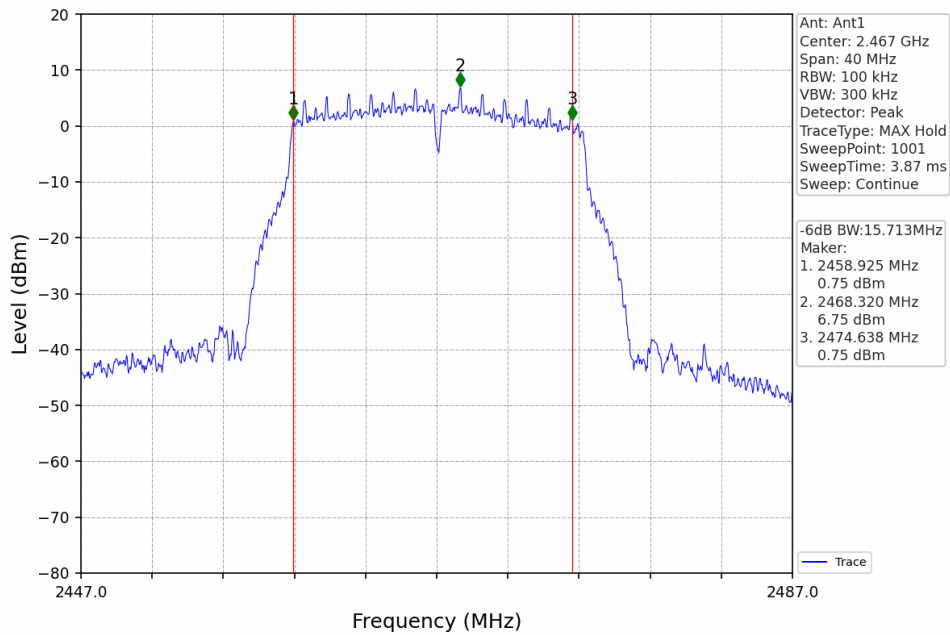
11B\_HCH\_2472MHz\_Ant2\_NTNV



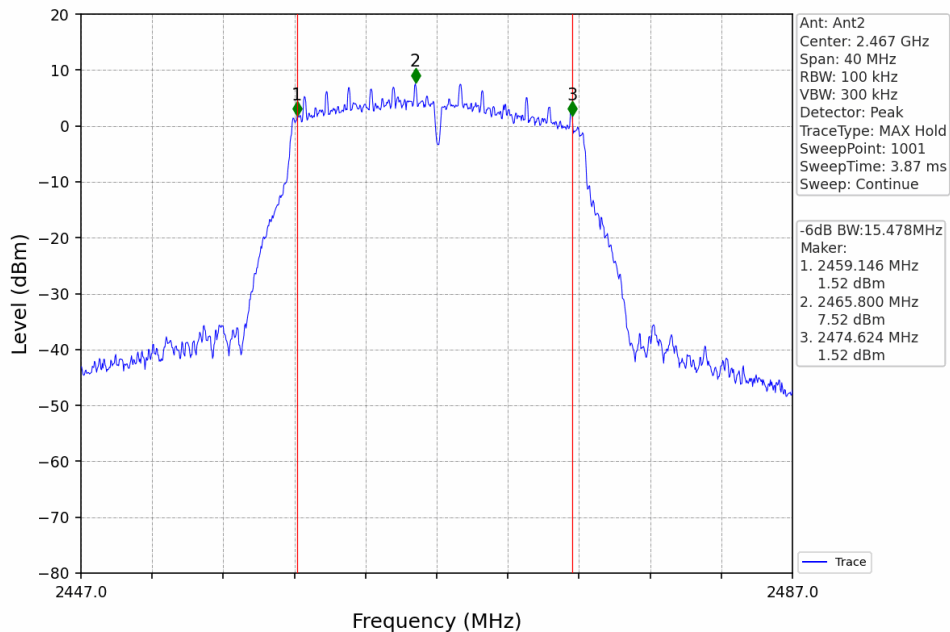
11B\_HCH\_2472MHz\_Ant3\_NTNV



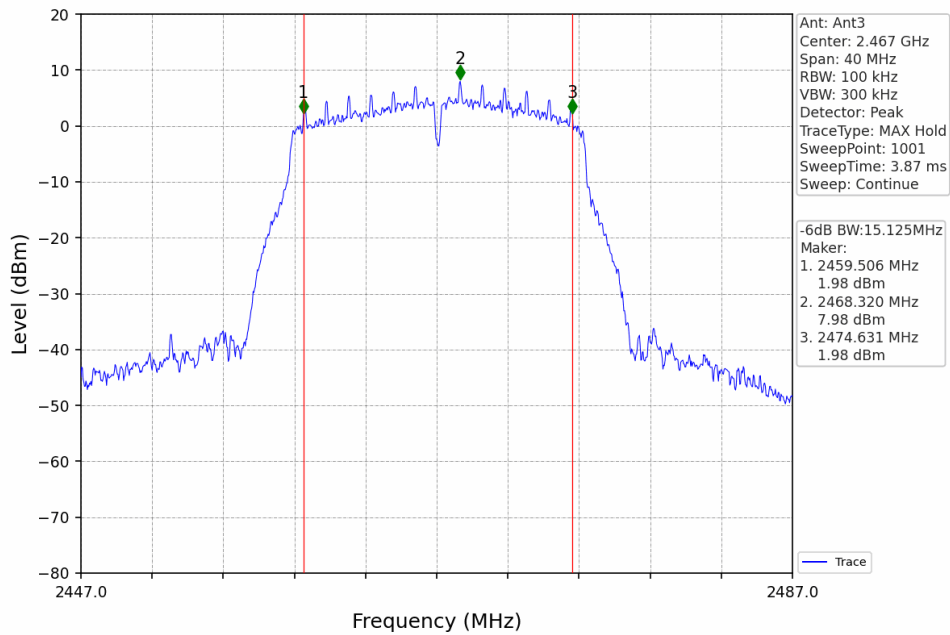
11G\_MCH\_2467MHz\_Ant1\_NTNV



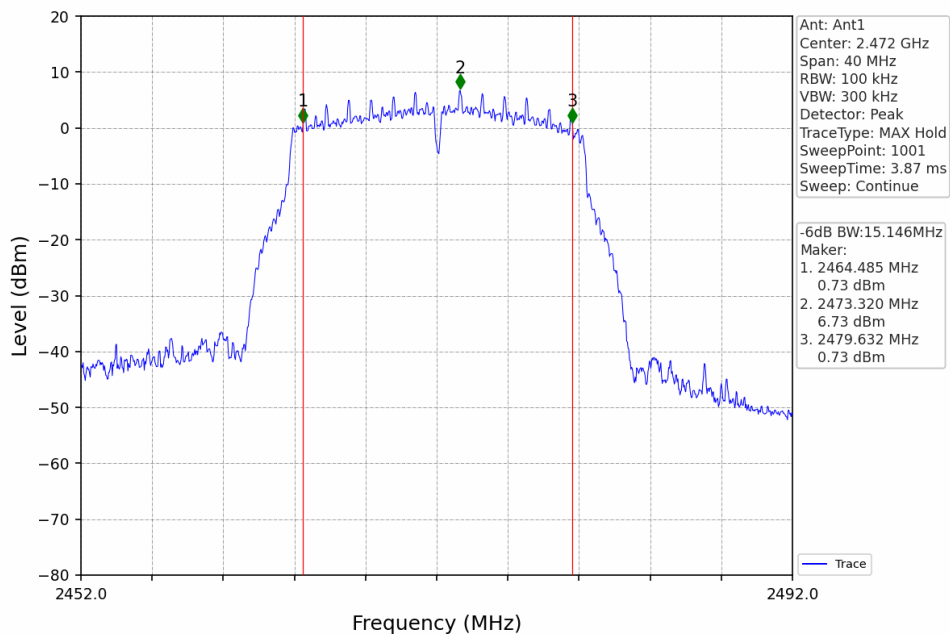
11G\_MCH\_2467MHz\_Ant2\_NTNV



11G\_MCH\_2467MHz\_Ant3\_NTNV

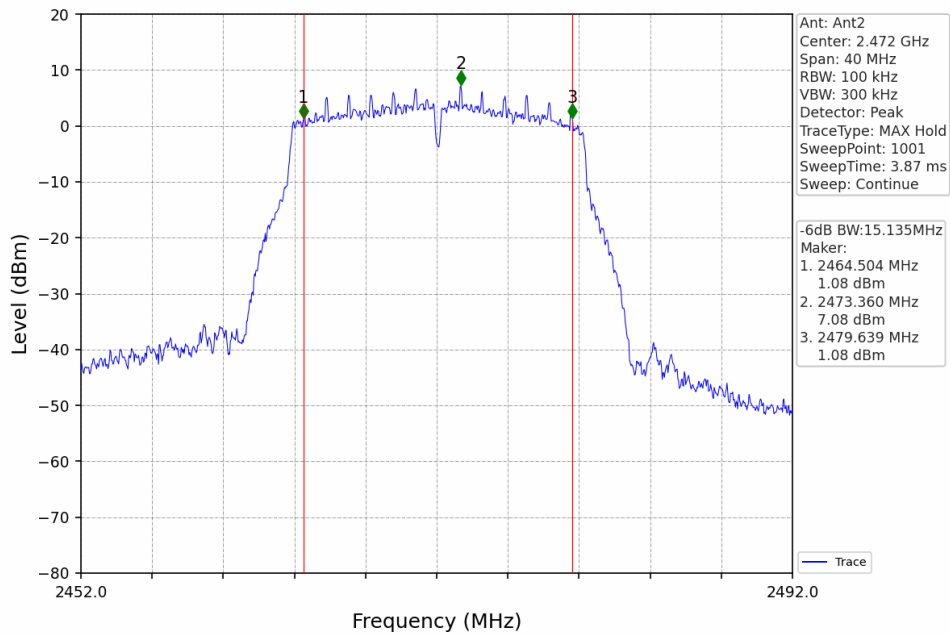


11G\_HCH\_2472MHz\_Ant1\_NTNV

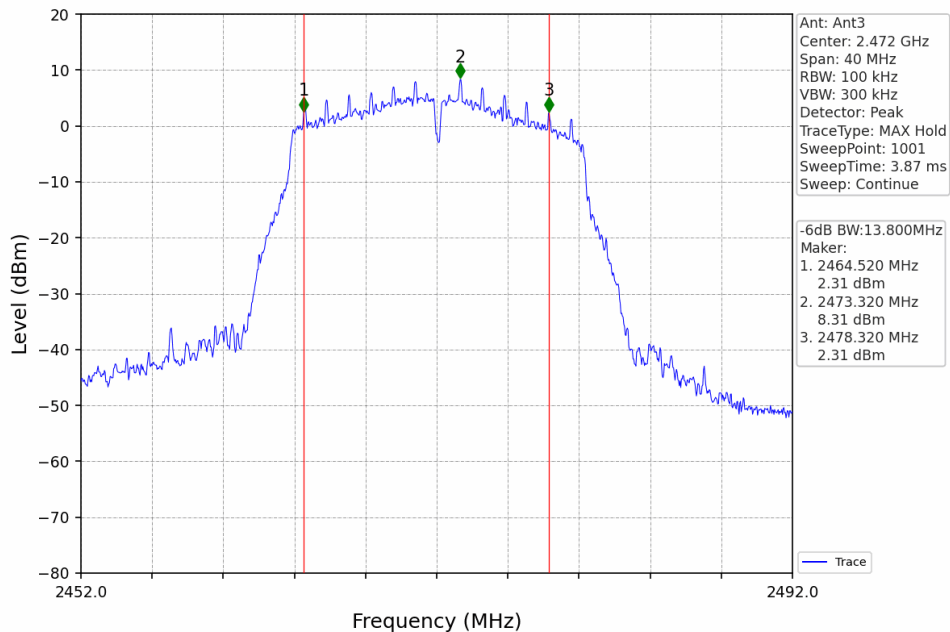




11G\_HCH\_2472MHz\_Ant2\_NTNV



11G\_HCH\_2472MHz\_Ant3\_NTNV

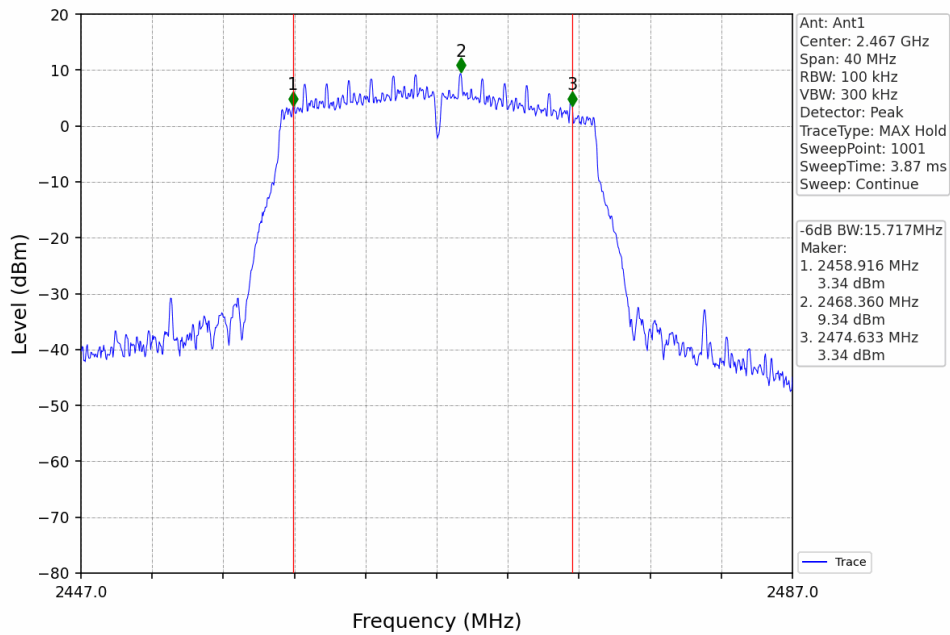


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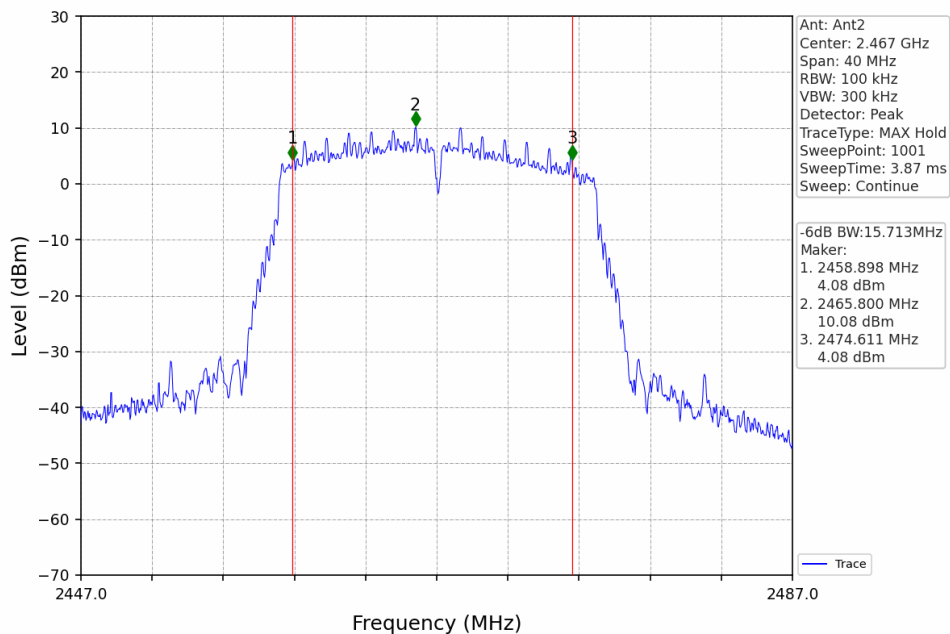
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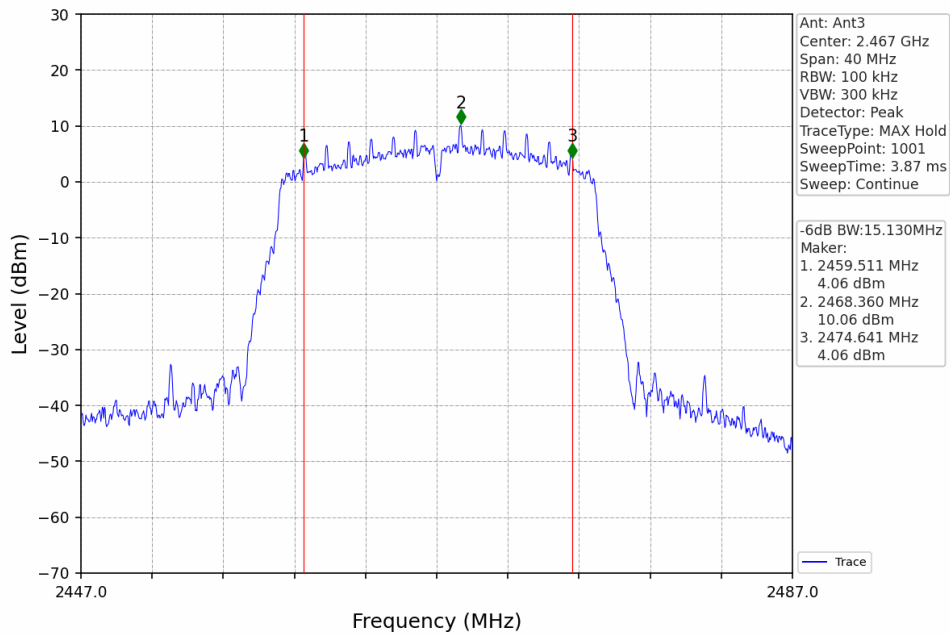
11N20\_MCH\_2467MHz\_Ant1\_NTNV



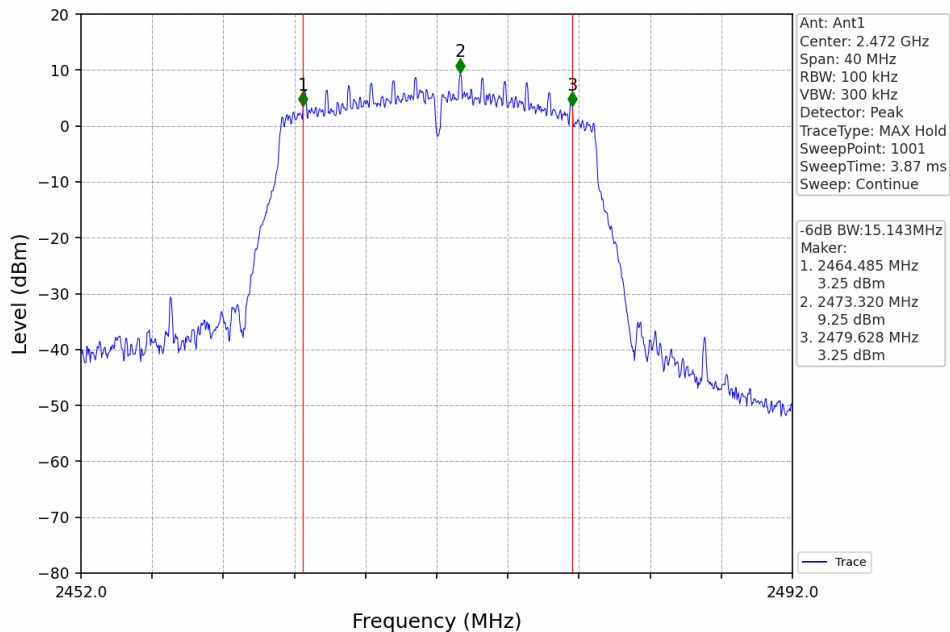
11N20\_MCH\_2467MHz\_Ant2\_NTNV



11N20\_MCH\_2467MHz\_Ant3\_NTNV



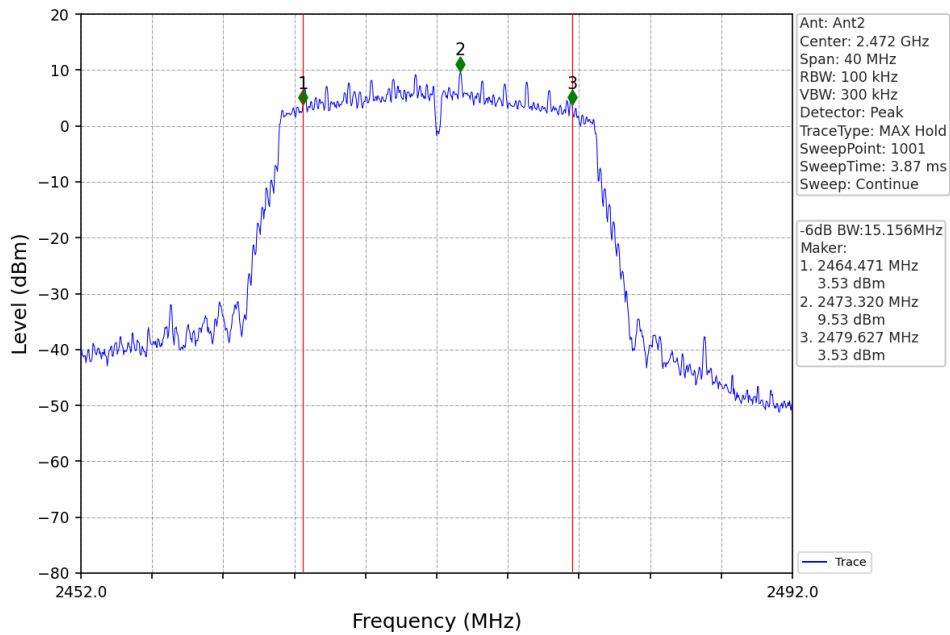
11N20\_HCH\_2472MHz\_Ant1\_NTNV



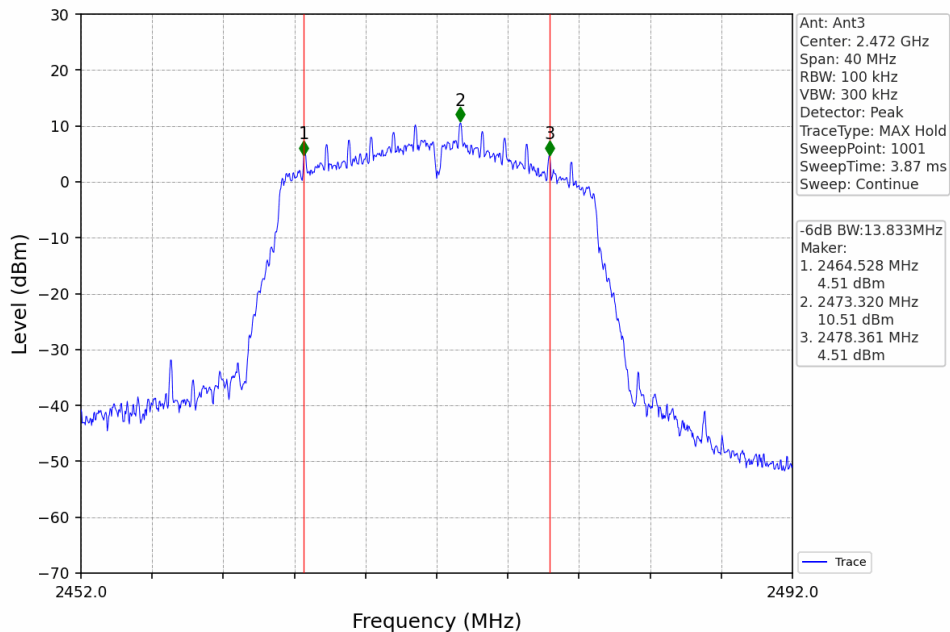
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11N20\_HCH\_2472MHz\_Ant2\_NTNV



11N20\_HCH\_2472MHz\_Ant3\_NTNV

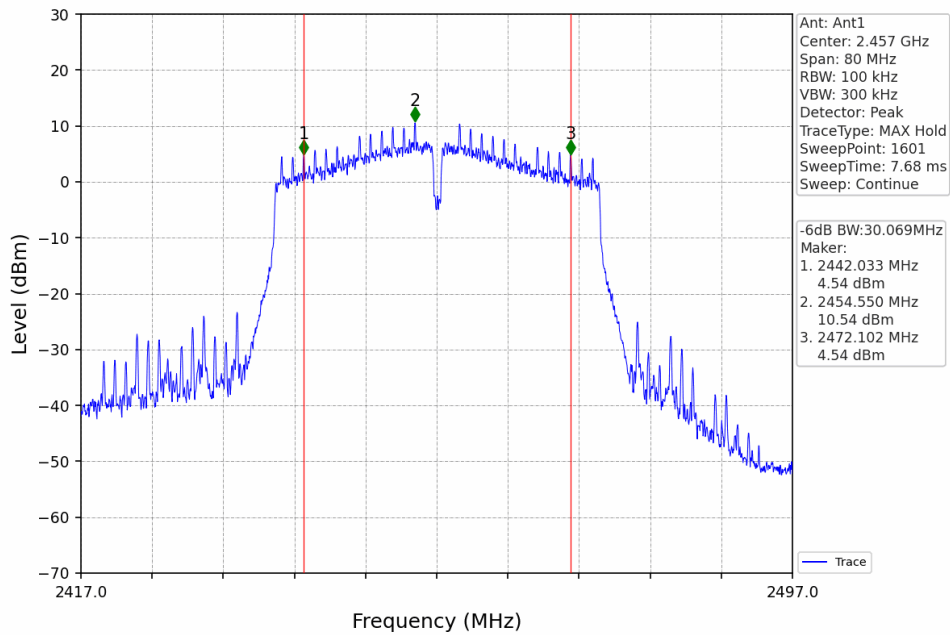


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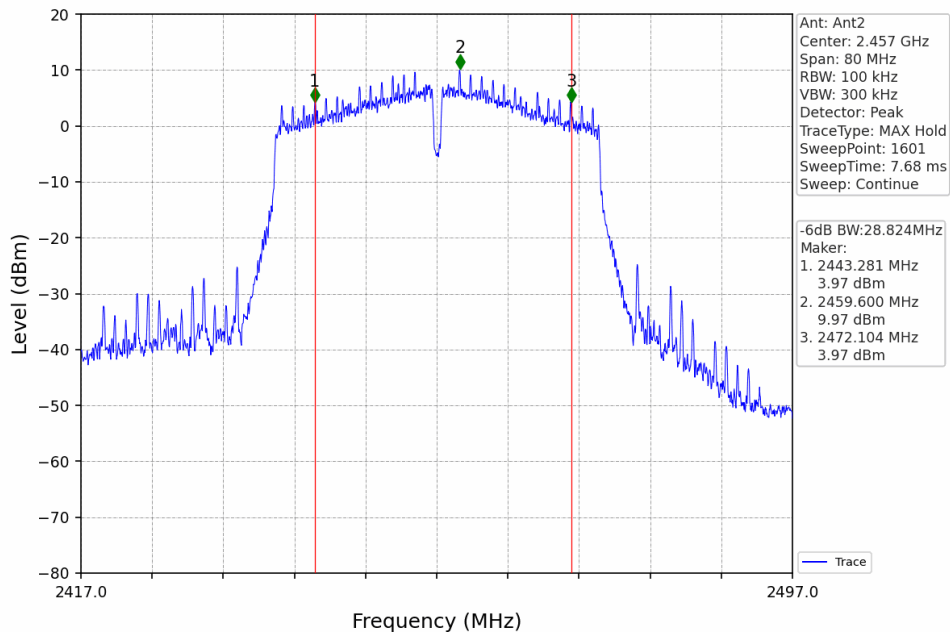
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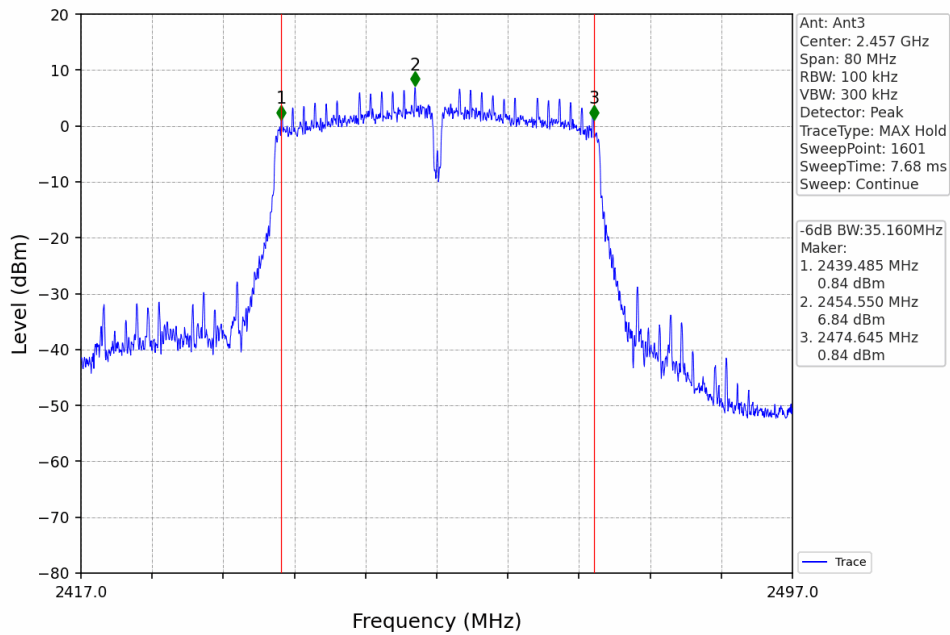
11N40\_MCH\_2457MHz\_Ant1\_NTNV



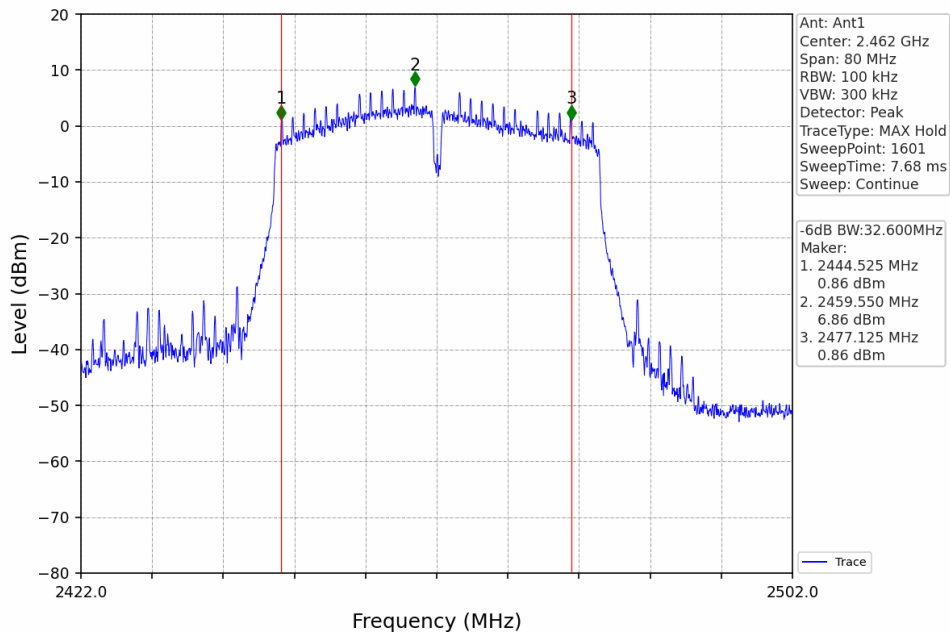
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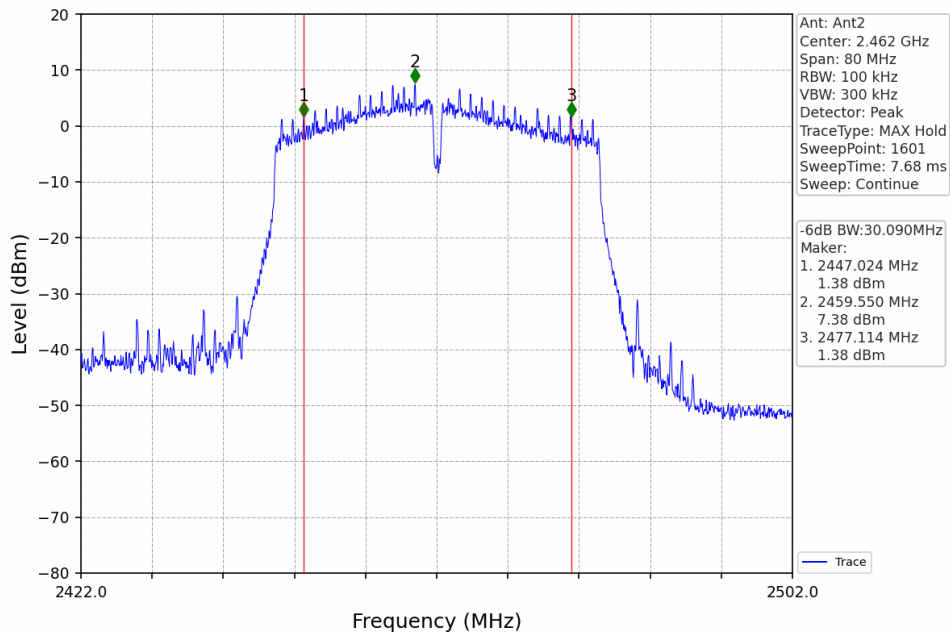
11N40\_MCH\_2457MHz\_Ant3\_NTNV



11N40\_HCH\_2462MHz\_Ant1\_NTNV



11N40\_HCH\_2462MHz\_Ant2\_NTNV



11N40\_HCH\_2462MHz\_Ant3\_NTNV

