

# TEST REPORT

**Application No.:** GZCR2303000211AT  
**Applicant:** KEEP Labs Inc.  
**Address of Applicant:** 200 Cambria St, Stratford, ON, N5A1H8, Canada  
**Manufacturer:** KEEP Labs Inc.  
**Address of Manufacturer:** 200 Cambria St, Stratford, ON, N5A1H8, Canada  
**Factory:** Aztech Communication Device (DG) Ltd  
**Address of Factory:** Jiu Jiang Shui Village, Chang Ping Town Dongguan City 523588 Guangdong P.R. China

### Equipment Under Test (EUT):

**EUT Name:** Smart storage device  
**Model No.:** KLB-KEEP-UJ-01, KLB-KEEP-UJ-02 ♣  
 ♣ Please refer to section 2 of this report which indicates which item was actually tested and which were electrically identical.

**Trade Mark:** KEEP  
**Standard(s) :** 47 CFR Part 15, Subpart C 15.247  
**Date of Receipt:** 2023-03-01  
**Date of Test:** 2023-03-16 to 2023-03-21  
**Date of Issue:** 2023-04-20

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

*Ricky Liu*

Ricky Liu  
Manager

Revision Record			
Version	Report No.	Date	Remark
01	GZCR230300021102	2023-04-20	Original

Authorized for issue by			
		Kevin Zhang	
		Kevin Zhang/Project Engineer	
		Vico Cui	
		Vico Cui/Reviewer	



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## 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
Conducted Peak Output Power		ANSI C63.10 (2013) Section 11.9.2	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	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass
Radiated Spurious Emissions Above 1GHz		ANSI C63.10 (2013) Section 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.

**♣ Declaration of EUT Family Grouping:**

Model No.: KLB-KEEP-UJ-01, KLB-KEEP-UJ-02

According to the declaration from the applicant, the electrical circuit design, layout, components used and internal wiring were identical for all models, with only difference on shell color.

Only the model KLB-KEEP-UJ-02 was tested in this report.



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## 4 General Information

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

Power supply: AC 100-240, 50/60Hz Power Supply  
 Model: TYPE-C301D  
 Input: AC 100-240, 50/60Hz  
 Output: PD: 5V--3A / 9V--3A / 12V--2.5A / 15V--2A / 20V--1.5A MAX 30W

Test Voltage: AC 110 V, 60 Hz

Cable(s): Output cable (unshielded, 80cm)  
 Type-c port

For Wi-Fi

Operation Frequency: 802.11b/g/n(HT20): 2412MHz to 2462MHz;  
 802.11n(HT40): 2422MHz to 2452MHz

Modulation Type: 802.11b: DSSS (CCK, DQPSK, DBPSK);  
 802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK)

Number of Channels: 802.11b/g/n(HT20):11;802.11n(HT40):7

Channel Spacing: 5MHz

Antenna Type: Integrated antenna

Antenna Gain: 3.7dBi

Antenna Number: 1

For BLE

Operation Frequency: 2402MHz to 2480MHz

Modulation Type: GFSK

Number of Channels: 40

Channel Spacing: 2MHz

Antenna Type: Integrated antenna

Antenna Gain: 3.7dBi

### 4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Note Book Computer	LENOVO	Lenovo Xiaoxinchao 5000	PF0TNMG8
Router	TP-LINK	TL-WR841N	9727201635



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### 4.3 Measurement Uncertainty

Test Item	Measurement Uncertainty
Conducted Emissions at AC Power Line (150kHz-30MHz)	±2.76dB
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	±5.00dB (30MHz-1GHz; 3m);±4.38dB (30MHz-1GHz; 10m);± 5.12dB (1GHz-6GHz); ±5.38dB (6GHz-18GHz); ±5.61dB(18GHz-40GHz)
Radiated Spurious Emissions Below 1GHz	±5.00dB (3m); ±4.38dB (10m)
Radiated Spurious Emissions Above 1GHz	±5.12dB (1GHz-6GHz); ±5.38dB (6GHz-18GHz); ±5.61dB(18GHz-40GHz)

### 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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Guangzhou Branch EMC Laboratory

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## 4.5 Test Facility

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

### ● 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.

### ● 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





## 5 Equipment List

Conducted Emissions at AC Power Line (150kHz-30MHz)					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Coaxial Cable	HangTianXing	2m	EMC0107	2022-08-24	2023-08-23
Shielding Room	ChangZhou ZhongYu	8m x 3m x 3.8m	EMC0306	2022-10-16	2025-10-15
Two-Line V-Network-GZ	Rohde & Schwarz	ENV216	EMC2135	2022-09-09	2023-09-08
EMI Test Receiver (9kHz-3.6GHz)	Rohde & Schwarz	ESR3	EMC2221	2022-05-20	2023-05-19
Test Software E3r	Audix	Ver.6.11812	GZE100-77	N/A	N/A

Conducted Peak Output Power					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
MI CABLE	SGS-EMC	0.8M	EMC2137	2021-11-02	2023-11-01
EXA Signal Analyzer (10Hz-44GHz)	Keysight	N9010A	EMC2138	2022-09-08	2023-09-07
4X4 Power sensor Unit	TST	TSPS2023R	EMC2226	2022-08-24	2023-08-23
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
MI CABLE	SGS-EMC	0.8M	EMC2137	2021-11-02	2023-11-01
EXA Signal Analyzer (10Hz-44GHz)	Keysight	N9010A	EMC2138	2022-09-08	2023-09-07
4X4 Power sensor Unit	TST	TSPS2023R	EMC2226	2022-08-24	2023-08-23
Test Software	TST	V2.0	GZE100-78	N/A	N/A

Power Spectrum Density					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
MI CABLE	SGS-EMC	0.8M	EMC2137	2021-11-02	2023-11-01
EXA Signal Analyzer (10Hz-44GHz)	Keysight	N9010A	EMC2138	2022-09-08	2023-09-07
4X4 Power sensor Unit	TST	TSPS2023R	EMC2226	2022-08-24	2023-08-23
Test Software	TST	V2.0	GZE100-78	N/A	N/A



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Conducted Band Edges Measurement					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
MI CABLE	SGS-EMC	0.8M	EMC2137	2021-11-02	2023-11-01
EXA Signal Analyzer (10Hz-44GHz)	Keysight	N9010A	EMC2138	2022-09-08	2023-09-07
4X4 Power sensor Unit	TST	TSPS2023R	EMC2226	2022-08-24	2023-08-23
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
MI CABLE	SGS-EMC	0.8M	EMC2137	2021-11-02	2023-11-01
EXA Signal Analyzer (10Hz-44GHz)	Keysight	N9010A	EMC2138	2022-09-08	2023-09-07
4X4 Power sensor Unit	TST	TSPS2023R	EMC2226	2022-08-24	2023-08-23
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
1GHz-26.5 GHz Pre-Amplifier	Agilent	8449B	EMC0521	2022-12-16	2023-12-15
EMI Test Receiver (10Hz-26.5GHz)	Rohde & Schwarz	ESIB26	EMC0522	2022-12-16	2023-12-15
Chamber cable (Above 1GHz)	Scoflex	KMKM-8.0m	EMC0545	2022-08-24	2024-08-23
Horn Antenna (1GHz-18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120D	EMC2026	2022-09-23	2025-09-22
Horn Antenna (14-40GHz)	SCHWARZBECK	BBHA 9170	EMC2041	2020-06-28	2023-06-27
EXA Signal Analyzer (10Hz-44GHz)	Keysight	N9010A	EMC2138	2022-09-08	2023-09-07
MXE EMI Receiver (10Hz-8.4GHz)	Keysight	N9038A	EMC2139	2022-10-21	2023-10-20
966 Anechoic Chamber	C.R.T	9m x 6m x 6m	EMC2142	2020-12-20	2023-12-19
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A



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Radiated Spurious Emissions Below 1GHz					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
966 Anechoic Chamber	Shenzhen C.R.T	CRTSGSSAC966	EMC2230	2022-04-12	2025-04-11
EMI Test Receiver(1Hz-8GHz)	Rohde & Schwarz	ESW8	EMC2229	2023-02-20	2024-02-19
Amplifier(9k-1000MHz)	SONOMA	310	EMC2237	2022-04-20	2023-04-29
TRILOG Broadband Antenna (25M-2GHz)	SCHWRZBECK	VULB 9168	EMC2238	2022-04-20	2025-04-19
Coaxial Cable	Times Microwave	BL03-NMNM-6	EMC2239	2022-05-18	2024-05-17
Test Software E3	Audix	Ver.6.191211	GZE100-81	N/A	N/A

Radiated Spurious Emissions Above 1GHz					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
1GHz-26.5 GHz Pre-Amplifier	Agilent	8449B	EMC0521	2022-12-16	2023-12-15
EMI Test Receiver (10Hz-26.5GHz)	Rohde & Schwarz	ESIB26	EMC0522	2022-12-16	2023-12-15
Chamber cable (Above 1GHz)	Scoflex	KMKM-8.0m	EMC0545	2022-08-24	2024-08-23
Horn Antenna (1GHz-18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120D	EMC2026	2022-09-23	2025-09-22
Horn Antenna (14-40GHz)	SCHWARZBECK	BBHA 9170	EMC2041	2020-06-28	2023-06-27
2.4GHz Filter	Micro-Tronics	BRM 50702	EMC2069	2022-12-16	2023-12-15
EXA Signal Analyzer (10Hz-44GHz)	Keysight	N9010A	EMC2138	2022-09-08	2023-09-07
MXE EMI Receiver (10Hz-8.4GHz)	Keysight	N9038A	EMC2139	2022-10-21	2023-10-20
966 Anechoic Chamber	C.R.T	9m x 6m x 6m	EMC2142	2020-12-20	2023-12-19
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A

General used equipment					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
DMM	Fluke	73	EMC0006	2022-06-24	2023-06-23



## 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

Standard 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, 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. 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 is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 3.7 dBi.

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.

Detector: Peak for pre-scan (9kHz resolution bandwidth) 0.15M to 30MHz

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

Operating Environment:

Temperature: 25.8 °C

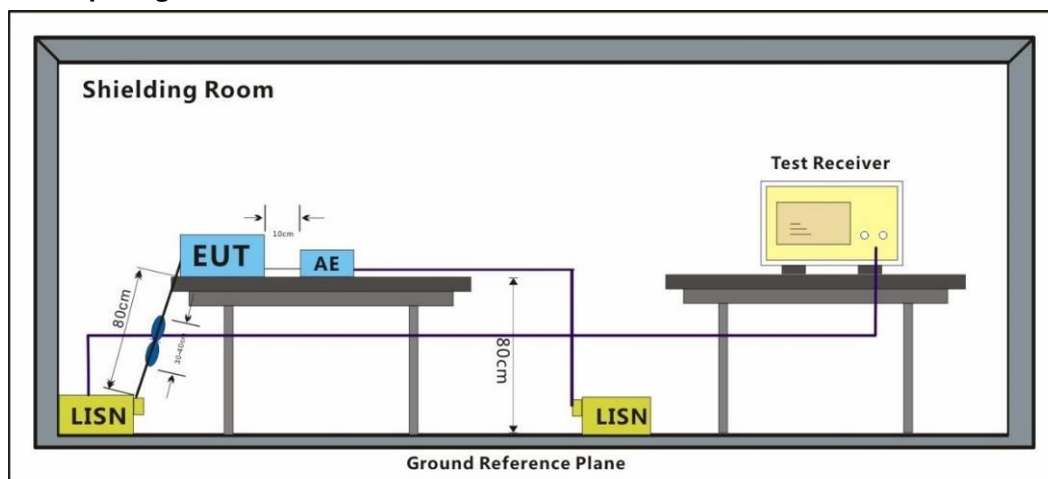
Humidity: 56.6 % RH

Atmospheric Pressure: 1020 mbar

#### 7.1.2 Test Mode Description

Pre-scan /	Mode	Description
Final test	Code	
Final test	05	Operation(BT)_Keep the EUT communicating with auxiliary devices.
Pre-scan	06	Operation(Wi-Fi)___Keep the EUT communicate with auxiliary devices.

#### 7.1.3 Test Setup Diagram

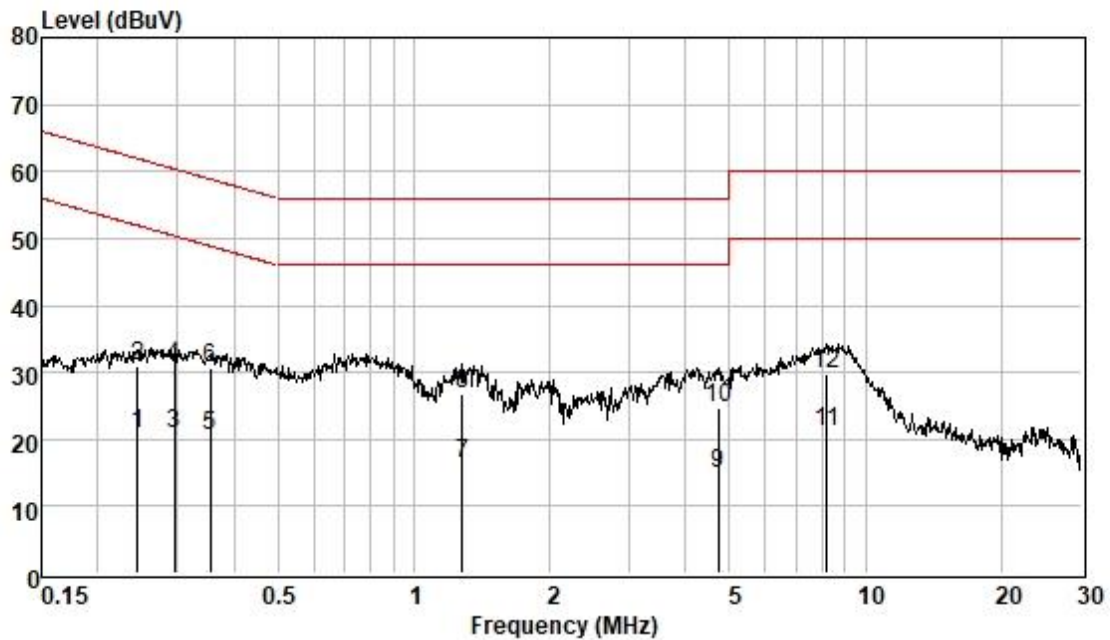


## 7.1.4 Measurement Procedure and Data

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

Test Mode: 06; Line: Live line



Pol : LINE  
Mode :  
Model :  
Power :

	Frequenc MHz	Read Level dBuV	Cable Loss dB	LISN Factor dB	Measured Level dBuV	Limit Line dBuV	Over Limit dB	Remark
1	0.244	11.21	0.06	9.61	20.88	51.95	-31.07	Average
2	0.244	21.31	0.06	9.61	30.98	61.95	-30.97	QP
3	0.296	11.16	0.06	9.62	20.84	50.37	-29.53	Average
4	0.296	21.11	0.06	9.62	30.79	60.37	-29.58	QP
5	0.354	11.00	0.06	9.60	20.66	48.87	-28.21	Average
6	0.354	20.88	0.06	9.60	30.54	58.87	-28.33	QP
7	1.282	6.52	0.09	9.60	16.21	46.00	-29.79	Average
8	1.282	17.07	0.09	9.60	26.76	56.00	-29.24	QP
9	4.721	5.17	0.17	9.64	14.98	46.00	-31.02	Average
10	4.721	14.98	0.17	9.64	24.79	56.00	-31.21	QP
11	8.192	11.14	0.21	9.66	21.01	50.00	-28.99	Average
12	8.192	19.84	0.21	9.66	29.71	60.00	-30.29	QP



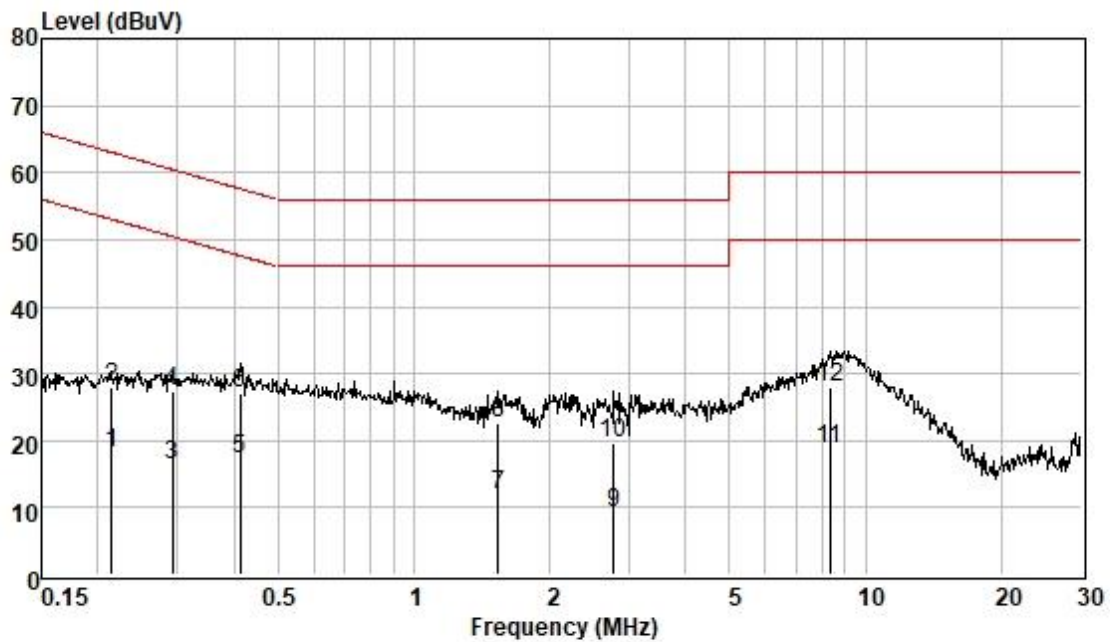
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Test Mode: 06; Line: Neutral Line



Pol : NEUTRAL  
Mode :  
Model :  
Power :

	Frequency MHz	Read Level dBuV	Cable Loss dB	LISN Factor dB	Measured Level dBuV	Limit Line dBuV	Over Limit dB	Remark
1	0.215	8.46	0.06	9.60	18.12	53.01	-34.89	Average
2	0.215	18.17	0.06	9.60	27.83	63.01	-35.18	QP
3	0.292	6.77	0.06	9.58	16.41	50.46	-34.05	Average
4	0.292	17.65	0.06	9.58	27.29	60.46	-33.17	QP
5	0.413	7.67	0.06	9.61	17.34	47.59	-30.25	Average
6	0.413	17.45	0.06	9.61	27.12	57.59	-30.47	QP
7	1.535	2.10	0.10	9.60	11.80	46.00	-34.20	Average
8	1.535	13.01	0.10	9.60	22.71	56.00	-33.29	QP
9	2.765	-0.51	0.14	9.62	9.25	46.00	-36.75	Average
10	2.765	9.77	0.14	9.62	19.53	56.00	-36.47	QP
11	8.323	8.96	0.21	9.69	18.86	50.00	-31.14	Average
12	8.323	17.93	0.21	9.69	27.83	60.00	-32.17	QP



### 7.2 Conducted Peak Output Power

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

Test Method: ANSI C63.10 (2013) Section 11.9.2

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

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

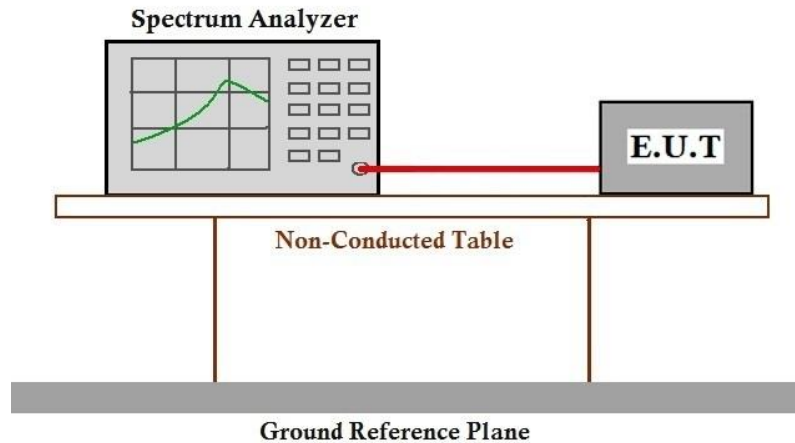
Operating Environment:

Temperature: 26.1 °C Humidity: 61.5 % RH Atmospheric Pressure: 1020 mbar

#### 7.2.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode(1Mbps)_Keep the EUT in charging and continuously transmitting mode with GFSK modulation.
Final test	03	TX mode_Keep the EUT in charging and 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), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.

### 7.2.3 Test Setup Diagram



### 7.2.4 Measurement Procedure and Data

Note: Since the verify power the same operating range bandwidth and smaller power can be covered by the higher power.

Please Refer to Appendix for Details

### 7.3 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

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

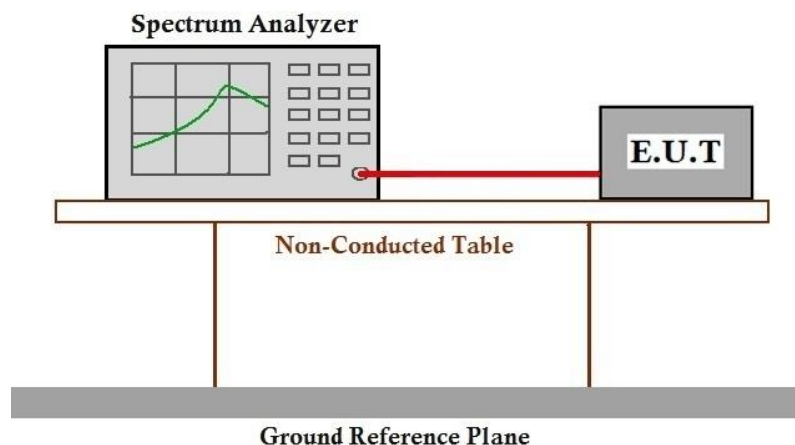
Operating Environment:

Temperature: 26.1 °C Humidity: 61.5 % RH Atmospheric Pressure: 1020 mbar

#### 7.3.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode(1Mbps)_Keep the EUT in charging and continuously transmitting mode with GFSK modulation.
Final test	03	TX mode_Keep the EUT in charging and 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), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.

#### 7.3.3 Test Setup Diagram



#### 7.3.4 Measurement Procedure and Data

Please Refer to Appendix for Details

### 7.4 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

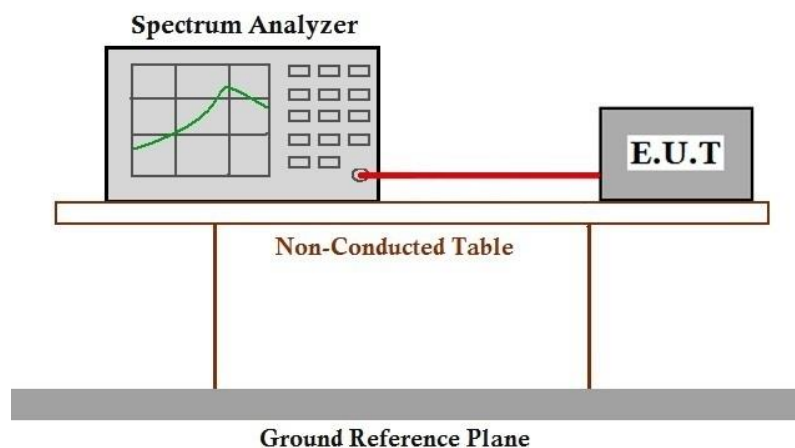
#### 7.4.1 E.U.T. Operation

Operating Environment:  
 Temperature: 26.1 °C Humidity: 61.5 % RH Atmospheric Pressure: 1020 mbar

#### 7.4.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode(1Mbps)_Keep the EUT in charging and continuously transmitting mode with GFSK modulation.
Final test	03	TX mode_Keep the EUT in charging and 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), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.

#### 7.4.3 Test Setup Diagram



#### 7.4.4 Measurement Procedure and Data

Please Refer to Appendix for Details



### 7.5 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)).

#### 7.5.1 E.U.T. Operation

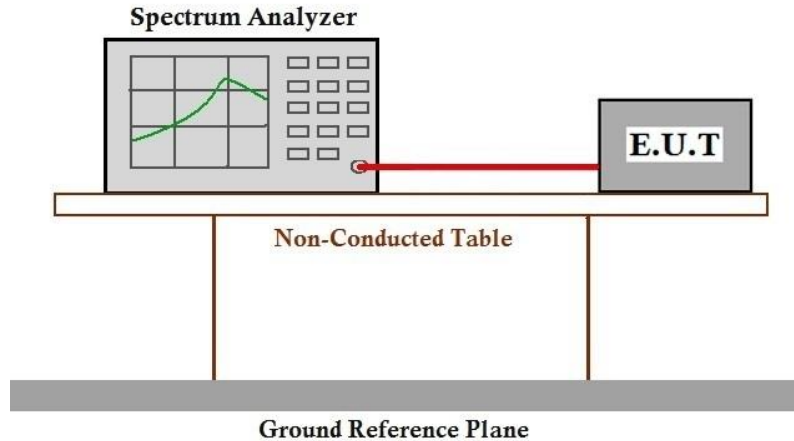
Operating Environment:

Temperature: 26.1 °C Humidity: 61.5 % RH Atmospheric Pressure: 1020 mbar

#### 7.5.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode(1Mbps)_Keep the EUT in charging and continuously transmitting mode with GFSK modulation.
Final test	03	TX mode_Keep the EUT in charging and 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), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.

### 7.5.3 Test Setup Diagram



### 7.5.4 Measurement Procedure and Data

Please Refer to Appendix for Details

### 7.6 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)).

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

Operating Environment:

Temperature: 26.1 °C

Humidity: 61.5 % RH

Atmospheric Pressure: 1020 mbar

#### 7.6.2 Test Mode Description

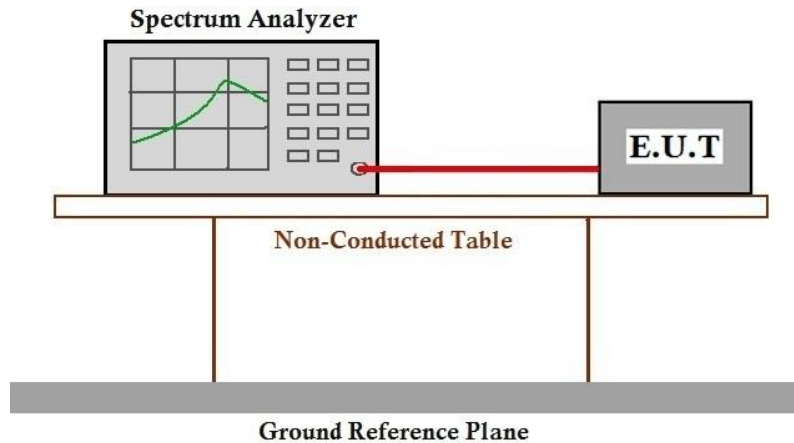
Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode(1Mbps)_Keep the EUT in charging and continuously transmitting mode with GFSK modulation.
Final test	03	TX mode_Keep the EUT in charging and continuously transmitting mode with all modulation types. All data rates for each modulation type 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), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.



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### 7.6.3 Test Setup Diagram



### 7.6.4 Measurement Procedure and Data

Please Refer to Appendix for Details



### 7.7 Radiated Emissions which fall in the restricted bands

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

Test Method: ANSI C63.10 (2013) Section 11.12

Limit:

Test Distance: 3 m

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.

#### 7.7.1 E.U.T. Operation

Operating Environment:

Temperature: 24.2 °C

Humidity: 63.0 % RH

Atmospheric Pressure: 1020 mbar

#### 7.7.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode(1Mbps)_Keep the EUT in charging and continuously transmitting mode with GFSK modulation.
Final test	03	TX mode_Keep the EUT in charging and 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), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.



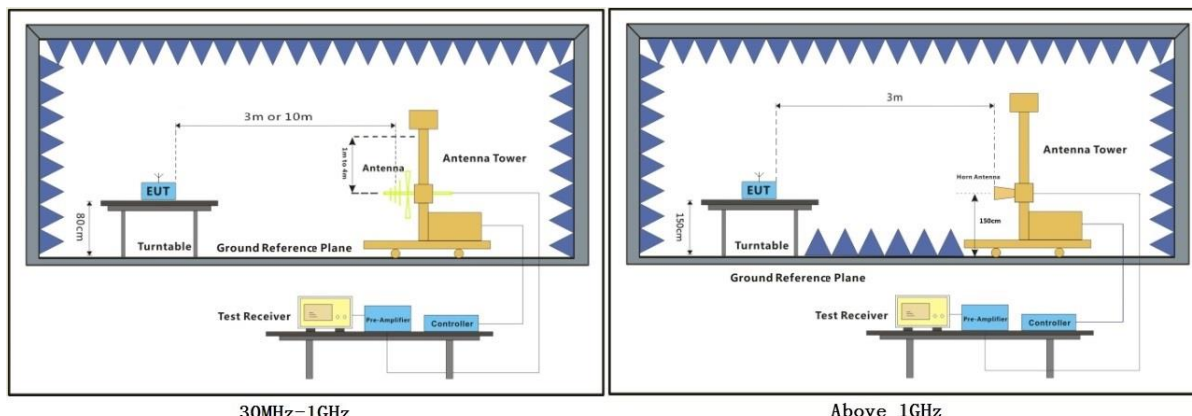
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### 7.7.3 Test Setup Diagram



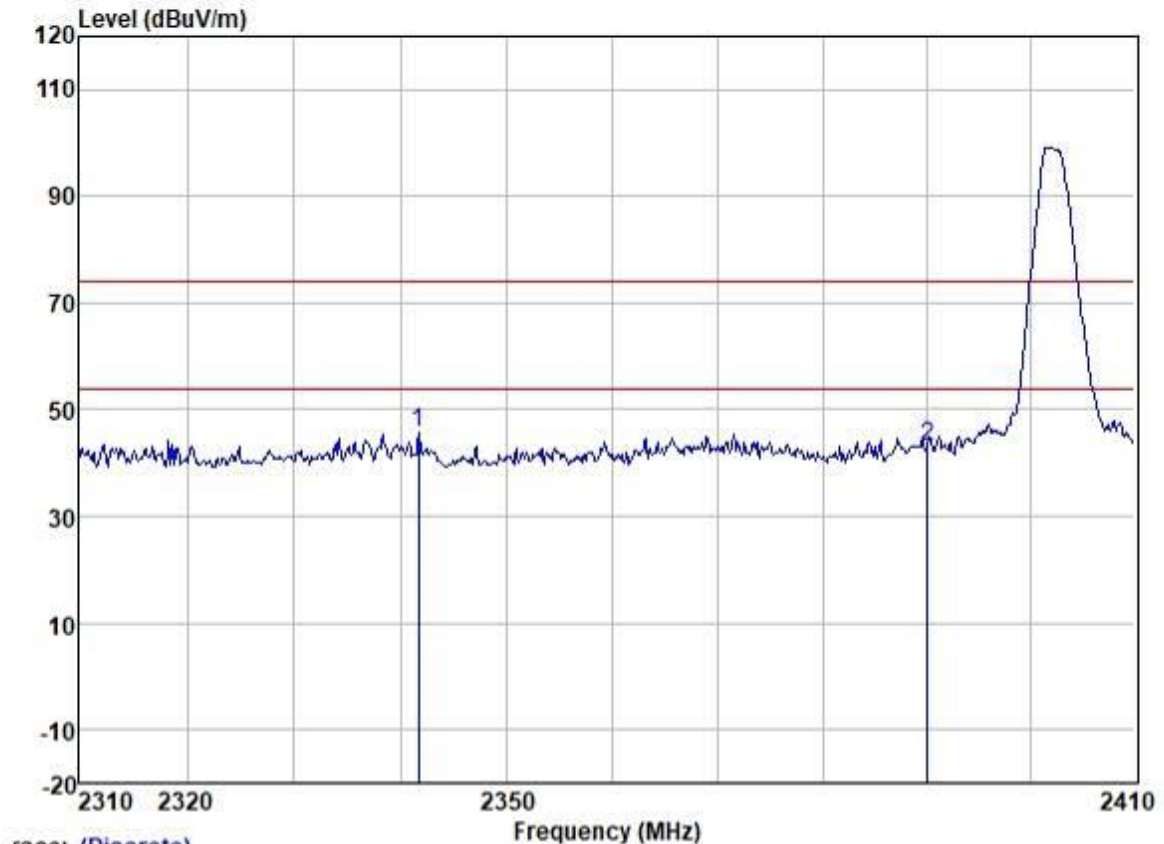
### 7.7.4 Measurement Procedure and Data

- 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.
- 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.
- 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.
- 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.
- 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.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- 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.
- Test the EUT in the lowest channel, the Highest channel.
- 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.
- 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: 00; Polarity: Vertical; Modulation: GFSK; Channel: Low

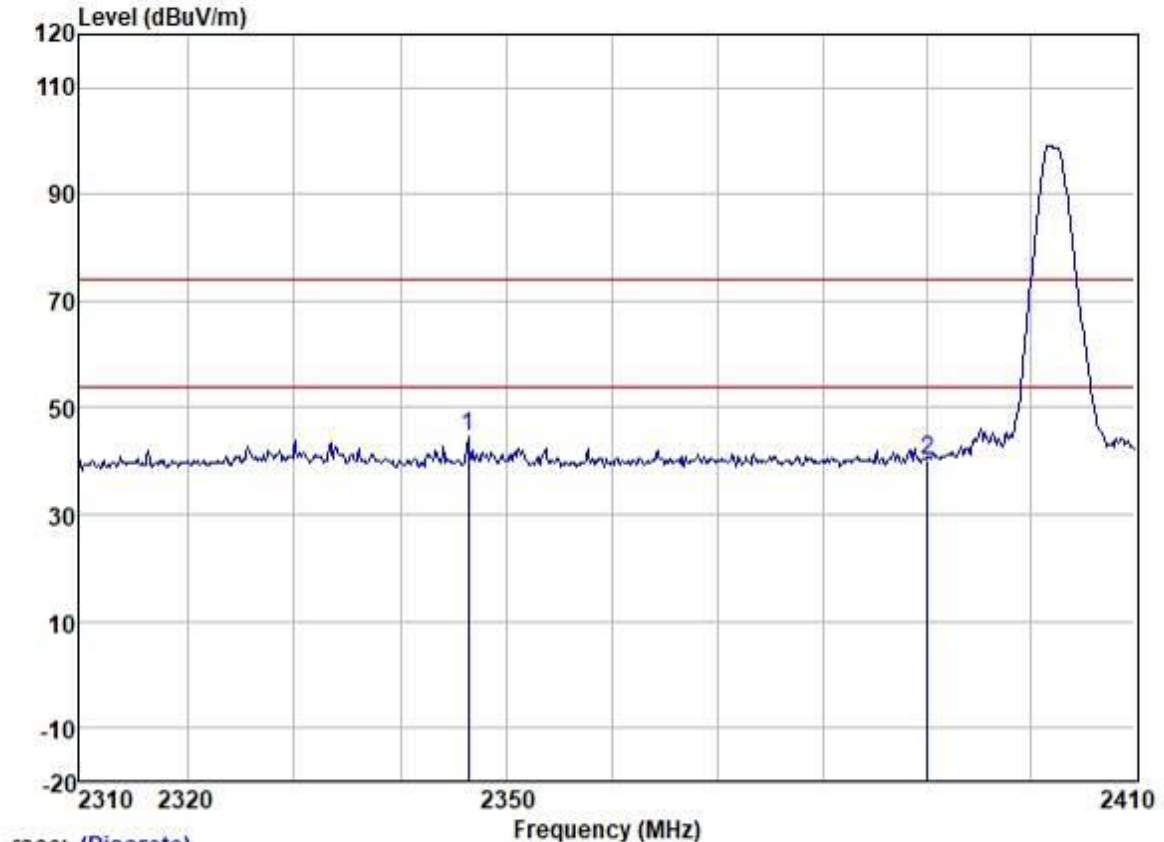


Trace: (Discrete)

		Read	Antenna	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	2341.639	51.27	27.57	4.68	37.78	45.74	74.00	-28.26	VERTICAL	Peak
2	2390.000	48.96	27.68	4.22	37.76	43.10	74.00	-30.90	VERTICAL	Peak



Test Mode: 00; Polarity: Horizontal; Modulation:GFSK; Channel:Low

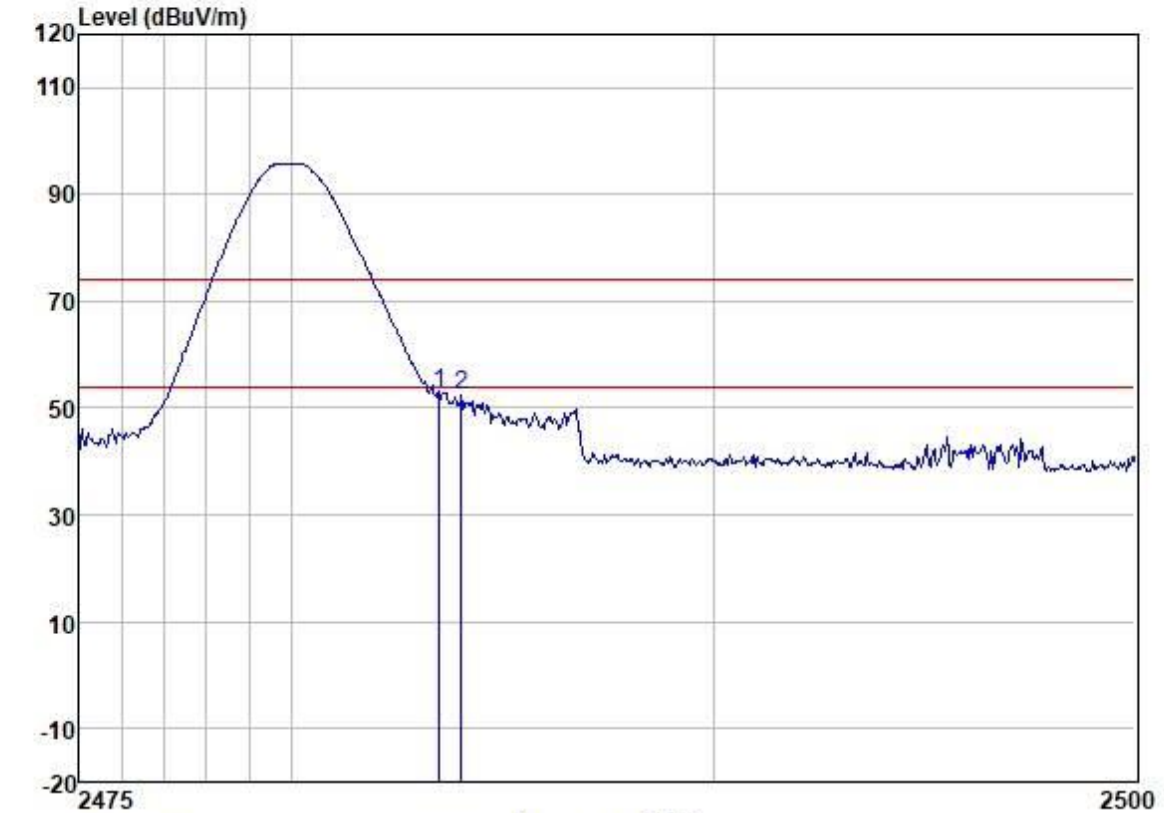


Trace: (Discrete)

	Freq	ReadAntenna	Cable	Preamp	Limit	Over		
	MHz	Level	Loss	Factor	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dB	
1	2346.308	50.01	27.59	4.60	37.78	44.42	74.00	-29.58 HORIZONTAL Peak
2	2390.000	45.95	27.68	4.22	37.76	40.09	74.00	-33.91 HORIZONTAL Peak



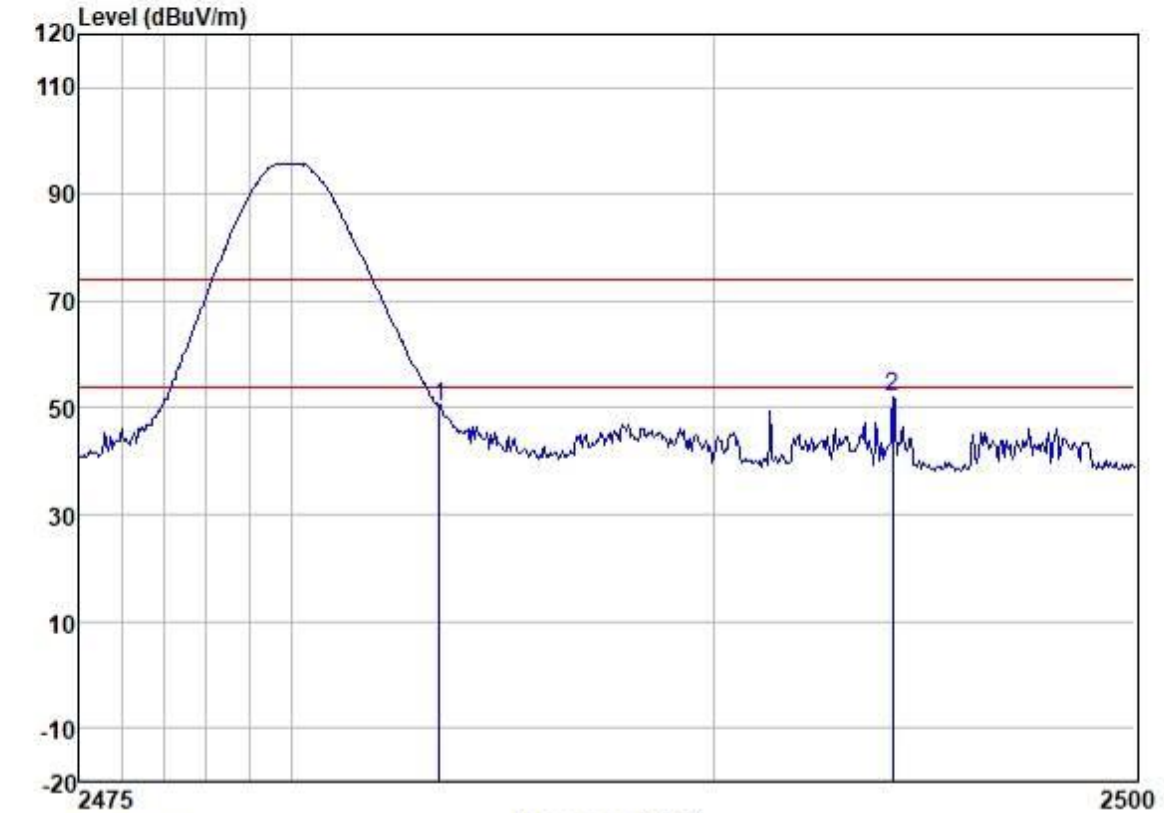
Test Mode: 00; Polarity: Vertical; Modulation: GFSK; Channel: High



Trace: (Discrete)

	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	2483.500	59.17	27.85	3.42	37.73	52.71	74.00	-21.29	VERTICAL	Peak
2	2484.021	58.88	27.85	3.42	37.73	52.42	74.00	-21.58	VERTICAL	Peak

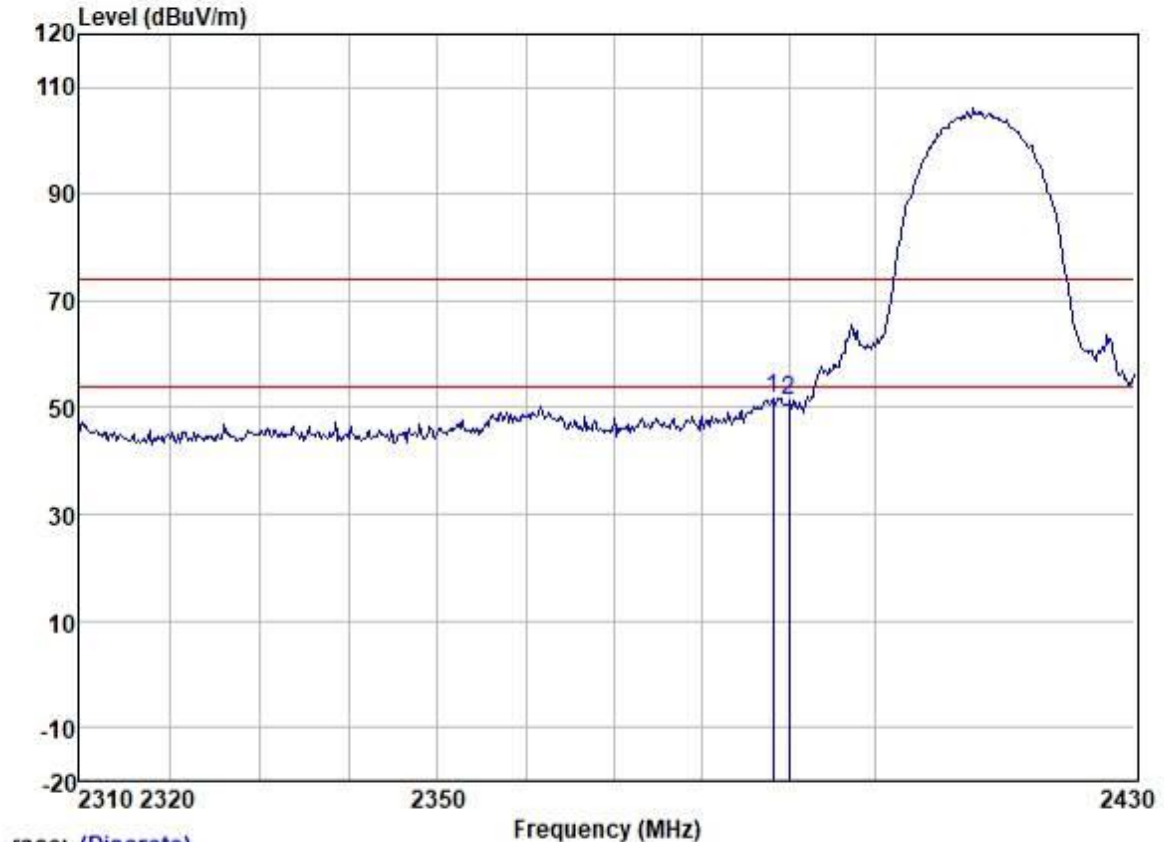
Test Mode: 00; Polarity: Horizontal; Modulation:GFSK; Channel:High



Trace: (Discrete)

	ReadAntenna	Cable	Preamp		Limit	Over		
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	Remark
1 2483.500	56.73	27.85	3.42	37.73	50.27	74.00	-23.73	HORIZONTAL Peak
2 2494.228	58.42	27.86	3.33	37.72	51.89	74.00	-22.11	HORIZONTAL Peak

Test Mode: 03; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:Low



Trace: (Discrete)

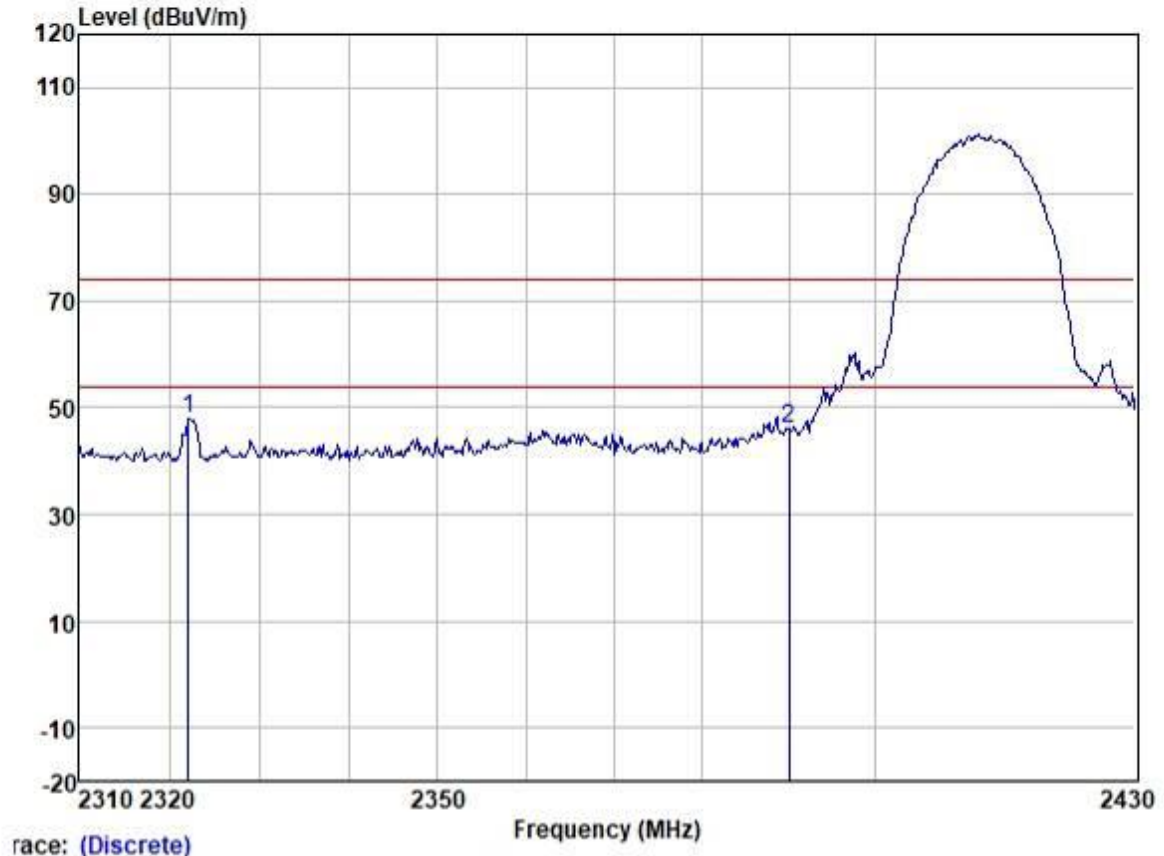
	ReadAntenna	Cable	Preamp		Limit	Over			
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1 2388.154	57.54	27.68	4.22	37.77	51.67	74.00	-22.33	VERTICAL	Peak
2 2390.000	57.24	27.68	4.22	37.76	51.38	74.00	-22.62	VERTICAL	Peak



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Test Mode: 03; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:Low



Trace: (Discrete)

	Freq	ReadAntenna	Cable	Preamp	Level	Limit	Over		
	MHz	Level	Loss	Factor	dBuV/m	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dB		
1	2322.081	53.43	27.52	4.94	37.79	48.10	74.00	-25.90	HORIZONTAL Peak
2	2390.000	52.11	27.68	4.22	37.76	46.25	74.00	-27.75	HORIZONTAL Peak

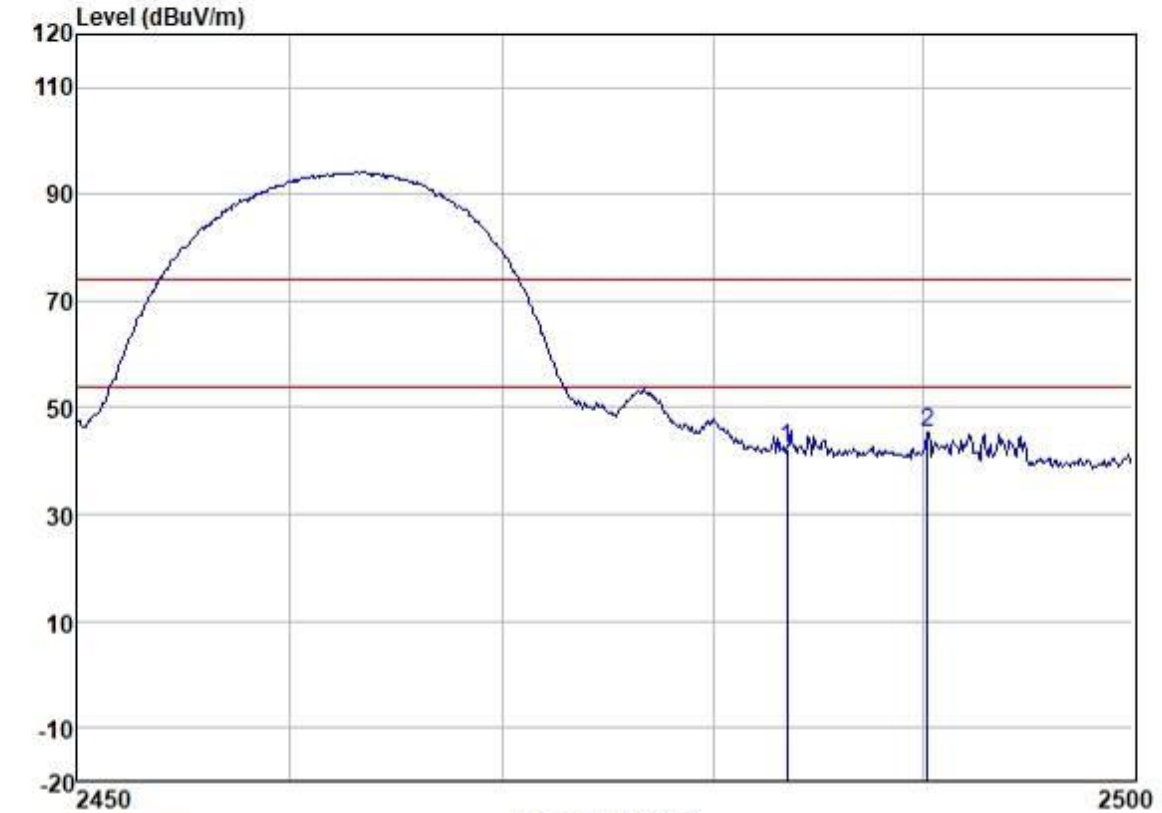


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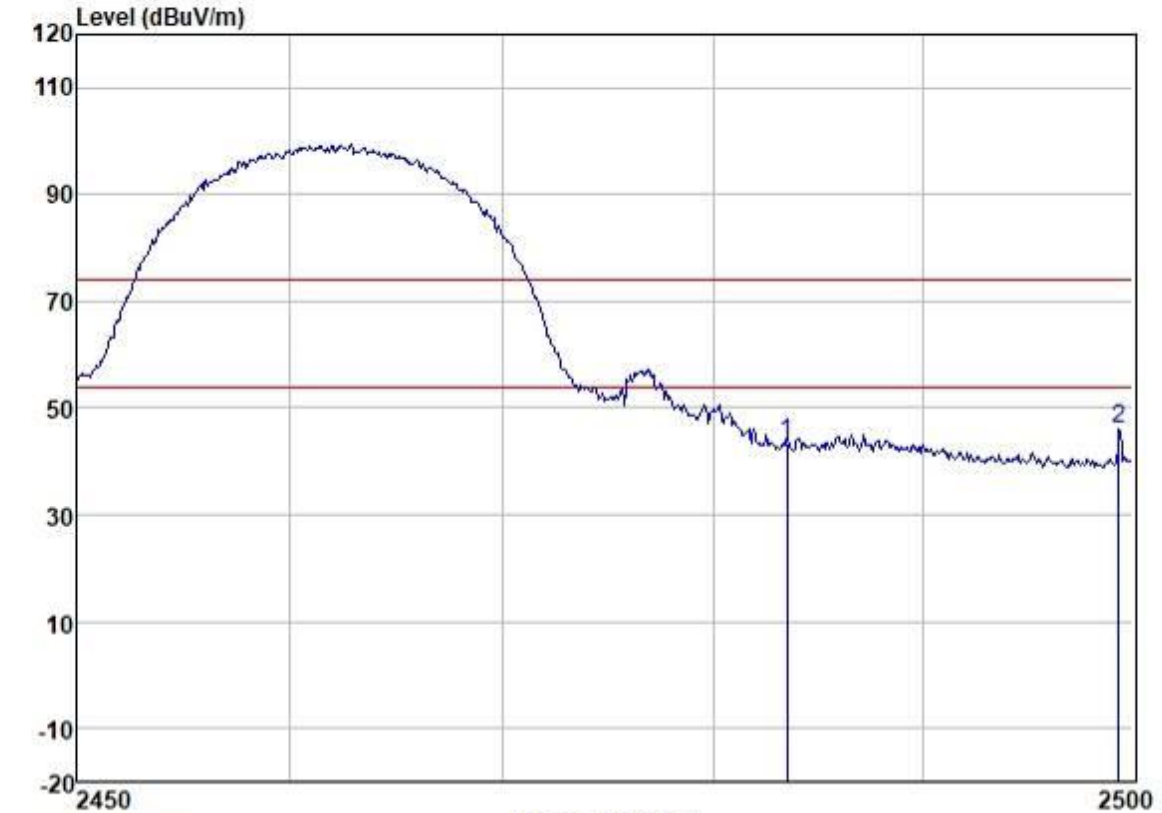
Test Mode: 03; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:High



Trace: (Discrete)

	Freq	ReadAntenna	Cable	Preamp	Level	Limit	Over		
	MHz	Level	Loss	Factor	dBuV/m	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dB		
1	2483.500	48.88	27.85	3.42	37.73	42.42	74.00	-31.58	VERTICAL Peak
2	2490.171	51.95	27.86	3.33	37.73	45.41	74.00	-28.59	VERTICAL Peak

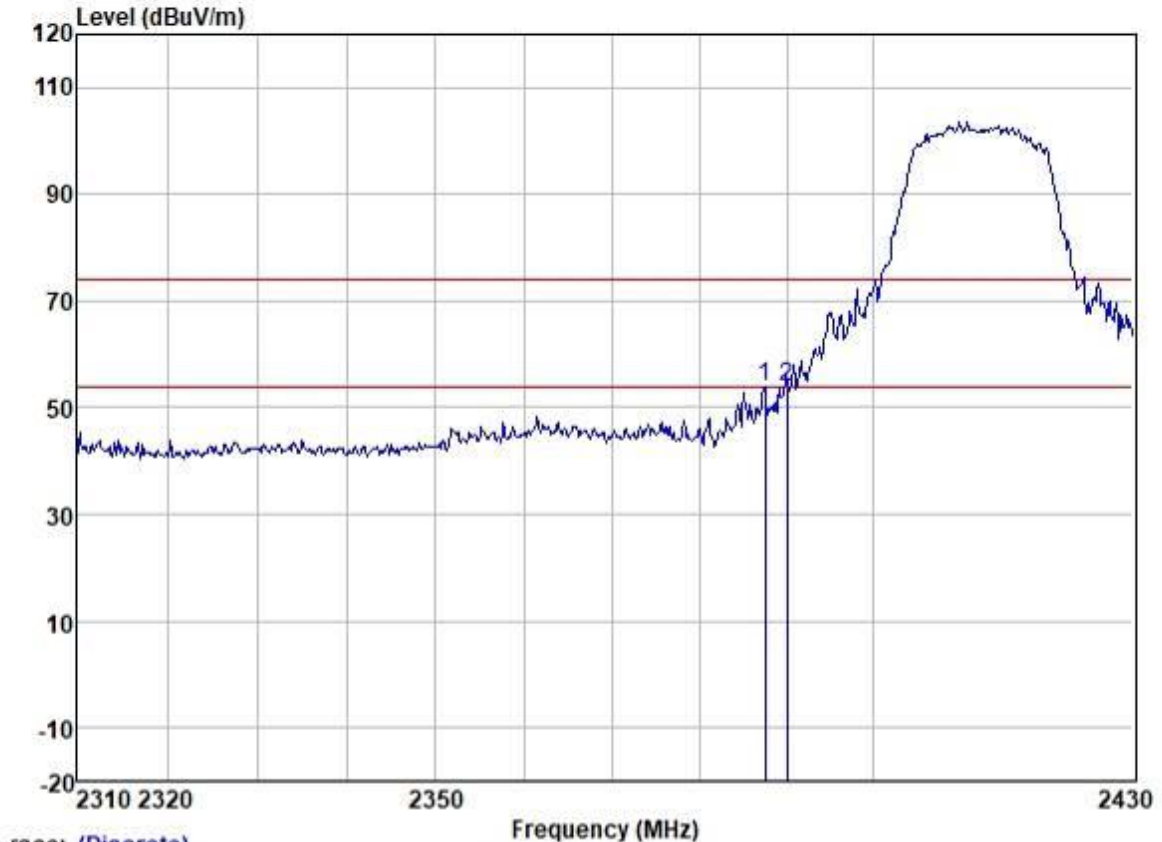
Test Mode: 03; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:High



Trace: (Discrete)

	Freq	ReadAntenna	Cable	Preamp	Level	Limit	Over		
	MHz	Level	Factor	Loss	Factor	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2483.500	49.97	27.85	3.42	37.73	43.51	74.00	-30.49	HORIZONTAL Peak
2	2499.293	52.65	27.87	3.24	37.72	46.04	74.00	-27.96	HORIZONTAL Peak

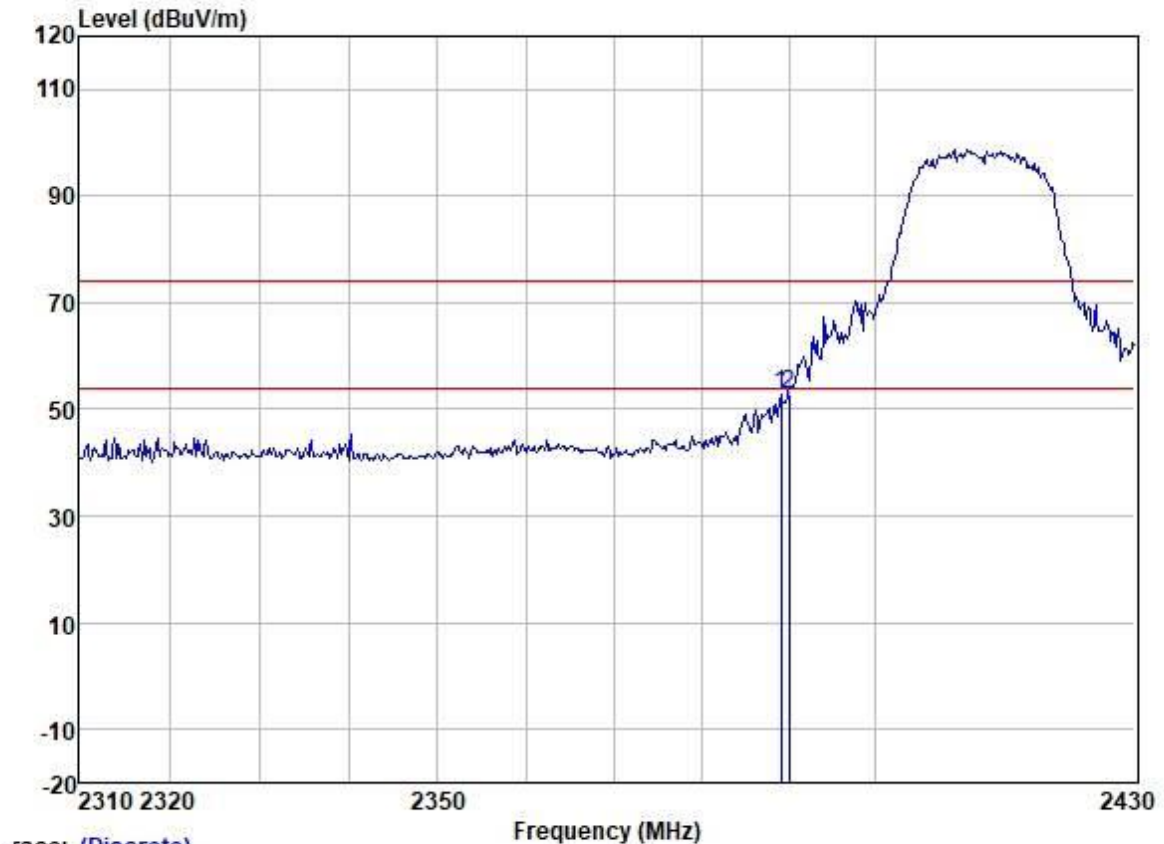
Test Mode: 03; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:Low



Trace: (Discrete)

	Freq	ReadAntenna	Cable	Preamp	Level	Limit	Over		
	MHz	Level	Loss	Factor	dBuV/m	Line	Limit	Pol/Phase	Remark
		dBuV	dB/m	dB	dB	dBuV/m	dB		
1	2387.428	59.87	27.68	4.22	37.77	54.00	74.00	-20.00	VERTICAL Peak
2	2390.000	59.65	27.68	4.22	37.76	53.79	74.00	-20.21	VERTICAL Peak

Test Mode: 03; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:Low

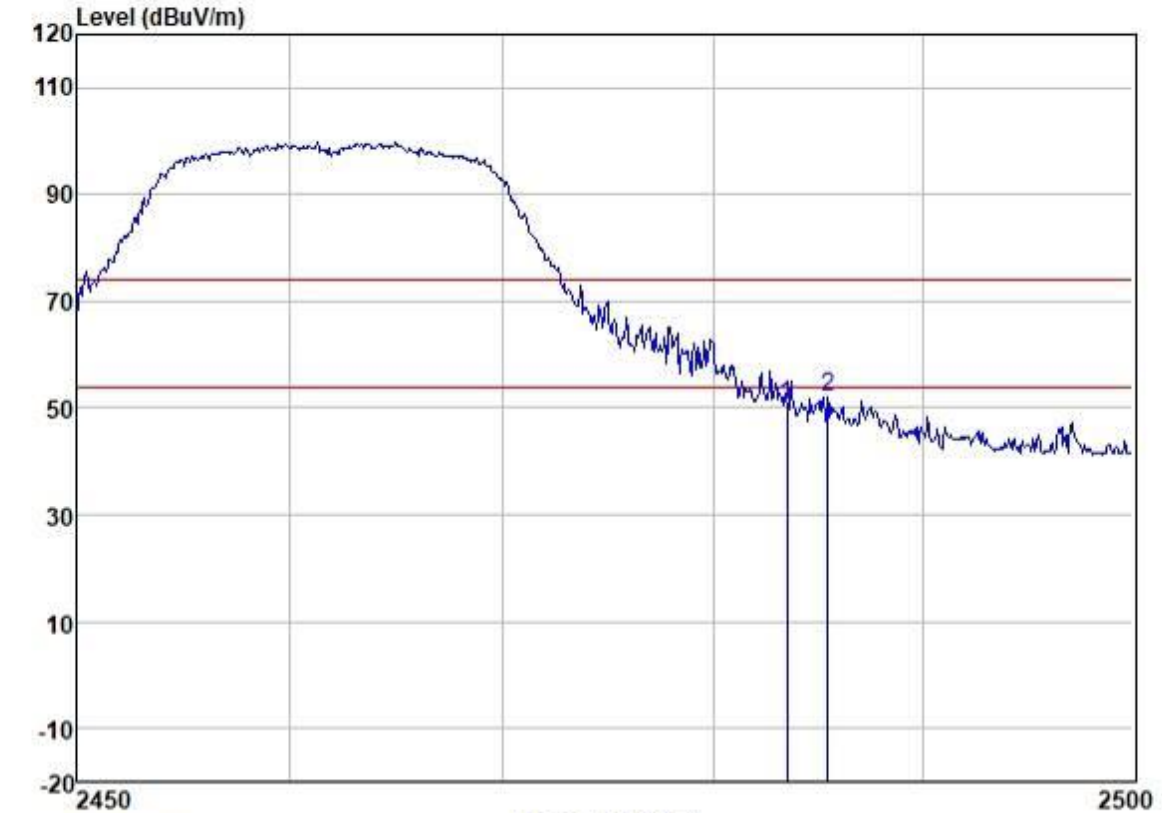


Trace: (Discrete)

	Read	Antenna	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	2389.121	58.73	27.68	4.22	37.77	52.86	74.00	-21.14	HORIZONTAL Peak
2	2390.000	58.72	27.68	4.22	37.76	52.86	74.00	-21.14	HORIZONTAL Peak



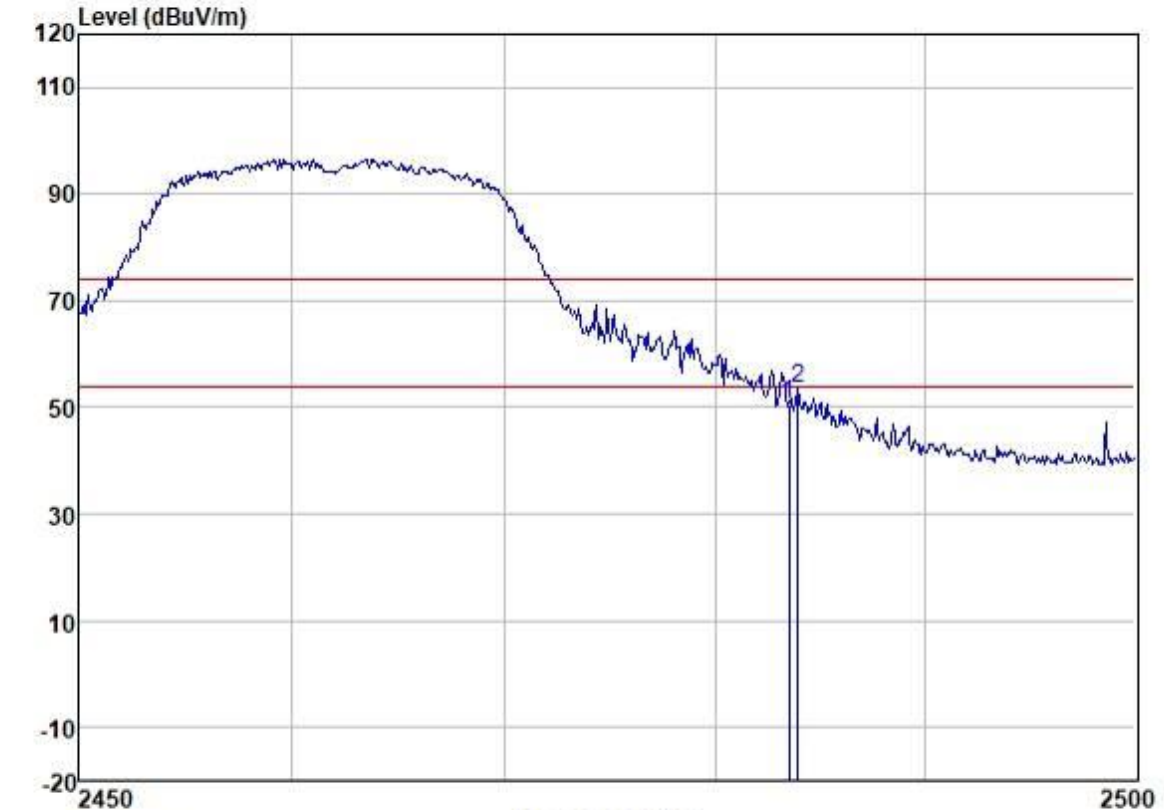
Test Mode: 03; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:High



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	2483.500	57.20	27.85	3.42	37.73	50.74	74.00	-23.26	VERTICAL	Peak
2	2485.446	58.40	27.85	3.42	37.73	51.94	74.00	-22.06	VERTICAL	Peak

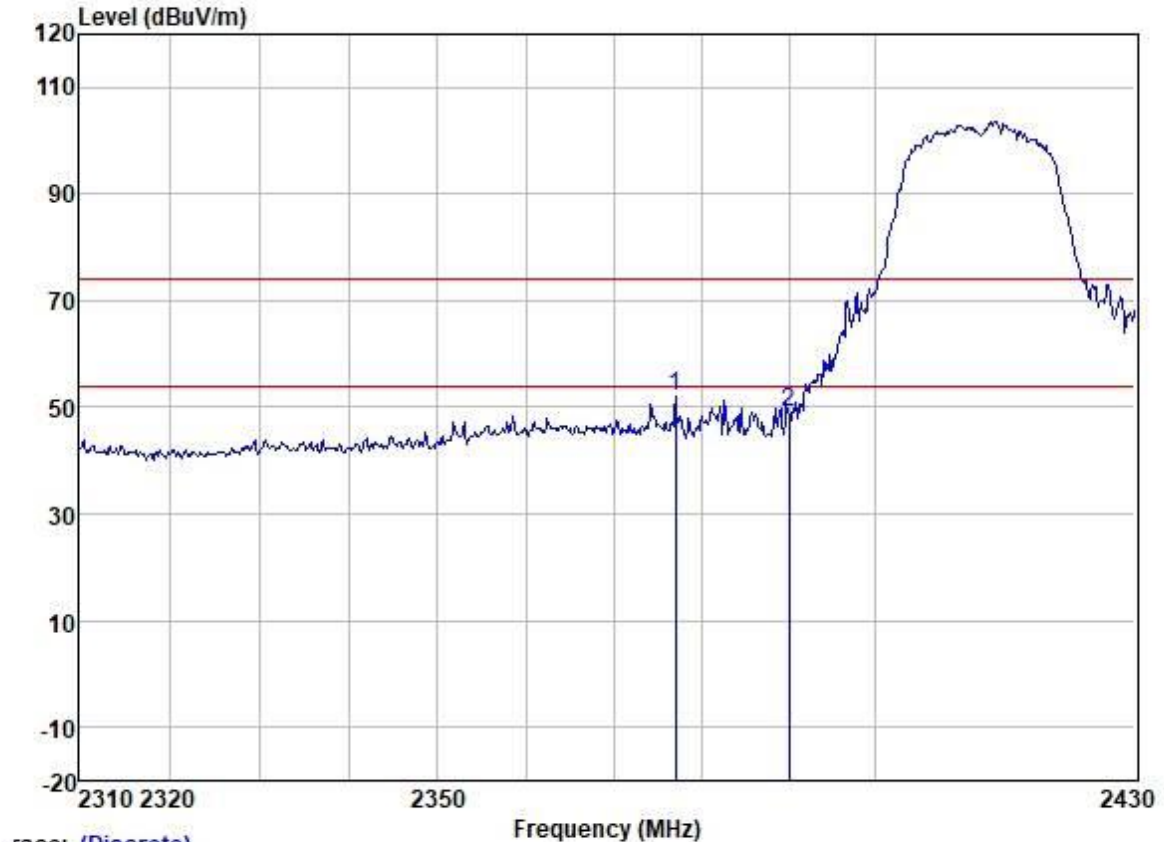
Test Mode: 03; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:High



Trace: (Discrete)

	ReadAntenna	Cable	Preamp		Limit	Over		
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	Remark
1	2483.500	57.16	27.85	3.42	37.73	50.70	74.00	-23.30 HORIZONTAL Peak
2	2483.940	59.87	27.85	3.42	37.73	53.41	74.00	-20.59 HORIZONTAL Peak

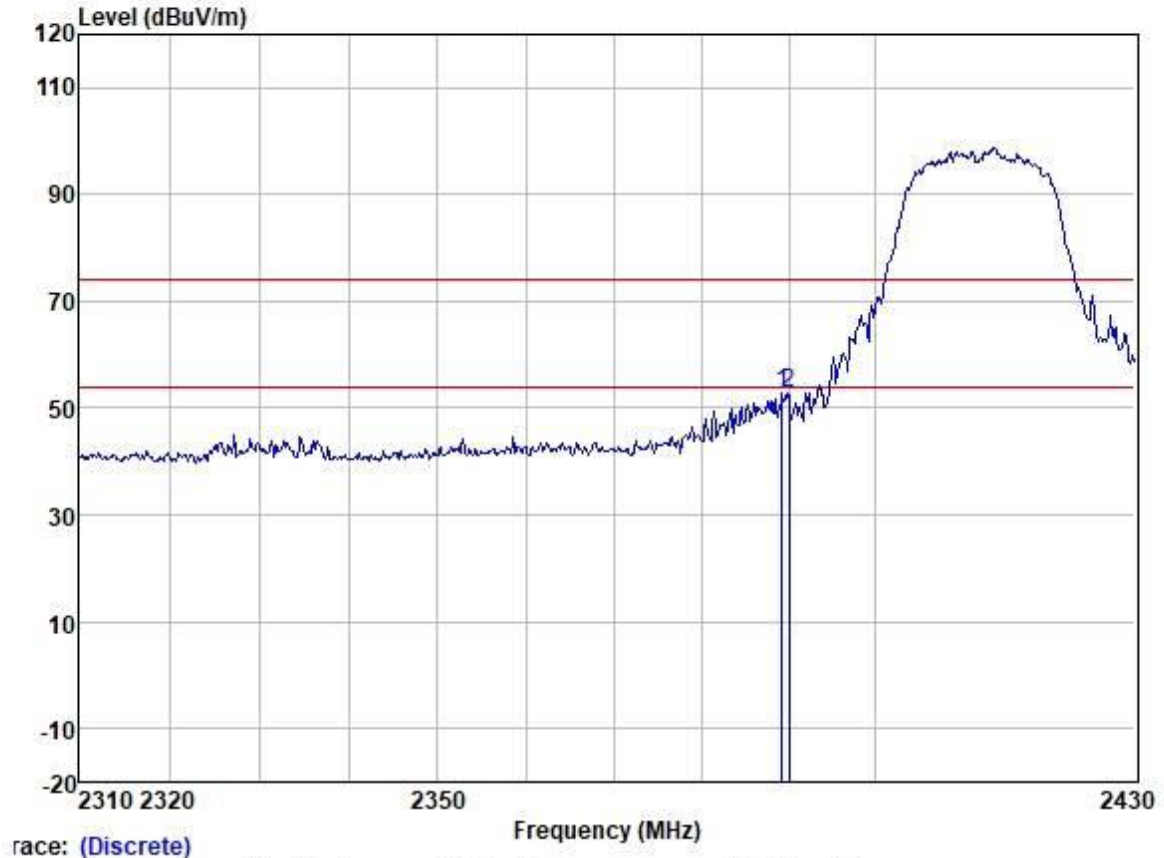
Test Mode: 03; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:Low



Trace: (Discrete)

	Read	Antenna	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	2377.052	57.76	27.67	4.27	37.77	51.93	74.00	-22.07	VERTICAL Peak
2	2390.000	54.94	27.68	4.22	37.76	49.08	74.00	-24.92	VERTICAL Peak

Test Mode: 03; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:Low



Trace: (Discrete)

	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	2389.242	58.54	27.68	4.22	37.77	52.67	74.00	-21.33	HORIZONTAL Peak
2	2390.000	58.71	27.68	4.22	37.76	52.85	74.00	-21.15	HORIZONTAL Peak

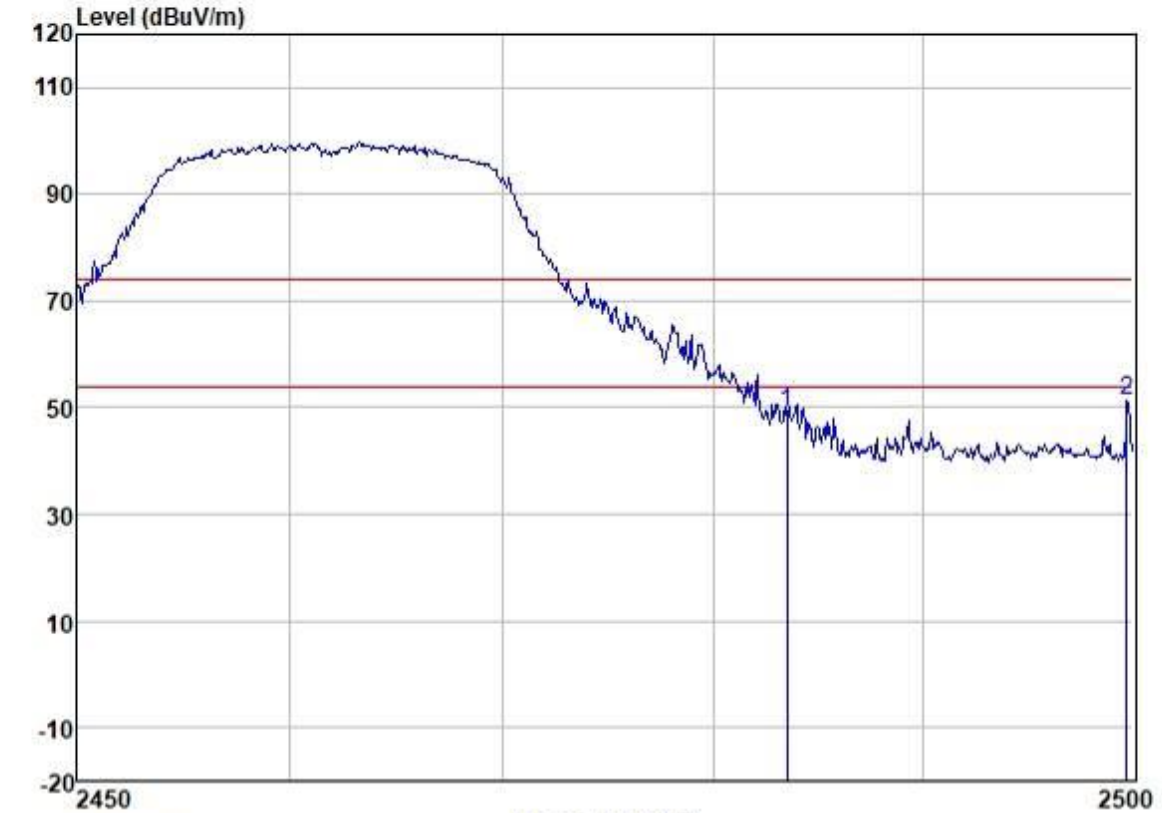


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Test Mode: 03; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:High



Trace: (Discrete)

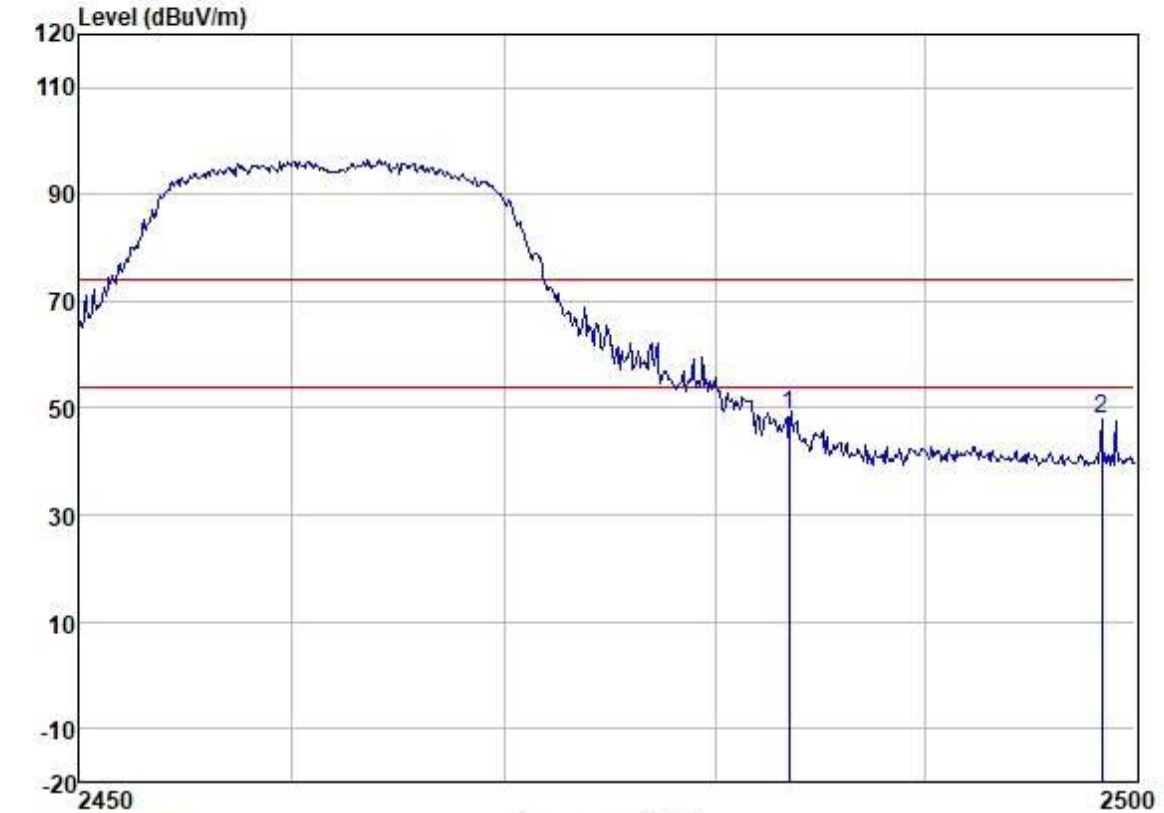
	Freq	ReadAntenna	Cable	Preamp	Limit	Over			
	MHz	Level	Loss	Factor	Line	Limit	Pol/Phase	Remark	
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2483.500	55.41	27.85	3.42	37.73	48.95	74.00	-25.05	VERTICAL Peak
2	2499.697	57.77	27.87	3.24	37.72	51.16	74.00	-22.84	VERTICAL Peak



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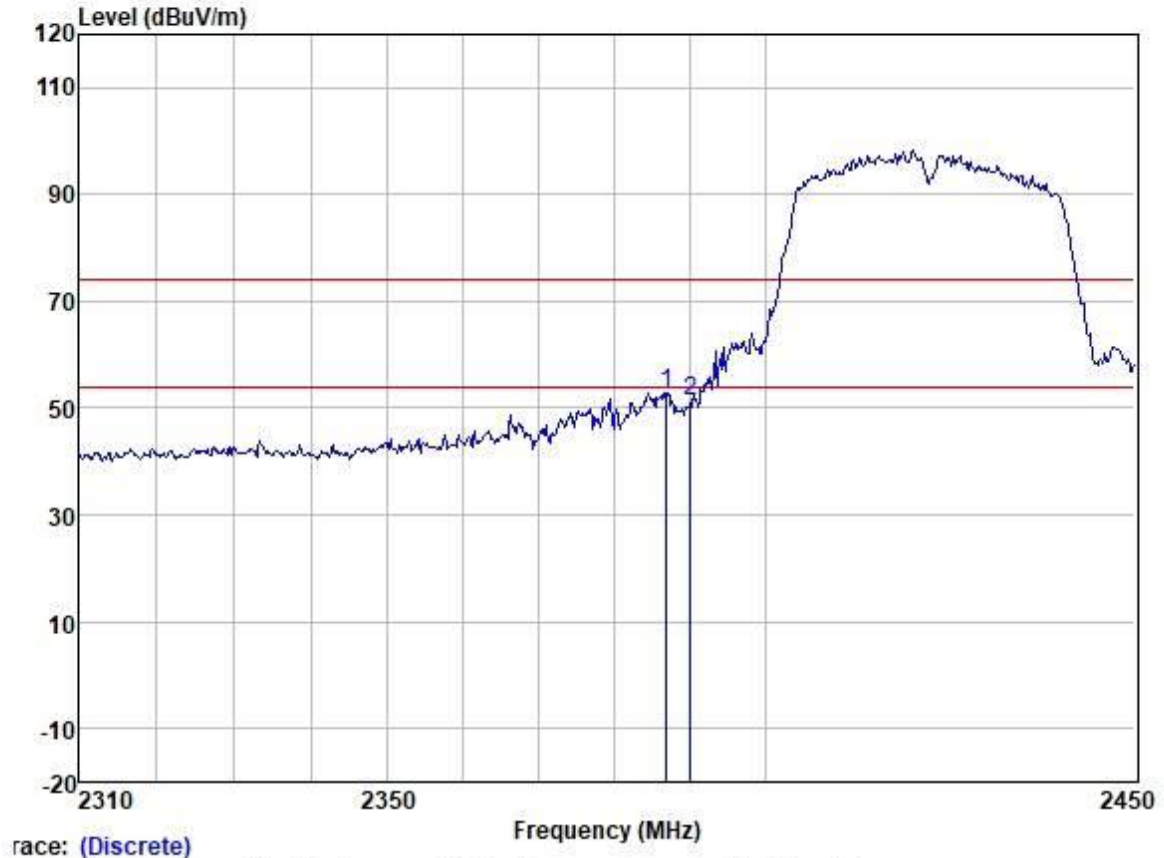
Test Mode: 03; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:High



Trace: (Discrete)

	Freq	ReadAntenna	Cable	Preamp	Limit	Over		
	MHz	Level	Loss	Factor	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dB	
1	2483.500	55.12	27.85	3.42	37.73	48.66	74.00	-25.34 HORIZONTAL Peak
2	2498.384	54.41	27.87	3.24	37.72	47.80	74.00	-26.20 HORIZONTAL Peak

Test Mode: 03; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:Low



Trace: (Discrete)

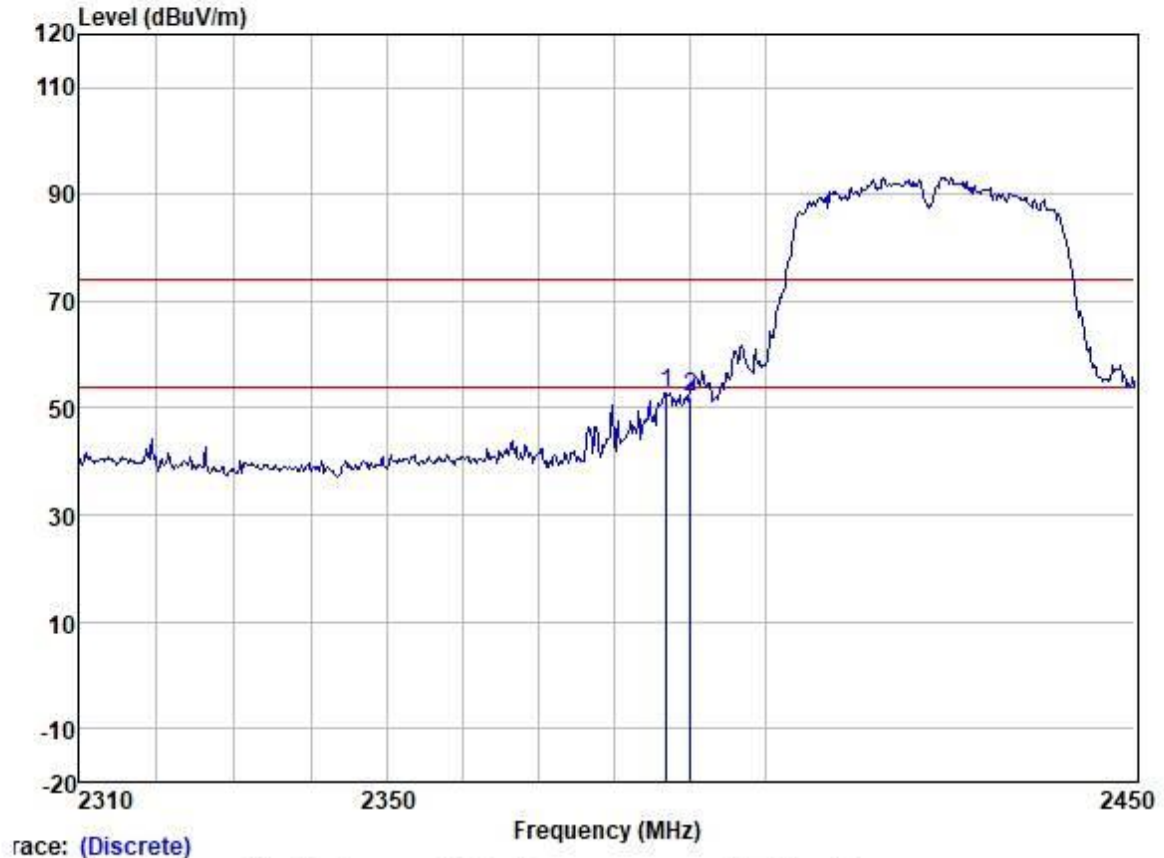
	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2386.822	58.81	27.68	4.22	37.77	52.94	74.00	-21.06	VERTICAL	Peak
2	2390.000	57.24	27.68	4.22	37.76	51.38	74.00	-22.62	VERTICAL	Peak



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Test Mode: 03; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:Low

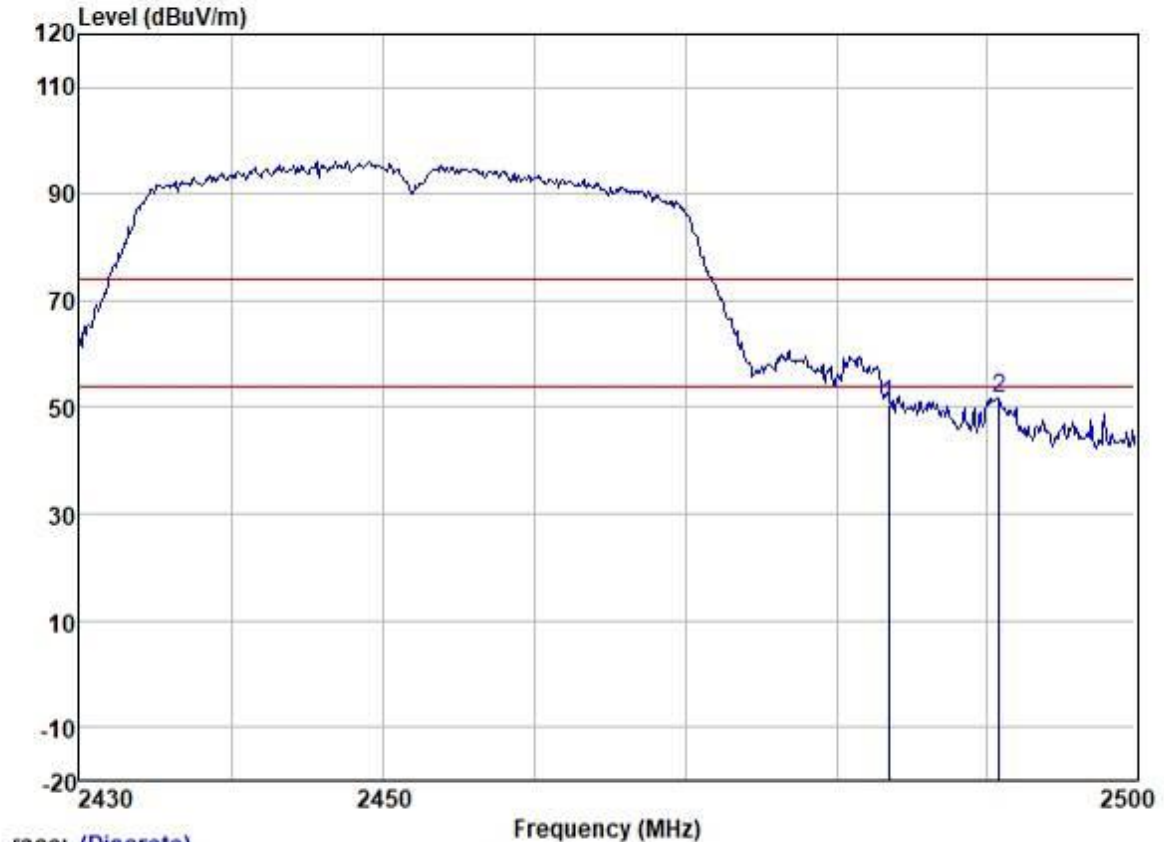


Trace: (Discrete)

	Freq	ReadAntenna	Cable	Preamp	Level	Limit	Over		
	MHz	Level	Factor	Loss	Factor	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2386.822	58.70	27.68	4.22	37.77	52.83	74.00	-21.17	HORIZONTAL Peak
2	2390.000	57.93	27.68	4.22	37.76	52.07	74.00	-21.93	HORIZONTAL Peak



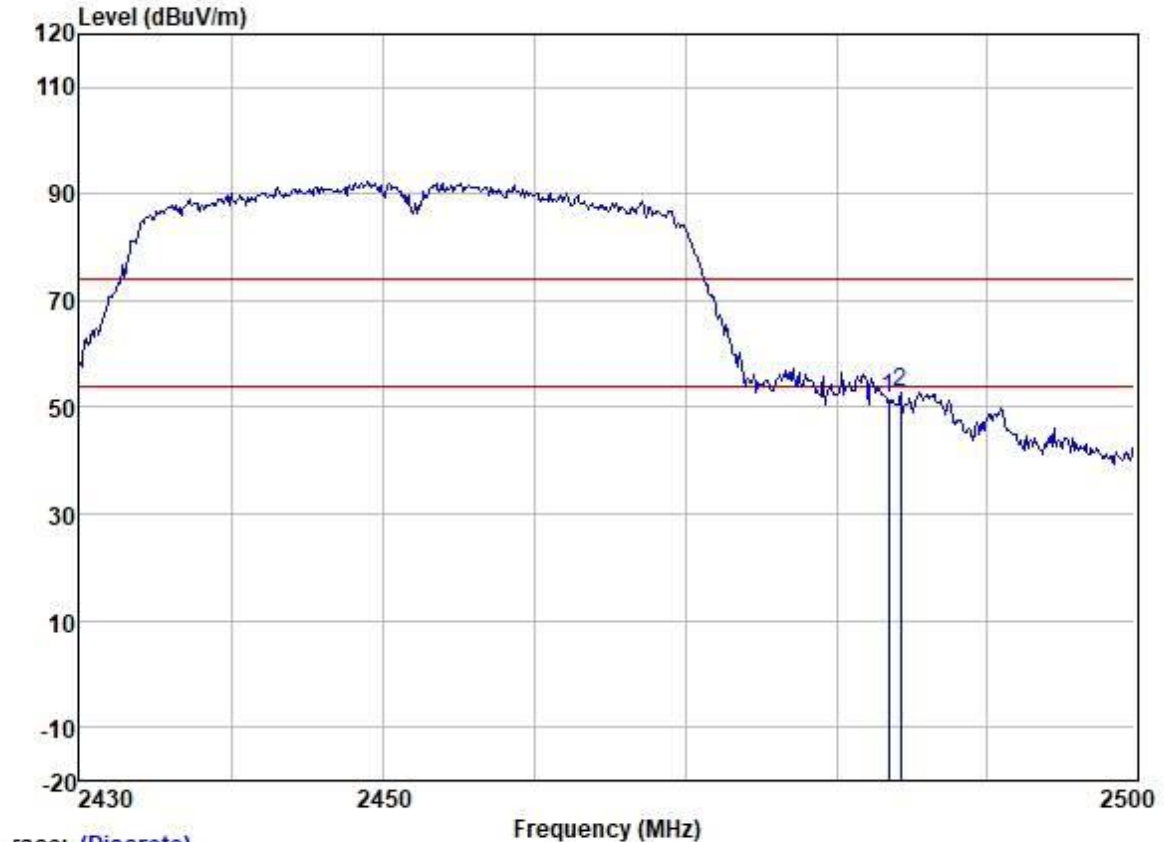
Test Mode: 03; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:High



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 2483.500	57.12	27.85	3.42	37.73	50.66	74.00	-23.34	VERTICAL	Peak
2 2490.858	58.33	27.86	3.33	37.73	51.79	74.00	-22.21	VERTICAL	Peak

Test Mode: 03; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:High



Trace: (Discrete)

	Freq	ReadAntenna	Cable	Preamp	Limit	Over		
	MHz	Level	Loss	Factor	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dB	
1	2483.500	58.13	27.85	3.42	37.73	51.67	74.00	-22.33 HORIZONTAL Peak
2	2484.288	59.38	27.85	3.42	37.73	52.92	74.00	-21.08 HORIZONTAL Peak

### 7.8 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

Limit:

Test Distance: 3 m

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
960-1000	500	3

#### 7.8.1 E.U.T. Operation

Operating Environment:

Temperature: 23.6 °C

Humidity: 56.3 % RH

Atmospheric Pressure: 1020 mbar

#### 7.8.2 Test Mode Description

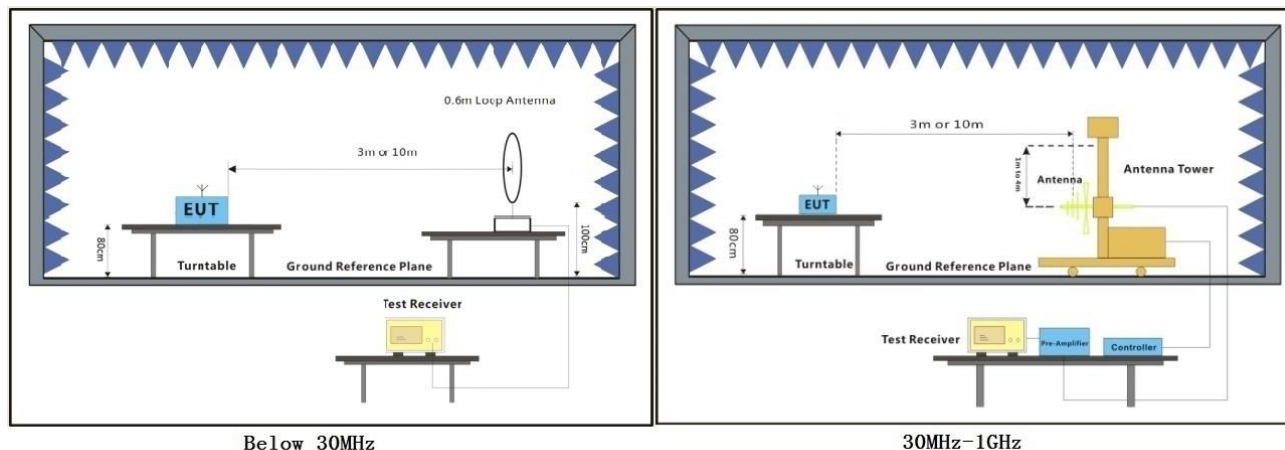
Pre-scan / Final test	Mode Code	Description
Pre-scan	00	TX mode(1Mbps)_Keep the EUT in charging and continuously transmitting mode with GFSK modulation.  TX mode_Keep the EUT in charging and continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested 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), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.
Final test	03	



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### 7.8.3 Test Setup Diagram



### 7.8.4 Measurement Procedure and Data

- 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.
- 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.
- 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.
- 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.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- 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 quasi-peak method as specified and then reported in a data sheet.
- Test the EUT in the lowest channel, the middle channel, the Highest channel.
- 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.
- Repeat above procedures until all frequencies measured was complete.

Remark:

- Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor
- Scan from 9kHz to 30MHz, 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.
- The disturbance below 1GHz was very low and the harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.

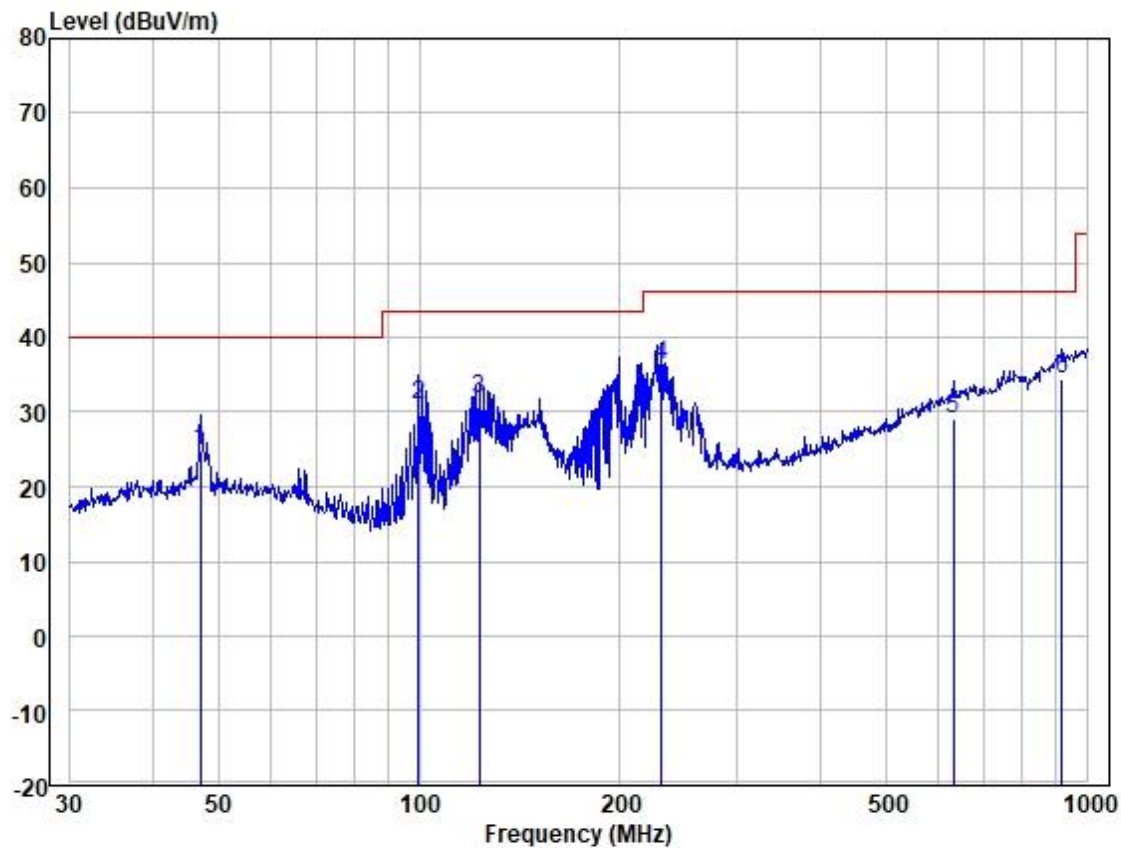


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Test Mode: 03; Polarity: Horizontal



Site : 966 Chamber  
Job :  
Model :  
Power :  
Test Mode :

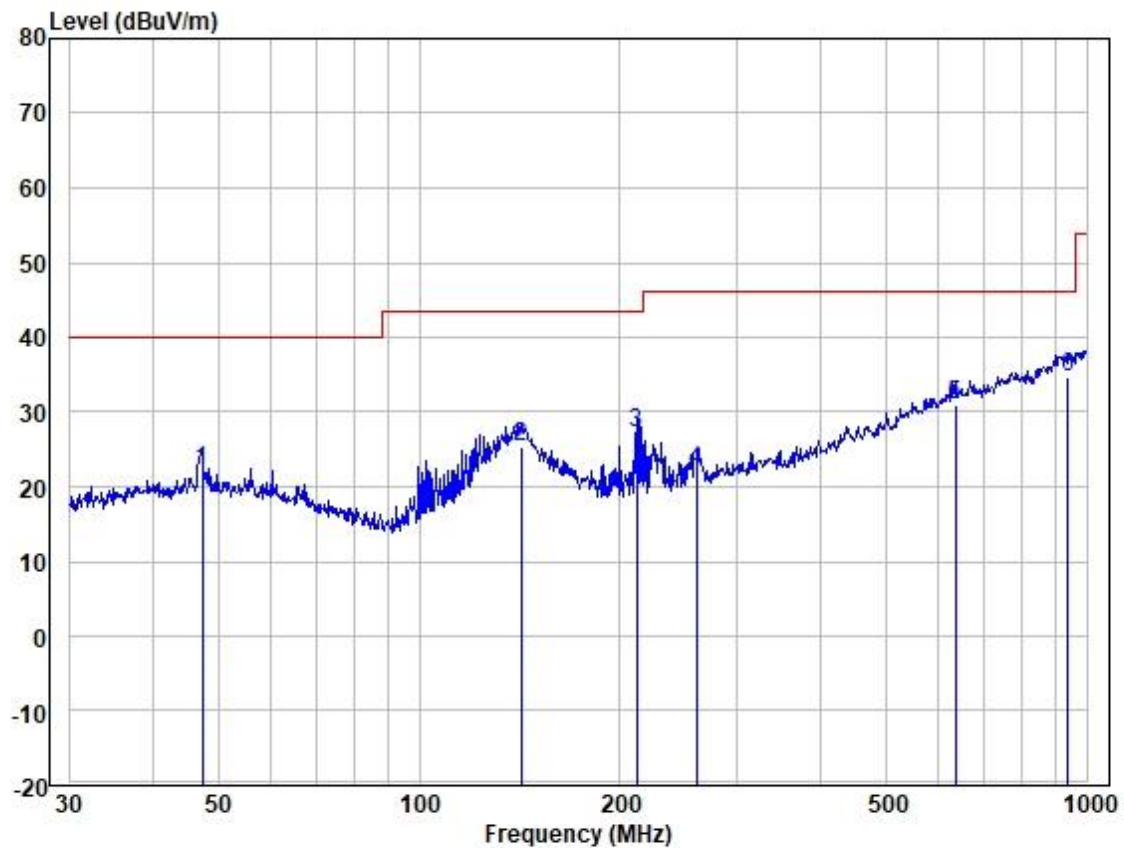
	Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Measured Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	46.995	37.41	19.50	0.76	32.99	24.68	40.00	-15.32	HORIZONTAL	QP
2	99.878	48.35	14.55	1.10	33.00	31.00	43.52	-12.52	HORIZONTAL	QP
3	123.266	46.01	17.52	1.23	33.00	31.76	43.52	-11.76	HORIZONTAL	QP
4	230.907	50.95	16.35	1.90	33.03	36.17	46.02	-9.85	HORIZONTAL	QP
5	631.688	32.97	26.37	3.21	33.37	29.18	46.02	-16.84	HORIZONTAL	QP
6	916.069	32.83	29.50	4.25	32.12	34.46	46.02	-11.56	HORIZONTAL	QP



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Test Mode: 03; Polarity: Vertical



Site : 966 Chamber  
Job :  
Model :  
Power :  
Test Mode :

	Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Measured Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	47.326	34.88	19.50	0.76	32.99	22.15	40.00	-17.85	VERTICAL	QP
2	142.324	38.21	18.74	1.35	33.00	25.30	43.52	-18.22	VERTICAL	QP
3	211.527	42.62	15.65	1.90	33.01	27.16	43.52	-16.36	VERTICAL	QP
4	260.144	35.53	17.77	1.90	33.06	22.14	46.02	-23.88	VERTICAL	QP
5	636.134	34.69	26.48	3.24	33.36	31.05	46.02	-14.97	VERTICAL	QP
6	935.546	32.48	29.78	4.26	31.90	34.62	46.02	-11.40	VERTICAL	QP



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### 7.9 Radiated Spurious Emissions Above 1GHz

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

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

Limit:

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance(meters)
Above 1000	500	3

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

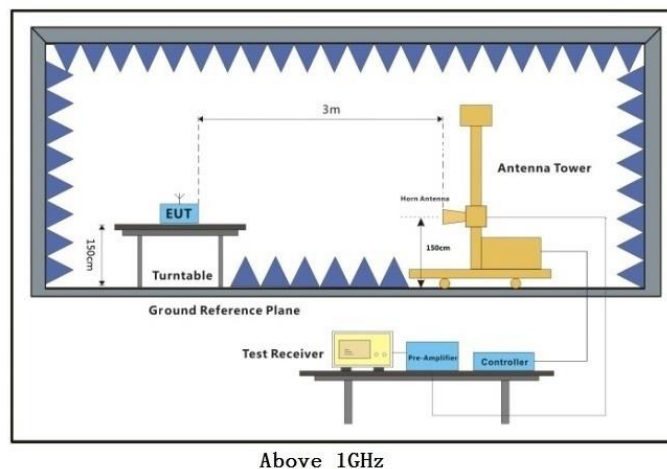
Operating Environment:

Temperature: 24.2 °C Humidity: 63.0 % RH Atmospheric Pressure: 1020 mbar

#### 7.9.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode(1Mbps)_Keep the EUT in charging and continuously transmitting mode with GFSK modulation.
Final test	03	TX mode_Keep the EUT in charging and 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), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.

#### 7.9.3 Test Setup Diagram





## 7.9.4 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 (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 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. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp 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. As shown in this section, 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.



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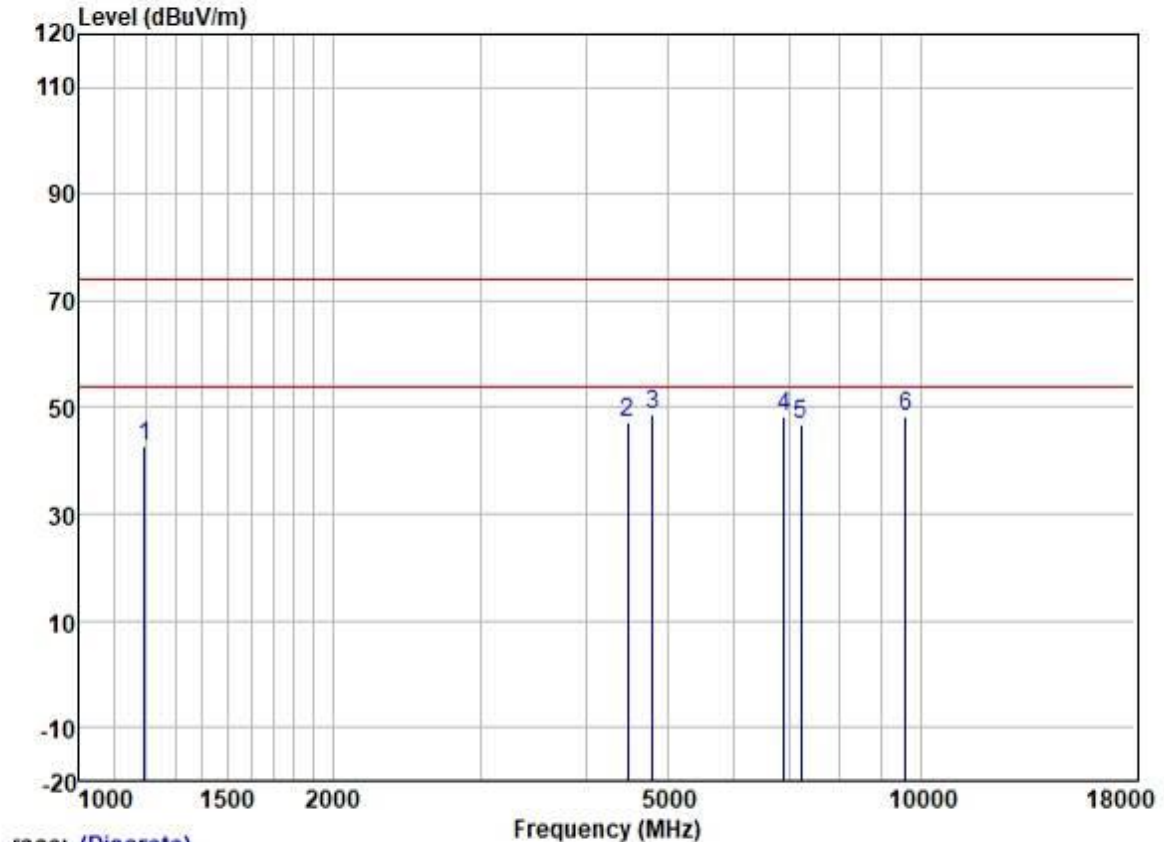
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Guangzhou Branch Testing Laboratory

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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

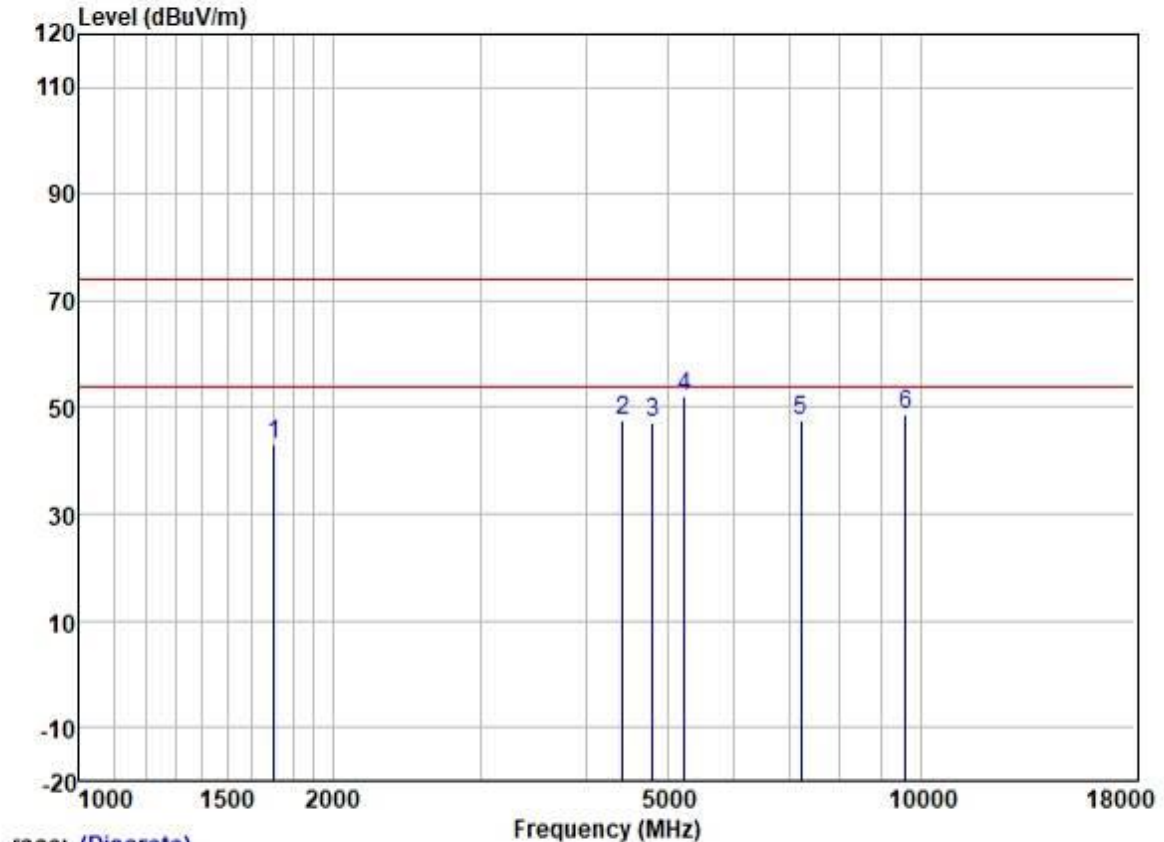


Test Mode: 00; Polarity: Vertical; Modulation:GFSK; Channel:Low



race: (Discrete)	Frequency (MHz)									
	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	1196.264	54.84	23.14	2.58	37.99	42.57	74.00	-31.43	VERTICAL	peak
2	4482.150	44.73	34.12	5.34	36.83	47.36	74.00	-26.64	VERTICAL	peak
3	4804.000	45.95	34.16	5.46	36.86	48.71	74.00	-25.29	VERTICAL	peak
4	6874.906	44.26	34.88	6.37	37.07	48.44	74.00	-25.56	VERTICAL	peak
5	7206.000	41.93	35.63	6.36	37.13	46.79	74.00	-27.21	VERTICAL	peak
6	9608.000	38.79	38.68	7.99	37.02	48.44	74.00	-25.56	VERTICAL	peak

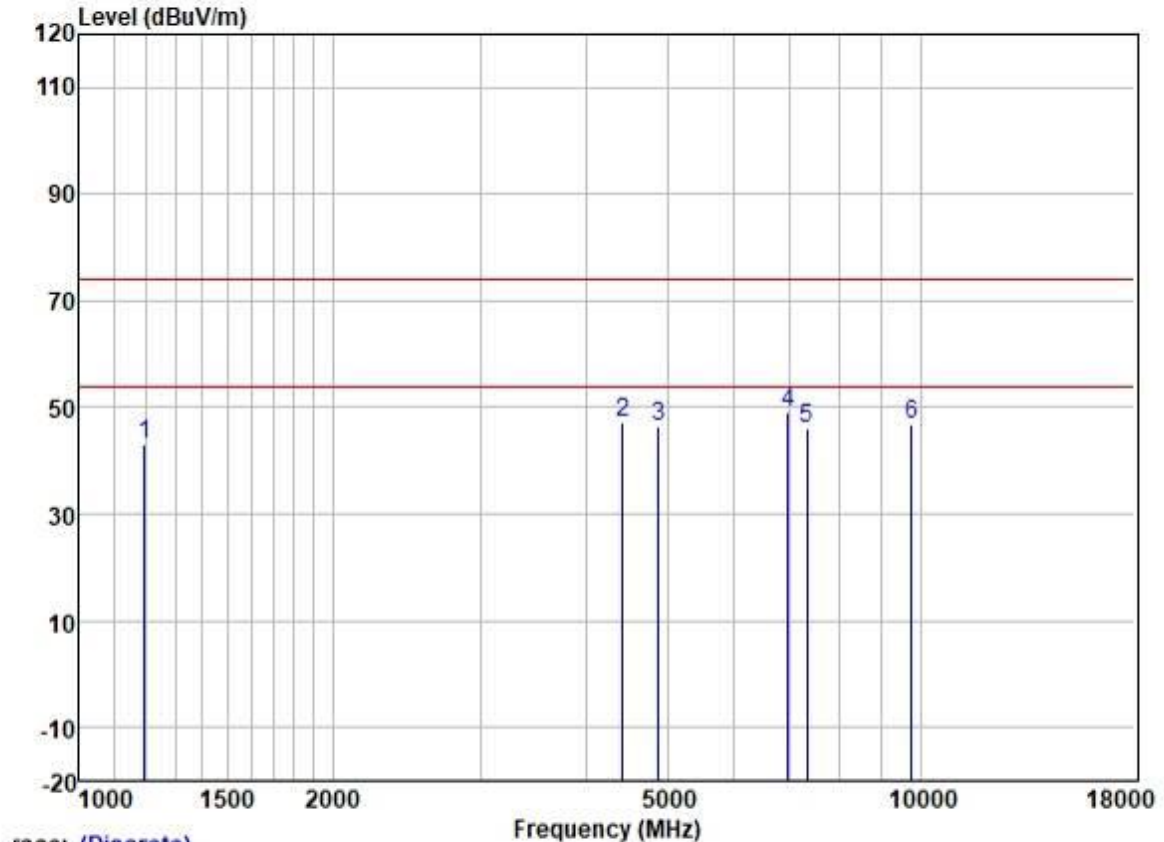
Test Mode: 00; Polarity: Horizontal; Modulation:GFSK; Channel:Low



Trace: (Discrete)

	Freq	ReadAntenna	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	1702.042	52.69	25.15	3.36	37.92	43.28	74.00	-30.72	HORIZONTAL peak
2	4430.628	45.03	33.87	5.36	36.83	47.43	74.00	-26.57	HORIZONTAL peak
3	4804.000	44.28	34.16	5.46	36.86	47.04	74.00	-26.96	HORIZONTAL peak
4	5239.274	50.14	33.45	5.37	36.94	52.02	74.00	-21.98	HORIZONTAL peak
5	7206.000	42.82	35.63	6.36	37.13	47.68	74.00	-26.32	HORIZONTAL peak
6	9608.000	39.10	38.68	7.99	37.02	48.75	74.00	-25.25	HORIZONTAL peak

Test Mode: 00; Polarity: Vertical; Modulation:GFSK; Channel:middle

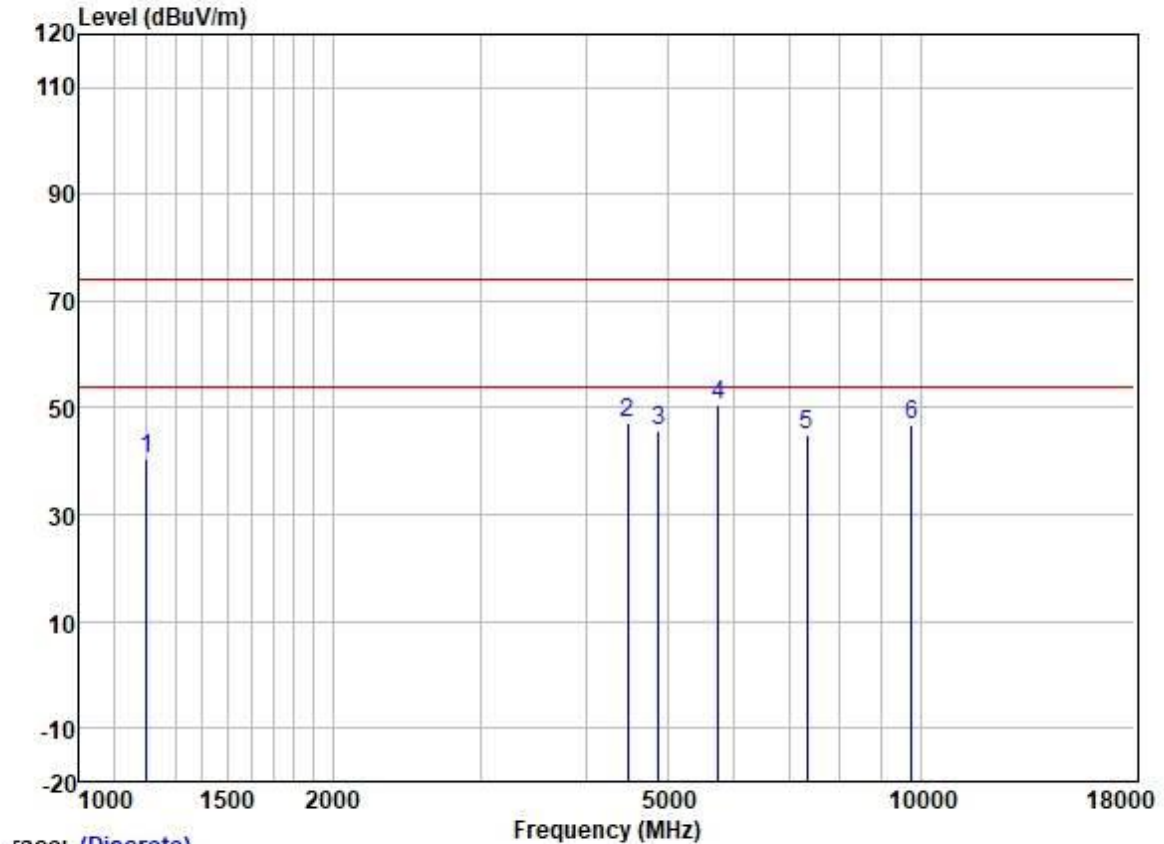


Trace: (Discrete)

	Freq	ReadAntenna	Cable	Preamp	Limit	Over			
	MHz	Level	Loss	Factor	Line	Limit	Pol/Phase	Remark	
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dB		
1	1196.264	55.27	23.14	2.58	37.99	43.00	74.00	-31.00	VERTICAL peak
2	4430.628	44.85	33.87	5.36	36.83	47.25	74.00	-26.75	VERTICAL peak
3	4880.000	43.73	34.15	5.49	36.87	46.50	74.00	-27.50	VERTICAL peak
4	6954.852	44.67	35.04	6.40	37.09	49.02	74.00	-24.98	VERTICAL peak
5	7320.000	40.86	36.07	6.32	37.15	46.10	74.00	-27.90	VERTICAL peak
6	9760.000	37.65	38.81	7.43	37.01	46.88	74.00	-27.12	VERTICAL peak



Test Mode: 00; Polarity: Horizontal; Modulation:GFSK; Channel:middle

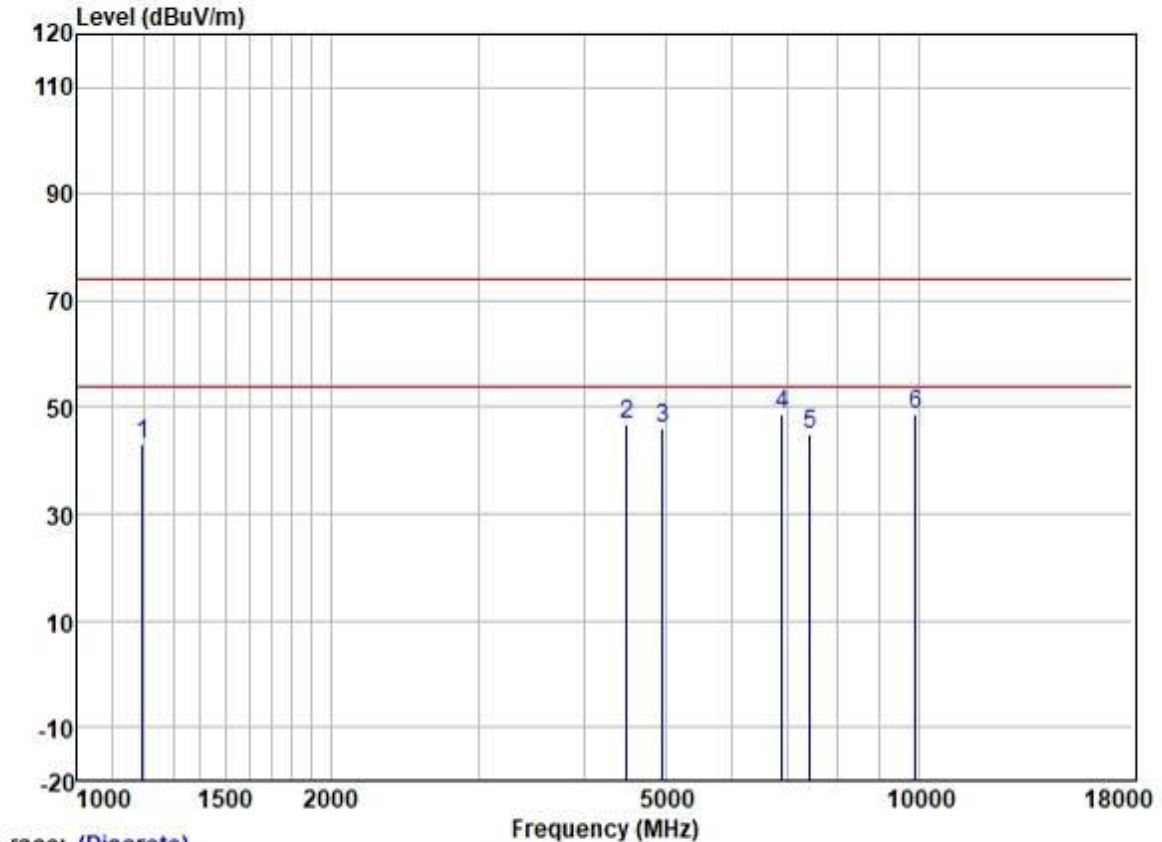


Trace: (Discrete)

	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	1203.199	52.77	23.20	2.58	37.99	40.56	74.00	-33.44	HORIZONTAL peak
2	4482.150	44.45	34.12	5.34	36.83	47.08	74.00	-26.92	HORIZONTAL peak
3	4880.000	43.06	34.15	5.49	36.87	45.83	74.00	-28.17	HORIZONTAL peak
4	5746.982	49.03	32.65	5.70	36.99	50.39	74.00	-23.61	HORIZONTAL peak
5	7320.000	39.59	36.07	6.32	37.15	44.83	74.00	-29.17	HORIZONTAL peak
6	9760.000	37.64	38.81	7.43	37.01	46.87	74.00	-27.13	HORIZONTAL peak



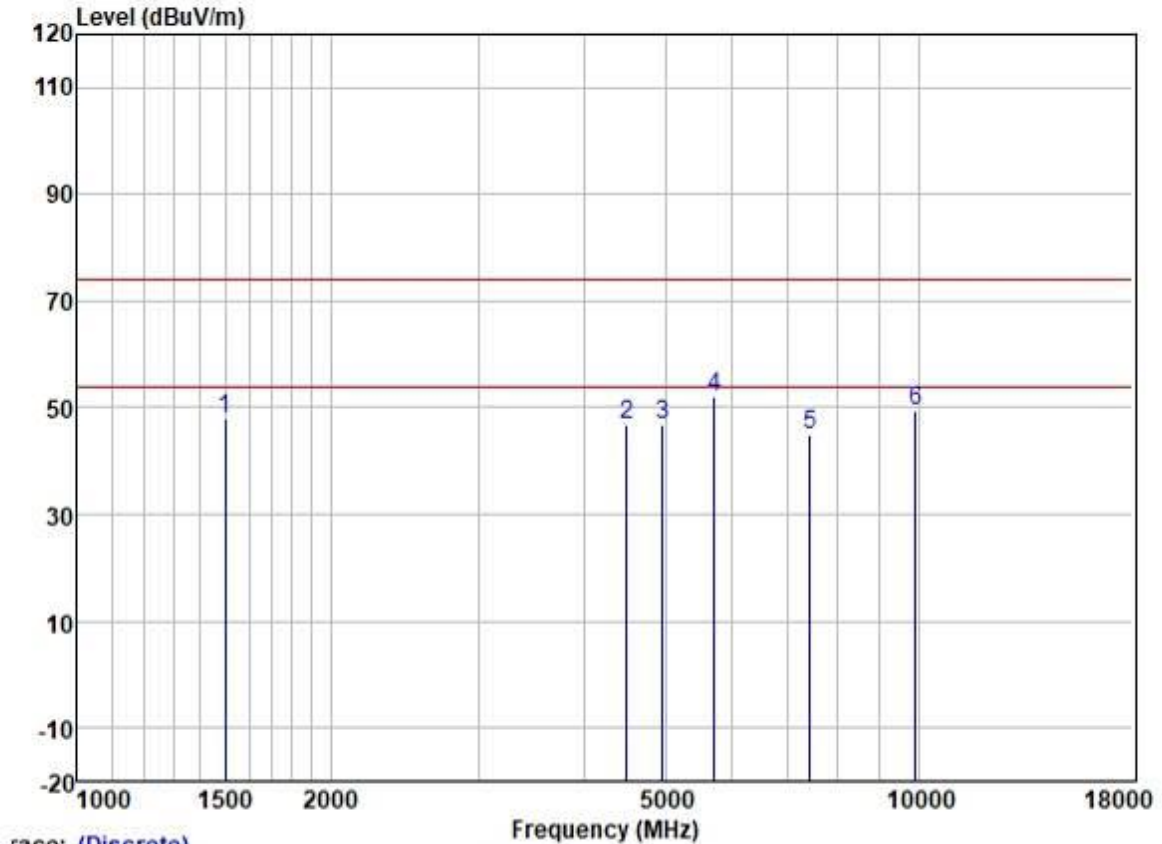
Test Mode: 00; Polarity: Vertical; Modulation:GFSK; Channel:High



Trace: (Discrete)

	Freq	ReadAntenna	Cable	Preamp	Level	Limit	Over		
	MHz	Level	Factor	Loss	Factor	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1196.264	55.20	23.14	2.58	37.99	42.93	74.00	-31.07	VERTICAL peak
2	4495.125	44.26	34.17	5.33	36.83	46.93	74.00	-27.07	VERTICAL peak
3	4960.000	43.37	34.15	5.53	36.89	46.16	74.00	-27.84	VERTICAL peak
4	6874.906	44.48	34.88	6.37	37.07	48.66	74.00	-25.34	VERTICAL peak
5	7440.000	39.56	36.33	6.29	37.16	45.02	74.00	-28.98	VERTICAL peak
6	9920.000	40.13	38.95	6.77	37.00	48.85	74.00	-25.15	VERTICAL peak

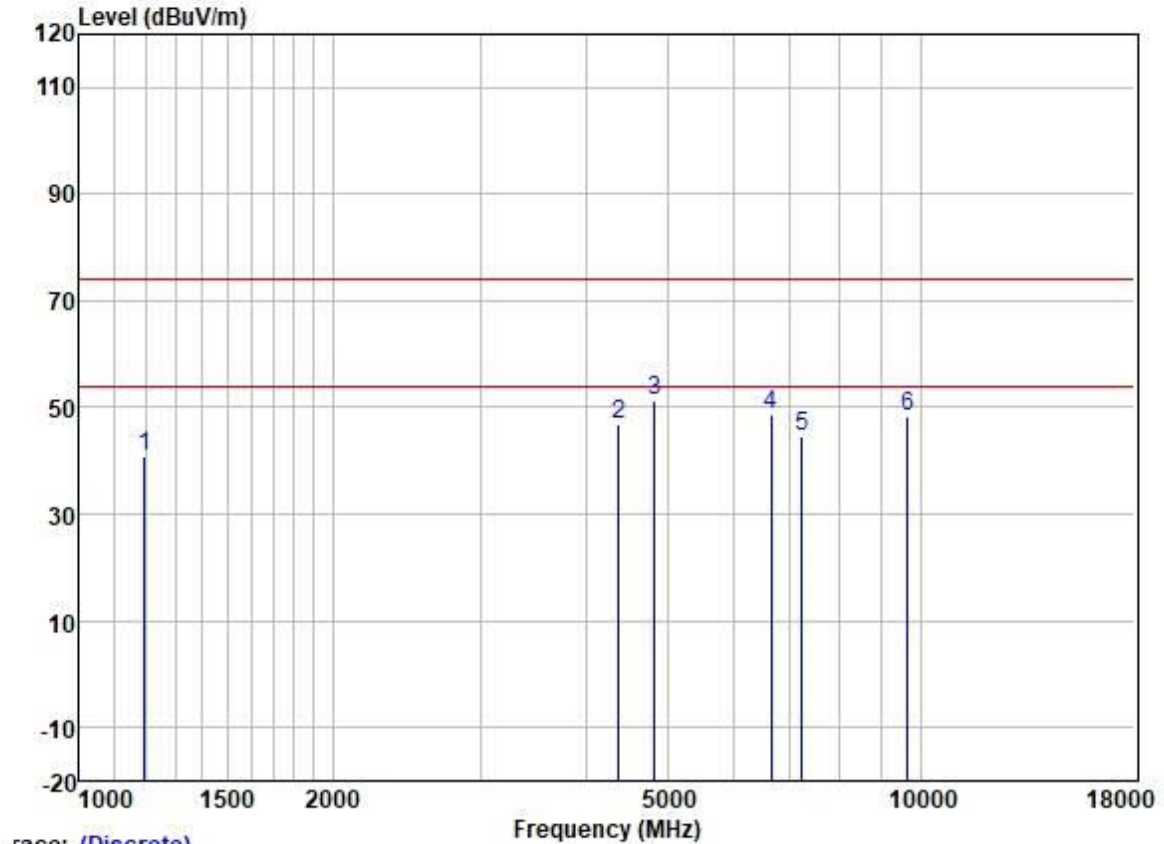
Test Mode: 00; Polarity: Horizontal; Modulation:GFSK; Channel:High



Trace: (Discrete)

	Freq	ReadAntenna	Cable	Preamp	Level	Limit	Over		
	MHz	Level	Loss	Factor	dBuV/m	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dB		
1	1498.781	58.47	24.43	2.89	37.95	47.84	74.00	-26.16	HORIZONTAL peak
2	4495.125	44.30	34.17	5.33	36.83	46.97	74.00	-27.03	HORIZONTAL peak
3	4960.000	44.12	34.15	5.53	36.89	46.91	74.00	-27.09	HORIZONTAL peak
4	5713.856	50.73	32.65	5.72	36.98	52.12	74.00	-21.88	HORIZONTAL peak
5	7440.000	39.36	36.33	6.29	37.16	44.82	74.00	-29.18	HORIZONTAL peak
6	9920.000	40.69	38.95	6.77	37.00	49.41	74.00	-24.59	HORIZONTAL peak

Test Mode: 03; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:Low

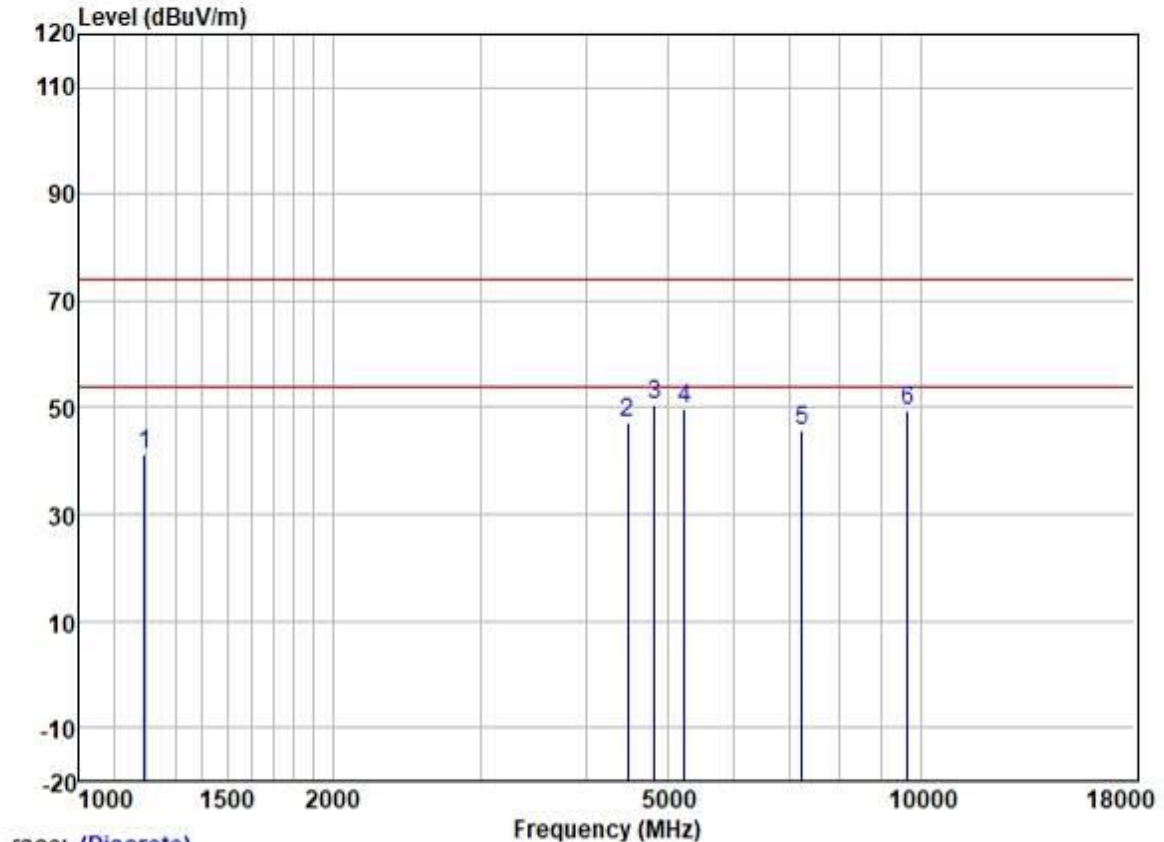


Trace: (Discrete)

	Freq	ReadAntenna	Cable	Preamp	Limit	Over			
	MHz	Level	Loss	Factor	Line	Limit	Pol/Phase	Remark	
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dB		
1	1196.264	53.00	23.14	2.58	37.99	40.73	74.00	-33.27	VERTICAL peak
2	4379.699	44.84	33.59	5.35	36.82	46.96	74.00	-27.04	VERTICAL peak
3	4824.000	48.38	34.16	5.46	36.87	51.13	74.00	-22.87	VERTICAL peak
4	6640.542	45.32	34.17	6.25	37.04	48.70	74.00	-25.30	VERTICAL peak
5	7236.000	39.50	35.78	6.35	37.14	44.49	74.00	-29.51	VERTICAL peak
6	9648.000	38.74	38.70	7.89	37.02	48.31	74.00	-25.69	VERTICAL peak



Test Mode: 03; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:Low

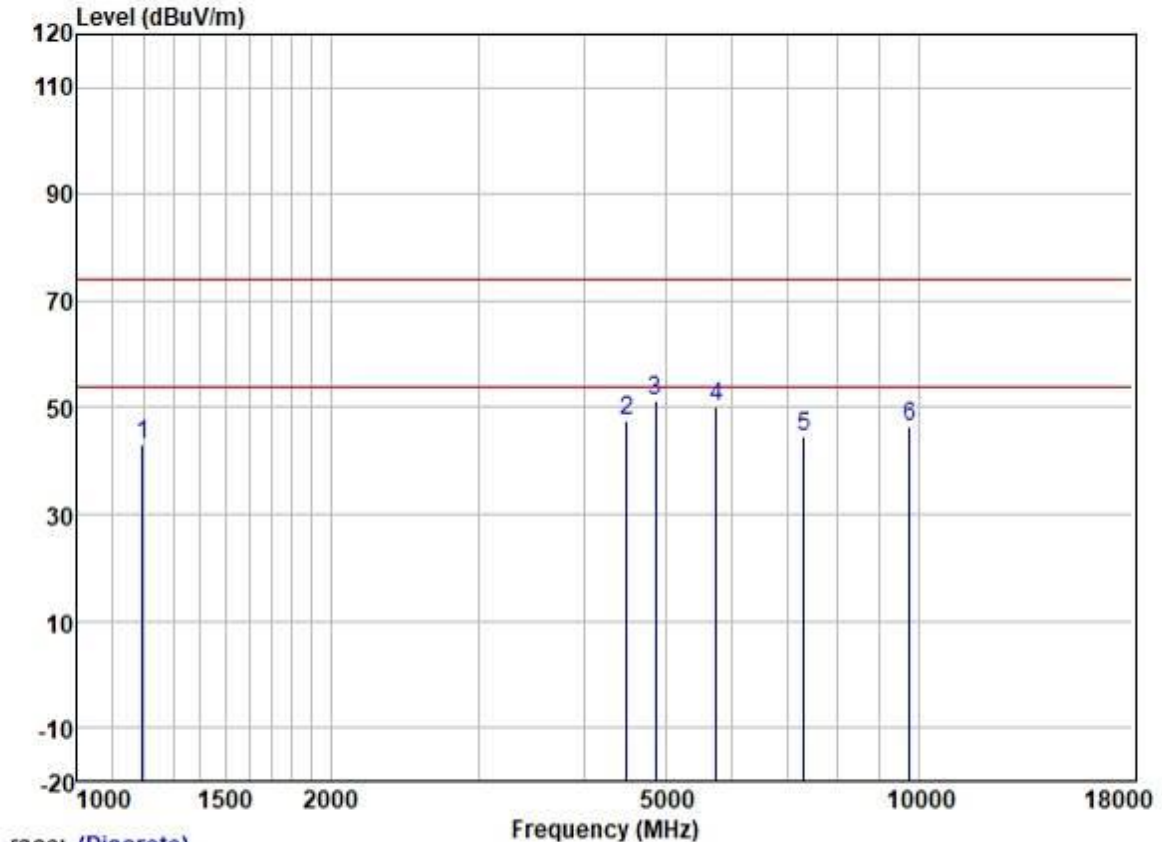


Trace: (Discrete)

	Freq	Read Level	Antenna 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	1196.264	53.66	23.14	2.58	37.99	41.39	74.00	-32.61	HORIZONTAL	peak
2	4482.150	44.61	34.12	5.34	36.83	47.24	74.00	-26.76	HORIZONTAL	peak
3	4824.000	47.95	34.16	5.46	36.87	50.70	74.00	-23.30	HORIZONTAL	peak
4	5239.274	48.06	33.45	5.37	36.94	49.94	74.00	-24.06	HORIZONTAL	peak
5	7236.000	40.66	35.78	6.35	37.14	45.65	74.00	-28.35	HORIZONTAL	peak
6	9648.000	39.69	38.70	7.89	37.02	49.26	74.00	-24.74	HORIZONTAL	peak



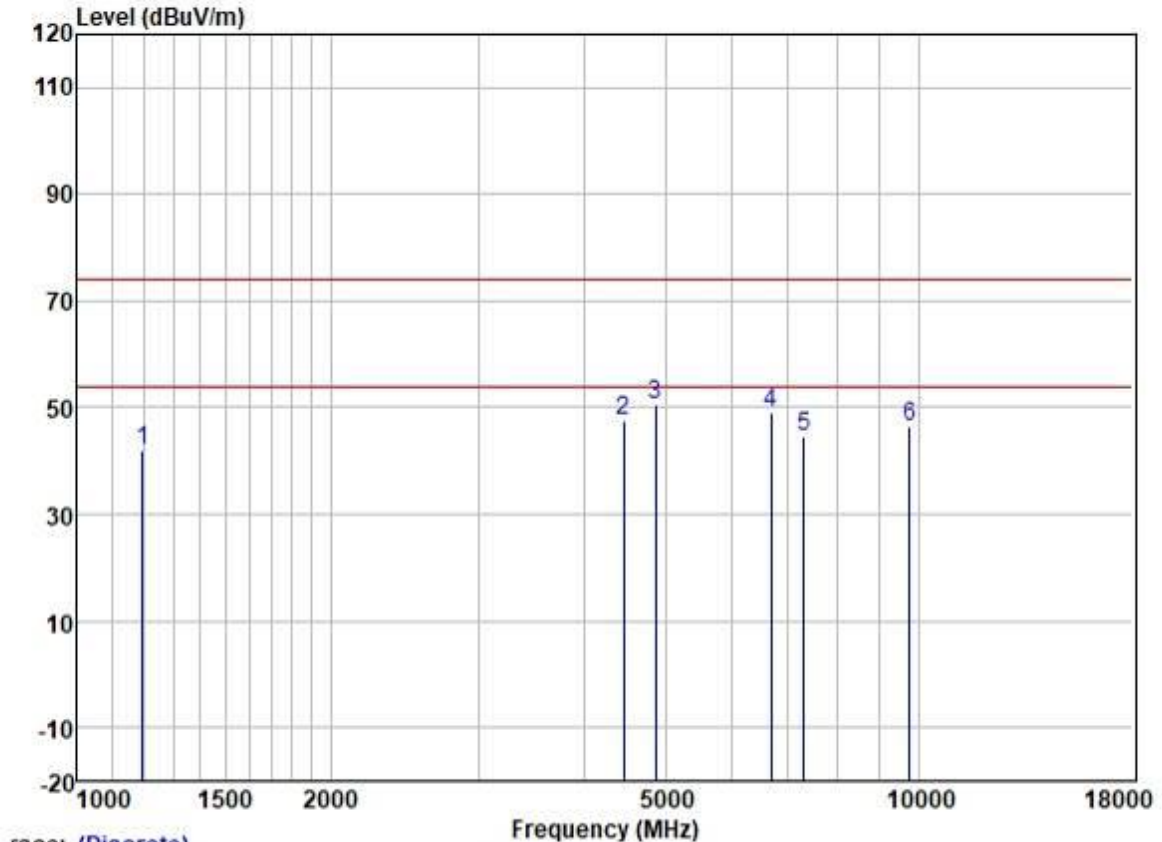
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Trace: (Discrete)

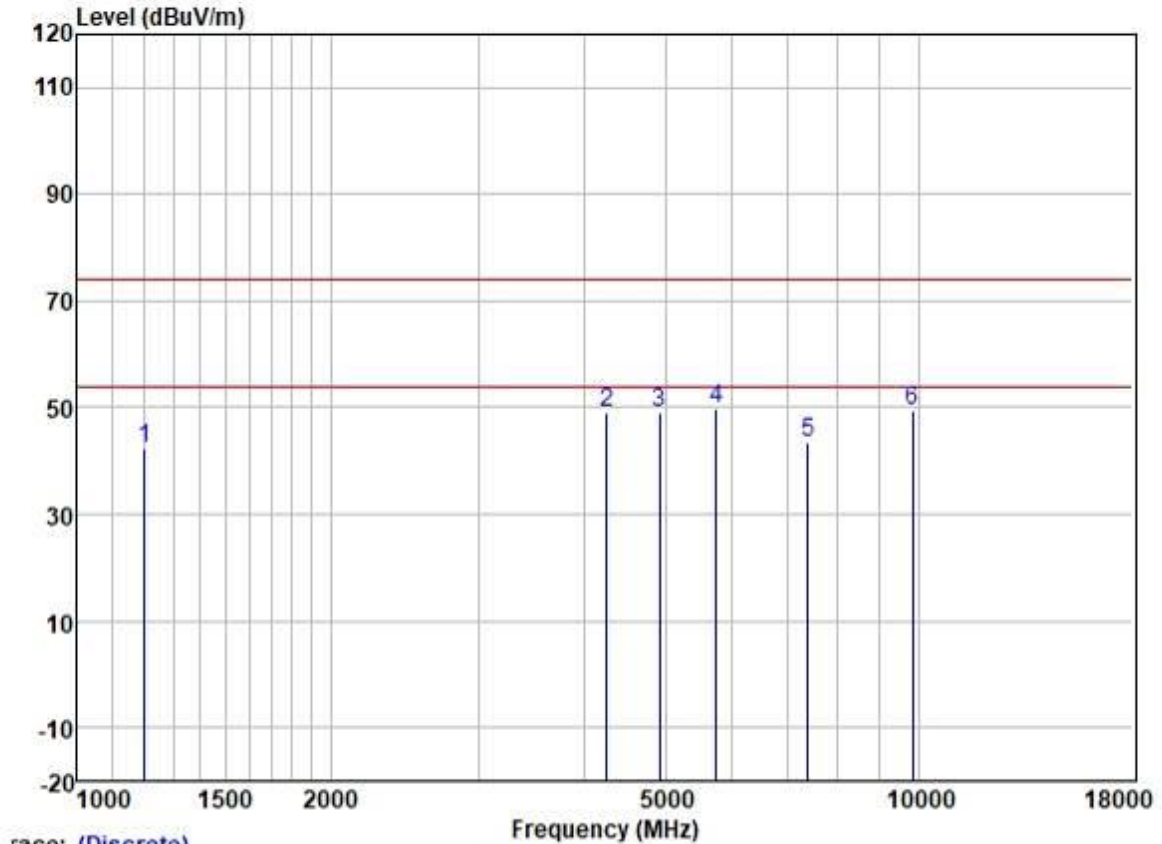
	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1196.264	55.46	23.14	2.58	37.99	43.19	74.00	-30.81	VERTICAL	peak
2	4495.125	44.76	34.17	5.33	36.83	47.43	74.00	-26.57	VERTICAL	peak
3	4874.000	48.39	34.15	5.49	36.87	51.16	74.00	-22.84	VERTICAL	peak
4	5746.982	48.90	32.65	5.70	36.99	50.26	74.00	-23.74	VERTICAL	peak
5	7311.000	39.35	36.00	6.32	37.15	44.52	74.00	-29.48	VERTICAL	peak
6	9748.000	37.12	38.81	7.43	37.01	46.35	74.00	-27.65	VERTICAL	peak

Test Mode: 03; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:middle



	Freq	ReadAntenna	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	1196.264	54.13	23.14	2.58	37.99	41.86	74.00	-32.14	HORIZONTAL peak
2	4456.315	45.05	34.00	5.35	36.83	47.57	74.00	-26.43	HORIZONTAL peak
3	4874.000	47.85	34.15	5.49	36.87	50.62	74.00	-23.38	HORIZONTAL peak
4	6679.040	45.52	34.28	6.27	37.05	49.02	74.00	-24.98	HORIZONTAL peak
5	7311.000	39.45	36.00	6.32	37.15	44.62	74.00	-29.38	HORIZONTAL peak
6	9748.000	37.21	38.81	7.43	37.01	46.44	74.00	-27.56	HORIZONTAL peak

Test Mode: 03; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:High

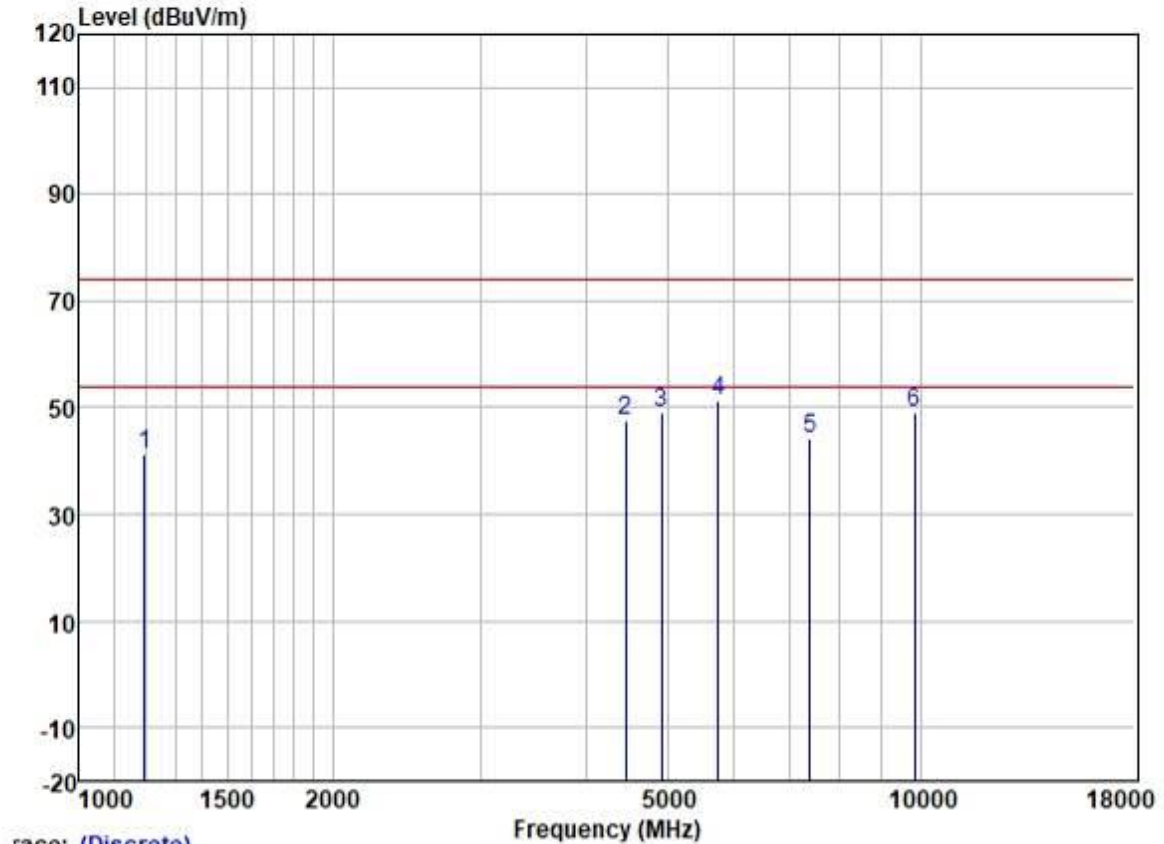


Trace: (Discrete)

	Freq	ReadAntenna	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	1203.199	54.49	23.20	2.58	37.99	42.28	74.00	-31.72	VERTICAL peak
2	4254.921	48.09	32.54	5.24	36.81	49.06	74.00	-24.94	VERTICAL peak
3	4924.000	46.41	34.15	5.51	36.88	49.19	74.00	-24.81	VERTICAL peak
4	5746.982	48.52	32.65	5.70	36.99	49.88	74.00	-24.12	VERTICAL peak
5	7386.000	38.26	36.23	6.30	37.16	43.63	74.00	-30.37	VERTICAL peak
6	9848.000	40.68	38.88	7.06	37.01	49.61	74.00	-24.39	VERTICAL peak



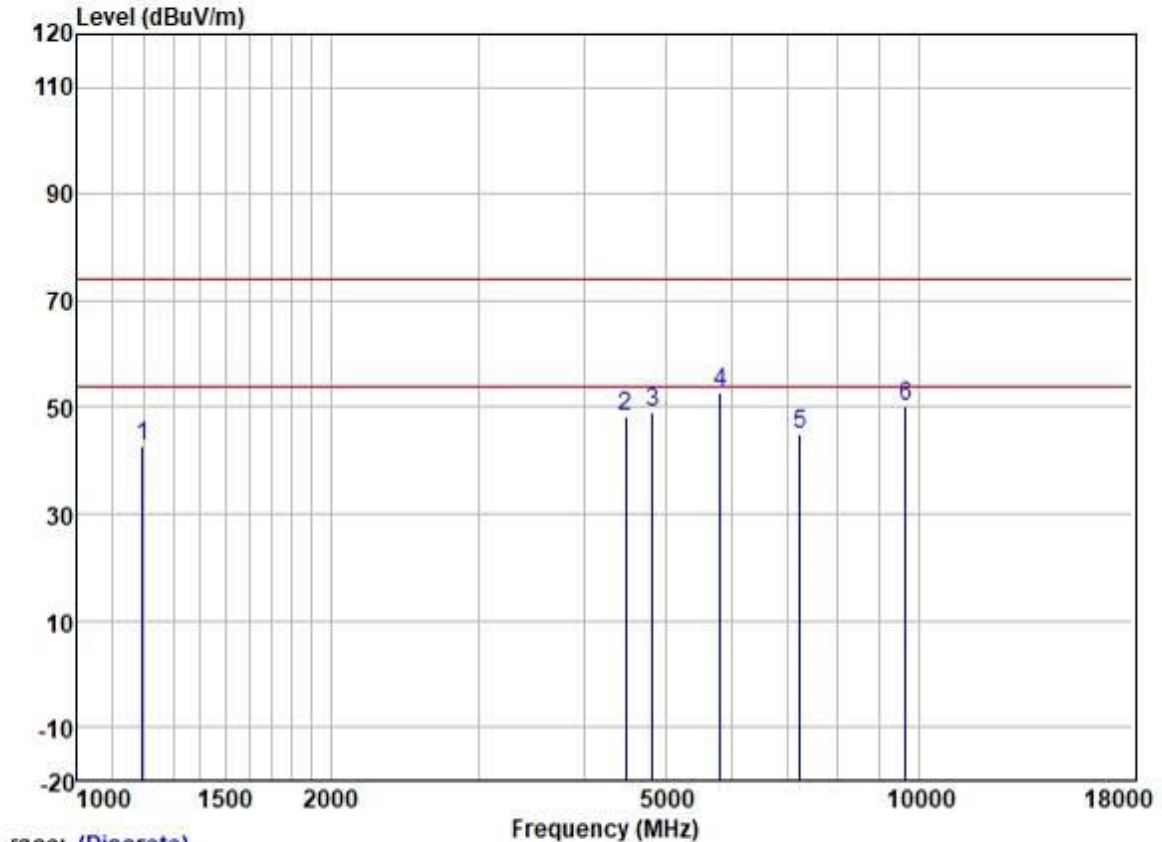
Test Mode: 03; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:High



	Freq	ReadAntenna	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	1196.264	53.33	23.14	2.58	37.99	41.06	74.00	-32.94	HORIZONTAL peak
2	4456.315	45.23	34.00	5.35	36.83	47.75	74.00	-26.25	HORIZONTAL peak
3	4924.000	46.18	34.15	5.51	36.88	48.96	74.00	-25.04	HORIZONTAL peak
4	5746.982	50.11	32.65	5.70	36.99	51.47	74.00	-22.53	HORIZONTAL peak
5	7386.000	38.76	36.23	6.30	37.16	44.13	74.00	-29.87	HORIZONTAL peak
6	9848.000	40.06	38.88	7.06	37.01	48.99	74.00	-25.01	HORIZONTAL peak

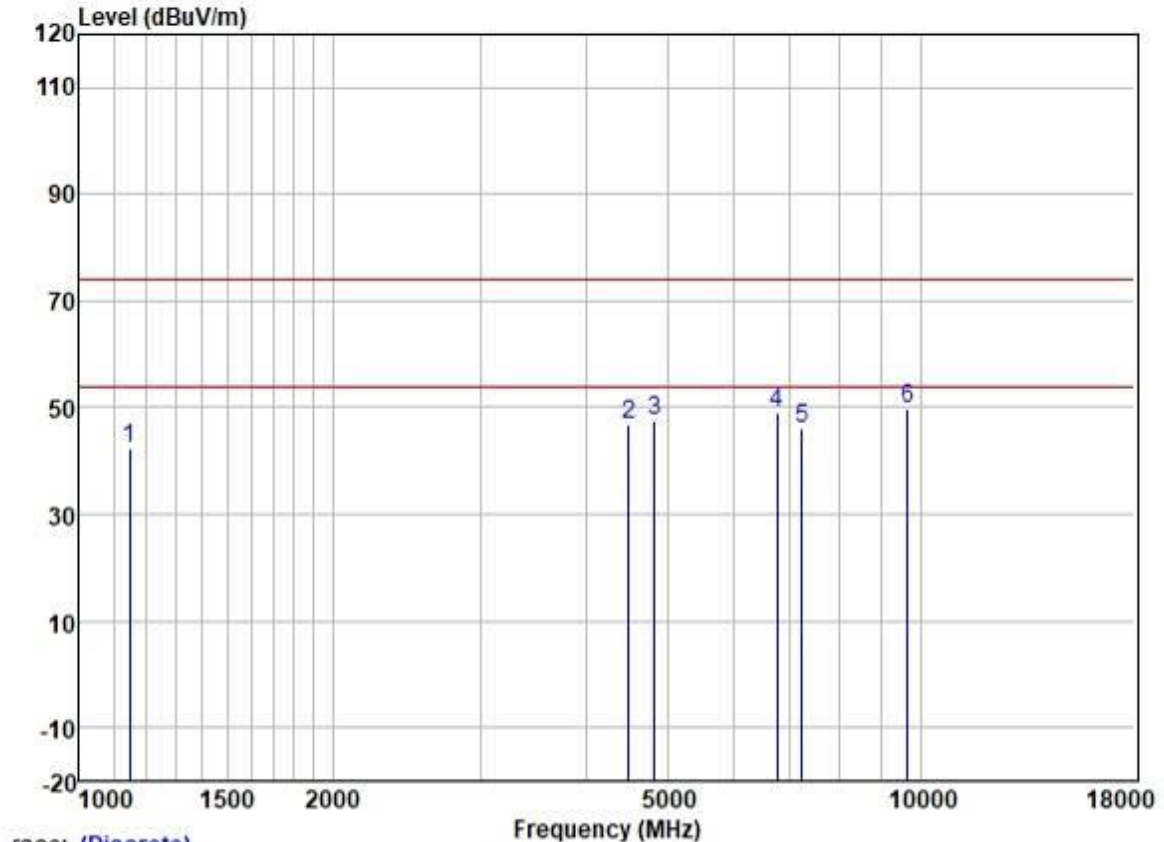


Test Mode: 03; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:Low



		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	1196.264	55.09	23.14	2.58	37.99	42.82	74.00	-31.18	VERTICAL	peak
2	4482.150	45.53	34.12	5.34	36.83	48.16	74.00	-25.84	VERTICAL	peak
3	4824.000	46.21	34.16	5.46	36.87	48.96	74.00	-25.04	VERTICAL	peak
4	5813.812	51.30	32.67	5.71	36.99	52.69	74.00	-21.31	VERTICAL	peak
5	7236.000	39.98	35.78	6.35	37.14	44.97	74.00	-29.03	VERTICAL	peak
6	9648.000	40.71	38.70	7.89	37.02	50.28	74.00	-23.72	VERTICAL	peak

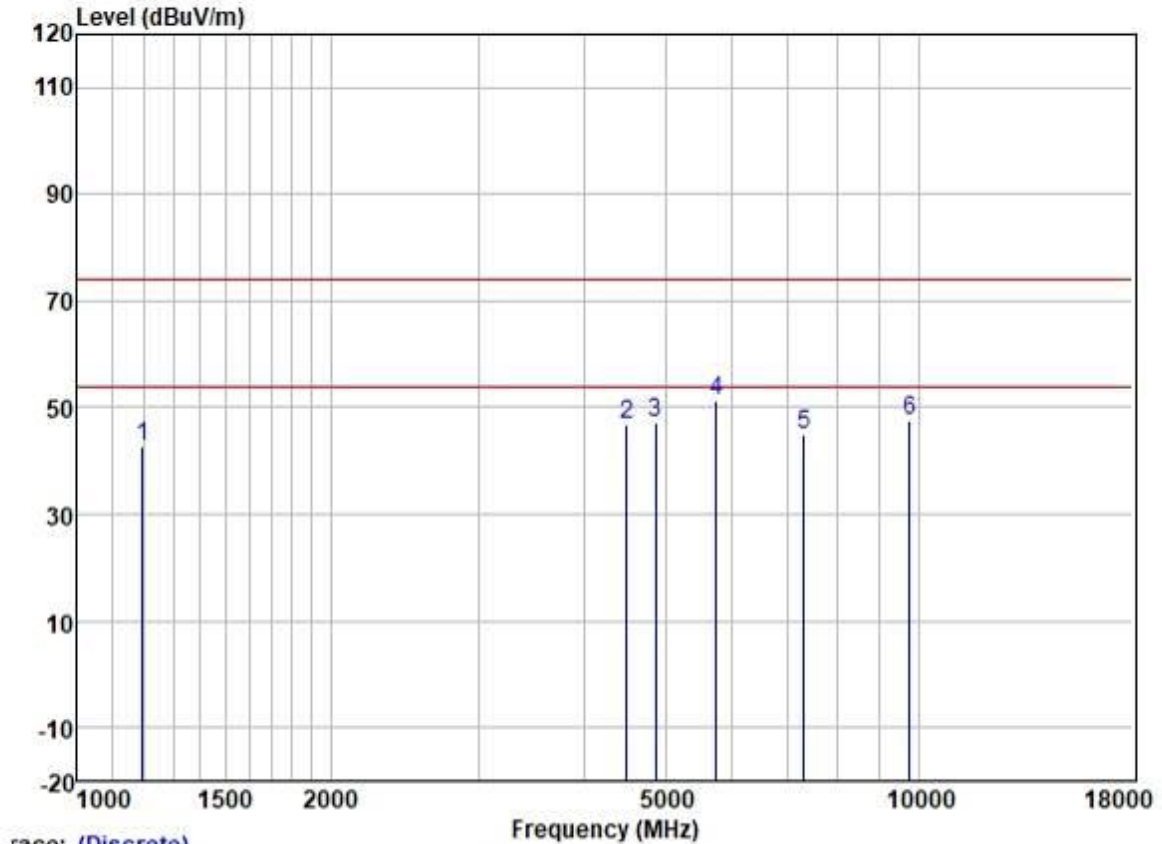
Test Mode: 03; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:Low



Trace: (Discrete)

	Freq	Read Level	Antenna 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	1148.823	55.08	22.86	2.55	37.99	42.50	74.00	-31.50	HORIZONTAL	peak
2	4495.125	44.21	34.17	5.33	36.83	46.88	74.00	-27.12	HORIZONTAL	peak
3	4824.000	44.93	34.16	5.46	36.87	47.68	74.00	-26.32	HORIZONTAL	peak
4	6756.708	45.28	34.56	6.32	37.06	49.10	74.00	-24.90	HORIZONTAL	peak
5	7236.000	40.98	35.78	6.35	37.14	45.97	74.00	-28.03	HORIZONTAL	peak
6	9648.000	40.27	38.70	7.89	37.02	49.84	74.00	-24.16	HORIZONTAL	peak

Test Mode: 03; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:middle

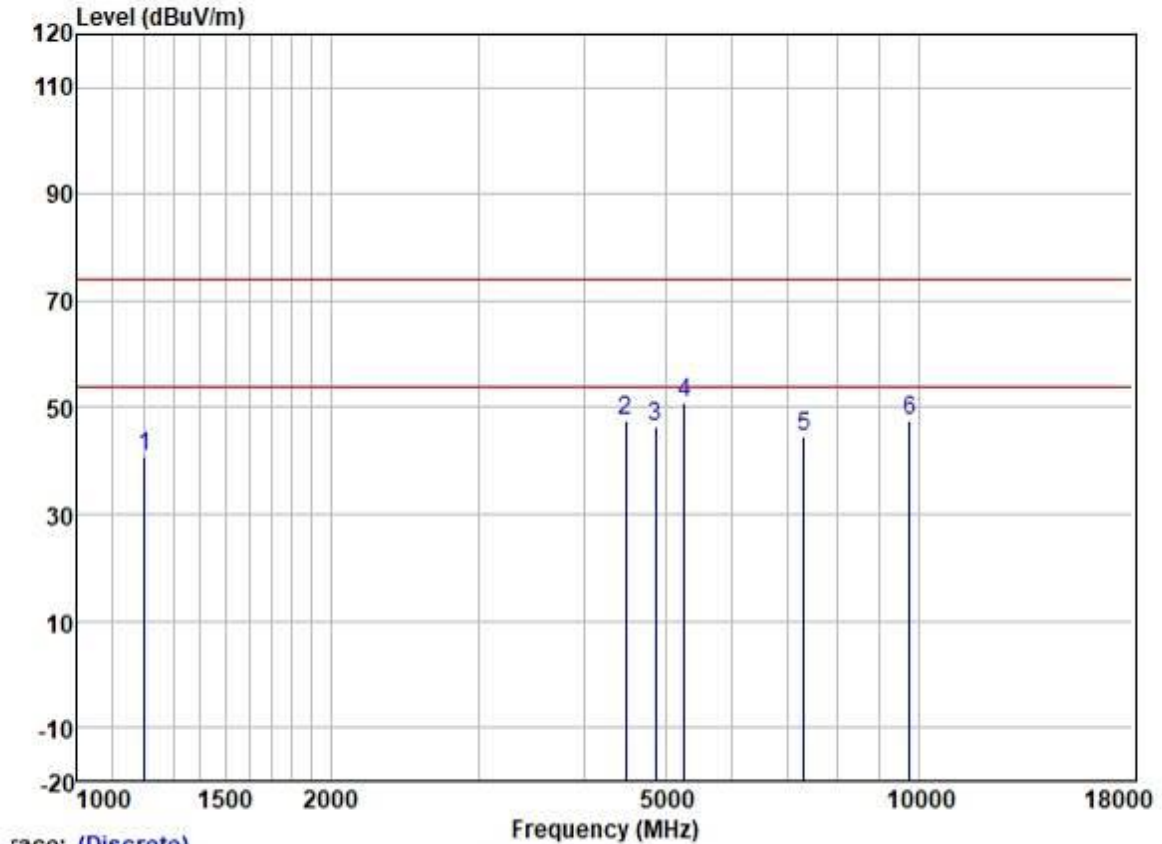


Trace: (Discrete)

	Freq	Read Level	Antenna 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	1196.264	55.08	23.14	2.58	37.99	42.81	74.00	-31.19	VERTICAL	peak
2	4495.125	44.30	34.17	5.33	36.83	46.97	74.00	-27.03	VERTICAL	peak
3	4874.000	44.33	34.15	5.49	36.87	47.10	74.00	-26.90	VERTICAL	peak
4	5746.982	50.12	32.65	5.70	36.99	51.48	74.00	-22.52	VERTICAL	peak
5	7311.000	39.69	36.00	6.32	37.15	44.86	74.00	-29.14	VERTICAL	peak
6	9748.000	38.41	38.81	7.43	37.01	47.64	74.00	-26.36	VERTICAL	peak



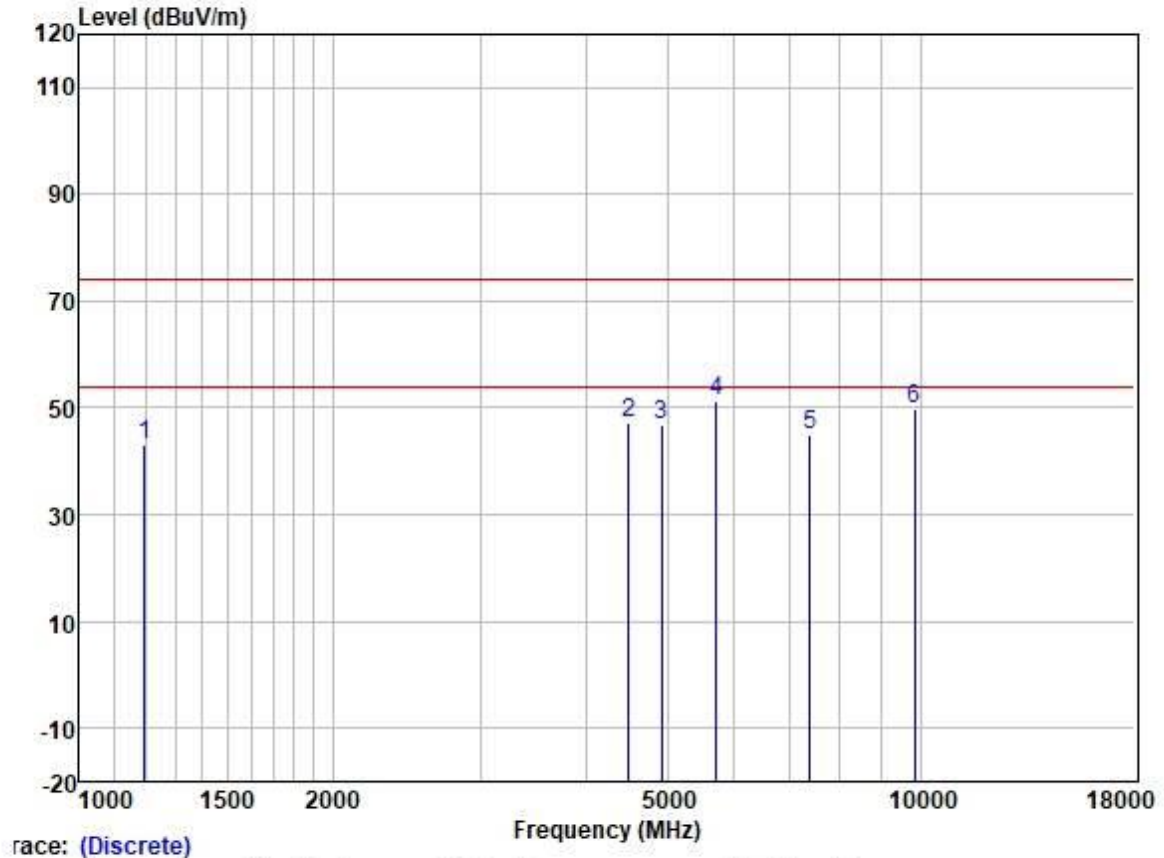
Test Mode: 03; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:middle



Race: (Discrete)	Frequency (MHz)									
	Freq	Read Level	Antenna 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	1203.199	53.12	23.20	2.58	37.99	40.91	74.00	-33.09	HORIZONTAL	peak
2	4482.150	44.99	34.12	5.34	36.83	47.62	74.00	-26.38	HORIZONTAL	peak
3	4874.000	43.86	34.15	5.49	36.87	46.63	74.00	-27.37	HORIZONTAL	peak
4	5269.649	49.04	33.30	5.42	36.94	50.82	74.00	-23.18	HORIZONTAL	peak
5	7311.000	39.55	36.00	6.32	37.15	44.72	74.00	-29.28	HORIZONTAL	peak
6	9748.000	38.49	38.81	7.43	37.01	47.72	74.00	-26.28	HORIZONTAL	peak

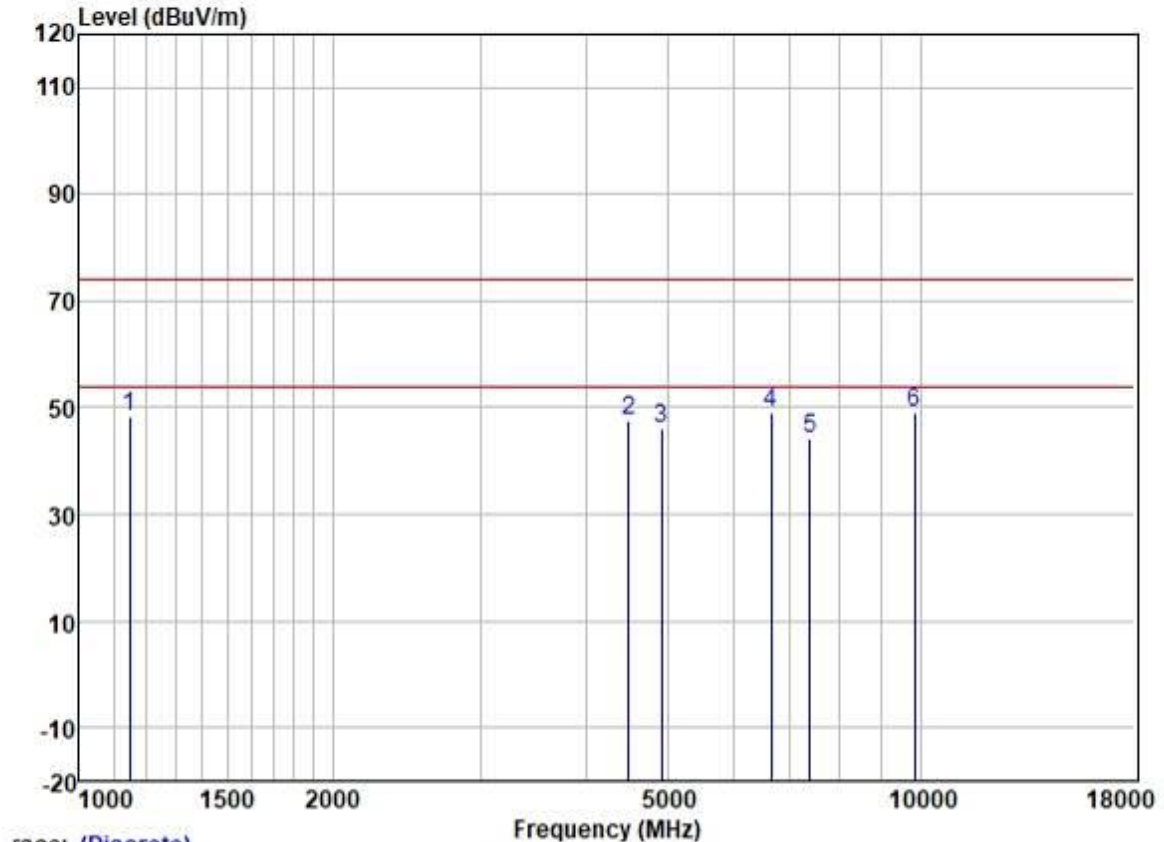


Test Mode: 03; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:High



	Freq	ReadAntenna	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	1196.264	55.47	23.14	2.58	37.99	43.20	74.00	-30.80	VERTICAL peak
2	4495.125	44.53	34.17	5.33	36.83	47.20	74.00	-26.80	VERTICAL peak
3	4924.000	44.08	34.15	5.51	36.88	46.86	74.00	-27.14	VERTICAL peak
4	5713.856	49.74	32.65	5.72	36.98	51.13	74.00	-22.87	VERTICAL peak
5	7386.000	39.41	36.23	6.30	37.16	44.78	74.00	-29.22	VERTICAL peak
6	9848.000	40.83	38.88	7.06	37.01	49.76	74.00	-24.24	VERTICAL peak

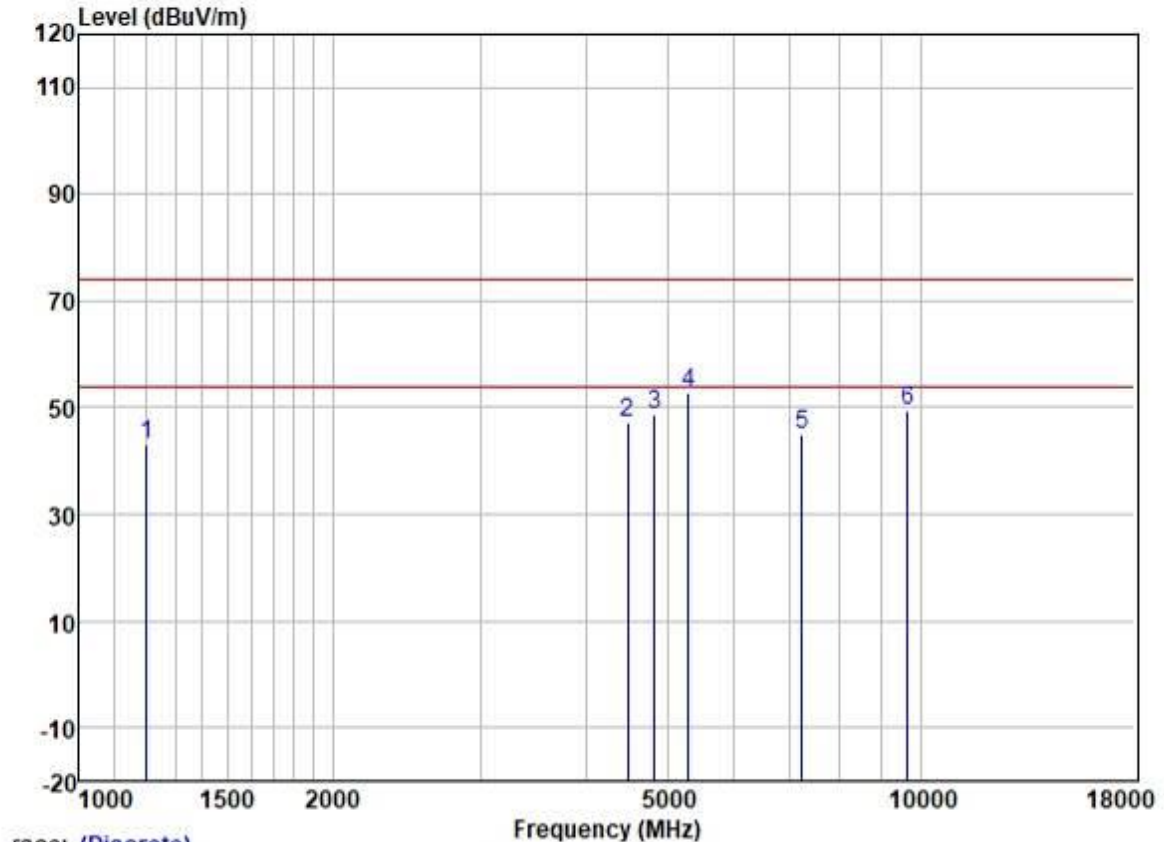
Test Mode: 03; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:High



Trace: (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	1148.823	60.76	22.86	2.55	37.99	48.18	74.00	-25.82	HORIZONTAL	peak
2	4495.125	44.95	34.17	5.33	36.83	47.62	74.00	-26.38	HORIZONTAL	peak
3	4924.000	43.23	34.15	5.51	36.88	46.01	74.00	-27.99	HORIZONTAL	peak
4	6640.542	45.53	34.17	6.25	37.04	48.91	74.00	-25.09	HORIZONTAL	peak
5	7386.000	38.97	36.23	6.30	37.16	44.34	74.00	-29.66	HORIZONTAL	peak
6	9848.000	40.17	38.88	7.06	37.01	49.10	74.00	-24.90	HORIZONTAL	peak

Test Mode: 03; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:Low

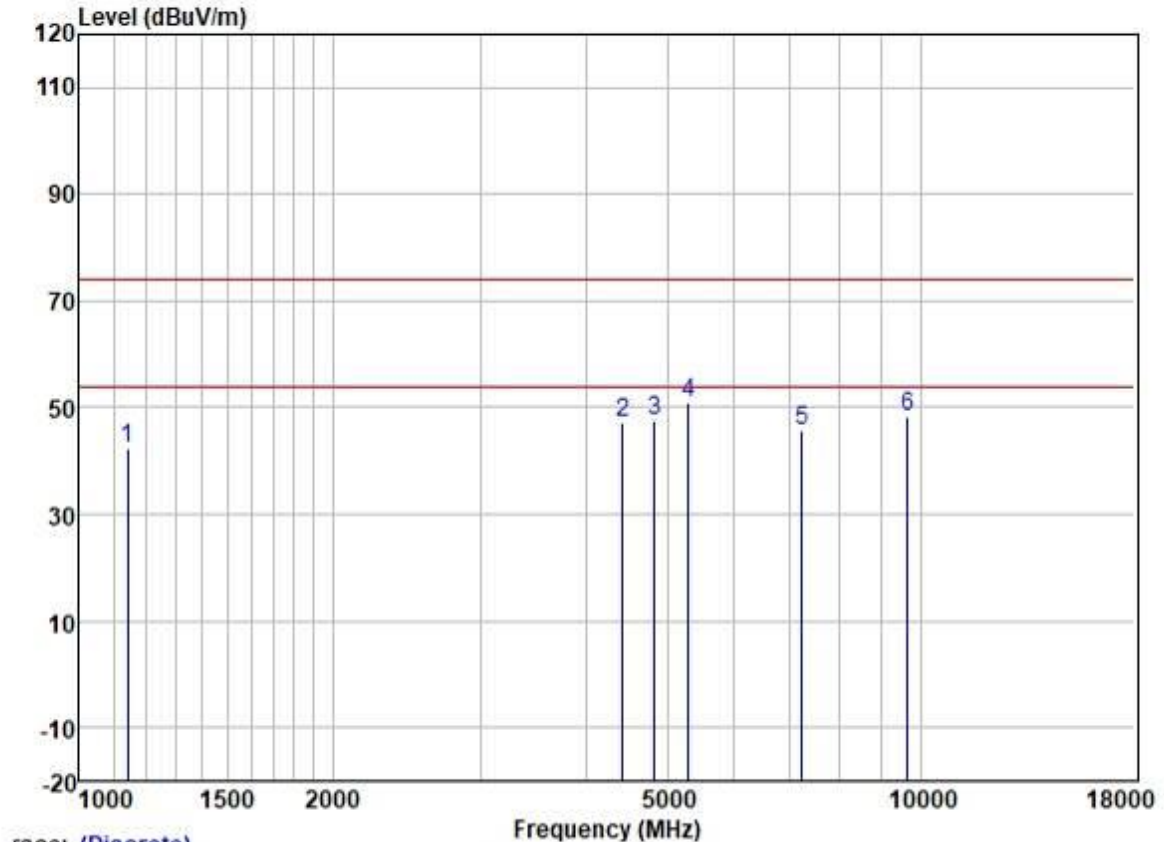


Trace: (Discrete)

	Freq	ReadAntenna	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	1203.199	55.21	23.20	2.58	37.99	43.00	74.00	-31.00	VERTICAL peak
2	4482.150	44.41	34.12	5.34	36.83	47.04	74.00	-26.96	VERTICAL peak
3	4824.000	45.97	34.16	5.46	36.87	48.72	74.00	-25.28	VERTICAL peak
4	5300.200	50.97	33.17	5.47	36.95	52.66	74.00	-21.34	VERTICAL peak
5	7236.000	40.01	35.78	6.35	37.14	45.00	74.00	-29.00	VERTICAL peak
6	9648.000	39.73	38.70	7.89	37.02	49.30	74.00	-24.70	VERTICAL peak



Test Mode: 03; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:Low

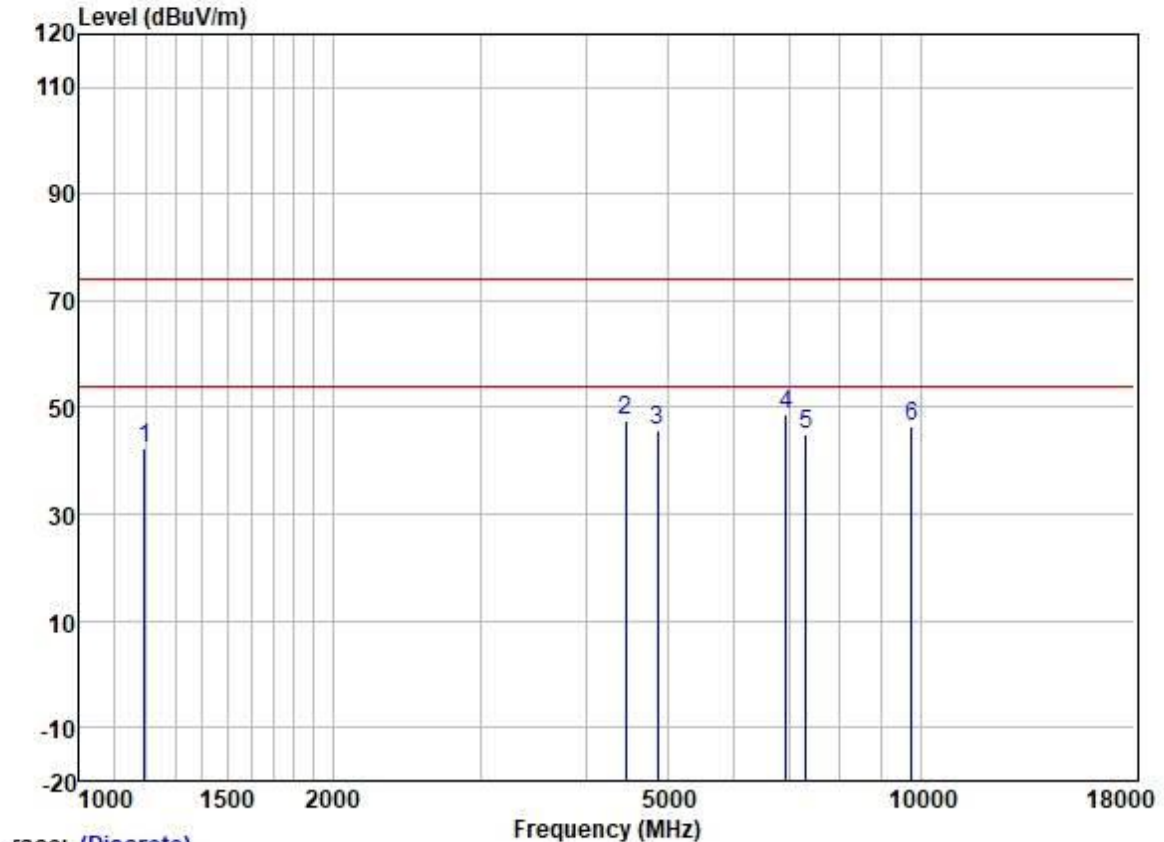


Trace: (Discrete)

	Freq	ReadAntenna	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	1142.201	54.89	22.83	2.54	37.99	42.27	74.00	-31.73	HORIZONTAL peak
2	4430.628	44.85	33.87	5.36	36.83	47.25	74.00	-26.75	HORIZONTAL peak
3	4824.000	45.00	34.16	5.46	36.87	47.75	74.00	-26.25	HORIZONTAL peak
4	5300.200	49.32	33.17	5.47	36.95	51.01	74.00	-22.99	HORIZONTAL peak
5	7236.000	40.69	35.78	6.35	37.14	45.68	74.00	-28.32	HORIZONTAL peak
6	9648.000	38.79	38.70	7.89	37.02	48.36	74.00	-25.64	HORIZONTAL peak



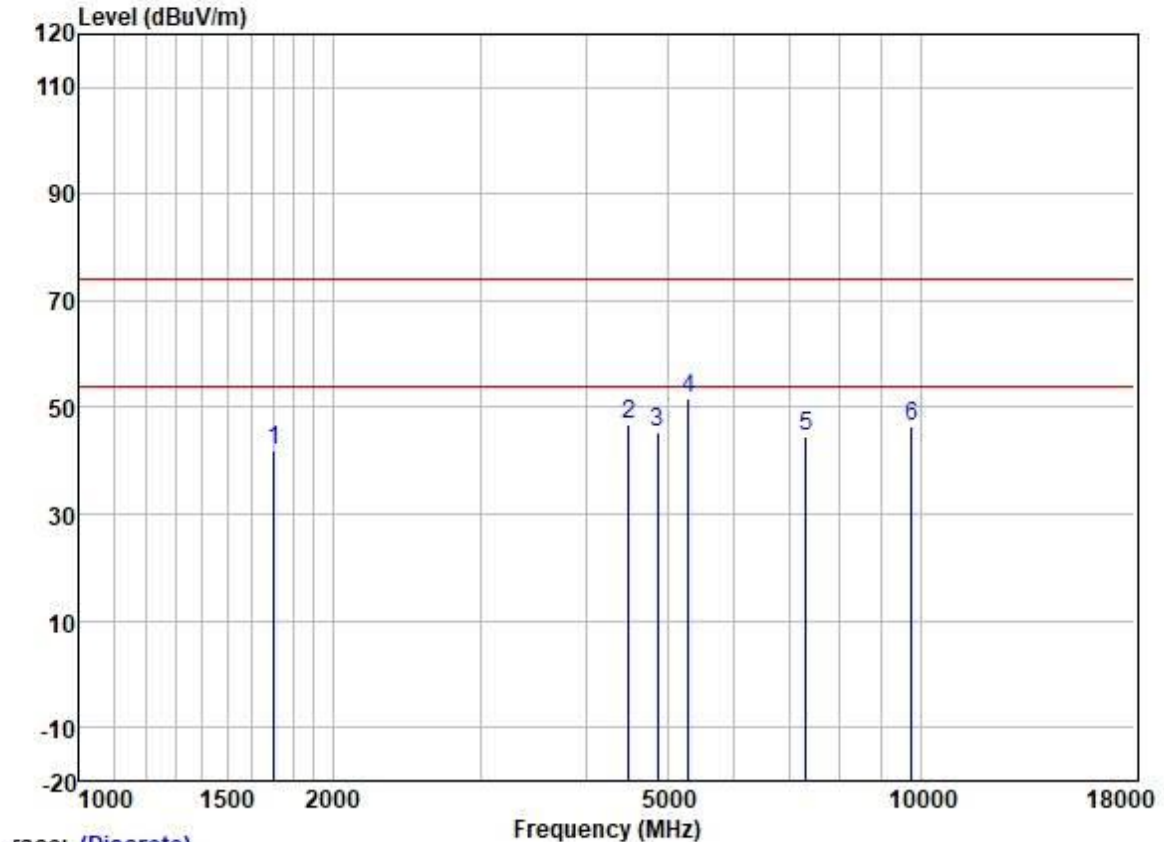
Test Mode: 03; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:middle



Trace: (Discrete)

	Freq	ReadAntenna	Cable	Preamp	Limit	Over			
	MHz	Level	Loss	Factor	Line	Limit	Pol/Phase	Remark	
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dB		
1	1196.264	54.72	23.14	2.58	37.99	42.45	74.00	-31.55	VERTICAL peak
2	4456.315	45.05	34.00	5.35	36.83	47.57	74.00	-26.43	VERTICAL peak
3	4874.000	43.01	34.15	5.49	36.87	45.78	74.00	-28.22	VERTICAL peak
4	6914.763	44.30	34.97	6.39	37.08	48.58	74.00	-25.42	VERTICAL peak
5	7311.000	39.72	36.00	6.32	37.15	44.89	74.00	-29.11	VERTICAL peak
6	9748.000	37.15	38.81	7.43	37.01	46.38	74.00	-27.62	VERTICAL peak

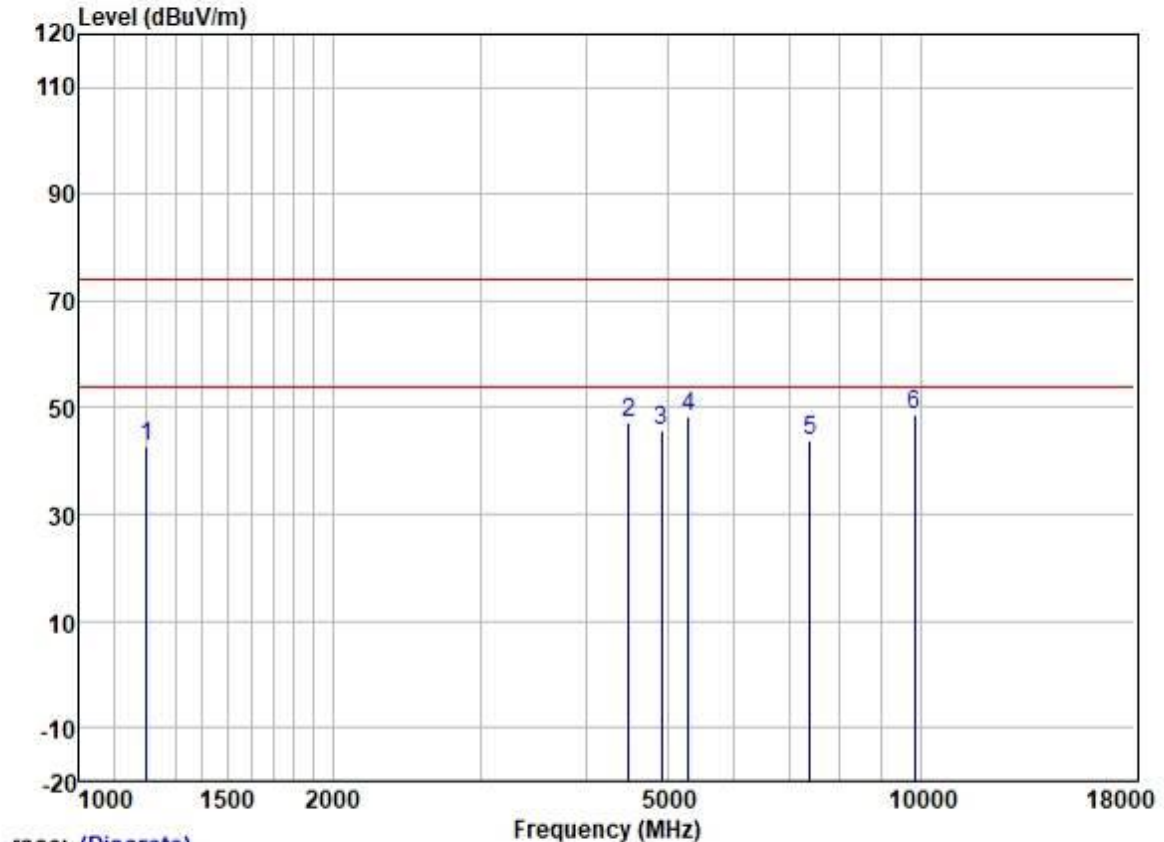
Test Mode: 03; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:middle



Trace: (Discrete)

	Freq	ReadAntenna	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	1702.042	51.20	25.15	3.36	37.92	41.79	74.00	-32.21	HORIZONTAL peak
2	4495.125	44.03	34.17	5.33	36.83	46.70	74.00	-27.30	HORIZONTAL peak
3	4874.000	42.75	34.15	5.49	36.87	45.52	74.00	-28.48	HORIZONTAL peak
4	5300.200	49.90	33.17	5.47	36.95	51.59	74.00	-22.41	HORIZONTAL peak
5	7311.000	39.43	36.00	6.32	37.15	44.60	74.00	-29.40	HORIZONTAL peak
6	9748.000	37.22	38.81	7.43	37.01	46.45	74.00	-27.55	HORIZONTAL peak

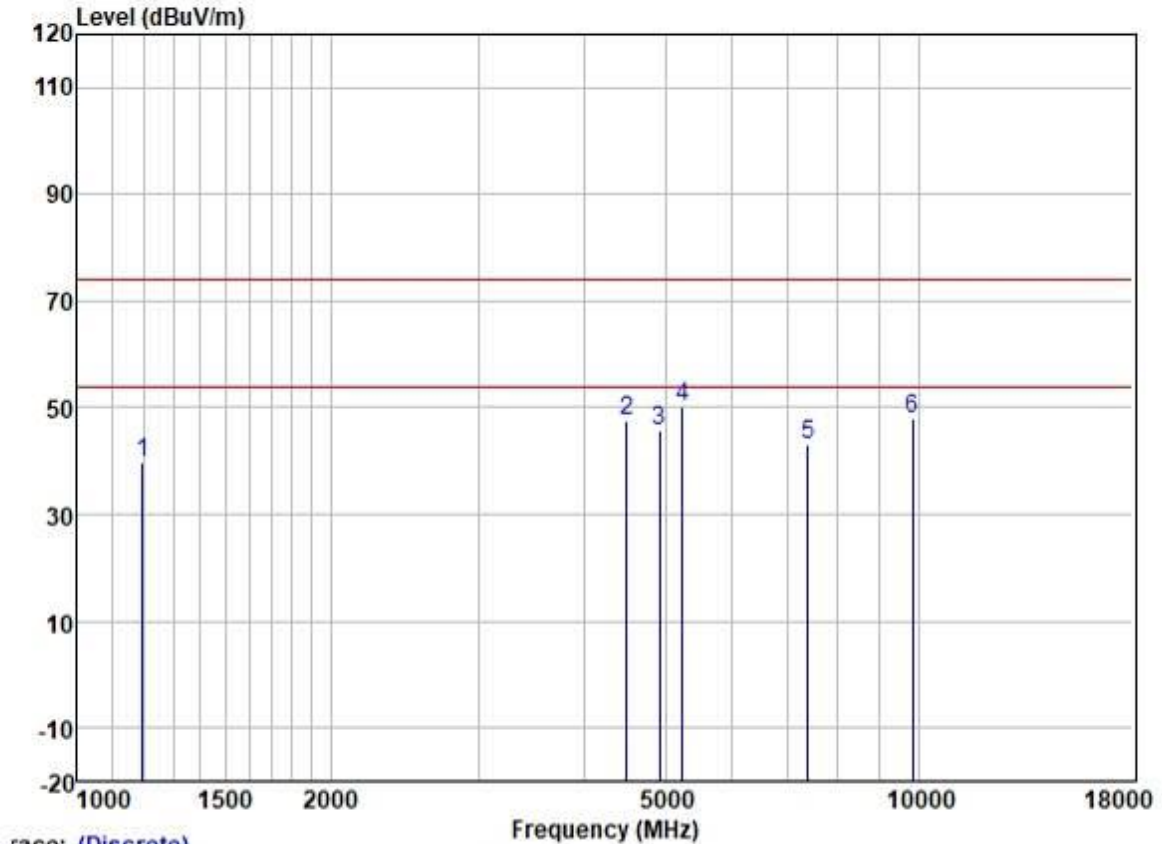
Test Mode: 03; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:High



race: (Discrete)	Frequency (MHz)									
	Freq	ReadAntenna	Cable	Preamp		Limit	Over	Pol/Phase	Remark	
		Level	Factor	Loss	Factor	Level	Line			Limit
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1203.199	54.97	23.20	2.58	37.99	42.76	74.00	-31.24	VERTICAL	peak
2	4495.125	44.49	34.17	5.33	36.83	47.16	74.00	-26.84	VERTICAL	peak
3	4924.000	43.05	34.15	5.51	36.88	45.83	74.00	-28.17	VERTICAL	peak
4	5300.200	46.79	33.17	5.47	36.95	48.48	74.00	-25.52	VERTICAL	peak
5	7386.000	38.60	36.23	6.30	37.16	43.97	74.00	-30.03	VERTICAL	peak
6	9848.000	39.93	38.88	7.06	37.01	48.86	74.00	-25.14	VERTICAL	peak



Test Mode: 03; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:High

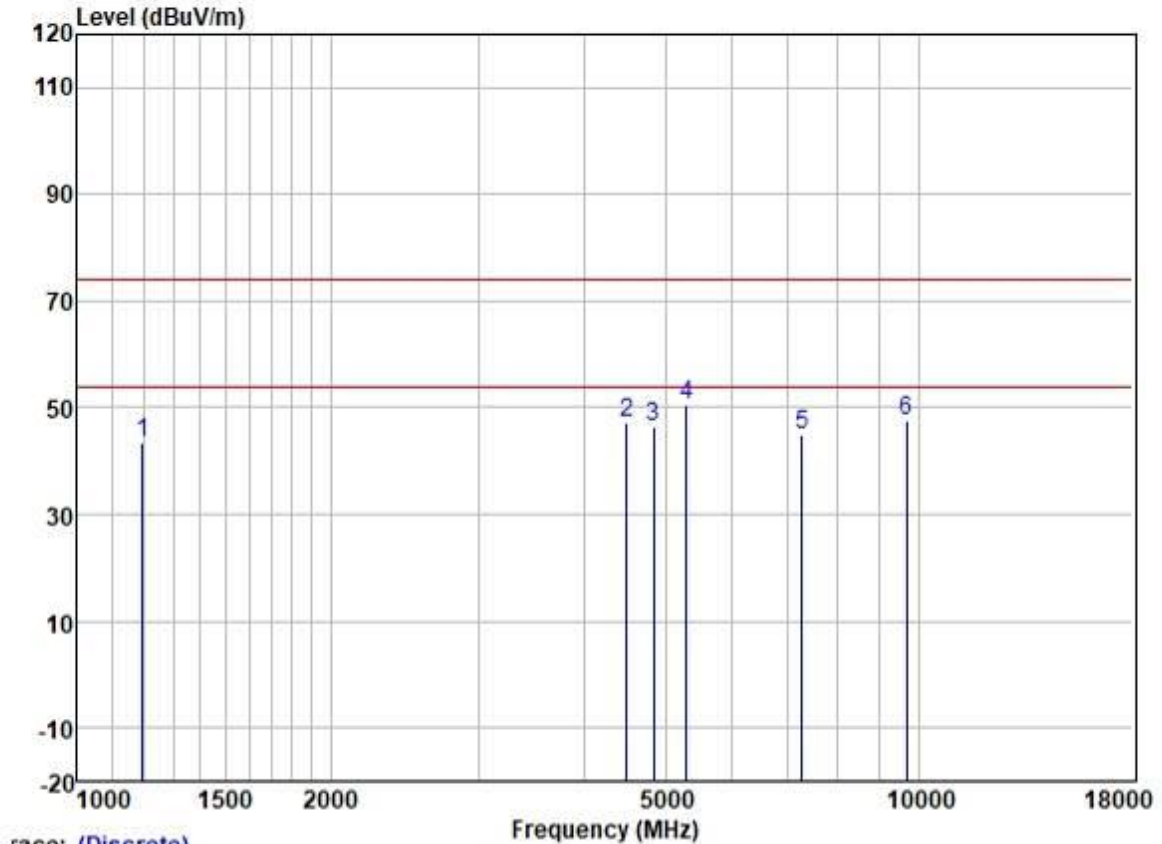


Trace: (Discrete)

	Freq	ReadAntenna	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	1196.264	52.03	23.14	2.58	37.99	39.76	74.00	-34.24	HORIZONTAL peak
2	4495.125	44.81	34.17	5.33	36.83	47.48	74.00	-26.52	HORIZONTAL peak
3	4924.000	43.09	34.15	5.51	36.88	45.87	74.00	-28.13	HORIZONTAL peak
4	5239.274	48.30	33.45	5.37	36.94	50.18	74.00	-23.82	HORIZONTAL peak
5	7386.000	37.79	36.23	6.30	37.16	43.16	74.00	-30.84	HORIZONTAL peak
6	9848.000	39.09	38.88	7.06	37.01	48.02	74.00	-25.98	HORIZONTAL peak

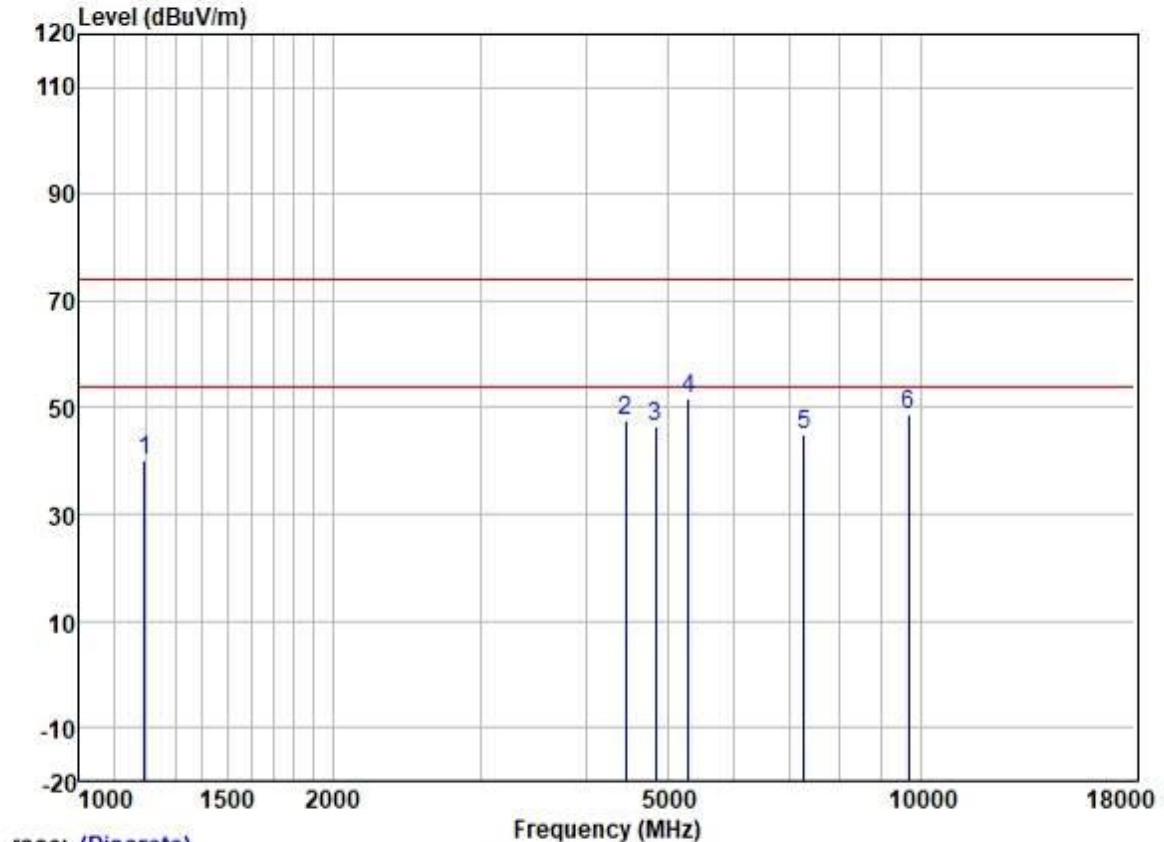


Test Mode: 03; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:Low



	ReadAntenna	Cable	Preamp		Limit	Over			
	Level	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark	
	Freq	Factor							
	MHz	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1196.264	55.66	23.14	2.58	37.99	43.39	74.00	-30.61	VERTICAL peak
2	4495.125	44.34	34.17	5.33	36.83	47.01	74.00	-26.99	VERTICAL peak
3	4844.000	43.64	34.15	5.47	36.87	46.39	74.00	-27.61	VERTICAL peak
4	5300.200	48.92	33.17	5.47	36.95	50.61	74.00	-23.39	VERTICAL peak
5	7266.000	40.08	35.86	6.34	37.14	45.14	74.00	-28.86	VERTICAL peak
6	9688.000	37.99	38.75	7.68	37.02	47.40	74.00	-26.60	VERTICAL peak

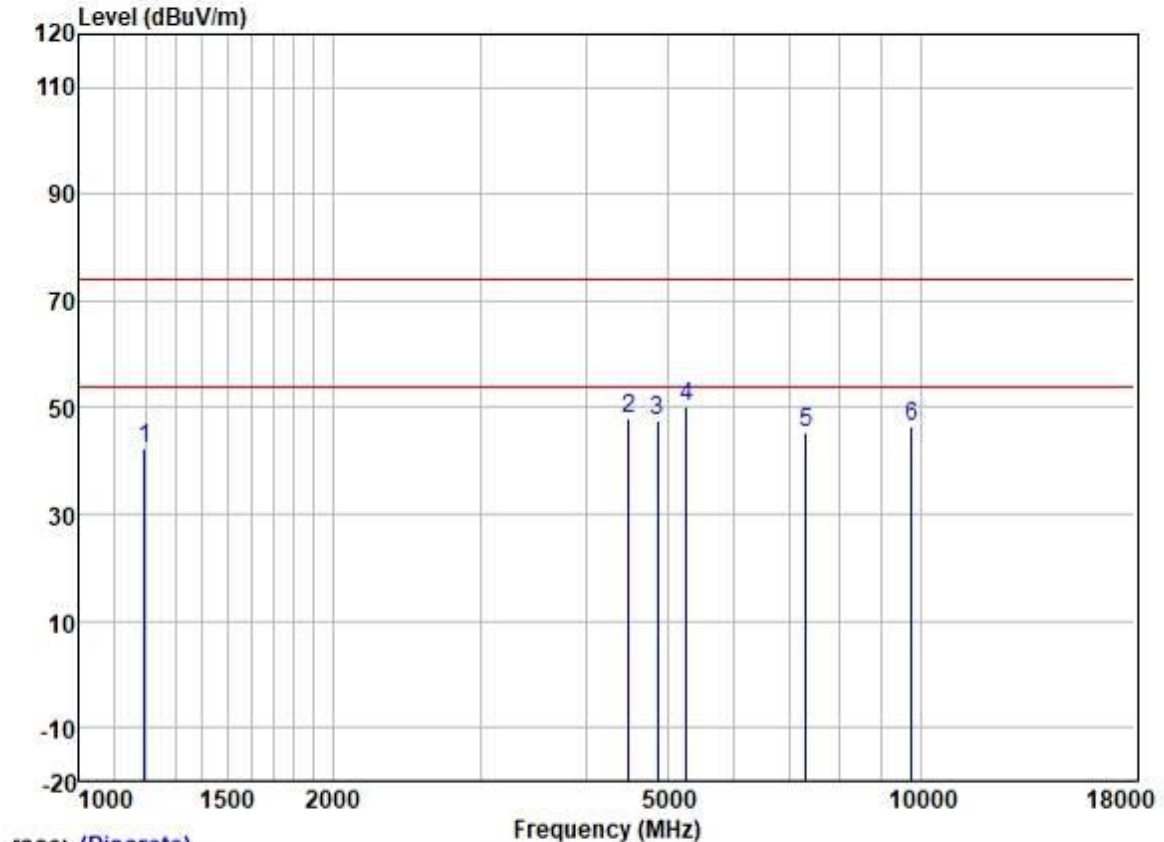
Test Mode: 03; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:Low



Trace: (Discrete)

	Freq	ReadAntenna	Cable	Preamp		Limit	Over		
	MHz	Level	Factor	Loss	Factor	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dB		
1	1196.264	52.55	23.14	2.58	37.99	40.28	74.00	-33.72	HORIZONTAL peak
2	4456.315	45.18	34.00	5.35	36.83	47.70	74.00	-26.30	HORIZONTAL peak
3	4844.000	43.88	34.15	5.47	36.87	46.63	74.00	-27.37	HORIZONTAL peak
4	5300.200	50.11	33.17	5.47	36.95	51.80	74.00	-22.20	HORIZONTAL peak
5	7266.000	39.98	35.86	6.34	37.14	45.04	74.00	-28.96	HORIZONTAL peak
6	9688.000	39.16	38.75	7.68	37.02	48.57	74.00	-25.43	HORIZONTAL peak

Test Mode: 03; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:middle

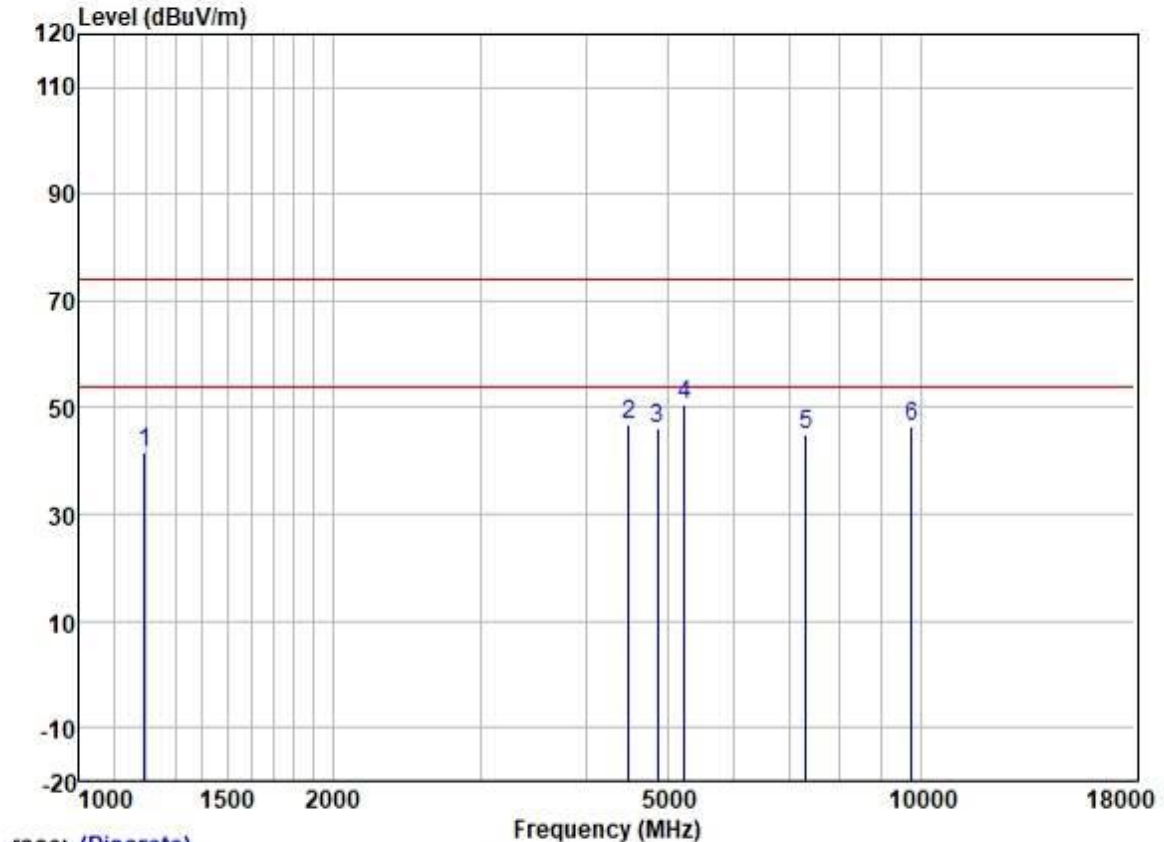


Trace: (Discrete)

	Freq	ReadAntenna	Cable	Preamp		Limit	Over		
		Level	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1196.264	54.78	23.14	2.58	37.99	42.51	74.00	-31.49	VERTICAL peak
2	4495.125	45.32	34.17	5.33	36.83	47.99	74.00	-26.01	VERTICAL peak
3	4874.000	44.72	34.15	5.49	36.87	47.49	74.00	-26.51	VERTICAL peak
4	5269.649	48.51	33.30	5.42	36.94	50.29	74.00	-23.71	VERTICAL peak
5	7311.000	40.32	36.00	6.32	37.15	45.49	74.00	-28.51	VERTICAL peak
6	9748.000	37.12	38.81	7.43	37.01	46.35	74.00	-27.65	VERTICAL peak



Test Mode: 03; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:middle

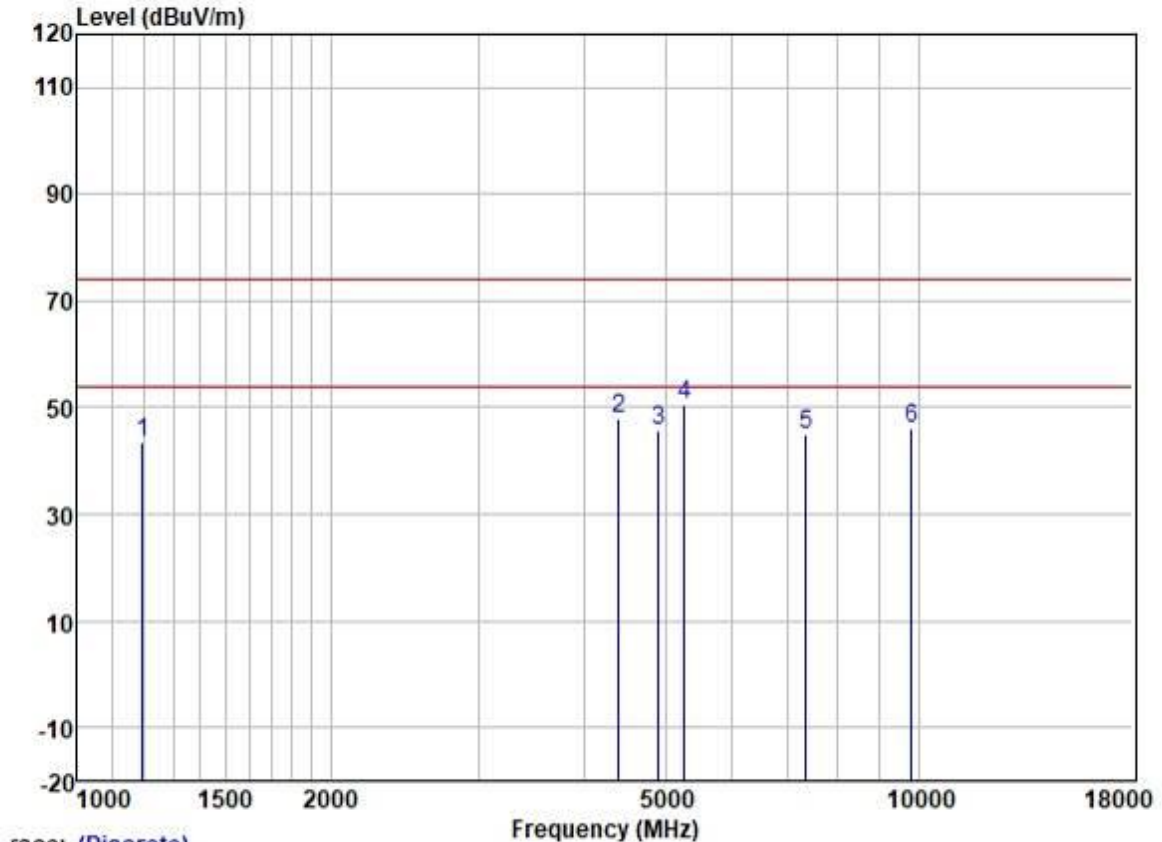


Trace: (Discrete)

	Freq	ReadAntenna	Cable	Preamp		Limit	Over		
		Level	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dB		
1	1196.264	54.02	23.14	2.58	37.99	41.75	74.00	-32.25	HORIZONTAL peak
2	4495.125	44.16	34.17	5.33	36.83	46.83	74.00	-27.17	HORIZONTAL peak
3	4874.000	43.39	34.15	5.49	36.87	46.16	74.00	-27.84	HORIZONTAL peak
4	5239.274	48.59	33.45	5.37	36.94	50.47	74.00	-23.53	HORIZONTAL peak
5	7311.000	39.87	36.00	6.32	37.15	45.04	74.00	-28.96	HORIZONTAL peak
6	9748.000	37.26	38.81	7.43	37.01	46.49	74.00	-27.51	HORIZONTAL peak



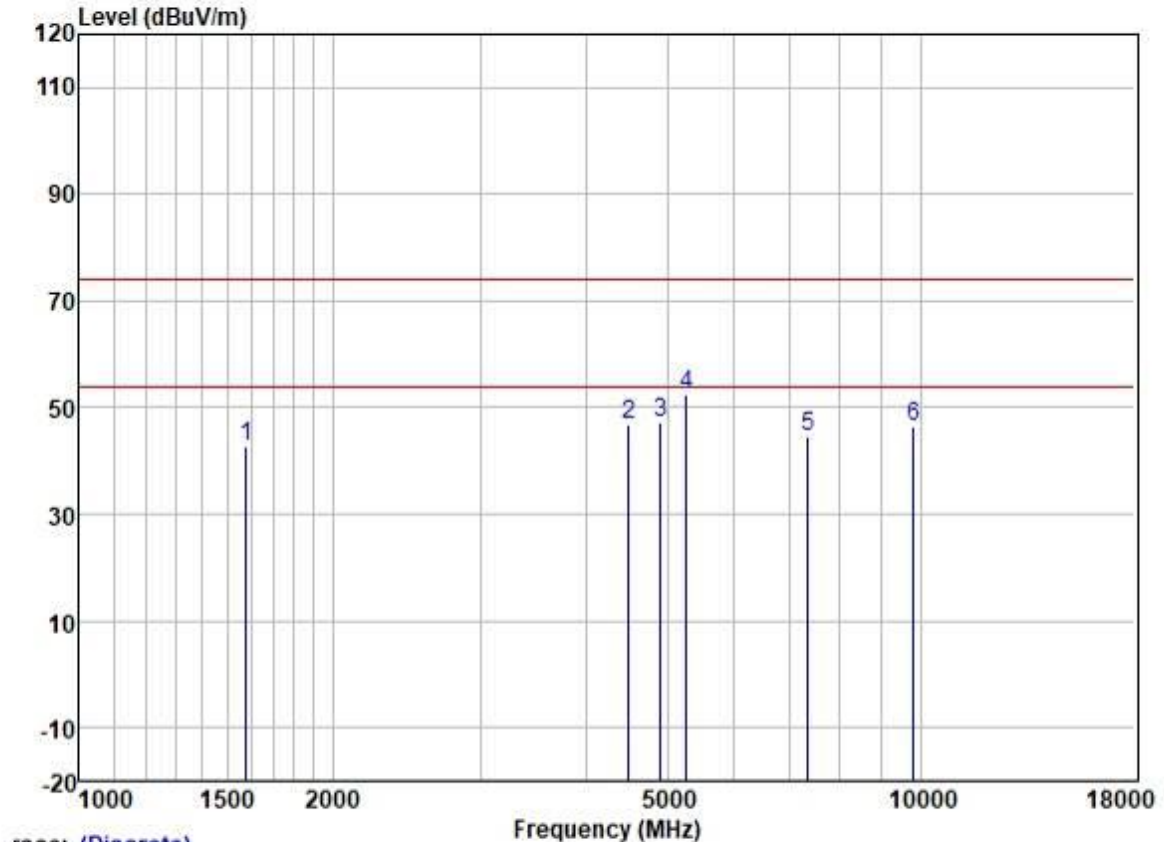
Test Mode: 03; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:High



Trace: (Discrete)

	Freq	ReadAntenna	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	1196.264	55.61	23.14	2.58	37.99	43.34	74.00	-30.66	VERTICAL peak
2	4405.090	45.49	33.74	5.37	36.82	47.78	74.00	-26.22	VERTICAL peak
3	4904.000	42.94	34.15	5.50	36.88	45.71	74.00	-28.29	VERTICAL peak
4	5269.649	48.75	33.30	5.42	36.94	50.53	74.00	-23.47	VERTICAL peak
5	7356.000	39.59	36.12	6.31	37.15	44.87	74.00	-29.13	VERTICAL peak
6	9808.000	37.14	38.86	7.17	37.01	46.16	74.00	-27.84	VERTICAL peak

Test Mode: 03; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:High



Trace: (Discrete)

	Freq	ReadAntenna	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	1578.822	53.16	24.62	2.99	37.94	42.83	74.00	-31.17	HORIZONTAL peak
2	4495.125	44.09	34.17	5.33	36.83	46.76	74.00	-27.24	HORIZONTAL peak
3	4904.000	44.26	34.15	5.50	36.88	47.03	74.00	-26.97	HORIZONTAL peak
4	5269.649	50.69	33.30	5.42	36.94	52.47	74.00	-21.53	HORIZONTAL peak
5	7356.000	39.24	36.12	6.31	37.15	44.52	74.00	-29.48	HORIZONTAL peak
6	9808.000	37.49	38.86	7.17	37.01	46.51	74.00	-27.49	HORIZONTAL peak

## 8 Test Setup Photo

Refer to Setup Photos for GZCR230300021102

## 9 EUT Constructional Details (EUT Photos)

Refer to External and Internal Photos for GZCR2303000211AT



## 10 Appendix

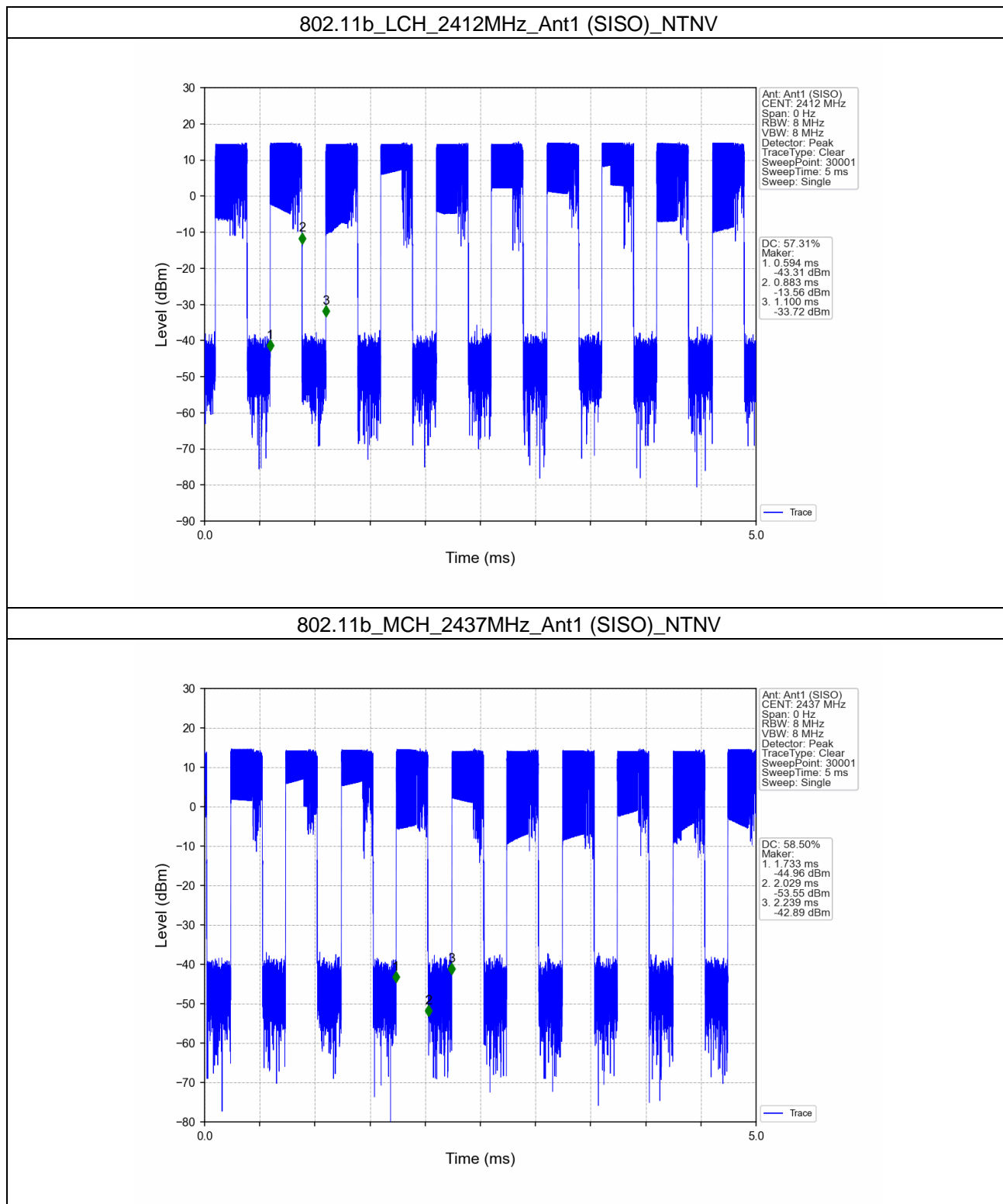
### 1. Duty Cycle

#### 1.1 Ant1

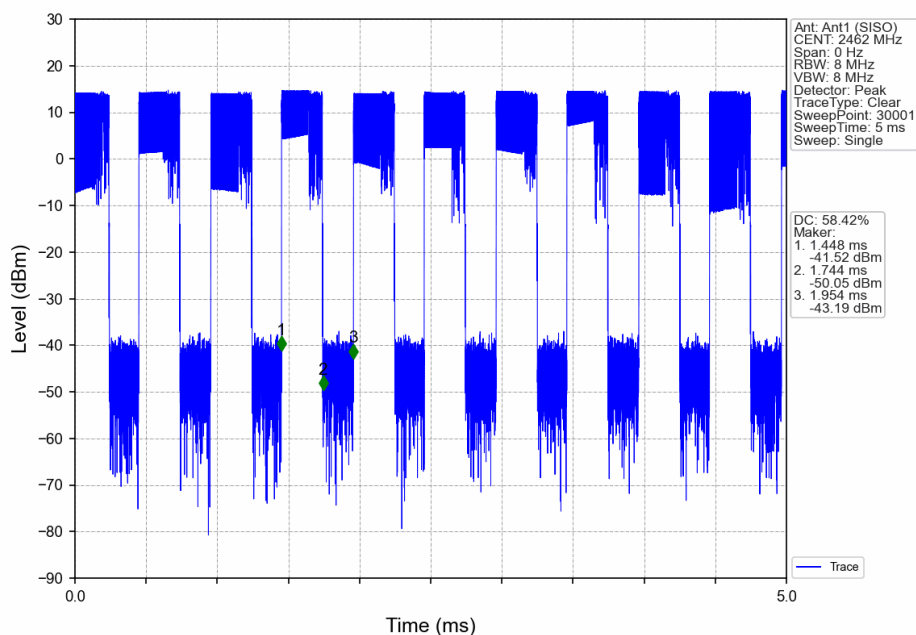
##### 1.1.1 Test Result

Ant1							
Mode	Tx Type	Frequency (MHz)	T <sub>on</sub> (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	Max. DC Variation (%)
802.11b	SISO	2412	0.290	0.506	57.31	2.42	1.09
		2437	0.296	0.506	58.50	2.33	1.10
		2462	0.295	0.505	58.42	2.33	1.10
802.11g	SISO	2412	0.043	0.263	16.35	7.86	0.63
		2437	0.043	0.263	16.35	7.86	0.65
		2462	0.043	0.263	16.35	7.86	0.59
802.11n (HT20)	SISO	2412	0.059	0.279	21.15	6.75	0.75
		2437	0.059	0.279	21.15	6.75	0.74
		2462	0.059	0.279	21.15	6.75	0.77
802.11n (HT40)	SISO	2422	0.047	0.267	17.60	7.54	0.65
		2437	0.047	0.267	17.60	7.54	0.69
		2452	0.047	0.267	17.60	7.54	0.66
1M	SISO	2402	100.000	100.000	100.00	0.00	0.00
		2440	100.000	100.000	100.00	0.00	0.00
		2480	100.000	100.000	100.00	0.00	0.00

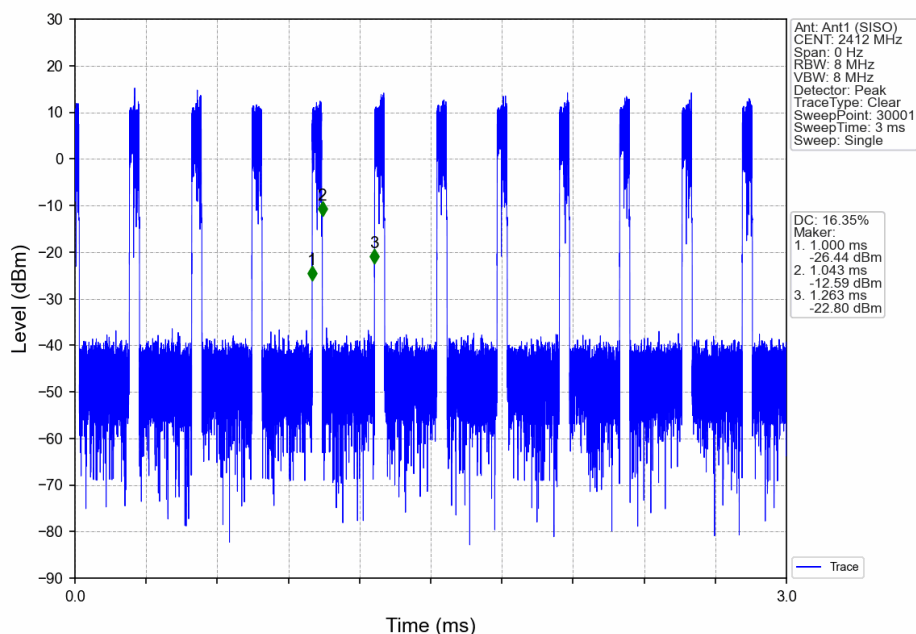
### 1.1.2 Test Graph



### 802.11b\_HCH\_2462MHz\_Ant1 (SISO)\_NTNV



### 802.11g\_LCH\_2412MHz\_Ant1 (SISO)\_NTNV



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