TEST REPORT

Application No.:	GZCR2202000224AT
Applicant:	Binatone Electronics International Ltd.
Address of Applicant:	25/F, Guangdong Investment Tower, 148 Connaught Road Central, Sheung Wan, Hong Kong.
Manufacturer:	Binatone Telecom Plc.
Address of Manufacturer:	1 Apsley Way London NW2 7HF, United Kingdom
Factory:	Heyuan Yongyida Technology Co., Ltd
Address of Factory:	Xinyongyi Science and Technology Park, No. 9, Gaoxin 3rd Road, High-tech Zone, Heyuan City, Guangdong, China
Equipment Under Test (EUT):	
EUT Name:	Kids Smart Watch
Model No.:	MIMO WATCH
Trade Mark:	hubble connected
Standard(s) :	47 CFR Part 15, Subpart C 15.247
Date of Receipt:	2022-02-14
Date of Test:	2022-02-16 to 2022-04-23
Date of Issue:	2022-04-25
Test Result:	**Pass***

* In the configuration tested, the EUT complied with the standards specified above.

Kobe Jian
EMC Laboratory Manager

Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
01		*2022-04-25*		*Original*

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

SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch Testing Center, EEC Laboratory.
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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 11.9.1.3	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	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
Duty Cycle		ANSI C63.10 (2013) Section 11.6	KDB 558074 D01 v05r02 section 6	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.

3 Contents

4 General Information

4.1 Details of E.U.T.

Power supply:	DC3.8V by li-ion battery(620mAh) Recharged by 5V/1A from wireless charger
Cable(s):	USB type C cable: 1m shielded cable without ferrite core
Operation Frequency:	802.11b/g/n(HT20): 2412MHz to 2462MHz
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
Channel Spacing:	5MHz
Antenna Type:	PIFA Antenna
Antenna Gain:	0.3dBi

4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
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The EUT has been tested as an independent unit.			

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	±5.08dB (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)
Duty Cycle	± 0.37%

4.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou Branch EMC Laboratory,

198 Kezhu Road, Scientech Park, Guangzhou Economic & Technology Development District, Guangzhou, China 510663

Tel: +86 20 82155555 Fax: +86 20 82075059

No tests were sub-contracted.

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

5 Equipment List

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
				2022-04-14	2024-04-13
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 Analzer(10Hz-44GHz)	Agilent Technologies	N9010A	EMC2138	2021-09-16	2022-09-15
6dB Attenuator	HP	8491A	EMC2062	2020-04-15	2022-04-14
				2022-04-14	2024-04-13
MI CABLE	SGS-EMC	0.8M	EMC2136	2021-11-01	2023-11-01
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**
EXA Signal Analzer(10Hz-44GHz)	Agilent Technologies	N9010A	EMC2138	2021-09-16	2022-09-15
6dB Attenuator	HP	8491A	EMC2062	2020-04-15	2022-04-14
				2022-04-14	2024-04-13
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 Analzer(10Hz-44GHz)	Agilent Technologies	N9010A	EMC2138	2021-09-16	2022-09-15
6dB Attenuator	HP	8491A	EMC2062	2020-04-15	2022-04-14
				2022-04-14	2024-04-13
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 Analzer(10Hz-44GHz)	Agilent Technologies	N9010A	EMC2138	2021-09-16	2022-09-15

6dB Attenuator	HP	8491A	EMC2062	2020-04-15	2022-04-14
				2022-04-14	2024-04-13
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**
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	2021-12-17	2022-12-16
966 Anechoic Chamber	C.R.T	9m x 6m x 6m	EMC2142	2020-12-20	2023-12-19
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
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**
EMI Test Receiver(10Hz-26.5GHz)	Rohde & Schwarz	ESIB26	EMC0522	2021-12-17	2022-12-16
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	2022-02-21
				2022-02-21	2025-02-20
Amplifier(9kHz-1.3GHz)	HP	8447F	EMC2065	2021-05-19	2022-05-18
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

Radiated Spurious Emissions (Above 1GHz)					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
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	2021-12-17	2022-12-16
2.4GHz Filter	Micro-Tronics	BRM 50702	EMC2069	2021-12-17	2022-12-16
966 Anechoic Chamber	C.R.T	9m x 6m x 6m	EMC2142	2020-12-20	2023-12-19
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
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

Duty Cycle

Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EXA Signal Analzer(10Hz-44GHz)	Agilent Technologies	N9010A	EMC2138	2021-09-16	2022-09-15
6dB Attenuator	HP	8491A	EMC2062	2020-04-15	2022-04-14
				2022-04-14	2024-04-13
MI CABLE	SGS-EMC	0.8M	EMC2136	2021-11-01	2023-11-01
Test Software	TST	V2.0	GZE100-78	N/A	N/A

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

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 is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 0.3 dBi.

Antenna location: Refer to internal photo.

7 Radio Spectrum Matter Test Results

7.1 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 ≥50 hopping channels
	0.25 for 25≤ hopping channels <50
	1 for digital modulation
2400-2483.5	1 for ≥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

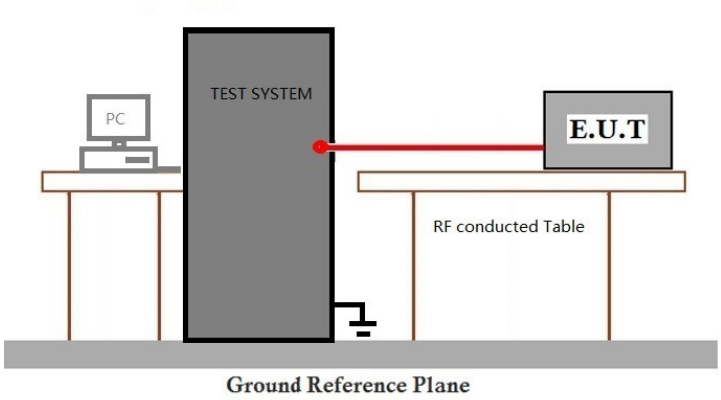
7.1.1 E.U.T. Operation

Operating Environment:
Temperature: 23 °C Humidity: 43 % RH Atmospheric Pressure: 1010 mbar

7.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	05	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). Only the data of worst case is recorded in the report.

7.1.3 Test Setup Diagram



7.1.4 Measurement Procedure and Data

Please Refer to Appendix for Details

7.2 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:

≥500 kHz

7.2.1 E.U.T. Operation

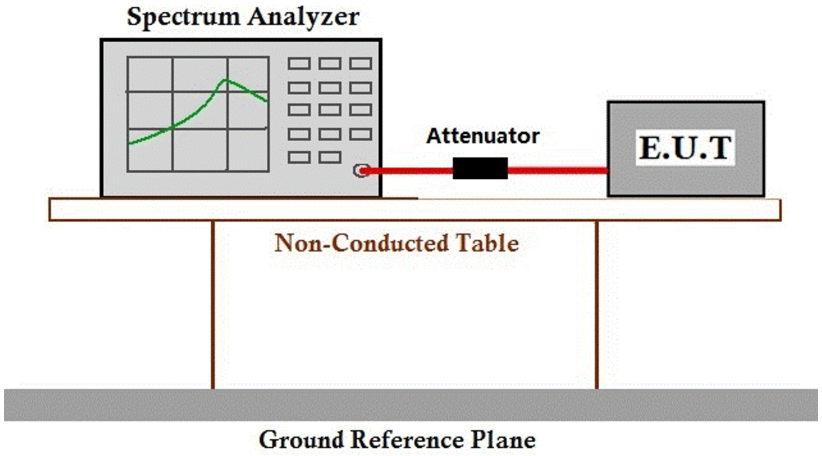
Operating Environment:

Temperature: 23 °C Humidity: 43 % RH Atmospheric Pressure: 1010 mbar

7.2.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	05	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). Only the data of worst case is recorded in the report.

7.2.3 Test Setup Diagram



7.2.4 Measurement Procedure and Data

Please Refer to Appendix for Details

7.3 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

7.3.1 E.U.T. Operation

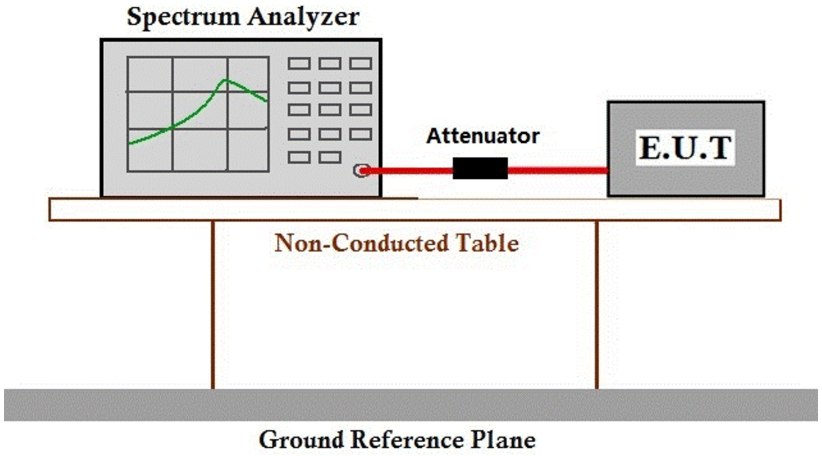
Operating Environment:

Temperature: 23 °C Humidity: 43 % RH Atmospheric Pressure: 1010 mbar

7.3.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	05	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). 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 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).

7.4.1 E.U.T. Operation

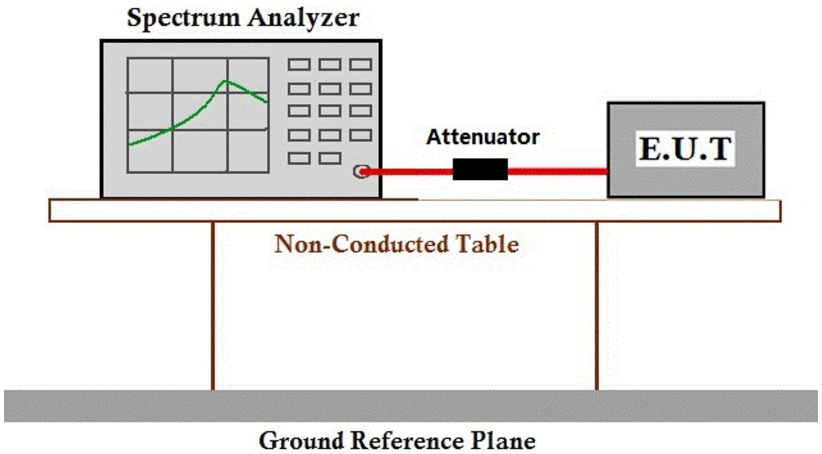
Operating Environment:

Temperature: 23 °C Humidity: 43 % RH Atmospheric Pressure: 1010 mbar

7.4.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	05	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). 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 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).

7.5.1 E.U.T. Operation

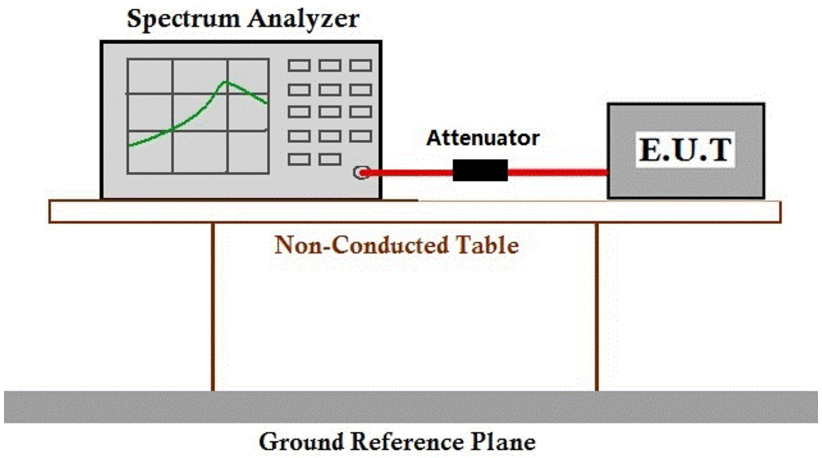
Operating Environment:

Temperature: 23 °C Humidity: 43 % RH Atmospheric Pressure: 1010 mbar

7.5.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	05	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). 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 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 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.		

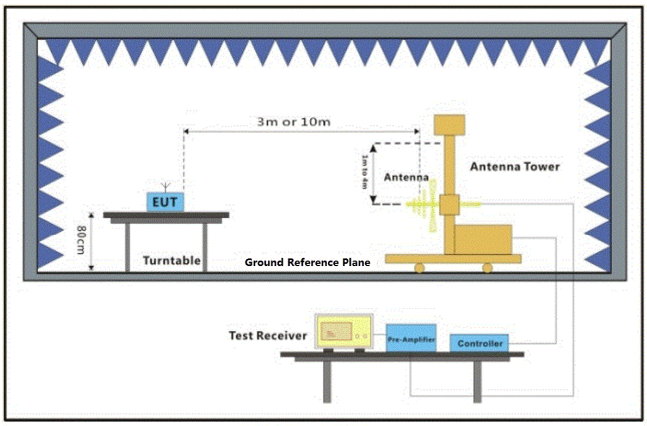
7.6.1 E.U.T. Operation

Operating Environment:
Temperature: 21 °C Humidity: 41 % RH Atmospheric Pressure: 1010 mbar

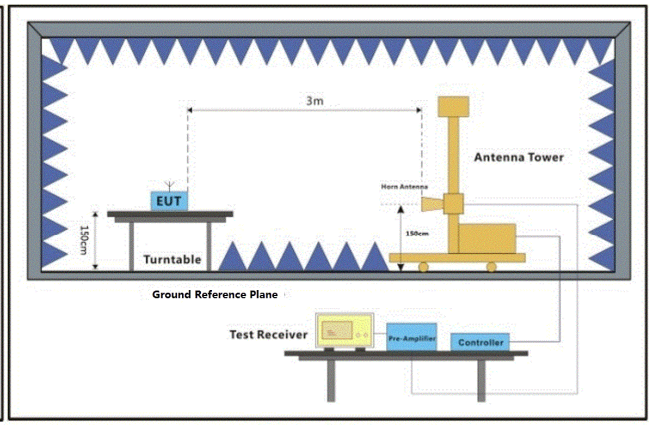
7.6.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	05	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). Only the data of worst case is recorded in the report.

7.6.3 Test Setup Diagram



30MHz-1GHz



Above 1GHz

7.6.4 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.

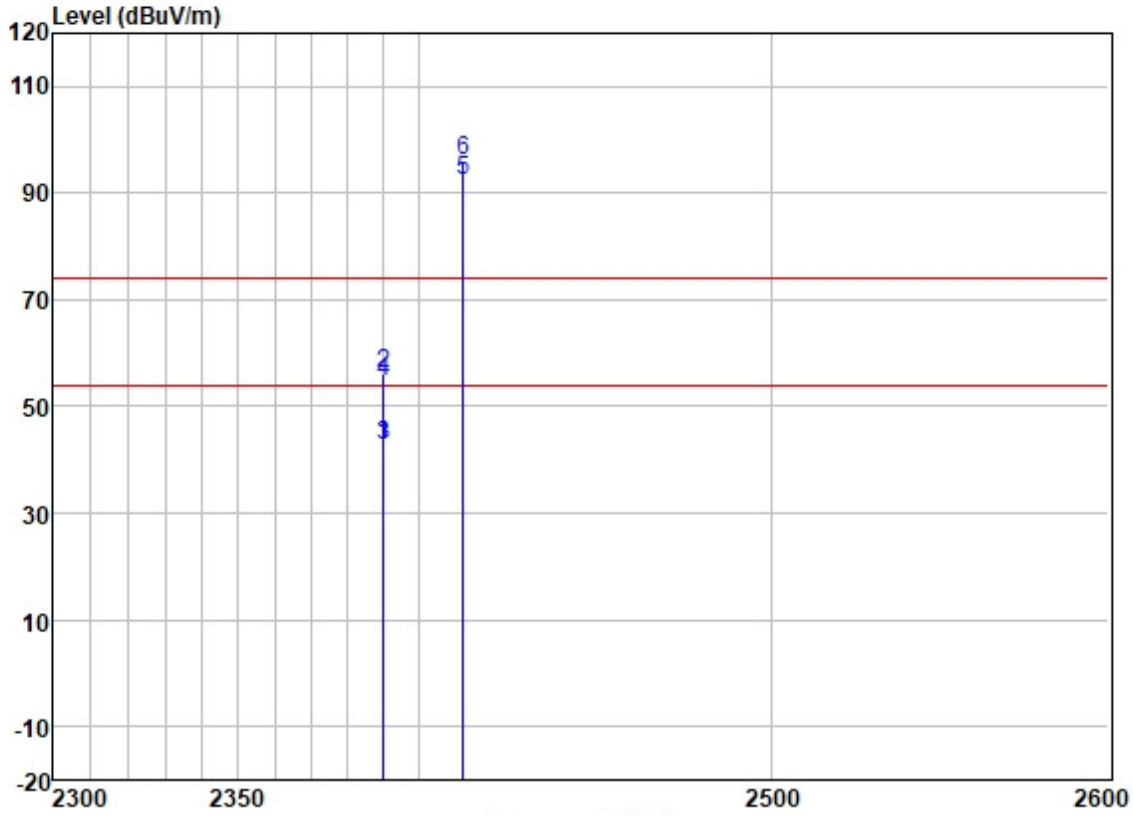
i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.

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.

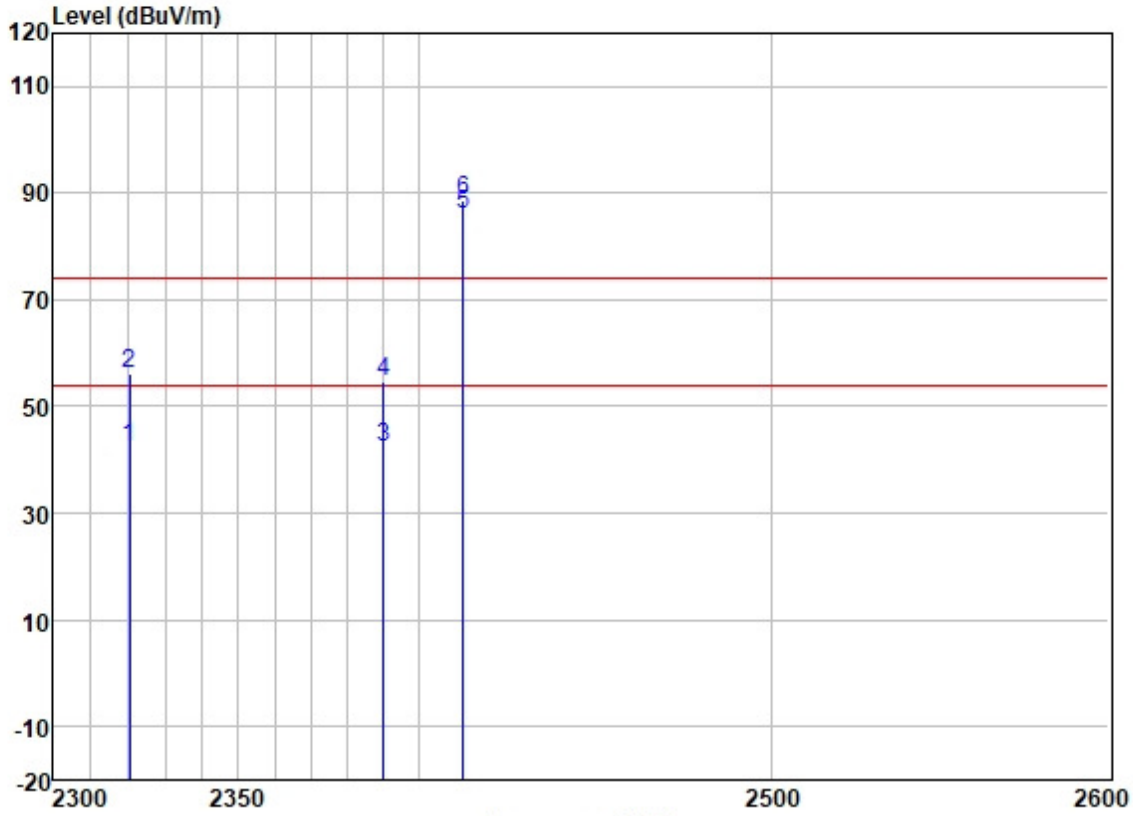
Test Mode: 05; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:Low



race: (Discrete)

		Freq	ReadLevel	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		2389.968	49.46	27.33	3.48	37.59	42.68	54.00	-11.32	HORIZONTAL	Average
2		2389.968	63.10	27.33	3.48	37.59	56.32	74.00	-17.68	HORIZONTAL	Peak
3		2390.000	49.46	27.33	3.48	37.59	42.68	54.00	-11.32	HORIZONTAL	Average
4		2390.000	61.45	27.33	3.48	37.59	54.67	74.00	-19.33	HORIZONTAL	Peak
5	*	2412.000	99.09	27.38	3.47	37.59	92.35	54.00	38.35	HORIZONTAL	Average
6	*	2412.000	103.01	27.38	3.47	37.59	96.27	74.00	22.27	HORIZONTAL	Peak

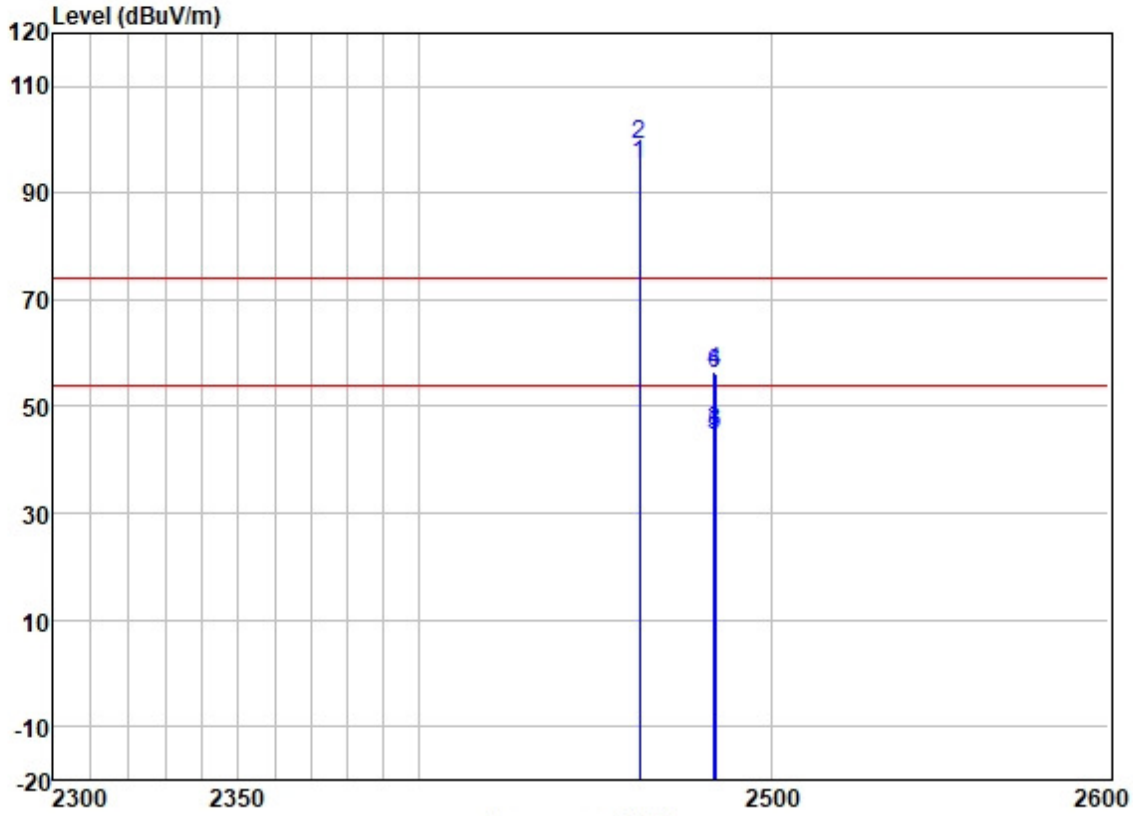
Test Mode: 05; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:Low



race: (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	2320.435	49.63	27.17	3.33	37.62	42.51	54.00	-11.49	VERTICAL	Average
2	2320.435	63.25	27.17	3.33	37.62	56.13	74.00	-17.87	VERTICAL	Peak
3	2390.000	48.99	27.33	3.48	37.59	42.21	54.00	-11.79	VERTICAL	Average
4	2390.000	61.34	27.33	3.48	37.59	54.56	74.00	-19.44	VERTICAL	Peak
5 *	2412.000	92.62	27.38	3.47	37.59	85.88	54.00	31.88	VERTICAL	Average
6 *	2412.000	95.22	27.38	3.47	37.59	88.48	74.00	14.48	VERTICAL	Peak

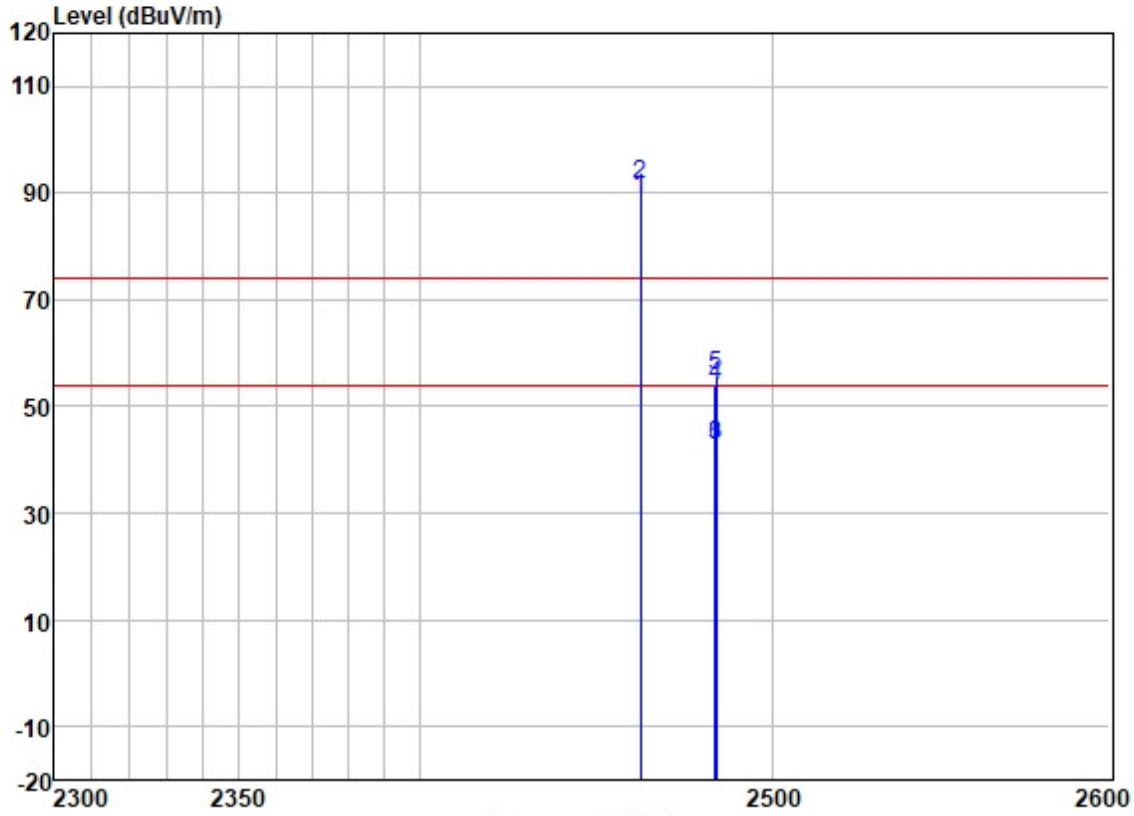
Test Mode: 05; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:High



race: (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	*	2462.000	101.97	27.45	3.50	37.58	95.34	54.00	41.34	HORIZONTAL	Average
2	*	2462.000	105.78	27.45	3.50	37.58	99.15	74.00	25.15	HORIZONTAL	Peak
3		2483.500	51.73	27.48	3.53	37.57	45.17	54.00	-8.83	HORIZONTAL	Average
4		2483.500	63.09	27.48	3.53	37.57	56.53	74.00	-17.47	HORIZONTAL	Peak
5		2483.790	51.15	27.48	3.53	37.57	44.59	54.00	-9.41	HORIZONTAL	Average
6		2483.790	62.89	27.48	3.53	37.57	56.33	74.00	-17.67	HORIZONTAL	Peak

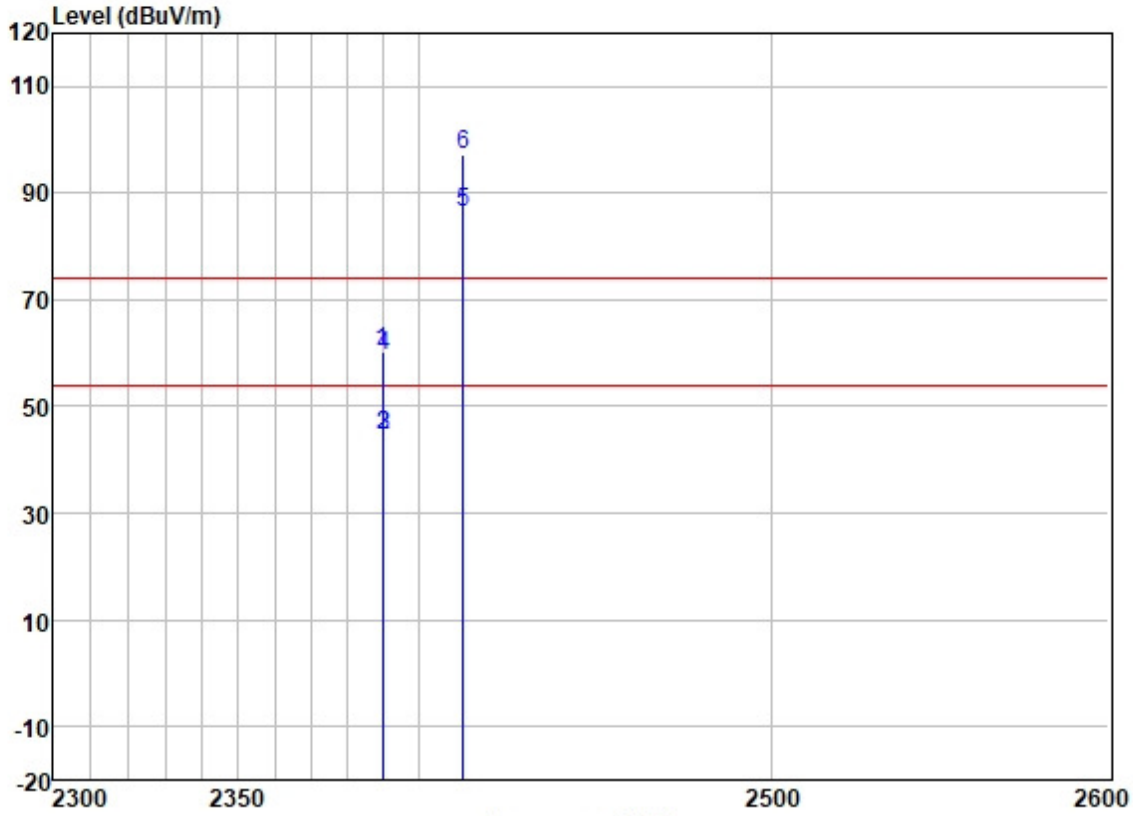
Test Mode: 05; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:High



race: (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 *	2462.000	95.75	27.45	3.50	37.58	89.12	54.00	35.12	VERTICAL	Average
2 *	2462.000	98.18	27.45	3.50	37.58	91.55	74.00	17.55	VERTICAL	Peak
3	2483.500	49.34	27.48	3.53	37.57	42.78	54.00	-11.22	VERTICAL	Average
4	2483.500	60.54	27.48	3.53	37.57	53.98	74.00	-20.02	VERTICAL	Peak
5	2483.719	62.51	27.48	3.53	37.57	55.95	74.00	-18.05	VERTICAL	Peak
6	2483.790	49.26	27.48	3.53	37.57	42.70	54.00	-11.30	VERTICAL	Average

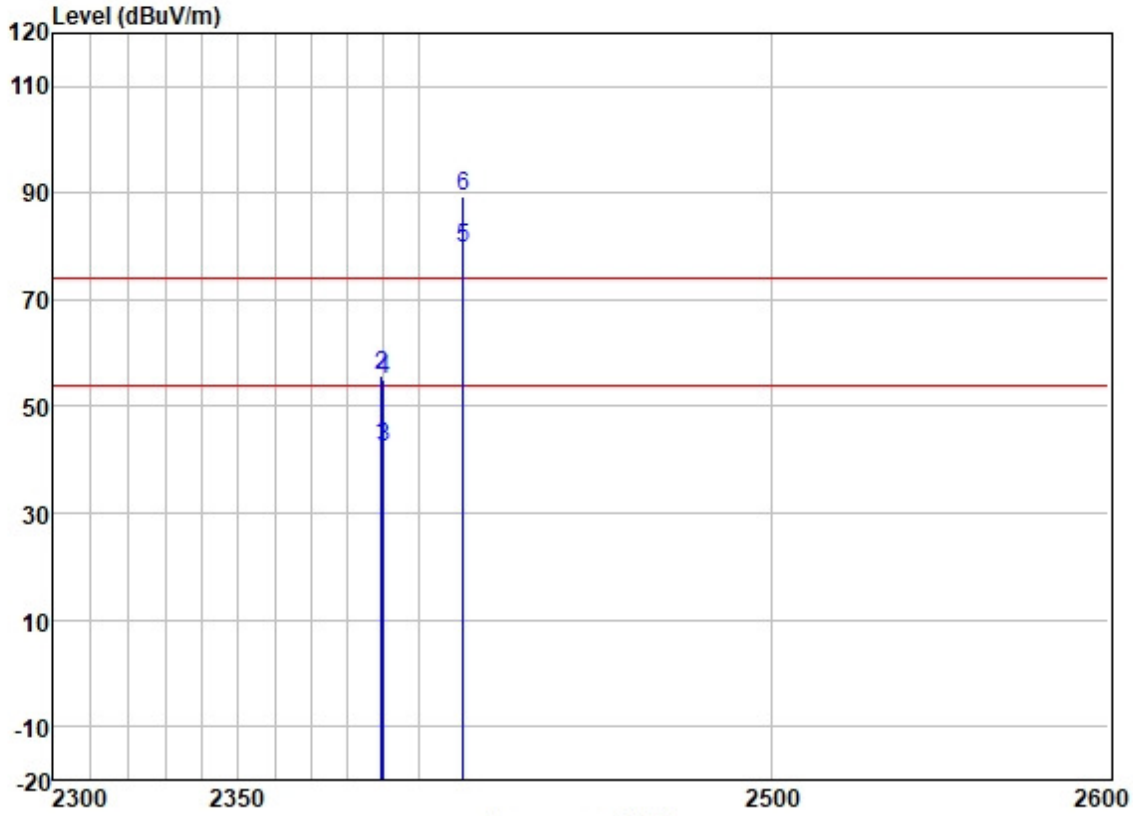
Test Mode: 05; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:Low



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		2389.726	66.89	27.33	3.48	37.59	60.11	74.00	-13.89	HORIZONTAL	Peak
2		2389.968	51.19	27.33	3.48	37.59	44.41	54.00	-9.59	HORIZONTAL	Average
3		2390.000	51.19	27.33	3.48	37.59	44.41	54.00	-9.59	HORIZONTAL	Average
4		2390.000	66.18	27.33	3.48	37.59	59.40	74.00	-14.60	HORIZONTAL	Peak
5	*	2412.000	93.22	27.38	3.47	37.59	86.48	54.00	32.48	HORIZONTAL	Average
6	*	2412.000	104.05	27.38	3.47	37.59	97.31	74.00	23.31	HORIZONTAL	Peak

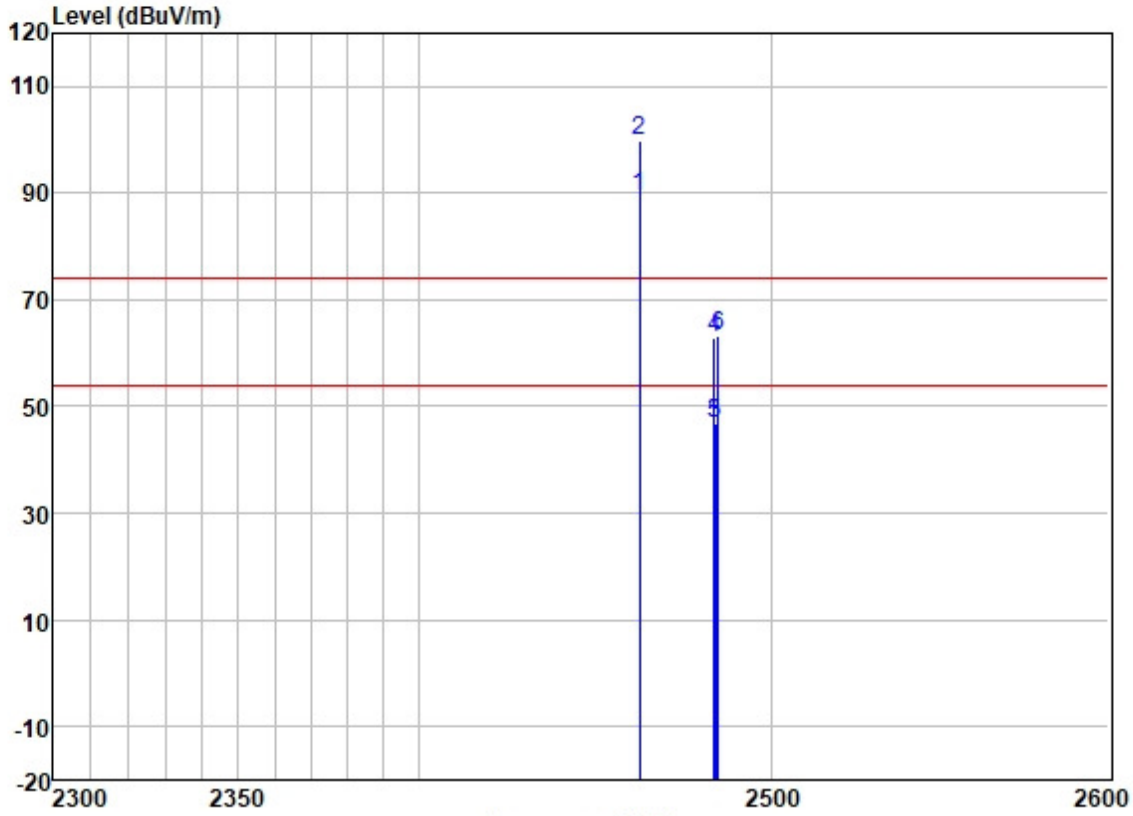
Test Mode: 05; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:Low



race: (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		2389.363	49.38	27.33	3.48	37.59	42.60	54.00	-11.40	VERTICAL	Average
2		2389.363	62.43	27.33	3.48	37.59	55.65	74.00	-18.35	VERTICAL	Peak
3		2390.000	49.31	27.33	3.48	37.59	42.53	54.00	-11.47	VERTICAL	Average
4		2390.000	61.87	27.33	3.48	37.59	55.09	74.00	-18.91	VERTICAL	Peak
5	*	2412.000	86.51	27.38	3.47	37.59	79.77	54.00	25.77	VERTICAL	Average
6	*	2412.000	96.06	27.38	3.47	37.59	89.32	74.00	15.32	VERTICAL	Peak

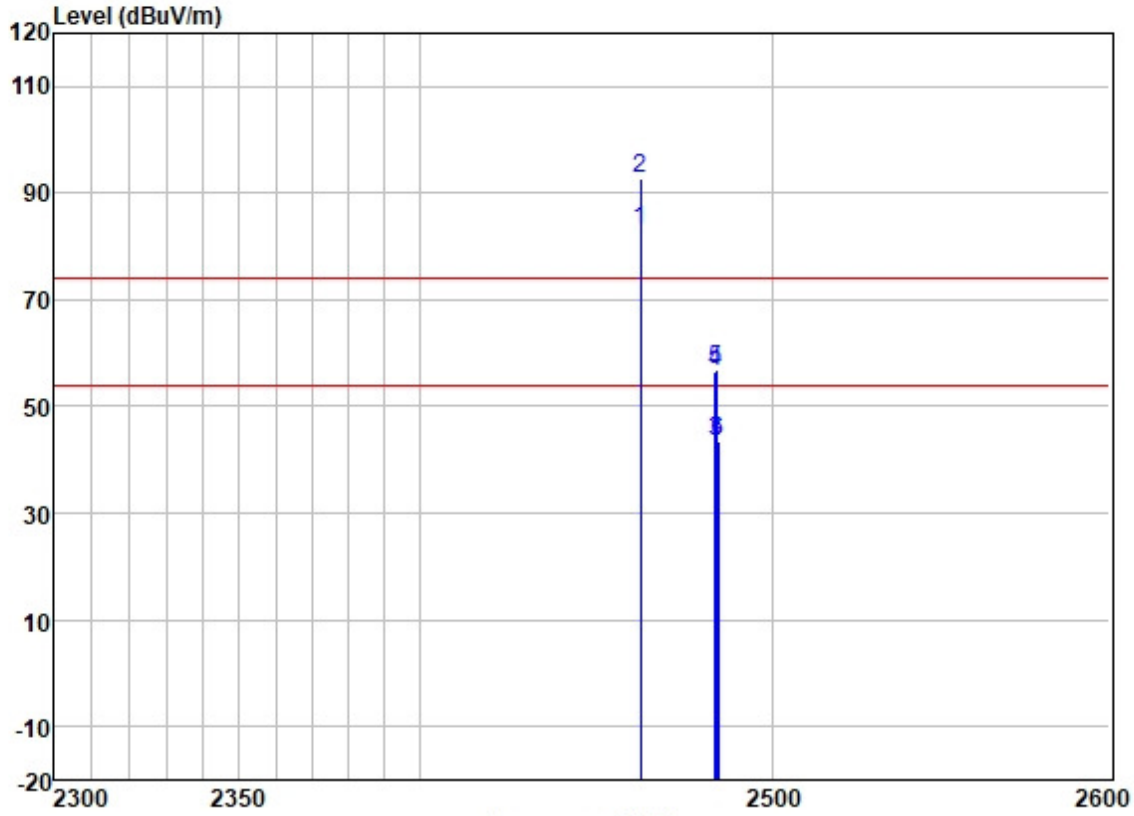
Test Mode: 05; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:High



race: (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	*	2462.000	96.08	27.45	3.50	37.58	89.45	54.00	35.45	HORIZONTAL	Average
2	*	2462.000	106.52	27.45	3.50	37.58	99.89	74.00	25.89	HORIZONTAL	Peak
3		2483.500	53.30	27.48	3.53	37.57	46.74	54.00	-7.26	HORIZONTAL	Average
4		2483.500	69.56	27.48	3.53	37.57	63.00	74.00	-11.00	HORIZONTAL	Peak
5		2483.790	53.25	27.48	3.53	37.57	46.69	54.00	-7.31	HORIZONTAL	Average
6		2484.593	69.79	27.48	3.53	37.57	63.23	74.00	-10.77	HORIZONTAL	Peak

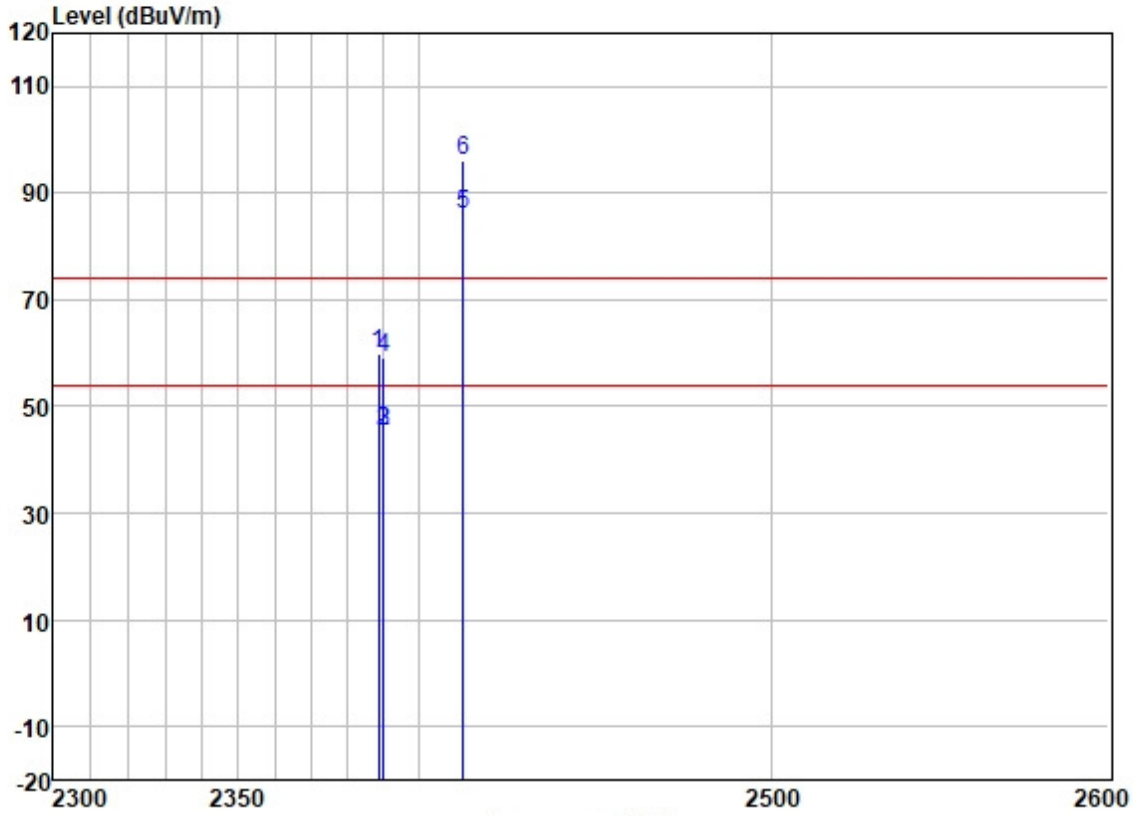
Test Mode: 05; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:High



race: (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	* 2462.000	89.51	27.45	3.50	37.58	82.88	54.00	28.88	VERTICAL	Average
2	* 2462.000	99.23	27.45	3.50	37.58	92.60	74.00	18.60	VERTICAL	Peak
3	2483.500	50.10	27.48	3.53	37.57	43.54	54.00	-10.46	VERTICAL	Average
4	2483.500	63.12	27.48	3.53	37.57	56.56	74.00	-17.44	VERTICAL	Peak
5	2483.840	63.40	27.48	3.53	37.57	56.84	74.00	-17.16	VERTICAL	Peak
6	2484.191	49.97	27.48	3.53	37.57	43.41	54.00	-10.59	VERTICAL	Average

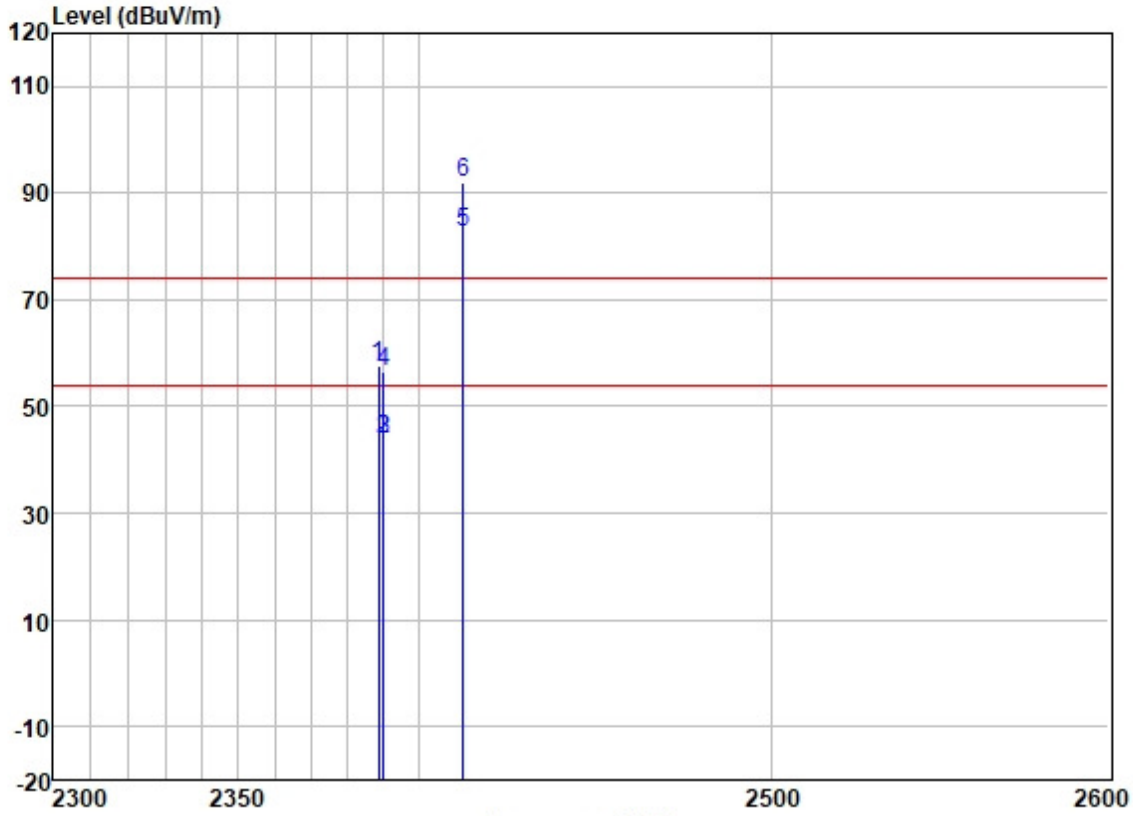
Test Mode: 05; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:Low



race: (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		2388.395	66.79	27.33	3.48	37.59	60.01	74.00	-13.99	HORIZONTAL	Peak
2		2389.968	51.96	27.33	3.48	37.59	45.18	54.00	-8.82	HORIZONTAL	Average
3		2390.000	51.96	27.33	3.48	37.59	45.18	54.00	-8.82	HORIZONTAL	Average
4		2390.000	66.08	27.33	3.48	37.59	59.30	74.00	-14.70	HORIZONTAL	Peak
5	*	2412.000	92.94	27.38	3.47	37.59	86.20	54.00	32.20	HORIZONTAL	Average
6	*	2412.000	102.76	27.38	3.47	37.59	96.02	74.00	22.02	HORIZONTAL	Peak

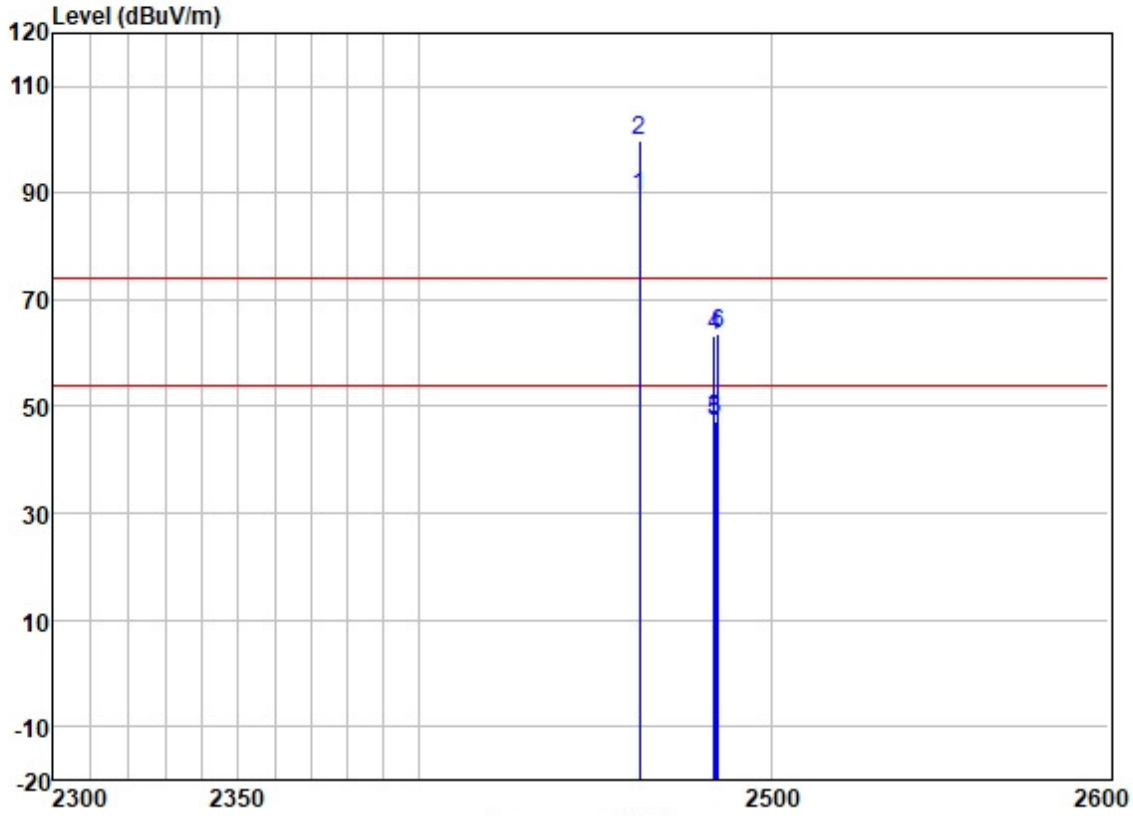
Test Mode: 05; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:Low



race: (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		2388.516	64.26	27.33	3.48	37.59	57.48	74.00	-16.52	VERTICAL	Peak
2		2389.968	50.76	27.33	3.48	37.59	43.98	54.00	-10.02	VERTICAL	Average
3		2390.000	50.76	27.33	3.48	37.59	43.98	54.00	-10.02	VERTICAL	Average
4		2390.000	63.17	27.33	3.48	37.59	56.39	74.00	-17.61	VERTICAL	Peak
5	*	2412.000	89.43	27.38	3.47	37.59	82.69	54.00	28.69	VERTICAL	Average
6	*	2412.000	98.60	27.38	3.47	37.59	91.86	74.00	17.86	VERTICAL	Peak

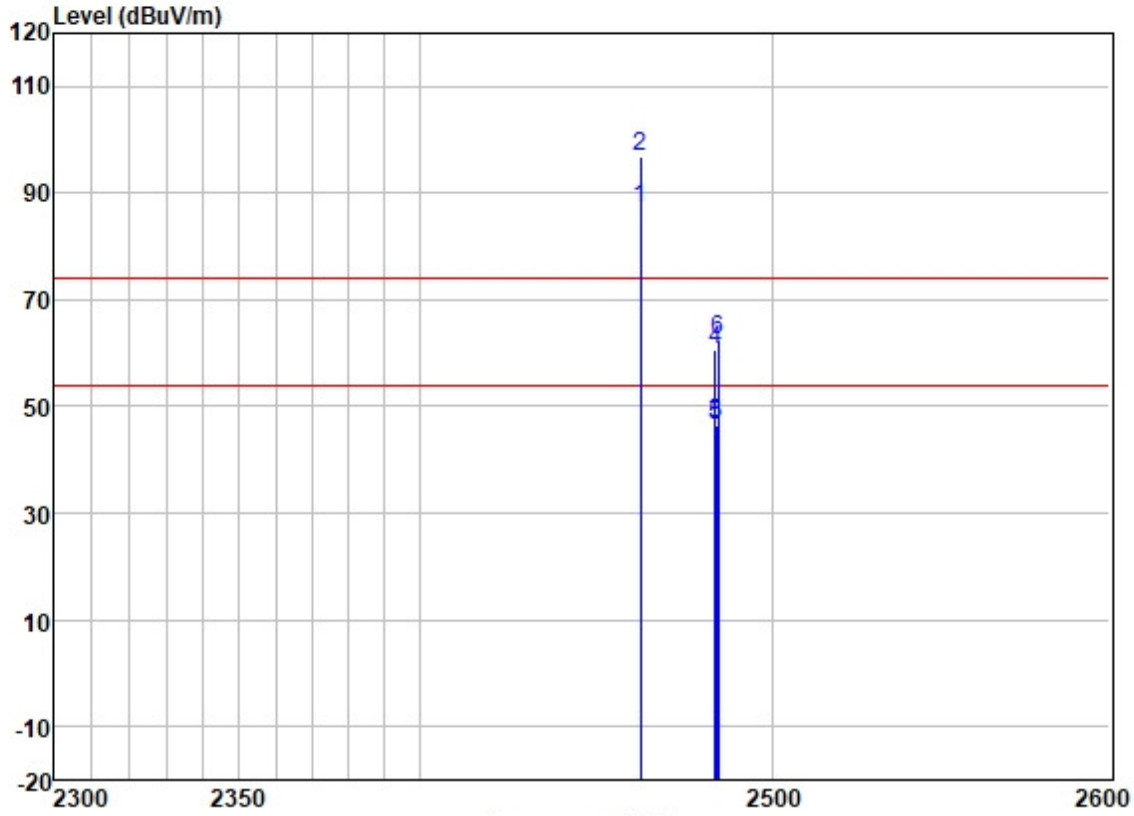
Test Mode: 05; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:High



race: (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 *	2462.000	96.10	27.45	3.50	37.58	89.47	54.00	35.47	HORIZONTAL	Average
2 *	2462.000	106.40	27.45	3.50	37.58	99.77	74.00	25.77	HORIZONTAL	Peak
3	2483.500	54.14	27.48	3.53	37.57	47.58	54.00	-6.42	HORIZONTAL	Average
4	2483.500	69.66	27.48	3.53	37.57	63.10	74.00	-10.90	HORIZONTAL	Peak
5	2483.890	53.76	27.48	3.53	37.57	47.20	54.00	-6.80	HORIZONTAL	Average
6	2484.643	70.22	27.48	3.53	37.57	63.66	74.00	-10.34	HORIZONTAL	Peak

Test Mode: 05; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:High



race: (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 *	2462.000	93.67	27.45	3.50	37.58	87.04	54.00	33.04	VERTICAL	Average
2 *	2462.000	103.37	27.45	3.50	37.58	96.74	74.00	22.74	VERTICAL	Peak
3	2483.500	53.20	27.48	3.53	37.57	46.64	54.00	-7.36	VERTICAL	Average
4	2483.500	67.18	27.48	3.53	37.57	60.62	74.00	-13.38	VERTICAL	Peak
5	2483.790	53.15	27.48	3.53	37.57	46.59	54.00	-7.41	VERTICAL	Average
6	2484.342	68.97	27.48	3.53	37.57	62.41	74.00	-11.59	VERTICAL	Peak

7.7 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
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.		

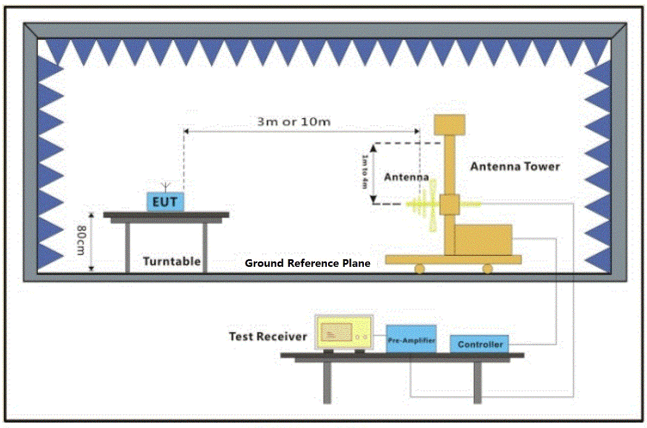
7.7.1 E.U.T. Operation

Operating Environment:
Temperature: 22 °C Humidity: 42 % RH Atmospheric Pressure: 1010 mbar

7.7.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	05	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). Only the data of worst case is recorded in the report.

7.7.3 Test Setup Diagram



30MHz-1GHz

7.7.4 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:

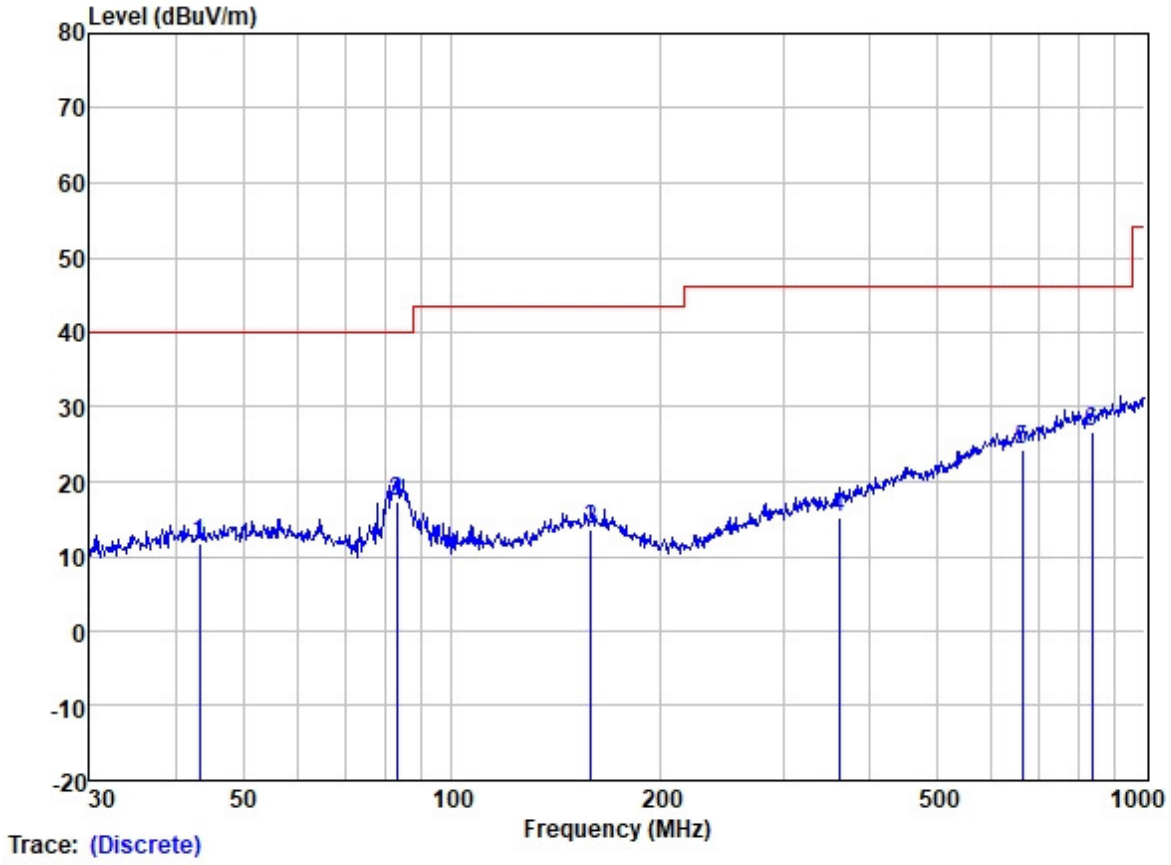
1) Through pre-scan found the worst case is the lowest channel. Only the worst case is recorded in the report.

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.

Test Mode: 05; Polarity: Horizontal

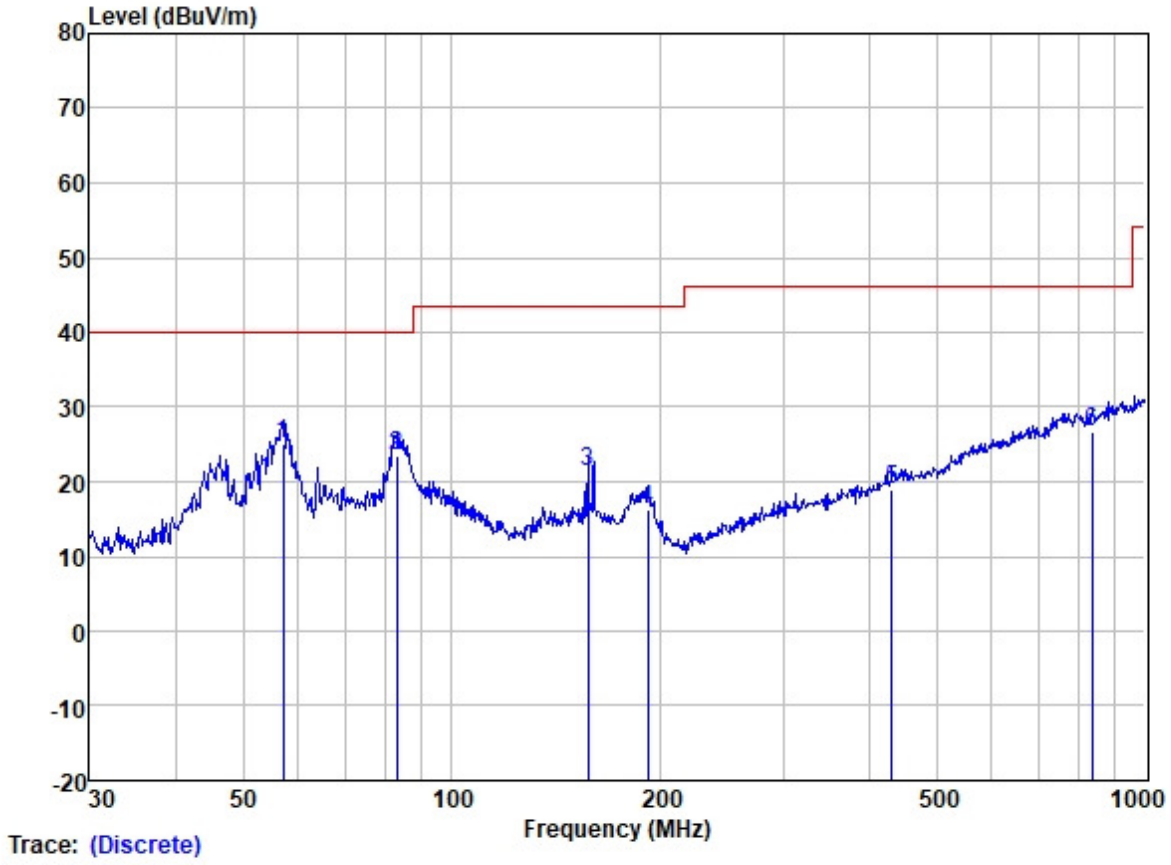


Trace: (Discrete)

Site : SGS
Job :
Model :
Power :
Test Mode : 2.4GWIFI

	Freq	Read Level	Anterna Factor	Cable Loss	Preamp Factor	Measured Level	Limit Line	Over Limit	Pol/ Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	43.202	24.25	13.57	1.12	27.17	11.77	40.00	-28.23	HORIZONTAL	QP
2	83.230	35.26	7.74	1.51	27.09	17.42	40.00	-22.58	HORIZONTAL	QP
3	158.668	24.57	13.41	2.33	26.80	13.51	43.50	-29.99	HORIZONTAL	QP
4	361.714	24.11	14.56	3.70	27.13	15.24	46.00	-30.76	HORIZONTAL	QP
5	665.804	26.60	20.30	5.61	28.17	24.34	46.00	-21.66	HORIZONTAL	QP
6	839.182	25.75	22.40	6.46	27.97	26.64	46.00	-19.36	HORIZONTAL	QP

Test Mode: 05; Polarity: Vertical



Trace: (Discrete)

Site : SGS
Job :
Model :
Power :
Test Mode : 2.4GWIFI

	Freq	Read Level	Anterna Factor	Cable Loss	Preamp Factor	Measured Level	Limit Line	Over Limit	Pol/ Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	56.991	37.45	13.45	1.21	27.16	24.95	40.00	-15.05	VERTICAL	QP
2	83.230	41.32	7.74	1.51	27.09	23.48	40.00	-16.52	VERTICAL	QP
3	157.007	32.30	13.42	2.31	26.81	21.22	43.50	-22.28	VERTICAL	QP
4	191.745	30.29	10.32	2.50	26.74	16.37	43.50	-27.13	VERTICAL	QP
5	431.032	25.87	16.55	4.09	27.50	19.01	46.00	-26.99	VERTICAL	QP
6	839.182	25.70	22.40	6.46	27.97	26.59	46.00	-19.41	VERTICAL	QP

7.8 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
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.		

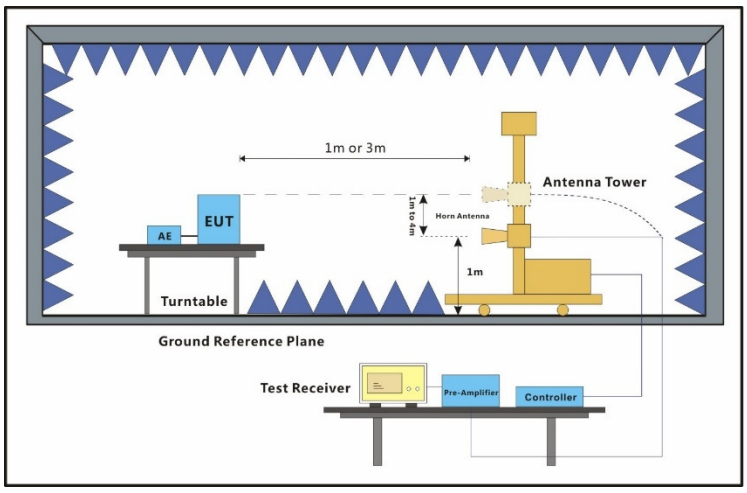
7.8.1 E.U.T. Operation

Operating Environment:
Temperature: 21 °C Humidity: 41 % RH Atmospheric Pressure: 1010 mbar

7.8.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	05	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). Only the data of worst case is recorded in the report.

7.8.3 Test Setup Diagram



7.8.4 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:

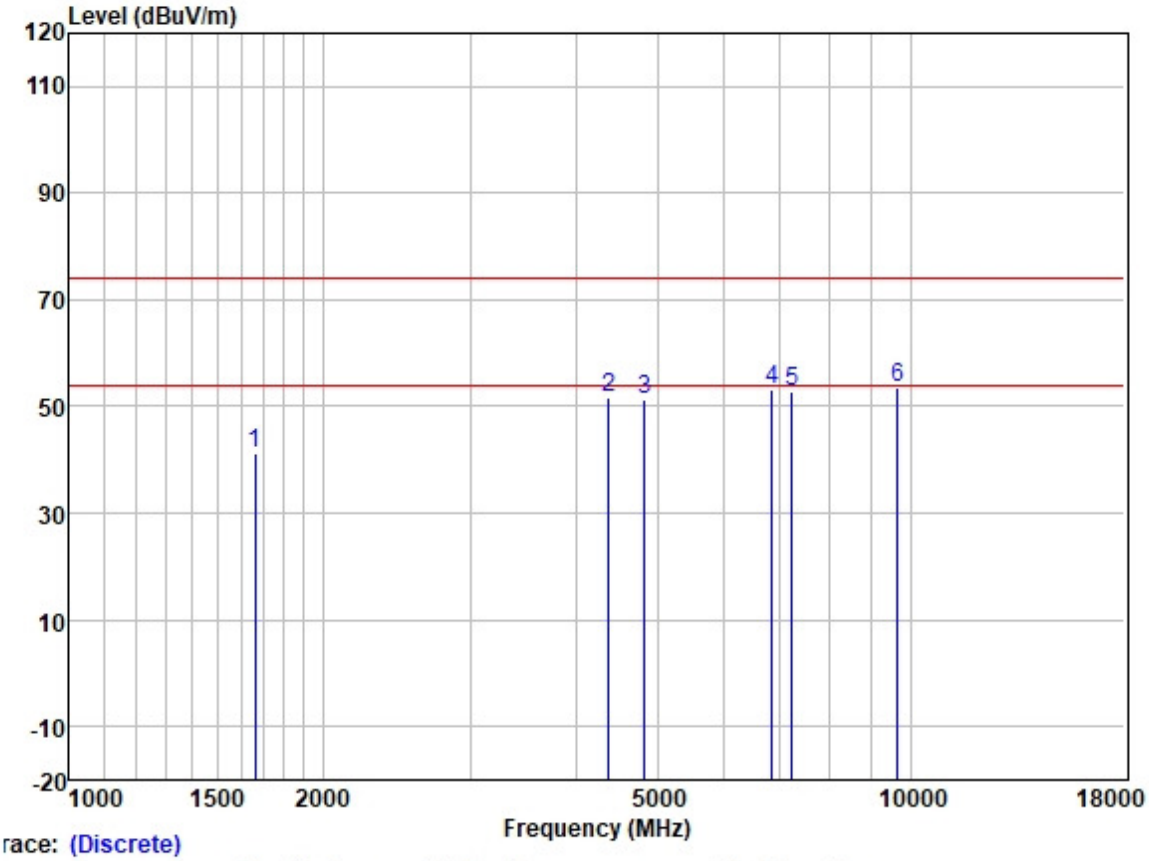
1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

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.

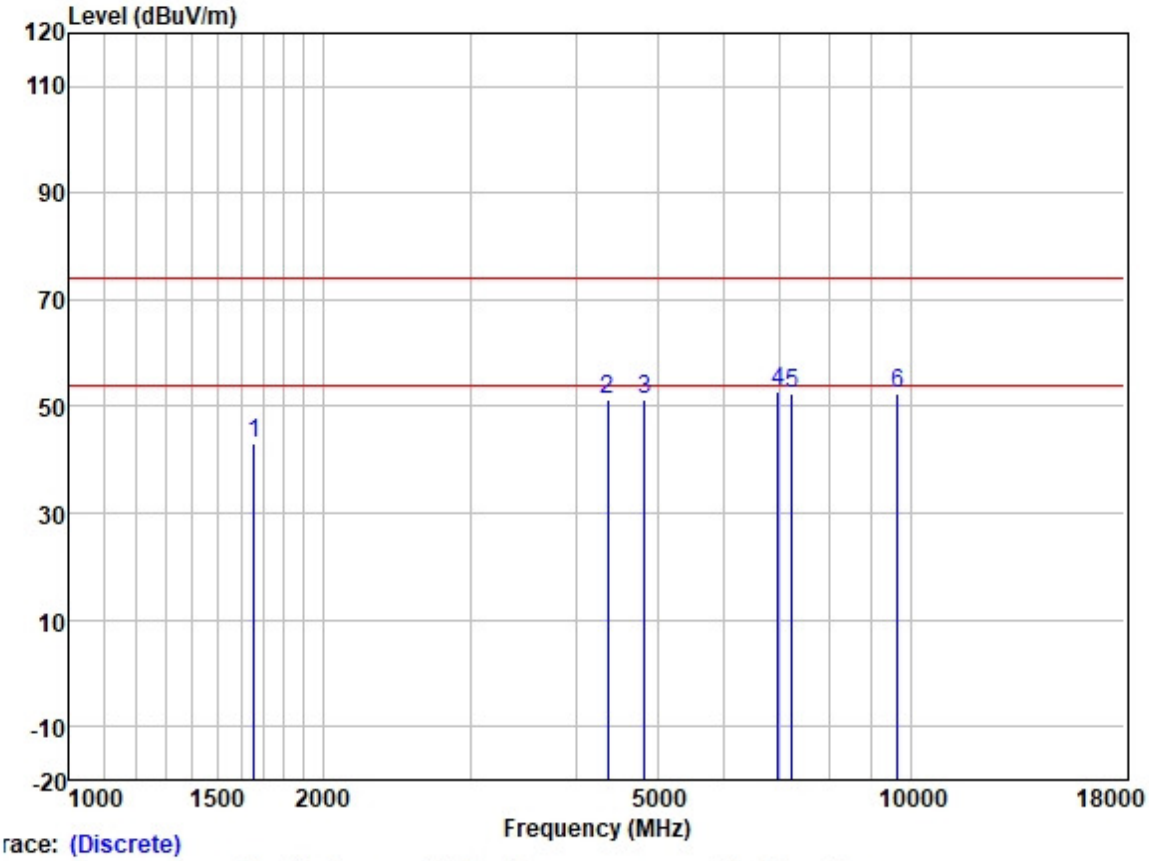
Test Mode: 05; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:Low



race: (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	1663.137	50.86	25.65	2.80	37.91	41.40	74.00	-32.60	HORIZONTAL	Peak
2	4379.699	52.98	30.64	4.69	36.81	51.50	74.00	-22.50	HORIZONTAL	Peak
3	4824.000	51.41	31.45	5.42	36.83	51.45	74.00	-22.55	HORIZONTAL	Peak
4	6855.063	49.83	34.78	5.82	37.15	53.28	74.00	-20.72	HORIZONTAL	Peak
5	7236.000	48.37	35.70	6.03	37.39	52.71	74.00	-21.29	HORIZONTAL	Peak
6	9648.000	45.35	38.40	7.06	37.42	53.39	74.00	-20.61	HORIZONTAL	Peak

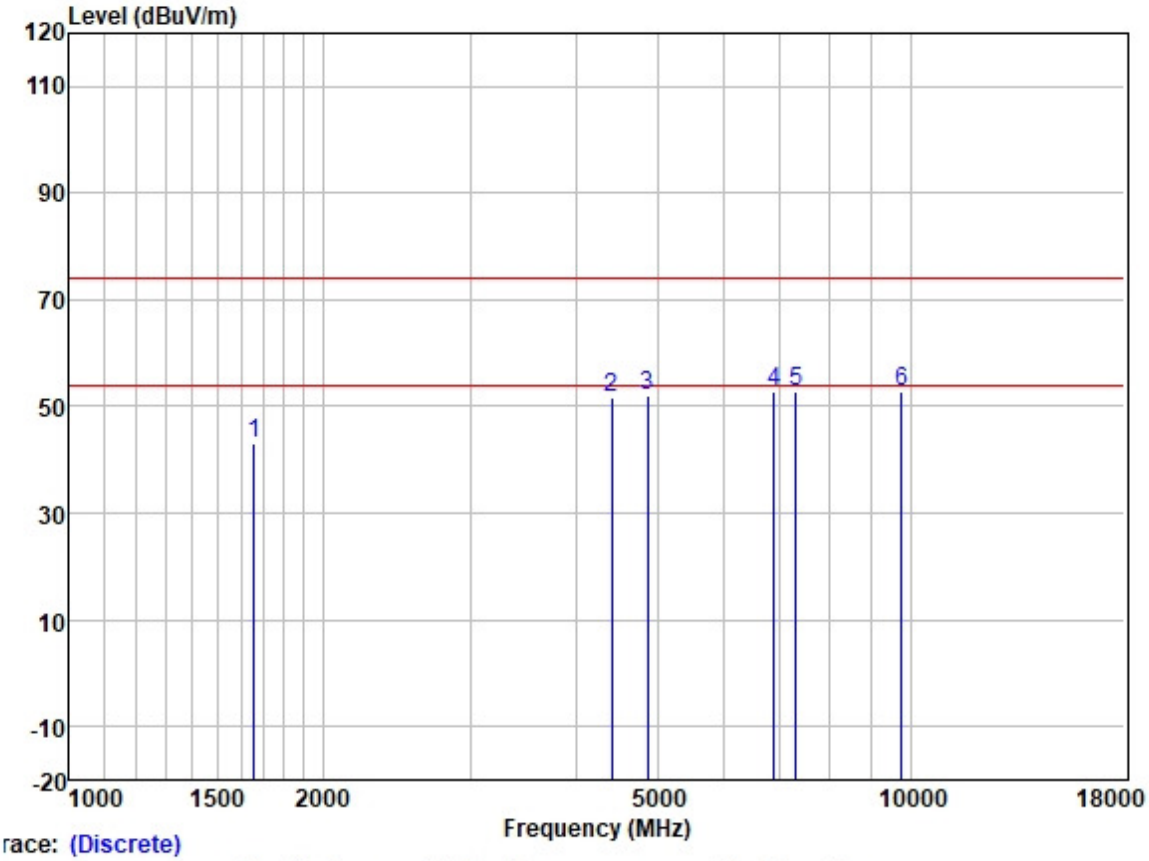
Test Mode: 05; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:Low



race: (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	1658.337	52.57	25.65	2.80	37.93	43.09	74.00	-30.91	VERTICAL	Peak
2	4367.058	52.82	30.62	4.68	36.81	51.31	74.00	-22.69	VERTICAL	Peak
3	4824.000	51.20	31.45	5.42	36.83	51.24	74.00	-22.76	VERTICAL	Peak
4	6954.852	49.10	34.95	5.81	37.21	52.65	74.00	-21.35	VERTICAL	Peak
5	7236.000	48.26	35.70	6.03	37.39	52.60	74.00	-21.40	VERTICAL	Peak
6	9648.000	44.45	38.40	7.06	37.42	52.49	74.00	-21.51	VERTICAL	Peak

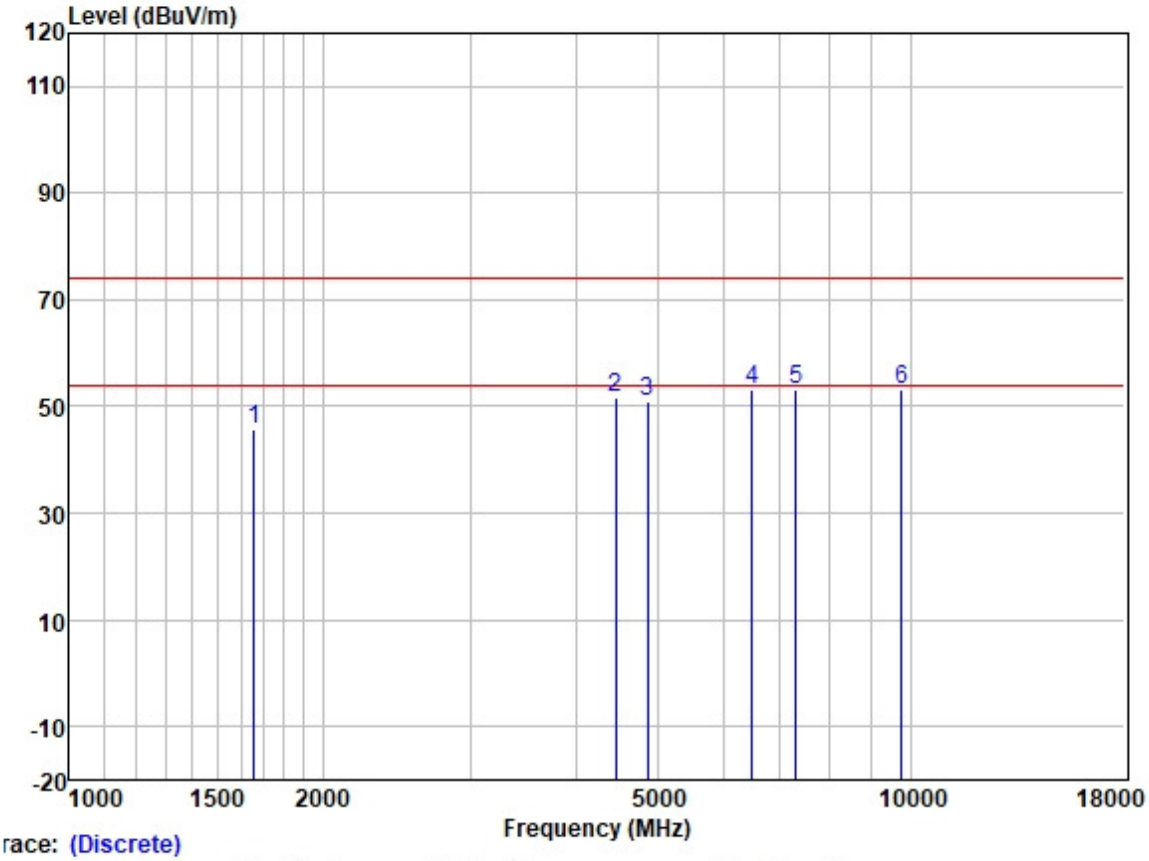
Test Mode: 05; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:middle



race: (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	1658.337	52.72	25.65	2.80	37.93	43.24	74.00	-30.76	HORIZONTAL	Peak
2	4417.841	53.04	30.70	4.74	36.81	51.67	74.00	-22.33	HORIZONTAL	Peak
3	4874.000	51.97	31.54	5.50	36.84	52.17	74.00	-21.83	HORIZONTAL	Peak
4	6874.906	49.19	34.82	5.82	37.16	52.67	74.00	-21.33	HORIZONTAL	Peak
5	7311.000	48.11	35.93	6.11	37.42	52.73	74.00	-21.27	HORIZONTAL	Peak
6	9748.000	44.59	38.50	7.02	37.41	52.70	74.00	-21.30	HORIZONTAL	Peak

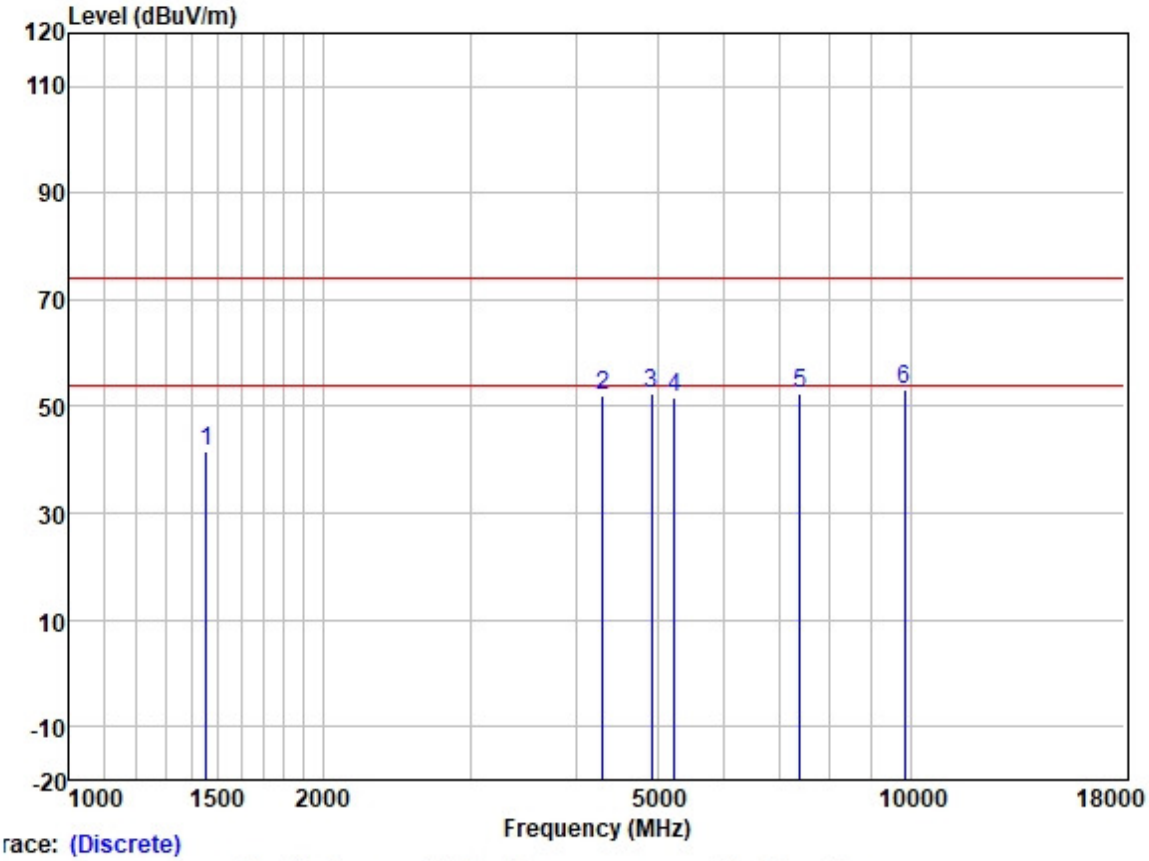
Test Mode: 05; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:middle



race: (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	1658.337	55.21	25.65	2.80	37.93	45.73	74.00	-28.27	VERTICAL	Peak
2	4456.315	53.00	30.75	4.88	36.81	51.82	74.00	-22.18	VERTICAL	Peak
3	4874.000	50.71	31.54	5.50	36.84	50.91	74.00	-23.09	VERTICAL	Peak
4	6488.754	50.45	33.96	5.85	37.01	53.25	74.00	-20.75	VERTICAL	Peak
5	7311.000	48.45	35.93	6.11	37.42	53.07	74.00	-20.93	VERTICAL	Peak
6	9748.000	45.10	38.50	7.02	37.41	53.21	74.00	-20.79	VERTICAL	Peak

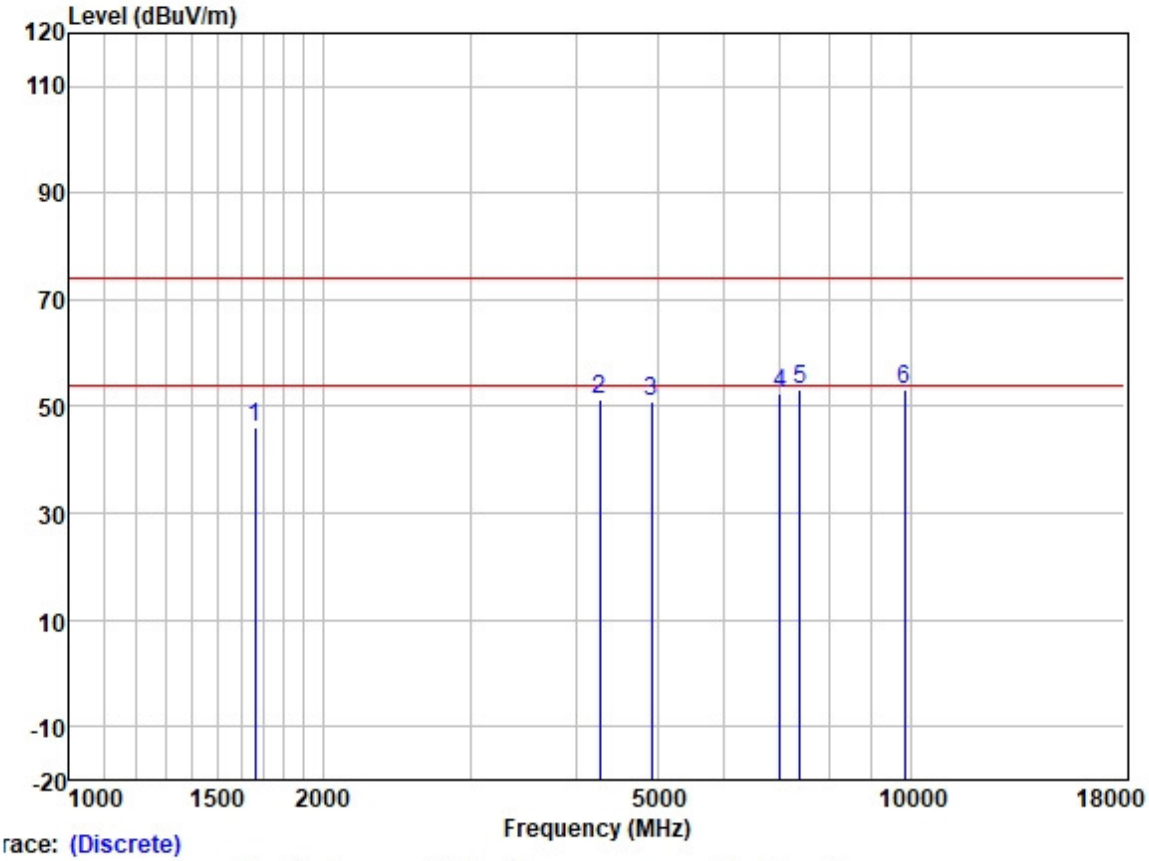
Test Mode: 05; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:High



race: (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	1456.081	51.51	25.46	2.72	38.17	41.52	74.00	-32.48	HORIZONTAL	Peak
2	4304.400	53.60	30.48	4.65	36.81	51.92	74.00	-22.08	HORIZONTAL	Peak
3	4924.000	51.99	31.62	5.60	36.84	52.37	74.00	-21.63	HORIZONTAL	Peak
4	5239.274	50.89	31.75	5.74	36.87	51.51	74.00	-22.49	HORIZONTAL	Peak
5	7386.000	47.47	36.17	6.19	37.45	52.38	74.00	-21.62	HORIZONTAL	Peak
6	9848.000	45.09	38.58	6.99	37.41	53.25	74.00	-20.75	HORIZONTAL	Peak

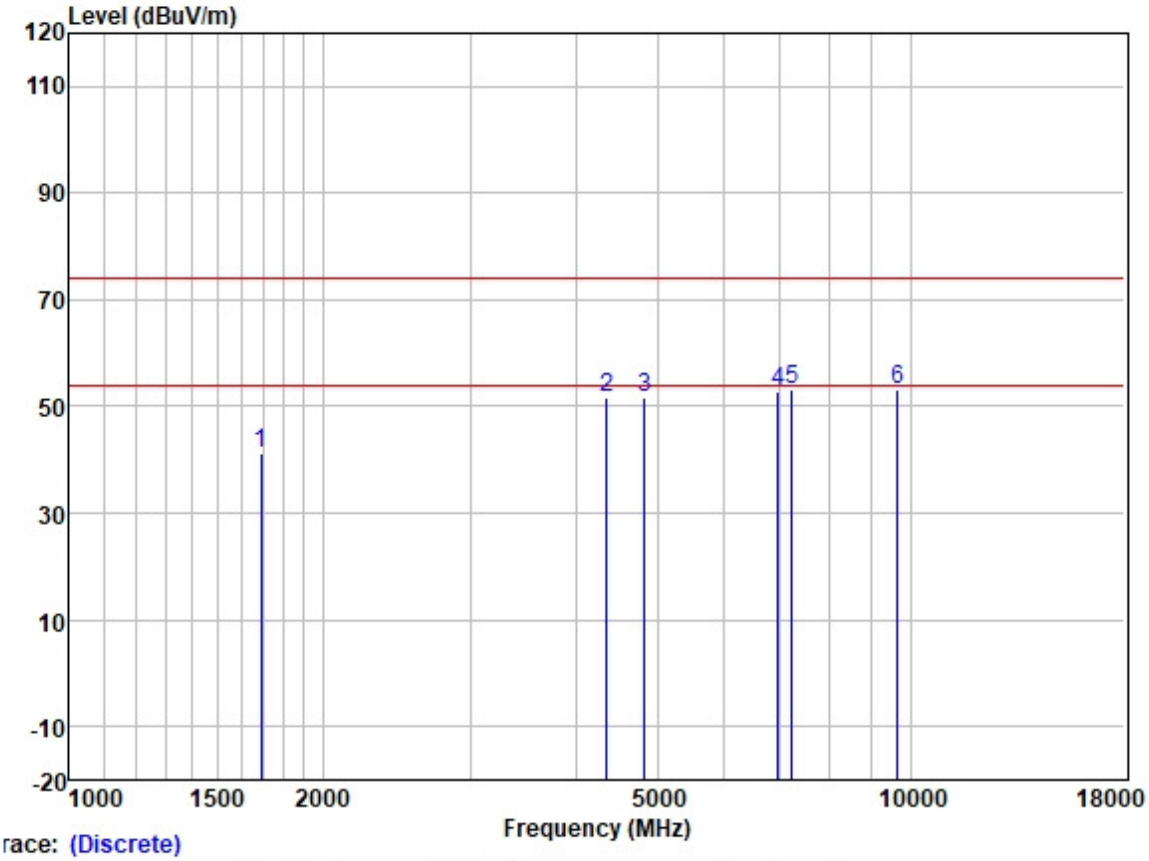
Test Mode: 05; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:High



race: (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	1663.137	55.52	25.65	2.80	37.91	46.06	74.00	-27.94	VERTICAL	Peak
2	4267.237	53.13	30.38	4.63	36.81	51.33	74.00	-22.67	VERTICAL	Peak
3	4924.000	50.52	31.62	5.60	36.84	50.90	74.00	-23.10	VERTICAL	Peak
4	6995.172	48.87	35.00	5.81	37.25	52.43	74.00	-21.57	VERTICAL	Peak
5	7386.000	48.27	36.17	6.19	37.45	53.18	74.00	-20.82	VERTICAL	Peak
6	9848.000	45.13	38.58	6.99	37.41	53.29	74.00	-20.71	VERTICAL	Peak

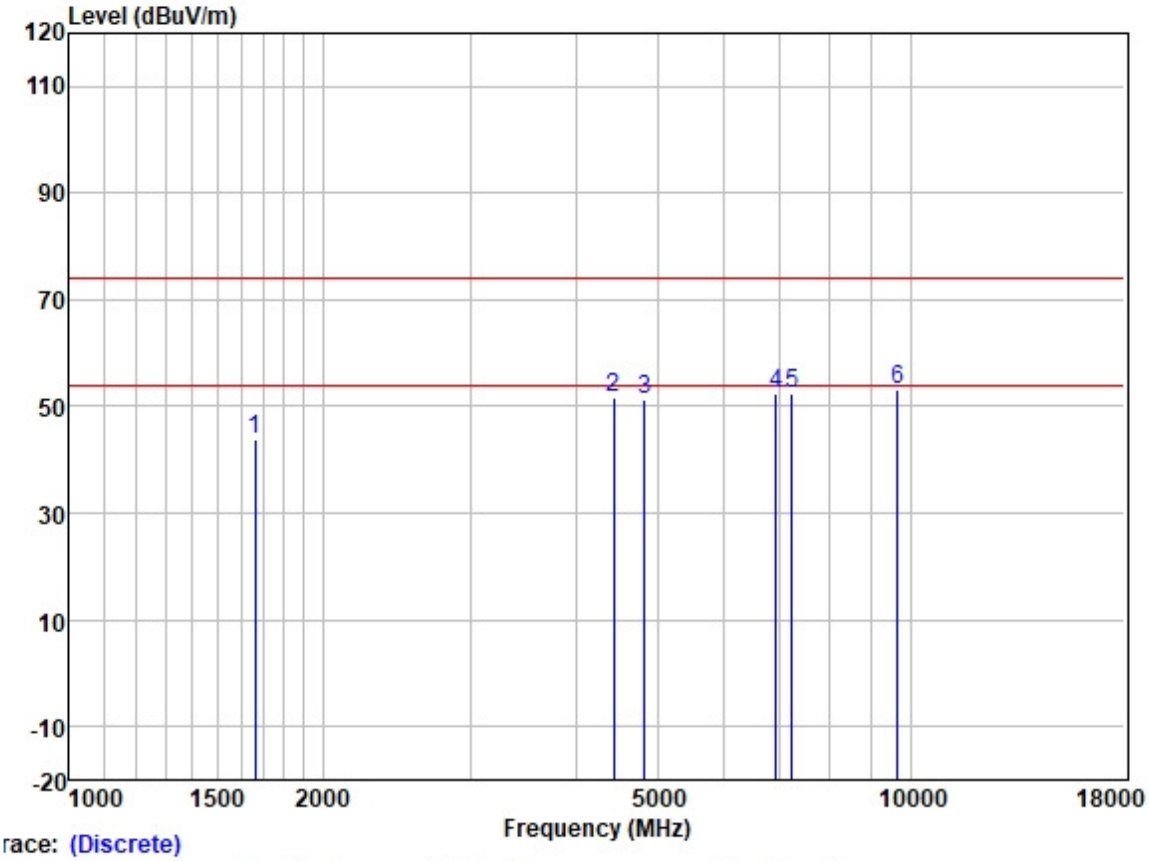
Test Mode: 05; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:Low



race: (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	1692.231	50.52	25.70	2.80	37.89	41.13	74.00	-32.87	HORIZONTAL	Peak
2	4354.454	53.24	30.59	4.68	36.81	51.70	74.00	-22.30	HORIZONTAL	Peak
3	4824.000	51.59	31.45	5.42	36.83	51.63	74.00	-22.37	HORIZONTAL	Peak
4	6954.852	49.25	34.95	5.81	37.21	52.80	74.00	-21.20	HORIZONTAL	Peak
5	7236.000	48.80	35.70	6.03	37.39	53.14	74.00	-20.86	HORIZONTAL	Peak
6	9648.000	45.04	38.40	7.06	37.42	53.08	74.00	-20.92	HORIZONTAL	Peak

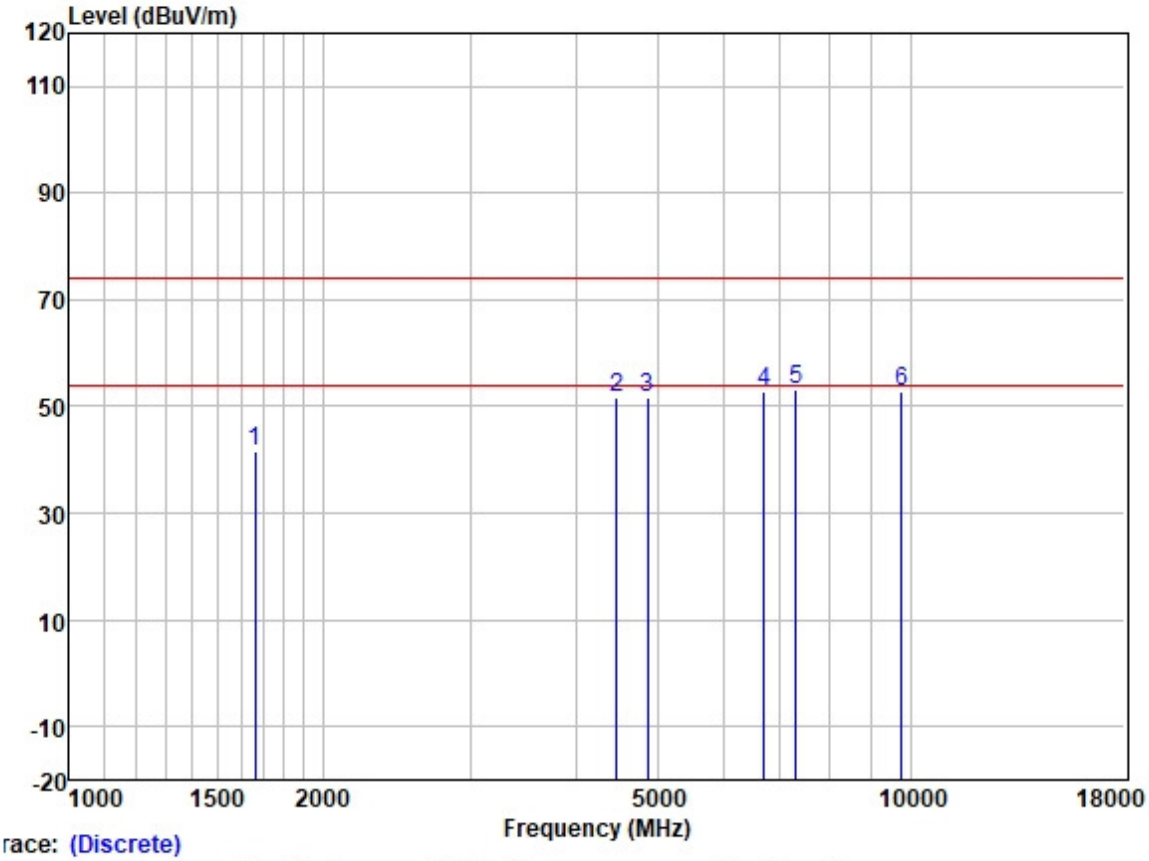
Test Mode: 05; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:Low



race: (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	1663.137	53.28	25.65	2.80	37.91	43.82	74.00	-30.18	VERTICAL	Peak
2	4443.453	52.89	30.73	4.83	36.81	51.64	74.00	-22.36	VERTICAL	Peak
3	4824.000	51.45	31.45	5.42	36.83	51.49	74.00	-22.51	VERTICAL	Peak
4	6914.763	49.10	34.89	5.81	37.19	52.61	74.00	-21.39	VERTICAL	Peak
5	7236.000	47.93	35.70	6.03	37.39	52.27	74.00	-21.73	VERTICAL	Peak
6	9648.000	44.96	38.40	7.06	37.42	53.00	74.00	-21.00	VERTICAL	Peak

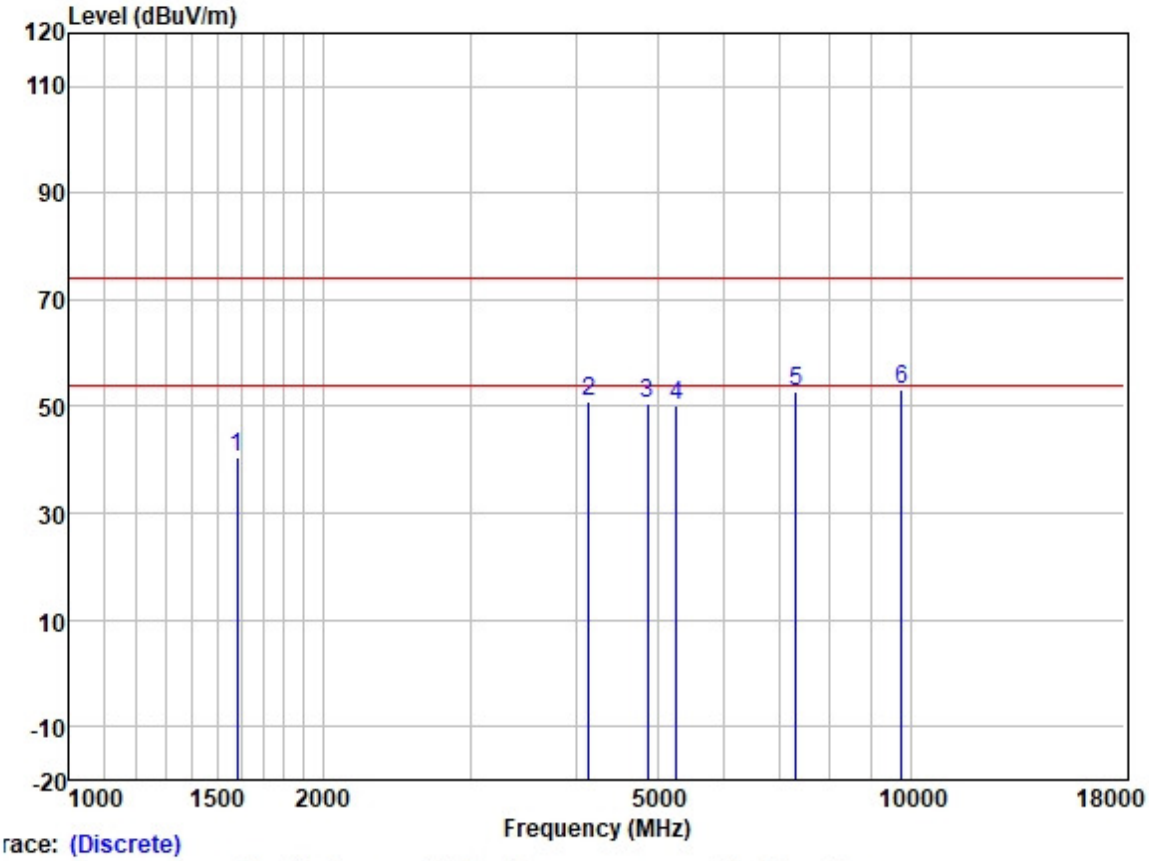
Test Mode: 05; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:middle



race: (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	1663.137	51.16	25.65	2.80	37.91	41.70	74.00	-32.30	HORIZONTAL	Peak
2	4469.214	52.79	30.77	4.93	36.81	51.68	74.00	-22.32	HORIZONTAL	Peak
3	4874.000	51.65	31.54	5.50	36.84	51.85	74.00	-22.15	HORIZONTAL	Peak
4	6698.373	49.68	34.38	5.83	37.08	52.81	74.00	-21.19	HORIZONTAL	Peak
5	7311.000	48.57	35.93	6.11	37.42	53.19	74.00	-20.81	HORIZONTAL	Peak
6	9748.000	44.83	38.50	7.02	37.41	52.94	74.00	-21.06	HORIZONTAL	Peak

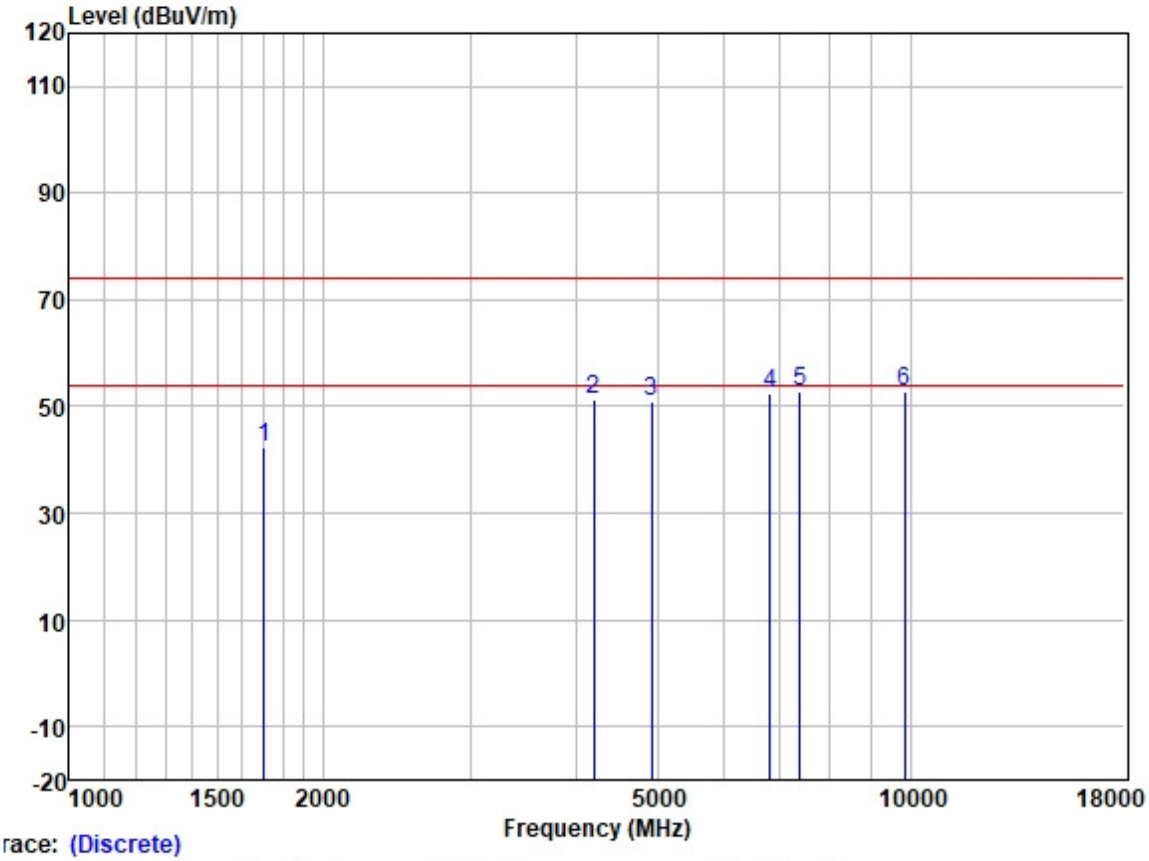
Test Mode: 05; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:middle



race: (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	1583.392	50.17	25.56	2.80	38.00	40.53	74.00	-33.47	VERTICAL	Peak
2	4145.664	53.03	30.03	4.60	36.80	50.86	74.00	-23.14	VERTICAL	Peak
3	4874.000	50.30	31.54	5.50	36.84	50.50	74.00	-23.50	VERTICAL	Peak
4	5269.649	49.40	31.75	5.80	36.87	50.08	74.00	-23.92	VERTICAL	Peak
5	7311.000	48.24	35.93	6.11	37.42	52.86	74.00	-21.14	VERTICAL	Peak
6	9748.000	45.08	38.50	7.02	37.41	53.19	74.00	-20.81	VERTICAL	Peak

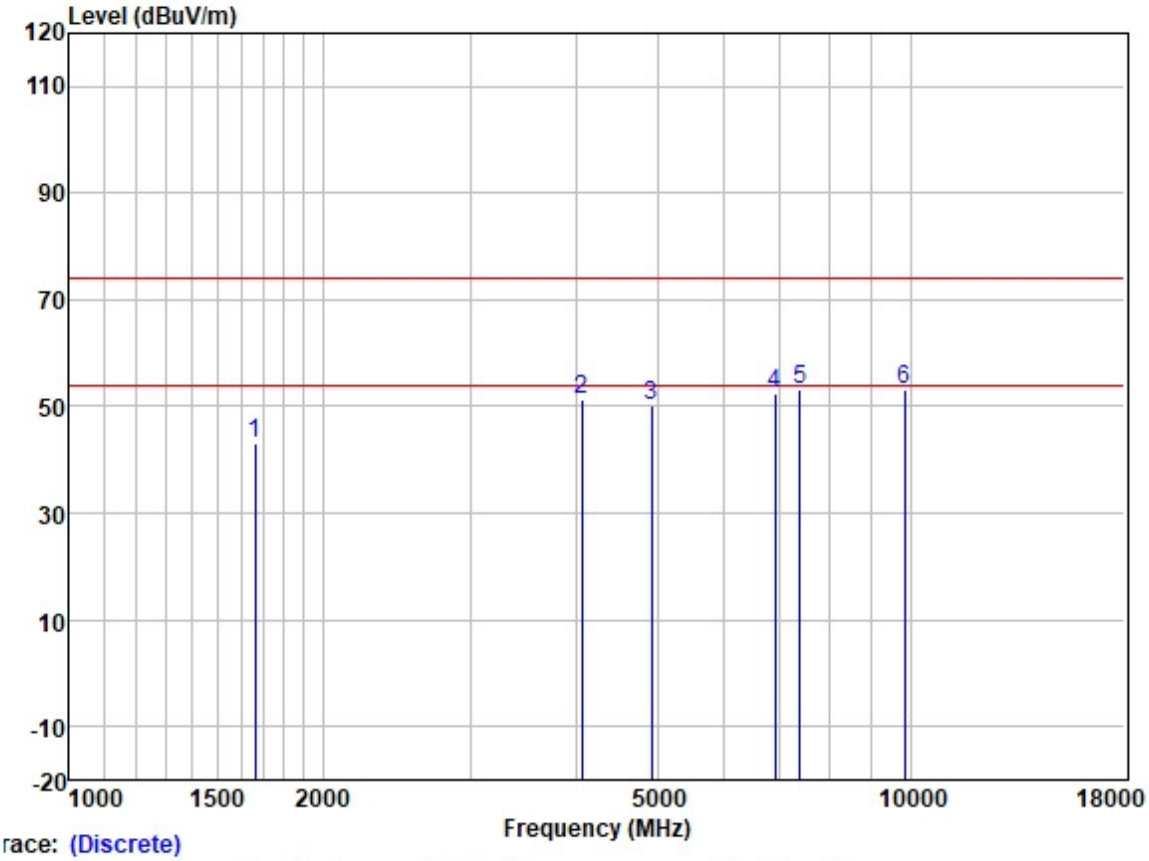
Test Mode: 05; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:High



race: (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	1702.042	51.77	25.72	2.80	37.89	42.40	74.00	-31.60	HORIZONTAL	Peak
2	4206.011	53.23	30.18	4.60	36.81	51.20	74.00	-22.80	HORIZONTAL	Peak
3	4924.000	50.45	31.62	5.60	36.84	50.83	74.00	-23.17	HORIZONTAL	Peak
4	6815.551	49.06	34.70	5.82	37.13	52.45	74.00	-21.55	HORIZONTAL	Peak
5	7386.000	47.92	36.17	6.19	37.45	52.83	74.00	-21.17	HORIZONTAL	Peak
6	9848.000	44.55	38.58	6.99	37.41	52.71	74.00	-21.29	HORIZONTAL	Peak

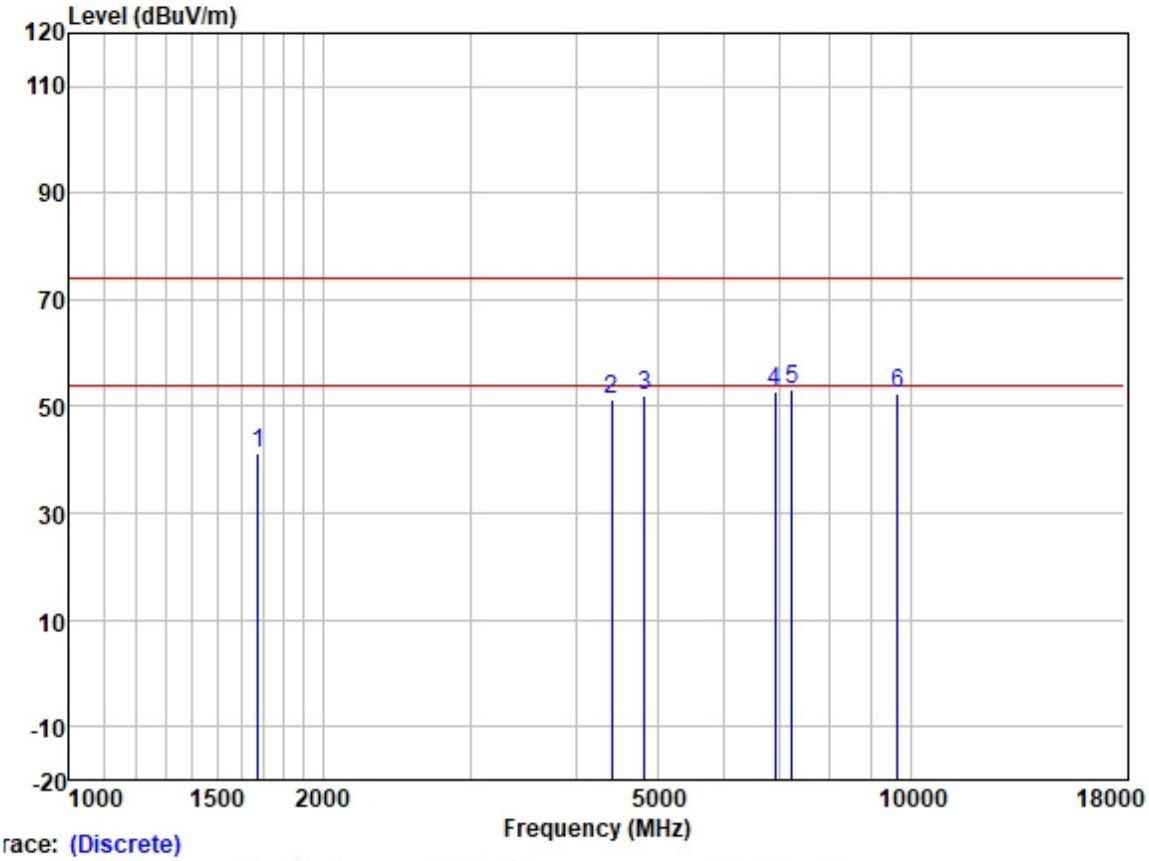
Test Mode: 05; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:High



race: (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	1663.137	52.63	25.65	2.80	37.91	43.17	74.00	-30.83	VERTICAL	Peak
2	4062.629	53.68	29.88	4.60	36.80	51.36	74.00	-22.64	VERTICAL	Peak
3	4924.000	49.83	31.62	5.60	36.84	50.21	74.00	-23.79	VERTICAL	Peak
4	6894.806	48.83	34.85	5.81	37.18	52.31	74.00	-21.69	VERTICAL	Peak
5	7386.000	48.15	36.17	6.19	37.45	53.06	74.00	-20.94	VERTICAL	Peak
6	9848.000	44.90	38.58	6.99	37.41	53.06	74.00	-20.94	VERTICAL	Peak

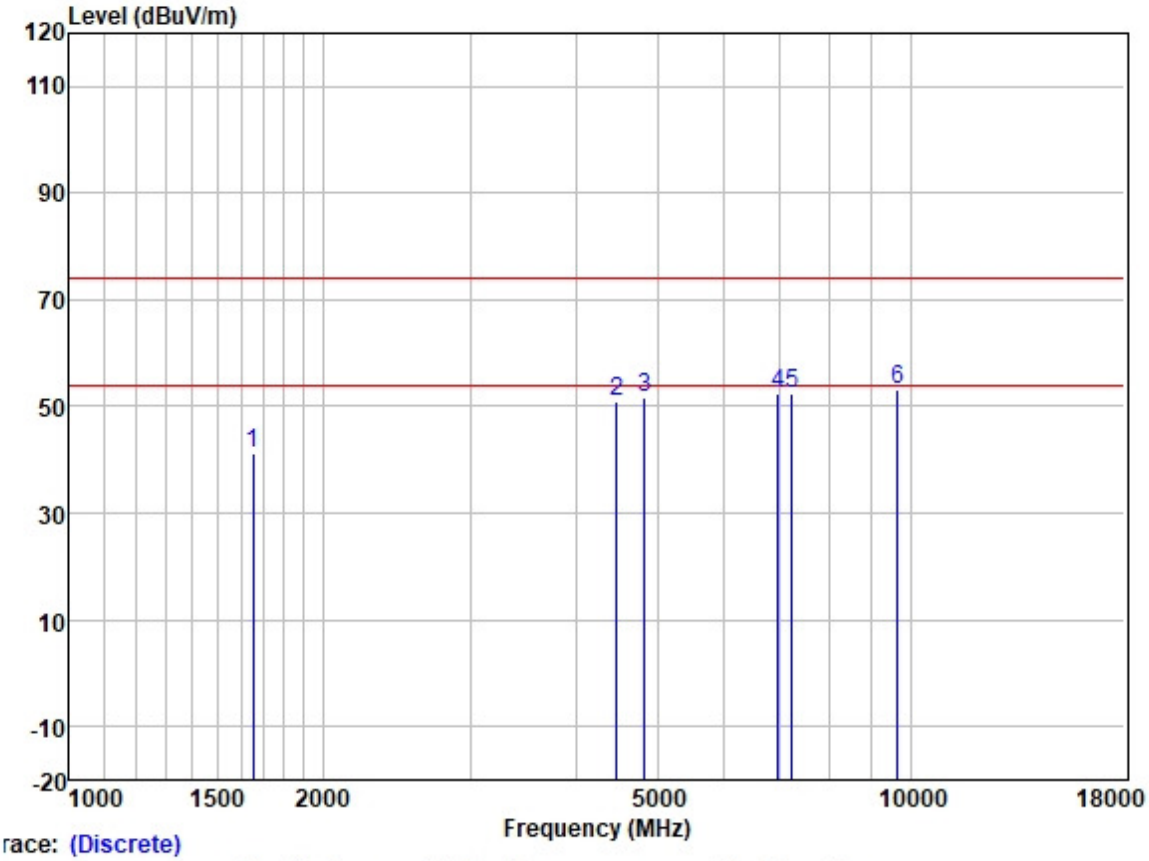
Test Mode: 05; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:Low



race: (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	1677.621	50.71	25.68	2.80	37.91	41.28	74.00	-32.72	HORIZONTAL	Peak
2	4417.841	52.82	30.70	4.74	36.81	51.45	74.00	-22.55	HORIZONTAL	Peak
3	4824.000	52.06	31.45	5.42	36.83	52.10	74.00	-21.90	HORIZONTAL	Peak
4	6894.806	49.25	34.85	5.81	37.18	52.73	74.00	-21.27	HORIZONTAL	Peak
5	7236.000	48.84	35.70	6.03	37.39	53.18	74.00	-20.82	HORIZONTAL	Peak
6	9648.000	44.42	38.40	7.06	37.42	52.46	74.00	-21.54	HORIZONTAL	Peak

Test Mode: 05; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:Low



race: (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	1653.550	50.82	25.64	2.80	37.93	41.33	74.00	-32.67	VERTICAL	Peak
2	4469.214	52.04	30.77	4.93	36.81	50.93	74.00	-23.07	VERTICAL	Peak
3	4824.000	51.54	31.45	5.42	36.83	51.58	74.00	-22.42	VERTICAL	Peak
4	6954.852	49.06	34.95	5.81	37.21	52.61	74.00	-21.39	VERTICAL	Peak
5	7236.000	47.98	35.70	6.03	37.39	52.32	74.00	-21.68	VERTICAL	Peak
6	9648.000	45.07	38.40	7.06	37.42	53.11	74.00	-20.89	VERTICAL	Peak