

TEST REPORT

Application No.: GZCR2208001061AT
Applicant: CLMBR, Inc
Address of Applicant: 3033 E 1st Avenue Suite 501 Denver, Colorado, 80206, United States
Manufacturer: CLMBR, Inc
Address of Manufacturer: 3033 E 1st Avenue Suite 501 Denver, Colorado, 80206, United States
Factory: TES Touch Embedded Solutions (Xiamen) Co., Ltd.
Address of Factory: No. 60, Xinglin South Rd., Jimei District, Xiamen, Fujian 361022, China
Equipment Under Test (EUT):
EUT Name: Clmbr Connected
Model No.: CLMBR-17002
Trade Mark: 
Standard(s) : 47 CFR Part 15, Subpart C 15.247
Date of Receipt: 2022-08-23
Date of Test: 2022-08-30 to 2022-09-29
Date of Issue: 2023-03-17

Test Result:	Pass*
---------------------	--------------

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

Ricky Liu

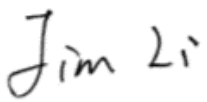
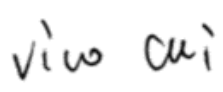
Ricky Liu
Manager

Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch Testing Services Laboratory
 No. 198 Kaizhu Road, Solentech Park, Guangzhou Economic & Technology Development District, Guangzhou, China 510663 t (86-20) 82155555 f (86-20) 82075058 www.sgsgroup.com.cn
 中国·广州·经济技术开发区科学城科珠路198号 邮编: 510663 t (86-20) 82155555 f (86-20) 82075058 sgs.china@sgs.com

Revision Record			
Version	Report No.	Date	Remark
01	GZCR220800106104	2023-03-17	Original

Authorized for issue by:			
			
		Jim Li/Project Engineer	
			
		Vico Cui/Reviewer	

2 Test Summary

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

Radio Spectrum Matter Part				
Item	Standard	Method	Requirement	Result
Conducted Emissions at AC Power Line (150kHz-30MHz)	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.2	47 CFR Part 15, Subpart C 15.207	Pass
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.

3 Contents

	Page
1 Cover Page	1
2 Test Summary	3
3 Contents	4
4 General Information	6
4.1 Details of E.U.T.	6
4.2 Description of Support Units	6
4.3 Measurement Uncertainty	7
4.4 Test Location	7
4.5 Test Facility	8
4.6 Deviation from Standards	8
4.7 Abnormalities from Standard Conditions	8
5 Equipment List	9
6 Radio Spectrum Technical Requirement	12
6.1 Antenna Requirement	12
6.1.1 Test Requirement:	12
6.1.2 Conclusion	12
7 Radio Spectrum Matter Test Results	13
7.1 Conducted Emissions at AC Power Line (150kHz-30MHz)	13
7.1.1 E.U.T. Operation	13
7.1.2 Test Mode Description	13
7.1.3 Test Setup Diagram	14
7.1.4 Measurement Procedure and Data	14
7.2 Conducted Peak Output Power	17
7.2.1 E.U.T. Operation	17
7.2.2 Test Mode Description	17
7.2.3 Test Setup Diagram	18
7.2.4 Measurement Procedure and Data	18
7.3 Minimum 6dB Bandwidth	19
7.3.1 E.U.T. Operation	19
7.3.2 Test Mode Description	19
7.3.3 Test Setup Diagram	19
7.3.4 Measurement Procedure and Data	19
7.4 Power Spectrum Density	20
7.4.1 E.U.T. Operation	20
7.4.2 Test Mode Description	20
7.4.3 Test Setup Diagram	20
7.4.4 Measurement Procedure and Data	20
7.5 Conducted Band Edges Measurement	21
7.5.1 E.U.T. Operation	21
7.5.2 Test Mode Description	21
7.5.3 Test Setup Diagram	22



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

7.5.4	Measurement Procedure and Data.....	22
7.6	Conducted Spurious Emissions	23
7.6.1	E.U.T. Operation	23
7.6.2	Test Mode Description	23
7.6.3	Test Setup Diagram	24
7.6.4	Measurement Procedure and Data.....	24
7.7	Radiated Emissions which fall in the restricted bands	25
7.7.1	E.U.T. Operation	25
7.7.2	Test Mode Description	25
7.7.3	Test Setup Diagram	26
7.7.4	Measurement Procedure and Data.....	26
7.8	Radiated Spurious Emissions Below 1GHz	43
7.8.1	E.U.T. Operation	43
7.8.2	Test Mode Description	43
7.8.3	Test Setup Diagram	44
7.8.4	Measurement Procedure and Data.....	44
7.9	Radiated Spurious Emissions Above 1GHz.....	47
7.9.1	E.U.T. Operation	47
7.9.2	Test Mode Description	47
7.9.3	Test Setup Diagram	47
7.9.4	Measurement Procedure and Data.....	48
8	Test Setup Photo	73
9	EUT Constructional Details (EUT Photos)	74
10	Appendix.....	75



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch
 No. 198 Kezhu Road, Sciotech Park, Guangzhou Economic & Technology Development District, Guangzhou, China 510663 t (86-20) 82155555 f (86-20) 82075058 www.sgsgroup.com.cn
 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

4 General Information

4.1 Details of E.U.T.

Power supply: Powered by SWITCHING ADAPTER
 MODEL: SOY-1200500-327
 INPUT:100-240V~, 50/60Hz, 1.7A Max
 OUTPUT:12.0V, 5.0A, 60.0W.

Test voltage: AC 120V, 60Hz

Cable(s): AC mains for adapter:3 wires, 1.8m, unshielded
 DC input for main unit:1.8m, with ferrite bead
 DC IN Port x1 for power supply.
 Type-C Port x1(only for debug)

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: FPC Antenna

Antenna Number: 2

Antenna Gain: Antenna 1: 0.36 dBi and Antenna 2: 0.36 dBi
 Two antennas support MIMO synchronous transmission for 802.11n.

4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Note Book Computer	LENOVO	ThinkPad T490	PF1D1MVJ
Wireless Router	TP-LINK	TL-WDR5620	1174017009906

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.



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

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

No. 198 Kezhu Road, Sciencetech Park, Guangzhou Economic & Technology Development District, Guangzhou, China 510663 t (86-20) 82155555 f (86-20) 82075058 www.sgs.com.cn
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

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



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

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

No. 198 Kezhu Road, Sciotech Park, Guangzhou Economic & Technology Development District, Guangzhou, China 510663 t (86-20) 82155555 f (86-20) 82075058 www.sgsgroup.com.cn
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

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	2019-10-20	2022-10-19
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



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	2021-12-17	2022-12-16
EMI Test Receiver (10Hz-26.5GHz)	Rohde & Schwarz	ESIB26	EMC0522	2021-12-17	2022-12-16
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	2022-09-21	2025-09-20
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	2021-11-01	2022-10-31
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



Radiated Spurious Emissions Below 1GHz					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
10m Semi-Anechoic Chamber	ETS	N/A	EMC0530	2019-10-20	2022-10-19
Chamber cable	HangTianXing	N/A	EMC0542	2022-08-24	2023-08-23
Amplifier (9kHz-1.3GHz)	HP	8447F	EMC2065	2022-06-21	2023-06-20
Active Loop Antenna-RED	ETS-Lindgren	6502	EMC2190	2022-04-06	2024-04-05
EMI Test Receiver (1Hz-8GHz)	Rohde & Schwarz	ESW8	EMC2220	2022-05-20	2023-05-19
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A
Trilog Broadband Antenna (25MHz-1GHz)	SCHWARZBECK MESS-ELEKTRONIK	VULB 9168	EMC2174	2022-06-19	2025-06-18

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	2021-12-17	2022-12-16
EMI Test Receiver (10Hz-26.5GHz)	Rohde & Schwarz	ESIB26	EMC0522	2021-12-17	2022-12-16
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	2022-09-21	2025-09-20
Horn Antenna (14-40GHz)	SCHWARZBECK	BBHA 9170	EMC2041	2020-06-28	2023-06-27
2.4GHz Filter	Micro-Tronics	BRM 50702	EMC2069	2021-12-17	2022-12-16
EXA Signal Analyzer (10Hz-44GHz)	Keysight	N9010A	EMC2138	2022-09-08	2023-09-07
MXE EMI Receiver (10Hz-8.4GHz)	Keysight	N9038A	EMC2139	2021-11-01	2022-10-31
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



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/terms-and-conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

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

No.198 Kezhu Road, Sciotech Park, Guangzhou Economic & Technology Development District, Guangzhou, China 510663 t (86-20) 82155555 f (86-20) 82075058 www.sgs.com.cn
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

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 0.36 dBi.

Antenna location: Refer to internal photo.

EUT support 2x2 MIMO for 802.11n, any transmit signals are correlated with each other, as unequal antenna gains for antenna 1 and antenna 2 but with equal transmit power, therefore,

$$\text{Directional gain} = G_{\text{ANT}} + 10 \log (N_{\text{ANT}}) \text{ dBi}$$

Directional gain= 0.36+10log (2) dBi=3.37 dBi

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: 22.9 °C

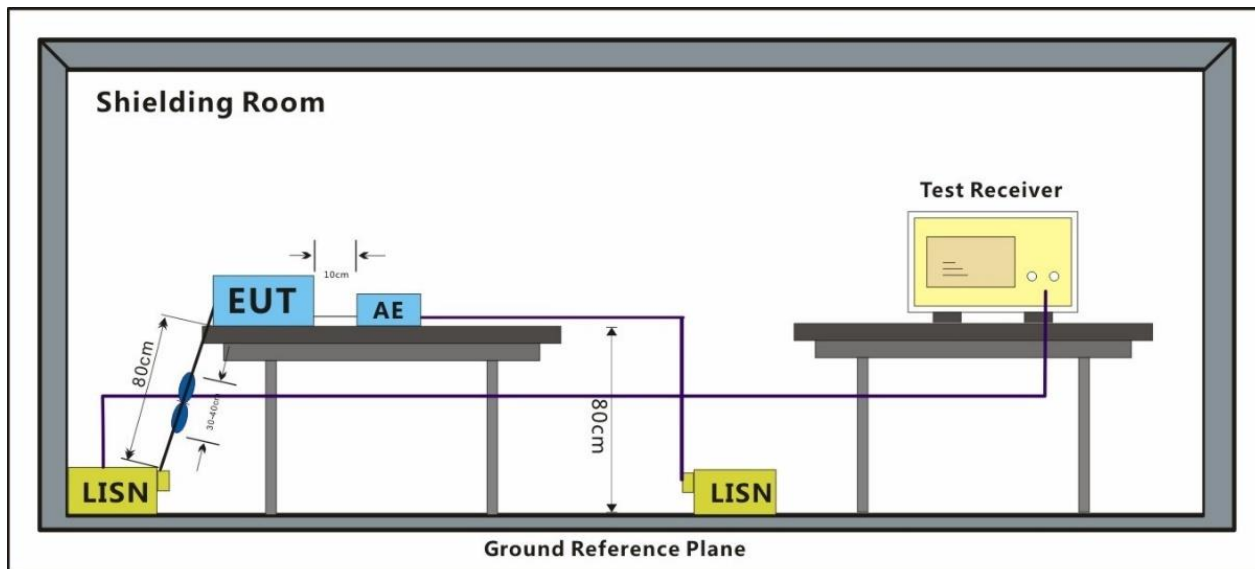
Humidity: 54.7 % RH

Atmospheric Pressure: 1006 mbar

7.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	03	TX mode(2.4G Wi-Fi)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.

7.1.3 Test Setup Diagram

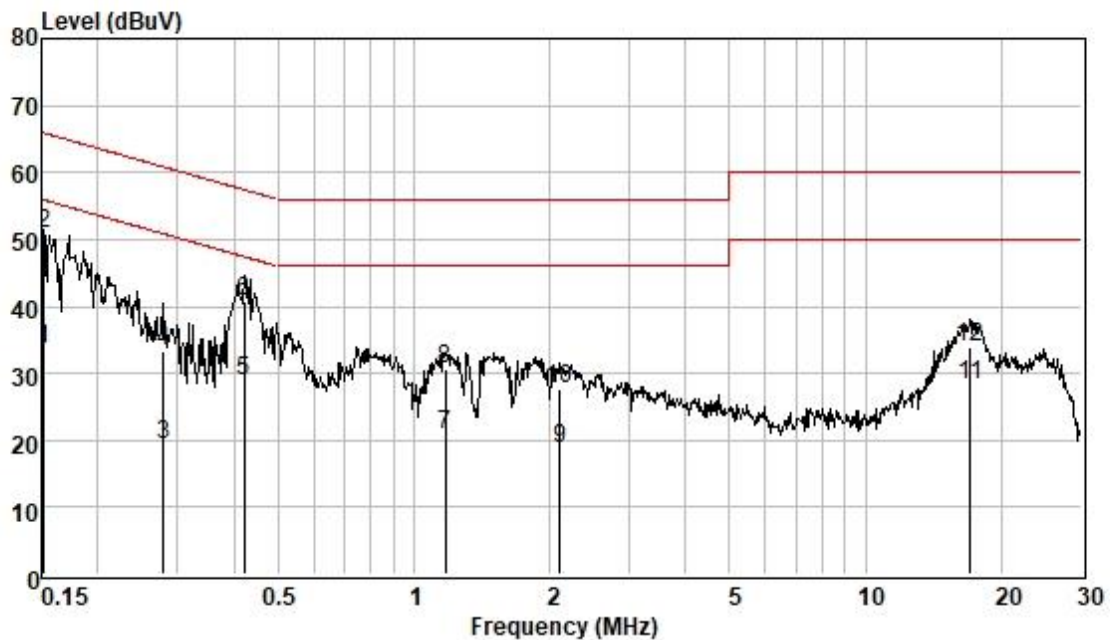


7.1.4 Measurement Procedure and Data

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

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

Test Mode: 03; Line: Live line



Pol :LINE
Mode :
Model :

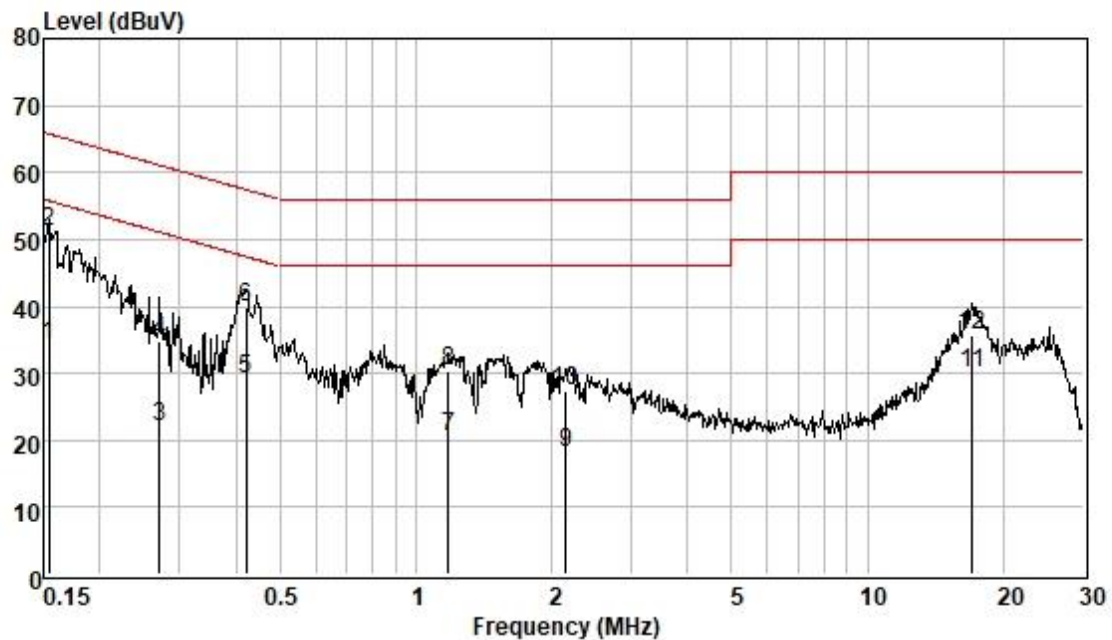
	Freque	Read	Cable	LISN	Measured	Limit	Over	
	nc	Level	Loss	Factor	Level	Line	Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.152	23.94	0.06	9.54	33.54	55.91	-22.37	Average
2	0.152	41.21	0.06	9.54	50.81	65.91	-15.10	QP
3	0.279	9.57	0.06	9.57	19.20	50.85	-31.65	Average
4	0.279	23.76	0.06	9.57	33.39	60.85	-27.46	QP
5	0.421	19.11	0.06	9.58	28.75	47.42	-18.67	Average
6	0.421	31.07	0.06	9.58	40.71	57.42	-16.71	QP
7	1.172	11.09	0.08	9.60	20.77	46.00	-25.23	Average
8	1.172	20.84	0.08	9.60	30.52	56.00	-25.48	QP
9	2.110	9.11	0.12	9.60	18.83	46.00	-27.17	Average
10	2.110	17.85	0.12	9.60	27.57	56.00	-28.43	QP
11	17.018	18.17	0.33	9.83	28.33	50.00	-21.67	Average
12	17.018	23.86	0.33	9.83	34.02	60.00	-25.98	QP



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

Test Mode: 03; Line: Neutral Line



Pol : NEUTRAL
Mode :
Model :

	Frequency MHz	Read Level dBuV	Cable Loss dB	LISN Factor dB	Measured Level dBuV	Limit Line dBuV	Over Limit dB	Remark
1	0.154	24.70	0.06	9.53	34.29	55.78	-21.49	Average
2	0.154	41.45	0.06	9.53	51.04	65.78	-14.74	QP
3	0.272	12.32	0.06	9.56	21.94	51.07	-29.13	Average
4	0.272	25.18	0.06	9.56	34.80	61.07	-26.27	QP
5	0.421	19.52	0.06	9.58	29.16	47.42	-18.26	Average
6	0.421	30.08	0.06	9.58	39.72	57.42	-17.70	QP
7	1.178	10.77	0.08	9.59	20.44	46.00	-25.56	Average
8	1.178	20.73	0.08	9.59	30.40	56.00	-25.60	QP
9	2.144	8.50	0.12	9.59	18.21	46.00	-27.79	Average
10	2.144	17.58	0.12	9.59	27.29	56.00	-28.71	QP
11	17.018	19.91	0.33	9.88	30.12	50.00	-19.88	Average
12	17.018	25.61	0.33	9.88	35.82	60.00	-24.18	QP



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

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 ≥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

7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 27.4 °C

Humidity: 57.8 % RH

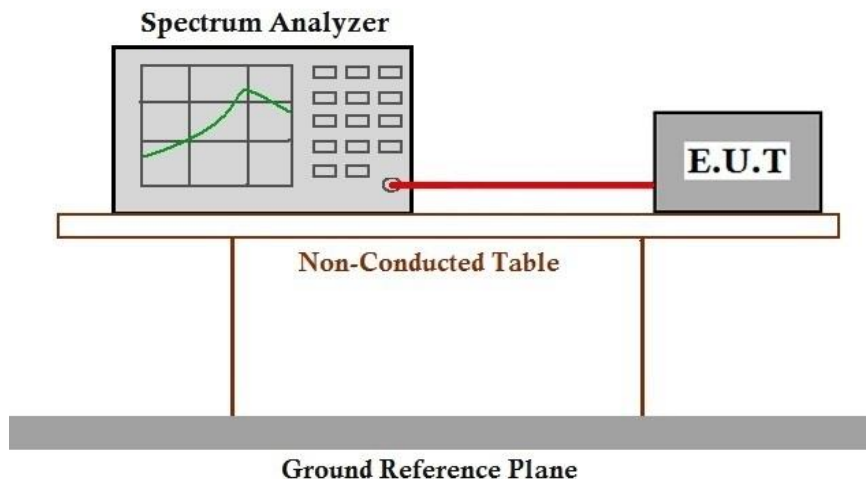
Atmospheric Pressure: 1006 mbar

7.2.2 Test Mode Description

Pre-scan / Mode
Final test Code Description

TX mode(2.4G Wi-Fi)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), 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

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: ≥ 500 kHz

7.3.1 E.U.T. Operation

Operating Environment:

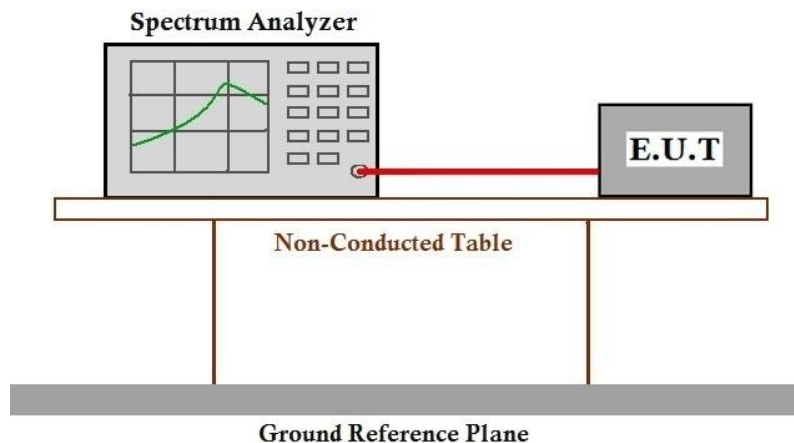
Temperature: 27.4 °C Humidity: 57.8 % RH Atmospheric Pressure: 1006 mbar

7.3.2 Test Mode Description

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

Final test	03	TX mode(2.4G Wi-Fi)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), 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

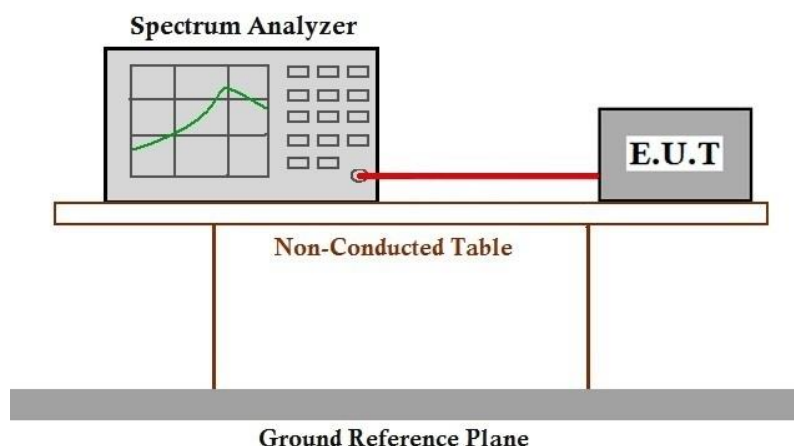
7.4.1 E.U.T. Operation

Operating Environment:
 Temperature: 27.4 °C Humidity: 57.8 % RH Atmospheric Pressure: 1006 mbar

7.4.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	03	TX mode(2.4G Wi-Fi)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), 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

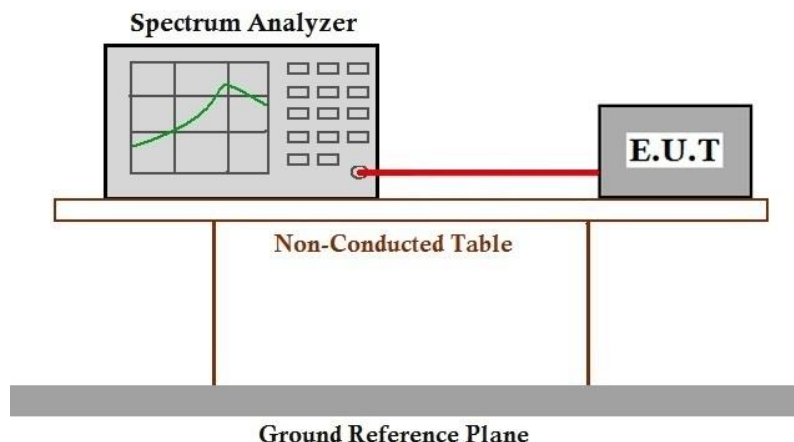
Operating Environment:

Temperature: 27.4 °C Humidity: 57.8 % RH Atmospheric Pressure: 1006 mbar

7.5.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	03	TX mode(2.4G Wi-Fi)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), 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: 27.4 °C

Humidity: 57.8 % RH

Atmospheric Pressure: 1006 mbar

7.6.2 Test Mode Description

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

Final test	03	TX mode(2.4G Wi-Fi)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.
------------	----	--



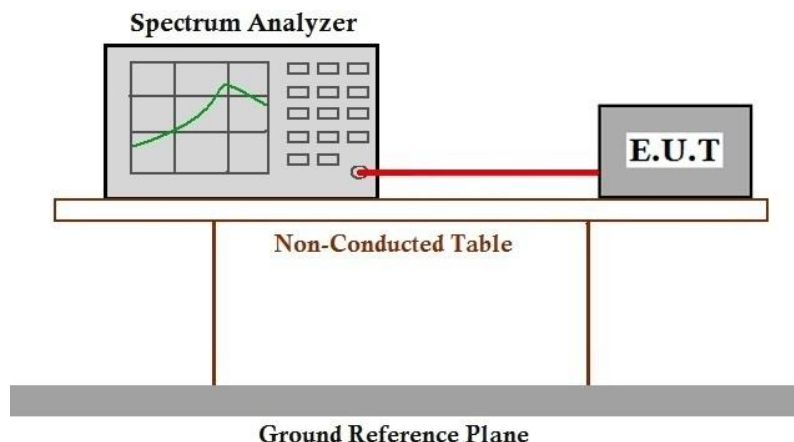
Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

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

No. 198 Kezhu Road, Sciotech Park, Guangzhou Economic & Technology Development District, Guangzhou, China 510663 t (86-20) 82155555 f (86-20) 82075058 www.sgsgroup.com.cn
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

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 6.10.5

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
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: 23 °C

Humidity: 55 % RH

Atmospheric Pressure: 1006 mbar

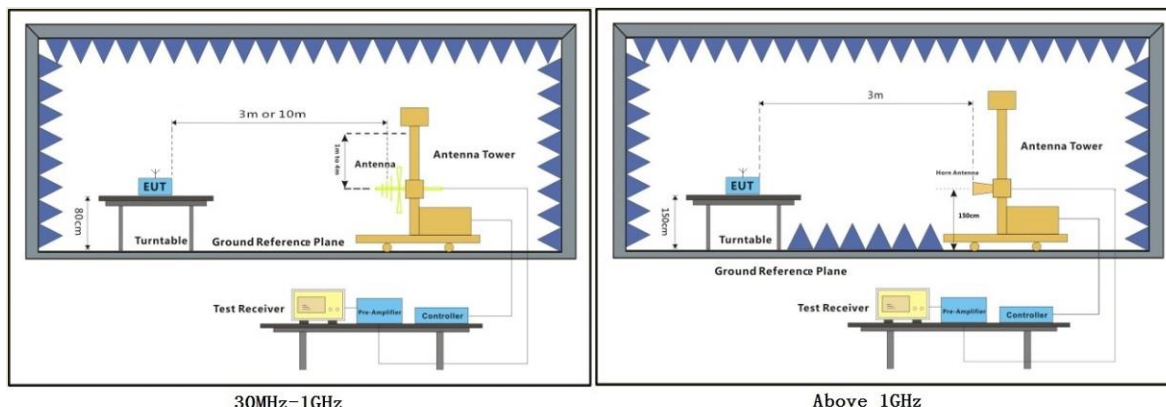
7.7.2 Test Mode Description

Pre-scan / Mode
Final test Code Description

TX mode(2.4G Wi-Fi)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), 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

7.7.3 Test Setup Diagram



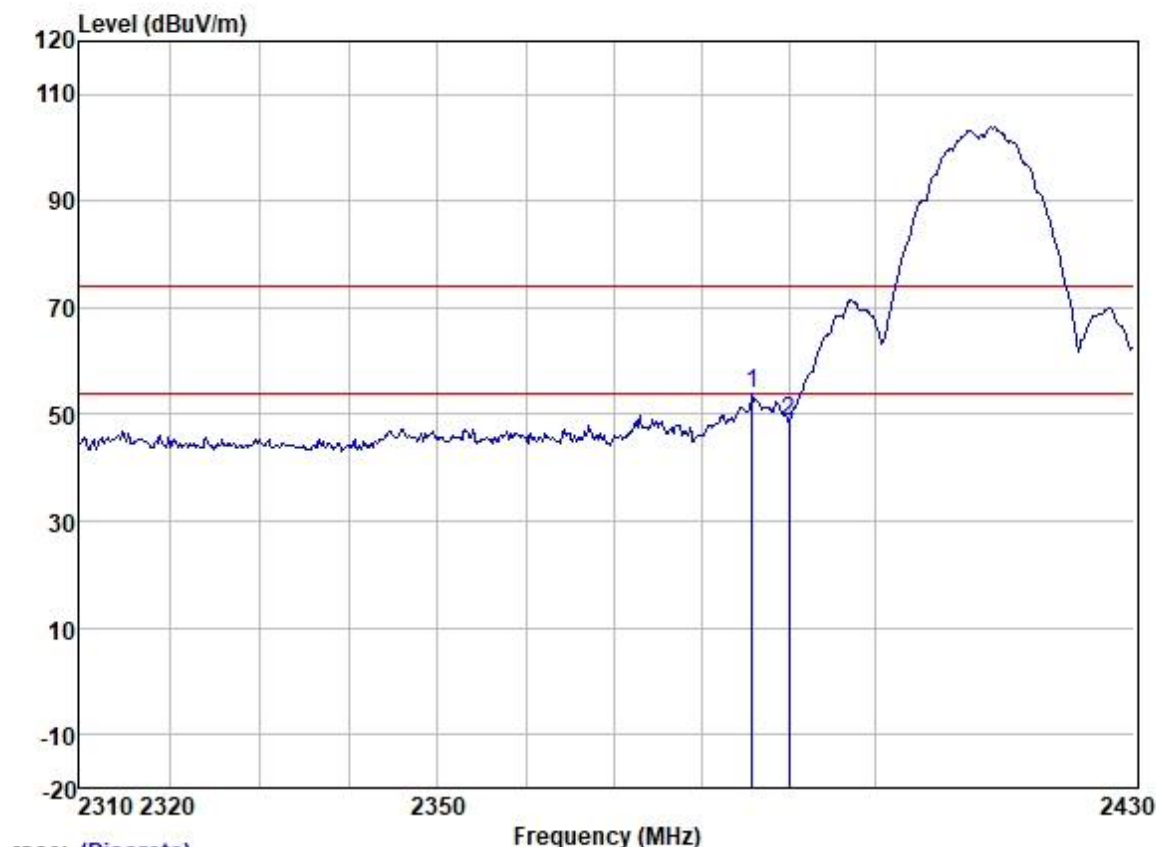
7.7.4 Measurement Procedure and Data

- 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 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 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.

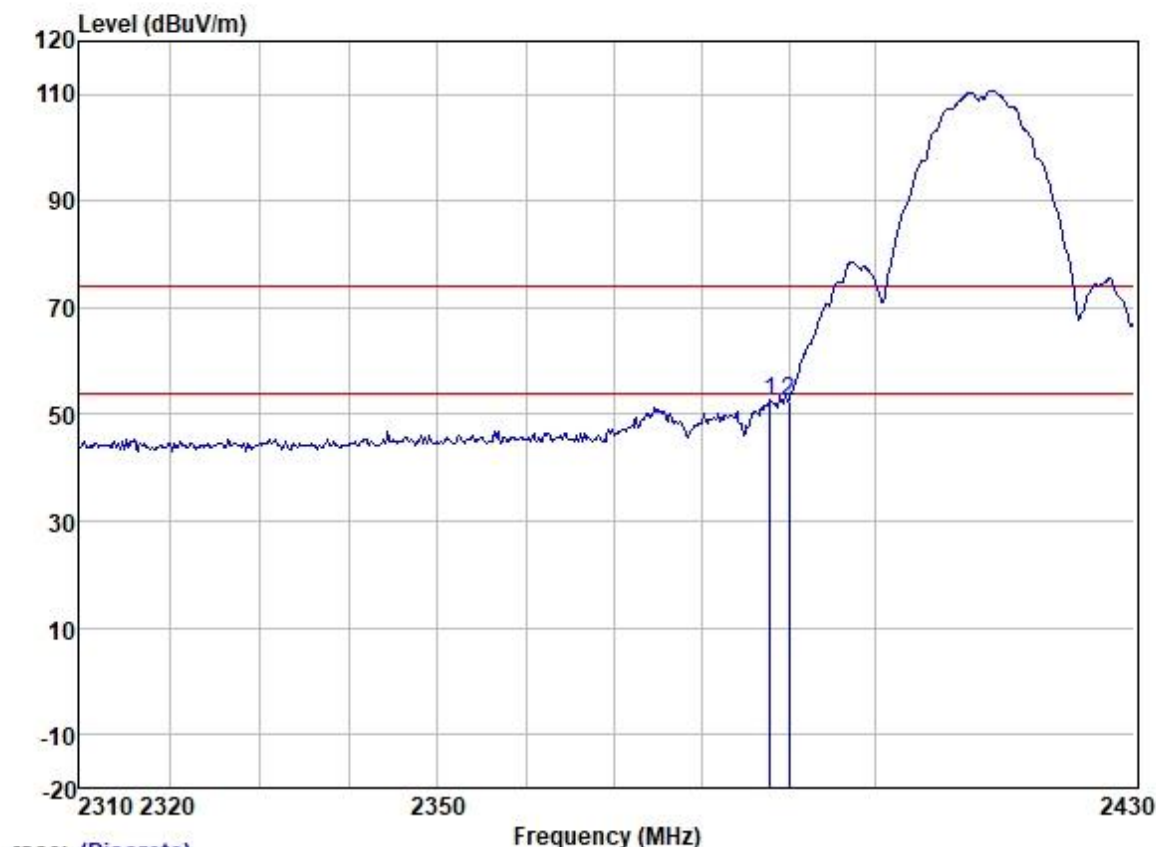
Test Mode: 03; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:Low



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	dBuV/m	dB	
1	2385.736	60.30	27.33	3.48	37.14	53.97	74.00	-20.03	VERTICAL Peak
2	2390.000	55.05	27.33	3.48	37.14	48.72	74.00	-25.28	VERTICAL Peak

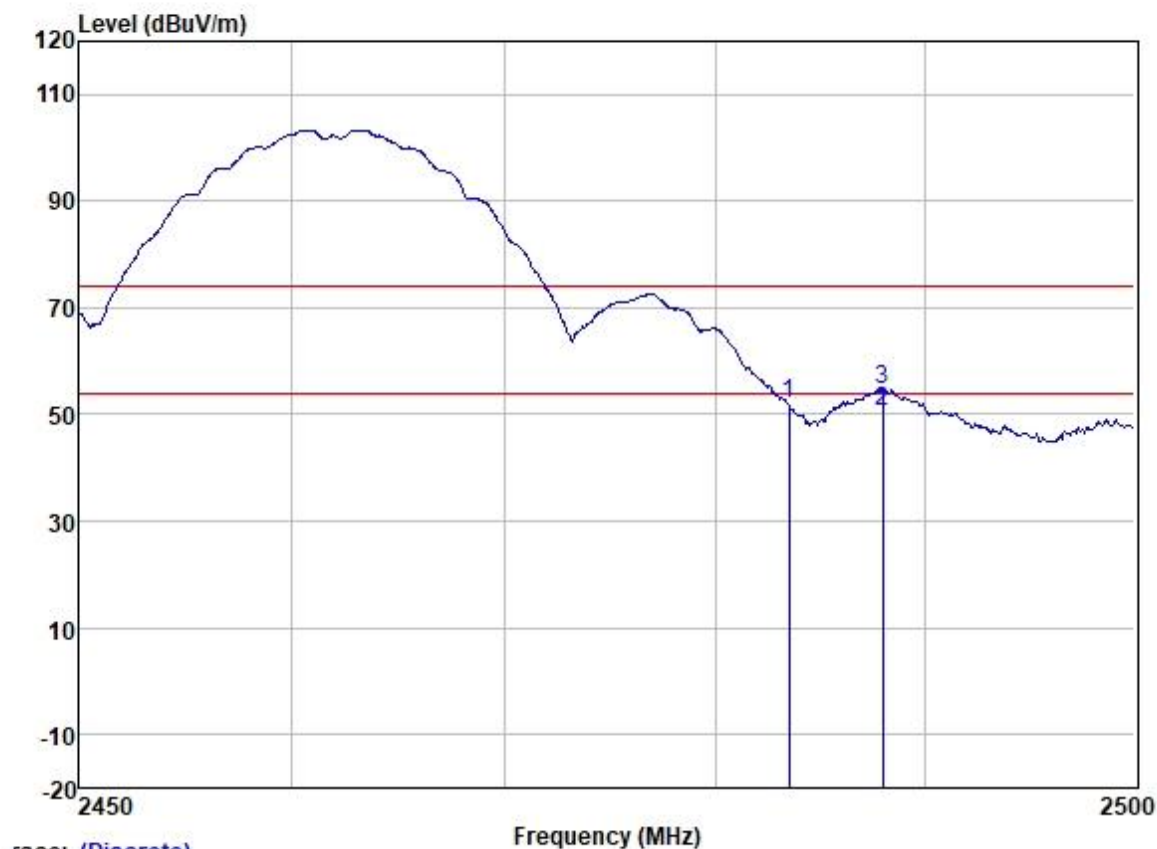
Test Mode: 03; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:Low



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	2387.791	58.92	27.33	3.48	37.14	52.59	74.00	-21.41	HORIZONTAL Peak
2	2390.000	58.69	27.33	3.48	37.14	52.36	74.00	-21.64	HORIZONTAL Peak

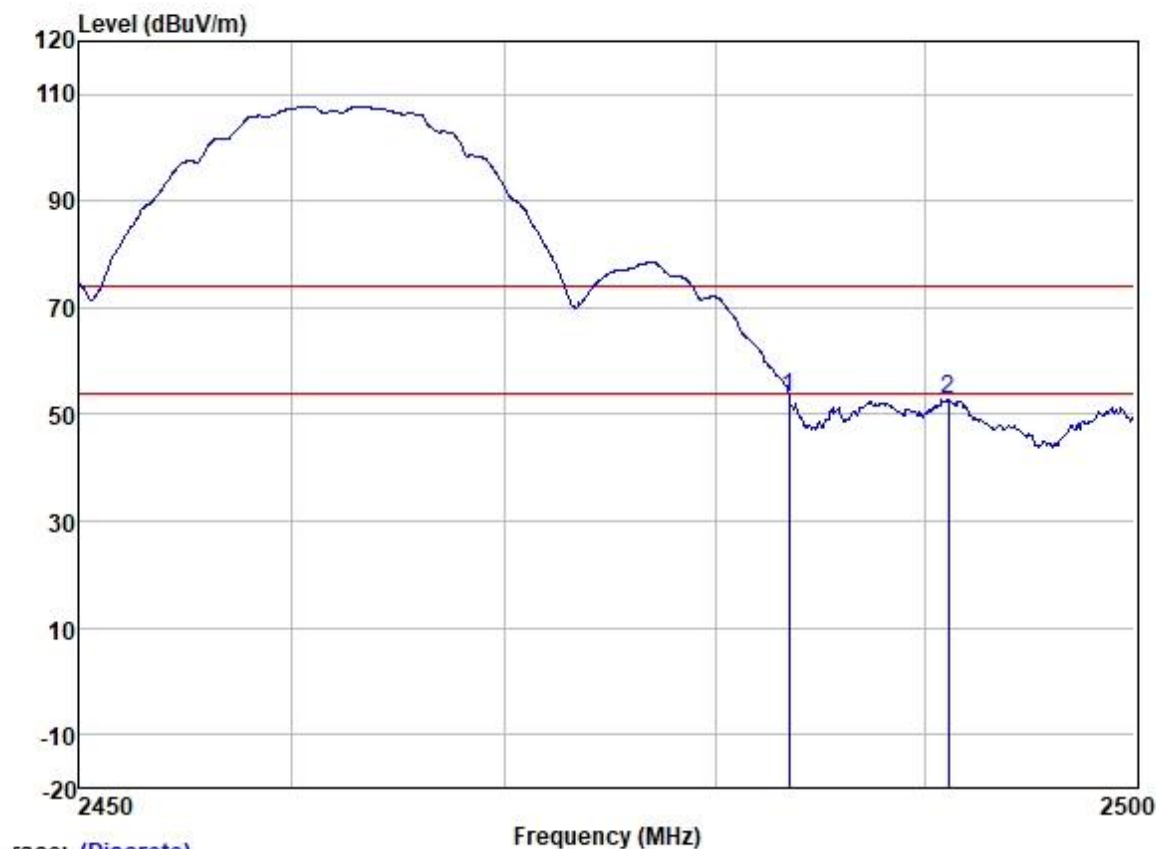
Test Mode: 03; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:High



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	58.26	27.48	3.53	37.13	52.14	74.00	-21.86	VERTICAL Peak
2	2487.958	56.85	27.48	3.53	37.12	50.74	54.00	-3.26	VERTICAL Average
3	2487.958	60.94	27.48	3.53	37.12	54.83	74.00	-19.17	VERTICAL Peak

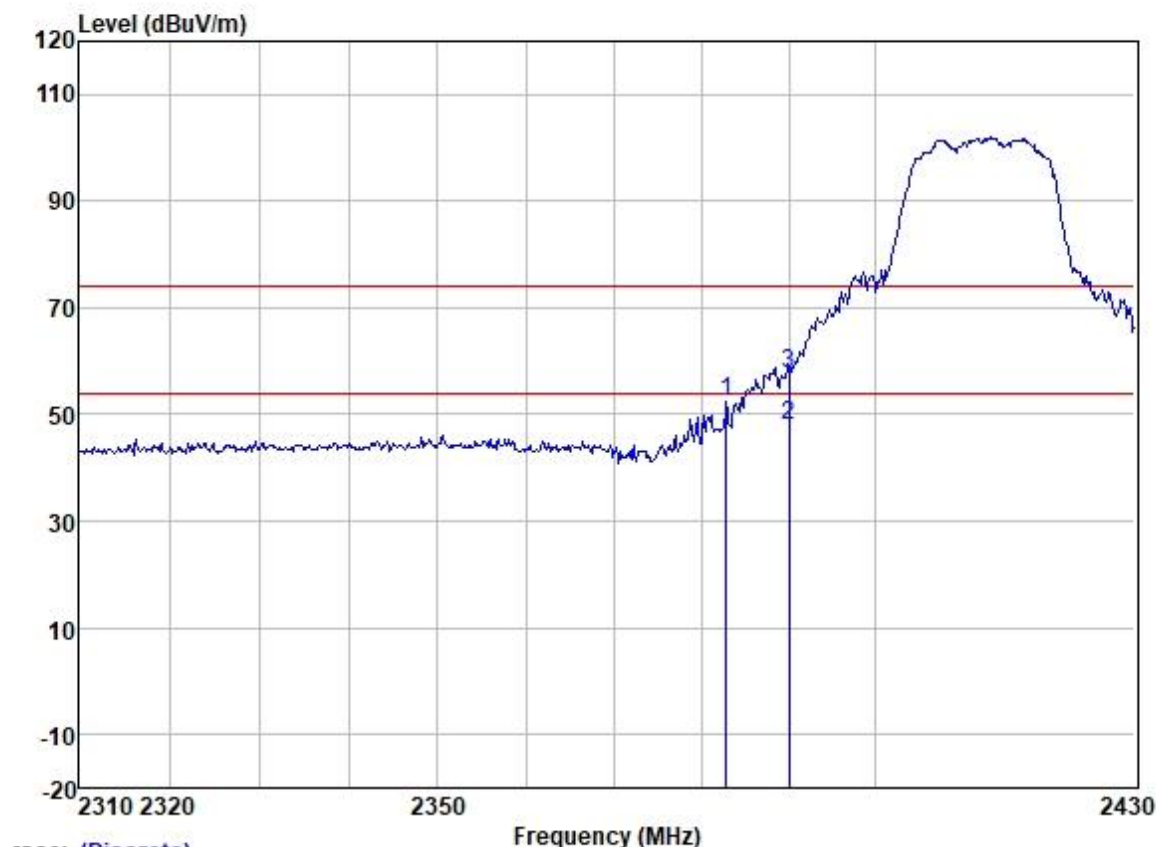
Test Mode: 03; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:High



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	59.12	27.48	3.53	37.13	53.00	74.00	-21.00 HORIZONTAL Peak
2	2491.076	58.94	27.49	3.47	37.12	52.78	74.00	-21.22 HORIZONTAL Peak

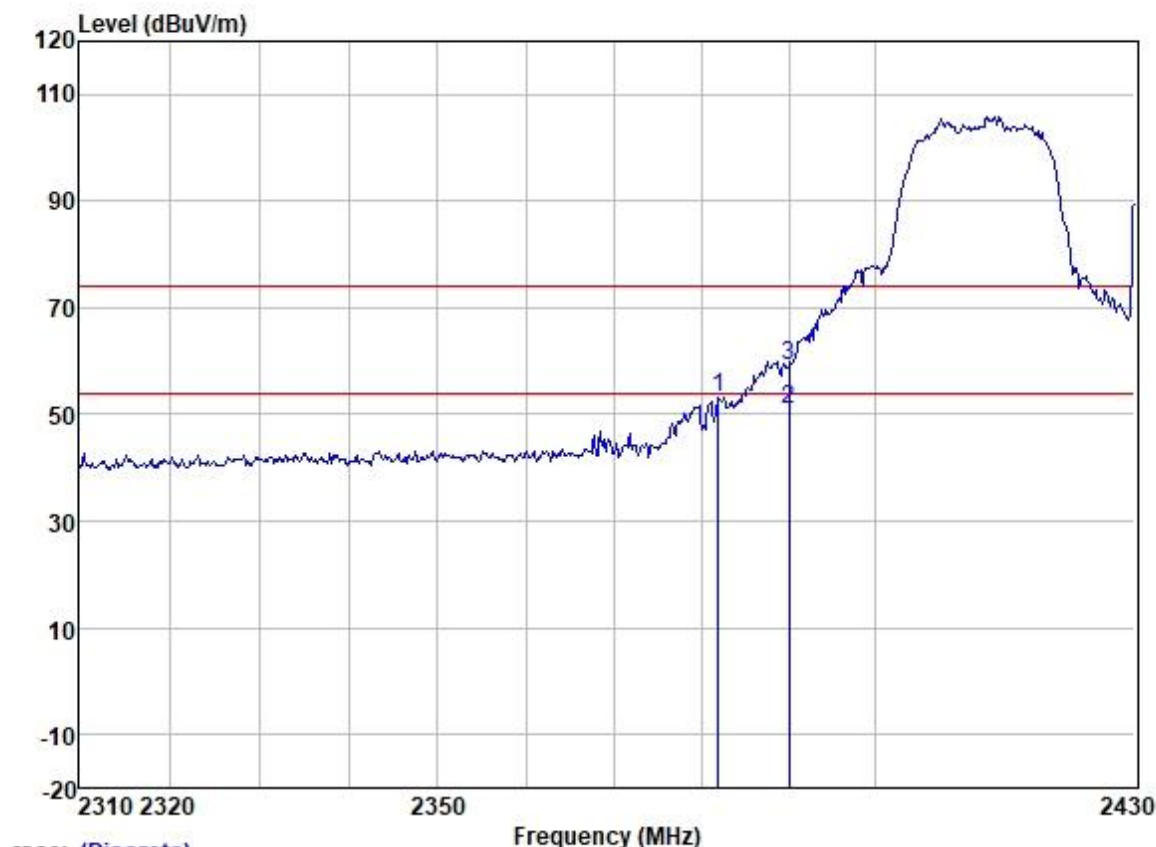
Test Mode: 03; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:Low



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	2382.838	58.86	27.31	3.46	37.14	52.49	74.00	-21.51	VERTICAL Peak
2	2390.000	54.29	27.33	3.48	37.14	47.96	54.00	-6.04	VERTICAL Average
3	2390.000	64.15	27.33	3.48	37.14	57.82	74.00	-16.18	VERTICAL Peak

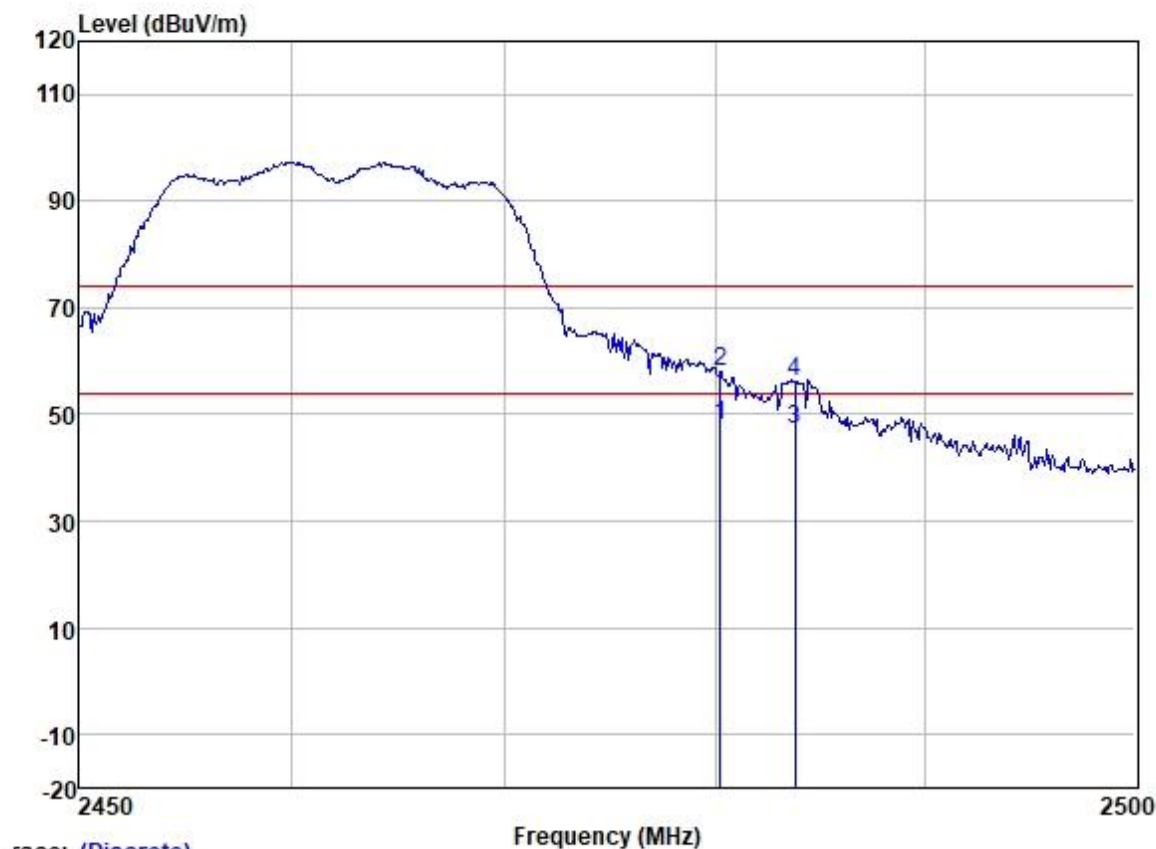
Test Mode: 03; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:Low



Trace: (Discrete)

	Freq	ReadAntenna Level	Cable Factor	Preamp Loss	Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2381.873	59.40	27.31	3.46	37.14	53.03	74.00	-20.97	HORIZONTAL	Peak
2	2390.000	57.16	27.33	3.48	37.14	50.83	54.00	-3.17	HORIZONTAL	Average
3	2390.000	65.64	27.33	3.48	37.14	59.31	74.00	-14.69	HORIZONTAL	Peak

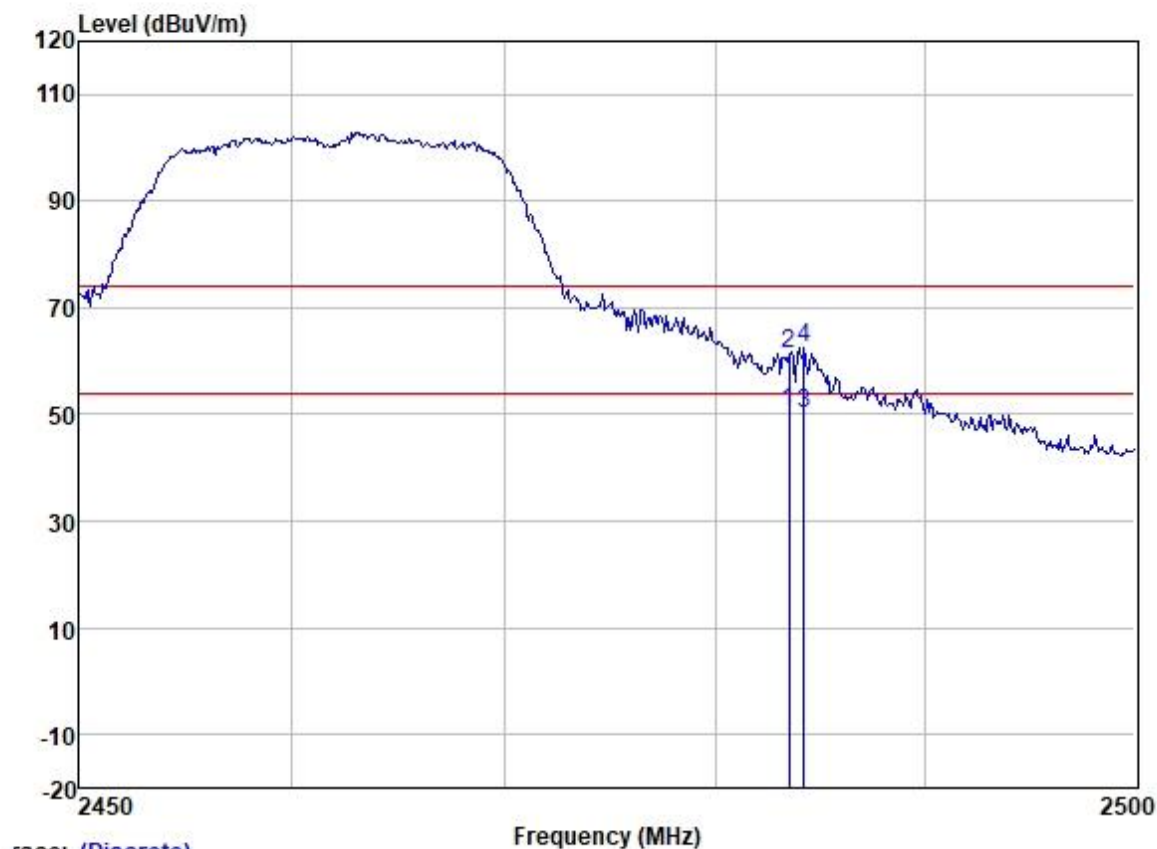
Test Mode: 03; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:High



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	2480.229	54.03	27.47	3.60	37.13	47.97	54.00	-6.03	VERTICAL	Average
2	2480.229	63.94	27.47	3.60	37.13	57.88	74.00	-16.12	VERTICAL	Peak
3	2483.790	53.16	27.48	3.53	37.13	47.04	54.00	-6.96	VERTICAL	Average
4	2483.790	62.28	27.48	3.53	37.13	56.16	74.00	-17.84	VERTICAL	Peak

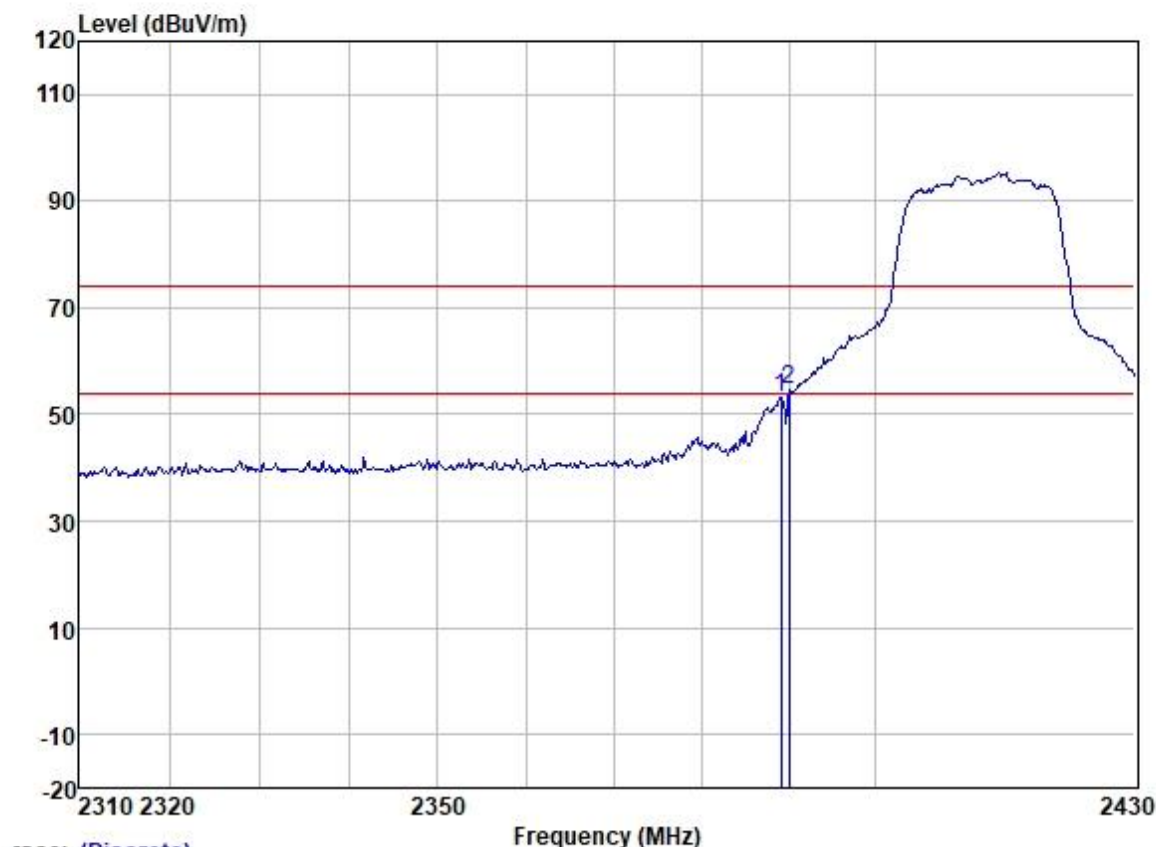
Test Mode: 03; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:High



Trace: (Discrete)

		ReadAntenna	Cable	Preamp		Limit	Over		
	Freq	Level	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2483.500	56.52	27.48	3.53	37.13	50.40	54.00	-3.60	HORIZONTAL Average
2	2483.500	67.38	27.48	3.53	37.13	61.26	74.00	-12.74	HORIZONTAL Peak
3	2484.191	56.31	27.48	3.53	37.13	50.19	54.00	-3.81	HORIZONTAL Average
4	2484.191	68.46	27.48	3.53	37.13	62.34	74.00	-11.66	HORIZONTAL Peak

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



Trace: (Discrete)

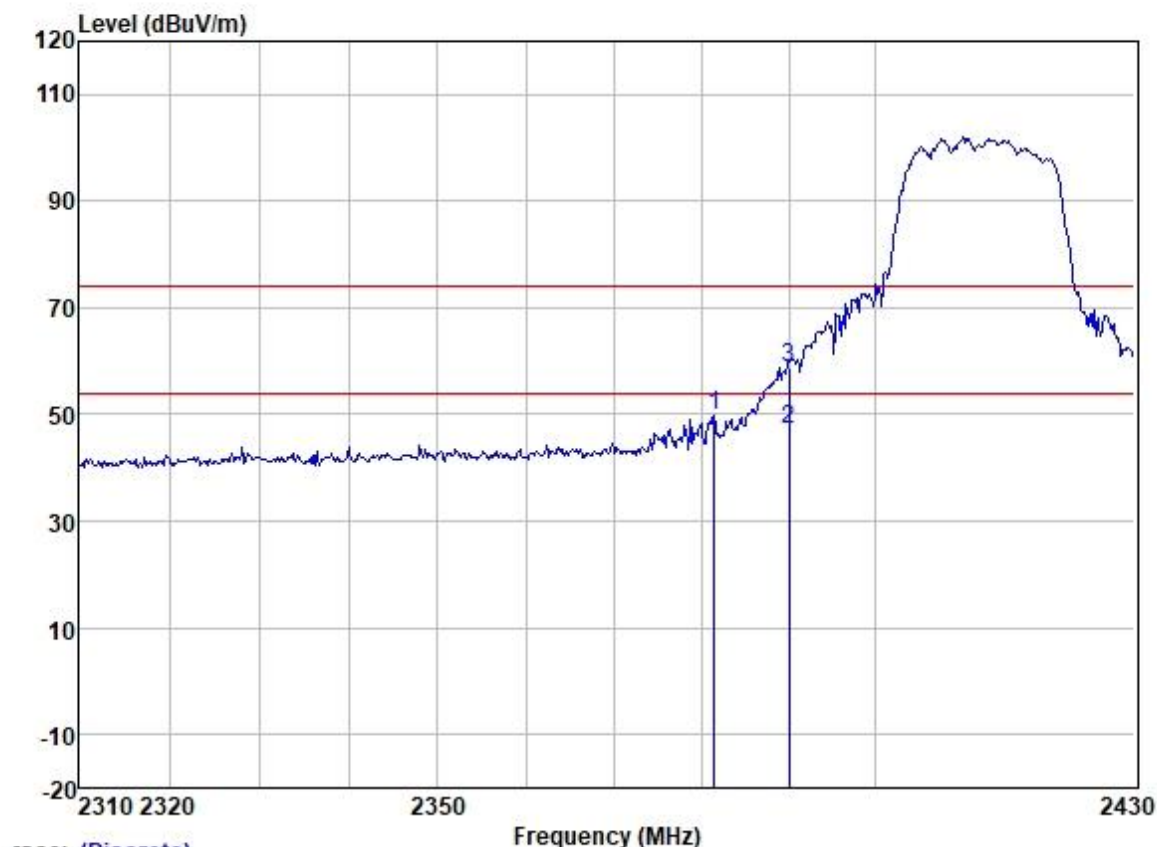
	Freq	ReadAntenna	Cable	Preamp	Limit	Over			
	MHz	Level	Loss	Factor	Line	Limit	Pol/Phase	Remark	
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2389.121	59.55	27.33	3.48	37.14	53.22	74.00	-20.78	VERTICAL Peak
2	2390.000	60.84	27.33	3.48	37.14	54.51	74.00	-19.49	VERTICAL Peak



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

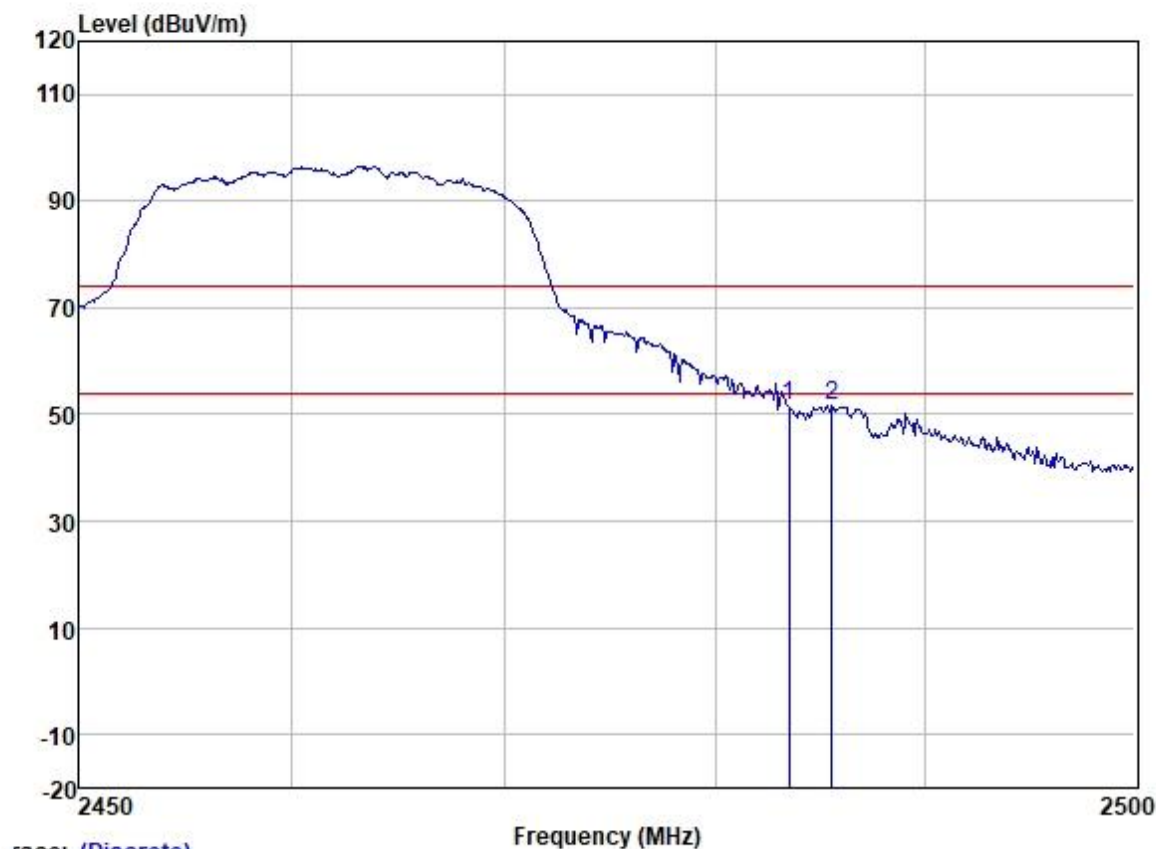
Test Mode: 03; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:Low



Trace: (Discrete)

	Freq	ReadAntenna Level	Cable Factor	Preamp Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2381.390	56.32	27.31	3.46	37.14	49.95	74.00	-24.05	HORIZONTAL	Peak
2	2390.000	53.64	27.33	3.48	37.14	47.31	54.00	-6.69	HORIZONTAL	Average
3	2390.000	65.12	27.33	3.48	37.14	58.79	74.00	-15.21	HORIZONTAL	Peak

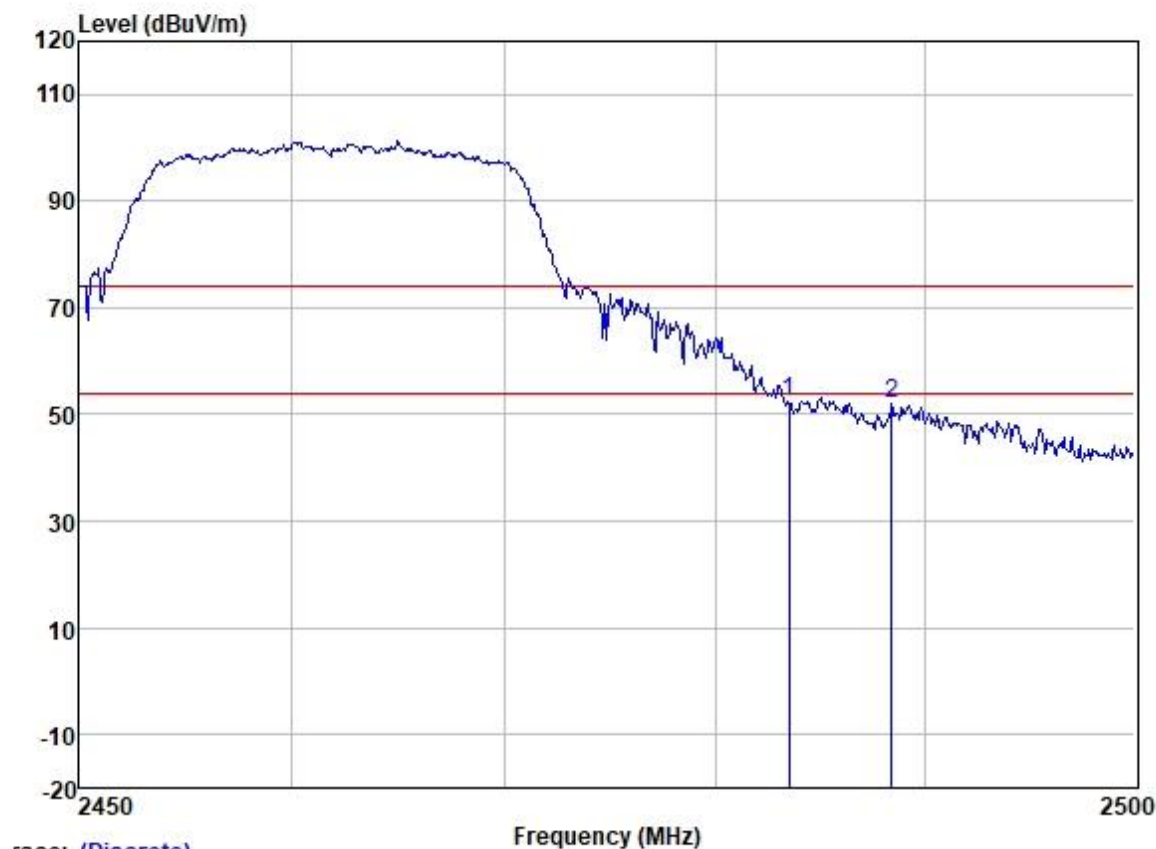
Test Mode: 03; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:High



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	57.98	27.48	3.53	37.13	51.86	74.00	-22.14	VERTICAL Peak
2	2485.546	57.87	27.48	3.53	37.13	51.75	74.00	-22.25	VERTICAL Peak

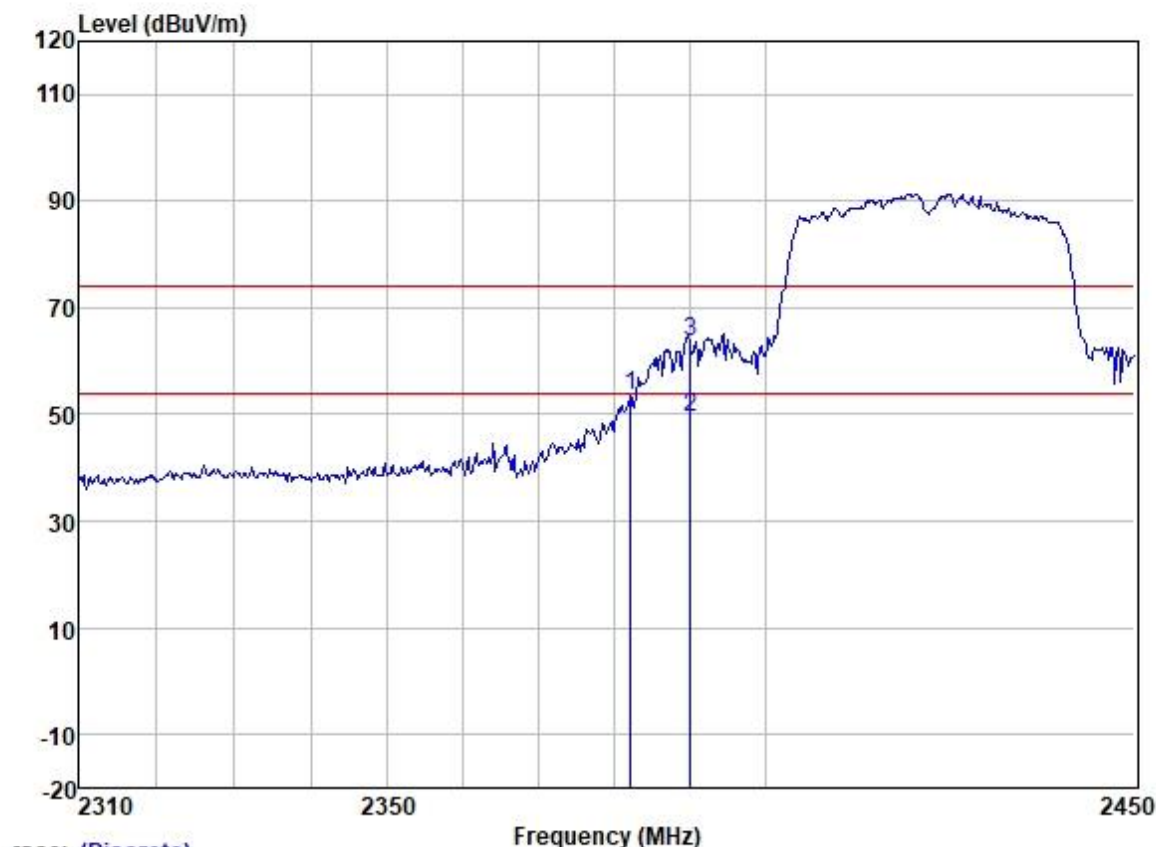
Test Mode: 03; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:High



Trace: (Discrete)

	Read	Antenna	Cable	Preamp	Limit	Over			
Freq	Level	Factor	Loss	Factor	Line	Limit	Pol/Phase	Remark	
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2483.500	58.53	27.48	3.53	37.13	52.41	74.00	-21.59	HORIZONTAL Peak
2	2488.360	58.31	27.48	3.53	37.12	52.20	74.00	-21.80	HORIZONTAL Peak

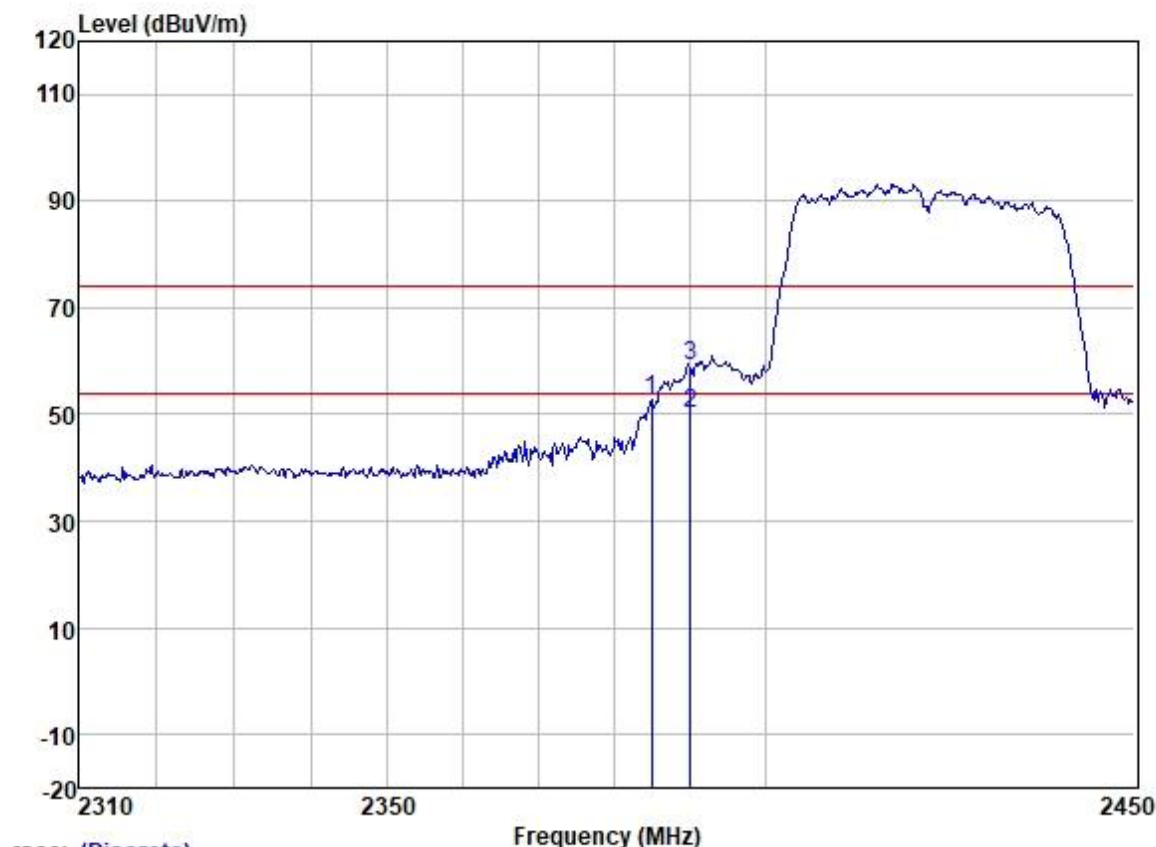
Test Mode: 03; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:Low



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	2382.052	59.90	27.31	3.46	37.14	53.53	74.00	-20.47	VERTICAL Peak
2	2390.000	55.94	27.33	3.48	37.14	49.61	54.00	-4.39	VERTICAL Average
3	2390.000	70.01	27.33	3.48	37.14	63.68	74.00	-10.32	VERTICAL Peak

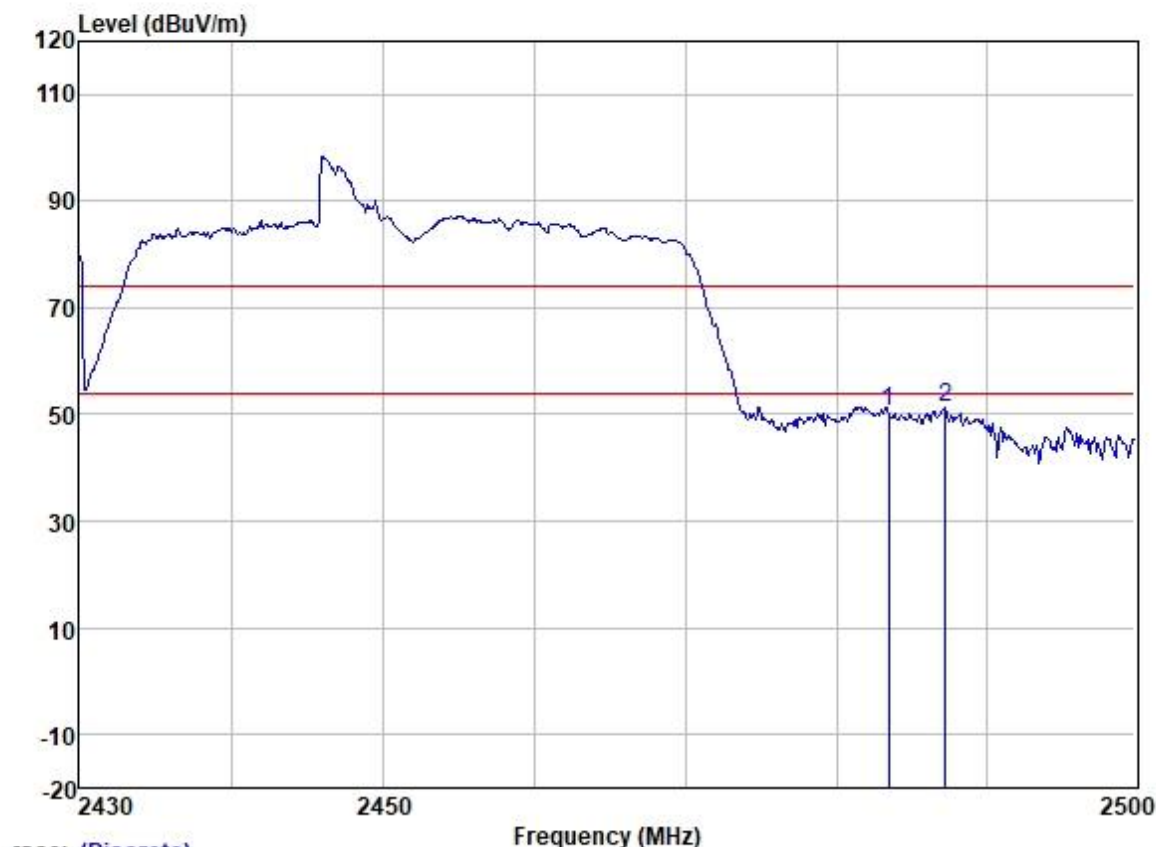
Test Mode: 03; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:Low



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	2384.857	59.15	27.33	3.48	37.14	52.82	74.00	-21.18	HORIZONTAL Peak
2	2390.000	56.36	27.33	3.48	37.14	50.03	54.00	-3.97	HORIZONTAL Average
3	2390.000	65.48	27.33	3.48	37.14	59.15	74.00	-14.85	HORIZONTAL Peak

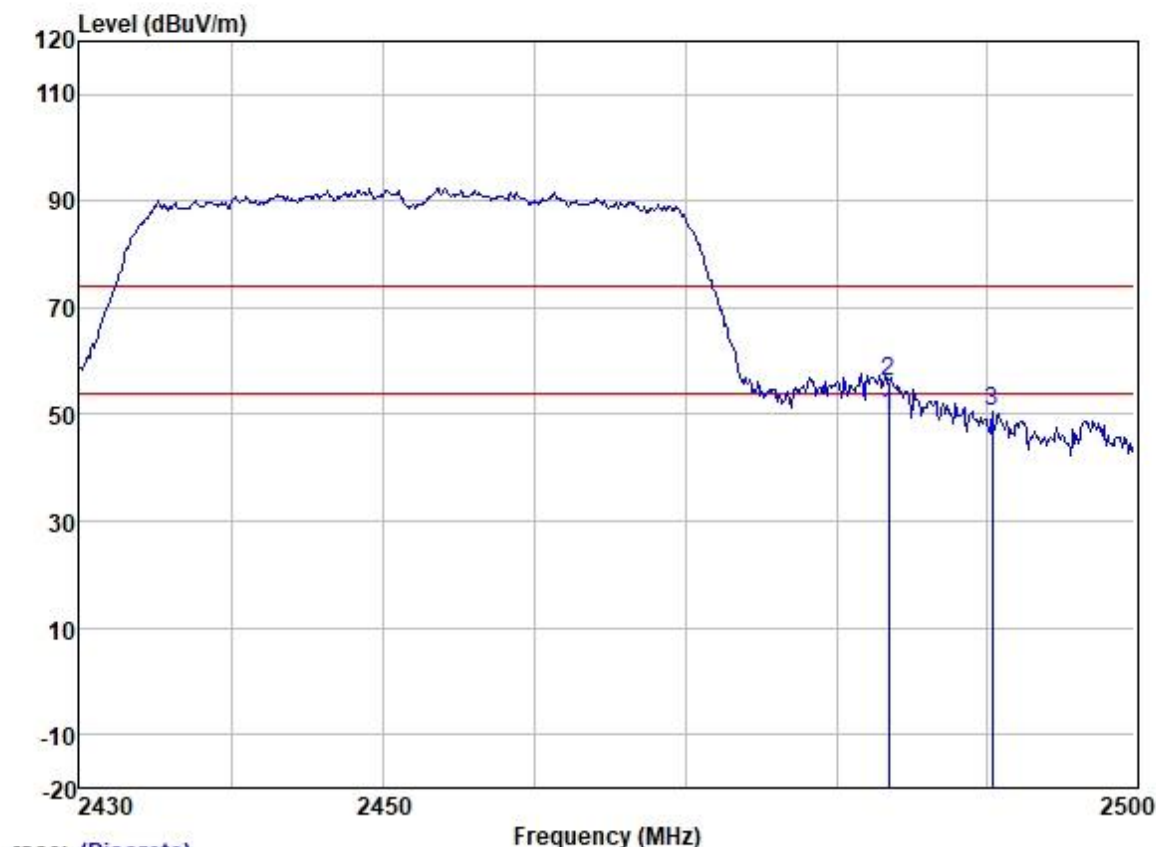
Test Mode: 03; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:High



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	2483.500	56.70	27.48	3.53	37.13	50.58	74.00	-23.42	VERTICAL Peak
2	2487.253	57.29	27.48	3.53	37.13	51.17	74.00	-22.83	VERTICAL Peak

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



Trace: (Discrete)

	ReadAntenna	Cable	Preamp		Limit	Over		
Freq	Level	Factor	Loss	Factor	Line	Limit	Pol/Phase	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1 2483.500	56.03	27.48	3.53	37.13	49.91	54.00	-4.09	HORIZONTAL Average
2 2483.500	62.23	27.48	3.53	37.13	56.11	74.00	-17.89	HORIZONTAL Peak
3 2490.434	56.77	27.49	3.47	37.12	50.61	74.00	-23.39	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: 25.9 °C

Humidity: 56.3 % RH

Atmospheric Pressure: 1006 mbar

7.8.2 Test Mode Description

Pre-scan / Mode
Final test Code Description

TX mode(2.4G Wi-Fi)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), 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

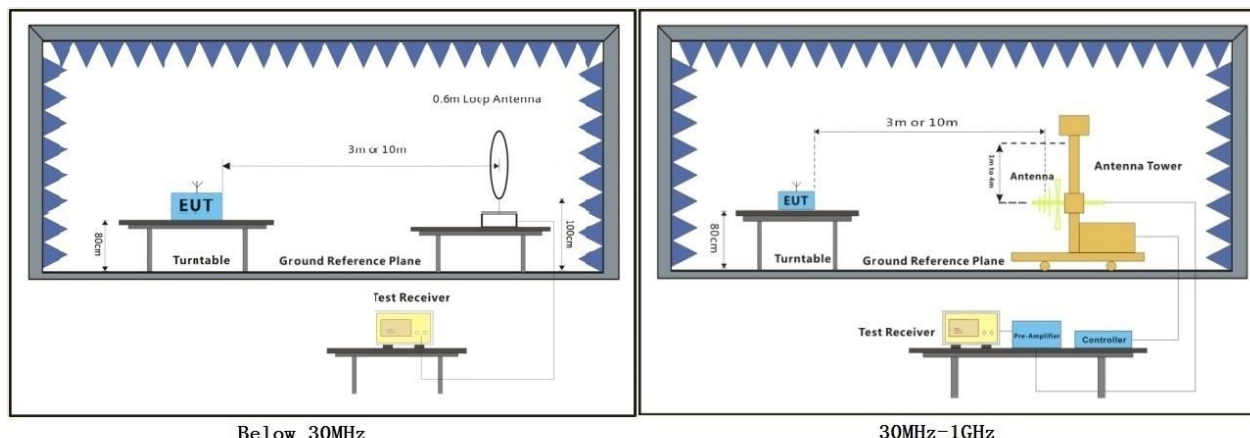


Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

SGS-CSTC Standards Technical Services Co., Ltd. No.198 Kezhu Road, Sciotech Park, Guangzhou Economic & Technology Development District, Guangzhou, China 510663 t (86-20) 82155555 f (86-20) 82075058 www.sgsgroup.com.cn
Guangzhou branch Technical Services Co., Ltd. EEC Laboratory. 中国·广州·经济技术开发区科学城科珠路198号 邮编: 510663 t (86-20) 82155555 f (86-20) 82075058 sgs.china@sgs.com

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:

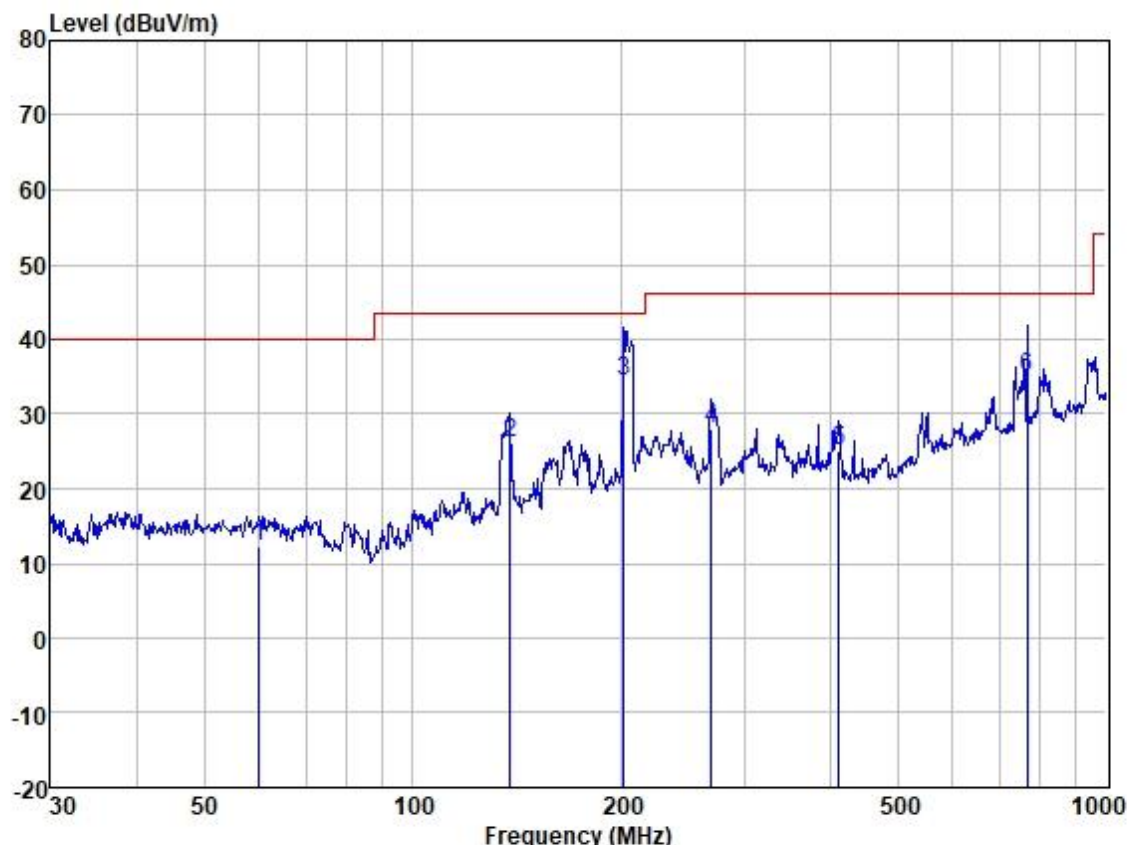
- Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor
- Scan from 9kHz to 30MHz, the disturbance below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from 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.



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

Test Mode: 03; Polarity: Horizontal



Site : SGS
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	60.069	25.37	13.33	1.26	27.60	12.36	40.00	-27.64	HORIZONTAL	QP
2	137.903	38.72	12.91	2.05	27.48	26.20	43.50	-17.30	HORIZONTAL	QP
3	201.393	49.22	10.05	2.53	27.30	34.50	43.50	-9.00	HORIZONTAL	QP
4	269.428	39.63	12.58	3.04	27.22	28.03	46.00	-17.97	HORIZONTAL	QP
5	411.824	33.28	15.79	3.99	28.05	25.01	46.00	-20.99	HORIZONTAL	QP
6	768.748	35.31	22.14	6.05	28.62	34.88	46.00	-11.12	HORIZONTAL	QP



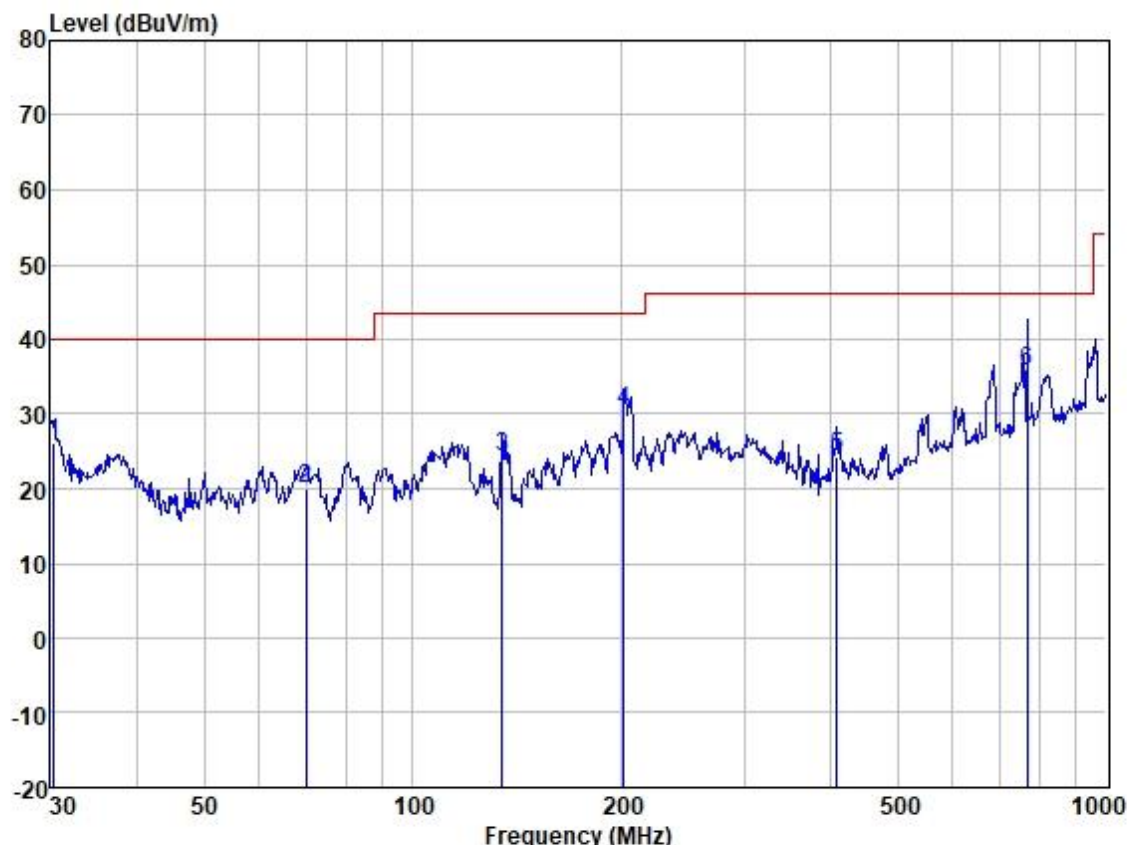
Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

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

No. 198 Kezhu Road, Sciotech Park, Guangzhou Economic & Technology Development District, Guangzhou, China 510663 t (86-20) 82155555 f (86-20) 82075058 www.sgs.com.cn
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: 03; Polarity: Vertical



Site : SGS
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	30.317	39.76	12.94	1.02	27.66	26.06	40.00	-13.94	VERTICAL	QP
2	70.090	34.60	11.68	1.41	27.60	20.09	40.00	-19.91	VERTICAL	QP
3	134.559	37.00	12.69	2.01	27.50	24.20	43.50	-19.30	VERTICAL	QP
4	201.393	45.18	10.05	2.53	27.30	30.46	43.50	-13.04	VERTICAL	QP
5	408.946	32.49	15.73	3.97	28.03	24.16	46.00	-21.84	VERTICAL	QP
6	768.748	36.20	22.14	6.05	28.62	35.77	46.00	-10.23	VERTICAL	QP



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

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

No. 198 Kezhu Road, Sciotech Park, Guangzhou Economic & Technology Development District, Guangzhou, China 510663 t (86-20) 82155555 f (86-20) 82075058 www.sgs.com.cn
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

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

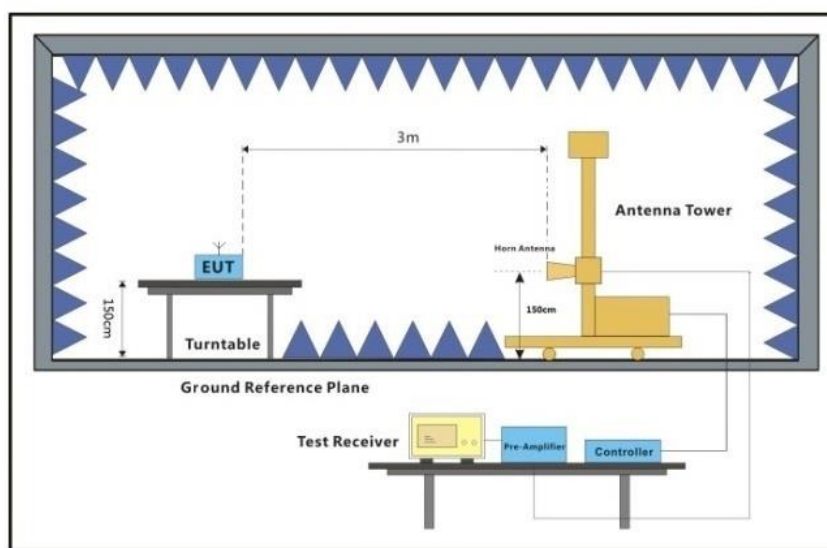
Operating Environment:

Temperature: 23 °C Humidity: 55 % RH Atmospheric Pressure: 1006 mbar

7.9.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	03	TX mode(2.4G Wi-Fi)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), 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



Above 1GHz

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.



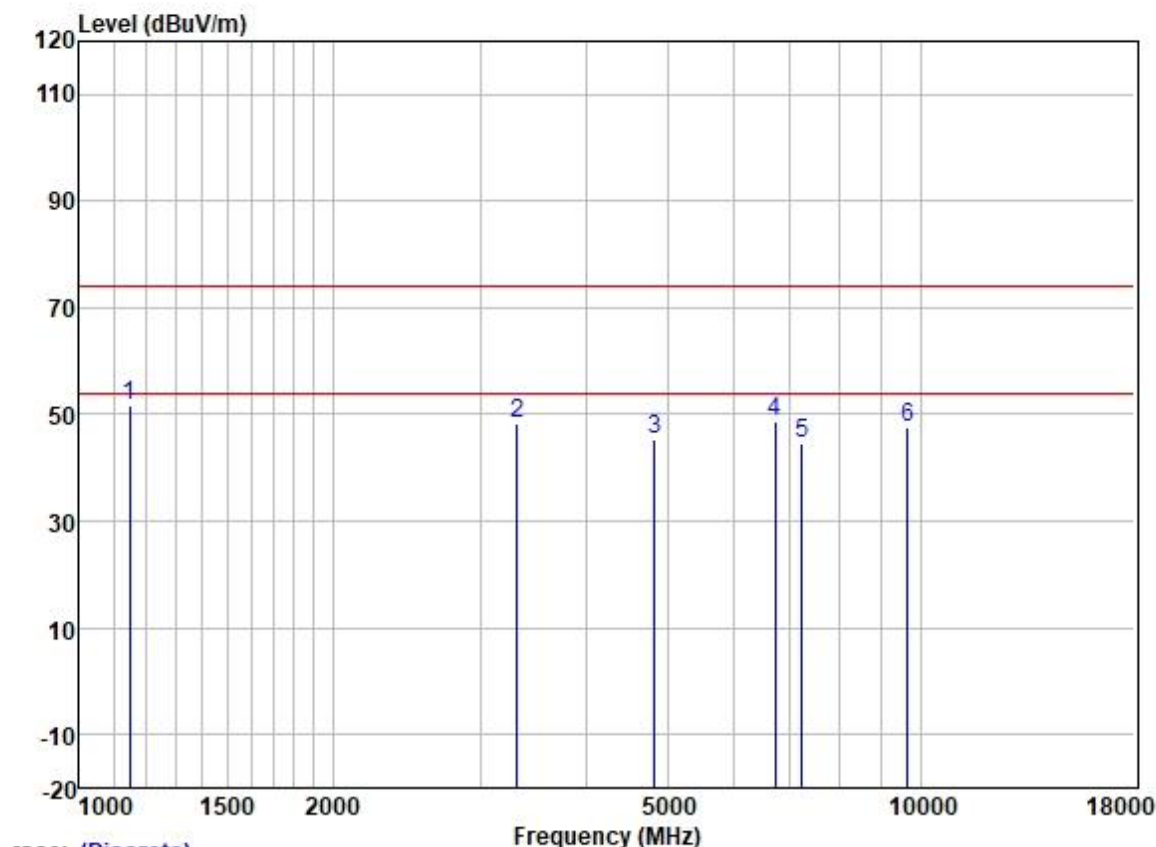
Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

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

No. 198 Kezhu Road, Sciotech Park, Guangzhou Economic & Technology Development District, Guangzhou, China 510663 t (86-20) 82155555 f (86-20) 82075058 www.sgsgroup.com.cn
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

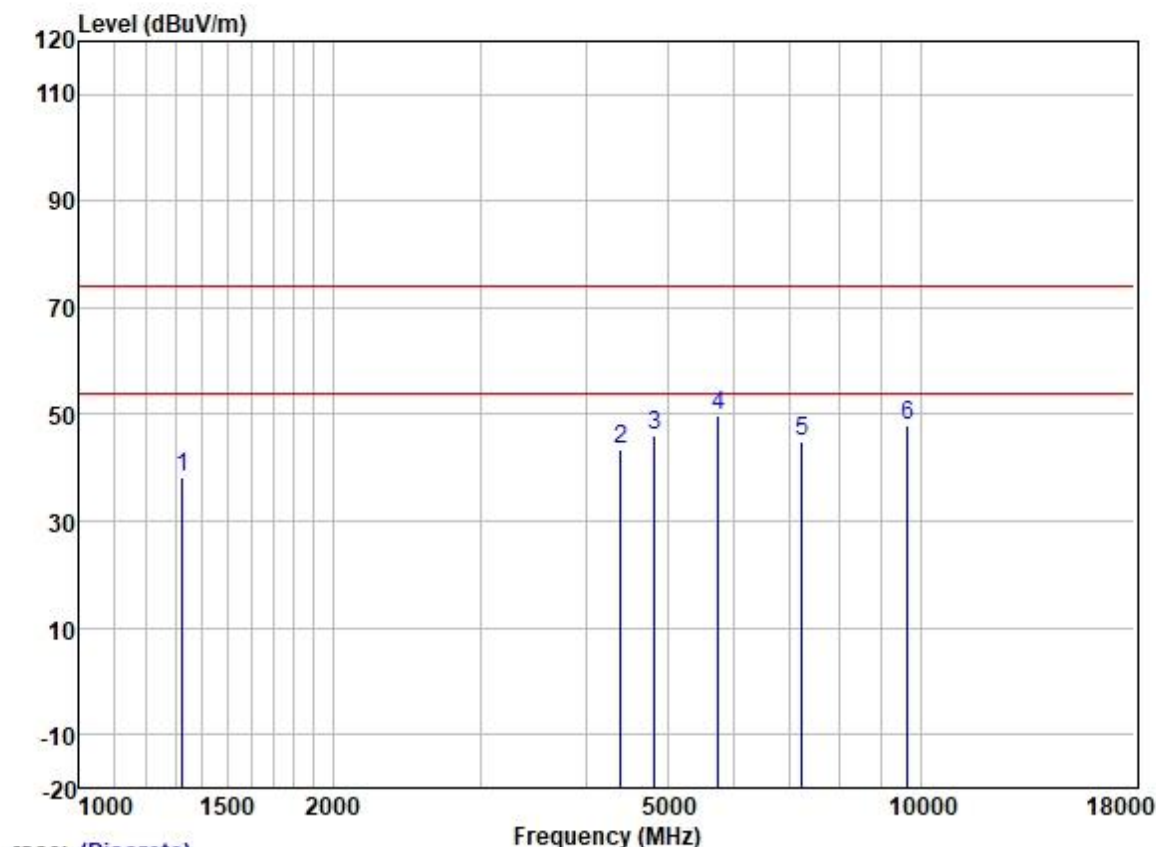
Test Mode: 03; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:Low



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	1148.823	62.88	24.49	2.34	38.19	51.52	74.00	-22.48	VERTICAL
2	3318.471	52.32	28.77	4.07	36.82	48.34	74.00	-25.66	VERTICAL
3	4824.000	44.85	31.45	5.42	36.50	45.22	74.00	-28.78	VERTICAL
4	6717.762	44.82	34.44	5.83	36.42	48.67	74.00	-25.33	VERTICAL
5	7236.000	39.87	35.70	6.03	36.94	44.66	74.00	-29.34	VERTICAL
6	9648.000	38.80	38.40	7.06	36.85	47.41	74.00	-26.59	VERTICAL

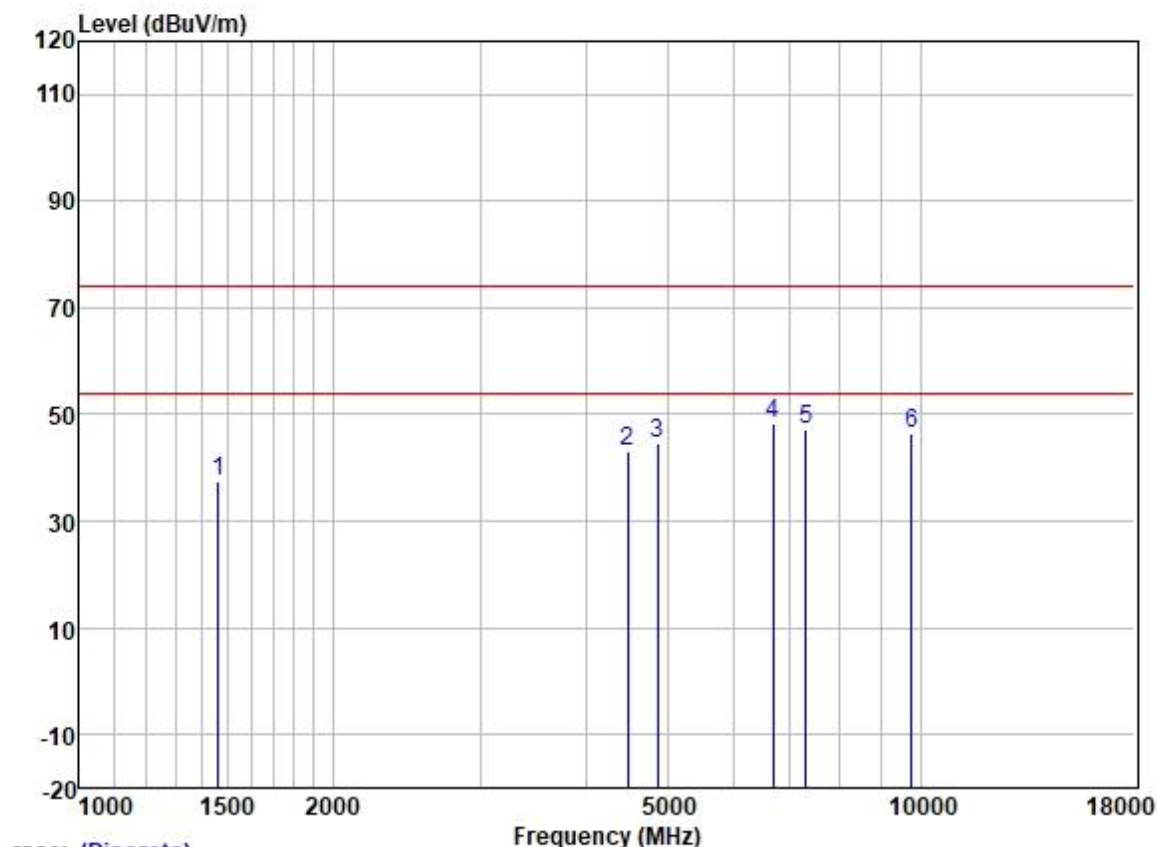
Test Mode: 03; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:Low



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	1327.446	48.39	25.27	2.60	38.02	38.24	74.00	-35.76	HORIZONTAL	peak
2	4405.090	44.80	30.68	4.70	36.63	43.55	74.00	-30.45	HORIZONTAL	peak
3	4824.000	45.81	31.45	5.42	36.50	46.18	74.00	-27.82	HORIZONTAL	peak
4	5746.982	47.72	32.10	6.20	36.14	49.88	74.00	-24.12	HORIZONTAL	peak
5	7236.000	40.21	35.70	6.03	36.94	45.00	74.00	-29.00	HORIZONTAL	peak
6	9648.000	39.25	38.40	7.06	36.85	47.86	74.00	-26.14	HORIZONTAL	peak

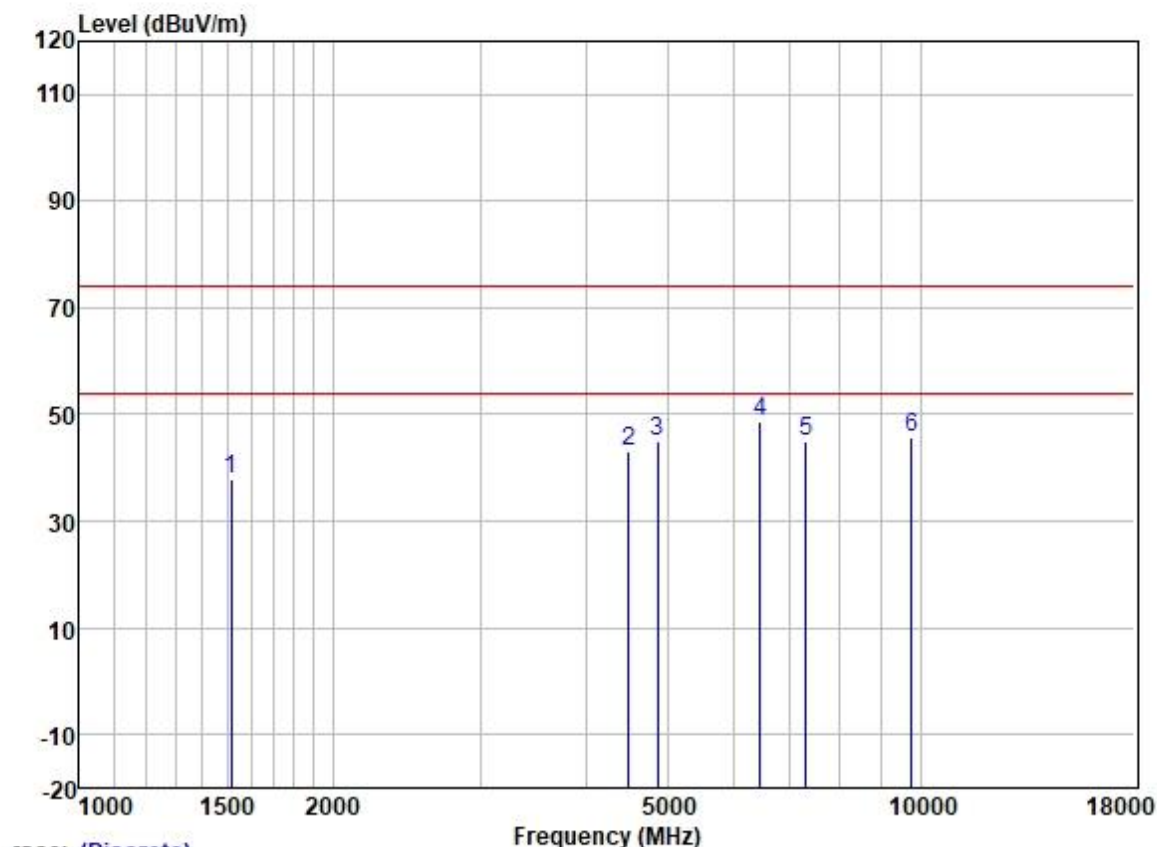
Test Mode: 03; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:middle



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	1464.522	47.14	25.47	2.74	37.80	37.55	74.00	-36.45	VERTICAL peak
2	4482.150	43.81	30.78	4.99	36.61	42.97	74.00	-31.03	VERTICAL peak
3	4874.000	43.96	31.54	5.50	36.48	44.52	74.00	-29.48	VERTICAL peak
4	6679.040	44.45	34.33	5.83	36.39	48.22	74.00	-25.78	VERTICAL peak
5	7311.000	42.18	35.93	6.11	36.99	47.23	74.00	-26.77	VERTICAL peak
6	9748.000	37.88	38.50	7.02	36.83	46.57	74.00	-27.43	VERTICAL peak

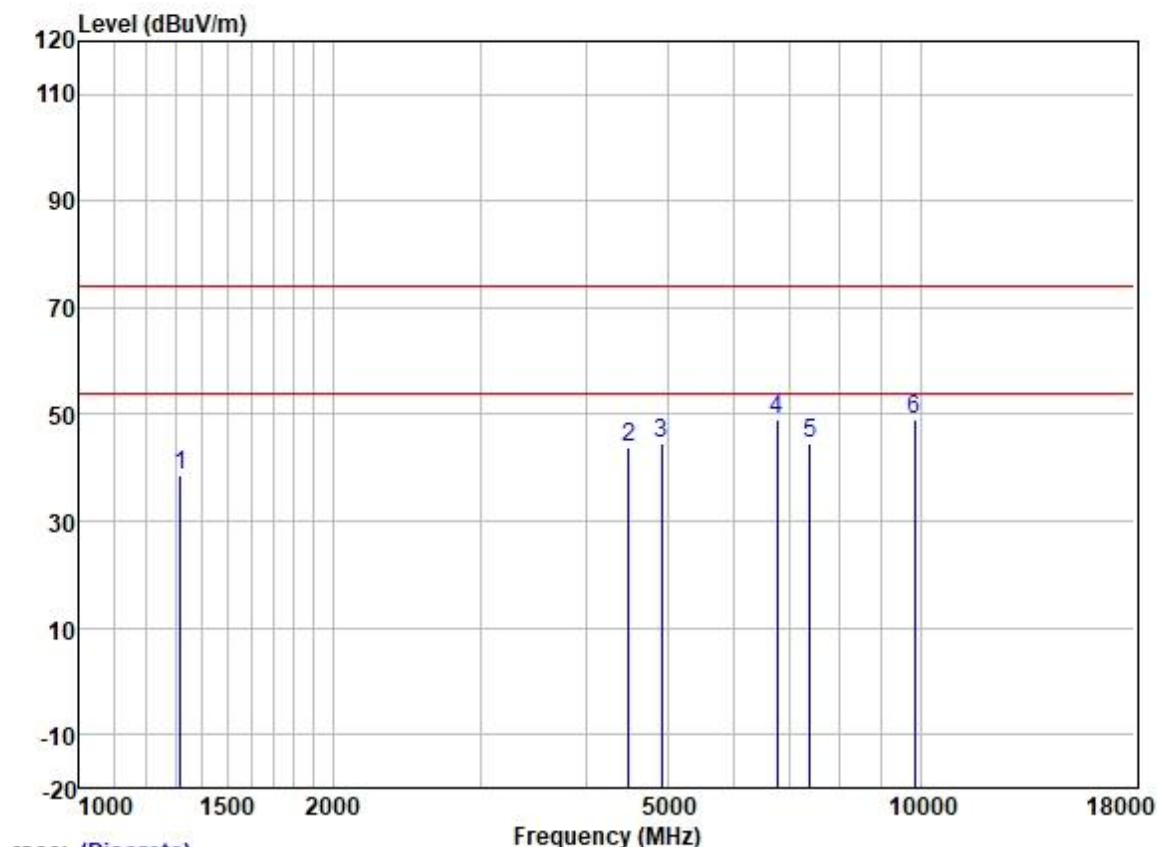
Test Mode: 03; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:middle



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	1516.210	47.36	25.51	2.80	37.70	37.97	74.00	-36.03	HORIZONTAL peak
2	4495.125	43.99	30.80	5.05	36.60	43.24	74.00	-30.76	HORIZONTAL peak
3	4874.000	44.33	31.54	5.50	36.48	44.89	74.00	-29.11	HORIZONTAL peak
4	6451.353	45.17	33.88	5.87	36.27	48.65	74.00	-25.35	HORIZONTAL peak
5	7311.000	39.82	35.93	6.11	36.99	44.87	74.00	-29.13	HORIZONTAL peak
6	9748.000	37.17	38.50	7.02	36.83	45.86	74.00	-28.14	HORIZONTAL peak

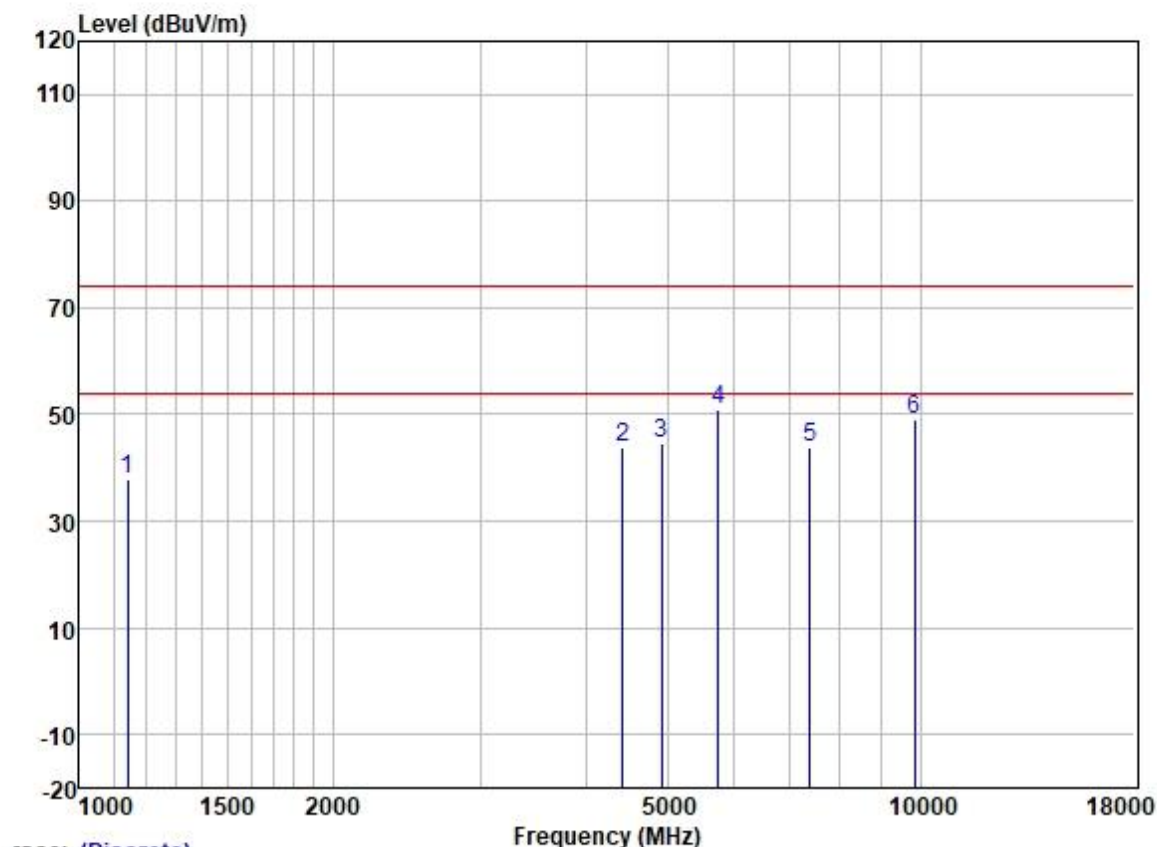
Test Mode: 03; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:High



Trace: (Discrete)

	Freq	ReadAntenna	Cable	Preamp		Limit	Over		
	MHz	Level	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1319.794	48.74	25.25	2.60	38.02	38.57	74.00	-35.43	VERTICAL peak
2	4495.125	44.76	30.80	5.05	36.60	44.01	74.00	-29.99	VERTICAL peak
3	4924.000	43.72	31.62	5.60	36.45	44.49	74.00	-29.51	VERTICAL peak
4	6756.708	44.99	34.56	5.82	36.44	48.93	74.00	-25.07	VERTICAL peak
5	7386.000	39.19	36.17	6.19	37.04	44.51	74.00	-29.49	VERTICAL peak
6	9848.000	40.50	38.58	6.99	36.82	49.25	74.00	-24.75	VERTICAL peak

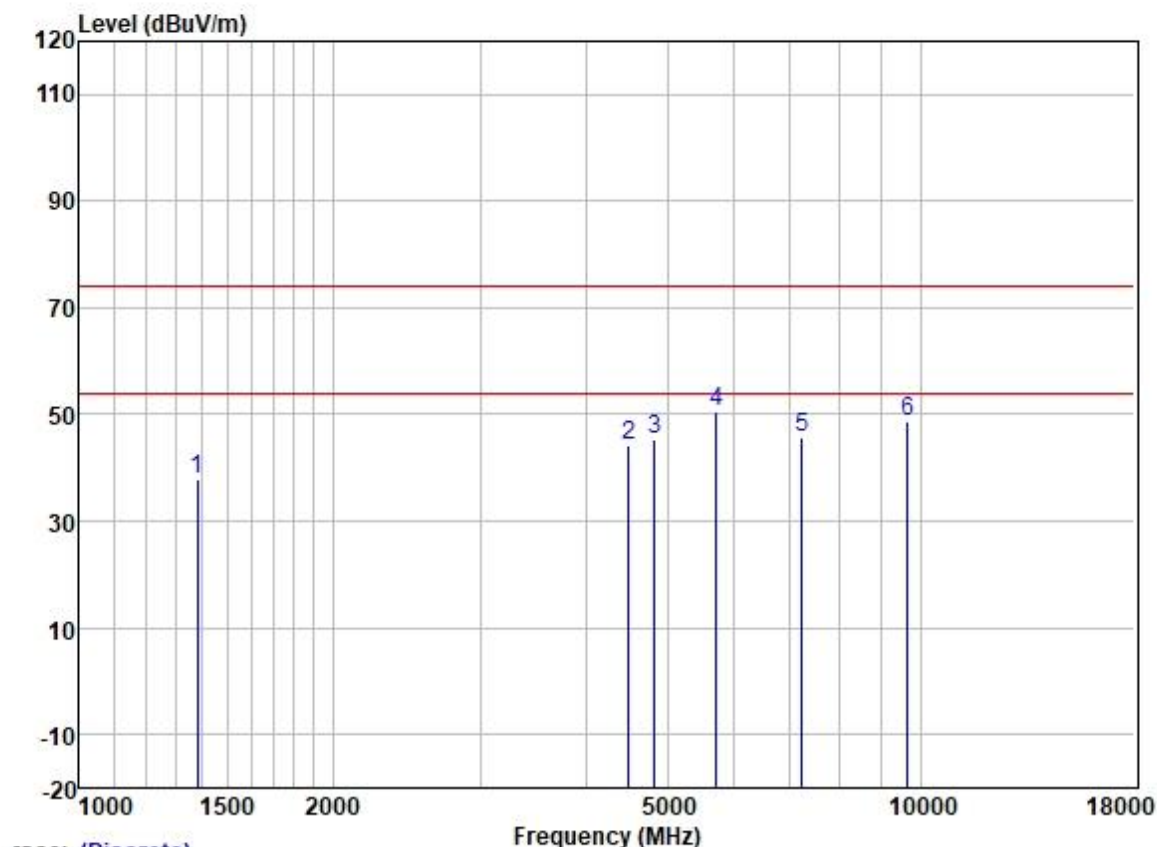
Test Mode: 03; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:High



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	1142.201	49.27	24.47	2.30	38.19	37.85	74.00	-36.15	HORIZONTAL peak
2	4430.628	44.81	30.72	4.78	36.62	43.69	74.00	-30.31	HORIZONTAL peak
3	4924.000	43.91	31.62	5.60	36.45	44.68	74.00	-29.32	HORIZONTAL peak
4	5746.982	48.94	32.10	6.20	36.14	51.10	74.00	-22.90	HORIZONTAL peak
5	7386.000	38.63	36.17	6.19	37.04	43.95	74.00	-30.05	HORIZONTAL peak
6	9848.000	40.29	38.58	6.99	36.82	49.04	74.00	-24.96	HORIZONTAL peak

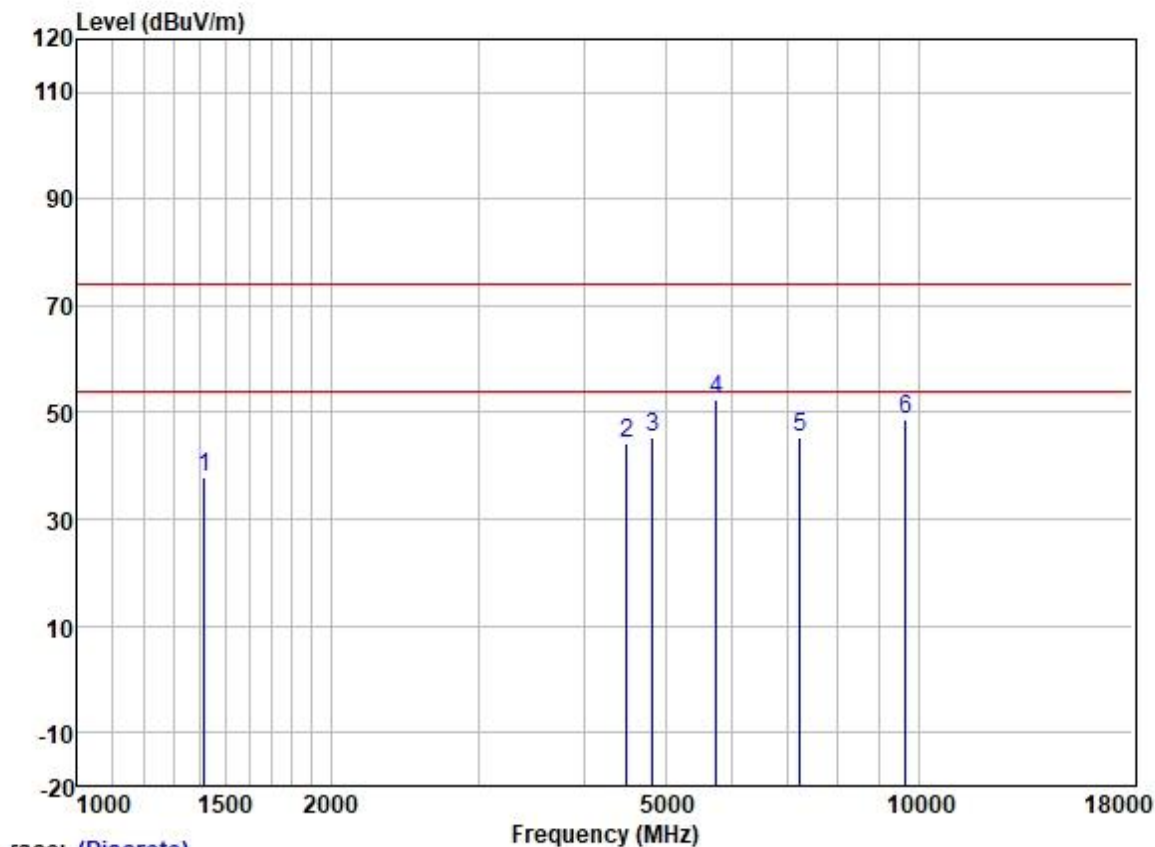
Test Mode: 03; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:Low



Trace: (Discrete)

	Freq	ReadAntenna	Cable	Preamp		Limit	Over		
	MHz	Level	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1382.262	47.75	25.37	2.60	37.95	37.77	74.00	-36.23	VERTICAL peak
2	4495.125	44.83	30.80	5.05	36.60	44.08	74.00	-29.92	VERTICAL peak
3	4824.000	45.07	31.45	5.42	36.50	45.44	74.00	-28.56	VERTICAL peak
4	5713.856	48.50	32.04	6.33	36.15	50.72	74.00	-23.28	VERTICAL peak
5	7236.000	40.79	35.70	6.03	36.94	45.58	74.00	-28.42	VERTICAL peak
6	9648.000	39.91	38.40	7.06	36.85	48.52	74.00	-25.48	VERTICAL peak

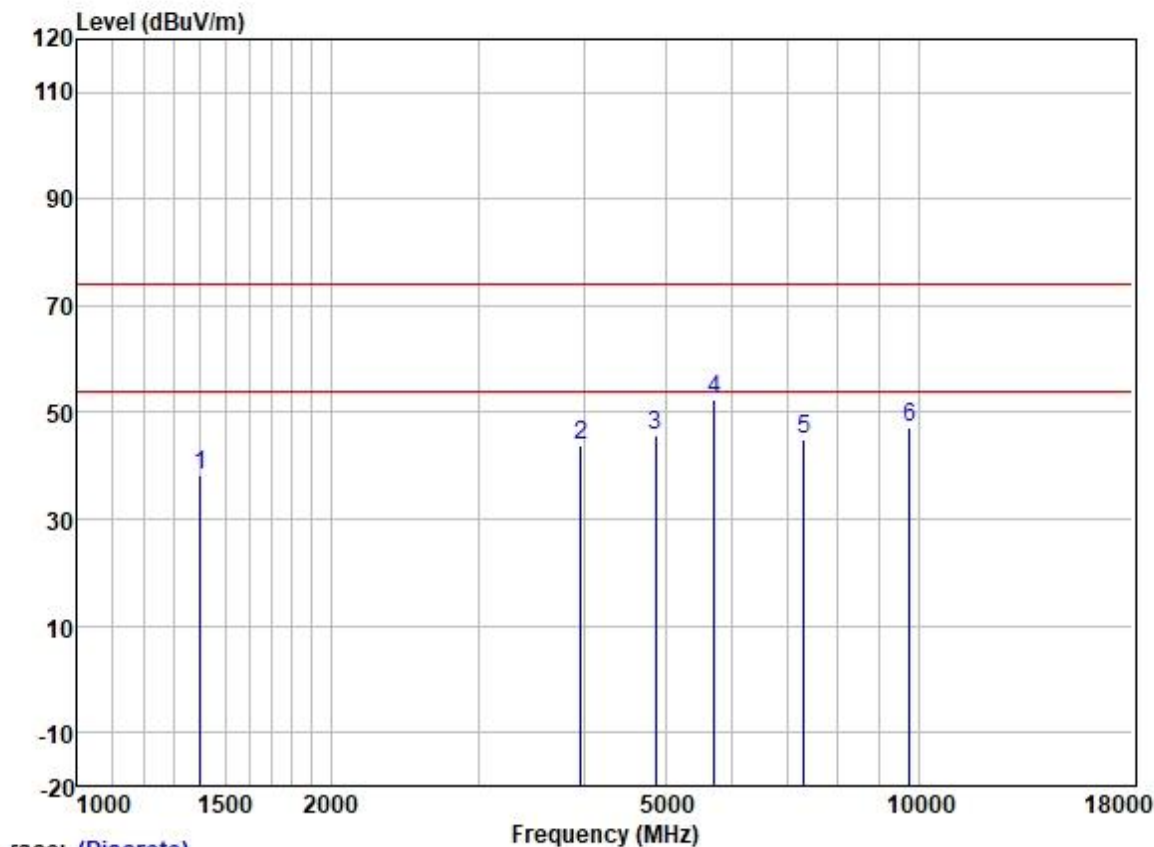
Test Mode: 03; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:Low



Trace: (Discrete)

	Freq	ReadAntenna	Cable	Preamp		Limit	Over		
	MHz	Level	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1414.597	47.61	25.41	2.63	37.88	37.77	74.00	-36.23	HORIZONTAL peak
2	4495.125	44.81	30.80	5.05	36.60	44.06	74.00	-29.94	HORIZONTAL peak
3	4824.000	45.11	31.45	5.42	36.50	45.48	74.00	-28.52	HORIZONTAL peak
4	5746.982	50.44	32.10	6.20	36.14	52.60	74.00	-21.40	HORIZONTAL peak
5	7236.000	40.39	35.70	6.03	36.94	45.18	74.00	-28.82	HORIZONTAL peak
6	9648.000	40.13	38.40	7.06	36.85	48.74	74.00	-25.26	HORIZONTAL peak

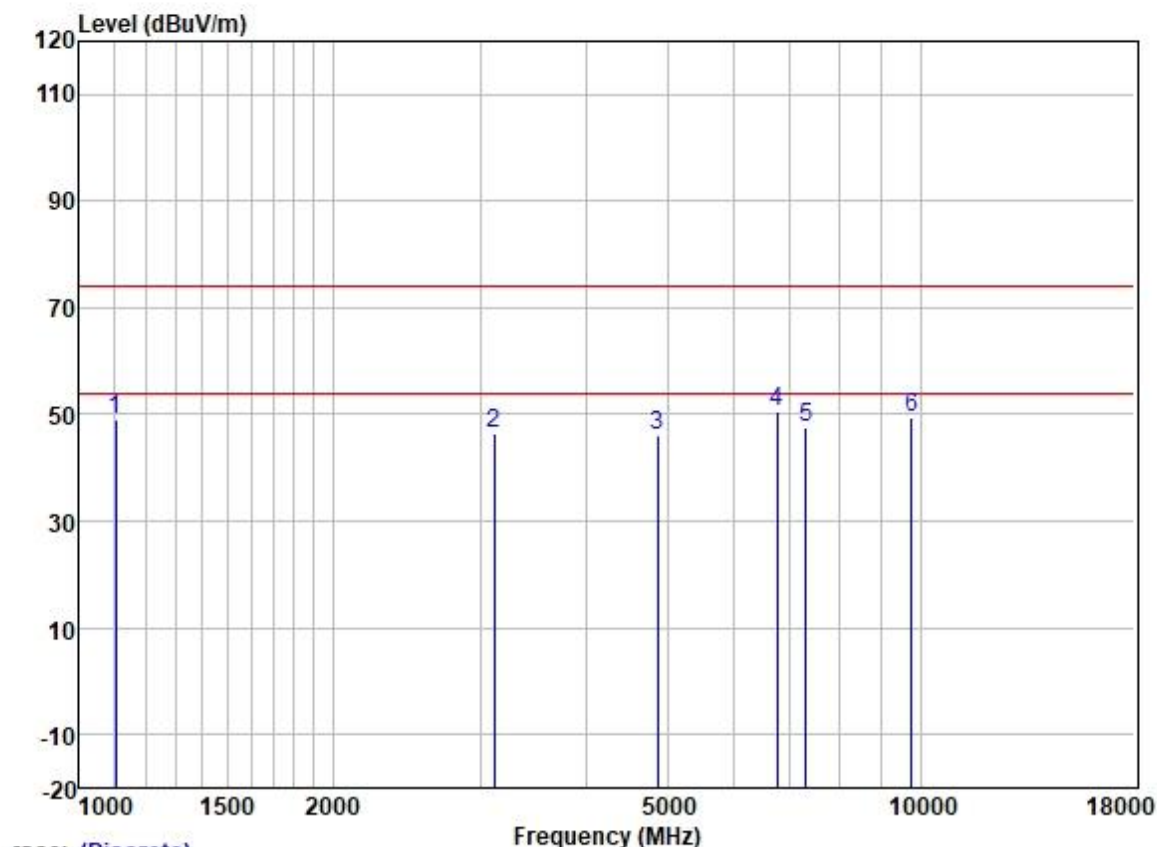
Test Mode: 03; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:middle



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	1398.336	48.17	25.39	2.60	37.92	38.24	74.00	-35.76	VERTICAL	peak
2	3969.767	46.22	29.77	4.60	36.70	43.89	74.00	-30.11	VERTICAL	peak
3	4874.000	45.03	31.54	5.50	36.48	45.59	74.00	-28.41	VERTICAL	peak
4	5713.856	50.39	32.04	6.33	36.15	52.61	74.00	-21.39	VERTICAL	peak
5	7311.000	39.88	35.93	6.11	36.99	44.93	74.00	-29.07	VERTICAL	peak
6	9748.000	38.46	38.50	7.02	36.83	47.15	74.00	-26.85	VERTICAL	peak

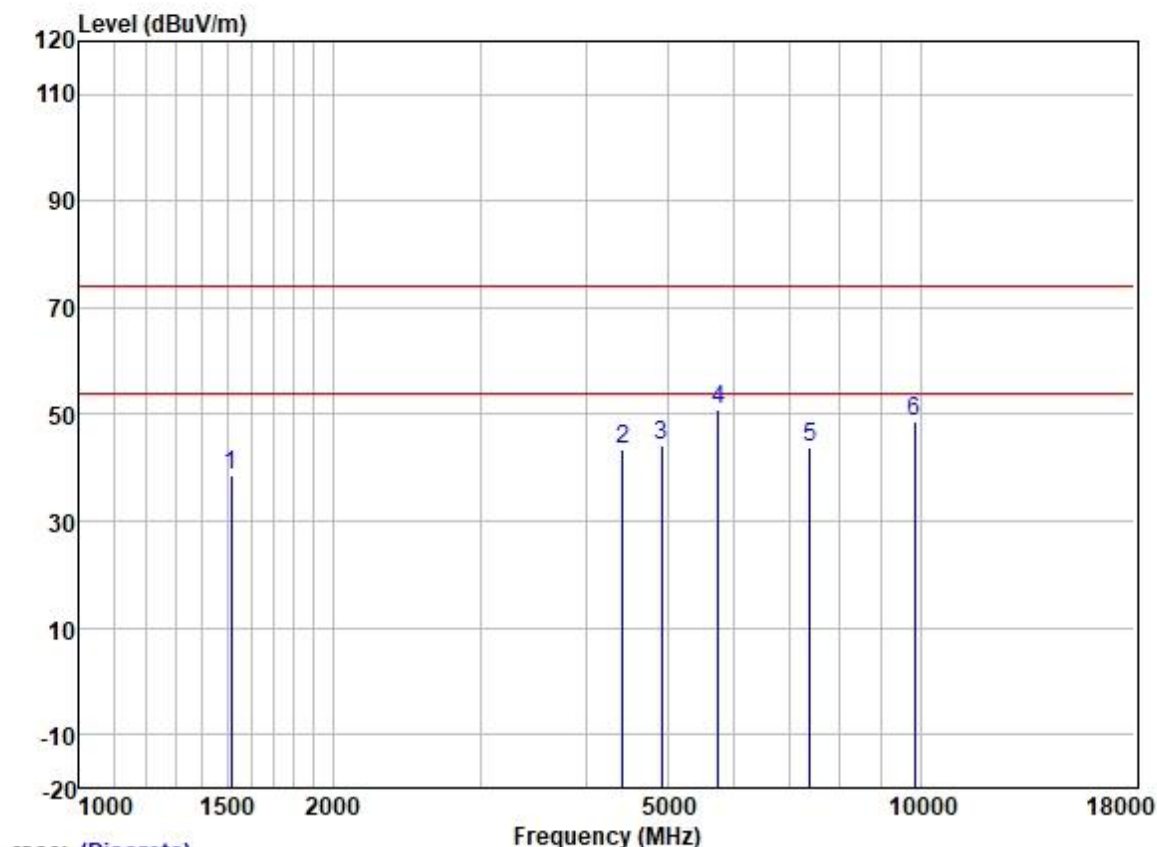
Test Mode: 03; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:middle



race: (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	1103.264	60.68	24.37	2.29	38.23	49.11	74.00	-24.89	HORIZONTAL peak
2	3114.025	50.94	28.49	3.92	36.89	46.46	74.00	-27.54	HORIZONTAL peak
3	4874.000	45.54	31.54	5.50	36.48	46.10	74.00	-27.90	HORIZONTAL peak
4	6756.708	46.73	34.56	5.82	36.44	50.67	74.00	-23.33	HORIZONTAL peak
5	7311.000	42.36	35.93	6.11	36.99	47.41	74.00	-26.59	HORIZONTAL peak
6	9748.000	40.58	38.50	7.02	36.83	49.27	74.00	-24.73	HORIZONTAL peak

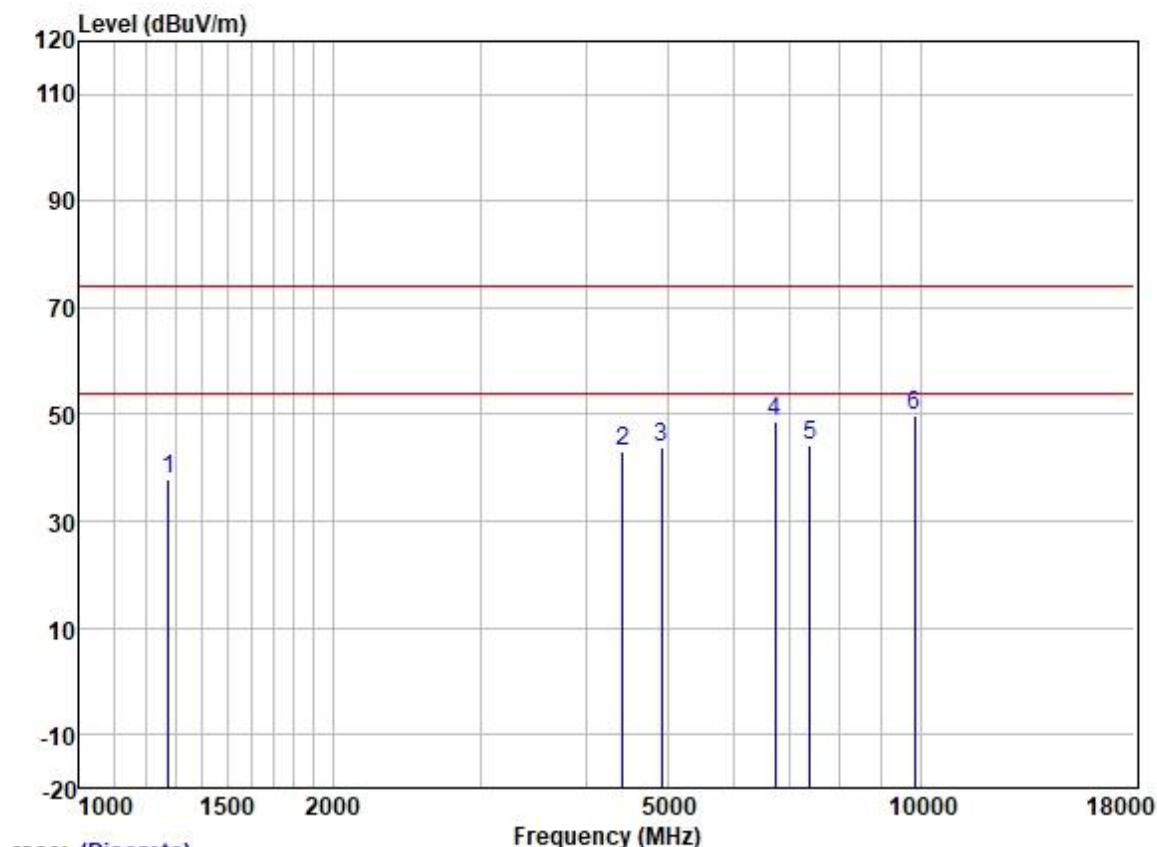
Test Mode: 03; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:High



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	1516.210	47.95	25.51	2.80	37.70	38.56	74.00	-35.44	VERTICAL peak
2	4430.628	44.57	30.72	4.78	36.62	43.45	74.00	-30.55	VERTICAL peak
3	4924.000	43.45	31.62	5.60	36.45	44.22	74.00	-29.78	VERTICAL peak
4	5746.982	48.69	32.10	6.20	36.14	50.85	74.00	-23.15	VERTICAL peak
5	7386.000	38.56	36.17	6.19	37.04	43.88	74.00	-30.12	VERTICAL peak
6	9848.000	39.84	38.58	6.99	36.82	48.59	74.00	-25.41	VERTICAL peak

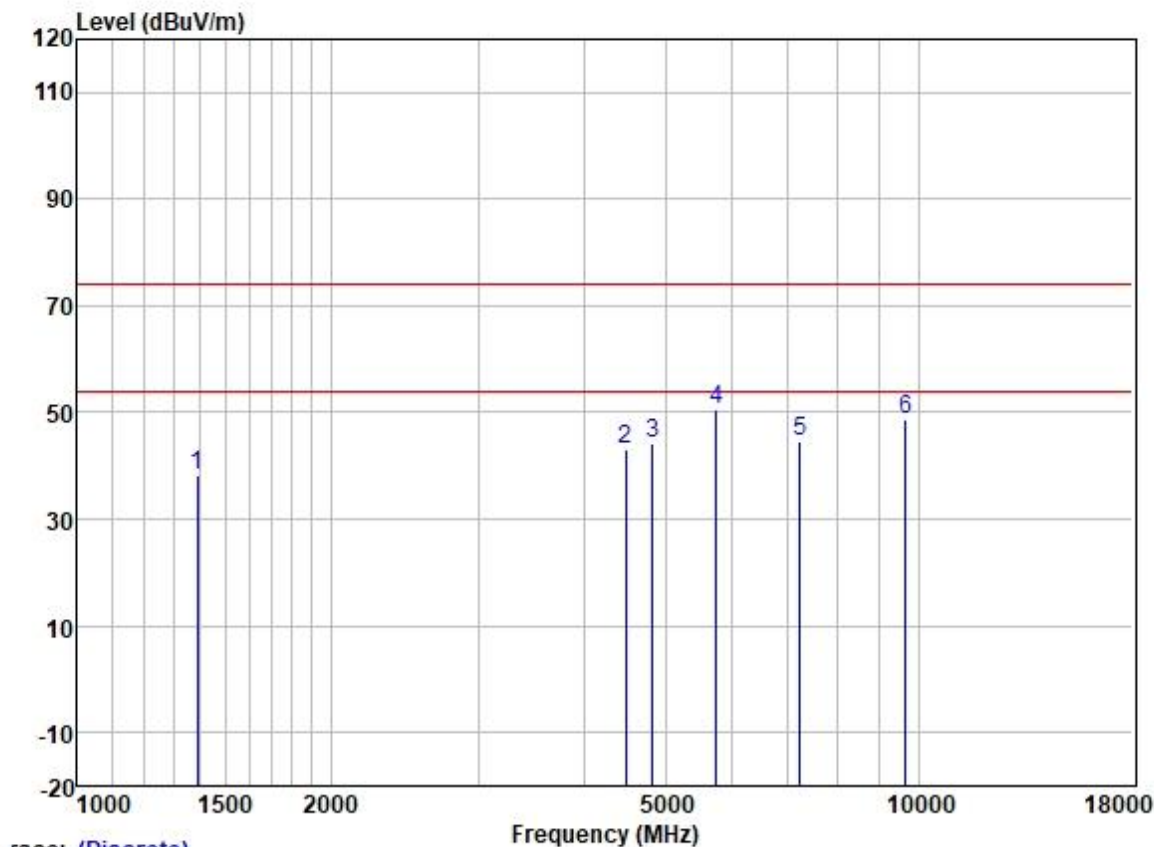
Test Mode: 03; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:High



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	1274.802	48.17	25.12	2.48	38.07	37.70	74.00	-36.30	HORIZONTAL peak
2	4430.628	44.36	30.72	4.78	36.62	43.24	74.00	-30.76	HORIZONTAL peak
3	4924.000	43.15	31.62	5.60	36.45	43.92	74.00	-30.08	HORIZONTAL peak
4	6717.762	44.73	34.44	5.83	36.42	48.58	74.00	-25.42	HORIZONTAL peak
5	7386.000	38.90	36.17	6.19	37.04	44.22	74.00	-29.78	HORIZONTAL peak
6	9848.000	40.98	38.58	6.99	36.82	49.73	74.00	-24.27	HORIZONTAL peak

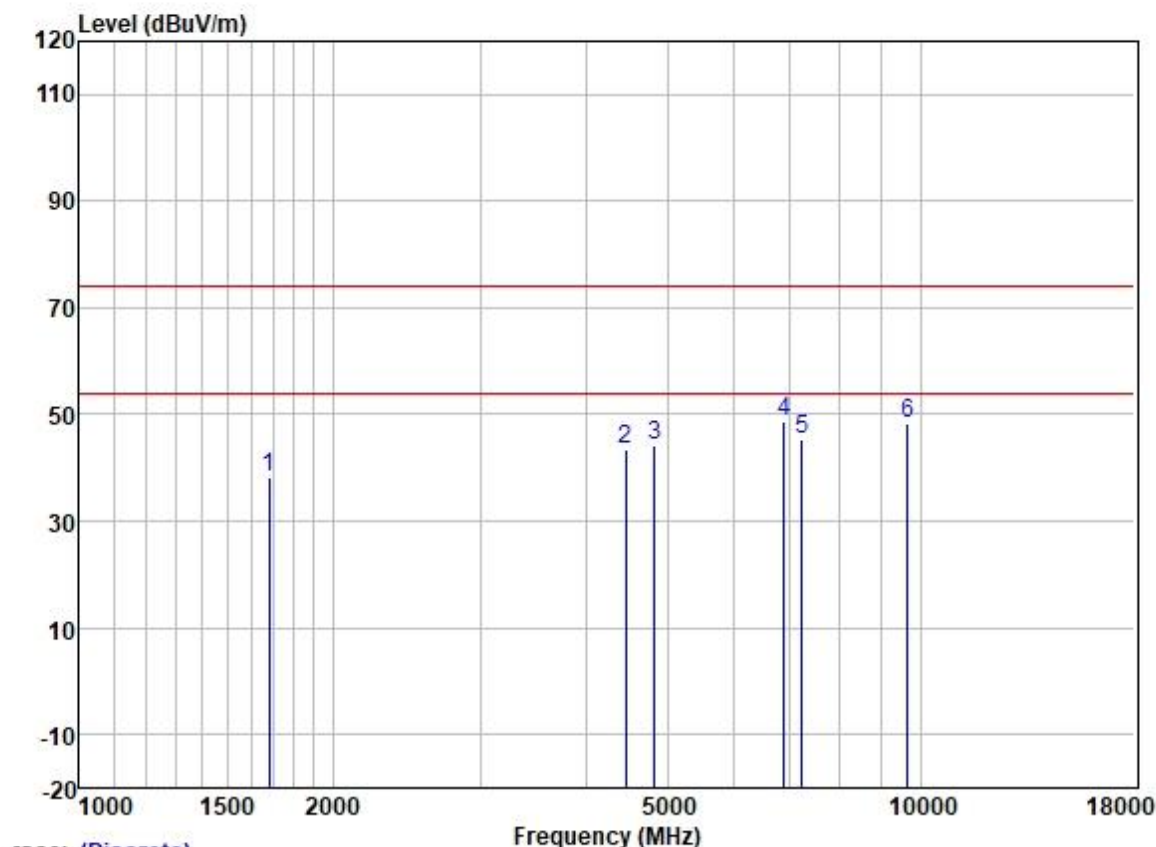
Test Mode: 03; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:Low



Trace: (Discrete)

	Freq	ReadAntenna	Cable	Preamp		Limit	Over		
	MHz	Level	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1390.276	48.30	25.38	2.60	37.92	38.36	74.00	-35.64	VERTICAL peak
2	4482.150	44.10	30.78	4.99	36.61	43.26	74.00	-30.74	VERTICAL peak
3	4824.000	43.95	31.45	5.42	36.50	44.32	74.00	-29.68	VERTICAL peak
4	5746.982	48.35	32.10	6.20	36.14	50.51	74.00	-23.49	VERTICAL peak
5	7236.000	39.68	35.70	6.03	36.94	44.47	74.00	-29.53	VERTICAL peak
6	9648.000	40.02	38.40	7.06	36.85	48.63	74.00	-25.37	VERTICAL peak

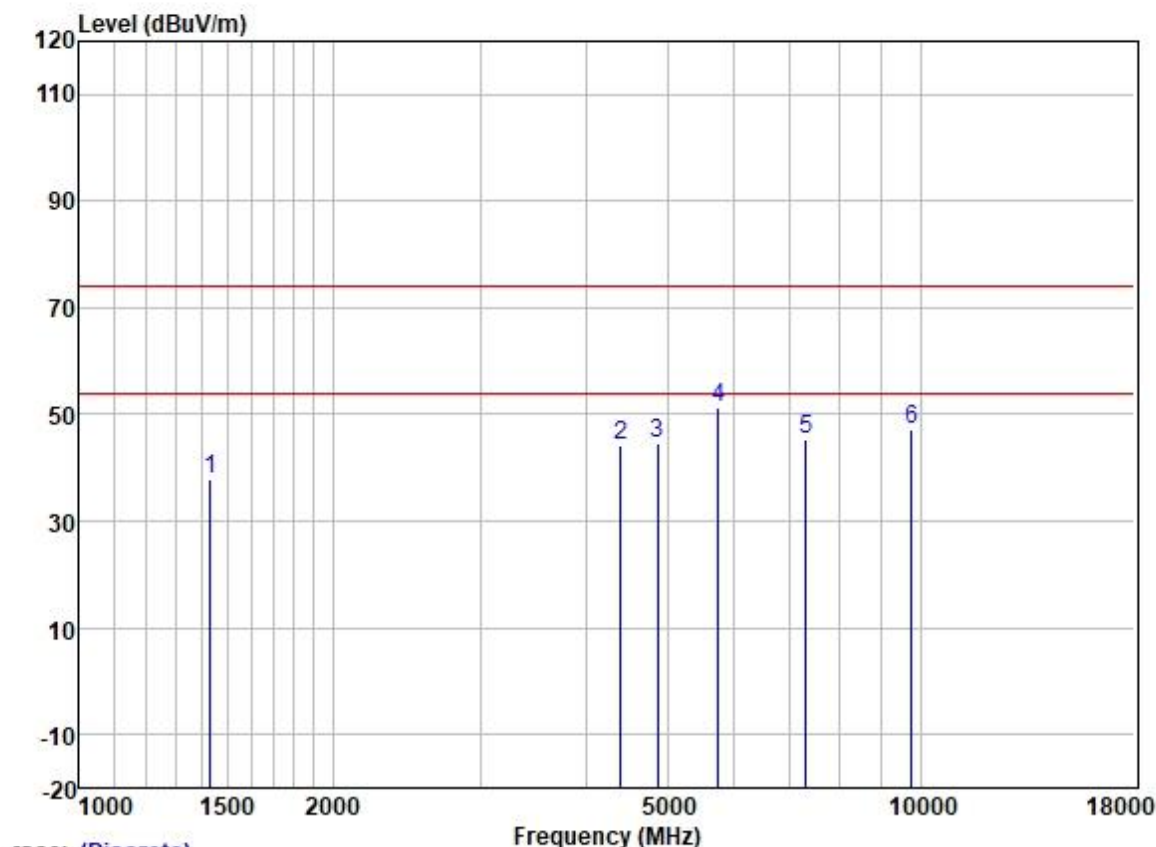
Test Mode: 03; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:Low



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	1682.477	47.33	25.68	2.80	37.48	38.33	74.00	-35.67	HORIZONTAL peak
2	4456.315	44.30	30.75	4.88	36.62	43.31	74.00	-30.69	HORIZONTAL peak
3	4824.000	43.95	31.45	5.42	36.50	44.32	74.00	-29.68	HORIZONTAL peak
4	6874.906	44.74	34.82	5.82	36.55	48.83	74.00	-25.17	HORIZONTAL peak
5	7236.000	40.42	35.70	6.03	36.94	45.21	74.00	-28.79	HORIZONTAL peak
6	9648.000	39.67	38.40	7.06	36.85	48.28	74.00	-25.72	HORIZONTAL peak

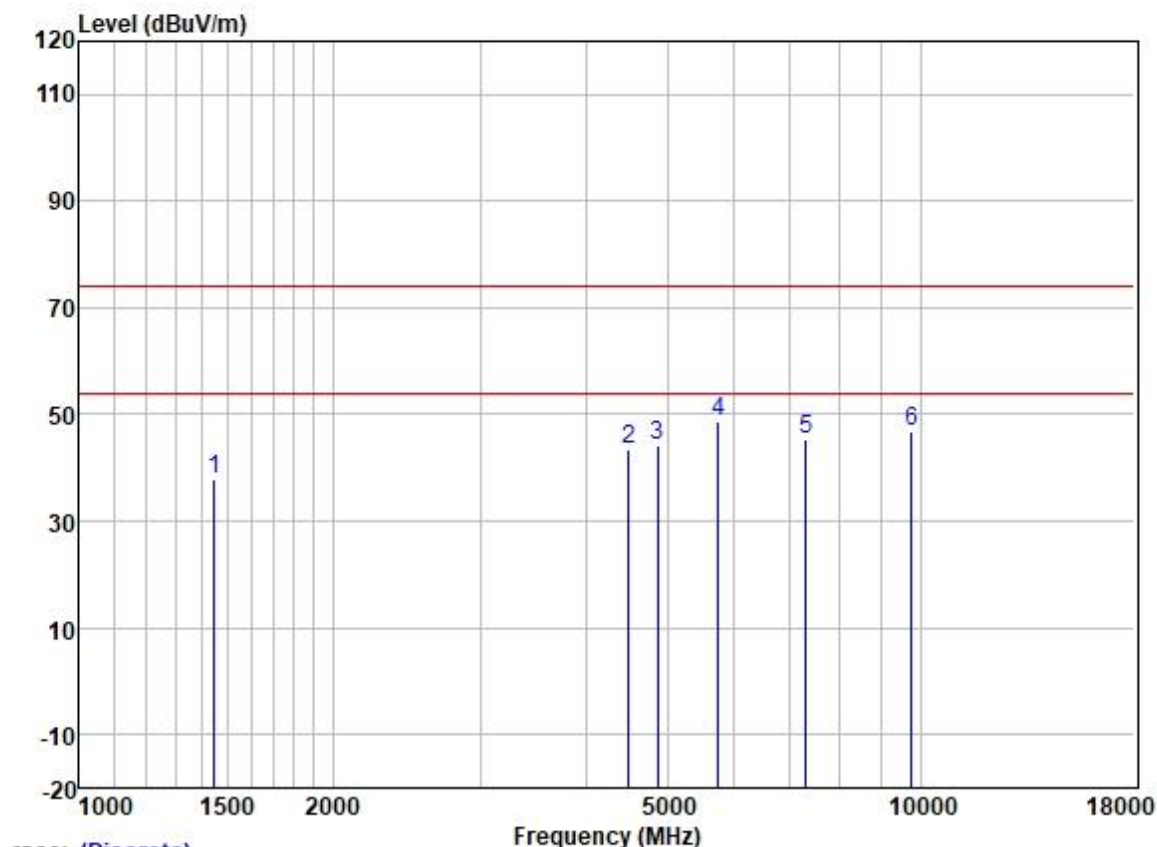
Test Mode: 03; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:middle



Trace: (Discrete)

	Freq	ReadAntenna	Cable	Preamp		Limit	Over		
	MHz	Level	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1431.047	47.63	25.43	2.66	37.88	37.84	74.00	-36.16	VERTICAL peak
2	4405.090	45.38	30.68	4.70	36.63	44.13	74.00	-29.87	VERTICAL peak
3	4874.000	44.06	31.54	5.50	36.48	44.62	74.00	-29.38	VERTICAL peak
4	5746.982	48.96	32.10	6.20	36.14	51.12	74.00	-22.88	VERTICAL peak
5	7311.000	40.22	35.93	6.11	36.99	45.27	74.00	-28.73	VERTICAL peak
6	9748.000	38.50	38.50	7.02	36.83	47.19	74.00	-26.81	VERTICAL peak

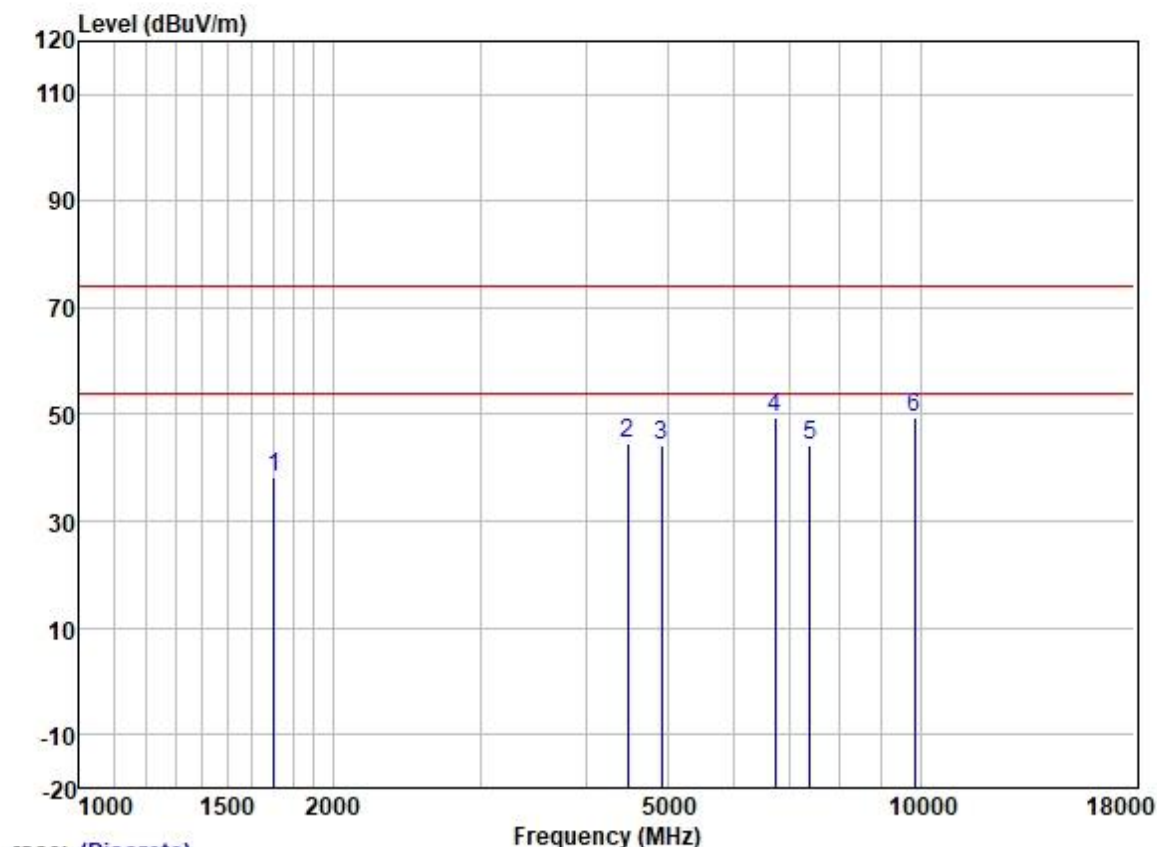
Test Mode: 03; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:middle



Trace: (Discrete)

	Freq	ReadAntenna	Cable	Preamp		Limit	Over		
	MHz	Level	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1447.688	47.70	25.45	2.70	37.84	38.01	74.00	-35.99	HORIZONTAL peak
2	4495.125	44.39	30.80	5.05	36.60	43.64	74.00	-30.36	HORIZONTAL peak
3	4874.000	43.51	31.54	5.50	36.48	44.07	74.00	-29.93	HORIZONTAL peak
4	5746.982	46.48	32.10	6.20	36.14	48.64	74.00	-25.36	HORIZONTAL peak
5	7311.000	40.29	35.93	6.11	36.99	45.34	74.00	-28.66	HORIZONTAL peak
6	9748.000	38.20	38.50	7.02	36.83	46.89	74.00	-27.11	HORIZONTAL peak

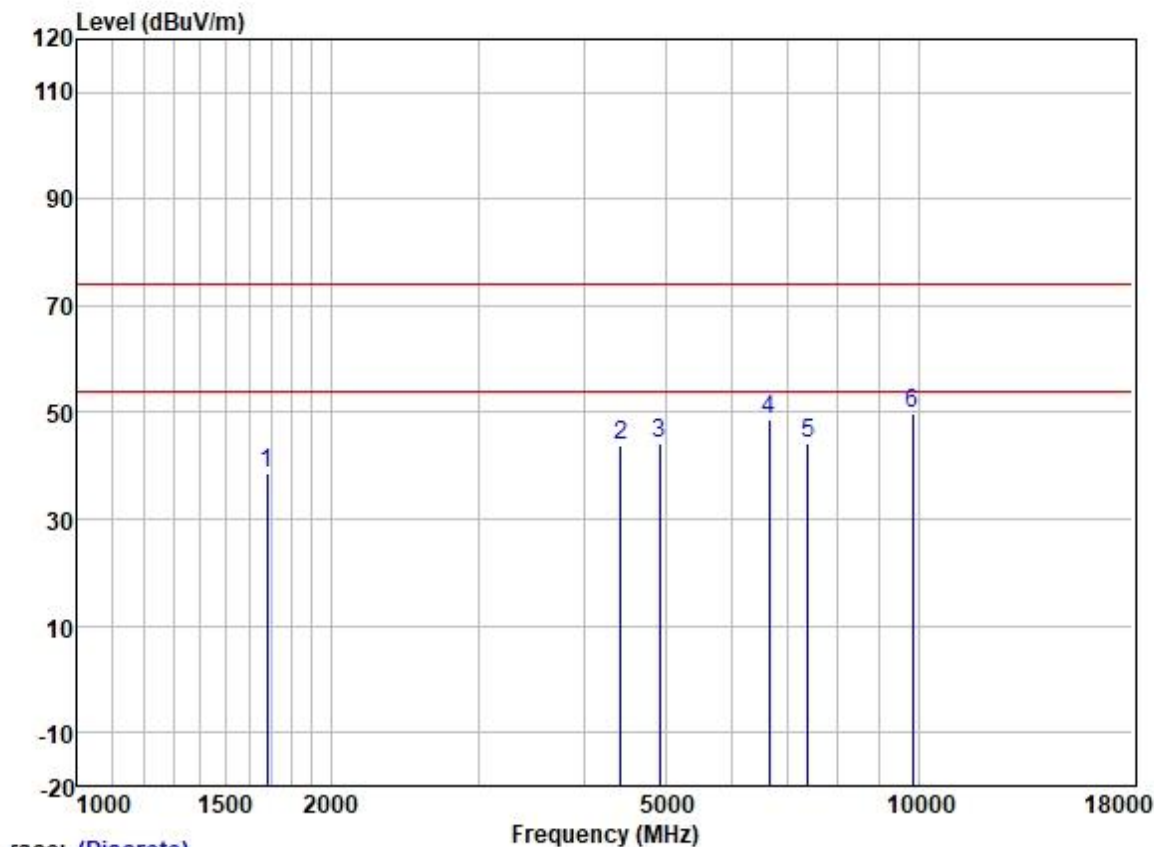
Test Mode: 03; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:High



Trace: (Discrete)

	Freq	ReadAntenna	Cable	Preamp		Limit	Over		
	MHz	Level	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1702.042	47.33	25.72	2.80	37.46	38.39	74.00	-35.61	VERTICAL peak
2	4482.150	45.24	30.78	4.99	36.61	44.40	74.00	-29.60	VERTICAL peak
3	4924.000	43.59	31.62	5.60	36.45	44.36	74.00	-29.64	VERTICAL peak
4	6717.762	45.68	34.44	5.83	36.42	49.53	74.00	-24.47	VERTICAL peak
5	7386.000	39.05	36.17	6.19	37.04	44.37	74.00	-29.63	VERTICAL peak
6	9848.000	40.68	38.58	6.99	36.82	49.43	74.00	-24.57	VERTICAL peak

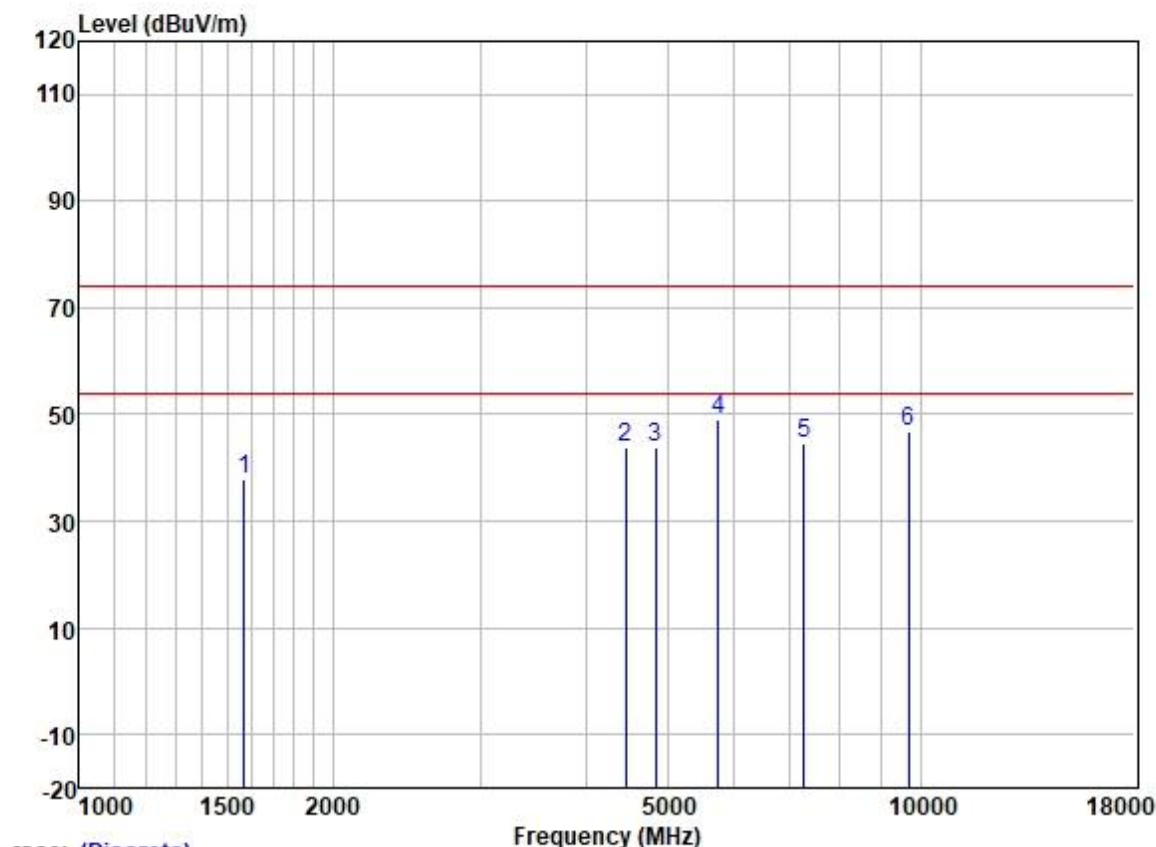
Test Mode: 03; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:High



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	1682.477	47.63	25.68	2.80	37.48	38.63	74.00	-35.37	HORIZONTAL peak
2	4430.628	44.83	30.72	4.78	36.62	43.71	74.00	-30.29	HORIZONTAL peak
3	4924.000	43.45	31.62	5.60	36.45	44.22	74.00	-29.78	HORIZONTAL peak
4	6640.542	44.89	34.24	5.83	36.37	48.59	74.00	-25.41	HORIZONTAL peak
5	7386.000	38.99	36.17	6.19	37.04	44.31	74.00	-29.69	HORIZONTAL peak
6	9848.000	41.23	38.58	6.99	36.82	49.98	74.00	-24.02	HORIZONTAL peak

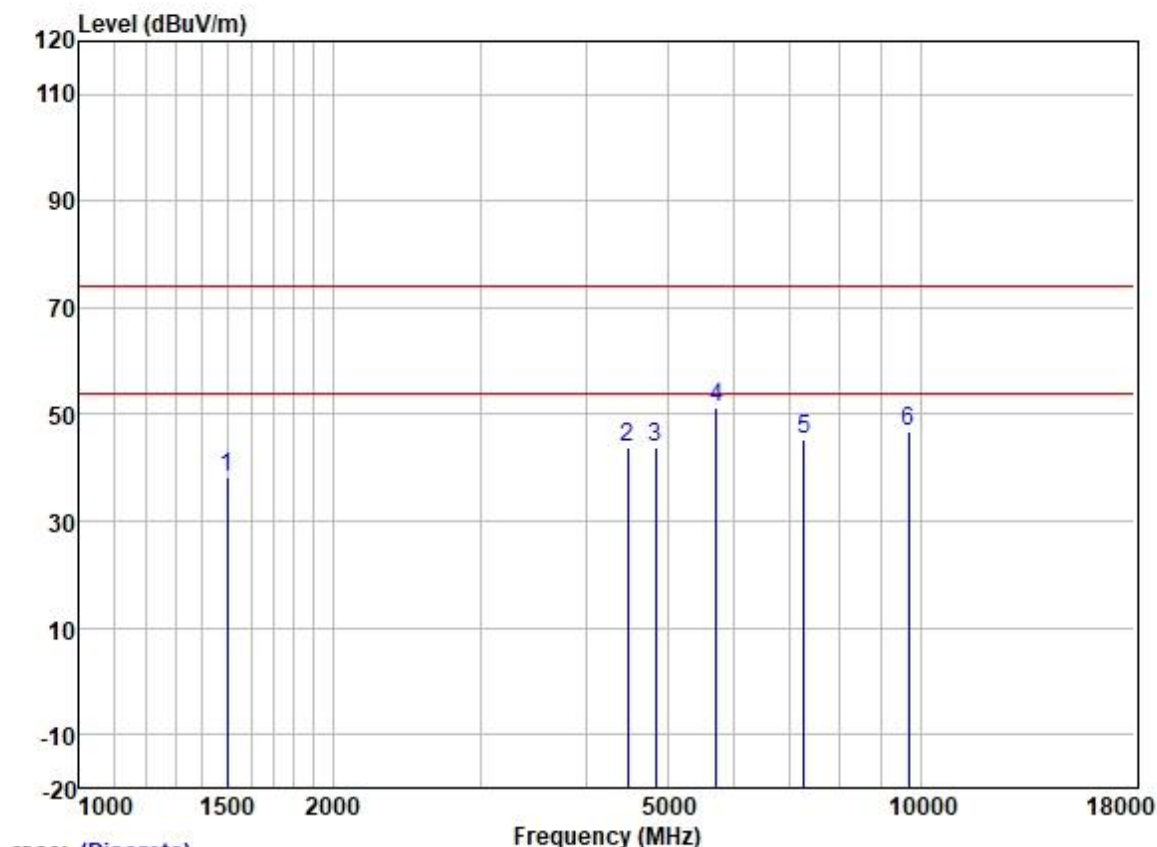
Test Mode: 03; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:Low



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	1569.721	47.04	25.55	2.80	37.62	37.77	74.00	-36.23	VERTICAL peak
2	4456.315	44.67	30.75	4.88	36.62	43.68	74.00	-30.32	VERTICAL peak
3	4844.000	43.41	31.50	5.45	36.49	43.87	74.00	-30.13	VERTICAL peak
4	5746.982	46.80	32.10	6.20	36.14	48.96	74.00	-25.04	VERTICAL peak
5	7266.000	39.79	35.78	6.06	36.98	44.65	74.00	-29.35	VERTICAL peak
6	9688.000	38.30	38.44	7.04	36.84	46.94	74.00	-27.06	VERTICAL peak

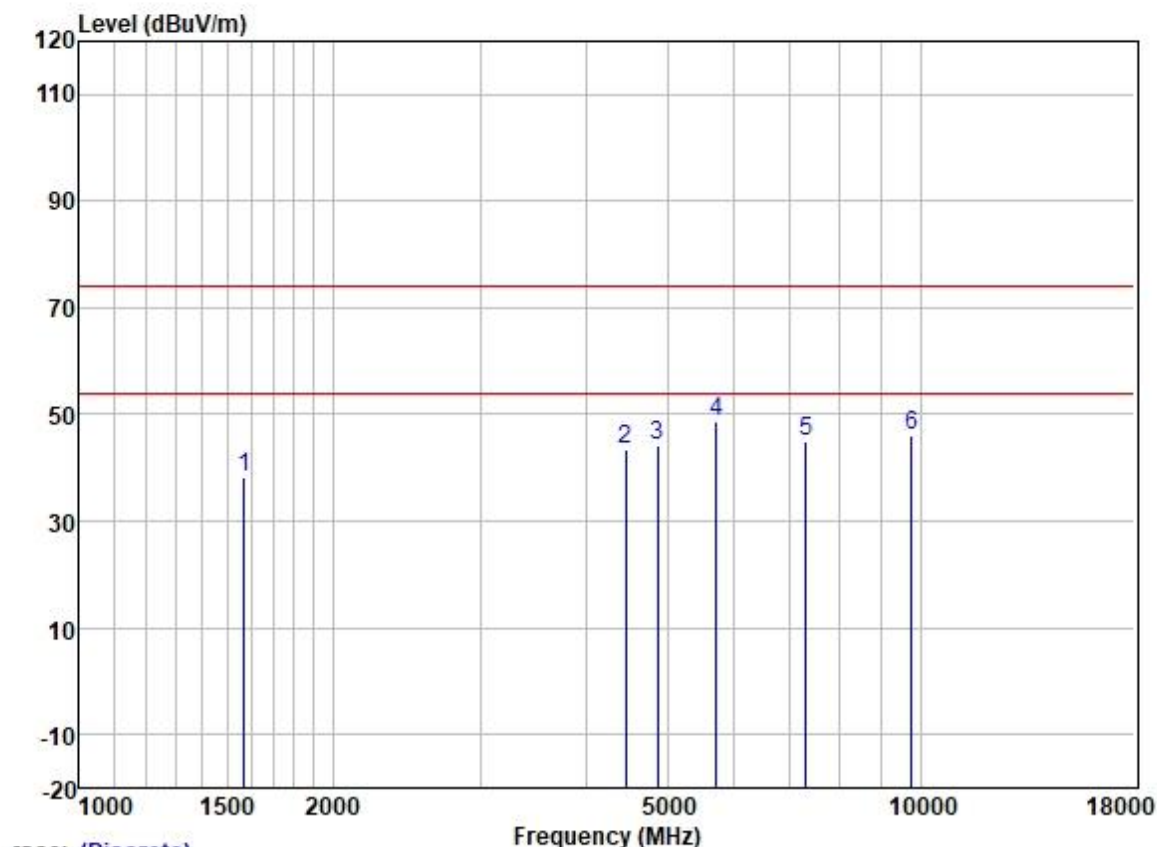
Test Mode: 03; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:Low



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	1498.781	47.59	25.50	2.80	37.75	38.14	74.00	-35.86	HORIZONTAL peak
2	4482.150	44.69	30.78	4.99	36.61	43.85	74.00	-30.15	HORIZONTAL peak
3	4844.000	43.46	31.50	5.45	36.49	43.92	74.00	-30.08	HORIZONTAL peak
4	5713.856	49.23	32.04	6.33	36.15	51.45	74.00	-22.55	HORIZONTAL peak
5	7266.000	40.32	35.78	6.06	36.98	45.18	74.00	-28.82	HORIZONTAL peak
6	9688.000	38.16	38.44	7.04	36.84	46.80	74.00	-27.20	HORIZONTAL peak

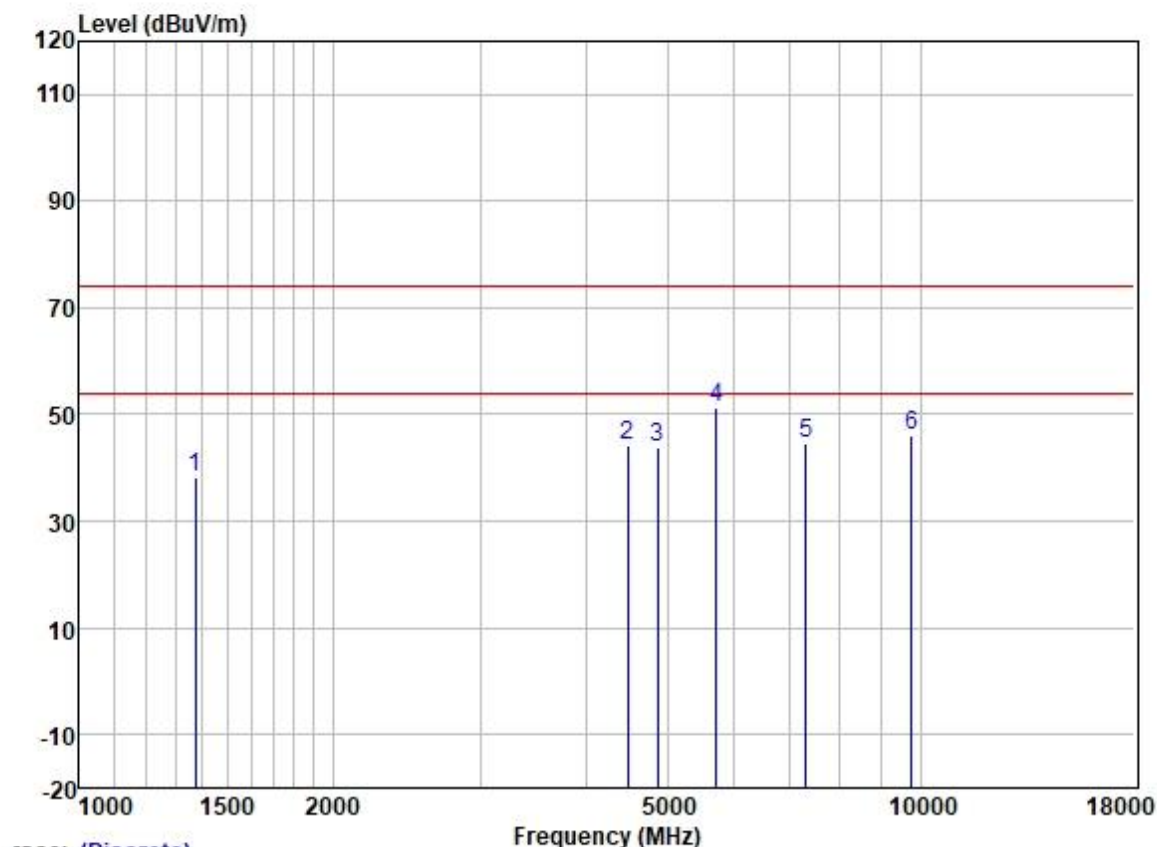
Test Mode: 03; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:middle



Trace: (Discrete)

	Freq	ReadAntenna	Cable	Preamp		Limit	Over		
	MHz	Level	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1569.721	47.54	25.55	2.80	37.62	38.27	74.00	-35.73	VERTICAL peak
2	4456.315	44.53	30.75	4.88	36.62	43.54	74.00	-30.46	VERTICAL peak
3	4874.000	43.76	31.54	5.50	36.48	44.32	74.00	-29.68	VERTICAL peak
4	5713.856	46.63	32.04	6.33	36.15	48.85	74.00	-25.15	VERTICAL peak
5	7311.000	39.85	35.93	6.11	36.99	44.90	74.00	-29.10	VERTICAL peak
6	9748.000	37.31	38.50	7.02	36.83	46.00	74.00	-28.00	VERTICAL peak

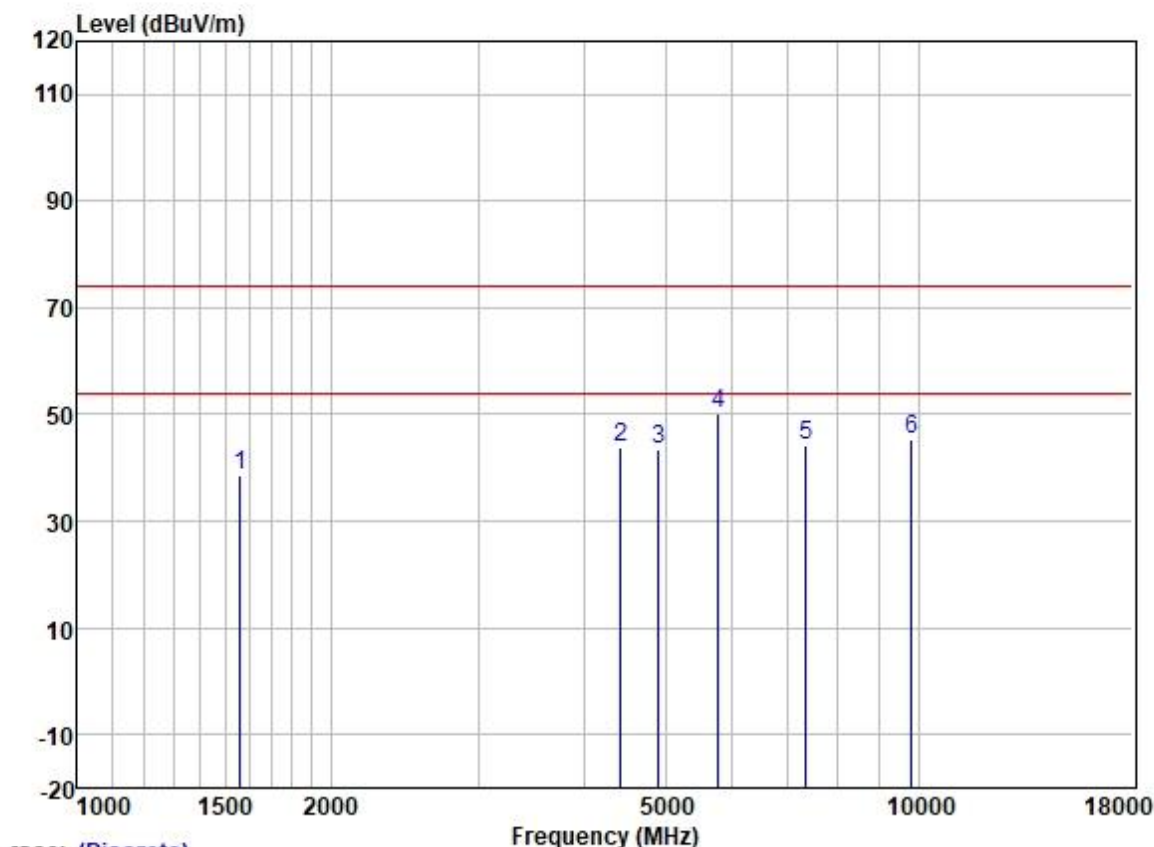
Test Mode: 03; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:middle



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	1374.295	48.39	25.35	2.60	37.95	38.39	74.00	-35.61	HORIZONTAL	peak
2	4482.150	44.89	30.78	4.99	36.61	44.05	74.00	-29.95	HORIZONTAL	peak
3	4874.000	43.37	31.54	5.50	36.48	43.93	74.00	-30.07	HORIZONTAL	peak
4	5713.856	49.05	32.04	6.33	36.15	51.27	74.00	-22.73	HORIZONTAL	peak
5	7311.000	39.66	35.93	6.11	36.99	44.71	74.00	-29.29	HORIZONTAL	peak
6	9748.000	37.32	38.50	7.02	36.83	46.01	74.00	-27.99	HORIZONTAL	peak

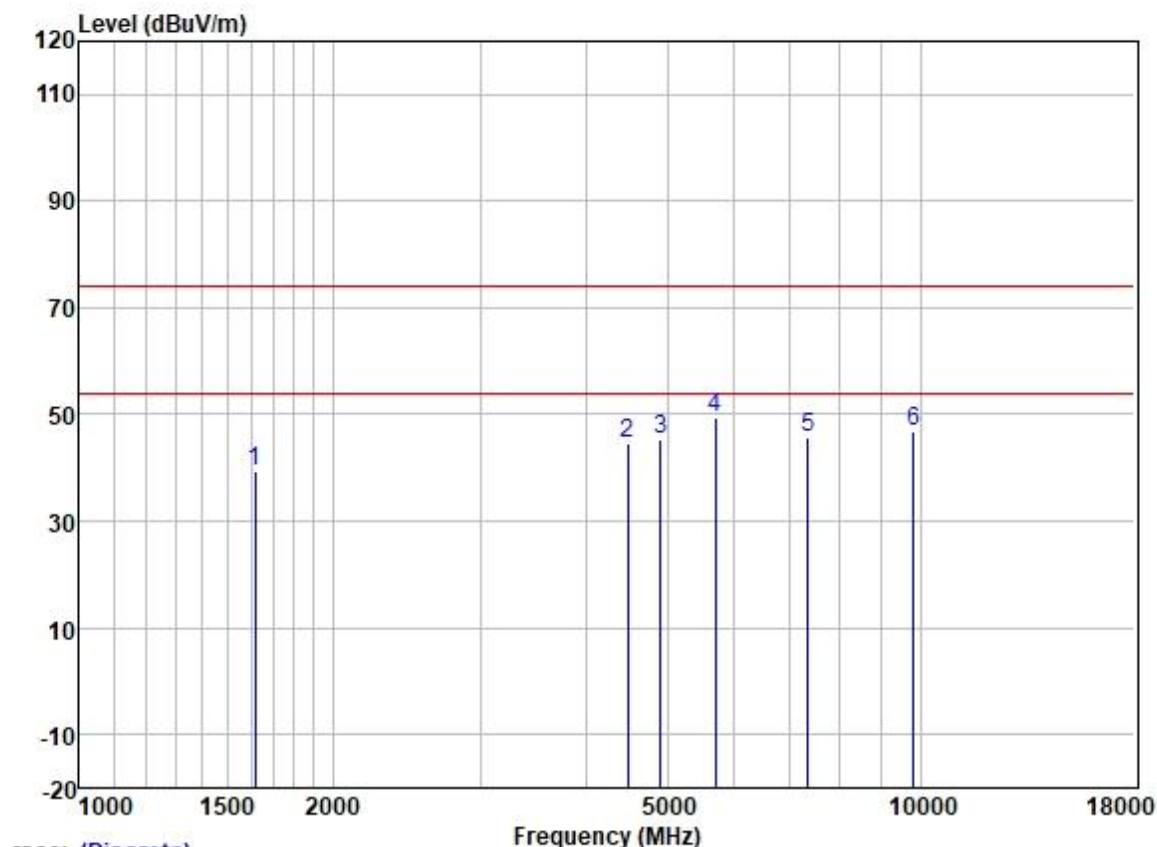
Test Mode: 03; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:High



Trace: (Discrete)

	Freq	ReadAntenna	Cable	Preamp	Limit	Over			
	MHz	Level	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1560.673	48.07	25.54	2.80	37.66	38.75	74.00	-35.25	VERTICAL peak
2	4430.628	44.96	30.72	4.78	36.62	43.84	74.00	-30.16	VERTICAL peak
3	4904.000	42.93	31.58	5.55	36.46	43.60	74.00	-30.40	VERTICAL peak
4	5780.300	48.21	32.16	6.10	36.14	50.33	74.00	-23.67	VERTICAL peak
5	7356.000	39.13	36.06	6.15	37.03	44.31	74.00	-29.69	VERTICAL peak
6	9808.000	36.52	38.56	7.00	36.83	45.25	74.00	-28.75	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	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1615.754	48.38	25.60	2.80	37.55	39.23	74.00	-34.77	HORIZONTAL peak
2	4482.150	45.43	30.78	4.99	36.61	44.59	74.00	-29.41	HORIZONTAL peak
3	4904.000	44.70	31.58	5.55	36.46	45.37	74.00	-28.63	HORIZONTAL peak
4	5697.365	47.16	32.01	6.40	36.15	49.42	74.00	-24.58	HORIZONTAL peak
5	7356.000	40.64	36.06	6.15	37.03	45.82	74.00	-28.18	HORIZONTAL peak
6	9808.000	37.93	38.56	7.00	36.83	46.66	74.00	-27.34	HORIZONTAL peak

8 Test Setup Photo

Refer to Setup Photo for GZCR220800106104

9 EUT Constructional Details (EUT Photos)

Refer to External and Internal Photos for GZCR2208001061AT

10 Appendix

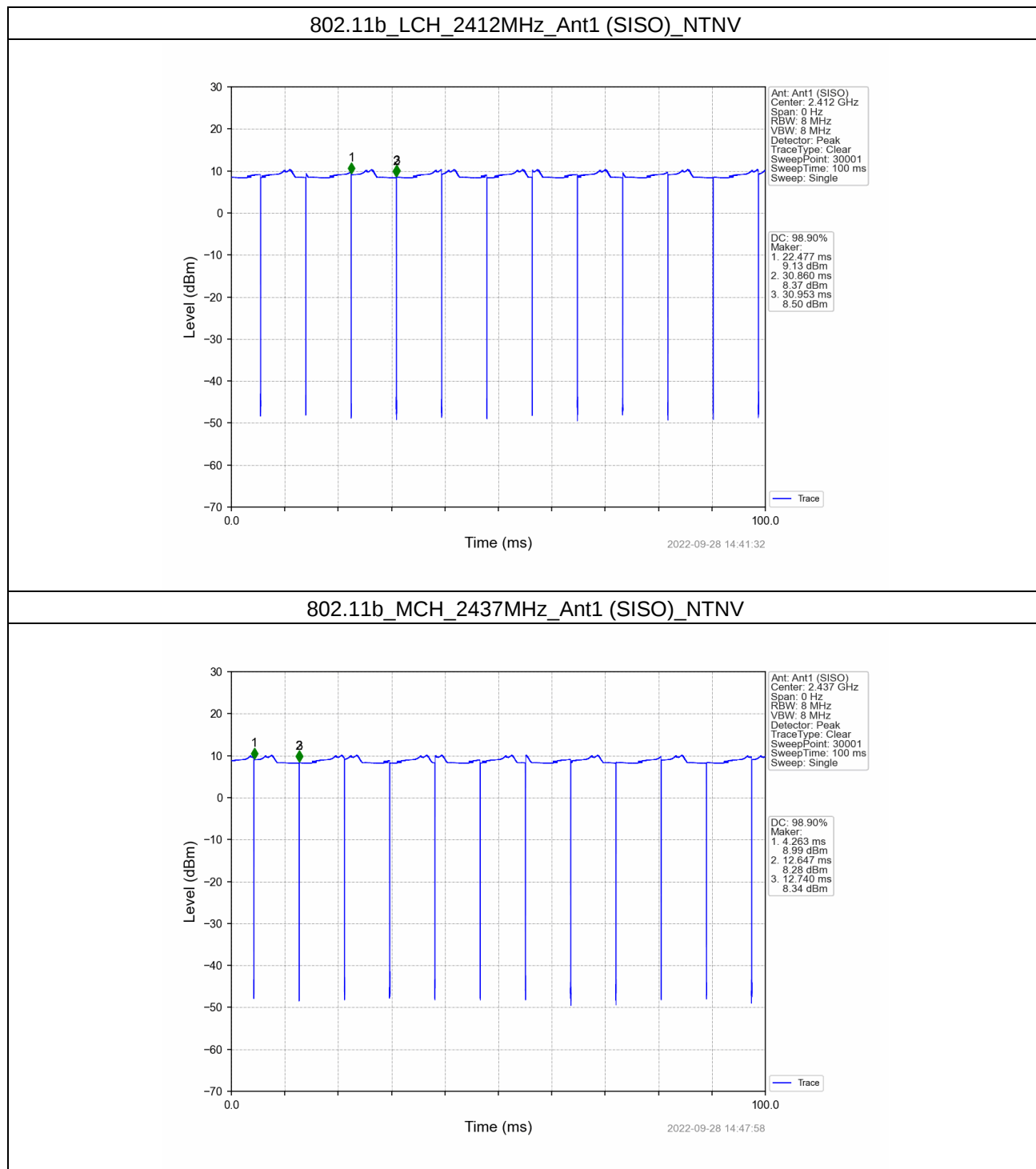
1. Duty Cycle

1.1 Ant1

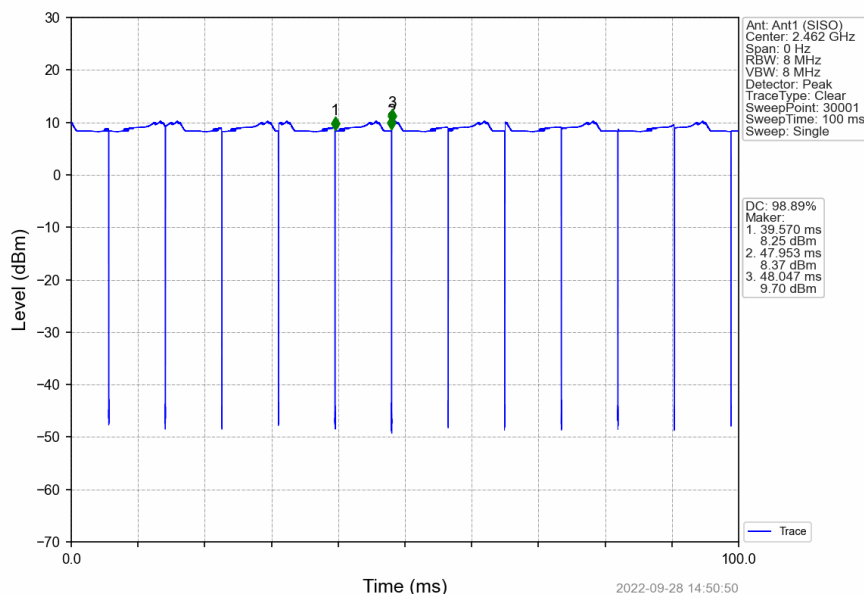
1.1.1 Test Result

Ant1							
Mode	TX Type	Frequency (MHz)	T_on (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	Max. DC Variation (%)
802.11b	SISO	2412	8.383	8.476	98.90	0.05	0.04
		2437	8.384	8.477	98.90	0.05	0.04
		2462	8.383	8.477	98.89	0.05	0.04
802.11g	SISO	2412	1.393	1.491	93.43	0.30	0.03
		2437	1.393	1.491	93.43	0.30	0.03
		2462	1.392	1.490	93.42	0.30	0.06
802.11n (HT20)	MIMO	2412	1.301	1.399	92.99	0.32	0.03
		2437	1.300	1.398	92.99	0.32	0.03
		2462	1.300	1.398	92.99	0.32	0.03
802.11n (HT40)	MIMO	2422	0.649	0.746	87.00	0.60	0.04
		2437	0.648	0.746	86.86	0.61	0.07
		2452	0.648	0.746	86.86	0.61	0.06

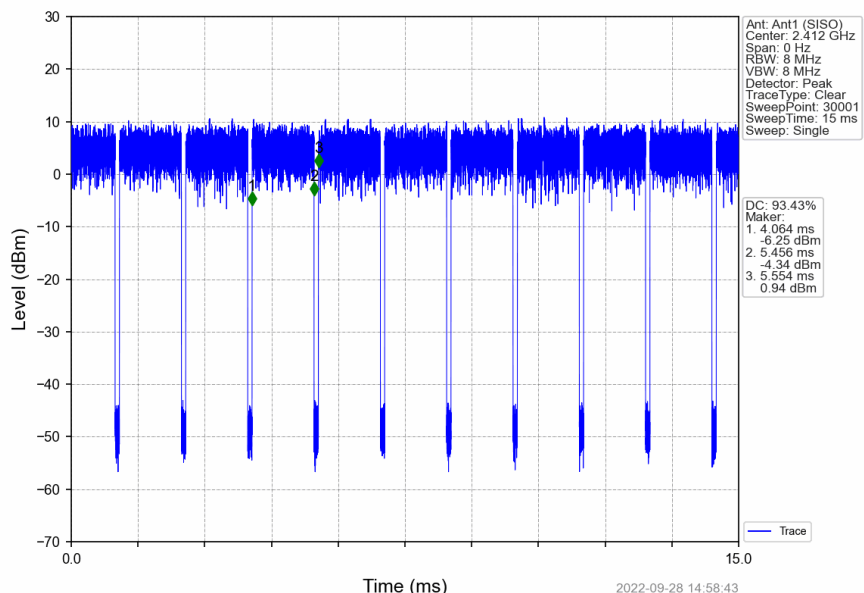
1.1.2 Test Graph



802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV

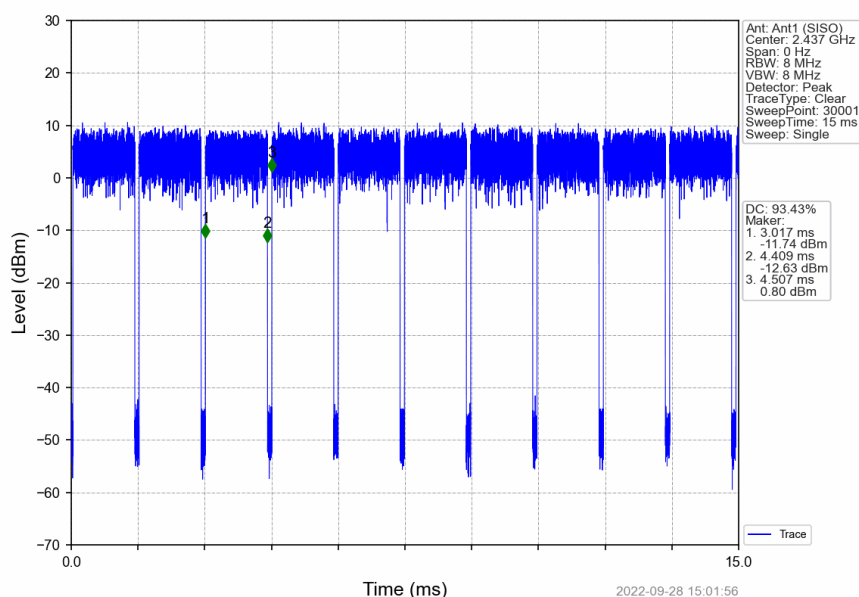


Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Document.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

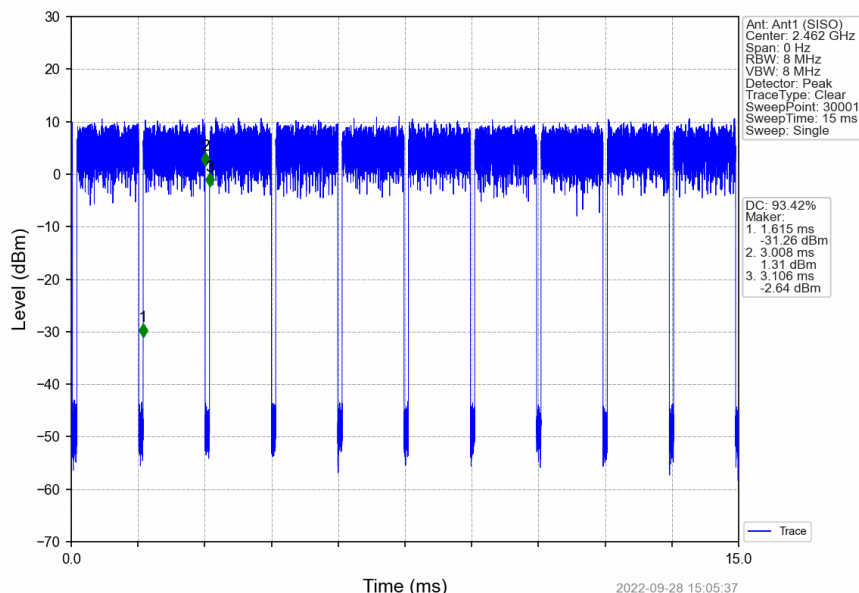
Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

No.198 Kezhu Road, Sciotech Park, Guangzhou Economic & Technology Development District, Guangzhou, China 510663 t (86-20) 82155555 f (86-20) 82075058 www.sgsgroup.com.cn
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

802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



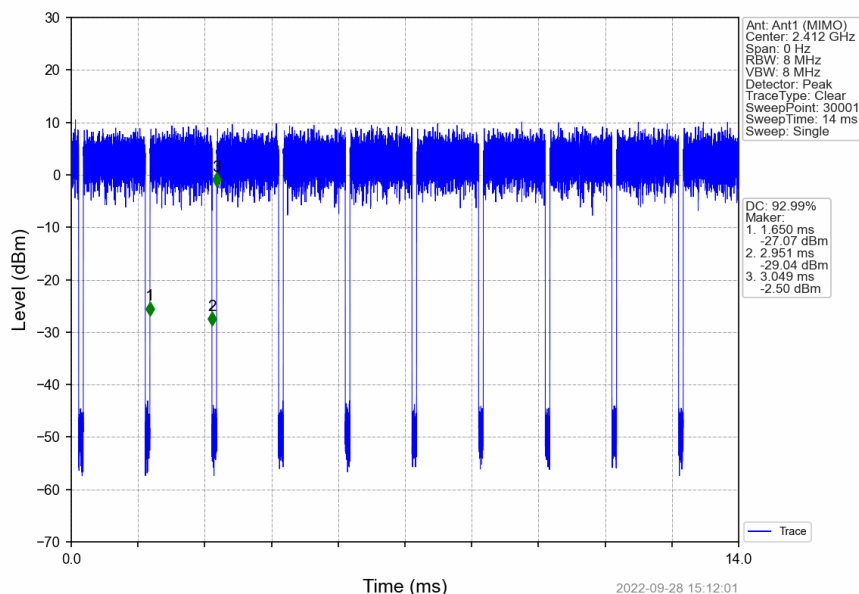
802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



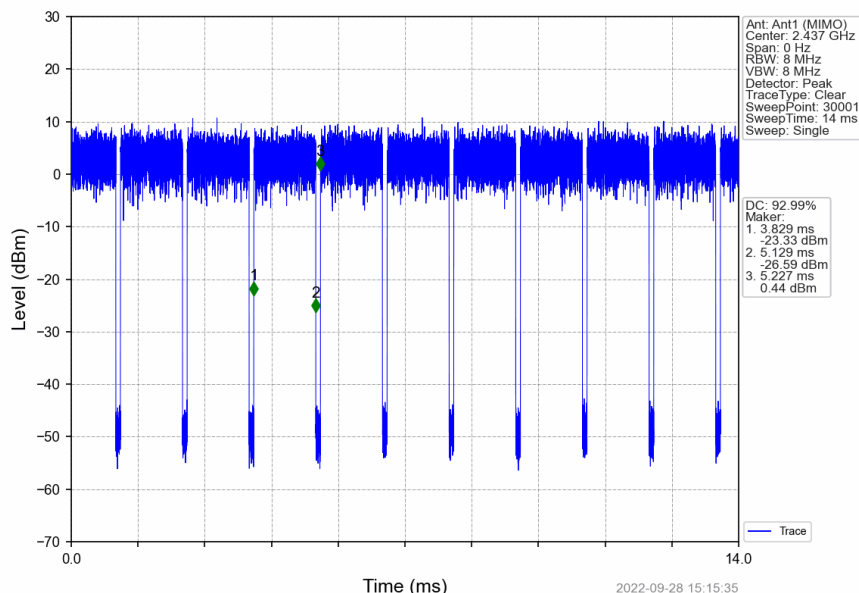
Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

802.11n(HT20)_LCH_2412MHz_Ant1 (MIMO)_NTNV



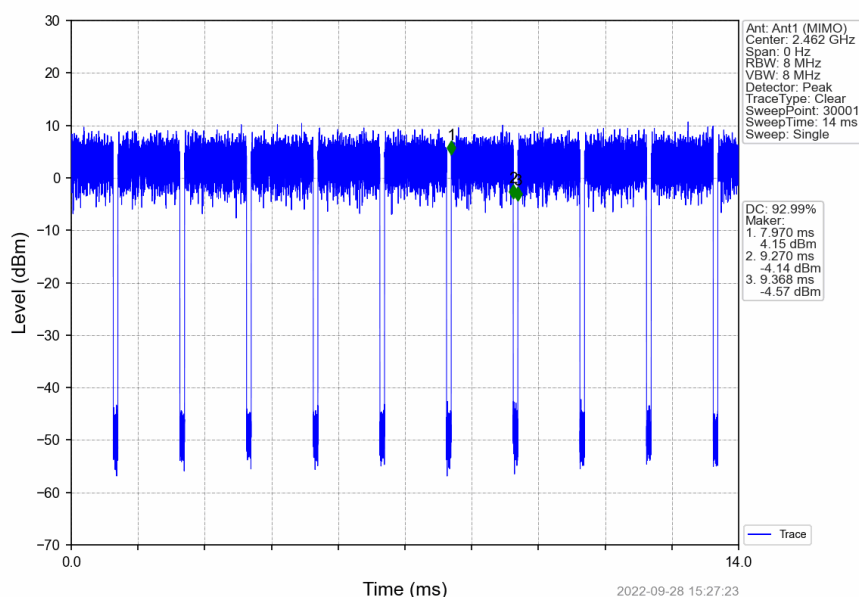
802.11n(HT20)_MCH_2437MHz_Ant1 (MIMO)_NTNV



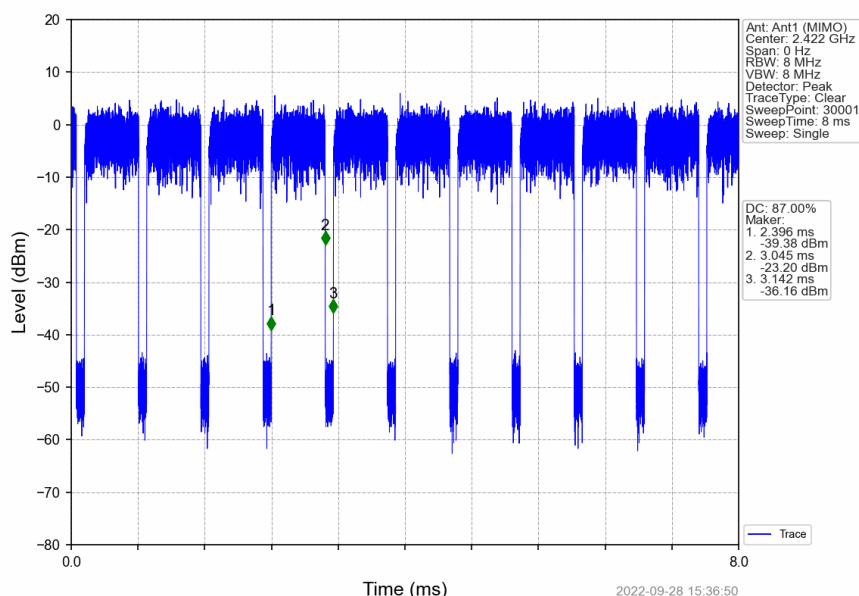
Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

802.11n(HT20)_HCH_2462MHz_Ant1 (MIMO)_NTNV



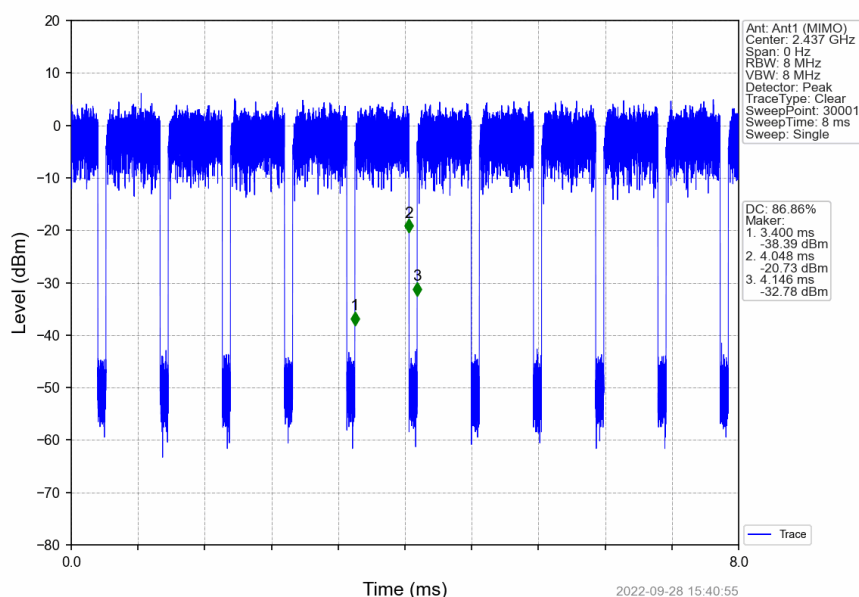
802.11n(HT40)_LCH_2422MHz_Ant1 (MIMO)_NTNV



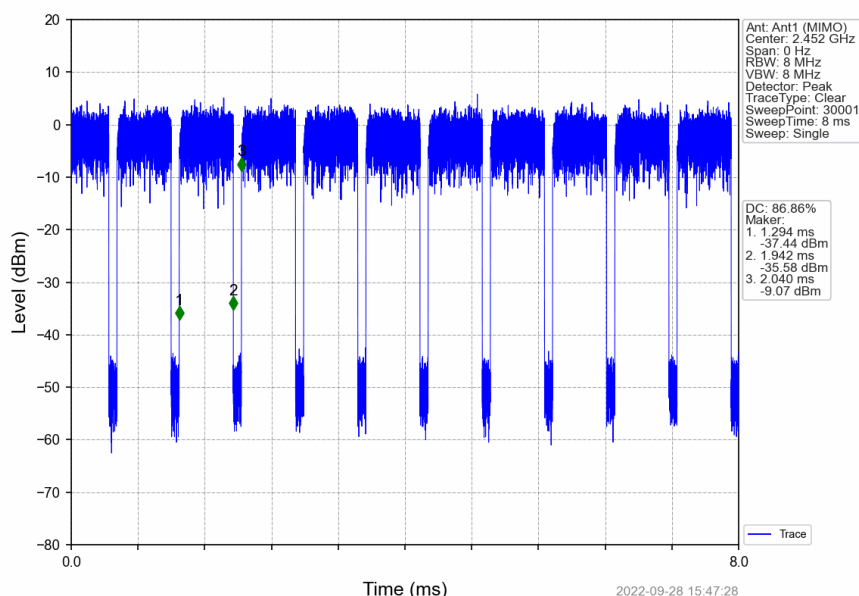
Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

802.11n(HT40)_MCH_2437MHz_Ant1 (MIMO)_NTNV



802.11n(HT40)_HCH_2452MHz_Ant1 (MIMO)_NTNV



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

2. Bandwidth

2.1 6dB BW

2.1.1 Test Result

Mode	TX Type	Frequency (MHz)	ANT	6dB Bandwidth (MHz)		Verdict
				Result	Limit	
802.11b	SISO	2412	1	9.105	>=0.5	Pass
			2	9.100	>=0.5	Pass
		2437	1	9.092	>=0.5	Pass
			2	9.101	>=0.5	Pass
		2462	1	9.095	>=0.5	Pass
			2	9.084	>=0.5	Pass
802.11g	SISO	2412	1	15.158	>=0.5	Pass
			2	15.146	>=0.5	Pass
		2437	1	15.139	>=0.5	Pass
			2	15.160	>=0.5	Pass
		2462	1	15.153	>=0.5	Pass
			2	15.176	>=0.5	Pass
802.11n (HT20)	MIMO	2412	1	16.322	>=0.5	Pass
			2	15.149	>=0.5	Pass
		2437	1	16.327	>=0.5	Pass
			2	15.159	>=0.5	Pass
		2462	1	16.340	>=0.5	Pass
			2	15.170	>=0.5	Pass
802.11n (HT40)	MIMO	2422	1	35.165	>=0.5	Pass
			2	35.171	>=0.5	Pass
		2437	1	35.165	>=0.5	Pass
			2	35.174	>=0.5	Pass
		2452	1	35.168	>=0.5	Pass
			2	35.164	>=0.5	Pass