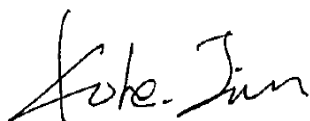


TEST REPORT

Application No.: GZCR2104020062AT
Applicant: Terrailon SAS
Address of Applicant: 1 rue Ernest Gouin CS50001 Croissy Sur Seine, 78290, France
Manufacturer: Zhongshan Transtek Electronics Co., Ltd
Address of Manufacturer: No. 23, Jin'an Road, Minzhong, Zhongshan, Guangdong, China
Factory: Zhongshan Transtek Electronics Co., Ltd
Address of Factory: No. 23, Jin'an Road, Minzhong, Zhongshan, Guangdong, China
Equipment Under Test (EUT):
EUT Name: Wifi Body Fat Analyzer
Model No.: MASTER COACH, GBF-1267-F, Master Fit, GBF-1267-F1 ♣
 ♣ Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.
Standard(s) : 47 CFR Part 15, Subpart C 15.247
Date of Receipt: 2021-04-02
Date of Test: 2021-04-13 to 2021-04-21
Date of Issue: 2021-06-01

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

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



Kobe Jian
EMC Laboratory 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

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2021-06-01		Original

Authorized for issue by			
Tested By			
		Lily Kuang/Project Engineer	
Reviewed By			
		Ricky Liu/Reviewer	



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed in full and available on request 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.

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

中国·广州·经济技术开发区科学城科珠路98号 邮编: 510663 t (86-20) 82155555 f (86-20) 82075058 sgs.china@sgs.com

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
Minimum 6dB Bandwidth	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 11.8.1	47 CFR Part 15, Subpart C 15.247a(2)	Pass
Power Spectrum Density	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 11.10.2	47 CFR Part 15, Subpart C 15.247(e)	Pass
Conducted Band Edges Measurement	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 11.13.3.2	47 CFR Part 15, Subpart C 15.247(d)	Pass
Conducted Spurious Emissions	47 CFR Part 15, Subpart C 15.247	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	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.10.5	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass
Radiated Spurious Emissions	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.4,6.5,6.6	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass

Note:

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

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

✦ Declaration of EUT Family Grouping:

Model No.: MASTER COACH, GBF-1267-F, Master Fit, GBF-1267-F1

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

Therefore only one model **GBF-1267-F** was tested in this report.



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	6
4.4 Test Location.....	7
4.5 Test Facility	7
4.6 Deviation from Standards.....	8
4.7 Abnormalities from Standard Conditions	8
4.8 Duty cycle of the EUT	8
5 Equipment List	10
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 Peak Output Power.....	13
7.1.1 E.U.T. Operation	13
7.1.2 Test Mode Description	13
7.1.3 Test Setup Diagram	13
7.1.4 Measurement Procedure and Data.....	13
7.2 Minimum 6dB Bandwidth	14
7.2.1 E.U.T. Operation	14
7.2.2 Test Mode Description	14
7.2.3 Test Setup Diagram	14
7.2.4 Measurement Procedure and Data.....	14
7.3 Power Spectrum Density.....	15
7.3.1 E.U.T. Operation	15
7.3.2 Test Mode Description	15
7.3.3 Test Setup Diagram	15
7.3.4 Measurement Procedure and Data.....	15
7.4 Conducted Band Edges Measurement	16
7.4.1 E.U.T. Operation	16
7.4.2 Test Mode Description	16
7.4.3 Test Setup Diagram	16
7.4.4 Measurement Procedure and Data.....	16
7.5 Conducted Spurious Emissions	17
7.5.1 E.U.T. Operation	17
7.5.2 Test Mode Description	17



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

7.5.3	Test Setup Diagram.....	17
7.5.4	Measurement Procedure and Data.....	17
7.6	Radiated Emissions which fall in the restricted bands.....	18
7.6.1	E.U.T. Operation.....	18
7.6.2	Test Mode Description.....	18
7.6.3	Test Setup Diagram.....	19
7.6.4	Measurement Procedure and Data.....	19
7.7	Radiated Spurious Emissions.....	32
7.7.1	E.U.T. Operation.....	32
7.7.2	Test Mode Description.....	32
7.7.3	Test Setup Diagram.....	33
7.7.4	Measurement Procedure and Data.....	34
8	Appendix.....	55
8.1	Appendix A: DTS Bandwidth.....	55
8.1.1	Test Result.....	55
8.1.2	Test Graphs.....	56
8.2	Appendix C: Maximum conducted output power.....	61
8.2.1	Test Result.....	61
8.2.2	Test Graphs.....	62
8.3	Appendix D: Maximum power spectral density.....	67
8.3.1	Test Result.....	67
8.3.2	Test Graphs.....	68
8.4	Appendix E: Band edge measurements.....	73
8.4.1	Test Result.....	73
8.4.2	Test Graphs.....	74
8.5	Appendix F: Conducted Spurious Emission.....	77
8.5.1	Test Result.....	77
8.5.2	Test Graphs.....	78
8.6	Appendix G: Duty Cycle.....	92
8.6.1	Test Result.....	92
8.6.2	Test Graphs.....	92



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

4 General Information

4.1 Details of E.U.T.

Power Supply:	DC 6V =4 x DC 1.5V size of "AAA" batteries
Test Voltage:	DC 6V
Function:	Wifi Body Fat Analyzer with Wi-Fi function
Antenna Gain	0 dBi declared by applicant
Antenna Type	PCB Antenna
Channel Spacing	5MHz
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
Operation Frequency	802.11b/g/n(HT20): 2412MHz to 2462MHz
Sample No.:	SP-2021060501
Hardware Version:	TSF1267-3
Firmware Version:	V1.00
Test Software:	SCRT ComTool
Power Setting:	13.37dBm can not be changed by user

4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Notebook	IBM	T30	S/N78-3VMLX 06/01
BT test board	SGS EMC	RF 07	RF 07

4.3 Measurement Uncertainty

Test Item	Measurement Uncertainty
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	± 4.5dB (Below 1GHz); ± 4.8dB (Above 1GHz)
Radiated Spurious Emissions	± 4.5dB (Below 1GHz); ± 4.8dB (Above 1GHz)

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.

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.



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

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None

4.8 Duty cycle of the EUT

Pre-analysis Check: While conducting average power measurement, duty cycle of each mode shall be checked to ensure its duty cycle in order to compensate for the loss due to insufficient ratio of duty cycle.

All duty cycle is pre-scanned and result as obtained below shows only the most representative ones where duty cycle is conducted as the given transmission with given virtual operation that expresses the percent.

Formula:

Duty Cycle = Ton/(Ton+Toff)

Measurement Procedure:

1. Set span = Zero
2. RBW=8MHz
3. VBW=8MHz
4. Detector=Peak

Mode	Channel(MHz)	Duty Cycle(%)	Correction Factor(dB)
11B	2412	97.35	0.12
	2442	97.06	0.13
	2462	97.35	0.12
11G	2412	88.89	0.51
	2442	89.54	0.48
	2462	89.54	0.48
11N20SISO	2412	96.39	0.16
	2442	96.17	0.17
	2462	96.4	0.16

*Correction Factor(dB) =10log(1/Duty Cycle)

Please refer to appendix for details.



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

5 Equipment List

Conducted Peak Output Power					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EXA Signal Analyzer (N9010A)	Agilent Technologies	N9010A	EMC2138	2020-09-17	2021-09-16
6dB Attenuator	HP	8491A	EMC2062	2020-04-15	2022-04-14
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A
MI CABLE	SGS-EMC	0.8M	EMC2136	2019-11-02	2021-11-01

Minimum 6dB Bandwidth					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EXA Signal Analyzer (N9010A)	Agilent Technologies	N9010A	EMC2138	2020-09-17	2021-09-16
6dB Attenuator	HP	8491A	EMC2062	2020-04-15	2022-04-14
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A
MI CABLE	SGS-EMC	0.8M	EMC2136	2019-11-02	2021-11-01

Power Spectrum Density					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EXA Signal Analyzer (N9010A)	Agilent Technologies	N9010A	EMC2138	2020-09-17	2021-09-16
6dB Attenuator	HP	8491A	EMC2062	2020-04-15	2022-04-14
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A
MI CABLE	SGS-EMC	0.8M	EMC2136	2019-11-02	2021-11-01

Conducted Band Edges Measurement					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EXA Signal Analyzer (N9010A)	Agilent Technologies	N9010A	EMC2138	2020-09-17	2021-09-16
6dB Attenuator	HP	8491A	EMC2062	2020-04-15	2022-04-14
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A
MI CABLE	SGS-EMC	0.8M	EMC2136	2019-11-02	2021-11-01

Conducted Spurious Emissions					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EXA Signal Analyzer (N9010A)	Agilent Technologies	N9010A	EMC2138	2020-09-17	2021-09-16
6dB Attenuator	HP	8491A	EMC2062	2020-04-15	2022-04-14
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A
MI CABLE	SGS-EMC	0.8M	EMC2136	2019-11-02	2021-11-01



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

Radiated Emissions which fall in the restricted bands					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Chamber cable	HangTianXing	N/A	EMC0542	2019-06-28	2021-06-27
Horn Antenna(BBHA 9120D)	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120D	EMC2026	2019-09-25	2022-09-24
1GHz-26.5 GHz Pre-Amplifier	Agilent	8449B	EMC0521	2021-01-08	2022-01-07
2.4GHz Filter	Micro-Tronics	BRM 50702	EMC2069	2021-01-08	2022-01-07
966 Anechoic Chamber	C.R.T	9m x 6m x 6m	EMC2142	2020-12-20	2023-12-19
MXE EMI Receiver(N9038A)	Keysight	N9038A	EMC2139	2020-11-13	2021-11-12
EXA Signal Analyzer(N9010A)	Keysight	N9010A	EMC2138	2020-09-17	2021-09-16
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A

Radiated Spurious Emissions					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Chamber cable	HangTianXing	N/A	EMC0542	2019-06-28	2021-06-27
Horn Antenna(BBHA 9120D)	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120D	EMC2026	2019-09-25	2022-09-24
1GHz-26.5 GHz Pre-Amplifier	Agilent	8449B	EMC0521	2021-01-08	2022-01-07
2.4GHz Filter	Micro-Tronics	BRM 50702	EMC2069	2021-01-08	2022-01-07
966 Anechoic Chamber	C.R.T	9m x 6m x 6m	EMC2142	2020-12-20	2023-12-19
MXE EMI Receiver(N9038A)	Keysight	N9038A	EMC2139	2020-11-13	2021-11-12
EXA Signal Analyzer(N9010A)	Keysight	N9010A	EMC2138	2020-09-17	2021-09-16
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	2020-07-09	2021-07-08
DMM	Fluke	73	EMC0007	2020-07-09	2021-07-08



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 Testing Laboratory, 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

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: Testing shall be performed using the highest gain antenna of each combination of licence-exempt transmitter and antenna type, with the transmitter output power set at the maximum level. When a measurement at the antenna connector is used to determine RF output power, the effective gain of the device's antenna shall be stated, based on a measurement or on data from the antenna manufacturer. 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 0dBi.

Please refer to internal photos.

7 Radio Spectrum Matter Test Results

7.1 Conducted Peak Output Power

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

Test Method: ANSI C63.10 (2013) Section 11.9.1

Limit:

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

7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 23.4 °C

Humidity: 64.2 % RH

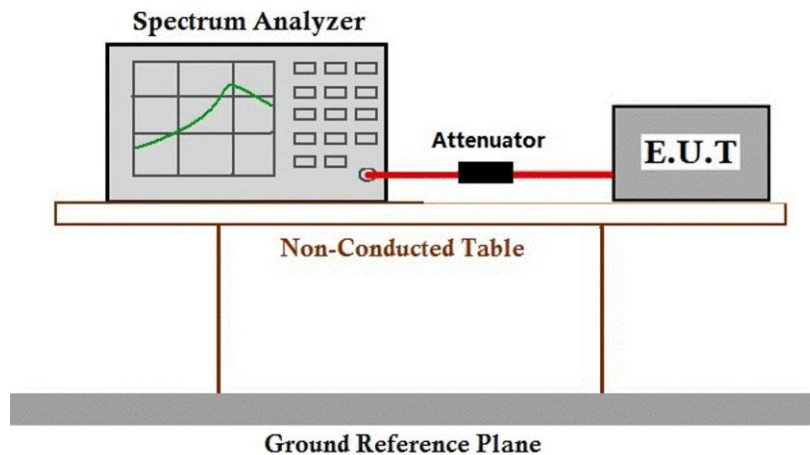
Atmospheric Pressure: 1010 mbar

7.1.2 Test Mode Description

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

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

7.1.3 Test Setup Diagram



7.1.4 Measurement Procedure and Data

Please Refer To Appendix For Details

7.2 Minimum 6dB Bandwidth

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

7.2.1 E.U.T. Operation

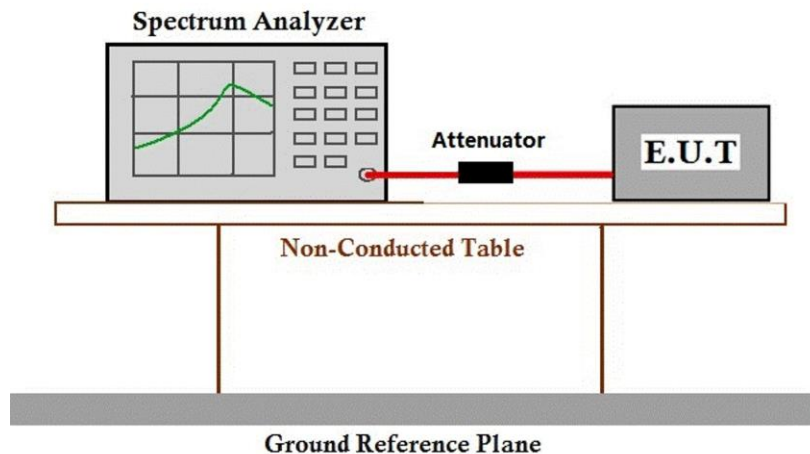
Operating Environment:

Temperature: 23.4 °C Humidity: 64.2 % RH Atmospheric Pressure: 1010 mbar

7.2.2 Test Mode Description

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

7.2.3 Test Setup Diagram



7.2.4 Measurement Procedure and Data

Please Refer To Appendix For Details

7.3 Power Spectrum Density

Test Requirement 47 CFR Part 15, Subpart C 15.247(e)
 Test Method: ANSI C63.10 (2013) Section 11.10.2
 Limit: $\leq 8\text{dBm}$ in any 3 kHz band during any time interval of continuous transmission

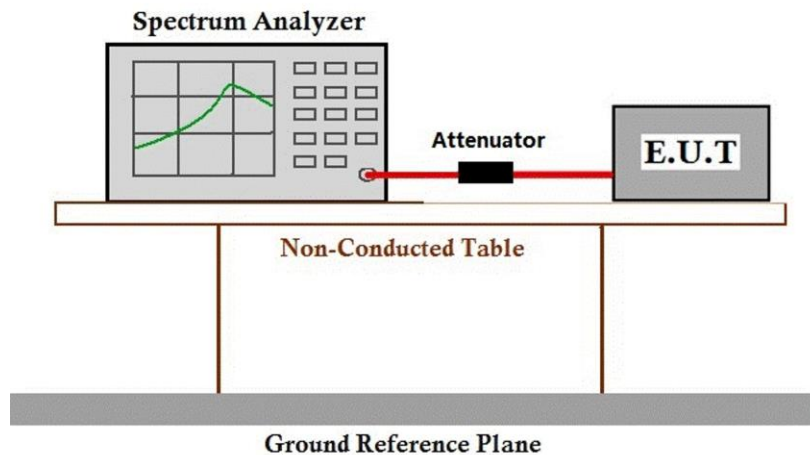
7.3.1 E.U.T. Operation

Operating Environment:
 Temperature: 23.4 °C Humidity: 64.2 % RH Atmospheric Pressure: 1010 mbar

7.3.2 Test Mode Description

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

7.3.3 Test Setup Diagram



7.3.4 Measurement Procedure and Data

Please Refer To Appendix For Details

7.4 Conducted Band Edges Measurement

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

Test Method: ANSI C63.10 (2013) Section 11.13.3.2

Limit:

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

7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 23.4 °C

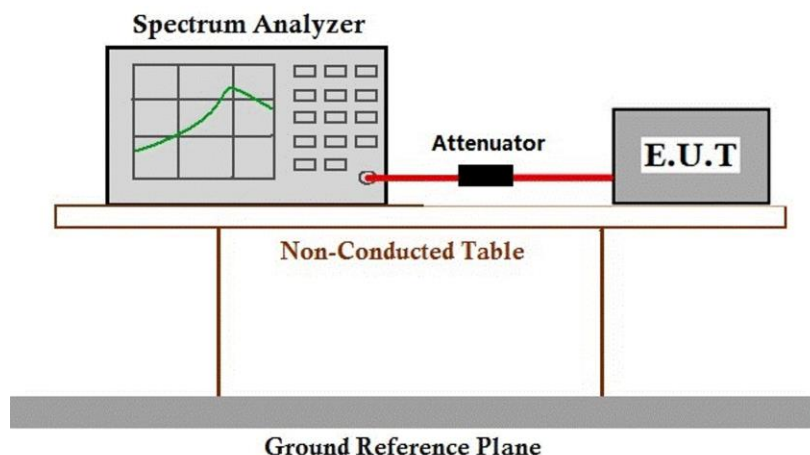
Humidity: 64.2 % RH

Atmospheric Pressure: 1010 mbar

7.4.2 Test Mode Description

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

7.4.3 Test Setup Diagram



7.4.4 Measurement Procedure and Data

Please Refer To Appendix For Details

7.5 Conducted Spurious Emissions

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

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

Limit:

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

7.5.1 E.U.T. Operation

Operating Environment:

Temperature: 23.4 °C

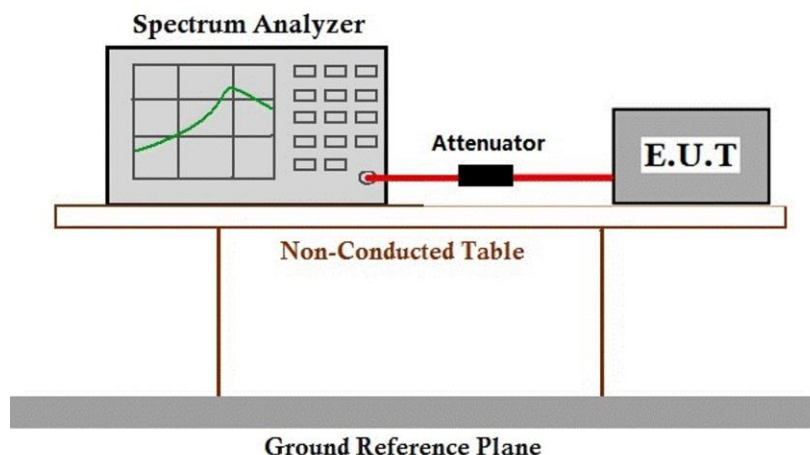
Humidity: 64.2 % RH

Atmospheric Pressure: 1010 mbar

7.5.2 Test Mode Description

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

7.5.3 Test Setup Diagram



7.5.4 Measurement Procedure and Data

Please Refer To Appendix For Details

7.6 Radiated Emissions which fall in the restricted bands

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209
Test Method: ANSI C63.10 (2013) Section 6.10.5 & 11.12.1
Limit:

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

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

7.6.1 E.U.T. Operation

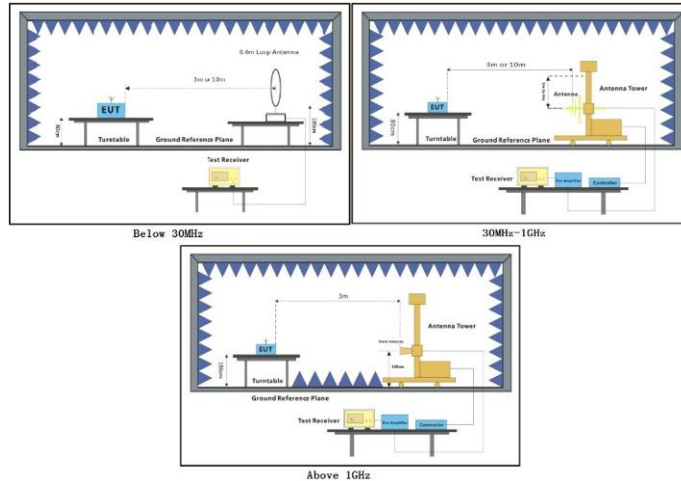
Operating Environment:

Temperature: 24.9 °C Humidity: 59.6 % RH Atmospheric Pressure: 1010 mbar

7.6.2 Test Mode Description

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

7.6.3 Test Setup Diagram



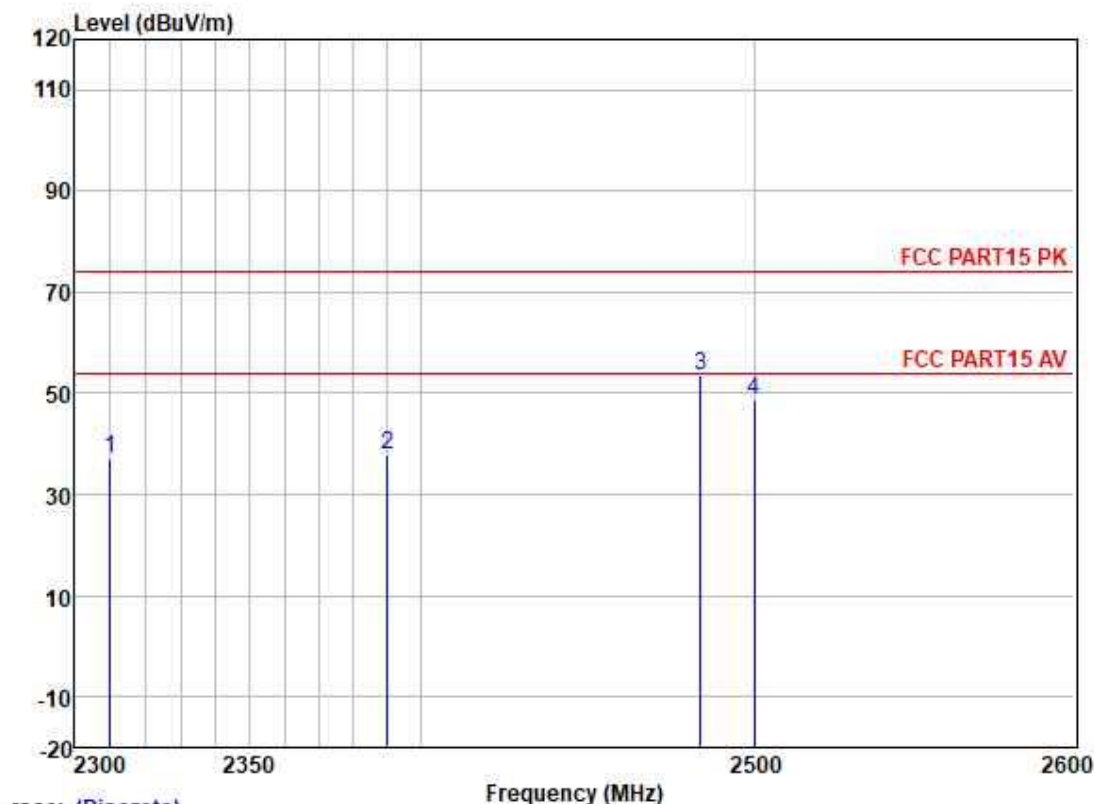
7.6.4 Measurement Procedure and Data

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

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

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

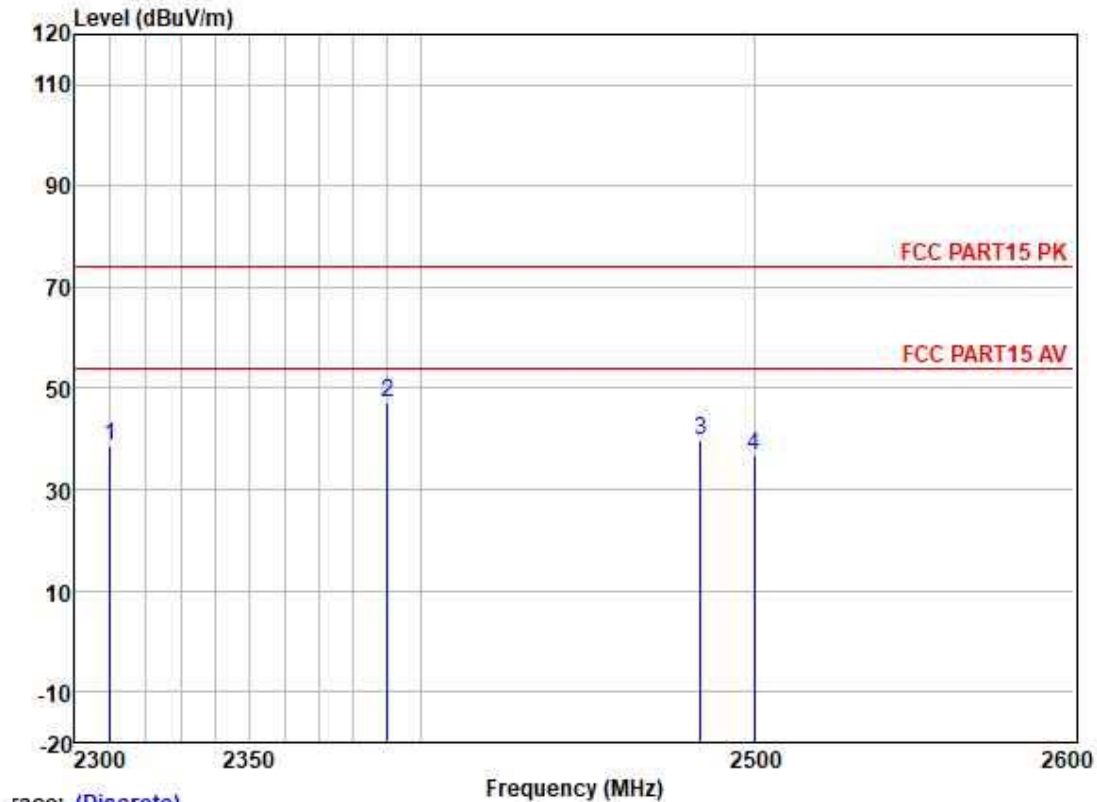
Test Mode: 01; Polarity: Horizontal; Modulation: 802.11b; Bandwidth: 20MHz; Channel: High;



Trace: (Discrete)

	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit	Over	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	44.41	27.15	3.32	37.62	37.26	74.00	-36.74	HORIZONTAL	Peak
2	2390.000	44.70	27.33	3.48	37.59	37.92	74.00	-36.08	HORIZONTAL	Peak
3	2483.500	60.02	27.48	3.53	37.57	53.46	74.00	-20.54	HORIZONTAL	Peak
4	2500.000	55.52	27.50	3.40	37.56	48.86	74.00	-25.14	HORIZONTAL	Peak

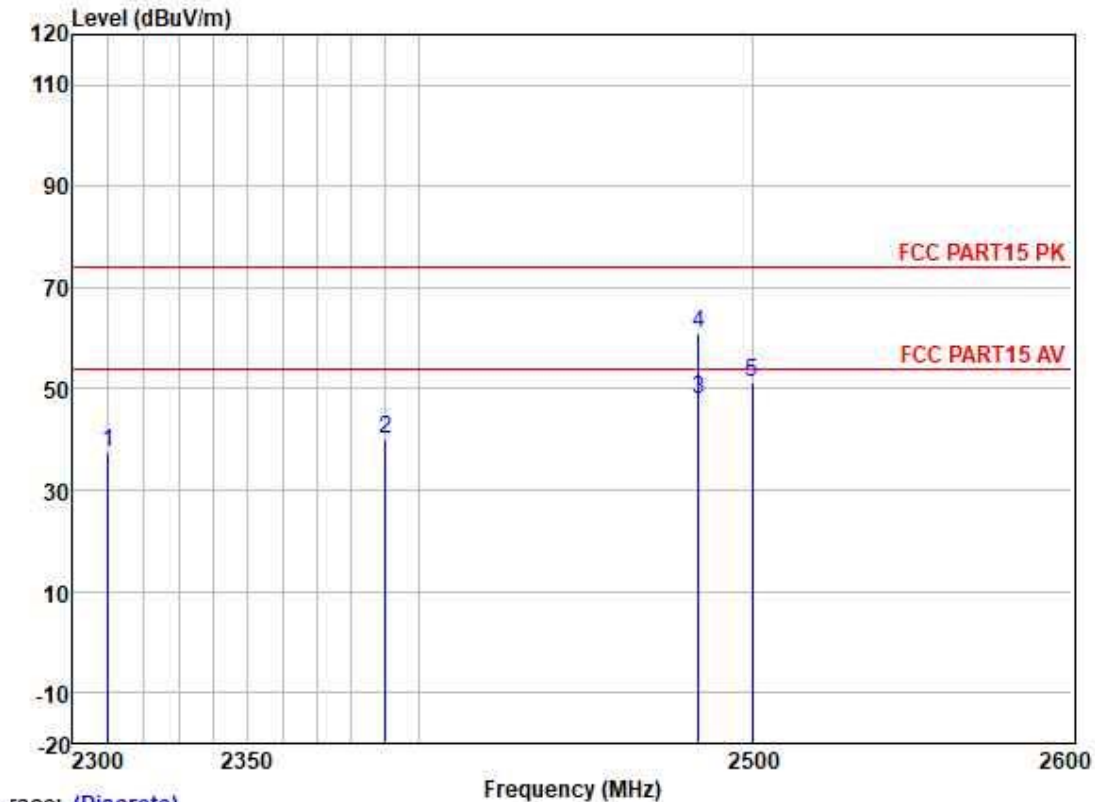
Test Mode: 01; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:Low;



Trace: (Discrete)

	Freq	ReadAntenna Level	Cable Factor	Preamp Loss	Factor	Level	Limit	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	45.61	27.15	3.32	37.62	38.46	74.00	-35.54	HORIZONTAL	Peak
2	2390.000	54.01	27.33	3.48	37.59	47.23	74.00	-26.77	HORIZONTAL	Peak
3	2483.500	46.15	27.48	3.53	37.57	39.59	74.00	-34.41	HORIZONTAL	Peak
4	2500.000	43.39	27.50	3.40	37.56	36.73	74.00	-37.27	HORIZONTAL	Peak

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



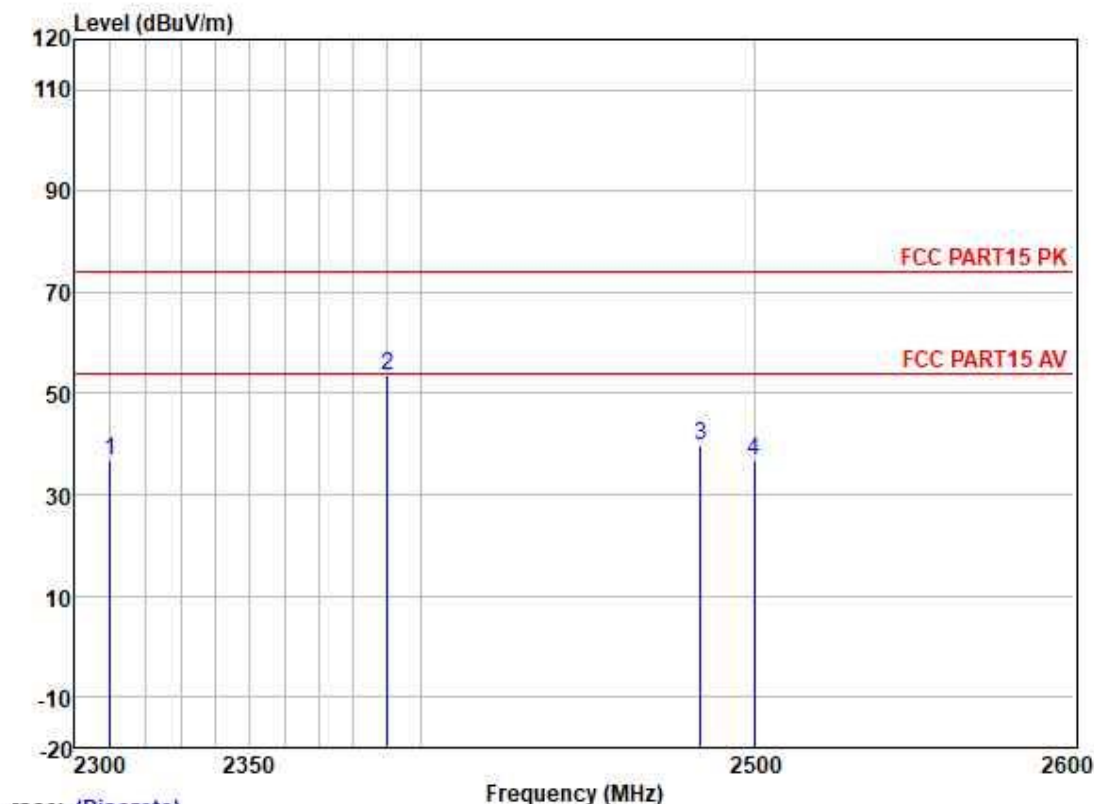
Trace: (Discrete)

	Freq	ReadAntenna	Cable	Preamp	Limit	Over		
	MHz	Level	Factor	Loss	Factor	Level	Line	Limit
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	2310.000	44.62	27.15	3.32	37.62	37.47	74.00	-36.53
2	2390.000	47.07	27.33	3.48	37.59	40.29	74.00	-33.71
3	2483.500	54.38	27.48	3.53	37.57	47.82	54.00	-6.18
4	2483.500	67.45	27.48	3.53	37.57	60.89	74.00	-13.11
5	2500.000	57.82	27.50	3.40	37.56	51.16	74.00	-22.84

Remark:

According to the clause 11.12.2.5.2 of ANSI C63.10, The average of test data add $10\log(1/D)$
 $= 47.82 + 10\log(1/0.895) = 47.82 + 0.48 = 48.3 \text{ dB}$ (limit=54dB).

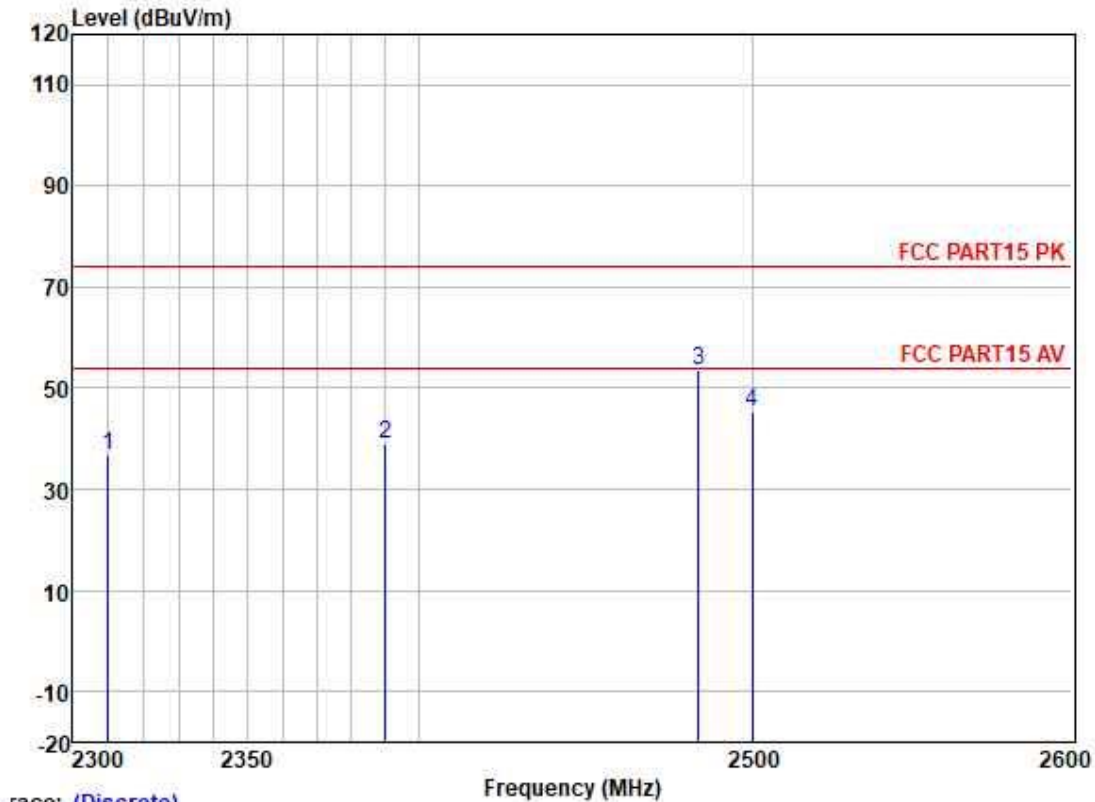
Test Mode: 01; Polarity: Horizontal; Modulation: 802.11g; Bandwidth: 20MHz; Channel: Low;



Trace: (Discrete)

	Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Level	Limit	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	43.82	27.15	3.32	37.62	36.67	74.00	-37.33	HORIZONTAL	Peak
2	2390.000	60.24	27.33	3.48	37.59	53.46	74.00	-20.54	HORIZONTAL	Peak
3	2483.500	46.15	27.48	3.53	37.57	39.59	74.00	-34.41	HORIZONTAL	Peak
4	2500.000	43.42	27.50	3.40	37.56	36.76	74.00	-37.24	HORIZONTAL	Peak

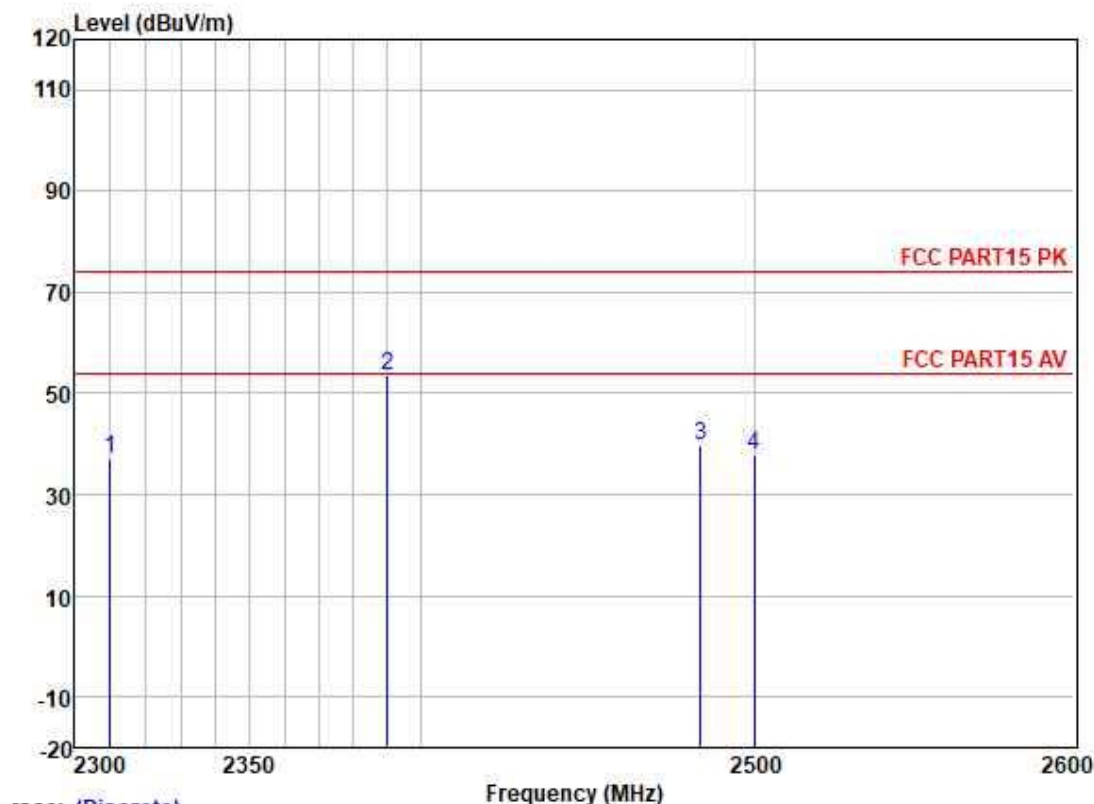
Test Mode: 01; Polarity: Horizontal; Modulation: 802.11n; Bandwidth: 20MHz; Channel: High;



Trace: (Discrete)

	Freq	ReadAntenna Level	Cable Factor	Preamp Loss	Factor	Level	Limit	Over	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	44.05	27.15	3.32	37.62	36.90	74.00	-37.10	HORIZONTAL	Peak
2	2390.000	45.88	27.33	3.48	37.59	39.10	74.00	-34.90	HORIZONTAL	Peak
3	2483.500	59.99	27.48	3.53	37.57	53.43	74.00	-20.57	HORIZONTAL	Peak
4	2500.000	51.98	27.50	3.40	37.56	45.32	74.00	-28.68	HORIZONTAL	Peak

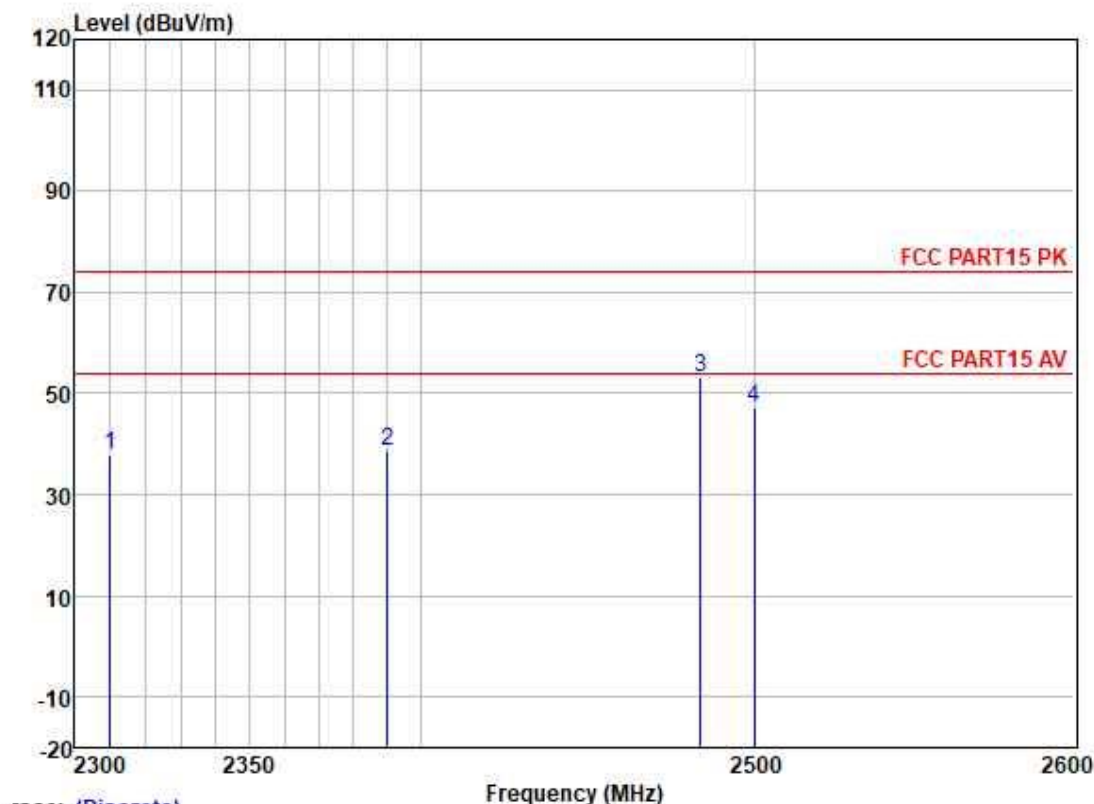
Test Mode: 01; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:Low;



Trace: (Discrete)

	Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Level	Limit	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	44.10	27.15	3.32	37.62	36.95	74.00	-37.05	HORIZONTAL	Peak
2	2390.000	60.44	27.33	3.48	37.59	53.66	74.00	-20.34	HORIZONTAL	Peak
3	2483.500	46.14	27.48	3.53	37.57	39.58	74.00	-34.42	HORIZONTAL	Peak
4	2500.000	44.59	27.50	3.40	37.56	37.93	74.00	-36.07	HORIZONTAL	Peak

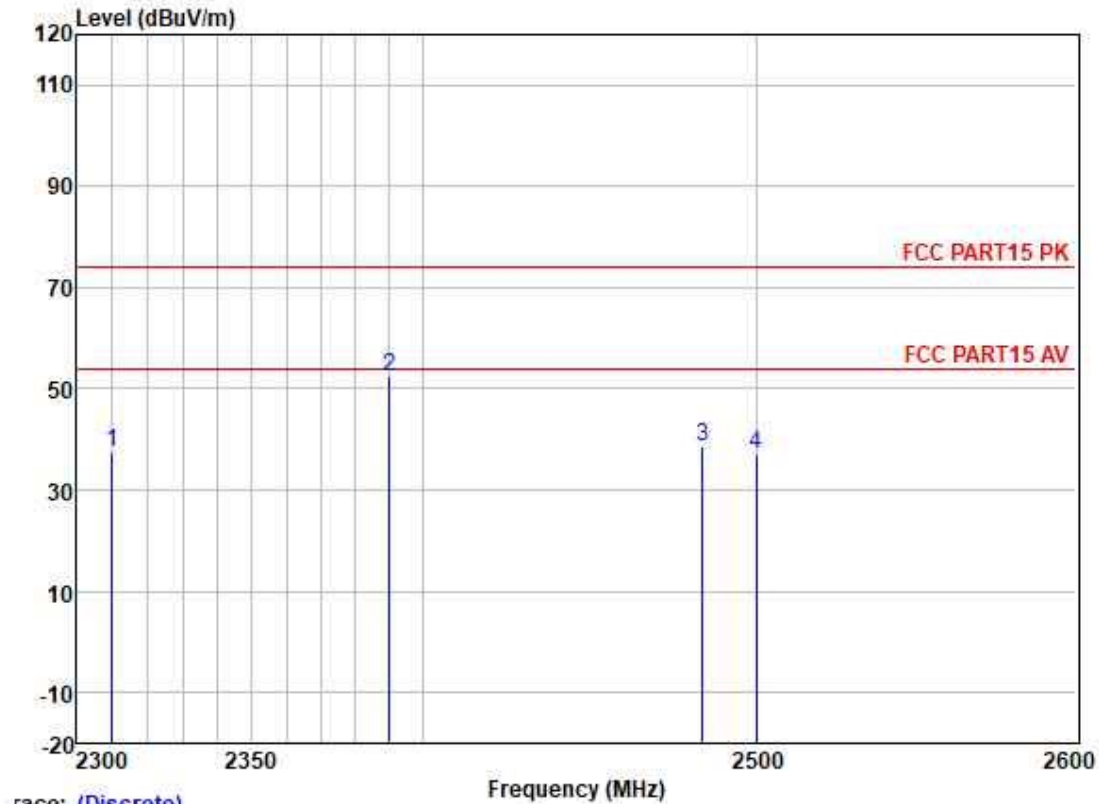
Test Mode: 01; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:High;



Trace: (Discrete)

	Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Level	Limit	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	44.84	27.15	3.32	37.62	37.69	74.00	-36.31	VERTICAL	Peak
2	2390.000	45.47	27.33	3.48	37.59	38.69	74.00	-35.31	VERTICAL	Peak
3	2483.500	59.88	27.48	3.53	37.57	53.32	74.00	-20.68	VERTICAL	Peak
4	2500.000	53.77	27.50	3.40	37.56	47.11	74.00	-26.89	VERTICAL	Peak

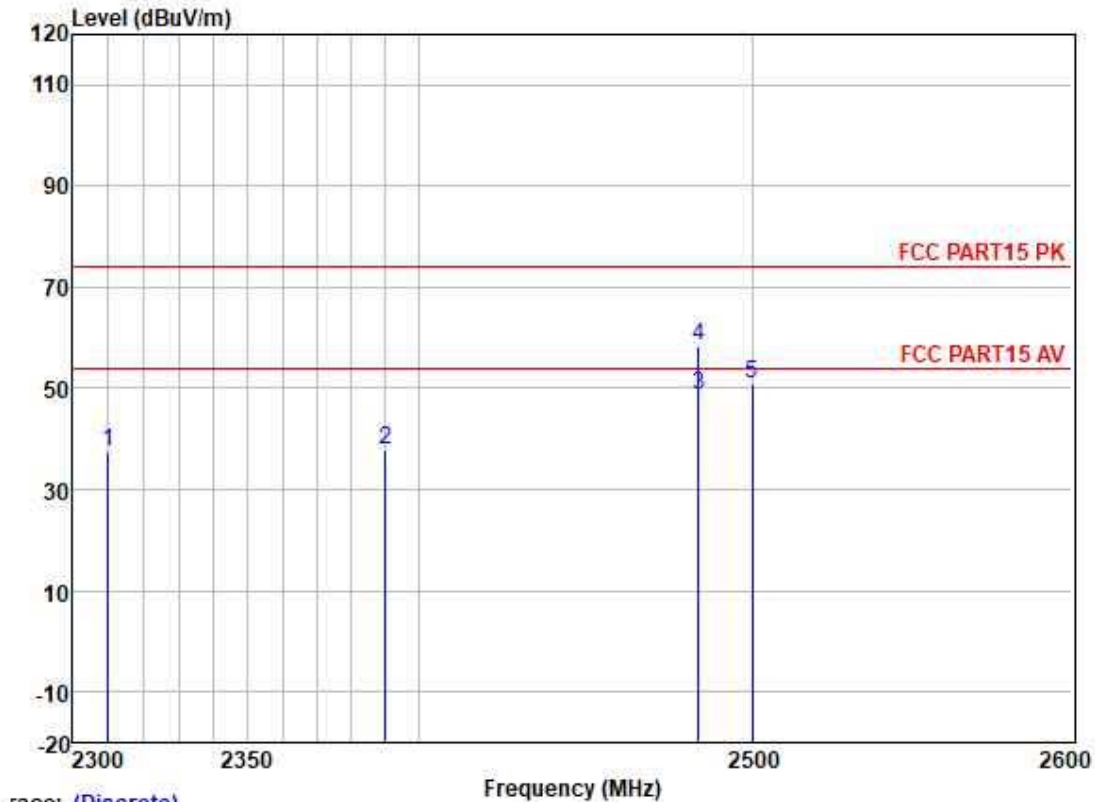
Test Mode: 01; Polarity: Vertical; Modulation: 802.11b; Bandwidth: 20MHz; Channel: Low;



Trace: (Discrete)

	Freq	ReadAntenna Level	Cable Factor	Preamp Loss	Level	Limit	Over Limit	Pol/Phase	Remark
	MHz	dBUV	dB/m	dB	dBUV/m	dBUV/m	dB		
1	2310.000	44.59	27.15	3.32	37.62	74.00	-36.56	VERTICAL	Peak
2	2390.000	59.04	27.33	3.48	37.59	74.00	-21.74	VERTICAL	Peak
3	2483.500	45.07	27.48	3.53	37.57	74.00	-35.49	VERTICAL	Peak
4	2500.000	43.72	27.50	3.40	37.56	74.00	-36.94	VERTICAL	Peak

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



Trace: (Discrete)

	Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Level	Limit	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	44.48	27.15	3.32	37.62	37.33	74.00	-36.67	VERTICAL	Peak
2	2390.000	44.58	27.33	3.48	37.59	37.80	74.00	-36.20	VERTICAL	Peak
3	2483.500	55.32	27.48	3.53	37.57	48.76	54.00	-5.24	VERTICAL	Average
4	2483.500	65.06	27.48	3.53	37.57	58.50	74.00	-15.50	VERTICAL	Peak
5	2500.000	57.48	27.50	3.40	37.56	50.82	74.00	-23.18	VERTICAL	Peak

Remark:

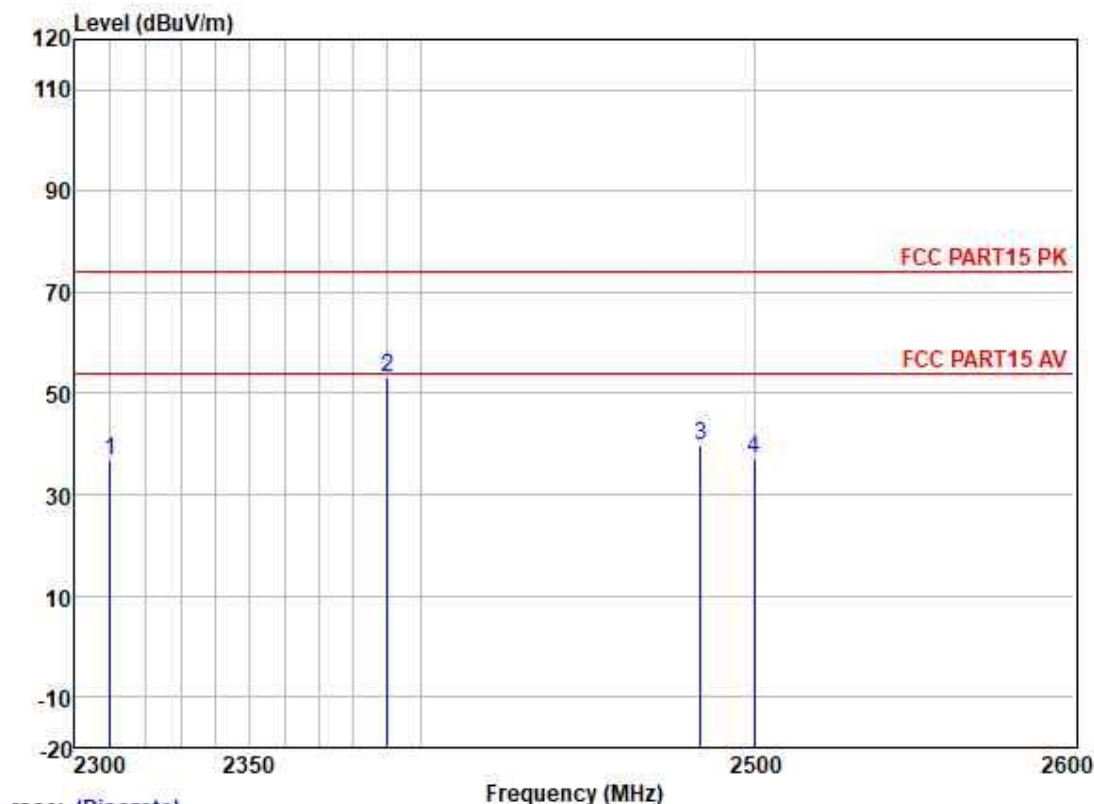
According to the clause 11.12.2.5.2 of ANSI C63.10, the average of test data add 10log (1/D) = 48.76 + 10log (1/0.895) = 48.76 + 0.48 = 49.24 dB (limit = 54 dB).



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

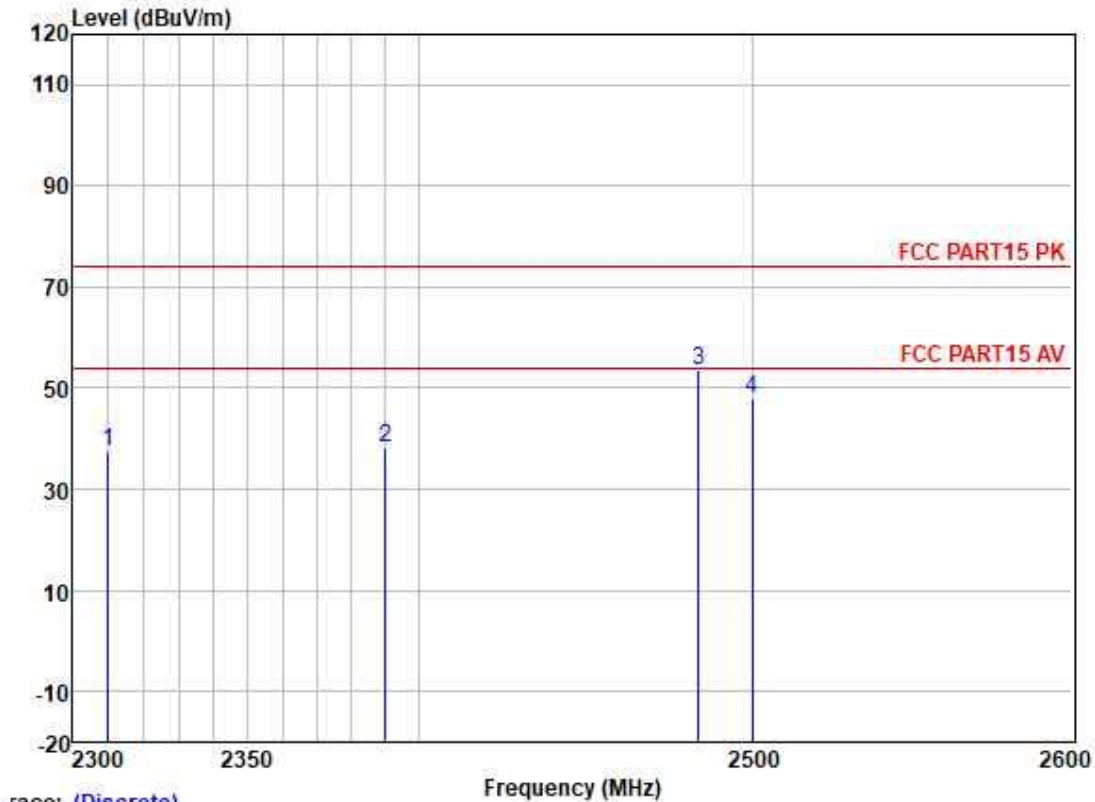
Test Mode: 01; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:Low;



Trace: (Discrete)

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	44.06	27.15	3.32	37.62	36.91	74.00	-37.09	VERTICAL	Peak
2	2390.000	60.00	27.33	3.48	37.59	53.22	74.00	-20.78	VERTICAL	Peak
3	2483.500	46.23	27.48	3.53	37.57	39.67	74.00	-34.33	VERTICAL	Peak
4	2500.000	43.62	27.50	3.40	37.56	36.96	74.00	-37.04	VERTICAL	Peak

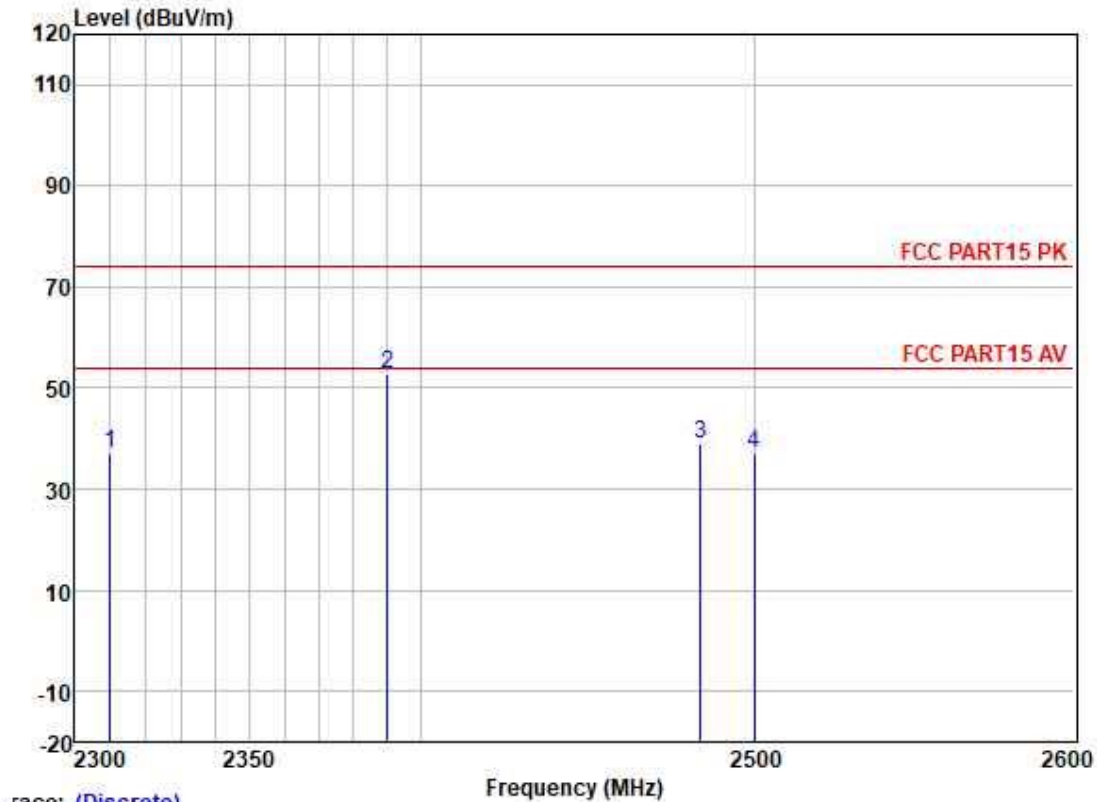
Test Mode: 01; Polarity: Vertical; Modulation: 802.11n; Bandwidth: 20MHz; Channel: High;



Trace: (Discrete)

	Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Level	Limit	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	44.55	27.15	3.32	37.62	37.40	74.00	-36.60	VERTICAL	Peak
2	2390.000	45.00	27.33	3.48	37.59	38.22	74.00	-35.78	VERTICAL	Peak
3	2483.500	60.10	27.48	3.53	37.57	53.54	74.00	-20.46	VERTICAL	Peak
4	2500.000	54.58	27.50	3.40	37.56	47.92	74.00	-26.08	VERTICAL	Peak

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



	Freq	ReadAntenna Level	Cable Factor	Preamp Loss	Factor	Level	Limit	Over	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	2310.000	44.30	27.15	3.32	37.62	37.15	74.00	-36.85	VERTICAL	Peak
2	2390.000	59.64	27.33	3.48	37.59	52.86	74.00	-21.14	VERTICAL	Peak
3	2483.500	45.57	27.48	3.53	37.57	39.01	74.00	-34.99	VERTICAL	Peak
4	2500.000	43.89	27.50	3.40	37.56	37.23	74.00	-36.77	VERTICAL	Peak

7.7 Radiated Spurious Emissions

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209
Test Method: ANSI C63.10 (2013) Section 6.4,6.5,6.6 & 11.12.1
Limit:

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

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

7.7.1 E.U.T. Operation

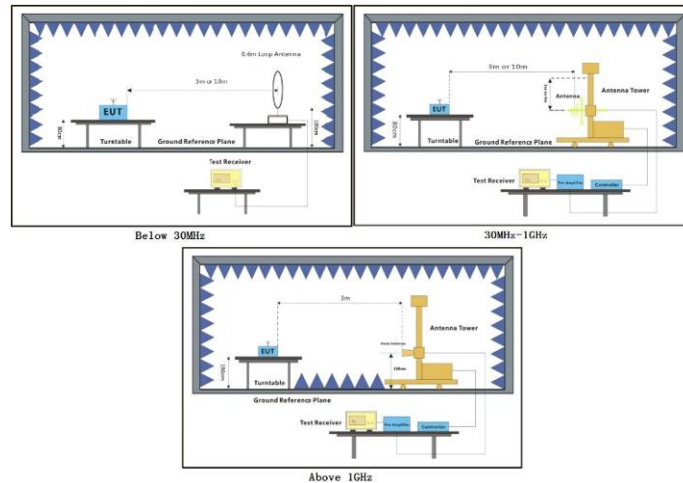
Operating Environment:

Temperature: 24.9 °C Humidity: 59.6 % RH Atmospheric Pressure: 1010 mbar

7.7.2 Test Mode Description

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

7.7.3 Test Setup Diagram



7.7.4 Measurement Procedure and Data

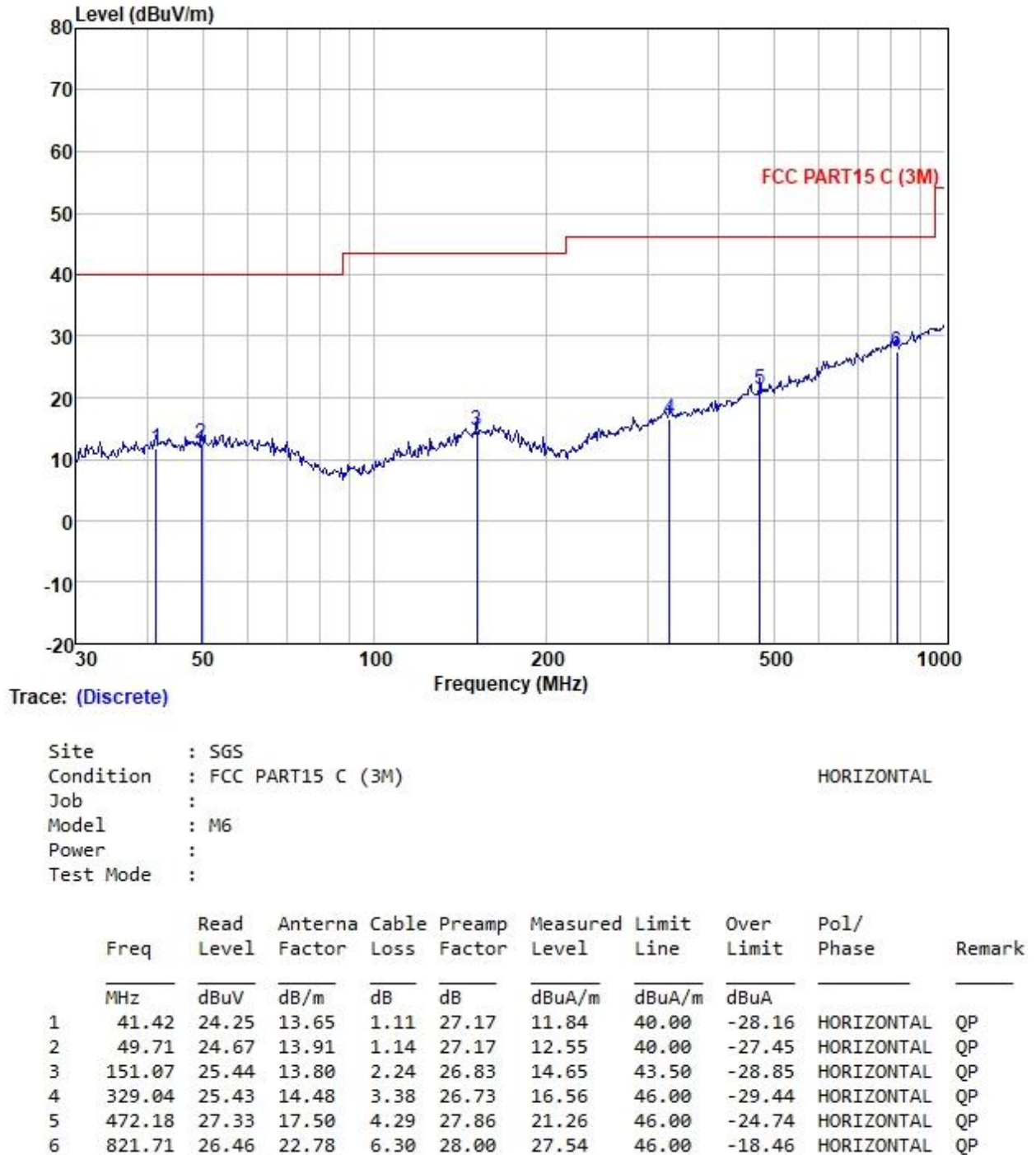
- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5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

Remark:

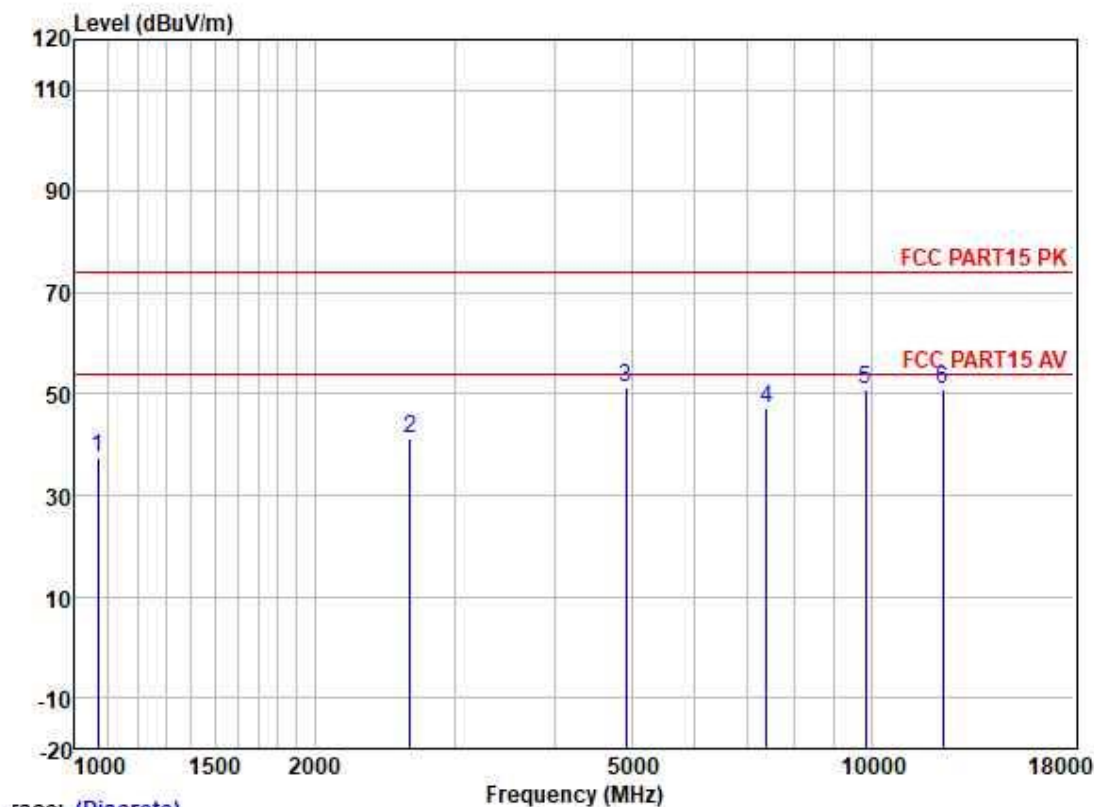
- 1) For emission below 1GHz, through pre-scan found the worst case is the lowest channel for 802.11b. Only the worst case is recorded in the report.
- 2) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:
Final Test Level = Receiver Reading + Antenna Factor + Cable Factor - Preamplifier Factor
- 3) Scan from 9kHz to 25GHz, the disturbance above 18GHz and 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.
- 4) For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.



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



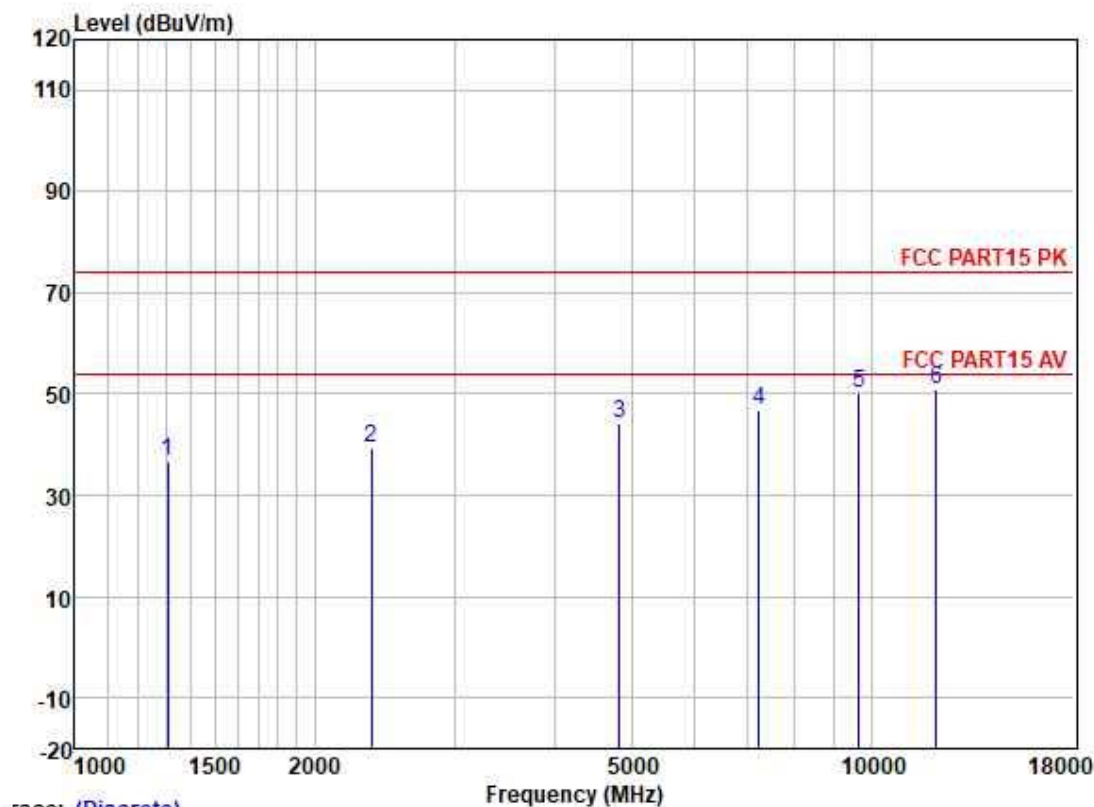
Test Mode: 01; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:High;



Trace: (Discrete)

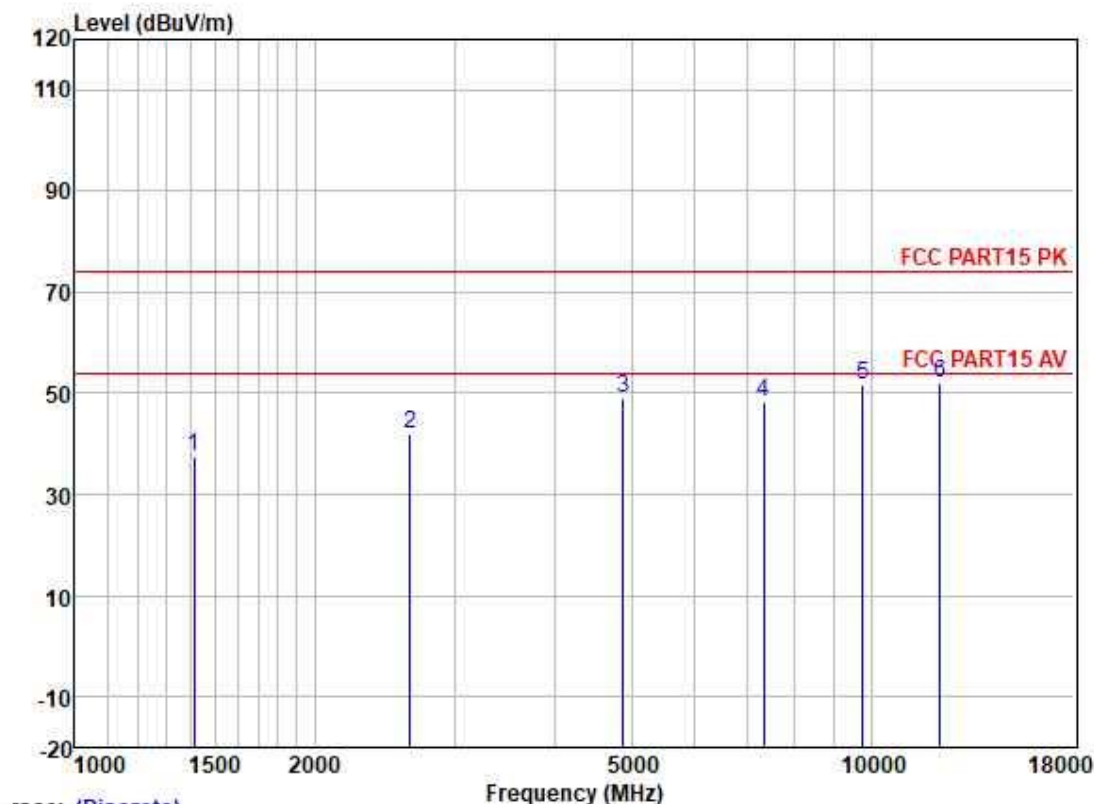
	Freq	ReadAntenna	Cable	Preamp	Level	Limit	Over		
	MHz	Level	Factor	Loss	Factor	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1068.738	49.28	24.31	2.37	38.46	37.50	74.00	-36.50	HORIZONTAL Peak
2	2633.397	47.45	27.68	3.53	37.51	41.15	74.00	-32.85	HORIZONTAL Peak
3	4924.490	51.11	31.62	5.60	36.84	51.49	74.00	-22.51	HORIZONTAL Peak
4	7386.778	42.40	36.17	6.19	37.45	47.31	74.00	-26.69	HORIZONTAL Peak
5	9848.710	42.89	38.58	6.99	37.41	51.05	74.00	-22.95	HORIZONTAL Peak
6	12310.780	41.35	38.63	8.01	36.95	51.04	74.00	-22.96	HORIZONTAL Peak

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



	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	1308.399	47.42	25.22	2.60	38.31	36.93	74.00	-37.07	HORIZONTAL Peak
2	2359.478	46.10	27.27	3.42	37.61	39.18	74.00	-34.82	HORIZONTAL Peak
3	4824.396	44.33	31.45	5.42	36.83	44.37	74.00	-29.63	HORIZONTAL Peak
4	7236.289	42.66	35.70	6.03	37.39	47.00	74.00	-27.00	HORIZONTAL Peak
5	9648.221	42.33	38.40	7.06	37.42	50.37	74.00	-23.63	HORIZONTAL Peak
6	12060.870	40.78	38.88	8.17	37.08	50.75	74.00	-23.25	HORIZONTAL Peak

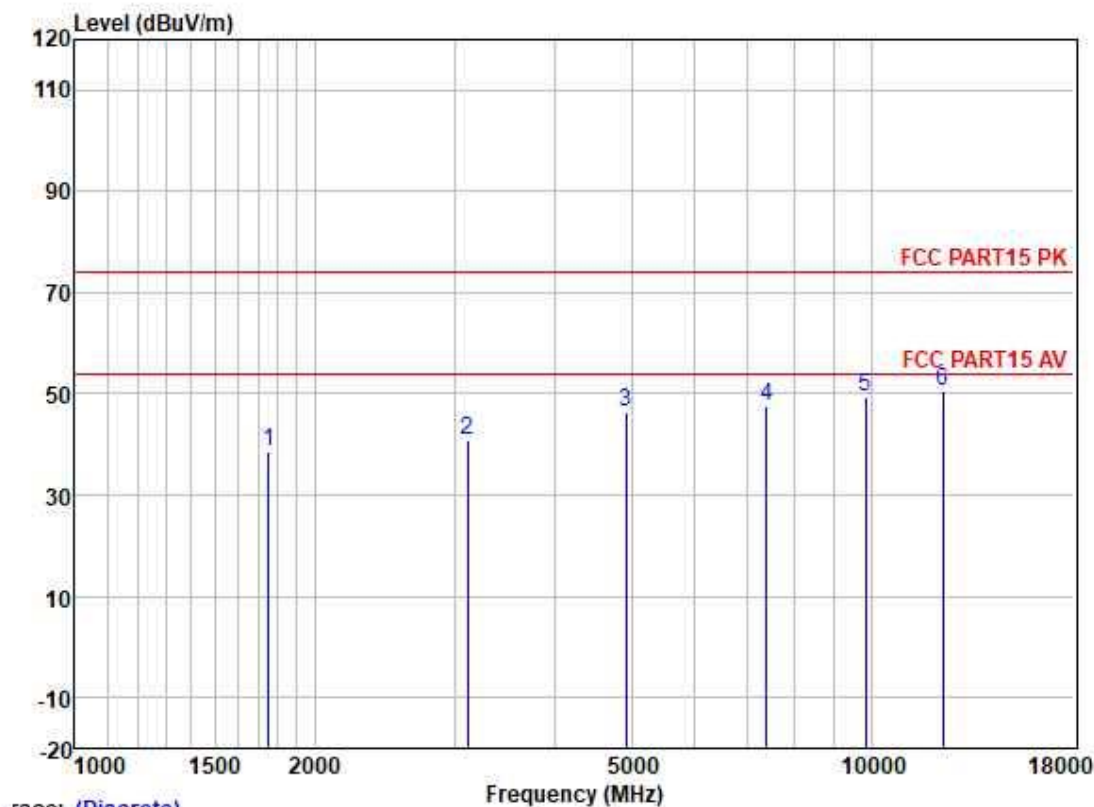
Test Mode: 01; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:middle;



Trace: (Discrete)

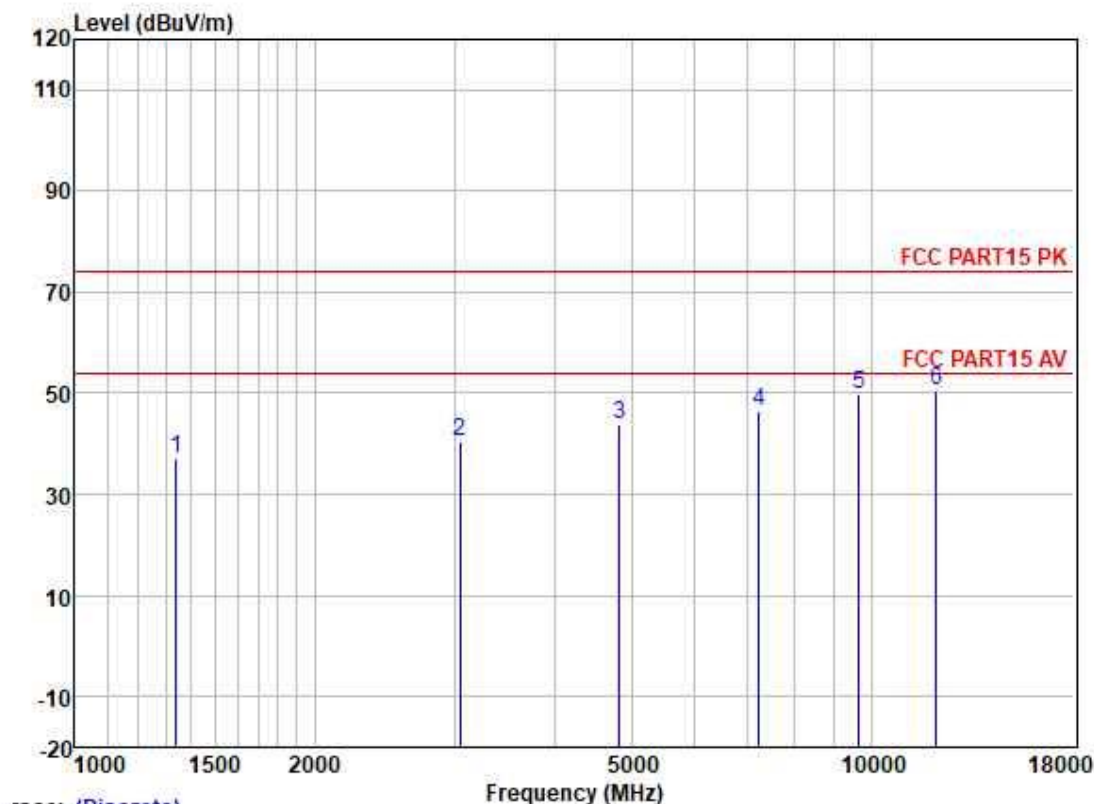
	Freq	ReadAntenna	Cable	Preamp	Level	Limit	Over		
	MHz	Level	Factor	Loss	Factor	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1410.514	47.63	25.40	2.62	38.22	37.43	74.00	-36.57	HORIZONTAL Peak
2	2633.397	48.15	27.68	3.53	37.51	41.85	74.00	-32.15	HORIZONTAL Peak
3	4884.151	48.76	31.56	5.52	36.84	49.00	74.00	-25.00	HORIZONTAL Peak
4	7326.122	43.66	36.00	6.13	37.43	48.36	74.00	-25.64	HORIZONTAL Peak
5	9768.430	43.55	38.53	7.01	37.41	51.68	74.00	-22.32	HORIZONTAL Peak
6	12210.250	42.11	38.74	8.08	37.00	51.93	74.00	-22.07	HORIZONTAL Peak

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



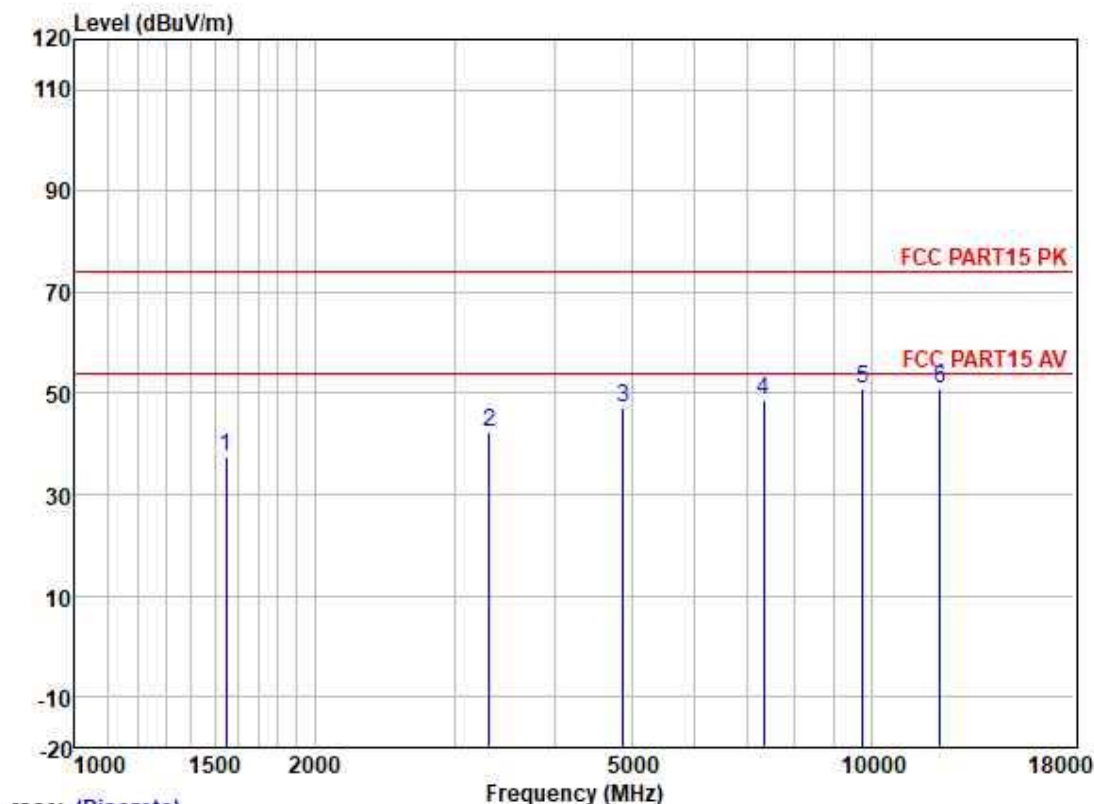
	Freq	ReadAntenna	Cable	Preamp	Limit	Over			
	MHz	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1751.955	47.74	25.86	2.90	37.85	38.65	74.00	-35.35	HORIZONTAL Peak
2	3114.025	45.71	28.49	3.92	37.14	40.98	74.00	-33.02	HORIZONTAL Peak
3	4924.490	46.25	31.62	5.60	36.84	46.63	74.00	-27.37	HORIZONTAL Peak
4	7386.375	42.81	36.17	6.19	37.45	47.72	74.00	-26.28	HORIZONTAL Peak
5	9848.911	41.38	38.58	6.99	37.41	49.54	74.00	-24.46	HORIZONTAL Peak
6	12310.430	40.76	38.63	8.01	36.95	50.45	74.00	-23.55	HORIZONTAL Peak

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



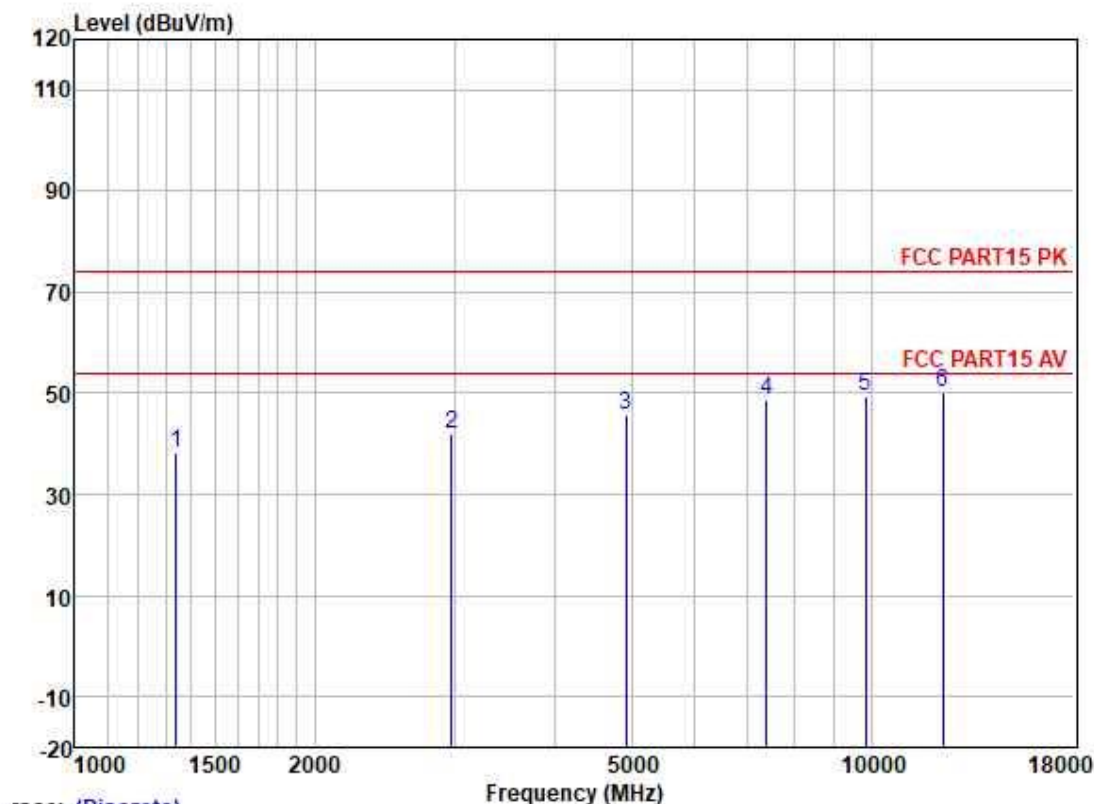
	Freq	ReadAntenna	Cable	Preamp	Level	Limit	Over		
	MHz	Level	Factor	Loss	Factor	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1339.006	47.38	25.29	2.60	38.27	37.00	74.00	-37.00	HORIZONTAL Peak
2	3042.846	45.46	28.43	3.84	37.20	40.53	74.00	-33.47	HORIZONTAL Peak
3	4824.617	43.77	31.45	5.42	36.83	43.81	74.00	-30.19	HORIZONTAL Peak
4	7236.788	42.09	35.70	6.03	37.39	46.43	74.00	-27.57	HORIZONTAL Peak
5	9648.274	41.93	38.40	7.06	37.42	49.97	74.00	-24.03	HORIZONTAL Peak
6	12060.580	40.76	38.88	8.17	37.08	50.73	74.00	-23.27	HORIZONTAL Peak

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



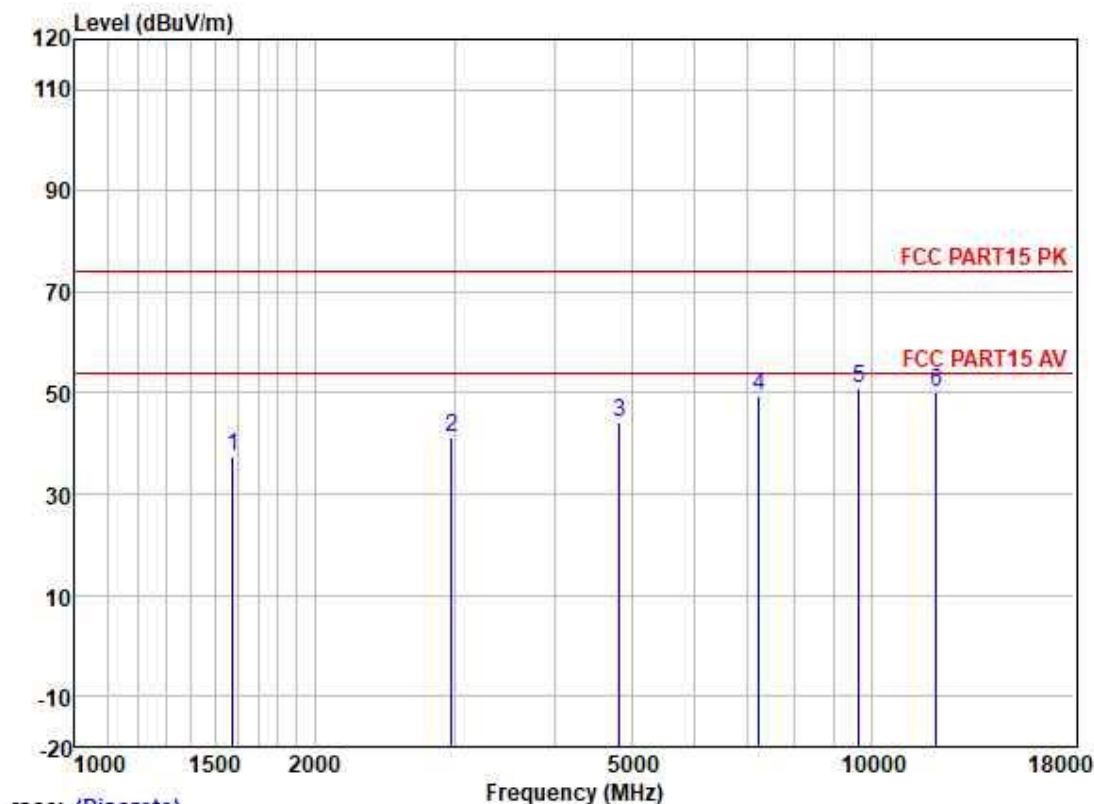
	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1547.199	47.18	25.53	2.80	38.03	37.48	74.00	-36.52	HORIZONTAL	Peak
2	3318.471	46.62	28.77	4.07	37.02	42.44	74.00	-31.56	HORIZONTAL	Peak
3	4884.948	46.98	31.56	5.52	36.84	47.22	74.00	-26.78	HORIZONTAL	Peak
4	7326.646	44.01	36.00	6.13	37.43	48.71	74.00	-25.29	HORIZONTAL	Peak
5	9768.432	42.66	38.53	7.01	37.41	50.79	74.00	-23.21	HORIZONTAL	Peak
6	12210.180	41.11	38.74	8.08	37.00	50.93	74.00	-23.07	HORIZONTAL	Peak

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



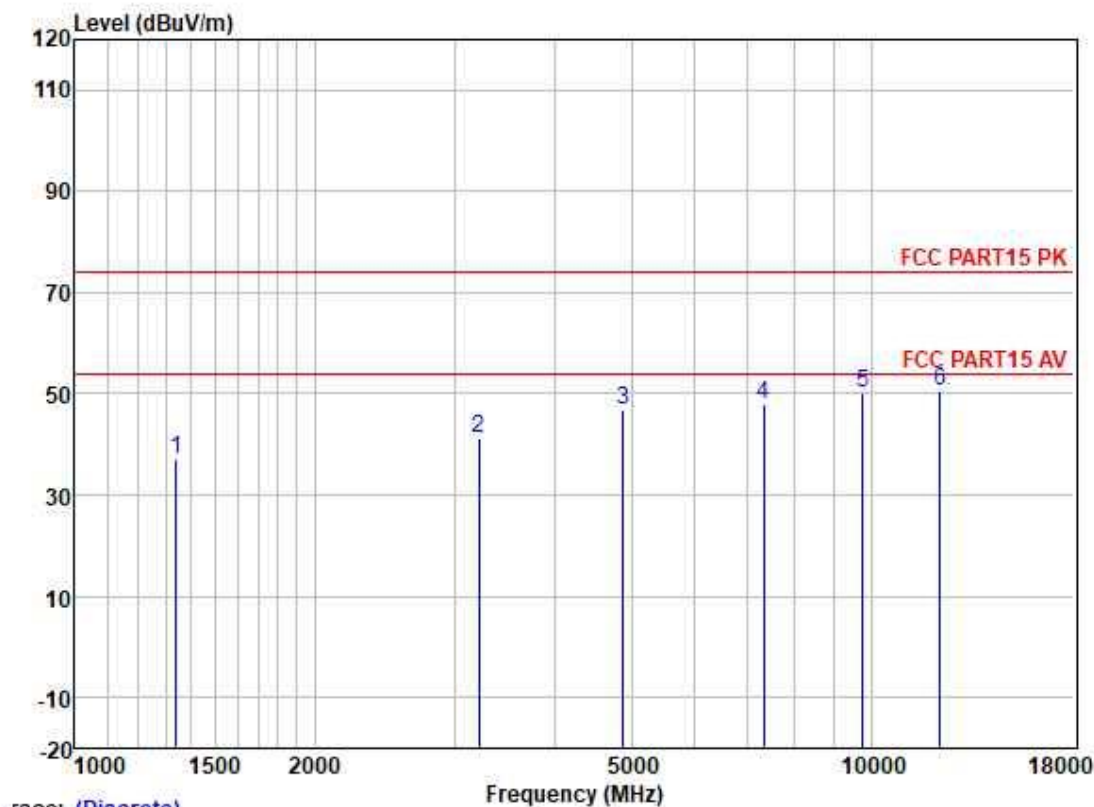
	Freq	ReadAntenna	Cable	Preamp	Level	Limit	Over		
	MHz	Level	Factor	Loss	Factor	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1339.006	48.48	25.29	2.60	38.27	38.10	74.00	-35.90	HORIZONTAL Peak
2	2973.293	46.91	28.38	3.78	37.28	41.79	74.00	-32.21	HORIZONTAL Peak
3	4924.058	45.34	31.62	5.60	36.84	45.72	74.00	-28.28	HORIZONTAL Peak
4	7386.015	43.96	36.17	6.19	37.45	48.87	74.00	-25.13	HORIZONTAL Peak
5	9848.274	41.14	38.58	6.99	37.41	49.30	74.00	-24.70	HORIZONTAL Peak
6	12310.100	40.48	38.63	8.01	36.95	50.17	74.00	-23.83	HORIZONTAL Peak

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



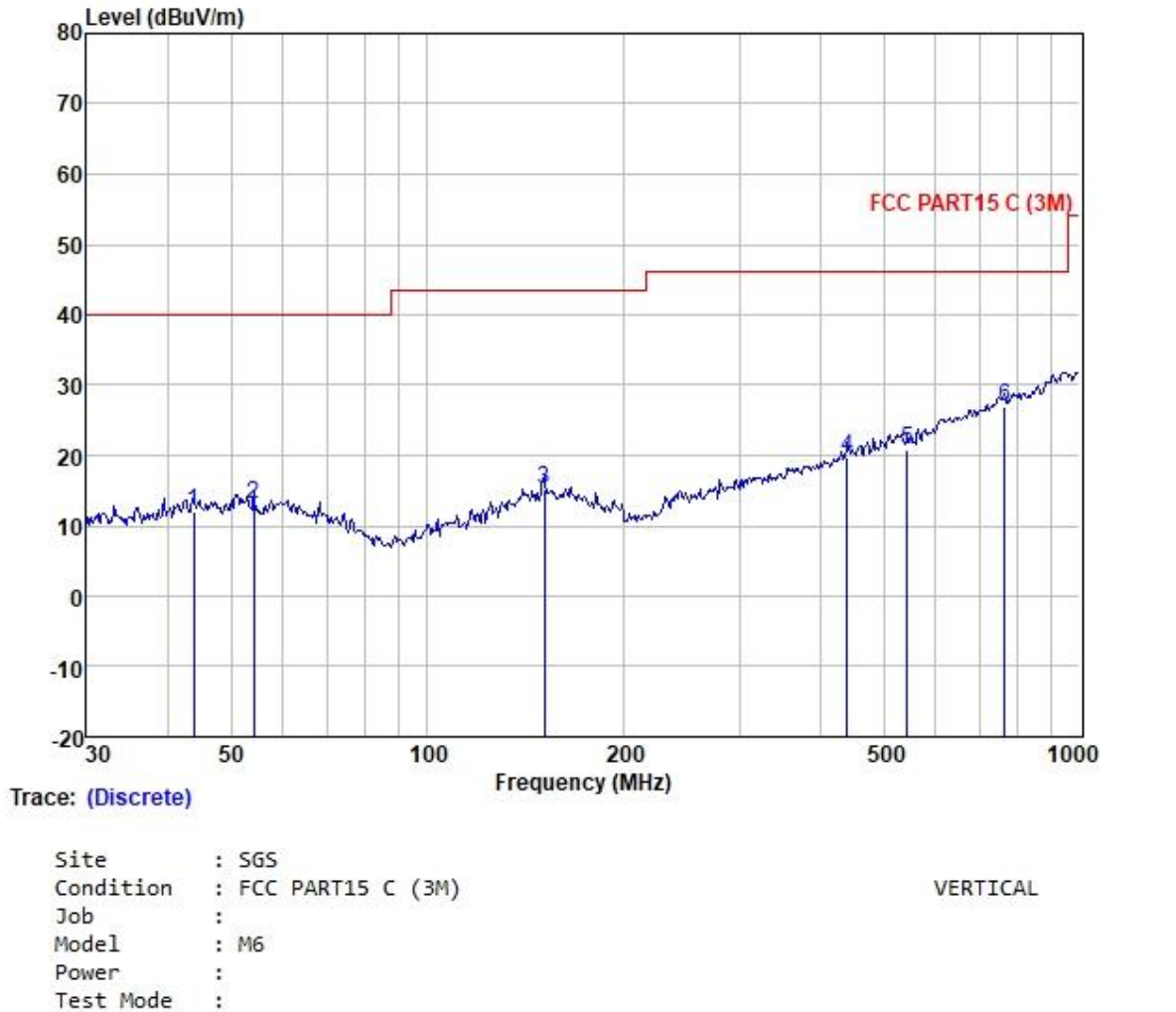
	Freq	ReadAntenna	Cable	Preamp	Level	Limit	Over		
	MHz	Level	Factor	Loss	Factor	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1578.822	47.10	25.56	2.80	38.00	37.46	74.00	-36.54	HORIZONTAL Peak
2	2973.293	46.32	28.38	3.78	37.28	41.20	74.00	-32.80	HORIZONTAL Peak
3	4824.396	44.33	31.45	5.42	36.83	44.37	74.00	-29.63	HORIZONTAL Peak
4	7236.404	44.94	35.70	6.03	37.39	49.28	74.00	-24.72	HORIZONTAL Peak
5	9648.230	42.98	38.40	7.06	37.42	51.02	74.00	-22.98	HORIZONTAL Peak
6	12060.250	40.08	38.88	8.17	37.08	50.05	74.00	-23.95	HORIZONTAL Peak

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



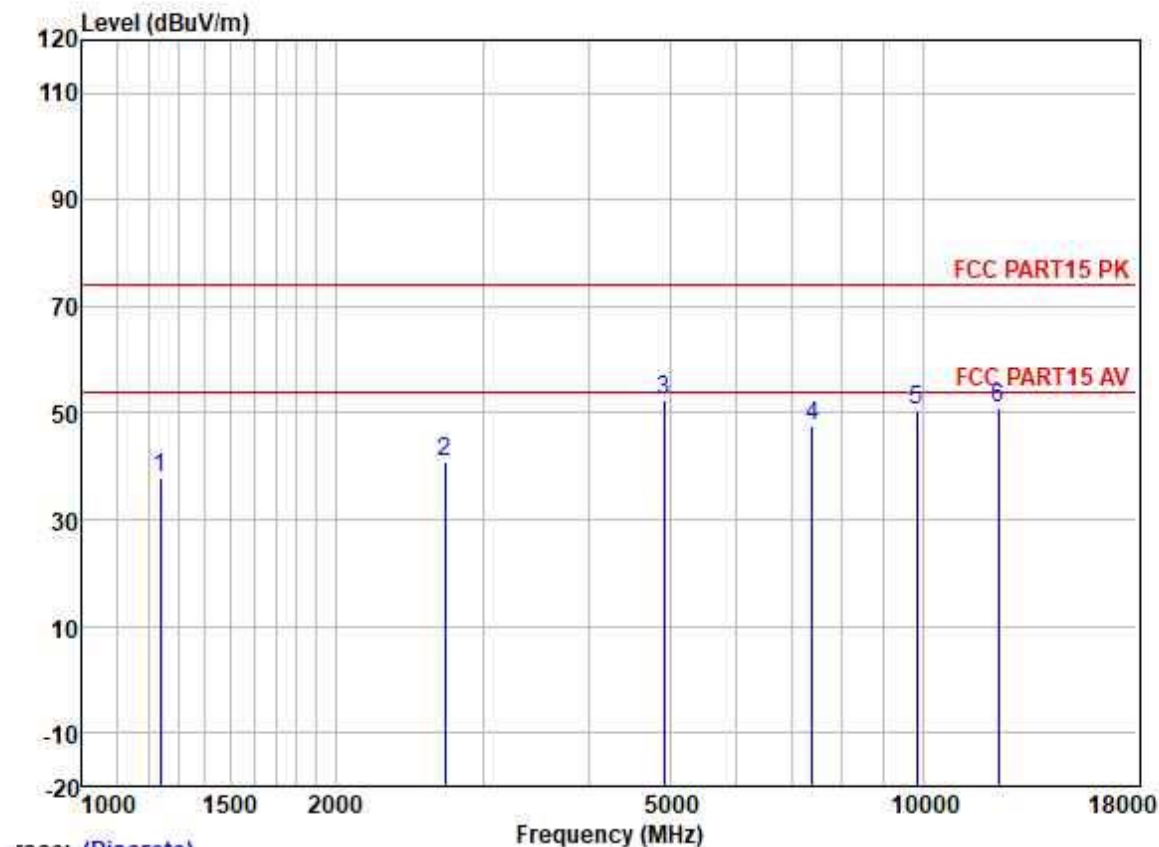
	Freq	ReadAntenna	Cable	Preamp		Limit	Over			
	MHz	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1339.006	47.38	25.29	2.60	38.27	37.00	74.00	-37.00	HORIZONTAL	Peak
2	3214.623	45.59	28.61	4.01	37.07	41.14	74.00	-32.86	HORIZONTAL	Peak
3	4884.948	46.58	31.56	5.52	36.84	46.82	74.00	-27.18	HORIZONTAL	Peak
4	7326.708	43.19	36.00	6.13	37.43	47.89	74.00	-26.11	HORIZONTAL	Peak
5	9768.584	42.12	38.53	7.01	37.41	50.25	74.00	-23.75	HORIZONTAL	Peak
6	12210.230	40.90	38.74	8.08	37.00	50.72	74.00	-23.28	HORIZONTAL	Peak

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



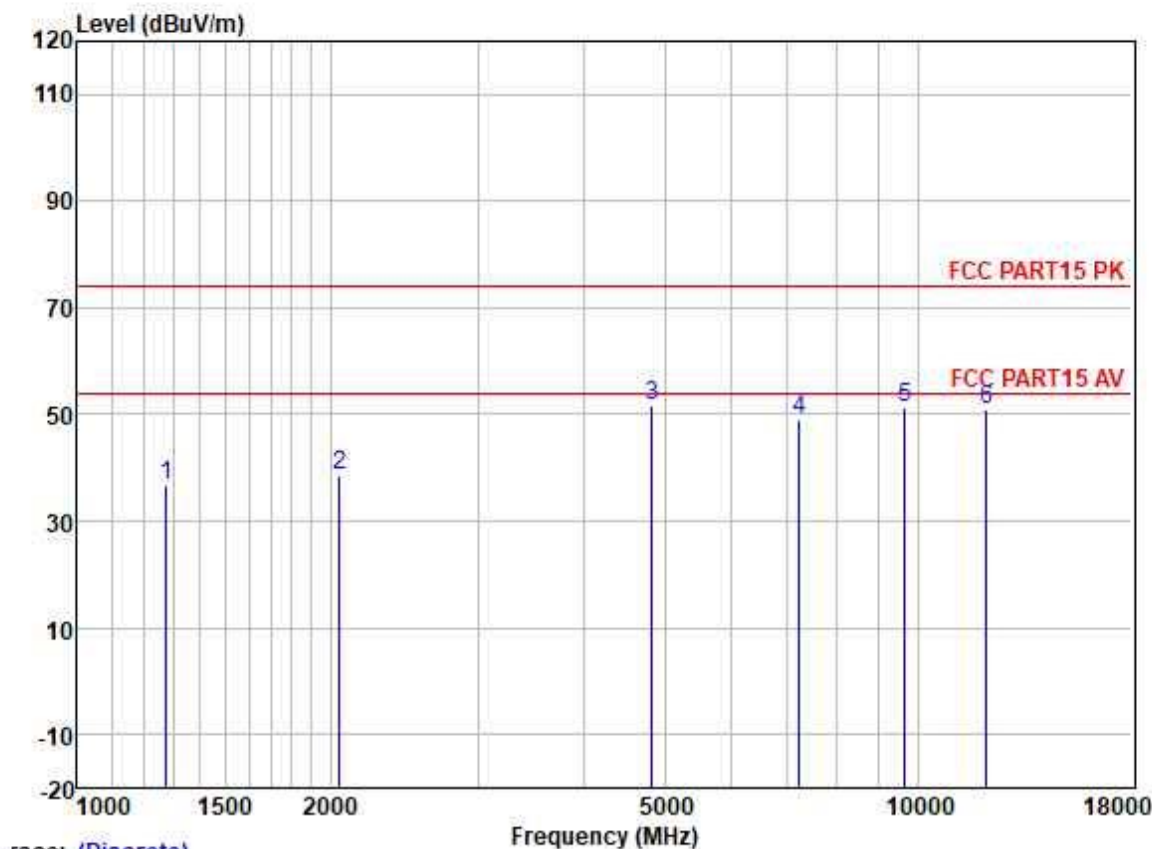
	Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Measured Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuA/m	dBuA/m	dBuA		
1	43.81	24.36	13.79	1.12	27.17	12.10	40.00	-27.90	VERTICAL	QP
2	54.07	25.16	13.80	1.18	27.17	12.97	40.00	-27.03	VERTICAL	QP
3	151.07	25.95	13.80	2.24	26.83	15.16	43.50	-28.34	VERTICAL	QP
4	440.20	26.21	17.00	4.13	27.57	19.77	46.00	-26.23	VERTICAL	QP
5	543.27	25.74	18.50	4.70	28.08	20.86	46.00	-25.14	VERTICAL	QP
6	766.06	26.70	22.20	6.05	28.06	26.89	46.00	-19.11	VERTICAL	QP

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



	Freq	ReadAntenna	Cable	Preamp	Level	Limit	Over	Pol/Phase	Remark
	MHz	Level	Factor	Loss	Factor	Line	Limit		
		dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1238.483	48.89	24.96	2.30	38.35	37.80	74.00	-36.20	VERTICAL Peak
2	2702.799	46.93	27.84	3.60	37.47	40.90	74.00	-33.10	VERTICAL Peak
3	4923.820	52.10	31.62	5.60	36.84	52.48	74.00	-21.52	VERTICAL Peak
4	7386.309	42.77	36.17	6.19	37.45	47.68	74.00	-26.32	VERTICAL Peak
5	9848.689	42.32	38.58	6.99	37.41	50.48	74.00	-23.52	VERTICAL Peak
6	12310.160	41.12	38.63	8.01	36.95	50.81	74.00	-23.19	VERTICAL Peak

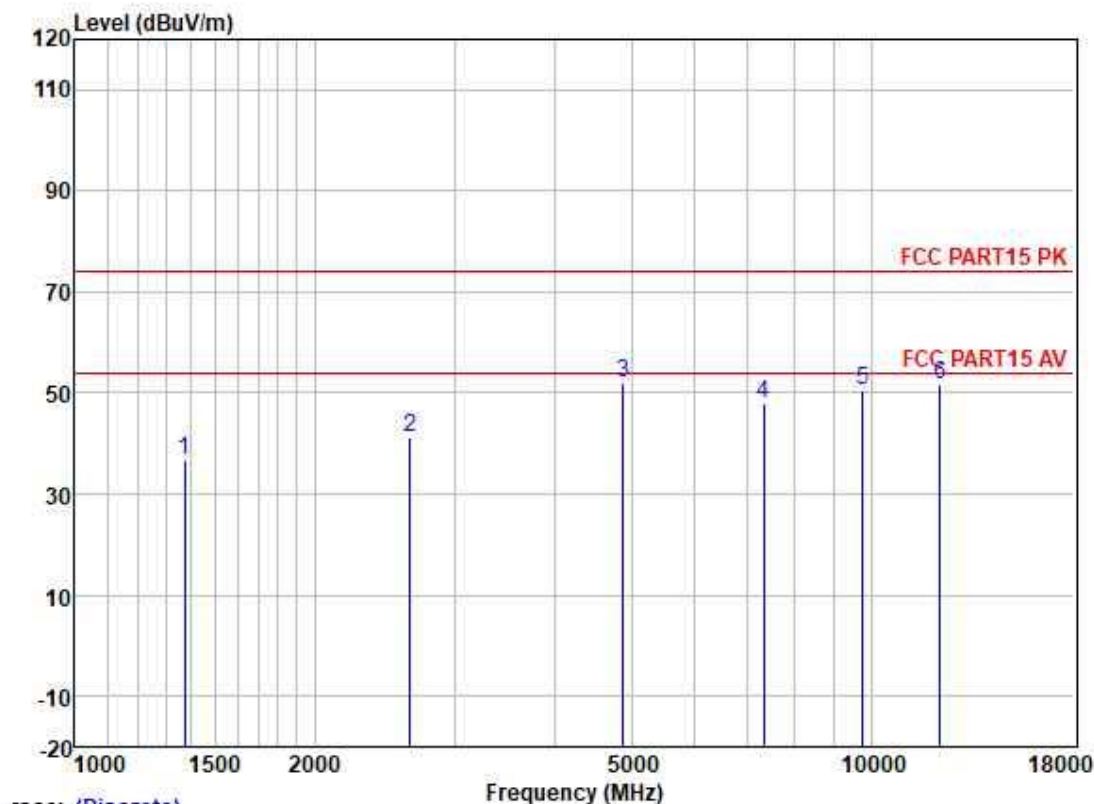
Test Mode: 01; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:Low;



Trace: (Discrete)

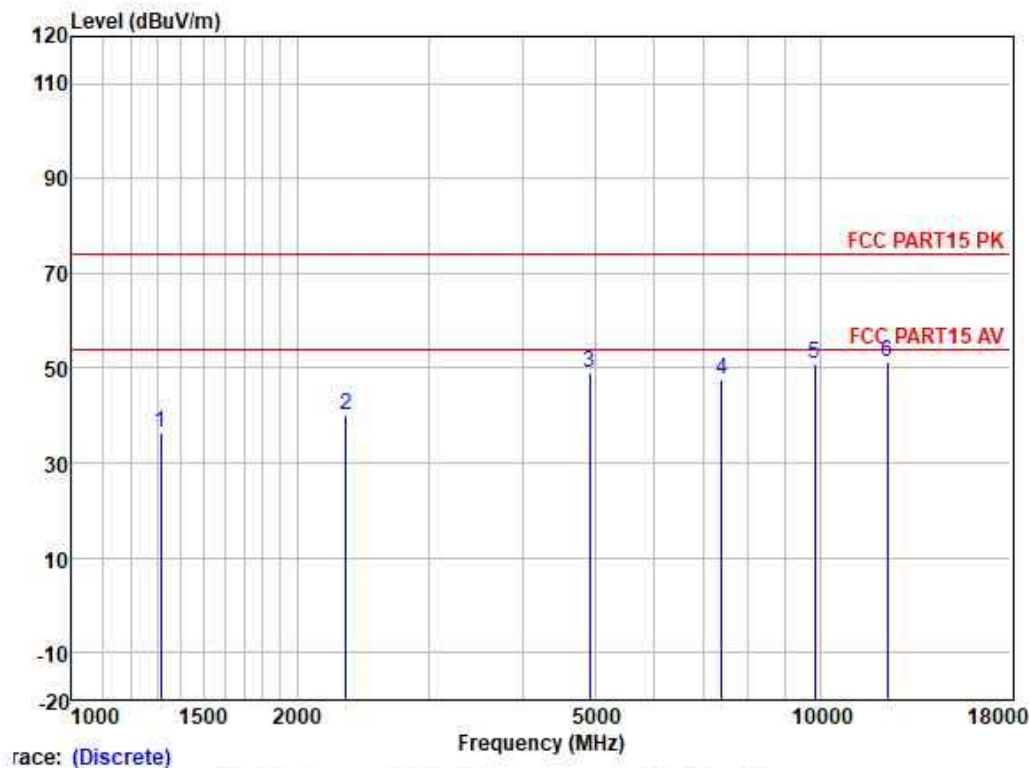
	Read Freq	Antenna Level	Cable Factor	Preamp Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1274.802	47.56	25.12	2.48	38.33	36.83	74.00	-37.17	VERTICAL	Peak
2	2053.822	47.04	26.19	3.12	37.69	38.66	74.00	-35.34	VERTICAL	Peak
3	4824.016	51.54	31.45	5.42	36.83	51.58	74.00	-22.42	VERTICAL	Peak
4	7236.267	44.57	35.70	6.03	37.39	48.91	74.00	-25.09	VERTICAL	Peak
5	9648.497	43.24	38.40	7.06	37.42	51.28	74.00	-22.72	VERTICAL	Peak
6	12060.210	40.96	38.88	8.17	37.08	50.93	74.00	-23.07	VERTICAL	Peak

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



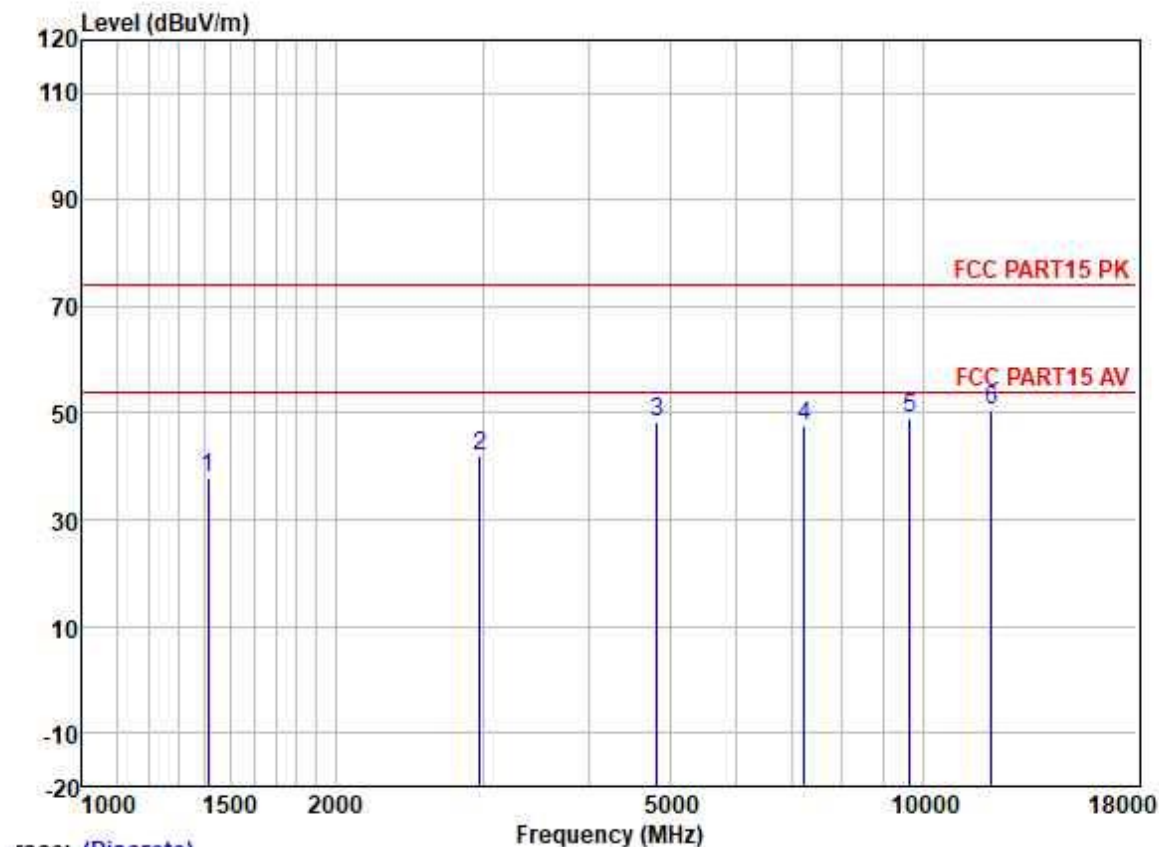
	ReadAntenna	Cable	Preamp		Limit	Over			
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1374.295	46.91	25.35	2.60	38.25	36.61	74.00	-37.39	VERTICAL Peak
2	2633.397	47.34	27.68	3.53	37.51	41.04	74.00	-32.96	VERTICAL Peak
3	4883.910	51.68	31.56	5.52	36.84	51.92	74.00	-22.08	VERTICAL Peak
4	7326.857	43.22	36.00	6.13	37.43	47.92	74.00	-26.08	VERTICAL Peak
5	9768.430	42.30	38.53	7.01	37.41	50.43	74.00	-23.57	VERTICAL Peak
6	12210.780	41.68	38.74	8.08	37.00	51.50	74.00	-22.50	VERTICAL Peak

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



	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	1315.985	46.68	25.24	2.60	38.29	36.23	74.00	-37.77	VERTICAL Peak
2	2325.624	47.04	27.19	3.34	37.62	39.95	74.00	-34.05	VERTICAL Peak
3	4924.214	48.87	31.62	5.60	36.84	49.25	74.00	-24.75	VERTICAL Peak
4	7386.788	42.67	36.17	6.19	37.45	47.58	74.00	-26.42	VERTICAL Peak
5	9848.349	42.73	38.58	6.99	37.41	50.89	74.00	-23.11	VERTICAL Peak
6	12310.130	41.47	38.63	8.01	36.95	51.16	74.00	-22.84	VERTICAL Peak

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



Trace: (Discrete)

	Freq	ReadAntenna	Cable	Preamp	Level	Limit	Over	Pol/Phase	Remark
	MHz	Level	Factor	Loss	Factor	Line	Limit		
		dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1410.514	48.25	25.40	2.62	38.22	38.05	74.00	-35.95	VERTICAL Peak
2	2973.293	47.02	28.38	3.78	37.28	41.90	74.00	-32.10	VERTICAL Peak
3	4824.016	48.39	31.45	5.42	36.83	48.43	74.00	-25.57	VERTICAL Peak
4	7236.888	43.05	35.70	6.03	37.39	47.39	74.00	-26.61	VERTICAL Peak
5	9648.479	41.08	38.40	7.06	37.42	49.12	74.00	-24.88	VERTICAL Peak
6	12060.130	40.65	38.88	8.17	37.08	50.62	74.00	-23.38	VERTICAL Peak