



SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

No. 1 Workshop, M-10, Middle section, Science & Technology Park,
Shenzhen, Guangdong, China 518057

Telephone: +86 (0) 755 2601 2053
Fax: +86 (0) 755 2671 0594
Email: ee.shenzhen@sgs.com

Report No.: SZEM170500540604
Page: 1 of 99

TEST REPORT

Application No.: SZEM1705005406CR
Applicant: PointGrab Ltd.
Address of Applicant: 4 Hacharash St. Building D Floor 12 P.O. Box 6442 Hod Hasharon, Israel
Manufacturer: PointGrab Ltd.
Address of Manufacturer: 4 Hacharash St. Building D Floor 12 P.O. Box 6442 Hod Hasharon, Israel
Factory: EMBEST TECHNOLOGY CO., LTD.
Address of Factory: Tower B 4/F, Shanshui Building, Nanshan Yungu Innovation Industry Park, Liuxian Ave. No.1183, Nanshan District, Shenzhen, Guangdong, China
Equipment Under Test (EUT):
EUT Name: Cognipoint
Model No.: PG1
FCC ID: 2AMYJPG1001A
Standards: 47 CFR Part 15, Subpart C 15.247
Date of Receipt: 2017-06-05
Date of Test: 2017-06-12 to 2017-06-29
Date of Issue: 2017-07-10

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

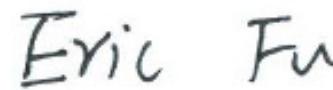
* In the configuration tested, the EUT complied with the standards specified above.

Jack Zhang
EMC Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals 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.

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2017-07-10		Original

Authorized for issue by:			
		Hank Yan /Project Engineer	
		Eric Fu /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(c)	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
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
Conducted Peak Output Power	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 11.9.1.3	47 CFR Part 15, Subpart C 15.247(b)(3)	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 15.209 & 15.247(d)	Pass
Radiated Spurious Emissions	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.10.4	47 CFR Part 15, Subpart C 15.209 & 15.247(d)	Pass

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	7
4.3 MEASUREMENT UNCERTAINTY	7
4.4 TEST LOCATION	8
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 <i>Test Requirement:</i>	12
6.1.2 <i>Conclusion</i>	12
7 RADIO SPECTRUM MATTER TEST RESULTS	13
7.1 CONDUCTED EMISSIONS AT AC POWER LINE (150kHz-30MHz)	13
7.1.1 <i>E.U.T. Operation</i>	13
7.1.2 <i>Test Setup Diagram</i>	13
7.1.3 <i>Measurement Procedure and Data</i>	14
7.2 MINIMUM 6DB BANDWIDTH	17
7.2.1 <i>E.U.T. Operation</i>	17
7.2.2 <i>Test Setup Diagram</i>	17
7.2.3 <i>Measurement Procedure and Data</i>	17
7.3 CONDUCTED PEAK OUTPUT POWER	18
7.3.1 <i>E.U.T. Operation</i>	18
7.3.2 <i>Test Setup Diagram</i>	18
7.3.3 <i>Measurement Procedure and Data</i>	18
7.4 POWER SPECTRUM DENSITY	19
7.4.1 <i>E.U.T. Operation</i>	19
7.4.2 <i>Test Setup Diagram</i>	19
7.4.3 <i>Measurement Procedure and Data</i>	19
7.5 CONDUCTED BAND EDGES MEASUREMENT	20
7.5.1 <i>E.U.T. Operation</i>	20
7.5.2 <i>Test Setup Diagram</i>	20
7.5.3 <i>Measurement Procedure and Data</i>	20
7.6 CONDUCTED SPURIOUS EMISSIONS	21
7.6.1 <i>E.U.T. Operation</i>	21
7.6.2 <i>Test Setup Diagram</i>	21
7.6.3 <i>Measurement Procedure and Data</i>	21
7.7 RADIATED EMISSIONS WHICH FALL IN THE RESTRICTED BANDS	22
7.7.1 <i>E.U.T. Operation</i>	22
7.7.2 <i>Test Setup Diagram</i>	22

7.7.3 <i>Measurement Procedure and Data</i>	23
7.8 RADIATED SPURIOUS EMISSIONS	36
7.8.1 <i>E.U.T. Operation</i>	37
7.8.2 <i>Test Setup Diagram</i>	37
7.8.3 <i>Measurement Procedure and Data</i>	38
8 PHOTOPHOTOGRAPHS.....	59
8.1 CONDUCTED EMISSIONS AT AC POWER LINE (150KHz-30MHz) TEST SETUP	59
8.2 RADIATED SPURIOUS EMISSIONS TEST SETUP	59
8.3 EUT CONSTRUCTIONAL DETAILS	61
9 APPENDIX.....	62
9.1 APPENDIX 15.247.....	62

4 General Information

4.1 Details of E.U.T.

Power supply:	Option 1. Powered by DC 12V
	Option 2. Powered by PoE port
Operation Frequency:	IEEE 802.11b/g/n(HT20): 2412MHz to 2462MHz
Channel Numbers:	IEEE 802.11b/g, IEEE 802.11n HT20: 11 Channels
Channel Separation:	5MHz
Type of Modulation:	IEEE for 802.11b: DSSS(CCK,DQPSK,DBPSK) IEEE for 802.11g : OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE for 802.11n(HT20) : OFDM (64QAM, 16QAM, QPSK,BPSK)
Antenna Type:	Chip Antenna
Antenna Gain:	1.5dBi

Channel list for 802.11b/g/n(HT20)							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2412MHz	4	2427MHz	7	2442MHz	10	2457MHz
2	2417MHz	5	2432MHz	8	2447MHz	11	2462MHz
3	2422MHz	6	2437MHz	9	2452MHz		

Selected Test Channel for 802.11b/g/n(HT20)	
Channel	Frequency
The lowest channel (CH1)	2412MHz
The middle channel (CH6)	2437MHz
The highest channel (CH11)	2462MHz

4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Network Cable	Provided by Customer	Shielded network cable	--
Power Adapter	XP Power	VEL12US120-US-JA	--
PoE Adapter	PHIHONG	POE31U-1AT	--

4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	7.25 x 10-8
2	Duty cycle	0.37%
3	Occupied Bandwidth	3%
4	RF conducted power	0.75dB
5	RF power density	2.84dB
6	Conducted Spurious emissions	0.75dB
7	RF Radiated power	4.5dB (below 1GHz)
		4.8dB (above 1GHz)
8	Radiated Spurious emission test	4.5dB (30MHz-1GHz)
		4.8dB (1GHz-18GHz)
9	Temperature test	1 °C
10	Humidity test	3%
11	Supply voltages	1.5%
12	Time	3%

4.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China.
518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

4.5 Test Facility

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

- CNAS (No. CNAS L2929)**

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

- VCCI**

The 10m Semi-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.: G-823, R-4188, T-1153 and C-2383 respectively.

- FCC – Registration No.: 556682**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No.: 556682.

- Industry Canada (IC)**

Two 3m Semi-anechoic chambers and the 10m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1, 4620C-2, 4620C-3.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None

5 Equipment List

Conducted Emissions at AC Power Line (150kHz-30MHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Shielding Room	ZhongYu Electron	GB-88	SEM001-06	2017-05-10	2018-05-10
Measurement Software	AUDIX	e3 V5.4.1221d	N/A	N/A	N/A
LISN	Rohde & Schwarz	ENV216	SEM007-01	2016-10-09	2017-10-09
LISN	ETS-LINDGREN	3816/2	SEM007-02	2017-04-14	2018-04-13
8 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T8-02	EMC0120	2016-09-28	2017-09-28
4 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T4-02	EMC0121	2016-09-28	2017-09-28
2 Line ISN	Fischer Custom	FCC-TLISN-T2-02	EMC0122	2016-09-28	2017-09-28

Minimum 6dB Bandwidth					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
DC Power Supply	ZhaoXin	RXN-305D	SEM011-02	2016-10-09	2017-10-09
Spectrum Analyzer	Rohde & Schwarz	FSP	SEM004-06	2016-10-09	2017-10-09
Measurement Software	JS Tonscend	JS1120-2 BT/WIFI V2.	N/A	N/A	N/A
Signal Generator	Rohde & Schwarz	SML03	SEM006-02	2017-04-14	2018-04-13
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2016-10-09	2017-10-09

Conducted Peak Output Power					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
DC Power Supply	ZhaoXin	RXN-305D	SEM011-02	2016-10-09	2017-10-09
Spectrum Analyzer	Rohde & Schwarz	FSP	SEM004-06	2016-10-09	2017-10-09
Measurement Software	JS Tonscend	JS1120-2 BT/WIFI V2.	N/A	N/A	N/A
Signal Generator	Rohde & Schwarz	SML03	SEM006-02	2017-04-14	2018-04-13
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2016-10-09	2017-10-09

Power Spectrum Density

Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
DC Power Supply	ZhaoXin	RXN-305D	SEM011-02	2016-10-09	2017-10-09
Spectrum Analyzer	Rohde & Schwarz	FSP	SEM004-06	2016-10-09	2017-10-09
Measurement Software	JS Tonscend	JS1120-2 BT/WIFI V2.	N/A	N/A	N/A
Signal Generator	Rohde & Schwarz	SML03	SEM006-02	2017-04-14	2018-04-13
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2016-10-09	2017-10-09

Conducted Band Edges Measurement

Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
DC Power Supply	ZhaoXin	RXN-305D	SEM011-02	2016-10-09	2017-10-09
Spectrum Analyzer	Rohde & Schwarz	FSP	SEM004-06	2016-10-09	2017-10-09
Measurement Software	JS Tonscend	JS1120-2 BT/WIFI V2.	N/A	N/A	N/A
Signal Generator	Rohde & Schwarz	SML03	SEM006-02	2017-04-14	2018-04-13
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2016-10-09	2017-10-09

Conducted Spurious Emissions

Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
DC Power Supply	ZhaoXin	RXN-305D	SEM011-02	2016-10-09	2017-10-09
Spectrum Analyzer	Rohde & Schwarz	FSP	SEM004-06	2016-10-09	2017-10-09
Measurement Software	JS Tonscend	JS1120-2 BT/WIFI V2.	N/A	N/A	N/A
Signal Generator	Rohde & Schwarz	SML03	SEM006-02	2017-04-14	2018-04-13
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2016-10-09	2017-10-09

RE in Chamber					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date (yyyy-mm-dd)	Cal. Due date (yyyy-mm-dd)
3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEM001-01	2017-05-10	2018-05-10
MXE EMI Receiver (20Hz-8.4GHz)	Agilent Technologies	N9038A	SEM004-05	2016-10-09	2017-10-09
BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEM003-02	2017-03-05	2020-03-05
Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEM005-01	2017-04-14	2018-04-13
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A

General used equipment					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-03	2016-10-12	2017-10-12
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-04	2016-10-12	2017-10-12
Humidity/ Temperature Indicator	Mingle	N/A	SEM002-08	2016-10-12	2017-10-12
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2017-04-18	2018-04-18

6 Radio Spectrum Technical Requirement

6.1 Antenna Requirement

6.1.1 Test Requirement:

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

6.1.2 Conclusion

Standard Requirement:

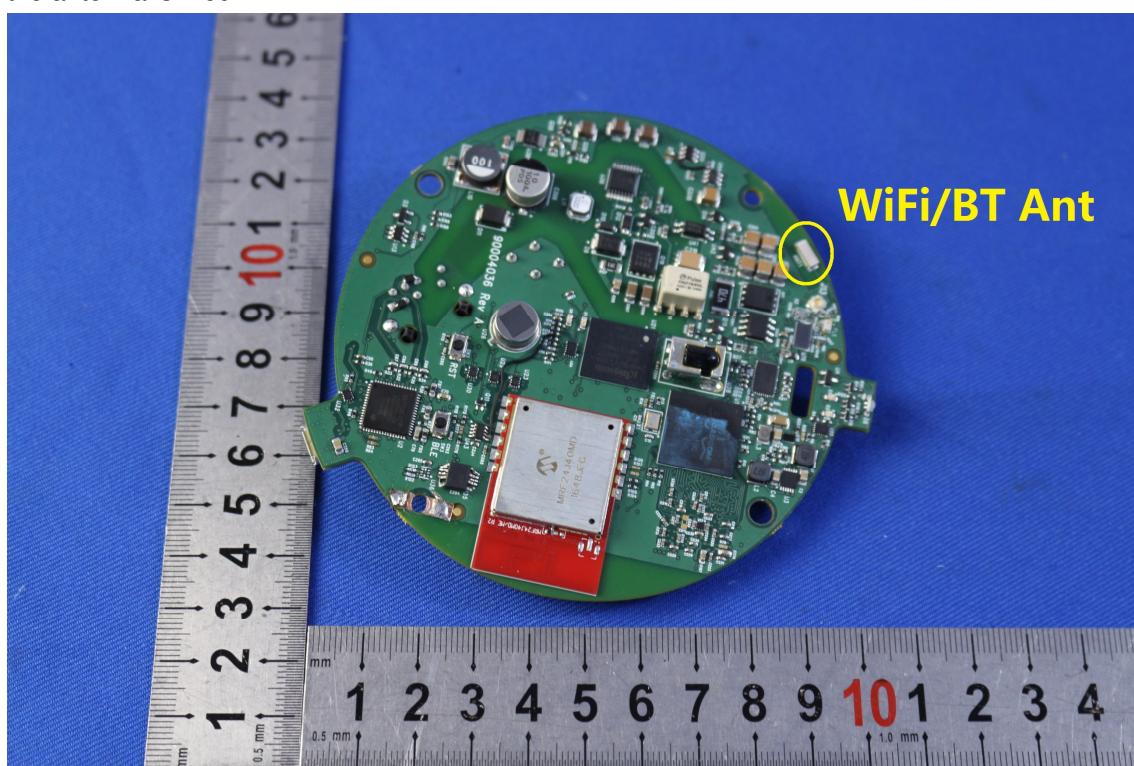
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit 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 1.5dBi.



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(dB μ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

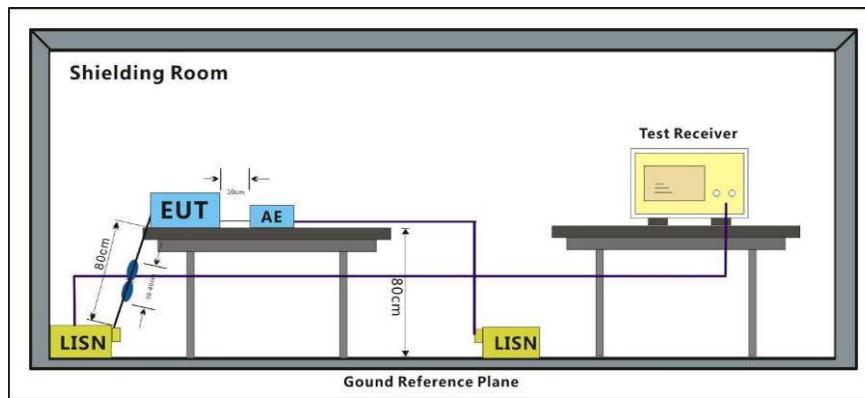
7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 25 °C Humidity: 55 % RH Atmospheric Pressure: 1010 mbar

Test mode e: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.

7.1.2 Test Setup Diagram

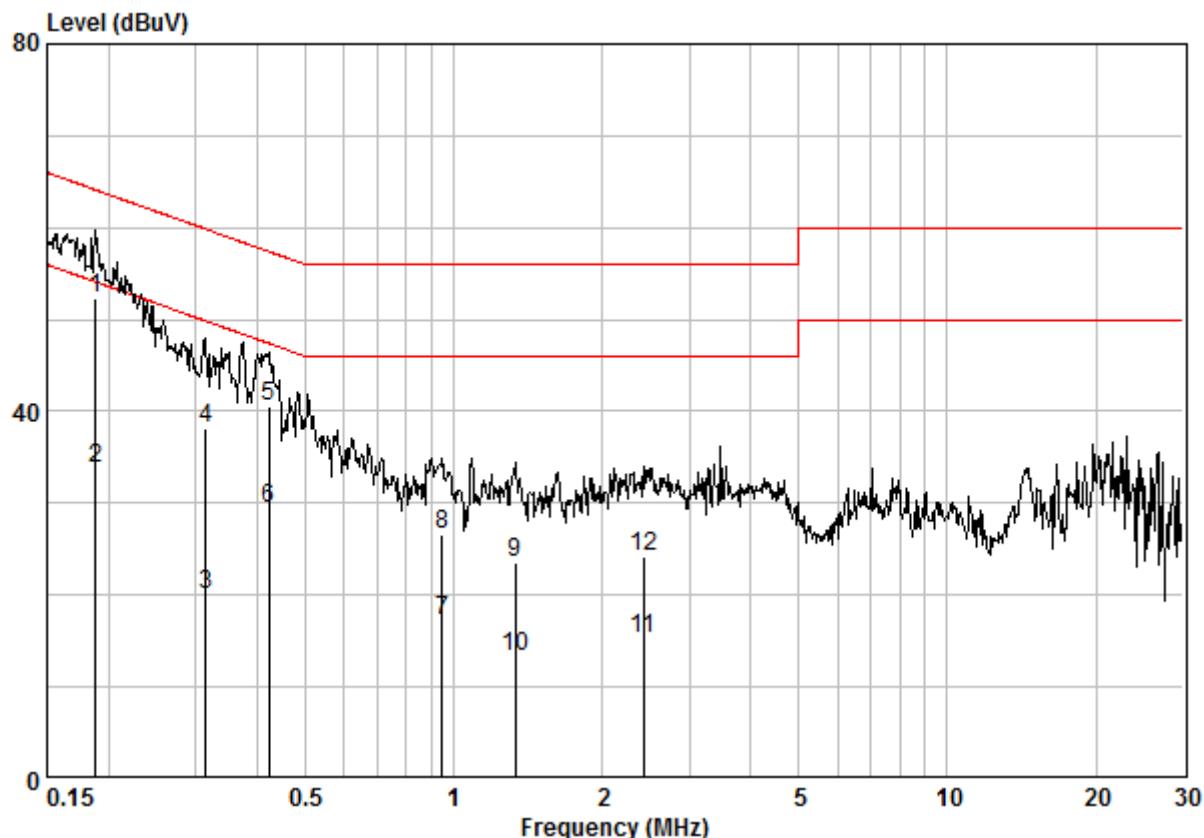


7.1.3 Measurement Procedure and Data

- 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/50 μ H + 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: The EUT had been tested under both power option mode, and found the power option1 is worse. Only the data of worst case is recorded in the report.

Mode:e; Line:Live Line



Site : Shielding Room

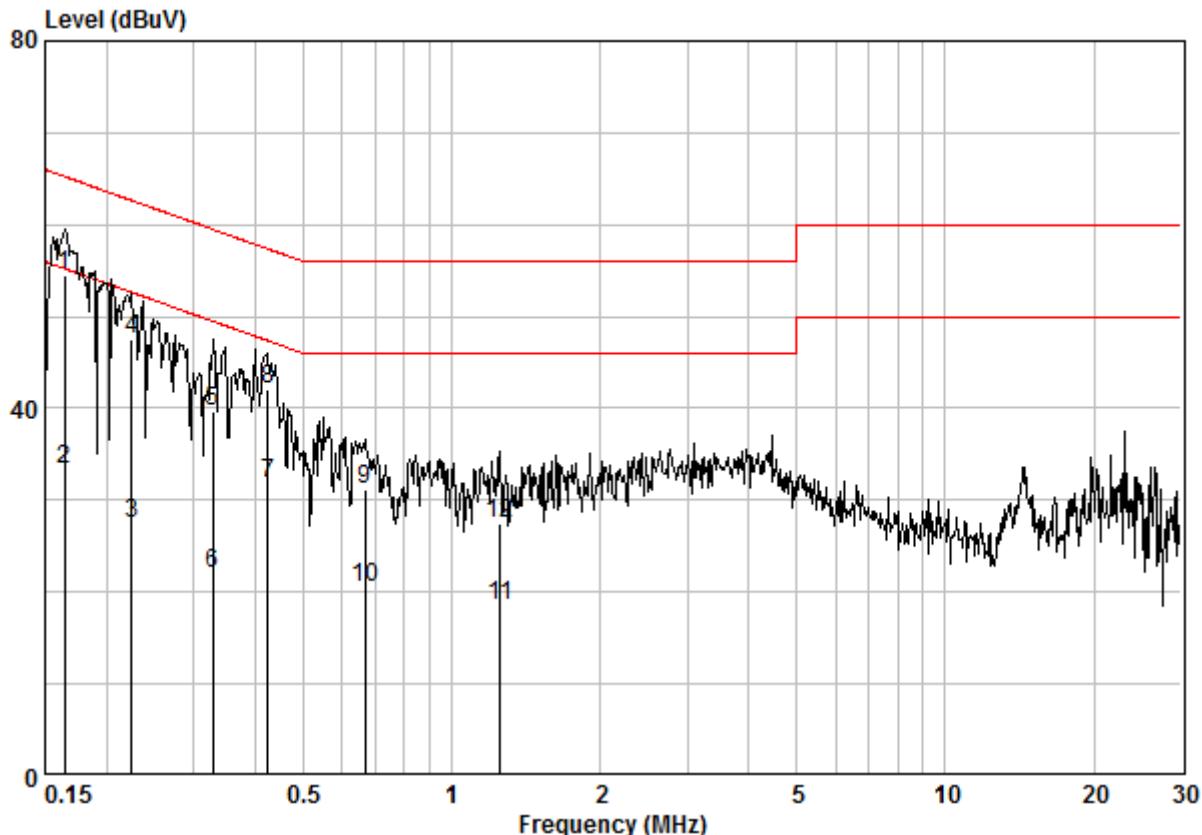
Condition : CE LINE

Job No. : 05406CR

Test Mode : e

	Freq	Cable	LISN	Read	Limit	Over	Remark
		Loss	Factor	Level	Level	Line	
	MHz	dB	dB	dBuV	dBuV	dBuV	dB
1	0.18838	0.02	9.64	42.74	52.40	64.11	-11.71 QP
2	0.18838	0.02	9.64	24.13	33.79	54.11	-20.32 AVERAGE
3	0.31495	0.02	9.64	10.37	20.03	49.84	-29.81 AVERAGE
4	0.31495	0.02	9.64	28.40	38.06	59.84	-21.78 QP
5	0.42149	0.02	9.64	30.95	40.61	57.42	-16.81 QP
6	0.42149	0.02	9.64	19.79	29.45	47.42	-17.97 AVERAGE
7	0.94809	0.03	9.65	7.57	17.25	46.00	-28.75 AVERAGE
8	0.94809	0.03	9.65	16.99	26.67	56.00	-29.33 QP
9	1.331	0.03	9.66	13.92	23.61	56.00	-32.39 QP
10	1.331	0.03	9.66	3.57	13.26	46.00	-32.74 AVERAGE
11	2.422	0.03	9.68	5.65	15.36	46.00	-30.64 AVERAGE
12	2.422	0.03	9.68	14.46	24.17	56.00	-31.83 QP

Mode:e; Line:Neutral Line



Site : Shielding Room

Condition : CE NEUTRAL

Job No. : 05406CR

Test Mode : e

	Freq	Cable	LISN	Read	Limit	Over	Remark
		Loss	Factor	Level			
	MHz	dB	dB	dBuV	dBuV	dBuV	dB
1 @	0.16414	0.02	9.63	44.75	54.41	65.25	-10.84 QP
2	0.16414	0.02	9.63	23.71	33.36	55.25	-21.89 AVERAGE
3	0.22437	0.02	9.63	17.80	27.45	52.66	-25.20 AVERAGE
4	0.22437	0.02	9.63	37.91	47.56	62.66	-15.09 QP
5	0.32858	0.02	9.63	30.13	39.78	59.49	-19.71 QP
6	0.32858	0.02	9.63	12.28	21.93	49.49	-27.56 AVERAGE
7	0.42373	0.02	9.63	22.20	31.85	47.37	-15.53 AVERAGE
8	0.42373	0.02	9.63	32.43	42.08	57.37	-15.30 QP
9	0.66832	0.02	9.64	21.56	31.22	56.00	-24.78 QP
10	0.66832	0.02	9.64	10.82	20.49	46.00	-25.51 AVERAGE
11	1.255	0.03	9.64	8.85	18.52	46.00	-27.48 AVERAGE
12	1.255	0.03	9.64	17.80	27.48	56.00	-28.52 QP

7.2 Minimum 6dB Bandwidth

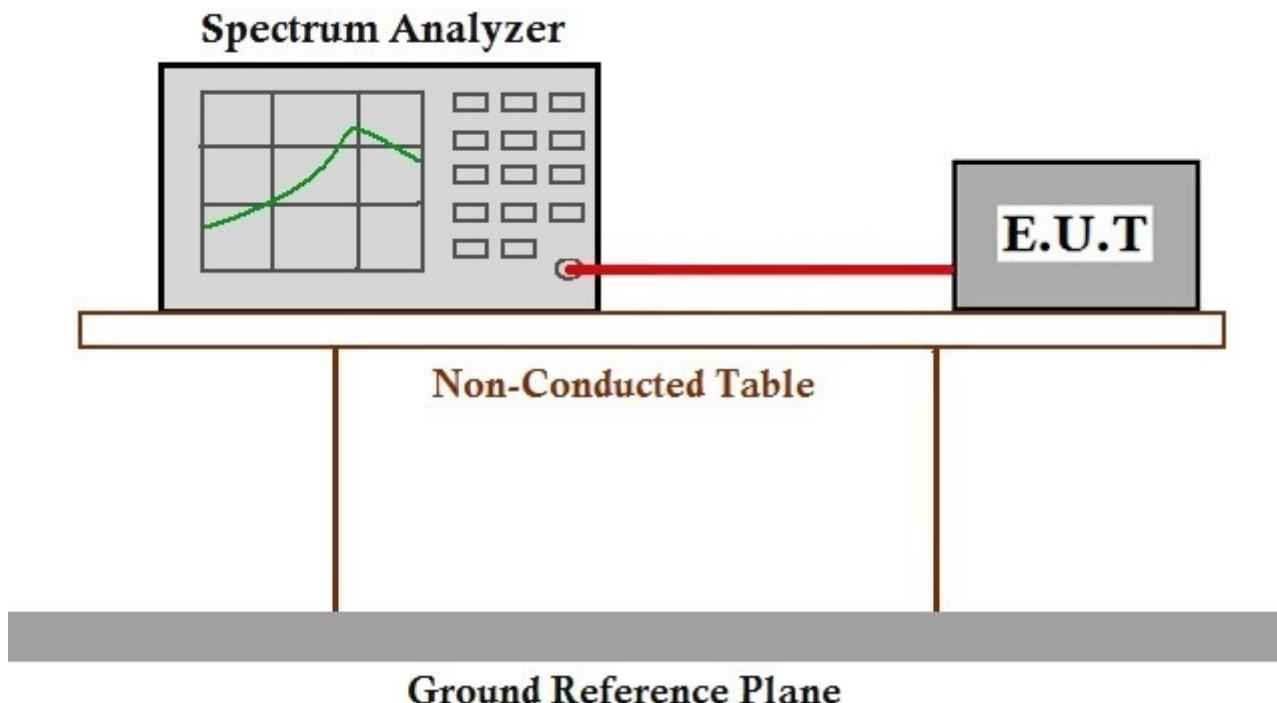
Test Requirement 47 CFR Part 15, Subpart C 15.247a(2)
Test Method: ANSI C63.10 (2013) Section 11.8.1
Limit: ≥ 500 kHz

7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 25 °C Humidity: 55 % RH Atmospheric Pressure: 1010 mbar
Test mode e: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.

7.2.2 Test Setup Diagram



7.2.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.247

7.3 Conducted Peak Output Power

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

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

Limit:

Frequency range(MHz)	Output power of the intentional radiator(watt)
902-928	1 for ≥ 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

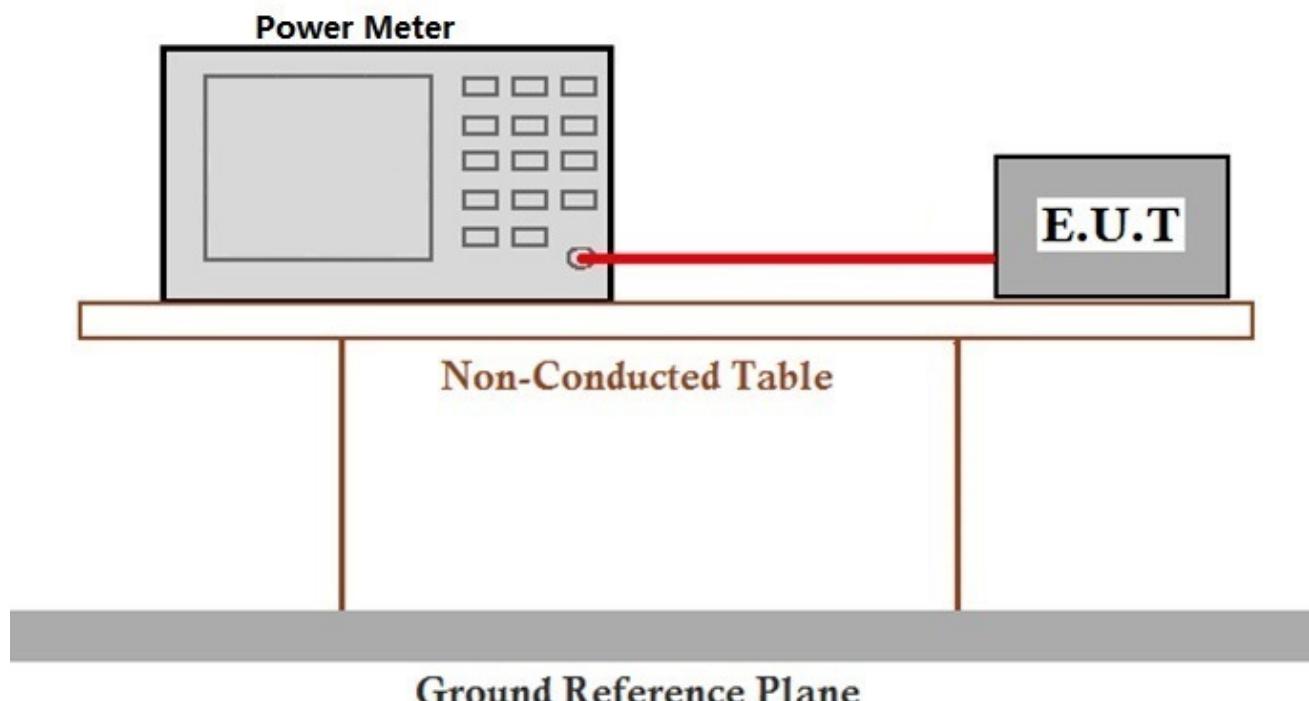
7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 25 °C Humidity: 55 % RH Atmospheric Pressure: 1010 mbar

Test mode e: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.

7.3.2 Test Setup Diagram



7.3.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.247

7.4 Power Spectrum Density

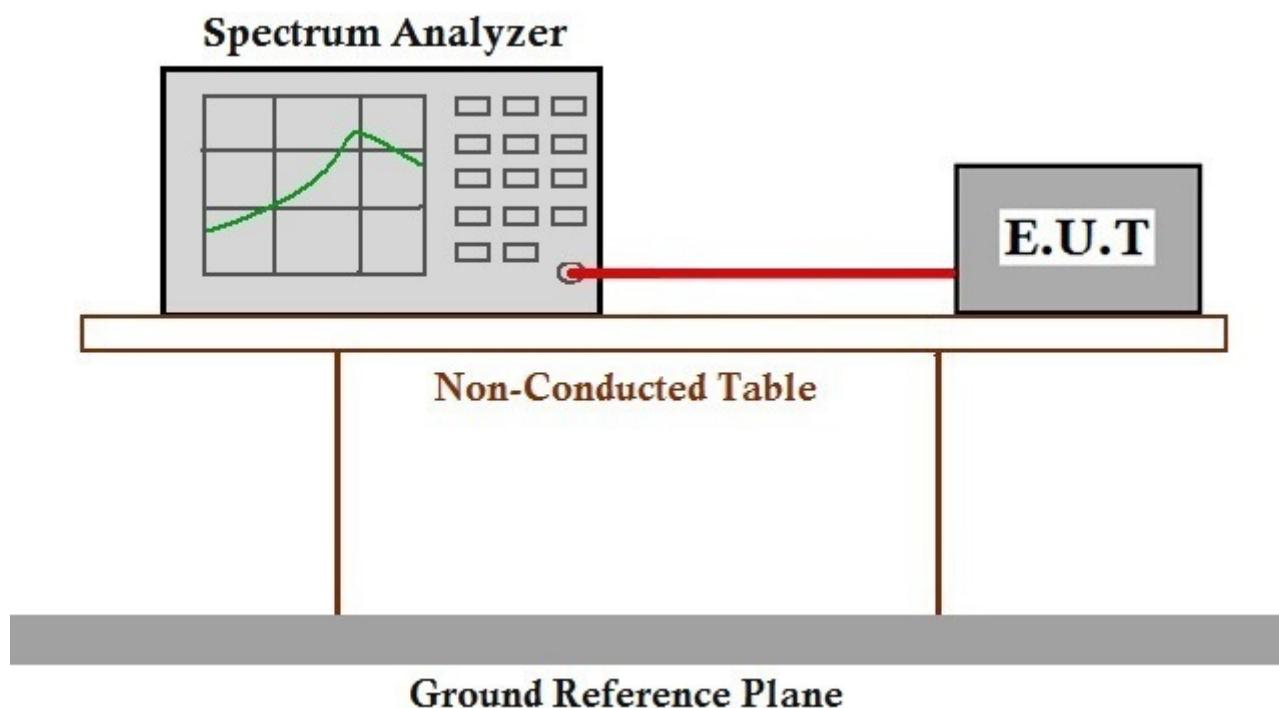
Test Requirement 47 CFR Part 15, Subpart C 15.247(e)
Test Method: ANSI C63.10 (2013) Section 11.10.2
Limit: $\leq 8\text{dBm}$ in any 3 kHz band during any time interval of continuous transmission

7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 25 °C Humidity: 55 % RH Atmospheric Pressure: 1010 mbar
Test mode e: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.

7.4.2 Test Setup Diagram



7.4.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.247

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

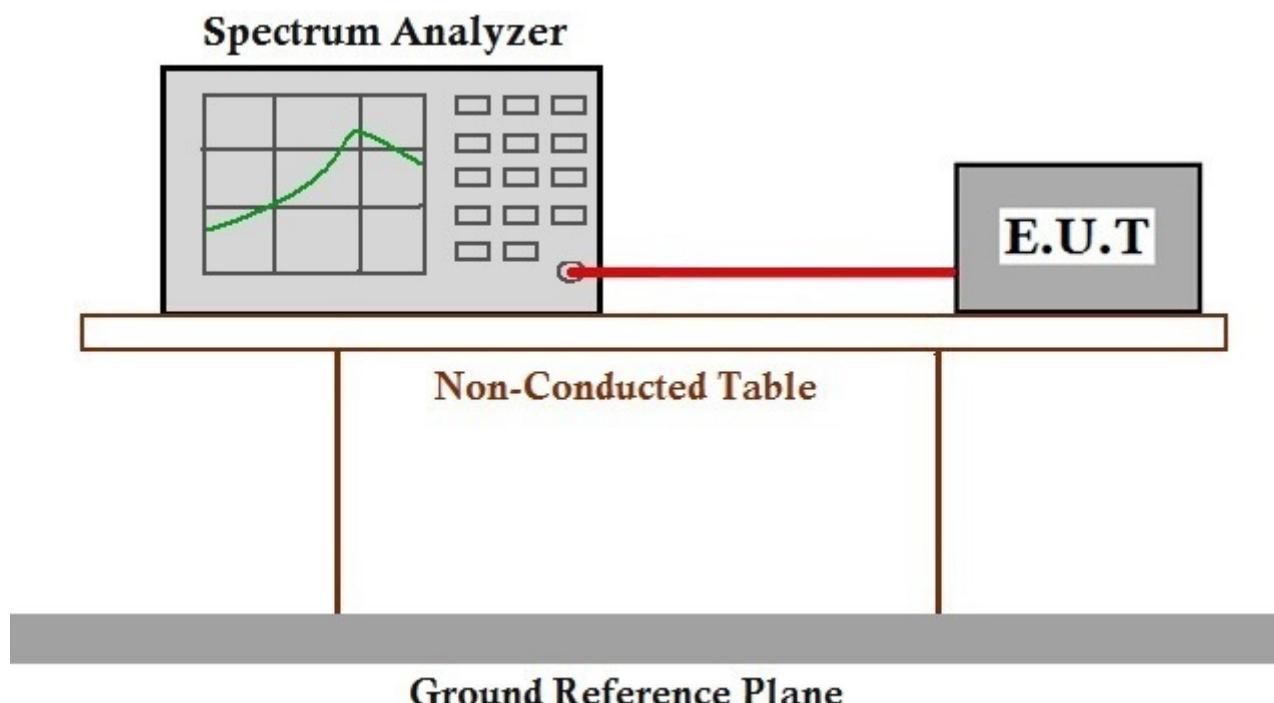
7.5.1 E.U.T. Operation

Operating Environment:

Temperature: 25 °C Humidity: 55 % RH Atmospheric Pressure: 1010 mbar

Test mode e: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.

7.5.2 Test Setup Diagram



7.5.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.247

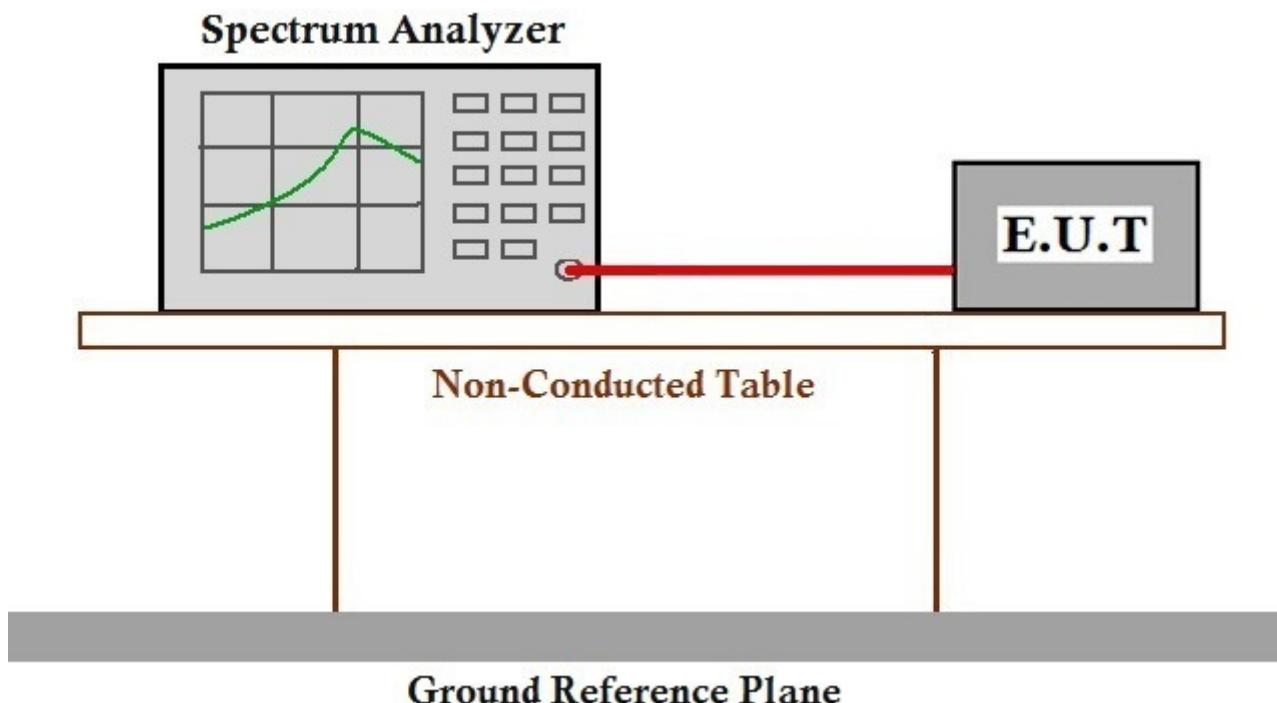
7.6 Conducted Spurious Emissions

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 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.

7.6.1 E.U.T. Operation

Operating Environment:
Temperature: 25 °C Humidity: 55 % RH Atmospheric Pressure: 1010 mbar
Test mode e: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.

7.6.2 Test Setup Diagram



7.6.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.247

7.7 Radiated Emissions which fall in the restricted bands

Test Requirement 47 CFR Part 15, Subpart C 15.209 & 15.247(d)

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

Measurement Distance: 3m

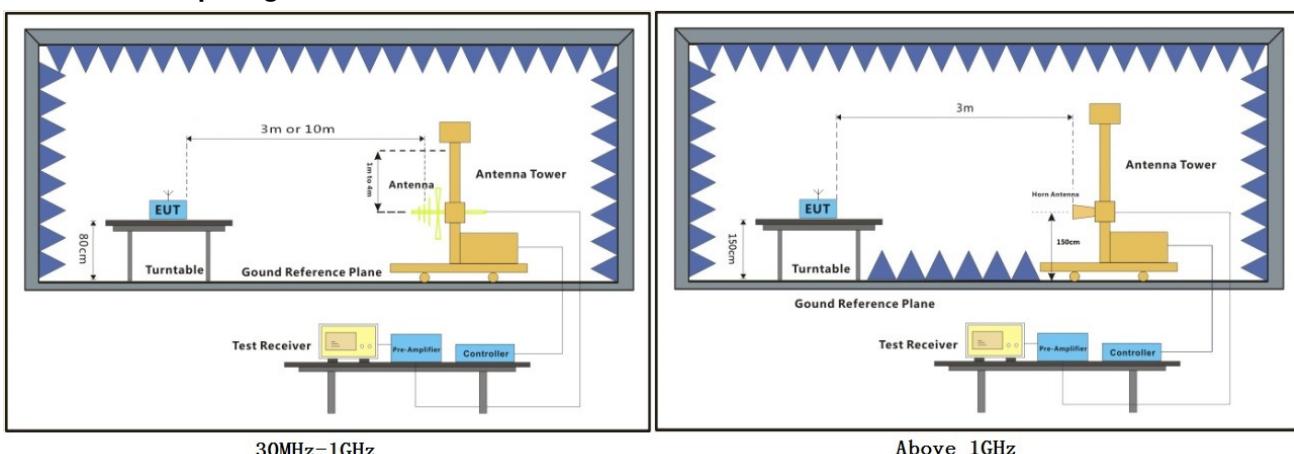
7.7.1 E.U.T. Operation

Operating Environment:

Temperature: 23 °C Humidity: 54 % RH Atmospheric Pressure: 1005 mbar

Test mode e: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.

7.7.2 Test Setup Diagram

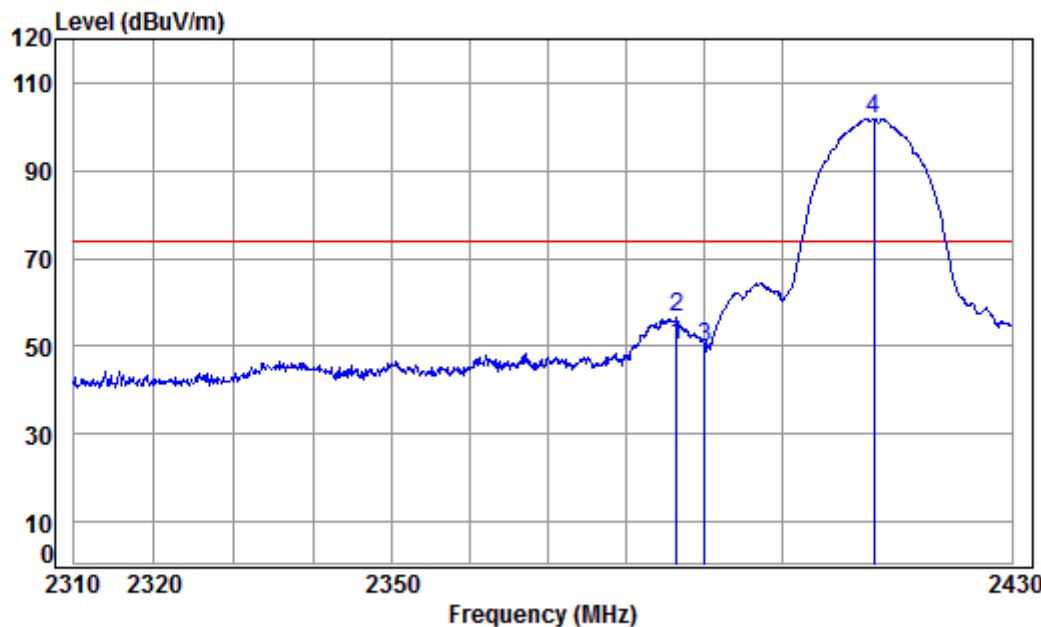


7.7.3 Measurement Procedure and Data

- 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: The EUT had been tested under both power option mode, and found the power option1 is worse. Only the data of worst case is recorded in the report.

Mode:e; Polarization:Horizontal; Modulation Type:802.11b; bandwidth:20MHz; Channel:Low



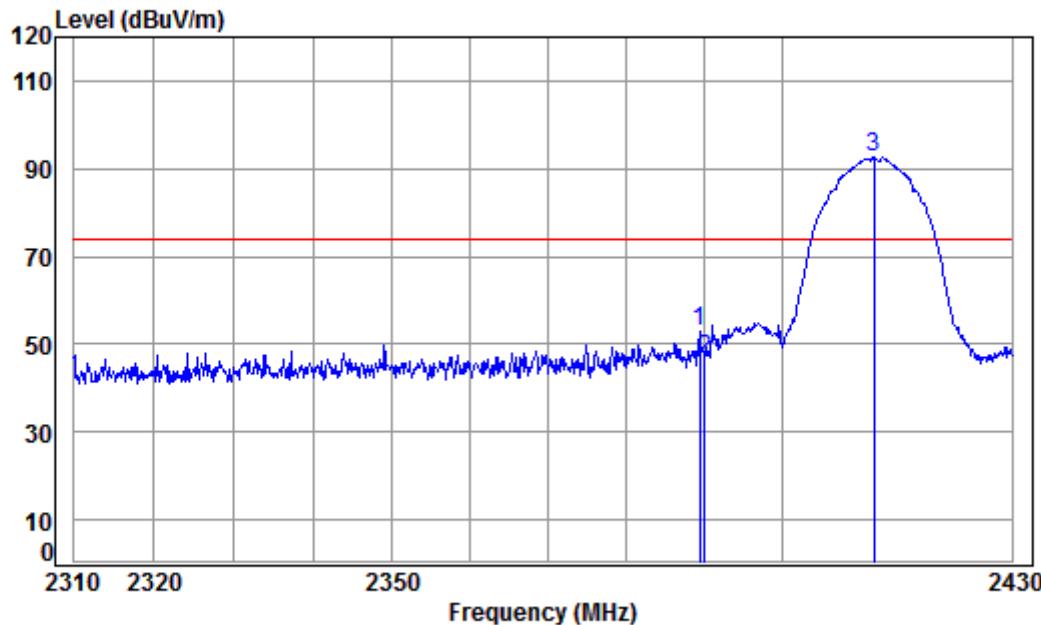
Condition: 3m HORIZONTAL

Job No: : 05406CR

Mode: : 2412 Band edge
: WIFI 11B

	Cable	Ant	Preamp	Read	Limit	Over	
Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dB
1	av	2386.461	5.33	29.07	37.96	53.63	50.07
2		2386.461	5.33	29.07	37.96	59.91	56.35
3		2390.000	5.34	29.08	37.96	53.34	49.80
4	pp	2411.977	5.35	29.14	37.96	105.38	101.91
							74.00
							74.00
							-3.93
							Average
							-17.65
							peak
							-24.20
							peak
							27.91
							peak

Mode:e; Polarization:Vertical; Modulation Type:802.11b; bandwidth:20MHz; Channel:Low



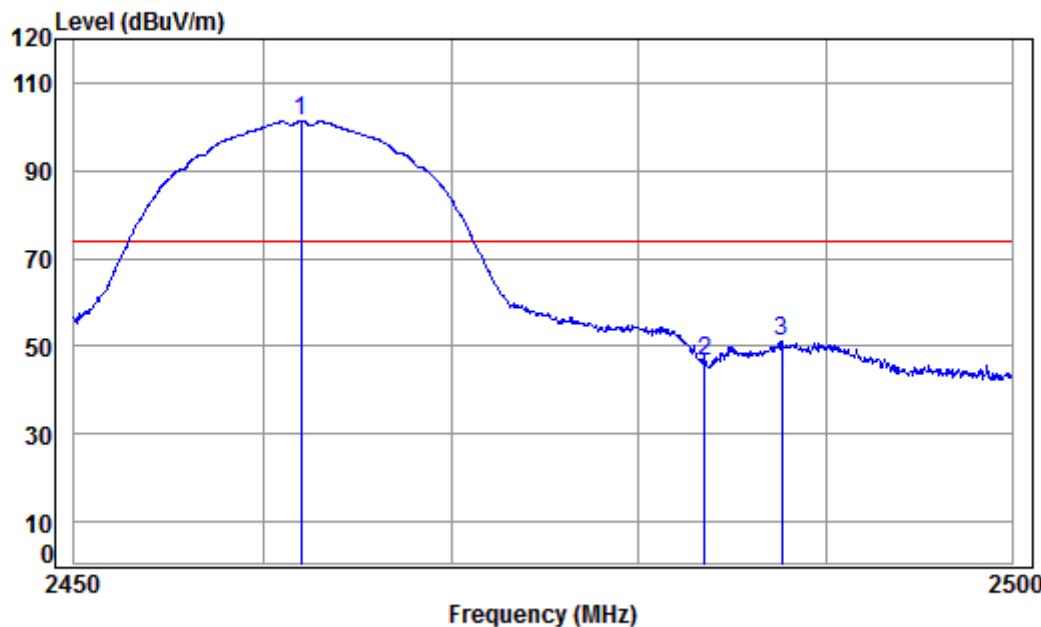
Condition: 3m VERTICAL

Job No: : 05406CR

Mode: : 2412 Band edge
: WIFI 11B

	Cable Freq	Ant Loss	Preamp Factor	Read Level	Limit Level	Over Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2389.363	5.34	29.08	37.96	56.37	52.83	74.00	-21.17 peak
2	2390.000	5.34	29.08	37.96	49.91	46.37	74.00	-27.63 peak
3	pp 2411.977	5.35	29.14	37.96	96.06	92.59	74.00	18.59 peak

Mode:e; Polarization:Horizontal; Modulation Type:802.11b; bandwidth:20MHz; Channel:High



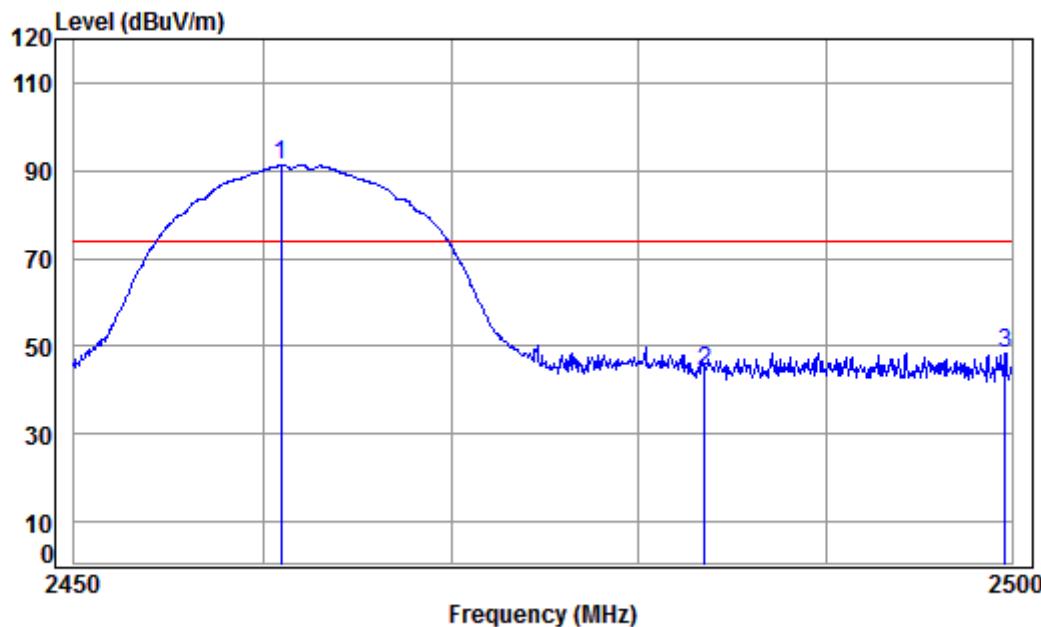
Condition: 3m HORIZONTAL

Job No: : 05406CR

Mode: : 2462 Band edge
: WIFI 11B

	Cable Freq	Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Over Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 pp	2462.008	5.39	29.29	37.95	104.52	101.25	74.00	27.25	peak
2	2483.500	5.41	29.35	37.95	49.72	46.53	74.00	-27.47	peak
3	2487.656	5.41	29.36	37.95	54.19	51.01	74.00	-22.99	peak

Mode:e; Polarization:Vertical; Modulation Type:802.11b; bandwidth:20MHz; Channel:High



Condition: 3m VERTICAL

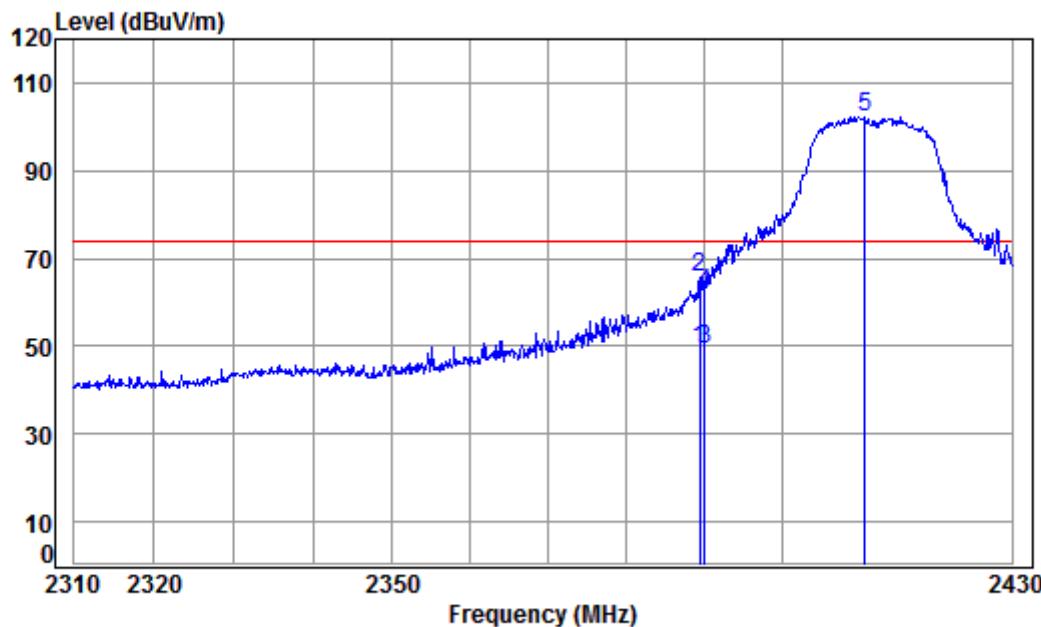
Job No: : 05406CR

Mode: : 2462 Band edge
: WIFI 11B

	Cable	Ant	Preamp	Read	Limit	Over	
--	-------	-----	--------	------	-------	------	--

1 pp	2460.963	5.39	29.29	37.95	94.54	91.27	74.00	17.27	peak
2	2483.500	5.41	29.35	37.95	47.35	44.16	74.00	-29.84	peak
3	2499.646	5.42	29.40	37.95	51.52	48.39	74.00	-25.61	peak

Mode:e; Polarization:Horizontal; Modulation Type:802.11g; bandwidth:20MHz; Channel:Low



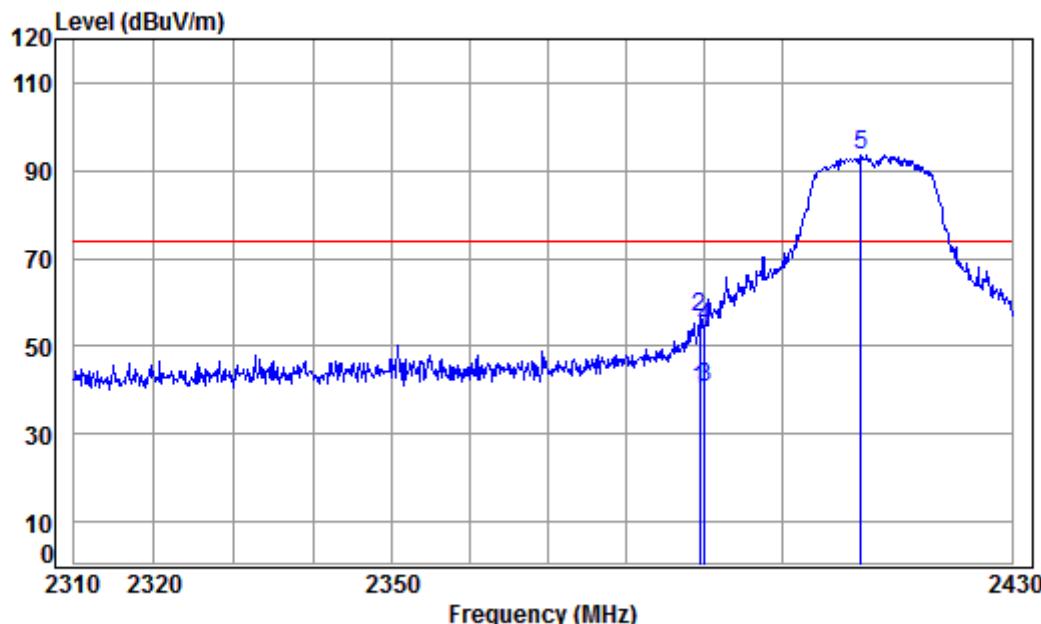
Condition: 3m HORIZONTAL

Job No: : 05406CR

Mode: : 2412 Band edge
: WIFI 11G

	Cable Freq	Ant Loss	Preamp Factor	Read Level	Limit Level	Line Level	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2389.363	5.34	29.08	37.96	52.75	49.21	54.00	-4.79 Average
2	2389.363	5.34	29.08	37.96	69.39	65.85	74.00	-8.15 peak
3 av	2390.000	5.34	29.08	37.96	52.95	49.41	54.00	-4.59 Average
4	2390.000	5.34	29.08	37.96	65.74	62.20	74.00	-11.80 peak
5 pp	2410.756	5.35	29.14	37.96	105.75	102.28	74.00	28.28 peak

Mode:e; Polarization:Vertical; Modulation Type:802.11g; bandwidth:20MHz; Channel:Low



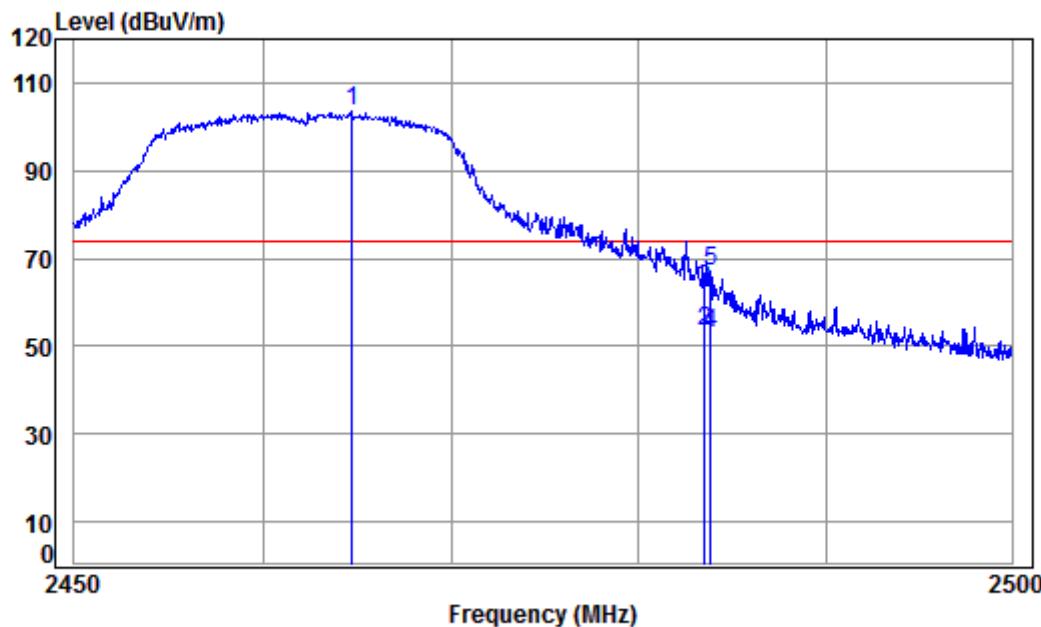
Condition: 3m VERTICAL

Job No: : 05406CR

Mode: : 2412 Band edge
: WIFI 11G

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2389.363	5.34	29.08	37.96	43.55	40.01	54.00	-13.99	Average
2	2389.363	5.34	29.08	37.96	60.02	56.48	74.00	-17.52	peak
3	av 2390.000	5.34	29.08	37.96	44.31	40.77	54.00	-13.23	Average
4	2390.000	5.34	29.08	37.96	58.04	54.50	74.00	-19.50	peak
5	pp 2410.267	5.35	29.14	37.96	97.11	93.64	74.00	19.64	peak

Mode:e; Polarization:Horizontal; Modulation Type:802.11g; bandwidth:20MHz; Channel:High



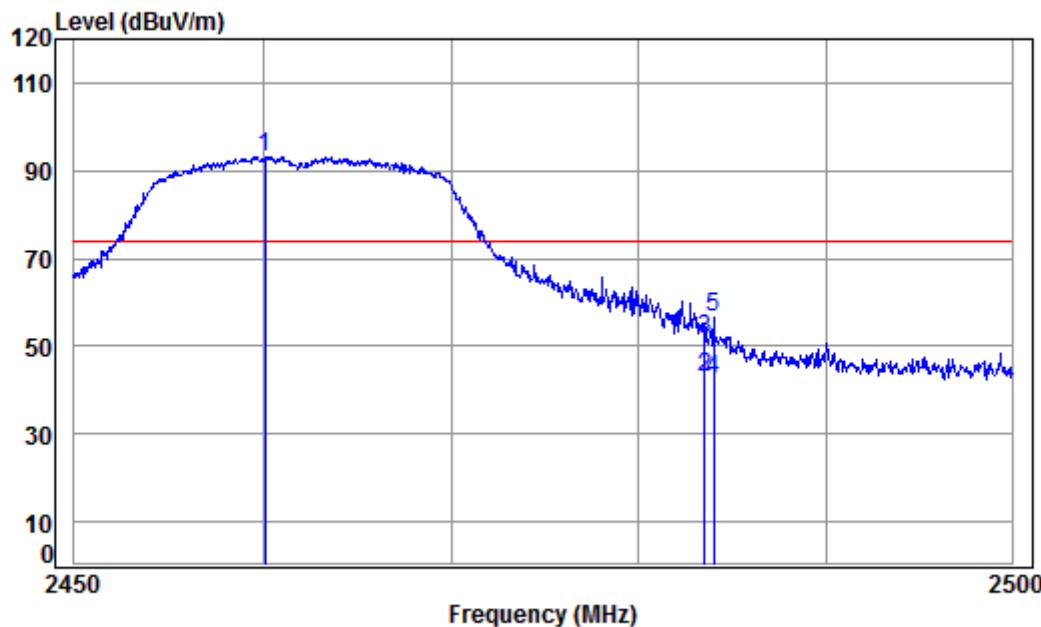
Condition: 3m HORIZONTAL

Job No: : 05406CR

Mode: : 2462 Band edge
: WIFI 11G

		Cable Freq	Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Over Line	Over Limit	Remark
		MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	pp	2464.745	5.39	29.30	37.95	106.92	103.66	74.00	29.66	peak
2	av	2483.500	5.41	29.35	37.95	56.37	53.18	54.00	-0.82	Average
3		2483.500	5.41	29.35	37.95	66.24	63.05	74.00	-10.95	peak
4		2483.840	5.41	29.35	37.95	55.94	52.75	54.00	-1.25	Average
5		2483.840	5.41	29.35	37.95	70.38	67.19	74.00	-6.81	peak

Mode:e; Polarization:Vertical; Modulation Type:802.11g; bandwidth:20MHz; Channel:High



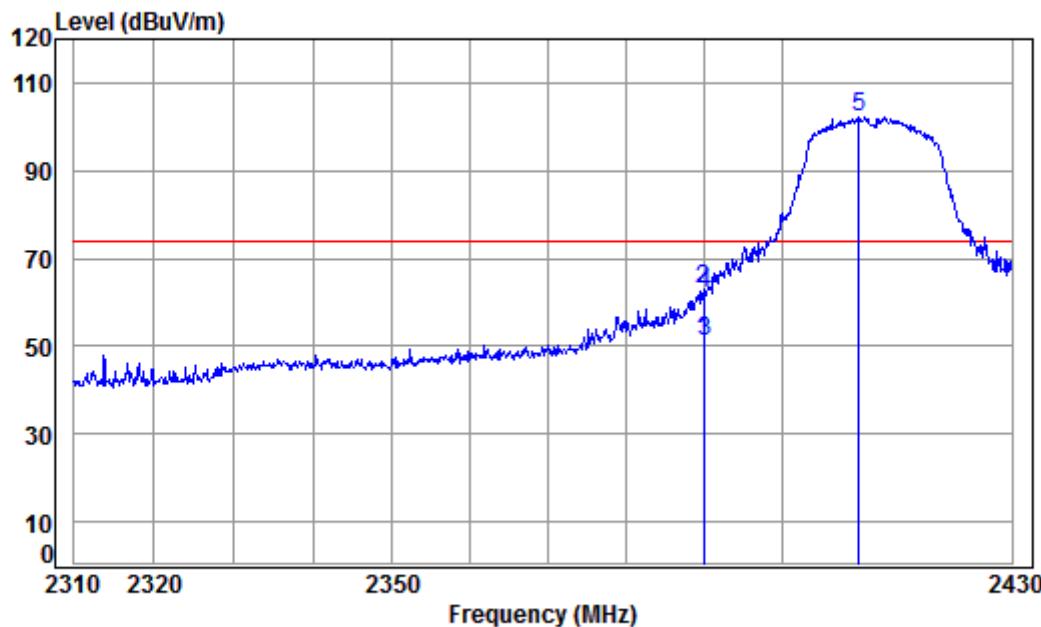
Condition: 3m VERTICAL

Job No: : 05406CR

Mode: : 2462 Band edge
: WIFI 11G

		Cable Freq	Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Over Line	Over Limit	Remark
		MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	pp	2460.118	5.39	29.28	37.95	96.54	93.26	74.00	19.26	Peak
2	av	2483.500	5.41	29.35	37.95	46.03	42.84	54.00	-11.16	Average
3		2483.500	5.41	29.35	37.95	54.93	51.74	74.00	-22.26	Peak
4		2483.990	5.41	29.35	37.95	45.59	42.40	54.00	-11.60	Average
5		2483.990	5.41	29.35	37.95	59.78	56.59	74.00	-17.41	Peak

Mode:e; Polarization:Horizontal; Modulation Type:802.11n; bandwidth:20MHz; Channel:Low



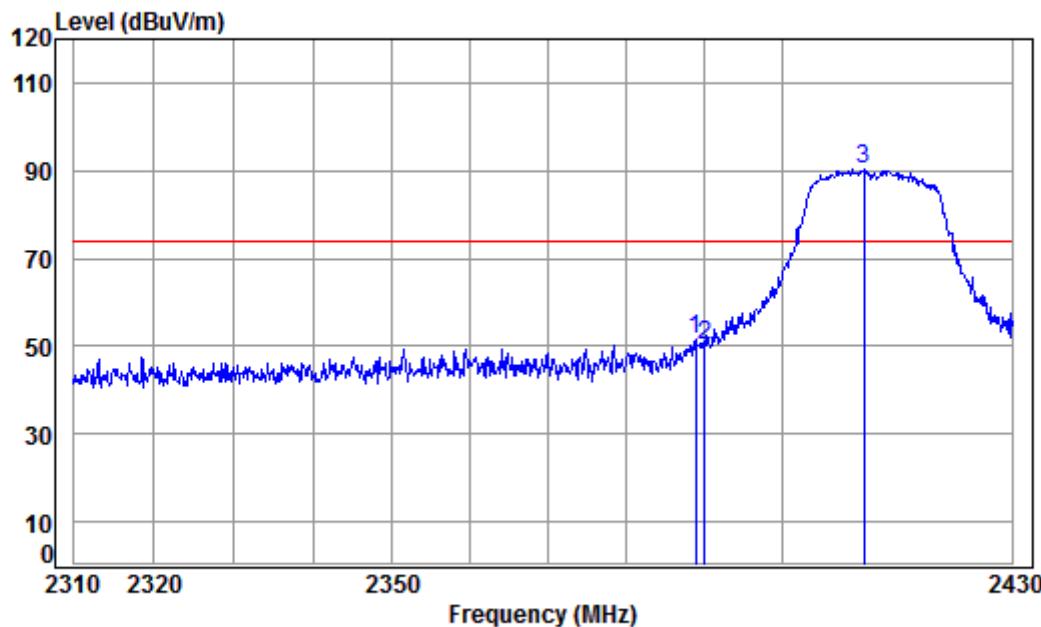
Condition: 3m HORIZONTAL

Job No: : 05406CR

Mode: : 2412 Band edge
: WIFI 11N 20

		Cable Freq	Ant Loss	Preamp Factor	Read Level	Limit Level	Line Level	Over Line	Over Limit	Remark
		MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2389.847	5.34	29.08	37.96	54.71	51.17	54.00	-2.83	Average	
2	2389.847	5.34	29.08	37.96	66.33	62.79	74.00	-11.21	peak	
3	av 2390.000	5.34	29.08	37.96	54.72	51.18	54.00	-2.82	Average	
4	2390.000	5.34	29.08	37.96	65.71	62.17	74.00	-11.83	peak	
5	pp 2410.023	5.35	29.14	37.96	105.83	102.36	74.00	28.36	peak	

Mode:e; Polarization:Vertical; Modulation Type:802.11n; bandwidth:20MHz; Channel:Low



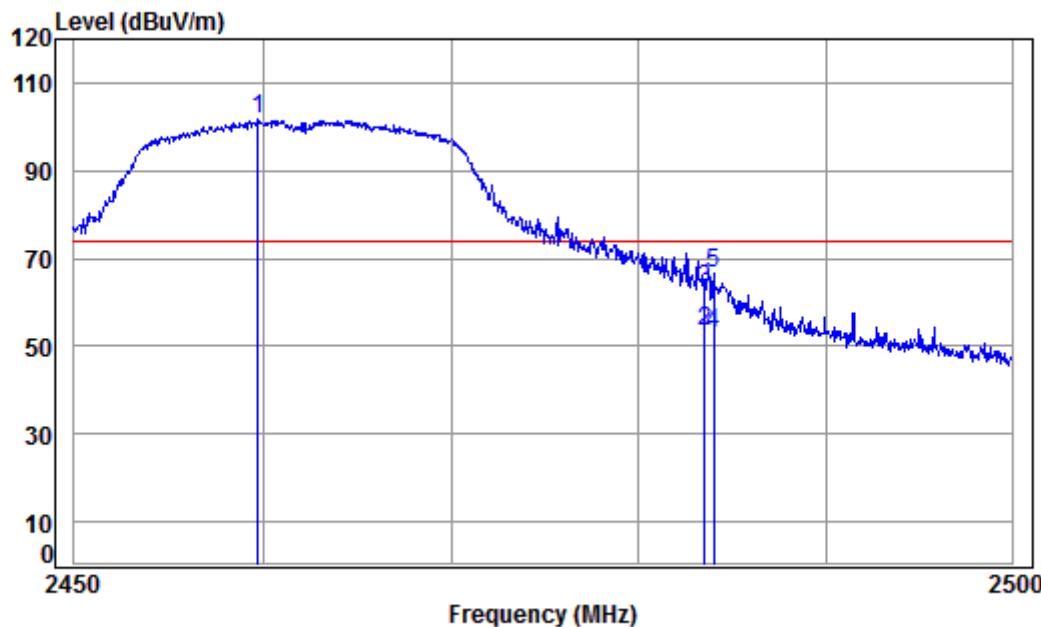
Condition: 3m VERTICAL

Job No: : 05406CR

Mode: : 2412 Band edge
: WIFI 11N 20

		Cable Freq	Ant Loss	Preamp Factor	Read Level	Limit Level	Over Line	Over Limit	Remark
		MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2388.879	5.34	29.07	37.96	55.04	51.49	74.00	-22.51	Peak
2	2390.000	5.34	29.08	37.96	53.76	50.22	74.00	-23.78	Peak
3 pp	2410.634	5.35	29.14	37.96	94.01	90.54	74.00	16.54	Peak

Mode:e; Polarization:Horizontal; Modulation Type:802.11n; bandwidth:20MHz; Channel:High



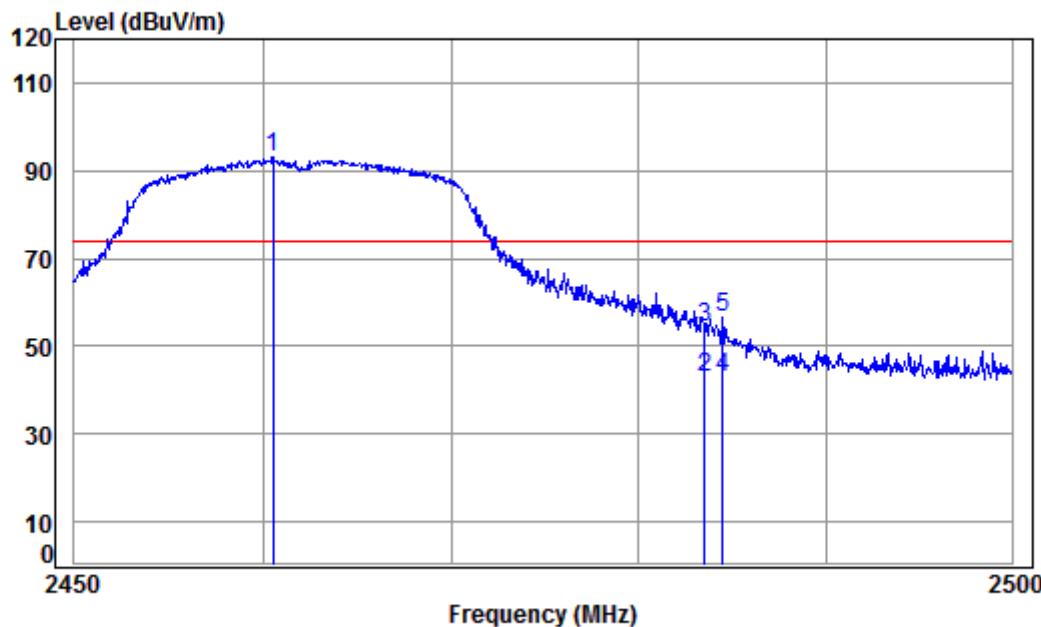
Condition: 3m HORIZONTAL

Job No: : 05406CR

Mode: : 2462 Band edge
: WIFI 11N 20

		Cable Freq	Ant Loss	Preamp Factor	Read Level	Limit Level	Over Line	Over Limit	Remark
		MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	pp	2459.720	5.39	29.28	37.95	105.26	101.98	74.00	27.98 peak
2	av	2483.500	5.41	29.35	37.95	56.49	53.30	54.00	-0.70 Average
3		2483.500	5.41	29.35	37.95	66.04	62.85	74.00	-11.15 peak
4		2483.990	5.41	29.35	37.95	55.94	52.75	54.00	-1.25 Average
5		2483.990	5.41	29.35	37.95	69.67	66.48	74.00	-7.52 peak

Mode:e; Polarization:Vertical; Modulation Type:802.11n; bandwidth:20MHz; Channel:High



Condition: 3m VERTICAL

Job No: : 05406CR

Mode: : 2462 Band edge
: WIFI 11N 20

		Cable Freq	Ant Loss	Preamp Factor	Read Level	Limit Level	Over Line	Over Limit	Remark
		MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	pp	2460.516	5.39	29.29	37.95	96.51	93.24	74.00	19.24 Peak
2	av	2483.500	5.41	29.35	37.95	46.30	43.11	54.00	-10.89 Average
3		2483.500	5.41	29.35	37.95	57.63	54.44	74.00	-19.56 Peak
4		2484.492	5.41	29.36	37.95	46.02	42.84	54.00	-11.16 Average
5		2484.492	5.41	29.36	37.95	59.97	56.79	74.00	-17.21 Peak

7.8 Radiated Spurious Emissions

Test Requirement 47 CFR Part 15, Subpart C 15.209 & 15.247(d)

Test Method: ANSI C63.10 (2013) Section 6.10.4

Measurement Distance: 3m

Limit:

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

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

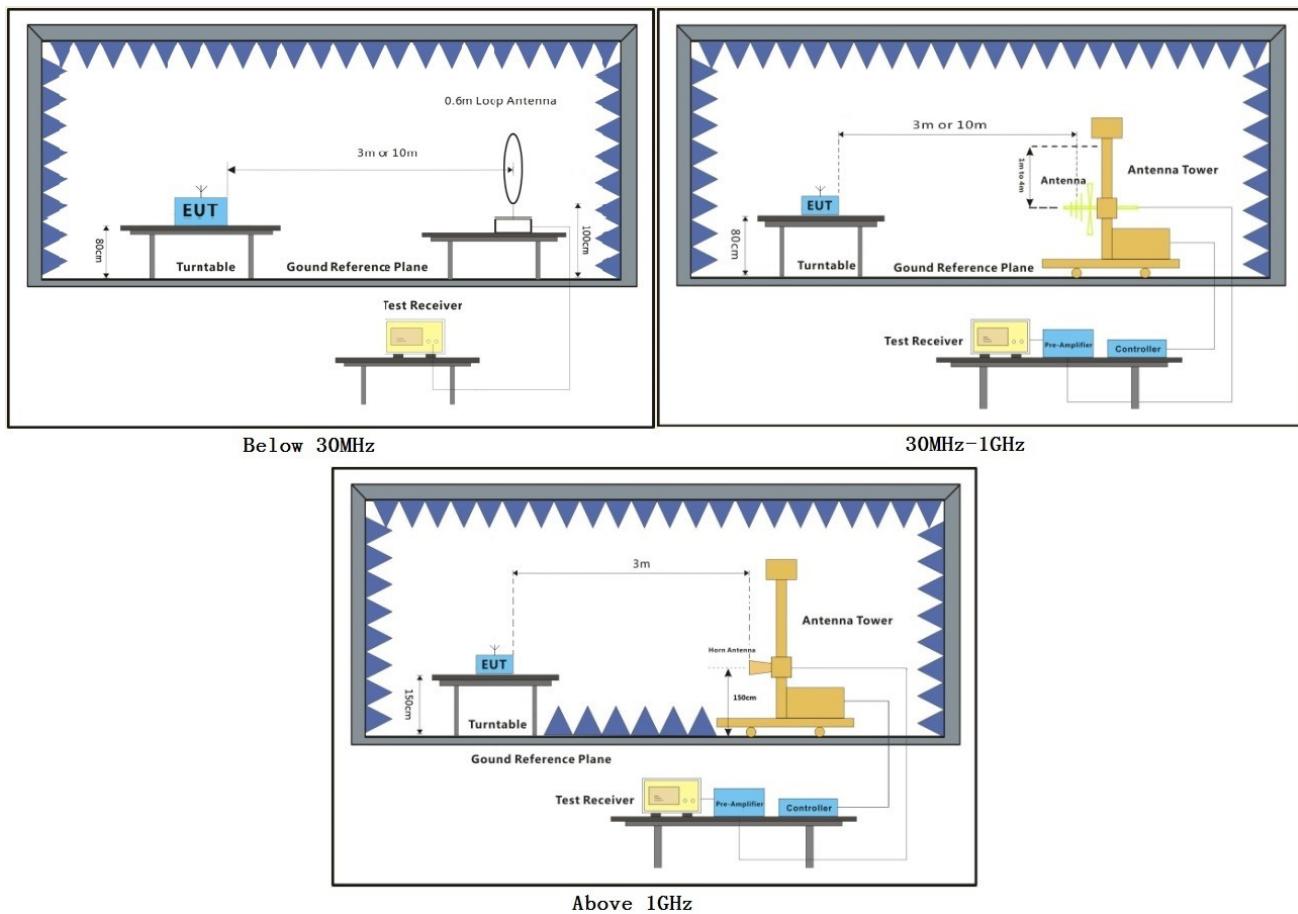
7.8.1 E.U.T. Operation

Operating Environment:

Temperature: 23 °C Humidity: 54 % RH Atmospheric Pressure: 1005 mbar

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

7.8.2 Test Setup Diagram



7.8.3 Measurement Procedure and Data

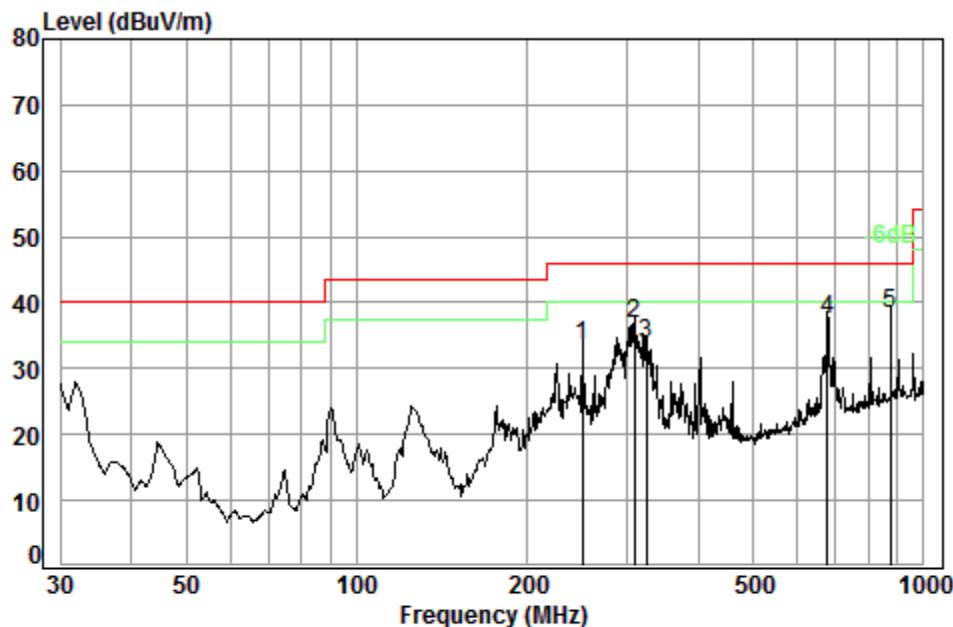
- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 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: The EUT had been tested under both power option mode, and found the power option1 is worse. Only the data of worst case is recorded in the report.

Radiated Emission below 1GHz

For emission below 1GHz, through pre-scan found the worst case is the lowest channel. Only the worst case is recorded in the report.

Mode:e; Polarization:Horizontal



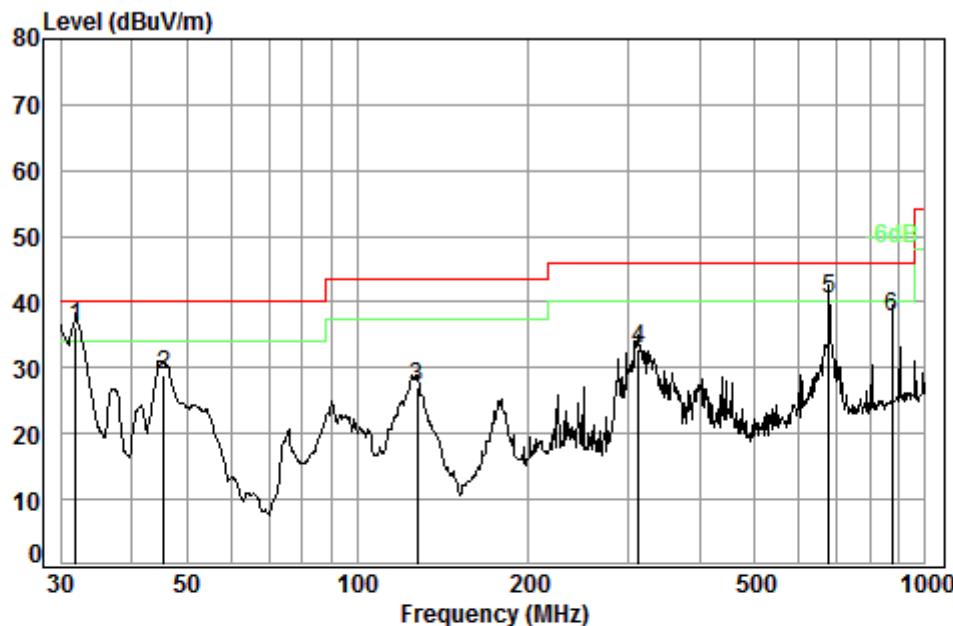
Condition: 3m HORIZONTAL

Job No. : 05406CR

Test mode: e

Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level		Limit Line	Over Limit	
				Level	Level			
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	250.30	1.68	12.31	26.54	45.86	33.31	46.00	-12.69
2	308.91	1.93	14.22	26.46	47.19	36.88	46.00	-9.12
3	324.46	1.98	14.78	26.58	43.67	33.85	46.00	-12.15
4	677.58	2.86	21.42	27.44	40.68	37.52	46.00	-8.48
5 pp	875.25	3.51	23.00	26.89	38.85	38.47	46.00	-7.53

Mode:e; Polarization:Vertical



Condition: 3m VERTICAL

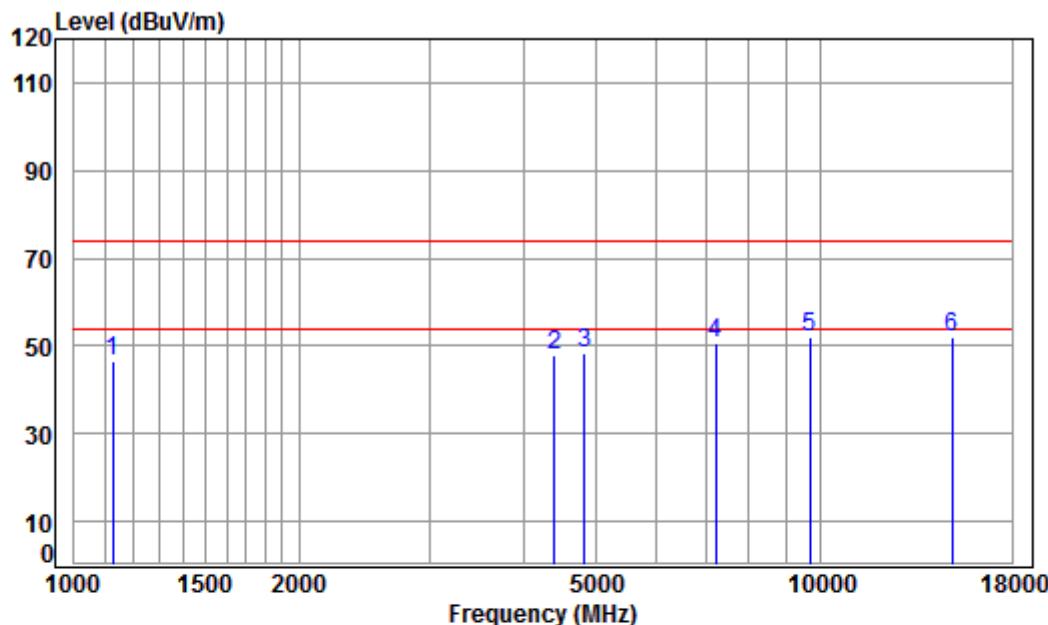
Job No. : 05406CR

Test mode: e

Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit		Over Limit
					Level	Line	
1 pp	31.95	0.60	17.61	27.35	45.41	36.27	40.00 -3.73
2	45.53	0.72	10.66	27.30	44.94	29.02	40.00 -10.98
3	127.22	1.27	7.76	27.03	44.96	26.96	43.50 -16.54
4	312.18	1.94	14.34	26.50	43.08	32.86	46.00 -13.14
5	675.21	2.85	21.40	27.44	43.71	40.52	46.00 -5.48
6	875.25	3.51	23.00	26.89	37.97	37.59	46.00 -8.41

Transmitter Emission above 1GHz

Mode:e; Polarization:Horizontal; Modulation Type:802.11b; bandwidth:20MHz; Channel:Low



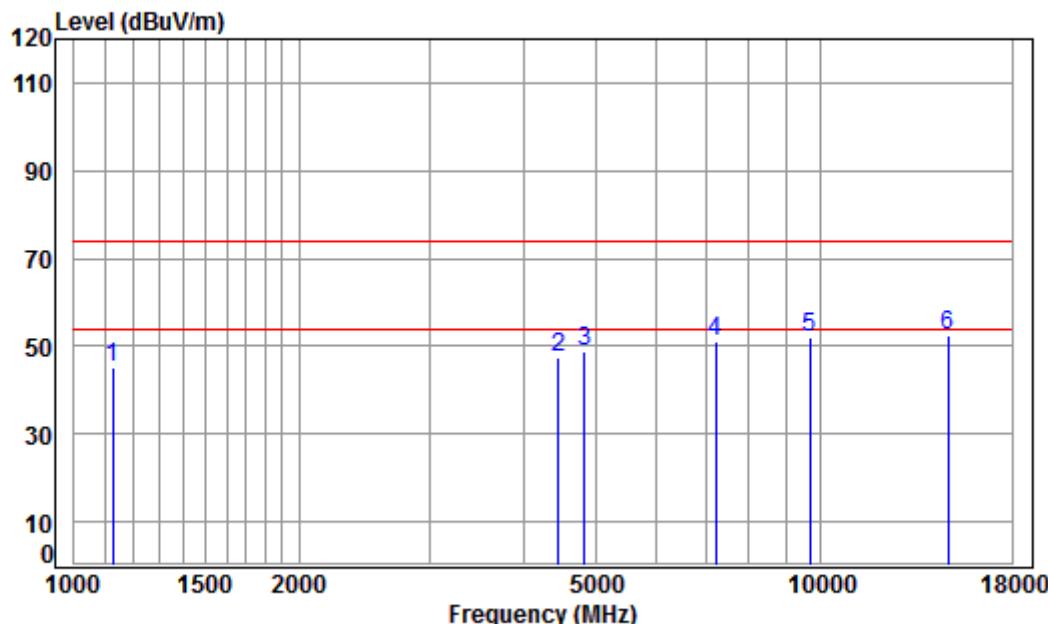
Condition: 3m HORIZONTAL

Job No: : 05406CR

Mode: : 2412 TX RSE
: WIFI 11B

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Line Limit	Over Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	1125.813	3.97	24.10	38.09	56.65	46.63	74.00	-27.37 peak
2	4392.376	7.16	33.60	38.20	45.39	47.95	74.00	-26.05 peak
3	4824.000	7.76	34.19	38.41	44.82	48.36	74.00	-25.64 peak
4	7236.000	9.67	36.40	37.09	41.52	50.50	74.00	-23.50 peak
5 pp	9648.000	11.10	37.53	35.08	38.43	51.98	74.00	-22.02 peak
6	14960.120	14.84	41.23	38.90	34.72	51.89	74.00	-22.11 peak

Mode:e; Polarization:Vertical; Modulation Type:802.11b; bandwidth:20MHz; Channel:Low



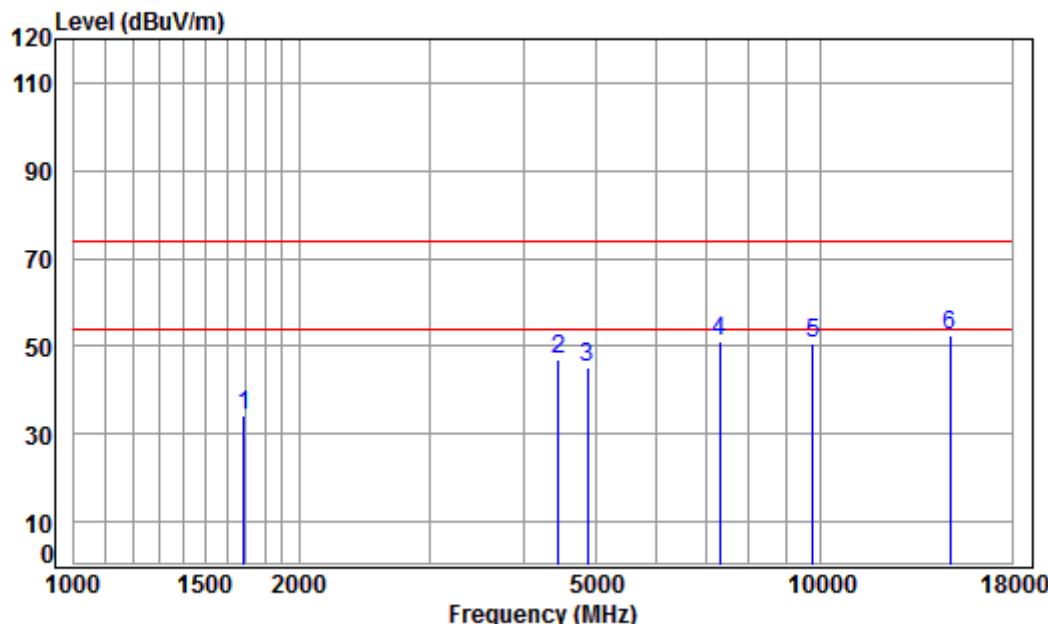
Condition: 3m VERTICAL

Job No: : 05406CR

Mode: : 2412 TX RSE
: WIFI 11B

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1125.813	3.97	24.10	38.09	55.07	45.05	74.00	-28.95	peak
2	4456.315	7.23	33.60	38.23	44.65	47.25	74.00	-26.75	peak
3	4824.000	7.76	34.19	38.41	45.33	48.87	74.00	-25.13	peak
4	7236.000	9.67	36.40	37.09	42.01	50.99	74.00	-23.01	peak
5	9648.000	11.10	37.53	35.08	38.65	52.20	74.00	-21.80	peak
6	pp14788.150	14.80	40.92	38.92	35.62	52.42	74.00	-21.58	peak

Mode:e; Polarization:Horizontal; Modulation Type:802.11b; bandwidth:20MHz; Channel:middle



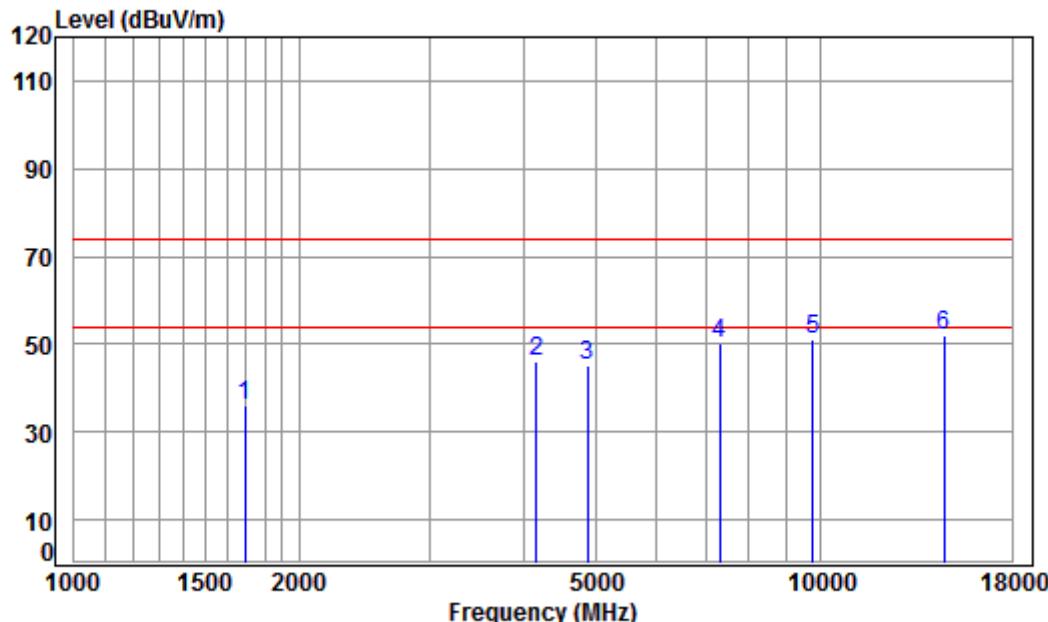
Condition: 3m HORIZONTAL

Job No: : 05406CR

Mode: : 2437 TX RSE
: WIFI 11B

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1687.347	4.69	26.62	38.03	40.99	34.27	74.00	-39.73	peak
2	4456.315	7.23	33.60	38.23	44.25	46.85	74.00	-27.15	peak
3	4874.000	7.83	34.28	38.44	41.34	45.01	74.00	-28.99	peak
4	7311.000	9.72	36.37	37.02	42.00	51.07	74.00	-22.93	peak
5	9748.000	11.20	37.55	35.03	37.00	50.72	74.00	-23.28	peak
6	pp14873.890	14.82	41.08	38.91	35.61	52.60	74.00	-21.40	peak

Mode:e; Polarization:Vertical; Modulation Type:802.11b; bandwidth:20MHz; Channel:middle



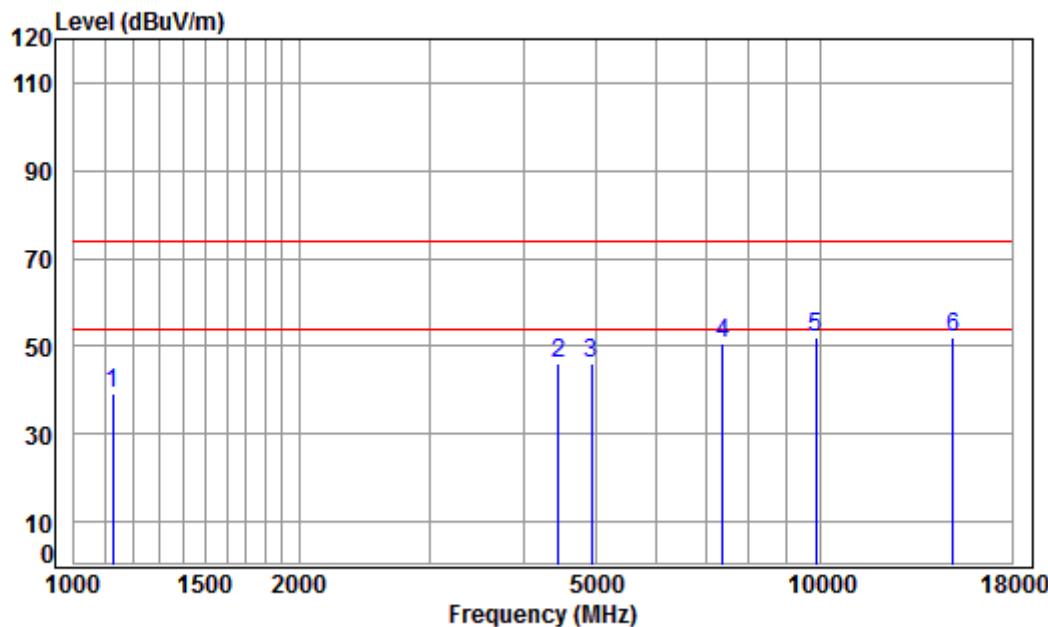
Condition: 3m VERTICAL

Job No: : 05406CR

Mode: : 2437 TX RSE
: WIFI 11B

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Line Limit	Over Line	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1692.231	4.70	26.64	38.03	42.69	36.00	74.00	-38.00	peak
2	4157.664	6.89	33.60	38.08	43.83	46.24	74.00	-27.76	peak
3	4874.000	7.83	34.28	38.44	41.38	45.05	74.00	-28.95	peak
4	7311.000	9.72	36.37	37.02	41.12	50.19	74.00	-23.81	peak
5	9748.000	11.20	37.55	35.03	37.40	51.12	74.00	-22.88	peak
6	pp14618.170	14.75	40.62	38.94	35.75	52.18	74.00	-21.82	peak

Mode:e; Polarization:Horizontal; Modulation Type:802.11b; bandwidth:20MHz; Channel:High



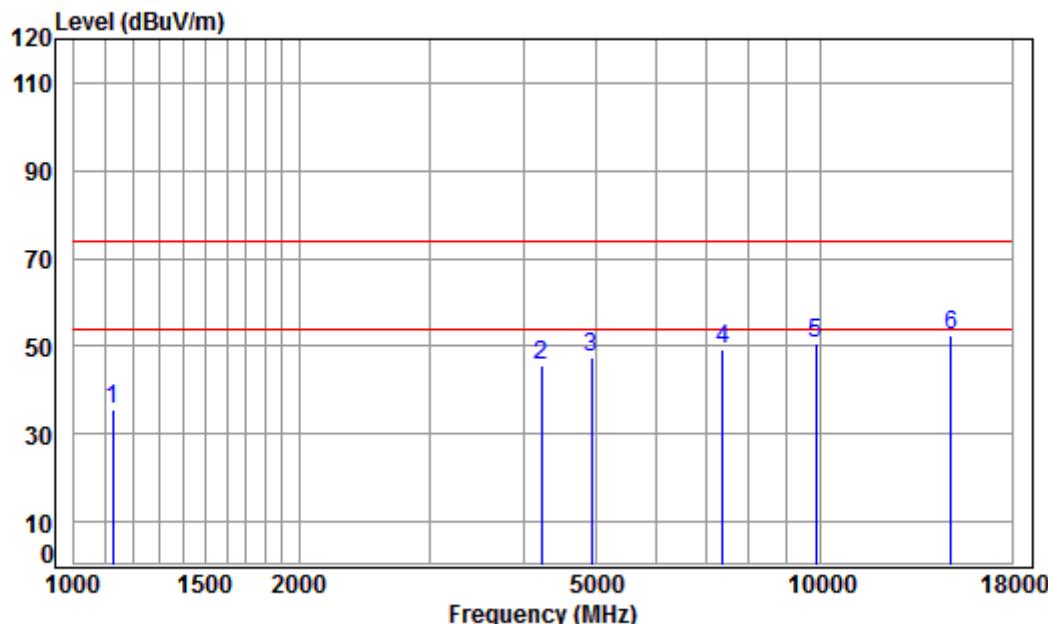
Condition: 3m HORIZONTAL

Job No: : 05406CR

Mode: : 2462 TX RSE
: WIFI 11B

		Cable Freq	Ant Loss	Preamp Factor	Read Level	Limit Level	Over Line	Over Limit	Remark
		MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	1125.813	3.97	24.10	38.09	49.34	39.32	74.00	-34.68	peak
2	4456.315	7.23	33.60	38.23	43.68	46.28	74.00	-27.72	peak
3	4924.000	7.90	34.37	38.46	42.48	46.29	74.00	-27.71	peak
4	7386.000	9.77	36.34	36.95	41.38	50.54	74.00	-23.46	peak
5 pp	9848.000	11.29	37.57	34.98	38.24	52.12	74.00	-21.88	peak
6	15003.420	14.85	41.30	38.90	34.77	52.02	74.00	-21.98	peak

Mode:e; Polarization:Vertical; Modulation Type:802.11b; bandwidth:20MHz; Channel:High



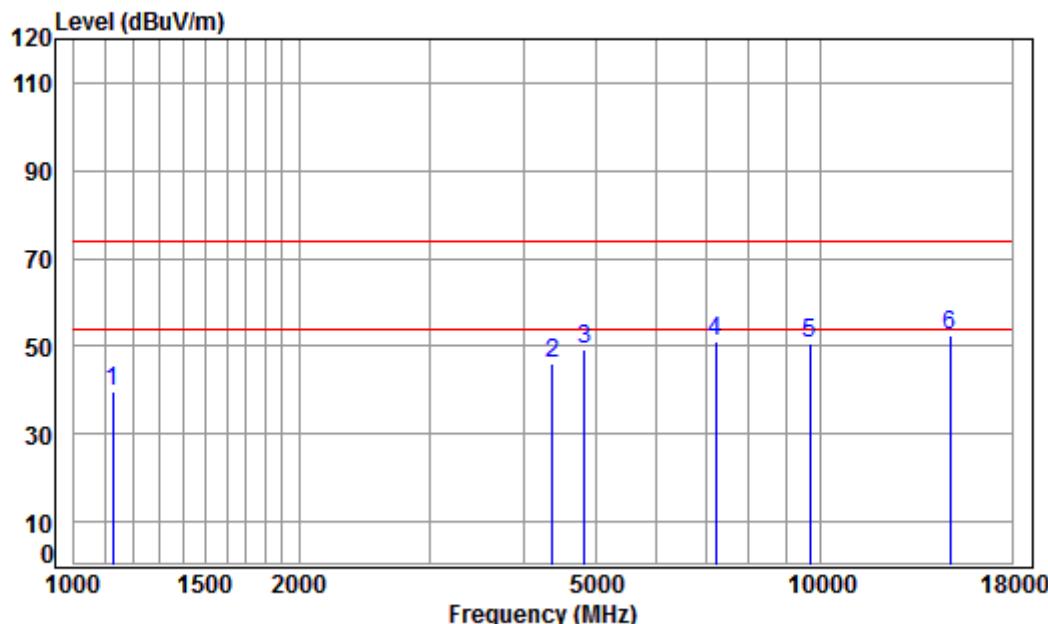
Condition: 3m VERTICAL

Job No: : 05406CR

Mode: : 2462 TX RSE
: WIFI 11B

		Cable Freq	Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Limit Line	Over Line	Over Limit	Remark
		MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1	1125.813	3.97	24.10	38.09	45.39	35.37	74.00	-38.63	peak		
2	4218.186	6.96	33.60	38.11	43.36	45.81	74.00	-28.19	peak		
3	4924.000	7.90	34.37	38.46	43.82	47.63	74.00	-26.37	peak		
4	7386.000	9.77	36.34	36.95	40.15	49.31	74.00	-24.69	peak		
5	9848.000	11.29	37.57	34.98	36.92	50.80	74.00	-23.20	peak		
6	pp14916.940	14.83	41.15	38.91	35.24	52.31	74.00	-21.69	peak		

Mode:e; Polarization:Horizontal; Modulation Type:802.11g; bandwidth:20MHz; Channel:Low



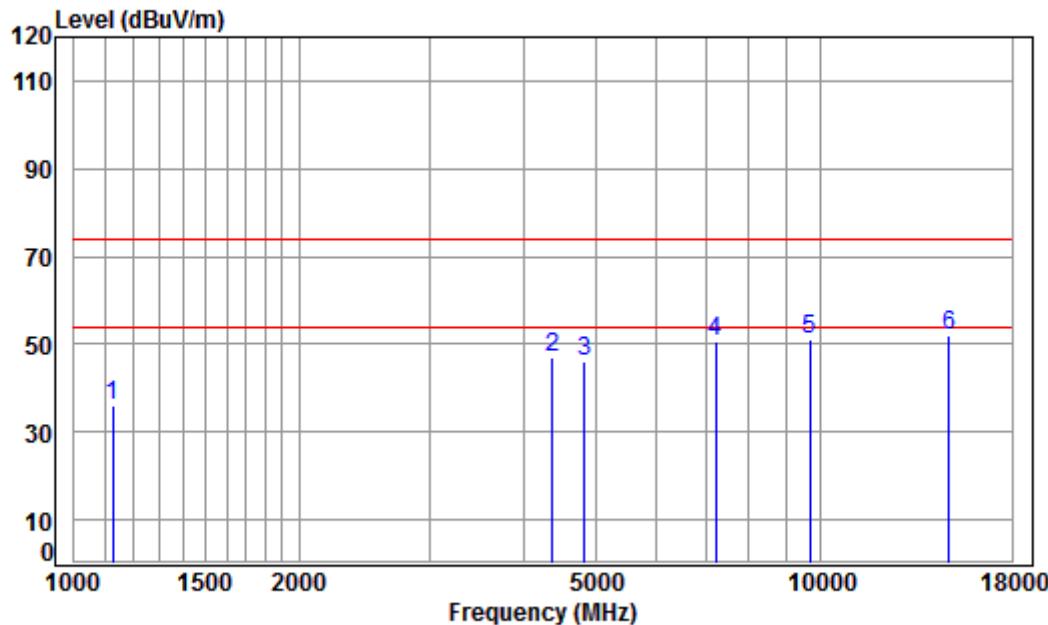
Condition: 3m HORIZONTAL

Job No: : 05406CR

Mode: : 2412 TX RSE
: WIFI 11G

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Line Limit	Over Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	1125.813	3.97	24.10	38.09	49.74	39.72	74.00	-34.28 peak
2	4367.058	7.13	33.60	38.18	43.43	45.98	74.00	-28.02 peak
3	4824.000	7.76	34.19	38.41	45.83	49.37	74.00	-24.63 peak
4	7236.000	9.67	36.40	37.09	42.31	51.29	74.00	-22.71 peak
5	9648.000	11.10	37.53	35.08	37.31	50.86	74.00	-23.14 peak
6	pp14873.890	14.82	41.08	38.91	35.63	52.62	74.00	-21.38 peak

Mode:e; Polarization:Vertical; Modulation Type:802.11g; bandwidth:20MHz; Channel:Low



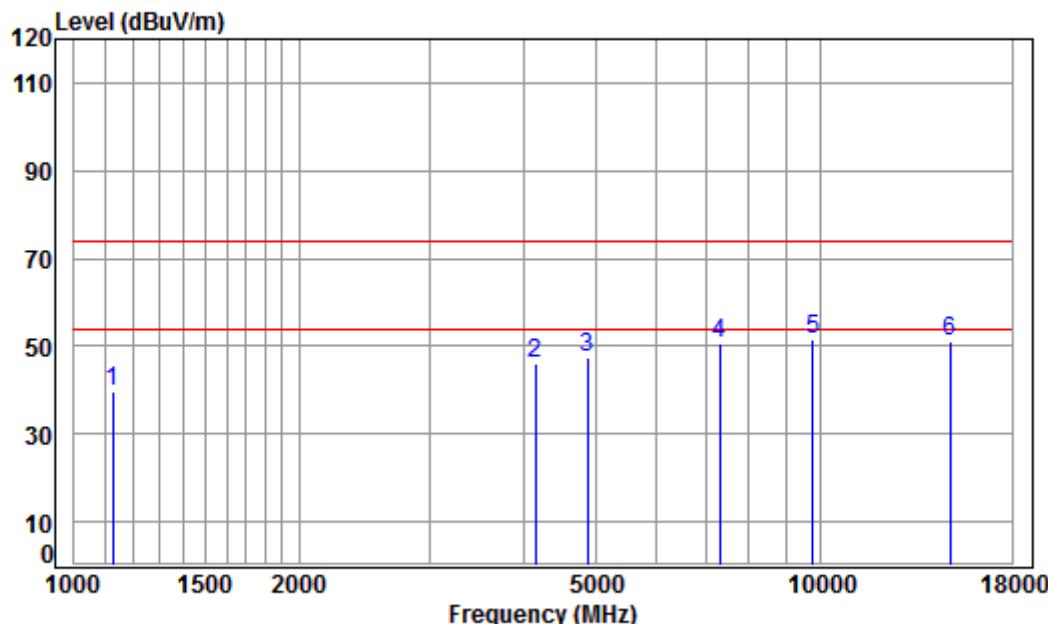
Condition: 3m VERTICAL

Job No: : 05406CR

Mode: : 2412 TX RSE
: WIFI 11G

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Line Limit	Over Line	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1125.813	3.97	24.10	38.09	46.28	36.26	74.00	-37.74	peak
2	4367.058	7.13	33.60	38.18	44.22	46.77	74.00	-27.23	peak
3	4824.000	7.76	34.19	38.41	42.50	46.04	74.00	-27.96	peak
4	7236.000	9.67	36.40	37.09	41.62	50.60	74.00	-23.40	peak
5	9648.000	11.10	37.53	35.08	37.52	51.07	74.00	-22.93	peak
6	pp14830.960	14.81	41.00	38.92	35.14	52.03	74.00	-21.97	peak

Mode:e; Polarization:Horizontal; Modulation Type:802.11g; bandwidth:20MHz; Channel:middle



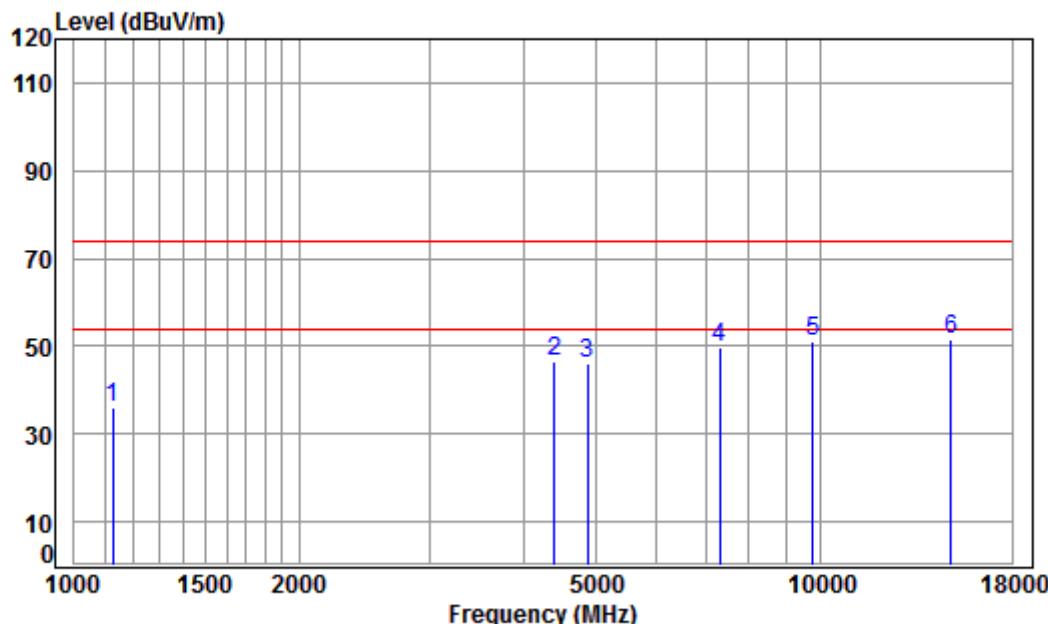
Condition: 3m HORIZONTAL

Job No: : 05406CR

Mode: : 2437 TX RSE
: WIFI 11G

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1125.813	3.97	24.10	38.09	49.69	39.67	74.00	-34.33	peak
2	4145.664	6.88	33.60	38.07	43.77	46.18	74.00	-27.82	peak
3	4874.000	7.83	34.28	38.44	43.58	47.25	74.00	-26.75	peak
4	7311.000	9.72	36.37	37.02	41.71	50.78	74.00	-23.22	peak
5 pp	9748.000	11.20	37.55	35.03	38.02	51.74	74.00	-22.26	peak
6	14873.890	14.82	41.08	38.91	34.01	51.00	74.00	-23.00	peak

Mode:e; Polarization:Vertical; Modulation Type:802.11g; bandwidth:20MHz; Channel:middle



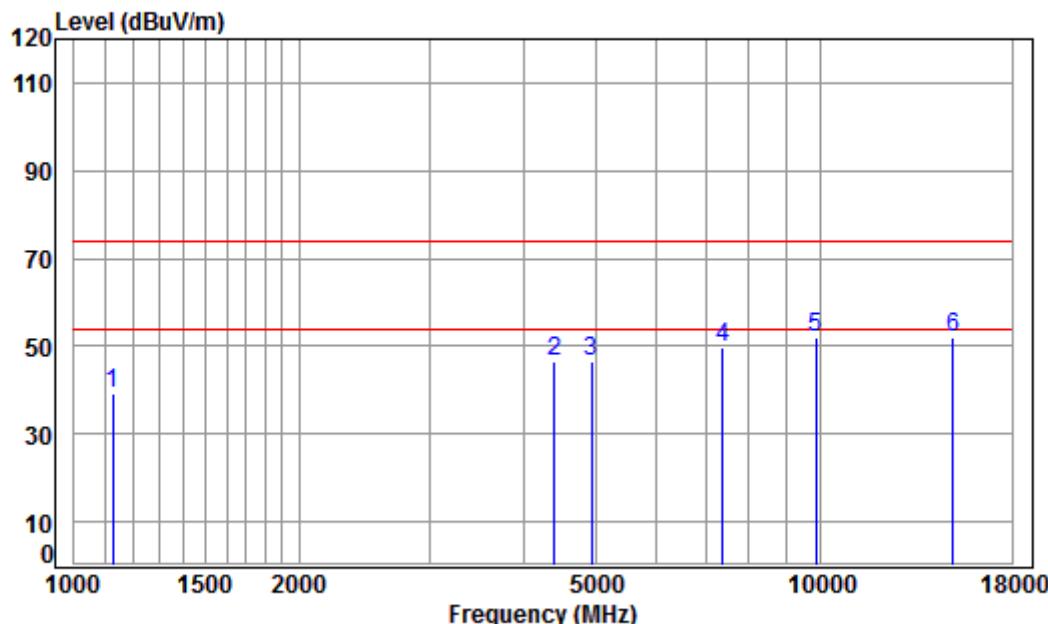
Condition: 3m VERTICAL

Job No: : 05406CR

Mode: : 2437 TX RSE
: WIFI 11G

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Line Limit	Over Line	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1125.813	3.97	24.10	38.09	46.26	36.24	74.00	-37.76	peak
2	4392.376	7.16	33.60	38.20	44.10	46.66	74.00	-27.34	peak
3	4874.000	7.83	34.28	38.44	42.59	46.26	74.00	-27.74	peak
4	7311.000	9.72	36.37	37.02	40.63	49.70	74.00	-24.30	peak
5	9748.000	11.20	37.55	35.03	37.27	50.99	74.00	-23.01	peak
6	pp14916.940	14.83	41.15	38.91	34.31	51.38	74.00	-22.62	peak

Mode:e; Polarization:Horizontal; Modulation Type:802.11g; bandwidth:20MHz; Channel:High



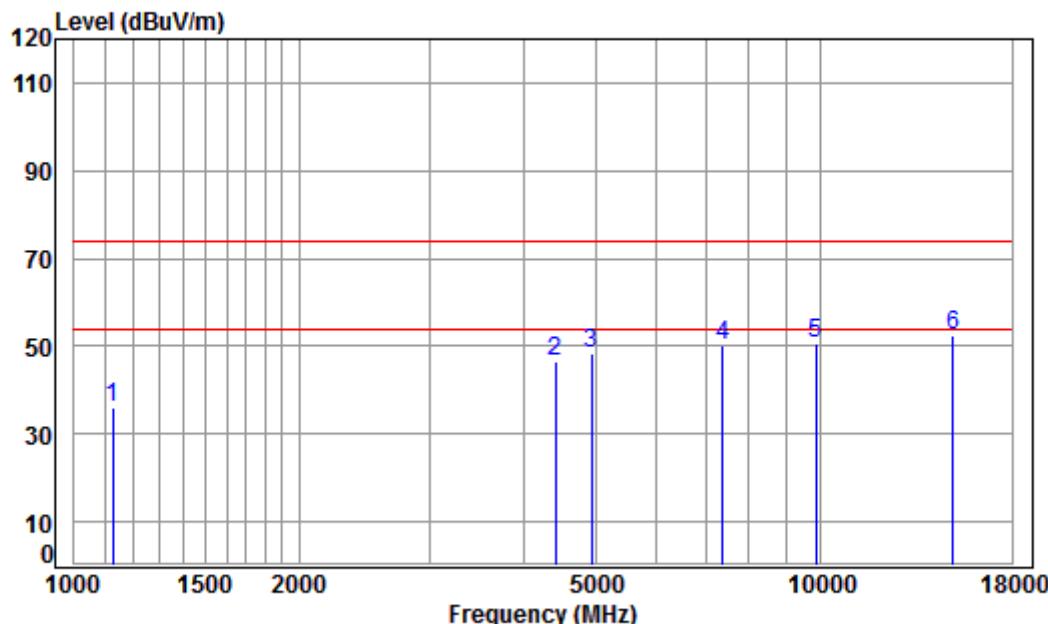
Condition: 3m HORIZONTAL

Job No: : 05406CR

Mode: : 2462 TX RSE
: WIFI 11G

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Line Limit	Over Line	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1125.813	3.97	24.10	38.09	49.24	39.22	74.00	-34.78	peak
2	4392.376	7.16	33.60	38.20	43.92	46.48	74.00	-27.52	peak
3	4924.000	7.90	34.37	38.46	42.65	46.46	74.00	-27.54	peak
4	7386.000	9.77	36.34	36.95	40.67	49.83	74.00	-24.17	peak
5	9848.000	11.29	37.57	34.98	37.96	51.84	74.00	-22.16	peak
6	pp15003.420	14.85	41.30	38.90	34.93	52.18	74.00	-21.82	peak

Mode:e; Polarization:Vertical; Modulation Type:802.11g; bandwidth:20MHz; Channel:High



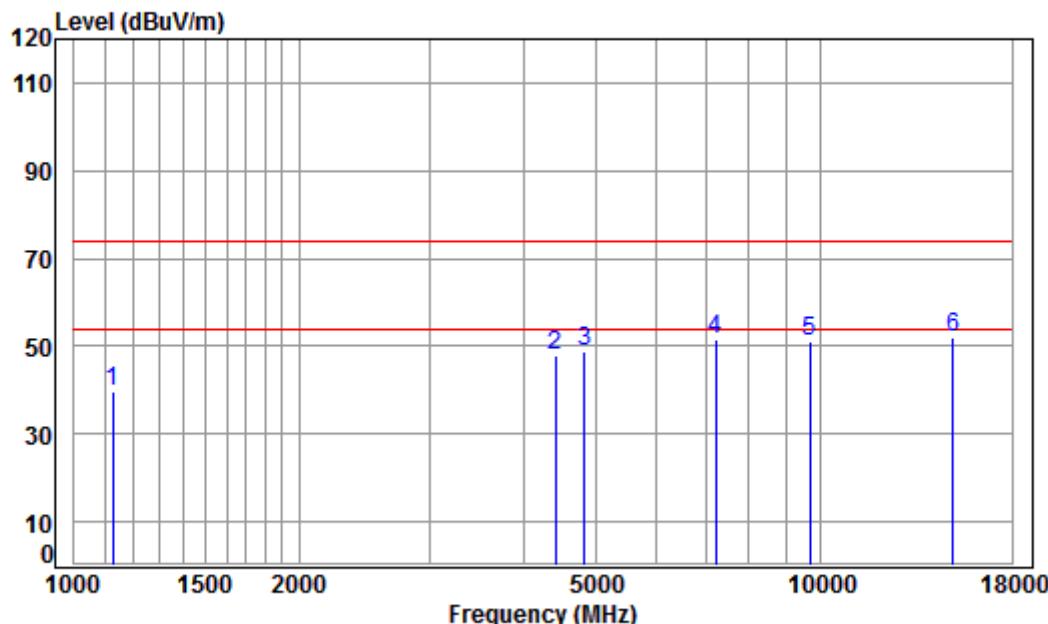
Condition: 3m VERTICAL

Job No: : 05406CR

Mode: : 2462 TX RSE
: WIFI 11G

		Cable Freq	Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Over Line	Over Limit	Remark
	MHz	dB	dB/m		dB	dBuV	dBuV/m	dBuV/m	dB	
1	1125.813	3.97	24.10	38.09	46.08	36.06	74.00	-37.94	peak	
2	4405.090	7.18	33.60	38.20	43.73	46.31	74.00	-27.69	peak	
3	4924.000	7.90	34.37	38.46	44.65	48.46	74.00	-25.54	peak	
4	7386.000	9.77	36.34	36.95	41.18	50.34	74.00	-23.66	peak	
5	9848.000	11.29	37.57	34.98	36.85	50.73	74.00	-23.27	peak	
6	pp15003.420	14.85	41.30	38.90	35.40	52.65	74.00	-21.35	peak	

Mode:e; Polarization:Horizontal; Modulation Type:802.11n; bandwidth:20MHz; Channel:Low



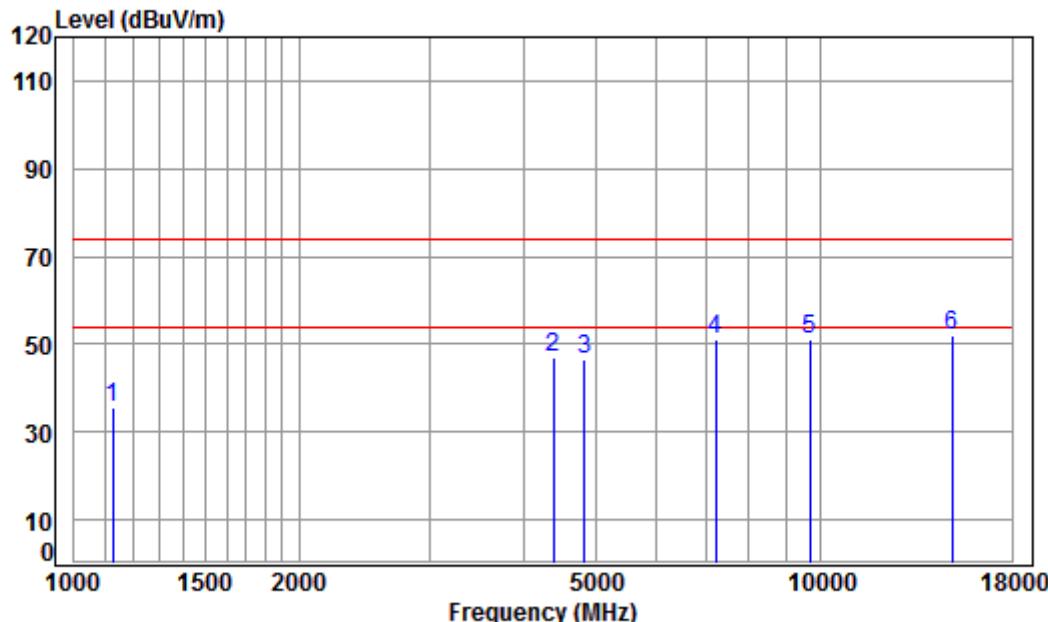
Condition: 3m HORIZONTAL

Job No: : 05406CR

Mode: : 2412 TX RSE
: WIFI 11N 20

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1125.813	3.97	24.10	38.09	49.84	39.82	74.00	-34.18	peak
2	4405.090	7.18	33.60	38.20	45.19	47.77	74.00	-26.23	peak
3	4824.000	7.76	34.19	38.41	45.33	48.87	74.00	-25.13	peak
4	7236.000	9.67	36.40	37.09	42.69	51.67	74.00	-22.33	peak
5	9648.000	11.10	37.53	35.08	37.46	51.01	74.00	-22.99	peak
6	pp15003.420	14.85	41.30	38.90	34.94	52.19	74.00	-21.81	peak

Mode:e; Polarization:Vertical; Modulation Type:802.11n; bandwidth:20MHz; Channel:Low



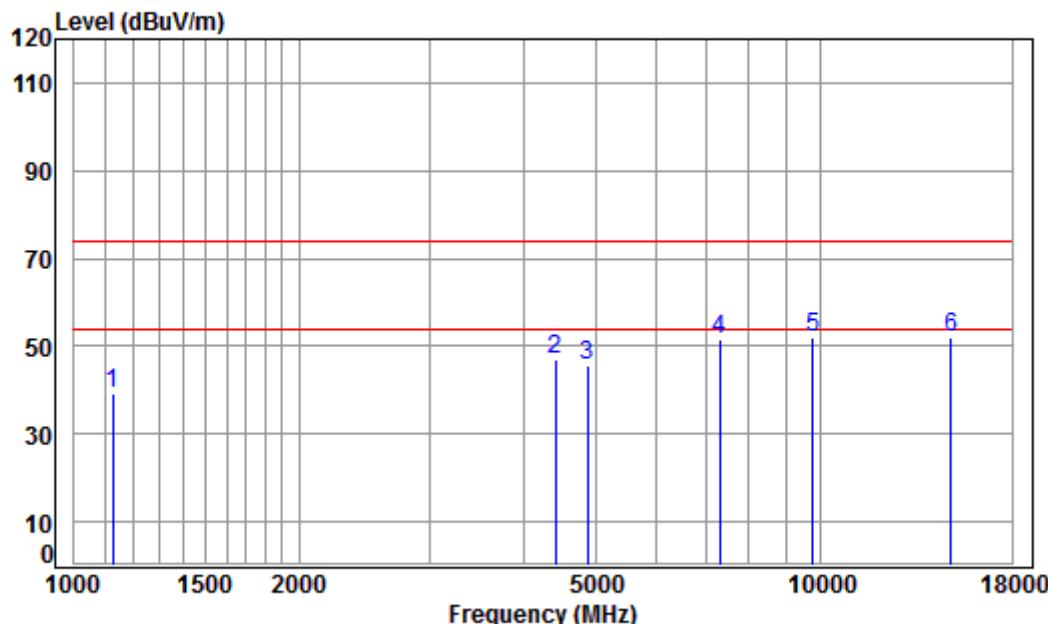
Condition: 3m VERTICAL

Job No: : 05406CR

Mode: : 2412 TX RSE
: WIFI 11N 20

		Cable Freq	Ant Loss	Preamp Factor	Read Level	Limit Level	Over Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1125.813	3.97	24.10	38.09	45.62	35.60	74.00	-38.40	peak
2	4379.699	7.15	33.60	38.19	44.43	46.99	74.00	-27.01	peak
3	4824.000	7.76	34.19	38.41	42.97	46.51	74.00	-27.49	peak
4	7236.000	9.67	36.40	37.09	42.21	51.19	74.00	-22.81	peak
5	9648.000	11.10	37.53	35.08	37.75	51.30	74.00	-22.70	peak
6	pp14960.120	14.84	41.23	38.90	34.79	51.96	74.00	-22.04	peak

Mode:e; Polarization:Horizontal; Modulation Type:802.11n; bandwidth:20MHz; Channel:middle



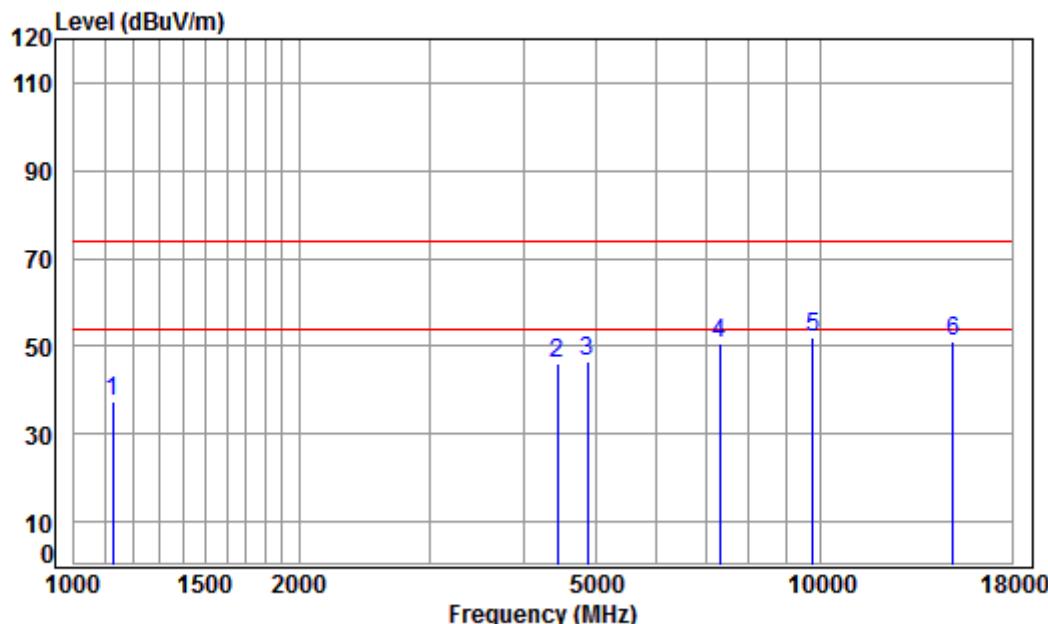
Condition: 3m HORIZONTAL

Job No: : 05406CR

Mode: : 2437 TX RSE
: WIFI 11N 20

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Line Limit	Over Line	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1125.813	3.97	24.10	38.09	49.49	39.47	74.00	-34.53	peak
2	4405.090	7.18	33.60	38.20	44.45	47.03	74.00	-26.97	peak
3	4874.000	7.83	34.28	38.44	42.15	45.82	74.00	-28.18	peak
4	7311.000	9.72	36.37	37.02	42.56	51.63	74.00	-22.37	peak
5	9748.000	11.20	37.55	35.03	38.09	51.81	74.00	-22.19	peak
6	pp14916.940	14.83	41.15	38.91	34.89	51.96	74.00	-22.04	peak

Mode:e; Polarization:Vertical; Modulation Type:802.11n; bandwidth:20MHz; Channel:middle



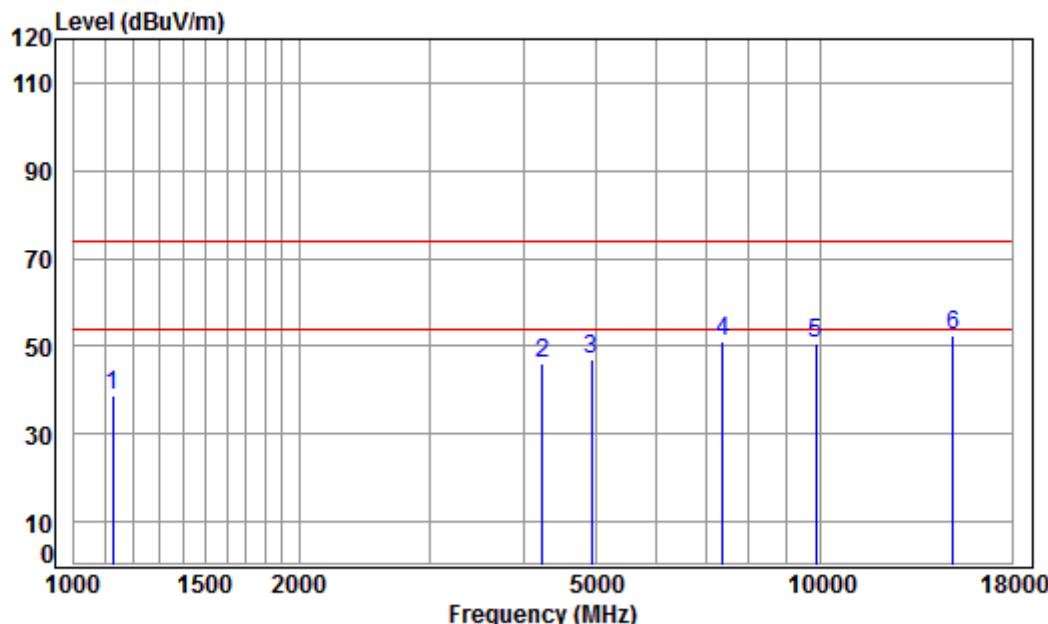
Condition: 3m VERTICAL

Job No: : 05406CR

Mode: : 2437 TX RSE
: WIFI 11N 20

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Line Limit	Over Line	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1125.813	3.97	24.10	38.09	47.24	37.22	74.00	-36.78	peak
2	4430.628	7.20	33.60	38.22	43.43	46.01	74.00	-27.99	peak
3	4874.000	7.83	34.28	38.44	42.94	46.61	74.00	-27.39	peak
4	7311.000	9.72	36.37	37.02	41.80	50.87	74.00	-23.13	peak
5 pp	9748.000	11.20	37.55	35.03	38.23	51.95	74.00	-22.05	peak
6	15003.420	14.85	41.30	38.90	33.97	51.22	74.00	-22.78	peak

Mode:e; Polarization:Horizontal; Modulation Type:802.11n; bandwidth:20MHz; Channel:High



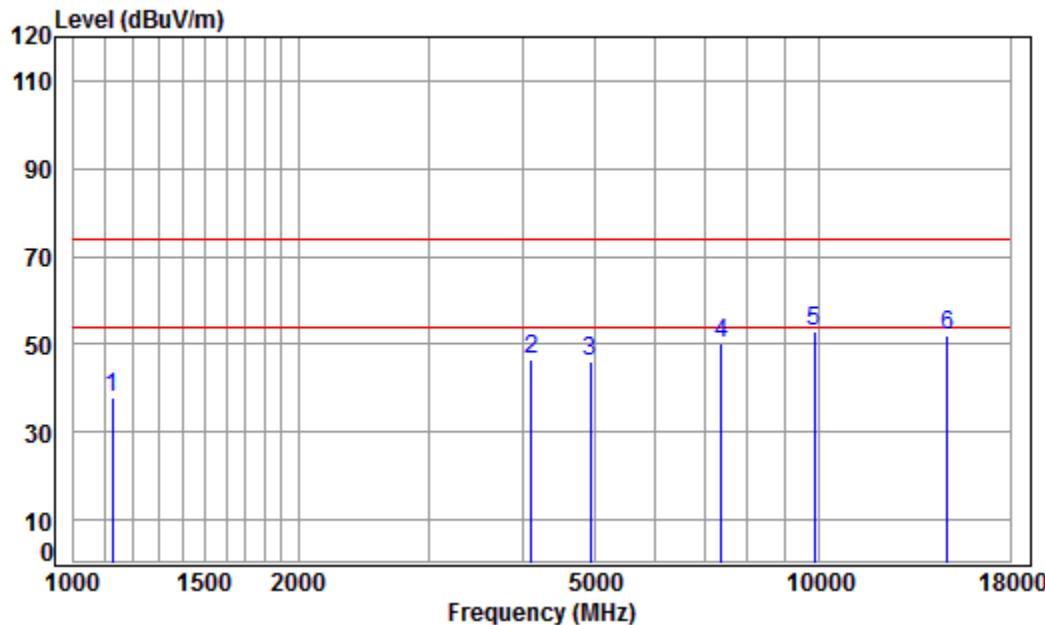
Condition: 3m HORIZONTAL

Job No: : 05406CR

Mode: : 2462 TX RSE
: WIFI 11N 20

		Cable Freq	Ant Loss	Preamp Factor	Read Level	Limit Level	Over Line	Over Limit	Remark
		MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	1125.813	3.97	24.10	38.09	48.69	38.67	74.00	-35.33	peak
2	4230.396	6.98	33.60	38.12	43.48	45.94	74.00	-28.06	peak
3	4924.000	7.90	34.37	38.46	43.24	47.05	74.00	-26.95	peak
4	7386.000	9.77	36.34	36.95	42.07	51.23	74.00	-22.77	peak
5	9848.000	11.29	37.57	34.98	36.58	50.46	74.00	-23.54	peak
6	pp15003.420	14.85	41.30	38.90	35.13	52.38	74.00	-21.62	peak

Mode:e; Polarization:Vertical; Modulation Type:802.11n; bandwidth:20MHz; Channel:High



Condition: 3m VERTICAL

Job No: : 05406CR

Mode: : 2462 TX RSE
: WIFI 11N 20

Freq	Cable	Ant	Preamp	Read	Limit	Over	Remark
	Loss	Factor	Factor	Level			
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 1125.813	3.97	24.10	38.09	47.79	37.77	74.00	-36.23 peak
2 4109.872	6.83	33.60	38.05	44.19	46.57	74.00	-27.43 peak
3 4924.000	7.90	34.37	38.46	42.30	46.11	74.00	-27.89 peak
4 7386.000	9.77	36.34	36.95	40.96	50.12	74.00	-23.88 peak
5 pp 9848.000	11.29	37.57	34.98	38.92	52.80	74.00	-21.20 peak
6 14830.960	14.81	41.00	38.92	35.21	52.10	74.00	-21.90 peak

Remark:

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

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

2) Scan from 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.

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.

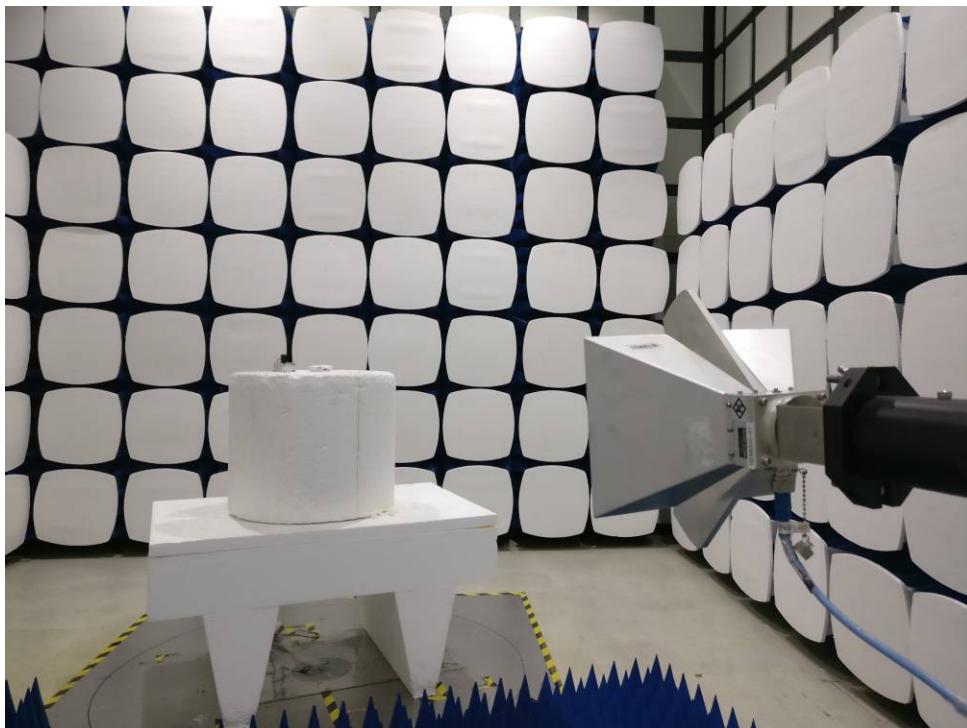
8 Photographs

8.1 Conducted Emissions at AC Power Line (150kHz-30MHz) Test Setup



8.2 Radiated Spurious Emissions Test Setup





8.3 EUT Constructional Details

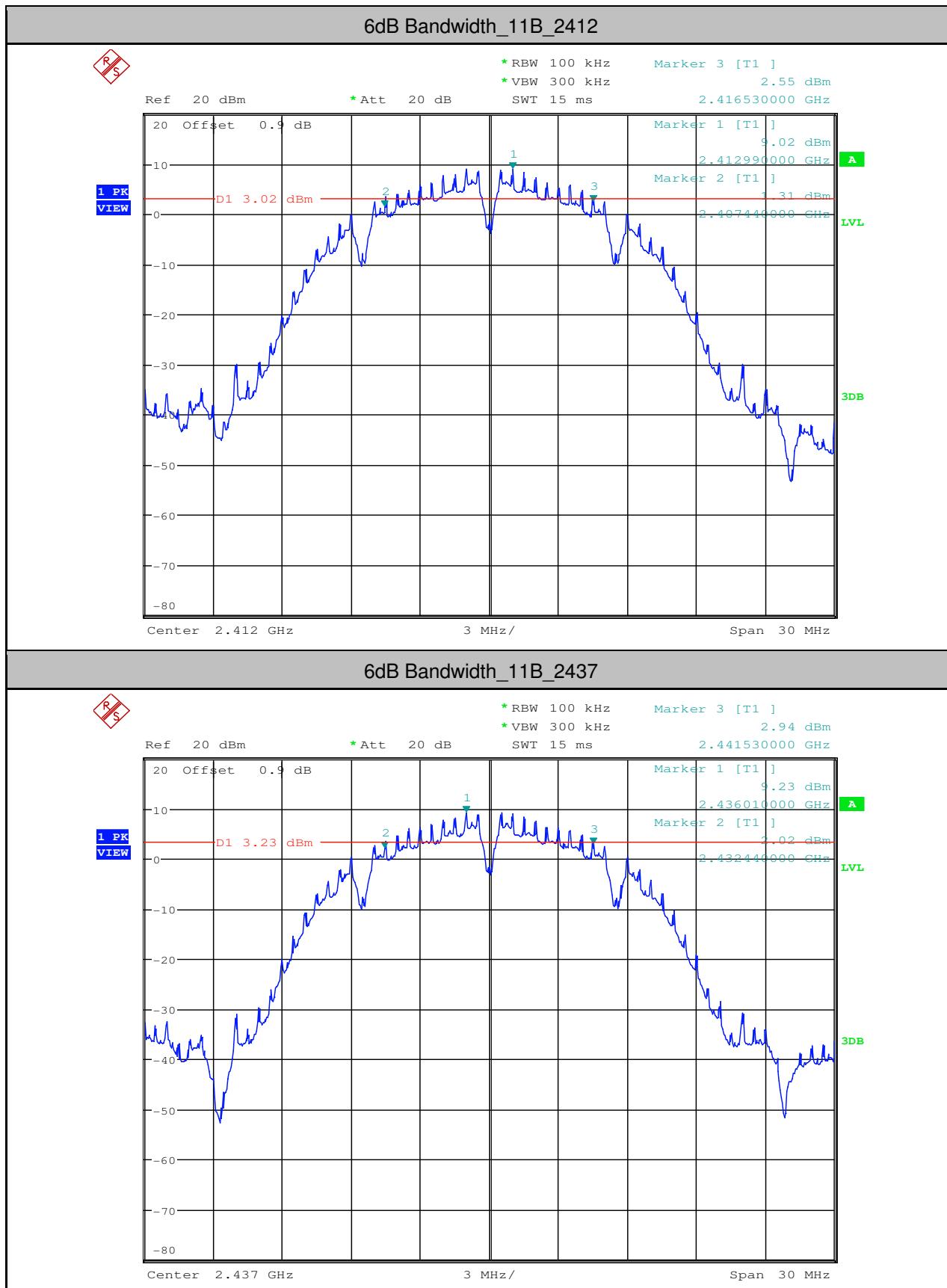
Refer to Appendix A - Photographs of EUT Constructional Details for SZEM1705005406CR.

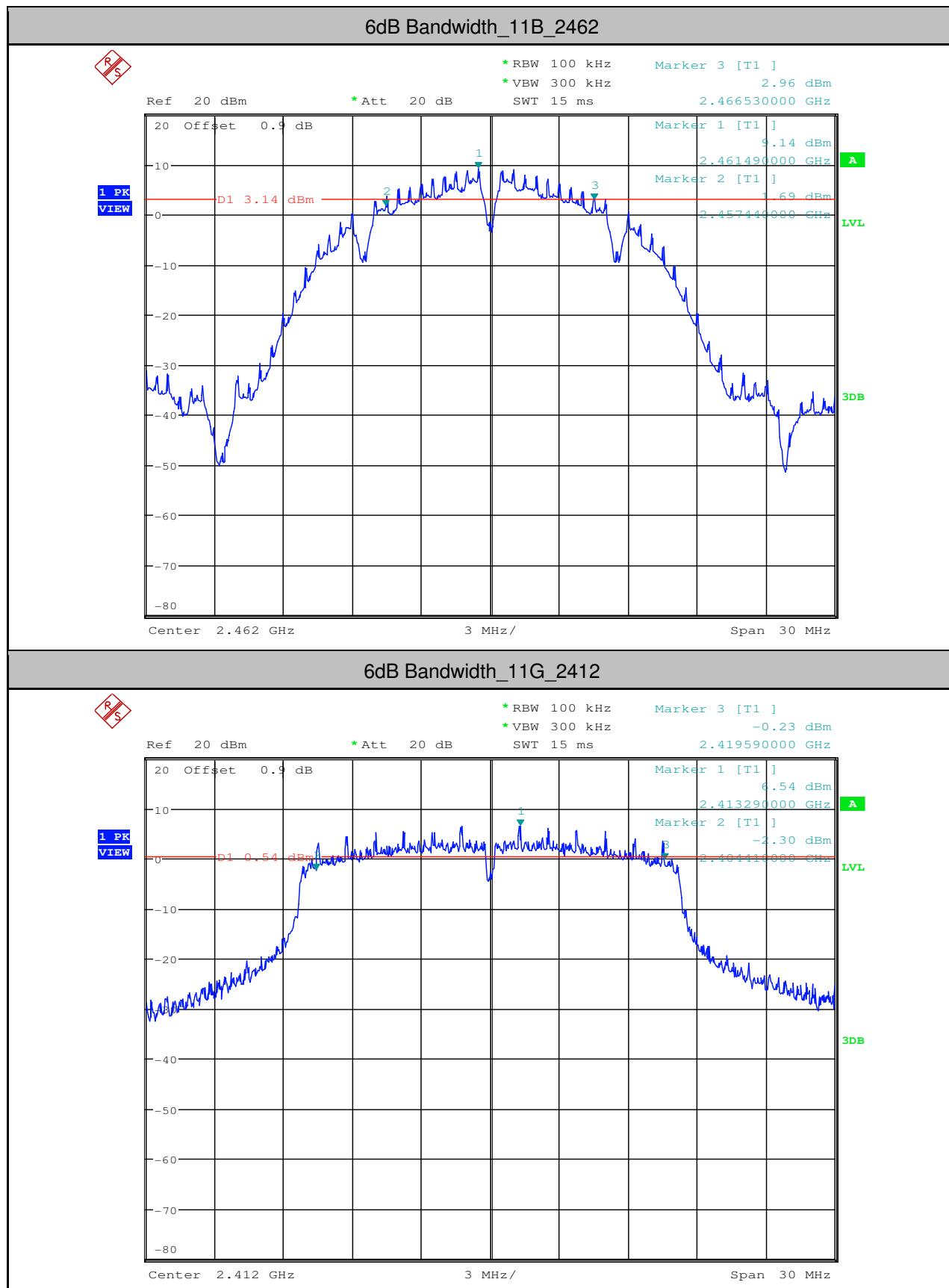
9 Appendix

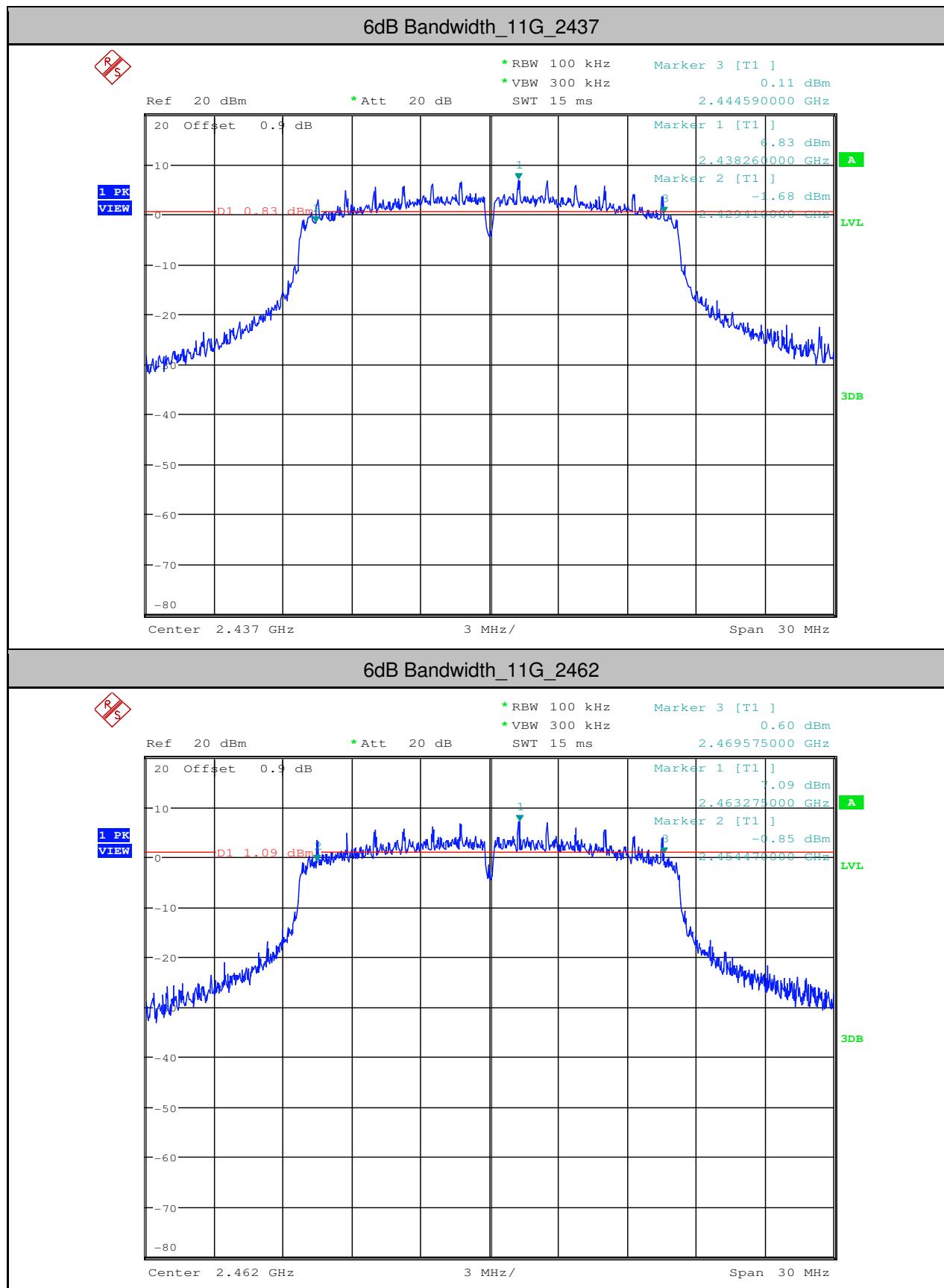
9.1 Appendix 15.247

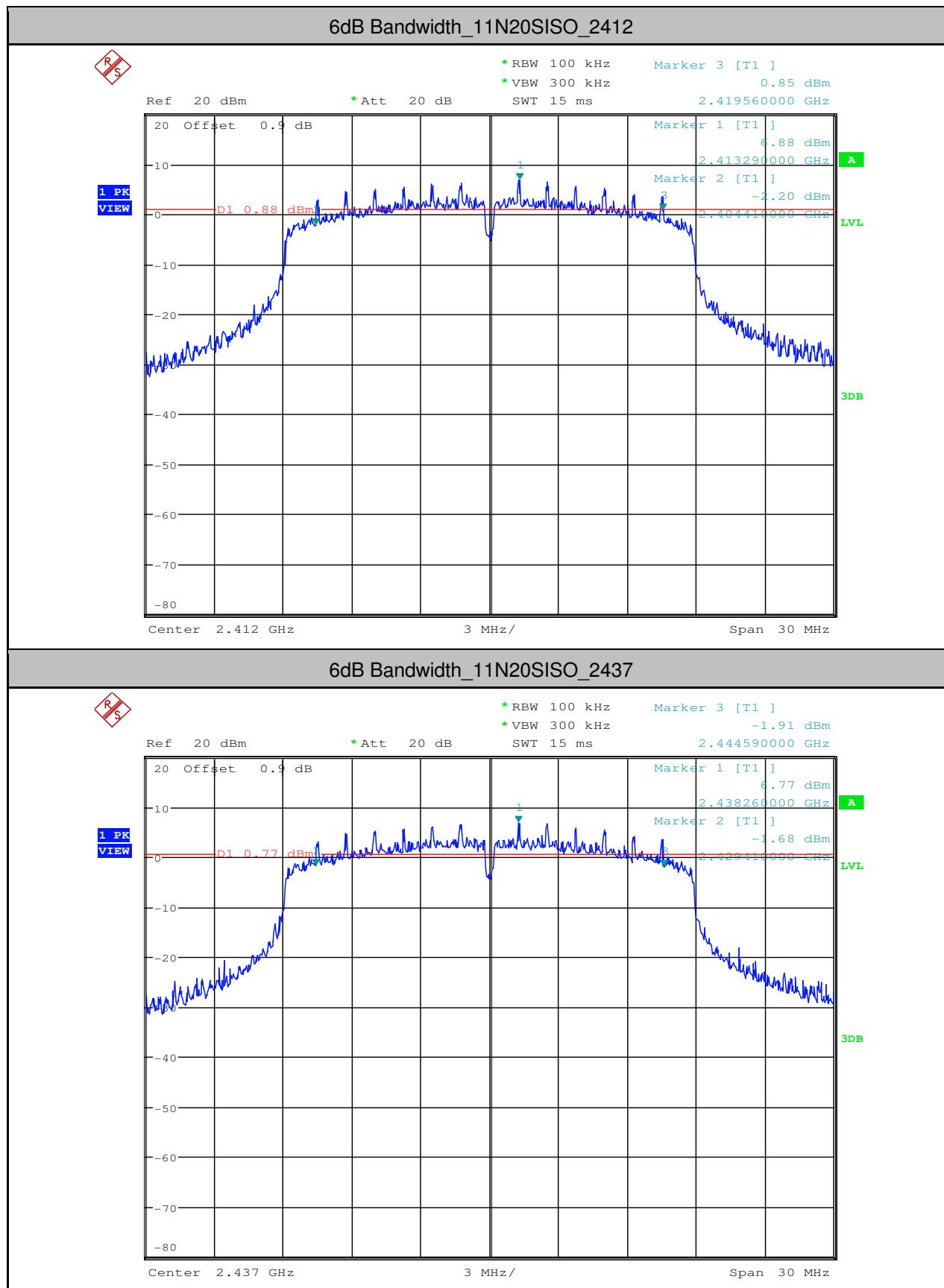
1.6dB Bandwidth

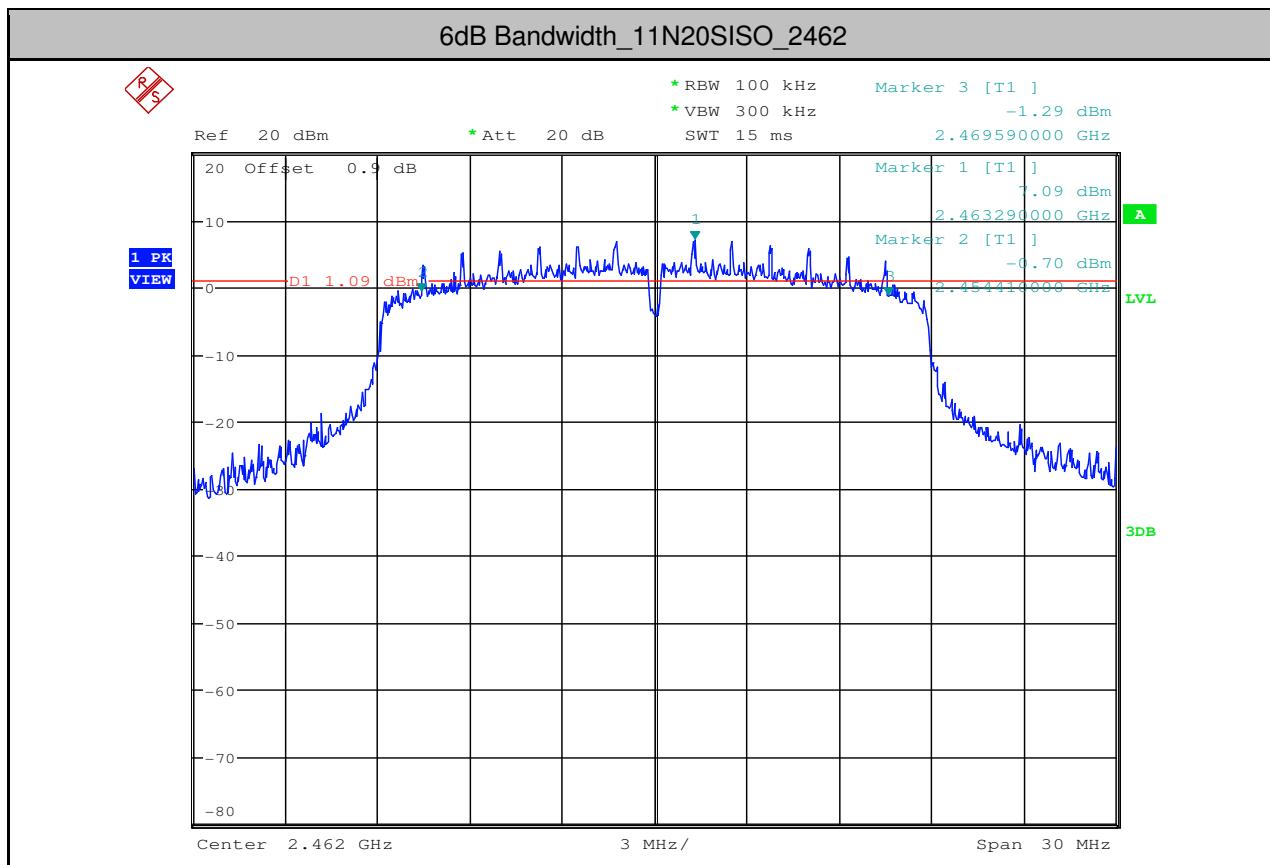
Test Mode	Test Channel	EBW[MHz]	Limit [MHz]	Verdict
11B	2412	9.090	>=0.5	PASS
11B	2437	9.090	>=0.5	PASS
11B	2462	9.090	>=0.5	PASS
11G	2412	15.180	>=0.5	PASS
11G	2437	15.180	>=0.5	PASS
11G	2462	15.105	>=0.5	PASS
11N20SISO	2412	15.150	>=0.5	PASS
11N20SISO	2437	15.180	>=0.5	PASS
11N20SISO	2462	15.180	>=0.5	PASS





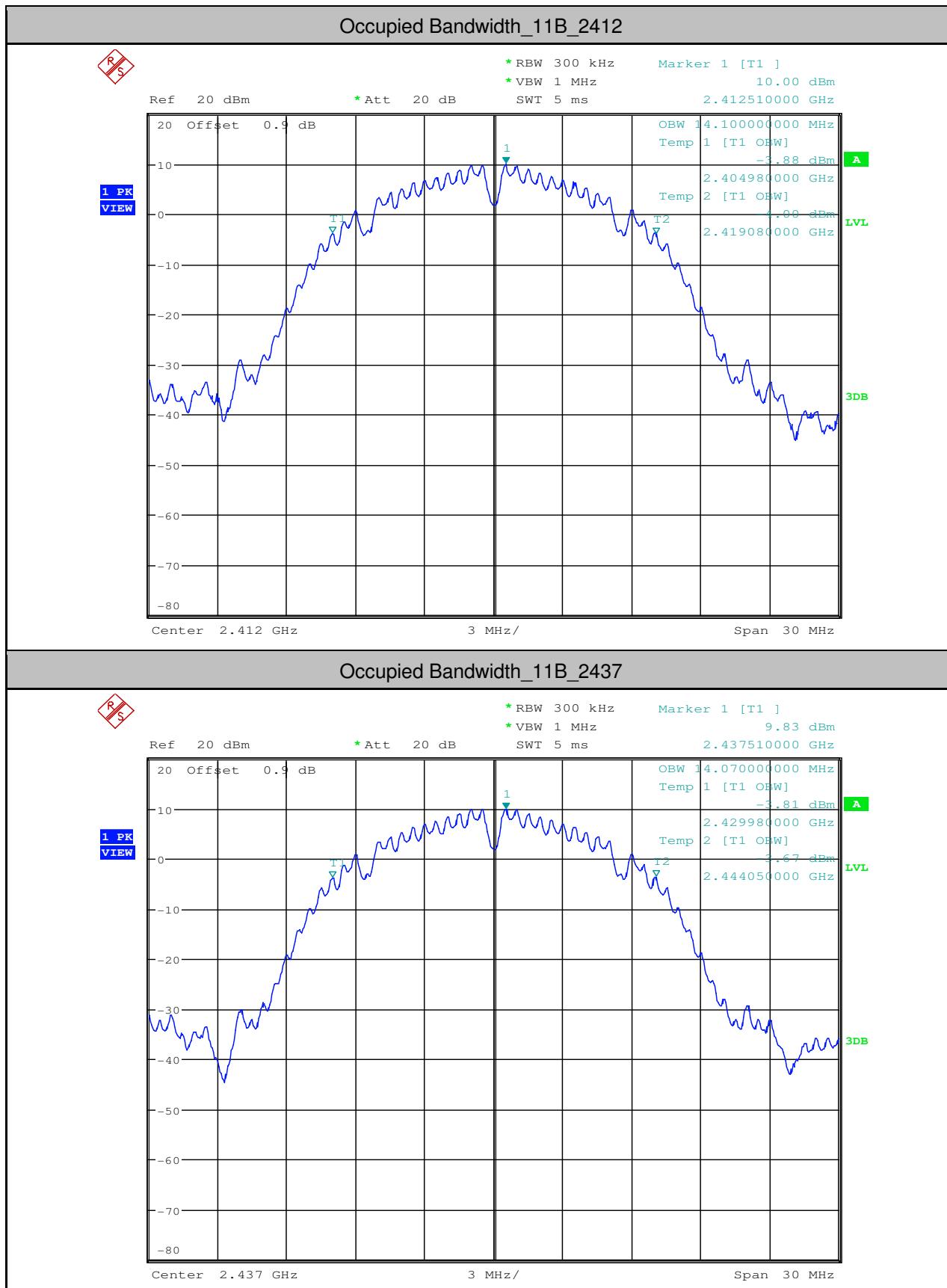


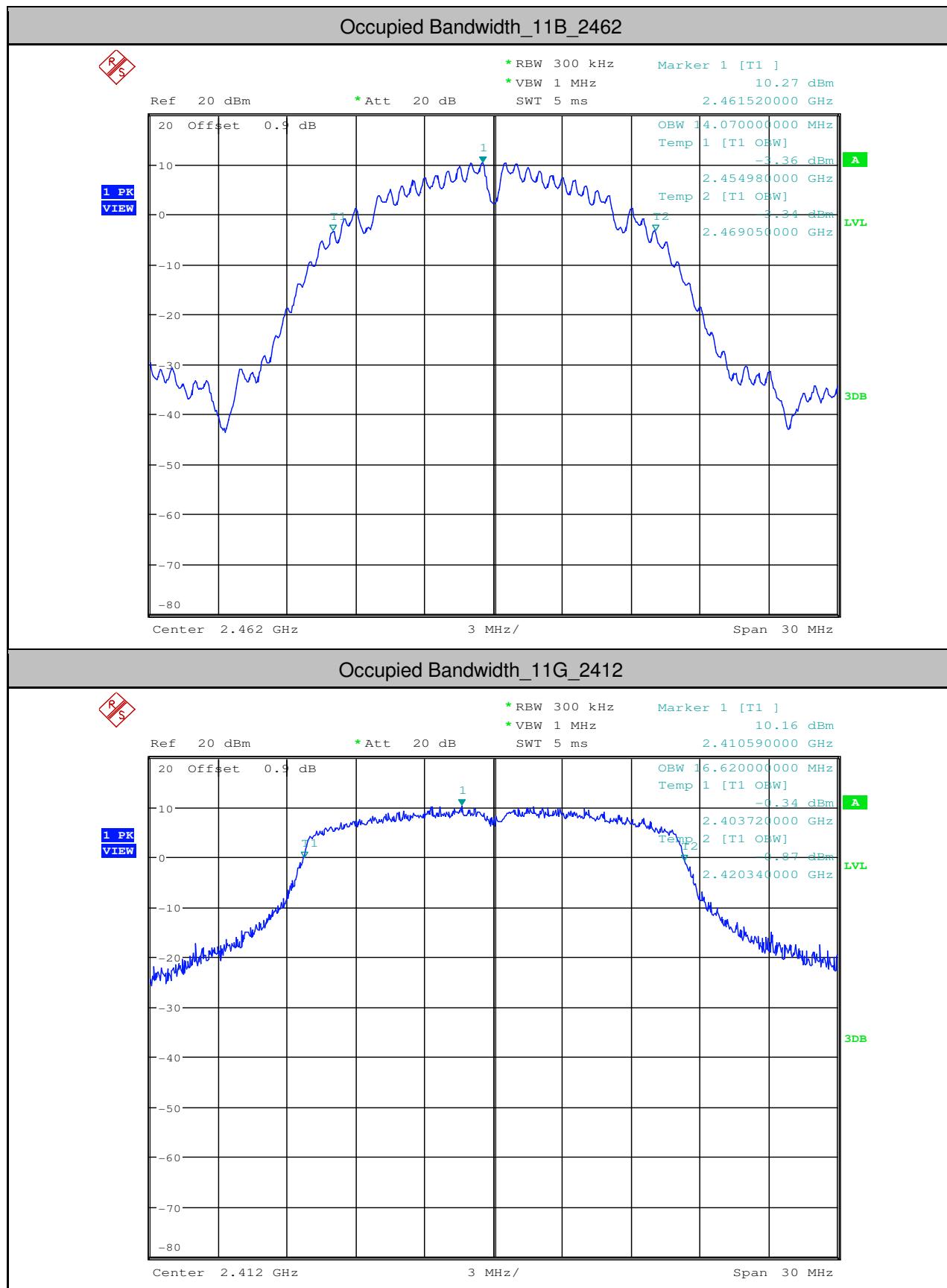


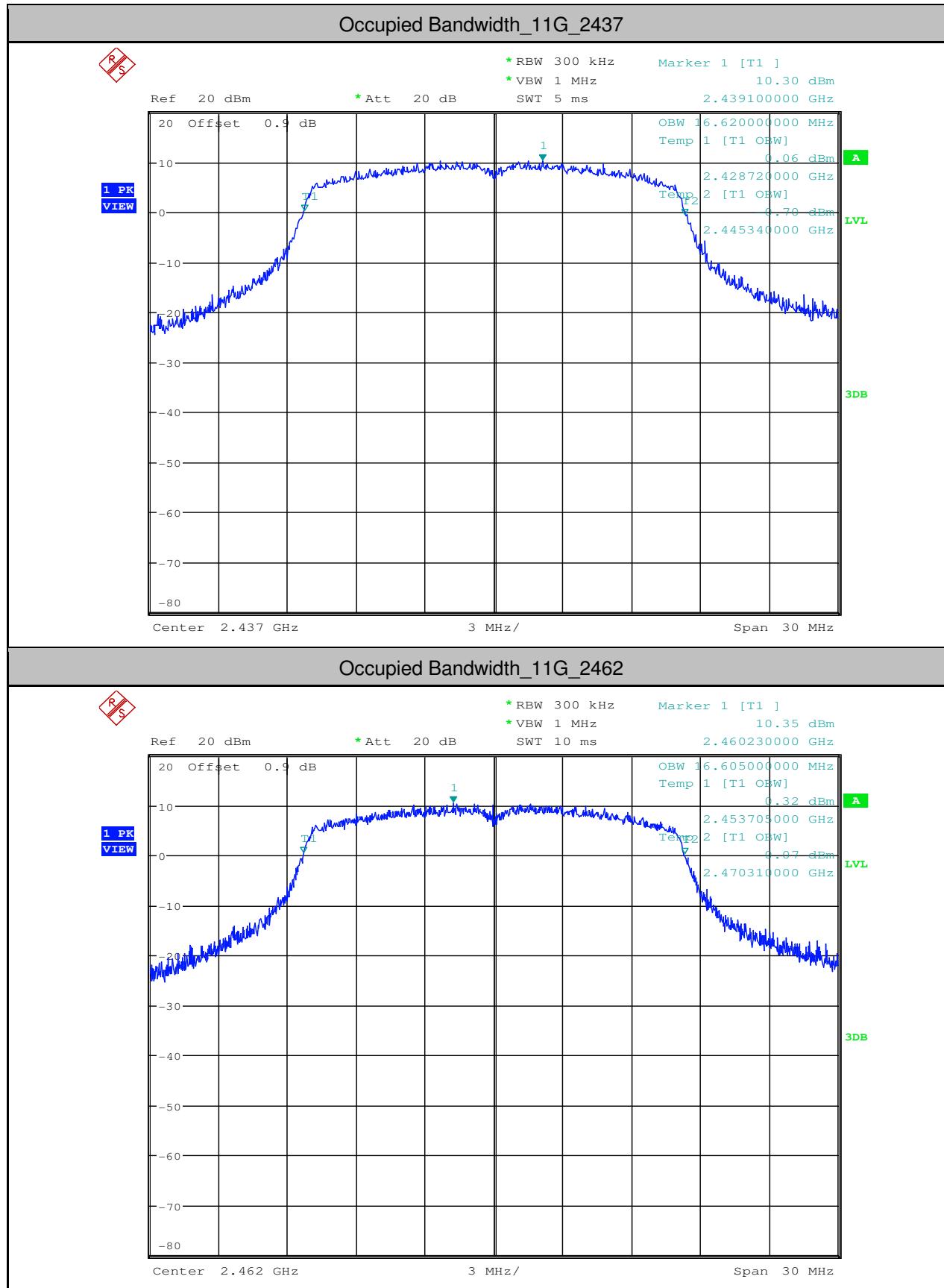


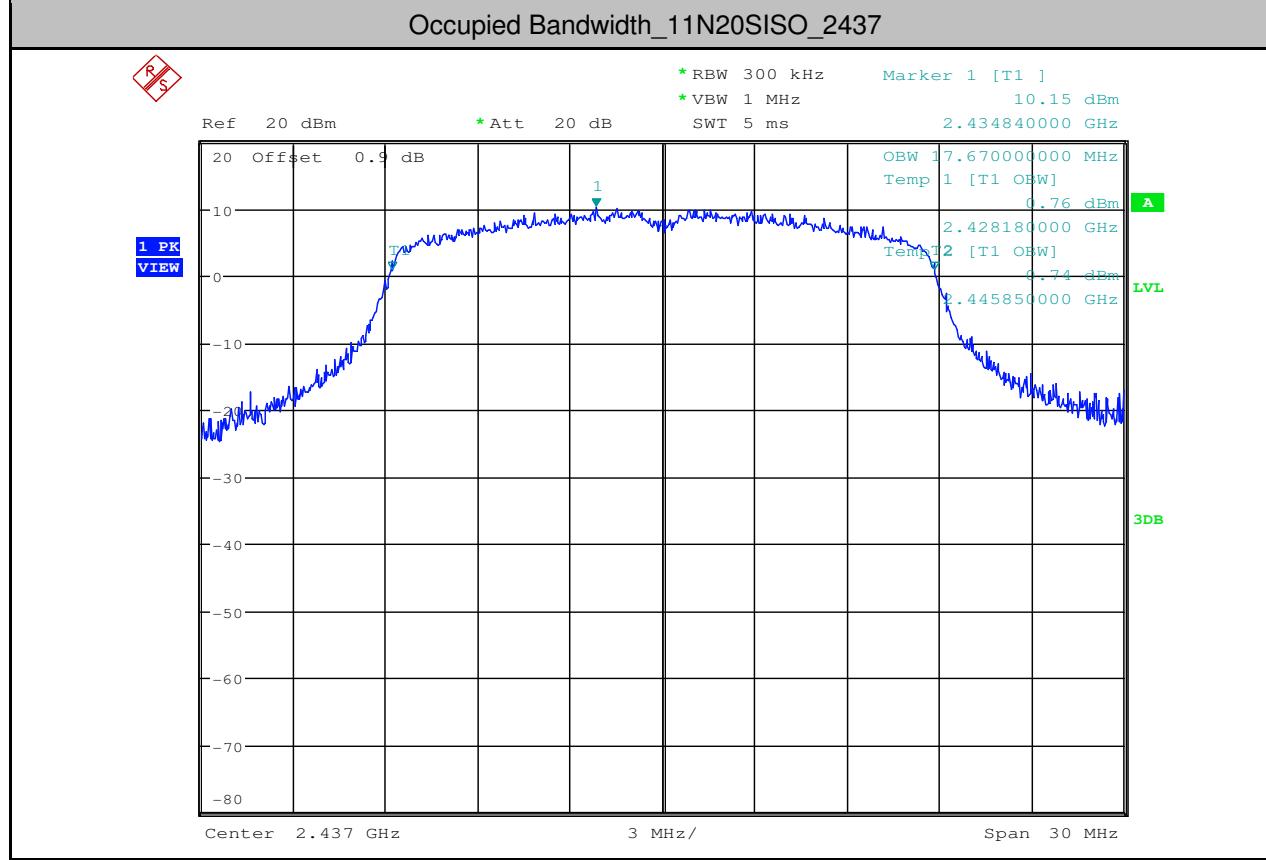
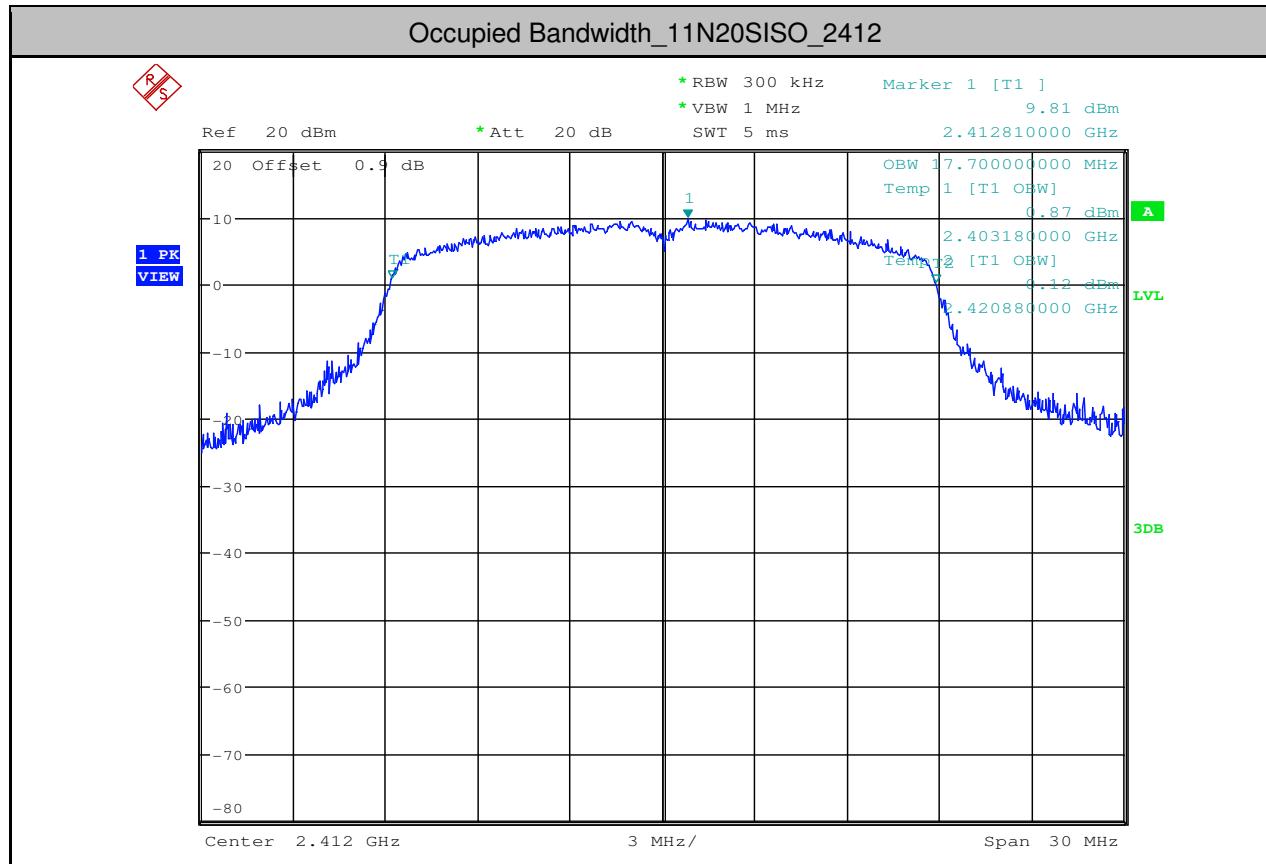
2.Occupied Bandwidth

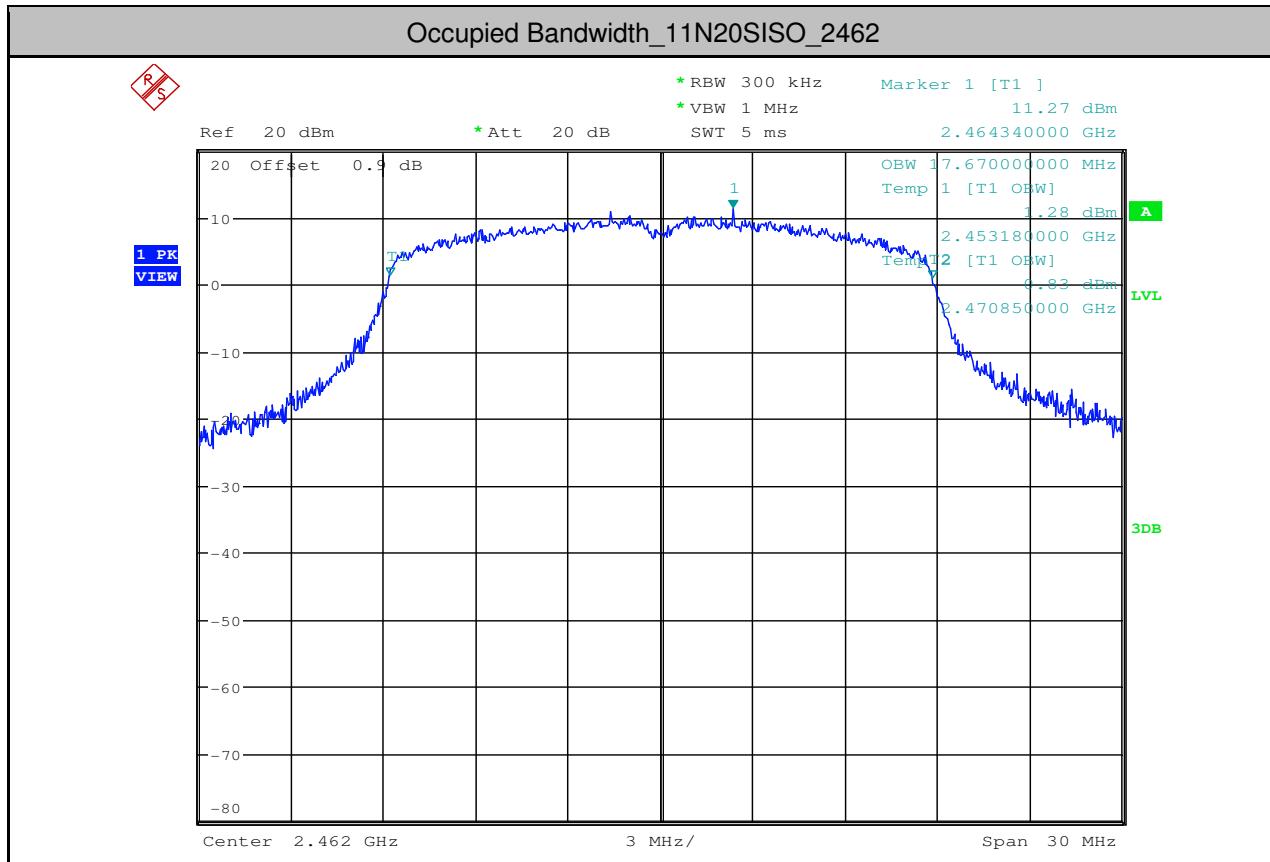
Test Mode	Test Channel	OBW[MHz]	Limit[MHz]	Verdict
11B	2412	14.100	---	PASS
11B	2437	14.070	---	PASS
11B	2462	14.070	---	PASS
11G	2412	16.620	---	PASS
11G	2437	16.620	---	PASS
11G	2462	16.605	---	PASS
11N20SISO	2412	17.700	---	PASS
11N20SISO	2437	17.670	---	PASS
11N20SISO	2462	17.670	---	PASS









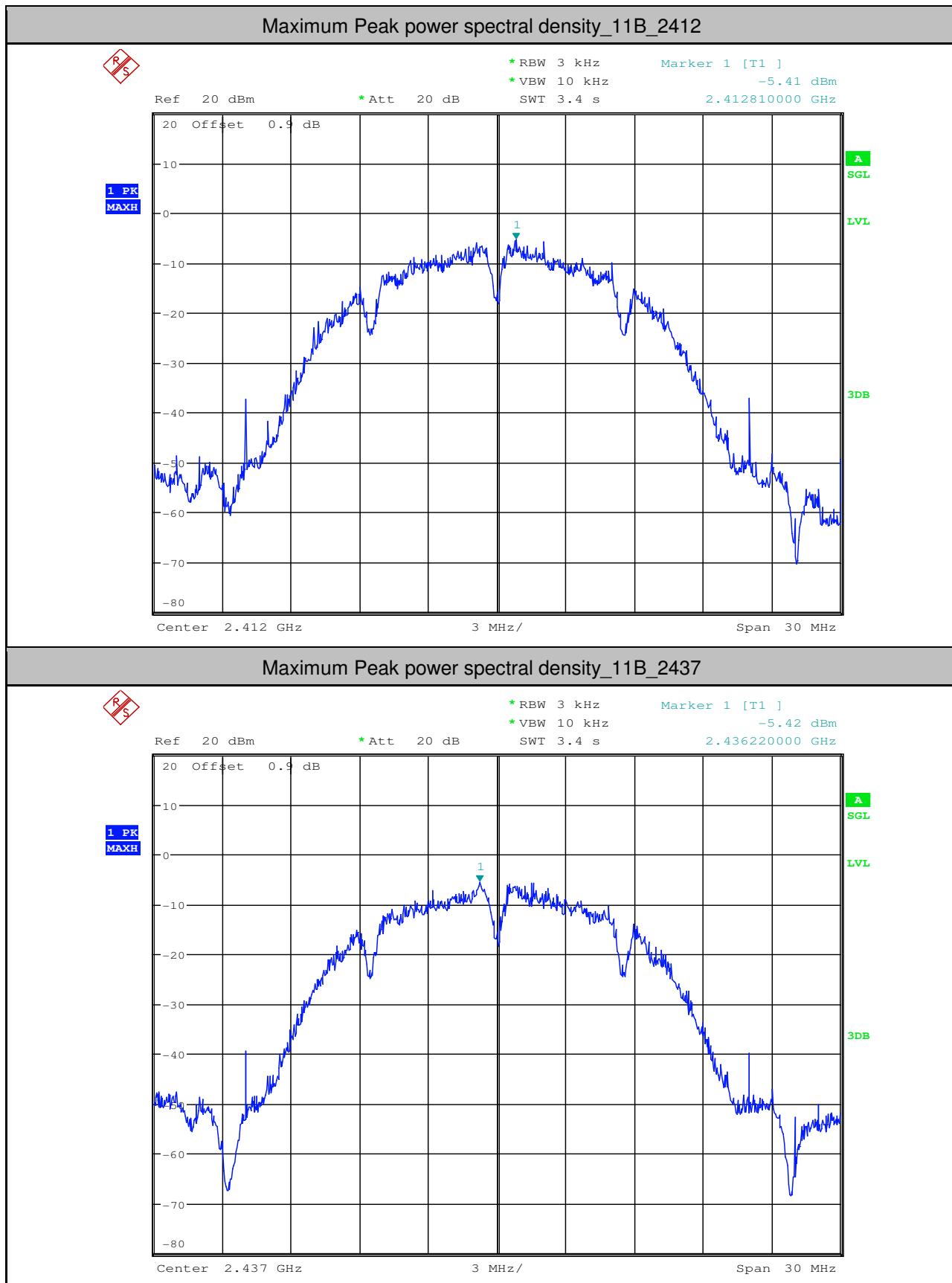


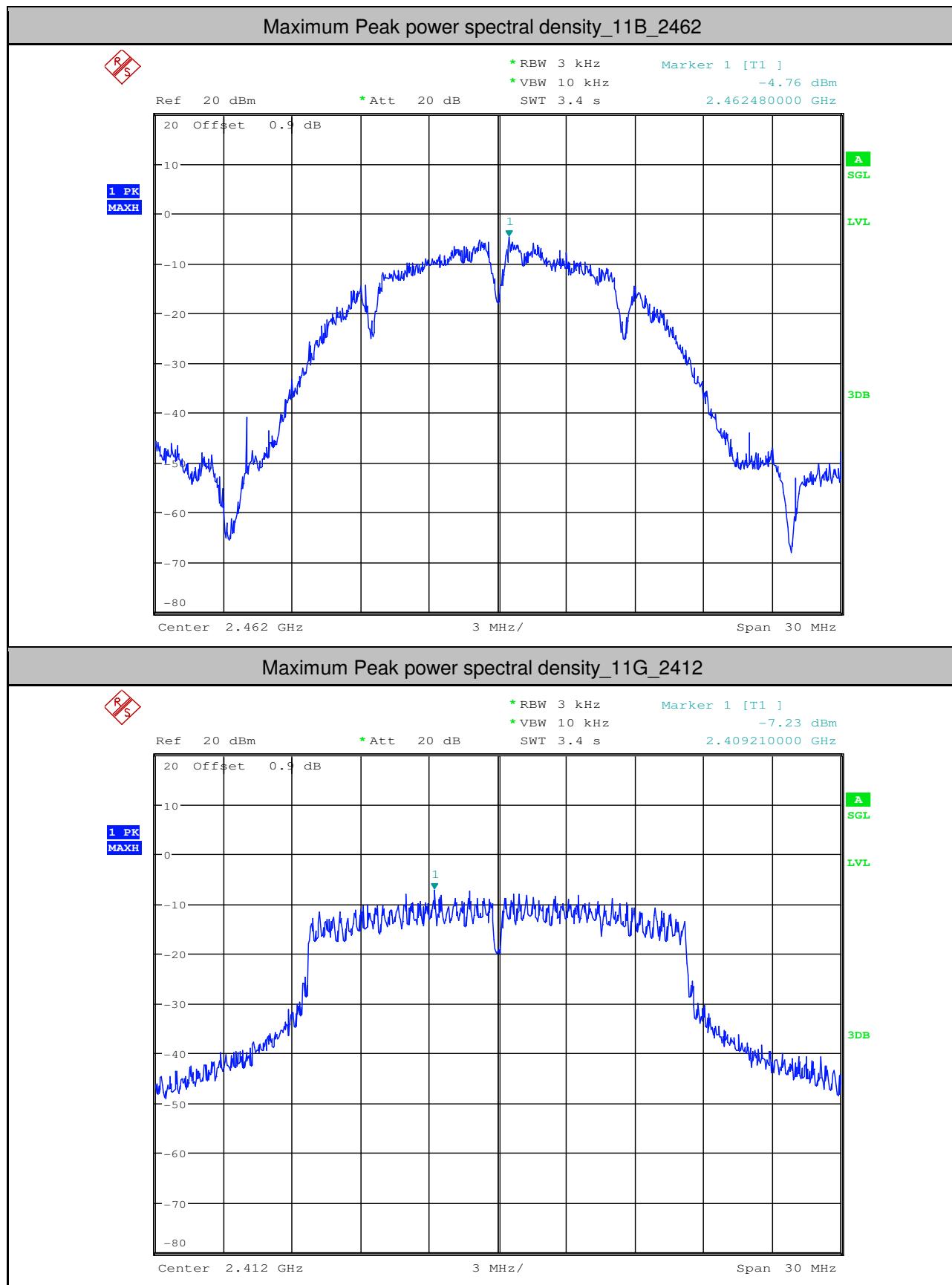
3. Maximum peak conducted output power

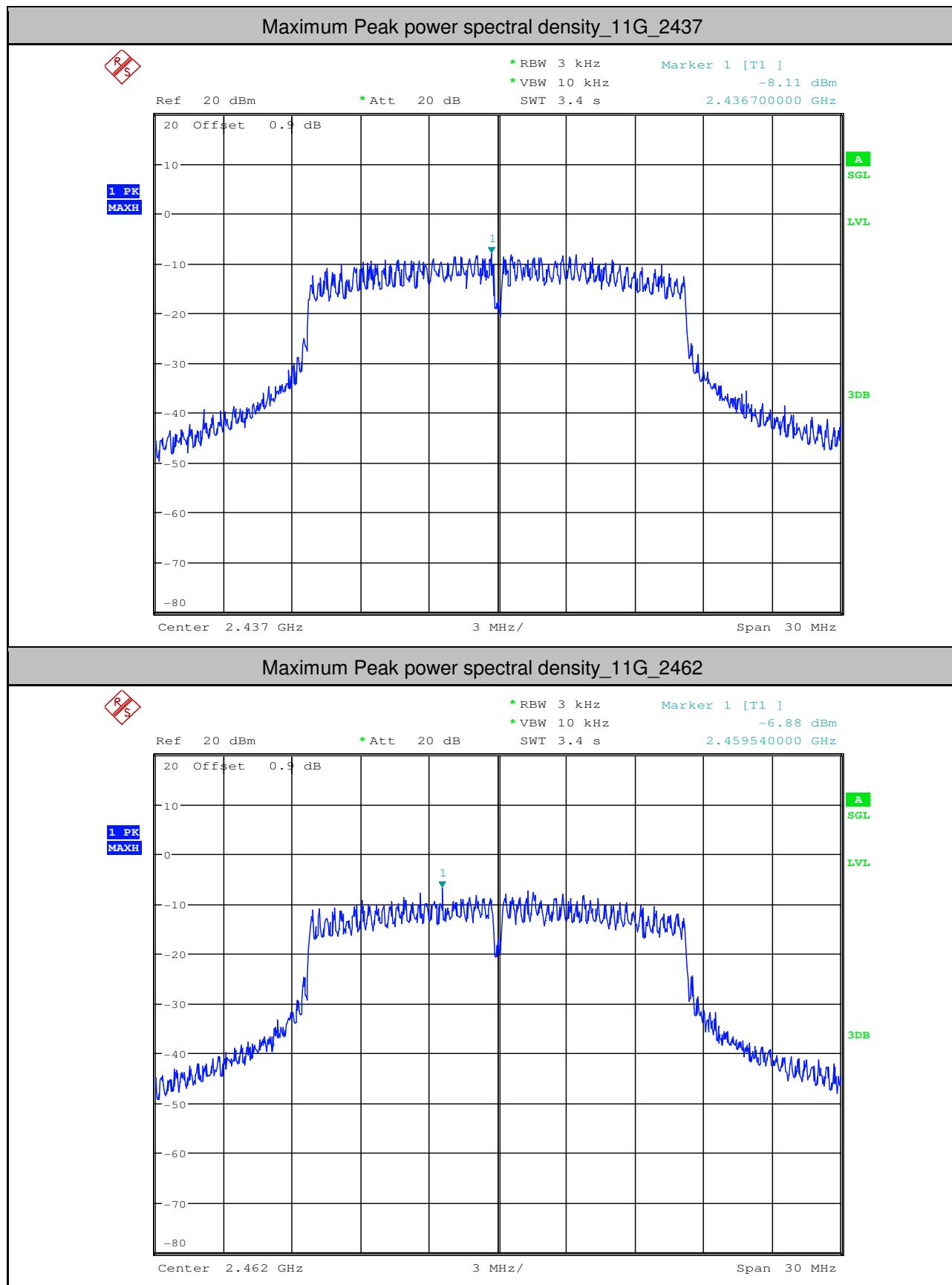
Test Mode	Test Channel	Power[dBm]	Limit[dBm]	Verdict
11B	2412	20.76	<30	PASS
11B	2437	21.12	<30	PASS
11B	2462	21.31	<30	PASS
11G	2412	20.84	<30	PASS
11G	2437	20.20	<30	PASS
11G	2462	20.25	<30	PASS
11N20SISO	2412	20.79	<30	PASS
11N20SISO	2437	20.89	<30	PASS
11N20SISO	2462	20.21	<30	PASS

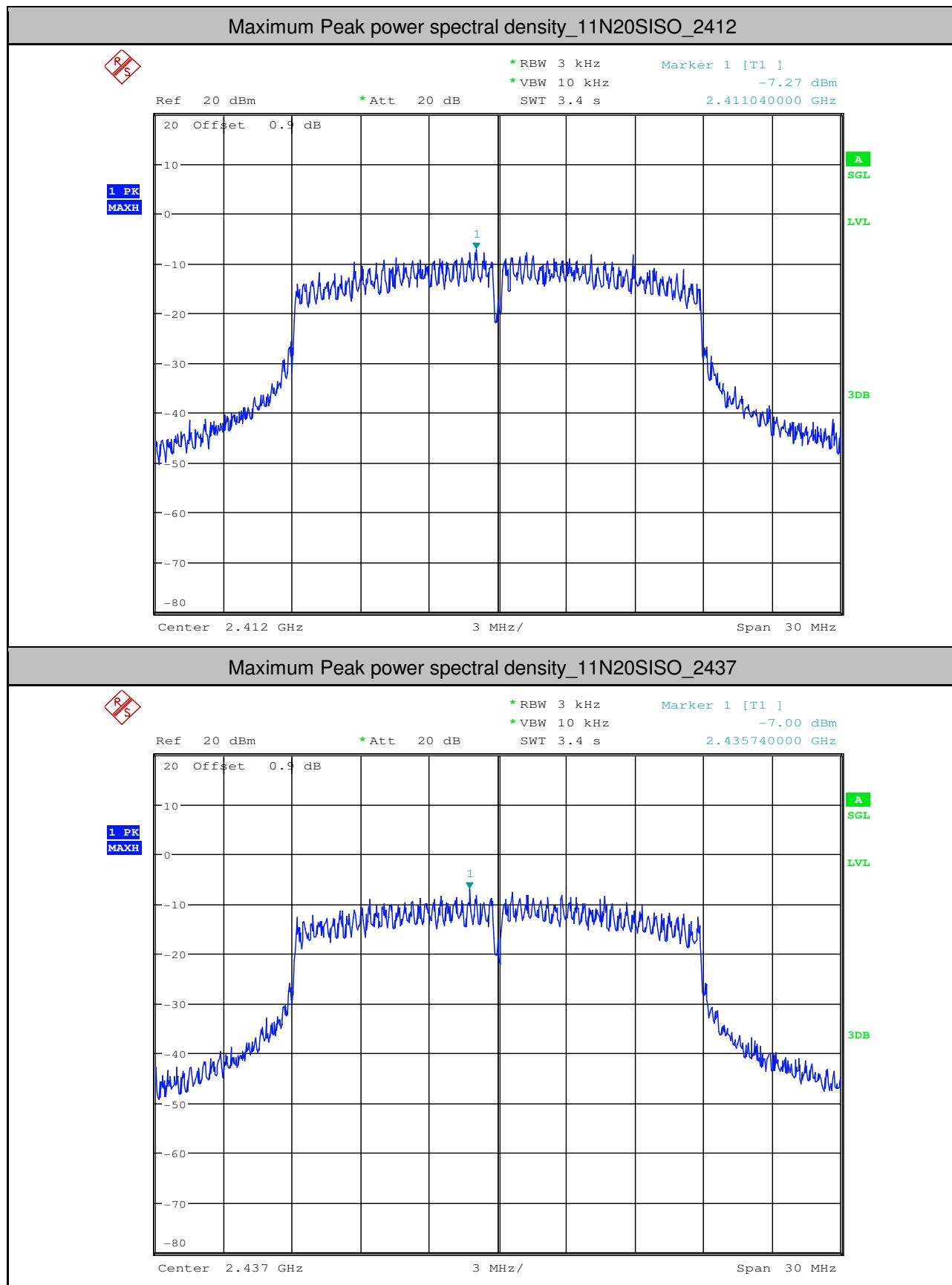
4. Maximum Peak power spectral density

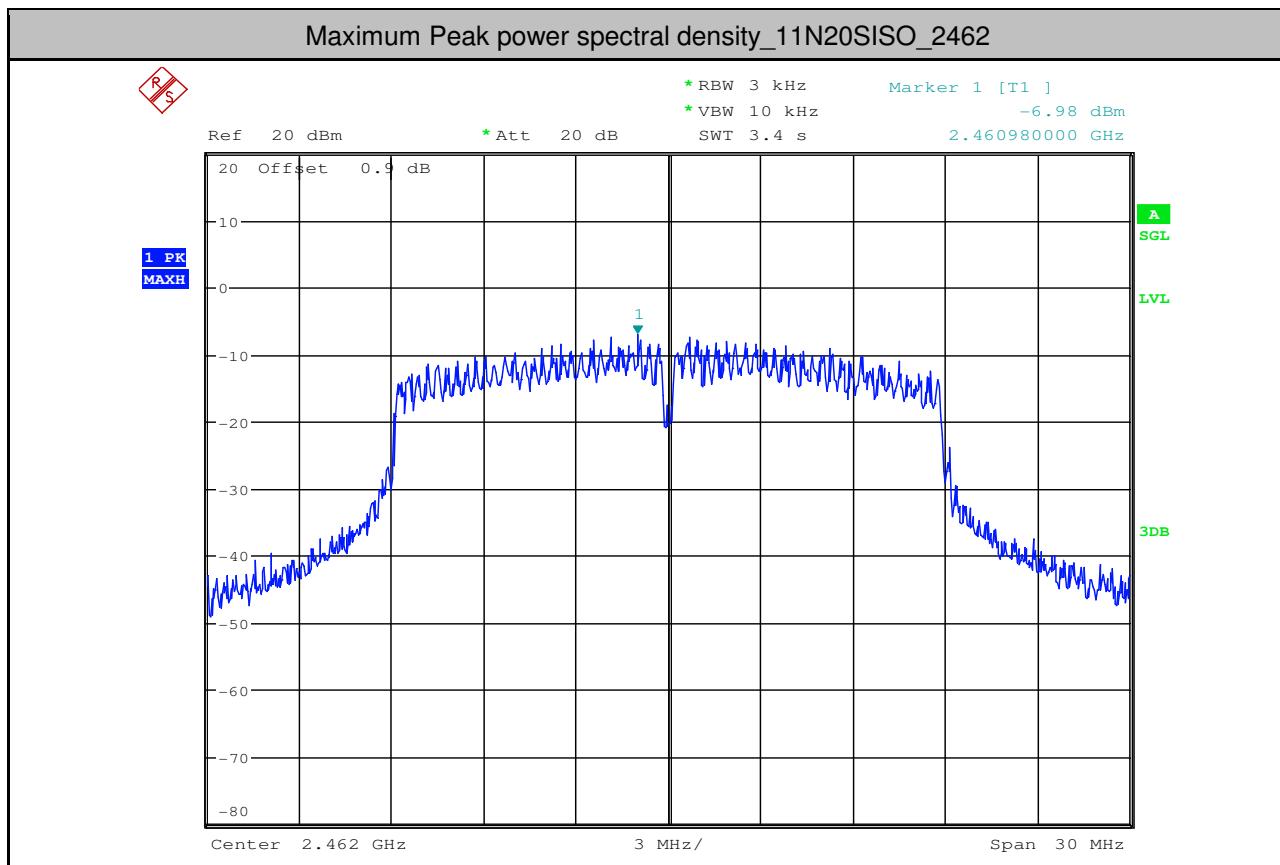
Test Mode	Test Channel	PSD[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
11B	2412	-5.41	<8.00	PASS
11B	2437	-5.42	<8.00	PASS
11B	2462	-4.76	<8.00	PASS
11G	2412	-7.23	<8.00	PASS
11G	2437	-8.11	<8.00	PASS
11G	2462	-6.88	<8.00	PASS
11N20SISO	2412	-7.27	<8.00	PASS
11N20SISO	2437	-7	<8.00	PASS
11N20SISO	2462	-6.98	<8.00	PASS





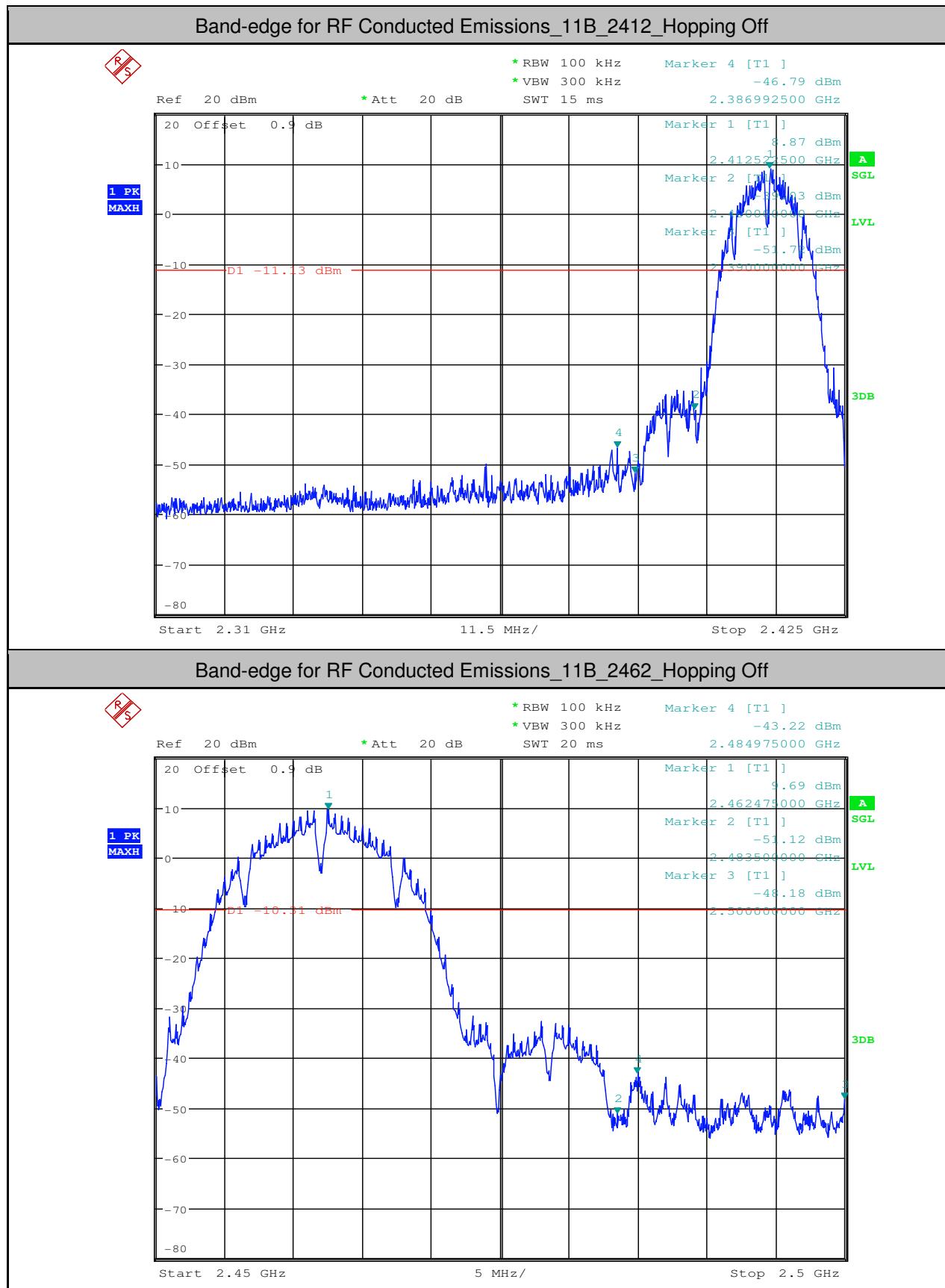


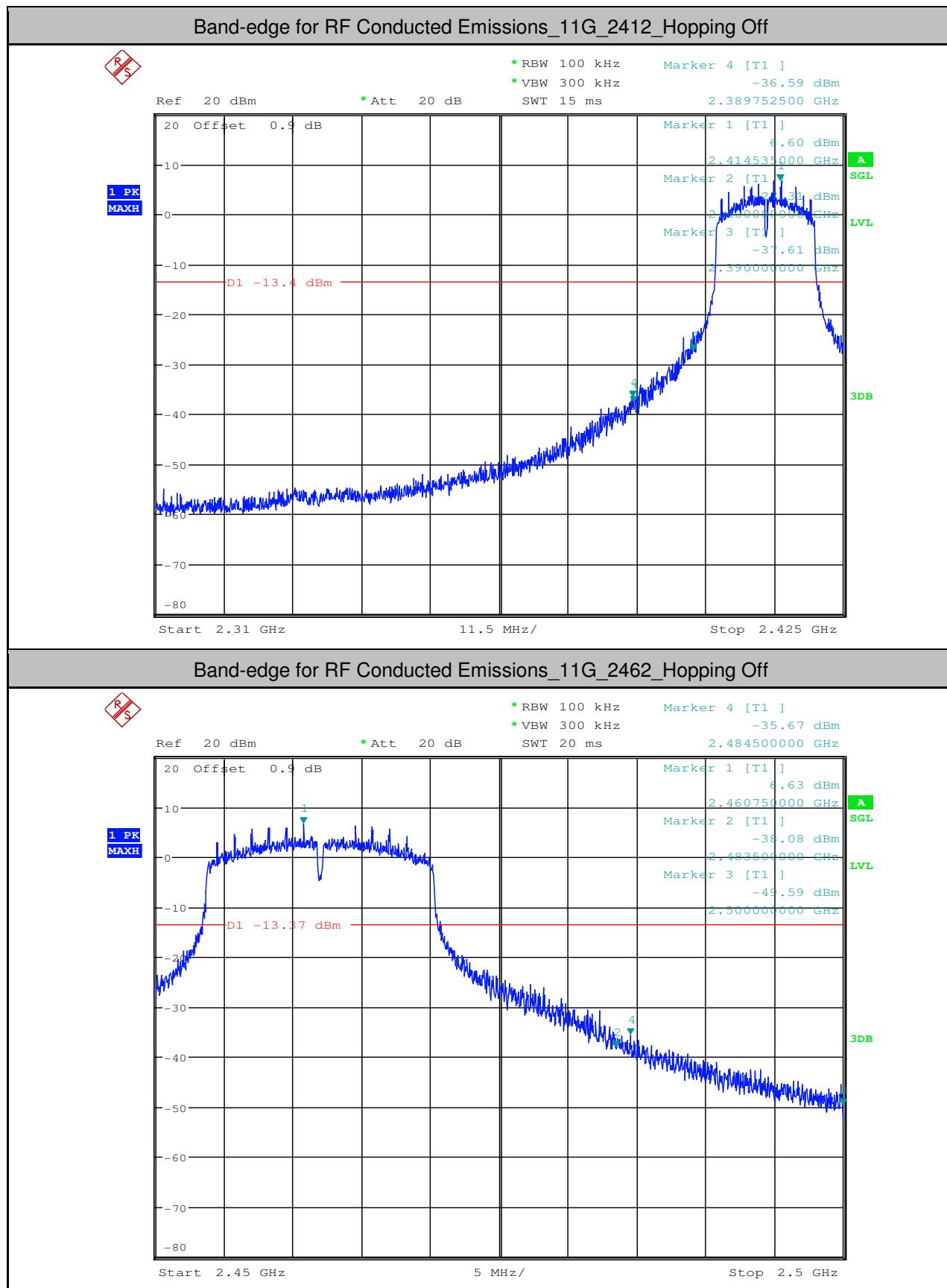


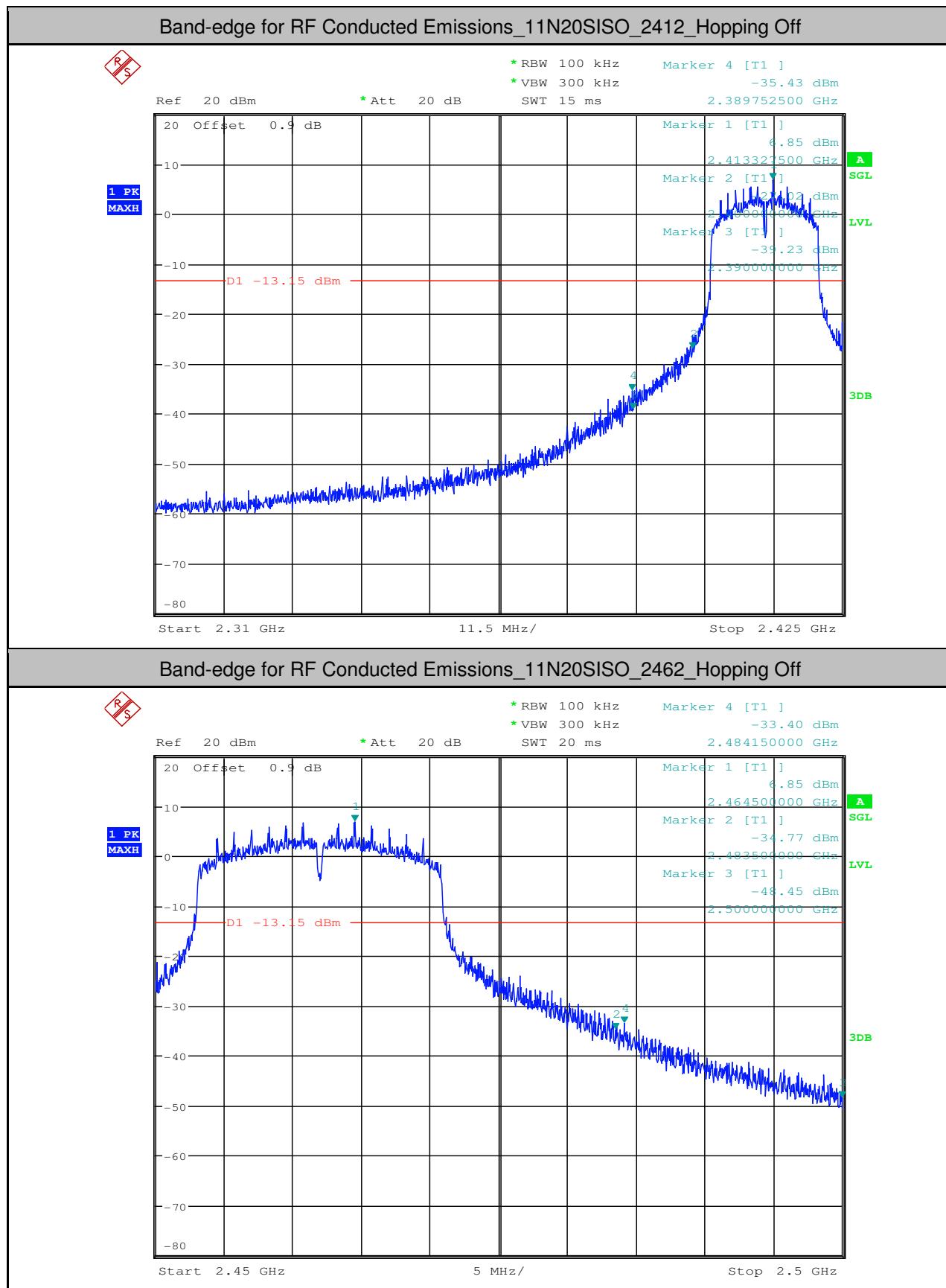


5.Band-edge for RF Conducted Emissions

Test Mode	Test Channel	Carrier Power[dBm]	Max. Spurious Level [dBm]	Limit [dBm]	Verdict
11B	2412	8.870	-46.793	<-11.13	PASS
11B	2462	9.690	-43.219	<-10.31	PASS
11G	2412	6.600	-36.587	<-13.4	PASS
11G	2462	6.630	-35.670	<-13.37	PASS
11N20SISO	2412	6.850	-35.427	<-13.15	PASS
11N20SISO	2462	6.850	-33.402	<-13.15	PASS







6.RF Conducted Spurious Emissions

Test Mode	Test Channel	StartFre [MHz]	StopFre [MHz]	RBW [kHz]	VBW [kHz]	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
11B	2412	30	10000	1000	3000	8.69	-26.770	<-11.31	PASS
11B	2412	10000	25000	1000	3000	8.69	-52.620	<-11.31	PASS
11B	2437	30	10000	1000	3000	9.5	-26.760	<-10.5	PASS
11B	2437	10000	25000	1000	3000	9.5	-52.570	<-10.5	PASS
11B	2462	30	10000	1000	3000	9.88	-26.070	<-10.12	PASS
11B	2462	10000	25000	1000	3000	9.88	-52.630	<-10.12	PASS
11G	2412	30	10000	1000	3000	6.1	-24.150	<-13.9	PASS
11G	2412	10000	25000	1000	3000	6.1	-52.640	<-13.9	PASS
11G	2437	30	10000	1000	3000	6.8	-25.290	<-13.2	PASS
11G	2437	10000	25000	1000	3000	6.8	-52.560	<-13.2	PASS
11G	2462	30	10000	1000	3000	7.32	-26.990	<-12.68	PASS
11G	2462	10000	25000	1000	3000	7.32	-52.530	<-12.68	PASS
11N20SISO	2412	30	10000	1000	3000	6.57	-26.150	<-13.43	PASS
11N20SISO	2412	10000	25000	1000	3000	6.57	-52.800	<-13.43	PASS
11N20SISO	2437	30	10000	1000	3000	5.9	-27.440	<-14.1	PASS
11N20SISO	2437	10000	25000	1000	3000	5.9	-51.820	<-14.1	PASS
11N20SISO	2462	30	10000	1000	3000	7.46	-27.640	<-12.54	PASS
11N20SISO	2462	10000	25000	1000	3000	7.46	-52.490	<-12.54	PASS

