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Report No.: SHEM130800162603

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1 Cover Page

RF TEST REPORT for DTS

Application No.:	SHEM1308001626RF
Applicant:	Hansong (Nanjing) Technology Ltd.
Manufacturer:	Vifa Denmark A/S
FCC ID:	XCO-VIFANORDIC
IC:	7756A-VIFANORDIC
Equipment Under Test (EUT): NOTE: The following sample(s) submitted was/were identified on behalf of the client as	
Product Name:	Active wireless loudspeaker
Model No.(EUT):	VIFA010, VIFA020
Standards:	FCC PART 15 Subpart C: 2012 RSS-210 Issue 8 (December 2010) RSS-Gen Issue 3 (December 2010)
Date of Receipt:	November 01, 2013
Date of Test:	November 11, 2013 to November 14, 2013
Date of Issue:	November 28, 2013
Test Result:	Pass*

*In the configuration tested, the EUT detailed in this report complied with the standards specified above.



Tony Wu
E&E Section Manager

SGS-CSTC (Shanghai) Co., Ltd.


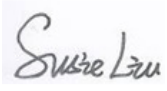
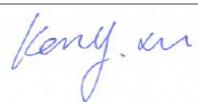
The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

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. All test results in this report can be traceable to National or International Standards.

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2 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
00	/	November 28, 2013	/	Original

Authorized for issue by:				
Engineer		Eddy Zong		
		Print Name		
Clerk		Susie Liu		
		Print Name		
Reviewer		Kenx Xu		
		Print Name		

3 Test Summary

Test Item	Test Requirement	IC REFERENCE	Test method	Result
Antenna Requirement	FCC Part 15, Subpart C Section 15.203/15.247 (c)	RSS-Gen 7.1.2	---	PASS
AC Power Line Conducted Emission	FCC Part 15, Subpart C Section 15.207	RSS-Gen Issue 8 Clause 7.2.4	ANSI C63.10 (2009) Section 6.2	PASS
Minimum 6dB Bandwidth	FCC Part 15, Subpart C Section 15.247 (a)(2)	RSS-210 Issue 8 Annex 8	ANSI C63.10 (2009) Section 6.9.1	PASS
Conducted Peak Output Power	FCC Part 15, Subpart C Section 15.247 (b)(3)	RSS-210 Issue 8 Annex 8	ANSI C63.10 (2009) Section 6.10.2	PASS
Power Spectrum Density	FCC Part 15, Subpart C Section 15.247 (e)	RSS-210 Issue 8 Annex 8	ANSI C63.10 (2009) Section 6.11.2	PASS
RF Conducted Spurious Emissions	FCC Part 15, Subpart C Section 15.247(d)	RSS-210 Issue 8 Annex 8.5	ANSI C63.10 (2009) Section 7.7.10	PASS
Band-edge for RF Conducted Emissions	FCC Part 15, Subpart C Section 15.247(d)	RSS-210 Issue 8 Annex 8.5	ANSI C63.10 (2009) Section 7.7.10	PASS
Radiated Spurious emissions	FCC Part 15, Subpart C Section 15.209 & 15.205	RSS-210 Issue 8 Annex 8.5	ANSI C63.10 (2009) Section 6.12	PASS
Radiated Band-edge	FCC Part 15, Subpart C Section 15.205&15.209	RSS-210 Issue 8 Annex 8.5	ANSI C63.10 (2009) Section 6.5	PASS
Occupied bandwidth	---	RSS-Gen Issue 3 Clause 4.6.1	RSS-Gen Issue 3 Clause 4.6.1	PASS

Note: There are 2 models mentioned in this report, The main board and PSU board and operating panel of above models, the electrical circuit design, PCB layout, electrical components used, internal wiring and functions are identical, only different on their physical design and

1. VIFA010 contains an independent Charging board and a Li-ion Battery,
2. and VIFA020 contains an independent RF remote receiver board.

The test of Radiated method to be required to 2 models, and the test of conducted method is performed in VIFA010 only



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5 General Information

5.1 Client Information

Applicant:	Hansong (Nanjing) Technology Ltd.
Address of Applicant:	8th Kangping Road, Jiangning Economy and Technology Development Zone, Nanjing, 211106, China
Manufacturer:	Vifa Denmark A/S
Address of Manufacturer:	Mariendalsvej 2A, DK8800 Viborg, Denmark
Factory:	Guoguang Electric Co., Ltd
Address of Factory:	No.8 Jinghu Road, Xinhua Street, Huadu Reg, Guangzhou, China

5.2 General Description of E.U.T.

Product Name:	Active wireless loudspeaker
Model No.(EUT):	VIFA010, VIFA020
Brand Name:	Vifa
Product Description:	Mobile Product

5.3 Details of E.U.T.

Operation Frequency:	2412MHz-2462MHz
Modulation Type:	802.11b: DSSS(CCK, DQPSK, DBPSK) 802.11g: OFDM(64QAM, 16QAM, QPSK, BPSK)
Number of Channel:	11 Channels
Data Rate:	802.11b: 1Mbps, 5.5Mbps, 11Mbps, 802.11g: 6Mbps, 9Mbps, 12Mbps, 18Mbps, 36Mbps, 48Mbps, 54Mbps
Power Supply:	AC100-240V 50/60Hz
Cable Type:	About 150cm length (2Wires)
Antenna Type	Integral (the two PIFA antennas are not working simultaneously.)
Antenna Gain	2 dBi
Engineering Mode:	Using test software was control EUT work in continuous transmitter and receiver mode.

5.4 Description of Support Units

The EUT has been tested with associated equipment below.

Description	Manufacturer	Model No.	Supplied by
Laptop	Lenovo	ThinkPad X100e	SGS
Software name	Manufacturer	Supplied By	
HyperTerminal	/	SGS	

Using test software was control EUT work in continuous transmitter and receiver mode. And select test channel as below:

For 802.11b/g

Channel	Frequency
The lowest channel(CH1)	2412MHz
The middle channel(CH6)	2437MHz
The Highest channel(CH11)	2462MHz

Through Pre-scan under all rate at lowest channel 1(CH1), the data rate as below table described is the worst case, so we chose these data rate for test.

Type	Data rate
802.11b	1Mbps
802.11g	6Mbps

5.5 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.
No.588 West Jindu Road, Songjiang District, Shanghai, China.201612.
Tel: +86 21 6191 5666
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5.6 Test Facility

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

- **CNAS (No. CNAS L0599)**

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. 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. Date of expiry: 2014-07-26.

- **FCC – Registration No.: 402683**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered and fully described in a report filed with the Federal Communications Commission (FCC). The acceptance letter from the FCC is maintained in our files. Registration No.: 402683, Expiry Date: 2015-02-22.

- **Industry Canada (IC) – IC Assigned Code: 8617A**

The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 8617A. Expiry Date: 2014-09-20.

- **VCCI (Member No.: 3061)**

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-3868 and C-4336 respectively. Date of Registration: 2012-05-29. Date of Expiry: 2015-05-28.

6 Equipments Used during Test

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due date
1	Spectrum Analyzer	Rohde & Schwarz	FSP-30	2705121009	2013-02-23	2014-02-22
2	EMI test receiver	Rohde & Schwarz	ESU40	100109	2013-02-23	2014-02-22
3	Horn Antenna (1GHz to 18GHz)	SCHWARZBECK	BBHA9120 D	9120D-679	2013-03-07	2014-03-06
4	Horn Antenna (14GHz to 40GHz)	SCHWARZBECK	BBHA 9170	BBHA91703 73	2013-03-07	2014-03-06
5	ANTENNA (25MHz to 2GHz)	SCHWARZBECK	VULB9168	9168-313	2013-03-07	2014-03-06
6	Ultra broadband antenna (30MHz to 3GHz)	Rohde & Schwarz	HL562	100227	2013-10-09	2014-10-08
7	Horn Antenna (1GHz to 18GHz)	Rohde & Schwarz	HF906	100284	2013-06-02	2014-06-01
8	Active Loop Antenna (9kHz to 30MHz)	Rohde & Schwarz	FMZB 1519	1519-034	2013-07-28	2014-07-27
9	High-low temperature cabinet	Suzhou Zhihe	TL-40	50110050	2013-04-13	2014-04-12
10	Tunable Notch Filter	Wainwright instruments GmbH	WRCT800. 0/880.0- 0.2/40- 5SSK	9	2013-06-02	2014-06-01
11	High pass Filter	FSCW	HP 12/2800- 5AA2	19A45-02	2013-06-02	2014-06-01
12	Low noise amplifier	TESEQ	LNA6900	70133	2013-02-23	2014-02-22
13	Attenuator	HUAXIANG	TS2-6dB	11051002	/	/
14	Attenuator	HUAXIANG	TS2-6dB	11051001	/	/
15	AC power stabilizer	WOCEN	6100	51122	2013-06-02	2014-06-01
16	DC power	QJE	QJ30003SI I	611145	2013-06-02	2014-06-01

7 Test Results

7.1 E.U.T. test conditions

Test Power:	AC 120V, 60Hz
Requirements:	15.31(e) For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. For battery operated equipment, the equipment tests shall be performed using a new battery.
Operating Environment:	
Temperature:	20.0 -25.0 °C
Humidity:	35-75 % RH
Atmospheric Pressure:	992 -1020 mbar
Test frequencies:	According to the 15.31(m) Measurements on intentional radiators or receivers, other than TV broadcast receivers, shall be performed and, if required, reported for each band in which the device can be operated with the device operating at the number of frequencies in each band specified in the following table:

Frequency range over which device operates	Number of frequencies	Location in the range of operation
1 MHz or less	1	Middle
1 to 10 MHz	2	1 near top and 1 near bottom
More than 10 MHz	3	1 near top, 1 near middle and 1 near bottom

Pursuant to Part 15.31(c) For swept frequency equipment, measurements shall be made with the frequency sweep stopped at those frequencies chosen for the measurements to be reported. Test frequency is the lowest channel: 2412MHz, middle channel: 2437MHz and highest channel: 2462MHz with fixed at channel.

7.2 Antenna Requirement

Standard requirement

15.203 requirement:

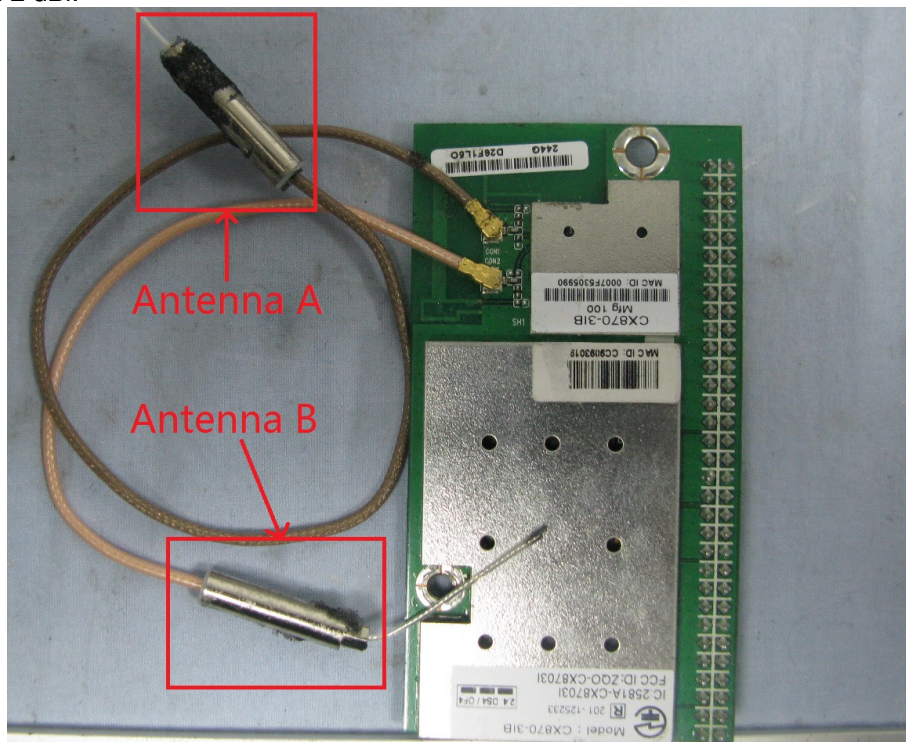
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit 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 gain of the antenna is less than 2 dBi.



7.3 Conducted Emissions on Mains Terminals

Test Requirement: FCC Part 15C, Section 15.207
RSS-Gen Issue 8 Clause 7.2.4

Test Method: ANSI C63.10:2009 Section 6.2

Test Result: Pass

Test Voltage: AC 120V 60Hz

Frequency Range: 150 KHz to 30 MHz

Class/Severity: Class B

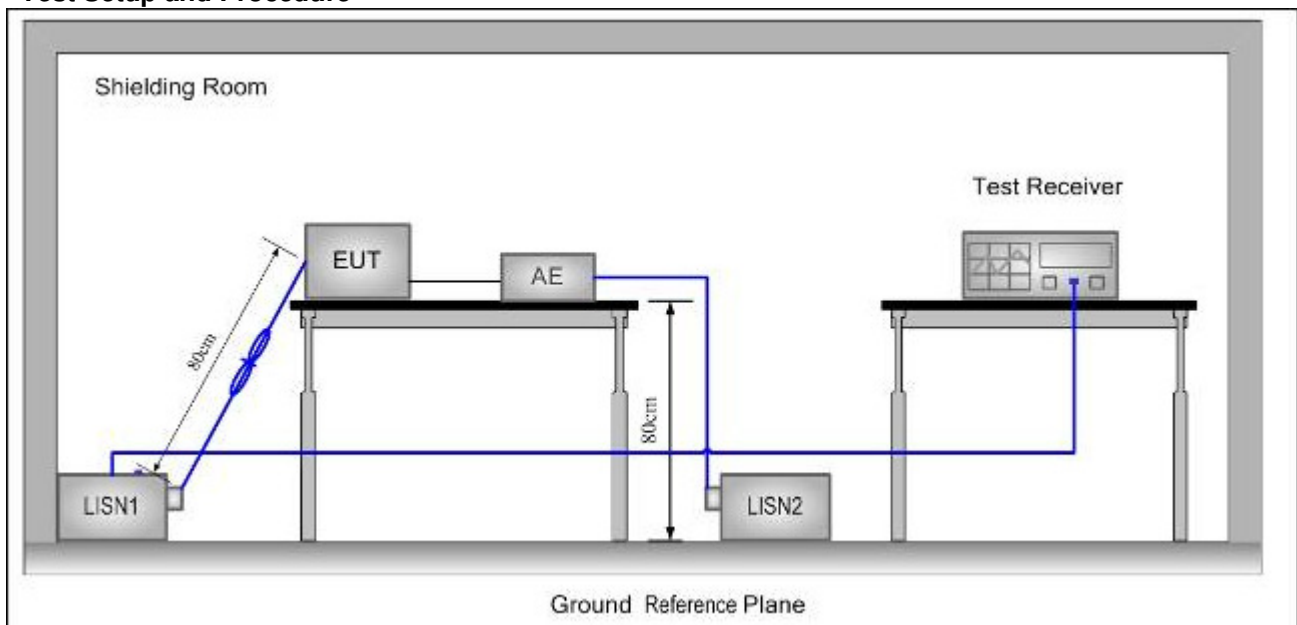
Test mode: Transmitting mode

Limit:

Frequency range MHz	Class B Limits dB (μV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

Note1: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50MHz.
Note2: The lower limit is applicable at the transition frequency.

Test Setup and Procedure



1. The mains terminal disturbance voltage was measured with the EUT in a shielded room.
2. The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides 50Ω/50μH + 5Ω linear impedance. The power cable of all other units of the EUT was connected to a second LISN, which was bonded to the ground reference plane in the same way as the LISN 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

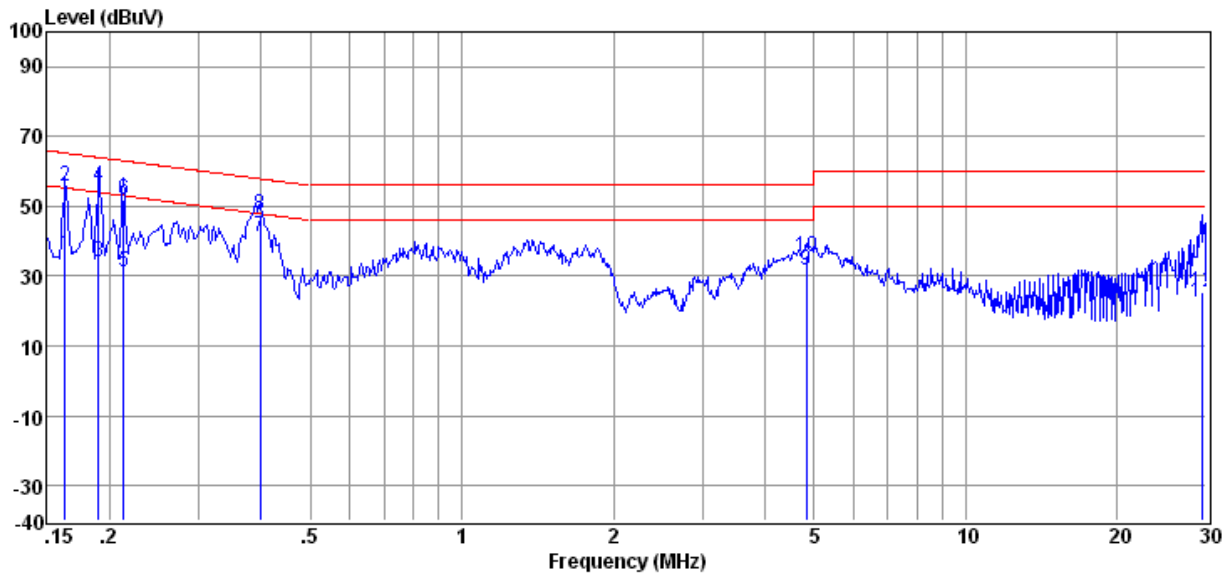
3. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation.
4. The test was performed 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 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISN mounted on top of the ground reference plane. This distance was between the closest points of the LISN and the EUT. The mains lead of EUT excess 0.8m was folded back and forth parallel to the lead so as to form a horizontal bundle with a length between 0.3m and 0.4m. All other units of the EUT and associated equipment was at least 0,8 m from the LISN.

Measurement Data

Pre-scan was performed with peak detected on all ports, Quasi-peak & average measurements were performed at the frequencies at which maximum peak emission level were detected.
Please see the attached Quasi-peak and Average test results.

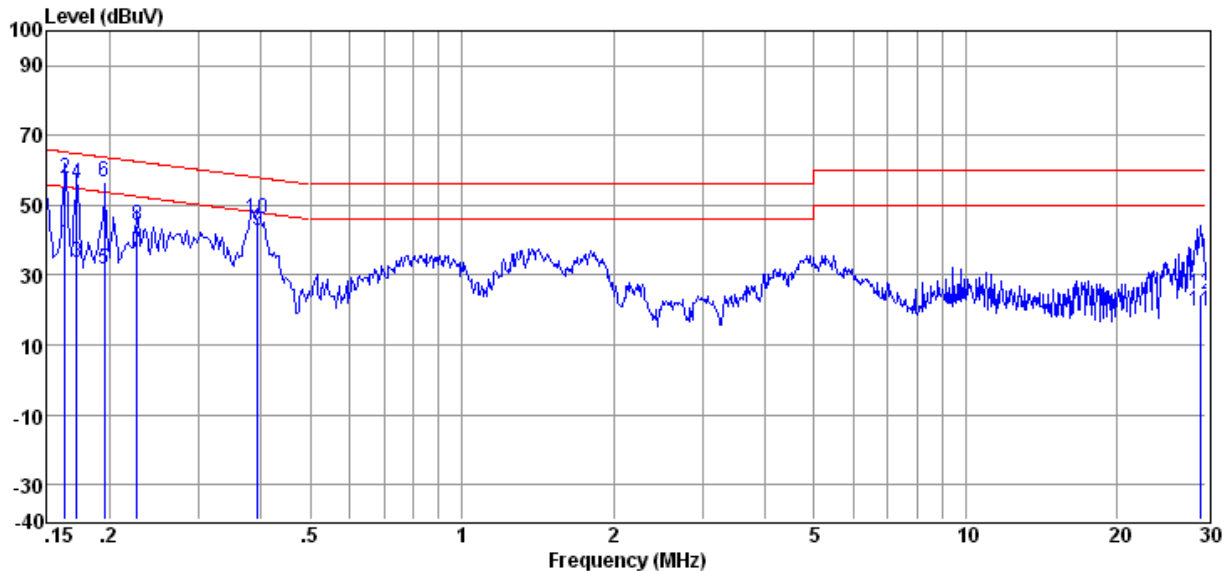
Level = Read Level + LISN/ISN Factor + Cable Loss.

Test Port: AC Live Line



Item	Freq.	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Detector
(Mark)	(MHz)	(dBμV)	(dB)	(dB)	(dBμV)	(dBμV)	(dB)	
1	0.163	35.69	0.17	0.10	35.96	55.30	-19.34	Average
2	0.163	55.65	0.17	0.10	55.92	65.30	-9.38	QP
3	0.190	33.66	0.12	0.10	33.88	54.02	-20.14	Average
4	0.190	55.28	0.12	0.10	55.50	64.02	-8.52	QP
5	0.213	30.99	0.10	0.10	31.19	53.10	-21.91	Average
6	0.213	51.59	0.10	0.10	51.79	63.10	-11.31	QP
7	0.398	40.80	0.17	0.10	41.07	47.90	-6.83	Average
8	0.398	47.12	0.17	0.10	47.39	57.90	-10.51	QP
9	4.822	31.30	0.30	0.19	31.79	46.00	-14.21	Average
10	4.822	35.03	0.30	0.19	35.52	56.00	-20.48	QP
11	29.527	21.51	0.89	0.20	22.60	50.00	-27.40	Average
12	29.527	24.24	0.89	0.20	25.33	60.00	-34.67	QP

Test Port: AC Neutral Line



Item	Freq.	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Detector
(Mark)	(MHz)	(dBμV)	(dB)	(dB)	(dBμV)	(dBμV)	(dB)	
1	0.163	38.49	0.17	0.10	38.76	55.30	-16.54	Average
2	0.163	57.39	0.17	0.10	57.66	65.30	-7.64	QP
3	0.172	33.14	0.15	0.10	33.39	54.86	-21.47	Average
4	0.172	55.74	0.15	0.10	55.99	64.86	-8.87	QP
5	0.196	31.56	0.11	0.10	31.77	53.80	-22.03	Average
6	0.196	56.28	0.11	0.10	56.49	63.80	-7.31	QP
7	0.227	36.20	0.10	0.10	36.40	52.57	-16.17	Average
8	0.227	43.96	0.10	0.10	44.16	62.57	-18.41	QP
9	0.393	42.76	0.10	0.10	42.96	47.99	-5.03	Average
10	0.393	46.00	0.10	0.10	46.20	57.99	-11.79	QP
11	0.163	38.49	0.17	0.10	38.76	55.30	-16.54	Average
12	0.163	57.39	0.17	0.10	57.66	65.30	-7.64	QP

7.4 6dB Occupied Bandwidth

Test Requirement: FCC Part 15 C Section 15.247 (a)(2)
RSS-210 Issue 8 Annex 8

Test Method: ANSI C63.10:2009 Section 6.9.1

Test Result: Pass

Test Mode: Transmitting mode

Final Test Mode: The EUT fixed on Low channel, Middle Channel and High Channel.

Limit: ≥ 500 kHz

Test Procedure:

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW=300KHz, VBW =3* RBW, Span=30/50MHz, Sweep=auto
4. Mark the peak frequency and -6dB (upper and lower) frequency.
5. Repeat above procedures until all frequency measured was complete.

Test Data for Antenna A

Test mode: 802.11b

CH	Frequency (MHz)	Bandwidth (MHz)	Limit Bandwidth (KHz)	Result
Low	2412	11.04	500	PASS
Mid	2437	11.12	500	PASS
High	2462	10.72	500	PASS

Test Data for Antenna A

Test mode: 802.11g

CH	Frequency (MHz)	Bandwidth (MHz)	Limit Bandwidth (KHz)	Result
Low	2412	16.64	500	PASS
Mid	2437	16.64	500	PASS
High	2462	16.68	500	PASS

Test Data for Antenna B

Test mode: 802.11b

CH	Frequency (MHz)	Bandwidth (MHz)	Limit Bandwidth (KHz)	Result
Low	2412	10.54	500	PASS
Mid	2437	10.88	500	PASS
High	2462	10.54	500	PASS

Test Data for Antenna B

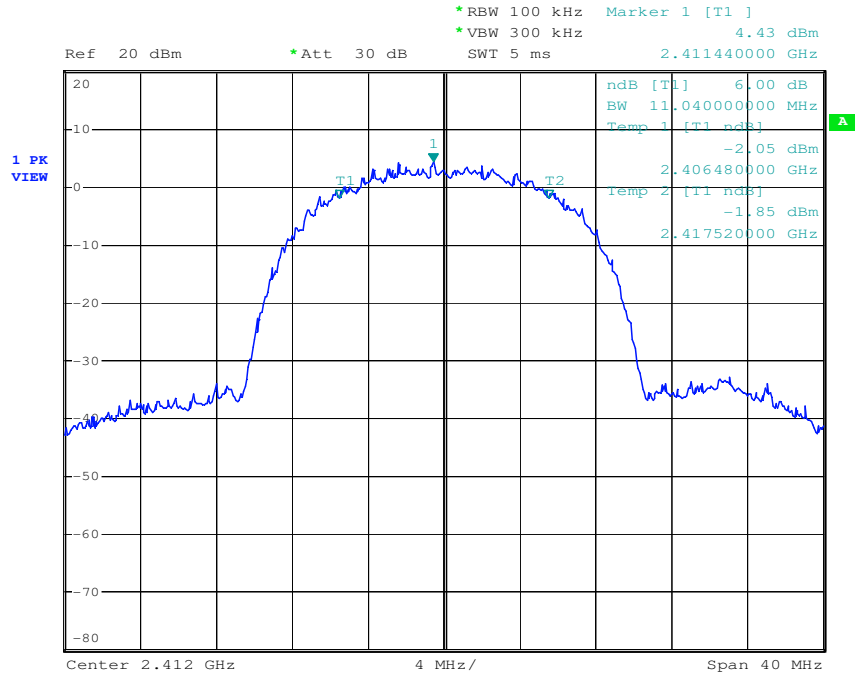
Test mode: 802.11g

CH	Frequency (MHz)	Bandwidth (MHz)	Limit Bandwidth (KHz)	Result
Low	2412	16.64	500	PASS
Mid	2437	16.60	500	PASS
High	2462	16.72	500	PASS

Test plot as follows:

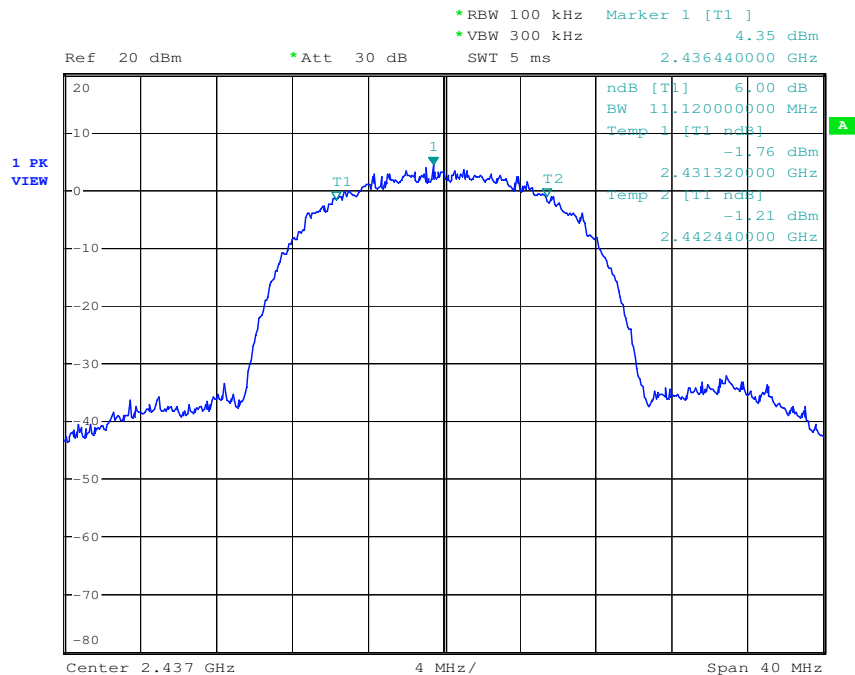
Lowest Channel for Antenna A

Test mode: 802.11b



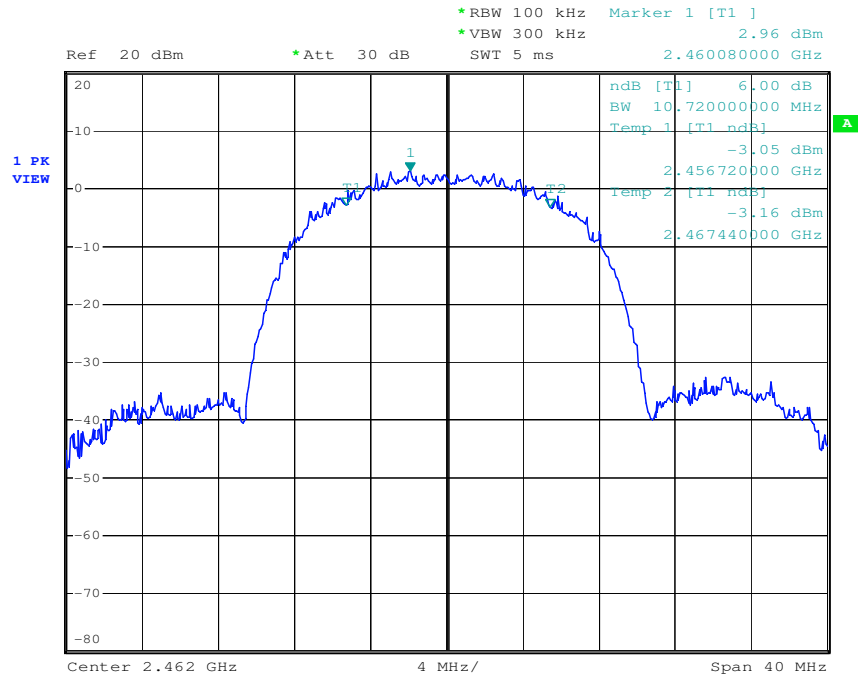
Middle Channel for Antenna A

Test mode: 802.11b



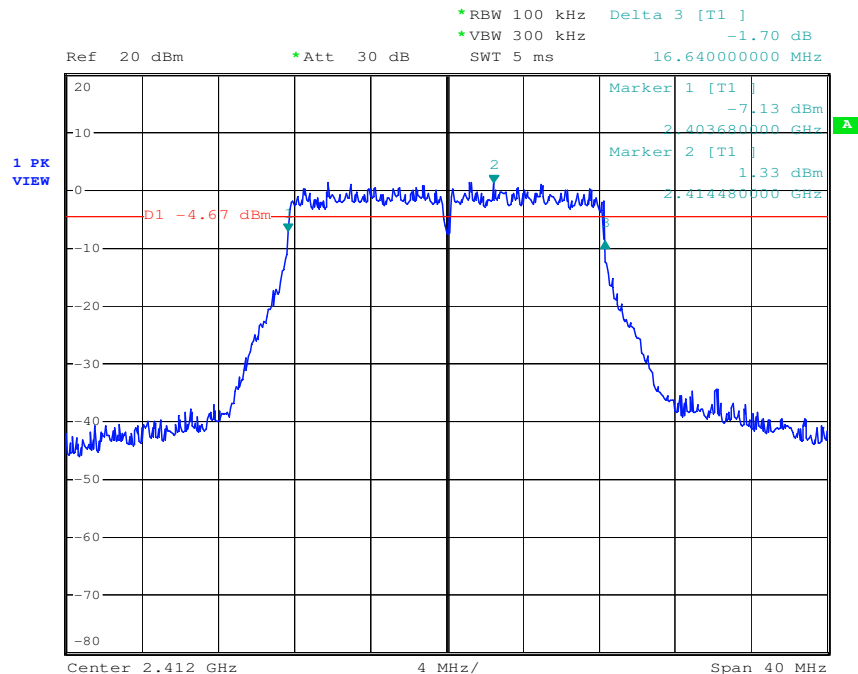
Highest Channel for Antenna A

Test mode: 802.11b



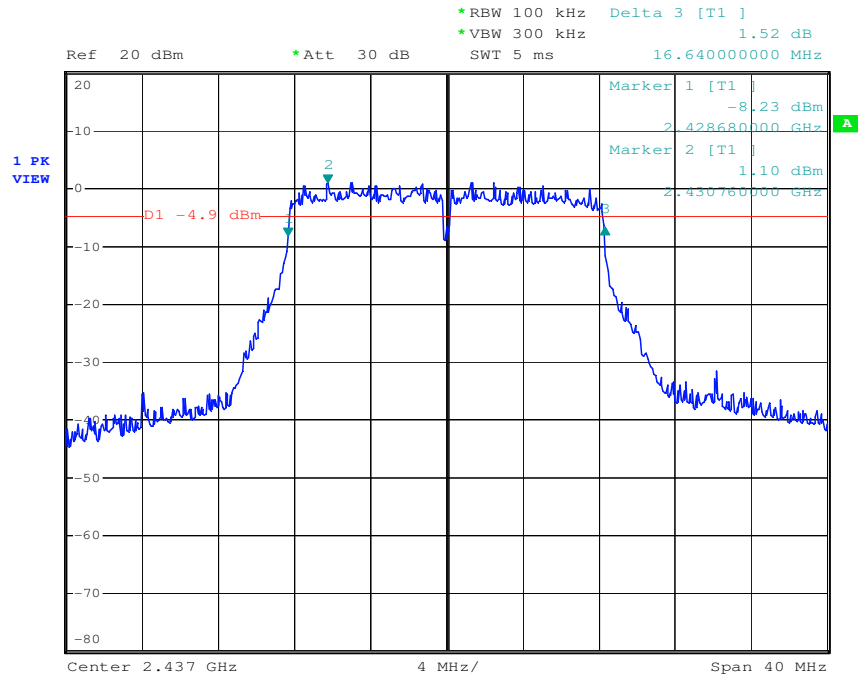
Lowest Channel for Antenna A

Test mode: 802.11g



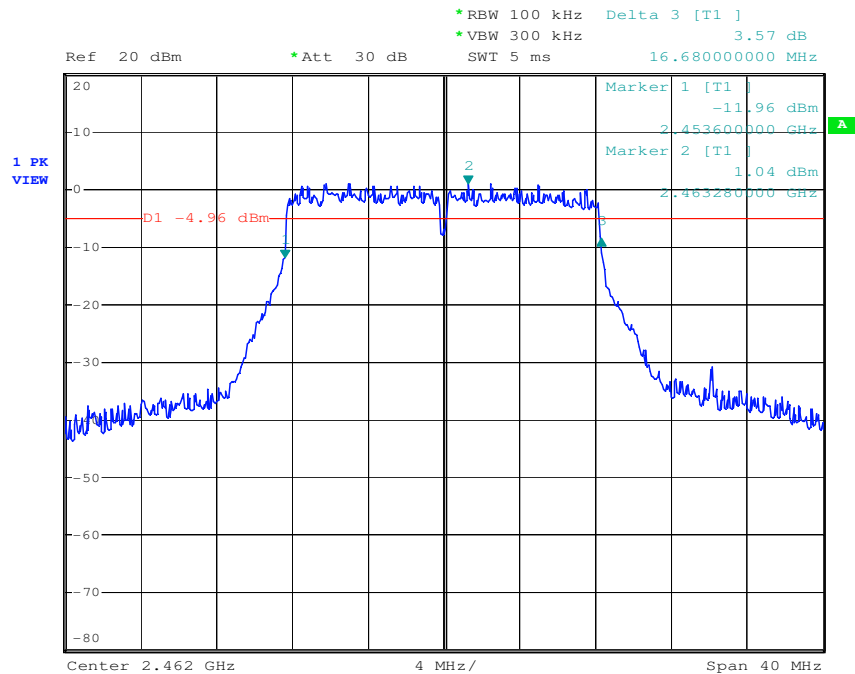
Middle Channel for Antenna A

Test mode: 802.11g



Highest Channel for Antenna A

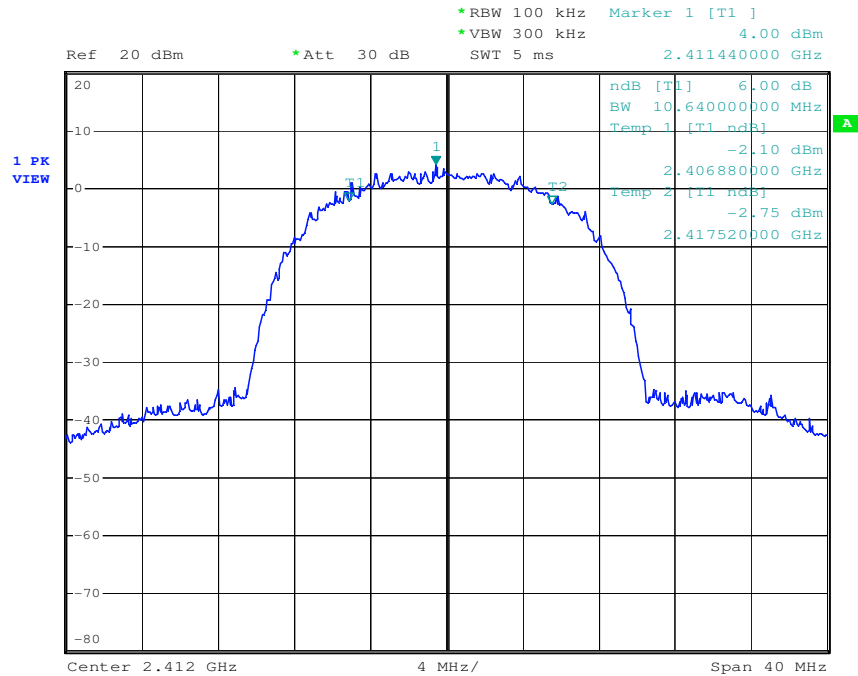
Test mode: 802.11g





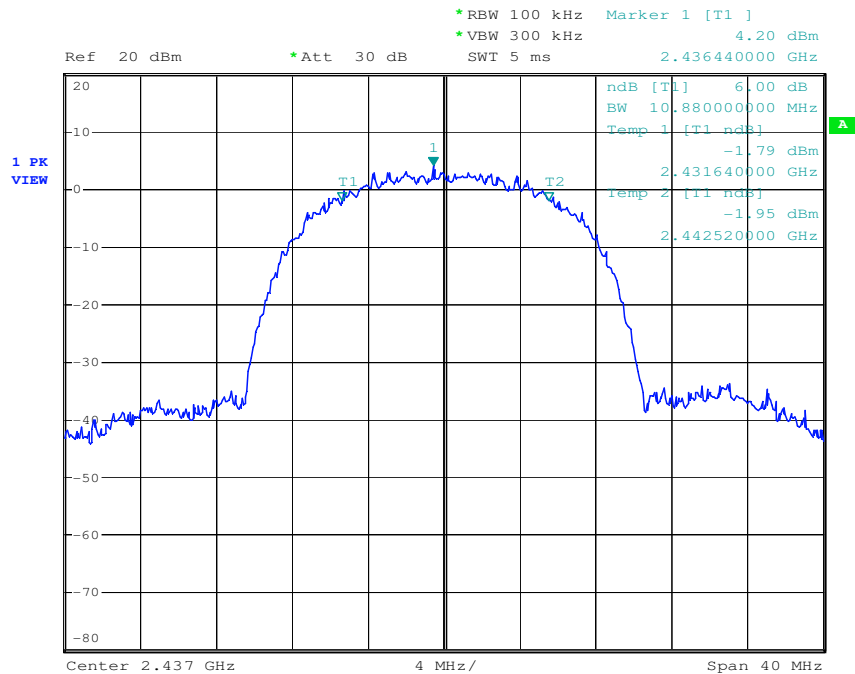
Lowest Channel for Antenna B

Test mode: 802.11b



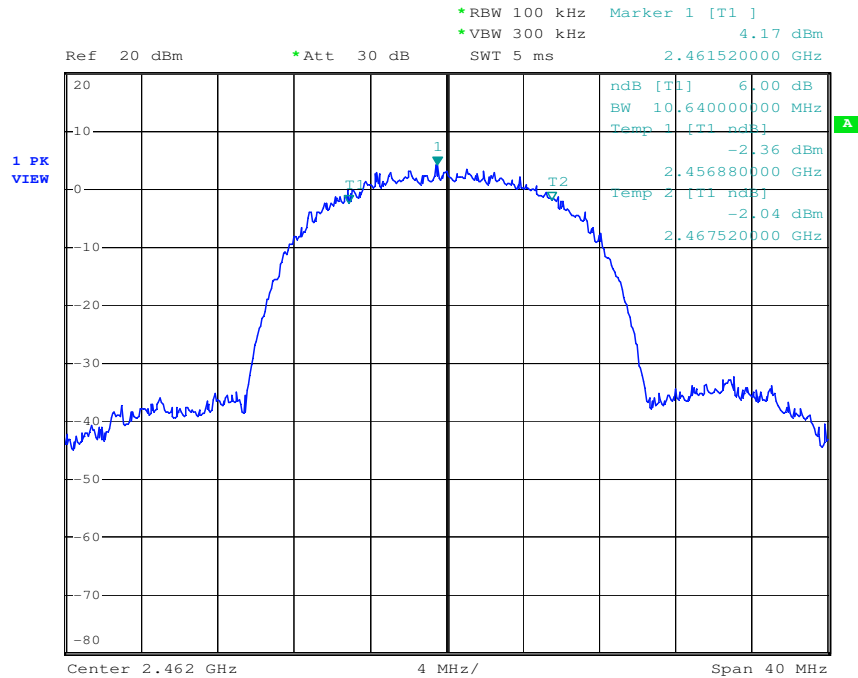
Middle Channel for Antenna B

Test mode: 802.11b



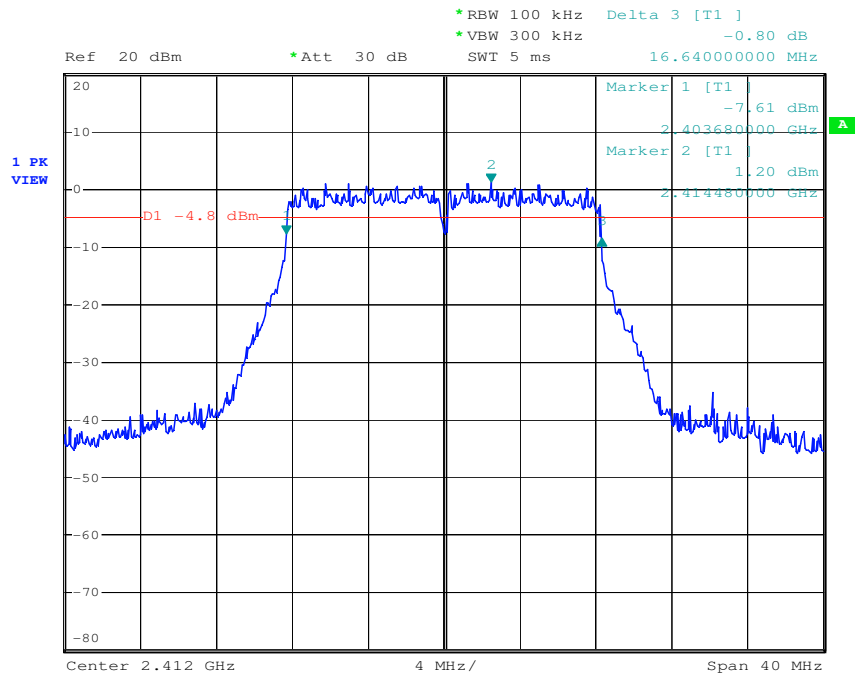
Highest Channel for Antenna B

Test mode: 802.11b



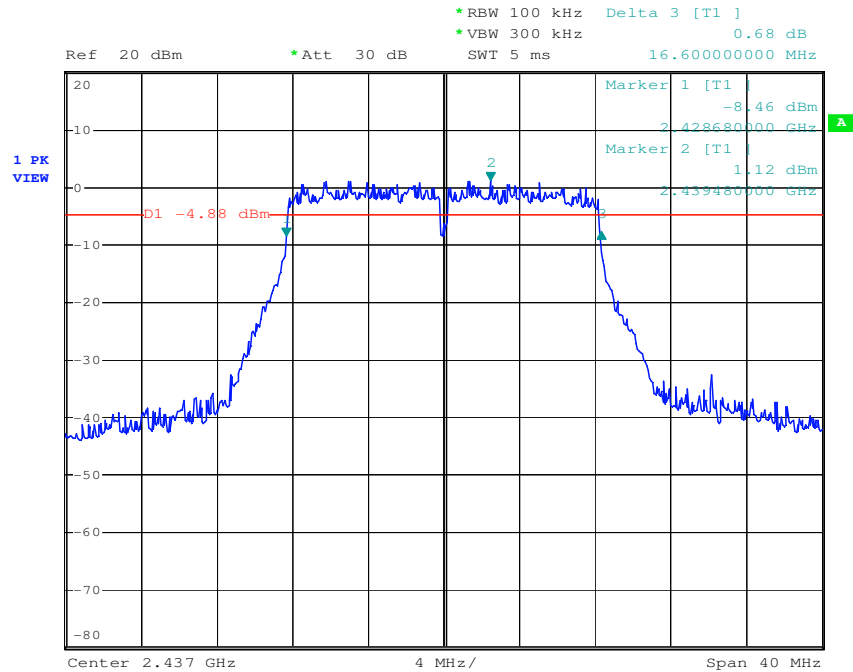
Lowest Channel for Antenna B

Test mode: 802.11g



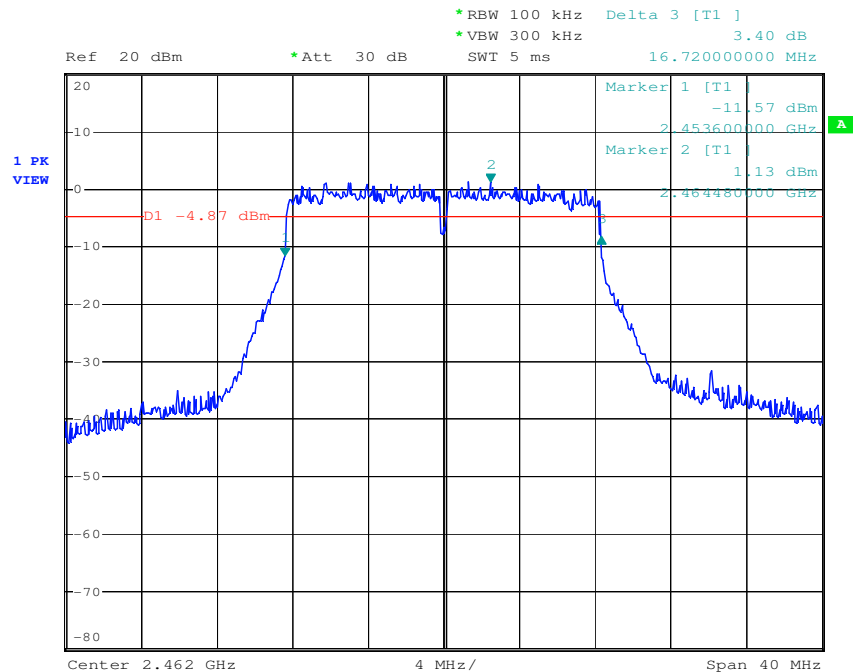
Middle Channel for Antenna B

Test mode: 802.11g



Highest Channel for Antenna B

Test mode: 802.11g



7.5 Conducted Peak Output Power

Test Requirement: FCC Part 15.247 Section 15.247(b)(3)
RSS-210 Issue 8 Annex 8

Test Method: ANSI C63.10:2009 Section 6.10.2

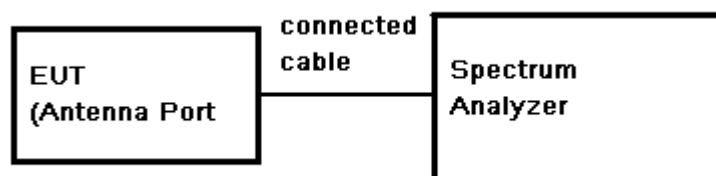
Test Result: Pass

Test Limit: 30dBm

Test Mode: Transmitting mode

Final Test Mode: The EUT fixed on Low channel, Middle Channel and High Channel.

Test Configuration:



Test Procedure:

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum.
3. Set the occur band to the entire emission 26dB bandwidth of the signal.
4. Record the max. Power channel reading.

Repeat above procedures until all the frequency measured were complete.

Test Data for Antenna A

Test mode: 802.11b

CH	Frequency (MHz)	Reading Peak Power (dBm)	Cable Loss (dB)	Output Peak Power (dBm)	Output Peak Power (mW)	Peak Power Limit (dBm)	Result
Low	2412	20.54	0.5	21.04	127.06	30	PASS
Mid	2437	20.53	0.5	21.13	129.72	30	PASS
High	2462	20.53	0.5	21.03	126.77	30	PASS

Test Data for Antenna A

Test mode: 802.11g

CH	Frequency (MHz)	Reading Peak Power (dBm)	Cable Loss (dB)	Output Peak Power (dBm)	Output Peak Power (mW)	Peak Power Limit (dBm)	Result
Low	2412	22.22	0.5	22.72	187.07	30	PASS
Mid	2437	22.13	0.5	22.63	183.23	30	PASS
High	2462	21.96	0.5	22.46	176.20	30	PASS



Test Data for Antenna B

Test mode: 802.11b

CH	Frequency (MHz)	Reading Peak Power (dBm)	Cable Loss (dB)	Output Peak Power (dBm)	Output Peak Power (mW)	Peak Power Limit (dBm)	Result
Low	2412	20.42	0.5	20.92	123.59	30	PASS
Mid	2437	20.52	0.5	21.12	129.42	30	PASS
High	2462	20.55	0.5	21.15	130.32	30	PASS

Test Data for Antenna B

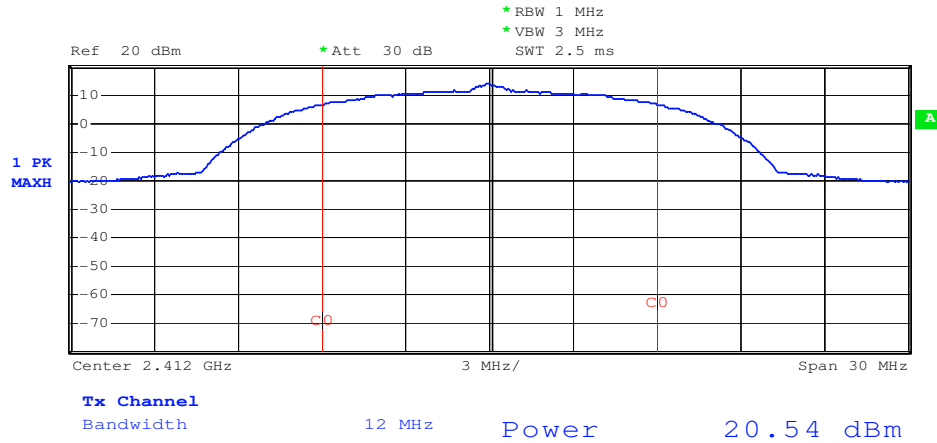
Test mode: 802.11g

CH	Frequency (MHz)	Reading Peak Power (dBm)	Cable Loss (dB)	Output Peak Power (dBm)	Output Peak Power (mW)	Peak Power Limit (dBm)	Result
Low	2412	22.03	0.5	22.53	179.06	30	PASS
Mid	2437	21.99	0.5	22.49	177.42	30	PASS
High	2462	21.98	0.5	22.48	177.01	30	PASS

Test result plot as follows:

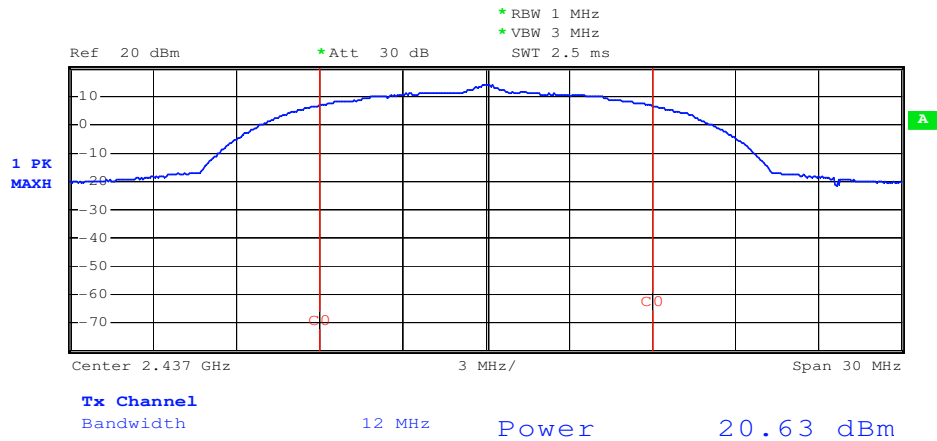
Low Channel for Antenna A

Test mode: 802.11b



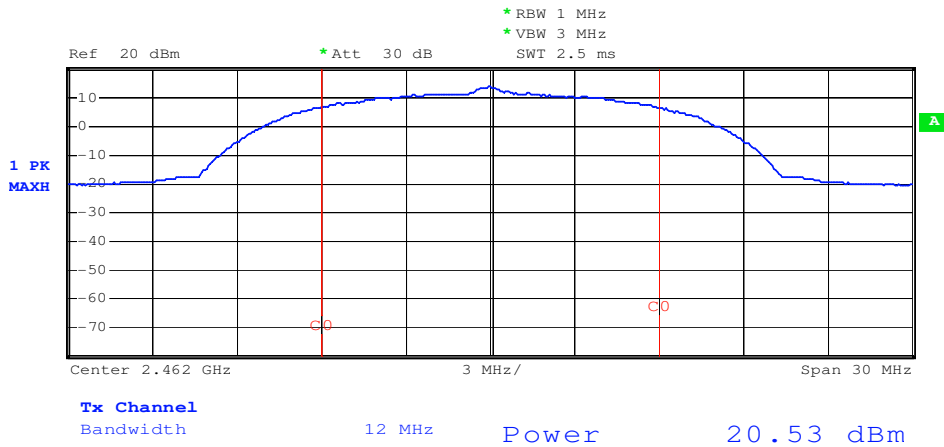
Mid Channel for Antenna A

Test mode: 802.11b



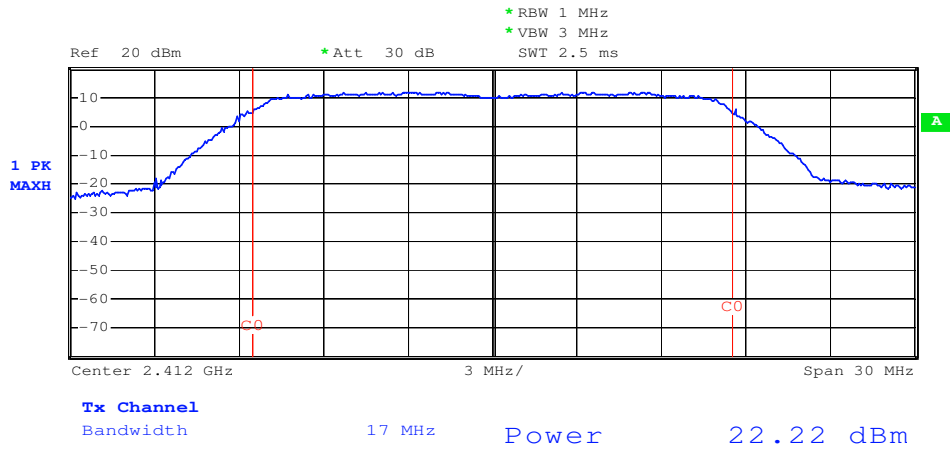
High Channel for Antenna A

Test mode: 802.11b



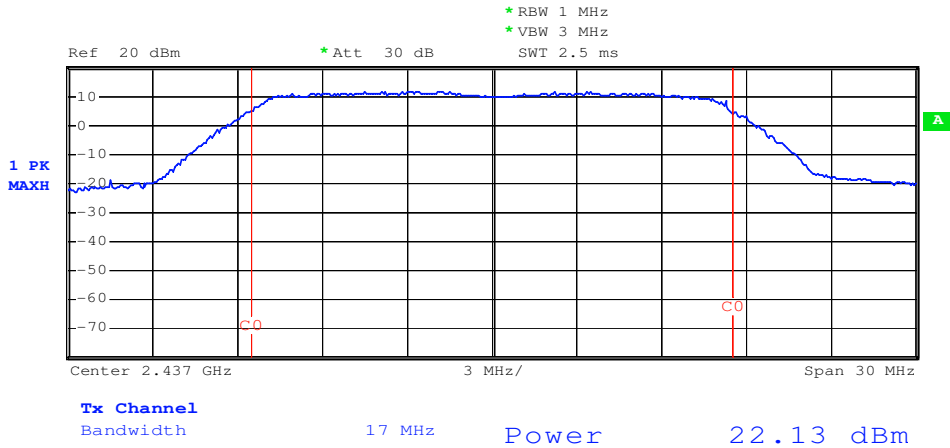
Low Channel for Antenna A

Test mode: 802.11g



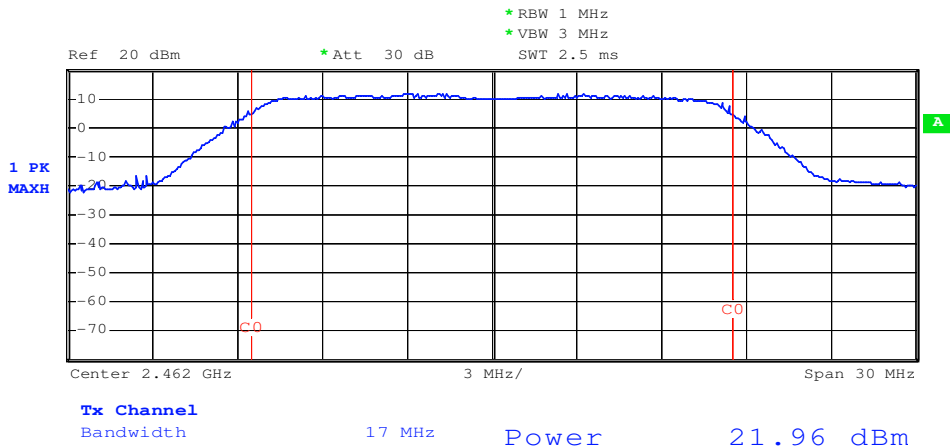
Mid Channel for Antenna A

Test mode: 802.11g



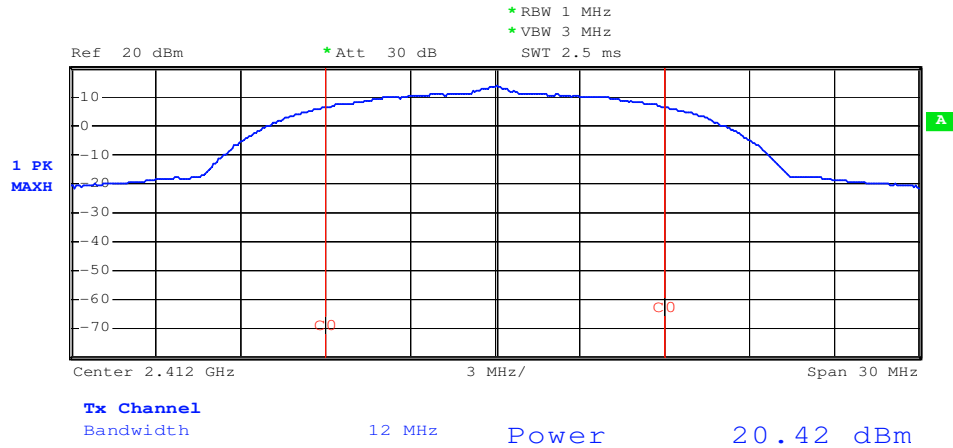
High Channel for Antenna A

Test mode: 802.11g



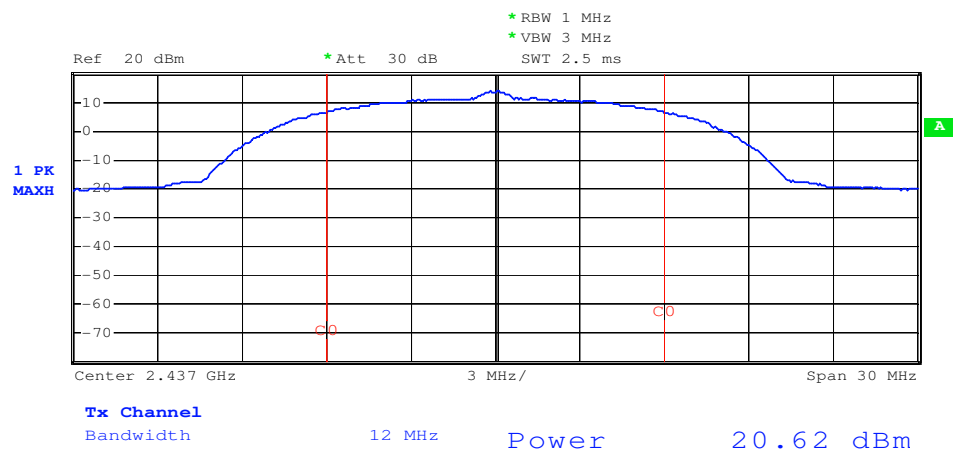
Low Channel for Antenna B

Test mode: 802.11b



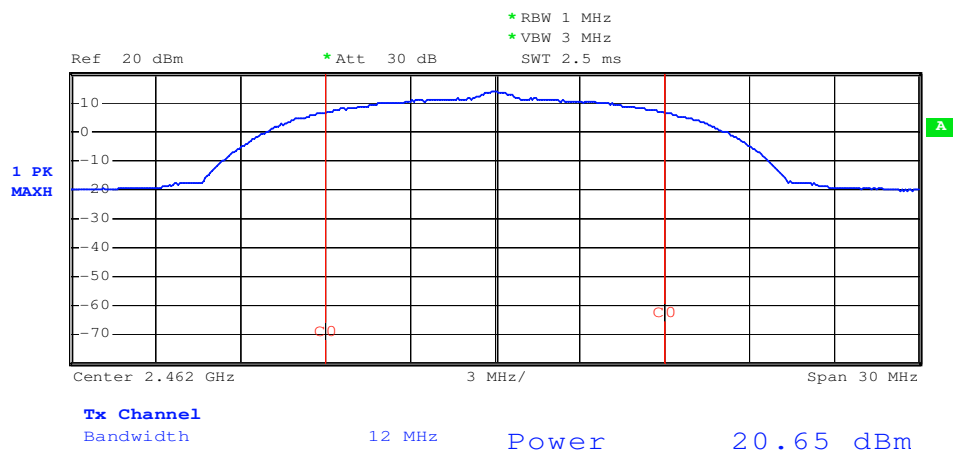
Mid Channel for Antenna B

Test mode: 802.11b



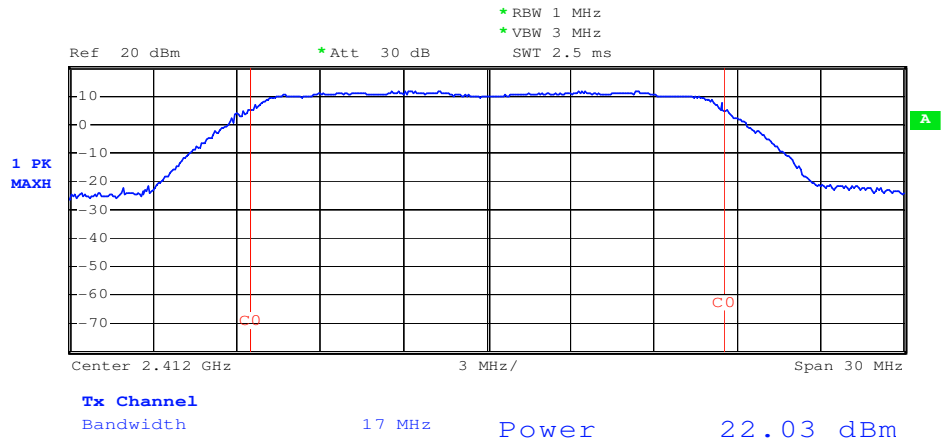
High Channel for Antenna B

Test mode: 802.11b



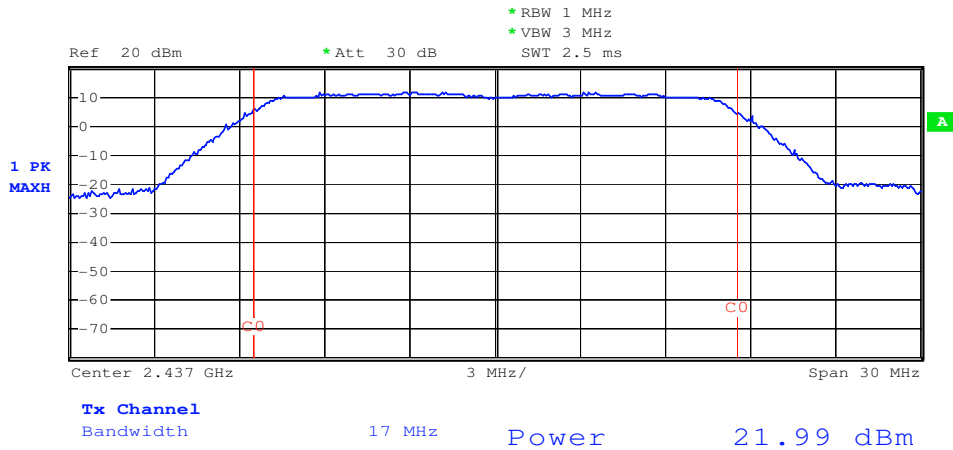
Low Channel for Antenna B

Test mode: 802.11g



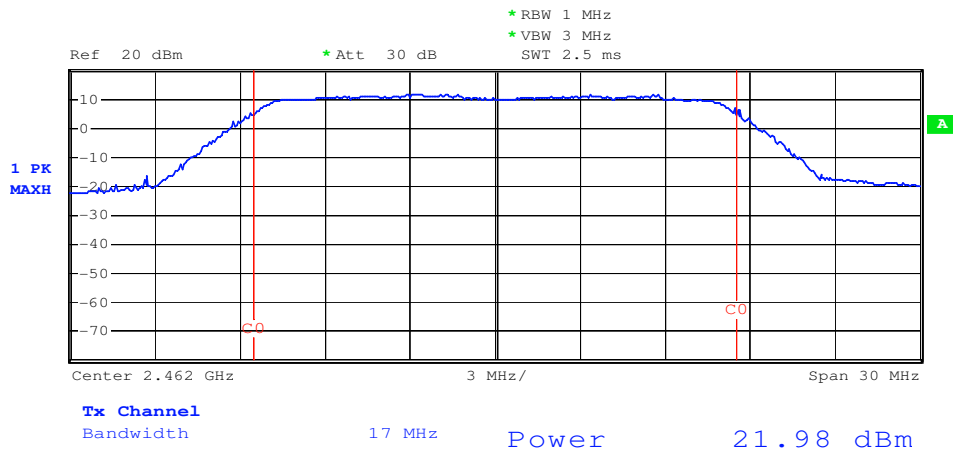
Mid Channel for Antenna B

Test mode: 802.11g



High Channel for Antenna B

Test mode: 802.11g



7.6 Peak Power Spectral Density

Test Requirement:	FCC Part 15, Subpart C Section 15.247 (e) RSS-210 Issue 8 Annex 8
Test Method:	ANSI C63.10,2009 Section 6.11.2
Test Result:	Pass
Test Limit:	8dBm/3kHz
Test Mode:	Transmitting mode
Final Test Mode:	The EUT fixed on Low channel, Middle Channel and High Channel.
Measurement Procedure:	<ol style="list-style-type: none"> 1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum. 2. Set the spectrum analyzer: Center Frequency= Channel Frequency, RBW = 3 kHz VBW = 10 kHz. Span= fully encompass the bandwidth, Sweep = auto; Detector Function = Peak Trace mode=max hold, 3. Set MKR=Center Frequency, Trace=Clear Write. 4. Adjust the Span = 300 kHz, Sweep Time=100s, Trace=Max Hold, MKR=Peak Search. 5. Record the marker level for the particular mode. 6. Repeat these steps for other channel and device modes.

Test Results record:

802.11b

For Antenna A

CH	Frequency (MHz)	Reading (dBm)	Cable Loss (dB)	RF Power Density (dBm)	Limit (dBm)	Result
LOW	2412	-9.52	0.5	-9.02	8	PASS
MID	2437	0.40	0.5	0.90	8	PASS
HIGH	2462	0.47	0.5	0.97	8	PASS

802.11g

For Antenna A

CH	Frequency (MHz)	Reading (dBm)	Cable Loss (dB)	RF Power Density (dBm)	Limit (dBm)	Result
LOW	2412	-12.51	0.5	-12.01	8	PASS
MID	2437	-12.75	0.5	-12.25	8	PASS
HIGH	2462	-12.84	0.5	-12.34	8	PASS



802.11b

For Antenna B

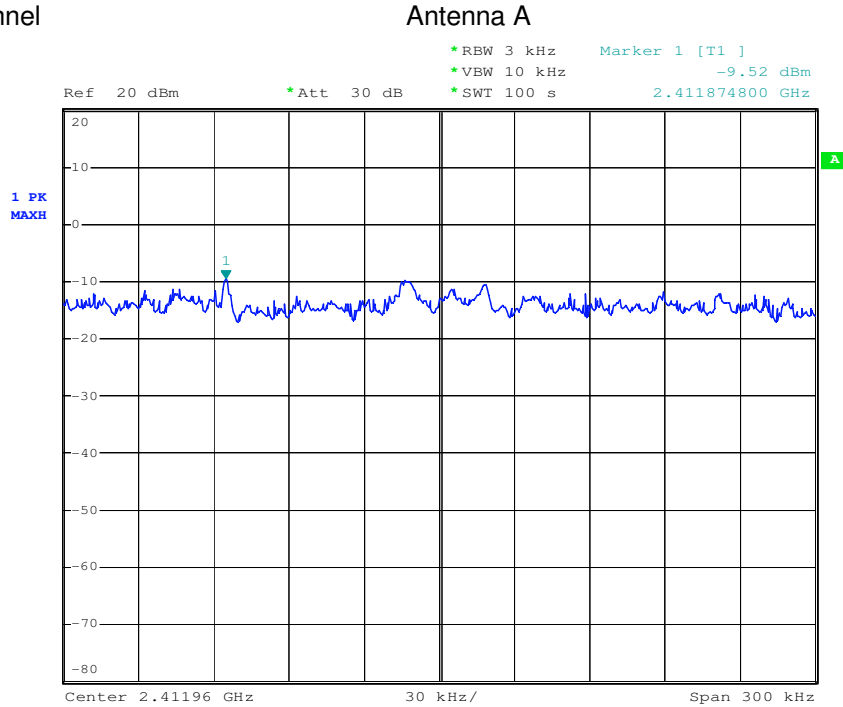
CH	Frequency (MHz)	Reading (dBm)	Cable Loss (dB)	RF Power Density (dBm)	Limit (dBm)	Result
LOW	2412	0.12	0.5	0.62	8	PASS
MID	2437	-5.06	0.5	-4.56	8	PASS
HIGH	2462	-7.80	0.5	-7.3	8	PASS

802.11g

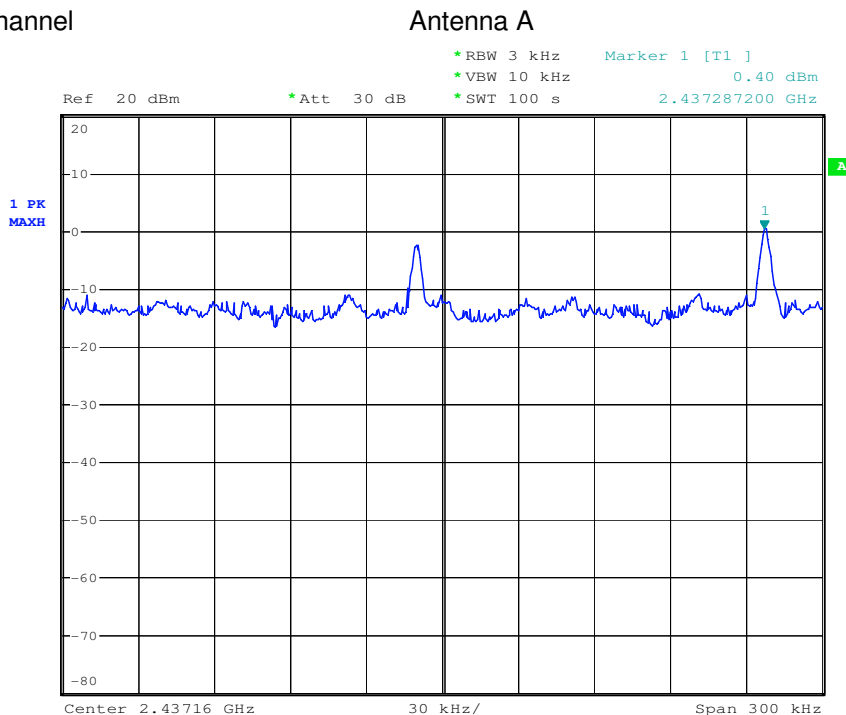
For Antenna B

CH	Frequency (MHz)	Reading (dBm)	Cable Loss (dB)	RF Power Density (dBm)	Limit (dBm)	Result
LOW	2412	-13.05	0.5	-12.55	8	PASS
MID	2437	-11.87	0.5	-11.37	8	PASS
HIGH	2462	-12.38	0.5	-11.88	8	PASS

Test plot as follows:
802.11b Low Channel

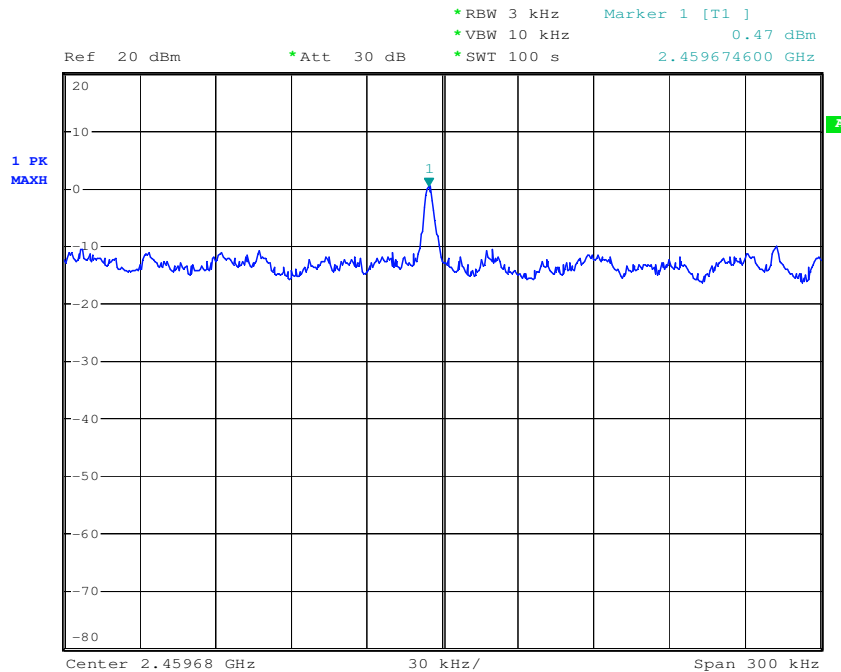


802.11b Middle Channel



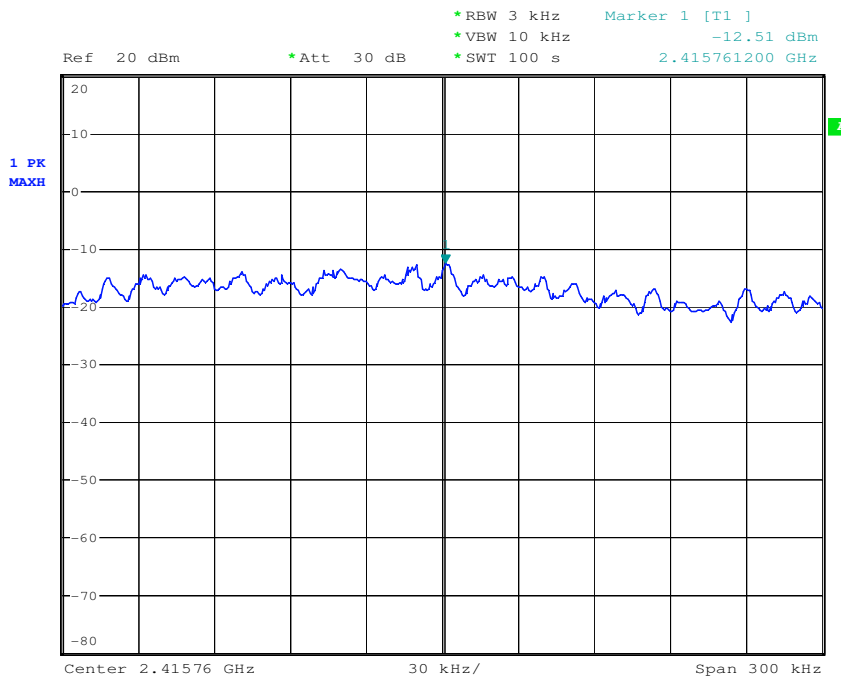
802.11b High Channel

Antenna A



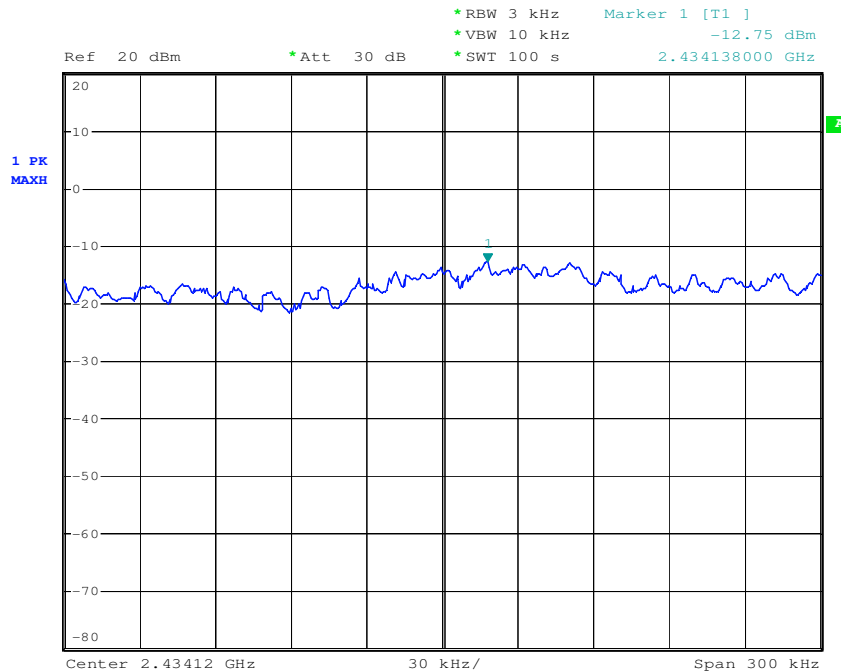
802.11g Low Channel

Antenna A



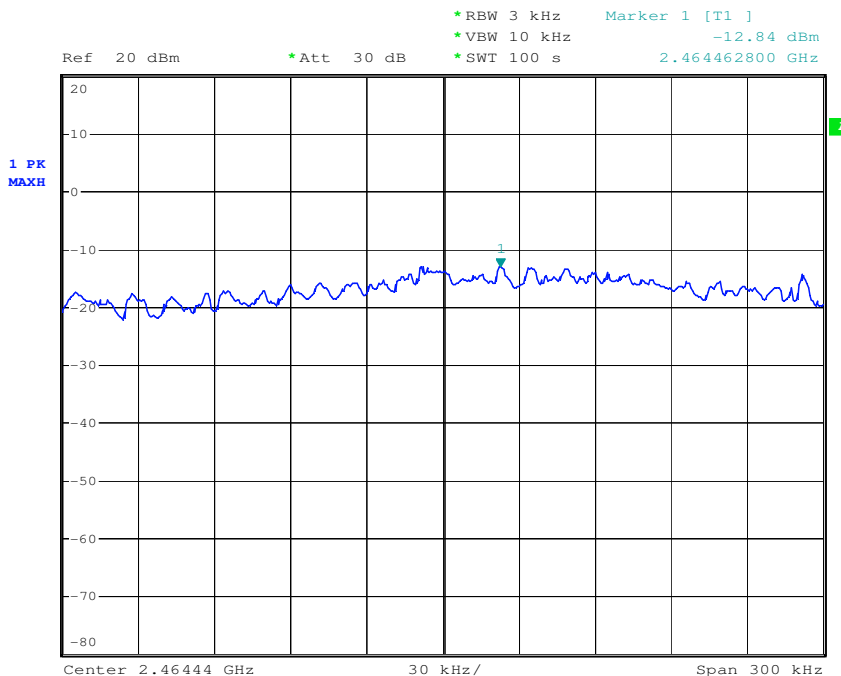
802.11g Middle Channel

Antenna A



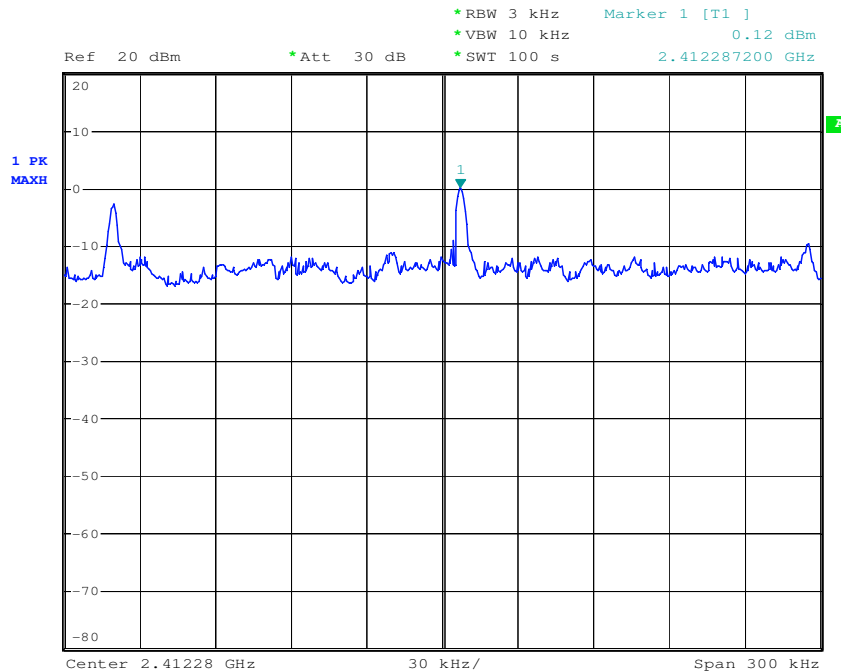
802.11g High Channel

Antenna A



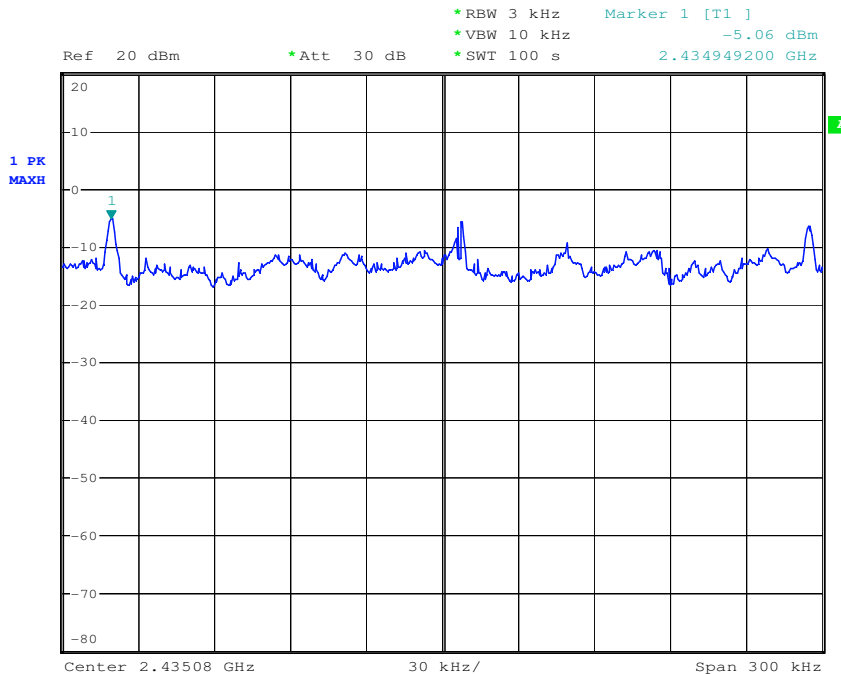
802.11b Low Channel

Antenna B



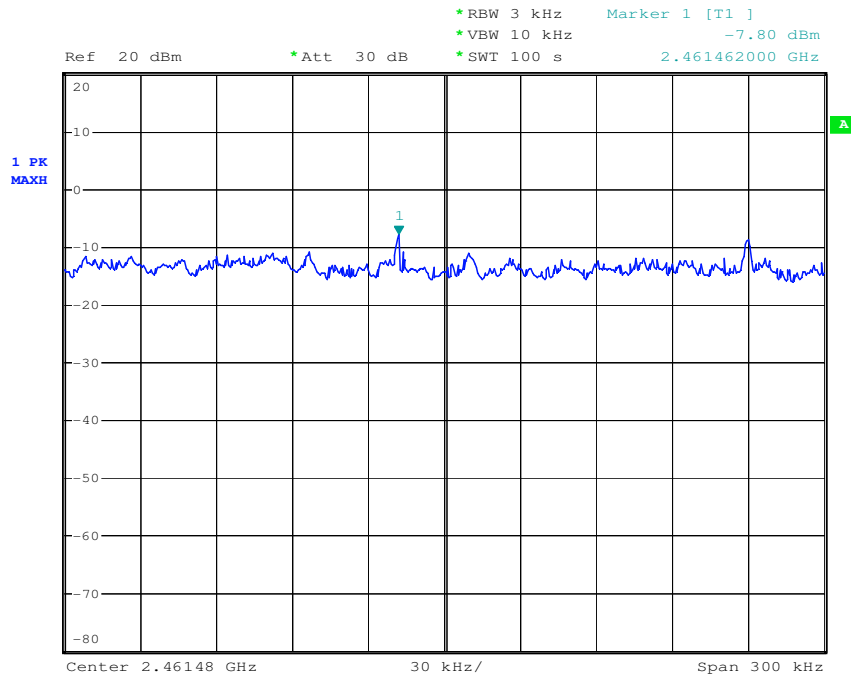
802.11b Middle Channel

Antenna B



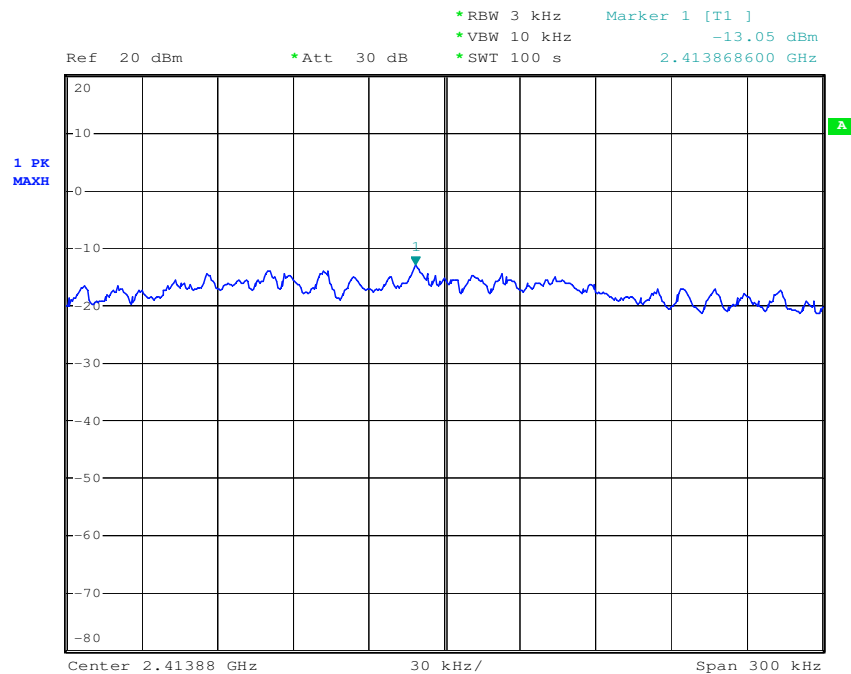
802.11b High Channel

Antenna B



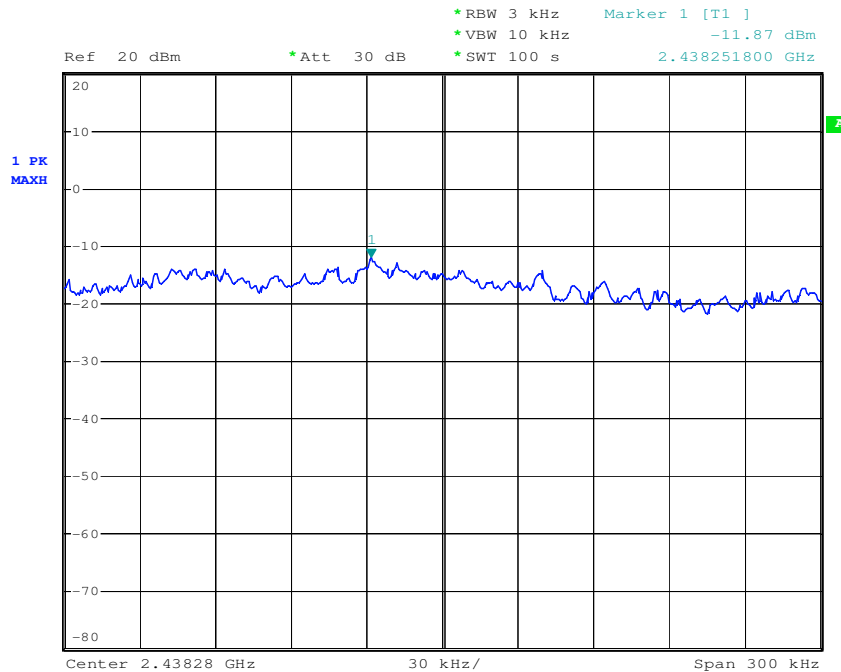
802.11g Low Channel

Antenna B



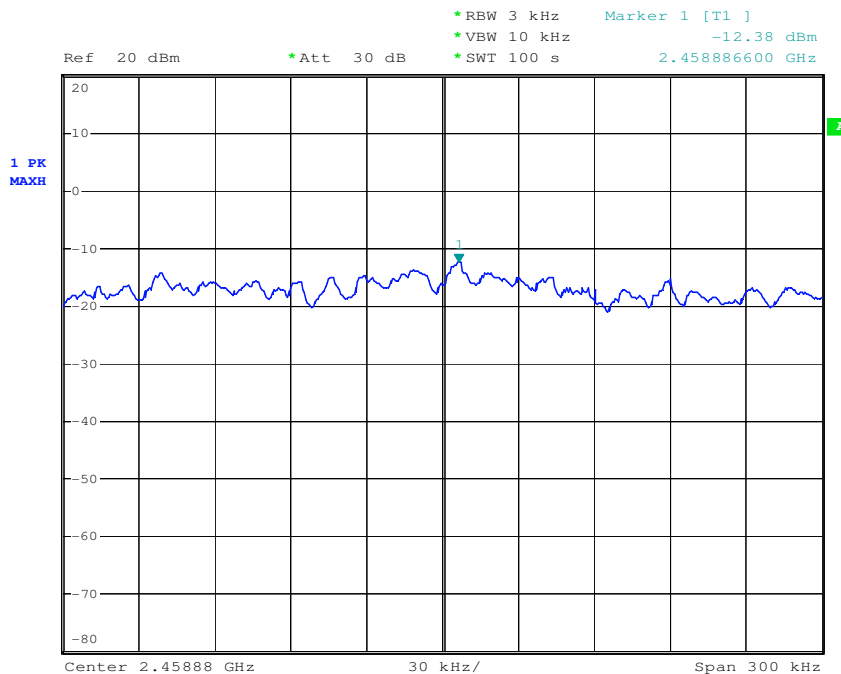
802.11g Middle Channel

Antenna B



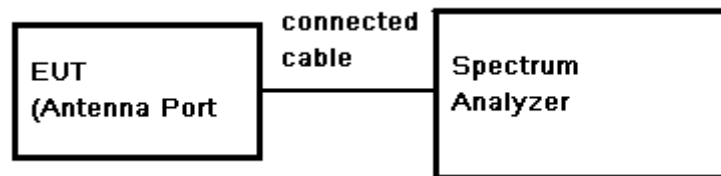
802.11g High Channel

Antenna B



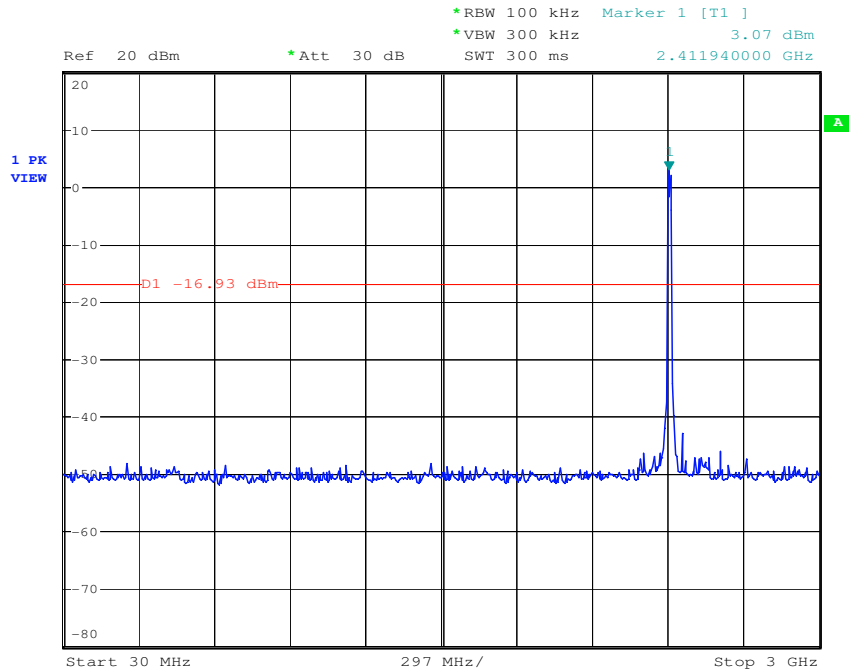
7.7 Conducted Spurious Emissions

Test Requirement:	FCC Part 15 Section 15.247(d) RSS-210 Issue 8 Annex 8.5
Test Method:	ANSI C63.10:2009 Clause 7.7.10
Test Result:	Pass
Limit:	(d) 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 High 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.
Test Mode:	Transmitting mode
Final Test Mode:	The EUT fixed on Low channel, Middle Channel and High Channel.
Test Configuration:	

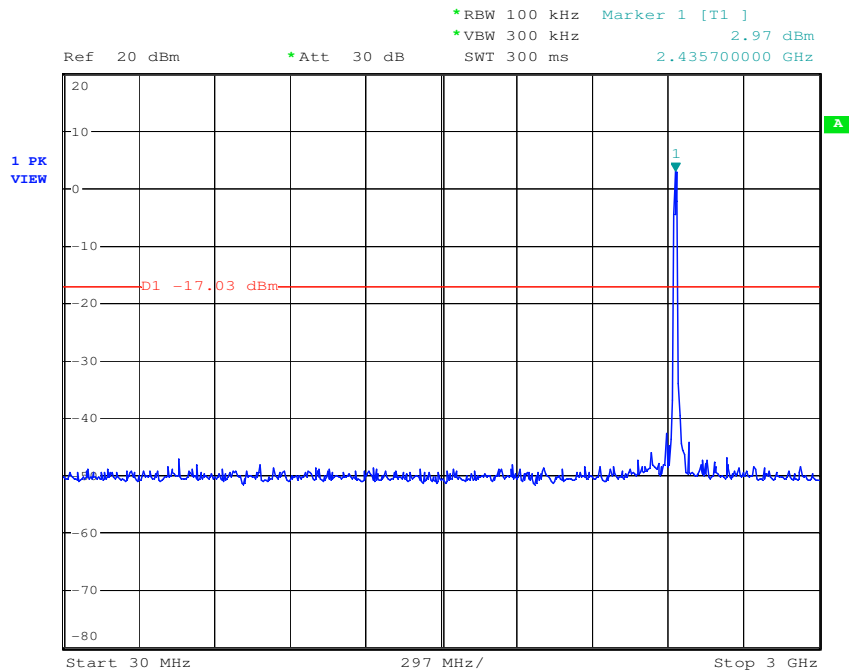


Test Procedure:	<ol style="list-style-type: none"> 1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum. 2. Set the spectrum analyzer: RBW = 100KHz. VBW \geq RBW. Sweep = auto; Detector Function = Peak (Max. hold).
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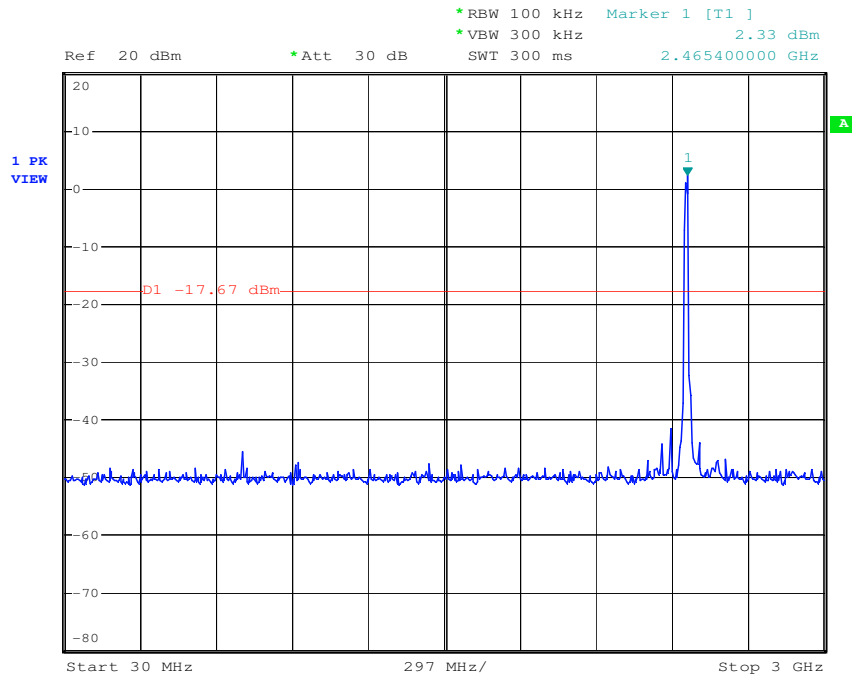
Test plot as follows:
Antenna A for 802.11b
CH Low 30MHz-3GHz



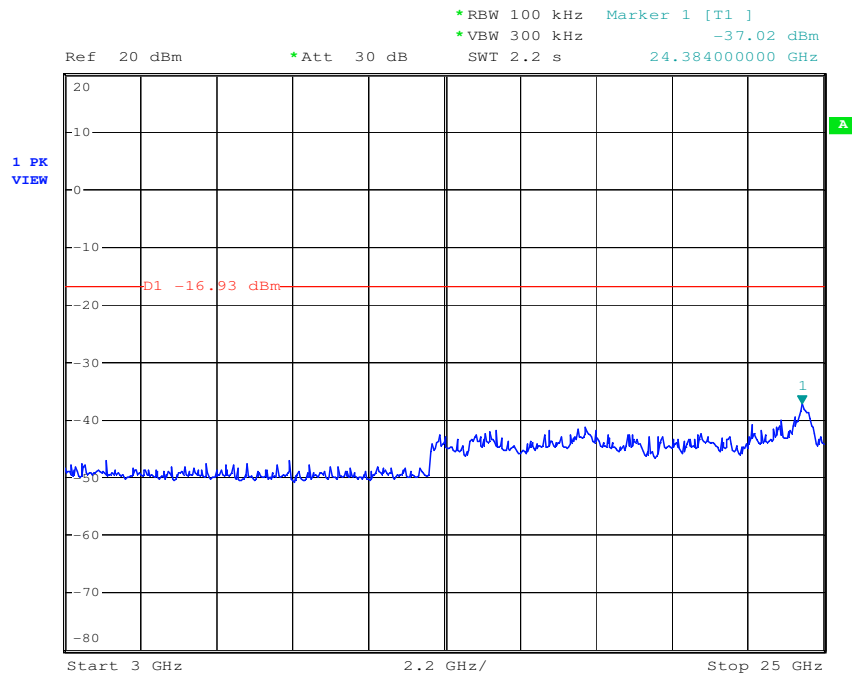
Ch Mid 30MHz-3GHz



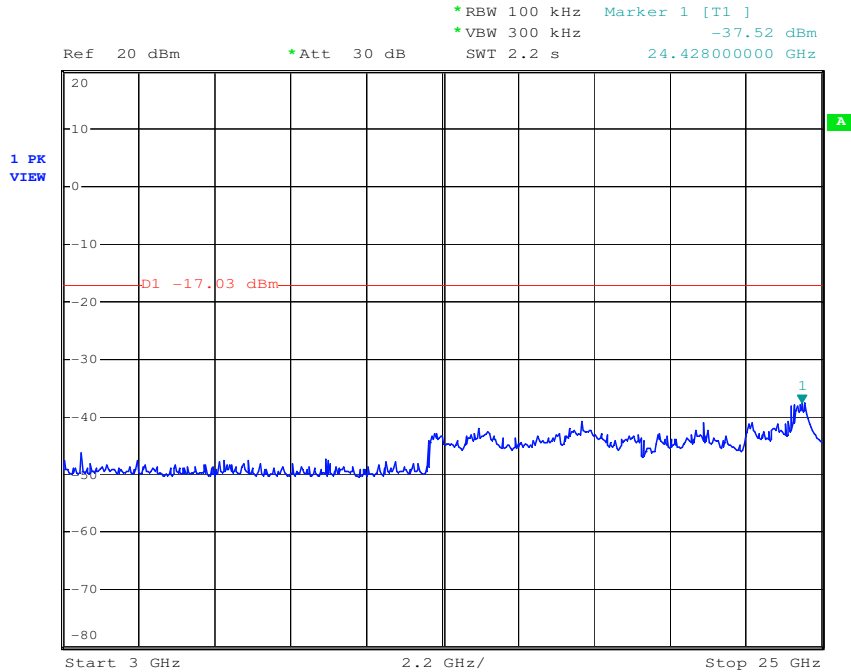
Ch High 30MHz-3GHz



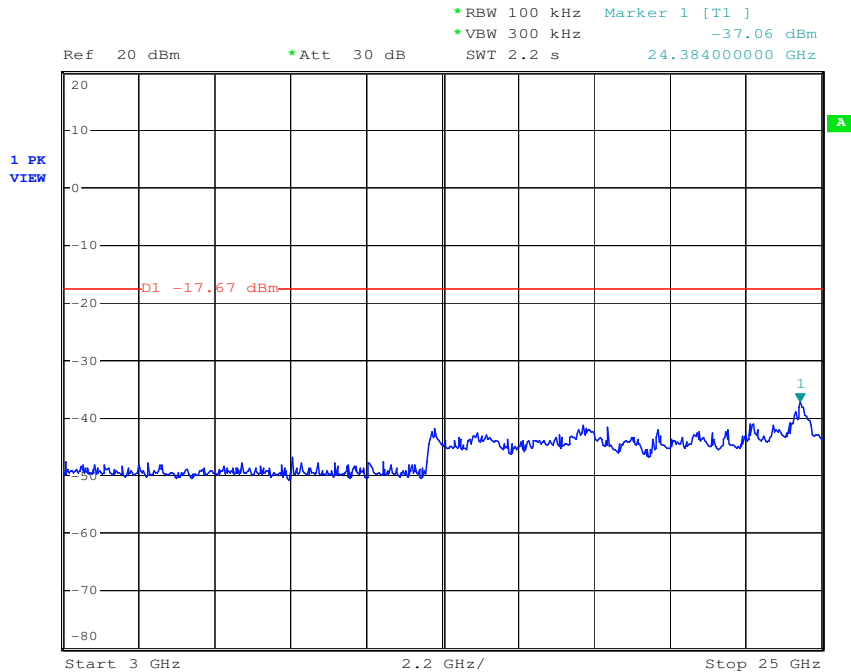
CH Low 3GHz-25GHz



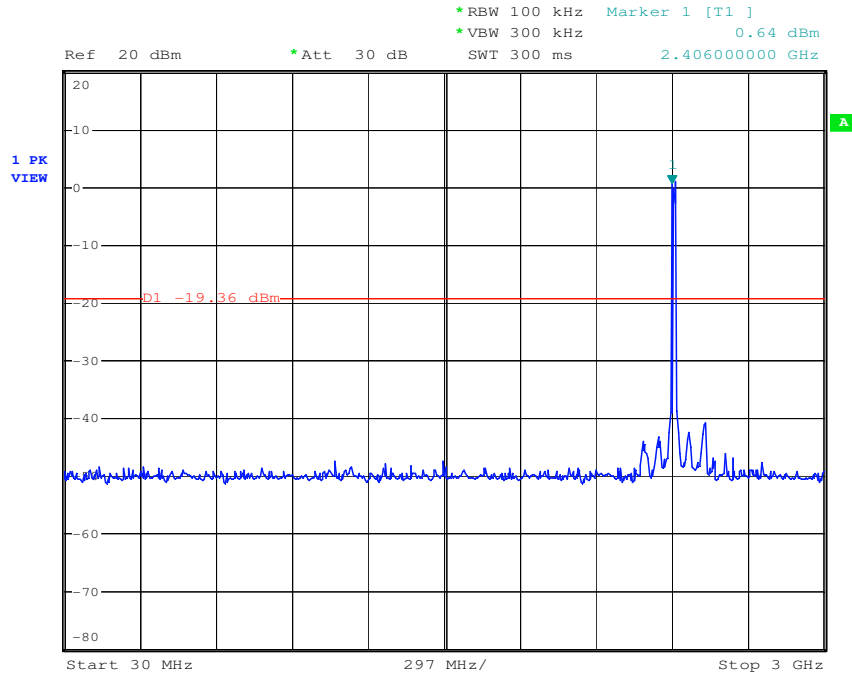
Ch Mid 3GHz-25GHz



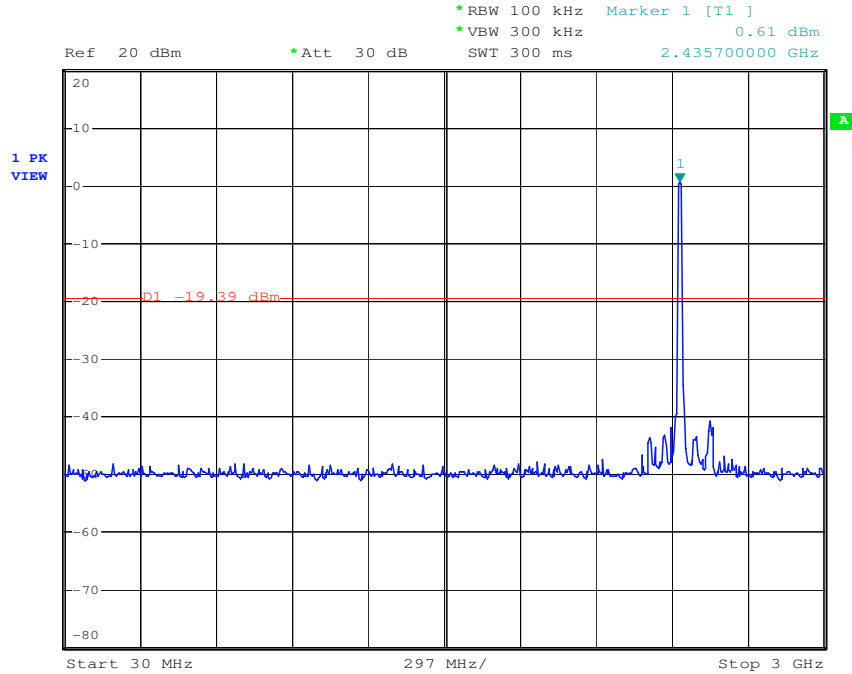
Ch High 3GHz-25GHz



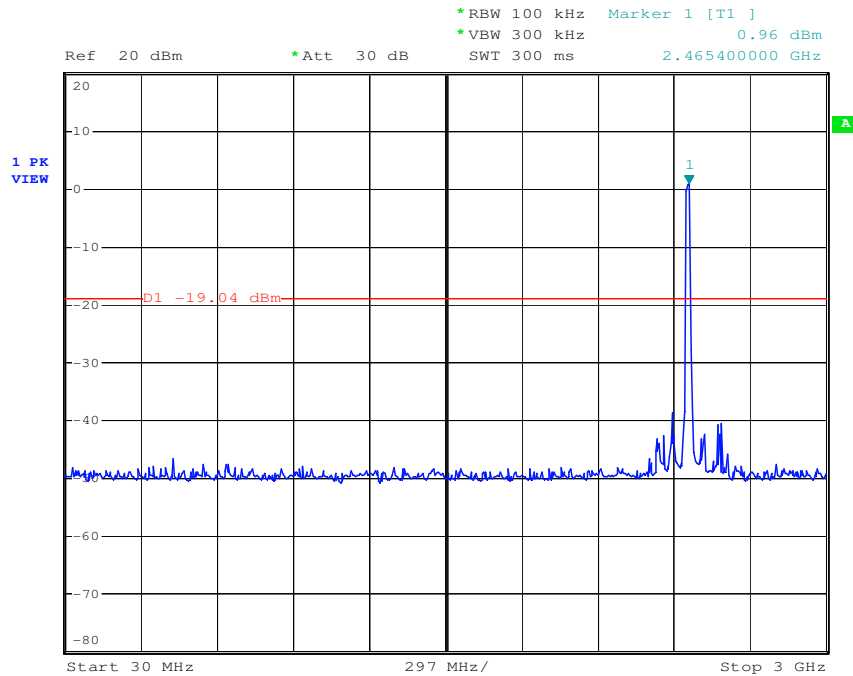
Antenna A for 802.11g CH Low 30MHz-3GHz



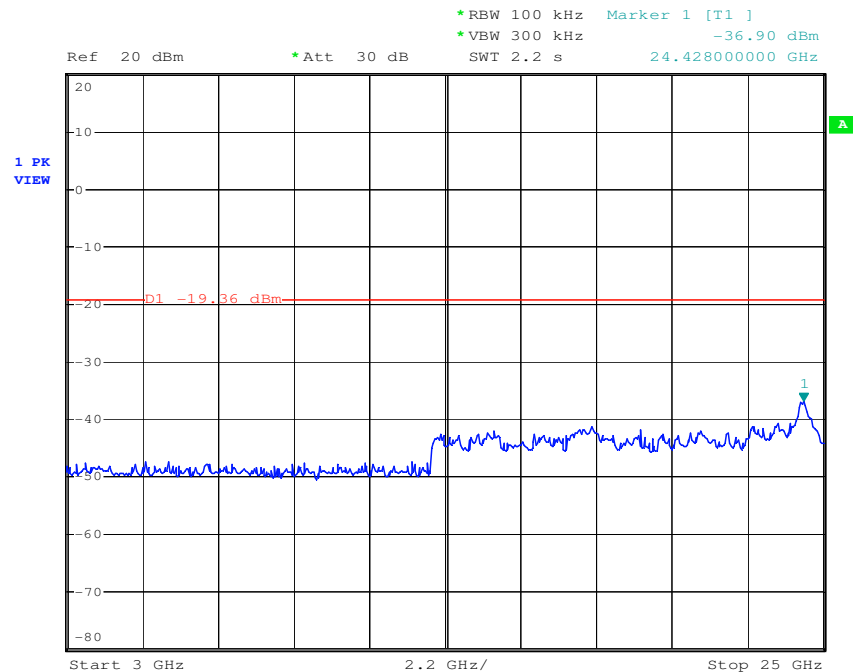
Ch Mid 30MHz-3GHz



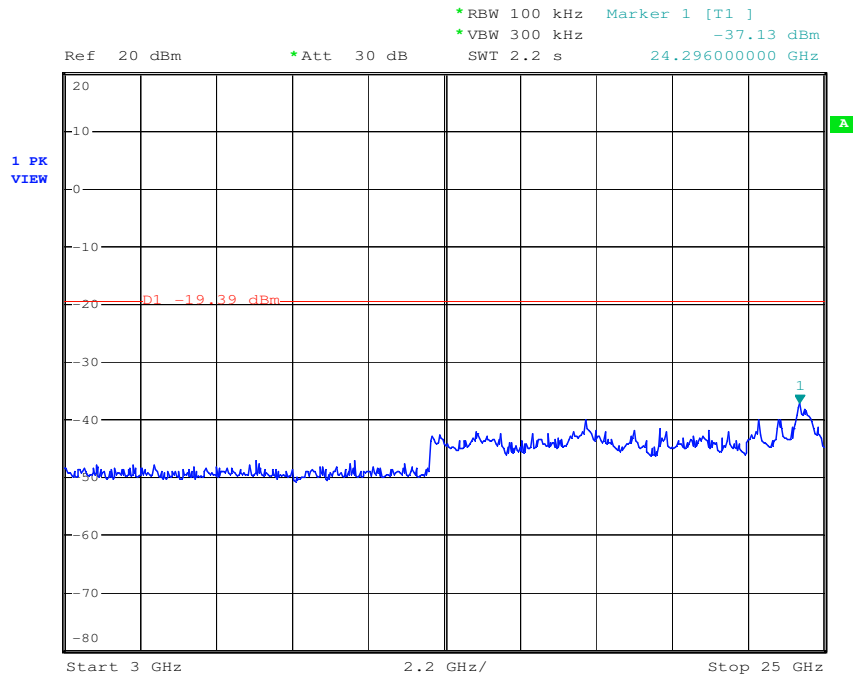
Ch High 30MHz-3GHz



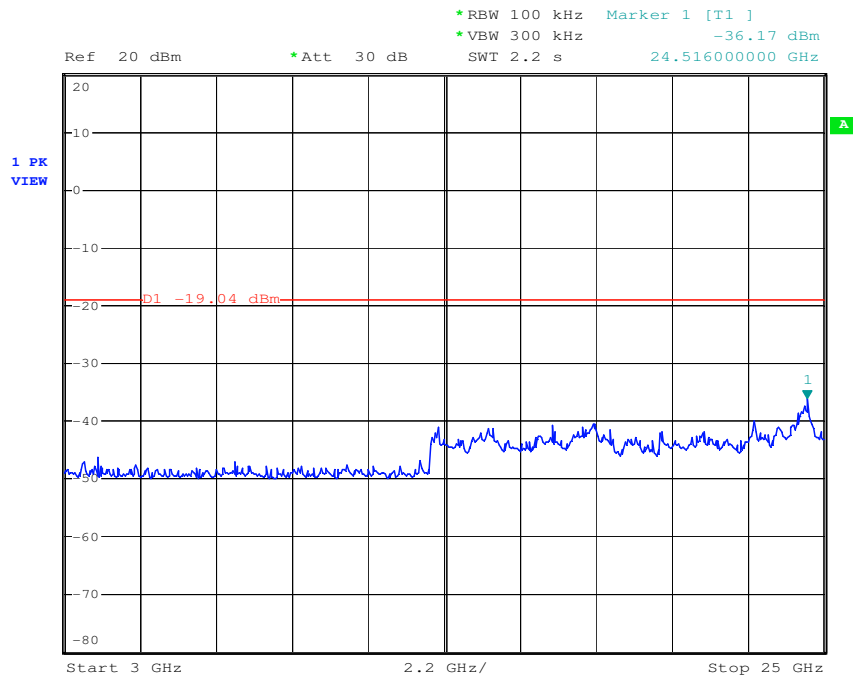
CH Low 3GHz-25GHz



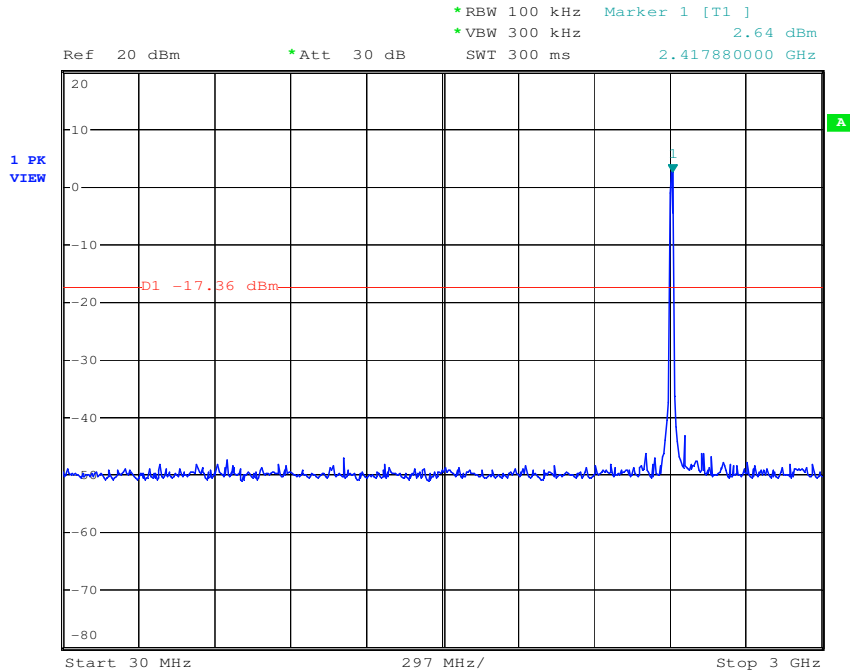
Ch Mid 3GHz-25GHz



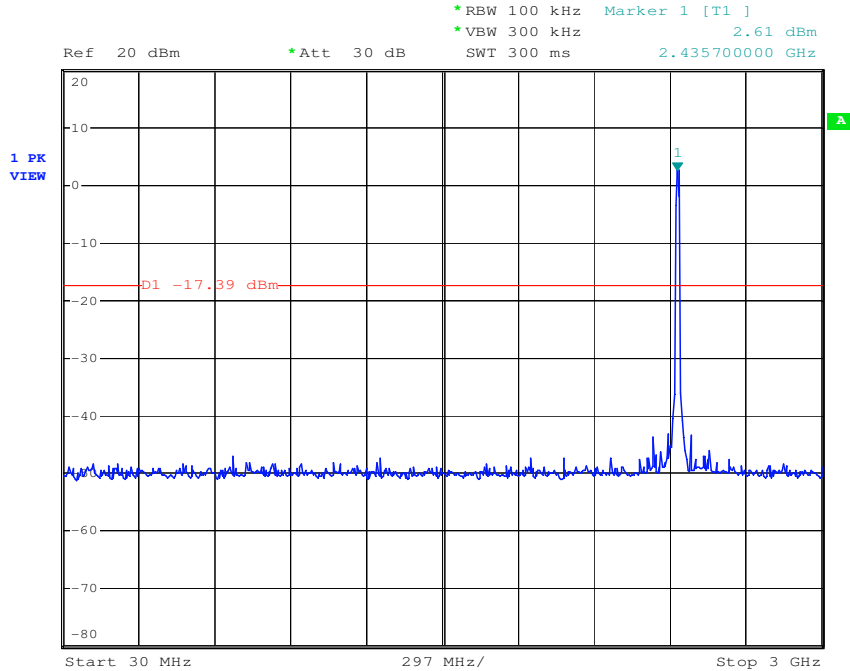
Ch High 3GHz-25GHz



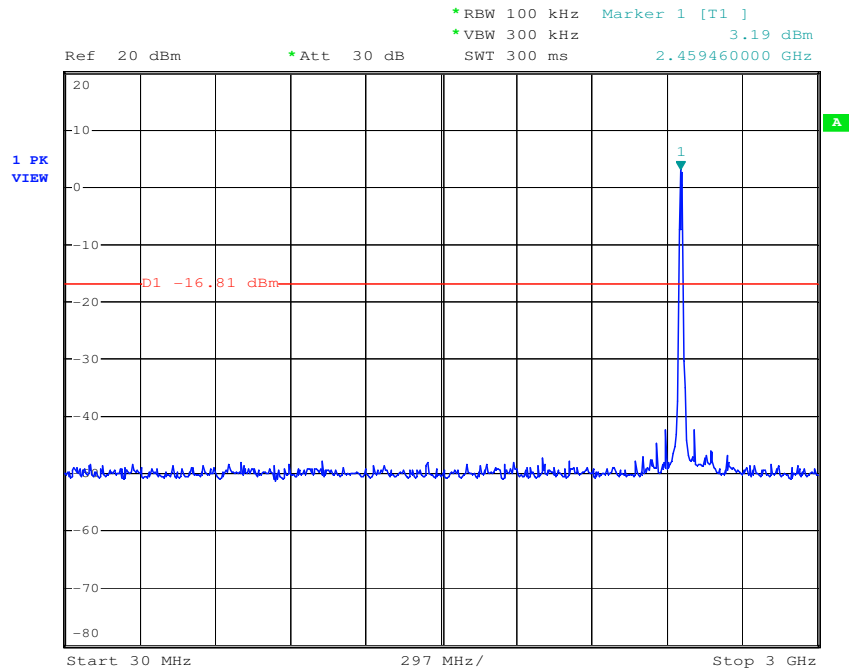
Antenna B for 802.11b CH Low 30MHz-3GHz



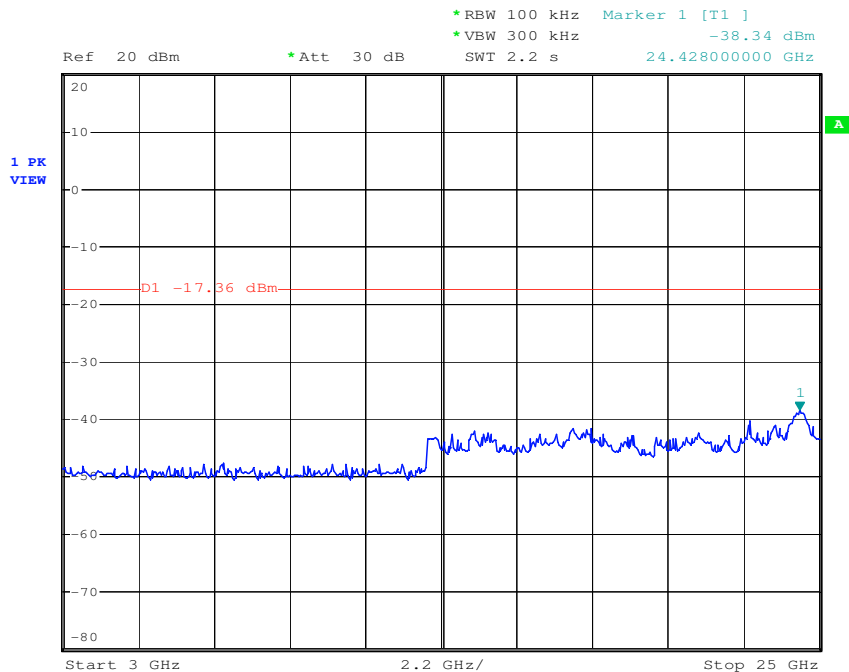
Ch Mid 30MHz-3GHz



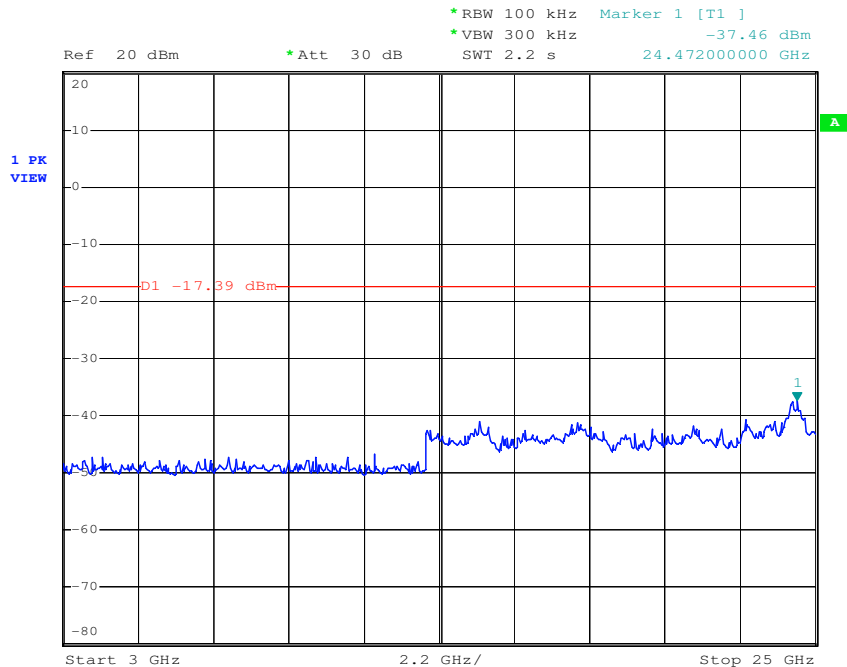
Ch High 30MHz-3GHz



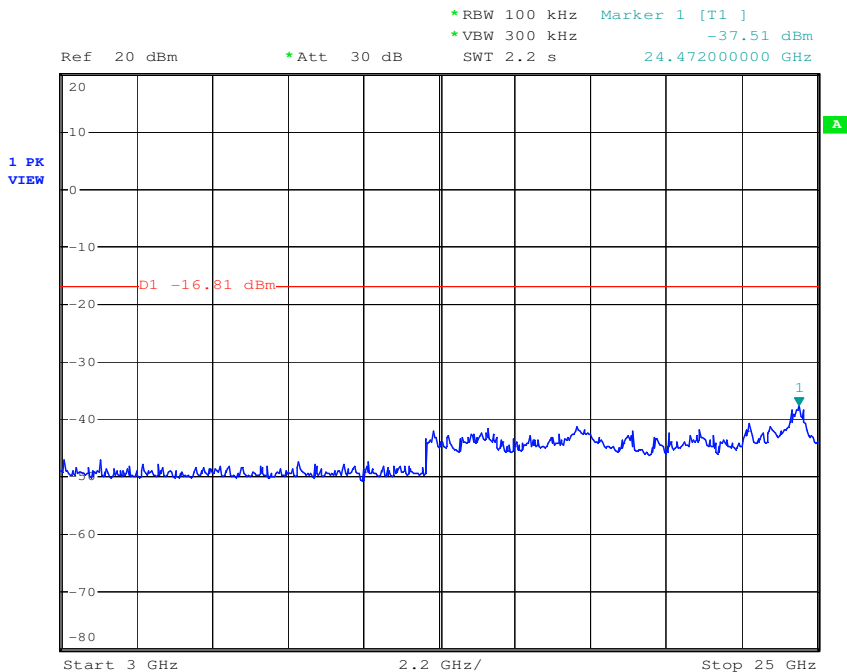
CH Low 3GHz-25GHz



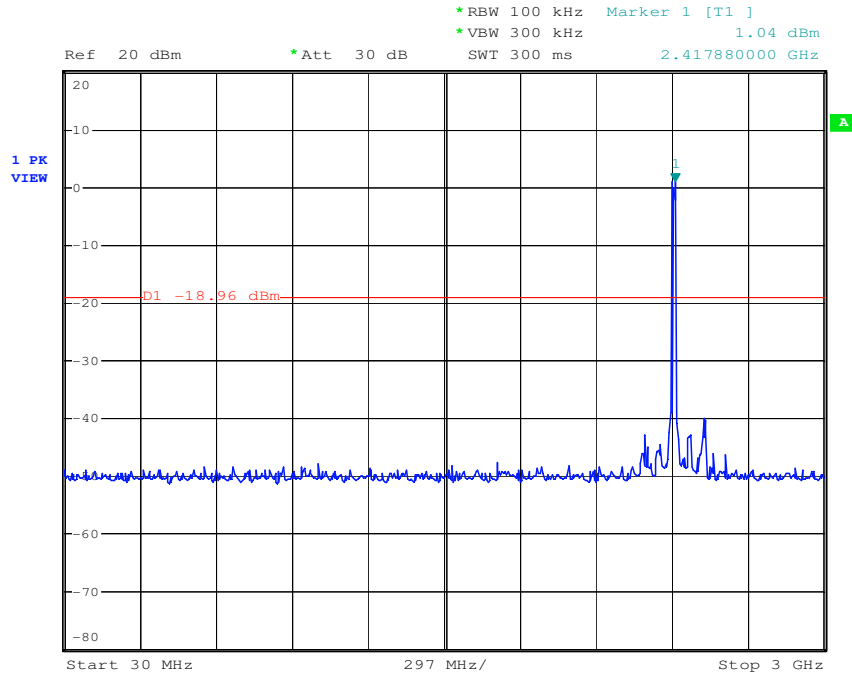
Ch Mid 3GHz-25GHz



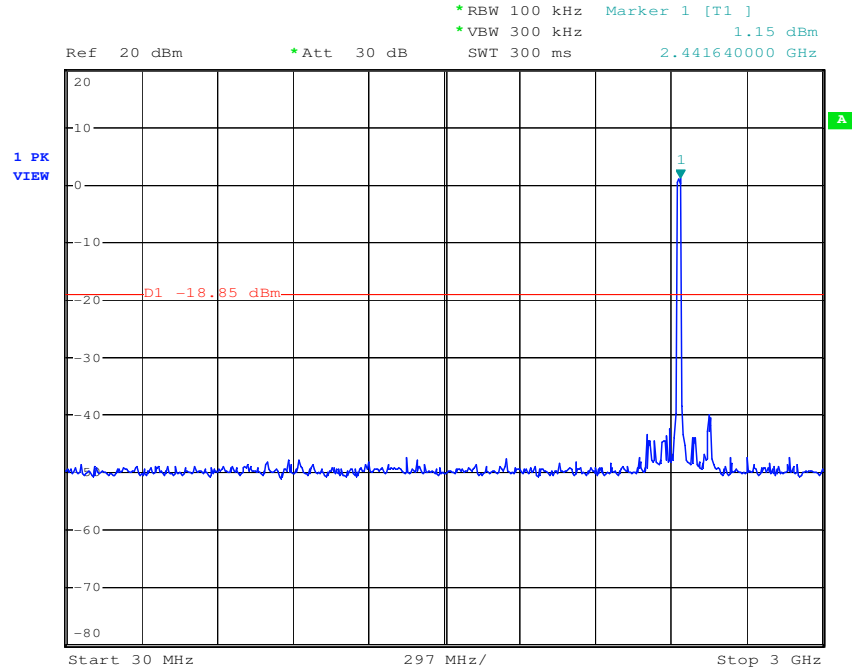
Ch High 3GHz-25GHz



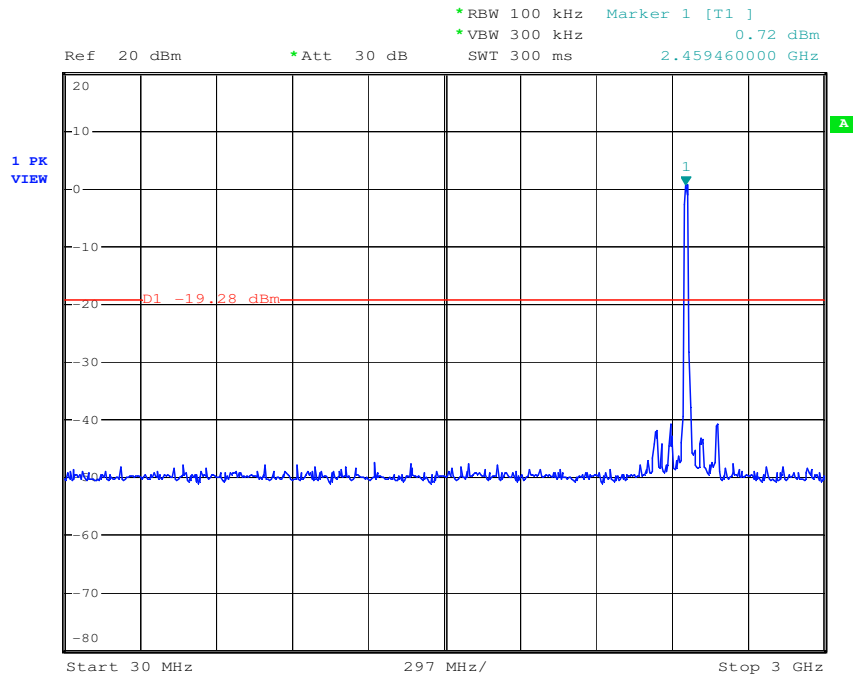
Antenna B for 802.11g CH Low 30MHz-3GHz



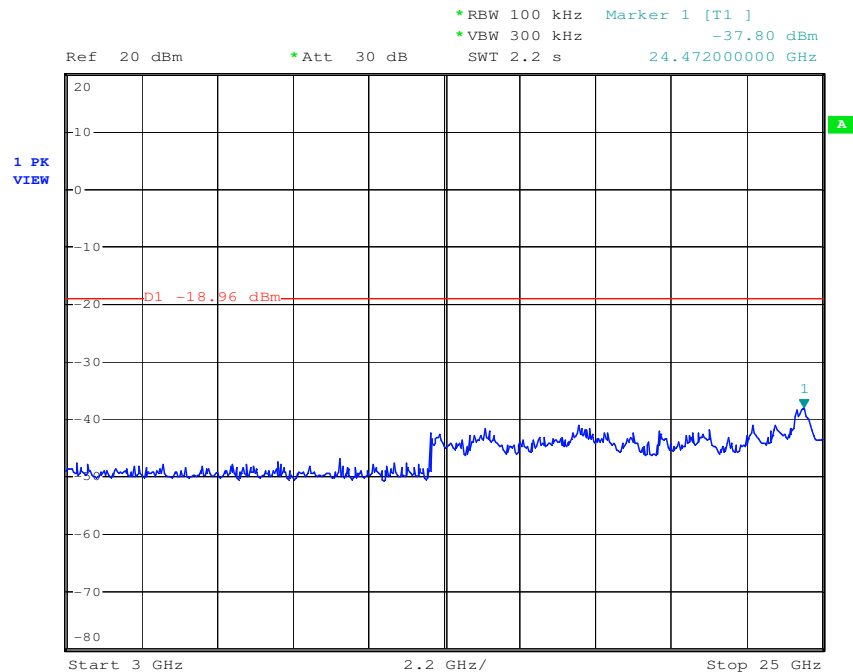
Ch Mid 30MHz-3GHz



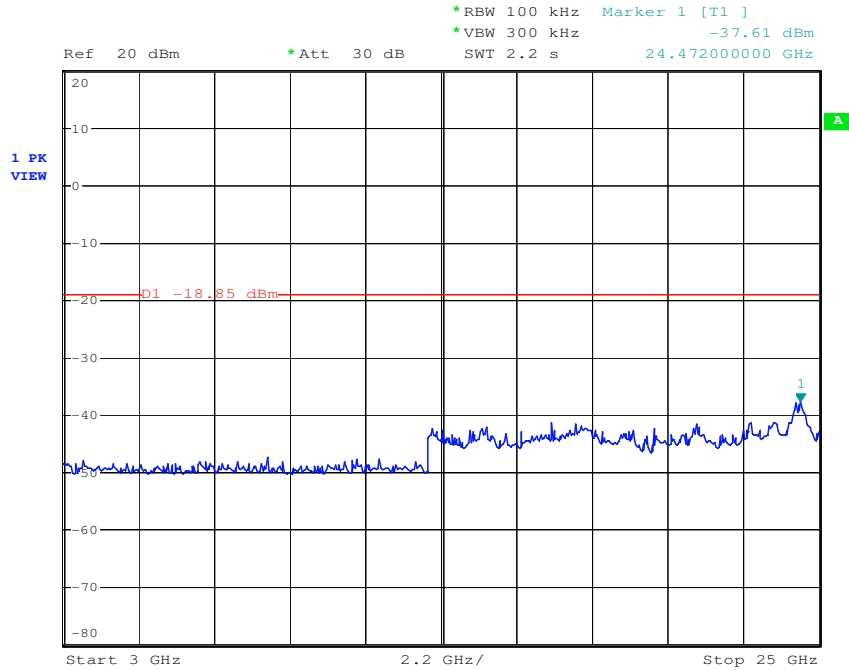
Ch High 30MHz-3GHz



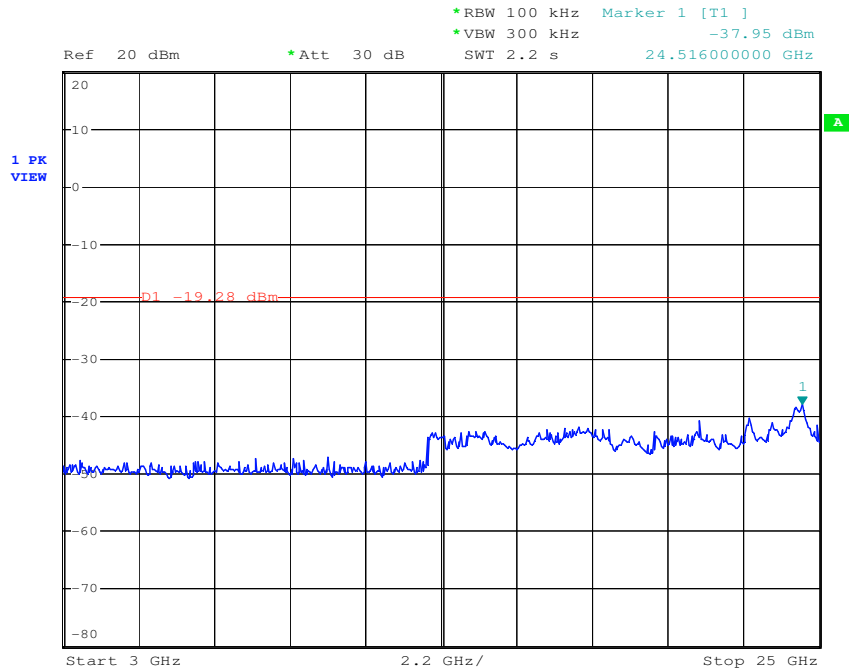
CH Low 3GHz-25GHz



Ch Mid 3GHz-25GHz

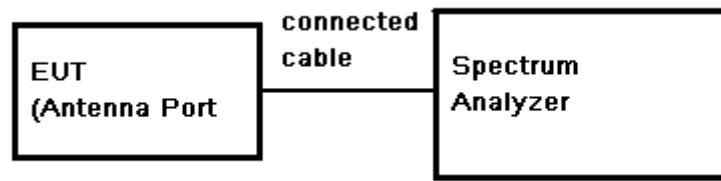


Ch High 3GHz-25GHz



7.8 Conducted Band-edge

Test Requirement:	FCC Part 15 Section 15.247(d) RSS-210 Issue 8 Annex 8.5
Test Method:	ANSI C63.10:2009 Clause 7.7.10
Test Result:	Pass
Limit:	(d) 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 High 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.
Test Mode:	Transmitting mode
Final Test Mode:	The EUT fixed on Low channel and High Channel.
Test Configuration:	

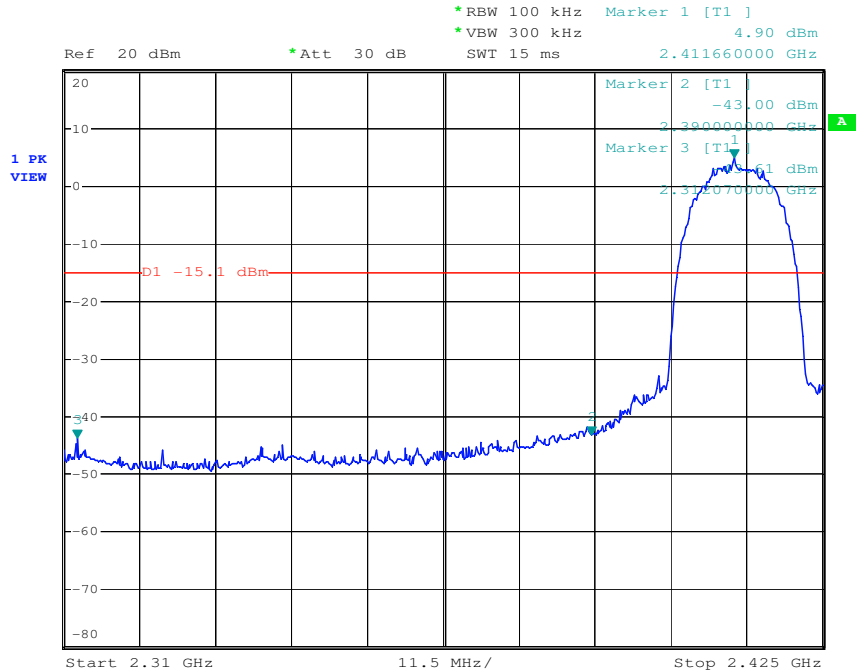


Test Procedure:	<ol style="list-style-type: none"> 1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum. 2. Set the spectrum analyzer: RBW = 100KHz. VBW >= RBW. Sweep = auto; Detector Function = Peak (Max. hold).
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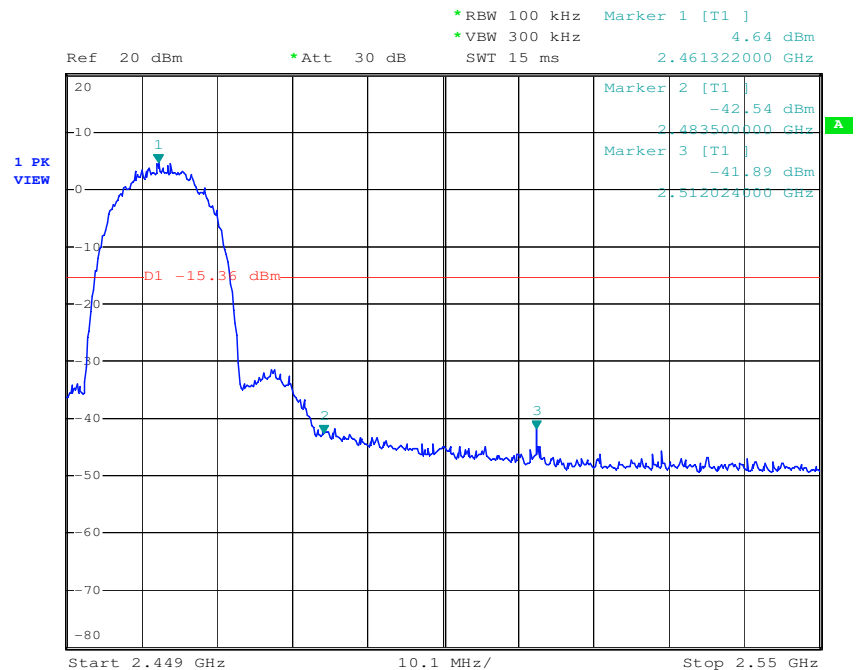
Test plot as follows:

Antenna A for 802.11b

Test mode:	Antenna A	Test channel:	Low
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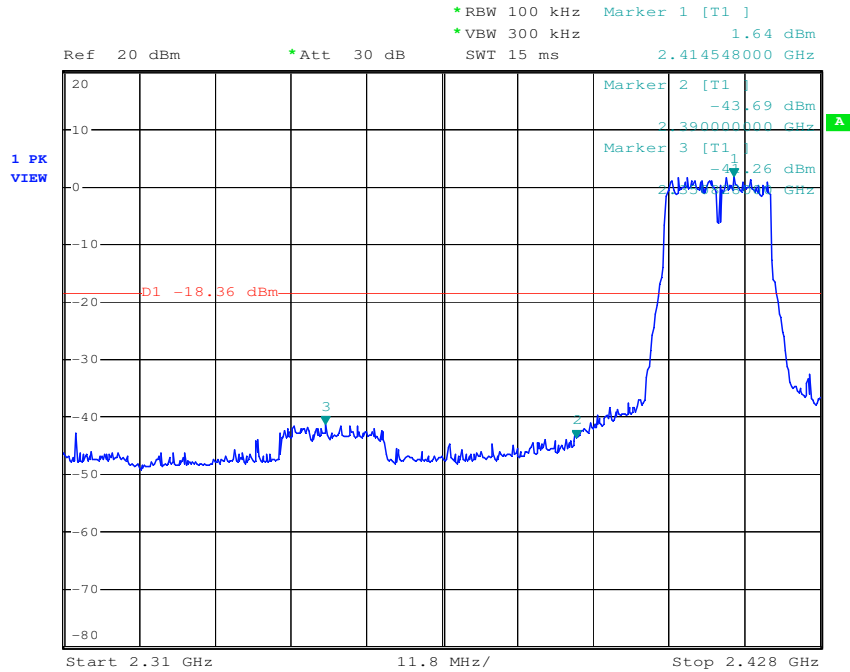
Test mode:	Antenna A	Test channel:	High
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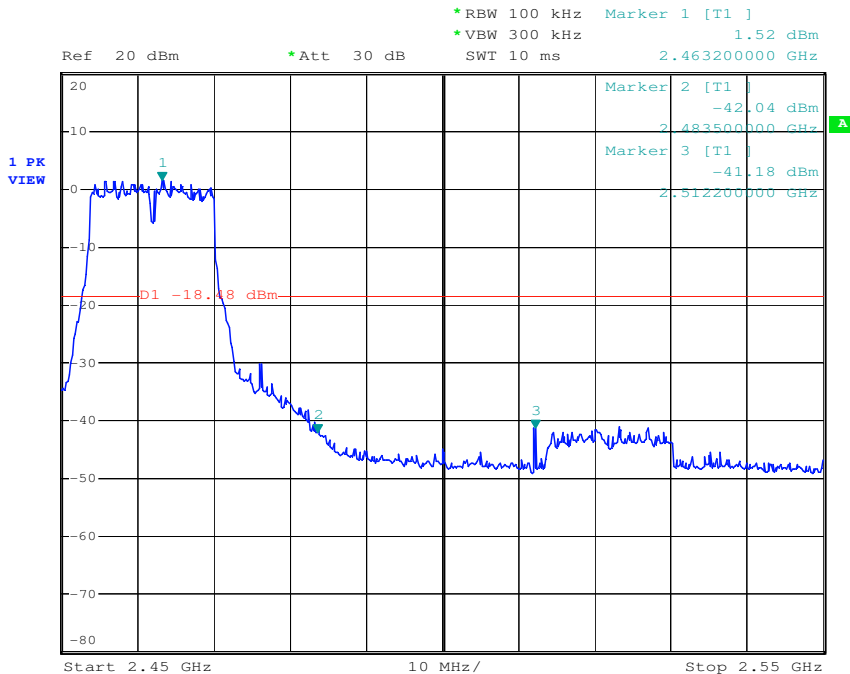
Antenna A for 802.11g

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Test mode:	Antenna A	Test channel:	Low
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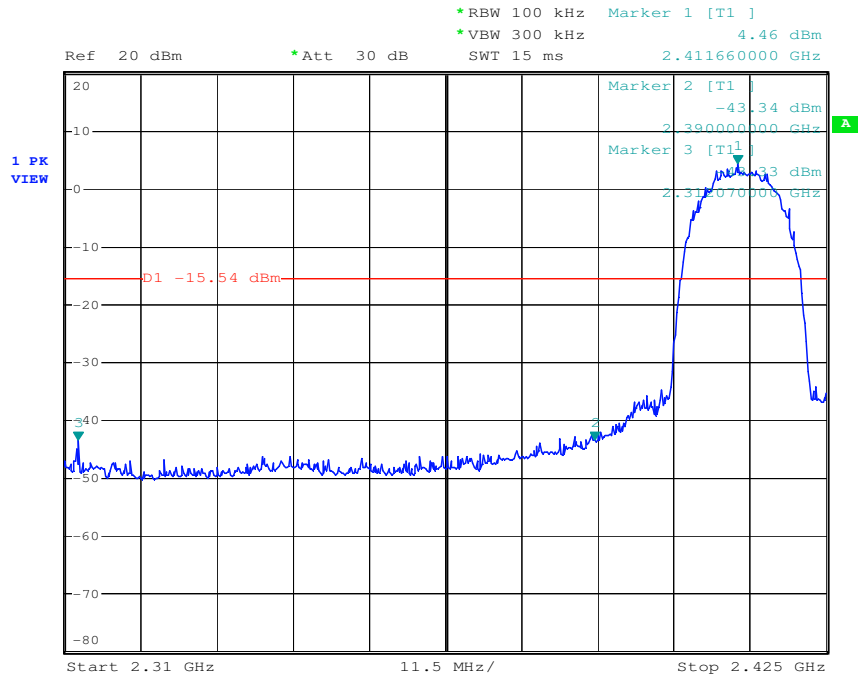


Test mode:	Antenna A	Test channel:	High
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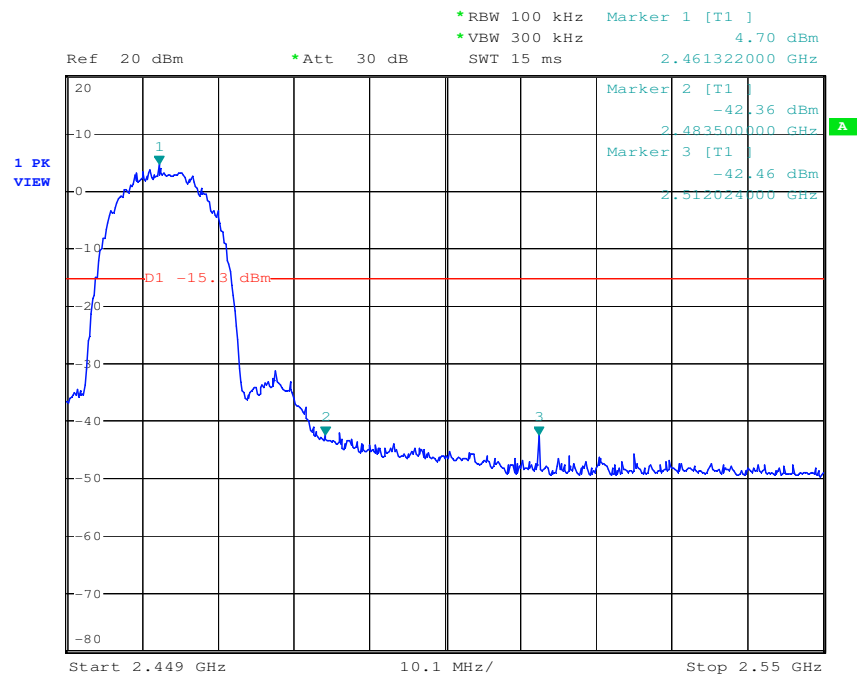


Antenna B for 802.11b

Test mode:	Antenna B	Test channel:	Low
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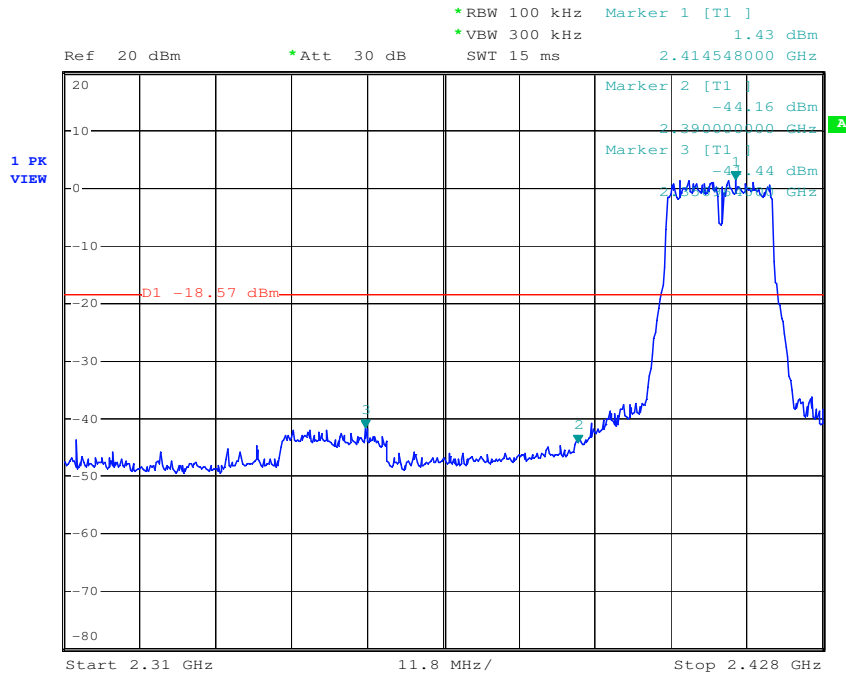


Test mode:	Antenna B	Test channel:	High
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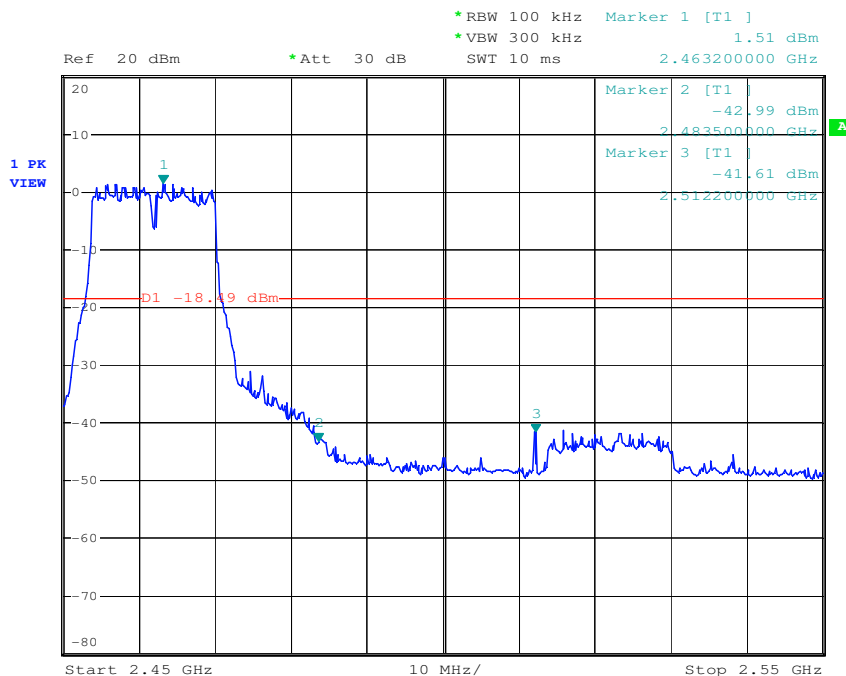


Antenna B for 802.11g

Test mode:	Antenna B	Test channel:	Low
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Test mode:	Antenna B	Test channel:	High
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7.9 Radiated Spurious Emissions

Test Requirement:	FCC Part 15 Section 15.209 and Section 15.205 RSS-210 Issue 8 Annex 8.5
Test Method:	ANSI C63.10:2009 Clause 6.12
Test Mode:	Transmitting mode
Final Test Mode:	The EUT fixed on Low channel, middle channel and High channel.
Test site/setup:	Measurement Distance: 3m (Semi-Anechoic Chamber) Test instrumentation resolution bandwidth 120 kHz and Quasi-Peak detector applies (30 MHz - 1000 MHz). For PK value: RBW = 1 MHz for $f \geq 1$ GHz VBW \geq RBW; Sweep = auto Detector function = peak Trace = max hold For AV value: RBW = 1 MHz for $f \geq 1$ GHz VBW = 10Hz; Sweep = auto Detector function = peak Trace = max hold
15.209 Limit:	Receive antenna scan height 1 m - 4 m. polarization Vertical / Horizontal 40.0 dB μ V/m between 30MHz & 88MHz 43.5 dB μ V/m between 88MHz & 216MHz 46.0 dB μ V/m between 216MHz & 960MHz 54.0 dB μ V/m above 960MHz

Test Configuration:

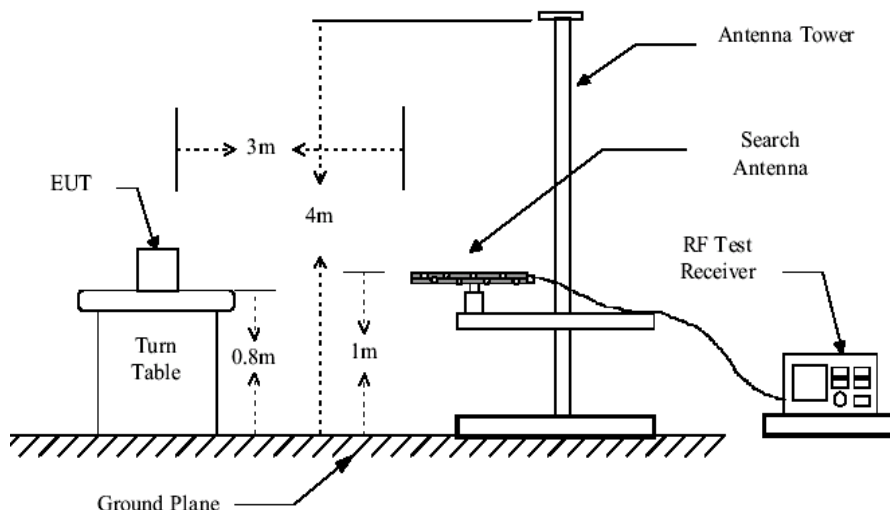


Figure 1. 30MHz to 1GHz radiated emissions test configuration

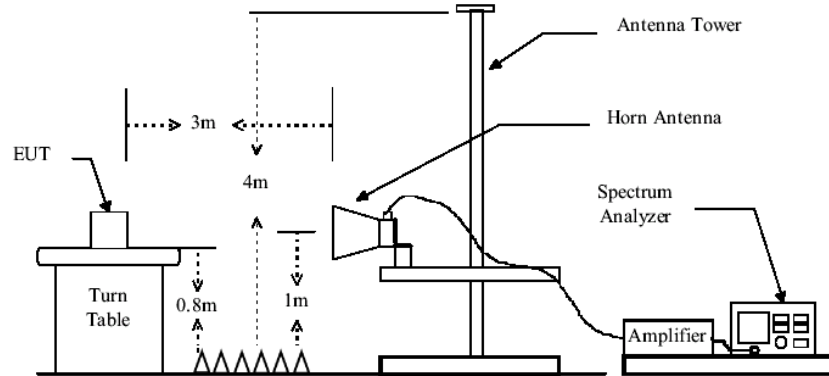


Figure 2. Above 1GHz radiated emissions test configuration

Test Procedure:

The procedure used was ANSI Standard C63.10:2009. The receiver was scanned from 30MHz to 25GHz. When an emission was found, the table was rotated to produce the maximum signal strength. An initial pre-scan was performed in peak detection mode using the receiver. The EUT was measured for both the Horizontal and Vertical polarities and performed a pre-test three orthogonal planes. For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. The worst case emissions were reported.

Low noise amplifier was used below 1GHz, High pass Filter was used above 3GHz.

Between 1G and 3GHz, we did not use any amplifier or filter.

Pre-test was performed on Antenna A and Antenna B mode, Compliance test was performed on worse case (Antenna A mode).

Test were performed for their spatial orthogonal(X, Y, Z), the worst test data (X orthogonal) was submitted.

1) For this intentional radiator operates below 25 GHz. the spectrum shall be investigated to the tenth harmonic of the High fundamental frequency. And above the third harmonic of this intentional radiator, the disturbance is very low. So the test result only displays to 5rd harmonic.

As shown in Section, for frequencies above 1000 MHz the above 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.

The test only perform the EUT in transmitting status since the test frequencies were over 1GHz only required transmitting status.

Test Result: The EUT does meet the FCC requirements.

Test data as follows:

VIFA010

Operation Mode: Low CH 2412MHz Antenna A for 802.11b

Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Emission Level (dBμV /m)	Limit (dBμV /m)	Over Limit (dB)	Antenna polarization
4818.75	38.79	8.46	47.25	74	-26.75	Vertical
7227.50	38.54	10.69	49.23	74	-24.77	Vertical
9659.75	38.02	14.28	52.30	74	-21.70	Vertical
4818.75	40.05	8.46	48.51	74	-25.49	Horizontal
7227.50	39.53	10.69	50.22	74	-23.78	Horizontal
9659.75	36.14	14.28	50.42	74	-23.58	Horizontal

Operation Mode: Mid CH 2437MHz Antenna A for 802.11b

Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Emission Level (dBμV /m)	Limit (dBμV /m)	Over Limit (dB)	Antenna polarization
4877.50	37.75	8.83	46.58	74	-27.42	Vertical
7333.25	38.13	10.93	49.06	74	-24.94	Vertical
9765.50	37.20	14.43	51.63	74	-22.37	Vertical
4877.50	38.84	8.83	47.67	74	-26.33	Horizontal
7333.25	36.89	10.93	47.82	74	-26.18	Horizontal
9765.50	36.72	14.43	51.15	74	-22.85	Horizontal

Operation Mode: High CH 2462MHz Antenna A for 802.11b

Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Emission Level (dBμV /m)	Limit (dBμV /m)	Over Limit (dB)	Antenna polarization
4924.50	38.96	8.95	47.91	74	-26.09	Vertical
7380.25	38.43	11.04	49.47	74	-24.53	Vertical
9859.5	35.97	14.59	50.56	74	-23.44	Vertical
4924.50	38.57	8.95	47.52	74	-26.48	Horizontal
7380.25	39.35	11.04	50.39	74	-23.61	Horizontal
9859.50	36.92	14.59	51.51	74	-22.49	Horizontal

Operation Mode: Low CH 2412MHz Antenna A for 802.11g

Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Emission Level (dBμV /m)	Limit (dBμV /m)	Over Limit (dB)	Antenna polarization
4830.50	39.76	8.53	48.29	74	-25.71	Vertical
7262.75	37.97	10.77	48.74	74	-25.26	Vertical
9624.50	37.28	14.25	51.53	74	-22.47	Vertical
4830.50	38.48	8.53	47.01	74	-26.99	Horizontal
7262.75	38.76	10.77	49.53	74	-24.47	Horizontal
9624.50	36.97	14.25	51.22	74	-22.78	Horizontal

Operation Mode: Mid CH 2437MHz Antenna A for 802.11g

Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Emission Level (dBμV /m)	Limit (dBμV /m)	Over Limit (dB)	Antenna polarization
4865.75	36.94	8.76	45.7	74	-28.3	Vertical
7321.5	37.26	10.9	48.16	74	-25.84	Vertical
9730.25	35.76	14.38	50.14	74	-23.86	Vertical
4865.75	36.73	8.76	45.49	74	-28.51	Horizontal
7321.5	37.53	10.9	48.43	74	-25.57	Horizontal
9730.25	36.67	14.38	51.05	74	-22.95	Horizontal

Operation Mode: High CH 2462MHz Antenna A for 802.11g

Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Emission Level (dBμV /m)	Limit (dBμV /m)	Over Limit (dB)	Antenna polarization
4912.75	39.07	8.97	48.04	74	-25.96	Vertical
7403.75	38.72	11.08	49.80	74	-24.20	Vertical
9824.25	35.90	14.53	50.43	74	-23.57	Vertical
4912.75	40.18	8.97	49.15	74	-24.85	Horizontal
7403.75	38.11	11.08	49.19	74	-24.81	Horizontal
9824.25	36.48	14.53	51.01	74	-22.99	Horizontal

VIFA010:

Operation Mode: Low CH 2412MHz Antenna A for 802.11b

Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Emission Level (dBμV /m)	Limit (dBμV /m)	Over Limit (dB)	Antenna polarization
4842.25	37.99	8.60	46.59	74	-27.41	Vertical
7239.25	38.22	10.71	48.93	74	-25.07	Vertical
9636.25	37.10	14.26	51.36	74	-22.64	Vertical
4842.25	39.71	8.60	48.31	74	-25.69	Horizontal
7239.25	38.8	10.71	49.51	74	-24.49	Horizontal
9636.25	36.42	14.26	50.68	74	-23.32	Horizontal

Operation Mode: Mid CH 2437MHz Antenna A for 802.11b

Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Emission Level (dBμV /m)	Limit (dBμV /m)	Over Limit (dB)	Antenna polarization
4889.25	36.89	8.9	45.79	74	-28.21	Vertical
7309.75	37.93	10.88	48.81	74	-25.19	Vertical
9753.75	37.16	14.41	51.57	74	-22.43	Vertical
4889.25	36.89	8.90	45.79	74	-28.21	Horizontal
7309.75	36.85	10.88	47.73	74	-26.27	Horizontal
9753.75	36.61	14.41	51.02	74	-22.98	Horizontal

Operation Mode: High CH 2462MHz Antenna A for 802.11b

Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Emission Level (dBμV /m)	Limit (dBμV /m)	Over Limit (dB)	Antenna polarization
4936.25	39.21	8.96	48.17	74	-25.83	Vertical
7380.25	38.93	11.04	49.97	74	-24.03	Vertical
9847.75	36.28	14.57	50.85	74	-23.15	Vertical
4936.25	39.52	8.96	48.48	74	-25.52	Horizontal
7380.25	38.69	11.04	49.73	74	-24.27	Horizontal
9847.75	37.27	14.57	51.84	74	-22.16	Horizontal

Operation Mode: Low CH 2412MHz Antenna A for 802.11g

Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Emission Level (dBμV /m)	Limit (dBμV /m)	Over Limit (dB)	Antenna polarization
4842.25	38.80	8.60	47.40	74	-26.60	Vertical
7215.75	37.19	10.65	47.84	74	-26.16	Vertical
9671.50	36.91	14.29	51.20	74	-22.80	Vertical
4842.25	39.29	8.60	47.89	74	-26.11	Horizontal
7215.75	37.66	10.65	48.31	74	-25.69	Horizontal
9671.50	36.91	14.29	51.20	74	-22.80	Horizontal

Operation Mode: Mid CH 2437MHz Antenna A for 802.11g

Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Emission Level (dBμV /m)	Limit (dBμV /m)	Over Limit (dB)	Antenna polarization
4877.50	38.08	8.83	46.91	74	-27.09	Vertical
7309.75	37.12	10.88	48.00	74	-26.00	Vertical
9777.25	37.36	14.45	51.81	74	-22.19	Vertical
4877.50	38.41	8.83	47.24	74	-26.76	Horizontal
7309.75	37.60	10.88	48.48	74	-25.52	Horizontal
9777.25	36.64	14.45	51.09	74	-22.91	Horizontal

Operation Mode: High CH 2462MHz Antenna A for 802.11g

Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Emission Level (dBμV /m)	Limit (dBμV /m)	Over Limit (dB)	Antenna polarization
4959.75	40.96	8.94	49.90	74	-24.10	Vertical
7380.25	39.30	11.04	50.34	74	-23.66	Vertical
9871.25	35.58	14.61	50.19	74	-23.81	Vertical
4959.75	39.42	8.94	48.36	74	-25.64	Horizontal
7380.25	38.37	11.04	49.41	74	-24.59	Horizontal
9871.25	35.82	14.61	50.43	74	-23.57	Horizontal

7.10 Band edge (Radiated Emission)

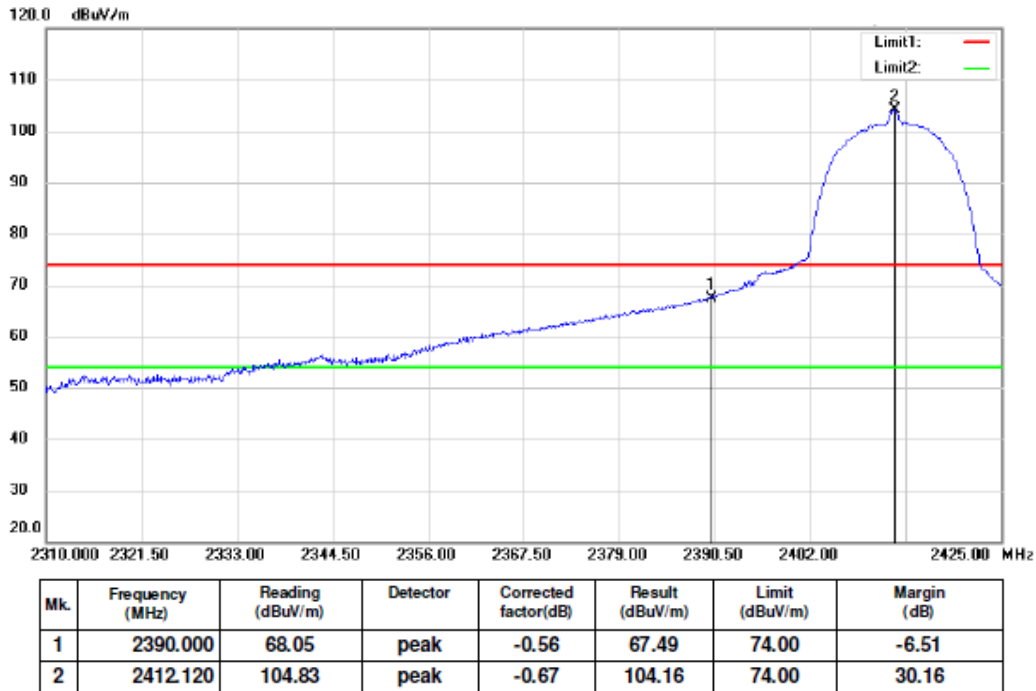
Test Requirement:	FCC Part 15, Subpart C Section 15.205 and Section 15.209 RSS-210 Issue 8 Annex 8.5
Test Method:	ANSI 63.10:2009 Clause 6.12
Measurement Distance:	3m (Semi-Anechoic Chamber)
Limit:	40.0 dB μ V/m between 30MHz & 88MHz; 43.5 dB μ V/m between 88MHz & 216MHz; 46.0 dB μ V/m between 216MHz & 960MHz; 54.0 dB μ V/m above 960MHz.
Detector:	For PK value: RBW = 1 MHz for $f \geq 1$ GHz VBW \geq RBW; Sweep = auto Detector function = peak Trace = max hold For AV value: RBW = 1 MHz for $f \geq 1$ GHz VBW = 10Hz; Sweep = auto Detector function = peak Trace = max hold
Test Procedure:	According to section, 15.35(b) for frequencies above 1000 MHz the above 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. Pre-test was performed on Antenna A and Antenna B mode, Compliance test was performed on worse case (Antenna A mode). Test were performed for their spatial orthogonal(X, Y, Z), the worst test data (X orthogonal) was submitted.
Test Result:	The EUT does meet the FCC requirements.

Test data as follows:

VIFA010:

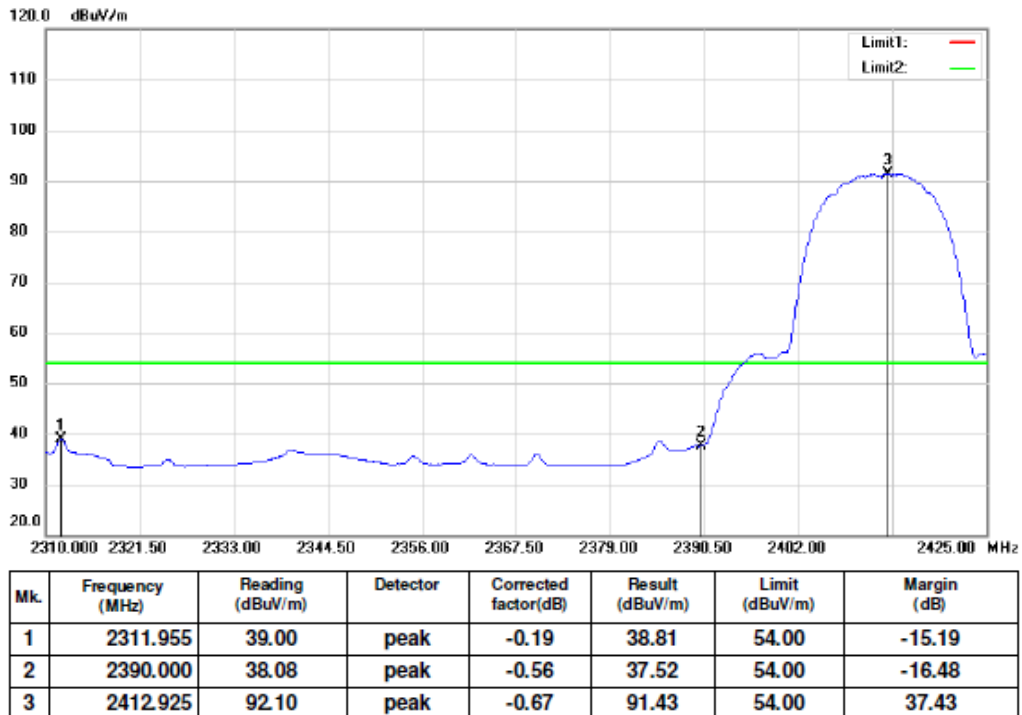
CH Low 2412MHz Antenna A for 802.11 b

Horizontal, Peak Detector:



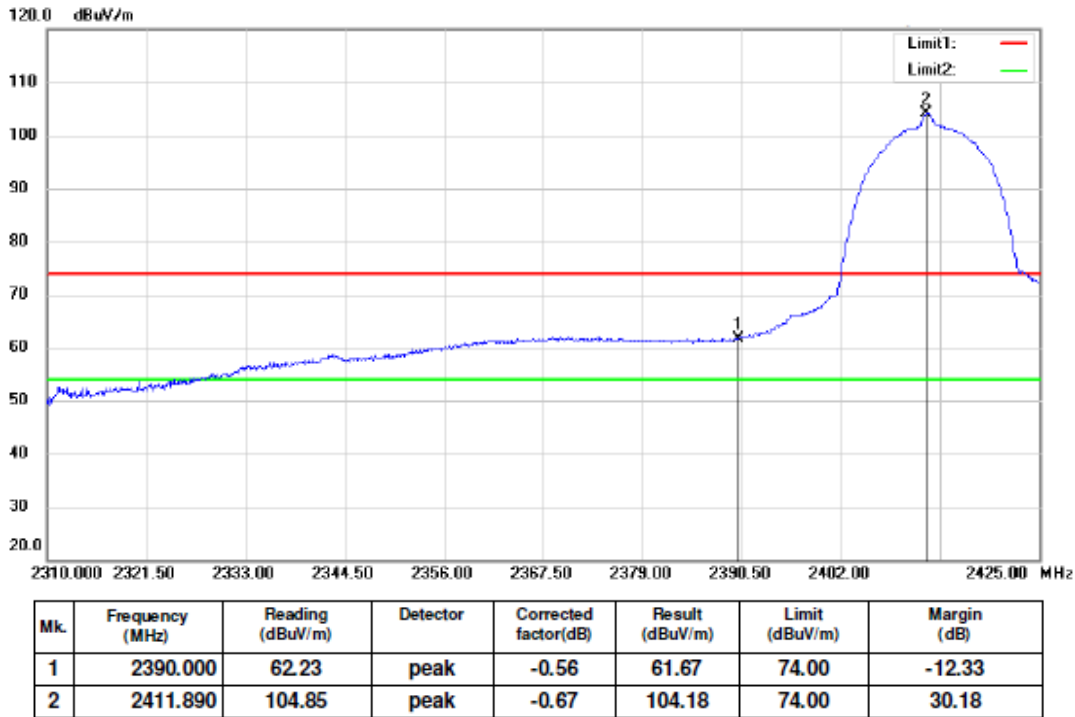
CH Low 2412MHz Antenna A for 802.11 b

Horizontal, Averager Detector:



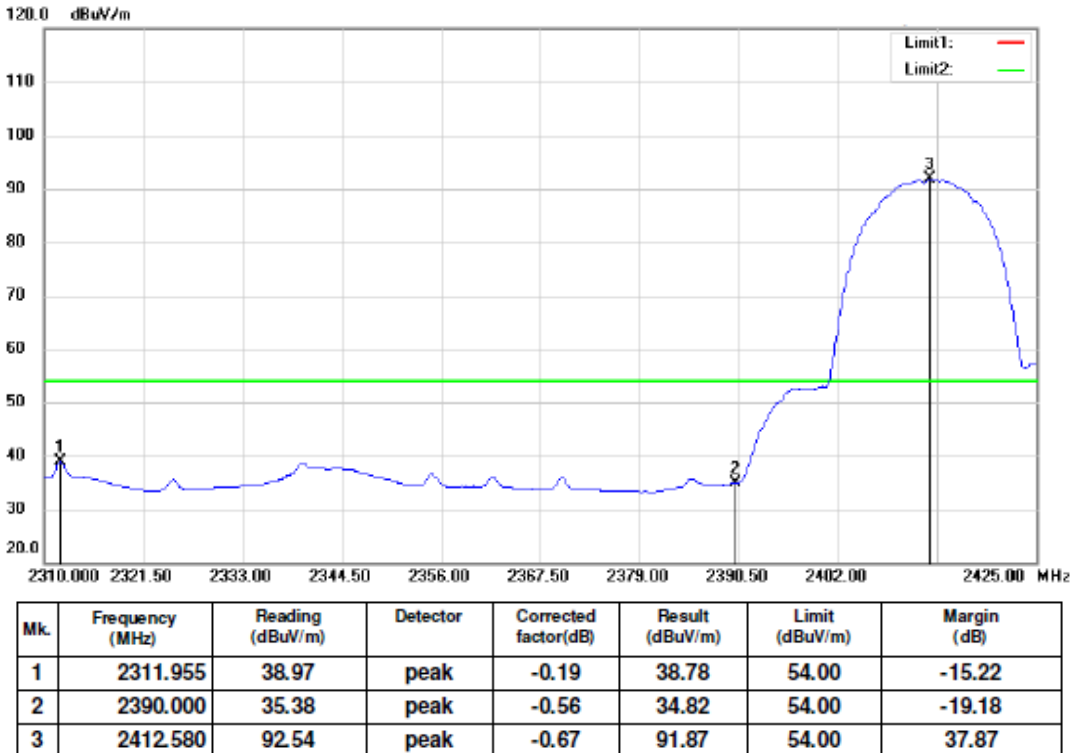
CH Low 2412MHz Antenna A for 802.11 b

Vertical, Peak Detector:



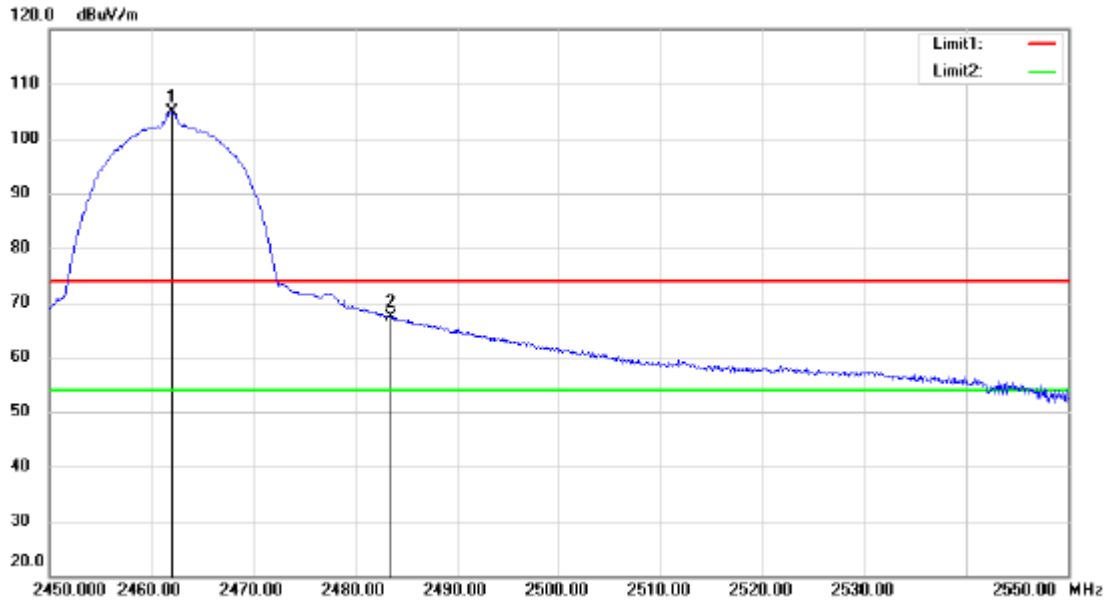
CH Low 2412MHz Antenna A for 802.11 b

Vertical, Averager Detector:



CH High 2462MHz Antenna A for 802.11 b

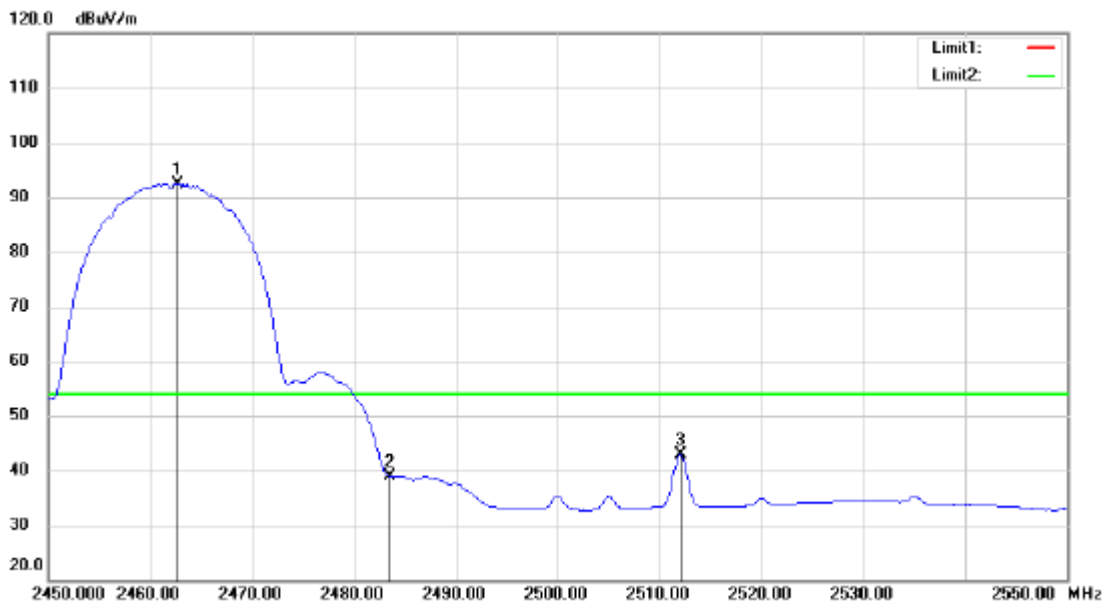
Horizontal, Peak Detector:



Mk.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	2462.000	105.75	peak	-0.91	104.84	74.00	30.84
2	2483.500	68.32	peak	-1.01	67.31	74.00	-6.69

CH High 2462MHz Antenna A for 802.11 b

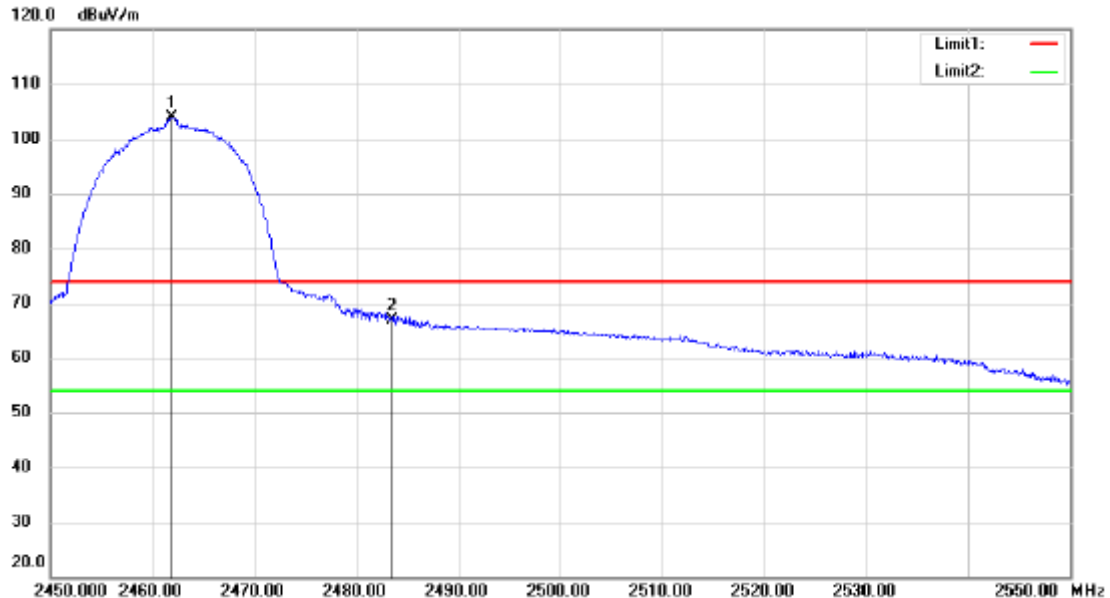
Horizontal, Averager Detector:



Mk.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	2462.700	93.39	peak	-0.91	92.48	54.00	38.48
2	2483.500	39.85	peak	-1.01	38.84	54.00	-15.16
3	2512.000	43.78	peak	-0.97	42.81	54.00	-11.19

CH High 2462MHz Antenna A for 802.11 b

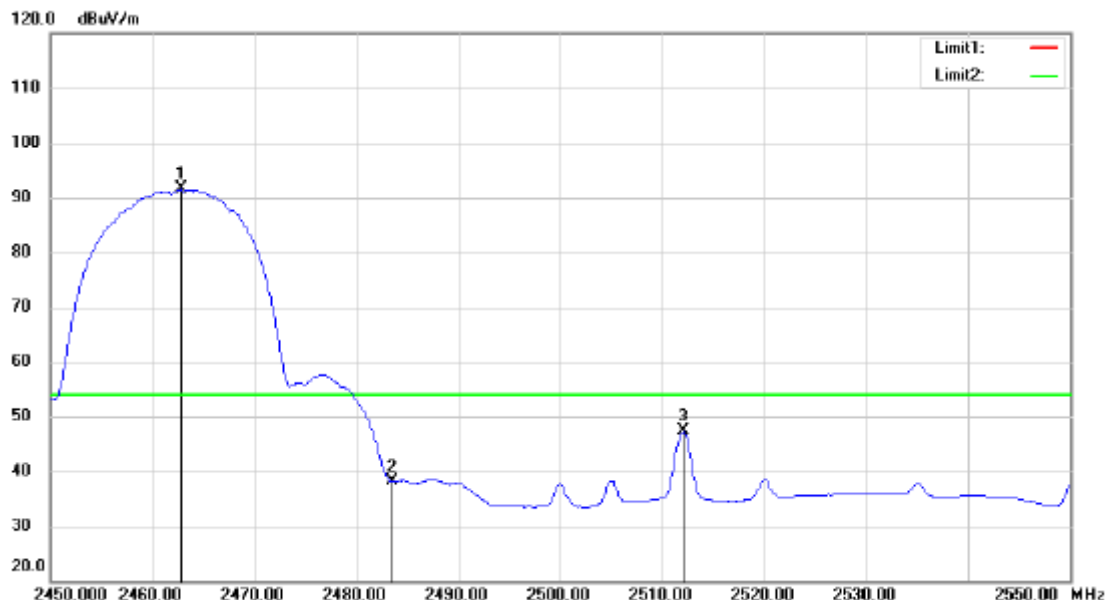
Vertical, Peak Detector:



Mk.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	2461.900	104.81	peak	-0.91	103.90	74.00	29.90
2	2483.500	67.82	peak	-1.01	66.81	74.00	-7.19

CH High 2462MHz Antenna A for 802.11 b

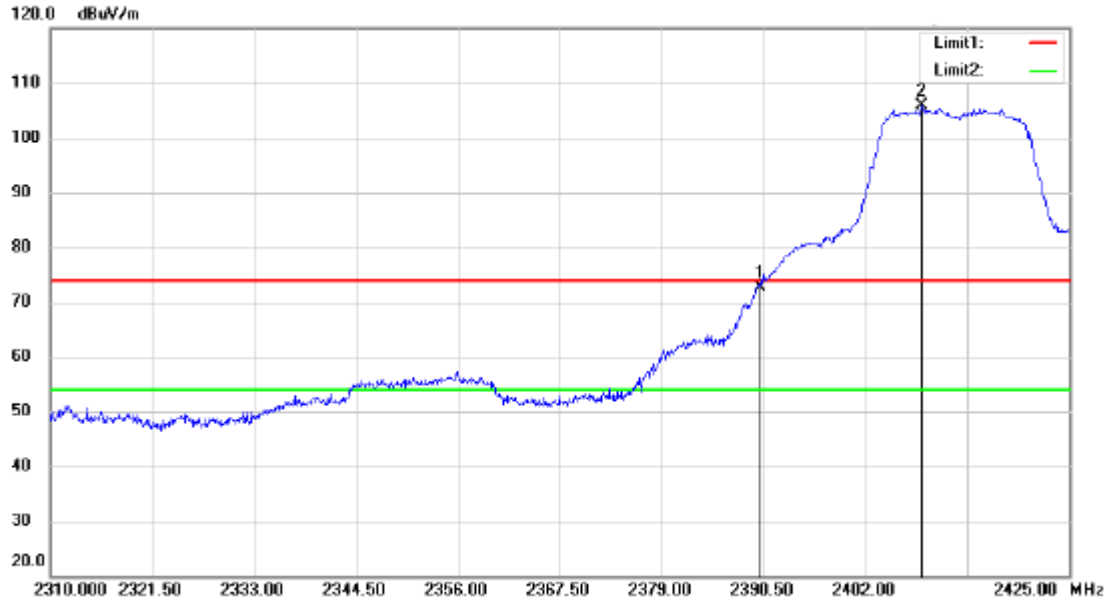
Vertical, Averager Detector:



Mk.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	2462.900	92.45	peak	-0.91	91.54	54.00	37.54
2	2483.500	39.10	peak	-1.01	38.09	54.00	-15.91
3	2512.000	48.24	peak	-0.97	47.27	54.00	-6.73

CH Low 2412MHz Antenna A for 802.11 g

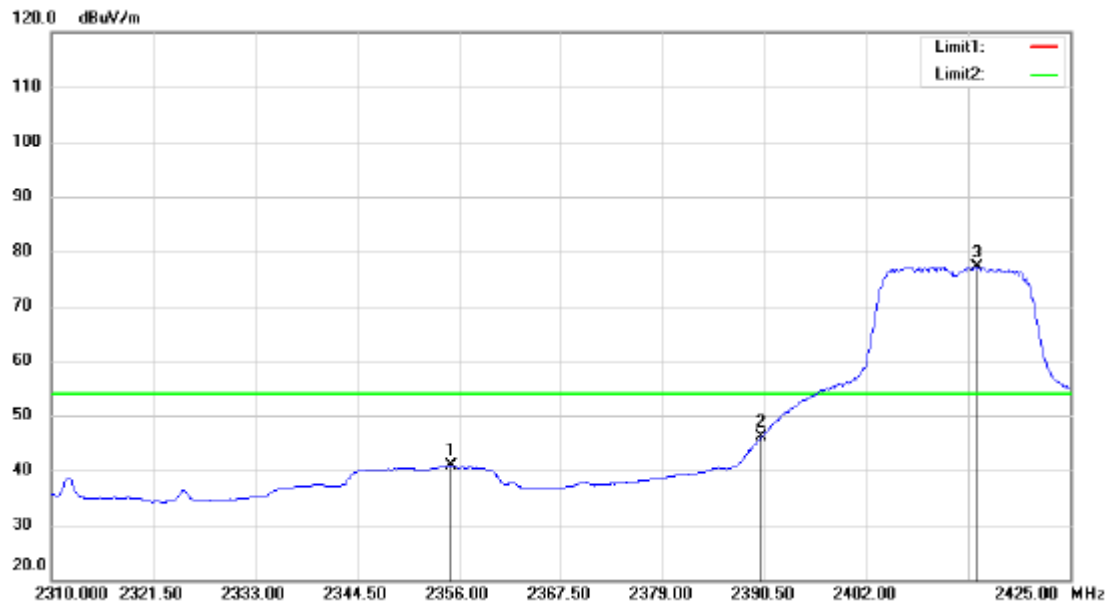
Horizontal, Peak Detector:



Mk.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	2390.000	73.30	peak	-0.56	72.74	74.00	-1.26
2	2408.325	106.51	peak	-0.65	105.86	74.00	31.86

CH Low 2412MHz Antenna A for 802.11 g

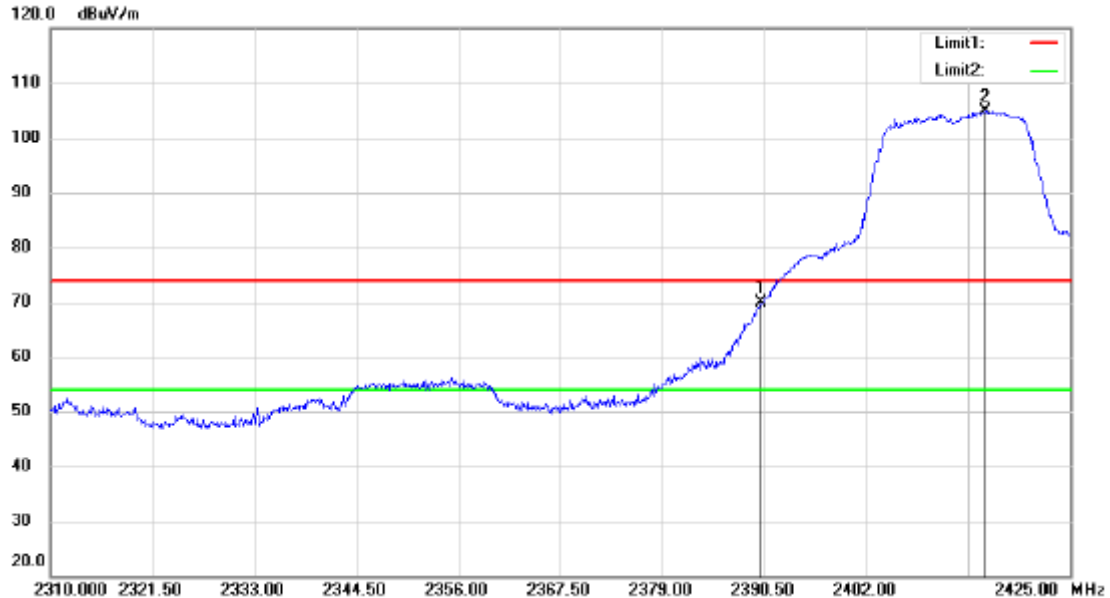
Horizontal, Averager Detector:



Mk.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	2355.195	41.18	peak	-0.39	40.79	54.00	-13.21
2	2390.000	46.64	peak	-0.56	46.08	54.00	-7.92
3	2414.420	77.77	peak	-0.68	77.09	54.00	23.09

CH Low 2412MHz Antenna A for 802.11 g

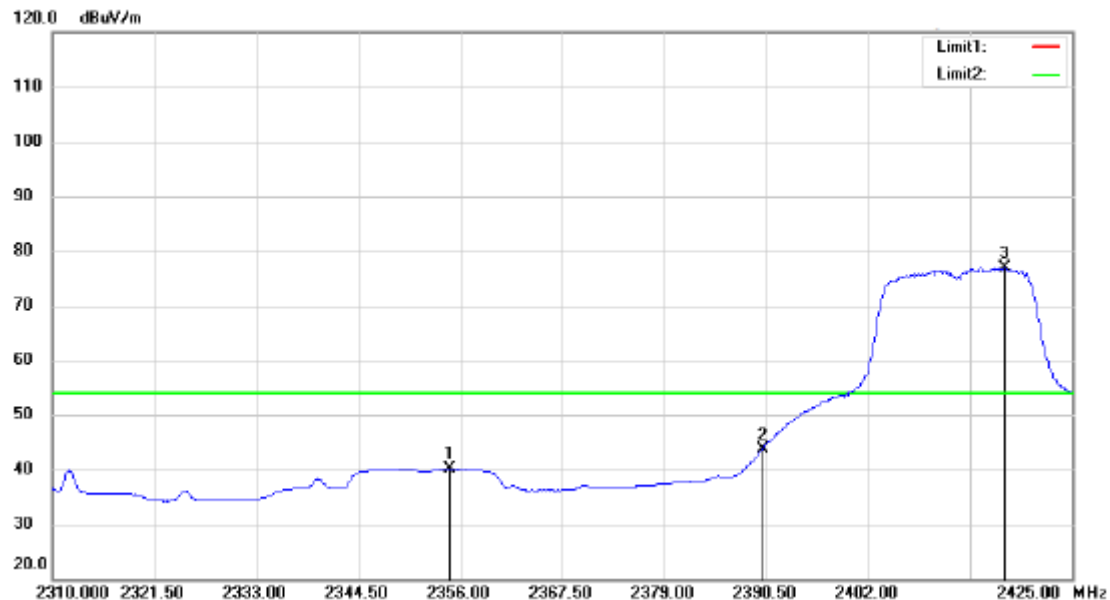
Vertical, Peak Detector:



Mk.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	2390.000	70.43	peak	-0.56	69.87	74.00	-4.13
2	2415.455	105.57	peak	-0.68	104.89	74.00	30.89

CH Low 2412MHz Antenna A for 802.11 g

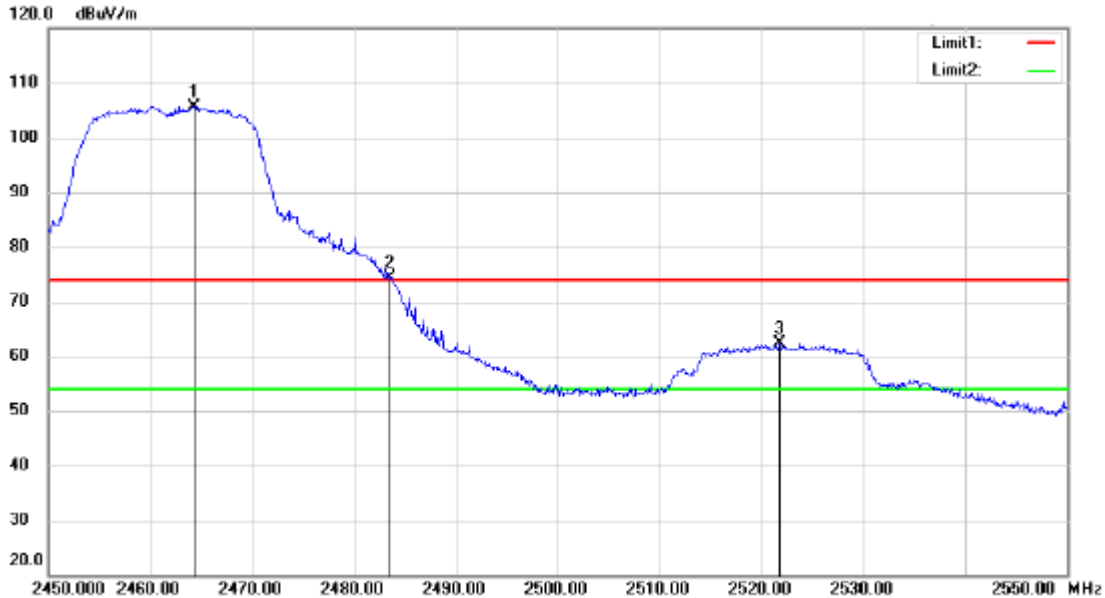
Vertical, Averager Detector:



Mk.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	2354.850	40.64	peak	-0.39	40.25	54.00	-13.75
2	2390.000	44.26	peak	-0.56	43.70	54.00	-10.30
3	2417.410	77.66	peak	-0.69	76.97	54.00	22.97

CH High 2462MHz Antenna A for 802.11 g

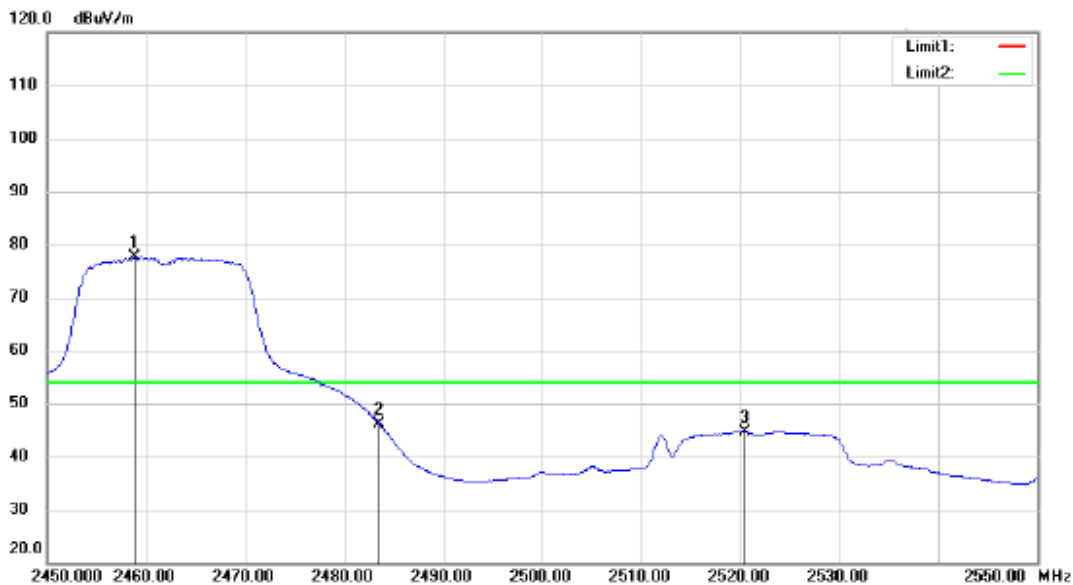
Horizontal, Peak Detector:



Mk.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	2464.300	106.64	peak	-0.91	105.73	74.00	31.73
2	2483.500	75.41	peak	-1.01	74.40	74.00	0.40
3	2521.800	63.16	peak	-0.86	62.30	74.00	-11.70

CH High 2462MHz Antenna A for 802.11 g

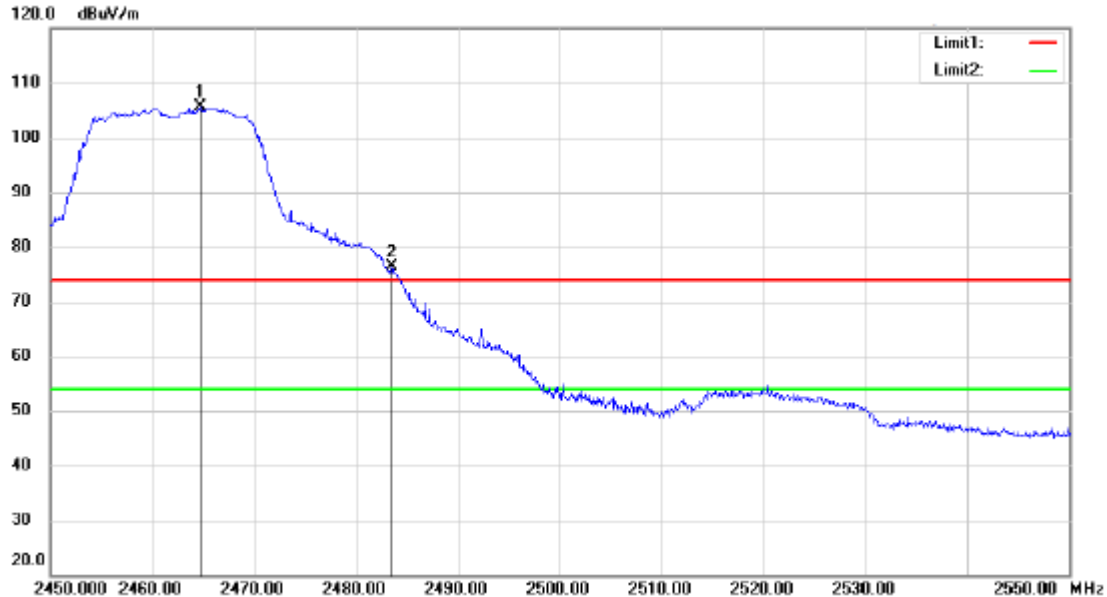
Horizontal, Averager Detector:



Mk.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	2458.900	78.50	peak	-0.89	77.61	54.00	23.61
2	2483.500	47.15	peak	-1.01	46.14	54.00	-7.86
3	2520.400	45.58	peak	-0.87	44.71	54.00	-9.29

CH High 2462MHz Antenna A for 802.11 g

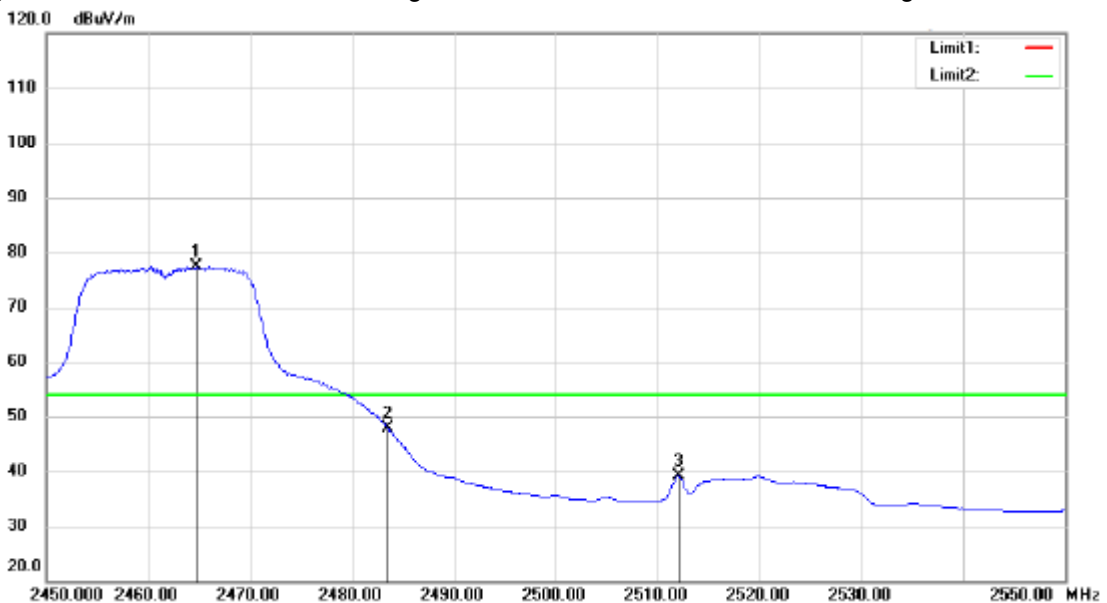
Vertical, Peak Detector:



Mk.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	2464.700	106.53	peak	-0.91	105.62	74.00	31.62
2	2483.500	77.37	peak	-1.01	76.36	74.00	2.36

CH High 2462MHz Antenna A for 802.11 g

Vertical, Averager Detector:

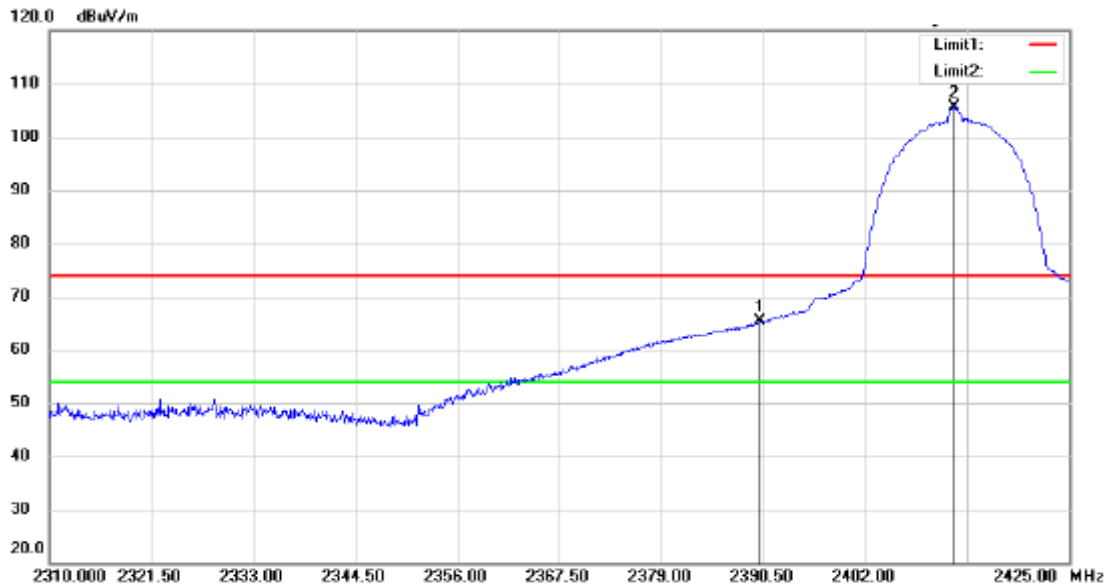


Mk.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	2464.700	78.31	peak	-0.91	77.40	54.00	23.40
2	2483.500	48.93	peak	-1.01	47.92	54.00	-6.08
3	2512.000	40.11	peak	-0.97	39.14	54.00	-14.86

VIFA020:

CH Low 2412MHz Antenna A for 802.11 b

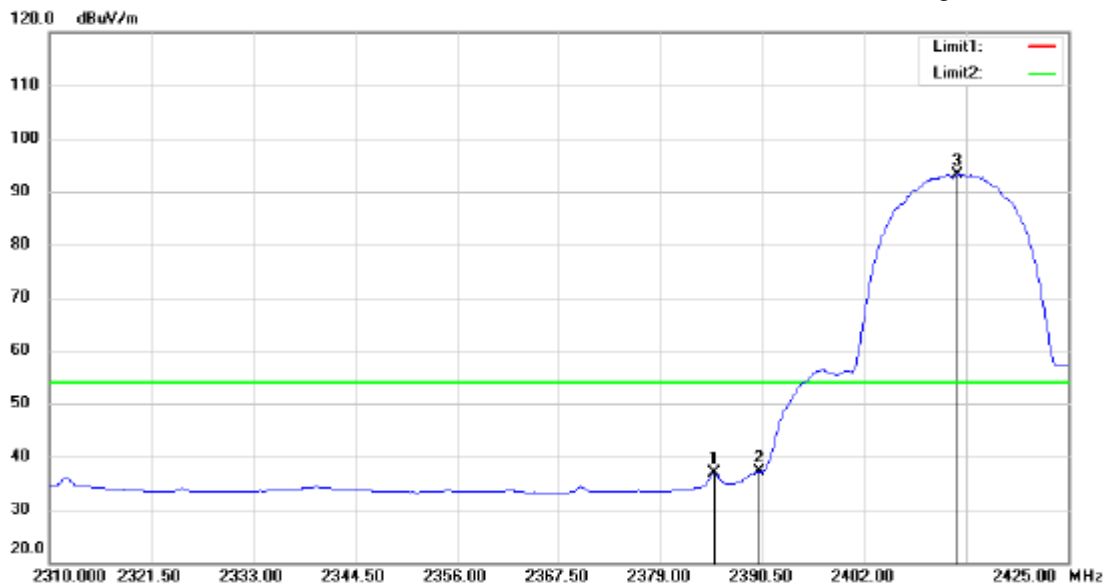
Horizontal, Peak Detector:



Mk.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	2390.000	65.83	peak	-0.56	65.27	74.00	-8.73
2	2412.005	106.39	peak	-0.67	105.72	74.00	31.72

CH Low 2412 MHz Antenna A for 802.11 b

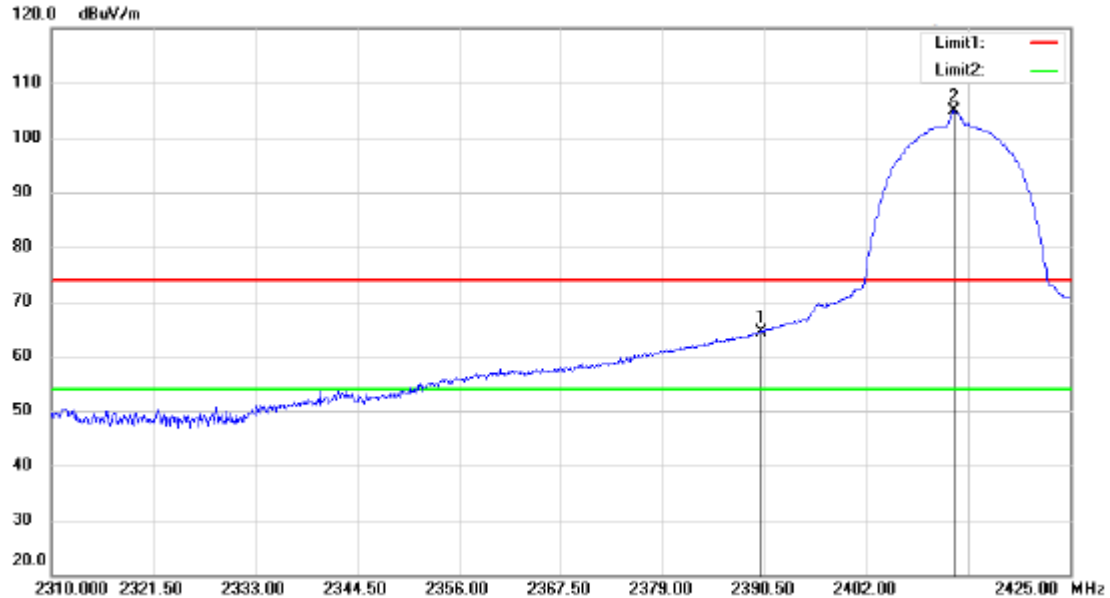
Horizontal, Averager Detector:



Mk.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	2385.095	37.41	peak	-0.54	36.87	54.00	-17.13
2	2390.000	37.60	peak	-0.56	37.04	54.00	-16.96
3	2412.465	93.93	peak	-0.68	93.25	54.00	39.25

CH Low 2412MHz Antenna A for 802.11 b

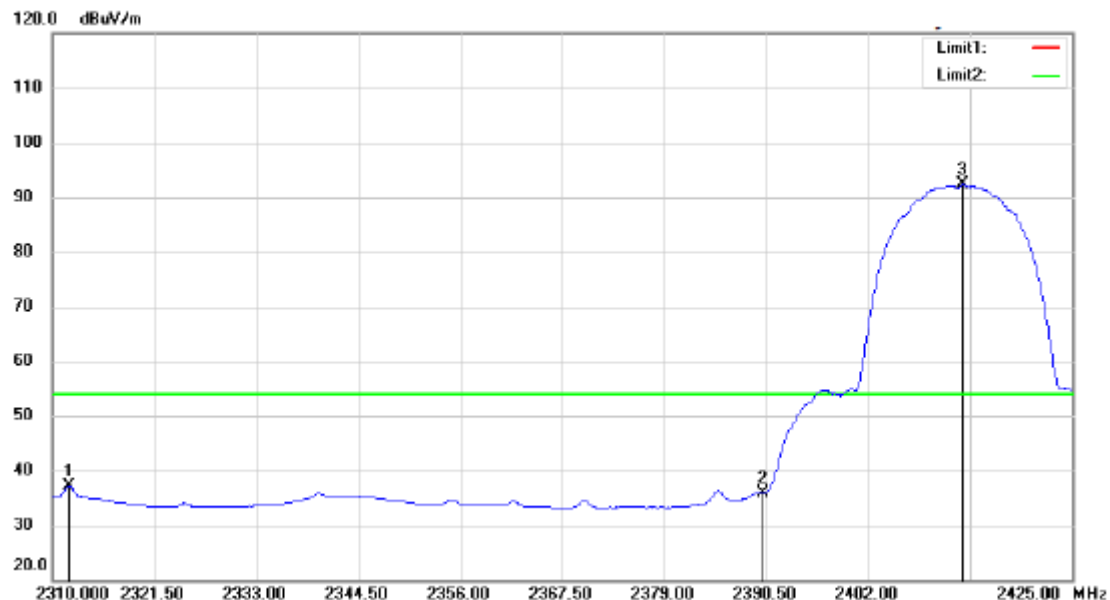
Vertical, Peak Detector:



Mk.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	2390.000	65.01	peak	-0.56	64.45	74.00	-9.55
2	2411.890	105.48	peak	-0.67	104.81	74.00	30.81

CH Low 2412MHz Antenna A for 802.11 b

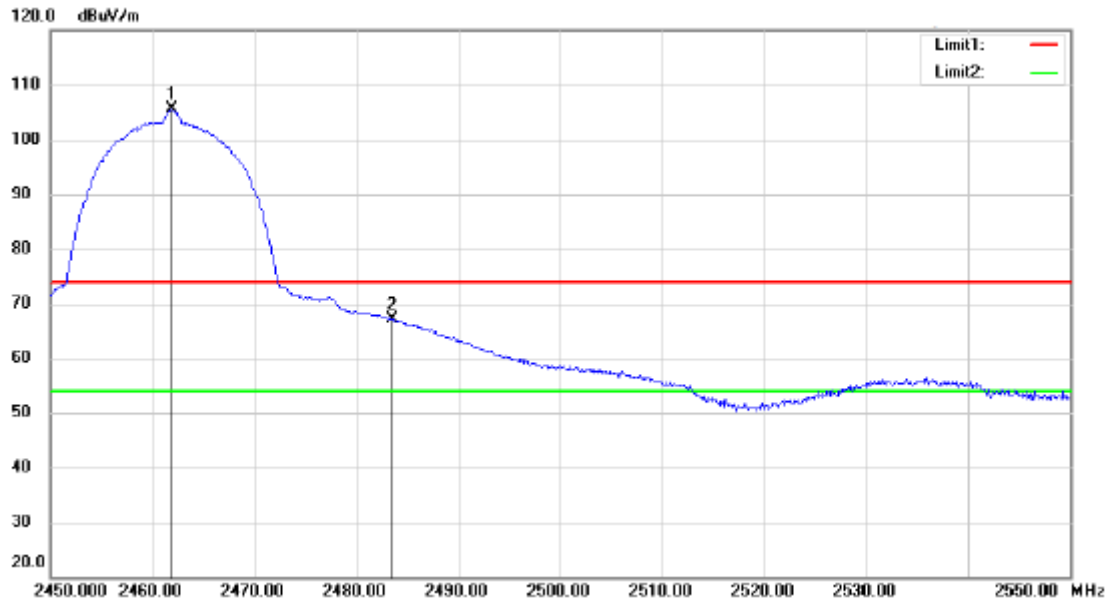
Vertical, Averager Detector:



Mk.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	2311.955	37.38	peak	-0.19	37.19	54.00	-16.81
2	2390.000	36.54	peak	-0.56	35.98	54.00	-18.02
3	2412.695	92.98	peak	-0.67	92.31	54.00	38.31

CH High 2462MHz Antenna A for 802.11 b

Horizontal, Peak Detector:



Mk.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	2461.900	106.58	peak	-0.91	105.67	74.00	31.67
2	2483.500	68.02	peak	-1.01	67.01	74.00	-6.99

CH High 2462MHz Antenna A for 802.11 b

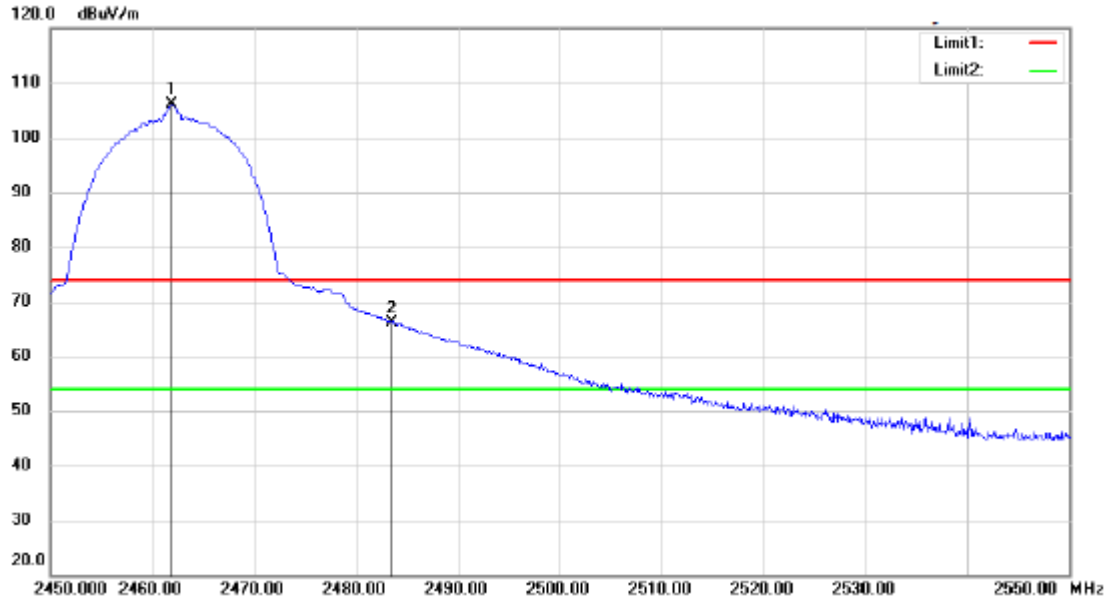
Horizontal, Averager Detector:



Mk.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	2460.900	93.91	peak	-0.90	93.01	54.00	39.01
2	2483.500	40.25	peak	-1.01	39.24	54.00	-14.76
3	2512.000	39.28	peak	-0.97	38.31	54.00	-15.69

CH High 2462MHz Antenna A for 802.11 b

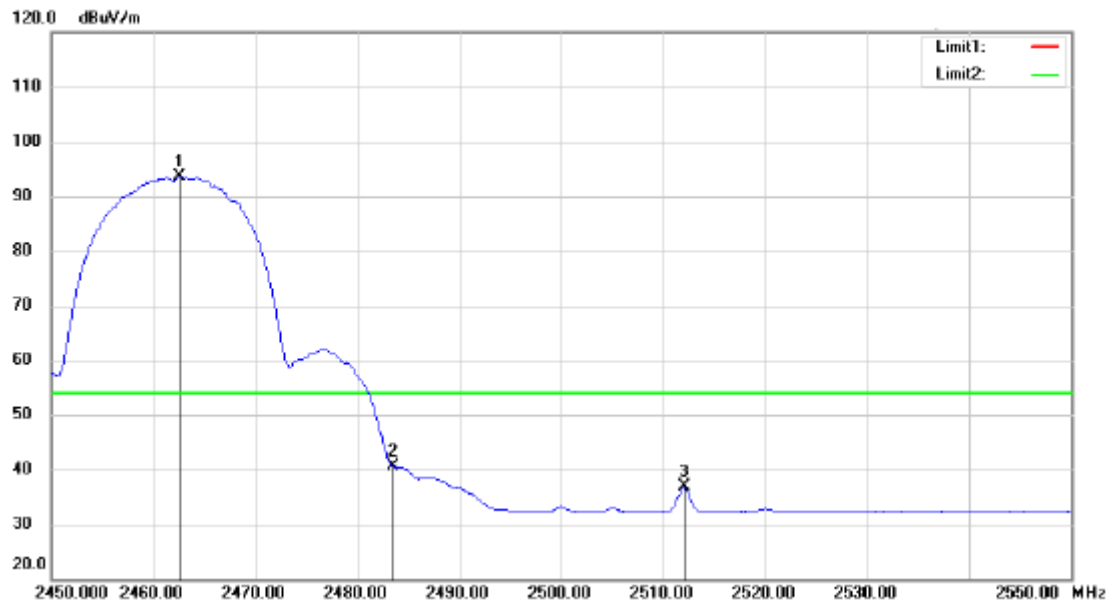
Vertical, Peak Detector:



Mk.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	2461.900	107.00	peak	-0.91	106.09	74.00	32.09
2	2483.500	67.16	peak	-1.01	66.15	74.00	-7.85

CH High 2462MHz Antenna A for 802.11 b

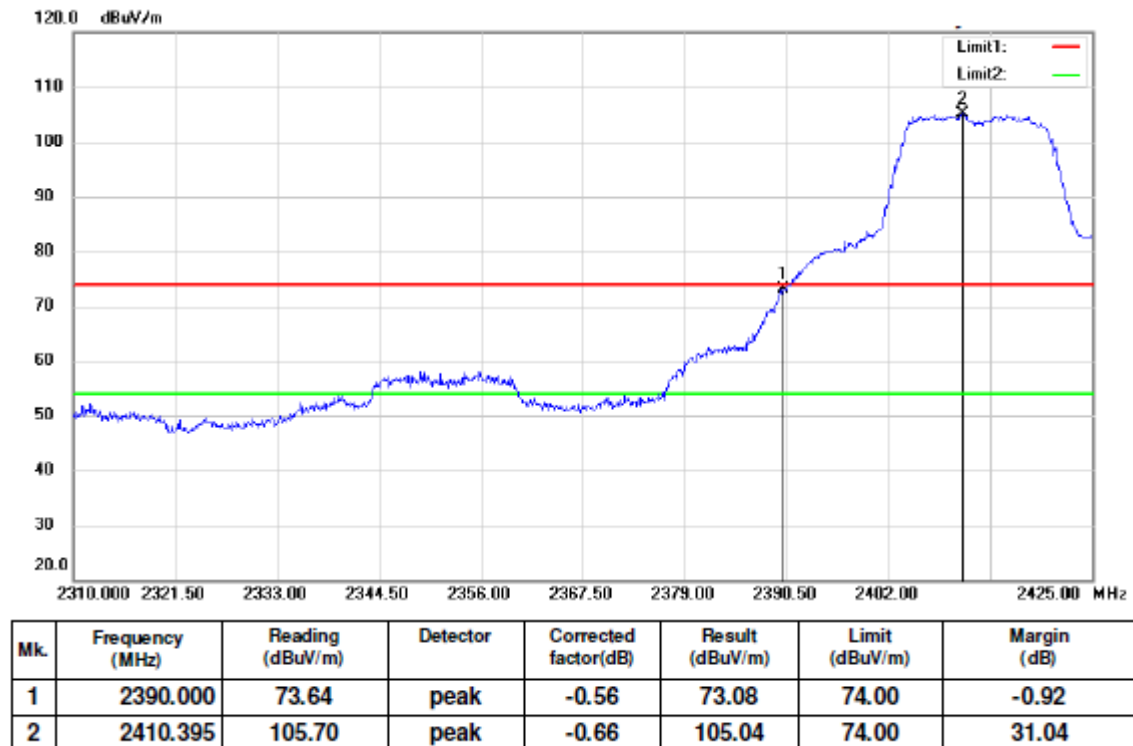
Vertical, Averager Detector:



Mk.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	2462.600	94.45	peak	-0.91	93.54	54.00	39.54
2	2483.500	41.68	peak	-1.01	40.67	54.00	-13.33
3	2512.000	37.73	peak	-0.97	36.76	54.00	-17.24

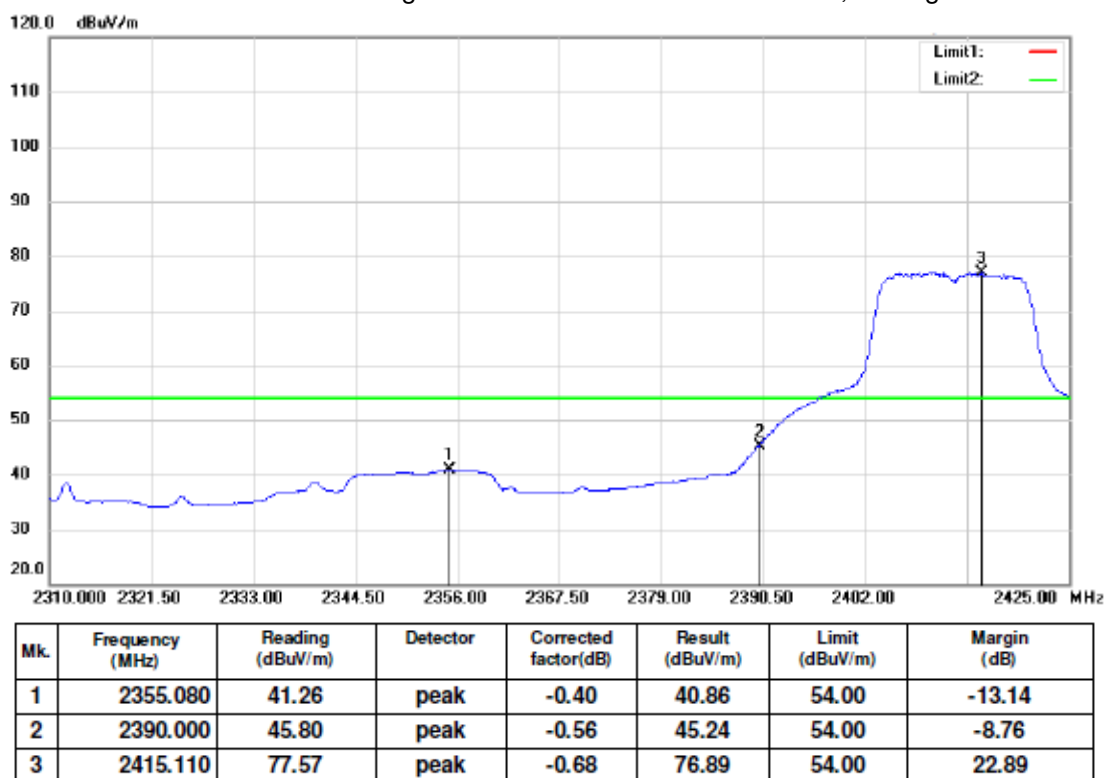
CH Low 2412MHz Antenna A for 802.11 g

Horizontal, Peak Detector:



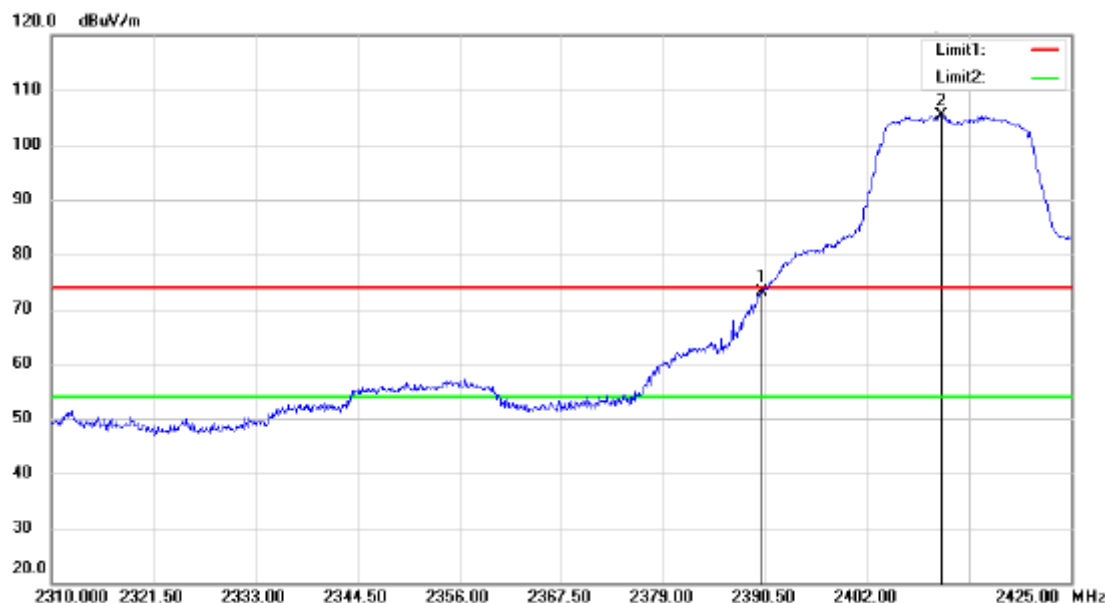
CH Low 2412MHz Antenna A for 802.11 g

Horizontal, Averager Detector:



CH Low 2412MHz Antenna A for 802.11 g

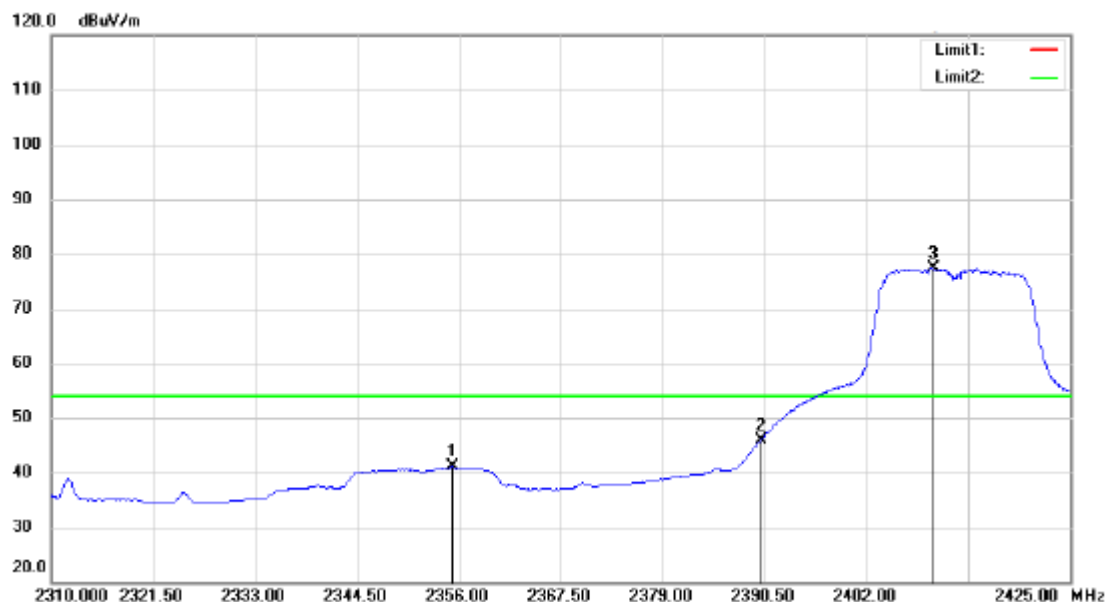
Vertical, Peak Detector:



Mk.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	2390.000	73.77	peak	-0.56	73.21	74.00	-0.79
2	2410.395	106.10	peak	-0.66	105.44	74.00	31.44

CH Low 2412MHz Antenna A for 802.11 g

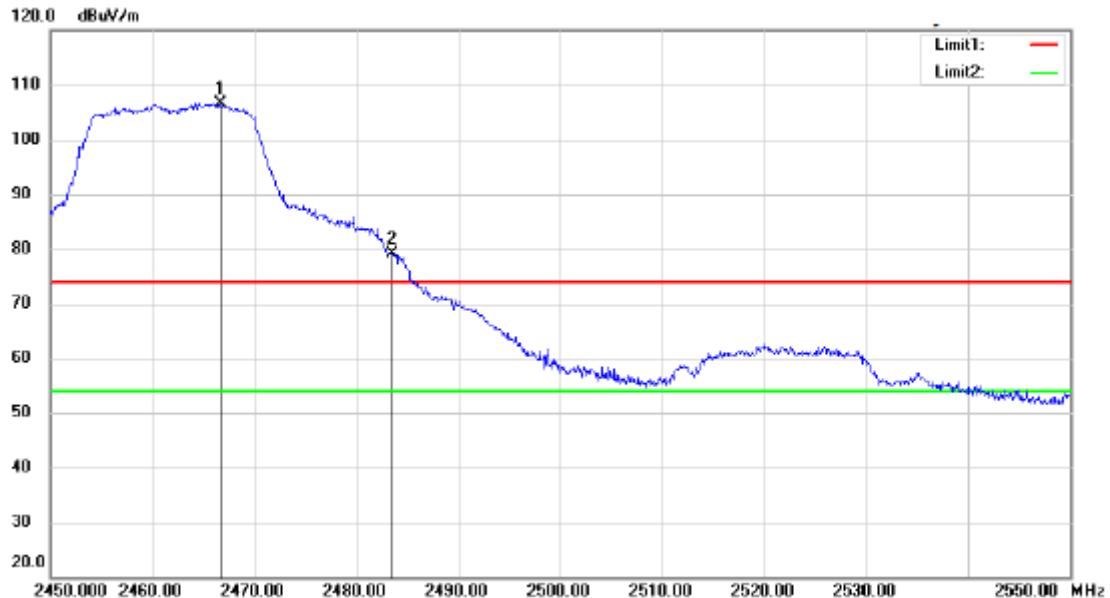
Vertical, Averager Detector:



Mk.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	2355.310	41.41	peak	-0.39	41.02	54.00	-12.98
2	2390.000	46.42	peak	-0.56	45.86	54.00	-8.14
3	2409.590	77.99	peak	-0.66	77.33	54.00	23.33

CH High 2462MHz Antenna A for 802.11 g

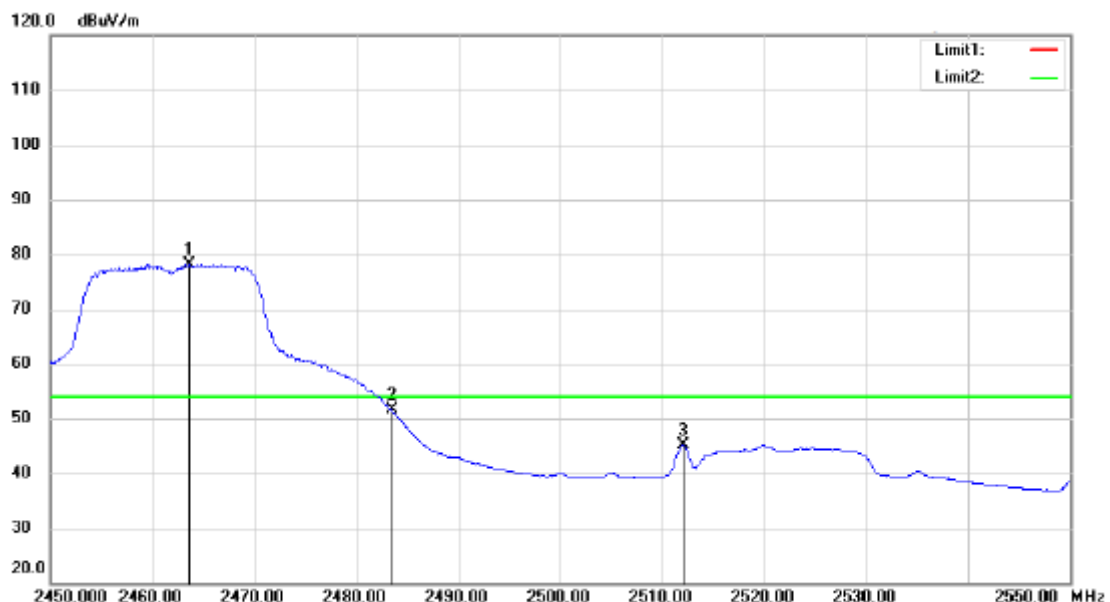
Horizontal, Peak Detector:



Mk.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	2466.700	107.47	peak	-0.93	106.54	74.00	32.54
2	2483.500	80.12	peak	-1.01	79.11	74.00	5.11

CH High 2462MHz Antenna A for 802.11 g

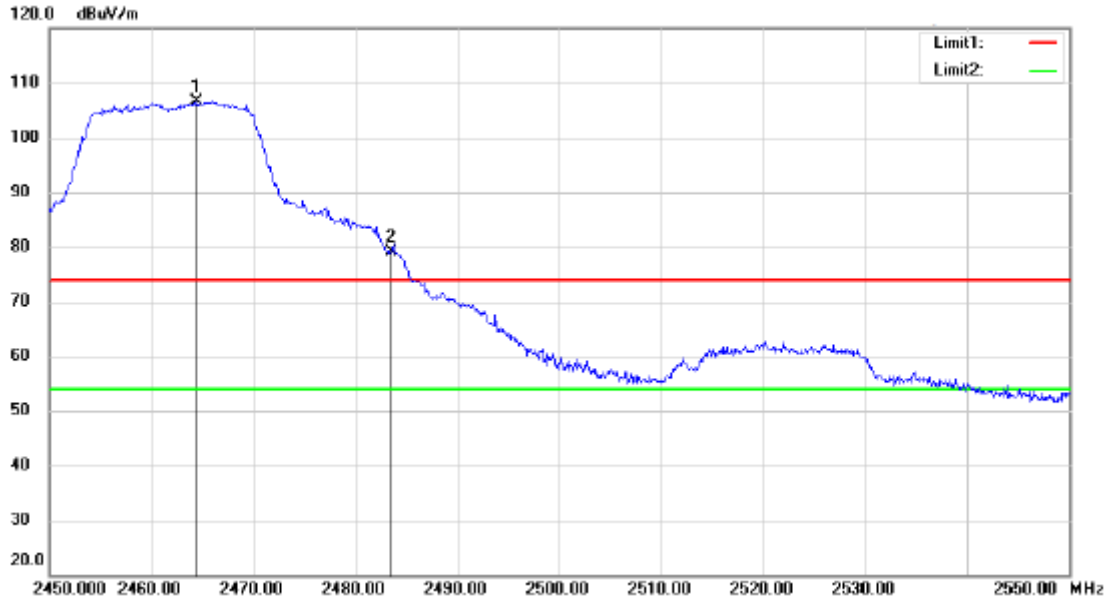
Horizontal, Averager Detector:



Mk.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	2463.600	79.08	peak	-0.91	78.17	54.00	24.17
2	2483.500	52.52	peak	-1.01	51.51	54.00	-2.49
3	2512.000	46.15	peak	-0.97	45.18	54.00	-8.82

CH High 2462MHz Antenna A for 802.11 g

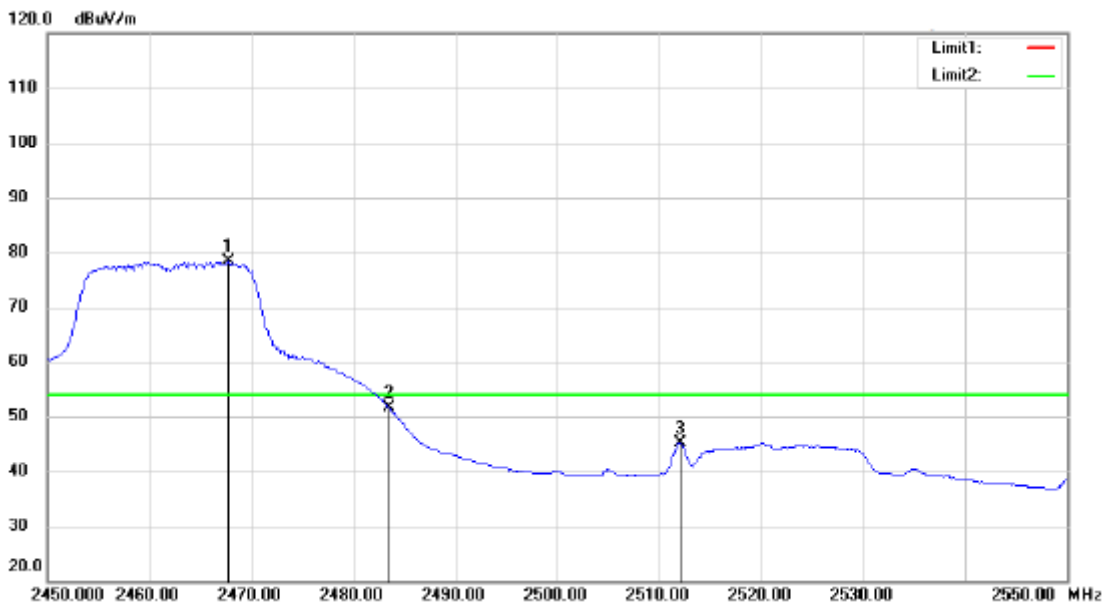
Vertical, Peak Detector:



Mk.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	2464.400	107.57	peak	-0.91	106.66	74.00	32.66
2	2483.500	80.13	peak	-1.01	79.12	74.00	5.12

CH High 2462MHz Antenna A for 802.11 g

Vertical, Averager Detector:



Mk.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	2467.800	79.24	peak	-0.93	78.31	54.00	24.31
2	2483.500	52.54	peak	-1.01	51.53	54.00	-2.47
3	2512.000	46.12	peak	-0.97	45.15	54.00	-8.85



Remark: 1. The Peak Level less than the AV limit, so the AV level is no greater than the AV limit.

2. No any other emission which fall in restricted bands can be detected and be reported.

Test Level = Receiver Reading + Antenna Factor + Cable Loss- Preamplifier Factor

All frequencies within the "Restricted bands" have been evaluated to compliance. Section 15.205 Restricted bands of operation.

Except as shown in paragraph of this section. only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.5 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	
13.36 - 13.41	322 - 335.4		

7.11 99% Occupied Bandwidth

Test Requirement: RSS-Gen section 4.6.1
Test Method: RSS-Gen section 4.6.1
Test Mode: Transmitting mode
Final Test Mode: The EUT fixed on Low channel, Middle Channel and High Channel.

Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: Span = approximately 2 to 3 times the 20dB bandwidth, centred on the hopping channel;
3. Set the spectrum analyzer: RBW \geq 1% of the 20dB bandwidth (set 300 kHz). VBW \geq RBW. Sweep = auto; Detector Function = Peak. Trace = Max Hold.
4. Mark the peak frequency and -20dB points.

Test date

802.11b

For Antenna A

Channel	Frequency (MHz)	Bandwidth (MHz)
LOW	2412	16.08
MID	2437	16.08
HIGH	2462	16.00

802.11g

For Antenna A

Channel	Frequency (MHz)	Bandwidth (MHz)
LOW	2412	16.48
MID	2437	16.48
HIGH	2462	16.48

802.11b

For Antenna B

Channel	Frequency (MHz)	Bandwidth (MHz)
LOW	2412	16.08
MID	2437	16.08
HIGH	2462	16.00

802.11g

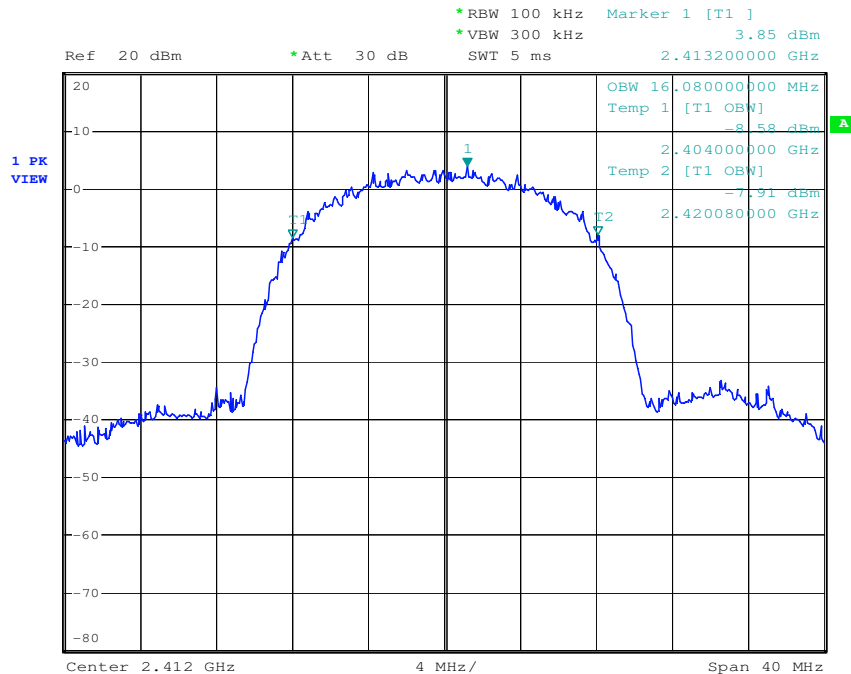
For Antenna B

Channel	Frequency (MHz)	Bandwidth (MHz)
LOW	2412	16.48
MID	2437	16.48
HIGH	2462	16.48

Test plot as follows:

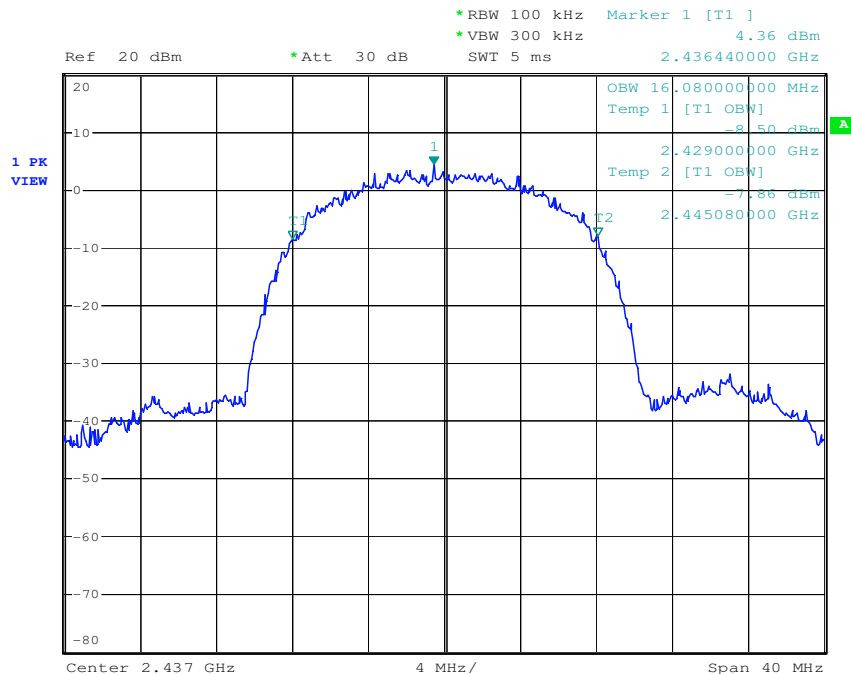
802.11b Low Channel

Antenna A



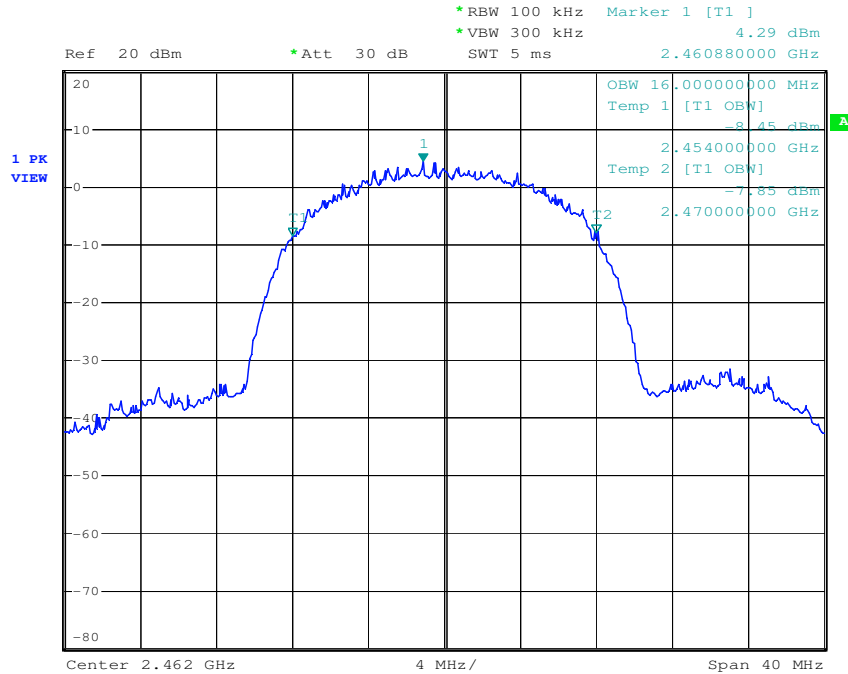
802.11b Middle Channel

Antenna A



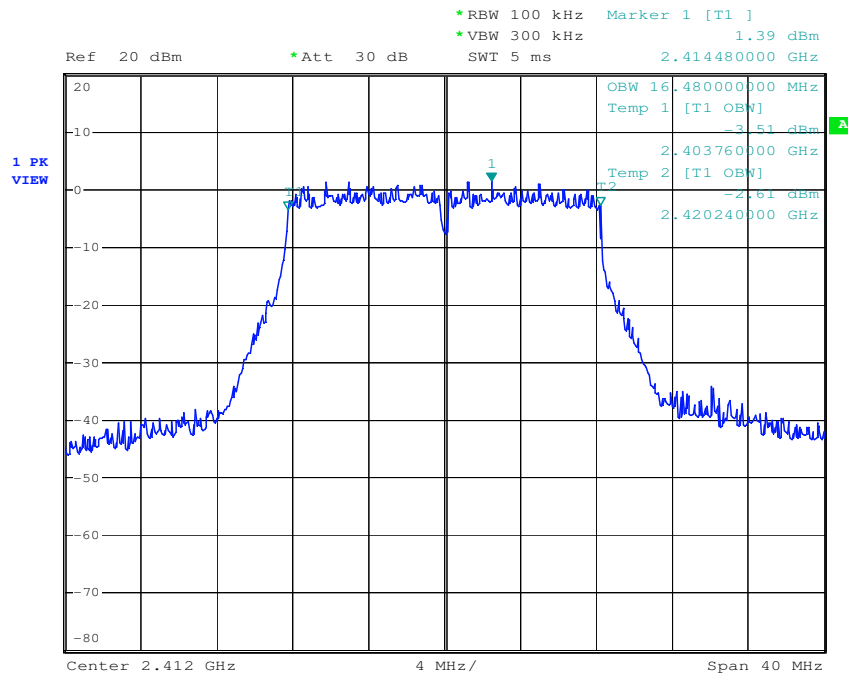
802.11b High Channel

Antenna A



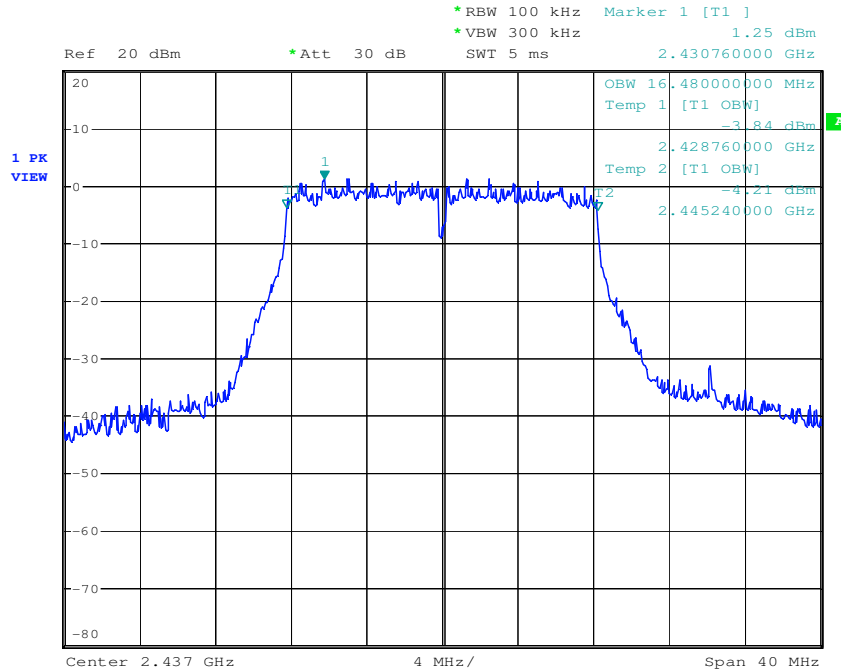
802.11g Low Channel

Antenna A



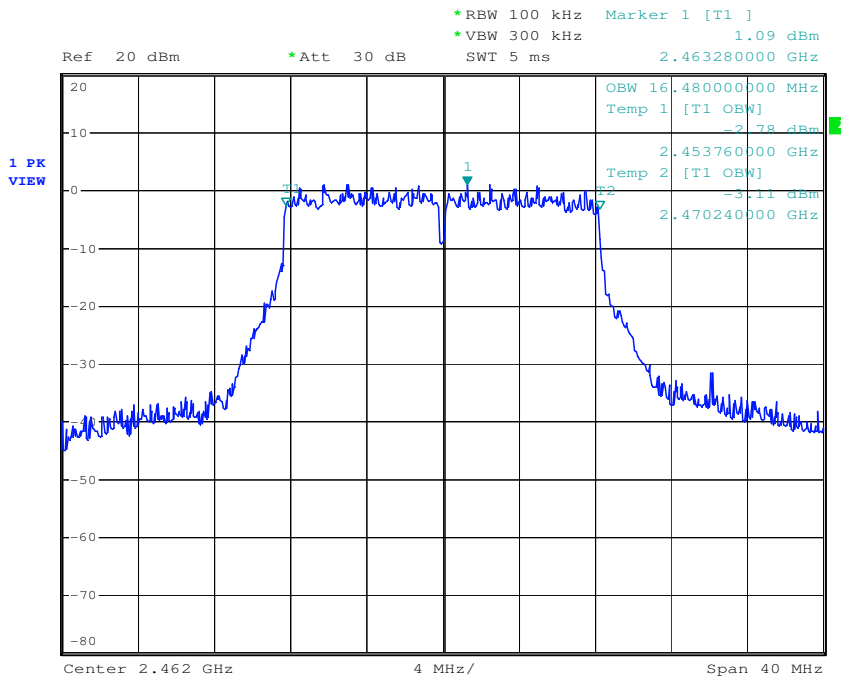
802.11g Middle Channel

Antenna A



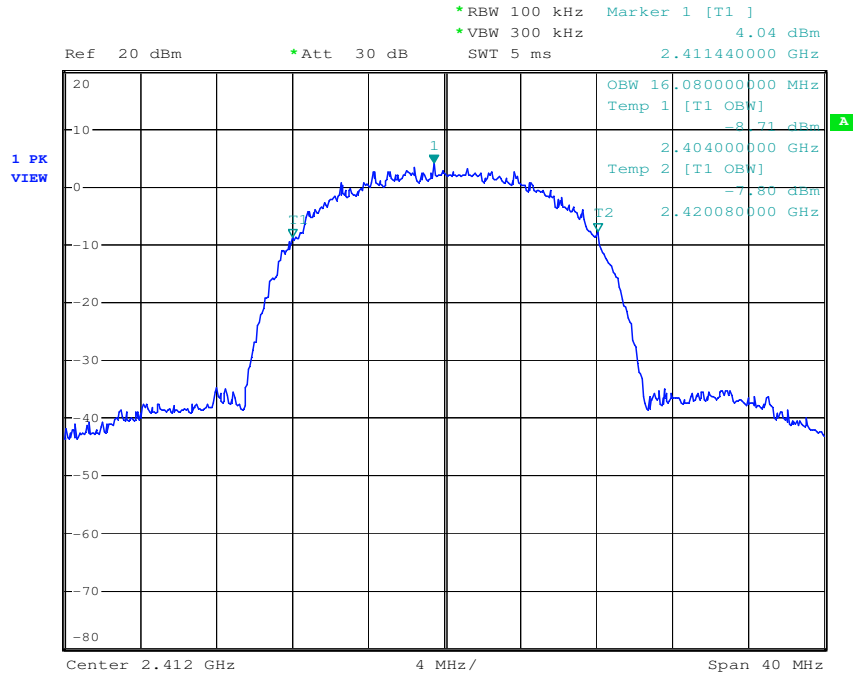
802.11g High Channel

Antenna A



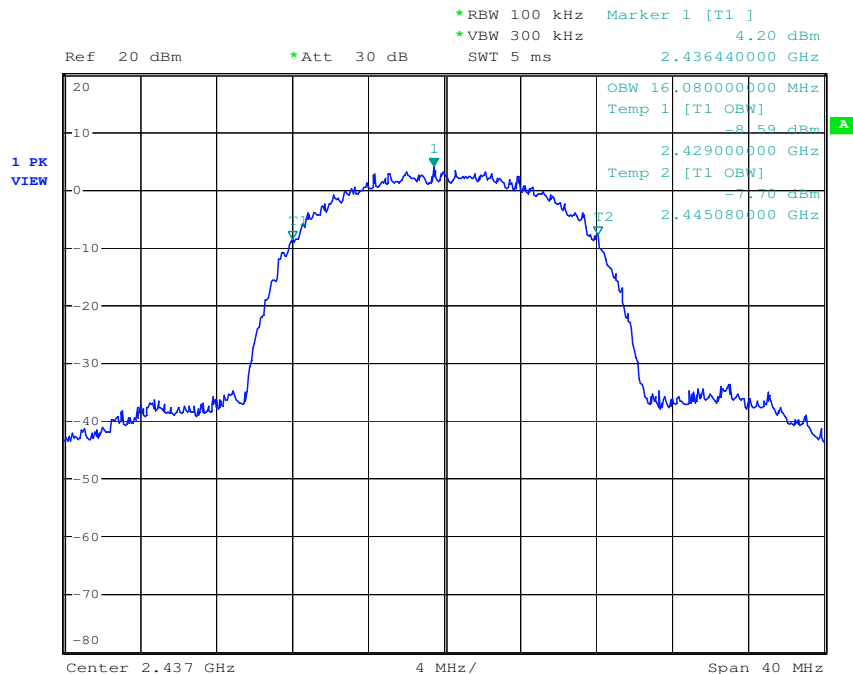
802.11b Low Channel

Antenna B



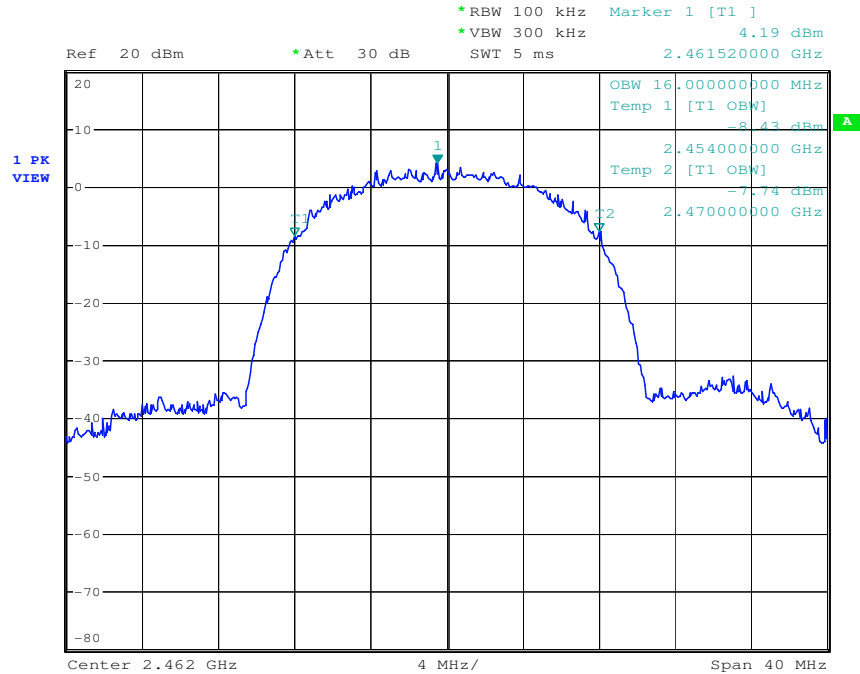
802.11b Middle Channel

Antenna B



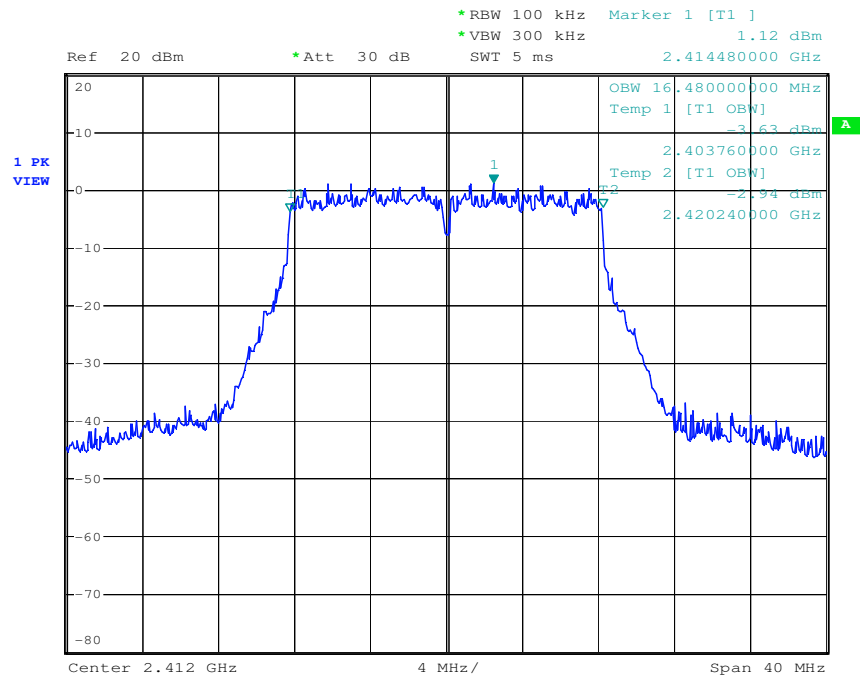
802.11b High Channel

Antenna B



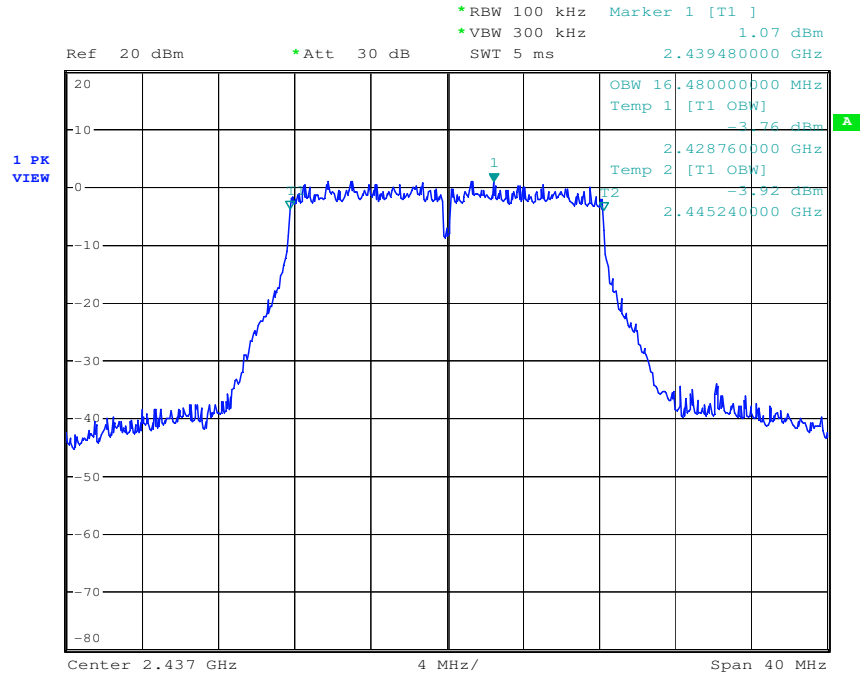
802.11g Low Channel

Antenna B



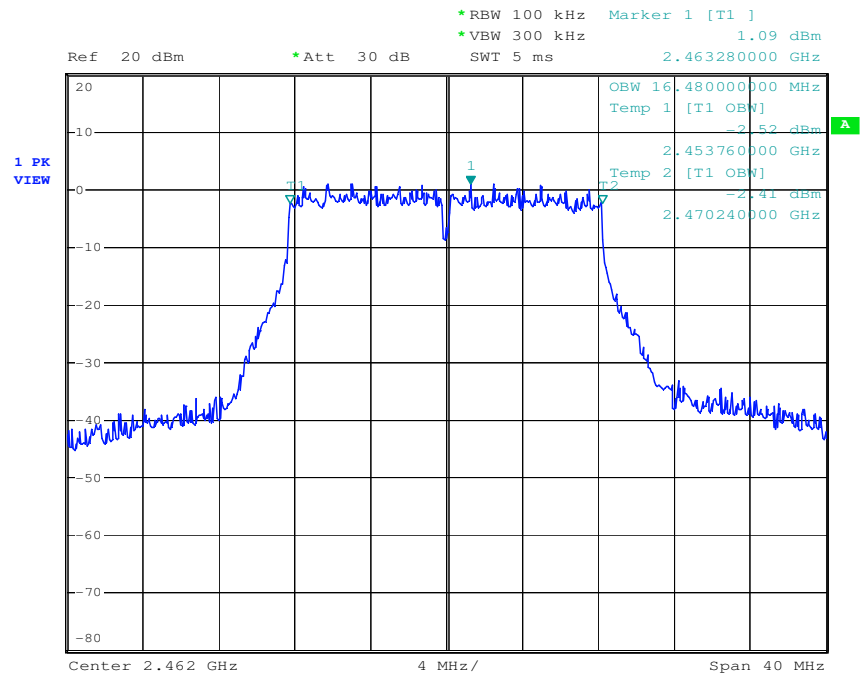
802.11g Middle Channel

Antenna B



802.11g High Channel

Antenna B





8 Test Setup Photographs

Refer to the <VIFA_Test Setup photos>.

9 EUT Constructional Details

Refer to the <VIFA_External Photos > & <VIFA_Internal Photos>.

--End of the Report--