FCC/IC TEST REPORT

Test report No:	**EMC- FCC- R0067**
FCC ID:	**TOUONU-1-3-105-D**
Type of Equipment:	**GE-PON ONT**
Model Name:	**BOS-ONU-1-3-105-D**
Applicant:	**COMMSCOPE INC OF NORTH CAROLINA.**
FCC Rule Part(s):	**FCC Part 15 Subpart C** **Section 15.203, Section 15.209** **Section 15.207, Section 15.247** **IC RSS-210, Issue 8 : 2010**
Frequency Range:	**2 412 MHz ~ 2 462 MHz /** **2 422 MHz ~ 2 452 MHz**
Test result:	**Complied**

The above equipment was tested by EMC compliance Testing Laboratory for compliance with the requirements of FCC Rules and Regulations.
The results of testing in this report apply to the product/system which was tested only. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Date of test: July 5, 2012 ~ July 16, 2012

Issued date: July 16, 2012

Tested by: SON, MIN GI

Approved by: KIM, CHANG MIN

[Contents]

480-5 Shin-dong, Yeongtong-gu, Suwon-city, Gyunggi-do, 443-390, Korea
82 31 336 9919 (Main) 82 31 336 4767 (Fax)

1. Client information

Applicant:	COMMSCOPE INC OF NORTH CAROLINA
Address:	1100 CommScope Place SE Hickory NC 28602, USA
Telephone number:	+828-431-2563
Facsimile number :	+828-323-4896
Contact person:	J. Roberto Mazariego / Product Engineering Manager

Manufacturer :	Ubiquoss Inc.
Address:	24F Millennium Building, 467-12 Dogok-Dong, Gangnam-Gu Seoul,Korea

2. Laboratory information

Address
EMC Compliance Ltd.
480-5 Shin-dong, Yeongtong-gu, Suwon-city, Gyunggi-do, 443-390, Korea
Telephone Number: 82 31 336 9919 Facsimile Number: 82 31 336 4767

Certificate
CBTL Testing Laboratory, KOLAS NO.: 231
FCC Filing No.: 508785
VCCI Registration No.: C-1713, R-1606, T-258

SITE MAP

3. Description of E.U.T.

3.1 Basic description

Applicant :	COMMSCOPE INC OF NORTH CAROLINA
Address of Applicant:	1100 CommScope Place SE Hickory NC 28602, USA
Manufacturer:	Ubiquoss Inc.
Address of Manufacturer:	24F Millennium Building, 467-12 Dogok-Dong, Gangnam-Gu Seoul,Korea
Type of equipment:	GE-PON ONT
Basic Model:	BOS-ONU-1-3-105-D
Serial number:	Proto Type

3.2 General description

Model Name	BOS-ONU-1-3-105-D
Communication	IEEE 802.11b/g/n
Frequency Range	2 412 ~ 2 462 MHz / 2 422 ~ 2 452 MHz
Type of Modulation	CCK, OFDM
Channel capacity	11 ch(b/g/n20), 7 ch(n40)
Antenna Gain	Ant1 : 4.30 dBi, Ant2 : 3.20 dBi
Type of Antenna	Dipole ANTENNA
Power supply	AC 120V / 60 Hz
Operating temperature	-20 ~ 55 °C
Dimension	215 mm x 160 mm x 45 mm (W x D x H)

3.3 Test frequency

	Frequency
Low frequency	2 412 MHz / 2 422 MHz
Middle frequency	2 437 MHz / 2 437 MHz
High frequency	2 462 MHz / 2 452 MHz

3.4 Test Voltage

mode	Voltage
Norminal voltage	AC 120V

4. Summary of test results

4.1 Standards & results

Rule Reference	Parameter	Report Section	Test Result
15.203, 15.247(b)(4)	Antenna Requirement	5.1	C
15.247(b)(3)	Maximum Peak Output Power	5.2	C
15.247(e)	Peak Power Spectral Density	5.3	C
15.247(a)(2)	6 dB Channel Bandwidth	5.4	C
15.247(d), 15.205(a), 15.209(a)	Spurious Emission, Band Edge, and Restricted bands	5.5	C
15.207(a)	Conducted Emissions	5.6	C
15.247(i), 1.1307(b)(1)	RF Exposure	5.7	C
RSS-Gen, Issue 3,6	Receiver Spurious Emission (Radiated)	5.8	C

Note: C=complies
NC= Not complies
NT=Not tested
NA=Not Applicable

4.2 Uncertainty

Measurement Item	Combined Standard Uncertainty Uc	Expanded Uncertainty U = KUc (K = 2)
Conducted RF power	± 0.75 dB	± 1.3 dB
Radiated disturbance	+2.280dB / - 2.278 dB	+4.560dB / - 4.556 dB
Conducted disturbance	+1.883 dB / - 1.676 dB	+3.766dB / - 3.352 dB

5. Test results

5.1 Antenna Requirement

5.1.1 Regulation

According to §15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

And according to §15.247(b)(4), 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.

5.1.2 Result

-Complied

The transmitter has an integral dipole antenna. type of antenna connector reverse sma female.
The directional gain of the antenna is 4.3 dBi(Ant1), 3.2 dBi(Ant2).

5.2 Maximum Peak Output Power

5.2.1 Regulation

According to §15.247(b)(3), For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

According to §15.247(b)(4) 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.

5.2.2 Measurement Procedure

5.2.2.2 Measurement Procedure PK2:

1. This procedure provides an integrated measurement alternative when the maximumavailable RBW < EBW.
2. Set the RBW = 1 MHz.
3. Set the VBW = 3 MHz.
4. Set the span to a value that is 5-30 % greater than the EBW.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the spectrum analyzer's integrated band power measurement function with band limits set equal to the EBW band edges (for some analyzers, this may require a manual override to ensure use of peak detector). If the spectrum analyzer does not have a band power function, sum the spectrum levels (in linear power units) at 1 MHz intervals extending across the EBW of the spectrum.

5.2.3 Test Result

-Complied

802.11b (ANT 1)

Channel	Frequency (MHz)	Result (dBm)	Limit (dBm)	Margin (dB)
Low	2 412	15.09	30.00	14.91
Middle	2 437	14.80	30.00	15.20
High	2 462	14.88	30.00	15.12

802.11b (ANT 2)

Channel	Frequency (MHz)	Result (dBm)	Limit (dBm)	Margin (dB)
Low	2 412	15.68	30.00	14.32
Middle	2 437	15.74	30.00	14.26
High	2 462	15.55	30.00	14.45

802.11g (ANT 1)

Channel	Frequency (MHz)	Result (dBm)	Limit (dBm)	Margin (dB)
Low	2 412	16.67	30.00	13.33
Middle	2 437	16.45	30.00	13.55
High	2 462	16.90	30.00	13.10

802.11g (ANT 2)

Channel	Frequency (MHz)	Result (dBm)	Limit (dBm)	Margin (dB)
Low	2 412	18.58	30.00	11.42
Middle	2 437	17.37	30.00	12.63
High	2 462	17.26	30.00	12.74

802.11n-20 MHz BW (ANT 1)

Channel	Frequency (MHz)	Result (dBm)	Limit (dBm)	Margin (dB)
Low	2 412	17.93	30.00	12.07
Middle	2 437	16.84	30.00	13.16
High	2 462	16.80	30.00	13.20

802.11n- 20 MHz BW (ANT 2)

Channel	Frequency (MHz)	Result (dBm)	Limit (dBm)	Margin (dB)
Low	2 412	18.49	30.00	11.51
Middle	2 437	17.54	30.00	12.46
High	2 462	17.91	30.00	12.09

802.11n-20 MHz BW (MIMO)

Channel	Frequency (MHz)	Reading Ant1(dBm)	Reading Ant2(dBm)	Result (dBm)	Limit (dBm)	Margin (dB)
Low	2 412	17.31	17.14	20.24	30.00	9.76
Middle	2 437	15.29	17.62	19.62	30.00	10.38
High	2 462	15.87	17.13	19.56	30.00	10.44

802.11n-40 MHz BW (ANT 1)

Channel	Frequency (MHz)	Result (dBm)	Limit (dBm)	Margin (dB)
Low	2 422	17.02	30.00	12.98
Middle	2 437	16.22	30.00	13.78
High	2 452	16.08	30.00	13.92

802.11n-40 MHz BW (ANT 2)

Channel	Frequency (MHz)	Result (dBm)	Limit (dBm)	Margin (dB)
Low	2 422	17.34	30.00	12.66
Middle	2 437	16.80	30.00	13.20
High	2 452	16.57	30.00	13.43

802.11n-40 MHz BW (MIMO)

Channel	Frequency (MHz)	Reading Ant1(dBm)	Reading Ant2(dBm)	Result (dBm)	Limit (dBm)	Margin (dB)
Low	2 422	15.90	15.91	18.92	30.00	11.08
Middle	2 437	15.42	16.18	18.83	30.00	11.17
High	2 452	15.90	15.90	18.73	30.00	11.27

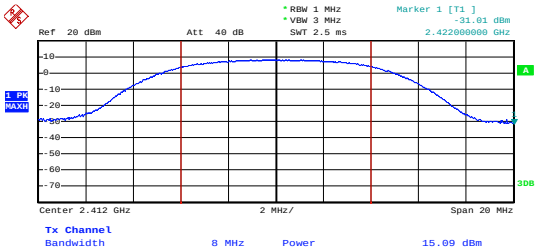
-NOTE:

1. Since the directional gain of the integral antenna declared by the manufacturer (G_{ANT1} = 4.3 dBi, G_{ANT2} = 3.2 dBi,) does not exceed 6.0 dBi, there was no need to reduce the output power.
2. We took the insertion loss of the cable loss into consideration within the measuring instrument.
3. MIMO Result=10*LOG(10^(Reading Ant1/10)+10^(Reading Ant2/10))

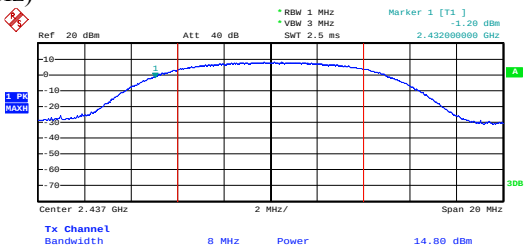
5.2.4 Test Plot

Figure 1. Plot of the Maximum Peak Output Power
802.11 b (ANT 1)

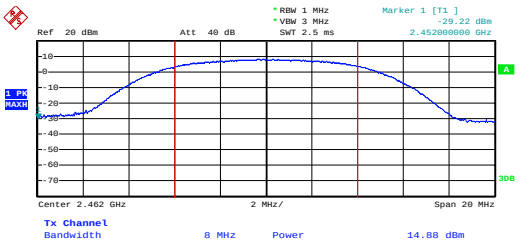
- Lowest Channel (2 412 MHz)



- Middle Chnnel (2 437 MHz)

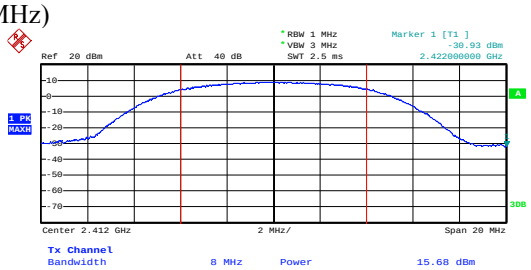


- Highest Chnnel (2 462 MHz)

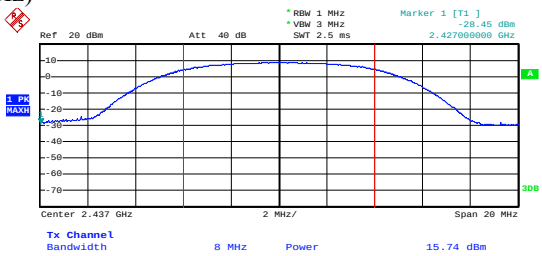


802.11b (ANT 2)

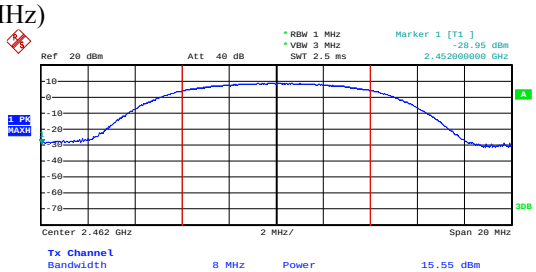
- Lowest Channel (2 412 MHz)



- Middle Chnnel (2 437 MHz)

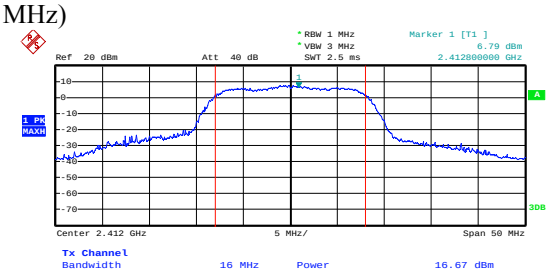


- Highest Chnnel (2 462 MHz)

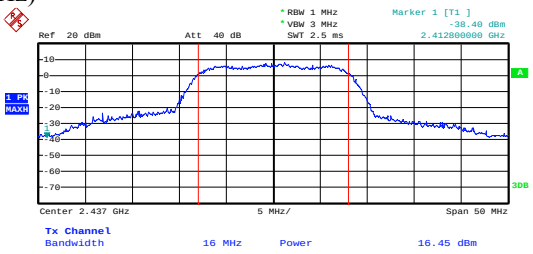


802.11g (ANT 1)

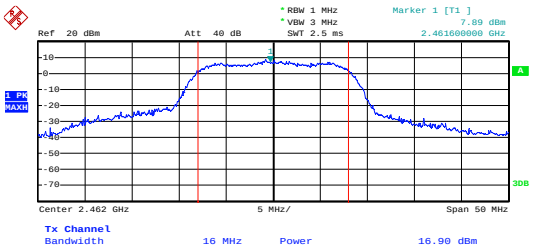
- Lowest Channel (2 412 MHz)



- Middle Chnnel (2 437 MHz)

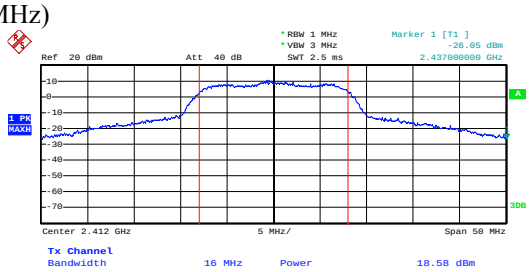


- Highest Chnnel (2 462 MHz)

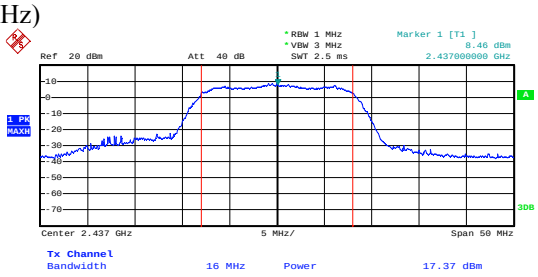


802.11g (ANT 2)

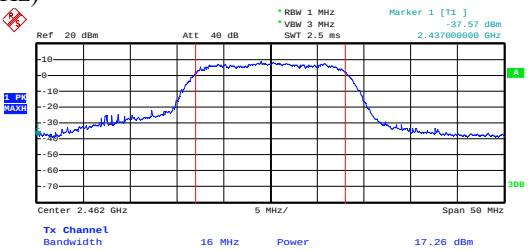
- Lowest Channel (2 412 MHz)



- Middle Chnnel (2 437 MHz)

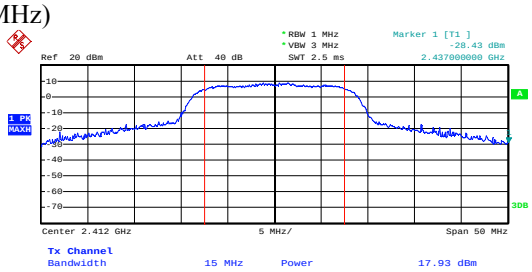


- Highest Chnnel (2 462 MHz)

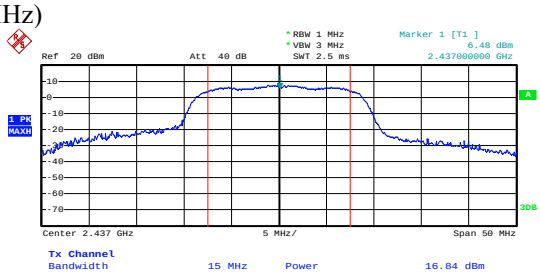


802.11n-20 MHz BW (ANT 1)

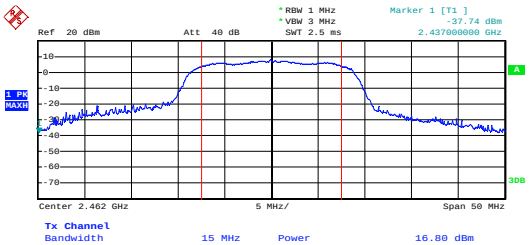
- Lowest Channel (2 412 MHz)



- Middle Chnnel (2 437 MHz)

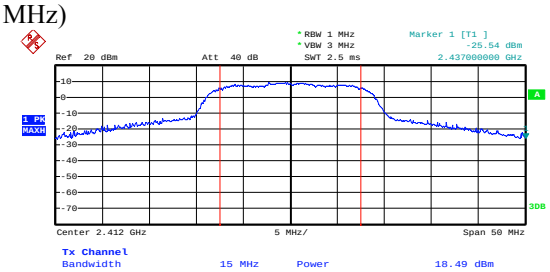


- Highest Chnnel (2 462 MHz)

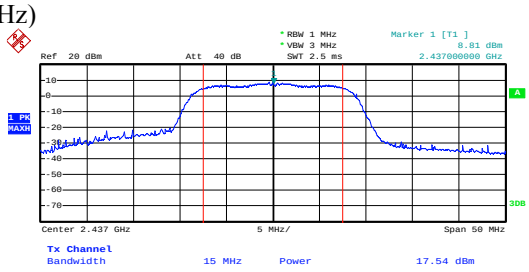


802.11n- 20 MHz BW (ANT 2)

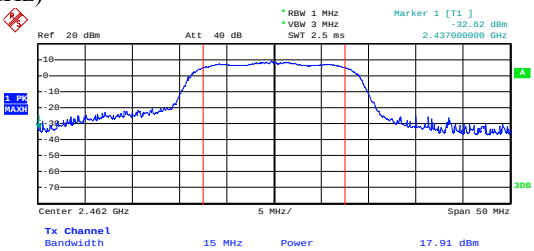
- Lowest Channel (2 412 MHz)



- Middle Chnnel (2 437 MHz)

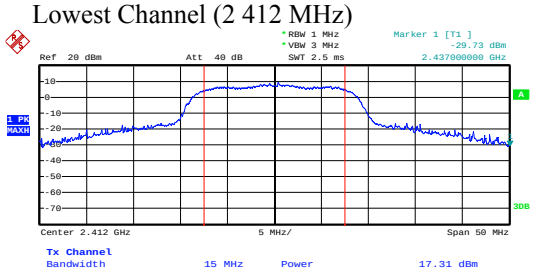


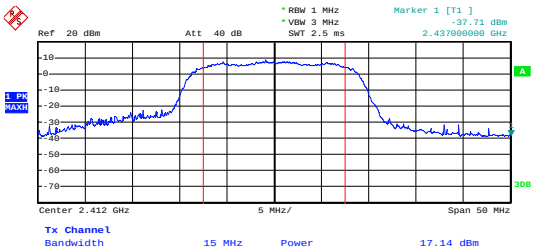
- Highest Chnnel (2 462 MHz)



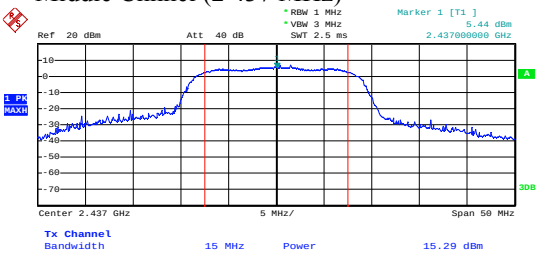
802.11n-20 MHz BW (MIMO)

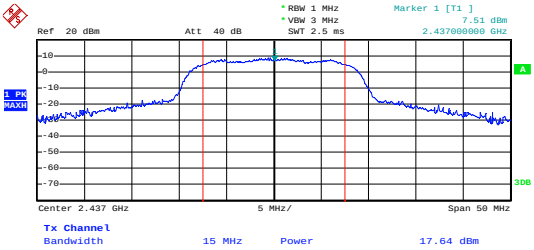
- Lowest Channel (2 412 MHz)



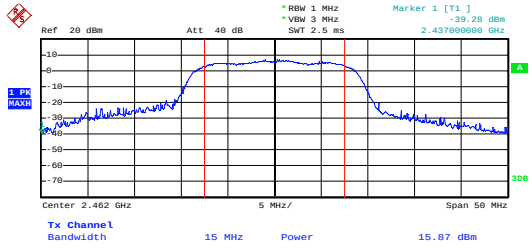


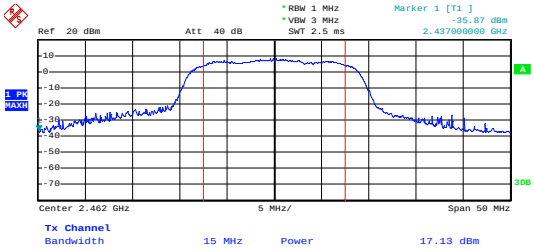
- Middle Chnnel (2 437 MHz)





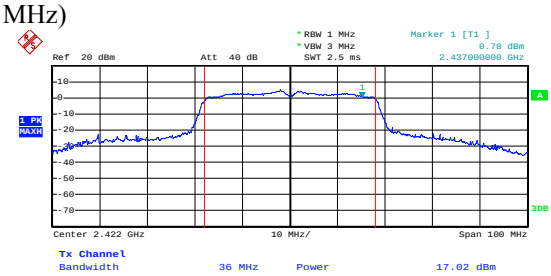
- Highest Chnnel (2 462 MHz)



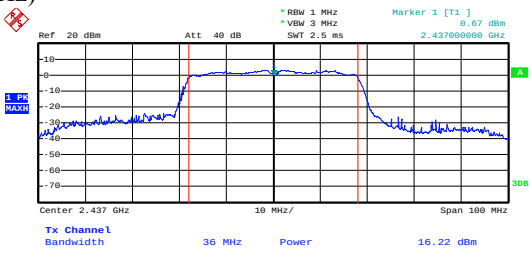


802.11n-40 MHz BW (ANT 1)

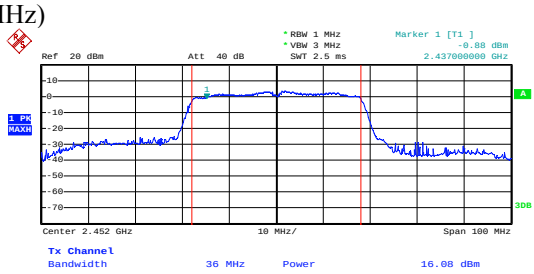
- Lowest Channel (2 422 MHz)



- Middle Chnnel (2 437 MHz)

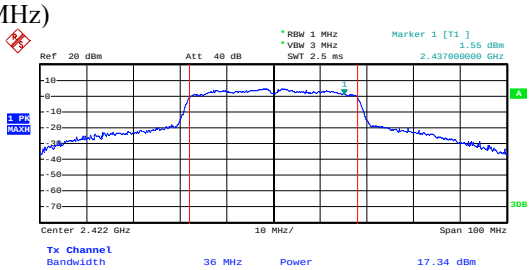


- Highest Chnnel (2 452 MHz)

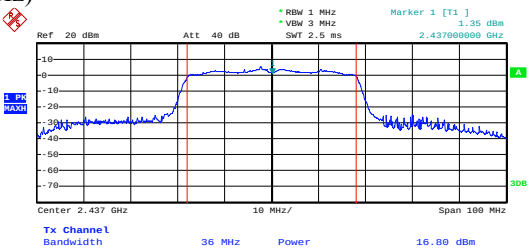


802.11n-40 MHz BW (ANT 2)

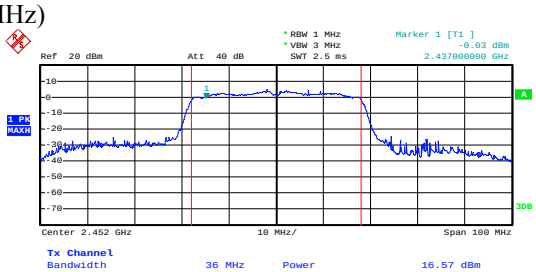
- Lowest Channel (2 422 MHz)



- Middle Chnnel (2 437 MHz)

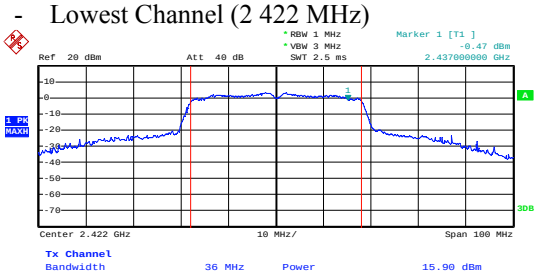


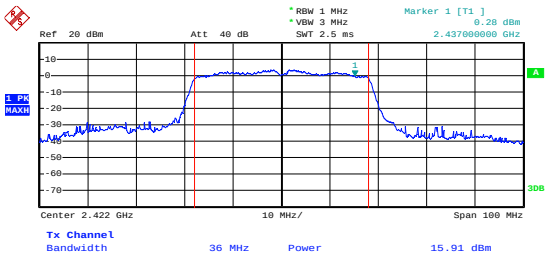
- Highest Chnnel (2 452 MHz)



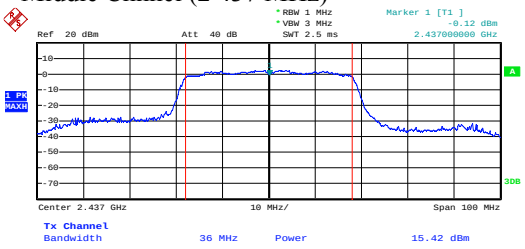
802.11n-40 MHz BW (MIMO)

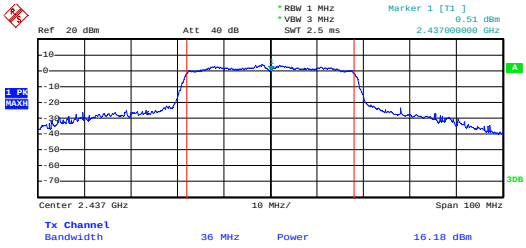
- Lowest Channel (2 422 MHz)



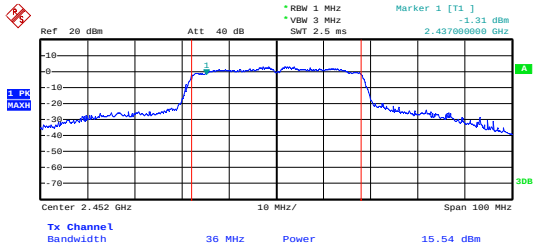


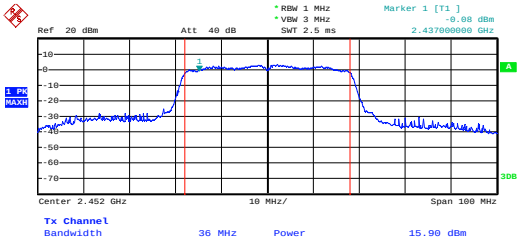
- Middle Chnnel (2 437 MHz)





- Highest Chnnel (2 452 MHz)





5.3 Peak Power Spectral Density

5.3.1 Regulation

According to §15.247(e), for digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

5.3.2 Measurement Procedure

Measurement Procedure PKPSD:

1. Use this procedure when the maximum peak conducted output power in the fundamental emission is used to demonstrate compliance.
2. Set the RBW = 100 kHz.
3. Set the VBW ≥ 300 kHz.
4. Set the span to 5-30 % greater than the EBW.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.
10. Scale the observed power level to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where BWCF = 10log(3 kHz/100 kHz= -15.2 dB).
11. The resulting peak PSD level must be ≤ 8 dBm.

5.3.3 Test Result

-Complied

802.11b (ANT 1)

Channel	Reading [dBm]	BWCF [dB]	Result [dBm]	Limit [dBm]	Margin [dBm]
Low	1.44	-15.20	-13.76	8.00	21.76
Middle	1.89	-15.20	-13.31	8.00	21.31
High	2.04	-15.20	-13.16	8.00	21.16

802.11b (ANT 2)

Channel	Reading [dBm]	BWCF [dB]	Result [dBm]	Limit [dBm]	Margin [dBm]
Low	2.20	-15.20	-13.00	8.00	21.00
Middle	2.78	-15.20	-12.42	8.00	20.42
High	2.08	-15.20	-13.12	8.00	21.12

802.11g (ANT 1)

Channel	Reading [dBm]	BWCF [dB]	Result [dBm]	Limit [dBm]	Margin [dBm]
Low	1.09	-15.20	-14.11	8.00	22.11
Middle	0.36	-15.20	-14.84	8.00	22.84
High	0.25	-15.20	-14.95	8.00	22.95

802.11g (ANT 2)

Channel	Reading [dBm]	BWCF [dB]	Result [dBm]	Limit [dBm]	Margin [dBm]
Low	1.02	-15.20	-14.18	8.00	22.18
Middle	0.86	-15.20	-14.34	8.00	22.34
High	0.6	-15.20	-14.60	8.00	22.60

480-5 Shin-dong, Yeongtong-gu, Suwon-city, Gyunggi-do, 443-390, Korea
82 31 336 9919 (Main) 82 31 336 4767 (Fax)

802.11n-20 MHz BW (ANT 1)

Channel	Reading [dBm]	BWCF [dB]	Result [dBm]	Limit [dBm]	Margin [dBm]
Low	0.30	-15.20	-14.90	8.00	22.90
Middle	-0.45	-15.20	-15.65	8.00	23.65
High	0.34	-15.20	-14.86	8.00	22.86

802.11n-20 MHz BW (ANT 2)

Channel	Reading [dBm]	BWCF [dB]	Result [dBm]	Limit [dBm]	Margin [dBm]
Low	0.87	-15.20	-14.33	8.00	22.33
Middle	0.7	-15.20	-14.50	8.00	22.50
High	0.33	-15.20	-14.87	8.00	22.87

802.11n-20 MHz BW (MIMO)

Channel	Reading ANT 1 [dBm]	Reading ANT 2 [dBm]	BWCF [dB]	Result [dBm]	Limit [dBm]	Margin [dBm]
Low	-1.37	-0.61	-15.20	-13.16	8.00	21.16
Middle	-0.5	-0.76	-15.20	-12.82	8.00	20.82
High	-0.31	-1.45	-15.20	-13.03	8.00	21.03

480-5 Shin-dong, Yeongtong-gu, Suwon-city, Gyunggi-do, 443-390, Korea
82 31 336 9919 (Main) 82 31 336 4767 (Fax)

802.11n-40 MHz BW (ANT 1)

Channel	Reading [dBm]	BWCF [dB]	Result [dBm]	Limit [dBm]	Margin [dBm]
Low	-2.94	-15.20	-18.14	8.00	26.14
Middle	-2.99	-15.20	-18.19	8.00	26.19
High	-2.6	-15.20	-17.80	8.00	25.80

802.11n-40 MHz BW (ANT 2)

n20_ant1 Channel	Reading [dBm]	BWCF [dB]	Result [dBm]	Limit [dBm]	Margin [dBm]
Low	-3.15	-15.20	-18.35	8.00	26.35
Middle	-2.91	-15.20	-18.11	8.00	26.11
High	-2.46	-15.20	-17.66	8.00	25.66

802.11n-40 MHz BW (MIMO)

Channel	Reading ANT 1 [dBm]	Reading ANT 2 [dBm]	BWCF [dB]	Result [dBm]	Limit [dBm]	Margin [dBm]
Low	-4.86	-4.74	-15.20	-16.99	8.00	24.99
Middle	-5.79	-5.36	-15.20	-17.76	8.00	25.76
High	-4.93	-4.59	-15.20	-16.95	8.00	24.95

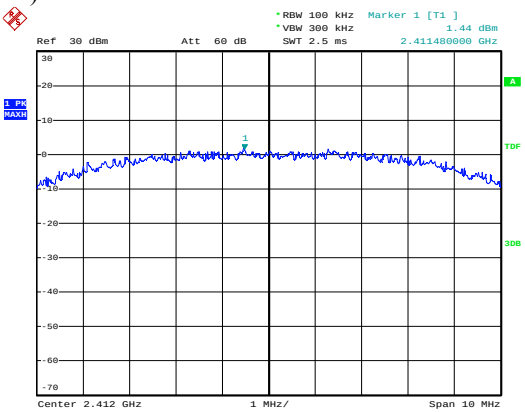
NOTE: We took the insertion loss of the cable loss into consideration within the measuring instrument.
MIMO Result=10*LOG(10^(Reading Ant1/10)+10^(Reading Ant2/10))+BWCF

5.3.4 Test Plot

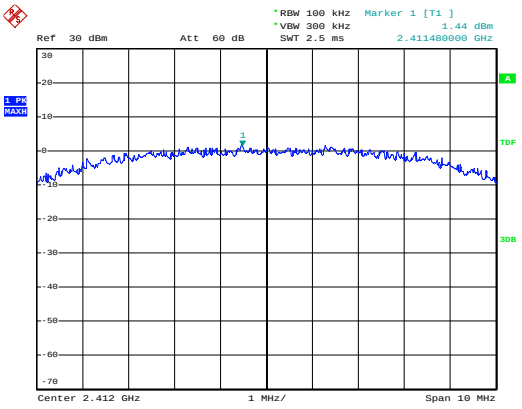
Figure 2. Plot of the Power Density (Conducted)

802.11b (ANT 1)

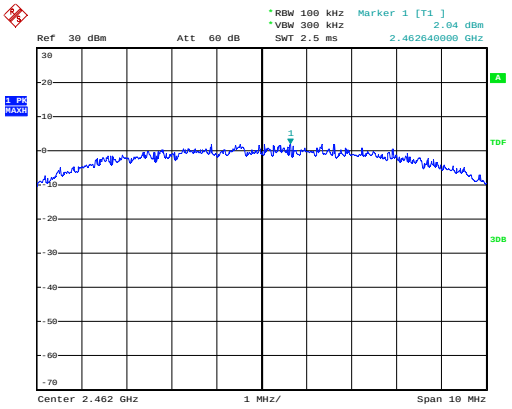
- Lowest Channel(2 412 MHz)



- Middle Chnnel (2 437 MHz)

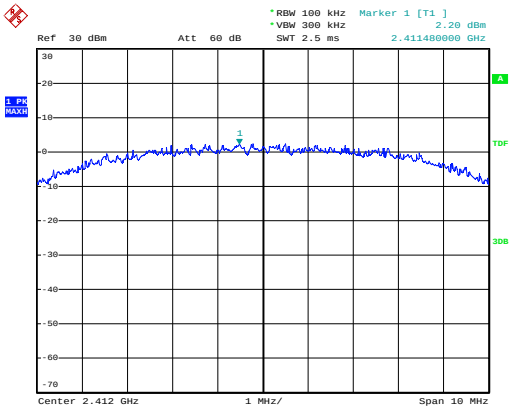


- Highest Chnnel (2 462 MHz)

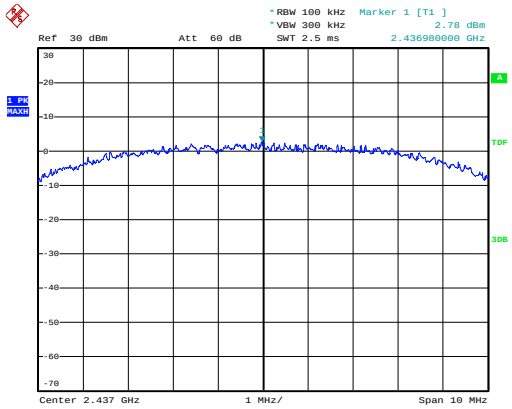


802.11b (ANT 2)

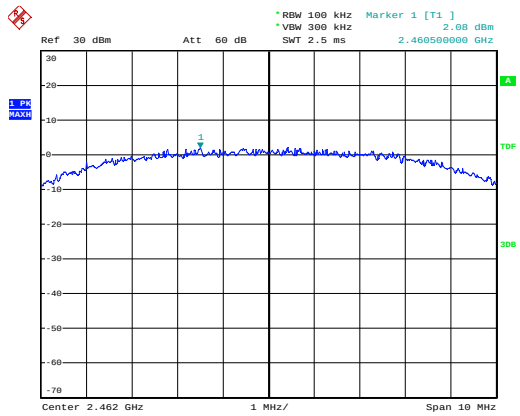
- Lowest Channel (2 412 MHz)



- Middle Chnnel (2 437 MHz)

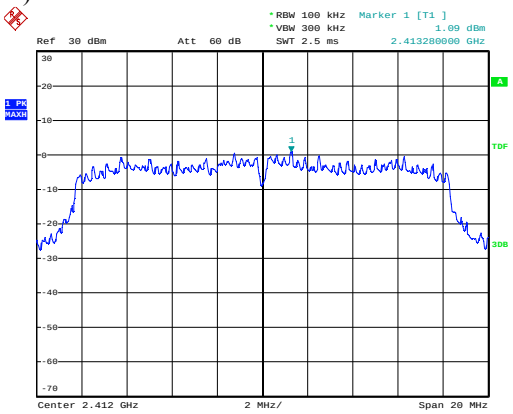


- Highest Chnnel (2 462 MHz)

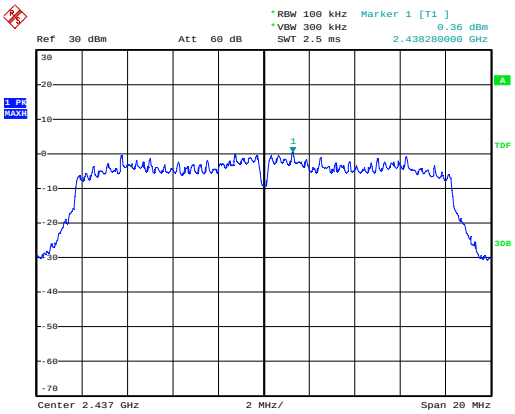


802.11g (ANT 1)

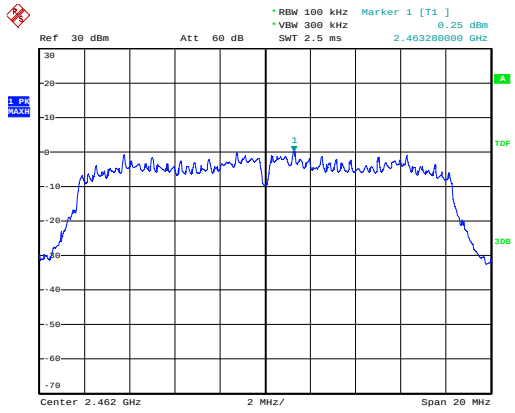
- Lowest Channel(2 412 MHz)



- Middle Chnnel (2 437 MHz)



- Highest Chnnel (2 462 MHz)



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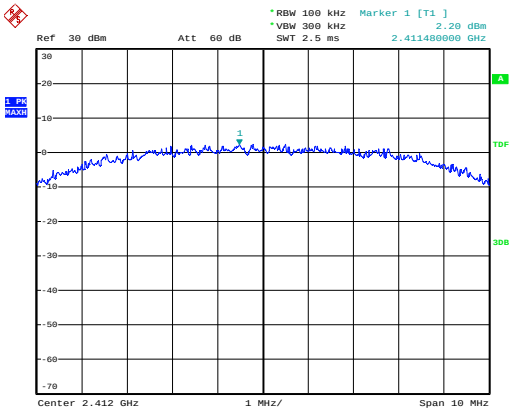
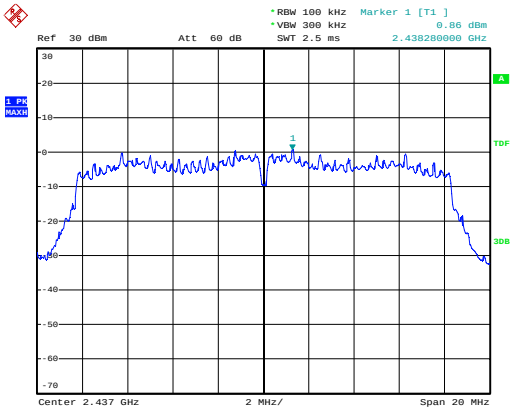
802.11g (ANT 2)

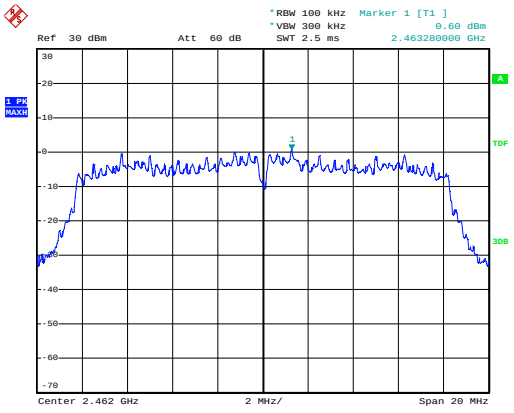
- Lowest Channel (2 412 MHz)



- Middle Chnnel (2 437 MHz)

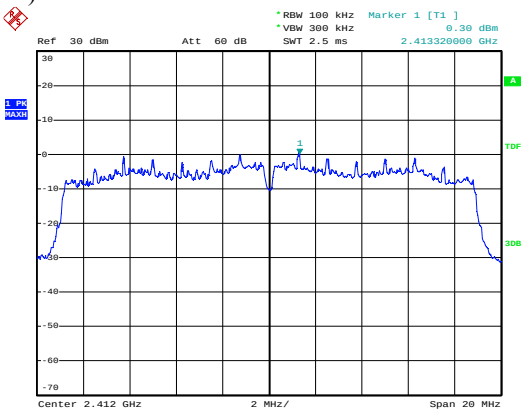


- Highest Chnnel (2 462 MHz)

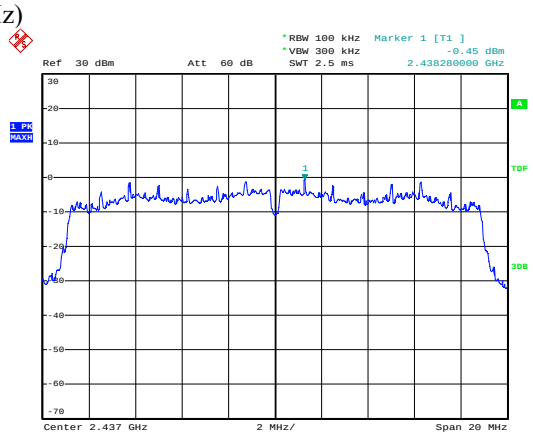


802.11n-20 MHz BW (ANT 1)

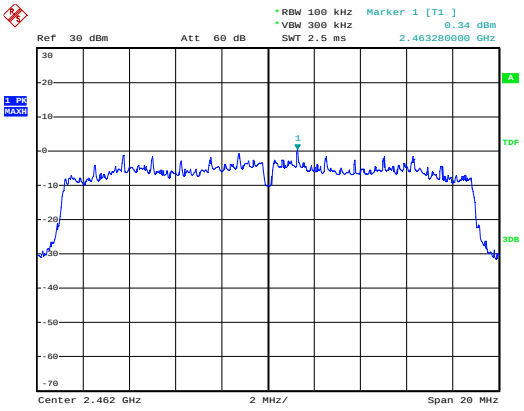
- Lowest Channel(2 412 MHz)



- Middle Chnnel (2 437 MHz)

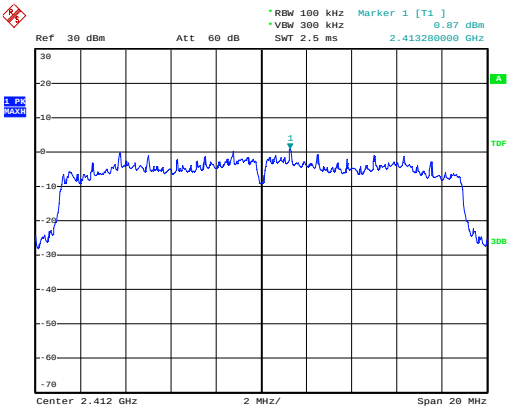


- Highest Chnnel (2 462 MHz)

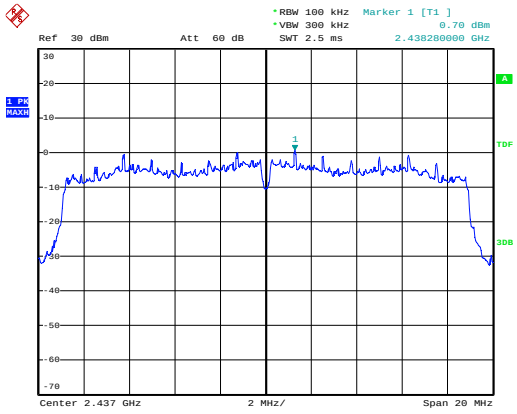


802.11n-20 MHz BW (ANT 2)

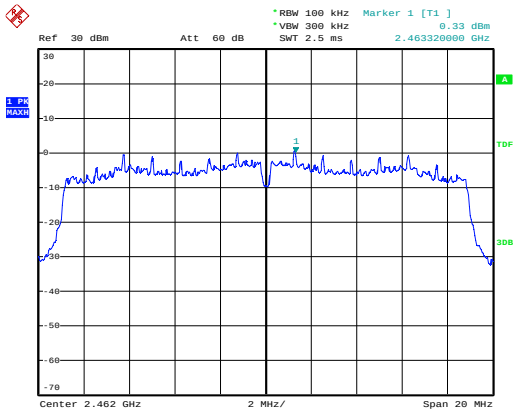
- Lowest Channel (2 412 MHz)



- Middle Chnnel (2 437 MHz)

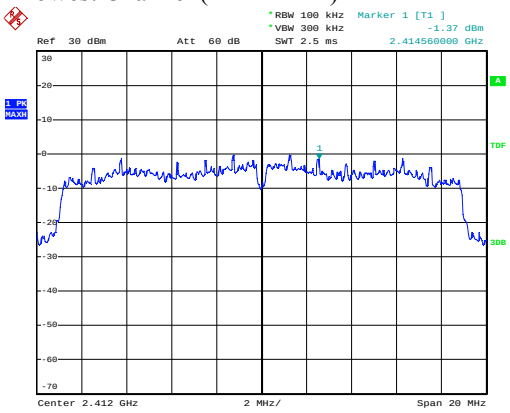


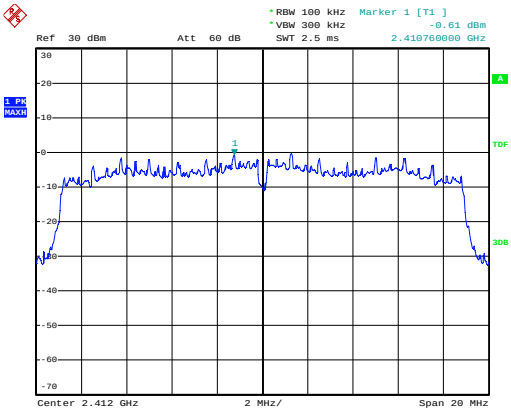
- Highest Chnnel (2 462 MHz)



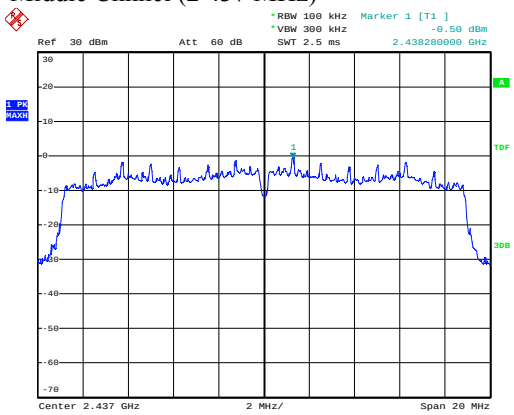
802.11n-20 MHz BW (MIMO)

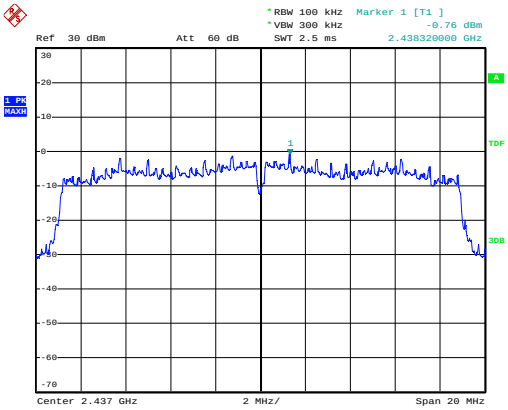
- Lowest Channel (2 412 MHz)



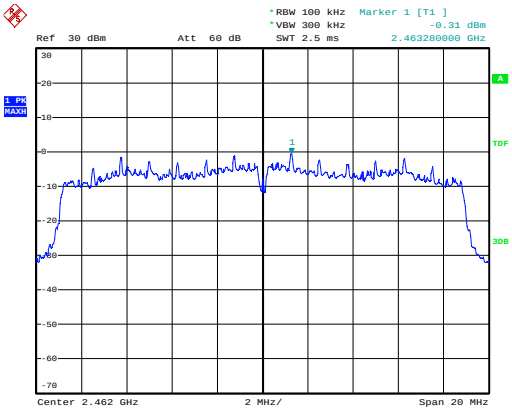


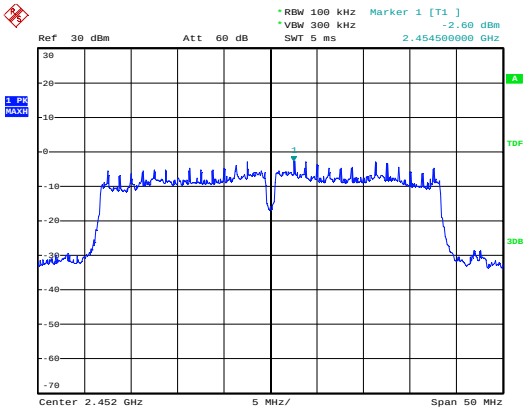
- Middle Chnnel (2 437 MHz)





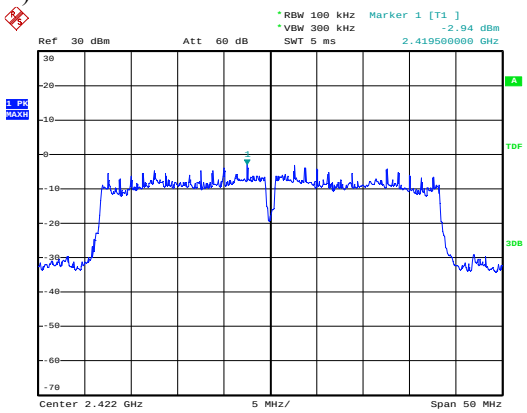
- Highest Chnnel (2 462 MHz)



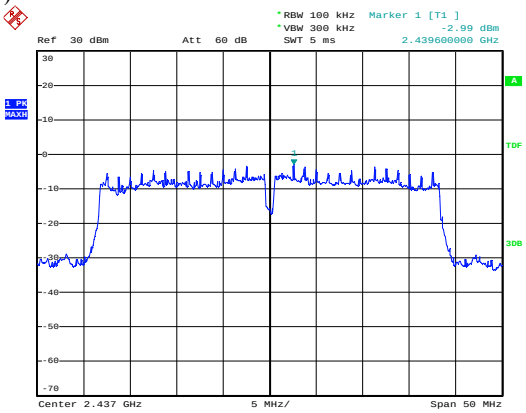


802.11n-40 MHz BW (ANT 1)

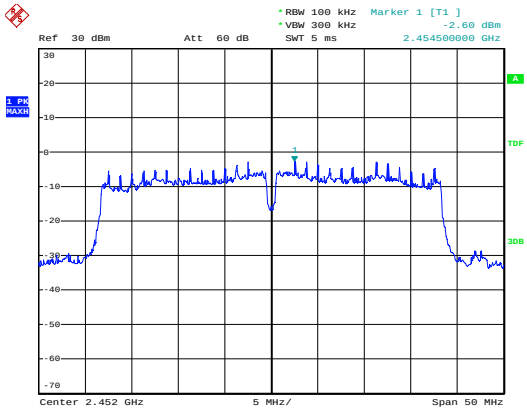
- Lowest Channel(2 422 MHz)



- Middle Chnnel (2 437 MHz)

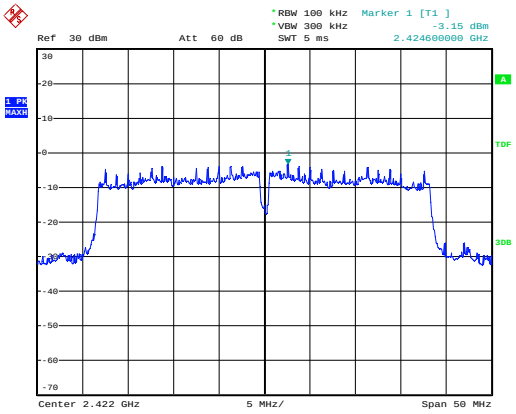


- Highest Chnnel (2 452 MHz)

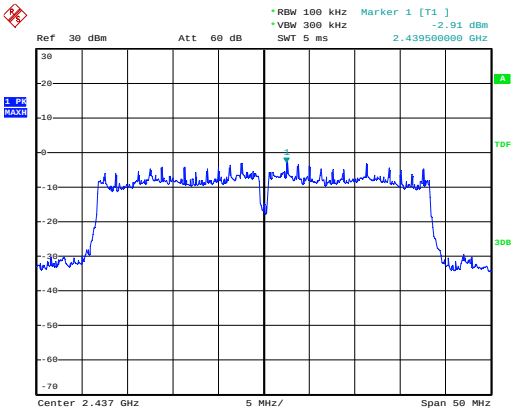


802.11n-40 MHz BW (ANT 2)

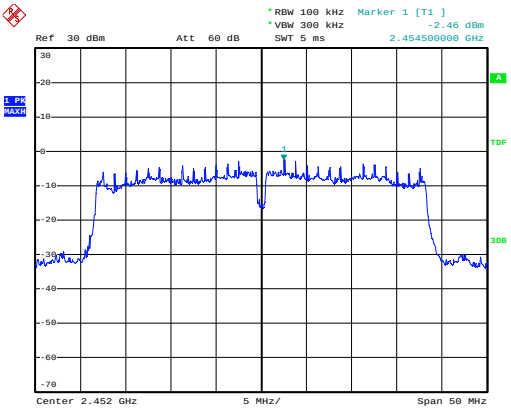
- Lowest Channel (2 412 MHz)



- Middle Chnnel (2 437 MHz)

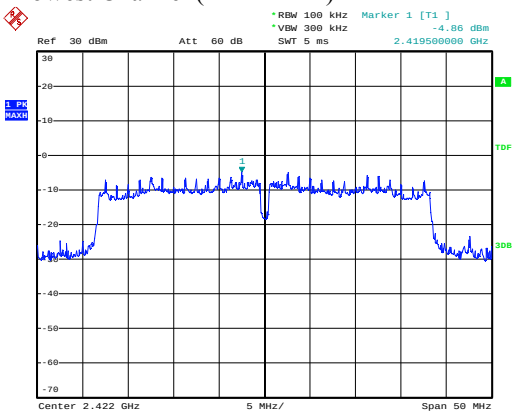


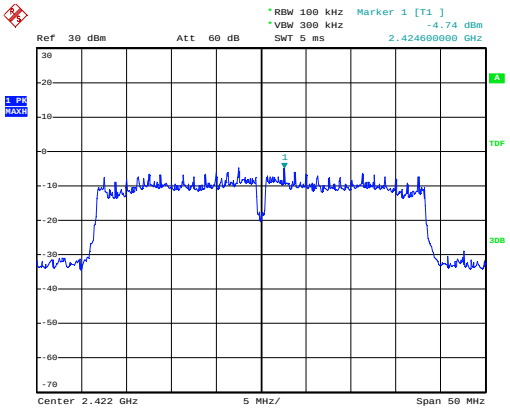
- Highest Chnnel (2 452 MHz)



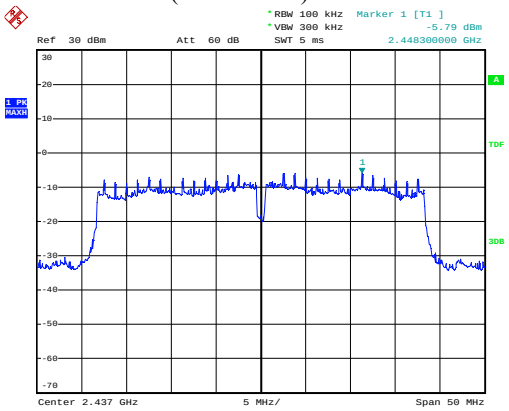
802.11n-40 MHz BW (MIMO)

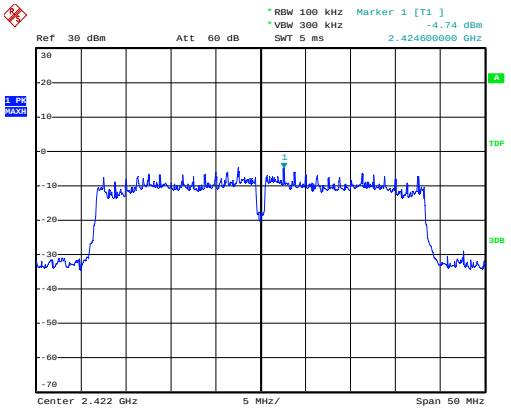
- Lowest Channel (2 422 MHz)



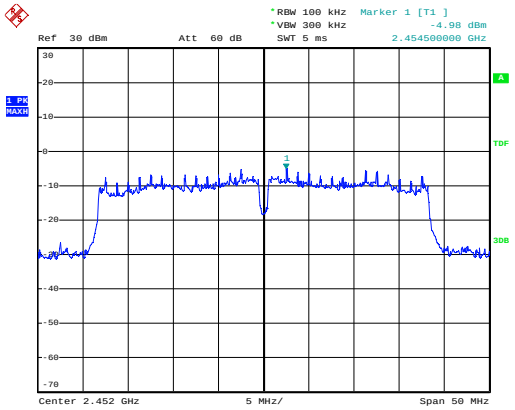


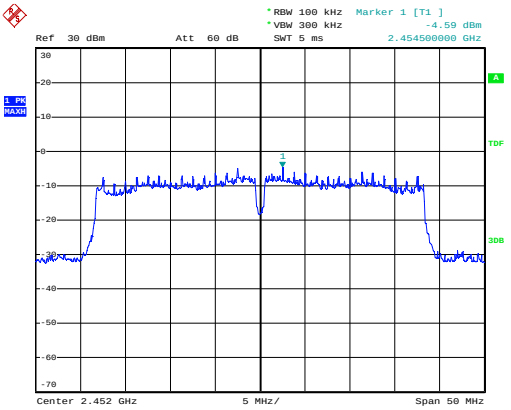
- Middle Chnnel (2 437 MHz)





- Highest Chnnel (2 452 MHz)





5.4 6 dB Bandwidth

5.4.1 Regulation

Systems using digital modulation techniques may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz, and 5725 - 5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

5.4.2 Measurement Procedure

The antenna output of the EUT was connected to the spectrum analyzer. The resolution bandwidth is set to 100 kHz, and peak detection was used. The 6dB bandwidth is defined as the total spectrum over which the power is higher than the peak power minus 6dB.

5.4.3 Test Result

-Complied

802.11b (ANT 1)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)
Low	2412	8.120	10.680	500
Middle	2437	8.040	10.720	500
High	2462	8.200	10.560	500

802.11b (ANT 2)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)
Low	2412	7.960	10.560	500
Middle	2437	8.320	10.640	500
High	2462	7.880	10.560	500

802.11g (ANT 1)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)
Low	2412	15.720	16.400	500
Middle	2437	16.000	16.320	500
High	2462	14.840	16.360	500

802.11g (ANT 2)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)
Low	2412	15.760	16.360	500
Middle	2437	15.680	16.360	500
High	2462	15.360	16.360	500

802.11n-20 MHz BW (ANT 1)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)
Low	2412	15.160	17.480	500
Middle	2437	14.840	17.480	500
High	2462	15.000	17.480	500

802.11n-20 MHz BW (ANT 2)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)
Low	2412	14.160	17.480	500
Middle	2437	15.160	17.480	500
High	2462	15.080	17.480	500

802.11n-20 MHz BW (MIMO)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)
Low	2412	15.160	17.560	500
Middle	2437	15.160	17.520	500
High	2462	15.080	17.560	500

802.11n-40 MHz BW (ANT 1)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)
Low	2422	36.000	36.300	500
Middle	2437	36.300	36.300	500
High	2452	36.100	36.300	500

802.11n-40 MHz BW (ANT 2)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)
Low	2412	35.600	36.200	500
Middle	2437	36.400	36.300	500
High	2462	36.300	36.300	500

802.11n-40 MHz BW (MIMO)

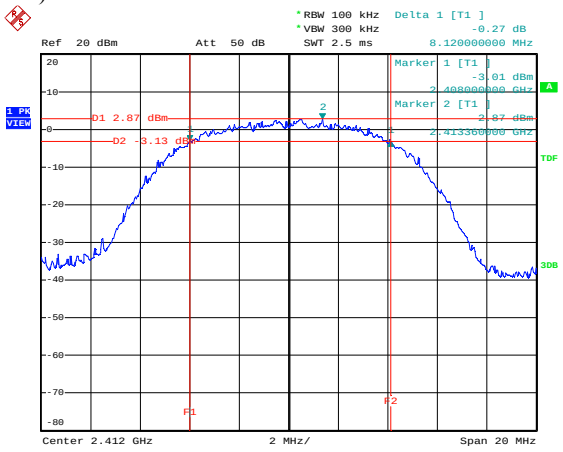
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)
Low	2412	36.300	36.200	500
Middle	2437	36.400	36.200	500
High	2462	36.300	36.200	500

5.4.4 Test Plo

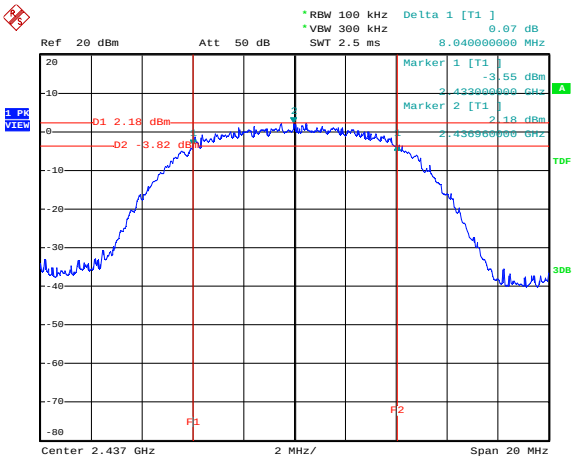
Figure 3. Plot of the 6dB Bandwidth (Conducted)

802.11b (ANT 1)

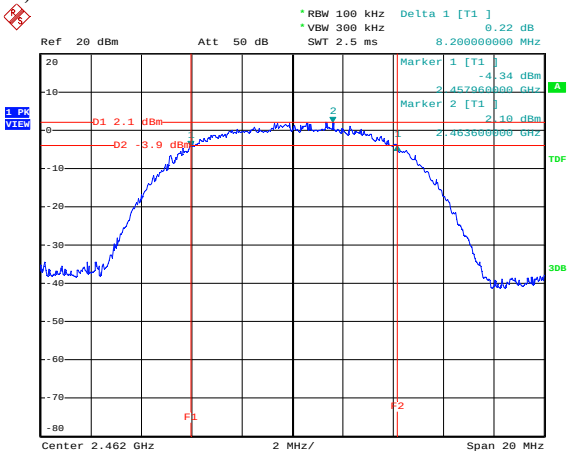
- Lowest Channel (2 412 MHz)



- Middle Channel (2 437MHz)

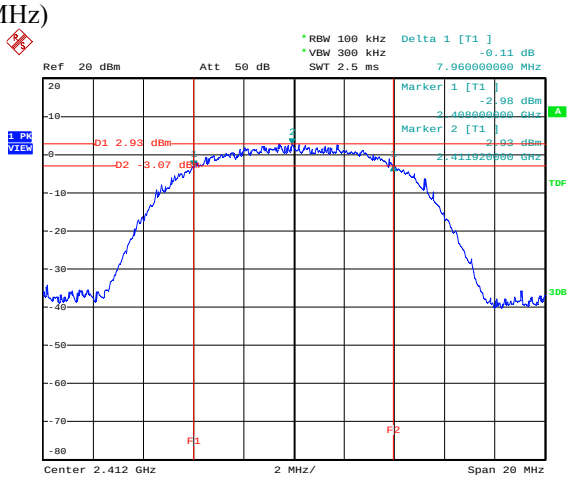


- Highest Channel (2 462 MHz)

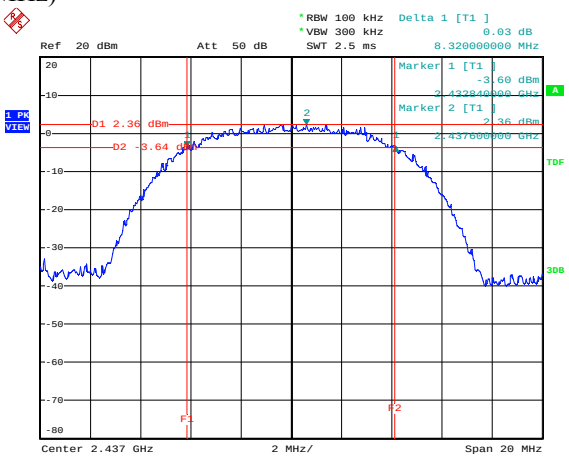


802.11b (ANT 2)

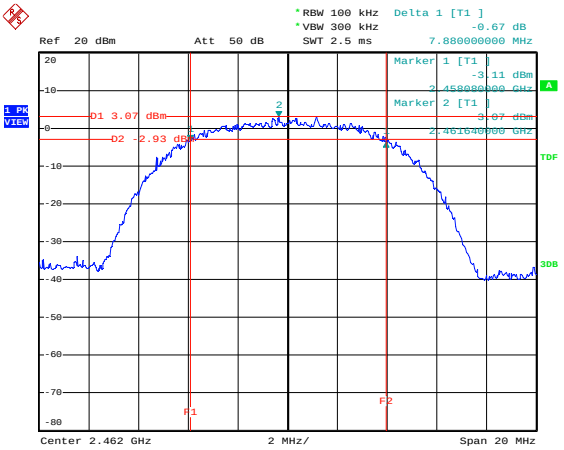
- Lowest Channel (2 412 MHz)



- Middle Channel (2 437 MHz)

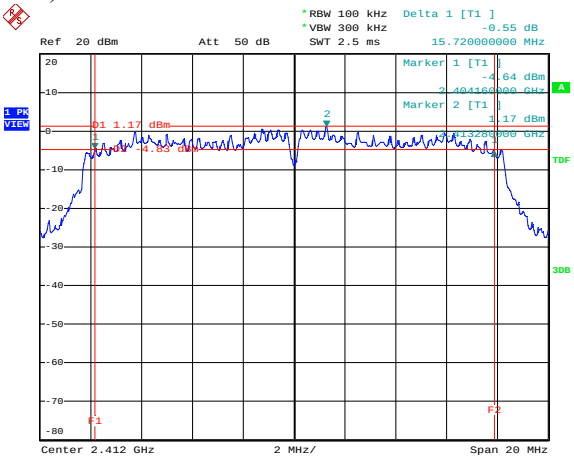


- Highest Channel (2 462 MHz)

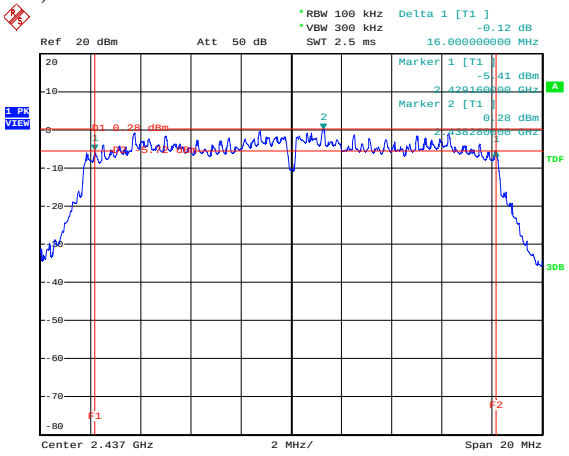


802.11g (ANT 1)

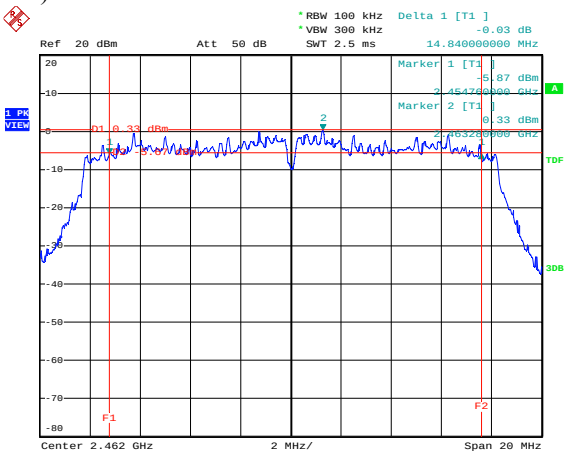
- Lowest Channel (2 412 MHz)



- Middle Channel (2 437 MHz)

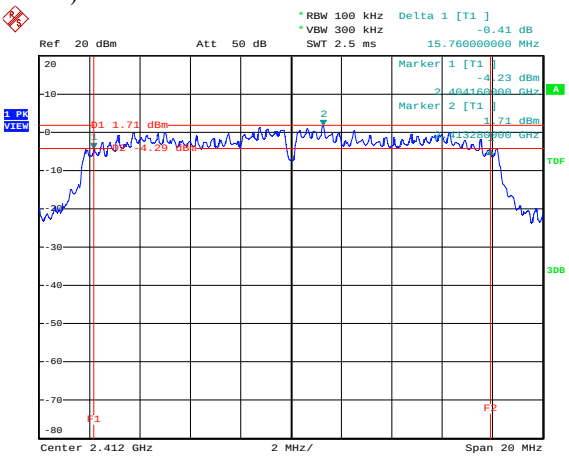


- Highest Channel (2 462 MHz)

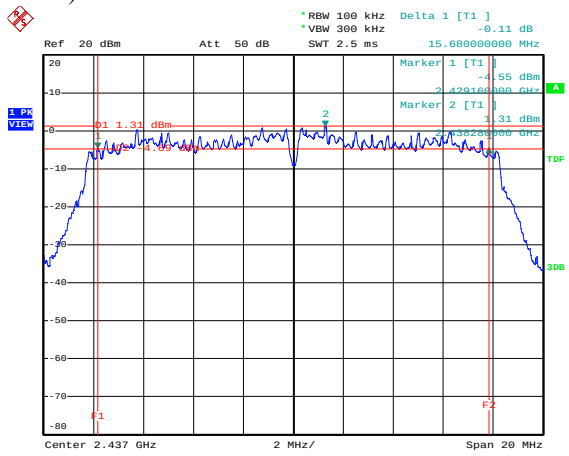


802.11g (ANT 2)

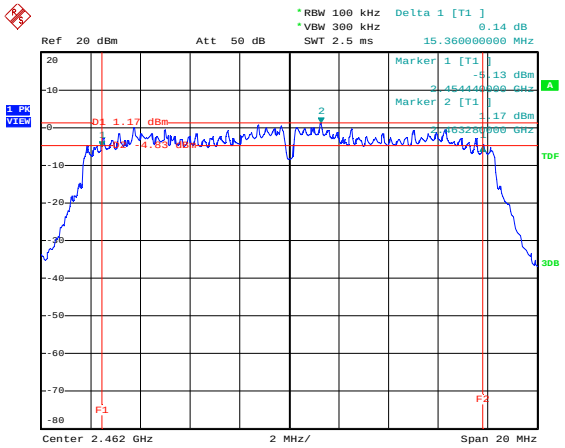
- Lowest Channel (2 412 MHz)



- Middle Channel (2 437 MHz)

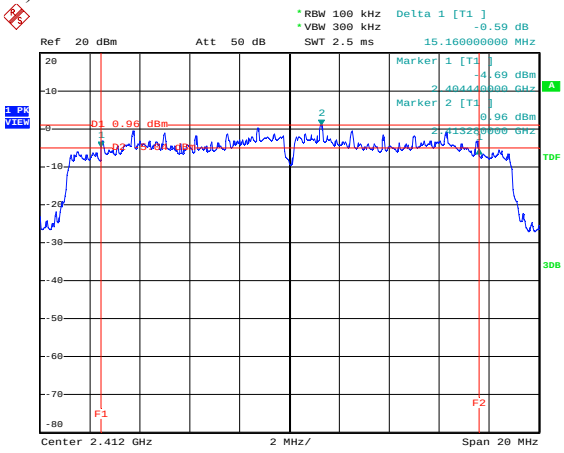


- Highest Channel (2 462 MHz)

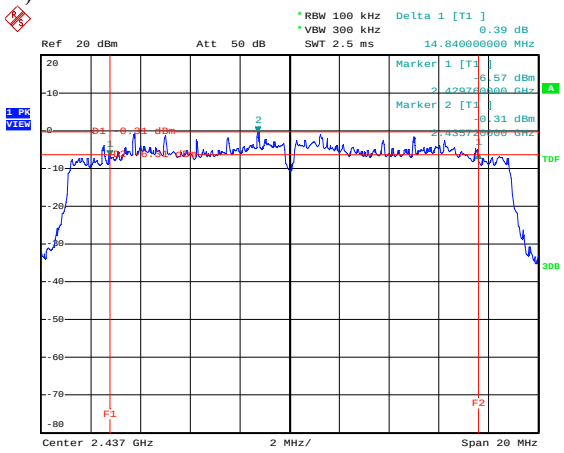


802.11n-20 MHz BW (ANT 1)

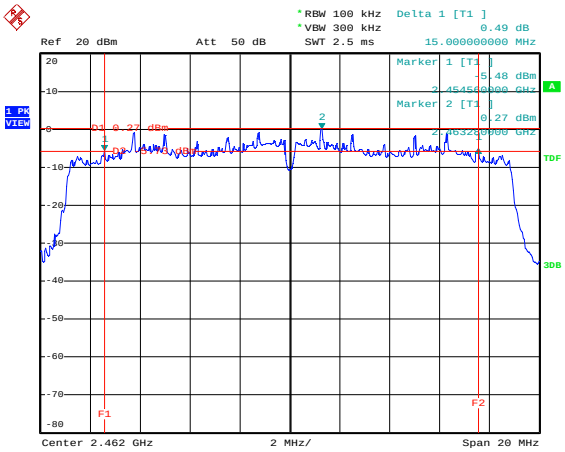
- Lowest Channel (2 412 MHz)



- Middle Channel (2 437 MHz)

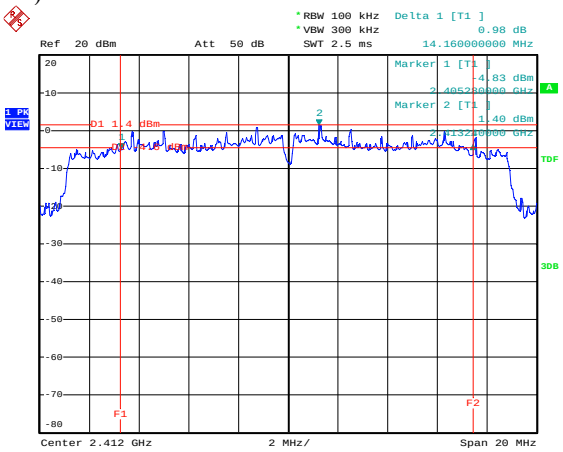


- Highest Channel (2 462 MHz)

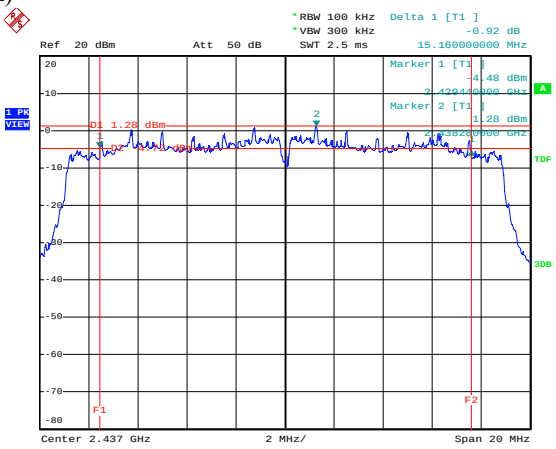


802.11n-20 MHz BW (ANT 2)

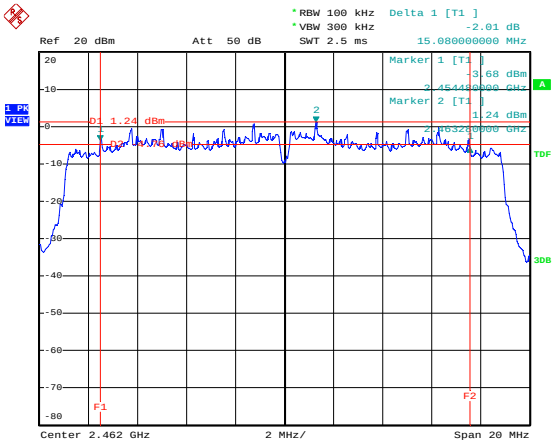
- Lowest Channel (2 412 MHz)



- Middle Channel (2 437 MHz)

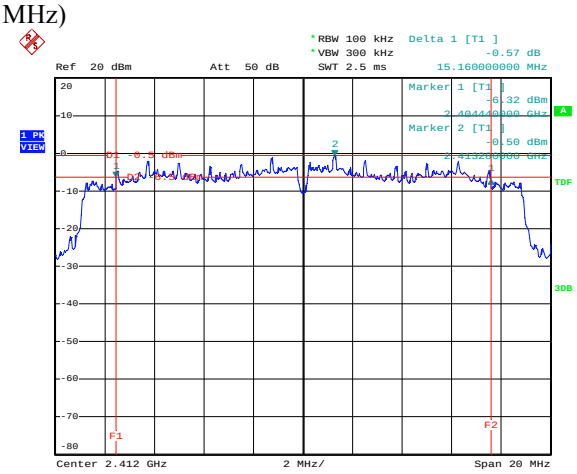


- Highest Channel (2 462 MHz)

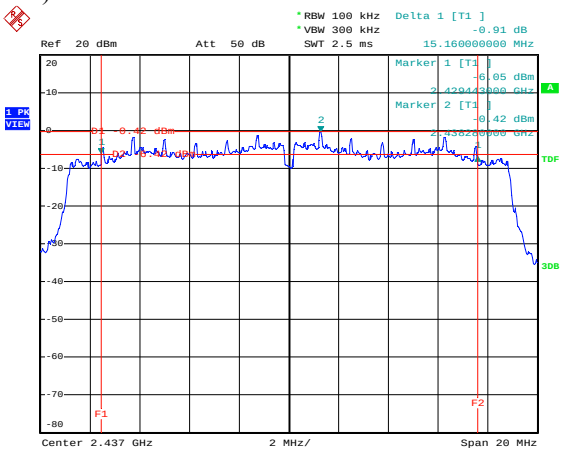


802.11n-20 MHz BW (MIMO)

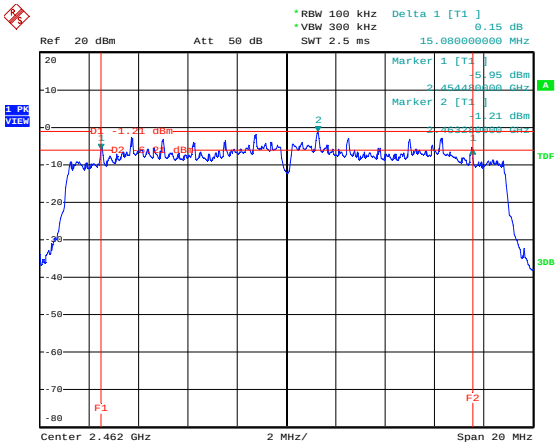
- Lowest Channel (2 412 MHz)



- Middle Channel (2 437 MHz)

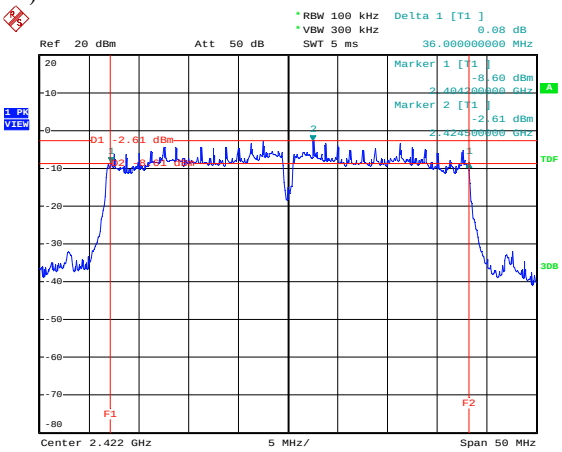


- Highest Channel (2 462 MHz)

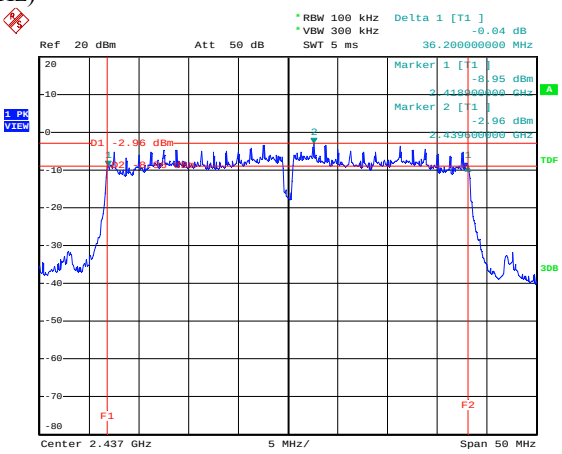


802.11n-40 MHz BW (ANT 1)

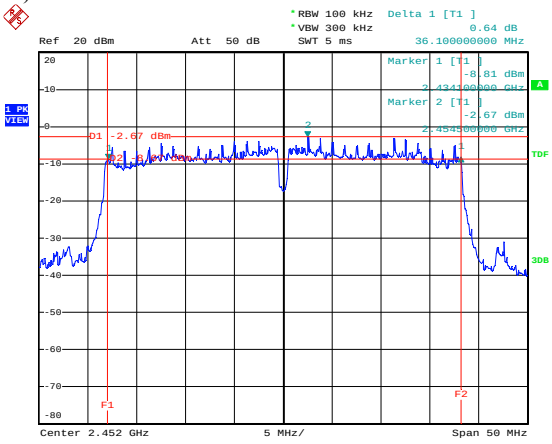
- Lowest Channel (2 422 MHz)



- Middle Channel (2 437 MHz)

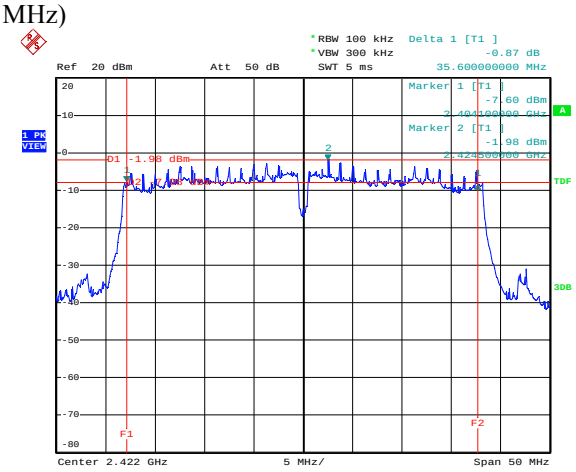


- Highest Channel (2 452 MHz)

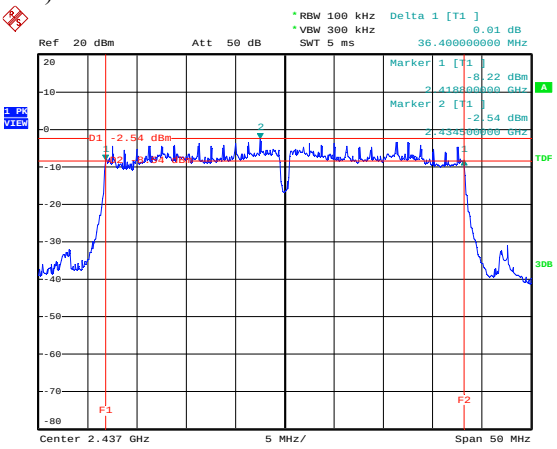


802.11n-40 MHz BW (ANT 2)

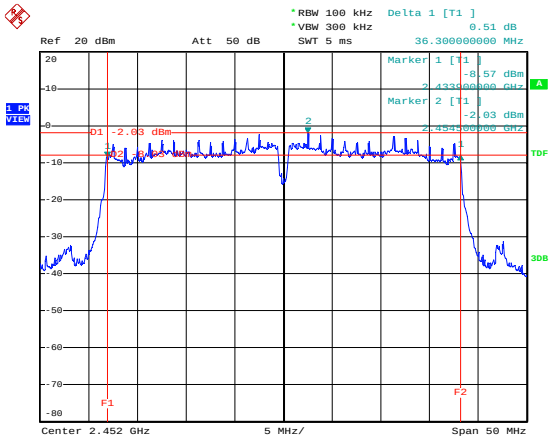
- Lowest Channel (2 422 MHz)



- Middle Channel (2 437 MHz)

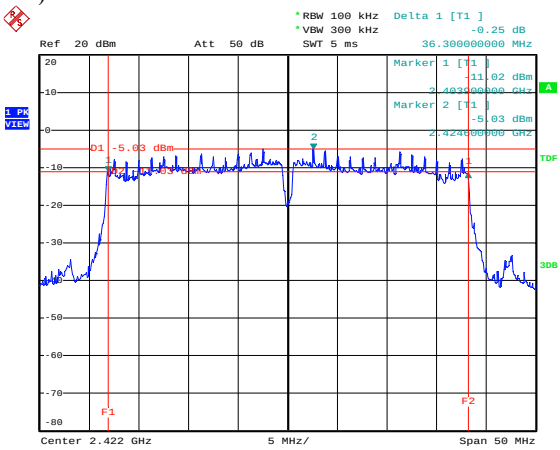


- Highest Channel (2 452 MHz)

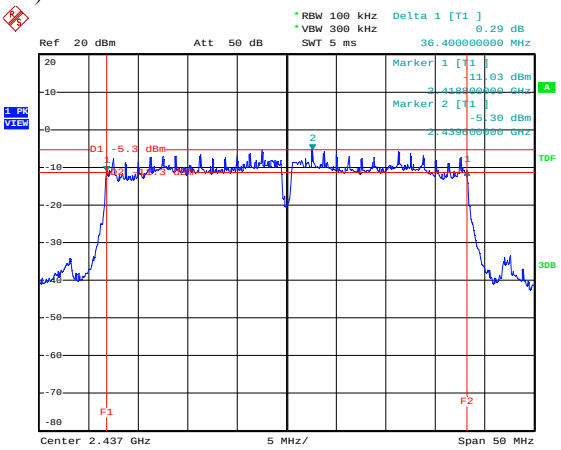


802.11n-40 MHz BW (MIMO)

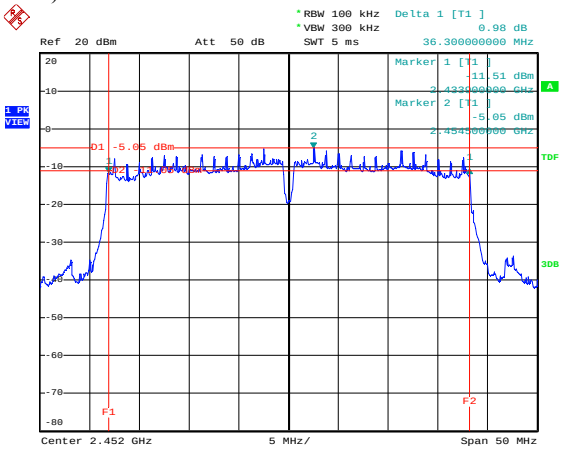
- Lowest Channel (2 422 MHz)



- Middle Channel (2 437 MHz)



- Highest Channel (2 452 MHz)



5.5 SPURIOUS EMISSION, BAND EDGE, AND RESTRICTED BANDS

5.5.1 Regulation

According to §15.247(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 highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).
According to §15.209(a), for an intentional device, the general requirement of field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency (MHz)	Field strength (μV/m @ 3m)	Field strength (dBμV/m @ 3m)
30–88	100	40.0
88–216	150	43.5
216–960	200	46.0
Above 960	500	54.0

According to §15.109(a), for an unintentional device, except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the above table.

** The emission limits shown in the above table are based on measurement instrumentation employing a CISPR quasi-peak detector and above 1000 MHz are based on the average value of measured emissions.

480-5 Shin-dong, Yeongtong-gu, Suwon-city, Gyunggi-do, 443-390, Korea
82 31 336 9919 (Main) 82 31 336 4767 (Fax)

5.5.2 Measurement Procedure

1) Band-edge Compliance of RF Conducted Emissions
2)

1. Set the spectrum analyzer as follows:
   Span = wide enough to capture the peak level of the emission operating on the channel closest to the bandedge, as well as any modulation products which fall outside of the authorized band of operation
   RBW ≥ 1% of the span
   VBW ≥ RBW
   Sweep = auto
   Detector function = peak
   Trace = max hold
2. Allow the trace to stabilize. Set the marker on the emission at the band-edge, or on the highest modulation product outside of the band, if this level is greater than that at the band-edge. Enable the marker-delta function, and then use the marker-to-peak function to move the marker to the peak of the in-band emission.
3. Now, using the same instrument settings, enable the hopping function of the EUT. Allow the trace to stabilize. Follow the same procedure listed above to determine if any spurious emissions caused by the hopping function also comply with the specified limit.

2) Spurious RF Conducted Emissions:

1. Set the spectrum analyzer as follows:
   Span = wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic. Typically, several plots are required to cover this entire span.
   RBW = 100 kHz
   VBW ≥ RBW
   Sweep = auto
   Detector function = peak
   Trace = max hold
2. Allow the trace to stabilize. Set the marker on the peak of any spurious emission recorded.

a 4 × 4 meter at the Open Area Test Site. The EUT was tested at a distance 3 meters.

5. Each frequency found during preliminary measurements was re-examined and investigated. The test-receiver system was set up to average, peak, and quasi-peak detector function with specified bandwidth.

3) Spurious Radiated Emissions:

1. The preliminary radiated measurements were performed to determine the frequency producing the maximum emissions in an anechoic chamber at a distance of 3 meters.
2. The EUT was placed on the top of the 0.8-meter height, 1 × 1.5 meter non-metallic table. To find the maximum emission levels, the height of a measuring antenna was changed and the turntable was rotated 360˚.
3. The antenna polarization was also changed from vertical to horizontal. The spectrum was scanned from 9 kHz to 30 MHz using the loop antenna, and from 30 to 1000 MHz using the TRILOG broadband antenna, and from 1000 MHz to 26500 MHz using the horn antenna.
4. To obtain the final measurement data, the EUT was arranged on a turntable situated on a 4 × 4 meter at the Open Area Test Site. The EUT was tested at a distance 3 meters.
5. Each frequency found during preliminary measurements was re-examined and investigated. The test-receiver system was set up to average, peak, and quasi-peak detector function with specified bandwidth.

5.7.3 Test Result

-complied

1. Band edge compliance of RF Conducted Emissions was shown in figure 4.
2. Band edge compliance of RF Radiated Emissions was shown in figure 5.
3. Spurious RF conducted Emissions were shown in the Figure 6.

   Note: We took the insertion loss of the cable into consideration within the measuring instrument.

4. Measured value of the Field strength of spurious Emissions (Radiated)

- 802.11b (ANT 1)

Low channel (2 412 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
Below 30	**Not Detected**	-	-	-	-	-	-
Quasi-Peak DATA. Emissions below 1GHz							
124.955	120	V	49.4	-13.6	35.8	43.5	7.7
250.018	120	H	49.0	-10.6	38.4	46.0	7.6
500.001	120	V	43.3	-2.7	40.6	46.0	5.4
Peak DATA. Emissions above 1GHz							
2 363.590	1 000	V	53.0	-1.9	51.1	74.0	22.9
4 822.875	1 000	V	54.2	6.0	60.2	74.0	13.8
7 238.999	1 000	V	46.9	15.4	62.3	74.0	11.7
Above 7 300.000	**Not Detected**	-	-	-	-	-	-
Average DATA. Emissions above 1GHz							
2 365.000	1 000	V	38.8	-1.9	36.9	54.0	17.1
4 822.875	1 000	V	36.9	6.0	42.9	54.0	11.1
7 238.999	1 000	V	34.6	15.4	50.0	54.0	4.0
Above 7 300.000	**Not Detected**	-	-	-	-	-	-

Middle channel (2 437 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
Below 30	**Not Detected**	-	-	-	-	-	-
Quasi-Peak DATA. Emissions below 1GHz							
128.688	120	V	49.2	-13.2	36.0	43.5	7.5
500.007	120	V	43.6	-2.7	40.9	46.0	5.1
875.223	120	V	34.5	5.5	40.0	46.0	6.0
Peak DATA. Emissions above 1GHz							
4 873.875	1 000	V	58.3	6.0	64.3	74.0	9.7
7 309.124	1 000	V	44.6	15.8	60.4	74.0	13.6
Above 7 400.000	**Not Detected**	-	-	-	-	-	-
Average DATA. Emissions above 1GHz							
4 873.875	1 000	V	44.6	6.0	50.6	54.0	3.4
7 309.124	1 000	V	31.1	15.8	46.9	54.0	7.1
Above 7 400.000	**Not Detected**	-	-	-	-	-	-

High channel (2 462 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
Below 30	**Not Detected**	-	-	-	-	-	-
Quasi-Peak DATA. Emissions below 1GHz							
128.368	120	V	49.0	-13.2	35.8	43.5	7.7
500.011	120	V	43.7	-2.7	41.0	46.0	5.0
875.248	120	V	34.1	5.5	39.6	46.0	6.4
Peak DATA. Emissions above 1GHz							
2 499.979	1 000	V	47.4	-1.7	45.7	74.0	28.3
4924.114	1000	V	56.8	6.0	62.8	74.0	11.2
7385.673	1000	V	45.7	16.1	61.8	74.0	12.2
Above 7 400.000	**Not Detected**	-	-	-	-	-	-
Average DATA. Emissions above 1GHz							
2 499.979	1 000	V	34.7	-1.7	33.0	54.0	21.0
4924.114	1000	V	41.4	6.0	47.4	54.0	6.6
7385.673	1000	V	33.6	16.1	49.7	54.0	4.3
Above 7 400.000	**Not Detected**	-	-	-	-	-	-

- **802.11b (ANT 2)**
  Low channel (2 412 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
Below 30	**Not Detected**	-	-	-	-	-	-
Quasi-Peak DATA. Emissions below 1GHz							
249.968	120	H	48.8	-10.6	38.2	46.0	7.8
499.986	120	V	43.3	-2.7	40.6	46.0	5.4
875.331	120	H	33.9	5.5	39.4	46.0	6.6
Peak DATA. Emissions above 1GHz							
2 361.448	1 000	V	50.0	-1.9	48.1	74.0	25.9
4 824.202	1 000	V	50.2	6.0	56.2	74.0	17.8
7 232.152	1 000	V	47.5	15.4	62.9	74.0	11.1
Above 7 300.000	**Not Detected**	-	-	-	-	-	-
Average DATA. Emissions above 1GHz							
2 364.760	1 000	V	36.1	-1.9	34.2	54.0	19.8
4 824.202	1 000	V	37.1	6.0	43.1	54.0	10.9
7 232.152	1 000	V	33.6	15.4	49.0	54.0	5.0
Above 7 300.000	**Not Detected**	-	-	-	-	-	-

Middle channel (2 437 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
Below 30	**Not Detected**	-	-	-	-	-	-
Quasi-Peak DATA. Emissions below 1GHz							
500.002	120	V	43.5	-2.7	40.8	46.0	5.2
625.153	120	H	36.6	0.7	37.3	46.0	8.7
875.247	120	V	34.6	5.5	40.1	46.0	5.9
Peak DATA. Emissions above 1GHz							
4874.125	1000	V	49.4	6.0	55.4	74.0	18.6
7328.099	1000	V	47.6	15.9	63.5	74.0	10.5
Above 7 400.000	**Not Detected**	-	-	-	-	-	-
Average DATA. Emissions above 1GHz							
4874.125	1000	V	34.0	6.0	40.0	54.0	14.0
7328.099	1000	V	33.0	15.9	48.9	54.0	5.1
Above 7 400.000	**Not Detected**	-	-	-	-	-	-

High channel (2 462 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
Below 30	**Not Detected**	-	-	-	-	-	-
Quasi-Peak DATA. Emissions below 1GHz							
499.968	120	V	43.8	-2.7	41.1	46.0	4.9
625.026	120	H	36.8	0.7	37.5	46.0	8.5
875.098	120	V	34.5	5.5	40.0	46.0	6.0
Peak DATA. Emissions above 1GHz							
2 496.190	1 000	V	47.4	-1.7	45.7	74.0	28.3
4 923.948	1 000	V	51.5	6.0	57.5	74.0	16.5
7 379.029	1 000	V	44.0	16.1	60.1	74.0	13.9
Above 7 400.000	**Not Detected**	-	-	-	-	-	-
Average DATA. Emissions above 1GHz							
2499.843	1 000	V	34.6	-1.7	32.9	54.0	21.1
4923.948	1 000	V	33.6	6.0	39.6	54.0	14.4
7379.029	1 000	V	29.8	16.1	45.9	54.0	8.1
Above 7 400.000	**Not Detected**	-	-	-	-	-	-

- **802.11g (ANT 1)**
  Low channel (2 412 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
Below 30	**Not Detected**	-	-	-	-	-	-
Quasi-Peak DATA. Emissions below 1GHz							
125.006	120	V	49.6	-13.6	36.0	43.5	7.5
249.958	120	H	48.5	-10.6	37.9	46.0	8.1
500.003	120	V	43.4	-2.6	40.8	46.0	5.2
Peak DATA. Emissions above 1GHz							
2 338.184	1 000	V	53.0	-1.9	51.1	74.0	22.9
4 829.669	1 000	V	50.7	6.0	56.7	74.0	17.3
7 236.955	1 000	V	46.1	15.4	61.5	74.0	12.5
Above 7 300.000	**Not Detected**	-	-	-	-	-	-
Average DATA. Emissions above 1GHz							
2 364.970	1 000	V	38.5	-1.9	36.6	54.0	17.4
4 829.669	1 000	V	36.2	6.0	42.2	54.0	11.8
7 236.955	1 000	V	32.2	15.4	47.6	54.0	6.4
Above 7 300.000	**Not Detected**	-	-	-	-	-	-

Middle channel (2 437 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
Below 30	**Not Detected**	-	-	-	-	-	-
Quasi-Peak DATA. Emissions below 1GHz							
129.685	120	V	49.0	-13.2	35.8	43.5	7.7
500.008	120	V	43.5	-2.7	40.8	46.0	5.2
875.386	120	V	34.2	5.5	39.7	46.0	6.3
Peak DATA. Emissions above 1GHz							
4874.225	1000	V	47.3	6.0	53.3	74.0	20.7
7300.115	1000	V	46.8	15.8	62.6	74.0	11.4
Above 7 400.000	**Not Detected**	-	-	-	-	-	-
Average DATA. Emissions above 1GHz							
4874.225	1000	V	34.0	6.0	40.0	54.0	14.0
7300.115	1000	V	33.7	15.8	49.5	54.0	4.5
Above 7 400.000	**Not Detected**	-	-	-	-	-	-

High channel (2 462 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
Below 30	**Not Detected**	-	-	-	-	-	-
Quasi-Peak DATA. Emissions below 1GHz							
128.334	120	V	48.8	-13.2	35.6	43.5	7.9
500.004	120	V	43.2	-2.6	40.6	46.0	5.4
875.112	120	V	34.1	5.5	39.6	46.0	6.4
Peak DATA. Emissions above 1GHz							
2 483.611	1 000	V	58.7	-1.7	57.0	74.0	17.0
4 922.750	1 000	V	57.8	6.0	63.8	74.0	10.2
7 387.749	1 000	V	45.8	16.1	61.9	74.0	12.1
Above 7 400.000	**Not Detected**	-	-	-	-	-	-
Average DATA. Emissions above 1GHz							
2 489.341	1 000	V	41.6	-1.7	39.9	54.0	14.1
4 922.750	1 000	V	42.0	6.0	48.0	54.0	6.0
7 387.749	1 000	V	33.6	16.1	49.7	54.0	4.3
Above 7 400.000	**Not Detected**	-	-	-	-	-	-

- **802.11g (ANT 2)**
  Low channel (2 412 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
Below 30	**Not Detected**	-	-	-	-	-	-
Quasi-Peak DATA. Emissions below 1GHz							
250.003	120	H	48.3	-10.6	37.7	46.0	8.3
500.011	120	V	43.1	-2.7	40.4	46.0	5.6
875.248	120	H	34.0	5.5	39.5	46.0	6.5
Peak DATA. Emissions above 1GHz							
2 364.171	1 000	V	53.8	-1.9	51.9	74.0	22.1
4 822.875	1 000	V	49.8	6.0	55.8	74.0	11.5
7 234.749	1 000	V	47.5	15.4	62.9	74.0	4.4
9 648.749	1 000	V	46.1	17.2	63.3	74.0	5.3
Above 9 700.000	**Not Detected**	-	-	-	-	-	-
Average DATA. Emissions above 1GHz							
2 365.000	1 000	V	38.8	-1.9	36.9	54.0	17.1
4 822.875	1 000	V	36.5	6.0	42.5	54.0	11.5
7 234.749	1 000	V	34.2	15.4	49.6	54.0	4.4
9 648.749	1 000	V	31.5	17.2	48.7	54.0	5.3
Above 9 700.000	**Not Detected**	-	-	-	-	-	-

Middle channel (2 437 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
Below 30	**Not Detected**	-	-	-	-	-	-
Quasi-Peak DATA. Emissions below 1GHz							
500.008	120	V	43.7	-2.7	41.0	46.0	5.0
625.013	120	H	36.5	0.7	37.2	46.0	8.8
875.386	120	V	34.4	5.5	39.9	46.0	6.1
Peak DATA. Emissions above 1GHz							
4874.750	1000	V	53.8	6.0	59.8	74.0	14.2
7311.249	1000	V	47.6	15.8	63.4	74.0	10.6
9752.874	1000	V	46.4	17.5	63.9	74.0	10.1
Above 9 800.000	**Not Detected**	-	-	-	-	-	-
Average DATA. Emissions above 1GHz							
4874.750	1000	V	38.9	6.0	44.9	54.0	9.1
7311.249	1000	V	33.8	15.8	49.6	54.0	4.4
9752.874	1000	V	33.1	17.5	50.6	54.0	3.4
Above 9 800.000	**Not Detected**	-	-	-	-	-	-

High channel (2 462 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
Below 30	**Not Detected**	-	-	-	-	-	-
Quasi-Peak DATA. Emissions below 1GHz							
500.004	120	V	43.6	-2.6	41.0	46.0	5.0
624.995	120	H	36.3	0.7	37.0	46.0	9.0
875.112	120	V	34.6	5.5	40.1	46.0	5.9
Peak DATA. Emissions above 1GHz							
2 483.828	1 000	V	55.0	-1.7	53.3	74.0	20.7
4 922.750	1 000	V	50.9	6.0	56.9	74.0	17.1
7 381.374	1 000	V	47.3	16.1	63.4	74.0	10.6
9 842.124	1 000	V	35.0	17.8	52.8	74.0	21.2
Above 9 900.000	**Not Detected**	-	-	-	-	-	-
Average DATA. Emissions above 1GHz							
2 489.263	1 000	V	40.2	-1.7	38.5	54.0	15.5
4 922.750	1 000	V	36.8	6.0	42.8	54.0	11.2
7 381.374	1 000	V	33.1	16.1	49.2	54.0	4.8
9 842.124	1 000	V	32.8	17.8	50.6	54.0	3.4
Above 9 900.000	**Not Detected**	-	-	-	-	-	-

- **802.11n20 (ANT 1)**
  Low channel (2 412 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
Below 30	**Not Detected**	-	-	-	-	-	-
Quasi-Peak DATA. Emissions below 1GHz							
250.012	120	H	48.2	-10.6	37.6	46.0	8.4
500.002	120	V	43.7	-2.6	41.1	46.0	4.9
875.412	120	V	34.8	5.5	40.3	46.0	5.7
Peak DATA. Emissions above 1GHz							
2 363.590	1 000	V	53.0	-1.9	51.1	74.0	22.9
4 824.713	1 000	V	53.2	6.0	59.2	74.0	14.8
7 234.580	1 000	V	50.9	15.4	66.3	74.0	7.7
Above 7 300.000	**Not Detected**	-	-	-	-	-	-
Average DATA. Emissions above 1GHz							
2 364.910	1 000	V	38.6	-1.9	36.7	54.0	17.3
4 824.713	1 000	V	38.6	6.0	44.6	54.0	9.4
7 234.580	1 000	V	35.5	15.4	50.9	54.0	3.1
Above 7 300.000	**Not Detected**	-	-	-	-	-	-

Middle channel (2 437 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
Below 30	**Not Detected**	-	-	-	-	-	-
Quasi-Peak DATA. Emissions below 1GHz							
128.568	120	V	48.8	-13.2	35.6	43.5	7.9
500.001	120	V	43.2	-2.7	40.5	46.0	5.5
875.338	120	V	33.7	5.5	39.2	46.0	6.8
Peak DATA. Emissions above 1GHz							
4876.000	1000	V	52.5	6.0	58.5	74.0	15.5
7313.374	1000	V	48.8	15.8	64.6	74.0	9.4
Above 7 400.000	**Not Detected**	-	-	-	-	-	-
Average DATA. Emissions above 1GHz							
4876.000	1000	V	38.1	6.0	44.1	54.0	9.9
7313.374	1000	V	35.2	15.8	51.0	54.0	3.0
Above 7 400.000	**Not Detected**	-	-	-	-	-	-

High channel (2 462 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
Below 30	**Not Detected**	-	-	-	-	-	-
Quasi-Peak DATA. Emissions below 1GHz							
128.685	120	V	48.2	-13.2	35.0	43.5	8.5
499.982	120	V	43.2	-2.7	40.5	46.0	5.5
875.235	120	V	33.8	5.5	39.3	46.0	6.7
Peak DATA. Emissions above 1GHz							
2 484.383	1 000	V	64.0	-1.7	62.3	74.0	11.7
4 922.750	1 000	V	49.5	6.0	55.5	74.0	18.5
7 389.874	1 000	V	50.6	16.1	66.7	74.0	7.3
Above 7 400.000	**Not Detected**	-	-	-	-	-	-
Average DATA. Emissions above 1GHz							
2 483.500	1 000	V	43.2	-1.7	41.5	54.0	12.5
4 922.750	1 000	V	37.2	6.0	43.2	54.0	10.8
7 389.874	1 000	V	34.7	16.1	50.8	54.0	3.2
Above 7 400.000	**Not Detected**	-	-	-	-	-	-

- **802.11n20 (ANT 2)**
  Low channel (2 412 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
Below 30	**Not Detected**	-	-	-	-	-	-
Quasi-Peak DATA. Emissions below 1GHz							
249.983	120	H	48.6	-10.6	38.0	46.0	8.0
500.011	120	V	43.1	-2.7	40.4	46.0	5.6
875.221	120	V	34.8	5.5	40.3	46.0	5.7
Peak DATA. Emissions above 1GHz							
2 363.028	1 000	V	51.6	-1.9	49.7	74.0	24.3
4 825.000	1 000	V	51.5	6.0	57.5	74.0	16.5
7 232.624	1 000	V	47.2	15.4	62.6	74.0	11.4
Above 7 300.000	**Not Detected**	-	-	-	-	-	-
Average DATA. Emissions above 1GHz							
2 364.940	1 000	V	38.2	-1.9	36.3	54.0	17.7
4 825.000	1 000	V	37.0	6.0	43.0	54.0	11.0
7 232.624	1 000	V	33.8	15.4	49.2	54.0	4.8
Above 7 300.000	**Not Detected**	-	-	-	-	-	-

Middle channel (2 437 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
Below 30	**Not Detected**	-	-	-	-	-	-
Quasi-Peak DATA. Emissions below 1GHz							
128.415	120	V	49.1	-13.2	35.9	43.5	7.6
499.977	120	V	43.6	-2.7	40.9	46.0	5.1
875.229	120	V	34.2	5.5	39.7	46.0	6.3
Peak DATA. Emissions above 1GHz							
4878.125	1000	V	50.6	6.0	56.6	74.0	17.4
7309.124	1000	V	47.4	15.8	63.2	74.0	10.8
9748.624	1000	V	46.3	17.5	63.8	74.0	10.2
Above 4 900.000	**Not Detected**	-	-	-	-	-	-
Average DATA. Emissions above 1GHz							
4878.125	1000	V	36.7	6.0	42.7	54.0	11.3
7309.124	1000	V	33.8	15.8	49.6	54.0	4.4
9748.624	1000	V	32.9	17.5	50.4	54.0	3.6
Above 4 900.000	**Not Detected**	-	-	-	-	-	-

High channel (2 462 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
Below 30	**Not Detected**	-	-	-	-	-	-
Quasi-Peak DATA. Emissions below 1GHz							
128.539	120	V	48.8	-13.2	35.6	43.5	7.9
500.009	120	V	43.6	-2.7	40.9	46.0	5.1
875.334	120	V	34.3	5.5	39.8	46.0	6.2
Peak DATA. Emissions above 1GHz							
2 497.484	1 000	V	56.5	-1.7	54.8	74.0	19.2
4 920.625	1 000	V	49.3	6.0	55.3	74.0	18.7
7 387.749	1 000	V	45.4	16.1	61.5	74.0	12.5
Above 7 400.000	**Not Detected**	-	-	-	-	-	-
Average DATA. Emissions above 1GHz							
2 495.615	1 000	V	41.0	-1.7	39.3	54.0	14.7
4 920.625	1 000	V	35.1	6.0	55.3	54.0	12.9
7 387.749	1 000	V	32.1	16.1	61.5	54.0	5.8
Above 7 400.000	**Not Detected**	-	-	-	-	-	-

- **802.11n20 (MIMO)**
  Low channel (2 412 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
Below 30	**Not Detected**	-	-	-	-	-	-
Quasi-Peak DATA. Emissions below 1GHz							
249.963	120	H	48.7	-10.6	38.1	46.0	7.9
500.008	120	V	43.0	-2.7	40.3	46.0	5.7
875.329	120	V	34.8	5.5	40.3	46.0	5.7
Peak DATA. Emissions above 1GHz							
2 363.028	1 000	V	51.1	-1.9	49.2	74.0	24.8
4 827.125	1 000	V	58.9	6.0	64.9	74.0	9.1
Above 4 900.000	**Not Detected**	-	-	-	-	-	-
Average DATA. Emissions above 1GHz							
2 364.940	1 000	V	38.2	-1.9	36.3	54.0	17.7
4 827.125	1 000	V	35.9	6.0	41.9	54.0	12.1
Above 4 900.000	**Not Detected**	-	-	-	-	-	-

Middle channel (2 437 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
Below 30	**Not Detected**	-	-	-	-	-	-
Quasi-Peak DATA. Emissions below 1GHz							
128.632	120	V	48.7	-13.2	35.5	43.5	8.0
499.991	120	V	43.6	-2.7	40.9	46.0	5.1
875.337	120	V	34.3	5.5	39.8	46.0	6.2
Peak DATA. Emissions above 1GHz							
4878.125	1000	V	49.8	6.0	55.8	74.0	18.2
Above 4 900.000	**Not Detected**	-	-	-	-	-	-
Average DATA. Emissions above 1GHz							
4878.125	1000	V	35.7	6.0	41.7	54.0	12.3
Above 4 900.000	**Not Detected**	-	-	-	-	-	-

High channel (2 462 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
Below 30	**Not Detected**	-	-	-	-	-	-
Quasi-Peak DATA. Emissions below 1GHz							
128.412	120	V	49.1	-13.2	35.9	43.5	7.6
499.931	120	V	43.7	-2.7	41.0	46.0	5.0
875.214	120	V	34.4	5.5	39.9	46.0	6.1
Peak DATA. Emissions above 1GHz							
2 497.484	1 000	V	56.5	-1.7	54.8	74.0	19.2
4 922.750	1 000	V	61.3	6.0	67.3	74.0	6.7
Above 5 000.000	**Not Detected**	-	-	-	-	-	-
Average DATA. Emissions above 1GHz							
2 495.615	1 000	V	55.7	-1.7	39.3	54.0	14.7
4 922.750	1 000	V	36.1	6.0	42.1	54.0	11.9
Above 5 000.000	**Not Detected**	-	-	-	-	-	-

- **802.11n40 (ANT 1)**
  Low channel (2 422 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
Below 30	**Not Detected**	-	-	-	-	-	-
Quasi-Peak DATA. Emissions below 1GHz							
250.131	120	H	48.1	-10.6	37.5	46.0	8.5
500.113	120	V	42.9	-2.7	40.2	46.0	5.8
875.019	120	V	35.0	5.5	40.5	46.0	5.5
Peak DATA. Emissions above 1GHz							
2 363.530	1 000	V	54.5	-1.8	52.7	74.0	21.3
4 856.875	1 000	V	57.4	6.0	63.4	74.0	10.6
Above 4 900.000	**Not Detected**	-	-	-	-	-	-
Average DATA. Emissions above 1GHz							
2 364.760	1 000	V	36.0	-1.8	34.2	54.0	19.8
4 856.875	1 000	V	40.9	6.0	46.9	54.0	7.1
Above 4 900.000	**Not Detected**	-	-	-	-	-	-

Middle channel (2 437 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
Below 30	**Not Detected**	-	-	-	-	-	-
Quasi-Peak DATA. Emissions below 1GHz							
128.661	120	V	48.6	-13.2	35.4	43.5	8.1
499.991	120	V	43.5	-2.7	40.8	46.0	5.2
875.328	120	V	34.2	5.5	39.7	46.0	6.3
Peak DATA. Emissions above 1GHz							
4888.750	1000	V	57.1	6.0	63.1	74.0	10.9
Above 4 900.000	**Not Detected**	-	-	-	-	-	-
Average DATA. Emissions above 1GHz							
4888.750	1000	V	40.1	6.0	46.1	54.0	7.9
Above 4 900.000	**Not Detected**	-	-	-	-	-	-

High channel (2 452 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
Below 30	**Not Detected**	-	-	-	-	-	-
Quasi-Peak DATA. Emissions below 1GHz							
128.433	120	V	49.1	-13.2	35.9	43.5	7.6
500.012	120	V	43.5	-2.7	40.8	46.0	5.2
875.116	120	V	34.4	5.5	39.9	46.0	6.1
Peak DATA. Emissions above 1GHz							
2 483.954	1 000	V	73.3	-1.7	71.6	74.0	2.4
4 933.375	1 000	V	50.0	6.0	56.1	74.0	17.9
Above 5 000.000	**Not Detected**	-	-	-	-	-	-
Average DATA. Emissions above 1GHz							
2 484.207	1000	V	53.1	-1.7	51.4	54.0	2.6
4 933.375	1000	V	33.9	6.0	40.0	54.0	14.0
Above 5 000.000	**Not Detected**	-	-	-	-	-	-

- **802.11n40 (ANT 2)**
  Low channel (2 422 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
Below 30	**Not Detected**	-	-	-	-	-	-
Quasi-Peak DATA. Emissions below 1GHz							
250.091	120	H	48.7	-10.6	38.1	46.0	7.9
500.013	120	V	43.0	-2.7	40.3	46.0	5.7
875.229	120	V	34.9	5.5	40.4	46.0	5.6
Peak DATA. Emissions above 1GHz							
2 363.339	1 000	V	52.5	-1.8	50.7	74.0	23.3
4 839.875	1 000	V	61.8	6.0	67.8	74.0	6.2
Above 4 900.000	**Not Detected**	-	-	-	-	-	-
Average DATA. Emissions above 1GHz							
2 364.820	1 000	V	37.6	-1.8	35.8	54.0	18.2
4 839.875	1 000	V	43.1	6.0	49.1	54.0	6.2
Above 4 900.000	**Not Detected**	-	-	-	-	-	-

Middle channel (2 437 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
Below 30	**Not Detected**	-	-	-	-	-	-
Quasi-Peak DATA. Emissions below 1GHz							
128.582	120	V	49.0	-13.2	35.8	43.5	7.7
500.035	120	V	43.6	-2.7	40.9	46.0	5.1
875.278	120	V	34.5	5.5	40.0	46.0	6.0
Peak DATA. Emissions above 1GHz							
4888.750	1000	V	56.8	6.0	62.8	74.0	11.2
Above 4 900.000	**Not Detected**	-	-	-	-	-	-
Average DATA. Emissions above 1GHz							
4888.750	1000	V	39.7	6.0	45.7	54.0	8.3
Above 4 900.000	**Not Detected**	-	-	-	-	-	-

High channel (2 452 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
Below 30	**Not Detected**	-	-	-	-	-	-
Quasi-Peak DATA. Emissions below 1GHz							
128.373	120	V	48.9	-13.2	35.7	43.5	7.8
500.048	120	V	43.6	-2.7	40.9	46.0	5.1
875.238	120	V	34.2	5.5	39.7	46.0	6.3
Peak DATA. Emissions above 1GHz							
2 483.520	1 000	V	71.9	-1.7	70.2	74.0	3.8
4 924.875	1 000	V	56.1	6.0	62.1	74.0	11.9
Above 5 000.000	**Not Detected**	-	-	-	-	-	-
Average DATA. Emissions above 1GHz							
2 484.168	1000	V	52.3	-1.7	50.6	54.0	3.4
4 924.875	1000	V	39.8	6.0	45.8	54.0	8.2
Above 5 000.000	**Not Detected**	-	-	-	-	-	-

- **802.11n40 (MIMO)**
  Low channel (2 412 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
Below 30	**Not Detected**	-	-	-	-	-	-
Quasi-Peak DATA. Emissions below 1GHz							
250.176	120	H	48.3	-10.6	37.7	46.0	8.3
500.233	120	V	43.1	-2.7	40.4	46.0	5.6
875.214	120	V	35.1	5.5	40.6	46.0	5.4
Peak DATA. Emissions above 1GHz							
Above 1 000.000	**Not Detected**	-	-	-	-	-	-
Average DATA. Emissions above 1GHz							
Above 1 000.000	**Not Detected**	-	-	-	-	-	-

Middle channel (2 437 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
Below 30	**Not Detected**	-	-	-	-	-	-
Quasi-Peak DATA. Emissions below 1GHz							
128.439	120	V	48.7	-13.2	35.5	43.5	8.0
500.004	120	V	43.5	-2.7	40.8	46.0	5.2
875.243	120	V	33.9	5.5	39.4	46.0	6.6
Peak DATA. Emissions above 1GHz							
Above 1 000.000	**Not Detected**	-	-	-	-	-	-
Average DATA. Emissions above 1GHz							
Above 1 000.000	**Not Detected**	-	-	-	-	-	-

High channel (2 452 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
Below 30	**Not Detected**	-	-	-	-	-	-
Quasi-Peak DATA. Emissions below 1GHz							
128.752	120	V	48.7	-13.2	35.5	43.5	8.0
500.023	120	V	43.7	-2.7	41.0	46.0	5.0
875.168	120	V	34.4	5.5	39.9	46.0	6.1
Peak DATA. Emissions above 1GHz							
Above 1 000.000	**Not Detected**	-	-	-	-	-	-
Average DATA. Emissions above 1GHz							
Above 1 000.000	**Not Detected**	-	-	-	-	-	-

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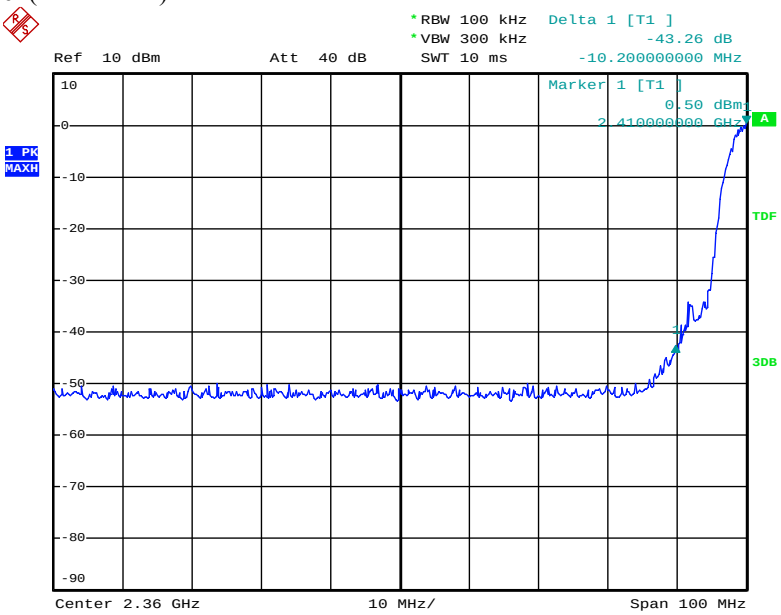
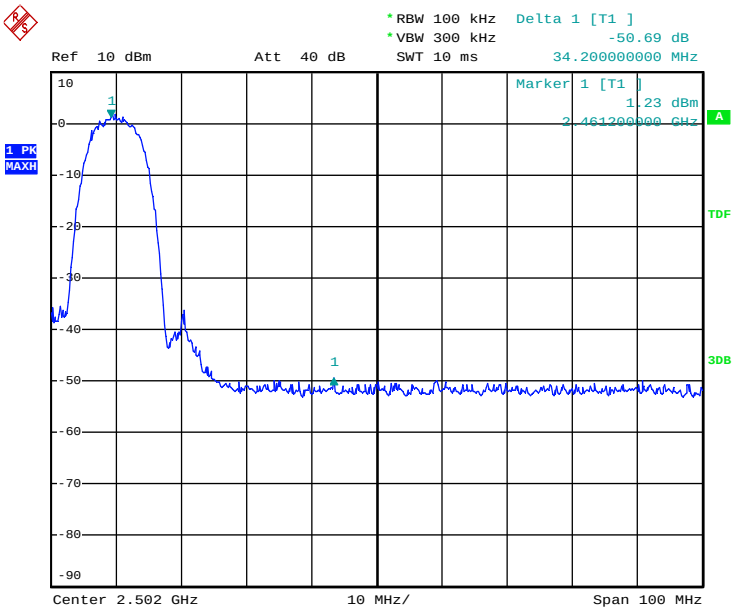
5.6.4 Test Plot

Figure 4. Plot of the Band Edge (Conducted)
802.11b (ANT 1)

- Lowest Channel (2 412 MHz)

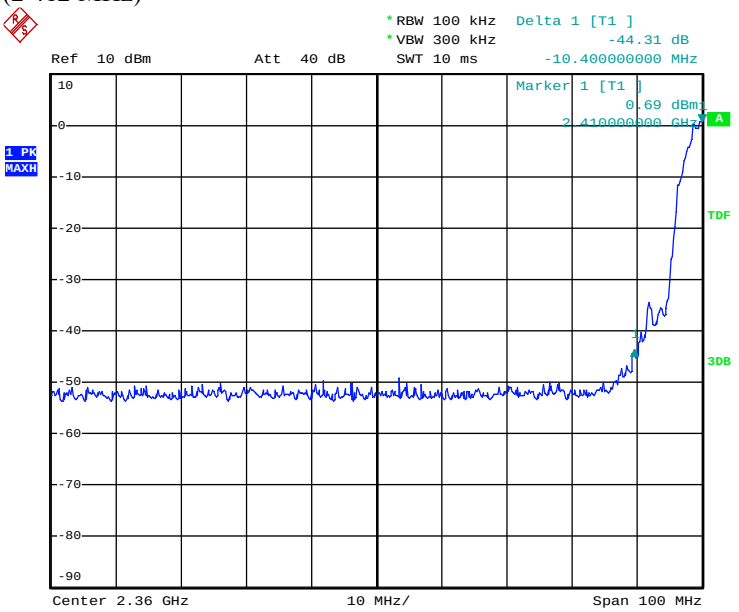


- Highest Chnnel (2 462 MHz)

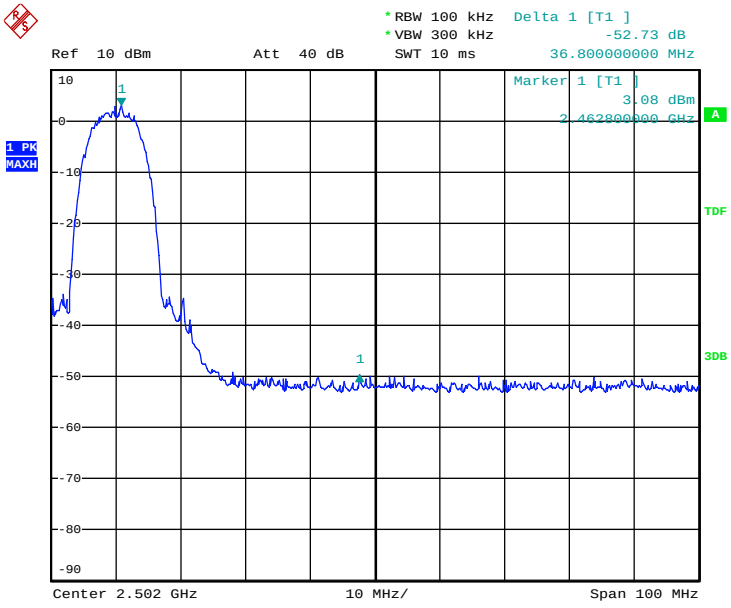


802.11b (ANT 2)

- Lowest Channel (2 412 MHz)

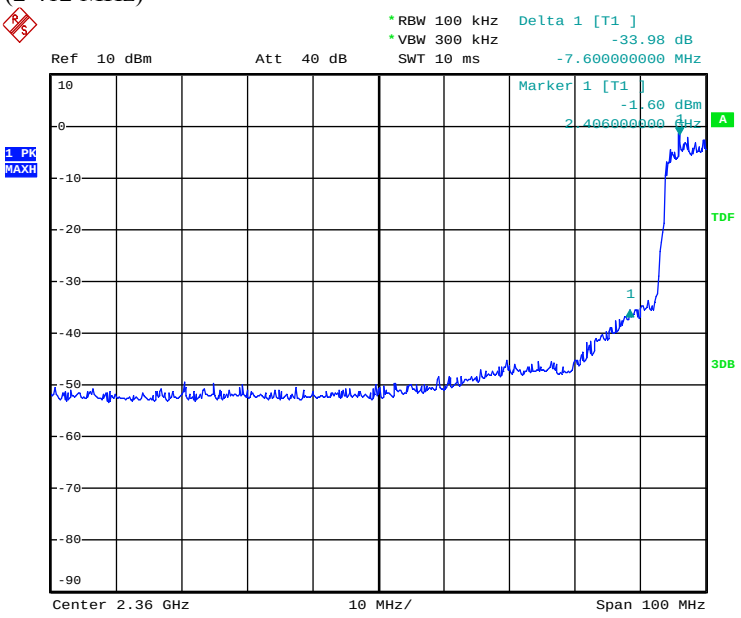


- Highest Chnnel (2 462 MHz)

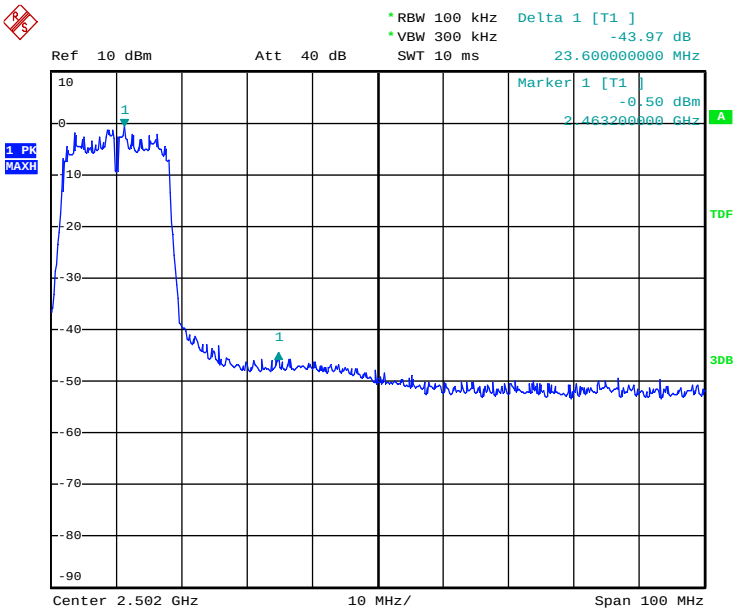


802.11g (ANT 1)

- Lowest Channel (2 412 MHz)

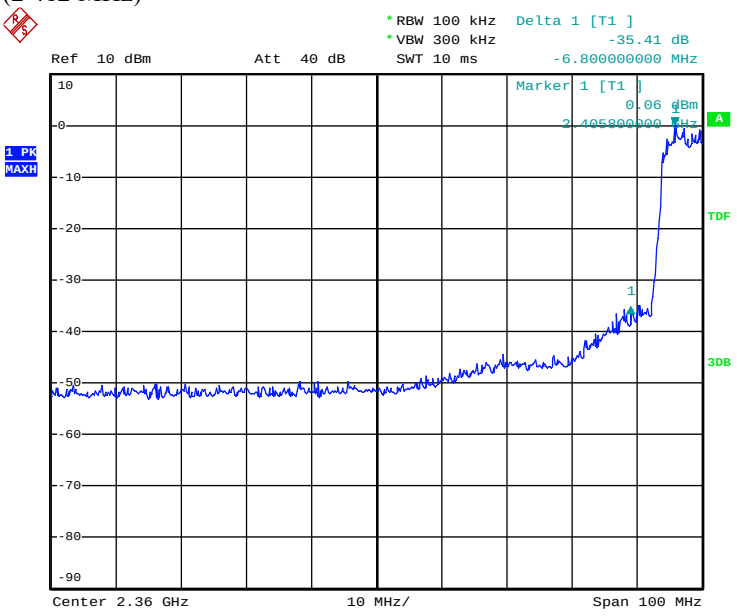


- Highest Chnnel (2 462 MHz)

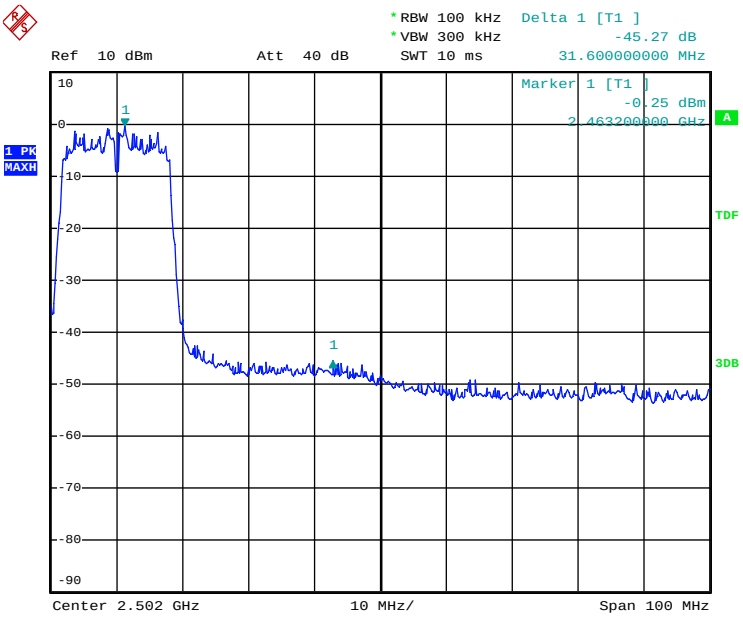


802.11g (ANT 2)

- Lowest Channel (2 412 MHz)

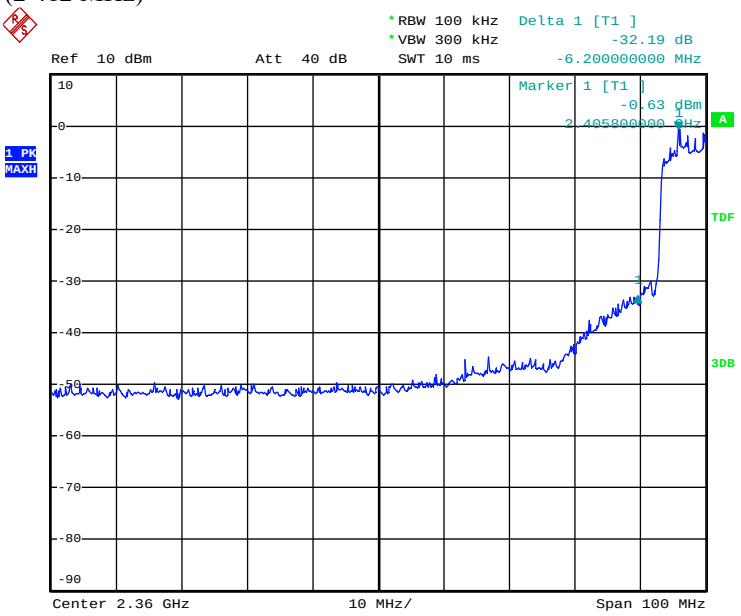


- Highest Chnnel (2 462 MHz)

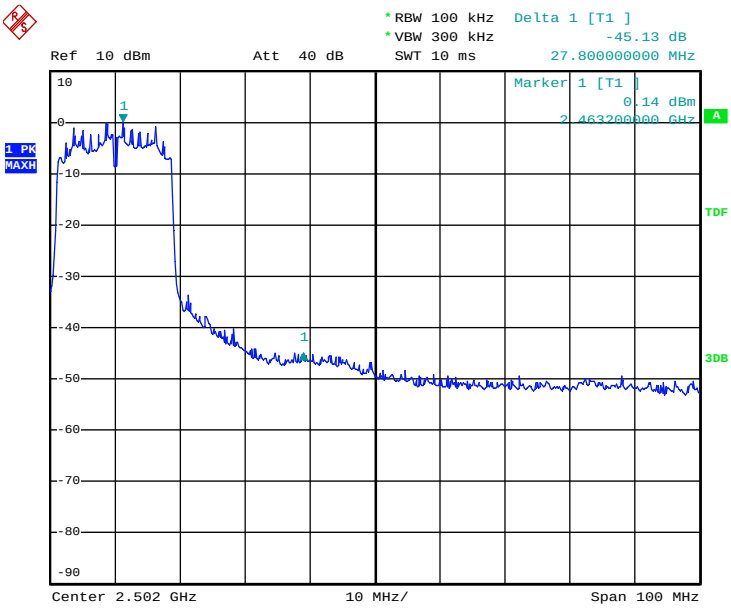


802.11n-20 MHz BW (ANT 1)

- Lowest Channel (2 412 MHz)

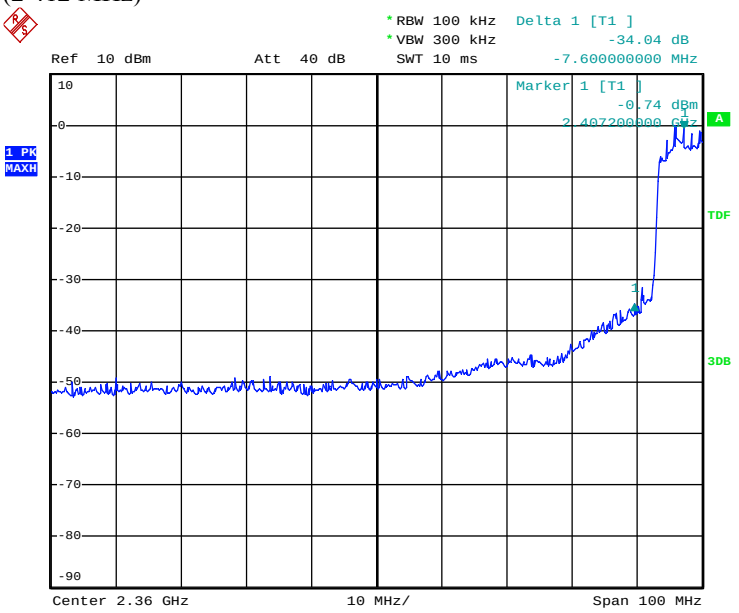


- Highest Chnnel (2 462 MHz)

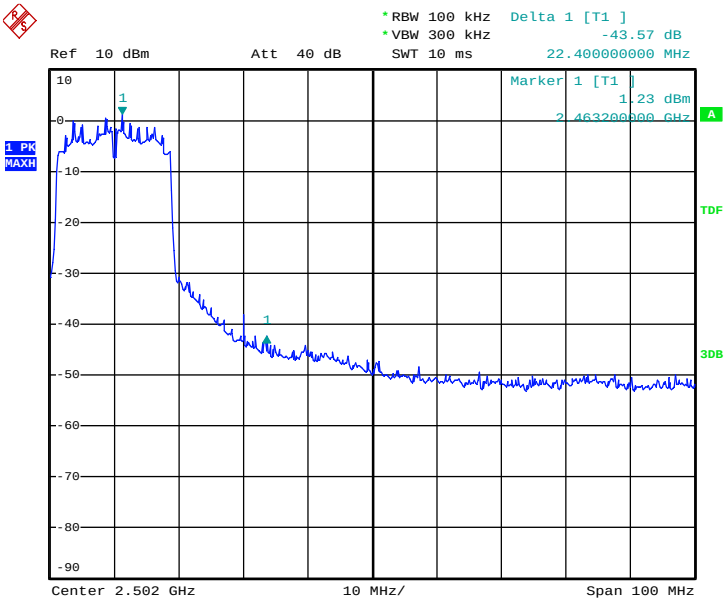


802.11n-20 MHz BW (ANT 2)

- Lowest Channel (2 412 MHz)

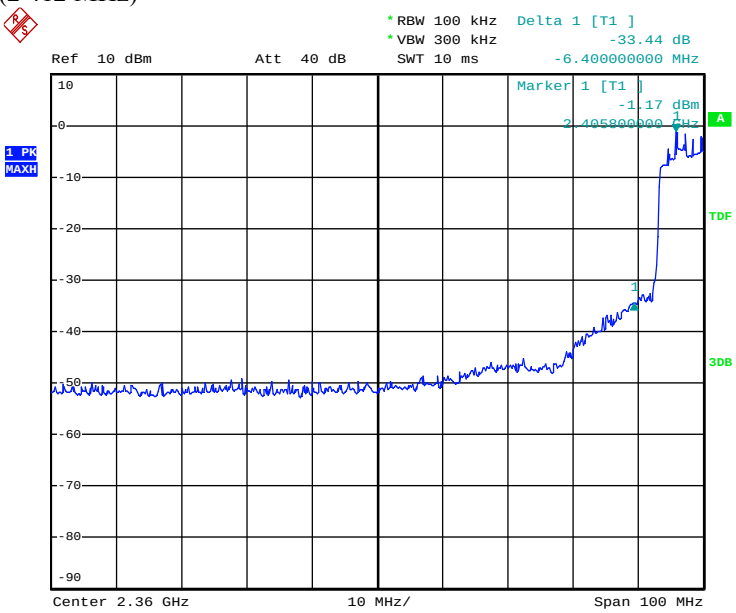


- Highest Chnnel (2 462 MHz)

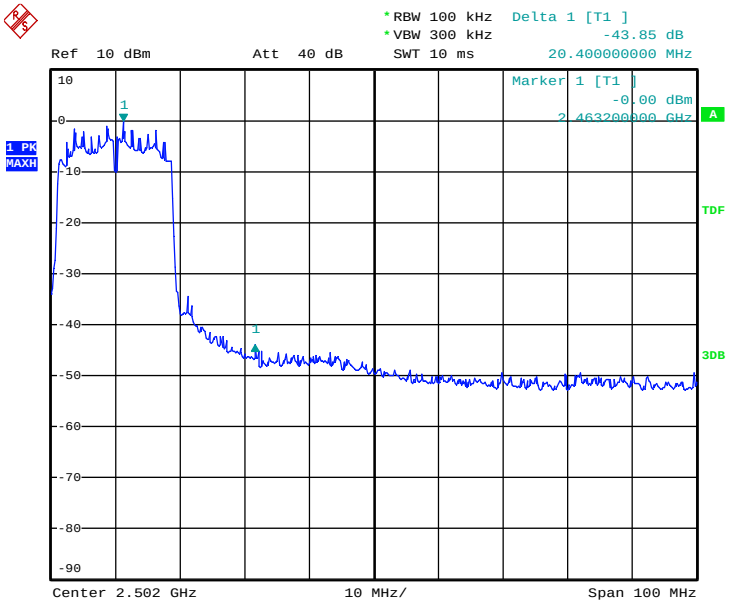


802.11n-20 MHz BW (MIMO)

- Lowest Channel (2 412 MHz)

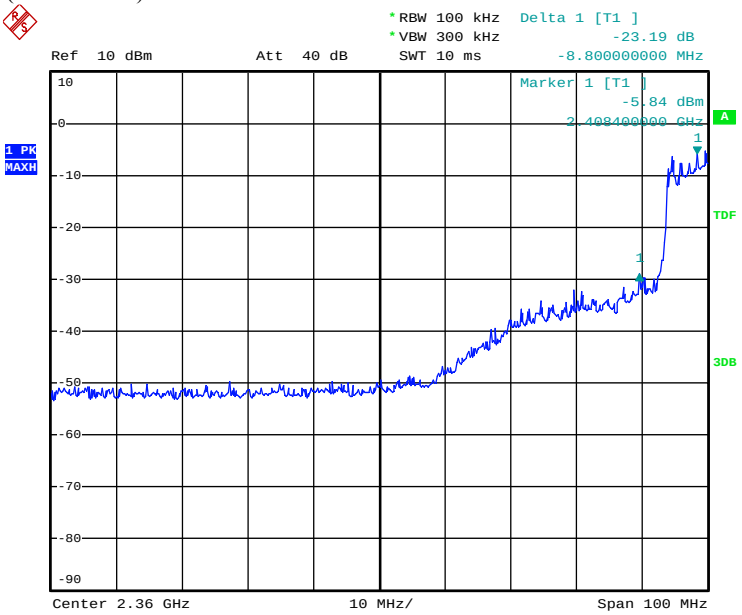


- Highest Chnnel (2 462 MHz)

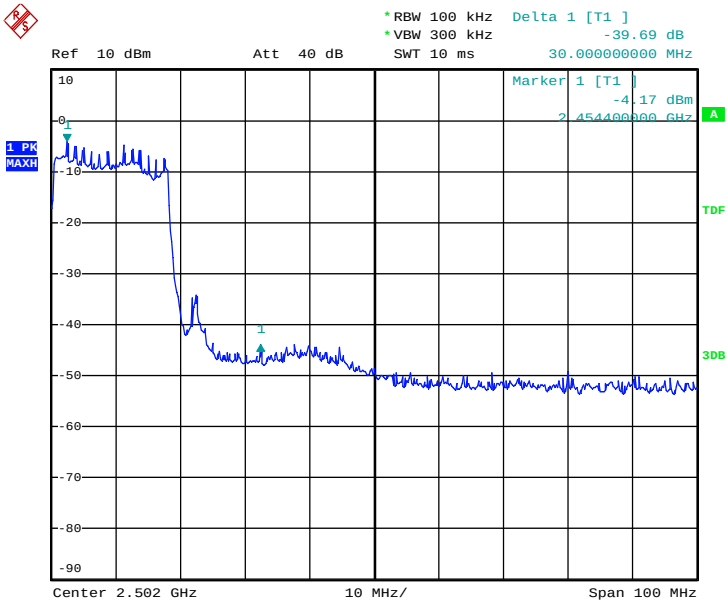


802.11n-40 MHz BW (ANT 1)

- Lowest Channel (2 412 MHz)

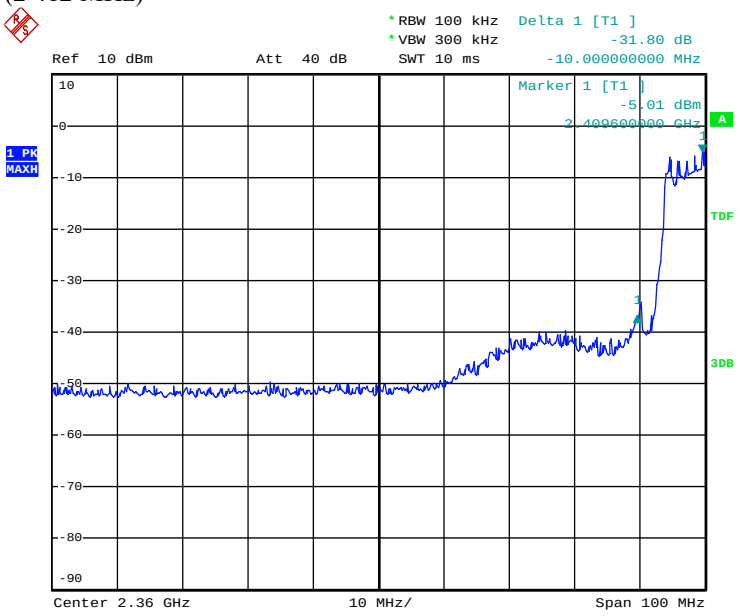


- Highest Chnnel (2 462 MHz)

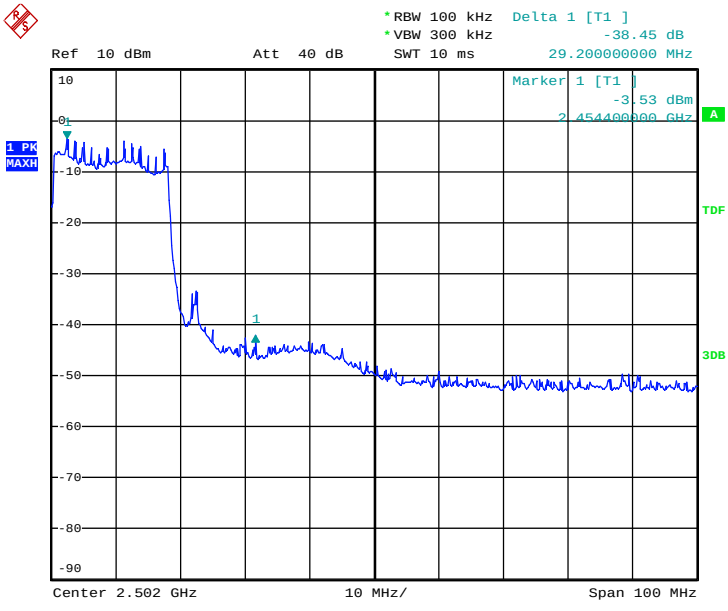


802.11n-40 MHz BW (ANT 2)

- Lowest Channel (2 412 MHz)

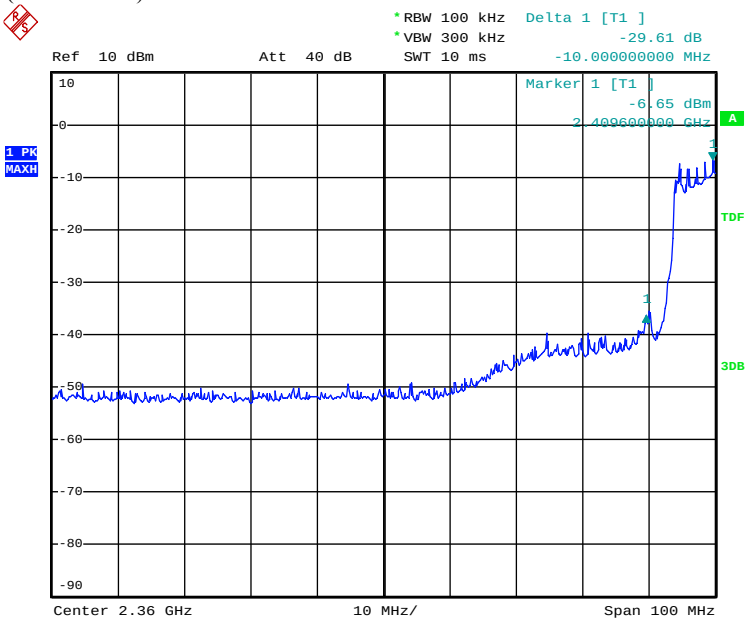


- Highest Chnnel (2 462 MHz)

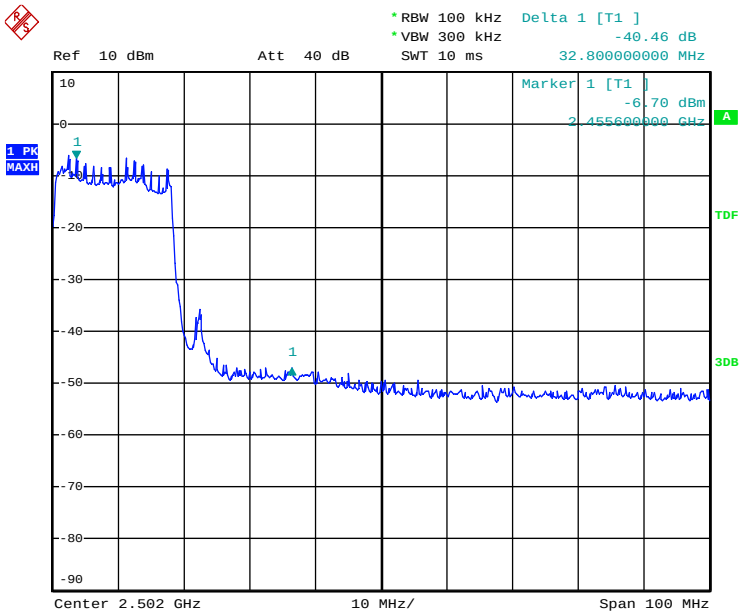


802.11n-40 MHz BW (MIMO)

- Lowest Channel (2 412 MHz)



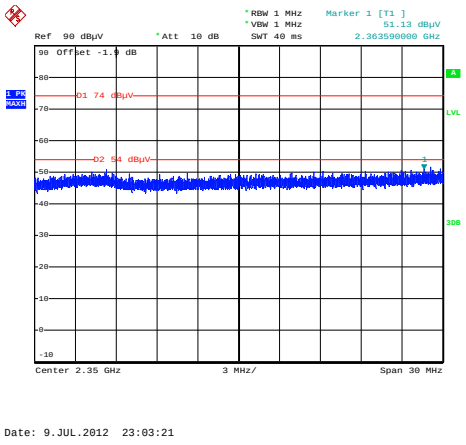
- Highest Chnnel (2 462 MHz)



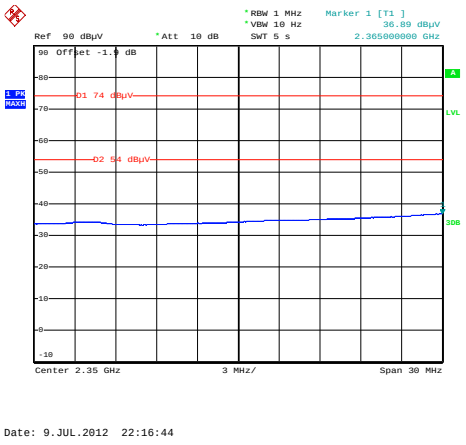
5.6.4 Test Plot (Continue)

Figure 5. Plot of the Band Edge (Radiated)
802.11b (ANT 1)

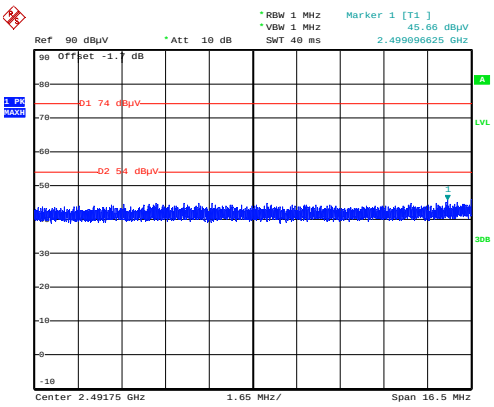
Lowest Channel(2 412 MHz): PEAK



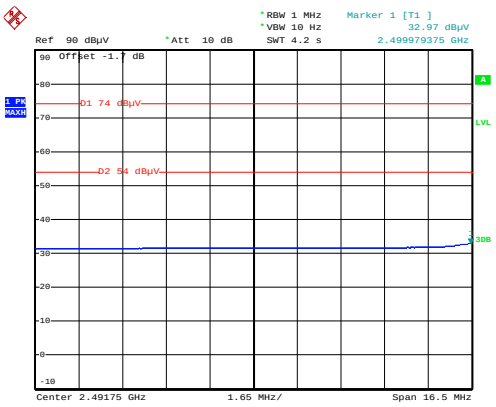
Lowest Channel(2 412 MHz): AVERAGE



Highest Channel(2 462 MHz): PEAK



Highest Channel(2 462 MHz): AVERAGE



*** offset = Factor (ANT Factor+ Amp Gain + Cable Loss) [dB]**
= 1.9 dB (2 412 MHz)
= 1.7 dB (2 462 MHz)

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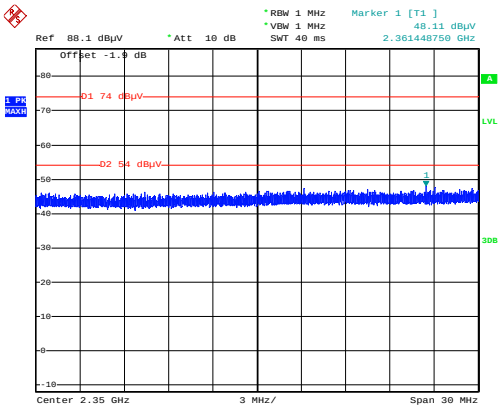
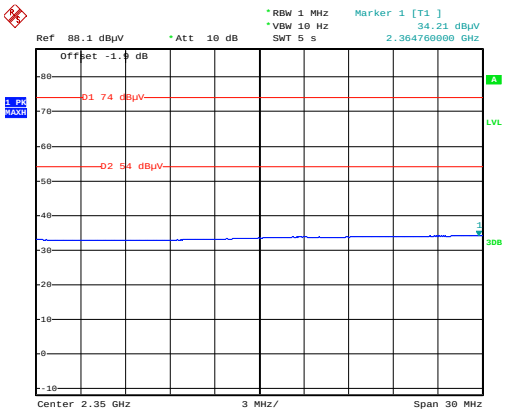
802.11b (ANT 2)

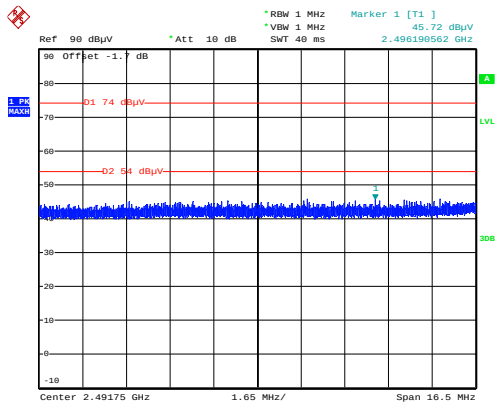
Lowest Channel(2 412 MHz): PEAK



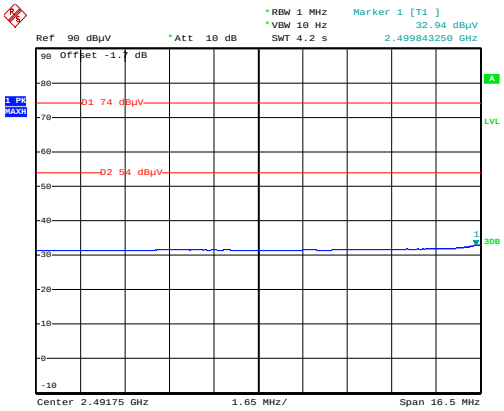
Lowest Channel(2 412 MHz): AVERAGE



Highest Channel(2 462 MHz): PEAK



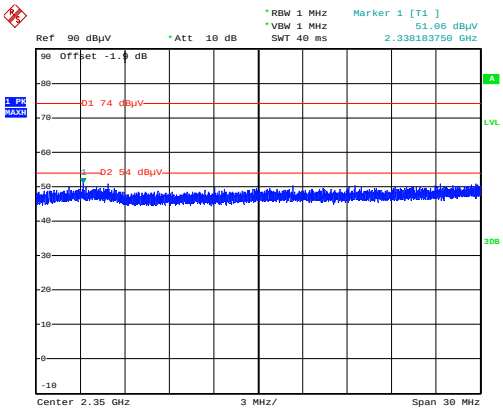
Highest Channel(2 462 MHz): AVERAGE



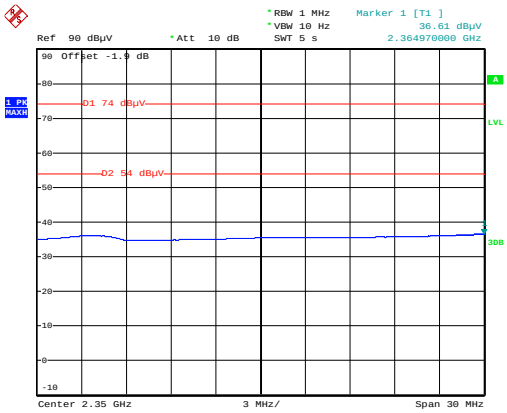
* **offset = Factor (ANT Factor+ Amp Gain + Cable Loss) [dB]**
= 1.9 dB (2 412 MHz)
= 1.7 dB (2 462 MHz)

802.11g (ANT 1)

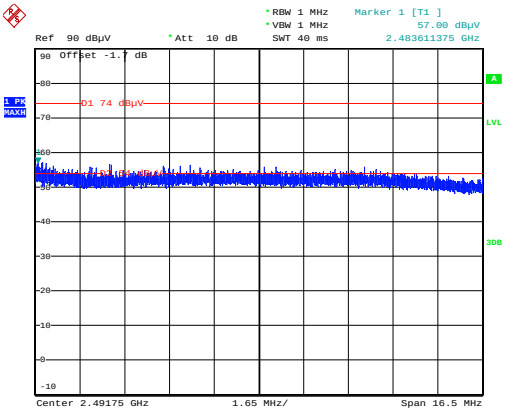
Lowest Channel(2 412 MHz): PEAK



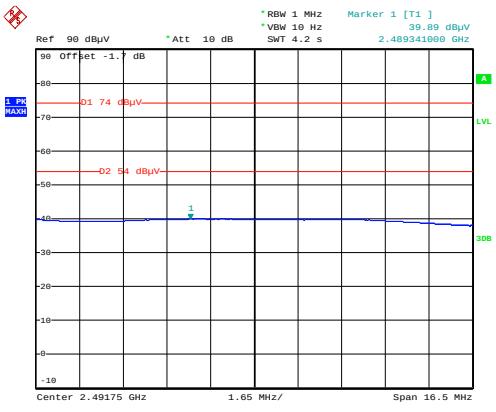
Lowest Channel(2 412 MHz): AVERAGE



Highest Channel(2 462 MHz): PEAK



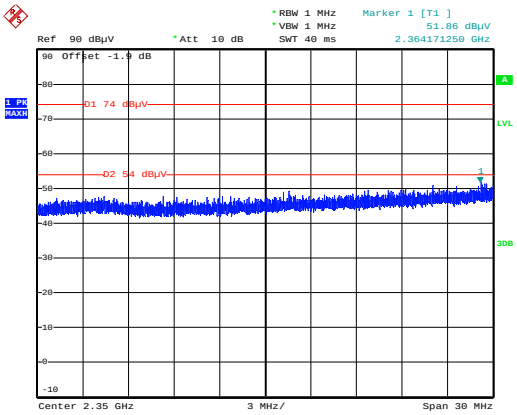
Highest Channel(2 462 MHz): AVERAGE



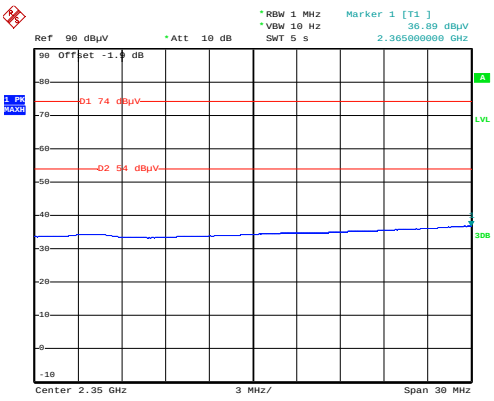
* **offset = Factor (ANT Factor+ Amp Gain + Cable Loss) [dB]**
= 1.9 dB (2 412 MHz)
= 1.7 dB (2 462 MHz)

802.11g (ANT 2)

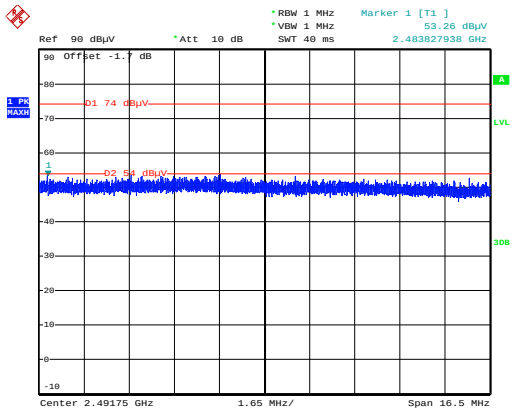
Lowest Channel(2 412 MHz): PEAK



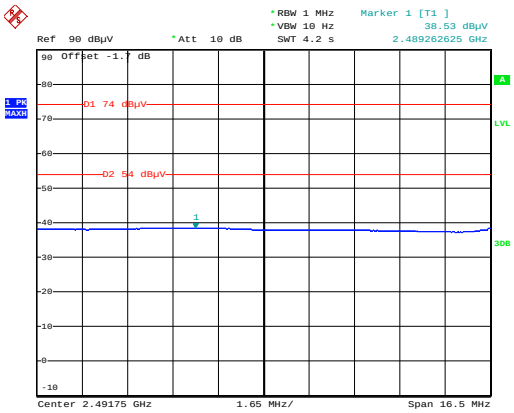
Lowest Channel(2 412 MHz): AVERAGE



Highest Channel(2 462 MHz): PEAK



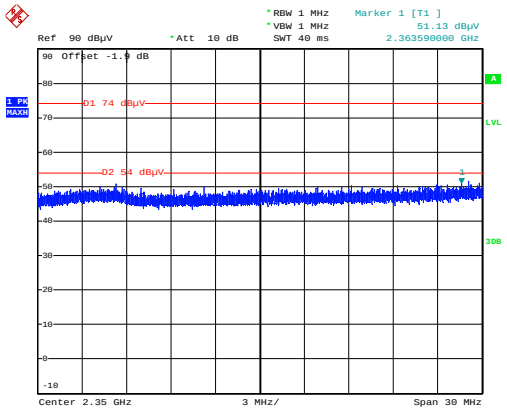
Highest Channel(2 462 MHz): AVERAGE



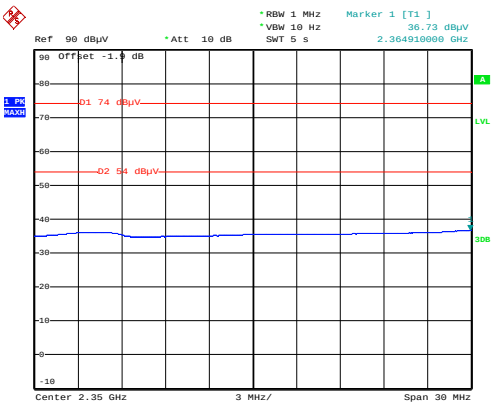
* **offset = Factor (ANT Factor+ Amp Gain + Cable Loss) [dB]**
= 1.9 dB (2 412 MHz)
= 1.7 dB (2 462 MHz)

802.11n-20 MHz BW (ANT 1)

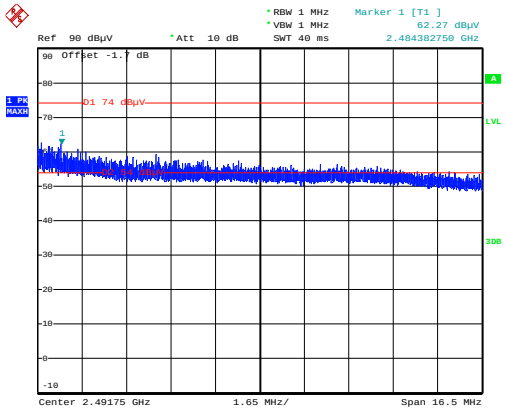
Lowest Channel(2 412 MHz): PEAK



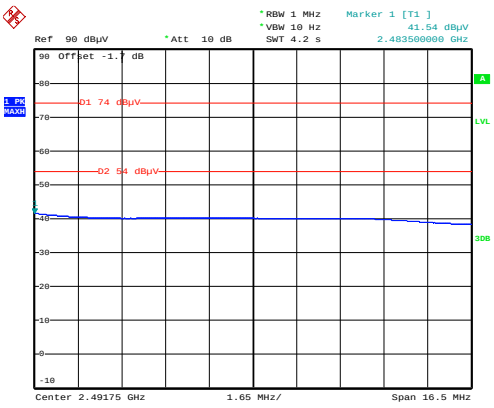
Lowest Channel(2 412 MHz): AVERAGE



Highest Channel(2 462 MHz): PEAK



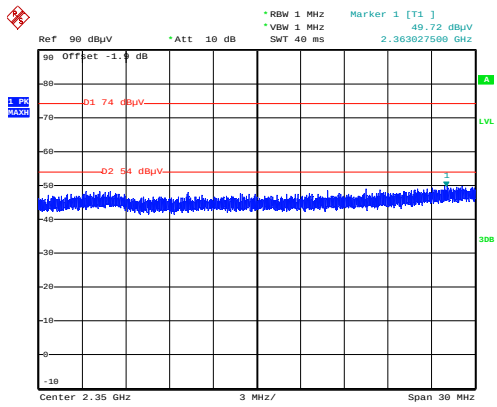
Highest Channel(2 462 MHz): AVERAGE



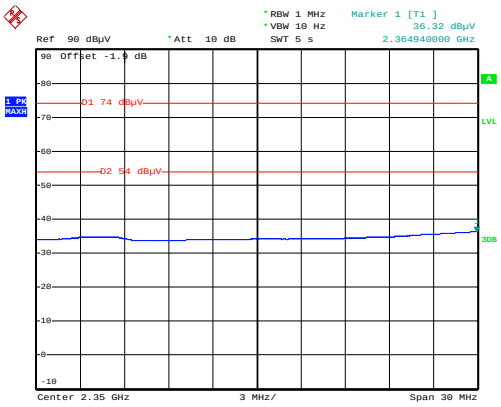
*** offset = Factor (ANT Factor+ Amp Gain + Cable Loss) [dB]**
= 1.9 dB (2 412 MHz)
= 1.7 dB (2 462 MHz)

802.11n-20 MHz BW (ANT 2)

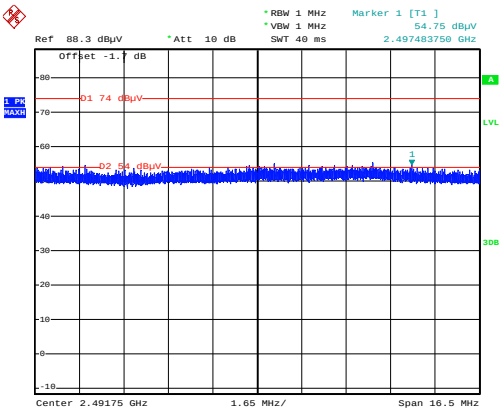
Lowest Channel(2 412 MHz): PEAK



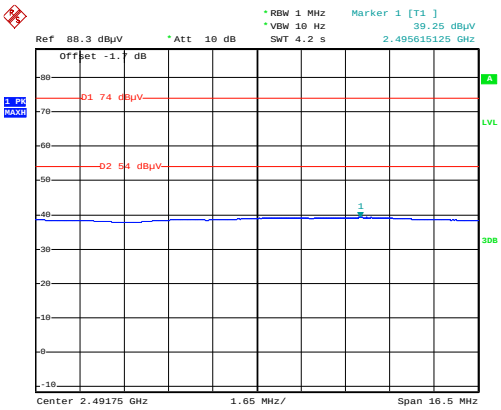
Lowest Channel(2 412 MHz): AVERAGE



Highest Channel(2 462 MHz): PEAK



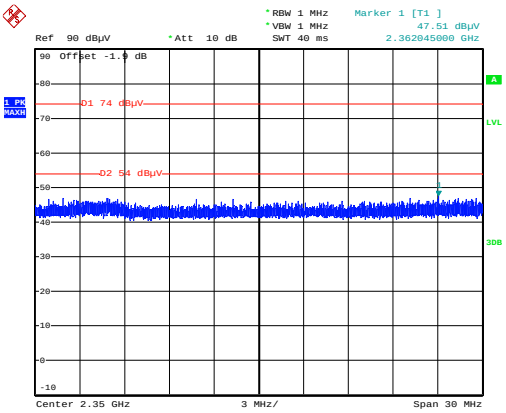
Highest Channel(2 462 MHz): AVERAGE



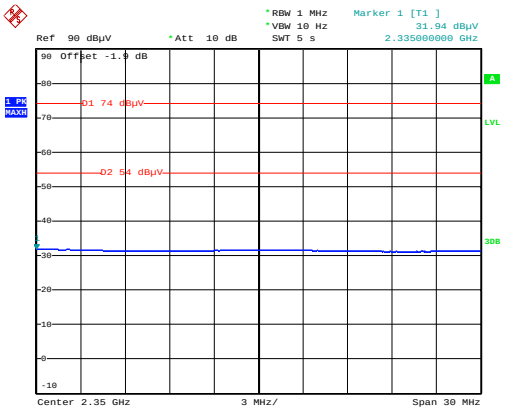
* **offset = Factor (ANT Factor+ Amp Gain + Cable Loss) [dB]**
= 1.9 dB (2 412 MHz)
= 1.7 dB (2 462 MHz)

802.11n-20 MHz BW (MIMO)

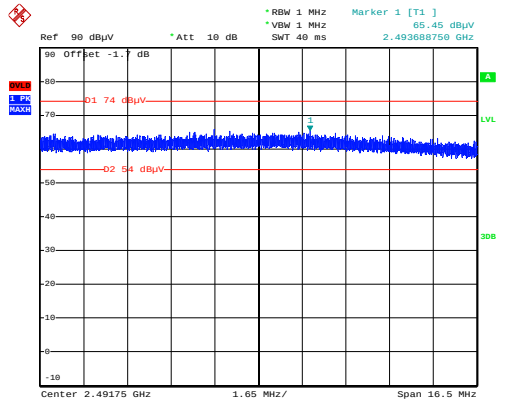
Lowest Channel(2 412 MHz): PEAK



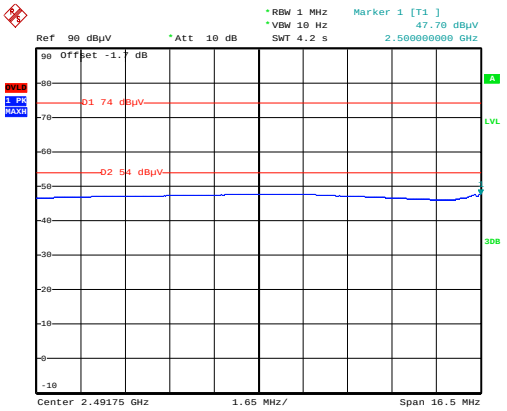
Lowest Channel(2 412 MHz): AVERAGE



Highest Channel(2 462 MHz): PEAK



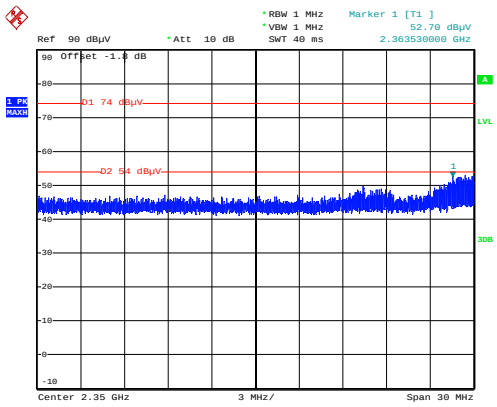
Highest Channel(2 462 MHz): AVERAGE



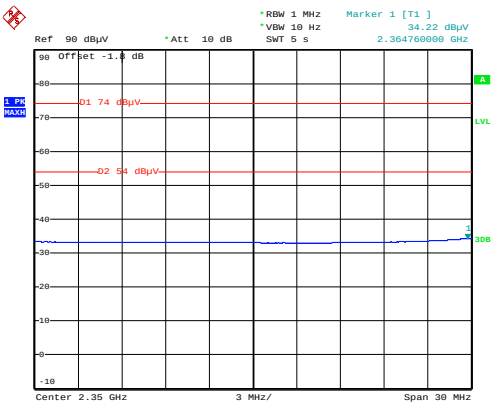
* **offset = Factor (ANT Factor+ Amp Gain + Cable Loss) [dB]**
= 1.9 dB (2 412 MHz)
= 1.7 dB (2 462 MHz)

802.11n-40 MHz BW (ANT 1)

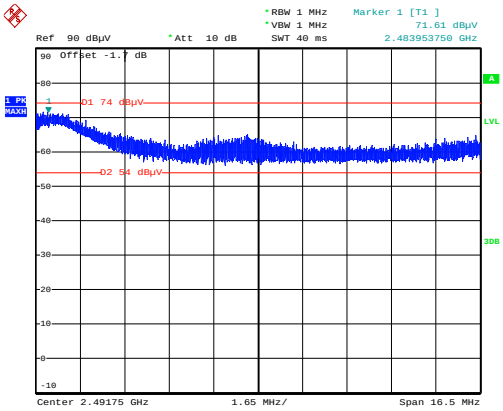
Lowest Channel(2 422 MHz): PEAK



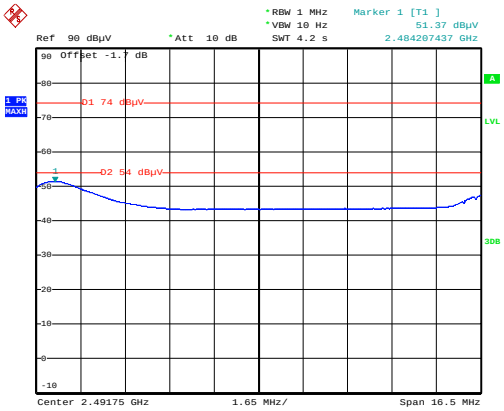
Lowest Channel(2 422 MHz): AVERAGE



Highest Channel(2 452 MHz): PEAK



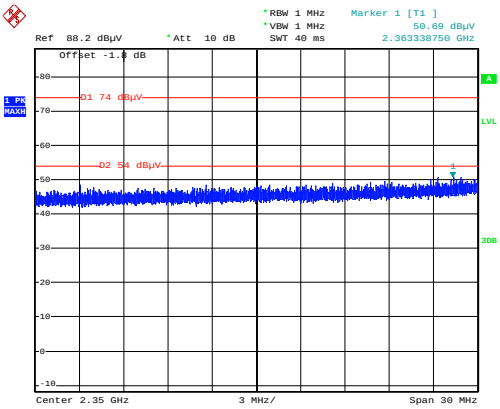
Highest Channel(2 452 MHz): AVERAGE



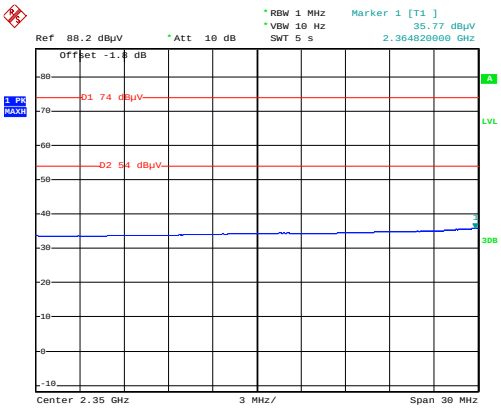
* **offset = Factor (ANT Factor+ Amp Gain + Cable Loss) [dB]**
= 1.9 dB (2 412 MHz)
= 1.7 dB (2 462 MHz)

802.11n-40 MHz BW (ANT 2)

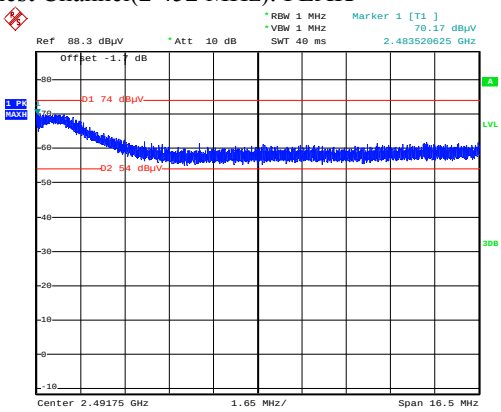
Lowest Channel(2 422 MHz): PEAK



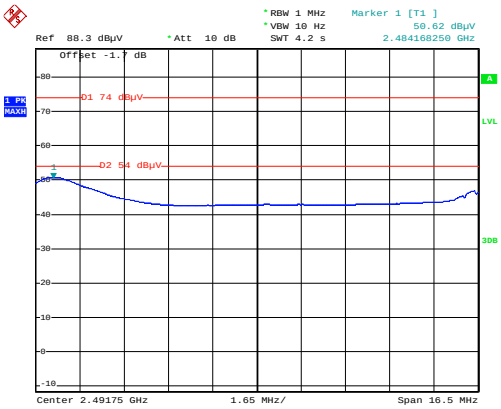
Lowest Channel(2 422 MHz): AVERAGE



Highest Channel(2 452 MHz): PEAK



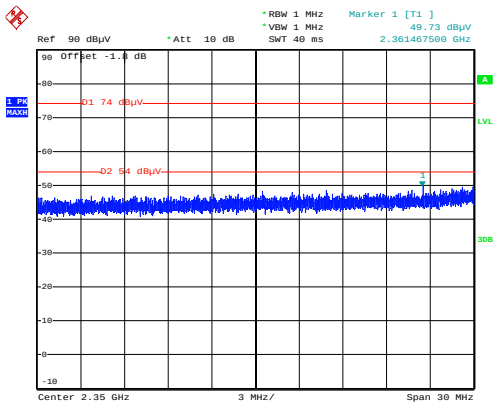
Highest Channel(2 452 MHz): AVERAGE



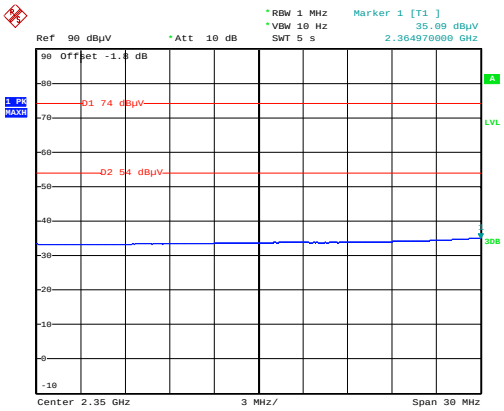
*** offset = Factor (ANT Factor+ Amp Gain + Cable Loss) [dB]**
= 1.9 dB (2 412 MHz)
= 1.7 dB (2 462 MHz)

802.11n-40 MHz BW (MIMO)

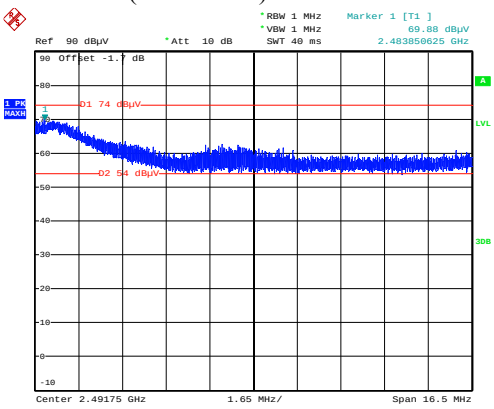
Lowest Channel(2 422 MHz): PEAK



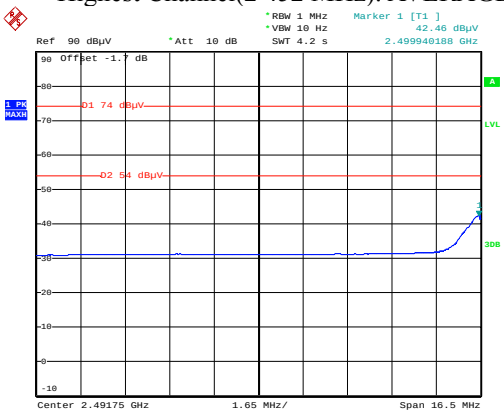
Lowest Channel(2 422 MHz): AVERAGE



Highest Channel(2 452 MHz): PEAK



Highest Channel(2 452 MHz): AVERAGE

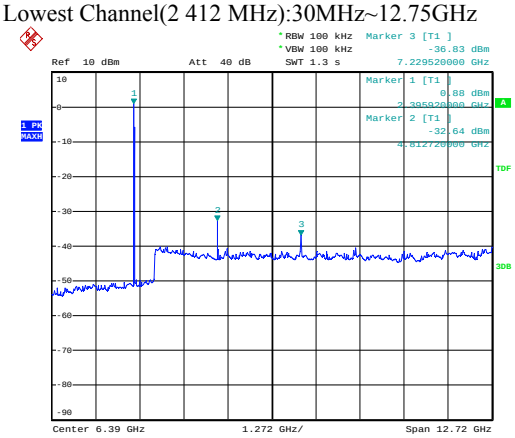


*** offset = Factor (ANT Factor+ Amp Gain + Cable Loss) [dB]**
= 1.9 dB (2 412 MHz)
= 1.7 dB (2 462 MHz)

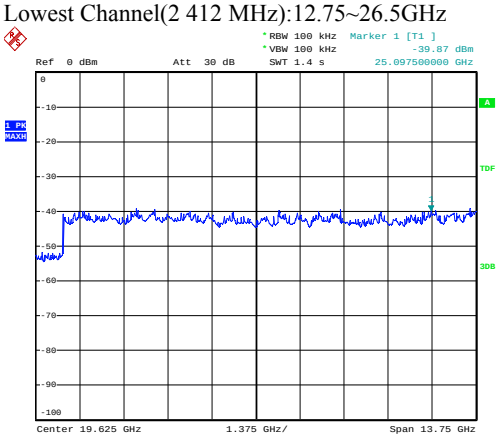
480-5 Shin-dong, Yeongtong-gu, Suwon-city, Gyunggi-do, 443-390, Korea
82 31 336 9919 (Main) 82 31 336 4767 (Fax)

Figure 6. Plot of the Spurious RF conducted emissions
802.11b (ANT 1)

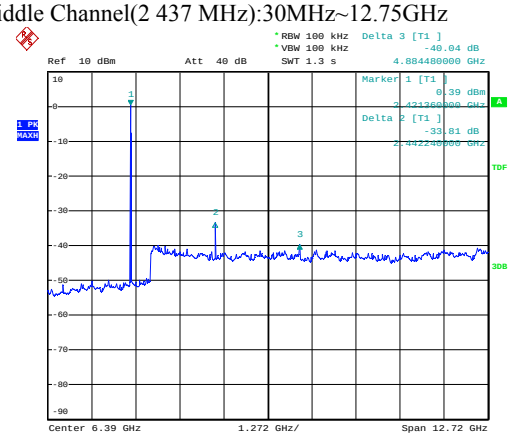
Lowest Channel(2 412 MHz):30MHz~12.75GHz



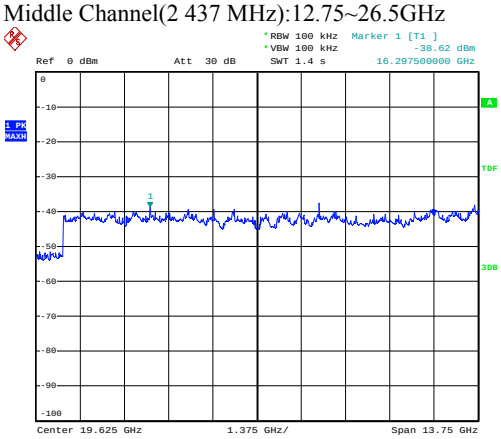
Lowest Channel(2 412 MHz):12.75~26.5GHz



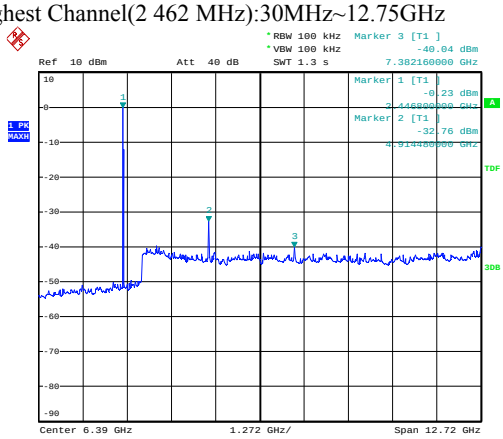
Middle Channel(2 437 MHz):30MHz~12.75GHz



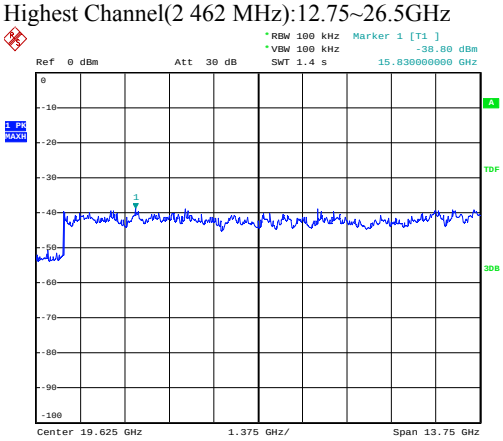
Middle Channel(2 437 MHz):12.75~26.5GHz



Highest Channel(2 462 MHz):30MHz~12.75GHz

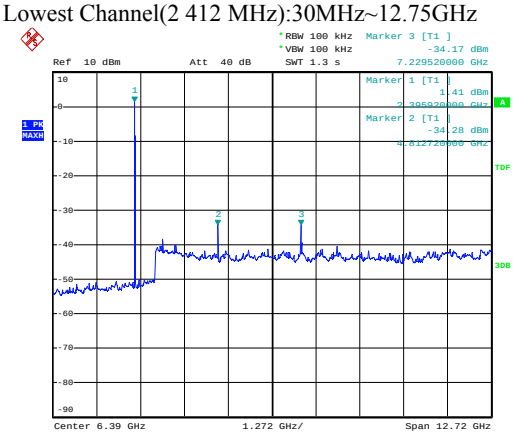


Highest Channel(2 462 MHz):12.75~26.5GHz

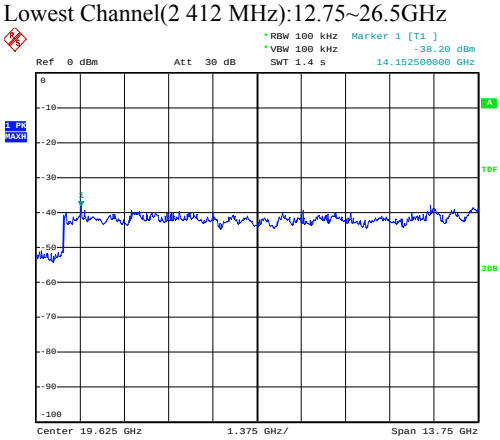


802.11b (ANT 2)

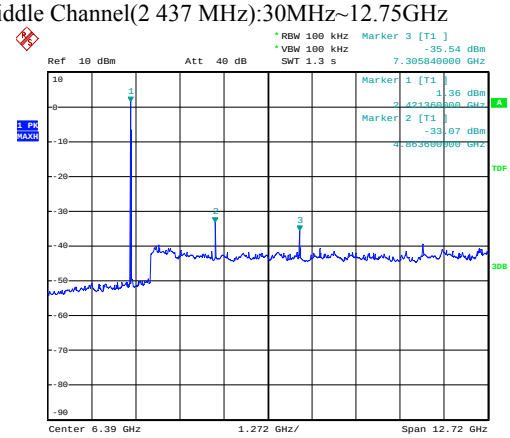
Lowest Channel(2 412 MHz):30MHz~12.75GHz



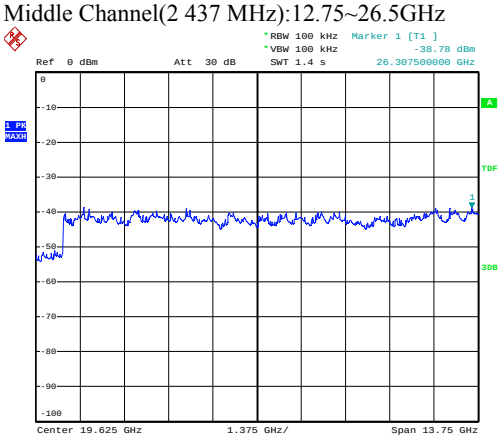
Lowest Channel(2 412 MHz):12.75~26.5GHz



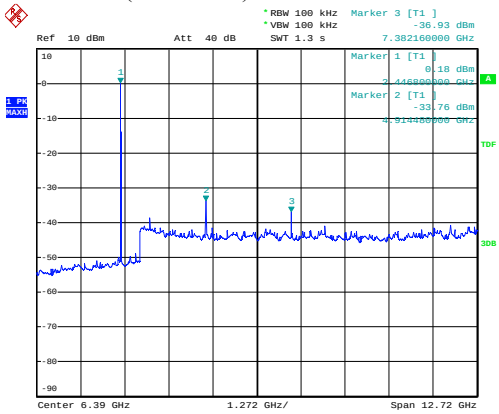
Middle Channel(2 437 MHz):30MHz~12.75GHz



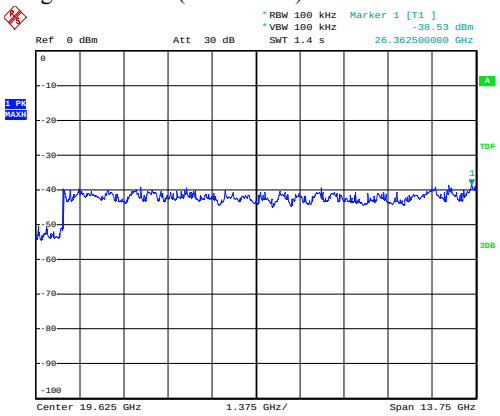
Middle Channel(2 437 MHz):12.75~26.5GHz



Highest Channel(2 462 MHz):30MHz~12.75GHz

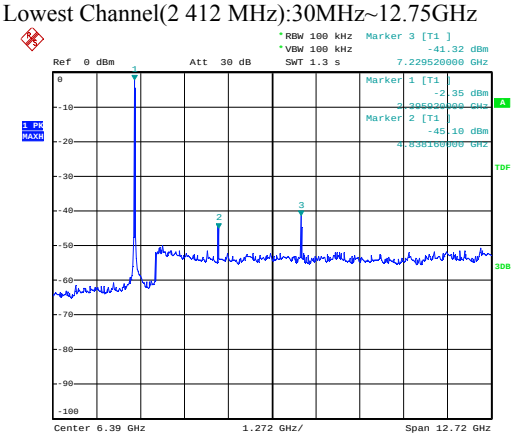


Highest Channel(2 462 MHz):12.75~26.5GHz

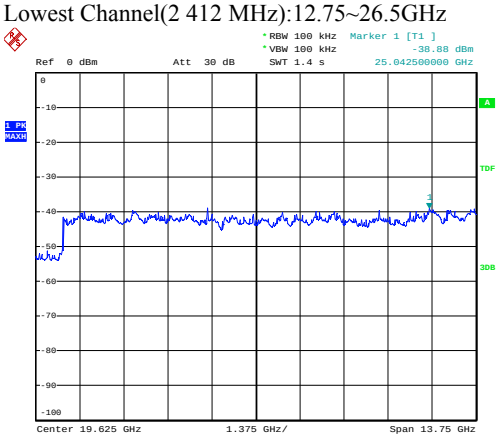


802.11g (ANT 1)

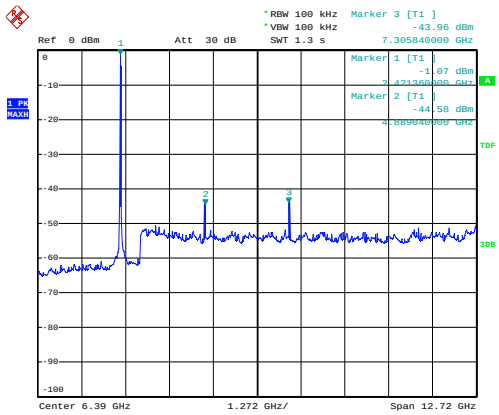
Lowest Channel(2 412 MHz):30MHz~12.75GHz



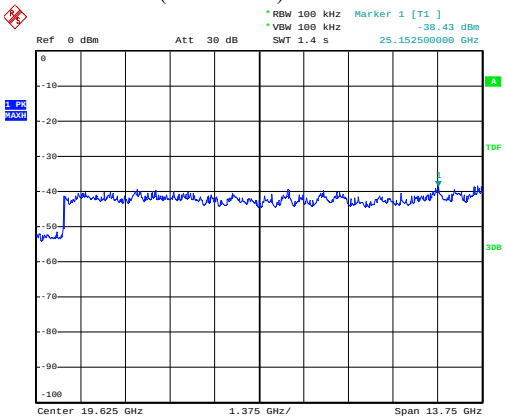
Lowest Channel(2 412 MHz):12.75~26.5GHz



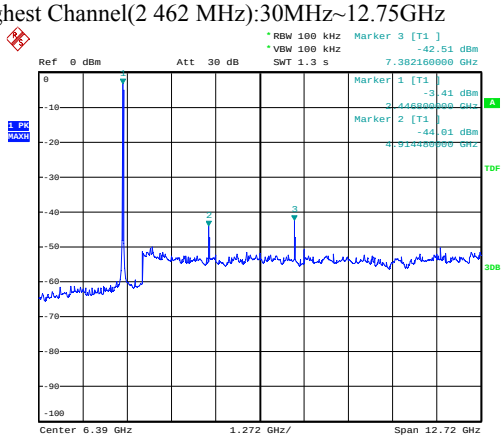
Middle Channel(2 437 MHz):30MHz~12.75GHz



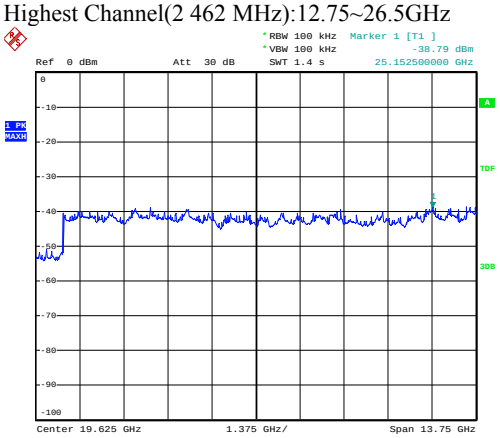
Middle Channel(2 437 MHz):12.75~26.5GHz



Highest Channel(2 462 MHz):30MHz~12.75GHz

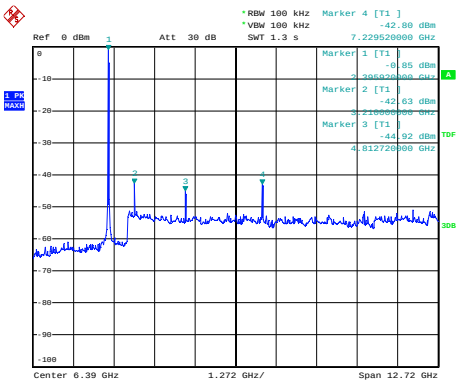


Highest Channel(2 462 MHz):12.75~26.5GHz

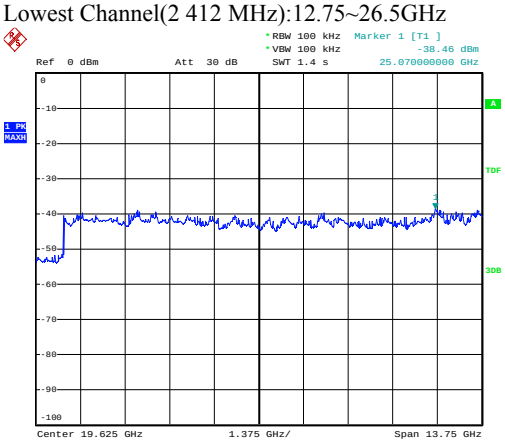


802.11g (ANT 2)

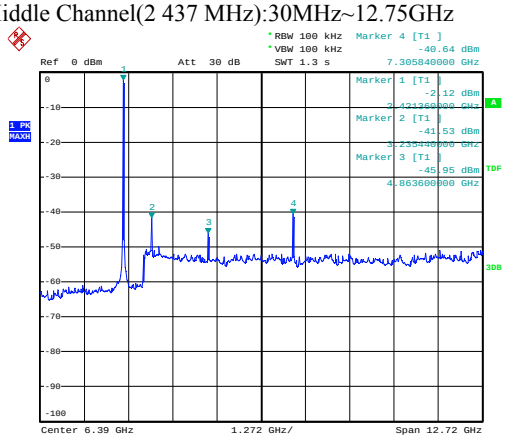
Lowest Channel(2 412 MHz):30MHz~12.75GHz



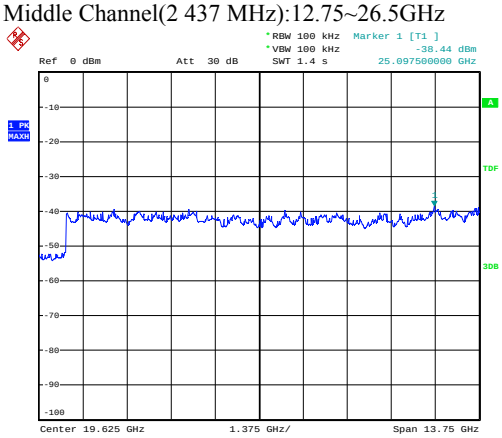
Lowest Channel(2 412 MHz):12.75~26.5GHz



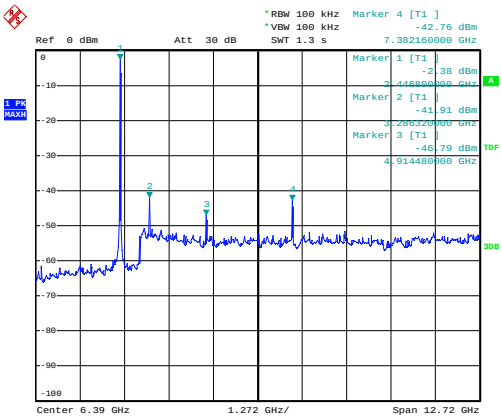
Middle Channel(2 437 MHz):30MHz~12.75GHz



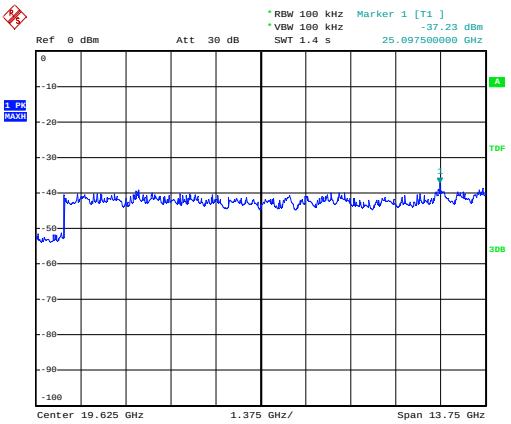
Middle Channel(2 437 MHz):12.75~26.5GHz



Highest Channel(2 462 MHz):30MHz~12.75GHz

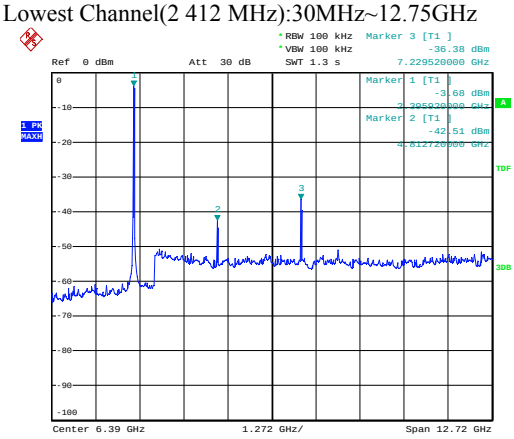


Highest Channel(2 462 MHz):12.75~26.5GHz

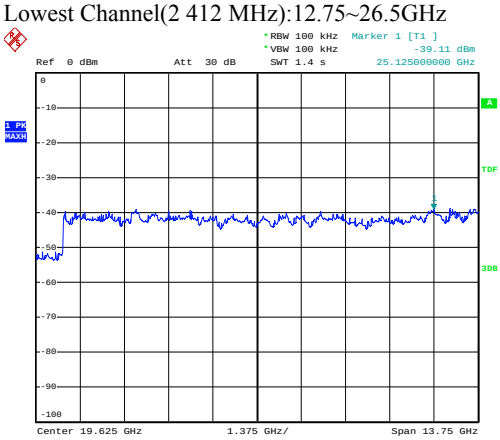


802.11n-20 MHz BW (ANT 1)

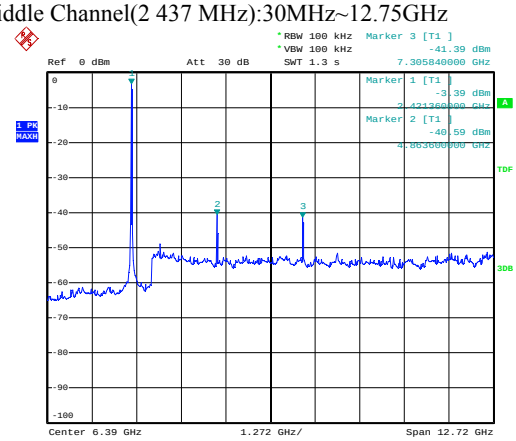
Lowest Channel(2 412 MHz):30MHz~12.75GHz



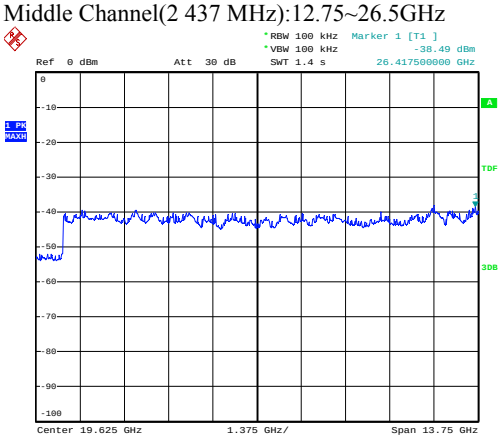
Lowest Channel(2 412 MHz):12.75~26.5GHz



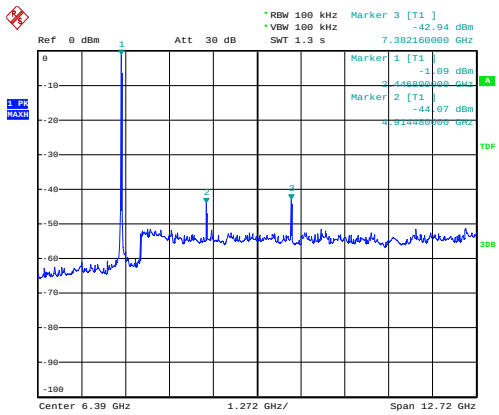
Middle Channel(2 437 MHz):30MHz~12.75GHz



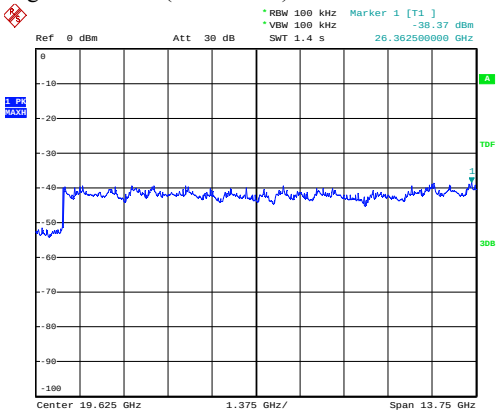
Middle Channel(2 437 MHz):12.75~26.5GHz



Highest Channel(2 462 MHz):30MHz~12.75GHz

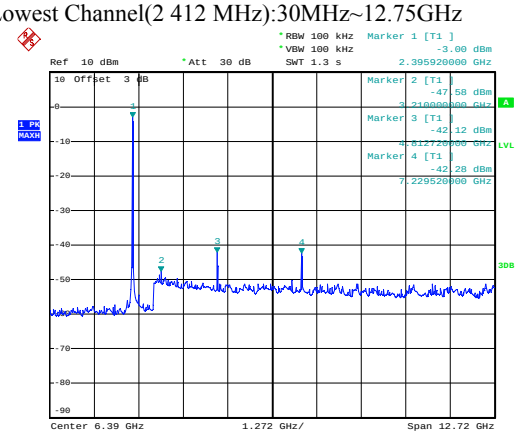


Highest Channel(2 462 MHz):12.75~26.5GHz

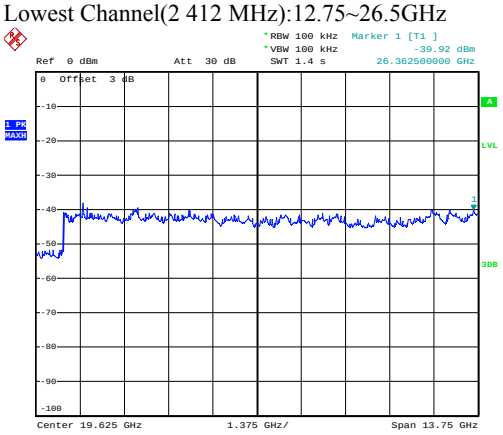


802.11n-20 MHz BW (ANT 2)

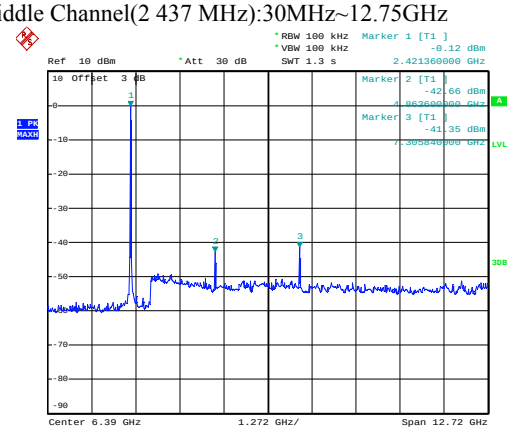
Lowest Channel(2 412 MHz):30MHz~12.75GHz



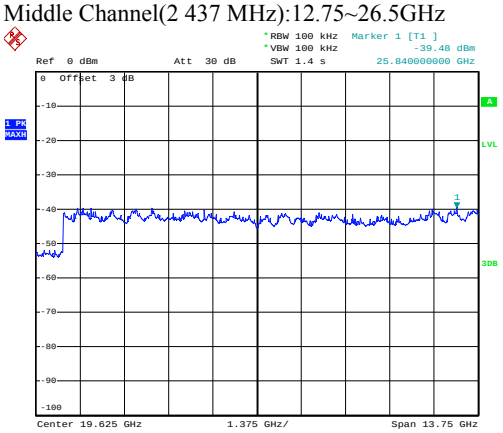
Lowest Channel(2 412 MHz):12.75~26.5GHz



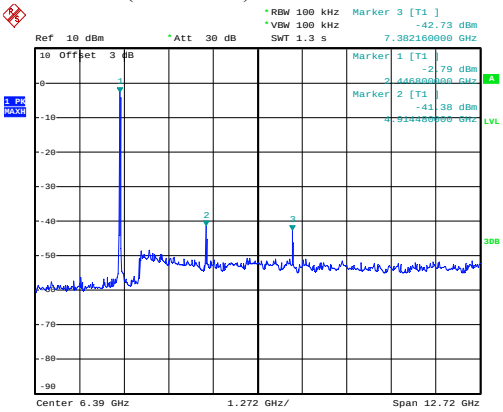
Middle Channel(2 437 MHz):30MHz~12.75GHz



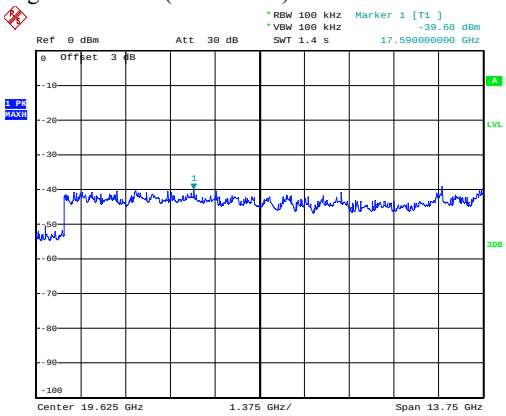
Middle Channel(2 437 MHz):12.75~26.5GHz



Highest Channel(2 462 MHz):30MHz~12.75GHz

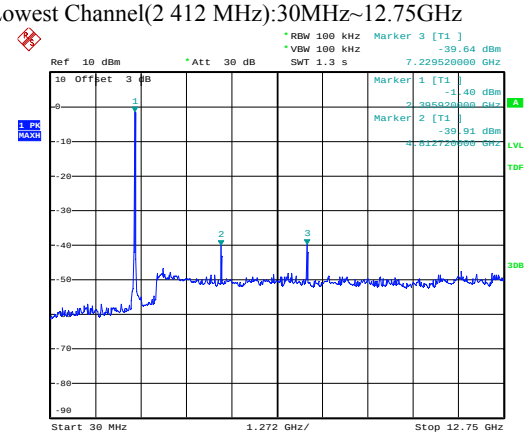


Highest Channel(2 462 MHz):12.75~26.5GHz

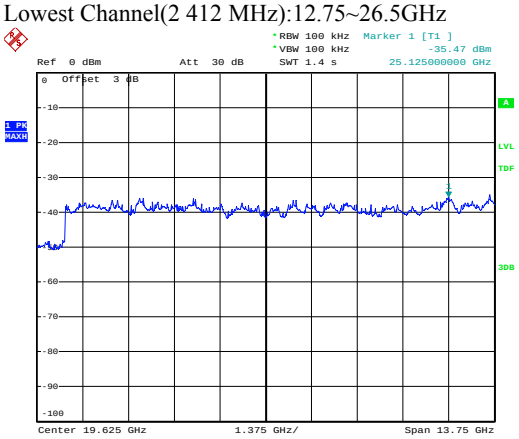


802.11n-20 MHz BW (MIMO)

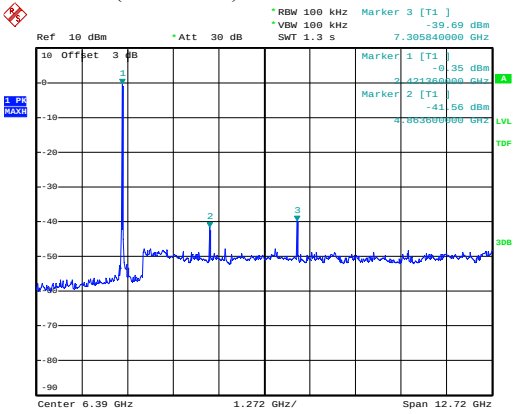
Lowest Channel(2 412 MHz):30MHz~12.75GHz



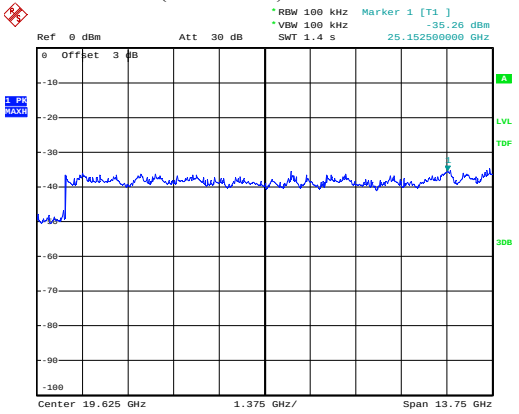
Lowest Channel(2 412 MHz):12.75~26.5GHz



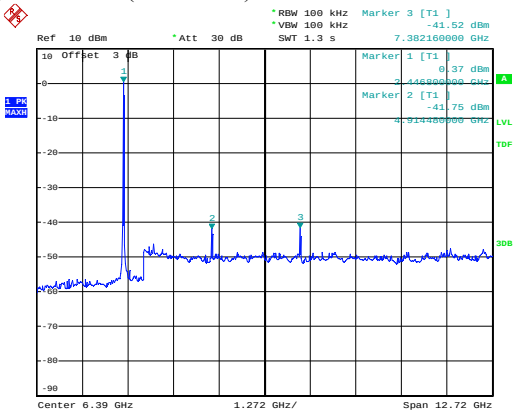
Middle Channel(2 437 MHz):30MHz~12.75GHz



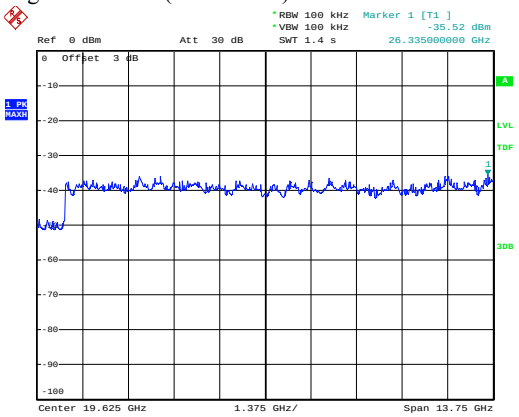
Middle Channel(2 437 MHz):12.75~26.5GHz



Highest Channel(2 462 MHz):30MHz~12.75GHz

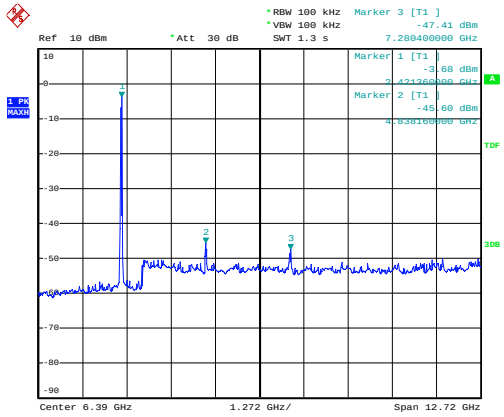


Highest Channel(2 462 MHz):12.75~26.5GHz

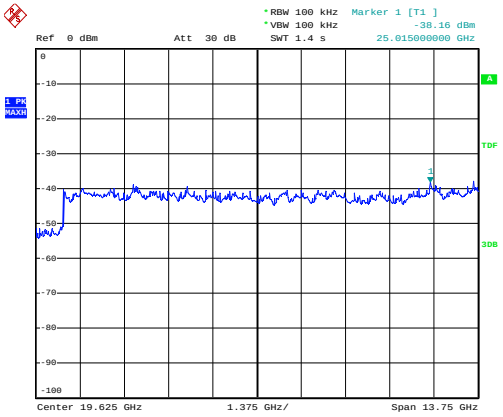


802.11n-40 MHz BW (ANT 1)

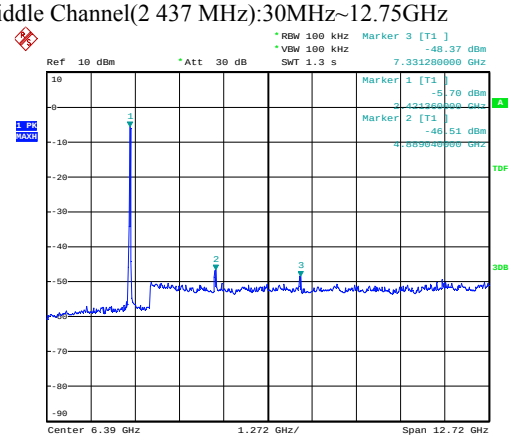
Lowest Channel(2 422 MHz):30MHz~12.75GHz



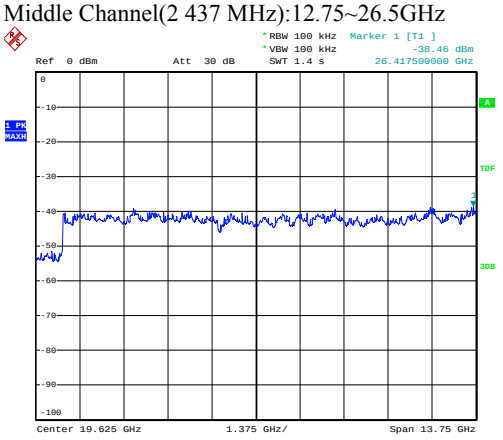
Lowest Channel(2 422 MHz):12.75~26.5GHz



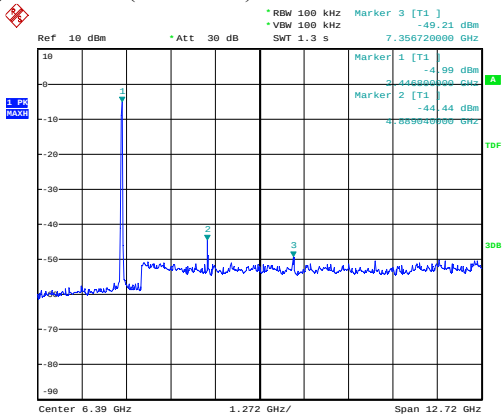
Middle Channel(2 437 MHz):30MHz~12.75GHz



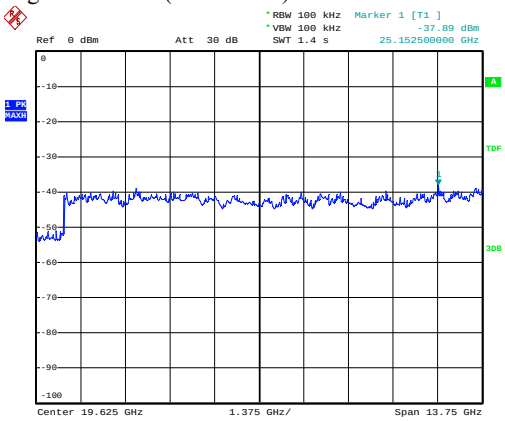
Middle Channel(2 437 MHz):12.75~26.5GHz



Highest Channel(2 452 MHz):30MHz~12.75GHz

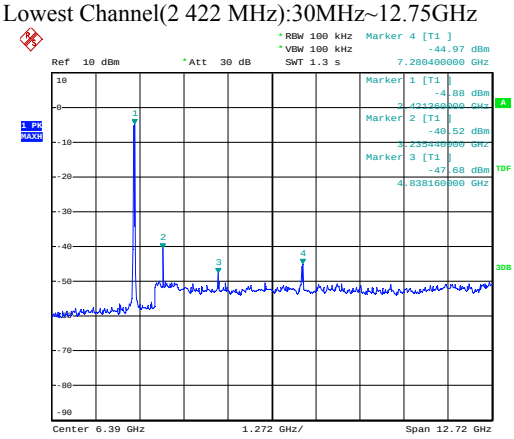


Highest Channel(2 452 MHz):12.75~26.5GHz

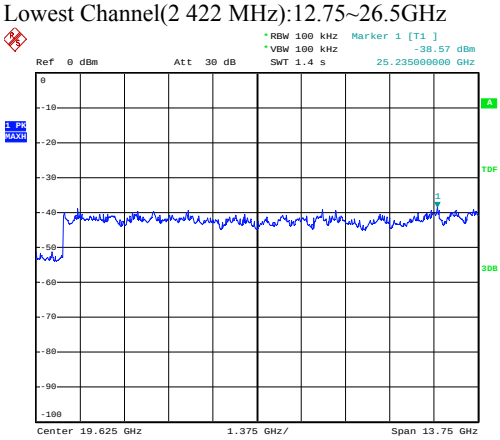


802.11n-40 MHz BW (ANT 2)

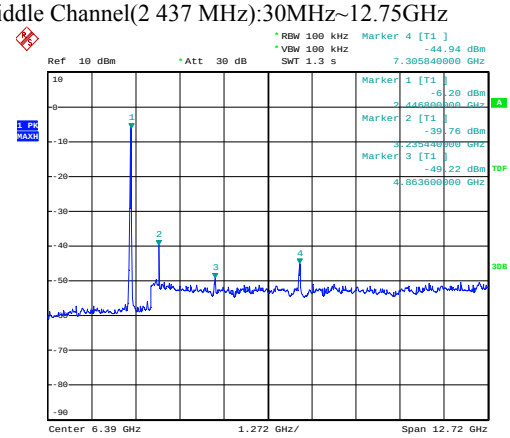
Lowest Channel(2 422 MHz):30MHz~12.75GHz



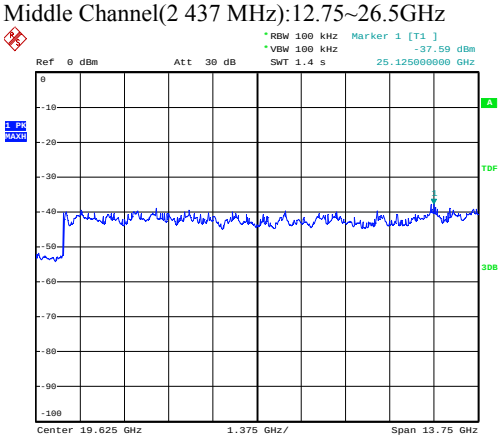
Lowest Channel(2 422 MHz):12.75~26.5GHz



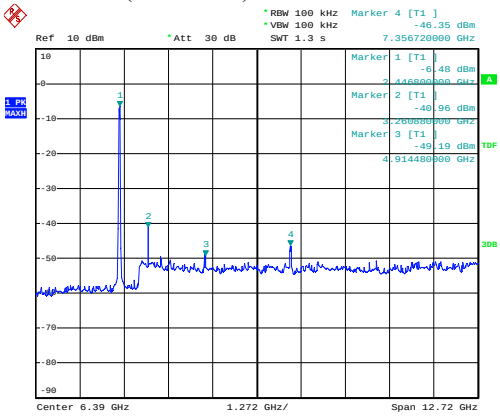
Middle Channel(2 437 MHz):30MHz~12.75GHz



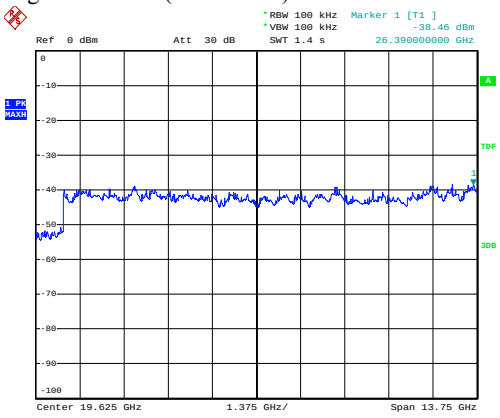
Middle Channel(2 437 MHz):12.75~26.5GHz



Highest Channel(2 452 MHz):30MHz~12.75GHz

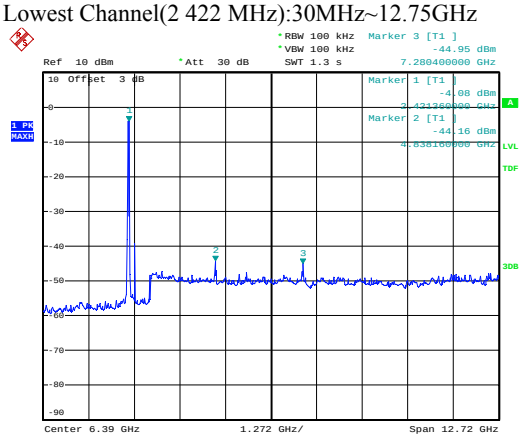


Highest Channel(2 452 MHz):12.75~26.5GHz

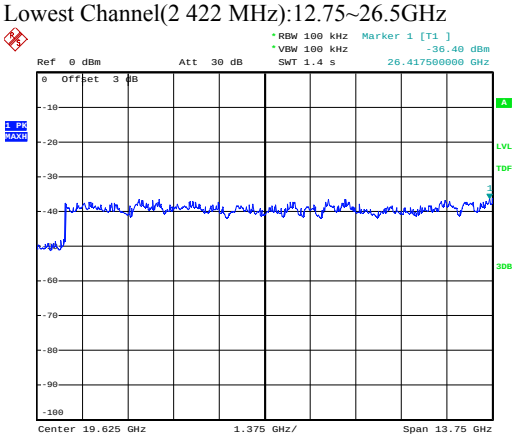


802.11n-40 MHz BW (MIMO)

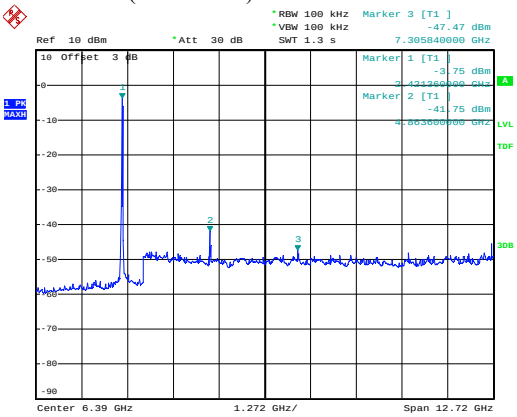
Lowest Channel(2 422 MHz):30MHz~12.75GHz



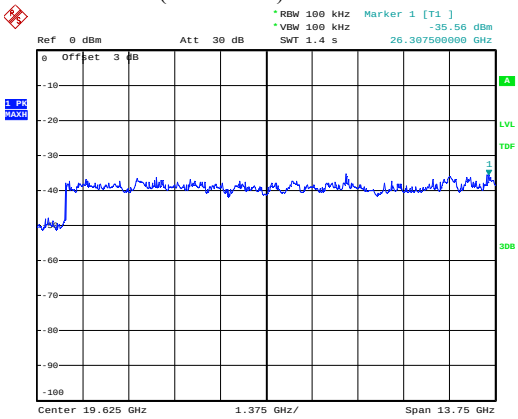
Lowest Channel(2 422 MHz):12.75~26.5GHz



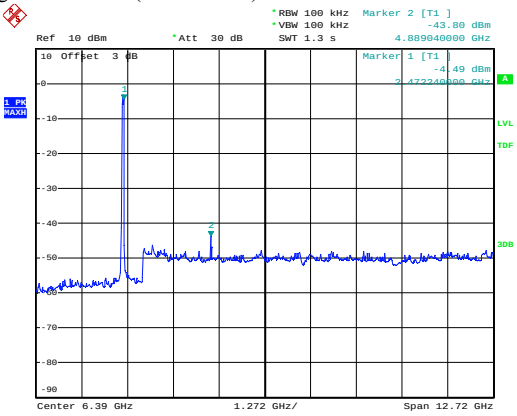
Middle Channel(2 437 MHz):30MHz~12.75GHz



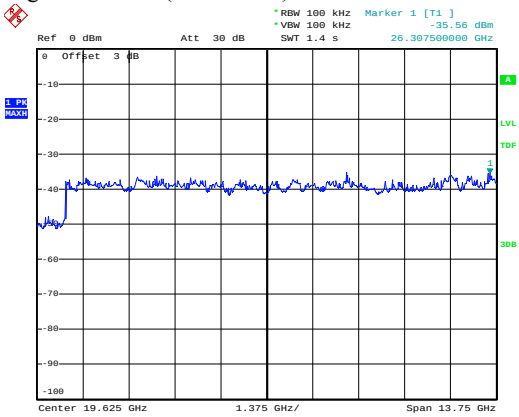
Middle Channel(2 437 MHz):12.75~26.5GHz



Highest Channel(2 452 MHz):30MHz~12.75GHz



Highest Channel(2 452 MHz):12.75~26.5GHz



5.6 Conducted Emission

5.6.1 Regulation

According to §15.207(a), for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50μH/50Ω line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency of emission (MHz)	Conducted limit (dBμV)	
	Qausi-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.

According to §15.107(a), for unintentional device, except for Class A digital devices, line conducted emission limits are the same as the above table.

5.6.2 Measurement Procedure

1. The EUT was placed on a wooden table of size, 1 m by 1.5 m, raised 80 cm in which is located 40 cm away from the vertical wall and 1.5m away from the side wall of the shielded room.
2. Each current-carrying conductor of the EUT power cord was individually connected through a 50Ω/50μH LISN, which is an input transducer to a Spectrum Analyzer or an EMI/Field Intensity Meter, to the input power source.
3. Exploratory measurements were made to identify the frequency of the emission that had the highest amplitude relative to the limit by operating the EUT in a range of typical modes of operation, cable position, and with a typical system equipment configuration and arrangement. Based on the exploratory tests of the EUT, the one EUT cable configuration and arrangement and mode of operation that had produced the emission with the highest amplitude relative to the limit was selected for the final measurement.
4. The final test on all current-carrying conductors of all of the power cords to the equipment that comprises the EUT (but not the cords associated with other non-EUT equipment is the system) was then performed over the frequency range of 0.15 MHz to 30 MHz.
5. The measurements were made with the detector set to PEAK amplitude within a bandwidth of 10 kHz or to QUASI-PEAK and AVERAGE within a bandwidth of 9 kHz. The EUT was in transmitting mode during the measurements.

5.6.3 Test Result

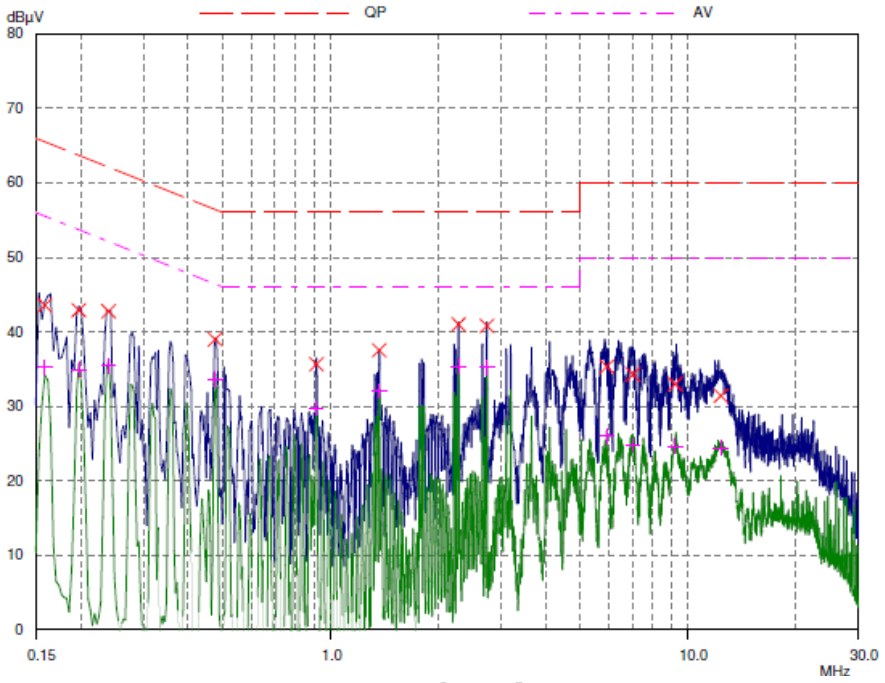
-Complied

Frequency [MHz]	Correction Factor		Line	Quasi-peak				Average			
	LISN	Cable		Limit [dBuV]	Reading [dBuV]	Result [dBuV]	Margin [dB]	Limit [dBuV]	Reading [dBuV]	Result [dBuV]	Margin [dB]
0.159	0.49	0.02	H	65.52	43.56	44.07	21.45	55.52	35.21	35.72	19.80
0.198	0.50	0.02	N	63.69	44.44	44.96	18.73	53.69	28.98	29.50	24.19
0.240	0.50	0.02	N	62.10	42.78	43.30	18.80	52.10	29.53	30.05	22.05
0.279	0.50	0.02	N	60.85	40.16	40.68	20.17	50.85	27.45	27.97	22.88
0.477	0.59	0.03	H	56.39	38.98	39.60	16.79	46.39	33.63	34.25	12.14
0.912	0.88	0.05	N	56.00	30.29	31.22	24.78	46.00	23.32	24.25	21.75
0.915	0.89	0.05	H		35.64	36.58	19.42		29.74	30.68	15.32
1.371	0.98	0.06	H		37.54	38.58	17.42		32.05	33.09	12.91
2.886	2.06	0.07	H		41.00	43.13	12.87		35.37	37.50	8.50
2.742	2.43	0.08	H		40.81	43.32	12.68		35.21	37.72	8.28
5.940	3.88	0.13	H	60.00	35.32	39.33	20.67	50.00	25.96	29.97	20.03
6.400	3.92	0.13	N		33.18	3.23	22.77		24.70	28.75	21.25
7.030	3.79	0.14	H		34.27	38.20	21.80		24.80	28.73	21.27
9.200	4.18	0.15	N		31.74	36.07	23.93		24.96	29.29	20.71
9.230	4.22	0.15	H		32.97	37.34	22.66		24.63	29.00	21.00
12.110	4.33	0.16	N		32.89	37.38	22.62		24.60	29.09	20.91

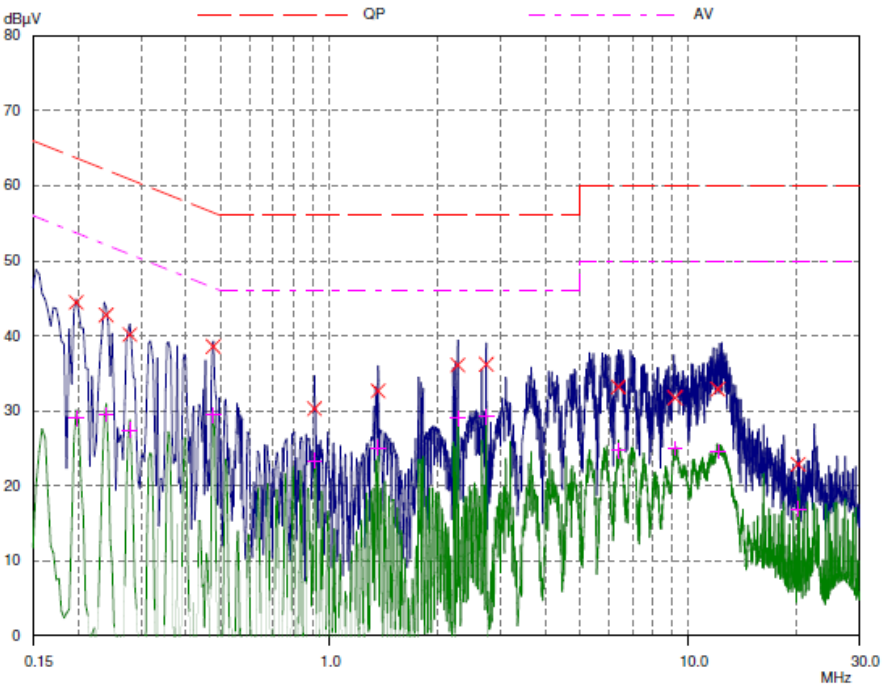
480-5 Shin-dong, Yeongtong-gu, Suwon-city, Gyunggi-do, 443-390, Korea
82 31 336 9919 (Main) 82 31 336 4767 (Fax)

5.6.4 Test plot

[Hot-Line]



[Neutral-Line]



5.7 RF Exposure

5.7.1 Regulation

According to §15.247(i), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines. See § 1.1307(b)(1) of this Chapter.

Limits for Maximum Permissive Exposure: RF exposure is calculated.

Frequency Range	Electric Field Strength [V/m]	Magnetic Field Strength [A/m]	Power Density [mW/cm^2]	Averaging Time [minute]
Limits for General Population / Uncontrolled Exposure				
0.3 ~ 1.34	614	1.63	*(100)	30
1.34 ~ 30	824 /f	2.19/f	*(180/f^2)	30
30 ~ 300	27.5	0.073	0.2	30
300 ~ 1500	/	/	f/1500	30
1500 ~ 15000	/	/	1.0	30

*f=frequency in MHz, *= plane-wave equivalent power density*

MPE (Maximum Permissive Exposure) Prediction
Predication of MPE limit at a given distance: Equation from page 18 of OET Bulletin 65, Edition 97-01

$S = PG/4\pi R^2 \quad \left(\Rightarrow R = \sqrt{PG/4\pi S}\right)$

S=power density [mW/cm^2]
P=Power input to antenna [mW]
G=Power gain of the antenna in the direction of interest relative to an isotropic radiator
R= distance to the center of radiation of the antenna [cm]

EUT: Maximum peak output power = 105.68 [mW] (= 20.24 dBm) Antenna gain=2.692 (= 4.3 [dBi])	
100 mW, at 20 cm from an antenna 6[dBi]	S = PG/4πR² = 100 × 3.98 / (4 × π × 400) = 0.0792 [mW/cm^2] < 1.0 [mW/cm^2]
72.11 mW, at 20 cm from an antenna 4.3 [dBi]	S = PG/4πR²= 0.056598 [mW/cm^2] < 1.0 [mW/cm^2]

5.7.2 RF Exposure Compliance Issue

The information should be included in the user's manual:
This appliance and its antenna must not be co-located or operation in conjunction with any other antenna or transmitter. A minimum separation distance of 20 cm must be maintained between the antenna and the person for this appliance to satisfy the RF exposure requirements.

5.8 Receiver Spurious Emission

5.8.1 Regulation

According to § RSS-Gen, Issue 3, 6
Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table: 2

Frequency (MHz)	Field Strength (microvolts/m at 3 meters)
30 – 88	100
88 – 216	150
216 -960	200
Above 960	500

5.3.2 Measurement Procedure

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter anechoic chamber test site. The table was rotated 360 degrees to determine the position of the highest radiation.

b. During performing radiated emission below 1 ㎓, the EUT was set 3 meters away from the interference receiving antenna, which was mounted on the top of a variable-height antenna tower. During performing radiated emission above 1 ㎓, the EUT was set 3 meter away from the interference-receiving antenna.

c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was 10 dB 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 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

5.7.3 Test Result

- **802.11b (ANT 1)**

Low channel (2 412 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
		Not detected (In the noise floor)					
Quasi-Peak DATA. Emissions below 1GHz							
124.986	120	V	49.1	-13.6	35.5	43.5	8
250.103	120	H	49.8	-10.6	36.2	46.0	9.8
500.002	120	V	43.5	-2.7	29.9	46.0	16.1
Peak DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					
Average DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					

Middle channel (2 437 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
		Not detected (In the noise floor)					
Quasi-Peak DATA. Emissions below 1GHz							
128.673	120	V	49.5	-13.2	36.3	43.5	7.2
500.010	120	V	43.7	-2.7	41.0	46.0	5.0
875.227	120	V	34.9	5.5	40.4	46.0	5.6
Peak DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					
Average DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					

High channel (2 462 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
		Not detected (In the noise floor)					
Quasi-Peak DATA. Emissions below 1GHz							
128.359	120	V	49.1	-13.2	35.9	43.5	7.6
500.008	120	V	43.2	-2.7	40.5	46.0	5.5
875.241	120	V	34.3	5.5	39.8	46.0	6.2
Peak DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					
Average DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					

- **802.11b (ANT 2)**
  Low channel (2 412 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
		Not detected (In the noise floor)					
Quasi-Peak DATA. Emissions below 1GHz							
249.961	120	H	48.9	-10.6	38.3	43.5	5.2
499.979	120	V	43.5	-2.7	40.8	46.0	5.2
875.328	120	H	34.1	5.5	39.6	46.0	6.4
Peak DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					
Average DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					

Middle channel (2 437 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
		Not detected (In the noise floor)					
Quasi-Peak DATA. Emissions below 1GHz							
500.007	120	V	43.2	-2.7	40.5	46.0	5.5
625.149	120	H	36.4	0.7	37.1	46.0	8.9
875.246	120	V	34.3	5.5	39.8	46.0	6.2
Peak DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					
Average DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					

High channel (2 462 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
		Not detected (In the noise floor)					
Quasi-Peak DATA. Emissions below 1GHz							
499.966	120	V	43.6	-2.7	40.9	46.0	5.1
625.029	120	H	36.7	0.7	37.4	46.0	8.6
875.091	120	V	34.4	5.5	39.9	46.0	6.1
Peak DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					
Average DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					

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- **802.11g (ANT 1)**
  Low channel (2 412 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
		Not detected (In the noise floor)					
Quasi-Peak DATA. Emissions below 1GHz							
125.008	120	V	49.5	-13.6	35.9	43.5	7.6
249.953	120	H	48.4	-10.6	37.8	46.0	8.2
500.001	120	V	43.2	-2.6	40.6	46.0	5.4
Peak DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					
Average DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					

Middle channel (2 437 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
		Not detected (In the noise floor)					
Quasi-Peak DATA. Emissions below 1GHz							
129.683	120	V	48.8	-13.2	35.6	43.5	7.9
500.002	120	V	43.3	-2.7	40.6	46.0	5.4
875.384	120	V	34.1	5.5	39.6	46.0	6.4
Peak DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					
Average DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					

High channel (2 462 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
		Not detected (In the noise floor)					
Quasi-Peak DATA. Emissions below 1GHz							
128.327	120	V	48.7	-13.2	35.5	43.5	8.0
500.006	120	V	43.0	-2.6	40.4	46.0	5.6
875.117	120	V	34.1	5.5	39.6	46.0	6.4
Peak DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					
Average DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					

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- **802.11g (ANT 2)**
  Low channel (2 412 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
		Not detected (In the noise floor)					
Quasi-Peak DATA. Emissions below 1GHz							
250.005	120	H	48.1	-10.6	37.5	46.0	8.5
500.014	120	V	42.9	-2.7	40.2	46.0	5.8
875.245	120	H	33.7	5.5	39.2	46.0	6.8
Peak DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					
Average DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					

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Middle channel (2 437 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
		Not detected (In the noise floor)					
Quasi-Peak DATA. Emissions below 1GHz							
500.011	120	V	43.6	-2.7	40.9	46.0	5.1
625.018	120	H	36.3	0.7	37.0	46.0	9.0
875.381	120	V	34.1	5.5	39.6	46.0	6.4
Peak DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					
Average DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					

High channel (2 462 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
		Not detected (In the noise floor)					
Quasi-Peak DATA. Emissions below 1GHz							
500.001	120	V	43.4	-2.7	40.7	46.0	5.3
624.991	120	H	36.1	0.7	36.8	46.0	9.2
875.115	120	V	34.5	5.5	40.0	46.0	6.0
Peak DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					
Average DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					

- **802.11n20 (ANT 1)**
  Low channel (2 412 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
		Not detected (In the noise floor)					
Quasi-Peak DATA. Emissions below 1GHz							
250.014	120	H	48.1	-10.6	37.5	46.0	8.5
500.004	120	V	43.5	-2.6	40.9	46.0	5.1
875.415	120	V	34.6	5.5	40.1	46.0	5.9
Peak DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					
Average DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					

Middle channel (2 437 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
		Not detected (In the noise floor)					
Quasi-Peak DATA. Emissions below 1GHz							
128.566	120	V	48.7	-13.2	35.5	43.5	8.0
500.002	120	V	43.0	-2.7	40.3	46.0	5.7
875.336	120	V	33.4	5.5	38.9	46.0	7.1
Peak DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					
Average DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					

High channel (2 462 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
		Not detected (In the noise floor)					
Quasi-Peak DATA. Emissions below 1GHz							
128.683	120	V	48.1	-13.2	34.9	43.5	8.6
499.981	120	V	42.9	-2.7	40.2	46.0	5.8
875.236	120	V	33.7	5.5	39.2	46.0	6.8
Peak DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					
Average DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					

- **802.11n20 (ANT 2)**
  Low channel (2 412 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
		Not detected (In the noise floor)					
Quasi-Peak DATA. Emissions below 1GHz							
249.981	120	H	48.5	-10.6	37.9	46.0	8.1
500.013	120	V	43.2	-2.7	40.5	46.0	5.5
875.220	120	V	34.6	5.5	40.1	46.0	5.9
Peak DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					
Average DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					

Middle channel (2 437 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
		Not detected (In the noise floor)					
Quasi-Peak DATA. Emissions below 1GHz							
128.412	120	V	49.3	-13.2	36.1	43.5	7.4
499.976	120	V	43.5	-2.7	40.8	46.0	5.2
875.231	120	V	34.0	5.5	39.5	46.0	6.5
Peak DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					
Average DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					

High channel (2 462 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
		Not detected (In the noise floor)					
Quasi-Peak DATA. Emissions below 1GHz							
128.537	120	V	48.6	-13.2	35.4	43.5	8.1
500.006	120	V	43.7	-2.7	41.0	46.0	5.0
875.332	120	V	34.2	5.5	39.7	46.0	6.3
Peak DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					
Average DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					

- **802.11n20 (MIMO)**
  Low channel (2 412 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
		Not detected (In the noise floor)					
Quasi-Peak DATA. Emissions below 1GHz							
249.966	120	H	48.5	-10.6	37.9	46.0	8.1
500.009	120	V	42.7	-2.7	40.0	46.0	6.0
875.325	120	V	34.6	5.5	40.1	46.0	5.9
Peak DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					
Average DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					

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Middle channel (2 437 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
		Not detected (In the noise floor)					
Quasi-Peak DATA. Emissions below 1GHz							
128.633	120	V	48.8	-13.2	35.6	43.5	7.9
499.994	120	V	43.5	-2.7	40.8	46.0	5.2
875.336	120	V	34.1	5.5	39.6	46.0	6.4
Peak DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					
Average DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					

High channel (2 462 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
		Not detected (In the noise floor)					
Quasi-Peak DATA. Emissions below 1GHz							
128.415	120	V	49.3	-13.2	36.1	43.5	7.4
499.929	120	V	43.6	-2.7	40.9	46.0	5.1
875.216	120	V	34.5	5.5	40.0	46.0	6.0
Peak DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					
Average DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					

- **802.11n40 (ANT 1)**
  Low channel (2 422 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
		Not detected (In the noise floor)					
Quasi-Peak DATA. Emissions below 1GHz							
250.129	120	H	48.7	-10.6	38.1	46.0	7.9
500.111	120	V	42.8	-2.7	40.1	46.0	5.9
875.017	120	V	35.2	5.5	40.7	46.0	5.3
Peak DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					
Average DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					

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Middle channel (2 437 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
		Not detected (In the noise floor)					
Quasi-Peak DATA. Emissions below 1GHz							
128.662	120	V	48.4	-13.2	35.2	43.5	8.3
499.993	120	V	43.3	-2.7	40.6	46.0	5.4
875.325	120	V	34.1	5.5	39.6	46.0	6.4
Peak DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					
Average DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					

High channel (2 452 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
		Not detected (In the noise floor)					
Quasi-Peak DATA. Emissions below 1GHz							
128.429	120	V	49.0	-13.2	35.8	43.5	7.7
500.011	120	V	43.4	-2.7	40.7	46.0	5.3
875.119	120	V	34.1	5.5	39.6	46.0	6.4
Peak DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					
Average DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					

- **802.11n40 (ANT 2)**
  Low channel (2 422 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
		Not detected (In the noise floor)					
Quasi-Peak DATA. Emissions below 1GHz							
250.089	120	H	48.5	-10.6	37.9	46.0	8.1
500.011	120	V	42.9	-2.7	40.2	46.0	5.8
875.227	120	V	34.7	5.5	40.2	46.0	5.8
Peak DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					
Average DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					

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Middle channel (2 437 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
		Not detected (In the noise floor)					
Quasi-Peak DATA. Emissions below 1GHz							
128.583	120	V	48.8	-13.2	35.6	43.5	7.9
500.037	120	V	43.3	-2.7	40.6	46.0	5.4
875.277	120	V	34.1	5.5	39.6	46.0	6.4
Peak DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					
Average DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					

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High channel (2 452 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
		Not detected (In the noise floor)					
Quasi-Peak DATA. Emissions below 1GHz							
128.371	120	V	48.7	-13.2	35.5	43.5	8.0
500.045	120	V	43.5	-2.7	40.8	46.0	5.2
875.237	120	V	34.3	5.5	39.8	46.0	6.2
Peak DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					
Average DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					

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- **802.11n40 (MIMO)**
  Low channel (2 412 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
		Not detected (In the noise floor)					
Quasi-Peak DATA. Emissions below 1GHz							
250.173	120	H	48.6	-10.6	38.0	46.0	8.0
500.236	120	V	43.3	-2.7	40.6	46.0	5.4
875.215	120	V	35.4	5.5	40.9	46.0	5.1
Peak DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					
Average DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					

Middle channel (2 437 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
		Not detected (In the noise floor)					
Quasi-Peak DATA. Emissions below 1GHz							
128.436	120	V	48.9	-13.2	35.7	43.5	7.8
500.001	120	V	43.2	-2.7	40.5	46.0	5.5
875.242	120	V	33.5	5.5	39.0	46.0	7.0
Peak DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					
Average DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					

High channel (2 452 MHz)

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. [V/H]	Reading [dB(μV)]	Factor [dB]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 30 MHz							
		Not detected (In the noise floor)					
Quasi-Peak DATA. Emissions below 1GHz							
128.754	120	V	48.5	-13.2	35.3	43.5	8.2
500.020	120	V	43.3	-2.7	40.6	46.0	5.4
875.167	120	V	34.1	5.5	39.6	46.0	6.4
Peak DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					
Average DATA. Emissions above 1GHz							
		Not detected (In the noise floor)					

6. Test equipment used for test

	Description	Manufacture	Model No.	Serial No.	Next Cal Date.
□	Temp & humidity chamber	taekwang	TK-04	TK001	12.12.10
■	Temp & humidity chamber	taekwang	TK-500	TK002	12.09.05
□	Power Meter	Agilent	E4416A	GB41292365	12.10.26
□	Frequency Counter	HP	53150A	US39250565	12.09.07
□	Spectrum Analyzer	Agilent	E4407B	US39010142	12.10.26
■	Spectrum Analyzer	R & S	FSP40	100209	12.10.26
■	Signal Generator	R & S	SMR40	100007	13.06.27
□	Modulation Analyzer	HP	8901B	3538A05527	12.10.26
□	Audio Analyzer	HP	8903B	3729A19213	12.10.28
■	AC Power Supply	KIKUSUI	PCR2000W	GB001619	12.10.25
□	DC Power Supply	Tektronix	PS2520G	TW50517	12.10.25
□	DC Power Supply	Tektronix	PS2521G	TW53135	12.02.25
□	Dummy Load	BIRD	8141	7560	-
□	Dummy Load	BIRD	8401-025	799	-
■	EMI Test Receiver	R&S	ESCI	100001	13.07.10
□	Attenuator	HP	8494A	2631A09825	12.10.26
□	Attenuator	HP	8496A	3308A16640	12.10.26
□	Attenuator	R&S	RBS1000	D67079	12.10.26
□	Power sensor	Agilent	E9321A	US40390422	12.10.26
□	LOOP Antenna	EMCO	EMCO6502	9205-2745	13.05.23
■	BILOG Antenna	Schwarzbeck	VULB 9168	375	13.09.21
■	HORN Antenna	ETS	3115	00062589	13.11.21
■	HORN Antenna	ETS	3116	00086632	13.11.15
□	Power Divider	Weinschel	1580-1	NX375	12.10.26
■	Power Divider	Weinschel	1580-1	NX380	12.09.14
□	Power Divider	Weinschel	1594	671	12.09.14
■	Test Receiver	R&S	ESHS30	828765/009	12.10.28
■	LISN	R&S	ENV216	101358	12.10.26
■	LISN	PMM	L2-16A	0000J10705	-