TEST REPORT

KEL Korea EMC Laboratory	**Korea EMC Laboratory Co., Ltd.** 390 Bora-dong, Giheung-gu, Yongin-si, Gyeonggi-do, Republic of Korea (446-904) Tel : 82-31-286-5881 Fax : 82-31-286-2661 www.koreaemc.com	Report Ref. No : KEL10–F10074

1. Client

- Name : Cydle Corp.
- Address : 12th Floor, Kofomo Tower, 16-3, Sunae-Dong, Bundang-Gu, Sungnam-City, Kyonggi-Do, Korea
- Date of receipt : October 31, 2010

2. Use of report : -

3. Name of product / model : Multi PAD / M7

4. FCC ID : YXQM7

5. Manufacturer and country of origin : Cydle Corp. / KOREA

6. Date of test : November 01, 2010 – December 13, 2010

7. Applied standard : FCC Part 15_2010, Subpart C(Section 15.247_DTS)
ANSI C63.4_2003

8. Testing location : ☒ In Laboratory ☐ In Chamber ☐ On Site Test

9. Test results : ☒ Pass ☐ Fail

Affirmation	Tested by Name : Sang-Hoon Lee (Signature)	Technical manager Name : Su-Gil Moon (Signature)

January 11, 2011

Korea EMC Laboratory Co., Ltd.

0. REPORT REVISION HISTORY

Date	Revision	Page no.
January 11, 2011	Issued	All

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1. TEST LABORATORY

1.1 General

Name of Test Laboratory	Korea EMC Laboratory Co., Ltd.
President	Won-Hyang Oh
Address	390 Bora-dong, Giheung-gu, Yongin-si, Gyeonggi-do, Republic of Korea (446-904)
TEL	+82-31-286-5881
FAX	+82-31-286-2661
e-mail	webmaster@koreaemc.com

1.2 Certificate of designated testing laboratory

Area and Category	Regulation	Registration & Certification No.	Mark.
Radio Research Agency EMI(Radiated & Conducted emission) EMS(Radiated Immunity) Safety Radio Communication Part	Regulation of KCC No. 2009-48 (2009. 11. 10)	KR0002	방송통신위원회
Korea Laboratory Accreditation Scheme (KOLAS) EMI(Radiated & Conducted emission) EMS(Radiated Immunity) Safety Road Vehicle component test(EMC) Military EMC(MIL-STD-461E)	KS A ISO/IEC 17025:2006	No. 154	KOLAS
FCC Part 15 & 18 EMI(Radiated & Conducted emission)	ANSI 63.4	90751 (KR0002)	FC
VCCI EMI(Radiated & Conducted emission)	VCCI	C-2314 R-2139 R-2140	VCCI
UL Korea Ltd. Safety	Star Alliance Program	-	c UL us
European Conformity EMC & Safety	2004/108/EC 2006/95/EC	-	CE
TUV SUD Certification after Recognition of Agent's Testing EMC	ISO/IEC 17025	ROK1006C	TÜV SÜD Product Service

2. DESCRIPTION OF THE EQUIPMENT UNDER TEST

The product specification described herein was obtained from the product data sheet or user's manual

2.1 Characteristics

Product name	Multi PAD
Model no.	M7
FCC ID	YXQM7
Operation frequency	802.11 b/g : 2412 MHz – 2462 MHz
RF power	802.11 b/g : 10.94 dBm(12.41 mW)
Spread spectrum method	802.11 b/g : DSSS, OFDM
Modulation type	802.11 b : CCK, DQPSK, DBPSK 802.11 g : 64QAM, 16QAM, QPSK, BPSK
Data rate	802.11 b : 11.0 / 5.5 / 2.0 / 1.0 Mbps 802.11 g : 54.0 / 48.0 / 36.0 / 24.0 / 18.0 / 12.0 / 9.0 / 6.0 Mbps
Number of channel	802.11 b/g : 11 Channel
Antenna type / max. gain	802.11 b/g : Chip Antenna / 1.99 dBi
Power source	DC 5.0 V(Adapter) DC 3.7 V(Battery)
Size	181 mm X 122 mm X 20.4 mm
Interface ports	USB 2.0, HDMI, Micro SD, MIC, Audio out
Accessory	USB Cable, Adapter, Earphone

2.2 Applied standard

- FCC part 15, subpart C(15.247_DTS)
- ANSI C63.4_2003

Note : It has been verified to comply with requirements of FCC part 15, subpart B, Class B(DoC). The test report has been issued separately

2.3 Submitted documents

- Block diagram
- Schematic diagram
- Antenna specification
- Part list(B.O.M)
- User manual

2.4 Channel chart

802.11 b/g(11 Channel)

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
1	2412	2	2417	3	2422	4	2427
5	2432	6	2437	7	2442	8	2447
9	2452	10	2457	11	2462		

- Measurement Channel

  802.11 b/g : Low(2412 MHz), Middle(2437 MHz), High(2462 MHz)

- Test rate : 802.11 b/g(11, 54 Mbps)

3. TEST CONDITIONS

3.1 Description of test configuration

The EUT has been tested as an independent unit with other necessary accessories or support unit. The following support units or accessories were used to form a representative test configuration during the tests.

3.2 List of peripherals

Type	Model no.	Serial no.	Manufacturer
EUT(Multi PAD)	M7	-	Cydle Corp.
Adapter	PA-050200SN	-	Perfect Power
Lab top	PP11L	CN-0D4571-46843-5AB-0772	Dell Asia Pacific Sdn.
Adapter	PA-1900-02DK	CN-CO1104-71815-51L-00F9	Dongguang Litepower 2nd Plant
LCD Monitor	U2410f	CN-0G550M-72312-99N-016L	Innocom Technology(Shenzhen) Co., Ltd.
MIC	-	-	-
Earphone	-	-	Cydle Corp.

3.3 Uncertainty

Measurement	Frequency	Uncertainty
Conducted Emission	150 kHz ~ 30 MHz	1.5
Radiated Emission	30 MHz ~ 1 GHz	4.4
	1 GHz ~ 40 GHz	4.1

3.4 Environment condition

Measurement	Temperature	Humidity	Atmospheric pressure
Conducted emission	24 ± 4 ℃	30 – 60 % R.H.	101.5 kPa
Radiated emission	20 ± 4 ℃	30 – 60 % R.H.	101.4 kPa

This uncertainty represents an expanded uncertainty expressed at approximately the 95 % confidence level using a coverage factor if k=2.

4. SUMMARY OF TEST RESULTS

Section	Test type	Limit	Remark	Result
15.207	▪ AC Power conducted emission	Table 15.207	Meet the requirement	Pass
15.209, 15.247	▪ Out of band emissions & Band edge	-	Meet the requirement	Pass
15.247(a)(2)	▪ Minimum 6 dB bandwidth	Min. 500 kHz	Meet the requirement	Pass
15.247(b)(1)	▪ Maximum peak out power	WLAN : 1 W	Meet the requirement	Pass
15.247(d)	▪ Peak power spectral density	> 8 dBm	Meet the requirement	Pass
15.203, 15.247(b)(3)	▪ Antenna requirement	-	Meet the requirement	Pass

5. TEST AND RESULTS

5.1 AC Power conducted emission

5.1.1 Test procedures

1. The EUT was place 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 1.5 m away from the side wall of the shielded room.
2. Each current-carrying conductor of the EUT power cord was individually connected through a 50 Ω / 50 uH LISN, which is an input transducer to a Spectrum Analyzer or an EMI Test Receiver, to the input power source
3. Exploratory measurements were mode 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 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. The measuring level is calculated by adding the Correction Factor, Cable Loss.
   The basic equation with a sample calculation is as follow :
   Final Test Level = Receiver Reading + Correction Factor + Cable Factor

5.1.2 Limits of AC power conducted emission

Frequency of emission(MHz)	Conducted limit(dBuV)	
	Quasi-peak	Average
0.15 – 0.5	66 to 56*	56 to 46*
0.5 – 5	56	46
5 – 30	60	50

* Decreases with the logarithm of the frequency

5.1.3 Test instruments

Description	Manufacturer	Model no.	Serial no.	Due cal.	Use
Test receiver	Rohde&Schwarz	ESCS30	10054	2011.10.02	☒
Two line V-Network	Rohde&Schwarz	ESH3-Z5	560685/005	2011.10.02	☒
LISN (for peripheral)	Kyoritsu	KNW-407	8-883-14	2011.10.02	☒

5.1.4 Test results

1. Data

802.11 b : Frequency – 2437 MHz

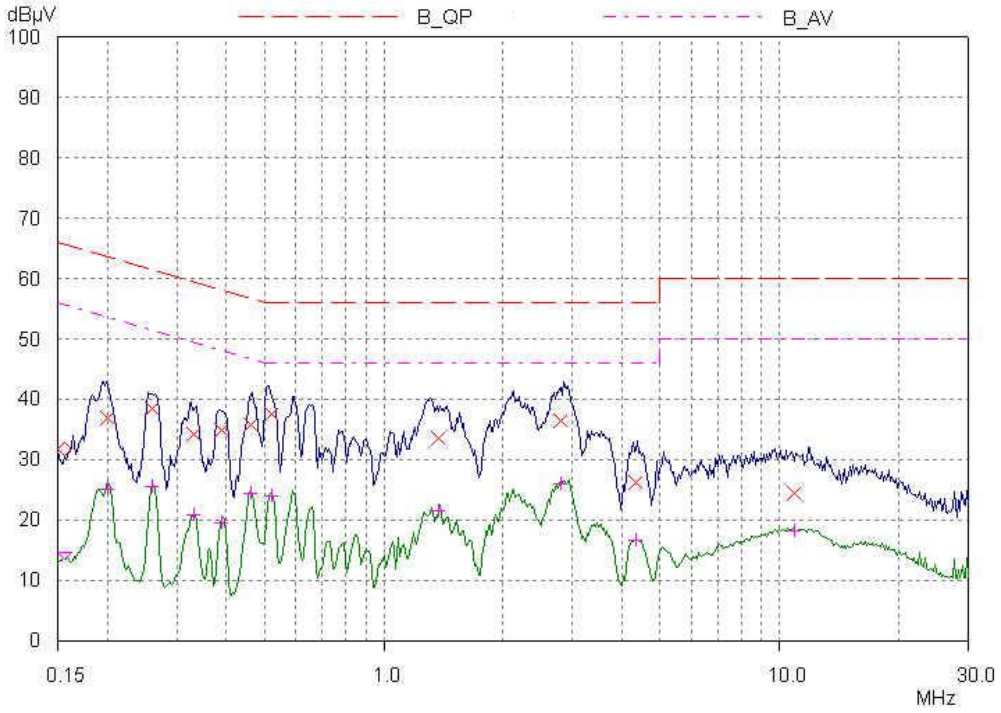
Frequency [MHz]	Correction factor		Line (H/N)	Quasi-peak			Average		
	LISN [dB]	Cable [dB]		Limit (dBuV)	Reading (dBuV)	Result (dBuV)	Limit (dBuV)	Reading (dBuV)	Result (dBuV)
0.199	0.09	0.00	H	64.60	36.77	36.86	54.60	24.97	25.06
0.260	0.09	0.00	H	62.69	38.32	38.41	52.69	25.59	25.68
0.329	0.09	0.00	H	60.88	34.14	34.23	50.88	20.95	21.04
0.387	0.09	0.00	H	59.23	34.89	34.98	49.23	19.43	19.52
0.462	0.09	0.00	N	57.08	40.49	40.58	47.08	30.34	30.43
0.519	0.09	0.00	N	56.00	**40.39**	**40.48**	46.00	28.93	29.02
1.380	0.11	0.00	N	56.00	37.21	37.32	46.00	26.79	26.90
2.782	0.14	0.00	N	56.00	39.84	39.98	46.00	**29.71**	**29.85**
4.306	0.14	0.00	N	56.00	28.86	29.00	46.00	20.19	20.33
10.873	0.51	0.40	N	60.00	28.89	29.80	50.00	22.31	23.22

802.11 g : Frequency – 2437 MHz

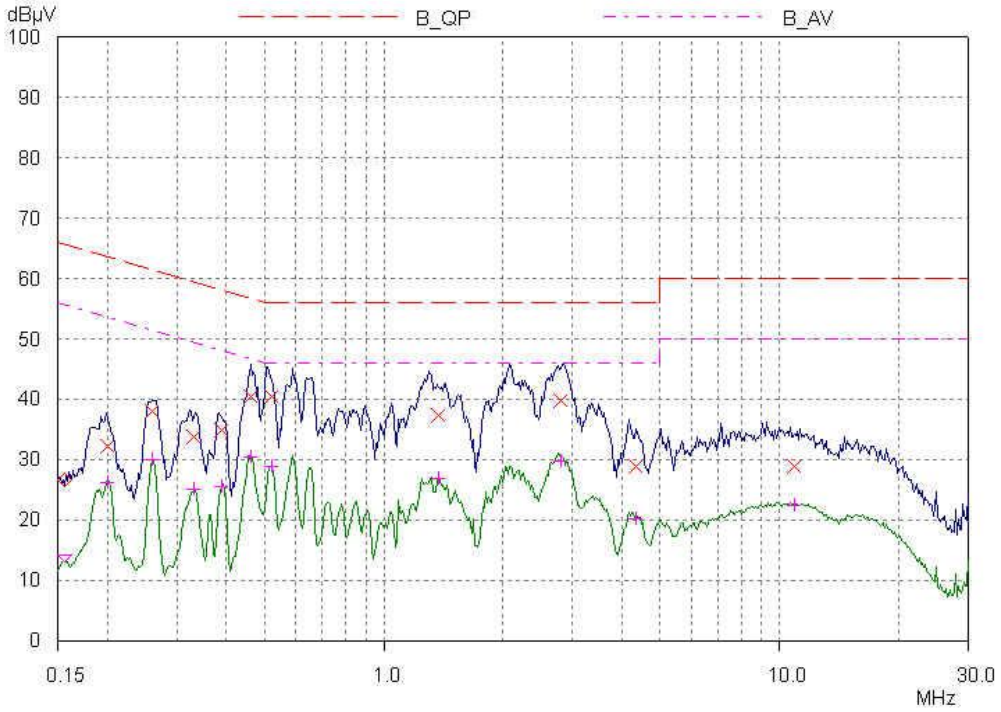
Frequency [MHz]	Correction factor		Line (H/N)	Quasi-peak			Average		
	LISN [dB]	Cable [dB]		Limit (dBuV)	Reading (dBuV)	Result (dBuV)	Limit (dBuV)	Reading (dBuV)	Result (dBuV)
0.199	0.09	0.00	H	64.60	34.58	34.67	54.60	23.62	23.71
0.258	0.09	0.00	N	62.91	38.16	38.25	52.91	29.90	29.99
0.328	0.09	0.00	N	60.91	34.04	34.13	50.91	25.55	25.64
0.387	0.09	0.00	N	59.23	34.75	34.84	49.23	25.95	26.04
0.460	0.09	0.00	N	56.97	40.72	40.81	46.97	31.06	31.15
0.585	0.09	0.00	N	56.00	39.66	39.75	46.00	**30.71**	**30.80**
2.074	0.14	0.00	N	56.00	**40.37**	**40.51**	46.00	28.93	29.07
2.743	0.14	0.00	N	56.00	39.97	40.11	46.00	30.65	30.79
4.952	0.14	0.00	N	56.00	29.03	29.17	46.00	20.64	20.78
10.573	0.51	0.40	N	60.00	29.11	30.02	50.00	22.53	23.44

2. Graph

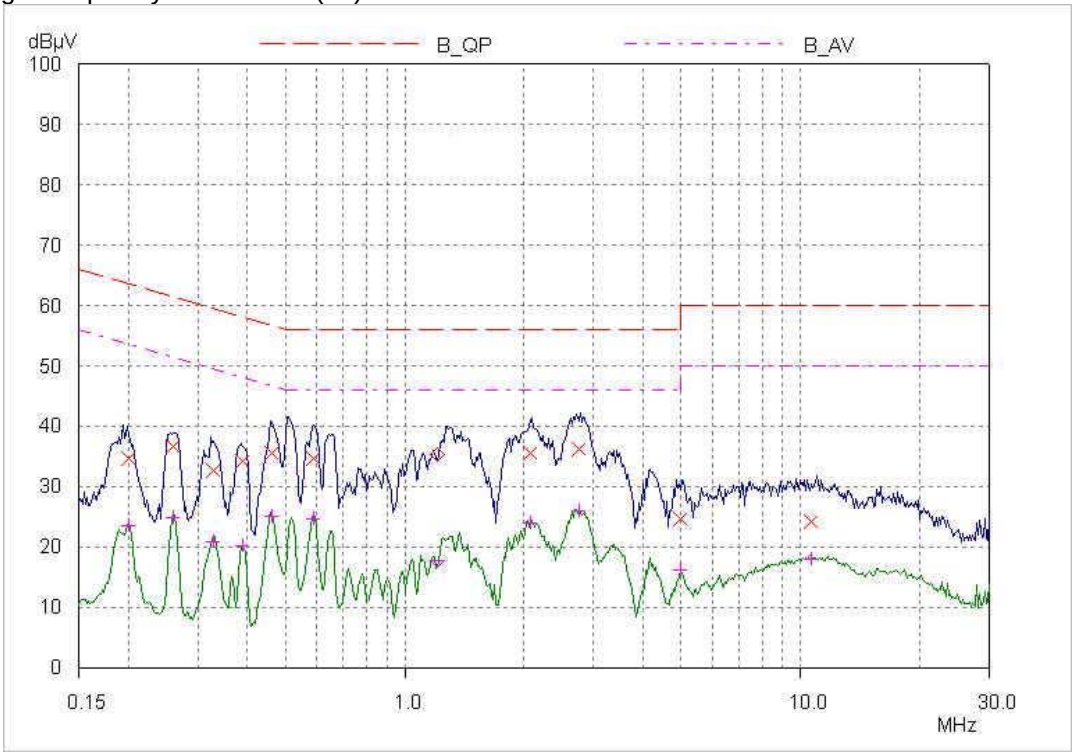
802.11 b : Frequency – 2437 MHz(L1)



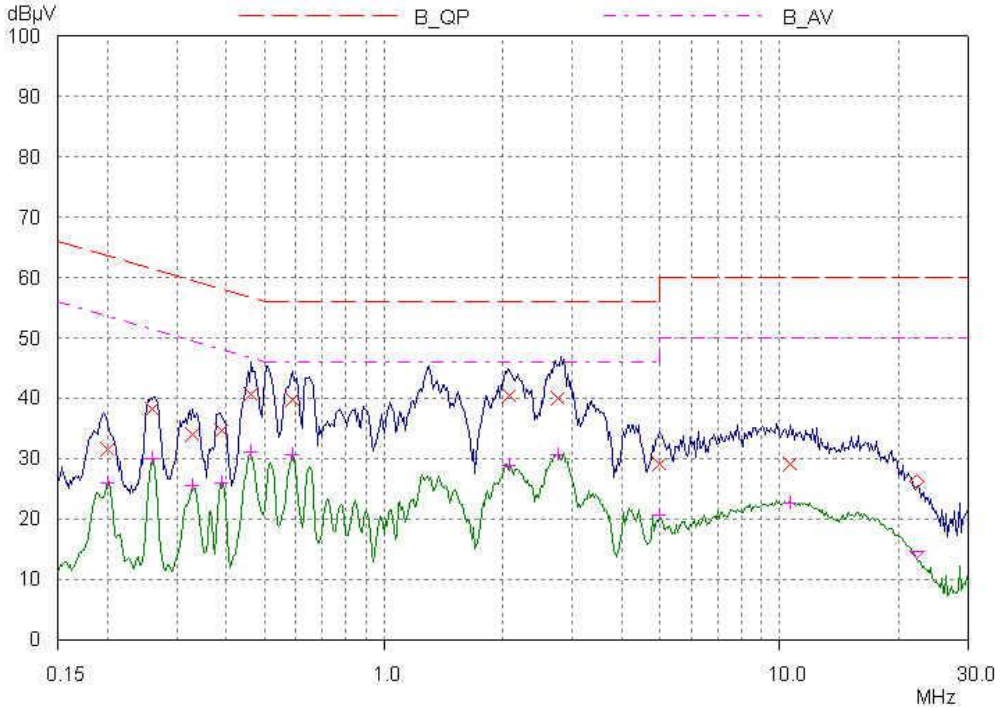
802.11 b : Frequency – 2437 MHz(L2)



802.11 g : Frequency – 2437 MHz(L1)



802.11 g : Frequency – 2437 MHz(L2)



5.2 Out of band emissions & Band edge

5.2.1 Test procedures

1) Spurious RF conducted emissions :

The Out of Band emission was measured with a spectrum analyzer connected to the antenna port. At RBW = 100 kHz, VBW = 300 kHz, spurious emission in the frequency range 30 MHz – 25 GHz which was out fo 2400 – 2483.5 MHz was lower 20 dB than radio frequency power.

2) 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 m height, 1 × 1.5 m 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 30 to 1000 MHz using the Bi-Log antenna, and from 1000 MHz to 18000 MHz using the horn antenna.

4. To obtain the final measurement data, the EUT was arranged on a turntable situated on a 4 × 4 m at the test Site.

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.

6. The presence of ambient signals was verified by turning the EUT off. In case an ambient signal was detected, the measurement bandwidth was reduced temporarily and verification was made that an additional adjacent peak did not exist. This ensures that the ambient signal does not hide any emissions from the EUT.

7. The field strength is calculated by adding the Antenna Factor, Cable factor, & preamplifier.
The basic equation with a sample calculation is as follow :
Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor

5.2.2 Limits of out of band emission & band edge

According to 15.209(a), for an intentional device, the general requirement of filed strength of radiated emission from intentional radiators at a distance of 3 m shall not exceed the following values :

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

Note : For frequency above 1000 MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20 dB under any condition of modulation

5.2.3 Test instruments

Description	Manufacturer	Model no.	Serial no.	Due cal.	Use
Spectrum Analyzer	Rohde&Schwarz	FSQ40	200062	2011.10.02	☒
Horn Antenna	AH Systems	SAS-571	500	2011.03.12	☒
Bi-Log Antenna	VULB9160	Schwarzbeck	3049	2011.12.18	☒
Pre Amplifier	8447E	HP	2434A02093	2012.01.10	☒
Pre Amplifier	87405-60021	AGILENT	10004	2012.01.04	☒
Test Receiver / Spectrum Analyzer	Rohde&Schwarz	ESCI	100561	2011.07.17	☒
Attenuator	AGILENT	8491A	51517	2011.10.08	☐

5.2.4 Test results

1) Out of band emissions & Band edge(Conducted)

1. Data

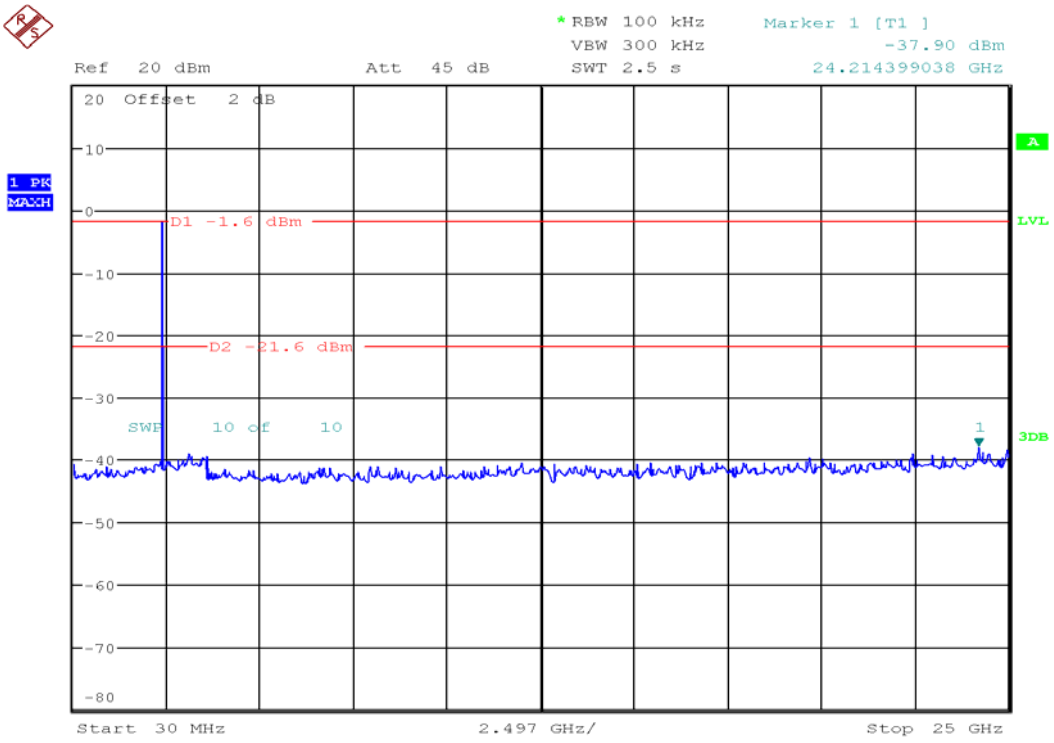
802.11 b			
Frequency[MHz]	**Result[dBc]**	**Limit[dBc]**	**Margin[dB]**
2412	36.30	20	16.30
2437	39.13	20	19.13
2462	39.71	20	19.71

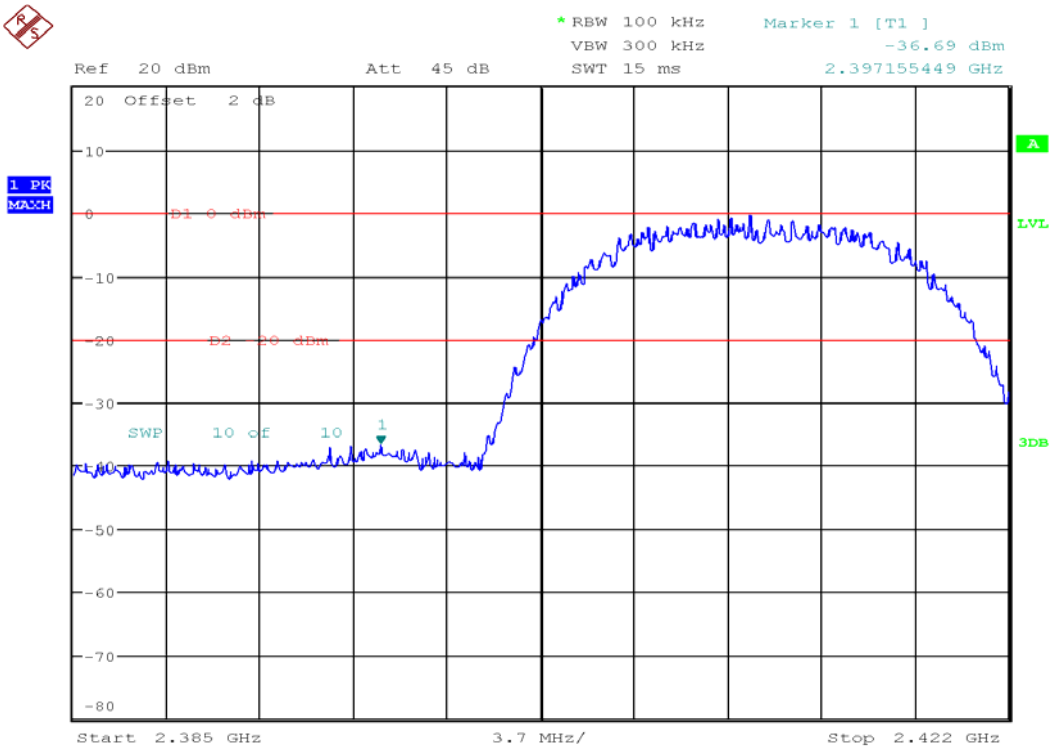
802.11 g			
Frequency[MHz]	**Result[dBc]**	**Limit[dBc]**	**Margin[dB]**
2412	29.24	20	9.24
2437	37.51	20	17.51
2462	38.99	20	18.99

2. Graph

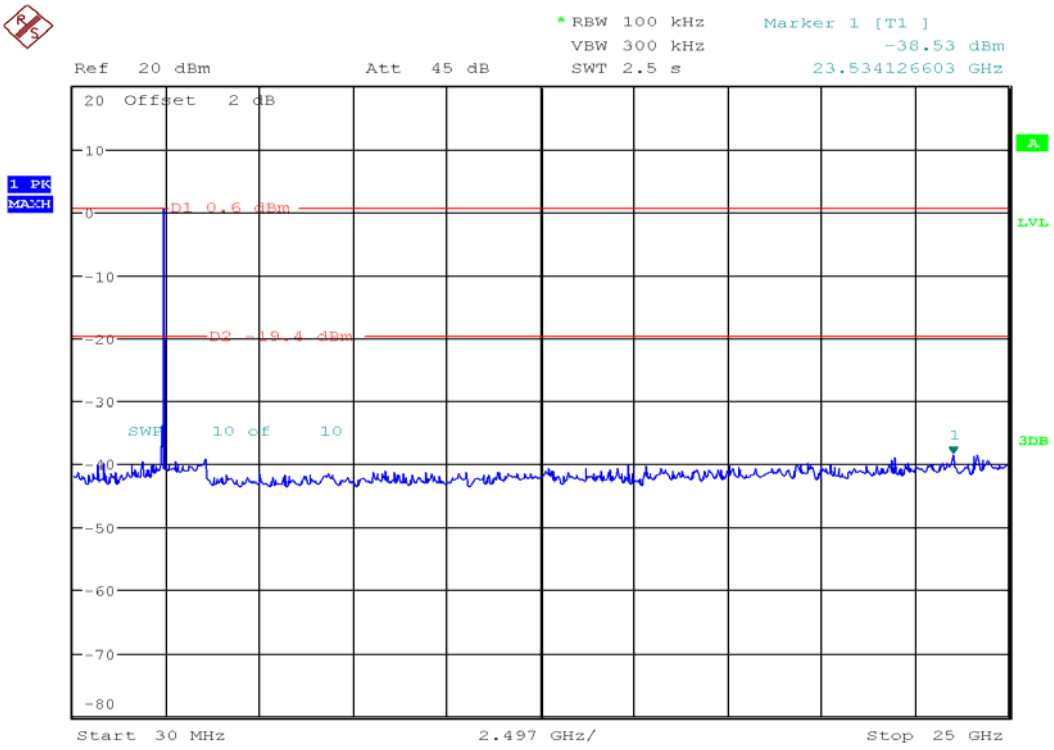
802.11 b

Lowest Channel(operating at 2412 MHz)

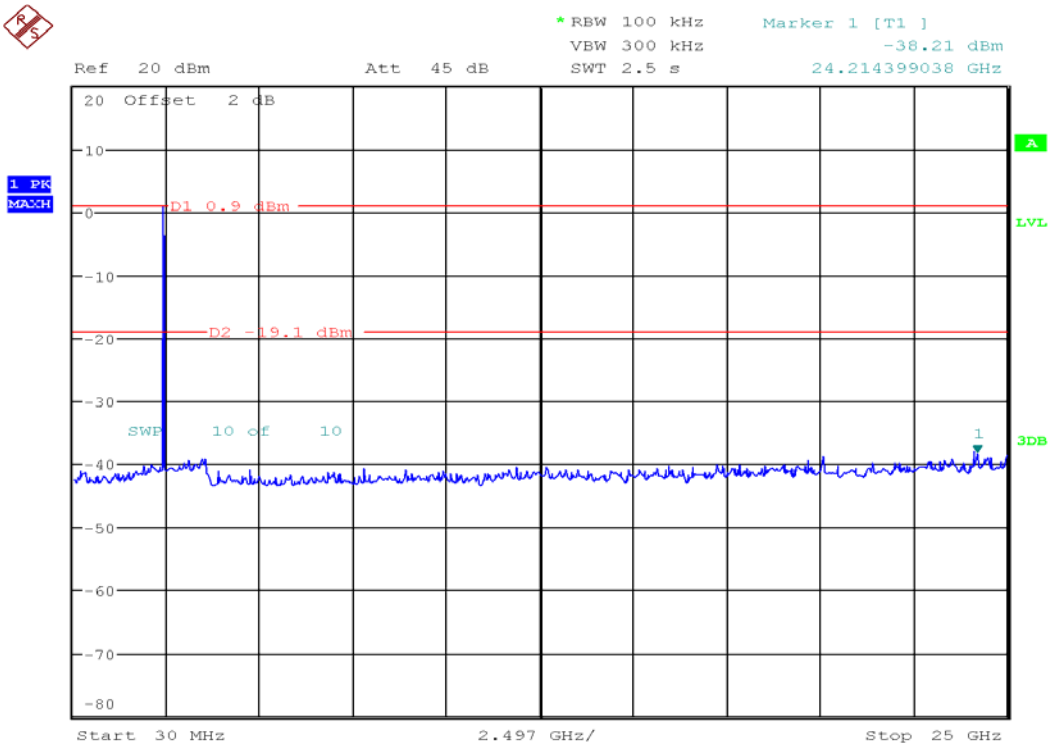


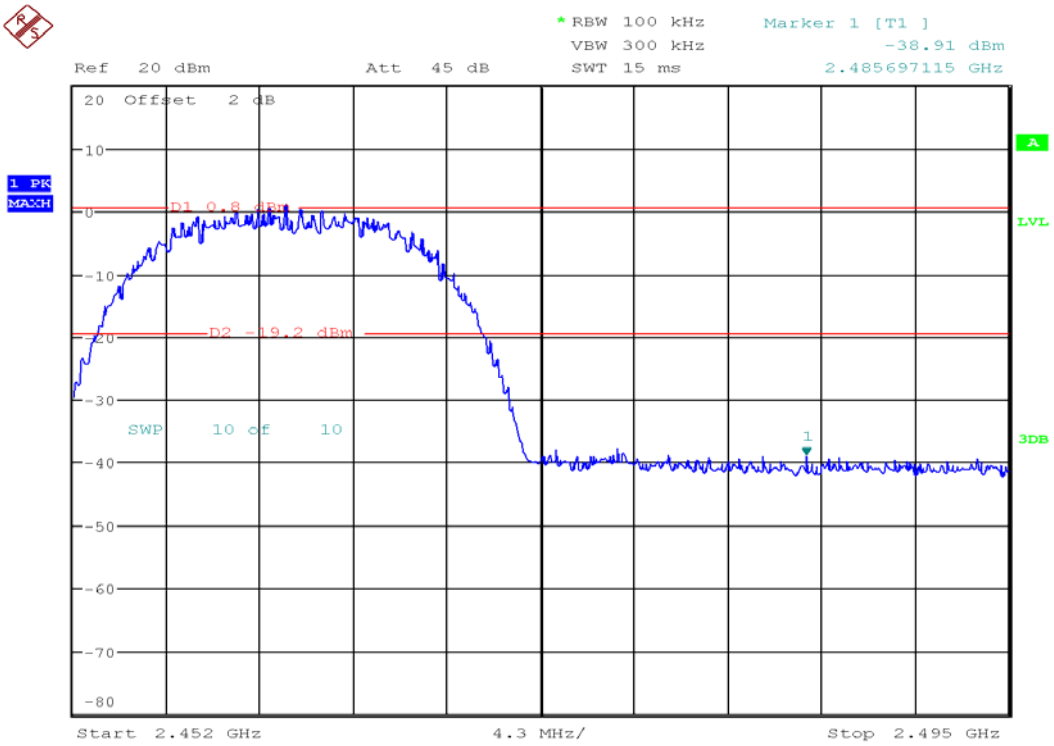


Middle Channel(operating at 2437 MHz)



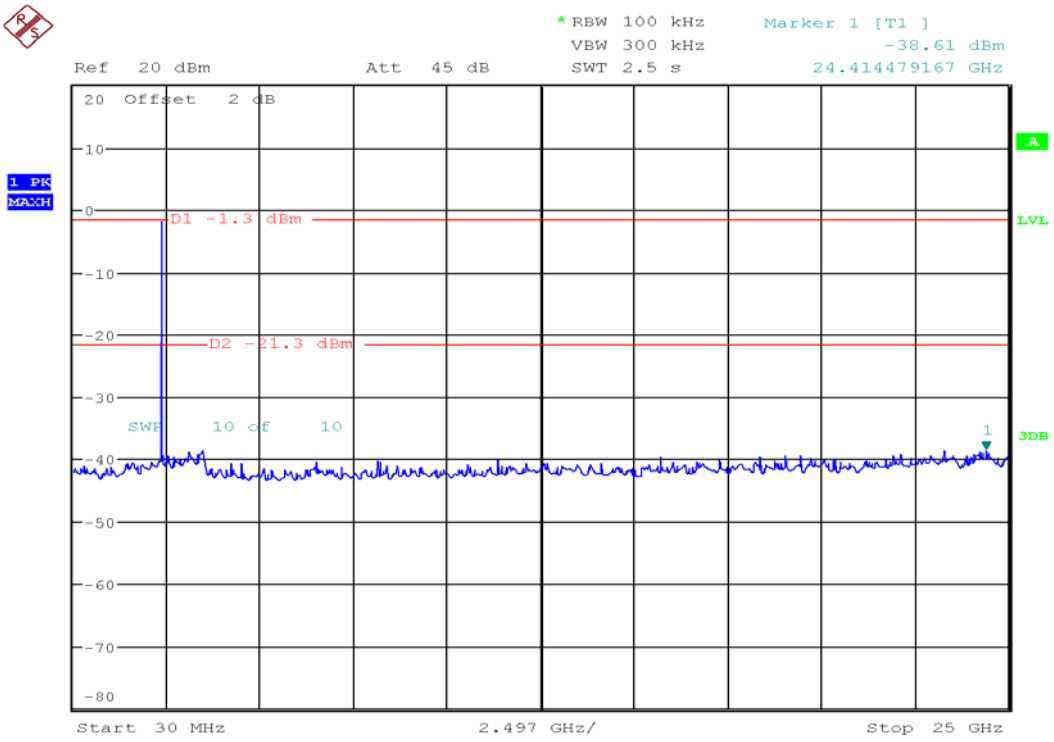
Highest Channel(operating at 2462 MHz)

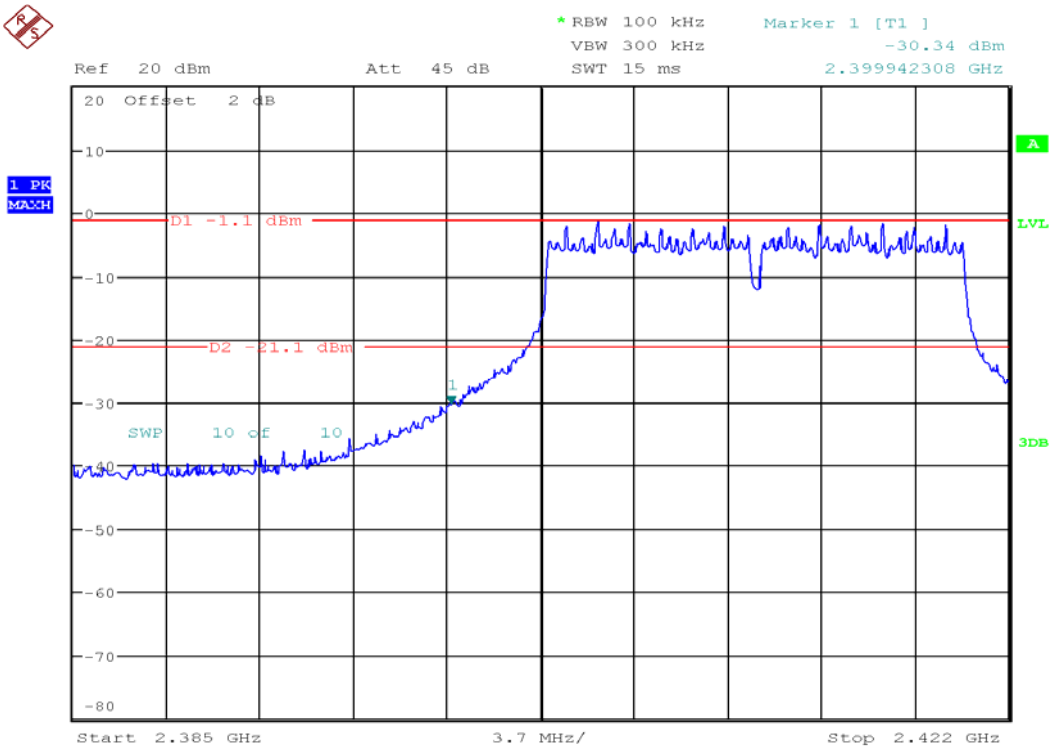




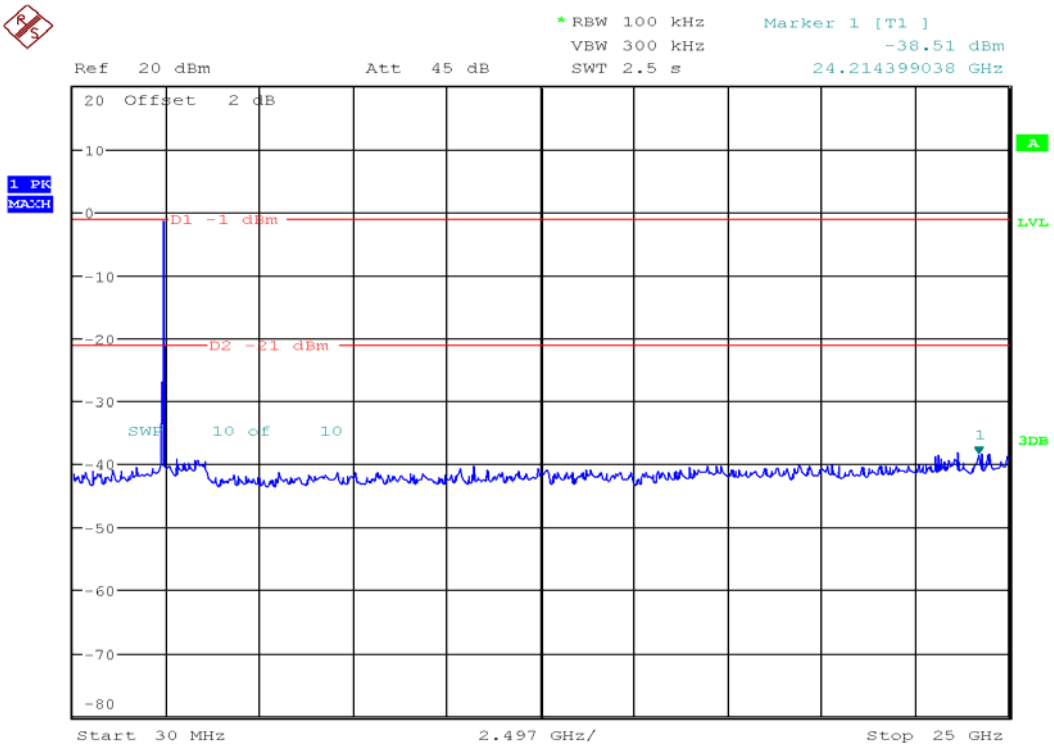
802.11 g

Lowest Channel(operating at 2412 MHz)

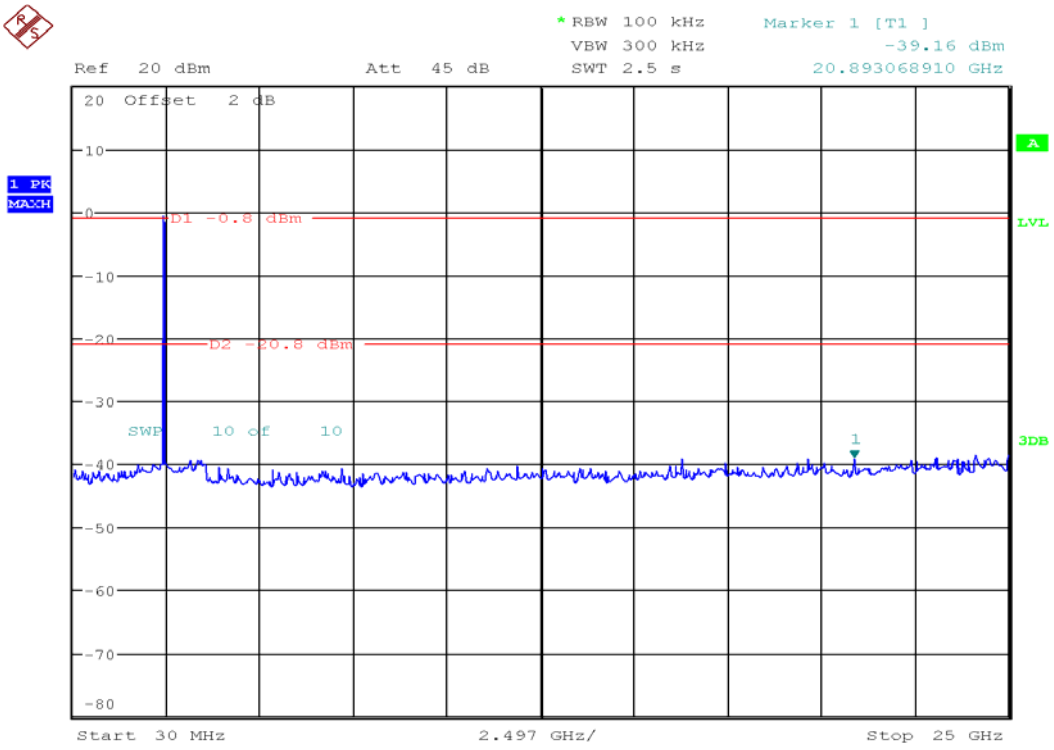


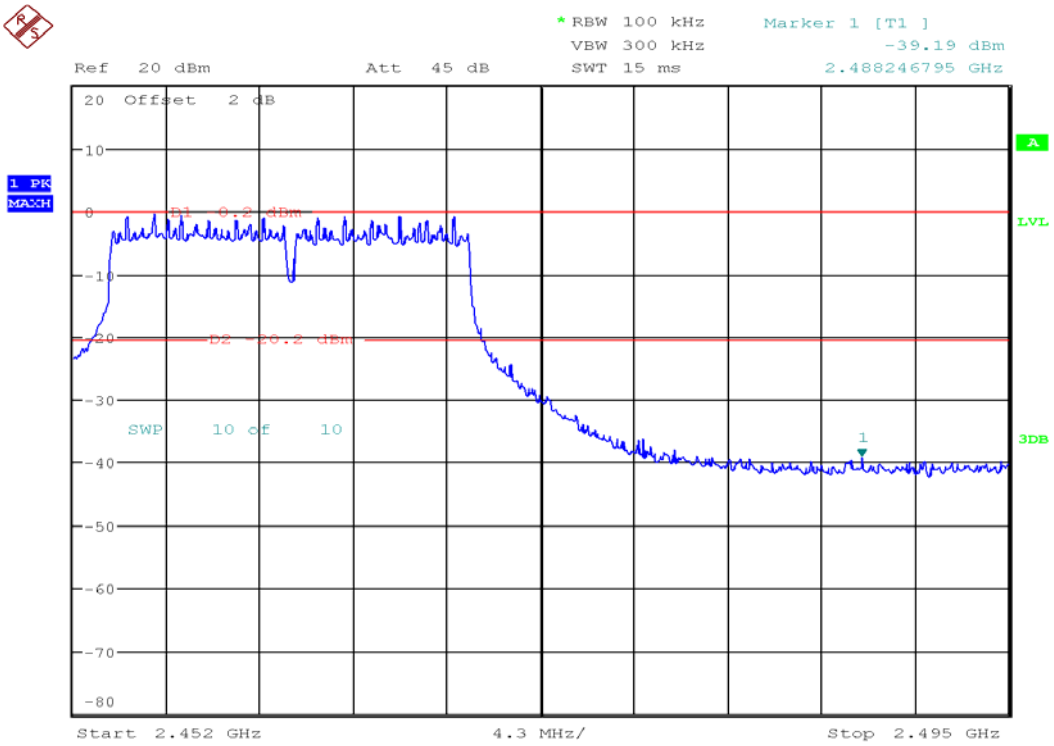


Middle Channel(operating at 2437 MHz)



Highest Channel(operating at 2462 MHz)





2) Out of band emissions & Band edge(Radiated)

1. Above 1000 MHz

802.11 b : Frequency – 2412 MHz(above 1000 MHz)								
Frequency [MHz]	Reading [dBuV]	Pol. [H/V]	Height [m]	Correction Factor		Result Value		
				Ant. Factor [dB]	Cable+Amp. [dB]	Limit [dBuV/m]	Result [dBuV/m]	Margin [dB]
Average data, emissions above 1000 MHz(RBW = 1 MHz, VBW = 10 Hz)								
2389.65*	35.5	H	1.3	30.1	25.0	54.0	40.6	13.4
2412	86.9	H	1.3	30.2	25.0	-	92.1	-
4824	36.3	H	1.1	34.5	23.5	54.0	47.3	6.7
Peak data, emissions above 1000 MHz(RBW = 1 MHz, VBW = 3 MHz)								
2389.65*	48.7	H	1.3	30.1	25.0	74.0	53.8	20.2
2412	97.6	H	1.3	30.2	25.0	-	102.8	-
4824	53.9	H	1.1	34.5	23.5	74.0	64.9	9.1

802.11 b : Frequency – 2437 MHz(above 1000 MHz)								
Frequency [MHz]	Reading [dBuV]	Pol. [H/V]	Height [m]	Correction Factor		Result Value		
				Ant. Factor [dB]	Cable+Amp. [dB]	Limit [dBuV/m]	Result [dBuV/m]	Margin [dB]
Average data, emissions above 1000 MHz(RBW = 1 MHz, VBW = 10 Hz)								
2437	83.8	H	1.3	30.3	24.8	-	89.3	-
4874	36.0	H	1.1	34.6	23.5	54.0	47.1	6.9
Peak data, emissions above 1000 MHz(RBW = 1 MHz, VBW = 3 MHz)								
2437	95.3	H	1.3	30.2	24.8	-	100.7	-
4874	48.2	H	1.1	34.6	23.5	74.0	59.3	14.7

802.11 b : Frequency – 2462 MHz(above 1000 MHz)								
Frequency [MHz]	Reading [dBuV]	Pol. [H/V]	Height [m]	Correction Factor		Result Value		
				Ant. Factor [dB]	Cable+Amp. [dB]	Limit [dBuV/m]	Result [dBuV/m]	Margin [dB]
Average data, emissions above 1000 MHz(RBW = 1 MHz, VBW = 10 Hz)								
2462	81.3	H	1.2	30.3	24.8	-	86.6	-
2496.71*	31.6	H	1.2	30.4	24.8	54.0	37.2	16.8
4924	32.5	H	1.1	34.7	23.5	54.0	43.7	10.3
Peak data, emissions above 1000 MHz(RBW = 1 MHz, VBW = 3 MHz)								
2462	94.0	H	1.2	30.3	24.8	-	99.5	-
2496.71*	45.8	H	1.2	30.4	24.8	74.0	51.4	22.6
4924	44.9	H	1.1	34.7	23.5	74.0	56.1	17.9

Note : * Restricted band

802.11 g : Frequency – 2412 MHz(above 1000 MHz)								
Frequency [MHz]	Reading [dBuV]	Pol. [H/V]	Height [m]	Correction Factor		Result Value		
				Ant. Factor [dB]	Cable+Amp. [dB]	Limit [dBuV/m]	Result [dBuV/m]	Margin [dB]
Average data, emissions above 1000 MHz(RBW = 1 MHz, VBW = 10 Hz)								
2387.65*	41.7	V	1.3	30.1	25.0	54.0	46.8	7.2
2412	81.6	H	1.3	30.2	25.0	-	86.8	-
4824	33.5	H	1.1	34.5	23.5	54.0	44.5	9.5
Peak data, emissions above 1000 MHz(RBW = 1 MHz, VBW = 3 MHz)								
2387.65*	65.0	V	1.3	30.1	25.0	74.0	70.1	**3.9**
2412	94.0	H	1.3	30.2	25.0	-	99.2	-
4824	44.9	H	1.1	34.5	23.5	74.0	55.9	18.1

802.11 g : Frequency – 2437 MHz(above 1000 MHz)								
Frequency [MHz]	Reading [dBuV]	Pol. [H/V]	Height [m]	Correction Factor		Result Value		
				Ant. Factor [dB]	Cable+Amp. [dB]	Limit [dBuV/m]	Result [dBuV/m]	Margin [dB]
Average data, emissions above 1000 MHz(RBW = 1 MHz, VBW = 10 Hz)								
2437	83.5	H	1.3	30.3	24.8	-	89.0	-
4874	36.6	H	1.1	34.6	23.5	54.0	47.7	**6.3**
Peak data, emissions above 1000 MHz(RBW = 1 MHz, VBW = 3 MHz)								
2437	96.4	H	1.3	30.2	24.8	-	101.8	-
4874	49.5	H	1.1	34.6	23.5	74.0	60.6	13.4

802.11 g : Frequency – 2462 MHz(above 1000 MHz)								
Frequency [MHz]	Reading [dBuV]	Pol. [H/V]	Height [m]	Correction Factor		Result Value		
				Ant. Factor [dB]	Cable+Amp. [dB]	Limit [dBuV/m]	Result [dBuV/m]	Margin [dB]
Average data, emissions above 1000 MHz(RBW = 1 MHz, VBW = 10 Hz)								
2462	81.7	H	1.2	30.3	24.8	-	87.2	-
2483.75*	36.7	V	1.2	30.4	24.8	54.0	42.3	11.7
4924	31.8	H	1.1	34.7	23.5	54.0	43.0	11.0
Peak data, emissions above 1000 MHz(RBW = 1 MHz, VBW = 3 MHz)								
2462	94.6	H	1.2	30.3	24.8	-	100.1	-
2483.75*	59.9	V	1.2	30.4	24.8	74.0	65.5	**8.5**
4924	43.6	H	1.1	34.7	23.5	74.0	54.8	19.2

Note : * Restricted band

2. Below 1000 MHz

Worst case – 802.11 b : Below 1000 MHz								
Frequency [MHz]	Reading [dBuV]	Pol. [H/V]	Height [m]	Correction Factor		Result Value		
				Ant. Factor [dB]	Cable+Amp. [dB]	Limit [dBuV/m]	Result [dBuV/m]	Margin [dB]
34.92	47.2	V	1.0	11.3	23.1	40.0	35.4	4.6
148.01	42.6	H	2.3	12.7	22.0	43.5	33.3	10.2
296.74	46.9	H	2.1	12.4	21.2	46.0	38.1	7.9
354.95	39.1	H	1.4	13.8	21.1	46.0	31.8	14.2
445.45	36.8	H	1.4	16.1	20.7	46.0	32.2	13.8
592.57	34.9	H	1.2	18.7	19.9	46.0	33.7	12.3
741.32	38.5	V	1.5	20.9	19.3	46.0	40.1	5.9

5.3 Minimum 6 dB bandwidth

5.3.1 Test procedures

1. The transmitter out was connected to the Spectrum analyzer through a cable.

2. The bandwidth of the fundamental frequency was measured by Spectrum analyzer with RBW=100 kHz, VBW=300 kHz.

3. The 6 dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6 dB.

5.3.2 Limit of minimum 6 dB bandwidth

The minimum of 6 dB bandwidth measurement is 0.5 MHz.

5.3.3 Test instruments

Description	Manufacturer	Model no.	Serial no.	Due cal.	Use
Spectrum analyzer	Rohde&Schwarz	FSQ40	200062	2011.10.02	☒

5.3.4 Test Results

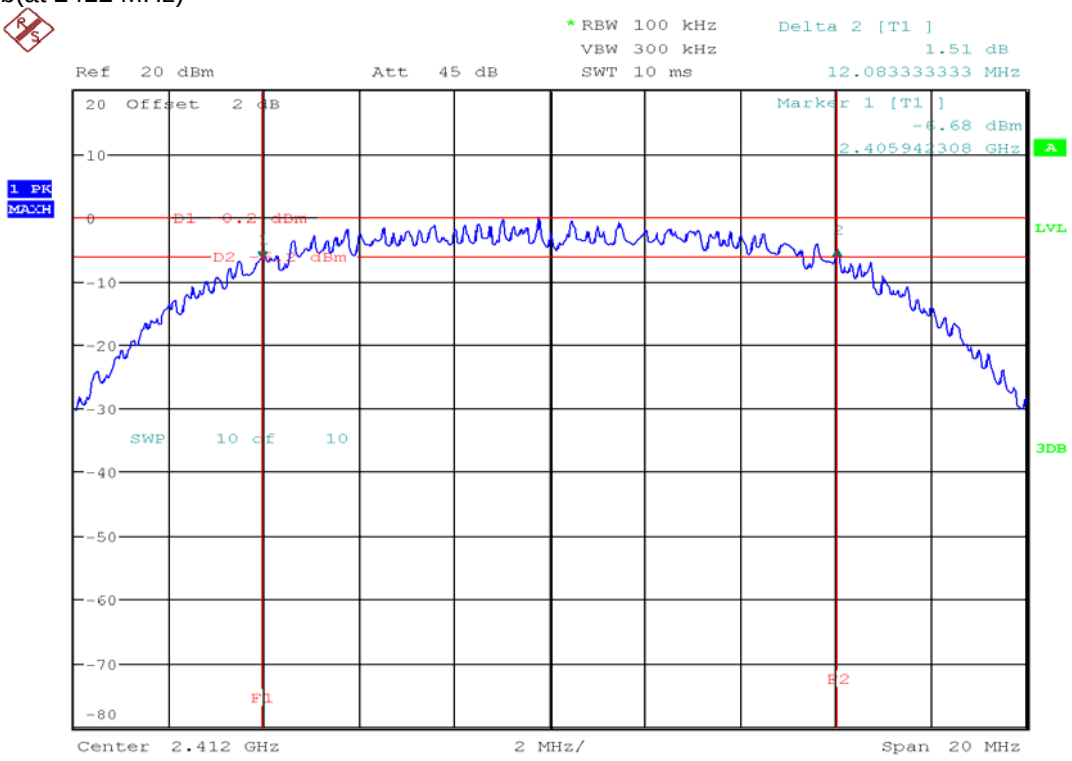
1. Data

802.11 b			
Frequency[MHz]	**6 dB bandwidth[MHz]**	**Minimum limit[MHz]**	**Result**
2412	12.08	0.5	Pass
2437	12.11	0.5	Pass
2462	12.11	0.5	Pass

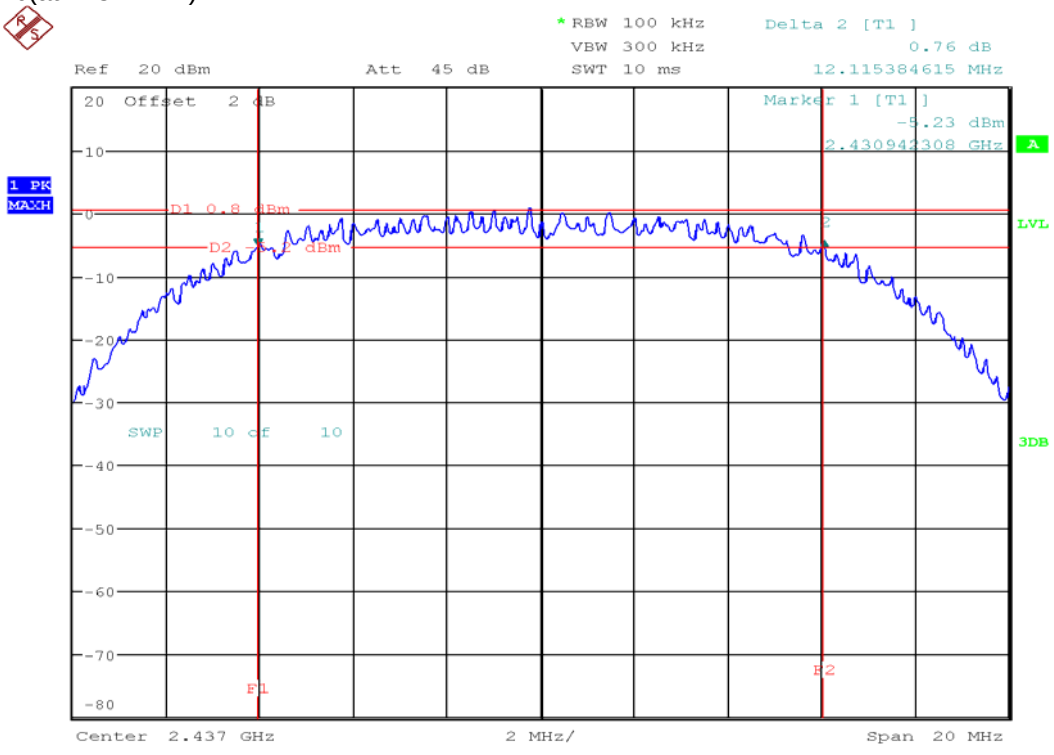
802.11 g			
Frequency[MHz]	**6 dB bandwidth[MHz]**	**Minimum limit[MHz]**	**Result**
2412	16.50	0.5	Pass
2437	16.50	0.5	Pass
2462	16.50	0.5	Pass

2. Graph

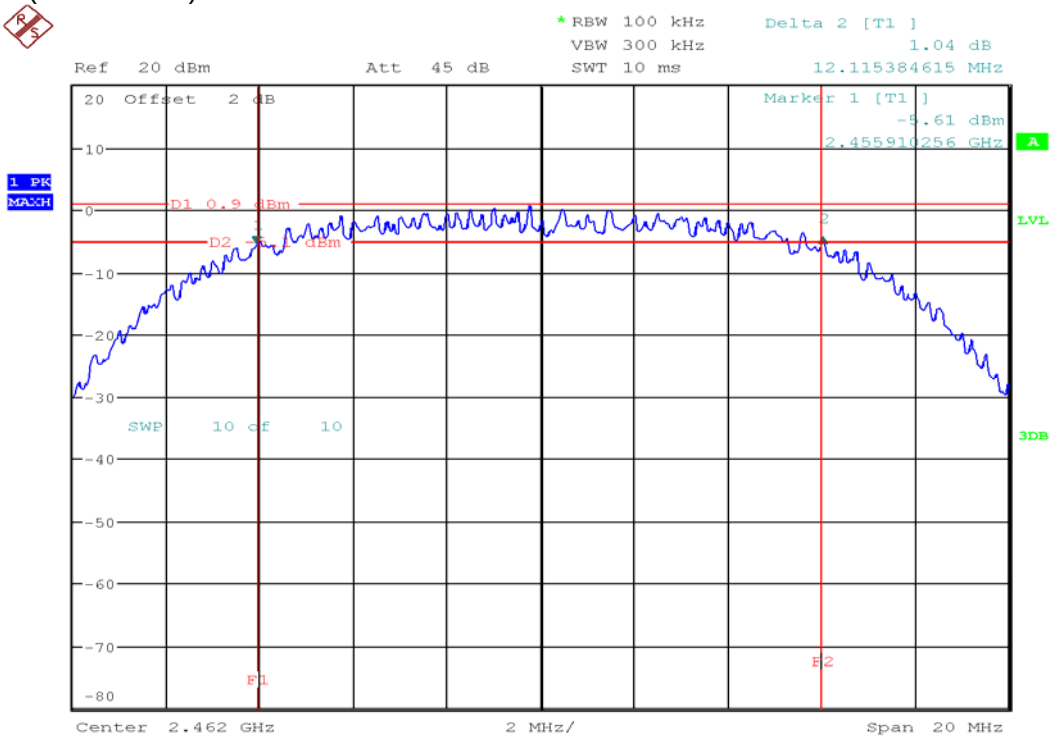
802.11 b(at 2412 MHz)



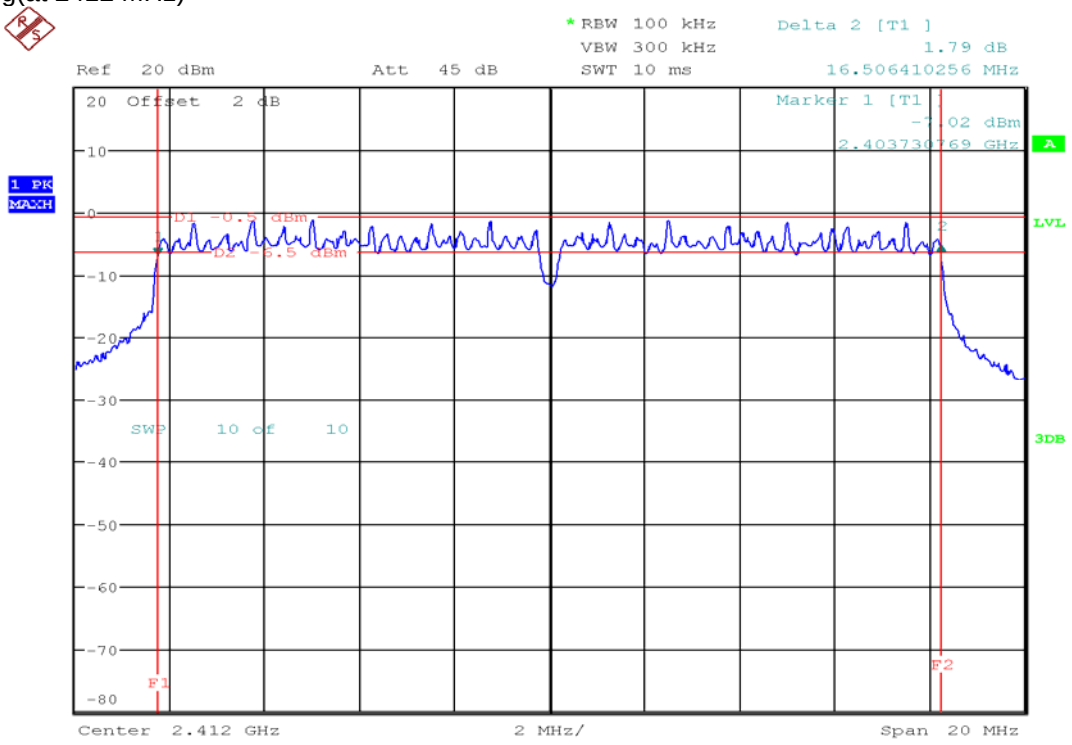
802.11 b(at 2437 MHz)



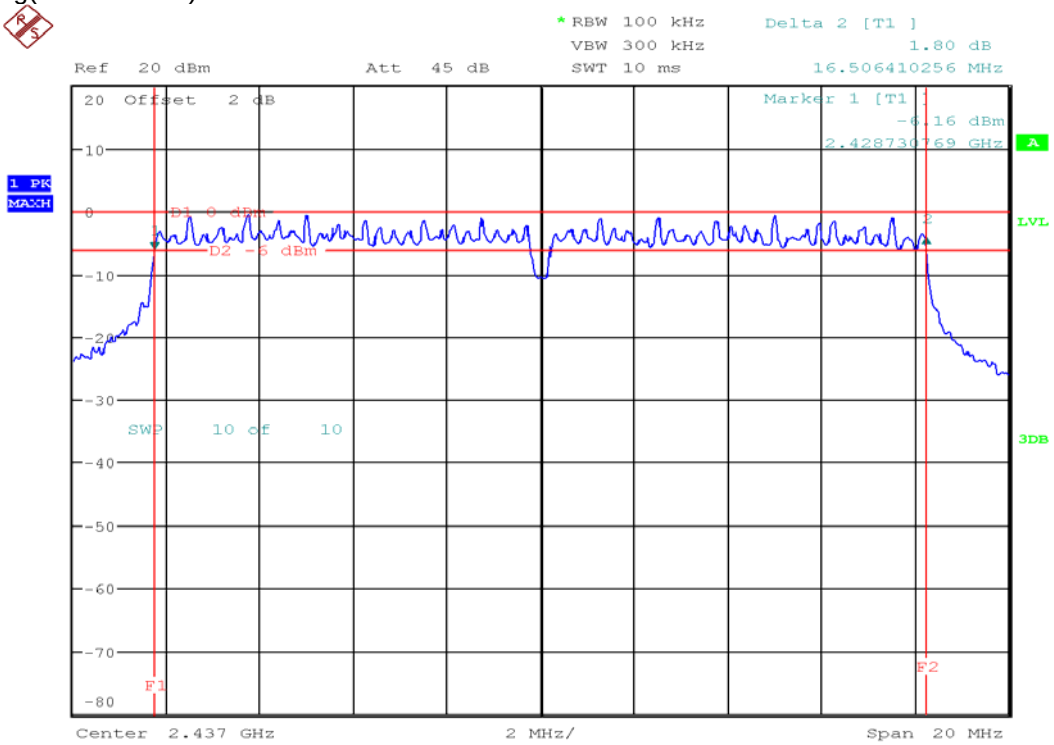
802.11 b(at 2462 MHz)



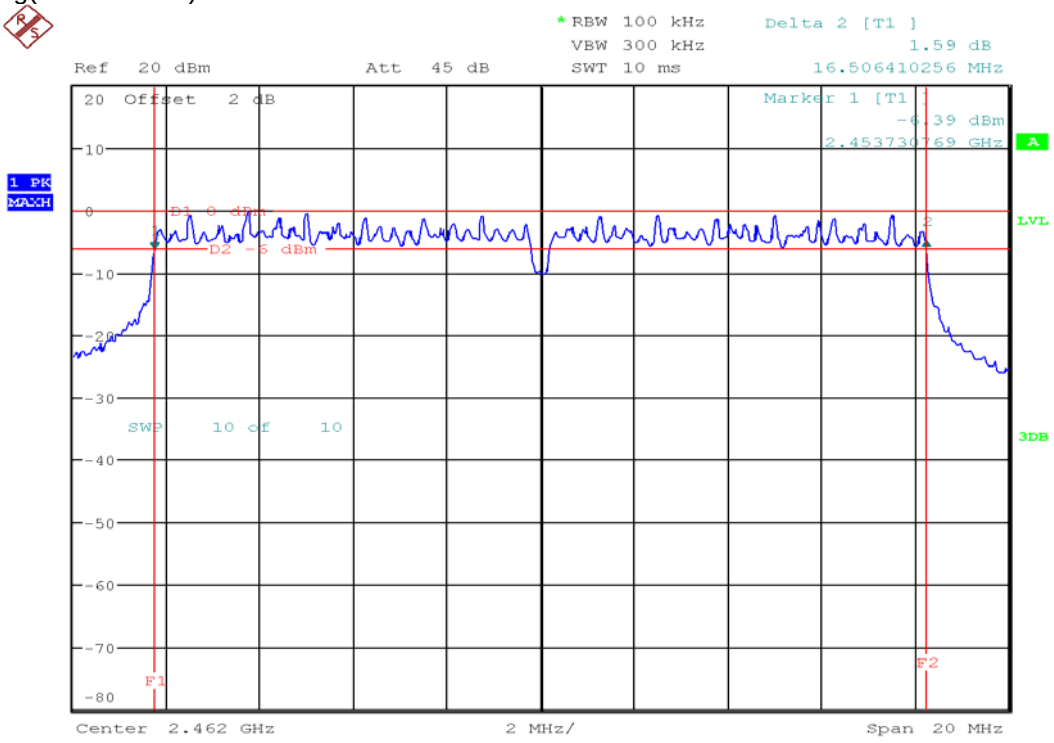
802.11 g(at 2412 MHz)



802.11 g(at 2437 MHz)



802.11 g(at 2462 MHz)



5.4 Maximum peak out power

5.4.1 Test procedures

1. A power sensor was used on the output port of the EUT.

2. A power meter was used to read the response of the power sensor.

3. Record the power lever

5.4.2 Limit of maximum peak out power

The maximum out peak power = 30 dBm

5.4.3 Test instruments

Description	Manufacturer	Model no.	Serial no.	Due cal.	Use
Spectrum analyzer	Rohde&Schwarz	FSQ40	200062	2011.10.02	☒
Power sensor	AGILENT	N1921A	MY45200258	2011.10.02	☒
Power meter	AGILENT	N1911A	MY45101189	2011.10.02	☒

5.4.4 Test Results

802.11 b				
Frequency [MHz]	**Out power [dBm]**	**Out power [mW]**	**Out power limit [dBm]**	**Result**
2412	9.31	8.53	30	Pass
2437	10.45	11.09	30	Pass
2462	10.69	11.69	30	Pass

802.11 g				
Frequency [MHz]	**Out power [dBm]**	**Out power [mW]**	**Out power limit [dBm]**	**Result**
2412	9.58	9.07	30	Pass
2437	10.68	11.69	30	Pass
2462	10.94	12.41	30	Pass

5.5 Peak power spectral density(PSD)

5.5.1 Test procedures

1. The transmitter out was connected to the Spectrum analyzer through a cable.

2. The bandwidth of the fundamental frequency was measured with the Spectrum analyzer using RBW = 3 kHz and VBW = 30 kHz, set sweep time = span / 3 kHz.

3. The power spectral density was measured and recorded.

5.5.2 Limit of maximum peak out power

The maximum of power spectral density measurement is 8 dBm.

5.5.3 Test instruments

Description	Manufacturer	Model no.	Serial no.	Due cal.	Use
Spectrum analyzer	Rohde&Schwarz	FSQ40	200062	2011.10.02	☒

5.5.4 Test Results

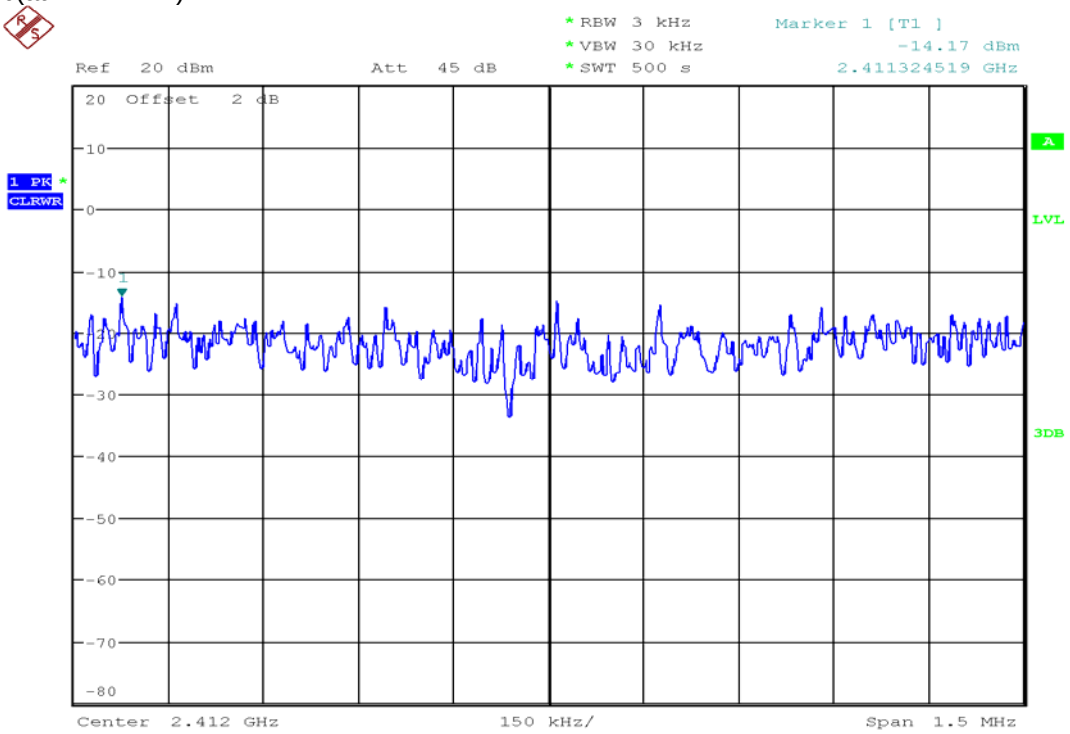
1. Data

802.11 b			
Frequency[MHz]	**PSD level[dBm]**	**Maximum limit[dBm]**	**Result**
2412	-14.17	8	Pass
2437	-13.51	8	Pass
2462	-13.36	8	Pass

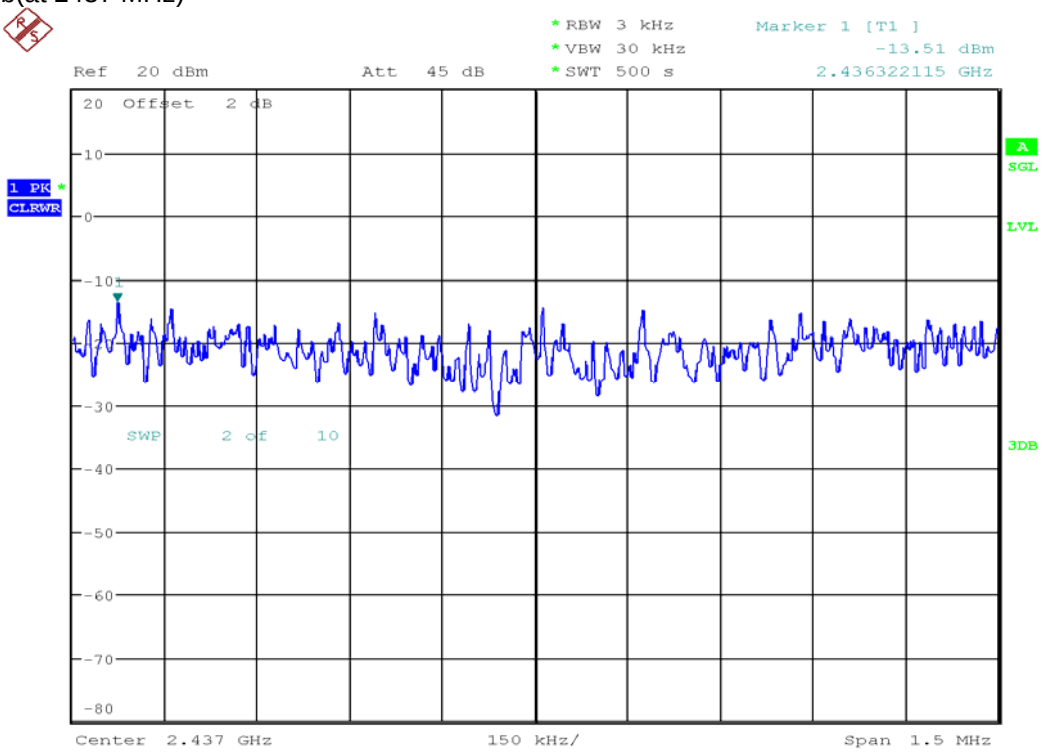
802.11 g			
Frequency[MHz]	**PSD level[dBm]**	**Maximum limit[dBm]**	**Result**
2412	-15.91	8	Pass
2437	-15.19	8	Pass
2462	-14.92	8	Pass

2. Graph

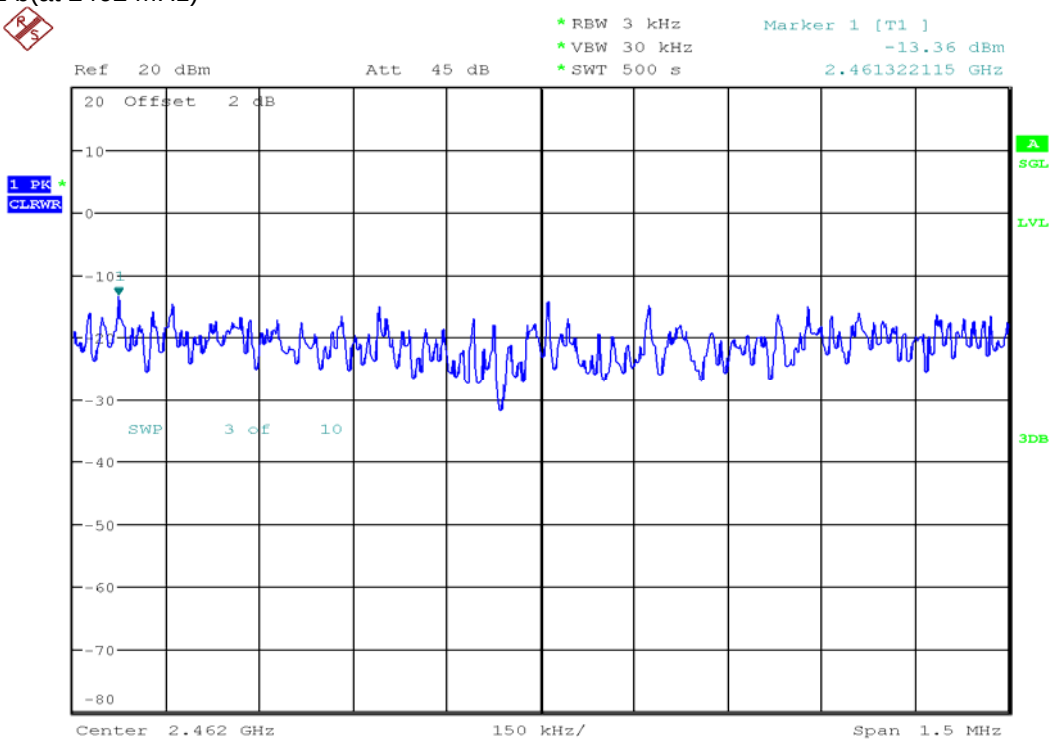
802.11 b(at 2412 MHz)



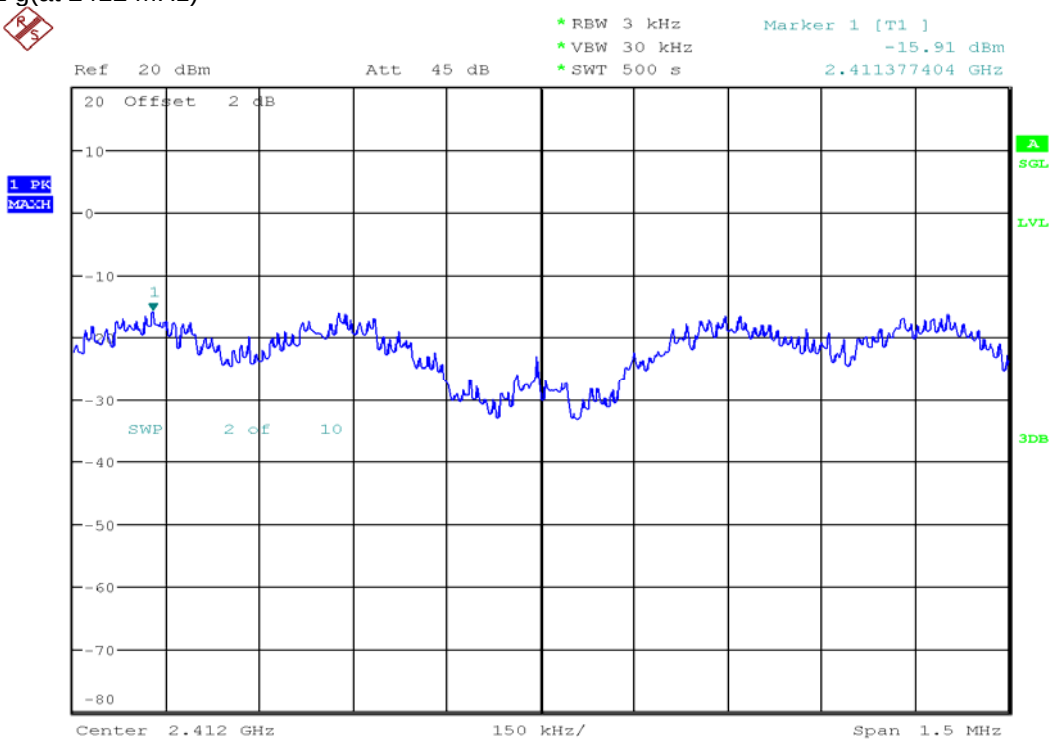
802.11 b(at 2437 MHz)



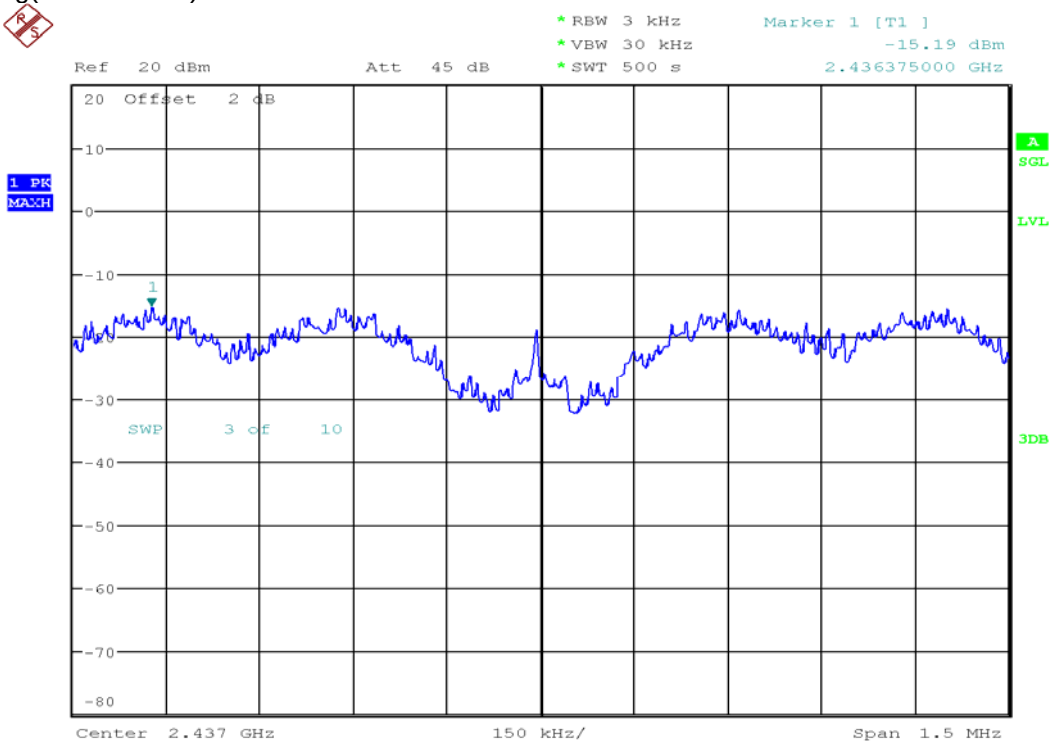
802.11 b(at 2462 MHz)



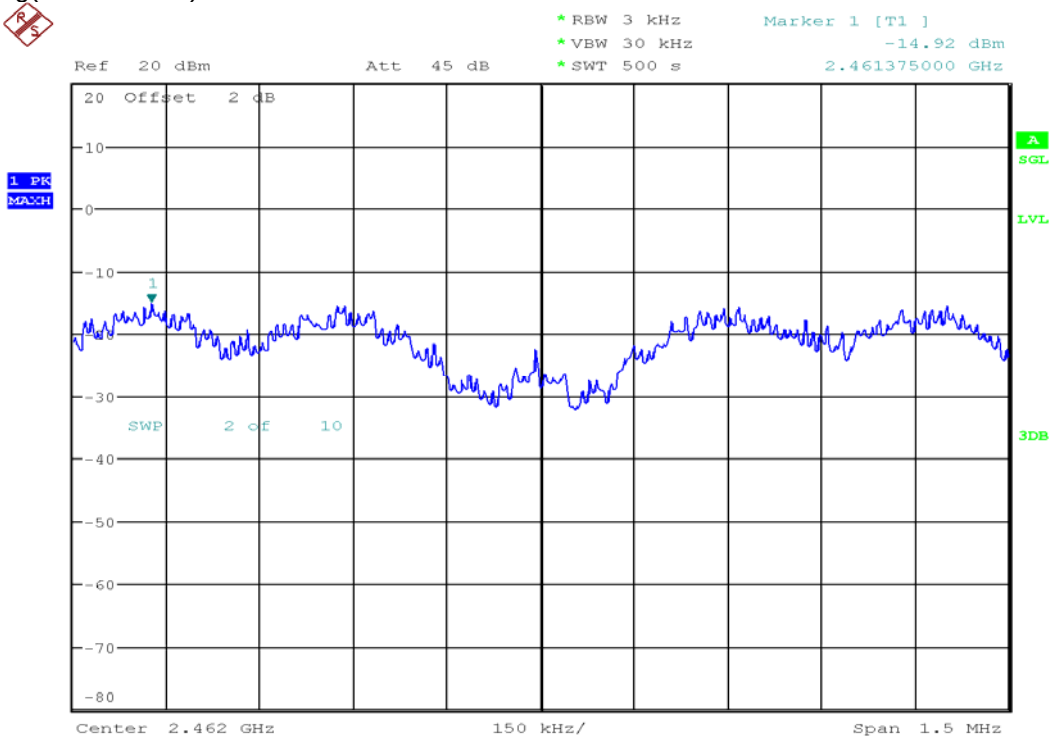
802.11 g(at 2412 MHz)



802.11 g(at 2437 MHz)



802.11 g(at 2462 MHz)



5.6 Antenna requirement

5.6.1 Regulation

For intentional device, according to FCC 47 CFR Section 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. And according to FCC 47 CFR Section 15.24

5.6.2 Antenna connected construction

The antenna types used in this product are integral antenna.

802.11 b/g : Chip antenna(gain : 1.99 dBi)

5.7 RF exposure

No SAR Evaluation required if power is below the following threshold : 802.11 b/g

802.11 b/g Tunable range			
F(GHz) Low	**F(GHz) High**	**Center of tunable band (GHz)**	**60/f SAR Limitation (mW)**
2.412	2.462	2.437	24.62

Maximum measured transmitter power :

Pout Conducted (dBm)	Pout Conducted (mW)	Maximum Antenna Gain (dBi)	Pout EIRP(mW)
10.94	12.41	1.99	19.63

Conclusion : No SAR evaluation required since maximum transmitter pout(both conducted and EIRP) is below FCC threshold