JQA File No. : KL80150483S
Issue Date : January 28, 2016

TEST REPORT

Applicant	:	WESTUNITIS CO., LTD.
Address	:	29F Grand Front Osaka Tower-A , 4-20 Ofukacho, Kita-ku, Osaka, Japan,530-0011
Products	:	InfoLinker
Model No.	:	WUZ-01B-NB01
Serial No.	:	501550014
FCC ID	:	2AFRZWUZ-01B-NB01
Test Standard	:	CFR 47 FCC Rules and Regulations Part 15
Test Results	:	**Passed**
Date of Test	:	November 18 ~ December 2, 2015

ilac-MRA VLAC Lab Accreditation VLAC-001-2

Kousei Shibata
Manager
Japan Quality Assurance Organization
KITA-KANSAI Testing Center
SAITO EMC Branch
7-3-10, Saito-asagi, Ibaraki-shi, Osaka 567-0085, Japan

- The measurement values stated in Test Report was made with traceable to National Institute of Advanced Industrial Science and Technology (AIST) of Japan and National Institute of Information and Communications Technology (NICT) of Japan.
- The applicable standard, testing condition and testing method which were used for the tests are based on the request of the applicant.
- The test results presented in this report relate only to the offered test sample.
- The contents of this test report cannot be used for the purposes, such as advertisement for consumers.
- This test report shall not be reproduced except in full without the written approval of JQA.
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DEFINITIONS FOR ABBREVIATION AND SYMBOLS USED IN THIS TEST REPORT

EUT : Equipment Under Test
AE : Associated Equipment
N/A : Not Applicable
N/T : Not Tested

EMC : Electromagnetic Compatibility
EMI : Electromagnetic Interference
EMS : Electromagnetic Susceptibility

☑ - indicates that the listed condition, standard or equipment is applicable for this report.
☐ - indicates that the listed condition, standard or equipment is not applicable for this report.

1 Description of the Equipment Under Test

1.	Manufacturer	:	WESTUNITIS CO., LTD. 29F Grand Front Osaka Tower-A , 4-20 Ofukacho, Kita-ku, Osaka, Japan,530-0011
2.	Products	:	InfoLinker
3.	Model No.	:	WUZ-01B-NB01
4.	Serial No.	:	501550014
5.	Product Type	:	Mass Production
6.	Date of Manufacture	:	June, 2015
7.	Power Rating	:	3.7VDC (Lithium-ion Battery WHB-001 300mAh) 5.0VDC (USB)
8.	Grounding	:	None
9.	Transmitting Frequency	:	WLAN: 2412.0 MHz(01CH) – 2462.0MHz(11CH)
10.	Receiving Frequency	:	WLAN: 2412.0 MHz(01CH) – 2462.0MHz(11CH)
11.	Max. RF Output Power	:	10.57 dBm(Measure Value of IEEE802.11b)
		:	15.75 dBm(Measure Value of IEEE802.11g)
		:	15.75 dBm(Measure Value of IEEE802.11n HT20)
		:	15.82 dBm(Measure Value of IEEE802.11n HT40)
12.	Antenna Type	:	1/2 λ Type Antenna (Integral)
13.	Antenna Gain	:	-3.0 dBi
14.	Category	:	DTS
15.	EUT Authorization	:	Certification
16.	Received Date of EUT	:	October 9, 2015

17. Channel Plan

WLAN:
The carrier spacing is 5 MHz.
The carrier frequency is designated by the absolute frequency channel number (ARFCN).
The carrier frequency is expressed in the equation shown as follows:

Transmitting Frequency (in MHz) = 2407.0 + 5*n
Receiving Frequency (in MHz) = 2407.0 + 5*n
where, n : channel number ($1 \leq n \leq 11$)

2 Summary of Test Results

Applied Standard : CFR 47 FCC Rules and Regulations Part 15
Subpart C – Intentional Radiators

The EUT described in clause 1 was tested according to the applied standard shown above.
Details of the test configuration is shown in clause 6.
The conclusion for the test items of which are required by the applied standard is indicated under the test result.

☑ - The test result was **passed** for the test requirements of the applied standard.

☐ - The test result was **failed** for the test requirements of the applied standard.

☐ - The test result was **not judged** the test requirements of the applied standard.

In the approval of test results,
- Determining compliance with the limits in this report was based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
- No deviations were employed from the applied standard.
- No modifications were conducted by JQA to achieve compliance to the limitations.

Reviewed by:

Shigeru Osawa
Deputy Manager
JQA KITA-KANSAI Testing Center
SAITO EMC Branch

Tested by:

Takeshi Choda
Assistant Manager
JQA KITA-KANSAI Testing Center
SAITO EMC Branch

3 Test Procedure

Test Requirements : §15.247, §15.207 and §15.209

Test Procedure : ANSI C63.10–2013
Testing unlicensed wireless devices.

KDB 558074 D01
DTS Meas Guidance v03r03: June 9, 2015.

KDB 447498
RF exposure and equipment authorization requirements

4 Test Location

Japan Quality Assurance Organization (JQA)
KITA-KANSAI Testing Center
7-7, Ishimaru, 1-chome, Minoh-shi, Osaka, 562-0027, Japan
SAITO EMC Branch
7-3-10, Saito-asagi, Ibaraki-shi, Osaka 567-0085, Japan

5 Recognition of Test Laboratory

JQA KITA-KANSAI Testing Center SAITO EMC Branch is accredited under ISO/IEC 17025 by following accreditation bodies and the test facility is registered by the following bodies.

VLAC Accreditation No.	:	VLAC-001-2 (Expiry date : March 30, 2016)
VCCI Registration No.	:	A-0002 (Expiry date : March 30, 2016)
BSMI Registration No.	:	SL2-IS-E-6006, SL2-IN-E-6006, SL2-R1/R2-E-6006, SL2-A1-E-6006 (Expiry date : September 14, 2016)
IC Registration No.	:	2079E-3, 2079E-4 (Expiry date : July 16, 2017)

Accredited as conformity assessment body for Japan electrical appliances and material law by METI. (Expiry date : February 22, 2016)

6 Description of Test Setup

6.1 Test Configuration

The equipment under test (EUT) consists of :

	Item	Manufacturer	Model No.	Serial No.	FCC ID
A	InfoLinker	WESTUNITIS	WUZ-01B-NB01	501550014	2AFRZWUZ-01B-NB01
B	Li-ion Battery	WESTUNITIS	WHB-001	--	N/A

The auxiliary equipment used for testing :

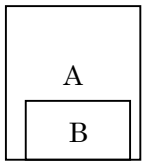
	Item	Manufacturer	Model No.	Serial No.	FCC ID
C	Earphone	--	--	--	N/A
D	Note PC	Fujitsu	FMV A 05010P	CP660964-01	None
E	AC Adapter (for PC)	Fujitsu	ADP-65JH AB	CP500588-01	N/A
F	Mouse	Hewlett Packard	M-UAE96	265986-011	N/A
G	Access Point	Cisco	AIR-CAP3702E-A-K9	FJC1928F02H	LDK102087
H	AC Adapter (for AP)	Cisco	EADP-18MB B	DAB1925M1RG	N/A

Type of Cable:

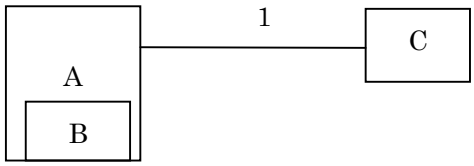
No.	Description	Identification (Manu. etc.)	Connector Shielded	Cable Shielded	Ferrite Core	Length (m)
1	Earphone cable	--	--	NO	NO	1.2
2	USB Cable1	--	YES	YES	NO	1.2
3	USB Cable2	--	YES	YES	NO	1.8
4	DC Cable	--	--	NO	YES	1.8
5	AC Cable	--	--	NO	NO	1.0
6	DC Cable	--	--	NO	YES	1.8
7	AC Cable	--	--	NO	NO	1.8

6.2 Test Arrangement (Drawings)

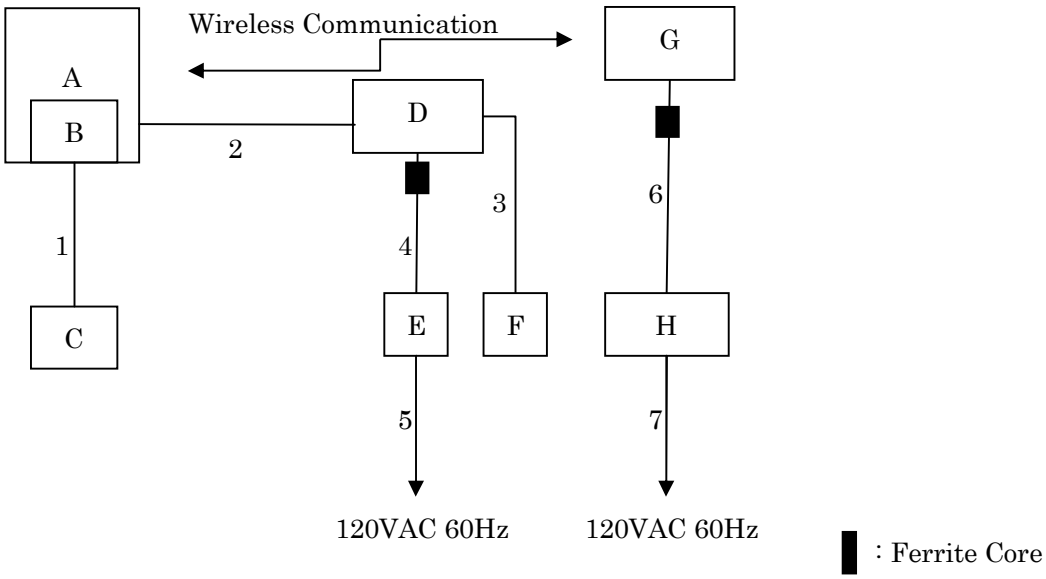
a) Single Unit



b) Earphone used



c) Wireless LAN Tx and USB Charging



6.3 Operating Condition

Power Supply Voltage : 3.7VDC (for Battery)
5.0VDC (for USB)

Transmitting/Receiving

WLAN:
Transmitting frequency : 2412.0 MHz(1CH) – 2462.0 MHz(11CH)
Receiver frequency : 2412.0 MHz(1CH) – 2462.0 MHz(11CH)

Modulation Type
1. 802.11b : DSSS
2. 802.11g : OFDM
3. 802.11n HT20 : OFDM
4. 802.11n HT40 : OFDM

Other Clock Frequency
1.5GHz (CPU)

The tests were performed in the following worst condition.

Mode	Condition
IEEE802.11b	1 Mbps
IEEE802.11g	6 Mbps
IEEE802.11n HT20	MCS0 (6.5 Mbps)
IEEE802.11n HT40	MCS0 (13.5 Mbps)

Note: The worst condition was determined based on the test result of Maximum Peak Output Power(Mid channel).

The EUT was rotated through three orthogonal axis (X, Y and Z axis) in radiated measurement.
The EUT with temporary antenna port was used in conducted measurement.

The test were carried out using the following test program supplied by applicant;
- Software Name: Real Time Tuning Tool
- Software Version: Version 2.0.0.55
- Storage Location: Controller PC

7 Test Requirements

7.0 Summary of the Test Results

Test Item	FCC Specification	Reference of the Test Report	Results	Remarks
Antenna Requirement	Section 15.203	Section 1.12	Passed	-
Channel Separation	Section 15.247(a)(1)	-		-
Minimum Hopping Channel	Section 15.247(a)(1)(iii)	-	-	-
Occupied Bandwidth	Section 15.247(a)(2)	Section 7.3	Passed	-
Dwell Time	Section 15.247(a)(1)(iii)	-	-	-
Peak Output Power (Conduction)	Section 15.247(b)(3)	Section 7.5	Passed	-
Peak Power Density (Conduction)	Section 15.247(e)	Section 7.6	Passed	-
Spurious Emissions (Conduction)	Section 15.247(d)	Section 7.7	Passed	-
AC Powerline Conducted Emission	Section 15.207	Section 7.8	Passed	-
Radiated Emission	Section 15.247(d)	Section 7.9	Passed	-
SAR Test Exclusion	Section 15.247(i)	Section 7.10	Passed	-

7.1 Channel Separation

For the requirements, ☐ - Applicable [☐ - Tested. ☐ - Not tested by applicant request.]
☑ - Not Applicable

Remarks : _____

7.2 Minimum Hopping Channel

For the requirements, ☐ - Applicable [☐ - Tested. ☐ - Not tested by applicant request.]
☑ - Not Applicable

Remarks : _____

7.3 Occupied Bandwidth

For the requirements, ☑ - Applicable [☑ - Tested. ☐ - Not tested by applicant request.]
☐ - Not Applicable

7.3.1 Test Results

For the standard, ☑ - **Passed** ☐ - **Failed** ☐ - **Not judged**

The 99% Bandwidth of IEEE802.11b is	14.487	MHz	at	2462.0	MHz
The 99% Bandwidth of IEEE802.11g is	16.380	MHz	at	2412.0	MHz
The 99% Bandwidth of IEEE802.11n HT20 is	17.558	MHz	at	2412.0	MHz
The 99% Bandwidth of IEEE802.11n HT40 is	35.556	MHz	at	2452.0	MHz
The 6dB Bandwidth of IEEE802.11b is	10.082	MHz	at	2412.0	MHz
				2462.0	MHz
The 6dB Bandwidth of IEEE802.11g is	15.140	MHz	at	2412.0	MHz
The 6dB Bandwidth of IEEE802.11n HT20 is	15.135	MHz	at	2412.0	MHz
The 6dB Bandwidth of IEEE802.11n HT40 is	31.372	MHz	at	2452.0	MHz
Uncertainty of Measurement Results				± 0.9	%(2σ)

Remarks : _____

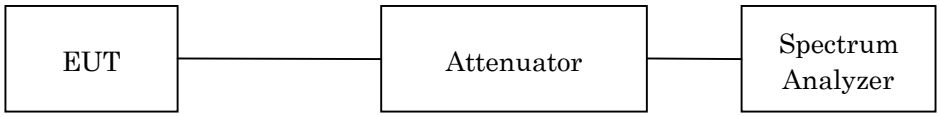
7.3.2 Test Instruments

Shielded Room S4				
Type	**Model**	**Serial No. (ID)**	**Manufacturer**	**Cal. Due**
Spectrum Analyzer	E4446A	US44300388 (A-39)	Agilent	2016/08/11
RF Cable	SUCOFLEX102	14253/2 (C-52)	HUBER+SUHNER	2016/08/16
Attenuator	54A-10	W5675 (D-28)	Weinschel	2016/08/16

NOTE : The calibration interval of the above test instruments is 12 months.

7.3.3 Test Method and Test Setup (Diagrammatic illustration)

The test system is shown as follows:



The setting of the spectrum analyzer are shown as follows:

	WLAN	Bluetooth
Res. Bandwidth	100 kHz	100 kHz
Video Bandwidth	300 kHz	300 kHz
Span	30 MHz	3 MHz
Sweep Time	AUTO	AUTO
Trace	Maxhold	Maxhold

7.3.4 Test Data

Mode of EUT : WLAN

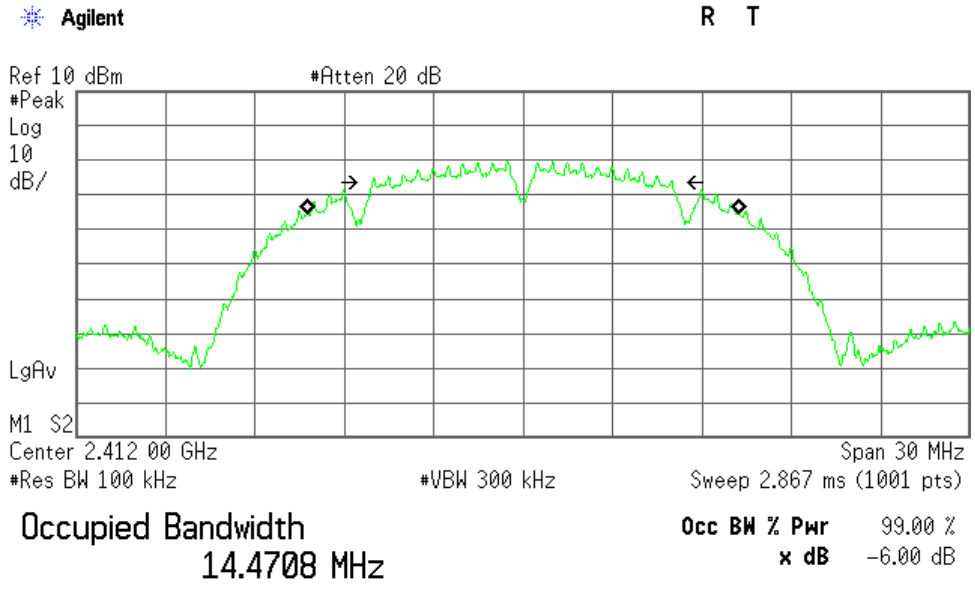
Test Date :November 24, 2015
Temp.:20°C, Humi:64%

The resolution bandwidth was set to 100 kHz, -6dBc display line was placed on the screen (or 99% bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace.

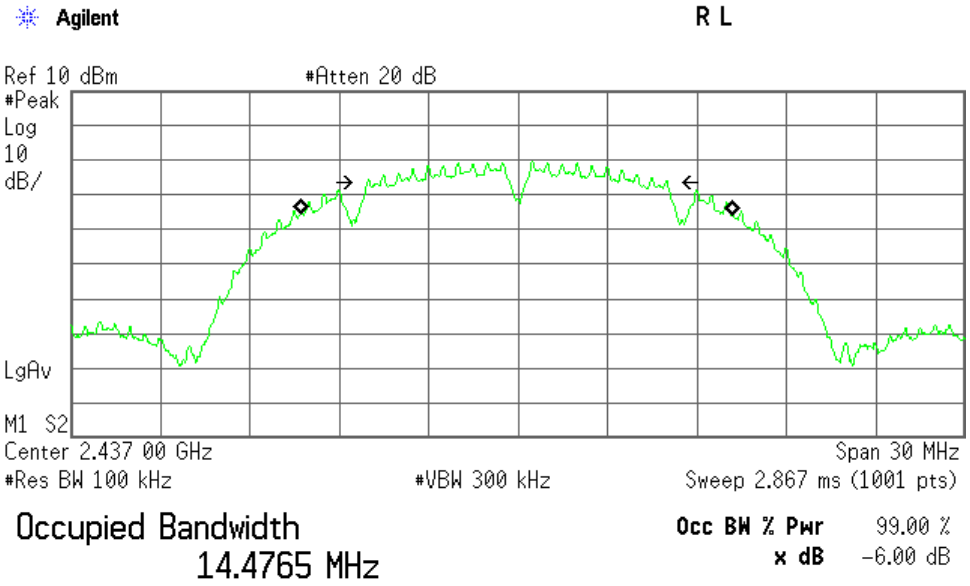
A) IEEE 802.11b

Channel	Frequency (MHz)	99% Bandwidth (MHz)	-6dBc Bandwidth (MHz)	Minimum -6dBc Bandwidth Limit (kHz)
01	2412.0	14.471	10.082	500
06	2437.0	14.477	10.072	500
11	2462.0	14.487	10.082	500

Low Channel

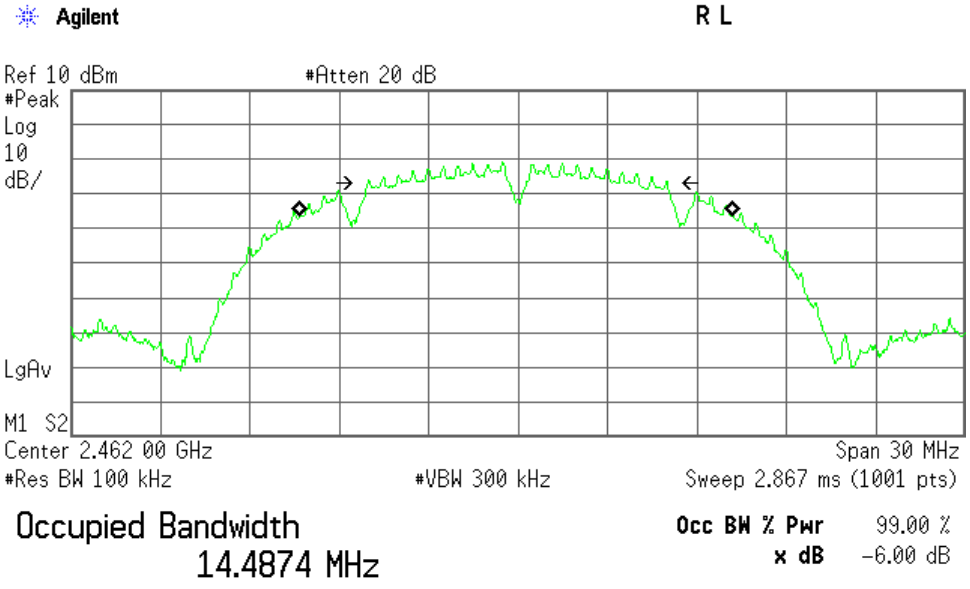


Middle Channel



Transmit Freq Error	-54.018 kHz
Occupied Bandwidth	10.072 MHz

High Channel

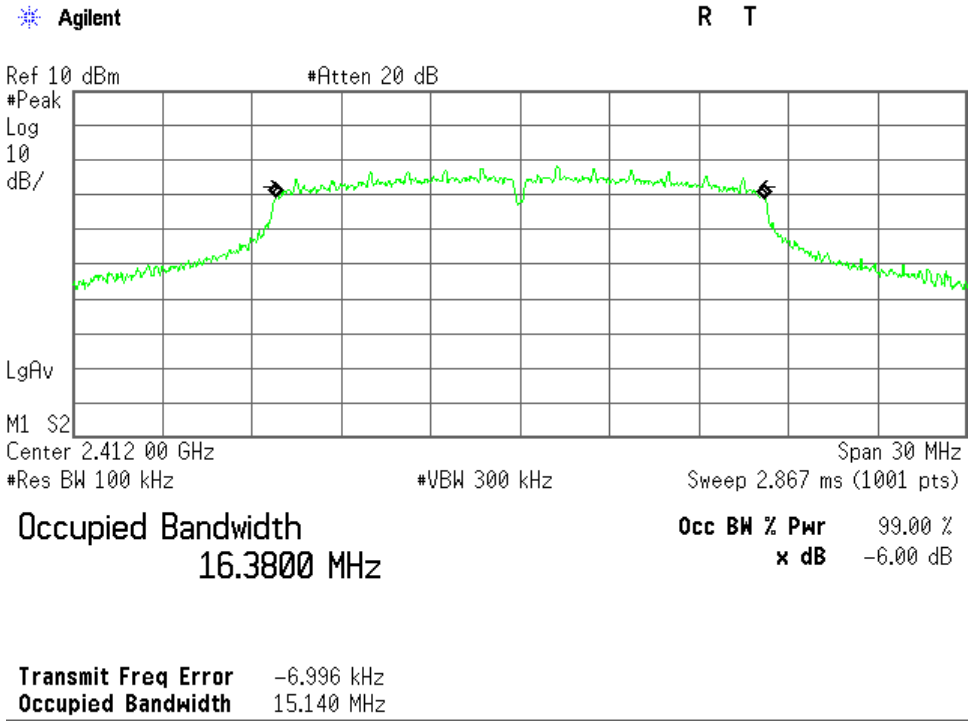


Transmit Freq Error	-66.971 kHz
Occupied Bandwidth	10.082 MHz

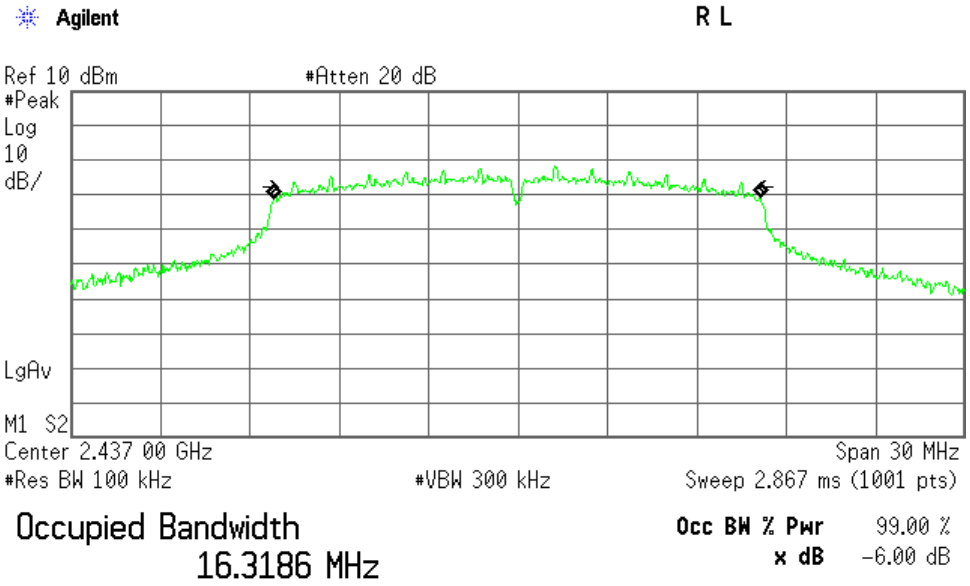
B) IEEE 802.11g

Channel	Frequency (MHz)	99% Bandwidth (MHz)	-6dBc Bandwidth (MHz)	Minimum -6dBc Bandwidth Limit (kHz)
01	2412.0	16.380	15.140	500
06	2437.0	16.319	15.112	500
11	2462.0	16.342	15.112	500

Low Channel

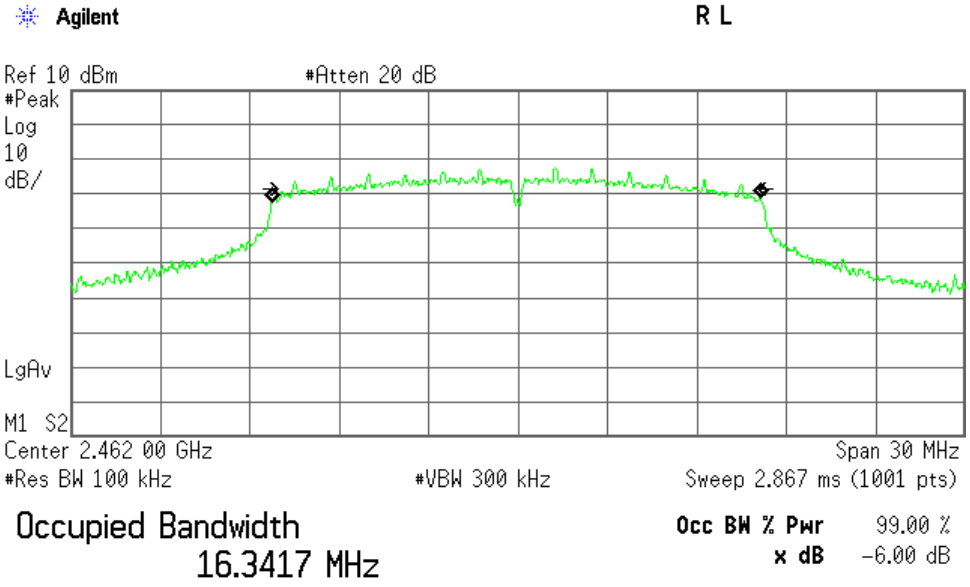


Middle Channel



Transmit Freq Error	-35.265 kHz
Occupied Bandwidth	15.112 MHz

High Channel

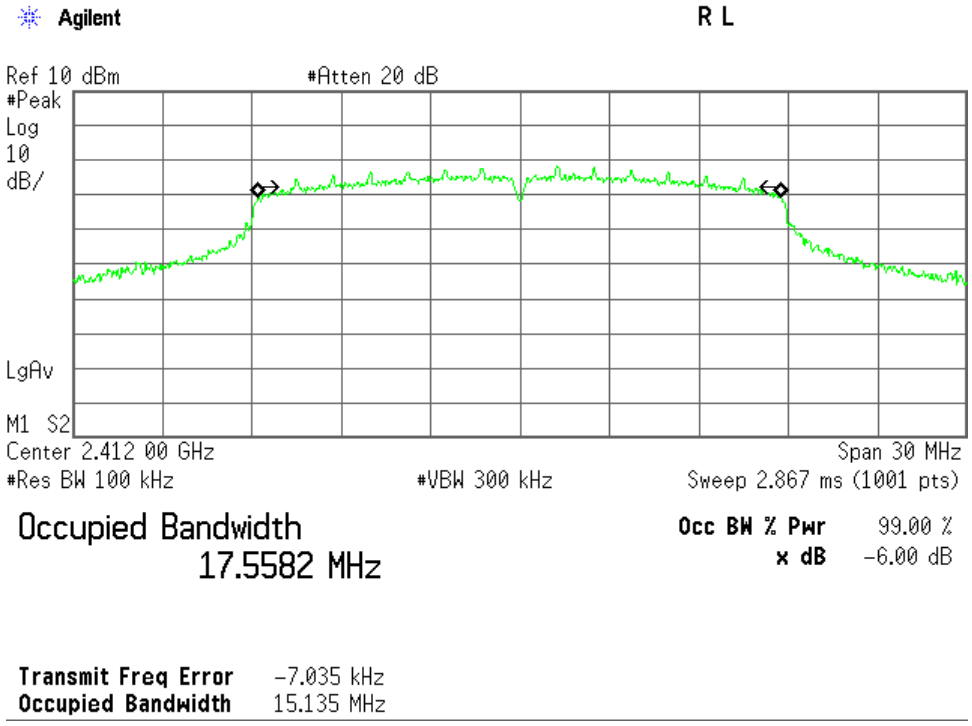


Transmit Freq Error	-40.657 kHz
Occupied Bandwidth	15.112 MHz

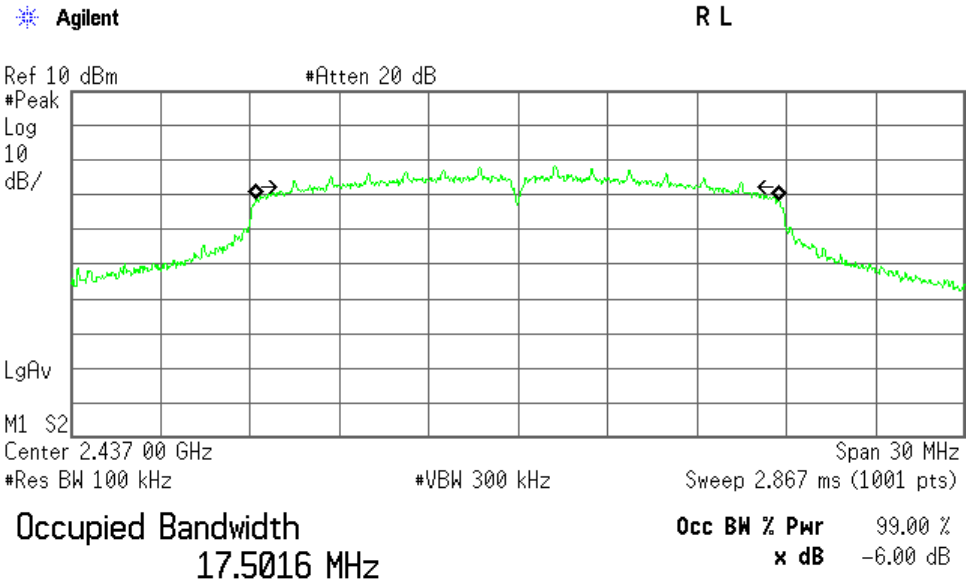
C) IEEE 802.11n HT20

Channel	Frequency (MHz)	99% Bandwidth (MHz)	-6dBc Bandwidth (MHz)	Minimum -6dBc Bandwidth Limit (kHz)
01	2412.0	17.558	15.135	500
06	2437.0	17.502	15.120	500
11	2462.0	17.497	15.111	500

Low Channel

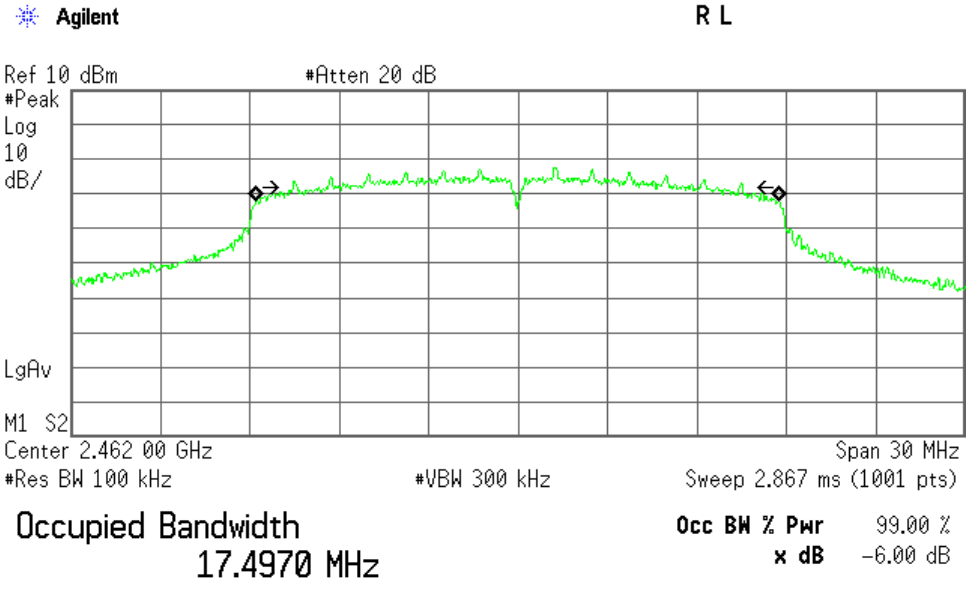


Middle Channel



Transmit Freq Error	-32.486 kHz
Occupied Bandwidth	15.120 MHz

High Channel

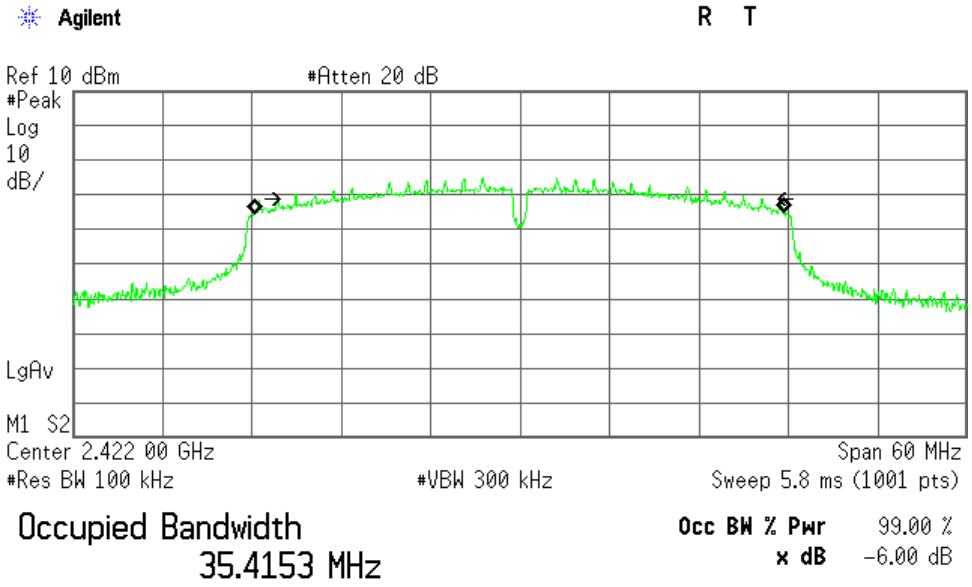


Transmit Freq Error	-26.671 kHz
Occupied Bandwidth	15.111 MHz

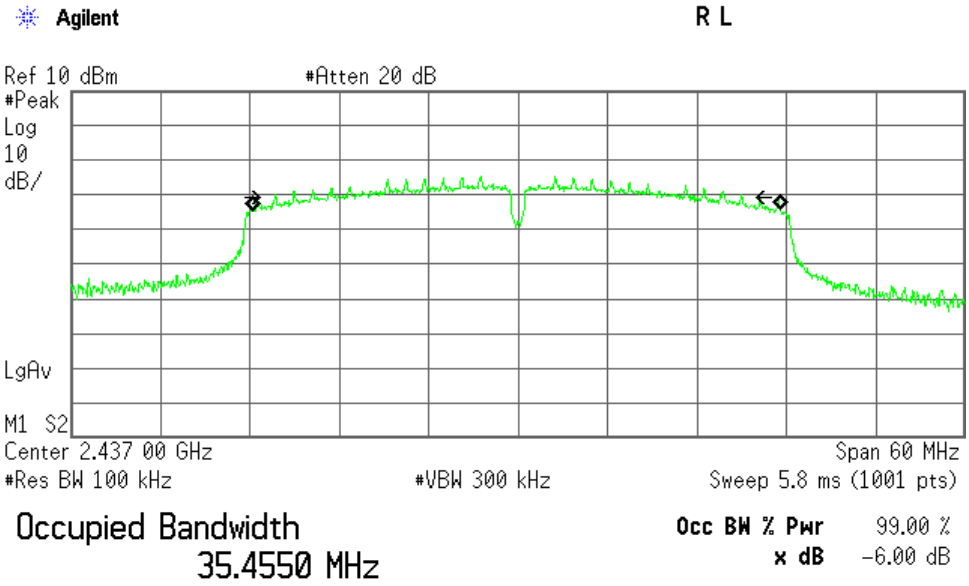
D) IEEE 802.11n HT40

Channel	Frequency (MHz)	99% Bandwidth (MHz)	-6dBc Bandwidth (MHz)	Minimum -6dBc Bandwidth Limit (kHz)
03	2422.0	35.415	31.359	500
06	2437.0	35.455	31.360	500
09	2452.0	35.556	31.372	500

Low Channel

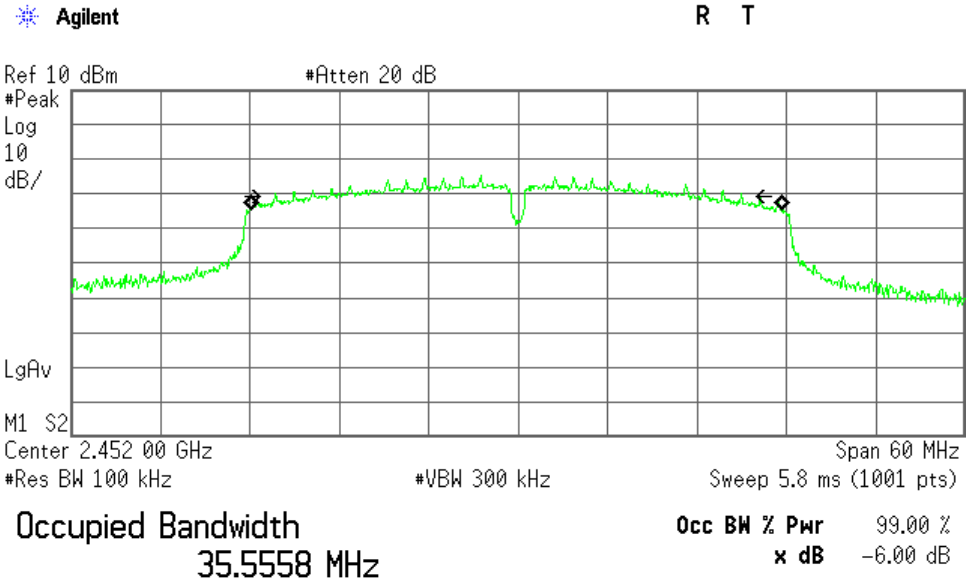


Middle Channel



Transmit Freq Error	-83.809 kHz
Occupied Bandwidth	31.360 MHz

High Channel



Transmit Freq Error	-103.220 kHz
Occupied Bandwidth	31.372 MHz

7.4 Dwell Time

For the requirements, ☐ - Applicable [☐ - Tested. ☐ - Not tested by applicant request.]
☑ - Not Applicable

Remarks : _____

7.5 Peak Output Power(Conduction)

For the requirements, ☑ - Applicable [☑ - Tested. ☐ - Not tested by applicant request.]
☐ - Not Applicable

7.5.1 Test Results

For the standard, ☑ - **Passed** ☐ - **Failed** ☐ - **Not judged**

Peak Output Power of IEEE802.11b is	10.57	dBm	at	2412.0	MHz
Peak Output Power of IEEE802.11g is	15.75	dBm	at	2412.0	MHz
Peak Output Power of IEEE802.11n HT20 is	15.75	dBm	at	2412.0	MHz
Peak Output Power of IEEE802.11n HT40 is	15.82	dBm	at	2412.0	MHz

Uncertainty of Measurement Results ± 0.9 dB(2σ)

Remarks : _____

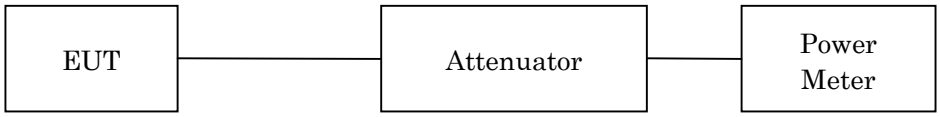
7.5.2 Test Instruments

Shielded Room S4				
Type	**Model**	**Serial No. (ID)**	**Manufacturer**	**Cal. Due**
Power Meter	ML2495A	1423001 (B-16)	Anritsu	2016/07/16
Power Sensor	MA2411B	1339136 (B-18)	Anritsu	2016/07/16
Attenuator	54A-10	W5675 (D-28)	Weinschel	2016/08/16

NOTE : The calibration interval of the above test instruments is 12 months.

7.5.3 Test Method and Test Setup (Diagrammatic illustration)

The Conducted RF Power Output was measured with a power meter, one attenuator and a short, low loss cable.



7.5.4 Test Data

1) IEEE 802.11b

Test Date: November 18, 2015
Temp.: 21 °C, Humi: 71 %

Data Rate : 1Mbps

Transmitting Frequency		Correction Factor	Meter Reading	Conducted Peak Output Power		Limits	Margin
CH	[MHz]	[dB]	[dBm]	[dBm]	[mW]	[dBm]	[dB]
01	2412	9.64	0.93	10.57	11.40	30.00	+19.43
06	2437	9.65	0.63	10.28	10.67	30.00	+19.72
11	2462	9.65	0.07	9.72	9.38	30.00	+20.28

Calculated result at 2412.000 MHz, as the worst point shown on underline:

	Correction Factor	=	9.64 dB
+)	Meter Reading	=	0.93 dBm
	Result	=	10.57 dBm = 11.40 mW

Minimum Margin: 30.00 - 10.57 = 19.43 (dB)

NOTES
1. The correction factor shows the attenuation pad loss including the short, low loss cable or adapter.
2. Setting of measuring instrument(s) :

Detector Function	Video B.W.
Peak	OFF

CH 06 **[MHz] 2437**

Rate	Meter Reading [dBm]	Remark
1Mbps	0.63	*
2Mbps	0.61	
5.5Mbps	0.58	
11Mbps	0.59	

* : Worst Rate
All comparison were performed on the same measurement condition.

2) IEEE 802.11g

Test Date: November 18, 2015
Temp.: 21 °C, Humi: 71 %

Data Rate : 6Mbps

Transmitting Frequency		Correction Factor	Meter Reading	Conducted Peak Output Power		Limits	Margin
CH	[MHz]	[dB]	[dBm]	[dBm]	[mW]	[dBm]	[dB]
01	2412	9.64	6.11	15.75	37.58	30.00	+14.25
06	2437	9.65	6.07	15.72	37.33	30.00	+14.28
11	2462	9.65	5.65	15.30	33.88	30.00	+14.70

Calculated result at 2412.000 MHz, as the worst point shown on underline:

	Correction Factor	=	9.64 dB
+)	Meter Reading	=	6.11 dBm
	Result	=	15.75 dBm = 37.58 mW

Minimum Margin: 30.00 - 15.75 = 14.25 (dB)

NOTES
1. The correction factor shows the attenuation pad loss including the short, low loss cable or adapter.
2. Setting of measuring instrument(s) :

Detector Function	Video B.W.
Peak	OFF

CH	[MHz]
06	2437

Rate	Meter Reading [dBm]	Remark
6Mbps	6.07	*
9Mbps	5.92	
12Mbps	5.99	
18Mbps	6.00	
24Mbps	5.98	
36Mbps	6.03	
48Mbps	6.01	
54Mbps	6.05	

* : Worst Rate
All comparison were performed on the same measurement condition.

3) IEEE 802.11n HT20

Test Date: November 18, 2015
Temp.: 21 °C, Humi: 71 %

Data Rate : MCS0

Transmitting Frequency		Correction Factor	Meter Reading	Conducted Peak Output Power		Limits	Margin
CH	[MHz]	[dB]	[dBm]	[dBm]	[mW]	[dBm]	[dB]
01	2412	9.64	6.11	15.75	37.58	30.00	+14.25
06	2437	9.65	6.09	15.74	37.50	30.00	+14.26
11	2462	9.65	5.65	15.30	33.88	30.00	+14.70

Calculated result at 2412.000 MHz, as the worst point shown on underline:

	Correction Factor	=	9.64 dB
+)	Meter Reading	=	6.11 dBm
	Result	=	15.75 dBm = 37.58 mW

Minimum Margin: 30.00 - 15.75 = 14.25 (dB)

NOTES
1. The correction factor shows the attenuation pad loss including the short, low loss cable or adapter.
2. Setting of measuring instrument(s) :

Detector Function	Video B.W.
Peak	OFF

CH	[MHz]
06	2437

Rate	Meter Reading [dBm]	Remark
MCS0	6.09	*
MCS1	6.03	
MCS2	6.01	
MCS3	6.02	
MCS4	5.97	
MCS5	6.04	
MCS6	6.05	
MCS7	6.01	

* : Worst Rate
All comparison were performed on the same measurement condition.

4) IEEE 802.11n HT40

Test Date: November 18, 2015
Temp.: 21 °C, Humi: 71 %

Data Rate : MCS0

Transmitting Frequency		Correction Factor	Meter Reading	Conducted Peak Output Power		Limits	Margin
CH	[MHz]	[dB]	[dBm]	[dBm]	[mW]	[dBm]	[dB]
03	2422	9.65	6.17	15.82	38.19	30.00	+14.18
06	2437	9.65	6.13	15.78	37.84	30.00	+14.22
09	2452	9.65	5.92	15.57	36.06	30.00	+14.43

Calculated result at 2422.000 MHz, as the worst point shown on underline:

	Correction Factor	=	9.65 dB
+)	Meter Reading	=	6.17 dBm
	Result	=	15.82 dBm = 38.19 mW

Minimum Margin: 30.00 - 15.82 = 14.18 (dB)

NOTES
1. The correction factor shows the attenuation pad loss including the short, low loss cable or adapter.
2. Setting of measuring instrument(s) :

Detector Function	Video B.W.
Peak	OFF

CH	[MHz]
06	2437

Rate	Meter Reading [dBm]	Remark
MCS0	6.13	*
MCS1	5.97	
MCS2	6.03	
MCS3	5.91	
MCS4	6.01	
MCS5	5.98	
MCS6	5.94	
MCS7	5.76	

* : Worst Rate
All comparison were performed on the same measurement condition.

7.6 Peak Power Density(Conduction)

For the requirements, ☑ - Applicable [☑ - Tested. ☐ - Not tested by applicant request.]
☐ - Not Applicable

7.6.1 Test Results

For the standard, ☑ - **Passed** ☐ - **Failed** ☐ - **Not judged**

Peak Power Density of IEEE802.11b is	-2.43	dBm	at	2412.0	MHz
Peak Power Density of IEEE802.11g is	-6.41	dBm	at	2412.0	MHz
Peak Power Density of IEEE802.11n HT20 is	-6.26	dBm	at	2437.0	MHz
Peak Power Density of IEEE802.11n HT40 is	-9.44	dBm	at	2437.0	MHz

Uncertainty of Measurement Results ± 1.7 dB(2σ)

Remarks : _____

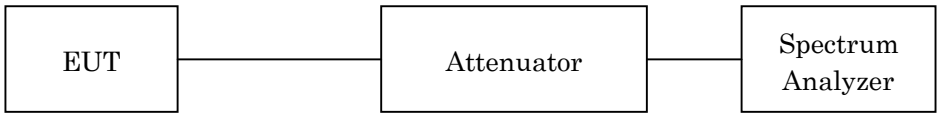
7.6.2 Test Instruments

Shielded Room S4				
Type	**Model**	**Serial No. (ID)**	**Manufacturer**	**Cal. Due**
Spectrum Analyzer	E4446A	US44300388 (A-39)	Agilent	2016/08/11
Attenuator	54A-10	W5675 (D-28)	Weinschel	2016/08/16
RF Cable	SUCOFLEX102	14253/2 (C-52)	HUBER+SUHNER	2016/08/16

NOTE : The calibration interval of the above test instruments is 12 months.

7.6.3 Test Method and Test Setup (Diagrammatic illustration)

The test system is shown as follows:



7.6.4 Test Data

1) IEEE 802.11b

Test Date: November 24, 2015
Temp.: 20 °C, Humi: 64 %

Data Rate : 11Mbps

Transmitting Frequency		Correction Factor	Meter Reading	Conducted Peak Power Density		Limits	Margin
CH	[MHz]	[dB]	[dBm]	[dBm]	[mW]	[dBm]	[dB]
01	2412	9.92	-12.35	-2.43	0.57	8.00	+10.43
06	2437	9.93	-12.85	-2.92	0.51	8.00	+10.92
11	2462	9.93	-13.56	-3.63	0.43	8.00	+11.63

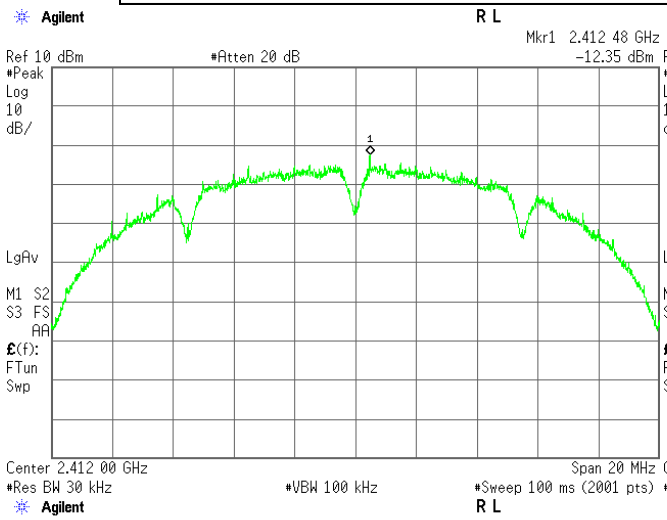
Calculated result at 2412.000 MHz, as the worst point shown on underline:

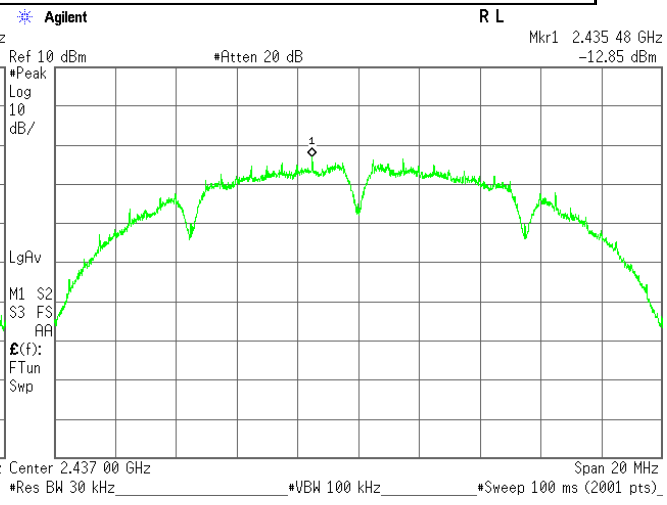
Correction Factor	=	9.92 dB
+) Meter Reading	=	-12.35 dBm
Result	=	-2.43 dBm = 0.57 mW

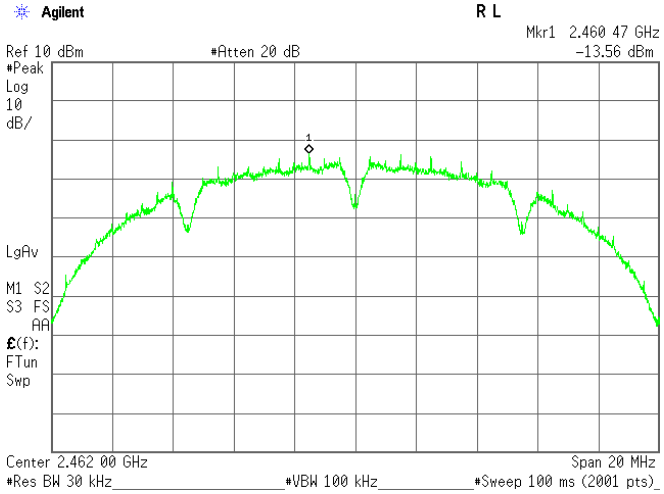
Minimum Margin: 8.00 - -2.43 = 10.43 (dB)

NOTES
1. The peak power density complied with the limit using 30 kHz resolution bandwidth of Spectrum Analyzer.
2. The correction factor shows the attenuation pad loss including the short, low loss cable or adapter.
3. Setting of measuring instrument(s) :

Detector Function	RES B.W.	Video B.W.
Peak	30kHz	100kHz







2) IEEE 802.11g

Test Date: November 24, 2015
Temp.: 20 °C, Humi: 64 %

Data Rate : 6Mbps

Transmitting Frequency		Correction Factor	Meter Reading	Conducted Peak Power Density		Limits	Margin
CH	[MHz]	[dB]	[dBm]	[dBm]	[mW]	[dBm]	[dB]
01	2412	9.92	-16.33	-6.41	0.23	8.00	+14.41
06	2437	9.93	-16.42	-6.49	0.22	8.00	+14.49
11	2462	9.93	-17.46	-7.53	0.18	8.00	+15.53

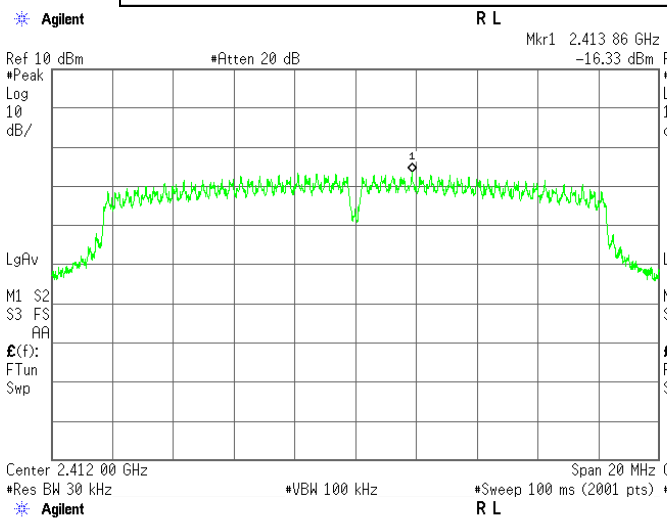
Calculated result at 2412.000 MHz, as the worst point shown on underline:

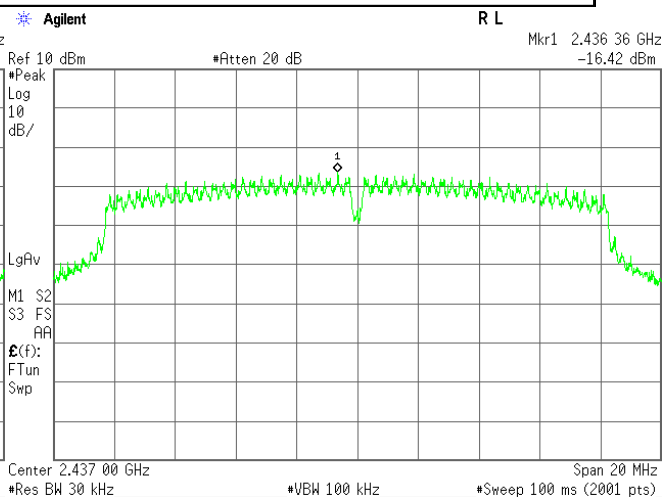
Correction Factor	=	9.92 dB
+) Meter Reading	=	-16.33 dBm
Result	=	-6.41 dBm = 0.23 mW

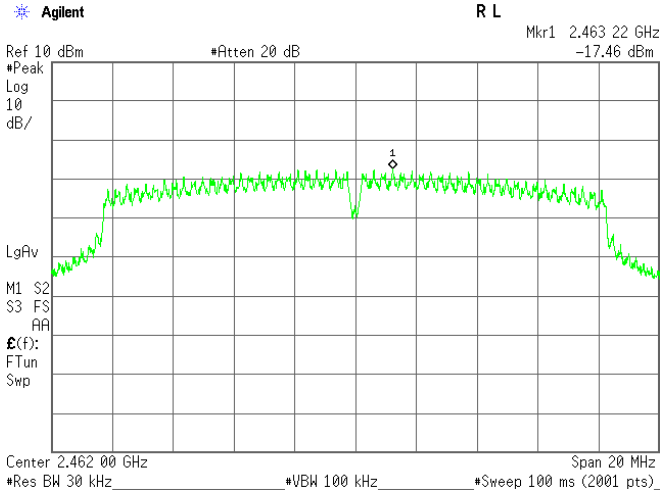
Minimum Margin: 8.00 - -6.41 = 14.41 (dB)

NOTES
1. The peak power density complied with the limit using 30 kHz resolution bandwidth of Spectrum Analyzer.
2. The correction factor shows the attenuation pad loss including the short, low loss cable or adapter.
3. Setting of measuring instrument(s) :

Detector Function	RES B.W.	Video B.W.
Peak	30kHz	100kHz







3) IEEE 802.11n HT20

Test Date: November 24, 2015
Temp.: 20 °C, Humi: 64 %

Data Rate : MCS0

Transmitting Frequency		Correction Factor	Meter Reading	Conducted Peak Power Density		Limits	Margin
CH	[MHz]	[dB]	[dBm]	[dBm]	[mW]	[dBm]	[dB]
01	2412	9.92	-17.33	-7.41	0.18	8.00	+15.41
06	2437	9.93	-16.19	-6.26	0.24	8.00	+14.26
11	2462	9.93	-17.03	-7.10	0.19	8.00	+15.10

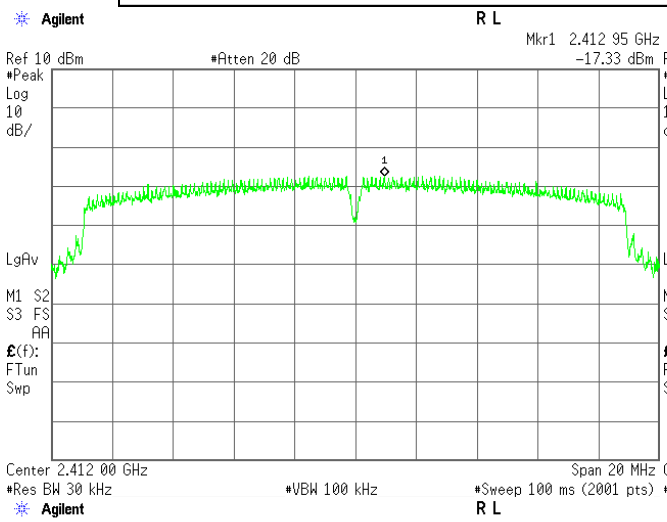
Calculated result at 2437.000 MHz, as the worst point shown on underline:

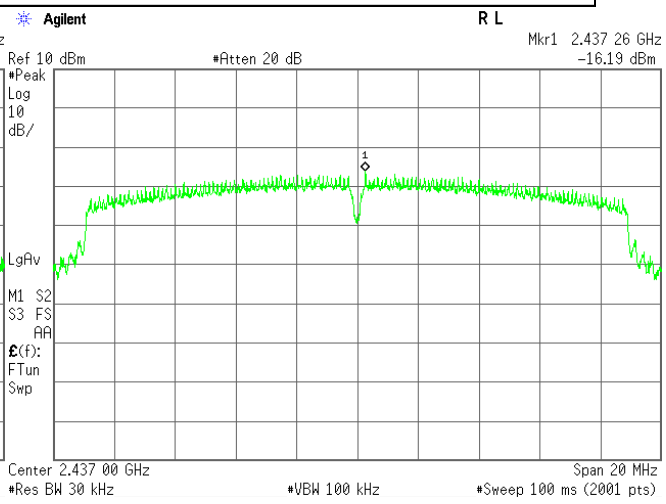
Correction Factor	=	9.93 dB
+) Meter Reading	=	-16.19 dBm
Result	=	-6.26 dBm = 0.24 mW

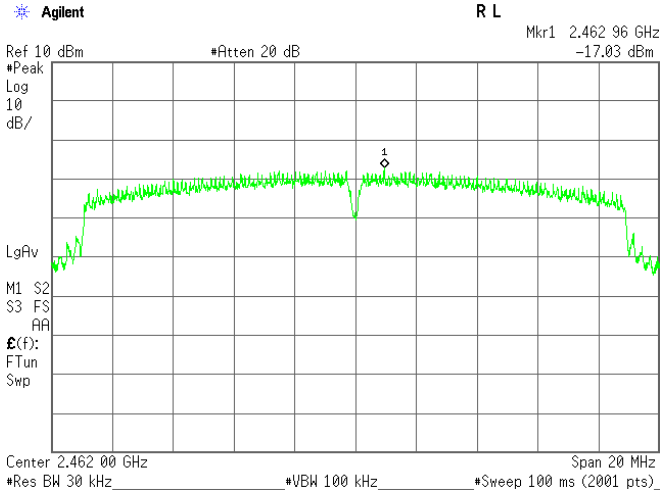
Minimum Margin: 8.00 - -6.26 = 14.26 (dB)

NOTES
1. The peak power density complied with the limit using 30 kHz resolution bandwidth of Spectrum Analyzer.
2. The correction factor shows the attenuation pad loss including the short, low loss cable or adapter.
3. Setting of measuring instrument(s) :

Detector Function	RES B.W.	Video B.W.
Peak	30kHz	100kHz







4) IEEE 802.11n HT40

Test Date: November 24, 2015
Temp.: 20 °C, Humi: 64 %

Data Rate : MCS0

Transmitting Frequency		Correction Factor	Meter Reading	Conducted Peak Power Density		Limits	Margin
CH	[MHz]	[dB]	[dBm]	[dBm]	[mW]	[dBm]	[dB]
03	2422	9.92	-20.31	-10.39	0.09	8.00	+18.39
06	2437	9.93	-19.37	-9.44	0.11	8.00	+17.44
09	2452	9.93	-19.69	-9.76	0.11	8.00	+17.76

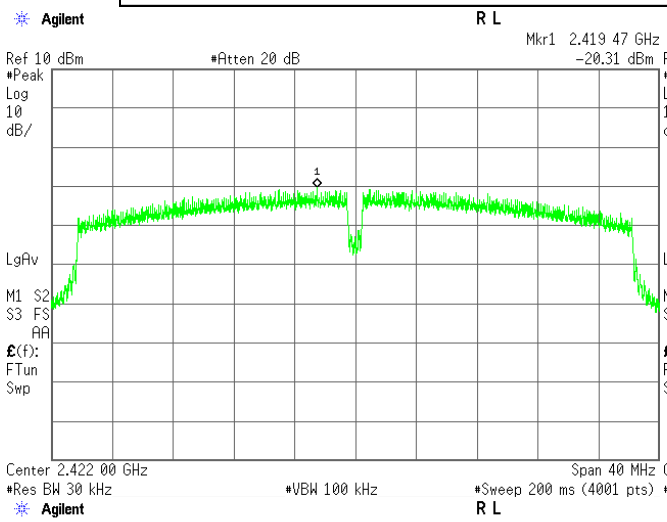
Calculated result at 2437.000 MHz, as the worst point shown on underline:

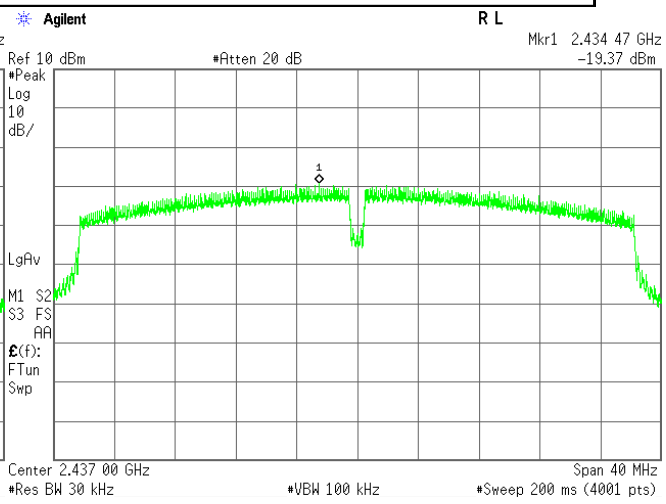
	Correction Factor	=	9.93 dB
+)	Meter Reading	=	-19.37 dBm
	Result	=	-9.44 dBm = 0.11 mW

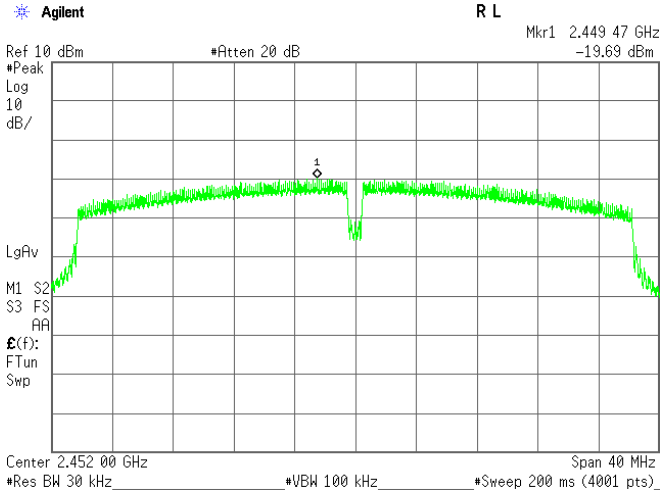
Minimum Margin: 8.00 - -9.44 = 17.44 (dB)

NOTES
1. The peak power density complied with the limit using 30 kHz resolution bandwidth of Spectrum Analyzer.
2. The correction factor shows the attenuation pad loss including the short, low loss cable or adapter.
3. Setting of measuring instrument(s) :

Detector Function	RES B.W.	Video B.W.
Peak	30kHz	100kHz







7.7 Spurious Emissions(Conduction)

For the requirements, ☑ - Applicable [☑ - Tested. ☐ - Not tested by applicant request.]
☐ - Not Applicable

7.7.1 Test Results

For the standard, ☑ - **Passed** ☐ - **Failed** ☐ - **Not judged**

Uncertainty of Measurement Results

9 kHz – 1 GHz	± 1.4	dB(2σ)
1 GHz – 18 GHz	± 1.7	dB(2σ)
18 GHz – 40 GHz	± 2.3	dB(2σ)

Remarks : _____

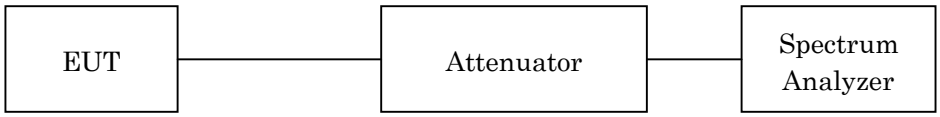
7.7.2 Test Instruments

Shielded Room S4				
Type	**Model**	**Serial No. (ID)**	**Manufacturer**	**Cal. Due**
Spectrum Analyzer	E4446A	US44300388 (A-39)	Agilent	2016/08/11
Attenuator	54A-10	W5675 (D-28)	Weinschel	2016/08/16
RF Cable	SUCOFLEX102	14253/2 (C-52)	HUBER+SUHNER	2016/08/16

NOTE : The calibration interval of the above test instruments is 12 months.

7.7.3 Test Method and Test Setup (Diagrammatic illustration)

The test system is shown as follows:



The setting of the spectrum analyzer are shown as follows:

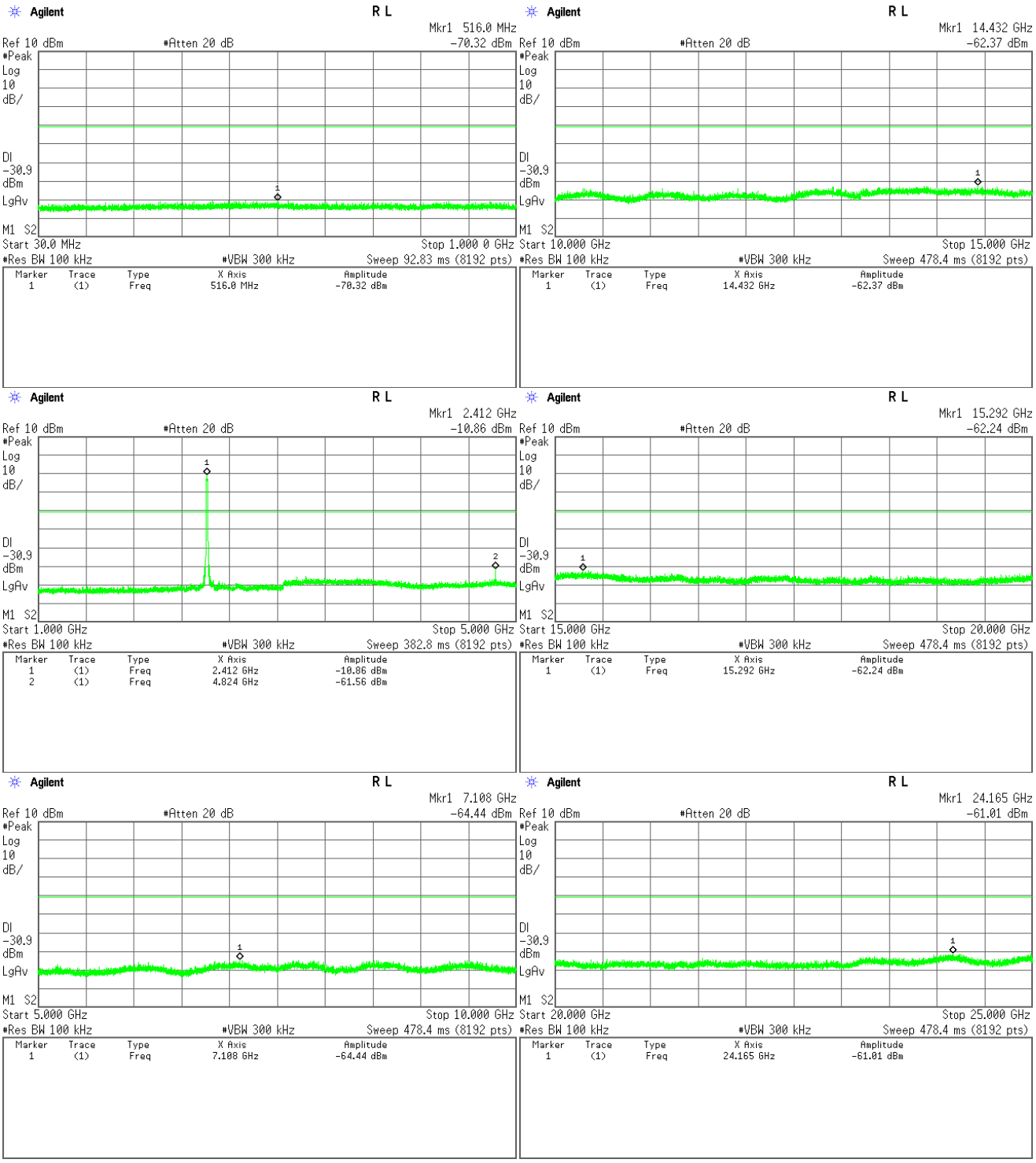
Frequency Range	30 MHz - 25 GHz	Band-Edge
Res. Bandwidth	100 kHz	100 kHz
Video Bandwidth	300 kHz	300 kHz
Sweep Time	AUTO	AUTO
Trace	Maxhold	Maxhold

7.7.4 Test Data

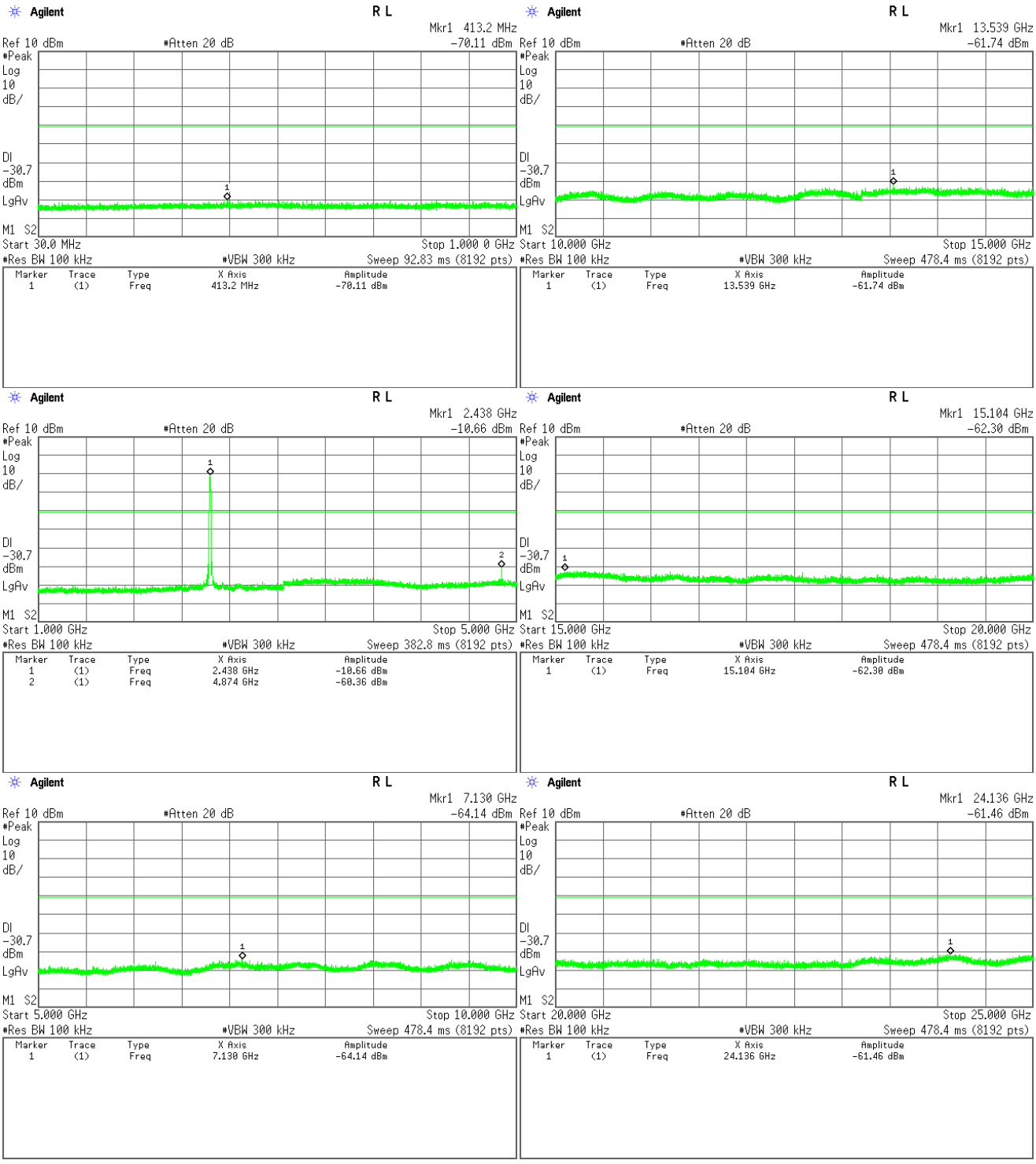
Test Date :November 24, 2015
Temp.:20°C, Humi:64%

1) IEEE 802.11b

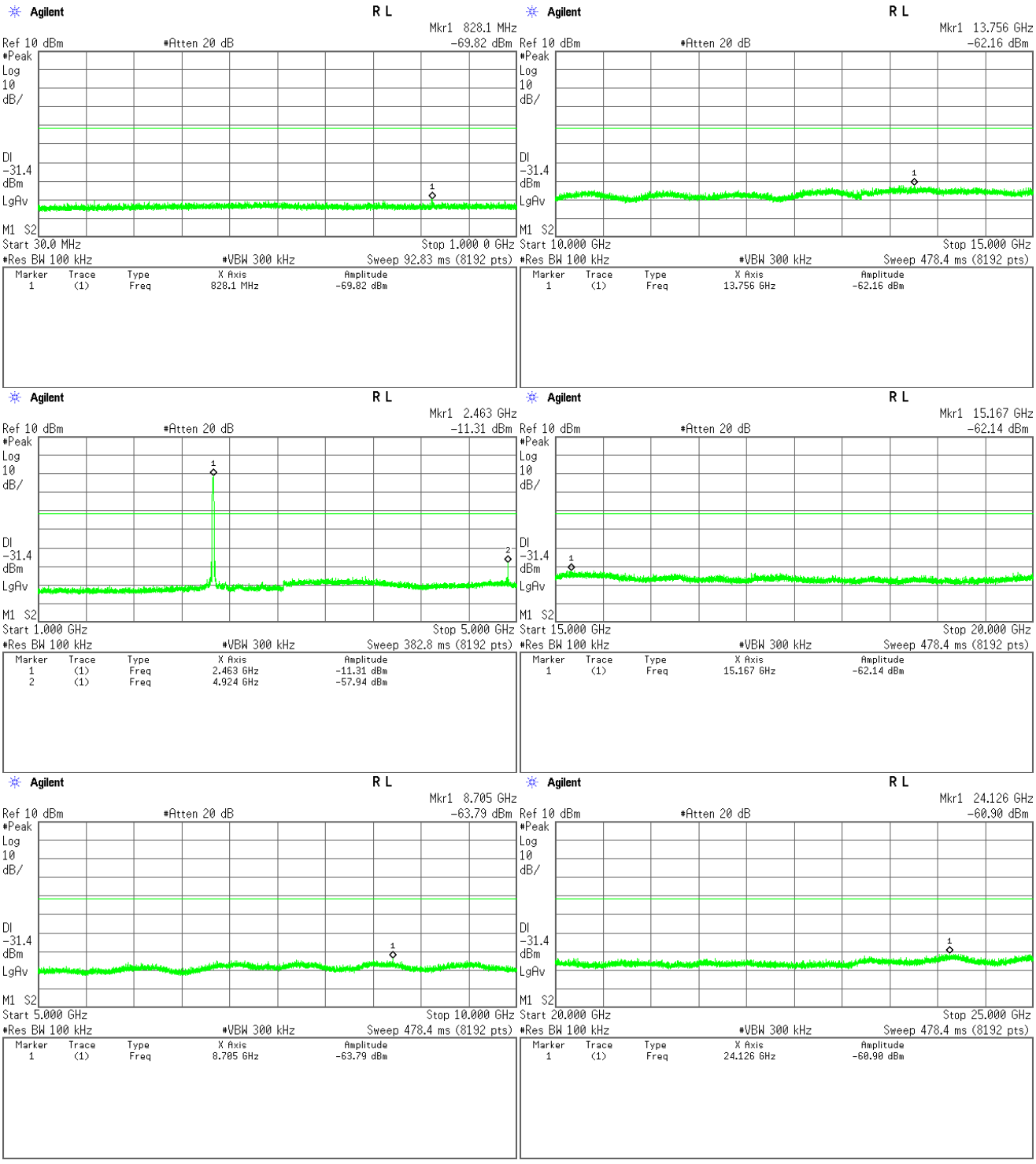
Low Channel



Middle Channel

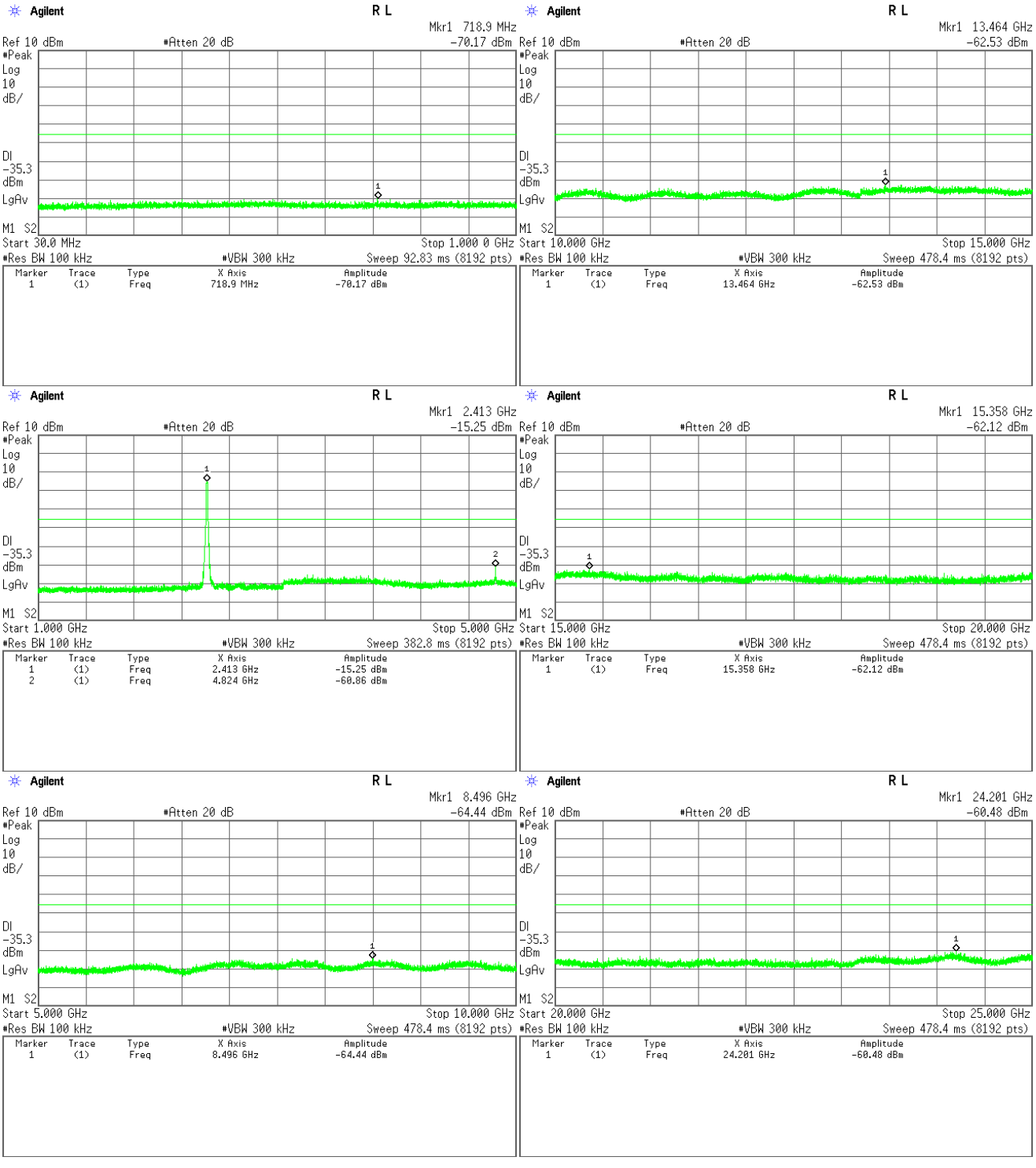


High Channel

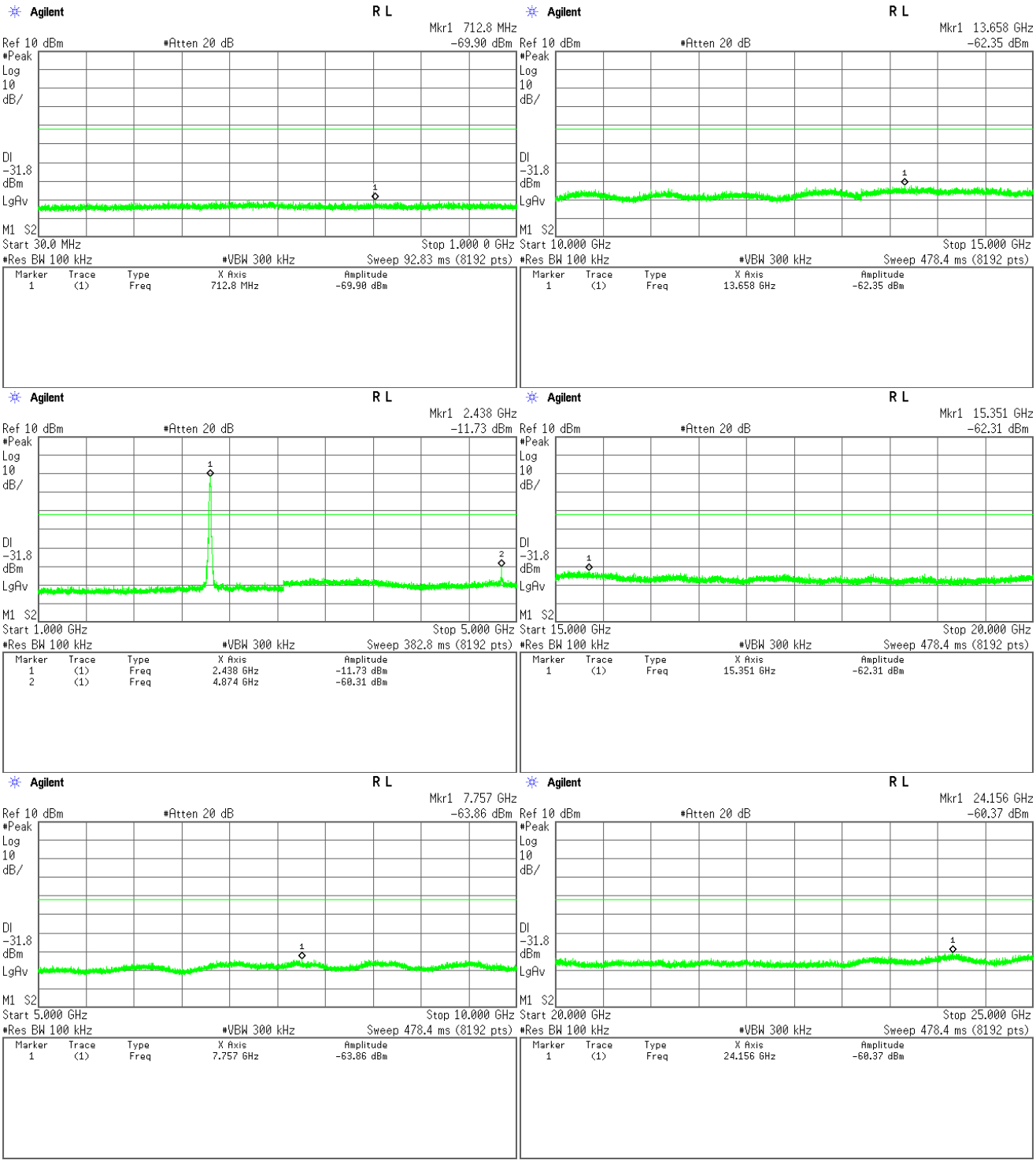


2) IEEE 802.11g

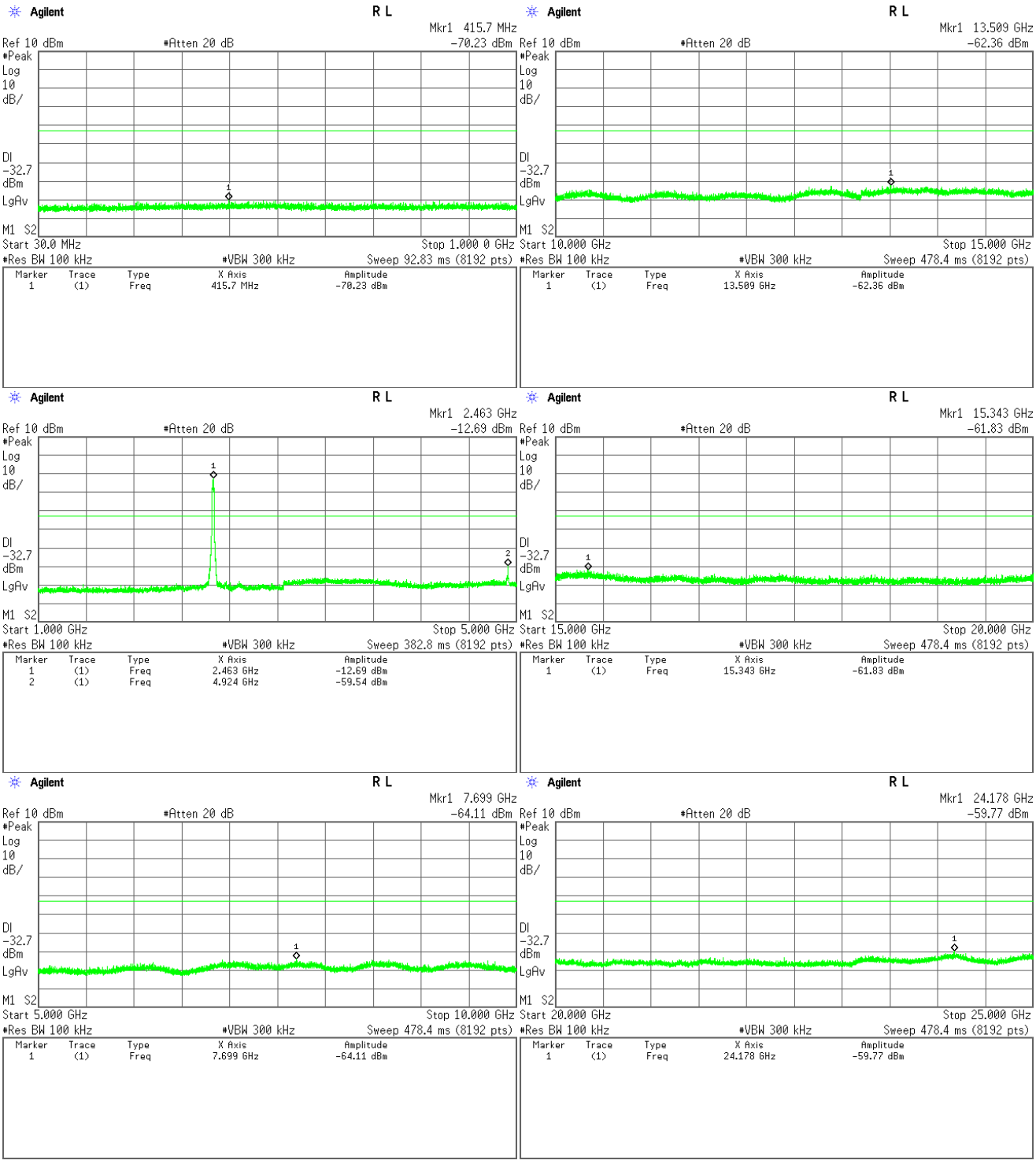
Low Channel



Middle channel

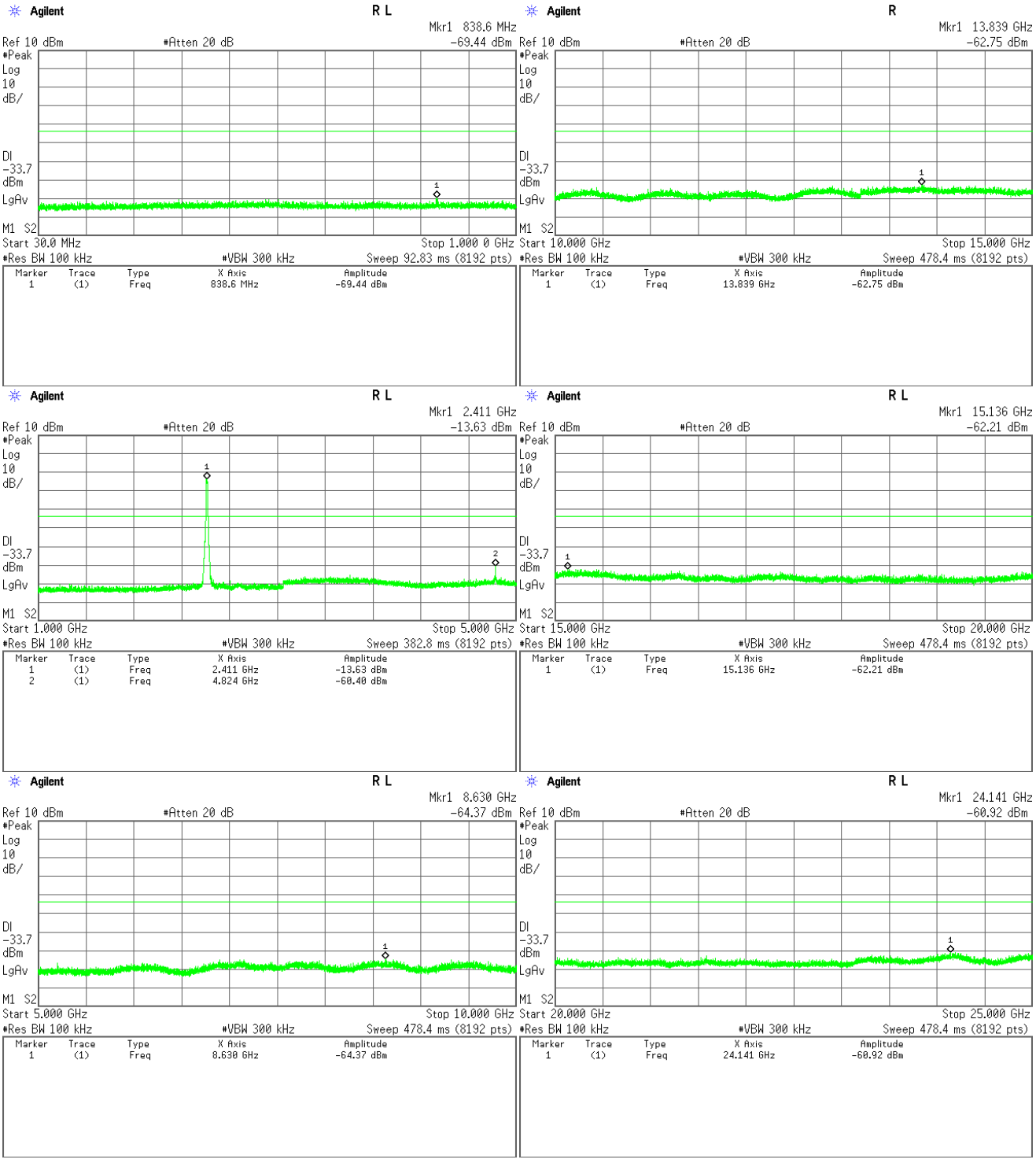


High Channel

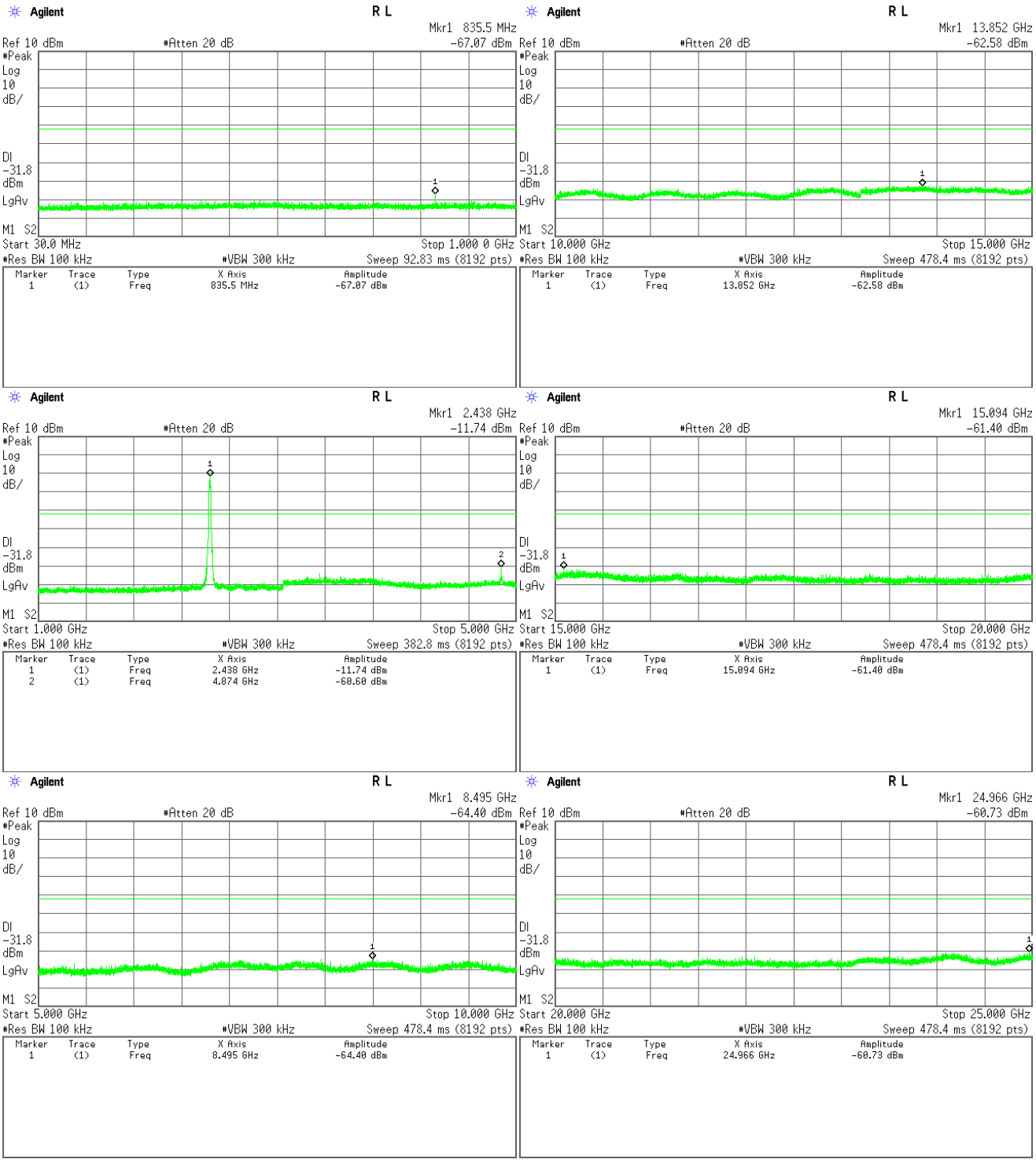


3) IEEE 802.11n HT20

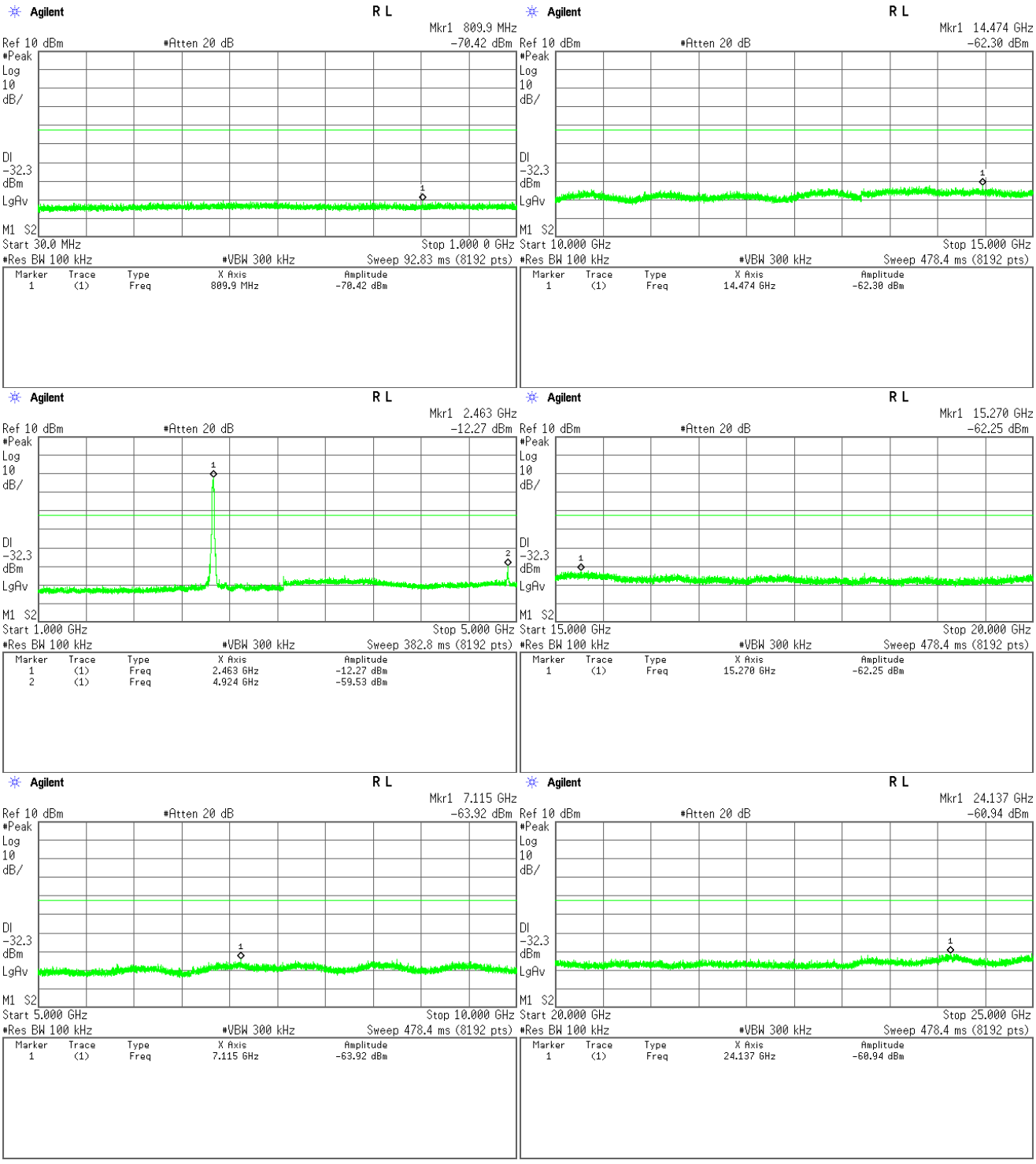
Low Channel



Middle Channel

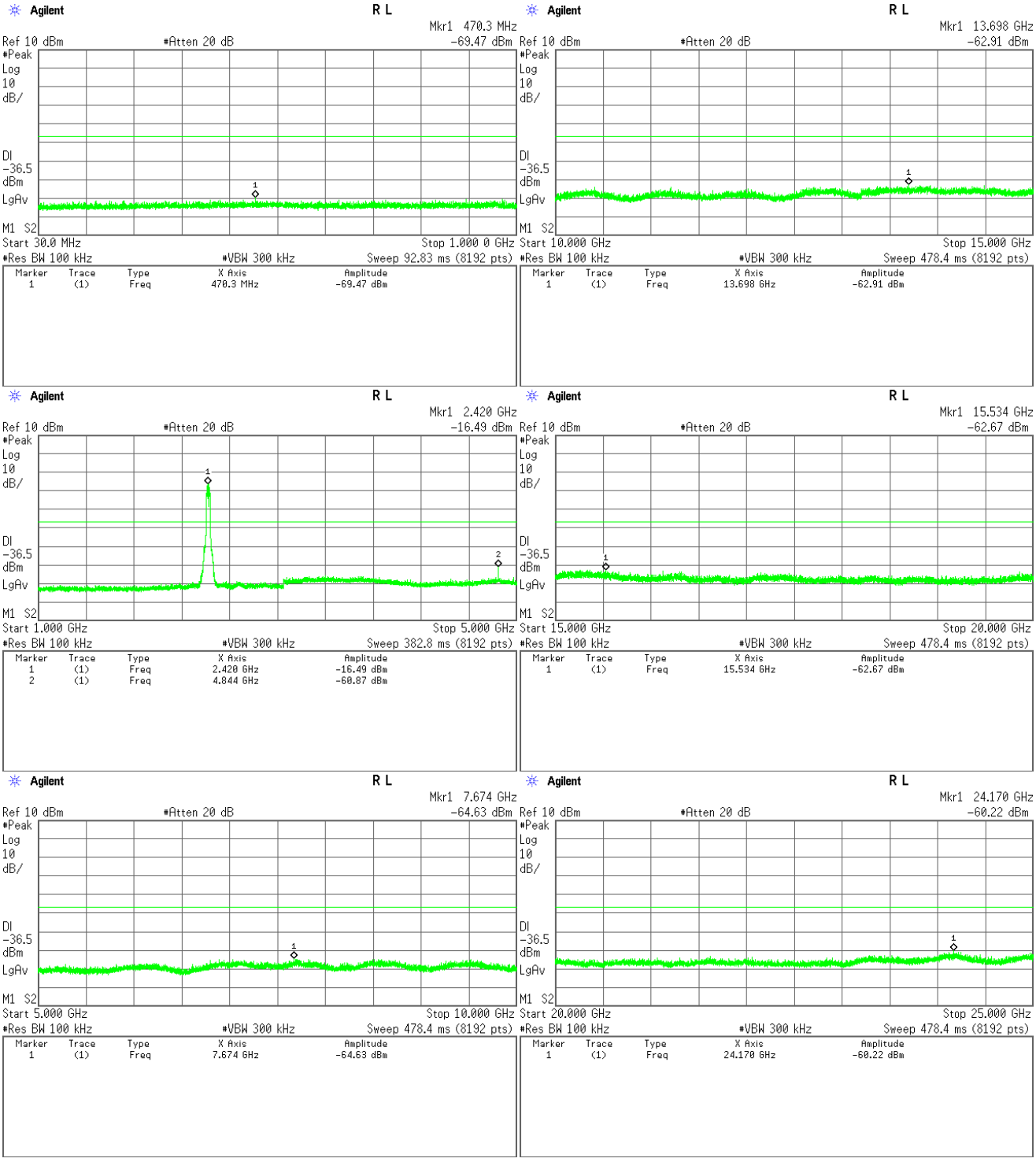


High Channel

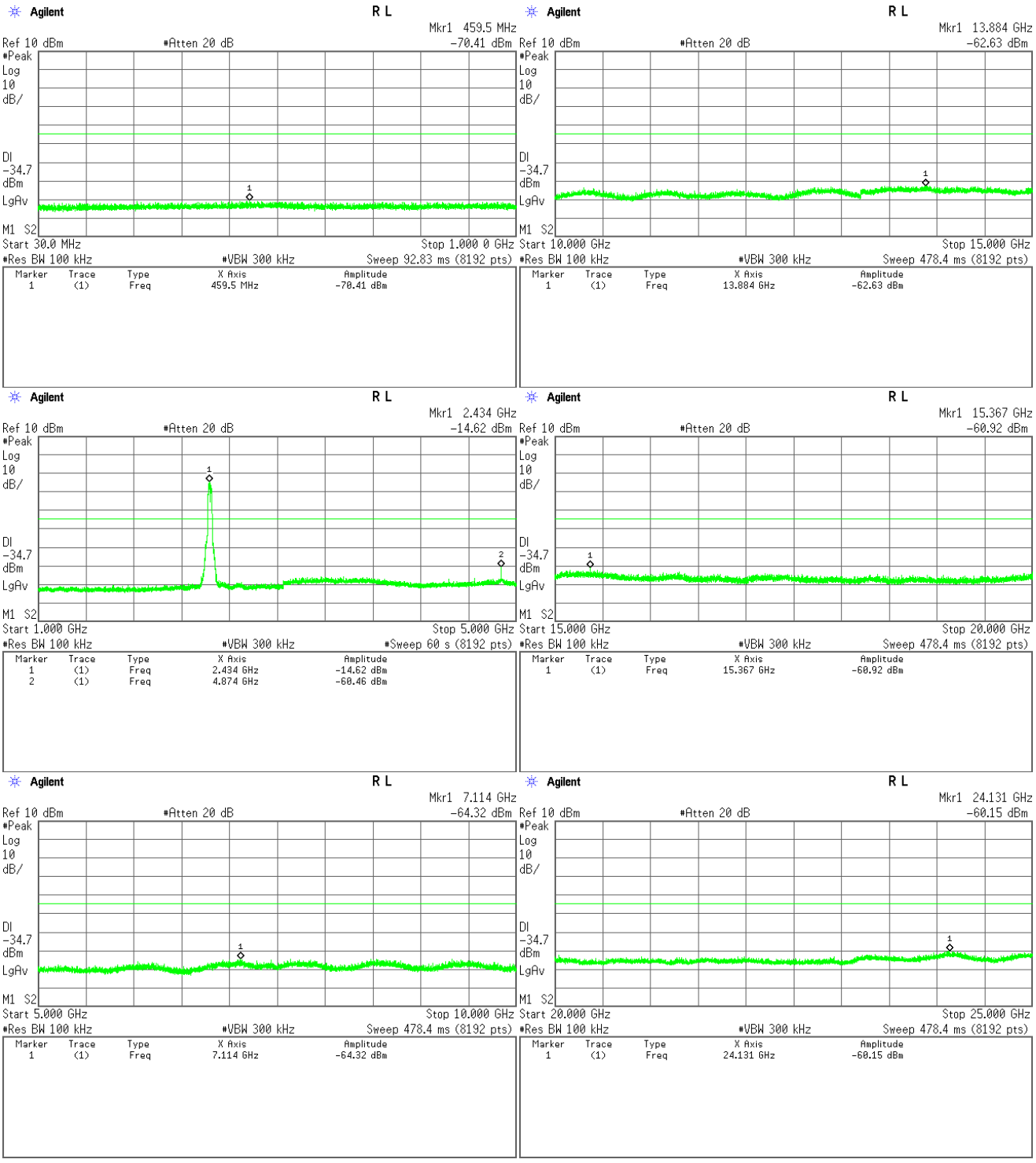


4) IEEE 802.11n HT40

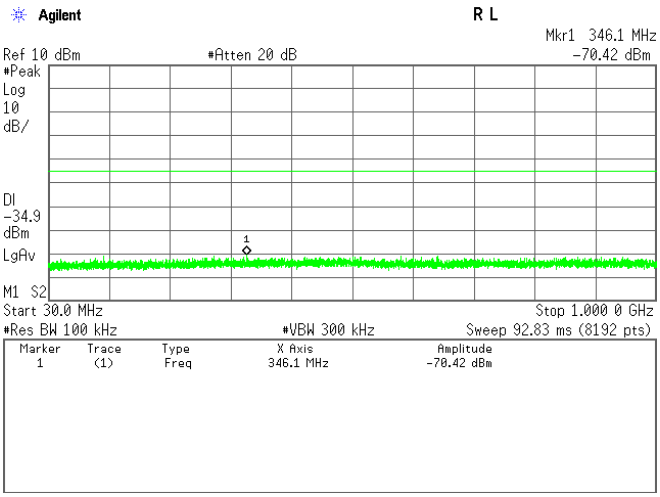
Low Channel

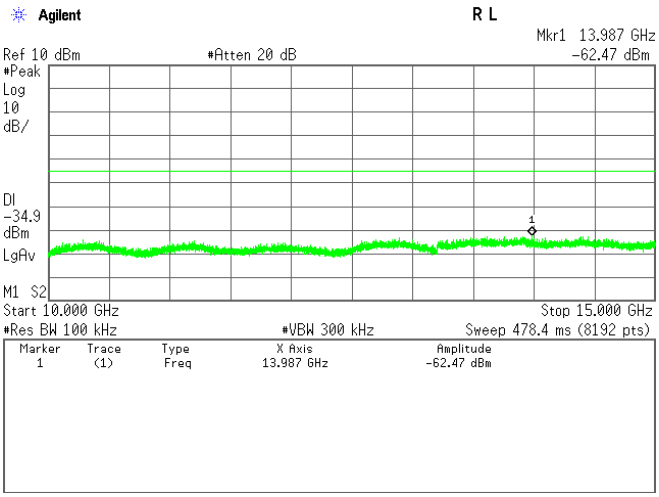


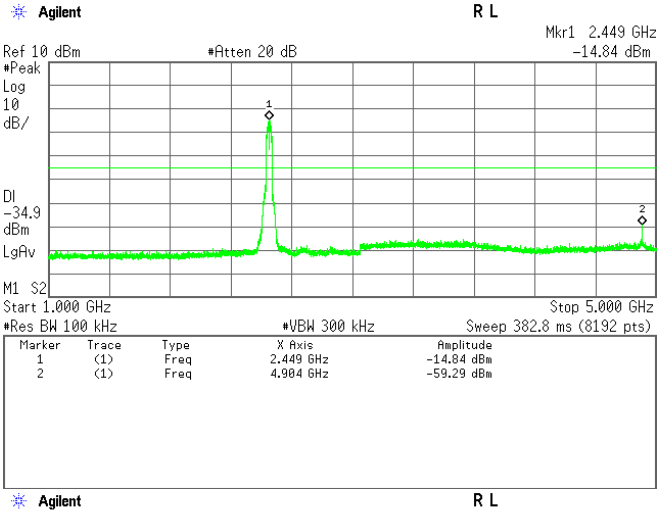
Middle Channel

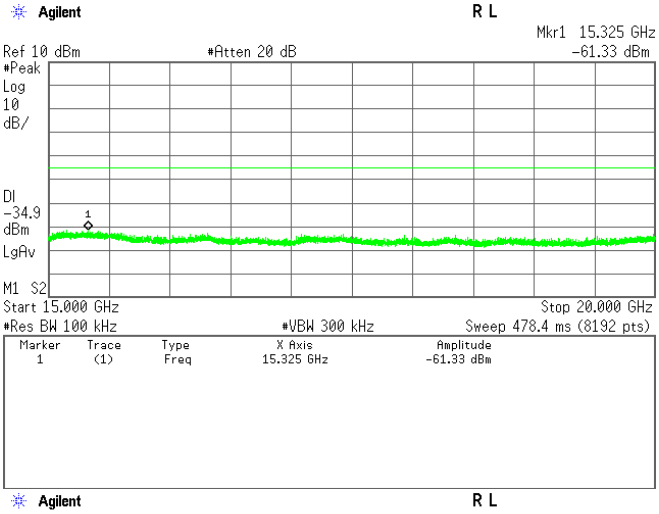


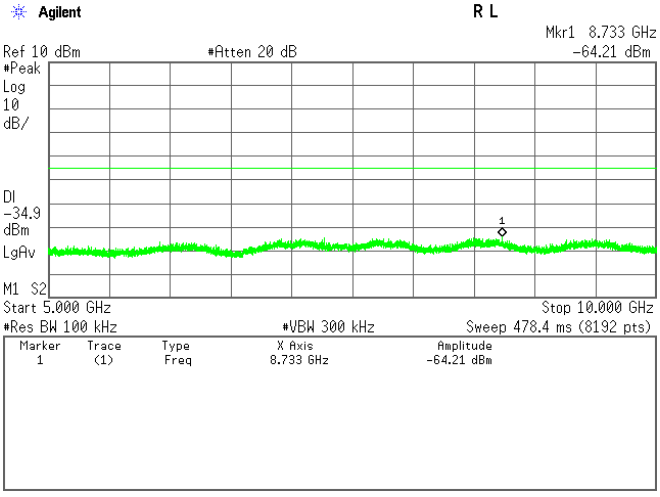
High Channel

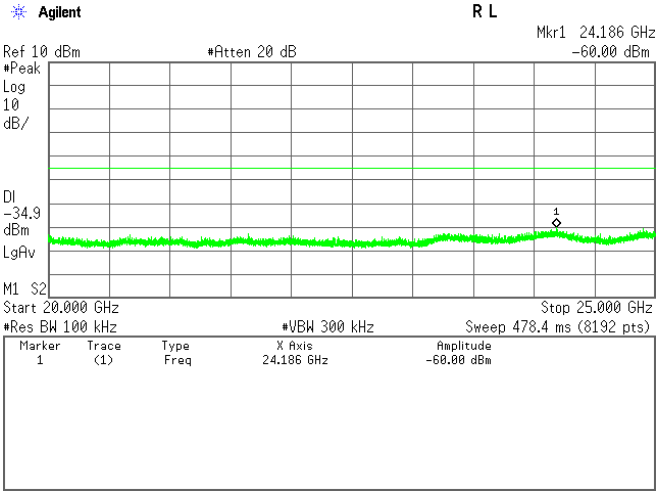










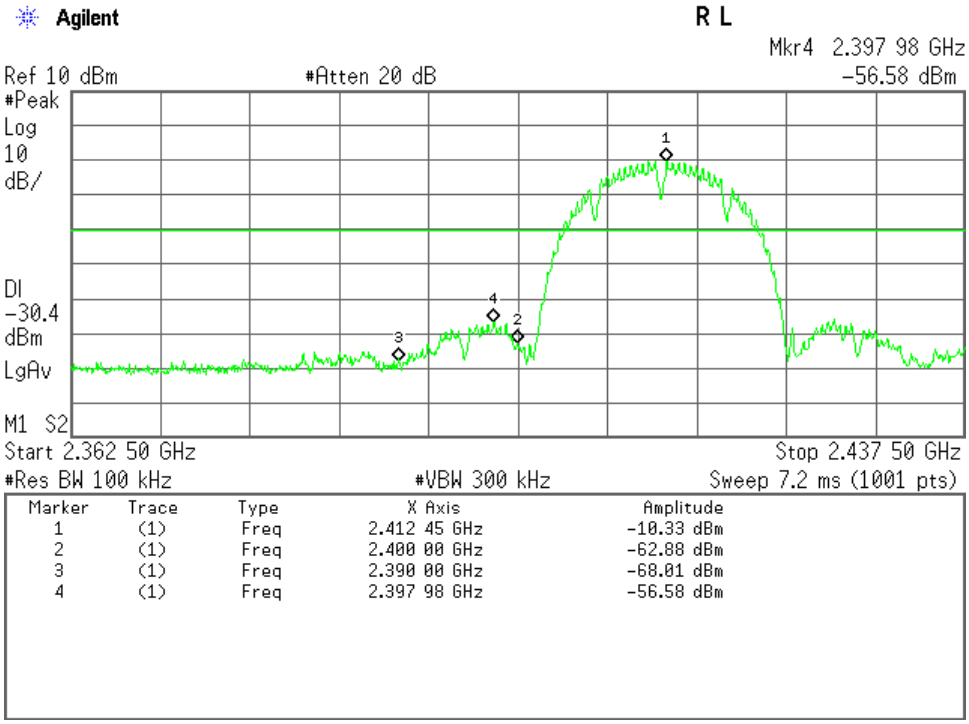


Band-Edge Emission

Test Date :November 24, 2015
Temp.:20°C, Humi:64%

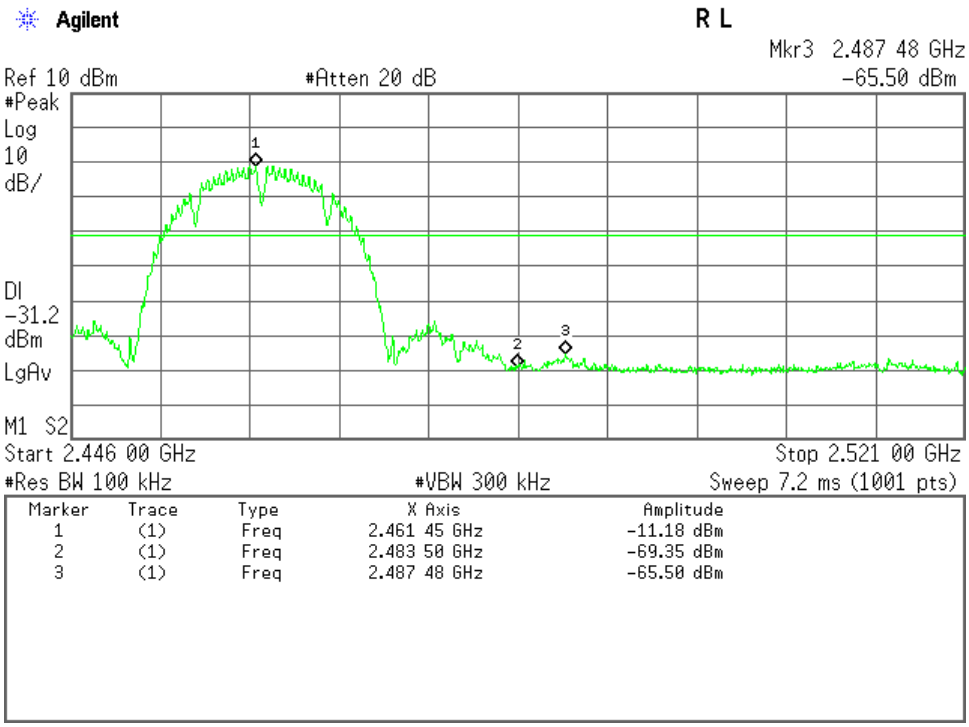
1) IEEE 802.11b

Low Channel



Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.412 45 GHz	-10.33 dBm
2	(1)	Freq	2.400 00 GHz	-62.88 dBm
3	(1)	Freq	2.390 00 GHz	-68.01 dBm
4	(1)	Freq	2.397 98 GHz	-56.58 dBm

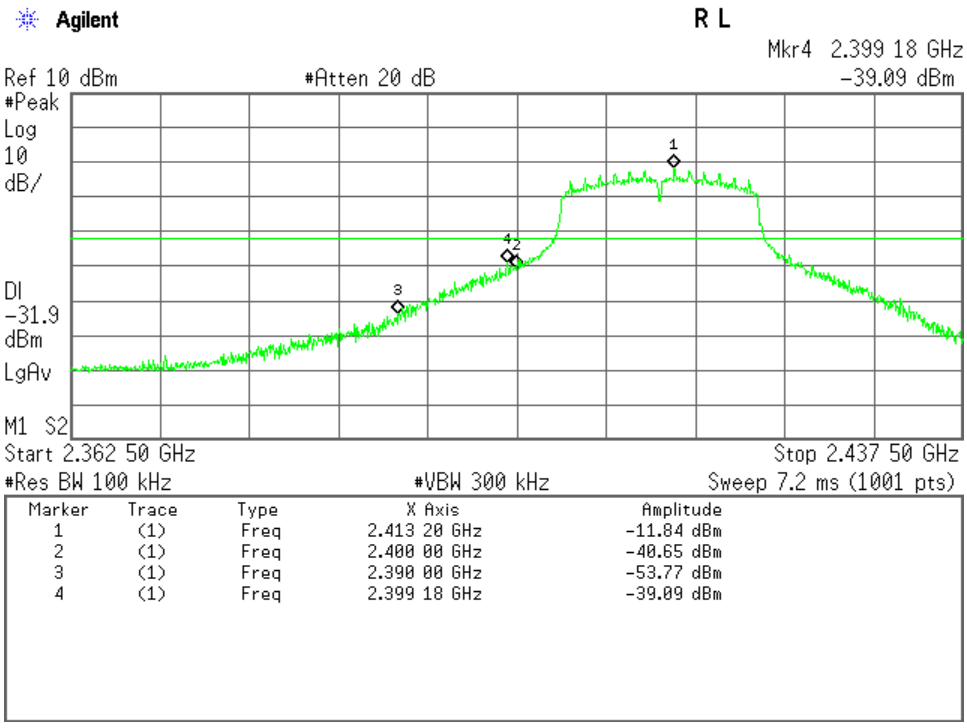
High Channel



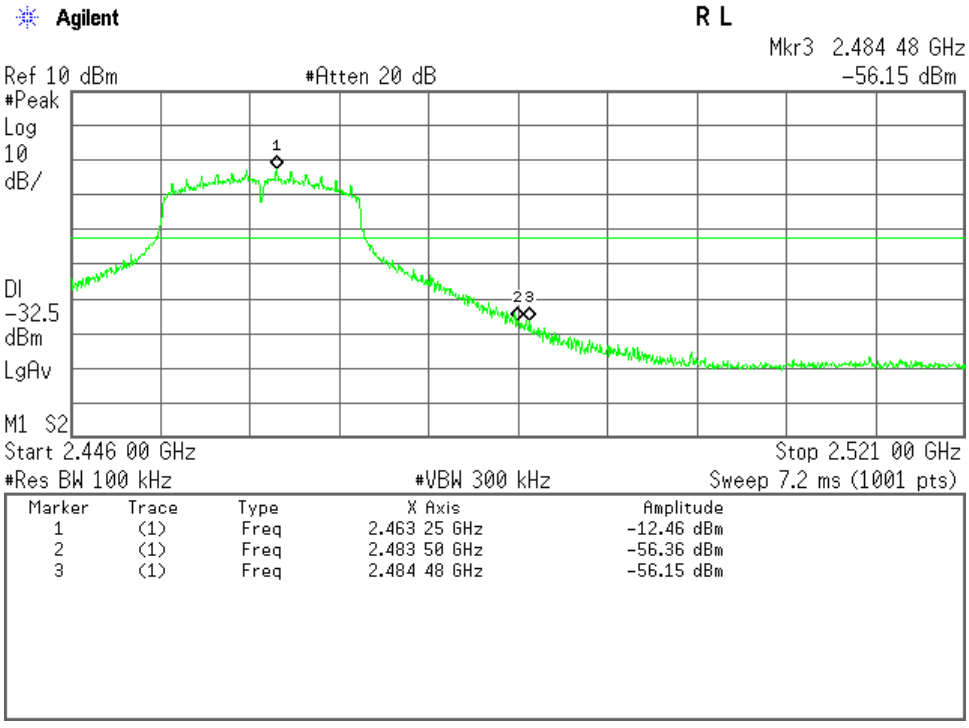
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.461 45 GHz	-11.18 dBm
2	(1)	Freq	2.483 50 GHz	-69.35 dBm
3	(1)	Freq	2.487 48 GHz	-65.50 dBm

2) IEEE 802.11g

Low Channel

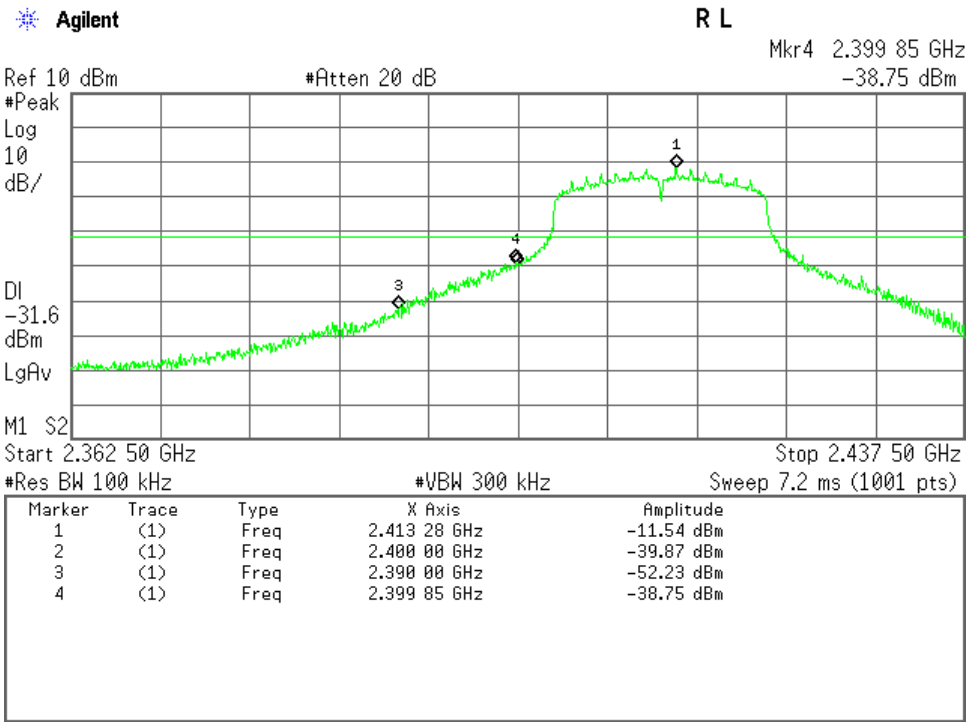


High Channel

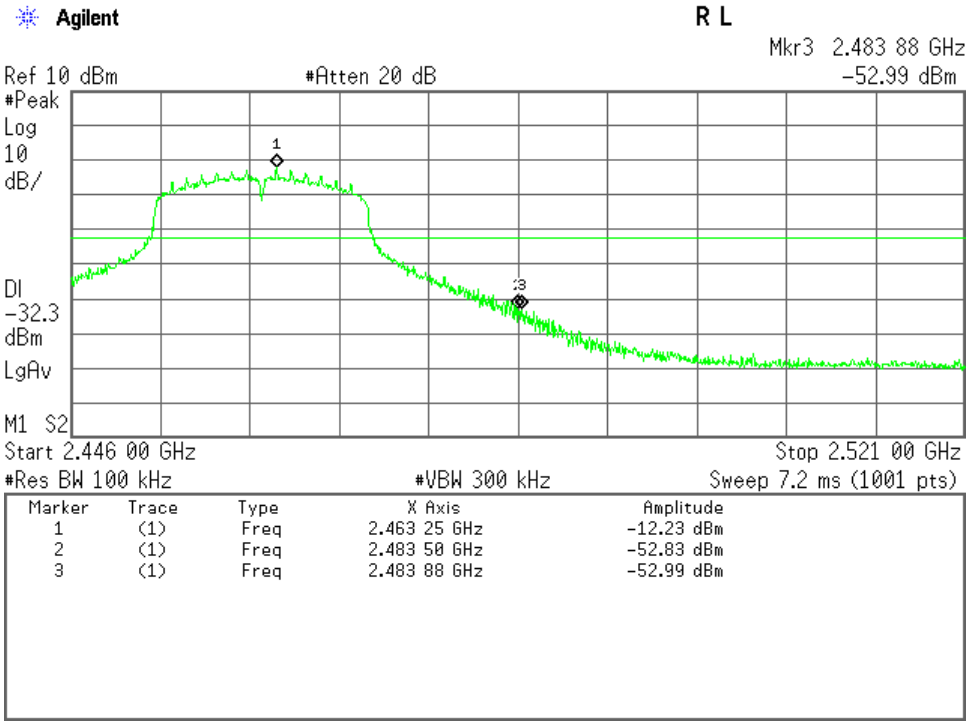


3) IEEE 802.11n HT20

Low Channel

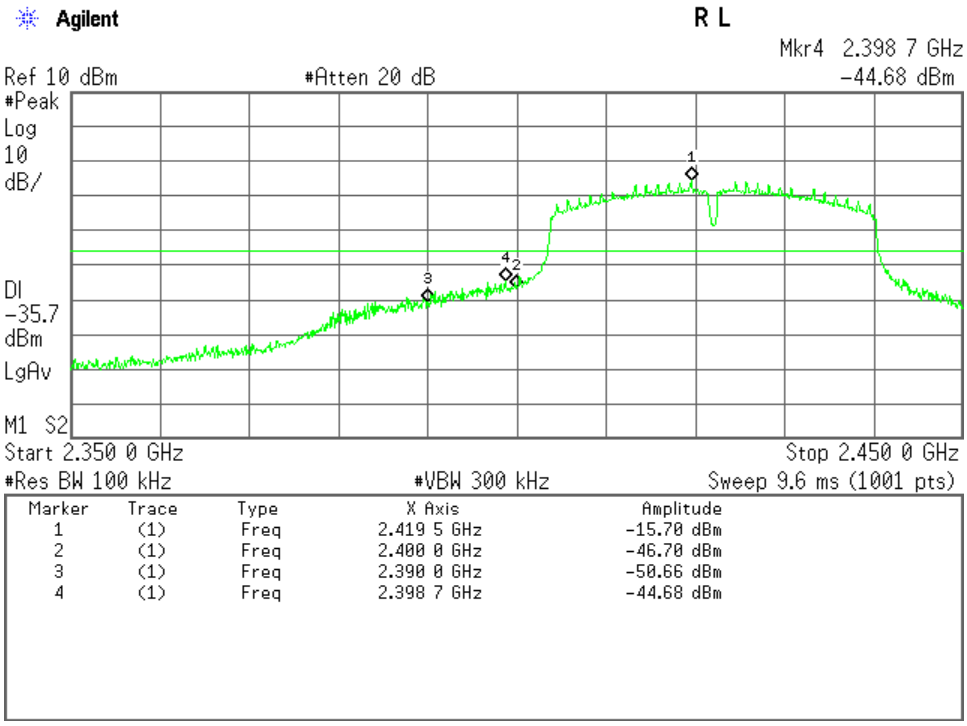


High Channel

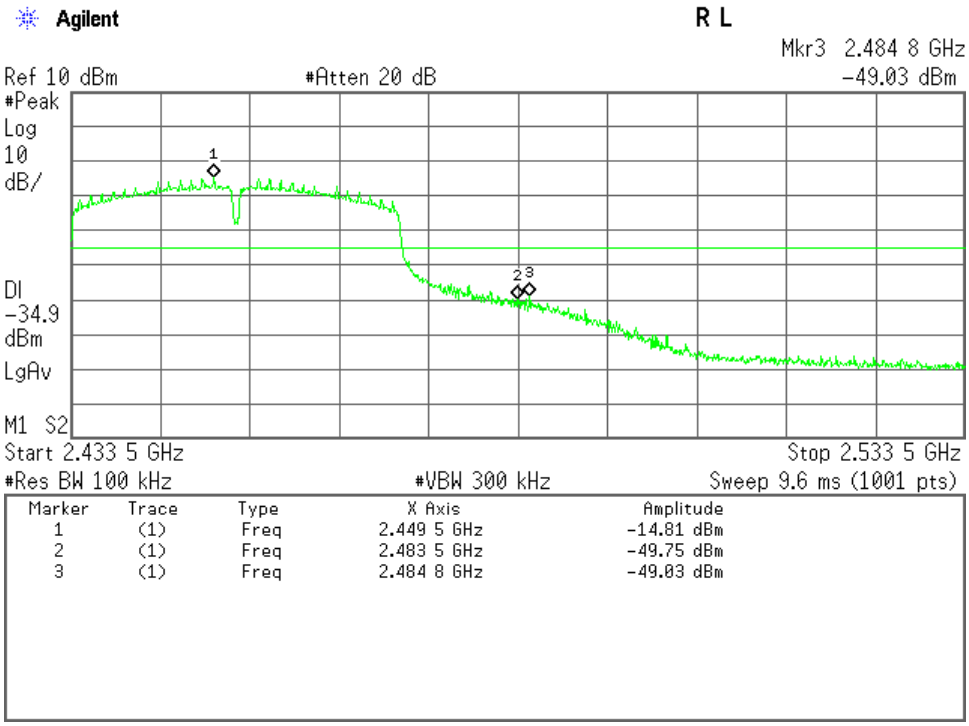


4) IEEE 802.11n HT40

Low Channel



High Channel



7.8 AC Powerline Conducted Emission

For the requirements, ☑ - Applicable [☑ - Tested. ☐ - Not tested by applicant request.]
☐ - Not Applicable

7.8.1 Test Results

For the standard, ☑ - **Passed** ☐ - **Failed** ☐ - **Not judged**

Min. Limit Margin (Quasi-Peak) 21.1 dB at 0.150 MHz

Uncertainty of Measurement Results ± 2.6 dB(2σ)

Remarks :

7.8.2 Test Instruments

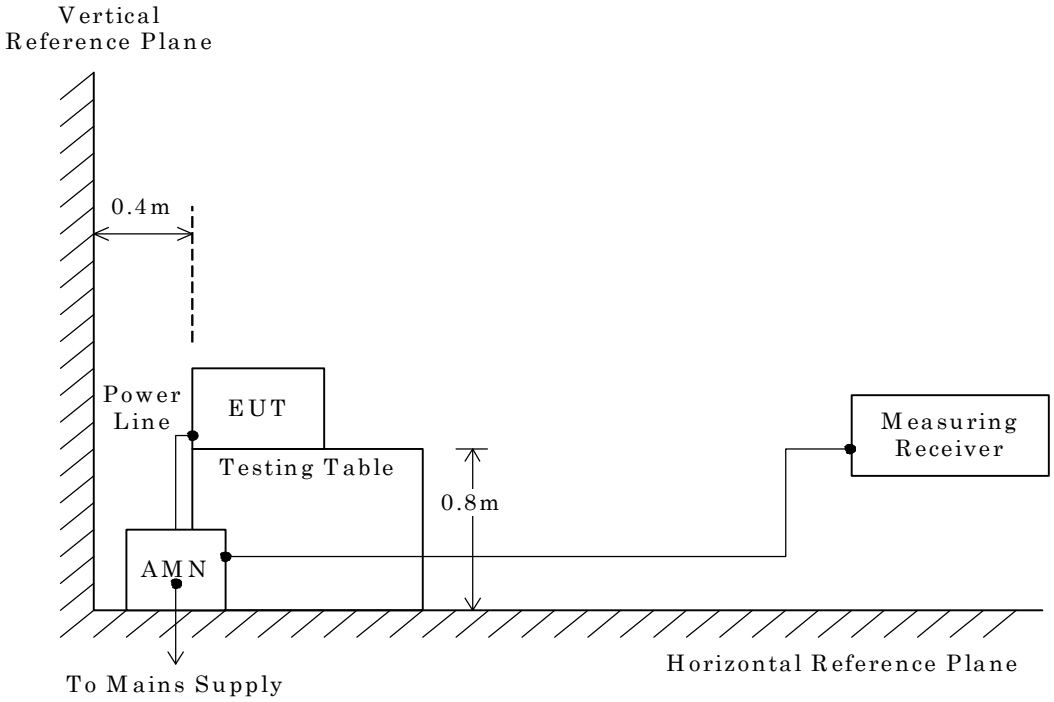
Shielded Room S1				
Type	**Model**	**Serial No. (ID)**	**Manufacturer**	**Cal. Due**
Test Receiver	ESU 26	100170 (A-6)	Rohde & Schwarz	2016/04/25
AMN (main)	KNW-407FR	8-2019-1 (D-103)	Kyoritsu	2016/10/15
RF Cable	RG223/U	--- (H-9)	HUBER+SUHNER	2016/07/09

NOTE : The calibration interval of the above test instruments is 12 months.

7.8.3 Test Method and Test Setup (Diagrammatic illustration)

The preliminary tests were performed using the scan mode of test receiver or spectrum analyzer to observe the emissions characteristics of the EUT.
The EUT configuration, cable configuration and mode of operation were determined for producing the maximum level of emissions.
This configurations was used for final tests.

– Side View –



NOTE
AMN : Artificial Mains Network

7.8.4 Test Data

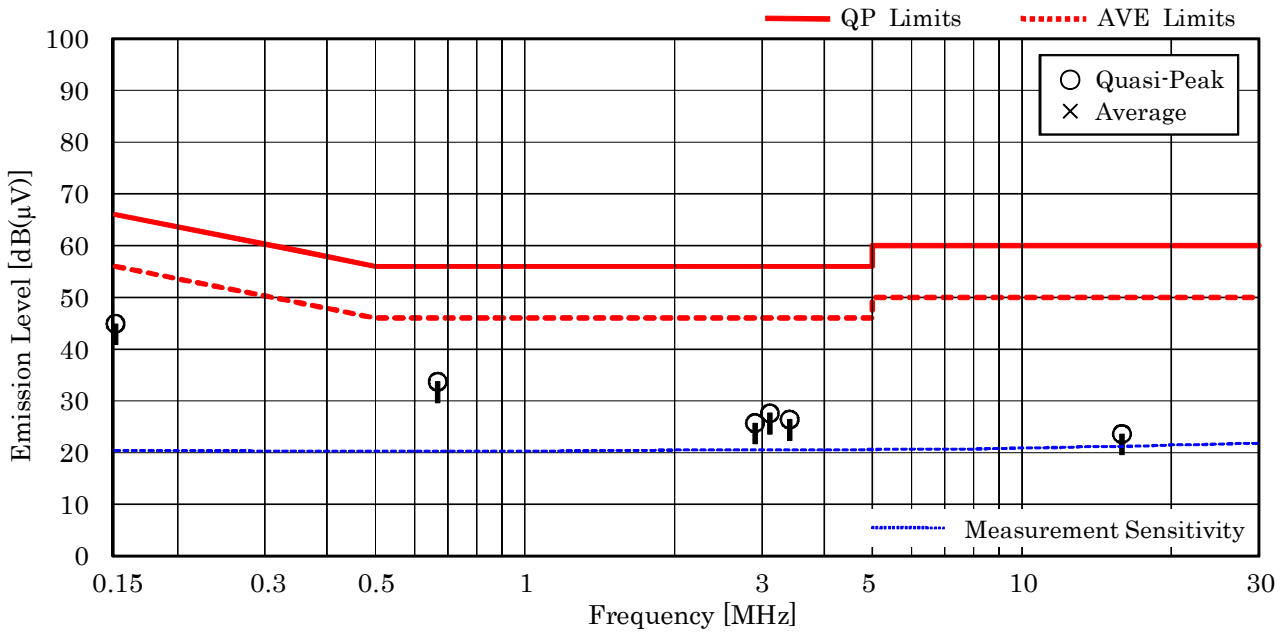
1) Mode of EUT : (WLAN) All modes have been investigated and the worst case mode for channel (06ch: 2437MHz / IEEE 802.11b, IEEE 802.11g and IEEE 802.11n) has been listed.

Test voltage : 120VAC 60Hz

Test Date: December 2, 2015
Temp.: 20 °C, Humi.: 44 %

Measured phase : L1

Frequency [MHz]	Corr. Factor [dB]	Meter Readings [dB(μV)] QP	AVE	Limits [dB(μV)] QP	AVE	Results [dB(μV)] QP	AVE	Margin [dB] QP	AVE	Remarks
0.150	10.4	34.5	--	66.0	56.0	44.9	--	+21.1	--	-
0.668	10.3	23.4	--	56.0	46.0	33.7	--	+22.3	--	-
2.904	10.5	15.2	--	56.0	46.0	25.7	--	+30.3	--	-
3.111	10.5	17.1	--	56.0	46.0	27.6	--	+28.4	--	-
3.409	10.5	15.9	--	56.0	46.0	26.4	--	+29.6	--	-
15.895	11.2	12.4	--	60.0	50.0	23.6	--	+36.4	--	-



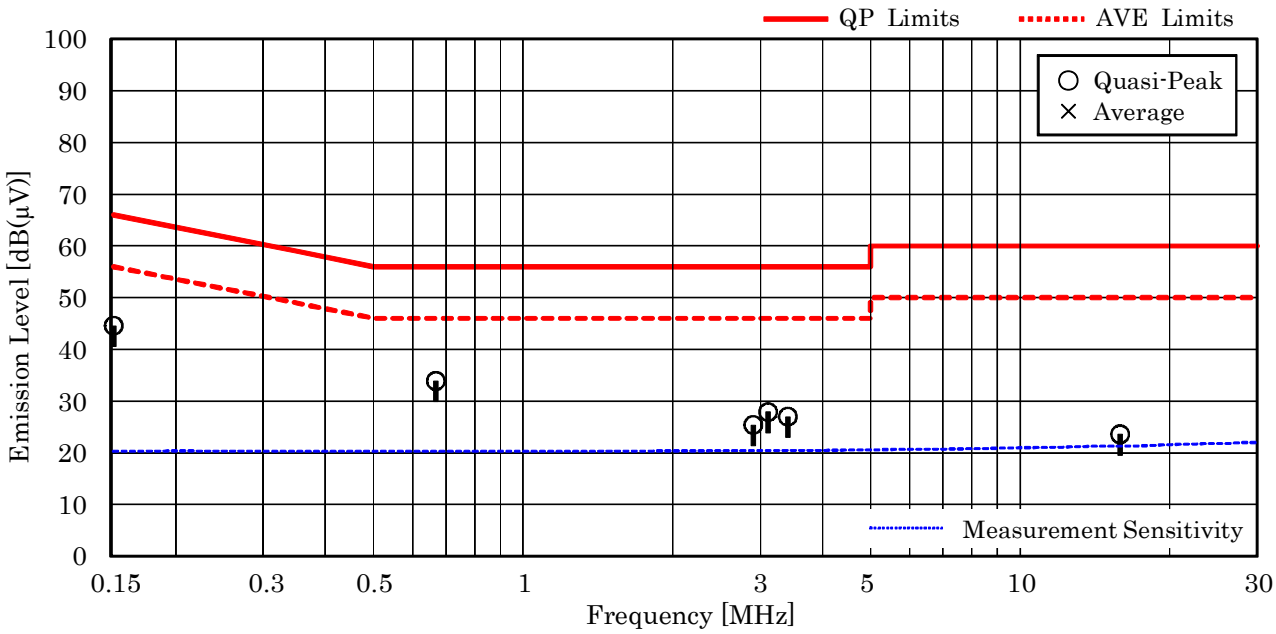
NOTES
1. The spectrum was checked from 0.15 MHz to 30 MHz.
2. The correction factor includes the AMN insertion loss and the cable loss.
3. The symbol of "<" means "or less".
4. The symbol of ">" means "more than".
5. The symbol of "--" means "not applicable".
6. Calculated result at 0.150 MHz, as the worst point shown on underline:
   Correction Factor + Meter Reading (QP) = 10.4 + 34.5 = 44.9 dB(μV)
7. QP : Quasi-Peak Detector / AVE : Average Detector
8. Test receiver setting(s) : CISPR QP 9 kHz / Average 9 kHz

Test voltage : 120VAC 60Hz

Test Date: December 2, 2015
Temp.: 20 °C, Humi.: 44 %

Measured phase : L2

Frequency [MHz]	Corr. Factor [dB]	Meter Readings [dB(μV)] QP	AVE	Limits [dB(μV)] QP	AVE	Results [dB(μV)] QP	AVE	Margin [dB] QP	AVE	Remarks
0.150	10.3	34.3	--	66.0	56.0	44.6	--	+21.4	--	-
0.668	10.3	23.6	--	56.0	46.0	33.9	--	+22.1	--	-
2.904	10.5	14.9	--	56.0	46.0	25.4	--	+30.6	--	-
3.111	10.5	17.4	--	56.0	46.0	27.9	--	+28.1	--	-
3.409	10.5	16.5	--	56.0	46.0	27.0	--	+29.0	--	-
15.895	11.3	12.3	--	60.0	50.0	23.6	--	+36.4	--	-



NOTES
1. The spectrum was checked from 0.15 MHz to 30 MHz.
2. The correction factor includes the AMN insertion loss and the cable loss.
3. The symbol of "<" means "or less".
4. The symbol of ">" means "more than".
5. The symbol of "--" means "not applicable".
6. Calculated result at 0.150 MHz, as the worst point shown on underline:
   Correction Factor + Meter Reading (QP) = 10.3 + 34.3 = 44.6 dB(μV)
7. QP : Quasi-Peak Detector / AVE : Average Detector
8. Test receiver setting(s) : CISPR QP 9 kHz / Average 9 kHz

7.9 Radiated Emission

For the requirements, ☑ - Applicable [☑ - Tested. ☐ - Not tested by applicant request.]
☐ - Not Applicable

7.9.1 Test Results

For the standard, ☑ - **Passed** ☐ - **Failed** ☐ - **Not judged**

Min. Limit Margin (Average) 1.1 dB at 2483.5 MHz

Uncertainty of Measurement Results		
9 kHz – 30 MHz	± 3.0	dB(2σ)
30 MHz – 300 MHz	± 3.8	dB(2σ)
300 MHz – 1000 MHz	± 4.8	dB(2σ)
1 GHz – 6 GHz	± 4.7	dB(2σ)
6 GHz – 18 GHz	± 4.6	dB(2σ)
18 GHz – 40 GHz	± 5.5	dB(2σ)

Remarks : IEEE802.11n HT40 mode, Z axis position.

7.9.2 Test Instruments

Anechoic Chamber A2				
Type	**Model**	**Serial No. (ID)**	**Manufacturer**	**Cal. Due**
Test Receiver	ESU 26	100170 (A-6)	Rohde & Schwarz	2016/04/25
Loop Antenna	HFH2-Z2	872096/25 (C-2)	Rohde & Schwarz	2016/07/26
RF Cable	RG213/U	--- (H-28)	HUBER+SUHNER	2016/07/26
Pre-Amplifier	310N	304573 (A-17)	SONOMA	2016/04/15
Biconical Antenna	VHA9103/BBA9106	2355 (C-30)	Schwarzbeck	2016/05/24
Log-periodic Antenna	UHALP9108-A1	0694 (C-31)	Schwarzbeck	2016/05/24
RF Cable	S 10162 B-11 etc.	--- (H-4)	HUBER+SUHNER	2016/04/15
Site Attenuation	--	--- (H-15)	----	2016/01/05
Pre-Amplifier	TPA0118-36	1010 (A-37)	TOYO	2016/05/11
Double-Ridge Guide Horn Antenna	TR17206	73370006 (C-29)	ADVANTEST	2016/06/23
Horn Antenna	91888-2	562 (C-41-1)	EATON	2016/06/16
Horn Antenna	91889-2	568 (C-41-2)	EATON	2016/06/16
Horn Antenna	3160-04	9903-1053 (C-55)	EMCO	2016/06/29
Horn Antenna	3160-05	9902-1061 (C-56)	EMCO	2016/06/29
Horn Antenna	3160-06	9712-1045 (C-57)	EMCO	2016/06/29
Horn Antenna	3160-07	9902-1113 (C-58)	EMCO	2016/06/29
Horn Antenna	3160-08	9904-1099 (C-59)	EMCO	2016/06/29
Horn Antenna	3160-09	9808-1117 (C-48)	EMCO	2016/06/28
Attenuator	54A-10	W5713 (D-29)	Weinschel	2016/08/16
Attenuator	2-10	BA6214 (D-79)	Weinschel	2016/11/19
RF Cable	SUCOFLEX104	267479/4 (C-66)	HUBER+SUHNER	2016/01/19
RF Cable	SUCOFLEX104	267414/4 (C-67)	HUBER+SUHNER	2016/01/19
RF Cable	SUCOFLEX102EA	3041/2EA (C-69)	HUBER+SUHNER	2016/01/19
Band Rejection Filter	BRM50701	029 (D-93)	MICRO-TRONICS	2016/02/08
SVSWR	--	--- (H-19)	----	2016/02/27

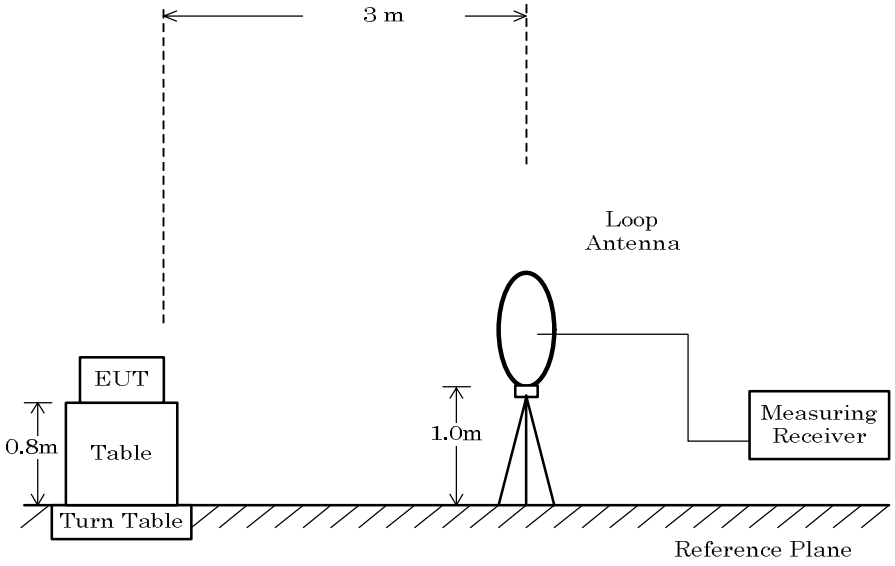
NOTE : The calibration interval of the above test instruments is 12 months.

7.9.3 Test Method and Test Setup (Diagrammatic illustration)

7.9.3.1 Radiated Emission 9 kHz – 30 MHz

The preliminary tests were performed at the measurement distance that specified for compliance to determine the emission characteristics of the EUT.
The EUT configuration(in X, Y and Z axis), cable configuration and mode of operation were determined for producing the maximum level of emissions.
The measurement were performed about three antenna orientations (parallel, perpendicular, and ground-parallel).
This configurations was used for the final tests.

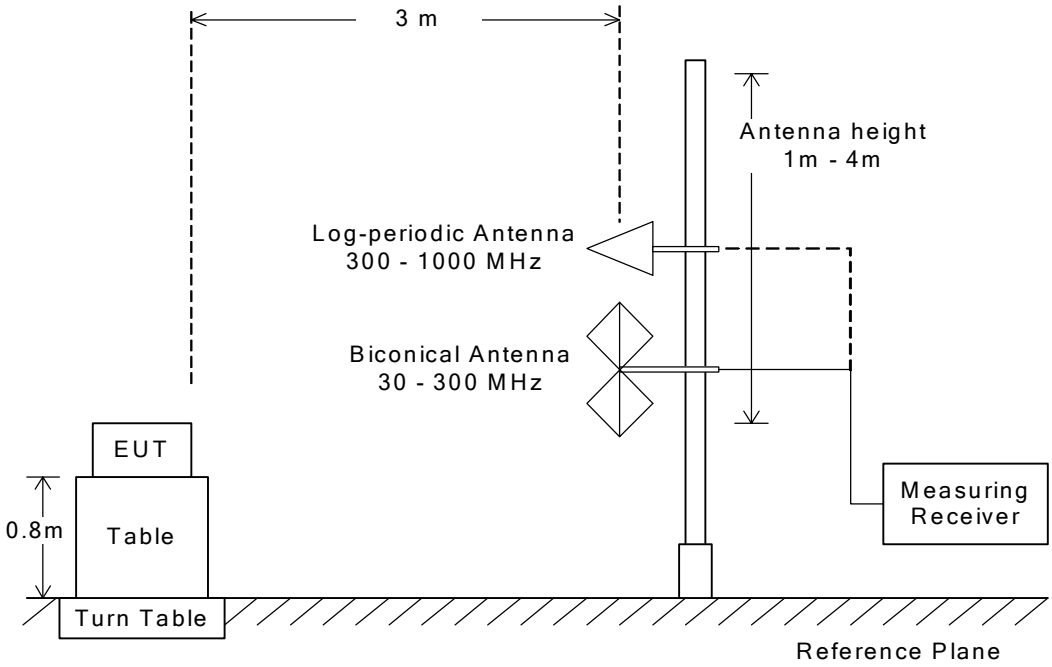
– Side View –



7.9.3.2 Radiated Emission 30 MHz – 1000 MHz

The preliminary tests were performed at the measurement distance that specified for compliance to determine the emission characteristics of the EUT.
The EUT configuration(in X, Y and Z axis), cable configuration and mode of operation were determined for producing the maximum level of emissions.
This configurations was used for the final tests.

– Side View –



7.9.3.3 Radiated Emission above 1 GHz

The preliminary tests were performed at the measurement distance that specified for compliance to determine the emission characteristics of the EUT.
The EUT configuration(in X, Y and Z axis), cable configuration and mode of operation were determined for producing the maximum level of emissions.
This configurations was used for the final tests.

The setting of the measuring instruments are shown as follows:

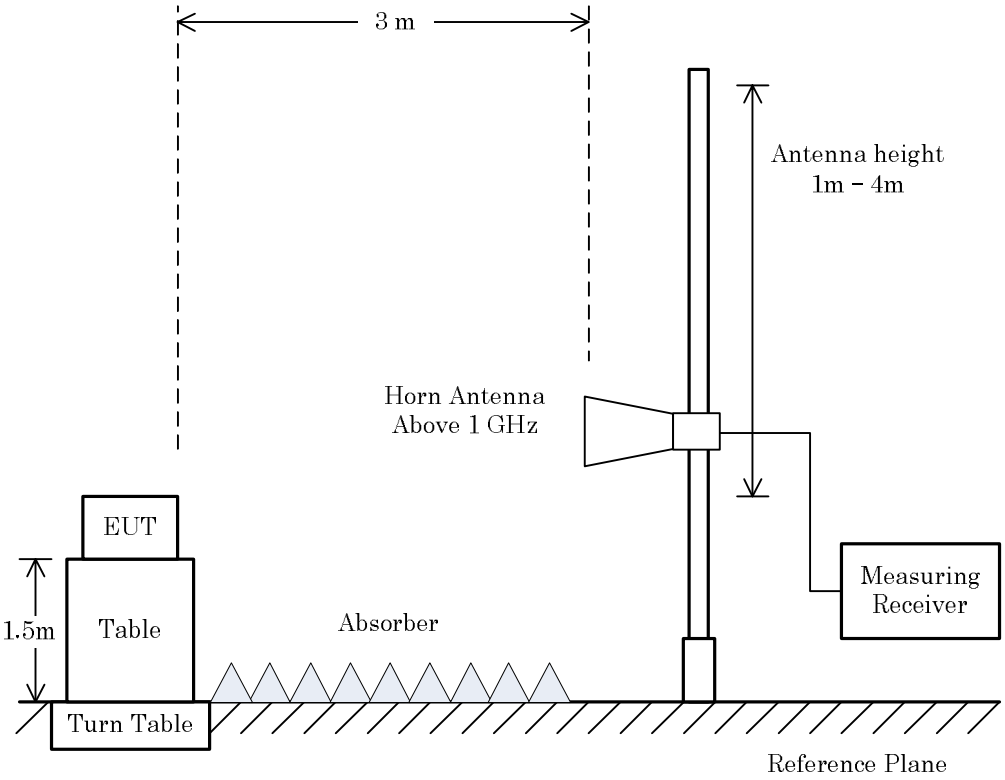
Type	Peak	Average
Detector Function	Peak	Peak
Res. Bandwidth	1 MHz	1 MHz
Video Bandwidth	3 MHz	≥ 1/T *1)
Video Filtering	Linear Voltage	Linear Voltage
Sweep Time	AUTO	AUTO
Trace	Max Hold	Max Hold

Note: 1. T: Minimum transmission duration

Average (VBW) Setting:

Mode	Interval	Cycle	Duty cycle	Burst on period(T)	Min. VBW(1/T)	VBW Setting
	(msec)	(msec)	(%)	(msec)	(kHz)	(kHz))
IEEE802.11b(1Mbps)	0.40	16.84	97.6%	16.44	0.06	0.50
IEEE802.11g(6Mbps)	0.41	3.14	87.0%	2.73	0.37	0.50
IEEE802.11n HT20(MCS0)	0.20	2.74	92.7%	2.54	0.39	0.50
IEEE802.11n HT40(MCS0)	0.19	1.44	86.5%	1.24	0.80	1.00

– Side View –



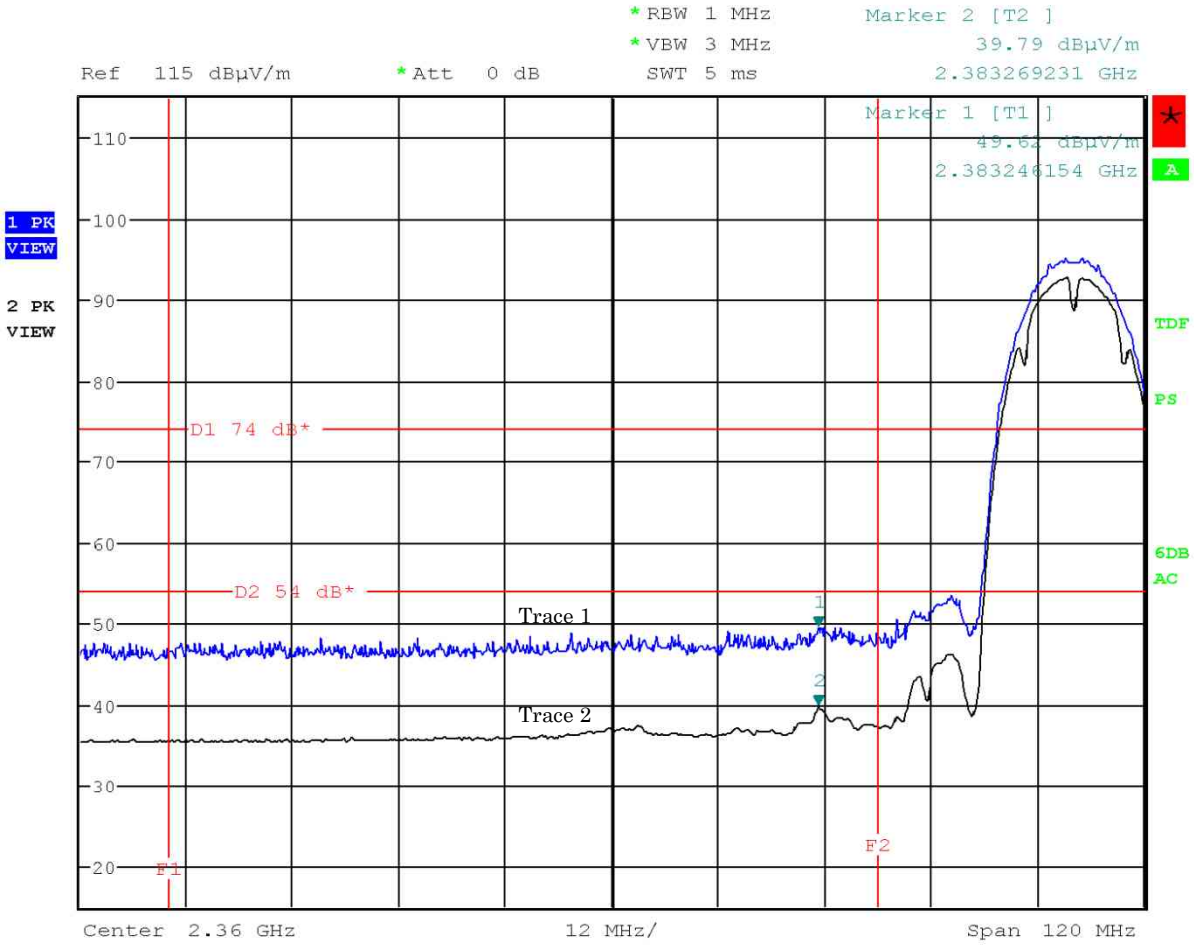
NOTE
When the EUT is manipulated through three different orientations, the scan height upper range for the measurement antenna is limited to 2.5 m or 0.5 m above the top of the EUT.

7.9.4 Test Data

7.9.4.1 Band-edge Compliance

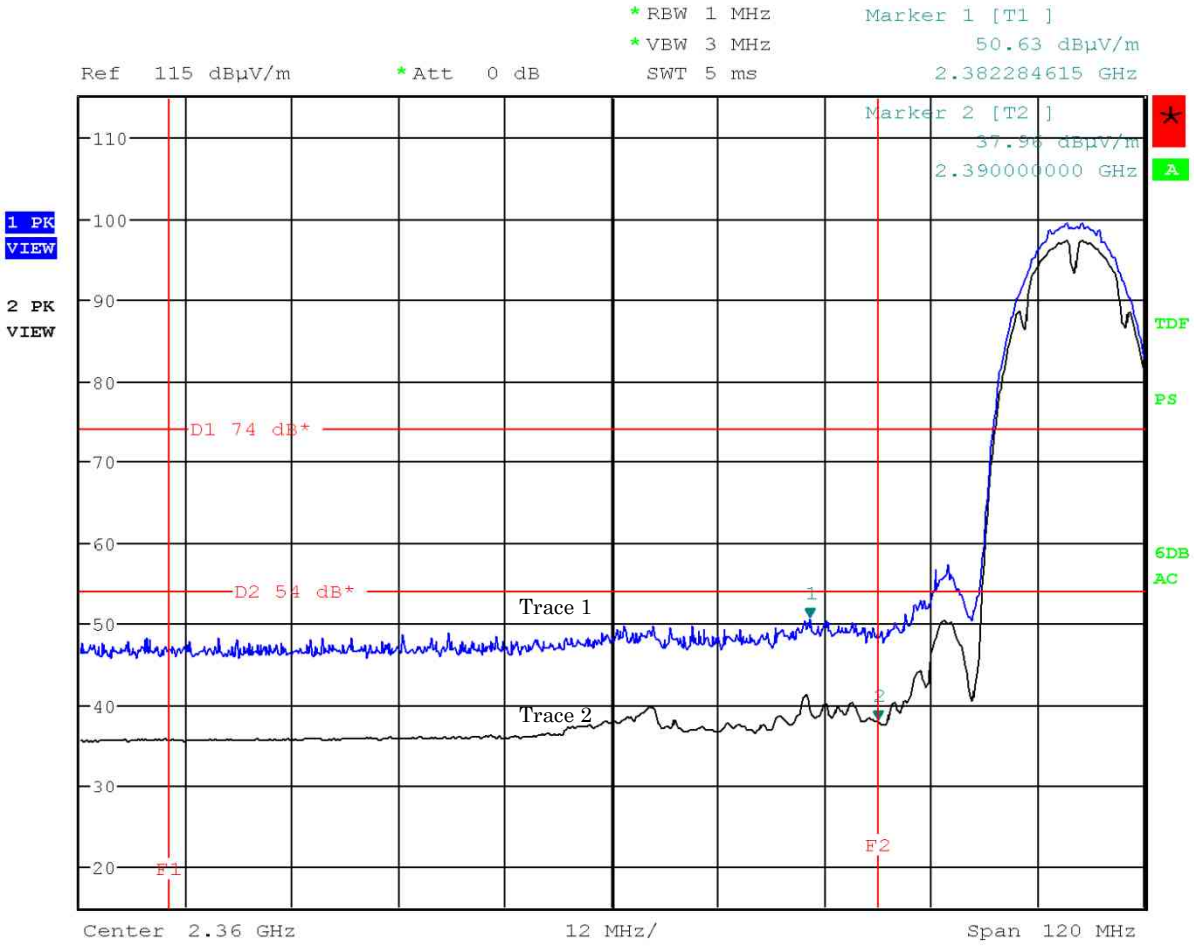
Test Date :November 19, 2015
Temp.:21°C, Humi:37%

Mode of EUT : 1ch: 2412 MHz, (IEEE 802.11b)
Antenna Polarization : Horizontal



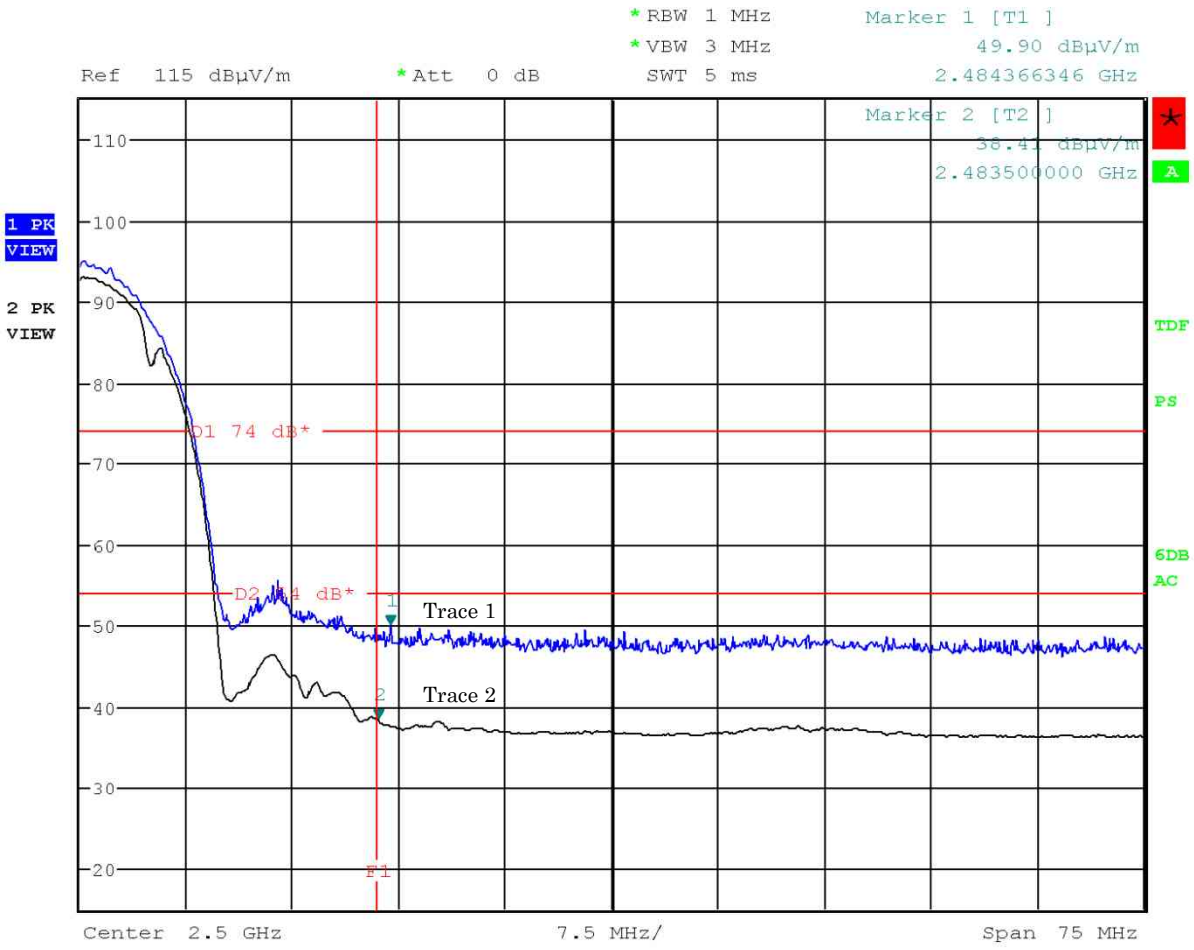
Note: The trace 1 is Peak . The trace 2 is Average.

Mode of EUT : 1ch: 2412 MHz, (IEEE 802.11b)
Antenna Polarization : Vertical



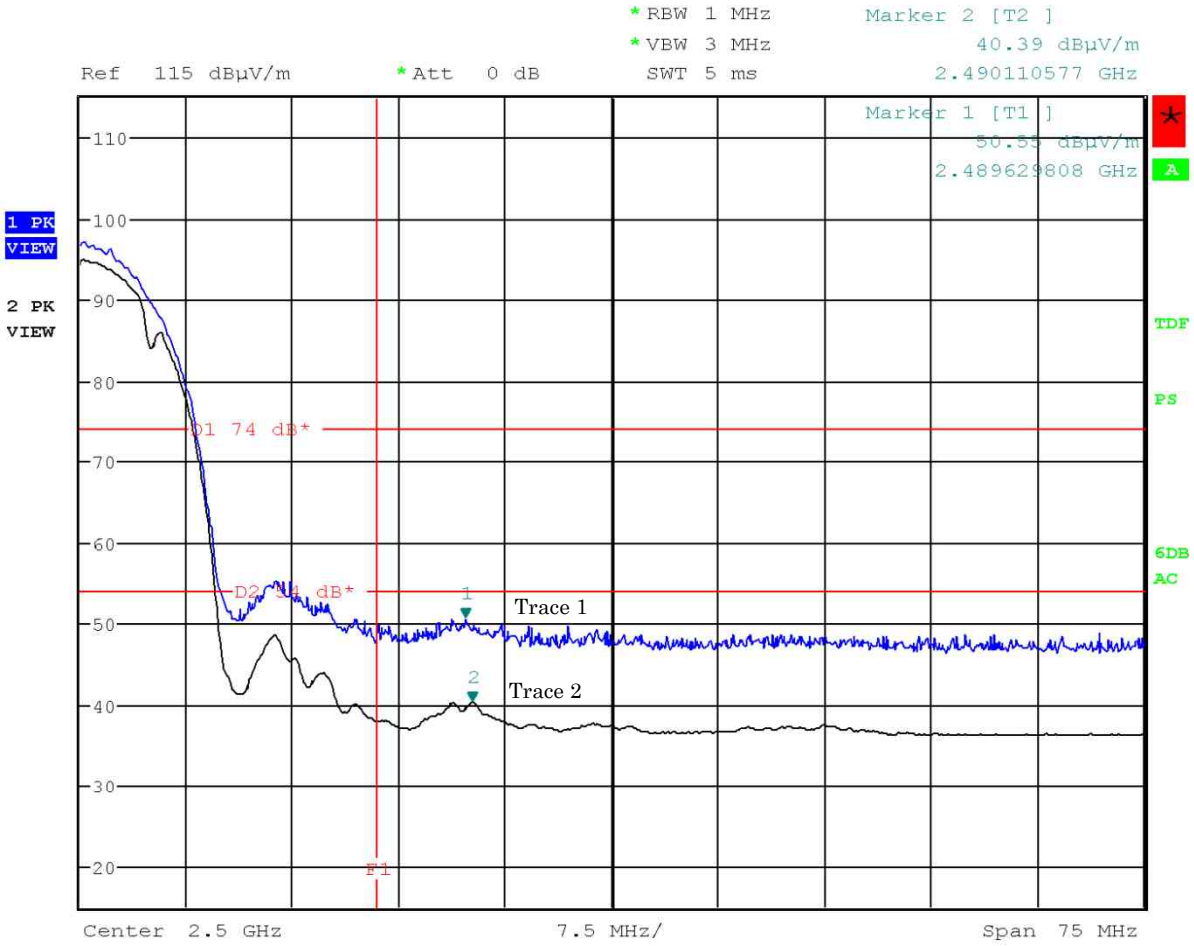
Note: The trace 1 is Peak . The trace 2 is Average.

Mode of EUT : 11ch: 2462 MHz, (IEEE 802.11b)
Antenna Polarization : Horizontal



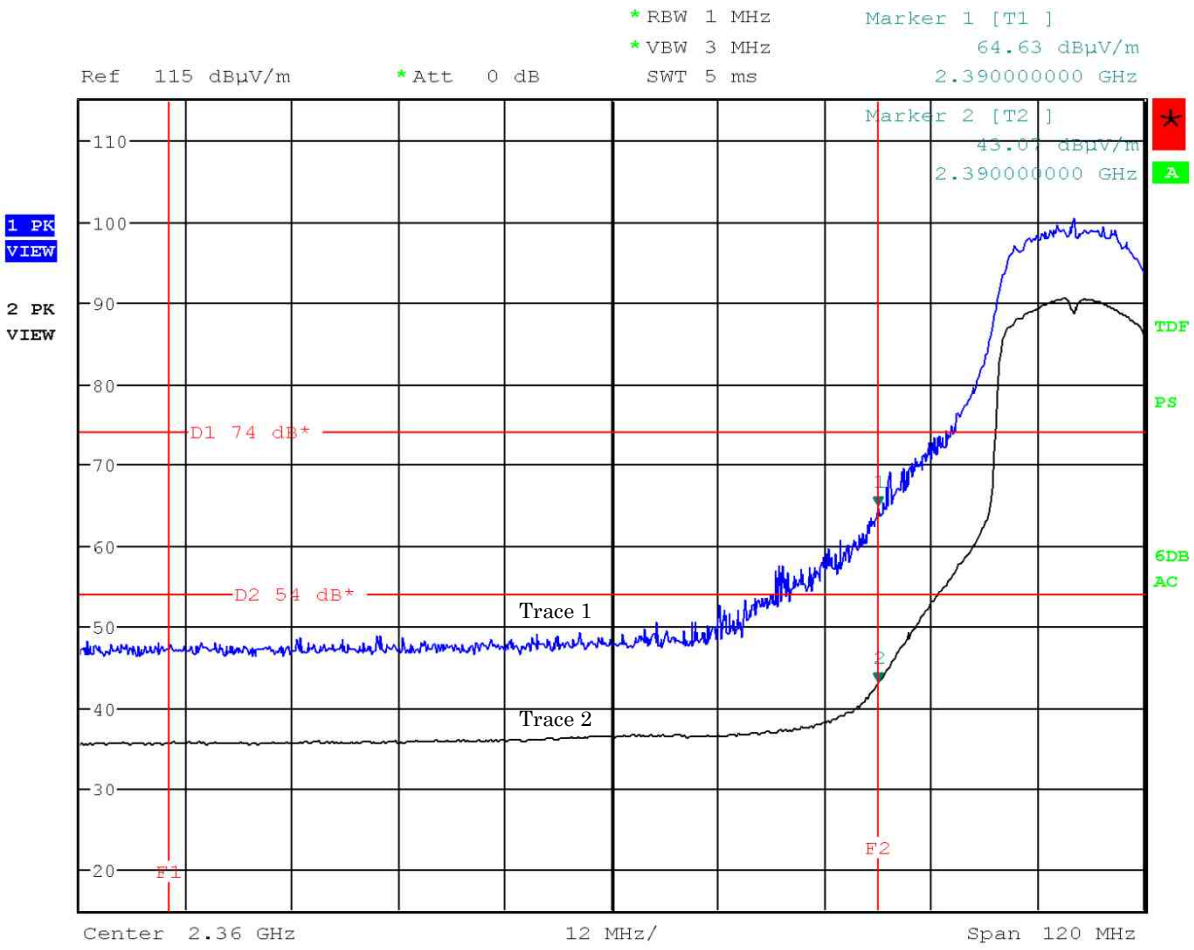
Note: The trace 1 is Peak . The trace 2 is Average.

Mode of EUT : 11ch: 2462 MHz, (IEEE 802.11b)
Antenna Polarization : Vertical



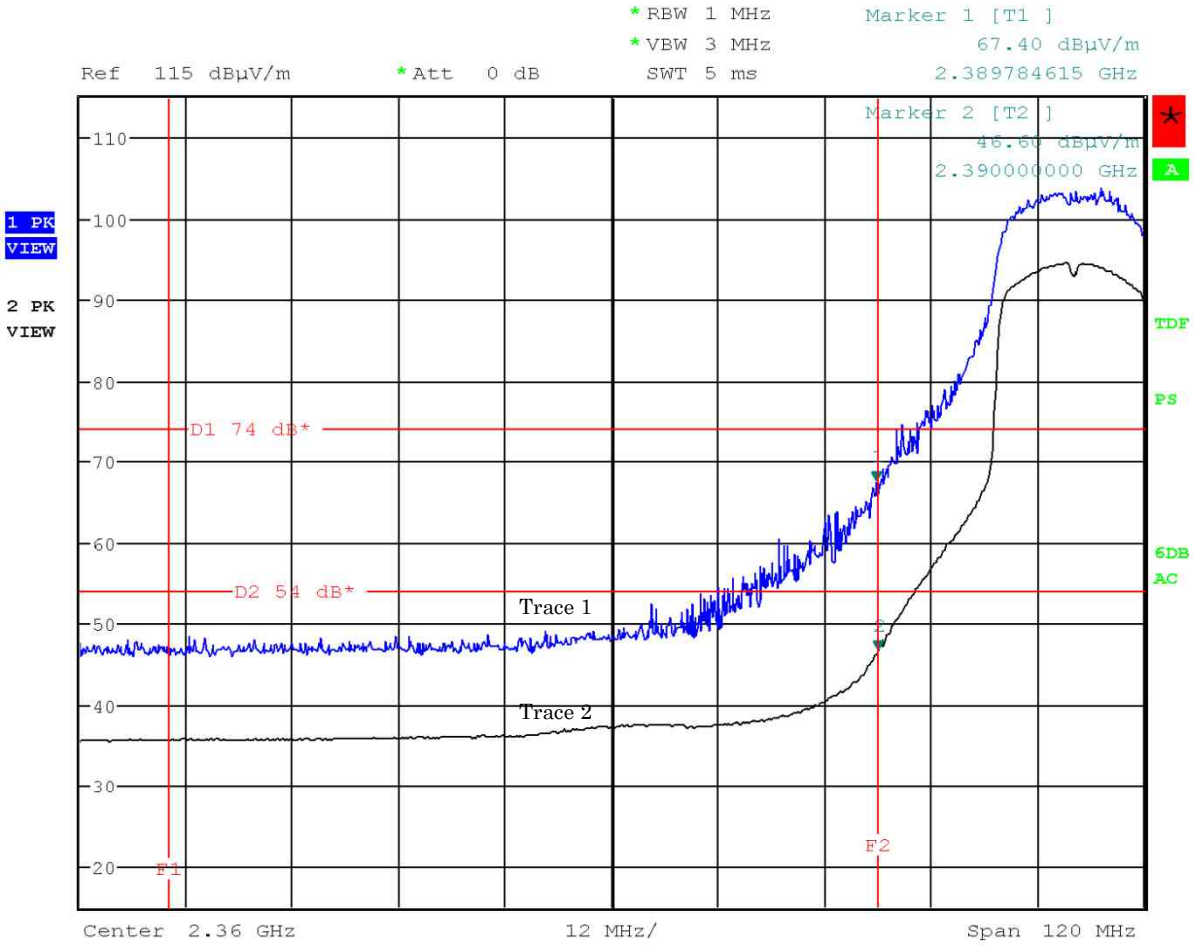
Note: The trace 1 is Peak . The trace 2 is Average.

Mode of EUT : 1ch: 2412 MHz, (IEEE 802.11g)
Antenna Polarization : Horizontal



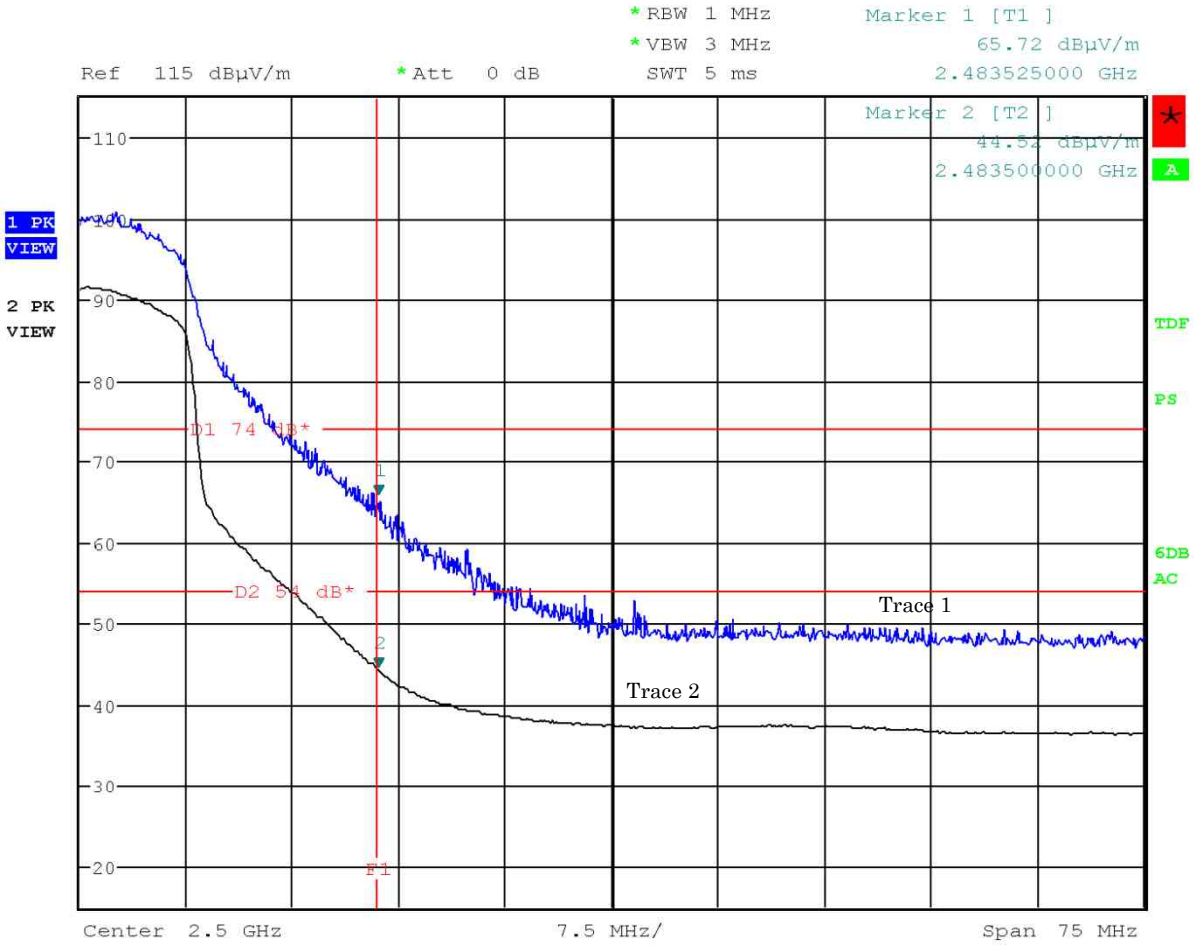
Note: The trace 1 is Peak . The trace 2 is Average.

Mode of EUT : 1ch: 2412 MHz, (IEEE 802.11g)
Antenna Polarization : Vertical



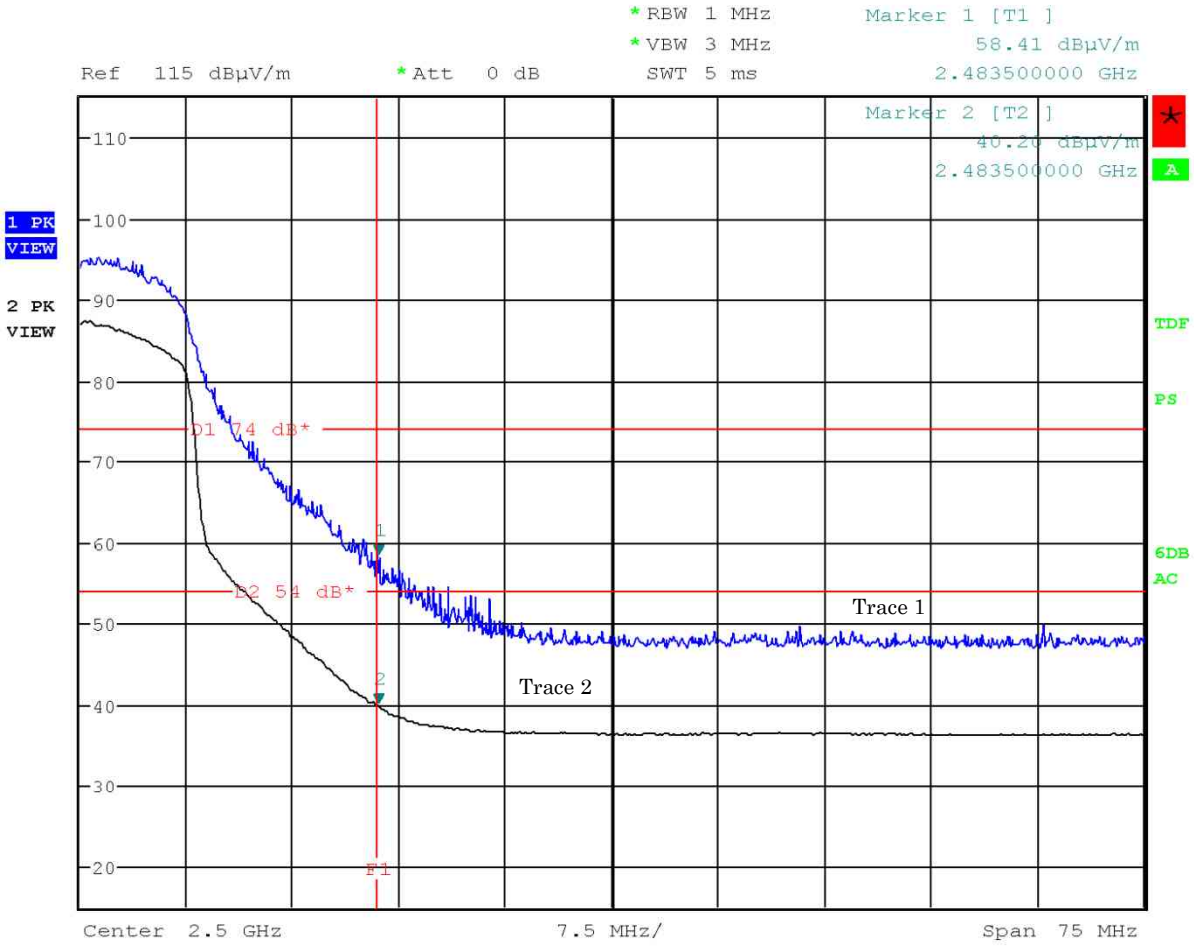
Note: The trace 1 is Peak . The trace 2 is Average.

Mode of EUT : 11ch: 2462 MHz, (IEEE 802.11g)
Antenna Polarization : Horizontal



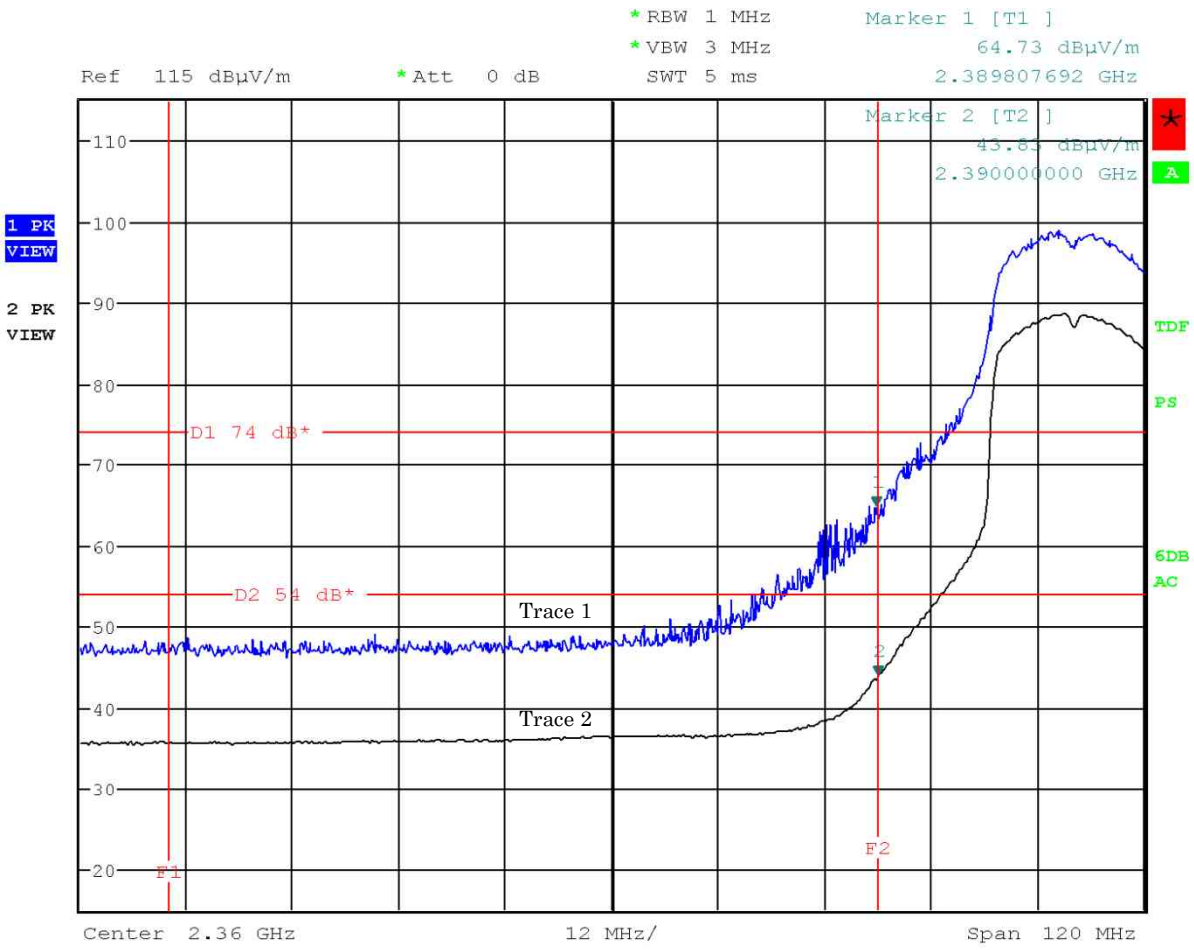
Note: The trace 1 is Peak . The trace 2 is Average.

Mode of EUT : 11ch: 2462 MHz, (IEEE 802.11g)
Antenna Polarization : Vertical



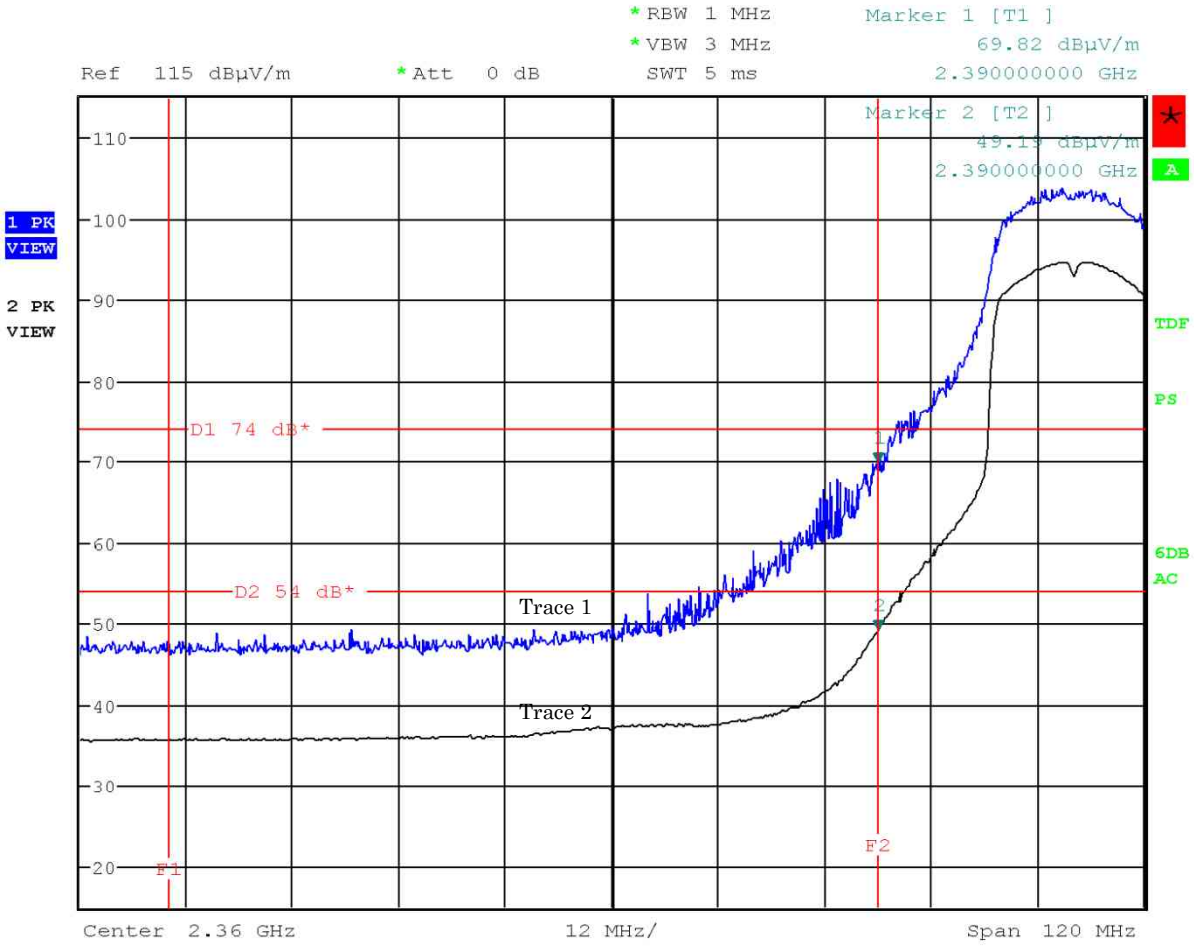
Note: The trace 1 is Peak . The trace 2 is Average.

Mode of EUT : 1ch: 2412 MHz, (IEEE 802.11n HT20)
Antenna Polarization : Horizontal



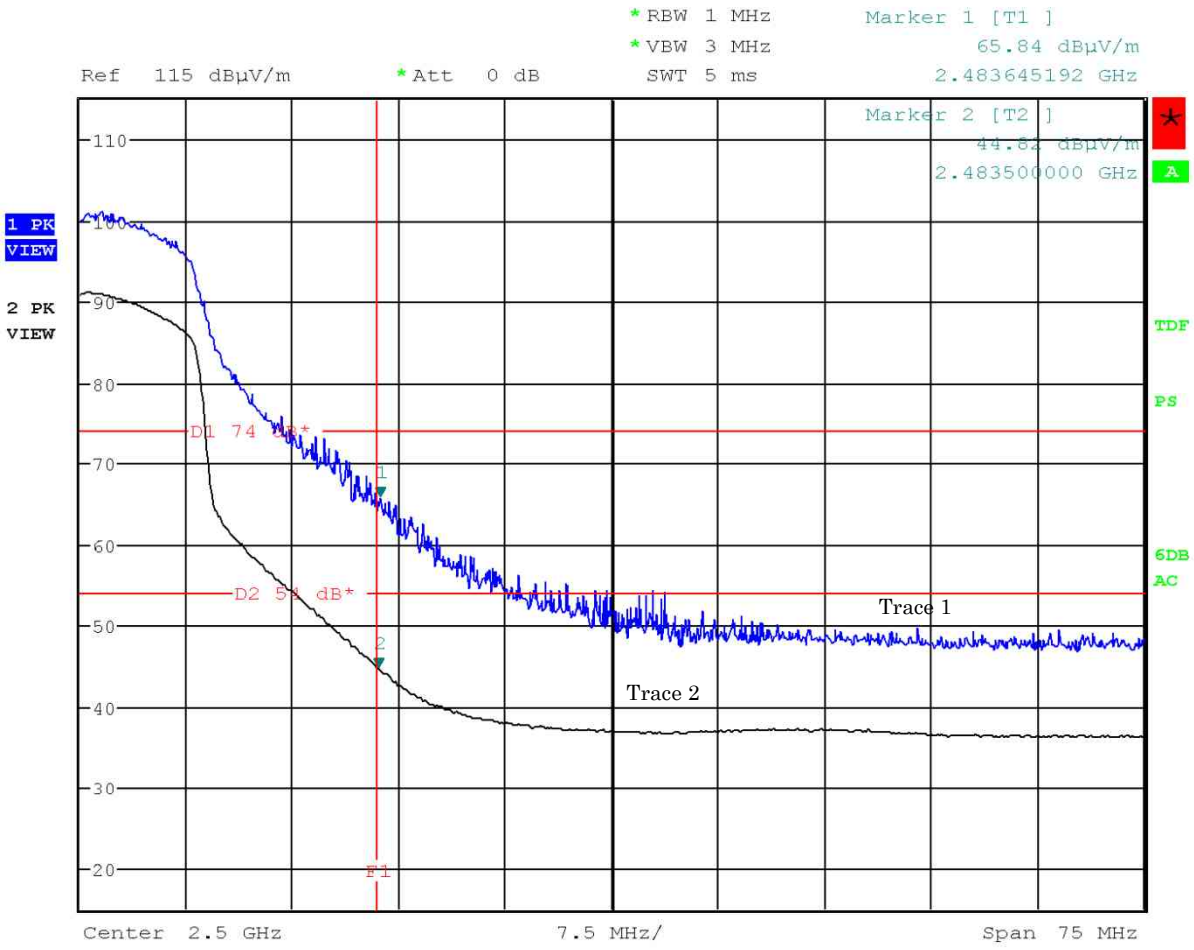
Note: The trace 1 is Peak . The trace 2 is Average.

Mode of EUT : 1ch: 2412 MHz, (IEEE 802.11n HT20)
Antenna Polarization : Vertical



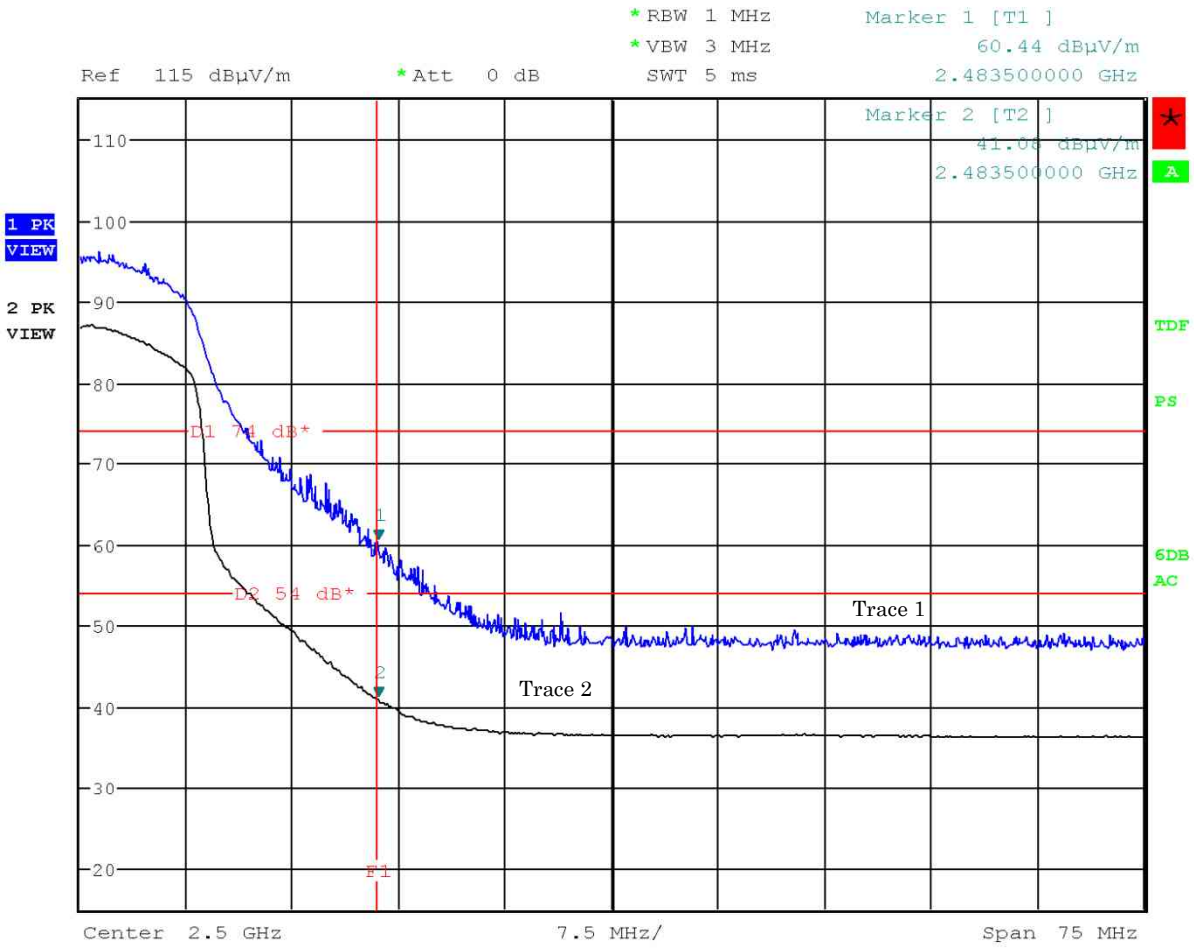
Note: The trace 1 is Peak . The trace 2 is Average.

Mode of EUT : 11ch: 2462 MHz, (IEEE 802.11n HT20)
Antenna Polarization : Horizontal



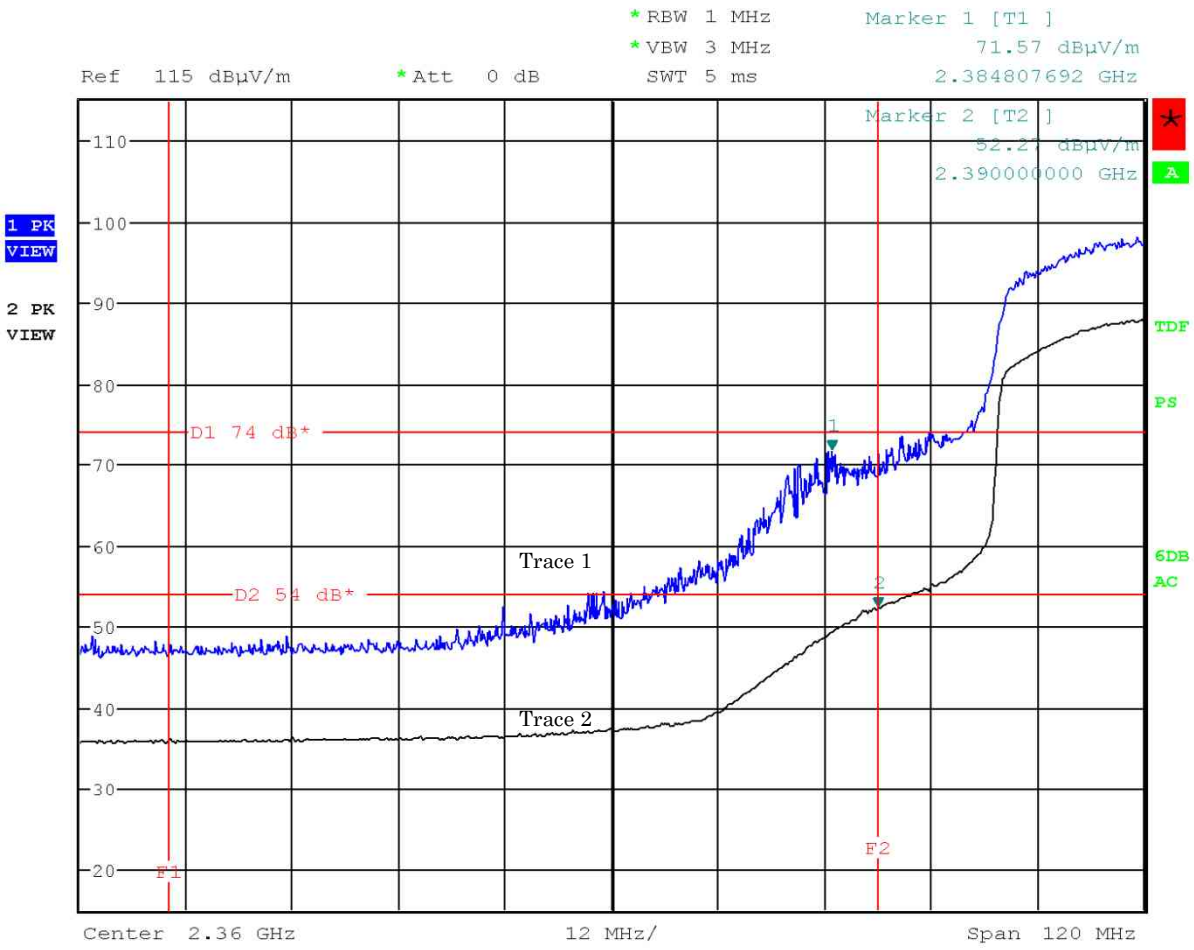
Note: The trace 1 is Peak . The trace 2 is Average.

Mode of EUT : 11ch: 2462 MHz, (IEEE 802.11n HT20)
Antenna Polarization : Vertical



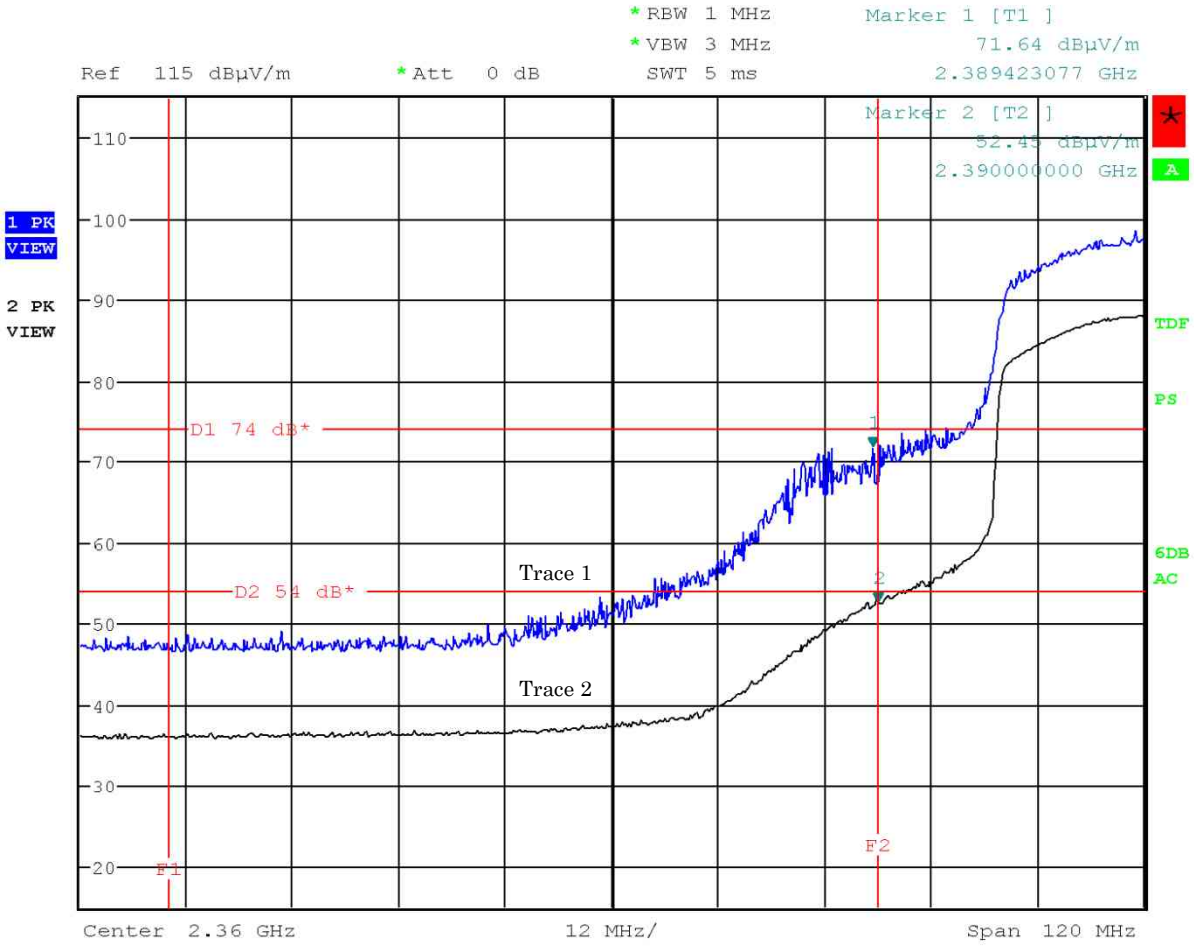
Note: The trace 1 is Peak . The trace 2 is Average.

Mode of EUT : 3ch: 2422 MHz, (IEEE 802.11n HT40)
Antenna Polarization : Horizontal



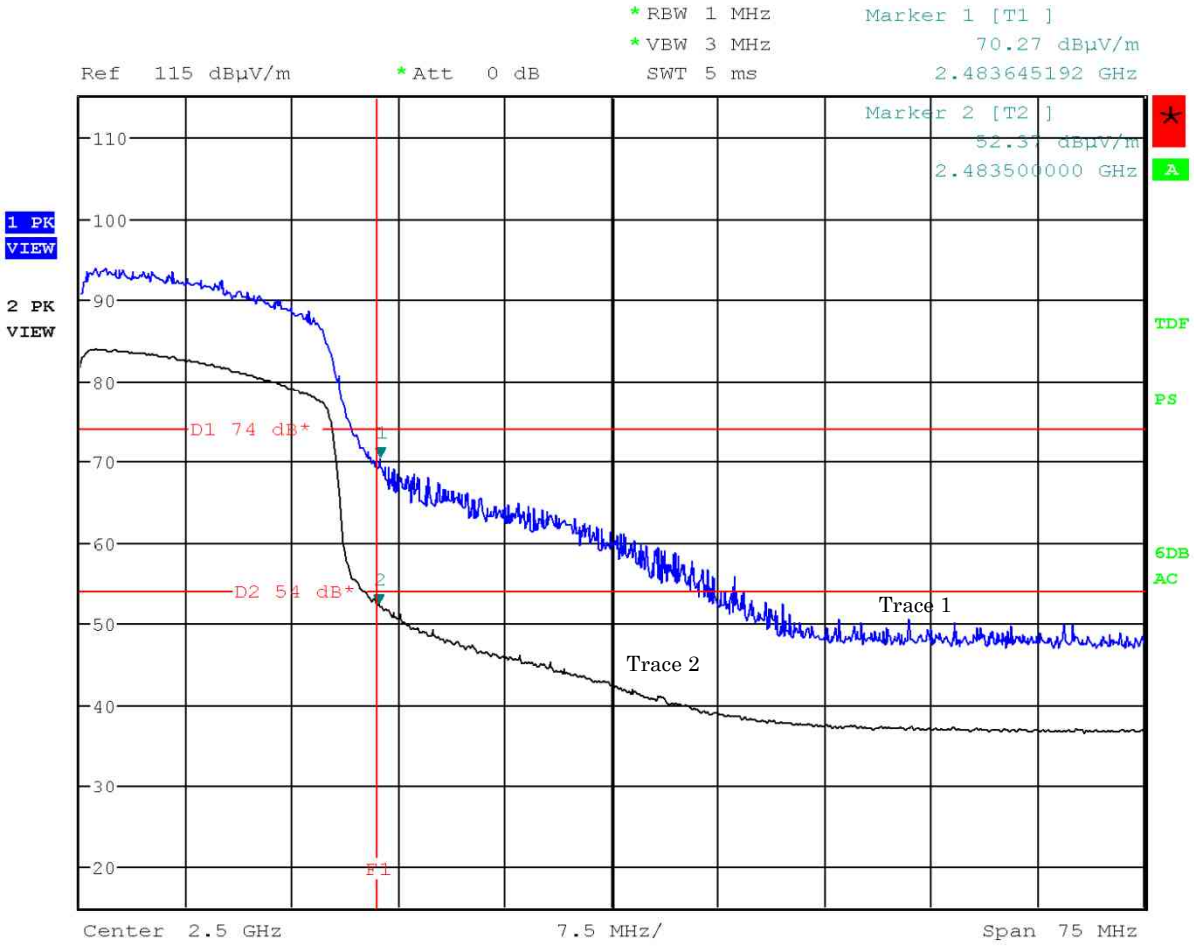
Note: The trace 1 is Peak . The trace 2 is Average.

Mode of EUT : 1ch: 2422 MHz, (IEEE 802.11n HT40)
Antenna Polarization : Vertical



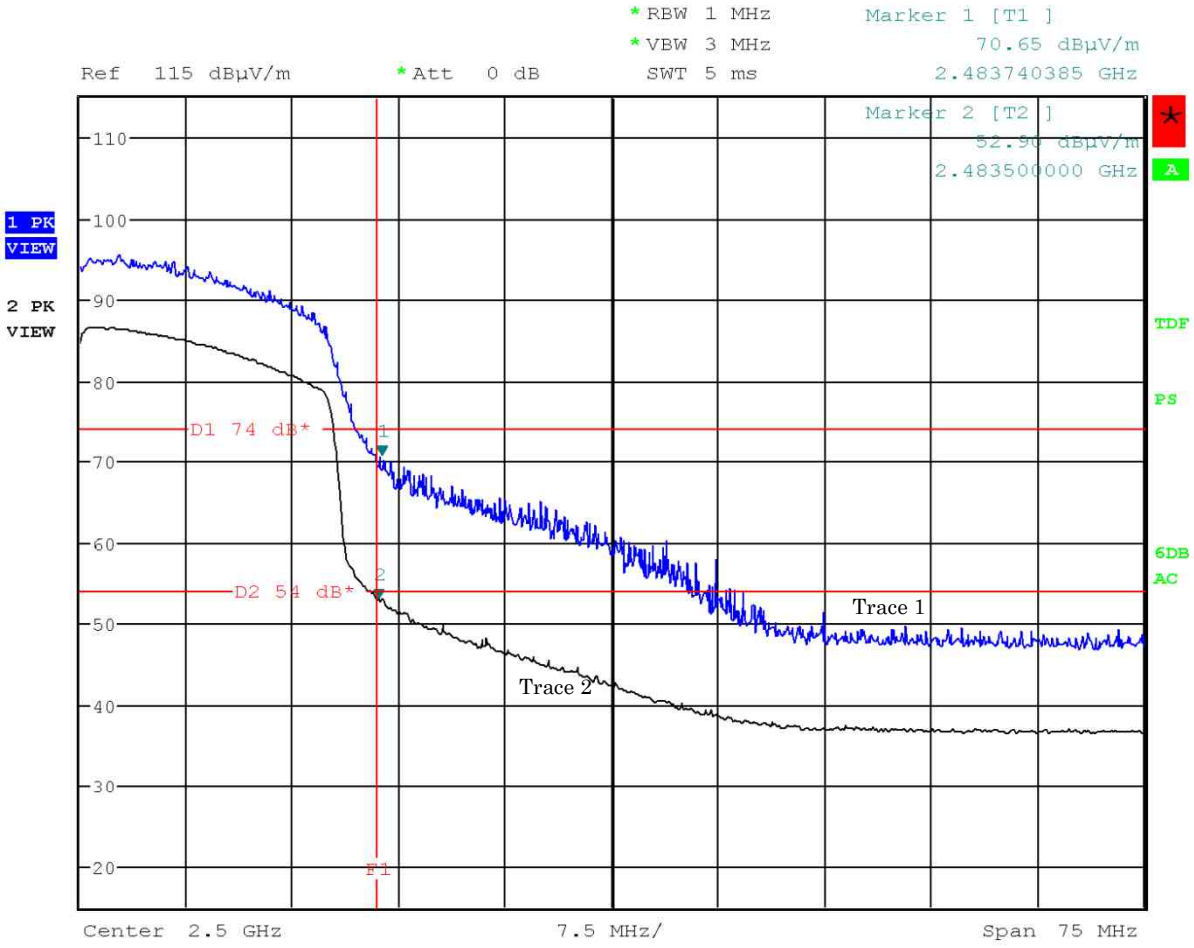
Note: The trace 1 is Peak . The trace 2 is Average.

Mode of EUT : 11ch: 2452 MHz, (IEEE 802.11n HT40)
Antenna Polarization : Horizontal



Note: The trace 1 is Peak . The trace 2 is Average.

Mode of EUT : 9ch: 2452 MHz, (IEEE 802.11n HT40)
Antenna Polarization : Vertical



Note: The trace 1 is Peak . The trace 2 is Average.

7.9.4.2 Other Spurious Emission (9kHz – 30MHz)

Test Date :November 30, 2015
Temp.:19°C, Humi:54%

Mode of EUT : WLAN
Results : No spurious emissions in the range 20dB below the limit.

7.9.4.3 Other Spurious Emission (30MHz – 1000MHz)

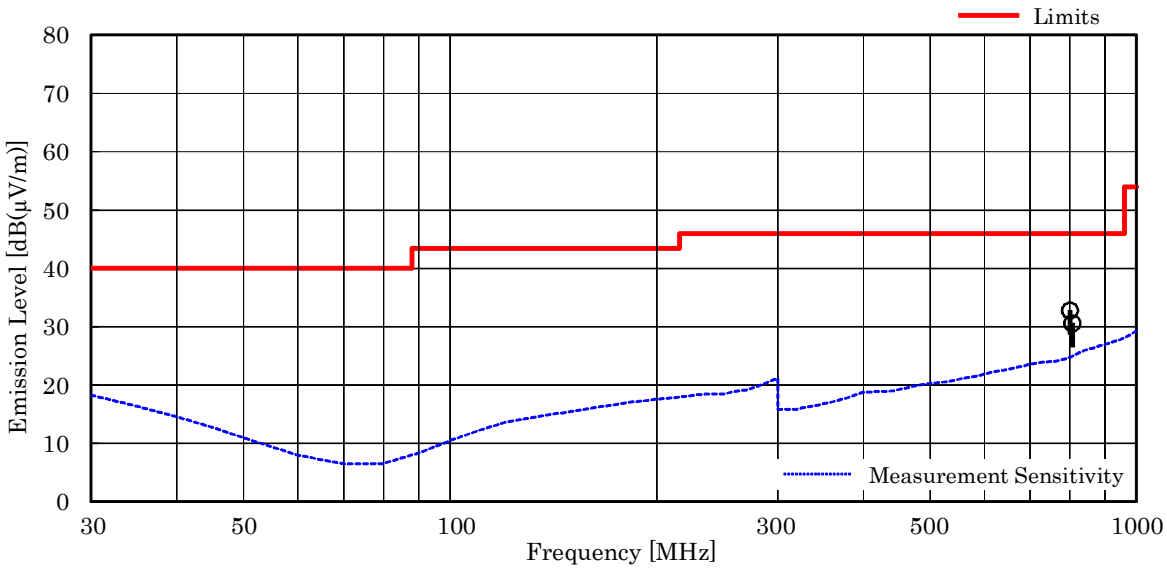
Mode of EUT : (WLAN) All modes have been investigated and the worst case mode for channel (01ch: 2412MHz / IEEE802.11b, IEEE802.11g and IEEE802.11n) has been listed.

Test voltage : 120VAC 60Hz

Test Date: November 30, 2015
Temp.: 19 °C, Humi: 54 %

Antenna pole : Horizontal

Frequency [MHz]	Antenna Factor [dB(1/m)]	Corr. Factor [dB]	Meter Readings [dB(μV)]	Limits [dB(μV/m)]	Results [dB(μV/m)]	Margin [dB]	Remarks
800.00	20.7	-22.9	35.0	46.0	32.8	+13.2	-
806.39	20.8	-22.9	32.7	46.0	30.6	+15.4	-



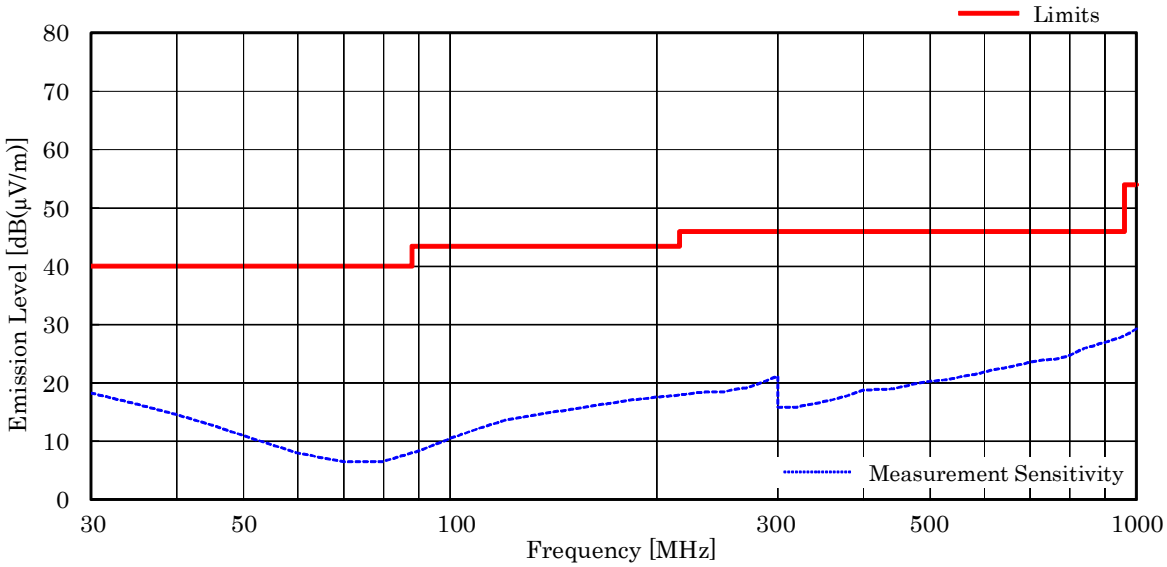
NOTES
1. Test Distance : 3 m
2. The spectrum was checked from 30 MHz to 1000 MHz.
3. The correction factor is composed of cable loss, pad attenuation and/or amplifier gain.
4. The symbol of "<" means "or less".
5. The symbol of ">" means "more than".
6. Calculated result at 800.00 MHz, as the worst point shown on underline:
   Antenna Factor + Coorection Factor + Meter Reading = 20.7 + (-22.9) + 35.0 = 32.8 dB(μV/m)
   Antenna Height : 1.07 m, Turntable Angle : 177 °
7. Test receiver setting(s) : CISPR QP 120 kHz (QP : Quasi-Peak)

Test voltage : 120VAC 60Hz

Test Date: November 30, 2015
Temp.: 19 °C, Humi: 54 %

Antenna pole : Vertical

Frequency [MHz]	Antenna Factor [dB(1/m)]	Corr. Factor [dB]	Meter Readings [dB(μV)]	Limits [dB(μV/m)]	Results [dB(μV/m)]	Margin [dB]	Remarks
800.00	20.7	-22.9	< 27.0	46.0	< 24.8	> +21.2	-
816.39	21.1	-22.8	< 27.0	46.0	< 25.3	> +20.7	-



NOTES
1. Test Distance : 3 m
2. The spectrum was checked from 30 MHz to 1000 MHz.
3. The correction factor is composed of cable loss, pad attenuation and/or amplifier gain.
4. The symbol of "<" means "or less".
5. The symbol of ">" means "more than".
6. Calculated result at 816.39 MHz, as the worst point shown on underline:
   Antenna Factor + Coorection Factor + Meter Reading = 21.1 + (-22.8) + <27.0 = <25.3 dB(μV/m)
   Antenna Height : 1.17 m, Turntable Angle : 321 °
7. Test receiver setting(s) : CISPR QP 120 kHz (QP : Quasi-Peak)

7.9.4.4 Other Spurious Emission (Above 1000MHz)

Mode of EUT : IEEE802.11b

Test Date: November 26, 2015
Temp.: 18 °C, Humi: 59 %

Frequency	Antenna Factor	Corr. Factor	Meter Readings [dB(μV)] Horizontal		Meter Readings [dB(μV)] Vertical		Limits [dB(μV/m)]		Results [dB(μV/m)]		Margin [dB]	Remarks
[MHz]	[dB(1/m)]	[dB]	PK	AVE	PK	AVE	PK	AVE	PK	AVE		
Test condition : Tx Low Ch												
4824.0	32.9	-35.6	53.6	49.9	50.5	45.4	74.0	54.0	50.9	47.2	+ 6.8	
12060.0	39.1	-35.4	< 48.0	< 38.0	< 48.0	< 38.0	74.0	54.0	< 51.7	< 41.7	> +12.3	
14472.0	41.8	-36.1	< 48.0	< 38.0	< 48.0	< 38.0	74.0	54.0	< 53.7	< 43.7	> +10.3	
19296.0	40.5	-42.8	< 50.0	< 40.0	< 50.0	< 40.0	74.0	54.0	< 47.7	< 37.7	> +16.3	
Test condition : TX Middle Ch												
4874.0	33.0	-35.5	52.7	48.9	49.0	43.0	74.0	54.0	50.2	46.4	+ 7.6	
7311.0	36.6	-36.1	< 48.0	< 38.0	< 48.0	< 38.0	74.0	54.0	< 48.5	< 38.5	> +15.5	
12185.0	38.9	-35.9	< 48.0	< 38.0	< 48.0	< 38.0	74.0	54.0	< 51.0	< 41.0	> +13.0	
19496.0	40.5	-42.8	< 50.0	< 40.0	< 50.0	< 40.0	74.0	54.0	< 47.7	< 37.7	> +16.3	
Test condition : TX High Ch												
4924.0	33.1	-35.4	54.7	51.4	50.8	46.1	74.0	54.0	52.4	49.1	+ 4.9	
7386.0	36.6	-35.7	< 48.0	< 38.0	< 48.0	< 38.0	74.0	54.0	< 48.9	< 38.9	> +15.1	
12310.0	38.8	-36.0	< 48.0	< 38.0	< 48.0	< 38.0	74.0	54.0	< 50.8	< 40.8	> +13.2	
19696.0	40.5	-42.9	< 50.0	< 40.0	< 50.0	< 40.0	74.0	54.0	< 47.6	< 37.6	> +16.4	
22158.0	40.6	-43.3	< 50.0	< 40.0	< 50.0	< 40.0	74.0	54.0	< 47.3	< 37.3	> +16.7	

Calculated result at 4924.0 MHz, as the worst point shown on underline:

	Antenna Factor	=	33.1 dB(1/m)
	Corr. Factor	=	-35.4 dB
+)	Meter Reading	=	51.4 dB(μV)
	Result	=	49.1 dB(μV/m)

Minimum Margin: 54.0 - 49.1 = 4.9 (dB)

NOTES
1. Test Distance : 3 m
2. The spectrum was checked from 1 GHz to 25 GHz (10th harmonic of the highest fundamental frequency).
3. The correction factor is shown as follows:
   Corr. Factor [dB] = Cable Loss + 20dB Pad Att. - Pre-Amp. Gain [dB] (1.0 - 7.6GHz)
   Corr. Factor [dB] = Cable Loss + 10dB Pad Att. - Pre-Amp. Gain [dB] (7.6 - 18.0GHz)
   Corr. Factor [dB] = Cable Loss - Pre-Amp. Gain [dB] (over 18 GHz)
4. The symbol of "<" means "or less".
5. The symbol of ">" means "more than".
6. PK : Peak / AVE : Average

Mode of EUT : IEEE802.11g

Test Date: November 26, 2015
Temp.: 18 °C, Humi: 59 %

Frequency	Antenna Factor	Corr. Factor	Meter Readings [dB(μV)] Horizontal PK	Horizontal AVE	Vertical PK	Vertical AVE	Limits [dB(μV/m)] PK	Limits [dB(μV/m)] AVE	Results [dB(μV/m)] PK	Results [dB(μV/m)] AVE	Margin [dB]	Remarks
[MHz]	[dB(1/m)]	[dB]										
Test condition : Tx Low Ch												
4824.0	32.9	-35.6	< 48.0	< 38.0	< 48.0	< 38.0	74.0	54.0	< 45.3	< 35.3	> +18.7	
12060.0	39.1	-35.4	< 48.0	< 38.0	< 48.0	< 38.0	74.0	54.0	< 51.7	< 41.7	> +12.3	
14472.0	41.8	-36.1	< 48.0	< 38.0	< 48.0	< 38.0	74.0	54.0	< 53.7	< 43.7	> +10.3	
19296.0	40.5	-42.8	< 50.0	< 40.0	< 50.0	< 40.0	74.0	54.0	< 47.7	< 37.7	> +16.3	
Test condition : TX Middle Ch												
4874.0	33.0	-35.5	< 48.0	< 38.0	< 48.0	< 38.0	74.0	54.0	< 45.5	< 35.5	> +18.5	
7311.0	36.6	-35.6	< 48.0	< 38.0	< 48.0	< 38.0	74.0	54.0	< 49.0	< 39.0	> +15.0	
12185.0	38.9	-35.7	< 48.0	< 38.0	< 48.0	< 38.0	74.0	54.0	< 51.2	< 41.2	> +12.8	
19496.0	40.5	-42.8	< 50.0	< 40.0	< 50.0	< 40.0	74.0	54.0	< 47.7	< 37.7	> +16.3	
Test condition : TX High Ch												
4924.0	33.1	-35.4	< 48.0	< 38.0	< 48.0	< 38.0	74.0	54.0	< 45.7	< 35.7	> +18.3	
7386.0	36.6	-35.7	< 48.0	< 38.0	< 48.0	< 38.0	74.0	54.0	< 48.9	< 38.9	> +15.1	
12310.0	38.8	-36.0	< 48.0	< 38.0	< 48.0	< 38.0	74.0	54.0	< 50.8	< 40.8	> +13.2	
19696.0	40.5	-42.9	< 50.0	< 40.0	< 50.0	< 40.0	74.0	54.0	< 47.6	< 37.6	> +16.4	
22158.0	40.6	-43.3	< 50.0	< 40.0	< 50.0	< 40.0	74.0	54.0	< 47.3	< 37.3	> +16.7	

Calculated result at 14472.0 MHz, as the worst point shown on underline:

	Antenna Factor	=	41.8 dB(1/m)
	Corr. Factor	=	-36.1 dB
+)	Meter Reading	=	<38.0 dB(μV)
	Result	=	<43.7 dB(μV/m)

Minimum Margin: 54.0 - <43.7 = >10.3 (dB)

NOTES
1. Test Distance : 3 m
2. The spectrum was checked from 1 GHz to 25 GHz (10th harmonic of the highest fundamental frequency).
3. The correction factor is shown as follows:
   Corr. Factor [dB] = Cable Loss + 20dB Pad Att. - Pre-Amp. Gain [dB] (1.0 - 7.6GHz)
   Corr. Factor [dB] = Cable Loss + 10dB Pad Att. - Pre-Amp. Gain [dB] (7.6 - 18.0GHz)
   Corr. Factor [dB] = Cable Loss - Pre-Amp. Gain [dB] (over 18 GHz)
4. The symbol of "<" means "or less".
5. The symbol of ">" means "more than".
6. PK : Peak / AVE : Average

Mode of EUT : IEEE802.11n HT20

Test Date: November 26, 2015
Temp.: 18 °C, Humi: 59 %

Frequency	Antenna Factor	Corr. Factor	Meter Readings [dB(μV)] Horizontal		Vertical		Limits [dB(μV/m)]		Results [dB(μV/m)]		Margin [dB]	Remarks
[MHz]	[dB(1/m)]	[dB]	PK	AVE	PK	AVE	PK	AVE	PK	AVE		
Test condition : Tx Low Ch												
4824.0	32.9	-35.6	< 48.0	< 38.0	< 48.0	< 38.0	74.0	54.0	< 45.3	< 35.3	> +18.7	
12060.0	39.1	-35.4	< 48.0	< 38.0	< 48.0	< 38.0	74.0	54.0	< 51.7	< 41.7	> +12.3	
14472.0	41.8	-36.1	< 48.0	< 38.0	< 48.0	< 38.0	74.0	54.0	< 53.7	< 43.7	> +10.3	
19296.0	40.5	-42.8	< 50.0	< 40.0	< 50.0	< 40.0	74.0	54.0	< 47.7	< 37.7	> +16.3	
Test condition : TX Middle Ch												
4874.0	33.0	-35.5	< 48.0	< 38.0	< 48.0	< 38.0	74.0	54.0	< 45.5	< 35.5	> +18.5	
7311.0	36.6	-35.6	< 48.0	< 38.0	< 48.0	< 38.0	74.0	54.0	< 49.0	< 39.0	> +15.0	
12185.0	38.9	-35.7	< 48.0	< 38.0	< 48.0	< 38.0	74.0	54.0	< 51.2	< 41.2	> +12.8	
19496.0	40.5	-42.8	< 50.0	< 40.0	< 50.0	< 40.0	74.0	54.0	< 47.7	< 37.7	> +16.3	
Test condition : TX High Ch												
4924.0	33.1	-35.4	< 48.0	< 38.0	< 48.0	< 38.0	74.0	54.0	< 45.7	< 35.7	> +18.3	
7386.0	36.6	-35.7	< 48.0	< 38.0	< 48.0	< 38.0	74.0	54.0	< 48.9	< 38.9	> +15.1	
12310.0	38.8	-36.0	< 48.0	< 38.0	< 48.0	< 38.0	74.0	54.0	< 50.8	< 40.8	> +13.2	
19696.0	40.5	-42.9	< 50.0	< 40.0	< 50.0	< 40.0	74.0	54.0	< 47.6	< 37.6	> +16.4	
22158.0	40.6	-43.3	< 50.0	< 40.0	< 50.0	< 40.0	74.0	54.0	< 47.3	< 37.3	> +16.7	

Calculated result at 14472.0 MHz, as the worst point shown on underline:

	Antenna Factor	=	41.8 dB(1/m)
	Corr. Factor	=	-36.1 dB
+)	Meter Reading	=	<38.0 dB(μV)
	Result	=	<43.7 dB(μV/m)

Minimum Margin: 54.0 - <43.7 = >10.3 (dB)

NOTES
1. Test Distance : 3 m
2. The spectrum was checked from 1 GHz to 25 GHz (10th harmonic of the highest fundamental frequency).
3. The correction factor is shown as follows:
   Corr. Factor [dB] = Cable Loss + 20dB Pad Att. - Pre-Amp. Gain [dB] (1.0 - 7.6GHz)
   Corr. Factor [dB] = Cable Loss + 10dB Pad Att. - Pre-Amp. Gain [dB] (7.6 - 18.0GHz)
   Corr. Factor [dB] = Cable Loss - Pre-Amp. Gain [dB] (over 18 GHz)
4. The symbol of "<" means "or less".
5. The symbol of ">" means "more than".
6. PK : Peak / AVE : Average

Mode of EUT : IEEE802.11n HT40

Test Date: November 26, 2015
Temp.: 18 °C, Humi: 59 %

Frequency	Antenna Factor	Corr. Factor	Meter Readings [dB(μV)] Horizontal PK	Horizontal AVE	Vertical PK	Vertical AVE	Limits [dB(μV/m)] PK	Limits AVE	Results [dB(μV/m)] PK	Results AVE	Margin [dB]	Remarks
[MHz]	[dB(1/m)]	[dB]										
Test condition : Tx Low Ch												
4844.0	33.0	-35.5	< 48.0	< 38.0	< 48.0	< 38.0	74.0	54.0	< 45.5	< 35.5	> +18.5	
7266.0	36.5	-35.6	< 48.0	< 38.0	< 48.0	< 38.0	74.0	54.0	< 48.9	< 38.9	> +15.1	
12110.0	39.0	-35.5	< 48.0	< 38.0	< 48.0	< 38.0	74.0	54.0	< 51.5	< 41.5	> +12.5	
19376.0	40.5	-42.8	< 50.0	< 40.0	< 50.0	< 40.0	74.0	54.0	< 47.7	< 37.7	> +16.3	
Test condition : TX Middle Ch												
4874.0	33.0	-35.5	< 48.0	< 38.0	< 48.0	< 38.0	74.0	54.0	< 45.5	< 35.5	> +18.5	
7311.0	36.6	-35.6	< 48.0	< 38.0	< 48.0	< 38.0	74.0	54.0	< 49.0	< 39.0	> +15.0	
12185.0	38.9	-35.7	< 48.0	< 38.0	< 48.0	< 38.0	74.0	54.0	< 51.2	< 41.2	> +12.8	
19496.0	40.5	-42.8	< 50.0	< 40.0	< 50.0	< 40.0	74.0	54.0	< 47.7	< 37.7	> +16.3	
Test condition : TX High Ch												
4904.0	33.0	-35.4	< 48.0	< 38.0	< 48.0	< 38.0	74.0	54.0	< 45.6	< 35.6	> +18.4	
7356.0	36.6	-35.7	< 48.0	< 38.0	< 48.0	< 38.0	74.0	54.0	< 48.9	< 38.9	> +15.1	
12260.0	38.7	-35.9	< 48.0	< 38.0	< 48.0	< 38.0	74.0	54.0	< 50.8	< 40.8	> +13.2	
19616.0	40.5	-42.8	< 50.0	< 40.0	< 50.0	< 40.0	74.0	54.0	< 47.7	< 37.7	> +16.3	
22068.0	40.6	-43.3	< 50.0	< 40.0	< 50.0	< 40.0	74.0	54.0	< 47.3	< 37.3	> +16.7	

Calculated result at 12110.0 MHz, as the worst point shown on underline:

	Antenna Factor	=	39.0 dB(1/m)
	Corr. Factor	=	-35.5 dB
+)	Meter Reading	=	<38.0 dB(μV)
	Result	=	<41.5 dB(μV/m)

Minimum Margin: 54.0 - <41.5 = >12.5 (dB)

NOTES
1. Test Distance : 3 m
2. The spectrum was checked from 1 GHz to 25 GHz (10th harmonic of the highest fundamental frequency).
3. The correction factor is shown as follows:
   Corr. Factor [dB] = Cable Loss + 20dB Pad Att. - Pre-Amp. Gain [dB] (1.0 - 7.6GHz)
   Corr. Factor [dB] = Cable Loss + 10dB Pad Att. - Pre-Amp. Gain [dB] (7.6 - 18.0GHz)
   Corr. Factor [dB] = Cable Loss - Pre-Amp. Gain [dB] (over 18 GHz)
4. The symbol of "<" means "or less".
5. The symbol of ">" means "more than".
6. PK : Peak / AVE : Average

7.10 SAR Test Exclusion

7.10.1 Maximum Output Power (Average)

Band	Mode	Data Rate	Ch#	Frequency (MHz)	Average Power (dBm)	
					Measured	Spec. Max.
2.4 GHz (DTS)	802.11b	1 Mbps	1	2412	8.67	9.0
			6	2437	8.33	
			11	2462	7.84	
	802.11g	6 Mbps	1	2412	8.35	9.0
			6	2437	8.18	
			11	2462	7.77	
	802.11n [HT20]	MCS 0	1	2412	8.57	9.0
			6	2437	8.22	
			11	2462	7.73	
	802.11n [HT40]	MCS 0	1	2412	8.46	9.0
			6	2437	8.39	
			11	2462	8.08	

Note(s):
Power measurement is required for the transmission mode configuration with the highest maximum output power specified for production units. (802.11b DSSS and 802.11g/n OFDM configurations are considered separately.)

- When the same highest maximum output power specification applies to multiple transmission modes, the largest channel bandwidth configuration with the lowest order modulation and lowest data rate is measured.
- When the same highest maximum output power is specified for multiple largest channel bandwidth configurations with the same lowest order modulation or lowest order modulation and lowest data rate, power measurement is required for all equivalent 802.11 configurations with the same maximum output power.

7.10.2 Standalone SAR Test Exclusion Considerations (KDB 447498 D01)

The 1 g SAR test exclusion thresholds for 100 MHz to 6 GHz at *test separation distances* ≤ 50 mm are determined by;
[(*max. power of channel, including tune-up tolerance, mW*) / (*min. test separation distance, mm*)] · [$\sqrt{f_{(GHz)}}$] ≤ 3.0, where

- $f_{(GHz)}$ is the RF channel transmit frequency in GHz.
- Power and distance are rounded to the nearest mW and mm before calculation.
- The result is rounded to one decimal place for comparison.
- When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied.

SAR exclusion calculations for antenna ≤ 50 mm from the user

Band	Freq. (MHz)	Max. Power		Distance (mm)	Threshold	Test Exclusion
		(dBm)	(mW)			
WLAN (DTS)	2462	9.0	8	< 5	2.5	YES

The minimum user separation distance was assumed to be 0 mm for the purpose of the SAR exclusion calculations.

Conclusion:
The device qualifies for the Standalone SAR test exclusion because the computed value is < 3.