Zacta

TEST REPORT

Report number : Z101C-14145

Issue date : January 9, 2014

The device, as described herewith, was tested pursuant to applicable test procedure and complies with the requirements of;

FCC Part15 Subpart C

The test results are traceable to the international or national standards.

Applicant	:	KYOCERA Corporation
Equipment under test (EUT)	:	Mobile Phone
Model number	:	KYV33
FCC ID	:	JOYKYV33

Date of test	:	December 3, 24, 26, 2014
Test place	:	TÜV SÜD Zacta Ltd. Yonezawa Testing Center 4149-7 Hachimanpara 5-chome Yonezawa-shi Yamagata 992-1128 Japan Phone: +81-238-28-2880 Fax: +81-238-28-2888
Test results	:	Complied

The results in this report are applicable only to the equipment tested.
This report shall not be re-produced except in full without the written approval of TÜV SÜD Zacta Ltd.
This test report must not be used by client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

Tested by : Taiki Watanabe

Tested by : Hikaru Shibata

Authorized by : Eiji Akiba
Deputy General Manager of EMC Technical Department

NVLAP LAB CODE 200306-0

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1. Summary of Test

1.1 Purpose of test

It is the original test in order to verify conformance to FCC Part 15 Subpart C.

1.2 Standards

CFR47 FCC Part 15 Subpart C

1.2.1 Test Methods

ANSI C63.4-2009

1.2.2 Deviation from standards

None

1.3 List of applied test to the EUT

Test items Section	Test items	Condition	Result
15.247(a)(2)	6dB Bandwidth	Conducted	PASS
15.247(b)(3)	Maximum Peak Output Power	Conducted	PASS
15.247(d)	Band Edge Compliance of RF Conducted Emissions	Conducted	PASS
15.247(d) 15.205 15.209	Spurious Emissions	Conducted Radiated	PASS
15.247(d) 15.205 15.209	Restricted Bands of Operation	Radiated	PASS
15.247(e)	Transmitter Power Spectral Density	Conducted	PASS
15.207	AC Power Line Conducted Emissions	Conducted	PASS

1.3.1 Test set up

Table-Top

1.4 Modification to the EUT by laboratory

None

2. Equipment Under Test

2.1 General Description of equipment

EUT is the Mobile Phone.

2.2 EUT information

Applicant	:	KYOCERA Corporation Yokohama Office 2-1-1 Kagahara, Tsuzuki-ku, Yokohama-shi, Kanagawa, Japan Phone: +81-45-943-6253 Fax: +81-45-943-6314
Equipment under test	:	Mobile Phone
Trade name	:	Kyocera
Model number	:	KYV33
Serial number	:	N/A
EUT condition	:	Pre-Production
Power ratings	:	Battery: DC 3.8V
Size	:	(W) 68.0 × (D) 8.9 × (H) 131.0 mm
Environment	:	Indoor and Outdoor use
Terminal limitation	:	-20˚C to 60˚C
RF Specification		
Protocol	:	IEEE802.11b, IEEE802.11g, IEEE802.11n (HT20)
Frequency range	:	2412MHz-2462MHz
Number of RF Channels	:	11 Channels
Modulation type	:	IEEE802.11b: DSSS (DBPSK, DQPSK, CCK) IEEE802.11g / n (HT20): OFDM (BPSK, QPSK, 16QAM, 64QAM)
Data rate	:	IEEE802.11b: 1, 2, 5.5, 11Mbps IEEE802.11g: 6, 9, 12, 18, 24, 36, 48, 54Mbps IEEE802.11n (HT20 LGI): 6.5, 13, 19.5, 26, 39, 52, 58.5, 65Mbps IEEE802.11n (HT20 SGI): 7.2, 14.4, 21.7, 28.9, 43.3, 57.8, 65, 72.2Mbps
Channel separation	:	5MHz
Output power	:	59.293mW (IEEE802.11b) 27.479mW (IEEE802.11g) 29.785mW (IEEE802.11n: HT20)
Antenna type	:	Internal antenna
Antenna gain	:	-0.2dBi

2.3 Variation of the family model(s)

Not applicable

2.4 Operating channels and frequencies

Channel	Frequency [MHz]
1	2412
2	2417
3	2422
4	2427
5	2432
6	2437
7	2442
8	2447
9	2452
10	2457
11	2462

2.5 Operating mode

The EUT had been tested under operating condition.
There are three channels have been tested as following:

Tested Channel	Frequency [MHz]
Low	2412
Middle	2437
High	2462

The pre-test has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates.

Tested Channel	Modulation Type	Data Rate
Low, Middle, High	IEEE802.11b: DSSS	1Mbps
Low, Middle, High	IEEE802.11g: OFDM	6Mbps
Low, Middle, High	IEEE802.11n (HT20 LGI): OFDM	MCS0 (6.5Mbps)

The field strength of spurious emissions was measured at each position of all three axis X, Y and Z to compare the level, and the maximum noise.
The worst emission was found in Z axis and the worst case recorded.

2.6 Operating flow

[Tx mode]
i) Test program setup to the DM tool
ii) Select a Test mode
Operating frequency: Channel Low: 2412MHz, Channel Middle: 2437MHz, Channel High: 2462MHz
iii) Start test mode

[Rx mode]
i) Test program setup to the DM tool
ii) Select a Test mode
Operating frequency: Channel Low: 2412MHz, Channel Middle: 2437MHz, Channel High: 2462MHz
iii) Start test mode

3. Configuration of equipment

3.1 Equipment(s) used

No.	Equipment	Company	Model No.	Serial No.	FCC ID / DoC	Comment
1	Mobile Phone	KYOCERA	KYV33	N/A	JOYKYV33	EUT
2	AC Adapter	au	N/A	N/A	N/A	*

*: AC power line Conducted Emission Test.

3.2 Cable(s) used

No.	Cable	Length[m]	Shield	Connector	Comment
a	Micro USB cable(for AC Adapter)	1.1	Yes	Metal	*

*: AC power line Conducted Emission Test.

3.3 System configuration

: Un-detachable cable

Note1: Numbers assigned to equipment or cables on this diagram correspond to the list in “3.1 Equipment(s) used” and “3.2 Cable(s) used”.

4. 6dB Bandwidth

4.1 Measurement procedure
[FCC 15.247(a)(2), KDB558074]

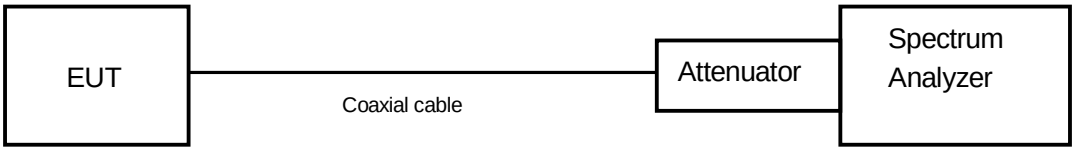
The bandwidth at 6dB down from the highest inband spectral density is measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate center frequency.

The spectrum analyzer is set to;
- RBW=100kHz, VBW=300kHz, Span=30MHz, Sweep=auto, Detector=Peak, Trace mode=Max hold

The EUT was set to operate with following conditions.
- Channel Low: 2412MHz, Channel Middle: 2437MHz, Channel High: 2462MHz

The test mode of EUT is as follows.
- Tx mode

- Test configuration



4.2 Limit

The minimum permissible 6dB bandwidth is 500kHz.

4.3 Measurement result

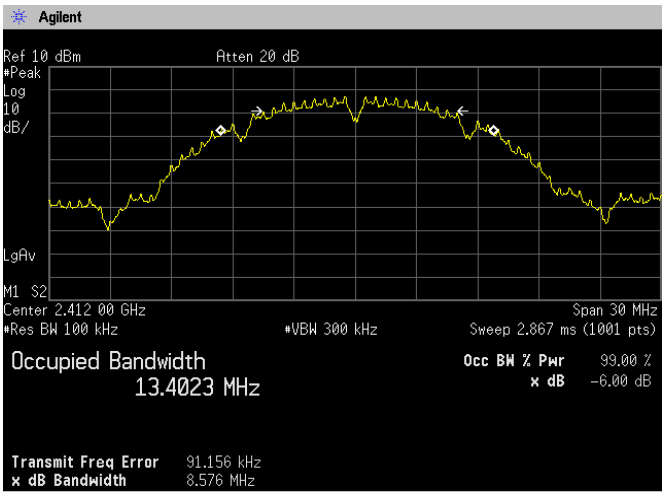
Date : December 26, 2014
Temperature : 23.0 [˚C]
Humidity : 27.6 [%]
Test place : Shielded room No.4

Test engineer : Hikaru Shibata

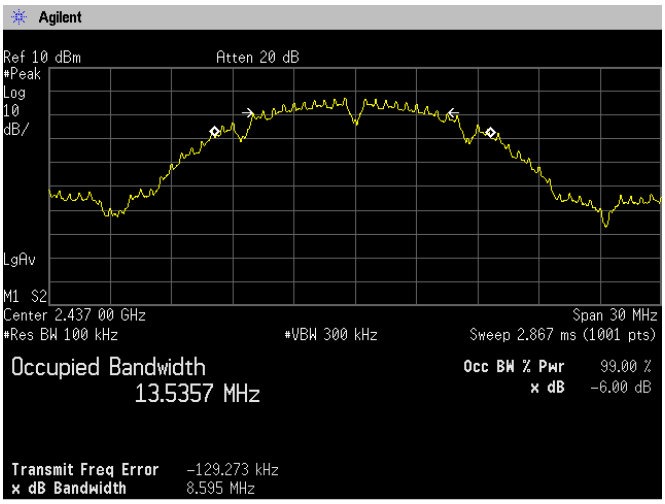
Channel	Frequency [MHz]	6dB bandwidth [MHz]		
		IEEE802.11b	IEEE802.11g	IEEE802.11n (HT20)
Low	2412	8.576	16.407	17.614
Middle	2437	8.595	16.386	17.342
High	2462	8.584	16.392	17.606

4.4 Trace data
[IEEE802.11b]

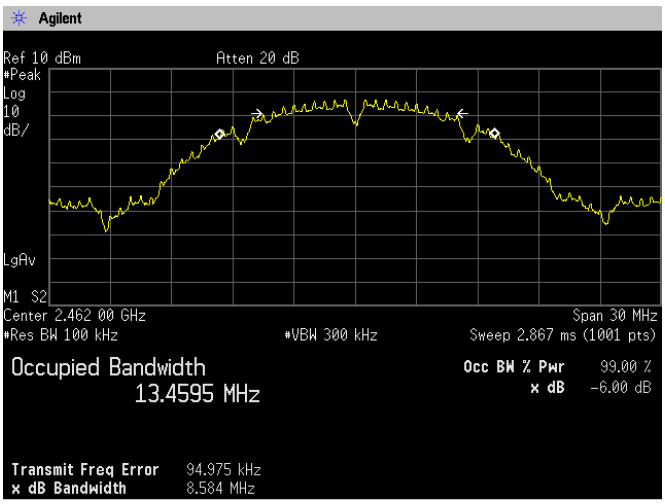
Channel Low



Channel Middle

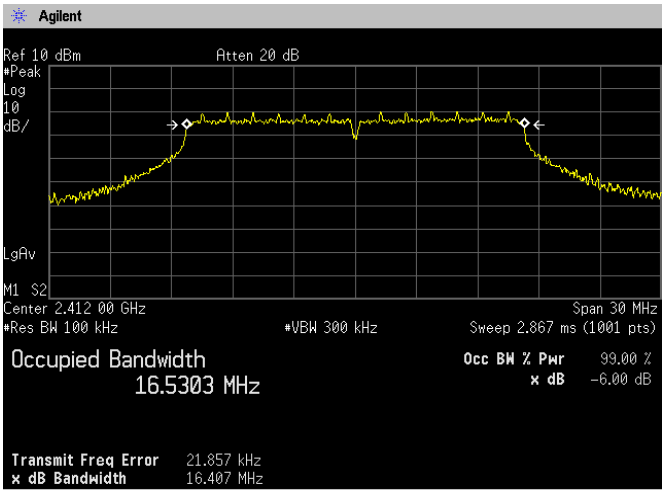


Channel High

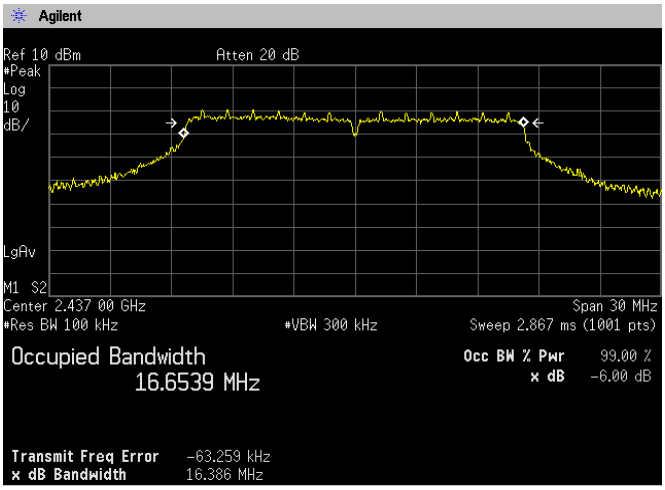


[IEEE802.11g]

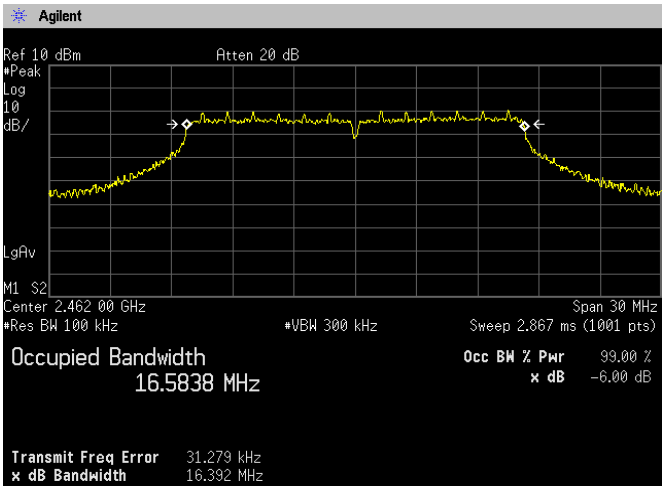
Channel Low



Channel Middle

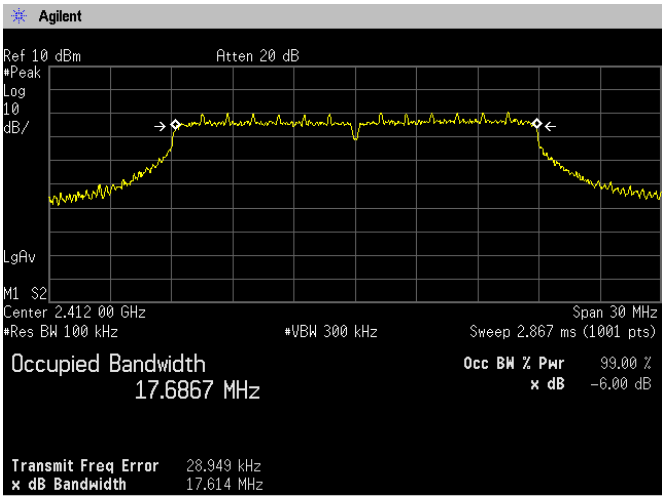


Channel High

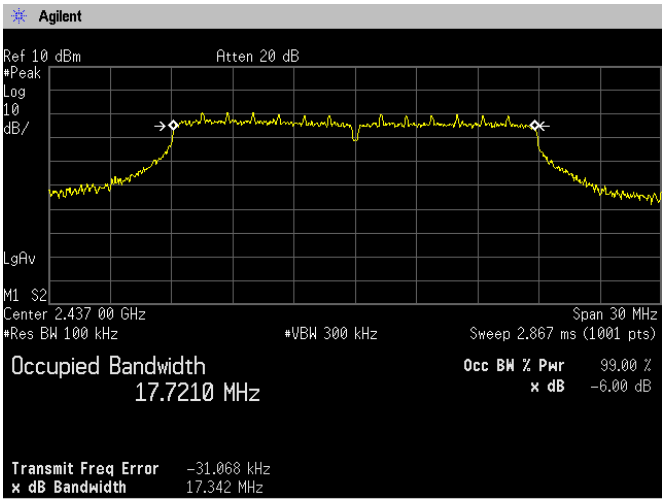


[IEEE802.11n (HT20)]

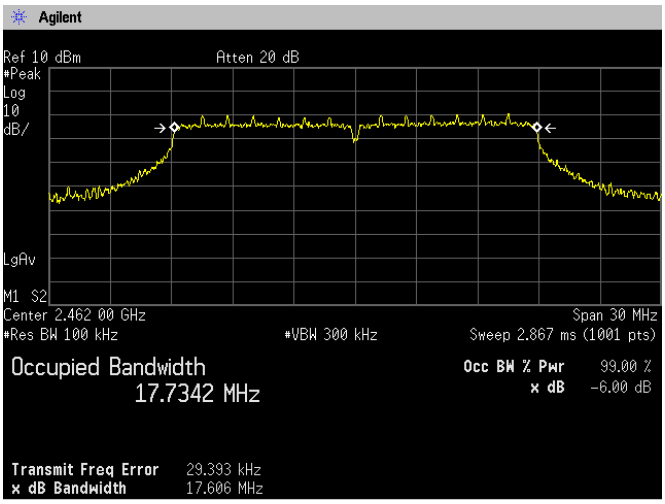
Channel Low



Channel Middle



Channel High



5. Maximum Peak Output Power

5.1 Measurement procedure
[FCC 15.247(b)(3), KDB558074]

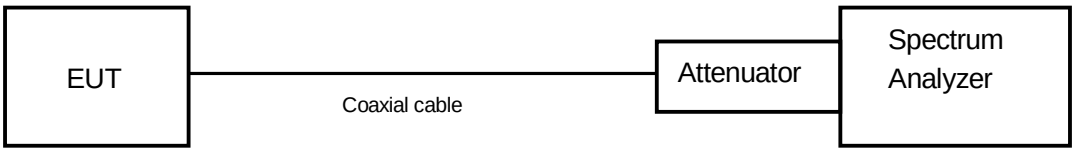
The peak power is measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate center frequency.

The spectrum analyzer is set to;
- RBW=1MHz, VBW=8MHz, Span=20MHz, Sweep=auto, Detector=Peak, Trace mode=Max hold

The EUT was set to operate with following conditions.
- Channel Low: 2412MHz, Channel Middle: 2437MHz, Channel High: 2462MHz

The test mode of EUT is as follows.
- Tx mode

- Test configuration



5.2 Limit

1W (1000mW) or less

5.3 Measurement result

Date	:	December 26, 2014		
Temperature	:	23.0 [˚C]		
Humidity	:	27.6 [%]	Test engineer	:
Test place	:	Shielded room No.4		Hikaru Shibata

[IEEE802.11b]
Battery Full

Channel	Center Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Peak Output Power (mW)	Limit (mW)	Result
Low	2412.00	7.11	10.62	17.73	59.293	≦1000	PASS
Middle	2437.00	7.12	10.62	17.74	59.429	≦1000	PASS
High	2462.00	6.97	10.62	17.59	57.412	≦1000	PASS

[IEEE802.11g]
Battery Full

Channel	Center Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Peak Output Power (mW)	Limit (mW)	Result
Low	2412.00	3.74	10.62	14.36	27.290	≦1000	PASS
Middle	2437.00	3.77	10.62	14.39	27.479	≦1000	PASS
High	2462.00	3.60	10.62	14.22	26.424	≦1000	PASS

[IEEE802.11n (HT20)]
Battery Full

Channel	Center Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Peak Output Power (mW)	Limit (mW)	Result
Low	2412.00	4.12	10.62	14.74	29.785	≦1000	PASS
Middle	2437.00	3.96	10.62	14.58	28.708	≦1000	PASS
High	2462.00	3.90	10.62	14.52	28.314	≦1000	PASS

Calculation;

Reading (dBm) + Factor (dB) = Level (dBm)

10logP = Level (dBm)

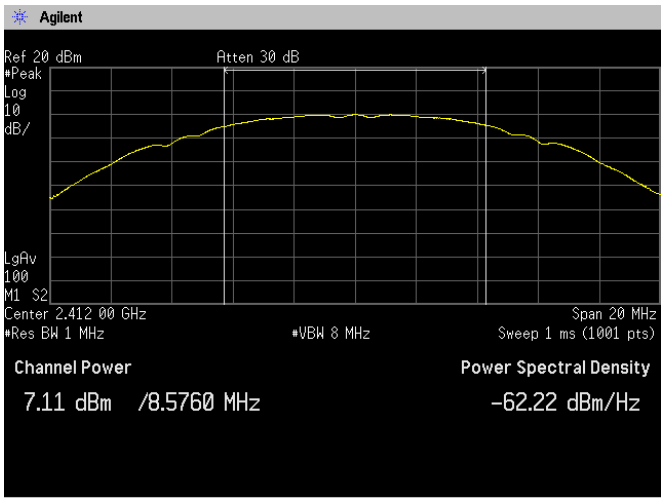
$P = 10^{(\text{Maximum Peak Output Power} / 10)}$ (mW)

5.4 Trace data

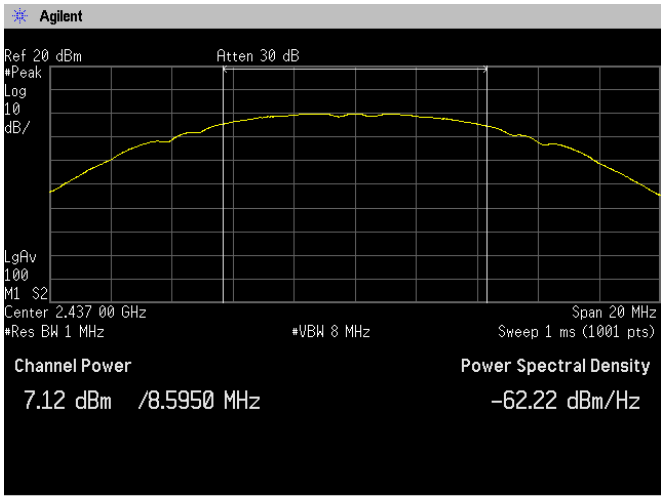
[IEEE802.11b]

[Battery Full]

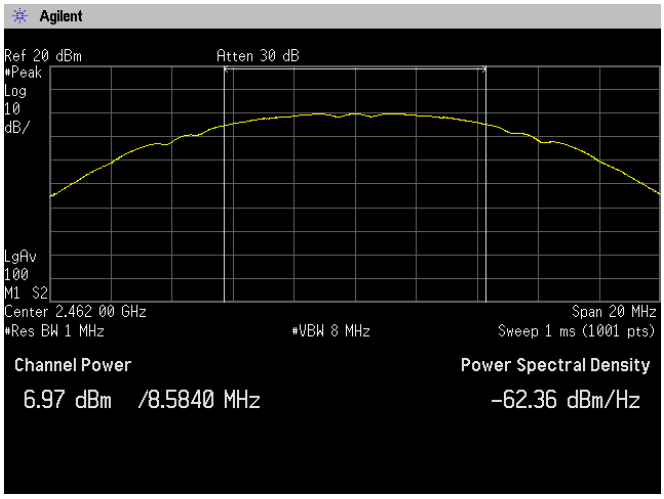
Channel Low



Channel Middle



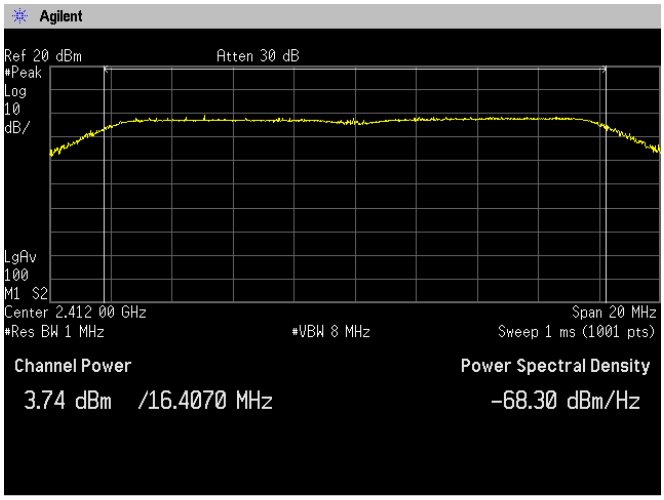
Channel High



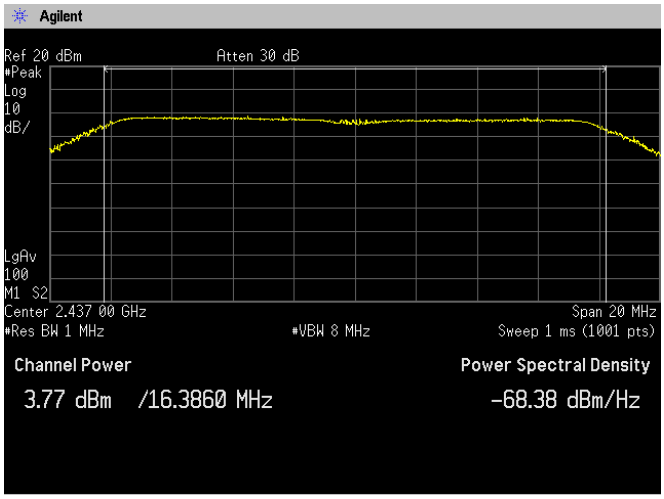
[IEEE802.11g]

[Battery Full]

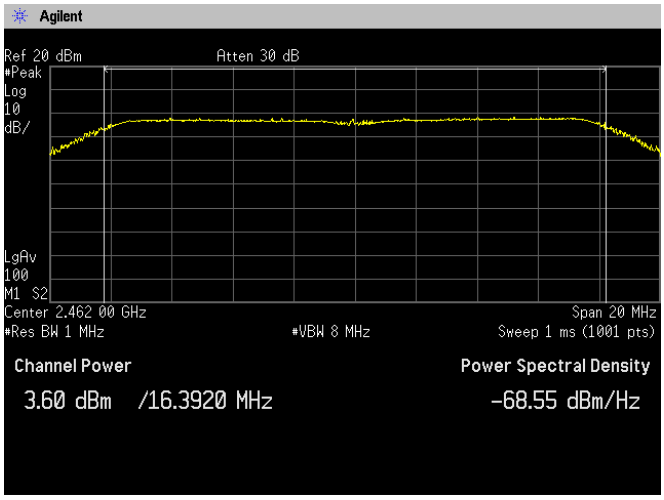
Channel Low



Channel Middle



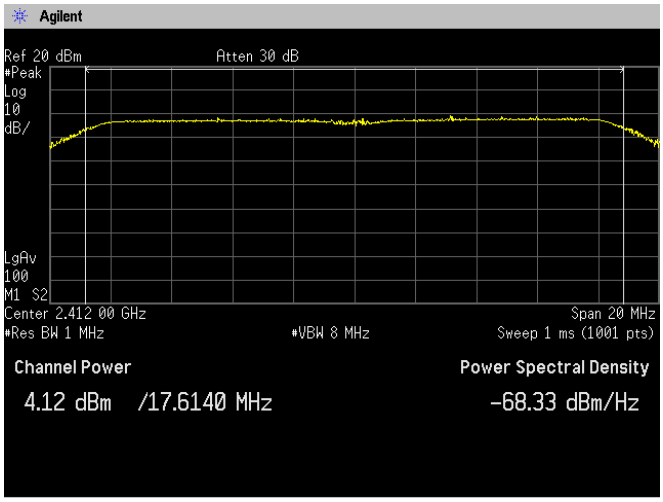
Channel High



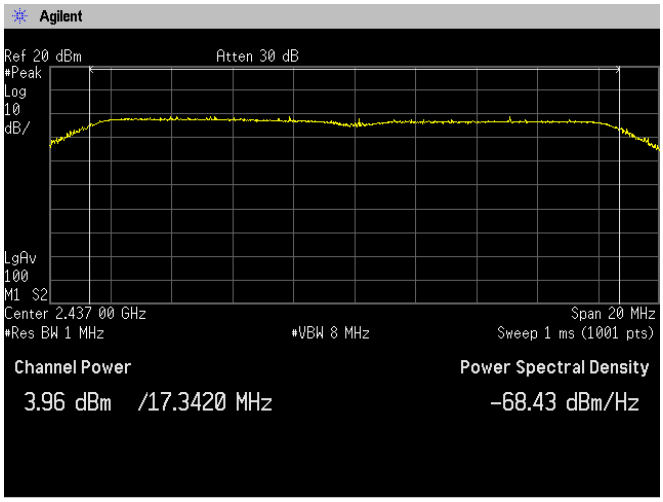
[IEEE802.11n(HT20)]

[Battery Full]

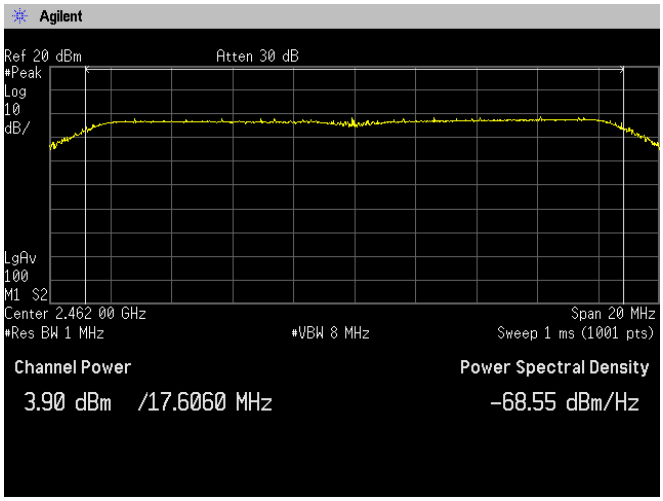
Channel Low



Channel Middle



Channel High



6. Band Edge Compliance of RF Conducted Emissions

6.1 Measurement procedure
[FCC 15.247(d), KDB558074]

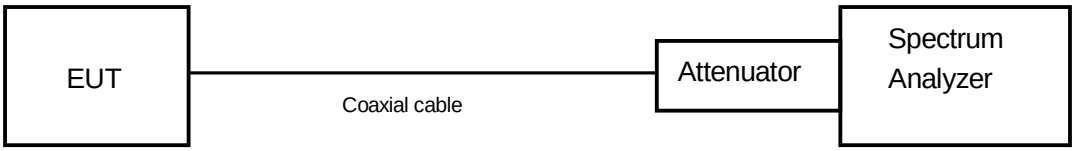
The Band Edge is measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate center frequency.

The spectrum analyzer is set to;
- RBW=100kHz, VBW=100kHz, Span=Arbitrary setting, Sweep=auto, Detector=Peak, Trace mode=Max hold

The EUT was set to operate with following conditions.
- Channel Low: 2412MHz, Channel High: 2462MHz

The test mode of EUT is as follows.
- Tx mode

- Test configuration



6.2 Limit

In any 100kHz bandwidth outside the frequency band the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power.

6.3 Measurement result

Date : December 26, 2014
Temperature : 23.0 [˚C]
Humidity : 27.6 [%]
Test place : Shielded room No.4

Test engineer : Hikaru Shibata

[IEEE802.11b]

Channel	Frequency (MHz)	RF Power Level (dBm)	Band-edge Frequency (MHz)	Band-edge Level (dBm)	Difference Level (dBm)	Limit (dBm)	Result
Low	2412.00	-2.93	2390.08	-62.98	60.05	At least 20dB below from peak of RF	PASS
High	2462.00	-3.48	2483.98	-62.32	58.84	At least 20dB below from peak of RF	PASS

[IEEE802.11g]

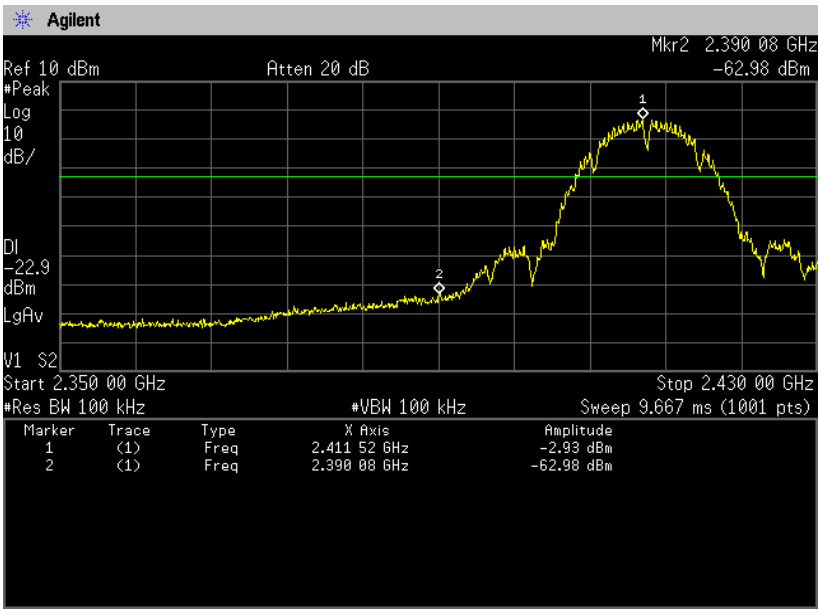
Channel	Frequency (MHz)	RF Power Level (dBm)	Band-edge Frequency (MHz)	Band-edge Level (dBm)	Difference Level (dBm)	Limit (dBm)	Result
Low	2412.00	-10.10	2390.48	-57.74	47.64	At least 20dB below from peak of RF	PASS
High	2462.00	-10.06	2483.50	-55.51	45.45	At least 20dB below from peak of RF	PASS

[IEEE802.11n (HT20)]

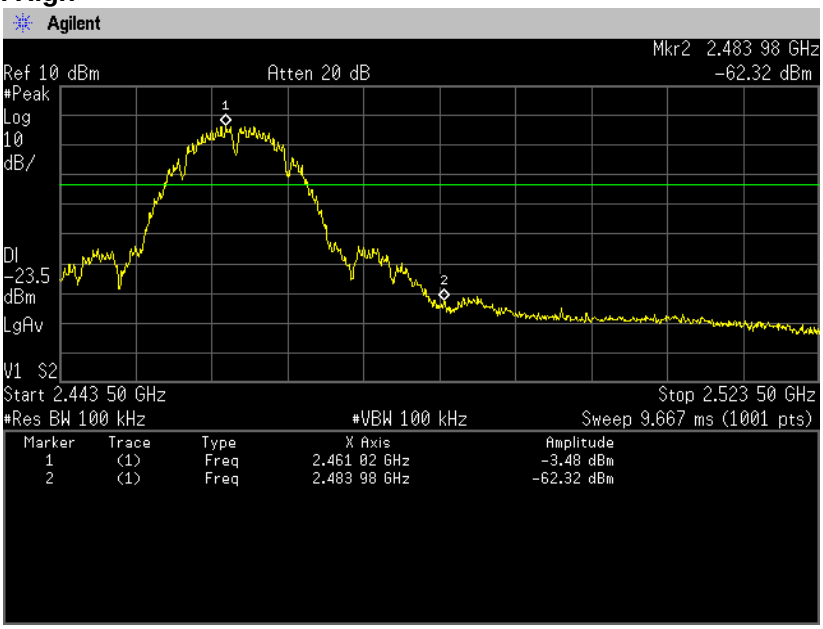
Channel	Frequency (MHz)	RF Power Level (dBm)	Band-edge Frequency (MHz)	Band-edge Level (dBm)	Difference Level (dBm)	Limit (dBm)	Result
Low	2412.00	-9.87	2390.40	-52.87	43.00	At least 20dB below from peak of RF	PASS
High	2462.00	-10.08	2483.34	-51.42	41.34	At least 20dB below from peak of RF	PASS

6.4 Trace data
[IEEE802.11b]

Channel Low

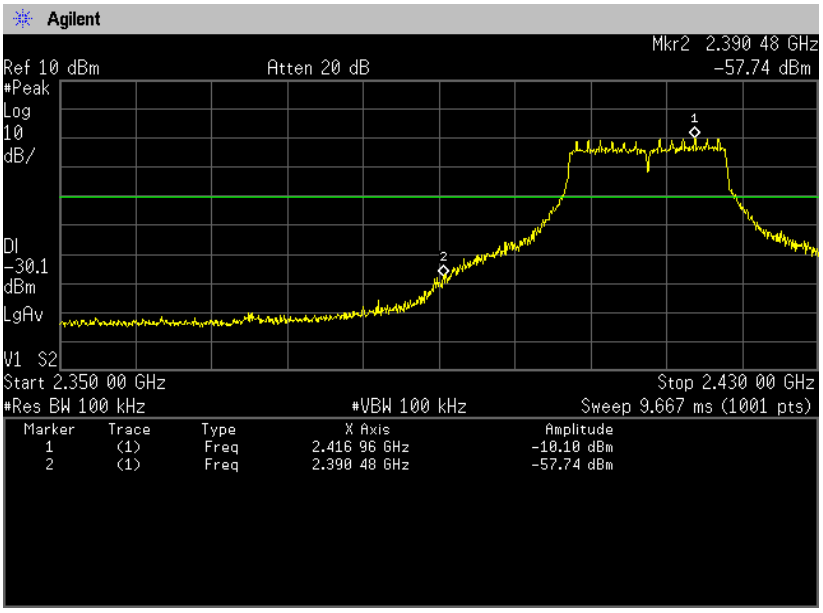


Channel High

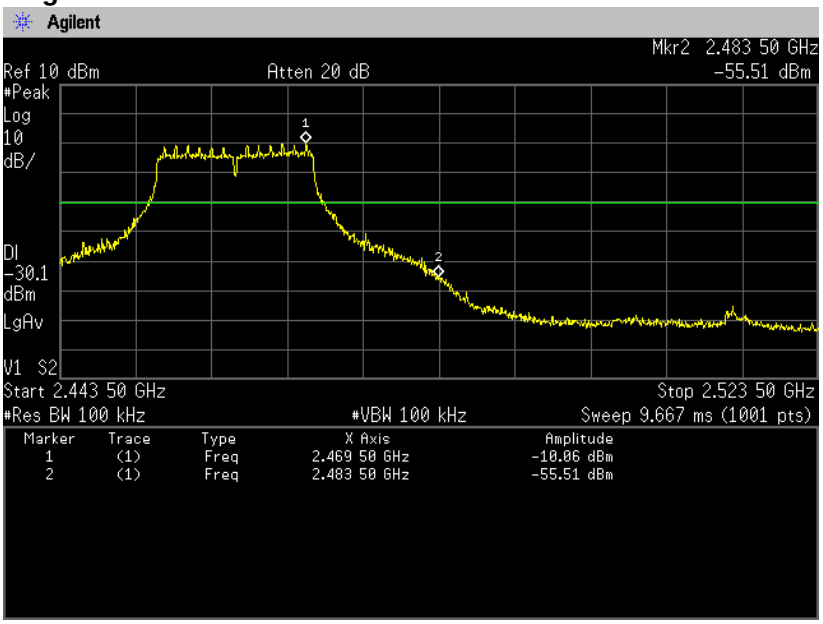


[IEEE802.11g]

Channel Low

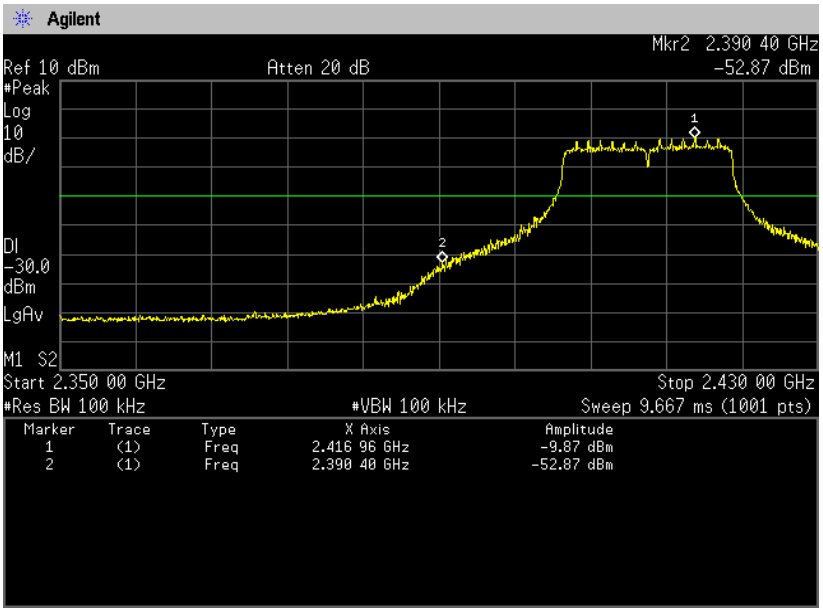


Channel High

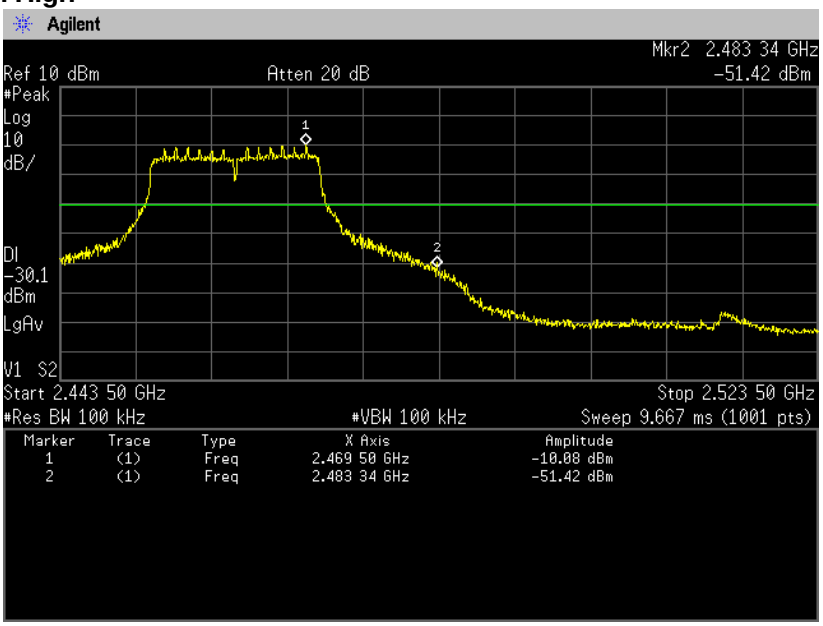


[IEEE802.11n (HT20)]

Channel Low



Channel High



7. Spurious emissions - Conducted -

7.1 Measurement procedure
[FCC 15.247(d), KDB558074]

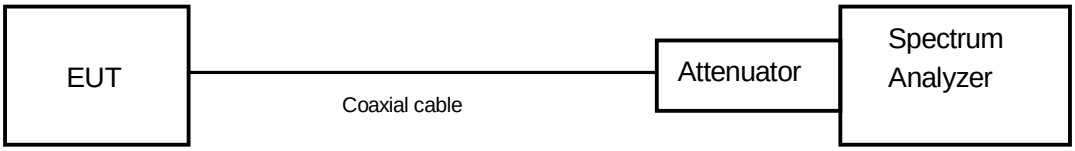
The spurious emissions (Conducted) are measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate center frequency.

The spectrum analyzer is set to;
- RBW=100kHz, VBW=300kHz, Span=Arbitrary setting, Sweep=auto, Detector=Peak, Trace mode=Max hold

The EUT was set to operate with following conditions.
- Channel Low: 2412MHz, Channel Middle: 2437MHz, Channel High: 2462MHz

The test mode of EUT is as follows.
- Tx mode

- Test configuration



7.2 Limit

In any 100kHz bandwidth outside the frequency band the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power.

7.3 Measurement result

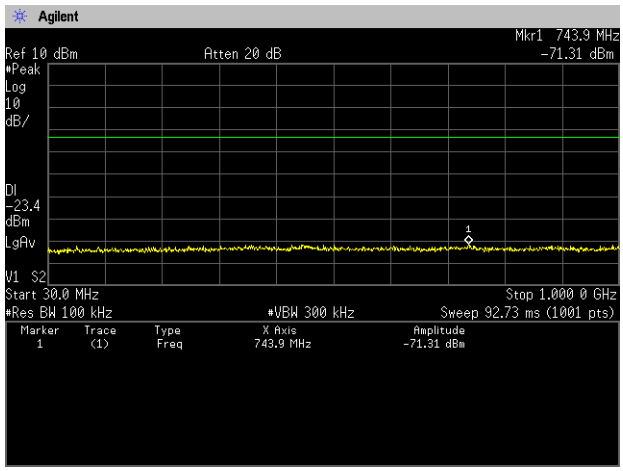
Date : December 26, 2014
Temperature : 23.0 [˚C]
Humidity : 27.6 [%]
Test place : Shielded room No.4

Tested by : Hikaru Shibata

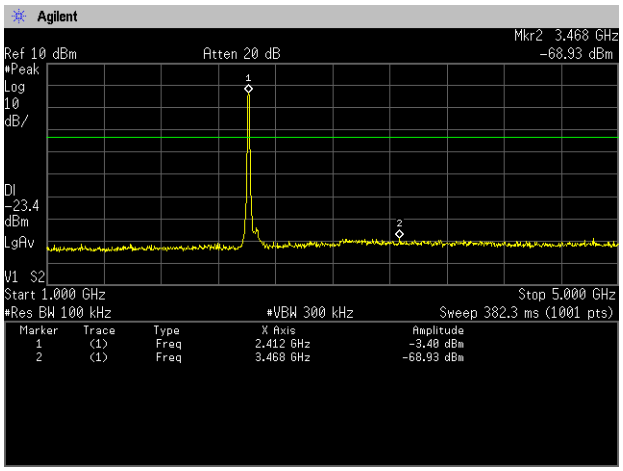
Channel	Frequency [MHz]	Limit [dB]	Results Chart	Result
Low	2412	At least 20dB below from peak of RF	See the trace Data	PASS
Middle	2437	At least 20dB below from peak of RF	See the trace Data	PASS
High	2462	At least 20dB below from peak of RF	See the trace Data	PASS

7.4 Trace data
[IEEE802.11b]
Channel Low

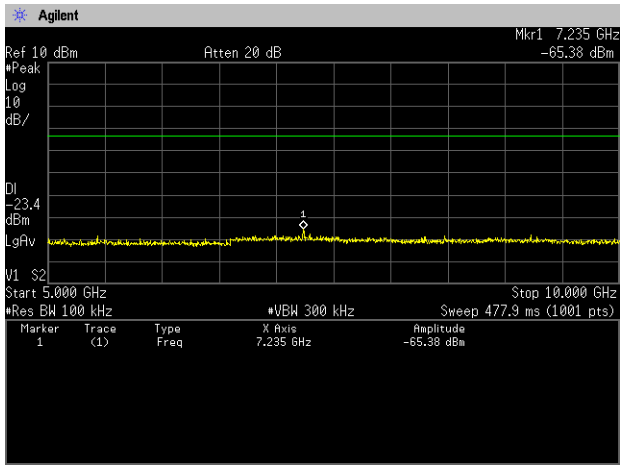
30MHz-1GHz



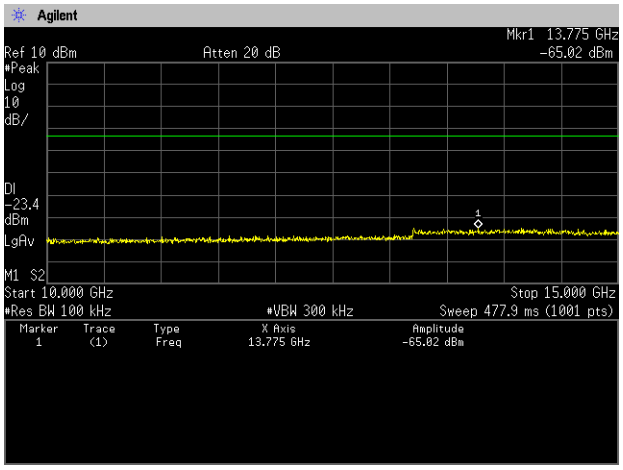
1GHz-5GHz



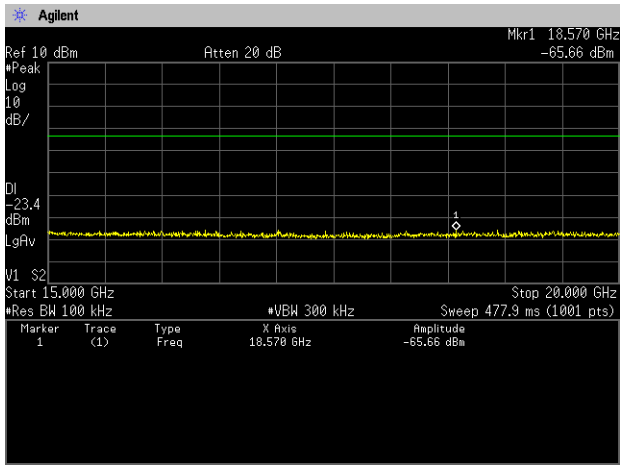
5GHz-10GHz



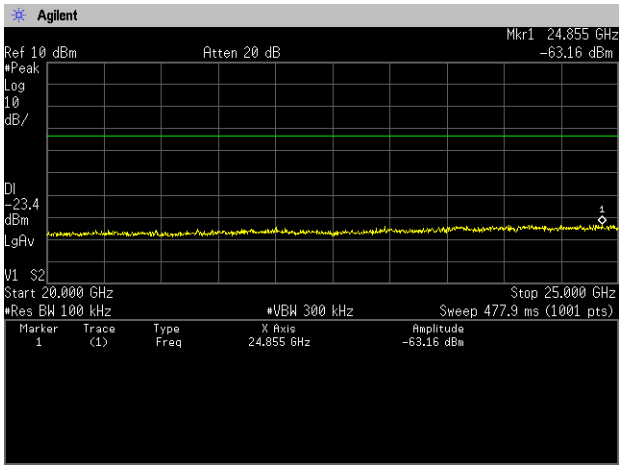
10GHz-15GHz



15GHz-20GHz

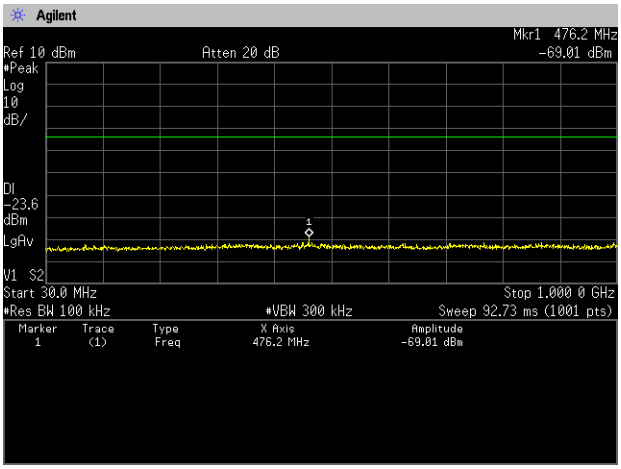


20GHz-25GHz

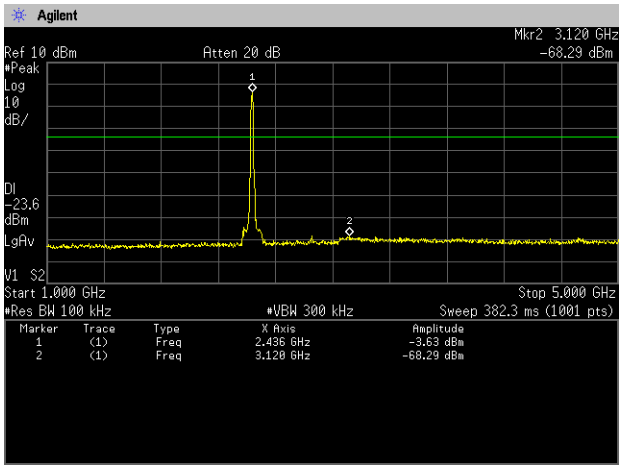


Channel Middle

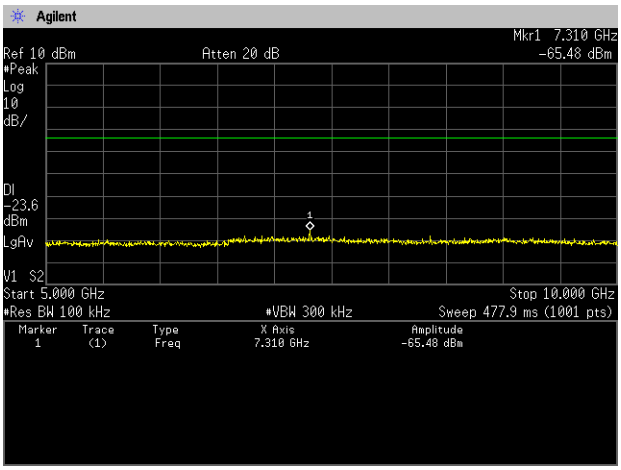
30MHz-1GHz



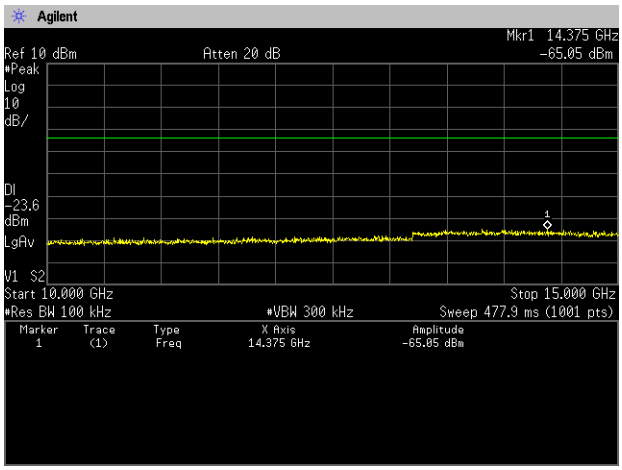
1GHz-5GHz



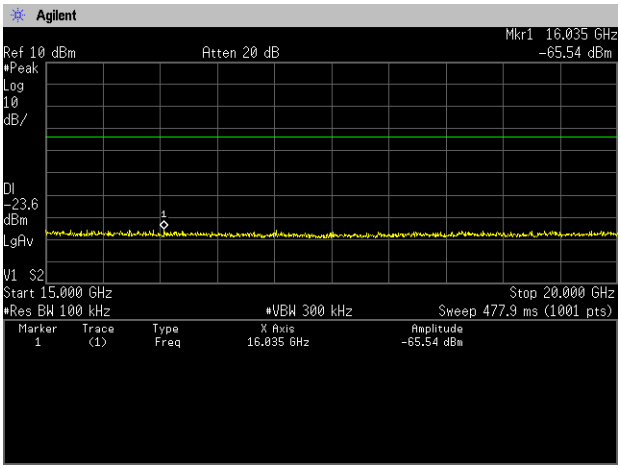
5GHz-10GHz



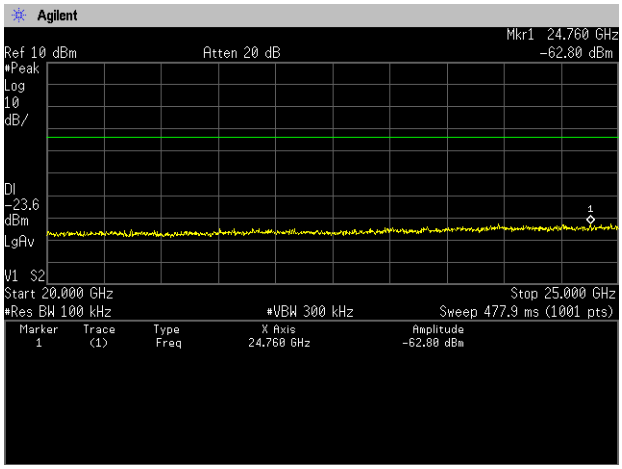
10GHz-15GHz



15GHz-20GHz

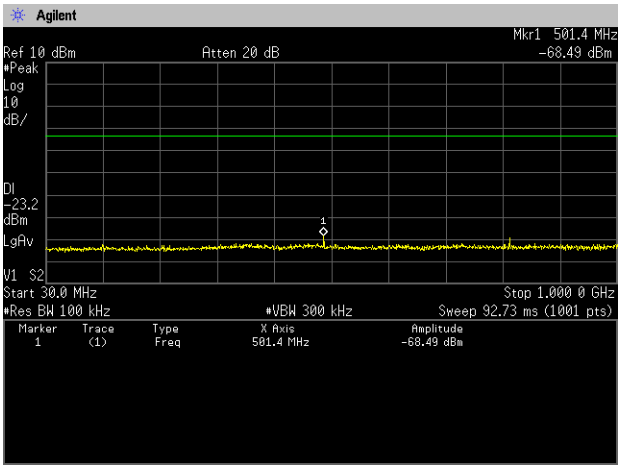


20GHz-25GHz

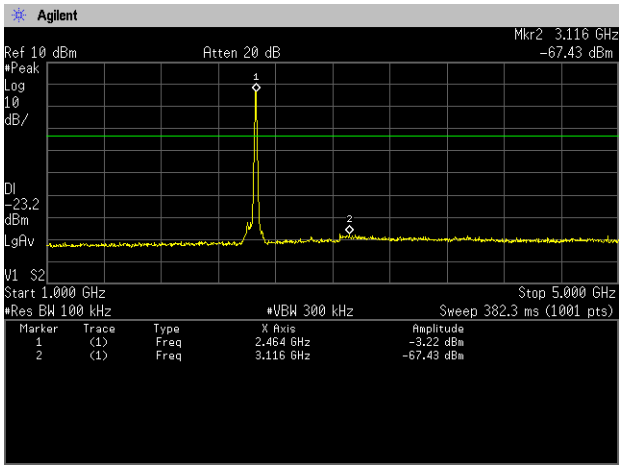


Channel High

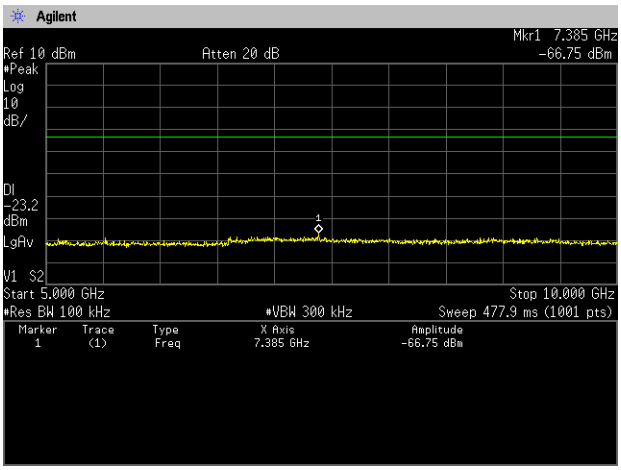
30MHz-1GHz



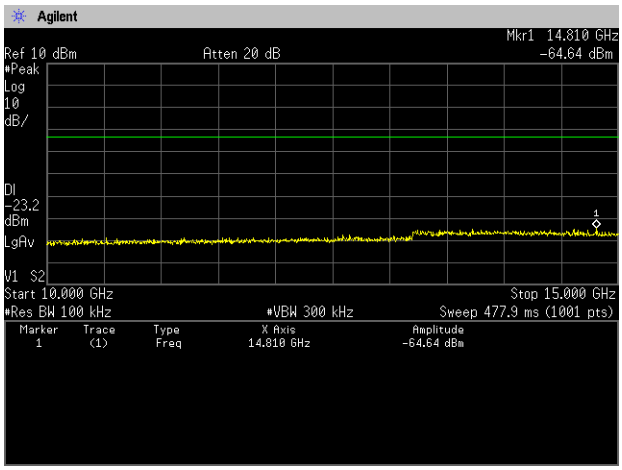
1GHz-5GHz



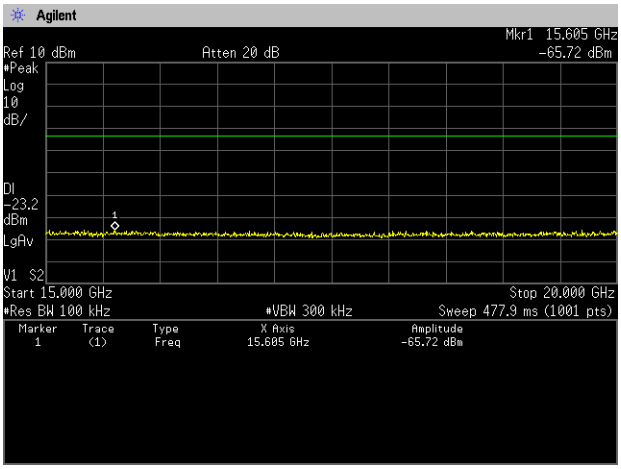
5GHz-10GHz



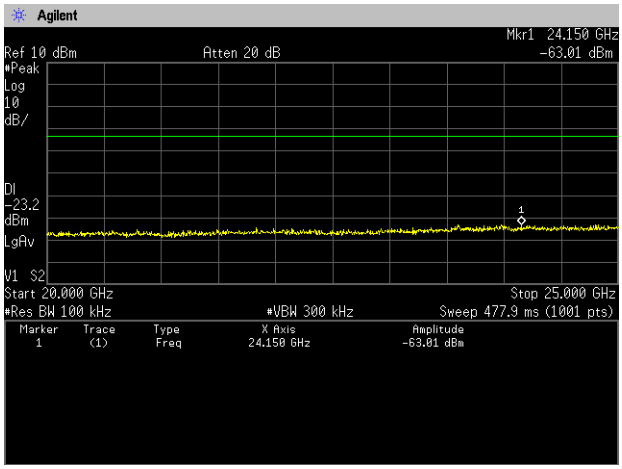
10GHz-15GHz



15GHz-20GHz



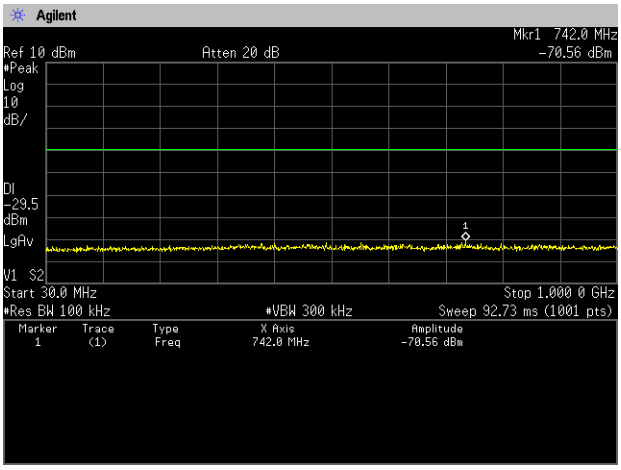
20GHz-25GHz



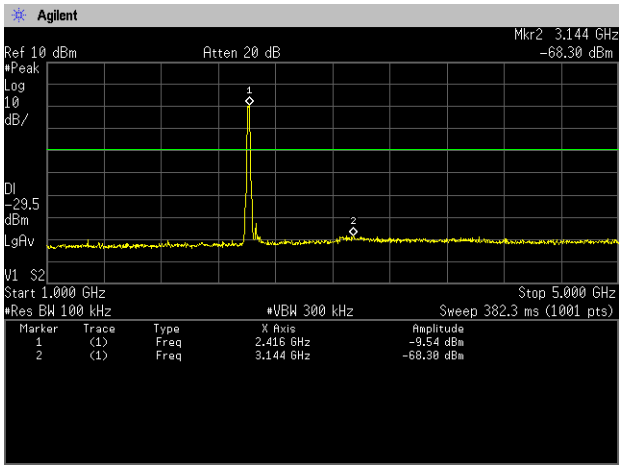
[IEEE802.11g]

Channel Low

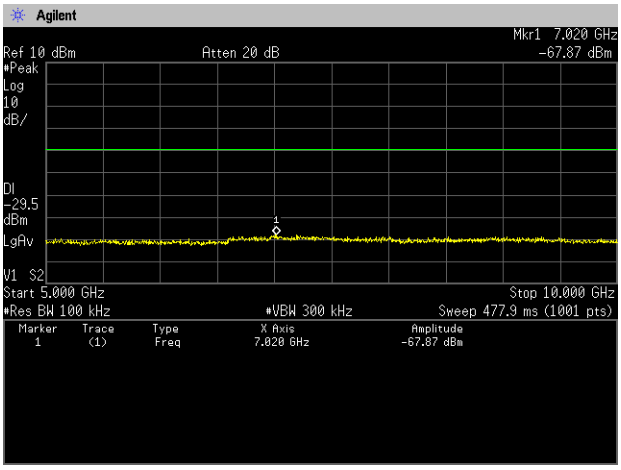
30MHz-1GHz



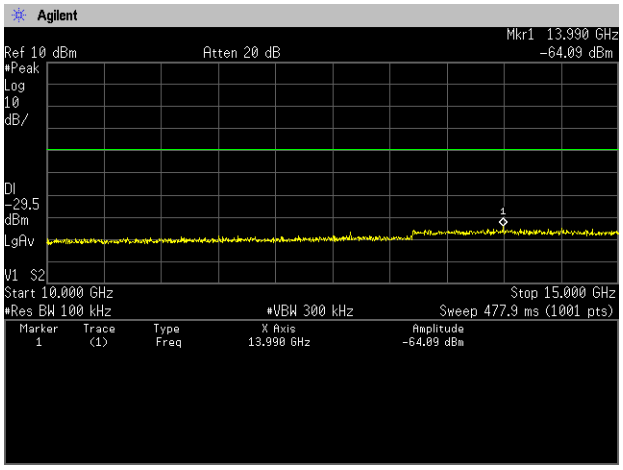
1GHz-5GHz



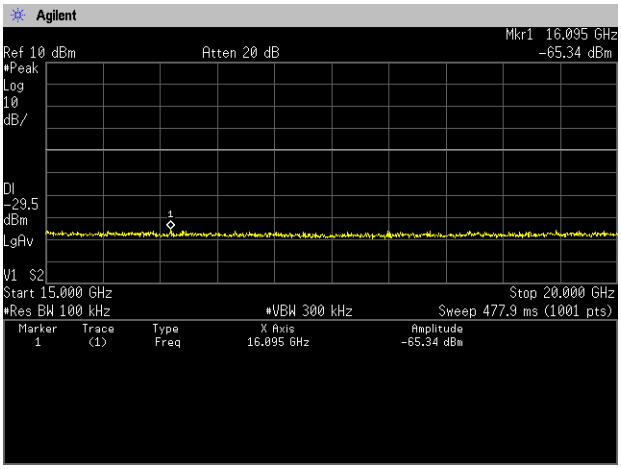
5GHz-10GHz



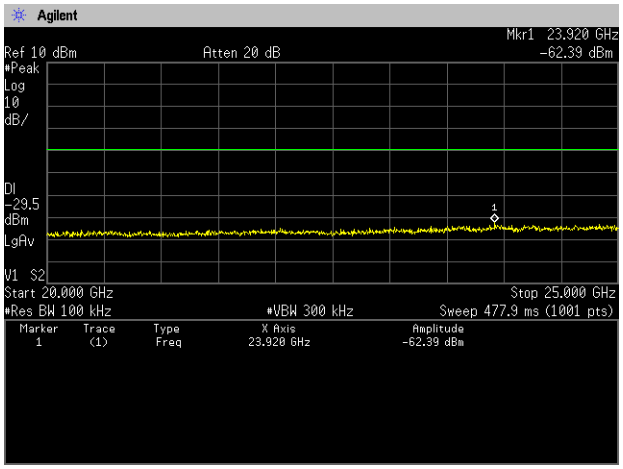
10GHz-15GHz



15GHz-20GHz

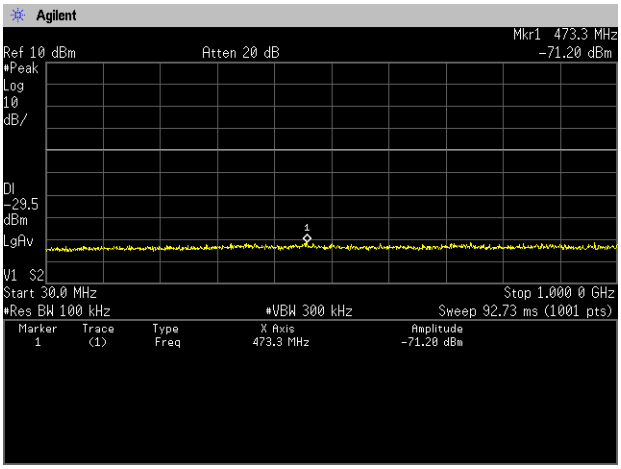


20GHz-25GHz

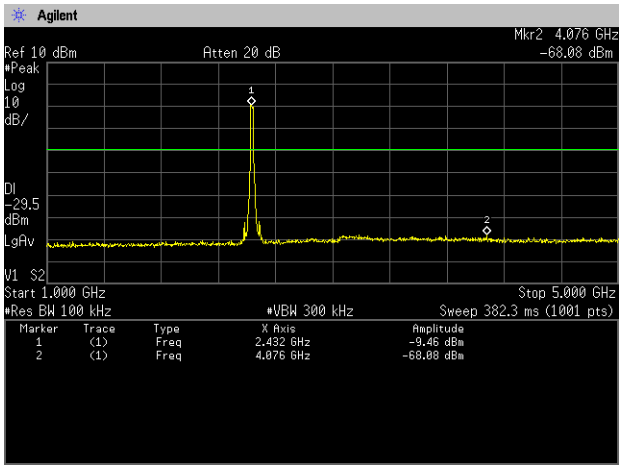


Channel Middle

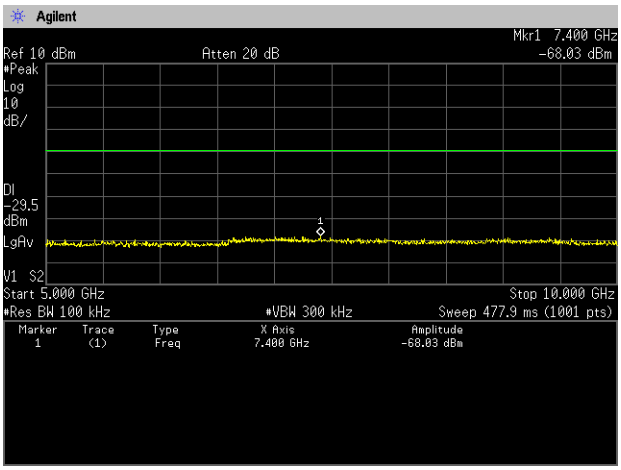
30MHz-1GHz



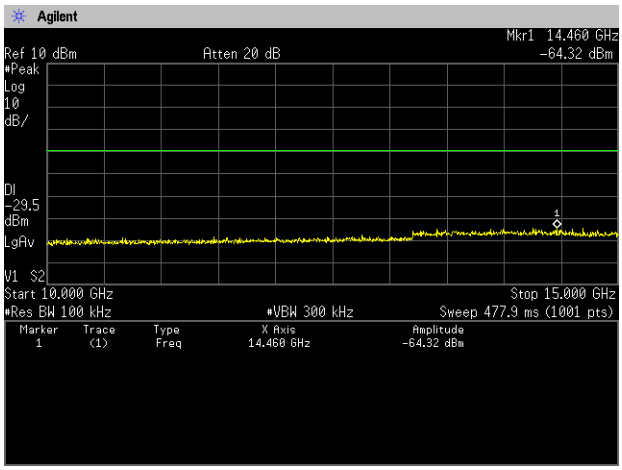
1GHz-5GHz



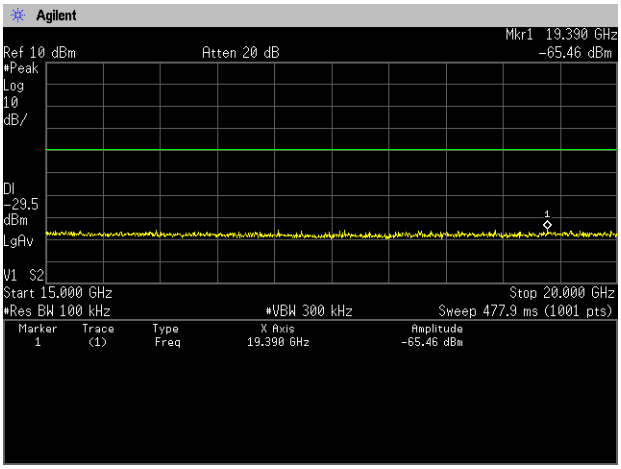
5GHz-10GHz



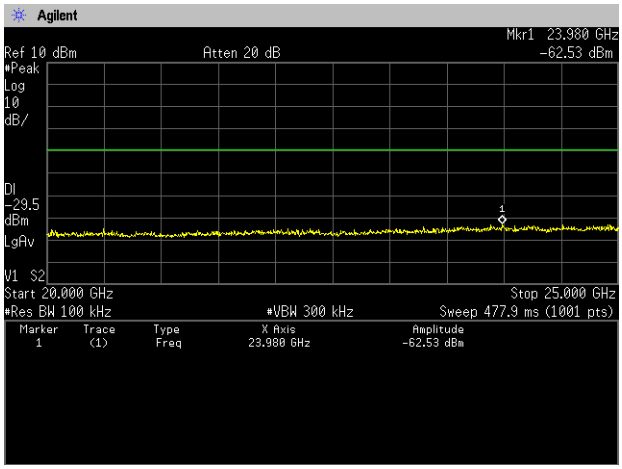
10GHz-15GHz



15GHz-20GHz

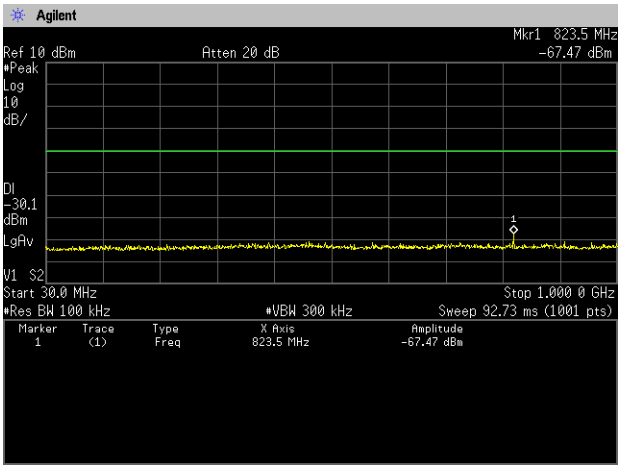


20GHz-25GHz

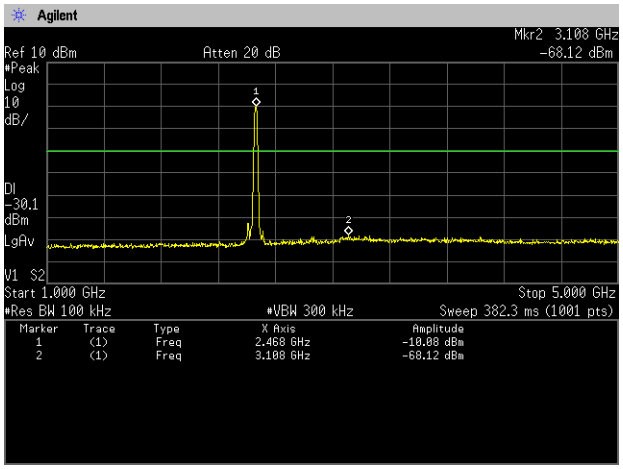


Channel High

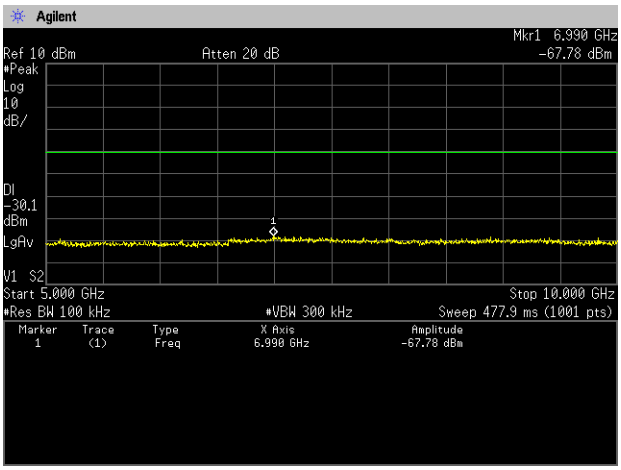
30MHz-1GHz



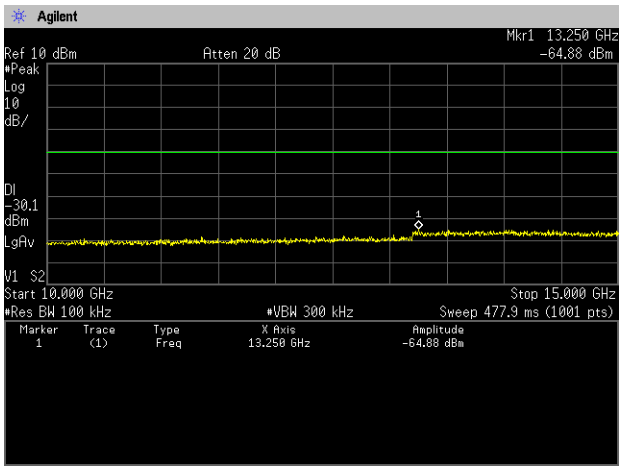
1GHz-5GHz



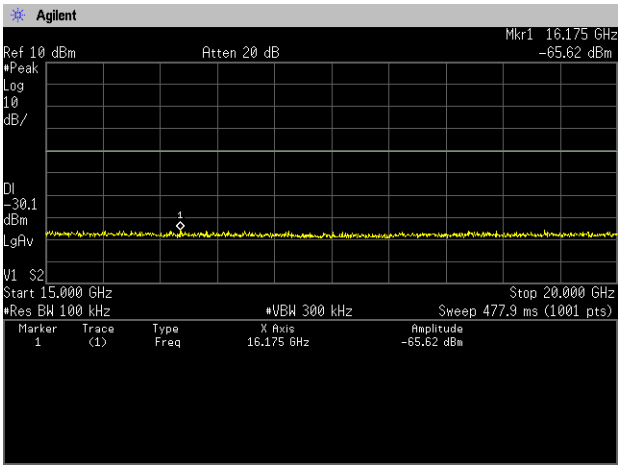
5GHz-10GHz



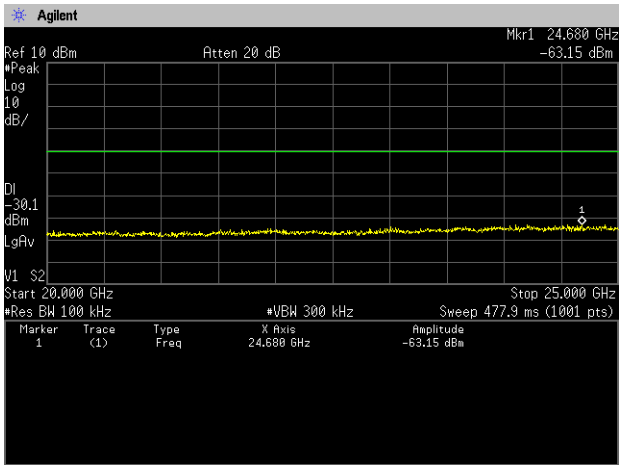
10GHz-15GHz



15GHz-20GHz



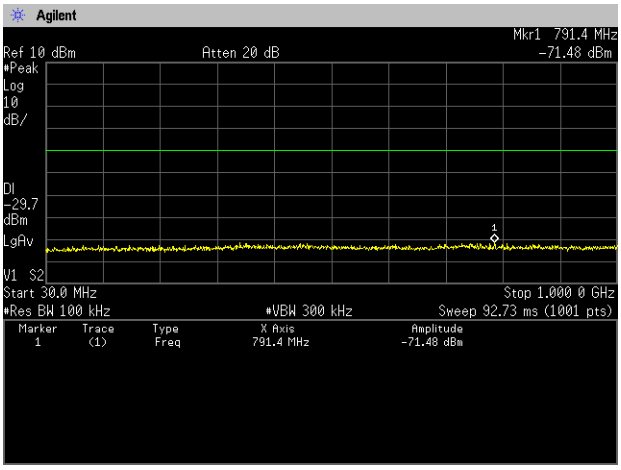
20GHz-25GHz



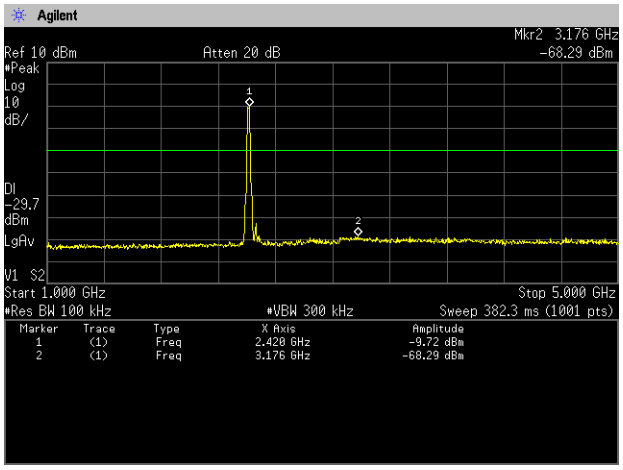
[IEEE802.11n (HT20)]

Channel Low

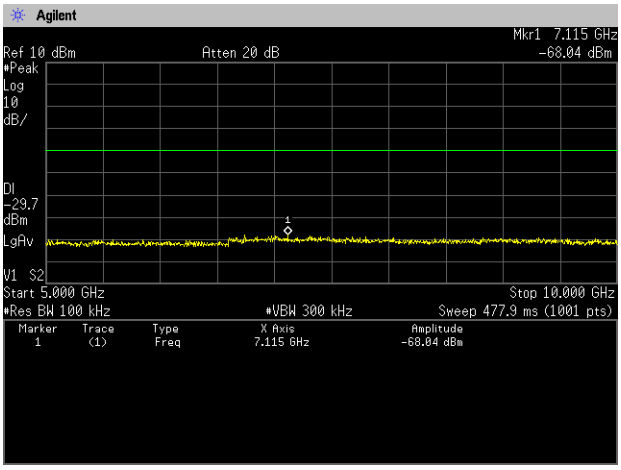
30MHz-1GHz



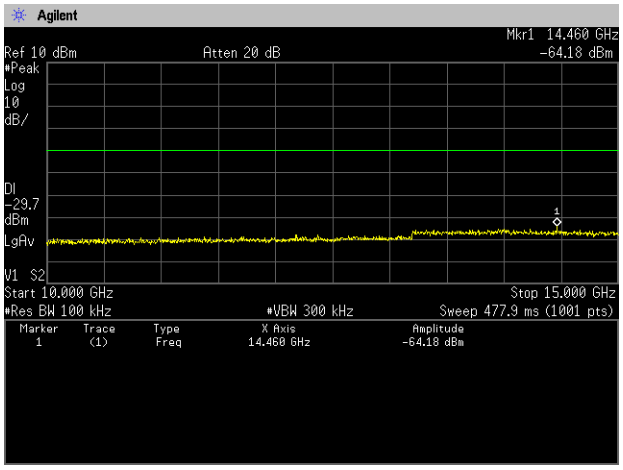
1GHz-5GHz



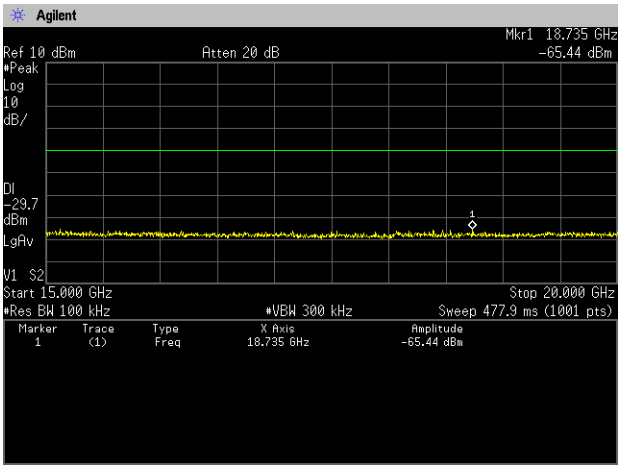
5GHz-10GHz



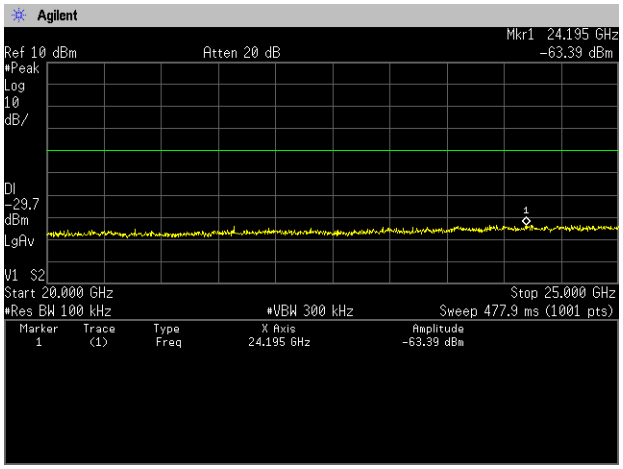
10GHz-15GHz



15GHz-20GHz

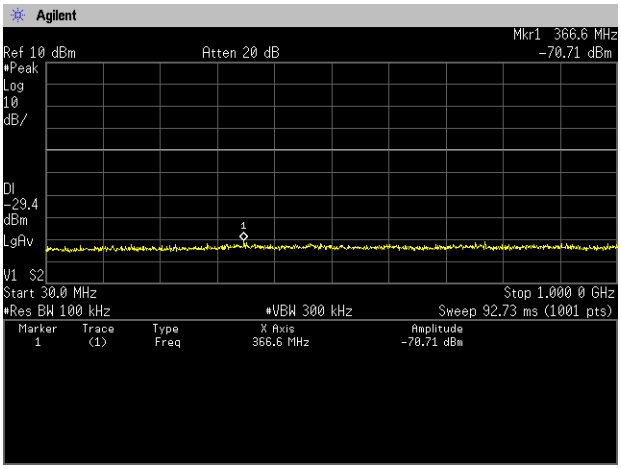


20GHz-25GHz

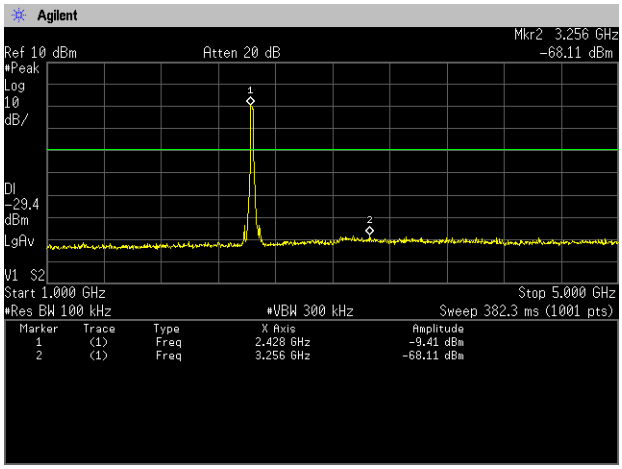


Channel Middle

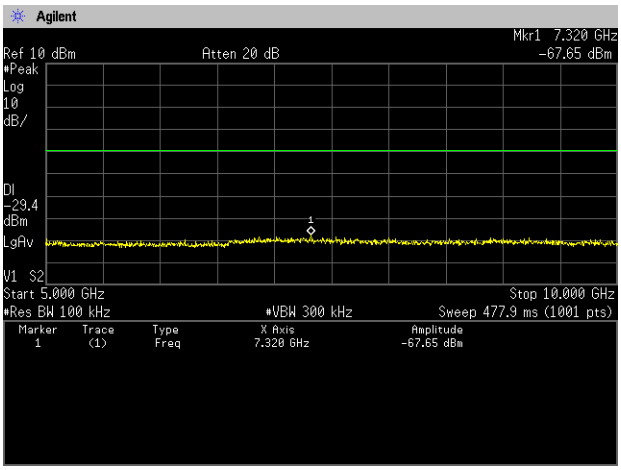
30MHz-1GHz



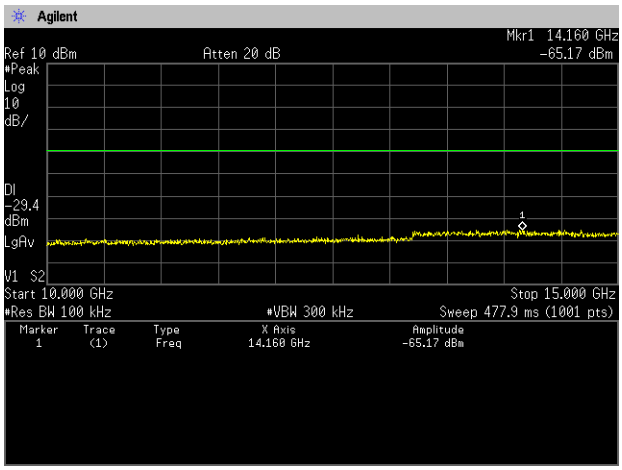
1GHz-5GHz



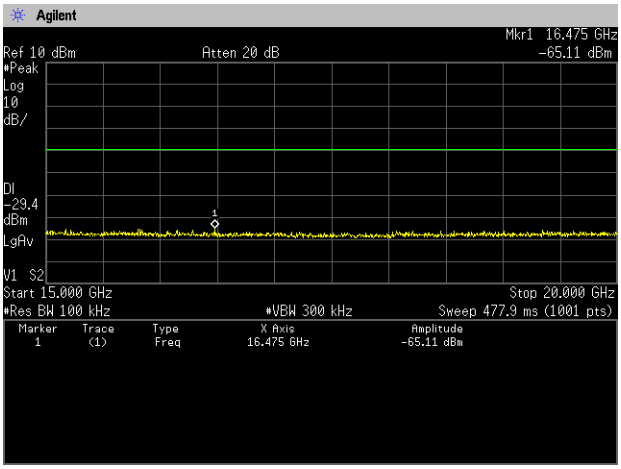
5GHz-10GHz



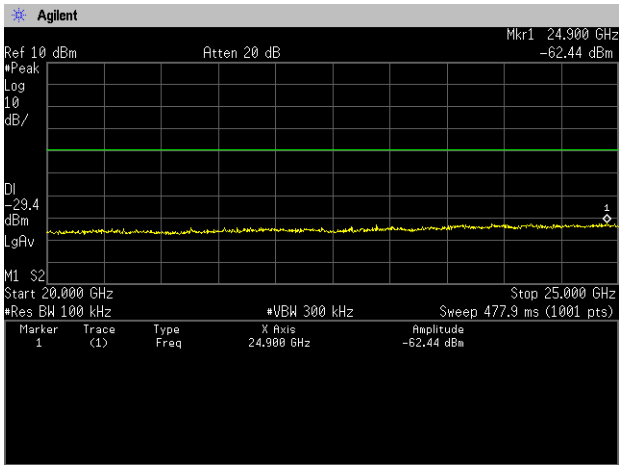
10GHz-15GHz



15GHz-20GHz

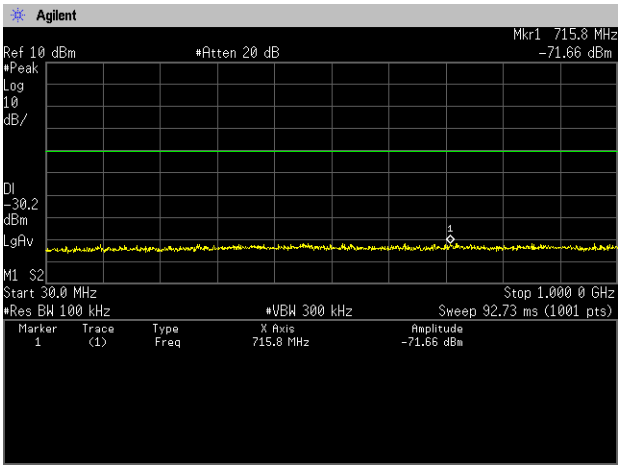


20GHz-25GHz

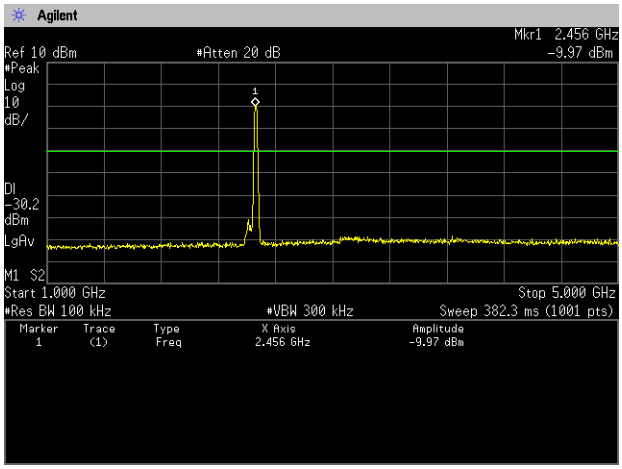


Channel High

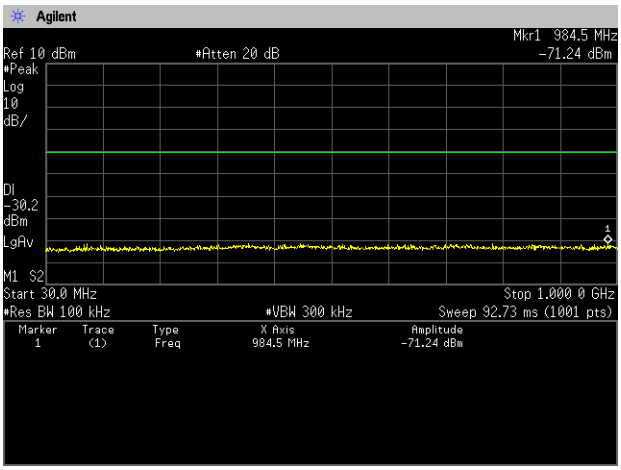
30MHz-1GHz



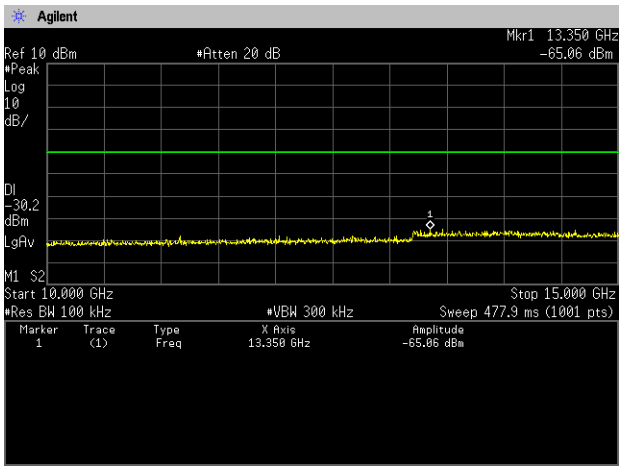
1GHz-5GHz



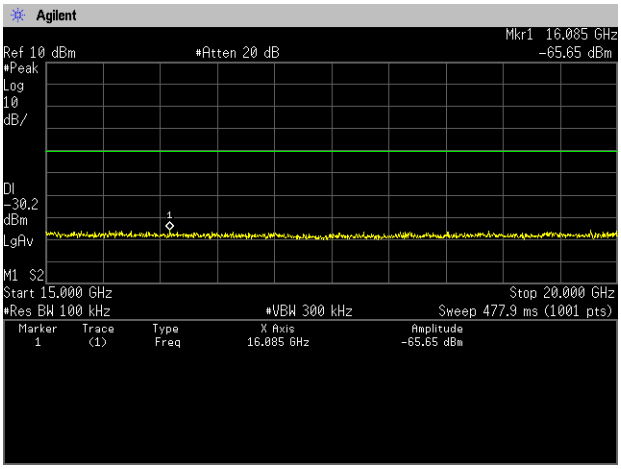
5GHz-10GHz



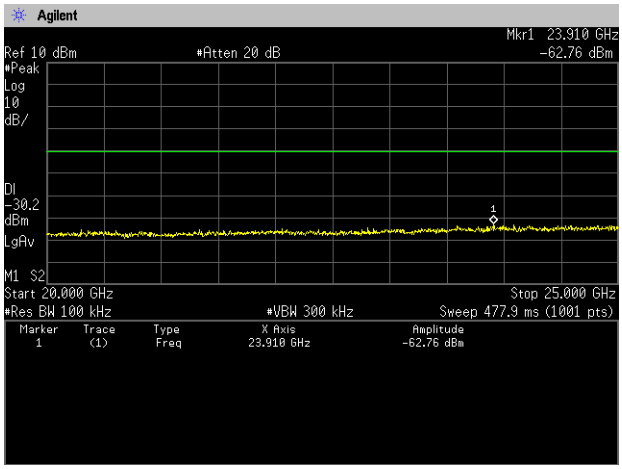
10GHz-15GHz



15GHz-20GHz



20GHz-25GHz



8. Spurious Emissions - Radiated -

8.1 Measurement procedure
[FCC 247(d), 15,205, 15.209]

Test was applied by following conditions.

Test method	:	ANSI C63.4
Frequency range	:	9kHz to 25GHz
Test place	:	3m Semi-anechoic chamber
EUT was placed on	:	FRP table / (W)2.0m × (D)1.0m × (H)0.8m
Antenna distance	:	3m
Test receiver setting		Below 1GHz
- Detector	:	Average (9kHz-90kHz, 110kHz-490kHz), Quasi-peak
- Bandwidth	:	200Hz, 120kHz
Spectrum analyzer setting		Above 1GHz
- Peak	:	RBW=1MHz, VBW=3MHz, Span=0Hz, Sweep=auto
- Average	:	RBW=1MHz, VBW=10Hz, Span=0Hz, Sweep=auto Display mode=Linear

Radiated emission measurements are performed at 3m distance with the broadband antenna (Loop antenna, TRILOG antenna and Double ridged guide antenna). The antenna is positioned both the horizontal and vertical planes of polarization and height is varied 1m to 4m and stopped at height producing the maximum emission. As for the Loop antenna, it is positioned with its plane vertical, and the center of the Loop antenna is 1m above the ground plane.
The EUT is Placed on a turntable, which is 0.8m above ground plane. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level. The test results represent the worst case emission for each emission with manipulating the EUT, support equipment, interconnecting cables and varying the mode of operation. Sufficient time for the EUT, support equipment, and test equipment are allowed in order for them to warm up to their normal operating condition.

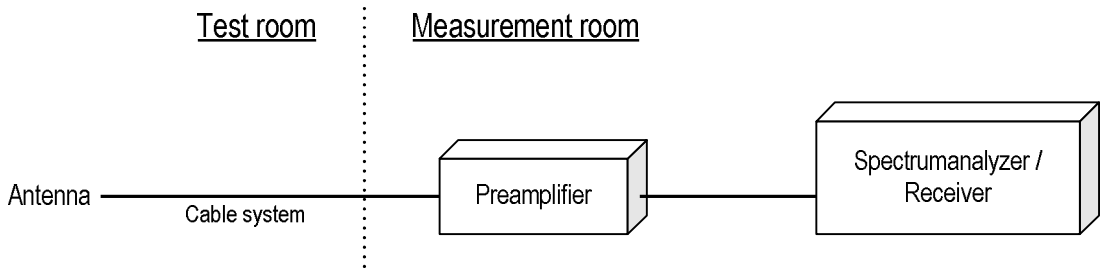
The EUT was set to operate with following conditions.

- Channel Low: 2412MHz, Channel Middle: 2437MHz, Channel High: 2462MHz

The test mode of EUT is as follows.

- Tx mode, Rx mode

- Test configuration



8.2 Calculation method

[9kHz to 150kHz]
Emission level = Reading + (Ant. factor + Cable system loss)
Margin = Limit – Emission level

[150kHz to 25GHz]
Emission level = Reading + (Ant. factor + Cable system loss – Amp. Gain)
Margin = Limit – Emission level

8.3 Limit

Frequency [MHz]	Field strength		Distance [m]
	[uV/m]	[dBuV/m]	
0.009-0.490	2400 / F [kHz]	20logE [uV/m]	300
0.490-1.705	24000 / F [kHz]	20logE [uV/m]	30
1.705-30	30	29.5	30
30-88	100	40.0	3
88-216	150	43.5	3
216-960	200	46.0	3
Above 960	500	54.0	3

Note:
1. The lower limit shall apply at the transition frequencies.
2. Emission level [dBuV/m] = 20log Emission [uV/m]
3. As shown in 15.35(b), for frequencies above 1000MHz, 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 20dB under any condition modulation.

Zacta

8.4 Test data

Date	:	December 3, 2014		
Temperature	:	15.4 [˚C]		
Humidity	:	32.1 [%]	Test engineer	:
Test place	:	3m Semi-anechoic chamber		Hikaru Shibata

[IEEE802.11b]
Channel Low

No.	Frequency [MHz]	(P)	Reading PK [dB(μV)]	Reading CAV [dB(μV)]	c.f [dB(1/m)]	Result PK [dB(μV/m)]	Result CAV [dB(μV/m)]	Limit PK [dB(μV/m)]	Limit AV [dB(μV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [°]
1	4824.000	H	42.7	35.8	11.2	53.9	47.0	74.0	54.0	20.1	7.0	100.0	0.0
2	4824.000	V	42.3	35.8	11.2	53.5	47.0	74.0	54.0	20.5	7.0	100.0	0.0

Channel Middle

No.	Frequency [MHz]	(P)	Reading PK [dB(μV)]	Reading CAV [dB(μV)]	c.f [dB(1/m)]	Result PK [dB(μV/m)]	Result CAV [dB(μV/m)]	Limit PK [dB(μV/m)]	Limit AV [dB(μV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [°]
1	4874.000	H	42.5	35.7	11.4	53.9	47.1	74.0	54.0	20.1	6.9	100.0	0.0
2	4874.000	V	43.1	35.6	11.4	54.5	47.0	74.0	54.0	19.5	7.0	100.0	0.0

Channel High

No.	Frequency [MHz]	(P)	Reading PK [dB(μV)]	Reading CAV [dB(μV)]	c.f [dB(1/m)]	Result PK [dB(μV/m)]	Result CAV [dB(μV/m)]	Limit PK [dB(μV/m)]	Limit AV [dB(μV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [°]
1	4960.000	H	42.3	35.4	11.7	54.0	47.1	74.0	54.0	20.0	6.9	100.0	0.0
2	4960.000	V	42.8	35.4	11.7	54.5	47.1	74.0	54.0	19.5	6.9	100.0	0.0

Note:
1. Emission Level (Margin) = Limit - [Reading + Factor (Antenna + Cable – Amp)]
2. No emission were detected in frequency range 9kHz to 1000MHz at the 3 meters distance.
3. No emission was detected in the receive mode.

[IEEE802.11g]
Channel Low

No.	Frequency [MHz]	(P)	Reading PK [dB(μV)]	Reading CAV [dB(μV)]	c.f [dB(1/m)]	Result PK [dB(μV/m)]	Result CAV [dB(μV/m)]	Limit PK [dB(μV/m)]	Limit AV [dB(μV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [°]
1	4824.000	H	41.9	35.6	11.2	53.1	46.8	74.0	54.0	20.9	7.2	100.0	0.0
2	4824.000	V	42.5	35.6	11.2	53.7	46.8	74.0	54.0	20.3	7.2	100.0	0.0

Channel Middle

No.	Frequency [MHz]	(P)	Reading PK [dB(μV)]	Reading CAV [dB(μV)]	c.f [dB(1/m)]	Result PK [dB(μV/m)]	Result CAV [dB(μV/m)]	Limit PK [dB(μV/m)]	Limit AV [dB(μV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [°]
1	4874.000	H	42.2	35.6	11.4	53.6	47.0	74.0	54.0	20.4	7.0	100.0	0.0
2	4874.000	V	42.4	35.5	11.4	53.8	46.9	74.0	54.0	20.2	7.1	100.0	0.0

Channel High

No.	Frequency [MHz]	(P)	Reading PK [dB(μV)]	Reading CAV [dB(μV)]	c.f [dB(1/m)]	Result PK [dB(μV/m)]	Result CAV [dB(μV/m)]	Limit PK [dB(μV/m)]	Limit AV [dB(μV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [°]
1	4924.000	H	42.3	35.5	11.6	53.9	47.1	74.0	54.0	20.1	6.9	100.0	0.0
2	4924.000	V	42.8	35.5	11.6	54.4	47.1	74.0	54.0	19.6	6.9	100.0	0.0

Note:
1. Emission Level (Margin) = Limit - [Reading + Factor (Antenna + Cable – Amp)]
2. No emission were detected in frequency range 9kHz to 1000MHz at the 3 meters distance.
3. No emission was detected in the receive mode.

[IEEE802.11n (HT20)]
Channel Low

No.	Frequency [MHz]	(P)	Reading PK [dB(μV)]	Reading CAV [dB(μV)]	c.f [dB(1/m)]	Result PK [dB(μV/m)]	Result CAV [dB(μV/m)]	Limit PK [dB(μV/m)]	Limit AV [dB(μV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [°]
1	4824.000	H	42.5	35.6	11.2	53.7	46.8	74.0	54.0	20.3	7.2	100.0	0.0
2	4824.000	V	42.5	35.6	11.2	53.7	46.8	74.0	54.0	20.3	7.2	100.0	0.0

Channel Middle

No.	Frequency [MHz]	(P)	Reading PK [dB(μV)]	Reading CAV [dB(μV)]	c.f [dB(1/m)]	Result PK [dB(μV/m)]	Result CAV [dB(μV/m)]	Limit PK [dB(μV/m)]	Limit AV [dB(μV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [°]
1	4874.000	H	42.1	35.5	11.4	53.5	46.9	74.0	54.0	20.5	7.1	100.0	0.0
2	4874.000	V	42.6	35.6	11.4	54.0	47.0	74.0	54.0	20.0	7.0	100.0	0.0

Channel High

No.	Frequency [MHz]	(P)	Reading PK [dB(μV)]	Reading CAV [dB(μV)]	c.f [dB(1/m)]	Result PK [dB(μV/m)]	Result CAV [dB(μV/m)]	Limit PK [dB(μV/m)]	Limit AV [dB(μV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [°]
1	4924.000	H	42.7	35.5	11.6	54.3	47.1	74.0	54.0	19.7	6.9	100.0	0.0
2	4924.000	V	42.5	35.5	11.6	54.1	47.1	74.0	54.0	19.9	6.9	100.0	0.0

Note:

1. Emission Level (Margin) = Limit - [Reading + Factor (Antenna + Cable – Amp)]
2. No emission were detected in frequency range 9kHz to 1000MHz at the 3 meters distance.
3. No emission was detected in the receive mode.

9. Restricted Band of Operation

9.1 Measurement procedure [FCC 247(d), 15,205, 15.209]

Test was applied by following conditions.

Test method	:	ANSI C63.4
Test place	:	3m Semi-anechoic chamber
EUT was placed on	:	FRP table / (W)2.0m × (D)1.0m × (H)0.8m
Antenna distance	:	3m

Spectrum analyzer setting

- Peak	:	RBW=1MHz, VBW=3MHz, Span=Arbitrary setting, Sweep=auto
- Average	:	RBW=1MHz, VBW=10Hz, Span=Arbitrary setting, Sweep=auto Display mode=Linear

Average Measurement Setting [VBW]

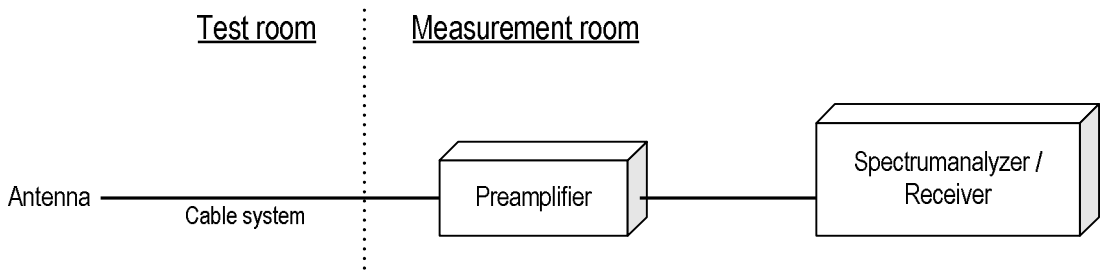
Mode	Duty Cycle (%)	T_{on} (us)	T_{off} (us)	Determined VBW Setting
IEEE802.11b	99.0	1022	10	10Hz (Duty Cycle ≧98%)
IEEE802.11g	99.4	1364	8	10Hz (Duty Cycle ≧98%)
IEEE802.11n(HT20)	99.4	1276	8	10Hz (Duty Cycle ≧98%)

Radiated emission measurements are performed at 3m distance with the broadband antenna (Double ridged guide antenna). The antenna is positioned both the horizontal and vertical planes of polarization and height is varied 1m to 4m and stopped at height producing the maximum emission.
The EUT is Placed on a turntable, which is 0.8m above ground plane. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level. The test results represent the worst case emission for each emission with manipulating the EUT, support equipment, interconnecting cables and varying the mode of operation. Sufficient time for the EUT, support equipment, and test equipment are allowed in order for them to warm up to their normal operating condition.

The EUT was set to operate with following conditions.
- Channel Low: 2412MHz, Channel High: 2462MHz

The test mode of EUT is as follows.
- Tx mode

- Test configuration



9.2 Limit

Emission at the boundary of the restricted band provided by 15.205 shall be lower than 15.209 limit.

9.3 Measurement Result

Channel	Frequency [MHz]	Results Chart	Result
Low	2412	See the Trace Data	Pass
High	2462	See the Trace Data	Pass

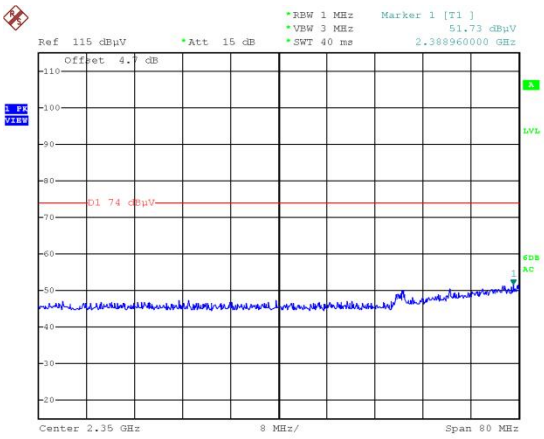
9.4 Test data

Date : December 24, 2014
Temperature : 18.0 [˚C]
Humidity : 32.5 [%]
Test place : 3m Semi-anechoic chamber

Test engineer : Taiki Watanabe

[IEEE802.11b]

Channel Low
Horizontal
Peak



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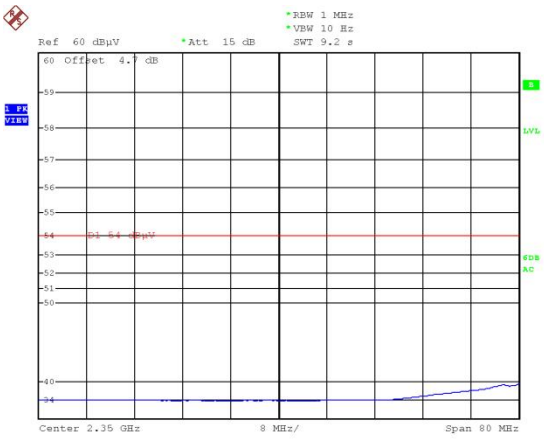
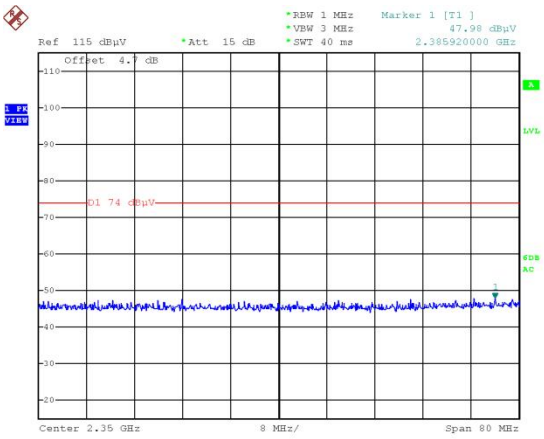


Date: 24.DEC.2014 16:52:01

Vertical
Peak



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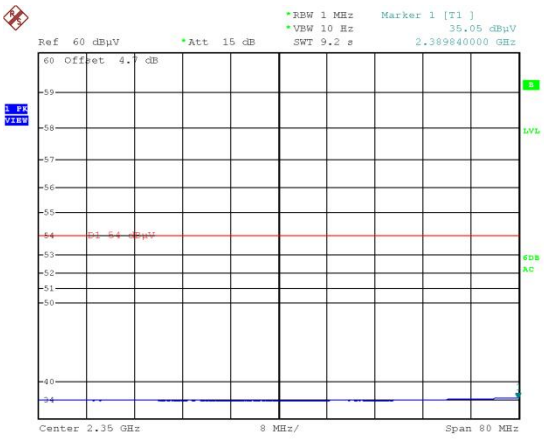

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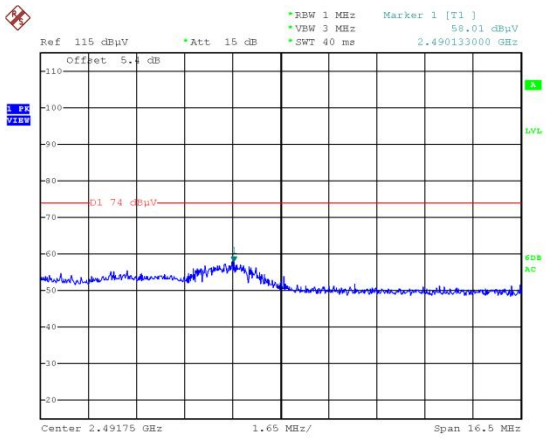
Channel High
Horizontal
Peak



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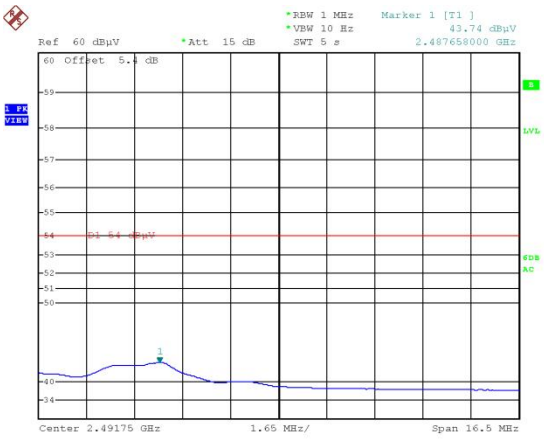
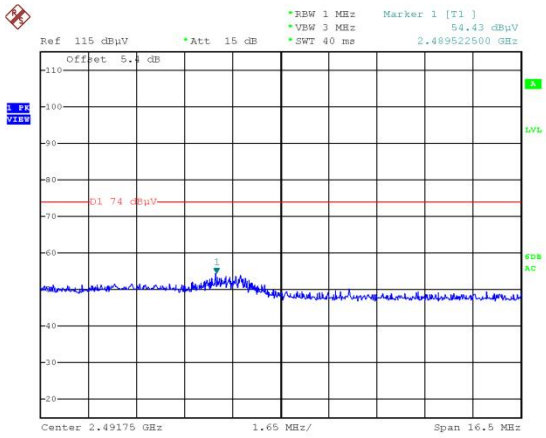


Date: 24.DEC.2014 17:04:03

Vertical
Peak



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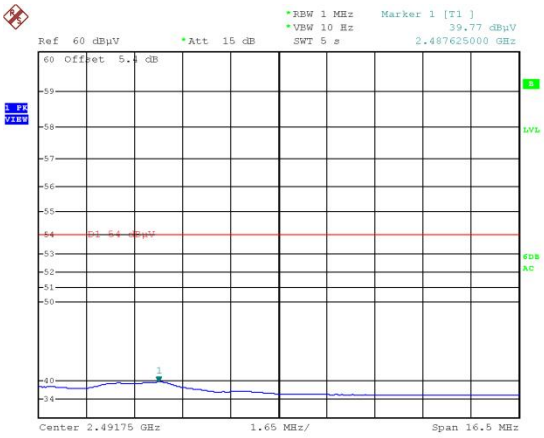
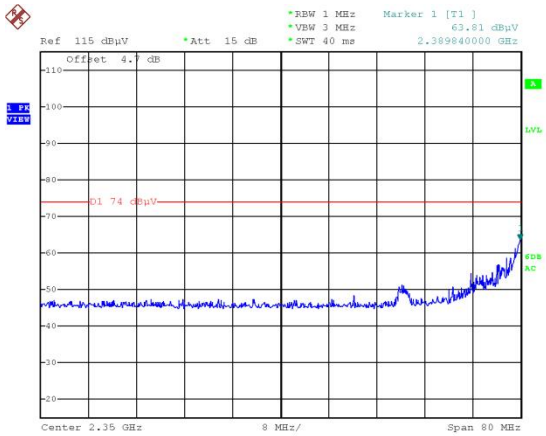


Date: 24.DEC.2014 17:04:47

[IEEE802.11g]

Channel Low
Horizontal
Peak



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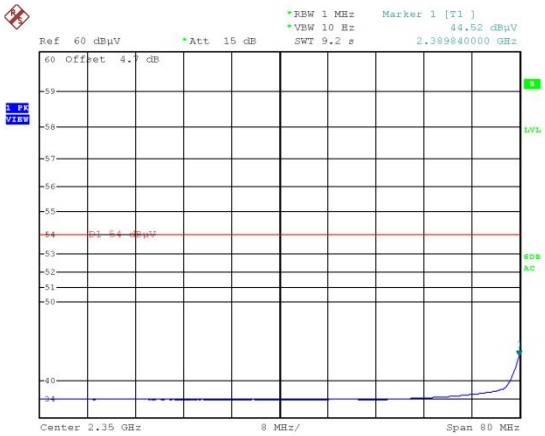
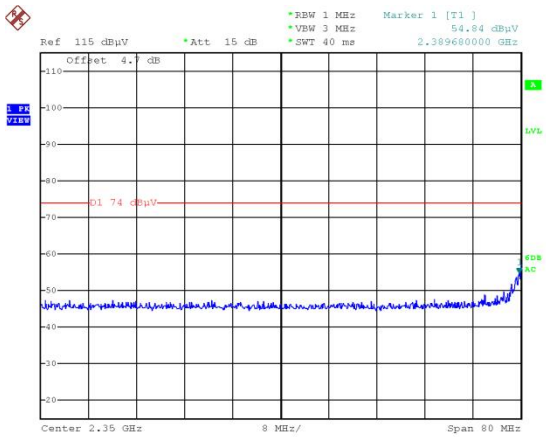


Date: 24.DEC.2014 17:16:40

Vertical
Peak



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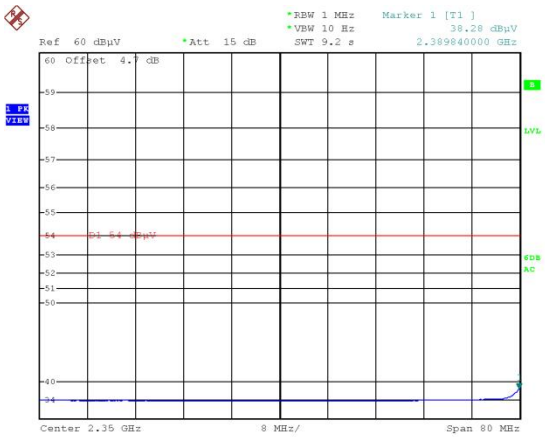
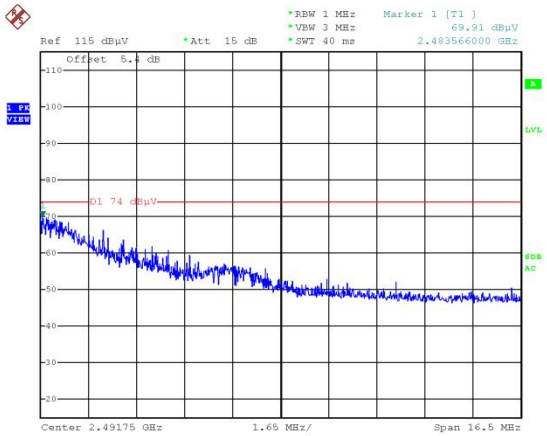


Date: 24.DEC.2014 17:18:39

Channel High
Horizontal
Peak



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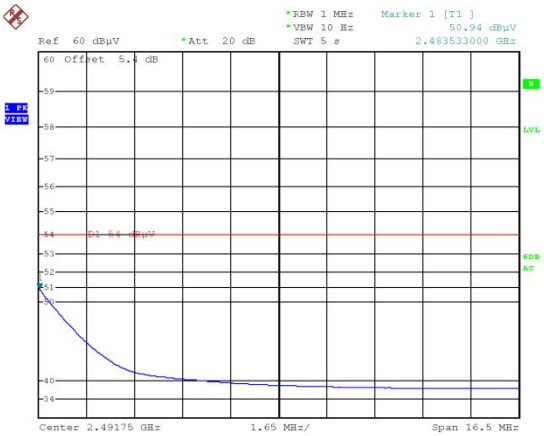

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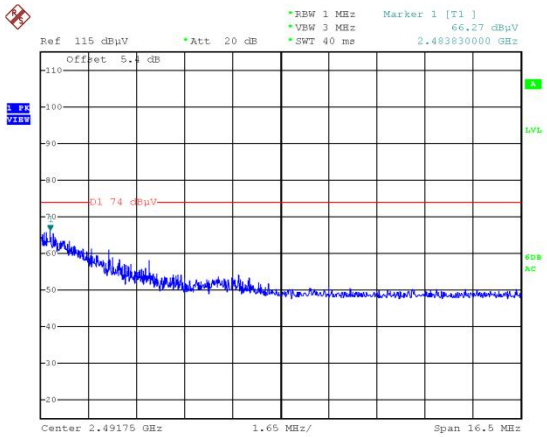
Vertical
Peak



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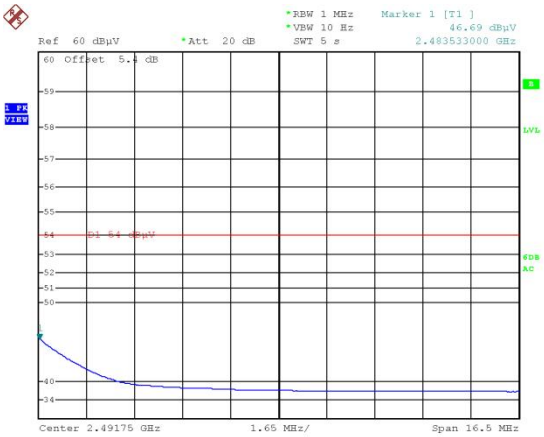
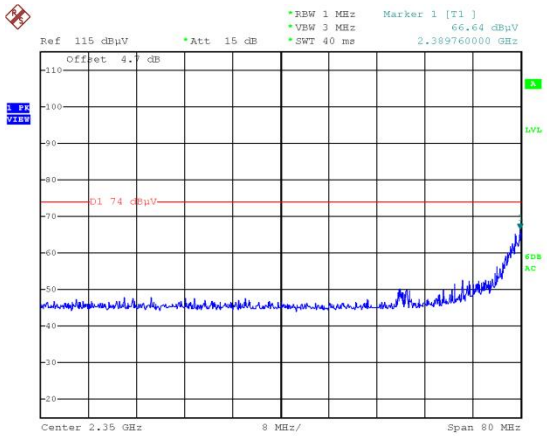
Average



Date: 24.DEC.2014 17:31:16

[IEEE802.11n (HT20)]

Channel Low
Horizontal
Peak



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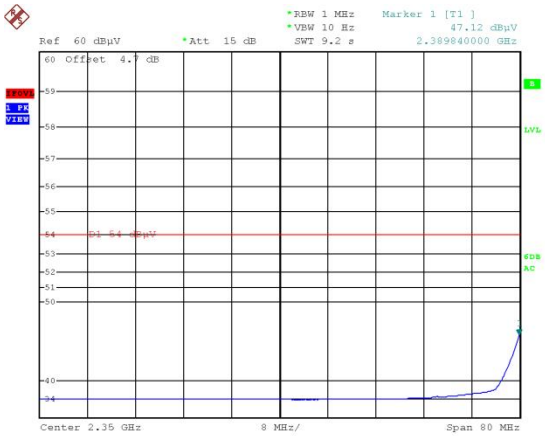
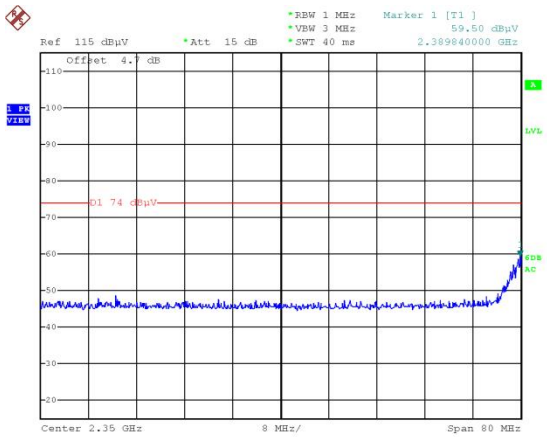


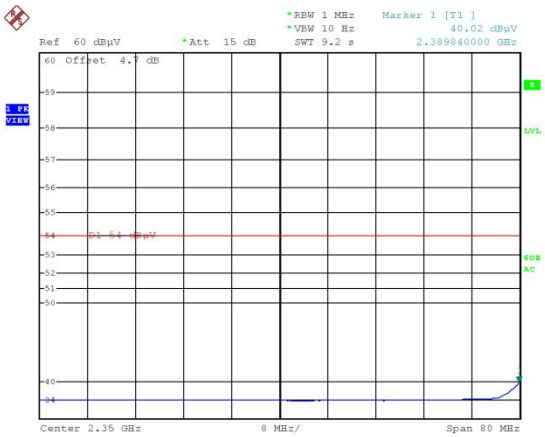
Date: 24.DEC.2014 17:43:07

Vertical
Peak



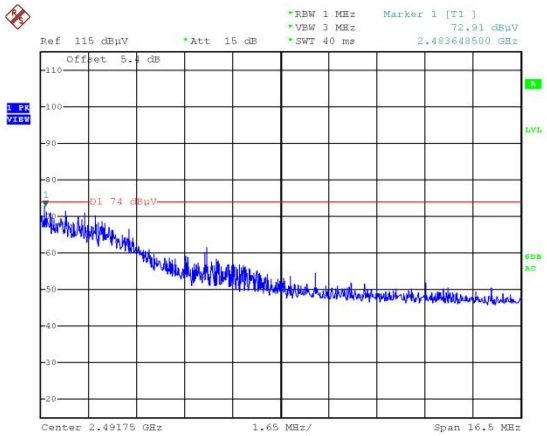
Date: 24.DEC.2014 17:44:36

Average



Date: 24.DEC.2014 17:44:07

Channel High
Horizontal
Peak



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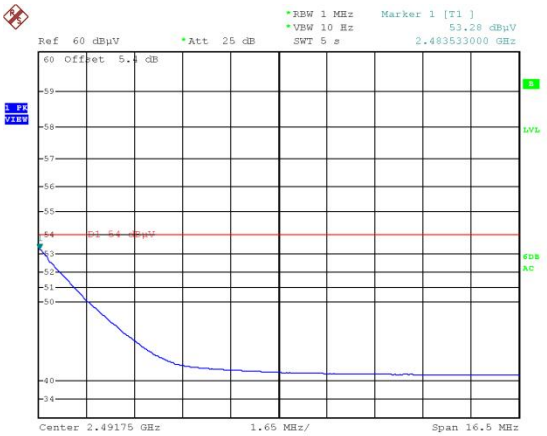
Average



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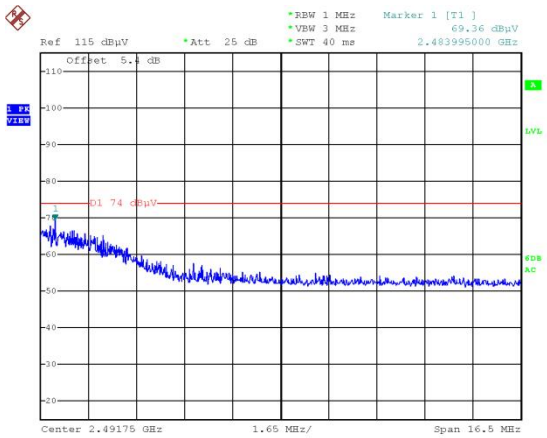
Vertical
Peak



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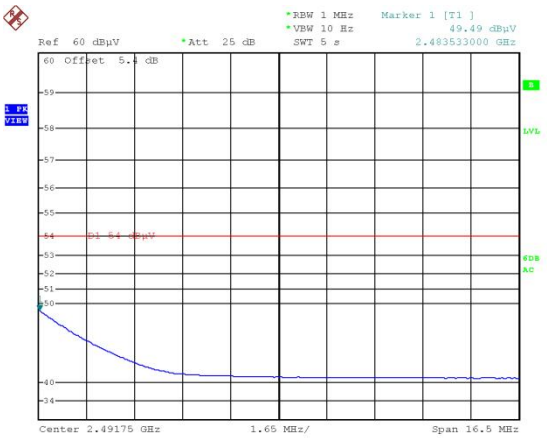


Date: 24.DEC.2014 17:57:41

10. Transmitter Power Spectral Density

10.1 Measurement procedure
[FCC 15.247(e), KDB558074]

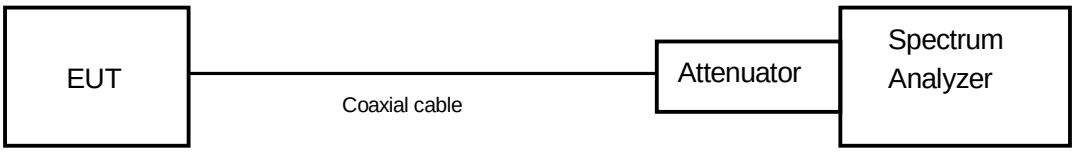
The peak power is measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate center frequency.

The spectrum analyzer is set to;
- RBW=3kHz, VBW=10kHz, Span=15/20MHz, Sweep=Auto, Detector=Peak, Trace mode=Max hold

The EUT was set to operate with following conditions.
- Channel Low: 2412MHz, Channel Middle: 2437MHz, Channel High: 2462MHz

The test mode of EUT is as follows.
- Tx mode

- Test configuration



10.2 Limit

The peak power spectral density shall not be greater than 8dBm in any 3kHz band.

10.3 Measurement result

Date : December 26, 2014
Temperature : 23.0 [˚C]
Humidity : 27.6 [%]
Test place : Shielded room No.4

Test engineer : Hikaru Shibata

[IEEE802.11b]

Channel	Center Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dBm)	Result
Low	2412.00	-16.50	10.62	-5.88	8.00	13.88	PASS
Middle	2437.00	-16.37	10.62	-5.75	8.00	13.75	PASS
High	2462.00	-16.60	10.62	-5.98	8.00	13.98	PASS

Calculation;
Transmitter Power Spectral Density Level (Margin) = Limit – (Reading + Factor)

[IEEE802.11g]

Channel	Center Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dBm)	Result
Low	2412.00	-23.09	10.62	-12.47	8.00	20.47	PASS
Middle	2437.00	-22.69	10.62	-12.07	8.00	20.07	PASS
High	2462.00	-22.34	10.62	-11.72	8.00	19.72	PASS

Calculation;
Transmitter Power Spectral Density Level (Margin) = Limit – (Reading + Factor)

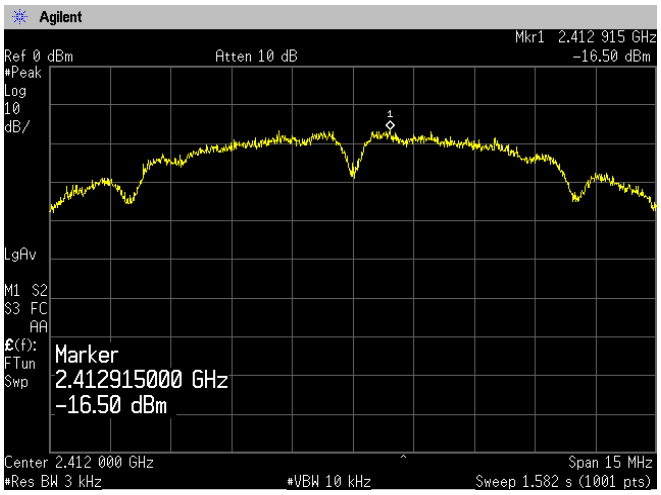
[IEEE802.11n (HT20)]

Channel	Center Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dBm)	Result
Low	2412.00	-22.87	10.62	-12.25	8.00	20.25	PASS
Middle	2437.00	-21.93	10.62	-11.31	8.00	19.31	PASS
High	2462.00	-22.14	10.62	-11.52	8.00	19.52	PASS

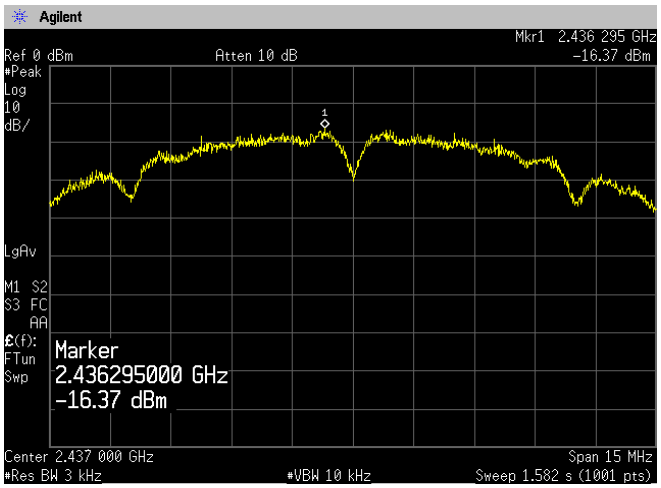
Calculation;
Transmitter Power Spectral Density Level (Margin) = Limit – (Reading + Factor)

10.4 Trace data [IEEE802.11b]

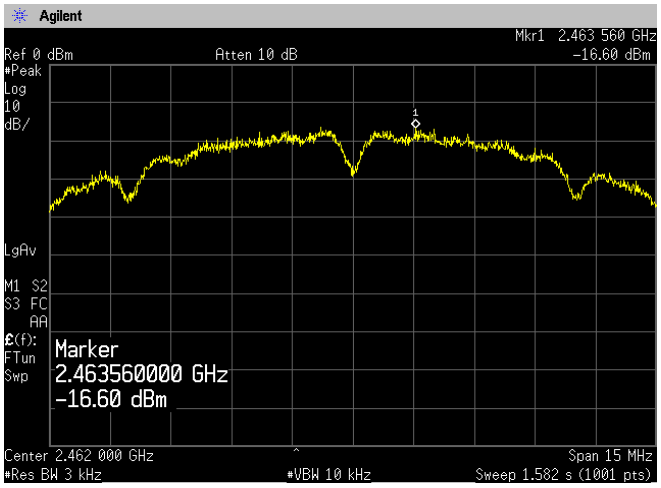
Channel Low



Channel Middle

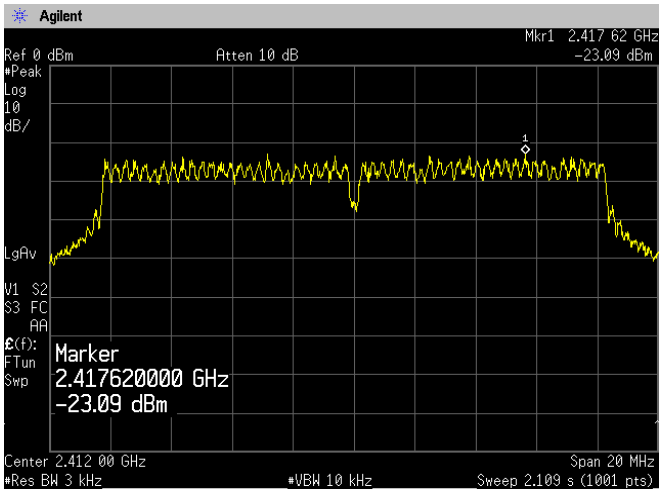


Channel High

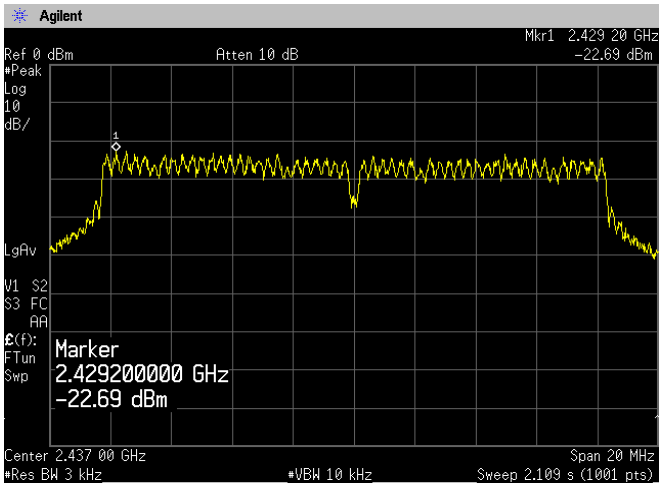


[IEEE802.11g]

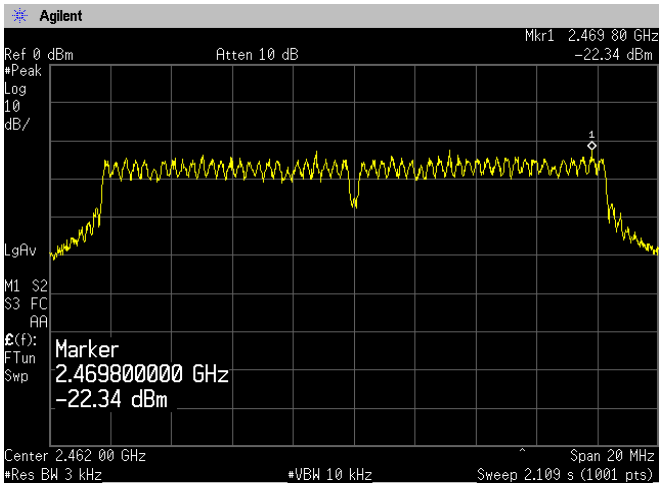
Channel Low



Channel Middle

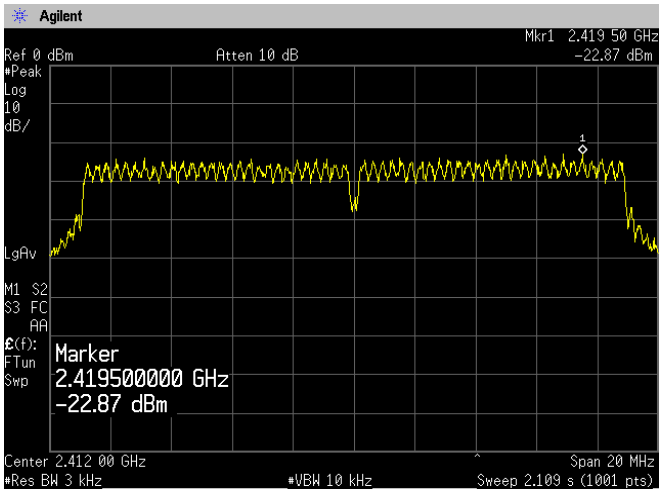


Channel High

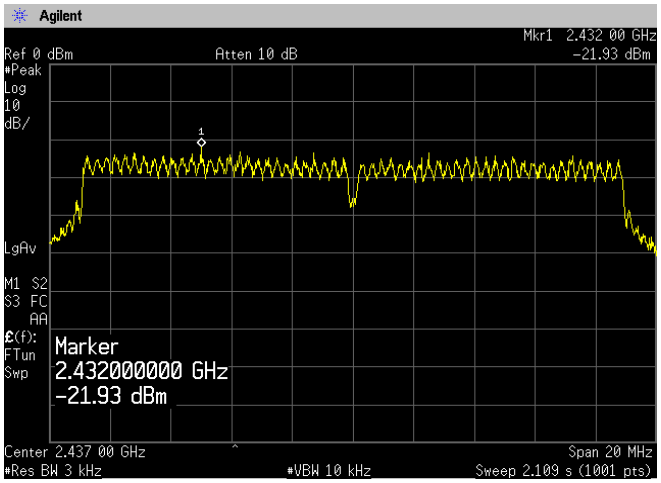


[IEEE802.11n (HT20)]

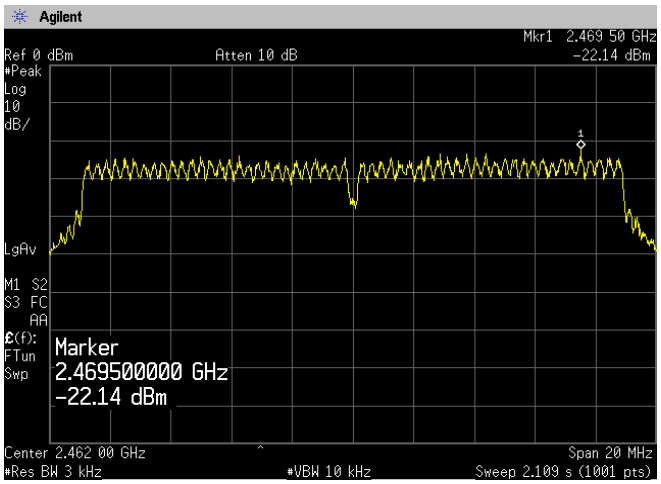
Channel Low



Channel Middle



Channel High



11. AC Power Line Conducted Emissions

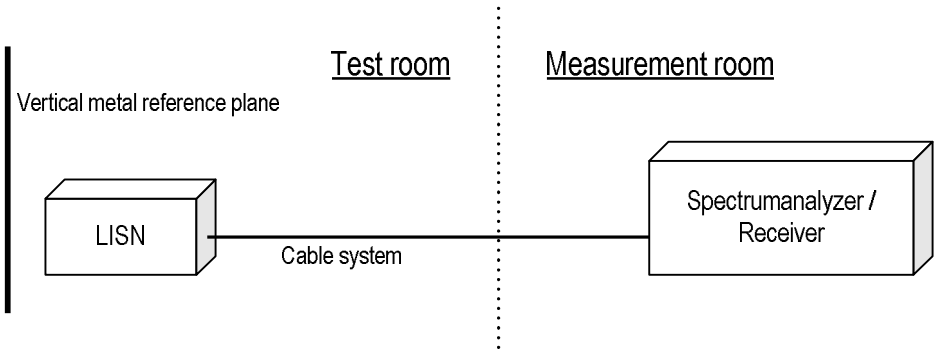
11.1 Measurement procedure [FCC 15.207]

Test was applied by following conditions.

Test method	:	ANSI C63.4
Frequency range	:	0.15MHz to 30MHz
Test place	:	10m Semi-anechoic chamber
EUT was placed on	:	FRP table / (W)2.0m × (D)1.0m × (H)0.8m
Vertical Metal Reference Plane	:	(W)2.0m × (H)2.0m 0.4m away from EUT
Test receiver setting		
- Detector	:	Quasi-peak, Average
- Bandwidth	:	9kHz

EUT and peripherals are connected to 50Ω/50μH Line Impedance Stabilization Network (LISN) which are connected to reference ground plane, and are placed 80cm away from EUT. Excess of AC power cable is bundled in center.
LISN for peripheral is terminated in 50Ω.
EUT operating mode is selected to emit the maximum noise. Overall frequency range is investigated with spectrum analyzer using peak detector. Maximum emission configuration is determined by manipulating the EUT, peripherals, interconnecting cables. Then, emission measurements are performed with test receiver in above setting to each current-carrying conductor of the mains port. Sufficient time for EUT, peripherals and test equipment is provided in order for them to warm up to their normal operating condition. If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both limits.

- Test configuration



11.2 Calculation method

Emission level = Reading + (LISN. factor + Cable system loss)
Margin = Limit – Emission level

11.3 Limit

Frequency [MHz]	Limit	
	QP [dBuV]	AV [dBuV]
0.15-0.5	66-56*	56-46*
0.5-5	56	46
5-30	60	50

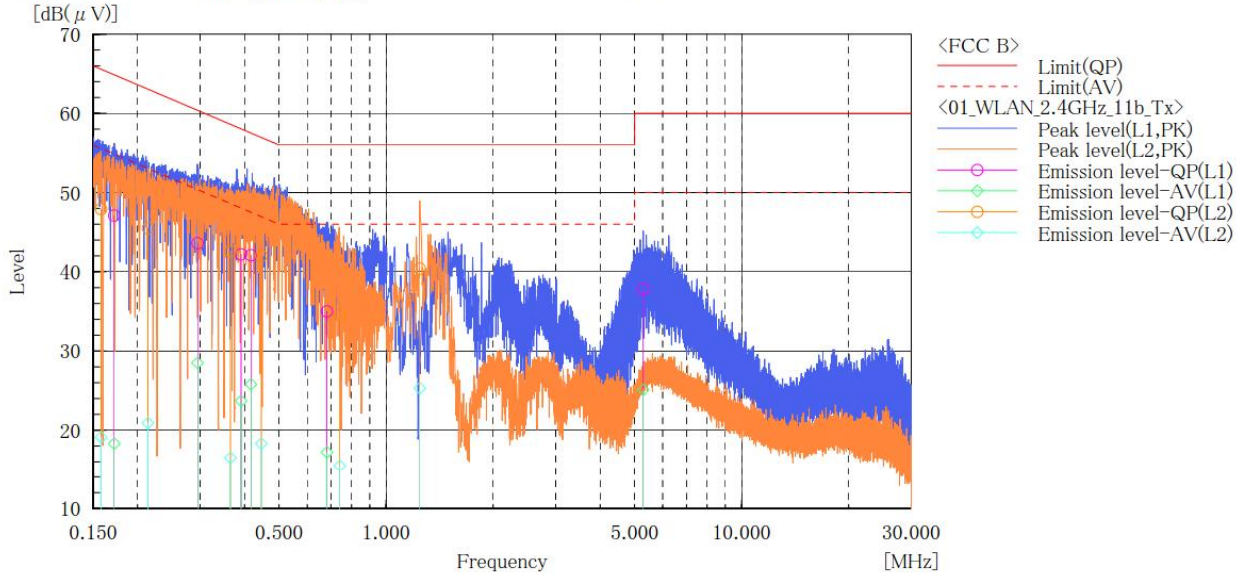
*: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz.

11.4 Test data

***** CONDUCTED EMISSION at MAINS PORT *****
≪ 3m Semi-anechoic chamber ≫

TUV SUD Zacta Ltd. | <<Data Sheet No.1>> | 26 December,2014

Company Name	: KYOCERA Corporation	Standard	: FCC Part.15 C
EUT	: Mobile Phone	Operator	: H.Shibata
Model No.	: KYV33	Temp.Hum.	: 19.8[℃] 22.5[%]
Serial No.	: RF2	Note1	:
Test mode	: 2.4GHz_WLAN_11b_Tx	Note2	:



Final Result

--- L1 Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading AV [dB(μV)]	c.f [dB]	Result QP [dB(μV)]	Result AV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin AV [dB]
1	0.172	36.7	7.9	10.4	47.1	18.3	64.9	54.9	17.8	36.6
2	0.295	33.3	18.2	10.3	43.6	28.5	60.4	50.4	16.8	21.9
3	0.391	31.9	13.4	10.3	42.2	23.7	58.0	48.0	15.8	24.3
4	0.417	31.8	15.5	10.3	42.1	25.8	57.5	47.5	15.4	21.7
5	0.682	24.7	6.9	10.3	35.0	17.2	56.0	46.0	21.0	28.8
6	5.288	27.3	14.6	10.5	37.8	25.1	60.0	50.0	22.2	24.9

--- L2 Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading AV [dB(μV)]	c.f [dB]	Result QP [dB(μV)]	Result AV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin AV [dB]
1	0.158	37.4	8.6	10.5	47.9	19.1	65.6	55.6	17.7	36.5
2	0.214	35.1	10.5	10.4	45.5	20.9	63.0	53.0	17.5	32.1
3	0.365	32.2	6.1	10.4	42.6	16.5	58.6	48.6	16.0	32.1
4	0.446	31.6	7.9	10.4	42.0	18.3	56.9	46.9	14.9	28.6
5	0.741	24.1	5.1	10.4	34.5	15.5	56.0	46.0	21.5	30.5
6	1.244	30.0	14.9	10.4	40.4	25.3	56.0	46.0	15.6	20.7

12. Antenna requirement

According to FCC 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.
The antenna is a special antenna mounted inside of the EUT. Therefore, the EUT complies with the antenna requirement of FCC section 15.203.

13. Uncertainty of measurement

Expanded uncertainties stated are calculated with a coverage Factor k=2.
Please note that these results are not taken into account when determining compliance or non-compliance with test result.

Test item	Measurement uncertainty
Conducted emission at mains port	±3.0dB
Radiated emission (9kHz – 30MHz)	±4.4dB
Radiated emission (30MHz – 1000MHz)	±4.5dB
Radiated emission (1000MHz – 26GHz)	±3.9dB

14. Laboratory description

1. Location:

TÜV SÜD Zacta Ltd. Yonezawa Testing Center
4149-7 Hachimanpara 5-chome Yonezawa-shi Yamagata 992-1128 Japan
Phone: +81-238-28-2880 Fax: +81-238-28-2888

2. Facility filing information:

1) NVLAP accreditation: NVLAP Lab. code: 200306-0

2) VLAC accreditation: Lab. code: VLAC-013

<table>
<tr><th>Site name</th><th>Radiated emission</th><th>Conducted emission for mains port</th><th>Conducted emission for telecom port</th><th>Radiated emission (CMAD)</th><th>Expiry Date</th></tr>
<tr><td>3m Semi-anechoic chamber</td><td colspan="3" rowspan="3">VLAC-013</td><td>-</td><td rowspan="4">Jul. 3, 2015</td></tr>
<tr><td>10m Semi-anechoic chamber No.1</td><td rowspan="2">VLAC-013</td></tr>
<tr><td>10m Semi-anechoic chamber No.2</td></tr>
<tr><td>Shielded room No.1</td><td>-</td><td colspan="2">VLAC-013</td><td>-</td></tr>
</table>

3) FCC filing:

<table>
<tr><th>Site name</th><th>Registration Number</th><th>Expiry Date</th></tr>
<tr><td>Site 3</td><td>91065</td><td>Oct. 1, 2017</td></tr>
<tr><td>3m Semi-anechoic chamber</td><td rowspan="4">540072</td><td rowspan="4">Feb. 20, 2017</td></tr>
<tr><td>10m Semi-anechoic chamber No.1</td></tr>
<tr><td>10m Semi-anechoic chamber No.2</td></tr>
<tr><td>Shielded room No.1</td></tr>
</table>

4) Industry Canada Oats site filing:

<table>
<tr><th>Site name</th><th>Sites on file: Oats 3m/10m</th><th>Expiry Date</th></tr>
<tr><td>Site 3</td><td>4224A-3</td><td rowspan="3">Jan. 23, 2015</td></tr>
<tr><td>3m Semi-anechoic chamber</td><td>4224A-4</td></tr>
<tr><td>10m Semi-anechoic chamber No.1</td><td>4224A-5</td></tr>
<tr><td>10m Semi-anechoic chamber No.2</td><td>4224A-6</td><td>Jan. 15, 2017</td></tr>
</table>

5) VCCI site filing:

<table>
<tr><th>Site name</th><th>Radiated emission</th><th>Conducted emission for mains port</th><th>Conducted emission for telecom port</th><th>Expiry Date</th></tr>
<tr><td>Site 3</td><td>R-138</td><td>C-134</td><td>T-1222</td><td>Nov. 16, 2017</td></tr>
<tr><td>3m Semi-anechoic chamber</td><td colspan="3" rowspan="3">A-0166</td><td rowspan="4">Jul. 3, 2015</td></tr>
<tr><td>10m Semi-anechoic chamber No.1</td></tr>
<tr><td>10m Semi-anechoic chamber No.2</td></tr>
<tr><td>Shielded room No.1</td><td>-</td><td colspan="2">A-0166</td></tr>
</table>

6) TÜV SÜD PS authorization:
Authorized as an EMC test laboratory

7) TÜV Rheinland authorization:
Authorized as an EMC test laboratory

Appendix A. Test equipment

Antenna port conducted test

Equipment	Company	Model No.	Serial No.	Cal. due	Cal. date
Spectrum analyzer	Agilent Technologies	E4440A	US44302655	May 31, 2015	May 30, 2014
Microwave cable	RS	YH_13S5	N/A (S403)	May 31, 2015	May 10, 2014
Attenuator	Weinschel	56-10	J4180	Nov. 30, 2015	Nov. 12, 2014

Radiated emission

Equipment	Company	Model No.	Serial No.	Cal. Due	Cal. Date
EMI Receiver	ROHDE&SCHWARZ	ESCI	100765	Aug. 31, 2015	Aug. 9, 2014
Preamplifier	ANRITSU	MH648A	M96057	Jun. 30, 2015	Jun. 12, 2014
Loop antenna	ROHDE&SCHWARZ	HFH2-Z2	891847/17	Mar. 31, 2015	Mar. 5, 2014
Biconical antenna	Schwarzbeck	VHA9103/BBA9106	2125	May 31, 2015	May 7, 2014
Log periodic antenna	Schwarzbeck	UHALP9108A	0560	May 31, 2015	May 7, 2014
Attenuator	TME	CFA-01NPJ-6	N/A (S275)	Jun. 30, 2015	Jun. 9, 2014
Attenuator	TME	CFA-01NPJ-3	N/A (S272)	Jun. 30, 2015	Jun. 9, 2014
Spectrum analyzer	Agilent Technologies	E4440A	US44302655	May 31, 2015	May 30, 2014
Preamplifier	Agilent Technologies	8449B	3008A1008	Dec. 31, 2015	Dec. 5, 2014
Double ridged guide antenna	EMCO	3115	5205	Dec. 31, 2015	Dec. 10, 2013
Attenuator	Agilent Technologies	8491B	MY39268633	Jan. 31, 2015	Jan. 15, 2013
Broad-Band Horn Antenna	Schwarzbeck	BBHA9170	BBHA9170189	May 31, 2015	May 2, 2013
Preamplifier	TSJ	MLA-1840-B03-35	1240332	May 31, 2015	May 2, 2013
Notch filter	Micro-Tronics	BRM50702	045	Nov. 30, 2015	Nov. 12, 2014
Microwave cable	SUHNER	SUCOFLEX104/9m	346316/4	Oct. 31, 2015	Oct. 31, 2014
		SUCOFLEX104/1m	322084/4	Oct. 31, 2015	Oct. 31, 2014
		SUCOFLEX104/1.5m	317226/4	Oct. 31, 2015	Oct. 31, 2014
		SUCOFLEX104/7m	41625/6	Oct. 31, 2015	Oct. 31, 2014
PC	DELL	DIMENSION E521	75465BX	N/A	N/A
Software	TOYO Corporation	EP5/RE-AJ	0611193/V5.3.61	N/A	N/A
3m Semi-anechoic chamber	TOKIN	N/A	N/A (9002-NSA)	May 31, 2015	May 6, 2014
3m Semi-anechoic chamber	TOKIN	N/A	N/A (9002-SVSWR)	May 31, 2015	May 6, 2014

Conducted emission at mains port

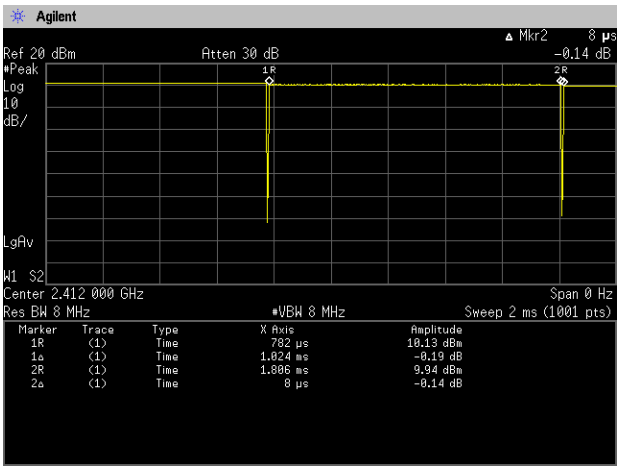
Equipment	Company	Model No.	Serial No.	Cal. due	Cal. date
EMI Receiver	ROHDE&SCHWARZ	ESCI	100765	Aug. 31, 2015	Aug. 9, 2014
Attenuator	HUBER+SUHNER	6810.01.A	N/A (S411)	Feb. 28, 2015	Feb. 28, 2014
Line impedance stabilization network for EUT	Kyoritsu Electrical Works, Ltd.	KNW-407F	8-2003-1	Mar. 31, 2015	Mar. 13, 2014
Coaxial cable	FUJIKURA	5D-2W/4m	N/A (S350)	Feb. 28, 2015	Feb. 5, 2014
Coaxial cable	FUJIKURA	5D-2W/1m	N/A (S193)	Feb. 28, 2015	Feb. 5, 2014
Coaxial cable	SUHNER	RG214/U/10m	N/A (S194)	Feb. 28, 2015	Feb. 5, 2014
PC	DELL	DIMENSION	75465BX	N/A	N/A

*: The calibrations of the above equipment are traceable to NIST or equivalent standards of the reference organizations.

Appendix B. Duty Cycle

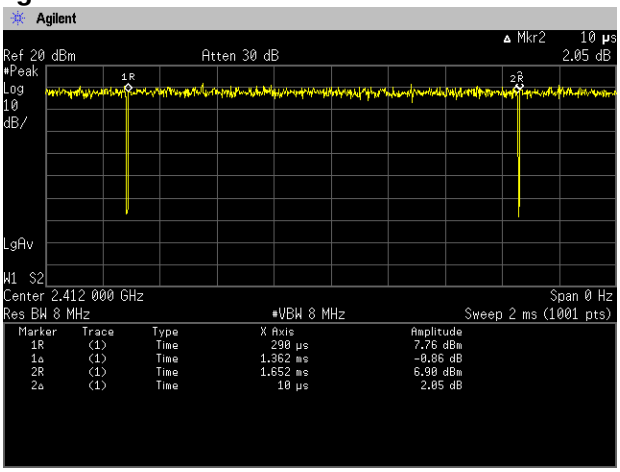
[Plot & Calculation]

11b



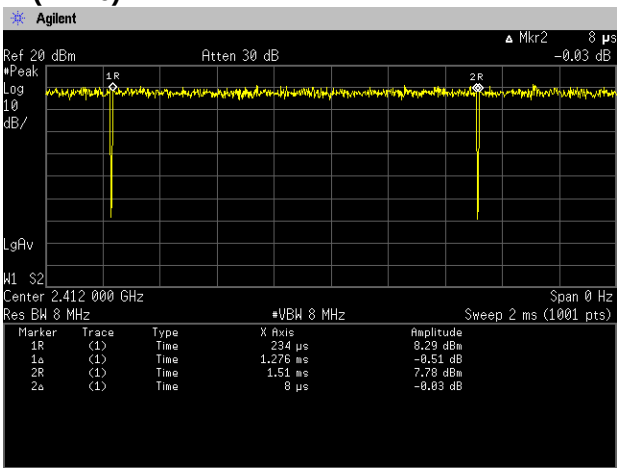
Duty Cycle = T_{on} / (T_{on} + T_{off}) = 1024[us] / (1024[us] + 8[us]) = 99.2481[%]

11g



Duty Cycle = T_{on} / (T_{on} + T_{off}) = 1652[us] / (1652[us] + 10[us]) = 99.39832[%]

11n(HT:20)



Duty Cycle = T_{on} / (T_{on} + T_{off}) = 1276[us] / (1276[us] + 8[us]) = 99.37695[%]