RADIO TEST REPORT

Test Report No. : 10840757S-G

Applicant	:	**Canon Inc.**
Type of Equipment	:	**Wireless Module**
Model No.	:	**ES200**
FCC ID	:	**AZD230**
Test regulation	:	**FCC Part 15 Subpart C: 2015**
Test result	:	**Complied**

1. This test report shall not be reproduced in full or partial, without the written approval of UL Japan, Inc.
2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the above regulation.
4. The test results in this report are traceable to the national or international standards.
5. The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan has been accredited.
6. This test report covers Radio technical requirements. It does not cover administrative issues such as Manual or non-Radio test related Requirements. (if applicable)

Date of test: July 10 to August 2, 2015

Representative test engineer:
S. Takano
Shinichi Takano
Engineer
Consumer Technology Division

Approved by:
T. Imamura
Toyokazu Imamura
Leader
Consumer Technology Division

RTL02610

☒ The testing in which "Non-accreditation" is displayed is outside the accreditation scopes in UL Japan.
☐ There is no testing item of "Non-accreditation".

REVISION HISTORY

Original Test Report No.: 10840757S-G

Revision	Test report No.	Date	Page revised	Contents
- (Original)	10840757S-G	November 19, 2015	-	-
1	10840757S-G	December 9, 2015	5	Addition of *1) to 3.2

UL Japan, Inc.
Shonan EMC Lab.
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN
Telephone : +81 463 50 6400
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SECTION 1: Customer information

Company Name	:	Canon Inc.
Address	:	30-2, Shimomaruko 3-chome, Ohta-ku, Tokyo, 146-8501 Japan
Telephone Number	:	+81-3-5482-8070
Facsimile Number	:	+81-3-3757-8431
Contact Person	:	Takato Matsuura

SECTION 2: Equipment under test (E.U.T.)

2.1 Identification of E.U.T.

Type of Equipment	:	Wireless Module
Model No.	:	ES200
Serial No.	:	Refer to Section 4, Clause 4.2
Rating	:	DC 3.3 V, DC 1.8 V
Receipt Date of Sample	:	July 9, 2015
Country of Mass-production	:	China
Condition of EUT	:	Engineering prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT	:	No Modification by the test lab

2.2 Product Description

Model: ES200 (referred to as the EUT in this report) is a Wireless Module.

General Specification

Clock frequency(ies) in the system	:	38.4 MHz

Radio Specification

Radio Type	:	Transceiver
Frequency of Operation	:	2412 MHz - 2462 MHz
Modulation	:	DSSS (IEEE 802.11b), OFDM (IEEE 802.11g/n)
Antenna type	:	Pattern
Antenna Gain	:	2.14 dBi

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification	:	FCC Part 15 Subpart C: 2015, final revised on September 8, 2015
Title	:	FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators Section 15.207 Conducted limits Section 15.247 Operation within the bands 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz

* The revision on September 8, 2015 does not affect the test specification applied to the EUT.

3.2 Procedures and results

Item	Test Procedure	Specification	Worst margin	Results	Remarks
Conducted Emission	**FCC:** ANSI C63.4-2009 7. AC powerline Conducted Emission measurements	**FCC:** Section 15.207	20.5 dB, 0.43335 MHz, L1 QP	Complied	-
	IC: RSS-Gen 8.8	**IC:** RSS-Gen 8.8			
6dB Bandwidth	**FCC:** KDB 558074 D01 DTS Meas Guidance v03r03	**FCC:** Section 15.247(a)(2)	See data.	Complied	Conducted
	IC: -	**IC:** RSS-247 5.2(1)			
Maximum Peak Output Power	**FCC:** KDB 558074 D01 DTS Meas Guidance v03r03	**FCC:** Section 15.247(b)(3)		Complied	Conducted
	IC: RSS-Gen 6.12	**IC:** RSS-247 5.4(4)			
Power Density	**FCC:** KDB 558074 D01 DTS Meas Guidance v03r03	**FCC:** Section 15.247(e)		Complied	Conducted
	IC: -	**IC:** RSS-247 5.2(2)			
Spurious Emission Restricted Band Edges	**FCC:** KDB 558074 D01 DTS Meas Guidance v03r03	**FCC:** Section15.247(d)	5.0 dB 2390.00 MHz, AV, Horizontal	Complied	Conducted (below 30 MHz)/ Radiated (above 30 MHz) *1)
	IC: RSS-Gen 6.13	**IC:** RSS-247 5.5 RSS-Gen 8.9 RSS-Gen 8.10			

Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422.
*1) Radiated test was selected over 30 MHz based on section 15.247(d) and KDB 558074 D01 DTS Meas Guidance v03r03 12.2.7.

* In case any questions arise about test procedure, ANSI C 63.10:2013 is also referred.
However, there is one deviation from ANSI C 63.10:2013. (ANSI C63.10:2013 is Non-accreditation)
Measurement height is not 1.5 m, but 0.8 m.

FCC 15.31 (e) / 212
The host device provides stable voltage (DC 3.3 V, DC 1.8 V) constantly to RF Module regardless of input voltage. Therefore, this EUT complies with the requirement.

FCC 15.203 / 212
The antenna is not removable from the EUT. Therefore, the equipment complies with the requirement.

3.3 Addition to standard

Item	Test Procedure	Specification	Worst margin	Results	Remarks
99% Occupied Bandwidth	**IC:** RSS-Gen 6.6	**IC:** -	N/A	-	Conducted

Other than above, no addition, exclusion nor deviation has been made from the standard.

3.4 Uncertainty

The following uncertainties have been calculated to provide a confidence level of 95 % using a coverage factor $k = 2$.

Shonan EMC Lab.

Item	Frequency range	Uncertainty (+/-)		
		No. 1 SAC / SR	No. 2 SAC / SR	No. 3 SAC / SR
Conducted emission (AC Mains) LISN	150kHz - 30MHz	3.6 dB	3.4 dB	3.4 dB
Radiated emission (Measurement distance: 3m)	9kHz - 30MHz	3.7 dB	3.5 dB	3.5 dB
	30MHz - 300MHz	4.9 dB	4.9 dB	4.7 dB
	300MHz - 1GHz	5.0 dB	5.0 dB	4.8 dB
	1GHz - 15GHz	4.9 dB	4.9 dB	4.9 dB
Radiated emission (Measurement distance: 1m)	15GHz - 18GHz	5.7 dB	5.7 dB	5.7 dB
	18GHz - 40GHz	4.5 dB	4.3 dB	4.3 dB

SAC=Semi-Anechoic Chamber

SR= Shielded Room is applied besides radiated emission

Antenna terminal test	Uncertainty (+/-)
Power Measurement above 1GHz	0.68dB
Spurious emission (Conducted) below 1GHz	1.5dB
Spurious emission (Conducted) 1GHz - 3GHz	1.7dB
Spurious emission (Conducted) 3GHz - 18GHz	2.4dB
Spurious emission (Conducted) 18GHz - 26.5GHz	2.5dB
Bandwidth Measurement	0.66%

Conducted Emission test

The data listed in this test report has enough margin, more than the site margin.

Radiated emission test

The data listed in this test report has enough margin, more than the site margin.

3.5 Test Location

UL Japan, Inc. Shonan EMC Lab.
1-22-3, Megumigaoka, Hiratsuka-shi, Kanagawa-ken 259-1220 JAPAN
Telephone: +81 463 50 6400, Facsimile: +81 463 50 6401
JAB Accreditation No. RTL02610

Test site	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Maximum measurement distance
No.1 Semi-anechoic chamber	2973D-1	20.6 x 11.3 x 7.65	20.6 x 11.3	10m
No.2 Semi-anechoic chamber	2973D-2	20.6 x 11.3 x 7.65	20.6 x 11.3	10m
No.3 Semi-anechoic chamber	2973D-3	12.7 x 7.7 x 5.35	12.7 x 7.7	5m
No.4 Semi-anechoic chamber	-	8.1 x 5.1 x 3.55	8.1 x 5.1	-
No.1 Shielded room	-	6.8 x 4.1 x 2.7	6.8 x 4.1	-
No.2 Shielded room	-	6.8 x 4.1 x 2.7	6.8 x 4.1	-
No.3 Shielded room	-	6.3 x 4.7 x 2.7	6.3 x 4.7	-
No.4 Shielded room	-	4.4 x 4.7 x 2.7	4.4 x 4.7	-
No.5 Shielded room	-	7.8 x 6.4 x 2.7	7.8 x 6.4	-
No.6 Shielded room	-	7.8 x 6.4 x 2.7	7.8 x 6.4	-
No.8 shielded room	-	3.45 x 5.5 x 2.4	3.45 x 5.5	-
No.1 Measurement room	-	2.55 x 4.1 x 2.5	-	-

3.6 Test data, Test instruments, and Test set up

Refer to APPENDIX.

SECTION 4: Operation of E.U.T. during testing

4.1 Operating Mode(s)

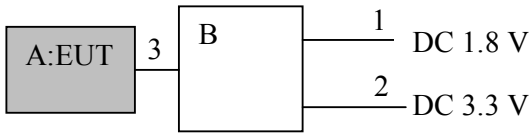
Test operating mode was determined as follows according to "Section 1 of 6 802.11 a/b/g/n testing- Managing Complex Regulatory Approvals - "of TCB Council Workshop October 2009.

Mode	Remarks*
IEEE 802.11b (11b)	1 Mbps, PN9
IEEE 802.11g (11g)	6 Mbps, PN9
IEEE 802.11n 20 MHz BW (11n-20)	MCS 0, PN9
*The worst condition was determined based on the test result of Maximum Peak Output Power (Low Channel)	
Power settings: Normal Power mode: 11b = 12 dBm, 11g = 12 dBm, 11n-20 = 11 dBm Low Power mode: 11b = 10 dBm, 11g = 8 dBm, 11n-20 = 7 dBm Software: DutApiWiFi8801BrdigeEth.exe Version 2.0.0.89	

*The details of Operating mode(s)

Test Item	Operating Mode	Tested frequency
Conducted Emission Spurious Emission (below 1GHz)	11g Tx	2412 MHz
Spurious Emission (above 1GHz) 6dB Bandwidth Maximum Peak Output Power Power Density 99% Occupied Bandwidth	11b Tx 11g Tx 11n-20 Tx	2412 MHz 2437 MHz 2462 MHz

4.2 Configuration and peripherals



* Cabling and setup(s) were taken into consideration and test data was taken under worse case conditions.

Description of EUT

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Wireless module	ES200	2 *1) 1 *2)	Canon Inc.	EUT
B	Jig	-	-	Canon Inc.	-

*1) Used for Antenna Terminal conducted test
*2) Used for Conducted Emission test and Radiated Emission test

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	DC	1.0	Unshielded	Unshielded	-
2	DC	1.0	Unshielded	Unshielded	-
3	FLAT	0.02	Unshielded	Unshielded	-

SECTION 5: Conducted Emission

Test Procedure and conditions

EUT was placed on a platform of nominal size, 1.0 m by 1.5 m, raised 0.8 m above the conducting ground plane. The table is made of Styrofoam and covered with polyvinyl chloride. That has very low permittivity.

The rear of tabletop was located 40 cm to the vertical conducting plane. The rear of EUT, including peripherals aligned and flushed with rear of tabletop. All other surfaces of tabletop were at least 80cm from any other grounded conducting surface. EUT was located 80 cm from a Line Impedance Stabilization Network (LISN) / Artificial mains Network (AMN) and excess AC cable was bundled in center.

All unused 50ohm connectors of the LISN (AMN) were resistivity terminated in 50 ohm when not connected to the measuring equipment.

The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT in a Semi Anechoic Chamber.
The EUT was connected to a LISN (AMN).
An overview sweep with peak detection has been performed.

The test results and limit are rounded off to one decimal place, so some differences might be observed.

Detector : QP and CISPR AV
Measurement range : 0.15 MHz – 30 MHz
Test data : APPENDIX
Test result : Pass

SECTION 6: Radiated Spurious Emission

Test Procedure

It was measured based on "11.0 Emissions in non-restricted frequency bands" of "558074 D01 DTS Meas Guidance v03r03".
EUT was placed on a polystyrene platform of nominal size, 0.5 m by 0.5 m, raised 0.8 m above the conducting ground plane.
The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.
The height of the measuring antenna varied between 1 m and 4 m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field strength.
The measurements were performed for both vertical and horizontal antenna polarization with the Test Receiver, or the Spectrum Analyzer.
The measurements were made with the following detector function of the test receiver and the Spectrum analyzer (in linear mode).
The test was made with the detector (RBW/VBW) in the following table.
When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

Test Antennas are used as below;

Frequency	30 MHz to 300 MHz	300 MHz to 1 GHz	Above 1 GHz
Antenna Type	Biconical	Logperiodic	Horn

In any 100 kHz bandwidth outside the restricted band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator confirmed 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on a radiated measurement.

20 dBc was applied to the frequency over the limit of FCC 15.209 / Table 4 of RSS-Gen 8.9(IC) and outside the restricted band of FCC15.205 / Table 6 of RSS-Gen 8.10 (IC).

Frequency	Below 1 GHz	Above 1 GHz		20 dBc
Instrument used	Test Receiver	Spectrum Analyzer		Spectrum Analyzer
Detector	QP	PK	AV *2)	PK
IF Bandwidth	BW 120 kHz	RBW: 1 MHz VBW: 3 MHz	Average Power Method: 12.2.5.2 RBW: 1 MHz VBW: 3 MHz Detector: Voltage Averaging (Linear voltage) Trace: 100 traces Duty factor was added to the results.	RBW: 100 kHz VBW: 300kHz
Test Distance	3m	3 m (below 15 GHz), 1 m *1) (above 15 GHz)		3 m (below 15 GHz), 1 m *1) (above 15 GHz)

*1) Distance Factor: 20 x log (3.0 m / 1.0 m) = 9.5 dB
*2) Average Power Measurement was performed based on 6.0 & 12.2.5 of "KDB 558074 D01 DTS Meas Guidance v03r03"

- The carrier level and noise levels were confirmed at each position of X, Y and Z axes of EUT to see the position of maximum noise, and the test was made at the position that has the maximum noise.

The test results and limit are rounded off to one decimal place, so some differences might be observed.

Measurement range : 30 M - 25 GHz
Test data : APPENDIX
Test result : Pass

SECTION 7: Antenna Terminal Conducted Tests

Test Procedure

The tests were made with below setting connected to the antenna port.

Test	Span	RBW	VBW	Sweep time	Detector	Trace	Instrument used
6dB Bandwidth	50 MHz	100 kHz	300 kHz	Auto	Peak	Max Hold	Spectrum Analyzer
99% Occupied Bandwidth *1)	Enough width to display emission skirts	1 to 5 % of OBW	Three times of RBW	Auto	Peak	Max Hold	Spectrum Analyzer
Maximum Peak Output Power	-	-	-	Auto	Peak/ Average *2)	-	Power Meter (Sensor: 50 MHz BW)
Peak Power Density	1.5 times the 6dB Bandwidth	3 kHz	9.1 kHz	Auto	Peak	Max Hold	Spectrum Analyzer *3)
Conducted Spurious Emission *4)	9kHz to 150kHz	200 Hz	620 Hz	Auto	Peak	Max Hold	Spectrum Analyzer
	150kHz to 30MHz	10 kHz	30 kHz				
Band Edge confirmation	100 MHz	100 kHz	300 kHz	Auto	Peak	Max Hold	Spectrum Analyzer *2)

*1) Peak hold was applied as Worst-case measurement.
*2) Reference data
*3) Section 10.2 Method PKPSD (peak PSD) of "KDB 558074 D01 DTS Meas Guidance v03r03".
*4) In the frequency range below 30MHz, RBW was narrowed to separate the noise contents.
Then, wide-band noise near the limit was checked separately, however the noise was not detected as shown in the chart.
(9 kHz - 150 kHz: RBW = 200 Hz, 150 kHz - 30 MHz: RBW = 10 kHz)

The test results and limit are rounded off to two decimals place, so some differences might be observed.

Test data : APPENDIX
Test result : Pass

APPENDIX 1: Test data

Conducted Emission

[Normal Power mode]

DATA OF CONDUCTED EMISSION TEST

UL Japan,Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2015/07/31

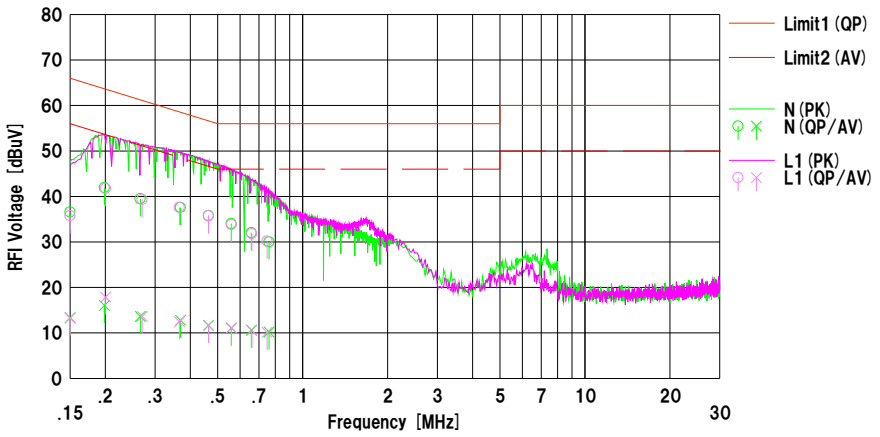
Mode : Tx_11g_2412MHz, Power : 12dBm

Power : DC 1.8 V / DC 3.3 V
Temp./Humi. : 25 deg.C / 45 %RH

Remarks : DC Line:1.8 V Side

Limit1 : FCC 15C (15.207) QP
Limit2 : FCC 15C (15.207) AV

Engineer : Shinichi Takano



No.	Freq.	Reading <QP>	Reading <AV>	C.Fac	Results <QP>	Results <AV>	Limit <QP>	Limit <AV>	Margin <QP>	Margin <AV>	Phase	Comment
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	0.15000	24.22	1.00	12.35	36.57	13.35	66.00	56.00	29.4	42.6	N	
2	0.19861	29.63	3.68	12.34	41.97	16.02	63.67	53.67	21.7	37.6	N	
3	0.26596	27.12	1.26	12.37	39.49	13.63	61.24	51.24	21.7	37.6	N	
4	0.36921	25.22	0.40	12.37	37.59	12.77	58.52	48.52	20.9	35.7	N	
5	0.46399	23.42	-0.75	12.40	35.82	11.65	56.62	46.62	20.8	34.9	N	
6	0.55878	21.64	-1.32	12.40	34.04	11.08	56.00	46.00	21.9	34.9	N	
7	0.65780	19.63	-1.80	12.40	32.03	10.60	56.00	46.00	23.9	35.4	N	
8	0.76020	17.59	-2.20	12.43	30.02	10.23	56.00	46.00	25.9	35.7	N	
9	0.15000	23.43	0.89	12.35	35.78	13.24	66.00	56.00	30.2	42.7	L1	
10	0.20050	29.43	5.54	12.34	41.77	17.88	63.59	53.59	21.8	35.7	L1	
11	0.27010	27.00	1.27	12.37	39.37	13.64	61.11	51.11	21.7	37.4	L1	
12	0.36600	25.24	0.12	12.37	37.61	12.49	58.59	48.59	20.9	36.1	L1	
13	0.46399	23.33	-0.77	12.40	35.73	11.63	56.62	46.62	20.8	34.9	L1	
14	0.55988	21.43	-1.31	12.40	33.83	11.09	56.00	46.00	22.1	34.9	L1	
15	0.66080	19.40	-1.82	12.40	31.80	10.58	56.00	46.00	24.2	35.4	L1	
16	0.74800	17.80	-2.30	12.40	30.20	10.10	56.00	46.00	25.8	35.9	L1	

Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+Cable+ATT) [dB]
LISN:SLS-05

Conducted Emission

[Normal Power mode]

DATA OF CONDUCTED EMISSION TEST

UL Japan,Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2015/07/31

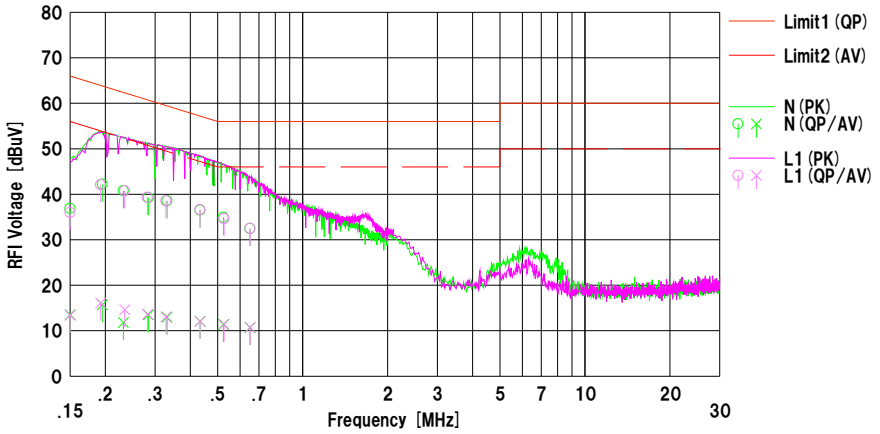
Mode : Tx_11g_2412MHz, Power : 12dBm

Power : DC 1.8 V / DC 3.3 V
Temp./Humi. : 25 deg.C / 45 %RH

Remarks : DC Line:3.3 V Side

Limit1 : FCC 15C (15.207) QP
Limit2 : FCC 15C (15.207) AV

Engineer : Shinichi Takano



No.	Freq.	Reading <QP>	Reading <AV>	C.Fac	Results <QP>	Results <AV>	Limit <QP>	Limit <AV>	Margin <QP>	Margin <AV>	Phase	Comment
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	0.15000	24.49	1.17	12.35	36.84	13.52	66.00	56.00	29.1	42.4	N	
2	0.19520	29.87	3.37	12.34	42.21	15.71	63.81	53.81	21.6	38.1	N	
3	0.23160	28.43	-0.56	12.37	40.80	11.81	62.39	52.39	21.5	40.5	N	
4	0.28400	26.89	1.13	12.37	39.26	13.50	60.70	50.70	21.4	37.2	N	
5	0.33100	26.22	0.62	12.37	38.59	12.99	59.43	49.43	20.8	36.4	N	
6	0.43335	24.12	-0.28	12.38	36.50	12.10	57.19	47.19	20.6	35.0	N	
7	0.52425	22.53	-1.03	12.40	34.93	11.37	56.00	46.00	21.0	34.6	N	
8	0.65118	20.05	-1.67	12.40	32.45	10.73	56.00	46.00	23.5	35.2	N	
9	0.15000	23.67	1.04	12.35	36.02	13.39	66.00	56.00	29.9	42.6	L1	
10	0.19266	29.74	3.76	12.34	42.08	16.10	63.92	53.92	21.8	37.8	L1	
11	0.23430	28.38	2.27	12.37	40.75	14.64	62.30	52.30	21.5	37.6	L1	
12	0.28180	26.96	1.25	12.37	39.33	13.62	60.76	50.76	21.4	37.1	L1	
13	0.32810	26.17	0.67	12.37	38.54	13.04	59.50	49.50	20.9	36.4	L1	
14	0.43335	24.23	-0.33	12.38	36.61	12.05	57.19	47.19	20.5	35.1	L1	
15	0.52690	22.25	-0.99	12.40	34.65	11.41	56.00	46.00	21.3	34.5	L1	
16	0.65200	20.09	-1.66	12.40	32.49	10.74	56.00	46.00	23.5	35.2	L1	

Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+Cable+ATT) [dB]
LISN:SLS-05

Conducted Emission

[Low Power mode]

DATA OF CONDUCTED EMISSION TEST

UL Japan,Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2015/07/31

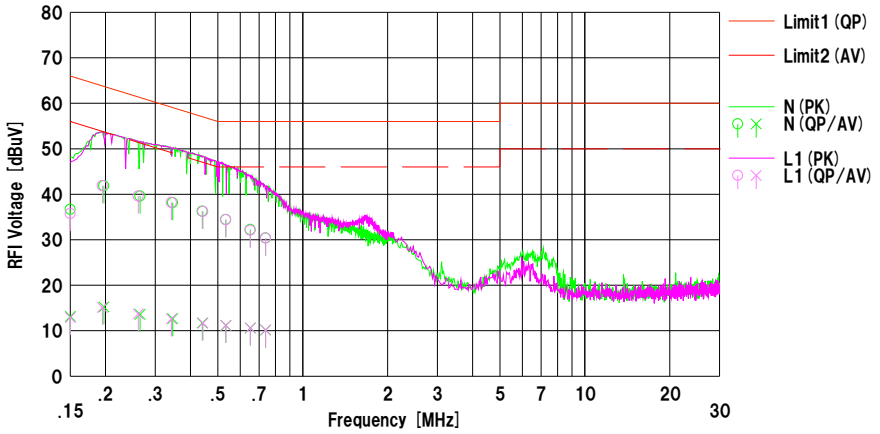
Mode : Tx_11g_2412MHz, Power : 8dBm

Power : DC 1.8 V / DC 3.3 V
Temp./Humi. : 25 deg.C / 45 %RH

Remarks : DC Line:1.8 V Side

Limit1 : FCC 15C (15.207) QP
Limit2 : FCC 15C (15.207) AV

Engineer : Shinichi Takano



No.	Freq.	Reading <QP>	Reading <AV>	C.Fac	Results <QP>	Results <AV>	Limit <QP>	Limit <AV>	Margin <QP>	Margin <AV>	Phase	Comment
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	0.15000	24.34	0.78	12.35	36.69	13.13	66.00	56.00	29.3	42.8	N	
2	0.19741	29.51	2.89	12.34	41.85	15.23	63.72	53.72	21.8	38.4	N	
3	0.26500	27.22	1.25	12.37	39.59	13.62	61.27	51.27	21.6	37.6	N	
4	0.34580	25.79	0.29	12.37	38.16	12.66	59.06	49.06	20.9	36.4	N	
5	0.44090	23.88	-0.67	12.38	36.26	11.71	57.04	47.04	20.7	35.3	N	
6	0.53379	22.05	-1.22	12.40	34.45	11.18	56.00	46.00	21.5	34.8	N	
7	0.65211	19.85	-1.81	12.40	32.25	10.59	56.00	46.00	23.7	35.4	N	
8	0.73869	17.97	-2.26	12.40	30.37	10.14	56.00	46.00	25.6	35.8	N	
9	0.15000	23.41	0.55	12.35	35.76	12.90	66.00	56.00	30.2	43.1	L1	
10	0.19489	29.56	2.77	12.34	41.90	15.11	63.83	53.83	21.9	38.7	L1	
11	0.26136	27.22	1.32	12.38	39.60	13.70	61.39	51.39	21.7	37.6	L1	
12	0.34274	25.84	0.23	12.37	38.21	12.60	59.14	49.14	20.9	36.5	L1	
13	0.44300	23.84	-0.67	12.39	36.23	11.72	57.01	47.01	20.7	35.2	L1	
14	0.53400	21.98	-1.22	12.40	34.38	11.18	56.00	46.00	21.6	34.8	L1	
15	0.65200	19.69	-1.81	12.40	32.09	10.59	56.00	46.00	23.9	35.4	L1	
16	0.73900	18.00	-2.21	12.40	30.40	10.19	56.00	46.00	25.6	35.8	L1	

Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+Cable+ATT) [dB]
LISN:SLS-05

Conducted Emission

[Low Power mode]

DATA OF CONDUCTED EMISSION TEST

UL Japan,Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2015/07/31

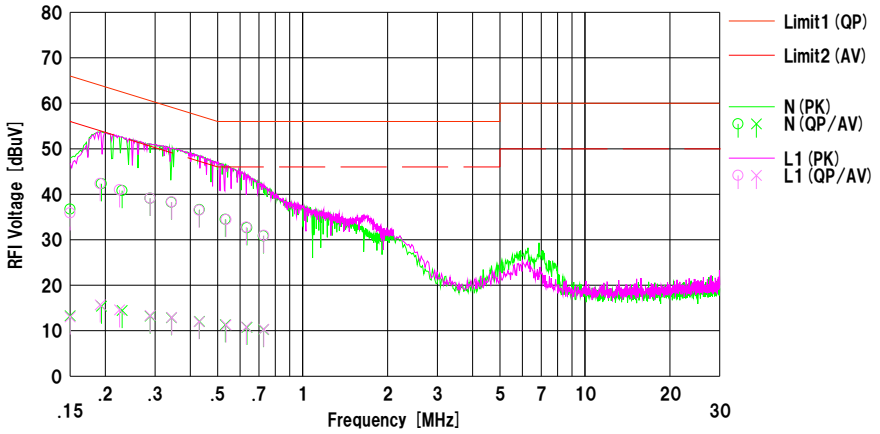
Mode : Tx_11g_2412MHz, Power : 8dBm

Power : DC 1.8 V / DC 3.3 V
Temp./Humi. : 25 deg.C / 45 %RH

Remarks : DC Line:3.3 V Side

Limit1 : FCC 15C (15.207) QP
Limit2 : FCC 15C (15.207) AV

Engineer : Shinichi Takano



No.	Freq.	Reading <QP>	Reading <AV>	C.Fac	Results <QP>	Results <AV>	Limit <QP>	Limit <AV>	Margin <QP>	Margin <AV>	Phase	Comment
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	0.15000	24.40	0.93	12.35	36.75	13.28	66.00	56.00	29.2	42.7	N	
2	0.19380	29.98	3.06	12.34	42.32	15.40	63.87	53.87	21.5	38.4	N	
3	0.22942	28.44	2.07	12.37	40.81	14.44	62.47	52.47	21.6	38.0	N	
4	0.28844	26.75	0.87	12.36	39.11	13.23	60.57	50.57	21.4	37.3	N	
5	0.34300	25.89	0.51	12.37	38.26	12.88	59.13	49.13	20.8	36.2	N	
6	0.43117	24.23	-0.32	12.38	36.61	12.06	57.23	47.23	20.6	35.1	N	
7	0.53258	22.11	-1.08	12.40	34.51	11.32	56.00	46.00	21.4	34.6	N	
8	0.63500	20.23	-1.67	12.41	32.64	10.74	56.00	46.00	23.3	35.2	N	
9	0.72681	18.44	-2.16	12.40	30.84	10.24	56.00	46.00	25.1	35.7	N	
10	0.15000	23.55	0.70	12.35	35.90	13.05	66.00	56.00	30.1	42.9	L1	
11	0.19180	29.99	3.32	12.35	42.34	15.67	63.96	53.96	21.6	38.2	L1	
12	0.22460	28.63	2.23	12.36	40.99	14.59	62.65	52.65	21.6	38.0	L1	
13	0.28844	26.77	1.00	12.36	39.13	13.36	60.57	50.57	21.4	37.2	L1	
14	0.34370	25.94	0.55	12.37	38.31	12.92	59.11	49.11	20.8	36.1	L1	
15	0.43000	24.11	-0.39	12.38	36.49	11.99	57.25	47.25	20.7	35.2	L1	
16	0.53530	22.05	-1.12	12.40	34.45	11.28	56.00	46.00	21.5	34.7	L1	
17	0.63190	20.36	-1.61	12.41	32.77	10.80	56.00	46.00	23.2	35.2	L1	
18	0.72890	18.54	-2.08	12.40	30.94	10.32	56.00	46.00	25.0	35.6	L1	

Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+Cable+ATT) [dB]
LISN:SLS-05

6dB Bandwidth

Test place	Shonan EMC Lab. No.1 Measurement Room
Report No.	10840757S-G
Date	July 10, 2015
Temperature / Humidity	25 deg. C / 67 % RH
Engineer	Shinichi Takano
Mode	Tx

Normal Power mode

Mode	Frequency [MHz]	6dB Bandwidth [MHz]	Limit [kHz]
11b	2412	10.116	> 500
	2437	10.112	> 500
	2462	10.111	> 500
11g	2412	16.397	> 500
	2437	16.404	> 500
	2462	16.409	> 500
11n-20	2412	17.645	> 500
	2437	17.627	> 500
	2462	17.649	> 500

Low Power mode

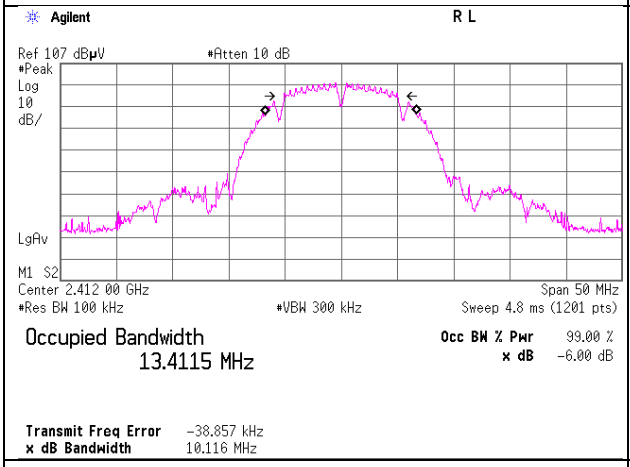
Mode	Frequency [MHz]	6dB Bandwidth [MHz]	Limit [kHz]
11b	2412	10.131	> 500
	2437	10.111	> 500
	2462	10.114	> 500
11g	2412	16.423	> 500
	2437	16.392	> 500
	2462	16.387	> 500
11n-20	2412	17.629	> 500
	2437	17.645	> 500
	2462	17.622	> 500

6dB Bandwidth

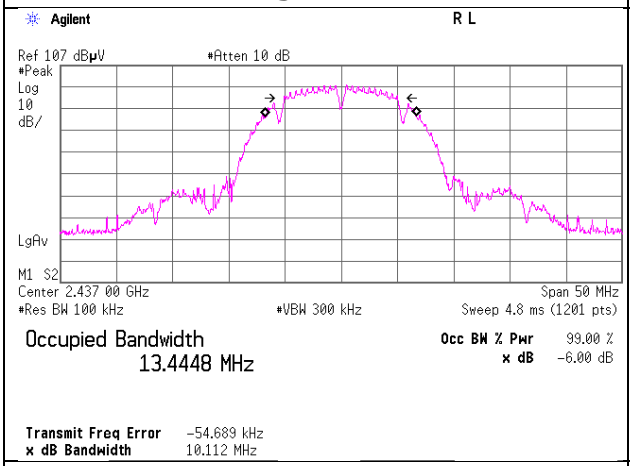
[Normal Power mode]

11b

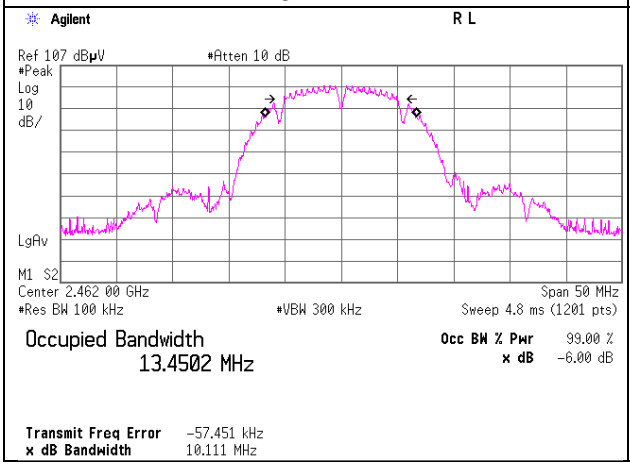
2412 MHz



2437 MHz

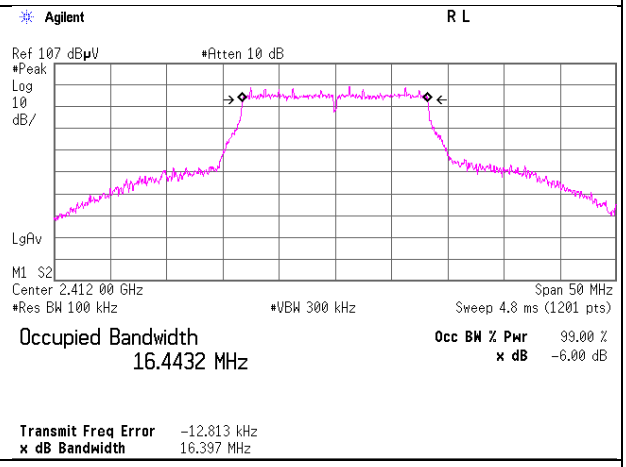


2462 MHz

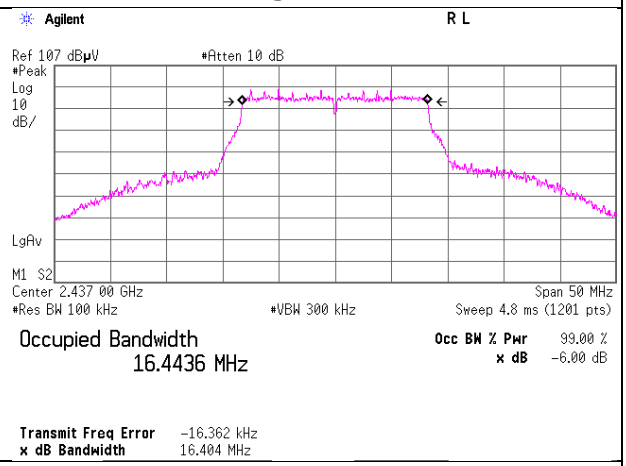


11g

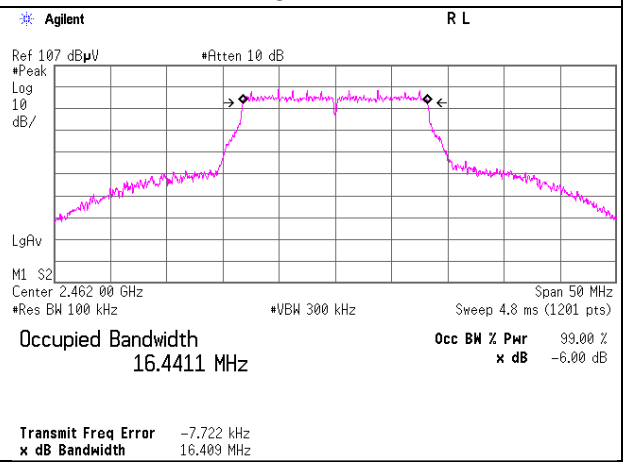
2412 MHz



2437 MHz



2462 MHz

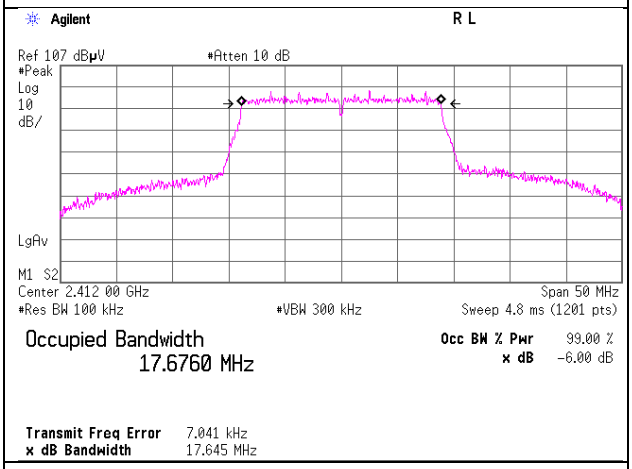


6dB Bandwidth

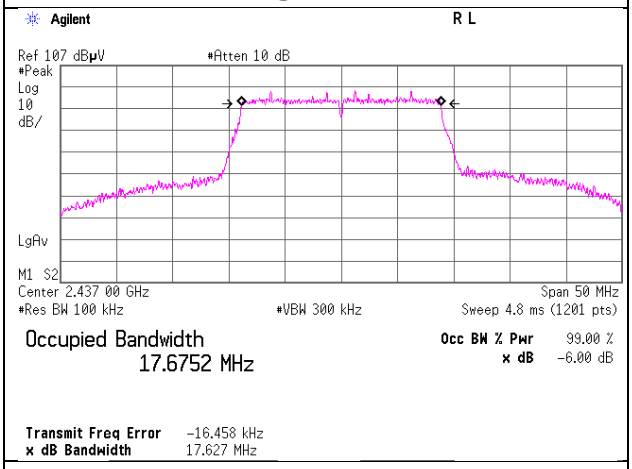
[Normal Power mode]

11n-20

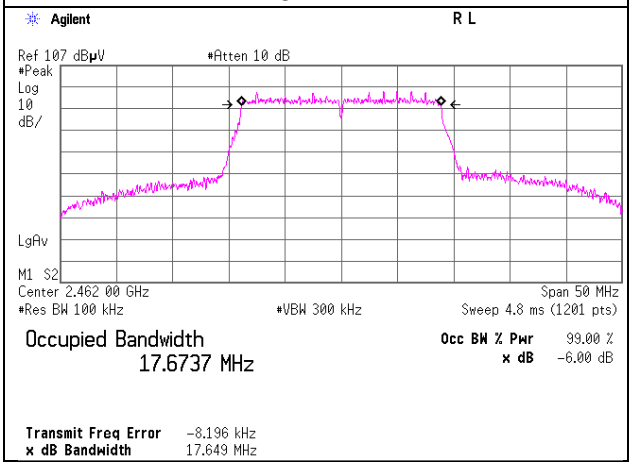
2412 MHz



2437 MHz



2462 MHz

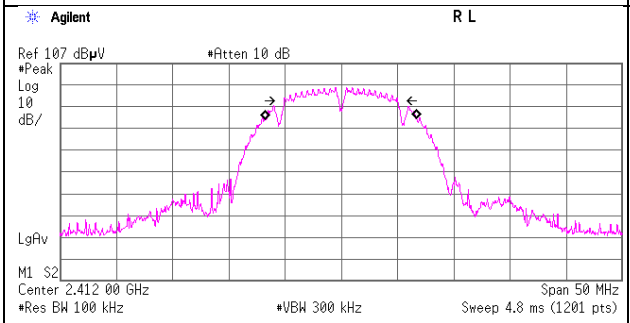


6dB Bandwidth

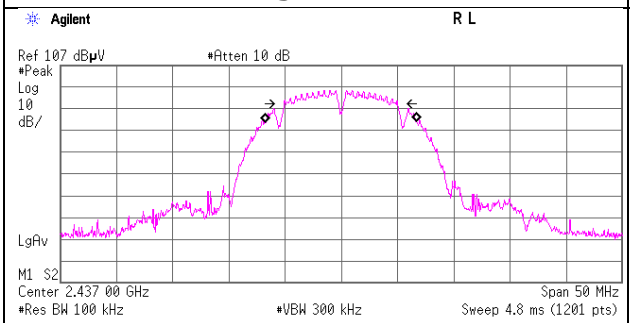
[Low Power mode]

11b

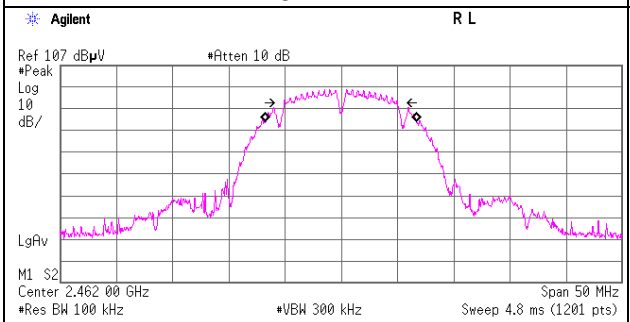
2412 MHz



2437 MHz

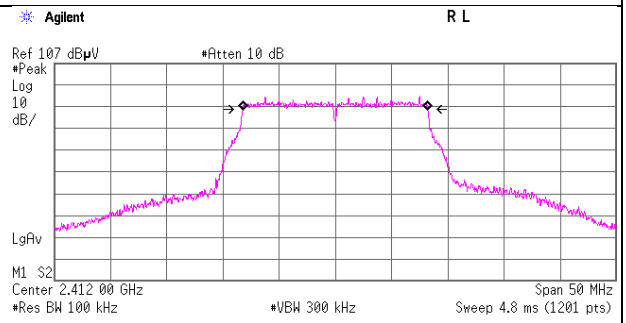


2462 MHz

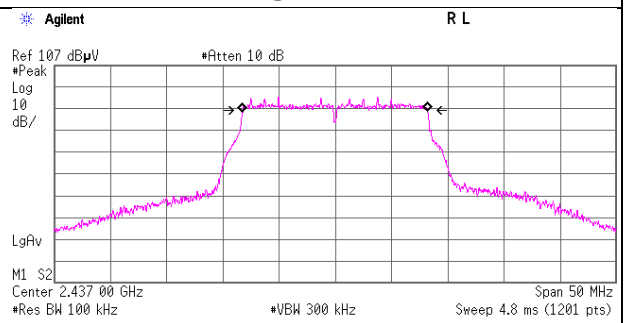


11g

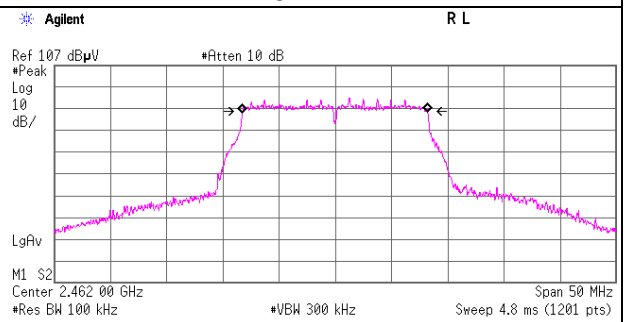
2412 MHz



2437 MHz



2462 MHz

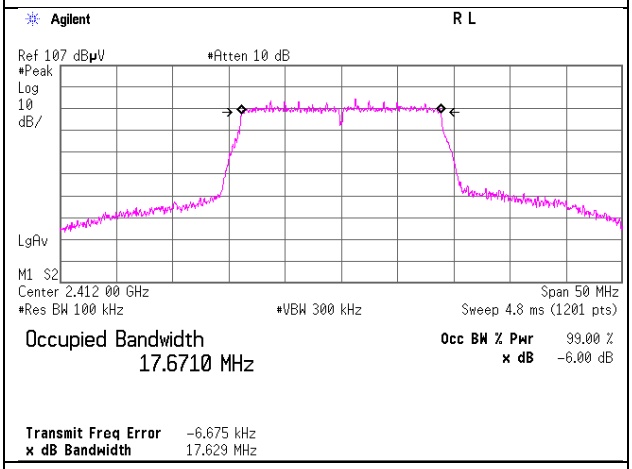


6dB Bandwidth

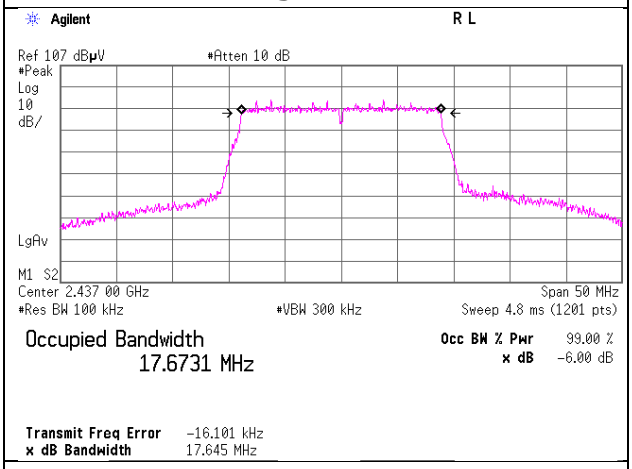
[Low Power mode]

11n-20

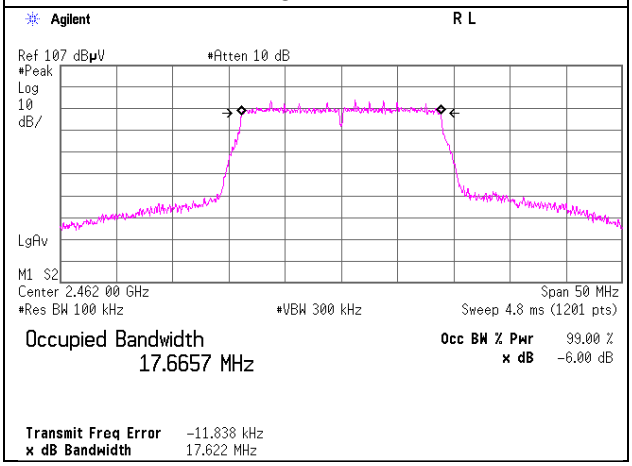
2412 MHz



2437 MHz



2462 MHz



Maximum Peak Output Power

Test place	Shonan EMC Lab. No.1 Measurement Room
Report No.	10840757S-G
Date	July 10, 2015
Temperature / Humidity	25 deg. C / 67 % RH
Engineer	Shinichi Takano
Mode	Tx 11b

Normal Power mode

Freq.	Reading	Cable Loss	Atten. Loss	Result		Limit		Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]
2412	4.03	1.39	9.99	15.41	34.75	30.00	1000	14.59
2437	3.96	1.39	10.00	15.35	34.28	30.00	1000	14.65
2462	3.76	1.39	10.00	15.15	32.73	30.00	1000	14.85

Low Power mode

Freq.	Reading	Cable Loss	Atten. Loss	Result		Limit		Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]
2412	1.80	1.39	9.99	13.18	20.80	30.00	1000	16.82
2437	1.73	1.39	10.00	13.12	20.51	30.00	1000	16.88
2462	1.63	1.39	10.00	13.02	20.04	30.00	1000	16.98

Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

*The equipment and cables were not used for factor 0 dB of the data sheets.

Normal Power mode, 2412MHz

Rate	Reading	Remark
[Mbps]	[dBm]	
1	4.03	*
2	3.98	
5.5	3.71	
11	3.86	

*: Worst Rate
All comparison were carried out on same frequency and measurement factors.

Maximum Peak Output Power

Test place	Shonan EMC Lab. No.1 Measurement Room
Report No.	10840757S-G
Date	July 10, 2015
Temperature / Humidity	25 deg. C / 67 % RH
Engineer	Shinichi Takano
Mode	Tx 11g

Normal Power mode

Freq.	Reading	Cable Loss	Atten. Loss	Result		Limit		Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]
2412	11.36	1.39	9.99	22.74	187.93	30.00	1000	7.26
2437	11.30	1.39	10.00	22.69	185.78	30.00	1000	7.31
2462	11.12	1.39	10.00	22.51	178.24	30.00	1000	7.49

Low Power mode

Freq.	Reading	Cable Loss	Atten. Loss	Result		Limit		Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]
2412	8.01	1.39	9.99	19.39	86.90	30.00	1000	10.61
2437	7.81	1.39	10.00	19.20	83.18	30.00	1000	10.80
2462	7.73	1.39	10.00	19.12	81.66	30.00	1000	10.88

Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

*The equipment and cables were not used for factor 0 dB of the data sheets.

Normal Power mode, 2412 MHz

Rate	Reading	Remark
[Mbps]	[dBm]	
6	11.36	*
9	10.78	
12	10.61	
18	10.60	
24	11.19	
36	11.01	
48	11.05	
54	11.03	

*: Worst Rate
All comparison were carried out on same frequency and measurement factors.

Maximum Peak Output Power

Test place	Shonan EMC Lab. No.1 Measurement Room
Report No.	10840757S-G
Date	July 10, 2015
Temperature / Humidity	25 deg. C / 67 % RH
Engineer	Shinichi Takano
Mode	Tx 11n-20

Normal Power mode

Freq.	Reading	Cable Loss	Atten. Loss	Result		Limit		Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]
2412	10.22	1.39	9.99	21.60	144.54	30.00	1000	8.40
2437	10.17	1.39	10.00	21.56	143.22	30.00	1000	8.44
2462	10.09	1.39	10.00	21.48	140.60	30.00	1000	8.52

Low Power mode

Freq.	Reading	Cable Loss	Atten. Loss	Result		Limit		Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]
2412	6.22	1.39	9.99	17.60	57.54	30.00	1000	12.40
2437	6.13	1.39	10.00	17.52	56.49	30.00	1000	12.48
2462	6.06	1.39	10.00	17.45	55.59	30.00	1000	12.55

Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

*The equipment and cables were not used for factor 0.0 dB of the data sheets.

Normal Power mode, 2412 MHz

MCS Number	Reading [dBm]	Remark
0	10.22	*
1	10.15	
2	10.00	
3	9.23	
4	9.82	
5	9.68	
6	10.15	
7	10.01	

* Worst MCS
All comparison were carried out on same frequency and measurement factors.

Average Output Power
(Reference data for SAR testing)

Test place	Shonan EMC Lab. No.1 Measurement Room
Report No.	10840757S-G
Date	July 10, 2015
Temperature / Humidity	25 deg. C / 67 % RH
Engineer	Shinichi Takano
Mode	Tx 11b

Normal Power mode

Freq.	Reading	Cable Loss	Atten. Loss	Result (Frame power)		Duty factor	Result (Burst power)	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dB]	[dBm]	[mW]
2412	1.45	1.39	9.99	12.83	19.19	0.00	12.83	19.19
2437	1.40	1.39	10.00	12.79	19.01	0.00	12.79	19.01
2462	1.23	1.39	10.00	12.62	18.28	0.00	12.62	18.28

Low Power mode

Freq.	Reading	Cable Loss	Atten. Loss	Result (Frame power)		Duty factor	Result (Burst power)	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dB]	[dBm]	[mW]
2412	-0.73	1.39	9.99	10.65	11.61	0.00	10.65	11.61
2437	-0.84	1.39	10.00	10.55	11.35	0.00	10.55	11.35
2462	-0.92	1.39	10.00	10.47	11.14	0.00	10.47	11.14

Sample Calculation:
Result (Frame power) = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuato
Result (Burst power) = Frame power + Duty factor

*The equipment and cables were not used for factor 0 dB of the data sheets.

Normal Power mode, 2412 MHz

Mode	Rate	Reading	Duty factor	Burst power	Remarks
	Mbps	[dBm]	[dB]	[dBm]	
11b	1	1.45	0.00	1.45	*
	2	1.42	0.01	1.43	
	5.5	1.21	0.02	1.23	
	11	1.27	0.04	1.31	

* Worst rate
Sample Calculation:
Burst power = Reading (timed average) + Duty factor
All comparison were carried out on same frequency and measurement factors.

Average Output Power
(Reference data for SAR testing)

Test place	Shonan EMC Lab. No.1 Measurement Room
Report No.	10840757S-G
Date	July 10, 2015
Temperature / Humidity	25 deg. C / 67 % RH
Engineer	Shinichi Takano
Mode	Tx 11g

Normal Power mode

Freq.	Reading	Cable Loss	Atten. Loss	Result (Frame power)		Duty factor	Result (Burst power)	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dB]	[dBm]	[mW]
2412	1.23	1.39	9.99	12.61	18.24	0.02	12.63	18.32
2437	1.12	1.39	10.00	12.51	17.82	0.02	12.53	17.91
2462	0.96	1.39	10.00	12.35	17.18	0.02	12.37	17.26

Low Power mode

Freq.	Reading	Cable Loss	Atten. Loss	Result (Frame power)		Duty factor	Result (Burst power)	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dB]	[dBm]	[mW]
2412	-2.74	1.39	9.99	8.64	7.31	0.02	8.66	7.35
2437	-2.79	1.39	10.00	8.60	7.24	0.02	8.62	7.28
2462	-2.85	1.39	10.00	8.54	7.14	0.02	8.56	7.18

Sample Calculation:
Result (Frame power) = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuato
Result (Burst power) = Frame power + Duty factor

*The equipment and cables were not used for factor 0 dB of the data sheets.

Normal Power mode, 2412 MHz

Mode	Rate	Reading	Duty factor	Burst power	Remarks
	Mbps	[dBm]	[dB]	[dBm]	
11g	6	1.23	0.02	1.25	*
	9	1.20	0.04	1.24	
	12	1.13	0.05	1.18	
	18	1.15	0.07	1.22	
	24	1.08	0.10	1.18	
	36	0.97	0.14	1.11	
	48	0.81	0.19	1.00	
	54	1.01	0.20	1.21	

* Worst rate
Sample Calculation:
Burst power = Reading (timed average) + Duty factor
All comparison were carried out on same frequency and measurement factors.

Average Output Power
(Reference data for SAR testing)

Test place	Shonan EMC Lab. No.1 Measurement Room
Report No.	10840757S-G
Date	July 10, 2015
Temperature / Humidity	25 deg. C / 67 % RH
Engineer	Shinichi Takano
Mode	Tx 11n-20

Normal Power mode

Freq.	Reading	Cable Loss	Atten. Loss	Result (Frame power)		Duty factor	Result (Burst power)	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dB]	[dBm]	[mW]
2412	0.32	1.39	9.99	11.70	14.79	0.03	11.73	14.89
2437	0.25	1.39	10.00	11.64	14.59	0.03	11.67	14.69
2462	0.15	1.39	10.00	11.54	14.26	0.03	11.57	14.35

Low Power mode

Freq.	Reading	Cable Loss	Atten. Loss	Result (Frame power)		Duty factor	Result (Burst power)	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dB]	[dBm]	[mW]
2412	-3.86	1.39	9.99	7.52	5.65	0.03	7.55	5.69
2437	-3.97	1.39	10.00	7.42	5.52	0.03	7.45	5.56
2462	-4.05	1.39	10.00	7.34	5.42	0.03	7.37	5.46

Sample Calculation:
Result (Frame power) = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuato
Result (Burst power) = Frame power + Duty factor

*The equipment and cables were not used for factor 0 dB of the data sheets.

Normal Power mode, 2412 MHz

Mode	Rate MCS	Reading [dBm]	Duty factor [dB]	Burst power [dBm]	Remarks
11n-20	0	0.32	0.03	0.35	*
	1	0.25	0.05	0.30	
	2	0.19	0.07	0.26	
	3	0.11	0.10	0.21	
	4	-0.08	0.15	0.07	
	5	-0.06	0.19	0.13	
	6	-0.05	0.21	0.16	
	7	-0.13	0.21	0.08	

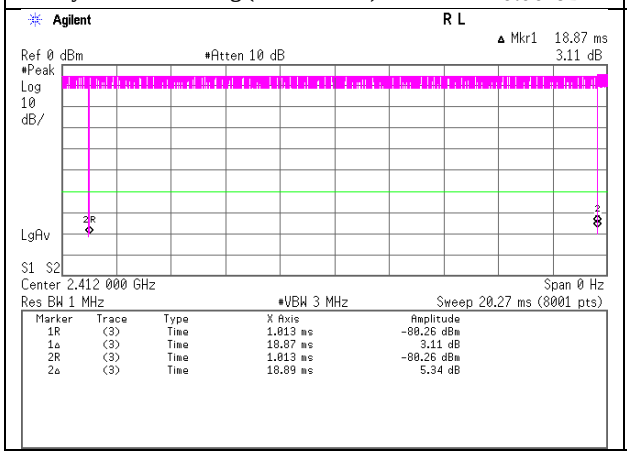
* Worst rate
Sample Calculation:
Burst power = Reading (timed average) + Duty factor
All comparison were carried out on same frequency and measurement factors.

Burst rate confirmation

Test place	Shonan EMC Lab. No.1 Measurement Room
Report No.	10840757S-G
Date	July 10, 2015
Temperature / Humidity	25 deg. C / 67 % RH
Engineer	Shinichi Takano
Mode	Tx

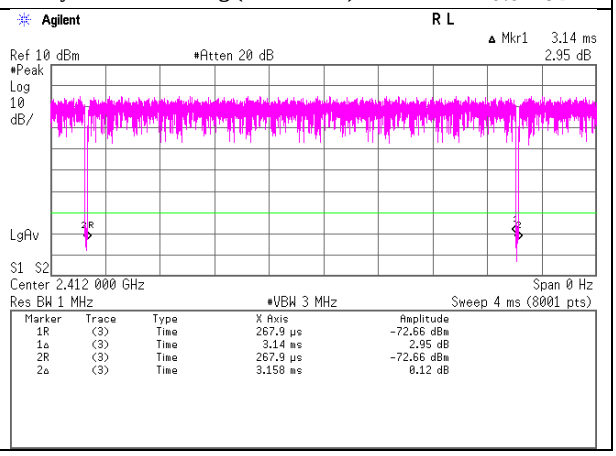
11b 1 Mbps

Tx on / (Tx on + Tx off) =	**0.999**
Tx on / (Tx on + Tx off) * 100 =	**99.9 %**
Duty factor = 10 * log (18.89 / 18.87) =	**0.00 dB**



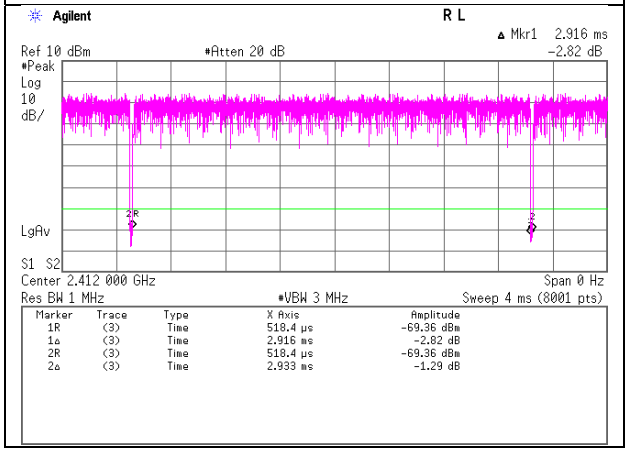
11g 6 Mbps

Tx on / (Tx on + Tx off) =	**0.994**
Tx on / (Tx on + Tx off) * 100 =	**99.4 %**
Duty factor = 10 * log (3.158 / 3.14) =	**0.02 dB**



11n-20 MCS 0

Tx on / (Tx on + Tx off) =	**0.994**
Tx on / (Tx on + Tx off) * 100 =	**99.4 %**
Duty factor = 10 * log (2.933 / 2.916) =	**0.03 dB**



Radiated Spurious Emission

Test place	Shonan EMC Lab. No.1, and 2 Semi Anechoic Chamber	
Report No.	10840757S-G	
Date	July 23, 2015	July 30, 2015
Temperature / Humidity	22 deg. C / 69 % RH	25 deg. C / 67 % RH
Engineer	Hiroyuki Morikawa (1-15GHz, No.1 SAC)	Wataru Kojima (15-25GHz, No.2 SAC)
Mode	Tx 11b 2412 MHz [Normal Power mode]	

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2390.000	PK	46.0	25.9	14.8	40.7	2.4	48.4	73.9	25.5	100	28	
Hori.	4824.000	PK	50.8	30.6	7.3	41.6	2.4	49.5	73.9	24.4	100	213	
Hori.	7236.000	PK	46.7	36.2	8.7	41.2	2.4	52.8	73.9	21.1	100	0	
Hori.	9648.000	PK	45.6	38.3	9.8	40.1	2.4	56.0	73.9	17.9	100	0	
Hori.	2390.000	AV	36.6	25.9	14.8	40.7	2.4	39.0	53.9	14.9	100	28	
Hori.	4824.000	AV	40.1	30.6	7.3	41.6	2.4	38.8	53.9	15.1	100	213	
Hori.	7236.000	AV	37.2	36.2	8.7	41.2	2.4	43.3	53.9	10.6	100	0	
Hori.	9648.000	AV	36.4	38.3	9.8	40.1	2.4	46.8	53.9	7.1	100	0	
Vert.	2390.000	PK	46.1	25.9	14.8	40.7	2.4	48.5	73.9	25.4	267	348	
Vert.	4824.000	PK	48.6	30.6	7.3	41.6	2.4	47.3	73.9	26.6	100	9	
Vert.	7236.000	PK	47.0	36.2	8.7	41.2	2.4	53.1	73.9	20.8	100	0	
Vert.	9648.000	PK	45.7	38.3	9.8	40.1	2.4	56.1	73.9	17.8	100	0	
Vert.	2390.000	AV	36.3	25.9	14.8	40.7	2.4	38.7	53.9	15.2	267	348	
Vert.	4824.000	AV	39.1	30.6	7.3	41.6	2.4	37.8	53.9	16.1	100	9	
Vert.	7236.000	AV	37.7	36.2	8.7	41.2	2.4	43.8	53.9	10.1	100	0	
Vert.	9648.000	AV	36.5	38.3	9.8	40.1	2.4	46.9	53.9	**7.0**	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 15 GHz : 20log (3.935 m / 3.0 m) = 2.4 dB
15 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

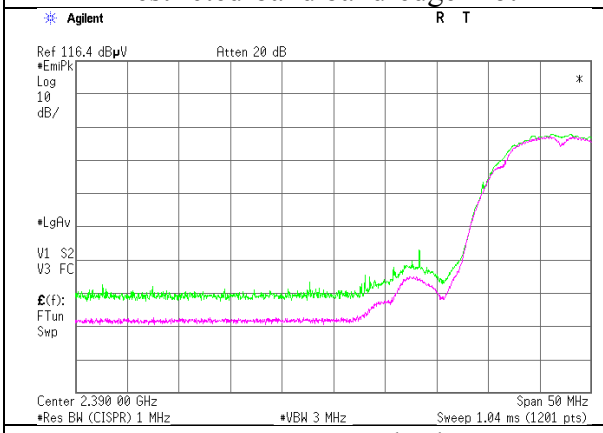
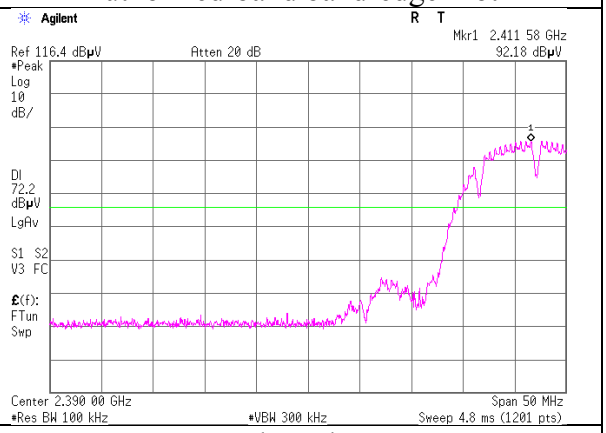
20 dBc Data Sheet **(RBW 100 kHz, VBW 300 kHz)**

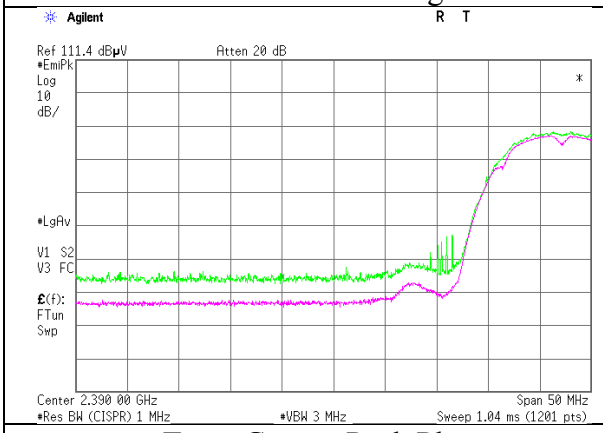
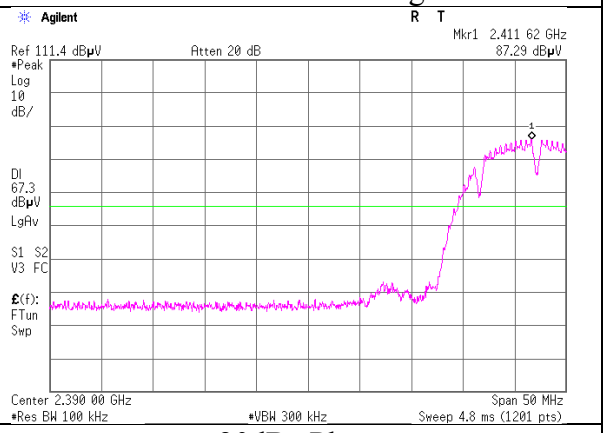
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	92.4	26.0	14.8	40.7	2.4	94.9	-	-	Carrier
Hori.	2397.360	PK	48.3	26.0	14.8	40.7	2.4	50.8	74.8	24.0	
Hori.	2400.000	PK	47.8	26.0	14.8	40.7	2.4	50.3	74.8	24.5	
Vert.	2412.000	PK	87.7	26.0	14.8	40.7	2.4	90.2	-	-	Carrier
Vert.	2397.360	PK	43.9	26.0	14.8	40.7	2.4	46.4	70.2	23.8	
Vert.	2400.000	PK	44.4	26.0	14.8	40.7	2.4	46.9	70.2	23.3	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 15 GHz : 20log (3.935 m / 3.0 m) = 2.4 dB
15 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission
(Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.1 Semi Anechoic Chamber
Report No.	10840757S-G
Date	July 23, 2015
Temperature / Humidity	22 deg. C / 69 % RH
Engineer	Hiroyuki Morikawa
Mode	Tx 11b 2412 MHz [Normal Power mode]

Horizontal	
Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

Vertical	
Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.1, and 2 Semi Anechoic Chamber	
Report No.	10840757S-G	
Date	July 25, 2015	July 30, 2015
Temperature / Humidity	26 deg. C / 68 % RH	25 deg. C / 67 % RH
Engineer	Shinichi Takano (1-15GHz, No.1 SAC)	Wataru Kojima (15-25GHz, No.2 SAC)
Mode	Tx 11b 2437 MHz [Normal Power mode]	

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	4874.000	PK	48.2	30.8	7.4	41.6	2.4	47.2	73.9	26.7	100	211	
Hori.	7311.000	PK	47.2	36.3	9.0	41.3	2.4	53.6	73.9	20.3	100	0	
Hori.	9748.000	PK	45.1	38.3	9.9	40.1	2.4	55.6	73.9	18.3	100	0	
Hori.	4874.000	AV	39.8	30.8	7.4	41.6	2.4	38.8	53.9	15.1	100	211	
Hori.	7311.000	AV	38.0	36.3	9.0	41.3	2.4	44.4	53.9	9.5	100	0	
Hori.	9748.000	AV	36.0	38.3	9.9	40.1	2.4	46.5	53.9	7.4	100	0	
Vert.	4874.000	PK	47.4	30.8	7.4	41.6	2.4	46.4	73.9	27.5	100	317	
Vert.	7311.000	PK	48.0	36.3	9.0	41.3	2.4	54.4	73.9	19.5	100	0	
Vert.	9748.000	PK	44.8	38.3	9.9	40.1	2.4	55.3	73.9	18.6	100	0	
Vert.	4874.000	AV	39.1	30.8	7.4	41.6	2.4	38.1	53.9	15.8	100	317	
Vert.	7311.000	AV	38.2	36.3	9.0	41.3	2.4	44.6	53.9	9.3	100	0	
Vert.	9748.000	AV	36.2	38.3	9.9	40.1	2.4	46.7	53.9	**7.2**	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 15 GHz : 20log (3.935 m / 3.0 m) = 2.4 dB
15 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.1, and 2 Semi Anechoic Chamber	
Report No.	10840757S-G	
Date	July 25, 2015	July 30, 2015
Temperature / Humidity	26 deg. C / 68 % RH	25 deg. C / 67 % RH
Engineer	Shinichi Takano (1-15GHz, No.1 SAC)	Wataru Kojima (15-25GHz, No.2 SAC)
Mode	Tx 11b 2462 MHz [Normal Power mode]	

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2483.500	PK	50.7	26.1	14.9	40.7	2.4	53.4	73.9	20.5	122	32	
Hori.	4924.000	PK	49.1	31.0	7.5	41.6	2.4	48.4	73.9	25.5	100	324	
Hori.	7386.000	PK	46.8	36.4	8.9	41.3	2.4	53.2	73.9	20.7	100	0	
Hori.	9848.000	PK	45.4	38.3	10.0	40.0	2.4	56.1	73.9	17.8	100	0	
Hori.	2483.500	AV	36.6	26.1	14.9	40.7	2.4	39.3	53.9	14.6	122	32	
Hori.	4924.000	AV	40.6	31.0	7.5	41.6	2.4	39.9	53.9	14.0	100	324	
Hori.	7386.000	AV	37.8	36.4	8.9	41.3	2.4	44.2	53.9	9.7	100	0	
Hori.	9848.000	AV	36.0	38.3	10.0	40.0	2.4	46.7	53.9	7.2	100	0	
Vert.	2483.500	PK	46.7	26.1	14.9	40.7	2.4	49.4	73.9	24.5	220	359	
Vert.	4924.000	PK	48.4	31.0	7.5	41.6	2.4	47.7	73.9	26.2	100	316	
Vert.	7386.000	PK	46.7	36.4	8.9	41.3	2.4	53.1	73.9	20.8	100	0	
Vert.	9848.000	PK	45.2	38.3	10.0	40.0	2.4	55.9	73.9	18.0	100	0	
Vert.	2483.500	AV	36.3	26.1	14.9	40.7	2.4	39.0	53.9	14.9	220	359	
Vert.	4924.000	AV	39.5	31.0	7.5	41.6	2.4	38.8	53.9	15.1	100	316	
Vert.	7386.000	AV	39.9	36.4	8.9	41.3	2.4	46.3	53.9	7.6	100	0	
Vert.	9848.000	AV	36.4	38.3	10.0	40.0	2.4	47.1	53.9	**6.8**	100	0	

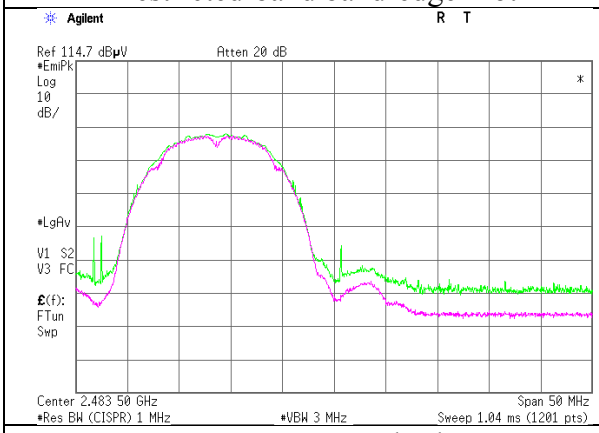
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 15 GHz : 20log (3.935 m / 3.0 m) = 2.4 dB
15 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission
(Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.1 Semi Anechoic Chamber
Report No.	10840757S-G
Date	July 25, 2015
Temperature / Humidity	26 deg. C / 68 % RH
Engineer	Shinichi Takano
Mode	Tx 11b 2462 MHz [Normal Power mode]

Horizontal

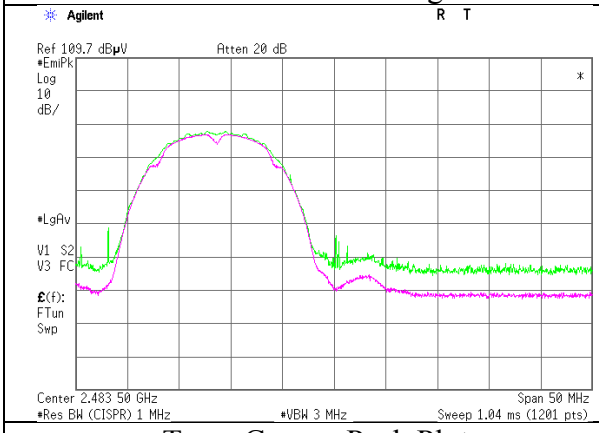
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.1, 2, and 3 Semi Anechoic Chamber		
Report No.	10840757S-G		
Date	July 23, 2015	July 30, 2015	July 31, 2015
Temperature / Humidity	22 deg. C / 69 % RH	25 deg. C / 67 % RH	25 deg. C / 45 % RH
Engineer	Hiroyuki Morikawa (1-15GHz, No.1 SAC)	Wataru Kojima (15-25GHz, No.2 SAC)	Shinichi Takano (30M-1GHz, No.3 SAC)
Mode	Tx 11g 2412 MHz [Normal Power mode]		

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	168.174	QP	22.9	15.5	7.9	32.0	0.0	14.3	43.5	29.2	150	193	
Hori.	257.691	QP	22.4	17.3	8.4	32.0	0.0	16.1	46.0	29.9	300	1	
Hori.	284.670	QP	22.4	18.6	8.6	32.0	0.0	17.6	46.0	28.4	150	38	
Hori.	912.842	QP	21.9	22.6	11.0	30.8	0.0	24.7	46.0	21.3	100	231	
Hori.	994.677	QP	21.4	23.3	11.3	30.1	0.0	25.9	53.9	28.0	150	1	
Hori.	1206.000	PK	45.2	24.0	13.3	40.7	2.4	44.2	73.9	29.7	100	0	
Hori.	2390.000	PK	53.3	25.9	14.8	40.7	2.4	55.7	73.9	18.2	100	35	
Hori.	4824.000	PK	47.5	30.6	7.3	41.6	2.4	46.2	73.9	27.7	100	204	
Hori.	7236.000	PK	46.6	36.2	8.7	41.2	2.4	52.7	73.9	21.2	100	0	
Hori.	9648.000	PK	45.5	38.3	9.8	40.1	2.4	55.9	73.9	18.0	100	0	
Hori.	1206.000	AV	36.3	24.0	13.3	40.7	2.4	35.3	53.9	18.6	100	0	
Hori.	2390.000	AV	43.6	25.9	14.8	40.7	2.4	46.0	53.9	7.9	100	35	
Hori.	4824.000	AV	38.5	30.6	7.3	41.6	2.4	37.2	53.9	16.7	100	204	
Hori.	7236.000	AV	37.2	36.2	8.7	41.2	2.4	43.3	53.9	10.6	100	0	
Hori.	9648.000	AV	36.3	38.3	9.8	40.1	2.4	46.7	53.9	7.2	100	0	
Vert.	173.452	QP	22.8	15.8	8.0	32.0	0.0	14.6	43.5	28.9	100	79	
Vert.	215.059	QP	22.9	16.5	8.2	32.0	0.0	15.6	43.5	27.9	100	339	
Vert.	283.991	QP	22.4	18.6	8.6	32.0	0.0	17.6	46.0	28.4	100	358	
Vert.	913.579	QP	22.0	22.6	11.0	30.8	0.0	24.8	46.0	21.2	100	357	
Vert.	986.783	QP	21.7	23.2	11.2	30.2	0.0	25.9	53.9	28.0	100	310	
Vert.	1206.000	PK	45.1	24.0	13.3	40.7	2.4	44.1	73.9	29.8	100	0	
Vert.	2390.000	PK	49.0	25.9	14.8	40.7	2.4	51.4	73.9	22.5	217	23	
Vert.	4824.000	PK	47.6	30.6	7.3	41.6	2.4	46.3	73.9	27.6	100	9	
Vert.	7236.000	PK	46.6	36.2	8.7	41.2	2.4	52.7	73.9	21.2	100	0	
Vert.	9648.000	PK	45.5	38.3	9.8	40.1	2.4	55.9	73.9	18.0	100	0	
Vert.	1206.000	AV	36.2	24.0	13.3	40.7	2.4	35.2	53.9	18.7	100	0	
Vert.	2390.000	AV	39.4	25.9	14.8	40.7	2.4	41.8	53.9	12.1	217	23	
Vert.	4824.000	AV	37.9	30.6	7.3	41.6	2.4	36.6	53.9	17.3	100	9	
Vert.	7236.000	AV	37.8	36.2	8.7	41.2	2.4	43.9	53.9	10.0	100	0	
Vert.	9648.000	AV	36.4	38.3	9.8	40.1	2.4	46.8	53.9	**7.1**	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 15 GHz : 20log (3.935 m / 3.0 m) = 2.4 dB
15 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

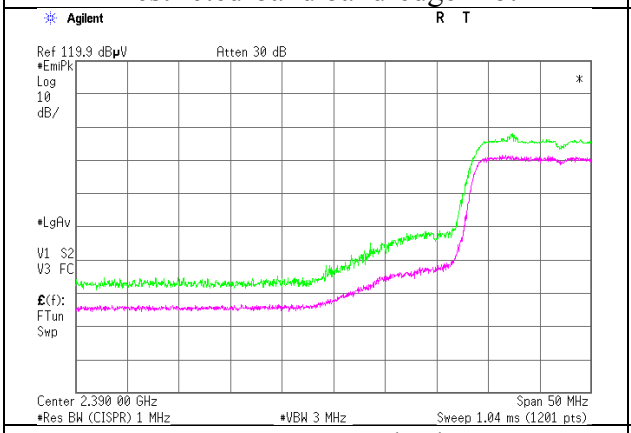
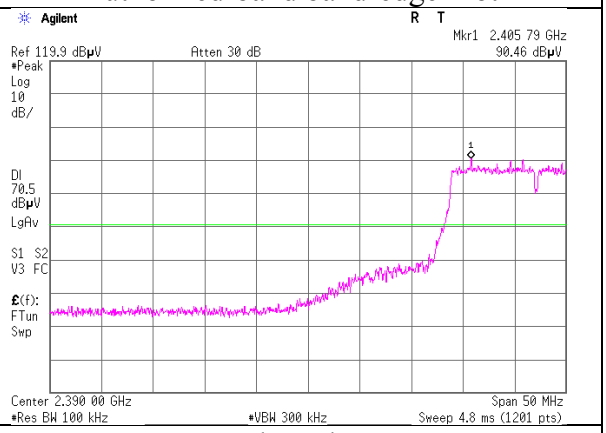
20 dBc Data Sheet **(RBW 100 kHz, VBW 300 kHz)**

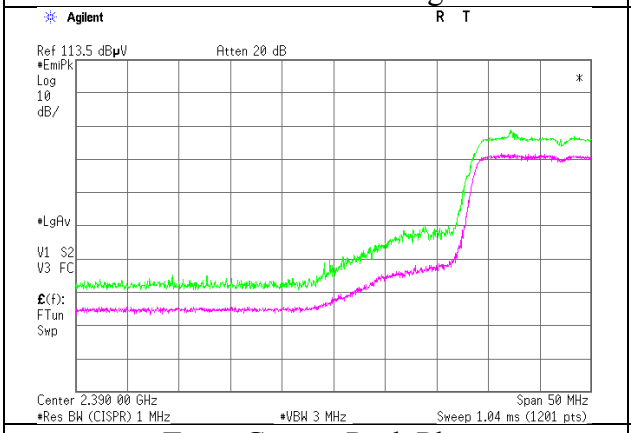
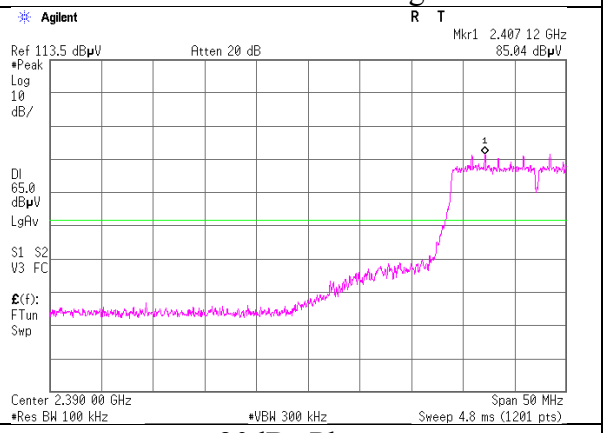
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	89.3	26.0	14.8	40.7	2.4	91.8	-	-	Carrier
Hori.	2398.839	PK	56.9	26.0	14.8	40.7	2.4	59.4	71.8	12.4	
Hori.	2400.000	PK	56.0	26.0	14.8	40.7	2.4	58.5	71.8	13.3	
Vert.	2412.000	PK	83.7	26.0	14.8	40.7	2.4	86.2	-	-	Carrier
Vert.	2398.839	PK	51.2	26.0	14.8	40.7	2.4	53.7	66.2	12.5	
Vert.	2400.000	PK	50.3	26.0	14.8	40.7	2.4	52.8	66.2	13.4	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 15 GHz : 20log (3.935 m / 3.0 m) = 2.4 dB
15 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission
(Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.1 Semi Anechoic Chamber
Report No.	10840757S-G
Date	July 23, 2015
Temperature / Humidity	22 deg. C / 69 % RH
Engineer	Hiroyuki Morikawa
Mode	Tx 11g 2412 MHz [Normal Power mode]

Horizontal	
Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

Vertical	
Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.1, and 2 Semi Anechoic Chamber	
Report No.	10840757S-G	
Date	July 25, 2015	July 30, 2015
Temperature / Humidity	26 deg. C / 68 % RH	25 deg. C / 67 % RH
Engineer	Shinichi Takano (1-15GHz, No.1 SAC)	Wataru Kojima (15-25GHz, No.2 SAC)
Mode	Tx 11g 2437 MHz [Normal Power mode]	

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	4874.000	PK	47.3	30.8	7.4	41.6	2.4	46.3	73.9	27.6	100	322	
Hori.	7311.000	PK	47.4	36.3	9.0	41.3	2.4	53.8	73.9	20.1	100	0	
Hori.	9748.000	PK	46.0	38.3	9.9	40.1	2.4	56.5	73.9	17.4	100	0	
Hori.	4874.000	AV	37.4	30.8	7.4	41.6	2.4	36.4	53.9	17.5	100	322	
Hori.	7311.000	AV	38.1	36.3	9.0	41.3	2.4	44.5	53.9	9.4	100	0	
Hori.	9748.000	AV	36.1	38.3	9.9	40.1	2.4	46.6	53.9	**7.3**	100	0	
Vert.	4874.000	PK	46.6	30.8	7.4	41.6	2.4	45.6	73.9	28.3	100	320	
Vert.	7311.000	PK	46.9	36.3	9.0	41.3	2.4	53.3	73.9	20.6	100	0	
Vert.	9748.000	PK	45.5	38.3	9.9	40.1	2.4	56.0	73.9	17.9	100	0	
Vert.	4874.000	AV	37.5	30.8	7.4	41.6	2.4	36.5	53.9	17.4	100	320	
Vert.	7311.000	AV	38.0	36.3	9.0	41.3	2.4	44.4	53.9	9.5	100	0	
Vert.	9748.000	AV	36.1	38.3	9.9	40.1	2.4	46.6	53.9	**7.3**	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 15 GHz : 20log (3.935 m / 3.0 m) = 2.4 dB
15 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.1, and 2 Semi Anechoic Chamber	
Report No.	10840757S-G	
Date	July 25, 2015	July 30, 2015
Temperature / Humidity	26 deg. C / 68 % RH	25 deg. C / 67 % RH
Engineer	Shinichi Takano (1-15GHz, No.1 SAC)	Wataru Kojima (15-25GHz, No.2 SAC)
Mode	Tx 11g 2462 MHz [Normal Power mode]	

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2483.500	PK	57.4	26.1	14.9	40.7	2.4	60.1	73.9	13.8	113	32	
Hori.	4924.000	PK	47.6	31.0	7.5	41.6	2.4	46.9	73.9	27.0	100	318	
Hori.	7386.000	PK	46.9	36.4	8.9	41.3	2.4	53.3	73.9	20.6	100	0	
Hori.	9848.000	PK	45.3	38.3	10.0	40.0	2.4	56.0	73.9	17.9	100	0	
Hori.	2483.500	AV	43.7	26.1	14.9	40.7	2.4	46.4	53.9	7.5	113	32	
Hori.	4924.000	AV	38.2	31.0	7.5	41.6	2.4	37.5	53.9	16.4	100	318	
Hori.	7386.000	AV	37.7	36.4	8.9	41.3	2.4	44.1	53.9	9.8	100	0	
Hori.	9848.000	AV	35.9	38.3	10.0	40.0	2.4	46.6	53.9	7.3	100	0	
Vert.	2483.500	PK	54.0	26.1	14.9	40.7	2.4	56.7	73.9	17.2	219	12	
Vert.	4924.000	PK	46.8	31.0	7.5	41.6	2.4	46.1	73.9	27.8	100	280	
Vert.	7386.000	PK	47.2	36.4	8.9	41.3	2.4	53.6	73.9	20.3	100	0	
Vert.	9848.000	PK	45.4	38.3	10.0	40.0	2.4	56.1	73.9	17.8	100	0	
Vert.	2483.500	AV	40.9	26.1	14.9	40.7	2.4	43.6	53.9	10.3	219	12	
Vert.	4924.000	AV	38.2	31.0	7.5	41.6	2.4	37.5	53.9	16.4	100	280	
Vert.	7386.000	AV	37.8	36.4	8.9	41.3	2.4	44.2	53.9	9.7	100	0	
Vert.	9848.000	AV	36.2	38.3	10.0	40.0	2.4	46.9	53.9	**7.0**	100	0	

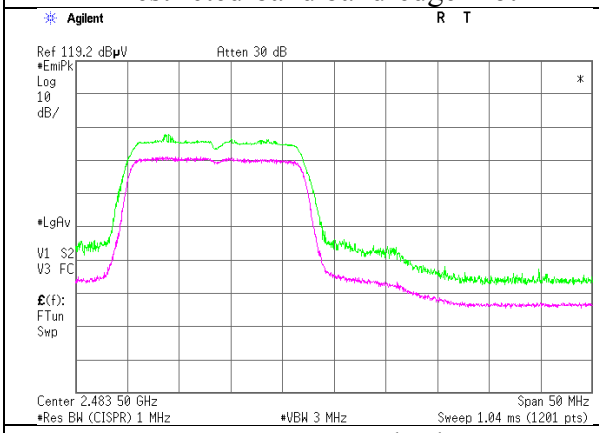
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 15 GHz : 20log (3.935 m / 3.0 m) = 2.4 dB
15 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission
(Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.1 Semi Anechoic Chamber
Report No.	10840757S-G
Date	July 25, 2015
Temperature / Humidity	26 deg. C / 68 % RH
Engineer	Shinichi Takano
Mode	Tx 11g 2462 MHz [Normal Power mode]

Horizontal

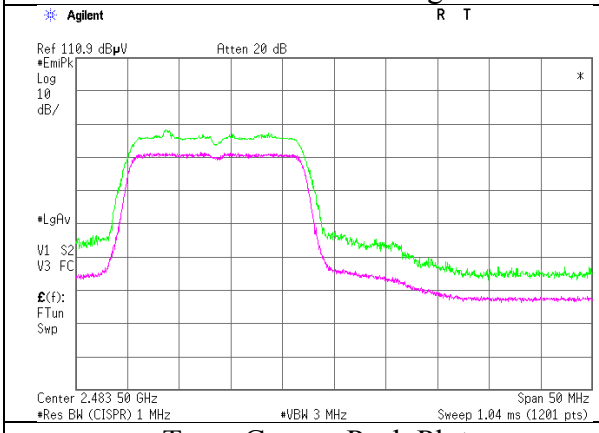
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.1, and 2 Semi Anechoic Chamber	
Report No.	10840757S-G	
Date	July 23, 2015	July 30, 2015
Temperature / Humidity	22 deg. C / 69 % RH	25 deg. C / 67 % RH
Engineer	Hiroyuki Morikawa (1-15GHz, No.1 SAC)	Wataru Kojima (15-25GHz, No.2 SAC)
Mode	Tx 11n-20 2412 MHz [Normal Power mode]	

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2390.000	PK	58.1	25.9	14.8	40.7	2.4	60.5	73.9	13.4	100	32	
Hori.	4824.000	PK	47.9	30.6	7.4	41.6	2.4	46.7	73.9	27.2	100	210	
Hori.	7236.000	PK	46.1	36.2	9.0	41.2	2.4	52.5	73.9	21.4	100	0	
Hori.	9648.000	PK	45.5	38.3	9.9	40.1	2.4	56.0	73.9	17.9	100	0	
Hori.	2390.000	AV	46.5	25.9	14.8	40.7	2.4	48.9	53.9	**5.0**	100	32	
Hori.	4824.000	AV	38.3	30.6	7.4	41.6	2.4	37.1	53.9	16.8	100	210	
Hori.	7236.000	AV	37.3	36.2	9.0	41.2	2.4	43.7	53.9	10.2	100	0	
Hori.	9648.000	AV	36.2	38.3	9.9	40.1	2.4	46.7	53.9	7.2	100	0	
Vert.	2390.000	PK	52.6	25.9	14.8	40.7	2.4	55.0	73.9	18.9	100	0	
Vert.	4824.000	PK	47.3	30.6	7.4	41.6	2.4	46.1	73.9	27.8	100	13	
Vert.	7236.000	PK	46.4	36.2	9.0	41.2	2.4	52.8	73.9	21.1	100	0	
Vert.	9648.000	PK	45.2	38.3	9.9	40.1	2.4	55.7	73.9	18.2	100	0	
Vert.	2390.000	AV	40.6	25.9	14.8	40.7	2.4	43.0	53.9	10.9	100	0	
Vert.	4824.000	AV	38.0	30.6	7.4	41.6	2.4	36.8	53.9	17.1	100	13	
Vert.	7236.000	AV	37.7	36.2	9.0	41.2	2.4	44.1	53.9	9.8	100	0	
Vert.	9648.000	AV	36.3	38.3	9.9	40.1	2.4	46.8	53.9	7.1	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 15 GHz : 20log (3.935 m / 3.0 m) = 2.4 dB
15 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

20 dBc Data Sheet **(RBW 100 kHz, VBW 300 kHz)**

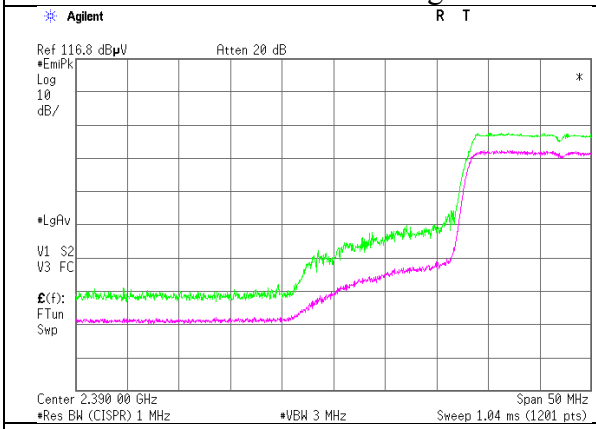
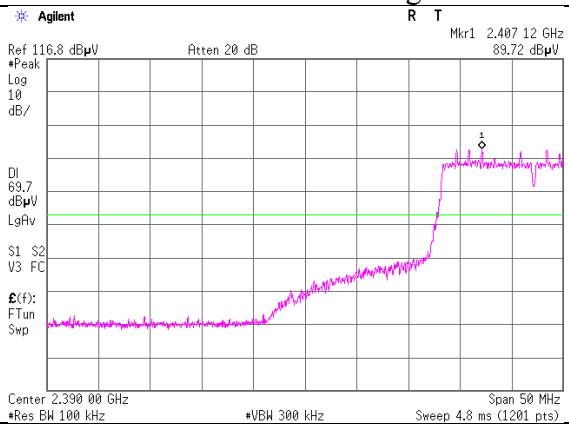
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	88.3	26.0	14.8	40.7	2.4	90.8	-	-	Carrier
Hori.	2400.000	PK	55.3	26.0	14.8	40.7	2.4	57.8	70.7	12.9	
Vert.	2412.000	PK	82.1	26.0	14.8	40.7	2.4	84.6	-	-	Carrier
Vert.	2400.000	PK	49.5	26.0	14.8	40.7	2.4	52.0	64.6	12.6	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 15 GHz : 20log (3.935 m / 3.0 m) = 2.4 dB
15 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

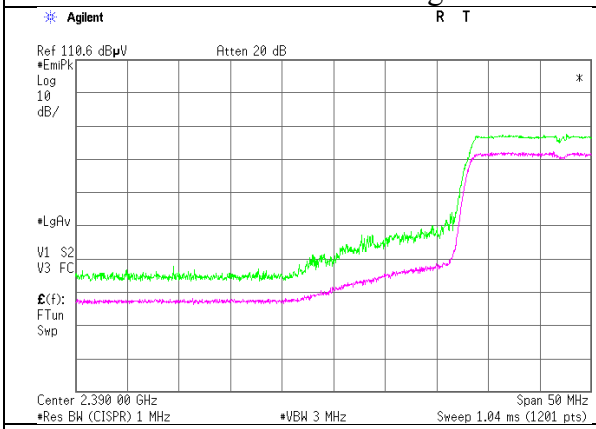
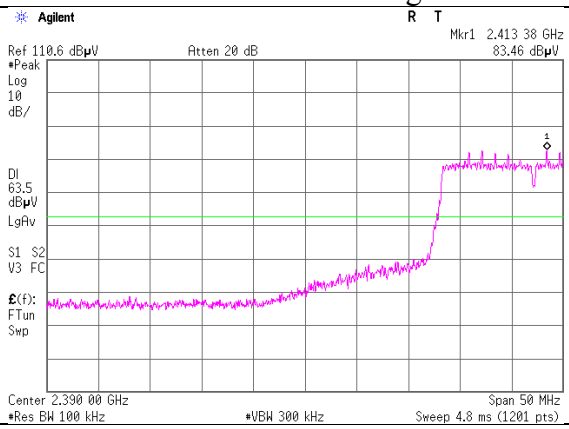
Radiated Spurious Emission
(Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.1 Semi Anechoic Chamber
Report No.	10840757S-G
Date	July 23, 2015
Temperature / Humidity	22 deg. C / 69 % RH
Engineer	Hiroyuki Morikawa
Mode	Tx 11n-20 2412 MHz [Normal Power mode]

Horizontal

Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

Vertical

Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.1, and 2 Semi Anechoic Chamber	
Report No.	10840757S-G	
Date	July 25, 2015	July 30, 2015
Temperature / Humidity	26 deg. C / 68 % RH	25 deg. C / 67 % RH
Engineer	Shinichi Takano (1-15GHz, No.1 SAC)	Wataru Kojima (15-25GHz, No.2 SAC)
Mode	Tx 11n-20 2437 MHz [Normal Power mode]	

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	4874.000	PK	47.4	30.8	7.4	41.6	2.4	46.4	73.9	27.5	100	0	
Hori.	7311.000	PK	47.5	36.3	9.0	41.3	2.4	53.9	73.9	20.0	100	0	
Hori.	9748.000	PK	45.4	38.3	9.9	40.1	2.4	55.9	73.9	18.0	100	0	
Hori.	4874.000	AV	37.7	30.8	7.4	41.6	2.4	36.7	53.9	17.2	100	0	
Hori.	7311.000	AV	38.0	36.3	9.0	41.3	2.4	44.4	53.9	9.5	100	0	
Hori.	9748.000	AV	36.0	38.3	9.9	40.1	2.4	46.5	53.9	**7.4**	100	0	
Vert.	4874.000	PK	46.4	30.8	7.4	41.6	2.4	45.4	73.9	28.5	100	0	
Vert.	7311.000	PK	47.1	36.3	9.0	41.3	2.4	53.5	73.9	20.4	100	0	
Vert.	9748.000	PK	45.8	38.3	9.9	40.1	2.4	56.3	73.9	17.6	100	0	
Vert.	4874.000	AV	37.7	30.8	7.4	41.6	2.4	36.7	53.9	17.2	100	0	
Vert.	7311.000	AV	38.0	36.3	9.0	41.3	2.4	44.4	53.9	9.5	100	0	
Vert.	9748.000	AV	35.9	38.3	9.9	40.1	2.4	46.4	53.9	7.5	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 15 GHz : 20log (3.935 m / 3.0 m) = 2.4 dB
15 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.1, and 2 Semi Anechoic Chamber	
Report No.	10840757S-G	
Date	July 25, 2015	July 30, 2015
Temperature / Humidity	26 deg. C / 68 % RH	25 deg. C / 67 % RH
Engineer	Shinichi Takano (1-15GHz, No.1 SAC)	Wataru Kojima (15-25GHz, No.2 SAC)
Mode	Tx 11n-20 2462 MHz [Normal Power mode]	

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2483.500	PK	59.1	26.1	14.9	40.7	2.4	61.8	73.9	12.1	100	35	
Hori.	4924.000	PK	48.0	31.0	7.5	41.6	2.4	47.3	73.9	26.6	100	0	
Hori.	7386.000	PK	47.3	36.4	8.9	41.3	2.4	53.7	73.9	20.2	100	0	
Hori.	9848.000	PK	44.6	38.3	10.0	40.0	2.4	55.3	73.9	18.6	100	0	
Hori.	2483.500	AV	44.9	26.1	14.9	40.7	2.4	47.6	53.9	**6.3**	100	35	
Hori.	4924.000	AV	38.1	31.0	7.5	41.6	2.4	37.4	53.9	16.5	100	0	
Hori.	7386.000	AV	37.8	36.4	8.9	41.3	2.4	44.2	53.9	9.7	100	0	
Hori.	9848.000	AV	35.9	38.3	10.0	40.0	2.4	46.6	53.9	7.3	100	0	
Vert.	2483.500	PK	54.8	26.1	14.9	40.7	2.4	57.5	73.9	16.4	220	11	
Vert.	4924.000	PK	47.4	31.0	7.5	41.6	2.4	46.7	73.9	27.2	100	0	
Vert.	7386.000	PK	46.9	36.4	8.9	41.3	2.4	53.3	73.9	20.6	100	0	
Vert.	9848.000	PK	45.1	38.3	10.0	40.0	2.4	55.8	73.9	18.1	100	0	
Vert.	2483.500	AV	42.3	26.1	14.9	40.7	2.4	45.0	53.9	8.9	220	11	
Vert.	4924.000	AV	38.1	31.0	7.5	41.6	2.4	37.4	53.9	16.5	100	0	
Vert.	7386.000	AV	37.8	36.4	8.9	41.3	2.4	44.2	53.9	9.7	100	0	
Vert.	9848.000	AV	36.1	38.3	10.0	40.0	2.4	46.8	53.9	7.1	100	0	

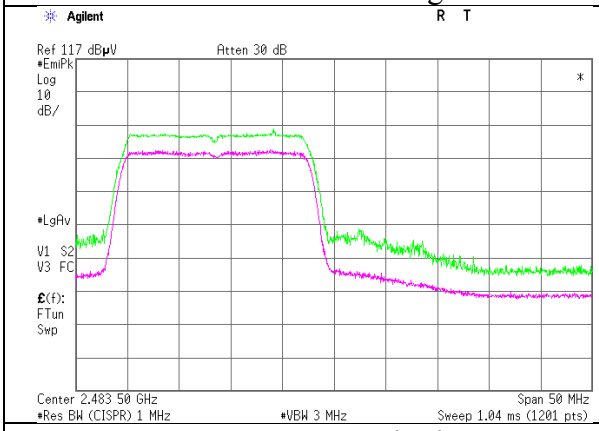
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 15 GHz : 20log (3.935 m / 3.0 m) = 2.4 dB
15 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission
(Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.1 Semi Anechoic Chamber
Report No.	10840757S-G
Date	July 25, 2015
Temperature / Humidity	26 deg. C / 68 % RH
Engineer	Shinichi Takano
Mode	Tx 11n-20 2462 MHz [Normal Power mode]

Horizontal

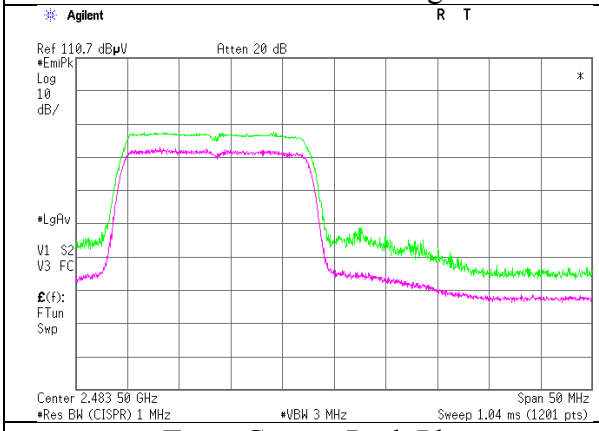
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Vertical

Restricted-band band-edge Plot

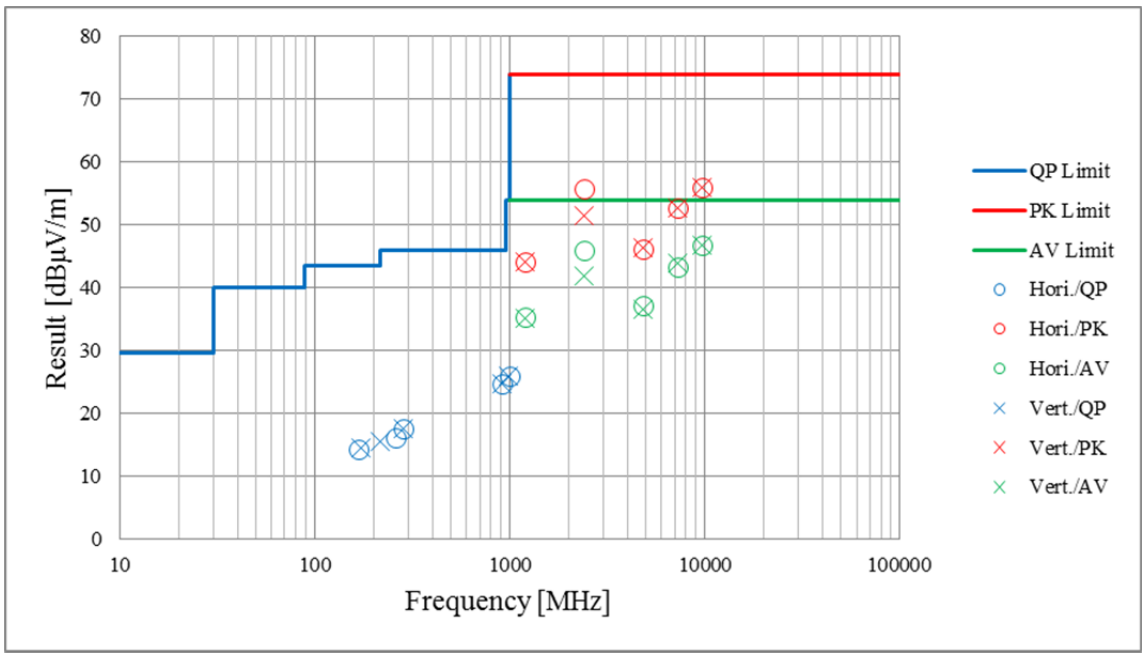


Trace Green : Peak Plot
Trace Purple : Average Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission
(Plot data, Worst case)

Test place	Shonan EMC Lab. No.1, 3 Semi Anechoic Chamber	
Report No.	10840757S-G	
Date	July 24, 2015	July 31, 2015
Temperature / Humidity	22 deg. C / 69 % RH	25 deg. C / 45 % RH
Engineer	Hiroyuki Morikawa (1-15GHz, No.1 SAC)	Shinichi Takano (30M-1GHz, No.3 SAC)
Mode	Tx 11g 2412 MHz [Normal Power mode]	



*These plots data contains sufficient number to show the trend of characteristic features for EUT.

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.1, and 2 Semi Anechoic Chamber	
Report No.	10840757S-G	
Date	July 25, 2015	July 30, 2015
Temperature / Humidity	26 deg. C / 68 % RH	25 deg. C / 67 % RH
Engineer	Shinichi Takano (1-15GHz, No.1 SAC)	Wataru Kojima (15-25GHz, No.2 SAC)
Mode	Tx 11b 2412 MHz [Low Power mode]	

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2390.000	PK	51.1	25.9	14.8	40.7	2.4	53.5	73.9	20.4	124	27	
Hori.	4824.000	PK	47.9	30.6	7.4	41.6	2.4	46.7	73.9	27.2	100	211	
Hori.	7236.000	PK	46.9	36.2	9.0	41.2	2.4	53.3	73.9	20.6	100	0	
Hori.	9648.000	PK	45.7	38.3	9.9	40.1	2.4	56.2	73.9	17.7	100	0	
Hori.	2390.000	AV	36.6	25.9	14.8	40.7	2.4	39.0	53.9	14.9	124	27	
Hori.	4824.000	AV	38.2	30.6	7.4	41.6	2.4	37.0	53.9	16.9	100	211	
Hori.	7236.000	AV	37.4	36.2	9.0	41.2	2.4	43.8	53.9	10.1	100	0	
Hori.	9648.000	AV	36.0	38.3	9.9	40.1	2.4	46.5	53.9	**7.4**	100	0	
Vert.	2390.000	PK	49.0	25.9	14.8	40.7	2.4	51.4	73.9	22.5	225	359	
Vert.	4824.000	PK	46.7	30.6	7.4	41.6	2.4	45.5	73.9	28.4	100	351	
Vert.	7236.000	PK	46.3	36.2	9.0	41.2	2.4	52.7	73.9	21.2	100	0	
Vert.	9648.000	PK	45.1	38.3	9.9	40.1	2.4	55.6	73.9	18.3	100	0	
Vert.	2390.000	AV	36.8	25.9	14.8	40.7	2.4	39.2	53.9	14.7	225	359	
Vert.	4824.000	AV	37.9	30.6	7.4	41.6	2.4	36.7	53.9	17.2	100	351	
Vert.	7236.000	AV	37.6	36.2	9.0	41.2	2.4	44.0	53.9	9.9	100	0	
Vert.	9648.000	AV	35.9	38.3	9.9	40.1	2.4	46.4	53.9	7.5	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 15 GHz : 20log (4.435 m / 3.0 m) = 2.4 dB
15 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

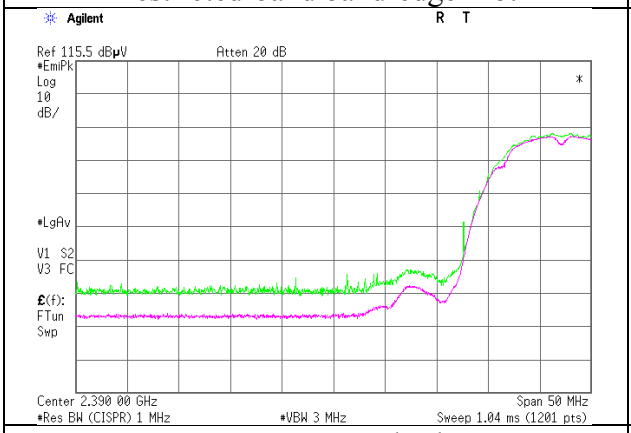
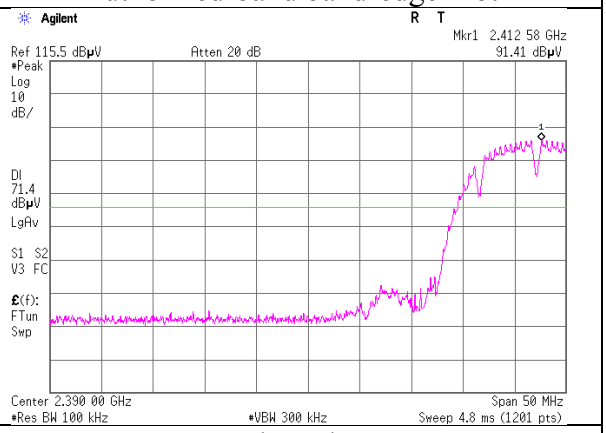
20 dBc Data Sheet **(RBW 100 kHz, VBW 300 kHz)**

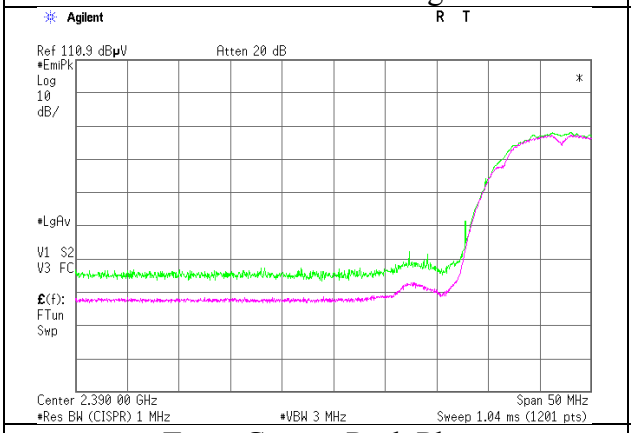
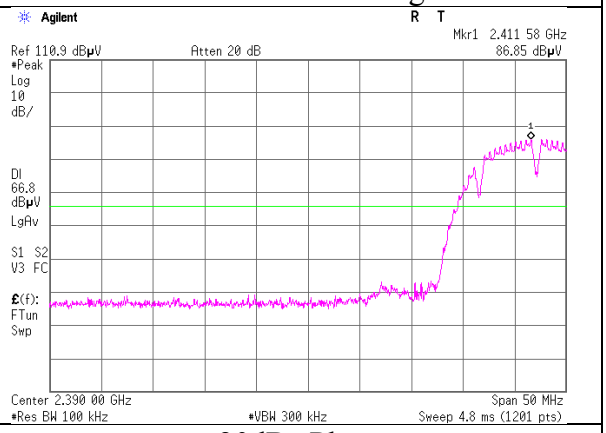
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	91.4	26.0	14.8	40.7	2.4	93.9	-	-	Carrier
Hori.	2397.971	PK	47.6	26.0	14.8	40.7	2.4	50.1	73.9	23.8	
Hori.	2400.000	PK	45.7	26.0	14.8	40.7	2.4	48.2	73.9	25.7	
Vert.	2412.000	PK	86.9	26.0	14.8	40.7	2.4	89.4	-	-	Carrier
Vert.	2398.040	PK	43.2	26.0	14.8	40.7	2.4	45.7	69.3	23.6	
Vert.	2400.000	PK	41.4	26.0	14.8	40.7	2.4	43.9	69.3	25.4	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 15 GHz : 20log (4.435 m / 3.0 m) = 2.4 dB
15 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission
(Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.1 Semi Anechoic Chamber
Report No.	10840757S-G
Date	July 25, 2015
Temperature / Humidity	26 deg. C / 68 % RH
Engineer	Shinichi Takano
Mode	Tx 11b 2412 MHz [Low Power mode]

Horizontal	
Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

Vertical	
Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.1, and 2 Semi Anechoic Chamber	
Report No.	10840757S-G	
Date	July 25, 2015	July 30, 2015
Temperature / Humidity	26 deg. C / 68 % RH	25 deg. C / 67 % RH
Engineer	Shinichi Takano (1-15GHz, No.1 SAC)	Wataru Kojima (15-25GHz, No.2 SAC)
Mode	Tx 11b 2437 MHz [Low Power mode]	

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	4874.000	PK	48.2	30.8	7.4	41.6	2.4	47.2	73.9	26.7	100	99	
Hori.	7311.000	PK	47.8	36.3	9.0	41.3	2.4	54.2	73.9	19.7	100	0	
Hori.	9748.000	PK	46.6	38.3	9.9	40.1	2.4	57.1	73.9	16.8	100	0	
Hori.	4874.000	AV	39.2	30.8	7.4	41.6	2.4	38.2	53.9	15.7	100	99	
Hori.	7311.000	AV	38.0	36.3	9.0	41.3	2.4	44.4	53.9	9.5	100	0	
Hori.	9748.000	AV	36.1	38.3	9.9	40.1	2.4	46.6	53.9	**7.3**	100	0	
Vert.	4874.000	PK	47.3	30.8	7.4	41.6	2.4	46.3	73.9	27.6	120	359	
Vert.	7311.000	PK	47.2	36.3	9.0	41.3	2.4	53.6	73.9	20.3	100	0	
Vert.	9748.000	PK	46.1	38.3	9.9	40.1	2.4	56.6	73.9	17.3	100	0	
Vert.	4874.000	AV	38.8	30.8	7.4	41.6	2.4	37.8	53.9	16.1	120	359	
Vert.	7311.000	AV	38.0	36.3	9.0	41.3	2.4	44.4	53.9	9.5	100	0	
Vert.	9748.000	AV	36.0	38.3	9.9	40.1	2.4	46.5	53.9	7.4	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 15 GHz : 20log (4.435 m / 3.0 m) = 2.4 dB
15 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.1, and 2 Semi Anechoic Chamber	
Report No.	10840757S-G	
Date	July 25, 2015	July 30, 2015
Temperature / Humidity	26 deg. C / 68 % RH	25 deg. C / 67 % RH
Engineer	Shinichi Takano (1-15GHz, No.1 SAC)	Wataru Kojima (15-25GHz, No.2 SAC)
Mode	Tx 11b 2462 MHz [Low Power mode]	

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2483.500	PK	47.5	26.1	14.9	40.7	2.4	50.2	73.9	23.7	123	32	
Hori.	4924.000	PK	48.4	31.0	7.5	41.6	2.4	47.7	73.9	26.2	100	221	
Hori.	7386.000	PK	47.7	36.4	8.9	41.3	2.4	54.1	73.9	19.8	100	0	
Hori.	9848.000	PK	47.1	38.3	10.0	40.0	2.4	57.8	73.9	16.1	100	0	
Hori.	2483.500	AV	37.0	26.1	14.9	40.7	2.4	39.7	53.9	14.2	123	32	
Hori.	4924.000	AV	39.0	31.0	7.5	41.6	2.4	38.3	53.9	15.6	100	221	
Hori.	7386.000	AV	38.0	36.4	8.9	41.3	2.4	44.4	53.9	9.5	100	0	
Hori.	9848.000	AV	36.1	38.3	10.0	40.0	2.4	46.8	53.9	**7.1**	100	0	
Vert.	2483.500	PK	46.2	26.1	14.9	40.7	2.4	48.9	73.9	25.0	227	9	
Vert.	4924.000	PK	47.7	31.0	7.5	41.6	2.4	47.0	73.9	26.9	100	359	
Vert.	7386.000	PK	48.4	36.4	8.9	41.3	2.4	54.8	73.9	19.1	100	0	
Vert.	9848.000	PK	45.2	38.3	10.0	40.0	2.4	55.9	73.9	18.0	100	0	
Vert.	2483.500	AV	36.8	26.1	14.9	40.7	2.4	39.5	53.9	14.4	227	9	
Vert.	4924.000	AV	38.7	31.0	7.5	41.6	2.4	38.0	53.9	15.9	100	359	
Vert.	7386.000	AV	37.8	36.4	8.9	41.3	2.4	44.2	53.9	9.7	100	0	
Vert.	9848.000	AV	36.0	38.3	10.0	40.0	2.4	46.7	53.9	7.2	100	0	

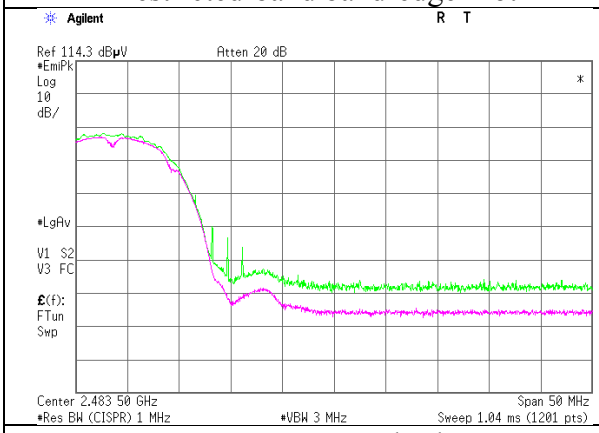
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 15 GHz : 20log (4.435 m / 3.0 m) = 2.4 dB
15 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission
(Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.1 Semi Anechoic Chamber
Report No.	10840757S-G
Date	July 25, 2015
Temperature / Humidity	26 deg. C / 68 % RH
Engineer	Shinichi Takano
Mode	Tx 11b 2462 MHz [Low Power mode]

Horizontal

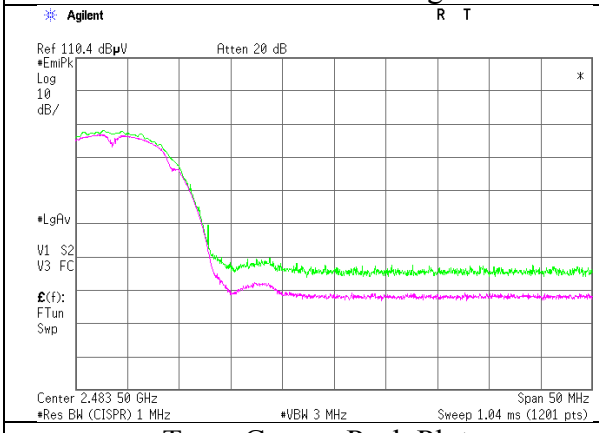
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.2, and 3 Semi Anechoic Chamber		
Report No.	10840757S-G		
Date	August 2, 2015	July 30, 2015	July 31, 2015
Temperature / Humidity	24 deg. C / 59 % RH	25 deg. C / 67 % RH	25 deg. C / 45 % RH
Engineer	Hiroyuki Morikawa (1-15GHz, No.3 SAC)	Wataru Kojima (15-25GHz, No.2 SAC)	Shinichi Takano (30M-1GHz, No.3 SAC)
Mode	Tx 11g 2412 MHz [Low Power mode]		

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	135.898	QP	22.6	14.0	7.7	32.1	0.0	12.2	43.5	31.3	200	330	
Hori.	165.150	QP	22.3	15.4	7.9	32.0	0.0	13.6	43.5	29.9	200	359	
Hori.	296.385	QP	22.4	19.2	8.6	32.0	0.0	18.2	46.0	27.8	300	1	
Hori.	778.018	QP	22.3	20.9	10.6	31.6	0.0	22.2	46.0	23.8	150	3	
Hori.	900.019	QP	21.9	22.5	11.0	30.9	0.0	24.5	46.0	21.5	100	325	
Hori.	1206.000	PK	44.3	24.2	12.6	40.7	3.4	43.8	73.9	30.1	100	0	
Hori.	2390.000	PK	46.2	26.4	13.7	41.0	3.4	48.7	73.9	25.2	160	27	
Hori.	4824.000	PK	46.0	30.7	5.7	39.5	3.4	46.3	73.9	27.6	100	207	
Hori.	7236.000	PK	45.3	36.7	7.1	40.1	3.4	52.4	73.9	21.5	100	0	
Hori.	9648.000	PK	44.6	38.6	8.2	39.6	3.4	55.2	73.9	18.7	100	0	
Hori.	1206.000	AV	36.2	24.2	12.6	40.7	3.4	35.7	53.9	18.2	100	0	
Hori.	2390.000	AV	38.5	26.4	13.7	41.0	3.4	41.0	53.9	12.9	160	27	
Hori.	4824.000	AV	36.5	30.7	5.7	39.5	3.4	36.8	53.9	17.1	100	207	
Hori.	7236.000	AV	36.4	36.7	7.1	40.1	3.4	43.5	53.9	10.4	100	0	
Hori.	9648.000	AV	36.3	38.6	8.2	39.6	3.4	46.9	53.9	7.0	100	0	
Vert.	175.284	QP	22.8	15.8	8.0	32.0	0.0	14.6	43.5	28.9	100	173	
Vert.	201.285	QP	22.8	16.3	8.1	32.0	0.0	15.2	43.5	28.3	100	292	
Vert.	295.693	QP	22.2	19.2	8.6	32.0	0.0	18.0	46.0	28.0	100	3	
Vert.	936.667	QP	21.6	22.8	11.1	30.7	0.0	24.8	46.0	21.2	100	8	
Vert.	990.669	QP	21.3	23.3	11.3	30.2	0.0	25.7	53.9	28.2	100	5	
Vert.	1206.000	PK	44.6	24.2	12.6	40.7	3.4	44.1	73.9	29.8	100	0	
Vert.	2390.000	PK	46.1	26.4	13.7	41.0	3.4	48.6	73.9	25.3	100	60	
Vert.	4824.000	PK	44.9	30.7	5.7	39.5	3.4	45.2	73.9	28.7	100	58	
Vert.	7236.000	PK	45.0	36.7	7.1	40.1	3.4	52.1	73.9	21.8	100	0	
Vert.	9648.000	PK	45.2	38.6	8.2	39.6	3.4	55.8	73.9	18.1	100	0	
Vert.	1206.000	AV	36.4	24.2	12.6	40.7	3.4	35.9	53.9	18.0	100	0	
Vert.	2390.000	AV	37.2	26.4	13.7	41.0	3.4	39.7	53.9	14.2	100	60	
Vert.	4824.000	AV	36.3	30.7	5.7	39.5	3.4	36.6	53.9	17.3	100	58	
Vert.	7236.000	AV	36.5	36.7	7.1	40.1	3.4	43.6	53.9	10.3	100	0	
Vert.	9648.000	AV	36.6	38.6	8.2	39.6	3.4	47.2	53.9	**6.7**	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 15 GHz : 20log (4.435 m / 3.0 m) = 3.4 dB
15 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

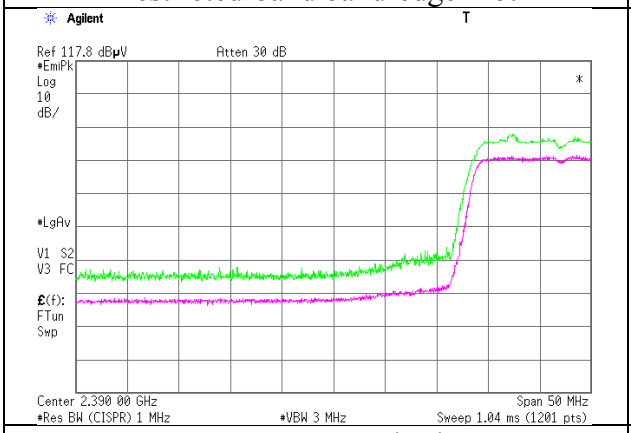
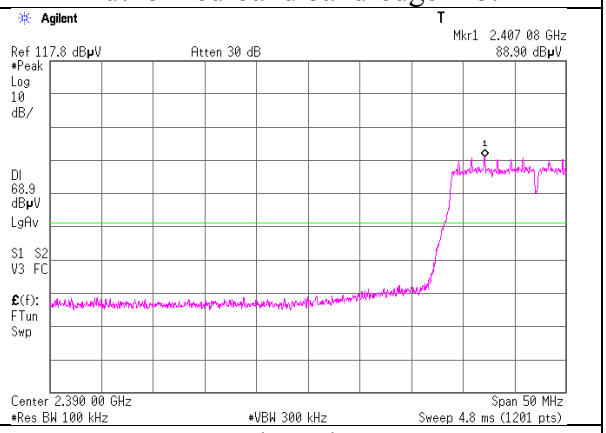
20 dBc Data Sheet **(RBW 100 kHz, VBW 300 kHz)**

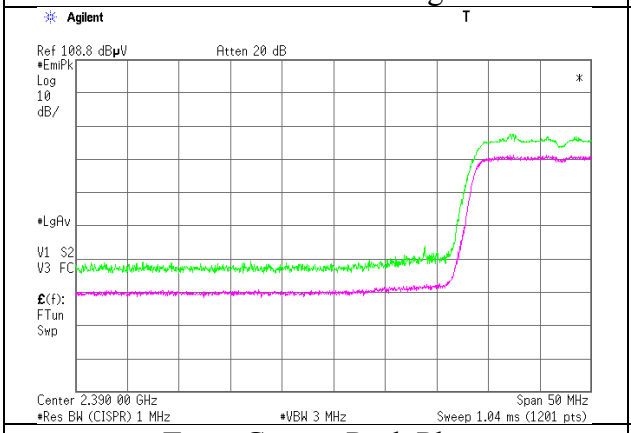
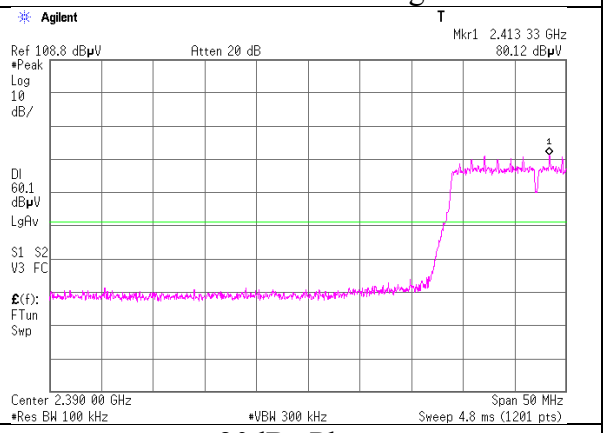
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	88.4	26.4	13.7	41.0	3.4	90.9	-	-	Carrier
Hori.	2398.814	PK	48.7	26.4	13.7	41.0	3.4	51.2	71.0	19.8	
Hori.	2400.000	PK	48.0	26.4	13.7	41.0	3.4	50.5	71.0	20.5	
Vert.	2412.000	PK	79.7	26.4	13.7	41.0	3.4	82.2	-	-	Carrier
Vert.	2398.942	PK	40.6	26.4	13.7	41.0	3.4	43.1	62.2	19.1	
Vert.	2400.000	PK	40.9	26.4	13.7	41.0	3.4	43.4	62.2	18.8	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 15 GHz : 20log (4.435 m / 3.0 m) = 3.4 dB
15 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission
(Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	10840757S-G
Date	August 2, 2015
Temperature / Humidity	24 deg. C / 59 % RH
Engineer	Hiroyuki Morikawa
Mode	Tx 11g 2412 MHz [Low Power mode]

Horizontal	
Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

Vertical	
Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.2, and 3 Semi Anechoic Chamber	
Report No.	10840757S-G	
Date	August 2, 2015	July 30, 2015
Temperature / Humidity	24 deg. C / 59 % RH	25 deg. C / 67 % RH
Engineer	Hiroyuki Morikawa (1-15GHz, No.3 SAC)	Wataru Kojima (15-25GHz, No.2 SAC)
Mode	Tx 11g 2437 MHz [Low Power mode]	

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	4874.000	PK	44.4	30.9	5.8	39.5	3.4	45.0	73.9	28.9	151	180	
Hori.	7311.000	PK	44.6	36.8	7.2	40.2	3.4	51.8	73.9	22.1	100	0	
Hori.	9748.000	PK	44.0	38.6	8.2	39.5	3.4	54.7	73.9	19.2	100	0	
Hori.	4874.000	AV	35.9	30.9	5.8	39.5	3.4	36.5	53.9	17.4	151	180	
Hori.	7311.000	AV	35.9	36.8	7.2	40.2	3.4	43.1	53.9	10.8	100	0	
Hori.	9748.000	AV	35.5	38.6	8.2	39.5	3.4	46.2	53.9	7.7	100	0	
Vert.	4874.000	PK	44.8	30.9	5.8	39.5	3.4	45.4	73.9	28.5	152	337	
Vert.	7311.000	PK	45.1	36.8	7.2	40.2	3.4	52.3	73.9	21.6	100	0	
Vert.	9748.000	PK	44.5	38.6	8.2	39.5	3.4	55.2	73.9	18.7	100	0	
Vert.	4874.000	AV	35.9	30.9	5.8	39.5	3.4	36.5	53.9	17.4	152	337	
Vert.	7311.000	AV	35.9	36.8	7.2	40.2	3.4	43.1	53.9	10.8	100	0	
Vert.	9748.000	AV	35.7	38.6	8.2	39.5	3.4	46.4	53.9	**7.5**	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 15 GHz : 20log (4.435 m / 3.0 m) = 3.4 dB
15 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.2, and 3 Semi Anechoic Chamber	
Report No.	10840757S-G	
Date	August 2, 2015	July 30, 2015
Temperature / Humidity	24 deg. C / 59 % RH	25 deg. C / 67 % RH
Engineer	Hiroyuki Morikawa (1-15GHz, No.3 SAC)	Wataru Kojima (15-25GHz, No.2 SAC)
Mode	Tx 11g 2462 MHz [Low Power mode]	

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2483.500	PK	50.9	26.6	13.7	41.0	3.4	53.6	73.9	20.3	100	37	
Hori.	4924.000	PK	45.4	31.1	5.8	39.4	3.4	46.3	73.9	27.6	100	194	
Hori.	7386.000	PK	45.3	36.9	7.2	40.3	3.4	52.5	73.9	21.4	100	0	
Hori.	9848.000	PK	43.8	38.6	8.2	39.4	3.4	54.6	73.9	19.3	100	0	
Hori.	2483.500	AV	39.2	26.6	13.7	41.0	3.4	41.9	53.9	12.0	100	37	
Hori.	4924.000	AV	36.0	31.1	5.8	39.4	3.4	36.9	53.9	17.0	100	194	
Hori.	7386.000	AV	34.4	36.9	7.2	40.3	3.4	41.6	53.9	12.3	100	0	
Hori.	9848.000	AV	35.0	38.6	8.2	39.4	3.4	45.8	53.9	8.1	100	0	
Vert.	2483.500	PK	47.2	26.6	13.7	41.0	3.4	49.9	73.9	24.0	316	20	
Vert.	4924.000	PK	44.3	31.1	5.8	39.4	3.4	45.2	73.9	28.7	100	350	
Vert.	7386.000	PK	43.9	36.9	7.2	40.3	3.4	51.1	73.9	22.8	100	0	
Vert.	9848.000	PK	43.7	38.6	8.2	39.4	3.4	54.5	73.9	19.4	100	0	
Vert.	2483.500	AV	37.6	26.6	13.7	41.0	3.4	40.3	53.9	13.6	316	20	
Vert.	4924.000	AV	36.0	31.1	5.8	39.4	3.4	36.9	53.9	17.0	100	350	
Vert.	7386.000	AV	35.6	36.9	7.2	40.3	3.4	42.8	53.9	11.1	100	0	
Vert.	9848.000	AV	35.1	38.6	8.2	39.4	3.4	45.9	53.9	**8.0**	100	0	

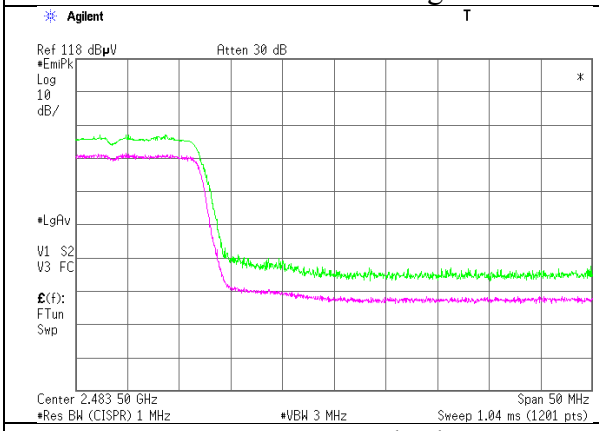
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 15 GHz : 20log (4.435 m / 3.0 m) = 3.4 dB
15 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission
(Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	10840757S-G
Date	August 2, 2015
Temperature / Humidity	24 deg. C / 59 % RH
Engineer	Hiroyuki Morikawa
Mode	Tx 11g 2462 MHz [Low Power mode]

Horizontal

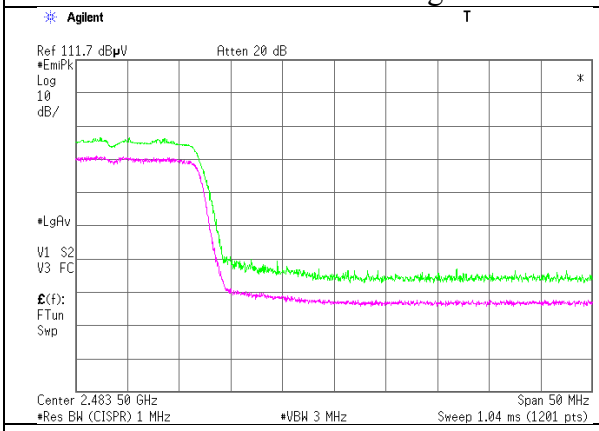
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.2, and 3 Semi Anechoic Chamber	
Report No.	10840757S-G	
Date	August 2, 2015	July 30, 2015
Temperature / Humidity	24 deg. C / 59 % RH	25 deg. C / 67 % RH
Engineer	Hiroyuki Morikawa (1-15GHz, No.3 SAC)	Wataru Kojima (15-25GHz, No.2 SAC)
Mode	Tx 11n-20 2412 MHz [Low Power mode]	

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2390.000	PK	50.6	26.4	13.7	41.0	3.4	53.1	73.9	20.8	104	41	
Hori.	4824.000	PK	44.5	30.7	5.7	39.5	3.4	44.8	73.9	29.1	100	185	
Hori.	7236.000	PK	45.6	36.7	7.1	40.1	3.4	52.7	73.9	21.2	100	0	
Hori.	9648.000	PK	45.1	38.6	8.2	39.6	3.4	55.7	73.9	18.2	100	0	
Hori.	2390.000	AV	39.5	26.4	13.7	41.0	3.4	42.0	53.9	11.9	104	41	
Hori.	4824.000	AV	35.8	30.7	5.7	39.5	3.4	36.1	53.9	17.8	100	185	
Hori.	7236.000	AV	36.4	36.7	7.1	40.1	3.4	43.5	53.9	10.4	100	0	
Hori.	9648.000	AV	36.5	38.6	8.2	39.6	3.4	47.1	53.9	**6.8**	100	0	
Vert.	2390.000	PK	47.5	26.4	13.7	41.0	3.4	50.0	73.9	23.9	208	20	
Vert.	4824.000	PK	44.9	30.7	5.7	39.5	3.4	45.2	73.9	28.7	110	349	
Vert.	7236.000	PK	45.4	36.7	7.1	40.1	3.4	52.5	73.9	21.4	100	0	
Vert.	9648.000	PK	44.7	38.6	8.2	39.6	3.4	55.3	73.9	18.6	100	0	
Vert.	2390.000	AV	37.5	26.4	13.7	41.0	3.4	40.0	53.9	13.9	208	20	
Vert.	4824.000	AV	35.9	30.7	5.7	39.5	3.4	36.2	53.9	17.7	110	349	
Vert.	7236.000	AV	36.9	36.7	7.1	40.1	3.4	44.0	53.9	9.9	100	0	
Vert.	9648.000	AV	36.3	38.6	8.2	39.6	3.4	46.9	53.9	7.0	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 15 GHz : 20log (4.435 m / 3.0 m) = 3.4 dB
15 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

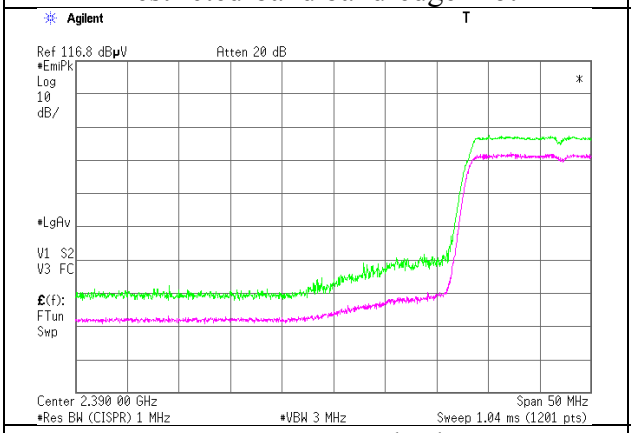
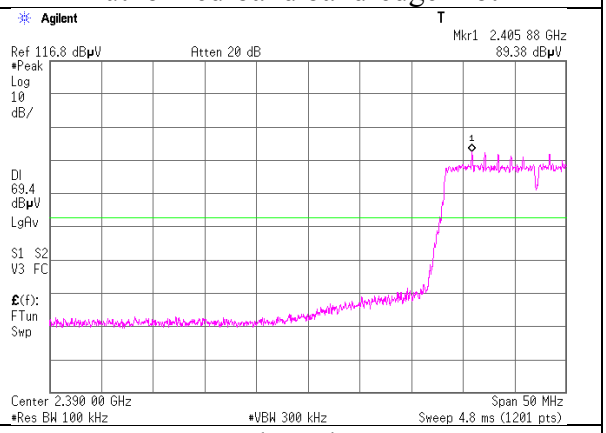
20 dBc Data Sheet **(RBW 100 kHz, VBW 300 kHz)**

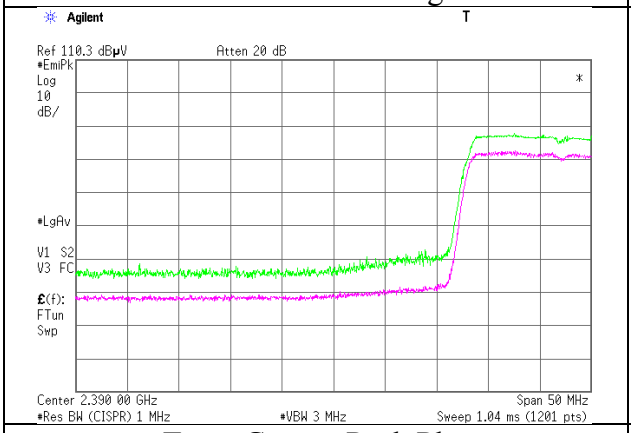
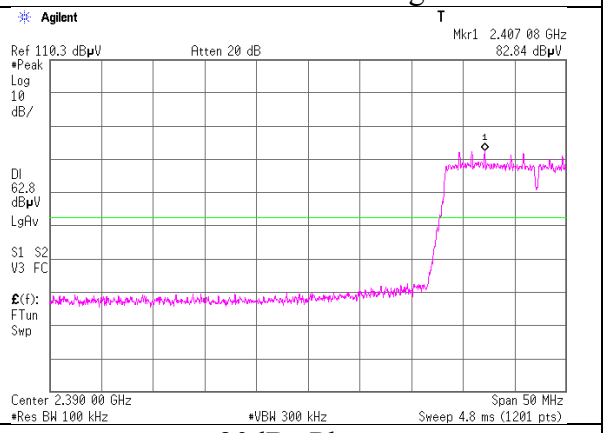
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	88.4	26.4	13.7	41.0	3.4	90.9	-	-	Carrier
Hori.	2397.452	PK	47.0	26.4	13.7	41.0	3.4	49.5	70.9	21.4	
Hori.	2400.000	PK	47.5	26.4	13.7	41.0	3.4	50.0	70.9	20.9	
Vert.	2412.000	PK	82.8	26.4	13.7	41.0	3.4	85.3	-	-	Carrier
Vert.	2398.933	PK	41.4	26.4	13.7	41.0	3.4	43.9	65.3	21.4	
Vert.	2400.000	PK	42.3	26.4	13.7	41.0	3.4	44.8	65.3	20.5	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 15 GHz : 20log (4.435 m / 3.0 m) = 3.4 dB
15 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission
(Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	10840757S-G
Date	August 2, 2015
Temperature / Humidity	24 deg. C / 59 % RH
Engineer	Hiroyuki Morikawa
Mode	Tx 11n-20 2412 MHz [Low Power mode]

Horizontal	
Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

Vertical	
Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.2, and 3 Semi Anechoic Chamber	
Report No.	10840757S-G	
Date	August 2, 2015	July 30, 2015
Temperature / Humidity	24 deg. C / 59 % RH	25 deg. C / 67 % RH
Engineer	Hiroyuki Morikawa (1-15GHz, No.3 SAC)	Wataru Kojima (15-25GHz, No.2 SAC)
Mode	Tx 11n-20 2437 MHz [Low Power mode]	

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	4874.000	PK	44.7	30.9	5.8	39.5	3.4	45.3	73.9	28.6	100	213	
Hori.	7311.000	PK	44.3	36.8	7.2	40.2	3.4	51.5	73.9	22.4	100	0	
Hori.	9748.000	PK	44.8	38.6	8.2	39.5	3.4	55.5	73.9	18.4	100	0	
Hori.	4874.000	AV	36.0	30.9	5.8	39.5	3.4	36.6	53.9	17.3	100	213	
Hori.	7311.000	AV	36.2	36.8	7.2	40.2	3.4	43.4	53.9	10.5	100	0	
Hori.	9748.000	AV	35.7	38.6	8.2	39.5	3.4	46.4	53.9	7.5	100	0	
Vert.	4874.000	PK	45.3	30.9	5.8	39.5	3.4	45.9	73.9	28.0	104	339	
Vert.	7311.000	PK	44.7	36.8	7.2	40.2	3.4	51.9	73.9	22.0	100	0	
Vert.	9748.000	PK	44.4	38.6	8.2	39.5	3.4	55.1	73.9	18.8	100	0	
Vert.	4874.000	AV	35.8	30.9	5.8	39.5	3.4	36.4	53.9	17.5	104	339	
Vert.	7311.000	AV	36.3	36.8	7.2	40.2	3.4	43.5	53.9	10.4	100	0	
Vert.	9748.000	AV	36.0	38.6	8.2	39.5	3.4	46.7	53.9	**7.2**	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 15 GHz : 20log (4.435 m / 3.0 m) = 3.4 dB
15 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.2, and 3 Semi Anechoic Chamber	
Report No.	10840757S-G	
Date	August 2, 2015	July 30, 2015
Temperature / Humidity	24 deg. C / 59 % RH	25 deg. C / 67 % RH
Engineer	Hiroyuki Morikawa (1-15GHz, No.3 SAC)	Wataru Kojima (15-25GHz, No.2 SAC)
Mode	Tx 11n-20 2462 MHz [Low Power mode]	

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2483.500	PK	52.2	26.6	13.7	41.0	3.4	54.9	73.9	19.0	100	39	
Hori.	4924.000	PK	44.5	31.1	5.8	39.4	3.4	45.4	73.9	28.5	100	205	
Hori.	7386.000	PK	45.3	36.9	7.2	40.3	3.4	52.5	73.9	21.4	100	0	
Hori.	9848.000	PK	44.7	38.6	8.2	39.4	3.4	55.5	73.9	18.4	100	0	
Hori.	2483.500	AV	39.8	26.6	13.7	41.0	3.4	42.5	53.9	11.4	100	39	
Hori.	4924.000	AV	35.9	31.1	5.8	39.4	3.4	36.8	53.9	17.1	100	205	
Hori.	7386.000	AV	36.2	36.9	7.2	40.3	3.4	43.4	53.9	10.5	100	0	
Hori.	9848.000	AV	35.3	38.6	8.2	39.4	3.4	46.1	53.9	7.8	100	0	
Vert.	2483.500	PK	47.4	26.6	13.7	41.0	3.4	50.1	73.9	23.8	261	36	
Vert.	4924.000	PK	45.1	31.1	5.8	39.4	3.4	46.0	73.9	27.9	273	323	
Vert.	7386.000	PK	44.6	36.9	7.2	40.3	3.4	51.8	73.9	22.1	100	0	
Vert.	9848.000	PK	44.3	38.6	8.2	39.4	3.4	55.1	73.9	18.8	100	0	
Vert.	2483.500	AV	37.1	26.6	13.7	41.0	3.4	39.8	53.9	14.1	261	36	
Vert.	4924.000	AV	36.0	31.1	5.8	39.4	3.4	36.9	53.9	17.0	273	323	
Vert.	7386.000	AV	35.7	36.9	7.2	40.3	3.4	42.9	53.9	11.0	100	0	
Vert.	9848.000	AV	35.5	38.6	8.2	39.4	3.4	46.3	53.9	**7.6**	100	0	

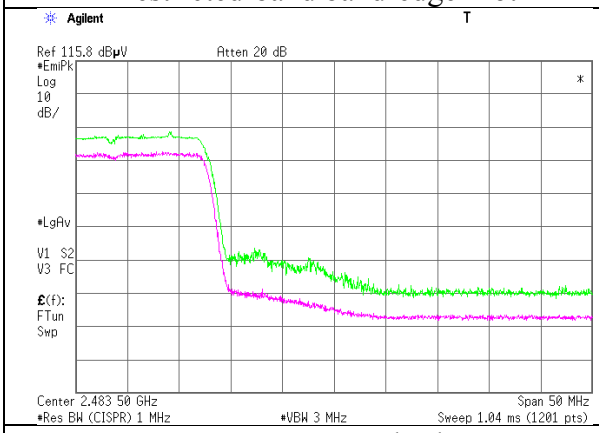
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 15 GHz : 20log (4.435 m / 3.0 m) = 3.4 dB
15 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission
(Reference Plot for band-edge)

Test place	Shonan EMC Lab. No. 3 Semi Anechoic Chamber
Report No.	10840757S-G
Date	August 2, 2015
Temperature / Humidity	24 deg. C / 59 % RH
Engineer	Hiroyuki Morikawa
Mode	Tx 11n-20 2462 MHz [Low Power mode]

Horizontal

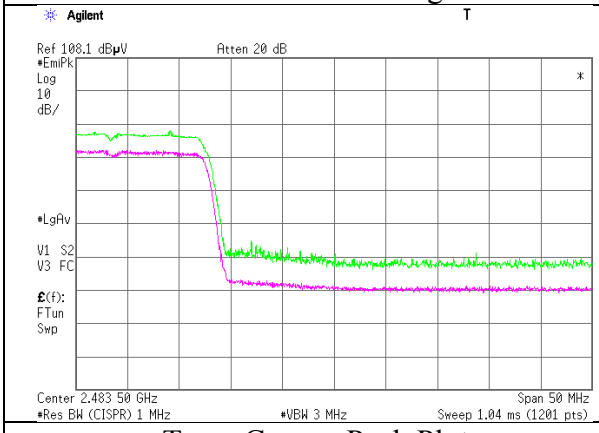
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Vertical

Restricted-band band-edge Plot

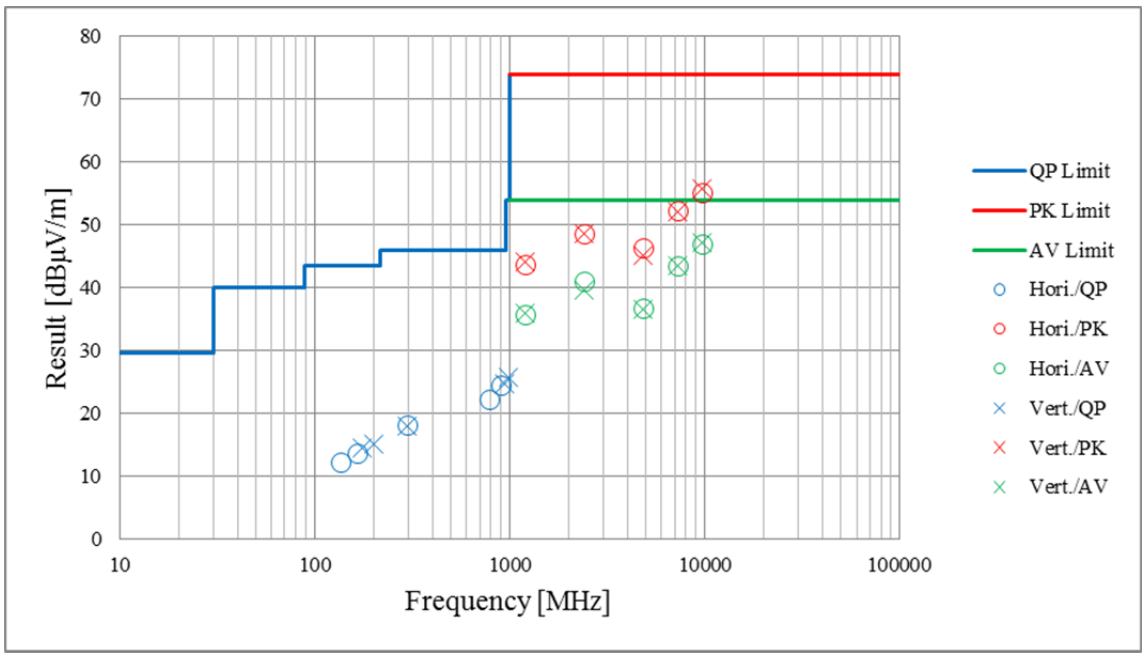


Trace Green : Peak Plot
Trace Purple : Average Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission
(Plot data, Worst case)

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber	
Report No.	10840757S-G	
Date	July 24, 2015	July 31, 2015
Temperature / Humidity	22 deg. C / 69 % RH	25 deg. C / 45 % RH
Engineer	Hiroyuki Morikawa (1-15GHz, No.3 SAC)	Shinichi Takano (30M-1GHz, No.3 SAC)
Mode	Tx 11g 2412 MHz [Low Power mode]	



*These plots data contains sufficient number to show the trend of characteristic features for EUT.

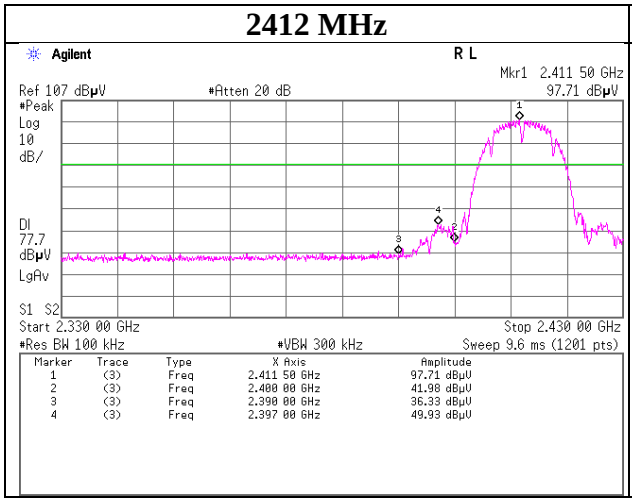
Band Edge confirmation

Test place	Shonan EMC Lab. No.1 Measurement Room
Report No.	10840757S-G
Date	July 10, 2015
Temperature / Humidity	25 deg. C / 67 % RH
Engineer	Shinichi Takano
Mode	Tx 11b, 11g

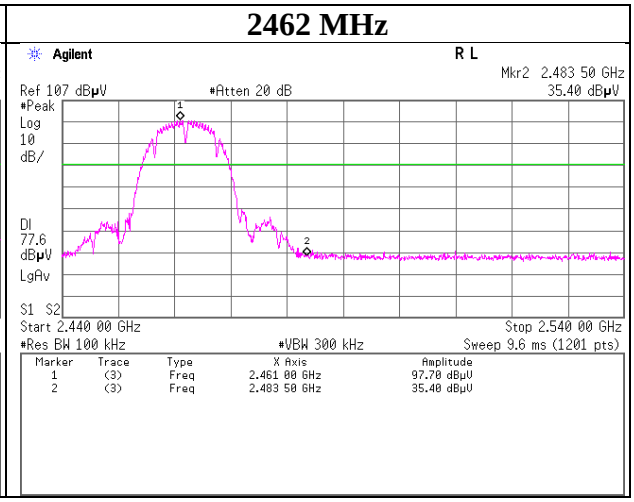
[Normal Power mode]

11b

2412 MHz

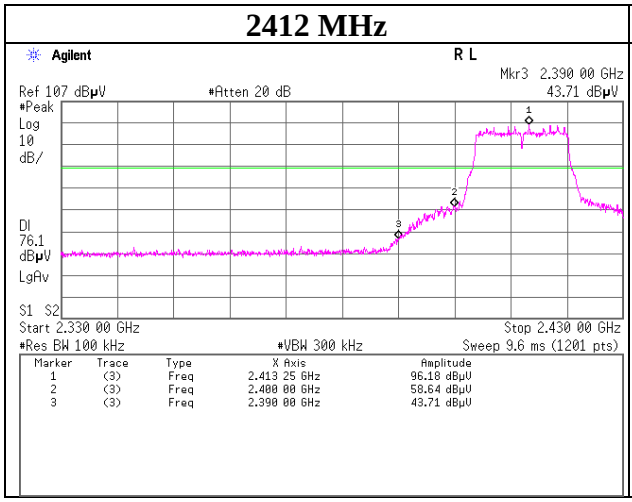


2462 MHz

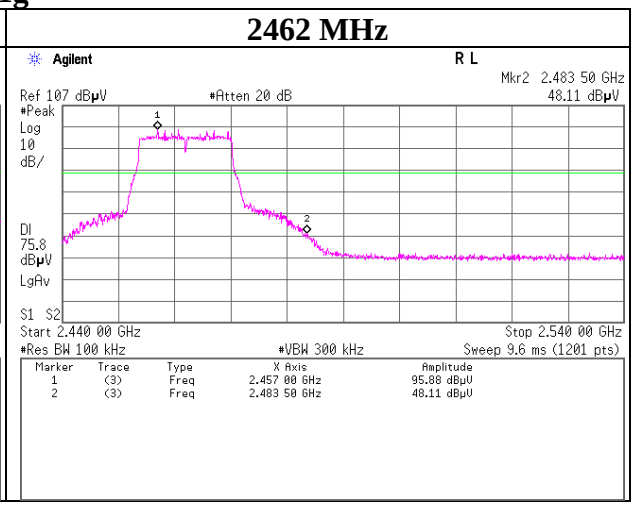


11g

2412 MHz



2462 MHz



* Final result of band edge was measured as radiated spurious emission. Refer to Radiated Spurious Emission's pages.

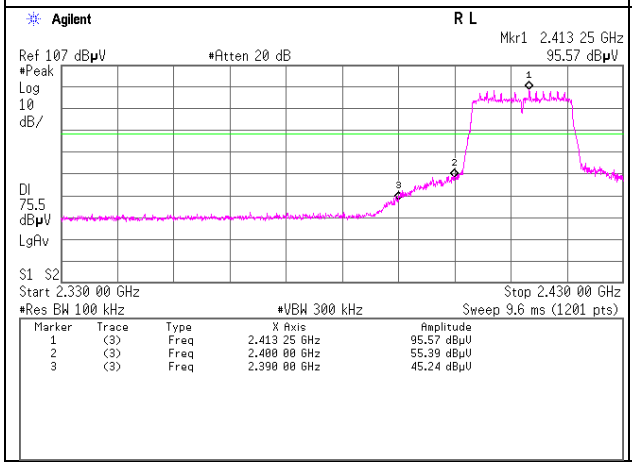
Band Edge confirmation

Test place	Shonan EMC Lab. No.1 Measurement Room
Report No.	10840757S-G
Date	July 10, 2015
Temperature / Humidity	25 deg. C / 67 % RH
Engineer	Shinichi Takano
Mode	Tx 11n-20

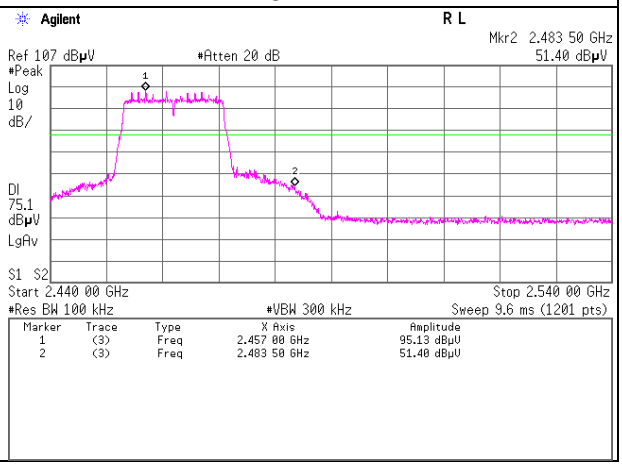
[Normal Power mode]

11n-20

2412 MHz



2462 MHz



* Final result of band edge was measured as radiated spurious emission. Refer to Radiated Spurious Emission's pages.

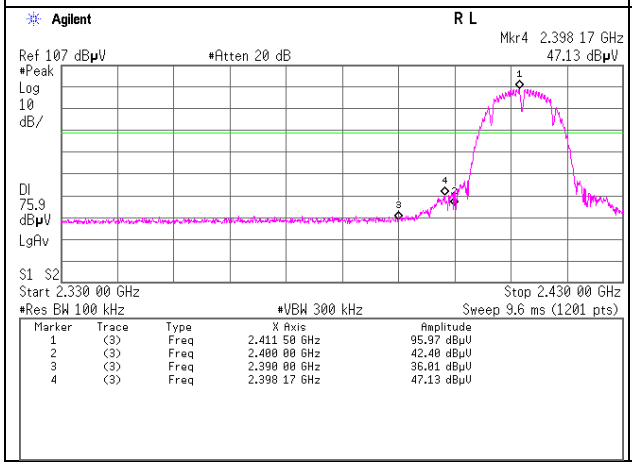
Band Edge confirmation

Test place	Shonan EMC Lab. No.1 Measurement Room
Report No.	10840757S-G
Date	July 10, 2015
Temperature / Humidity	25 deg. C / 67 % RH
Engineer	Shinichi Takano
Mode	Tx 11b , 11g

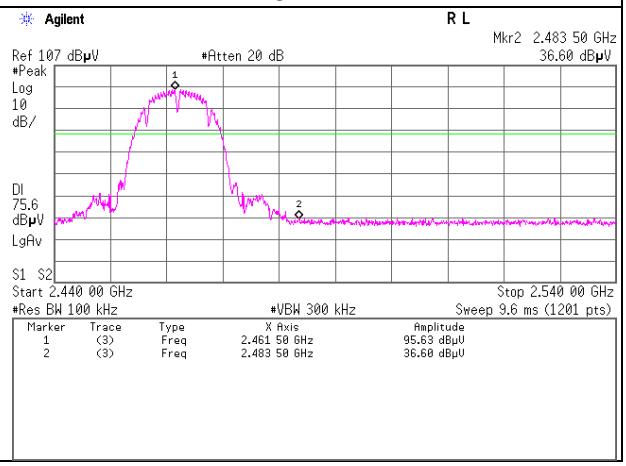
[Low Power mode]

11b

2412 MHz

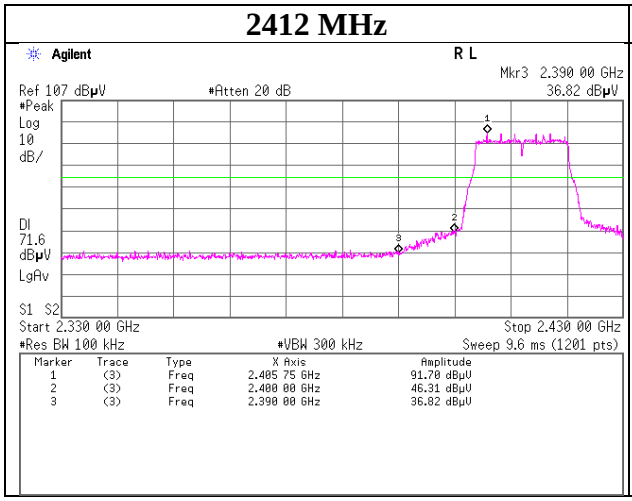


2462 MHz

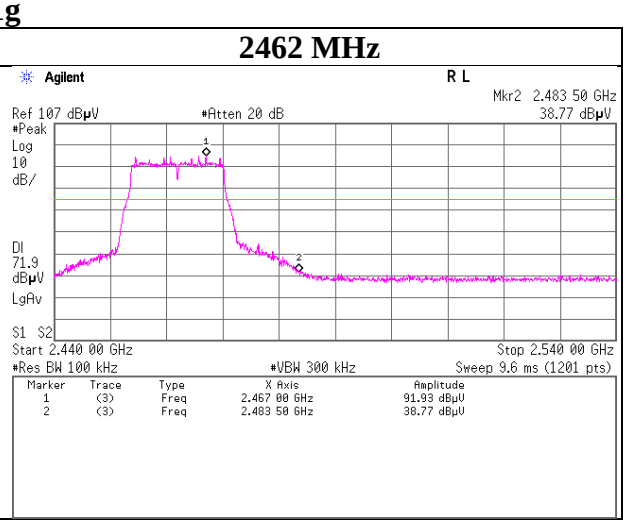


11g

2412 MHz



2462 MHz



* Final result of band edge was measured as radiated spurious emission. Refer to Radiated Spurious Emission's pages.

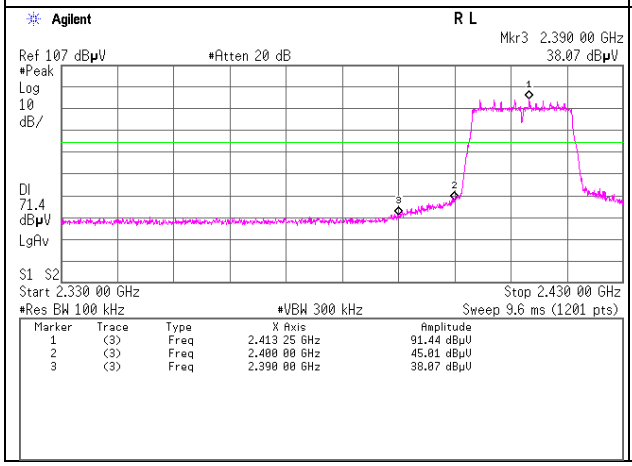
Band Edge confirmation

Test place	Shonan EMC Lab. No.1 Measurement Room
Report No.	10840757S-G
Date	July 10, 2015
Temperature / Humidity	25 deg. C / 67 % RH
Engineer	Shinichi Takano
Mode	Tx 11n-20

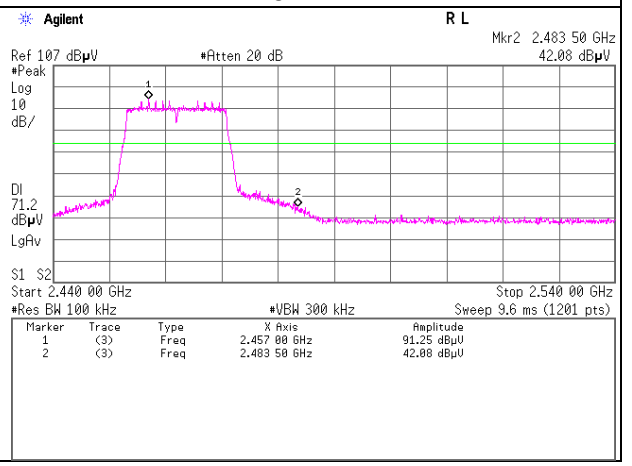
[Low Power mode]

11n-20

2412 MHz



2462 MHz



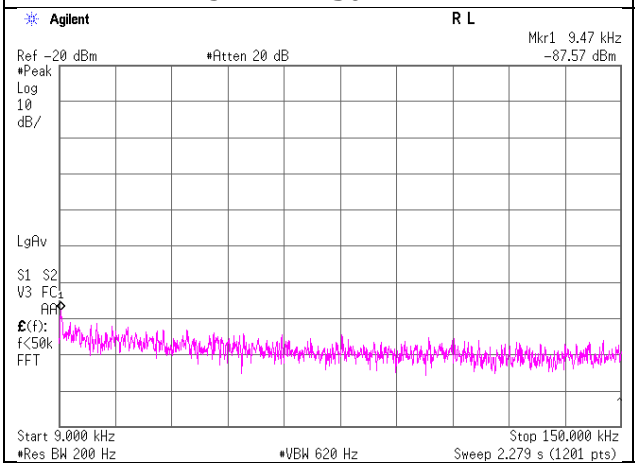
* Final result of band edge was measured as radiated spurious emission. Refer to Radiated Spurious Emission's pages.

Conducted Spurious Emission

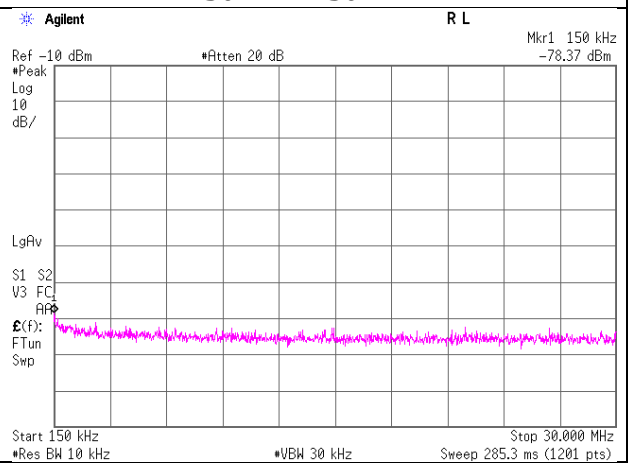
Test place	Shonan EMC Lab. No.1 Measurement Room
Report No.	10840757S-G
Date	July 10, 2015
Temperature / Humidity	25 deg. C / 67 % RH
Engineer	Shinichi Takano
Mode	Tx 11g 2412 MHz

[Normal Power mode]

9 kHz - 150 kHz



150 kHz - 30 MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenator Loss [dB]	Antenna Gain [dBi]	N (Number of Output	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
9.47	-87.6	0.60	9.9	2.1	1	-74.9	300	6.0	-13.7	48.0	61.7	
150.00	-78.4	0.60	9.9	2.1	1	-65.7	300	6.0	-4.5	24.0	28.5	

E = EIRP - 20 log (D) + Ground bounce + 104.8 [dBuV/m]

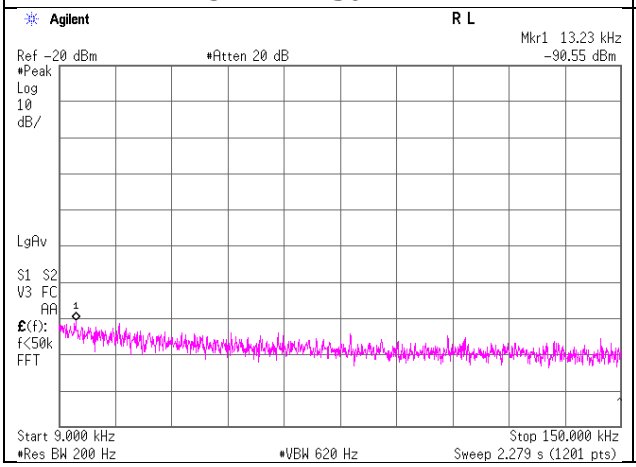
EIRP = Reading + Cable Loss + Attenator Loss + Antenna Gain + 10 * log (N)

Conducted Spurious Emission

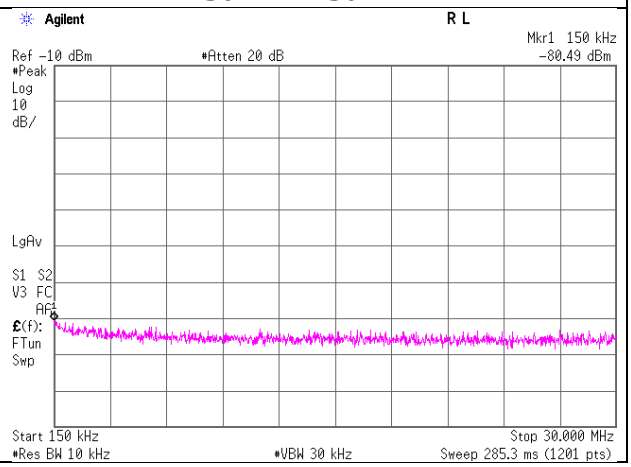
Test place	Shonan EMC Lab. No.1 Measurement Room
Report No.	10840757S-G
Date	July 10, 2015
Temperature / Humidity	25 deg. C / 67 % RH
Engineer	Shinichi Takano
Mode	Tx 11g 2412 MHz

[Low Power mode]

9 kHz - 150 kHz



150 kHz - 30 MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenator Loss [dB]	Antenna Gain [dBi]	N (Number of Output	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
13.23	-90.6	0.60	9.9	2.1	1	-77.9	300	6.0	-16.7	45.1	61.8	
150.00	-80.5	0.60	9.9	2.1	1	-67.9	300	6.0	-6.6	24.0	30.6	

E = EIRP - 20 log (D) + Ground bounce + 104.8 [dBuV/m]

EIRP = Reading + Cable Loss + Attenator Loss + Antenna Gain + 10 * log (N)

Power Density

Test place	Shonan EMC Lab. No.1 Measurement Room
Report No.	10840757S-G
Date	July 10, 2015
Temperature / Humidity	25 deg. C / 67 % RH
Engineer	Shinichi Takano
Mode	Tx

[Normal Power mode]

11b

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412	-25.48	1.39	9.99	-14.10	8.00	22.10
2437	-23.84	1.39	10.00	-12.45	8.00	20.45
2462	-26.01	1.39	10.00	-14.62	8.00	22.62

11g

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412	-26.22	1.39	9.99	-14.84	8.00	22.84
2437	-25.56	1.39	10.00	-14.17	8.00	22.17
2462	-27.02	1.39	10.00	-15.63	8.00	23.63

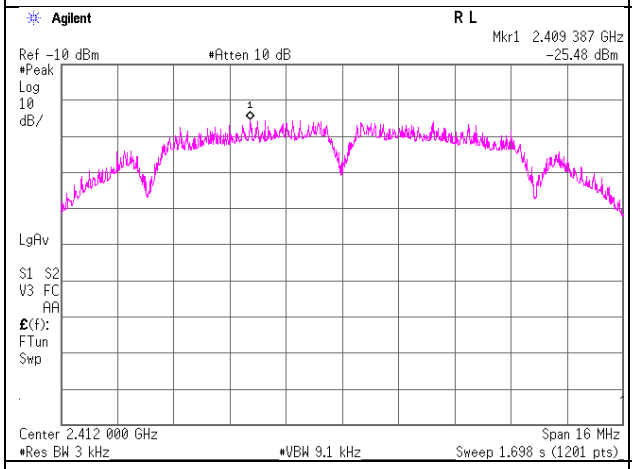
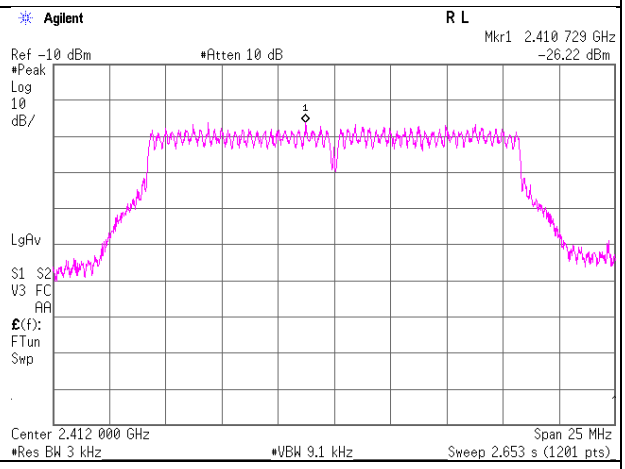
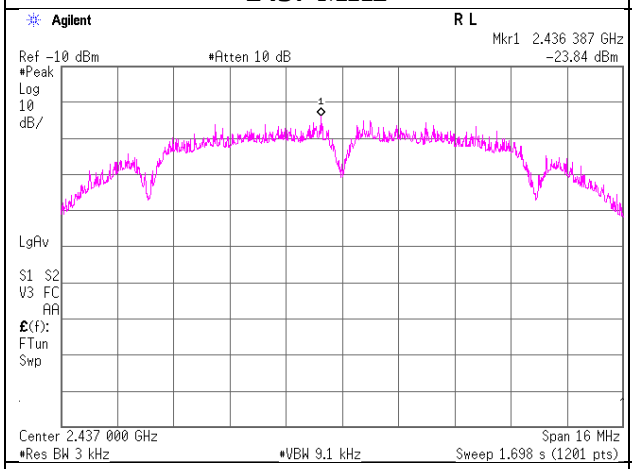
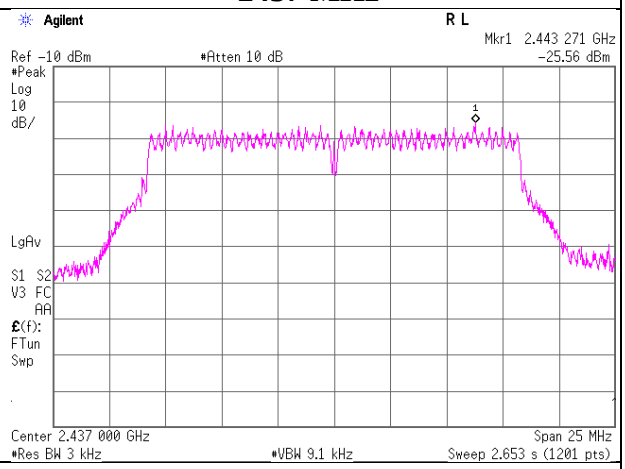
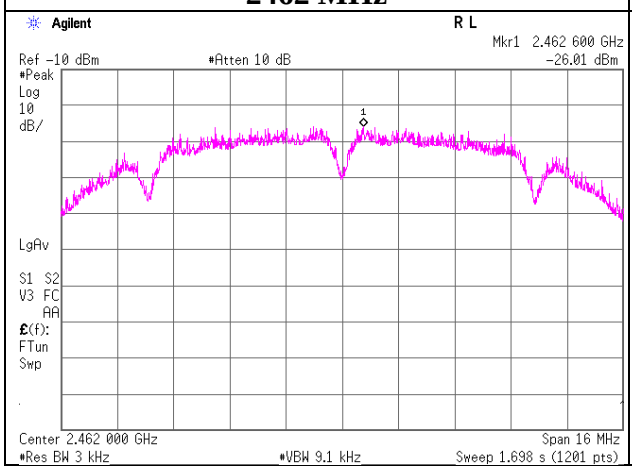
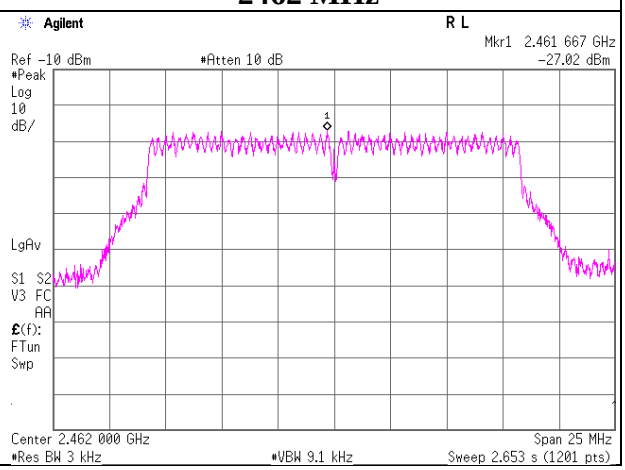
11n-20

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412	-24.93	1.39	9.99	-13.55	8.00	21.55
2437	-26.31	1.39	10.00	-14.92	8.00	22.92
2462	-27.88	1.39	10.00	-16.49	8.00	24.49

Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator

Power Density

[Normal Power mode]

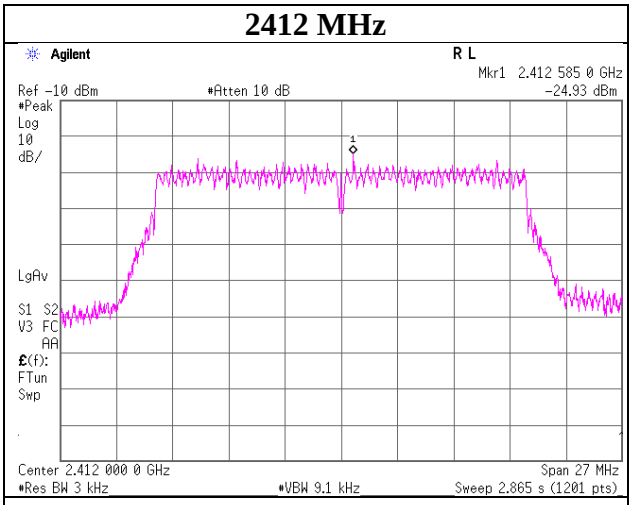
11b	11g
2412 MHz	**2412 MHz**
	
2437 MHz	**2437 MHz**
	
2462 MHz	**2462 MHz**
	

Power Density

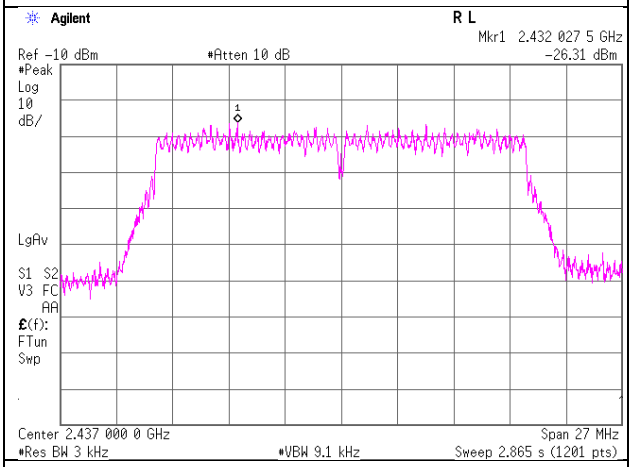
[Normal Power mode]

11n-20

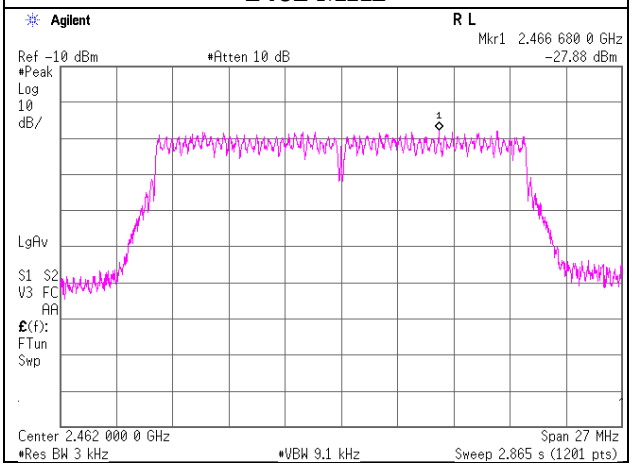
2412 MHz



2437 MHz



2462 MHz



Power Density

[Low Power mode]

11b

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412	-26.85	1.39	9.99	-15.47	8.00	23.47
2437	-25.91	1.39	10.00	-14.52	8.00	22.52
2462	-27.33	1.39	10.00	-15.94	8.00	23.94

11g

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412	-29.34	1.39	9.99	-17.96	8.00	25.96
2437	-28.69	1.39	10.00	-17.30	8.00	25.30
2462	-30.35	1.39	10.00	-18.96	8.00	26.96

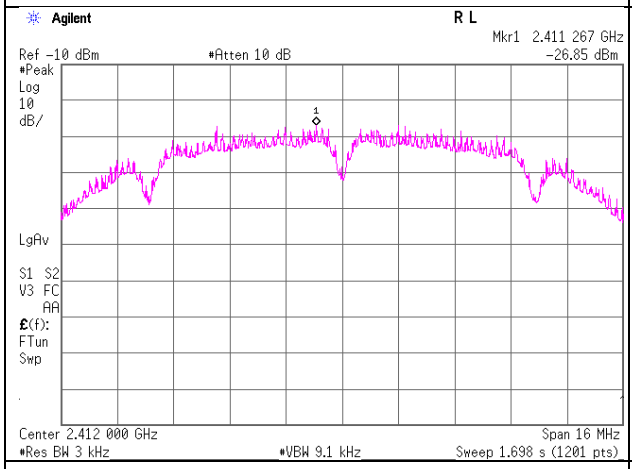
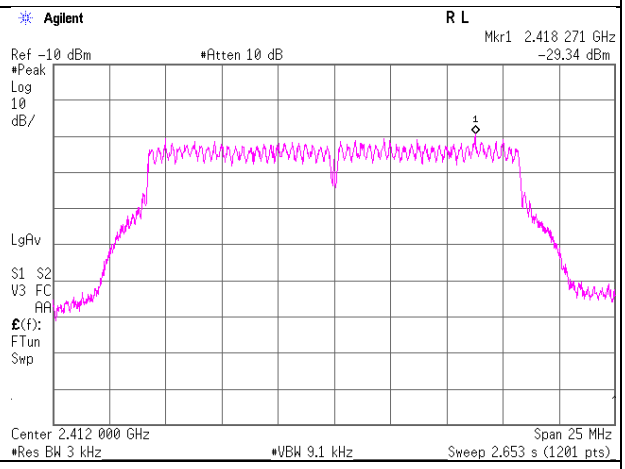
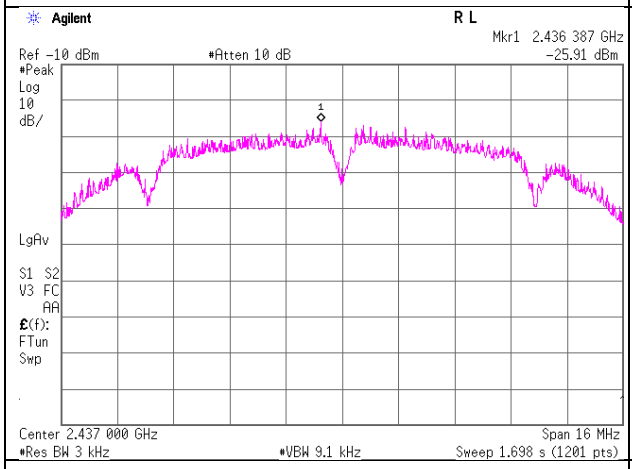
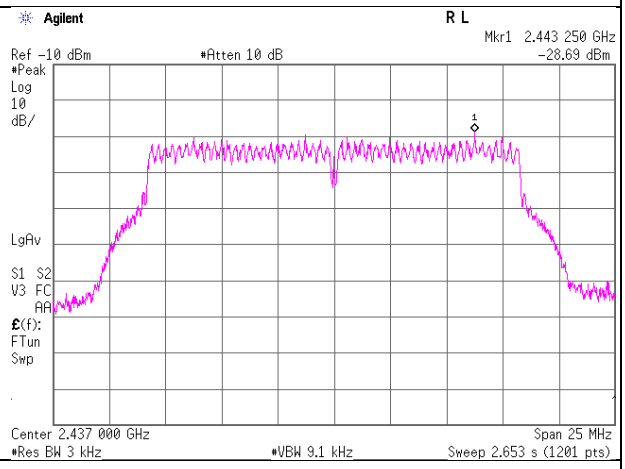
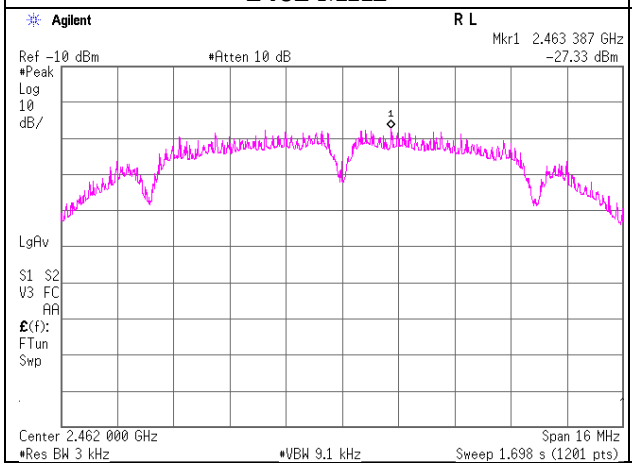
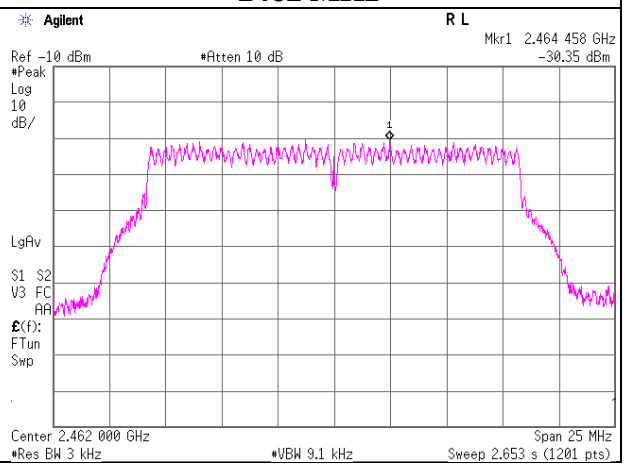
11n-20

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412	-30.56	1.39	9.99	-19.18	8.00	27.18
2437	-29.64	1.39	10.00	-18.25	8.00	26.25
2462	-30.37	1.39	10.00	-18.98	8.00	26.98

Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator

Power Density

[Low Power mode]

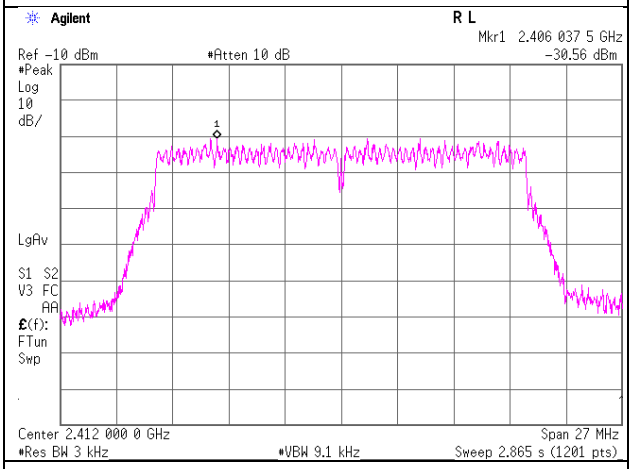
11b	11g
2412 MHz	**2412 MHz**
	
2437 MHz	**2437 MHz**
	
2462 MHz	**2462 MHz**
	

Power Density

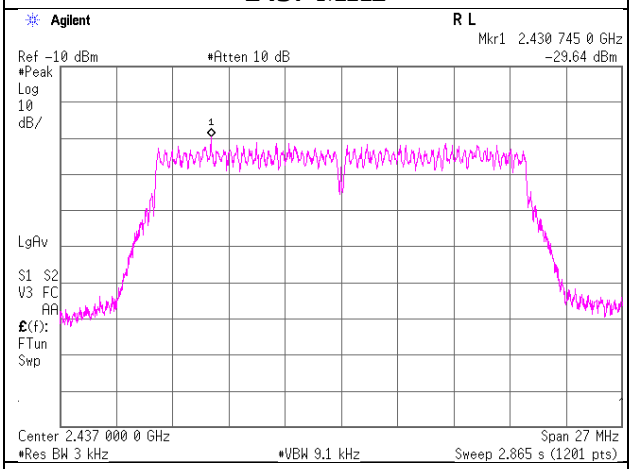
[Low Power mode]

11n-20

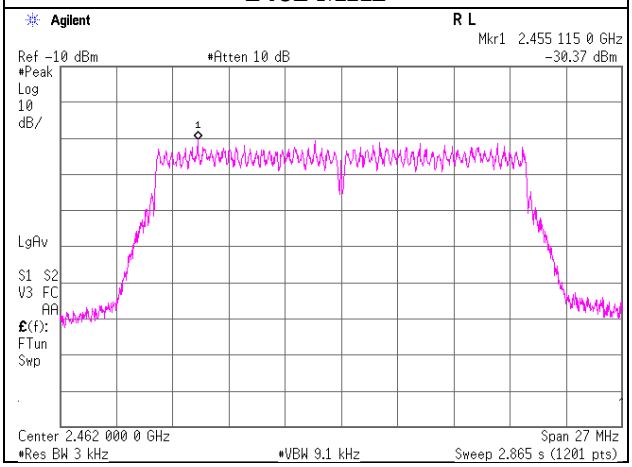
2412 MHz



2437 MHz



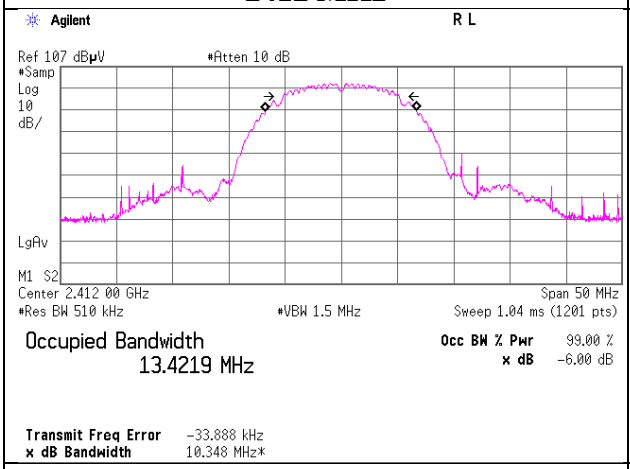
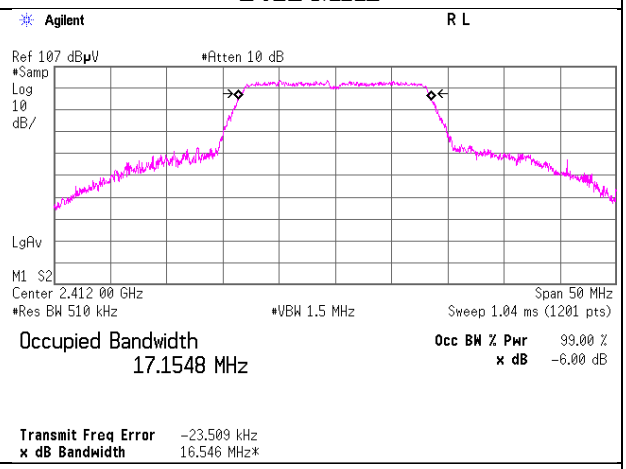
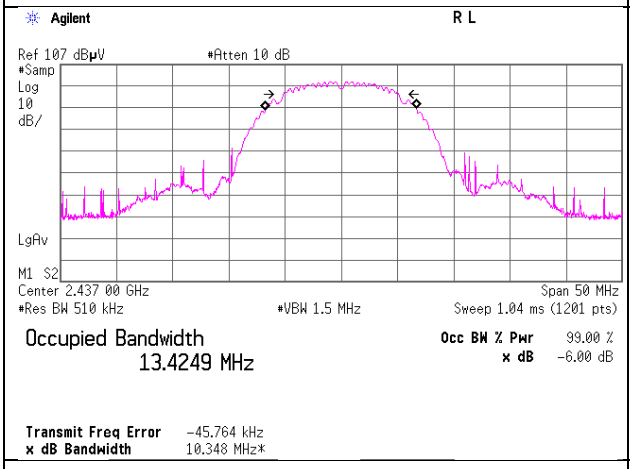
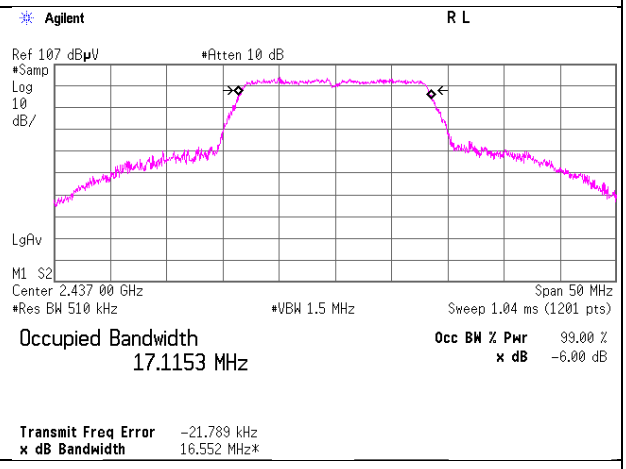
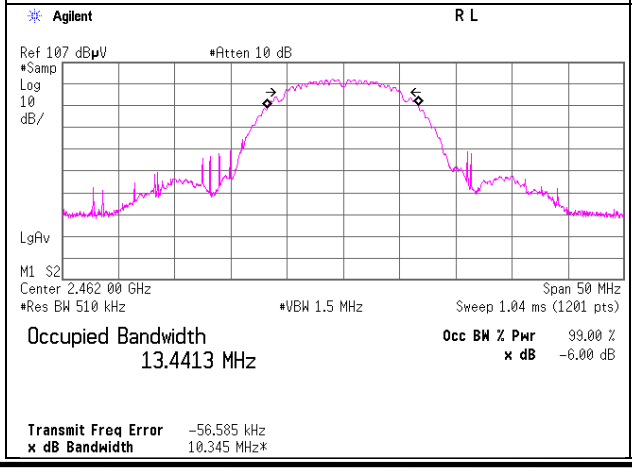
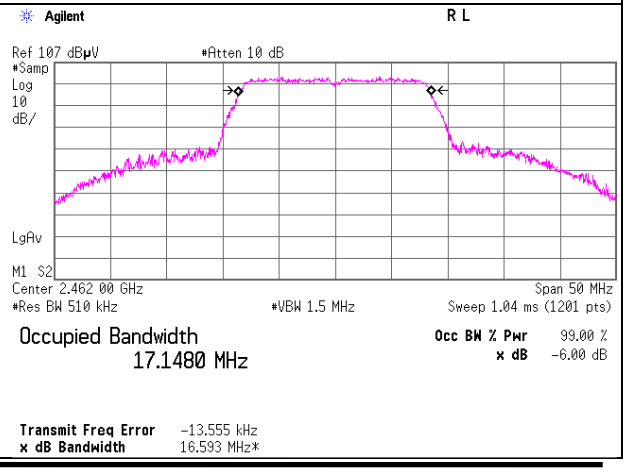
2462 MHz



99%Occupied Bandwidth

Test place	Shonan EMC Lab. No.1 Measurement Room
Report No.	10840757S-G
Date	July 10, 2015
Temperature / Humidity	25 deg. C / 67 % RH
Engineer	Shinichi Takano
Mode	Tx

[Normal Power mode]

11b	11g
2412 MHz	**2412 MHz**
	
2437 MHz	**2437 MHz**
	
2462 MHz	**2462 MHz**
	

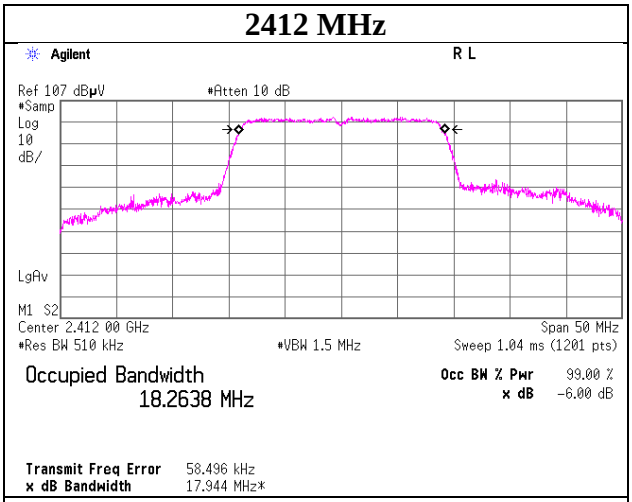
99% Occupied Bandwidth

Test place	Shonan EMC Lab. No.1 Measurement Room
Report No.	10840757S-G
Date	July 10, 2015
Temperature / Humidity	25 deg. C / 67 % RH
Engineer	Shinichi Takano
Mode	Tx

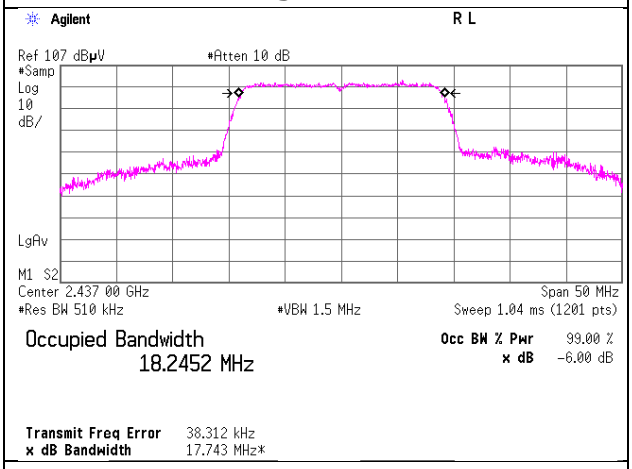
[Normal Power mode]

11n-20

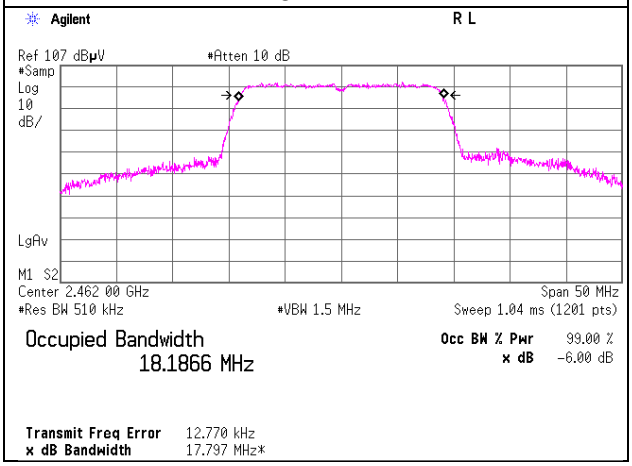
2412 MHz



2437 MHz



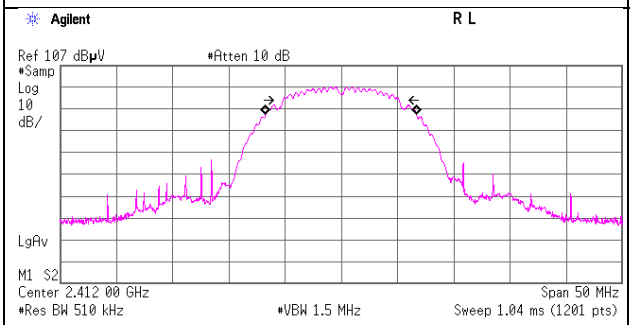
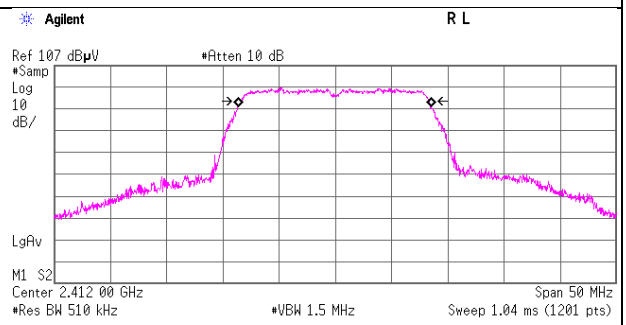
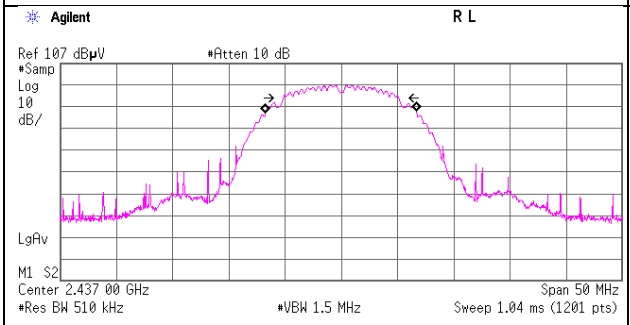
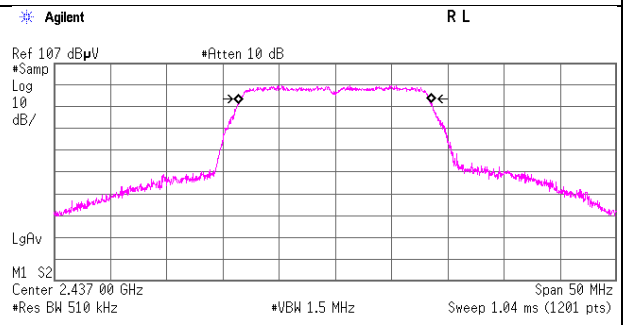
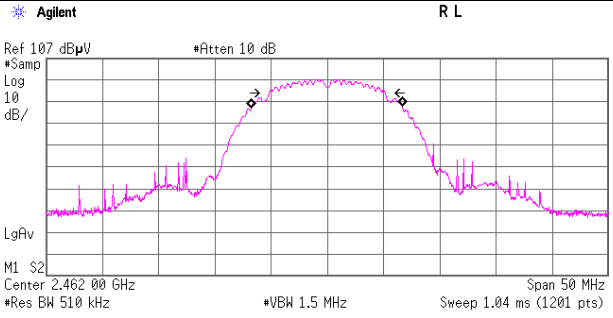
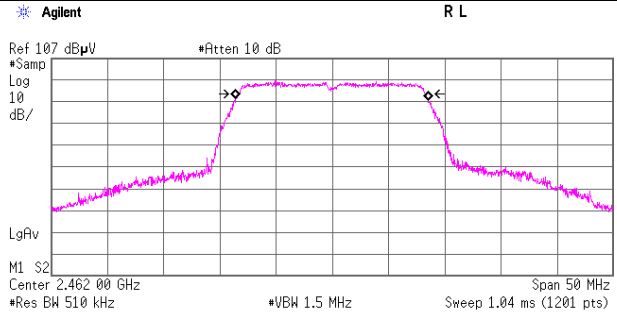
2462 MHz



99% Occupied Bandwidth

Test place	Shonan EMC Lab. No.1 Measurement Room
Report No.	10840757S-G
Date	July 10, 2015
Temperature / Humidity	25 deg. C / 67 % RH
Engineer	Shinichi Takano
Mode	Tx

[Low Power mode]

11b	11g
2412 MHz	**2412 MHz**
	
2437 MHz	**2437 MHz**
	
2462 MHz	**2462 MHz**
	

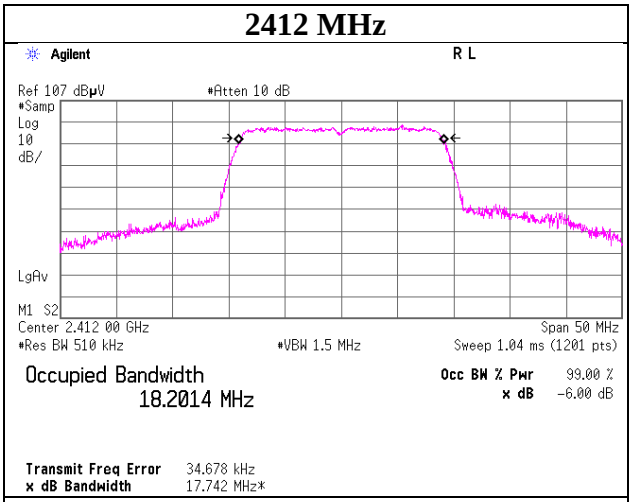
99% Occupied Bandwidth

Test place	Shonan EMC Lab. No.1 Measurement Room
Report No.	10840757S-G
Date	July 10, 2015
Temperature / Humidity	25 deg. C / 67 % RH
Engineer	Shinichi Takano
Mode	Tx

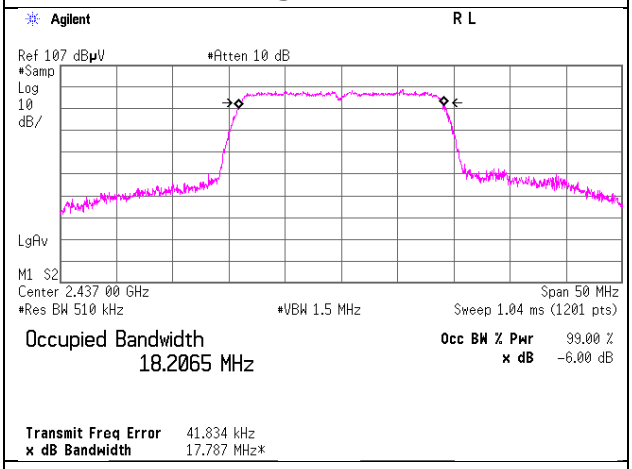
[Low Power mode]

11n-20

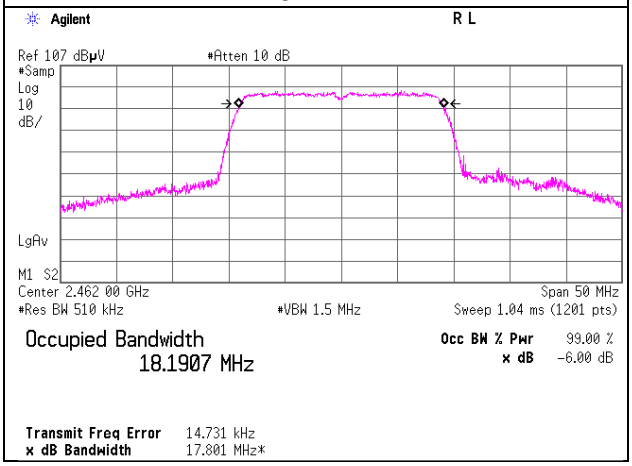
2412 MHz



2437 MHz



2462 MHz



APPENDIX 2: Test instruments

Test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
CSA-07	Spectrum Analyzer	Agilent	E4448A	MY52490024	AT	2015/05/28 * 12
SCC-G12	Coaxial Cable	Suhner	SUCOFLEX 102	30790/2	AT	2015/03/11 * 12
SAT10-11	Attenuator	Weinschel Corp.	54A-10	37588	AT	2015/04/09 * 12
SPM-06	Power Meter	Anritsu	ML2495A	0850009	AT	2015/04/07 * 12
SPSS-03	Power sensor	Anritsu	MA2411B	0917063	AT	2015/04/07 * 12
SOS-13	Humidity Indicator	Custom	CTH-202	Q.C.17	AT	2015/04/28 * 12
SAF-04	Pre Amplifier	TOYO Corporation	TPA0118-36	1440489	RE	2015/03/23 * 12
SCC-G01	Coaxial Cable	Suhner	SUCOFLEX 104A	46497/4A	RE	2015/04/17 * 12
SCC-G21	Coaxial Cable	Suhner	SUCOFLEX 104	296169/4	RE	2015/05/19 * 12
SHA-01	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-725	RE	2014/08/12 * 12
SOS-01	Humidity Indicator	A&D	AD-5681	4062555	RE	2014/10/30 * 12
SJM-13	Measure	ASKUL	-	-	RE	-
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,CE,RFI,MF)	-	RE	-
STR-01	Test Receiver	Rohde & Schwarz	ESU40	100093	RE	2014/11/11 * 12
SAEC-01(SVSWR)	Semi-Anechoic Chamber	TDK	SAEC-01(SVSWR)	1	RE	2015/07/08 * 12
SSA-03	Spectrum Analyzer	Agilent	E4448A	MY48250152	RE	2015/02/24 * 12
STS-01	Digital Hitester	Hioki	3805-50	080997812	RE	2014/11/11 * 12
SAT10-06	Attenuator	Agilent	8493C-010	74865	RE	2014/11/21 * 12
SFL-02	Highpass Filter	MICRO-TRONICS	HPM50111	051	RE	2014/11/21 * 12
SAT10-05	Attenuator(above1GHz)	Agilent	8493C-010	74864	RE	2014/11/21 * 12
KSA-08	Spectrum Analyzer	Agilent	E4446A	MY46180525	RE	2015/03/23 * 12
SAEC-02(NSA)	Semi-Anechoic Chamber	TDK	SAEC-02(NSA)	2	RE	2015/07/15 * 12
KAF-04	Pre Amplifier	Agilent	8449B	3008A01600	RE	2015/04/28 * 12
SCC-G05	Coaxial Cable	Junkosha	J12J102207-00	APR-30-15-037	RE	2015/05/11 * 12
SCC-G22	Coaxial Cable	Suhner	SUCOFLEX 104	296199/4	RE	2015/05/19 * 12
SHA-02	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-726	RE	2014/08/12 * 12
SOS-03	Humidity Indicator	A&D	AD-5681	4063325	RE	2014/10/30 * 12
SJM-14	Measure	ASKUL	-	-	RE	-
SHA-04	Horn Antenna	ETS LINDGREN	3160-09	LM3640	RE	2015/03/17 * 12
SAF-08	Pre Amplifier	TOYO Corporation	HAP18-26W	00000019	RE	2015/03/23 * 12
SCC-G15	Coaxial Cable	Suhner	SUCOFLEX 102	32703/2	RE	2015/03/11 * 12
SFL-18	Highpass Filter	MICRO-TRONICS	HPM50111	119	RE	2015/04/09 * 12
SAEC-03(NSA)	Semi-Anechoic Chamber	TDK	SAEC-03(NSA)	3	RE	2015/07/16 * 12
SBA-03	Biconical Antenna	Schwarzbeck	BBA9106	91032666	RE	2014/10/18 * 12
SLA-03	Logperiodic Antenna	Schwarzbeck	UHALP9108A	UHALP 9108-A 0901	RE	2014/10/18 * 12
SAT6-08	Attenuator	HIROSE ELECTRIC CO.,LTD.	AT-406(40)	-	RE	2014/08/27 * 12
SCC-C1/C2/C3/C4/C5/C10/SRSE-03	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-271(RF Selector)	RE	2015/04/17 * 12
SAF-03	Pre Amplifier	SONOMA	310N	290213	RE	2015/02/18 * 12
STR-06	Test Receiver	Rohde & Schwarz	ESCI	101259	RE,CE	2015/03/24 * 12
SOS-05	Humidity Indicator	A&D	AD-5681	4062518	RE	2014/10/30 * 12
SJM-15	Measure	ASKUL	-	-	RE	-

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
SCC-C9/C10/SRSE-03	Coaxial Cable&RF Selector	Suhner/Suhner/TOYO	RG223U/141PE/NS4906	-/0901-271(RF Selector)	CE	2015/04/17 * 12
SLS-05	LISN	Rohde & Schwarz	ENV216	100516	CE(EUT)	2015/02/24 * 12
SAT3-07	Attenuator	JFW	50HF-003N	-	CE	2014/09/02 * 12
SOS-06	Humidity Indicator	A&D	AD-5681	4062118	CE	2014/12/24 * 12
STM-12	Terminator	TME	CT-01 BP	-	CE	2014/12/19 * 12
SLS-03	LISN	Rohde & Schwarz	ENV216	100513	CE(AE)	2015/02/25 * 12
STS-03	Digital Hitester	Hioki	3805-50	080997823	RE,CE	2014/11/11 * 12
SAF-06	Pre Amplifier	TOYO Corporation	TPA0118-36	1440491	RE	2015/05/27 * 12
SCC-G04	Coaxial Cable	Junkosha	J12J102207-00	JUN-12-14-018	RE	2015/06/08 * 12
SCC-G23	Coaxial Cable	Suhner	SUCOFLEX 104	297342/4	RE	2015/05/19 * 12
SHA-03	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-739	RE	2014/08/12 * 12
SSA-02	Spectrum Analyzer	Agilent	E4448A	MY48250106	RE	2015/03/26 * 12
SFL-02	Highpass Filter	MICRO-TRONICS	HPM50111	051	RE	2014/11/21 * 12
SAT10-05	Attenuator(above1GHz)	Agilent	8493C-010	74864	RE	2014/11/21 * 12
SAEC-03(SVSWR)	Semi-Anechoic Chamber	TDK	SAEC-03(SVSWR)	3	RE	2015/03/11 * 12

The expiration date of the calibration is the end of the expired month.
All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.

As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chains of calibrations.

Test Item: **CE: Conducted Emission test**
RE: Radiated Emission test
AT: Antenna Terminal Conducted test