



# RADIO TEST REPORT

**Test Report No. : 10762865S-B**

**Applicant** : PIONEER CORPORATION  
**Type of Equipment** : Car Audio with Bluetooth / WLAN  
**Model No.** : PVH-5558  
**FCC ID** : AJDK091  
**Test regulation** : FCC Part 15 Subpart C: 2015  
**Test result** : Complied

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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:** June 12 to 18, 2015

**Representative test engineer:**

Hikaru Shirasawa  
Engineer  
Consumer Technology Division

**Approved by:**

Toyokazu Imamura  
Leader  
Consumer Technology Division



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

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13-EM-F0429



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## **SECTION 1: Customer information**

Company Name : PIONEER CORPORATION  
Address : 25-1 Yamada, Kawagoe-shi, Saitama-ken 350-8555, JAPAN  
Telephone Number : +81-49-228-6415  
Facsimile Number : +81-49-228-6493  
Contact Person : Tomoyuki Tanaka

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

### **2.1 Identification of E.U.T.**

Type of Equipment : Car Audio with Bluetooth / WLAN  
Model No. : PVH-5558  
Serial No. : Refer to Section 4, Clause 4.2  
Rating : DC 12 V  
Receipt Date of Sample : May 11, 2015  
Country of Mass-production : Thailand  
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: PVH-5558 (referred to as the EUT in this report) is a Car Audio with Bluetooth / WLAN.

#### **General Specification**

Clock frequency(ies) in the system : 26 MHz

#### **Radio Specification**

##### **Bluetooth (Ver. 3.0 with EDR function):**

Radio Type : Transceiver  
Frequency of Operation : 2402 MHz - 2480 MHz  
Modulation : FHSS  
Power Supply (radio part input) : DC 3.3 V  
Antenna type : F pattern type  
Antenna Gain : -1.98 dBi

##### **Wireless LAN:**

Radio Type : Transceiver  
Frequency of Operation : 2412 MHz - 2462 MHz  
Modulation : DSSS  
Power Supply (radio part input) : DC 3.3 V  
Antenna type : F pattern type  
Antenna Gain : -0.38 dBi

\* Refer to the test report: 10762865S-A for Bluetooth part.

## **SECTION 3: Test specification, procedures & results**

### **3.1 Test Specification**

Test Specification : FCC Part 15 Subpart C: 2015, final revised on January 21, 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

### **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 IC: RSS-Gen 8.8	FCC: Section 15.207 IC: RSS-Gen 8.8		N/A *1)	-
6dB Bandwidth	FCC: KDB 558074 D01 DTS Meas Guidance v03r03 IC: -	FCC: Section 15.247(a)(2) IC: RSS-247 5.2(1)	See data.	Complied	Conducted
Maximum Peak Output Power	FCC: KDB 558074 D01 DTS Meas Guidance v03r03 IC: RSS-Gen 6.12	FCC: Section 15.247(b)(3) IC: RSS-247 5.4(4)		Complied	Conducted
Power Density	FCC: KDB 558074 D01 DTS Meas Guidance v03r03 IC: -	FCC: Section 15.247(e) IC: RSS-247 5.2(2)		Complied	Conducted
Spurious Emission Restricted Band Edges	FCC: KDB 558074 D01 DTS Meas Guidance v03r03 IC: RSS-Gen 6.13	FCC: Section15.247(d) IC: RSS-247 5.5 RSS-Gen 8.9 RSS-Gen 8.10		1.3 dB 4824.00 MHz, AV, Vert.	Complied
Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422. *1) The test is not applicable since the EUT has no AC mains. *2) 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 C63.4: 2009 is also referred.

#### **FCC 15.31 (e)**

The EUT provides stable voltage (DC 3.3 V) constantly to the wireless transmitter regardless of input voltage. Instead of a new battery, DC power supply was used for the test. That does not affect the test result. Therefore, this EUT complies with the requirement.

#### **FCC 15.203**

It is impossible for end users to replace the antenna, because the antenna is mounted inside of the EUT. Therefore, the equipment complies with the antenna requirement.

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### 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

### 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%

#### Radiated emission test

The data listed in this report meets the limits unless the uncertainty is taken into consideration.

### 3.5 Test Location

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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.

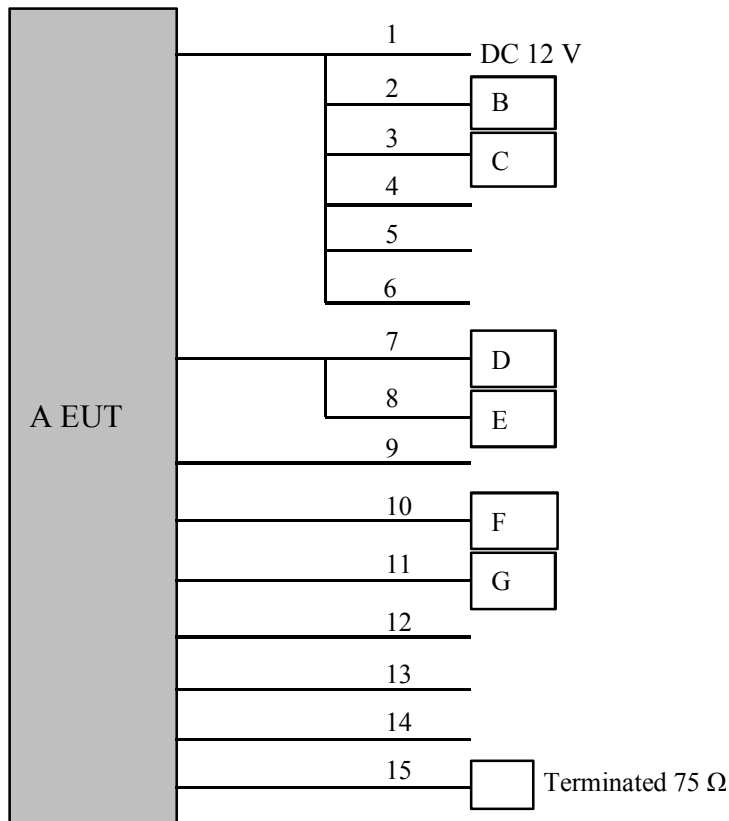
<b>Mode</b>	<b>Remarks*</b>
IEEE 802.11b (11b)	1Mbps, PN9
IEEE 802.11g (11g)	6Mbps, PN9
IEEE 802.11n SISO 20MHz BW (11n-20)	MCS 0, PN9
*The worst condition was determined based on the test result of Maximum Peak Output Power (Mid Channel)	
Power setting : Fixed Firmware version: 0.040203	

\*The details of Operating mode(s)

<b>Test Item</b>	<b>Operating Mode</b>	<b>Tested frequency</b>
Spurious Emission	11b Tx	2412MHz
6dB Bandwidth	11g Tx	2437MHz
Maximum Peak Output Power	11n-20 Tx	2462MHz
Power Density		
99% Occupied Bandwidth		



## 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 and auxiliary equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Car Audio with Bluetooth	PVH-5558	AABB000027CS *1) AABB000029CS *2)	PIONEER CORPORATION	EUT
B	Speaker	LV-002	S11014200775	L&V	-
C	Speaker	LV-002	S11014200775	L&V	-
D	Speaker	LV-002	S11014200775	L&V	-
E	Speaker	LV-002	S11014200775	L&V	-
F	USB	SDK-USM4GL(B)	-	SONY	-
G	GPS antenna	-	-	MITSUMI ELECTRONICS	-

\*1) Used for Antenna Terminal conducted test

\*2) Used for Radiated Emission test

**List of cables used**

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	DC cable	1.5	Unshielded	Unshielded	-
2	Speaker cable	3.4	Unshielded	Unshielded	-
3	Speaker cable	3.4	Unshielded	Unshielded	-
4	Cable	1.4	Unshielded	Unshielded	-
5	Cable	2.0	Unshielded	Unshielded	-
6	Cable	2.0	Unshielded	Unshielded	-
7	Speaker cable	3.4	Unshielded	Unshielded	-
8	Speaker cable	3.4	Unshielded	Unshielded	-
9	Cable	1.0	Shielded	Shielded	-
10	USB cable	2.1	Shielded	Shielded	-
11	GPS antenna cable	1.3	Unshielded	Unshielded	-
12	Cable	1.0	Shielded	Shielded	-
13	Cable	1.0	Unshielded	Unshielded	-
14	Cable	1.4	Unshielded	Unshielded	-
15	FM antenna cable	1.7	Shielded	Shielded	-

## **SECTION 5: 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 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 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: Power Averaging (Linear voltage) Trace: 100 traces Duty factor was added to the results.	RBW: 100 kHz VBW: 300 kHz
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:  $20 \times \log(3.0 \text{ m} / 1.0 \text{ m}) = 9.5 \text{ dB}$

\*2) Average Power Measurement was performed based on 6.0 & 12.2.5 of "KDB 558074 D01 DTS Meas Guidance v03r03"

The EUT was set at 30 degree as normal position according to the EUT's specification.

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 6: Antenna Terminal Conducted Tests**

### **Test Procedure**

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

<b>Test</b>	<b>Span</b>	<b>RBW</b>	<b>VBW</b>	<b>Sweep time</b>	<b>Detector</b>	<b>Trace</b>	<b>Instrument used</b>
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	Sample	Max Hold	Spectrum Analyzer
Maximum Peak Output Power	-	-	-	Auto	Peak/ Average *1)	-	Power Meter (Sensor: 160 MHz BW)
Peak Power Density	1.5 times the 6dB Bandwidth	30 kHz	100 kHz	Auto	Peak	Max Hold	Spectrum Analyzer *2)
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	40 MHz	100 kHz	300 kHz	Auto	Peak	Max Hold	Spectrum Analyzer *1)
*1) Reference data *2) Section 10.2 Method PKPSD (peak PSD) of "KDB 558074 D01 DTS Meas Guidance v03r03". *3) The test was not performed at RBW:3 kHz however the measurement is to be performed with RBW:3kHz in the regulation, because the measurement value with RBW:3 kHz is less than the value of RBW:30 kHz and the test data met the limit with RBW:30 kHz. *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

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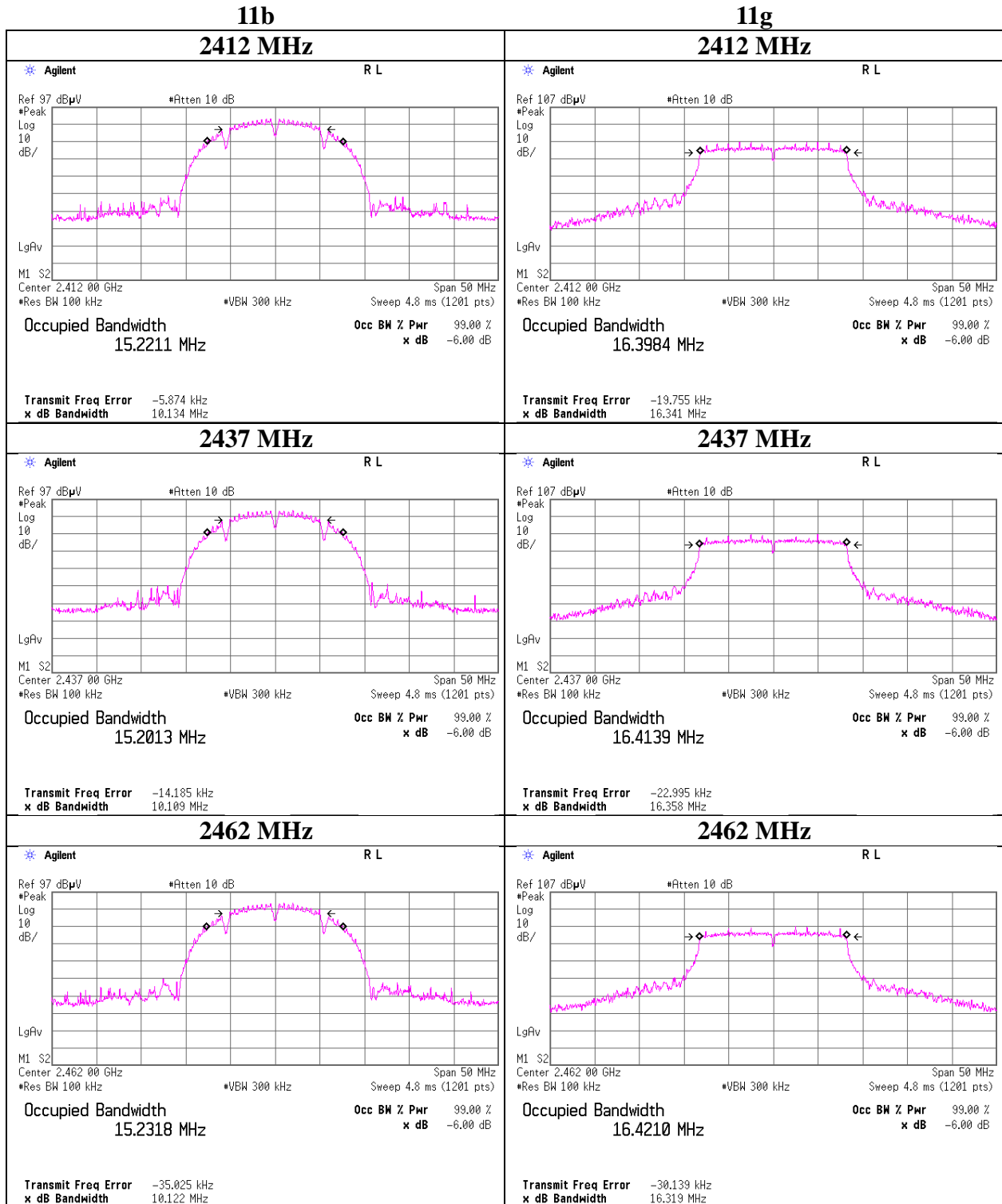
## APPENDIX 1: Test data

### 6dB Bandwidth

Test place	Shonan EMC Lab. No.6 Shielded Room
Report No.	10762865S-B
Date	June 18, 2015
Temperature / Humidity	23 deg. C / 40 % RH
Engineer	Hikaru Shirasawa
Mode	Tx

Mode	Frequency [MHz]	6dB Bandwidth [MHz]	Limit [kHz]
11b	2412	10.134	> 500
	2437	10.109	> 500
	2462	10.122	> 500
11g	2412	16.341	> 500
	2437	16.358	> 500
	2462	16.319	> 500
11n-20	2412	17.109	> 500
	2437	17.011	> 500
	2462	16.643	> 500

### 6dB Bandwidth



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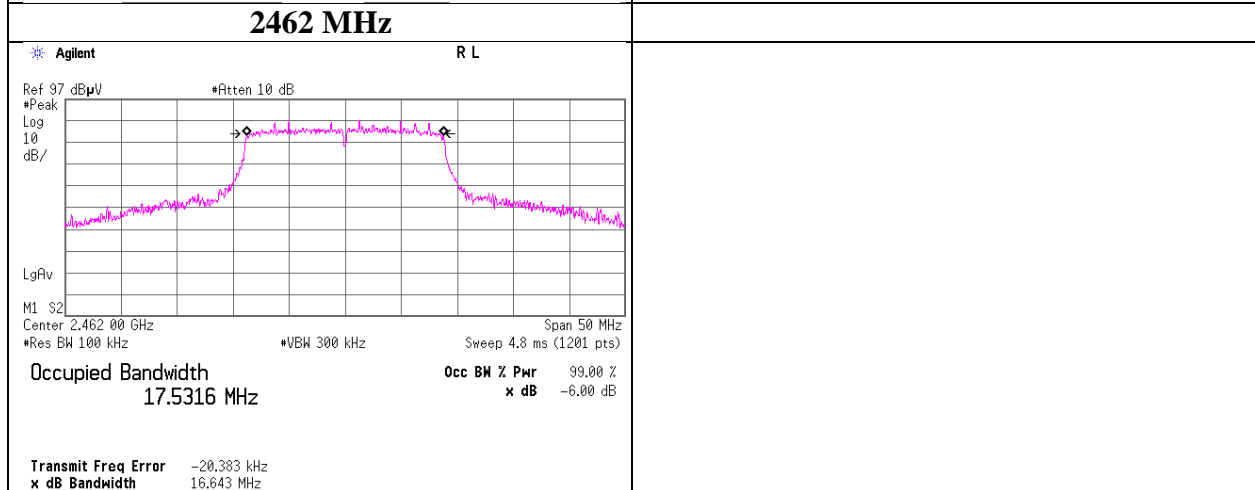
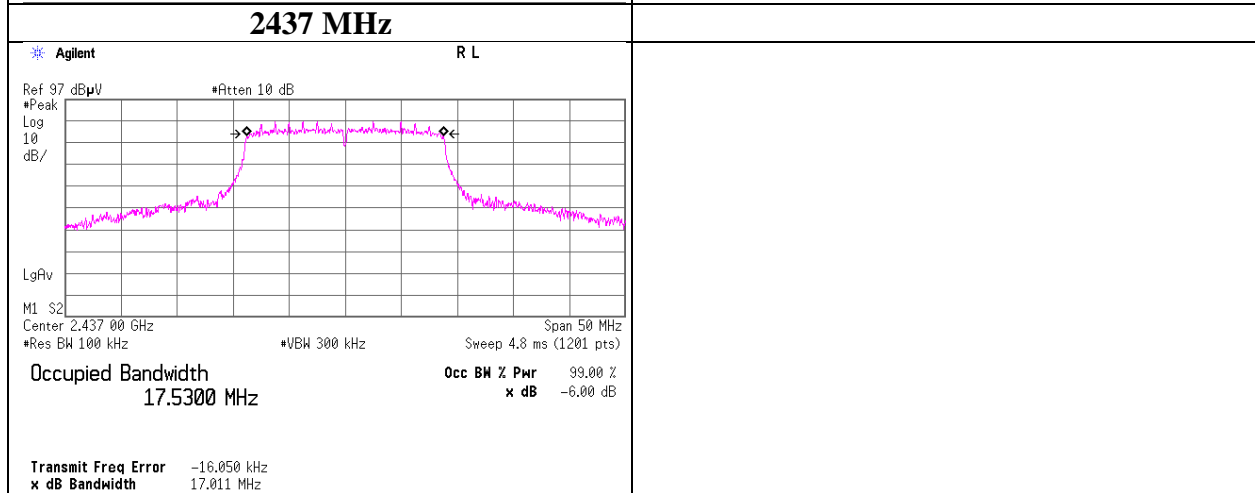
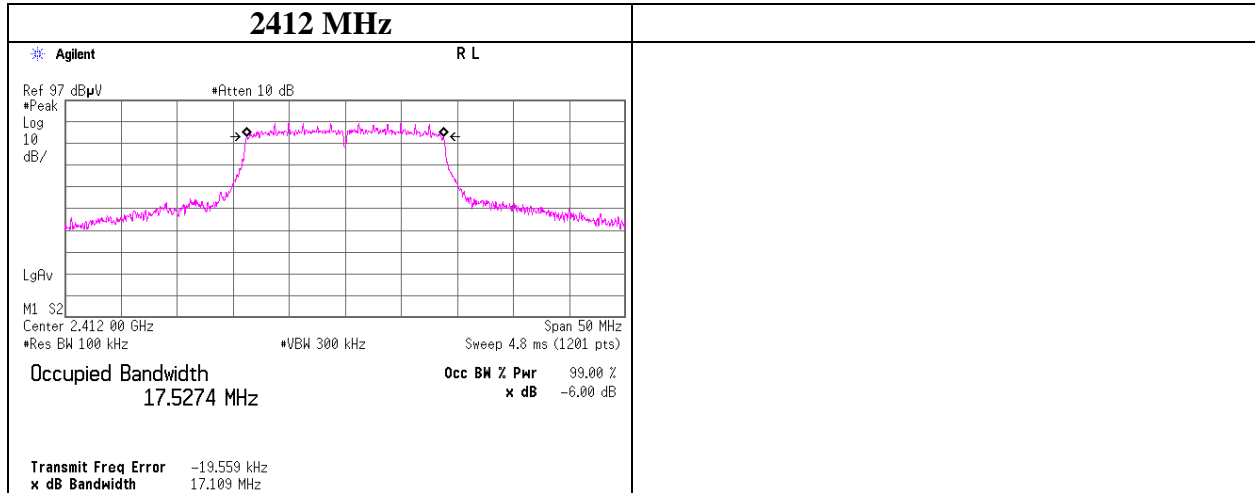
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**6dB Bandwidth**

**11n-20**



### Maximum Peak Output Power

Test place Shonan EMC Lab. No.5 Shielded Room  
Report No. 10762865S-B  
Date June 12, 2015  
Temperature / Humidity 23 deg. C / 50 % RH  
Engineer Akio Hayashi  
Mode Tx 11b

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
2412	-4.76	2.09	20.13	17.46	55.72	30.00	1000	12.54
2437	-4.80	2.10	20.13	17.43	55.34	30.00	1000	12.57
2462	-4.94	2.11	20.13	17.30	53.70	30.00	1000	12.70

Sample Calculation:

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

2437MHz

Rate	Reading	Remark
[Mbps]	[dBm]	
1	-4.80	*
2	-4.81	
5.5	-4.85	
11	-4.84	

\*: Worst Rate

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



### Maximum Peak Output Power

Test place : Shonan EMC Lab. No.5 Shielded Room  
Report No. : 10762865S-B  
Date : June 12, 2015  
Temperature / Humidity : 23 deg. C / 50 % RH  
Engineer : Akio Hayashi  
Mode : Tx 11g

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
2412	-0.52	2.09	20.13	21.70	147.91	30.00	1000	8.30
2437	-0.58	2.10	20.13	21.65	146.22	30.00	1000	8.35
2462	-0.85	2.11	20.13	21.39	137.72	30.00	1000	8.61

Sample Calculation:

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

2437 MHz

Rate [Mbps]	Reading [dBm]	Remark
6	-0.58	*
9	-0.70	
12	-0.60	
18	-0.67	
24	-0.64	
36	-0.72	
48	-0.61	
54	-0.62	

\*: Worst Rate

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

### Maximum Peak Output Power

Test place                   Shonan EMC Lab. No.5 Shielded Room  
Report No.                   10762865S-B  
Date                         June 12, 2015  
Temperature / Humidity   23 deg. C / 50 % RH  
Engineer                    Akio Hayashi  
Mode                         Tx 11n-20

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
2412	-0.46	2.09	20.13	21.76	149.97	30.00	1000	8.24
2437	-0.52	2.10	20.13	21.71	148.25	30.00	1000	8.29
2462	-0.79	2.11	20.13	21.45	139.64	30.00	1000	8.55

Sample Calculation:

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

2437 MHz, Long GI

MCS Number	Reading [dBm]	Remark
0	-0.52	*
1	-0.62	
2	-0.58	
3	-0.70	
4	-0.74	
5	-1.00	
6	-0.77	
7	-0.95	

\* Worst MCS

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

**Average Output Power**  
**(Reference data for RF Exposure)**

Test place : Shonan EMC Lab. No.5 Shielded Room  
Report No. : 10762865S-B  
Date : June 12, 2015  
Temperature / Humidity : 23 deg. C / 50 % RH  
Engineer : Akio Hayashi  
Mode : Tx

**11b 11 Mbps**

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Frame power)		Duty factor [dB]	Result (Burst power)	
				[dBm]	[mW]		[dBm]	[mW]
2412	-7.17	2.09	20.13	15.05	31.99	0.06	15.11	32.43
2437	-7.19	2.10	20.13	15.04	31.92	0.06	15.10	32.36
2462	-7.31	2.11	20.13	14.93	31.12	0.06	14.99	31.55

**11g 48 Mbps**

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Frame power)		Duty factor [dB]	Result (Burst power)	
				[dBm]	[mW]		[dBm]	[mW]
2412	-9.66	2.09	20.13	12.56	18.03	1.02	13.58	22.80
2437	-9.61	2.10	20.13	12.62	18.28	1.02	13.64	23.12
2462	-9.68	2.11	20.13	12.56	18.03	1.02	13.58	22.80

**11n-20 MCS 4**

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Frame power)		Duty factor [dB]	Result (Burst power)	
				[dBm]	[mW]		[dBm]	[mW]
2412	-9.22	2.09	20.13	13.00	19.95	0.24	13.24	21.09
2437	-9.25	2.10	20.13	12.98	19.86	0.24	13.22	20.99
2462	-9.27	2.11	20.13	12.97	19.82	0.24	13.21	20.94

Sample Calculation:

Result (Frame power) = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuatc

Result (Burst power) = Frame power + Duty factor

**Average Output Power**  
**(Reference data for RF Exposure)**

Test place : Shonan EMC Lab. No.5 Shielded Room  
Report No. : 10762865S-B  
Date : June 12, 2015  
Temperature / Humidity : 23 deg. C / 50 % RH  
Engineer : Akio Hayashi  
Mode : Tx

2437 MHz

Mode	Rate Mbps	Reading [dBm]	Duty factor [dB]	Burst power [dBm]	Remarks
11b	1	-7.14	0.00	-7.14	
	2	-7.15	0.01	-7.14	
	5.5	-7.17	0.03	-7.14	
	11	-7.19	0.06	-7.13	*
11g	6	-9.12	0.04	-9.08	
	9	-9.15	0.06	-9.09	
	12	-9.14	0.08	-9.06	
	18	-9.15	0.12	-9.03	
	24	-9.20	0.16	-9.04	
	36	-9.32	0.25	-9.07	
	48	-9.61	1.02	-8.59	*
	54	-10.11	1.48	-8.63	

\* Worst rate

Sample Calculation:

$$\text{Burst power} = \text{Reading (timed average)} + \text{Duty factor}$$

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

2437 MHz

Mode	Rate MCS	Reading [dBm]	Duty factor [dB]	Burst power [dBm]	Remarks
11n-20	0	-9.24	0.04	-9.20	
	1	-9.34	0.09	-9.25	
	2	-9.37	0.13	-9.24	
	3	-9.32	0.16	-9.16	
	4	-9.25	0.24	-9.01	*
	5	-12.10	1.21	-10.89	
	6	-12.47	1.67	-10.80	
	7	-12.66	1.95	-10.71	

\* Worst rate

Sample Calculation:

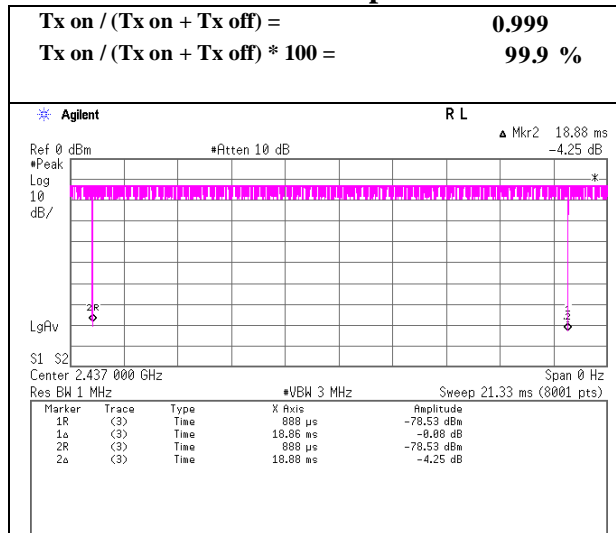
$$\text{Burst power} = \text{Reading (timed average)} + \text{Duty factor}$$

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

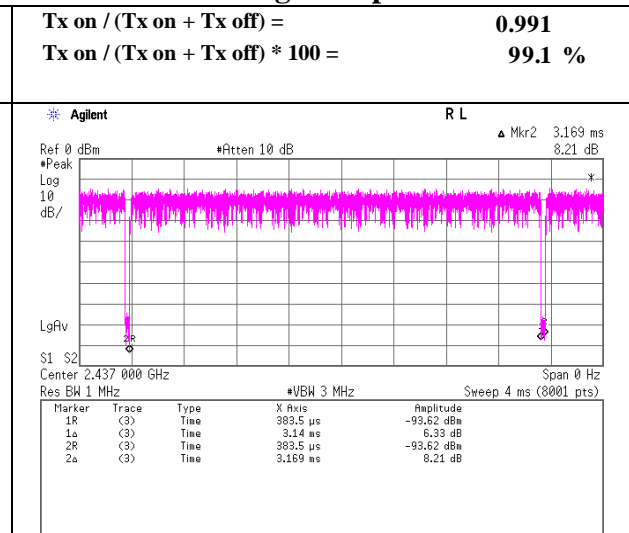
### Burst rate confirmation

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	10762865S-B
Date	June 12, 2015
Temperature / Humidity	23 deg. C / 50 % RH
Engineer	Akio Hayashi
Mode	Tx

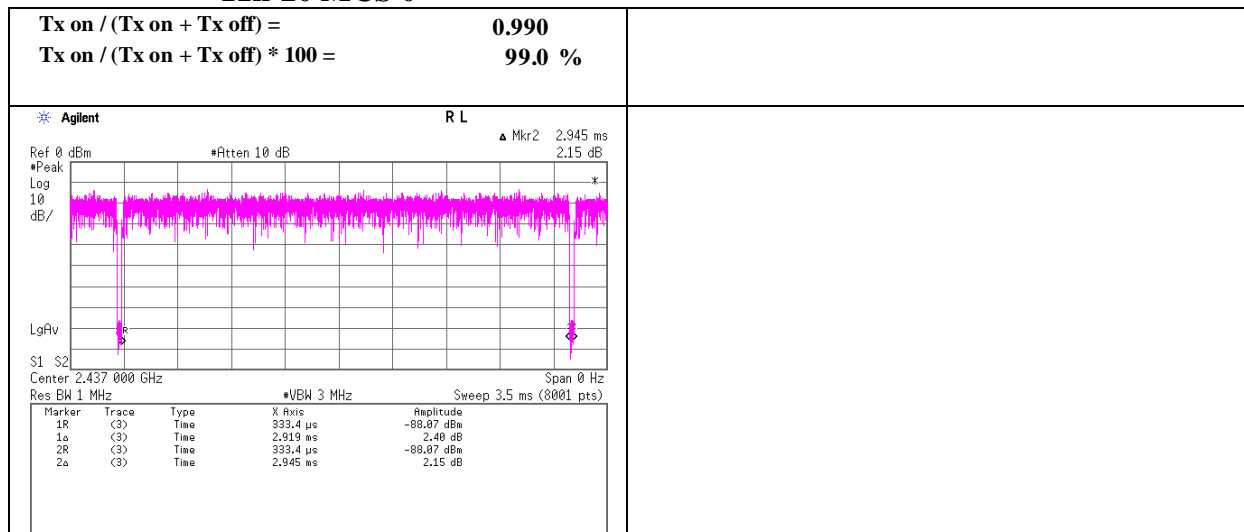
#### 11b 1 Mbps



#### 11g 6 Mbps



#### 11n-20 MCS 0



## Radiated Spurious Emission

Test place : Shonan EMC Lab. No.1 and 3 Semi Anechoic Chamber  
Report No. : 10762865S-B  
Date : June 16, 2015      June 16, 2015      June 17, 2015  
Temperature / Humidity : 24 deg. C / 60 % RH    24 deg. C / 66 % RH    24 deg. C / 57 % RH  
Engineer : Yosuke Ishikawa    Kenichi Adachi    Shinichi Takano  
              (1-15GHz, No.3 SAC)    (15-18GHz, No.1 SAC)    (18-25GHz, No.3 SAC)  
Mode : Tx 11b 2412 MHz

(\* 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.	1584.026	PK	48.9	25.1	12.9	40.8	2.0	48.1	73.9	25.8	100	359	
Hori.	1979.914	PK	48.0	25.6	13.4	41.0	2.0	48.0	73.9	25.9	100	317	
Hori.	2390.000	PK	63.1	26.4	13.7	41.0	2.0	64.2	73.9	9.7	226	61	
Hori.	2822.431	PK	49.4	27.2	5.8	40.8	2.0	43.6	73.9	30.3	100	159	
Hori.	4824.000	PK	53.9	30.7	5.7	39.5	2.0	52.8	73.9	21.1	140	93	
Hori.	7236.000	PK	43.9	36.7	6.9	40.1	2.0	49.4	73.9	24.5	100	0	
Hori.	9648.000	PK	46.5	38.5	8.1	39.6	2.0	55.5	73.9	18.4	112	51	
Hori.	12060.000	PK	44.2	39.5	8.9	39.3	2.0	55.3	73.9	18.6	100	0	
Hori.	1584.026	AV	39.6	25.1	12.9	40.8	2.0	38.8	53.9	15.1	100	359	
Hori.	1979.914	AV	40.9	25.6	13.4	41.0	2.0	40.9	53.9	13.0	100	317	
Hori.	2390.000	AV	39.3	26.4	13.7	41.0	2.0	40.4	53.9	13.5	226	61	
Hori.	2822.431	AV	44.0	27.2	5.8	40.8	2.0	38.2	53.9	15.7	100	159	
Hori.	4824.000	AV	51.6	30.7	5.7	39.5	2.0	50.5	53.9	3.4	140	93	
Hori.	7236.000	AV	35.5	36.7	6.9	40.1	2.0	41.0	53.9	12.9	100	0	
Hori.	9648.000	AV	35.9	38.5	8.1	39.6	2.0	44.9	53.9	9.0	112	51	
Hori.	12060.000	AV	35.8	39.5	8.9	39.3	2.0	46.9	53.9	7.0	100	0	
Vert.	1584.170	PK	48.5	25.1	12.9	40.8	2.0	47.7	73.9	26.2	100	342	
Vert.	1979.974	PK	49.6	25.6	13.4	41.0	2.0	49.6	73.9	24.3	100	65	
Vert.	2390.000	PK	60.5	26.4	13.7	41.0	2.0	61.6	73.9	12.3	196	44	
Vert.	2822.346	PK	49.5	27.2	5.8	40.8	2.0	43.7	73.9	30.2	100	199	
Vert.	4824.000	PK	56.4	30.7	5.7	39.5	2.0	55.3	73.9	18.6	106	329	
Vert.	7236.000	PK	44.7	36.7	6.9	40.1	2.0	50.2	73.9	23.7	100	0	
Vert.	9648.000	PK	46.6	38.5	8.1	39.6	2.0	55.6	73.9	18.3	194	5	
Vert.	12060.000	PK	45.0	39.5	8.9	39.3	2.0	56.1	73.9	17.8	100	0	
Vert.	1584.170	AV	37.9	25.1	12.9	40.8	2.0	37.1	53.9	16.8	100	342	
Vert.	1979.974	AV	44.6	25.6	13.4	41.0	2.0	44.6	53.9	9.3	100	65	
Vert.	2390.000	AV	37.6	26.4	13.7	41.0	2.0	38.7	53.9	15.2	196	44	
Vert.	2822.346	AV	44.1	27.2	5.8	40.8	2.0	38.3	53.9	15.6	100	199	
Vert.	4824.000	AV	53.7	30.7	5.7	39.5	2.0	52.6	53.9	1.3	106	329	
Vert.	7236.000	AV	35.1	36.7	6.9	40.1	2.0	40.6	53.9	13.3	100	0	
Vert.	9648.000	AV	39.7	38.5	8.1	39.6	2.0	48.7	53.9	5.2	194	5	
Vert.	12060.000	AV	36.1	39.5	8.9	39.3	2.0	47.2	53.9	6.7	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor  
Distance factor : 1 GHz - 15 GHz : 20log (3.75 m / 3.0 m) = 2.0 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	94.8	26.4	13.7	41.0	2.0	95.9	-	-	Carrier
Hori.	2398.162	PK	49.9	26.4	13.7	41.0	2.0	51.0	75.9	24.9	
Hori.	2400.000	PK	51.1	26.4	13.7	41.0	2.0	52.2	75.9	23.7	
Vert.	2412.000	PK	91.9	26.4	13.7	41.0	2.0	93.0	-	-	Carrier
Vert.	2398.208	PK	47.8	26.4	13.7	41.0	2.0	48.9	73.0	24.1	
Vert.	2400.000	PK	48.9	26.4	13.7	41.0	2.0	50.0	73.0	23.0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor  
Distance factor : 1 GHz - 15 GHz : 20log (3.75 m / 3.0 m) = 2.0 dB

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## Radiated Spurious Emission

Test place : Shonan EMC Lab. No.1 and 3 Semi Anechoic Chamber  
Report No. : 10762865S-B  
Date : June 16, 2015      June 16, 2015      June 17, 2015  
Temperature / Humidity : 24 deg. C / 60 % RH    24 deg. C / 66 % RH    24 deg. C / 57 % RH  
Engineer : Yosuke Ishikawa    Kenichi Adachi    Shinichi Takano  
              (1-15GHz, No.3 SAC)    (15-18GHz, No.1 SAC)    (18-25GHz, No.3 SAC)  
Mode : Tx 11b 2437 MHz

(\* 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.	1584.075	PK	48.7	25.1	12.9	40.8	2.0	47.9	73.9	26.0	100	1	
Hori.	1979.931	PK	47.2	25.6	13.4	41.0	2.0	47.2	73.9	26.7	100	317	
Hori.	2822.479	PK	49.6	27.2	5.8	40.8	2.0	43.8	73.9	30.1	100	161	
Hori.	3563.845	PK	47.1	28.3	5.4	40.8	2.0	42.0	73.9	31.9	100	189	
Hori.	4874.000	PK	54.1	30.9	5.7	39.5	2.0	53.2	73.9	20.7	140	106	
Hori.	7311.000	PK	45.5	36.8	7.0	40.2	2.0	51.1	73.9	22.8	100	0	
Hori.	9748.000	PK	46.6	38.6	8.2	39.5	2.0	55.9	73.9	18.0	207	112	
Hori.	12185.000	PK	44.9	39.4	9.0	39.4	2.0	55.9	73.9	18.0	100	0	
Hori.	1584.075	AV	39.0	25.1	12.9	40.8	2.0	38.2	53.9	15.7	100	1	
Hori.	1979.931	AV	42.0	25.6	13.4	41.0	2.0	42.0	53.9	11.9	100	317	
Hori.	2822.479	AV	44.8	27.2	5.8	40.8	2.0	39.0	53.9	14.9	100	161	
Hori.	3563.845	AV	39.6	28.3	5.4	40.8	2.0	34.5	53.9	19.4	100	189	
Hori.	4874.000	AV	51.9	30.9	5.7	39.5	2.0	51.0	53.9	2.9	140	106	
Hori.	7311.000	AV	37.1	36.8	7.0	40.2	2.0	42.7	53.9	11.2	100	0	
Hori.	9748.000	AV	37.7	38.6	8.2	39.5	2.0	47.0	53.9	6.9	207	112	
Hori.	12185.000	AV	36.4	39.4	9.0	39.4	2.0	47.4	53.9	6.5	100	0	
Vert.	1584.234	PK	47.9	25.1	12.9	40.8	2.0	47.1	73.9	26.8	100	323	
Vert.	1979.947	PK	49.5	25.6	13.4	41.0	2.0	49.5	73.9	24.4	100	62	
Vert.	2822.491	PK	49.9	27.2	5.8	40.8	2.0	44.1	73.9	29.8	100	194	
Vert.	3564.105	PK	47.8	28.3	5.4	40.8	2.0	42.7	73.9	31.2	108	351	
Vert.	4874.000	PK	54.0	30.9	5.7	39.5	2.0	53.1	73.9	20.8	158	59	
Vert.	7311.000	PK	45.4	36.8	7.0	40.2	2.0	51.0	73.9	22.9	100	0	
Vert.	9748.000	PK	48.4	38.6	8.2	39.5	2.0	57.7	73.9	16.2	192	346	
Vert.	12185.000	PK	44.4	39.4	9.0	39.4	2.0	55.4	73.9	18.5	100	0	
Vert.	1584.234	AV	37.9	25.1	12.9	40.8	2.0	37.1	53.9	16.8	100	323	
Vert.	1979.947	AV	43.8	25.6	13.4	41.0	2.0	43.8	53.9	10.1	100	62	
Vert.	2822.491	AV	44.9	27.2	5.8	40.8	2.0	39.1	53.9	14.8	100	194	
Vert.	3564.105	AV	40.9	28.3	5.4	40.8	2.0	35.8	53.9	18.1	108	351	
Vert.	4874.000	AV	51.4	30.9	5.7	39.5	2.0	50.5	53.9	3.4	158	59	
Vert.	7311.000	AV	36.8	36.8	7.0	40.2	2.0	42.4	53.9	11.5	100	0	
Vert.	9748.000	AV	42.4	38.6	8.2	39.5	2.0	51.7	53.9	2.2	192	346	
Vert.	12185.000	AV	36.4	39.4	9.0	39.4	2.0	47.4	53.9	6.5	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor  
Distance factor : 1 GHz - 15 GHz : 20log(3.75 m / 3.0 m) = 2.0 dB

## Radiated Spurious Emission

Test place : Shonan EMC Lab. No.1 and 3 Semi Anechoic Chamber  
Report No. : 10762865S-B  
Date : June 16, 2015      June 16, 2015      June 17, 2015  
Temperature / Humidity : 24 deg. C / 60 % RH    24 deg. C / 66 % RH    24 deg. C / 57 % RH  
Engineer : Yosuke Ishikawa    Kenichi Adachi    Shinichi Takano  
              (1-15GHz, No.3 SAC)    (15-18GHz, No.1 SAC)    (18-25GHz, No.3 SAC)  
Mode : Tx 11b 2462 MHz

(\* 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.	1584.034	PK	48.1	25.1	12.9	40.8	2.0	47.3	73.9	26.6	100	3	
Hori.	1979.983	PK	48.3	25.6	13.4	41.0	2.0	48.3	73.9	25.6	100	317	
Hori.	2483.500	PK	54.4	26.6	13.7	41.0	2.0	55.7	73.9	18.2	224	66	
Hori.	2822.405	PK	50.0	27.2	5.8	40.8	2.0	44.2	73.9	29.7	100	161	
Hori.	4924.000	PK	52.9	31.1	5.7	39.4	2.0	52.3	73.9	21.6	133	112	
Hori.	7386.000	PK	45.1	36.9	7.0	40.3	2.0	50.7	73.9	23.2	100	0	
Hori.	9848.000	PK	46.3	38.6	8.2	39.4	2.0	55.7	73.9	18.2	148	297	
Hori.	12310.000	PK	44.5	39.3	9.0	39.5	2.0	55.3	73.9	18.6	100	0	
Hori.	1584.034	AV	38.6	25.1	12.9	40.8	2.0	37.8	53.9	16.1	100	3	
Hori.	1979.983	AV	41.8	25.6	13.4	41.0	2.0	41.8	53.9	12.1	100	317	
Hori.	2483.500	AV	40.1	26.6	13.7	41.0	2.0	41.4	53.9	12.5	224	66	
Hori.	2822.405	AV	44.3	27.2	5.8	40.8	2.0	38.5	53.9	15.4	100	161	
Hori.	4924.000	AV	50.4	31.1	5.7	39.4	2.0	49.8	53.9	4.1	133	112	
Hori.	7386.000	AV	36.2	36.9	7.0	40.3	2.0	41.8	53.9	12.1	100	0	
Hori.	9848.000	AV	38.3	38.6	8.2	39.4	2.0	47.7	53.9	6.2	148	297	
Hori.	12310.000	AV	35.8	39.3	9.0	39.5	2.0	46.6	53.9	7.3	100	0	
Vert.	1583.820	PK	49.0	25.1	12.9	40.8	2.0	48.2	73.9	25.7	100	328	
Vert.	1980.025	PK	49.9	25.6	13.4	41.0	2.0	49.9	73.9	24.0	143	65	
Vert.	2483.500	PK	50.0	26.6	13.7	41.0	2.0	51.3	73.9	22.6	208	52	
Vert.	2822.384	PK	49.9	27.2	5.8	40.8	2.0	44.1	73.9	29.8	106	200	
Vert.	4924.000	PK	53.4	31.1	5.7	39.4	2.0	52.8	73.9	21.1	170	56	
Vert.	7386.000	PK	45.8	36.9	7.0	40.3	2.0	51.4	73.9	22.5	100	0	
Vert.	9848.000	PK	46.9	38.6	8.2	39.4	2.0	56.3	73.9	17.6	181	347	
Vert.	12310.000	PK	43.9	39.3	9.0	39.5	2.0	54.7	73.9	19.2	100	0	
Vert.	1583.820	AV	38.1	25.1	12.9	40.8	2.0	37.3	53.9	16.6	100	328	
Vert.	1980.025	AV	44.5	25.6	13.4	41.0	2.0	44.5	53.9	9.4	143	65	
Vert.	2483.500	AV	39.0	26.6	13.7	41.0	2.0	40.3	53.9	13.6	208	52	
Vert.	2822.384	AV	44.8	27.2	5.8	40.8	2.0	39.0	53.9	14.9	106	200	
Vert.	4924.000	AV	50.3	31.1	5.7	39.4	2.0	49.7	53.9	4.2	170	56	
Vert.	7386.000	AV	36.1	36.9	7.0	40.3	2.0	41.7	53.9	12.2	100	0	
Vert.	9848.000	AV	40.1	38.6	8.2	39.4	2.0	49.5	53.9	4.4	181	347	
Vert.	12310.000	AV	34.9	39.3	9.0	39.5	2.0	45.7	53.9	8.2	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor  
Distance factor : 1 GHz - 15 GHz : 20log(3.75 m / 3.0 m) = 2.0 dB



## Radiated Spurious Emission

Test place : Shonan EMC Lab. No.1 and 3 Semi Anechoic Chamber  
Report No. : 10762865S-B  
Date : June 16, 2015      June 16, 2015      June 17, 2015  
Temperature / Humidity : 24 deg. C / 60 % RH    24 deg. C / 66 % RH    24 deg. C / 57 % RH  
Engineer : Yosuke Ishikawa    Kenichi Adachi    Shinichi Takano  
              (1-15GHz, No.3 SAC)    (15-18GHz, No.1 SAC)    (18-25GHz, No.3 SAC)  
Mode : Tx 11g 2412 MHz

(\* 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.	1584.000	PK	48.6	25.1	12.9	40.8	2.0	47.8	73.9	26.1	100	3	
Hori.	1979.888	PK	47.8	25.6	13.4	41.0	2.0	47.8	73.9	26.1	100	312	
Hori.	2390.000	PK	58.4	26.4	13.7	41.0	2.0	59.5	73.9	14.4	183	60	
Hori.	2822.567	PK	49.6	27.2	5.8	40.8	2.0	43.8	73.9	30.1	100	161	
Hori.	3563.897	PK	47.2	28.3	5.4	40.8	2.0	42.1	73.9	31.8	100	191	
Hori.	4823.776	PK	48.4	30.7	5.7	39.5	2.0	47.3	73.9	26.6	140	113	
Hori.	7236.000	PK	45.1	36.7	6.9	40.1	2.0	50.6	73.9	23.3	100	0	
Hori.	9648.000	PK	46.5	38.5	8.1	39.6	2.0	55.5	73.9	18.4	114	51	
Hori.	12060.000	PK	45.2	39.5	8.9	39.3	2.0	56.3	73.9	17.6	100	0	
Hori.	1584.000	AV	38.3	25.1	12.9	40.8	2.0	37.5	53.9	16.4	100	3	
Hori.	1979.888	AV	41.2	25.6	13.4	41.0	2.0	41.2	53.9	12.7	100	312	
Hori.	2390.000	AV	43.0	26.4	13.7	41.0	2.0	44.1	53.9	9.8	183	60	
Hori.	2822.567	AV	44.1	27.2	5.8	40.8	2.0	38.3	53.9	15.6	100	161	
Hori.	3563.897	AV	38.9	28.3	5.4	40.8	2.0	33.8	53.9	20.1	100	191	
Hori.	4823.776	AV	38.6	30.7	5.7	39.5	2.0	37.5	53.9	16.4	140	113	
Hori.	7236.000	AV	35.5	36.7	6.9	40.1	2.0	41.0	53.9	12.9	100	0	
Hori.	9648.000	AV	36.9	38.5	8.1	39.6	2.0	45.9	53.9	8.0	114	51	
Hori.	12060.000	AV	35.8	39.5	8.9	39.3	2.0	46.9	53.9	7.0	100	0	
Vert.	1584.089	PK	49.2	25.1	12.9	40.8	2.0	48.4	73.9	25.5	100	14	
Vert.	1980.015	PK	49.4	25.6	13.4	41.0	2.0	49.4	73.9	24.5	100	64	
Vert.	2390.000	PK	54.2	26.4	13.7	41.0	2.0	55.3	73.9	18.6	198	44	
Vert.	2822.476	PK	49.8	27.2	5.8	40.8	2.0	44.0	73.9	29.9	100	197	
Vert.	3563.742	PK	47.3	28.3	5.4	40.8	2.0	42.2	73.9	31.7	103	354	
Vert.	4824.000	PK	51.9	30.7	5.7	39.5	2.0	50.8	73.9	23.1	113	329	
Vert.	7236.000	PK	44.4	36.7	6.9	40.1	2.0	49.9	73.9	24.0	100	0	
Vert.	9648.000	PK	48.5	38.5	8.1	39.6	2.0	57.5	73.9	16.4	195	5	
Vert.	12060.000	PK	44.4	39.5	8.9	39.3	2.0	55.5	73.9	18.4	100	0	
Vert.	1584.089	AV	36.9	25.1	12.9	40.8	2.0	36.1	53.9	17.8	100	14	
Vert.	1980.015	AV	43.7	25.6	13.4	41.0	2.0	43.7	53.9	10.2	100	64	
Vert.	2390.000	AV	40.4	26.4	13.7	41.0	2.0	41.5	53.9	12.4	198	44	
Vert.	2822.476	AV	44.2	27.2	5.8	40.8	2.0	38.4	53.9	15.5	100	197	
Vert.	3563.742	AV	39.7	28.3	5.4	40.8	2.0	34.6	53.9	19.3	103	354	
Vert.	4824.000	AV	42.0	30.7	5.7	39.5	2.0	40.9	53.9	13.0	113	329	
Vert.	7236.000	AV	36.0	36.7	6.9	40.1	2.0	41.5	53.9	12.4	100	0	
Vert.	9648.000	AV	40.5	38.5	8.1	39.6	2.0	49.5	53.9	4.4	195	5	
Vert.	12060.000	AV	35.9	39.5	8.9	39.3	2.0	47.0	53.9	6.9	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor  
Distance factor : 1 GHz - 15 GHz : 20log(3.75 m / 3.0 m) = 2.0 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	90.8	26.4	13.7	41.0	2.0	91.9	-	-	Carrier
Hori.	2400.000	PK	55.8	26.4	13.7	41.0	2.0	56.9	71.9	15.0	
Vert.	2412.000	PK	87.9	26.4	13.7	41.0	2.0	89.0	-	-	Carrier
Vert.	2400.000	PK	52.8	26.4	13.7	41.0	2.0	53.9	69.0	15.1	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor  
Distance factor : 1 GHz - 15 GHz : 20log(3.75 m / 3.0 m) = 2.0 dB

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## Radiated Spurious Emission

Test place : Shonan EMC Lab. No.1 and 3 Semi Anechoic Chamber  
Report No. : 10762865S-B  
Date : June 16, 2015      June 16, 2015      June 17, 2015  
Temperature / Humidity : 24 deg. C / 60 % RH    24 deg. C / 66 % RH    24 deg. C / 57 % RH  
Engineer : Yosuke Ishikawa    Kenichi Adachi    Shinichi Takano  
              (1-15GHz, No.3 SAC)    (15-18GHz, No.1 SAC)    (18-25GHz, No.3 SAC)  
Mode : Tx 11g 2437 MHz

(\* 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.	1584.032	PK	48.2	25.1	12.9	40.8	2.0	47.4	73.9	26.5	100	2	
Hori.	1979.981	PK	48.0	25.6	13.4	41.0	2.0	48.0	73.9	25.9	100	319	
Hori.	2822.529	PK	49.5	27.2	5.8	40.8	2.0	43.7	73.9	30.2	100	161	
Hori.	3563.957	PK	46.6	28.3	5.4	40.8	2.0	41.5	73.9	32.4	100	192	
Hori.	4874.000	PK	49.2	30.9	5.7	39.5	2.0	48.3	73.9	25.6	139	109	
Hori.	7311.000	PK	44.6	36.8	7.0	40.2	2.0	50.2	73.9	23.7	100	0	
Hori.	9748.000	PK	45.4	38.6	8.2	39.5	2.0	54.7	73.9	19.2	127	105	
Hori.	12185.000	PK	43.9	39.4	9.0	39.4	2.0	54.9	73.9	19.0	100	0	
Hori.	1584.032	AV	38.0	25.1	12.9	40.8	2.0	37.2	53.9	16.7	100	2	
Hori.	1979.981	AV	41.2	25.6	13.4	41.0	2.0	41.2	53.9	12.7	100	319	
Hori.	2822.529	AV	44.5	27.2	5.8	40.8	2.0	38.7	53.9	15.2	100	161	
Hori.	3563.957	AV	38.2	28.3	5.4	40.8	2.0	33.1	53.9	20.8	100	192	
Hori.	4874.000	AV	39.7	30.9	5.7	39.5	2.0	38.8	53.9	15.1	139	109	
Hori.	7311.000	AV	36.0	36.8	7.0	40.2	2.0	41.6	53.9	12.3	100	0	
Hori.	9748.000	AV	36.1	38.6	8.2	39.5	2.0	45.4	53.9	8.5	127	105	
Hori.	12185.000	AV	35.6	39.4	9.0	39.4	2.0	46.6	53.9	7.3	100	0	
Vert.	1584.227	PK	49.7	25.1	12.9	40.8	2.0	48.9	73.9	25.0	100	330	
Vert.	1979.951	PK	49.3	25.6	13.4	41.0	2.0	49.3	73.9	24.6	100	59	
Vert.	2822.419	PK	50.1	27.2	5.8	40.8	2.0	44.3	73.9	29.6	100	193	
Vert.	3563.781	PK	46.8	28.3	5.4	40.8	2.0	41.7	73.9	32.2	108	354	
Vert.	4874.000	PK	50.4	30.9	5.7	39.5	2.0	49.5	73.9	24.4	175	55	
Vert.	7311.000	PK	45.1	36.8	7.0	40.2	2.0	50.7	73.9	23.2	100	0	
Vert.	9748.000	PK	47.1	38.6	8.2	39.5	2.0	56.4	73.9	17.5	184	345	
Vert.	12185.000	PK	44.3	39.4	9.0	39.4	2.0	55.3	73.9	18.6	100	0	
Vert.	1584.227	AV	37.5	25.1	12.9	40.8	2.0	36.7	53.9	17.2	100	330	
Vert.	1979.951	AV	43.7	25.6	13.4	41.0	2.0	43.7	53.9	10.2	100	59	
Vert.	2822.419	AV	44.9	27.2	5.8	40.8	2.0	39.1	53.9	14.8	100	193	
Vert.	3563.781	AV	39.4	28.3	5.4	40.8	2.0	34.3	53.9	19.6	108	354	
Vert.	4874.000	AV	40.7	30.9	5.7	39.5	2.0	39.8	53.9	14.1	175	55	
Vert.	7311.000	AV	36.2	36.8	7.0	40.2	2.0	41.8	53.9	12.1	100	0	
Vert.	9748.000	AV	39.2	38.6	8.2	39.5	2.0	48.5	53.9	5.4	184	345	
Vert.	12185.000	AV	35.5	39.4	9.0	39.4	2.0	46.5	53.9	7.4	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor  
Distance factor : 1 GHz - 15 GHz : 20log(3.75 m / 3.0 m) = 2.0 dB

## Radiated Spurious Emission

Test place : Shonan EMC Lab. No.1 and 3 Semi Anechoic Chamber  
Report No. : 10762865S-B  
Date : June 16, 2015      June 16, 2015      June 17, 2015  
Temperature / Humidity : 24 deg. C / 60 % RH    24 deg. C / 66 % RH    24 deg. C / 57 % RH  
Engineer : Yosuke Ishikawa    Kenichi Adachi    Shinichi Takano  
              (1-15GHz, No.3 SAC)    (15-18GHz, No.1 SAC)    (18-25GHz, No.3 SAC)  
Mode : Tx 11g 2462 MHz

(\* 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.	1583.828	PK	47.5	25.1	12.9	40.8	2.0	46.7	73.9	27.2	100	10	
Hori.	1980.004	PK	48.3	25.6	13.4	41.0	2.0	48.3	73.9	25.6	100	318	
Hori.	2483.500	PK	59.0	26.6	13.7	41.0	2.0	60.3	73.9	13.6	244	63	
Hori.	2822.520	PK	49.3	27.2	5.8	40.8	2.0	43.5	73.9	30.4	100	162	
Hori.	4924.000	PK	49.7	31.1	5.7	39.4	2.0	49.1	73.9	24.8	122	114	
Hori.	7386.000	PK	45.6	36.9	7.0	40.3	2.0	51.2	73.9	22.7	100	0	
Hori.	9848.000	PK	46.2	38.6	8.2	39.4	2.0	55.6	73.9	18.3	152	304	
Hori.	12310.000	PK	44.9	39.3	9.0	39.5	2.0	55.7	73.9	18.2	100	0	
Hori.	1583.828	AV	37.5	25.1	12.9	40.8	2.0	36.7	53.9	17.2	100	10	
Hori.	1980.004	AV	41.3	25.6	13.4	41.0	2.0	41.3	53.9	12.6	100	318	
Hori.	2483.500	AV	46.7	26.6	13.7	41.0	2.0	48.0	53.9	5.9	244	63	
Hori.	2822.520	AV	44.1	27.2	5.8	40.8	2.0	38.3	53.9	15.6	100	162	
Hori.	4924.000	AV	38.9	31.1	5.7	39.4	2.0	38.3	53.9	15.6	122	114	
Hori.	7386.000	AV	36.3	36.9	7.0	40.3	2.0	41.9	53.9	12.0	100	0	
Hori.	9848.000	AV	36.6	38.6	8.2	39.4	2.0	46.0	53.9	7.9	152	304	
Hori.	12310.000	AV	35.9	39.3	9.0	39.5	2.0	46.7	53.9	7.2	100	0	
Vert.	1583.767	PK	47.3	25.1	12.9	40.8	2.0	46.5	73.9	27.4	100	354	
Vert.	1980.008	PK	49.7	25.6	13.4	41.0	2.0	49.7	73.9	24.2	100	69	
Vert.	2483.500	PK	57.2	26.6	13.7	41.0	2.0	58.5	73.9	15.4	218	49	
Vert.	2822.355	PK	50.2	27.2	5.8	40.8	2.0	44.4	73.9	29.5	105	192	
Vert.	4924.000	PK	50.0	31.1	5.7	39.4	2.0	49.4	73.9	24.5	170	56	
Vert.	7386.000	PK	45.4	36.9	7.0	40.3	2.0	51.0	73.9	22.9	100	0	
Vert.	9848.000	PK	46.0	38.6	8.2	39.4	2.0	55.4	73.9	18.5	182	346	
Vert.	12310.000	PK	45.4	39.3	9.0	39.5	2.0	56.2	73.9	17.7	100	0	
Vert.	1583.767	AV	36.7	25.1	12.9	40.8	2.0	35.9	53.9	18.0	100	354	
Vert.	1980.008	AV	44.6	25.6	13.4	41.0	2.0	44.6	53.9	9.3	100	69	
Vert.	2483.500	AV	44.5	26.6	13.7	41.0	2.0	45.8	53.9	8.1	218	49	
Vert.	2822.355	AV	44.4	27.2	5.8	40.8	2.0	38.6	53.9	15.3	105	192	
Vert.	4924.000	AV	39.9	31.1	5.7	39.4	2.0	39.3	53.9	14.6	170	56	
Vert.	7386.000	AV	36.2	36.9	7.0	40.3	2.0	41.8	53.9	12.1	100	0	
Vert.	9848.000	AV	37.7	38.6	8.2	39.4	2.0	47.1	53.9	6.8	182	346	
Vert.	12310.000	AV	35.8	39.3	9.0	39.5	2.0	46.6	53.9	7.3	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor  
Distance factor : 1 GHz - 15 GHz : 20log(3.75 m / 3.0 m) = 2.0 dB

### **Radiated Spurious Emission**

Test place	Shonan EMC Lab. No.1 and 3 Semi Anechoic Chamber	
Report No.	10762865S-B	
Date	June 16, 2015	June 17, 2015
Temperature / Humidity	24 deg. C / 66 % RH	24 deg. C / 57 % RH
Engineer	Kenichi Adachi	Shinichi Takano
	(1-18GHz, No.1 SAC)	(30M-1GHz, and 18-25GHz, No.3 SAC)
Mode	Tx 1 In-20 2412MHz	

(\* 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.	150.005	QP	32.0	14.8	7.9	32.1	0.0	22.6	43.5	20.9	170	165	
Hori.	701.989	QP	32.8	20.5	10.3	31.7	0.0	31.9	46.0	14.1	125	141	
Hori.	1583.971	PK	49.8	24.7	13.9	40.6	0.9	48.7	73.9	25.2	100	349	
Hori.	1979.964	PK	49.9	25.0	14.3	40.7	0.9	49.4	73.9	24.5	100	9	
Hori.	2390.000	PK	59.3	25.9	14.8	40.7	0.9	60.2	73.9	13.7	238	9	
Hori.	2822.452	PK	50.8	26.9	7.4	40.7	0.9	45.3	73.9	28.6	100	197	
Hori.	4824.000	PK	52.7	30.6	7.4	41.6	0.9	50.0	73.9	23.9	148	108	
Hori.	7236.000	PK	47.6	36.2	9.0	41.2	0.9	52.5	73.9	21.4	100	0	
Hori.	9648.000	PK	47.9	38.3	10.0	40.1	0.9	57.0	73.9	16.9	100	7	
Hori.	12060.000	PK	46.4	39.4	11.1	39.4	0.9	58.4	73.9	15.5	100	0	
Hori.	1583.971	AV	38.4	24.7	13.9	40.6	0.9	37.3	53.9	16.6	100	349	
Hori.	1979.964	AV	42.1	25.0	14.3	40.7	0.9	41.6	53.9	12.3	100	9	
Hori.	2390.000	AV	41.5	25.9	14.8	40.7	0.9	42.4	53.9	11.5	238	9	
Hori.	2822.452	AV	43.5	26.9	7.4	40.7	2.0	39.1	53.9	14.8	100	197	
Hori.	4824.000	AV	40.0	30.6	7.4	41.6	2.0	38.4	53.9	15.5	148	108	
Hori.	7236.000	AV	36.2	36.2	9.0	41.2	2.0	42.2	53.9	11.7	100	0	
Hori.	9648.000	AV	36.4	38.3	10.0	40.1	2.0	46.6	53.9	7.3	100	7	
Hori.	12060.000	AV	34.4	39.4	11.1	39.4	0.9	46.4	53.9	7.5	100	0	
Vert.	90.001	QP	41.6	8.1	7.6	32.1	0.9	26.1	43.5	17.4	100	239	
Vert.	161.490	QP	29.0	15.2	8.0	32.0	0.9	21.1	43.5	22.4	100	359	
Vert.	539.993	QP	36.5	18.4	9.7	31.9	0.9	33.6	46.0	12.4	100	173	
Vert.	779.994	QP	30.9	20.9	10.6	31.6	0.9	31.7	46.0	14.3	100	329	
Vert.	1583.971	PK	52.6	24.7	13.9	40.6	0.9	51.5	73.9	22.4	100	41	
Vert.	1979.964	PK	50.2	25.0	14.3	40.7	0.9	49.7	73.9	24.2	100	60	
Vert.	2390.000	PK	54.1	25.9	14.8	40.7	0.9	55.0	73.9	18.9	245	8	
Vert.	2822.452	PK	51.2	26.9	7.4	40.7	0.9	45.7	73.9	28.2	100	197	
Vert.	4824.000	PK	55.1	30.6	7.4	41.6	0.9	52.4	73.9	21.5	100	332	
Vert.	7236.000	PK	47.7	36.2	9.0	41.2	0.9	52.6	73.9	21.3	100	0	
Vert.	9648.000	PK	49.1	38.3	10.0	40.1	0.9	58.2	73.9	15.7	176	349	
Vert.	12060.000	PK	46.3	39.4	11.1	39.4	0.9	58.3	73.9	15.6	100	0	
Vert.	1583.971	AV	40.1	24.7	13.9	40.6	0.9	39.0	53.9	14.9	100	41	
Vert.	1979.964	AV	43.2	25.0	14.3	40.7	0.9	42.7	53.9	11.2	100	60	
Vert.	2390.000	AV	37.5	25.9	14.8	40.7	0.9	38.4	53.9	15.5	245	8	
Vert.	2822.452	AV	45.3	26.9	7.4	40.7	0.9	39.8	53.9	14.1	100	197	
Vert.	4824.000	AV	42.1	30.6	7.4	41.6	0.9	39.4	53.9	14.5	100	332	
Vert.	7236.000	AV	36.3	36.2	9.0	41.2	0.9	41.2	53.9	12.7	100	0	
Vert.	9648.000	AV	38.4	38.3	10.0	40.1	0.9	47.5	53.9	6.4	176	349	
Vert.	12060.000	AV	34.3	39.4	11.1	39.4	0.9	46.3	53.9	7.6	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor  
Distance factor : 1 GHz - 15 GHz : 20log (3.3 m / 3.0 m) = 0.9 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	90.7	26.0	14.9	40.7	0.9	91.8	-	-	Carrier
Hori.	2398.887	PK	51.0	25.9	14.8	40.7	0.9	51.9	71.8	19.9	
Hori.	2400.000	PK	49.1	26.0	14.9	40.7	0.9	50.2	71.8	21.6	
Vert.	2412.000	PK	87.2	26.0	14.9	40.7	0.9	88.3	-	-	Carrier
Vert.	2398.310	PK	47.2	25.9	14.8	40.7	0.9	48.1	68.3	20.2	
Vert.	2400.000	PK	44.8	26.0	14.9	40.7	0.9	45.9	68.3	22.4	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor  
Distance factor : 1 GHz - 15 GHz : 20log (3.3 m / 3.0 m) = 0.9 dB

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## Radiated Spurious Emission

Test place Shonan EMC Lab. No.1 and 3 Semi Anechoic Chamber  
Report No. 10762865S-B  
Date June 16, 2015 June 17, 2015  
Temperature / Humidity 24 deg. C / 66 % RH 24 deg. C / 57 % RH  
Engineer Kenichi Adachi Shinichi Takano  
(1-18GHz, No.1 SAC) (18-25GHz, No.3 SAC)  
Mode Tx 11n-20 2437MHz

(\* 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.	1583.968	PK	49.7	24.7	13.9	40.6	0.9	48.6	73.9	25.3	100	354	
Hori.	1979.966	PK	50.0	25.0	14.3	40.7	0.9	49.5	73.9	24.4	100	11	
Hori.	2822.453	PK	50.2	26.9	7.4	40.7	0.9	44.7	73.9	29.2	100	198	
Hori.	4874.000	PK	53.8	30.8	7.4	41.6	0.9	51.3	73.9	22.6	147	104	
Hori.	7311.000	PK	47.8	36.3	8.9	41.3	0.9	52.6	73.9	21.3	100	0	
Hori.	9748.000	PK	48.0	38.3	10.0	40.1	0.9	57.1	73.9	16.8	100	9	
Hori.	12185.000	PK	46.4	39.3	11.1	39.2	0.9	58.5	73.9	15.4	100	0	
Hori.	1583.968	AV	38.2	24.7	13.9	40.6	0.9	37.1	53.9	16.8	100	354	
Hori.	1979.966	AV	42.2	25.0	14.3	40.7	0.9	41.7	53.9	12.2	100	11	
Hori.	2822.453	AV	43.3	26.9	7.4	40.7	0.9	37.8	53.9	16.1	100	198	
Hori.	4874.000	AV	41.0	30.8	7.4	41.6	0.9	38.5	53.9	15.4	147	104	
Hori.	7311.000	AV	36.3	36.3	8.9	41.3	0.9	41.1	53.9	12.8	100	0	
Hori.	9748.000	AV	36.3	38.3	10.0	40.1	0.9	45.4	53.9	8.5	100	9	
Hori.	12185.000	AV	34.3	39.3	11.1	39.2	0.9	46.4	53.9	7.5	100	0	
Vert.	1583.968	PK	52.4	24.7	13.9	40.6	0.9	51.3	73.9	22.6	100	38	
Vert.	1979.966	PK	50.0	25.0	14.3	40.7	0.9	49.5	73.9	24.4	100	59	
Vert.	2822.453	PK	50.0	26.9	7.4	40.7	0.9	44.5	73.9	29.4	100	198	
Vert.	4874.000	PK	53.9	30.8	7.4	41.6	0.9	51.4	73.9	22.5	100	330	
Vert.	7311.000	PK	47.9	36.3	8.9	41.3	0.9	52.7	73.9	21.2	100	0	
Vert.	9748.000	PK	48.3	38.3	10.0	40.1	0.9	57.4	73.9	16.5	177	350	
Vert.	12185.000	PK	46.3	39.3	11.1	39.2	0.9	58.4	73.9	15.5	100	0	
Vert.	1583.968	AV	39.9	24.7	13.9	40.6	0.9	38.8	53.9	15.1	100	38	
Vert.	1979.966	AV	42.9	25.0	14.3	40.7	0.9	42.4	53.9	11.5	100	59	
Vert.	2822.453	AV	44.4	26.9	7.4	40.7	0.9	38.9	53.9	15.0	100	198	
Vert.	4874.000	AV	40.9	30.8	7.4	41.6	0.9	38.4	53.9	15.5	100	330	
Vert.	7311.000	AV	36.3	36.3	8.9	41.3	0.9	41.1	53.9	12.8	100	0	
Vert.	9748.000	AV	37.7	38.3	10.0	40.1	0.9	46.8	53.9	7.1	177	350	
Vert.	12185.000	AV	34.2	39.3	11.1	39.2	0.9	46.3	53.9	7.6	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor  
Distance factor : 1 GHz - 15 GHz : 20log (3.3 m / 3.0 m) = 0.9 dB

## Radiated Spurious Emission

Test place	Shonan EMC Lab. No.1 and 3 Semi Anechoic Chamber		
Report No.	10762865S-B		
Date	June 16, 2015	June 17, 2015	
Temperature / Humidity	24 deg. C / 66 % RH	24 deg. C / 57 % RH	
Engineer	Kenichi Adachi	Shinichi Takano	
	(1-18GHz, No.1 SAC)	(18-25GHz, No.3 SAC)	
Mode	Tx 11n-20 2462MHz		

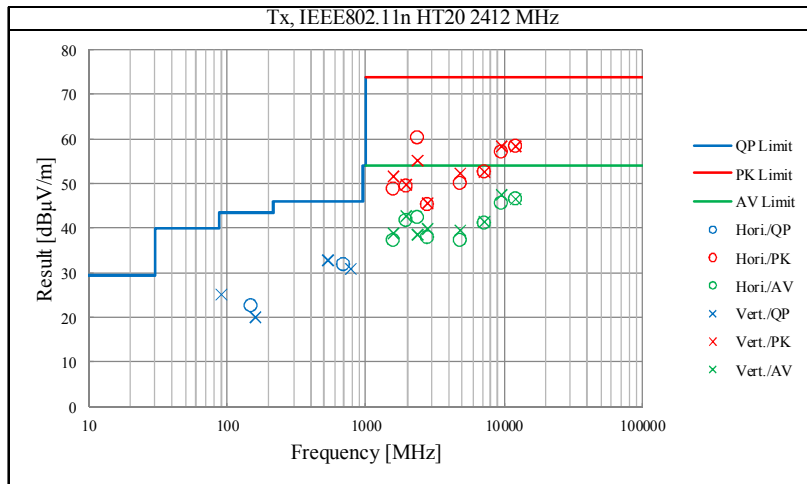
(\* PK: Peak, AV: Average, QP: Quasi-Peak)

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.	1583.970	PK	49.6	24.7	13.9	40.6	0.9	48.5	73.9	25.4	100	345	
Hori.	1979.965	PK	49.7	25.0	14.3	40.7	0.9	49.2	73.9	24.7	100	8	
Hori.	2483.500	PK	60.6	26.1	15.0	40.7	0.9	61.9	73.9	12.0	236	7	
Hori.	2822.454	PK	49.6	26.9	7.4	40.7	0.9	44.1	73.9	29.8	100	194	
Hori.	4924.000	PK	53.5	31.0	7.5	41.6	0.9	51.3	73.9	22.6	145	102	
Hori.	7386.000	PK	47.9	36.4	9.0	41.3	0.9	52.9	73.9	21.0	100	0	
Hori.	9848.000	PK	48.0	38.3	9.9	40.0	0.9	57.1	73.9	16.8	100	9	
Hori.	12310.000	PK	46.2	39.3	11.3	39.1	0.9	58.6	73.9	15.3	100	0	
Hori.	1583.970	AV	38.2	24.7	13.9	40.6	0.9	37.1	53.9	16.8	100	345	
Hori.	1979.965	AV	41.8	25.0	14.3	40.7	0.9	41.3	53.9	12.6	100	8	
Hori.	2483.500	AV	46.2	26.1	15.0	40.7	0.9	47.5	53.9	6.4	236	7	
Hori.	2822.454	AV	42.3	26.9	7.4	40.7	0.9	36.8	53.9	17.1	100	194	
Hori.	4924.000	AV	40.2	31.0	7.5	41.6	0.9	38.0	53.9	15.9	145	102	
Hori.	7386.000	AV	36.4	36.4	9.0	41.3	0.9	41.4	53.9	12.5	100	0	
Hori.	9848.000	AV	36.2	38.3	9.9	40.0	0.9	45.3	53.9	8.6	100	9	
Hori.	12310.000	AV	34.3	39.3	11.3	39.1	0.9	46.7	53.9	7.2	100	0	
Vert.	1583.970	PK	52.3	24.7	13.9	40.6	0.9	51.2	73.9	22.7	100	43	
Vert.	1979.965	PK	50.0	25.0	14.3	40.7	0.9	49.5	73.9	24.4	100	58	
Vert.	2483.500	PK	59.9	26.1	15.0	40.7	0.9	61.2	73.9	12.7	243	9	
Vert.	2822.454	PK	50.2	26.9	7.4	40.7	0.9	44.7	73.9	29.2	100	196	
Vert.	4924.000	PK	52.0	31.0	7.5	41.6	0.9	49.8	73.9	24.1	100	336	
Vert.	7386.000	PK	48.0	36.4	9.0	41.3	0.9	53.0	73.9	20.9	100	0	
Vert.	9848.000	PK	48.0	38.3	9.9	40.0	0.9	57.1	73.9	16.8	177	347	
Vert.	12310.000	PK	46.1	39.3	11.3	39.1	0.9	58.5	73.9	15.4	100	0	
Vert.	1583.970	AV	40.0	24.7	13.9	40.6	0.9	38.9	53.9	15.0	100	43	
Vert.	1979.965	AV	43.1	25.0	14.3	40.7	0.9	42.6	53.9	11.3	100	58	
Vert.	2483.500	AV	43.9	26.1	15.0	40.7	0.9	45.2	53.9	8.7	243	9	
Vert.	2822.454	AV	44.6	26.9	7.4	40.7	0.9	39.1	53.9	14.8	100	196	
Vert.	4924.000	AV	39.1	31.0	7.5	41.6	0.9	36.9	53.9	17.0	100	336	
Vert.	7386.000	AV	36.5	36.4	9.0	41.3	0.9	41.5	53.9	12.4	100	0	
Vert.	9848.000	AV	37.5	38.3	9.9	40.0	0.9	46.6	53.9	7.3	177	347	
Vert.	12310.000	AV	34.2	39.3	11.3	39.1	0.9	46.6	53.9	7.3	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor  
 Distance factor : 1 GHz - 15 GHz : 20log(3.3 m / 3.0 m) = 0.9 dB

**Radiated Spurious Emission**  
**(worst mode plot)**

Test place	Shonan EMC Lab. No.1 and 3 Semi Anechoic Chamber		
Report No.	10762865S-B		
Date	June 16, 2015	June 17, 2015	
Temperature / Humidity	24 deg. C / 66 % RH	24 deg. C / 57 % RH	
Engineer	Kenichi Adachi	Shinichi Takano	
	(1-18GHz, No.1 SAC)	(30M-1GHz, and 18-25GHz, No.3 SAC)	
Mode	Tx 11n-20		

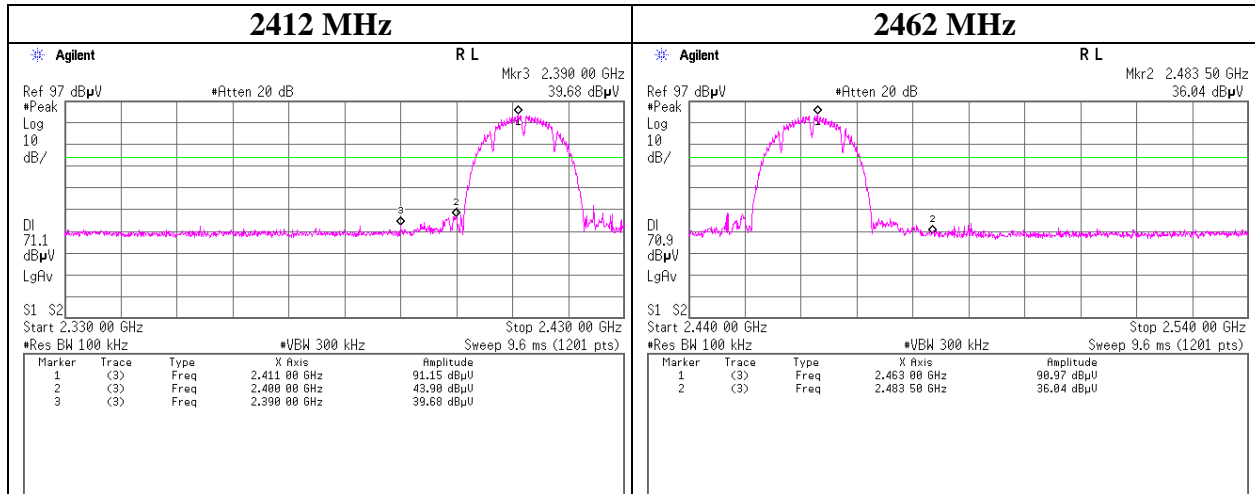


\* These plots data contains sufficient number to show the trend of characteristic features for EUT.

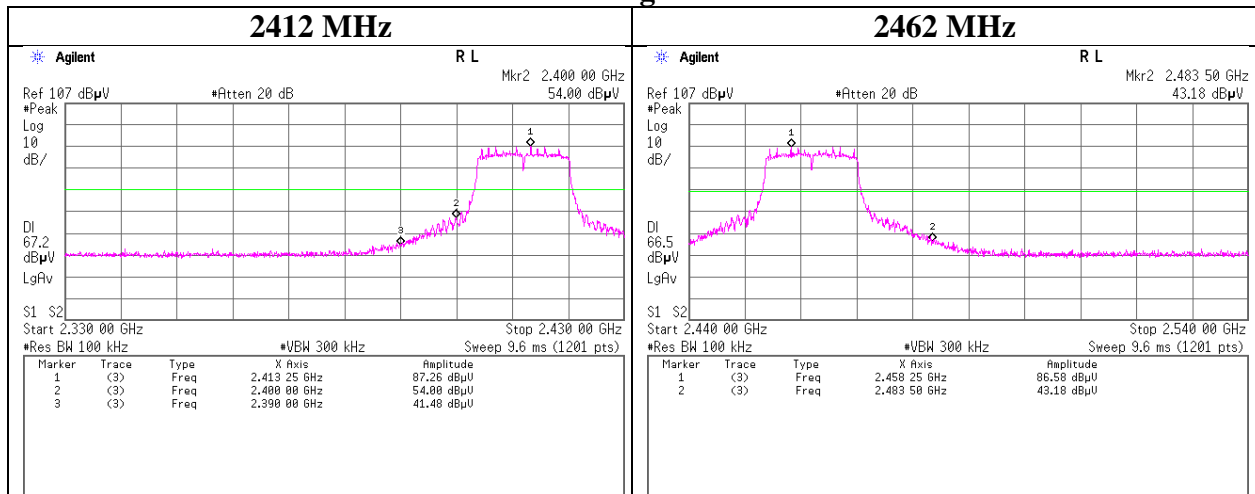
**Band Edge confirmation**

Test place : Shonan EMC Lab. No.6 Shielded Room  
 Report No. : 10762865S-B  
 Date : June 18, 2015  
 Temperature / Humidity : 23 deg. C / 40 % RH  
 Engineer : Hikaru Shirasawa  
 Mode : Tx

**11b**



**11g**



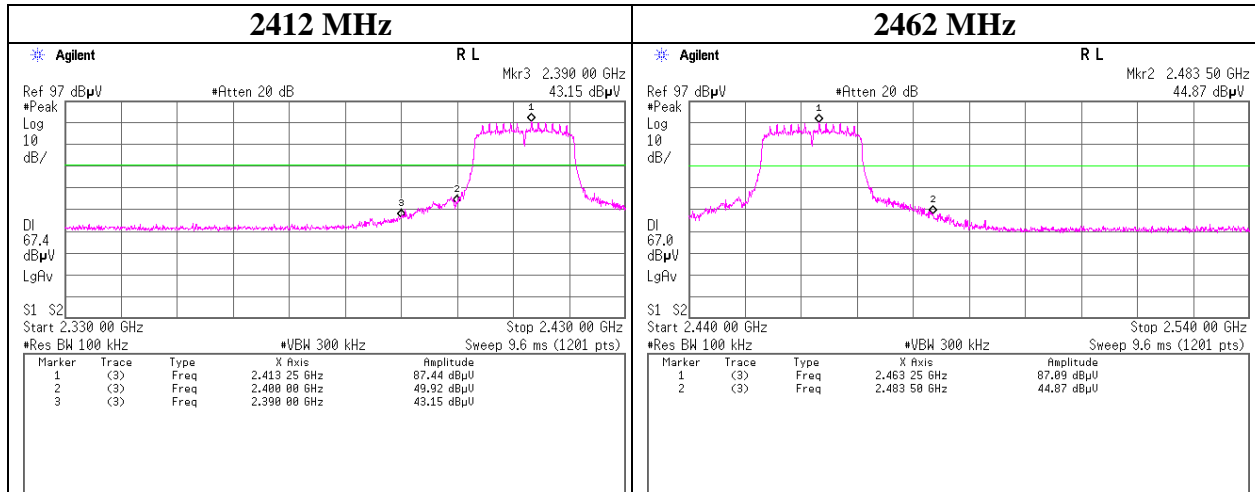
\* Final result of band edge was measured as radiated spurious emission. Refer to Radiated Spurious Emission's pages.



**Band Edge confirmation**

Test place : Shonan EMC Lab. No.6 Shielded Room  
Report No. : 10762865S-B  
Date : June 18, 2015  
Temperature / Humidity : 23 deg. C / 40 % RH  
Engineer : Hikaru Shirasawa  
Mode : Tx

**11n-20**



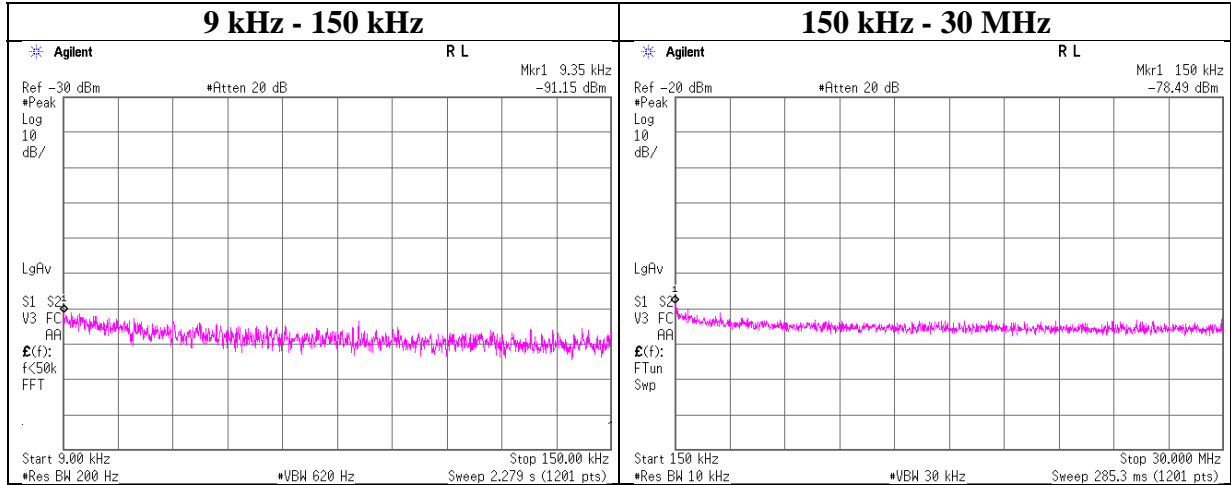
\* Final result of band edge was measured as radiated spurious emission. Refer to Radiated Spurious Emission's pages.

\* For radiated emission, RBW was set to 1 MHz for 2390 MHz. In addition, RBW of 2400 MHz were set to 100 kHz for confirmation of 20 dBc.

Considering the difference in both settings, the data has a correlation.

## Conducted Spurious Emission

Test place	Shonan EMC Lab. No.6 Shielded Room
Report No.	10762865S-B
Date	June 18, 2015
Temperature / Humidity	23 deg. C / 40 % RH
Engineer	Hikaru Shirasawa
Mode	Tx 11n-20 2412 MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator 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
9.35	-91.2	0.73	20.1	-0.4	1	-70.7	300	6.0	-9.4	48.1	57.5	
150.00	-78.5	0.73	20.1	-0.4	1	-58.0	300	6.0	3.2	24.0	20.8	

$$E = \text{EIRP} - 20 \log(D) + \text{Ground bounce} + 104.8 \text{ [dBuV/m]}$$

$$\text{EIRP} = \text{Reading} + \text{Cable Loss} + \text{Attenuator Loss} + \text{Antenna Gain} + 10 * \log(N)$$

### Power Density

Test place Shonan EMC Lab. No.6 Shielded Room  
Report No. 10762865S-B  
Date June 18, 2015  
Temperature / Humidity 23 deg. C / 40 % RH  
Engineer Hikaru Shirasawa  
Mode Tx

11b

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412.00	-18.17	2.09	20.13	4.06	8.00	3.95
2437.00	-19.60	2.10	20.13	2.63	8.00	5.37
2462.00	-20.06	2.11	20.13	2.19	8.00	5.82

11g

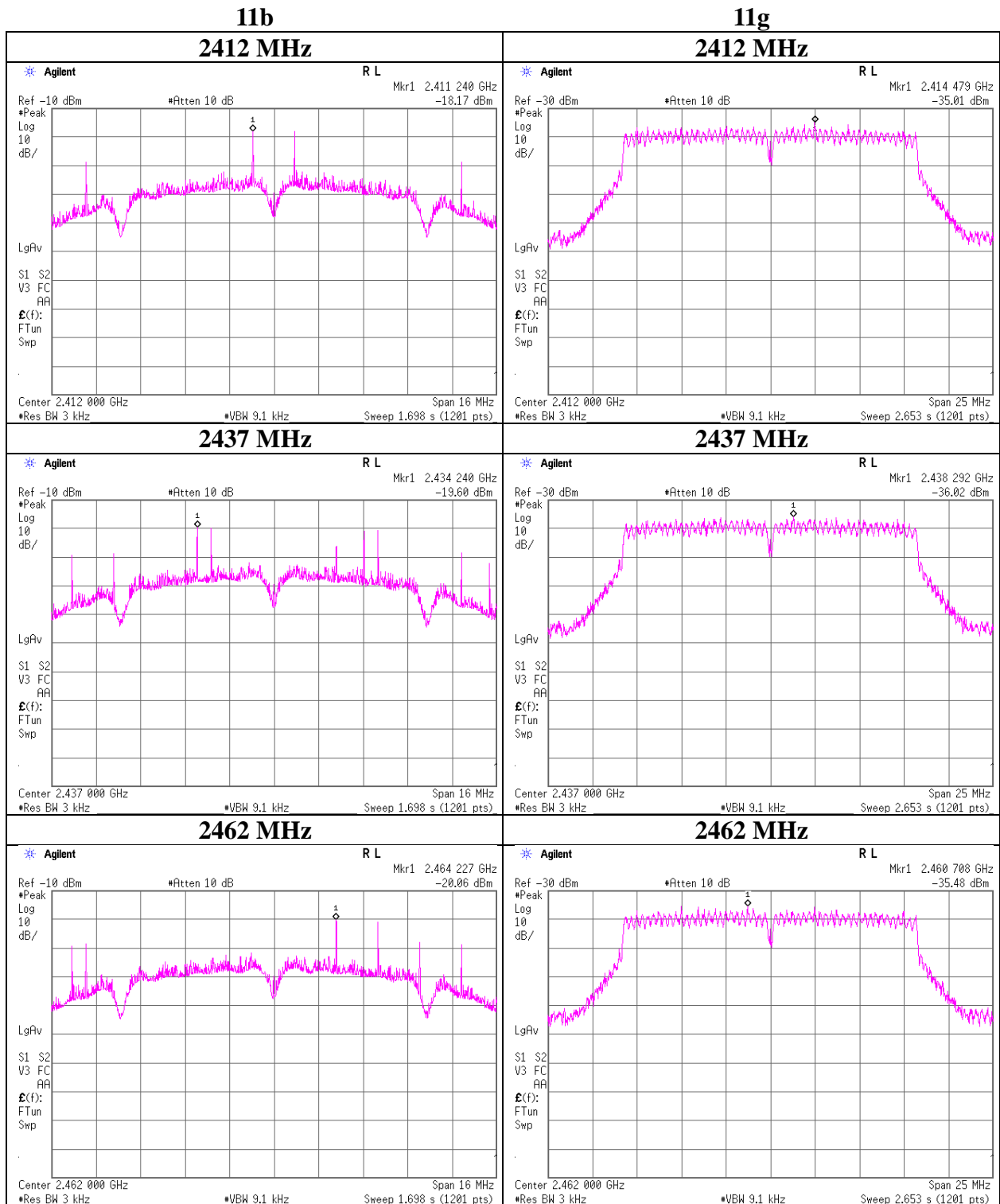
Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412.00	-35.01	2.09	20.13	-12.79	8.00	20.79
2437.00	-36.02	2.10	20.13	-13.79	8.00	21.79
2462.00	-35.48	2.11	20.13	-13.24	8.00	21.24

Sample Calculation:

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

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

**Power Density**



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### Power Density

Test place                   Shonan EMC Lab. No.6 Shielded Room  
Report No.                   10762865S-B  
Date                         June 18, 2015  
Temperature / Humidity     23 deg. C / 40 % RH  
Engineer                    Hikaru Shirasawa  
Mode                         Tx

11n-20

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit [dBm]	Margin [dB]
				[dBm]	[mW]		
2412.00	-34.87	2.09	20.13	-12.65	0.05	8.00	20.65
2437.00	-34.65	2.10	20.13	-12.42	0.06	8.00	20.42
2462.00	-35.62	2.11	20.13	-13.38	0.05	8.00	21.38

Sample Calculation:

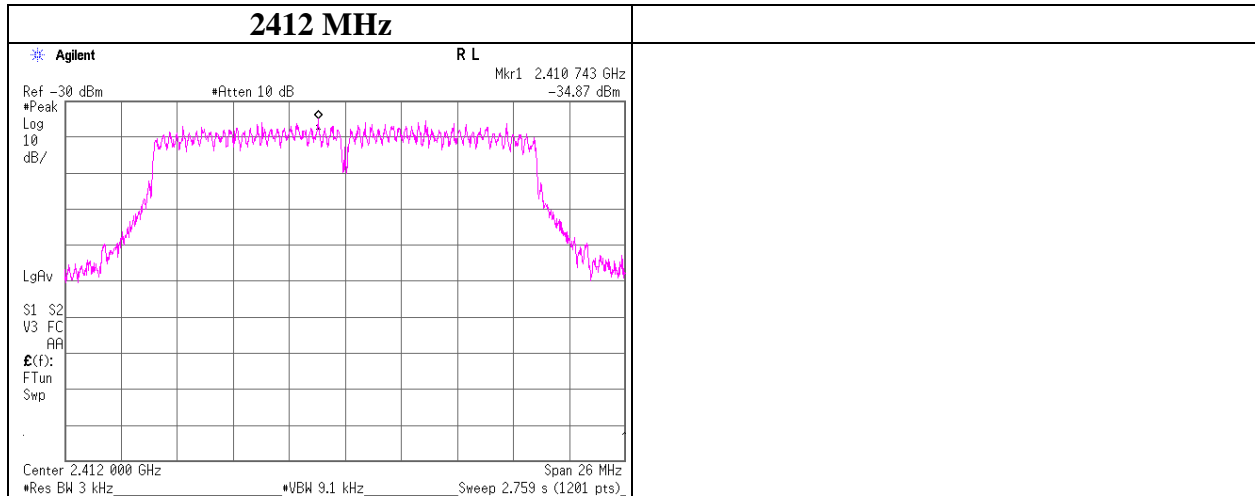
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

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

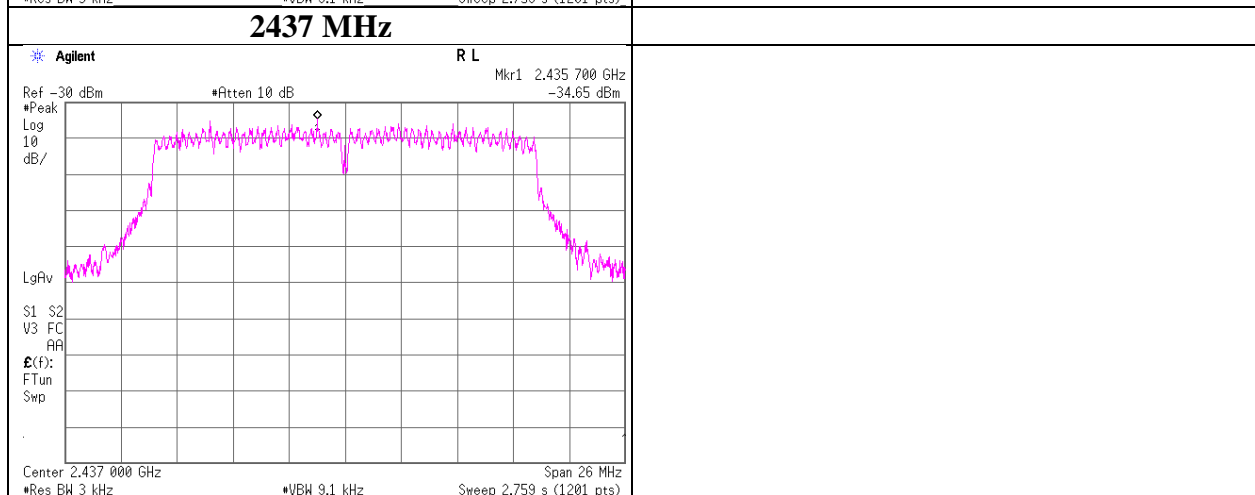
**Power Density**

**11n-20**

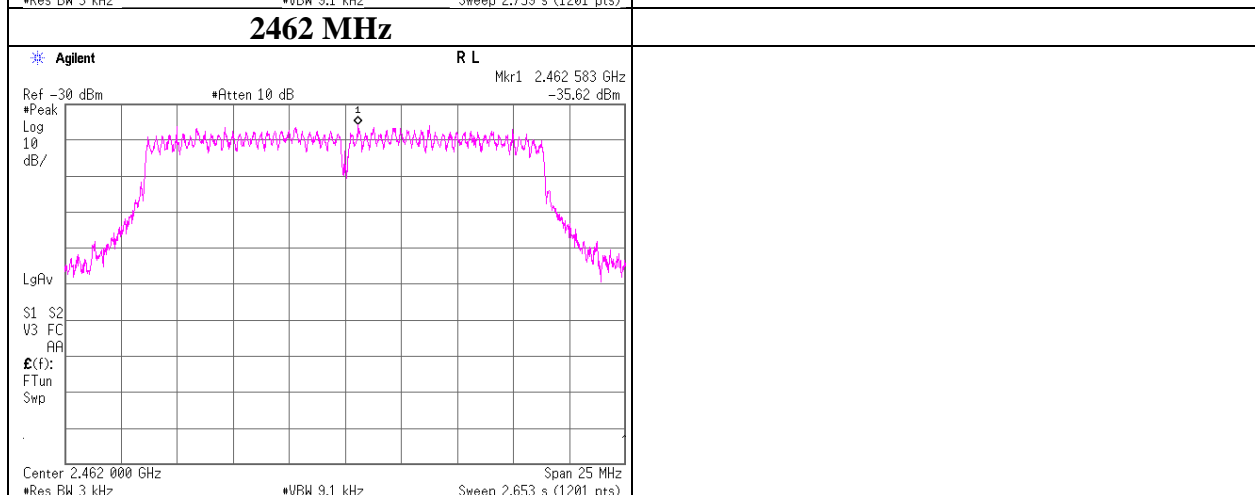
**2412 MHz**



**2437 MHz**



**2462 MHz**



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**Shonan EMC Lab.**

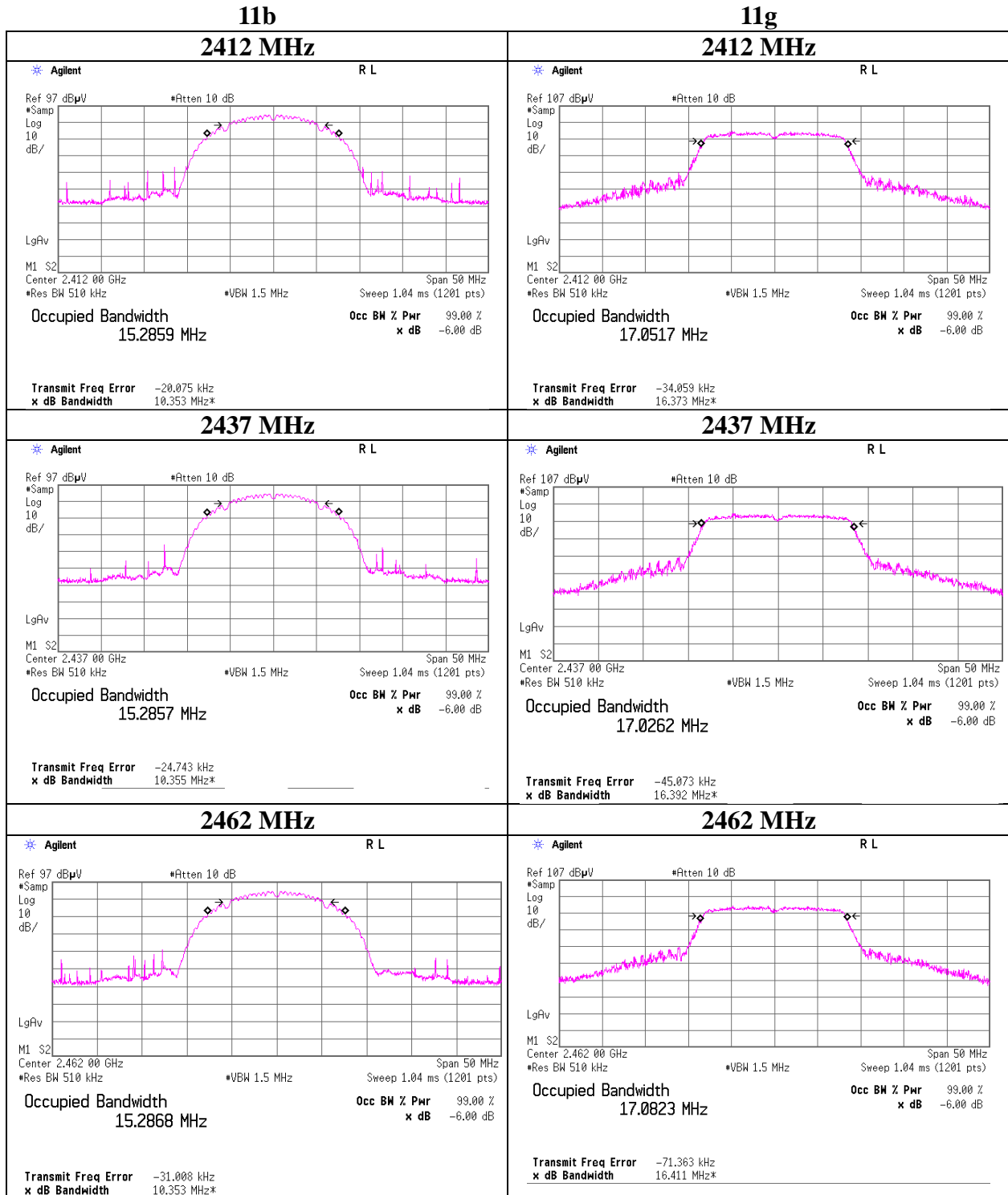
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### 99% Occupied Bandwidth

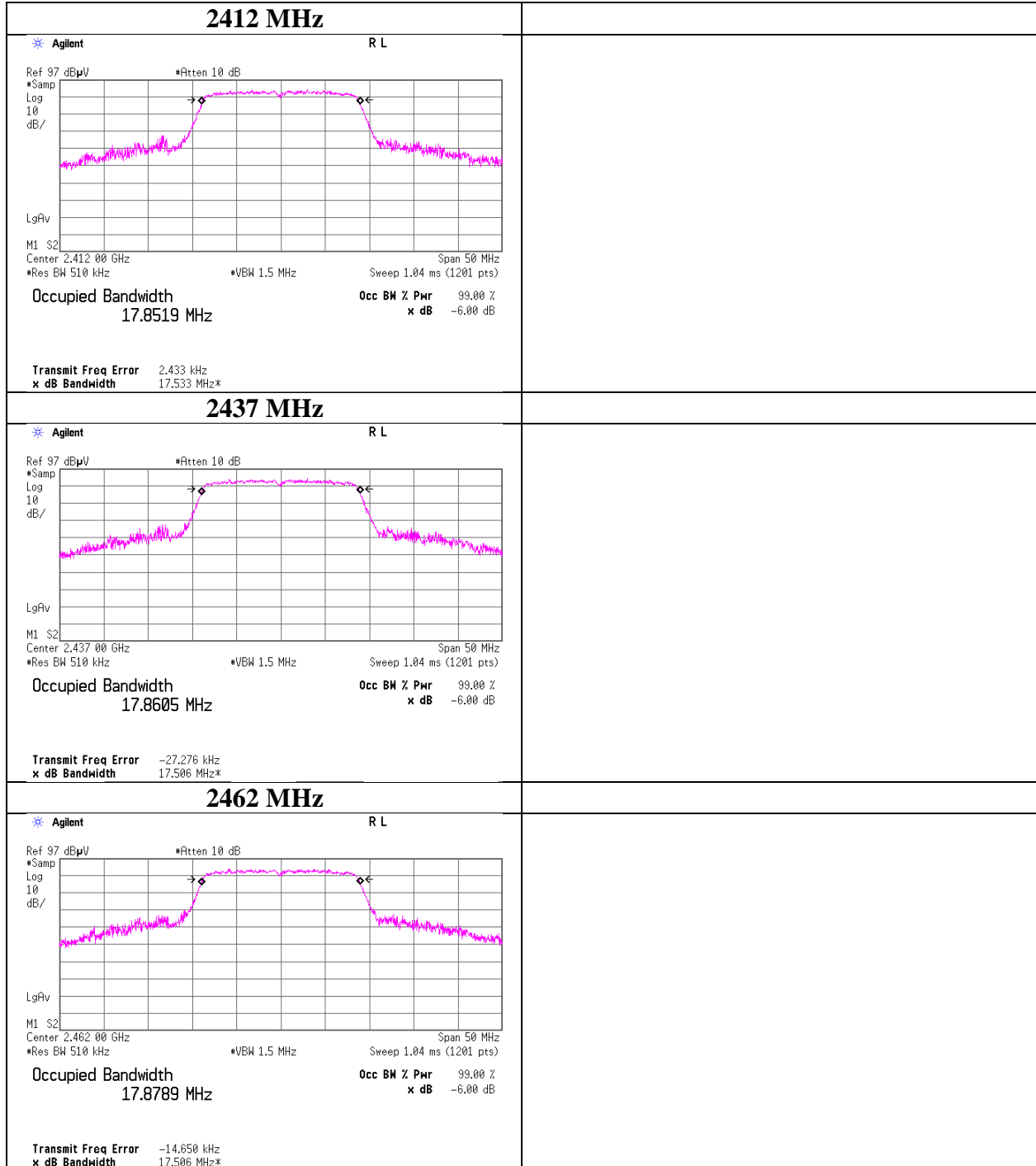
Test place	Shonan EMC Lab. No.6 Shielded Room
Report No.	10762865S-B
Date	June 18, 2015
Temperature / Humidity	23 deg. C / 40 % RH
Engineer	Hikaru Shirasawa
Mode	Tx



## 99% Occupied Bandwidth

Test place	Shonan EMC Lab. No.6 Shielded Room
Report No.	10762865S-B
Date	June 18, 2015
Temperature / Humidity	23 deg. C / 40 % RH
Engineer	Hikaru Shirasawa
Mode	Tx

### 11n-20





## APPENDIX 2: Test instruments

### Test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
SAT20-03	Attenuator	Agilent	8493C-020	74891	AT	2015/03/11 * 12
SCC-G14	Coaxial Cable	Suhner	SUCOFLEX 102	31600/2	AT	2015/03/11 * 12
SPM-07	Power Meter	Agilent	8990B	MY5100272	AT	2015/04/02 * 12
KSA-08	Spectrum Analyzer	Agilent	E4446A	MY46180525	AT	2015/03/23 * 12
SOS-09	Humidity Indicator	A&D	AD-5681	4061484	AT	2014/12/24 * 12
SPSS-04	Power sensor	Agilent	N1923A	MY5326009	AT	2015/04/02 * 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
CSA-07	Spectrum Analyzer	Agilent	E4448A	MY52490024	AT,RE	2015/05/28 * 12
SOS-10	Humidity Indicator	A&D	AD-5681	4064561	AT	2014/10/30 * 12
SAEC-03(NSA)	Semi-Anechoic Chamber	TDK	SAEC-03(NSA )	3	RE	2014/07/14 * 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
SOS-05	Humidity Indicator	A&D	AD-5681	4062518	RE	2014/10/30 * 12
SJM-15	Measure	ASKUL	-	-	RE	-
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE ,CE,RFI,MF)	-	RE	-
SAT10-05	Attenuator(above1GHz)	Agilent	8493C-010	74864	RE	2014/11/21 * 12
SFL-18	Highpass Filter	MICRO-TRONICS	HPM50111	119	RE	2015/04/09 * 12
SAEC-01(NSA)	Semi-Anechoic Chamber	TDK	SAEC-01(NSA )	1	RE	2014/07/09 * 12
SHA-01	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-725	RE	2014/08/12 * 12
SCC-G01	Coaxial Cable	Suhner	SUCOFLEX 104A	46497/4A	RE	2015/04/17 * 12
SAF-04	Pre Amplifier	TOYO Corporation	TPA0118-36	1440489	RE	2015/03/23 * 12
SCC-G21	Coaxial Cable	Suhner	SUCOFLEX 104	296169/4	RE	2015/05/19 * 12
STR-01	Test Receiver	Rohde & Schwarz	ESU40	100093	RE	2014/11/11 * 12
SOS-01	Humidity Indicator	A&D	AD-5681	4062555	RE	2014/10/30 * 12
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
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/T OYO	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	2015/03/24 * 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: RE: Radiated Emission test

AT: Antenna Terminal Conducted test

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