RADIO TEST REPORT

Test Report No. : 10956518S-A-R1

Applicant	:	**RICOH COMPANY, LTD.**
Type of Equipment	:	**Wireless LAN Module**
Model No.	:	**LBWB1ZZWU6**
FCC ID	:	**BBP-WLALT01**
Test regulation	:	**FCC Part 15 Subpart E: 2015** **W58 (5745-5825 MHz Band) only**
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)
7. This report is a revised version of 10956518S-A. 10956518S-A is replaced with this report.

Date of test: September 25 to 29, 2015

Representative test engineer:
Y. Ishikawa
Yosuke Ishikawa
Engineer
Consumer Technology Division

Approved by:
T. Arai
Tatsuya Arai
Engineer
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".

RTL02610

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Shonan EMC Lab.
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REVISION HISTORY

Original Test Report No.: 10956518S-A

Revision	Test report No.	Date	Page revised	Contents
- (Original)	10956518S-A	October 21, 2015	-	-
1	10956518S-A-R1	October 23, 2015	(full revision)	Update of output power data
2	10956518S-A-R1	October 27, 2015	1	Addition of tested band
			5	Correction of typo
			34	Update of data
3	10956518S-A-R1	November 10, 2015	27-29,34	Correction of antenna gain

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SECTION 1: Customer information

Company Name	:	RICOH COMPANY, LTD.
Address	:	810, Shimo-imaizumi, Ebina-shi, Kanagawa, 243-0460 Japan
Telephone Number	:	+81-050-3814-8979
Facsimile Number	:	+81-3-6893-1409
Contact Person	:	Yuuki Nakada

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

2.1 Identification of E.U.T.

Type of Equipment	:	Wireless LAN Module
Model Number	:	LBWB1ZZWU6
Serial Number	:	Refer to Section 4, Clause 4.2
Rating	:	DC 3.6V
Country of Mass-production	:	China
Condition of EUT	:	Engineering prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Receipt Date of Sample	:	September 24, 2015
Modification of EUT	:	No modification by the test lab.

2.2 Product Description

Model: LBWB1ZZWU6 (referred to as the EUT in this report) is a Wireless LAN Module.

General Specification

Clock frequency(ies) in the system	:	37.4MHz

Radio Specification

Radio Type	:	Transceiver
Frequency of Operation	:	2412-2462MHz / 5180-5320 MHz / 5500-5700 MHz / 5745-5825 MHz
Modulation	:	OFDM, DSSS
Bandwidth	:	20MHz
Channel spacing	:	5MHz (2.4GHz), 20MHz/40MHz (5GHz)
Antenna type	:	Printed PCB
Antenna Gain	:	-1.1 dBi (2.4 GHz) , W52/W53: 2.3 dBi, W56: 4.5 dBi, W58: 2.7 dBi

Remarks: This Wireless Module consists of 1 chip each of 5 GHz band and 2.4 GHz band.

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification	:	FCC Part 15 Subpart E: 2015, final revised on September 8, 2015
Title	:	FCC 47CFR Part15 Radio Frequency Device Subpart E Unlicensed National Information Infrastructure Devices Section 15.407 General technical requirements

3.2 Procedures and results

Item	Test Procedure	Specification	Worst margin	Results	Remarks
Conducted Emission	**FCC:** ANSI C63.10-2013	**FCC:** 15.407 (b) (6) / 15.207	21.0 dB Freq.: 0.15000 MHz Detection: Qusai-Peak Phase: N Mode: Tx. 11n-40. 5795 MHz	Complied	-
26 dB Emission Bandwidth	**FCC:** KDB Publication Number 789033 ANSI C63.10-2013	**FCC:** 15.407 (a) (1) (2) (3)	See data	N/A	Conducted
Maximum Conducted Output Power	**FCC:** KDB Publication Number 789033 ANSI C63.10-2013	**FCC:** 15.407 (a) (1) (2) (3)		Complied	Conducted
Maximum Power Spectral Density	**FCC:** KDB Publication Number 789033 ANSI C63.10-2013	**FCC :** 15.407 (a) (1) (2) (3)		Complied	Conducted
Spurious Emission Restricted Band Edge	**FCC: ANSI C63.10-2013** KDB Publication Number 789033	**FCC:** 15.407 (b), 15.205 and 15.209	3.1 dB Freq.: 7673.3 MHz Mode: Tx 11n-40 5755 MHz Polarization: Horizontal Detection: Average	Complied	Conducted (< 30 MHz) / Radiated (> 30 MHz) *1)
6 dB Emission Bandwidth	**FCC: ANSI C63.10-2013**	**FCC:** 15.407 (e)	See data	Complied	Conducted

Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422.
* For DFS tests, please see the test report number 32KE0045-SH-04-C issued by UL Japan, Inc.
*1) Radiated test was selected over 30 MHz based on section FCC 15.407 (b) and KDB 789033 D02 G.3.b).

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

FCC Part 15.203 Antenna requirement / 212
The EUT has a unique coupling/antenna connector (U.FL-LP). Therefore the equipment complies with the requirement.

3.3 Addition to standard

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

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

3.4 Uncertainty

EMI

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	150 kHz-30 MHz	3.6 dB	3.4 dB	3.4 dB
Radiated emission (Measurement distance: 3 m)	9 kHz-30 MHz	3.7 dB	3.5 dB	3.5 dB
	30 MHz-300 MHz	4.9 dB	4.9 dB	4.7 dB
	300 MHz-1 GHz	5.0 dB	5.0 dB	4.8 dB
	1 GHz-13 GHz	4.9 dB	4.9 dB	4.9 dB
Radiated emission (Measurement distance: 1 m)	13 GHz-18 GHz	5.7 dB	5.7 dB	5.7 dB
	18 GHz-40 GHz	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 1 GHz (Average Detector)_SPM-06	0.76 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-06	0.79 dB
Power Measurement above 1 GHz (Average Detector)_SPM-07	0.74 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-07	1.08 dB
Spurious emission (Conducted) below 1GHz	1.5 dB
Spurious emission (Conducted) 1 GHz-3 GHz	1.7 dB
Spurious emission (Conducted) 3 GHz-18 GHz	2.4 dB

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 report meets the limits unless the uncertainty is taken into consideration.

3.5 Test Location

UL Japan, Inc. Shonan EMC Lab.
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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	10 m
No.2 Semi-anechoic chamber	2973D-2	20.6 x 11.3 x 7.65	20.6 x 11.3	10 m
No.3 Semi-anechoic chamber	2973D-3	12.7 x 7.7 x 5.35	12.7 x 7.7	5 m
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)

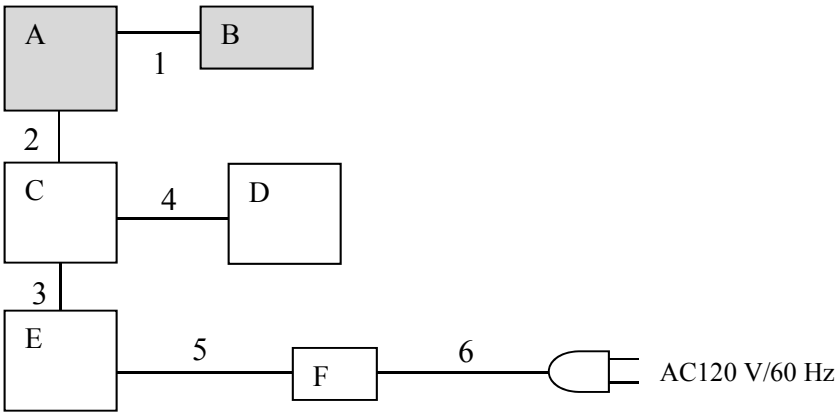
Test operating mode was determined as follows according to "Section 1 of 6 802.11 a/b/g/n testing - Managing Complex Regulatory Approvals -" of TCB Council Workshop October 2009

Mode	Remarks*
IEEE 802.11a (11a)	6 Mbps, PN9
IEEE 802.11n SISO 20 MHz BW (11n-20)	MCS 0, PN9
IEEE 802.11n SISO 40 MHz BW (11n-40)	MCS 0, PN9
*The worst condition was determined based on the test result of Maximum Conducted Output Power.	
*Power of the EUT was set by the software as follows; Power settings: 13 dBm Software: Tera Term Version 4.7.1 *This setting of software is the worst case. Any conditions under the normal use do not exceed the condition of setting. In addition, end users cannot change the settings of the output power of the product.	

*The details of Operation mode(s)

Test Item	Operating Mode	Tested Frequency
Conducted emission Radiated Spurious Emission (Below 1 GHz) Conducted Spurious Emission	11n-40 Tx *)	5795 MHz *)
99 % Occupied Bandwidth, Maximum Conducted Output Power, Maximum Power Spectral Density 6 dB Bandwidth Radiated Spurious Emission (Above 1 GHz)	11a Tx 11n-20 Tx 11n-40 Tx	5745 MHz / 5785 MHz / 5825 MHz (20 MHz band) 5755 MHz / 5795 MHz (40 MHz band)
*) The mode was tested as a representative, because it had the highest power at antenna terminal test.		

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 LAN Module	LBWB1ZZWU6	FCDBB388621F	RICOH	EUT
B	Antenna	Y0515780	406S0085	RICOH	EUT
C	Network Board	NETWORK: ALT-2	#29	RICOH	
D	Debug Board	SOL_NW:DBG	#10	RICOH	
E	Power Supply Board	EXCHANGE: NW2	9	RICOH	
F	AC Adapter	LTE50ES-S3-3	144700931	LI TONE ELECTRONICS	

List of cables used

No.	Cable name	Length (m)	Shield		Remarks
			Cable	Connector	
1	Antenna	0.09	Shielded	Shielded	-
2	Flat	0.10	Unshielded	Unshielded	
3	Flat	0.05	Unshielded	Unshielded	
4	Flat	0.18	Unshielded	Unshielded	
5	DC	1.8	Unshielded	Unshielded	
6	AC	1.2	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 40cm 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 80cm from a Line Impedance Stabilization Network (LISN) / Artificial mains Network (AMN) and excess AC cable was bundled in center.

I/O cables that were connected to the peripherals were bundled in center. They were folded back and forth forming a bundle 30 cm to 40 cm long and were hanged at a 40 cm height to the ground plane.

The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT via AC adapter within a Shielded room. The EUT via AC adapter 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 Average**
Measurement range	**: 0.15 MHz-30 MHz**
Test data	**: APPENDIX**
Test result	**: Pass**

SECTION 6: Radiated Spurious Emission and Band Edge Compliance

Test Procedure

EUT was placed on a urethane 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 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 made with the following detector function of the test receiver and the Spectrum analyzer (in linear mode).
The measurements were performed for both vertical and horizontal antenna polarization with the Test Receiver, or the Spectrum Analyzer.
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.

< Below 1GHz >

The result also satisfied with the general limits specified in section 15.209 (a).

< Above 1GHz >

Inside of restricted bands (Section 15.205):

Apply to limit in the Section 15.209 (a).

Outside of the restricted bands:

Apply to limit 68.2 dBuV/m, 3 m (-27 dBm e.i.r.p.*) in the Section 15.407 (b) (1) (2) (3).
Apply to limit 68.2 dBuV/m, 3 m (-27 dBm e.i.r.p.*) or
78.2 dBuV/m, 3 m (-17 dBm e.i.r.p.*) in the Section 15.407 (b).

Restricted band edge:

Apply to limit in the Section 15.209 (a).
Since this limit is severer than the limit of the inside of restricted bands.

*Electric field strength to e.i.r.p. conversion:

$$E = \frac{1000000\sqrt{30P}}{3} \quad \text{(uV/m)} \qquad :P \text{ is the e.i.r.p. (Watts)}$$

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

Frequency	Below 1 GHz	Above 1 GHz	
Instrument used	Test Receiver	Spectrum Analyzer	
Detector	QP	Peak	Average
IF Bandwidth	BW: 120 kHz	RBW: 1 MHz VBW: 3 MHz	Method AD *1) RBW: 1 MHz VBW: Duty ≥ 98 % VBW is 10 Hz Duty < 98% VBW is 1 / burst time
Test Distance	3 m	3 m (below 13 GHz), 1 m*2) (above 13 GHz),	

*1) The test method was also referred to KDB 789033 D02 General UNII Test Procedures 1 New Rules v01 "Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E (Issued on June 6, 2014)".
*2) Distance Factor: 20 x log (3.0 m/1.0 m) = 9.5 dB

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 MHz-40 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 and Test method
99 % Occupied Bandwidth *1)	Enough width to display emission skirts	1 % to 5 % of OBW	≥ 3 RBW	Auto	Peak	Max Hold	Spectrum Analyzer
6 dB Bandwidth	Enough to capture the emission	100 kHz	300 kHz	Auto	Peak	Max Hold	Spectrum Analyzer
Maximum Conducted Output Power	-	-	-	Auto	Average	-	Power Meter (Sensor: 80 MHz BW) (Method PM)
Maximum Power Spectral Density	Encompass the entire EBW	100 KHz*2)	≥ 3 RBW	Auto	RMS Power Averaging (100 times)	Clear Write	Spectrum Analyzer
Conducted Spurious Emission*3)	9 kHz – 150 kHz	200 Hz	620 Hz	Auto	Peak	Max Hold	Spectrum Analyzer
	150 kHz – 30 MHz	10 kHz	30 kHz				

* The test method was also referred to KDB 789033 D02 General UNII Test Procedures New Rules v01 "Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E (Issued on June 6, 2014)".

*1) Peak hold was applied as Worst-case measurement.
*2) FCC standard says that RBW is set to be 500 kHz for 5.725 GHz-5.850 GHz, but it is not possible with spectrum analyzer, so 10log(500 kHz/100 kHz) was added to the test result.
*3) In the frequency range below 30 MHz, 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

DATA OF CONDUCTED EMISSION TEST

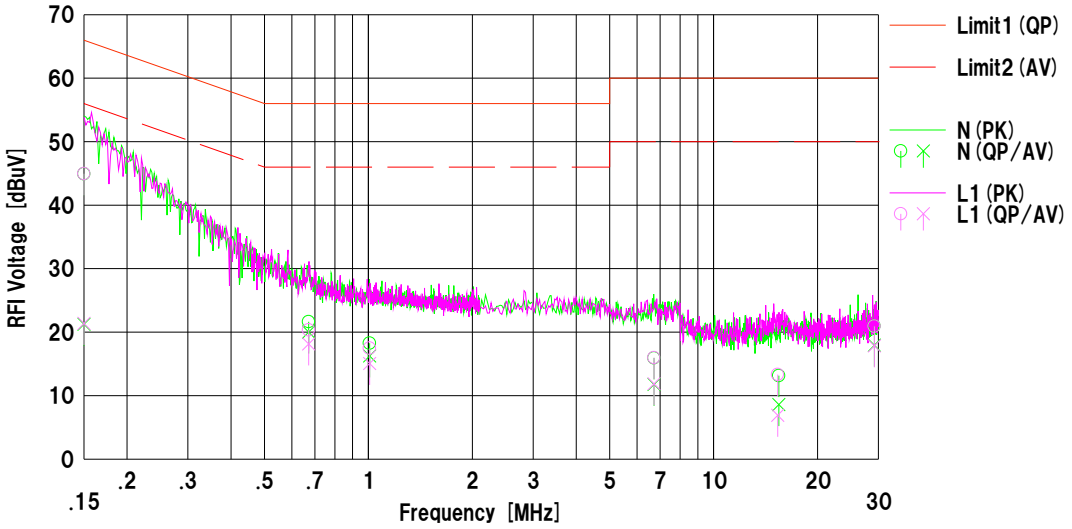
UL Japan,Inc. Shonan EMC Lab. No.2 Shielded Room
Date : 2015/09/27

Mode : Tx. 11n HT40. 5795 MHz

Power : AC 120V / 60Hz
Temp./Humi. : 25 deg.C / 63 %RH

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

Engineer : Kenichi Adachi



No.	Freq.	Reading		C.Fac	Results		Limit		Margin		Phase	Comment
		<QP>	<AV>		<QP>	<AV>	<QP>	<AV>	<QP>	<AV>		
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	0.15000	32.43	8.72	12.51	44.94	21.23	66.00	56.00	21.0	34.7	N	
2	0.67193	9.04	7.42	12.60	21.64	20.02	56.00	46.00	34.3	25.9	N	
3	1.00851	5.64	3.63	12.62	18.26	16.25	56.00	46.00	37.7	29.7	N	
4	6.71565	2.95	-1.22	12.98	15.93	11.76	60.00	50.00	44.0	38.2	N	
5	15.45076	-0.21	-4.77	13.36	13.15	8.59	60.00	50.00	46.8	41.4	N	
6	29.21782	6.98	3.97	13.99	20.97	17.96	60.00	50.00	39.0	32.0	N	
7	0.15000	32.45	8.87	12.51	44.96	21.38	66.00	56.00	21.0	34.6	L1	
8	0.67193	7.74	5.54	12.60	20.34	18.14	56.00	46.00	35.6	27.8	L1	
9	1.00851	4.85	2.44	12.62	17.47	15.06	56.00	46.00	38.5	30.9	L1	
10	6.71566	2.99	-1.12	12.98	15.97	11.86	60.00	50.00	44.0	38.1	L1	
11	15.33075	-0.02	-6.45	13.35	13.33	6.90	60.00	50.00	46.6	43.1	L1	
12	29.21782	6.94	3.84	13.99	20.93	17.83	60.00	50.00	39.0	32.1	L1	

Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+ATT+Cable) [dB]
LISN: SLS-03

99 % Occupied Bandwidth

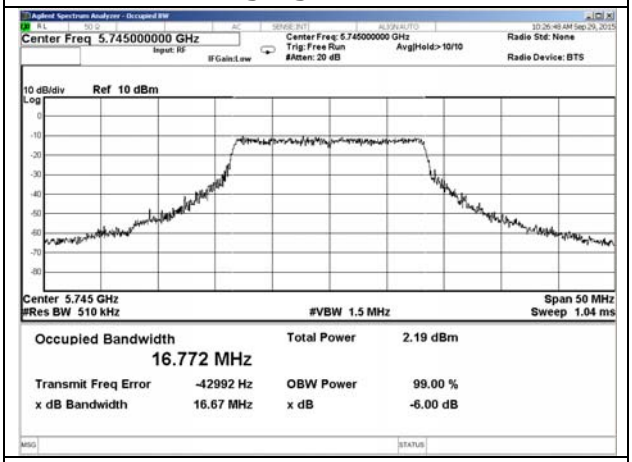
Test place	Shonan EMC Lab. No.3 Shielded Room
Report No.	10956518S-A-R1
Date	September 29, 2015
Temperature / Humidity	24deg. C / 49 % RH
Engineer	Tomohiro Hara
Mode	Tx 11a

Tested Frequency [MHz]	99 % Occupied Bandwidth [MHz]	Limit [MHz]
5745	16.772	-
5785	16.752	-
5825	16.812	-

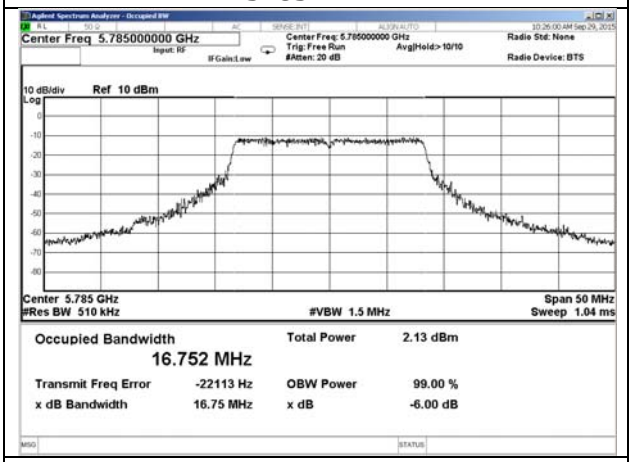
99 % Occupied Bandwidth

11a

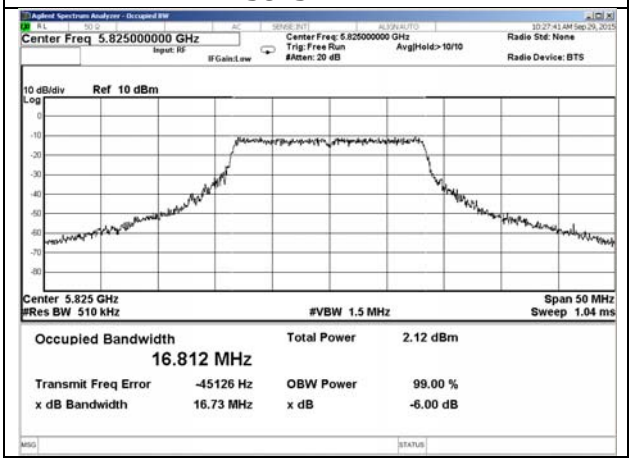
5745 MHz



5785 MHz



5825 MHz



99 % Occupied Bandwidth

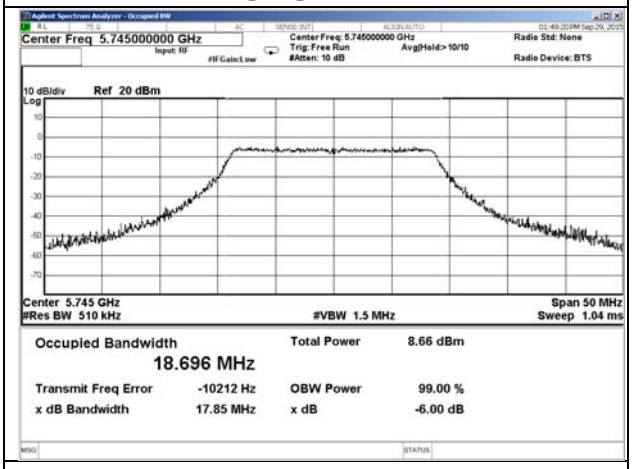
Test place	Shonan EMC Lab. No.3 Shielded Room
Report No.	10956518S-A-R1
Date	September 29, 2015
Temperature / Humidity	24deg. C / 49 % RH
Engineer	Tomohiro Hara
Mode	Tx 11n-20

Tested Frequency [MHz]	99 % Occupied Bandwidth [MHz]	Limit [MHz]
5745	18.696	-
5785	18.827	-
5825	18.699	-

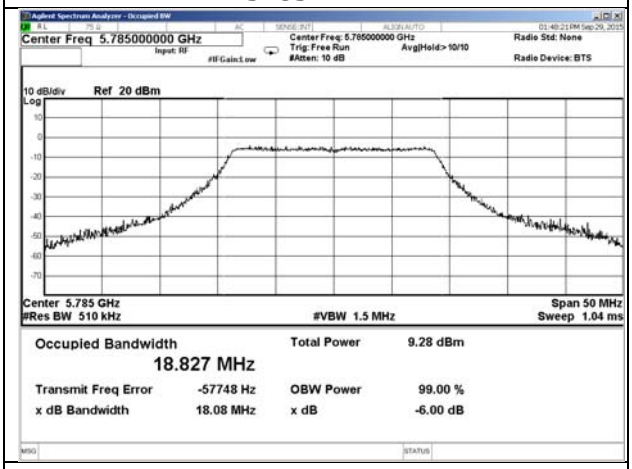
99 % Occupied Bandwidth

11n-20

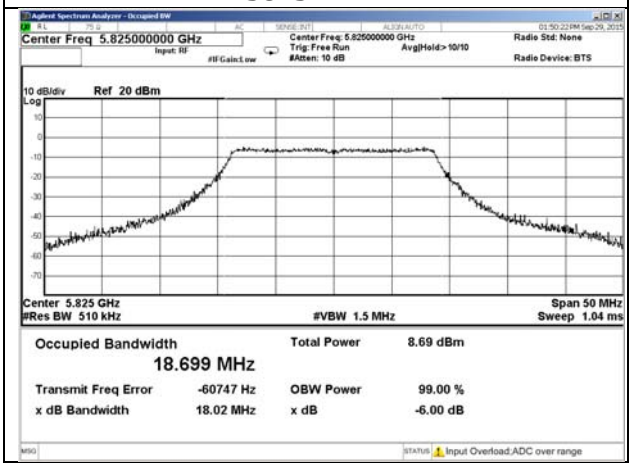
5745 MHz



5785 MHz



5825 MHz



99 % Occupied Bandwidth

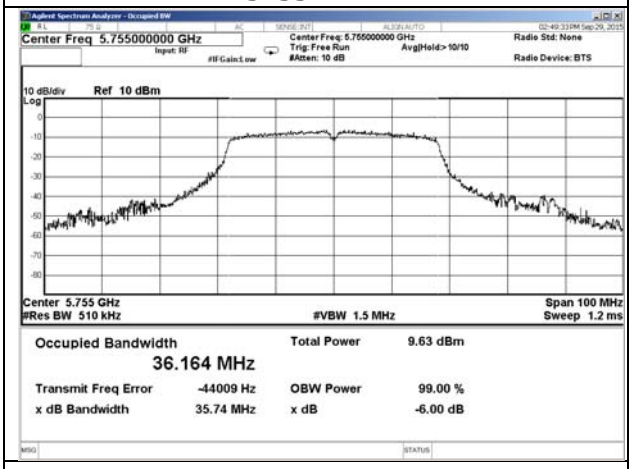
Test place	Shonan EMC Lab. No.3 Shielded Room
Report No.	10956518S-A-R1
Date	September 29, 2015
Temperature / Humidity	24deg. C / 49 % RH
Engineer	Tomohiro Hara
Mode	Tx 11n-40

Tested Frequency [MHz]	99 % Occupied Bandwidth [MHz]	Limit [MHz]
5755	36.164	-
5795	36.207	-

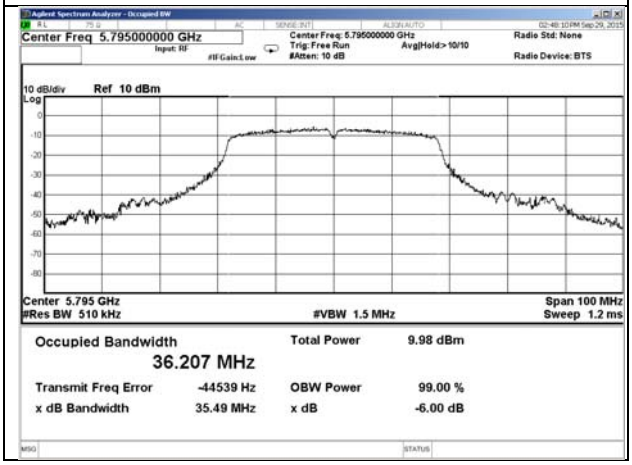
99 % Occupied Bandwidth

11n-40

5755 MHz



5795 MHz



6 dB Bandwidth

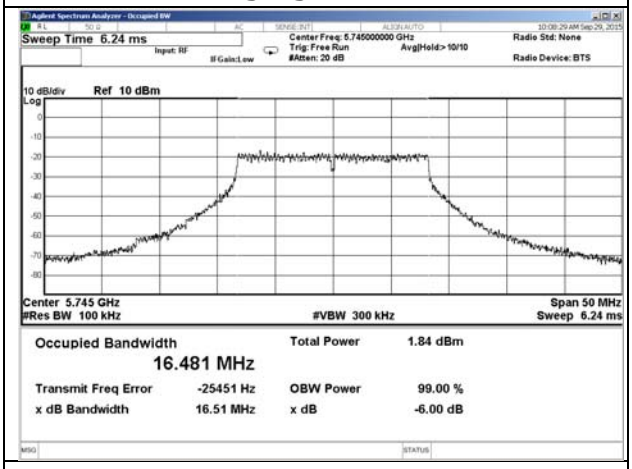
Test place	Shonan EMC Lab. No.3 Shielded Room
Report No.	10956518S-A-R1
Date	September 29, 2015
Temperature / Humidity	24deg. C / 49 % RH
Engineer	Tomohiro Hara
Mode	Tx 11a

Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [kHz]
5745	16.510	>500
5785	16.570	>500
5825	16.540	>500

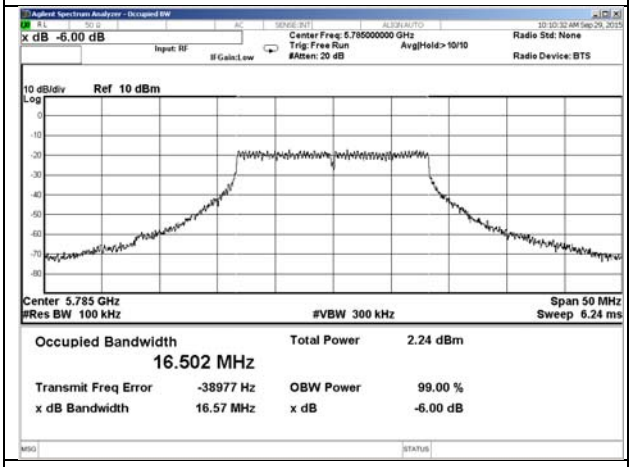
6 dB Bandwidth

11a

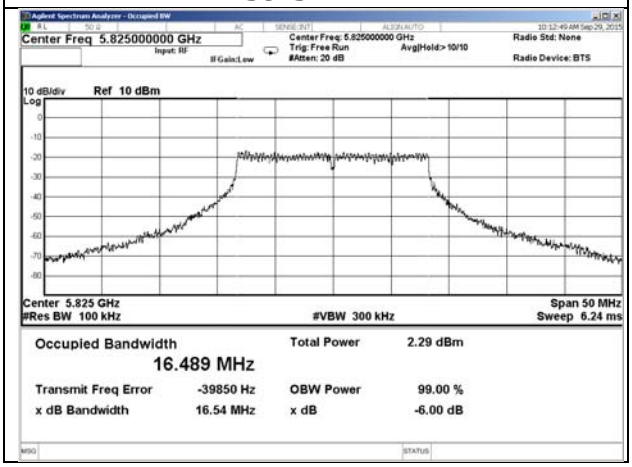
5745 MHz



5785 MHz



5825 MHz



6 dB Bandwidth

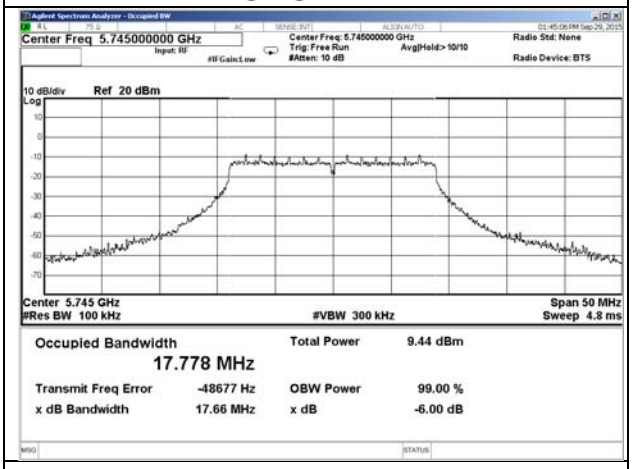
Test place	Shonan EMC Lab. No.3 Shielded Room
Report No.	10956518S-A-R1
Date	September 29, 2015
Temperature / Humidity	24deg. C / 49 % RH
Engineer	Tomohiro Hara
Mode	Tx 11n-20

Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [kHz]
5745	17.660	>500
5785	17.650	>500
5825	17.660	>500

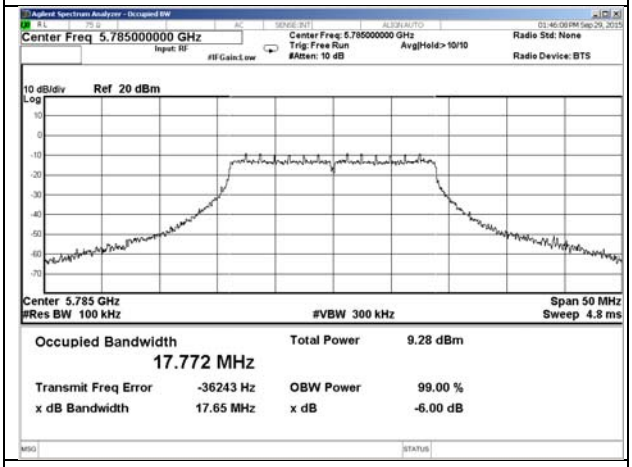
6 dB Bandwidth

11n-20

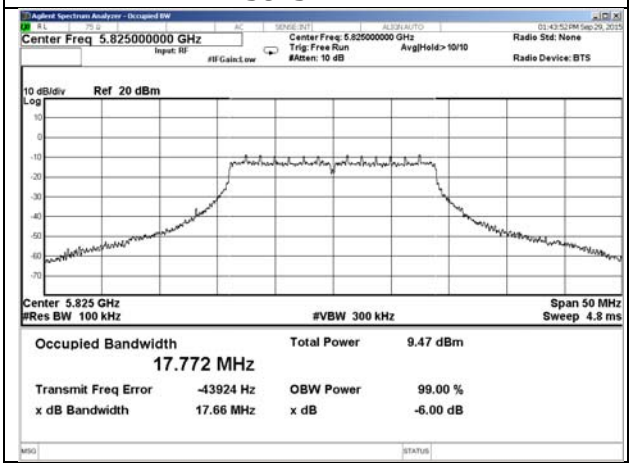
5745 MHz



5785 MHz



5825 MHz



6 dB Bandwidth

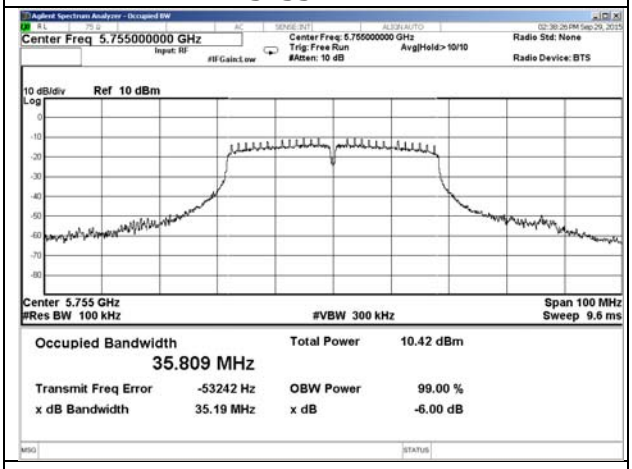
Test place	Shonan EMC Lab. No.3 Shielded Room
Report No.	10956518S-A-R1
Date	September 29, 2015
Temperature / Humidity	24deg. C / 49 % RH
Engineer	Tomohiro Hara
Mode	Tx 11n-40

Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [kHz]
5755	35.190	>500
5795	35.180	>500

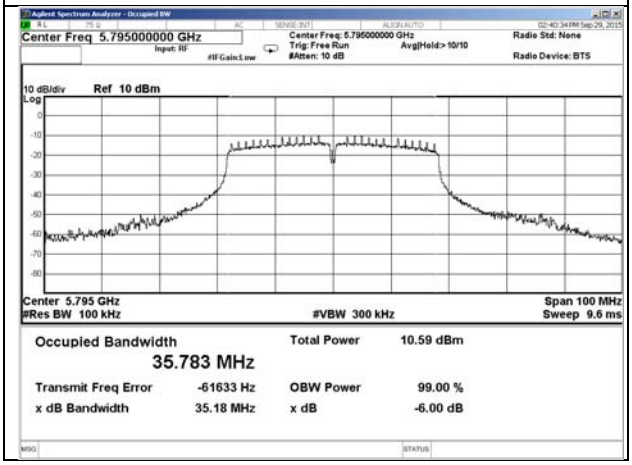
6 dB Bandwidth

11n-40

5755MHz



5795 MHz



Maximum Conducted Output Power

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	10956518S-A-R1
Date	September 25, 2015
Temperature / Humidity	25deg. C / 56 % RH
Engineer	Tomohiro Hara
Mode	Tx 11a

11a

Tested Frequency	Power Meter Reading	Cable Loss	Atten. Loss	Duty Factor	Antenna Gain	26 dB EBW (B for FCC)	99% OBW (B for IC)	Conducted Power Result		Limit	Margin	e.i.r.p. Result		Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBi]	[MHz]	[MHz]	[dBm]	[mW]	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[dB]
5745	1.90	1.83	9.97	0.09	2.7	-	16.772	13.79	23.93	30.00	16.21	16.49	44.57	36.00	19.51
5785	1.85	1.84	9.97	0.09	2.7	-	16.752	13.75	23.71	30.00	16.25	16.45	44.16	36.00	19.55
5825	1.78	1.85	9.97	0.09	2.7	-	16.812	13.69	23.39	30.00	16.31	16.39	43.55	36.00	19.61

Sample Calculation:
Conducted Power Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor
e.i.r.p. Result = Conducted Power Result + Antenna Gain

Maximum Conducted Output Power

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	10956518S-A-R1
Date	September 25, 2015
Temperature / Humidity	25deg. C / 56 % RH
Engineer	Tomohiro Hara
Mode	Tx 11n-20

11n-20

Tested Frequency	Power Meter Reading	Cable Loss	Atten. Loss	Duty Factor	Antenna Gain	26 dB EBW (B for FCC)	99% OBW (B for IC)	Conducted Power Result		Limit	Margin	e.i.r.p. Result		Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBi]	[MHz]	[MHz]	[dBm]	[mW]	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[dB]
5745	1.94	1.83	9.97	0.03	2.7	-	18.696	13.77	23.82	30.00	16.23	16.47	44.36	36.00	19.53
5785	1.91	1.84	9.97	0.03	2.7	-	18.827	13.75	23.71	30.00	16.25	16.45	44.16	36.00	19.55
5825	1.83	1.85	9.97	0.03	2.7	-	18.699	13.68	23.33	30.00	16.32	16.38	43.45	36.00	19.62

Sample Calculation:
Conducted Power Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor
e.i.r.p. Result = Conducted Power Result + Antenna Gain

Maximum Conducted Output Power

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	10956518S-A-R1
Date	September 25, 2015
Temperature / Humidity	25deg. C / 56 % RH
Engineer	Tomohiro Hara
Mode	Tx 11n-40

11n-40

Tested Frequency	Power Meter Reading	Cable Loss	Atten. Loss	Duty Factor	Antenna Gain	26 dB EBW (B for FCC)	99% OBW (B for IC)	Conducted Power Result		Limit	Margin	e.i.r.p. Result		Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBi]	[MHz]	[MHz]	[dBm]	[mW]	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[dB]
5755	2.32	1.83	9.97	0.06	2.7	-	36.164	14.18	26.18	30.00	15.82	16.88	48.75	36.00	19.12
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5795	2.30	1.85	9.97	0.06	2.7	-	36.207	14.18	26.18	30.00	15.82	16.88	48.75	36.00	19.12

Sample Calculation:
Conducted Power Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor
e.i.r.p. Result = Conducted Power Result + Antenna Gain

Maximum Conducted Output Power

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	10956518S-A-R1
Date	September 25, 2015
Temperature / Humidity	25deg. C / 56 % RH
Engineer	Tomohiro Hara
Mode	Tx 11a

5785 MHz

Mode	Rate Mbps	Reading [dBm]	Duty factor [dB]	Burst power [dBm]	Remarks
11a	6	1.85	0.06	1.91	*
	9	1.73	0.09	1.82	
	12	1.75	0.06	1.81	
	18	1.69	0.09	1.78	
	24	1.58	0.11	1.69	
	36	1.46	0.32	1.78	
	48	1.39	0.33	1.72	
	54	1.43	0.46	1.89	

* Worst rate

Sample Calculation:

Burst power = Reading (timed average) + Duty factor

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

Maximum Conducted Output Power

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	10956518S-A-R1
Date	September 25, 2015
Temperature / Humidity	25deg. C / 56 % RH
Engineer	Tomohiro Hara
Mode	Tx 11n-20

5785 MHz

Mode	MCS Number	Reading [dBm]	Duty factor [dB]	Burst power [dBm]	Remarks
11n-20	0	1.91	0.03	1.94	*
	1	1.54	0.03	1.57	
	2	1.51	0.09	1.60	
	3	0.94	0.12	1.06	
	4	1.57	0.32	1.89	
	5	1.52	0.41	1.93	
	6	1.50	0.35	1.85	
	7	1.43	0.48	1.91	

* Worst rate

Sample Calculation:

Burst power = Reading (timed average) + Duty factor

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

Maximum Conducted Output Power

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	10956518S-A-R1
Date	September 25, 2015
Temperature / Humidity	25deg. C / 56 % RH
Engineer	Tomohiro Hara
Mode	Tx 11n-40

5775 MHz

Mode	MCS Number	Reading [dBm]	Duty factor [dB]	Burst power [dBm]	Remarks
11n-40	0	2.32	0.06	2.38	*
	1	2.17	0.12	2.29	
	2	2.04	0.33	2.37	
	3	2.00	0.21	2.21	
	4	1.84	0.28	2.12	
	5	1.70	0.67	2.37	
	6	1.68	0.54	2.22	
	7	1.58	0.79	2.37	

* Worst rate

Sample Calculation:

Burst power = Reading (timed average) + Duty factor

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

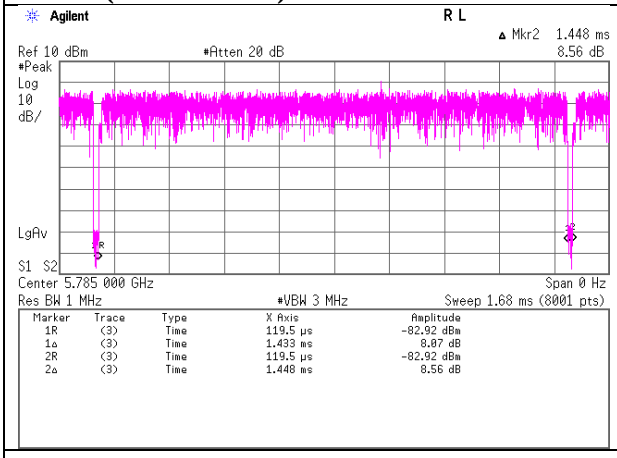
Burst rate confirmation

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	10956518S-A-R1
Date	September 25, 2015
Temperature / Humidity	25deg. C / 56 % RH
Engineer	Tomohiro Hara
Mode	Tx

11a

x: (Tx on + Tx off) = 1.448 ms

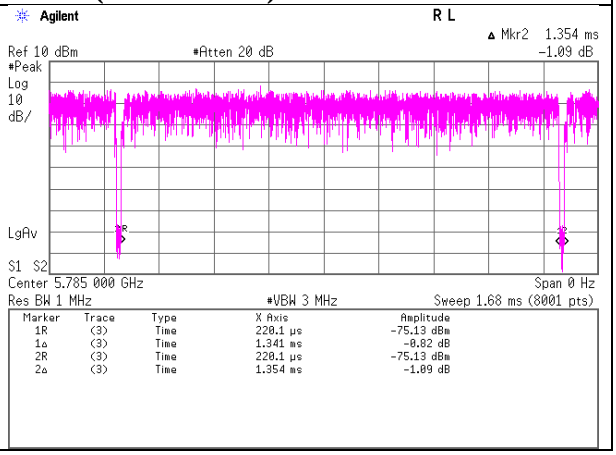
Tx on / (Tx on + Tx off) * 100 = 98.90%



11n-20

x: (Tx on + Tx off) = 1.354 ms

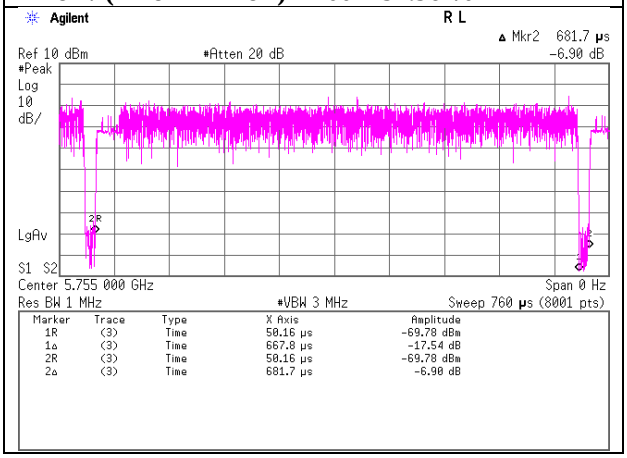
Tx on / (Tx on + Tx off) * 100 = 99.04 %



11n-40

x: (Tx on + Tx off) = 0.6817 ms

Tx on / (Tx on + Tx off) * 100 = 97.96 %



Maximum Power Spectral Density

Test place	Shonan EMC Lab. No.3 Shielded Room
Report No.	10956518S-A-R1
Date	September 29, 2015
Temperature / Humidity	24deg. C / 49 % RH
Engineer	Tomohiro Hara
Mode	Tx

11a

Tested Frequency [MHz]	PSD Reading [dBm /MHz]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Antenna Gain [dBi]	RBW Correction Factor [dB]	PSD (Conducted) Result [dBm /500kHz]	PSD (Conducted) Limit [dBm /500kHz]	PSD (Conducted) Margin [dB]	PSD (e.i.r.p.) Result [dBm /500kHz]	PSD (e.i.r.p.) Limit [dBm /500kHz]	PSD (e.i.r.p.) Margin [dB]
5745	-18.12	1.83	9.97	0.06	2.7	6.99	0.73	30.00	29.27	3.43	36.00	32.57
5785	-17.60	1.84	9.97	0.06	2.7	6.99	1.27	30.00	28.74	3.97	36.00	32.04
5825	-17.95	1.85	9.97	0.06	2.7	6.99	0.93	30.00	29.08	3.63	36.00	32.38

11n-20

Tested Frequency [MHz]	PSD Reading [dBm /MHz]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Antenna Gain [dBi]	RBW Correction Factor [dB]	PSD (Conducted) Result [dBm /500kHz]	PSD (Conducted) Limit [dBm /500kHz]	PSD (Conducted) Margin [dB]	PSD (e.i.r.p.) Result [dBm /500kHz]	PSD (e.i.r.p.) Limit [dBm /500kHz]	PSD (e.i.r.p.) Margin [dB]
5745	-18.21	1.83	9.97	0.03	2.7	6.99	0.61	30.00	29.39	3.31	36.00	32.69
5785	-18.07	1.84	9.97	0.03	2.7	6.99	0.76	30.00	29.24	3.46	36.00	32.54
5825	-18.66	1.85	9.97	0.03	2.7	6.99	0.18	30.00	29.82	2.88	36.00	33.12

11n-40

Tested Frequency [MHz]	PSD Reading [dBm /MHz]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Antenna Gain [dBi]	RBW Correction Factor [dB]	PSD (Conducted) Result [dBm /500kHz]	PSD (Conducted) Limit [dBm /500kHz]	PSD (Conducted) Margin [dB]	PSD (e.i.r.p.) Result [dBm /500kHz]	PSD (e.i.r.p.) Limit [dBm /500kHz]	PSD (e.i.r.p.) Margin [dB]
5755	-20.48	1.83	9.97	0.06	2.7	6.99	-1.63	30.00	31.63	1.07	36.00	34.93
5795	-20.42	1.85	9.97	0.06	2.7	6.99	-1.55	30.00	31.55	1.16	36.00	34.85

Sample Calculation:

PSD: Power Spectral Density

The PSD within 5725 MHz to 5825 MHz are based on any 500 kHz band.

RBW Correction Factor = 10 * log (Specified bandwidth / Measured bandwidth)

PSD Result (Conducted) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor + RBW Correction Factor

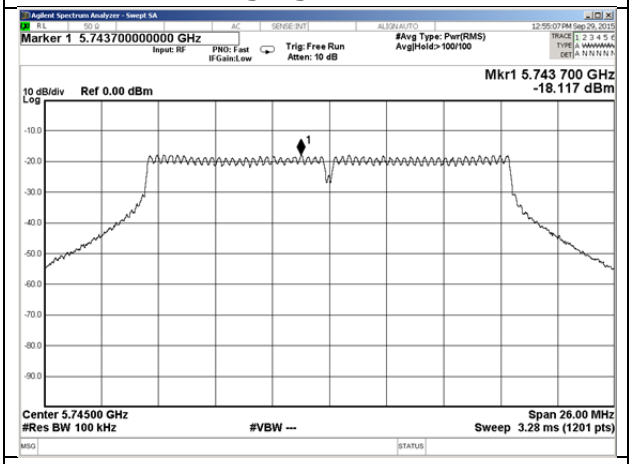
PSD Result (e.i.r.p.) = Conducted PSD Result + Antenna Gain

Maximum Power Spectral Density

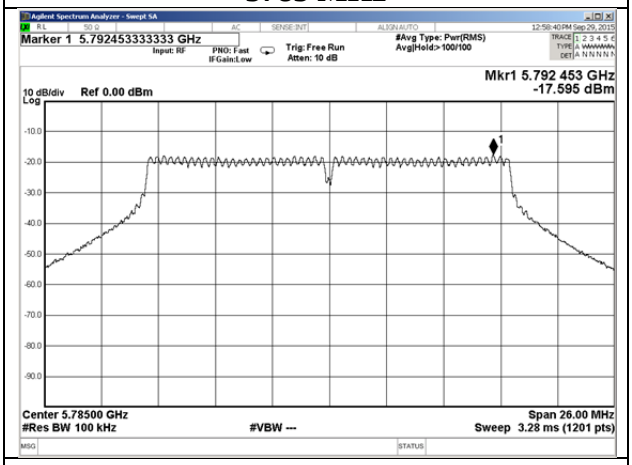
Test place	Shonan EMC Lab. No.3 Shielded Room
Report No.	10956518S-A-R1
Date	September 29, 2015
Temperature / Humidity	24deg. C / 49 % RH
Engineer	Tomohiro Hara
Mode	Tx 11a

11a

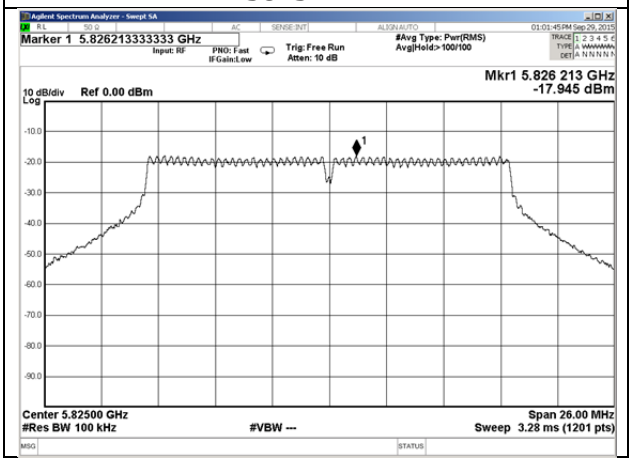
5745 MHz



5785 MHz



5825 MHz

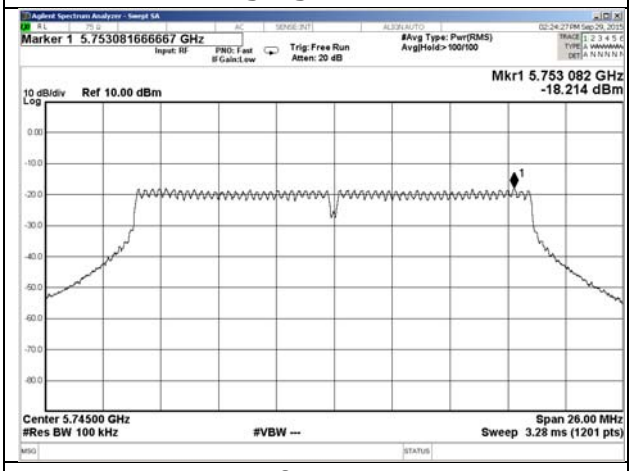


Maximum Power Spectral Density

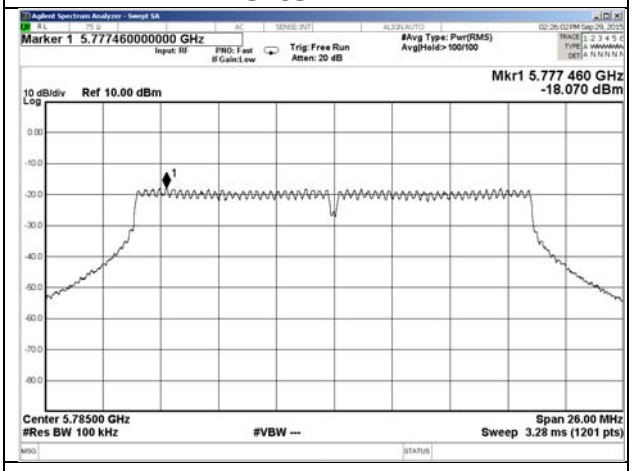
Test place	Shonan EMC Lab. No.3 Shielded Room
Report No.	10956518S-A-R1
Date	September 29, 2015
Temperature / Humidity	24deg. C / 49 % RH
Engineer	Tomohiro Hara
Mode	Tx 11n-20

11n-20

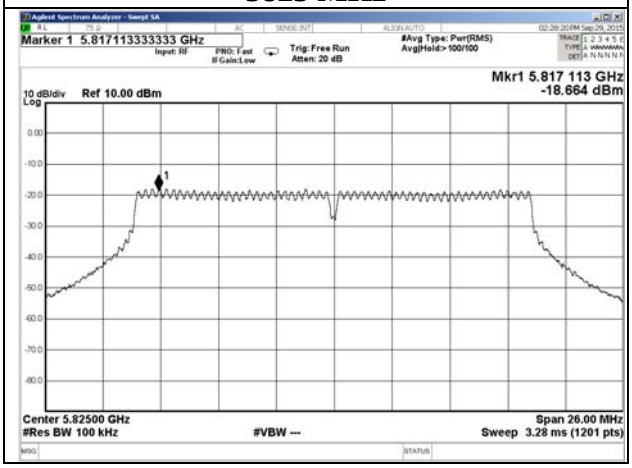
5745 MHz



5785 MHz



5825 MHz

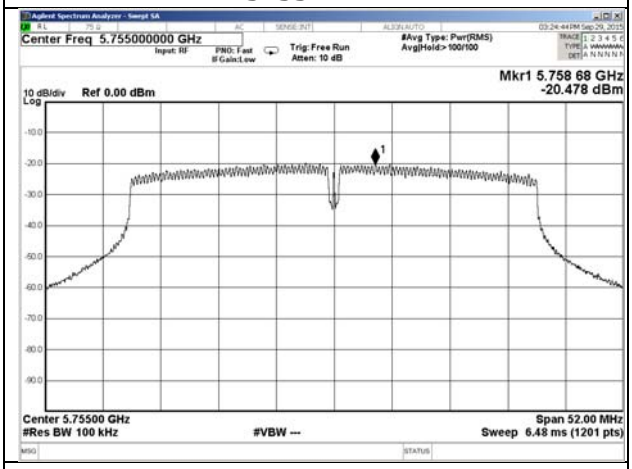


Maximum Power Spectral Density

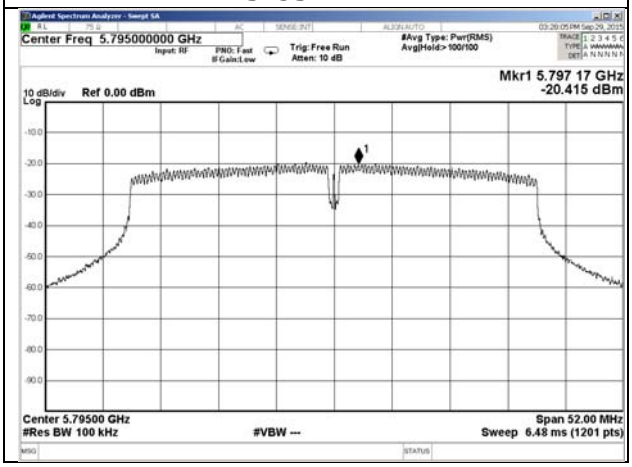
Test place	Shonan EMC Lab. No.3 Shielded Room
Report No.	10956518S-A-R1
Date	September 29, 2015
Temperature / Humidity	24deg. C / 49 % RH
Engineer	Tomohiro Hara
Mode	Tx 11n-40

11n-40

5755 MHz



5795 MHz



Radiated Spurious Emission

Test place	Shonan EMC Lab. No.2 Semi Anechoic Chamber		
Report No.	10956518S-A-R1		
Date	September 25, 2015	September 26, 2015	September 27, 2015
Temperature / Humidity	24 deg. C / 58 % RH	23 deg. C / 59 % RH	25deg. C / 67 % RH
Engineer	Takahiro Suzuki	Yosuke Ishikawa	Kenichi Adachi
	(6.4 GHz-18 GHz)	(1 GHz-6.4 GHz)	(26.5 GHz-40 GHz)
		(18 GHz-26.5 GHz)	(30 MHz-1000 MHz)
Mode	Tx 11a 5745 MHz		

(below 1GHz and above 1GHz Inside of the restricted band)

(* 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.	7660.0	PK	48.3	37.2	7.6	33.8	2.4	61.7	73.9	12.2	144	137	
Hori.	11490.0	PK	45.3	39.9	8.6	33.8	2.4	62.4	73.9	11.5	100	17	
Hori.	17235.0	PK	45.7	43.0	10.9	33.4	-9.5	56.7	73.9	17.2	100	41	
Hori.	22980.0	PK	51.6	41.0	7.1	48.0	-9.5	42.2	73.9	31.7	100	18	
Hori.	28725.0	PK	66.4	44.0	13.3	68.1	-9.5	46.1	73.9	27.8	100	236	
Hori.	34470.0	PK	58.9	44.1	14.7	67.0	-9.5	41.2	73.9	32.7	109	165	
Hori.	7660.0	AV	37.2	37.2	7.6	33.8	2.4	50.6	53.9	**3.3**	144	137	VBW:10Hz
Hori.	11490.0	AV	32.1	39.9	8.6	33.8	2.4	49.2	53.9	4.7	100	17	VBW:10Hz
Hori.	17235.0	AV	33.5	43.0	10.9	33.4	-9.5	44.5	53.9	9.4	100	41	VBW:10Hz
Hori.	22980.0	AV	42.7	41.0	7.1	48.0	-9.5	33.3	53.9	20.6	100	18	VBW:10Hz
Hori.	28725.0	AV	51.8	44.0	13.3	68.1	-9.5	31.5	53.9	22.4	100	236	VBW:10Hz
Hori.	34470.0	AV	49.5	44.1	14.7	67.0	-9.5	31.8	53.9	22.1	109	165	VBW:10Hz
Vert.	7660.0	PK	46.0	37.2	7.6	33.8	2.4	59.4	73.9	14.5	100	1	
Vert.	11490.0	PK	48.3	39.9	8.6	33.8	2.4	65.4	73.9	8.5	190	346	
Vert.	17235.0	PK	48.2	43.0	10.9	33.4	-9.5	59.2	73.9	14.7	100	19	
Vert.	22980.0	PK	55.1	41.0	7.1	48.0	-9.5	45.7	73.9	28.2	100	108	
Vert.	28725.0	PK	64.7	44.0	13.3	68.1	-9.5	44.4	73.9	29.5	100	49	
Vert.	34470.0	PK	58.8	44.1	14.7	67.0	-9.5	41.1	73.9	32.8	112	73	
Vert.	7660.0	AV	35.1	37.2	7.6	33.8	2.4	48.5	53.9	5.4	100	1	VBW:10Hz
Vert.	11490.0	AV	32.9	39.9	8.6	33.8	2.4	50.0	53.9	3.9	190	346	VBW:10Hz
Vert.	17235.0	AV	32.7	43.0	10.9	33.4	-9.5	43.7	53.9	10.2	100	19	VBW:10Hz
Vert.	22980.0	AV	48.3	41.0	7.1	48.0	-9.5	38.9	53.9	15.0	100	108	VBW:10Hz
Vert.	28725.0	AV	51.8	44.0	13.3	68.1	-9.5	31.5	53.9	22.4	100	49	VBW:10Hz
Vert.	34470.0	AV	48.0	44.1	14.7	67.0	-9.5	30.3	53.9	23.6	112	73	VBW:10Hz

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).
*The 4th harmonic was not seen so the result was its base noise level.
Distance factor : 1 GHz - 13 GHz : 20log (3.92 m / 3.0 m) = 2.4 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

(Calculation) (above 1GHz Outside of the restricted band)

(* 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]	Result (EIRP) [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	5715.0	PK	42.4	32.6	16.2	33.8	2.4	59.8	-35.4	-27.0	8.4	106	208	
Hori.	5725.0	PK	48.4	32.6	16.2	33.8	2.4	65.8	-29.4	-17.0	12.4	106	208	
Vert.	5715.0	PK	43.3	32.6	16.2	33.8	2.4	60.7	-34.5	-27.0	**7.5**	117	338	
Vert.	5725.0	PK	48.6	32.6	16.2	33.8	2.4	66.0	-29.2	-17.0	12.2	117	338	

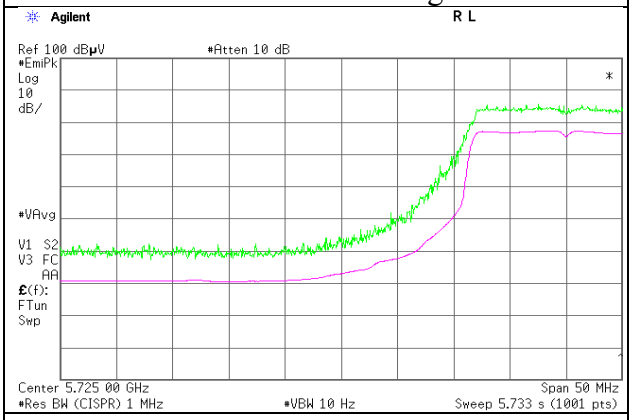
Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Resrult(EIRP[dBm])=10*LOG（({ 10 ^ (Electric Field Strength [dBuV/m] / 20) * 10 ^ (-6) * Distance:3[m]) ^ 2 } / 30) *10^3)
*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).
*The 4th harmonic was not seen so the result was its base noise level.
Distance factor : 1 GHz - 13 GHz : 20log (3.92 m / 3.0 m) = 2.4 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.2 Semi Anechoic Chamber
Report No.	10956518S-A-R1
Date	September 26, 2015
Temperature / Humidity	23 deg. C / 59 % RH
Engineer	Yosuke Ishikawa
Mode	Tx 11a 5745 MHz

Horizontal

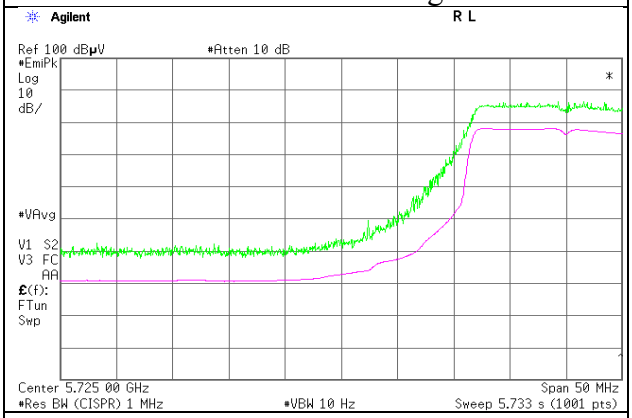
Restricted-band band-edge Plot



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 Semi Anechoic Chamber		
Report No.	10956518S-A-R1		
Date	September 25, 2015	September 26, 2015	September 27, 2015
Temperature / Humidity	24 deg. C / 58 % RH	23 deg. C / 59 % RH	25deg. C / 67 % RH
Engineer	Takahiro Suzuki	Yosuke Ishikawa	Kenichi Adachi
	(6.4 GHz-18 GHz)	(1 GHz-6.4 GHz)	(26.5 GHz-40 GHz)
		(18 GHz-26.5 GHz)	(30 MHz-1000 MHz)
Mode	Tx 11a 5785 MHz		

(below 1GHz and above 1GHz Inside of the restricted band)

(* 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.	7713.3	PK	48.0	37.3	7.7	33.9	2.4	61.5	73.9	12.4	158	137	
Hori.	11570.0	PK	45.4	39.9	8.7	33.9	2.4	62.5	73.9	11.4	100	34	
Hori.	17355.0	PK	44.4	43.3	11.0	33.4	-9.5	55.8	73.9	18.1	100	47	
Hori.	23140.0	PK	52.0	41.0	7.1	48.1	-9.5	42.5	73.9	31.4	100	17	
Hori.	28925.0	PK	66.9	44.0	13.4	68.0	-9.5	46.8	73.9	27.1	100	283	
Hori.	34710.0	PK	59.7	44.0	14.8	67.4	-9.5	41.6	73.9	32.3	110	163	
Hori.	7713.3	AV	37.1	37.3	7.7	33.9	2.4	50.6	53.9	**3.3**	158	137	VBW:10Hz
Hori.	11570.0	AV	32.2	39.9	8.7	33.9	2.4	49.3	53.9	4.6	100	34	VBW:10Hz
Hori.	17355.0	AV	33.2	43.3	11.0	33.4	-9.5	44.6	53.9	9.3	100	47	VBW:10Hz
Hori.	23140.0	AV	44.3	41.0	7.1	48.1	-9.5	34.8	53.9	19.1	100	17	VBW:10Hz
Hori.	28925.0	AV	53.3	44.0	13.4	68.0	-9.5	33.2	53.9	20.7	100	283	VBW:10Hz
Hori.	34710.0	AV	49.6	44.0	14.8	67.4	-9.5	31.5	53.9	22.4	110	163	VBW:10Hz
Vert.	7713.3	PK	46.0	37.3	7.7	33.9	2.4	59.5	73.9	14.4	100	4	
Vert.	11570.0	PK	47.9	39.9	8.7	33.9	2.4	65.0	73.9	8.9	157	338	
Vert.	17355.0	PK	47.8	43.3	11.0	33.4	-9.5	59.2	73.9	14.7	100	28	
Vert.	23140.0	PK	53.5	41.0	7.1	48.1	-9.5	44.0	73.9	29.9	100	106	
Vert.	28925.0	PK	65.7	44.0	13.4	68.0	-9.5	45.6	73.9	28.3	100	91	
Vert.	34710.0	PK	59.1	44.0	14.8	67.4	-9.5	41.0	73.9	32.9	111	95	
Vert.	7713.3	AV	35.1	37.3	7.7	33.9	2.4	48.6	53.9	5.3	100	4	VBW:10Hz
Vert.	11570.0	AV	32.8	39.9	8.7	33.9	2.4	49.9	53.9	4.0	157	338	VBW:10Hz
Vert.	17355.0	AV	32.0	43.3	11.0	33.4	-9.5	43.4	53.9	10.5	100	28	VBW:10Hz
Vert.	23140.0	AV	49.0	41.0	7.1	48.1	-9.5	39.5	53.9	14.4	100	106	VBW:10Hz
Vert.	28925.0	AV	51.7	44.0	13.4	68.0	-9.5	31.6	53.9	22.3	100	91	VBW:10Hz
Vert.	34710.0	AV	48.4	44.0	14.8	67.4	-9.5	30.3	53.9	23.6	111	95	VBW:10Hz

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor

*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).

*The 4th harmonic was not seen so the result was its base noise level.

Distance factor : 1 GHz - 13 GHz : 20log (3.92 m / 3.0 m) = 2.4 dB

13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.2 Semi Anechoic Chamber		
Report No.	10956518S-A-R1		
Date	September 25, 2015	September 26, 2015	September 27, 2015
Temperature / Humidity	24 deg. C / 58 % RH	23 deg. C / 59 % RH	25deg. C / 67 % RH
Engineer	Takahiro Suzuki	Yosuke Ishikawa	Kenichi Adachi
	(6.4 GHz-18 GHz)	(1 GHz-6.4 GHz)	(26.5 GHz-40 GHz)
		(18 GHz-26.5 GHz)	(30 MHz-1000 MHz)
Mode	Tx 11a 5825 MHz		

(below 1GHz and above 1GHz Inside of the restricted band)

(* 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.	7766.6	PK	47.6	37.4	7.7	33.9	2.4	61.2	73.9	12.7	152	139	
Hori.	11650.0	PK	44.8	39.8	8.8	33.9	2.4	61.9	73.9	12.0	100	54	
Hori.	17475.0	PK	44.8	43.7	11.0	33.4	-9.5	56.6	73.9	17.3	100	36	
Hori.	23300.0	PK	51.3	41.0	7.1	48.1	-9.5	41.8	73.9	32.1	100	16	
Hori.	29125.0	PK	68.3	43.9	13.4	68.0	-9.5	48.1	73.9	25.8	100	275	
Hori.	34950.0	PK	59.5	44.0	14.8	67.7	-9.5	41.1	73.9	32.8	108	161	
Hori.	7766.6	AV	37.0	37.4	7.7	33.9	2.4	50.6	53.9	**3.3**	152	139	VBW:10Hz
Hori.	11650.0	AV	32.0	39.8	8.8	33.9	2.4	49.1	53.9	4.8	100	54	VBW:10Hz
Hori.	17475.0	AV	32.2	43.7	11.0	33.4	-9.5	44.0	53.9	9.9	100	36	VBW:10Hz
Hori.	23300.0	AV	44.4	41.0	7.1	48.1	-9.5	34.9	53.9	19.0	100	16	VBW:10Hz
Hori.	29125.0	AV	53.6	43.9	13.4	68.0	-9.5	33.4	53.9	20.5	100	275	VBW:10Hz
Hori.	34950.0	AV	48.7	44.0	14.8	67.7	-9.5	30.3	53.9	23.6	108	161	VBW:10Hz
Vert.	7766.6	PK	45.3	37.4	7.7	33.9	2.4	58.9	73.9	15.0	100	0	
Vert.	11650.0	PK	47.9	39.8	8.8	33.9	2.4	65.0	73.9	8.9	175	340	
Vert.	17475.0	PK	47.5	43.7	11.0	33.4	-9.5	59.3	73.9	14.6	100	26	
Vert.	23300.0	PK	53.1	41.0	7.1	48.1	-9.5	43.6	73.9	30.3	100	105	
Vert.	29125.0	PK	63.9	43.9	13.4	68.0	-9.5	43.7	73.9	30.2	100	80	
Vert.	34950.0	PK	59.4	44.0	14.8	67.7	-9.5	41.0	73.9	32.9	109	93	
Vert.	7766.6	AV	34.6	37.4	7.7	33.9	2.4	48.2	53.9	5.7	100	0	VBW:10Hz
Vert.	11650.0	AV	32.5	39.8	8.8	33.9	2.4	49.6	53.9	4.3	175	340	VBW:10Hz
Vert.	17475.0	AV	31.8	43.7	11.0	33.4	-9.5	43.6	53.9	10.3	100	26	VBW:10Hz
Vert.	23300.0	AV	48.5	41.0	7.1	48.1	-9.5	39.0	53.9	14.9	100	105	VBW:10Hz
Vert.	29125.0	AV	51.0	43.9	13.4	68.0	-9.5	30.8	53.9	23.1	100	80	VBW:10Hz
Vert.	34950.0	AV	48.3	44.0	14.8	67.7	-9.5	29.9	53.9	24.0	109	93	VBW:10Hz

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).
*The 4th harmonic was not seen so the result was its base noise level.
Distance factor : 1 GHz - 13 GHz : 20log (3.92 m / 3.0 m) = 2.4 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

(Calculation) (above 1GHz Outside of the restricted band)

(* 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]	Result (EIRP) [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	5850.0	PK	46.9	32.9	16.3	33.8	2.4	64.7	-30.5	-17.0	13.5	100	209	
Hori.	5860.0	PK	44.6	32.9	16.3	33.8	2.4	62.4	-32.8	-27.0	**5.8**	100	209	
Vert.	5850.0	PK	45.1	32.9	16.3	33.8	2.4	62.9	-32.3	-17.0	15.3	100	327	
Vert.	5860.0	PK	44.2	32.9	16.3	33.8	2.4	62.0	-33.2	-27.0	6.2	100	327	

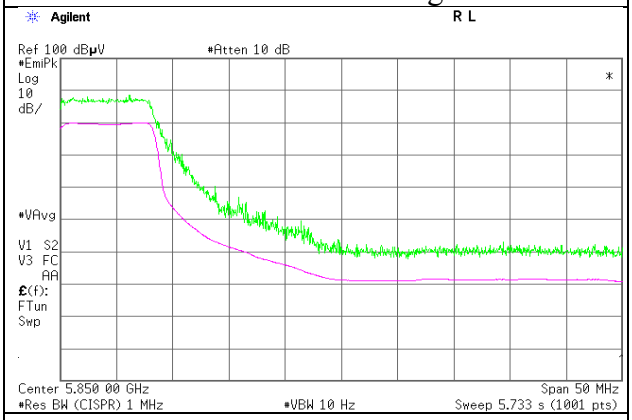
Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Resrult(EIRP[dBm])=10*LOG（({ 10 ^ (Electric Field Strength [dBuV/m] / 20) * 10 ^ (-6) * Distance:3[m]) ^ 2 } / 30) *10^3)
*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).
*The 4th harmonic was not seen so the result was its base noise level.
Distance factor : 1 GHz - 13 GHz : 20log (3.92 m / 3.0 m) = 2.4 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.2 Semi Anechoic Chamber
Report No.	10956518S-A-R1
Date	September 26, 2015
Temperature / Humidity	23 deg. C / 59 % RH
Engineer	Yosuke Ishikawa
Mode	Tx 11a 5825 MHz

Horizontal

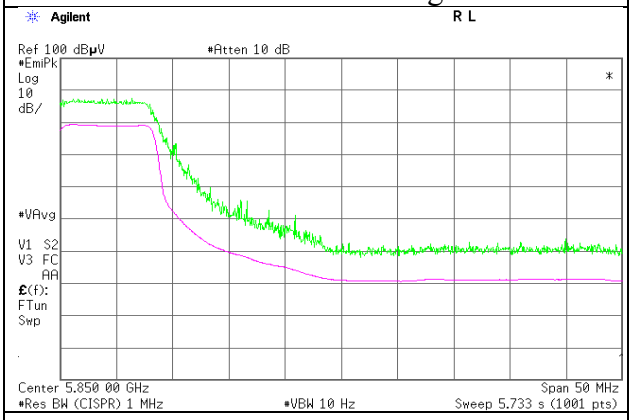
Restricted-band band-edge Plot



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 Semi Anechoic Chamber		
Report No.	10956518S-A-R1		
Date	September 25, 2015	September 26, 2015	September 27, 2015
Temperature / Humidity	24 deg. C / 58 % RH	23 deg. C / 59 % RH	25deg. C / 67 % RH
Engineer	Takahiro Suzuki	Yosuke Ishikawa	Kenichi Adachi
	(6.4 GHz-18 GHz)	(1 GHz-6.4 GHz)	(26.5 GHz-40 GHz)
		(18 GHz-26.5 GHz)	(30 MHz-1000 MHz)
Mode	Tx 11n-20 5745 MHz		

(below 1GHz and above 1GHz Inside of the restricted band)

(* 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.	7660.0	PK	48.1	37.2	7.6	33.8	2.4	61.5	73.9	12.4	142	135	
Hori.	11490.0	PK	44.9	39.9	8.6	33.8	2.4	62.0	73.9	11.9	100	27	
Hori.	17235.0	PK	44.7	43.0	10.9	33.4	-9.5	55.7	73.9	18.2	100	39	
Hori.	22980.0	PK	52.8	41.0	7.1	48.0	-9.5	43.4	73.9	30.5	100	8	
Hori.	28725.0	PK	66.3	44.0	13.3	68.1	-9.5	46.0	73.9	27.9	100	272	
Hori.	34470.0	PK	58.8	44.1	14.7	67.0	-9.5	41.1	73.9	32.8	106	162	
Hori.	7660.0	AV	37.1	37.2	7.6	33.8	2.4	50.5	53.9	3.4	142	135	VBW:10Hz
Hori.	11490.0	AV	32.0	39.9	8.6	33.8	2.4	49.1	53.9	4.8	100	27	VBW:10Hz
Hori.	17235.0	AV	33.1	43.0	10.9	33.4	-9.5	44.1	53.9	9.8	100	39	VBW:10Hz
Hori.	22980.0	AV	44.4	41.0	7.1	48.0	-9.5	35.0	53.9	18.9	100	8	VBW:10Hz
Hori.	28725.0	AV	52.9	44.0	13.3	68.1	-9.5	32.6	53.9	21.3	100	272	VBW:10Hz
Hori.	34470.0	AV	49.2	44.1	14.7	67.0	-9.5	31.5	53.9	22.4	106	162	VBW:10Hz
Vert.	7660.0	PK	46.0	37.2	7.6	33.8	2.4	59.4	73.9	14.5	100	5	
Vert.	11490.0	PK	47.9	39.9	8.6	33.8	2.4	65.0	73.9	8.9	195	3	
Vert.	17235.0	PK	47.5	43.0	10.9	33.4	-9.5	58.5	73.9	15.4	100	25	
Vert.	22980.0	PK	53.6	41.0	7.1	48.0	-9.5	44.2	73.9	29.7	100	106	
Vert.	28725.0	PK	64.5	44.0	13.3	68.1	-9.5	44.2	73.9	29.7	100	93	
Vert.	34470.0	PK	58.8	44.1	14.7	67.0	-9.5	41.1	73.9	32.8	108	99	
Vert.	7660.0	AV	35.2	37.2	7.6	33.8	2.4	48.6	53.9	5.3	100	5	VBW:10Hz
Vert.	11490.0	AV	32.4	39.9	8.6	33.8	2.4	49.5	53.9	4.4	195	3	VBW:10Hz
Vert.	17235.0	AV	31.8	43.0	10.9	33.4	-9.5	42.8	53.9	11.1	100	25	VBW:10Hz
Vert.	22980.0	AV	48.6	41.0	7.1	48.0	-9.5	39.2	53.9	14.7	100	106	VBW:10Hz
Vert.	28725.0	AV	51.5	44.0	13.3	68.1	-9.5	31.2	53.9	22.7	100	93	VBW:10Hz
Vert.	34470.0	AV	47.8	44.1	14.7	67.0	-9.5	30.1	53.9	23.8	108	99	VBW:10Hz

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).
*The 4th harmonic was not seen so the result was its base noise level.
Distance factor : 1 GHz - 13 GHz : 20log (3.92 m / 3.0 m) = 2.4 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

(Calculation) (above 1GHz Outside of the restricted band)

(* 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]	Result (EIRP) [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	5715.0	PK	43.3	32.6	16.2	33.8	2.4	60.7	-34.5	-27.0	7.5	100	320	
Hori.	5725.0	PK	50.9	32.6	16.2	33.8	2.4	68.3	-26.9	-17.0	9.9	100	320	
Vert.	5715.0	PK	43.6	32.6	16.2	33.8	2.4	61.0	-34.2	-27.0	**7.2**	109	224	
Vert.	5725.0	PK	51.3	32.6	16.2	33.8	2.4	68.7	-26.5	-17.0	9.5	109	224	

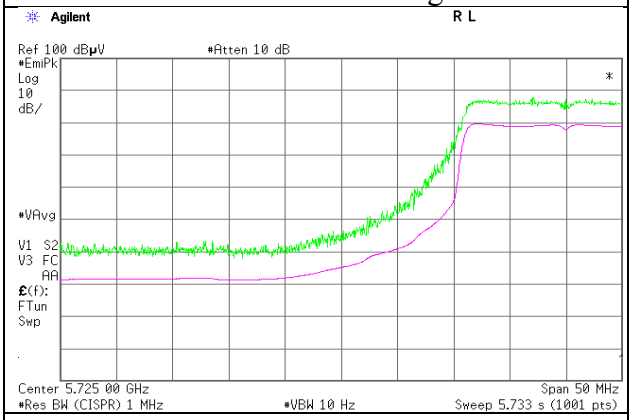
Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Resrult(EIRP[dBm])=10*LOG（({ 10 ^ (Electric Field Strength [dBuV/m] / 20) * 10 ^ (-6) * Distance:3[m]) ^ 2 } / 30) *10^3)
*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).
*The 4th harmonic was not seen so the result was its base noise level.
Distance factor : 1 GHz - 13 GHz : 20log (3.92 m / 3.0 m) = 2.4 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.2 Semi Anechoic Chamber
Report No.	10956518S-A-R1
Date	September 26, 2015
Temperature / Humidity	23 deg. C / 59 % RH
Engineer	Yosuke Ishikawa
Mode	Tx 11n-20 5745 MHz

Horizontal

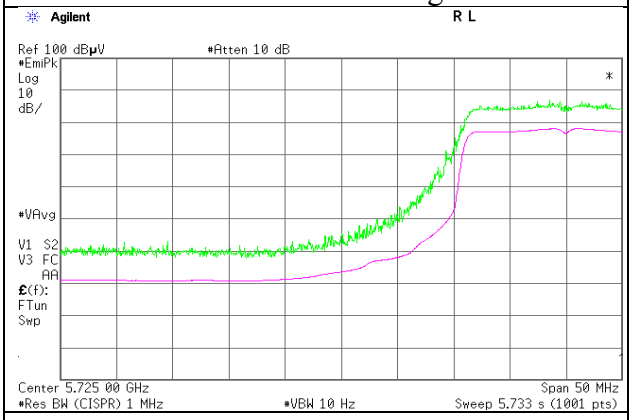
Restricted-band band-edge Plot



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 Semi Anechoic Chamber		
Report No.	10956518S-A-R1		
Date	September 25, 2015	September 26, 2015	September 27, 2015
Temperature / Humidity	24 deg. C / 58 % RH	23 deg. C / 59 % RH	25deg. C / 67 % RH
Engineer	Takahiro Suzuki	Yosuke Ishikawa	Kenichi Adachi
	(6.4 GHz-18 GHz)	(1 GHz-6.4 GHz)	(26.5 GHz-40 GHz)
		(18 GHz-26.5 GHz)	(30 MHz-1000 MHz)
Mode	Tx 11n-20 5785 MHz		

(below 1GHz and above 1GHz Inside of the restricted band)

(* 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.	7713.3	PK	47.8	37.3	7.7	33.9	2.4	61.3	73.9	12.6	155	139	
Hori.	11570.0	PK	45.0	39.9	8.7	33.9	2.4	62.1	73.9	11.8	100	23	
Hori.	17355.0	PK	44.8	43.3	11.0	33.4	-9.5	56.2	73.9	17.7	100	48	
Hori.	23140.0	PK	51.1	41.0	7.1	48.1	-9.5	41.6	73.9	32.3	100	17	
Hori.	28925.0	PK	66.8	44.0	13.4	68.0	-9.5	46.7	73.9	27.2	100	281	
Hori.	34710.0	PK	59.5	44.0	14.8	67.4	-9.5	41.4	73.9	32.5	107	161	
Hori.	7713.3	AV	36.9	37.3	7.7	33.9	2.4	50.4	53.9	**3.5**	155	139	VBW:10Hz
Hori.	11570.0	AV	32.2	39.9	8.7	33.9	2.4	49.3	53.9	4.6	100	23	VBW:10Hz
Hori.	17355.0	AV	32.8	43.3	11.0	33.4	-9.5	44.2	53.9	9.7	100	48	VBW:10Hz
Hori.	23140.0	AV	44.5	41.0	7.1	48.1	-9.5	35.0	53.9	18.9	100	17	VBW:10Hz
Hori.	28925.0	AV	53.2	44.0	13.4	68.0	-9.5	33.1	53.9	20.8	100	281	VBW:10Hz
Hori.	34710.0	AV	49.3	44.0	14.8	67.4	-9.5	31.2	53.9	22.7	107	161	VBW:10Hz
Vert.	7713.3	PK	45.9	37.3	7.7	33.9	2.4	59.4	73.9	14.5	100	8	
Vert.	11570.0	PK	47.6	39.9	8.7	33.9	2.4	64.7	73.9	9.2	151	340	
Vert.	17355.0	PK	47.9	43.3	11.0	33.4	-9.5	59.3	73.9	14.6	100	27	
Vert.	23140.0	PK	54.4	41.0	7.1	48.1	-9.5	44.9	73.9	29.0	100	108	
Vert.	28925.0	PK	65.3	44.0	13.4	68.0	-9.5	45.2	73.9	28.7	100	90	
Vert.	34710.0	PK	59.1	44.0	14.8	67.4	-9.5	41.0	73.9	32.9	109	97	
Vert.	7713.3	AV	34.9	37.3	7.7	33.9	2.4	48.4	53.9	5.5	100	8	VBW:10Hz
Vert.	11570.0	AV	32.6	39.9	8.7	33.9	2.4	49.7	53.9	4.2	151	340	VBW:10Hz
Vert.	17355.0	AV	32.3	43.3	11.0	33.4	-9.5	43.7	53.9	10.2	100	27	VBW:10Hz
Vert.	23140.0	AV	48.9	41.0	7.1	48.1	-9.5	39.4	53.9	14.5	100	108	VBW:10Hz
Vert.	28925.0	AV	51.5	44.0	13.4	68.0	-9.5	31.4	53.9	22.5	100	90	VBW:10Hz
Vert.	34710.0	AV	48.3	44.0	14.8	67.4	-9.5	30.2	53.9	23.7	109	97	VBW:10Hz

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor

*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).

*The 4th harmonic was not seen so the result was its base noise level.

Distance factor : 1 GHz - 13 GHz : 20log (3.92 m / 3.0 m) = 2.4 dB

13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.2 Semi Anechoic Chamber		
Report No.	10956518S-A-R1		
Date	September 25, 2015	September 26, 2015	September 27, 2015
Temperature / Humidity	24 deg. C / 58 % RH	23 deg. C / 59 % RH	25deg. C / 67 % RH
Engineer	Takahiro Suzuki	Yosuke Ishikawa	Kenichi Adachi
	(6.4 GHz-18 GHz)	(1 GHz-6.4 GHz)	(26.5 GHz-40 GHz)
		(18 GHz-26.5 GHz)	(30 MHz-1000 MHz)
Mode	Tx 11n-20 5825 MHz		

(below 1GHz and above 1GHz Inside of the restricted band)

(* 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.	7766.6	PK	47.3	37.4	7.7	33.9	2.4	60.9	73.9	13.0	148	140	
Hori.	11650.0	PK	44.6	39.8	8.8	33.9	2.4	61.7	73.9	12.2	100	43	
Hori.	17475.0	PK	44.8	43.7	11.0	33.4	-9.5	56.6	73.9	17.3	100	33	
Hori.	23300.0	PK	52.1	41.0	7.1	48.1	-9.5	42.6	73.9	31.3	100	17	
Hori.	29125.0	PK	68.1	43.9	13.4	68.0	-9.5	47.9	73.9	26.0	100	274	
Hori.	34950.0	PK	59.5	44.0	14.8	67.7	-9.5	41.1	73.9	32.8	106	163	
Hori.	7766.6	AV	36.8	37.4	7.7	33.9	2.4	50.4	53.9	**3.5**	148	140	VBW:10Hz
Hori.	11650.0	AV	31.8	39.8	8.8	33.9	2.4	48.9	53.9	5.0	100	43	VBW:10Hz
Hori.	17475.0	AV	32.7	43.7	11.0	33.4	-9.5	44.5	53.9	9.4	100	33	VBW:10Hz
Hori.	23300.0	AV	44.4	41.0	7.1	48.1	-9.5	34.9	53.9	19.0	100	17	VBW:10Hz
Hori.	29125.0	AV	53.4	43.9	13.4	68.0	-9.5	33.2	53.9	20.7	100	274	VBW:10Hz
Hori.	34950.0	AV	48.8	44.0	14.8	67.7	-9.5	30.4	53.9	23.5	106	163	VBW:10Hz
Vert.	7766.6	PK	45.0	37.4	7.7	33.9	2.4	58.6	73.9	15.3	100	3	
Vert.	11650.0	PK	47.6	39.8	8.8	33.9	2.4	64.7	73.9	9.2	169	328	
Vert.	17475.0	PK	47.7	43.7	11.0	33.4	-9.5	59.5	73.9	14.4	100	28	
Vert.	23300.0	PK	53.3	41.0	7.1	48.1	-9.5	43.8	73.9	30.1	100	105	
Vert.	29125.0	PK	63.7	43.9	13.4	68.0	-9.5	43.5	73.9	30.4	100	78	
Vert.	34950.0	PK	59.3	44.0	14.8	67.7	-9.5	40.9	73.9	33.0	107	94	
Vert.	7766.6	AV	34.2	37.4	7.7	33.9	2.4	47.8	53.9	6.1	100	3	VBW:10Hz
Vert.	11650.0	AV	32.3	39.8	8.8	33.9	2.4	49.4	53.9	4.5	169	328	VBW:10Hz
Vert.	17475.0	AV	31.8	43.7	11.0	33.4	-9.5	43.6	53.9	10.3	100	28	VBW:10Hz
Vert.	23300.0	AV	48.8	41.0	7.1	48.1	-9.5	39.3	53.9	14.6	100	105	VBW:10Hz
Vert.	29125.0	AV	50.8	43.9	13.4	68.0	-9.5	30.6	53.9	23.3	100	78	VBW:10Hz
Vert.	34950.0	AV	48.4	44.0	14.8	67.7	-9.5	30.0	53.9	23.9	107	94	VBW:10Hz

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).
*The 4th harmonic was not seen so the result was its base noise level.
Distance factor : 1 GHz - 13 GHz : 20log (3.92 m / 3.0 m) = 2.4 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

(Calculation) (above 1GHz Outside of the restricted band)

(* 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]	Result (EIRP) [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	5850.0	PK	45.6	32.9	16.3	33.8	2.4	63.4	-31.8	-17.0	14.8	100	325	
Hori.	5860.0	PK	43.6	32.9	16.3	33.8	2.4	61.4	-33.8	-27.0	**6.8**	100	325	
Vert.	5850.0	PK	45.0	32.9	16.3	33.8	2.4	62.8	-32.4	-17.0	15.4	122	334	
Vert.	5860.0	PK	43.5	32.9	16.3	33.8	2.4	61.3	-33.9	-27.0	6.9	122	334	

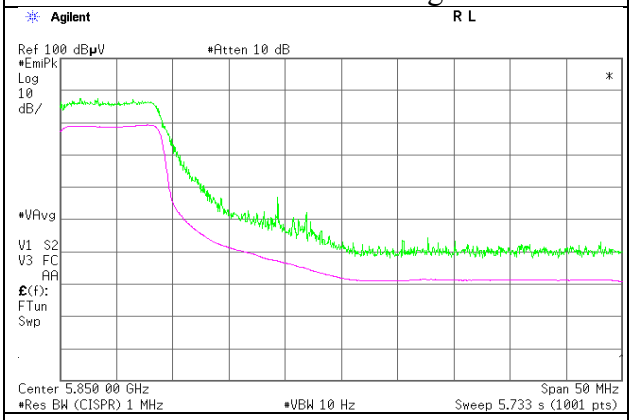
Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Resrult(EIRP[dBm])=10*LOG（({ 10 ^ (Electric Field Strength [dBuV/m] / 20) * 10 ^ (-6) * Distance:3[m]) ^ 2 } / 30) *10^3)
*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).
*The 4th harmonic was not seen so the result was its base noise level.
Distance factor : 1 GHz - 13 GHz : 20log (3.92 m / 3.0 m) = 2.4 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.2 Semi Anechoic Chamber
Report No.	10956518S-A-R1
Date	September 26, 2015
Temperature / Humidity	23 deg. C / 59 % RH
Engineer	Yosuke Ishikawa
Mode	Tx 11n-20 5825 MHz

Horizontal

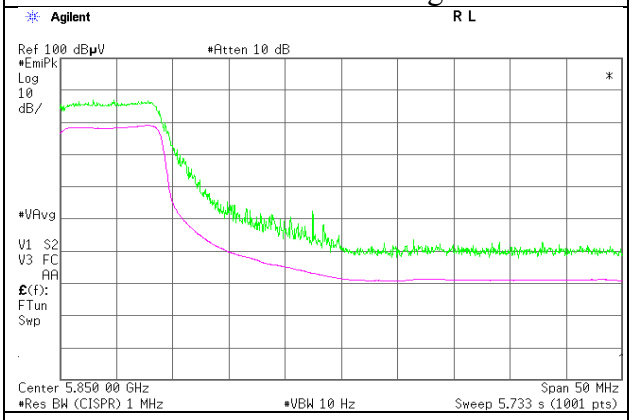
Restricted-band band-edge Plot



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 Semi Anechoic Chamber		
Report No.	10956518S-A-R1		
Date	September 25, 2015	September 26, 2015	September 27, 2015
Temperature / Humidity	24 deg. C / 58 % RH	23 deg. C / 59 % RH	25deg. C / 67 % RH
Engineer	Takahiro Suzuki	Yosuke Ishikawa	Kenichi Adachi
	(6.4 GHz-18 GHz)	(1 GHz-6.4 GHz)	(26.5 GHz-40 GHz)
		(18 GHz-26.5 GHz)	(30 MHz-1000 MHz)
Mode	Tx 11n-40 5755 MHz		

(below 1GHz and above 1GHz Inside of the restricted band)

(* 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.	7673.3	PK	47.7	37.3	7.7	33.8	2.4	61.3	73.9	12.6	160	139	
Hori.	11510.0	PK	45.1	39.9	8.6	33.8	2.4	62.2	73.9	11.7	100	39	
Hori.	17265.0	PK	44.4	43.1	10.9	33.4	-9.5	55.5	73.9	18.4	100	32	
Hori.	23020.0	PK	51.1	41.0	7.1	48.0	-9.5	41.7	73.9	32.2	100	17	
Hori.	28775.0	PK	67.5	44.0	13.3	68.1	-9.5	47.2	73.9	26.7	100	283	
Hori.	34530.0	PK	59.4	44.1	14.8	67.1	-9.5	41.7	73.9	32.2	107	166	
Hori.	7673.3	AV	37.2	37.3	7.7	33.8	2.4	50.8	53.9	3.1	160	139	VBW:1.5kHz
Hori.	11510.0	AV	32.3	39.9	8.6	33.8	2.4	49.4	53.9	4.5	100	39	VBW:1.5kHz
Hori.	17265.0	AV	32.8	43.1	10.9	33.4	-9.5	43.9	53.9	10.0	100	32	VBW:1.5kHz
Hori.	23020.0	AV	44.4	41.0	7.1	48.0	-9.5	35.0	53.9	18.9	100	17	VBW:1.5kHz
Hori.	28775.0	AV	53.7	44.0	13.3	68.1	-9.5	33.4	53.9	20.5	100	283	VBW:1.5kHz
Hori.	34530.0	AV	50.4	44.1	14.8	67.1	-9.5	32.7	53.9	21.2	107	166	VBW:1.5kHz
Vert.	5715.0	PK	47.6	32.6	16.2	33.8	2.4	65.0	73.9	8.9	100	229	
Vert.	7673.3	PK	47.0	37.3	7.7	33.8	2.4	60.6	73.9	13.3	100	23	
Vert.	11510.0	PK	48.0	39.9	8.6	33.8	2.4	65.1	73.9	8.8	164	351	
Vert.	17265.0	PK	47.6	43.1	10.9	33.4	-9.5	58.7	73.9	15.2	100	29	
Vert.	23020.0	PK	53.7	41.0	7.1	48.0	-9.5	44.3	73.9	29.6	100	106	
Vert.	28775.0	PK	67.0	44.0	13.3	68.1	-9.5	46.7	73.9	27.2	100	88	
Vert.	34530.0	PK	59.2	44.1	14.8	67.1	-9.5	41.5	73.9	32.4	109	104	
Vert.	5715.0	AV	32.9	32.6	16.2	33.8	2.4	50.3	53.9	3.6	100	229	VBW:1.5kHz
Vert.	7673.3	AV	35.8	37.3	7.7	33.8	2.4	49.4	53.9	4.5	100	23	VBW:1.5kHz
Vert.	11510.0	AV	32.8	39.9	8.6	33.8	2.4	49.9	53.9	4.0	164	351	VBW:1.5kHz
Vert.	17265.0	AV	31.6	43.1	10.9	33.4	-9.5	42.7	53.9	11.2	100	29	VBW:1.5kHz
Vert.	23020.0	AV	49.7	41.0	7.1	48.0	-9.5	40.3	53.9	13.6	100	106	VBW:1.5kHz
Vert.	28775.0	AV	52.7	44.0	13.3	68.1	-9.5	32.4	53.9	21.5	100	88	VBW:1.5kHz
Vert.	34530.0	AV	49.1	44.1	14.8	67.1	-9.5	31.4	53.9	22.5	109	104	VBW:1.5kHz

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).
*The 4th harmonic was not seen so the result was its base noise level.
Distance factor : 1 GHz - 13 GHz : 20log (3.92 m / 3.0 m) = 2.4 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

(Calculation) (above 1GHz Outside of the restricted band)

(* 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]	Result (EIRP) [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	5715.0	PK	46.8	32.6	16.2	33.8	2.4	64.2	-31.0	-27.0	**4.0**	100	202	
Hori.	5725.0	PK	53.6	32.6	16.2	33.8	2.4	71.0	-24.2	-17.0	7.2	100	202	
Vert.	5725.0	PK	52.4	32.6	16.2	33.8	2.4	69.8	-25.4	-17.0	8.4	100	229	

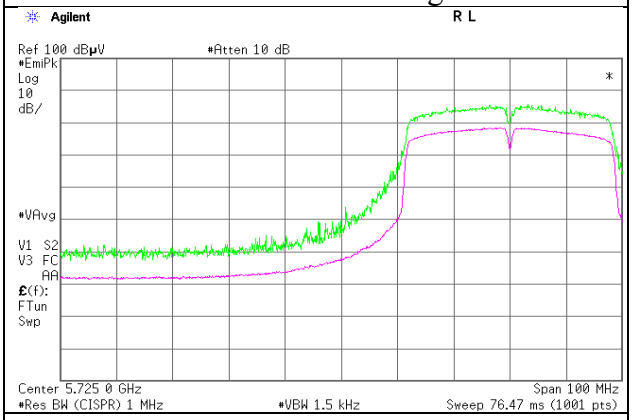
Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Resrult(EIRP[dBm])=10*LOG（{ 10 ^ (Electric Field Strength [dBuV/m] / 20) * 10 ^ (-6) * Distance:3[m]) ^ 2 } / 30) *10^3)
*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).
*The 4th harmonic was not seen so the result was its base noise level.
Distance factor : 1 GHz - 13 GHz : 20log (3.92 m / 3.0 m) = 2.4 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.2 Semi Anechoic Chamber
Report No.	10956518S-A-R1
Date	September 26, 2015
Temperature / Humidity	23 deg. C / 59 % RH
Engineer	Yosuke Ishikawa
Mode	Tx 11n-40 5755 MHz

Horizontal

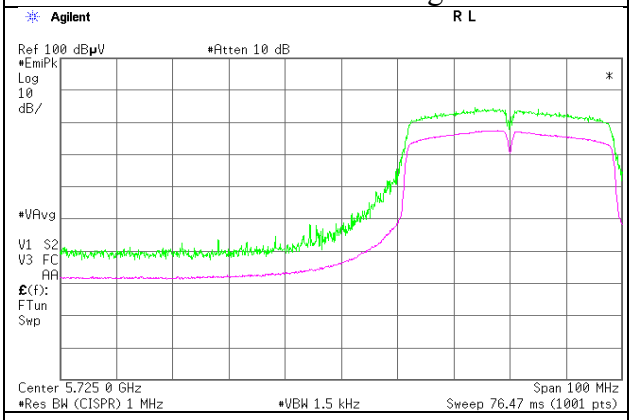
Restricted-band band-edge Plot



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 Semi Anechoic Chamber		
Report No.	10956518S-A-R1		
Date	September 25, 2015	September 26, 2015	September 27, 2015
Temperature / Humidity	24 deg. C / 58 % RH	23 deg. C / 59 % RH	25deg. C / 67 % RH
Engineer	Takahiro Suzuki	Yosuke Ishikawa	Kenichi Adachi
	(6.4 GHz-18 GHz)	(1 GHz-6.4 GHz)	(26.5 GHz-40 GHz)
		(18 GHz-26.5 GHz)	(30 MHz-1000 MHz)
Mode	Tx 11n-40 5795 MHz		

(below 1GHz and above 1GHz Inside of the restricted band)

(* 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.	47.3	QP	31.0	11.7	7.2	31.9	0.0	18.0	40.0	22.0	177	301	
Hori.	83.9	QP	39.4	7.0	8.2	31.9	0.0	22.7	40.0	17.3	354	302	
Hori.	129.9	QP	35.4	13.6	8.1	31.8	0.0	25.3	43.5	18.2	269	305	
Hori.	321.7	QP	48.6	14.5	6.8	31.7	0.0	38.2	46.0	7.8	100	196	
Hori.	374.0	QP	23.0	15.6	7.1	31.6	0.0	14.1	46.0	31.9	100	182	
Hori.	470.2	QP	37.7	17.1	7.7	31.6	0.0	30.9	46.0	15.1	139	51	
Hori.	519.7	QP	45.4	17.8	7.9	31.6	0.0	39.5	46.0	6.5	197	43	
Hori.	569.2	QP	44.5	18.5	8.2	31.6	0.0	39.6	46.0	6.4	185	48	
Hori.	618.7	QP	44.4	19.3	8.4	31.6	0.0	40.5	46.0	5.5	147	41	
Hori.	668.2	QP	41.2	19.9	8.7	31.5	0.0	38.3	46.0	7.7	138	36	
Hori.	7726.6	PK	47.9	37.4	7.7	33.9	2.4	61.5	73.9	12.4	177	138	
Hori.	11590.0	PK	45.0	39.9	8.7	33.9	2.4	62.1	73.9	11.8	100	28	
Hori.	17385.0	PK	44.7	43.4	11.0	33.4	-9.5	56.2	73.9	17.7	100	49	
Hori.	23180.0	PK	51.5	41.0	7.1	48.1	-9.5	42.0	73.9	31.9	100	15	
Hori.	28975.0	PK	66.5	44.0	13.4	68.0	-9.5	46.4	73.9	27.5	100	280	
Hori.	34770.0	PK	59.3	44.0	14.8	67.5	-9.5	41.1	73.9	32.8	104	164	
Hori.	7726.6	AV	37.1	37.4	7.7	33.9	2.4	50.7	53.9	**3.2**	177	138	VBW:1.5kHz
Hori.	11590.0	AV	32.3	39.9	8.7	33.9	2.4	49.4	53.9	4.5	100	28	VBW:1.5kHz
Hori.	17385.0	AV	32.7	43.4	11.0	33.4	-9.5	44.2	53.9	9.7	100	49	VBW:1.5kHz
Hori.	23180.0	AV	44.9	41.0	7.1	48.1	-9.5	35.4	53.9	18.5	100	15	VBW:1.5kHz
Hori.	28975.0	AV	52.8	44.0	13.4	68.0	-9.5	32.7	53.9	21.2	100	280	VBW:1.5kHz
Hori.	34770.0	AV	50.1	44.0	14.8	67.5	-9.5	31.9	53.9	22.0	104	164	VBW:1.5kHz
Vert.	47.3	QP	49.7	11.7	7.2	31.9	0.0	36.7	40.0	3.3	100	214	
Vert.	83.9	QP	52.3	7.0	8.2	31.9	0.0	35.6	40.0	4.4	100	203	
Vert.	129.9	QP	43.2	13.6	8.1	31.8	0.0	33.1	43.5	10.4	100	26	
Vert.	321.7	QP	48.3	14.5	6.8	31.7	0.0	37.9	46.0	8.1	151	221	
Vert.	374.0	QP	24.4	15.6	7.1	31.6	0.0	15.5	46.0	30.5	161	126	
Vert.	470.2	QP	43.5	17.1	7.7	31.6	0.0	36.7	46.0	9.3	127	133	
Vert.	519.7	QP	41.4	17.8	7.9	31.6	0.0	35.5	46.0	10.5	113	139	
Vert.	569.2	QP	37.2	18.5	8.2	31.6	0.0	32.3	46.0	13.7	113	118	
Vert.	618.7	QP	36.0	19.3	8.4	31.6	0.0	32.1	46.0	13.9	142	138	
Vert.	668.2	QP	33.3	19.9	8.7	31.5	0.0	30.4	46.0	15.6	100	359	
Vert.	7726.6	PK	45.6	37.4	7.7	33.9	2.4	59.2	73.9	14.7	100	2	
Vert.	11590.0	PK	48.0	39.9	8.7	33.9	2.4	65.1	73.9	8.8	153	337	
Vert.	17385.0	PK	47.3	43.4	11.0	33.4	-9.5	58.8	73.9	15.1	100	31	
Vert.	23180.0	PK	54.9	41.0	7.1	48.1	-9.5	45.4	73.9	28.5	100	106	
Vert.	28975.0	PK	64.3	44.0	13.4	68.0	-9.5	44.2	73.9	29.7	100	94	
Vert.	34770.0	PK	59.1	44.0	14.8	67.5	-9.5	40.9	73.9	33.0	107	101	
Vert.	7726.6	AV	35.5	37.4	7.7	33.9	2.4	49.1	53.9	4.8	100	2	VBW:1.5kHz
Vert.	11590.0	AV	32.8	39.9	8.7	33.9	2.4	49.9	53.9	4.0	153	337	VBW:1.5kHz
Vert.	17385.0	AV	31.8	43.4	11.0	33.4	-9.5	43.3	53.9	10.6	100	31	VBW:1.5kHz
Vert.	23180.0	AV	49.6	41.0	7.1	48.1	-9.5	40.1	53.9	13.8	100	106	VBW:1.5kHz
Vert.	28975.0	AV	51.0	44.0	13.4	68.0	-9.5	30.9	53.9	23.0	100	94	VBW:1.5kHz
Vert.	34770.0	AV	48.8	44.0	14.8	67.5	-9.5	30.6	53.9	23.3	107	101	VBW:1.5kHz

Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).
*The 4th harmonic was not seen so the result was its base noise level.
Distance factor : 1 GHz - 13 GHz : 20log (3.92 m / 3.0 m) = 2.4 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

(Calculation) (above 1GHz Outside of the restricted band)

(* 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]	Result (EIRP) [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	5850.0	PK	44.3	32.9	16.3	33.8	2.4	62.1	-33.1	-17.0	16.1	100	205	
Hori.	5860.0	PK	44.9	32.9	16.3	33.8	2.4	62.7	-32.5	-27.0	**5.5**	100	205	
Vert.	5850.0	PK	43.1	32.9	16.3	33.8	2.4	60.9	-34.3	-17.0	17.3	110	327	
Vert.	5860.0	PK	43.9	32.9	16.3	33.8	2.4	61.7	-33.5	-27.0	6.5	110	327	

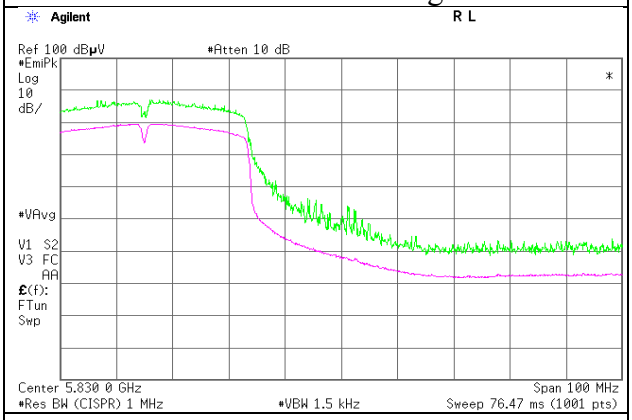
Result [dBuV/m] = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Resrult(EIRP[dBm])=10*LOG ({ 10 ^ (Electric Field Strength [dBuV/m] / 20) * 10 ^ (-6) * Distance:3[m]) ^ 2 } / 30) * 10^3)
*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).
*The 4th harmonic was not seen so the result was its base noise level.
Distance factor : 1 GHz - 13 GHz : 20log (3.92 m / 3.0 m) = 2.4 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.2 Semi Anechoic Chamber
Report No.	10956518S-A-R1
Date	September 26, 2015
Temperature / Humidity	23 deg. C / 59 % RH
Engineer	Yosuke Ishikawa
Mode	Tx 11n-40 5795 MHz

Horizontal

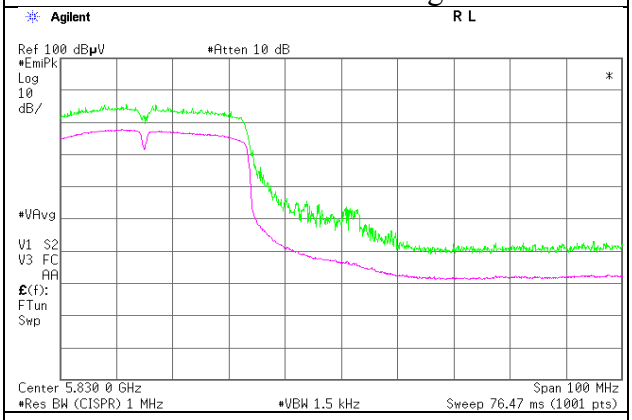
Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot

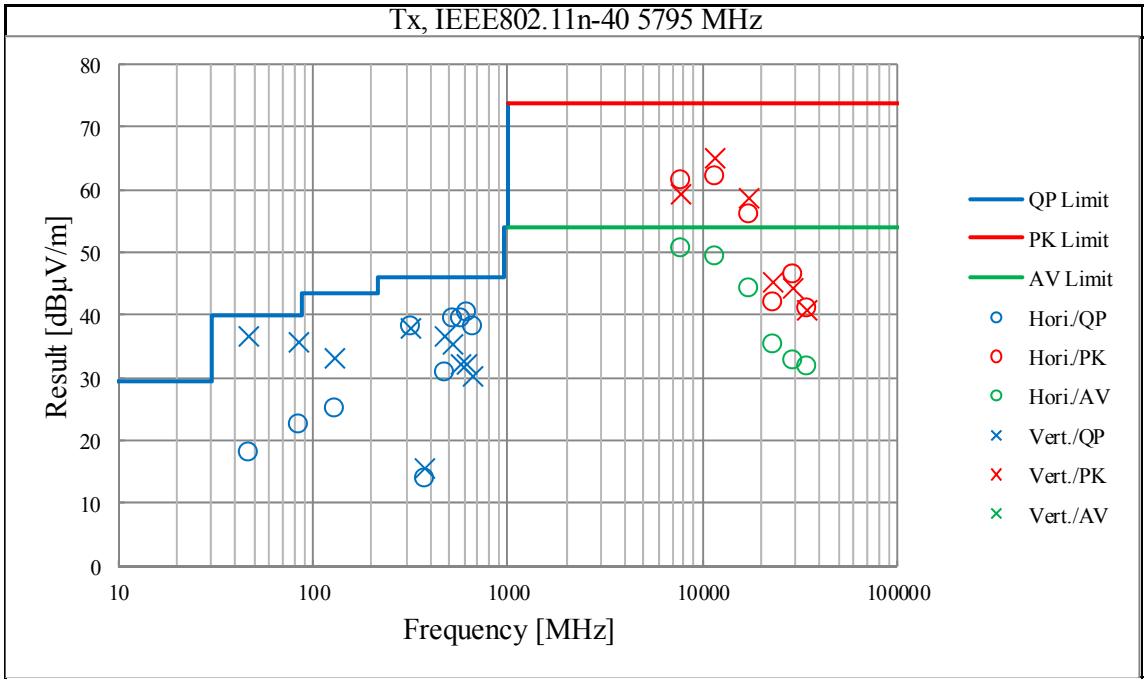


Trace Green: Peak Plot
Trace Purple: Average Plot

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

Radiated Spurious Emission
(Plot data, Worst case)

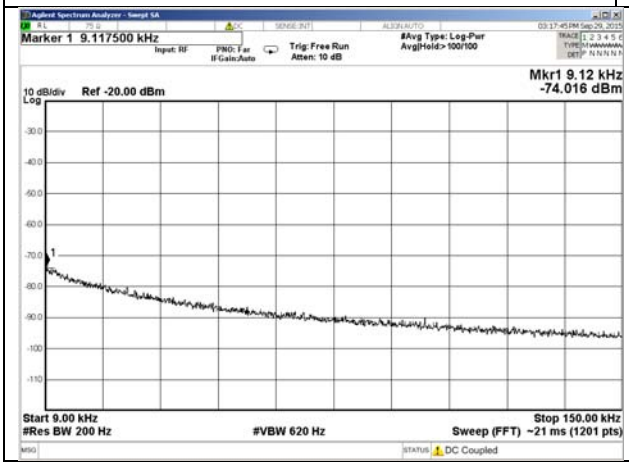
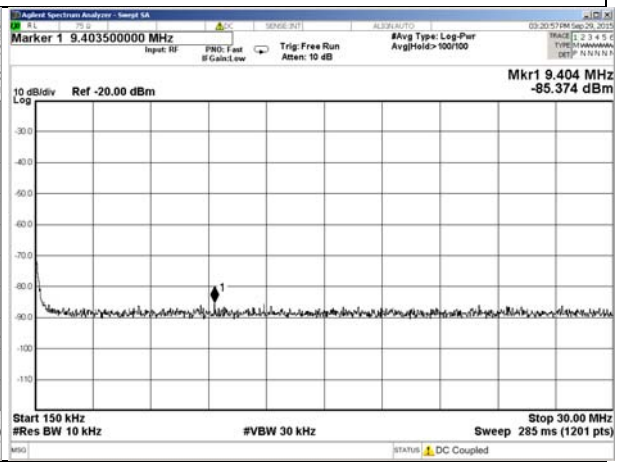
Test place	Shonan EMC Lab. No.2 Semi Anechoic Chamber		
Report No.	10956518S-A-R1		
Date	September 25, 2015	September 26, 2015	September 27, 2015
Temperature / Humidity	24 deg. C / 58 % RH	23 deg. C / 59 % RH	25deg. C / 67 % RH
Engineer	Takahiro Suzuki	Yosuke Ishikawa	Kenichi Adachi
	(6.4 GHz-18 GHz)	(1 GHz-6.4 GHz)	(26.5 GHz-40 GHz)
		(18 GHz-26.5 GHz)	(30 MHz-1000 MHz)
Mode	Tx 11n-40 5795 MHz		



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

Conducted Spurious Emission

Test place	Shonan EMC Lab. No.3 Shielded Room
Report No.	10956518S-A-R1
Date	September 29, 2015
Temperature / Humidity	24deg. C / 49 % RH
Engineer	Tomohiro Hara
Mode	Tx 11n-40 5795 MHz

9 kHz-150 kHz	150 kHz-30 MHz
	

Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenator [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
9.00	-74.0	1.83	9.94	0.9	10.87	-51.0	300	6.0	10.3	48.5	38.2	
9404.00	-85.4	1.83	9.94	0.9	10.87	-62.3	30	6.0	18.9	29.5	10.6	

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

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

APPENDIX 2: Test instruments

Test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
KSA-08	Spectrum Analyzer	Agilent	E4446A	MY46180525	AT, RE	2015/03/23 * 12
SPM-07	Power Meter	Agilent	8990B	MY5100272	AT	2015/04/02 * 12
SPSS-04	Power sensor	Agilent	N1923A	MY5326009	AT	2015/04/02 * 12
SAT10-10	Attenuator	Weinschel Corp.	54A-10	37584	AT	2015/04/09 * 12
SCC-G31	Coaxial Cable	Junkosha	MWX241-01000KMSKMS	OCT-08-13-046	AT	2015/04/09 * 12
SOS-09	Humidity Indicator	A&D	AD-5681	4061484	AT	2014/12/24 * 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	2015/08/10 * 12
SOS-03	Humidity Indicator	A&D	AD-5681	4063325	RE	2014/10/30 * 12
SJM-14	Measure	ASKUL	-	-	RE, CE	-
SAEC-02(SVSWR)	Semi-Anechoic Chamber	TDK	SAEC-02(SVSWR)	2	RE	2015/07/09 * 12
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,CE,RFI,MF)	-	RE, CE	-
SHA-05	Horn Antenna	ETS LINDGREN	3160-09	LM4210	RE	2015/03/17 * 12
SAF-09	Pre Amplifier	TOYO Corporation	HAP18-26W	00000018	RE	2015/09/07 * 12
SCC-G20	Coaxial Cable	Junkosha	J12J102518-00	APR-15-15-003	RE	2015/04/30 * 12
STS-02	Digital Hitester	Hioki	3805-50	080997819	RE, CE	2015/03/10 * 12
SFL-03	Highpass Filter	MICRO-TRONICS	HPM50112	028	RE	2014/11/21 * 12
SAEC-02(NSA)	Semi-Anechoic Chamber	TDK	SAEC-02(NSA)	2	RE	2015/07/15 * 12
SHA-06	Horn Antenna	ETS LINDGREN	3160-10	LM3459	RE	2015/03/17 * 12
SAF-10	Pre Amplifier	TOYO Corporation	HAP26-40W	00000010	RE	2015/03/23 * 12
SCC-G19	Coaxial Cable	Suhner	SUCOFLEX 102A	1188/2A	RE	2015/03/11 * 12
SBA-02	Biconical Antenna	Schwarzbeck	BBA9106	91032665	RE	2014/11/22 * 12
SAT6-02	Attenuator	JFW	50HF-006N	-	RE	2015/02/18 * 12
SCC-B1/B3/B5/B7/B8/B13/SRSE-02	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-270(RF Selector)	RE	2015/04/17 * 12
SLA-02	Logperiodic Antenna	Schwarzbeck	UHALP9108A	UHALP 9108-A 0893	RE	2014/11/22 * 12
KAT3-11	Attenuator	JFW IND. INC.	50HF-003N	-	RE	2015/08/31 * 12
SCC-B2/B4/B6/B7/B8/B13/SRSE-02	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-270(RF Selector)	RE	2015/04/17 * 12
SAF-02	Pre Amplifier	SONOMA	310N	290212	RE	2015/02/18 * 12
STR-07	Test Receiver	Rohde & Schwarz	ESU26	100484	RE, CE	2015/09/04 * 12
SSA-01	Spectrum Analyzer	Agilent	N9010A-526	MY48031482	AT	2015/04/10 * 12
SAT10-06	Attenuator	Agilent	8493C-010	74865	AT	2014/11/21 * 12
SOS-06	Humidity Indicator	A&D	AD-5681	4062118	AT	2014/12/24 * 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: CE: Conducted Emission
RE: Radiated Emission
AT: Antenna Terminal Conducted test