



RADIO TEST REPORT

Test Report No. : 10724035H-A-R2

Applicant : Sony Computer Entertainment Inc.
Type of Equipment : Computer Entertainment System
Model No. : CUH-1215A
FCC ID : AK8CUH120W1
Test regulation : FCC Part 15 Subpart C: 2015
*WLAN, Bluetooth (LE) Part
Test Result : Complied

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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 10724035H-A-R1. 10724035H-A-R1 is replaced with this report.

Date of test: March 16 to April 14, 2015

Representative test engineer:

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Approved by:

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Manager

Consumer Technology Division



NVLAP LAB CODE: 200572-0

This laboratory is accredited by the NVLAP LAB CODE 200572-0, U.S.A. The tests reported herein have been performed in accordance with its terms of accreditation.
*As for the range of Accreditation in NVLAP, you may refer to the WEB address,
<http://www.ul.com/japan/jpn/pages/services/emc/about/mark1/index.jsp#nvlap>

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SECTION 1: Customer information

Company Name	Sony Computer Entertainment Inc.
Brand Name	SONY
Address	1-7-1 Konan, Minato-ku, Tokyo, 108-0075 Japan
Telephone Number	+81-3-6748-6333
Facsimile Number	+81-3-6748-6383
Contact Person	Kiyoto Sasaki

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

2.1 Identification of E.U.T.

Type of Equipment	Computer Entertainment System
Model No	CUH-1215A
Serial No	Refer to Clause 4.2
Country of Manufacture	China/Japan
Receipt Date of Sample	March 12, 2015
Condition of EUT	Production 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

CUH-1215A is the Computer Entertainment System.

List of Model No.:

Model No.	Product Name	HDD capacity
CUH-1215A*	Computer Entertainment System	500GB
CUH-1215B	Computer Entertainment System	1TB

*Tested model

Product Specification

Maximum clock frequency in the system	2.75GHz
Clock frequency in the system (radio part)	40MHz
Operating Temperature	5-35 deg. C
Power Supply	AC 100-240V, 50Hz/60Hz
Size	275 x 53x 305 mm
Weight	Approx. 2.5kg

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Radio Specification

WLAN (IEEE802.11b/g/n-20)

Equipment Type	Transceiver
Frequency of Operation	2412-2462MHz
Type of Modulation	DSSS, OFDM
Bandwidth & Channel spacing	Less than 20MHz & 5MHz
Method of frequency generation	Synthesizer
Power Supply (inner)	DC 3.3V/1.8V
Antenna Type	IFA (Antenna A/B)
Antenna Gain: G _{ANT}	4.0dBi (Antenna A/B)
Directional Gain	7.01dBi (Antenna A/B)

Bluetooth (BDR/EDR)

Equipment Type	Transceiver
Frequency of Operation	2402-2480MHz
Type of Modulation	FHSS (GFSK, $\pi/4$ DQPSK, 8DPSK)
Bandwidth & Channel spacing	79MHz & 1MHz
Method of frequency generation	Synthesizer
Power Supply (inner)	DC 3.3V/1.8V
Antenna Type	PIFA
Antenna Gain	5.6dBi (peak)

Bluetooth (Low Energy)

Equipment Type	Transceiver
Frequency of Operation	2402-2480MHz
Type of Modulation	GFSK
Bandwidth & Channel spacing	1MHz & 2MHz
Method of frequency generation	Synthesizer
Power Supply (inner)	DC 3.3V/1.8V
Antenna Type	PIFA
Antenna Gain	5.6dBi (peak)

This test report applies to WLAN and Bluetooth (Low Energy).

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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

* The EUT complies with FCC Part 15 Subpart B: 2015, final revised on January 21, 2015.

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	QP 7.0dB, 0.15134MHz, L AV 8.2dB, 0.19047MHz, L	Complied	-
6dB Bandwidth	FCC: "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247(issued on June 5, 2014)" ----- IC: -	FCC: Section 15.247(a)(2) ----- IC: RSS-210 A8.2(a)	See data.	Complied	Conducted
Maximum Peak Output Power	FCC: "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247(issued on June 5, 2014)" ----- IC: RSS-Gen 6.12	FCC: Section 15.247(b)(3) ----- IC: RSS-210 A8.4(4)		Complied	Conducted
Power Density	FCC: "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247(issued on June 5, 2014)" ----- IC: -	FCC: Section 15.247 (e) ----- IC: RSS-210 A8.2(b)		Complied	Conducted
Spurious Emission Restricted Band Edges	FCC: "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247(issued on June 5, 2014)" ----- IC: RSS-Gen 6.13	FCC: Section15.247(d) ----- IC: RSS-210 A8.5 RSS-Gen 8.9 RSS-Gen 8.10	0.8dB (9848.000MHz, AV, Hori.) (2483.500MHz, AV, Vert.) (2390.000MHz, AV, Hori.)	Complied	Conducted (below 30MHz)/ Radiated (above 30MHz)

Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422.

* In case any questions arise about test procedure, ANSI C63.4: 2009 is also referred.

FCC 15.31 (e)

This EUT provides stable voltage (DC 3.3V/1.8V) constantly to RF Part regardless of input voltage. Therefore, this EUT complies with the requirement.

FCC Part 15.203 Antenna requirement

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 of Section 15.203.

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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

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.

Test room (semi-anechoic chamber)	Conducted emission (+dB)
	150kHz-30MHz
No.1	3.5dB
No.2	3.5dB
No.3	3.4dB
No.4	3.5dB

Test room (semi-anechoic chamber)	Radiated emission						
	(3m*)(+dB)				(1m*)(+dB)		(0.5m*)(+dB)
	9kHz -30MHz	30MHz -300MHz	300MHz -1GHz	1GHz -10GHz	10GHz -18GHz	18GHz -26.5GHz	26.5GHz -40GHz
No.1	4.3dB	5.5dB	6.3dB	5.5dB	5.8dB	5.8dB	4.3dB
No.2	4.2dB	5.4dB	6.3dB	5.4dB	5.7dB	5.9dB	5.6dB
No.3	4.4dB	5.4dB	6.4dB	5.2dB	5.5dB	5.8dB	5.5dB
No.4	4.7dB	5.6dB	6.4dB	5.3dB	5.7dB	5.9dB	5.5dB

*3m/1m/0.5m = Measurement distance

Power meter (+dB)	
Below 1GHz	Above 1GHz
0.7dB	1.5dB

Antenna terminal conducted emission and Power density (+dB)			Antenna terminal conducted emission (+dB)		Channel power (+dB)
Below 1GHz	1GHz-3GHz	3GHz-18GHz	18GHz-26.5GHz	26.5GHz-40GHz	
1.5dB	1.7dB	2.8dB	2.8dB	2.9dB	2.6dB

Conducted Emission test

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

Radiated emission test (3m)

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

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3.5 Test Location

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	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms
No.1 semi-anechoic chamber	2973C-1	19.2 x 11.2 x 7.7m	7.0 x 6.0m	No.1 Power source room
No.2 semi-anechoic chamber	2973C-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 semi-anechoic chamber	2973C-3	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.3 Preparation room
No.3 shielded room	-	4.0 x 6.0 x 2.7m	N/A	-
No.4 semi-anechoic chamber	2973C-4	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.4 Preparation room
No.4 shielded room	-	4.0 x 6.0 x 2.7m	N/A	-
No.5 semi-anechoic chamber	-	6.0 x 6.0 x 3.9m	6.0 x 6.0m	-
No.6 shielded room	-	4.0 x 4.5 x 2.7m	4.0 x 4.5 m	-
No.6 measurement room	-	4.75 x 5.4 x 3.0m	4.75 x 4.15 m	-
No.7 shielded room	-	4.7 x 7.5 x 2.7m	4.7 x 7.5m	-
No.8 measurement room	-	3.1 x 5.0 x 2.7m	N/A	-
No.9 measurement room	-	8.0 x 4.6 x 2.8m	2.4 x 2.4m	-
No.11 measurement room	-	6.2 x 4.7 x 3.0m	4.8 x 4.6m	-

* Size of vertical conducting plane (for Conducted Emission test) : 2.0 x 2.0m for No.1, No.2, No.3, and No.4 semi-anechoic chambers and No.3 and No.4 shielded rooms.

3.6 Test data, Test instruments, and Test set up

Refer to APPENDIX.

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

4.1 Operating Mode(s)

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

Mode	Remarks*
IEEE 802.11b (11b)	2Mbps, PN9
IEEE 802.11g (11g)	9Mbps, PN9
IEEE 802.11n MIMO 20MHz BW (11n-20)	MCS 0, PN9
Bluetooth Low Energy(BT LE)	Maximum Packet Size, PRBS9
*The worst condition was determined based on the test result of Maximum Peak Output Power (Mid Channel) *WLAN antennas (Antenna A and B) transmit simultaneously. Bluetooth antenna also transmits simultaneously with WLAN antennas, and the antennas are not common. There is no correlation between WLAN antennas and Bluetooth antenna. *Power of the EUT was set by the software as follows; Power settings: WLAN 9(dBm) Bluetooth (LE) Same as production model Software: CPro_DOS_Labtool_Ver2.0.0.68 *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.	

*Details of Operating mode for WLAN

Test Item	Operating Mode	Used Antenna	Tested frequency
Conducted Emission	11n-20 Tx *1) *2)	Antenna A+B	2437MHz
Spurious Emission (Conducted)	11n-20 Tx *1)	Antenna B	2437MHz
6dB Bandwidth, 99% Occupied Bandwidth	11b Tx 11g Tx 11n-20 Tx	Antenna A, Antenna B	2412MHz 2437MHz 2462MHz
Maximum Peak Output Power, Power Density	11b Tx 11g Tx 11n-20 Tx	Antenna A+B, Antenna A, Antenna B	2412MHz 2437MHz 2462MHz
Spurious Emission (Radiated)	11b Tx *2) 11n-20 Tx *2) *3)	Antenna A+B	2412MHz 2437MHz 2462MHz
*1) The test was performed on the mode as a representative, because it had the highest power at antenna terminal test. *2) The test was performed for both of Power Supply: Chicony and DELTA. *3) The test was performed on 11n-20 Tx mode according to “Section 1 of 6 802.11 a/b/g/n testing- Managing Complex Regulatory Approvals - ” of TCB Council Workshop October 2009, as the 11n-20 Tx mode had higher power than 11g mode at antenna terminal test.			

*Details of Operating mode for BT LE

Test Item	Operating Mode	Tested frequency
Conducted Emission *1), 6dB Bandwidth, Maximum Peak Output Power, Power Density, 99% Occupied Bandwidth, Spurious Emission (Radiated *1)/Conducted)	BT LE	2402MHz 2440MHz 2480MHz
*1) The test was performed for both of Power Supply: Chicony and DELTA.		

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4.2 Configuration and peripherals

This page has been submitted for a separate exhibit.

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SECTION 5: Conducted Emission

Test Procedure and conditions

EUT was placed on a urethane platform of nominal size, 1.0m by 1.5m, raised 0.8m above the conducting ground plane.

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.

For the tests on EUT with other peripherals (as a whole system)

I/O cables that were connected to the peripherals were bundled in center. They were folded back and forth forming a bundle 30cm to 40cm long and were hanged at a 40cm height to the ground plane. All unused 50ohm connectors of the LISN(AMN) were resistivity terminated in 50ohm when not connected to the measuring equipment.

The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT in a Semi Anechoic Chamber.

The EUT was connected to a LISN (AMN).

An overview sweep with peak detection has been performed.

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

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

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SECTION 6: Radiated Spurious Emission

Test Procedure

It was measured based on "11.0 Emissions in non-restricted frequency bands" of "558074 D01 DTS Meas Guidance v03r02 (Issued on June 5, 2014)".

EUT was placed on a urethane platform of nominal size, 1.0m by 1.5m, raised 0.8m 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 4m 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	30MHz to 300MHz	300MHz to 1GHz	Above 1GHz
Antenna Type	Biconical	Logperiodic	Horn

In any 100kHz 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 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on a radiated measurement.

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20dBc 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 1GHz	Above 1GHz		20dBc
Instrument used	Test Receiver	Spectrum Analyzer		Spectrum Analyzer
Detector	QP	PK	AV *1)	PK
IF Bandwidth	BW 120kHz	RBW: 1MHz VBW: 3MHz	Average Power Method: <u>WLAN: 12.2.5.1</u> RBW: 1MHz VBW: 3MHz Detector: Power Averaging (RMS) Trace: 100 traces <u>BT(LE): 12.2.5.2</u> Average Power Method: Alternative 1 *1) RBW: 1MHz VBW: 3MHz Detector: Power Averaging (RMS) Trace: 100 traces Duty factor was added to the results. <u>Noise other than RF part</u> RBW: 1MHz VBW: 10Hz	RBW: 100kHz VBW: 300kHz
Test Distance	3m	3m (below 10GHz), 1m *2) (above 10GHz)		3m (below 10GHz), 1m *2) (above 10GHz)

*1) Average Power Measurement was performed based on 6.0 & 12.2.5 of "558074 D01 DTS Meas Guidance v03r02 (Issued on June 5, 2014)"

*2) Distance Factor: $20 \times \log(3.0\text{m}/1.0\text{m}) = 9.5\text{dB}$

- The carrier level and noise levels were confirmed at each position of X and Y 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 : 30M-26.5GHz
Test data : APPENDIX
Test result : Pass

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SECTION 7: Antenna Terminal Conducted Tests

Test Procedure

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

Test	Span	RBW	VBW	Sweep time	Detector	Trace	Instrument used
6dB Bandwidth	20MHz / 3MHz	100kHz	300kHz	Auto	Peak	Max Hold	Spectrum Analyzer
99% Occupied Bandwidth *1)	Enough width to display emission skirts	1 to 5% of OBW	Three times of RBW	Auto	Peak	Max Hold	Spectrum Analyzer
Maximum Peak Output Power	-	-	-	Auto	Peak/ Average *2)	-	Power Meter (Sensor: 50MHz BW)
Peak Power Density	1.5 times the 6dB Bandwidth	3kHz	10kHz	Auto	Peak	Max Hold	Spectrum Analyzer *3)
Conducted Spurious Emission *4)	9kHz to 150kHz	200Hz	620Hz	Auto	Peak	Max Hold	Spectrum Analyzer
	150kHz to 30MHz	9.1kHz	27kHz				
*1) Peak hold was applied as Worst-case measurement. *2) Reference data *3) Section 10.2 Method PKPSD (peak PSD) of "558074 D01 DTS Meas Guidance v03r02 (Issued on June 5, 2014)". *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 low enough as shown in the chart.(9kHz-150kHz:RBW=200Hz, 150kHz-30MHz:RBW=9.1kHz).							

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

Conducted Emission (Power Supply: Chicony)

DATA OF CONDUCTED EMISSION TEST

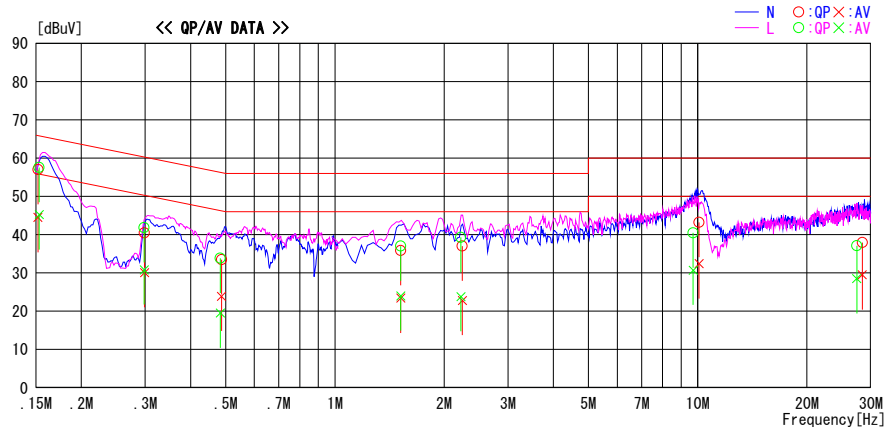
UL Japan, Inc. Ise EMC Lab. No.3 Semi Anechoic Chamber
Date: 2015/03/25

Report No. : 10724035H

Temp./Humi. : 18deg. C / 32% RH
Engineer : Takafumi Noguchi

Mode / Remarks : 11n-20 Tx 2437MHz

LIMIT : FCC15.207 QP
FCC15.207 AV



Frequency	Reading Level		Corr. Factor	Results		Limit		Margin		Phase
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]	
0.15190	43.8	31.3	13.2	57.0	44.5	65.9	55.9	8.9	11.4	N
0.29877	27.2	16.8	13.3	40.5	30.1	60.3	50.3	19.8	20.2	N
0.48723	20.2	10.6	13.3	33.5	23.9	56.2	46.2	22.7	22.3	N
1.51972	22.4	10.0	13.4	35.8	23.4	56.0	46.0	20.2	22.6	N
2.24457	23.6	9.4	13.4	37.0	22.8	56.0	46.0	19.0	23.2	N
10.08585	29.2	18.4	14.0	43.2	32.4	60.0	50.0	16.8	17.6	N
28.41800	23.0	14.6	14.9	37.9	29.5	60.0	50.0	22.1	20.5	N
0.15310	44.4	32.0	13.2	57.6	45.2	65.8	55.8	8.2	10.6	L
0.29815	28.5	17.5	13.3	41.8	30.8	60.3	50.3	18.5	19.5	L
0.48318	20.5	6.2	13.3	33.8	19.5	56.3	46.3	22.5	26.8	L
1.51878	23.6	10.6	13.4	37.0	24.0	56.0	46.0	19.0	22.0	L
2.22405	25.9	10.4	13.4	39.3	23.8	56.0	46.0	16.7	22.2	L
9.71215	26.5	16.7	14.0	40.5	30.7	60.0	50.0	19.5	19.3	L
27.44991	22.3	13.7	14.8	37.1	28.5	60.0	50.0	22.9	21.5	L

CHART: WITH FACTOR, Peak hold data. CALCULATION: RESULT=READING+C.F (LISN LOSS+ATT LOSS +CABLE LOSS)
Except for the above table : adequate margin data below the limits.

Conducted Emission
(Power Supply: Chicony)

DATA OF CONDUCTED EMISSION TEST

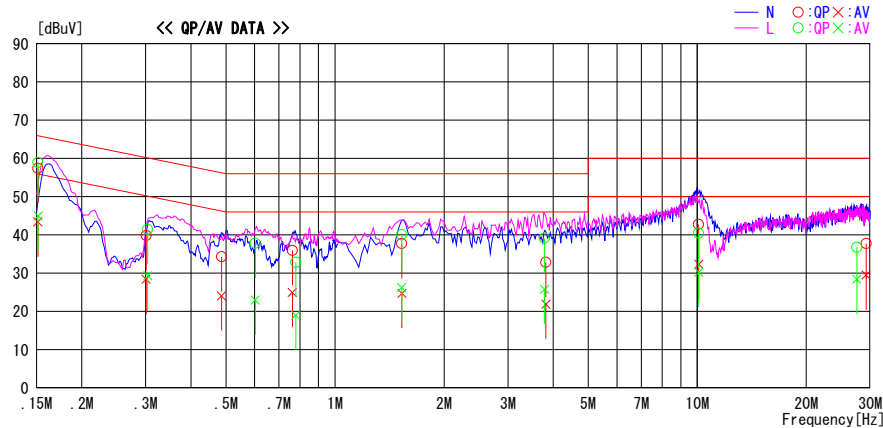
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Date: 2015/03/25

Report No. : 10724035H

Temp./Humi. : 18deg. C / 32% RH
Engineer : Takafumi Noguchi

Mode / Remarks : BT LE Tx 2440MHz

LIMIT : FCC15.207 QP
FCC15.207 AV

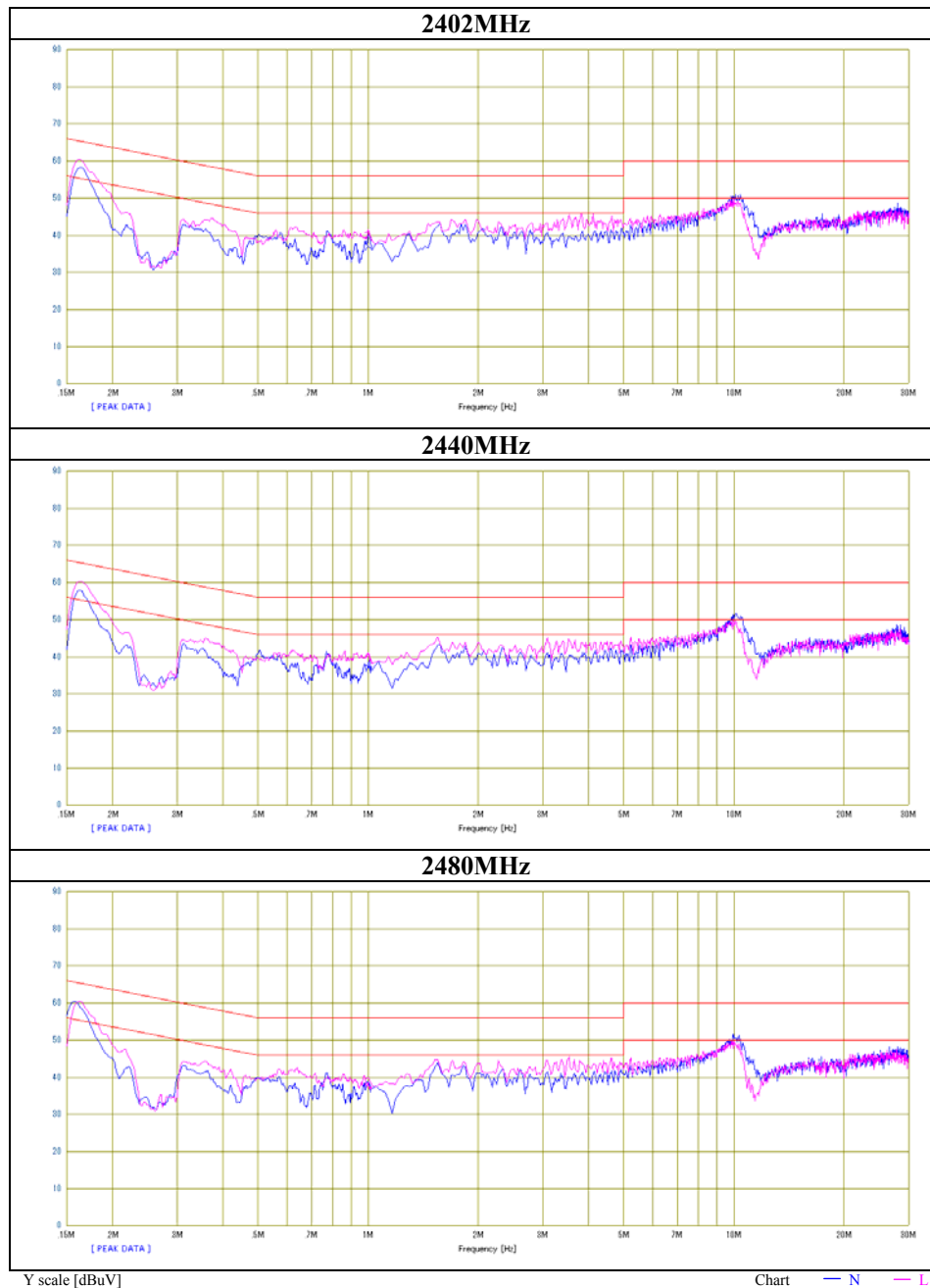


Frequency [MHz]	Reading Level		Corr. Factor [dB]	Results		Limit		Margin		Phase
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]	
0.15116	44.2	30.2	13.2	57.4	43.4	65.9	55.9	8.5	12.5	N
0.30112	26.5	15.1	13.3	39.8	28.4	60.2	50.2	20.4	21.8	N
0.48575	21.0	10.8	13.3	34.3	24.1	56.2	46.2	21.9	22.1	N
0.76188	22.6	11.7	13.3	35.9	25.0	56.0	46.0	20.1	21.0	N
1.52934	24.3	11.3	13.4	37.7	24.7	56.0	46.0	18.3	21.3	N
3.82096	19.2	8.3	13.6	32.8	21.9	56.0	46.0	23.2	24.1	N
10.09172	28.7	18.3	14.0	42.7	32.3	60.0	50.0	17.3	17.7	N
29.25400	22.8	14.6	14.9	37.7	29.5	60.0	50.0	22.3	20.5	N
0.15134	45.7	31.8	13.2	58.9	45.0	65.9	55.9	7.0	10.9	L
0.30399	28.2	16.0	13.3	41.5	29.3	60.1	50.1	18.6	20.8	L
0.60205	24.5	9.7	13.3	37.8	23.0	56.0	46.0	18.2	23.0	L
0.77947	19.5	5.7	13.3	32.8	19.0	56.0	46.0	23.2	27.0	L
1.52704	26.6	12.8	13.4	40.0	26.2	56.0	46.0	16.0	19.8	L
3.78658	25.5	12.2	13.6	39.1	25.8	56.0	46.0	16.9	20.2	L
10.08300	26.5	16.2	14.0	40.5	30.2	60.0	50.0	19.5	19.8	L
27.57456	21.9	13.6	14.8	36.7	28.4	60.0	50.0	23.3	21.6	L

CHART: WITH FACTOR, Peak hold data. CALCULATION: RESULT=READING+C. F (LISN LOSS+ATT LOSS +CABLE LOSS)
Except for the above table : adequate margin data below the limits.

Conducted Emission
(Power Supply: Chicony)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No.	10724035H
Date	03/25/2015
Temperature/ Humidity	18deg. C / 32% RH
Engineer	Takafumi Noguchi
Mode	BT LE Tx



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Conducted Emission
(Power Supply: DELTA)

DATA OF CONDUCTED EMISSION TEST

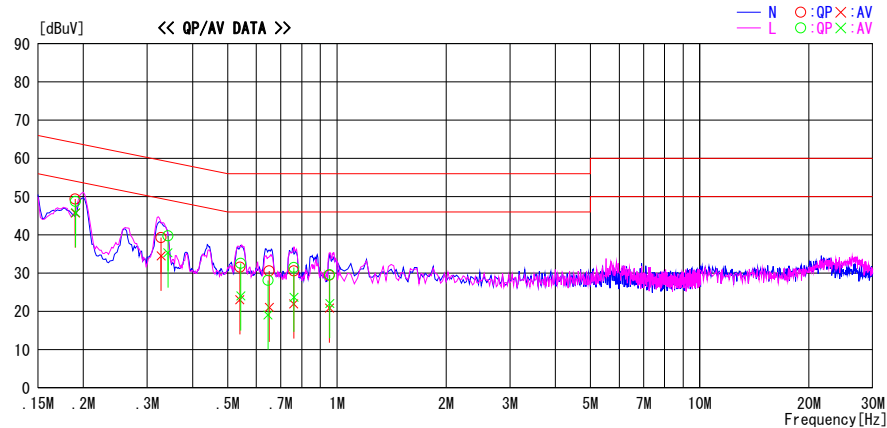
UL Japan, Inc. Ise EMC Lab. No.3 Semi Anechoic Chamber
Date: 2015/03/25

Report No. : 10724035H

Temp./Humi. : 18deg. C / 32% RH
Engineer : Takafumi Noguchi

Mode / Remarks : 11n-20 Tx 2437MHz

LIMIT : FCC15.207 QP
FCC15.207 AV



Frequency [MHz]	Reading Level		Corr. Factor	Results		Limit		Margin		Phase
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]	
0.18992	36.2	32.5	13.2	49.4	45.7	64.0	54.0	14.6	8.3	N
0.32768	26.0	21.2	13.3	39.3	34.5	59.5	49.5	20.2	15.0	N
0.54048	18.3	9.8	13.3	31.6	23.1	56.0	46.0	24.4	22.9	N
0.65115	17.3	7.8	13.3	30.6	21.1	56.0	46.0	25.4	24.9	N
0.76036	17.3	8.7	13.3	30.6	22.0	56.0	46.0	25.4	24.0	N
0.95316	16.2	7.6	13.3	29.5	20.9	56.0	46.0	26.5	25.1	N
0.19047	35.5	32.6	13.2	48.7	45.8	64.0	54.0	15.3	8.2	L
0.34225	26.4	22.0	13.3	39.7	35.3	59.1	49.1	19.4	13.8	L
0.54332	19.3	10.8	13.3	32.6	24.1	56.0	46.0	23.4	21.9	L
0.64567	14.8	5.8	13.3	28.1	19.1	56.0	46.0	27.9	26.9	L
0.76161	18.2	10.4	13.3	31.5	23.7	56.0	46.0	24.5	22.3	L
0.95515	16.3	8.8	13.3	29.6	22.1	56.0	46.0	26.4	23.9	L

CHART: WITH FACTOR, Peak hold data. CALCULATION: RESULT=READING+C. F (LISN LOSS+ATT LOSS +CABLE LOSS)
Except for the above table : adequate margin data below the limits.

Conducted Emission
(Power Supply: DELTA)

DATA OF CONDUCTED EMISSION TEST

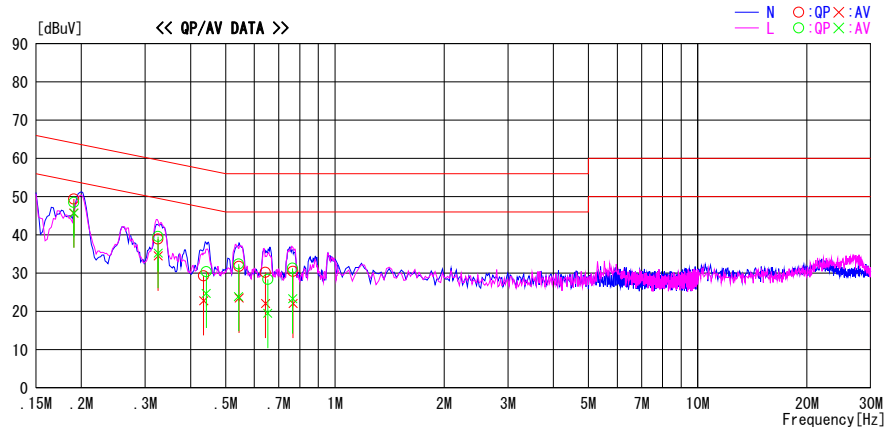
UL Japan, Inc. Ise EMC Lab. No.3 Semi Anechoic Chamber
Date: 2015/03/25

Report No. : 10724035H

Temp./Humi. : 18deg. C / 32% RH
Engineer : Takafumi Noguchi

Mode / Remarks : BT LE Tx 2440MHz

LIMIT : FCC15.207 QP
FCC15.207 AV

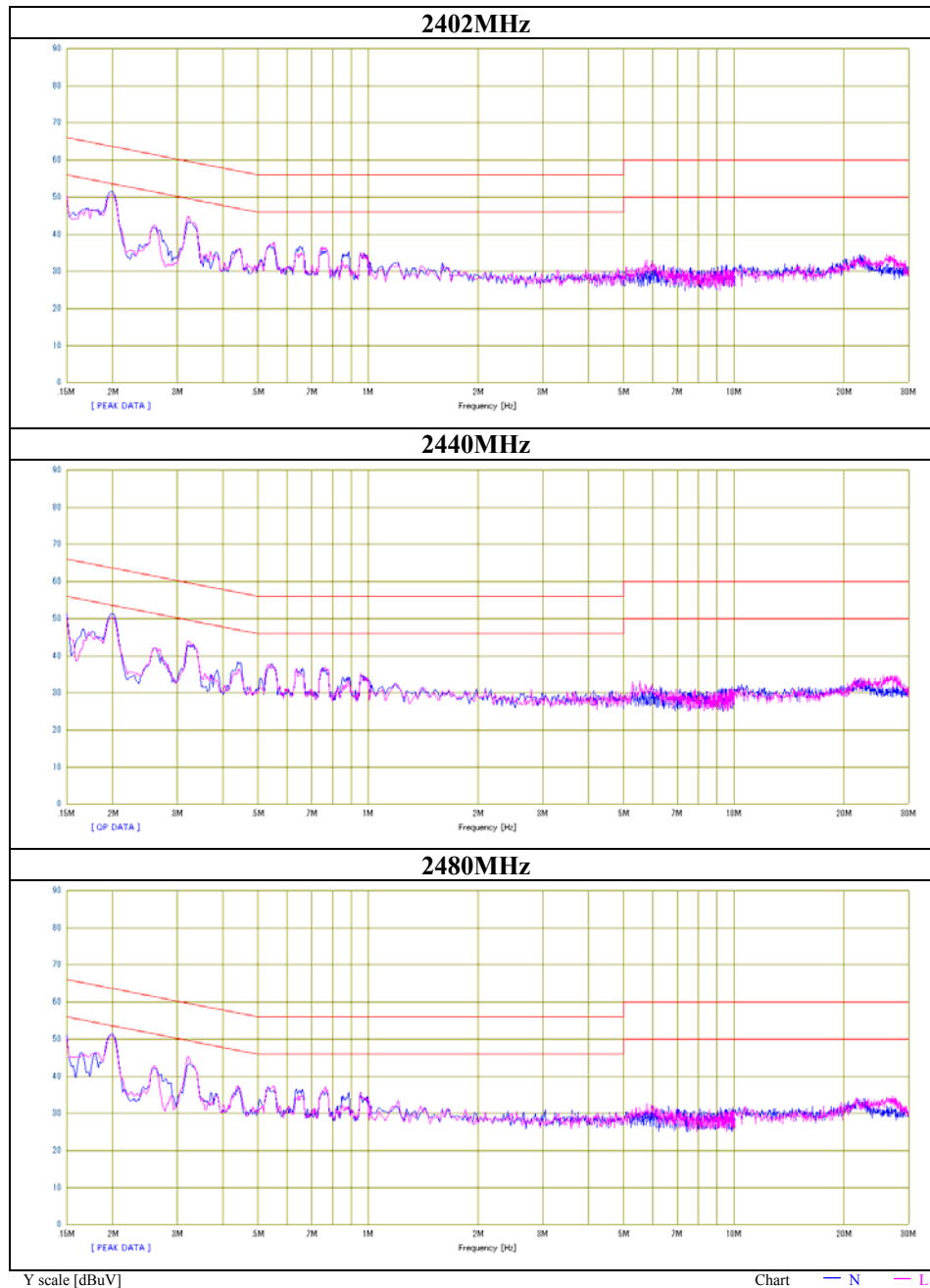


Frequency [MHz]	Reading Level		Corr. Factor	Results		Limit		Margin		Phase
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]	
0.19056	36.2	32.5	13.2	49.4	45.7	64.0	54.0	14.6	8.3	N
0.32569	25.6	21.2	13.3	38.9	34.5	59.6	49.6	20.7	15.1	N
0.43444	16.0	9.5	13.3	29.3	22.8	57.2	47.2	27.9	24.4	N
0.54446	18.4	10.2	13.3	31.7	23.5	56.0	46.0	24.3	22.5	N
0.64348	16.9	8.8	13.3	30.2	22.1	56.0	46.0	25.8	23.9	N
0.76641	17.2	8.8	13.3	30.5	22.1	56.0	46.0	25.5	23.9	N
0.19091	35.3	32.5	13.2	48.5	45.7	64.0	54.0	15.5	8.3	L
0.32548	26.3	21.9	13.3	39.6	35.2	59.6	49.6	20.0	14.4	L
0.44200	17.1	11.4	13.3	30.4	24.7	57.0	47.0	26.6	22.3	L
0.54285	19.1	10.6	13.3	32.4	23.9	56.0	46.0	23.6	22.1	L
0.65338	15.1	6.2	13.3	28.4	19.5	56.0	46.0	27.6	26.5	L
0.76465	18.0	10.0	13.3	31.3	23.3	56.0	46.0	24.7	22.7	L

CHART: WITH FACTOR, Peak hold data. CALCULATION: RESULT=READING+C. F (LISN LOSS+ATT LOSS +CABLE LOSS)
Except for the above table : adequate margin data below the limits.

Conducted Emission (Power Supply: DELTA)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No.	10724035H
Date	03/25/2015
Temperature/ Humidity	18deg. C / 32% RH
Engineer	Takafumi Noguchi
Mode	BT LE Tx



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6dB Bandwidth

Test place : Ise EMC Lab. No.6 Measurement Room
Report No. : 10724035H
Date : 03/17/2015
Temperature/ Humidity : 22deg. C / 36% RH
Engineer : Shinya Watanabe
Mode : Tx

11b

Antenna	Frequency [MHz]	6dB Bandwidth [MHz]	Limit [kHz]
A	2412	9.884	>500
	2437	9.893	>500
	2462	9.986	>500
B	2412	9.744	>500
	2437	9.896	>500
	2462	9.833	>500

11g

Antenna	Frequency [MHz]	6dB Bandwidth [MHz]	Limit [kHz]
A	2412	16.357	>500
	2437	16.353	>500
	2462	16.387	>500
B	2412	16.408	>500
	2437	16.396	>500
	2462	16.370	>500

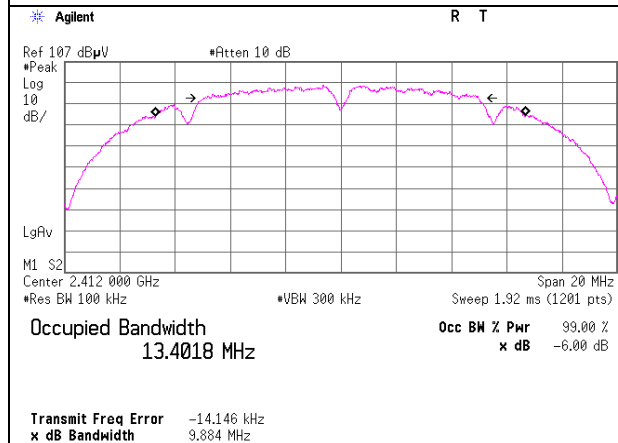
11n-20

Antenna	Frequency [MHz]	6dB Bandwidth [MHz]	Limit [kHz]
A	2412	17.567	>500
	2437	17.542	>500
	2462	17.560	>500
B	2412	17.593	>500
	2437	17.589	>500
	2462	17.581	>500

6dB Bandwidth

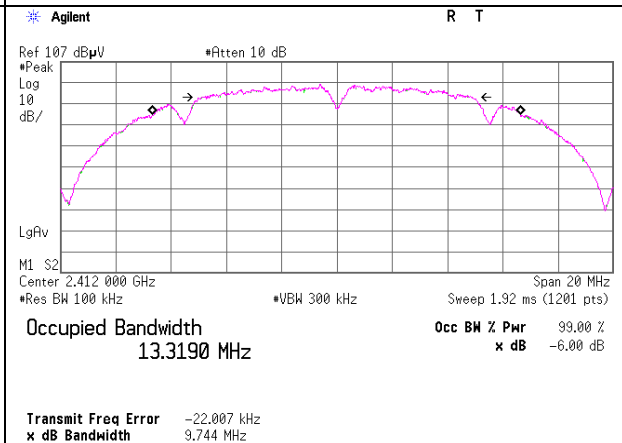
11b Antenna A

2412MHz

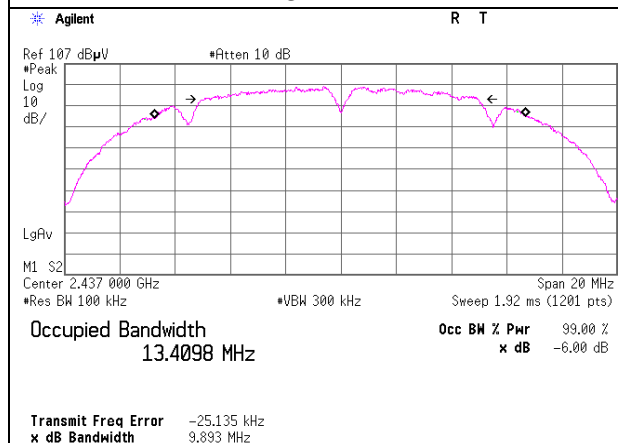


11b Antenna B

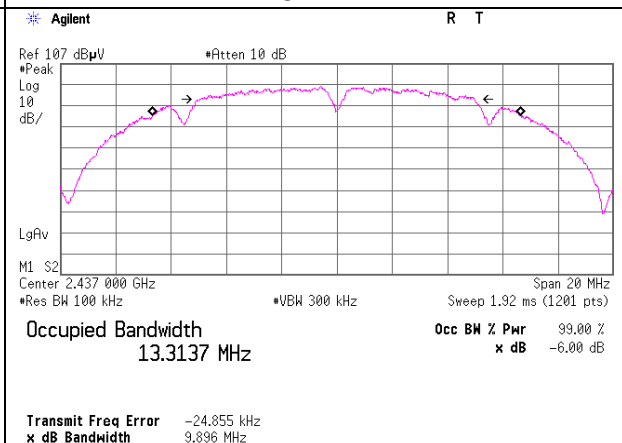
2412MHz



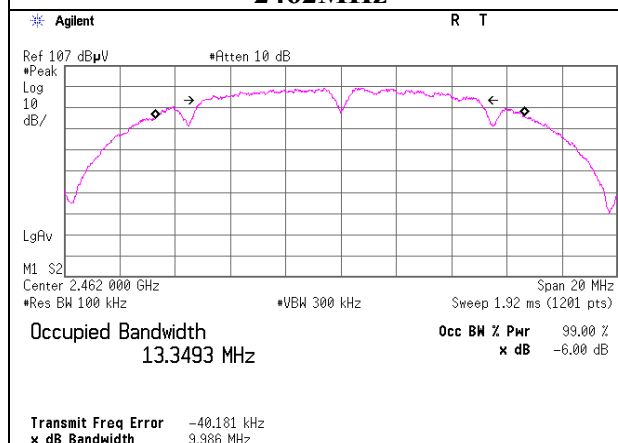
2437MHz



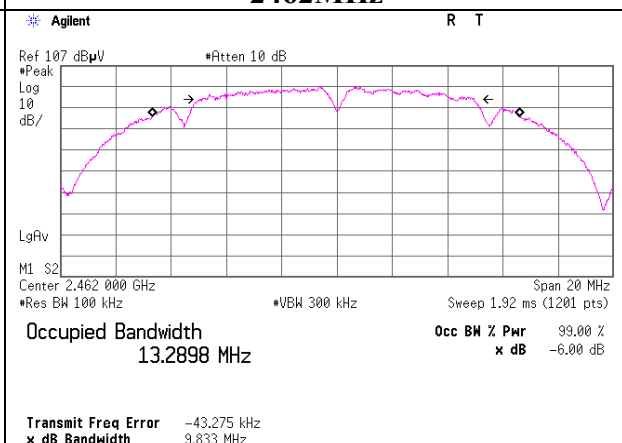
2437MHz



2462MHz



2462MHz



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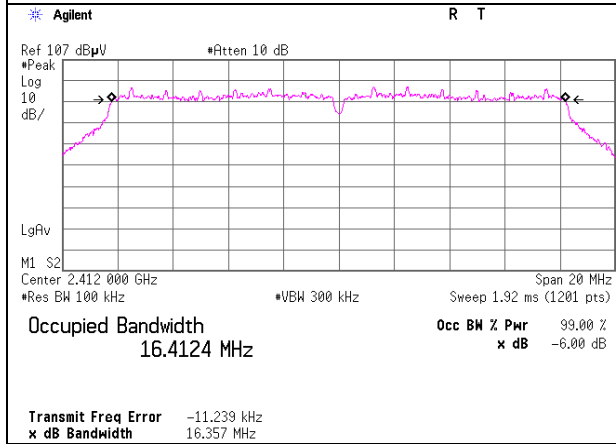
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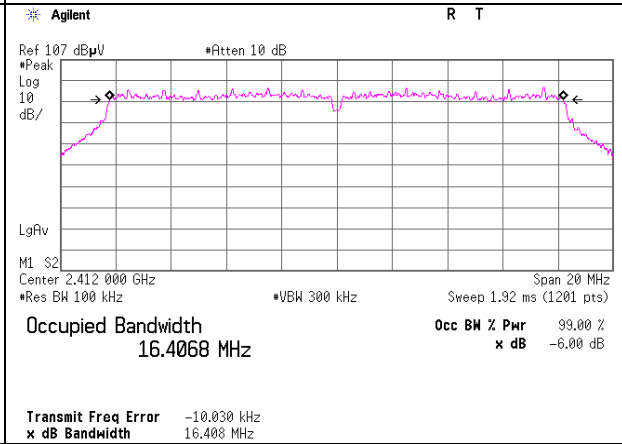
Facsimile : +81 596 24 8124

6dB Bandwidth

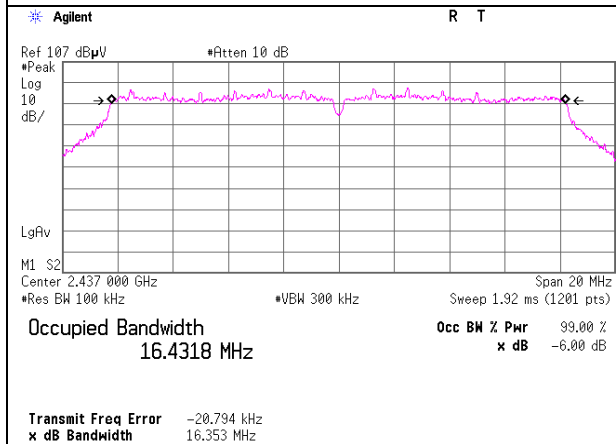
11g Antenna A 2412MHz



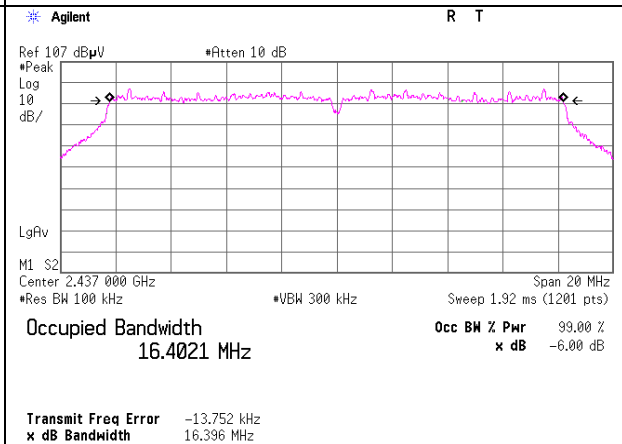
11g Antenna B 2412MHz



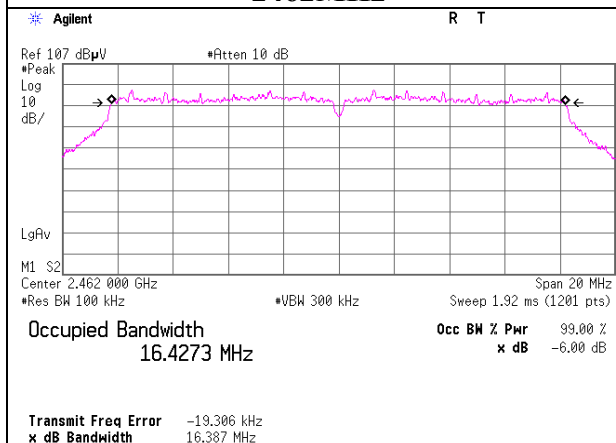
2437MHz



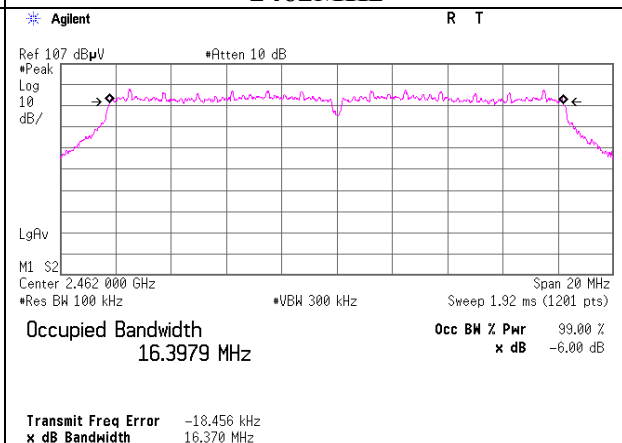
2437MHz



2462MHz



2462MHz



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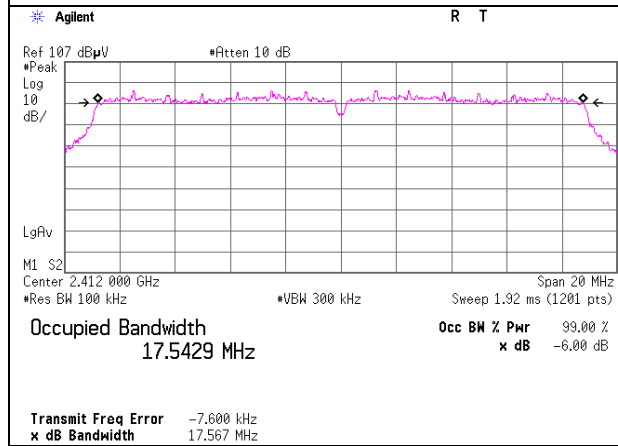
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Facsimile : +81 596 24 8124

6dB Bandwidth

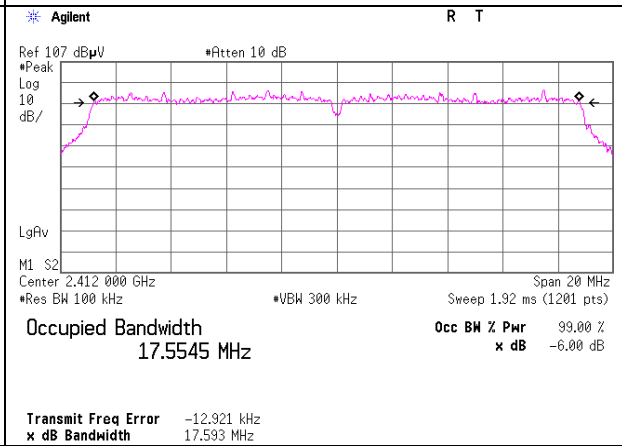
11n-20 Antenna A

2412MHz

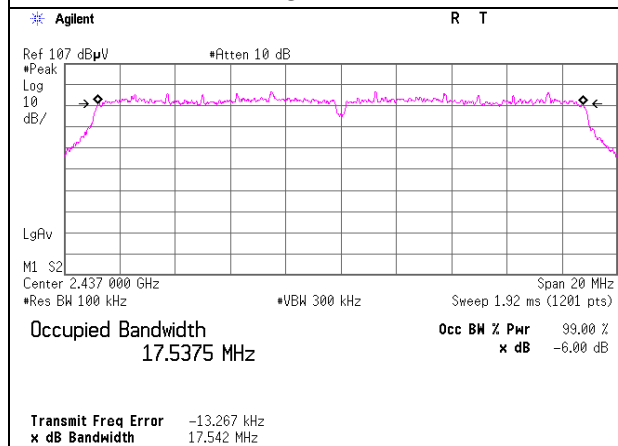


11n-20 Antenna B

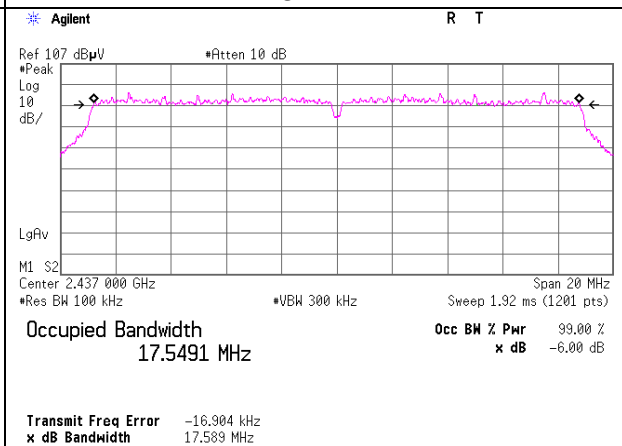
2412MHz



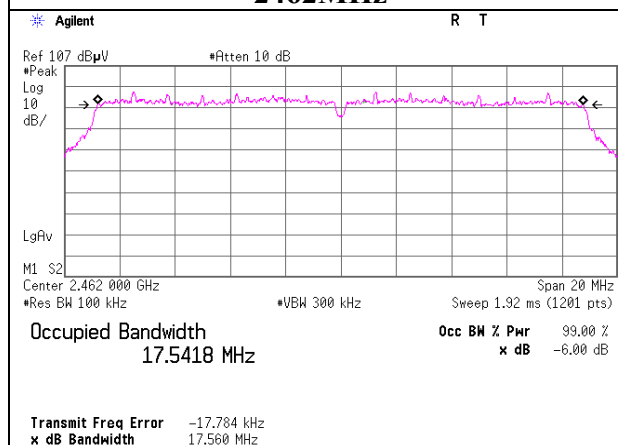
2437MHz



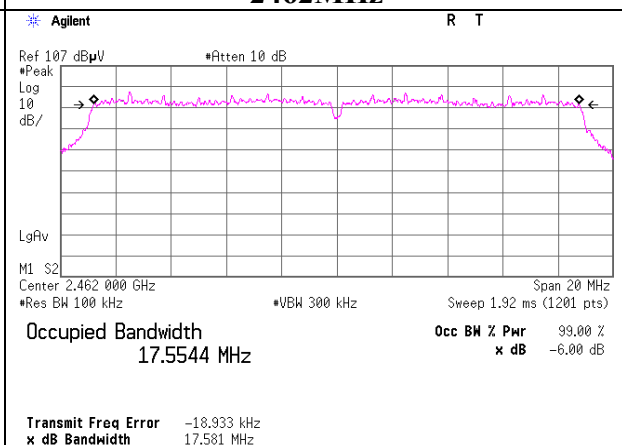
2437MHz



2462MHz



2462MHz



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6dB Bandwidth

Test place Ise EMC Lab. No.6 Measurement Room
Report No. 10724035H
Date 03/23/2015
Temperature/ Humidity 22 deg. C / 42% RH
Engineer Ken Fujita
Mode BT LE Tx

Frequency [MHz]	6dB Bandwidth [MHz]	Limit [kHz]
2402	0.704	>500
2440	0.716	>500
2480	0.719	>500

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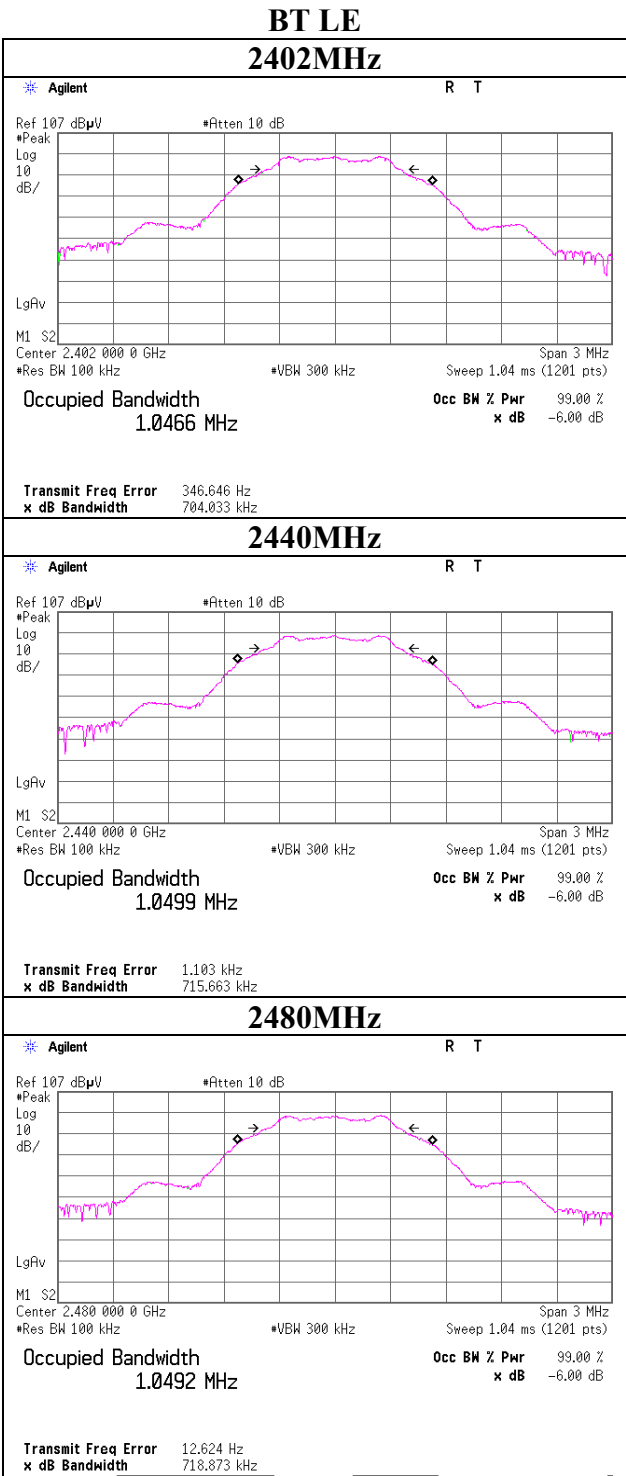
Ise EMC Lab.

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Facsimile : +81 596 24 8124

6dB Bandwidth



Maximum Peak Output Power

Test place : Ise EMC Lab. No.6 Measurement Room
Report No. : 10724035H
Date : 03/16/2015
Temperature/ Humidity : 23deg. C / 33% RH
Engineer : Shinya Watanabe
Mode : 11b Tx

Antenna A + B

Freq. [MHz]	Antenna A Result [mW]	Antenna B Result [mW]	Result		Limit		Margin [dB]
			[dBm]	[mW]	[dBm]	[mW]	
2412	15.10	16.00	14.93	31.10	29.00	794.32	14.07
2437	16.75	16.37	15.20	33.12	29.00	794.32	13.80
2462	20.04	18.92	15.91	38.96	29.00	794.32	13.09

Sample Calculation:

Result = Antenna A + B

*This Limit was reduced by 1dB for directional gain of the antenna/antenna array exceeding 6 dBi.

Antenna A

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
				[dBm]	[mW]
2412	0.93	0.80	10.06	11.79	15.10
2437	1.38	0.80	10.06	12.24	16.75
2462	2.16	0.80	10.06	13.02	20.04

Antenna B

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
				[dBm]	[mW]
2412	1.18	0.80	10.06	12.04	16.00
2437	1.28	0.80	10.06	12.14	16.37
2462	1.91	0.80	10.06	12.77	18.92

Sample Calculation:

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

Rate [Mbps]	Antenna A Reading Peak		Antenna B Reading Peak		Total Reading Power		Remark
	[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]	
1	1.06	1.28	0.98	1.25	4.03	2.53	
2	1.38	1.37	1.28	1.34	4.34	2.72	*
5.5	0.21	1.05	0.19	1.04	3.21	2.09	
11	0.56	1.14	0.41	1.10	3.50	2.24	

*: Worst Rate

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

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Maximum Peak Output Power

Test place : Ise EMC Lab. No.6 Measurement Room
Report No. : 10724035H
Date : 03/16/2015
Temperature/ Humidity : 23deg. C / 33% RH
Engineer : Shinya Watanabe
Mode : 11g Tx

Antenna A + B

Freq. [MHz]	Antenna A Result [mW]	Antenna B Result [mW]	Result		Limit		Margin [dB]
			[dBm]	[mW]	[dBm]	[mW]	
2412	113.24	111.69	23.52	224.93	29.00	794.32	5.48
2437	98.63	95.28	22.88	193.91	29.00	794.32	6.12
2462	112.20	94.19	23.15	206.39	29.00	794.32	5.85

Sample Calculation:

Result = Antenna A + B

*This Limit was reduced by 1dB for directional gain of the antenna/antenna array exceeding 6 dBi.

Antenna A

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
				[dBm]	[mW]
2412	9.68	0.80	10.06	20.54	113.24
2437	9.08	0.80	10.06	19.94	98.63
2462	9.64	0.80	10.06	20.50	112.20

Antenna B

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
				[dBm]	[mW]
2412	9.62	0.80	10.06	20.48	111.69
2437	8.93	0.80	10.06	19.79	95.28
2462	8.88	0.80	10.06	19.74	94.19

Sample Calculation:

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

Rate [Mbps]	Antenna A Reading Peak		Antenna B Reading Peak		Total Reading Power		Remark
	[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]	
6	8.90	7.76	8.84	7.66	11.88	15.42	
9	9.08	8.09	8.93	7.82	12.02	15.91	*
12	8.30	6.76	8.29	6.75	11.31	13.51	
18	8.44	6.98	8.31	6.78	11.39	13.76	
24	8.03	6.35	7.98	6.28	11.02	12.63	
36	7.75	5.96	7.59	5.74	10.68	11.70	
48	8.38	6.89	8.21	6.62	11.31	13.51	
54	8.27	6.71	8.15	6.53	11.22	13.25	

*: Worst Rate

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

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Maximum Peak Output Power

Test place : Ise EMC Lab. No.6 Measurement Room
Report No. : 10724035H
Date : 03/16/2015
Temperature/ Humidity : 23deg. C / 33% RH
Engineer : Shinya Watanabe
Mode : 11n-20 Tx

Antenna A + B

Freq. [MHz]	Antenna A Result [mW]	Antenna B Result [mW]	Result		Limit		Margin [dB]
			[dBm]	[mW]	[dBm]	[mW]	
2412	114.82	132.74	23.94	247.56	29.00	794.32	5.06
2437	122.46	127.06	23.97	249.52	29.00	794.32	5.03
2462	128.82	111.17	23.80	239.99	29.00	794.32	5.20

Sample Calculation:

Result = Antenna A + B

*This Limit was reduced by 1dB for directional gain of the antenna/antenna array exceeding 6 dBi.

Antenna A

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
				[dBm]	[mW]
2412	9.74	0.80	10.06	20.60	114.82
2437	10.02	0.80	10.06	20.88	122.46
2462	10.24	0.80	10.06	21.10	128.82

Antenna B

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
				[dBm]	[mW]
2412	10.37	0.80	10.06	21.23	132.74
2437	10.18	0.80	10.06	21.04	127.06
2462	9.60	0.80	10.06	20.46	111.17

Sample Calculation:

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

MCS Number	Antenna A Reading Peak		Antenna B Reading Peak		Total Reading Power		Remark
	[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]	
0	10.02	10.05	10.18	10.42	13.11	20.47	*
1	9.27	8.45	9.32	8.55	12.31	17.00	
2	8.34	6.82	8.41	6.93	11.39	13.76	
3	8.45	7.00	8.39	6.90	11.43	13.90	
4	8.69	7.40	8.73	7.46	11.72	14.86	
5	8.98	7.91	9.02	7.98	12.01	15.89	
6	8.80	7.59	8.83	7.64	11.83	15.22	
7	8.51	7.10	8.55	7.16	11.54	14.26	
8	8.28	6.73	8.21	6.62	11.26	13.35	
9	7.63	5.79	8.14	6.52	10.90	12.31	
10	8.31	6.78	8.35	6.84	11.34	13.62	
11	8.44	6.98	8.41	6.93	11.44	13.92	
12	8.92	7.80	8.98	7.91	11.96	15.71	
13	8.09	6.44	8.36	6.85	11.24	13.30	
14	8.81	7.60	8.84	7.66	11.84	15.26	
15	8.31	6.78	8.39	6.90	11.36	13.68	

*Worst MCS

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

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

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Maximum Average Output Power (Reference data for RF EXposure)

Test place : Ise EMC Lab. No.6 Measurement Room
Report No. : 10724035H
Date : 04/14/2015
Temperature/ Humidity : 24deg. C / 48% RH
Engineer : Takumi Shimada
Mode : 11b Tx

Antenna A + B

Freq. [MHz]	Antenna A Result [mW]	Antenna B Result [mW]	Result	
			[dBm]	[mW]
2412	9.57	8.93	12.67	18.50
2437	9.14	8.95	12.58	18.09
2462	9.64	9.71	12.87	19.35

Sample Calculation:

Result = Antenna A + B

Antenna A

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
				[dBm]	[mW]
2412	-1.05	0.80	10.06	9.81	9.57
2437	-1.25	0.80	10.06	9.61	9.14
2462	-1.02	0.80	10.06	9.84	9.64

Antenna B

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
				[dBm]	[mW]
2412	-1.35	0.80	10.06	9.51	8.93
2437	-1.34	0.80	10.06	9.52	8.95
2462	-0.99	0.80	10.06	9.87	9.71

Sample Calculation:

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

Rate [Mbps]	Antenna A		Antenna B		Total		Remark
	Reading Average [dBm]	[mW]	Reading Average [dBm]	[mW]	Reading Power [dBm]	[mW]	
1	-1.56	0.70	-1.45	0.72	1.51	1.41	
2	-1.25	0.75	-1.34	0.73	1.72	1.48	*
5.5	-2.28	0.59	-2.30	0.59	0.72	1.18	
11	-1.98	0.63	-1.99	0.63	1.03	1.27	

*: Worst Rate

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

*The test was conducted by the use of Gate function.

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Maximum Average Output Power (Reference data for RF EXposure)

Test place : Ise EMC Lab. No.6 Measurement Room
Report No. : 10724035H
Date : 04/14/2015
Temperature/ Humidity : 24deg. C / 48% RH
Engineer : Takumi Shimada
Mode : 11g Tx

Antenna A + B

Freq. [MHz]	Antenna A Result [mW]	Antenna B Result [mW]	Result	
			[dBm]	[mW]
2412	7.38	7.36	11.69	14.74
2437	7.13	7.23	11.57	14.36
2462	7.83	7.71	11.92	15.54

Sample Calculation:

Result = Antenna A + B

Antenna A

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
				[dBm]	[mW]
2412	-2.18	0.80	10.06	8.68	7.38
2437	-2.33	0.80	10.06	8.53	7.13
2462	-1.92	0.80	10.06	8.94	7.83

Antenna B

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
				[dBm]	[mW]
2412	-2.19	0.80	10.06	8.67	7.36
2437	-2.27	0.80	10.06	8.59	7.23
2462	-1.99	0.80	10.06	8.87	7.71

Sample Calculation:

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

Rate [Mbps]	Antenna A Reading Average		Antenna B Reading Average		Total Reading Power		Remark [dB]
	[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]	
6	-2.53	0.56	-2.32	0.59	0.59	1.14	
9	-2.33	0.58	-2.27	0.59	0.71	1.18	*
12	-2.51	0.56	-2.29	0.59	0.61	1.15	
18	-2.32	0.59	-2.36	0.58	0.67	1.17	
24	-2.34	0.58	-2.31	0.59	0.69	1.17	
36	-2.29	0.59	-2.34	0.58	0.70	1.17	
48	-2.33	0.58	-2.33	0.58	0.68	1.17	
54	-2.42	0.57	-2.29	0.59	0.66	1.16	

*: Worst Rate

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

*The test was conducted by the use of Gate function.

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Maximum Average Output Power (Reference data for RF EXposure)

Test place : Ise EMC Lab. No.6 Measurement Room
Report No. : 10724035H
Date : 04/14/2015
Temperature/ Humidity : 24deg. C / 48% RH
Engineer : Takumi Shimada
Mode : 11n-20 Tx

Antenna A + B

Freq. [MHz]	Antenna A Result [mW]	Antenna B Result [mW]	Result	
			[dBm]	[mW]
2412	7.28	7.48	11.69	14.76
2437	7.40	7.50	11.73	14.90
2462	8.39	8.36	12.24	16.75

Sample Calculation:

Result = Antenna A + B

Antenna A

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
				[dBm]	[mW]
2412	-2.24	0.80	10.06	8.62	7.28
2437	-2.17	0.80	10.06	8.69	7.40
2462	-1.62	0.80	10.06	9.24	8.39

Antenna B

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
				[dBm]	[mW]
2412	-2.12	0.80	10.06	8.74	7.48
2437	-2.11	0.80	10.06	8.75	7.50
2462	-1.64	0.80	10.06	9.22	8.36

Sample Calculation:

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

MCS Number	Antenna A Reading Average		Antenna B Reading Average		Total Reading Power		Remark
	[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]	
0	-2.17	0.61	-2.11	0.62	0.87	1.22	*
1	-2.16	0.61	-2.19	0.60	0.84	1.21	
2	-2.19	0.60	-2.15	0.61	0.84	1.21	
3	-2.21	0.60	-2.18	0.61	0.82	1.21	
4	-2.23	0.60	-2.19	0.60	0.80	1.20	
5	-2.25	0.60	-2.21	0.60	0.78	1.20	
6	-2.19	0.60	-2.23	0.60	0.80	1.20	
7	-2.18	0.61	-2.21	0.60	0.82	1.21	
8	-2.19	0.60	-2.24	0.60	0.80	1.20	
9	-2.19	0.60	-2.18	0.61	0.83	1.21	
10	-2.20	0.60	-2.16	0.61	0.83	1.21	
11	-2.16	0.61	-2.18	0.61	0.84	1.21	
12	-2.17	0.61	-2.20	0.60	0.83	1.21	
13	-2.18	0.61	-2.21	0.60	0.82	1.21	
14	-2.19	0.60	-2.23	0.60	0.80	1.20	
15	-2.15	0.61	-2.20	0.60	0.84	1.21	

*Worst MCS

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

*The test was conducted by the use of Gate function.

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Maximum Peak Output Power

Test place : Ise EMC Lab. No.6 Measurement Room
Report No. : 10724035H
Date : 03/23/2015
Temperature/ Humidity : 22 deg. C / 42% RH
Engineer : Ken Fujita
Mode : BT LE Tx

Freq. [MHz]	Reading Peak [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
2402	-10.54	2.07	10.02	1.55	1.43	30.00	1000	28.45
2440	-10.57	2.08	10.02	1.53	1.42	30.00	1000	28.47
2480	-10.61	2.09	10.02	1.50	1.41	30.00	1000	28.50

Sample Calculation:

Result = Reading + Cable Loss + Attenuator

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Average Power
(For reporting purpose only)

Test place Ise EMC Lab. No.6 Measurement Room
Report No. 10724035H
Date 03/23/2015
Temperature/ Humidity 22 deg. C / 42% RH
Engineer Ken Fujita
Mode BT LE Tx

Freq. [MHz]	Reading Average [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
				[dBm]	[mW]
2402	-12.83	2.07	10.02	-0.74	0.84
2440	-12.87	2.08	10.02	-0.77	0.84
2480	-12.91	2.09	10.02	-0.80	0.83

Sample Calculation:

Result = Reading + Cable Loss + Attenuator

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Radiated Spurious Emission (Power Supply: Chicony)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber		
Report No.	10724035H		
Date	03/20/2015	03/23/2015	03/23/2015
Temperature/ Humidity	20deg. C / 55% RH	20deg. C / 37% RH	20deg. C / 37% RH
Engineer	Tomoki Matsui	Takafumi Noguchi	Keisuke Kawamura
	(1-10GHz)	(10-18GHz)	(18-26.5GHz)
Mode	11b Tx 2412MHz		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2390.000	PK	49.6	26.8	3.2	32.0	47.6	73.9	26.3	
Hori	2747.733	PK	61.0	27.1	3.5	31.7	59.9	73.9	14.0	
Hori	4824.000	PK	40.3	30.6	5.3	31.3	44.9	73.9	29.0	Floor Noise
Hori	7236.000	PK	42.1	35.9	6.6	32.0	52.6	73.9	21.3	Floor Noise
Hori	9648.000	PK	39.9	38.5	7.0	32.4	53.0	73.9	20.9	Floor Noise
Hori	2390.000	AV	40.5	26.8	3.2	32.0	38.5	53.9	15.4	
Hori	2747.733	AV	41.2	27.1	3.5	31.7	40.1	53.9	13.8	RBW: 1MHz / VBW: 10Hz
Hori	4824.000	AV	32.1	30.6	5.3	31.3	36.7	53.9	17.2	Floor Noise
Hori	7236.000	AV	33.8	35.9	6.6	32.0	44.3	53.9	9.6	Floor Noise
Hori	9648.000	AV	32.4	38.5	7.0	32.4	45.5	53.9	8.4	Floor Noise
Vert	2390.000	PK	46.4	26.8	3.2	32.0	44.4	73.9	29.5	
Vert	2747.733	PK	61.3	27.1	3.5	31.7	60.2	73.9	13.7	
Vert	4824.000	PK	41.9	30.6	5.3	31.3	46.5	73.9	27.4	Floor Noise
Vert	7236.000	PK	43.7	35.9	6.6	32.0	54.2	73.9	19.7	Floor Noise
Vert	9648.000	PK	41.0	38.5	7.0	32.4	54.1	73.9	19.8	Floor Noise
Vert	2390.000	AV	38.2	26.8	3.2	32.0	36.2	53.9	17.7	
Vert	2747.733	AV	41.3	27.1	3.5	31.7	40.2	53.9	13.7	RBW: 1MHz / VBW: 10Hz
Vert	4824.000	AV	32.0	30.6	5.3	31.3	36.6	53.9	17.3	Floor Noise
Vert	7236.000	AV	33.8	35.9	6.6	32.0	44.3	53.9	9.6	Floor Noise
Vert	9648.000	AV	32.5	38.5	7.0	32.4	45.6	53.9	8.3	Floor Noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2412.000	PK	103.0	26.8	3.2	32.0	101.0	-	-	Carrier
Hori	2396.970	PK	52.3	26.8	3.2	32.0	50.3	81.0	30.7	
Hori	2400.000	PK	46.0	26.8	3.2	32.0	44.0	81.0	37.0	
Vert	2412.000	PK	99.3	26.8	3.2	32.0	97.3	-	-	Carrier
Vert	2399.167	PK	46.1	26.8	3.2	32.0	44.1	77.3	33.2	
Vert	2400.000	PK	42.1	26.8	3.2	32.0	40.1	77.3	37.2	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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Radiated Spurious Emission (Power Supply: Chicony)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber		
Report No.	10724035H		
Date	03/20/2015	03/23/2015	03/23/2015
Temperature/ Humidity	20deg. C / 55% RH	20deg. C / 37% RH	20deg. C / 37% RH
Engineer	Tomoki Matsui (1-10GHz)	Takafumi Noguchi (10-18GHz)	Keisuke Kawamura (18-26.5GHz)
Mode	11b Tx 2437MHz		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2741.250	PK	62.6	27.1	3.5	31.7	61.5	73.9	12.4	
Hori	4874.000	PK	40.6	30.7	5.3	31.3	45.3	73.9	28.6	Floor Noise
Hori	7311.000	PK	42.8	35.9	6.5	32.0	53.2	73.9	20.7	Floor Noise
Hori	9748.000	PK	39.9	38.7	7.1	32.4	53.3	73.9	20.6	Floor Noise
Hori	2741.250	AV	42.1	27.1	3.5	31.7	41.0	53.9	12.9	RBW: 1MHz / VBW: 10Hz
Hori	4874.000	AV	32.3	30.7	5.3	31.3	37.0	53.9	16.9	Floor Noise
Hori	7311.000	AV	33.8	35.9	6.5	32.0	44.2	53.9	9.7	Floor Noise
Hori	9748.000	AV	32.1	38.7	7.1	32.4	45.5	53.9	8.4	Floor Noise
Vert	2743.900	PK	59.9	27.1	3.5	31.7	58.8	73.9	15.1	
Vert	4874.000	PK	41.1	30.7	5.3	31.3	45.8	73.9	28.1	Floor Noise
Vert	7311.000	PK	41.4	35.9	6.5	32.0	51.8	73.9	22.1	Floor Noise
Vert	9748.000	PK	42.2	38.7	7.1	32.4	55.6	73.9	18.3	Floor Noise
Vert	2743.900	AV	34.6	27.1	3.5	31.7	33.5	53.9	20.4	RBW: 1MHz / VBW: 10Hz
Vert	4874.000	AV	32.2	30.7	5.3	31.3	36.9	53.9	17.0	Floor Noise
Vert	7311.000	AV	33.9	35.9	5.6	32.0	43.4	53.9	10.5	Floor Noise
Vert	9748.000	AV	31.0	38.7	7.1	32.4	44.4	53.9	9.5	Floor Noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB

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Radiated Spurious Emission (Power Supply: Chicony)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber		
Report No.	10724035H		
Date	03/20/2015	03/23/2015	03/23/2015
Temperature/ Humidity	20deg. C / 55% RH	20deg. C / 37% RH	20deg. C / 37% RH
Engineer	Tomoki Matsui	Takafumi Noguchi	Keisuke Kawamura
	(1-10GHz)	(10-18GHz)	(18-26.5GHz)
Mode	11b Tx 2462MHz		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2483.500	PK	49.5	26.9	3.2	32.0	47.6	73.9	26.3	
Hori	2741.580	PK	61.4	27.1	3.5	31.7	60.3	73.9	13.6	
Hori	4924.000	PK	40.4	30.8	5.3	31.3	45.2	73.9	28.7	Floor Noise
Hori	7386.000	PK	42.6	35.9	6.5	32.1	52.9	73.9	21.0	Floor Noise
Hori	9848.000	PK	39.9	38.8	7.1	32.5	53.3	73.9	20.6	Floor Noise
Hori	2483.500	AV	40.8	26.9	3.2	32.0	38.9	53.9	15.0	
Hori	2741.580	AV	41.9	27.1	3.5	31.7	40.8	53.9	13.1	RBW: 1MHz / VBW: 10Hz
Hori	4924.000	AV	32.1	30.8	5.3	31.3	36.9	53.9	17.0	Floor Noise
Hori	7386.000	AV	33.7	35.9	6.5	32.1	44.0	53.9	9.9	Floor Noise
Hori	9848.000	AV	32.0	38.8	7.1	32.5	45.4	53.9	8.5	Floor Noise
Vert	2483.500	PK	45.6	26.9	3.2	32.0	43.7	73.9	30.2	
Vert	2742.670	PK	60.4	27.1	3.5	31.7	59.3	73.9	14.6	
Vert	4924.000	PK	40.0	30.8	5.3	31.3	44.8	73.9	29.1	Floor Noise
Vert	7386.000	PK	43.2	35.9	6.5	32.1	53.5	73.9	20.4	Floor Noise
Vert	9848.000	PK	42.0	38.8	7.1	32.5	55.4	73.9	18.5	Floor Noise
Vert	2483.500	AV	36.7	26.9	3.2	32.0	34.8	53.9	19.1	
Vert	2742.670	AV	40.7	27.1	3.5	31.7	39.6	53.9	14.3	RBW: 1MHz / VBW: 10Hz
Vert	4924.000	AV	32.2	30.8	5.3	31.3	37.0	53.9	16.9	Floor Noise
Vert	7386.000	AV	33.6	35.9	6.5	32.1	43.9	53.9	10.0	Floor Noise
Vert	9848.000	AV	32.0	38.8	7.1	32.5	45.4	53.9	8.5	Floor Noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB

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Radiated Spurious Emission (Power Supply: Chicony)

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 10724035H
Date : 03/20/2015 03/23/2015 03/23/2015
Temperature/ Humidity : 20deg. C / 55% RH 20deg. C / 37% RH 20deg. C / 37% RH
Engineer : Tomoki Matsui Takafumi Noguchi Keisuke Kawamura
Mode : 11n-20 Tx 2412MHz
(1-10GHz) (10-18GHz) (18-26.5GHz)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2390.000	PK	68.0	26.8	3.2	32.0	66.0	73.9	7.9	
Hori	2734.420	PK	62.1	27.1	3.4	31.7	60.9	73.9	13.0	
Hori	4824.000	PK	40.7	30.6	5.3	31.3	45.3	73.9	28.6	Floor Noise
Hori	7236.000	PK	42.3	35.9	6.6	32.0	52.8	73.9	21.1	Floor Noise
Hori	9648.000	PK	39.9	38.5	7.0	32.4	53.0	73.9	20.9	Floor Noise
Hori	2390.000	AV	50.7	26.8	3.2	32.0	48.7	53.9	5.2	
Hori	2734.420	AV	42.1	27.1	3.4	31.7	40.9	53.9	13.0	RBW: 1MHz / VBW: 10Hz
Hori	4824.000	AV	32.0	30.6	5.3	31.3	36.6	53.9	17.3	Floor Noise
Hori	7236.000	AV	33.8	35.9	6.6	32.0	44.3	53.9	9.6	Floor Noise
Hori	9648.000	AV	31.9	38.5	7.0	32.4	45.0	53.9	8.9	Floor Noise
Vert	2390.000	PK	71.6	26.8	3.2	32.0	69.6	73.9	4.3	
Vert	2745.720	PK	59.0	27.1	3.5	31.7	57.9	73.9	16.0	
Vert	4824.000	PK	40.6	30.6	5.3	31.3	45.2	73.9	28.7	Floor Noise
Vert	7236.000	PK	42.6	35.9	6.6	32.0	53.1	73.9	20.8	Floor Noise
Vert	9648.000	PK	42.5	38.5	7.0	32.4	55.6	73.9	18.3	Floor Noise
Vert	2390.000	AV	53.6	26.8	3.2	32.0	51.6	53.9	2.3	
Vert	2745.720	AV	39.7	27.1	3.5	31.7	38.6	53.9	15.3	RBW: 1MHz / VBW: 10Hz
Vert	4824.000	AV	32.2	30.6	5.3	31.3	36.8	53.9	17.1	Floor Noise
Vert	7236.000	AV	33.9	35.9	6.6	32.0	44.4	53.9	9.5	Floor Noise
Vert	9648.000	AV	32.0	38.5	7.0	32.4	45.1	53.9	8.8	Floor Noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2412.000	PK	100.4	26.8	3.2	32.0	98.4	-	-	Carrier
Hori	2396.000	PK	62.8	26.8	3.2	32.0	60.8	78.4	17.6	
Hori	2400.000	PK	57.0	26.8	3.2	32.0	55.0	78.4	23.4	
Vert	2412.000	PK	100.9	26.8	3.2	32.0	98.9	-	-	Carrier
Vert	2395.766	PK	61.0	26.8	3.2	32.0	59.0	78.9	19.9	
Vert	2400.000	PK	60.1	26.8	3.2	32.0	58.1	78.9	20.8	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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Radiated Spurious Emission (Power Supply: Chicony)

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 10724035H
Date : 03/20/2015 03/23/2015 03/23/2015
Temperature/ Humidity : 20deg. C / 55% RH 20deg. C / 37% RH 20deg. C / 37% RH
Engineer : Tomoki Matsui Takafumi Noguchi Keisuke Kawamura
(1-10GHz) (10-18GHz) (18-26.5GHz, Below 1GHz)
Mode : 11n-20 Tx 2437MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	68.977	QP	48.4	6.2	7.6	32.1	30.1	40.0	9.9	
Hori	100.811	QP	43.4	10.2	8.1	32.3	29.4	43.5	14.1	
Hori	148.503	QP	44.7	14.9	8.6	32.2	36.0	43.5	7.5	
Hori	256.658	QP	44.4	17.5	9.5	32.0	39.4	46.0	6.6	
Hori	593.741	QP	31.0	19.4	11.8	32.1	30.1	46.0	15.9	
Hori	742.505	QP	39.4	21.2	12.6	31.9	41.3	46.0	4.7	
Hori	2745.420	PK	62.4	27.1	3.5	31.7	61.3	73.9	12.6	
Hori	4874.000	PK	40.2	30.7	5.3	31.3	44.9	73.9	29.0	Floor Noise
Hori	7311.000	PK	42.8	35.9	6.5	32.0	53.2	73.9	20.7	Floor Noise
Hori	9748.000	PK	39.9	38.7	7.1	32.4	53.3	73.9	20.6	Floor Noise
Hori	2745.420	AV	42.2	27.1	3.5	31.7	41.1	53.9	12.8	RBW: 1MHz / VBW: 10Hz
Hori	4874.000	AV	32.3	30.7	5.3	31.3	37.0	53.9	16.9	Floor Noise
Hori	7311.000	AV	33.6	35.9	6.5	32.0	44.0	53.9	9.9	Floor Noise
Hori	9748.000	AV	31.8	38.7	7.1	32.4	45.2	53.9	8.7	Floor Noise
Vert	43.651	QP	44.9	12.8	7.2	32.2	32.7	40.0	7.3	
Vert	100.811	QP	47.8	10.2	8.1	32.3	33.8	43.5	9.7	
Vert	148.503	QP	45.6	14.9	8.6	32.2	36.9	43.5	6.6	
Vert	256.658	QP	39.1	17.5	9.5	32.0	34.1	46.0	11.9	
Vert	597.881	QP	29.9	19.4	11.8	32.1	29.0	46.0	17.0	
Vert	742.505	QP	41.1	21.2	12.6	31.9	43.0	46.0	3.0	
Vert	2745.480	PK	60.4	27.1	3.5	31.7	59.3	73.9	14.6	
Vert	4874.000	PK	40.8	30.7	5.3	31.3	45.5	73.9	28.4	Floor Noise
Vert	7311.000	PK	43.0	35.9	6.5	32.0	53.4	73.9	20.5	Floor Noise
Vert	9748.000	PK	42.1	38.7	7.1	32.4	55.5	73.9	18.4	Floor Noise
Vert	2745.480	AV	40.6	27.1	3.5	31.7	39.5	53.9	14.4	RBW: 1MHz / VBW: 10Hz
Vert	4874.000	AV	32.3	30.7	5.3	31.3	37.0	53.9	16.9	Floor Noise
Vert	7311.000	AV	34.0	35.9	6.5	32.0	44.4	53.9	9.5	Floor Noise
Vert	9748.000	AV	33.3	38.7	7.1	32.4	46.7	53.9	7.2	Floor Noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB

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Radiated Spurious Emission (Power Supply: Chicony)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber		
Report No.	10724035H		
Date	03/20/2015	03/23/2015	03/23/2015
Temperature/ Humidity	20deg. C / 55% RH	20deg. C / 37% RH	20deg. C / 37% RH
Engineer	Tomoki Matsui	Takafumi Noguchi	Keisuke Kawamura
	(1-10GHz)	(10-18GHz)	(18-26.5GHz)
Mode	11n-20 Tx 2462MHz		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2483.500	PK	65.9	26.9	3.2	32.0	64.0	73.9	9.9	
Hori	2748.000	PK	61.3	27.1	3.5	31.7	60.2	73.9	13.7	
Hori	4924.000	PK	40.6	30.8	5.3	31.3	45.4	73.9	28.5	Floor Noise
Hori	7386.000	PK	42.6	35.9	6.5	32.1	52.9	73.9	21.0	Floor Noise
Hori	9848.000	PK	39.9	38.8	7.1	32.5	53.3	73.9	20.6	Floor Noise
Hori	2483.500	AV	50.1	26.9	3.2	32.0	48.2	53.9	5.7	
Hori	2748.000	AV	40.7	27.1	3.5	31.7	39.6	53.9	14.3	RBW: 1MHz / VBW: 10Hz
Hori	4924.000	AV	32.5	30.8	5.3	31.3	37.3	53.9	16.6	Floor Noise
Hori	7386.000	AV	33.6	35.9	6.5	32.1	43.9	53.9	10.0	Floor Noise
Hori	9848.000	AV	39.7	38.8	7.1	32.5	53.1	53.9	0.8	Floor Noise
Vert	2483.500	PK	72.6	26.9	3.2	32.0	70.7	73.9	3.2	
Vert	2742.500	PK	59.6	27.1	3.5	31.7	58.5	73.9	15.4	
Vert	4924.000	PK	42.6	30.8	5.3	31.3	47.4	73.9	26.5	Floor Noise
Vert	7386.000	PK	31.8	35.9	6.5	32.1	42.1	73.9	31.8	Floor Noise
Vert	9848.000	PK	42.1	38.8	7.1	32.5	55.5	73.9	18.4	Floor Noise
Vert	2483.500	AV	54.0	26.9	3.2	32.0	52.1	53.9	1.8	
Vert	2742.500	AV	40.2	27.1	3.5	31.7	39.1	53.9	14.8	RBW: 1MHz / VBW: 10Hz
Vert	4924.000	AV	31.6	30.8	5.3	31.3	36.4	53.9	17.5	Floor Noise
Vert	7386.000	AV	33.3	35.9	6.5	32.1	43.6	53.9	10.3	Floor Noise
Vert	9848.000	AV	32.9	38.8	7.1	32.5	46.3	53.9	7.6	Floor Noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB

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Radiated Spurious Emission (Power Supply: Chicony)

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 10724035H
Date : 03/20/2015 03/23/2015 03/23/2015 03/24/2015
Temperature/ Humidity : 20deg. C / 55% RH 20deg. C / 37% RH 20deg. C / 37% RH 18deg. C / 31% RH
Engineer : Takumi Shimada Takafumi Noguchi Keisuke Kawamura Takafumi Noguchi
(1-10GHz) (10-18GHz) (18-26.5GHz) (Below 1GHz)
Mode : BT LE Tx 2402MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	68.936	QP	47.8	6.2	7.6	32.1	-	29.5	40.0	10.5	
Hori	93.924	QP	45.8	9.1	8.0	32.2	-	30.7	43.5	12.8	
Hori	148.496	QP	44.5	14.9	8.6	32.2	-	35.8	43.5	7.7	
Hori	256.658	QP	42.8	17.5	9.5	32.0	-	37.8	46.0	8.2	
Hori	300.009	QP	45.7	14.7	10.0	32.0	-	38.4	46.0	7.6	
Hori	405.008	QP	34.2	17.6	10.6	32.0	-	30.4	46.0	15.6	
Hori	742.477	QP	42.0	21.2	12.6	31.9	-	43.9	46.0	2.1	
Hori	2390.000	PK	55.2	26.8	3.2	32.0	-	53.2	73.9	20.7	
Hori	2749.638	PK	62.3	27.1	3.5	31.7	-	61.2	73.9	12.7	
Hori	4804.000	PK	42.2	30.6	5.2	31.3	-	46.7	73.9	27.2	
Hori	7206.000	PK	43.0	35.9	6.6	32.0	-	53.5	73.9	20.4	
Hori	9608.000	PK	42.3	38.4	7.0	32.4	-	55.3	73.9	18.6	
Hori	2390.000	AV	38.4	26.8	3.2	32.0	2.0	38.4	53.9	15.5	*1)
Hori	2749.638	AV	41.0	27.1	3.5	31.7	-	39.9	53.9	14.0	
Hori	4804.000	AV	35.9	30.6	5.2	31.3	2.0	42.4	53.9	11.5	
Hori	7206.000	AV	34.0	35.9	6.6	32.0	-	44.5	53.9	9.4	Floor Noise
Hori	9608.000	AV	34.4	38.4	7.0	32.4	-	47.4	53.9	6.5	Floor Noise
Vert	47.373	QP	45.1	11.5	7.3	32.2	-	31.7	40.0	8.3	
Vert	72.932	QP	46.8	6.3	7.7	32.1	-	28.7	40.0	11.3	
Vert	92.698	QP	46.1	8.9	7.9	32.2	-	30.7	43.5	12.8	
Vert	148.497	QP	42.5	14.9	8.6	32.2	-	33.8	43.5	9.7	
Vert	264.359	QP	36.0	17.9	9.7	32.0	-	31.6	46.0	14.4	
Vert	405.008	QP	38.0	17.6	10.6	32.0	-	34.2	46.0	11.8	
Vert	742.476	QP	41.3	21.2	12.6	31.9	-	43.2	46.0	2.8	
Vert	2390.000	PK	62.6	26.8	3.2	32.0	-	60.6	73.9	13.3	
Vert	2748.777	PK	61.6	27.1	3.5	31.7	-	60.5	73.9	13.4	
Vert	4804.000	PK	43.7	30.6	5.2	31.3	-	48.2	73.9	25.7	
Vert	7206.000	PK	42.3	35.9	6.6	32.0	-	52.8	73.9	21.1	
Vert	9608.000	PK	43.0	38.4	7.0	32.4	-	56.0	73.9	17.9	
Vert	2390.000	AV	43.9	26.8	3.2	32.0	2.0	43.9	53.9	10.0	*1)
Vert	2748.777	AV	38.5	27.1	3.5	31.7	-	37.4	53.9	16.5	
Vert	4804.000	AV	36.1	30.6	5.2	31.3	2.0	42.6	53.9	11.3	
Vert	7206.000	AV	33.8	35.9	6.6	32.0	-	44.3	53.9	9.6	Floor Noise
Vert	9608.000	AV	34.2	38.4	7.0	32.4	-	47.2	53.9	6.7	Floor Noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier) + Duty Factor

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

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB

*1) Not Out of Band emission(Leakage Power)

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2402.000	PK	100.0	26.8	3.2	32.0	98.0	-	-	Carrier
Hori	2400.000	PK	55.1	26.8	3.2	32.0	53.1	78.0	24.9	
Vert	2402.000	PK	107.2	26.8	3.2	32.0	105.2	-	-	Carrier
Vert	2400.000	PK	62.1	26.8	3.2	32.0	60.1	85.2	25.1	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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Radiated Spurious Emission (Power Supply: Chicony)

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 10724035H
Date : 03/20/2015 03/23/2015 03/23/2015 03/24/2015
Temperature/Humidity : 20deg. C / 55% RH 20deg. C / 37% RH 20deg. C / 37% RH 18deg. C / 31% RH
Engineer : Takumi Shimada Takafumi Noguchi Keisuke Kawamura Keisuke Kawamura
 (1-10GHz) (10-18GHz) (18-26.5GHz) (30M-1000MHz)
Mode : BT LE Tx 2440MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	47.551	QP	35.7	11.5	7.3	32.2	-	22.3	40.0	17.7	
Hori	92.691	QP	47.5	8.9	7.9	32.2	-	32.1	43.5	11.4	
Hori	148.503	QP	39.8	14.9	8.6	32.2	-	31.1	43.5	12.4	
Hori	301.167	QP	41.4	14.7	10.0	32.0	-	34.1	46.0	11.9	
Hori	405.009	QP	34.5	17.6	10.6	32.0	-	30.7	46.0	15.3	
Hori	742.489	QP	39.8	21.2	12.6	31.9	-	41.7	46.0	4.3	
Hori	2749.623	PK	65.9	27.1	3.5	31.7	-	64.8	73.9	9.1	
Hori	4880.000	PK	41.8	30.8	5.3	31.3	-	46.6	73.9	27.3	Floor Noise
Hori	7320.000	PK	42.4	35.9	6.5	32.0	-	52.8	73.9	21.1	Floor Noise
Hori	9760.000	PK	42.5	38.7	7.1	32.5	-	55.8	73.9	18.1	Floor Noise
Hori	2749.623	AV	42.9	27.1	3.5	31.7	-	41.8	53.9	12.1	RBW: 1MHz / VBW: 10Hz
Hori	4880.000	AV	34.5	30.8	5.3	31.3	2.0	41.3	53.9	12.6	
Hori	7320.000	AV	33.9	35.9	6.5	32.0	-	44.3	53.9	9.6	Floor Noise
Hori	9760.000	AV	33.8	38.7	7.1	32.5	-	47.1	53.9	6.8	Floor Noise
Vert	47.551	QP	44.4	11.5	7.3	32.2	-	31.0	40.0	9.0	
Vert	92.691	QP	46.1	8.9	7.9	32.2	-	30.7	43.5	12.8	
Vert	148.503	QP	41.7	14.9	8.6	32.2	-	33.0	43.5	10.5	
Vert	301.167	QP	39.0	14.7	10.0	32.0	-	31.7	46.0	14.3	
Vert	405.009	QP	38.2	17.6	10.6	32.0	-	34.4	46.0	11.6	
Vert	742.489	QP	40.6	21.2	12.6	31.9	-	42.5	46.0	3.5	
Vert	2749.858	PK	61.3	27.1	3.5	31.7	-	60.2	73.9	13.7	
Vert	4880.000	PK	42.6	30.8	5.3	31.3	-	47.4	73.9	26.5	Floor Noise
Vert	7320.000	PK	42.8	35.9	6.5	32.0	-	53.2	73.9	20.7	Floor Noise
Vert	9760.000	PK	42.6	38.7	7.1	32.5	-	55.9	73.9	18.0	Floor Noise
Vert	2749.858	AV	37.8	27.1	3.5	31.7	-	36.7	53.9	17.2	RBW: 1MHz / VBW: 10Hz
Vert	4880.000	AV	35.3	30.8	5.3	31.3	2.0	42.1	53.9	11.8	
Vert	7320.000	AV	33.8	35.9	6.5	32.0	-	44.2	53.9	9.7	Floor Noise
Vert	9760.000	AV	33.8	38.7	7.1	32.5	-	47.1	53.9	6.8	Floor Noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier) + Duty Factor

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

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB

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Radiated Spurious Emission (Power Supply: Chicony)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber			
Report No.	10724035H			
Date	03/20/2015	03/23/2015	03/23/2015	03/24/2015
Temperature/ Humidity	20deg. C / 55% RH	20deg. C / 37% RH	20deg. C / 37% RH	18deg. C / 31% RH
Engineer	Takumi Shimada (1-10GHz)	Takafumi Noguchi (10-18GHz)	Keisuke Kawamura (18-26.5GHz)	Keisuke Kawamura (30M-1000MHz)
Mode	BT LE Tx 2480MHz			

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	68.551	QP	45.7	6.3	7.6	32.1	-	27.5	40.0	12.5	
Hori	92.691	QP	45.6	8.9	7.9	32.2	-	30.2	43.5	13.3	
Hori	148.503	QP	43.2	14.9	8.6	32.2	-	34.5	43.5	9.0	
Hori	301.167	QP	42.9	14.7	10.0	32.0	-	35.6	46.0	10.4	
Hori	405.090	QP	34.2	17.6	10.6	32.0	-	30.4	46.0	15.6	
Hori	742.489	QP	41.2	21.2	12.6	31.9	-	43.1	46.0	2.9	
Hori	2483.500	PK	68.1	26.9	3.2	32.0	-	66.2	73.9	7.7	
Hori	2749.730	PK	63.7	27.1	3.5	31.7	-	62.6	73.9	11.3	
Hori	4960.000	PK	40.9	30.9	5.2	31.2	-	45.8	73.9	28.1	
Hori	7440.000	PK	42.7	35.9	6.6	32.1	-	53.1	73.9	20.8	Floor Noise
Hori	9920.000	PK	42.2	38.9	7.1	32.5	-	55.7	73.9	18.2	Floor Noise
Hori	2483.500	AV	49.0	26.9	3.2	32.0	2.0	49.1	53.9	4.8	*1)
Hori	2749.730	AV	40.2	27.1	3.5	31.7	-	39.1	53.9	14.8	RBW: 1MHz / VBW: 10Hz
Hori	4960.000	AV	32.7	30.9	5.2	31.2	2.0	39.6	53.9	14.3	
Hori	7440.000	AV	33.7	35.9	6.6	32.1	-	44.1	53.9	9.8	Floor Noise
Hori	9920.000	AV	33.6	38.9	7.1	32.5	-	47.1	53.9	6.8	Floor Noise
Vert	47.551	QP	44.0	11.5	7.3	32.2	-	30.6	40.0	9.4	
Vert	92.691	QP	44.2	8.9	7.9	32.2	-	28.8	43.5	14.7	
Vert	148.503	QP	43.4	14.9	8.6	32.2	-	34.7	43.5	8.8	
Vert	301.167	QP	39.4	14.7	10.0	32.0	-	32.1	46.0	13.9	
Vert	405.009	QP	37.7	17.6	10.6	32.0	-	33.9	46.0	12.1	
Vert	742.489	QP	41.7	21.2	12.6	31.9	-	43.6	46.0	2.4	
Vert	2483.500	PK	69.2	26.9	3.2	32.0	-	67.3	73.9	6.6	
Vert	2749.688	PK	63.1	27.1	3.5	31.7	-	62.0	73.9	11.9	
Vert	4960.000	PK	41.5	30.9	5.2	31.2	-	46.4	73.9	27.5	
Vert	7440.000	PK	42.5	35.9	6.6	32.1	-	52.9	73.9	21.0	Floor Noise
Vert	9920.000	PK	42.7	38.9	7.1	32.5	-	56.2	73.9	17.7	Floor Noise
Vert	2483.500	AV	53.0	26.9	3.2	32.0	2.0	53.1	53.9	0.8	*1)
Vert	2749.688	AV	40.3	27.1	3.5	31.7	-	39.2	53.9	14.7	RBW: 1MHz / VBW: 10Hz
Vert	4960.000	AV	33.2	30.9	5.2	31.2	2.0	40.1	53.9	13.8	
Vert	7440.000	AV	33.8	35.9	6.6	32.1	-	44.2	53.9	9.7	Floor Noise
Vert	9920.000	AV	33.7	38.9	7.1	32.5	-	47.2	53.9	6.7	Floor Noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier) + Duty Factor

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

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB

*1) Not Out of Band emission(Leakage Power)

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Radiated Spurious Emission (Power Supply: DELTA)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber		
Report No.	10724035H		
Date	03/22/2015	03/23/2015	03/23/2015
Temperature/ Humidity	20deg. C / 42% RH	20deg. C / 37% RH	20deg. C / 37% RH
Engineer	Keisuke Kawamura (1-10GHz)	Takafumi Noguchi (10-18GHz)	Keisuke Kawamura (18-26.5GHz)
Mode	11b Tx 2412MHz		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2390.000	PK	49.0	26.8	3.2	32.0	47.0	73.9	26.9	
Hori	2740.171	PK	58.8	27.1	3.5	31.7	57.7	73.9	16.2	
Hori	4824.000	PK	40.1	30.6	5.3	31.3	44.7	73.9	29.2	Floor Noise
Hori	7236.000	PK	42.4	35.9	6.6	32.0	52.9	73.9	21.0	Floor Noise
Hori	9648.000	PK	39.8	38.5	7.0	32.4	52.9	73.9	21.0	Floor Noise
Hori	2390.000	AV	39.6	26.8	3.2	32.0	37.6	53.9	16.3	
Hori	2740.171	AV	41.6	27.1	3.5	31.7	40.5	53.9	13.4	RBW: 1MHz / VBW: 10Hz
Hori	4824.000	AV	32.3	30.6	5.3	31.3	36.9	53.9	17.0	Floor Noise
Hori	7236.000	AV	33.7	35.9	6.6	32.0	44.2	53.9	9.7	Floor Noise
Hori	9648.000	AV	32.1	38.5	7.0	32.4	45.2	53.9	8.7	Floor Noise
Vert	2390.000	PK	48.0	26.8	3.2	32.0	46.0	73.9	27.9	
Vert	2740.171	PK	56.2	27.1	3.5	31.7	55.1	73.9	18.8	
Vert	4824.000	PK	40.0	30.6	5.3	31.3	44.6	73.9	29.3	Floor Noise
Vert	7236.000	PK	41.1	35.9	6.6	32.0	51.6	73.9	22.3	Floor Noise
Vert	9648.000	PK	42.6	38.5	7.0	32.4	55.7	73.9	18.2	Floor Noise
Vert	2390.000	AV	39.1	26.8	3.2	32.0	37.1	53.9	16.8	
Vert	2740.171	AV	40.9	27.1	3.5	31.7	39.8	53.9	14.1	RBW: 1MHz / VBW: 10Hz
Vert	4824.000	AV	32.0	30.6	5.3	31.3	36.6	53.9	17.3	Floor Noise
Vert	7236.000	AV	33.9	35.9	6.6	32.0	44.4	53.9	9.5	Floor Noise
Vert	9648.000	AV	32.1	38.5	7.0	32.4	45.2	53.9	8.7	Floor Noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2412.000	PK	105.3	26.8	3.2	32.0	103.3	-	-	Carrier
Hori	2397.211	PK	56.4	26.8	3.2	32.0	54.4	83.3	28.9	
Hori	2400.000	PK	48.5	26.8	3.2	32.0	46.5	83.3	36.8	
Vert	2412.000	PK	103.2	26.8	3.2	32.0	101.2	-	-	Carrier
Vert	2397.211	PK	51.9	26.8	3.2	32.0	49.9	81.2	31.3	
Vert	2400.000	PK	45.1	26.8	3.2	32.0	43.1	81.2	38.1	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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Radiated Spurious Emission (Power Supply: DELTA)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber		
Report No.	10724035H		
Date	03/22/2015	03/23/2015	03/23/2015
Temperature/ Humidity	20deg. C / 42% RH	20deg. C / 37% RH	20deg. C / 37% RH
Engineer	Keisuke Kawamura (1-10GHz)	Takafumi Noguchi (10-18GHz)	Keisuke Kawamura (18-26.5GHz)
Mode	11b Tx 2437MHz		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2740.171	PK	57.3	27.1	3.5	31.7	56.2	73.9	17.7	
Hori	4874.000	PK	40.1	30.7	5.3	31.3	44.8	73.9	29.1	Floor Noise
Hori	7311.000	PK	42.4	35.9	6.5	32.0	52.8	73.9	21.1	Floor Noise
Hori	9748.000	PK	39.8	38.7	7.1	32.4	53.2	73.9	20.7	Floor Noise
Hori	2740.171	AV	41.0	27.1	3.5	31.7	39.9	53.9	14.0	RBW: 1MHz / VBW: 10Hz
Hori	4874.000	AV	32.3	30.7	5.3	31.3	37.0	53.9	16.9	Floor Noise
Hori	7311.000	AV	33.7	35.9	6.5	32.0	44.1	53.9	9.8	Floor Noise
Hori	9748.000	AV	32.1	38.7	7.1	32.4	45.5	53.9	8.4	Floor Noise
Vert	2740.171	PK	56.9	27.1	3.5	31.7	55.8	73.9	18.1	
Vert	4874.000	PK	40.0	30.7	5.3	31.3	44.7	73.9	29.2	Floor Noise
Vert	7311.000	PK	41.1	35.9	6.5	32.0	51.5	73.9	22.4	Floor Noise
Vert	9748.000	PK	42.6	38.7	7.1	32.4	56.0	73.9	17.9	Floor Noise
Vert	2740.171	AV	40.6	27.1	3.5	31.7	39.5	53.9	14.4	RBW: 1MHz / VBW: 10Hz
Vert	4874.000	AV	32.0	30.7	5.3	31.3	36.7	53.9	17.2	Floor Noise
Vert	7311.000	AV	33.9	35.9	6.5	32.0	44.3	53.9	9.6	Floor Noise
Vert	9748.000	AV	32.1	38.7	7.1	32.4	45.5	53.9	8.4	Floor Noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB

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Radiated Spurious Emission (Power Supply: DELTA)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber		
Report No.	10724035H		
Date	03/22/2015	03/23/2015	03/23/2015
Temperature/ Humidity	20deg. C / 42% RH	20deg. C / 37% RH	20deg. C / 37% RH
Engineer	Keisuke Kawamura (1-10GHz)	Takafumi Noguchi (10-18GHz)	Keisuke Kawamura (18-26.5GHz)
Mode	11b Tx 2462MHz		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2483.500	PK	50.1	26.9	3.2	32.0	48.2	73.9	25.7	
Hori	2740.171	PK	57.1	27.1	3.5	31.7	56.0	73.9	17.9	
Hori	4924.000	PK	40.1	30.8	5.3	31.3	44.9	73.9	29.0	Floor Noise
Hori	7386.000	PK	42.4	35.9	6.5	32.1	52.7	73.9	21.2	Floor Noise
Hori	9848.000	PK	39.8	38.8	7.1	32.5	53.2	73.9	20.7	Floor Noise
Hori	2483.500	AV	41.3	26.9	3.2	32.0	39.4	53.9	14.5	
Hori	2740.171	AV	40.6	27.1	3.5	31.7	39.5	53.9	14.4	RBW: 1MHz / VBW: 10Hz
Hori	4924.000	AV	32.3	30.8	5.3	31.3	37.1	53.9	16.8	Floor Noise
Hori	7386.000	AV	33.7	35.9	6.5	32.1	44.0	53.9	9.9	Floor Noise
Hori	9848.000	AV	32.1	38.8	7.1	32.5	45.5	53.9	8.4	Floor Noise
Vert	2483.500	PK	49.6	26.9	3.2	32.0	47.7	73.9	26.2	
Vert	2740.171	PK	57.2	27.1	3.5	31.7	56.1	73.9	17.8	
Vert	4924.000	PK	40.0	30.8	5.3	31.3	44.8	73.9	29.1	Floor Noise
Vert	7386.000	PK	41.1	35.9	6.5	32.1	51.4	73.9	22.5	Floor Noise
Vert	9848.000	PK	42.6	38.8	7.1	32.5	56.0	73.9	17.9	Floor Noise
Vert	2483.500	AV	40.0	26.9	3.2	32.0	38.1	53.9	15.8	
Vert	2740.171	AV	41.1	27.1	3.5	31.7	40.0	53.9	13.9	RBW: 1MHz / VBW: 10Hz
Vert	4924.000	AV	32.0	30.8	5.3	31.3	36.8	53.9	17.1	Floor Noise
Vert	7386.000	AV	33.9	35.9	6.5	32.1	44.2	53.9	9.7	Floor Noise
Vert	9848.000	AV	32.1	38.8	7.1	32.5	45.5	53.9	8.4	Floor Noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB

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Radiated Spurious Emission (Power Supply: DELTA)

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 10724035H
Date : 03/22/2015 03/23/2015 03/23/2015
Temperature/ Humidity : 20deg. C / 42% RH 20deg. C / 37% RH 20deg. C / 37% RH
Engineer : Keisuke Kawamura Takafumi Noguchi Keisuke Kawamura
Mode : 11n-20 Tx 2412MHz (1-10GHz) (10-18GHz) (18-26.5GHz)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2390.000	PK	72.0	26.8	3.2	32.0	70.0	73.9	3.9	
Hori	2740.171	PK	65.0	27.1	3.5	31.7	63.9	73.9	10.0	
Hori	4824.000	PK	40.1	30.6	5.3	31.3	44.7	73.9	29.2	Floor Noise
Hori	7236.000	PK	42.4	35.9	6.6	32.0	52.9	73.9	21.0	Floor Noise
Hori	9648.000	PK	39.8	38.5	7.0	32.4	52.9	73.9	21.0	Floor Noise
Hori	2390.000	AV	55.1	26.8	3.2	32.0	53.1	53.9	0.8	
Hori	2740.171	AV	44.2	27.1	3.5	31.7	43.1	53.9	10.8	RBW: 1MHz / VBW: 10Hz
Hori	4824.000	AV	32.3	30.6	5.3	31.3	36.9	53.9	17.0	Floor Noise
Hori	7236.000	AV	33.7	35.9	6.6	32.0	44.2	53.9	9.7	Floor Noise
Hori	9648.000	AV	32.1	38.5	7.0	32.4	45.2	53.9	8.7	Floor Noise
Vert	2390.000	PK	71.0	26.8	3.2	32.0	69.0	73.9	4.9	
Vert	2740.171	PK	60.3	27.1	3.5	31.7	59.2	73.9	14.7	
Vert	4824.000	PK	40.0	30.6	5.3	31.3	44.6	73.9	29.3	Floor Noise
Vert	7236.000	PK	41.1	35.9	6.6	32.0	51.6	73.9	22.3	Floor Noise
Vert	9648.000	PK	42.6	38.5	7.0	32.4	55.7	73.9	18.2	Floor Noise
Vert	2390.000	AV	53.3	26.8	3.2	32.0	51.3	53.9	2.6	
Vert	2740.171	AV	42.6	27.1	3.5	31.7	41.5	53.9	12.4	RBW: 1MHz / VBW: 10Hz
Vert	4824.000	AV	32.0	30.6	5.3	31.3	36.6	53.9	17.3	Floor Noise
Vert	7236.000	AV	33.9	35.9	6.6	32.0	44.4	53.9	9.5	Floor Noise
Vert	9648.000	AV	32.1	38.5	7.0	32.4	45.2	53.9	8.7	Floor Noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2412.000	PK	104.4	26.8	3.2	32.0	102.4	-	-	Carrier
Hori	2395.133	PK	62.5	26.8	3.2	32.0	60.5	82.4	21.9	
Hori	2400.000	PK	61.6	26.8	3.2	32.0	59.6	82.4	22.8	
Vert	2412.000	PK	101.4	26.8	3.2	32.0	99.4	-	-	Carrier
Vert	2395.133	PK	61.2	26.8	3.2	32.0	59.2	79.4	20.2	
Vert	2400.000	PK	59.3	26.8	3.2	32.0	57.3	79.4	22.1	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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Radiated Spurious Emission (Power Supply: DELTA)

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 10724035H
Date : 03/22/2015 03/23/2015 03/23/2015
Temperature/ Humidity : 20deg. C / 42% RH 20deg. C / 37% RH 20deg. C / 37% RH
Engineer : Keisuke Kawamura Takafumi Noguchi Keisuke Kawamura
Mode : 11n-20 Tx 2437MHz (1-10GHz) (10-18GHz) (18-26.5GHz, Below 1GHz)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	31.255	QP	37.4	17.0	7.0	32.3	29.1	40.0	10.9	
Hori	68.977	QP	48.8	6.2	7.6	32.1	30.5	40.0	9.5	
Hori	148.503	QP	44.0	14.9	8.6	32.2	35.3	43.5	8.2	
Hori	256.658	QP	35.2	17.5	9.5	32.0	30.2	46.0	15.8	
Hori	500.000	QP	34.8	18.2	11.2	32.1	32.1	46.0	13.9	
Hori	742.505	QP	38.6	21.2	12.6	31.9	40.5	46.0	5.5	
Hori	2740.171	PK	57.3	27.1	3.5	31.7	56.2	73.9	17.7	
Hori	4874.000	PK	40.1	30.7	5.3	31.3	44.8	73.9	29.1	Floor Noise
Hori	7311.000	PK	42.4	35.9	6.5	32.0	52.8	73.9	21.1	Floor Noise
Hori	9748.000	PK	39.8	38.7	7.1	32.4	53.2	73.9	20.7	Floor Noise
Hori	2740.171	AV	41.0	27.1	3.5	31.7	39.9	53.9	14.0	RBW: 1MHz / VBW: 10Hz
Hori	4874.000	AV	32.3	30.7	5.3	31.3	37.0	53.9	16.9	Floor Noise
Hori	7311.000	AV	33.7	35.9	6.5	32.0	44.1	53.9	9.8	Floor Noise
Hori	9748.000	AV	32.1	38.7	7.1	32.4	45.5	53.9	8.4	Floor Noise
Vert	31.255	QP	39.5	17.0	7.0	32.3	31.2	40.0	8.8	
Vert	43.651	QP	42.9	12.8	7.2	32.2	30.7	40.0	9.3	
Vert	148.503	QP	44.7	14.9	8.6	32.2	36.0	43.5	7.5	
Vert	256.658	QP	31.6	17.5	9.5	32.0	26.6	46.0	19.4	
Vert	500.000	QP	35.0	18.2	11.2	32.1	32.3	46.0	13.7	
Vert	742.505	QP	39.9	21.2	12.6	31.9	41.8	46.0	4.2	
Vert	2740.171	PK	56.9	27.1	3.5	31.7	55.8	73.9	18.1	
Vert	4874.000	PK	40.0	30.7	5.3	31.3	44.7	73.9	29.2	Floor Noise
Vert	7311.000	PK	41.1	35.9	6.5	32.0	51.5	73.9	22.4	Floor Noise
Vert	9748.000	PK	42.6	38.7	7.1	32.4	56.0	73.9	17.9	Floor Noise
Vert	2740.171	AV	40.6	27.1	3.5	31.7	39.5	53.9	14.4	RBW: 1MHz / VBW: 10Hz
Vert	4874.000	AV	32.0	30.7	5.3	31.3	36.7	53.9	17.2	Floor Noise
Vert	7311.000	AV	33.9	35.9	6.5	32.0	44.3	53.9	9.6	Floor Noise
Vert	9748.000	AV	32.1	38.7	7.1	32.4	45.5	53.9	8.4	Floor Noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB

UL Japan, Inc.

Ise EMC Lab.

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Radiated Spurious Emission (Power Supply: DELTA)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber		
Report No.	10724035H		
Date	03/22/2015	03/23/2015	03/23/2015
Temperature/ Humidity	20deg. C / 42% RH	20deg. C / 37% RH	20deg. C / 37% RH
Engineer	Keisuke Kawamura (1-10GHz)	Takafumi Noguchi (10-18GHz)	Keisuke Kawamura (18-26.5GHz)
Mode	11n-20 Tx 2462MHz		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2483.500	PK	73.0	26.9	3.2	32.0	71.1	73.9	2.8	
Hori	2740.171	PK	57.1	27.1	3.5	31.7	56.0	73.9	17.9	
Hori	4924.000	PK	40.1	30.8	5.3	31.3	44.9	73.9	29.0	Floor Noise
Hori	7386.000	PK	42.4	35.9	6.5	32.1	52.7	73.9	21.2	Floor Noise
Hori	9848.000	PK	39.8	38.8	7.1	32.5	53.2	73.9	20.7	Floor Noise
Hori	2483.500	AV	52.3	26.9	3.2	32.0	50.4	53.9	3.5	
Hori	2740.171	AV	40.6	27.1	3.5	31.7	39.5	53.9	14.4	RBW: 1MHz / VBW: 10Hz
Hori	4924.000	AV	32.3	30.8	5.3	31.3	37.1	53.9	16.8	Floor Noise
Hori	7386.000	AV	33.7	35.9	6.5	32.1	44.0	53.9	9.9	Floor Noise
Hori	9848.000	AV	32.1	38.8	7.1	32.5	45.5	53.9	8.4	Floor Noise
Vert	2483.500	PK	70.6	26.9	3.2	32.0	68.7	73.9	5.2	
Vert	2740.171	PK	57.2	27.1	3.5	31.7	56.1	73.9	17.8	
Vert	4924.000	PK	40.0	30.8	5.3	31.3	44.8	73.9	29.1	Floor Noise
Vert	7386.000	PK	41.1	35.9	6.5	32.1	51.4	73.9	22.5	Floor Noise
Vert	9848.000	PK	42.6	38.8	7.1	32.5	56.0	73.9	17.9	Floor Noise
Vert	2483.500	AV	49.7	26.9	3.2	32.0	47.8	53.9	6.1	
Vert	2740.171	AV	41.1	27.1	3.5	31.7	40.0	53.9	13.9	RBW: 1MHz / VBW: 10Hz
Vert	4924.000	AV	32.0	30.8	5.3	31.3	36.8	53.9	17.1	Floor Noise
Vert	7386.000	AV	33.9	35.9	6.5	32.1	44.2	53.9	9.7	Floor Noise
Vert	9848.000	AV	32.1	38.8	7.1	32.5	45.5	53.9	8.4	Floor Noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB

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Radiated Spurious Emission (Power Supply: DELTA)

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 10724035H
Date : 03/21/2015 03/23/2015 03/23/2015 03/24/2015
Temperature/ Humidity : 20deg. C / 42% RH 20deg. C / 37% RH 20deg. C / 37% RH 18deg. C / 31% RH
Engineer : Keisuke Kawamura Takafumi Noguchi Keisuke Kawamura Takafumi Noguchi
(1-10GHz) (10-18GHz) (18-26.5GHz) (Below 1GHz)
Mode : BT LE Tx 2402MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	31.250	QP	34.4	17.0	7.0	32.3	-	26.1	40.0	13.9	
Hori	46.688	QP	37.9	11.7	7.3	32.2	-	24.7	40.0	15.3	
Hori	68.942	QP	47.9	6.2	7.6	32.1	-	29.6	40.0	10.4	
Hori	148.495	QP	46.9	14.9	8.6	32.2	-	38.2	43.5	5.3	
Hori	405.008	QP	34.6	17.6	10.6	32.0	-	30.8	46.0	15.2	
Hori	742.477	QP	38.6	21.2	12.6	31.9	-	40.5	46.0	5.5	
Hori	2390.000	PK	55.3	26.8	3.2	32.0	-	53.3	73.9	20.6	
Hori	2740.171	PK	63.8	27.1	3.5	31.7	-	62.7	73.9	11.2	
Hori	4804.000	PK	41.4	30.6	5.2	31.3	-	45.9	73.9	28.0	
Hori	7206.000	PK	42.2	35.9	6.6	32.0	-	52.7	73.9	21.2	Floor Noise
Hori	9608.000	PK	42.1	38.4	7.0	32.4	-	55.1	73.9	18.8	Floor Noise
Hori	2390.000	AV	40.4	26.8	3.2	32.0	2.0	40.4	53.9	13.5	*1)
Hori	2740.171	AV	43.5	27.1	3.5	31.7	-	42.4	53.9	11.5	RBW: 1MHz / VBW: 10Hz
Hori	4804.000	AV	33.7	30.6	5.2	31.3	2.0	40.2	53.9	13.7	
Hori	7206.000	AV	34.1	35.9	6.6	32.0	-	44.6	53.9	9.3	Floor Noise
Hori	9608.000	AV	33.9	38.4	7.0	32.4	-	46.9	53.9	7.0	Floor Noise
Vert	31.252	QP	40.2	17.0	7.0	32.3	-	31.9	40.0	8.1	
Vert	47.301	QP	45.6	11.5	7.3	32.2	-	32.2	40.0	7.8	
Vert	72.929	QP	46.8	6.3	7.7	32.1	-	28.7	40.0	11.3	
Vert	148.494	QP	44.1	14.9	8.6	32.2	-	35.4	43.5	8.1	
Vert	405.008	QP	38.1	17.6	10.6	32.0	-	34.3	46.0	11.7	
Vert	742.470	QP	41.5	21.2	12.6	31.9	-	43.4	46.0	2.6	
Vert	2390.000	PK	60.5	26.8	3.2	32.0	-	58.5	73.9	15.4	
Vert	2740.171	PK	56.3	27.1	3.5	31.7	-	55.2	73.9	18.7	
Vert	4804.000	PK	42.7	30.6	5.2	31.3	-	47.2	73.9	26.7	
Vert	7206.000	PK	41.7	35.9	6.6	32.0	-	52.2	73.9	21.7	Floor Noise
Vert	9608.000	PK	40.8	38.4	7.0	32.4	-	53.8	73.9	20.1	Floor Noise
Vert	2390.000	AV	46.0	26.8	3.2	32.0	2.0	46.0	53.9	7.9	*1)
Vert	2740.171	AV	39.3	27.1	3.5	31.7	-	38.2	53.9	15.7	RBW: 1MHz / VBW: 10Hz
Vert	4804.000	AV	35.0	30.6	5.2	31.3	2.0	41.5	53.9	12.4	
Vert	7206.000	AV	34.1	35.9	6.6	32.0	-	44.6	53.9	9.3	Floor Noise
Vert	9608.000	AV	33.8	38.4	7.0	32.4	-	46.8	53.9	7.1	Floor Noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier) + Duty Factor

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

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB

*1) Not Out of Band emission(Leakage Power)

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2402.000	PK	98.1	26.8	3.2	32.0	96.1	-	-	Carrier
Hori	2400.000	PK	53.7	26.8	3.2	32.0	51.7	76.1	24.4	
Vert	2402.000	PK	104.6	26.8	3.2	32.0	102.6	-	-	Carrier
Vert	2400.000	PK	59.8	26.8	3.2	32.0	57.8	82.6	24.8	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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Radiated Spurious Emission (Power Supply: DELTA)

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 10724035H
Date : 03/21/2015 03/23/2015 03/23/2015 03/24/2015
Temperature/ Humidity : 20deg. C / 42% RH 20deg. C / 37% RH 20deg. C / 37% RH 18deg. C / 31% RH
Engineer : Keisuke Kawamura Takafumi Noguchi Keisuke Kawamura Takafumi Noguchi
(1-10GHz) (10-18GHz) (18-26.5GHz) (Below 1GHz)
Mode : BT LE Tx 2440MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	31.251	QP	34.3	17.0	7.0	32.3	-	26.0	40.0	14.0	
Hori	46.692	QP	38.0	11.7	7.3	32.2	-	24.8	40.0	15.2	
Hori	68.940	QP	48.0	6.2	7.6	32.1	-	29.7	40.0	10.3	
Hori	148.493	QP	46.8	14.9	8.6	32.2	-	38.1	43.5	5.4	
Hori	405.008	QP	34.6	17.6	10.6	32.0	-	30.8	46.0	15.2	
Hori	742.481	QP	38.5	21.2	12.6	31.9	-	40.4	46.0	5.6	
Hori	2740.171	PK	57.8	27.1	3.5	31.7	-	56.7	73.9	17.2	
Hori	4880.000	PK	42.0	30.8	5.3	31.3	-	46.8	73.9	27.1	
Hori	7320.000	PK	42.2	35.9	6.5	32.0	-	52.6	73.9	21.3	Floor Noise
Hori	9760.000	PK	42.1	38.7	7.1	32.5	-	55.4	73.9	18.5	Floor Noise
Hori	2740.171	AV	41.4	27.1	3.5	31.7	-	40.3	53.9	13.6	RBW: 1MHz / VBW: 10Hz
Hori	4880.000	AV	33.3	30.8	5.3	31.3	2.0	40.1	53.9	13.8	
Hori	7320.000	AV	34.1	35.9	6.5	32.0	-	44.5	53.9	9.4	Floor Noise
Hori	9760.000	AV	33.9	38.7	7.1	32.5	-	47.2	53.9	6.7	Floor Noise
Vert	31.255	QP	40.1	17.0	7.0	32.3	-	31.8	40.0	8.2	
Vert	47.305	QP	45.7	11.5	7.3	32.2	-	32.3	40.0	7.7	
Vert	72.930	QP	46.7	6.3	7.7	32.1	-	28.6	40.0	11.4	
Vert	148.492	QP	44.2	14.9	8.6	32.2	-	35.5	43.5	8.0	
Vert	405.008	QP	38.3	17.6	10.6	32.0	-	34.5	46.0	11.5	
Vert	742.473	QP	41.4	21.2	12.6	31.9	-	43.3	46.0	2.7	
Vert	2740.171	PK	58.4	27.1	3.5	31.7	-	57.3	73.9	16.6	
Vert	4880.000	PK	41.8	30.8	5.3	31.3	-	46.6	73.9	27.3	
Vert	7320.000	PK	41.7	35.9	6.5	32.0	-	52.1	73.9	21.8	Floor Noise
Vert	9760.000	PK	40.8	38.7	7.1	32.5	-	54.1	73.9	19.8	Floor Noise
Vert	2740.171	AV	41.8	27.1	3.5	31.7	-	40.7	53.9	13.2	RBW: 1MHz / VBW: 10Hz
Vert	4880.000	AV	33.7	30.8	5.3	31.3	2.0	40.5	53.9	13.4	
Vert	7320.000	AV	34.1	35.9	6.5	32.0	-	44.5	53.9	9.4	Floor Noise
Vert	9760.000	AV	33.8	38.7	7.1	32.5	-	47.1	53.9	6.8	Floor Noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier) + Duty Factor

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

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB

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Facsimile : +81 596 24 8124

Radiated Spurious Emission (Power Supply: DELTA)

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 10724035H
Date : 03/21/2015 03/23/2015 03/23/2015 03/24/2015
Temperature/ Humidity : 20deg. C / 42% RH 20deg. C / 37% RH 20deg. C / 37% RH 18deg. C / 31% RH
Engineer : Keisuke Kawamura Takafumi Noguchi Keisuke Kawamura Takafumi Noguchi
Mode : BT LE Tx 2480MHz (1-10GHz) (10-18GHz) (18-26.5GHz) (Below 1GHz)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	31.249	QP	34.2	17.0	7.0	32.3	-	25.9	40.0	14.1	
Hori	46.699	QP	38.2	11.7	7.3	32.2	-	25.0	40.0	15.0	
Hori	68.942	QP	48.1	6.2	7.6	32.1	-	29.8	40.0	10.2	
Hori	148.494	QP	50.2	14.9	8.6	32.2	-	41.5	43.5	2.0	
Hori	405.008	QP	34.7	17.6	10.6	32.0	-	30.9	46.0	15.1	
Hori	742.477	QP	38.6	21.2	12.6	31.9	-	40.5	46.0	5.5	
Hori	2483.500	PK	66.1	26.9	3.2	32.0	-	64.2	73.9	9.7	
Hori	2740.171	PK	57.7	27.1	3.5	31.7	-	56.6	73.9	17.3	
Hori	4960.000	PK	40.3	30.9	5.2	31.2	-	45.2	73.9	28.7	Floor Noise
Hori	7440.000	PK	42.2	35.9	6.6	32.1	-	52.6	73.9	21.3	Floor Noise
Hori	9920.000	PK	42.1	38.9	7.1	32.5	-	55.6	73.9	18.3	Floor Noise
Hori	2483.500	AV	47.7	26.9	3.2	32.0	2.0	47.8	53.9	6.1	*1)
Hori	2740.171	AV	41.1	27.1	3.5	31.7	-	40.0	53.9	13.9	RBW: 1MHz / VBW: 10Hz
Hori	4960.000	AV	32.4	30.9	5.2	31.2	-	37.3	53.9	16.6	Floor Noise
Hori	7440.000	AV	34.1	35.9	6.6	32.1	-	44.5	53.9	9.4	Floor Noise
Hori	9920.000	AV	33.9	38.9	7.1	32.5	-	47.4	53.9	6.5	Floor Noise
Vert	31.258	QP	40.0	17.0	7.0	32.3	-	31.7	40.0	8.3	
Vert	47.310	QP	45.7	11.5	7.3	32.2	-	32.3	40.0	7.7	
Vert	72.932	QP	46.8	6.3	7.7	32.1	-	28.7	40.0	11.3	
Vert	148.494	QP	47.1	14.9	8.6	32.2	-	38.4	43.5	5.1	
Vert	405.008	QP	38.5	17.6	10.6	32.0	-	34.7	46.0	11.3	
Vert	742.469	QP	41.4	21.2	12.6	31.9	-	43.3	46.0	2.7	
Vert	2483.500	PK	69.5	26.9	3.2	32.0	-	67.6	73.9	6.3	
Vert	2740.171	PK	58.1	27.1	3.5	31.7	-	57.0	73.9	16.9	
Vert	4960.000	PK	41.4	30.9	5.2	31.2	-	46.3	73.9	27.6	Floor Noise
Vert	7440.000	PK	41.7	35.9	6.6	32.1	-	52.1	73.9	21.8	Floor Noise
Vert	9920.000	PK	40.8	38.9	7.1	32.5	-	54.3	73.9	19.6	Floor Noise
Vert	2483.500	AV	50.5	26.9	3.2	32.0	2.0	50.6	53.9	3.3	*1)
Vert	2740.171	AV	41.6	27.1	3.5	31.7	-	40.5	53.9	13.4	RBW: 1MHz / VBW: 10Hz
Vert	4960.000	AV	32.4	30.9	5.2	31.2	-	37.3	53.9	16.6	Floor Noise
Vert	7440.000	AV	34.1	35.9	6.6	32.1	-	44.5	53.9	9.4	Floor Noise
Vert	9920.000	AV	33.8	38.9	7.1	32.5	-	47.3	53.9	6.6	Floor Noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier) + Duty Factor

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

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB

*1) Not Out of Band emission(Leakage Power)

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Ise EMC Lab.

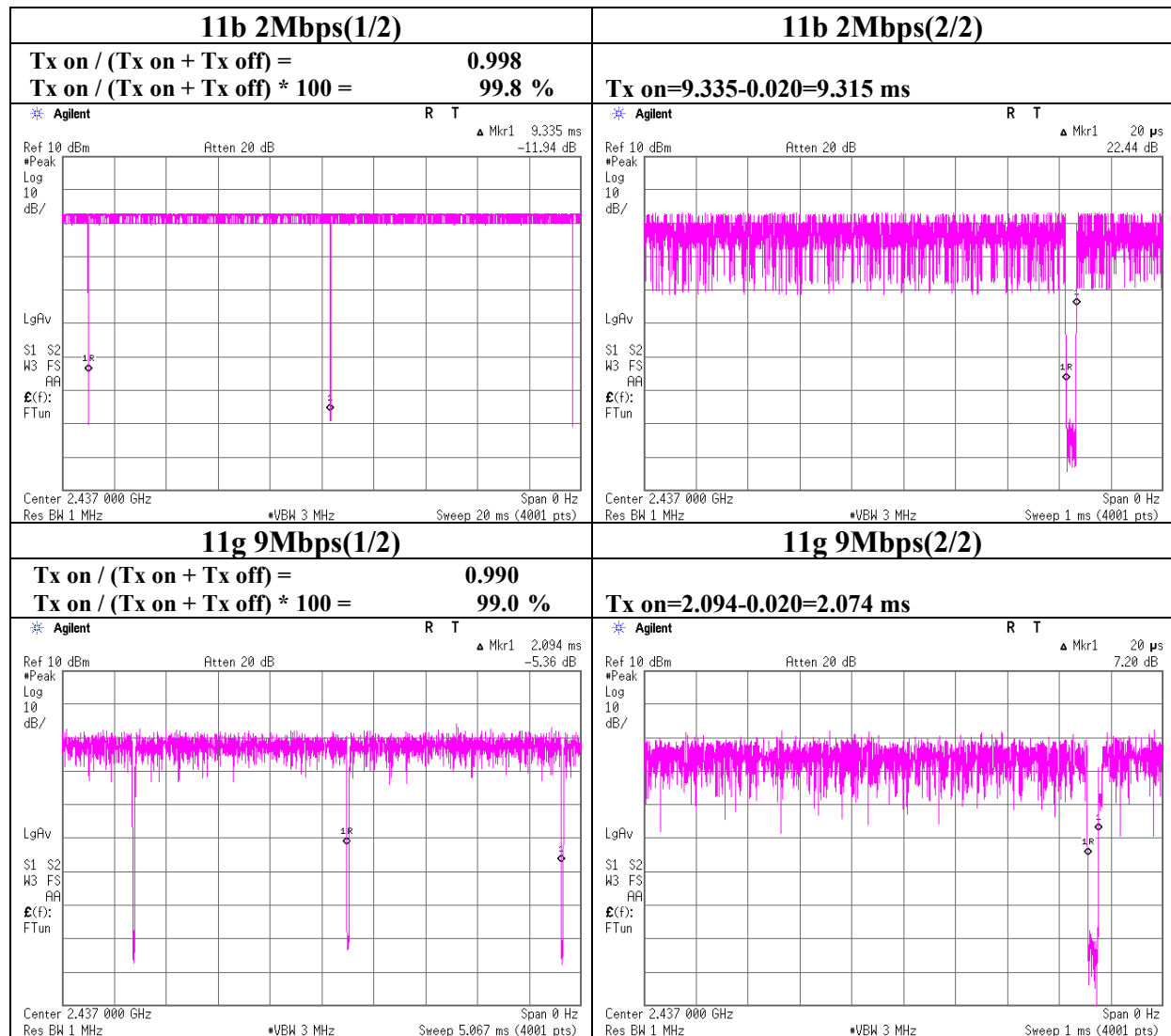
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Burst rate confirmation

Test place Ise EMC Lab. No.6 Measurement Room
Report No. 10724035H
Date 03/17/2015
Temperature/ Humidity 22deg. C / 36% RH
Engineer Shinya Watanabe
Mode 11b,11g Tx



UL Japan, Inc.

Ise EMC Lab.

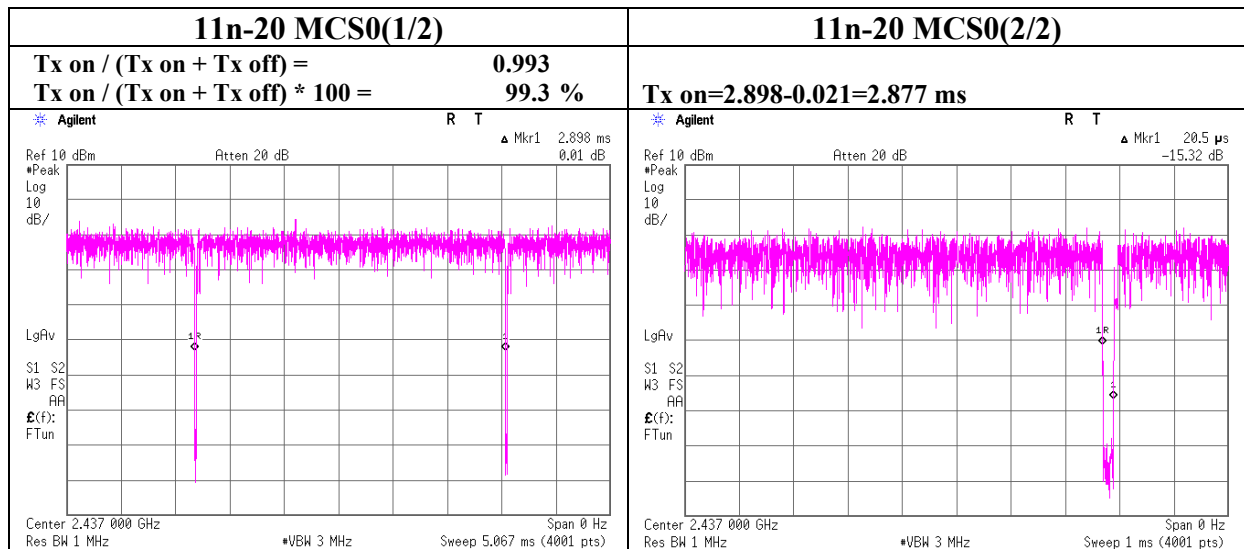
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Burst rate confirmation

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10724035H
Date	03/17/2015
Temperature/ Humidity	22deg. C / 36% RH
Engineer	Shinya Watanabe
Mode	11n-20 Tx



UL Japan, Inc.

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Burst rate confirmation and Dwell time factor
BT LE

Test place

Report No.

Date

Temperature/ Humidity

Engineer

Mode

Ise EMC Lab. No.6 Measurement Room

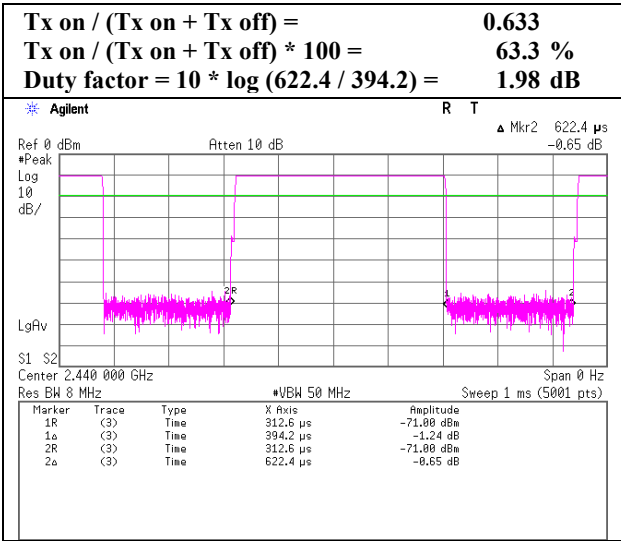
10724035H

03/23/2015

22 deg. C / 42% RH

Ken Fujita

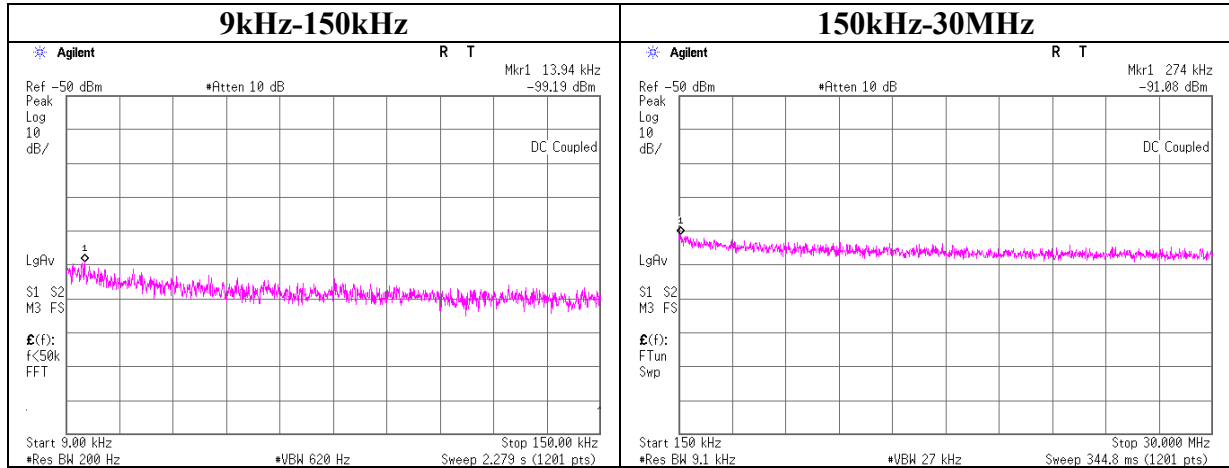
BT LE Tx



Conducted Spurious Emission

Test place : Ise EMC Lab. No.6 Measurement Room
Report No. : 10724035H
Date : 03/16/2015
Temperature/ Humidity : 23deg. C / 33% RH
Engineer : Shinya Watanabe
Mode : 11n-20 Tx

11n-20 Tx 2437MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dBi]	N (Number of Output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
13.94	-99.2	0.80	10.1	4.0	2	-81.3	300	6.0	-20.1	44.7	64.8	
274.00	-91.1	0.80	10.1	4.0	2	-73.2	300	6.0	-12.0	18.8	30.8	

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

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

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Ise EMC Lab.

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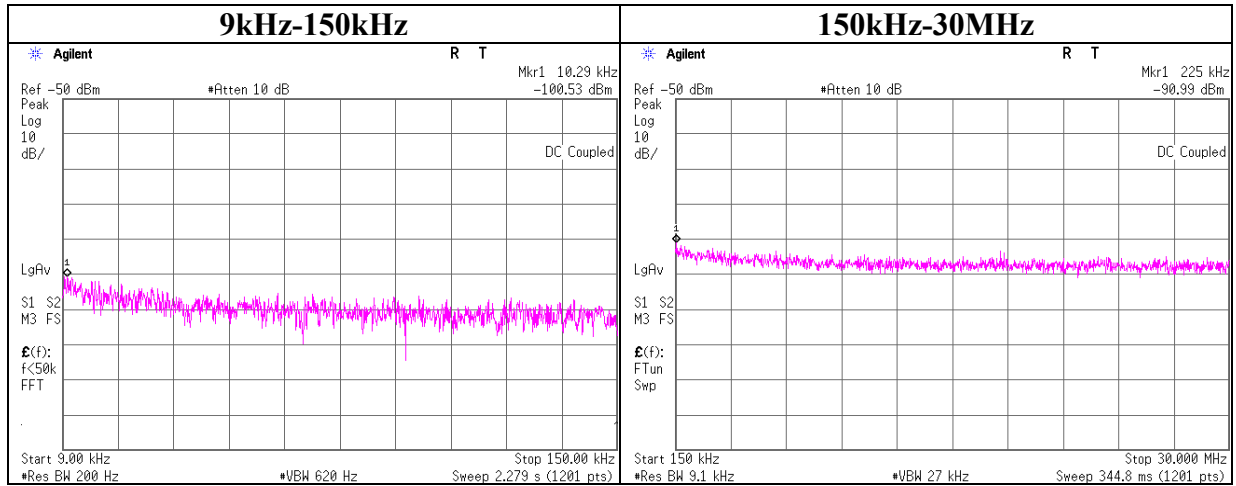
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Conducted Spurious Emission

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10724035H
Date	03/23/2015
Temperature/ Humidity	22 deg. C / 42% RH
Engineer	Ken Fujita
Mode	BT LE Tx

BT LE Tx 2402MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dBi]	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]
10.29	-99.9	0.80	10.0	5.6	-83.5	300.0	6.0	-22.2	47.4
225	-90.9	0.80	10.0	5.6	-74.5	300.0	6.0	-13.2	20.6

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

$\text{EIRP} = \text{Reading} + \text{Cable Loss} + \text{Attenuator} + \text{Antenna Gain}$

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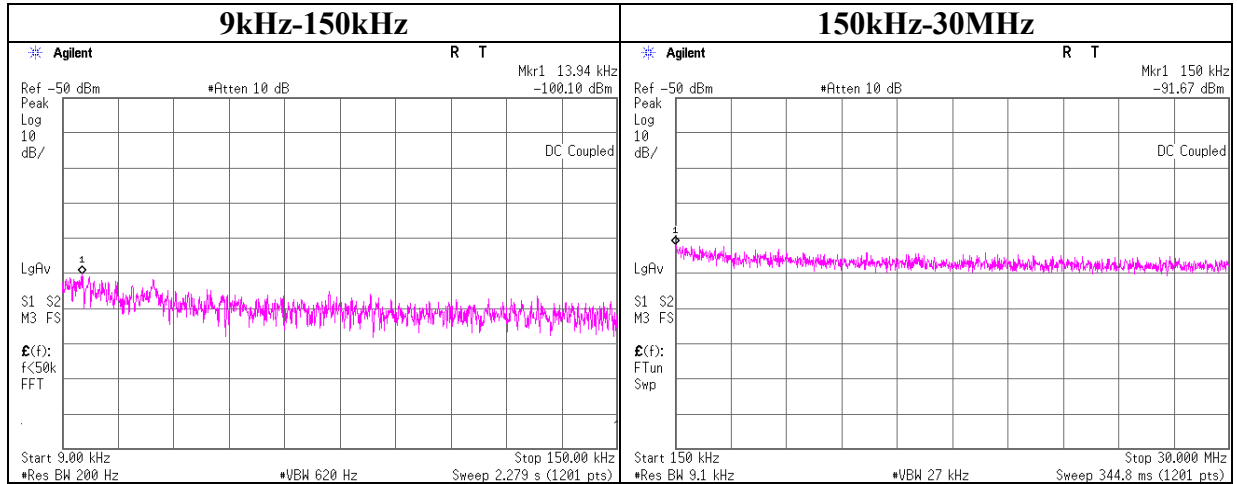
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Conducted Spurious Emission

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10724035H
Date	03/23/2015
Temperature/ Humidity	22 deg. C / 42% RH
Engineer	Ken Fujita
Mode	BT LE Tx

BT LE Tx 2440MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dBi]	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]
13.94	-96.9	0.80	10.0	5.6	-80.5	300.0	6.0	-19.3	44.7
150	-85.3	0.80	10.0	5.6	-68.9	300.0	6.0	-7.6	24.1

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

$\text{EIRP} = \text{Reading} + \text{Cable Loss} + \text{Attenuator} + \text{Antenna Gain}$

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Ise EMC Lab.

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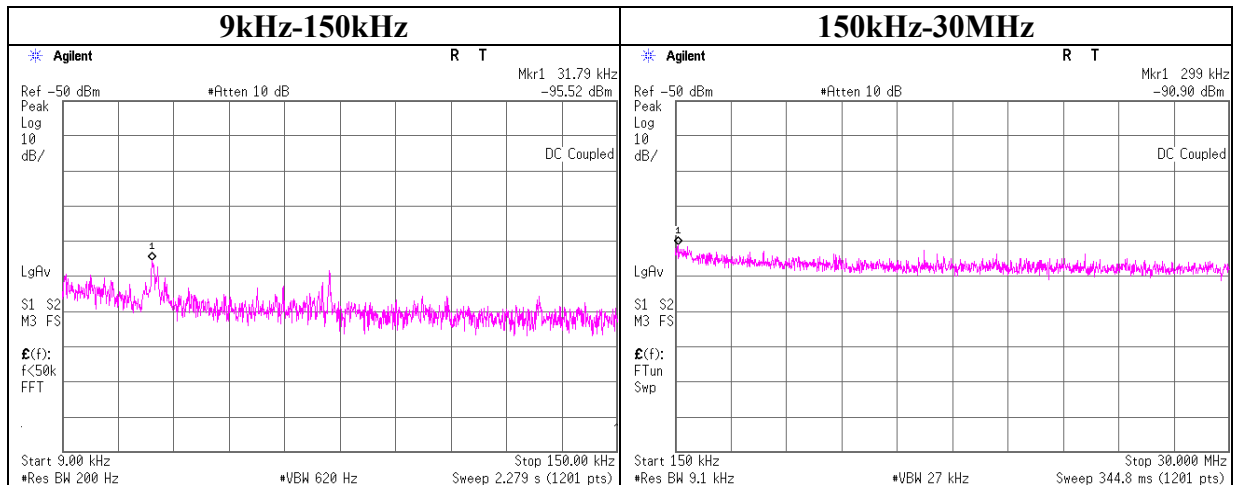
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Conducted Spurious Emission

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10724035H
Date	03/23/2015
Temperature/ Humidity	22 deg. C / 42% RH
Engineer	Ken Fujita
Mode	BT LE Tx

BT LE Tx 2480MHz



Frequency	Reading	Cable Loss	Attenuator	Antenna Gain	EIRP	Distance	Ground bounce	E (field strength)	Limit
[kHz]	[dBm]	[dB]	[dB]	[dBi]	[dBm]	[m]	[dB]	[dBuV/m]	[dBuV/m]
31.79	-99.0	0.80	10.0	5.6	-82.6	300.0	6.0	-21.4	37.6
299	-90.7	0.80	10.0	5.6	-74.3	30.0	6.0	7.0	38.1

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

$EIRP = \text{Reading} + \text{Cable Loss} + \text{Attenuator} + \text{Antenna Gain}$

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Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Power Density

Test place : Ise EMC Lab. No.6 Measurement Room
Report No. : 10724035H
Date : 03/17/2015
Temperature/ Humidity : 22deg. C / 36% RH
Engineer : Shinya Watanabe
Mode : 11b Tx

Antenna A + B

Freq. [MHz]	Antenna A Result	Antenna B Result	Result		Limit	Margin
	[mW]	[mW]	[dBm]	[mW]	[dBm]	[dB]
2412.00	0.12	0.10	-6.64	0.22	8.00	14.64
2437.00	0.12	0.10	-6.55	0.22	8.00	14.55
2462.00	0.12	0.10	-6.59	0.22	8.00	14.59

Sample Calculation:

Result = Antenna A + B

Antenna A

Freq. [MHz]	Reading	Cable Loss	Atten.	Result		Limit	Margin
	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[dB]
2412.00	-20.01	0.80	10.06	-9.15	0.12	8.00	17.15
2437.00	-19.92	0.80	10.06	-9.06	0.12	8.00	17.06
2462.00	-20.12	0.80	10.06	-9.26	0.12	8.00	17.26

Antenna B

Freq. [MHz]	Reading	Cable Loss	Atten.	Result		Limit	Margin
	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[dB]
2412.00	-21.07	0.80	10.06	-10.21	0.10	8.00	18.21
2437.00	-20.99	0.80	10.06	-10.13	0.10	8.00	18.13
2462.00	-20.84	0.80	10.06	-9.98	0.10	8.00	17.98

Sample Calculation:

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

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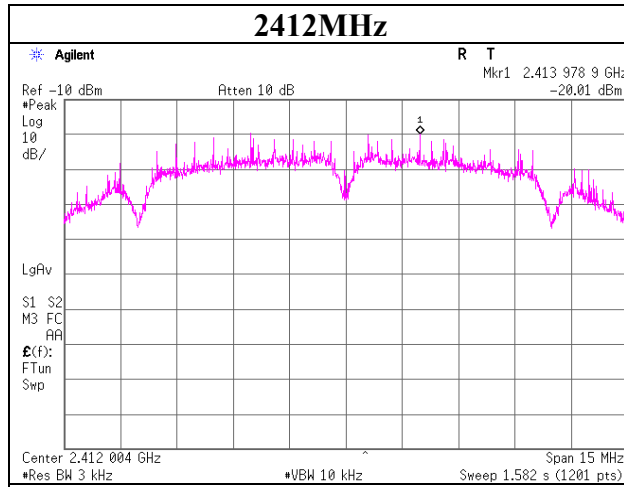
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Power Density

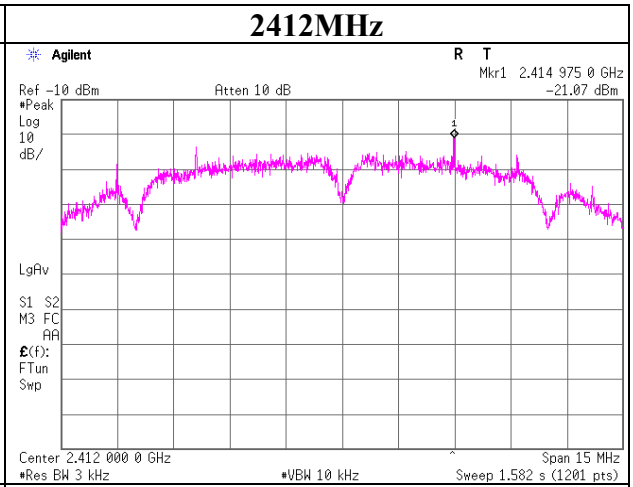
11b Antenna A

2412MHz

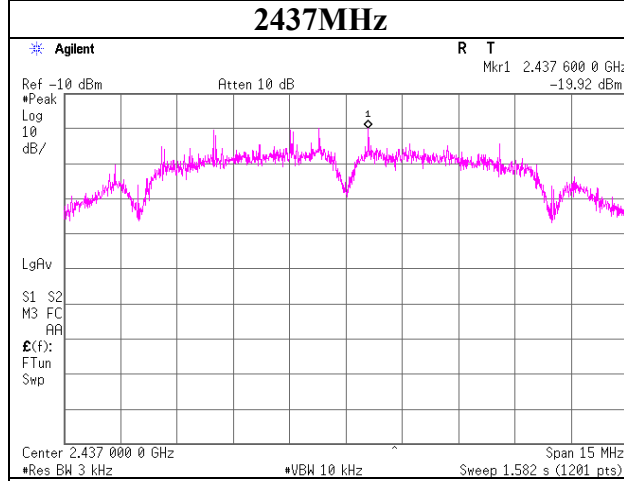


11b Antenna B

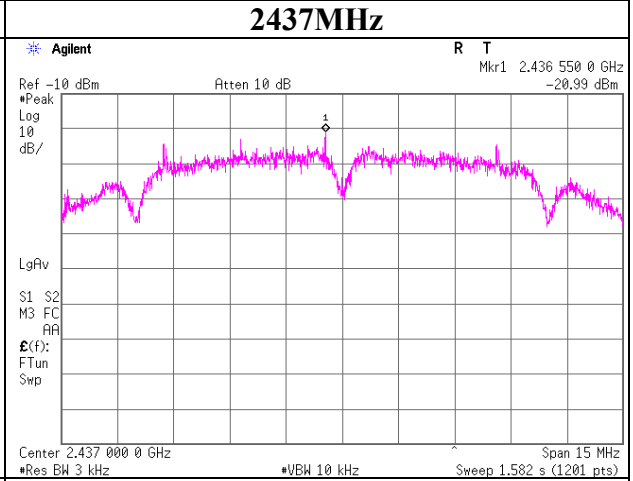
2412MHz



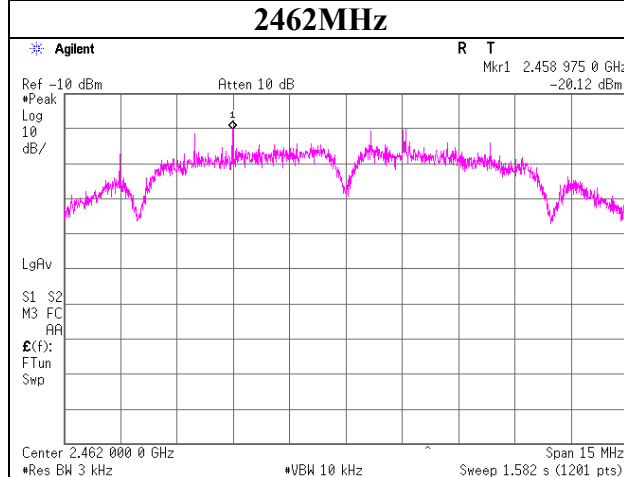
2437MHz



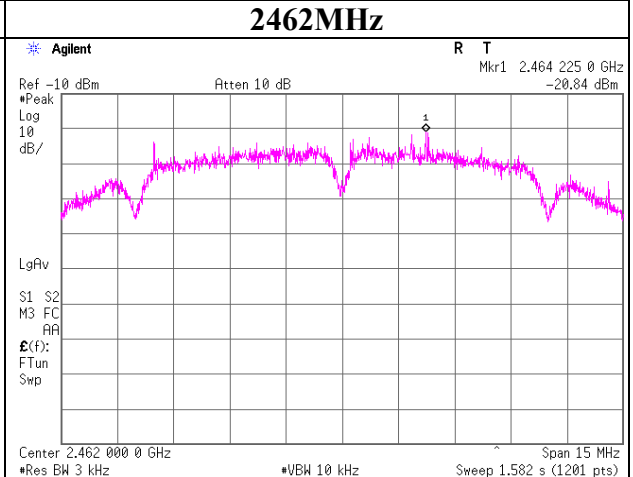
2437MHz



2462MHz



2462MHz



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4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Power Density

Test place : Ise EMC Lab. No.6 Measurement Room
Report No. : 10724035H
Date : 03/17/2015
Temperature/ Humidity : 22deg. C / 36% RH
Engineer : Shinya Watanabe
Mode : 11g Tx

Antenna A + B

Freq. [MHz]	Antenna A Result [mW]	Antenna B Result [mW]	Result		Limit	Margin
			[dBm]	[mW]	[dBm]	[dB]
2412.00	0.02	0.02	-14.20	0.04	8.00	22.20
2437.00	0.02	0.02	-13.81	0.04	8.00	21.81
2462.00	0.02	0.03	-13.20	0.05	8.00	21.20

Sample Calculation:

Result = Antenna A + B

Antenna A

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit	Margin
				[dBm]	[mW]	[dBm]	[dB]
2412.00	-28.28	0.80	10.06	-17.42	0.02	8.00	25.42
2437.00	-27.26	0.80	10.06	-16.40	0.02	8.00	24.40
2462.00	-27.32	0.80	10.06	-16.46	0.02	8.00	24.46

Antenna B

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit	Margin
				[dBm]	[mW]	[dBm]	[dB]
2412.00	-27.87	0.80	10.06	-17.01	0.02	8.00	25.01
2437.00	-28.15	0.80	10.06	-17.29	0.02	8.00	25.29
2462.00	-26.84	0.80	10.06	-15.98	0.03	8.00	23.98

Sample Calculation:

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

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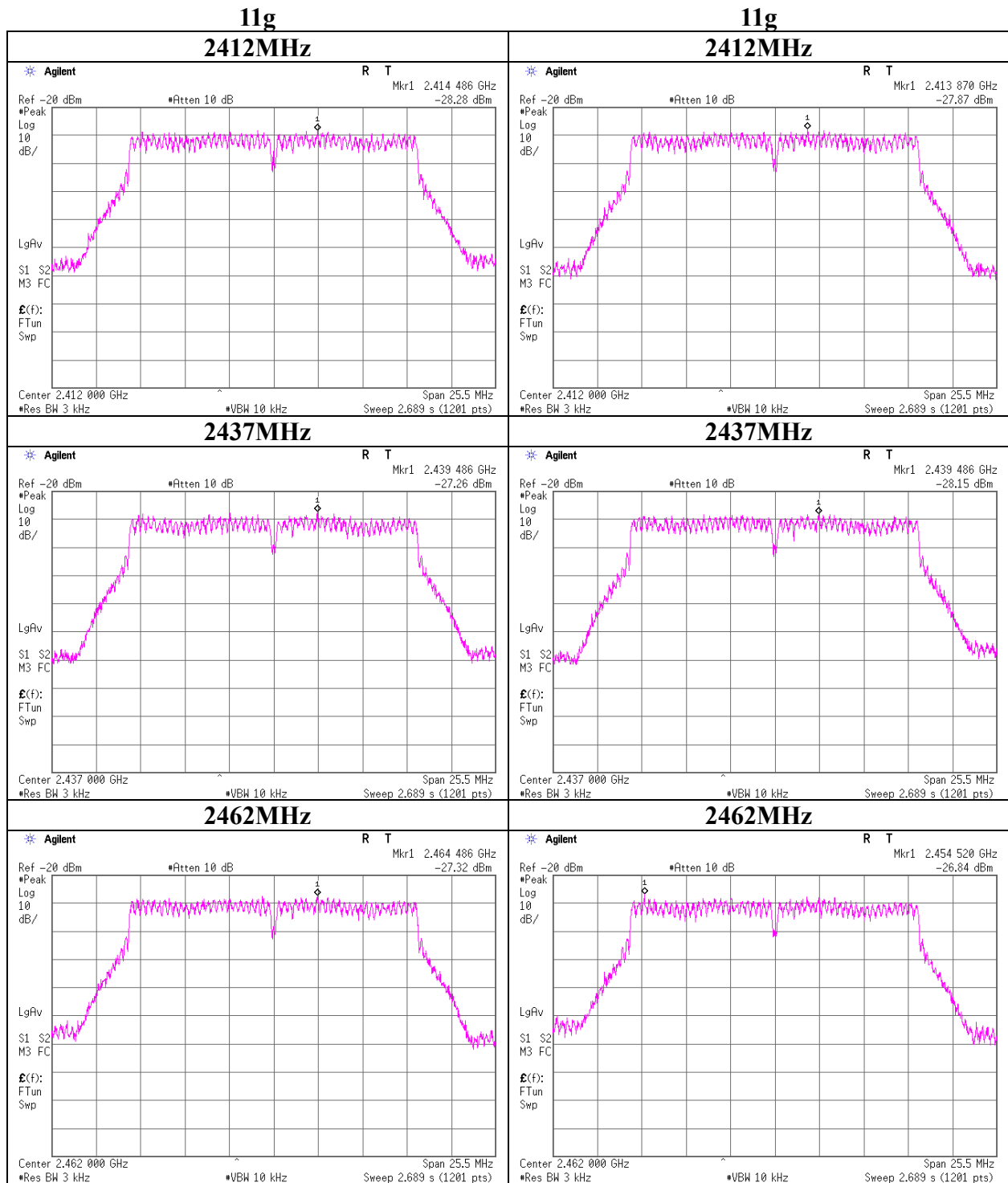
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Power Density



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Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Power Density

Test place : Ise EMC Lab. No.6 Measurement Room
Report No. : 10724035H
Date : 03/17/2015
Temperature/ Humidity : 22deg. C / 36% RH
Engineer : Shinya Watanabe
Mode : 11n-20 Tx

Antenna A + B

Freq. [MHz]	Antenna A Result [mW]	Antenna B Result [mW]	Result		Limit	Margin
			[dBm]	[mW]	[dBm]	[dB]
2412.00	0.02	0.02	-13.37	0.05	8.00	21.37
2437.00	0.02	0.02	-13.57	0.04	8.00	21.57
2462.00	0.02	0.02	-13.65	0.04	8.00	21.65

Sample Calculation:

Result = Antenna A + B

Antenna A

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit	Margin
				[dBm]	[mW]	[dBm]	[dB]
2412.00	-27.56	0.80	10.06	-16.70	0.02	8.00	24.70
2437.00	-27.52	0.80	10.06	-16.66	0.02	8.00	24.66
2462.00	-27.62	0.80	10.06	-16.76	0.02	8.00	24.76

Antenna B

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit	Margin
				[dBm]	[mW]	[dBm]	[dB]
2412.00	-26.95	0.80	10.06	-16.09	0.02	8.00	24.09
2437.00	-27.37	0.80	10.06	-16.51	0.02	8.00	24.51
2462.00	-27.42	0.80	10.06	-16.56	0.02	8.00	24.56

Sample Calculation:

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

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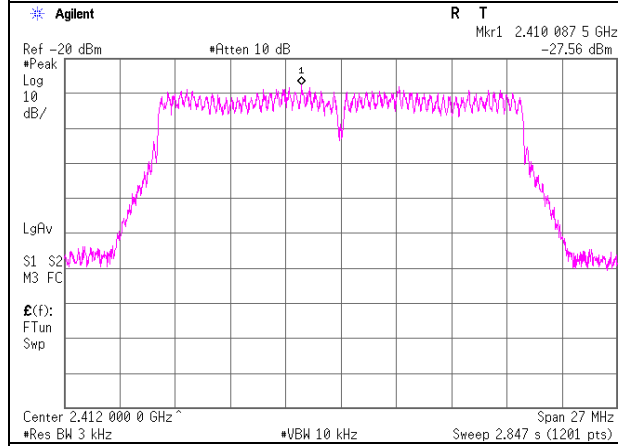
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Power Density

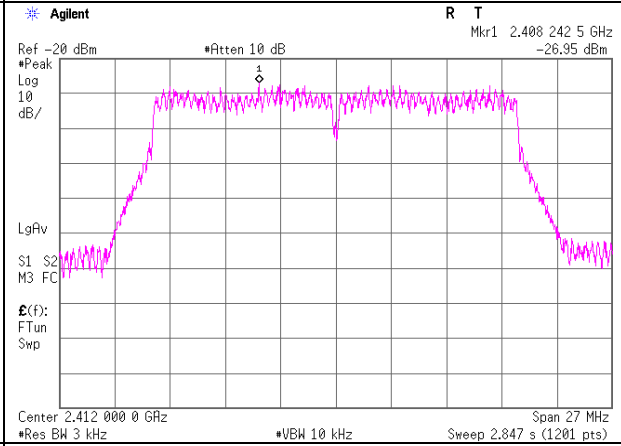
11n-20 Antenna A

2412MHz

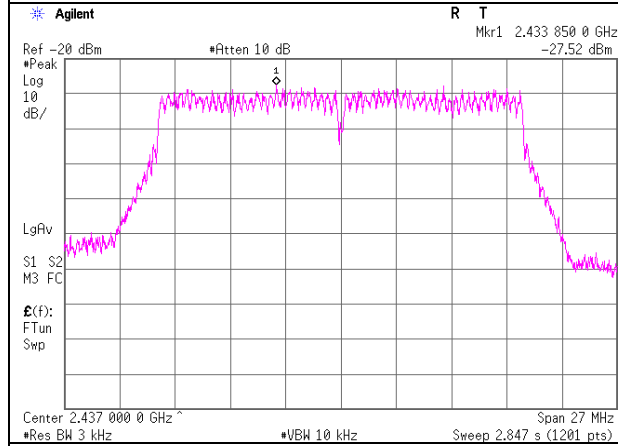


11n-20 Antenna B

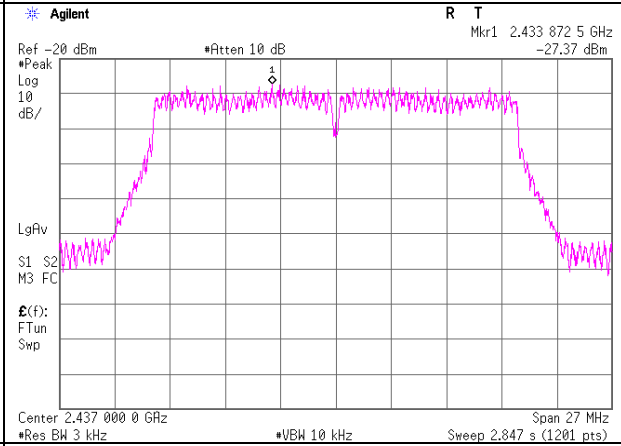
2412MHz



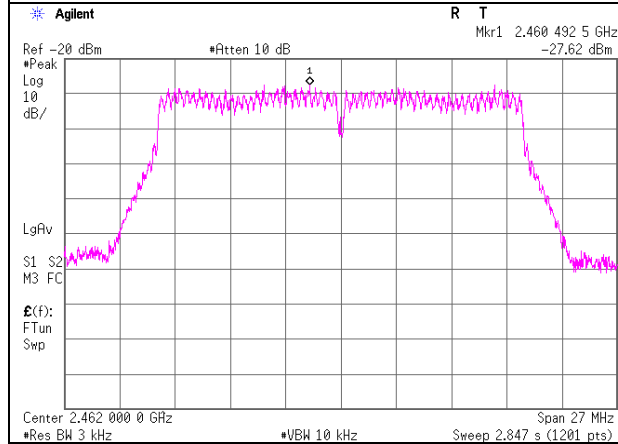
2437MHz



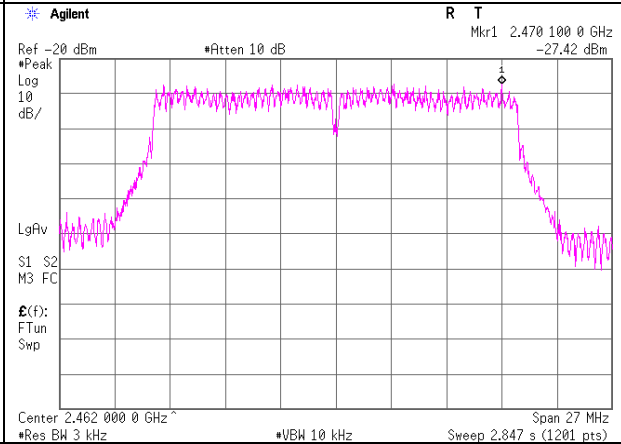
2437MHz



2462MHz



2462MHz



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Ise EMC Lab.

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Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Power Density

Test place Ise EMC Lab. No.6 Measurement Room
Report No. 10724035H
Date 03/23/2015
Temperature/ Humidity 22 deg. C / 42% RH
Engineer Ken Fujita
Mode BT LE Tx

Freq.	Reading	Cable Loss	Atten.	Result		Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[dB]
2402	-26.00	2.07	10.02	-13.91	0.04	8.00	21.91
2440	-26.02	2.08	10.02	-13.92	0.04	8.00	21.92
2480	-26.18	2.09	10.02	-14.07	0.04	8.00	22.07

Sample Calculation:

Result = Reading + Cable Loss + Attenuator

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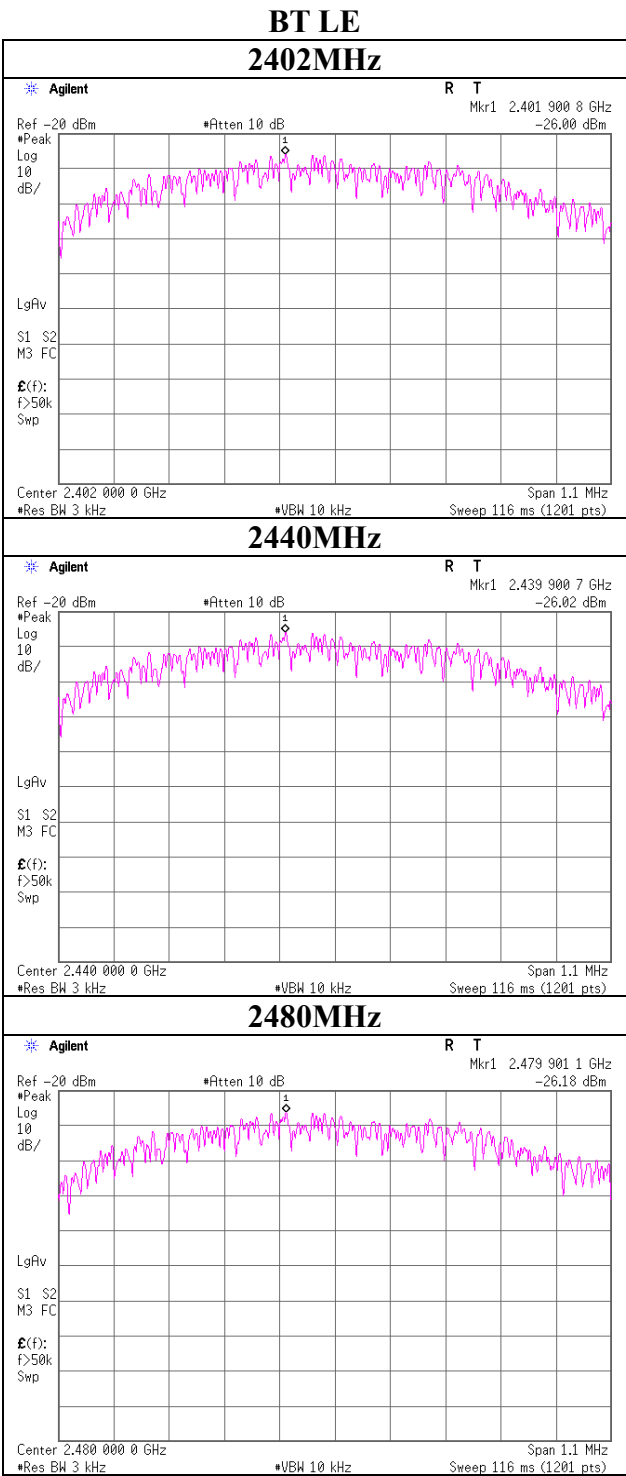
Ise EMC Lab.

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Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Power Density

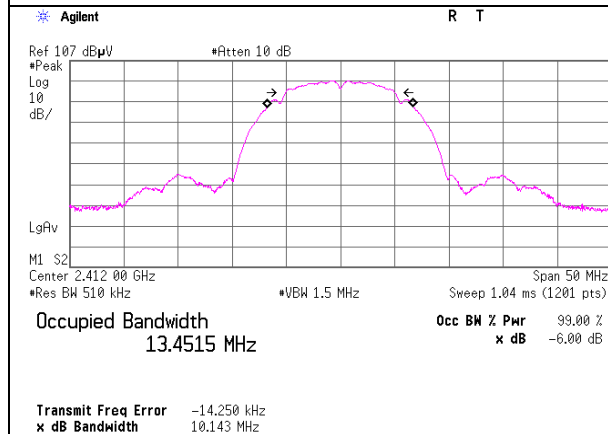


99% Occupied Bandwidth

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10724035H
Date	03/17/2015
Temperature/ Humidity	22deg. C / 36% RH
Engineer	Shinya Watanabe
Mode	11b Tx

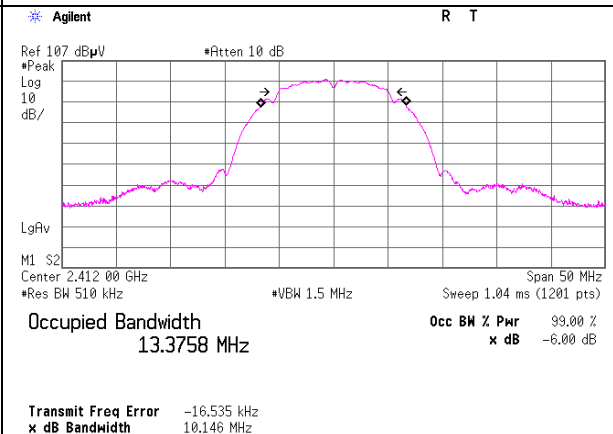
11b Antenna A

2412MHz

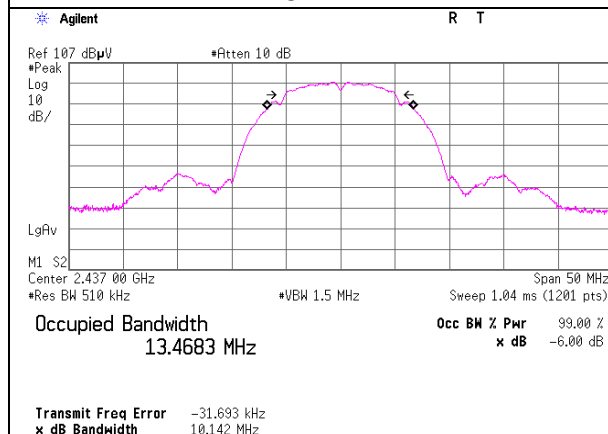


11b Antenna B

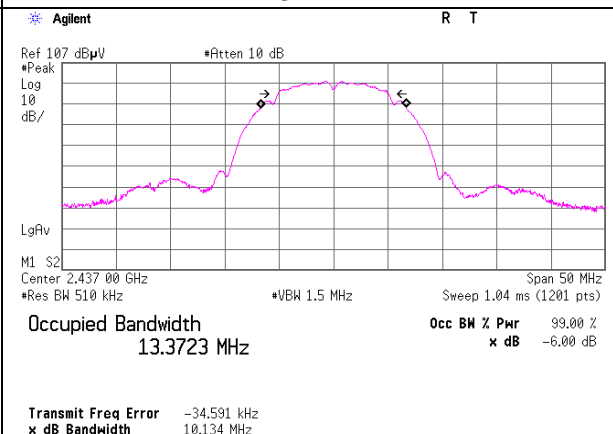
2412MHz



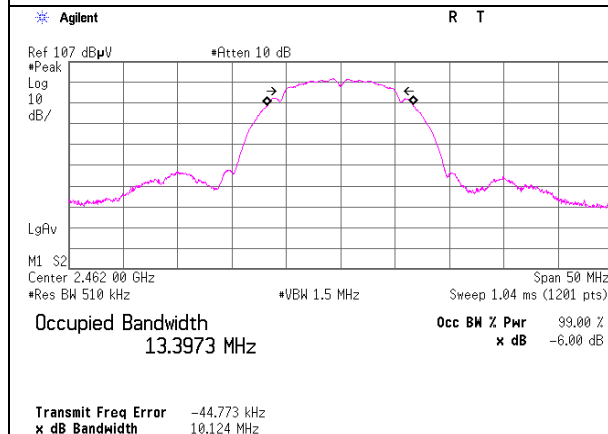
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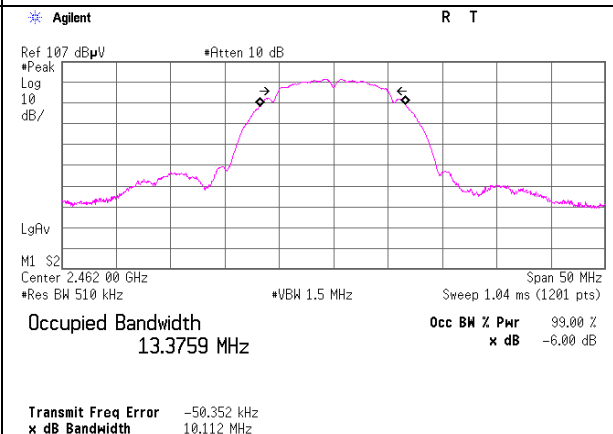
2437MHz



2462MHz



2462MHz



UL Japan, Inc.

Ise EMC Lab.

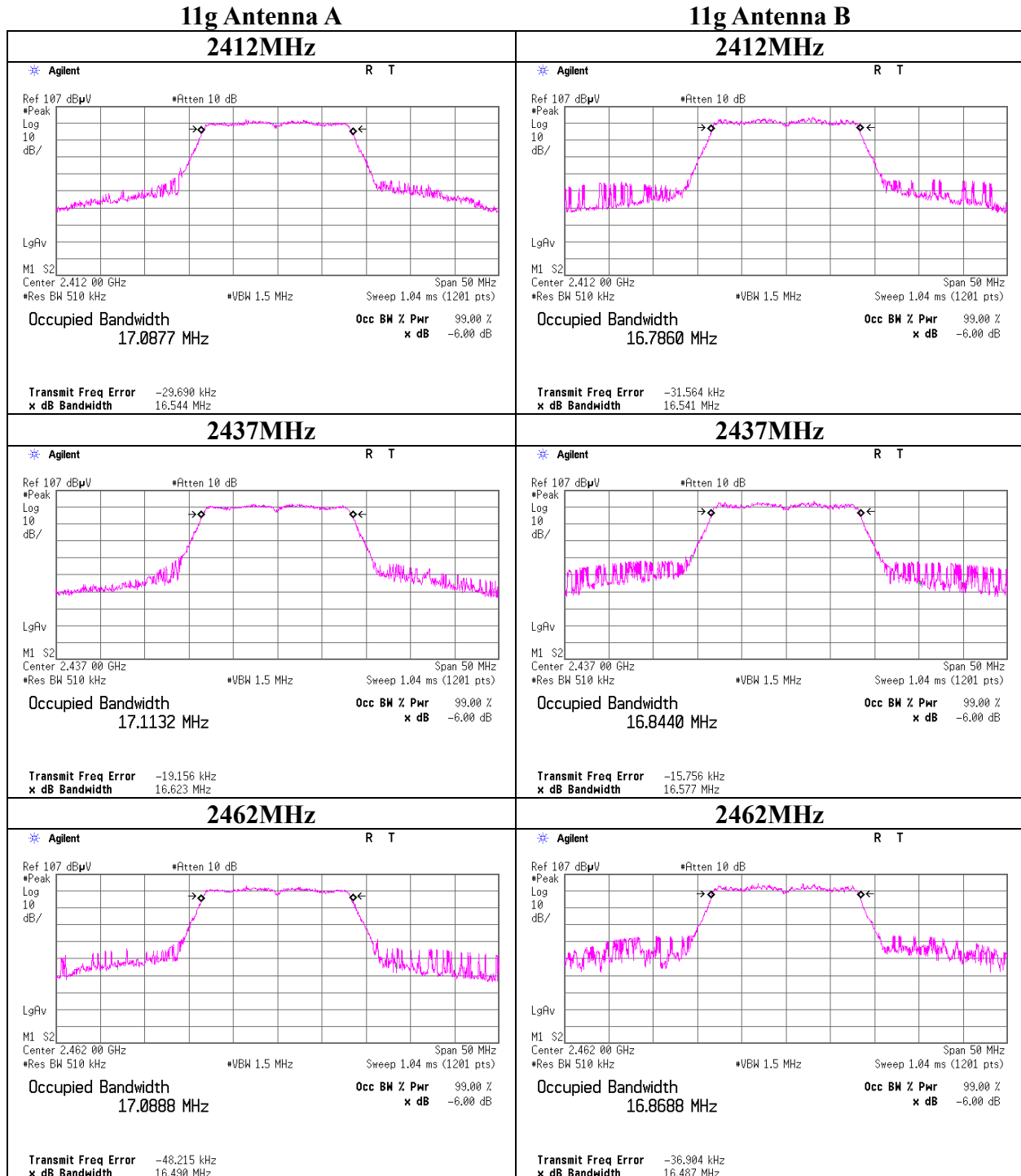
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

99% Occupied Bandwidth

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10724035H
Date	03/17/2015
Temperature/ Humidity	22deg. C / 36% RH
Engineer	Shinya Watanabe
Mode	11g Tx

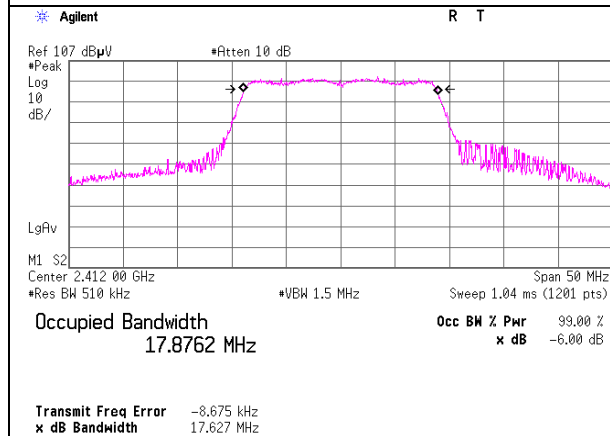


99% Occupied Bandwidth

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10724035H
Date	03/17/2015
Temperature/ Humidity	22deg. C / 36% RH
Engineer	Shinya Watanabe
Mode	11n-20 Tx

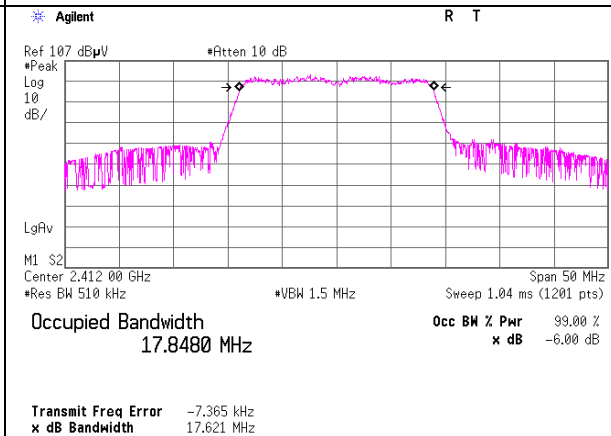
11n-20 Antenna A

2412MHz

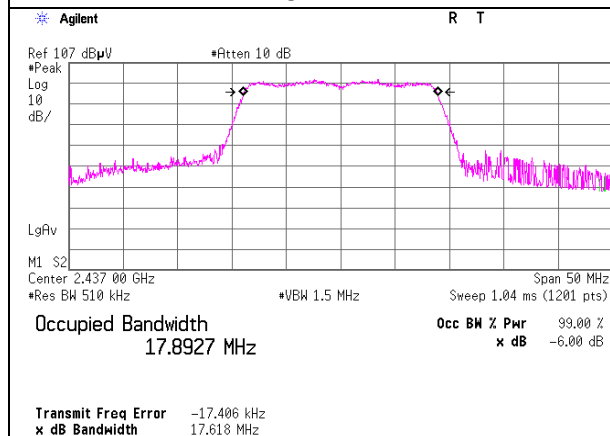


11n-20 Antenna B

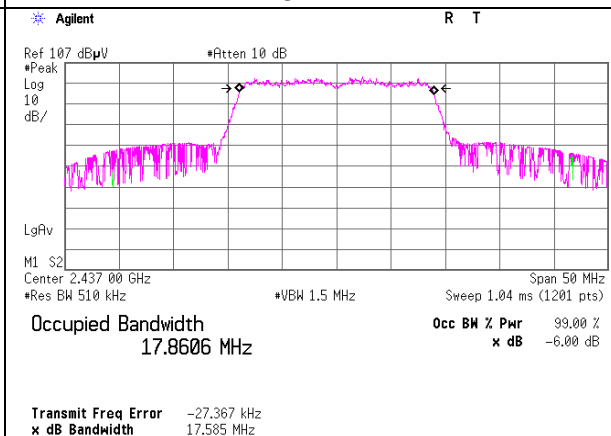
2412MHz



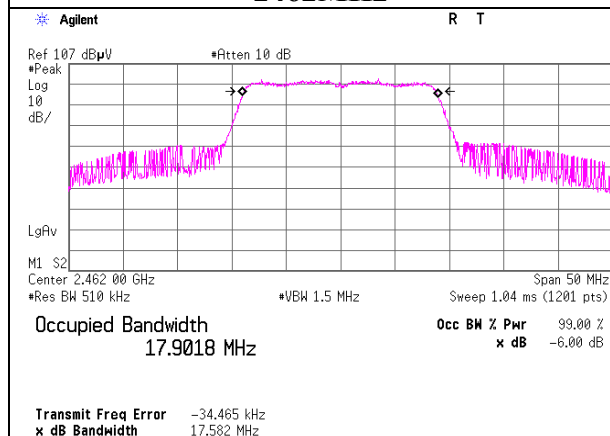
2437MHz



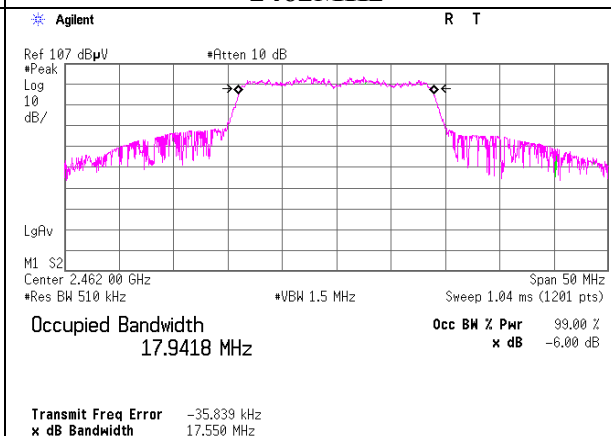
2437MHz



2462MHz



2462MHz



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Telephone : +81 596 24 8999

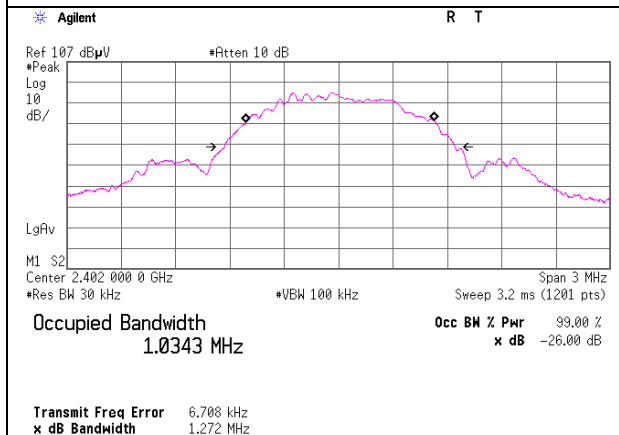
Facsimile : +81 596 24 8124

99%Occupied Bandwidth

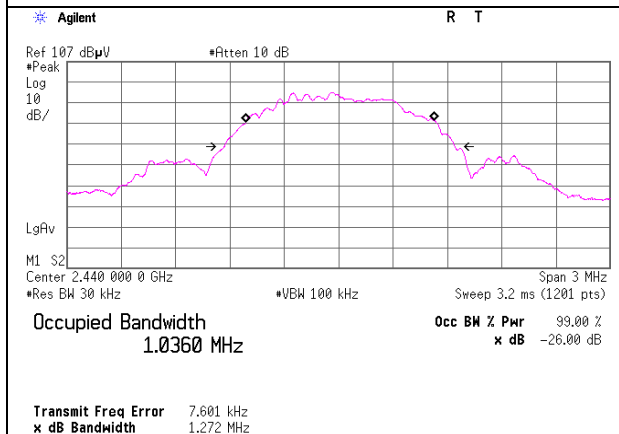
Test place Ise EMC Lab. No.6 Measurement Room
Report No. 10724035H
Date 03/23/2015
Temperature/ Humidity 22 deg. C / 42% RH
Engineer Ken Fujita
Mode BT LE Tx

BT LE

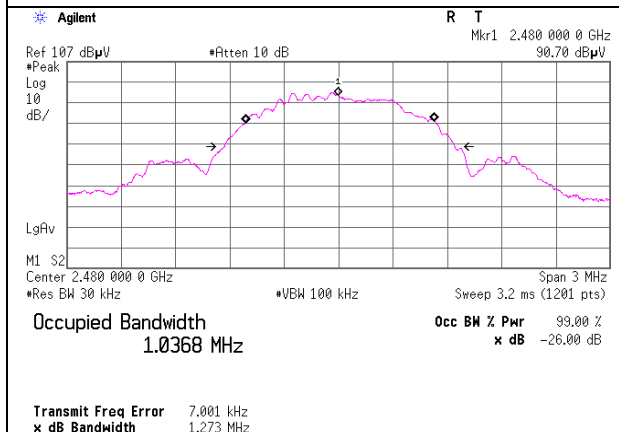
2402MHz



2440MHz



2480MHz



UL Japan, Inc.

Ise EMC Lab.

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Telephone : +81 596 24 8999

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APPENDIX 2: Test instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MAEC-03	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE/CE	2015/02/19 * 12
MOS-13	Thermo-Hygrometer	Custom	CTH-180	1301	RE/CE	2015/01/13 * 12
MJM-16	Measure	KOMELON	KMC-36	-	RE/CE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE/CE	-
MSA-03	Spectrum Analyzer	Agilent	E4448A	MY44020357	RE	2014/04/08 * 12
MHA-20	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	258	RE	2014/05/26 * 12
MCC-167	Microwave Cable	Junkosha	MWX221	1404S374(1m) / 1405S074(5m)	RE	2014/05/26 * 12
MPA-11	MicroWave System Amplifier	Agilent	83017A	MY39500779	RE	2015/03/19 * 12
MHF-25	High Pass Filter 3.5-18.0GHz	UL Japan	HPF SELECTOR	001	RE	2014/09/22 * 12
MHA-16	Horn Antenna 15-40GHz	Schwarzbeck	BBHA9170	BBHA9170306	RE	2014/05/26 * 12
MTR-08	Test Receiver	Rohde & Schwarz	ESCI	100767	RE/CE	2014/08/19 * 12
MBA-03	Biconical Antenna	Schwarzbeck	BBA9106	1915	RE	2014/10/18 * 12
MLA-03	Logperiodic Antenna	Schwarzbeck	USLP9143	174	RE	2014/10/18 * 12
MCC-51	Coaxial cable	UL Japan	-	-	RE	2014/07/14 * 12
MAT-70	Attenuator(6dB)	Agilent	8491A-006	MY52460153	RE	2014/04/14 * 12
MPA-13	Pre Amplifier	SONOMA INSTRUMENT	310	260834	RE	2015/03/10 * 12
MTW-03	Torque wrench	HUBER+SUHNER	74 Z-0-0-21	98142	RE	2015/01/16 * 36
MAT-20	Attenuator(10dB)(above 1 GHz)	HIROSE ELECTRIC CO.,LTD.	AT-110	-	RE	2015/01/08 * 12
MLS-23	LISN(AMN)	Schwarzbeck	NSLK8127	8127-729	CE(AE)	2014/07/10 * 12
MLS-24	LISN(AMN)	Schwarzbeck	NSLK8127	8127-730	CE(EUT)	2014/07/10 * 12
MTA-31	Terminator	TME	CT-01	-	CE	2015/01/19 * 12
MCC-112	Coaxial cable	Fujikura/Suhner/TSJ	5D-2W(10m)/SFM141(3m)/suoform 141-PE(1m)/421-010(1.5m)/RFM-E321(Switcher)	-/00640	CE	2014/07/14 * 12
MAT-66	Attenuator(13dB)	JFW Industries, Inc.	50FP-013H2 N	-	CE	2015/01/29 * 12
MOS-14	Thermo-Hygrometer	Custom	CTH-201	1401	AT	2015/01/13 * 12
MSA-13	Spectrum Analyzer	Agilent	E4440A	MY46185823	AT	2014/06/06 * 12
MPM-09	Power Meter	Anritsu	ML2495A	6K00003348	AT	2014/10/06 * 12
MPSE-12	Power sensor	Anritsu	MA2411B	011598	AT	2014/10/06 * 12
MCC-138	Microwave cable	HUBER+SUHNER	SUCOFLEX 102	37953/2	AT	2014/10/02 * 12
MAT-22	Attenuator(10dB) 1-18GHz	Orient Microwave	BX10-0476-00	-	AT	2015/03/18 * 12

The expiration date of the calibration is the end of the expired month.

All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.

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

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

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