



RADIO TEST REPORT

Test Report No. : 10938437S-A-R3

Applicant : Nintendo Co., Ltd.
Type of Equipment : Bluetooth product
Model No. : PMC-001
FCC ID : BKEP
Test regulation : FCC Part 15 Subpart C: 2015
Test Result : Complied

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2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the above regulation.
4. The test results in this report are traceable to the national or international standards.
5. The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan has been accredited.
6. This test report covers Radio technical requirements. It does not cover administrative issues such as Manual or non-Radio test related Requirements. (if applicable)
7. This report is a revised version of 10938437S-A-R2. 10938437S-A-R2 is replaced with this report.

Date of test: September 30 to October 9, 2015

Representative test engineer:

Yosuke Ishikawa
Engineer
Consumer Technology Division

Approved by:

Akio Hayashi
Leader
Consumer Technology Division



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

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13-EM-F0429

Original Test Report No.: 10959367S-A

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CONTENTS	PAGE
SECTION 1: Customer information.....	4
SECTION 2: Equipment under test (E.U.T.).....	4
SECTION 3: Test specification, procedures & results.....	5
SECTION 4: Operation of E.U.T. during testing.....	7
SECTION 5: Radiated Spurious Emission	8
SECTION 6: Antenna Terminal Conducted Tests.....	9
APPENDIX 1: Test data	10
6dB Bandwidth	10
Maximum Peak Output Power	12
Average Output Power	13
Radiated Spurious Emission	15
Conducted Spurious Emission	26
Power Density	27
99%Occupied Bandwidth	29
APPENDIX 2: Test instruments	30
APPENDIX 3: Photographs of test setup	32
Radiated Spurious Emission	32
Worst Case Position	33

SECTION 1: Customer information

Company Name	:	Nintendo Co., Ltd.
Address	:	11-1 Hokotate-cho, Kamitoba, Minami-ku, Kyoto 601-8501, Japan
Telephone Number	:	+81-075-662-9600
Facsimile Number	:	+81-075-662-9624
Contact Person	:	Shigenobu Kinoshita

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

2.1 Identification of E.U.T.

Type of Equipment	:	Bluetooth product
Model No.	:	PMC-001
Serial No.	:	Refer to Section 4, Clause 4.2
Rating	:	DC 3 V (Lithium Battery)
Receipt Date of Sample	:	September 30, 2015
Country of Mass-production	:	China
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

Model: PMC-001 (referred to as the EUT in this report) is a Bluetooth product.

General Specification

Clock frequency(ies) in the system	:	Xtal: 16MHz
------------------------------------	---	-------------

Radio Specification

Radio Type	:	Transceiver
Frequency of Operation	:	2402 MHz - 2480 MHz
Modulation	:	GFSK
Power Supply (radio part input)	:	DC 3V
Antenna type	:	Inverted-F
Antenna Gain	:	-4.2 dBi (Maximum, measurement value)

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C: 2015, final revised on November 23, 2015
 Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
 Section 15.207 Conducted limits
 Section 15.247 Operation within the bands 902-92 8MHz,
 2400-2483.5 MHz, and 5725-5850 MHz

*Some parts are effective on and after December 17, 2015 or December 23, 2015. The revision does not affect the test specification applied to the EUT.

The EUT has been tested for compliance with FCC Part 15 Subpart B. Refer to the test report 10938436S-A.

3.2 Procedures and results

Item	Test Procedure	Specification	Worst margin	Results	Remarks
Conducted Emission	FCC: ANSI C63.10-2013 6. Standard test methods IC: RSS-Gen 8.8	FCC: Section 15.207 IC: RSS-Gen 8.8	-	N/A *1)	-
6dB Bandwidth	FCC: KDB 558074 D01 DTS Meas Guidance v03r05 IC: -	FCC: Section 15.247(a)(2) IC: RSS-247 5.2(1)	See data.	-	Conducted
Maximum Peak Output Power	FCC: KDB 558074 D01 DTS Meas Guidance v03r05 IC: RSS-Gen 6.12	FCC: Section 15.247(b)(3) IC: RSS-247 5.4(4)		Complied	Conducted
Power Density	FCC: KDB 558074 D01 DTS Meas Guidance v03r05 IC: -	FCC: Section 15.247(e) IC: RSS-247 5.2(2)		Complied	Conducted
Spurious Emission Restricted Band Edges	FCC: KDB 558074 D01 DTS Meas Guidance v03r05 IC: RSS-Gen 6.13	FCC: Section 15.247(d) IC: RSS-247 5.5 RSS-Gen 8.9 RSS-Gen 8.10	3.3 dB 12010.00 MHz, AV, Hori. Tx 2402 MHz S/N: A4-001	Complied	Conducted (below 30 MHz)/ Radiated (above 30 MHz) *1)

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

*1) The test is not applicable since the EUT has no AC mains.

*2) Radiated test was selected over 30 MHz based on section 15.247(d) and KDB 558074 D01 DTS Meas Guidance v03r05 12.2.7.

In case any questions arise about test procedure, ANSI C 63.10:2013 is also referred. (ANSI C63.10:2013 is Non-accreditation)

FCC Part 15.31 (e)

Instead of a new battery, DC power supply (DC 3.0 V) was used for the test. The data using the DC power supply (DC 3.0 V) was compared with that of using the new battery and it was confirmed in advance that there was no influence on the result. Therefore, the EUT complies with the requirement.

FCC Part 15.203

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

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.

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3.4 Uncertainty

The following uncertainties have been calculated to provide a confidence level of 95 % using a coverage factor $k = 2$.
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Item	Frequency range	Uncertainty (+/-)		
		No. 1 SAC / SR	No. 2 SAC / SR	No. 3 SAC / SR
Conducted emission (AC Mains) LISN	150 kHz-30 MHz	3.6 dB	3.4 dB	3.4 dB
Radiated emission (Measurement distance: 3 m)	9 kHz-30 MHz	3.7 dB	3.5 dB	3.5 dB
	30 MHz-300 MHz	4.9 dB	4.9 dB	4.7 dB
	300 MHz-1 GHz	5.0 dB	5.0 dB	4.8 dB
	1 GHz-13 GHz	4.9 dB	4.9 dB	4.9 dB
Radiated emission (Measurement distance: 1 m)	13 GHz-18 GHz	5.7 dB	5.7 dB	5.7 dB
	18 GHz-40 GHz	4.5 dB	4.3 dB	4.3 dB

SAC=Semi-Anechoic Chamber

SR= Shielded Room is applied besides radiated emission

Antenna terminal test	Uncertainty (+/-)
Power Measurement above 1 GHz (Average Detector)_SPM-06	0.76 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-06	0.79 dB
Power Measurement above 1 GHz (Average Detector)_SPM-07	0.74 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-07	1.08 dB
Spurious emission (Conducted) below 1GHz	1.5 dB

Radiated emission test

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

3.5 Test Location

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JAB Accreditation No. RTL02610

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

3.6 Test data, Test instruments, and Test set up

Refer to APPENDIX.

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

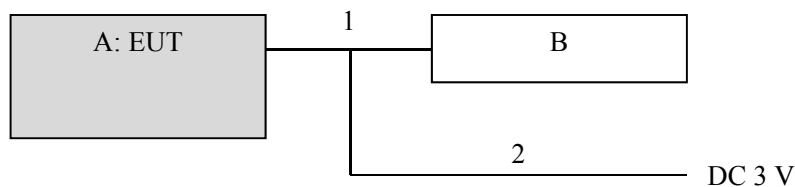
4.1 Operating Mode(s)

Mode	Remarks*
Bluetooth Low Energy	PN9
*Transmitting duty was 100 % on all tests.	
*The worst condition was determined based on the test result of Maximum Peak Output Power (s/n:B3-003, Low Channel)	
*Power of the EUT was set by the software as follows; Power settings: Fixed Software: Connection Manager version 3.0.8	

*The details of Operating mode(s)

Test Item	Operating Mode	Tested frequency
Spurious Emission, 6dB Bandwidth Maximum Peak Output Power Power Density, 99% Occupied Bandwidth	Bluetooth Low Energy	2402 MHz, 2440 MHz, 2480 MHz

4.2 Configuration and peripherals



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

Description of EUT and support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Bluetooth product	PMC-001	A4-002, B3-003 *1) A4-001, B3-001 *2)	Nintendo	EUT
B	Jig Board	-	-	-	-

*1) Used for Antenna Terminal conducted test

*2) Used for Radiated Emission test

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	Signal Cable	0.1	Unshielded	Unshielded	-
2	DC Cable	0.15+1.0	Unshielded	Unshielded	-

Accessory and model differences

The difference between mode A (X'tal A) and mode B (X'tal B) is that the mode A has crystal part number DSX221G and Mode B has crystal part number FA-20H. The two crystals are compatible and are electrically identical having same radio parameters.

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SECTION 5: Radiated Spurious Emission

Test Procedure

It was measured based on "11.0 Emissions in non-restricted frequency bands" of "558074 D01 DTS Meas Guidance v03r05".

Below 1 GHz

EUT was placed on a platform of nominal size, 0.5 m by 0.5 m, raised 0.8 m above the conducting ground plane. The table is made of Styrofoam and covered with polyvinyl chloride. That has very low permittivity.

Above 1 GHz

EUT was placed on a urethane platform of nominal size, 0.5 m by 0.5 m, raised 1.5 m above the conducting ground plane.

The height of the measuring antenna varied between 1 m and 4 m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field strength.

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

The test was made with the detector (RBW/VBW) in the following table.

When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

Test Antennas are used as below;

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

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

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

Frequency	Below 1 GHz	Above 1 GHz		20 dBc
Instrument used	Test Receiver	Spectrum Analyzer		Spectrum Analyzer
Detector	QP	PK	AV *2)	PK
IF Bandwidth	BW 120 kHz	RBW: 1 MHz VBW: 3 MHz	RBW: 1 MHz VBW: 3 MHz Detector: Power Averaging (RMS) Trace: 100 traces	RBW: 100 kHz VBW: 300kHz
Test Distance	3m	3 m (below 13 GHz), 1 m *1) (above 13 GHz)		3 m (below 13 GHz), 1 m *1) (above 13 GHz)

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

*2) Average Power Measurement was performed based on 6.0 & 12.2.5.1 of "KDB 558074 D01 DTS Meas Guidance v03r05"

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

Antenna polarization	Carrier	Spurious (Below 1 GHz)	Spurious (1 GHz-13 GHz)	Spurious (13 GHz-18 GHz)	Spurious (18 GHz-25 GHz)
Horizontal	Z	X	Z	X	X
Vertical	Y	X	Y	X	X

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

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

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SECTION 6: 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	10 MHz	100 kHz	300 kHz	Auto	Peak	Max Hold	Spectrum Analyzer
99% Occupied Bandwidth *1)	Enough width to display emission skirts	1 to 5 % of OBW	Three times of RBW	Auto	Peak	Max Hold	Spectrum Analyzer
Maximum Peak Output Power	-	-	-	Auto	Peak/ Average *2)	-	Power Meter (Sensor: 50 MHz BW)
Peak Power Density	1.5 times the 6dB Bandwidth	3 kHz	9.1 kHz	Auto	Peak	Max Hold	Spectrum Analyzer *3)
Conducted Spurious Emission *4)	9kHz to 150kHz	200 Hz	620 Hz	Auto	Peak	Max Hold	Spectrum Analyzer
	150kHz to 30MHz	10 kHz	30 kHz				
*1) Peak hold was applied as Worst-case measurement. *2) Reference data *3) Section 10.2 Method PKPSD (peak PSD) of "KDB 558074 D01 DTS Meas Guidance v03r05". *4) In the frequency range below 30MHz, RBW was narrowed to separate the noise contents. Then, wide-band noise near the limit was checked separately, however the noise was not detected as shown in the chart. (9 kHz - 150 kHz: RBW = 200 Hz, 150 kHz - 30 MHz: RBW = 9.1 kHz)							

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

Test data : APPENDIX
Test result : Pass

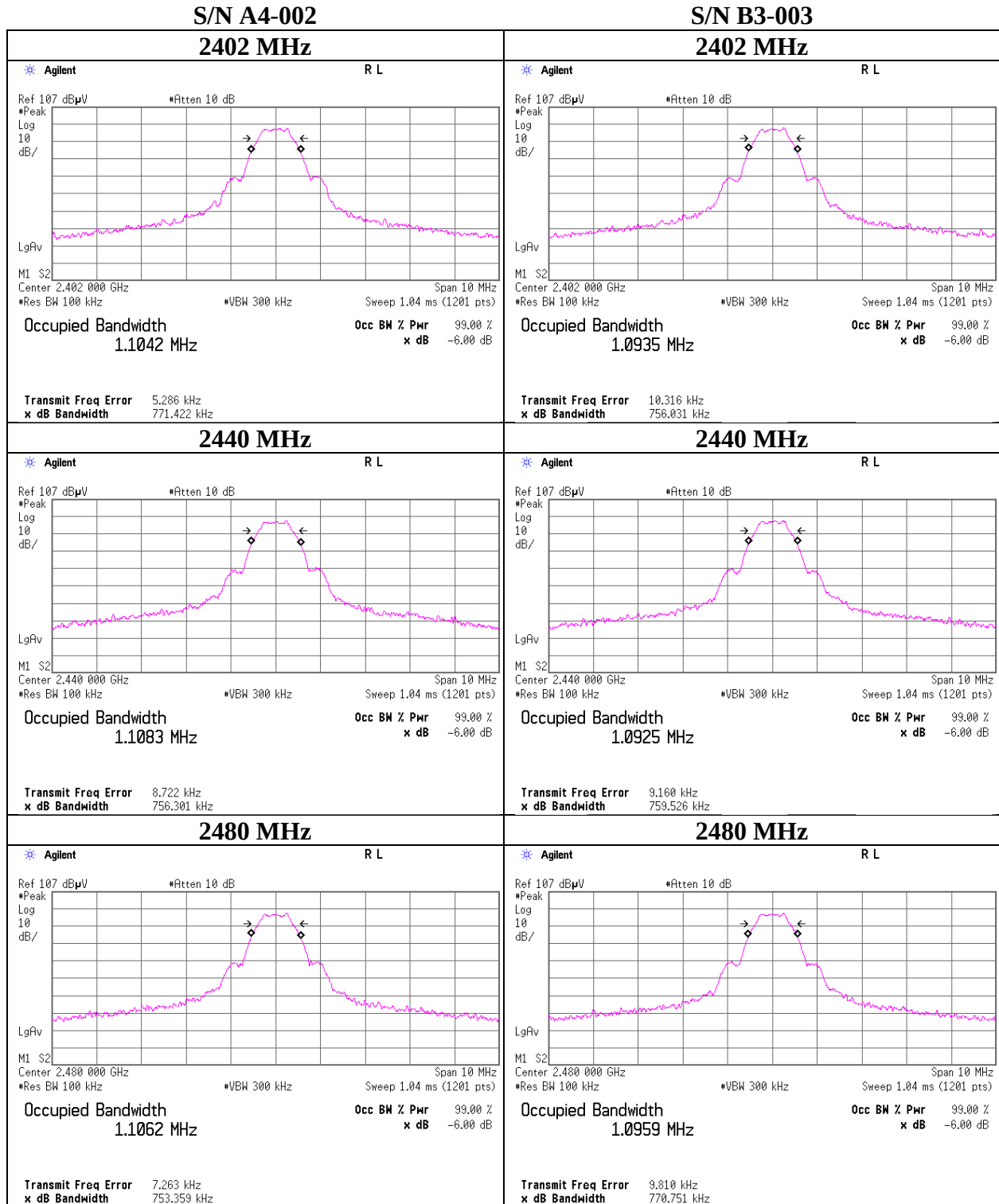
APPENDIX 1: Test data

6dB Bandwidth

Test place	Shonan EMC Lab. No.1 Measurement Room
Report No.	10938437S-A-R3
Date	October 9, 2015
Temperature / Humidity	25 deg. C / 44 % RH
Engineer	Yosuke Ishikawa
Mode	Tx BT LE

S/N	Frequency [MHz]	6dB Bandwidth [MHz]	Limit [kHz]
A4-002	2402	0.771	> 500
	2440	0.756	> 500
	2480	0.753	> 500
B3-003	2402	0.756	> 500
	2440	0.760	> 500
	2480	0.771	> 500

6dB Bandwidth



Maximum Peak Output Power

Test place Shonan EMC Lab. No.1 Measurement Room
Report No. 10938437S-A-R3
Date October 9, 2015
Temperature / Humidity 25 deg. C / 44 % RH
Engineer Yosuke Ishikawa
Mode Tx BT LE

S/N A4-002

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
2402	-11.22	1.04	9.98	-0.20	0.95	30.00	1000	30.20
2440	-11.30	1.04	9.98	-0.28	0.94	30.00	1000	30.28
2480	-11.48	1.05	9.98	-0.45	0.90	30.00	1000	30.45

S/N B3-003

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
2402	-11.21	1.04	9.98	-0.19	0.96	30.00	1000	30.19
2440	-11.41	1.04	9.98	-0.39	0.91	30.00	1000	30.39
2480	-11.54	1.05	9.98	-0.51	0.89	30.00	1000	30.51

Sample Calculation:

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

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

Average Output Power
(Reference data)

Test place	Shonan EMC Lab. No.1 Measurement Room
Report No.	10938437S-A-R3
Date	October 9, 2015
Temperature / Humidity	25 deg. C / 44 % RH
Engineer	Yosuke Ishikawa
Mode	Tx BT LE

S/N A4-002

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Frame power)		Duty factor [dB]	Result (Burst power)	
				[dBm]	[mW]		[dBm]	[mW]
2402	-11.64	1.04	9.98	-0.62	0.87	0.00	-0.62	0.87
2440	-11.78	1.04	9.98	-0.76	0.84	0.00	-0.76	0.84
2480	-11.93	1.05	9.98	-0.90	0.81	0.00	-0.90	0.81

S/N B3-003

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Frame power)		Duty factor [dB]	Result (Burst power)	
				[dBm]	[mW]		[dBm]	[mW]
2402	-11.66	1.04	9.98	-0.64	0.86	0.00	-0.64	0.86
2440	-11.82	1.04	9.98	-0.80	0.83	0.00	-0.80	0.83
2480	-11.98	1.05	9.98	-0.95	0.80	0.00	-0.95	0.80

Sample Calculation:

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

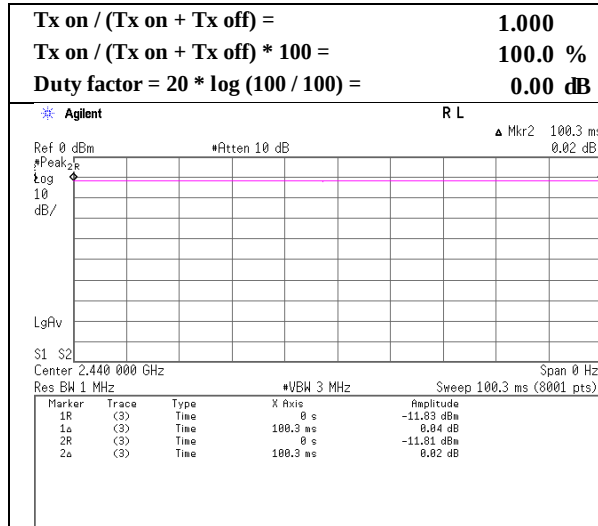
Result (Burst power) = Frame power + Duty factor

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

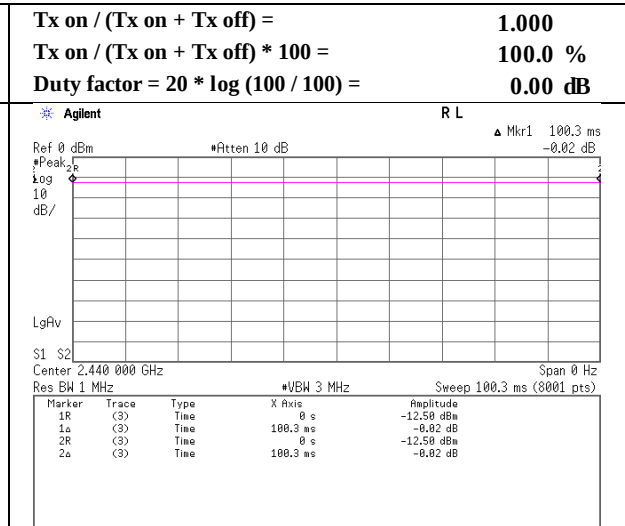
Burst rate confirmation

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	10938437S-A-R3
Date	September 30, 2015
Temperature / Humidity	27 deg. C / 50 % RH
Engineer	Yosuke Ishikawa
Mode	Tx

S/N A4-001



S/N B3-001



Radiated Spurious Emission

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 10938437S-A-R3
Date : September 30, 2015 October 4, 2015
Temperature / Humidity : 27 deg. C / 50 % RH 22 deg. C / 56 % RH
Engineer : Yosuke Ishikawa Yasumasa Owaki
(1-18 GHz) (30-1000 MHz, 18-25 GHz)
Mode : Tx BT LE 2402 MHz, S/N: A4-001

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	160.000	QP	22.8	15.2	8.0	32.1	0.0	13.9	43.5	29.6	200	0	
Hori.	320.000	QP	21.8	14.5	8.8	31.9	0.0	13.2	46.0	32.8	100	0	
Hori.	480.000	QP	21.8	17.5	9.5	31.9	0.0	16.9	46.0	29.1	100	0	
Hori.	2390.000	PK	45.5	27.8	13.7	41.0	3.5	49.5	73.9	24.4	191	216	
Hori.	4804.000	PK	47.1	31.4	5.7	39.6	3.5	48.1	73.9	25.8	111	176	
Hori.	7206.000	PK	45.3	36.9	7.1	40.1	3.5	52.7	73.9	21.2	100	0	
Hori.	9608.000	PK	45.0	38.5	8.2	39.6	3.5	55.6	73.9	18.3	100	0	
Hori.	12010.000	PK	47.3	39.7	9.3	39.3	3.5	60.5	73.9	13.4	100	0	
Hori.	2390.000	AV	36.5	27.8	13.7	41.0	3.5	40.5	53.9	13.4	191	216	
Hori.	4804.000	AV	39.1	31.4	5.7	39.6	3.5	40.1	53.9	13.8	111	176	
Hori.	7206.000	AV	36.5	36.9	7.1	40.1	3.5	43.9	53.9	10.0	100	0	
Hori.	9608.000	AV	36.6	38.5	8.2	39.6	3.5	47.2	53.9	6.7	100	0	
Hori.	12010.000	AV	37.4	39.7	9.3	39.3	3.5	50.6	53.9	3.3	100	0	
Vert.	640.000	QP	22.1	19.7	10.1	31.9	0.0	20.0	46.0	26.0	100	0	
Vert.	800.000	QP	21.5	21.0	10.6	31.5	0.0	21.6	46.0	24.4	100	0	
Vert.	960.000	QP	21.0	23.0	11.2	30.5	0.0	24.7	46.0	21.3	100	0	
Vert.	2390.000	PK	46.3	27.8	13.7	41.0	3.5	50.3	73.9	23.6	118	254	
Vert.	4804.000	PK	48.1	31.4	5.7	39.6	3.5	49.1	73.9	24.8	126	143	
Vert.	7206.000	PK	45.7	36.9	7.1	40.1	3.5	53.1	73.9	20.8	100	0	
Vert.	9608.000	PK	46.5	38.5	8.2	39.6	3.5	57.1	73.9	16.8	100	0	
Vert.	12010.000	PK	46.6	39.7	9.3	39.3	3.5	59.8	73.9	14.1	100	0	
Vert.	2390.000	AV	36.4	27.8	13.7	41.0	3.5	40.4	53.9	13.5	118	254	
Vert.	4804.000	AV	40.3	31.4	5.7	39.6	3.5	41.3	53.9	12.6	126	143	
Vert.	7206.000	AV	36.6	36.9	7.1	40.1	3.5	44.0	53.9	9.9	100	0	
Vert.	9608.000	AV	36.5	38.5	8.2	39.6	3.5	47.1	53.9	6.8	100	0	
Vert.	12010.000	AV	36.9	39.7	9.3	39.3	3.5	50.1	53.9	3.8	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : $20\log(4.48 \text{ m} / 3.0 \text{ m}) = 3.5 \text{ dB}$

13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.5 \text{ dB}$

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2402.000	PK	87.4	27.8	13.7	41.0	3.5	91.4	-	-	Carrier
Hori.	2400.000	PK	42.1	27.8	13.7	41.0	3.5	46.1	71.3	25.2	
Vert.	2402.000	PK	84.8	27.8	13.7	41.0	3.5	88.8	-	-	Carrier
Vert.	2400.000	PK	39.5	27.8	13.7	41.0	3.5	43.5	68.7	25.2	

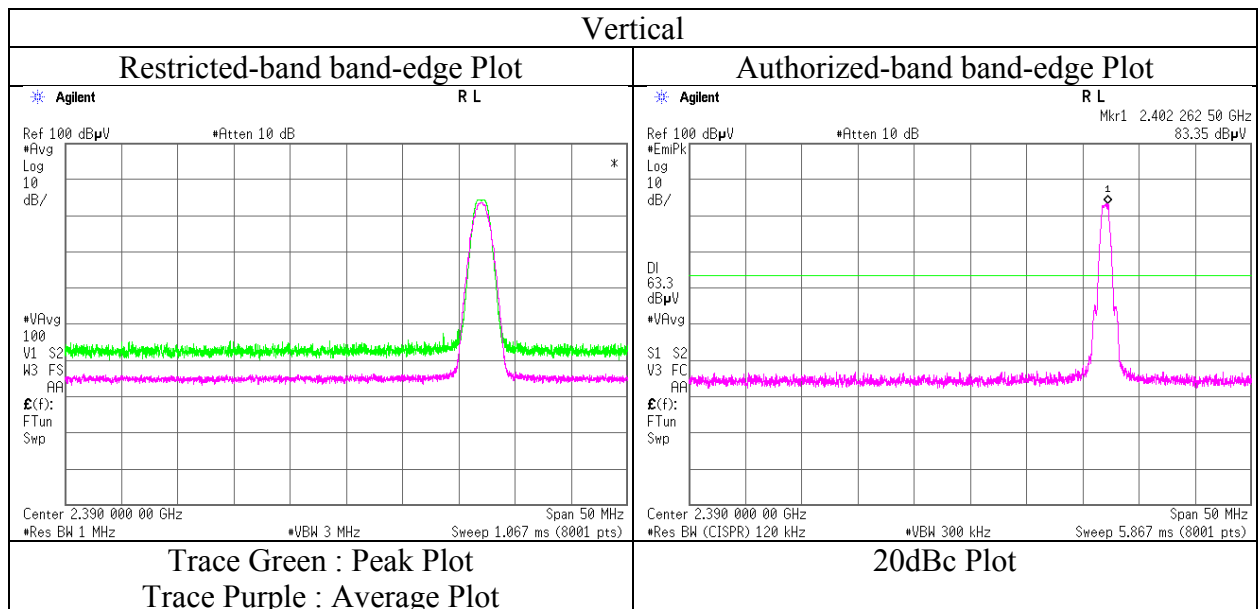
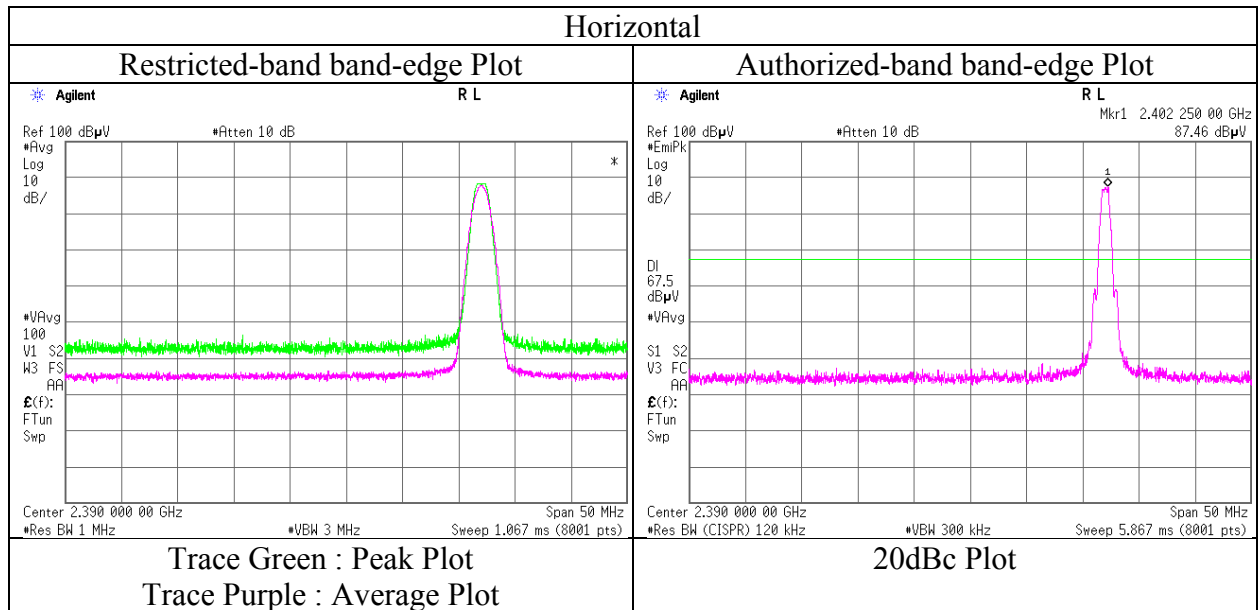
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : $20\log(4.48 \text{ m} / 3.0 \text{ m}) = 3.5 \text{ dB}$

13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.5 \text{ dB}$

Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	10938437S-A-R3
Date	September 30, 2015
Temperature / Humidity	27 deg. C / 50 % RH
Engineer	Yosuke Ishikawa (1-18 GHz)
Mode	Tx BT LE 2402 MHz, S/N: A4-001



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

Radiated Spurious Emission

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 10938437S-A-R3
Date : September 30, 2015 October 4, 2015
Temperature / Humidity : 27 deg. C / 50 % RH 22 deg. C / 56 % RH
Engineer : Yosuke Ishikawa Yasumasa Owaki
(1-18 GHz) (30-1000 MHz, 18-25 GHz)
Mode : Tx BT LE 2440 MHz, S/N: A4-001

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	160.000	QP	22.9	15.2	8.0	32.1	0.0	14.0	43.5	29.5	200	0	
Hori.	320.000	QP	21.9	14.5	8.8	31.9	0.0	13.3	46.0	32.7	100	0	
Hori.	480.000	QP	21.8	17.5	9.5	31.9	0.0	16.9	46.0	29.1	100	0	
Hori.	4880.000	PK	46.3	31.7	5.8	39.5	3.5	47.8	73.9	26.1	100	30	
Hori.	7320.000	PK	45.7	36.9	7.2	40.2	3.5	53.1	73.9	20.8	100	0	
Hori.	9760.000	PK	45.7	38.5	8.2	39.5	3.5	56.4	73.9	17.5	100	0	
Hori.	12200.000	PK	44.7	39.6	9.4	39.4	3.5	57.8	73.9	16.1	100	0	
Hori.	4880.000	AV	38.7	31.7	5.8	39.5	3.5	40.2	53.9	13.7	100	30	
Hori.	7320.000	AV	36.2	36.9	7.2	40.2	3.5	43.6	53.9	10.3	100	0	
Hori.	9760.000	AV	35.8	38.5	8.2	39.5	3.5	46.5	53.9	7.4	100	0	
Hori.	12200.000	AV	35.7	39.6	9.4	39.4	3.5	48.8	53.9	5.1	100	0	
Vert.	640.000	QP	22.1	19.7	10.1	31.9	0.0	20.0	46.0	26.0	100	0	
Vert.	800.000	QP	21.5	21.0	10.6	31.5	0.0	21.6	46.0	24.4	100	0	
Vert.	960.000	QP	21.1	23.0	11.2	30.5	0.0	24.8	46.0	21.2	100	0	
Vert.	4880.000	PK	47.3	31.7	5.8	39.5	3.5	48.8	73.9	25.1	100	32	
Vert.	7320.000	PK	45.9	36.9	7.2	40.2	3.5	53.3	73.9	20.6	100	0	
Vert.	9760.000	PK	44.7	38.5	8.2	39.5	3.5	55.4	73.9	18.5	100	0	
Vert.	12200.000	PK	45.4	39.6	9.4	39.4	3.5	58.5	73.9	15.4	100	0	
Vert.	4880.000	AV	39.8	31.7	5.8	39.5	3.5	41.3	53.9	12.6	100	32	
Vert.	7320.000	AV	36.2	36.9	7.2	40.2	3.5	43.6	53.9	10.3	100	0	
Vert.	9760.000	AV	35.5	38.5	8.2	39.5	3.5	46.2	53.9	7.7	100	0	
Vert.	12200.000	AV	35.6	39.6	9.4	39.4	3.5	48.7	53.9	5.2	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : $20\log(4.48 \text{ m} / 3.0 \text{ m}) = 3.5 \text{ dB}$

13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.5 \text{ dB}$

UL Japan, Inc.

Shonan EMC Lab.

1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Radiated Spurious Emission

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 10938437S-A-R3
Date : September 30, 2015 October 4, 2015
Temperature / Humidity : 27 deg. C / 50 % RH 22 deg. C / 56 % RH
Engineer : Yosuke Ishikawa Yasumasa Owaki
(1-18 GHz) (30-1000 MHz, 18-25 GHz)
Mode : Tx BT LE 2480 MHz, S/N: A4-001

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	160.000	QP	22.9	15.2	8.0	32.1	0.0	14.0	43.5	29.5	200	0	
Hori.	320.000	QP	21.8	14.5	8.8	31.9	0.0	13.2	46.0	32.8	100	0	
Hori.	480.000	QP	21.9	17.5	9.5	31.9	0.0	17.0	46.0	29.0	100	0	
Hori.	2483.500	PK	48.6	27.9	13.7	41.0	3.5	52.7	73.9	21.2	183	201	
Hori.	4960.000	PK	47.7	32.0	5.8	39.4	3.5	49.6	73.9	24.3	104	78	
Hori.	7440.000	PK	44.4	37.0	7.2	40.4	3.5	51.7	73.9	22.2	100	0	
Hori.	9920.000	PK	44.5	38.4	8.2	39.4	3.5	55.2	73.9	18.7	100	0	
Hori.	12400.000	PK	44.1	39.5	9.6	39.6	3.5	57.1	73.9	16.8	100	0	
Hori.	2483.500	AV	38.5	27.9	13.7	41.0	3.5	42.6	53.9	11.3	183	201	
Hori.	4960.000	AV	41.0	32.0	5.8	39.4	3.5	42.9	53.9	11.0	104	78	
Hori.	7440.000	AV	35.9	37.0	7.2	40.4	3.5	43.2	53.9	10.7	100	0	
Hori.	9920.000	AV	34.9	38.4	8.2	39.4	3.5	45.6	53.9	8.3	100	0	
Hori.	12400.000	AV	34.9	39.5	9.6	39.6	3.5	47.9	53.9	6.0	100	0	
Vert.	640.000	QP	22.1	19.7	10.1	31.9	0.0	20.0	46.0	26.0	100	0	
Vert.	800.000	QP	21.6	21.0	10.6	31.5	0.0	21.7	46.0	24.3	100	0	
Vert.	960.000	QP	21.1	23.0	11.2	30.5	0.0	24.8	46.0	21.2	100	0	
Vert.	2483.500	PK	47.2	27.9	13.7	41.0	3.5	51.3	73.9	22.6	100	212	
Vert.	4960.000	PK	47.8	32.0	5.8	39.4	3.5	49.7	73.9	24.2	103	66	
Vert.	7440.000	PK	45.0	37.0	7.2	40.4	3.5	52.3	73.9	21.6	100	0	
Vert.	9920.000	PK	44.9	38.4	8.2	39.4	3.5	55.6	73.9	18.3	100	0	
Vert.	12400.000	PK	44.4	39.5	9.6	39.6	3.5	57.4	73.9	16.5	100	0	
Vert.	2483.500	AV	37.3	27.9	13.7	41.0	3.5	41.4	53.9	12.5	100	212	
Vert.	4960.000	AV	41.2	32.0	5.8	39.4	3.5	43.1	53.9	10.8	103	66	
Vert.	7440.000	AV	36.6	37.0	7.2	40.4	3.5	43.9	53.9	10.0	100	0	
Vert.	9920.000	AV	34.9	38.4	8.2	39.4	3.5	45.6	53.9	8.3	100	0	
Vert.	12400.000	AV	34.7	39.5	9.6	39.6	3.5	47.7	53.9	6.2	100	0	

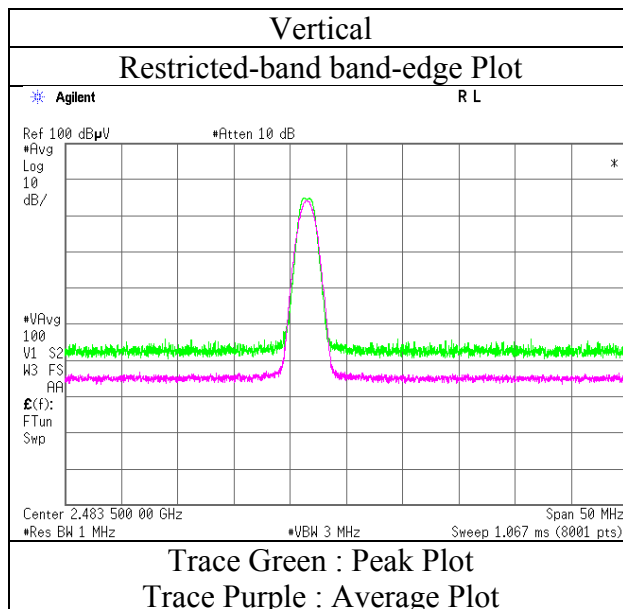
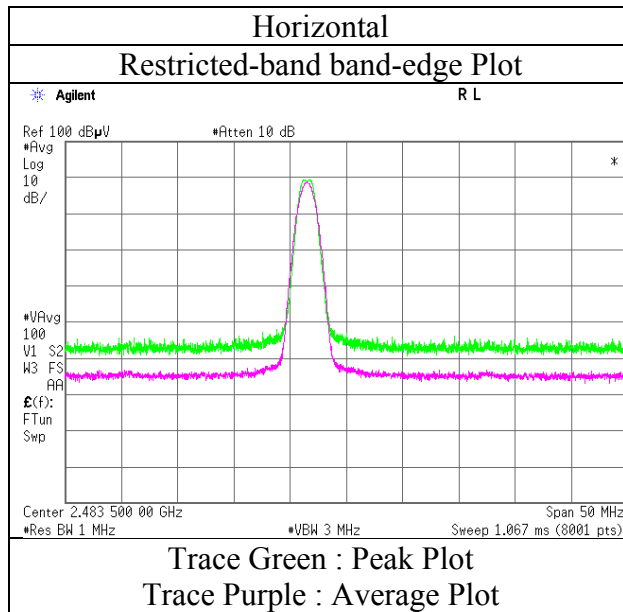
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : $20\log(4.48\text{ m} / 3.0\text{ m}) = 3.5\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	10938437S-A-R3
Date	September 30, 2015
Temperature / Humidity	27 deg. C / 50 % RH
Engineer	Yosuke Ishikawa
	(1-18 GHz)
Mode	Tx BT LE 2480 MHz, S/N: A4-001



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

Radiated Spurious Emission

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 10938437S-A-R3
Date : September 30, 2015 October 4, 2015
Temperature / Humidity : 27 deg. C / 50 % RH 22 deg. C / 56 % RH
Engineer : Yosuke Ishikawa Yasumasa Owaki
(1-18 GHz) (30-1000 MHz, 18-25 GHz)
Mode : Tx BT LE 2402 MHz, S/N: B3-001

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	160.000	QP	22.9	15.2	8.0	32.1	0.0	14.0	43.5	29.5	200	0	
Hori.	320.000	QP	21.9	14.5	8.8	31.9	0.0	13.3	46.0	32.7	100	0	
Hori.	480.000	QP	21.9	17.5	9.5	31.9	0.0	17.0	46.0	29.0	100	0	
Hori.	2390.000	PK	46.1	27.8	13.7	41.0	3.5	50.1	73.9	23.8	189	211	
Hori.	4804.000	PK	46.7	31.4	5.7	39.6	3.5	47.7	73.9	26.2	113	93	
Hori.	7206.000	PK	46.1	36.9	7.1	40.1	3.5	53.5	73.9	20.4	100	0	
Hori.	9608.000	PK	45.7	38.5	8.2	39.6	3.5	56.3	73.9	17.6	100	0	
Hori.	12010.000	PK	47.0	39.7	9.3	39.3	3.5	60.2	73.9	13.7	100	0	
Hori.	2390.000	AV	36.6	27.8	13.7	41.0	3.5	40.6	53.9	13.3	189	211	
Hori.	4804.000	AV	39.6	31.4	5.7	39.6	3.5	40.6	53.9	13.3	113	93	
Hori.	7206.000	AV	36.8	36.9	7.1	40.1	3.5	44.2	53.9	9.7	100	0	
Hori.	9608.000	AV	37.0	38.5	8.2	39.6	3.5	47.6	53.9	6.3	100	0	
Hori.	12010.000	AV	37.1	39.7	9.3	39.3	3.5	50.3	53.9	3.6	100	0	
Vert.	640.000	QP	22.2	19.7	10.1	31.9	0.0	20.1	46.0	25.9	100	0	
Vert.	800.000	QP	21.8	21.0	10.6	31.5	0.0	21.9	46.0	24.1	100	0	
Vert.	960.000	QP	21.0	23.0	11.2	30.5	0.0	24.7	46.0	21.3	100	0	
Vert.	2390.000	PK	45.9	27.8	13.7	41.0	3.5	49.9	73.9	24.0	122	234	
Vert.	4804.000	PK	47.3	31.4	5.7	39.6	3.5	48.3	73.9	25.6	100	215	
Vert.	7206.000	PK	45.9	36.9	7.1	40.1	3.5	53.3	73.9	20.6	100	0	
Vert.	9608.000	PK	45.9	38.5	8.2	39.6	3.5	56.5	73.9	17.4	100	0	
Vert.	12010.000	PK	45.9	39.7	9.3	39.3	3.5	59.1	73.9	14.8	100	0	
Vert.	2390.000	AV	36.9	27.8	13.7	41.0	3.5	40.9	53.9	13.0	122	234	
Vert.	4804.000	AV	38.0	31.4	5.7	39.6	3.5	39.0	53.9	14.9	100	215	
Vert.	7206.000	AV	37.0	36.9	7.1	40.1	3.5	44.4	53.9	9.5	100	0	
Vert.	9608.000	AV	36.6	38.5	8.2	39.6	3.5	47.2	53.9	6.7	100	0	
Vert.	12010.000	AV	37.3	39.7	9.3	39.3	3.5	50.5	53.9	3.4	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : $20\log(4.48 \text{ m} / 3.0 \text{ m}) = 3.5 \text{ dB}$

13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.5 \text{ dB}$

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2402.000	PK	86.4	27.8	13.7	41.0	3.5	90.4	-	-	Carrier
Hori.	2400.000	PK	41.4	27.8	13.7	41.0	3.5	45.4	70.4	25.0	
Vert.	2402.000	PK	85.3	27.8	13.7	41.0	3.5	89.3	-	-	Carrier
Vert.	2400.000	PK	39.9	27.8	13.7	41.0	3.5	43.9	69.3	25.4	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : $20\log(4.48 \text{ m} / 3.0 \text{ m}) = 3.5 \text{ dB}$

13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.5 \text{ dB}$

UL Japan, Inc.

Shonan EMC Lab.

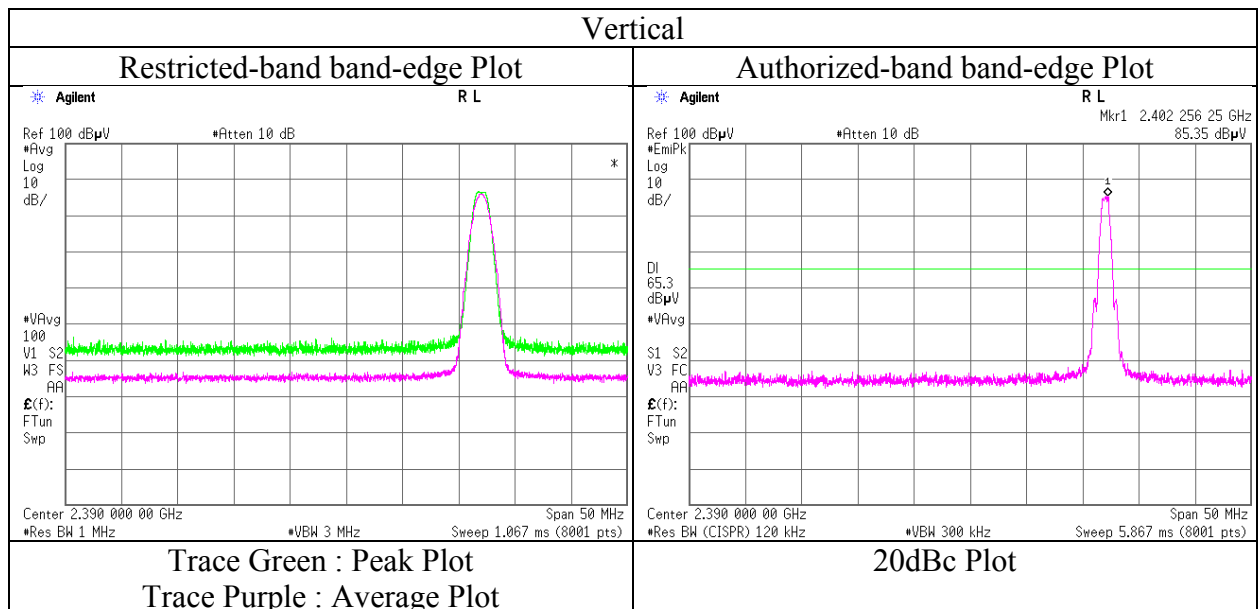
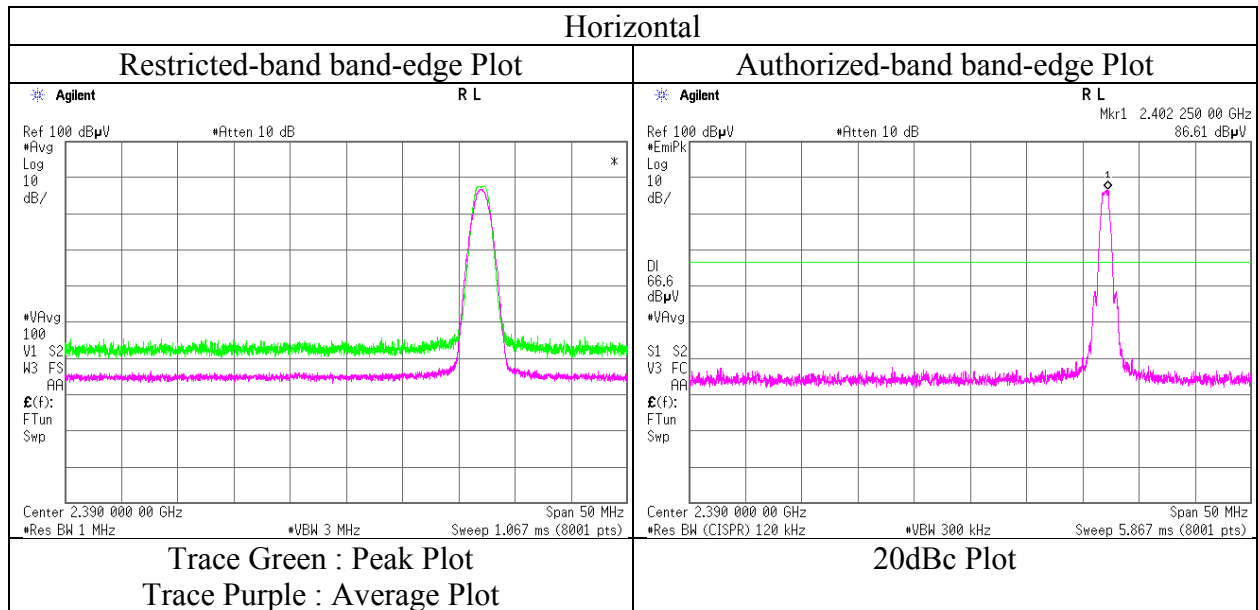
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

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Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	10938437S-A-R3
Date	September 30, 2015
Temperature / Humidity	27 deg. C / 50 % RH
Engineer	Yosuke Ishikawa (1-18 GHz)
Mode	Tx BT LE 2402 MHz, S/N: B3-001



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

Radiated Spurious Emission

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 10938437S-A-R3
Date : September 30, 2015 October 4, 2015
Temperature / Humidity : 27 deg. C / 50 % RH 22 deg. C / 56 % RH
Engineer : Yosuke Ishikawa Yasumasa Owaki
(1-18 GHz) (30-1000 MHz, 18-25 GHz)
Mode : Tx BT LE 2440 MHz, S/N: B3-001

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	160.000	QP	22.8	15.2	8.0	32.1	0.0	13.9	43.5	29.6	200	0	
Hori.	320.000	QP	21.8	14.5	8.8	31.9	0.0	13.2	46.0	32.8	100	0	
Hori.	480.000	QP	21.8	17.5	9.5	31.9	0.0	16.9	46.0	29.1	100	0	
Hori.	4880.000	PK	45.2	31.7	5.8	39.5	3.5	46.7	73.9	27.2	100	32	
Hori.	7320.000	PK	45.5	36.9	7.2	40.2	3.5	52.9	73.9	21.0	100	0	
Hori.	9760.000	PK	46.0	38.5	8.2	39.5	3.5	56.7	73.9	17.2	100	0	
Hori.	12200.000	PK	44.5	39.6	9.4	39.4	3.5	57.6	73.9	16.3	100	0	
Hori.	4880.000	AV	38.0	31.7	5.8	39.5	3.5	39.5	53.9	14.4	100	32	
Hori.	7320.000	AV	36.2	36.9	7.2	40.2	3.5	43.6	53.9	10.3	100	0	
Hori.	9760.000	AV	35.1	38.5	8.2	39.5	3.5	45.8	53.9	8.1	100	0	
Hori.	12200.000	AV	35.9	39.6	9.4	39.4	3.5	49.0	53.9	4.9	100	0	
Vert.	640.000	QP	22.2	19.7	10.1	31.9	0.0	20.1	46.0	25.9	100	0	
Vert.	800.000	QP	21.9	21.0	10.6	31.5	0.0	22.0	46.0	24.0	100	0	
Vert.	960.000	QP	20.9	23.0	11.2	30.5	0.0	24.6	46.0	21.4	100	0	
Vert.	4880.000	PK	47.1	31.7	5.8	39.5	3.5	48.6	73.9	25.3	100	59	
Vert.	7320.000	PK	47.9	36.9	7.2	40.2	3.5	55.3	73.9	18.6	100	0	
Vert.	9760.000	PK	44.6	38.5	8.2	39.5	3.5	55.3	73.9	18.6	100	0	
Vert.	12200.000	PK	46.0	39.6	9.4	39.4	3.5	59.1	73.9	14.8	100	0	
Vert.	4880.000	AV	39.0	31.7	5.8	39.5	3.5	40.5	53.9	13.4	100	59	
Vert.	7320.000	AV	36.1	36.9	7.2	40.2	3.5	43.5	53.9	10.4	100	0	
Vert.	9760.000	AV	36.0	38.5	8.2	39.5	3.5	46.7	53.9	7.2	100	0	
Vert.	12200.000	AV	35.5	39.6	9.4	39.4	3.5	48.6	53.9	5.3	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : $20\log(4.48 \text{ m} / 3.0 \text{ m}) = 3.5 \text{ dB}$

13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.5 \text{ dB}$

Radiated Spurious Emission

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 10938437S-A-R3
Date : September 30, 2015 October 4, 2015
Temperature / Humidity : 27 deg. C / 50 % RH 22 deg. C / 56 % RH
Engineer : Yosuke Ishikawa Yasumasa Owaki
(1-18 GHz) (30-1000 MHz, 18-25 GHz)
Mode : Tx BT LE 2480 MHz, S/N: B3-001

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	160.000	QP	22.8	15.2	8.0	32.1	0.0	13.9	43.5	29.6	200	0	
Hori.	320.000	QP	21.8	14.5	8.8	31.9	0.0	13.2	46.0	32.8	100	0	
Hori.	480.000	QP	21.9	17.5	9.5	31.9	0.0	17.0	46.0	29.0	100	0	
Hori.	2483.500	PK	47.7	27.9	13.7	41.0	3.5	51.8	73.9	22.1	146	218	
Hori.	4960.000	PK	49.9	32.0	5.8	39.4	3.5	51.8	73.9	22.1	100	94	
Hori.	7440.000	PK	44.8	37.0	7.2	40.4	3.5	52.1	73.9	21.8	100	0	
Hori.	9920.000	PK	44.0	38.4	8.2	39.4	3.5	54.7	73.9	19.2	100	0	
Hori.	12400.000	PK	43.7	39.5	9.6	39.6	3.5	56.7	73.9	17.2	100	0	
Hori.	2483.500	AV	38.4	27.9	13.7	41.0	3.5	42.5	53.9	11.4	146	218	
Hori.	4960.000	AV	44.0	32.0	5.8	39.4	3.5	45.9	53.9	8.0	100	94	
Hori.	7440.000	AV	37.4	37.0	7.2	40.4	3.5	44.7	53.9	9.2	100	0	
Hori.	9920.000	AV	35.0	38.4	8.2	39.4	3.5	45.7	53.9	8.2	100	0	
Hori.	12400.000	AV	34.6	39.5	9.6	39.6	3.5	47.6	53.9	6.3	100	0	
Vert.	640.000	QP	22.2	19.7	10.1	31.9	0.0	20.1	46.0	25.9	100	0	
Vert.	800.000	QP	21.8	21.0	10.6	31.5	0.0	21.9	46.0	24.1	100	0	
Vert.	960.000	QP	21.0	23.0	11.2	30.5	0.0	24.7	46.0	21.3	100	0	
Vert.	2483.500	PK	48.5	27.9	13.7	41.0	3.5	52.6	73.9	21.3	115	248	
Vert.	4960.000	PK	47.9	32.0	5.8	39.4	3.5	49.8	73.9	24.1	100	145	
Vert.	7440.000	PK	45.4	37.0	7.2	40.4	3.5	52.7	73.9	21.2	100	0	
Vert.	9920.000	PK	45.1	38.4	8.2	39.4	3.5	55.8	73.9	18.1	100	0	
Vert.	12400.000	PK	44.4	39.5	9.6	39.6	3.5	57.4	73.9	16.5	100	0	
Vert.	2483.500	AV	38.3	27.9	13.7	41.0	3.5	42.4	53.9	11.5	115	248	
Vert.	4960.000	AV	41.0	32.0	5.8	39.4	3.5	42.9	53.9	11.0	100	145	
Vert.	7440.000	AV	35.8	37.0	7.2	40.4	3.5	43.1	53.9	10.8	100	0	
Vert.	9920.000	AV	34.9	38.4	8.2	39.4	3.5	45.6	53.9	8.3	100	0	
Vert.	12400.000	AV	34.8	39.5	9.6	39.6	3.5	47.8	53.9	6.1	100	0	

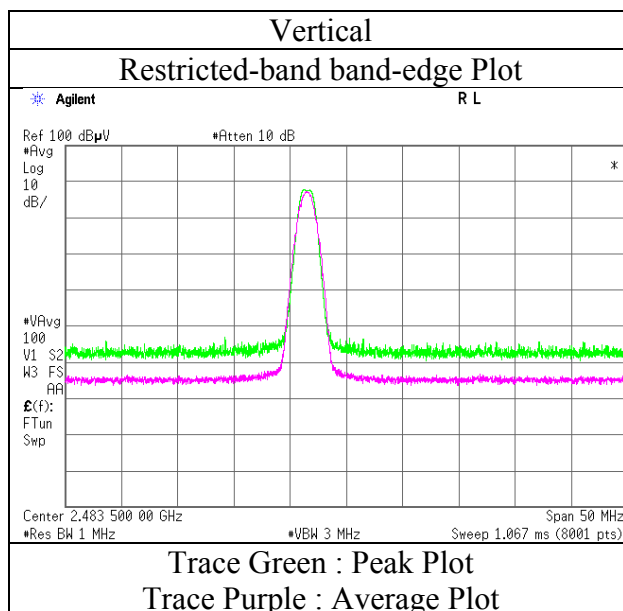
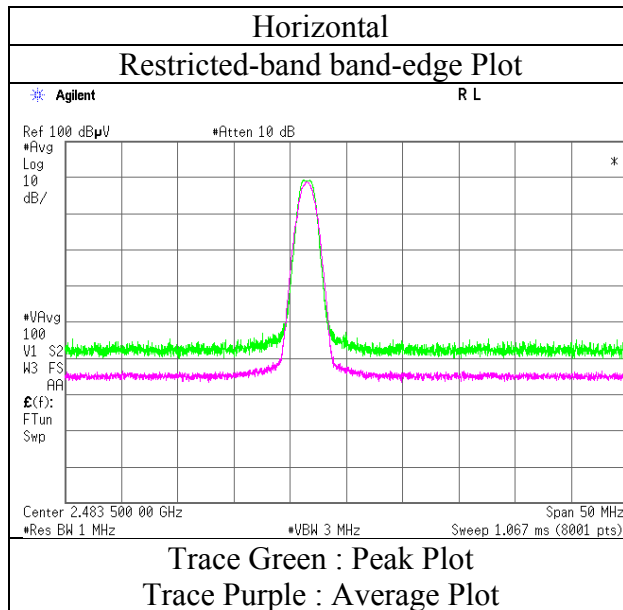
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : $20\log(4.48\text{ m} / 3.0\text{ m}) = 3.5\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Radiated Spurious Emission
(Reference Plot for band-edge)

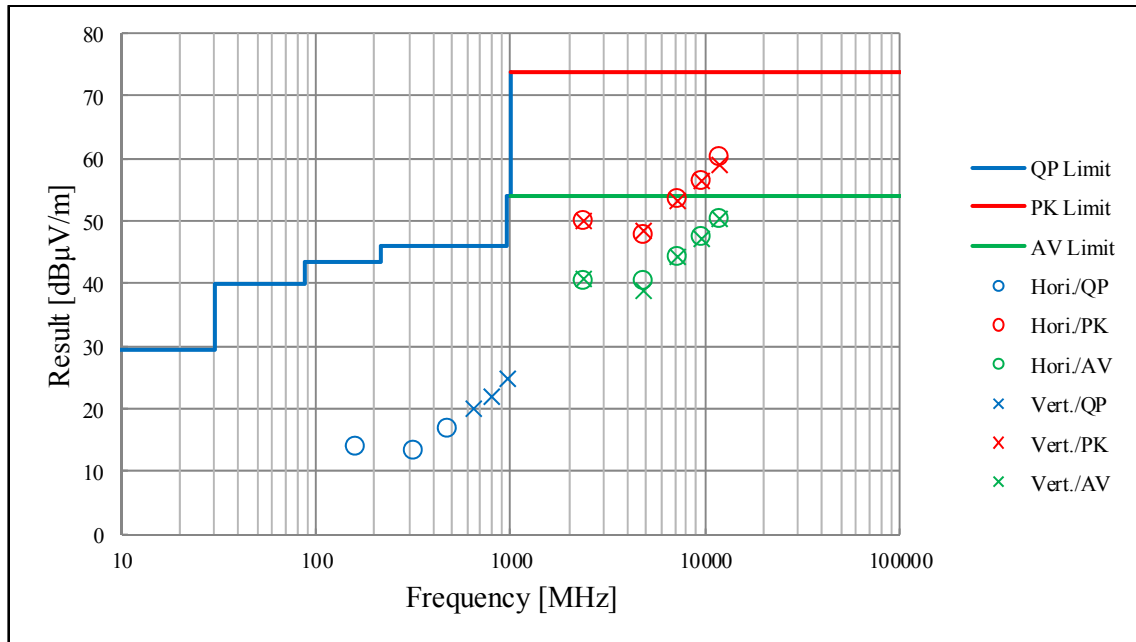
Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 10938437S-A-R3
Date : September 30, 2015
Temperature / Humidity : 27 deg. C / 50 % RH
Engineer : Yosuke Ishikawa
(1-18 GHz)
Mode : Tx BT LE 2480 MHz, S/N: B3-001



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

Radiated Spurious Emission (Plot data, Worst case)

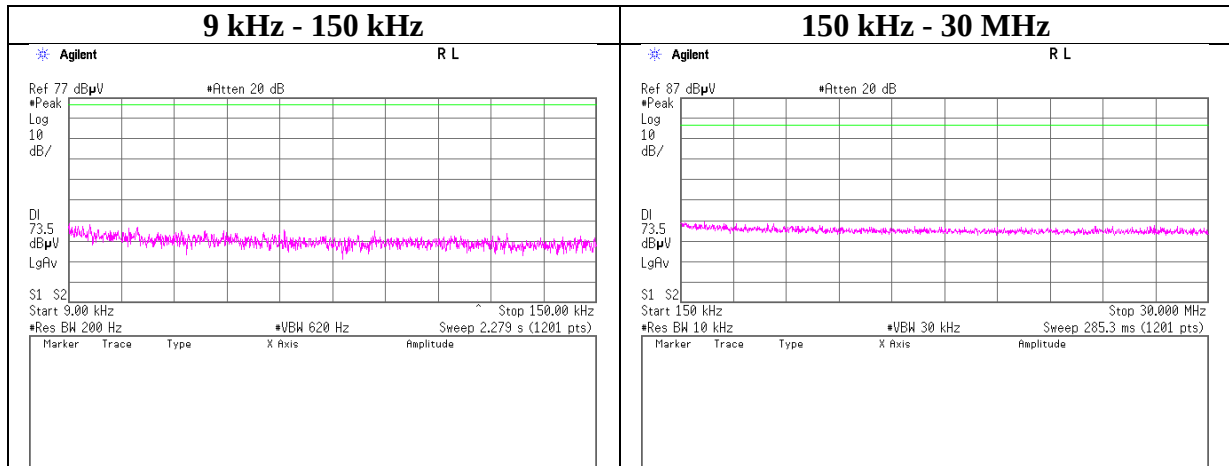
Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber		
Report No.	10938437S-A-R3		
Date	September 30, 2015	October 4, 2015	
Temperature / Humidity	27 deg. C / 50 % RH	22 deg. C / 56 % RH	
Engineer	Yosuke Ishikawa	Yasumasa Owaki	
	(1-18 GHz)	(30-1000 MHz, 18-25 GHz)	
Mode	Tx BT LE 2402 MHz, S/N B3-001		



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

Conducted Spurious Emission

Test place Shonan EMC Lab. No.1 Measurement Room
Report No. 10938437S-A-R3
Date October 9, 2015
Temperature / Humidity 25 deg. C / 44 % RH
Engineer Yosuke Ishikawa
Mode Tx BT LE 2402 MHz, S/N B3-003



Power Density

Test place Shonan EMC Lab. No.1 Measurement Room
Report No. 10938437S-A-R3
Date October 9, 2015
Temperature / Humidity 25 deg. C / 44 % RH
Engineer Yosuke Ishikawa
Mode Tx

S/N A4-002

Freq.	Reading	Cable Loss	Atten. Loss	Result	Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[dBm]	[dB]
2402.00	-28.19	1.04	9.98	-17.17	8.00	25.17
2440.00	-28.23	1.04	9.98	-17.21	8.00	25.21
2480.00	-27.95	1.05	9.98	-16.92	8.00	24.92

S/N B3-003

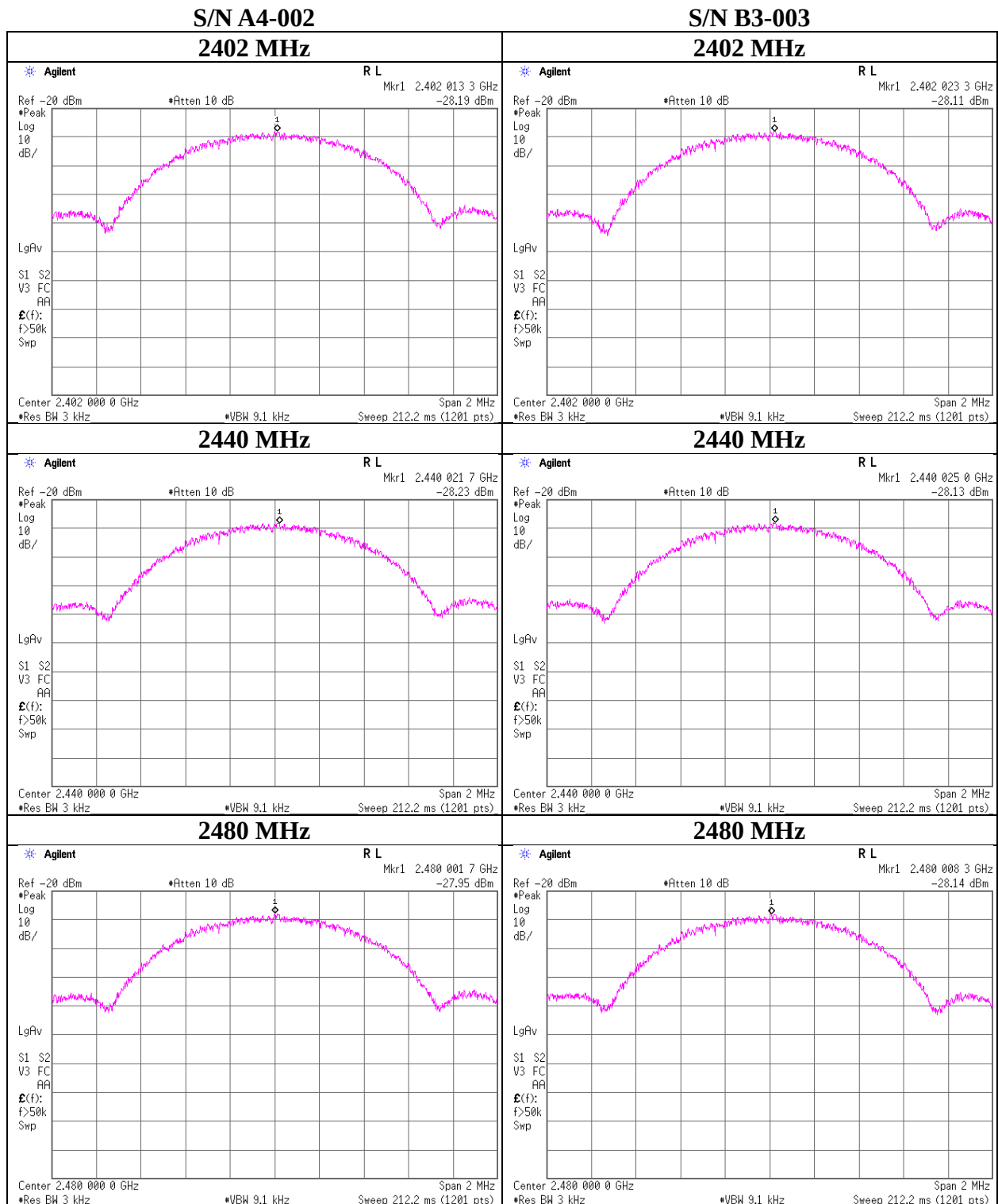
Freq.	Reading	Cable Loss	Atten. Loss	Result	Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[dBm]	[dB]
2402.00	-28.11	1.04	9.98	-17.09	8.00	25.09
2440.00	-28.13	1.04	9.98	-17.11	8.00	25.11
2480.00	-28.14	1.05	9.98	-17.11	8.00	25.11

Sample Calculation:

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

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

Power Density



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Shonan EMC Lab.

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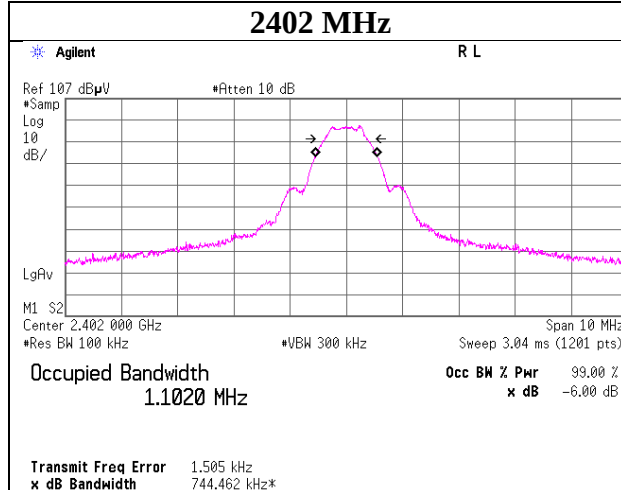
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

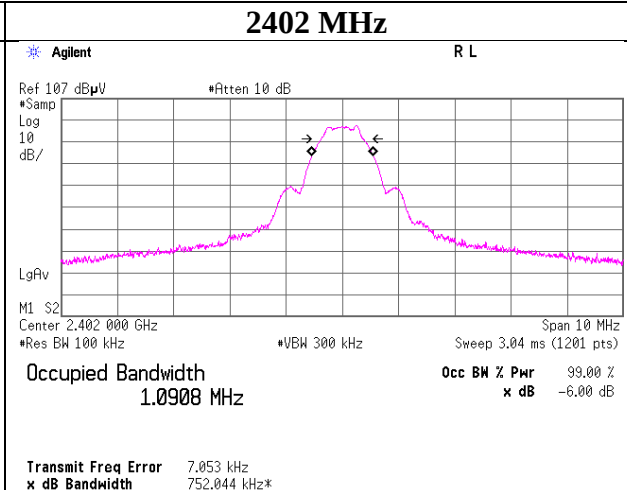
99% Occupied Bandwidth

Test place : Shonan EMC Lab. No.1 Measurement Room
Report No. : 10938437S-A-R3
Date : October 9, 2015
Temperature / Humidity : 25 deg. C / 44 % RH
Engineer : Yosuke Ishikawa
Mode : Tx

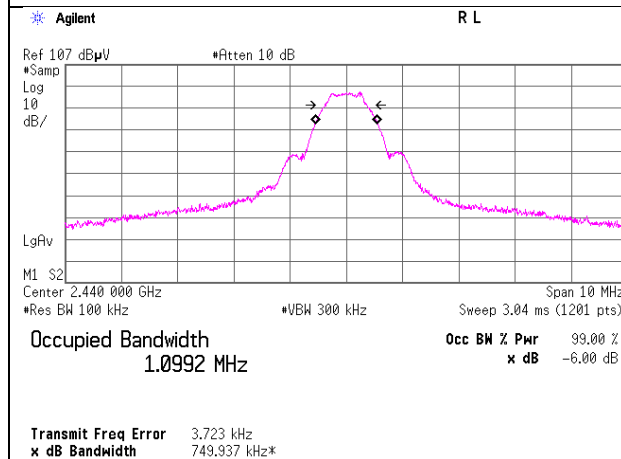
S/N A4-002 2402 MHz



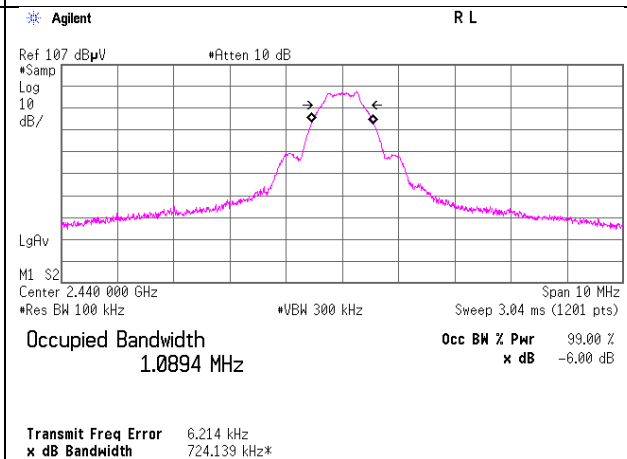
S/N B3-003 2402 MHz



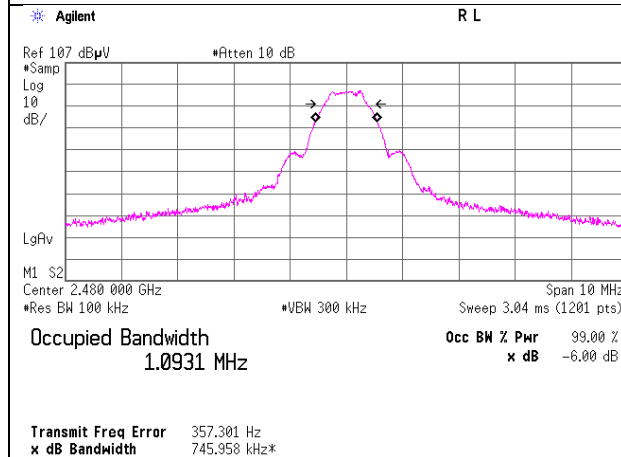
2440 MHz



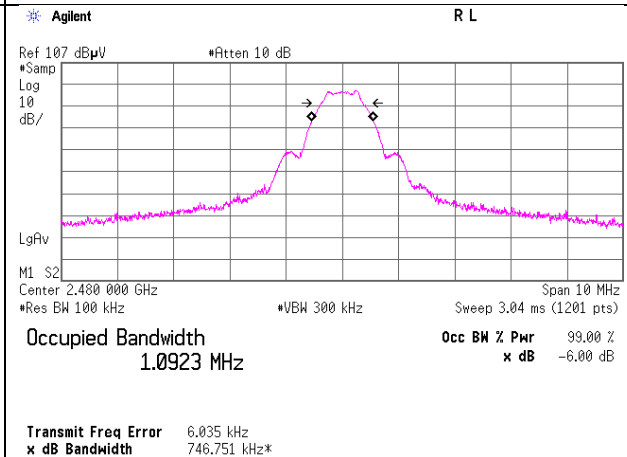
2440 MHz



2480 MHz



2480 MHz



APPENDIX 2: Test instruments

Test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
SAF-06	Pre Amplifier	TOYO Corporation	TPA0118-36	1440491	RE	2015/05/27 * 12
SCC-G04	Coaxial Cable	Junkosha	J12J102207-00	JUN-12-14-018	RE	2015/06/08 * 12
SCC-G23	Coaxial Cable	Suhner	SUCOFLEX 104	297342/4	RE	2015/05/19 * 12
SHA-03	Horn Antenna	Schwarzbeck	BBHA9120 D	9120D-739	RE	2015/08/11 * 12
SOS-05	Humidity Indicator	A&D	AD-5681	4062518	RE	2014/10/30 * 12
SSA-02	Spectrum Analyzer	Agilent	E4448A	MY48250106	RE	2015/03/26 * 12
SJM-15	Measure	ASKUL	-	-	RE	-
SAEC-03(SV SWR)	Semi-Anechoic Chamber	TDK	SAEC-03(S VSWR)	3	RE	2015/08/28 * 12
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV (RE,CE,RFI, MF)	-	RE	-
SAT10-05	Attenuator(above 1G Hz)	Agilent	8493C-010	74864	RE	2014/11/21 * 12
SFL-02	Highpass Filter	MICRO-TRONICS	HPM50111	051	RE	2014/11/21 * 12
SHA-04	Horn Antenna	ETS LINDGREN	3160-09	LM3640	RE	2015/03/17 * 12
SAF-08	Pre Amplifier	TOYO Corporation	HAP18-26 W	00000019	RE	2015/03/23 * 12
SCC-G15	Coaxial Cable	Suhner	SUCOFLEX 102	32703/2	RE	2015/03/11 * 12
KSA-08	Spectrum Analyzer	Agilent	E4446A	MY46180525	RE	2015/03/23 * 12
SAEC-03(NS A)	Semi-Anechoic Chamber	TDK	SAEC-03(N SA)	3	RE	2015/07/16 * 12
SBA-03	Biconical Antenna	Schwarzbeck	BBA9106	91032666	RE	2014/10/18 * 12
SLA-03	Logperiodic Antenna	Schwarzbeck	UHALP9108A	UHALP 9108-A 0901	RE	2014/10/18 * 12
SAT6-08	Attenuator	HIROSE ELECTRIC CO.,LTD.	AT-406(40)	-	RE	2015/08/31 * 12
SCC-C1/C2/C3/C4/C5/C10/SRSE-03	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/TOYO	8D2W/12D SFA/141PE/141PE/141PE/NS 4906	-/0901-271 (RF Selector)	RE	2015/04/17 * 12
SAF-03	Pre Amplifier	SONOMA	310N	290213	RE	2015/02/18 * 12
STR-06	Test Receiver	Rohde & Schwarz	ESCI	101259	RE	2015/03/24 * 12

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Test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
SRENT-05	Spectrum Analyzer	KEYSIGHT	E4440A	MY46187 752	AT	2015/10/05 * 12
SCC-G12	Coaxial Cable	Suhner	SUCOFLEX 102	30790/2	AT	2015/03/11 * 12
SAT10-05	Attenuator(above1G Hz)	Agilent	8493C-010	74864	AT	2014/11/21 * 12
SPM-06	Power Meter	Anritsu	ML2495A	0850009	AT	2015/04/07 * 12
SPSS-03	Power sensor	Anritsu	MA2411B	0917063	AT	2015/04/07 * 12
SOS-09	Humidity Indicator	A&D	AD-5681	4061484	AT	2014/12/24 * 12
STS-05	Digital Hitester	Hioki	3805-50	080997828	AT	2014/11/11 * 12

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

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

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

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

UL Japan, Inc.

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