



RADIO TEST REPORT

Test Report No. : 12563995S-B-R2

Applicant : Sony Corporation
Type of Equipment : Wireless Stereo Headset
Model No. : WH-XB700
FCC ID : AK8WHXB700
Test regulation : FCC Part 15 Subpart C: 2018
(* Bluetooth Low Energy part)
Test Result : Complied

1. This test report shall not be reproduced in full or partial, without the written approval of UL Japan, Inc.
2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the limits of the above regulation.
4. The test results in this test report are traceable to the national or international standards.
5. This test report must not be used by the customer to claim product certification, approval, or endorsement by any agency of the Federal Government.
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. The all test items in this test report are conducted by UL Japan, Inc. Shonan EMC Lab.
8. The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan has been accredited.
9. This report is a revised version of 12563995S-B-R1. 12563995S-B-R1 is replaced with this report.

Date of test: October 15 to 19, 2018

Representative test engineer:

K. Takeyama

Kazutaka Takeyama
Engineer
Consumer Technology Division

Approved by:

T. Imamura

Toyokazu Imamura
Leader
Consumer Technology Division



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

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

13-EM-F0429

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.....	9
SECTION 5: Radiated Spurious Emission	10
SECTION 6: Antenna Terminal Conducted Tests.....	12
APPENDIX 1: Test data	13
6 dB Bandwidth and 99 % Occupied Bandwidth.....	13
Maximum Peak Output Power	16
Average Output Power	17
Radiated Spurious Emission	19
Conducted Spurious Emission	25
Power Density	28
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	: Sony Corporation
Address	: 1-7-1 Konan Minato-ku, Tokyo, 108-0075 Japan
Telephone Number	: +604-3835075
Contact Person	: Teh Cheong Chieh

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

2.1 Identification of E.U.T.

Type of Equipment	: Wireless Stereo Headset
Model No.	: WH-XB700
Serial No.	: Refer to Section 4, Clause 4.2
Rating	: DC 3.7 V: Built-in lithium-ion rechargeable battery DC 5 V: When charged using USB
Receipt Date of Sample	: October 11, 2018
Country of Mass-production	: China
Condition of EUT	: Engineering prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT	: No Modification by the test lab

2.2 Product Description

Model: WH-XB700 (referred to as the EUT in this report) is a Wireless Stereo Headset.

Radio Specification

Bluetooth Low Energy

Radio Type	: Transceiver
Frequency of Operation	: 2402 MHz - 2480 MHz
Modulation	: GFSK
Power Supply (radio part input)	: DC 1.35 V
Antenna type	: Chip Antenna
Antenna Gain	: 1.6 dBi
Clock frequency	: crystal (X211: 26 MHz)

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification	:	FCC Part 15 Subpart C FCC Part 15 final revised on March 12, 2018 and effective April 11, 2018
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

* Also the EUT complies with FCC Part 15 Subpart B.

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	N/A	*1)
6 dB Bandwidth	FCC: KDB 558074 D01 15.247 Meas Guidance v05 ----- IC: -	FCC: Section 15.247(a)(2) ----- IC: RSS-247 5.2(a)	See data.	Complied	Conducted
Maximum Peak Output Power	FCC: KDB 558074 D01 15.247 Meas Guidance v05 ----- IC: RSS-Gen 6.12	FCC: Section 15.247(b)(3) ----- IC: RSS-247 5.4(d)		Complied	Conducted
Power Density	FCC: KDB 558074 D01 15.247 Meas Guidance v05 ----- IC: -	FCC: Section 15.247(e) ----- IC: RSS-247 5.2(b)		Complied	Conducted
Spurious Emission Restricted Band Edges	FCC: KDB 558074 D01 15.247 Meas Guidance v05 ----- IC: RSS-Gen 6.13	FCC: Section 15.247(d) ----- IC: RSS-247 5.5 RSS-Gen 8.9 RSS-Gen 8.10	5.4 dB 2558.000 MHz, AV, Hori. Tx BT LE 2402 MHz	Complied	Conducted (below 30 MHz)/ Radiated (above 30 MHz) *2)

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

*1) The EUT operates with a battery. AC Line can be connected to the EUT via other device's USB port; however, the EUT stops transmission during recharging. Therefore, the test is not applicable to the EUT.

*2) Radiated test was selected over 30 MHz based on section 15.247(d) and KDB 558074 D01 15.247 Meas Guidance v05 8.5 and 8.6.

Symbols:

Complied The data of this test item has enough margin, more than the measurement uncertainty.

Complied# The data of this test item meets the limits unless the measurement uncertainty is taken into consideration.

* In case any questions arise about test procedure, ANSI C63.10: 2013 is also referred.

FCC Part 15.31 (e)

The EUT is a battery-operated device and test was performed with the full-charged battery. 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.

3.3 Addition to standard

Item	Test Procedure	Specification	Worst margin	Results	Remarks
99 % Occupied Bandwidth	RSS-Gen 6.7	IC: -	N/A	-	Conducted
Symbols: Complied The data of this test item has enough margin, more than the measurement uncertainty. Complied# The data of this test item meets the limits unless the measurement uncertainty is taken into consideration.					

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

3.4 Uncertainty

EMI

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

Shonan EMC Lab.

Item	Frequency range	Uncertainty (+/-)				
		No. 1 SAC / SR	No. 2 SAC / SR	No. 3 SAC / SR	No. 4 SAC / SR	No. 5,6,8 SR
Conducted emission (AC Mains) LISN	150 kHz-30 MHz	2.5 dB	2.5 dB	2.5 dB	2.6 dB	2.6 dB
Radiated emission (Measurement distance: 3 m)	9 kHz-30 MHz	3.2 dB	3.2 dB	3.3 dB	-	-
	30 MHz-200 MHz	4.9 dB	4.8 dB	4.9 dB	-	-
	200 MHz-1 GHz	6.1 dB	6.1 dB	6.1 dB	-	-
	1 GHz-6 GHz	4.7 dB	4.7 dB	4.7 dB	-	-
	6 GHz-18 GHz	5.3 dB	5.3 dB	5.3 dB	-	-
	18 GHz-40 GHz	5.6 dB	5.6 dB	5.6 dB	-	-
Radiated emission (Measurement distance: 1 m)	1 GHz-18 GHz	5.6 dB	5.6 dB	5.6 dB	-	-
	18 GHz-40 GHz	5.9 dB	5.9 dB	5.9 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	0.48 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-06	0.66 dB
Power Measurement above 1 GHz (Average Detector)_SPM-07	0.47 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-07	0.64 dB
Power Measurement above 1 GHz (Average Detector)_SPM-13	0.90 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-13	1.04 dB
Spurious emission (Conducted) below 1GHz	1.8 dB
Spurious emission (Conducted) 1 GHz-3 GHz	1.7 dB
Spurious emission (Conducted) 3 GHz-18 GHz	2.5 dB
Spurious emission (Conducted) 18 GHz-26.5 GHz	2.5 dB
Spurious emission (Conducted) 26.5 GHz-40 GHz	2.7 dB
Bandwidth Measurement	1.01 %
Duty cycle and Time Measurement	0.012 %

3.5 Test Location

UL Japan, Inc. Shonan EMC Lab.
 1-22-3, Megumigaoka, Hiratsuka-shi, Kanagawa-ken 259-1220 JAPAN
 Telephone: +81 463 50 6400, Facsimile: +81 463 50 6401
 JAB Accreditation No. RTL02610
 FCC Test Firm Registration Number: 839876

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

3.6 Test data, Test instruments, and Test set up

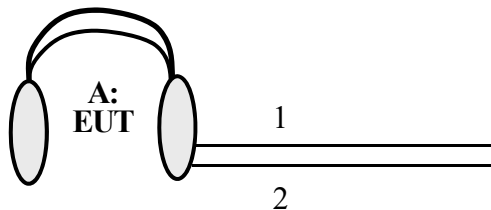
Refer to APPENDIX.

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

4.1 Operating Mode(s)

Mode	Frequency	Remarks*
Bluetooth Low Energy (BT LE)	2402 MHz, 2440 MHz, 2480 MHz	PRBS9
*Power of the EUT was set by the software as follows; Power settings: BT LE: FixedSoftware: CSR BlueSuite BlueTest Version 2.6.6.1311 *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.		

4.2 Configuration and peripherals



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

Description of EUT

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Wireless Stereo Headset	WH-XB700	9000004 *1) 9000064 *2)	Sony Corporation	EUT

*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	USB Cable	0.2 + 2.0	Shielded	Shielded	-
2	Stereo Cable	1.2	Shielded	Shielded	-

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

SECTION 5: Radiated Spurious Emission

Test Procedure

It was measured based on "8.5 and 8.6 of KDB 558074 D01 15.247 Meas Guidance v05".

[For below 1 GHz]

EUT was placed on a urethane platform of nominal size, 0.5 m by 0.5 m, raised 0.8 m above the conducting ground plane. The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.

[For 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 Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with absorbent materials lined on a ground plane.

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

The measurements were 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 200 MHz	200 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 *1)	PK
IF Bandwidth	BW 120 kHz	RBW: 1 MHz VBW: 3 MHz	11.12.2.5.2 RBW: 1 MHz VBW: 3 MHz Detector: Power Averaging (Linear voltage) Trace: 100 traces Duty factor was added to the results.	RBW: 100 kHz VBW: 300 kHz

*1) Average Power Measurement was performed based on ANSI C63.10-2013.

UL Japan, Inc.

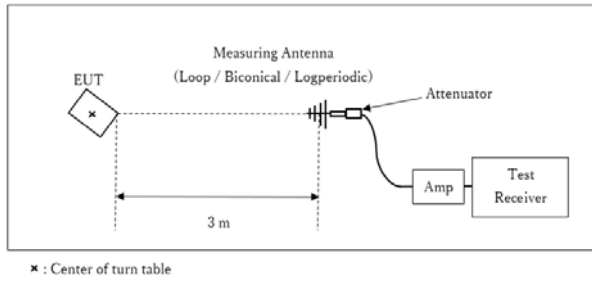
Shonan EMC Lab.

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

Telephone : +81 463 50 6400

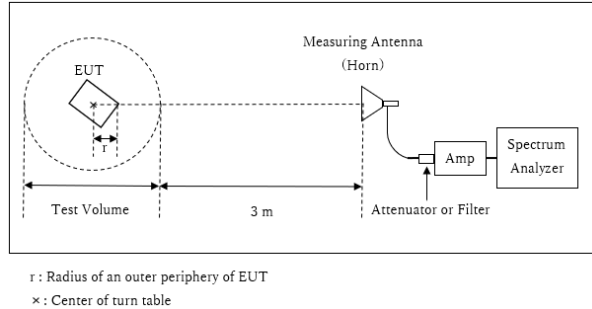
Facsimile : +81 463 50 6401

Below 1 GHz



Test Distance: 3 m

1 GHz - 13 GHz



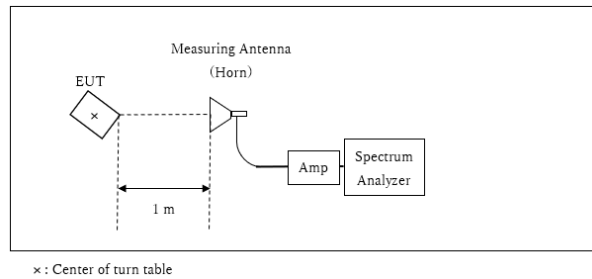
Distance Factor: $20 \times \log((3.91 \text{ m}^*/3.0 \text{ m}) = 2.31 \text{ dB}$

* Test Distance: $(3 + \text{Test Volume} / 2) - r = 3.91 \text{ m}$

Test Volume: 2 m

(Test Volume has been calibrated based on CISPR 16-1-4.)
 $r = 0.09 \text{ m}$

13 GHz - 26.5 GHz



Distance Factor: $20 \times \log(1.0 \text{ m}^* / 3.0 \text{ m}) = -9.54 \text{ dB}$

*Test Distance: 1 m

- The carrier level and noise levels were confirmed at each position of X, Y and Z axes of EUT to see the position of maximum noise, and the test was made at the position that has the maximum noise.
The test results and limit are rounded off to one decimal place, so some differences might be observed.

Worst position:

Antenna polarization	Frequency				
	Below 1 GHz	1 GHz - 2.8 GHz	2.8 GHz - 13 GHz	13 GHz - 18 GHz	18 GHz - 26.5 GHz
Horizontal	Y	Y	Z	X	Y
Vertical	Z	Z	Y	X	Y

Measurement range : 30 MHz - 26.5 GHz

Test data : APPENDIX

Test result : Pass

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

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
6 dB 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	27 kHz				
*1) Peak hold was applied as Worst-case measurement. *2) Reference data *3) Section 11.10.2 Method PKPSD (peak PSD) of "ANSI C63.10-2013". *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 0shown in the chart.							

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

6 dB Bandwidth and 99 % Occupied Bandwidth

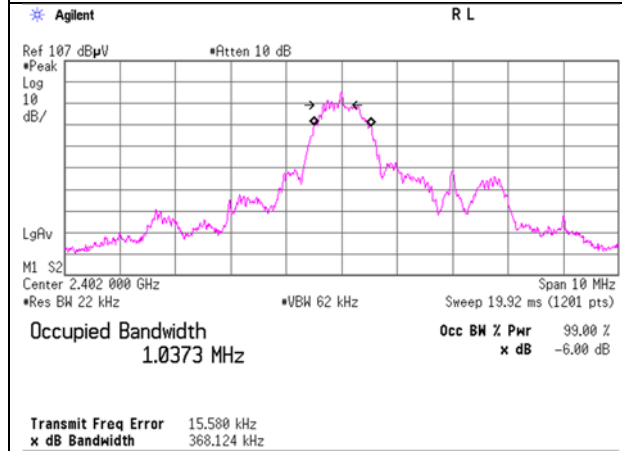
Report No. 12563995S-B-R2
Test place Shonan EMC Lab. No.5 Shielded Room
Date October 19, 2018
Temperature / Humidity 25 deg. C / 41 % RH
Engineer Kazutaka Takeyama
Mode Tx

Mode	Frequency [MHz]	99% Occupied Bandwidth [kHz]	6dB Bandwidth [MHz]	Limit for 6dB Bandwidth [MHz]
BT LE	2402	1037.3	0.728	> 0.5000
	2440	1040.0	0.728	> 0.5000
	2480	1038.7	0.730	> 0.5000

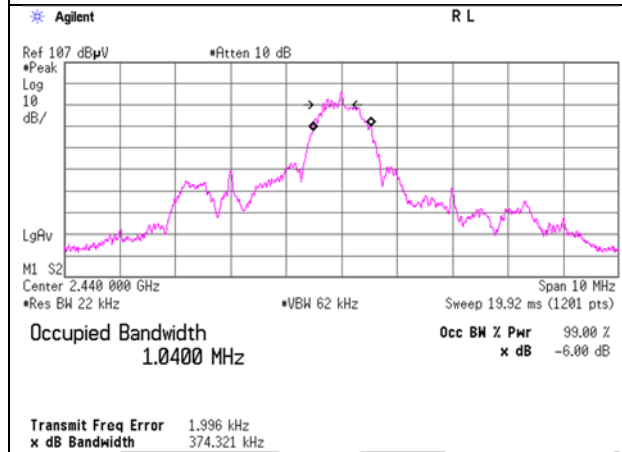
99%Occupied Bandwidth

BT LE

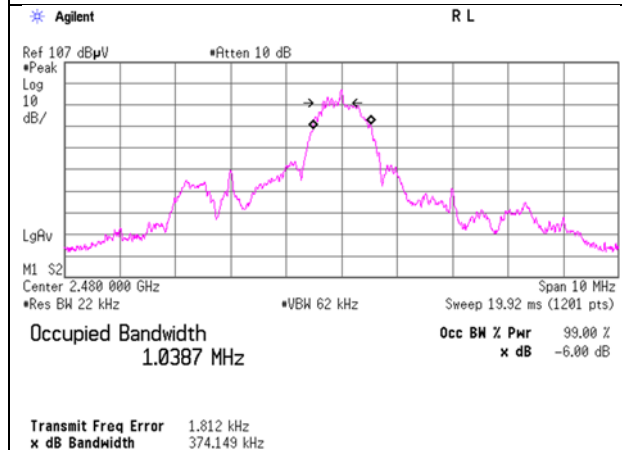
2402 MHz



2440 MHz



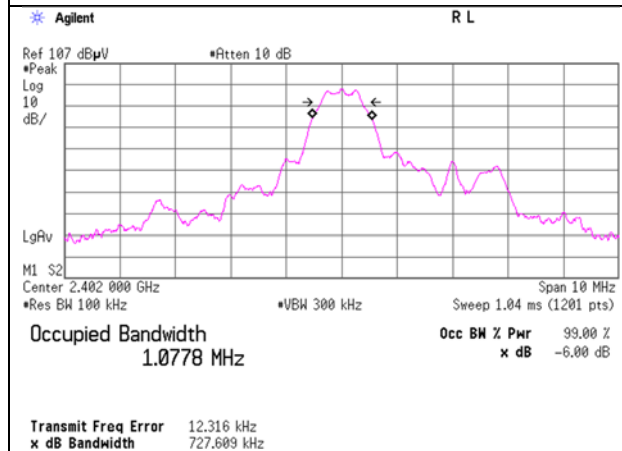
2480 MHz



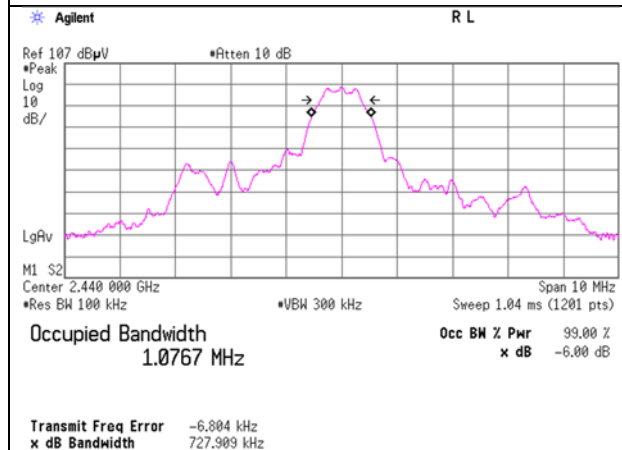
6dB Bandwidth

BT LE

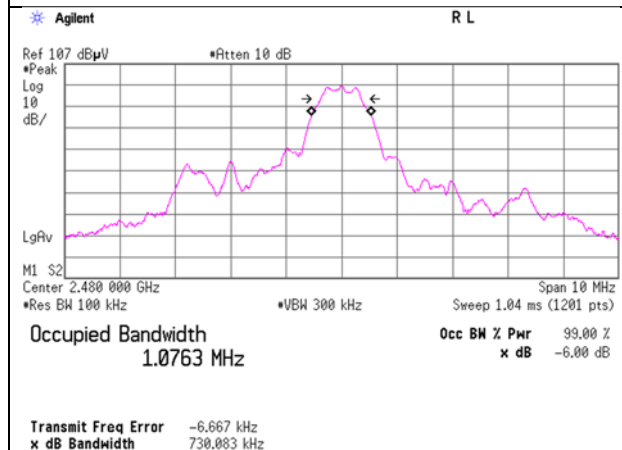
2402 MHz



2440 MHz



2480 MHz



Maximum Peak Output Power

Report No. 12563995S-B-R2
Test place Shonan EMC Lab. No.5 Shielded Room
Date October 19, 2018
Temperature / Humidity 25 deg. C / 41 % RH
Engineer Kazutaka Takeyama
Mode Tx

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Conducted Power					e.i.r.p. for RSS-247					
				Result		Limit		Margin [dB]	Antenna Gain [dBi]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]			[dBm]	[mW]	[dBm]	[mW]	
2402	-11.52	1.52	10.18	0.18	1.04	30.00	1000	29.82	1.60	1.78	1.51	36.02	4000	34.24
2440	-10.73	1.53	10.18	0.98	1.25	30.00	1000	29.02	1.60	2.58	1.81	36.02	4000	33.44
2480	-10.12	1.54	10.18	1.60	1.45	30.00	1000	28.40	1.60	3.20	2.09	36.02	4000	32.82

Sample Calculation:

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

e.i.r.p. Result = Conducted Power Result + Antenna Gain

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

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

Average Output Power
(Reference data for RF Exposure)

Report No. 12563995S-B-R2
Test place Shonan EMC Lab. No.5 Shielded Room
Date October 19, 2018
Temperature / Humidity 25 deg. C / 41 % RH
Engineer Kazutaka Takeyama
Mode Tx

BT LE

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Time average)		Duty factor [dB]	Result (Burst power average)	
				[dBm]	[mW]		[dBm]	[mW]
2402	-14.41	1.52	10.18	-2.71	0.54	1.68	-1.03	0.79
2440	-13.58	1.53	10.18	-1.87	0.65	1.68	-0.19	0.96
2480	-12.86	1.54	10.18	-1.14	0.77	1.68	0.54	1.13

Sample Calculation:

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

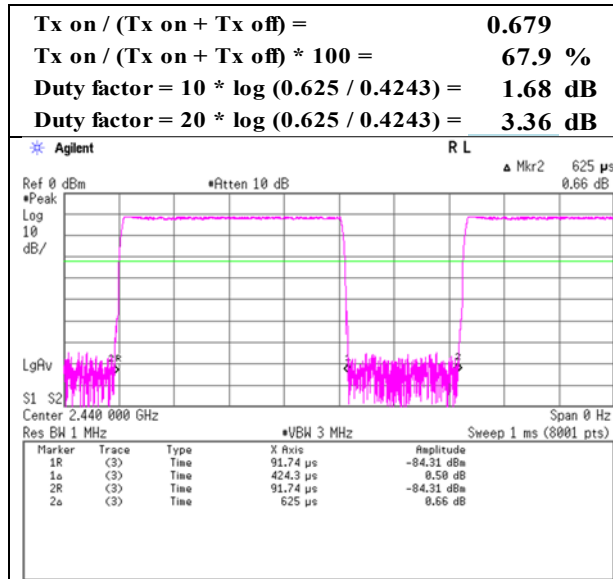
Result (Burst power average) = Time average + Duty factor

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

Burst rate confirmation

Report No.	12563995S-B-R2
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	October 19, 2018
Temperature / Humidity	25 deg. C / 41 % RH
Engineer	Kazutaka Takeyama
Mode	Tx

BT LE



* Since the burst rate is not different between the channels, the data has been obtained on the representative channel.

Radiated Spurious Emission

Report No.	12563995S-B-R2		
Test place	Shonan EMC Lab.		
Semi Anechoic Chamber	No.2	No.2	No.1
Date	October 17, 2018	October 15, 2018	October 18, 2018
Temperature / Humidity	24 deg. C / 49 % RH	24 deg. C / 51 % RH	23 deg. C / 44 % RH
Engineer	Shiro Kobayashi	Shiro Kobayashi	Shiro Kobayashi
	(30 MHz -1 GHz)	(1 GHz -13 GHz)	(13 GHz -26.5 GHz)
Mode	Tx BT LE 2402 MHz		

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	395.999	QP	30.54	15.57	7.02	31.66	0.00	21.47	46.00	24.5	146	239	
Hori.	400.003	QP	31.58	15.68	7.05	31.67	0.00	22.64	46.00	23.3	100	204	
Hori.	637.417	QP	22.91	19.31	8.01	31.66	0.00	18.57	46.00	27.4	100	102	
Hori.	650.138	QP	23.88	19.20	8.06	31.66	0.00	19.48	46.00	26.5	103	257	
Hori.	2390.000	PK	43.30	27.91	13.93	36.58	2.31	50.87	73.90	23.0	215	238	
Hori.	2558.000	PK	45.49	27.81	14.06	36.52	2.31	53.15	73.90	20.7	165	239	
Hori.	4804.000	PK	45.53	31.31	6.53	36.88	2.31	48.80	73.90	25.1	184	81	
Hori.	7206.000	PK	44.32	36.77	7.58	37.26	2.31	53.72	73.90	20.1	150	0	Floor Noise
Hori.	19216.000	PK	44.91	40.14	11.69	48.16	-9.54	39.04	73.90	34.8	149	234	
Hori.	7206.000	AV	36.15	36.77	7.58	37.26	2.31	45.55	53.90	8.3	150	0	Floor Noise
Vert.	412.002	QP	31.53	15.94	7.10	31.67	0.00	22.90	46.00	23.1	100	263	
Vert.	420.002	QP	33.33	16.03	7.13	31.67	0.00	24.82	46.00	21.1	100	236	
Vert.	652.019	QP	25.12	19.22	8.07	31.66	0.00	20.75	46.00	25.2	100	49	
Vert.	2390.000	PK	42.91	27.91	13.93	36.58	2.31	50.48	73.90	23.4	149	168	
Vert.	2558.000	PK	44.84	27.81	14.06	36.52	2.31	52.50	73.90	21.4	149	202	
Vert.	4804.000	PK	46.24	31.31	6.53	36.88	2.31	49.51	73.90	24.3	126	342	
Vert.	7206.000	PK	44.15	36.77	7.58	37.26	2.31	53.55	73.90	20.3	150	0	Floor Noise
Vert.	19216.000	PK	48.82	40.14	11.69	48.16	-9.54	42.95	73.90	30.9	146	323	
Vert.	7206.000	AV	35.99	36.77	7.58	37.26	2.31	45.39	53.90	8.5	150	0	Floor Noise

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

Distance factor : 1 GHz - 13 GHz : 20log (3.91 m / 3.0 m) = 2.31 dB

13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	AV	34.30	27.91	13.93	36.58	3.36	2.31	45.23	53.90	8.7	
Hori.	2558.000	AV	37.46	27.81	14.06	36.52	3.36	2.31	48.48	53.90	5.4	
Hori.	4804.000	AV	37.03	31.31	6.53	36.88	3.36	2.31	43.66	53.90	10.2	
Hori.	19216.000	AV	33.86	40.14	11.69	48.16	3.36	-9.54	31.35	53.90	22.6	
Vert.	2390.000	AV	34.39	27.91	13.93	36.58	3.36	2.31	45.32	53.90	8.6	
Vert.	2558.000	AV	36.60	27.81	14.06	36.52	3.36	2.31	47.62	53.90	6.3	
Vert.	4804.000	AV	38.00	31.31	6.53	36.88	3.36	2.31	44.63	53.90	9.3	
Vert.	19216.000	AV	41.71	40.14	11.69	48.16	3.36	-9.54	39.20	53.90	14.7	

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

Distance factor : 1 GHz - 13 GHz : 20log (3.91 m / 3.0 m) = 2.31 dB

13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Duty factor refer to "Duty factor Calculation chart" sheet.

*1) Not out of band emission (Leakage Power)

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	87.75	27.90	13.94	36.57	2.31	95.33	-	-	Carrier
Hori.	2398.695	PK	40.01	27.91	13.94	36.58	2.31	47.59	75.33	27.7	
Hori.	2400.000	PK	41.97	27.91	13.94	36.58	2.31	49.55	75.33	25.8	
Vert.	2402.000	PK	88.21	27.90	13.94	36.57	2.31	95.79	-	-	Carrier
Vert.	2398.677	PK	41.51	27.91	13.94	36.58	2.31	49.09	75.79	26.7	
Vert.	2400.000	PK	42.67	27.91	13.94	36.58	2.31	50.25	75.79	25.5	

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

Distance factor : 1 GHz - 13 GHz : 20log (3.91 m / 3.0 m) = 2.31 dB

13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

UL Japan, Inc.

Shonan EMC Lab.

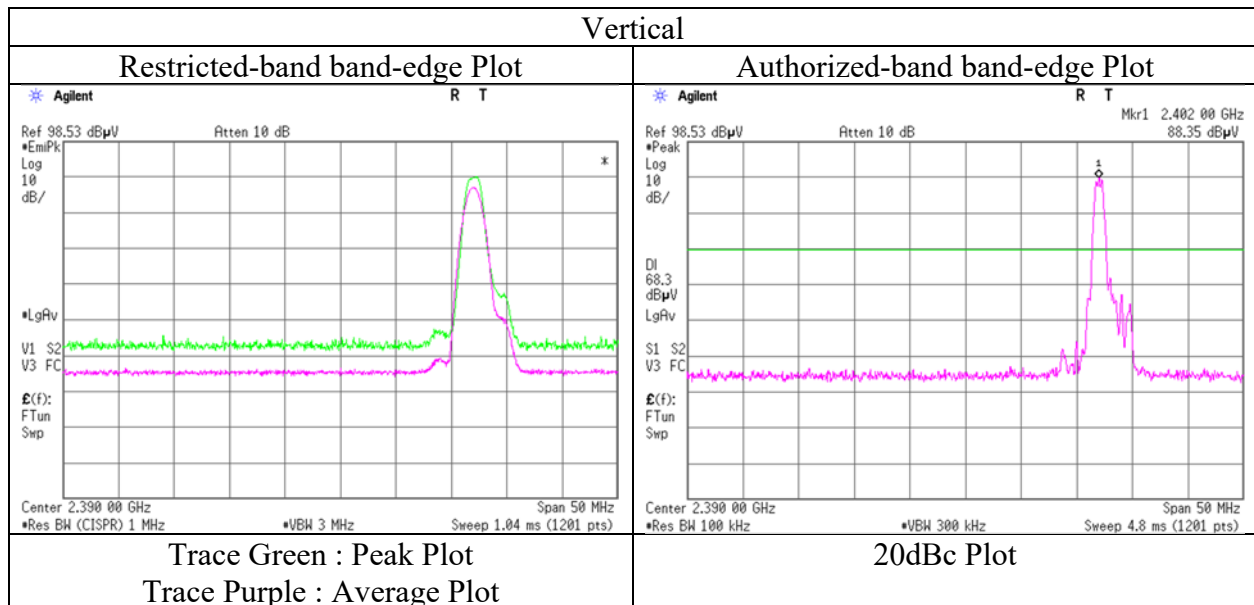
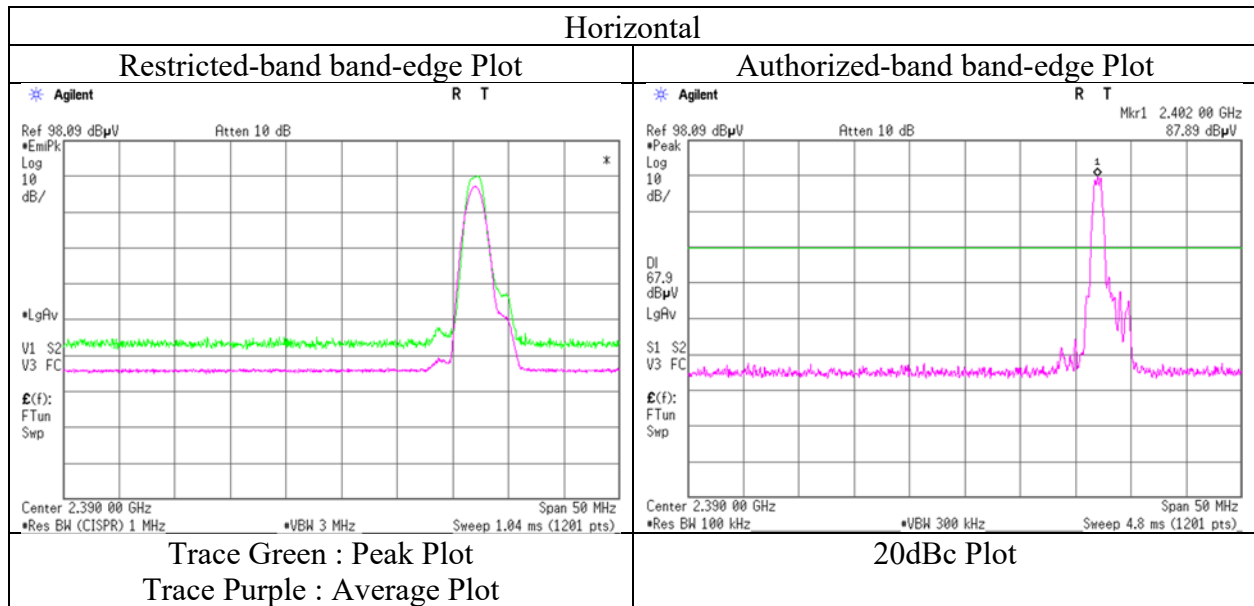
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Radiated Spurious Emission (Reference Plot for band-edge)

Report No.	12563995S-B-R2
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	No.2
Date	October 15, 2018
Temperature / Humidity	24 deg. C / 51 % RH
Engineer	Shiro Kobayashi
	(1 GHz -13 GHz)
Mode	Tx BT LE 2402 MHz



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

Radiated Spurious Emission

Report No.	12563995S-B-R2		
Test place	Shonan EMC Lab.		
Semi Anechoic Chamber	No.2	No.2	No.1
Date	October 17, 2018	October 15, 2018	October 18, 2018
Temperature / Humidity	24 deg. C / 49 % RH	24 deg. C / 51 % RH	23 deg. C / 44 % RH
Engineer	Shiro Kobayashi	Shiro Kobayashi	Shiro Kobayashi
	(30 MHz -1 GHz)	(1 GHz -13 GHz)	(13 GHz -26.5 GHz)
Mode	Tx BT LE 2440 MHz		

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	296.002	QP	26.93	13.53	6.19	31.70	0.00	14.95	46.00	31.0	100	79	
Hori.	412.001	QP	33.68	15.94	7.10	31.67	0.00	25.05	46.00	20.9	100	15	
Hori.	418.003	QP	31.30	16.01	7.12	31.67	0.00	22.76	46.00	23.2	100	210	
Hori.	646.019	QP	23.91	19.20	8.04	31.66	0.00	19.49	46.00	26.5	129	259	
Hori.	2544.000	PK	44.57	27.79	14.04	36.52	2.31	52.19	73.90	21.7	203	246	
Hori.	4880.000	PK	46.75	31.15	6.56	36.90	2.31	49.87	73.90	24.0	152	102	
Hori.	7320.000	PK	44.28	36.84	7.64	37.44	2.31	53.63	73.90	20.2	150	0	Floor Noise
Hori.	19520.000	PK	46.66	40.09	11.88	47.70	-9.54	41.39	73.90	32.5	142	243	
Hori.	7320.000	AV	34.98	36.84	7.64	37.44	2.31	44.33	53.90	9.5	150	0	Floor Noise
Vert.	416.003	QP	33.12	16.00	7.11	31.67	0.00	24.56	46.00	21.4	100	266	
Vert.	420.001	QP	34.41	16.03	7.13	31.67	0.00	25.90	46.00	20.1	100	258	
Vert.	655.972	QP	22.98	19.25	8.09	31.65	0.00	18.67	46.00	27.3	101	358	
Vert.	2544.000	PK	44.41	27.79	14.04	36.52	2.31	52.03	73.90	21.8	207	208	
Vert.	4880.000	PK	46.81	31.15	6.56	36.90	2.31	49.93	73.90	23.9	124	359	
Vert.	7320.000	PK	44.31	36.84	7.64	37.44	2.31	53.66	73.90	20.2	150	0	Floor Noise
Vert.	19520.000	PK	48.79	40.09	11.88	47.70	-9.54	43.52	73.90	30.3	148	321	
Vert.	7320.000	AV	35.30	36.84	7.64	37.44	2.31	44.65	53.90	9.2	150	0	Floor Noise

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.91\text{ m} / 3.0\text{ m}) = 2.31\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2544.000	AV	35.91	27.79	14.04	36.52	3.36	2.31	46.89	53.90	7.0	
Hori.	4880.000	AV	37.79	31.15	6.56	36.90	3.36	2.31	44.27	53.90	9.6	
Hori.	19520.000	AV	37.00	40.09	11.88	47.70	3.36	-9.54	35.09	53.90	18.8	
Vert.	2544.000	AV	36.20	27.79	14.04	36.52	3.36	2.31	47.18	53.90	6.7	
Vert.	4880.000	AV	38.19	31.15	6.56	36.90	3.36	2.31	44.67	53.90	9.2	
Vert.	19520.000	AV	40.95	40.09	11.88	47.70	3.36	-9.54	39.04	53.90	14.9	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.91\text{ m} / 3.0\text{ m}) = 2.31\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

Duty factor refer to "Duty factor Calculation chart" sheet.

*1) Not out of band emission (Leakage Power)

Radiated Spurious Emission

Report No.	12563995S-B-R2		
Test place	Shonan EMC Lab.		
Semi Anechoic Chamber	No.2	No.2	No.1
Date	October 17, 2018	October 15, 2018	October 18, 2018
Temperature / Humidity	24 deg. C / 49 % RH	24 deg. C / 51 % RH	23 deg. C / 44 % RH
Engineer	Shiro Kobayashi	Shiro Kobayashi	Shiro Kobayashi
	(30 MHz -1 GHz)	(1 GHz -13 GHz)	(13 GHz -26.5 GHz)
Mode	Tx BT LE 2480 MHz		

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	292.001	QP	31.45	13.50	6.15	31.71	0.00	19.39	46.00	26.6	100	232	
Hori.	396.002	QP	32.18	15.57	7.02	31.66	0.00	23.11	46.00	22.8	119	310	
Hori.	403.995	QP	28.62	15.77	7.07	31.67	0.00	19.79	46.00	26.2	100	298	
Hori.	686.416	QP	23.51	19.63	8.21	31.62	0.00	19.73	46.00	26.2	100	95	
Hori.	2483.500	PK	44.94	27.67	14.00	36.52	2.31	52.40	73.90	21.5	114	235	
Hori.	2584.000	PK	44.24	27.82	14.08	36.53	2.31	51.92	73.90	21.9	110	259	
Hori.	4960.000	PK	46.14	31.33	6.61	36.93	2.31	49.46	73.90	24.4	184	90	
Hori.	7440.000	PK	43.51	36.97	7.69	37.63	2.31	52.85	73.90	21.0	150	0	Floor Noise
Hori.	19840.000	PK	46.09	39.94	12.02	47.72	-9.54	40.79	73.90	33.1	144	231	
Hori.	7440.000	AV	34.31	36.97	7.69	37.63	2.31	43.65	53.90	10.2	150	0	Floor Noise
Vert.	412.002	QP	32.22	15.94	7.10	31.67	0.00	23.59	46.00	22.4	100	232	
Vert.	419.999	QP	34.51	16.03	7.13	31.67	0.00	26.00	46.00	20.0	100	235	
Vert.	648.016	QP	23.52	19.20	8.05	31.66	0.00	19.11	46.00	26.8	121	82	
Vert.	2483.500	PK	45.16	27.67	14.00	36.52	2.31	52.62	73.90	21.2	227	207	
Vert.	2584.000	PK	43.75	27.82	14.08	36.53	2.31	51.43	73.90	22.4	205	179	
Vert.	4960.000	PK	46.04	31.33	6.61	36.93	2.31	49.36	73.90	24.5	202	357	
Vert.	7440.000	PK	43.34	36.97	7.69	37.63	2.31	52.68	73.90	21.2	150	0	Floor Noise
Vert.	19840.000	PK	46.60	39.94	12.02	47.72	-9.54	41.30	73.90	32.6	143	320	
Vert.	7440.000	AV	34.44	36.97	7.69	37.63	2.31	43.78	53.90	10.1	150	0	Floor Noise

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.91 \text{ m} / 3.0 \text{ m}) = 2.31 \text{ dB}$

13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.54 \text{ dB}$

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	AV	35.77	27.67	14.00	36.52	3.36	2.31	46.59	53.90	7.3	*1)
Hori.	2584.000	AV	35.71	27.82	14.08	36.53	3.36	2.31	46.75	53.90	7.2	
Hori.	4960.000	AV	38.50	31.33	6.61	36.93	3.36	2.31	45.18	53.90	8.7	
Hori.	19840.000	AV	35.37	39.94	12.02	47.72	3.36	-9.54	33.43	53.90	20.5	
Vert.	2483.500	AV	35.67	27.67	14.00	36.52	3.36	2.31	46.49	53.90	7.4	*1)
Vert.	2584.000	AV	35.45	27.82	14.08	36.53	3.36	2.31	46.49	53.90	7.4	
Vert.	4960.000	AV	37.40	31.33	6.61	36.93	3.36	2.31	44.08	53.90	9.8	
Vert.	19840.000	AV	37.84	39.94	12.02	47.72	3.36	-9.54	35.90	53.90	18.0	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.91 \text{ m} / 3.0 \text{ m}) = 2.31 \text{ dB}$

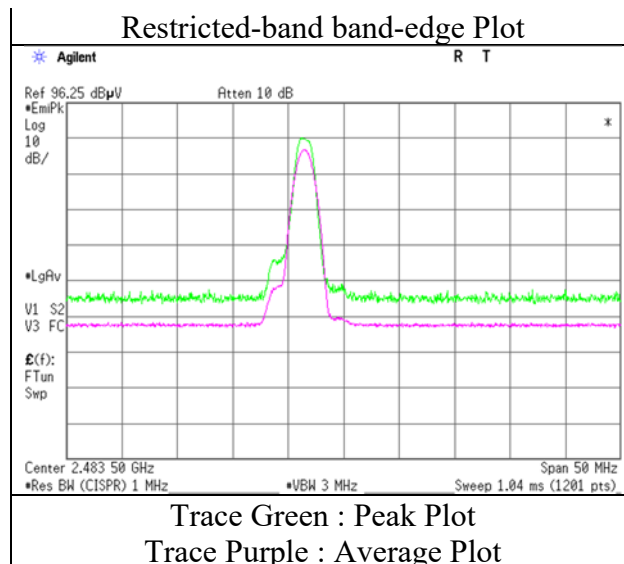
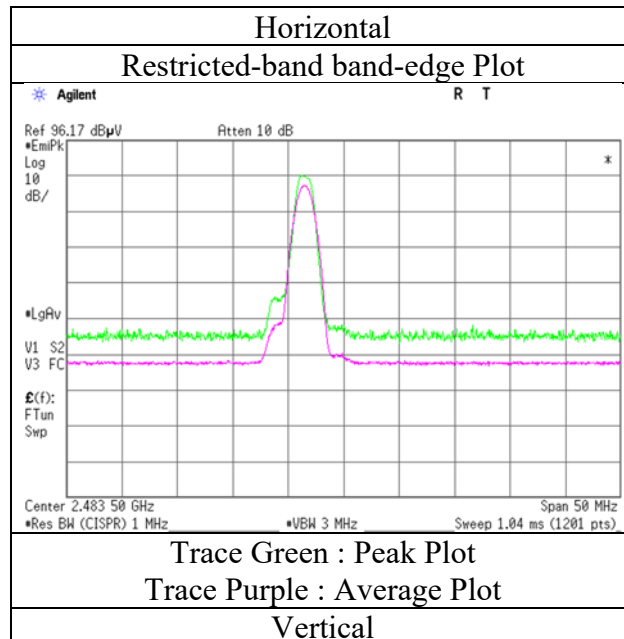
13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.54 \text{ dB}$

Duty factor refer to "Duty factor Calculation chart" sheet.

*1) Not out of band emission (Leakage Power)

Radiated Spurious Emission (Reference Plot for band-edge)

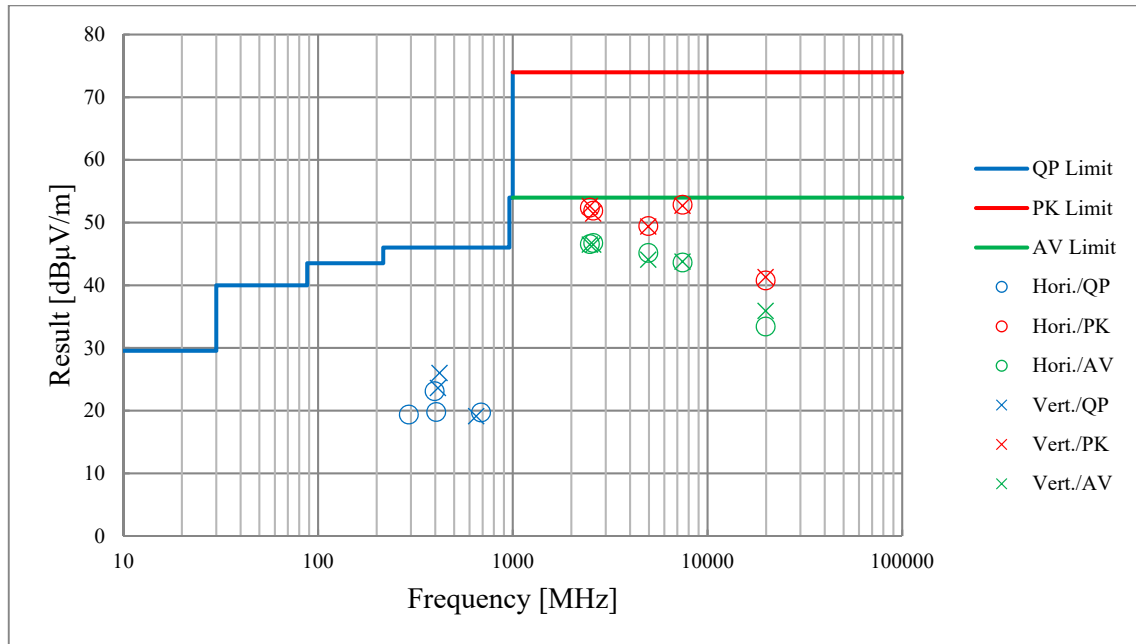
Report No.	12563995S-B-R2
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	No.2
Date	October 15, 2018
Temperature / Humidity	24 deg. C / 51 % RH
Engineer	Shiro Kobayashi
	(1 GHz -13 GHz)
Mode	Tx BT LE 2480 MHz



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

Radiated Spurious Emission
(Plot data, Worst case)

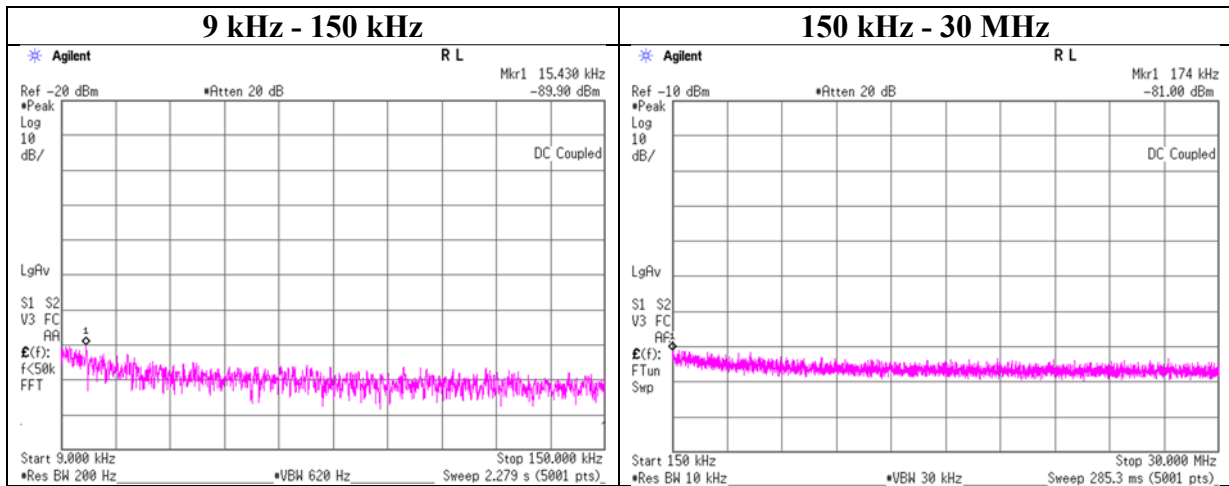
Report No.	12563995S-B-R2		
Test place	Shonan EMC Lab.		
Semi Anechoic Chamber	No.2	No.2	No.1
Date	October 17, 2018	October 15, 2018	October 18, 2018
Temperature / Humidity	24 deg. C / 49 % RH	24 deg. C / 51 % RH	23 deg. C / 44 % RH
Engineer	Shiro Kobayashi (30 MHz -1 GHz)	Shiro Kobayashi (1 GHz -13 GHz)	Shiro Kobayashi (13 GHz -26.5 GHz)
Mode	Tx BT LE 2480 MHz		



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

Conducted Spurious Emission

Report No.	12563995S-B-R2
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	October 19, 2018
Temperature / Humidity	25 deg. C / 41 % RH
Engineer	Kazutaka Takeyama
Mode	Tx BT LE 2402 MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator Loss [dB]	Antenna Gain* [dBi]	N (Number of Output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
15.43	-89.9	0.01	10.1	2.0	1	-77.8	300	6.0	-16.5	43.8	60.3	
174.00	-81.0	0.01	10.1	2.0	1	-68.9	300	6.0	-7.6	22.7	30.3	

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

$\text{EIRP [dBm]} = \text{Reading [dBm]} + \text{Cable loss [dB]} + \text{Attenuator Loss [dB]} + \text{Antenna gain [dBi]} + 10 * \log(N)$

N: Number of output

*2.0 dBi was applied to the test result based on KDB 558074 since antenna gain was less than 2.0 dBi.

UL Japan, Inc.

Shonan EMC Lab.

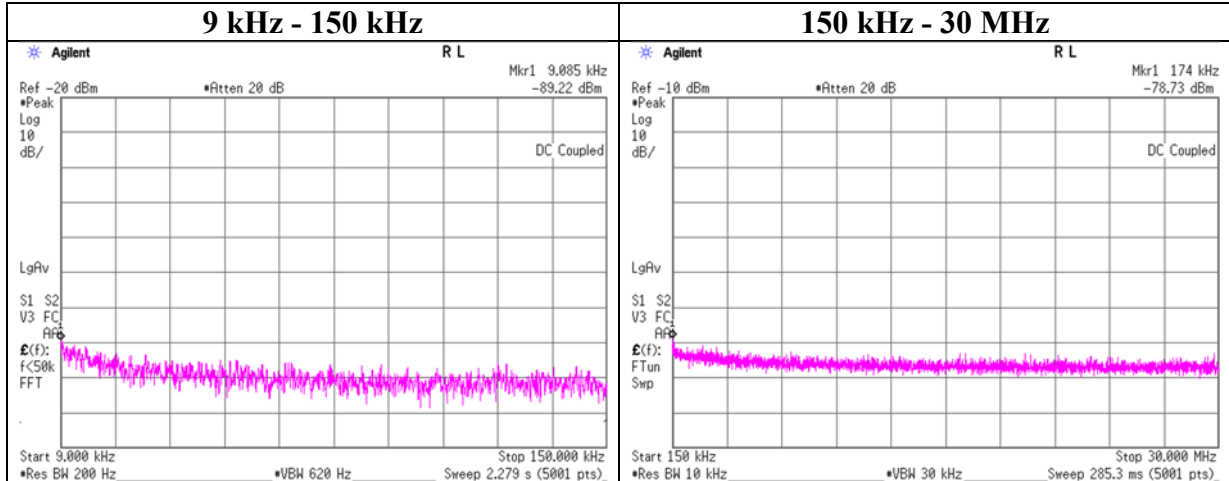
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Conducted Spurious Emission

Report No.	12563995S-B-R2
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	October 19, 2018
Temperature / Humidity	25 deg. C / 41 % RH
Engineer	Kazutaka Takeyama
Mode	Tx BT LE 2440 MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator Loss [dB]	Antenna Gain* [dBi]	N (Number of Output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
9.09	-89.2	0.01	10.1	2.0	1	-77.1	300	6.0	-15.8	48.4	64.2	
174.00	-78.7	0.01	10.1	2.0	1	-66.6	300	6.0	-5.4	22.7	28.1	

$E [dBuV/m] = EIRP [dBm] - 20 \log (Distance [m]) + Ground\ bounce [dB] + 104.8 [dBuV/m]$

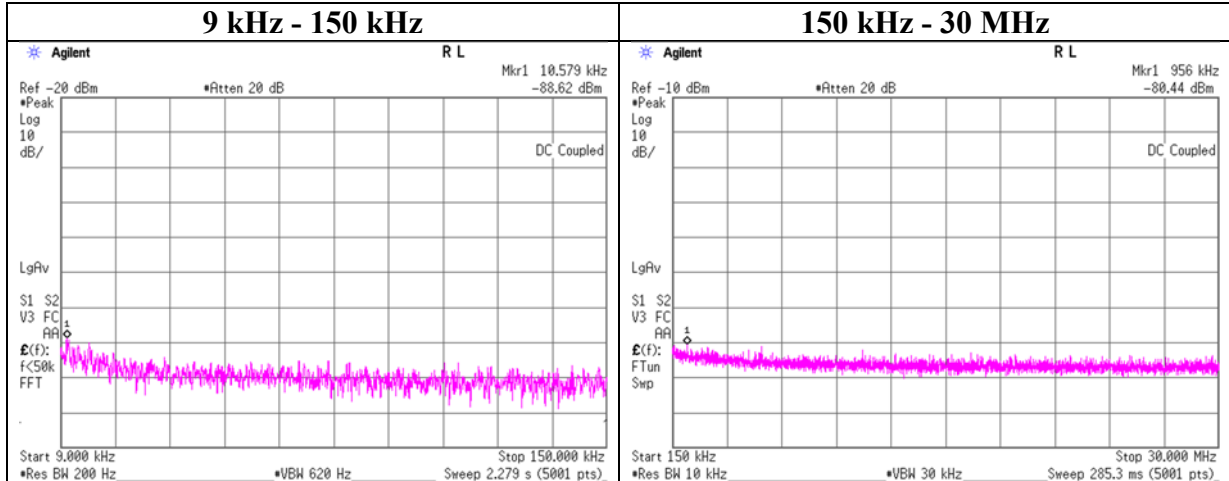
$EIRP [dBm] = Reading [dBm] + Cable\ loss [dB] + Attenuator\ Loss [dB] + Antenna\ gain [dBi] + 10 * \log (N)$

N: Number of output

*2.0 dBi was applied to the test result based on KDB 558074 since antenna gain was less than 2.0 dBi.

Conducted Spurious Emission

Report No.	12563995S-B-R2
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	October 19, 2018
Temperature / Humidity	25 deg. C / 41 % RH
Engineer	Kazutaka Takeyama
Mode	Tx BT LE 2480 MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator Loss [dB]	Antenna Gain* [dBi]	N (Number of Output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
10.58	-88.6	0.01	10.0	2.0	1	-76.6	300	6.0	-15.4	47.1	62.5	
956.00	-80.4	0.01	10.1	2.0	1	-68.3	30	6.0	12.9	27.9	15.0	

$E [dBuV/m] = EIRP [dBm] - 20 \log (Distance [m]) + Ground\ bounce [dB] + 104.8 [dBuV/m]$

$EIRP[dBm] = Reading [dBm] + Cable\ loss [dB] + Attenuator\ Loss [dB] + Antenna\ gain [dBi] + 10 * \log (N)$

N: Number of output

*2.0 dBi was applied to the test result based on KDB 558074 since antenna gain was less than 2.0 dBi.

Power Density

Report No. 12563995S-B-R2
Test place Shonan EMC Lab. No.5 Shielded Room
Date October 19, 2018
Temperature / Humidity 25 deg. C / 41 % RH
Engineer Kazutaka Takeyama
Mode Tx

BT LE

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2402.00	-27.44	1.52	10.18	-15.74	8.00	23.74
2440.00	-26.62	1.53	10.18	-14.91	8.00	22.91
2480.00	-25.81	1.54	10.18	-14.09	8.00	22.09

Sample Calculation:

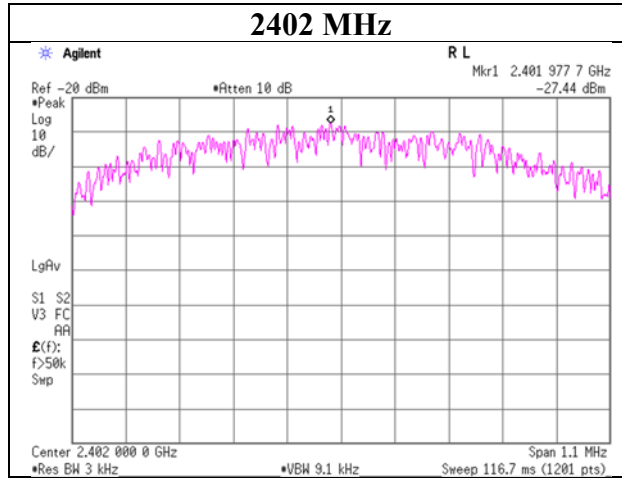
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

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

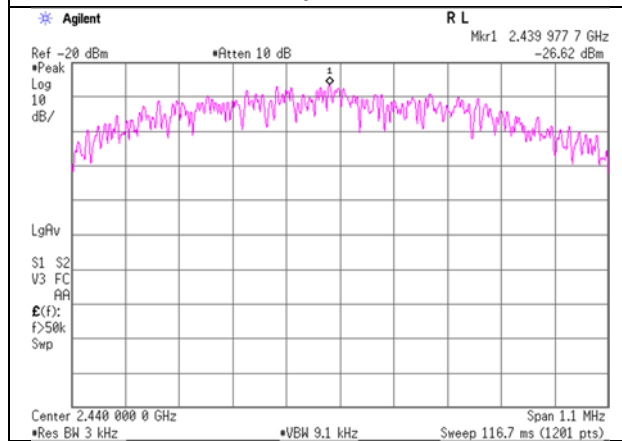
Power Density

BT LE

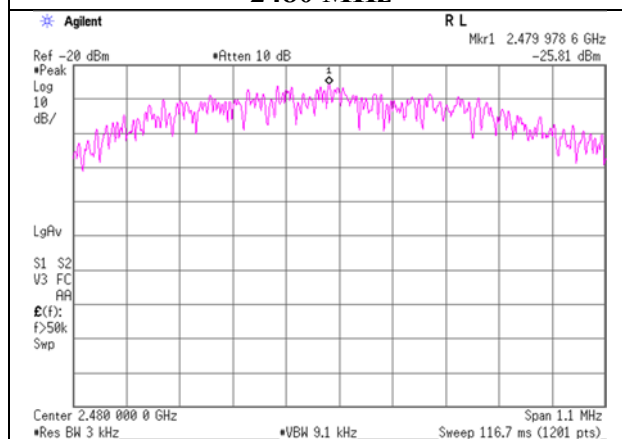
2402 MHz



2440 MHz



2480 MHz



APPENDIX 2: Test instruments

Test Instruments (1 / 2)

Local ID	Test Name	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Calibration Due Date	Calibration Interval (Month)
SAT10-15	AT	160493	Attenuator	Weinschel Corp.	54A-10	83406	2017/12/8	2018/12/31	12
SCC-G14	AT	145175	Coaxial Cable	Suhner	SUCOFLEX 102	31600/2	2018/3/19	2019/3/31	12
SOS-09	AT	146318	Humidity Indicator	A&D	AD-5681	4061484	2017/12/21	2018/12/31	12
SPM-07	AT	146247	Power Meter	AGILENT	8990B	MY5100272	2018/7/13	2019/7/31	12
SPSS-04	AT	146310	Power sensor	AGILENT	N1923A	MY5326009	2018/7/13	2019/7/31	12
SRENT-15	AT	160899	Spectrum Analyzer	AGILENT (KEYSIGHT)	E4440A	MY46185516	2017/12/26	2018/12/31	12
COTS-SEMI-1	RE	144865	EMI Software	TSJ	TEPTO-DV(RE,CE,R FL,ME)	-	-	-	-
KJM-09	RE	145929	Measure	KOMELON	KMC-36	-	-	-	-
SAEC-01(SVSWR)	RE	145561	Semi-Anechoic Chamber	TDK	SAEC-01(SVSWR)	1	2018/7/19	2019/7/31	12
SAEC-02(NSA)	RE	145563	Semi-Anechoic Chamber	TDK	SAEC-02(NSA)	2	2018/5/31	2019/5/31	12
SAEC-02(SVSWR)	RE	145598	Semi-Anechoic Chamber	TDK	SAEC-02(SVSWR)	2	2018/7/15	2019/7/31	12
SAF-02	RE	145004	Pre Amplifier	SONOMA	310N	290212	2018/2/16	2019/2/28	12
SAF-04	RE	145127	Pre Amplifier	Toyo Corporation	TPA0118-36	2072554	2018/6/26	2019/6/30	12
SAF-05	RE	145128	Pre Amplifier	Toyo Corporation	TPA0118-36	1440490	2018/2/15	2019/2/28	12
SAF-08	RE	145007	Pre Amplifier	Toyo Corporation	HAP18-26W	19	2018/3/27	2019/3/31	12
SAT10-06	RE	145137	Attenuator	AGILENT	8493C-010	74865	2017/11/22	2018/11/30	12
SAT3-11	RE	150921	Attenuator	JFW	50HF-003N	-	2018/2/22	2019/2/28	12
SAT6-02	RE	145045	Attenuator	JFW	50HF-006N	-	2018/2/16	2019/2/28	12
SBA-02	RE	145022	Biconical Antenna	Schwarzbeck	BBA9106	91032665	2018/6/5	2019/6/30	12
SCC-B1/B3/B5/B7/B8/B13/SRSE-02	RE	144975	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/TOYO	8D2W/12DSF A/141PE/141PE/141PE/141P	-/0901-270(RF Selector)	2018/4/9	2019/4/30	12
SCC-B2/B4/B6/B7/B8/B13/SRSE-02	RE	144976	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/TOYO	8D2W/12DSF A/141PE/141PE/141PE/141P	-/0901-270(RF Selector)	2018/4/7	2019/4/30	12
SCC-G05	RE	145039	Coaxial Cable	Junkosha	J12J102207-00	APR-30-15-037	2018/1/29	2019/1/31	12
SCC-G22	RE	145180	Coaxial Cable	Suhner	SUCOFLEX 104	296199/4	2018/5/11	2019/5/31	12
SCC-G33	RE	145184	Coaxial Cable	Junkosha	MWX241-01000KMSK MS	-	2018/4/20	2019/4/30	12
SCC-G40	RE	166491	Coaxial Cable	Junkosha	MWX221-01000NFSN MS/B	1612S005	2018/1/29	2019/1/31	12
SCC-G43	RE	156380	Coaxial Cable	HUBER+SUNER	SUCOFLEX_104_E	SN MY 13406/4E	2018/7/10	2019/7/31	12
SCC-G44	RE	168300	Coaxial Cable	HUBER+SUNER	SUCOFLEX 104	800070/4A	2018/3/28	2019/3/31	12

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

Test Instruments (2 / 2)

Local ID	Test Name	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Calibration Due Date	Calibration Interval (Month)
SCC-G45	RE	168301	Coaxial Cable	HUBER+SUNER	SUCOFLEX 102 E	800137/2E A	2018/3/28	2019/3/31	12
SFL-18	RE	145305	Highpass Filter	MICRO-TRONICS	HPM50111	119	2018/4/20	2019/4/30	12
SHA-01	RE	145383	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-725	2018/7/23	2019/7/31	12
SHA-02	RE	145384	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-726	2018/7/23	2019/7/31	12
SHA-04	RE	145512	Horn Antenna	ETS LINDGREN	Sep-60	LM3640	2018/7/23	2019/7/31	12
SJM-09	RE	145336	Measure	PROMART	SEN1935	-	-	-	-
SLA-06	RE	145528	Logperiodic Antenna	Schwarzbeck	VUSLP9111B	195	2018/6/5	2019/6/30	12
SOS-01	RE	146316	Humidity Indicator	A&D	AD-5681	4062555	2018/10/25	2019/10/31 *1)	12
SOS-03	RE	146317	Humidity Indicator	A&D	AD-5681	4063325	2018/10/25	2019/10/31 *1)	12
SSA-02	RE	145800	Spectrum Analyzer	AGILENT	E4448A	MY48250106	2018/3/5	2019/3/31	12
STR-07	RE	146209	Test Receiver	Rohde & Schwarz	ESU26	100484	2018/9/26	2019/9/30	12
STS-01	RE	145792	Digital Hitester	HIOKI	3805-50	80997812	2018/10/16	2019/10/31	12
STS-02	RE	145793	Digital Hitester	HIOKI	3805-50	80997819	2018/3/8	2019/3/31	12

*1) This test equipment was used for the tests before the expiration date of the calibration.

*Hyphens for Last Calibration Date, Calibration Due Date and Cal Int (month) are instruments that Calibration is not required (e.g. software), or instruments checked in advance before use.

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.

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