




RADIO TEST REPORT


Test Report No. : 11169434S-A-R1

Applicant : Canon Inc.
Type of Equipment : Wireless Module
Model No. : WM500
FCC ID : AZD500
Test regulation : FCC Part 15 Subpart C: 2015
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 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 11169434S-A. 11169434S-A is replaced with this report.

Date of test: March 23 to April 14, 2016

Representative test engineer: 
Shinichi Takano
Engineer
Consumer Technology Division

Approved by: 
Toyokazu Imamura
Leader
Consumer Technology Division



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

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.....	8
SECTION 5: Conducted Emission.....	10
SECTION 6: Radiated Spurious Emission	11
SECTION 7: Antenna Terminal Conducted Tests.....	13
APPENDIX 1: Test data	14
Conducted Emission	14
6dB Bandwidth	18
Maximum Peak Output Power	20
Average Output Power	21
Radiated Spurious Emission	23
Conducted Spurious Emission	29
Power Density	32
99%Occupied Bandwidth	34
APPENDIX 2: Test instruments	35
APPENDIX 3: Photographs of test setup	37
Conducted Emission	37
Radiated Spurious Emission	38
Worst Case Position	39

SECTION 1: Customer information

Company Name : Canon Inc.
Address : 30-2, Shimomaruko 3-chome, Ohta-ku, Tokyo 146-8501, Japan
Telephone Number : +81-3-3757-6798
Facsimile Number : +81-3-3757-8431
Contact Person : Ryoji Kon

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

2.1 Identification of E.U.T.

Type of Equipment : Wireless Module
Model No. : WM500
Serial No. : Refer to Section 4, Clause 4.2
Rating : DC 1.8 V
Receipt Date of Sample : March 4, 2016
Country of Mass-production : Japan
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: WM500 (referred to as the EUT in this report) is a Wireless Module.

General Specification

Clock frequency(ies) in the system : Main Clock: 24 MHz,
LPO: 32.7 kHz

Radio Specification

[Bluetooth]

Radio Type : Transceiver
Frequency of Operation : 2402 MHz - 2480 MHz
Modulation : GFSK
Power Supply (radio part input) : DC 1.2 V
Antenna type : Internal Antenna
Antenna Gain : 2.14 dBi

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 902-928 MHz,
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.

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	QP 21.6 dB, 0.17060 MHz, L1 AV 21.2 dB, 0.57594 MHz, L1 Tx BLE 2402 MHz	Complied	Conducted
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.	Complied	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	6.2 dB 7440.000 MHz, AV, Hori, Tx BT LE 2480 MHz	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) 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 C63.10: 2013 is also referred.

FCC Part 15.31 (e)

The EUT has its own regulator.

The RF part is constantly provided voltage (DC 1.2 V) through the regulator. 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.

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

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 $k = 2$.
Shonan EMC Lab.

Item	Frequency range	Uncertainty (+/-)			
		No. 1 SAC / SR	No. 2 SAC / SR	No. 3 SAC / SR	No. 4 SAC / SR
Conducted emission (AC Mains) LISN	150 kHz-30 MHz	2.1 dB	2.1 dB	2.6 dB	2.2 dB
Radiated emission (Measurement distance: 3 m)	9 kHz-30 MHz	2.7 dB	2.7 dB	3.1 dB	-
	30 MHz-300 MHz	4.4 dB	4.4 dB	4.6 dB	-
	300 MHz-1 GHz	5.6 dB	5.5 dB	5.3 dB	-
	1 GHz-13 GHz	5.2 dB	5.2 dB	5.2 dB	-
Radiated emission (Measurement distance: 1 m)	13 GHz-18 GHz	4.9 dB	4.9 dB	4.9 dB	-
	18 GHz-40 GHz	4.9 dB	4.9 dB	4.9 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	0.76 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-06	0.79 dB
Power Measurement above 1 GHz (Average Detector)_SPM-07	0.74 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-07	1.08 dB
Spurious emission (Conducted) below 1GHz	1.5 dB
Spurious emission (Conducted) 1 GHz-3 GHz	1.7 dB
Spurious emission (Conducted) 3 GHz-18 GHz	2.4 dB
Spurious emission (Conducted) 18 GHz-26.5 GHz	2.5 dB
Spurious emission (Conducted) 26.5 GHz-40 GHz	2.5 dB
Bandwidth Measurement	0.66 %
Duty cycle and Time Measurement	0.012 %

Conducted Emission test

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

Radiated emission test

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

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

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

3.6 Test data, Test instruments, and Test set up

Refer to APPENDIX.

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

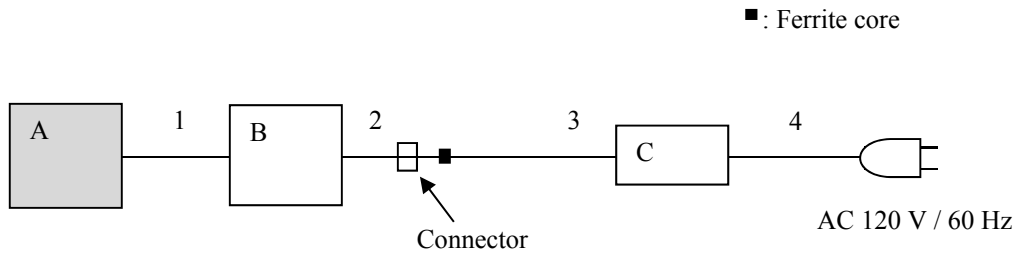
4.1 Operating Mode(s)

Mode	Remarks*
Bluetooth Low Energy	PN9
<p>*Power of the EUT was set by the software as follows; Power settings: 3 dBm Software: RFTEST ver.CL650054</p> <p>*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.</p>	

*The details of Operating mode(s)

Test Item	Operating Mode	Tested frequency
Conducted Emission Spurious Emission 6dB Bandwidth Maximum Peak Output Power Power Density 99% Occupied Bandwidth	BLE Tx	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.

** The ferrite cores attached to DC cable (except CE Test) are not used to reduce the noise from the EUT. Therefore, that does not affect the emission level of the EUT.

Description of EUT and support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Wireless Module	WM500	*1)	Canon	EUT
B	Digital Camera	PC2258	*2)	Canon	-
C	Compact Power Adapter	CA-DC10 N	1427	Canon	-

*1) Antenna terminal conducted test : 1, Radiated emission: 7

*2) Antenna terminal conducted test : 1, Radiated emission : 2

List of cables used

No.	Cable Name	Length (m)	Shield		Remark
			Cable	Connector	
1	Jig	0.25	Unshielded	Unshielded	-
2	DC	0.15	Unshielded	Unshielded	-
3	DC	1.9	Unshielded	Unshielded	-
4	AC	1.9	Unshielded	Unshielded	-

SECTION 5: Conducted Emission

Test Procedure and conditions

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

The rear of tabletop was located 40 cm 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 80 cm from any other grounded conducting surface. EUT was located 80 cm from a Line Impedance Stabilization Network (LISN) / Artificial mains Network (AMN) and excess AC cable was bundled in center. I/O cables that were connected to the peripherals were bundled in center. They were folded back and forth forming a bundle 30 cm to 40 cm long and were hanged at a 40 cm height to the ground plane.

The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT in a shielded room. 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 MHz - 30 MHz
Test data	: APPENDIX
Test result	: Pass

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 v03r05".

[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 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 *3)	PK
IF Bandwidth	BW 120 kHz	RBW: 1 MHz VBW: 3 MHz	Average Power Method: <u>12.2.5.2</u> RBW: 1 MHz VBW: 3 MHz Detector: Power Averaging (Linear voltage) Trace: 100 traces Duty factor was added to the results.	RBW: 100 kHz VBW: 300 kHz
Test Distance	3 m	3 m *1) (1 GHz – 13 GHz), 1 m *2) (13 GHz – 26.5 GHz)		3 m *1) (1 GHz – 13 GHz)

*1) Distance Factor: $20 \times \log(4.49 \text{ m} / 3.0 \text{ m}) = 3.6 \text{ dB}$

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

*3) Average Power Measurement was performed based on 6.0 & 12.2.5 of "KDB 558074 D01 DTS Meas Guidance v03r05"

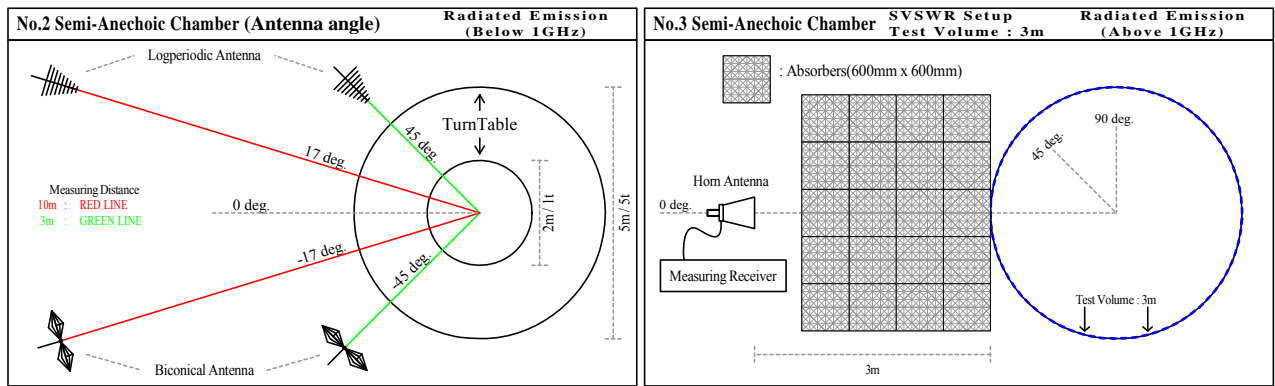
UL Japan, Inc.

Shonan EMC Lab.

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

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401



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.

Worst axis:

Antenna polarization	Carrier	Spurious (Below 1 GHz)	Spurious (1-2.8 GHz)	Spurious (2.8-26.5 GHz)
Horizontal	X	Y	X	X
Vertical	Z	Y	Z	Y

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

Measurement range : 30 MHz – 26.5 GHz
Test data : APPENDIX
Test result : Pass

SECTION 7: Antenna Terminal Conducted Tests

Test Procedure

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

Test	Span	RBW	VBW	Sweep time	Detector	Trace	Instrument used
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	Sample	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 6 dB Bandwidth	3 kHz	9.1 kHz	Auto	Peak	Max Hold	Spectrum Analyzer *3)
Conducted Spurious Emission *4)	9 kHz to 150 kHz	200 Hz	620 Hz	Auto	Peak	Max Hold	Spectrum Analyzer
	150 kHz to 30 MHz	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 30 MHz, RBW was narrowed to separate the noise contents. Then, wide-band noise near the limit was checked separately, however the noise was not detected as shown in the chart. (9 kHz - 150 kHz: RBW = 200 Hz, 150 kHz - 30 MHz: RBW = 10 kHz)							

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

Test data : APPENDIX
Test result : Pass

APPENDIX 1: Test data

Conducted Emission

DATA OF CONDUCTED EMISSION TEST

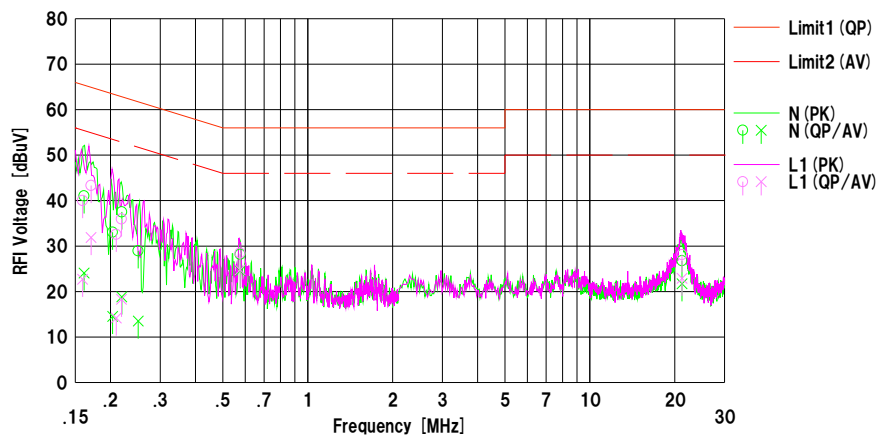
UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2016/04/14

Mode : Tx BLE 2402 MHz
Power : AC 120 V / 60 Hz
Temp./Humi. : 24 deg.C. / 49 %RH

Remarks : -

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

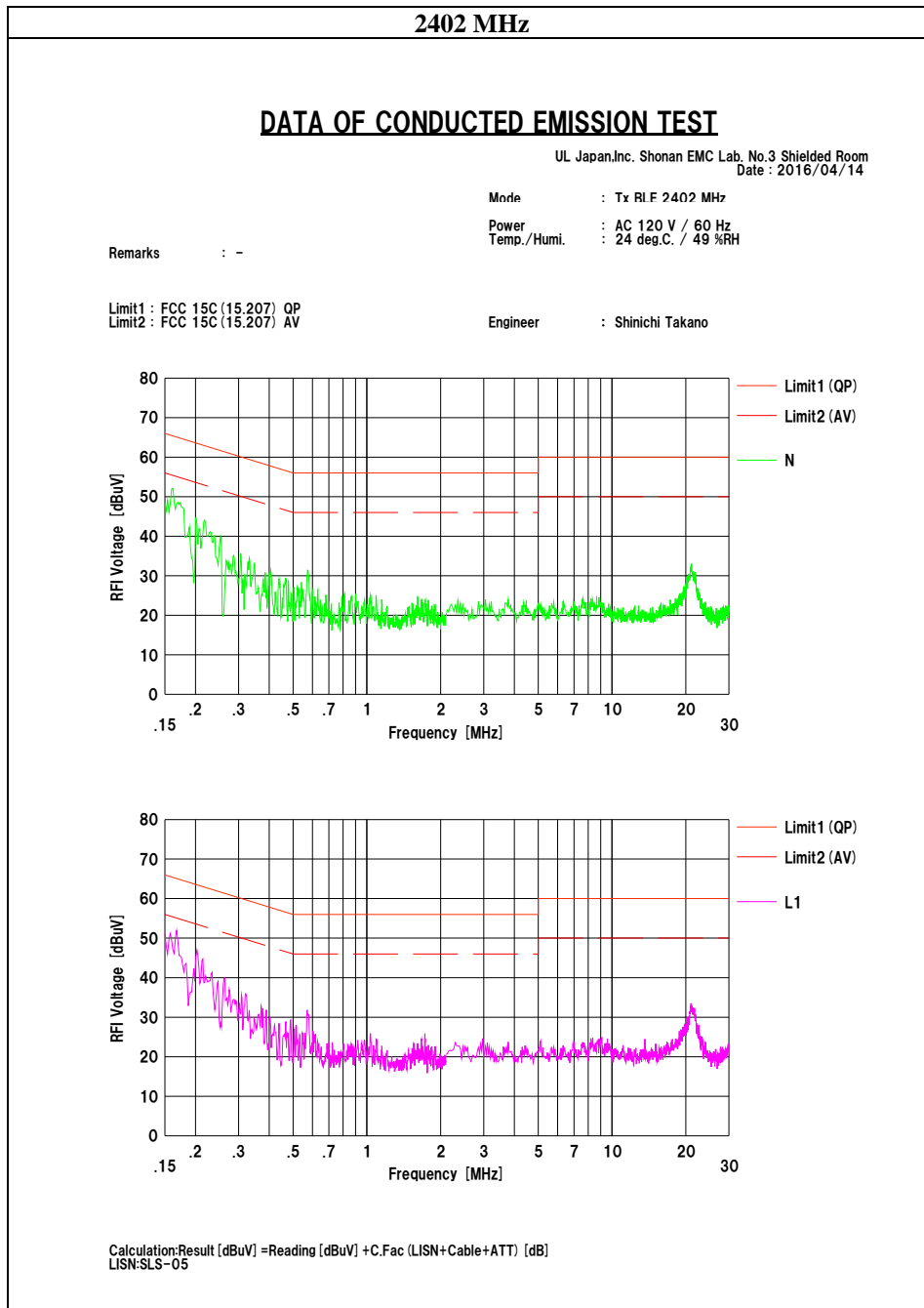
Engineer : Shinichi Takano



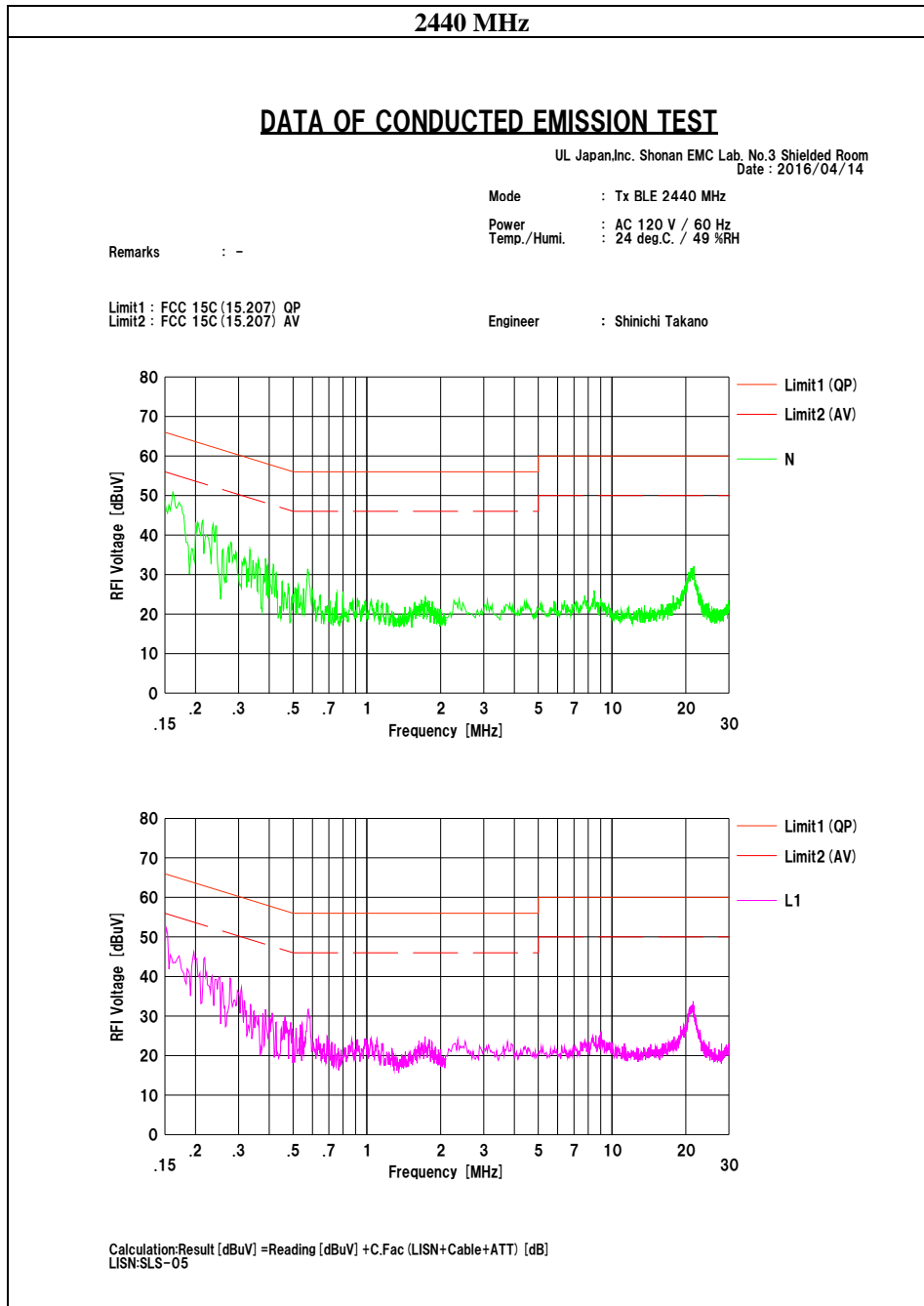
No.	Freq. [MHz]	Reading		C.Fac	Results		Limit		Margin		Phase	Comment
		<QP> [dBuV]	<AV> [dBuV]		[dB]	<QP> [dBuV]	<AV> [dBuV]	<QP> [dBuV]	<AV> [dBuV]	<QP> [dB]		
1	0.16111	28.64	11.67	12.39	41.03	24.06	65.41	55.41	24.3	31.3	N	
2	0.20342	20.68	2.16	12.38	33.06	14.54	63.47	53.47	30.4	38.9	N	
3	0.21923	25.12	6.45	12.39	37.51	18.84	62.85	52.85	25.3	34.0	N	
4	0.25077	16.55	1.12	12.40	28.95	13.52	61.73	51.73	32.7	38.2	N	
5	0.57654	15.76	12.15	12.42	28.18	24.57	56.00	46.00	27.8	21.4	N	
6	21.21830	13.43	8.39	13.33	26.76	21.72	60.00	50.00	33.2	28.2	N	
7	0.15923	27.63	10.30	12.39	40.02	22.69	65.50	55.50	25.4	32.8	L1	
8	0.17060	30.92	19.47	12.40	43.32	31.87	64.93	54.93	21.6	23.0	L1	
9	0.20949	20.18	1.81	12.39	32.57	14.20	63.23	53.23	30.6	39.0	L1	
10	0.21872	23.56	5.92	12.39	35.95	18.31	62.87	52.87	26.9	34.5	L1	
11	0.57594	16.03	12.35	12.42	28.45	24.77	56.00	46.00	27.5	21.2	L1	
12	21.21902	14.79	9.56	13.33	28.12	22.89	60.00	50.00	31.8	27.1	L1	

Calculation: Result [dBuV] = Reading [dBuV] + C.Fac (LISN+Cable+ATT) [dB]
LISN-SLS-05

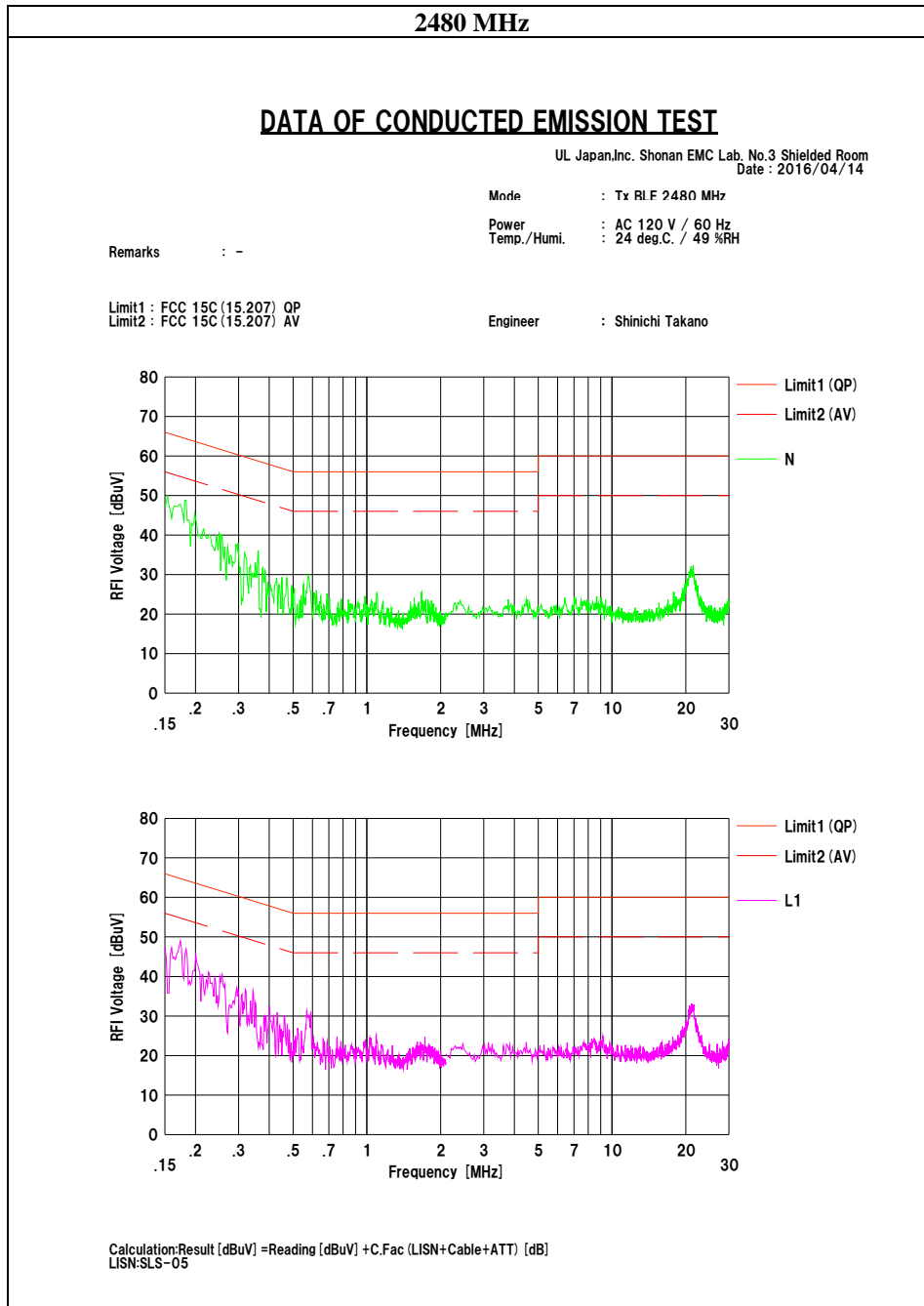
Conducted Emission



Conducted Emission



Conducted Emission



6dB Bandwidth

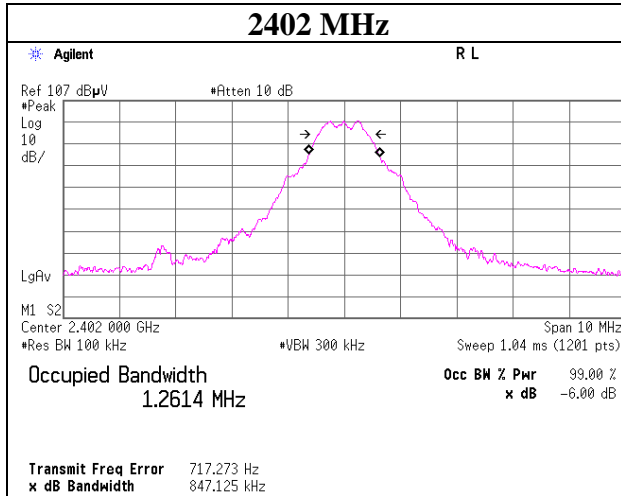
Test place Shonan EMC Lab. No.5 Shielded Room
Report No. 11169434S-A-R1
Date April 6, 2016
Temperature / Humidity 24 deg. C / 47 % RH
Engineer Yosuke Ishikawa
Mode Tx BT LE

Mode	Frequency [MHz]	6dB Bandwidth [MHz]	Limit [kHz]
BT LE	2402	0.847	> 500
	2440	0.854	> 500
	2480	0.835	> 500

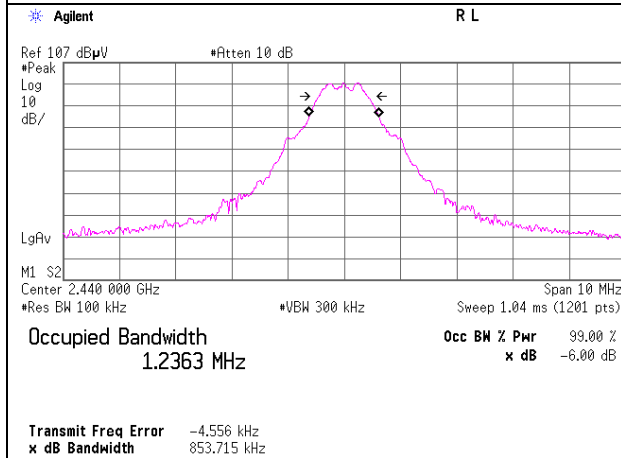
6dB Bandwidth

BT LE

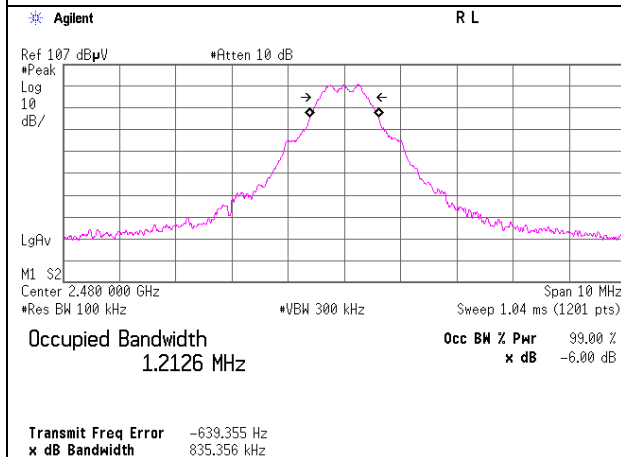
2402 MHz



2440 MHz



2480 MHz



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

Maximum Peak Output Power

Test place Shonan EMC Lab. No.5 Shielded Room
Report No. 11169434S-A-R1
Date April 6, 2016
Temperature / Humidity 24 deg. C / 47 % RH
Engineer Yosuke Ishikawa
Mode Tx BT LE

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
2402	-8.63	1.13	9.93	2.43	1.75	30.00	1000	27.57
2440	-8.64	1.13	9.93	2.42	1.75	30.00	1000	27.58
2480	-8.54	1.14	9.93	2.53	1.79	30.00	1000	27.47

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)

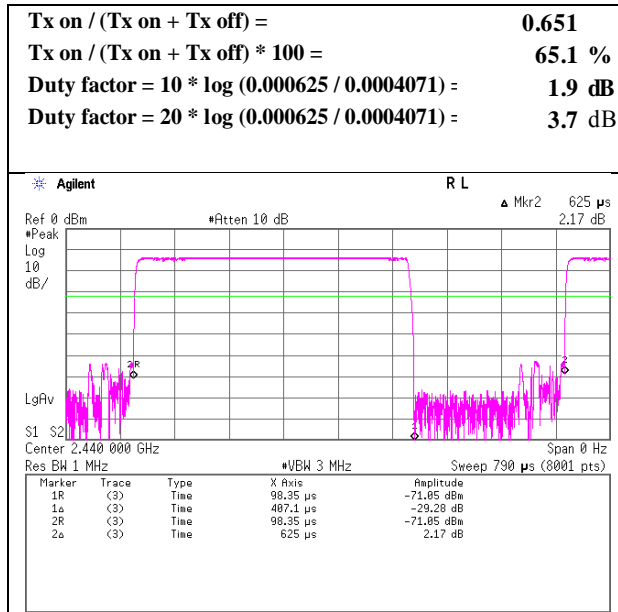
Test place Shonan EMC Lab. No.5 Shielded Room
Report No. 11169434S-A-R1
Date April 6, 2016
Temperature / Humidity 24 deg. C / 47 % RH
Engineer Yosuke Ishikawa
Mode Tx BT LE

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Frame power)		Duty factor [dB]	Result (Burst power)	
				[dBm]	[mW]		[dBm]	[mW]
2402	-10.77	1.13	9.93	0.29	1.07	1.90	2.19	1.66
2440	-10.76	1.13	9.93	0.30	1.07	1.90	2.20	1.66
2480	-10.67	1.14	9.93	0.40	1.10	1.90	2.30	1.70

Burst rate confirmation

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11169434S-A-R1
Date	March 23, 2016
Temperature / Humidity	23 deg. C / 30 % RH
Engineer	Hiroyuki Morikawa
Mode	Tx BT LE

BT LE



Radiated Spurious Emission

Test place : Shonan EMC Lab. No.2 and 3 Semi Anechoic Chamber
Report No. : 11169434S-A-R1
Date : April 12, 2016 April 13, 2016
Temperature / Humidity : 23 deg. C / 40 % RH 23 deg. C / 46 % RH
Engineer : Takahiro Suzuki Shinichi Takano
 (30M-1GHz, (1-13GHz)
 13-26.5GHz)
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.	244.129	QP	32.8	17.6	9.3	31.7	0.0	28.0	46.0	18.0	142	14	
Hori.	268.746	QP	39.8	18.4	9.5	31.7	0.0	36.0	46.0	10.0	149	208	
Hori.	485.523	QP	38.6	17.4	7.8	31.6	0.0	32.2	46.0	13.8	100	357	
Hori.	502.557	QP	39.1	17.6	7.8	31.6	0.0	32.9	46.0	13.1	100	353	
Hori.	529.084	QP	40.0	17.9	8.0	31.6	0.0	34.3	46.0	11.7	100	1	
Hori.	640.174	QP	38.6	19.5	8.5	31.6	0.0	35.0	46.0	11.0	170	358	
Hori.	661.891	QP	39.6	19.8	8.6	31.6	0.0	36.4	46.0	9.6	177	1	
Hori.	702.947	QP	37.7	20.3	8.8	31.5	0.0	35.3	46.0	10.7	164	6	
Hori.	739.176	QP	35.3	20.6	9.0	31.5	0.0	33.4	46.0	12.6	152	19	
Hori.	2390.000	PK	45.9	27.8	13.7	41.0	3.6	50.0	73.9	23.9	163	271	
Hori.	4804.000	PK	46.0	31.4	5.8	39.6	3.6	47.2	73.9	26.7	268	187	
Hori.	7206.000	PK	44.5	36.9	7.2	40.1	3.6	52.1	73.9	21.8	150	0	
Vert.	512.086	QP	38.7	17.7	7.9	31.6	0.0	32.7	46.0	13.3	100	5	
Vert.	2390.000	PK	45.8	27.8	13.7	41.0	3.6	49.9	73.9	24.0	162	76	
Vert.	4804.000	PK	47.4	31.4	5.8	39.6	3.6	48.6	73.9	25.3	156	116	
Vert.	7206.000	PK	44.7	36.9	7.2	40.1	3.6	52.3	73.9	21.6	150	0	

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

Distance factor : 1 GHz - 13 GHz : $20\log(4.49 \text{ m} / 3.0 \text{ m}) = 3.6 \text{ dB}$

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.	2390.000	AV	36.6	27.8	13.7	41.0	3.7	3.6	44.4	53.9	9.5	*1)
Hori.	4804.000	AV	36.4	31.4	5.8	39.6	3.7	3.6	41.3	53.9	12.6	
Hori.	7206.000	AV	35.8	36.9	7.2	40.1	3.7	3.6	47.1	53.9	6.8	
Vert.	2390.000	AV	36.4	27.8	13.7	41.0	3.7	3.6	44.2	53.9	9.7	*1)
Vert.	4804.000	AV	38.4	31.4	5.8	39.6	3.7	3.6	43.3	53.9	10.6	
Vert.	7206.000	AV	35.9	36.9	7.2	40.1	3.7	3.6	47.2	53.9	6.7	

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

Distance factor : 1 GHz - 13 GHz : $20\log(4.49 \text{ m} / 3.0 \text{ m}) = 3.6 \text{ dB}$

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)

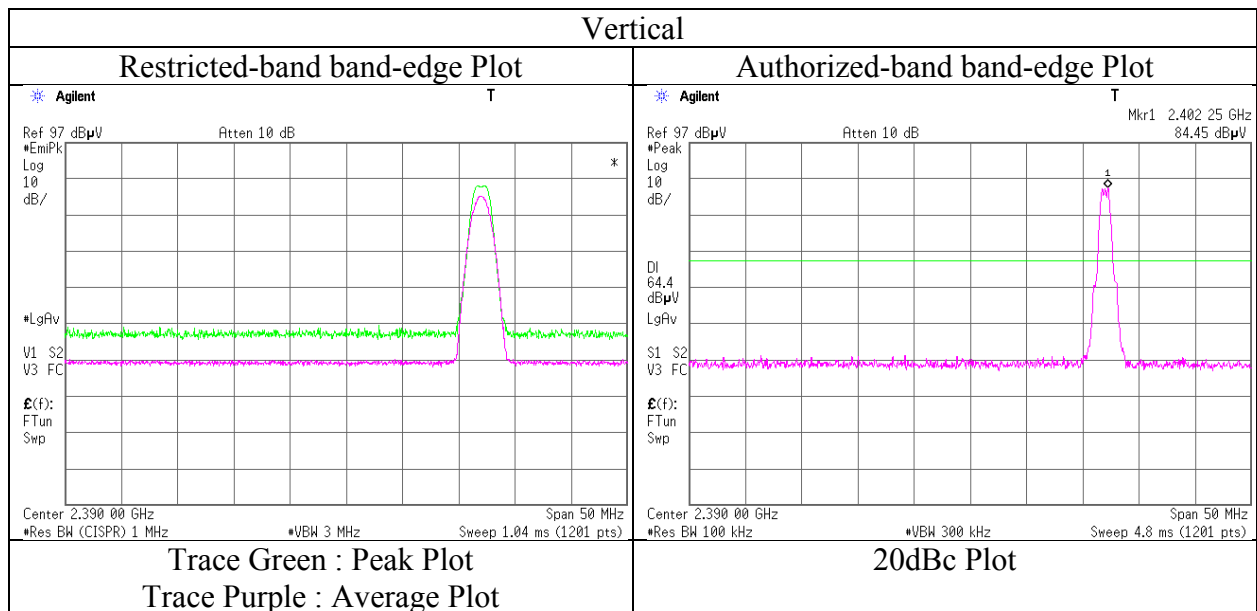
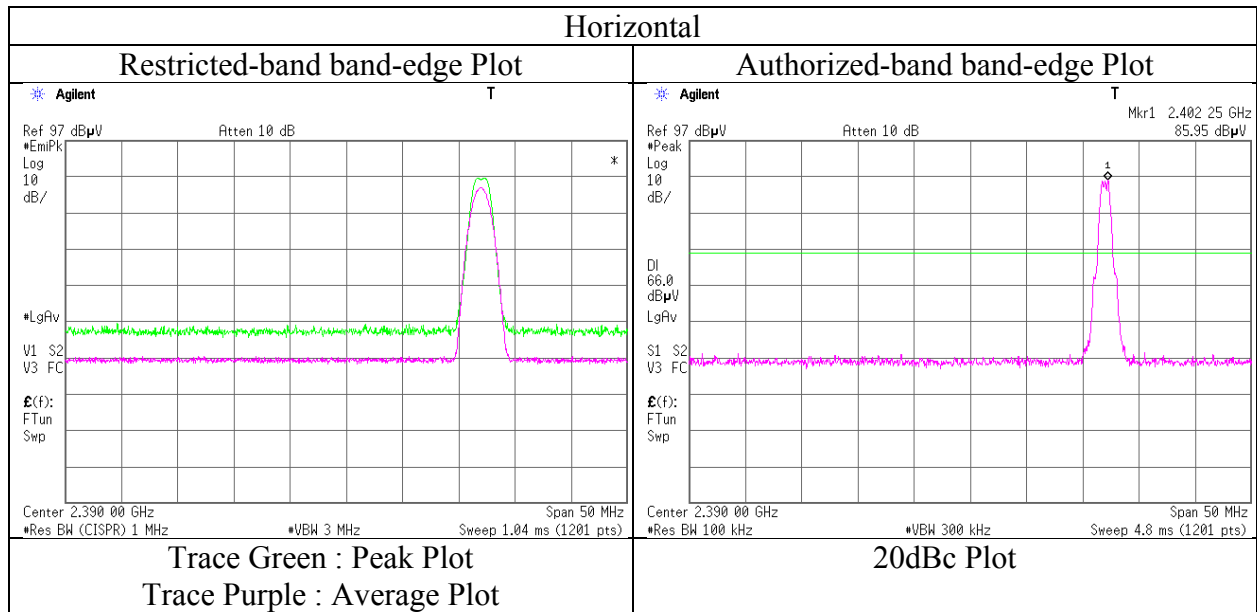
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2402.000	PK	85.8	27.8	13.7	41.0	3.6	89.9	-	-	Carrier
Hori.	2400.000	PK	38.9	27.8	13.7	41.0	3.6	43.0	69.8	26.8	
Vert.	2402.000	PK	84.0	27.8	13.7	41.0	3.6	88.1	-	-	Carrier
Vert.	2400.000	PK	38.1	27.8	13.7	41.0	3.6	42.2	68.1	25.9	

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

Distance factor : 1 GHz - 13 GHz : $20\log(4.49 \text{ m} / 3.0 \text{ m}) = 3.6 \text{ dB}$

Radiated Spurious Emission
(Reference Plot for band-edge)

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 11169434S-A-R1
Date : April 13, 2016
Temperature / Humidity : 23 deg. C / 46 % RH
Engineer : Shinichi Takano
Mode : Tx BT LE 2402 MHz



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

Radiated Spurious Emission

Test place : Shonan EMC Lab. No.2 and 3 Semi Anechoic Chamber
Report No. : 11169434S-A-R1
Date : April 12, 2016 April 13, 2016
Temperature / Humidity : 23 deg. C / 40 % RH 23 deg. C / 46 % RH
Engineer : Takahiro Suzuki Shinichi Takano
 (30M-1GHz, (1-13GHz)
 13-26.5GHz)
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.	244.123	QP	32.7	17.6	9.3	31.7	0.0	27.9	46.0	18.1	147	1	
Hori.	268.756	QP	40.1	18.4	9.5	31.7	0.0	36.3	46.0	9.7	139	358	
Hori.	483.384	QP	38.8	17.3	7.7	31.6	0.0	32.2	46.0	13.8	100	2	
Hori.	504.962	QP	39.7	17.6	7.9	31.6	0.0	33.6	46.0	12.4	100	358	
Hori.	529.148	QP	40.3	17.9	8.0	31.6	0.0	34.6	46.0	11.4	100	1	
Hori.	637.876	QP	38.8	19.5	8.5	31.6	0.0	35.2	46.0	10.8	168	1	
Hori.	657.219	QP	40.0	19.7	8.6	31.6	0.0	36.7	46.0	9.3	176	1	
Hori.	693.464	QP	37.8	20.2	8.8	31.6	0.0	35.2	46.0	10.8	165	4	
Hori.	712.755	QP	38.2	20.4	8.9	31.5	0.0	36.0	46.0	10.0	152	2	
Hori.	4880.000	PK	47.1	31.7	5.9	39.5	3.6	48.8	73.9	25.1	261	194	
Hori.	7320.000	PK	45.8	36.9	7.3	40.2	3.6	53.4	73.9	20.5	150	0	
Vert.	504.997	QP	37.3	17.6	7.9	31.6	0.0	31.2	46.0	14.8	100	43	
Vert.	4880.000	PK	47.1	31.7	5.9	39.5	3.6	48.8	73.9	25.1	201	200	
Vert.	7320.000	PK	45.7	36.9	7.3	40.2	3.6	53.3	73.9	20.6	150	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log(4.49 m / 3.0 m) = 3.6 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.	4880.000	AV	38.2	31.7	5.9	39.5	3.7	3.6	43.6	53.9	10.3	
Hori.	7320.000	AV	36.3	36.9	7.3	40.2	3.7	3.6	47.6	53.9	6.3	
Vert.	4880.000	AV	38.1	31.7	5.9	39.5	3.7	3.6	43.5	53.9	10.4	
Vert.	7320.000	AV	36.1	36.9	7.3	40.2	3.7	3.6	47.4	53.9	6.5	

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(4.49 m / 3.0 m) = 3.6 dB
Duty factor refer to "Duty factor Calculation chart" sheet.

Radiated Spurious Emission

Test place : Shonan EMC Lab. No.2 and 3 Semi Anechoic Chamber
Report No. : 11169434S-A-R1
Date : April 13, 2016
Temperature / Humidity : 23 deg. C / 46 % RH
Engineer : Shinichi Takano
(1-13GHz)
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.	244.108	QP	33.5	17.6	9.3	31.7	0.0	28.7	46.0	17.3	142	221	
Hori.	268.756	QP	40.0	18.4	9.5	31.7	0.0	36.2	46.0	9.8	152	1	
Hori.	485.722	QP	38.8	17.4	7.8	31.6	0.0	32.4	46.0	13.6	100	354	
Hori.	509.826	QP	40.0	17.7	7.9	31.6	0.0	34.0	46.0	12.0	100	328	
Hori.	526.765	QP	40.7	17.9	8.0	31.6	0.0	35.0	46.0	11.0	100	353	
Hori.	645.131	QP	40.2	19.6	8.6	31.6	0.0	36.8	46.0	9.2	186	357	
Hori.	652.406	QP	39.8	19.7	8.6	31.6	0.0	36.5	46.0	9.5	177	1	
Hori.	696.013	QP	39.4	20.2	8.8	31.6	0.0	36.8	46.0	9.2	166	358	
Hori.	739.291	QP	35.5	20.6	9.0	31.5	0.0	33.6	46.0	12.4	152	16	
Hori.	2483.500	PK	46.1	27.9	13.8	41.0	3.6	50.4	73.9	23.5	154	266	
Hori.	4960.000	PK	46.0	32.0	6.0	39.4	3.6	48.2	73.9	25.7	216	203	
Hori.	7440.000	PK	46.5	37.0	7.5	40.4	3.6	54.2	73.9	19.7	150	0	
Vert.	526.720	QP	36.0	17.9	8.0	31.6	0.0	30.3	46.0	15.7	100	2	
Vert.	2483.500	PK	45.6	27.9	13.8	41.0	3.6	49.9	73.9	24.0	146	74	
Vert.	4960.000	PK	47.9	32.0	6.0	39.4	3.6	50.1	73.9	23.8	134	278	
Vert.	7440.000	PK	46.4	37.0	7.5	40.4	3.6	54.1	73.9	19.8	150	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log(4.49 m / 3.0 m) = 3.6 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	36.3	27.9	13.8	41.0	3.7	3.6	44.3	53.9	9.6	*1)
Hori.	4960.000	AV	37.5	32.0	6.0	39.4	3.7	3.6	43.4	53.9	10.5	
Hori.	7440.000	AV	36.3	37.0	7.5	40.4	3.7	3.6	47.7	53.9	6.2	
Vert.	2483.500	AV	36.6	27.9	13.8	41.0	3.7	3.6	44.6	53.9	9.3	*1)
Vert.	4960.000	AV	38.4	32.0	6.0	39.4	3.7	3.6	44.3	53.9	9.6	
Vert.	7440.000	AV	36.2	37.0	7.5	40.4	3.7	3.6	47.6	53.9	6.3	

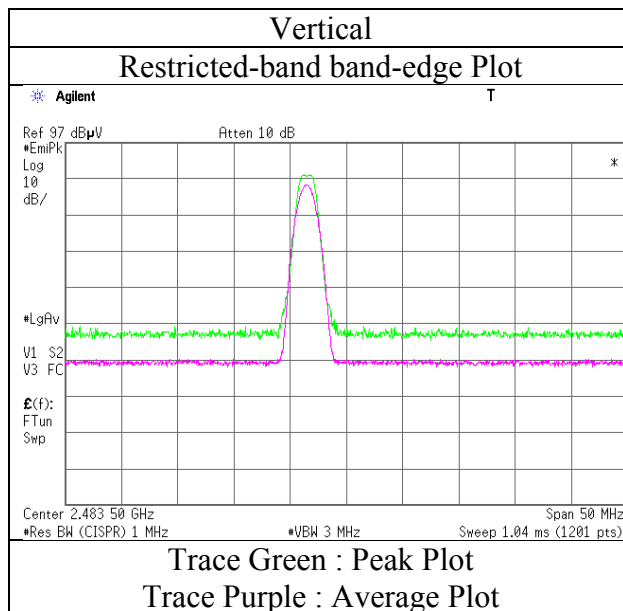
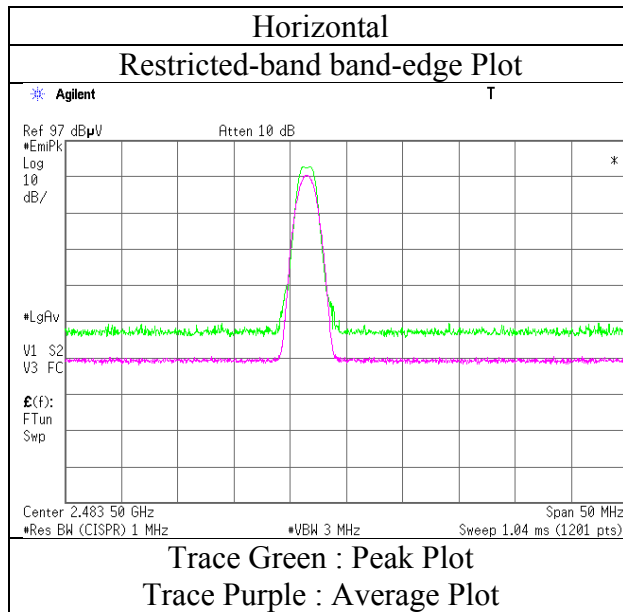
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Duty factor + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log(4.49 m / 3.0 m) = 3.6 dB

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)

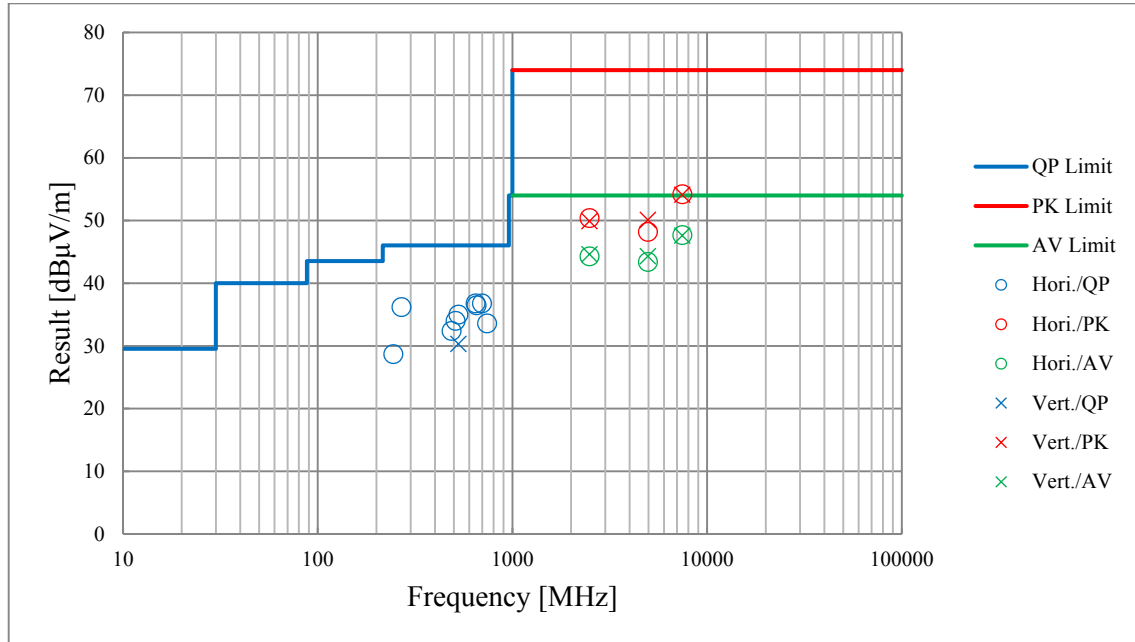
Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11169434S-A-R1
Date	April 13, 2016
Temperature / Humidity	23 deg. C / 46 % RH
Engineer	Shinichi Takano
Mode	Tx BT LE 2480 MHz



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

Radiated Spurious Emission (Plot data, Worst case)

Test place	Shonan EMC Lab. No.2 and 3 Semi Anechoic Chamber	
Report No.	11169434S-A-R1	
Date	April 12, 2016	April 13, 2016
Temperature / Humidity	23 deg. C / 40 % RH	23 deg. C / 46 % RH
Engineer	Takahiro Suzuki (30M-1GHz, 13-26.5GHz)	Shinichi Takano (1-13GHz)
Mode	Tx BT LE 2480 MHz	



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

UL Japan, Inc.

Shonan EMC Lab.

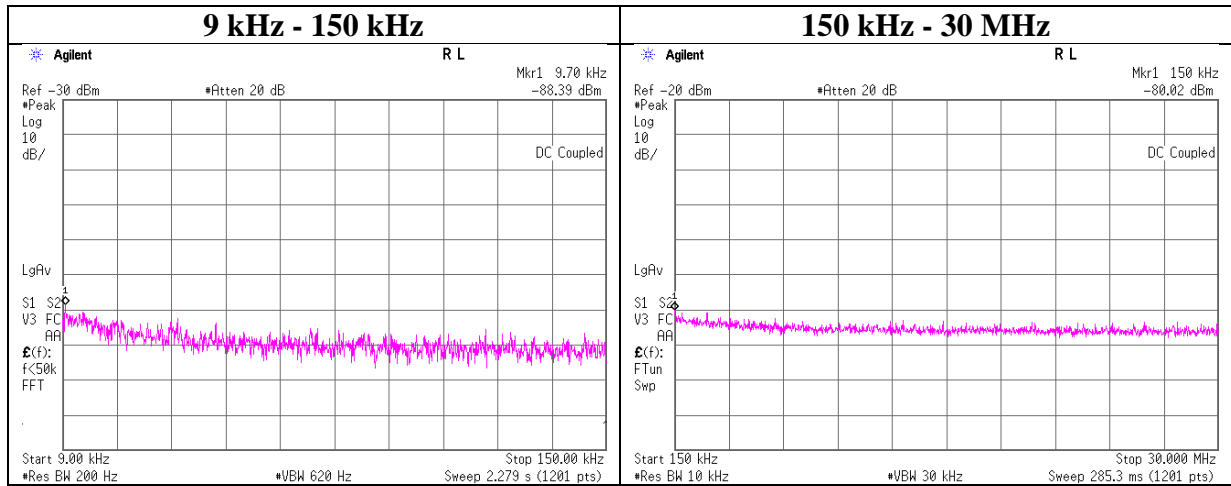
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Conducted Spurious Emission

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11169434S-A-R1
Date	March 23, 2016
Temperature / Humidity	23 deg. C / 30 % RH
Engineer	Hiroyuki Morikawa
Mode	Tx BT LE 2402 MHz



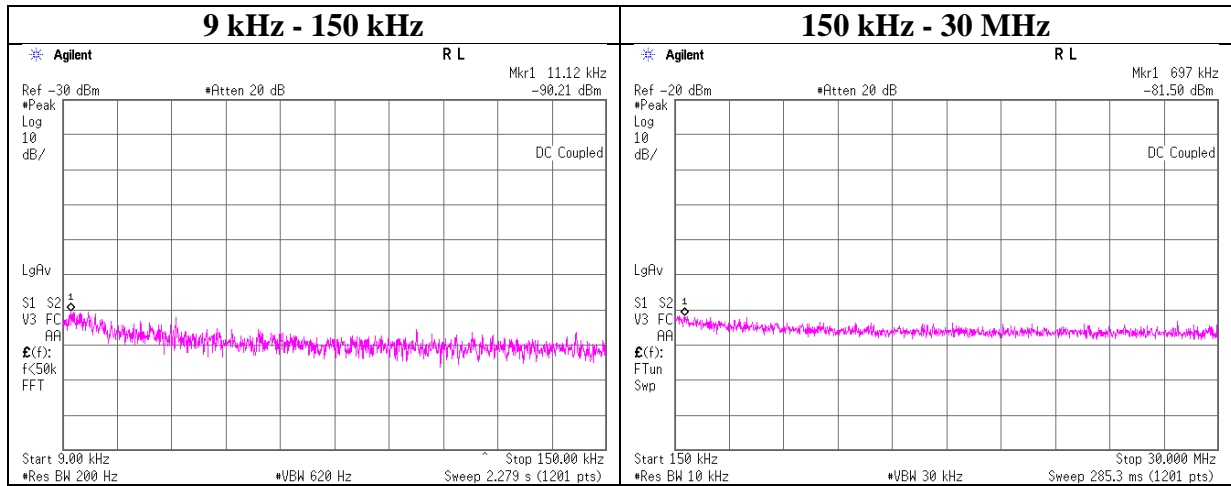
Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator Loss [dB]	Antenna Gain [dBi]	N (Number of Output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
0.0097	-88.4	0.01	9.54	2.1	1	-76.7	300	6.0	-15.4	107.8	123.2	
0.15	-80.0	0.01	9.54	2.1	1	-68.3	300	6.0	-7.1	84.0	91.1	

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

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

Conducted Spurious Emission

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11169434S-A-R1
Date	March 23, 2016
Temperature / Humidity	23 deg. C / 30 % RH
Engineer	Hiroyuki Morikawa
Mode	Tx BT LE 2440 MHz



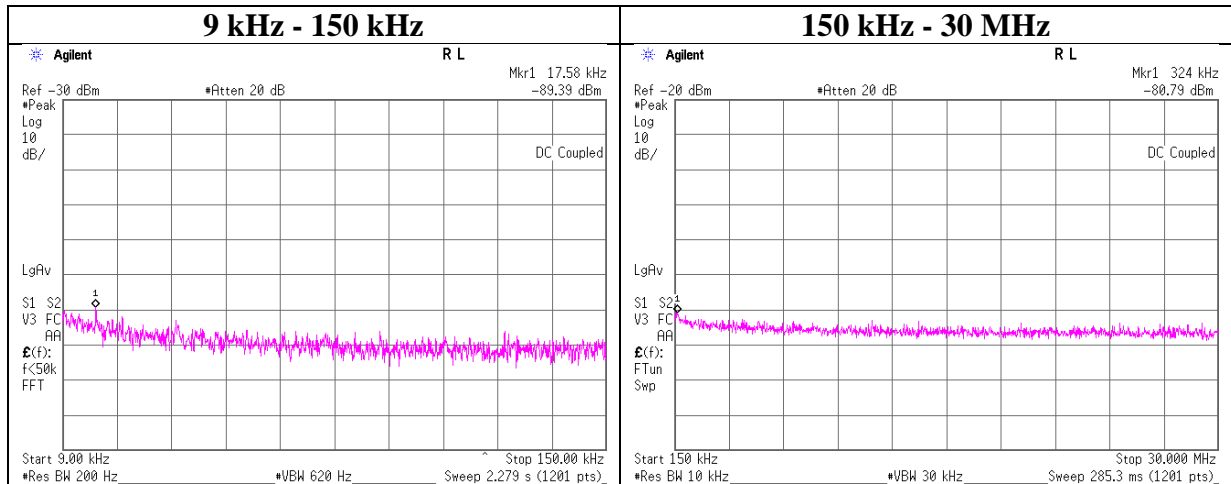
Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator Loss [dB]	Antenna Gain [dBi]	N (Number of Output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
0.01112	-90.2	0.01	9.54	2.1	1	-78.5	300	6.0	-17.3	106.6	123.9	
0.697	-81.5	0.02	9.55	2.1	1	-69.8	300	6.0	-8.5	70.7	79.2	

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

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

Conducted Spurious Emission

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11169434S-A-R1
Date	March 23, 2016
Temperature / Humidity	23 deg. C / 30 % RH
Engineer	Hiroyuki Morikawa
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
0.01758	-89.4	0.01	9.54	2.1	1	-77.7	300	6.0	-16.4	102.7	119.1	
0.324	-80.8	0.02	9.54	2.1	1	-69.1	300	6.0	-7.8	77.3	85.1	

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

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

Power Density

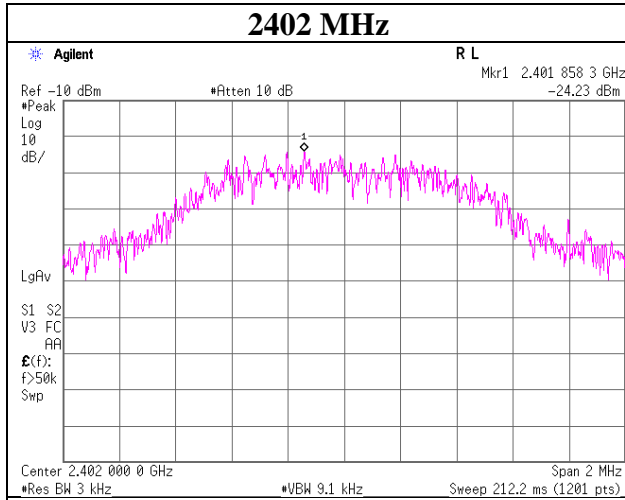
Test place Shonan EMC Lab. No.5 Shielded Room
Report No. 11169434S-A-R1
Date April 6, 2016
Temperature / Humidity 24 deg. C / 47 % RH
Engineer Yosuke Ishikawa
Mode Tx BT LE

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2402.00	-24.23	1.13	9.93	-13.17	8.00	21.17
2440.00	-24.36	1.13	9.93	-13.30	8.00	21.30
2480.00	-24.10	1.14	9.93	-13.03	8.00	21.03

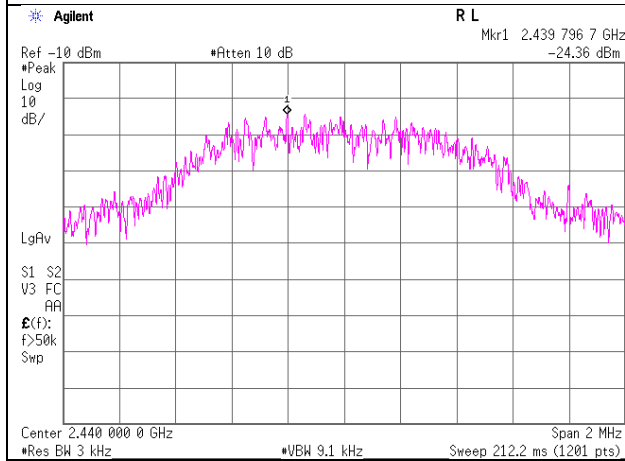
Power Density

BT LE

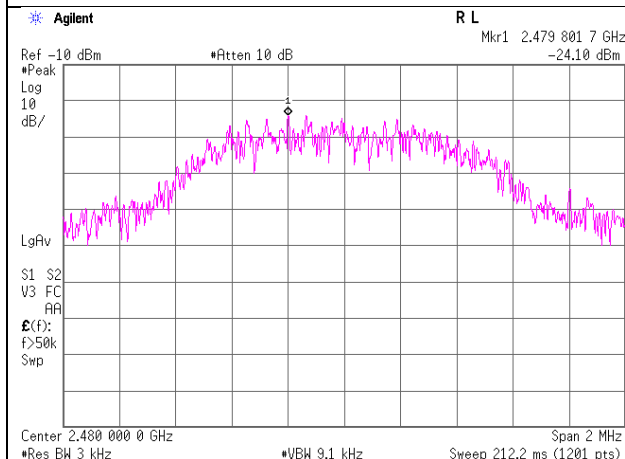
2402 MHz



2440 MHz



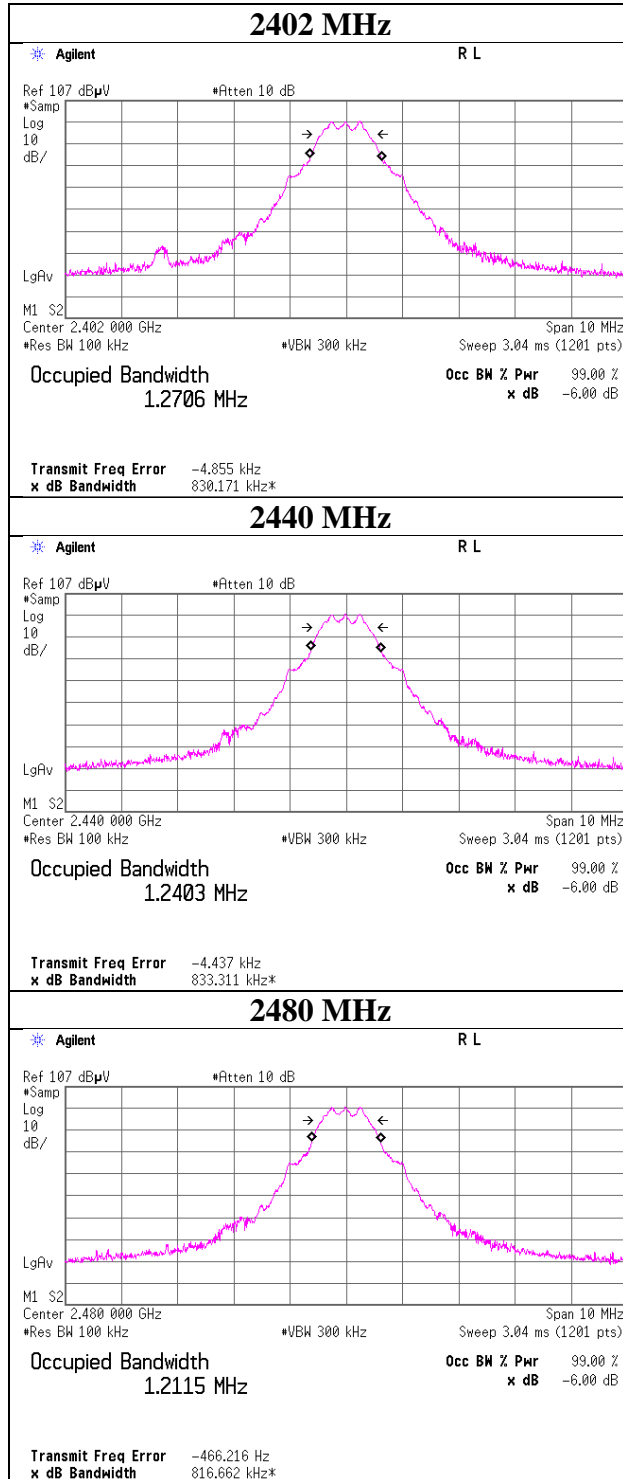
2480 MHz



99% Occupied Bandwidth

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11169434S-A-R1
Date	April 6, 2016
Temperature / Humidity	24 deg. C / 47 % RH
Engineer	Yosuke Ishikawa
Mode	Tx BT LE

BT LE



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

APPENDIX 2: Test instruments

Test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
SSA-03	Spectrum Analyzer	Agilent	E4448A	MY48250152	AT	2015/09/16 * 12
SPM-06	Power Meter	Anritsu	ML2495A	0850009	AT	2016/04/01 * 12
SPSS-03	Power sensor	Anritsu	MA2411B	0917063	AT	2016/04/01 * 12
SAT10-10	Attenuator	Weinschel Corp.	54A-10	37584	AT	2015/04/09 * 12
SCC-G12	Coaxial Cable	Suhner	SUCOFLEX 102	30790/2	AT	2016/03/23 * 12
SOS-09	Humidity Indicator	A&D	AD-5681	4061484	AT	2015/12/07 * 12
STS-05	Digital Hitester	Hioki	3805-50	080997828	AT	2015/11/18 * 12
SAF-02	Pre Amplifier	SONOMA	310N	290212	RE	2016/02/19 * 12
SAT6-02	Attenuator	JFW	50HF-006N	-	RE	2016/02/25 * 12
KAT3-11	Attenuator	JFW IND. INC.	50HF-003N	-	RE	2015/08/31 * 12
SBA-02	Biconical Antenna	Schwarzbeck	BBA9106	91032665	RE	2015/11/02 * 12
SCC-B1/B3/B5/B7/B8/B13/SRSE-02	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/T OYO	8D2W/12DSFA /141PE/141PE/141PE/141PE/NS4906	-/0901-270(R F Selector)	RE	2015/04/17 * 12
SCC-B2/B4/B6/B7/B8/B13/SRSE-02	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/T OYO	8D2W/12DSFA /141PE/141PE/141PE/141PE/NS4906	-/0901-270(R F Selector)	RE	2015/04/17 * 12
SLA-02	Logperiodic Antenna	Schwarzbeck	UHALP9108A	UHALP 9108-A 0893	RE	2015/11/03 * 12
SOS-03	Humidity Indicator	A&D	AD-5681	4063325	RE	2015/10/22 * 12
STR-07	Test Receiver	Rohde & Schwarz	ESU26	100484	RE	2015/09/04 * 12
SJM-09	Measure	PROMART	SEN1935	-	RE	-
SAEC-02(NSA)	Semi-Anechoic Chamber	TDK	SAEC-02(NSA)	2	RE	2015/07/15 * 12
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE ,CE,RFI,MF)	-	RE, CE	-
STS-02	Digital Hitester	Hioki	3805-50	080997819	RE	2016/03/22 * 12
KAF-04	Pre Amplifier	Agilent	8449B	3008A01600	RE	2015/04/28 * 12
SCC-G05	Coaxial Cable	Junkosha	J12J102207-00	APR-30-15-037	RE	2015/05/11 * 12
SCC-G22	Coaxial Cable	Suhner	SUCOFLEX 104	296199/4	RE	2015/05/19 * 12
SHA-02	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-726	RE	2015/08/10 * 12
SHA-04	Horn Antenna	ETS LINDGREN	3160-09	LM3640	RE	2016/03/15 * 12
SAF-08	Pre Amplifier	TOYO Corporation	HAP18-26W	00000019	RE	2016/03/23 * 12
SAJ-02	Antenna Tilt Jig	Intelligent System Engineering Co., Ltd	Antenna Tilt Jig	T-S002	RE	Pre Check
SCC-G33	Coaxial Cable	Junkosha	MWX241-0100 0KMSKMS	-	RE	2015/04/09 * 12
SCC-G15	Coaxial Cable	Suhner	SUCOFLEX 102	32703/2	RE	2016/03/08 * 12
SAF-06	Pre Amplifier	TOYO Corporation	TPA0118-36	1440491	RE	2015/05/27 * 12
SCC-G04	Coaxial Cable	Junkosha	J12J102207-00	JUN-12-14-018	RE	2015/06/08 * 12
SCC-G23	Coaxial Cable	Suhner	SUCOFLEX 104	297342/4	RE	2015/05/19 * 12
SHA-03	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-739	RE	2015/08/11 * 12
SOS-05	Humidity Indicator	A&D	AD-5681	4062518	RE	2015/10/22 * 12
KSA-08	Spectrum Analyzer	Agilent	E4446A	MY46180525	RE	2016/03/28 * 12
SJM-15	Measure	ASKUL	-	-	RE, CE	-
SAEC-03(SVSW R)	Semi-Anechoic Chamber	TDK	SAEC-03(SVSW R)	3	RE	2015/08/28 * 12
STS-03	Digital Hitester	Hioki	3805-50	080997823	RE, CE	2015/11/18 * 12
SAT10-05	Attenuator(above1GHz)	Agilent	8493C-010	74864	RE	2015/11/04 * 12
SFL-02	Highpass Filter	MICRO-TRONICS	HPM50111	051	RE	2015/11/16 * 12
SCC-C9/C10/SR SE-03	Coaxial Cable&RF Selector	Suhner/Suhner/TOYO	RG223U/141P E/NS4906	-/0901-271(R F Selector)	CE	2015/04/17 * 12
SLS-05	LISN	Rohde & Schwarz	ENV216	100516	CE	2016/02/09 * 12
SAT3-07	Attenuator	JFW	50HF-003N	-	CE	2015/09/18 * 12
SOS-06	Humidity Indicator	A&D	AD-5681	4062118	CE	2015/12/07 * 12
STR-06	Test Receiver	Rohde & Schwarz	ESCI	101259	CE	2016/03/28 * 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

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