



RADIO TEST REPORT

Test Report No. : 12366336H-A-R2

Applicant : Ascensia Diabetes Care Holdings AG
Type of EUT : CONTOUR NEXT
Model Number of EUT : 7901
Test regulation : FCC Part 15 Subpart C: 2020
Test Result : Complied (Refer to SECTION 3.2)

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. This test report covers Radio technical requirements. It does not cover administrative issues such as Manual or non-Radio test related Requirements. (if applicable)
6. The all test items in this test report are conducted by UL Japan, Inc. Ise EMC Lab.
7. This test report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.
8. The information provided from the customer for this report is identified in SECTION 1.
9. This report is a revised version of 12366336H-A-R1. 12366336H-A-R1 is replaced with this report.

Date of test: June 27 to July 12, 2018

Representative test engineer:

J. Nagatomi
Junki Nagatomi
Engineer

Consumer Technology Division

Approved by:

S. Miyazono
Shinichi Miyazono
Engineer

Consumer Technology Division



This laboratory is accredited by the NVLAP LAB CODE 200572-0, U.S.A. The tests reported herein have been performed in accordance with its terms of accreditation.
*As for the range of Accreditation in NVLAP, you may refer to the WEB address,
http://japan.ul.com/resources/emc_accredited/

- ☐ 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.

Ise EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

REVISION HISTORY

Original Test Report No.: 12366336H-A

Revision	Test report No.	Date	Page revised	Contents
- (Original)	12366336H-A	December 5, 2018	-	-
1	12366336H-A-R1	July 1, 2019	corresponding page	Correction due to ISO 17025 revision
1	12366336H-A-R1	July 1, 2019	P.1	Change of NVLAP logo to NVLAP combined ILAC MRA mark
1	12366336H-A-R1	July 1, 2019	P.1, 6	Update of FCC version
1	12366336H-A-R1	July 1, 2019	P.9	Correction of Configuration and peripherals in Clause 4.2
2	12366336H-A-R2	October 20, 2020	corresponding page	Correction due to ISO 17025 revision
2	12366336H-A-R2	October 20, 2020	P.1, 7	Update of FCC version
2	12366336H-A-R2	October 20, 2020	P.3	Addition of the Abbreviations list
2	12366336H-A-R2	October 20, 2020	P.6	Addition of the following variant model; CONTOUR NEXT GEN (7902, 7902H)

UL Japan, Inc.

Ise EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Reference: Abbreviations (Including words undescribed in this report)

A2LA	The American Association for Laboratory Accreditation	MCS	Modulation and Coding Scheme
AC	Alternating Current	MRA	Mutual Recognition Arrangement
AFH	Adaptive Frequency Hopping	N/A	Not Applicable
AM	Amplitude Modulation	NIST	National Institute of Standards and Technology
Amp, AMP	Amplifier	NS	No signal detect.
ANSI	American National Standards Institute	NSA	Normalized Site Attenuation
Ant, ANT	Antenna	NVLAP	National Voluntary Laboratory Accreditation Program
AP	Access Point	OBW	Occupied Band Width
ASK	Amplitude Shift Keying	OFDM	Orthogonal Frequency Division Multiplexing
Atten., ATT	Attenuator	P/M	Power meter
AV	Average	PCB	Printed Circuit Board
BPSK	Binary Phase-Shift Keying	PER	Packet Error Rate
BR	Bluetooth Basic Rate	PHY	Physical Layer
BT	Bluetooth	PK	Peak
BT LE	Bluetooth Low Energy	PN	Pseudo random Noise
BW	BandWidth	PRBS	Pseudo-Random Bit Sequence
Cal Int	Calibration Interval	PSD	Power Spectral Density
CCK	Complementary Code Keying	QAM	Quadrature Amplitude Modulation
Ch., CH	Channel	QP	Quasi-Peak
CISPR	Comite International Special des Perturbations Radioelectriques	QPSK	Quadri-Phase Shift Keying
CW	Continuous Wave	RBW	Resolution Band Width
DBPSK	Differential BPSK	RDS	Radio Data System
DC	Direct Current	RE	Radio Equipment
D-factor	Distance factor	RF	Radio Frequency
DFS	Dynamic Frequency Selection	RMS	Root Mean Square
DQPSK	Differential QPSK	RSS	Radio Standards Specifications
DSSS	Direct Sequence Spread Spectrum	Rx	Receiving
EDR	Enhanced Data Rate	SA, S/A	Spectrum Analyzer
EIRP, e.i.r.p.	Equivalent Isotropically Radiated Power	SG	Signal Generator
EMC	ElectroMagnetic Compatibility	SVSWR	Site-Voltage Standing Wave Ratio
EMI	ElectroMagnetic Interference	TR	Test Receiver
EN	European Norm	Tx	Transmitting
ERP, e.r.p.	Effective Radiated Power	VBW	Video BandWidth
EU	European Union	Vert.	Vertical
EUT	Equipment Under Test	WLAN	Wireless LAN
Fac.	Factor		
FCC	Federal Communications Commission		
FHSS	Frequency Hopping Spread Spectrum		
FM	Frequency Modulation		
Freq.	Frequency		
FSK	Frequency Shift Keying		
GFSK	Gaussian Frequency-Shift Keying		
GNSS	Global Navigation Satellite System		
GPS	Global Positioning System		
Hori.	Horizontal		
ICES	Interference-Causing Equipment Standard		
IEC	International Electrotechnical Commission		
IEEE	Institute of Electrical and Electronics Engineers		
IF	Intermediate Frequency		
ILAC	International Laboratory Accreditation Conference		
ISED	Innovation, Science and Economic Development Canada		
ISO	International Organization for Standardization		
JAB	Japan Accreditation Board		
LAN	Local Area Network		
LIMS	Laboratory Information Management System		

UL Japan, Inc.

Ise EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

CONTENTS	PAGE
SECTION 1: Customer information.....	5
SECTION 2: Equipment under test (EUT).....	5
SECTION 3: Test specification, procedures & results.....	7
SECTION 4: Operation of EUT during testing.....	10
SECTION 5: Radiated Spurious Emission	11
SECTION 6: Antenna Terminal Conducted Tests.....	13
APPENDIX 1: Test data	14
6 dB Bandwidth and 99 % Occupied Bandwidth.....	14
Maximum Peak Output Power	17
Average Output Power	18
Radiated Spurious Emission	20
Conducted Spurious Emission	26
Power Density	29
APPENDIX 2: Test instruments	31
APPENDIX 3: Photographs of test setup	32
Radiated Spurious Emission	32
Worst Case Position	33

SECTION 1: Customer information

[Applicant]

Company Name	:	Ascensia Diabetes Care Holdings AG
Address	:	Peter Merian-Strasse 90 4052 Basel, Switzerland

[Manufacturer]

Company Name	:	PHC Corporation
Address	:	2131-1 Minamigata, Toon, Ehime 791-0395 Japan
Telephone Number	:	+81-70-1499-9786
Facsimile Number	:	+81-89-966-2890
Contact Person	:	Masahiro Kishida

The information provided from the customer is as follows;

- Applicant, Type of EUT, Model Number of EUT on the cover and other relevant pages
- Operating/Test Mode(s) (Mode(s)) on all the relevant pages
- SECTION 1: Customer information
- SECTION 2: Equipment under test (EUT) other than the Receipt Date
- SECTION 4: Operation of EUT during testing
- * The laboratory is exempted from liability of any test results affected from the above information in SECTION 2 and 4.

SECTION 2: Equipment under test (EUT)

2.1 Identification of EUT

Type	:	CONTOUR NEXT
Model Number	:	7901
Serial Number	:	Refer to Section 4, Clause 4.2
Rating	:	DC 3.0 V
Receipt Date	:	June 26, 2018
Country of Mass-production	:	Japan
Condition	:	Production prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification	:	No Modification by the test lab

2.2 Product Description

Model: 7901 (referred to as the EUT in this report) is a CONTOUR NEXT.

Radio Specification

Bluetooth Low Energy (Ver.4.2)

Equipment Type	:	Transceiver
Frequency of Operation	:	2402 MHz – 2480 MHz
Type of Modulation	:	GFSK
Antenna Type	:	Pattern Antenna
Antenna Gain	:	2.41 dBi
Operating Temperature	:	0 deg. C to +55 deg. C

Variant models

Tested model; 7901 has following variant models;

CONTOUR NEXT	CONTOUR NEXT GEN	CONTOUR PLUS ELITE
7901(Tested model) 7901H	7902 7902H	7926 7926H

The differences between above variant model's type of equipment are intended country of destination and corresponding test strip.

The differences between above variant model's model No. are range of measurement results displayed and displayed unit.

These models are completely identical in Electrical characteristics and configuration.

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C
FCC Part 15 final revised on October 13, 2020

Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.207 Conducted limits
Section 15.247 Operation within the bands 902-928MHz,
2400-2483.5MHz, and 5725-5850MHz

* The revision does not affect the test result conducted before its effective date.

* 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	FCC: Section 15.207	N/A	N/A	*1)
	IC: RSS-Gen 8.8	IC: RSS-Gen 8.8			
6dB Bandwidth	FCC: KDB 558074 D01 15.247 Meas Guidance v05	FCC: Section 15.247(a)(2)	See data.	Complied a)	Conducted
	IC: -	IC: RSS-247 5.2(a)			
Maximum Peak Output Power	FCC: KDB 558074 D01 15.247 Meas Guidance v05	FCC: Section 15.247(b)(3)		Complied b)	Conducted
	IC: RSS-Gen 6.12	IC: RSS-247 5.4(d)			
Power Density	FCC: KDB 558074 D01 15.247 Meas Guidance v05	FCC: Section 15.247(e)		Complied c)	Conducted
	IC: -	IC: RSS-247 5.2(b)			
Spurious Emission Restricted Band Edges	FCC: KDB 558074 D01 15.247 Meas Guidance v05	FCC: Section 15.247(d)	5.6 dB 2387.903 MHz, AV, Horizontal	Complied d), e)	Conducted (below 30 MHz)/ Radiated (above 30 MHz) *2)
	IC: RSS-Gen 6.13	IC: RSS-247 5.5 RSS-Gen 8.9 RSS-Gen 8.10			

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 is not the device that is designed to be connected to the public utility (AC) power line and during USB communication EUT cannot transmit Radio frequency.

*2) Radiated test was selected over 30 MHz based on section 15.247(d) and KDB 558074 D01 DTS Meas Guidance v04 12.2.7.

a) Refer to APPENDIX 1 (data of 6 dB Bandwidth and 99 % Occupied Bandwidth)

b) Refer to APPENDIX 1 (data of Maximum Peak Output Power)

c) Refer to APPENDIX 1 (data of Power Density)

d) Refer to APPENDIX 1 (data of Conducted Spurious Emission)

e) Refer to APPENDIX 1 (data of Radiated Spurious Emission)

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.

UL Japan, Inc.

Ise EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

FCC Part 15.31 (e)

The test was performed with the New Battery and the stable voltage was supplied to the EUT during the tests. Therefore, the 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	IC: RSS-Gen 6.7	IC: -	N/A	Complied	Conducted

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

3.4 Uncertainty

There is no applicable rule of uncertainty in this applied standard. Therefore, the results are derived depending on whether or not laboratory uncertainty is applied.

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

Ise EMC Lab.

Antenna Terminal test

Test Item	Uncertainty (+/-)
6 dB Bandwidth / 99 % Occupied Bandwidth	0.96 %
Maximum Peak Output Power / Average Output Power	1.3 dB
Burst Rate	0.10 %
Power Density	2.7 dB
Conducted Spurious Emission	2.7 dB

Radiated emission

Measurement distance	Frequency range	Uncertainty (+/-)
3 m	9 kHz to 30 MHz	3.3 dB
10 m		3.2 dB
3 m	30 MHz to 200 MHz (Horizontal) (Vertical)	4.8 dB
		5.0 dB
	200 MHz to 1000 MHz (Horizontal) (Vertical)	5.2 dB
		6.3 dB
10 m	30 MHz to 200 MHz (Horizontal) (Vertical)	4.8 dB
		4.9 dB
	200 MHz to 1000 MHz (Horizontal) (Vertical)	5.0 dB
		5.0 dB
3 m	1 GHz to 6 GHz	5.0 dB
	6 GHz to 18 GHz	5.3 dB
1 m	10 GHz to 26.5 GHz	5.8 dB
	26.5 GHz to 40 GHz	5.8 dB
10 m	1 GHz to 18 GHz	5.2 dB

3.5 Test Location

UL Japan, Inc. Ise EMC Lab.

*NVLAP Lab. code: 200572-0 / FCC Test Firm Registration Number: 199967 / ISED Lab Company Number: 2973C

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

Telephone: +81 596 24 8999, Facsimile: +81 596 24 8124

Test site	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms	Maximum measurement distance
No.1 semi-anechoic chamber	19.2 x 11.2 x 7.7	7.0 x 6.0	No.1 Power source room	10 m
No.2 semi-anechoic chamber	7.5 x 5.8 x 5.2	4.0 x 4.0	-	3 m
No.3 semi-anechoic chamber	12.0 x 8.5 x 5.9	6.8 x 5.75	No.3 Preparation room	3 m
No.3 shielded room	4.0 x 6.0 x 2.7	N/A	-	-
No.4 semi-anechoic chamber	12.0 x 8.5 x 5.9	6.8 x 5.75	No.4 Preparation room	3 m
No.4 shielded room	4.0 x 6.0 x 2.7	N/A	-	-
No.5 semi-anechoic chamber	6.0 x 6.0 x 3.9	6.0 x 6.0	-	-
No.5 measurement room	6.4 x 6.4 x 3.0	6.4 x 6.4	-	-
No.6 shielded room	4.0 x 4.5 x 2.7	4.0 x 4.5	-	-
No.6 measurement room	4.75 x 5.4 x 3.0	4.75 x 4.15	-	-
No.7 shielded room	4.7 x 7.5 x 2.7	4.7 x 7.5	-	-
No.8 measurement room	3.1 x 5.0 x 2.7	3.1 x 5.0	-	-
No.9 measurement room	8.8 x 4.6 x 2.8	2.4 x 2.4	-	-

3.6 Test data, Test instruments, and Test set up

Refer to APPENDIX.

UL Japan, Inc.

Ise EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

SECTION 4: Operation of EUT during testing

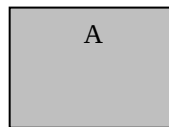
4.1 Operating Mode(s)

Bluetooth (BT) Low Energy (LE): Transmitting (Tx)

Test Item	Operating Mode	Tested Frequency
Spurious Emission 6dB Bandwidth Maximum Peak Output Power Power Density 99% Occupied Bandwidth	Tx BT LE	2402 MHz 2440 MHz 2480 MHz
*Power of the EUT was set by the software as follows; Power settings: 0dBm Software: DE (Digital Engine): 01.10 RFE (RF Engine): 01.10 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

[Radiated emission test]



[Antenna Terminal Conducted test]



* Setup was taken into consideration and test data was taken under worse case conditions.

Description of EUT

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	CONTOUR NEXT	7901	P202482 *1) P200225 *2)	PHC Corporation	EUT

*1) Used for Antenna Terminal conducted test

*2) Used for Radiated Emission test

UL Japan, Inc.

Ise EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

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 1.0 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.

Test antenna was aimed at the EUT for receiving the maximum signal and always kept within the illumination area of the 3 dB beamwidth of the antenna.

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	Average Power Method: RBW: 1 MHz VBW: 3 MHz Detector: Power Averaging (RMS) Trace: 100 traces If duty cycle was less than 98%, a duty factor was added to the results.	RBW: 100 kHz VBW: 300kHz

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

UL Japan, Inc.

Ise EMC Lab.

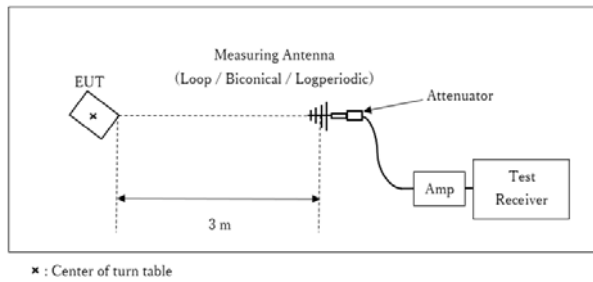
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

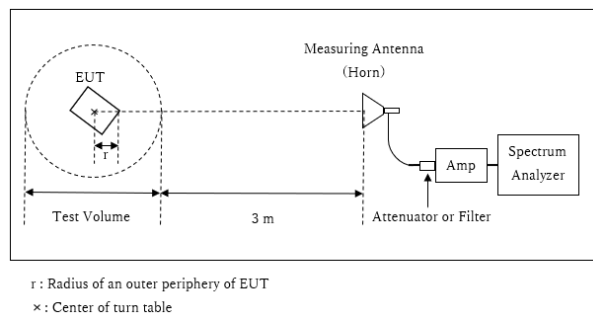
Test Setup

Below 1 GHz



Test Distance: 3 m

1 GHz - 10 GHz



Distance Factor: $20 \times \log (3.75 \text{ m} / 3.0 \text{ m}) = 1.94 \text{ dB}$

* Test Distance: $(3 + \text{Test Volume} / 2) - r = 3.75 \text{ m}$

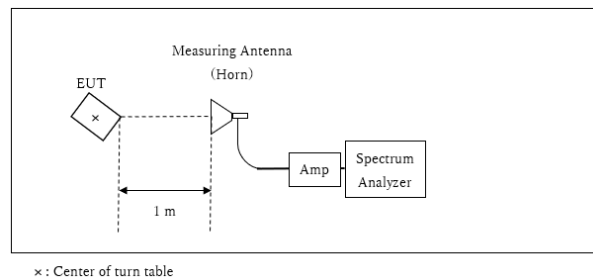
Test Volume : 1.5 m

(Test Volume has been calibrated based on CISPR 16-1-4.)

r = 0.0 m

* The test was performed with r = 0.0 m since EUT is small and it was the rather conservative condition.

10 GHz - 26.5 GHz



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

*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.

Measurement range : 30 MHz - 26.5 GHz

Test data : APPENDIX

Test result : Pass

UL Japan, Inc.

Ise EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

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	20 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	10 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	9.1 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 the noise was low enough as shown 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

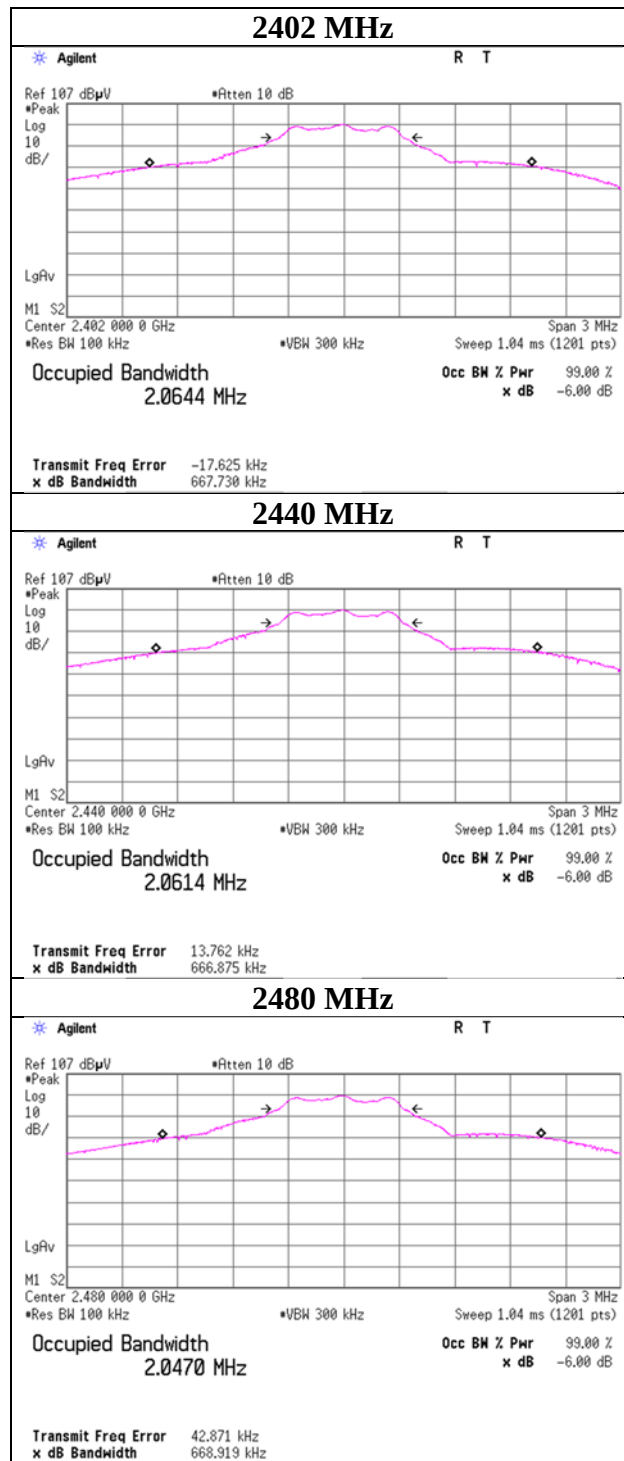
APPENDIX 1: Test data

6 dB Bandwidth and 99 % Occupied Bandwidth

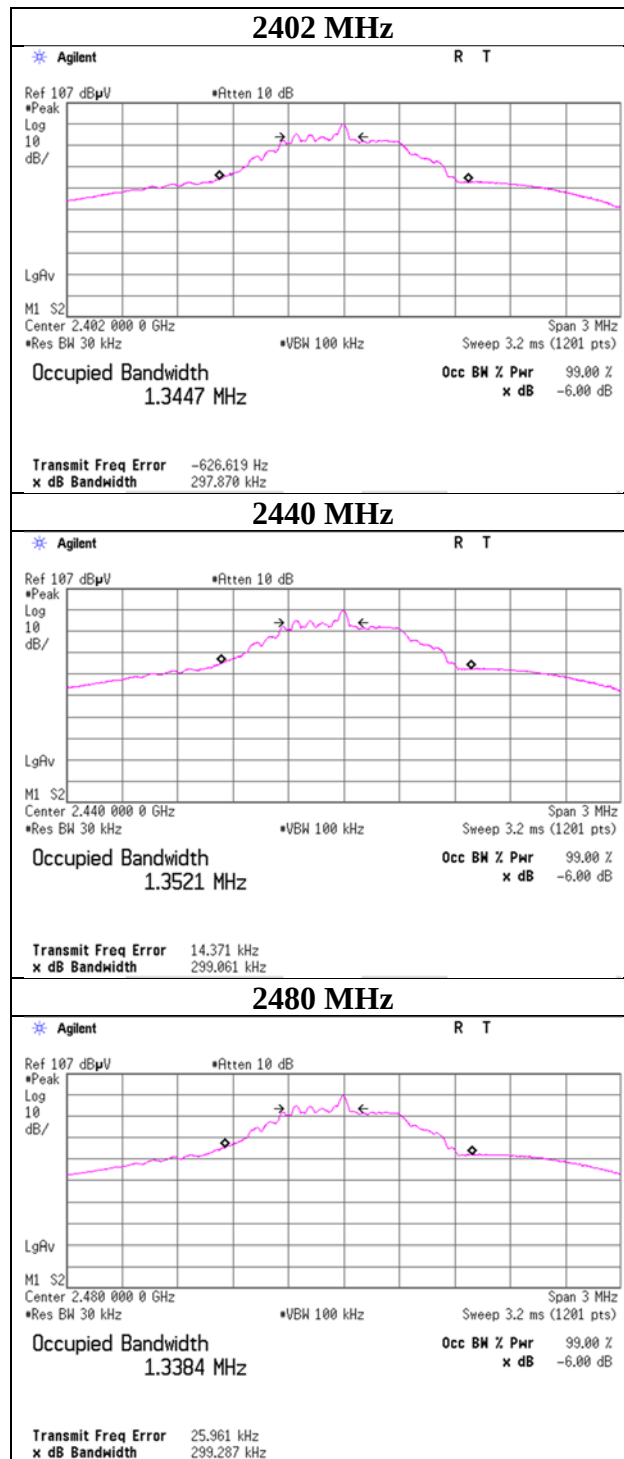
Report No. 12366336H
Test place Ise EMC Lab. No.6 Measurement Room
Date June 27, 2018
Temperature / Humidity 23 deg. C / 62 % RH
Engineer Takafumi Noguchi
Mode Tx BT LE

Mode	Frequency [MHz]	99% Occupied Bandwidth [kHz]	6dB Bandwidth [MHz]	Limit for 6dB Bandwidth [MHz]
BT LE	2402	1344.7	0.668	> 0.5000
	2440	1352.1	0.667	> 0.5000
	2480	1338.4	0.669	> 0.5000

6dB Bandwidth



99% Occupied Bandwidth



UL Japan, Inc.

Ise EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Maximum Peak Output Power

Report No. 12366336H
Test place Ise EMC Lab. No.6 Measurement Room
Date June 27, 2018
Temperature / Humidity 23 deg. C / 62 % RH
Engineer Takafumi Noguchi
Mode Tx BT LE

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Conducted Power				
				Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
2402	-0.17	0.16	0.00	-0.01	1.00	30.00	1000	30.01
2440	-0.26	0.16	0.00	-0.10	0.98	30.00	1000	30.10
2480	-0.38	0.16	0.00	-0.22	0.95	30.00	1000	30.22

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 for RF Exposure)

Report No. 12366336H
Test place Ise EMC Lab. No.6 Measurement Room
Date June 27, 2018
Temperature / Humidity 23 deg. C / 62 % RH
Engineer Takafumi Noguchi
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	-1.97	0.16	0.00	-1.81	0.66	1.69	-0.12	0.97
2440	-2.07	0.16	0.00	-1.91	0.64	1.69	-0.22	0.95
2480	-2.18	0.16	0.00	-2.02	0.63	1.69	-0.33	0.93

Sample Calculation:

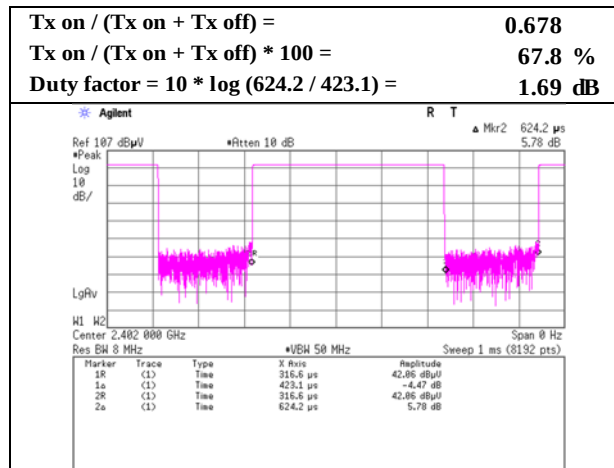
Result (Time average) = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

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. 12366336H
Test place Ise EMC Lab. No.6 Measurement Room
Date June 27, 2018
Temperature / Humidity 23 deg. C / 62 % RH
Engineer Takafumi Noguchi
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.	12366336H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.2	No.2	No.2
Date	July 11, 2018	July 12, 2018 (day)	July 12, 2018 (night)
Temperature / Humidity	20 deg. C / 62 % RH	22 deg. C / 58 % RH	24 deg. C / 60 % RH
Engineer	Ryota Yamanaka (1 GHz - 10 GHz)	Akihiko Maeda (10 GHz - 26.5 GHz)	Junki Nagatomi (Below 1 GHz)
Mode	Tx BT LE 2402 MHz		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	37.998	QP	24.8	15.5	6.8	30.5	-	16.6	40.0	23.4	
Hori	114.997	QP	24.3	12.4	7.6	30.2	-	14.1	43.5	29.4	
Hori	180.003	QP	24.9	16.1	8.0	29.8	-	19.2	43.5	24.3	
Hori	273.003	QP	23.3	12.8	8.7	29.3	-	15.5	46.0	30.5	
Hori	470.995	QP	23.7	16.8	9.6	29.9	-	20.2	46.0	25.8	
Hori	824.995	QP	22.4	20.9	11.1	28.5	-	25.9	46.0	20.1	
Hori	2350.052	PK	51.3	27.4	5.0	34.4	-	49.3	73.9	24.6	
Hori	2389.996	PK	57.5	27.7	5.0	34.4	-	55.8	73.9	18.1	
Hori	2390.000	PK	57.6	27.7	5.0	34.4	-	55.9	73.9	18.0	
Hori	4804.000	PK	44.3	31.2	7.3	33.7	-	49.1	73.9	24.8	Floor noise
Hori	7206.000	PK	43.9	35.5	8.6	33.6	-	54.4	73.9	19.5	Floor noise
Hori	9608.000	PK	44.4	38.4	7.3	33.9	-	56.2	73.9	17.7	Floor noise
Hori	2350.052	AV	45.0	27.4	5.0	34.4	1.7	44.7	53.9	9.2	*1)
Hori	2389.996	AV	42.0	27.7	5.0	34.4	1.7	42.0	53.9	11.9	*1)
Hori	2390.000	AV	42.0	27.7	5.0	34.4	1.7	42.0	53.9	11.9	*1)
Hori	4804.000	AV	34.1	31.2	7.3	33.7	-	38.9	53.9	15.0	Floor noise
Hori	7206.000	AV	34.9	35.5	8.6	33.6	-	45.4	53.9	8.5	Floor noise
Hori	9608.000	AV	36.0	38.4	7.3	33.9	-	47.8	53.9	6.1	Floor noise
Vert	37.998	QP	24.9	15.5	6.8	30.5	-	16.7	40.0	23.3	
Vert	114.997	QP	24.3	12.4	7.6	30.2	-	14.1	43.5	29.4	
Vert	180.003	QP	23.9	16.1	8.0	29.8	-	18.2	43.5	25.3	
Vert	273.003	QP	23.2	12.8	8.7	29.3	-	15.4	46.0	30.6	
Vert	470.995	QP	23.6	16.8	9.6	29.9	-	20.1	46.0	25.9	
Vert	824.995	QP	22.4	20.9	11.1	28.5	-	25.9	46.0	20.1	
Vert	2350.008	PK	51.5	27.4	5.0	34.4	-	49.5	73.9	24.4	
Vert	2389.820	PK	57.1	27.7	5.0	34.4	-	55.4	73.9	18.5	
Vert	2390.000	PK	57.4	27.7	5.0	34.4	-	55.7	73.9	18.2	
Vert	4804.000	PK	44.3	31.2	7.3	33.7	-	49.1	73.9	24.8	Floor noise
Vert	7206.000	PK	43.9	35.5	8.6	33.6	-	54.4	73.9	19.5	Floor noise
Vert	9608.000	PK	44.4	38.4	7.3	33.9	-	56.2	73.9	17.7	Floor noise
Vert	2350.008	AV	45.4	27.4	5.0	34.4	1.7	45.1	53.9	8.8	*1)
Vert	2389.820	AV	41.6	27.7	5.0	34.4	1.7	41.6	53.9	12.3	*1)
Vert	2390.000	AV	42.0	27.7	5.0	34.4	1.7	42.0	53.9	11.9	*1)
Vert	4804.000	AV	34.1	31.2	7.3	33.7	-	38.9	53.9	15.0	Floor noise
Vert	7206.000	AV	34.9	35.5	8.6	33.6	-	45.4	53.9	8.5	Floor noise
Vert	9608.000	AV	36.0	38.4	7.3	33.9	-	47.8	53.9	6.1	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

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

Distance factor: 1 GHz - 10 GHz 20log(3.75 m / 3.0 m) = 1.94 dB
 10 GHz - 26.5 GHz 20log(1.0 m / 3.0 m) = -9.5 dB

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

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result dBuV/m	Limit dBuV/m	Margin [dB]	Remark
Hori	2402.000	PK	98.9	27.7	5.0	34.4	97.2	-	-	Carrier
Hori	2400.000	PK	65.7	27.8	5.0	34.4	64.1	77.2	13.1	
Vert	2402.000	PK	98.2	27.7	5.0	34.4	96.5	-	-	Carrier
Vert	2400.000	PK	65.0	27.8	5.0	34.4	63.4	76.5	13.1	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

UL Japan, Inc.

Ise EMC Lab.

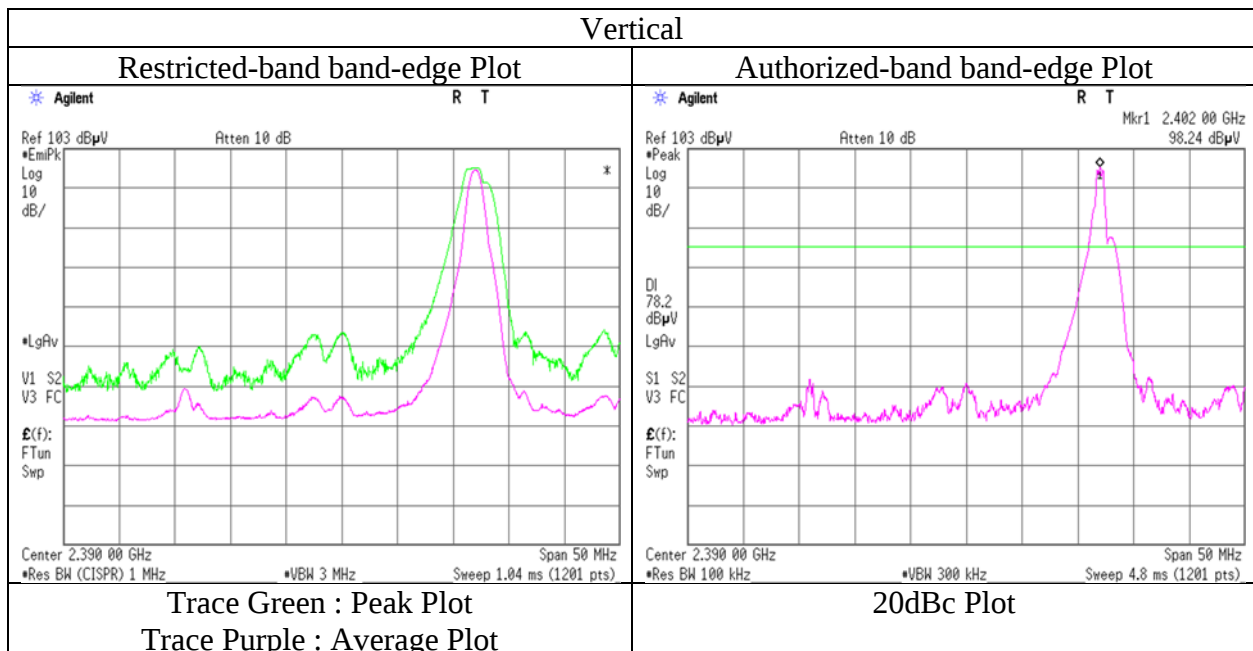
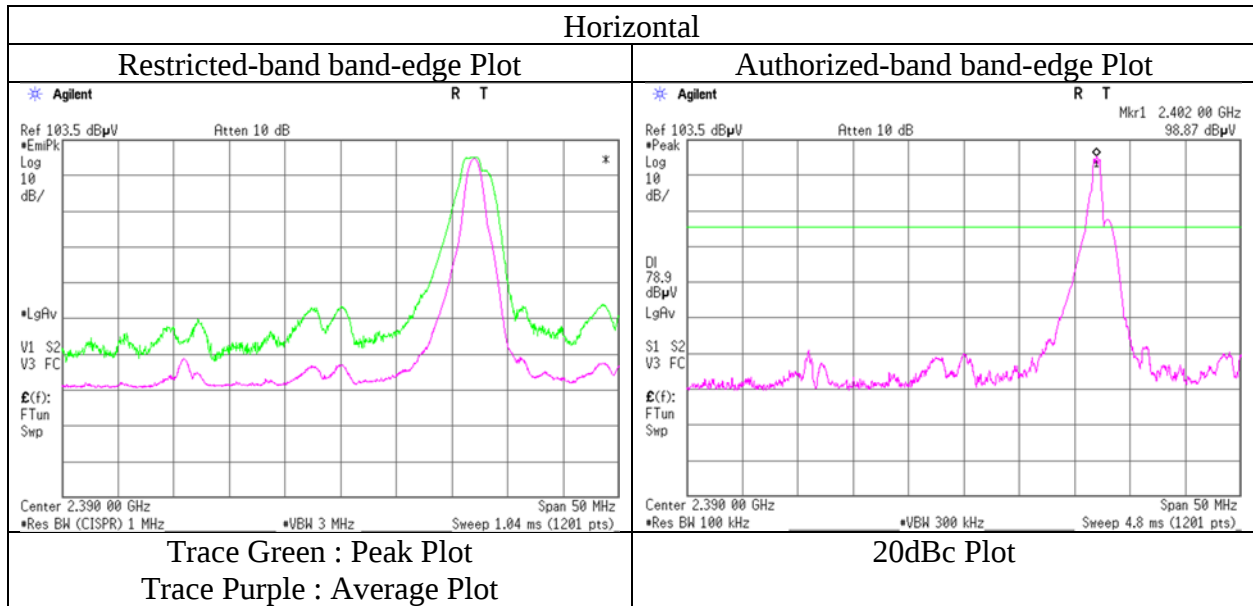
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission (Reference Plot for band-edge)

Report No. 12366336H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.2
Date July 11, 2018
Temperature / Humidity 20 deg. C / 62 % RH
Engineer Ryota Yamanaka
(1 GHz - 10 GHz)
Mode Tx BT LE 2402 MHz



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

UL Japan, Inc.

Ise EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission

Report No.	12366336H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.2	No.2	No.2
Date	July 11, 2018	July 12, 2018 (day)	July 12, 2018 (night)
Temperature / Humidity	20 deg. C / 60 % RH	22 deg. C / 58 % RH	24 deg. C / 60 % RH
Engineer	Junki Nagatomi	Akihiko Maeda	Junki Nagatomi
	(1 GHz - 10 GHz)	(10 GHz - 26.5 GHz)	(Below 1 GHz)
Mode	Tx BT LE 2440 MHz		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	37.998	QP	24.8	15.5	6.8	30.5	-	16.6	40.0	23.4	
Hori	114.997	QP	24.3	12.4	7.6	30.2	-	14.1	43.5	29.4	
Hori	180.003	QP	24.0	16.1	8.0	29.8	-	18.3	43.5	25.2	
Hori	273.003	QP	23.3	12.8	8.7	29.3	-	15.5	46.0	30.5	
Hori	470.995	QP	23.7	16.8	9.6	29.9	-	20.2	46.0	25.8	
Hori	824.995	QP	22.3	20.9	11.1	28.5	-	25.8	46.0	20.2	
Hori	2387.903	PK	53.2	27.7	5.0	34.4	-	51.5	73.9	22.4	
Hori	2492.045	PK	51.8	27.6	5.1	34.4	-	50.1	73.9	23.8	
Hori	4880.000	PK	42.5	31.5	7.3	33.7	-	47.6	73.9	26.3	Floor noise
Hori	7320.000	PK	43.6	35.9	8.7	33.6	-	54.6	73.9	19.3	Floor noise
Hori	9760.000	PK	44.0	38.6	7.3	34.0	-	55.9	73.9	18.0	Floor noise
Hori	2387.903	AV	48.3	27.7	5.0	34.4	1.7	48.3	53.9	5.6	*1)
Hori	2492.045	AV	46.5	27.6	5.1	34.4	1.7	46.5	53.9	7.4	*1)
Hori	4880.000	AV	34.3	31.5	7.3	33.7	-	39.4	53.9	14.5	Floor noise
Hori	7320.000	AV	34.6	35.9	8.7	33.6	-	45.6	53.9	8.3	Floor noise
Hori	9760.000	AV	34.5	38.6	7.3	34.0	-	46.4	53.9	7.5	Floor noise
Vert	37.998	QP	24.8	15.5	6.8	30.5	-	16.6	40.0	23.4	
Vert	114.997	QP	24.3	12.4	7.6	30.2	-	14.1	43.5	29.4	
Vert	180.003	QP	23.9	16.1	8.0	29.8	-	18.2	43.5	25.3	
Vert	273.003	QP	23.2	12.8	8.7	29.3	-	15.4	46.0	30.6	
Vert	470.995	QP	23.7	16.8	9.6	29.9	-	20.2	46.0	25.8	
Vert	824.995	QP	22.4	20.9	11.1	28.5	-	25.9	46.0	20.1	
Vert	2387.903	PK	52.4	27.7	5.0	34.4	-	50.7	73.9	23.2	
Vert	2492.132	PK	52.3	27.6	5.1	34.4	-	50.6	73.9	23.3	
Vert	4880.000	PK	42.5	31.5	7.3	33.7	-	47.6	73.9	26.3	Floor noise
Vert	7320.000	PK	43.6	35.9	8.7	33.6	-	54.6	73.9	19.3	Floor noise
Vert	9760.000	PK	44.0	38.6	7.3	34.0	-	55.9	73.9	18.0	Floor noise
Vert	2387.903	AV	46.5	27.7	5.0	34.4	1.7	46.5	53.9	7.4	*1)
Vert	2492.132	AV	46.4	27.6	5.1	34.4	1.7	46.4	53.9	7.5	*1)
Vert	4880.000	AV	34.3	31.5	7.3	33.7	-	39.4	53.9	14.5	Floor noise
Vert	7320.000	AV	34.6	35.9	8.7	33.6	-	45.6	53.9	8.3	Floor noise
Vert	9760.000	AV	34.5	38.6	7.3	34.0	-	46.4	53.9	7.5	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

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

Distance factor: 1 GHz - 10 GHz $20\log(3.75\text{ m} / 3.0\text{ m}) = 1.94\text{ dB}$
 10 GHz - 26.5 GHz $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

UL Japan, Inc.

Ise EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission

Report No.	12366336H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.2	No.2	No.2
Date	July 11, 2018	July 12, 2018 (day)	July 12, 2018 (night)
Temperature / Humidity	20 deg. C / 60 % RH	22 deg. C / 58 % RH	24 deg. C / 60 % RH
Engineer	Junki Nagatomi	Akihiko Maeda	Junki Nagatomi
	(1 GHz - 10 GHz)	(10 GHz - 26.5 GHz)	(Below 1 GHz)
Mode	Tx BT LE 2480 MHz		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	37.998	QP	24.8	15.5	6.8	30.5	-	16.6	40.0	23.4	
Hori	114.997	QP	24.3	12.4	7.6	30.2	-	14.1	43.5	29.4	
Hori	180.003	QP	24.9	16.1	8.0	29.8	-	19.2	43.5	24.3	
Hori	273.003	QP	23.3	12.8	8.7	29.3	-	15.5	46.0	30.5	
Hori	470.995	QP	23.7	16.8	9.6	29.9	-	20.2	46.0	25.8	
Hori	824.995	QP	22.3	20.9	11.1	28.5	-	25.8	46.0	20.2	
Hori	2483.500	PK	55.2	27.5	5.1	34.4	-	53.4	73.9	20.5	
Hori	2493.573	PK	57.9	27.6	5.1	34.4	-	56.2	73.9	17.7	
Hori	4960.000	PK	43.4	31.7	7.4	33.7	-	48.8	73.9	25.1	Floor noise
Hori	7440.000	PK	42.4	36.1	8.6	33.6	-	53.5	73.9	20.4	Floor noise
Hori	9920.000	PK	44.1	38.5	7.4	34.0	-	56.0	73.9	17.9	Floor noise
Hori	2483.500	AV	44.1	27.5	5.1	34.4	1.7	44.0	53.9	9.9	*1)
Hori	2493.573	AV	37.9	27.6	5.1	34.4	1.7	37.9	53.9	16.0	*1)
Hori	4960.000	AV	34.1	31.7	7.4	33.7	-	39.5	53.9	14.4	Floor noise
Hori	7440.000	AV	34.2	36.1	8.6	33.6	-	45.3	53.9	8.6	Floor noise
Hori	9920.000	AV	34.8	38.5	7.4	34.0	-	46.7	53.9	7.2	Floor noise
Vert	37.998	QP	24.8	15.5	6.8	30.5	-	16.6	40.0	23.4	
Vert	114.997	QP	24.4	12.4	7.6	30.2	-	14.2	43.5	29.3	
Vert	180.003	QP	23.8	16.1	8.0	29.8	-	18.1	43.5	25.4	
Vert	273.003	QP	23.2	12.8	8.7	29.3	-	15.4	46.0	30.6	
Vert	470.995	QP	23.6	16.8	9.6	29.9	-	20.1	46.0	25.9	
Vert	824.995	QP	22.4	20.9	11.1	28.5	-	25.9	46.0	20.1	
Vert	2483.500	PK	54.3	27.5	5.1	34.4	-	52.5	73.9	21.4	
Vert	2493.633	PK	57.4	27.6	5.1	34.4	-	55.7	73.9	18.2	
Vert	4960.000	PK	43.4	31.7	7.4	33.7	-	48.8	73.9	25.1	Floor noise
Vert	7440.000	PK	42.4	36.1	8.6	33.6	-	53.5	73.9	20.4	Floor noise
Vert	9920.000	PK	44.1	38.5	7.4	34.0	-	56.0	73.9	17.9	Floor noise
Vert	2483.500	AV	42.4	27.5	5.1	34.4	1.7	42.3	53.9	11.6	*1)
Vert	2493.633	AV	39.6	27.6	5.1	34.4	1.7	39.6	53.9	14.3	*1)
Vert	4960.000	AV	34.1	31.7	7.4	33.7	-	39.5	53.9	14.4	Floor noise
Vert	7440.000	AV	34.2	36.1	8.6	33.6	-	45.3	53.9	8.6	Floor noise
Vert	9920.000	AV	34.8	38.5	7.4	34.0	-	46.7	53.9	7.2	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.75 m / 3.0 m) = 1.94 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

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

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result dBuV/m	Limit dBuV/m	Margin [dB]	Remark
Hori	2480.000	PK	99.5	27.5	5.1	34.4	97.7	-	-	Carrier
Hori	2531.980	PK	49.5	27.9	5.1	34.4	48.1	77.7	29.6	
Vert	2480.000	PK	98.5	27.5	5.1	34.4	96.7	-	-	Carrier
Vert	2531.985	PK	47.7	27.9	5.1	34.4	46.3	76.7	30.4	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

UL Japan, Inc.

Ise EMC Lab.

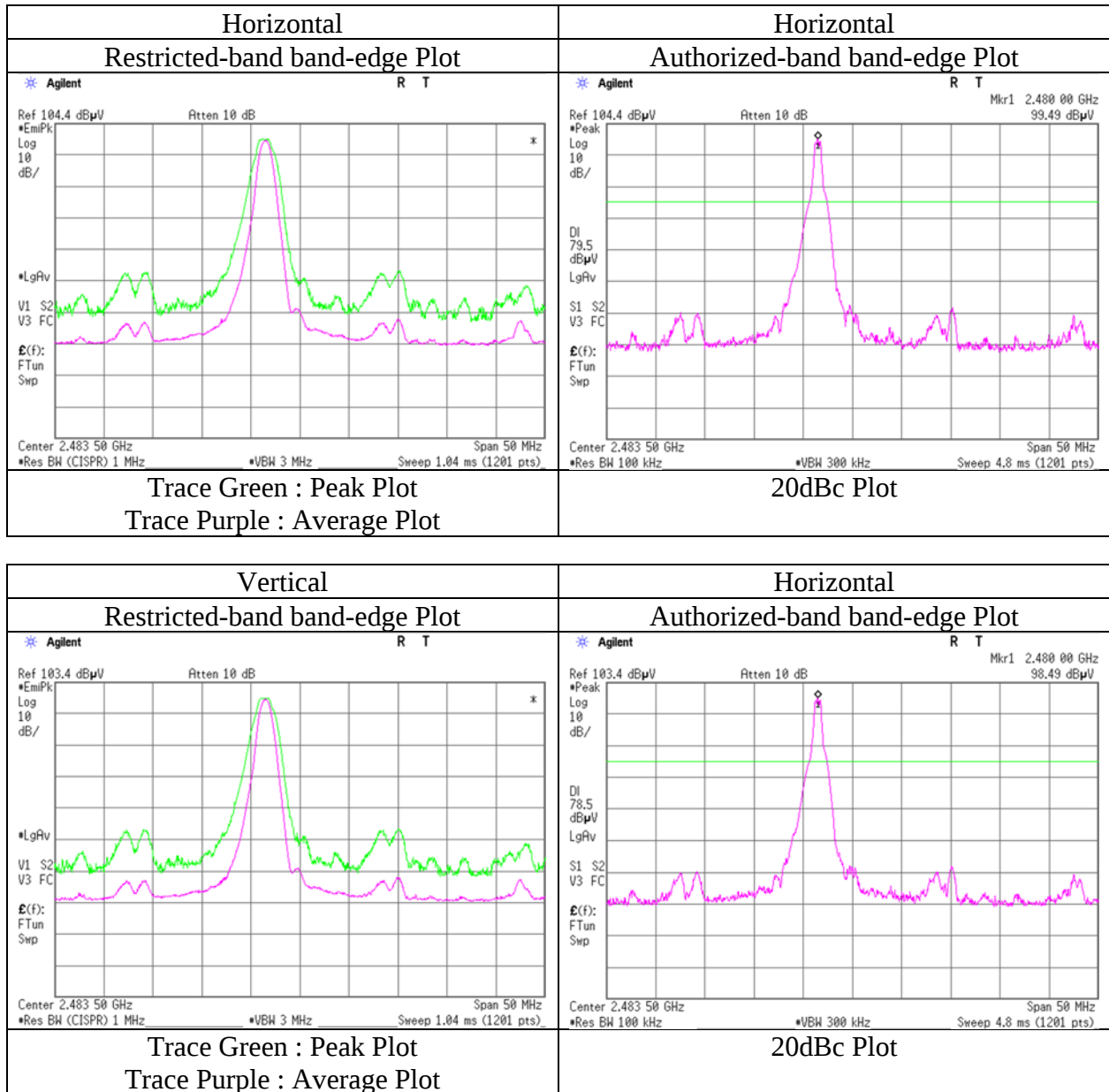
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission (Reference Plot for band-edge)

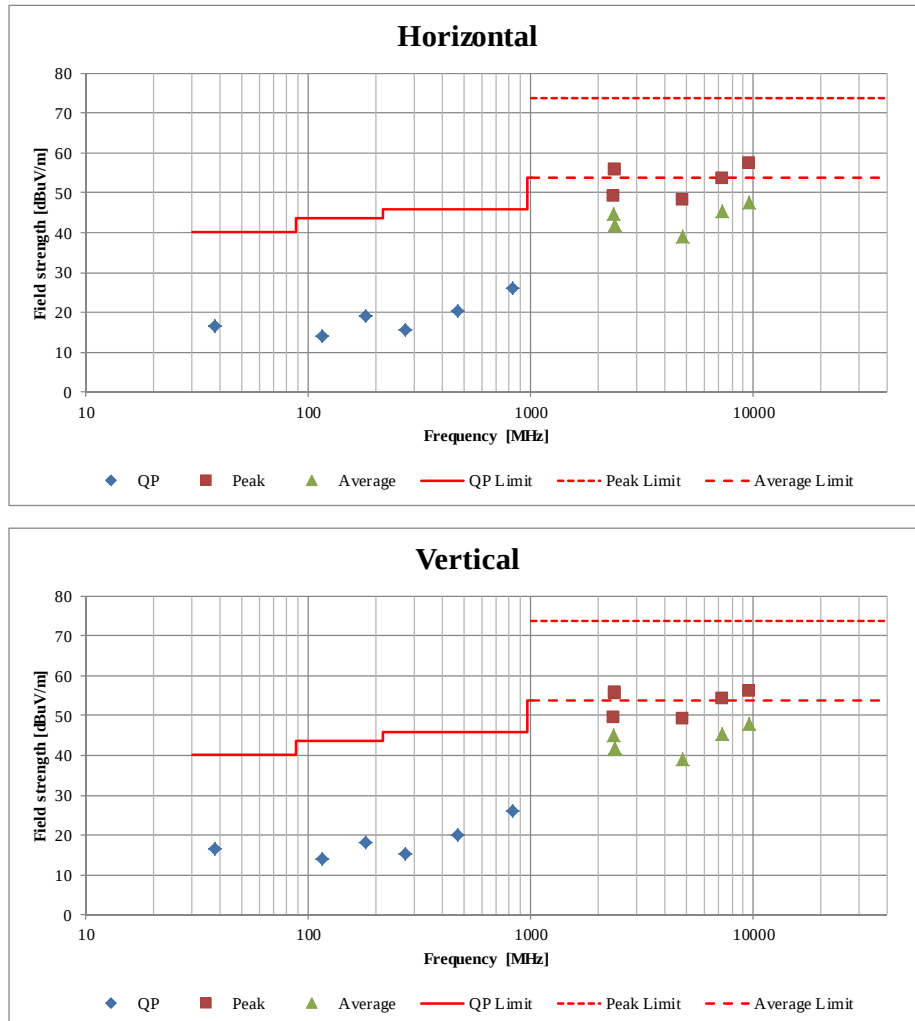
Report No. 12366336H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.2
Date July 11, 2018
Temperature / Humidity 20 deg. C / 60 % RH
Engineer Junki Nagatomi
(1 GHz - 10 GHz)
Mode Tx BT LE 2480 MHz



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

Radiated Spurious Emission **(Plot data, Worst case)**

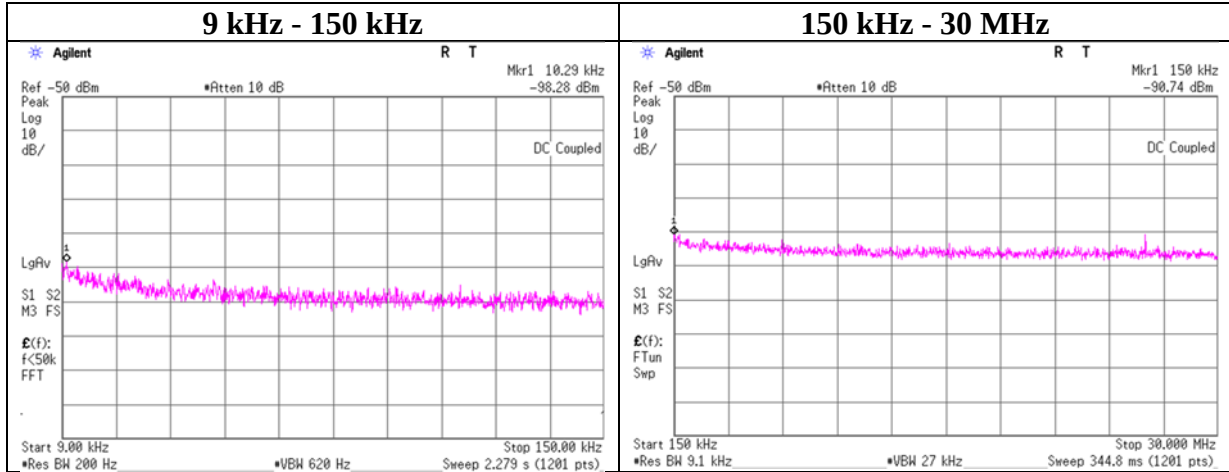
Report No.	12366336H	No.2	No.2
Test place	Ise EMC Lab.	No.2	No.2
Semi Anechoic Chamber	No.2	No.2	No.2
Date	July 11, 2018	July 12, 2018 (day)	July 12, 2018 (night)
Temperature / Humidity	20 deg. C / 62 % RH	22 deg. C / 58 % RH	24 deg. C / 60 % RH
Engineer	Ryota Yamanaka (1 GHz - 10 GHz)	Akihiko Maeda (10 GHz - 26.5 GHz)	Junki Nagatomi (Below 1 GHz)
Mode	Tx BT LE 2402 MHz		



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

Conducted Spurious Emission

Report No. 12366336H
Test place Ise EMC Lab. No.6 Measurement Room
Date June 27, 2018
Temperature / Humidity 23 deg. C / 62 % RH
Engineer Takafumi Noguchi
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
10.29	-98.3	0.16	10.0	2.4	1	-85.7	300	6.0	-24.4	47.3	71.7	
150.00	-90.7	0.26	10.0	2.4	1	-78.0	300	6.0	-16.8	24.0	40.8	

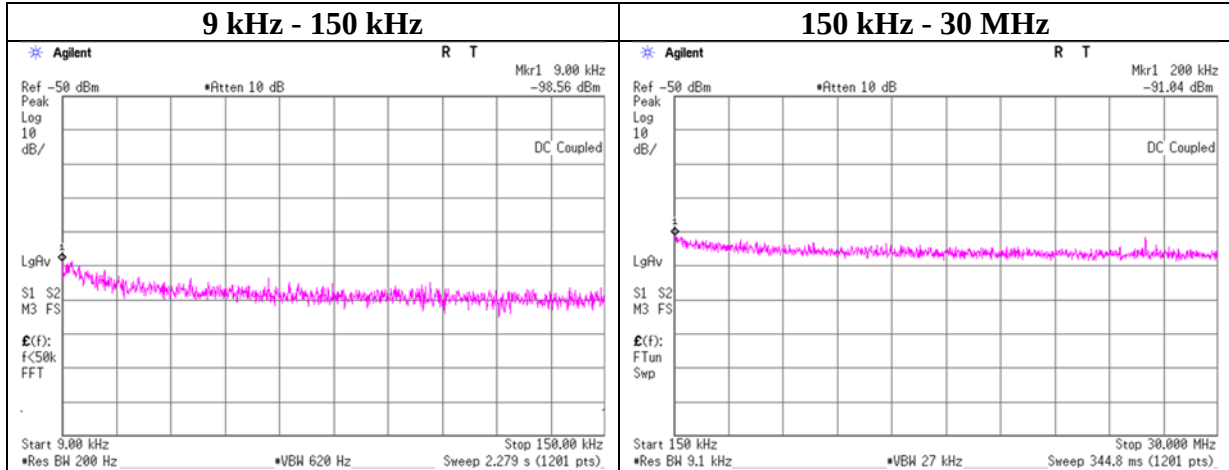
$E \text{ [dBuV/m]} = \text{EIRP [dBm]} - 20 \log (\text{Distance [m]}) + \text{Ground bounce [dB]} + 104.8 \text{ [dBuV/m]}$

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

N: Number of output

Conducted Spurious Emission

Report No. 12366336H
Test place Ise EMC Lab. No.6 Measurement Room
Date June 27, 2018
Temperature / Humidity 23 deg. C / 62 % RH
Engineer Takafumi Noguchi
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
9.00	-98.6	0.16	10.0	2.4	1	-86.0	300	6.0	-24.7	48.5	73.2	
200.00	-91.0	0.16	10.0	2.4	1	-78.4	300	6.0	-17.2	21.5	38.7	

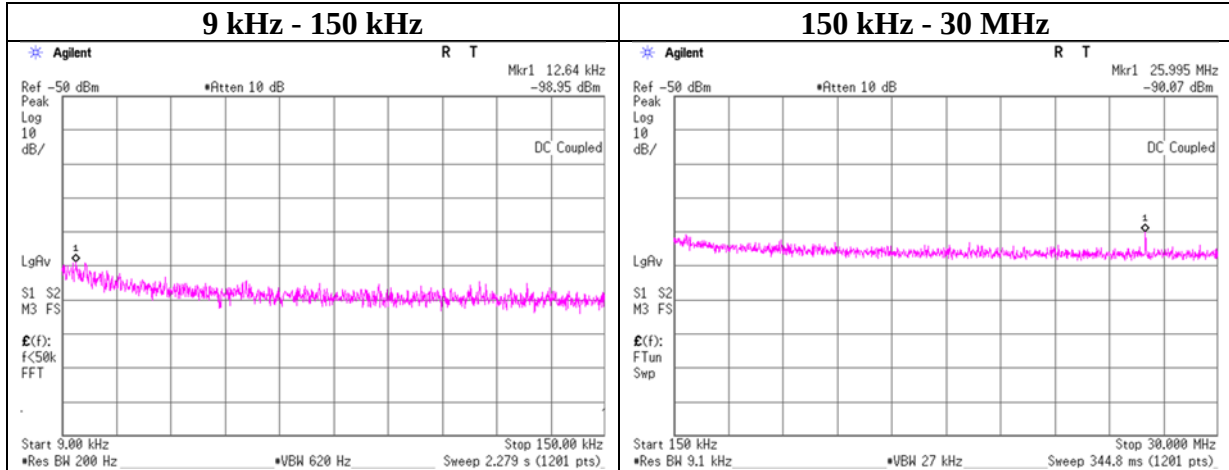
$E \text{ [dBuV/m]} = \text{EIRP [dBm]} - 20 \log (\text{Distance [m]}) + \text{Ground bounce [dB]} + 104.8 \text{ [dBuV/m]}$

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

N: Number of output

Conducted Spurious Emission

Report No. 12366336H
Test place Ise EMC Lab. No.6 Measurement Room
Date June 27, 2018
Temperature / Humidity 23 deg. C / 62 % RH
Engineer Takafumi Noguchi
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
12.64	-99.0	0.16	10.0	2.4	1	-86.3	300	6.0	-25.1	45.5	70.6	
25995.00	-90.1	0.16	10.0	2.4	1	-77.5	30	6.0	3.8	29.5	25.7	

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

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

N: Number of output

Power Density

Report No. 12366336H
Test place Ise EMC Lab. No.6 Measurement Room
Date June 27, 2018
Temperature / Humidity 23 deg. C / 62 % RH
Engineer Takafumi Noguchi
Mode Tx BT LE

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2402.00	-23.10	0.16	10.04	-12.90	8.00	20.90
2440.00	-23.32	0.16	10.04	-13.12	8.00	21.12
2480.00	-23.53	0.16	10.04	-13.33	8.00	21.33

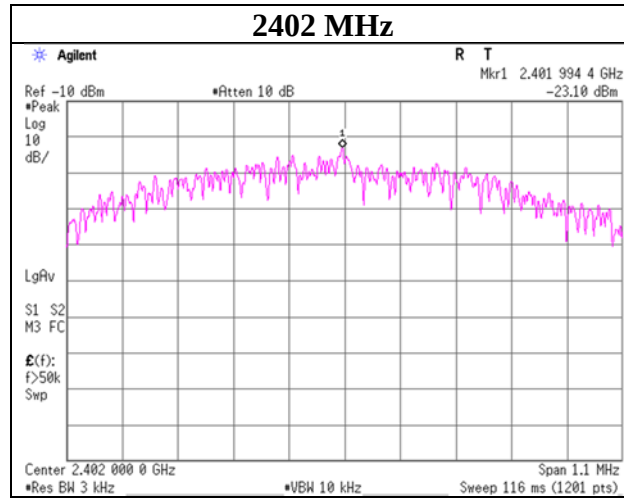
Sample Calculation:

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

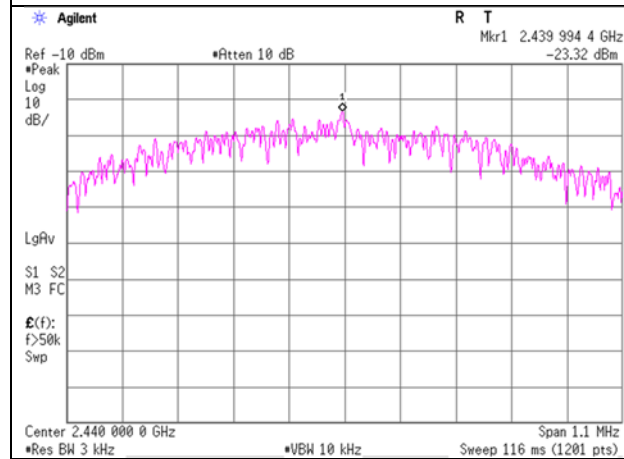
Power Density

BT LE

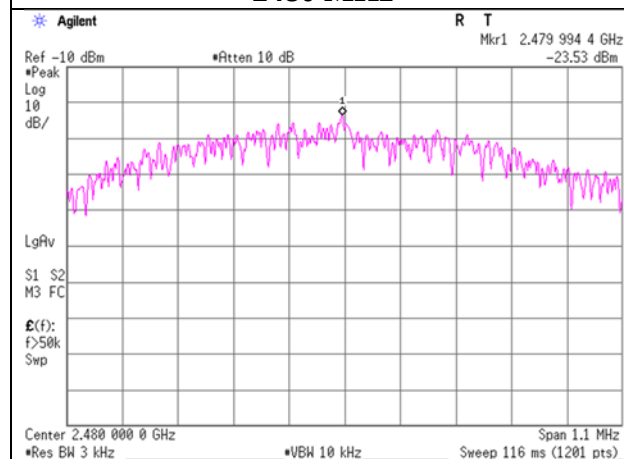
2402 MHz



2440 MHz



2480 MHz



UL Japan, Inc.

Ise EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

APPENDIX 2: Test instruments

Test Instruments

Test item	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Calibration Due Date	Cal Int
RE	141203	Attenuator(6dB)	Weinschel Corp	2	BK7970	11/14/2017	11/30/2018	12
RE	141317	Coaxial Cable	Fujikura/Agilent	-	-	2/23/2018	2/28/2019	12
RE	141578	Pre Amplifier	AGILENT	8447D	2944A10845	9/27/2017	9/30/2018	12
RE	141942	Test Receiver	Rohde & Schwarz	ESCI	100300	8/21/2017	8/31/2018	12
RE	141427	Biconical Antenna	Schwarzbeck	VHA9103B	8031	5/31/2018	5/31/2019	12
RE	141232	High Pass Filter 3.5-18.0GHz	UL Japan	HPF SELECTOR	001	9/22/2017	9/30/2018	12
RE	141503	Horn Antenna 18-26.5GHz	EMCO	Sep-60	1265	6/6/2018	6/30/2019	12
RE	141392	Microwave Cable	Junkosha	MWX221	1604S253(1 m) / 1608S087(5 m)	8/4/2017	8/31/2018	12
RE	141884	Spectrum Analyzer	AGILENT	E4448A	MY44020357	11/7/2017	11/30/2018	12
RE	141512	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	254	6/6/2018	6/30/2019	12
RE	141542	Digital Tester	Fluke Corporation	FLUKE 26-3	78030611	8/7/2017	8/31/2018	12
RE	141265	Logperiodic Antenna(200-1000MHz)	Schwarzbeck	VUSLP9111B	911B-190	5/31/2018	5/31/2019	12
RE	141579	Pre Amplifier	AGILENT	8449B	3008A02142	1/23/2018	1/31/2019	12
RE	142182	Measure	KOMELON	KMC-36	-	-	-	-
RE/AT	141556	Thermo-Hygrometer	CUSTOM	CTH-201	0003	12/21/2017	12/31/2018	12
RE	142004	AC2_Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	8/31/2017	8/31/2018	12
RE	142006	AC2_Semi Anechoic Chamber(SVSWR)	TDK	Semi Anechoic Chamber 3m	DA-06902	4/2/2018	4/30/2019	12
RE	141152	EMI measurement program	TSJ	TEPTO-DV	-	-	-	-
AT	141269	Attenuator(10dB) 1-18GHz	Orient Microwave	BX10-0476-00	-	3/12/2018	3/31/2019	12
AT	141855	Spectrum Analyzer	AGILENT	E4440A	MY46187750	11/17/2017	11/30/2018	12
AT	141810	Power Meter	ANRITSU	ML2495A	824014	11/16/2017	11/30/2018	12
AT	141832	Power sensor	ANRITSU	MA2411B	738174	11/16/2017	11/30/2018	12
AT	141561	Thermo-Hygrometer	CUSTOM	CTH-201	1401	1/24/2018	1/31/2019	12

*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.

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.

Ise EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124