



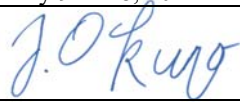
# RADIO TEST REPORT


**Test Report No. : 13912420H-C-R1**

**Applicant** : silex technology, Inc.  
**Type of EUT** : Wireless E84 Digital Communication Device  
**Model Number of EUT** : WDCD-3310  
**FCC ID** : N6C-WDCD3310  
**Test regulation** : FCC Part 15 Subpart E: 2021  
\*For Permissive Change  
**Test Result** : Complied (Refer to SECTION 3)  
\* Maximum Conducted Output Power and Radiated  
Spurious Emission tests only

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 the A2LA accreditation body.
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. Ise EMC Lab.
8. The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan, Inc. has been accredited.
9. The information provided from the customer for this report is identified in Section 1.
10. This report is a revised version of 13912420H-C. 13912420H-C is replaced with this report.

**Date of test:** July 9 to 18, 2021

**Representative test engineer:**   
Junya Okuno  
Engineer

**Approved by:**   
Satofumi Matsuyama  
Engineer



CERTIFICATE 5107.02

- The testing in which "Non-accreditation" is displayed is outside the accreditation scopes in UL Japan, Inc.  
 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.: 13912420H-C

Revision	Test report No.	Date	Page revised	Contents
- (Original)	13912420H-C	August 10, 2021	-	-
1	13912420H-C-R1	August 27, 2021	P 7	Correction of detection of worst margin for Radiated Spurious Emission. QP→PK
1	13912420H-C-R1	August 27, 2021	P 19	Correction of Limit and related parts.  [Limit] <u>13292.0 MHz</u> QP/PK: 68.2 → 73.9 AV: 68.2→ 53.9  <u>17178.0 MHz</u> QP/PK: 73.9 → 68.2 AV: 53.9→ -
1	13912420H-C-R1	August 27, 2021	P 21	Correction of Limit and related parts.  [Limit] <u>17325.0 MHz</u> QP/PK: 73.9 → 68.2 AV: 53.9→ -
1	13912420H-C-R1	August 27, 2021	P 22	Correction of Limit and related parts.  [Limit] <u>17475.0 MHz</u> QP/PK: 73.9 → 68.2 AV: 53.9→ -  <u>23300.0 MHz</u> QP/PK: 73.9 → 68.2
1	13912420H-C-R1	August 27, 2021	P 24	Replacement to new plot 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

## 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

<b>CONTENTS</b>	<b>PAGE</b>
<b>SECTION 1: Customer information.....</b>	<b>5</b>
<b>SECTION 2: Equipment under test (EUT).....</b>	<b>5</b>
<b>SECTION 3: Test specification, procedures &amp; results.....</b>	<b>7</b>
<b>SECTION 4: Operation of EUT during testing .....</b>	<b>10</b>
<b>SECTION 5: Radiated Spurious Emission and Band Edge Compliance .....</b>	<b>13</b>
<b>SECTION 6: Antenna Terminal Conducted Tests.....</b>	<b>16</b>
<b>APPENDIX 1: Test data .....</b>	<b>17</b>
Maximum Conducted Output Power .....	17
Radiated Spurious Emission .....	19
<b>APPENDIX 2: Test instruments .....</b>	<b>25</b>
<b>APPENDIX 3: Photographs of test setup .....</b>	<b>27</b>
Radiated Spurious Emission .....	27
Worst Case Position .....	28
Antenna Terminal Conducted Tests.....	30

## **SECTION 1: Customer information**

Company Name : silex technology, Inc.  
Address : 2-3-1 Hikaridai, Seika-cho, Soraku-gun, Kyoto 619-0237, Japan  
Telephone Number : +81-774-98-3878  
Facsimile Number : +81-774-98-3758  
Contact Person : Keisuke Ishiro

The information provided from the customer is as follows;

- Applicant, Type of EUT, Model Number of EUT, FCC ID 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 : Wireless E84 Digital Communication Device  
Model Number : WDCD-3310  
Serial Number : Refer to SECTION 4.2  
Rating : DC 24 V  
Receipt Date : July 9, 2021  
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: WDCD-3310 (referred to as the EUT in this report) is a Wireless E84 Digital Communication Device.

### Radio Specification

Radio Type : Transceiver  
Method of Frequency Generation : Synthesizer

#### [short-range wireless 2.4 GHz]

Radio Type : Transceiver  
Frequency of Operation : 2403 MHz to 2480 MHz  
Modulation : FSK  
Antenna type : PCB Antenna  
Antenna Gain : 6 dBi  
Clock frequency (Maximum) : 32 MHz

#### [short-range wireless 5.8 GHz] \*

Radio Type : Transceiver  
Frequency of Operation : 5726 MHz to 5825 MHz  
Modulation : FSK  
Antenna type : PCB Antenna  
Antenna Gain : 1.0 dBi  
Clock frequency (Maximum) : 32 MHz

\* This test report applies to 5 GHz Band.

## **SECTION 3: Test specification, procedures & results**

### **3.1 Test Specification**

Test Specification : FCC Part 15 Subpart E  
FCC Part 15 final revised on May 3, 2021 and effective July 2, 2021

Title : FCC 47 CFR Part 15 Radio Frequency Device Subpart E  
Unlicensed National Information Infrastructure Devices  
Section 15.407 General technical requirements

### **3.2 Procedures and results**

Item	Test Procedure	Specification	Worst margin	Results	Remarks
Maximum Conducted Output Power	FCC: KDB Publication Number 789033	FCC: 15.407 (a) (1) (2) (3)	See data	Complied a)	Conducted
	ISED: -	ISED: RSS-247 6.2.1.1 6.2.2.1 6.2.3.1 6.2.4.1			
Spurious Emission Restricted Band Edge	FCC: ANSI C63.10-2013 KDB Publication Number 789033	FCC: 15.407 (b), 15.205 and 15.209	2.9 dB 6646.0 MHz, PK, Vertical	Complied# b)	Radiated (> 30 MHz) *1)
	ISED: -	ISED: RSS-247 6.2.1.2 6.2.2.2 6.2.3.2 6.2.4.2			
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 FCC 15.407 (b) and KDB 789033 D02 G.3.b). a) Refer to APPENDIX 1 (data of Maximum Conducted Output Power) b) 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.

#### **FCC Part 15.31 (e)**

This EUT provides stable voltage constantly to RF Module regardless of input voltage.  
Therefore, this EUT complies with the requirement.

#### **FCC Part 15.203 Antenna requirement**

The EUT has an external antenna connector, but it is installed by the professionals.  
Therefore, the equipment complies with the antenna requirement of Section 15.203.

### 3.3 Addition to standard

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 following 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.

#### 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
		4.8 dB
	200 MHz to 1000 MHz (Horizontal) (Vertical)	5.0 dB
		5.0 dB
3 m	1 GHz to 6 GHz	4.9 dB
	6 GHz to 18 GHz	5.2 dB
1 m	10 GHz to 26.5 GHz	5.5 dB
	26.5 GHz to 40 GHz	5.5 dB
0.5 m	26.5 GHz to 40 GHz	5.5 dB
10 m	1 GHz to 18 GHz	5.2 dB

#### Antenna Terminal test

Test Item	Uncertainty (+/-)
26 dB Emission Bandwidth / 6 dB Emission Bandwidth /	0.96 %
Maximum Conducted Output Power / Average Output Power	1.4 dB
Burst Rate	0.10 %
Maximum Power Spectral Density	2.6 dB
Spurious Emission (Conducted)	2.6 dB



### 3.5 Test Location

UL Japan, Inc. Ise EMC Lab.

\*A2LA Certificate Number: 5107.02 / FCC Test Firm Registration Number: 199967

ISED Lab Company Number: 2973C / CAB identifier: JP0002

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	-	-
No.10 shielded room	3.8 x 2.8 x 2.8	3.8 x 2.8	-	-
No.11 measurement room	4.0 x 3.4 x 2.5	N/A	-	-
No.12 measurement room	2.6 x 3.4 x 2.5	N/A	-	-

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

### 3.6 Test data, Test instruments, and Test set up

Refer to APPENDIX.

**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)**

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

<b>Mode</b>	<b>Remarks*</b>
Transmitting (5 GHz)	Tx
*Transmitting duty was 100 % on all tests.	
*Power of the EUT was set by the software as follows; Power settings: 2 dBm (All Tests) , -20dBm (Maximum Peak Output Power only) Software: Tera Term Ver.4.8.7 (Date: 2015.5.31, Storage location: Driven by connected PC)	
*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.	

\*The details of Operation mode(s)

<b>Test Item</b>	<b>Operating Mode</b>	<b>Tested Frequency</b>
Maximum Conducted Output Power, Radiated Spurious Emission (Below 1 GHz), Radiated Spurious Emission (Above 1 GHz)	Tx	5726 MHz 5775 MHz 5825 MHz

**UL Japan, Inc.**

**Ise EMC Lab.**

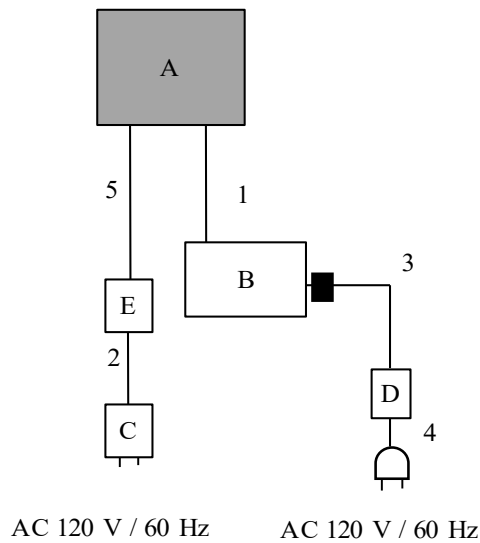
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

## 4.2 Configuration and peripherals

### Maximum Conducted Output Power



■ : Standard Ferrite Core

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

### Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Wireless E84 Digital Communication Device	WDCD-3310	02	silex technology, Inc.	EUT
B	Laptop PC	CF-LX4EDHCS	5GKSA17377	Panasonic	-
C	AC Adapter	WB-18D12R	Y19490019658	Asian Power Devices Inc.	-
D	AC Adapter	CF-AA62J2C	64B2CM114703755B	Panasonic	-
E	Terminal	JIG1	001	silex technology, Inc.	*1)

\*1) DC power passes because E is a termination connector. DC power output from C is directly supplied to A.

### List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	RS-232C Cable	1.1	Shielded	Shielded	-
2	DC Cable	1.8	Unshielded	Unshielded	-
3	DC Cable	0.9	Unshielded	Unshielded	-
4	AC Cable	0.8	Unshielded	Unshielded	-
5	Signal and DC Cable	3.0	Shielded	Unshielded	-

**UL Japan, Inc.**

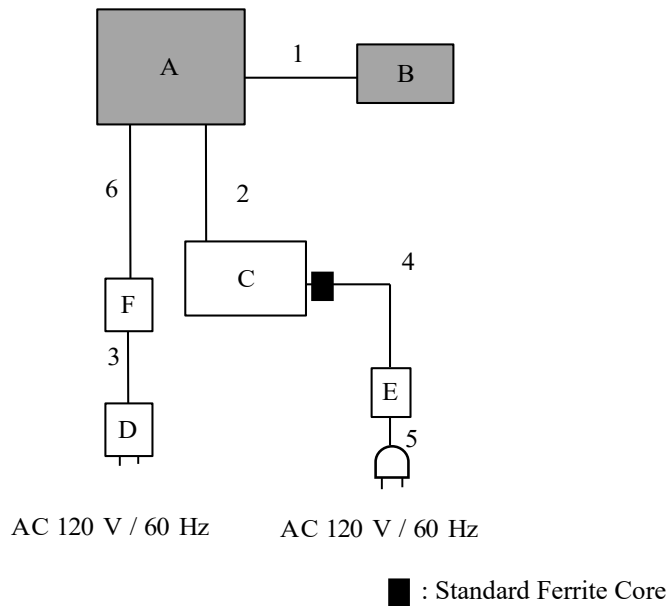
**Ise EMC Lab.**

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission



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

**Description of EUT and Support equipment**

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Wireless E84 Digital Communication Device	WDCD-3310	02	silex technology, Inc.	EUT
B	Antenna	JUM2458PO_W1	US_D_ANT01	silex technology, Inc.	EUT
C	Laptop PC	CF-LX4EDHCS	5GKSA17377	Panasonic	-
D	AC Adapter	WB-18D12R	Y19490019658	Asian Power Devices Inc.	-
E	AC Adapter	CF-AA62J2C	64B2CM114703755B	Panasonic	-
F	Terminal	JIG1	001	silex technology, Inc.	*1)

\*1) DC power passes because F is a termination connector. DC power output from D is directly supplied to A.

**List of cables used**

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	Antenna Cable	0.4	Shielded	Shielded	-
2	RS-232C Cable	1.1	Shielded	Shielded	-
3	DC Cable	1.8	Unshielded	Unshielded	-
4	DC Cable	0.9	Unshielded	Unshielded	-
5	AC Cable	0.8	Unshielded	Unshielded	-
6	Signal and DC Cable	3.0	Shielded	Unshielded	-

**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 and Band Edge Compliance**

### **Test Procedure**

< Below 1GHz >

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.

< Above 1GHz >

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 m 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.

< Below 1GHz >

The result also satisfied with the general limits specified in section 15.209 (a).

< Above 1GHz >

Inside of restricted bands (Section 15.205):

Apply to limit in the Section 15.209 (a).

Outside of the restricted bands:

Apply to limit 68.2 dBuV/m, 3 m (-27 dBm e.i.r.p. \*) in the Section 15.407 (b) (1) (2) (3).

For W58 Bandedge

-27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge in the section 15.407(b)(4)(i).

Restricted band edge:

Apply to limit in the Section 15.209 (a).

Since this limit is severer than the limit of the inside of restricted bands.

\*Electric field strength to e.i.r.p. conversion:

$$E = \frac{1000000 \sqrt{30P}}{3} \text{ (uV/m)} \quad :P \text{ is the e.i.r.p. (Watts)}$$

**Test Antennas are used as below;**

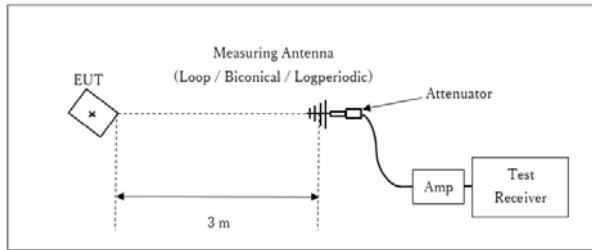
Frequency	30 MHz to 200 MHz	200 MHz to 1 GHz	Above 1 GHz
Antenna Type	Biconical	Logperiodic	Horn

Frequency	Below 1 GHz	Above 1 GHz	
Instrument used	Test Receiver	Spectrum Analyzer	
Detector	QP	Peak	Average
IF Bandwidth	BW: 120 kHz	RBW: 1 MHz VBW: 3 MHz	Method AD *1) 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.

\*1) The test method was also referred to KDB 789033 D02 General UNII Test Procedures New Rules v02r01 "Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E".

**Figure 2: Test Setup**

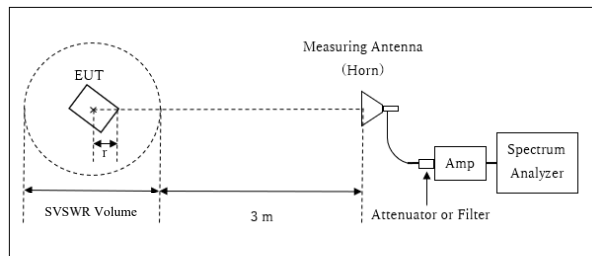
Below 1 GHz



× : Center of turn table

Test Distance: 3 m

1 GHz - 10 GHz

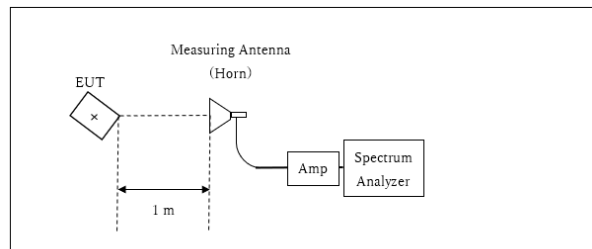


r : Radius of an outer periphery of EUT  
 × : Center of turn table

Distance Factor:  $20 \times \log(3.65 \text{ m} / 3.0 \text{ m}) = 1.71 \text{ dB}$   
 \* Test Distance:  $(3 + \text{SVSWR Volume} / 2) - r = 3.65 \text{ m}$

SVSWR Volume : 1.5 m  
 (SVSWR Volume has been calibrated based on CISPR 16-1-4.)  
 $r = 0.1 \text{ m}$

10 GHz - 40 GHz



× : Center of turn table

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 and Antenna 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 - 40 GHz  
**Test data** : APPENDIX  
**Test result** : Pass

## **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 and Test method
Maximum Conducted Output Power	-	-	-	Auto	Average	-	Power Meter (Sensor: 80 MHz BW) (Method PM-G)

\* The test method was also referred to KDB 789033 D02 General UNII Test Procedures New Rules v02r01 "Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E".

The test results and limit are rounded off to two decimals place, so some differences might be observed.  
The equipment and cables were not used for factor 0 dB of the data sheets.

**Test data** : APPENDIX  
**Test result** : Pass



**APPENDIX 1: Test data**

**Maximum Conducted Output Power**

Report No. 13912420H  
Test place Ise EMC Lab. No.6 Measurement Room  
Date July 9, 2021  
Temperature / Humidity 23 deg. C / 53 % RH  
Engineer Junya Okuno  
Mode Tx

**Power Setting (+2dBm)**

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Antenna Gain [dBi]	Conducted Power				e.i.r.p.			
						Result [dBm]	[mW]	Limit [dBm]	Margin [dB]	Result [dBm]	[mW]	Limit [dBm]	Margin [dB]
5726	-8.12	0.41	9.83	0.00	1.0	2.12	1.63	30.00	27.88	3.12	2.05	36.00	32.88
5775	-8.24	0.41	9.83	0.00	1.0	2.01	1.59	30.00	27.99	3.01	2.00	36.00	32.99
5825	-9.99	0.41	9.83	0.00	1.0	0.26	1.06	30.00	29.74	1.26	1.34	36.00	34.74

Sample Calculation:

Conducted Power Result = Reading + Cable Loss + Atten. Loss + Duty Factor

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

Conducted Power Limit (5725 MHz-5850 MHz) = 1W

**Power Setting (-20dBm)**

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Antenna Gain [dBi]	Conducted Power				e.i.r.p.			
						Result [dBm]	[mW]	Limit [dBm]	Margin [dB]	Result [dBm]	[mW]	Limit [dBm]	Margin [dB]
5726	-30.39	0.41	9.83	0.00	1.0	-20.15	0.01	30.00	50.15	-19.15	0.01	36.00	55.15
5775	-30.50	0.41	9.83	0.00	1.0	-20.25	0.01	30.00	50.25	-19.25	0.01	36.00	55.25
5825	-32.35	0.41	9.83	0.00	1.0	-22.10	0.01	30.00	52.10	-21.10	0.01	36.00	57.10

Sample Calculation:

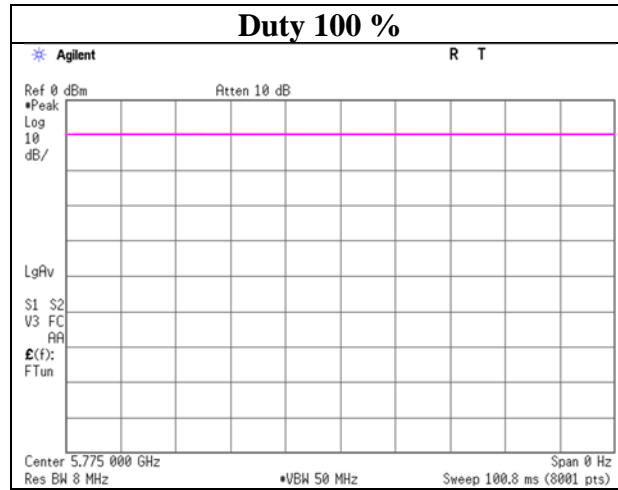
Conducted Power Result = Reading + Cable Loss + Atten. Loss + Duty Factor

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

Conducted Power Limit (5725 MHz-5850 MHz) = 1W

### Burst rate confirmation

Report No. 13912420H  
Test place Ise EMC Lab. No.6 Measurement Room  
Date July 9, 2021  
Temperature / Humidity 23 deg. C / 53 % RH  
Engineer Junya Okuno  
Mode Tx



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

## Radiated Spurious Emission

Report No.	13912420H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.2	No.2	No.4
Date	July 10, 2021	July 12, 2021	July 18, 2021
Temperature / Humidity	23 deg. C / 55 % RH	24 deg. C / 58 % RH	22 deg. C / 56 % RH
Engineer	Junya Okuno (Below 1 GHz)	Hiroki Numata (1 GHz - 10 GHz)	Hiroki Numata (10 GHz - 40 GHz)
Mode	Tx 5726 MHz		

Polarity	Frequency	Reading (QP / PK)	Reading (AV)	Ant. Factor	Loss	Gain	Duty Factor	Result (QP / PK)	Result (AV)	Limit (QP / PK)	Limit (AV)	Margin (QP / PK)	Margin (AV)	Remark
[Hori/Vert]	[MHz]	[dBuV]	[dBuV]	[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dB]	[dB]	
Hori.	216.0	44.7	-	10.6	8.3	27.8	-	35.7	-	43.5	-	7.8	-	
Hori.	240.0	47.9	-	12.0	8.5	27.7	-	40.6	-	46.0	-	5.4	-	
Hori.	312.0	45.6	-	13.5	8.9	27.7	-	40.3	-	46.0	-	5.7	-	
Hori.	336.0	42.6	-	14.3	9.1	27.9	-	38.2	-	46.0	-	7.8	-	
Hori.	360.0	40.0	-	14.8	9.3	28.0	-	36.1	-	46.0	-	9.9	-	
Hori.	920.0	36.0	-	22.0	11.4	28.7	-	40.7	-	46.0	-	5.3	-	
Hori.	2403.0	65.8	-	27.5	4.2	34.6	-	62.9	-	68.2	-	5.3	-	
Hori.	3323.0	46.6	-	28.2	4.6	34.0	-	45.4	-	68.2	-	22.8	-	
Hori.	5650.0	42.0	-	31.8	5.6	33.5	-	45.8	-	68.2	-	22.4	-	
Hori.	5700.0	44.4	-	31.8	5.6	33.5	-	48.3	-	105.2	-	56.9	-	
Hori.	5720.0	45.7	-	31.9	5.6	33.5	-	49.7	-	110.8	-	61.1	-	
Hori.	5725.0	79.9	-	31.9	5.6	33.5	-	83.8	-	122.2	-	38.4	-	
Hori.	6646.0	55.4	-	34.2	5.9	33.5	-	62.0	-	68.2	-	6.2	-	
Hori.	7209.0	49.5	-	35.8	6.1	33.6	-	57.8	-	68.2	-	10.4	-	
Hori.	11452.0	41.9	34.3	40.0	-1.5	33.1	-	47.2	39.6	73.9	53.9	26.7	14.3	Floor noise
Hori.	13292.0	46.0	40.1	40.5	-1.1	32.5	-	52.9	47.0	73.9	53.9	21.0	6.9	
Hori.	17178.0	43.3	-	41.4	-0.4	32.6	-	51.8	-	68.2	-	16.4	-	Floor noise
Hori.	22904.0	43.3	33.8	38.5	-0.7	33.3	-	47.9	38.4	73.9	53.9	26.0	15.5	Floor noise
Vert.	216.0	44.0	-	10.6	8.3	27.8	-	35.0	-	43.5	-	8.5	-	
Vert.	240.0	48.2	-	12.0	8.5	27.7	-	40.9	-	46.0	-	5.1	-	
Vert.	312.0	39.4	-	13.5	8.9	27.7	-	34.1	-	46.0	-	11.9	-	
Vert.	336.0	36.2	-	14.3	9.1	27.9	-	31.8	-	46.0	-	14.2	-	
Vert.	360.0	34.2	-	14.8	9.3	28.0	-	30.3	-	46.0	-	15.7	-	
Vert.	920.0	36.4	-	22.0	11.4	28.7	-	41.1	-	46.0	-	4.9	-	
Vert.	2403.0	64.6	-	27.5	4.2	34.6	-	61.8	-	68.2	-	6.4	-	
Vert.	3323.0	48.4	-	28.2	4.6	34.0	-	47.1	-	68.2	-	21.1	-	
Vert.	5650.0	41.0	-	31.8	5.6	33.5	-	44.8	-	68.2	-	23.4	-	
Vert.	5700.0	42.9	-	31.8	5.6	33.5	-	46.8	-	105.2	-	58.4	-	
Vert.	5720.0	42.8	-	31.9	5.6	33.5	-	46.7	-	110.8	-	64.1	-	
Vert.	5725.0	75.7	-	31.9	5.6	33.5	-	79.7	-	122.2	-	42.6	-	
Vert.	6646.0	58.7	-	34.2	5.9	33.5	-	65.3	-	68.2	-	2.9	-	
Vert.	7209.0	45.7	-	35.8	6.1	33.6	-	54.0	-	68.2	-	14.2	-	
Vert.	11452.0	42.4	34.3	40.0	-1.5	33.1	-	47.8	39.7	73.9	53.9	26.1	14.2	Floor noise
Vert.	13292.0	45.9	40.2	40.5	-1.1	32.5	-	52.8	47.1	73.9	53.9	21.1	6.8	
Vert.	17178.0	42.5	-	41.4	-0.4	32.6	-	50.9	-	68.2	-	17.3	-	Floor noise
Vert.	22904.0	34.4	33.9	38.5	-0.7	33.3	-	39.0	38.5	73.9	53.9	34.9	15.4	Floor noise

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

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

\*QP detector was used up to 1GHz.

\*Above noise was synchronized with carrier frequency.

Distance factor:    1 GHz - 10 GHz        20log(3.65 m / 3.0 m) = 1.71 dB  
                          10 GHz - 40 GHz        20log(1.0 m / 3.0 m) = -9.5 dB

**UL Japan, Inc.**

**Ise EMC Lab.**

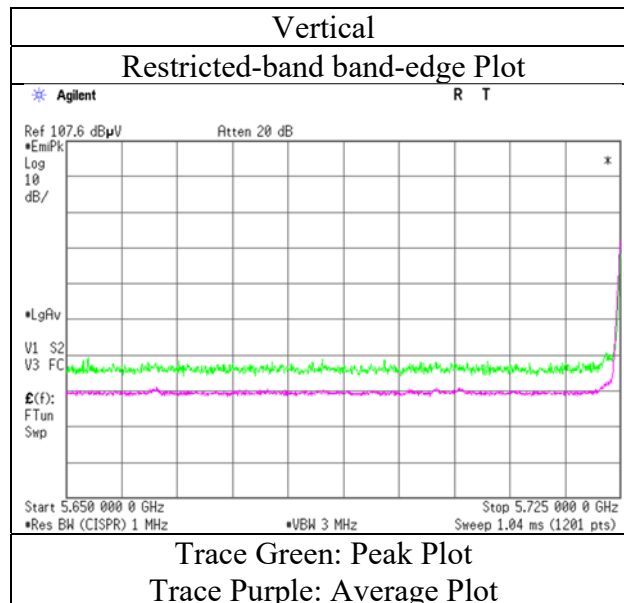
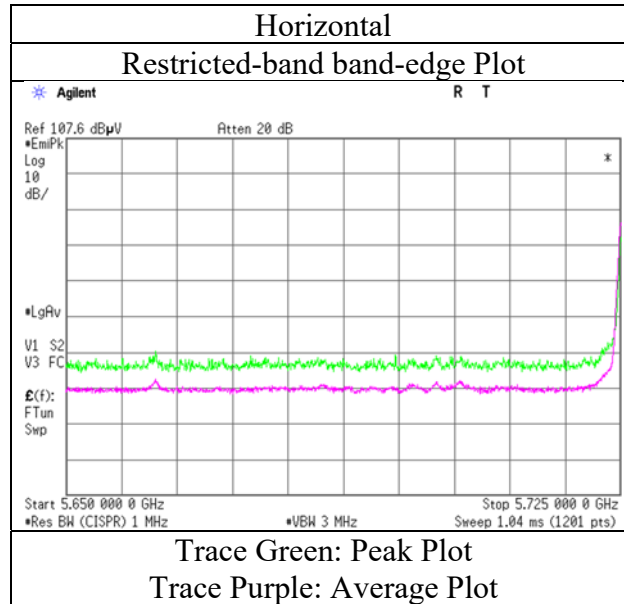
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

## Radiated Spurious Emission

Report No.	13912420H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	July 12, 2021
Temperature / Humidity	24 deg. C / 58 % RH
Engineer	Hiroki Numata
	(1 GHz - 10 GHz)
Mode	Tx 5726 MHz



\* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.  
 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.	13912420H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.2	No.2	No.4
Date	July 10, 2021	July 12, 2021	July 18, 2021
Temperature / Humidity	23 deg. C / 55 % RH	24 deg. C / 58 % RH	22 deg. C / 56 % RH
Engineer	Junya Okuno (Below 1 GHz)	Hiroki Numata (1 GHz - 10 GHz)	Hiroki Numata (10 GHz - 40 GHz)
Mode	Tx 5775 MHz		

Polarity	Frequency	Reading (QP / PK)	Reading (AV)	Ant. Factor	Loss	Gain	Duty Factor	Result (QP / PK)	Result (AV)	Limit (QP / PK)	Limit (AV)	Margin (QP / PK)	Margin (AV)	Remark
[Hori/Vert]	[MHz]	[dBuV]	[dBuV]	[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dB]	[dB]	
Hori.	216.0	44.3	-	10.6	8.3	27.8	-	35.3	-	43.5	-	8.2	-	
Hori.	240.0	47.9	-	12.0	8.5	27.7	-	40.6	-	46.0	-	5.4	-	
Hori.	312.0	45.5	-	13.5	8.9	27.7	-	40.2	-	46.0	-	5.8	-	
Hori.	336.0	42.8	-	14.3	9.1	27.9	-	38.4	-	46.0	-	7.6	-	
Hori.	360.0	39.9	-	14.8	9.3	28.0	-	36.0	-	46.0	-	10.0	-	
Hori.	969.0	36.5	-	22.0	11.6	28.6	-	41.5	-	53.9	-	12.4	-	
Hori.	2403.0	63.8	-	27.5	4.2	34.6	-	60.9	-	68.2	-	7.3	-	
Hori.	3372.0	46.3	-	28.2	4.7	34.0	-	45.1	-	68.2	-	23.1	-	
Hori.	6744.0	53.9	-	34.0	5.9	33.5	-	60.3	-	68.2	-	7.9	-	
Hori.	7209.0	49.7	-	35.8	6.1	33.6	-	58.1	-	68.2	-	10.1	-	
Hori.	11550.0	42.4	34.2	39.8	-1.5	33.0	-	47.6	39.4	73.9	53.9	26.3	14.5	Floor noise
Hori.	13488.0	47.9	-	41.0	-1.1	32.5	-	55.3	-	68.2	-	12.9	-	
Hori.	17325.0	44.0	-	42.6	-0.3	32.6	-	53.6	-	68.2	-	14.6	-	Floor noise
Hori.	23100.0	43.8	34.4	38.7	-0.6	33.3	-	48.5	39.1	73.9	53.9	25.4	14.8	Floor noise
Vert.	216.0	44.0	-	10.6	8.3	27.8	-	35.0	-	43.5	-	8.5	-	
Vert.	240.0	48.0	-	12.0	8.5	27.7	-	40.7	-	46.0	-	5.3	-	
Vert.	312.0	39.6	-	13.5	8.9	27.7	-	34.3	-	46.0	-	11.7	-	
Vert.	336.0	36.5	-	14.3	9.1	27.9	-	32.1	-	46.0	-	13.9	-	
Vert.	360.0	34.1	-	14.8	9.3	28.0	-	30.2	-	46.0	-	15.8	-	
Vert.	969.0	34.1	-	22.0	11.6	28.6	-	39.1	-	53.9	-	14.8	-	
Vert.	2403.0	65.5	-	27.5	4.2	34.6	-	62.6	-	68.2	-	5.6	-	
Vert.	3372.0	47.7	-	28.2	4.7	34.0	-	46.5	-	68.2	-	21.7	-	
Vert.	6744.0	55.8	-	34.0	5.9	33.5	-	62.2	-	68.2	-	6.0	-	
Vert.	7209.0	44.5	-	35.8	6.1	33.6	-	52.8	-	68.2	-	15.4	-	
Vert.	11550.0	42.3	34.1	39.8	-1.5	33.0	-	47.5	39.3	73.9	53.9	26.4	14.6	Floor noise
Vert.	13488.0	46.4	-	41.0	-1.1	32.5	-	53.8	-	68.2	-	14.4	-	
Vert.	17325.0	43.5	-	42.6	-0.3	32.6	-	53.2	-	68.2	-	15.0	-	Floor noise
Vert.	23100.0	43.7	34.5	38.7	-0.6	33.3	-	48.4	39.2	73.9	53.9	25.5	14.7	Floor noise

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

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

\*QP detector was used up to 1GHz.

\*Above noise was synchronized with carrier frequency.

Distance factor:      1 GHz - 10 GHz      20log(3.65 m / 3.0 m) = 1.71 dB  
                             10 GHz - 40 GHz      20log(1.0 m / 3.0 m) = -9.5 dB

## Radiated Spurious Emission

Report No.	13912420H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.2	No.2	No.4
Date	July 10, 2021	July 12, 2021	July 18, 2021
Temperature / Humidity	23 deg. C / 55 % RH	24 deg. C / 58 % RH	22 deg. C / 56 % RH
Engineer	Junya Okuno (Below 1 GHz)	Hiroki Numata (1 GHz - 10 GHz)	Hiroki Numata (10 GHz - 40 GHz)
Mode	Tx 5825 MHz		

Polarity	Frequency	Reading	Reading	Ant.	Loss	Gain	Duty	Result	Result	Limit	Limit	Margin	Margin	Remark
[Hori/Vert]	[MHz]	(QP / PK)	(AV)	Factor	[dB]	[dB]	[dB]	(QP / PK)	(AV)	(QP / PK)	(AV)	(QP / PK)	(AV)	
		[dBuV]	[dBuV]	[dB/m]				[dBuV/m]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dB]	[dB]	
Hori.	216.0	44.6	-	10.6	8.3	27.8	-	35.6	-	43.5	-	-	7.9	-
Hori.	240.0	47.8	-	12.0	8.5	27.7	-	40.5	-	46.0	-	-	5.5	-
Hori.	312.0	45.8	-	13.5	8.9	27.7	-	40.5	-	46.0	-	-	5.5	-
Hori.	336.0	43.2	-	14.3	9.1	27.9	-	38.8	-	46.0	-	-	7.2	-
Hori.	360.0	40.1	-	14.8	9.3	28.0	-	36.2	-	46.0	-	-	9.8	-
Hori.	480.0	37.1	-	16.9	9.8	28.9	-	34.8	-	46.0	-	-	11.2	-
Hori.	2403.0	63.6	-	27.5	4.2	34.6	-	60.7	-	68.2	-	-	7.5	-
Hori.	3422.0	46.6	-	28.4	4.7	34.0	-	45.7	-	68.2	-	-	22.5	-
Hori.	5850.0	40.2	-	32.3	5.6	33.5	-	44.5	-	122.2	-	-	77.7	-
Hori.	5855.0	40.6	-	32.3	5.6	33.5	-	44.9	-	110.8	-	-	65.9	-
Hori.	5875.0	40.0	-	32.3	5.7	33.5	-	44.5	-	105.2	-	-	60.7	-
Hori.	5925.0	41.2	-	32.4	5.7	33.5	-	45.6	-	68.2	-	-	22.6	-
Hori.	6844.0	54.4	-	34.4	6.0	33.5	-	61.4	-	68.2	-	-	6.8	-
Hori.	7209.0	49.1	-	35.8	6.1	33.6	-	57.4	-	68.2	-	-	10.8	-
Hori.	11650.0	42.8	34.8	39.4	-1.5	33.0	-	47.7	39.7	73.9	53.9	26.2	14.2	Floor noise
Hori.	13688.0	47.4	-	41.2	-1.1	32.5	-	55.1	-	68.2	-	-	13.1	-
Hori.	17475.0	43.8	-	43.8	-0.3	32.6	-	54.7	-	68.2	-	-	13.5	Floor noise
Hori.	23300.0	43.5	-	38.8	-0.6	33.4	-	48.3	-	68.2	-	-	19.9	Floor noise
Vert.	216.0	44.3	-	10.6	8.3	27.8	-	35.3	-	43.5	-	-	8.2	-
Vert.	240.0	47.8	-	12.0	8.5	27.7	-	40.5	-	46.0	-	-	5.5	-
Vert.	312.0	39.9	-	13.5	8.9	27.7	-	34.6	-	46.0	-	-	11.4	-
Vert.	336.0	36.9	-	14.3	9.1	27.9	-	32.5	-	46.0	-	-	13.5	-
Vert.	360.0	34.9	-	14.8	9.3	28.0	-	31.0	-	46.0	-	-	15.0	-
Vert.	480.0	39.4	-	16.9	9.8	28.9	-	37.1	-	46.0	-	-	8.9	-
Vert.	2403.0	65.7	-	27.5	4.2	34.6	-	62.8	-	68.2	-	-	5.4	-
Vert.	3422.0	49.1	-	28.4	4.7	34.0	-	48.1	-	68.2	-	-	20.1	-
Vert.	5850.0	40.1	-	32.3	5.6	33.5	-	44.4	-	122.2	-	-	77.8	-
Vert.	5855.0	39.8	-	32.3	5.6	33.5	-	44.2	-	110.8	-	-	66.6	-
Vert.	5875.0	40.0	-	32.3	5.7	33.5	-	44.5	-	105.2	-	-	60.8	-
Vert.	5925.0	41.0	-	32.4	5.7	33.5	-	45.5	-	68.2	-	-	22.7	-
Vert.	6844.0	53.1	-	34.4	6.0	33.5	-	60.0	-	68.2	-	-	8.2	-
Vert.	7209.0	45.7	-	35.8	6.1	33.6	-	54.1	-	68.2	-	-	14.1	-
Vert.	11650.0	43.2	34.7	39.4	-1.5	33.0	-	48.1	39.6	73.9	53.9	25.8	14.3	Floor noise
Vert.	13688.0	47.1	-	41.2	-1.1	32.5	-	54.8	-	68.2	-	-	13.4	-
Vert.	17475.0	43.8	-	43.8	-0.3	32.6	-	54.7	-	68.2	-	-	13.5	Floor noise
Vert.	23300.0	43.5	-	38.8	-0.6	33.4	-	48.3	-	68.2	-	-	19.9	Floor noise

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

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

\*QP detector was used up to 1GHz.

\*Above noise was synchronized with carrier frequency.

Distance factor:      1 GHz - 10 GHz      20log(3.65 m / 3.0 m) = 1.71 dB  
                                 10 GHz - 40 GHz      20log(1.0 m / 3.0 m) = -9.5 dB

**UL Japan, Inc.**

**Ise EMC Lab.**

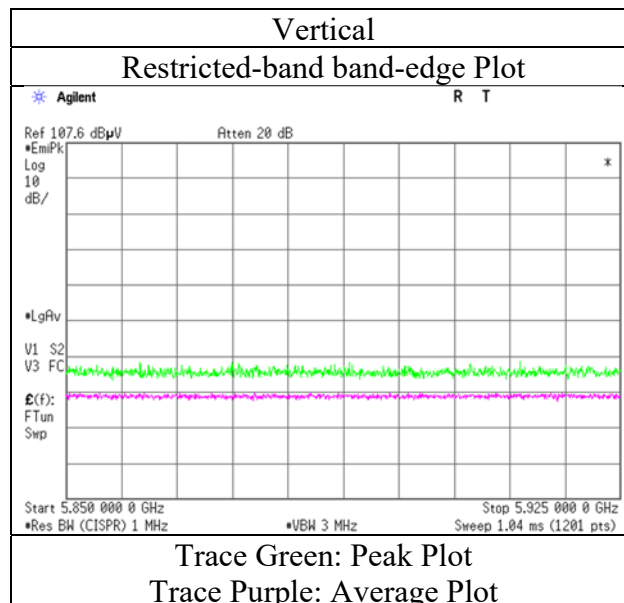
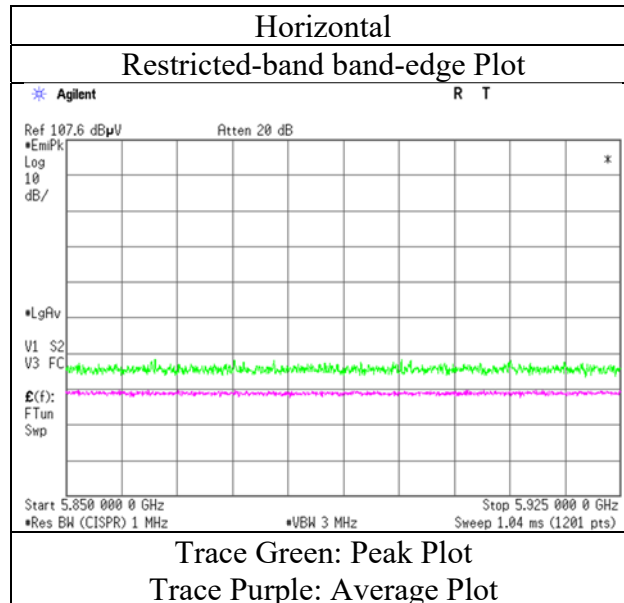
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

## Radiated Spurious Emission

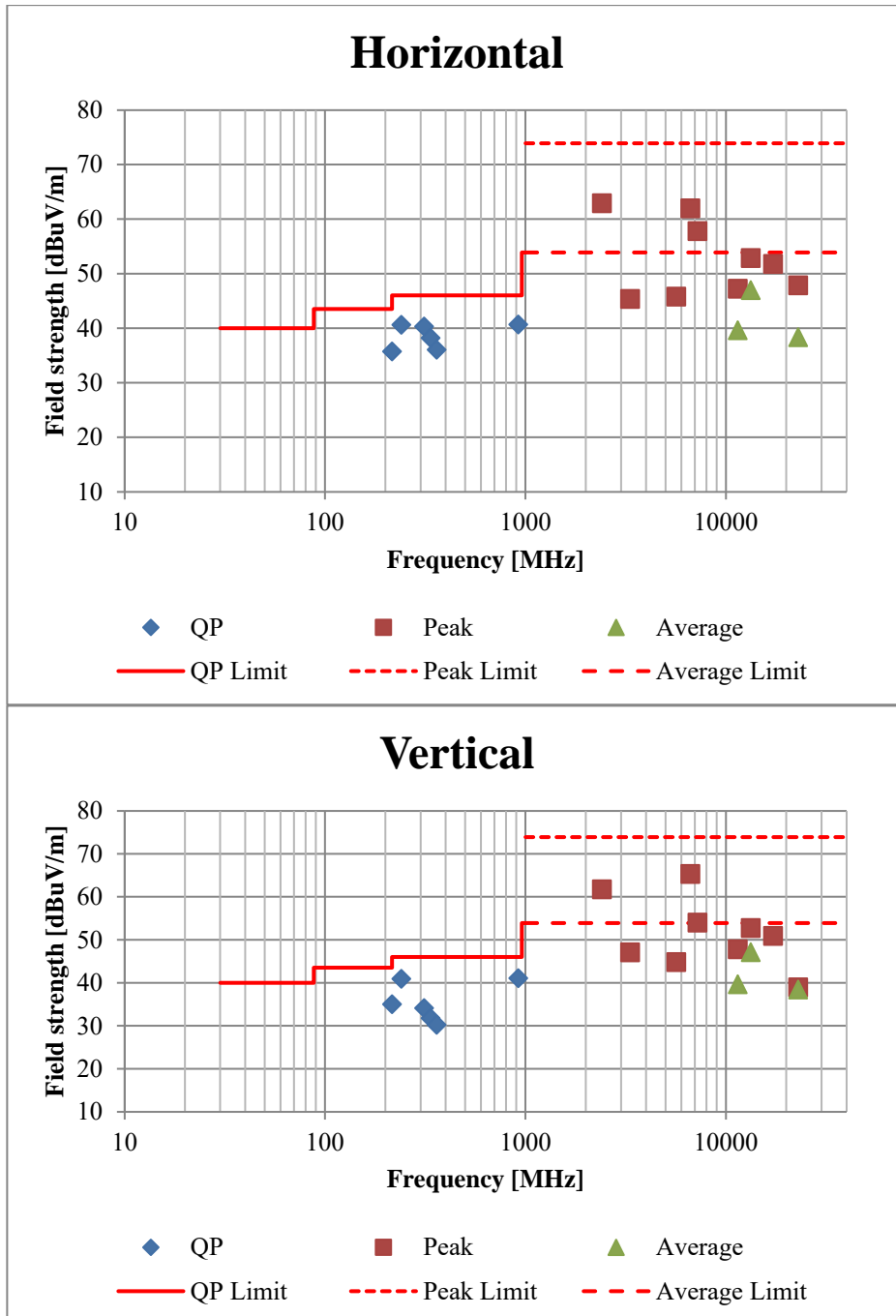
Report No.	13912420H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	July 12, 2021
Temperature / Humidity	24 deg. C / 58 % RH
Engineer	Hiroki Numata
Mode	Tx 5825 MHz



\* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.  
Final result of restricted band edge was shown in tabular data.

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

Report No.	13912420H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.2	No.2	No.4
Date	July 10, 2021	July 12, 2021	July 18, 2021
Temperature / Humidity	23 deg. C / 55 % RH	24 deg. C / 58 % RH	22 deg. C / 56 % RH
Engineer	Junya Okuno (Below 1 GHz)	Hiroki Numata (1 GHz - 10 GHz)	Hiroki Numata (10 GHz - 40 GHz)
Mode	Tx 5726 MHz		



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



## APPENDIX 2: Test instruments

### Test equipment (1/2)

Test Item	Local ID	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Cal Int
AT	MOS-14	141561	Thermo-Hygrometer	CUSTOM. Inc	CTH-201	1401	2021/01/15	12
AT	MPM-01	141801	Power Meter	Keysight Technologies Inc	E4417A	GB41290639	2021/04/06	12
AT	MPSE-03	141837	Power sensor	Keysight Technologies Inc	E9327A	US40440576	2021/04/06	12
AT	MSA-03	141884	Spectrum Analyzer	Keysight Technologies Inc	E4448A	MY44020357	2021/03/10	12
AT	MAT-88	141312	Attenuator	Weinschel Associates	WA56-10	56100304	2021/05/14	12
AT	MCC-178	141227	Microwave Cable	Junkosha	MMX221-00500D	1502S305	2021/03/01	12
AT	MMM-12	141547	DIGITAL HiTESTER	HIOKI E.E. CORPORATION	3805	60500120	2021/02/01	12
AT	MJM-24	142225	Measure	ASKUL	-	-	-	-
RE	MAEC-02	142004	AC2_Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	2020/05/26	24
RE	MOS-41	192300	Thermo-Hygrometer	CUSTOM. Inc	CTH-201	0013	2020/12/06	12
RE	MMM-01	141542	Digital Tester	Fluke Corporation	FLUKE 26-3	78030611	2020/08/18	12
RE	MJM-27	142228	Measure	KOMELON	KMC-36	-	-	-
RE	COTS-ME MI-02	178648	EMI measurement program	TSJ (Techno Science Japan)	TEPTO-DV	-	-	-
RE	MAT-07	141203	Attenuator(6dB)	Weinschel Corp	2	BK7970	2020/11/13	12
RE	YBA-03	197990	Biconical Antenna	Schwarzbeck Mess-Elektronik OHG	VHBB 9124 + BBA 9106	01365	2020/11/15	12
RE	MCC-12	141317	Coaxial Cable	UL Japan Inc.	-	-	2020/09/25	12
RE	LA-17	160924	Logperiodic Antenna	Schwarzbeck Mess-Elektronik OHG	VUSLP9111B	225	2020/11/15	12
RE	MPA-24	141594	Pre Amplifier	Keysight Technologies Inc	8447D	2944A10150	2021/02/18	12
RE	MTR-08	141949	Test Receiver	Rohde & Schwarz	ESCI	100767	2020/08/18	12
RE	MSA-14	141901	Spectrum Analyzer	Keysight Technologies Inc	E4440A	MY48250080	2020/12/18	12
RE	MHA-06	141512	Horn Antenna 1-18GHz	Schwarzbeck Mess-Elektronik OHG	BBHA9120D	254	2020/09/14	12
RE	MCC-218	141394	Microwave Cable	Junkosha	MWX221	1607S141(1 m) / 1608S264(5 m)	2020/09/23	12
RE	MPA-10	141579	Pre Amplifier	Keysight Technologies Inc	8449B	3008A02142	2021/02/18	12
RE	MSA-03	141884	Spectrum Analyzer	Keysight Technologies Inc	E4448A	MY44020357	2021/03/10	12
RE	MTR-10	141951	EMI Test Receiver	Rohde & Schwarz	ESR26	101408	2021/03/09	12
RE	MAJ-01	142236	Antenna Tilt Jig	Intelligent System Engineering Co., Ltd	Antenna Tilt Jig	T-0001	-	-
RE	MAEC-04	142011	AC4_Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	2020/05/25	24
RE	MOS-15	141562	Thermo-Hygrometer	CUSTOM. Inc	CTH-201	0010	2021/01/15	12
RE	MMM-10	141545	DIGITAL HiTESTER	HIOKI E.E. CORPORATION	3805	51201148	2021/01/07	12
RE	MJM-29	142230	Measure	KOMELON	KMC-36	-	-	-
RE	MHA-21	141508	Horn Antenna 1-18GHz	Schwarzbeck Mess-Elektronik OHG	BBHA9120D	557	2021/05/10	12
RE	MPA-12	141581	MicroWave System Amplifier	Keysight Technologies Inc	83017A	00650	2020/10/19	12
RE	MCC-231	177964	Microwave Cable	Junkosha INC.	MMX221	1901S329(1m)/ 1902S579(5m)	2021/03/04	12

### 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 equipment (2/2)**

Test Item	Local ID	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Cal Int
RE	MSA-10	141899	Spectrum Analyzer	Keysight Technologies Inc	E4448A	MY46180655	2020/08/04	12
RE	MHF-23	141294	High Pass Filter 7-20GHz	TOKIMEC	TF37NCCC	603	2021/02/18	12
RE	MCC-178	141227	Microwave Cable	Junkosha	MMX221-00500D MSDMS	1502S305	2021/03/01	12
RE	MHA-29	141517	Horn Antenna 26.5-40GHz	ETS-Lindgren	3160-10	152399	2020/08/03	12
RE	MPA-22	141588	Pre Amplifier	MITEQ, Inc	AMF-6F-2600400- 33-8P / AMF-4F-2600400- 33-8P	1871355 /1871328	2020/09/07	12
RE	MHA-16	141513	Horn Antenna 15-40GHz	Schwarzbeck Mess-Elektronik OHG	BBHA9170	BBHA9170306	2021/06/07	12
RE	MCC-224	160324	Coaxial Cable	Huber+Suhner	SUCOFLEX 102A	MY009/2A	2020/11/17	12
RE	MAEC-02 -SVSWR	142006	AC2_Semi Anechoic Chamber(SVSWR)	TDK	Semi Anechoic Chamber 3m	DA-06902	04/09/2021	24

\*Hyphens for Last Calibration 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.

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

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

Test item:

RE: Radiated Emission

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