




# RADIO TEST REPORT


Test Report No. : 11920658S-A-R2

**Applicant** : Ueda Japan Radio Co., Ltd.  
**Type of Equipment** : Wireless Printer Adapter  
**Model No.** : DTG-114  
**FCC ID** : 2ADKK-DTG114  
**Test regulation** : FCC Part 15 Subpart F: 2018  
**Test Result** : Complied

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2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the above regulation.
4. The test results in this report are traceable to the national or international standards.
5. The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan has been accredited.
6. This test report covers Radio technical requirements. It does not cover administrative issues such as Manual or non-Radio test related Requirements. (if applicable)
7. This report is a revised version of 11920658S-A-R1. 11920658S-A-R1 is replaced with this report.

**Date of test:** January 29 to February 6, 2018

**Representative test engineer:**   
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**Approved by:**   
Toyokazu Imamura  
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Consumer Technology Division



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

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13-EM-F0429



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## **SECTION 1: Customer information**

Company Name : Ueda Japan Radio Co., Ltd.  
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## **SECTION 2: Equipment under test (E.U.T.)**

### **2.1 Identification of E.U.T.**

Type of Equipment : Wireless Printer Adapter  
Model No. : DTG-114  
Serial No. : Refer to Section 4, Clause 4.2  
Rating : DC 5 V typical (DC 4.85 V to 5.25 V) (from USB or AC adapter)  
AC adapter input: AC 100 V to 240 V, 50 Hz/60 Hz  
Receipt Date of Sample : December 5, 2017  
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: DTG-114 (referred to as the EUT in this report) is a Wireless Printer Adapter.

### **General Specification**

Clock frequency(ies) in the system : 44 MHz (RF part), 20 MHz (baseband), 24 MHz (USB)

### **Radio Specification**

Equipment type : Transceiver  
Frequency of operation : 7392 MHz - 8976 MHz  
Type of modulation : OFDM  
Antenna type : Chip  
Antenna connector type : None  
Antenna gain : +2.6 dBi max  
Operating temperature : +5 deg.C to +35 deg.C  
Subclass of UWB : Indoor communications device

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

### **3.1 Test Specification**

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

\* The revisions made after testing date do not affect the test specification applied to the EUT.

Title : FCC 47CFR Part15 Radio Frequency Device  
Section 15.207 Conducted limits  
Subpart F Ultra-Wideband Operation  
Section 15.517 Technical requirements for indoor UWB systems.

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

### 3.2 Procedures and results

#### < Requirements for indoor UWB systems >

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 Section 15.505(a) IC: RSS-220 5.2.1(b)	4.3 dB 0.63223 MHz L1, AV (PC's AC adapter)	Complied	-
UWB Bandwidth	FCC: Section 15.503(a) ANSI C63.10:2013 6 Standard test methods, 10 Procedures for measuring ultra-wideband devices IC: RSS-220 Annex 2	FCC: Section 15.503(d) Section 15.517(b) IC: RSS-220 2 RSS-220 5.1	-	Complied	Radiated
Radiated emission	FCC: Section 15.521(d) ANSI C63.10:2013 6 Standard test methods, 10 Procedures for measuring ultra-wideband devices IC: RSS-Gen 6.5 RSS-220 Annex 4	FCC: Section 15.209 Section 15.517 (c), (d) IC: RSS-220 5.2.1(c),(d),(e)	4.4 dB 143.997 MHz QP, Vertical	Complied	Radiated (above 30 MHz) / Conducted (below 30 MHz) *1)
Peak level of the Emission	FCC: Section 15.521(e)(g) ANSI C63.10:2013 6 Standard test methods, 10 Procedures for measuring ultra-wideband devices IC: RSS-220 Annex 4	FCC: Section 15.517 (e) IC: RSS-220 5.2.1(g)	8.7 dB 8546.660 MHz PK, Vertical	Complied	Radiated

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

\*1) In the frequency range of less than 30 MHz, only measurement of antenna terminal conduction measurement was carried out and the radiated emission measurement was omitted, since it nothing was detected at the antenna terminal.

\* 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 (DC 1.2 V, DC 2.4 V) constantly to RF part (except base band part) regardless of input voltage. Therefore, this EUT complies with the requirement.

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

It is impossible for end users to replace the antenna, because the antenna is mounted inside of the EUT. Therefore, the equipment complies with the antenna requirement of Section 15.203.

### 3.3 Addition to standard

Item	Test Procedure	Specification	Worst margin	Results	Remarks
99 % Occupied Bandwidth	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	No. 5,6,8 SR
Conducted emission (AC Mains) LISN	150 kHz-30 MHz	2.5 dB	2.5 dB	2.6 dB	2.6 dB	2.6 dB
Radiated emission (Measurement distance: 3 m)	9 kHz-30 MHz	3.2 dB	3.2 dB	3.3 dB	-	-
	30 MHz-200 MHz	4.3 dB	4.3 dB	4.3 dB	-	-
	200 MHz-1 GHz	5.9 dB	5.9 dB	5.9 dB	-	-
	1 GHz-6 GHz	4.7 dB	4.7 dB	4.7 dB	-	-
	6 GHz-18 GHz	5.3 dB	5.3 dB	5.3 dB	-	-
Radiated emission (Measurement distance: 1 m)	18 GHz-40 GHz	5.6 dB	5.6 dB	5.6 dB	-	-
	1 GHz-18 GHz	5.9 dB	5.9 dB	5.9 dB	-	-
Radiated emission (Substitution measurement;3m) (EUT height 1.5m)	30 MHz-200 MHz	4.8 dB	4.8 dB	4.8 dB	-	-
	200 MHz-1 GHz	3.6 dB	3.6 dB	3.6 dB	-	-
Radiated emission (Substitution measurement;1m) (EUT height 1.5m)	1 GHz-13 GHz	4.4 dB	4.4 dB	4.4 dB	-	-
	1 GHz-13 GHz	5.0 dB	5.0 dB	5.0 dB	-	-
	13 GHz-18 GHz	5.7 dB	5.7 dB	5.7 dB	-	-
	18 GHz-26.5 GHz	4.3 dB	4.3 dB	4.3 dB	-	-
Radiated emission (Substitution measurement;0.5m) (EUT height 1.5m)	26.5 GHz-40 GHz	4.5 dB	4.5 dB	4.5 dB	-	-
	1 GHz-13 GHz	5.0 dB	5.0 dB	5.0 dB	-	-
	13 GHz-18 GHz	5.6 dB	5.6 dB	5.6 dB	-	-
	18 GHz-26.5 GHz	4.2 dB	4.2 dB	4.2 dB	-	-
Radiated emission (Substitution measurement;0.3m) (EUT height 1.5m)	26.5 GHz-40 GHz	4.4 dB	4.4 dB	4.4 dB	-	-
	1 GHz-13 GHz	5.1 dB	5.1 dB	5.1 dB	-	-
	13 GHz-18 GHz	5.6 dB	5.6 dB	5.6 dB	-	-
	18 GHz-26.5 GHz	4.2 dB	4.2 dB	4.2 dB	-	-
Radiated emission (Substitution measurement;0.1m) (EUT height 1.5m)	26.5 GHz-40 GHz	4.4 dB	4.4 dB	4.4 dB	-	-
	1 GHz-13 GHz	5.8 dB	5.8 dB	5.8 dB	-	-
	13 GHz-18 GHz	5.9 dB	5.9 dB	5.9 dB	-	-
	18 GHz-26.5 GHz	4.6 dB	4.6 dB	4.6 dB	-	-
	26.5 GHz-40 GHz	4.8 dB	4.8 dB	4.8 dB	-	-

SAC=Semi-Anechoic Chamber

SR= Shielded Room is applied besides radiated emission

Antenna terminal test	Uncertainty (+/-)
Power Measurement above 1 GHz (Average Detector)_SPM-06	0.48 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-06	0.66 dB
Power Measurement above 1 GHz (Average Detector)_SPM-07	0.47 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-07	0.64 dB
Spurious emission (Conducted) below 1GHz	1.8 dB
Spurious emission (Conducted) 1 GHz-3 GHz	1.7 dB
Spurious emission (Conducted) 3 GHz-18 GHz	2.5 dB
Spurious emission (Conducted) 18 GHz-26.5 GHz	2.5 dB
Spurious emission (Conducted) 26.5 GHz-40 GHz	2.7 dB
Bandwidth Measurement	1.01 %
Duty cycle and Time Measurement	0.012 %

#### 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 report meets the limits unless the uncertainty is taken into consideration.

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### 3.5 Test Location

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JAB Accreditation No. RTL02610  
FCC Test Firm Registration Number: 839876

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

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

Refer to APPENDIX.



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

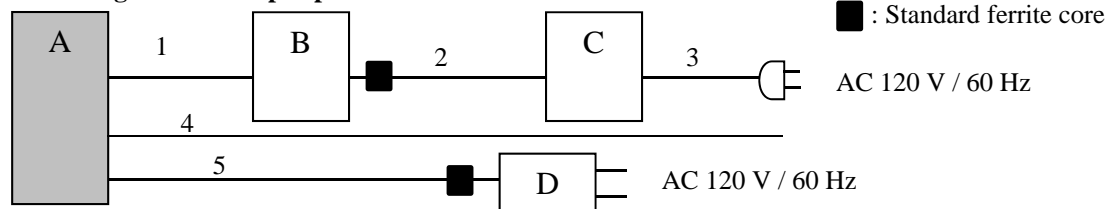
### 4.1 Operating Mode(s)

The EUT exercise program used during testing was designed to exercise the various system components in a manner similar to typical use.

Test Item	Mode
All items	Transmitting
	Software: RET Tool, ver.8.14.8 Power setting: Fixed *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.  *1) We tested with the operation mode in three channel simultaneous transmission and with the worst case of the modulation operation mode used in actual radio operation. Pre-check was by customer in test of this job while being seen by customers. (This EUT is In a normal communication operation, a transmission operation is always performed in which three channels are transmitted.)

Justification: The system was configured in typical fashion (as customer would normally use it) for testing.

### 4.2 Configuration and peripherals



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

\* The ferrite core attached to DC cable is 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 Printer Adapter	DTG-114	9990011	Ueda Japan Radio Co., Ltd.	EUT
B	Personal Computer	Latitude E5500	33406843389	Dell	-
C	AC adapter	HA90PE0-00	0W529	Dell	-
D	AC adapter	HPU15-102-UJ/UL	S02205041747	SINPRO	*2)

\*2) This is an old specification AC adapter name (HPU15-102-UJ/UL) and this AC adapter is with ferrite core.

However, the new specification AC adapter (ACM18US05) has no ferrite core. However, in the test of FCC 15B of the EMC test conducted on another schedule, it was done with the new AC adapter in UWB transmission mode (communication test).

### List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	USB	3.0	Shielded	Shielded	*3)
2	DC	1.8	Unshielded	Unshielded	-
3	AC	0.8	Unshielded	Unshielded	-
4	USB	3.0	Shielded	Shielded	-
5	DC	1.2	Unshielded	Unshielded	-

\* 3) There was measured for AC conducted emission test as line from AC adapter and USB interface from ancillary equipment, since there are two input voltage types of AC adapter and USB.

## **SECTION 5: Conducted Emission**

### **Test Procedure and conditions**

EUT was placed on a platform of nominal size, 1.0 m by 1.5 m, raised 0.8 m above the conducting ground plane. The table is made of expanded polystyrol and expanded polypropylene and the table top is covered with polycarbonate. That has very low permittivity.

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. All unused 50 ohm connectors of the LISN (AMN) were resistivity terminated in 50 ohm when not connected to the measuring equipment.

The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT via AC adapter in a Shielded room.

The EUT via AC adapter 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.

<b>Detector</b>	<b>: QP and CISPR AV</b>
<b>Measurement range</b>	<b>: 0.15 MHz - 30 MHz</b>
<b>Test data</b>	<b>: APPENDIX</b>
<b>Test result</b>	<b>: Pass</b>

## **SECTION 6: Radiated Spurious Emission**

### **Test Procedure**

[For below 960 MHz]

EUT was placed on a platform of nominal size, 0.15 m by 0.05 m, raised 0.8 m above the conducting ground plane. The table is made of expanded polystyrol and expanded polypropylene and the table top is covered with polycarbonate. That has very low permittivity.

[For above 960 MHz]

EUT was placed on a platform of nominal size, 0.15 m by 0.05 m, raised 1.5 m above the conducting ground plane. The table is made of expanded polystyrol and expanded polypropylene and the table top is covered with polycarbonate. That has very low permittivity.

(UWB emissions and other emissions)

1) 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.

(UWB emissions only)

2) Exchanged the EUT to the Substitution Antenna, the measurement was set for the same height 1.5m as the EUT. The frequency below 1GHz of the Substitution Antenna was used the Half wave dipole Antenna, which was tuned the measured frequency in 1).

The frequency above 1GHz of the Substitution Antenna was used Horn Antenna.

The Substitution Antenna was connected to the Signal Generator, and the polarized electromagnetic radiation of the Substitution Antenna was matched with the one of the measuring Antenna, which was set with the Signal Generator to the measured frequency in 1). Then, we set with the Output power (CW) of the Signal Generator where the measuring electromagnetic field strength is equal to the measured value in 1) by means of varying the measuring antenna height between 1 to 4m to obtain maximum receiving level.

Its Output power of Signal Generator was recorded.

3) Effective radiated power was calculated by subtracting the cable loss and the attenuator loss connected between the Signal Generator and the Substitution Antenna from the Output power of the Signal Generator recorded in 2).

For the usage of the antenna (horn Antenna) except for the half wave dipole antenna (2.15dBi) for the substitution antenna, the equivalent isotropic radiated power was calculated by compensating not the finite difference in the antenna gain of the half wave dipole antenna, and substitution antenna.

**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 960 MHz	Above 960 MHz	
Instrument used	Test Receiver	Spectrum Analyzer	
Detector	Quasi-Peak (QP)	Peak (PK)	RMS (AV)
IF Bandwidth	BW 120 kHz	(for UWB spurious emission): RBW: 1 MHz VBW: 3 MHz (for carrier's emission): RBW: 3 MHz VBW: 3 MHz	(for UWB spurious emission): RBW: 1 MHz VBW: 3 MHz (for Peak level of the emission) RBW: 1 kHz VBW: 3 kHz
Test Distance	3 m	0.5 m *1) (960 MHz – 10.6 GHz), 0.3 m *2) (10.6 GHz – 17 GHz), 0.1 m *3) (above 17 GHz)	

- \*1) Distance Factor:  $20 \times \log(0.5 \text{ m} / 3.0 \text{ m}) = -15.56 \text{ dB}$   
\*2) Distance Factor:  $20 \times \log(0.3 \text{ m} / 3.0 \text{ m}) = -20.00 \text{ dB}$   
\*3) Distance Factor:  $20 \times \log(0.1 \text{ m} / 3.0 \text{ m}) = -29.54 \text{ dB}$

- 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.

Polarity	Frequency [GHz]							
	0.03-0.96	0.96-1	1-4.8	4.8-10.6	10.6-17	17-18	18-26.5	26.5-40
Hor.	X	X	Z	Y	Y	X	Z	Y
Ver.	X	X	Z	Z	Z	Z	X	X

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 7: UWB bandwidth and 99 % occupied bandwidth**

**Test Procedure**

The tests were made with below setting by a radiated electric field in semi-anechoic chamber.

Test	Span	RBW	VBW	Sweep	Detector	Trace	Instrument used
UWB Bandwidth 99 % Occupied Bandwidth	2 GHz	1 MHz	1 MHz	Auto	Peak	Max Hold	Spectrum Analyzer

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

## **SECTION 8: Antenna terminal conducted tests**

### **Test Procedure**

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

<b>Test</b>	<b>Span</b>	<b>RBW</b>	<b>VBW</b>	<b>Sweep time</b>	<b>Detector</b>	<b>Trace</b>	<b>Instrument used</b>
Conducted	9 kHz to 150 kHz	200 Hz	620 Hz	Auto	Peak	Max Hold	Spectrum Analyzer
Spurious Emission *1)	150 kHz to 30 MHz	10 kHz	30 kHz				
*1) In the frequency range below 30MHz, RBW was narrowed to separate the noise contents. Then, wide-band noise near the limit was checked separately, however the noise was not detected as shown in the chart. (9 kHz -150 kHz: RBW = 200 Hz, 150 kHz - 30 MHz: RBW = 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**

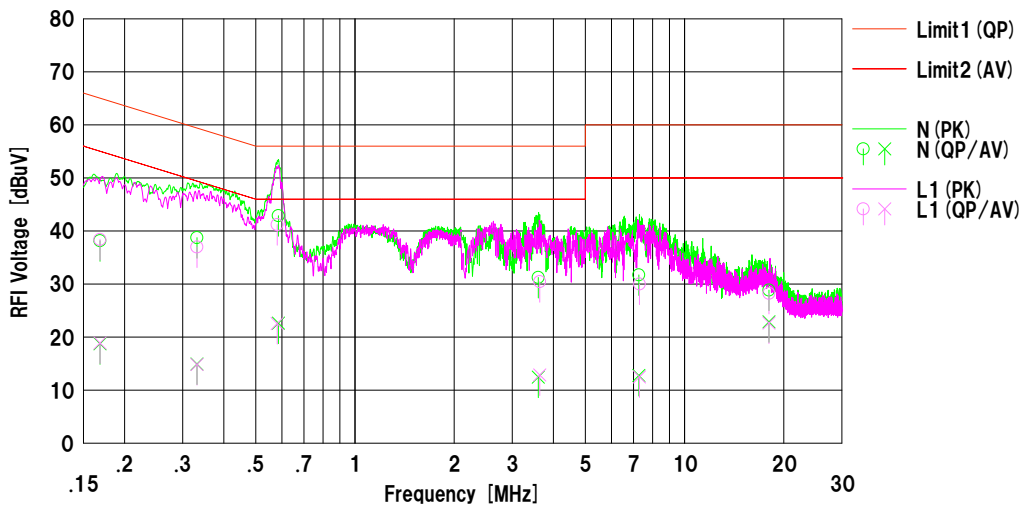
UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room  
Date : 2018/01/30

Mode : Transmittig UWB  
Power : AC 120 V / 60 Hz (EUT's adapter in)  
Temp./Humi. : 23 deg.C / 23 %RH

Remarks : with AC adapter (HPU15-102-UJ/UL)

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

Engineer : Kenichi Adachi



No.	Freq. [MHz]	Reading		C.Fac [dB]	Results		Limit		Margin		Phase	Comment
		<QP> [dBuV]	<AV> [dBuV]		<QP> [dBuV]	<AV> [dBuV]	<QP> [dBuV]	<AV> [dBuV]	<QP> [dB]	<AV> [dB]		
1	0.16845	25.65	6.23	12.51	38.16	18.74	65.04	55.04	26.8	36.3	N	
2	0.33158	26.21	2.39	12.53	38.74	14.92	59.41	49.41	20.6	34.4	N	
3	0.58561	30.32	10.05	12.57	42.89	22.62	56.00	46.00	13.1	23.3	N	
4	3.59962	18.33	-0.45	12.90	31.23	12.45	56.00	46.00	24.7	33.5	N	
5	7.26815	18.32	-0.63	13.39	31.71	12.76	60.00	50.00	28.2	37.2	N	
6	18.04254	14.16	8.18	14.69	28.85	22.87	60.00	50.00	31.1	27.1	N	
7	0.16845	25.89	6.36	12.51	38.40	18.87	65.04	55.04	26.6	36.1	L1	
8	0.33158	24.46	2.29	12.53	36.99	14.82	59.41	49.41	22.4	34.5	L1	
9	0.58082	28.63	9.97	12.57	41.20	22.54	56.00	46.00	14.8	23.4	L1	
10	3.63512	17.55	-0.04	12.90	30.45	12.86	56.00	46.00	25.5	33.1	L1	
11	7.29526	16.59	-0.92	13.41	30.00	12.49	60.00	50.00	30.0	37.5	L1	
12	18.04254	13.54	7.95	14.69	28.23	22.64	60.00	50.00	31.7	27.3	L1	

Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN (AMN) +Cable+ATT) [dB]  
LISN: SLS-02 + Extention cable

Except for the above table: adequate margin data below the limits.

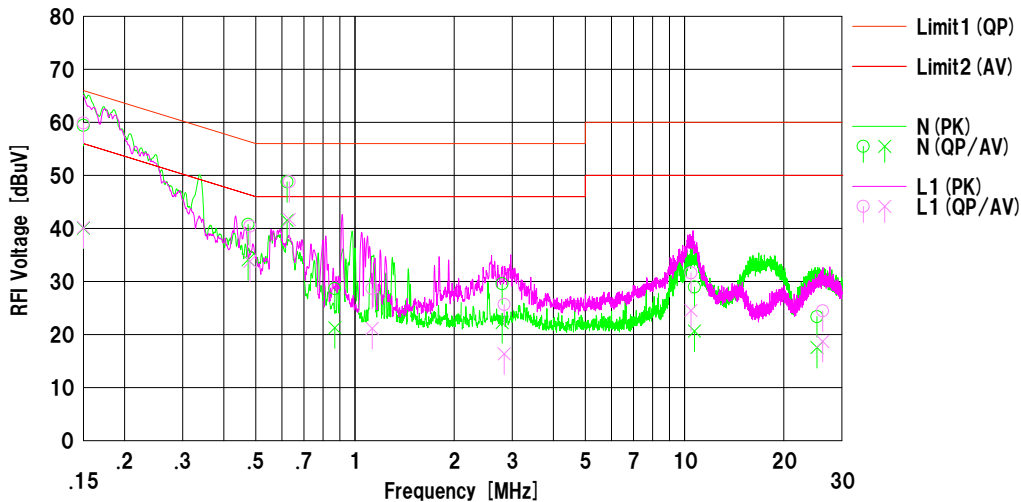
## Conducted Emission

# DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room  
Date : 2018/01/30

Mode : Transmittig UWB  
Power : AC 120 V / 60 Hz (PC's AC adapter in)  
Temp./Humi. : 23 deg.C / 23 %RH  
Remarks : with AC adapter of personal computer

Limit1 : FCC 15C (15.207) QP  
Limit2 : FCC 15C (15.207) AV  
Engineer : Kenichi Adachi



No.	Freq. [MHz]	Reading		C.Fac [dB]	Results		Limit		Margin		Phase	Comment
		<QP> [dBuV]	<AV> [dBuV]		<QP> [dBuV]	<AV> [dBuV]	<QP> [dB]	<AV> [dB]				
1	0.15000	46.91	27.54	12.52	59.43	40.06	66.00	56.00	6.5	15.9	N	
2	0.47413	28.22	21.54	12.56	40.78	34.10	56.44	46.44	15.6	12.3	N	
3	0.62258	36.22	28.94	12.57	48.79	41.51	56.00	46.00	7.2	4.4	N	
4	0.86827	16.05	8.66	12.61	28.66	21.27	56.00	46.00	27.3	24.7	N	
5	2.79581	16.78	9.46	12.80	29.58	22.26	56.00	46.00	26.4	23.7	N	
6	10.71505	15.06	6.75	13.90	28.96	20.65	60.00	50.00	31.0	29.3	N	
7	25.21736	8.29	2.48	15.07	23.36	17.55	60.00	50.00	36.6	32.4	N	
8	0.15000	47.34	27.66	12.52	59.86	40.18	66.00	56.00	6.1	15.8	L1	
9	0.48022	27.86	21.25	12.56	40.42	33.81	56.34	46.34	15.9	12.5	L1	
10	0.63223	36.24	29.11	12.57	48.81	41.68	56.00	46.00	7.1	4.3	L1	
11	1.12826	16.09	8.54	12.62	28.71	21.16	56.00	46.00	27.2	24.8	L1	
12	2.83712	12.86	3.55	12.80	25.66	16.35	56.00	46.00	30.3	29.6	L1	
13	10.45692	17.76	10.68	13.87	31.63	24.55	60.00	50.00	28.3	25.4	L1	
14	26.23710	9.36	3.58	15.11	24.47	18.69	60.00	50.00	35.5	31.3	L1	

Calculation: Result [dBuV] = Reading [dBuV] + C.Fac (LISN (AMN) + Cable + ATT) [dB]  
LISN: SLS-02

Except for the above table: adequate margin data below the limits.

**Data of Radiation Test (Regulation: FCC 15.517 (c))**

Test place : Shonan EMC Lab. No.2 Semi Anechoic Chamber  
Report No. : 11920658S-A-R2  
Date : February 2, 2018  
Temperature / Humidity : 22 deg. C / 35 % RH  
Engineer : Kazutaka Takeyama  
Mode : Transmitting

(UWB emission, RBW 1 MHz)

Limit : FCC15.517 (c), Substitution limit

Engineer : Kazutaka Takeyama

<< EIRP DATA >>

No.	Freq. [MHz]	Reading <AV>	SG Level [dBm]	TX Ant.Gain [dB]	TX Loss [dB]	EIRP		Margin [dB]	Pola.	Height [cm]	Angle [deg]	TX Ant.Type	Comment
		[dBuV]				Result [dBm]	Limit [dBm]						
1	7798.543	52.90	-49.70	11.46	10.69	-48.93	-41.30	7.6	Hori.	150	70	Horn	AV-RMS
2	8038.621	50.44	-51.70	11.33	10.83	-51.20	-41.30	9.9	Hori.	150	70	Horn	AV-RMS
3	8561.590	51.10	-50.10	11.97	11.12	-49.25	-41.30	7.9	Hori.	150	70	Horn	AV-RMS
4	7802.410	54.00	-49.90	11.45	10.69	-49.14	-41.30	7.8	Vert.	150	72	Horn	AV-RMS
5	8194.708	53.20	-49.90	11.57	10.91	-49.24	-41.30	7.9	Vert.	150	72	Horn	AV-RMS
6	8546.660	53.10	-49.00	11.99	11.11	-48.12	-41.30	6.8	Vert.	150	72	Horn	AV-RMS

\* There were no detect UWB emissions in the range that below 5000 MHz, 9000 MHz to 17000 MHz and above 18000 MHz.

Calculation: Result [dBm] = SG level [dB] + Tx Ant Gain [dBi] - Tx Loss (Cable) [dB]  
Tx Antenna: Horn (1G-40G) / Rx-Antenna: Horn (1G-40G)

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**Data of Radiation Test (Regulation: FCC 15.517 (c))**

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber  
Report No. : 11920658S-A-R2  
Date : February 5, 2018  
Temperature / Humidity : 23 deg. C / 28 % RH  
Engineer : Kenichi Adachi  
Mode : Transmitting

(UWB emission, RBW 1 MHz)

Limit : FCC15.517 (c), Substitution limit

Engineer : Kenichi Adachi

<< EIRP DATA >>

No.	Freq. [MHz]	Reading	SG Level [dBm]	TX Ant.Gain [dBi]	TX Loss [dB]	EIRP		Margin [dB]	Pola.	Height [cm]	Angle [deg]	TX Ant.Type	Comment
		<AV> [dBuV]				Result [dBm]	Limit [dBm]						
1	17424.219	47.70	-63.48	11.42	18.08	-70.14	-51.30	18.8	Hori.	152	73	Horn	AvRMS
2	17424.219	53.45	-58.04	11.42	18.08	-64.70	-51.30	13.4	Vert.	157	57	Horn	AvRMS

\* There were no detect UWB emissions in the range that below 5000 MHz, 9000 MHz to 17000 MHz and above 18000 MHz.

Calculation:Result [dBm]=SG level [dB] +Tx Ant Gain [dBi] -Tx Loss (Cable) [dB]  
Tx Antenna: Horn (1G-40G) / Rx-Antenna: Horn (1G-40G)

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**Data of Radiation Test (Regulation: FCC 15.517 (c))**

(Reference data)

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber  
Report No. : 11920658S-A-R2  
Date : February 2, 2018  
Temperature / Humidity : 22 deg. C / 35 % RH  
Engineer : Kazutaka Takeyama  
Mode : Transmitting

(UWB emission, RBW 1 MHz, 3 m distance result)

Limit1 : FCC15.209 3m, below 1GHz:QP, above 1GHz:AV  
Limit2 : FCC15.209 3m, below 1GHz:QP, above 1GHz:PK

Engineer : Kazutaka Takeyama

<< AV/PK DATA >>

No.	Freq. [MHz]	Reading		Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	D.Fac [dB]	Result		Limit		Margin		Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
		<AV> [dBuV]	<PK> [dBuV]					<AV> [dBuV/m]	<PK> [dBuV/m]	<AV> [dB]	<PK> [dB]	<AV> [dB]	<PK> [dB]					
1	7798.543	52.90	69.20	37.39	7.82	37.94	-15.56	44.61	60.91	53.90	73.90	9.2	12.9	Hori.	150	70	SHA02	AV:RMS
2	8038.621	50.44	66.66	37.68	7.83	37.93	-15.56	42.46	58.68	53.90	73.90	11.4	15.2	Hori.	150	70	SHA02	AV:RMS
3	8561.590	51.10	67.00	37.27	8.19	38.24	-15.56	42.76	58.66	53.90	73.90	11.1	15.2	Hori.	150	70	SHA02	AV:RMS
4	7802.410	54.00	70.30	37.39	7.82	37.94	-15.56	45.71	62.01	53.90	73.90	8.1	11.8	Vert.	150	72	SHA02	AV:RMS
5	8194.708	53.20	69.00	37.54	7.95	38.02	-15.56	45.11	60.91	53.90	73.90	8.7	12.9	Vert.	150	72	SHA02	AV:RMS
6	8546.660	53.10	69.10	37.27	8.18	38.23	-15.56	44.76	60.76	53.90	73.90	9.1	13.1	Vert.	150	72	SHA02	AV:RMS

\* PK was measured setting was RBW 3 MHz, VBW 50 MHz, peak value, in the frequency range from 7000 MHz to 9000 MHz.  
\* AV was measured setting was RBW1 MHz, VBW 3 MHz, RMS value, in the frequency range from 7000 MHz to 9000 MHz.

\* There were no detect UWB emissions in the range that below 5000 MHz, 9000 MHz to 17000 MHz and above 18000 MHz.

Calculation:Result [dBuV/m] =Reading [dBuV] +Ant.Fac [dB/m] +Loss (Cable) [dB] -Gain (AMP) [dB]  
Ant.Type=BC:Biconical Antenna LP:Logperiodic Antenna SHA\*\* : Horn

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**Data of Radiation Test (Regulation: FCC 15.517 (c))**

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber  
Report No. : 11920658S-A-R2  
Date : January 29, 2018  
Temperature / Humidity : 20 deg. C / 25 % RH  
Engineer : Yosuke Ishikawa  
Mode : Transmitting

(Other emission)

Limit1 : FCC15.209 3m, below 1GHz:QP, above 1GHz:AV

Engineer : Yosuke Ishikawa

<< QP DATA >>

No.	Freq. [MHz]	Reading	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result	Limit	Margin	Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
		<QP> [dBuV]				<QP> [dBuV/m]	<QP> [dB]						
1	143.996	31.00	14.50	7.78	32.04	21.24	43.50	22.2	Hori.	238	165	BC	
2	240.000	36.70	11.62	8.38	31.94	24.76	46.00	21.2	Hori.	186	68	LP	
3	609.638	32.30	19.01	10.05	31.82	29.54	46.00	16.4	Hori.	195	151	LP	
4	41.025	45.60	13.87	6.89	32.12	34.24	40.00	5.7	Vert.	100	170	BC	
5	85.457	49.50	7.28	7.33	32.09	32.02	40.00	7.9	Vert.	100	153	BC	
6	90.360	48.10	8.23	7.37	32.09	31.61	43.50	11.8	Vert.	100	85	BC	
7	143.997	48.80	14.50	7.78	32.04	39.04	43.50	4.4	Vert.	100	96	BC	
8	240.001	42.40	11.62	8.38	31.94	30.46	46.00	15.5	Vert.	100	152	LP	

Calculation:Result [dBuV/m] =Reading [dBuV] +Ant.Fac [dB/m] +Loss (Cable+ATT) [dB] -Gain (AMP) [dB]  
Ant.Type=BC:Biconical Antenna LP:Logperiodic Antenna SHA\*: Horn Antenna

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**Data of Radiation Test (Regulation: FCC 15.517 (c))**

Test place : Shonan EMC Lab. No.2 Semi Anechoic Chamber  
Report No. : 11920658S-A-R2  
Date : February 2, 2018  
Temperature / Humidity : 22 deg. C / 35 % RH  
Engineer : Kazutaka Takeyama  
Mode : Transmitting

(Other emission)

Limit1 : FCC15.209 3m, below 1GHz:QP, above 1GHz:AV  
Limit2 : FCC15.209 3m, below 1GHz:QP, above 1GHz:PK

Engineer : Kazutaka Takeyama

<< AV/PK DATA >>

No.	Freq. [MHz]	Reading		Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	D.Fac [dB]	Result		Limit		Margin		Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
		<AV> [dBuV]	<PK> [dBuV]					<AV> [dBuV/m]	<PK> [dBuV/m]	<AV> [dBuV/m]	<PK> [dBuV/m]	<AV> [dB]	<PK> [dB]					
1	1919.990	43.70	50.30	25.66	3.70	37.05	-15.56	20.45	27.05	53.90	73.90	33.4	46.8	Hori.	151	191	SHA02	AvRMS (other)
2	2111.023	48.70	52.60	26.21	3.91	36.96	-15.56	26.30	30.20	53.90	73.90	27.6	43.7	Hori.	150	193	SHA02	AvRMS (other)
3	3359.989	38.80	48.40	28.67	4.94	36.73	-15.56	20.12	29.72	53.90	73.90	33.7	44.1	Hori.	150	138	SHA02	AvRMS (other)
4	1440.003	50.30	55.00	24.70	3.20	37.25	-15.56	25.39	30.09	53.90	73.90	28.5	43.8	Vert.	150	80	SHA02	AvRMS (other)
5	2112.026	46.30	51.10	26.21	3.91	36.96	-15.56	23.90	28.70	53.90	73.90	30.0	45.2	Vert.	150	281	SHA02	AvRMS (other)
6	2399.989	45.80	51.41	27.20	4.20	36.83	-15.56	24.81	30.42	53.90	73.90	29.0	43.4	Vert.	146	226	SHA02	AvRMS (other)
7	4224.042	47.50	52.00	30.08	5.68	36.85	-15.56	30.85	35.35	53.90	73.90	23.0	38.5	Vert.	130	245	SHA02	AvRMS (other)

Calculation:Result [dBuV/m] = Reading [dBuV] + Ant.Fac [dB/m] + Loss (Cable) [dB] + D.Fac [dB] - Gain (AMP) [dB]  
Ant.Type=BC:Biconical Antenna LP:Logperiodic Antenna SHA\*: Horn Antenna

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**Data of Radiation Test (Regulation: FCC 15.517 (c))**

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber  
Report No. : 11920658S-A-R2  
Date : February 5, 2018  
Temperature / Humidity : 23 deg. C / 28 % RH  
Engineer : Kenichi Adachi  
Mode : Transmitting

(Other emission)

Limit1 : FCC15.209 3m, below 1GHz:QP, above 1GHz:AV  
Limit2 : FCC15.209 3m, below 1GHz:QP, above 1GHz:PK

Engineer : Kenichi Adachi

<< AV/PK DATA >>

No.	Freq. [MHz]	Reading		Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	D.Fac [dB]	Result		Limit		Margin		Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
		<AV> [dBuV]	<PK> [dBuV]					<AV> [dBuV/m]	<PK> [dBuV/m]	<AV> [dBuV/m]	<PK> [dBuV/m]	<AV> [dB]	<PK> [dB]					
1	16896.199	51.62	53.59	39.96	12.13	41.70	-20.00	42.01	43.98	53.90	73.90	11.8	29.9	Hori.	151	76	SHA03	AvRMS (other)
2	16896.199	50.82	52.34	39.96	12.13	41.70	-20.00	41.21	42.73	53.90	73.90	12.6	31.1	Vert.	154	282	SHA03	AvRMS (other)

Calculation:Result [dBuV/m] =Reading [dBuV] +Ant.Fac [dB/m] +Loss (Cable) [dB] +D.Fac [dB] -Gain (AMP) [dB]  
Ant.Type=BC:Biconical Antenna LP:Logperiodic Antenna SHA\*: Horn Antenna

**Data of Radiation Test (Regulation: FCC 15.517 (c))**

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber  
Report No. : 11920658S-A-R2  
Date : February 5, 2018  
Temperature / Humidity : 23 deg. C / 28 % RH  
Engineer : Kenichi Adachi  
Mode : Transmitting

(Other emission)

Limit1 : FCC15.209 3m, below 1GHz:QP, above 1GHz:AV  
Limit2 : FCC15.209 3m, below 1GHz:QP, above 1GHz:PK

Engineer : Kenichi Adachi

<< AV/PK DATA >>

No.	Freq. [MHz]	Reading		Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	D.Fac [dB]	Result		Limit		Margin		Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
		<AV> [dBuV]	<PK> [dBuV]					<AV> [dBuV/m]	<PK> [dBuV/m]	<AV> [dBuV/m]	<PK> [dBuV/m]	<AV> [dB]	<PK> [dB]					
1	21120.252	41.32	43.22	39.79	14.17	47.16	-29.54	18.58	20.48	53.90	73.90	35.3	53.4	Hori.	158	208	SHA04	Av:RMS (other)
2	25344.303	41.24	43.87	39.99	16.29	47.28	-29.54	20.70	23.33	53.90	73.90	33.2	50.5	Hori.	157	317	SHA04	Av:RMS (other)
3	21120.252	39.42	41.54	39.79	14.17	47.16	-29.54	16.68	18.80	53.90	73.90	37.2	55.1	Vert.	156	116	SHA04	Av:RMS (other)
4	25344.303	40.11	42.44	39.99	16.29	47.28	-29.54	19.57	21.90	53.90	73.90	34.3	52.0	Vert.	155	72	SHA04	Av:RMS (other)

Calculation:Result [dBuV/m] = Reading [dBuV] + Ant.Fac [dB/m] + Loss (Cable) [dB] + D.Fac [dB] - Gain (AMP) [dB]  
Ant.Type=BC:Biconical Antenna LP:Logperiodic Antenna SHA\*: Horn Antenna

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**Data of Radiation Test (Regulation: FCC 15.517 (c))**

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber  
Report No. : 11920658S-A-R2  
Date : February 6, 2018  
Temperature / Humidity : 21 deg. C / 21 % RH  
Engineer : Shiro Kobayashi  
Mode : Transmitting

(Other emission)

Limit1 : FCC15.209 3m, below 1GHz:QP, above 1GHz:AV  
Limit2 : FCC15.209 3m, below 1GHz:QP, above 1GHz:PK

Engineer : Shiro Kobayashi

<< AV/PK DATA >>

No.	Freq. [MHz]	Reading		Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	D.Fac [dB]	Result		Limit		Margin		Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
		<AV> [dBuV]	<PK> [dBuV]					<AV> [dBuV/m]	<PK> [dBuV/m]	<AV> [dBuV/m]	<PK> [dBuV/m]	<AV> [dB]	<PK> [dB]					
1	30624.330	65.09	73.95	43.21	17.30	66.04	-29.54	30.02	38.88	53.90	73.90	23.8	35.0	Hori.	155	135	SHA06	AvRMS (other)
2	33792.363	75.96	77.27	43.37	18.05	66.50	-29.54	41.34	42.65	53.90	73.90	12.5	31.2	Hori.	155	106	SHA06	AvRMS (other)
3	33792.563	71.97	73.34	43.37	18.05	66.50	-29.54	37.35	38.72	53.90	73.90	16.5	35.1	Vert.	154	329	SHA06	AvRMS (other)

Calculation:Result [dBuV/m] =Reading [dBuV] +Ant.Fac [dB/m] +Loss (Cable) [dB] +D.Fac [dB] -Gain (AMP) [dB]  
Ant.Type=BC:Biconical Antenna LP:Logperiodic Antenna SHA\*: Horn Antenna

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**Data of Radiation Test (Regulation: FCC 15.517 (d))**

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber  
Report No. : 11920658S-A-R2  
Date : February 5, 2018  
Temperature / Humidity : 23 deg. C / 28 % RH  
Engineer : Kenichi Adachi  
Mode : Transmitting

Limit : FCC15.517 (d), Substitution limit (1164-1240 MHz, 1559-1610 MHz)  
Engineer : Kenichi Adachi

<< EIRP DATA >>

No.	Freq. [MHz]	Reading <AV>	SG Level [dBm]	TX Ant.Gain [dBi]	TX Loss [dB]	EIRP		Margin [dB]	Pola.	Height [cm]	Angle [deg]	TX Ant.Type	Comment
		[dBuV]				Result [dBm]	Limit [dBm]						
1	1209.475	22.59	-116.28	6.11	4.50	-114.67	-85.30	29.3	Hori.	156	262	Horn	AvRMS. RBW 1 kHz
2	1210.102	27.28	-103.86	6.11	4.50	-102.25	-85.30	16.9	Vert.	159	208	Horn	AvRMS. RBW 1 kHz

Calculation:Result [dBm] =SG level [dB] +Tx Ant Gain [dBi] -Tx Loss (Cable) [dB]  
Tx Antenna: Horn (1G-40G) / Rx-Antenna: Horn (1G-40G)



**Data of Radiation Test (Regulation: FCC 15.517 (d))**

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber  
Report No. : 11920658S-A-R2  
Date : February 5, 2018  
Temperature / Humidity : 23 deg. C / 28 % RH  
Engineer : Kenichi Adachi  
Mode : Transmitting

Limit : FCC15.517 (d), Substitution limit (1164-1240 MHz, 1559-1610 MHz)  
Engineer : Kenichi Adachi

<< EIRP DATA >>

No.	Freq. [MHz]	Reading <AV>	SG Level [dBm]	TX Ant.Gain [dBi]	TX Loss [dB]	EIRP		Margin [dB]	Pola.	Height [cm]	Angle [deg]	TX Ant.Type	Comment
		[dBuV]				Result [dBm]	Limit [dBm]						
1	1587.221	27.28	-106.34	8.20	5.19	-103.33	-85.30	18.0	Hori.	164	271	Horn	AvRMS. RBW 1 kHz
2	1587.221	24.04	-108.07	8.20	5.19	-105.06	-85.30	19.7	Vert.	163	150	Horn	AvRMS. RBW 1 kHz

Calculation:Result [dBm] =SG level [dB] +Tx Ant Gain [dBi] -Tx Loss (Cable) [dB]  
Tx Antenna: Horn (1G-40G) / Rx-Antenna: Horn (1G-40G)

**Data of Radiation Test (Regulation: FCC 15.517 (e))**

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber  
Report No. : 11920658S-A-R2  
Date : February 2, 2018  
Temperature / Humidity : 22 deg. C / 35 % RH  
Engineer : Kazutaka Takeyama  
Mode : Transmitting

Limit : FCC15.517 (e) , (RBW 50 MHz value) Substitution limit  
Engineer : Kazutaka Takeyama

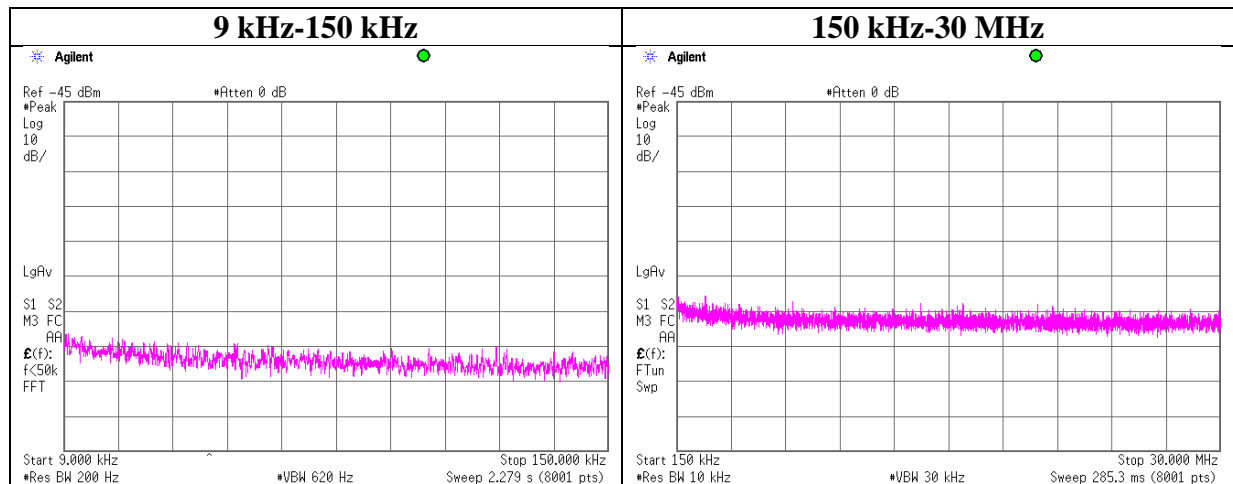
<< EIRP DATA >>

No.	Freq. [MHz]	Reading	SG Level [dBm]	TX Ant.Gain [dBi]	TX Loss [dB]	EIRP		Margin [dB]	Pola.	Height [cm]	Angle [deg]	TX Ant.Type	Comment
		<PK> [dBuV]				Result [dBm]	Limit [dBm]						
1	7798.543	69.20	-34.50	11.46	-13.71	-9.33	0.00	9.3	Hori.	150	70	Horn	Peak, RBW 3 MHz
2	8038.621	66.66	-37.00	11.33	-13.57	-12.10	0.00	12.1	Hori.	150	70	Horn	Peak, RBW 3 MHz
3	8561.590	67.00	-35.00	11.97	-13.28	-9.75	0.00	9.7	Hori.	150	70	Horn	Peak, RBW 3 MHz
4	7802.410	70.30	-34.20	11.45	-13.71	-9.04	0.00	9.0	Vert.	150	72	Horn	Peak, RBW 3 MHz
5	8194.708	69.00	-35.10	11.57	-13.49	-10.04	0.00	10.0	Vert.	150	72	Horn	Peak, RBW 3 MHz
6	8546.660	69.10	-34.00	11.99	-13.29	-8.72	0.00	8.7	Vert.	150	72	Horn	Peak, RBW 3 MHz

Calculation: Result [dBm] = SG level [dB] + Tx Ant Gain [dBi] - Tx Loss (Cable [dB] + RBW converted factor (-24.44 = 20 x log (3 / 50) ) [dB] )  
Tx Antenna: Horn (1G-40G) / Rx-Antenna: Horn (1G-40G)

**Data of Antenna terminal conducted Test (Regulation: FCC 15.517 (c))**

Test place                   Shonan EMC Lab. No.1 Measurement Room  
Report No.                 11920658S-A-R2  
Date                         January 31, 2018  
Temperature / Humidity    23 deg. C / 33 % RH  
Engineer                 Kenichi Adachi  
Mode                        Transmitting

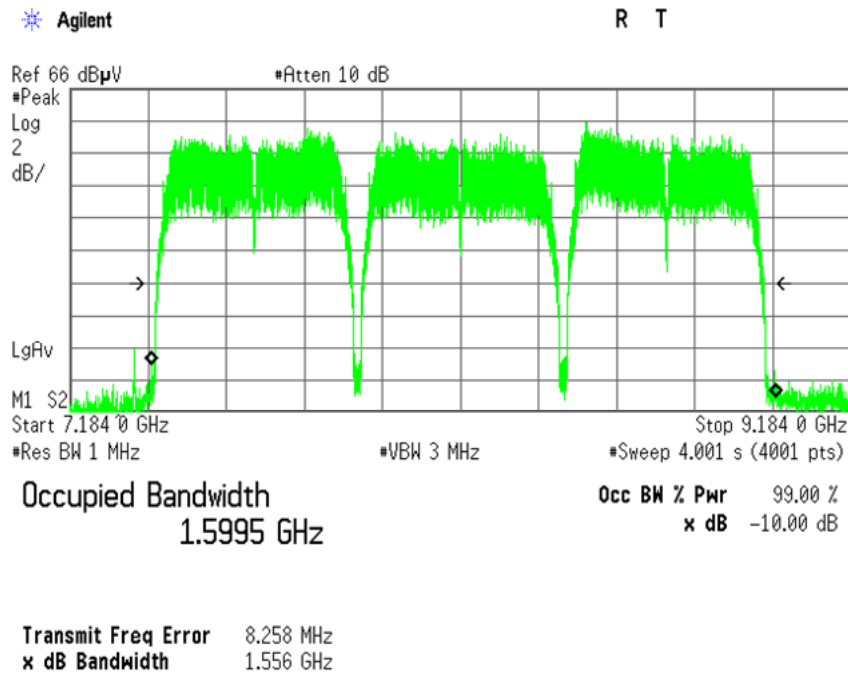


\* No detect signal

**Bandwidth (Regulation: FCC 15.503(d), FCC 15.517 (b))**

Test place Shonan EMC Lab. No.2 Semi Anechoic Chamber  
Report No. 11920658S-A-R2  
Date February 2, 2018  
Temperature / Humidity 23 deg. C / 24 % RH  
Engineer Kazutaka Takeyama  
Mode Transmitting

10 dB Bandwidth: 1556.000 MHz (= fH - fL) (Limit: >= 500 MHz)  
99 % Occupied Bandwidth: 1599.500 MHz fL = 7397.742 MHz  
Center Frequency 8175.742 MHz (= (fH + fL) / 2) fH = 8953.742 MHz



## APPENDIX 2: Test instruments

### Test Instruments (1/2)

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
SAEC-03(NSA)	Semi-Anechoic Chamber	TDK	SAEC-03(NSA)	3	RE	2017/06/11 * 12
SBA-03	Biconical Antenna	Schwarzbeck	BBA9106	91032666	RE	2017/10/02 * 12
SLA-07	Logperiodic Antenna	Schwarzbeck	VUSLP9111B	196	RE	2017/01/26 * 12 *1)
SAT6-08	Attenuator	HIROSE ELECTRIC CO.,LTD.	AT-406(40)	-	RE	2017/08/24 * 12
SCC-C1/C2/C3/C4/C5/C10/SRSE-03	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/NS4906	-/0901-271(RF Selector)	RE	2017/04/07 * 12
SAF-03	Pre Amplifier	SONOMA	310N	290213	RE	2017/02/09 * 12
STR-08	Test Receiver	Rohde & Schwarz	ESW44	101581	RE, CE	2017/11/24 * 12
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,CE,RF, MF)	-	RE, CE	
SOS-05	Humidity Indicator	A&D	AD-5681	4062518	RE	2017/10/30 * 12
SJM-02	Measure	KOMELON	KMC-36	-	RE, CE	-
STS-03	Digital Hitester	Hioki	3805-50	080997823	RE, CE	2017/10/16 * 12
SCC-C9/C10/SRSE-03	Coaxial Cable&RF Selector	Suhner/Suhner/TOYO	RG223U/141PE/NS4906	-/0901-271(RF Selector)	CE	2017/04/07 * 12
SLS-02	LISN	Rohde & Schwarz	ENV216	100512	CE (EUT)	2017/02/10 * 12
SAT3-07	Attenuator	JFW	50HF-003N	-	CE	2017/09/08 * 12
SLS-05	LISN	Rohde & Schwarz	ENV216	100516	CE (AE)	2017/02/27 * 12
STM-12	Terminator	TME	CT-01 BP	-	CE	2017/12/14 * 12
SOS-06	Humidity Indicator	A&D	AD-5681	4062118	CE	2017/12/21 * 12
SAEC-02(NSA)	Semi-Anechoic Chamber	TDK	SAEC-02(NSA)	2	RE	2017/06/08 * 12
SAF-05	Pre Amplifier	TOYO Corporation	TPA0118-36	1440490	RE	2017/02/17 * 12
SCC-G06	Coaxial Cable	Junkosha	J12J102207-00	MAY-23-16-091	RE	2017/06/13 * 12
SHA-02	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-726	RE	2017/08/14 * 12
SOS-03	Humidity Indicator	A&D	AD-5681	4063325	RE	2017/10/30 * 12
SRENT-08	Spectrum Analyzer	Agilent	E4448A	MY50180019	RE	2017/10/12 * 12
SJM-09	Measure	PROMART	SEN1935	-	RE	-
STS-02	Digital Hitester	Hioki	3805-50	080997819	RE	2017/03/08 * 12
SCC-G42	Coaxial Cable	Junkosha	J12J103275-00	FEB-28-17-017	RE	2017/03/23 * 12
SCC-G23	Coaxial Cable	Suhner	SUCOFLEX 104	297342/4	RE	2017/05/08 * 12

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

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

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

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

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

**UL Japan, Inc.**  
**Shonan EMC Lab.**

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**Test Instruments (2/2)**

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
SSG-02	Signal Generator	Agilent	E8257D-540	MY48051404	RE	2017/03/09 * 12
KHA-08	DRG Horn Antenna	A.H.Systems	SAS-200/571	224	RE	2017/06/29 * 12
SCC-G41	Coaxial Cable	Junkosha	MWX221-01000NFS NMS/B	1612S006	RE	2017/01/08 * 12 *1)
SHA-06	Horn Antenna	ETS LINDGREN	3160-10	LM3459	RE	2017/03/15 * 12
SAF-10	Pre Amplifier	TOYO Corporation	HAP26-40W	00000010	RE	2017/03/17 * 12
SCC-G33	Coaxial Cable	Junkosha	MWX241-01000KMS KMS	-	RE	2017/04/20 * 12
SCC-G19	Coaxial Cable	Suhner	SUCOFLEX 102A	1188/2A	RE	2017/03/23 * 12
SAEC-03(SVSWR)	Semi-Anechoic Chamber	TDK	SAEC-03(SVSWR)	3	RE	2017/07/17 * 12
SAJ-01	Antenna Tilt Jig	Intelligent System Engineering Co., Ltd	Antenna Tilt Jig	T-S001	RE	Pre Check
SHA-03	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-739	RE	2017/08/23 * 12
SAJ-02	Antenna Tilt Jig	Intelligent System Engineering Co., Ltd	Antenna Tilt Jig	T-S002	RE	Pre Check
SCC-G40	Coaxial Cable	Junkosha	MWX221-01000NFS NMS/B	1612S005	RE	2017/01/08 * 12 *1)
SCC-G05	Coaxial Cable	Junkosha	J12J102207-00	APR-30-15-037	RE	2017/01/08 * 12 *1)
SAF-06	Pre Amplifier	TOYO Corporation	TPA0118-36	2046104	RE	2017/09/22 * 12
SCC-G22	Coaxial Cable	Suhner	SUCOFLEX 104	296199/4	RE	2017/05/08 * 12
SHA-04	Horn Antenna	ETS LINDGREN	3160-09	LM9861	RE	2017/07/11 * 12
SAF-08	Pre Amplifier	TOYO Corporation	HAP18-26W	00000019	RE	2017/03/17 * 12
SCC-G15	Coaxial Cable	Suhner	SUCOFLEX 102	32703/2	RE	2017/03/23 * 12
KHA-02	Horn Antenna	Schwarzbeck	BBHA9120D	230	RE	2017/06/29 * 12
SCC-G16	Coaxial Cable	Suhner	SUCOFLEX 102	32704/2	RE	2017/03/23 * 12
SSA-03	Spectrum Analyzer	Agilent	E4448A	MY48250152	AT	2017/08/20 * 12
SCC-G11	Coaxial Cable	Suhner	SUCOFLEX 102	31595/2	AT	2017/03/23 * 12
SOS-13	Humidity Indicator	Custom	CTH-202	Q.C.17	AT	2017/12/21 * 12
KTS-08	Digital Tester	SANWA	PC500	7019224	AT	2017/03/08 * 12

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

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

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

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RE: Radiated Emission test  
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