



# RADIO TEST REPORT

**Test Report No.: 11154873S-E-R1**

**Applicant** : Sony Corporation  
**Type of Equipment** : Wireless Print Receiver  
**Model No.** : UPA-WU10R  
**FCC ID** : AK8UPAWU10R  
**Test regulation** : FCC Part15 Subpart F: 2016  
**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 limits of the above regulation.
4. The test results in this test report are traceable to the national or international standards.
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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 11154873S-E. 11154873S-E is replaced with this report.

**Date of test:** March 4 to April 24, 2016

**Representative test engineer:**   
Yosuke Ishikawa  
Engineer  
Consumer Technology Division

**Approved by :**   
Toyokazu Imamura  
Leader  
Consumer Technology Division



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## **SECTION 1: Customer information**

Company Name : Sony Corporation  
Address : 4-14-1 Asahi-cho, Atsugi-shi, Kanagawa 243-0014 Japan  
Telephone Number : +81-50-3141-0313  
Facsimile Number : +81-50-3809-1352  
Contact Person : Chiemi Nagai

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

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

Type of equipment : Wireless Print Receiver  
Model No. : UPA-WU10R  
Serial No. : 5  
Rating : DC 5 V  
Country of Mass-production : Japan  
Condition of EUT : Production prototype  
(Not for Sale: This sample is equivalent to mass-produced items.)  
Receipt Date of Sample : March 4, 2016  
Modification of EUT : No modification by the test lab.

### **2.2 Product description**

Model: UPA-WU10R (referred to as the EUT in this report) is a Wireless Print Receiver.

Wireless Print System UPA-WU10 consists of the UPA-WU10T and the UPA-WU10R.  
UPA-WU10 has functions of a transmission of the print out data to the printer from the modality, a transmission of the printer status, a setup of communication channel, a firmware update.

Clock frequency(ies) in the system : BB/MAC: 20 MHz RF: 44 MHz USB PHY: 24 MHz

Radio part:

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

FCC 15.31 (e)

This EUT provides stable voltage (DC 3.3 V, DC 2.4 V, DC 1.2 V) constantly to RF part regardless of input voltage. Therefore, this EUT complies with the requirement.

FCC 15.203

The antenna is not removable from the EUT. Therefore the EUT complies with the requirement.

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

### **3.1 Test specification**

Test specification : FCC Part 15 Subpart F: 2016  
FCC Part 15 final revised on April 6, 2016.  
Title : FCC 47CFR Part15 Radio Frequency Device  
Subpart F Ultra-Wideband Operation  
Section 15.517 Technical requirements for indoor UWB systems.

### **3.2 Procedures & Results**

#### **< Requirements for indoor UWB systems >**

<b>Item</b>	<b>Test Procedure</b>	<b>Specification</b>	<b>Worst margin</b>	<b>Results</b>	<b>Remarks</b>
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)	19.3 dB 0.19045 MHz N, QP	Complied	-
UWB Bandwidth	FCC: Section 15.503(a) ANSI C63.10:2013 6 Standard test methods IC: -	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 IC: RSS-Gen 6.5 RSS-220 Annex 4	FCC: Section 15.517(c)(d) IC: RSS-220 3.4 RSS-220 5.2.1(c)(d)(e)	9.8 dB 8504.00 MHz Vertical	Complied	Radiated
Peak level of the Emission	FCC: Section 15.521(e)(g) ANSI C63.10:2013 6 Standard test methods IC: RSS-220 Annex 4	FCC: Section 15.209 Section 15.517(e) IC: RSS-220 5.2.1(g)	10.1 dB 8195.00 MHz PK, Vertical	Complied	Radiated (above 30 MHz) / Conducted (below 30 MHz)

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

### **3.3 Addition to standard**

<b>Item</b>	<b>Test Procedure</b>	<b>Specification</b>	<b>Worst margin</b>	<b>Results</b>	<b>Remarks</b>
99 % occupied bandwidth	IC: RSS-Gen 6.6	IC: -	-	-	Radiated

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

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### 3.4 Uncertainty

The following uncertainties have been calculated to provide a confidence level of 95 % using a coverage factor  $k=2$ .  
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Item	Frequency range	Uncertainty (+/-)			
		No. 1 SAC / SR	No. 2 SAC / SR	No. 3 SAC / SR	No. 4 SAC / SR
Conducted emission (AC Mains) LISN	150 kHz-30 MHz	2.1 dB	2.1 dB	2.6 dB	2.2 dB
Radiated emission (Measurement distance: 3 m)	9 kHz-30 MHz	2.7 dB	2.7 dB	3.1 dB	-
	30 MHz-300 MHz	4.4 dB	4.4 dB	4.6 dB	-
	300 MHz-1 GHz	5.6 dB	5.5 dB	5.3 dB	-
Radiated emission (Measurement distance: 1 m)	1 GHz-13 GHz	5.2 dB	5.2 dB	5.2 dB	-
	13 GHz-18 GHz	4.9 dB	4.9 dB	4.9 dB	-
	18 GHz-40 GHz	4.9 dB	4.9 dB	4.9 dB	-

SAC=Semi-Anechoic Chamber

SR= Shielded Room is applied besides radiated emission

Antenna terminal test	Uncertainty (+/-)
Power Measurement above 1 GHz (Average Detector)_SPM-06	0.76 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-06	0.79 dB
Power Measurement above 1 GHz (Average Detector)_SPM-07	0.74 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-07	1.08 dB
Spurious emission (Conducted) below 1GHz	1.5 dB
Spurious emission (Conducted) 1 GHz-3 GHz	1.7 dB
Spurious emission (Conducted) 3 GHz-18 GHz	2.4 dB
Spurious emission (Conducted) 18 GHz-26.5 GHz	2.5 dB
Spurious emission (Conducted) 26.5 GHz-40 GHz	2.5 dB
Bandwidth Measurement	0.66 %
Duty cycle and Time Measurement	0.012 %

#### Conducted emission

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

#### Radiated emission

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

### 3.5 Test location

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Facsimile number : +81 463 50 6401

	IC Registration No.	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Maximum measurement distance
<input type="checkbox"/> No.1 Semi-anechoic chamber	2973D-1	20.6 x 11.3 x 7.65	20.6 x 11.3	10 m
<input checked="" type="checkbox"/> No.2 Semi-anechoic chamber	2973D-2	20.6 x 11.3 x 7.65	20.6 x 11.3	10 m
<input checked="" type="checkbox"/> No.3 Semi-anechoic chamber	2973D-3	12.7 x 7.7 x 5.35	12.7 x 7.7	5 m
<input type="checkbox"/> No.4 Semi-anechoic chamber	-	8.1 x 5.1 x 3.55	8.1 x 5.1	-
<input type="checkbox"/> No.1 shielded room	-	6.8 x 4.1 x 2.7	6.8 x 4.1	-
<input checked="" type="checkbox"/> No.2 shielded room	-	6.8 x 4.1 x 2.7	6.8 x 4.1	-
<input checked="" type="checkbox"/> No.3 shielded room	-	6.3 x 4.7 x 2.7	6.3 x 4.7	-
<input type="checkbox"/> No.4 shielded room	-	4.4 x 4.7 x 2.7	4.4 x 4.7	-
<input checked="" type="checkbox"/> No.5 shielded room	-	7.8 x 6.4 x 2.7	7.8 x 6.4	-
<input type="checkbox"/> No.6 shielded room	-	7.8 x 6.4 x 2.7	7.8 x 6.4	-
<input type="checkbox"/> No.1 Measurement room	-	2.55 x 4.1 x 2.5	-	-

### 3.6 Test setup, Data of test & Test instruments

Refer to APPENDIX 1 to 3.

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

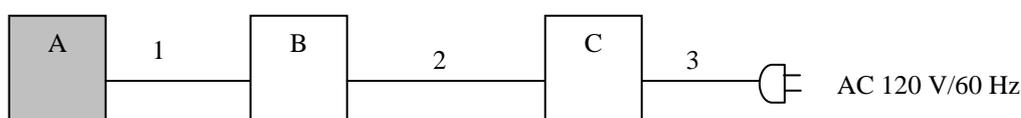
### **4.1 Operating mode**

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: RETTool ver1.0, Power setting: Fixed)

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

### **4.2 Configuration and peripherals**



\* Test data was taken under worse case conditions.

#### **Description of EUT and support equipment**

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Wireless Print Receiver	UPA-WU10R	5	Ueda Japan Radio	EUT
B	Laptop Computer	ProBook4530s	CNU1402133	HP	-
C	AC adapter	PPP009H	F12921133043152	HP	-

#### **List of cables used**

No.	Name	Length (m)	Shield	
			Cable	Connector
1	USB	3.0	Shielded	Shielded
2	DC	1.7	Unshielded	Unshielded
3	AC	1.7	Unshielded	Unshielded

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## **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 Styrofoam and covered with polyvinyl chloride. 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.

Each EUT current-carrying power lead, except the ground (safety) lead, was individually connected through a LISN / (AMN) to the input power source.

The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT via host equipment in a shielded room.

The EUT via host equipment was connected to a LISN (AMN).

An overview sweep with peak detection has been performed.

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

**Detector** : QP and CISPR AV  
**Measurement range** : 0.15 MHz - 30 MHz  
**Test data** : APPENDIX  
**Test result** : Pass

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## **SECTION 6: Radiated emission and Peak level of the Emission**

### **Test Procedure and conditions**

[For below 960 MHz]

EUT was placed on a urethane platform of nominal size, 0.15 m by 0.05 m, raised 1.0 m above the conducting ground plane.

[For above 960 MHz]

EUT was placed on a urethane platform of nominal size, 0.15 m by 0.05 m, raised 1.5 m above the conducting ground plane.

The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane. Photographs of the set up are shown in Appendix 3.

The Radiated Electric Field Strength has been measured on Semi anechoic chamber with a ground plane and at a distance of 3 m. The measuring antenna height was 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. The radiated emission measurements were made with the following detector function of the test receiver / spectrum analyzer.

### **Test Antennas are used as below;**

Frequency	30 MHz to 300 MHz	300 MHz to 1 GHz	Above 1 GHz
Antenna Type	Biconical	Logperiodic	Horn

	30 MHz to 960 MHz	Above 960 MHz
Detector Type	Quasi-Peak	RMS and Peak
IF Bandwidth	120 kHz	RMS: RBW 1 MHz, VBW: 1 MHz RBW 1 kHz, VBW: 1 kHz (Peak level of the Emission)  PK: RBW 3 MHz, VBW: 3 MHz

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	0.96-10.6	Carrier	10.6-17	17-18	18-26.5	26.5-40
Hor.	Y	Z	X	X	X	X	Z
Ver.	Y	Y	Z	Z	X	X	Z

The result is rounded off to the second decimal place, so some differences might be observed.

**Measurement range** : 30 MHz - 40 GHz  
**Test data** : APPENDIX  
**Test result** : Pass

\* For 9 kHz - 30 MHz. the emission was measured with a spectrum analyzer connected to the antenna port and no noise was detected.

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## **SECTION 7: UWB bandwidth and 99 % occupied bandwidth**

### **Test Procedure**

The test was measured with a spectrum analyzer using a horn antenna.

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

**Test data** : APPENDIX

**Test result** : Pass

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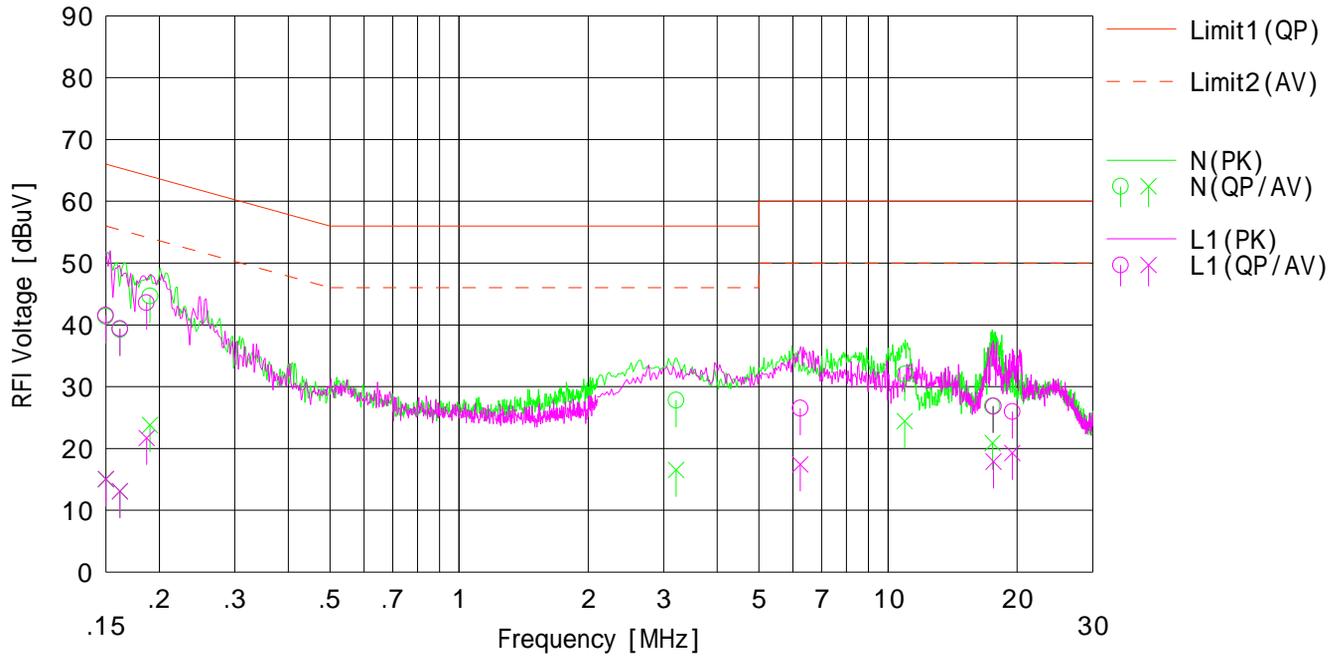
# DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room  
Date : 2016/04/24

Model No. : UPA-WU10R Serial No. : 5 Remarks : -	Mode : Transmitting Order No. : 11154873S Power : AC 120 V / 60 Hz Temp./Humi. : 23 deg.C / 60 %RH
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Limit1 : FCC 15C(15.207) QP  
 Limit2 : FCC 15C(15.207) AV

Engineer : Yosuke Ishikawa



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	0.15000	28.80	2.40	12.58	41.38	14.98	66.00	56.00	24.6	41.0	N	
2	0.16192	26.70	0.50	12.58	39.28	13.08	65.36	55.36	26.0	42.2	N	
3	0.19045	32.10	11.20	12.58	44.68	23.78	64.02	54.02	19.3	30.2	N	
4	3.20643	15.00	3.70	12.81	27.81	16.51	56.00	46.00	28.1	29.4	N	
5	10.93829	18.80	11.20	13.23	32.03	24.43	60.00	50.00	27.9	25.5	N	
6	17.51066	13.40	7.40	13.48	26.88	20.88	60.00	50.00	33.1	29.1	N	
7	0.15000	29.00	2.50	12.58	41.58	15.08	66.00	56.00	24.4	40.9	L1	
8	0.16180	26.80	0.50	12.58	39.38	13.08	65.37	55.37	25.9	42.2	L1	
9	0.18680	31.00	9.10	12.58	43.58	21.68	64.18	54.18	20.6	32.5	L1	
10	6.24389	13.50	4.40	13.00	26.50	17.40	60.00	50.00	33.5	32.6	L1	
11	17.63389	13.40	4.40	13.48	26.88	17.88	60.00	50.00	33.1	32.1	L1	
12	19.48124	12.40	5.70	13.55	25.95	19.25	60.00	50.00	34.0	30.7	L1	

Calculation: Result [dBuV] = Reading [dBuV] + C.Fac (LISN+Cable+ATT) [dB]  
 LISN: SLS - 03

**DATA OF RADIATION TEST (Regulation: FCC 15.517(c))**

UL Japan, Inc.

Shonan EMC Lab. No.2 and No.3 Semi-Anechoic Chamber

Model	: UPA-WU10R	Regulation	: FCC Part15F Section 15.517(c)
Sample No.	: 5	Test Distance	: 3 m / 0.5 m / 0.3 m / 0.1 m
Power	: DC5 V (from USB)	Anechoic Chamber	No.3 No.3 No.2
Mode	: Transmitting	Date	: April 16, 2016 April 22, 2016 April 24, 2016
		Temperature	: 23 deg.C 25 deg.C 23 deg.C
		Humidity	: 29 %RH 50 %RH 60 %RH
		ENGINEER	: Hiroyuki Morikawa Yosuke Ishikawa Yosuke Ishikawa

**Horizontal (RBW: 1 MHz)**

No.	FREQ [MHz]	READING [dBuV]	ANT Factor [dB]	AMP GAIN [dB]	CABLE LOSS [dB]	Distance Factor [dB]	RESULT		LIMIT [dBm]	MARGIN [dB]	Detector
							3 m [dBuV/m]	EIRP [dBm]			
1	3168.00	47.9	28.2	40.8	2.8	15.6	22.5	-72.7	-41.3	31.4	RMS
2	5280.00	38.9	32.2	39.0	3.6	15.6	20.1	-75.1	-41.3	33.8	RMS
3	8536.00	56.8	37.4	40.7	4.6	15.6	42.5	-52.7	-41.3	11.4	RMS

No1-3: 0.5 m

**Vertical (RBW: 1 MHz)**

No.	FREQ [MHz]	READING [dBuV]	ANT Factor [dB]	AMP GAIN [dB]	CABLE LOSS [dB]	Distance Factor [dB]	RESULT		LIMIT [dBm]	MARGIN [dB]	Detector
							3 m [dBuV/m]	EIRP [dBm]			
1	3168.00	45.6	28.2	40.8	2.8	15.6	20.2	-75.0	-41.3	33.7	RMS
2	5280.00	36.3	32.2	39.0	3.6	15.6	17.5	-77.7	-41.3	36.4	RMS
3	8504.00	58.5	37.4	40.7	4.6	15.6	44.1	-51.1	-41.3	9.8	RMS

No1-3: 0.5 m

Sample Calculation :

RESULT=Reading + ANT Factor - Amp Gain + Loss (Cable) - Distance Factor

Distance Factor calculation 0.5 m:  $20 \cdot \log(3.0 \text{ m} / 0.5 \text{ m}) = 15.6 \text{ dB}$ 

RESULT (EIRP) = RESULT (3 m field strength) - 95.2

**Emissions from digital circuitry (limits in Section 15.209)****Horizontal**

No.	FREQ [MHz]	READING [dBuV]	ANT Factor [dB]	AMP GAIN [dB]	CABLE LOSS [dB]	Distance Factor [dB]	RESULT		LIMIT [dB]	MARGIN [dB]	Detector
							3 m [dBuV/m]	[dBuV/m]			
1	180.00	30.9	15.9	32.1	8.0	0.0	22.7	43.5	20.8	QP	
2	16896.00	44.0	41.0	39.8	10.0	20.0	35.2	53.9	18.7	RMS	
3	33792.00	74.8	43.2	66.5	17.0	29.5	39.0	53.9	14.9	RMS	

No1: 3.0 m, No2: 0.3 m, No3: 0.1 m

**Vertical**

No.	FREQ [MHz]	READING [dBuV]	ANT Factor [dB]	AMP GAIN [dB]	CABLE LOSS [dB]	Distance Factor [dB]	RESULT		LIMIT [dB]	MARGIN [dB]	Detector
							3 m [dBuV/m]	[dBuV/m]			
1	56.42	35.3	8.3	32.2	7.0	0.0	18.4	40.0	21.6	QP	
2	60.00	37.8	7.3	32.2	7.1	0.0	20.0	40.0	20.0	QP	
3	72.00	45.2	5.9	32.2	7.2	0.0	26.1	40.0	13.9	QP	
4	124.01	27.7	12.9	32.1	7.6	0.0	16.1	43.5	27.4	QP	
5	180.00	37.9	15.9	32.1	8.0	0.0	29.7	43.5	13.8	QP	
6	16896.00	42.0	41.0	39.8	10.0	20.0	33.2	53.9	20.7	RMS	
7	33792.00	67.0	43.2	66.5	17.0	29.5	31.2	53.9	22.7	RMS	

No1-5: 3.0 m, No6: 0.3 m, No7: 0.1 m

Distance Factor calculation 0.3 m:  $20 \cdot \log(3.0 \text{ m} / 0.3 \text{ m}) = 20.0 \text{ dB}$ 0.1 m:  $20 \cdot \log(3.0 \text{ m} / 0.1 \text{ m}) = 29.5 \text{ dB}$

**DATA OF RADIATION TEST (Regulation: FCC 15.517(d))**

UL Japan, Inc.  
Shonan EMC Lab. No.3 Semi-Anechoic Chamber

Model	: UPA-WU10R	Regulation	: FCC Part15F Section 15.517(d)
Sample No.	: 5	Test Distance	: 0.5 m
Power	: DC5 V (from USB)	Date	: April 16, 2016
Mode	: Transmitting	Temperature	: 23 deg.C
		Humidity	: 29 %RH

ENGINEER : Hiroyuki Morikawa

***Horizontal (RBW: 1 kHz)***

No.	FREQ [MHz]	READING [dBuV]	ANT Factor [dB]	AMP GAIN [dB]	CABLE LOSS [dB]	Distance Factor [dB]	RESULT		LIMIT [dBm]	MARGIN [dB]	Detector
							3 m [dBuV/m]	EIRP [dBm]			
1	1239.99	28.3	24.5	40.7	1.9	15.6	-1.6	-96.8	-85.3	11.5	RMS
2	1608.01	23.6	25.3	40.8	2.1	15.6	-5.3	-100.6	-85.3	15.3	RMS

***Vertical (RBW: 1 kHz)***

No.	FREQ [MHz]	READING [dBuV]	ANT Factor [dB]	AMP GAIN [dB]	CABLE LOSS [dB]	Distance Factor [dB]	RESULT		LIMIT [dBm]	MARGIN [dB]	Detector
							3 m [dBuV/m]	EIRP [dBm]			
1	1239.99	28.7	24.5	40.7	1.9	15.6	-1.3	-96.5	-85.3	11.2	RMS
2	1608.01	17.8	25.3	40.8	2.1	15.6	-11.2	-106.4	-85.3	21.1	RMS

Sample Calculation :

RESULT=Reading + ANT Factor - Amp Gain + Loss (Cable) - Distance Factor

Distance Factor calculation:  $20 \cdot \log(3.0 \text{ m} / 0.5 \text{ m}) = 15.6 \text{ dB}$

RESULT (EIRP) = RESULT (3 m field strength) - 95.2

**DATA OF RADIATION TEST (Regulation: FCC 15.517(e))**

UL Japan, Inc.  
Shonan EMC Lab. No.3 Semi-Anechoic Chamber

Model	: UPA-WU10R	Regulation	: FCC Part15F Section 15.517(e)
Sample No.	: 5	Test Distance	: 0.5 m
Power	: DC5 V (from USB)	Date	: April 16, 2016
Mode	: Transmitting	Temperature	: 23 deg.C
		Humidity	: 29 %RH

ENGINEER : Hiroyuki Morikawa

***Horizontal (RBW: 3 MHz)***

No.	FREQ [MHz]	READING [dBuV]	ANT Factor [dB]	AMP GAIN [dB]	CABLE LOSS [dB]	Distance Factor [dB]	RESULT		LIMIT EIRP [dBm]	MARGIN [dB]	Detector
							3 m [dBuV/m]	EIRP [dBm]			
1	8520.00	72.7	37.4	40.7	4.6	15.6	58.5	-12.3	0.0	12.3	Peak

***Vertical (RBW: 3 MHz)***

No.	FREQ [MHz]	READING [dBuV]	ANT Factor [dB]	AMP GAIN [dB]	CABLE LOSS [dB]	Distance Factor [dB]	RESULT		LIMIT EIRP [dBm]	MARGIN [dB]	Detector
							3 m [dBuV/m]	EIRP [dBm]			
1	8195.00	74.8	37.6	40.6	4.5	15.6	60.7	-10.1	0.0	10.1	Peak

Sample Calculation :

RESULT=Reading + ANT Factor - Amp Gain + Loss (Cable) - Distance Factor

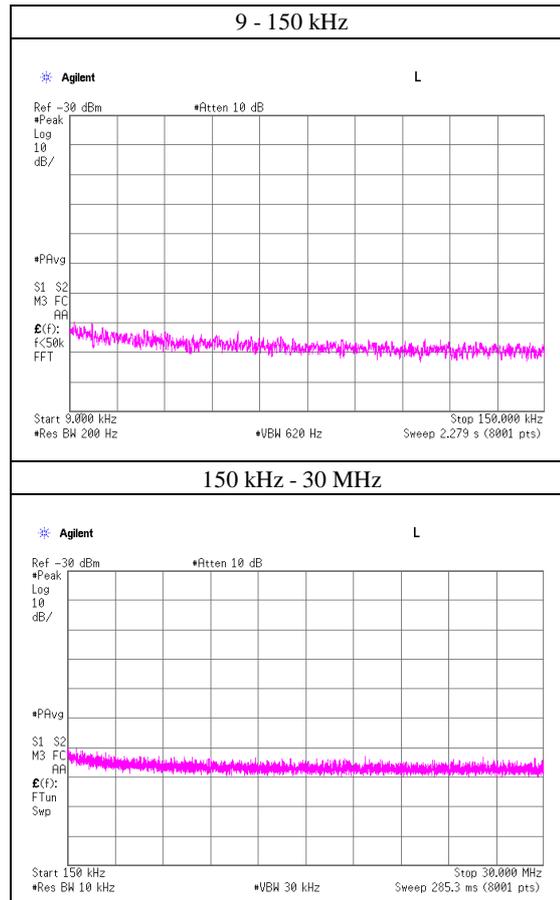
Distance Factor calculation:  $20 \cdot \log(3.0 \text{ m} / 0.5 \text{ m}) = 15.6 \text{ dB}$

RESULT (EIRP) = RESULT (3 m field strength) - 95.2 -  $20 \log(\text{RBW}/50)$

## DATA OF CONDUCTED TEST (Regulation: FCC 15.517(c))

UL Japan, Inc.  
Shonan EMC Lab. No.5 Shielded room

		Regulation	: FCC Part15F Section 15.517(c)
Model	: UPA-WU10R	Test Distance	: -
Sample No.	: 5	Date	: March 18, 2016
Power	: DC5 V (from USB)	Temperature	: 26 deg.C
Mode	: Transmitting	Humidity	: 34 %RH
		ENGINEER	: Kenichi Adachi



### Bandwidth (Regulation: FCC 15.503(d) 517(b))

UL Japan, Inc. Shonan EMC Lab. No.2 Shielded Room

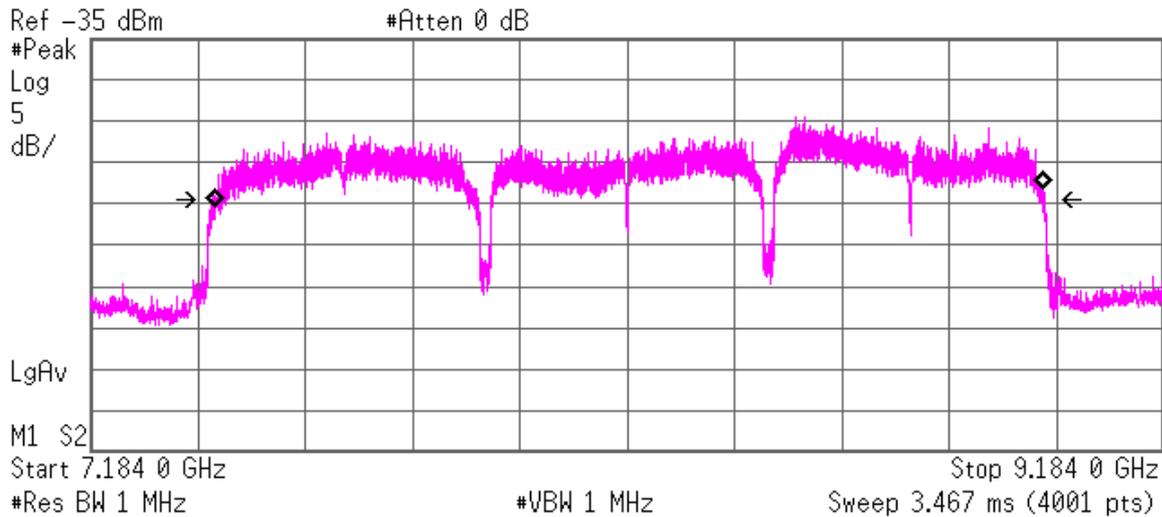
MODEL NUMBER: UPA-WU10R  
 SERIAL NUMBER: 5  
 POWER : DC5 V (from USB)  
 Remarks : -

REGULATION : FCC Part15SubpartF 503(d) 517(b)  
 DATE : April 24, 2016  
 TEMP./HUMI : 23 deg.C / 60 %RH  
 TEST MODE : Transmitting  
 ENGINEER : Yosuke Ishikawa

10dB Bandwidth: 1549 MHz (LIMIT: >500MHz)  
 Occupied Bandwidth (99%) : 1541.3 MHz

 Agilent

R T



Occupied Bandwidth  
 1.5413 GHz

Occ BW % Pwr 99.00 %  
 x dB -10.00 dB

Transmit Freq Error 3.181 MHz  
 x dB Bandwidth 1.549 GHz

Start Frequency: 7184 MHz  
 Stop Frequency: 9184 MHz

## APPENDIX 2 Test Instruments

### EMI test equipment (1/2)

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
SAF-06	Pre Amplifier	TOYO Corporation	TPA0118-36	1440491	RE	2015/05/27 * 12
SCC-G12	Coaxial Cable	Suhner	SUCOFLEX 102	30790/2	RE	2016/03/23 * 12
SCC-G23	Coaxial Cable	Suhner	SUCOFLEX 104	297342/4	RE	2015/05/19 * 12
SHA-03	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-739	RE	2015/08/11 * 12
SOS-05	Humidity Indicator	A&D	AD-5681	4062518	RE	2015/10/22 * 12
KSA-08	Spectrum Analyzer	Agilent	E4446A	MY46180525	RE	2016/03/28 * 12
SJM-02	Measure	KOMELON	KMC-36	-	RE	-
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,CE, RF, MF)	-	RE	-
STS-03	Digital Hitester	Hioki	3805-50	080997823	RE	2015/11/18 * 12
SAEC-03(SVSWR)	Semi-Anechoic Chamber	TDK	SAEC-03(SVSWR)	3	RE	2015/08/28 * 12
SCC-G13	Coaxial Cable	Suhner	SUCOFLEX 102	31599/2	RE	2016/03/23 * 12
SAEC-02(NSA)	Semi-Anechoic Chamber	TDK	SAEC-02(NSA)	2	RE	2015/07/15 * 12
KAF-04	Pre Amplifier	Agilent	8449B	3008A01600	RE	2016/04/22 * 12
SCC-G05	Coaxial Cable	Junkosha	J12J102207-00	APR-30-15-03 7	RE	2015/05/11 * 12
SCC-G22	Coaxial Cable	Suhner	SUCOFLEX 104	296199/4	RE	2015/05/19 * 12
SHA-02	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-726	RE	2015/08/10 * 12
SOS-03	Humidity Indicator	A&D	AD-5681	4063325	RE	2015/10/22 * 12
STR-07	Test Receiver	Rohde & Schwarz	ESU26	100484	RE	2015/09/04 * 12
SJM-09	Measure	PROMART	SEN1935	-	RE	-
STS-02	Digital Hitester	Hioki	3805-50	080997819	RE	2016/03/22 * 12
SHA-05	Horn Antenna	ETS LINDGREN	3160-09	LM4210	RE	2016/03/24 * 12
SAF-09	Pre Amplifier	TOYO Corporation	HAP18-26W	00000018	RE	2015/09/07 * 12
SCC-G20	Coaxial Cable	Junkosha	J12J102518-00	APR-15-15-00 3	RE	2016/04/18 * 12
SHA-06	Horn Antenna	ETS LINDGREN	3160-10	LM3459	RE	2016/03/24 * 12
SAF-10	Pre Amplifier	TOYO Corporation	HAP26-40W	00000010	RE	2016/03/23 * 12
SCC-G19	Coaxial Cable	Suhner	SUCOFLEX 102A	1188/2A	RE	2016/03/08 * 12
SAEC-03(NSA)	Semi-Anechoic Chamber	TDK	SAEC-03(NSA)	3	RE	2015/07/16 * 12
SBA-03	Biconical Antenna	Schwarzbeck	BBA9106	91032666	RE	2015/10/11 * 12
SLA-03	Logperiodic Antenna	Schwarzbeck	UHALP9108A	UHALP 9108-A 0901	RE	2015/10/11 * 12
SAT6-08	Attenuator	HIROSE ELECTRIC CO.,LTD.	AT-406(40)	-	RE	2015/08/31 * 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/141PE/NS4906	-/0901-271(RF Selector)	RE	2016/04/22 * 12
SAF-03	Pre Amplifier	SONOMA	310N	290213	RE	2016/02/25 * 12
STR-06	Test Receiver	Rohde & Schwarz	ESCI	101259	RE	2016/03/28 * 12
SJM-15	Measure	ASKUL	-	-	RE	-

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 :

CE: Conducted emission , RE: Radiated emission , AT: Antenna terminal conducted tests

## APPENDIX 2 Test Instruments

### EMI test equipment (2/2)

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
SCC-B12/B13/ SRSE-02	Coaxial Cable&RF Selector	Suhner/Suhner/TOYO	RG223U/141PE/N S4906	-/0901-270(RF Selector)	CE	2016/04/22 * 12
SLS-03	LISN	Rohde & Schwarz	ENV216	100513	CE	2016/02/08 * 12
SLS-04	LISN	Rohde & Schwarz	ENV216	100514	CE	2016/02/09 * 12
SAT3-06	Attenuator	JFW	50HF-003N	-	CE	2016/02/25 * 12
SOS-04	Humidity Indicator	A&D	AD-5681	4061512	CE	2015/12/07 * 12
STM-03	Terminator	TME	CT-01 BP	-	CE	2015/12/18 * 12
STR-07	Test Receiver	Rohde & Schwarz	ESU26	100484	CE	2015/09/04 * 12
SJM-09	Measure	PROMART	SEN1935	-	CE	-
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,CE, RF,IMF)	-	CE	-
STS-02	Digital Hitester	Hioki	3805-50	080997819	CE	2016/03/22 * 12
SSA-03	Spectrum Analyzer	Agilent	E4448A	MY48250152	AT	2015/09/16 * 12
SCC-G11	Coaxial Cable	Suhner	SUCOFLEX 102	31595/2	AT	2016/03/23 * 12
SOS-09	Humidity Indicator	A&D	AD-5681	4061484	AT	2015/12/07 * 12

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 :

- CE: Conducted emission ,
- RE: Radiated emission ,
- AT: Antenna terminal conducted tests