



RADIO TEST REPORT

Test Report No.: 30DE0169-SH-01-B

Applicant : KONICA MINOLTA MEDICAL & GRAPHIC, INC.
Type of Equipment : AeroDR SYSTEM
Model No. : AeroDR P-11
FCC ID : YR7AERODRP1
Test regulation : FCC Part15 Subpart E: 2010
Test result : Complied

1. This test report shall not be reproduced in full or partial, without the written approval of UL Japan, Inc.
2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the limits of the above regulation.
4. The test results in this test report are traceable to the national or international standards.

Date of test:

May 26, 28, 29 and June 3, 2010

**Representative
test engineer:**

Tatsuya Arai
Engineer of EMC Service

Approved by:

Go Ishiwata
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MF058b (15.09.10)

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1 Applicant information

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

2.1 Identification of E.U.T.

Type of Equipment : AeroDR SYSTEM
Model No. : AeroDR P-11
Serial No. : 11
Rating : DC15V
Country of Mass-production : Japan
Condition of EUT : Engineering prototype
(Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT : No modification by the test lab.
Receipt Date of Sample : May 25, 2010

2.2 Product description

Model: AeroDR P-11 (referred to as the EUT in this report) is a AeroDR SYSTEM.

The similar models of the EUT are as follows

AeroDR P-11:High image Quality
AeroDR P-12:Standard image Quality

Equipment type : Transceiver
Frequency of operation : 5180-5320MHz
5745-5825MHz *1
Clock frequency : 32.768kHz, 26MHz
Bandwidth & channel spacing : Bandwidth : 18MHz
Channel spacing : 20MHz
Type of modulation : 11a : OFDM
Antenna type : Planar Inverted F Antenna
Antenna gain with cable loss : +3.78dBi
Antenna connector type : U.FL
ITU code : D1D, G1D
Operation temperature range : +10 to +30 deg.C.
*1) Refer to 30DE0169-SH-01-A, FCC part 15C (FCC15.247) report..

FCC Part15.31 (e)

This EUT provides stable voltage (DC3.3V) constantly to RF part regardless of input voltage. Therefore, this EUT complies with the requirement.

FCC Part15.203 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.

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3 Test specification, procedures and results

3.1 Test specification

Test specification : FCC Part 15 Subpart E: 2010, final revised on January 22, 2010 and effective March 1, 2010
Title : FCC 47CFR Part15 Radio Frequency Device
: Subpart E Unlicensed National Information Infrastructure Devices
: Section 15.407 General technical requirements

3.2 Procedures & Results

Item	Test Procedure	Specification	Remarks	Deviation	Worst Margin	Results
Conducted Emission	ANSI C63.4:2003 7. AC powerline conducted emission measurements	15.407 (b)(6) and 15.207	-	N/A *1)	N/A	N/A
26dB Emission Bandwidth	ANSI C63.4:2003 13. Measurement of intentional radiators	FCC 15.407(a)(1)(2)	Conducted	N/A	See data	Complied
Maximum Peak Output Power	ANSI C63.4:2003 13. Measurement of intentional radiators	FCC 15.407 (a)(1)(2)	Conducted	N/A		Complied
Peak Power Spectral Density	ANSI C63.4:2003 13. Measurement of intentional radiators	FCC 15.407 (a)(1)(2)	Conducted	N/A		Complied
Peak Excursion Ratio	ANSI C63.4:2003 13. Measurement of intentional radiators	FCC 15.407 (a)(6)	Conducted	N/A		Complied
Out of Band Emission & Restricted Band Edges	ANSI C63.4:2003 13. Measurement of intentional radiators	15.407 (b)(1)(2)(4)(6) (7), 15.205 and 15.209	Conducted	N/A		Complied
Out of Band Emission & Restricted Band Edges	ANSI C63.4:2003 13. Measurement of intentional radiators	FCC 15.109, 15.407 (b)(1)(2)(5)(6) (7), 15.205 and 15.209	Radiated	N/A		0.2dB (10600.00MHz, Horizontal, AV, 11a Tx 5300MHz)
Dynamic Frequency Selection	FCC 06-96 APPENDIX	FCC 15.407 (h)(2)	Conducted	*2)	N/A	N/A

Note: UL Japan's EMI Work Procedures No. QPM05 and No. QPM15.
These tests were also referred to FCC Public Notice DA02-2138 "Measurement Procedure Updated for Peak Transmit Power in the Unlicensed National Information Infrastructure (U-NII) Bands".

*1) This equipment cannot operate WLAN card when it is connected to the control box at the interface cable. In that case, it can only use wire communication mode. This mode is tested by customer based on IEC 60601-1-2 for the compliance of Part 15 subpart B.

*2) Refer to 30DE0169-SH-01-C, FCC part 15E (FCC15.407) DFS report.

3.3 Addition to standard

Item	Test Procedure	Specification	Remarks	Worst Margin	Results
Occupied bandwidth (99%)	ANSI C63.4:2003 13. Measurement of intentional radiators RSS-Gen 4.6.1	RSS-Gen 4.6.1	Conducted	-	Complied

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

3.4 Uncertainty

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

Item	Frequency range	No.1 SAC ^{*1} (±)	No.2 SAC (±)	No.3 SAC (±)
Radiated emission (Measurement distance: 3m)	30MHz-300MHz	4.6 dB	4.5 dB	4.9 dB
	300MHz-1GHz	4.5 dB	4.6 dB	5.1 dB
	1GHz-13GHz	3.9 dB	3.9 dB	4.0 dB
Radiated emission (Measurement distance: 1m)	13GHz-18GHz	4.8 dB	4.8 dB	4.8 dB
	18GHz-40GHz	4.2 dB	4.2 dB	4.2 dB

*1: SAC=Semi-Anechoic Chamber

Radiated Emission Test

The data listed in this report meets the limits unless the uncertainty is taken into consideration.

Antenna Conducted Test

Conducted emissions Measurement (below 1GHz) uncertainty for this test was: (±) 1.1dB
Conducted emissions Measurement (1G-3GHz) uncertainty for this test was: (±) 1.2dB
Conducted emissions, Power Density Measurement (3G-18GHz) uncertainty for this test was: (±) 2.9dB
Conducted emissions Measurement (18G-26.5GHz) uncertainty for this test was: (±) 3.4dB
Conducted emissions Measurement (26.5G-40GHz) uncertainty for this test was: (±) 3.7dB
Power Measurement uncertainty above 1GHz for this test was: (±) 0.8dB
Bandwidth Measurement uncertainty for this test was: (±) 5.4%

3.5 Test location

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No.1/ No.2/ No.3 anechoic chamber has been fully described in a report submitted to FCC office, and accepted on April 17, 2009 (Registration No.: 697847).

IC Registration No. : 2973D-1 (No1 anechoic chamber)
2973D-2 (No2 anechoic chamber)
2973D-3 (No3 anechoic chamber)

Test room	Width x Depth x Height (m)	Test room	Width x Depth x Height (m)
No.1 Semi-anechoic chamber	20.6 x 11.3 x 7.65 Maximum measurement distance: 10m	No.1 Shielded room	6.8 x 4.1 x 2.7
No.2 Semi-anechoic chamber	20.6 x 11.3 x 7.65 Maximum measurement distance: 10m	No.2 Shielded room	6.8 x 4.1 x 2.7
No.3 Semi-anechoic chamber	12.7 x 7.7 x 5.35 Maximum measurement distance: 5m	No.3 Shielded room	6.3 x 4.7 x 2.7
No.4 Full-anechoic chamber	8.1 x 5.1 x 3.55	No.4 Shielded room	4.4 x 4.7 x 2.7
		No.5 Shielded room	7.8 x 6.4 x 2.7
		No.6 Shielded room	7.8 x 6.4 x 2.7

3.6 Test setup, Data of EMI & Test instruments

Refer to Appendix 1 to 3.

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4 System test configuration

4.1 Justification

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

Mode	Remarks*
IEEE 802.11a (11a)	9Mbps, PN9
*The worst condition was determined based on the test result of Maximum Peak Output Power (Low Channel)	

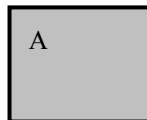
Test Item	Operating Mode	Tested frequency
26dB Bandwidth	11a Tx	[Low Band]
Occupied Bandwidth (99%)		5180MHz
Maximum Peak Output Power		5220MHz
Peak Power Spectral Density		5240MHz
Peak Excursion Ratio		[Middle Band]
Out of Band Emissions		5260MHz
		5300MHz
		5320MHz

*EUT has the power settings by the software as follows;

Power settings: 14

Software: KM-TB7-R-052-00 Version 00

4.2 Configuration and peripherals



Description of EUT and support equipment

No.	Item	Model number	Serial number	Manufacturer	FCC ID (Remark)
A	AeroDR SYSTEM	AeroDR P-11	11	KONICA MINOLTA MEDICAL & GRAPHIC, INC.	YR7AERODRP1 (EUT)

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5 26dB Bandwidth & Occupied Bandwidth (99%)

Test Procedure

The bandwidth was measured with a spectrum analyzer connected to the antenna port.

Summary of the test results: Pass

Date : June 6, 2010 Test engineer : Tatsuya Arai

6 Maximum Peak Output Power

Test Procedure

The Maximum Peak Output Power was measured with a spectrum analyzer connected to the antenna port. The test was made with the spectrum analyzer that has a function of channel-power measurement. We followed the method 1 specified in DA-02-2138A1.

Summary of the test results: Pass

Date : June 6, 2010 Test engineer : Tatsuya Arai

7 Peak Power Spectral Density

Test Procedure

The peak power spectral density was measured with a spectrum analyzer connected to the antenna port. We followed the method 2 specified in DA-02-2138A1.

Summary of the test results: Pass

Date : June 6, 2010 Test engineer : Tatsuya Arai

8 Peak Excursion Ratio

Test Procedure

The Peak Excursion Ratio was measured with a spectrum analyzer connected to the antenna port. The second sweep was measured based on method 1 specified in DA-02-2138A1

Summary of the test results: Pass

Date : June 6, 2010 Test engineer : Tatsuya Arai

9 Out of Band Emissions (Antenna Port Conducted)

Test Procedure

The Out of Band Emissions was measured with a spectrum analyzer connected to the antenna port.

Summary of the test results: Pass

Date : June 6, 2010 Test engineer : Shinichi Takano

10 Out of band emissions (Radiated)

10.1 Operating environment

The test was carried out in No.3 Semi-anechoic chamber.

10.2 Test configuration

EUT was placed on a urethane platform of nominal size, 0.5m by 1.5m, raised 80cm above the conducting ground plane. Photographs of the set up are shown in Appendix 1.

10.3 Test conditions

Frequency range : 30MHz - 40GHz

10.4 Test procedure

The Radiated Electric Field Strength intensity has been measured with a ground plane and at a distance of 3m(below 13GHz) and 1m(above13GHz).

The measuring antenna height was varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.

The measurements were performed for both vertical and horizontal antenna polarization.

Measurements were performed with QP, PK, and AV detector.

The radiated emission measurements were made with the following detector function of the test receiver.

Frequency	Below 1GHz	Above 1GHz
Instrument used	Test Receiver	Spectrum Analyzer *1)
Detector IF Bandwidth	QP: BW 120kHz	PK: RBW: 1MHz/VBW: 3MHz, AV RBW: 1MHz VBW: 10Hz (No pulse emission detected)
Measuring antenna	Biconical (30-300MHz) Logperiodic (300MHz-1GHz)	Horn
Test distance	3m	3m(below 13GHz) 1m(above 13GHz)

*1) When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

Substitution Method

- 1) EUT was placed on a platform of nominal size, 0.5m by 1.5m, raised 0.8m above the conducting ground plane. Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The Radiated Electric Field Strength has been measured in semi anechoic chamber at a distance of 3m (below 13GHz) and 1m(above13GHz)..
The measuring antenna height was varied between 1 to 4m and the turn table 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.
Spurious emissions were observed with enough time according to the test standard.
- 2) Exchanged the EUT to the Substitution Antenna, the measurement was set for the same height 0.8m as the EUT. 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) EIRP 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). The EIRP was calculated by compensating the finite difference in the Antenna gain of Substitution Antenna.

The radiated emission measurements were made with the following detector function of the spectrum analyzer.

Instrument used	Spectrum Analyzer
IF Bandwidth	PK: RBW: 1MHz /VBW: 3MHz

The equipment was previously checked at each position of three axis X, Y and Z. The position in which the maximum noise occurred was chosen to put into measurement.

Combinations of the worst case

Model	Worst position	
	Below 1GHz	Above 1GHz
EUT	Horizontal: Y, Vertical: Y	Carrier: Horizontal: X, Vertical: Z Spurious: Horizontal: Y, Vertical: Z

10.5 Band edge

Band edge level at 5150MHz and 5350MHz is below the limits of FCC 15.209. Refer to the data of Radiated emission.

10.6 Results

Summary of the test results : Pass *No noise was detected above the 5th order harmonics.
Date : May 26, 28 and 29, 2010 Test engineer : Shinichi Takano and Tatsuya Arai

APPENDIX 1: Photographs of test setup

Page 12	:	Radiated emission
Page 13	:	Pre-check of the worst position

APPENDIX 2: Test data

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Page 16	:	99% Occupied Bandwidth
Page 17 - 21	:	Peak Output Power
Page 22 - 33	:	Out of band emissions (Radiated)
Page 34 - 46	:	Out of band emissions (Antenna port conducted)
Page 47 - 49	:	Peak power density
Page 50 - 51	:	Peak Excursion Ratio

APPENDIX 3: Test instruments

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