RF Exposure Evaluation Report

Equipment	: LCD Projector
Brand Name	: EPSON
Model No.	: H714A
FCC ID	: BKMAE-H714RX
Standard	: 47 CFR Part 2.1091
Applicant	: SEIKO EPSON CORPORATION 3-3-5 Owa Suwa-shi Nagano-Ken 392-8502, Japan
Manufacturer	: SEIKO EPSON CORPORATION Toyoshina office 6925 Tazawa, Toyoshina Azumino-shi, Nagano 399-8285 Japan

The product sample received on Dec. 07, 2015 and completely tested on Jan. 13, 2016. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with 47 CFR Part 2.1091, and pass the limit.

Sam Chen
SPORTON INTERNATIONAL INC.

Testing Laboratory
1190

TABLE OF CONTENTS

REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA5D0421	Rev. 01	Initial issue of report.	Mar. 02, 2016
FA5D0421	Rev. 02	Adding RF exposure evaluation of Bluetooth.	Apr. 11, 2016

1 General Description

1.1 EUT General Information

The Channel Plan(s)	
Low-rate PHY (LRP) Band	Channel 2 LRP: 60.16275-60.79725 GHz Channel 3 LRP: 62.32275-62.95725 GHz

RF General Information			
Evaluation Mode	**Frequency Range (MHz)**	**Operating Frequency (MHz)**	**Modulation Type**
Bluetooth	2400-2483.5	2402-2480	BR / EDR: FHSS (GFSK / π/4-DQPSK / 8DPSK)

1.2 Testing Location

Testing Location			
☐	HWA YA	ADD : No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL : 886-3-327-3456 FAX : 886-3-327-0973	
☒	JHUBEI	ADD : No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C. TEL : 886-3-656-9065 FAX : 886-3-656-9085	

2 Maximum Permissible Exposure

2.1 Limit of Maximum Permissible Exposure

(A) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm²)	Averaging Time |E|²,|H|² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842 / f	4.89 / f	(900 / f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-100,000			5	6

(B) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm²)	Averaging Time |E|²,|H|² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30

Note: f = frequency in MHz ; *Plane-wave equivalent power density

2.2 MPE Calculation Method

The MPE was calculated at 20 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

E (V/m) = $\frac{\sqrt{30 \times P \times G}}{d}$ Power Density: *Pd* (W/m²) = $\frac{E^2}{377}$

E = Electric field (V/m)

P = RF output power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

Pd = $\frac{30 \times P \times G}{377 \times d^2}$

2.3 Calculated Result and Limit

Exposure Environment	General Population / Uncontrolled Exposure				
Temp	20.5℃	Humidity	32%		
Test Engineer	Owen Hsu	Test Date	Dec. 21, 2015		
Test results					
Maximum EIPR Power of Test Frequency (GHz)	Average EIRP Power (dBm)	Average EIRP Power (mW)	Power Density (S) (mW/cm²)	Separation Distance (cm)	Limit of Power Density (S) (mW/cm²)
LRP 62.64 GHz	25.04	319.14	0.064	20	1.00

For Bluetooth:

Distance (cm)	Test Freq. (MHz)	Antenna Gain (dBi)	Antenna Gain (numeric)	Average Output Power		Power Density (S) (mW/cm²)	Limit of Power Density (S) (mW/cm²)	Test Result
				(dBm)	(mW)			
20	2480	4.80	3.02	1.799	1.513	0.001	1	Complies

Conclusion:

Both of the Low-rate PHY (LRP) Band and Bluetooth can transmit simultaneously, the formula of calculated the MPE is:

CPD1 / LPD1 + CPD2 / LPD2 + ……etc. < 1

CPD = Calculation power density

LPD = Limit of power density

Therefore, the worst-case situation is 0.064 / 1 + 0.001 /1 = 0.065, which is less than “1”. This confirmed that the device complies.