RF Exposure Evaluation Report

APPLICANT	:	Gillon UK LLC
EQUIPMENT	:	HDMI Digital Media Receiver
MODEL NAME	:	LDC9WZ
FCC ID	:	2ALBL-1731
STANDARD	:	47 CFR Part 2.1091

We, SPORTON INTERNATIONAL INC., would like to declare that the device has been evaluated in accordance with 47 CFR Part 2.1091, and pass the limit. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Reviewed by: Eric Huang / Manager

Approved by: Jones Tsai / Manager

Testing Laboratory
1190

SPORTON INTERNATIONAL INC.
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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA730732-01	Rev. 01	Initial issue of report	Jul. 05, 2017
FA730732-01	Rev. 02	Updated section 3 & section 5.	Aug. 15, 2017

1. Administration Data

1.1. Testing Laboratory

Testing Laboratory	
Test Site	SPORTON INTERNATIONAL INC.
Test Site Location	No.52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978

Applicant	
Company Name	Gillon UK LLC
Address	106 E. Sixth Street, Suite 900, Austin, Texas 78701

2. Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT Type	HDMI Digital Media Receiver
Model Name	LDC9WZ
FCC ID	2ALBL-1731
Wireless Technology and Frequency Range	WLAN 2.4GHz Band: 2412 MHz ~ 2472 MHz WLAN 5.2GHz Band: 5180 MHz ~ 5240 MHz WLAN 5.8GHz Band: 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz
Mode	802.11a/b/g/n/ac HT20/HT40/VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

3. Maximum RF average output power among production units

Bluetooth

Mode / Band	Average Power (dBm)			
	BR/EDR			LE
	1Mbps	2Mbps	3Mbps	
2.4 GHz Bluetooth	9.5	6.0	6.0	7.5

WLAN

Band / Frequency (MHz)		IEEE 802.11 Average Power (dBm)		
		11b	11g	HT20
2.4GHz Band Ant 1	2412	17.0	15.0	13.5
	2437	14.0	15.5	15.5
	2462	14.5	15.5	15.5
	2467	14.5	15.5	15.0
	2472	11.0	15.0	14.5
2.4GHz Band Ant 2	2412	17.5	15.0	15.0
	2437	16.5	15.0	15.0
	2462	16.5	15.0	15.0
	2467	15.0	15.0	15.0
	2472	11.0	15.0	15.0
2.4GHz Band Ant 1+2	2412		16.0	14.5
	2437		19.0	19.0
	2462		17.0	17.0
	2467		15.0	15.0
	2472		12.5	13.0

Band / Frequency (MHz)		IEEE 802.11 Average Power (dBm)					
		11a	HT20	HT40	VHT20	VHT40	VHT80
5.2GHz Band Ant 1	5180	15.5	15.0		15.0		
	5190			7.5		7.5	
	5210						7.0
	5220	16.5	16.5		16.5		
	5230			15.5		15.5	
	5240	16.5	16.5		16.5		
5.2GHz Band Ant 2	5180	16.5	16.0		16.0		
	5190			12.0		12.0	
	5210						12.0
	5220	16.5	16.5		16.5		
	5230			16.5		16.5	
	5240	16.5	16.5		16.5		
5.2GHz Band Ant 1+2	5180	17.5	17.5		17.5		
	5190			11.5		11.5	
	5210						11.0
	5220	18.5	18.5		18.5		
	5230			18.5		18.5	
	5240	18.5	18.5		18.5		

Band / Frequency (MHz)		IEEE 802.11 Average Power (dBm)					
		11a	HT20	HT40	VHT20	VHT40	VHT80
5.8GHz Band Ant 1	5745	16.0	16.0		16.0		
	5755			16.0		16.0	
	5775						14.5
	5785	16.0	16.0		16.0		
	5795			16.0		16.0	
	5825	16.0	16.0		16.0		
5.8GHz Band Ant 2	5745	16.0	16.0		16.0		
	5755			16.0		16.0	
	5775						16.0
	5785	16.0	16.0		16.0		
	5795			16.0		16.0	
	5825	16.0	16.0		16.0		
5.8GHz Band Ant 1+2	5745	19.0	19.0		19.0		
	5755			19.0		19.0	
	5775						17.0
	5785	19.0	19.0		19.0		
	5795			19.0		19.0	
	5825	19.0	19.0		19.0		

4. RF Exposure Limit Introduction

According to ANSI/IEEE C95.1-1992, the criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in §1.1310.

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1842/f	4.89/f	*(900/f2)	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				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f2)	30
30-300	27.5	0.073	0.2	30
300-1500			f/1500	30
1500-100,000			1.0	30

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:

$$S = \frac{PG}{4\pi R^2}$$

Where:
S = Power Density
P = Output Power at Antenna Terminals
G = Gain of Transmit Antenna (linear gain)
R = Distance from Transmitting Antenna

5. Radio Frequency Radiation Exposure Evaluation

5.1. Standalone Power Density Calculation

Band	Frequency (MHz)	Antenna Gain (dBi)	Maximum Power (dBm)	Maximum EIRP (dBm)	Maximum EIRP (W)	Average EIRP (mW)	Power Density at 20cm (mW/cm^2)	Limit (mW/cm^2)	Power Density / Limit
Bluetooth	2402	5.52	9.50	15.020	0.032	31.769	0.006	1.000	0.006
2.4GHz WLAN Ant 1	2412	4.40	17.00	21.400	0.138	138.038	0.027	1.000	0.027
2.4GHz WLAN Ant 2	2412	4.68	17.50	22.180	0.165	165.196	0.033	1.000	0.033
2.4GHz WLAN Ant 1+2	2412	4.68	19.00	23.680	0.233	233.346	0.046	1.000	0.046
5GHz WLAN Ant 1	5180	5.47	16.50	21.970	0.157	157.398	0.031	1.000	0.031
5GHz WLAN Ant 2	5180	6.35	16.50	22.850	0.193	192.752	0.038	1.000	0.038
5GHz WLAN Ant 1+2	5180	6.35	19.00	25.350	0.343	342.768	0.068	1.000	0.068

Note:
1. For conservativeness, the lowest frequency of each band is used to determine the MPE limit of that band.
2. In the above table have assessed Bluetooth, 2.4GHz WLAN and 5GHz WLAN by referring to their maximum antenna gain and maximum power.

5.2. Collocated Power Density Calculation

Maximum WLAN Power Density / Limit	Bluetooth Power Density / Limit	∑(Power Density / Limit) of WLAN+Bluetooth
0.068	0.006	0.074

Note:
1. WLAN and Bluetooth can transmit simultaneously.
2. ∑(Power Density / Limit): This is a summation of [(power density for each transmitter/antenna included in the simultaneous transmission)/ (corresponding MPE limit)], for WLAN + Bluetooth.
3. Considering the WLAN module collocation with the Bluetooth transmitter of the EIRP performance listed in the table above, the aggregated (power density /limit) is smaller than 1, and MPE of 2 collocated transmitters is compliant

Conclusion:

According to 47 CFR §2.1091, the RF exposure analysis concludes that the RF Exposure is FCC compliant.