



# RF EXPOSURE EVALUATION REPORT

**FCC ID** : 2AOAI-5432  
**Equipment** : Digital Media Receiver  
**Model Name** : L9D29R  
**Applicant** : Reny7 LLC  
6701 Democracy Blvd. Suite 300  
Bethesda, Maryland, 20817  
**Standard** : 47 CFR Part 2.1091

We, SPORTON INTERNATIONAL INC has been evaluated in accordance with 47 CFR Part 2.1091 for the device and pass the limit.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The results in this variant report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERTIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Approved by: Jones Tsai / Manager

**SPORTON INTERTIONAL INC. EMC & Wireless Communications Laboratory**  
No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)



## **Table of Contents**

1. DESCRIPTION OF EQUIPMENT UNDER TEST (EUT) .....	4
2. MAXIMUM RF AVERAGE OUTPUT POWER AMONG PRODUCTION UNITS .....	5
3. RF EXPOSURE LIMIT INTRODUCTION .....	6
4. RADIO FREQUENCY RADIATION EXPOSURE EVALUATION .....	7
4.1. Standalone Power Density Calculation .....	7
4.2. Collocated Power Density Calculation.....	7



## History of this test report



## 1. Description of Equipment Under Test (EUT)

Product Feature & Specification	
<b>EUT Type</b>	Digital Media Receiver
<b>Model Name</b>	L9D29R
<b>FCC ID</b>	2AOAI-5432
<b>Wireless Technology and Frequency Range</b>	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 Zigbee: 2405 MHz ~ 2480 MHz
<b>Mode</b>	802.11a/b/g/n/ac HT20/HT40/VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE Zigbee: BPSK

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

Reviewed by: Eric Huang

Report Producer: Wan Liu



## 2. Maximum RF average output power among production units

### <Non-beamforming mode>

Mode		Maximum Average Power (dBm)		
		Ant 0	Ant 1	Ant 0+1
2.4GHz WLAN	802.11b	22.0	22.5	25.0
	802.11g	19.5	20.0	23.0
	802.11n-HT20	18.5	19.0	22.0
5GHz WLAN	802.11a	18.0	18.9	21.0
	802.11n-HT20	17.5	17.5	21.0
	802.11n-HT40	17.5	17.5	20.5
	802.11ac-VHT20	17.5	17.5	21.0
	802.11ac-VHT40	17.5	17.5	20.5
	802.11ac-VHT80	16.5	16.5	19.5
Bluetooth BR/EDR		10.5		
Bluetooth LE		3.0		
Zigbee		18.5		

### <Beamforming mode>

Mode		Maximum Average Power (dBm)
		Ant 0+1
5GHz WLAN	802.11ac-VHT20	21.0
	802.11ac-VHT40	20.5
	802.11ac-VHT80	20.0



### 3. 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 <sup>2</sup> )	Averaging time (minutes)
<b>(A) Limits for Occupational/Controlled Exposures</b>				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1842/f	4.89/f	*(900/f <sup>2</sup> )	6
30-300	61.4	0.163	1.0	6
300-1500			f/300	6
1500-100,000			5	6
<b>(B) Limits for General Population/Uncontrolled Exposure</b>				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f <sup>2</sup> )	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



## 4. Radio Frequency Radiation Exposure Evaluation

### 4.1. Standalone Power Density Calculation

<Non-beamforming mode>

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
Zigbee	2405.0	7.34	18.50	25.840	0.384	383.707	0.076	1.000	0.076
Bluetooth	2402.0	4.30	10.50	14.800	0.030	30.200	0.006	1.000	0.006
2.4GHz WLAN	2412.0	4.80	25.00	29.800	0.955	954.993	0.190	1.000	0.190
5GHz WLAN	5180.0	4.50	21.00	25.500	0.355	354.813	0.071	1.000	0.071

**Note:** For conservativeness, the lowest frequency of each band is used to determine the MPE limit of that band

<Beamforming mode>

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
5GHz WLAN	5180.0	7.36	21.00	28.360	0.685	685.488	0.136	1.000	0.136

**Note:**

1. For conservativeness, the lowest uplink frequency of each band is used to determine the MPE limit of that band.
2. This device supports Beamforming for WLAN 5GHz VHT20/VHT40/VHT80; therefore, in the table above which consider maximum directional 7.36dBi for WLAN 5GHz Beamforming mode.

### 4.2. Collocated Power Density Calculation

Maximum Bluetooth Power Density / Limit	Maximum WLAN Power Density / Limit	$\Sigma$ (Power Density / Limit) of Bluetooth+WLAN
0.006	0.190	0.196

**Note:**

1.  $\Sigma$ (Power Density / Limit): This is a summation of [(power density for each transmitter/antenna included in the simultaneous transmission)/ (corresponding MPE limit)], for Bluetooth+WLAN.
2. Considering all 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.