



# RF EXPOSURE EVALUATION REPORT

**FCC ID : 2AP67-5926**  
**Equipment : Digital Media Receiver**  
**Model Name : K9Y29E**  
**Applicant : Onaka LLC**  
**1915 NE Stucki Ave., Ste 400**  
**Beaverton, OR 97006**  
**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: Cona Huang / Deputy Manager

**SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory**  
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### History of this test report

Report No.	Version	Description	Issued Date
FA842410-01	Rev. 01	Initial issue of report	Nov. 02, 2018



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

Product Feature & Specification	
EUT Type	Digital Media Receiver
Model Name	K9Y29E
FCC ID	2AP67-5926
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.

**Reviewed by:** Jason Wang

**Report Producer:** Wan Liu

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

**<Non-Beamforming Mode>**

Band / Mode	Average Power (dBm)			
	BR / EDR			LE
	1M	2M	3M	GFSK
Bluetooth	5	5	5	5

2.4GHz WLAN	Mode	Channel	Frequency (MHz)	ANT0 Tune-Up Limit	ANT1 Tune-Up Limit	MIMO Tune-Up Limit
	802.11b	CH 1	2412	21.00	23.00	24.50
CH 6		2437	20.00	22.50	22.50	
CH 11		2462	19.50	21.00	22.00	
CH 12		2467	18.00	19.50	21.50	
CH 13		2472	14.50	15.00	19.50	
802.11g	CH 1	2412	18.00	18.00	19.50	
	CH 6	2437	19.50	20.00	23.00	
	CH 11	2462	17.00	16.50	18.50	
	CH 12	2467	13.50	14.50	15.00	
	CH 13	2472	10.50	10.00	13.00	
802.11n-HT20	CH 1	2412	17.50	17.00	19.00	
	CH 6	2437	18.50	19.00	22.00	
	CH 11	2462	15.50	16.00	18.00	
	CH 12	2467	12.00	15.50	14.50	
	CH 13	2472	10.00	10.00	12.00	



5.2GHz WLAN	Mode	Channel	Frequency (MHz)	ANT0 Tune-Up Limit	ANT1 Tune-Up Limit	MIMO Tune-Up Limit
	802.11a	36	5180	18.00	20.50	21.50
		44	5220	19.50	20.00	21.50
		48	5240	20.00	20.50	21.50
	802.11n-HT20	36	5180	18.00	19.50	21.50
		44	5220	19.00	19.00	21.50
		48	5240	19.00	19.50	21.50
	802.11n-HT40	38	5190	14.00	15.50	16.50
		46	5230	19.00	19.00	22.00
	802.11ac-VHT20	36	5180	17.50	19.50	21.50
44		5220	18.50	19.00	21.50	
48		5240	19.00	19.50	21.50	
802.11ac-VHT40	38	5190	14.00	15.50	16.50	
	46	5230	18.50	19.00	22.00	
802.11ac-VHT80	42	5210	9.50	14.50	13.00	

5.8GHz WLAN	Mode	Channel	Frequency (MHz)	ANT0 Tune-Up Limit	ANT1 Tune-Up Limit	MIMO Tune-Up Limit
	802.11a	149	5745	20.50	20.50	23.50
		157	5785	20.50	20.50	23.50
		165	5825	19.50	20.00	23.00
	802.11n-HT20	149	5745	19.00	19.50	22.50
		157	5785	19.00	19.50	22.50
		165	5825	18.50	19.00	22.00
	802.11n-HT40	151	5755	19.50	19.50	22.50
		159	5795	19.50	19.50	22.50
	802.11ac-VHT20	149	5745	19.00	19.50	22.50
		157	5785	19.00	19.00	22.50
		165	5825	18.50	19.00	22.00
	802.11ac-VHT40	151	5755	19.50	19.50	22.50
		159	5795	19.50	19.50	22.50
	802.11ac-VHT80	155	5775	18.50	18.50	20.50



**<Beamforming Mode>**

5.2GHz WLAN	Mode	Channel	Frequency (MHz)	MIMO Tune-Up Limit
5.2GHz WLAN	802.11ac-VHT20	36	5180	20.00
		44	5220	21.50
		48	5240	21.50
	802.11ac-VHT40	38	5190	14.50
		46	5230	22.00
	802.11ac-VHT80	42	5210	11.00

5.8GHz WLAN	Mode	Channel	Frequency	MIMO Tune-Up Limit
5.8GHz WLAN	802.11ac-VHT20	149	5745	22.50
		157	5785	22.50
		165	5825	22.50
	802.11ac-VHT40	151	5755	22.50
		159	5795	22.50
	802.11ac-VHT80	155	5775	20.00



### 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 <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	Power Density / Limit
Bluetooth	2402.0	3.01	5.00	8.010	0.006	6.324	0.001	1.000	0.001
2.4GHz WLAN	2412.0	1.41	24.50	25.910	0.390	389.942	0.078	1.000	0.078
5GHz WLAN	5180.0	3.91	23.50	27.410	0.551	550.808	0.110	1.000	0.110

**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 <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	Power Density / Limit
5GHz WLAN	5180.0	5.62	22.50	28.120	0.649	648.634	0.129	1.000	0.129

**Note:**

1. This device supports Beamforming for WLAN 5GHz VHT20/VHT40/VHT80 only; therefore, in the table above which consider maximum directional Gain 5.62dBi for Beamforming mode.
2. In the above table have assessed WLAN 5GHz by referring to the maximum antenna gain and maximum power.

### **4.2. Collocated Power Density Calculation**

WLAN Power Density / Limit	Bluetooth Power Density / Limit	$\Sigma$ (Power Density / Limit) of WLAN+Bluetooth
0.129	0.001	0.130

**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 WLAN + Bluetooth.
2. 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.