



# RF EXPOSURE EVALUATION REPORT

**FCC ID** : 2ASD3-7878  
**Equipment** : Digital Media Receiver  
**Model Name** : C77A68  
**Applicant** : H.C. China X LLC  
3450 N. Triumph Blvd., Suite 102  
Lehi, Utah 84043  
**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 report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL 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
FA941514-01	Rev. 01	Initial issue of report	Aug. 20, 2019
FA941514-01	Rev. 02	Add Ch02/Ch10 tune-up in Section 2	Sep. 06, 2019



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

Product Feature & Specification	
<b>EUT Type</b>	Digital Media Receiver
<b>Model Name</b>	C77A68
<b>FCC ID</b>	2ASD3-7878
<b>Wireless Technology and Frequency Range</b>	WLAN 2.4GHz Band: 2412 MHz ~ 2472 MHz WLAN 5.2GHz Band: 5180 MHz ~ 5240 MHz WLAN 5.3GHz Band: 5260 MHz ~ 5320 MHz WLAN 5.5GHz Band: 5500 MHz ~ 5720 MHz WLAN 5.8GHz Band: 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz
<b>Mode</b>	WLAN: 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:** Daisy Peng



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

Mode Band	Max Average power(dBm)	
	BR/EDR	LE
2.4GHz Bluetooth	7.5	7.5

Mode Band	Mode	Channel	Frequency (MHz)	Data Rate	Tune-Up Limit
	2.4GHz WLAN	802.11b	CH 1	2412	1Mbps
CH 6			2437	17.50	
CH 11			2462	17.50	
CH 12			2467	14.50	
CH 13			2472	12.00	
802.11g		CH 1	2412	6Mbps	16.00
		CH 2	2417		19.50
		CH 6	2437		21.00
		CH 10	2457		21.00
		CH 11	2462		15.50
		CH 12	2467		10.50
802.11n-HT20		CH 13	2472	MCS0	10.50
		CH 1	2412		15.00
		CH 2	2417		19.50
		CH 6	2437		21.00
		CH 10	2457		20.50
		CH 11	2462		15.00
		CH 12	2467	11.50	
	CH 13	2472	10.00		

Mode Band	Mode	Channel	Frequency (MHz)	Data Rate	Tune-Up Limit
	5.2GHz WLAN	802.11a	CH 36	5180	6Mbps
CH 44			5220	19.00	
CH 48			5240	19.00	
802.11n-HT20		CH 36	5180	MCS0	17.50
		CH 44	5220		19.00
		CH 48	5240		19.00
802.11n-HT40		CH 38	5190	MCS0	14.50
		CH 46	5230		19.00
802.11ac-VHT20		CH 36	5180	MCS0	17.50
		CH 44	5220		18.50
		CH 48	5240		18.50
802.11ac-VHT40		CH 38	5190	MCS0	14.50
		CH 46	5230		19.00
802.11ac-VHT80		CH 42	5210	MCS0	12.00



5.3GHz WLAN	Mode	Channel	Frequency (MHz)	Data Rate	Tune-Up Limit
	802.11a	CH 52	5260	6Mbps	19.00
		CH 60	5300		19.00
		CH 64	5320		17.50
	802.11n-HT20	CH 52	5260	MCS0	19.00
		CH 60	5300		19.00
		CH 64	5320		18.00
	802.11n-HT40	CH 54	5270	MCS0	19.00
		CH 62	5310		16.00
	802.11ac-VHT20	CH 52	5260	MCS0	19.00
CH 60		5300	19.00		
CH 64		5320	18.00		
802.11ac-VHT40	CH 54	5270	MCS0	19.00	
	CH 62	5310		16.00	
802.11ac-VHT80	CH 58	5290	MCS0	15.50	

5.5GHz WLAN	Mode	Channel	Frequency (MHz)	Data Rate	Tune-Up Limit
	802.11a	CH 100	5500	6Mbps	18.00
		CH 116	5580		18.50
		CH 140	5700		16.00
		CH 144	5720		19.00
	802.11n-HT20	CH 100	5500	MCS0	17.00
		CH 116	5580		18.50
		CH 140	5700		16.50
		CH 144	5720		19.00
	802.11n-HT40	CH 102	5510	MCS0	12.50
		CH 110	5550		20.00
		CH 134	5670		17.00
		CH 142	5710		20.00
	802.11ac-VHT20	CH 100	5500	MCS0	17.00
		CH 116	5580		18.50
		CH 140	5700		16.00
		CH 144	5720		18.50
	802.11ac-VHT40	CH 102	5510	MCS0	12.00
		CH 110	5550		20.00
		CH 134	5670		17.00
CH 142		5710	20.00		
802.11ac-VHT80	CH 106	5530	MCS0	11.00	
	CH 122	5610		18.50	
	CH 138	5690		20.00	



	Mode	Channel	Frequency (MHz)	Data Rate	Tune-Up Limit
5.8GHz WLAN	802.11a	CH 149	5745	MCS0	18.50
		CH 157	5785		18.50
		CH 165	5825		17.50
	802.11n-HT20	CH 149	5745	MCS0	18.50
		CH 157	5785		18.50
		CH 165	5825		17.50
	802.11n-HT40	CH 151	5755	MCS0	20.00
		CH 159	5795		19.50
	802.11ac-VHT20	CH 149	5745	MCS0	18.00
		CH 157	5785		18.00
		CH 165	5825		17.50
	802.11ac-VHT40	CH 151	5755	MCS0	20.00
		CH 159	5795		19.50
	802.11ac-VHT80	CH 155	5775	MCS0	18.00



### 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

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
2.4GHz WLAN	2412.0	1.80	21.00	22.800	0.191	190.546	0.038	1.000	0.038
5GHz WLAN	5180.0	6.00	20.00	26.000	0.398	398.107	0.079	1.000	0.079
Bluetooth	2402.0	1.00	7.50	8.500	0.007	7.079	0.001	1.000	0.001

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

### 4.2. Collocated Power Density Calculation

WLAN Power Density / Limit	Bluetooth Power Density / Limit	$\Sigma$ (Power Density / Limit) of WLAN+Bluetooth
0.079	0.001	0.080

**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.