Antenna Report

Model No: BV84J9

FCC ID: 2A8FA-6743

IC: 28954-6743

Frequency Range of operation:

- Wi-Fi: 2.4 to 2.48 GHz and 5.15 to 5.85 GHz
- Bluetooth (2.4 GHz): 2.4 to 2.48 GHz

Antenna Types:

- 2.4 GHz: PIFA (PCB Antenna, ANT1)
- 5 GHz: PIFA (PCB Antenna, ANT2)

Peak Antenna Gain:

Band	Peak Gain (dBi)	
	Ant1	Ant2
	PIFA	PIFA
BT	4.5	-
Wi-Fi at 2.4 GHz	-	4.5
Band 1 (5150-5250 MHz)	-	5
Band 2 (5250-5350 MHz)	-	5
Band 3 (5470-5725 MHz)	-	5
Band 4 (5725-5850 MHz)	-	5

Measurement Test Method:

- Solder pigtails on feeding point of antenna and measure passive antenna performance by VNA and OTA chamber system.

Test Equipment calibration information:

Name	Manufacturer	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
Base Station	R&S	CMW500	150823	2023/01/05	2024/01/04
WLAN Dynamic Range Extender	ETS-Lindgren	#115195	00154626	N/A	N/A
Switch Control	ETS-Lindgren	EMCenter	00160100	NCR	NCR
Diagonal Dual Polarized Horn	ETS-Lindgren	3164-08	00099205	NCR	NCR
Multi-Devices Controller	ETS-Lindgren	2090-OPT1	00066604	NCR	NCR
Medium Duty Holder	ETS-Lindgren	2015	N/A	NCR	NCR
Spectrum Analyzer	R&S	FSP 7	100819	2023/5/15	2024/5/14

Test site information: OTA04-KS in Sporton (Jiangsu China)

Test engineer information: Xing-chi Zhou

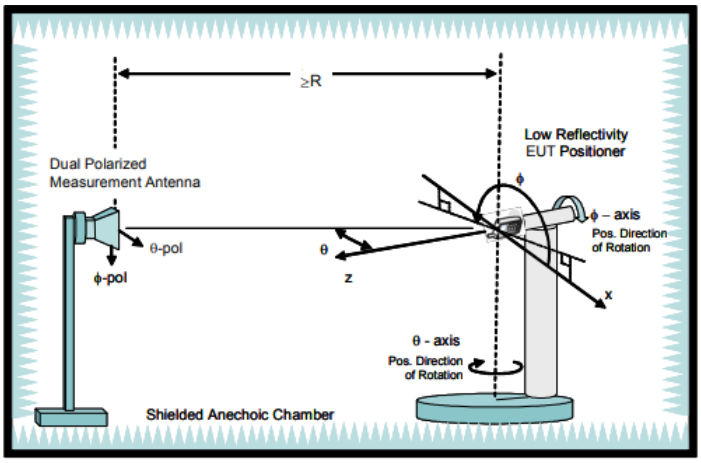
Test Set up (Refer to Antenna Setup Photo file)

1. Set up the device on the tablet jig

2. Set up the jig and device on the chamber turn table and connect the signal cable

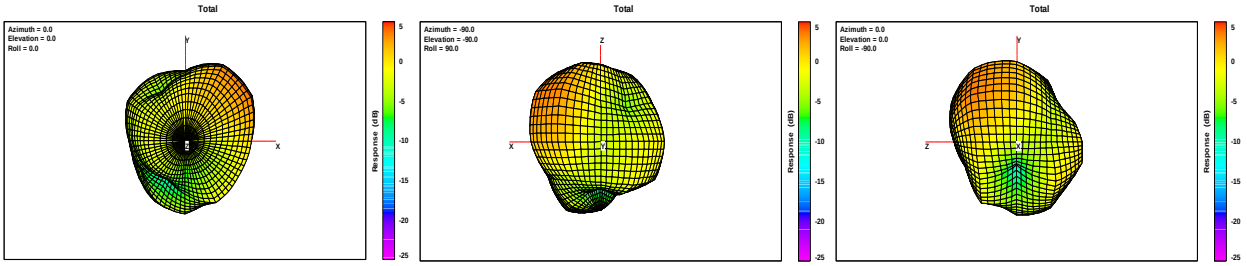
3. Measure the 3D passive performance according to the following coordinate axis

$\theta = 0$ degree
$\theta = 90$ degree

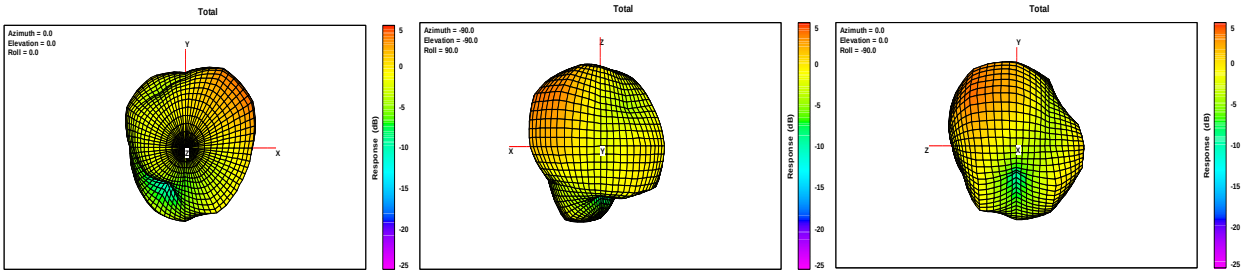


Antenna Pattern

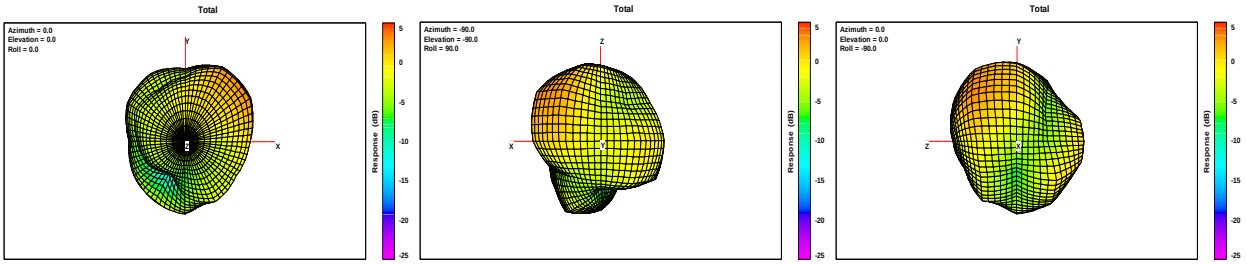
Wifi---2.4G



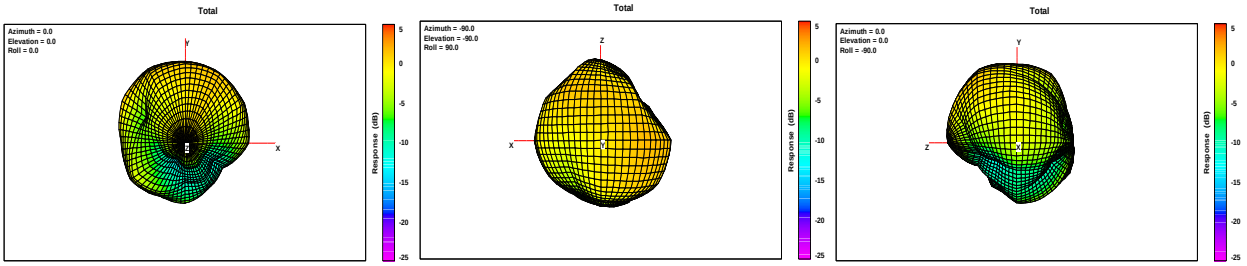
Wifi---2.45G



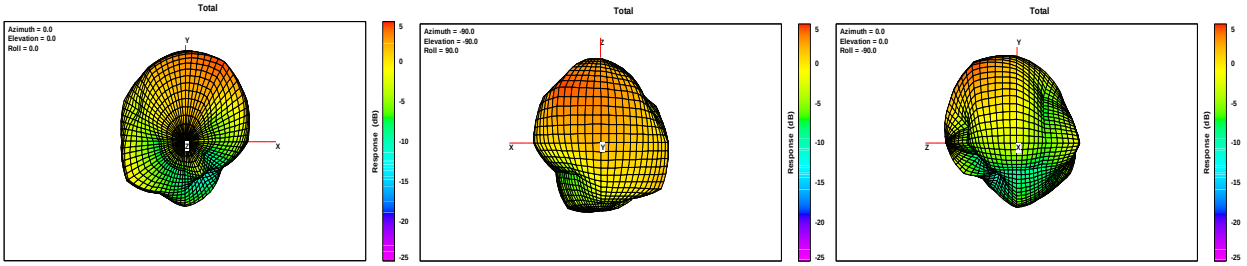
Wifi---2.5G



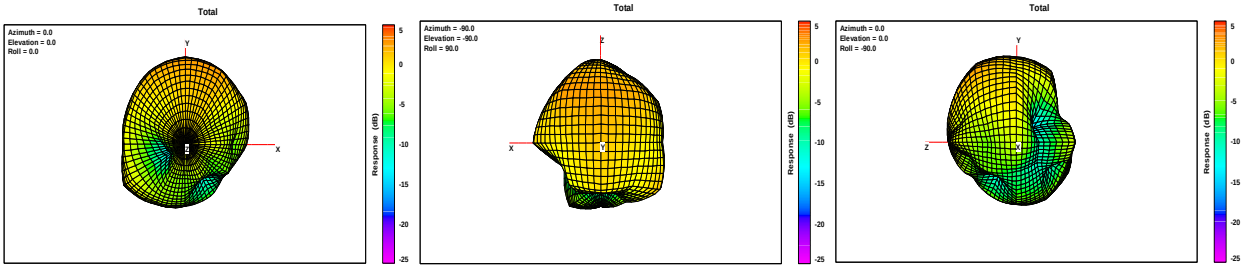
Wifi---5.15G



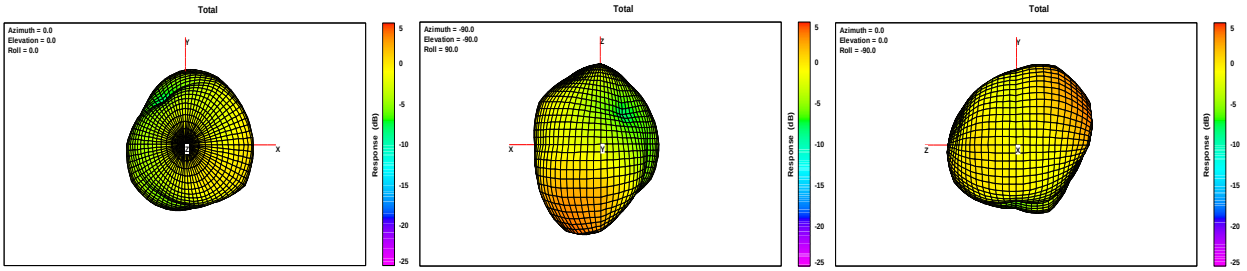
Wifi---5.5G



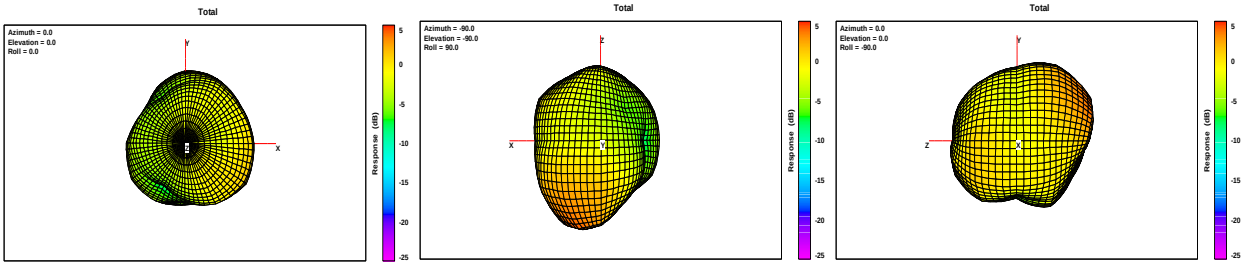
Wifi---5.85G



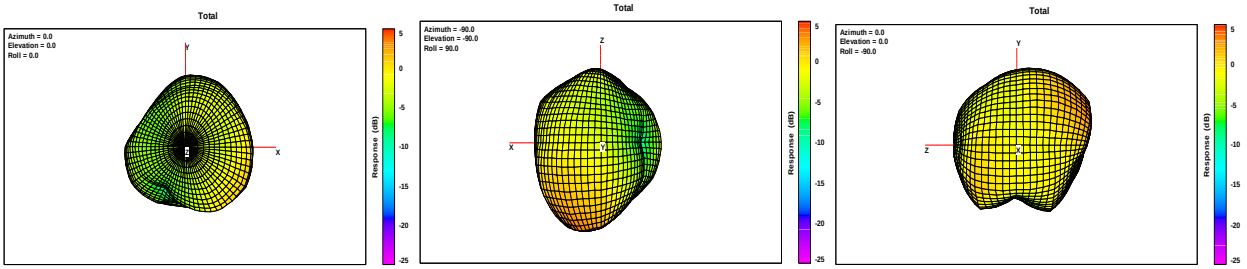
BT---2.4G



BT---2.45G



BT---2.5G



RF Exposure Evaluation Report

APPLICANT	:	**Jungle King LLC**
EQUIPMENT	:	**Digital Media Receiver**
MODEL NAME	:	**BV84J9**
FCC ID	:	**2A8FA-6743**
STANDARD	:	**47 CFR Part 2.1091** **FCC KDB 447498 D01 V06**

The product evaluation date was started from Aug. 22, 2023 and completed on Aug 22, 2023. We, Sporton International Inc. (Kunshan), would like to declare that the device has been evaluated in accordance with47 CFR Part 2.1091 and FCC KDB 447498 D01 v06, and pass the limit. Without written approval of Sporton International Inc. (Kunshan), the test report shall not be reproduced except in full.

Si Zhang

Approved by: Si Zhang

ACCREDITED Cert #5145.02

Sporton International Inc. (Kunshan)
No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300
People's Republic of China

Table of Contents

Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA330311-01	Rev. 01	Initial issue of report.	Aug. 22, 2023

1. Administration Data

1.1. Testing Laboratory

Sporton International Inc. (Kunshan) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

Testing Laboratory			
Test Firm	Sporton International Inc. (Kunshan)		
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China TEL : +86-512-57900158 FAX : +86-512-57900958		
Test Site No.	**Sporton Site No.**	**FCC Designation No.**	**FCC Test Firm Registration No.**
	SAR01-KS	CN1257	314309

Applicant	
Company Name	Jungle King LLC
Address	919 E. Main Street, Suite 1000, Richmond, Virginia 23219

2. Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT Type	Digital Media Receiver
Model Name	BV84J9
FCC ID	2A8FA-6743
Wireless Technology and Frequency Range	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
Mode	WLAN 2.4GHz 802.11b/g/n HT20 WLAN 5GHz 802.11a/n HT20/HT40 WLAN 5GHz 802.11ac VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE
Antenna Gain	WLAN2.4GHz/Bluetooth: 4.5 dBi WLAN5.2GHz: 5.0 dBi WLAN5.3GHz: 5.0 dBi WLAN5.5GHz: 5.0 dBi WLAN5.8GHz: 5.0 dBi
Antenna Type	Bluetooth: PIFA Antenna WLAN: PIFA Antenna

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

Comments and Explanations:
1. The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.
2. The maximum RF output tune up power, antenna gain also the safe distance used for evaluate RF exposure were declared by manufacturer.

3. Maximum RF average output tune up power among production units

<Bluetooth>

Mode		Maximum Average power(dBm)
Bluetooth	BR/EDR	11.5
	LE	7.5

<2.4GHz WLAN >

Mode		Maximum Average Power (dBm)
2.4GHz	802.11b	18.5
	802.11g	16.5
	802.11n-HT20	16.5

<5GHz WLAN >

Mode		Maximum Average Power (dBm)
5.2GHz	802.11a	18.5
	802.11n-HT20	16.5
	802.11n-HT40	16.5
	802.11ac-VHT20	17.0
	802.11ac-VHT40	16.5
	802.11ac-VHT80	12.5
5.3GHz	802.11a	18.5
	802.11n-HT20	16.5
	802.11n-HT40	16.5
	802.11ac-VHT20	17.0
	802.11ac-VHT40	17.0
	802.11ac-VHT80	14.0
5.5GHz	802.11a	18.5
	802.11n-HT20	16.5
	802.11n-HT40	16.5
	802.11ac-VHT20	16.5
	802.11ac-VHT40	17.0
	802.11ac-VHT80	16.5
5.8GHz	802.11a	18.5
	802.11n-HT20	16.5
	802.11n-HT40	16.5
	802.11ac-VHT20	16.5
	802.11ac-VHT40	16.5
	802.11ac-VHT80	16.0

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)	Average EIRP (mW)	Power Density at 20cm (mW/cm^2)	Limit (mW/cm^2)	Power Density / Limit
Bluetooth	2402.0	4.50	11.50	16.000	39.811	0.008	1.000	**0.008**
2.4GHz WLAN	2412.0	4.50	18.50	23.000	199.526	0.040	1.000	**0.040**
5.2GHz WLAN	5180.0	5.00	18.50	23.500	223.872	0.045	1.000	**0.045**
5.3GHz WLAN	5260.0	5.00	18.50	23.500	223.872	0.045	1.000	0.045
5.5GHz WLAN	5500.0	5.00	18.50	23.500	223.872	0.045	1.000	0.045
5.8GHz WLAN	5745.0	5.00	18.50	23.500	223.872	0.045	1.000	0.045

Note:
1. For conservativeness, the lowest frequency of each band is used to determine the MPE limit of that band.
2. Chose the maximum power to do MPE analysis.

5.2. Collocated Power Density Calculation

Bluetooth Power Density / Limit	WLAN 2.4GHz Power Density / Limit	Σ(Power Density / Limit) of Bluetooth + WLAN 2.4GHz
0.008	0.040	0.048

Bluetooth Power Density / Limit	WLAN 5GHz Power Density / Limit	Σ(Power Density / Limit) of Bluetooth + WLAN 5GHz
0.008	0.045	0.053

Note:
1. According to the EUT characteristic, WLAN 2.4GHz and WLAN5GHz cannot transmit simultaneously.
2. Σ(Power Density / Limit): This is a summation of [(power density for each transmitter/antenna included in the simultaneous transmission)/ (corresponding MPE limit)], for Bluetooth + WLAN2.4GHz, Bluetooth +WLAN5GHz.
3. Considering all 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.

------THE END------