

Antenna Specification

Frequency range and operation:

WiFi Antennas: 2.4 to 2.48 GHz and 5.15 to 5.85 GHz,

Bluetooth Antenna: 2.4 to 2.48 GHz,

ZigBee Antenna: 2.4 to 2.48 GHz,

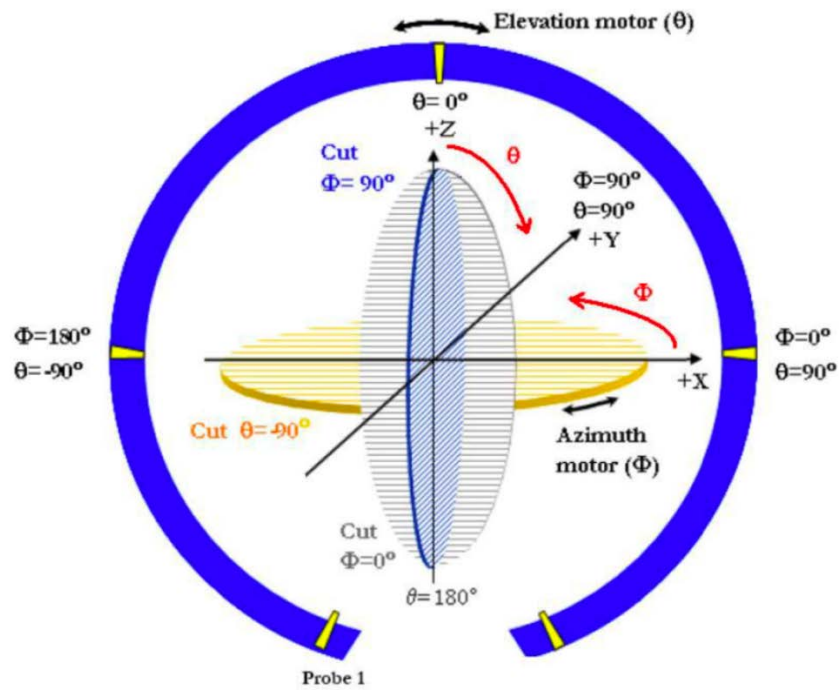
Antenna Types:

WiFi0 - Inverted L Antenna (ILA) which is a trace antenna on MLB

WiFi1 - Inverted L Antenna (ILA) which is a trace antenna on MLB

BT - Inverted F Antenna (IFA) which is a trace antenna on MLB

ZigBee – Dipole type on a separate PCB which is connect using coaxial cable connected to MLB



BT Antenna Gain

Frequency	Peak Gain
2400	2.75
2440.00	2.75
2480.00	3

ZB Antenna Gain

Frequency	Peak Gain
2400.00	4
2440.00	4
2480.00	4

WiFi 0 Antenna Gain

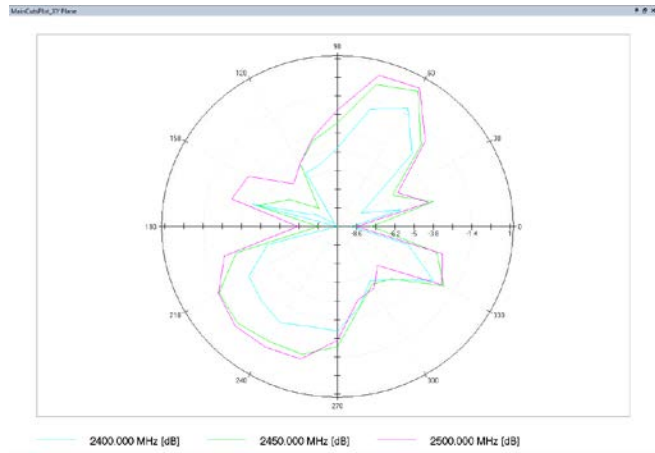
Frequency	Peak Gain
2400.00	3
2440.00	3
2480.00	3
5000.00	5.8
5200.00	5.8
5400.00	6
5500.00	6
5600.00	6
5700.00	5.9
5800.00	6
5900.00	6

WiFi 1 Antenna Gain

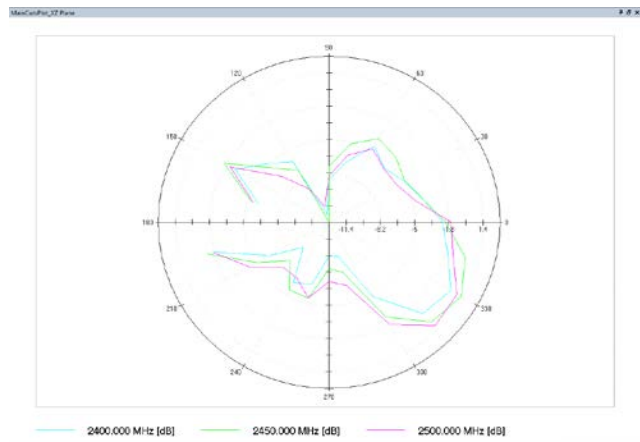
Frequency	Peak Gain
2400.00	2.9
2440.00	3
2480.00	2.9
5000.00	5.9
5200.00	6
5400.00	6
5500.00	6
5600.00	6
5700.00	6
5800.00	6
5900.00	6

BT Antenna Patterns

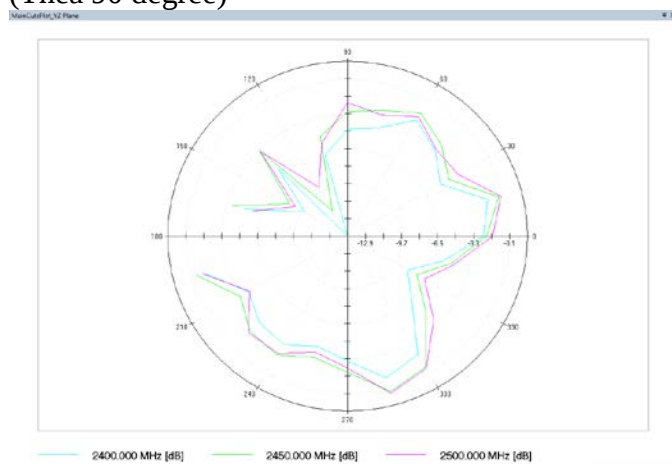
(Phi 0 degree)



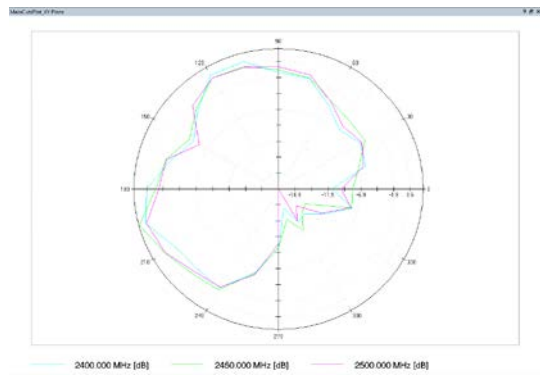
(Phi 90 degree)



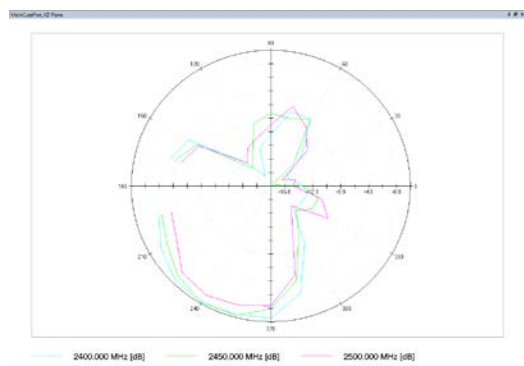
(Thea 90 degree)



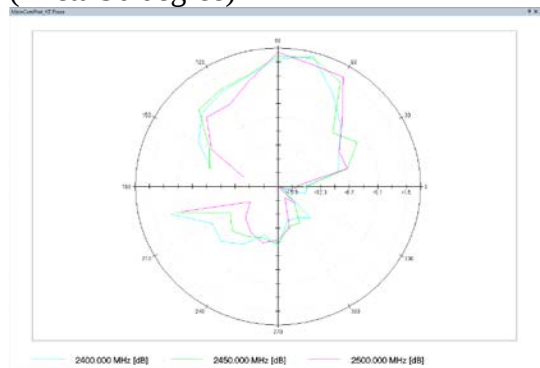
ZB antenna patterns
(Phi 0 degree)



(Phi 90 degree)

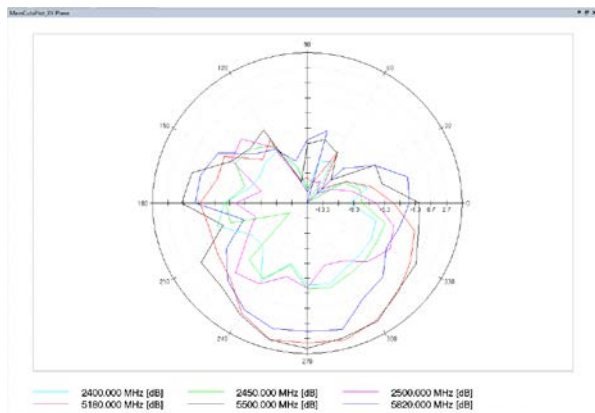


(Theta 90 degree)

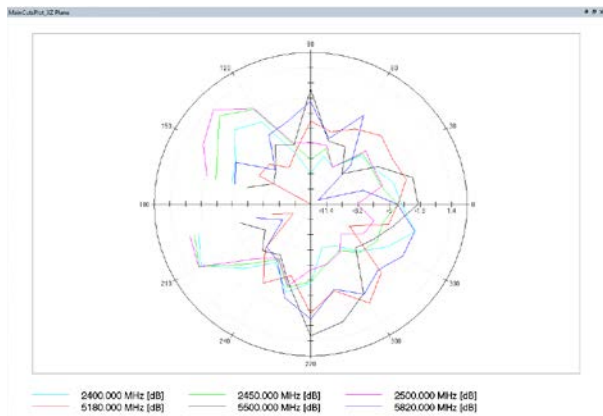


Wi-Fi 0 Patterns

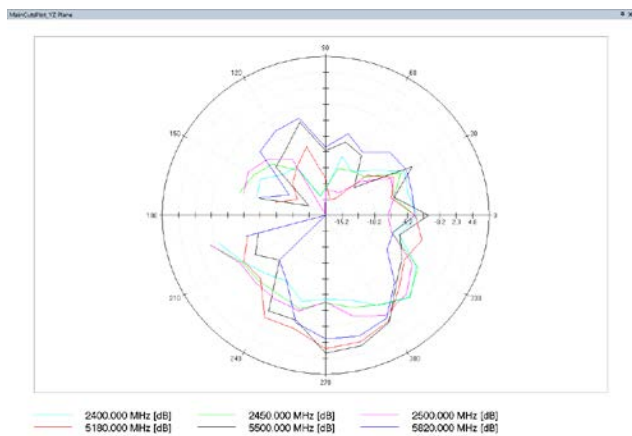
(Phi 0 degree)



(Phi 90 degree)

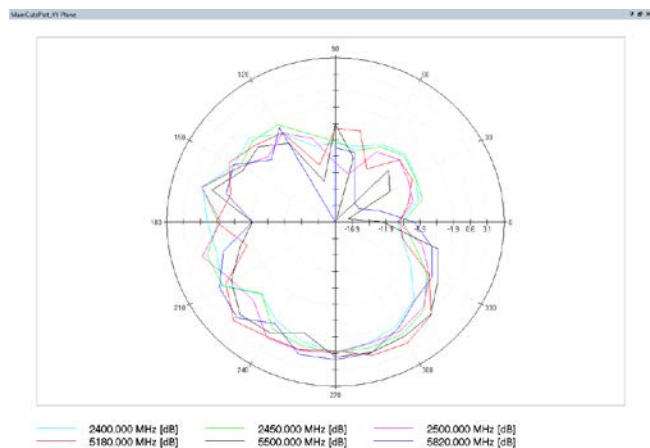


(Theta 90 degree)

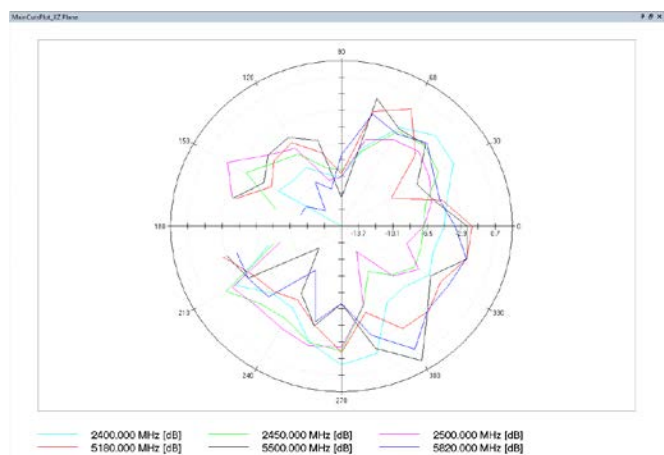


Wi-Fi 1 Antenna Patterns

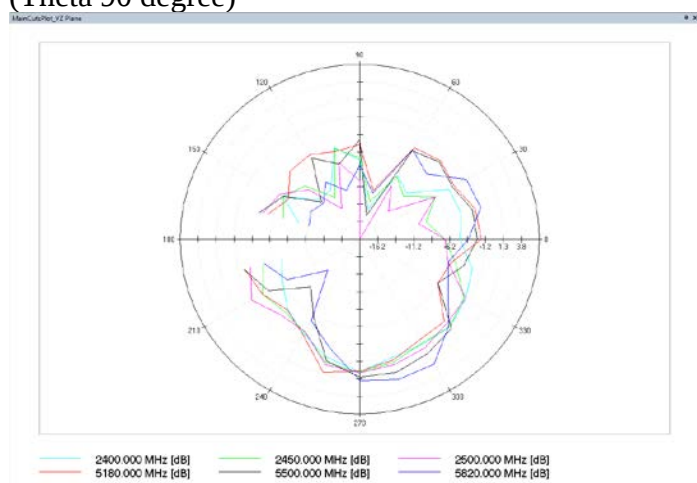
(Phi 0 degree)



(Phi 90 degree)



(Theta 90 degree)



Antenna test equipment & caribration

Description	Manufactur er	Model	Cal. Date	Cal. Due
Vector Network Analyzer	R&S	ZNB 8	2022.08.01	1 year
Signal and Spectrum Analyzer	R&S	FSV 7	2022.08.01	1 year
Wideband Radio Communication Tester	R&S	CMW500	2022.08.01	1 year

Antenna test engineer name

Carl Liu

Antenna test lab

TUV Rheinland (Shenzhen) Co., Ltd

OTA Measurement System type: R&S TS8991

RF Exposure Evaluation Report

APPLICANT : Evergreen Huckleberry LLC
EQUIPMENT : Digital Media Receiver
MODEL NAME : R85SD6
FCC ID : 2A8FC-8523
STANDARD : 47 CFR Part 2.1091
FCC KDB 447498 D01 V06

The product evaluation date was started from Apr. 26, 2023 and completed on May 12, 2023. We, Sporton International Inc. (Shenzhen), would like to declare that the device has been evaluated in accordance with 47 CFR Part 2.1091 and FCC KDB 447498 D01 v06, and pass the limit. Without written approval of Sporton International Inc. (Shenzhen), the test report shall not be reproduced except in full.



Approved by: Si Zhang

Sporton International Inc. (Shenzhen)

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People's Republic of China



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**Revision History**

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA2N2209-01	Rev. 01	Initial issue of report.	May 12, 2023
FA2N2209-01	Rev. 02	Revised Frequency Range of WLAN 2.4GHz on page 5	Aug. 31, 2023



1. Administration Data

1.1. Testing Laboratory

Sporton International Inc. (Shenzhen) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.01.

Testing Laboratory			
Test Firm	Sporton International Inc. (Shenzhen)		
Test Site Location	1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055 People's Republic of China TEL: +86-755-86379589 FAX: +86-755-86379595		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	SAR01-SZ	CN1256	421272

Applicant	
Company Name	Evergreen Huckleberry LLC
Address	100 S. Ashley Drive Suite 600 Tampa, FL 33602

2. Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT Type	Digital Media Receiver
Model Name	R85SD6
FCC ID	2A8FC-8523
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 ZigBee: 2405 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 ZigBee: O-QPSK
Antenna Gain	WLAN2.4GHz/Bluetooth: 3.0 dBi WLAN5.2GHz: 6.0 dBi WLAN5.3GHz: 6.0 dBi WLAN5.5GHz: 6.0 dBi WLAN5.8GHz: 6.0 dBi ZigBee: 4.0 dBi
Antenna Type	Bluetooth: IFA Antenna WLAN: ILA Antenna ZigBee: Dipole 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	14.5
	LE	9.0

<ZigBee>

Mode		Maximum Average power(dBm)
2.4GHz	ZigBee	15.5

<2.4GHz WLAN >

Mode		Maximum Average Power (dBm)
		ANT0+1
2.4GHz	802.11b	21.0
	802.11g	21.0
	802.11n-HT20	19.0

<5GHz WLAN >

Mode		Maximum Average Power (dBm)
		ANT0+1
5.2GHz	802.11a	18.5
	802.11n-HT20	18.5
	802.11n-HT40	20.5
	802.11ac-VHT20	18.5
	802.11ac-VHT40	20.5
	802.11ac-VHT80	17.0
5.3GHz	802.11a	18.5
	802.11n-HT20	19.0
	802.11n-HT40	20.5
	802.11ac-VHT20	19.0
	802.11ac-VHT40	20.5
	802.11ac-VHT80	18.0
5.5GHz	802.11a	18.5
	802.11n-HT20	18.5
	802.11n-HT40	20.0
	802.11ac-VHT20	18.5
	802.11ac-VHT40	20.0
	802.11ac-VHT80	19.5
5.8GHz	802.11a	20.0
	802.11n-HT20	20.0
	802.11n-HT40	20.0
	802.11ac-VHT20	20.0
	802.11ac-VHT40	20.0
	802.11ac-VHT80	19.5

Note: WLAN2.4GHz/WLAN5GHz support MIMO mode.

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/f ²)	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/f ²)	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	3.00	14.50	17.500	56.234	0.011	1.000	0.011
2.4GHz WLAN	2412.0	3.00	21.00	24.000	251.189	0.050	1.000	0.050
5.2GHz WLAN	5180.0	6.00	20.50	26.500	446.684	0.089	1.000	0.089
5.3GHz WLAN	5260.0	6.00	20.50	26.500	446.684	0.089	1.000	0.089
5.5GHz WLAN	5500.0	6.00	20.00	26.000	398.107	0.079	1.000	0.079
5.8GHz WLAN	5745.0	6.00	20.00	26.000	398.107	0.079	1.000	0.079
ZigBee	2405.0	4.00	15.50	19.500	89.125	0.018	1.000	0.018

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
0.011	0.050	0.061

Bluetooth Power Density / Limit	ZigBee Power Density / Limit	WLAN 5GHz Power Density / Limit	Σ (Power Density / Limit) of Bluetooth + ZigBee + WLAN 5GHz
0.011	0.018	0.089	0.118

Note:

1. According to the EUT characteristic, WLAN 2.4GHz and WLAN 5GHz 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 +ZigBee/WLAN2.4GHz/5GHz, Bluetooth +ZigBee+WLAN5GHz.
3. Considering the WLAN/ZigBee module collocation with 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.

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