

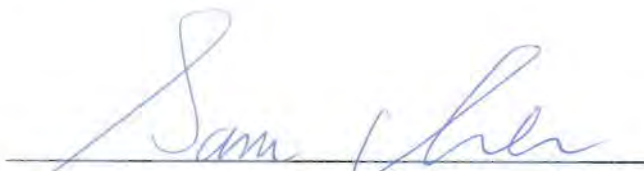


# RADIO EXPOSURE TEST REPORT

**FCC ID** : S9GR650P  
**Equipment** : R650p Access Point  
**Brand Name** : Ruckus  
**Model Name** : R650p  
**Applicant** : Ruckus Wireless, Inc.  
350 West Java Drive, Sunnyvale , California  
94089 United States  
**Manufacturer** : Ruckus Wireless, Inc.  
350 West Java Drive, Sunnyvale , California  
94089 United States  
**Standard** : 47 CFR Part 2.1091

The product was received on Sep. 11, 2019, and testing was started from Sep. 14, 2019 and completed on Jun. 21, 2021. We, Sporton International Inc. Hsinchu Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in 47 CFR Part 2.1091 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. Hsinchu Laboratory, the test report shall not be reproduced except in full.



Approved by: Sam Chen

**Sporton International Inc. Hsinchu Laboratory**  
No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)



## Table of Contents

History of this test report.....	3
Summary of Test Result.....	4
<b>1 General Description .....</b>	<b>5</b>
1.1 EUT General Information .....	5
1.2 Antenna Information .....	6
1.3 Accessories .....	6
1.4 Testing Location .....	7
<b>2 Maximum Permissible Exposure .....</b>	<b>8</b>
2.1 Limit of Maximum Permissible Exposure .....	8
2.2 MPE Calculation Method.....	8
2.3 Calculated Result and Limit.....	9
<b>Photographs of EUT v01</b>	



**History of this test report**

Report No.	Version	Description	Issued Date
FA980216-02	01	Initial issue of report	Jul. 02, 2021



### Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
2	-	Exposure evaluation	PASS	-

Note: Reference to Sporton Project No.: 980216-01

**Declaration of Conformity:**

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

**Comments and Explanations:**

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.

Reviewed by: **Sam Chen**

Report Producer: **Wendy Pan**



# 1 General Description

## 1.1 EUT General Information

RF General Information			
Evaluation Mode	Frequency Range (MHz)	Operating Frequency (MHz)	Modulation Type
2.4GHz WLAN	2400-2483.5	2412-2462	802.11b: DSSS (DBPSK, DQPSK, CCK) 802.11g/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) VHT: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM) 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)
5GHz WLAN	5150-5250 5250-5350 5470-5725 5725-5850	5180-5240 5260-5320 5500-5720 5745-5825	802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM) 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)



## 1.2 Antenna Information

Ant.	Port		Brand	Model Name	Ant. Type	Connector	Ant. Gain (dBi)	
	WLAN 2.4GHz	WLAN 5GHz					WLAN 2.4GHz	WLAN 5GHz
1	1	-	Ruckus	KAUS	PCB	I-PEX	2.3	-
2	2	-	Ruckus	HERSCHEL	PCB	I-PEX	2.3	-
3	-	1	Ruckus	PIFA5G	Metal	I-PEX	-	2
4	-	2	Ruckus	QUASAR	PCB	I-PEX	-	2
5	-	3	Ruckus	SADAL	PCB	I-PEX	-	2
6	-	4	Ruckus	CORZAR	PCB	I-PEX	-	2

Note 1:

WLAN 2.4GHz and 5GHz antenna configuration:

Ant.	Polarity				Array Gain (dBi)			
	WLAN 2.4GHz		WLAN 5GHz		WLAN 2.4GHz	WLAN 5GHz		
	Vertical	Horizontal	Vertical	Horizontal		Other Bandwidth	Continuously 80+80MHz-42 (port1+2)+58 (port3+4)	Continuously 80+80MHz-106 (port1+2)+122(port3+4)
1	V	-	-	-	0	-	-	-
2	-	V	-	-		-	-	-
3	-	-	V	-	-	3.01	0	3.01
4	-	-	-	V	-			
5	-	-	-	V	-			
6	-	-	V	-	-			

Note 2: The above information was declared by manufacturer.

**For 2.4GHz function:**

**For IEEE 802.11b/g/n/VHT/ax (2TX/2RX):**

Port 1 and Port 2 can be used as transmitting/receiving antenna.

Port 1 and Port 2 could transmit/receive simultaneously.

**For 5GHz function:**

**For IEEE 802.11a/n/ac/ax (4TX/4RX):**

Port 1, Port 2, Port 3 and Port 4 can be used as transmitting/receiving antenna.

Port 1, Port 2, Port 3 and Port 4 could transmit/receive simultaneously.

## 1.3 Accessories

N/A



## 1.4 Testing Location

Testing Location Information	
Test Lab. : Sporton International Inc. Hsinchu Laboratory	
Hsinchu	ADD: No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)
(TAF: 3787)	TEL: 886-3-656-9065      FAX: 886-3-656-9085
	Test site Designation No. TW3787 with FCC.
	Conformity Assessment Body Identifier (CABID) TW3787 with ISED.



## 2 Maximum Permissible Exposure

### 2.1 Limit of Maximum Permissible Exposure

(A) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm <sup>2</sup> )	Averaging Time  E  <sup>2</sup> , H  <sup>2</sup> or S (minutes)
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) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm <sup>2</sup> )	Averaging Time  E  <sup>2</sup> , H  <sup>2</sup> or S (minutes)
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

Note: f = frequency in MHz ; \*Plane-wave equivalent power density

### 2.2 MPE Calculation Method

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:

$$E \text{ (V/m)} = \frac{\sqrt{30 \times P \times G}}{d} \qquad \text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

**E** = Electric field (V/m)

**P** = RF output power (W)

**G** = EUT Antenna numeric gain (numeric)

**d** = Separation distance between radiator and human body (m)

The formula can be changed to

$$Pd = \frac{30 \times P \times G}{377 \times d^2}$$





### 2.3 Calculated Result and Limit

**Exposure Environment: General Population / Uncontrolled Exposure**

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm <sup>2</sup> )	S Limit (mW/cm <sup>2</sup> )
2.4G;G1D	2.30	26.05	28.35	0.50	28.85	0.76736	20	0.15266	1.00000
5.2G;D1D	2.00	28.15	30.15	0.50	30.65	1.16145	20	0.23106	1.00000
5.3G;D1D	2.00	23.97	25.97	0.50	26.47	0.44361	20	0.08825	1.00000
5.6G;D1D	2.00	23.87	25.87	0.50	26.37	0.43351	20	0.08624	1.00000
5.8G;D1D	2.00	28.01	30.01	0.50	30.51	1.12460	20	0.22373	1.00000

**Simultaneous Transmission Analysis Mode: WLAN 2.4GHz+WLAN 5GHz**

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm <sup>2</sup> )	S Limit (mW/cm <sup>2</sup> )	Ratio (S/Limit)
2.4G;G1D	2.30	26.05	28.35	0.50	28.85	0.76736	20	0.15266	1.00000	0.15266
5.2G;D1D	2.00	28.15	30.15	0.50	30.65	1.16145	20	0.23106	1.00000	0.23106
									Sum Ratio	0.38372
									Ratio Limit	1

Note: The above antenna gain was declared by manufacturer.

—————THE END—————