

## RF Exposure Report

**Report No.:** SA200114E03

**FCC ID:** TX2-RTL8822C

**Test Model:** RTL8822C

**Received Date:** Jan. 14, 2020

**Test Date:** Mar. 13 to 25, 2020

**Issued Date:** Apr. 14, 2020

**Applicant:** Realtek Semiconductor Corp.

**Address:** No. 2, Innovation Road II, Hsinchu Science Park, Hsinchu 300, Taiwan

**Issued By:** Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch  
Hsin Chu Laboratory

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Taiwan

**Test Location:** E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,  
Taiwan

**FCC Registration /  
Designation Number:** 723255 / TW2022

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### Release Control Record

Issue No.	Description	Date Issued
SA200114E03	Original release.	Apr. 14, 2020

## 1 Certificate of Conformity

**Product:** 11a/b/g/n/ac RTL8822C Combo module  
**Brand:** Realtek  
**Test Model:** RTL8822C  
**Sample Status:** ENGINEERING SAMPLE  
**Applicant:** Realtek Semiconductor Corp.  
**Test Date:** Mar. 13 to 25, 2020  
**Standards:** FCC Part 2 (Section 2.1091)  
IEEE C95.3 -2002  
**References Test Guidance:** KDB 447498 D01 General RF Exposure Guidance v06

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

**Prepared by :** Phoenix Huang , **Date:** Apr. 14, 2020  
Phoenix Huang / Specialist

**Approved by :** Clark Lin , **Date:** Apr. 14, 2020  
Clark Lin / Technical Manager

## 2 RF Exposure

### 2.1 Limits for Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm <sup>2</sup> )	Average Time (minutes)
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 <sup>2</sup> )*	30
30-300	27.5	0.073	0.2	30
300-1500	...	...	f/1500	30
1500-100,000	...	...	1.0	30

f = Frequency in MHz ; \*Plane-wave equivalent power density

### 2.2 MPE Calculation Formula

$$P_d = (P_{out} * G) / (4 * \pi * r^2)$$

where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = output power to antenna in mW

$G$  = gain of antenna in linear scale

$\pi$  = 3.1416

$R$  = distance between observation point and center of the radiator in cm

### 2.3 Classification

The antenna of this product, under normal use condition, is at least 20 cm away from the body of the user. So, this device is classified as **Mobile Device**.

## 2.4 Antenna Gain

Antenna Set	Chain No.	Brand	Model	Antenna Gain (dBi)	Frequency Range (GHz)	Antenna Type	Connector Type
1	Chain 0	LYNwave	ALA110-222050-300011	3.5	2.4~2.5	PIFA	i-pex(MHF)
				5	5.15~5.85		
	Chain 1	LYNwave	ALA110-222050-300011	3.5	2.4~2.5	PIFA	i-pex(MHF)
				5	5.15~5.85		
2	Chain 0	PSA	RFDPA171320EMLB301	3.14	2.4~2.5	Dipole	i-pex(MHF)
				5	5.15~5.85		
	Chain 1	PSA	RFDPA171320EMLB301	3.14	2.4~2.5	Dipole	i-pex(MHF)
				5	5.15~5.85		
3	-	REALTEK	RTK-ANT-0006	3.5	2.4~2.4835	PIFA	i-pex(MHF)
	-	REALTEK	RTK-ANT-0006	5	5.15~5.85	PIFA	i-pex(MHF)

**Note:**

1. The Bluetooth technology will fix transmission on Chain 1.
2. From the above antennas, antenna set 1 and 2 was selected as representative antenna for the test.

## 2.5 Calculation Result of Maximum Conducted Power

Operation Mode	Evaluation Frequency (MHz)	Max. Average Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
WLAN (2.4GHz)	2412~2472	240.455	6.51	20	0.21417	1
WLAN (U-NII-1)	5180~5240	197.256	8.01	20	0.24818	1
WLAN (U-NII-2A)	5260~5320	163.745	8.01	20	0.20601	1
WLAN (U-NII-2C)	5500~5720	208.905	8.01	20	0.26283	1
WLAN (U-NII-3)	5745~5825	254.707	8.01	20	0.32046	1
BT-EDR	2402~2480	4.634	3.5	20	0.00206	1
BT-LE	2402~2480	4.487	3.5	20	0.002	1

### Note:

1. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
2. 2.4GHz: The directional gain = 3.5 dBi + 10log(2) = 6.51 dBi
3. 5GHz: The irectional gain = 5 dBi + 10log(2) = 8.01 dBi

### Conclusion:

The formula of calculated the MPE is:

CPD1 / LPD1 + CPD2 / LPD2 + .....etc. < 1

CPD = Calculation power density

LPD = Limit of power density

WLAN 2.4GHz + Bluetooth = 0.21417 / 1 + 0.00206 / 1 = 0.21623

WLAN 5GHz + Bluetooth = 0.32046 / 1 + 0.00206 / 1 = 0.32252

**Therefore the maximum calculations of above situations are less than the "1" limit.**

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