

## RF Exposure Report

**Report No.:** SA180816E04

**FCC ID:** TX2-RTL8822CE

**Test Model:** RTL8822CE

**Received Date:** Aug. 16, 2018

**Test Date:** Oct. 20 to 22, 2018

**Issued Date:** Oct. 25, 2018

**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

**Lab Address:** E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,  
Taiwan R.O.C.

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

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

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### Release Control Record

Issue No.	Description	Date Issued
SA180816E04	Original release.	Oct. 25, 2018

## 1 Certificate of Conformity

**Product:** 802.11a/b/g/n/ac RTL8822CE Combo module

**Brand:** Realtek

**Test Model:** RTL8822CE

**Sample Status:** ENGINEERING SAMPLE

**Applicant:** Realtek Semiconductor Corp.

**Test Date:** Oct. 20 to 22, 2018

**Standards:** FCC Part 2 (Section 2.1091)

KDB 447498 D01 General RF Exposure Guidance v06

IEEE C95.1-1992

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 :** Wendy Wu , **Date:** Oct. 25, 2018  
Wendy Wu / Specialist

**Approved by :** May Chen , **Date:** Oct. 25, 2018  
May Chen / 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

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

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 20cm away from the body of the user.

So, this device is classified as **Mobile Device**.

### 2.4 Antenna Gain

Antenna No.	CON No.	Brand	Model	Ant. Net Gain (dBi)	Frequency range (GHz)	Antenna Type	Connector Type
1	CON1 CON2 CON3 (only for SKU A,B)	LYNwave	ALA110-222050-300011	3.5	2.4~2.4835	PIFA	i-pex(MHF)
				5	5.15~5.85	PIFA	i-pex(MHF)
2	CON1 CON2 CON3 (only for SKU A,B)	PSA	RFDPA171320E MLB301	3.14	2.4~2.4835	Dipole	i-pex(MHF)
				5	5.15~5.85	Dipole	i-pex(MHF)

## 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	2437	259.739	6.51	20	0.23135	1
WLAN UNII-1	5230	203.495	8.01	20	0.25603	1
WLAN UNII-2A	5270	207.037	8.01	20	0.26048	1
WLAN UNII-2C	5550	217.036	8.01	20	0.27306	1
WLAN UNII-3	5745	307.991	8.01	20	0.38750	1
Bluetooth (BT-EDR)	2402	19.231	3.5	20	0.00857	1
Bluetooth (BT-LE)	2404	14.555	3.5	20	0.00648	1

NOTE:

2.4GHz: Directional gain = 3.5dBi + 10log(2) = 6.51dB

5GHz: Directional gain = 5dBi + 10log(2) = 8.01dB

### Conclusion:

The formula of calculated the MPE is:

$CPD1 / LPD1 + CPD2 / LPD2 + \dots \text{etc.} < 1$

CPD = Calculation power density

LPD = Limit of power density

WLAN 2.4GHz + Bluetooth =  $0.23135 / 1 + 0.00857 / 1 = 0.23992$

WLAN 5GHz + Bluetooth =  $0.38750 / 1 + 0.00857 / 1 = 0.39607$

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

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