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Report Template Version: V03

Report Template Revision Date: Mar.1st, 2017

SAR Evaluation Report

Applicant: RNG International Inc.

Address of Applicant: 17534 Von Karman Avenue, Irvine, California, United States, 92614

Manufacturer: Renogy Suzhou Co., Ltd

Address of Manufacturer: No.1 Peiyuan Rd., BLDG 5, 4th floor, New District, Suzhou, Jiangsu Province, 215000, China


Factory: Renogy Suzhou Co., Ltd

Address of Factory: No.1 Peiyuan Rd., BLDG 5, 4th floor, New District, Suzhou, Jiangsu Province, 215000, China

Equipment Under Test (EUT):

Product: BT-1_RS232 turn bluetooth adapter

Model No.: BT-1

Brand Name: 

FCC ID: 2ANPBBT-1A0

Standards: 47 CFR Part 1.1307
47 CFR Part 2.1093
KDB447498D01 General RF Exposure Guidance v06

Date of Test: 2017-09-22 to 2017-10-11

Date of Issue: 2017-10-11

Report No. : CQASZ170901458EW-02

Test Result : **PASS***

Tested By:

(Aaron Ma)

Reviewed By:

(Owen Zhou)

Approved By:

(Jack Ai)



* In the configuration tested, the EUT complied with the standards specified above.

2 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ170901458EW-02	Rev.01	Initial report	2017-10-11

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4 General Information

4.1 Client Information

Applicant:	RNG International Inc.
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4.2 General Description of EUT

Product Name:	BT-1_RS232 turn bluetooth adapter
Model No.:	BT-1
Trade Mark:	RENOGY
Hardware Version:	V1.0
Software Version:	V1.0
Operation Frequency:	2402MHz~2480MHz
Bluetooth Version:	V4.0 BLE
Modulation Type:	GFSK
Number of Channel:	40
Sample Type:	Portable production
Test Software of EUT:	RF Test (manufacturer declare)
Antenna Type:	PCB Antenna
Antenna Gain:	0dBi
Power Supply:	DC 5V~12V

5 SAR Evaluation

5.1 RF Exposure Compliance Requirement

5.1.1 Standard Requirement

According to KDB447498D01 General RF Exposure Guidance v06

4.3.1. Standalone SAR test exclusion considerations

Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Exclusion Threshold condition, listed below, is satisfied.

5.1.2 Limits

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

$$\left[\frac{\text{max. power of channel, including tune-up tolerance, mW}}{\text{min. test separation distance, mm}} \right] \cdot \sqrt{f(\text{GHz})} \leq 3.0 \text{ for 1-g SAR and } \leq 7.5 \text{ for 10-g extremity SAR, where}$$

f(GHz) is the RF channel transmit frequency in GHz

Power and distance are rounded to the nearest mW and mm before calculation¹⁷

The result is rounded to one decimal place for comparison

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion

5.1.3 EUT RF Exposure

For BLE:

Measurement Data

GFSK mode	
Test channel	Peak Output Power (dBm)
Lowest	0.83
Middle	0.85
Highest	0.85

The Max Conducted Peak Output Power is 0.85dBm in highest channel(2.480GHz);

The best case gain of the antenna is 0dBi.

EIRP= 0.85dBm + 0dBi = 0.85dBm

0.85dBm logarithmic terms convert to numeric result is nearly 1.22mW

According to the formula. calculate the EIRP test result:

$$\left[\frac{\text{max. power of channel, including tune-up tolerance, mW}}{\text{min. test separation distance, mm}} \right] \cdot \sqrt{f(\text{GHz})}$$

General RF Exposure = $(1.22\text{mW} / 5 \text{ mm}) \times \sqrt{2.480\text{GHz}} = 0.384$ ①

SAR requirement:

S= 3.0

② ;

① < ②.

So the SAR report is not required.

Remark: The Max Conducted Peak Output Power data refer to report CQASZ170901458EW-01