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RF Exposure Evaluation Report

Report No. : CQASZ20190300147E-02
Applicant: SHENZHEN BOFU MECHANIC & ELECTRONIC CO., LTD.
Address of Applicant: 5F., E Building, Huachuangda Technology Park, Hangcheng Road, Baoan District, Shenzhen, China
Manufacturer: SHENZHEN BOFU MECHANIC & ELECTRONIC CO., LTD.
Address of Manufacturer: 5F., E Building, Huachuangda Technology Park, Hangcheng Road, Baoan District, Shenzhen, China
Equipment Under Test (EUT):
Product: Remoter
All Model No.: BF-305, BF-315, BF-405, BF-415, TE-306
Test Model No.: BF-305
Brand Name: BOFU
FCC ID: 2AS4V-BFREMOTE
Standards: 47 CFR Part 1.1307
47 CFR Part 2.1093
KDB447498D01 General RF Exposure Guidance v06
Date of Test: 2019-03-12 to 2019-04-11
Date of Issue: 2019-04-11
Test Result : PASS*

Tested By:

Daisy Qin

(Daisy Qin)

Reviewed By:

Aaron Ma

(Aaron Ma)

Approved By:

Jack Ai
(Jack Ai)



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

The test report is effective only with both signature and specialized stamp, The result(s) shown in this report refer only to the sample(s) tested. Without written approval of CQA, this report can't be reproduced except in full.

1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20190300147E-02	Rev.01	Initial report	2019-04-11

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3 General Information

3.1 Client Information

Applicant:	SHENZHEN BOFU MECHANIC & ELECTRONIC CO., LTD.
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Address of Manufacturer:	5F., E Building, Huachuangda Technology Park, Hangcheng Road, Baoan District, Shenzhen, China

3.2 General Description of EUT

Product Name:	Remoter
All Model No.:	BF-305, BF-315, BF-405, BF-415, TE-306
Test Model No.:	BF-305
Trade Mark:	BOFU
Hardware Version:	V1.0
Software Version:	V1.0
Sample Type:	Portable production
Operation Frequency:	434MHz
Channel Numbers:	1
Modulation Type:	ASK
Antenna Type:	PCB antenna
Antenna Gain:	0dBi
Power Supply:	Button battery: DC3.0V

Note: Using the new battery for testing.

Note:

All model: BF-305, BF-315, BF-405, BF-415, TE-306

Only the model BF-305 was tested, since the electrical circuit design, layout, components used and internal wiring were identical for the above models, with difference being color of appearance and model name.

4 SAR Evaluation

4.1 RF Exposure Compliance Requirement

4.1.1 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.

4.1.2 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:

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

$f(\text{GHz})$ 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

4.1.3 EUT RF Exposure

$$e_{irp} = p_t \times g_t = (E \times d)^2 / 30$$

where:

p_t = transmitter output power in watts,

g_t = numeric gain of the transmitting antenna (unitless),

E = electric field strength in V/m, $10^{((dB\mu V/m)/20)/10^6}$,

d = measurement distance in meters (m)---3m,

$$\text{So } p_t = (E \times d)^2 / 30 / g_t$$

The worst case (refer to report CQASZ20190300147E-01) is below:

Antenna polarization: Horizontal		
Frequency (MHz)	Level (dBuV/m)	Polarization
434	66.30	Peak
434	61.78	Average

Antenna polarization: Vertical		
Frequency (MHz)	Level (dBuV/m)	Polarization
434	58.08	Peak
434	53.56	Average

For 434MHz wireless:

Field strength = 66.30dB μ V/m @3m

Ant. gain 0dBi; so Ant numeric gain=1.0

$$\text{So } p_t = \{ [10^{(66.30/20)/10^6} \times 3]^2 / 30 / 1.0 \} \times 1000 \text{mW} = 0.0013 \text{mW}$$

$$\text{So } (0.0013 \text{mW} / 5 \text{mm}) \times \sqrt{0.434 \text{GHz}} = 0.00017,$$

$$0.00017 < 3.0 \text{ for 1-g SAR}$$

So the SAR report is not required.