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RF Exposure Evaluation Report

Report No.: CQASZ20180500067E-03

Applicant: SHENZHEN HUBSAN TECHNOLOGY CO., LTD.

Address of Applicant: 13th Floor, Bldg 1C, Shenzhen Software Industry Base, Xuefu Road, Nanshan District, Shenzhen, China. 518054

Manufacturer: SHENZHEN HUBSAN TECHNOLOGY CO., LTD.

Address of Manufacturer: 13th Floor, Bldg 1C, Shenzhen Software Industry Base, Xuefu Road, Nanshan District, Shenzhen, China. 518054

Factory: Dongguan Tengsheng Industrial Co., Ltd.

Address of Factory: A22# Luyi Street, Tianxin Village, Tangxia Town, Dongguan, China.

Equipment Under Test (EUT):

Product: Hubsan HT011 Transmitter

Model No.: HT011A, HT011B

Test Model No.: HT011A

Brand Name: HUBSAN

FCC ID: 2AN75-T011ATX

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

Date of Test: 2018-05-25 to 2018-06-08

Date of Issue: 2018-06-08

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.

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.

2 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20180500067E-03	Rev.01	Initial report	2018-06-08

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4 General Information

4.1 Client Information

Applicant:	SHENZHEN HUBSAN TECHNOLOGY CO., LTD.
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Manufacturer:	SHENZHEN HUBSAN TECHNOLOGY CO., LTD.
Address of Manufacturer:	13th Floor, Bldg 1C, Shenzhen Software Industry Base, Xuefu Road, Nanshan District, Shenzhen, China. 518054
Factory:	Dongguan Tengsheng Industrial Co., Ltd.
Address of Factory:	A22# Luyi Street, Tianxin Village, Tangxia Town, Dongguan, China.

4.2 General Description of EUT

Name:	Hubsan HT011 Transmitter
Model No.:	HT011A, HT011B
Trade Mark :	HUBSAN
Hardware Version:	V1.0
Software Version:	V1.0
Sample Type:	Portable production
Power Supply:	High performance battery: DC7.4V 1300mAh

4.3 General Description of WIFI

Operation Frequency:	IEEE 802.11b/g/n(HT20/40): 2452MHz (manufacturer declare)
Channel Numbers:	IEEE 802.11b/g, IEEE 802.11n HT20/40: 1 Channel (manufacturer declare)
Type of Modulation:	IEEE for 802.11b: DSSS(CCK,DQPSK,DBPSK) IEEE for 802.11g : OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE for 802.11n(HT20/40): OFDM (64QAM, 16QAM,QPSK,BPSK)
Test Software of EUT:	QATool_Dbg (manufacturer declare)
Antenna Type:	Integral antenna
Antenna Gain:	-2.0dBi

4.4 General Description of 2.4G

Operation Frequency:	2410 ~ 2465MHz
Channel Numbers:	12 (declared by the client)
Type of Modulation:	GFSK
Test Software of EUT:	RF test (manufacturer declare)
Antenna Type:	Integral antenna
Antenna Gain:	2.6dBi

Note:

1. Only the model HT011A 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.
2. The EUT had two WIFI Antennas, they can not transmitting at the same time. Antenna 1 and Antenna 2 had tested, the Antenna 1 is the worst case data, only recorded the worst case data in the report.
3. WIFI and 2.4G wireless can not transmitting at the same time.

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:

$$\left[\frac{\text{max. power of channel, including tune-up tolerance, mW}}{[\sqrt{f(\text{GHz})}]^2} \leq 3.0 \text{ for 1-g SAR and } \leq 7.5 \text{ for 10-g extremity SAR, where} \right.$$

$f(\text{GHz})$ 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

5.1.3 EUT RF Exposure

$$\text{eirp} = \text{pt} \times \text{gt} = (\text{E} \times \text{d})^2 / 30$$

where:

pt = transmitter output power in watts,

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

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

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

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

The worst case (refer to report CQASZ20180500067E-02) is below:

For 2.4G wireless:

Field strength = 89.19 dB μ V/m @ 3m

Ant. gain 2.6 dBi; so Ant numeric gain = 1.82

$$\text{So pt} = \{ [10^{(89.19/20)} / 10^6 \times 3]^2 / 30 / 1.82 \} \times 1000 \text{ mW} = 0.137 \text{ mW}$$

$$\text{So } (0.137 \text{ mW} / 5 \text{ mm}) \times \sqrt{2.435 \text{ GHz}} = 0.043,$$

$$0.043 < 3.0 \text{ for 1-g SAR}$$

So the SAR report is not required.

For WIFI

Measurement Data

802.11b mode	
Test channel	Average Output Power (dBm)
2452MHz	7.92
802.11g mode	
Test channel	Average Output Power (dBm)
2452MHz	7.86
802.11n(HT20)mode	
Test channel	Average Output Power (dBm)
2452MHz	7.84
802.11n(HT40)mode	
Test channel	Average Output Power (dBm)
2452MHz	7.89

The Max Conducted Average Output Power is 7.92dBm in 2.452GHz;

7.92dBm logarithmic terms convert to numeric result is nearly 6.195mW

According to the formula. calculate the EIRP test result:

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

General RF Exposure = $(6.195\text{mW} / 5 \text{ mm}) \times \sqrt{2.452\text{GHz}} = 1.94$ ①

SAR requirement:

S= 3.0 ② ;

① < ②.

So the SAR report is not required.

Remark: The Max Conducted Peak Average Power data refer to report Report No.: CQASZ20180500067E-01