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RF Exposure Evaluation Report

Report No. : CQASZ20180800081E-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: Video Streaming

Model No.: F22

Brand Name: HUBSAN

FCC ID: 2AN75-F22RX

Standards: 47 CFR Part 1.1307
47 CFR Part 2.1310
KDB447498D01 General RF Exposure Guidance v06

Date of Test: 2018-08-23 to 2018-08-31

Date of Issue: 2018-09-05

Test Result : PASS*

Tested By:

Tiny You

(Tiny You)

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
CQASZ20180800081E-03	Rev.01	Initial report	2018-09-05

2 Contents

	Page
1 VERSION	2
2 CONTENTS	3
3 GENERAL INFORMATION.....	4
3.1 CLIENT INFORMATION.....	4
3.2 GENERAL DESCRIPTION OF EUT	4
3.3 GENERAL DESCRIPTION OF 2.4G WIRELESS.....	4
3.4 GENERAL DESCRIPTION OF 5.8G WIRELESS.....	4
4 SAR EVALUATION	5
4.1 RF EXPOSURE COMPLIANCE REQUIREMENT	5
4.1.1 <i>Standard Requirement</i>	5
4.1.2 <i>Limits</i>	5
4.1.3 <i>EUT RF Exposure</i>	5

3 General Information

3.1 Client Information

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.

3.2 General Description of EUT

Product Name:	Video Streaming
Model No.:	F22
Trade Mark:	HUBSAN
Hardware Version:	V1.0
Software Version:	V1.0
Sample Type:	Mobile product
Power Supply:	LiPo battery, DC7.6V

3.3 General Description of 2.4G wireless

Frequency Range:	2410 MHz ~ 2465MHz
Modulation Type:	GFSK
Number of Channels:	12 (declared by the client)
Test Software of EUT:	RF test (manufacturer declare)
Antenna Type:	Integral antenna
Antenna Gain:	1.0dBi

3.4 General Description of 5.8G wireless

Frequency Range:	5735MHz ~ 5845MHz
Modulation Type:	GFSK
Number of Channels:	23(declared by the client)
Test Software of EUT:	RF test (manufacturer declare)
Antenna Type:	Integral antenna
Antenna Gain:	1.0dBi

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:

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

$f(\text{GHz})$ 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

4.1.3 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, $\sim 10^{((\text{dB}\mu\text{V/m})/20)}/10^6$,

d = measurement distance in meters (m) $\sim 3\text{m}$,

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

For 2.4G wireless:

The worst case (refer to report CQASZ20180800081E-01) is below:

Field strength = 98.19dB μ V/m @3m

Ant. gain 1dBi; so Ant numeric gain=1.26

$$\text{So pt} = \{ [10^{(98.19/20)} / 10^6 \times 3]^2 / 30 / 1.26 \} \times 1000\text{mW} = 1.571\text{mW}$$

$$\text{So } (1.571\text{mW}/5\text{mm}) \times \sqrt{2.465\text{GHz}} = 0.493,$$

$$0.493 < 3.0 \text{ for 1-g SAR}$$

So the SAR report is not required.

For 5.8G wireless:

The worst case (refer to report CQASZ20180800081E-02) is below:

Field strength = 101.29dB μ V/m @3m

Ant. gain 1dBi; so Ant numeric gain=1.26

So $P_t = \{ [10^{(101.29/20)} / 10^6 \times 3]^2 / 30 / 1.26 \} \times 1000 \text{mW} = 3.207 \text{mW}$

So $(3.207 \text{mW} / 5 \text{mm}) \times \sqrt{5.845 \text{GHz}} = 1.55$,

$1.55 < 3.0$ for 1-g SAR

So the SAR report is not required.