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SAR Evaluation Report

Applicant: Shenzhen TAT Electronics Co., Ltd

Address of Applicant: F5-6, Building B, Hedong Industrial Park, Xixiang, Shenzhen, China

Manufacturer: Shenzhen TAT Electronics Co., Ltd

Address of Manufacturer: F5-6, Building B, Hedong Industrial Park, Xixiang, Shenzhen, China

Factory: Shenzhen TAT Electronics Co., Ltd

Address of Factory: F5-6, Building B, Hedong Industrial Park, Xixiang, Shenzhen, China

Equipment Under Test (EUT):

Product: Action Camera

Model No.: T51, T71, T2

Test Model No.: T51

Brand Name: N/A

FCC ID: 2AM69T51

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

Date of Test: 2017-07-01 to 2017-07-11

Date of Issue: 2017-07-11

Report No. : CQASZ170701380EW-02

Test Result : PASS*

Tested By:

Aaron Ma

(Aaron Ma)

Reviewed By:

Owen Zhou

(Owen Zhou)

Approved By:

Jack Ai

(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
CQASZ170701380EW-02	Rev.01	Initial report	2017-07-11

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4 General Information

4.1 Client Information

Applicant:	Shenzhen TAT Electronics Co., Ltd.
Address of Applicant:	F5-6, Building B, Hedong Industrial Park, Xixiang, Shenzhen, China
Manufacturer:	Shenzhen TAT Electronics Co., Ltd.
Address of Manufacturer:	F5-6, Building B, Hedong Industrial Park, Xixiang, Shenzhen, China
Factory:	Shenzhen TAT Electronics Co., Ltd.
Address of Factory:	F5-6, Building B, Hedong Industrial Park, Xixiang, Shenzhen, China.

4.2 General Description of EUT

Product Name:	Action Camera
Model No.:	T51, T71, T2
Trade Mark:	N/A
Hardware version:	V1.0
Software version:	V1.0
Operation Frequency:	IEEE 802.11b/g/n(HT20): 2412MHz to 2462MHz IEEE 802.11n(HT40): 2422MHz to 2452MHz
Channel Numbers:	IEEE 802.11b/g, IEEE 802.11n HT20: 11 Channels IEEE 802.11n HT40: 7 Channels
Channel Separation:	5MHz
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 and HT40) : OFDM (64QAM, 16QAM, QPSK,BPSK)
Sample Type:	portable production
Test Software of EUT:	RF test (manufacturer declare)
Antenna Type:	Integral antenna
Antenna Gain:	1.0dBi
Power Supply:	Li-ion Battery 3.8V 1000mAh, 3.8Wh Charge by USB: DC5V

Note:

Only the model T51, 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.

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:

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

$f(\text{GHz})$ 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

The Max Conducted Average Output Power is 8.23dBm in highest channel(2.462GHz);

The best case gain of the antenna is 1.0dBi.

$\text{EIRP} = 8.23\text{dBm} + 1.0\text{dBi} = 9.23\text{dBm}$

9.23dBm logarithmic terms convert to numeric result is nearly 8.38mW

According to the formula. calculate the EIRP test result:

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

General RF Exposure = $(8.38\text{mW} / 5 \text{ mm}) \times \sqrt{2.462\text{GHz}} = 2.63$ ①

SAR requirement:

$S = 3.0$

② ;

① < ②.

So the SAR report is not required.

Measurement Data

802.11b mode		
Test channel	Peak Output Power (dBm)	Average Output Power (dBm)
Lowest	12.03	8.06
Middle	12.17	8.14
Highest	12.21	8.23
802.11g mode		
Test channel	Peak Output Power (dBm)	Average Output Power (dBm)
Lowest	11.38	6.87
Middle	11.46	6.91
Highest	11.53	7.01
802.11n(HT20)mode		
Test channel	Peak Output Power (dBm)	Average Output Power (dBm)
Lowest	10.10	6.12
Middle	10.16	6.18
Highest	10.34	6.23
802.11n(HT40)mode		
Test channel	Peak Output Power (dBm)	Average Output Power (dBm)
Lowest	8.45	4.78
Middle	8.53	4.89
Highest	8.62	4.93