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Report Template Version: V04

Report Template Revision Date: 2018-07-06

RF Exposure Evaluation Report

Report No. : CQASZ20191201282E-02
Applicant: SHANTOU LULA PLASTIC PRODUCTS CO., LIMITED.
Address of Applicant: 4TH FLOOR, JINCHENG BUILDING, PUMEI DISTRICT, GUANGYI STREET, CHENGHAI, SHANTOU, CHINA
Equipment Under Test (EUT):
EUT Name: R/C QUADCOPTER/DRONE
Model No.: X300C, 8816, 8816W, 8810, 8810W, A6, A6W, A6GPS, 8808, 8808W, 8801, 8802, 8802W, 8803, 8803W, 8805, 8805W, 8806, 8806W, 8807, 8807W, 8807OFP, 8809, 8809W, 8809OFP, 8811, 8811W, 8812, 8812W, 8813, 8813W, 8815, 8815W, 8816, 8816W, 8817, 8817W, 8818, 8818W, 8819, 8819W, 8820, 8820-1, 8820W, 8822, 8822-1, 8822W, 8823, 8823-1, 8823W, 88025, 8825-1, 88025W, 8826, 8826-1, 8826W, 8827, 8827-1, 8827W, 8828, 8828-1, 8828W, 8829, 8829-1, 8829W, S5
Test Model No.: X300C
Brand Name: N/A
FCC ID: 2AVJKX300C8810WRX
Standards: 47 CFR Part 1.1307
47 CFR Part 1.1310
KDB447498D01 General RF Exposure Guidance v06
Date of Receipt: 2019-12-10
Date of Test: 2019-12-10 to 2019-12-30
Date of Issue: 2019-12-30
Test Result : PASS*

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

Tested By:

Tom Chen

(Tom Chen)

Reviewed By:

Aaron Ma

(Aaron Ma)

Approved By:

Jack Ai

(Jack Ai)



1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20191201282E-02	Rev.01	Initial report	2019-12-30

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3 General Information

3.1 Client Information

Applicant:	SHANTOU LULA PLASTIC PRODUCTS CO., LIMITED.
Address of Applicant:	4TH FLOOR, JINCHENG BUILDING, PUMEI DISTRICT, GUANGYI STREET, CHENGHAI, SHANTOU, CHINA
Manufacturer:	SHANTOU LULA PLASTIC PRODUCTS CO., LIMITED.
Address of Manufacturer:	4TH FLOOR, JINCHENG BUILDING, PUMEI DISTRICT, GUANGYI STREET, CHENGHAI, SHANTOU, CHINA

3.2 General Description of EUT

Product Name:	R/C QUADCOPTER/DRONE
Model No.:	X300C, 8816, 8816W, 8810, 8810W, A6, A6W, A6GPS, 8808, 8808W, 8801, 8802, 8802W, 8803, 8803W, 8805, 8805W, 8806, 8806W, 8807, 8807W, 8807OFP, 8809, 8809W, 8809OFP, 8811, 8811W, 8812, 8812W, 8813, 8813W, 8815, 8815W, 8816, 8816W, 8817, 8817W, 8818, 8818W, 8819, 8819W, 8820, 8820-1, 8820W, 8822, 8822-1, 8822W, 8823, 8823-1, 8823W, 88025, 8825-1, 88025W, 8826, 8826-1, 8826W, 8827, 8827-1, 8827W, 8828, 8828-1, 8828W, 8829, 8829-1, 8829W, S5
Test Model No.:	X300C
Trade Mark:	N/A
Hardware Version:	KY-XLL8810T-132-1
Software Version:	KY-XLL8810T-132-1
Product Type:	☐ Mobile ☒ Portable ☐ Fix Location
Power Supply:	Li-ion Battery 3.7V, Charging by DC5V

3.3 General Description of 2.4G

Operation Frequency:	2445 MHz ~ 2473MHz
Modulation Type:	GFSK
Number of Channels:	5 (declared by the client)
Test Software of EUT:	RF test (manufacturer declare)
Antenna Type:	Integral antenna
Antenna Gain:	0dBi

Model No.: X300C, 8816, 8816W, 8810, 8810W, A6, A6W, A6GPS, 8808, 8808W, 8801, 8802, 8802W, 8803, 8803W, 8805, 8805W, 8806, 8806W, 8807, 8807W, 8807OFP, 8809, 8809W, 8809OFP, 8811, 8811W, 8812, 8812W, 8813, 8813W, 8815, 8815W, 8816, 8816W, 8817, 8817W, 8818, 8818W, 8819, 8819W, 8820, 8820-1, 8820W, 8822, 8822-1, 8822W, 8823, 8823-1, 8823W, 88025, 8825-1, 88025W, 8826, 8826-1, 8826W, 8827, 8827-1, 8827W, 8828, 8828-1, 8828W, 8829, 8829-1, 8829W, S5

Only the model X300C was tested, Their electrical circuit design, layout, components used and internal wiring are identical, Only the color or the packaging is different.

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

1) For 2.4G

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

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 CQASZ20191201282E-01) is below:

Antenna polarization: Horizontal		
Frequency (MHz)	Level (dBuV/m)	Polarization
2473	87.55	Peak
2473	79.66	Average

Antenna polarization: Vertical		
Frequency (MHz)	Level (dBuV/m)	Polarization
2473	86.66	Peak
2473	78.57	Average

For 2473MHz wireless:

Field strength = 87.55dBuV/m @3m

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

$$\text{So } p_t = \{ [10^{(87.55/20)/10^6} \times 3]^2 / 30 / 1.0 \} \times 1000 \text{mW} = 0.171 \text{mW}$$

$$\text{So } (0.171 \text{mW} / 5 \text{mm}) \times \sqrt{2.473 \text{GHz}} = 0.054,$$

$$0.054 < 3.0 \text{ for 1-g SAR}$$

So the SAR report is not required.