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RF Exposure Evaluation Report

Report No. : CQASZ20200300113E-02
Applicant: Shenzhen Hollyland Technology Co.,Ltd
Address of Applicant: 8F, 5D Building, Skyworth Innovation Valley, Tangtou, Shiyan, Baoan District Shenzhen, China.
Equipment Under Test (EUT):
Product: WIRELESS VIDEO TRANSMISSION SYSTEM
Model No.: MARS X
Brand Name: HOLLYLAND
FCC ID: 2ADZC-9816
Standards: 47 CFR Part 1.1307
47 CFR Part 2.1093
KDB447498D01 General RF Exposure Guidance v06
Date of Receipt: 2020-03-04
Date of Test: 2020-03-04 to 2020-03-18
Date of Issue: 2020-03-18
Test Result : PASS*

Tested By:

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(Tom Chen)

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Approved By:

Jack Ai

(Jack Ai)



1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20200300113E-02	Rev.01	Initial report	2020-03-18

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3 General Information

3.1 Client Information

Applicant:	Shenzhen Hollyland Technology Co.,Ltd
Address of Applicant:	8F, 5D Building, Skyworth Innovation Valley, Tangtou, Shiyan, Baoan District Shenzhen, China.
Manufacturer:	Shenzhen Hollyland Technology Co.,Ltd
Address of Manufacturer:	8F, 5D Building, Skyworth Innovation Valley, Tangtou, Shiyan, Baoan District Shenzhen, China.

3.2 General Description of EUT

Product Name:	WIRELESS VIDEO TRANSMISSION SYSTEM
Model No.:	MARS X
Trade Mark:	HOLLYLAND
Hardware Version:	V1.2
Software Version:	V1.0.1.0
Frequency Range:	5735MHz ~ 5840MHz
Modulation Type:	OFDM
Number of Channels:	3(declared by the client)
Sample Type:	☒ Mobile ☐ Portable ☐ Fix Location
Test Software of EUT:	RF test (manufacturer declare)
Antenna Type:	External antenna with ipex connector
Antenna Gain:	ANT1: 3dBi ANT2: 3dBi
Power Supply:	lithium battery:DC3.85V, Charge by DC5V

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 CQASZ20200300113E-01) is below:

Antenna polarization: Horizontal		
Frequency (MHz)	Level (dBuV/m)	Polarization
5825	93.59	Peak
5825	83.77	Average

Antenna polarization: Vertical		
Frequency (MHz)	Level (dBuV/m)	Polarization
5825	98.96	Peak
5825	88.75	Average

For 5825MHz wireless:

Field strength = 98.96dB μ V/m @3m

Ant. gain 3dBi; so Ant numeric gain=2.0

$$\text{So } p_t = \{ [10^{(98.96/20)/10^6} \times 3]^2 / 30 / 2.0 \} \times 1000 \text{mW} = 1.183 \text{mW}$$

$$\text{So } (1.183 \text{mW} / 5 \text{mm}) \times \sqrt{5.825 \text{GHz}} = 0.571$$

$$0.571 < 3.0 \text{ for 1-g SAR}$$

So the SAR report is not required.