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RF Exposure Evaluation Report

Report No. : CQASZ20191201320E-02
Applicant: Shenzhen HCY Electronics and Technology Co., Ltd
Address of Applicant: The 1st building , No 2 Gangbei Road, Bogang Village Shajing Town, Baoan, Shenzhen, China
Equipment Under Test (EUT):
EUT Name: Intelligent remote control
Model No.: HCY-Q20, W2
Test Model No.: HCY-Q20
Brand Name: N/A
FCC ID: 2AOBUHCY-Q20
Standards: 47 CFR Part 1.1307
47 CFR Part 1.1310
KDB447498D01 General RF Exposure Guidance v06
Date of Receipt: 2019-12-17
Date of Test: 2019-12-17 to 2019-12-30
Date of Issue: 2019-12-31
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
CQASZ20191201320E-02	Rev.01	Initial report	2019-12-31

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3 General Information

3.1 Client Information

Applicant:	Shenzhen HCY Electrics and Technology Co., Ltd
Address of Applicant:	The 1st building , No 2 Gangbei Road, Bogang Village Shajing Town, Baoan, Shenzhen, China
Manufacturer:	Shenzhen HCY Electrics and Technology Co., Ltd
Address of Manufacturer:	The 1st building , No 2 Gangbei Road, Bogang Village Shajing Town, Baoan, Shenzhen, China

3.2 General Description of EUT

Product Name:	Intelligent remote control
Model No.:	HCY-Q20, W2
Test Model No.:	HCY-Q20
Trade Mark:	N/A
Hardware Version:	V10
Software Version:	HCYQ20-A999-002-TX【0x36BF3E】
Product Type:	☐ Mobile ☒ Portable ☐ Fix Location
Power Supply:	lithium battery:DC3.7V, Charge by USB

3.3 General Description of 2.4G

Operation Frequency:	2404 MHz ~ 2480MHz
Modulation Type:	GFSK
Number of Channels:	65 (declared by the client)
Test Software of EUT:	RF test (manufacturer declare)
Antenna Type:	PCB antenna
Antenna Gain:	-3dBi

Note:

Model No.: HCY-Q20, W2

Only the model HCY-Q20 was tested, Their electrical circuit design, layout, components used and internal wiring are identical, Only the model name 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 CQASZ20191201320E-01) is below:

Antenna polarization: Horizontal		
Frequency (MHz)	Level (dBuV/m)	Polarization
2480	92.75	Peak
2480	83.94	Average

Antenna polarization: Vertical		
Frequency (MHz)	Level (dBuV/m)	Polarization
2480	90.28	Peak
2480	82.87	Average

For 2480MHz wireless:

Field strength = 92.75dBuV/m @3m

Ant. gain -3dBi; so Ant numeric gain=0.5

$$\text{So } p_t = \{ [10^{(92.75/20)/10^6} \times 3]^2 / 30 / 0.5 \} \times 1000 \text{mW} = 1.128 \text{mW}$$

$$\text{So } (1.128 \text{mW} / 5 \text{mm}) \times \sqrt{2.480 \text{GHz}} = 0.355,$$

0.355 < 3.0 for 1-g SAR

So the SAR report is not required.