

**RF EXPOSURE EVALUATION REPORT**

<b>Application No.:</b>	GZCR2406000631AT
<b>Applicant:</b>	GUANGZHOU HEYGEARS INC. INC
<b>Address of Applicant:</b>	BLOCK B2, 501, 601, ENTERPRISE ACCELERATOR, KAIFA DISTRICT, GUANGZHOU, GUANGDONG, CHINA
<b>Manufacturer:</b>	GUANGZHOU HEYGEARS INC. INC
<b>Address of Manufacturer:</b>	BLOCK B2, 501, 601, ENTERPRISE ACCELERATOR, KAIFA DISTRICT, GUANGZHOU, GUANGDONG, CHINA
<b>Factory:</b>	GUANGZHOU HEYGEARS INC. INC
<b>Address of Factory:</b>	BLOCK B2, 501, 601, ENTERPRISE ACCELERATOR, KAIFA DISTRICT, GUANGZHOU, GUANGDONG, CHINA
<b>Product Name:</b>	UltraCraft Reflex RS
<b>Model No.:</b>	UltraCraft Reflex RS
<b>Trade Mark:</b>	HEYGEARS
<b>Standard(s) :</b>	47 CFR Part 1.1310
	KDB447498D01 General RF Exposure Guidance v06
<b>Date of Receipt:</b>	2024-06-06
<b>Date of Evaluation:</b>	2024-07-03
<b>Date of Issue:</b>	2024-08-02
<b>Evaluation Result:</b>	<b>Pass*</b>

\* In the configuration evaluated, the EUT complied with the standards specified above.



Ricky Liu  
Manager



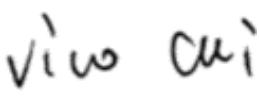
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Guangzhou Branch, Kezhu Road, EEC Laboratory.

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Revision Record			
Version	Report No.	Date	Remark
01	GZCR240600063104	2024-08-02	Original

Authorized for issue by:			
		Damon Guan/Project Engineer	
		Vico Cui/Reviewer	

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## 2 Evaluation Summary

Item	Standard	Method	Requirement	Result
RF Exposure	KDB447498 D01 General RF Exposure Guidance v06	KDB447498 D01 General RF Exposure Guidance v06	47 CFR Part 1.1310	Pass

**Note:**

E.U.T./EUT means Equipment Under Test.

Pass means the test result passed the test standard requirement, please find the detailed decision rule in the report relative section.



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## 4 General Information

### 4.1 Details of E.U.T.

Power supply:	AC 100-240VAC, 50/60Hz for AC/DC adapter.
AC/DC adapter:	AC/DC adapter model: TDX-2407500
	Input: AC 100-240VAC, 50/60Hz 3.0A
	Output: DC 24.0V 7.5A 180.0W
Cable(s):	About 2.0m x 3 wires unscreened AC input cable for AC/DC adapter. About 1.5m x 2 wires unscreened DC output cable for AC/DC adapter.
	USB Port x1
	Micro SD Port x1
	4 Pin DC output Port x1(Reserved only, function not developed)

### 2.4GHz wifi

Operation Frequency:	802.11b/g/n(HT20): 2412MHz to 2462MHz;802.11n(HT40): 2422MHz to 2452MHz
Modulation Type:	802.11b: DSSS (CCK, DQPSK, DBPSK);802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK)
Number of Channels:	802.11b/g/n(HT20):11;802.11n(HT40):7
Channel Spacing:	5MHz
Antenna Type:	Integral Antenna
Antenna Gain:	3.13 dBi according to antenna specification
Antenna Number:	1

### 13.56MHz NFC

Operation Frequency:	13.56MHz
Modulation Type:	ASK
Antenna Type:	Coil Antenna
Antenna Number:	2

Remark: The information in this section is provided by the applicant or manufacturer, SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.

### 4.2 Evaluating Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou Branch EMC Laboratory,  
No.198, Kezhu Road, Science City, Economic & Technological Development Area, Guangzhou,  
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No tests were sub-contracted.



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#### 4.3 Facility

The facility is recognized, certified, or accredited by the following organizations:

- **ACMA**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian/New Zealand Regulatory Compliance Mark (RCM).

- **SGS UK(Certificate No.: 32), SGS-TUV SAARLAND and SGS-FIMKO**

Have approved SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory as a supplier of EMC TESTING SERVICES and SAFETY TESTING SERVICES.

- **FCC Recognized Accredited Test Firm(Registration No.: 486818)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been accredited and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Designation Number: CN5016, Test Firm Registration Number: 486818.

- **ISED (Registration No.: 4620B, CAB identifier: CN0052)**

SGS-CSTC Standards Technical Services Co., Ltd., has been registered by Innovation Science and Economic Development Canada for Wireless Device Testing laboratories to test to Canadian radio equipment requirements. Registration No. 4620B, CAB identifier: CN0052.

- **VCCI (Registration No.: R-12460, C-12584, G-20107 and T-11179)**

The 10m Semi-anechoic chamber, 966 Anechoic Chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-12460, C-12584, G-20107 and T-11179 respectively.

- **CBTL (Lab Code: TL129)**

SGS-CSTC Standards Technical Services Co., Ltd., E&E Laboratory has been assessed and fully comply with the requirements of ISO/IEC 17025:2017, the Basic Rules, IECEE 01 and Rules of procedure IECEE 02, and the relevant IECEE CB-Scheme Operational documents.

#### 4.4 Deviation from Standards

None

#### 4.5 Abnormalities from Standard Conditions

None



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## 5 Technical Requirements Specification

### 5.1 General Description of Applied Standards

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.

### 5.2 RF Exposure Evaluation

#### 5.2.1 Limit & Test Method

According to FCC Part1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in part1.1307(b)

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm <sup>2</sup> )	Averaging time (minutes)
<b>(A) Limits for Occupational/Controlled Exposures</b>				
0.3–3.0 .....	614	1.63	*(100)	6
3.0–30 .....	1842/f	4.89/f	*(900/f <sup>2</sup> )	6
30–300 .....	61.4	0.163	1.0	6
300–1500 .....	.....	.....	f/300	6
1500–100,000 .....	.....	.....	5	6
<b>(B) Limits for General Population/Uncontrolled Exposure</b>				
0.3–1.34 .....	614	1.63	*(100)	30
1.34–30 .....	824/f	2.19/f	*(180/f <sup>2</sup> )	30
30–300 .....	27.5	0.073	0.2	30
300–1500 .....	.....	.....	f/1500	30
1500–100,000 .....	.....	.....	1.0	30

F= Frequency in MHz

Friis Formula

Friis transmission formula:  $P_d = (P_{out} * G) / (4 * \pi * R^2)$

Where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = output power to antenna in mW

G = gain of antenna in linear scale

$\pi$  = 3.1416

R = distance between observation point and center of the radiator in cm

$P_d$  is the limit of MPE, 1 mW/cm<sup>2</sup>. If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

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### 5.2.2 Conclusion

Normal use condition for Distance between antenna and body:  $\geq 20$  cm declared by applicant

For 2.4 GHz Wi-Fi

Antenna Gain: 3.13 dBi

Frequency (MHz)	Antenna Gain (Numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
11B						
2412	2.056	13.21	20.94	0.00856	1	Complies
2442	2.056	13.70	23.44	0.00959	1	Complies
2462	2.056	13.97	24.95	0.01020	1	Complies
11G						
2412	2.056	14.18	26.18	0.01071	1	Complies
2442	2.056	14.78	30.06	0.01229	1	Complies
2462	2.056	<b>15.14</b>	32.66	<b>0.01336</b>	1	Complies
11N40						
2422	2.056	12.89	19.45	0.00796	1	Complies
2442	2.056	13.28	21.28	0.00870	1	Complies
2452	2.056	13.48	22.28	0.00911	1	Complies

For 13.56MHz NFC:

Test Mode	Test Channel[MHz]	Power[dBuV/m]	Test distance[m]	Limit of E-field(V/m)	Test Result
ASK	13.56	60.61	3	60.767	Complies

**Limit of E-field(V/m)=824/13.56=60.77(V/m)**

2, RF Exposure Calculation

The max Radiated Power is 60.61 dBuV/m@ 3m

According to the formula. calculate the P test result:

$E(\text{dBuV/m})@0.2\text{m} = E(\text{dBuV/m})@3\text{m} + 40 * \log[E(\text{dBuV/m})@0.2\text{m} / 3 / 0.2] = 107.65 \text{ (dBuV/m)}@0.2\text{m}$

$E(\text{V/m})@0.2\text{m} = 10^{E(\text{dBuV/m})@0.2\text{m} / 20} * 10^{-6} = 0.2414 \text{ (V/m)}@0.2\text{m}$

$P = (E * d)^2 / 30 = 0.0777 \text{ mW}$

2.4G Wi-Fi and 13.56MHz can transmit simultaneously, so the maximum rate of MPE is  $0.01336 / 1 + 0.2414 / 60.77 = 0.019 + 0.00397 = 0.01733 < 1$ .

The EUT meet the Exemption Limits for Routine Evaluation – SAR Evaluation, so no SAR evaluation is required for the EUT.

Note: Refer to report No. GZCR240600063102 & GZCR240600063103 for EUT test Max Conducted Peak Output Power & E-field value.



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## 6 EUT Constructional Details (EUT Photos)

Refer to External and Internal Photos for GZCR2406000631AT

- End of the Report -



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