TEST REPORT

Verified Code:

Report No.:	E202101126468-4	**Application No.:**	E202101126468
Client:	GUANGZHOU LIUHUAN INFORMATION TECHNOLOGY CO., LTD.		
Address:	ROOM 1101 OF BUILDING 2, ROOM 802 OF BUILDING 1, NO.6, YUNPU FOUR ROAD, HUANGPU DISTRICT, GUANGZHOU CITY, GUANGDONG PROVINCE, CHINA		
Sample Description:	Multimedia player		
Model:	San Andres 970		
Test Specification:	CFR 47, FCC Part 2.1091 Radiofrequency radiation exposure evaluation: mobile devices.		
Receipt Date:	2021-01-20		
Test Date:	2021-01-28 to 2021-03-12		
Issue Date:	2021-04-01		
Test Result:	Pass		

Prepared By:	**Reviewed By:**	**Approved By:**
Test Engineer	Technical Manager	Manager

Other Aspects:

Note: Note

Abbreviations: *ok / P = passed; fail / F = failed; n.a. / N = not applicable;*

DIRECTIONS OF TEST

1. **This station carries out test task according to the national regulation of verifications which can be traced to National Primary Standards and BIPM.**

2. **The test report merely corresponds to the test sample. It is not permitted to copy extracts of these test result without the written permission of the test laboratory.**

3. **If there is any objection concerning the test, the client should inform the laboratory within 15 days from the date of receiving the test report.**

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1. GENERAL DESCRIPTION OF EUT

1.1. APPLICANT

Name:	GUANGZHOU LIUHUAN INFORMATION TECHNOLOGY CO., LTD.
Address:	ROOM 1101 OF BUILDING 2, ROOM 802 OF BUILDING 1, NO.6, YUNPU FOUR ROAD, HUANGPU DISTRICT, GUANGZHOU CITY, GUANGDONG PROVINCE, CHINA

1.2. MANUFACTURER

Name:	GUANGZHOU LIUHUAN INFORMATION TECHNOLOGY CO., LTD.
Address:	ROOM 1101 OF BUILDING 2, ROOM 802 OF BUILDING 1, NO.6, YUNPU FOUR ROAD, HUANGPU DISTRICT, GUANGZHOU CITY, GUANGDONG PROVINCE, CHINA

1.3. FACTORY

Name:	GUANGZHOU LIUHUAN INFORMATION TECHNOLOGY CO., LTD.
Address:	ROOM 1101 OF BUILDING 2, ROOM 802 OF BUILDING 1, NO.6, YUNPU FOUR ROAD, HUANGPU DISTRICT, GUANGZHOU CITY, GUANGDONG PROVINCE, CHINA

1.4. BASIC DESCRIPTION OF EQUIPMENT UNDER TEST

Equipment:	Multimedia player
Model No.:	San Andres 970
Adding Model:	/
Trade Name:	/
FCC ID:	2AQZN-SA970-1
Power supply:	DC12V power supplied by DC source
Frequency Range:	2402 ~ 2480MHz
Transmit Power:	BT: DH5: 0.45dBm 2DH5: 0.87dBm 3DH5: 1.59dBm WIFI: 13.19dBm for IEEE 802.11a 13.11dBm for IEEE 802.11n HT20 13.29dBm for IEEE 802.11ac VHT20
Modulation type:	OFDM
Channel space:	IEEE 802.11a: 20MHz IEEE 802.11n HT20: 20MHz IEEE 802.11ac VHT20: 20MHz
Antenna Specification:	BT: Internal antenna 2dBi gain (Max.)

	WIFI: Internal antenna with 4.2dBi gain (Max.)
Temperature Range:	-20 ℃ ~ +70 ℃
Hardware Version:	V1.0.5
Software Version:	C78_V1.0.1.0_T
Sample No:	E202101126468-0002
Note:	/

2. LABORATORY AND ACCREDITATIONS

2.1. LABORATORY

The tests & measurements refer to this report were performed by Shenzhen EMC Laboratory of Guangzhou GRG Metrology & Test Co,. Ltd.

Add.:	No.1301 Guanguang Road Xinlan Community, Guanlan Street, Longhua District Shenzhen, 518110, People's Republic of China.
P.C.:	518000
Tel :	0755-61180008
Fax:	0755-61180008

2.2. ACCREDITATIONS

Our laboratories are accredited and approved by the following approval agencies according to GB/T 27025(ISO/IEC 17025:2017)

USA	A2LA(Certificate #:2861.01)

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

Canada	Industry Canada
USA	FCC

3. EVALUATION METHOD

Exposure category: General population/uncontrolled environment
EUT Type: Production Unit
Device Type: Mobile Device
Refer Standard: KDB 447498 D01 General RF Exposure Guidance v06
FCC Part 2 §2.1091

Systems operating under the provisions of FCC 47 CFR section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.
In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as mobile device whereby a distance of 0.2m normally can be maintained between the user and the device, and below RF Permissible Exposure limit shall comply with.
In accordance with KDB447498D01 for Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneous transmitting antennas incorporated in a host device, based on the calculated/estimated, numerically modeled or measured field strengths or power density, is ≤ 1.0. The MPE ratio of each antenna is determined at the minimum test separation distance required by the operating configurations and exposure conditions of the host device, according to the ratio of field strengths or power density to MPE limit, at the test frequency. Either the maximum peak or spatially averaged results from measurements or numerical simulations may be used to determine the MPE ratios. Spatial averaging does not apply when MPE is estimated using simple calculations based on far-field plane-wave equivalent conditions. The antenna installation and operating requirements for the host device must meet the minimum test separation distances required by all antennas, in both standalone and simultaneous transmission operations, to satisfy compliance.

4. LIMITS FOR GENERAL POPULATION/UNCONTROLLEDEXPOSURE

(B)Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength(H) (A/m)	Power Density (S) (Mw/cm^2)	Averaging Time$[E]^2$, $[H]^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30

Note: f=frequency in MHz; *Plane-wave equivalent power density

5. CALCULATION METHOD

Predication of MPE limit at a given distance
Equation from page 18 of OET Bulletin 65, Edition 97-01
$S=PG/4\pi R^2$
Where: S=power density
P=power input to antenna
G=power gain of the antenna in the direction of interest relative to anisotropic radiator
R=distance to the center of radiation of the antenna
From the EUT RF output power, the minimum mobile separation distance, d=0.2m, as well as the maximum gain of the used as following information, the RF power density can be obtained.

Frequency Band	Antenna type	Internal Identification	Maximum antenna gain
2.4GHz	Internal antenna	Antenna 1	2dBi
5GHz	Internal antenna	Antenna 1	4.2dBi

6. ESTIMATION RESULT

4.1 CONDUCTED POWER RESULTS

2.4GHz

Mode	Channel	Frequency(MHz)	Conducted Output Power (dBm)
DH5	00	2402	-1.44
	39	2441	-0.85
	78	2480	-0.24
2DH5	00	2402	0.08
	39	2441	0.48
	78	2480	1.15
3DH5	00	2402	0.45
	39	2441	0.87
	78	2480	1.59

5GHz WIFI

Test Mode	Band	Frequency (MHz)	AVG Conducted Output Power (dBm)
802.11a	U-NII-3	5785	13.19
802.11n HT20	U-NII-3	5785	13.11
IEEE 802.11ac VHT20	U-NII-3	5785	13.29

4.2 MANUFACTURING TOLERANCE

2.4GHz

Frequency (MHz)	DH5	2DH5	3DH5
	2402	2402	2402
Target (dBm)	0	1.0	1.0
Tolerance ±(dB)	1.0	1.0	1.0

Frequency (MHz)	802.11a	802.11n HT20	802.11ac VHT20
	5785	5785	5785
Target (dBm)	13.0	13.0	13.0
Tolerance ±(dB)	1.0	1.0	1.0

4.3 MEASUREMENT RESULTS

4.3.1 STANDALONE MPE

Mode	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	Duty Cycle	MPE (mW/cm^2)	MPE Limits (mW/cm^2)
	(dBm)	(mW)					
DH5	1	1.2589	2	1.5849	100%	0.0004	1.0000
2DH5	2	1.5849	2	1.5849	100%	0.0005	1.0000
3DH5	2	1.5849	2	1.5849	100%	0.0005	1.0000

Mode	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	Duty Cycle	MPE (mW/cm^2)	MPE Limits (mW/cm^2)
	(dBm)	(mW)					
IEEE 802.11 a	14.0	25.1189	4.2	2.6303	100%	0.0132	1.0000
IEEE 802.11 n HT20	14.0	25.1189	4.2	2.6303	100%	0.0132	1.0000
IEEE 802.11ac VHT20	14.0	25.1189	4.2	2.6303	100%	0.0132	1.0000

Remark: 1. Maximum average power including tune-up tolerance;
2. MPE use distance is 20cm from manufacturer declaration of user manual.

According to KDB447498 for Transmitters used in mobile exposure conditions for simultaneous transmission operations;
∑of MPE ratios≤ 1.0

7. CONCLUSION

The measurement results comply with the FCC Limit per 47 CFR 2.1091 for the uncontrolled RF Exposure of mobile device.

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