

RF EXPOSURE EVALUATION REPORT

Application No.: GZCR2111021419AT
Applicant: Shenzhen Skyworth Digital Technology Co., LTD.
Address of Applicant: Unit A14/F. Skyworth Bldg., Gaoxin Ave.1s., Nanshan District, Shenzhen, China
Manufacturer: Shenzhen Skyworth Digital Technology Co., LTD.
Address of Manufacturer: 14/F, Block A, Skyworth Building, Gaoxin Ave.1.S., Nanshan District, Shenzhen, China
Factory: Shenzhen Skyworth Digital Technology Co.,LTD. Baoan Branch Factory
Address of Factory: 2-5F, Integration Multi-Storied Building, Skyworth Science and Technology Industrial Park, Tangtou Industrial Zone, Shiyan Street, Baoan District, Shenzhen city, China

Equipment Under Test (EUT):

EUT Name: 4K TV Stick
Model No.: Leap-S2, HP4609, HP46D, SRT41, KD3, 4K TV Stick, LB2106, Leap-S2C, RSG-11B, GT1 ♣
 ♣ Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.


Trade Mark: SKYWORTH, STRONG, MECOOL, Next, MEETPAI, COOCOA, REGZA, DUOBOSHI

Standard(s) :
 47 CFR Part 1.1307
 47 CFR Part 1.1310
 47 CFR Part 2.1091

Date of Receipt: 2021-12-08
Date of Evaluation: 2021-12-08 to 2021-12-10
Date of Issue: 2021-12-10


Evaluation Result:	Pass*
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* In the configuration evaluated, the EUT complied with the standards specified above.



Kobe Jian
 EMC Laboratory Manager

<i>Revision Record</i>				
<i>Version</i>	<i>Chapter</i>	<i>Date</i>	<i>Modifier</i>	<i>Remark</i>
01		2021-12-10		Original

Authorized for issue by			
Tested By			
	<hr/>		
	Curry Wu/Project Engineer		
Reviewed By			
	<hr/>		
	Ricky Liu/Reviewer		



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2 Evaluation Summary

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.

Declaration of EUT Family Grouping:

Model No.: Leap-S2, HP4609, HP46D, SRT41, KD3, 4K TV Stick, LB2106, Leap-S2C, RSG-11B, GT1

Only the model Leap-S2 was tested, since according to the declaration from the applicant, the electrical circuit design, PCB layout, components used and internal wiring and functions were identical for the above models, with only difference on model No..



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4 General Information

4.1 Details of E.U.T.

Power supply: Adapter:
 Model:UT-236A-5100
 Input:AC 100-240V 50/60Hz 0.2A
 Output: DC 5.0V 1.0A 5.0W
 3.0V DC (1.5V x 2 "AAA" Size Batteries) for remote controller

Test Voltage: AC 120V, 60Hz or AC 240V, 50Hz
 Note: Both nominal AC 120V, 60Hz and AC 240 V, 50Hz are required for testing in accordance with FCC KDB174176, this report only shows the results of the worst test result(AC 120V, 60Hz);

Cable(s): USB cable: 100cm unshielded
 HDMI cable: 12cm shielded

For BT:

Operation Frequency: 2402MHz to 2480MHz
 Bluetooth Version: V5.0 Dual mode
 Modulation Type: GFSK, pi/4DQPSK, 8DPSK
 Number of Channels: 79
 Channel Spacing: 1MHz
 Spectrum Spread Technology: Frequency Hopping Spread Spectrum(FHSS)
 Antenna Type: PCB Antenna
 Antenna Gain: Antenna 2 :4dBi

For BLE:

Operation Frequency: 2402MHz to 2480MHz
 Bluetooth Version: V5.0 Dual mode
 Modulation Type: GFSK
 Number of Channels: 40
 Channel Spacing: 2MHz
 Data rate: 1M/bits and 2M/bits
 Antenna Type: PCB Antenna
 Antenna Gain: Antenna 2 :4dBi

For 2.4G:

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: PCB Antenna
 Antenna Gain: Antenna 1:3.5dBi Antenna 2 :4dBi



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For 5G:

Operation Frequency (20MHz):	U-NII-1: 5180-5240MHz; U-NII-2A: 5260-5320MHz; U-NII-2C: 5500-5700MHz; U-NII-3: 5745-5825MHz
Operation Frequency (40MHz):	U-NII-1: 5190-5230MHz; U-NII-2A: 5270-5310MHz; U-NII-2C: 5510-5670MHz; U-NII-3: 5755-5795MHz
Operation Frequency (80MHz):	U-NII-1: 5210MHz; U-NII-2A: 5290MHz; U-NII-2C: 5530-5610MHz; U-NII-3: 5775MHz
Modulation Type:	802.11a: OFDM (64QAM, 16QAM, QPSK, BPSK); 802.11n: OFDM (BPSK, QPSK, 16QAM, 64QAM); 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)
Channel Spacing:	802.11a/n(HT20)/ac(HT20): 20MHz; 802.11n(HT40)/ac(HT40): 40MHz; 802.11ac(HT80): 80MHz
DFS Function:	Slave without Radar detection
TPC Function:	Without TPC function
Antenna Type:	PCB Antenna
Antenna Gain:	Antenna 1:4dBi Antenna 2:3dBi

4.2 Evaluating Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou Branch EMC Laboratory,
198 Kezhu Road, Sciencetech Park, Guangzhou Economic & Technology Development District,
Guangzhou, China 510663

Tel: +86 20 82155555

Fax: +86 20 82075059

No tests were sub-contracted.



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4.3 Facility

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

- **NVLAP (Lab Code: 200611-0)**

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

- **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.

- **CNAS (Lab Code: L0167)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been assessed and in compliance with CNAS-CL01:2018 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2017 General Requirements) for the Competence of Testing Laboratories.

- **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 Radio Spectrum Technical Requirement

5.1 RF Exposure Compliance Requirement

5.1.1 Limits

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 ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3–3.0	614	1.63	*(100)	6
3.0–30	1842/f	4.89/f	*(900/f ²)	6
30–300	61.4	0.163	1.0	6
300–1500 .....	.....	.....	f/300	6
1500–100,000 .....	.....	.....	5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f ²)	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/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

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

P_d is the limit of MPE, 1 mW/cm². 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.

5.1.2 Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.



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5.1.3 EUT RF Exposure Evaluation

For BT:

Antenna Gain: Antenna :4dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2.512 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
2402	10	10	0.005	1.0	PASS

Note: Refer to user manual for EUT test Max Conducted Peak Output Power value.

The distance r (4th column) calculated from the Fries transmission formula is far greater than 20 cm separation requirement.

For BLE:

Antenna Gain: Antenna :4dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2.512 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
2402	8	6.31	0.0032	1.0	PASS

Note: Refer to user manual for EUT test Max Conducted Peak Output Power value.

The distance r (4th column) calculated from the Fries transmission formula is far greater than 20 cm separation requirement.

For 2.4GHz Wifi:

Antenna Gain: Antenna 1:3.5dBi Antenna :4dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber are 2.239 & 2.512 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:



MIMO:

Frequency (MHz)	Antenna	Max Conducted Peak Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
2422	1+2	17	50.12	0.025	1.0	PASS

Note: Refer to user manual for EUT test Max Conducted Peak Output Power value.

The distance r (4th column) calculated from the Fries transmission formula is far greater than 20 cm separation requirement.

For 5GHz Wifi:

Antenna Gain: Antenna 1:4dBi Antenna :3dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber are 2.512 & 1.995 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

MIMO:

Frequency (MHz)	Antenna	Max Conducted Peak Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
5785	1+2	16	39.81	0.0199	1.0	PASS

Note: Refer to user manual for EUT test Max Conducted Peak Output Power value.

The distancer (4th column) calculated from the Fries transmission formula is far greater than 20 cm separation requirement.

Remark:

BT and Wi-Fi can transmit at the same time, but because BT and Wi-Fi share Antenna 2, and the power of Wi-Fi is greater than the power of BT, so we only need to evaluate the MIMO of Wi-Fi when evaluating simultaneous transmission

6 EUT Constructional Details (EUT Photos)

Refer to appendix - external and internal photos for GZCR2111021419AT

- End of the Report -

