FCC RF EXPOSURE EVALUATION REPORT

Product Name:	ANDROID SET TOP BOX
Trade Mark:	LSP.mini
Model No.:	LSPs912-G2-1706
Report Number:	170801012RFC-5
Test Standards:	FCC 47 CFR Part 1 Subpart I
FCC ID:	2AF98-LSPS912G2
Test Result:	PASS
Date of Issue:	September 20, 2017

Prepared for:

LIFE STYLE PANEL PTY LTD.
77 Logistics Place, Larapinta, Queensland, Australia

Prepared by:

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Tested by: Kevin Liang, Senior Engineer

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Date: September 20, 2017

UnionTrust Laboratories * Certified *

Version

Version No.	Date	Description
V1.0	September 20, 2017	Original

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1. GENERAL INFORMATION

1.1 CLIENT INFORMATION

Applicant:	LIFE STYLE PANEL PTY LTD.
Address of Applicant:	77 Logistics Place, Larapinta, Queensland, Australia
Manufacturer:	SHENZHEN GIEC DIGITAL CO., LTD
Address of Manufacturer:	No. 1 Building, Factory, No. 7 District, Dayang Development Areas, Fuyong Street, Bao'an, Shenzhen, Guangdong, China

1.2 EUT INFORMATION

Product Name:	ANDROID SET TOP BOX		
Model No.:	LSPs912-G2-1706		
Add. Model No.:	GK-MP1111D		
Trade Mark:	LSP.mini for LSPs912-G2-1706; GIEC for GK-MP1111D		
DUT Stage:	Identical Prototype		
EUT Supports Function:	2.4 GHz ISM Band:	IEEE 802.11b/g/n	
		Bluetooth: V4.1 (dual mode)	
	5 GHz U-NII Bands:	5 150 MHz to 5 250 MHz	IEEE 802.11a/n/ac
		5 725 MHz to 5 850 MHz	IEEE 802.11a/n/ac
Software Version:	V1.0.1.20170926		
Hardware Version:	RM-MPEG-187G VER1.0		
Sample Received Date:	August 3, 2017		
Sample Tested Date:	August 3, 2017 to September 16, 2017		
Note: All two models are with the same circuit and PCB layout. Color, silk screen and trademark of these two models are different. Model LSPs912-G2-1706 has IR extention Jack, GK-MP MP1111D doesn't have TR extention Jack. GK-MP1111D has AV output interface, LSPs912-G2-1706 doesn't have AV output interface, declared by the manufacturer.			

1.3 PRODUCT SPECIFICATION SUBJECTIVE TO THIS STANDARD

For BT_LE	
Frequency Range:	2400 MHz to 2483.5 MHz
Bluetooth Version:	Bluetooth V4.0 LE
Type of Modulation:	GFSK
Number of Channels:	40
Channel Separation:	2 MHz
Antenna Type:	FPCB Antenna
Antenna Gain:	2 dBi
Maximum Peak Power:	8.30 dBm

For BT_EDR	
Frequency Range:	2400 MHz to 2483.5 MHz
Bluetooth Version:	Bluetooth V3.0+EDR
Modulation Technique:	Frequency Hopping Spread Spectrum(FHSS)
Type of Modulation:	GFSK, π/4DQPSK, 8DPSK
Number of Channels:	79
Channel Separation:	1 MHz
Antenna Type:	FPCB Antenna
Antenna Gain:	2 dBi
Maximum Peak Power:	-5.85 dBm

For 2.4 GHz ISM Band of Wi-Fi	
Frequency Range:	2400 MHz to 2483.5 MHz
Support Standards:	IEEE 802.11b, IEEE 802.11g, IEEE 802.11n-HT20
Type of Modulation:	IEEE 802.11b: DSSS(CCK, DQPSK, DBPSK) IEEE 802.11g: OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n-HT20: OFDM(64QAM, 16QAM, QPSK, BPSK)
Data Rate:	IEEE 802.11b: Up to 11 Mbps IEEE 802.11g: Up to 54 Mbps IEEE 802.11n-HT20: Up to MCS7
Number of Channels:	IEEE 802.11b: 11 IEEE 802.11g: 11 IEEE 802.11n-HT20: 11
Channel Separation:	5 MHz
Antenna Type:	FPCB Antenna
Antenna Gain:	2 dBi
Maximum Peak Power:	IEEE 802.11b: 18.45 dBm IEEE 802.11g: 24.64 dBm IEEE 802.11n-HT20: 20.49 dBm

For 5 GHz U-NII Bands of Wi-Fi			
Frequency Range:	5150 MHz to 5250 MHz		
	5 725 MHz to 5 850 MHz		
Support Standards:	IEEE 802.11a/n/ac		
TPC Function:	Not Support		
DFS Operational mode:	Slave without radar Interference detection function		
Type of Modulation:	IEEE 802.11a: OFDM(64QAM, 16QAM, QPSK, BPSK)		
	IEEE 802.11n: OFDM(64QAM, 16QAM, QPSK, BPSK)		
	IEEE 802.11ac: OFDM(256QAM, 64QAM, 16QAM, QPSK, BPSK)		
Channel Spacing:	IEEE 802.11a/n-HT20/ac-VHT20: 20 MHz		
	IEEE 802.11n-HT40/ac-VHT40: 40 MHz		
	IEEE 802.11ac-VHT80/: 80 MHz		
Data Rate:	IEEE 802.11a: Up to 54 Mbps		
	IEEE 802.11n-HT20: Up to MCS7		
	IEEE 802.11n-HT40: Up to MCS7		
	IEEE 802.11ac-VHT20: Up to MCS8		
	IEEE 802.11ac-VHT40: Up to MCS9		
	IEEE 802.11ac-VHT80: Up to MCS9		
Number of Channels:	5150 MHz to 5250 MHz: 4 for IEEE 802.11a/n-HT20/ac-VHT20 2 for IEEE 802.11n-HT40)/ac-VHT40 1 for IEEE 802.11acVHT80		
	5725 MHz to 5850 MHz: 5 for IEEE 802.11a/n-HT20/ac-VHT20 2 for IEEE 802.11n-HT40/ac-VHT40 1 for IEEE 802.11ac-VHT80		
Antenna Type:	FPCB Antenna		
Antenna Gain:	5150 MHz to 5250 MHz	2 dBi	
	5725 MHz to 5850 MHz	2 dBi	
Maximum Conducted Output Power (dBm):	**Mode**	**U-NII-1**	**U-NII-3**
	IEEE 802.11a	17.99	17.13
	IEEE 802.11n-HT20	15.17	14.26
	IEEE 802.11n-HT40	11.70	11.19
	IEEE 802.11ac-VHT20	15.11	14.08
	IEEE 802.11ac-VHT40	11.42	11.22
	IEEE 802.11ac-VHT80	11.05	10.11

1.4 OTHER INFORMATION

Test channels for BT_LE				
Type of Modulation	**Tx/Rx Frequency**	**Test RF Channel Lists**		
		Lowest(L)	**Middle(M)**	**Highest(H)**
GFSK	2402 MHz to 2480 MHz	Channel 0	Channel 19	Channel 39
		2402 MHz	2440 MHz	2480 MHz

Test channels for BT_EDR				
Mode	Tx/Rx Frequency	Test RF Channel Lists		
		Lowest(L)	Middle(M)	Highest(H)
GFSK (DH1, DH3, DH5)	2402 MHz to 2480 MHz	Channel 0	Channel 39	Channel 78
		2402 MHz	2441 MHz	2480 MHz
π/4DQPSK (DH1, DH3, DH5)	2402 MHz to 2480 MHz	Channel 0	Channel 39	Channel 78
		2402 MHz	2441 MHz	2480 MHz
8DPSK (DH1, DH3, DH5)	2402 MHz to 2480 MHz	Channel 0	Channel 39	Channel 78
		2402 MHz	2441 MHz	2480 MHz

Test channels for 2.4 GHz ISM Band of Wi-Fi				
Mode	Tx/Rx Frequency	Test RF Channel Lists		
		Lowest(L)	Middle(M)	Highest(H)
IEEE 802.11b	2412 MHz to 2462 MHz	Channel 1	Channel 6	Channel 11
		2412 MHz	2437 MHz	2462 MHz
IEEE 802.11g	2412 MHz to 2462 MHz	Channel 1	Channel 6	Channel 11
		2412 MHz	2437 MHz	2462 MHz
IEEE 802.11n-HT20	2412 MHz to 2462 MHz	Channel 1	Channel 6	Channel 11
		2412 MHz	2437 MHz	2462 MHz

Test channels for 5 GHz U-NII Bands of Wi-Fi				
Mode	Tx/Rx Frequency	Test RF Channel Lists		
		Lowest(L)	Middle(M)	Highest(H)
IEEE 802.11a IEEE 802.11n-HT20 IEEE 802.11ac-VHT20	5150 MHz to 5250 MHz	Channel 36	Channel 44	Channel 48
		5180 MHz	5220 MHz	5240 MHz
	5725 MHz to 5850 MHz	Channel 149	Channel 157	Channel 161
		5745 MHz	5785 MHz	5805 MHz
IEEE 802.11n-HT40 IEEE 802.11ac-VHT40	5150 MHz to 5250 MHz	Channel 38	--	Channel 46
		5190 MHz	--	5230 MHz
	5725 MHz to 5850 MHz	Channel 151	--	Channel 159
		5755 MHz	--	5795 MHz
IEEE 802.11ac-HT80	5150 MHz to 5250 MHz	--	Channel 42	--
		--	5210 MHz	--
	5725 MHz to 5850 MHz	--	Channel 155	--
		--	5775 MHz	--

1.5 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF product, according to the specifications of the manufacturers. It must comply with the requirements of the following standards:

FCC 47 CFR Part 1 Subpart I

All test items have been performed and recorded as per the above standards

1.6 TEST LOCATION

All tests were performed at:

Shenzhen UnionTrust Quality and Technology Co., Ltd.

Address: 16/F, Block A, Building 6, Baoneng Science and Technology Park, Qingxiang Road No.1, Longhua New District, Shenzhen, China 518109
Telephone: +86 (0) 755 2823 0888
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1.7 TEST FACILITY

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

CNAS-Lab Code: L9069
The measuring equipment utilized to perform the tests documented in this report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable under the ISO/IEC/EN 17025 to international or national standards. Equipment has been calibrated by accredited calibration laboratories.

IC-Registration No.: 21600-1
The 3m Semi-anechoic chamber of Shenzhen UnionTrust Quality and Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 21600-1.

A2LA-Lab Certificate No.: 4312.01
Shenzhen UnionTrust Quality and Technology Co., Ltd. has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

FCC Accredited Lab.
Designation Number: CN1194
Test Firm Registration Number: 259480

1.8 DEVIATION FROM STANDARDS

None.

1.9 ABNORMALITIES FROM STANDARD CONDITIONS

None.

1.10 OTHER INFORMATION REQUESTED BY THE CUSTOMER

None.

2. EQUIPMENT LIST

Please refer to the RF test report.

3. MPE EVALUATION

3.1 REFERENCE DOCUMENTS FOR EVALUATION

No.	Identity	Document Title
1	FCC 47 CFR Part 1 Subpart I	PROCEDURES IMPLEMENTING THE NATIONAL ENVIRONMENTAL POLICY ACT OF 1969
2	KDB 447498 D01 General RF Exposure Guidance v06	RF EXPOSURE PROCEDURES AND EQUIPMENT AUTHORIZATION POLICIES FOR MOBILE AND PORTABLE DEVICES

3.2 MPE COMPLIANCE REQUIREMENT

3.2.1 Limits

According to §1.1307(b)(1), system operating under the provisions of this section shall be operating in a manner that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure.

Limits for Occupational / Controlled Exposure

Frequency range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Times $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f)*	6
30-300	61.4	0.163	1.0	6
300-1500	/	/	F/300	6
1500-100000	/	/	5	6

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 Times $\|E\|^2$, $\|H\|^2$ 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
1500-100000	/	/	1	30

Note: f = frequency in MHz: * = Plane-wave equivalents power density.

3.2.2 Test Procedure

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

3.3 MPE CALCULATION METHOD

S = PG/4πR^2= EIRP/4πR^2
S = power density (in appropriate units, e.g., mw/cm2)
P = power input to the antenna (in appropriate units, e.g., mw)
G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor is normally numeric gain.
R = distance to the center of radiation of the antenna (in appropriate units, e.g., cm)

3.4 MPE CALCULATION RESULTS

Note: *For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.*

3.4.1 For WLAN

For Wi-Fi function, operating at 2412MHz to 2462 MHz for IEEE802.11b/g/n and
operating at 5150 MHz to 5250 MHz for IEEE802.11a/n/ac and
operating at 5725 MHz to 5850 MHz for IEEE802.11a/n/ac.

3.4.1.1 Antenna Type:

Chain 0: Integral Antenna
Chain 1: Integral Antenna

3.4.1.2 Antenna Gain:

Chain 0: 2412MHz to 2462 MHz: 2 dBi
5150 MHz to 5250 MHz: 2 dBi
5725 MHz to 5850 MHz: 2 dBi

3.4.1.3 Results for WLAN

Operating Mode		Freq.	Declared maximum conducted average output power	Max. positive tolerance according manufacturer	Antenna Gain	Calculated maximum EIRP	Declared maximum EIRP	MPE Limit	MPE Value
		(MHz)	(dBm)		(dBi)	(dBm)	(mW)	(mw/cm^2)	
Antenna 1	IEEE 802.11b	2412	15.00	1.5	2	18.5	70.7946	1	0.0141
		2437	15.00	1.5	2	18.5	70.7946	1	0.0141
		2462	15.00	1.5	2	18.5	70.7946	1	0.0141
	IEEE 802.11g	2412	14.00	1.5	2	17.5	56.2341	1	0.0112
		2437	14.00	1.5	2	17.5	56.2341	1	0.0112
		2462	14.00	1.5	2	17.5	56.2341	1	0.0112
	IEEE 802.11n-HT20	2412	10.00	1.5	2	13.5	22.3872	1	0.0045
		2437	10.00	1.5	2	13.5	22.3872	1	0.0045
		2462	10.00	1.5	2	13.5	22.3872	1	0.0045
	IEEE 802.11a	5180	17.00	1.5	2	20.5	112.2018	1	0.0223
		5220	17.00	1.5	2	20.5	112.2018	1	0.0223
		5240	17.00	1.5	2	20.5	112.2018	1	0.0223
		5745	17.00	1.5	2	20.5	112.2018	1	0.0223
		5785	17.00	1.5	2	20.5	112.2018	1	0.0223
		5805	17.00	1.5	2	20.5	112.2018	1	0.0223
	IEEE 802.11n-HT20 IEEE 802.11ac-VHT20	5180	14.00	1.5	2	17.5	56.2341	1	0.0112
		5220	14.00	1.5	2	17.5	56.2341	1	0.0112
		5240	14.00	1.5	2	17.5	56.2341	1	0.0112
		5745	14.00	1.5	2	17.5	56.2341	1	0.0112
		5785	14.00	1.5	2	17.5	56.2341	1	0.0112
		5805	14.00	1.5	2	17.5	56.2341	1	0.0112
	IEEE 802.11n-HT40 IEEE 802.11ac-VHT40	5190	11.00	1.5	2	14.5	28.1838	1	0.0056
		5230	11.00	1.5	2	14.5	28.1838	1	0.0056
		5755	11.00	1.5	2	14.5	28.1838	1	0.0056
		5795	11.00	1.5	2	14.5	28.1838	1	0.0056
	IEEE 802.11ac-VHT80	5230	10.00	1.5	2	13.5	22.3872	1	0.0045
		5775	10.00	1.5	2	13.5	22.3872	1	0.0045

3.4.2 For BT

For BT_LE function, operating at 2402MHz to 2480 MHz for GFSK and

For BT_EDR function, operating at 2402MHz to 2480 MHz for GFSK, π/4 DQPSK, 8DPSK

3.4.2.1 Antenna Type:

Chain 0: Integral Antenna

3.4.2.2 Antenna Gain:

Chain 0: 2402MHz to 2480 MHz: 2 dBi

3.4.2.3 Results for BT

Operating Mode	Freq.	Declared maximum conducted average output power	Max. positive tolerance according manufacturer	Antenna Gain	Calculated maximum EIRP	Declared maximum EIRP	MPE Limit	MPE Value
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(mW)	(mw/cm^2)	
LE	2402	8.0	1	2	11	12.5893	1	0.0025
	2440	8.0	1	2	11	12.5893	1	0.0025
	2480	8.0	1	2	11	12.5893	1	0.0025
EDR	2402	-5.0	1	2	-2	0.6310	1	0.0001
	2441	-5.0	1	2	-2	0.6310	1	0.0001
	2480	-5.0	1	2	-2	0.6310	1	0.0001

APPENDIX 1 PHOTOS OF TEST SETUP

N/A

APPENDIX 2 PHOTOS OF EUT CONSTRUCTIONAL DETAILS

Refer to Appendix 2 for EUT external and internal photos.

*** End of Report ***