



**SGS-CSTC Standards Technical Services Co., Ltd.
Shenzhen Branch**

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Report No.: SZEM160500384304
Page: 1 of 10

RF Exposure Evaluation Report

Application No: SZEM1605003843CR
Applicant: SmartLabs LLC
Manufacturer: SmartLabs LLC
Factory: Sichuan Changhong Network Technologies Co., Ltd.
Shenzhen Giec Digital Co., Ltd
Product Name: IPTV Set-Top Box
Model No.(EUT): SML-5112W
Trade Mark: SmartLabs
FCC ID: 2AIBUSML5112W
Standards: 47 CFR Part 1.1307(2014)
47 CFR Part 1.1310(2014)
Date of Receipt: 2016-06-01
Date of Test: 2016-06-07 to 2016-06-30
Date of Issue: 2016-07-07

Test Result :	PASS*
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* In the configuration tested, the EUT detailed in this report complied with the standards specified above.

Authorized Signature:



Jack Zhang
EMC Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

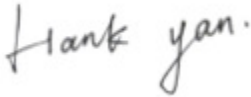


The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.

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2 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
00		2016-07-07		Original

Authorized for issue by:			
Tested By			2016-06-07 Date
Prepared By			2016-07-07 Date
Checked By			2016-07-07 Date



3 Contents

	Page
1 COVER PAGE	1
2 VERSION	2
3 CONTENTS	3
4 GENERAL INFORMATION	4
4.1 CLIENT INFORMATION	4
4.2 GENERAL DESCRIPTION OF EUT	4
4.3 TEST LOCATION	6
4.4 TEST FACILITY	6
4.5 DEVIATION FROM STANDARDS	7
4.6 ABNORMALITIES FROM STANDARD CONDITIONS	7
4.7 OTHER INFORMATION REQUESTED BY THE CUSTOMER	7
5 RF EXPOSURE EVALUATION	8
5.1 RF EXPOSURE COMPLIANCE REQUIREMENT	8
5.1.1 <i>Limits</i>	8
5.1.2 <i>Test Procedure</i>	8
5.1.3 EUT RF EXPOSURE EVALUATION	9-10



4 General Information

4.1 Client Information

Applicant:	SmartLabs LLC
Address of Applicant:	3, Sherbakovskaya str, Moscow, Russia, 105318
Manufacturer:	SmartLabs LLC
Address of Manufacturer:	3, Sherbakovskaya str, Moscow, Russia, 105318
Factory:	Sichuan Changhong Network Technologies Co., Ltd.
	Shenzhen Giec Digital Co., Ltd
Address of Factory:	Science and Technology Park, Mianyang City, Sichuan Province, China
	No.1 Building , Factory, No.7 District, Dayang Development Areas, Fuyong Street, Baoan, Shenzhen, China

4.2 General Description of EUT

Product Name:	IPTV Set-Top Box			
Model No.:	SML-5112W			
Trade Mark:	SmartLabs			
Operation Frequency:	Band	Mode	Frequency Range(MHz)	Number of channels
	UNII Band I	IEEE 802.11a	5180-5240	4
		IEEE 802.11n 20MHz	5180-5240	4
		IEEE 802.11n 40MHz	5190-5230	2
		IEEE 802.11ac 20MHz	5180-5240	4
		IEEE 802.11ac 40MHz	5190-5230	2
		IEEE 802.11ac 80MHz	5210	1
	UNII Band II-A	IEEE 802.11a	5260-5320	4
		IEEE 802.11n 20MHz	5260-5320	4
		IEEE 802.11n 40MHz	5270-5310	2
		IEEE 802.11ac 20MHz	5260-5320	4
		IEEE 802.11ac 40MHz	5270-5310	2
		IEEE 802.11ac 80MHz	5290	1
	UNII Band II-C	IEEE 802.11a	5500-5700	11
		IEEE 802.11n 20MHz	5500-5700	11
		IEEE 802.11n 40MHz	5510-5670	5
		IEEE 802.11ac 20MHz	5500-5700	11
		IEEE 802.11ac 40MHz	5510-5670	5
		IEEE 802.11ac 80MHz	5530-5610	2
	UNII Band III	IEEE 802.11a	5745-5825	5
		IEEE 802.11n 20MHz	5745-5825	5

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SGS-CSTC Standards Technical Services Co., Ltd.
Shenzhen Branch

Report No.: SZEM160500384304
Page: 5 of 10

		IEEE 802.11n 40MHz	5755-5795	2
		IEEE 802.11ac 20MHz	5745-5825	5
		IEEE 802.11ac 40MHz	5755-5795	2
		IEEE 802.11ac 80MHz	5775	1
Type of Modulation:	IEEE 802.11a: OFDM(BPSK/QPSK/16QAM/64QAM) IEEE 802.11n: OFDM(BPSK/QPSK/16QAM/64QAM) IEEE 802.11ac: OFDM (BPSK/QPSK/16QAM/64QAM/256QAM)			
Sample Type:	Mobile Device			
Antenna Type and Gain:	Integral: 4dBi MIMO 4x4			
Power Supply:	Model:SAW30-120-2500U Input: AC 100-240V, 50/60Hz, 0.8A Output: DC 12V, 2.5A			

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4.3 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch E&E Lab

No. 1 Workshop, M-10, Middle section, Science & Technology Park, Shenzhen, Guangdong, China
518057

Telephone: +86 (0) 755 2601 2053 Fax: +86 (0) 755 2671 0594

No tests were sub-contracted.

4.4 Test Facility

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

- **CNAS (No. CNAS L2929)**

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

- **VCCI**

The 10m Semi-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.: G-823, R-4188, T-1153 and C-2383 respectively.

- **FCC – Registration No.: 556682**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No.: 556682.

- **Industry Canada (IC)**

Two 3m Semi-anechoic chambers and the 10m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1, 4620C-2, 4620C-3.



4.5 Deviation from Standards

None.

4.6 Abnormalities from Standard Conditions

None.

4.7 Other Information Requested by the Customer

None.



5 RF Exposure Evaluation

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: $Pd = (Pout * G) / (4 * Pi * R^2)$

Where

Pd = power density in mW/cm²

Pout = 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

Pd 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

Antenna Gain: 4.0dBi

According to KDB 662911, the transmit signal is correlated,

So Directional gain = $G_{ANT} + 10 \log(N_{ANT})$ dBi = 4.0 + 6.02 = 10.02

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 10.05 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Band I

Channel	Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit	MPE Ratios	Result
48	5240 MHz	10.56	11.38	0.0227	1.0	0.0227	PASS

Note: Refer to report No. SZEM160500384302 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.

Band II

Channel	Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit	MPE Ratios	Result
58	5290 MHz	14.83	30.41	0.0608	1.0	0.0608	PASS

Note: Refer to report No. SZEM160500384302 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.

Band III

Channel	Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit	MPE Ratios	Result
140	5700 MHz	11.42	13.87	0.0277	1.0	0.0277	PASS

Note: Refer to report No. SZEM160500384302 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.

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SGS-CSTC Standards Technical Services Co., Ltd.
Shenzhen Branch

Report No.: SZEM160500384304
Page: 10 of 10

Band IV

Channel	Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit	MPE Ratios	Result
147	5775 MHz	11.73	14.89	0.0298	1.0	0.0298	PASS

Note: Refer to report No. SZEM160500384302 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.