

RF Exposure Evaluation Report

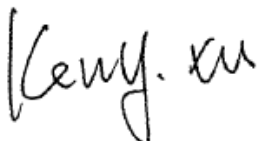
Application No.: SZCR2106021810AT
Applicant: Shenzhen Chuangwei-RGB Electronics Co., Ltd.
Address of Applicant: 13F-16F, Unit A, Skyworth Building, Shennan Road, Nanshan District, Shenzhen, 518108 China
Manufacturer: HTP (Jiangxi) Optoelectronic Technology Co., Ltd.
Address of Manufacturer: North Fenghuang Road, Ganzhou Economic Technology Development Zone, Ganzhou, Jiangxi, China
Factory: HTP (Jiangxi) Optoelectronic Technology Co., Ltd.
Address of Factory: North Fenghuang Road, Ganzhou Economic Technology Development Zone, Ganzhou, Jiangxi, China

Equipment Under Test (EUT):

Product Name: Projector
Model No.: T1
Trade Mark: SKYWORTH
FCC ID: 2ANM3STYT1K55
Standards: 47 CFR Part 1.1307
 47 CFR Part 2.1091
Date of Receipt: 2021-06-25
Date of Test: 2021-07-06 to 2021-07-17
Date of Issue: 2021-08-02

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



Keny Xu
 EMC Laboratory Manager



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2 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2021-08-02		Original

Authorized for issue by:				
		<i>Bill Chen</i>		
		Bill Chen/Project Engineer		
		<i>Eric Fu</i>		
		Eric Fu/Reviewer		



3 Contents

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



4 General Information

4.1 General Description of EUT

Power supply:	AC 110-240V,50/60Hz, 150W 3.0V DC (1.5V x 2 "AAA" Size Batteries) for remote controller
Cable(s):	AC cable: 145cm unshielded
For BT:	
Operation Frequency:	2402MHz to 2480MHz
Bluetooth Version:	V4.2 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:	PIFA
Antenna Gain:	2dBi
For BLE:	
Operation Frequency:	2402MHz to 2480MHz
Bluetooth Version:	V4.2 Dual mode
Modulation Type:	GFSK
Number of Channels:	40
Channel Spacing:	2MHz
Antenna Type:	PIFA Antenna
Antenna Gain:	2dBi
For 2.4G 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:	PIFA Antenna
Antenna Gain:	2dBi



4.2 Test Location

All tests were performed at:

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

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.

4.3 Test Facility

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

- **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 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

- **FCC –Designation Number: CN1178**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

- **Innovation, Science and Economic Development Canada**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

4.4 Deviation from Standards

None.

4.5 Abnormalities from Standard Conditions

None.

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

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.



4.1.3 EUT RF Exposure Evaluation

Remark:

Two antennas cannot transmit at the same time.

For BT:

Antenna Gain: 2dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.58 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Channel	Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
Middle	2441	7.12	5.15	0.0016	1.0	PASS

Note: Refer to report No. SZCR210602181002 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: 2dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.58 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Channel	Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
Middle	2440	5.89	3.88	0.0012	1.0	PASS

Note: Refer to report No. SZCR210602181003 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 2.4G WIFI:

Antenna Gain: 2dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.58 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

For Antenna0:

Channel	Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
Highest	2462	17.96	62.52	0.0197	1.0	PASS

For Antenna1:

Channel	Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
Highest	2462	17.40	54.95	0.0173	1.0	PASS

Note: Refer to report No. SZCR210602181004 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.

- End of the Report -

