Shenzhen Global Test Service Co.,Ltd.
No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road,
Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong

RF Exposure evaluation

Report Reference No.....:	**GTS20201016002-1-5**
FCC ID. .....:	**2AYAZ-L22**
Compiled by (position+printed name+signature) . :	File administrators Peter Xiao
Supervised by (position+printed name+signature) . :	Test Engineer Moon Tan
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Date of issue .....:	Dec.10, 2020

Representative Laboratory Name.:	**Shenzhen Global Test Service Co.,Ltd.**
Address .....:	No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong

Applicant's name.....:	**Luxnpro Chengdu Electronics Co., Ltd.**
Address .....:	Floor2, Building10, District A, Tianfu Jingrong Center, Science City, Tianfu New Area, Chengdu. China

Test specification.....**:**	
Standard.....:	**47CFR §1.1310** **47CFR §2.1091** **KDB447498 v06**
TRF Originator.....:	Shenzhen Global Test Service Co.,Ltd.
Master TRF .....:	Dated 2014-12

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Test item description .....:	**LED projector**
Trade Mark.....:	N/A
Manufacturer .....:	Luxnpro Chengdu Electronics Co., Ltd.
Model/Type reference .....:	BBQ4
Listed Models .....:	Please refer to page 5
Modulation Type.....:	IEEE 802.11a /802.11b/802.11g/802.11n/802.11ac
Operation Frequency.....:	From 2412MHz to 2462MHz, 5180MHz to 5240MHz, 5745MHz to 5825MHz, 2402MHz to 2480MHz
Hardware Version .....:	N/A
Software Version.....:	N/A
Rating .....:	Input: AC 100-240V,50/60Hz
Result .....:	**PASS**

T E S T R E P O R T

Test Report No. :	**GTS20201016002-1-5**	Dec.10, 2020 Date of issue

Equipment under Test	:	LED projector
Model /Type	:	BBQ4
Listed model	:	Please refer to page 5
Applicant	:	**Luxnpro Chengdu Electronics Co., Ltd.**
Address	:	Floor2, Building10, District A, Tianfu Jingrong Center, Science City, Tianfu New Area, Chengdu. China
Manufacturer	:	**Luxnpro Chengdu Electronics Co., Ltd.**
Address	:	Floor2, Building10, District A, Tianfu Jingrong Center, Science City, Tianfu New Area, Chengdu. China

Test Result:	**PASS**

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.

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1. SUMMARY

1.1 EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

● - supplied by the manufacturer

○ - supplied by the lab

●	/	Length (m) :	/
		Shield :	/
		Detachable :	/

1.2 Product Description

Product Name	LED projector
Trade Mark	N/A
Model/Type reference	BBQ4
List Models	Please refer to page 6
Model Declaration	PCB board, structure and internal of these model(s) are the same, So no additional models were tested.
Power supply:	Input: AC 100-240V,50/60Hz
Sample ID	GTS20201016002-1-1# & GTS20201016002-1-2#
Bluetooth	
Operation frequency	2402-2480MHz
Channel Number	79 channels for Bluetooth (DSS) 40 channels for Bluetooth (DTS)
Channel Spacing	1MHz for Bluetooth (DSS) 2MHz for Bluetooth (DTS)
Modulation Type	GFSK, π/4-DQPSK, 8DPSK for Bluetooth (DSS) GFSK for Bluetooth (DTS)
WIFI(2.4G Band)	
Frequency Range	2412MHz ~ 2462MHz
Channel Spacing	5MHz
Channel Number	11 Channel for 20MHz bandwidth(2412~2462MHz) 7 channels for 40MHz bandwidth(2422~2452MHz)
Modulation Type	802.11b: DSSS; 802.11g/n: OFDM
WIFI(5.2G Band)	
Frequency Range	5180MHz ~ 5240MHz
Channel Number	4 channels for 20MHz bandwidth(5180-5240MHz) 2 channels for 40MHz bandwidth(5190~5230MHz) 1 channels for 80MHz bandwidth(5210MHz)
Modulation Type	802.11a/n/ac: OFDM
WIFI (5.8G Band)	
Frequency Range	5745MHz ~ 5825MHz
Channel Number	5 channels for 20MHz bandwidth(5745-5825MHz) 2 channels for 40MHz bandwidth(5755~5795MHz) 1 channels for 80MHz bandwidth(5775MHz)
Modulation Type	802.11a/n/ac: OFDM
Antenna Description	Internal Antenna, 3.65dBi(Max.) for 2.4G Band and 2.88dBi(Max.) for 5G Band

1.3 Model list

Model list									
Z1	Z2	Z3	Z4	Z5	Z8	Z1000	Z2000	Z3000	Z4000
Z8000	ESP100	ESP200	ESP300	ESP400	ESP800	PTP100	PTP200	PTP300	PTP400
PTP800	SMART 100	SMART 200	SMART 300	SMART 400	SMART 800	CC1	CC2	CC3	CC4
CC5	CC6	CC7	CC8	CC9	Cine1	Cine2	Cine3	Cine8	S1
S2	S3	S4	S5	S6	S7	S8	S9	CM1	CM2
CM3	CM4	CM5	CM6	CM7	CM8	CM9	FHD4D 1	FHD5D 1	FHD6D 1
HQ2	HQ3	HQ4	HQ5	HQ6	HQ7	HQ8	HQ9	LX200F HD	LX300F HD
LX400F HD	LX500F HD	LX600F HD	LX700F HD	LX800F HD	LX900F HD	BBC2	BBC3	BBC4	BBC5
BBC6	BBC7	BBC8	BBC9	BBQ2	BBQ3	BBQ5	BBQ6	BBQ7	BBQ8
BBQ9	BBW2	BBW3	BBW4	BBW5	BBW6	BBW7	BBW8	V200	V201
V202	V203	V204	V205	V206	V301	V302	V303	V304	V305
V310	V320	V330	V340	V350	V500	V501	V502	V503	V504
V510	V520	V530	V540	V550	V560	L21	L22	L23	L24
L25	L26	L27	L28	A21	A22	A23	A24	Q1	Q2
Q3	Q6	Q7	Q8	EXPLORE 3	Cinema ngo 200	Cinema ngo 200P	Cinema ngo 200W	Cinema ngo 200B	Cinema ngo 200BW
Cinema ngo 200PW	Cinema ngo 200BPW	Torch 1	Torch 2	XPE600	XPE700	XPE800	XPE900	H1	H2
H3	H6	H7	H8	BW-VP6	BW-VP7	BW-VP8	BW-VP9	BW-VP10	BW-VP6 Pro
Play	Play Lite	PlayPlus	Play 2	Play 2 Plus	Play 2 Lite	Play 3	Play 3 Plus	Play 3 Lite	AKEY6
AKEY7	AKEY8	AKEY9	AKEY10	AKEY20	AKEY30	AKEY40	AKEY50	AKEY60	X2
X3	X5	X6	X7	X8	X9	X10	D50	D60	D70
D80	D90	ET10	ET20	ET30	ET40	ET50			

2. TEST ENVIRONMENT

2.1 Address of the test laboratory

Shenzhen Global Test Service Co.,Ltd.
No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong

2.2 Test Facility

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

CNAS (No. CNAS L8169)
Shenzhen Global Test Service Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2019 General Requirements) for the Competence of Testing and Calibration Laboratories.
A2LA (Certificate No. 4758.01)
Shenzhen Global Test Service Co., Ltd. has been assessed by the American Association for Laboratory Accreditation (A2LA). Certificate No. 4758.01.
Industry Canada Registration Number. is 24189.
FCC Designation Number is CN1234.
FCC Registered Test Site Number is165725.

2.3 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15-35 ° C
Humidity:	30-60 %
Atmospheric pressure:	950-1050mbar

2.4 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to TR-100028-01" Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 2 " and is documented in the Shenzhen Global Test Service Co.,Ltd quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen GTS laboratory is reported:

Test Items	Measurement Uncertainty	Notes
Transmitter power conducted	0.57 dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3. METHOD OF MEASUREMENT

3.1 Applicable Standard

According to §1.1307(b)(1), systems operating under the provisions of this 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.
According to §1.1310 and §2.1091 RF exposure is calculated.
KDB447498 v06: Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies

3.2 Requirement

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.

3.3 Limit

Limits for Maximum Permissible Exposure (MPE)/Controlled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm^2)	Averaging Time (minute)
Limits for Occupational/Controlled Exposure				
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

Limits for Maximum Permissible Exposure (MPE)/Uncontrolled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm^2)	Averaging Time (minute)
Limits for Occupational/Controlled Exposure				
0.3 – 3.0	614	1.63	(100) *	30
3.0 – 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
*=Plane-wave equivalent power density

3.4 MPE 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 an isotropic radiator
R=distance to the center of radiation of the antenna

As declared by the Applicant, the EUT transmits with the maximum soure-baed Duty Cycle of 100%-see the User manual, and the EUT is a wireless device used in a mobile application, at least 20 cm from any body part of the user or nearby persons; from the maximum EUT RF output power, the minimum mobile separation distance, r =20cm, as well as the gain of the used antenna is 1.06dBi for WLAN, and the power drift from Turn-up Procedure provide by manufacturer as following states, the RF power density can be obtained.

3.5 Antenna Information

BBQ4 can only use antennas certificated as follows provided by manufacturer;

Internal Identification	Antenna Identification in Internal photos	Antenna type and antenna number	Operate frequency band	Maximum antenna gain
Antenna 0	WLAN ANT0	External antenna	2.4 – 2.5 GHz 5.0 – 6.0 GHz	3.65dBi(Max.) for 2.4G 2.88dBi(Max.) for 5G

4. Conducted Power Results

Bluetooth

Mode	Channel	Frequency (MHz)	Peak Conducted Output Power (dBm)
GFSK	0	2402	8.43
	39	2441	8.71
	78	2480	9.09
π/4DQPSK	0	2402	6.62
	39	2441	6.63
	78	2480	6.90
8DPSK	0	2402	6.67
	39	2440	6.82
	78	2480	7.00
GFSK(BT LE)	0	2402	5.29
	19	2440	5.36
	39	2480	4.78

2.4GWLAN

Mode	Channel	Frequency (MHz)	Peak Conducted Output Power (dBm)
802.11b	01	2412	19.32
	06	2437	19.14
	11	2462	19.18
802.11g	01	2412	19.89
	06	2437	19.69
	11	2462	19.84
802.11n(HT20)	01	2412	19.83
	06	2437	19.69
	11	2462	19.79
802.11n(HT40)	03	2422	18.58
	06	2437	18.93
	09	2452	18.94

5.2GWLAN

Mode	Channel	Frequency (MHz)	Average Conducted Output Power (dBm)
802.11a	36	5180	15.52
	40	5200	15.38
	48	5240	16.00
802.11n20	36	5180	16.07
	40	5200	15.50
	48	5240	16.02
802.11ac20	36	5180	15.54
	40	5200	15.11
	48	5240	15.66
802.11n40	38	5190	16.07
	46	5230	16.07
802.11ac40	38	5190	15.68
	46	5230	15.98
802.11ac80	42	5210	15.63

5.8GWLAN

Mode	Channel	Frequency (MHz)	Average Conducted Output Power (dBm)
802.11a	149	5745	15.09
	157	5785	15.59
	165	5825	15.75
802.11n20	149	5745	15.60
	157	5785	16.00
	165	5825	15.20
802.11ac20	149	5745	15.72
	157	5785	15.28
	165	5825	15.94
802.11n40	151	5755	15.49
	159	5795	15.30
802.11ac40	151	5755	15.80
	159	5795	15.48
802.11ac80	155	5775	15.76

5. Manufacturing Tolerance

Bluetooth

GFSK (Peak)			
Channel	Channel 0	Channel 39	Channel 78
Target (dBm)	8.0	8.0	9.0
Tolerance ±(dB)	1.0	1.0	1.0
π/4DQPSK (Peak)			
Channel	Channel 0	Channel 39	Channel 78
Target (dBm)	6.0	6.0	6.0
Tolerance ±(dB)	1.0	1.0	1.0
8DPSK (Peak)			
Channel	Channel 0	Channel 39	Channel 78
Target (dBm)	6.0	6.0	7.0
Tolerance ±(dB)	1.0	1.0	1.0
GFSK BT LE (Peak)			
Channel	Channel 0	Channel 19	Channel 39
Target (dBm)	5.0	5.0	4.0
Tolerance ±(dB)	1.0	1.0	1.0

2.4GWLAN

IEEE 802.11b (Peak)			
Channel	Channel 01	Channel 06	Channel 11
Target (dBm)	19.0	19.0	19.0
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11g (Peak)			
Channel	Channel 01	Channel 06	Channel 11
Target (dBm)	19.0	19.0	19.0
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11n HT20 (Peak)			
Channel	Channel 01	Channel 06	Channel 11
Target (dBm)	19.0	19.0	19.0
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11n HT40 (Peak)			
Channel	Channel 03	Channel 06	Channel 09
Target (dBm)	18.0	18.0	18.0
Tolerance ±(dB)	1.0	1.0	1.0

5.2GWLAN

IEEE 802.11a (Average)			
Channel	Channel 36	Channel 40	Channel 48
Target (dBm)	15.0	15.0	16.0
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11n HT20 (Average)			
Channel	Channel 36	Channel 40	Channel 48
Target (dBm)	16.0	15.0	16.0
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11ac VHT20 (Average)			
Channel	Channel 36	Channel 40	Channel 48
Target (dBm)	15.0	15.0	15.0
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11n VHT40 (Average)			
Channel	Channel 38	Channel 46	/
Target (dBm)	16.0	16.0	/
Tolerance ±(dB)	1.0	1.0	/
IEEE 802.11ac VHT40 (Average)			
Channel	Channel 38	Channel 46	/
Target (dBm)	15.0	15.0	/
Tolerance ±(dB)	1.0	1.0	/
IEEE 802.11ac VHT80 (Average)			
Channel	Channel 42	/	/
Target (dBm)	15.0	/	/
Tolerance ±(dB)	1.0	/	/

5.8GWLAN

IEEE 802.11a (Average)			
Channel	Channel 149	Channel 157	Channel 165
Target (dBm)	15.0	15.0	15.0
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11n HT20 (Average)			
Channel	Channel 149	Channel 157	Channel 165
Target (dBm)	15.0	16.0	15.0
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11ac VHT20 (Average)			
Channel	Channel 149	Channel 157	Channel 165
Target (dBm)	15.0	15.0	15.0
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11n VHT40 (Average)			
Channel	Channel 151	Channel 159	/
Target (dBm)	15.0	15.0	/
Tolerance ±(dB)	1.0	1.0	/
IEEE 802.11ac VHT40 (Average)			
Channel	Channel 151	Channel 159	/
Target (dBm)	15.0	15.0	/
Tolerance ±(dB)	1.0	1.0	/
IEEE 802.11ac VHT80 (Average)			
Channel	Channel 155	/	/
Target (dBm)	15.0	/	/
Tolerance ±(dB)	1.0	/	/

6. Measurement Results

6.1 Standalone MPE Evaluation

As declared by the Applicant, the EUT is a wireless device used in a fix application, at least 20 cm from any body part of the user or nearby persons; from the maximum EUT RF output power, the minimum separation distance, r =20cm, as well as the gain of the used antenna refer to antenna information, the RF power density can be obtained.

BT

Modulation Type	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	MPE (mW/cm^2)	MPE Limits (mW/cm^2)
	dBm	mW				
GFSK	10.00	10.0000	3.65	2.3174	0.0046	1.0000
π/4DQPSK	7.00	5.0119	3.65	2.3174	0.0023	1.0000
8DPSK	8.00	6.3096	3.65	2.3174	0.0029	1.0000
GFSK(BT LE)	6.00	3.9811	3.65	2.3174	0.0018	1.0000

2.4GWLAN

Modulation Type	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	MPE (mW/cm^2)	MPE Limits (mW/cm^2)
	dBm	mW				
802.11b	20.00	100.0000	3.65	2.3174	0.0461	1.0000
802.11g	20.00	100.0000	3.65	2.3174	0.0461	1.0000
802.11n(HT20)	20.00	100.0000	3.65	2.3174	0.0461	1.0000
802.11n(HT40)	19.00	79.4328	3.65	2.3174	0.0366	1.0000

5.2GWLAN

Modulation Type	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	MPE (mW/cm^2)	MPE Limits (mW/cm^2)
	dBm	mW				
802.11a	17.00	50.1187	2.88	1.9409	0.0194	1.0000
802.11n20	17.00	50.1187	2.88	1.9409	0.0194	1.0000
802.11ac20	16.00	39.8107	2.88	1.9409	0.0154	1.0000
802.11n40	17.00	50.1187	2.88	1.9409	0.0194	1.0000
802.11ac40	16.00	39.8107	2.88	1.9409	0.0154	1.0000
802.11ac80	16.00	39.8107	2.88	1.9409	0.0154	1.0000

5.8GWLAN

Modulation Type	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	MPE (mW/cm^2)	MPE Limits (mW/cm^2)
	dBm	mW				
802.11a	16.00	39.8107	2.88	1.9409	0.0154	1.0000
802.11n20	17.00	50.1187	2.88	1.9409	0.0194	1.0000
802.11ac20	16.00	39.8107	2.88	1.9409	0.0154	1.0000
802.11n40	16.00	39.8107	2.88	1.9409	0.0154	1.0000
802.11ac40	16.00	39.8107	2.88	1.9409	0.0154	1.0000
802.11ac80	16.00	39.8107	2.88	1.9409	0.0154	1.0000

Remark:

1. Output power including tune-up tolerance;

2. MPE evaluate distance is 20cm from user manual provide by manufacturer;

7. Conclusion

The measurement results comply with the FCC Limit per 47 CFR 2.1091 for the uncontrolled RF Exposure and SAR Exclusion Threshold per KDB 447498 v06, No SAR is required.

.....End of Report.....