RF Test Report

For

Applicant name:	**Shenzhen Wanshan Changyang Electronics Co., Ltd.**
Address:	Room 1402, Building 9, Gemdale Seravi Garden, No. 38-9, Qiuzhi East Road, Luhu Community, Guanhu Street, Longhua District, Shenzhen, Guangdong
EUT name:	Mini Projector
Brand name:	WWSSCCYY
Model number:	TY300 Pro
Series model number:	N/A
FCC ID:	2BQXC-TY300PRO

Issued By

Company name:	**BTF Testing Lab (Shenzhen) Co., Ltd.**
Address:	101/201/301, Building 1, Block 2, Tantou Industrial Park,Tantou Community, Songgang Subdistrict, Bao'an District, Shenzhen, China
Report number:	BTF250703R00105
Test standards:	47 CFR Part 2 Subpart J Section 2.1091
Test conclusion:	Pass
Date of sample receipt:	2025-07-07
Test date:	2025-07-07 to 2025-07-11
Date of issue:	2025-07-19

Prepared by: Chris Liu — Chris.Liu /Project engineer

Approved by: Ryan.CJ /EMC manager

BTF Testing Lab (Shenzhen) Co., Ltd.

Note: All the test results in this report only related to the testing samples. Which can be duplicated completely for the legal use with approval of applicant; it shall not be reproduced except in full without the written approval of BTF Testing Lab (Shenzhen) Co., Ltd., All the objections should be raised within thirty days from the date of issue. To validate the report, you can contact us.

Revision History		
Version	Issue date	Revisions content
R_V0	2025-07-19	Original
Note: Once the revision has been made, then previous versions reports are invalid.		

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BTF Testing Lab (Shenzhen) Co., Ltd.
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1 Introduction

1.1 Laboratory Location

Test location:	BTF Testing Lab (Shenzhen) Co., Ltd.
Address:	101/201/301, Building 1, Block 2, Tantou Industrial Park,Tantou Community, Songgang Subdistrict, Bao'an District, Shenzhen, China
Description:	All measurement facilities used to collect the measurement data are located at 101/201/301, Building 1, Block 2, Tantou Industrial Park,Tantou Community, Songgang Subdistrict, Bao'an District, Shenzhen, China
Phone number:	+86-0755-23146130
Fax number:	+86-0755-23146130

1.2 Laboratory Facility

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

- **FCC - Designation No.: CN1409**
  BTF Testing Lab (Shenzhen) Co., Ltd. has been accredited as a testing laboratory by FCC (Federal Communications Commission). The test firm Registration No. is 695374.
- **CNAS - Registration No.: CNAS L17568**
  BTF Testing Lab (Shenzhen) Co., Ltd. is accredited to ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L17568.
- **A2LA - Registration No.: 6660.01**
  BTF Testing Lab (Shenzhen) Co., Ltd. is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories.

1.3 Announcement

(1) The test report reference to the report template version v0.
(2) The test report is invalid if not marked with the signatures of the persons responsible for preparing, reviewing and approving the test report.
(3) The test report is invalid if there is any evidence and/or falsification.
(4) This document may not be altered or revised in any way unless done so by BTF and all revisions are duly noted in the revisions section.
(5) Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.
(6) The laboratory is only responsible for the data released by the laboratory, except for the part provided by the applicant.
(7) All entrusted information in this report is provided by the client and has been confirmed through consultation with the client; The testing items for this report have been discussed and confirmed with the client, and our company is only responsible for the content reflected in the report.

2 Product Information

2.1 Application Information

Company name:	Shenzhen Wanshan Changyang Electronics Co., Ltd.
Address:	Room 1402, Building 9, Gemdale Seravi Garden, No. 38-9, Qiuzhi East Road, Luhu Community, Guanhu Street, Longhua District, Shenzhen, Guangdong

2.2 Manufacturer Information

Company name:	Shenzhen Wanshan Changyang Electronics Co., Ltd.
Address:	Room 1402, Building 9, Gemdale Seravi Garden, No. 38-9, Qiuzhi East Road, Luhu Community, Guanhu Street, Longhua District, Shenzhen, Guangdong

2.3 Factory Information

Company name:	Shenzhen Wanshan Changyang Electronics Co., Ltd.
Address:	Room 1402, Building 9, Gemdale Seravi Garden, No. 38-9, Qiuzhi East Road, Luhu Community, Guanhu Street, Longhua District, Shenzhen, Guangdong

2.4 General Description of Equipment under Test (EUT)

EUT name	Mini Projector
Under test model name	TY300 Pro
Series model name	N/A
Description of model name differentiation	N/A
Hardware Version	N/A
Software Version	N/A
Rating:	Input :100-240V~, 50/60Hz, 0.5A

2.5 Technical Information

Modulation Mode:	Bluetooth	GFSK, π/4 DQPSK, 8DPSK
	WLAN 2.4GHz	DSSS, OFDM
	WLAN 5GHz	OFDM-BPSK, QPSK, 16QAM, 64QAM, 256QAM
Frequency Bands:	Bluetooth	2402MHz-2480MHz
	WLAN 2.4GHz	2412MHz-2462MHz
	WLAN 5GHz	Band 1: 5150MHz ~ 5250MHz
Antenna type:	FPC Antenna	
Antenna Gain:	2.43 dBi (declare by Applicant)	
Antenna transmit mode:	SISO (1TX, 1RX)	

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3 RF Output Power

BLE

Mode	Channel	Frequency (MHz)	Maximum Peak Conducted Output Power (dBm)
BLE 1Mbps	CH00	2402	2.89
	CH19	2440	2.97
	CH39	2480	2.87
Maximum Tune-up (dBm)			3.00
BLE 2Mbps	CH00	2402	2.81
	CH19	2440	2.89
	CH39	2480	2.80
Maximum Tune-up (dBm)			3.00

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GFSK	CH00	2402	2.87
	CH39	2441	2.89
	CH78	2480	2.79
Maximum Tune-up (dBm)			3.00
Pi/4DQPSK	CH0	2402	4.71
	CH39	2441	4.75
	CH78	2480	4.65
Maximum Tune-up (dBm)			5.00
8DPSK	CH0	2402	6.05
	CH39	2441	6.09
	CH78	2480	5.99
Maximum Tune-up (dBm)			7.00

2.4GWIFI

Mode	Channel	Frequency (MHz)	Maximum Peak Conducted Output Power (dBm)
802.11b	CH1	2412	15.29
	CH7	2437	14.70
	CH13	2462	14.52
Maximum Tune-up (dBm)			16.00
802.11g	CH1	2412	14.71
	CH7	2437	15.41
	CH13	2462	16.07
Maximum Tune-up (dBm)			17.00
802.11n (HT20)	CH1	2412	14.20
	CH7	2437	14.11
	CH13	2462	15.21
Maximum Tune-up (dBm)			16.00
802.11n (HT40)	CH3	2422	13.73
	CH7	2437	14.17

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	CH11	2452	13.99
Maximum Tune-up (dBm)			15.00

5GWIFI

Mode	Channel	Frequency (MHz)	Maximum Peak Conducted Output Power (dBm)
802.11a	CH36	5180	10.14
	CH40	5200	9.92
	CH48	5240	9.88
Maximum Tune-up (dBm)			11.00
802.11n (HT20)	CH36	5180	10.86
	CH40	5200	10.33
	CH48	5240	10.06
Maximum Tune-up (dBm)			11.00
802.11n (HT40)	CH38	5190	10.33
	CH46	5230	9.54
Maximum Tune-up (dBm)			11.00
802.11ac (VHT20)	CH36	5180	10.28
	CH40	5200	9.67
	CH48	5240	9.37
Maximum Tune-up (dBm)			11.00
802.11ac (VHT40)	CH38	5190	10.44
	CH46	5230	9.82
Maximum Tune-up (dBm)			11.00

Note 1: According to KDB 447498, MPE assessment is based on source-based time-averaged maximum conducted output power of the RF channel requiring assessment, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions.

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4 Applied Reference Documents

Identity	Document Title
47 CFR Part 2(2.1091)	Radio Frequency Radiation Exposure Assessment: mobile devices
KDB 447498 D01v06	General RF Exposure Guidance

5 Device Category and RF Exposure Limit

Per user manual, Based on 47 CFR 2.1091, this device belongs to mobile device category with General Population/Uncontrolled exposure.	
Mobile Devices:	47 CFR 2.1091(b) For purposes of this section, a mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons. In this context, the term “fixed location” means that the device is physically secured at one location and is not able to be easily moved to another location. Transmitting devices designed to be used by consumers or workers that can be easily re-located, such as wireless devices associated with a personal computer, are considered to be mobile devices if they meet the 20 centimeter separation requirement.
General Population/ Uncontrolled Exposure:	The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity. Warning labels placed on low-power consumer devices such as cellular telephones are not considered sufficient to allow the device to be considered under the occupational/controlled category, and the general population/uncontrolled exposure limits apply to these devices.
Test Standards:	The limit for Maximum Permissible Exposure (MPE) specified in FCC 1.1310 is followed. The gain of the antennas used in the product is extracted from the Antenna data sheets provided and also the maximum total power input to the antenna is measured. Through the Friis transmission formula and the maximum gain of the antenna, we can calculate the distance, away from the product, where the limit of MPE is reached. Although the Friis Transmission formula is far field assumption, the calculated result of that is an over-prediction for near field power density. It is taken as worst case to specify the safety range.

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environmental impact of the human exposure to radio-frequency (RF) radiation as specified in 1.1307 (b)
Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric field strength(V/m)	Magnetic field strength (A/m)	Power density (mW/cm2)	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

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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 * = Plane-wave equivalent power density

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6 RF Exposure Assessment

➢ **Standalone Transmission Assessment:**

Bands	Frequency (MHz)	Tune-up Power(dBm)	Antenna Gain(dBi)	E.I.R.P. (mW)	Power Density (mW/cm²)	Limit for MPE (mW/cm²)
Bluetooth	2441	7	2.43	8.77	0.002	1.0
BLE	2440	3	2.43	3.49	0.001	1.0
WLAN 2.4GHz	2462	17	2.43	87.70	0.017	1.0
WIFI 5G	5180	11	1.91	19.54	0.004	1.0

Note:

1. According to KDB 447498, MPE assessment is based on source-based time-averaged maximum conducted output power of the RF channel requiring assessment, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions.
2. MPE calculate method

$$S = PG/4\pi R^2$$

Where:
S = Power density (in appropriate units, e.g. mW/cm²)
P = Time-average maximum tune-up power (in appropriate units, e.g. dBm)
G = numeric gain of the antenna (in appropriate units, e.g. dBi)
R = Separation distance to the centre of radiation of the antenna (20cm)

➢ **Conclusion:**

According to 47 CFR §2.1091, this device complies with human exposure basic restrictions.

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