



FCC TEST REPORT
FCC PART 18
MEASUREMENT AND TEST REPORT
For

Shenzhen ShenWangda Technology
4th floor, buiding C, KelunTe Low-carbonindustrial park, HuaRong Road, Longhua area, ShenZhen

Model: TBK938、TBK938M、TBK938L、TBK958、TBK958D、TBK983A、
TBK988、TBK988C、TBK988D、TBK988Z、TBK968、TBK968C、TBK968D、
TBK568、TBK568R、TBK228、TBK238、TBK258UV、TBK268、TBK288、
TBK008、TBK009

2022-07-19

This Report Concerns: <input checked="" type="checkbox"/> Original Report	Equipment Type: LCD Temperature Controller
Test Engineer: Fan Yang/	
Report Number: TH2207169-C04-R01	
Test Date: 2022-07-12 to 2022-07-19	
Reviewed By: Prince Huang/	
Approved By: Prince Huang/	
Prepared By:	Shenzhen Tian Hai Test Technology Co.,Ltd. 4F, A3 BLDG, The Silicon Valley Power intelligent terminal industrial park, Guanlan street, Longhua district, Shenzhen Tel: +86-755-86615100 Fax: +86-755-86615105

Note: This test report is limited to the above client company and the product model only.
It may not be duplicated without prior written consent of Shenzhen Tian Hai Test Technology Co.,Ltd.



TABLE OF CONTENTS

1 - GENERAL INFORMATION..... 3

1.1 DESCRIPTION OF DEVICE (EUT)..... 3

1.2 SUMMARY OF TEST RESULT..... 3

1.3 DESCRIPTION OF THE SUPPORT EQUIPMENTS..... 4

1.4 STATEMENT OF THE MEASUREMENT UNCERTAINTY TEST FACILITY..... 4

1.5 TEST UNCERTAINTY..... 4

2. TEST INSTRUMENT USED..... 5

3. CONDUCTED EMISSION AT MAINS TERMINALS TEST..... 6

3.1 BLOCK DIAGRAM OF TEST SETUP..... 6

3.2 LIMITS..... 6

3.3 TEST PROCEDURE..... 6

3.4 TEST RESULT..... 7

4. RADIATION EMISSION TEST..... 9

4.1 BLOCK DIAGRAM OF TEST SETUP..... 9

4.2 LIMITS..... 9

4.3 TEST PROCEDURE..... 9

4.4 TEST RESULT..... 10

APPENDIX A - TEST SETUP PHOTOGRAPHS..... 12

APPENDIX B - EUT PHOTOGRAPHS..... 13

APPENDIX C- LABEL AND USER REQUIREMENT..... 16



1 - GENERAL INFORMATION

1.1 DESCRIPTION OF DEVICE (EUT)

Client Information

Applicant: Shenzhen ShenWangda Technology Co.,Ltd
 Address: 4th floor, buiding C, KelunTe Low-carbonindustrial park, HuaRong Road, Longhua area, ShenZhen
 Manufacturer: Shenzhen ShenWangda Technology Co.,Ltd
 Address: 4th floor, buiding C, KelunTe Low-carbonindustrial park, HuaRong Road, Longhua area, ShenZhen

General Description of E.U.T

EUT: LCD Temperature Controller
 Trade mark: TBK
 Model Number: TBK938、TBK938M、TBK938L、TBK958、TBK958D、TBK983A、TBK988、TBK988C、TBK988D、TBK988Z、TBK968、TBK968C、TBK968D、TBK568、TBK568R、TBK228、TBK238、TBK258UV、TBK268、TBK288、TBK008、TBK009
 Model Difference: All models have the same circuit structure, only in different sizes
 Ratings: Input:AC 110V 60Hz
 Test Mode: On
 Note: All test results are based on model TBK568

1.2 SUMMARY OF TEST RESULT

Test Item	Test Requirement	Test Method	Class / Severity	Test Result
Conducted Emission	CFR 47, FCC Part 15 Subpart B	ANSI C63.4:2014	Meet standard limits	PASS
Radiated Emission	CFR 47, FCC Part 15 Subpart B	ANSI C63.4:2014	Meet standard limits	PASS



1.3 DESCRIPTION OF THE SUPPORT EQUIPMENTS

Setup Diagram

See test photographs attached in appendix B for the actual connections between EUT and support equipment.

Support Equipment

Peripherals Devices: None.

No.	Instrument	Manufacturer	Model No.	S/N	Next Cal. Date	Calculator due date
1	/	/	/	/	/	/
2	/	/	/	/	/	/
3	/	/	/	/	/	/

Note: All the above equipment /cable were placed in worse case position to maximize emission signals during emission test.

Grounding: Grounding was in accordance with the manufacturer’s requirement and conditions for the intended use.

1.4 STATEMENT OF THE MEASUREMENT UNCERTAINTY TEST FACILITY

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 CISPR 16-4-2“Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements” and is documented in the LCS 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.

1.5 TEST UNCERTAINTY

Test Item	Test Items	Polarization	Uncertainty
Conducted Emission At Mains Terminals	150kHz to 30MHz	LINE/NEUTRAL	2.35 dB
Radiated Emission	30 MHz ~ 1,000 MHz	Horizontal	5.78 dB
	30 MHz ~ 1,000 MHz	Vertical	5.78 dB

(1) Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus.

(2) The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor of k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.



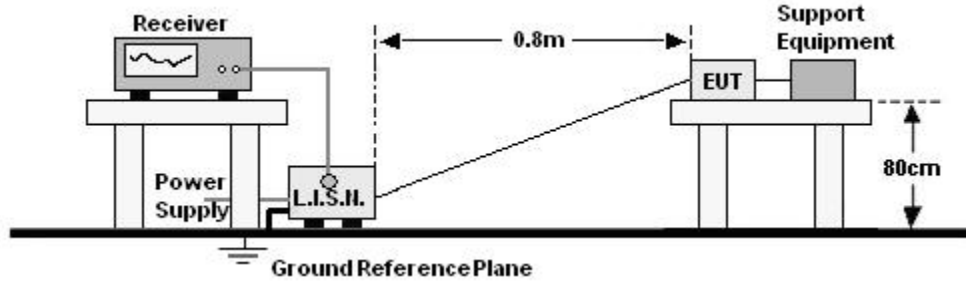
2. TEST INSTRUMENT USED

Kind of Equipment	Manufacturer	Type	S/N	Calibrate until
Conducted Emission				
EMI Test Receiver	R&S	ESRP3	102242	2022-11-15
L.I.S.N	Schwarzbeck	NNLK 8128	5089	2022-11-15
8-Wire ISN CAT6	Schwarzbeck	NTFM 8158	231	2022-11-15
Pulse Limiter	Schwarzbeck	VTSD 9561-F	847	2022-11-15
Radiated Emission (3m)				
EMI Test Receiver	R&S	ESR7	102333	2022-11-15
MXA Signal Analyzer	Keysight	N9020A	MY51281805	2023-04-15
Bilog Antenna	Schwarzbeck	VULB 9168	01148	2022-11-20
Pre-Amplifier	Schwarzbeck	BBV 9718 B	00109	2022-11-16
Pre-Amplifier	Schwarzbeck	BBV 9743 B	00253	2022-11-15
Horn Antenna	Schwarzbeck	BBHA 9120	02379	2022-11-20



3. CONDUCTED EMISSION AT MAINS TERMINALS TEST

3.1 BLOCK DIAGRAM OF TEST SETUP



3.2 LIMITS

Frequency Range (MHz)	Limits dB(μ V)	
	Quasi-Peak	Average
0.150~0.500	66~56*	56~46*
0.500~5.000	56	46
5.000~30.00	60	50

Notes: 1. *Decreasing linearly with logarithm of frequency.
2. The lower limit shall apply at the transition frequencies.

3.3 TEST PROCEDURE

The EUT is put on the plane 0.8m high above the ground by insulating support and connected to the AC mains through a Line Impedance Stability Network (L.I.S.N). This provided a 50ohm coupling impedance for the tested equipments. Both sides of AC line are investigated to find out the maximum conducted emission according to the FCC PART 15 B regulations during conducted emission measurement.

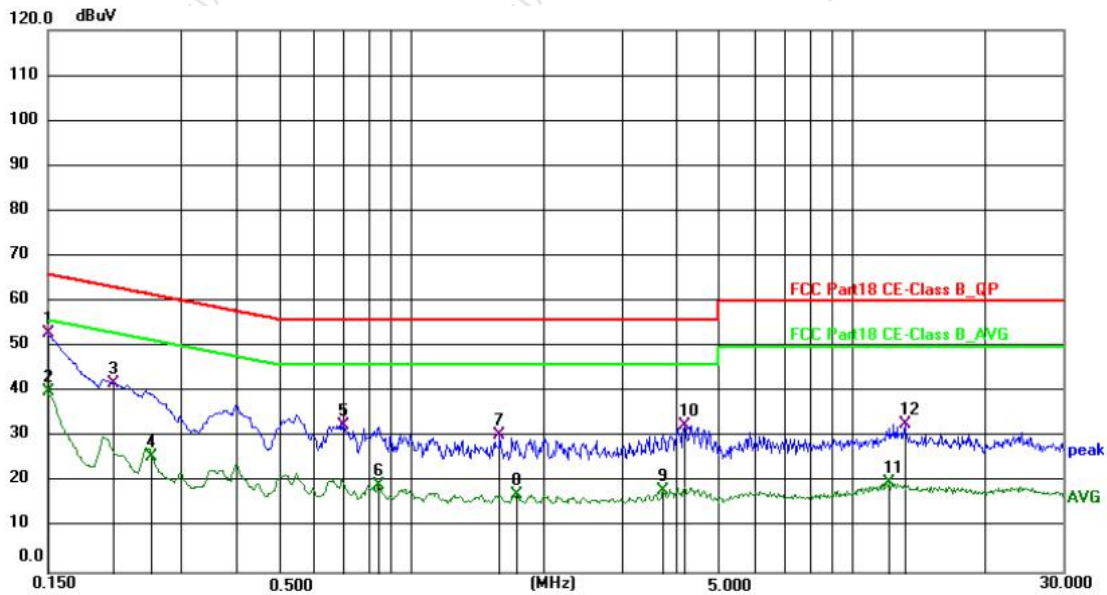
The bandwidth of the field strength meter is set at 9kHz.

The frequency range from 150kHz to 30MHz is investigated.



3.4 TEST RESULT

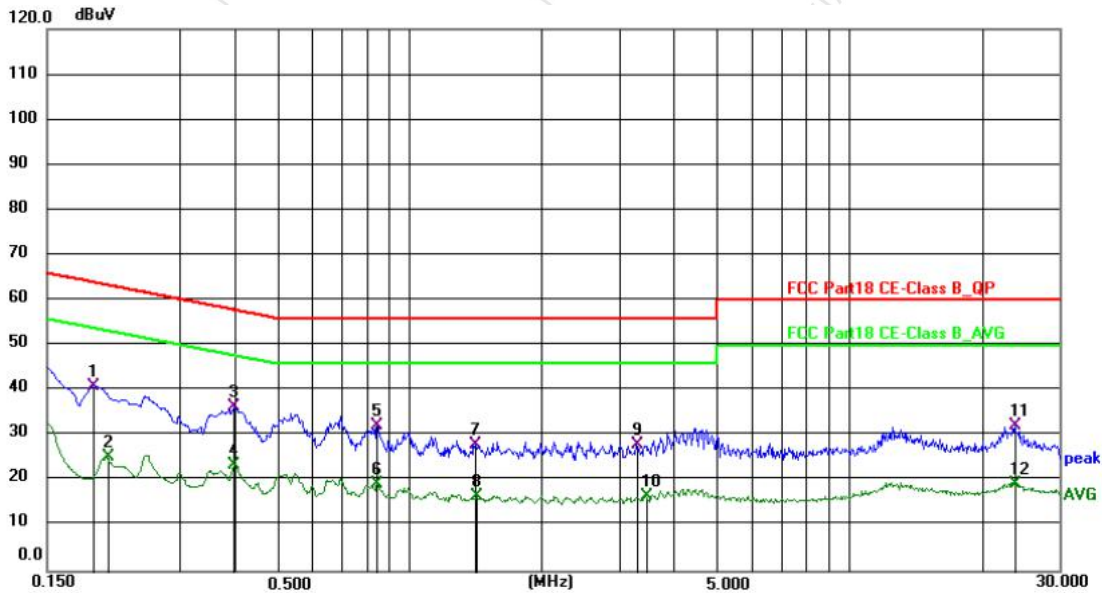
EUT:	LCD Temperature Controller	M/N:	TBK568
Test Mode:	On	Test Voltage :	AC110/60Hz
Phase:	L1	Temperature:	26°C
Humidity:	54%	Atmosphere pressure:	101Kpa



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1 *	0.1500	46.52	6.29	52.81	66.00	-13.19	QP	P
2	0.1500	33.65	6.29	39.94	56.00	-16.06	AVG	P
3	0.2106	35.63	6.29	41.92	63.18	-21.26	QP	P
4	0.2575	19.22	6.30	25.52	51.51	-25.99	AVG	P
5	0.7035	26.35	6.32	32.67	56.00	-23.33	QP	P
6	0.8430	13.06	6.34	19.40	46.00	-26.60	AVG	P
7	1.5900	23.95	6.37	30.32	56.00	-25.68	QP	P
8	1.7430	10.96	6.37	17.33	46.00	-28.67	AVG	P
9	3.7320	11.62	6.42	18.04	46.00	-27.96	AVG	P
10	4.1730	26.17	6.43	32.60	56.00	-23.40	QP	P
11	12.1600	13.24	6.57	19.81	50.00	-30.19	AVG	P
12	13.1815	26.20	6.58	32.78	60.00	-27.22	QP	P



EUT:	LCD Temperature Controller	M/N:	TBK568
Test Mode:	On	Test Voltage :	AC110/60Hz
Phase:	N	Temperature:	26°C
Humidity:	54%	Atmosphere pressure:	101Kpa

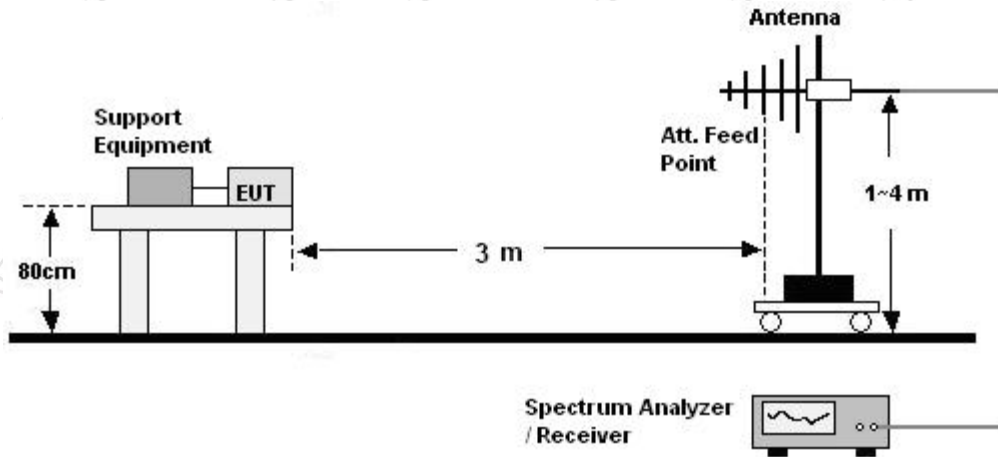


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1905	34.79	6.31	41.10	64.01	-22.91	QP	P
2	0.2040	18.93	6.31	25.24	53.45	-28.21	AVG	P
3 *	0.3975	30.02	6.33	36.35	57.91	-21.56	QP	P
4	0.3975	17.22	6.33	23.55	47.91	-24.36	AVG	P
5	0.8475	25.89	6.36	32.25	56.00	-23.75	QP	P
6	0.8475	13.02	6.36	19.38	46.00	-26.62	AVG	P
7	1.4144	21.80	6.37	28.17	56.00	-27.83	QP	P
8	1.4235	10.22	6.37	16.59	46.00	-29.41	AVG	P
9	3.2775	21.71	6.43	28.14	56.00	-27.86	QP	P
10	3.4395	10.13	6.43	16.56	46.00	-29.44	AVG	P
11	23.8600	25.51	6.81	32.32	60.00	-27.68	QP	P
12	23.8600	12.49	6.81	19.30	50.00	-30.70	AVG	P



4. RADIATION EMISSION TEST

4.1 BLOCK DIAGRAM OF TEST SETUP



4.2 LIMITS

Frequency Range (MHz)	QP dB(μ V)/m
	Distance: 3m
30 ~ 1000	63.50

4.3 TEST PROCEDURE

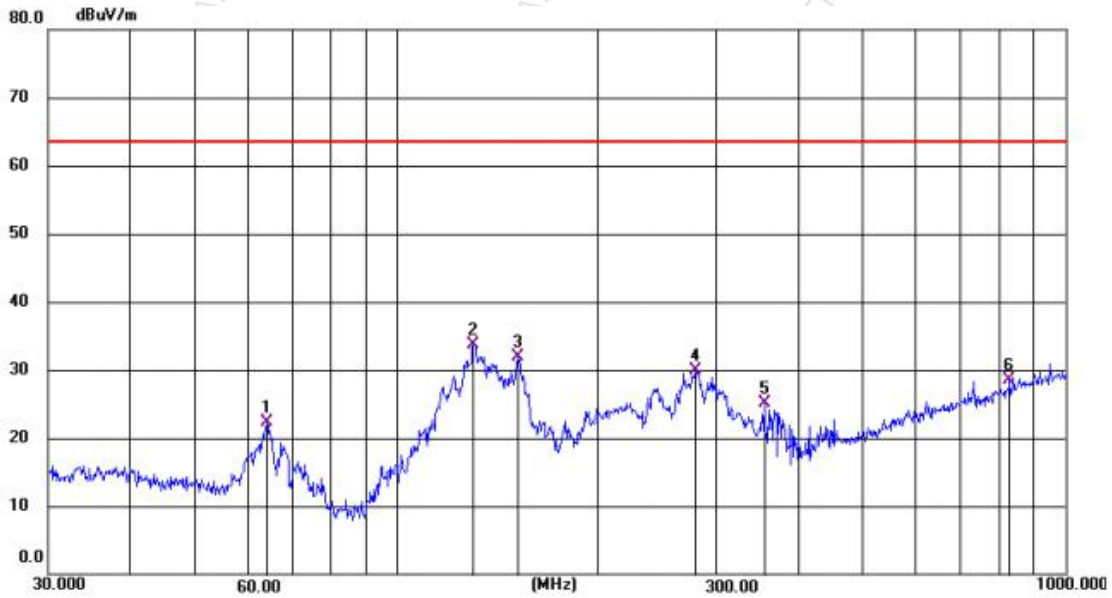
The EUT and its simulators are placed on a turned table that is 0.8 meter above the ground. The turned table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna that is mounted on the antenna tower. The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated biconical and log periodical antenna) is used as receiving antenna. Both horizontal and vertical polarization of the antenna is set on test. In order to find the maximum emission levels, the interface cable must be manipulated according to FCC PART 15 B on radiated emission test.

The bandwidth setting on the field strength meter (R&S Test Receiver ESR7) is set at 120KHz below 1GHz, set at 1MHz above 1GHz. The frequency range from 30MHz to 1000MHz is checked. The highest frequency of the internal sources of the EUT was below 108MHz, so the measurement was only made up to 1GHz.



4.4 TEST RESULT

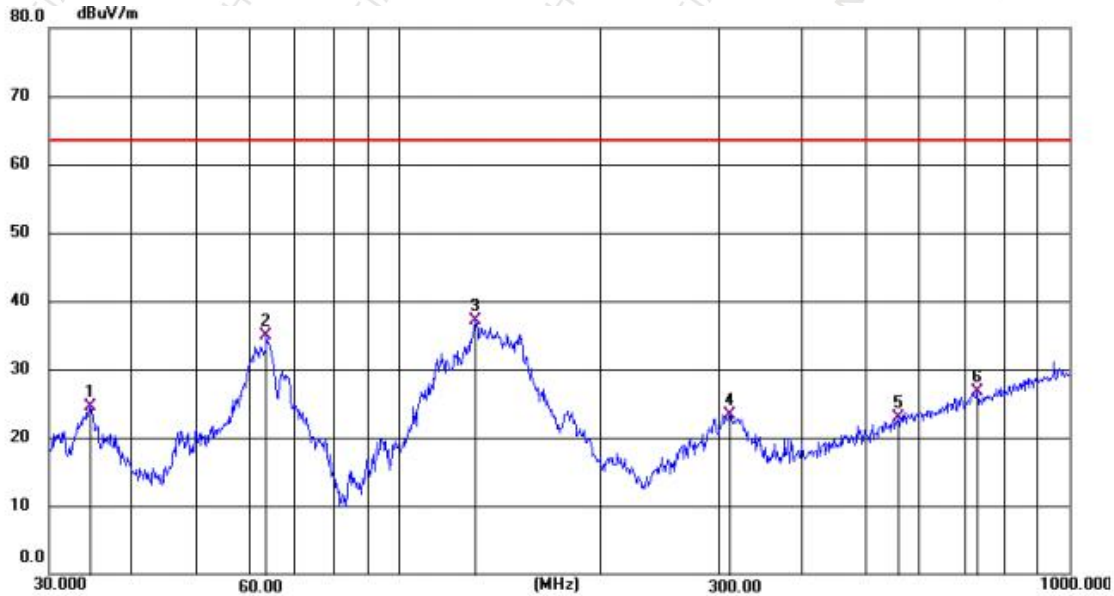
EUT:	LCD Temperature Controller	M/N:	TBK568
Test Mode:	On	Test Voltage :	AC110/60Hz
Polarization:	Horizontal	Temperature:	26°C
Humidity:	54%	Atmosphere pressure:	101Kpa



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	63.8707	38.88	-16.55	22.33	63.50	-41.17	QP
2 *	130.1506	49.96	-16.19	33.77	63.50	-29.73	QP
3	151.5972	47.21	-15.28	31.93	63.50	-31.57	QP
4	280.5152	44.92	-14.99	29.93	63.50	-33.57	QP
5	354.1831	38.50	-13.35	25.15	63.50	-38.35	QP
6	826.0439	32.45	-4.01	28.44	63.50	-35.06	QP



EUT:	LCD Temperature Controller	M/N:	TBK568
Test Mode:	On	Test Voltage :	AC110/60Hz
Polarization:	Vertical	Temperature:	26°C
Humidity:	54%	Atmosphere pressure:	101Kpa

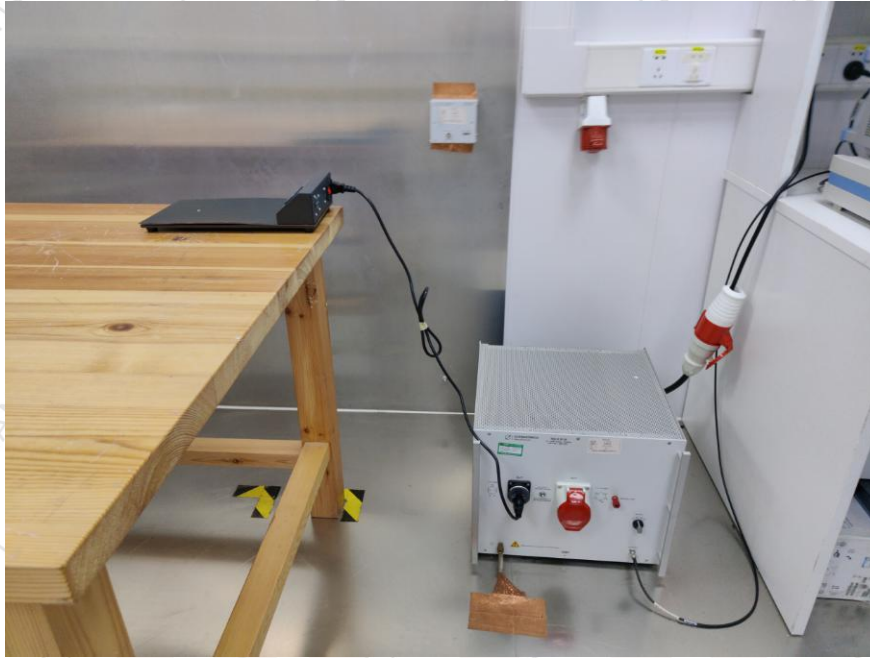


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	34.6993	38.08	-13.65	24.43	63.50	-39.07	QP
2	63.4243	51.32	-16.50	34.82	63.50	-28.68	QP
3 *	130.1506	53.35	-16.19	37.16	63.50	-26.34	QP
4	311.6326	37.79	-14.40	23.39	63.50	-40.11	QP
5	556.7744	31.60	-8.62	22.98	63.50	-40.52	QP
6	729.3583	32.35	-5.59	26.76	63.50	-36.74	QP

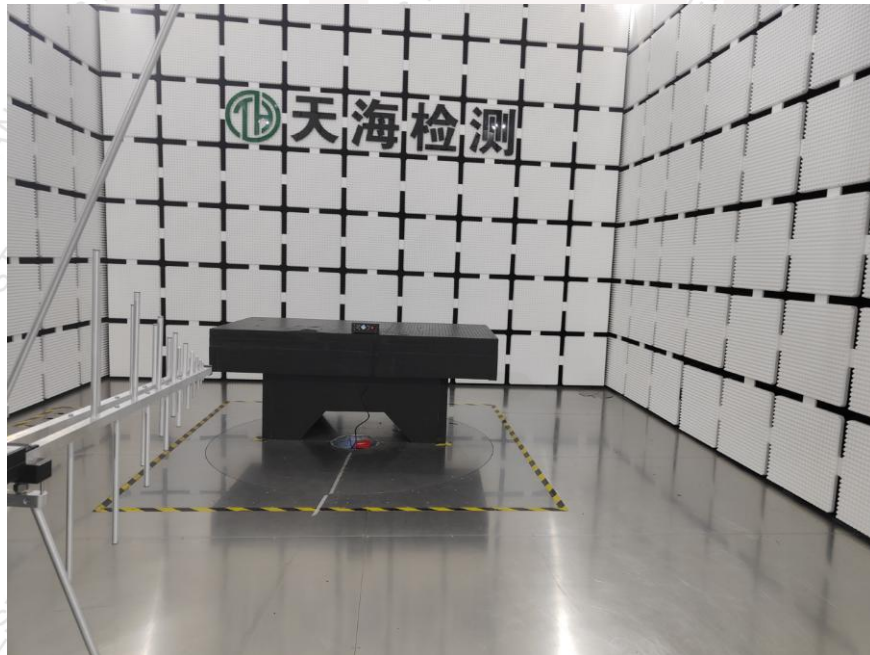


APPENDIX A - TEST SETUP PHOTOGRAPHS

Setup photo for Conducted Emission

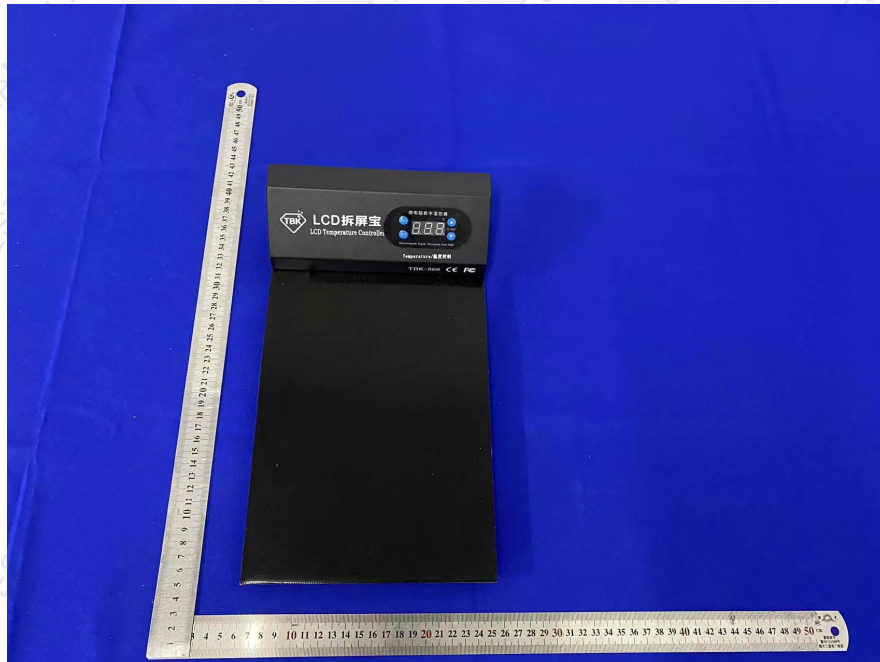


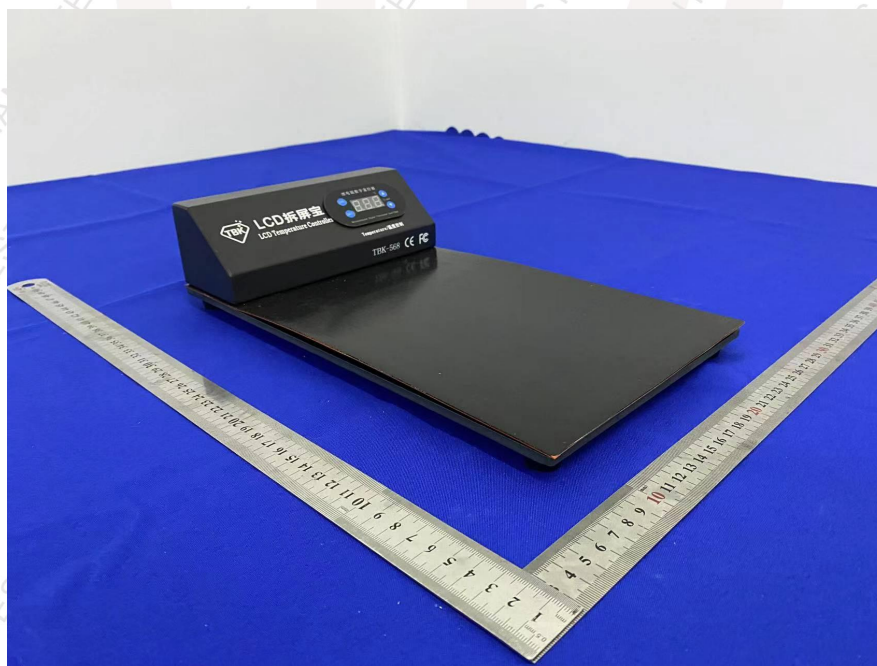
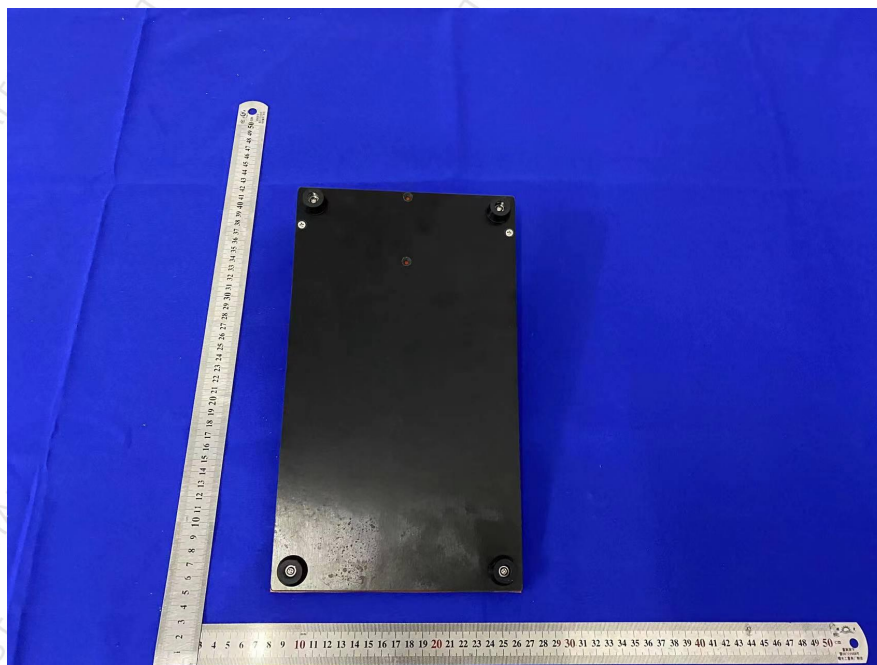
Setup photo for Radiated Emission

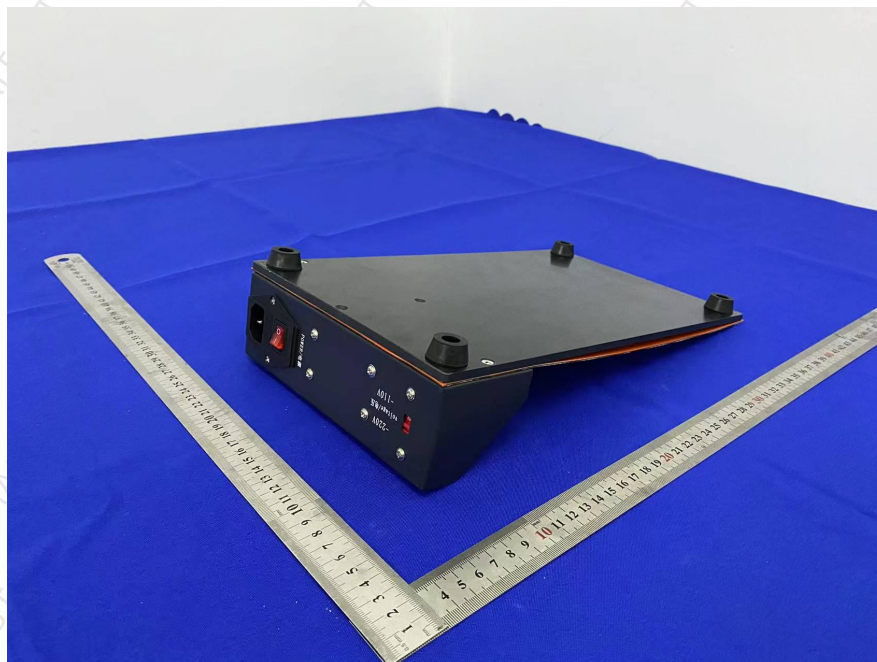




APPENDIX B - EUT PHOTOGRAPHS









APPENDIX C- LABEL AND USER REQUIREMENT

Labelling Requirements

According to FCC Part15 section 15.19, a device subject to certification or verification shall be labelled as follows:

“This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.”

Information to User

According to FCC Part15 section 15.21, the user’s manual or instruction manual for an intentional or unintentional radiator shall caution the user that:

“Changes or modifications not expressly approved by the party responsible for compliance could void the user’s authority to operate the equipment.”

Also, refer to FCC Part 15 section 15.105, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

“NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, maybe cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different form that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.”

*****END OF THE REPORT*****