A2LA Cert. No. 5463.01

TEST REPORT

Report Number	:	TZ0035250533FRF18
Product Name	:	Remote control car
Model/Type reference	:	(Series Model refer to page 4)
FCC ID	:	2BPUNWBHJLC
Prepared for	:	Shantou Chenghai Jiliang Toy Factory No. 2, Lane 2, Yun'anli, Yun'er Village, Lianxia Town, Chenghai District, Shantou City, Guangdong Province, China

Prepared By	:	Shenzhen Tongzhou Testing Co.,Ltd. 1st Floor, Building 1, Haomai High-tech Park, Huating Road 387, Dalang Street, Longhua, Shenzhen, China
Standards	:	FCC CFR Title 47 Part 15 Subpart C, ANSI C63.10: 2013
Date of Test	:	2025-05-28 ~ 2025-06-12
Date of Issue	:	2025-06-12
Prepared by	:	Lena Wen
Reviewed by	:	Allen Lai
Approved by	:	Max Zhang (Authorized Officer)

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The test report apply only to the specific sample(s) tested under stated test conditions.
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** Report Revise Record **

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	2025-06-12	Valid	Initial release

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1. GENERAL INFORMATION

1.1. Client Information

Applicant	:	Shantou Chenghai Jiliang Toy Factory
Address	:	No. 2, Lane 2, Yun'anli, Yun'er Village, Lianxia Town, Chenghai District, Shantou City, Guangdong Province, China
Manufacturer	:	Shantou Chenghai Jiliang Toy Factory
Address	:	No. 2, Lane 2, Yun'anli, Yun'er Village, Lianxia Town, Chenghai District, Shantou City, Guangdong Province, China

1.2. Description of Device (EUT)

Product Name	:	Remote control car
Trade Mark	:	/
Model Number	:	2288-91, 2288-1, 2288-2, 2288-3, 2288-4, 2288-5, 2288-6, 2288-7, 2288-8, 2288-9, 2288-10, 2288-11, 2288-12, 2288-13, 2288-14, 2288-15, 2288-16, 2288-17, 2288-18, 2288-19, 2288-20, 2288-21, 2288-22, 2288-23, 2288-24, 2288-25, 2288-26, 2288-27, 2288-28, 2288-29, 2288-30, 2288-31, 2288-32, 2288-33, 2288-34, 2288-35, 2288-36, 2288-37, 2288-38, 2288-39, 2288-40, 2288-41, 2288-42, 2288-43, 2288-44, 2288-45, 2288-46, 2288-47, 2288-48, 2288-49, 2288-50, 2288-51, 2288-52, 2288-53, 2288-54, 2288-55, 2288-56, 2288-57, 2288-58, 2288-59, 2288-60, 2288-61, 2288-62, 2288-63, 2288-64, 2288-65, 2288-66, 2288-67, 2288-68, 2288-69, 2288-70, 2288-71, 2288-72, 2288-73, 2288-74, 2288-75, 2288-76, 2288-77, 2288-78, 2288-79, 2288-80, 2288-81, 2288-82, 2288-83, 2288-84, 2288-85, 2288-86, 2288-87, 2288-88, 2288-89, 2288-90, 2288-92, 2288-93, 2288-94, 2288-95, 2288-96, 2288-97, 2288-98, 2288-99, 2288-100, 2288-61A, 2288-62A, 2288-63A, 2288-64A, 2288-65A, 2288-66A, 2288-67A, 2288-68A, 2288-69A, 2288-70A, 2288-71A, 2288-72A, 2288-73A, 2288-74A, 2288-75A, 2288-76A, 2288-77A, 2288-78A, 2288-79A, 2288-80A, 2288-81A, 2288-82A, 2288-83A, 2288-84A, 2288-85A, 2288-86A, 2288-87A, 2288-88A, 2288-89A, 2288-90A, 2288-91A, 2288-92A, 2288-93A, 2288-94A, 2288-95A, 2288-96A, 2288-97A, 2288-98A, 2288-99A, 2288-100A, 2288-P101, 2288-P102, 2288-P103, 2288-P104, 2288-P105, 2288-P106, 2288-P107, 2288-P108, 2288-P101A, 2288-P102A, 2288-P103A, 2288-P104A, 2288-P105A, 2288-P106A, 2288-P107A, 2288-P108A, 2288-120, 2288-121, 2288-122, 2288-123, 2288-124, 2288-125, 2288-126, 2288-127, 2288-128, 2288-129, 2288-130, 2288-131, 2288-132, 2288-133, 2288-134, 2288-135, 2288-136, 2288-137, 2288-138, 2288-139, 2288-140, 2288-141, 2288-142, 2288-143, 2288-144, 2288-145, 2288-146, 2288-147, 2288-148, 2288-149, 2288-150, MT1601
Model Declaration	:	The shape of the shell & the color difference, the internal circuit is the same
Test Model	:	2288-91
Power Supply	:	DC 3V by 1.5V*2 battery
Hardware version	:	YBS-04123TX-V1.0
Software version	:	YBS-TX2A-V1.0

1.3. Wireless Function Tested in this Report

Short Range Device		
Operation Frequency	:	27.145MHz
Modulation Technology	:	ASK
Antenna Type and Gain	:	Helix antenna

Note 1: Antenna position refer to EUT Photos.
Note 2: the above information was supplied by the applicant.

1.4. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:
●supplied by the manufacturer

○supplied by the lab

○	/	Model:	/
		Input:	/
		Output:	/

1.5. Description of Test Facility

FCC

Designation Number: CN1275
Test Firm Registration Number: 167722
Shenzhen Tongzhou Testing Co.,Ltd has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

A2LA

Certificate Number: 5463.01
Shenzhen Tongzhou Testing Co.,Ltd has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.

IC

ISED#: 22033
CAB identifier: CN0099
Shenzhen Tongzhou Testing Co.,Ltd has been listed by Innovation, Science and Economic Development Canada to perform electromagnetic emission measurement.

The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.4 and CISPR 16-1-4:2010

1.6. 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 CISPR 16 – 4 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements” and is documented in the Shenzhen Tongzhou Testing Co.,Ltd’s 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.

1.7. Measurement Uncertainty

Test Item		Uncertainty	Note
Radiation Uncertainty(9KHz~30MHz)	:	±3.26dB	(1)
Radiation Uncertainty(30MHz~1000MHz)	:	±3.92dB	(1)
Occupied Channel Bandwidth	:	±3.0%	(1)

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

1.8. Description of Test Modes

The EUT has been tested under operating condition.

This test was performed with EUT in X, Y, Z position and the worst case was found when EUT in X position.

Test Modes:		
Mode 1	Transmitting at 27.145MHz	Record
Note: All test modes were pre-tested, but we only recorded the worst case in this report.		

2. TEST METHODOLOGY

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.
The radiated testing was performed at an antenna-to-EUT distance of 3 meters. All radiated and conducted emissions measurement was performed at Shenzhen Tongzhou Testing Co.,Ltd

2.1. EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

2.2. EUT Exercise

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.
According to its specifications, the EUT must comply with the requirements of the Section 15.203, 15.205, 15.207, 15.209, 15.227 under the FCC Rules Part 15 Subpart C.

2.3. Test Sample

Sample ID	Description
TZ0035250533–1#	Normal sample

3. SYSTEM TEST CONFIGURATION

3.1. Justification

The system was configured for testing in a continuous transmits condition.

3.2. Special Accessories

No.	Equipment	Manufacturer	Model No.	Serial No.	Length	shielded/ unshielded	Notes
/	/	/	/	/	/	/	/

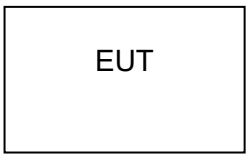
3.3. Block Diagram/Schematics

Please refer to the related document

3.4. Equipment Modifications

Shenzhen Tongzhou Testing Co.,Ltd has not done any modification on the EUT.

3.5. Configuration of Tested System



4. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Sample ID	Result
15.227(a)	Field Strength of Fundamental	TZ0035250533–1#	Compliant
§15.209&§15.205(a)& 15.227(a)	Radiated Emission	TZ0035250533–1#	Compliant
§15.215(c)	-20dB Bandwidth	TZ0035250533–1#	Compliant
§15.207(a)	Conducted Emissions	TZ0035250533–1#	Not applicable (See Note)
§15.203	Antenna Requirements	TZ0035250533–1#	Compliant
Note: The EUT is only powered by battery.			

Remark: The measurement uncertainty is not included in the test result.

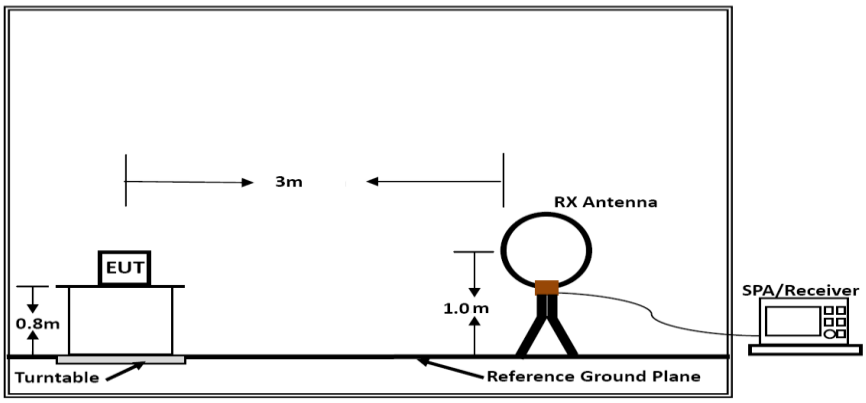
5. TEST RESULT

5.1. Bandwidth Measurement

5.1.1. Standard Applicable

Intentional radiators must be designed to ensure that the 20dB emission bandwidth in the specific band 26.98~27.28MHz.

5.1.2. Block Diagram of Test Setup



Below 30MHz

5.1.3. Test Procedures

1. Set the parameters of SPA as below:
2. Centre frequency = Operation Frequency
3. RBW=470Hz, VBW=4.7kHz
4. Span: 50kHz
5. Sweep time: Auto
6. Set the EUT to continue transmitting mode. Allow the trace to stabilize. Use the “N dB down” function of SPA to define the bandwidth.
7. Record the plots and Reported.

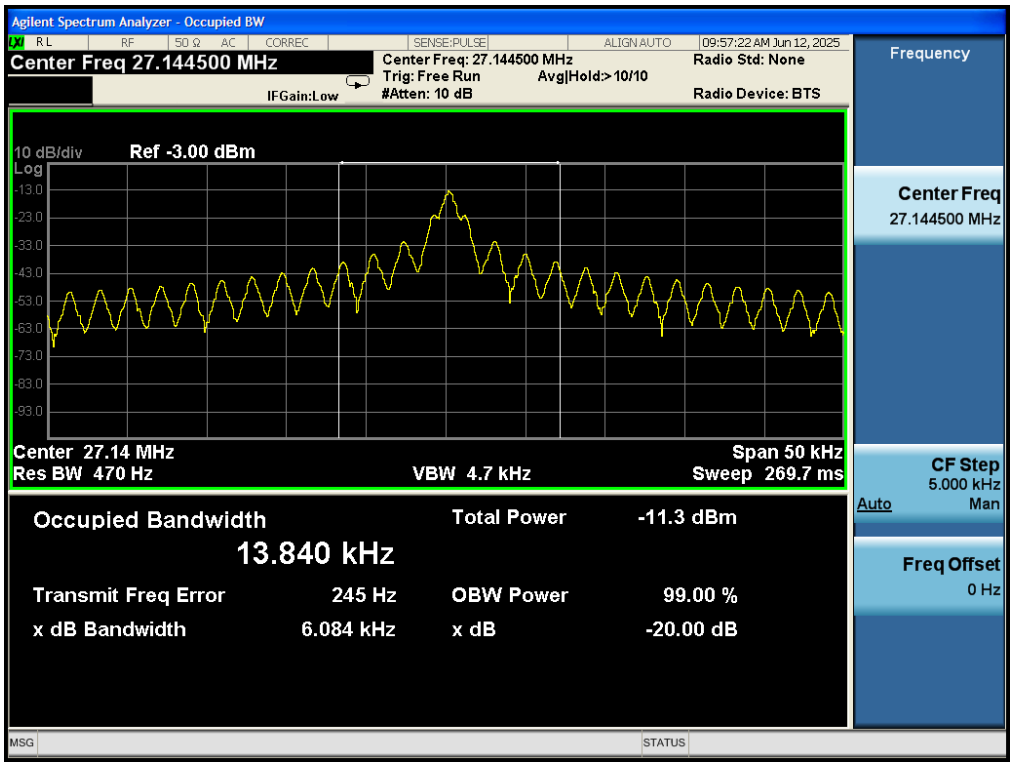
5.1.4. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.1.5. Test Result

Temperature	22.8℃	Humidity	55%
Test Engineer	Tony Luo	Configurations	Mode 1
Test Voltage	DC 3V	/	/

Mode	Freq (MHz)	-20dB Bandwidth (kHz)	Limit (kHz)	Conclusion
Tx Mode	27.145	6.084	N/A	PASS



5.2. Radiated Emissions Measurement

5.2.1. Standard Applicable

15.227

(a) The field strength of any emission within this band shall not exceed 10,000 microvolts/meter at 3 meters. The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply.

(b) The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in §15.209.

15.209(a):

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

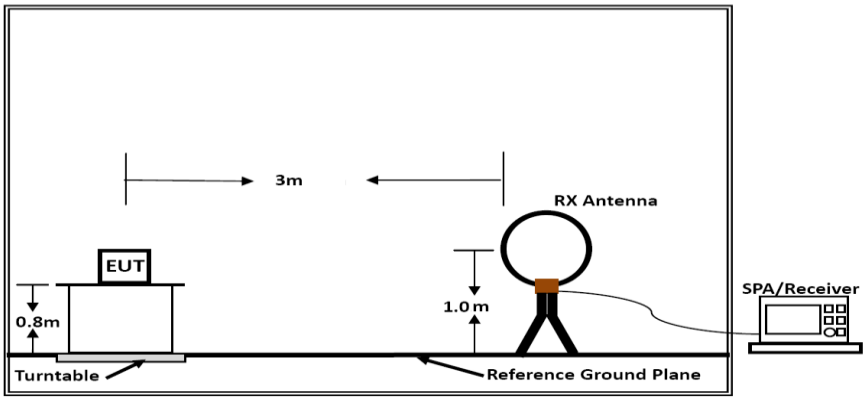
5.2.2. Measuring Instruments and Setting

The following table is the setting of spectrum analyzer and receiver.

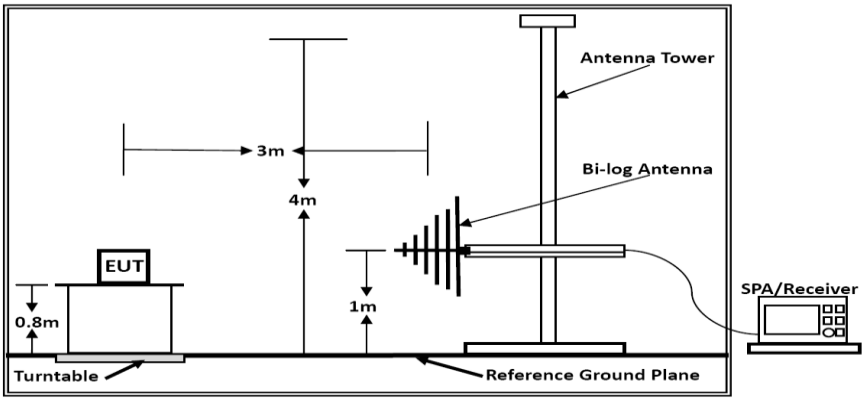
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB/VB 200Hz/1KHz for QP/AVG
Start ~ Stop Frequency	150kHz~30MHz / RB/VB 9kHz/30KHz for QP/AVG
Start ~ Stop Frequency	30MHz~1000MHz / RB/VB 120kHz/1MHz for QP

5.2.3. Block Diagram of Test Setup

For radiated emissions below 30MHz



Below 30MHz



Below 1GHz

5.2.4. Test Procedures

1) Sequence of testing 9 kHz to 30 MHz

Setup:
--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
--- If the EUT is a tabletop system, a rotatable table with 0.8 m height is used.
--- If the EUT is a floor standing device, it is placed on the ground.
--- Auxiliary equipment and cables were positioned to simulate normal operation conditions.
--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
--- The measurement distance is 3 meter.
--- The EUT was set into operation.
Premeasurement:
--- The turntable rotates from 0° to 315° using 45° steps.
--- The antenna height is 1.0 meter.
--- At each turntable position the analyzer sweeps with peak detection to find the maximum of all emissions
Final measurement:
--- Identified emissions during the premeasurement the software maximizes by rotating the turntable position (0° to 360°) and by rotating the elevation axes (0° to 360°).
--- The final measurement will be done in the position (turntable and elevation) causing the highest emissions with QPK detector.
--- The final levels, frequency, measuring time, bandwidth, turntable position, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.

2) Sequence of testing 30 MHz to 1 GHz

Setup:
--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
--- If the EUT is a tabletop system, a table with 0.8 m height is used, which is placed on the ground plane.
--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
--- Auxiliary equipment and cables were positioned to simulate normal operation conditions
--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
--- The measurement distance is 3 meter.
--- The EUT was set into operation.
Premeasurement:
--- The turntable rotates from 0° to 315° using 45° steps.
--- The antenna is polarized vertical and horizontal.
--- The antenna height changes from 1 to 3 meter.
--- At each turntable position, antenna polarization and height the analyzer sweeps three times in peak to find the maximum of all emissions.
Final measurement:
--- The final measurement will be performed with minimum the six highest peaks.
--- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position (± 45°) and antenna movement between 1 and 4 meter.
--- The final measurement will be done with QP detector with an EMI receiver.
--- The final levels, frequency, measuring time, bandwidth, antenna height, antenna polarization, turntable angle, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.

3) EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.2.5. Test Results

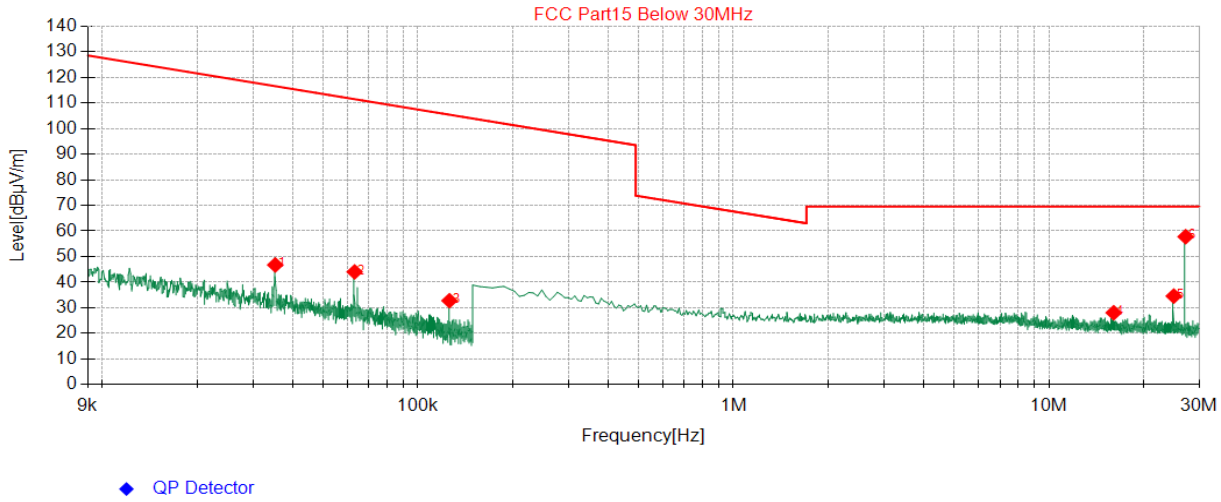
Results of Field Strength of Fundamental

NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Peak Level [dBμV/m]	Average Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	27.145	38.69	19.08	57.77	80.00	22.23	100	110	Coaxial
2	27.145	31.20	19.08	50.28	80.00	29.72	100	138	Coplanar

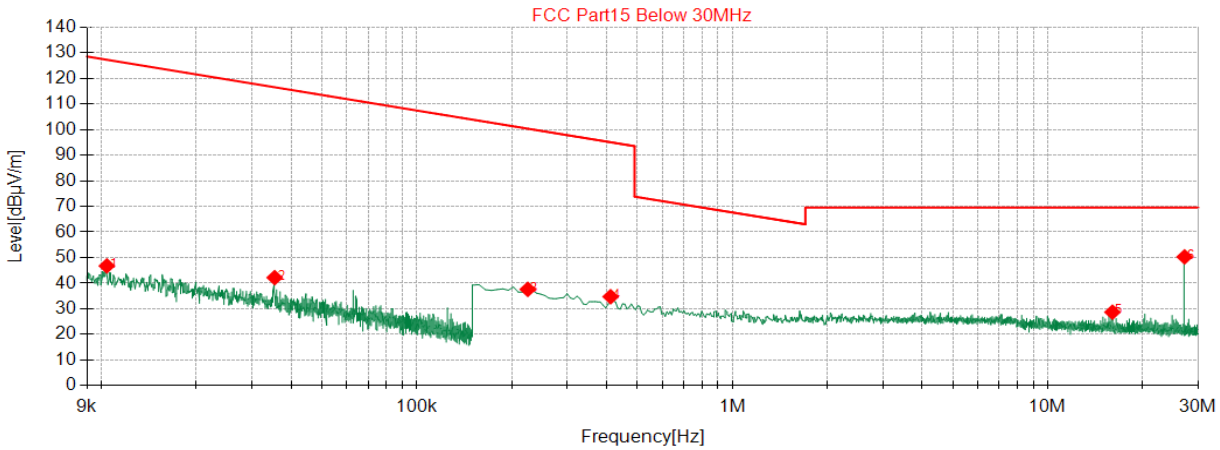
Note: The peak emissions are below the average limits, so the average value cannot be tested.

Results of Radiated Emissions (9 KHz~30MHz)

Temperature	22.5℃	Humidity	56%
Test Engineer	Tony Luo	Configurations	Mode 1
Test Voltage	DC 3V	/	/



NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	0.0353	26.58	20.15	46.73	116.54	69.81	100	265	Coaxial
2	0.063	23.53	20.49	44.02	111.47	67.45	100	274	Coaxial
3	0.1259	12.91	19.87	32.78	105.40	72.62	100	338	Coaxial
4	16.0675	8.65	19.43	28.08	69.50	41.42	100	358	Coaxial
5	24.9031	15.27	19.30	34.57	69.50	34.93	100	358	Coaxial
6	27.1493	38.69	19.08	57.77	80.00	22.23	100	110	Coaxial



◆ QP Detector

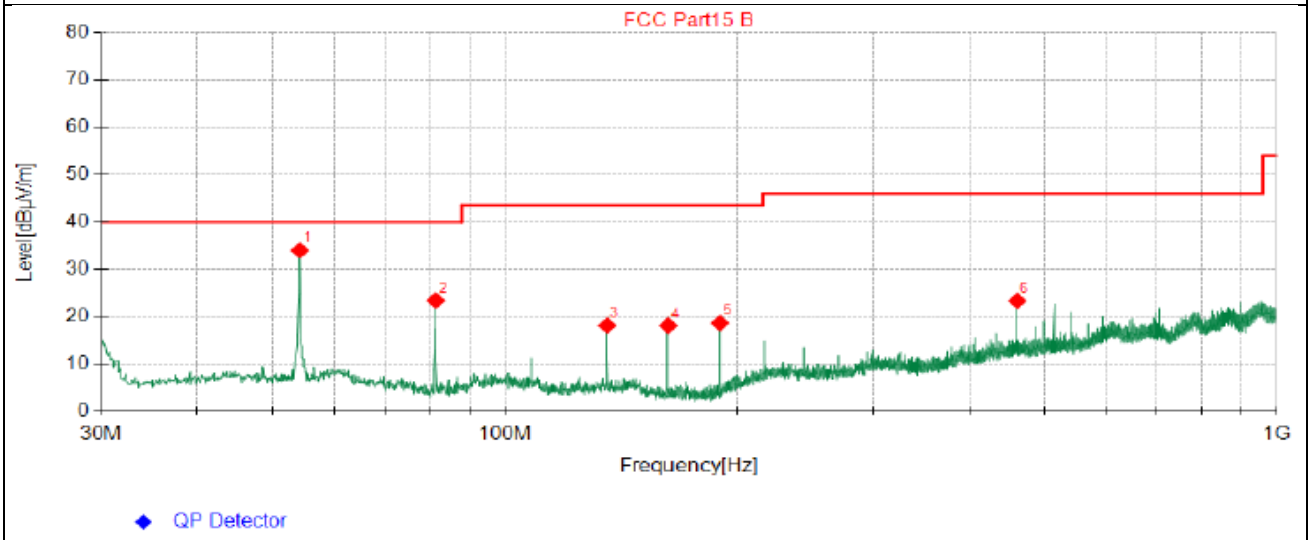
NO.	Freq. [MHz]	Reading [dBµV]	Factor [dB/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	0.0104	26.86	19.90	46.76	127.26	80.50	100	171	Coplanar
2	0.0354	22.03	20.15	42.18	116.52	74.34	100	48	Coplanar
3	0.2246	17.61	19.99	37.60	100.33	62.73	100	101	Coplanar
4	0.4112	14.53	20.20	34.73	95.04	60.31	100	290	Coplanar
5	16.0302	9.26	19.44	28.70	69.50	40.80	100	358	Coplanar
6	27.1493	31.20	19.08	50.28	80.00	29.72	100	138	Coplanar

Note:
Distance extrapolation factor = 40 log (specific distance / test distance) (dB).
Limit line = specific limits (dBuV) + distance extrapolation factor.

Results of Radiated Emissions (30MHz~1GHz)

Temperature	22.5℃	Humidity	56%
Test Engineer	Tony Luo	Configurations	Mode 1
Test Voltage	DC 3V	/	/

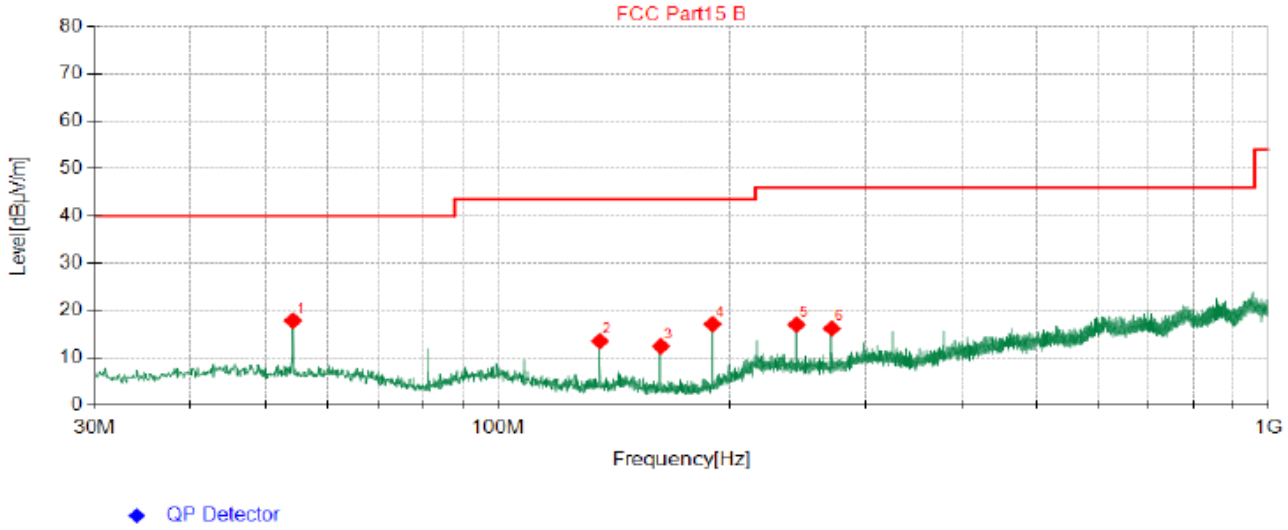
Vertical



Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	54.25	48.84	-14.81	34.03	40.00	5.97	100	6	Vertical
2	81.41	43.20	-19.75	23.45	40.00	16.55	100	36	Vertical
3	135.7	37.49	-19.32	18.17	43.50	25.33	100	357	Vertical
4	162.8	36.64	-18.50	18.14	43.50	25.36	100	36	Vertical
5	190.0	35.12	-16.45	18.67	43.50	24.83	100	45	Vertical
6	461.5	32.20	-8.82	23.38	46.00	22.62	100	258	Vertical

***Note:
1. Level [dBμV/m] = Reading [dBμV] + Factor [dB/m]
2. Margin [dB] = Limit [dBμV/m] - Level [dBμV/m]

Horizontal



Suspected Data List									
NO.	Freq. [MHz]	Reading [dBµV]	Factor [dB/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	54.25	32.70	-14.81	17.89	40.00	22.11	100	102	Horizontal
2	135.7	32.85	-19.32	13.53	43.50	29.97	100	264	Horizontal
3	162.8	30.97	-18.50	12.47	43.50	31.03	100	85	Horizontal
4	190.0	33.62	-16.45	17.17	43.50	26.33	100	111	Horizontal
5	244.2	31.12	-14.05	17.07	46.00	28.93	100	118	Horizontal
6	271.4	29.66	-13.41	16.25	46.00	29.75	100	102	Horizontal

***Note:
1. Level [dBµV/m] = Reading [dBµV] + Factor [dB/m]
2. Margin [dB] = Limit [dBµV/m] - Level [dBµV/m]

5.3. AC Power line conducted emissions

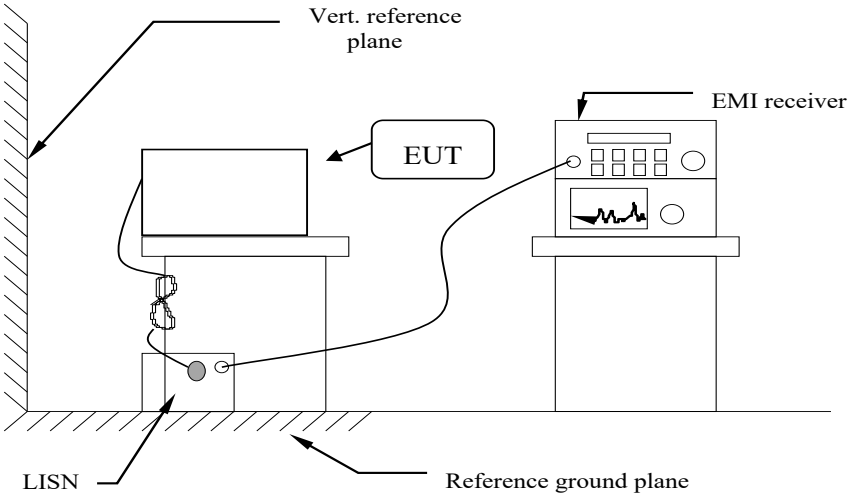
5.3.1. Standard Applicable

According to §15.207 (a): For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range are listed as follows:

Frequency Range (MHz)	Limits (dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

* Decreasing linearly with the logarithm of the frequency

5.3.2. Block Diagram of Test Setup



Note: the distance between LISN and Vertical reference plane is 40 cm and the distance between LISN and EUT is 80 cm.

5.3.3. Test Results

Not Applicable.

5.4. Antenna Requirements

5.4.1. Standard Applicable

According to antenna requirement of §15.203.
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be re-placed by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

5.4.2. Antenna Connected Construction

The antenna is an Internal antenna connect to PCB board and no consideration of replacement. Please see EUT photo for details.

5.4.3. Results

Compliance

6. LIST OF MEASURING EQUIPMENTS

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Due Date
1	MXA Signal Analyzer	Keysight	N9020A	MY52091623	2024-12-31	2025-12-30
2	Loop Antenna	schwarzbeck	FMZB1519 B	00023	2022/11/13	2025/11/12
3	Wideband Antenna	schwarzbeck	VULB 9163	958	2022/11/13	2025/11/12
4	Horn Antenna	schwarzbeck	BBHA 9120D	01989	2022/11/13	2025/11/12
5	EMI Test Receiver	R&S	ESCI	100849/003	2024-12-31	2025-12-30
6	Controller	MF	MF7802	N/A	N/A	N/A
7	Amplifier	schwarzbeck	BBV 9743	209	2024-12-31	2025-12-30
8	Amplifier	Tonscend	TSAMP-05 18SE	--	2024-12-31	2025-12-30
9	RF Cable(below 1GHz)	HUBER+SUHN ER	RG214	N/A	2024-12-31	2025-12-30
10	RF Cable(above 1GHz)	HUBER+SUHN ER	RG214	N/A	2024-12-31	2025-12-30

Test software used:

Item	Test Software	Manufacturer	Name	Version
1	EMI Test Software	ROHDE & SCHWARZ	ES-K1	V1.71
2	RE Test software	Tonscend	JS32-RE	V5.0.0.0

7. TEST SETUP PHOTOGRAPHS OF EUT

Please refer to separated files for Test Setup Photos of the EUT.

8. EXTERIOR PHOTOGRAPHS OF EUT

Please refer to separated files for External Photos of the EUT.

9. INTERIOR PHOTOGRAPHS OF EUT

Please refer to separated files for Internal Photos of the EUT.

----------THE END OF REPORT----------