



TEST REPORT

Report Number : TZ0059250206FRF19
Product Name : Car MP3 FM Transmitter
Model/Type reference : W1, W21, W22, W23, W25, W26, W27, W28, W29, W30, W31, W32, W33, W35, W38, W39, W40
FCC ID : 2BDHR-SIMRW1
Prepared for : Shenzhen Simr Technology Co., Ltd.
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Standards : FCC CFR Title 47 Part 15 Subpart C, ANSI C63.10: 2013
Date of Test : Feb. 24,2025 ~ Mar. 11, 2025
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**** Report Revise Record ****

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Mar. 11, 2025	Valid	Initial release



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1. GENERAL INFORMATION

1.1. Client Information

Applicant	: Shenzhen Simr Technology Co., Ltd.
Address	: 8/F, Zhida Building, Wuhe, Bantian Street, Longgang District, Shenzhen, Guangdong, China
Manufacturer	: Shenzhen Simr Technology Co., Ltd.
Address	: 8/F, Zhida Building, Wuhe, Bantian Street, Longgang District, Shenzhen, Guangdong, China

1.2. Description of Device (EUT)

Product Name	: Car MP3 FM Transmitter
Trade Mark	: N/A
Model Number	: W1, W21, W22, W23, W25, W26, W27, W28, W29, W30, W31, W32, W33, W35, W38, W39, W40
Model Declaration	: All the series models are the same as the test model except for the model names.
Test Model	: W1
Power Supply	: DC 12-24V
Hardware version	: V11
Software version	: V1.0

1.3. Wireless Function Tested in this Report

Short Range Device	
Operation Frequency	: 88.1MHz-107.9MHz
Modulation Technology	: FM
Number of channels	199(Channel spacing 100kHz)
Antenna Type and Gain	: Helix antenna with -6.17dBi Gain

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

○	Battery	Model:	L2 400-H
		Input:	DC12V/24V
		Output:	DC12V/24V

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		Frequency Range	Uncertainty	Note
Radiation Uncertainty	:	9KHz~30MHz	±3.08dB	(1)
		30MHz~1000MHz	±3.92dB	(1)
Conduction Uncertainty	:	150kHz~30MHz	±2.71dB	(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 88.1MHz	Record
Mode 2	Transmitting at 98MHz	Pre-test
Mode 3	Transmitting at 107.9MHz	Pre-test
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, 15.239 under the FCC Rules Part 15 Subpart C.

2.3. Test Sample

Sample ID	Description
TZ0059250206-1#	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
§15.239(b)	Field Strength of Fundamental	TZ0059250206-1#	Compliant
§15.209&§15.205(a)	Radiated Emission	TZ0059250206-1#	Compliant
§15.215(c)& 15.239(a)	-20dB Bandwidth	TZ0059250206-1#	Compliant
§15.207(a)	Conducted Emissions	/	Not applicable (See Note)
§15.203	Antenna Requirements	TZ0059250206-1#	Compliant

Note: The EUT is only powered by battery.

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



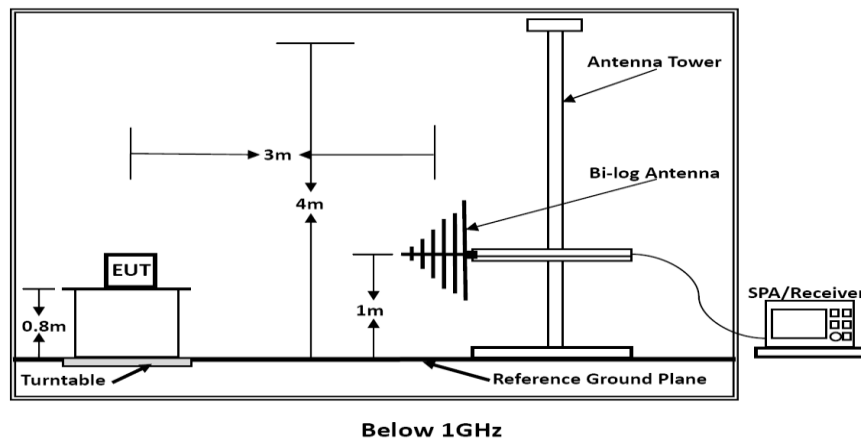
5. TEST RESULT

5.1. Bandwidth Measurement

5.1.1. Standard Applicable

Emissions from the intentional radiator shall be confined within a band 200 kHz wide centered on the operating frequency. The 200 kHz band shall lie wholly within the frequency range of 88-108 MHz.

5.1.2. Block Diagram of Test Setup



5.1.3. Test Procedures

1. Set the parameters of SPA as below:
2. Centre frequency = Operation Frequency
3. RBW=10kHz, VBW=30kHz
4. Span: 500kHz
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

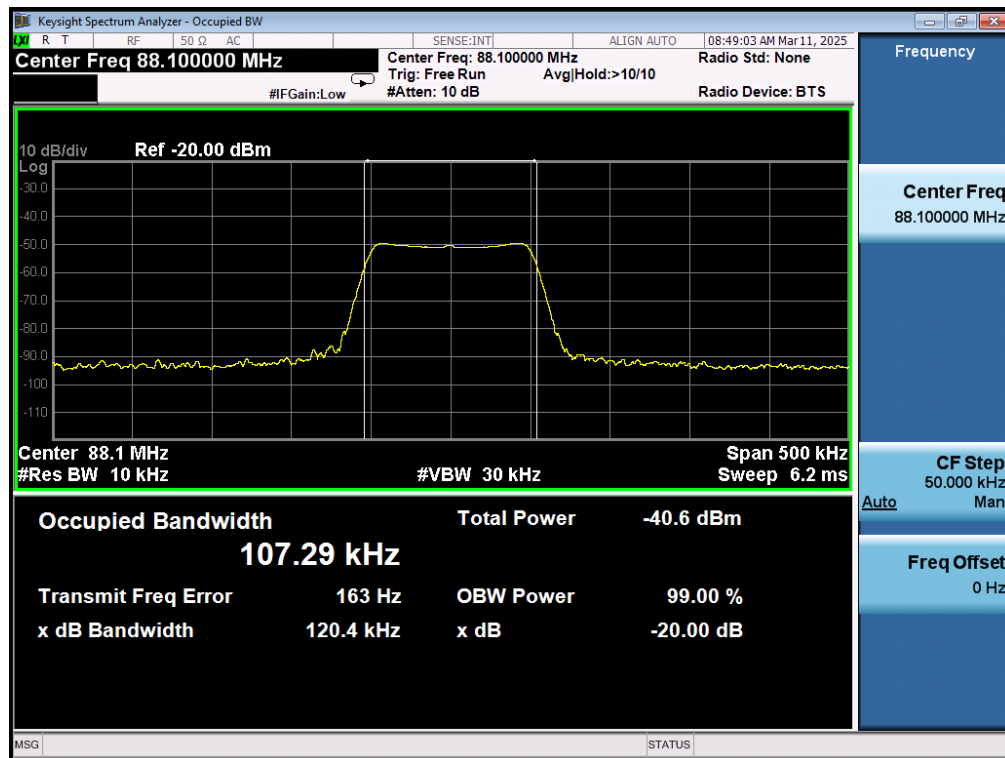
The EUT was programmed to be in continuously transmitting mode.



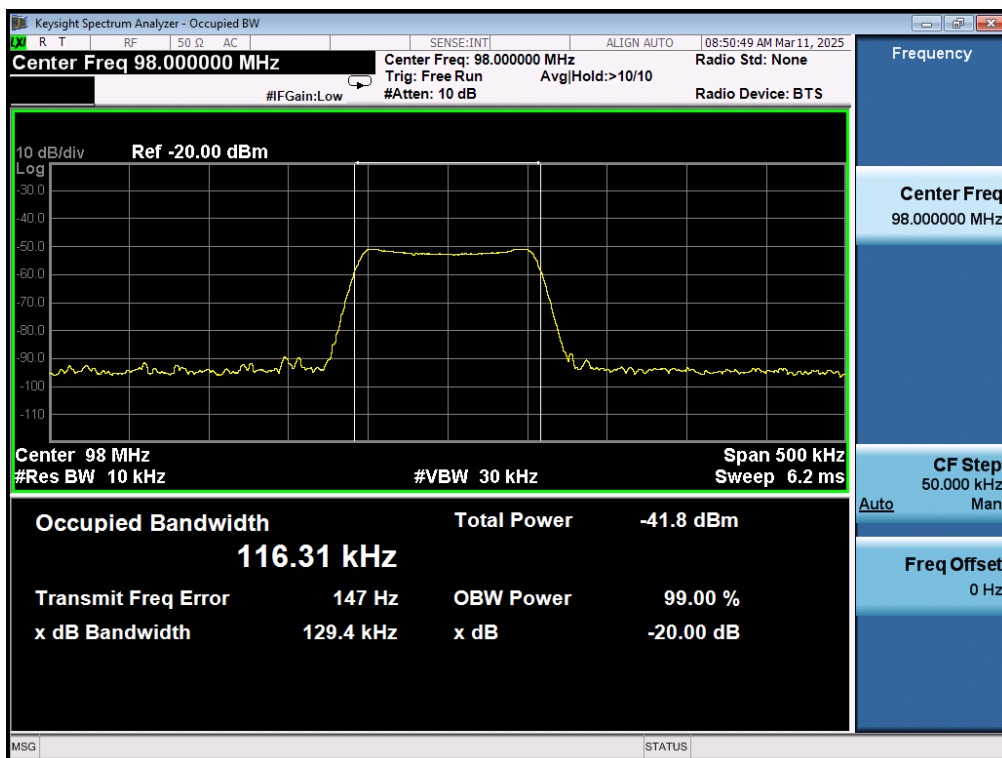
5.1.5. Test Result

Temperature	21.8°C	Humidity	46.2%
Test Engineer	Tony Luo	Configurations	TX

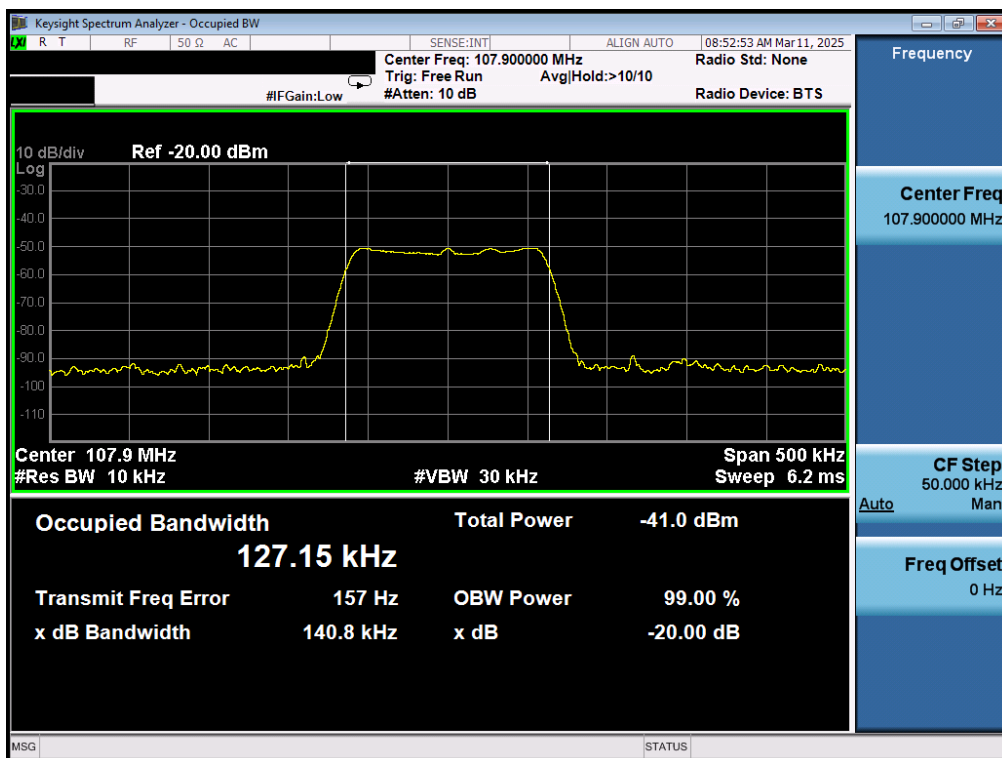
Mode	Freq (MHz)	-20dB Bandwidth (Hz)	Limit (kHz)	Conclusion
1	88.1	120.4	200	PASS
2	98.0	129.4	200	PASS
3	107.9	140.8	200	PASS



Low Channel_88.1MHz_OBW



Low Channel_98.0MHz_OBW



High Channel_107.9MHz_OBW



5.2. Radiated Emissions Measurement

5.2.1. Standard Applicable

15.239

(b) The field strength of any emissions within the permitted 200 kHz band shall not exceed 250 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.

(c) The field strength of any emissions radiated on any frequency outside of the specified 200 kHz 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



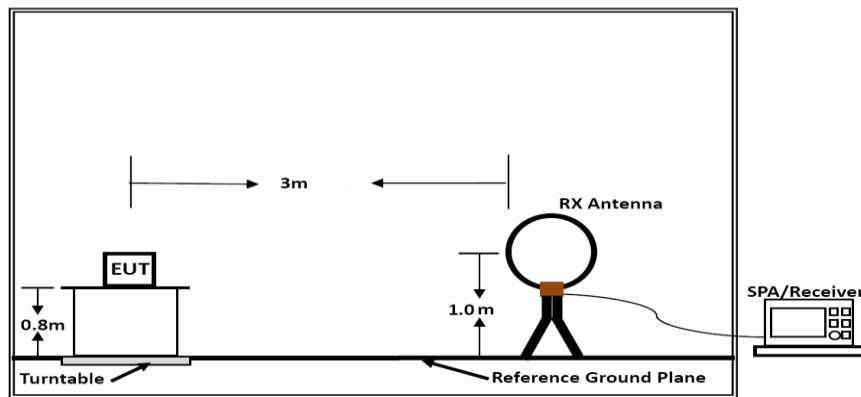
5.2.2. Measuring Instruments and Setting

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

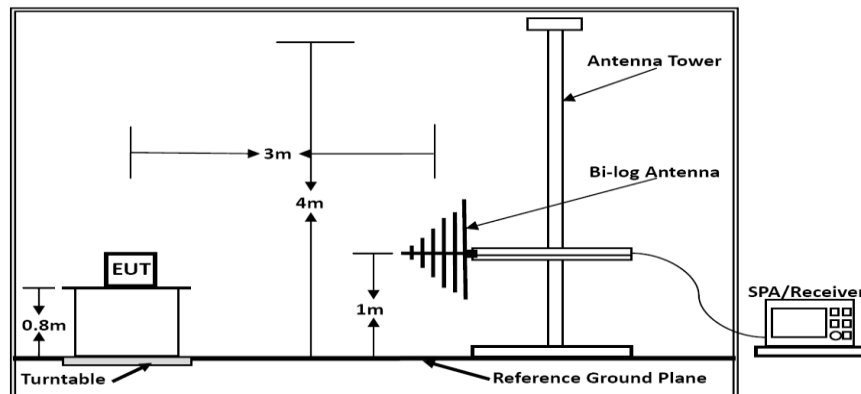
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB/VB 200Hz/1KHz for QP/AVG
Start ~ Stop Frequency	150kHz~30MHz / RB/VB 9kHz/30KHz for QP/AVG
Start ~ Stop Frequency	30MHz~1000MHz / RB/VB 120kHz/1MHz for QP

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 ($\pm 45^\circ$) 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 Radiated Emissions (9 KHz~30MHz)**

Temperature	21.6℃	Humidity	54.5%
Test Engineer	Tony Luo	Configurations	TX

Freq. (MHz)	Level (dBuV)	Over Limit (dB)	Over Limit (dBuV)	Remark
-	-	-	-	See Note

Note:

The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.

Distance extrapolation factor = $40 \log (\text{specific distance} / \text{test distance})$ (dB).

Limit line = specific limits (dBuV) + distance extrapolation factor.

Results of Field Strength of Fundamental

Frequency (MHz)	Field Strength (dBμV/m)	AV Limit @3m (dBμV/m)	Margin (dB)	Polarity
88.1	34.53	48.00	13.47	Horizontal
88.1	45.86	48.00	2.34	Vertical
98.0	32.38	48.00	15.62	Horizontal
98.0	45.12	48.00	2.88	Vertical
107.9	32.99	48.00	15.01	Horizontal
107.9	45.76	48.00	2.24	Vertical

***Note: Margin [dB] = Limit [dBμV/m] - Level [dBμV/m]

Results of Field Strength of Band Edge Emission

Frequency (MHz)	Field Strength (dBμV/m)	QP Limit @3m (dBμV/m)	Margin (dB)	Polarity
88	30.6	40	9.4	Horizontal
88	36.8	40	3.2	Vertical
108	28.8	43.5	14.7	Horizontal
108	40.2	43.5	3.3	Vertical

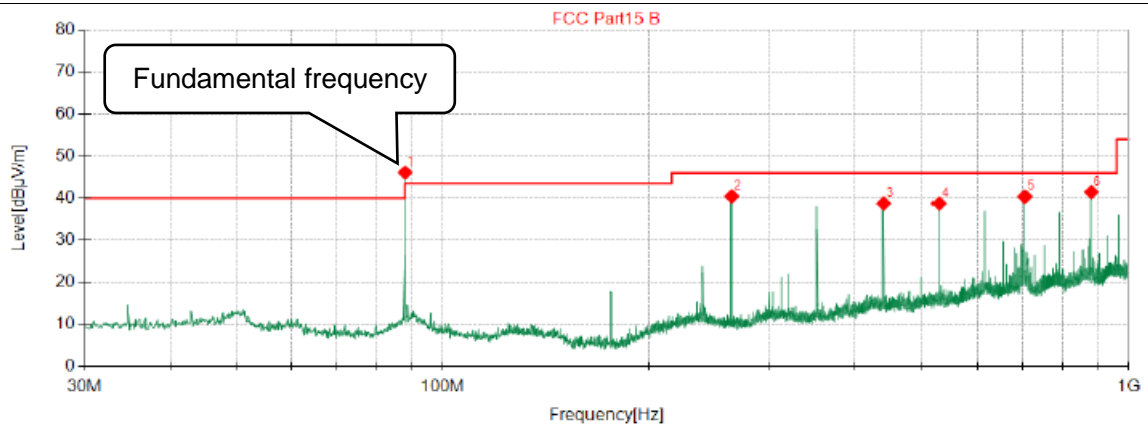
***Note: Margin [dB] = Limit [dBμV/m] - Level [dBμV/m]



Results of Radiated Emissions (30MHz~1GHz)

Temperature	24.8℃	Humidity	63%
Test Engineer	Tony Luo	Configurations	Mode 1

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	88.10	64.24	-18.14	46.10	68.00	21.90	100	360	Vertical
2	264.3	54.01	-13.56	40.45	46.00	5.55	100	179	Vertical
3	440.5	48.00	-9.24	38.76	46.00	7.24	100	172	Vertical
4	528.5	46.10	-7.36	38.74	46.00	7.26	100	286	Vertical
5	704.8	44.66	-4.28	40.38	46.00	5.62	100	125	Vertical
6	881.0	42.85	-1.39	41.46	46.00	4.54	100	147	Vertical

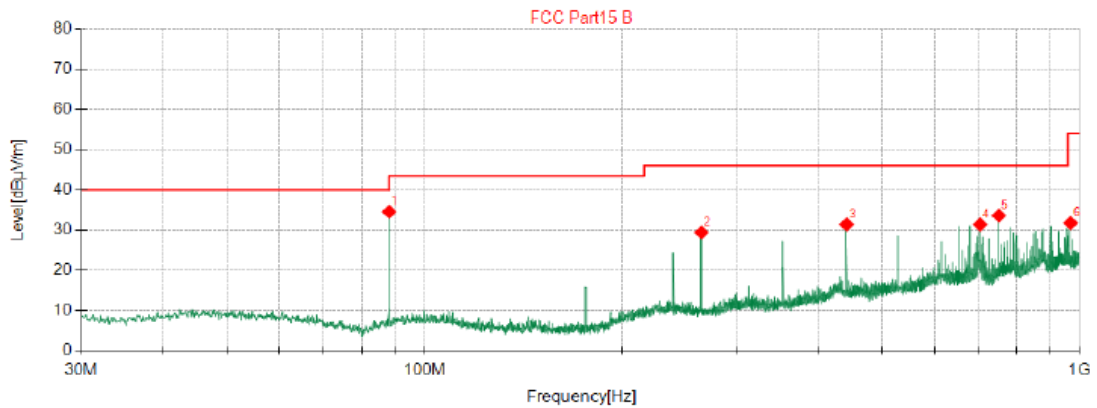
***Note:

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	88.10	52.75	-18.14	34.61	68.00	33.39	100	132	Horizontal
2	264.3	43.01	-13.56	29.45	46.00	16.55	100	148	Horizontal
3	440.5	40.68	-9.24	31.44	46.00	14.56	100	274	Horizontal
4	704.8	35.70	-4.28	31.42	46.00	14.58	100	141	Horizontal
5	752.8	37.22	-3.58	33.64	46.00	12.36	100	258	Horizontal
6	969.2	32.02	-0.22	31.80	54.00	22.20	100	125	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

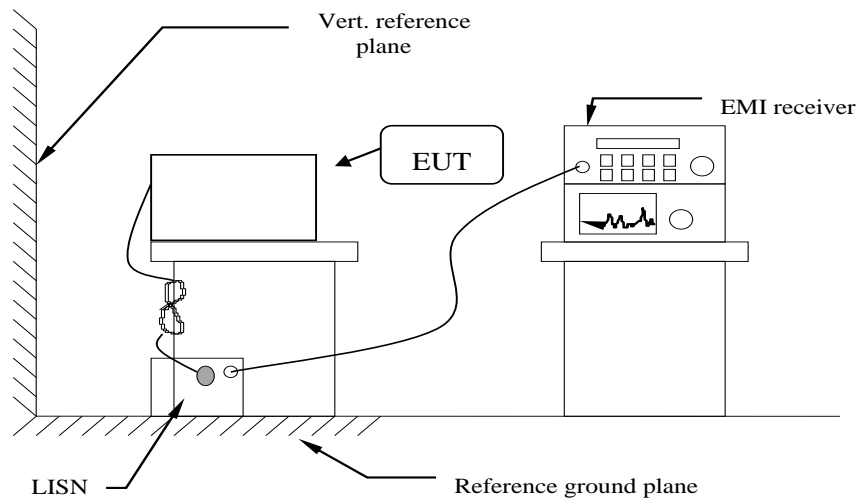
5.3.1. Standard Applicable

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 (dB μ V)	
	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 helix 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+SUHNER	RG214	N/A	2024-12-31	2025-12-30
10	RF Cable(above 1GHz)	HUBER+SUHNER	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.

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