

TEST REPORT

Report No.: SRTC2024-9003(F)-0026
Product Name: Auto EQ Bluetooth Audio Transmitter
Model Name: OTM-A01
Applicant: ALPINE ELECTRONICS MARKETING, INC.
Manufacturer: ALPINE ELECTRONICS MARKETING, INC.
Specification: FCC Part15B (Certification)
(2023 edition)
ANSI C63.4-2014
FCC ID 2A38M-OTMA01

The State Radio_monitoring_center Testing Center (SRTC)
15th Building, No.30 Shixing Street, Shijingshan District,
Beijing, China

Tel: 86-10-57996183 Fax: 86-10-57996388

CONTENTS

1. General information	3
1.1 Notes of the test report.....	3
1.2 Information about the testing laboratory	3
1.3 Applicant's details.....	3
1.4 Manufacturer's details	3
1.5 Application details.....	3
1.6 Reference specification	4
1.7 Information of EUT	4
1.7.1 General information	4
1.7.2 EUT details.....	4
1.7.3 Auxiliary equipment details.....	4
1.7.4 Test mode.....	5
2. Test information	6
2.1 Summary of the test results	6
2.2 Test result	7
2.2.1 Conducted Emissions-FCC Part15.107.....	7
2.2.2 Radiated Emissions-FCC Part15.109.....	10
2.3. List of test equipments	14

1. General information

1.1 Notes of the test report

The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written permission of The State Radio_monitoring_center Testing Center (SRTC).

The test results relate only to individual items of the samples which have been tested.

1.2 Information about the testing laboratory

Company: The State Radio_monitoring_center Testing Center (SRTC)
Test Site 1: 15th Building, No.30 Shixing Street, Shijingshan District
Test Site 2: No.80, Zhaojiachang, Beizang, Daxing District
City: Beijing
Country or Region: P.R.China
Contacted person: Liu Jia
Tel: +86 10 57996183
Fax: +86 10 57996388
Email: liujiat@srtc.org.cn
Designation Number: CN1267
Registration number: 239125

1.3 Applicant's details

Company: ALPINE ELECTRONICS MARKETING, INC.
Address: 1-7, Yukigaya-otsukamachi, Ota-ku
City: Tokyo
Country or Region: Japan
Contacted person: Keisuke Kitamoto
Tel: 03-5499-4531
Email: k-kitamoto@aoja.alpine.co.jp

1.4 Manufacturer's details

Company: ALPINE ELECTRONICS MARKETING, INC.
Address: 1-7, Yukigaya-otsukamachi, Ota-ku
City: Tokyo
Country or Region: Japan
Contacted person: Keisuke Kitamoto
Tel: 03-5499-4531
Email: k-kitamoto@aoja.alpine.co.jp

1.5 Application details

Date of reception of test sample: 28th April 2024

Date of test: 28th April 2024 to 17th May 2024

1.6 Reference specification

FCC Part 15B, 2023 (Certification)
ANSI C63.4-2014

1.7 Information of EUT

1.7.1 General information

Name of EUT	Auto EQ Bluetooth Audio Transmitter
Model Name of EUT	OTM-A01
FCC ID	2A38M-OTMA01
Frequency Range	Bluetooth: 2.4~2.48GHz
Input Rated Voltage	5VDC
Extreme Temperature	Lowest: -20°C Highest: +60°C
Extreme Voltage(Battery)	Minimum:4.5V, Maximum:5.5V
HW Version	V1.0
SW Version	V1.0

1.7.2 EUT details

No.	Model Name	IMEI
EUT	OTM-A01	/

1.7.3 Auxiliary equipment details

AE (Auxiliary Equipment) 1#: Charger

Equipment	Charger Power
Manufacturer	Foxlink Technology ltd.
Model Number	A1357

AE (Auxiliary Equipment) 2#: USB Cable

Manufacturer	GUOGUANG GROUP YUEQING HONGFA ELECTRONIC CO.,LTD
Model Number	HF3-23010-29001

AE (Auxiliary Equipment) 3#: Cell Phone

Equipment	Cell Phone
Manufacturer	Apple
Model Number	MHGU3J/A

AE (Auxiliary Equipment) 4#: Speaker

Equipment	Speaker
Manufacturer	JBL
Model Number	GO2H

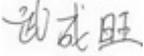
1.7.4 Test mode

Mode No.	Description of test mode
Mode 1:	Normal mode (EUT powered on with charger and worked in receiver mode)

2. Test information

2.1 Summary of the test results

No.	Test case	FCC reference	Verdict
1	Conducted emissions	15.107	Pass
2	Radiated emissions	15.109	Pass

Approved By: Mr.LiuWei Director of the test department 	Checked By: Mr.Guoyu Vice director of the test department 
Tested By: Mr.Wu Chengwang 	Issued date: 2024.06.17

2.2 Test result

2.2.1 Conducted Emissions-FCC Part15.107

Ambient condition:

Temperature	Relative humidity	Pressure
25.3°C	38.7%	100.8kPa

Test Setup with charger:

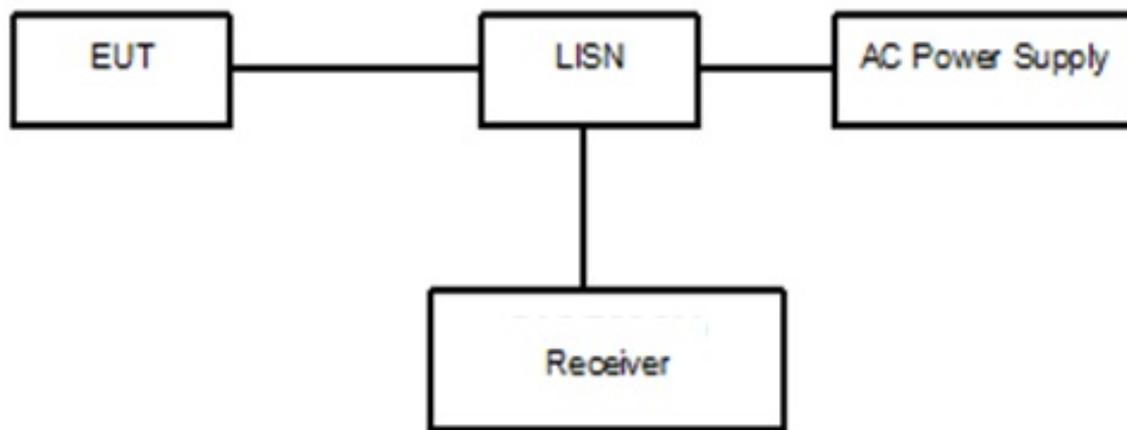


Figure 1

Test Procedure:

The EUT is placed on a non-metallic table 0.8m above the horizontal metal reference ground plane. The EUT is connected with LISN via the charger. The LISN is connected to the reference ground.

The test set-up and the test methods are performed according to ANSI C63.4:2014.

Then start the test software EMC32. Sweep the whole frequency band through the range from 150 KHz to 30 MHz with RBW 9kHz, VBW 30kHz. The measurement should be done for both L line and N line. During pre-test, the receiver uses both peak detector and average detector. And the final test, the receiver uses both average detector and Quasi-peak detector.

The data of cable loss has been calibrated in full testing frequency range before the testing.

A “reference path loss” Corr.(dB) is established and the $L_{cable}+ATT+VDF$ is the attenuation of “reference path loss”, and including the cable loss, the attenuation of the attenuator, the voltage division factor of AMN.

The measurement results are obtained as described below:

$$P_{result}=P_{mea}+Corr.(dB)$$

Limit:

Frequency of Emission(MHz)	Limits(dBμV)	
	Quasi-peak	Average
0.15~0.5	66 to 56*	56 to 46*
0.5~5	56	46
5~30	60	50

Note: * Decreases with the logarithm of the frequency

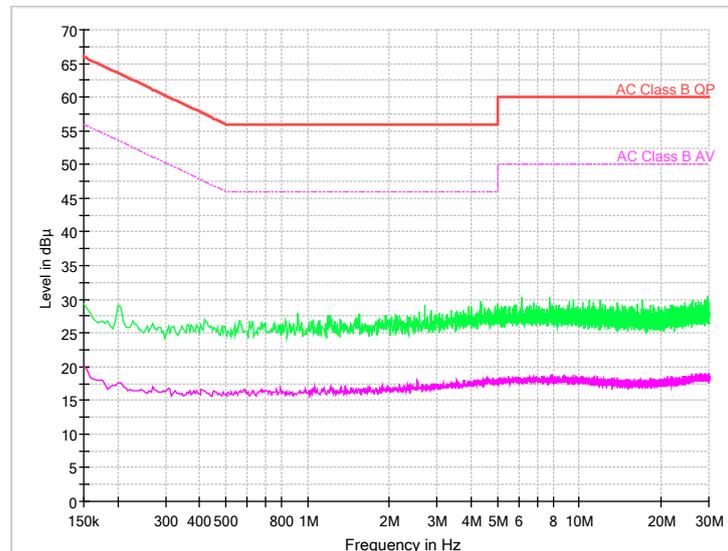
Uncertainty

Quasi-peak: 3.92dB

Average: 3.92dB

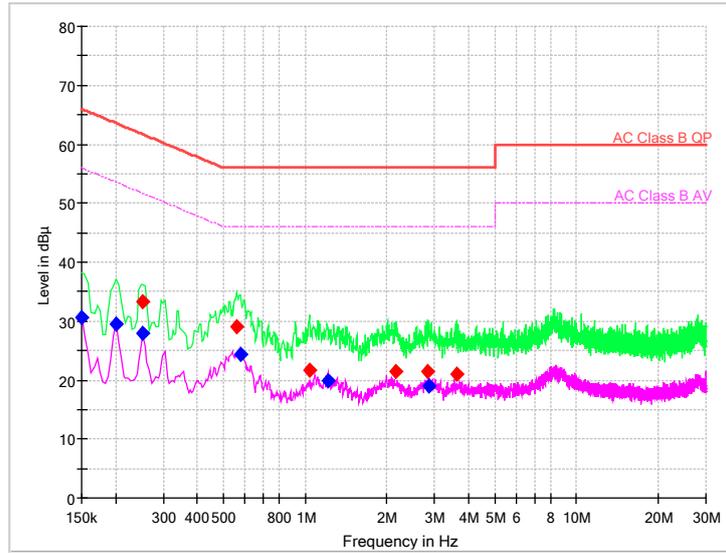
Test result:

Noise Level of the Measuring Instrument



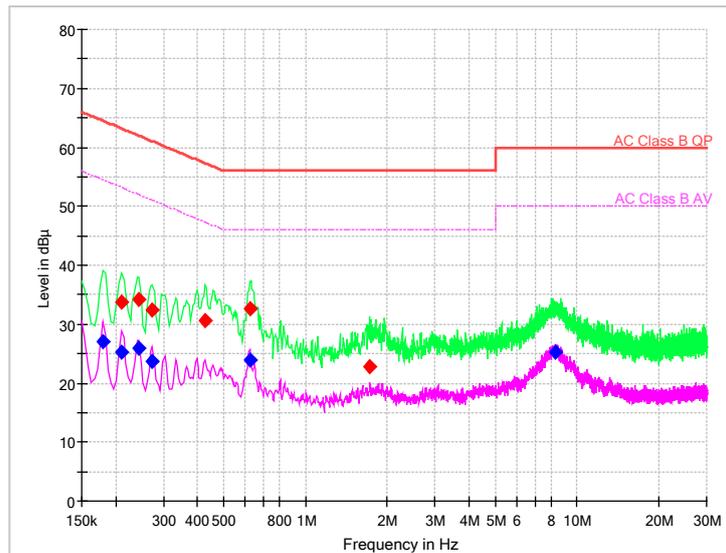
Pic1. Conducted emission L and N Line

EUT1 + AE#1: Charger:



Pic2. Conducted emission L&N Line 120V AC

EUT1 + AE#1: Charger:



Pic3. Conducted emission L&N Line 240V AC

2.2.2 Radiated Emissions-FCC Part15.109

Ambient condition:

Temperature	Relative humidity	Pressure
25.5°C	39.2%	100.8kPa

Test Setup:



Figure 2

Test Procedure:

EUT+Charger:

The EUT should be placed on a non-metallic table 80cm above the ground plane. The receive antennas shall be moved from 1 to 4 meters. The distance between EUT and receive antenna should be 3 meters.

The EUT should work in idle mode. The test set-up and the test methods are performed according to ANSI C63.4:2014.

Then start the test software EMC32. Sweep the whole frequency band through the range from 30MHz to 1GHz, using receive log period antenna VULB 9163.

During the test, the height of receive antenna shall be moved from 1 to 4 meters, and the antenna shall be performed under horizontal and vertical polarization. The turn table shall be rotated from 0 to 360 degrees for detecting the maximum of radiated spurious signal level. The measurements shall be repeated with orthogonal polarization of the test antenna. The EUT is laid in two modes as follow: 1. put the EUT in horizontal direction; 2. put the EUT in vertical direction.

The data of cable loss and antenna factor have been calibrated in full testing frequency range before the testing. All test results are performed with max hold at the horizontal and vertical polarity.

RBW=120kHz, VBW=300kHz, when the test frequency: 30MHz<f<1GHz

RBW=1MHz, VBW=3MHz, when the test frequency: f>1GHz

A “reference path loss” is established and the A_{Rpl} is the attenuation of “reference path loss”,

and including the gain of receive antenna, the gain of the preamplifier, the cable loss.

The measurement results are obtained as described below:

$$\text{Result} = P_{\text{mea}} + A_{\text{Rpl}}$$

Sample calculation: $(14.49 \text{ dB}\mu\text{V/m}) = (34.89 \text{ dB}\mu\text{V}) + (-20.4\text{dB/m})$, the corresponding frequency is 32.958500MHz.

Limit:

Frequency of Emission(MHz)	Limits	
	Detector	Unit (dB μ V/m)
30~88	Quasi-peak	40
88~216	Quasi-peak	43.5
216~960	Quasi-peak	46
960~1000	Quasi-peak	54
1000~5th harmonic of the highest frequency or 40GHz, whichever is lower	Average	54
	Peak	74

Uncertainty

30MHz~1000MHz 4.73dB

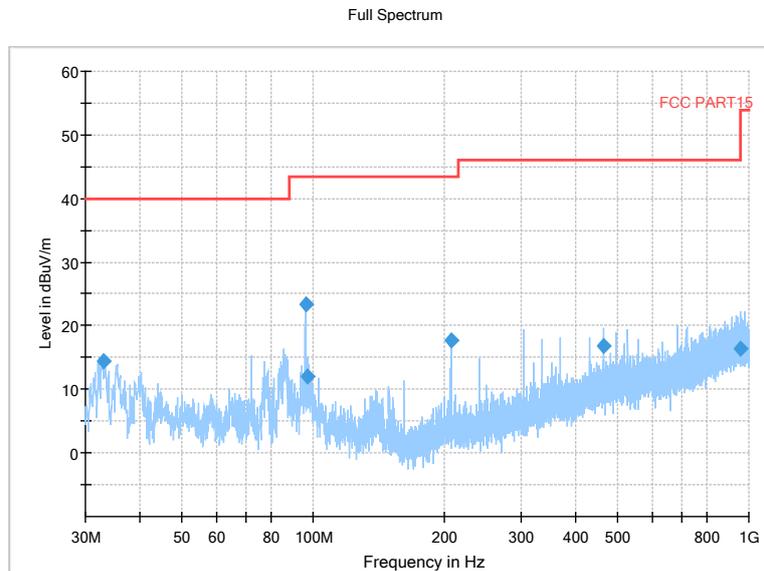
1000MHz~26000MHz 4.58dB

Test result:

EUT1 + AE#1: Charger:

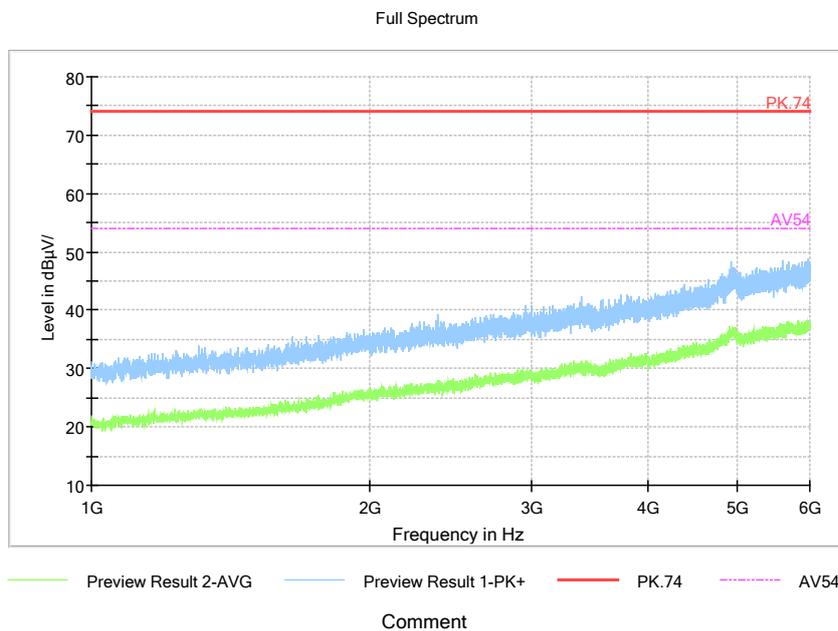
Frequency (MHz)	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	ARpl (dB/m)	Pmea (dB μ V)	Polarity
32.958500	14.49	40.00	25.51	-20.4	34.89	V
95.960000	23.38	43.50	20.12	-19.7	43.08	V
97.027000	11.98	43.50	31.52	-19.6	31.58	V
207.995000	17.75	43.50	25.75	-19.7	37.45	V
463.978000	16.73	46.00	29.27	-13.0	29.73	V
953.973500	16.33	46.00	29.67	-5.0	21.33	V

EUT1 + AE#1: Charger: refer to Pic4 to Pic6



Pic4. Radiated emission (30MHz – 1GHz)

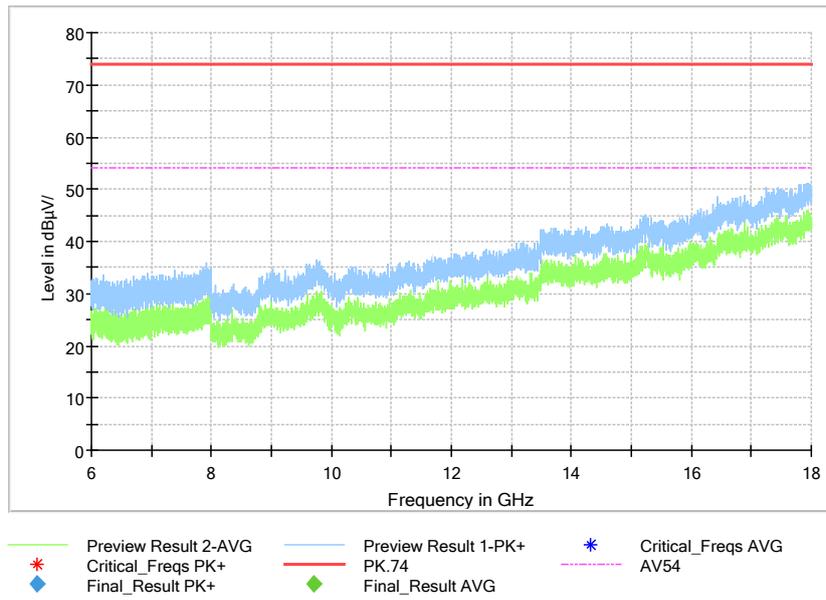
Note: The test data in the graph includes two polarizations: horizontal and vertical



Pic5. Radiated emission (1GHz –6GHz)

Note: The test data in the graph includes two polarizations: horizontal and vertical

Full Spectrum



Pic6. Radiated emission (6GHz –18GHz)

Note: The test data in the graph includes two polarizations: horizontal and vertical

2.3. List of test equipments

No.	Name/Model	Manufacturer	S/N	Calibration Due Date	Calibration Date
1	23.18m×16.88m×9.60m Semi-Anechoic Chamber	FRANKONIA	-----	2028.09.05	2023.09.05
2	ESW EMI test receiver	R&S	101574	2025.03.05	2024.03.05
3	ESR3 EMI test receiver	R&S	102361	2025.03.05	2024.03.05
4	9.080m×5.255m×3.525m Shielding room	FRANKONIA	-----	2027.03.25	2022.03.25
5	VULB 9163 Ultra log test antenna	schwarzbeck	727	2025.05.28	2023.05.28
6	HF 907 Double-Ridged Waveguide Horn Antenna	R&S	100512	2025.07.20	2023.07.20
7	SAS-574 Horn Antenna	schwarzbeck	535	2025.05.12	2023.05.12
8	ENV216 AMN	R&S	101881	2024.06.21	2023.06.21
9	EMC32EMI test software	R&S	V10	-----	-----

-----The end-----