

# TEST REPORT

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Report No.: SRTC2020-9003(F)-0034  
Product Name: UNIT ASSY, Display Audio  
Model Name: G10\_AO  
Applicant: ALPS ALPINE CO.,LTD  
Manufacturer: ALPS ALPINE CO.,LTD.  
Specification: FCC Part15B (Certification)  
(2021 edition)

The State Radio\_monitoring\_center Testing Center (SRTC)  
15th Building, No.30 Shixing Street, Shijingshan District,  
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## 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 .....	4
1.6 Reference specification .....	4
1.7 Information of EUT .....	4
1.7.1 General information .....	4
1.7.2 EUT details .....	5
1.7.3 Auxiliary equipment details .....	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

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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)  
Address: 15th Building, No.30 Shixing Street, Shijingshan District  
Testing location: No.80, Zhaojiachang, BeizangCun, Daxing District, Beijing, China.  
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### 1.3 Applicant's details

Company: ALPS ALPINE CO.,LTD  
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City: Fukushima  
Country or Region: Japan  
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Tel: +81-246-36-4111 Ext: 4170  
Email: ALJP\_SMB\_00436@alpsalpine.com

### 1.4 Manufacturer's details

Company: ALPS ALPINE CO.,LTD.  
Address: 20-1 Yoshima Industrial Park,Iwaki,Fukushima Japan  
City: Iwaki, Fukushima  
Country or Region: Japan  
Contacted person: Kenji Nagase  
Tel: +81-246-36-4111 Ext: 4170  
Email: ALJP\_SMB\_00436@alpsalpine.com

## 1.5 Application details

Date of reception of test sample: 4<sup>th</sup> August 2020

Date of test: 4<sup>th</sup> August 2020 to 31<sup>st</sup> December 2021

## 1.6 Reference specification

FCC Part 15B, 2021 (Certification)

## 1.7 Information of EUT

### 1.7.1 General information

Name of EUT	UNIT ASSY, Display Audio
Model Name	G10_AO
Frequency Range	Bluetooth: 2.4~2.4835GHz
Equipment Class	Class B
Power Supply	13.2V DC
Extreme Temperature	Lowest: -30°C Highest: +70°C
Extreme Voltage	Minimum: 10V Maximum: 16V
HW Version	2wk
SW Version	00.875.000

### 1.7.2 EUT details

Product Name	Model Name	IMEI
UNIT ASSY, Display Audio	G10_AO	/

### 1.7.3 Auxiliary equipment details

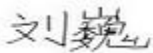
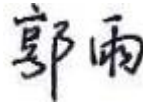
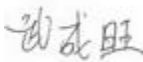
AE (Auxiliary Equipment) 1#:

Manufacturer	/
Model Number	/
S/N	/
Input Voltage	/

## 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: Liu Wei Director of the test department  	Checked By: Guo Yu Vice director of the test department  
Tested By: Mr. Wu Chengwang  	Issued date:  2021.12.31

## 2.2 Test result

### 2.2.1 Conducted Emissions-FCC Part15.107

Ambient condition:

Temperature	Relative humidity	Pressure
23.6°C	38.5%	100.8kPa

Test Setup with power supply:

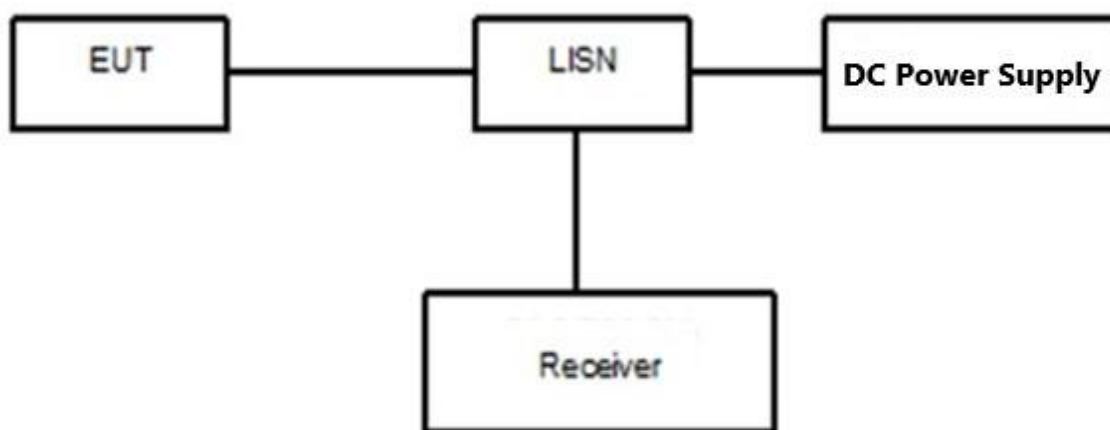


Figure 1

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. The LISN is connected to the reference ground. Open the following functions of EUT: FM.

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:

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

Sample calculation:  $(31.86dB\mu V) = (1.46dB\mu V) + (30.4dB)$ , the corresponding frequency is 0.38481MHz.

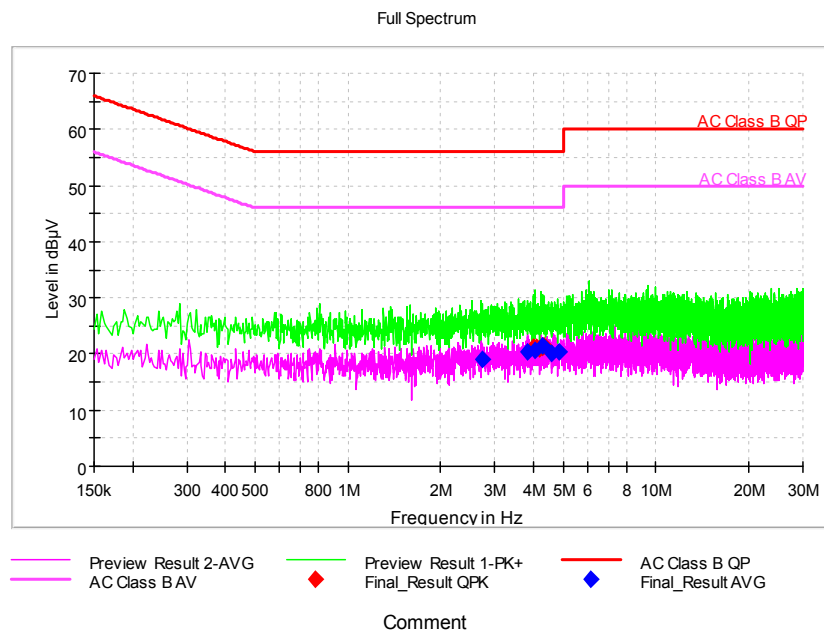
Limit:

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

Test result:

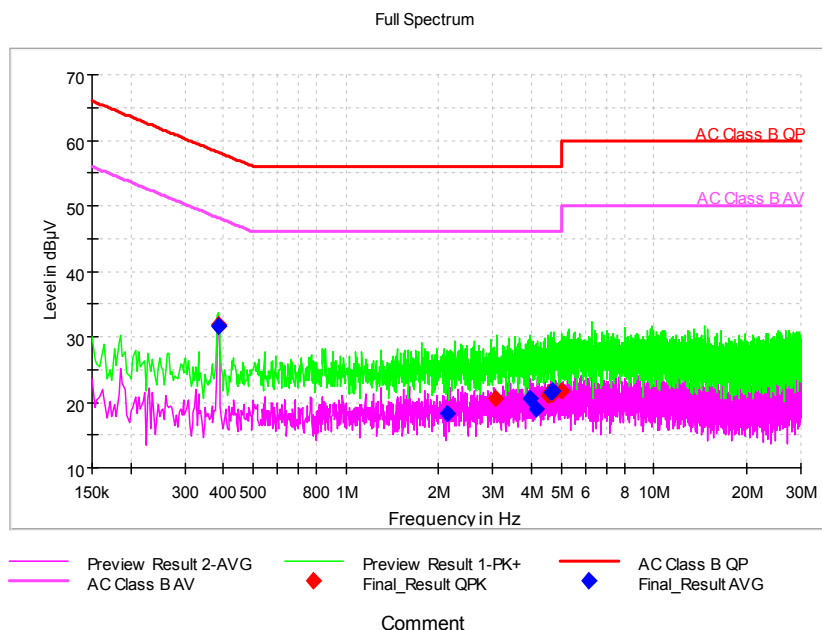
### Noise Level of the Measuring Instrument



Pic1. Conducted emission L and N Line



EUT + DC supply:



Pic2. Conducted emission L&N Line

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	Pmea QuasiPeak (dBµV)	Pmea Average (dBµV)
0.38481	31.86	---	58.1	26.31	L	30.4	1.46	---
0.38481	---	31.62	48.1	16.55	L	30.4	---	1.22
2.13796	---	18.21	46	27.79	L	30.5	---	-12.29
3.05227	20.62	---	56	35.38	L	30.5	-9.88	---
3.95983	---	20.68	46	25.32	L	30.5	---	-9.82
4.14281	---	19.07	46	26.93	L	30.5	---	-11.43
4.53205	21.13	---	56	34.87	L	30.5	-9.37	---
4.59348	21.38	---	56	34.62	L	30.5	-9.12	---
4.63748	---	21.42	46	24.58	L	30.5	---	-9.08
4.69396	---	21.76	46	24.24	L	30.5	---	-8.74
4.71396	21.28	---	56	34.72	L	30.5	-9.22	---
5.02965	21.64	---	60	38.36	L	30.5	-8.86	---

## 2.2.2 Radiated Emissions-FCC Part15.109

Ambient condition:

Temperature	Relative humidity	Pressure
23.9°C	38.6%	100.8kPa

Test Setup:

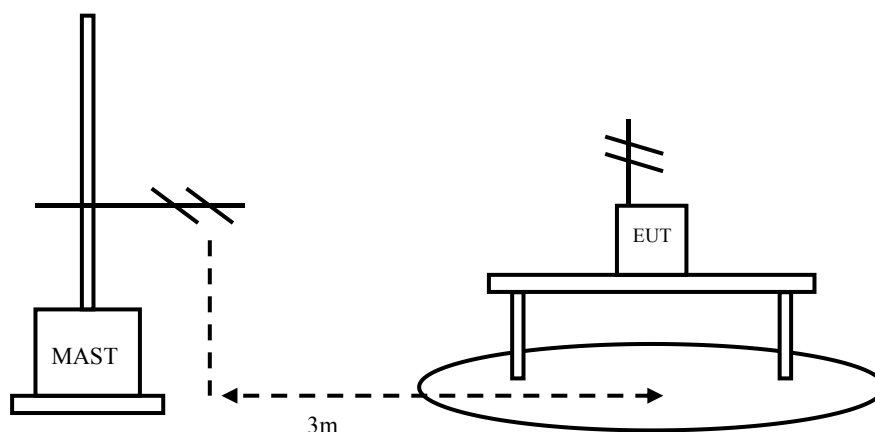


Figure 2

Test Procedure:

EUT+ power supply:

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. Open the following functions of EUT: FM. 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:

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

Limit:

Frequency of Emission(MHz)	Limits	
	Detector	Unit (dB $\mu$ 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

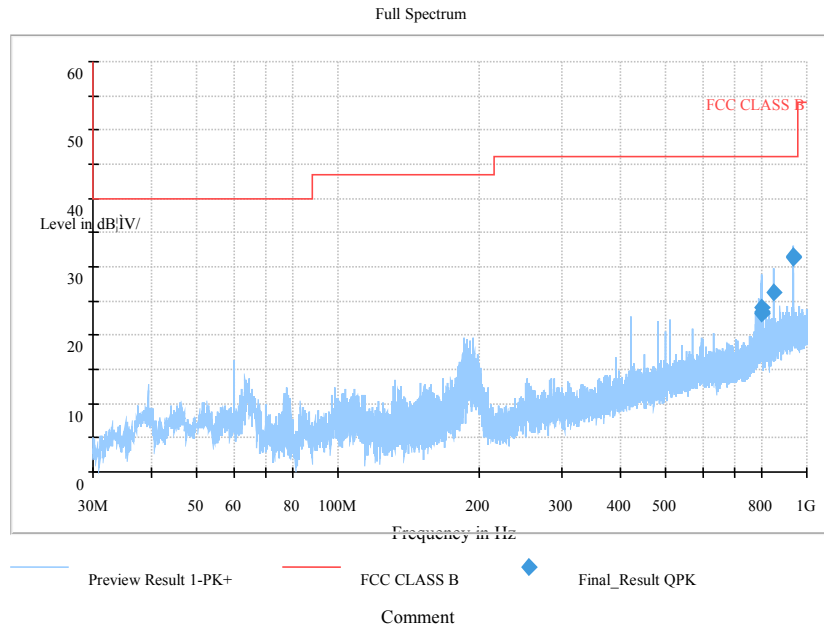
Test result:

Sample calculation: (23.22dB $\mu$ V/m) = (26.62dB $\mu$ V/m) + (-3.4dB), the corresponding frequency is 798.734000MHz.

EUT +DC supply:

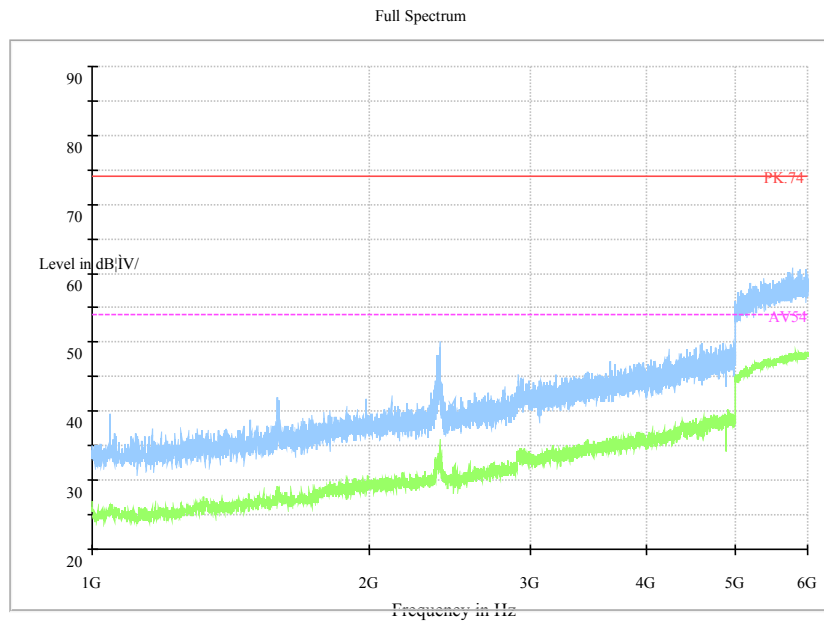
Frequency(MHz)	Result( dB $\mu$ V/m )	Limit (dB $\mu$ V/m)	ARpl (dB)	Pmea ( dB $\mu$ V/m )	Polarity
798.734000	23.22	46.00	-3.4	26.62	V
798.751000	23.42	46.00	-3.4	26.82	V
799.481000	23.96	46.00	-3.4	27.36	V
850.018000	26.21	46.00	-2.4	28.61	V
934.838500	31.32	46.00	-1.0	32.32	V
934.844500	31.55	46.00	-1.0	32.55	V

EUT + DC supply: refer to Pic3, Pic4, Pic5



Pic3. Radiated emission(30MHz – 1GHz)

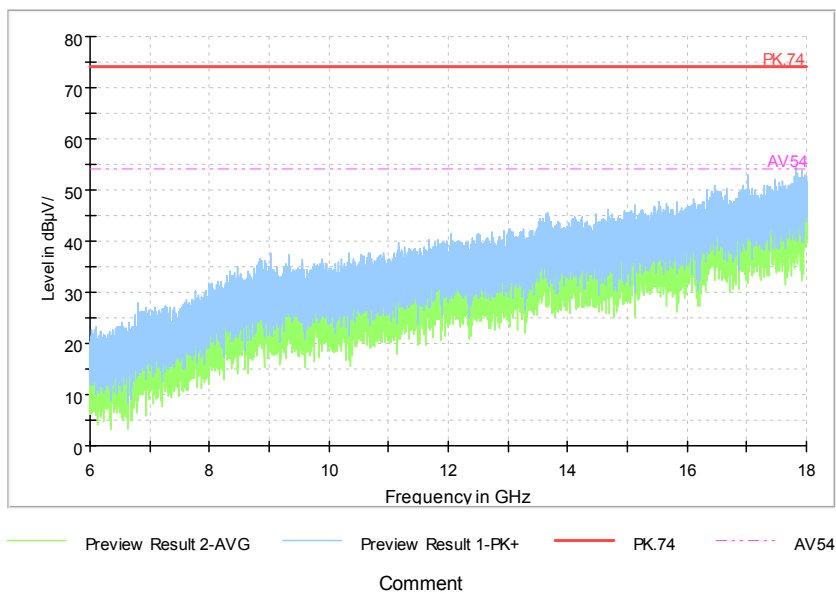
Note: The test data in the graph includes two polarizations: horizontal and vertical



Pic4. Radiated emission (1GHz –6GHz)

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

Full Spectrum



Pic5. 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×9.60mS emi-AnechoicChamber	FRANKONIA	-----	5th Sep. 2021	6th Sep. 2016
2	ESW EMI test receiver	R&S	101574	20th Aug. 2020	20th Aug. 2019
3	9.080m×5.255m×3.525m Shielding room	FRANKONIA	-----	5th Sep. 2021	6th Sep. 2016
4	ESR3EMI test receiver	R&S	102361	22th Apr. 2021	22th Apr. 2020
5	VULB 9163 Ultra log test antenna	Schwarzbeck	867	25th Mar. 2021	25th Mar. 2020
6	ENV4200 AMN	R&S	100091	20th Aug. 2020	20th Aug. 2019
7	HF 907 Double-Ridged Waveguide Horn Antenna	R&S	100512	25th Mar. 2021	25th Mar. 2020
8	PS2000 Turn Table	FRANKONIA	-----	-----	-----
9	MA260 Antenna Master	FRANKONIA	-----	-----	-----
10	EMC32EMI test software	R&S	-----	-----	-----

-----THE END-----