

# **FCC Test Report**

Report No.: AGC01110230214FE02A

**FCC ID** : 2AOKB-A3947

**APPLICATION PURPOSE**: Class II Permissive Change

**PRODUCT DESIGNATION**: Wireless Headphone

**BRAND NAME** : soundcore

MODEL NAME : A3947

**APPLICANT**: Anker Innovations Limited

**DATE OF ISSUE** : Oct. 17, 2023

**STANDARD(S)** : FCC Part 15.247

**REPORT VERSION**: V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd



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#### REPORT REVISE RECORD

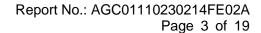
Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Oct. 17, 2023	Valid	Initial Release

Note: The original test report AGC01110230214FE02 (dated Mar. 17, 2023 and tested from Feb. 14, 2023 to Mar. 17, 2023) was modified on Oct. 17, 2023, including the following changes and additions:

-Replaced the battery from the model M1154A6 (3.85V, 53mAh, 0.204Wh) to M1154A7 (3.85V, 60mAh, 0.204Wh);

For the above described change(s) the following tests was considered to be necessary:

Clause	Testing
15.209	Radiated Emission





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## 1. VERIFICATION OF COMPLIANCE

Applicant	Anker Innovations Limited
Address	Room 1318-19, Hollywood Plaza, 610 Nathan Road, Mongkok, Kowloon, Hongkong
Manufacturer	Anker Innovations Limited
Address	Room 1318-19, Hollywood Plaza, 610 Nathan Road, Mongkok, Kowloon, Hongkong
Factory	Jiangxi Cosonic Electroacoustic Technologies Co., Ltd.
Address	Shangli Industrial Park, Jinshan Town, Shangli County, Pingxiang, Jiangxi Province, P.R.China
Product Designation	Wireless Headphone
Brand Name	soundcore
Test Model	A3947
Date of receipt of test item	Sep. 22, 2023
Date of test	Sep. 25, 2023 to Oct. 17, 2023
Deviation	No any deviation from the test method
Condition of Test Sample	Normal
Test Result	Pass
Report Template	AGCRT-US-BLE/RF

Note: The test results of this report relate only to the tested sample identified in this report.

Cool Cheng
(Project Engineer)

Calvin Liu
(Reviewer)

Approved By

Max Zhang
(Authorized Officer)

Cool Cheng
(Project Engineer)

Oct. 17, 2023

Oct. 17, 2023



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#### 2. GENERAL INFORMATION

#### 2.1. PRODUCT DESCRIPTION

The EUT is designed as a "Wireless Headphone". It is designed by way of utilizing the GFSK technology to achieve the system operation.

A major technical description of EUT is described as following

Operation Frequency	2.402 GHz to 2.480GHz
RF Output Power	Left: GFSK 1Mbps: 6.351dBm (Max) GFSK 2Mbps: 6.925dBm (Max) Right: GFSK 1Mbps: 6.584dBm (Max) GFSK 2Mbps: 7.084dBm (Max)
Bluetooth Version	V5.3
Modulation	BR □GFSK, EDR □π /4-DQPSK, □8DPSK BLE □GFSK 1Mbps □GFSK 2Mbps
Number of channels	40 Channels
Antenna Designation	FPC Antenna (Comply with requirements of the FCC part 15.203)
Antenna Gain	Left :-1.18dBi Right :-1.19dBi
Hardware Version	D
Software Version	V6.0.7
Power Supply	DC 3.85V by battery

Note: The EUT comprises left and right channel headsets, both are the same except for the antenna gain. The RF output power of each headset has been tested and recorded in the report. For other test items, the left headset has been tested and recorded as the worst case in this report.

#### 2.2. TABLE OF CARRIER FREQUENCYS

Frequency Band	Channel Number	Frequency
	0	2402 MHz
	1	2404 MHz
2400~2483.5MHz	:	:
	38	2478 MHz
	39	2480 MHz



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# 2.3. RELATED SUBMITTAL(S)/GRANT(S)

This submittal(s) (test report) is intended for **FCC ID: 2AOKB-A3947** filing to comply with the FCC Part 15.247 requirements.

#### 2.4. TEST METHODOLOGY

Both conducted and radiated testing was performed according to the procedures in ANSI C63.10 (2013). Radiated testing was performed at an antenna to EUT distance 3 meters.

#### 2.5. SPECIAL ACCESSORIES

Refer to section 5.2.

#### 2.6. EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

#### 2.7. ANTENNA REQUIREMENT

This intentional radiator is designed with a permanently attached antenna of an antenna to ensure that no antenna other than that furnished by the responsible party shall be used with the device. For more information of the antenna, please refer to the APPENDIX B: PHOTOGRAPHS OF EUT.



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#### 3. MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement y ±U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%.

Item	Measurement Uncertainty
Uncertainty of Conducted Emission for AC Port	$U_c = \pm 2.9 \text{ dB}$
Uncertainty of Radiated Emission below 1GHz	$U_c = \pm 3.9 \text{ dB}$
Uncertainty of Radiated Emission above 1GHz	$U_c = \pm 4.9 \text{ dB}$
Uncertainty of total RF power, conducted	$U_c = \pm 0.8 \text{ dB}$
Uncertainty of RF power density, conducted	$U_c = \pm 2.6 \text{ dB}$
Uncertainty of spurious emissions, conducted	$U_c = \pm 2.7 \%$
Uncertainty of Occupied Channel Bandwidth	U <sub>c</sub> = ±2 %



#### 4. DESCRIPTION OF TEST MODES

NO.	TEST MODE DESCRIPTION	
1	Low channel TX_2402MHz_GFSK_1Mbps	
2	Middle channel TX_2440MHz_GFSK_1Mbps	
3	High channel TX_2480MHz_GFSK_1Mbps	
4	Low channel TX_2402MHz_GFSK_2Mbps	
5	Middle channel TX_2440MHz_GFSK_2Mbps	
6	High channel TX_2480MHz_GFSK_2Mbps	

#### Note:

- 1. Only the result of the worst case was recorded in the report, if no other cases.
- 2. For Radiated Emission, 3axis were chosen for testing for each applicable mode.
- 3. For Conducted Test method, a temporary antenna connector is provided by the manufacture.

Software Setting Non Signaling Test Tool(20220409) <u>F</u>ile <u>D</u>evice SIGTEST NOSIGTEST VCO TEST BLE TX TEST BLE TX TEST V2 BLE TX TEST V3 BLE TX TEST V4 SETTING Address Port ID Name Address Ty: State Role Authenticatic Encryption Version Found -Transmitter Test COM11 0xEEEEEEEEEE DUT Private UNDEFI... IDLE Transmit Frequency 0 Payload Pattern 0:prbs9 ▼ Payload Size 37 Send PHŦ 0x01:1M Reciever Test Traces 2402**E**Hz ▼ Modulation Index standard ▼ PHT |--[13:14:51:651] DUT : CMD(RESET)-> |<-[13:14:51:771] DUT : CMD\_CMEL\_EVT(RESET(SUCCESS))-|--[13:14:56:171] DUT : CMD\_CMEL\_EVT(REST V2)-> |<-[13:14:56:171] DUT : CMD\_CMEL\_EVT(LE\_TX\_TEST\_V2(SUCCESS))-End Test ☑ Filter Sco 🗌 Show raw data



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# 5. SYSTEM TEST CONFIGURATION

#### **5.1. CONFIGURATION OF TESTED SYSTEM**

Radiated Emission Configure:

EUT

#### **5.2. EQUIPMENT USED IN TESTED SYSTEM**

Item	Equipment	Model No.	ID or Specification	Remark
1	Wireless Headphone	A3947	2AOKB-A3947	EUT

#### 5.3. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
15.209	Radiated Emission	Compliant



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# **6. TEST FACILITY**

Test Site Attestation of Global Compliance (Shenzhen) Co., Ltd	
Location	1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Designation Number	CN1259
FCC Test Firm Registration Number	975832
A2LA Cert. No.	5054.02
Description	Attestation of Global Compliance (Shenzhen) Co., Ltd is accredited by A2LA

# **TEST EQUIPMENT OF RADIATED EMISSION TEST**

TEST EQUIPMENT OF RADIATED EMISSION TEST							
Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due		
Test Receiver	R&S	ESCI	10096	Feb. 18, 2023	Feb. 17, 2024		
EXA Signal Analyzer	Agilent	N9010A	MY53470504	Jun. 01, 2023	May 31, 2024		
Signal Analyzer	Aglient	N9020A	MY52090123	Jun. 03, 2023	Jun. 02, 2024		
2.4GHz Filter	EM Electronics	N/A	N/A	Mar. 18, 2022	Mar. 19, 2024		
Attenuator	ZHINAN	E-002	N/A	Aug. 04, 2022	Aug. 03, 2024		
Horn Antenna	SCHWARZBEC	BBHA9170	768	Oct. 31, 2021	Oct. 30, 2023		
Active Loop Antenna (9K-30Mhz)	ZHINAN	ZN30900C	18051	Mar. 12, 2022	Mar. 11, 2024		
Double-Ridged Waveguide Horn	ETS	3117	00034609	Mar.23, 2023	Mar. 22, 2024		
Preamplifier Assembly	ETS	3117PA	00225134	Sep. 01, 2022	Sep. 02, 2024		
Wideband Antenna	SCHWARZBECK	VULB9168	VULB9168-49 4	Jan. 05, 2023	Jan. 04, 2025		
Test software	FARA	Ver RA-03A	N/A	N/A	N/A		



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## 7. RADIATED EMISSION

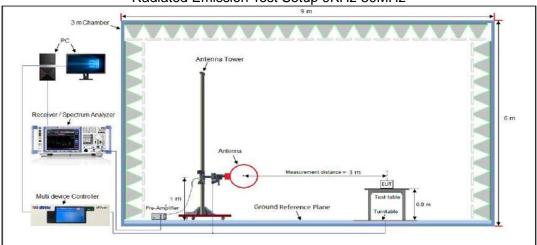
#### 7.1. MEASUREMENT PROCEDURE

- 1. The EUT was placed on the top of the turntable 0.8 or 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
- 2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
- 3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
- 4. For each suspected emission, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
- 5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
- 6. For emissions above 1GHz, use 1MHz RBW and 3MHz VBW for peak reading. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
- 7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.
- 8.If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
- 9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
- 10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High Low scan is not required in this case.

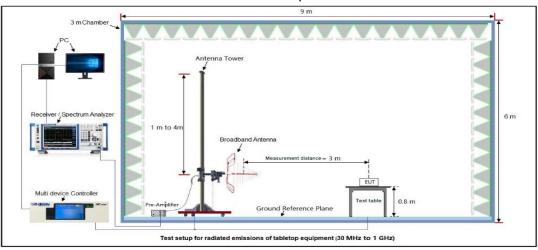


#### 7.2. TEST SETUP

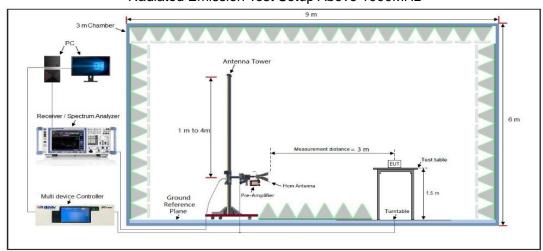
# Radiated Emission Test Setup 9KHz-30MHz



# Radiated Emission Test Setup 30MHz-1000MHz



# Radiated Emission Test Setup Above 1000MHz



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Tel: +86-755 2523 4088 E-mail: agc@agccert.com Web: http://www.agccert.com/



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# 7.3. LIMITS AND MEASUREMENT RESULT

15.209 Limit in the below table has to be followed

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

Note: All modes were tested for restricted band radiated emission, the test records reported below are the worst result compared to other modes.

#### 7.4. TEST RESULT

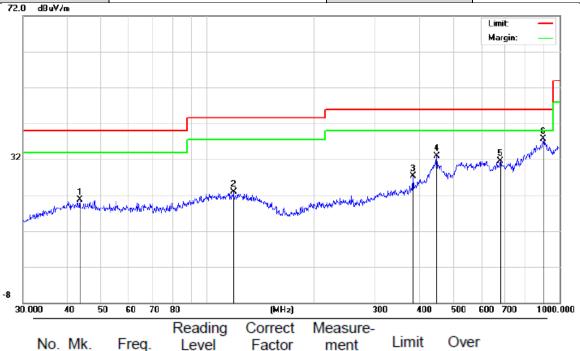
#### Radiated emission below 30MHz

The amplitude of spurious emissions from 9kHz to 30MHz which are attenuated more than 20 dB below the permissible value need not be reported.



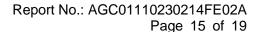
# Radiated emission from 30MHz to 1000MHz

EUT	Wireless Headphone	Model Name	A3947
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 4	Antenna	Horizontal



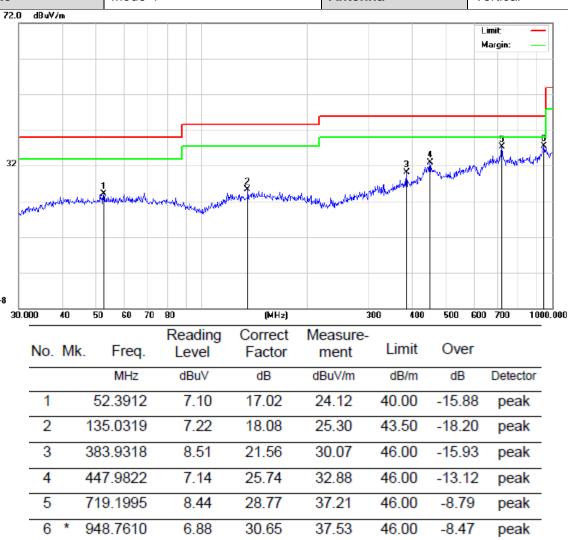
No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		43.5057	7.15	13.65	20.80	40.00	-19.20	peak
2		118.6014	6.47	16.39	22.86	43.50	-20.64	peak
3		383.9318	8.64	18.63	27.27	46.00	-18.73	peak
4		447.9822	8.10	24.82	32.92	46.00	-13.08	peak
5		679.9600	6.71	24.70	31.41	46.00	-14.59	peak
6	*	900.1474	6.00	31.78	37.78	46.00	-8.22	peak

**RESULT: PASS** 





EUT	Wireless Headphone	Model Name	A3947
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 4	Antenna	Vertical



# RESULT: PASS Note:

- 1. Factor=Antenna Factor + Cable loss, Margin=Measurement-Limit.
- 2. All test modes had been tested. The mode 4 is the worst case and recorded in the report.



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# Radiated emission above 1GHz

EUT	Wireless Headphone	Model Name	A3947
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 4	Antenna	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4804.000	47.64	0.08	47.72	74	-26.28	peak
4804.000	37.84	0.08	37.92	54	-16.08	AVG
7206.000	41.05	2.21	43.26	74	-30.74	peak
7206.000	32.42	2.21	34.63	54	-19.37	AVG

Remark:

Factor = Antenna Factor + Cable Loss - Pre-amplifier.

EUT	Wireless Headphone	Model Name	A3947
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 4	Antenna	Vertical

Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
47.62	0.08	47.7	74	-26.3	peak
38.41	0.08	38.49	54	-15.51	AVG
41.56	2.21	43.77	74	-30.23	peak
32.48	2.21	34.69	54	-19.31	AVG
	(dBµV) 47.62 38.41 41.56	(dBµV) (dB) 47.62 0.08 38.41 0.08 41.56 2.21	(dBμV)     (dB)     (dBμV/m)       47.62     0.08     47.7       38.41     0.08     38.49       41.56     2.21     43.77	(dBμV)     (dB)     (dBμV/m)     (dBμV/m)       47.62     0.08     47.7     74       38.41     0.08     38.49     54       41.56     2.21     43.77     74	(dBμV)     (dB)     (dBμV/m)     (dBμV/m)     (dBμV/m)       47.62     0.08     47.7     74     -26.3       38.41     0.08     38.49     54     -15.51       41.56     2.21     43.77     74     -30.23

Factor = Antenna Factor + Cable Loss - Pre-amplifier.



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EUT	Wireless Headphone	Model Name	A3947
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 5	Antenna	Horizontal

(dBµV) 46.28 36.27	(dB) 0.14	(dBµV/m) 46.42	(dBµV/m) 74	(dB)	Value Type		
		46.42	7/	27.50			
36.27			74	-27.58	peak		
· · · ·	0.14	36.41	54	-17.59	AVG		
41.05	2.36	43.41	74	-30.59	peak		
31.53	2.36	33.89	54	-20.11	AVG		
Remark:							
-	31.53	31.53 2.36		31.53 2.36 33.89 54	31.53 2.36 33.89 54 -20.11		

EUT	Wireless Headphone	Model Name	A3947
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 5	Antenna	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	- Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	
4880.000	47.54	0.14	47.68	74	-26.32	peak
4880.000	37.52	0.14	37.66	54	-16.34	AVG
7320.000	41.05	2.36	43.41	74	-30.59	peak
7320.000	32.42	2.36	34.78	54	-19.22	AVG

# Remark:

Factor = Antenna Factor + Cable Loss - Pre-amplifier.



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EUT	Wireless Headphone	Model Name	A3947
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 6	Antenna	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type	
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type	
4960.000	47.52	0.22	47.74	74	-26.26	peak	
4960.000	37.24	0.22	37.46	54	-16.54	AVG	
7440.000	42.05	2.64	44.69	74	-29.31	peak	
7440.000	30.49	2.64	33.13	54	-20.87	AVG	
Remark:							

Factor = Antenna Factor + Cable Loss - Pre-amplifier.

EUT	Wireless Headphone	Model Name	A3947
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 6	Antenna	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	- Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	
4960.000	48.61	0.22	48.83	74	-25.17	peak
4960.000	32.45	0.22	32.67	54	-21.33	AVG
7440.000	42.05	2.64	44.69	74	-29.31	peak
7440.000	31.52	2.64	34.16	54	-19.84	AVG
Remark:						
Factor = Anter	nna Factor + Cabl	e Loss - Pre-	amplifier.			

#### **RESULT: PASS**

#### Note:

The amplitude of other spurious emissions from 1G to 25 GHz which are attenuated more than 20 dB below the permissible value need not be reported.

Factor = Antenna Factor + Cable loss - Amplifier gain, Over=Measure-Limit.

The "Factor" value can be calculated automatically by software of measurement system.

All test modes had been tested. The 2Mbps modulation is the worst case and recorded in the report.



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# APPENDIX A: PHOTOGRAPHS OF TEST SETUP

Refer to the Report No.: AGC01110230214AP02A

APPENDIX B: PHOTOGRAPHS OF EUT

Refer to the Report No.: AGC01110230214AP03A

----END OF REPORT----



# Conditions of Issuance of Test Reports

- 1. All samples and goods are accepted by the Attestation of Global Compliance (Shenzhen) Co., Ltd (the "Company") solely for testing and reporting in accordance with the following terms and conditions. The company provides its services on the basis that such terms and conditions constitute express agreement between the company and any person, firm or company requesting its services (the "Clients").
- 2. Any report issued by Company as a result of this application for testing services (the "Report") shall be issued in confidence to the Clients and the Report will be strictly treated as such by the Company. It may not be reproduced either in its entirety or in part and it may not be used for advertising or other unauthorized purposes without the written consent of the Company. The Clients to whom the Report is issued may, however, show or send it, or a certified copy thereof prepared by the Company to its customer, supplier or other persons directly concerned. The Company will not, without the consent of the Clients, enter into any discussion or correspondence with any third party concerning the contents of the Report, unless required by the relevant governmental authorities, laws or court orders.
- 3. The Company shall not be called or be liable to be called to give evidence or testimony on the Report in a court of law without its prior written consent, unless required by the relevant governmental authorities, laws or court orders.
- 4. In the event of the improper use of the report as determined by the Company, the Company reserves the right to withdraw it, and to adopt any other additional remedies which may be appropriate.
- 5. Samples submitted for testing are accepted on the understanding that the Report issued cannot form the basis of, or be the instrument for, any legal action against the Company.
- 6. The Company will not be liable for or accept responsibility for any loss or damage however arising from the use of information contained in any of its Reports or in any communication whatsoever about its said tests or investigations.
- 7.Clients wishing to use the Report in court proceedings or arbitration shall inform the Company to that effect prior to submitting the sample for testing.
- 8. The Company is not responsible for recalling the electronic version of the original report when any revision is made to them. The Client assumes the responsibility to providing the revised version to any interested party who uses them.
- 9. Subject to the variable length of retention time for test data and report stored hereinto as otherwise specifically required by individual accreditation authorities, the Company will only keep the supporting test data and information of the test report for a period of six years. The data and information will be disposed of after the aforementioned retention period has elapsed. Under no circumstances shall we provide any data and information which has been disposed of after retention period. Under no circumstances shall we be liable for damage of any kind, including (but not limited to) compensatory damages, lost profits, lost data, or any form of special, incidental, indirect, consequential or punitive damages of any kind, whether based on breach of contract of warranty, tort (including negligence), product liability or otherwise, even if we are informed in advance of the possibility of such damages.