

FCC Test Report

Report No.: AGC05067221201FE08

FCC ID	:	MMABR10
APPLICATION PURPOSE	:	Original Equipment
PRODUCT DESIGNATION	:	Walkie-talkie
BRAND NAME	:	Midland Radio
MODEL NAME	:	BR10
APPLICANT	:	Midland Radio Corporation
DATE OF ISSUE	:	Jan. 16, 2023
STANDARD(S)	:	FCC Part 15 Rules
REPORT VERSION	:	V 1.0







REPORT REVISE RECORD

Report Version	Revise Time	Revise Time Issued Date		Notes	
V1.0	/	/ Jan. 16, 2023 Valid Initial Rele		Initial Release	



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1. VERIFICATION OF COMPLIANCE

Applicant:	Midland Radio Corporation
Address:	5900 Parretta Drive, Kansas City, MO 64120-2134, United States
Manufacturer:	Midland Radio Corporation
Address:	5900 Parretta Drive, Kansas City, MO 64120-2134, United States
Factory:	FUJIAN NANAN GAOYINGQI ELECTRONIC CO.,LTD.
Address:	Gaoyingqi Industrial Park,Wukeng,Xiamei,Nanan,Fujian,China
Product Designation:	Walkie-talkie
Brand Name:	Midland Radio
Test Model:	BR10
Measurement Procedure:	ANSI C63.4: 2014
Deviation:	No any deviation from the test method.
Date of receipt of test item	Dec. 20, 2022
Date of Test:	Dec. 20, 2022~Jan. 16, 2023
Condition of Test Sample:	Normal
Test Result:	Pass
Report Template;	AGCRT-US-PTT/EMC

The above equipment was tested by Attestation Of Global Compliance (Shenzhen) Co., Ltd. for compliance with the requirements set forth in the FCC Rules and Regulations Part 15, the measurement procedure according to ANSI C63.4:2014. This said equipment in the configuration described in this report shows the maximum emission levels emanating from equipment are within the compliance requirements. The test results of this report relate only to the tested sample identified in this report.

Prepared By

Bibo zhang

Bibo Zhang (Project Engineer)

Jan. 16, 2023

Reviewed By

alvin Lin u er)

Calvin Liu (Reviewer)

Jan. 16, 2023

Approved By

Max Zhang

Max Zhang Authorized Officer

Jan. 16, 2023



2. PRODUCT INFORMATION

The EUT is a Walkie-talkie designed for voice communication. It is designed by way of utilizing the F3E

modulation achieves the system operating.

A major technical description of EUT is described as following:

Communication Type	Voice / Tone only
Modulation	FM
RX Frequency Range462.5500MHz-462.7250MHz (GMRS 462 MHz main channels) 462.5625MHz-462.7125MHz (GMRS 462 MHz interstitial channel 467.5625MHz-467.7125MHz (GMRS 467 MHz interstitial channel)	
Emission Type	F3E
Antenna Designation	Inseparable Antenna
Antenna Gain	1.2dBi
Hardware Version	V1.0
Software Version	V1.0
Power Supply	DC 3.7V,1800mAh by battery, charging for DC8.4V

I/O Port Information (Applicable Not Applicable)

I/O Port of EUT				
I/O Port Type Q'TY Cable Tested with				
Antenna Port	1	-	1	
Earphone Port	1	-	1	



3. IDENTIFICATION OF THE RESPONSIBLE TESTING LOCATION

Test Site	Attestation of Global Compliance (Shenzhen) Co., Ltd
Location 1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Hep Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong	
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

List of Test Equipment:

TEST EQUIPMENT OF CONDUCTED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESPI	101206	May 09, 2022	May 08, 2023
LISN	R&S	ESH2-Z5	100086	Jun. 08, 2022	Jun. 07, 2023
TEST SOFTWARE	FARA	EZ-EMC	Ver.AGC-CO N03A1	N/A	N/A

TEST EQUIPMENT OF RADIATED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESPI	101206	May 09, 2022	May 08, 2023
ANTENNA	SCHWARZBECK	VULB9168	494	Jan. 08, 2021	Jan. 07, 2023
ANTENNA	SCHWARZBECK	VULB9168	D69250	Apr. 28, 2021	Apr. 27, 2023
Broadband Preamplifier	ETS LINDGREN	3117PA	00225134	Sep. 01, 2022	Aug. 31, 2023
POSITIONING CONTROLLER	MF	MF-7802	MF780208285		
HORN ANTENNA	ETS LINDGREN	3117	00034609	Apr. 23, 2021	Apr. 22, 2023
RF Communication Test Set	HP	8920B	US35010161	Aug. 03, 2022	Aug. 02, 2023
EXA Signal Analyzer	Agilent	N9020A	MY53300860	Jun. 08, 2022	Jun. 07, 2023
Attenuator	Schaffner	58-30-33	ML030	Oct. 22, 2022	Oct. 21, 2023
Test software	Tonscend	JS32-RE	Ver.2.5	N/A	N/A



4. SUPPORT EQUIPMENT LIST

Device Type	Manufacturer	Model Name	Serial No.	Data Cable	Power Cable
Charger	-	-	-	-	1.2m Unshielded
Adapter		PD-B101-01	-	-	-
Battery	-	BRB10	-	-	-
Back clip	-	N/A	-	-	-
USB Cable					

5. SYSTEM DESCRIPTION

EUT TEST PROCEDURE:

- 1. Connect EUT and peripheral devices.
- 2. Power on the EUT, the EUT begins to work.
- 3. Make sure the EUT normal working.

EMC TEST MODE:

No.	TEST MODES
1	Receiving at low channel of 467.5625 MHz to 467.7125 MHz
2	Receiving at middle channel of 467.5625 MHz to 467.7125 MHz
3	Receiving at high channel of 467.5625 MHz to 467.7125 MHz

Note: Only the result of the worst case was recorded in the report.



6. MEASUREMENT UNCERTAINTY

The uncertainty is calculated using the methods suggested in the "Guide to the Expression of Uncertainty in measurement" (GUM) published by CISPR and ANSI.

- Uncertainty of Conducted Emission, Uc = ±3.1 dB

- Uncertainty of Radiated Emission below 1GHz, Uc = ±4.0 dB

- Uncertainty of Radiated Emission above 1GHz, Uc = ±4.8 Db

7. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.107	Conduction Emission	Compliant
§15.109	Radiated Emission	Compliant



8. FCC RADIATED EMISSION TEST

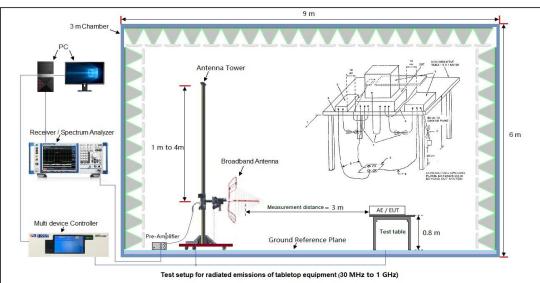
8.1 PROVISIONS APPLICABLE

FCC CFR Title 47 Part 15 Subpart B Section 15.109:

Frequency	Limit (dBuV/m @3m)	Value
30MHz-88MHz	40.00	Quasi-peak
88MHz-216MHz	43.50	Quasi-peak
216MHz-960MHz	46.00	Quasi-peak
960MHz-1GHz	54.00	Quasi-peak
Above 1GHz	54.00	Average
	74.00	Peak

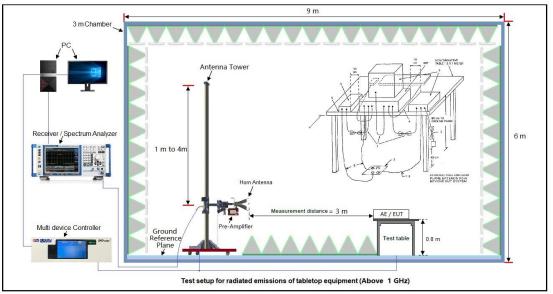
Note: The lower limit shall apply at the transition frequency. Because the EUT RX frequency range up to 480 MHz, so the upper the frequency range up to 2 GHz.

8.2 TEST SETUP BLOCK DIAGRAM



RADIATED EMISSION TEST SETUP 30MHz-1000MHz





RADIATED EMISSION TEST SETUP ABOVE 1000MHz

EMI TEST RECEIVER SETUP:

During the radiated emission test, the EMI test receiver was set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Measurment
30 MHz – 1000 MHz	100 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1MHz	3 MHz	/	PK
Above I GHZ	1MHz	10 Hz	/	Ave.

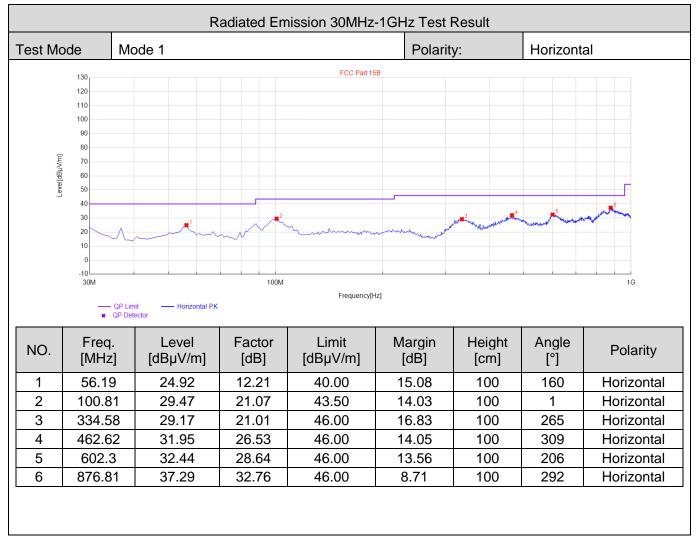


8.3 TEST PROCEDURE

- 1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden turntable with a height of 0.8 meters is used which is placed on the ground plane as per ANSI C63.4 (see Test Facility for the dimensions of the ground plane used). When the EUT is floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- 2. Support equipment, if needed, was placed as per ANSI C63.4.
- 3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
- 4. The EUT received power by AC 120V/60Hz.
- 5. The antenna was placed at 3 meter away from the EUT as stated in FCC Part 15. The antenna connected to the Analyzer via a cable and at times a pre-amplifier would be used.
- 6. The Analyzer / Receiver quickly scanned from 30MHz to 1000MHz. The EUT test program was started. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.
- 7. The test mode(s) were scanned during the test:
- 8. Recorded at least the six highest emissions. Emission frequency, amplitude, antenna position, polarization and turntable position were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit and Q.P./Peak reading is presented. For emissions below 1GHz, use 120KHz RBW and VBW>=3RBW for QP reading.
- 9. For emissions above 1GHz, use 1MHz RBW and 3MHz VBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
- 10. 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.
- 11. 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.
- 12. 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.
- 13. 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.
- 14. The test data of the worst case condition (mode 1) was reported on the following Data page.

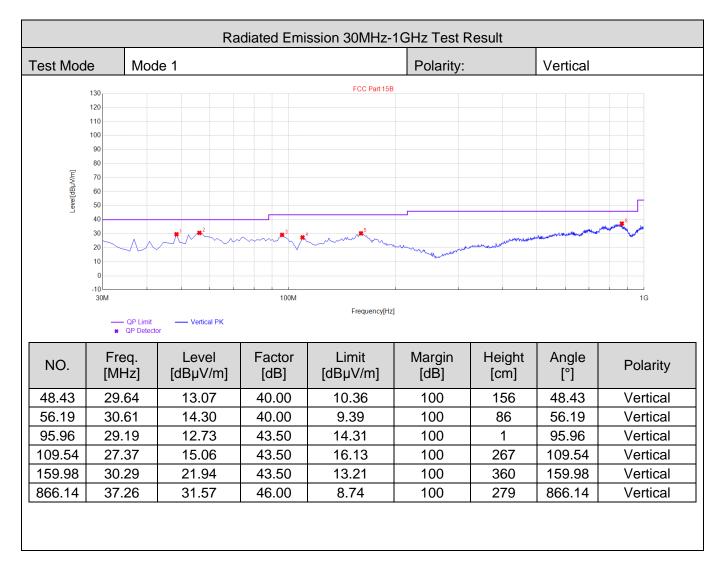


8.4 TEST RESULT



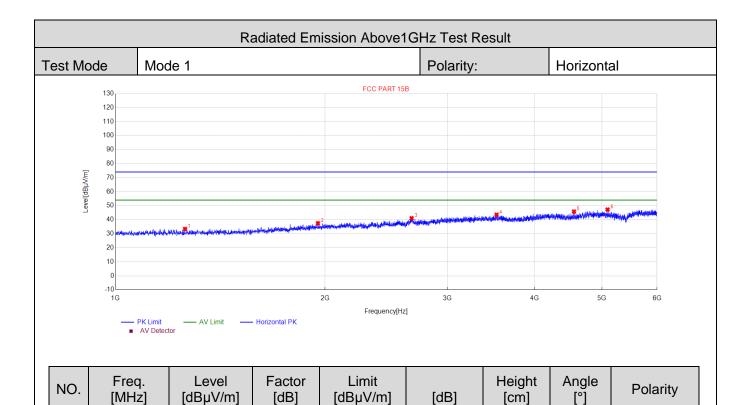
RESULT: PASS





RESULT: PASS





74.00

74.00

74.00

74.00

74.00

74.00

40.59

36.50

32.99

30.46

28.20

26.77

100

100

100

100

100

100

350

340

240

210

140

240

Horizontal

Horizontal

Horizontal

Horizontal

Horizontal

Horizontal

RESULT: PASS

1

2

3

4

5

6

1258.5259

1953.5954

2663.6664

3528.2528

4558.3558

5094.4094

33.41

37.50

41.01

43.54

45.80

47.23

-19.89

-16.38

-12.50

-9.61

-7.36

-6.37



est Mo	ode N	lode 1			Polarity:		Vertical	
	130			FCC PART 15	3			
(mi/tdBb)	120 110 100 90 80 70 60 50 40 30 20 10	ىرى ئۆلۈر بىرى ئۆلۈر بى	needer faite of the second	and where the contract of the destination of the de	* ³ ,,,,		5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	
	-10 1G			2G ErequencyfHz	3G	4G	5G	6G
NO.	-10 1G —— PK I	mit — AV Limit — Detector Level [dBµV/m]	- Vertical PK Factor [dB]	2G Frequency[Hz Limit [dBµV/m]		4G Height [cm]	5G Angle [°]	6G Polarity
NO. 1	-10 1G • PKI * AV	Level [dBµV/m]	Factor	Frequency[Hz	Margin	Height	Angle	
	-10 1G PKI * AV Freq. [MHz]	Level [dBμV/m] 5 33.68	Factor [dB]	Frequency[Hz Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	-10 1G Freq. [MHz] 1085.008	Level [dBμV/m] 55 33.68 11 39.32	Factor [dB] -19.86	Frequency[Hz Limit [dBµV/m] 74.00	Margin [dB] 40.32	Height [cm] 100	Angle [°] 220	Polarity Vertical
1 2	-10 -10 -10 Freq. [MHz] 1085.008 2120.612	Level [dBµV/m] 5 33.68 1 39.32 6 41.23	Factor [dB] -19.86 -15.32	Frequency[Hz Limit [dBµV/m] 74.00 74.00	Margin [dB] 40.32 34.68	Height [cm] 100 100	Angle [°] 220 150	Polarity Vertical Vertical
1 2 3	-10 1G Freq. [MHz] 1085.008 2120.612 2656.165	Level [dBμV/m] 5 33.68 1 39.32 6 41.23 3 43.55	Factor [dB] -19.86 -15.32 -12.53	Erequency[Hz Limit [dBµV/m] 74.00 74.00 74.00	Margin [dB] 40.32 34.68 32.77	Height [cm] 100 100 100	Angle [°] 220 150 20	Polarity Vertical Vertical Vertical

RESULT: PASS

Note: 1. Factor=Antenna Factor + Cable loss - Amplifier gain, Margin= Limit-Measurement

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



9. FCC CONDUCTED EMISSION TEST

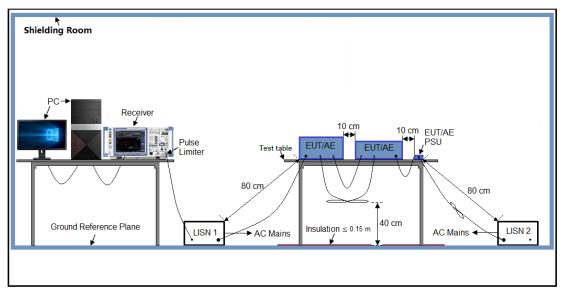
9.1 PROVISIONS APPLICABLE

For an intentional radiator that is designed to be connected to the public utility (AC) power line, the, the radio frequency voltage that is conducted back onto the AC power line on any frequencies within the band 150 KHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50uH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequencies ranges.

Frequency of Emission (MHz)	Conducted Limit(dBuV)			
	Quasi-Peak	Average		
0.15 – 0.5	66 to 56 *	56 to 46 *		
0.5 – 5	56	46		
5 – 30	60	50		

* Decreases with the logarithm of the frequency.

9.2 TEST SETUP BLOCK DIAGRAM



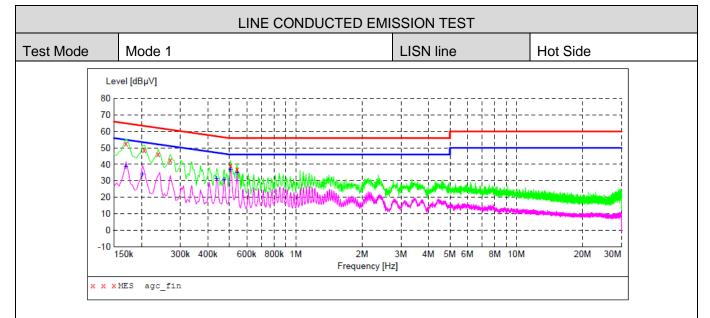


9.3 TEST PROCEDURE

- The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- 2. Support equipment, if needed, was placed as per ANSI C63.4.
- 3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
- 4. The EUT received AC 120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
- 5. All support equipments received AC power from a second LISN, if any.
- 6. The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- 7. Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.
- 8. During the above scans, the emissions were maximized by cable manipulation.
- 9. The test data of the worst case condition (mode 1) was reported on the following Data page.



9.4 TEST RESULT



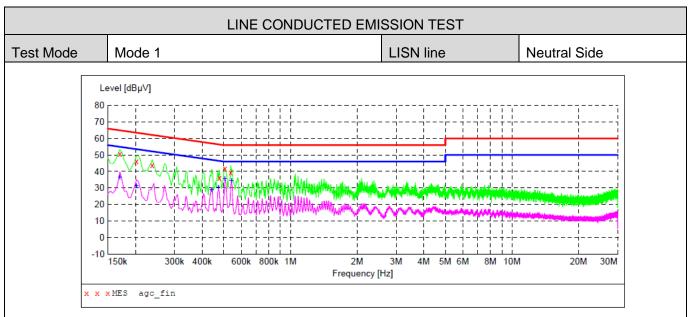
MEASUREMENT RESULT: "agc fin"

2023/1/15 11:17 Limit Line Frequency Level Transd Margin Detector MHz dBµV dB dBuV dB 0.170000 52.90 12.1 6.8 65 QP L10.206000 48.50 6.5 63 14.9 QP L10.238000 46.40 6.3 62 15.8 QP L10.270000 42.60 6.2 18.5 61 QP L10.506000 56 39.60 5.4 16.4 QP L10.542000 36.90 5.4 56 19.1QP L1

MEASUREMENT RESULT: "agc fin2"

2023/1/15 11:1	17					
Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line
0.170000	38.60	6.8	55	16.4	VA	L1
0.202000	34.00	6.5	54	19.5	VA	L1
0.438000	31.40	5.6	47	15.7	AV	L1
0.474000	30.80	5.5	46	15.6	VA	L1
0.506000	36.90	5.4	46	9.1	VA	L1
0.542000	35.10	5.4	46	10.9	VA	L1





MEASUREMENT RESULT: "agc fin"

2023/1/15 11:20

Frequency MHz		Transd dB	Limit dBµV	Margin dB	Detector	Line
0.170000 0.202000 0.238000 0.478000 0.506000 0.538000	50.70 46.20 44.00 36.30 41.80 39.30	6.8 6.5 5.5 5.4 5.4	65 64 56 56 56	14.3 17.3 18.2 20.1 14.2 16.7	Q́Р QP	N N N N N

MEASUREMENT RESULT: "agc fin2"

2023/1/15 11 Frequency MHz		Transd dB	Limit dBµV	Margin dB	Detector	Line
0.170000	36.50	6.8	55	18.5	AV	N
0.202000	31.30	6.5	54	22.2	VA	Ν
0.442000	29.10	5.6	47	17.9	VA	Ν
0.474000	30.70	5.5	46	15.7	VA	Ν
0.506000	35.60	5.4	46	10.4	VA	Ν
0.542000	34.70	5.4	46	11.3	AV	Ν
0.542000	54.70	5.4	40	11.5	AV	11



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APPENDIX I PHOTOGRAPHS OF TEST SETUP

Refer to the Report No.: AGC05067221201AP02

APPENDIX II: PHOTOGRAPHS OF Test EUT

Refer to the Report No.: AGC05067221201AP03

-----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.