

# **FCC Test Report**

Report No.: AGC02169190603FE03

FCC ID	: Q8WBH600
APPLICATION PURPOSE	: Original Equipment
PRODUCT DESIGNATION	: ANC Bluetooth Headphone
BRAND NAME	: W-king
MODEL NAME	: BH600
APPLICANT	: Shenzhen Weiking Technology Co., Ltd.
DATE OF ISSUE	: Jul. 08, 2019
STANDARD(S)	: FCC Part 15.247
REPORT VERSION	: V1.0

# Attestation of Global Compliance (Shenzhen) Co., Ltd

# CAUTION:

This report shall not be reproduced except in full without the written permission of the test laboratory and shall not be quoted out of context.







# **REPORT REVISE RECORD**

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Jul. 08, 2019	Valid	Initial Release





### TABLE OF CONTENTS

1. VERIFICATION OF CONFORMITY	
2. GENERAL INFORMATION	
2.1. PRODUCT DESCRIPTION	
2.2. TABLE OF CARRIER FREQUENCYS	
2.3. RECEIVER INPUT BANDWIDTH	
2.4. EXAMPLE OF A HOPPING SEQUENCY IN DATA MODE	
2.5. EQUALLY AVERAGE USE OF FREQUENCIES AND BEHAVIOUR	7
2.6. RELATED SUBMITTAL(S) / GRANT (S)	8
2.7. TEST METHODOLOGY	
2.8. SPECIAL ACCESSORIES	
2.9. EQUIPMENT MODIFICATIONS	
3. MEASUREMENT UNCERTAINTY	
4. DESCRIPTION OF TEST MODES	
5. SYSTEM TEST CONFIGURATION	
5.1. CONFIGURATION OF EUT SYSTEM	11
5.2 EQUIPMENT USED IN TESTED SYSTEM	
5.3. SUMMARY OF TEST RESULTS	
6. TEST FACILITY	
7. PEAK OUTPUT POWER	
7.1. MEASUREMENT PROCEDURE	
7.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)	
7.3. LIMITS AND MEASUREMENT RESULT	
8. 20DB BANDWIDTH	
8.1. MEASUREMENT PROCEDURE	
8.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)	
8.3. LIMITS AND MEASUREMENT RESULTS	
9. CONDUCTED SPURIOUS EMISSION	
9.1. MEASUREMENT PROCEDURE	
9.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)	
9.3. MEASUREMENT EQUIPMENT USED	
9.4. LIMITS AND MEASUREMENT RESULT	
10. RADIATED EMISSION	
10.1. MEASUREMENT PROCEDURE	
10.2. TEST SETUP	
10.3. LIMITS AND MEASUREMENT RESULT	





# Report No.: AGC02169190603FE03 Page 4 of 70

10.4. TEST RESULT	
11. NUMBER OF HOPPING FREQUENCY	50
11.1. MEASUREMENT PROCEDURE	
11.2. TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)	
11.3. MEASUREMENT EQUIPMENT USED	
11.4. LIMITS AND MEASUREMENT RESULT	
12. TIME OF OCCUPANCY (DWELL TIME)	
12.1. MEASUREMENT PROCEDURE	
12.2. TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)	
12.3. MEASUREMENT EQUIPMENT USED	
12.4. LIMITS AND MEASUREMENT RESULT	
13. FREQUENCY SEPARATION	
13.1. MEASUREMENT PROCEDURE	55
13.2. TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)	
13.3. MEASUREMENT EQUIPMENT USED	
13.4. LIMITS AND MEASUREMENT RESULT	
14. FCC LINE CONDUCTED EMISSION TEST	
14.1. LIMITS OF LINE CONDUCTED EMISSION TEST	
14.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST	
14.3. PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST	
14.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST	
14.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST	
APPENDIX A: PHOTOGRAPHS OF TEST SETUP	
APPENDIX B: PHOTOGRAPHS OF EUT	



 $\label{eq:attestation} Attestation of Global Compliance (Shenzhen) Co., Ltd.$ 

# **1. VERIFICATION OF CONFORMITY**

Applicant	Shenzhen Weiking Technology Co., Ltd.	
Address	Ground floor, No. 431, Huating Road, Langkou Community, Dalang Street, Longhua, Shenzhen China	
Manufacturer	Shenzhen Weiking Technology Co., Ltd.	
Address	Ground floor, No. 431, Huating Road, Langkou Community, Dalang Street, Longhua, Shenzhen China	
Factory	Shenzhen Weiking Technology Co., Ltd.	
Address	Ground floor, No. 431, Huating Road, Langkou Community, Dalang Street, Longhua, Shenzhen China	
Product Designation	ANC Bluetooth Headphone	
Brand Name	W-king	
Test Model	ВН600	
Date of test	Jun. 28, 2018 to Jul. 05, 2019	
Deviation	None	
Condition of Test Sample	Normal	
Test Result	Pass	
Report Template	AGCRT-US-BR/RF	

We hereby certify that:

The above equipment was tested by Attestation of Global Compliance (Shenzhen) Co., Ltd. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 (2013) and the energy emitted by the sample EUT tested as described in this report is in compliance with radiated emission limits of FCC PART 15.247.

Tested By

NINI

NiNi(Guo lili)

Jul. 05, 2019

Reviewed By

Max Zhang

Max Zhang(Zhang Yi)

Jul. 08, 2019

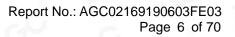
Approved By

Forrest in

Forrest Lei(Lei Yonggang) Authorized Officer

Jul. 08, 2019







# 2. GENERAL INFORMATION

# 2.1. PRODUCT DESCRIPTION

The EUT is designed as "ANC Bluetooth Headphone". It is designed by way of utilizing the GFSK, Pi/4 DQPSK and 8DPSK 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	3.875dBm(Max)
Bluetooth Version	V 4.1
Modulation	BR ⊠GFSK, EDR ⊠π /4-DQPSK, ⊠8DPSK BLE □GFSK 1Mbps □GFSK 2Mbps
Number of channels	79
Hardware Version	V1.1
Software Version	V4.2
Antenna Designation	PCB Antenna(Comply with requirements of the FCC part 15.203)
Antenna Gain	0dBi
Power Supply	DC 3.7V by battery

# 2.2. TABLE OF CARRIER FREQUENCYS

Frequency Band	Channel Number	Frequency
	0	2402MHZ
	1	2403MHZ
See e	38	2440 MHZ
2402~2480MHZ	39	2441 MHZ
	40	2442 MHZ
A ACC	77	2479 MHZ
	78	2480 MHZ





# 2.3. RECEIVER INPUT BANDWIDTH

The input bandwidth of the receiver is 1.3MHZ, In every connection one Bluetooth device is the master and the other one is slave. The master determines the hopping sequence. The slave follows this sequence. Both devices shift between RX and TX time slot according to the clock of the master. Additionally the type of connection(e.g. single of multislot packet) is set up at the beginning of the

connection. The master adapts its hopping frequency and its TX/RX timing according to the packet type of the connection. Also the slave of the connection will use these settings.

Repeating of a packet has no influence on the hopping sequence. The hopping sequence generated by the master of the connection will be followed in any case. That means, a repeated packet will not be send on the same frequency, it is send on the next frequency of the hopping sequence.

#### 2.4. EXAMPLE OF A HOPPING SEQUENCY IN DATA MODE

Example of a 79 hopping sequence in data mode: 40,21,44,23,42,53,46,55,48,33,52,35,50,65,54,67 56,37,60,39,58,69,62,71,64,25,68,27,66,57,70,59 72,29,76,31,74,61,78,63,01,41,05,43,03,73,07,75 09,45,13,47,11,77,15,00,64,49,66,53,68,02,70,06 01, 51, 03, 55, 05, 04

## 2.5. EQUALLY AVERAGE USE OF FREQUENCIES AND BEHAVIOUR

The generation of the hopping sequence in connection mode depends essentially on two input values: 1. LAP/UAP of the master of the connection.

2. Internal master clock

The LAP(lower address part) are the 24 LSB's of the 48 BD\_ADDRESS. The BD\_ADDRESS is an unambiguous number of every Bluetooth unit. The UAP(upper address part) are the 24MSB's of the 48BD\_ADDRESS

The internal clock of a Bluetooth unit is derived from a free running clock which is never adjusted and is never turned off. For ehavior zation with other units only offset are used. It has no relation to the time of the day. Its resolution is at least half the RX/TX slot length of 312.5us.The clock has a cycle of about one day(23h30).In most case it is implemented as 28 bit counter. For the deriving of the hopping sequence the entire. LAP(24 bits),4LSB's(4bits)(Input 1) and the 27MSB's of the clock(Input 2) are used. With this input values different mathematical procedures(permutations, additions, XOR-operations)are performed to generate te Sequence. This will be done at the beginning of every new transmission.

Regarding short transmissions the Bluetooth system has the following ehavior:

The first connection between the two devices is established, a hopping sequence was generated. For Transmitting the wanted data the complete hopping sequence was not used. The connection ended. The second connection will be established. A new hopping sequence is generated. Due to the fact the Bluetooth clock has a different value, because the period between the two transmission is longer(and it Cannot be shorter) than the minimum resolution of the clock(312.5us). The hopping sequence will always Differ from the first one.





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

This submittal(s) (test report) is intended for **FCC ID: Q8WBH600** filing to comply with the FCC PART 15.247 requirements.

#### 2.7. 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.

#### 2.8. SPECIAL ACCESSORIES

Refer to section 5.2.

#### 2.9. EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.





# **3. MEASUREMENT UNCERTAINTY**

The reported uncertainty of measurement y  $\pm$ 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%.

- Uncertainty of Conducted Emission, Uc = ±3.2 dB
- Uncertainty of Radiated Emission below 1GHz, Uc = ±3.9 dB
- Uncertainty of Radiated Emission above 1GHz, Uc = ±4.8 dB
- Uncertainty of total RF power, conducted,  $Uc = \pm 0.8$ dB
- Uncertainty of spurious emissions, conducted, Uc = ±2.7dB
- Uncertainty of Occupied Channel Bandwidth: Uc = ±2 %
- Uncertainty of Dwell Time: Uc =  $\pm 2$  %
- Uncertainty of Frequency:  $Uc = \pm 2 \%$





# 4. DESCRIPTION OF TEST MODES

NO.	TEST MODE DESCRIPTION
1	Low channel GFSK
2	Middle channel GFSK
3	High channel GFSK
4	Low channel π/4-DQPSK
5	Middle channel π/4-DQPSK
6	High channel π/4-DQPSK
7	Low channel 8DPSK
8	Middle channel 8DPSK
9	High channel 8DPSK
10	Hopping mode GFSK
11	Hopping mode π/4-DQPSK
12	Hopping mode 8DPSK

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.

4. The test software is the BlueTest3 which can set the EUT into the individual test modes.





# **5. SYSTEM TEST CONFIGURATION**

**5.1. CONFIGURATION OF EUT SYSTEM** 

Configure :

EUT

AE

## 5.2 EQUIPMENT USED IN TESTED SYSTEM

ltem	Equipment	Model No.	ID or Specification	Remark
1	ANC Bluetooth Headphone	BH600	Q8WBH600	EUT
2	Adapter	DYS602-050200W	DC 5V/2A	AE

#### **5.3. SUMMARY OF TEST RESULTS**

FCC RULES	DESCRIPTION OF TEST	RESULT
15.247 (b)(1)	Peak Output Power	Compliant
15.247 (a)(1)	20 dB Bandwidth	Compliant
15.247 (d)	Conducted Spurious Emission	Compliant
15.209	Radiated Emission	Compliant
15.247 (a)(1)(iii)	Number of Hopping Frequency	Compliant
15.247 (a)(1)(iii)	Time of Occupancy	Compliant
15.247 (a)(1)	Frequency Separation	Compliant
15.207	Conducted Emission	Compliant





# 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 CONDUCTED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESPI	101206	Jun. 12, 2018	Jun. 11, 2019
LISN	R&S	ESH2-Z5	100086	Aug. 28, 2018	Aug. 27, 2019

#### TEST EQUIPMENT OF RADIATED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESCI	10096	Jun. 12, 2019	Jun. 11, 2020
EXA Signal Analyzer	Aglient	N9010A	MY53470504	Dec. 20, 2018	Dec. 19, 2019
2.4GHz Fliter	EM Electronics	2400-2500MHz	N/A	Feb. 27, 2019	Feb. 26, 2020
Attenuator	ZHINAN	E-002	N/A	Aug. 28, 2018	Aug. 27, 2019
Horn antenna	SCHWARZBECK	BBHA 9170	#768	Sep. 21, 2017	Sep. 20, 2020
Active loop antenna (9K-30MHz)	ZHINAN	ZN30900C	18051	Jun. 14, 2018	Jun. 13, 2020
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	May. 26, 2018	May. 25, 2020
Broadband Preamplifier	ETS LINDGREN	3117PA	00225134	Oct. 25, 2018	Oct. 24, 2019
ANTENNA	SCHWARZBECK	VULB9168	D69250	Sep. 28, 2017	Sep. 27, 2019





# 7. PEAK OUTPUT POWER

#### 7.1. MEASUREMENT PROCEDURE

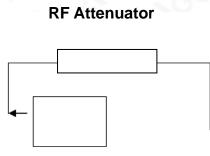
For peak power test:

- 1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
- 2. Span: Approximately five times the 20 dB bandwidth, centered on a hopping channel.
- 3. RBW > 20 dB bandwidth of the emission being measured.
- 4. VBW  $\geq$ RBW.
- 5. Sweep: Auto.
- 6. Detector function: Peak.
- 7. Trace: Max hold.

Allow trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. The indicated level is the peak output power, after any corrections for external attenuators and cables.

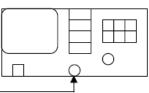
## 7.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

# PEAK POWER TEST SETUP





#### **Spectrum Analyzer**



RF Cable





#### 7.3. LIMITS AND MEASUREMENT RESULT

FOR GFSK MOUDULATION						
Frequency (GHz)	Peak Power (dBm)	Applicable Limits (dBm)	Pass or Fail			
2.402	3.570	30	Pass			
2.441	2.885	30	Pass			
2.480	2.871	30	Pass			

#### Peak Search Avg Type: Log-Pw Avg|Hold:>100/100 0000 GHz Trig: Free Run Atten: 30 dB PNO: Fast IFGain:Low Ð Next Peak 02 140 GHz 3.570 dBm Mkr1 2.402 Ref 20.00 dBm 10 dB/div Loa Next Pk Right **\**1 Next Pk Left Marker Delta Mkr→CF Mkr→RefLvl More 1 of 2 Center 2.402000 GHz #Res BW 1.5 MHz

#VBW 5.0 MHz



Attestation of Global Compliance(Shenzhen)Co.,Ltd.

Span 5.000 MHz Sweep 1.000 ms (1001 pts)

CH0



CH39



CH78

keysight Spectrum Analyzer - Swept L RF 50 Ω Marker 1 2.479800000	AC	SENSE:INT Trig: Free Run Atten: 30 dB	ALIGN AUTO Avg Type: Log-Pwr Avg Hold:>100/100	10:44:41 AM Jul 01, 2019 TRACE 1 2 3 4 5 6 TYPE MWWWW DET PNNNN	Peak Search
0 dB/div Ref 20.00 dB			Mkr1	2.479 800 GHz 2.871 dBm	Next Peal
10.0		▲1			Next Pk Righ
10.0					Next Pk Le
					Marker Del
40.0					Mkr→C
0.0					Mkr→RefL
70.0				Spap 5 000 MHz	Moi 1 of
Center 2.480000 GHz Res BW 1.5 MHz	#VBW	5.0 MHz	Sweep 1	Span 5.000 MHz .000 ms (1001 pts)	



	FOR II /4-DQPSK N	IODULATION	
Frequency (GHz)	Peak Power (dBm)	Applicable Limits (dBm)	Pass or Fail
2.402	1.322	30	Pass
2.441	2.189	30	Pass
2.480	3.364	30	Pass









CH39



CH78

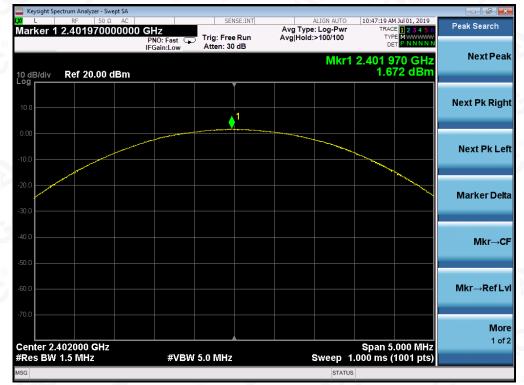
L RF 50 Ω AC Marker 1 2.47982500000	0 GHz PNO: Fast G IFGain:Low	Trig: Free Run Atten: 30 dB	ALIGN AUTO Avg Type: Log-Pwr Avg Hold:>100/100	10:46:41 AM Jul 01, 2019 TRACE 1 2 3 4 5 6 TYPE MWWWWW DET P N N N N N	Peak Search
0 dB/div Ref 20.00 dBm			Mkr1	2.479 825 GHz 3.364 dBm	NextPeal
10.0		1			Next Pk Righ
0.00					Next Pk Lef
20.0 months and a second					Marker Delt
40.0					Mkr→C
30.0					Mkr→RefLv
Center 2.480000 GHz				Span 5.000 MHz	Mon 1 of:
Res BW 1.5 MHz	#VBW	5.0 MHz	Sweep 1	.000 ms (1001 pts)	



R

	PEAK OUTPUT POWER MEA FOR 8-DPSK MO		
Frequency (GHz)	Peak Power (dBm)	Applicable Limits (dBm)	Pass or Fail
2.402	1.672	30	Pass
2.441	2.717	30	Pass
2.480	3.875	30	Pass









CH39



CH78

L RF Iarker 1 2.47	50 Ω AC 9995000000	GHz PNO: Fast	Trig: Free Run Atten: 30 dB	ALIGN AUTO Avg Type: Log-Pwr Avg Hold:>100/100	10:48:33 AM Jul 01, 2019 TRACE 1 2 3 4 5 6 TYPE MWWWW DET P NNNNN	Peak Search
0 dB/div Ref	20.00 dBm			Mkr1	2.479 995 GHz 3.875 dBm	NextPe
10.0						Next Pk Rig
10.0						Next Pk L
0.0						Marker De
0.0						Mkr→
0.0						Mkr→Ref
enter 2.48000	10 GHz				Span 5.000 MHz	<b>M</b> 0 1 0
Res BW 1.5 M		#VBV	V 5.0 MHz	Sweep 1	.000 ms (1001 pts)	



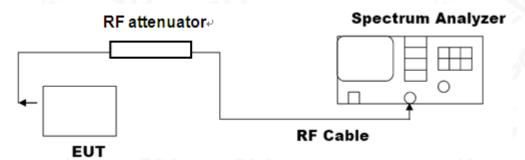


## 8. 20DB BANDWIDTH

#### 8.1. MEASUREMENT PROCEDURE

- 1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
- 2, Set the EUT Work on the top, the middle and the bottom operation frequency individually.
- 3. Set Span = approximately 2 to 5 times the 20 dB bandwidth, centered on a hoping channel The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW and video bandwidth (VBW) shall be approximately three times RBW; Sweep = auto; Detector function = peak
- 4. Set SPA Trace 1 Max hold, then View.

## 8.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



#### 8.3. LIMITS AND MEASUREMENT RESULTS

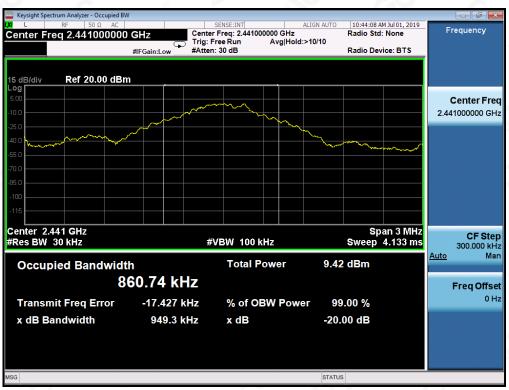
MEASUREMENT RESULT FOR GFSK MOUDULATION					
Applicable Limite	Measurement Result				
Applicable Limits	Test Data	Criteria			
	Low Channel	0.9434	PASS		
N/A	Middle Channel	0.9493	PASS		
	High Channel	0.9508	PASS		





#### TEST PLOT OF BANDWIDTH FOR LOW CHANNEL

#### TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL







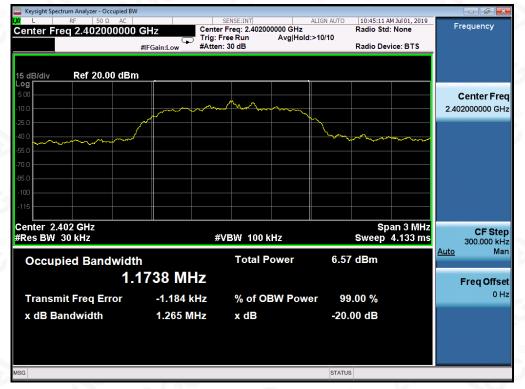
#### TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL





MEASUREMENT RESULT FOR II /4-DQPSK MODULATION					
Applicable Limite Measurement Result					
Applicable Limits	Test Data	Test Data (MHz)			
N/A	Low Channel	1.265	PASS		
	Middle Channel	1.221	PASS		
	High Channel	1.221	PASS		

#### TEST PLOT OF BANDWIDTH FOR LOW CHANNEL







#### TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL

#### TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL

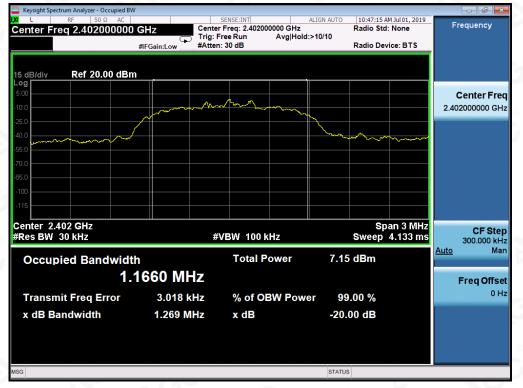




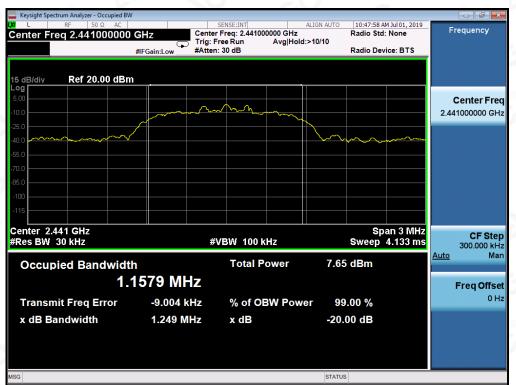


MEASUREMENT RESULT FOR 8-DPSK MODULATION					
Applicable Limite Measurement Result					
Applicable Limits	Test Data	Test Data (MHz)			
N/A	Low Channel	1.269	PASS		
	Middle Channel	1.249	PASS		
	High Channel	1.250	PASS		

#### TEST PLOT OF BANDWIDTH FOR LOW CHANNEL







#### TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL

## TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL







# 9. CONDUCTED SPURIOUS EMISSION

#### 9.1. MEASUREMENT PROCEDURE

- 1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
- 2. Set the EUT Work on the top, the Middle and the bottom operation frequency individually.
- Set the Span = wide enough to capture the peak level of the in-band emission and all spurious emissions from the lowest frequency generated in the EUT up through the 10th harmonic.
  RBW = 100 kHz; VBW= 300 kHz; Sweep = auto; Detector function = peak.
- 4. Set SPA Trace 1 Max hold, then View.

#### 9.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

The same as described in section 8.2

#### 9.3. MEASUREMENT EQUIPMENT USED

The same as described in section 6

#### 9.4. LIMITS AND MEASUREMENT RESULT

LIMITS AND MEA	SUREMENT RESULT	
	Measurement Resu	ult
Applicable Limits	Test Data	Criteria
In any 100 KHz Bandwidth Outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency	At least -20dBc than the limit Specified on the BOTTOM Channel	PASS
power that is produce by the intentional radiator shall be at least 20 dB below that in 100KHz bandwidth within the band that contains the highest level of the desired power. In addition, radiation emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in§15.209(a))	At least -20dBc than the limit Specified on the TOP Channel	PASS





# TEST RESULT FOR ENTIRE FREQUENCY RANGE TEST PLOT OF OUT OF BAND EMISSIONS WITH THE WORST CASE OF GFSK MODULATION IN LOW CHANNEL

Keysight Spectru 49:23 AM Jul 01, 2019 Peak Search Avg Type: Log-Pwr Avg|Hold:>100/100 Marker 1 2.402162422081 GHz Trig: Free Run Atten: 30 dB IFGain:Low Next Peak Mkr1 2.402 162 42 GHz 0.064 dBm Ref 20.00 dBm 10 dB/div Log Next Pk Right 1 Next Pk Left Marker Delta Mkr→CF Mkr→RefLv More 1 of 2 Center 2.402000 GHz #Res BW 100 kHz Span 5.000 MHz Sweep 2.000 ms (30000 pts) #VBW 300 kHz SENSE:INT Avg Type: Log-Pwr Avg|Hold:>100/100 Peak Search 16.503258108604 GHz Trig: Free Run Atten: 30 dB PNO: Fast IFGain:Low **Next Peak** Mkr3 16.503 3 GHz -52.396 dBm 0 dB/div Ref 20.00 dBm Next Pk Right

 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 0000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 000
 0000
 000
 000
 <td







#### TEST PLOT OF OUT OF BAND EMISSIONS OF GFSK MODULATION IN MIDDLE CHANNEL

Attestation of Global Compliance(Shenzhen)Co.,Ltd.

STATUS







#### TEST PLOT OF OUT OF BAND EMISSIONS OF GFSK MODULATION IN HIGH CHANNEL

Note: The peak emissions without marker on the above plots are fundamental wave and need not to compare with the limit. The GFSK modulation is the worst case and only those data recorded in the report.





#### TEST RESULT FOR BAND EDGE

#### GFSK MODULATION IN LOW CHANNEL

Hopping off



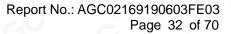
Hopping on





Attestation of Global Compliance(Shenzhen)Co.,Ltd.

Service Hotline:400 089 2118

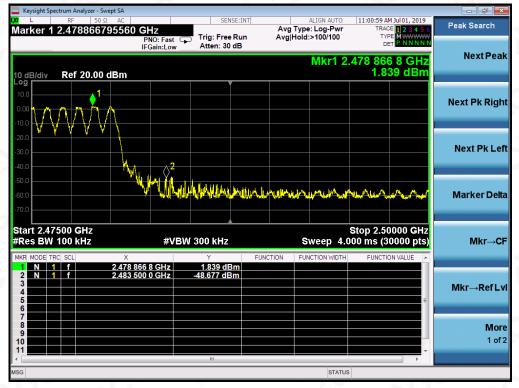






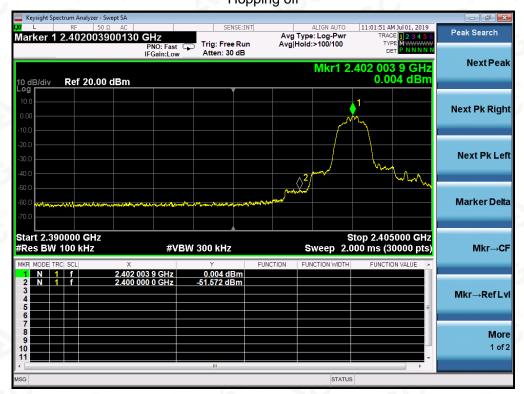
#### GFSK MODULATION IN HIGH CHANNEL Hopping off

Hopping on







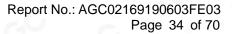


# $\pi$ /4-DQPSK MODULATION IN LOW CHANNEL Hopping off

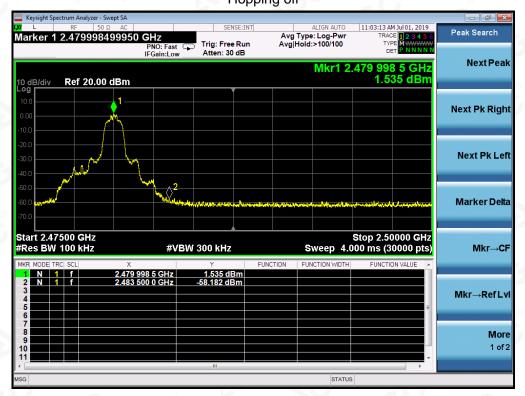
Hopping on





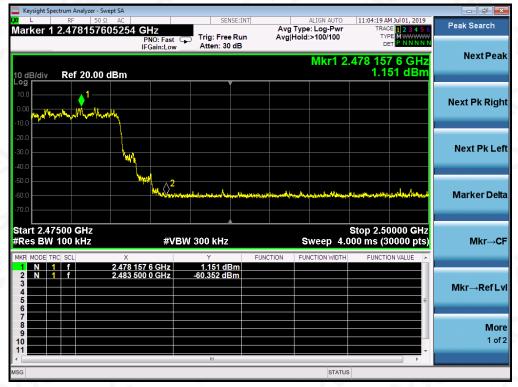




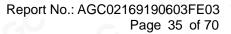


# $\pi$ /4-DQPSK MODULATION IN HIGH CHANNEL Hopping off

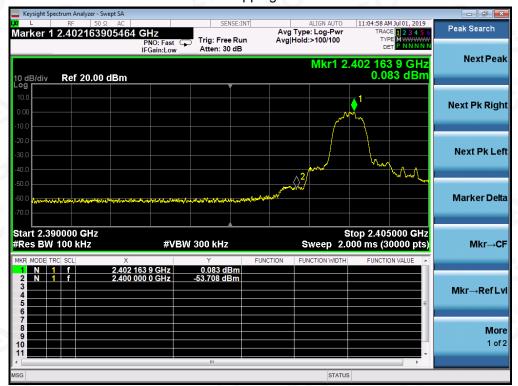
Hopping on









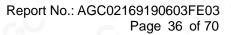


#### 8-DPSK MODULATION IN LOW CHANNEL Hopping off

Hopping on





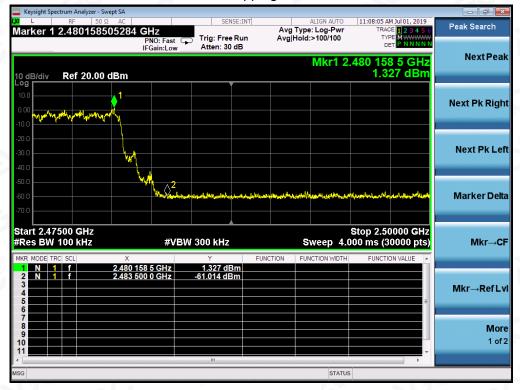






#### 8-DPSK MODULATION IN HIGH CHANNEL Hopping off

Hopping on







# **10. RADIATED EMISSION**

#### **10.1. 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 emissions, 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.





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

Spectrum Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP
Start ~Stop Frequency	1GHz~26.5GHz 1MHz/3MHz for Peak, 1MHz/3MHz for Average

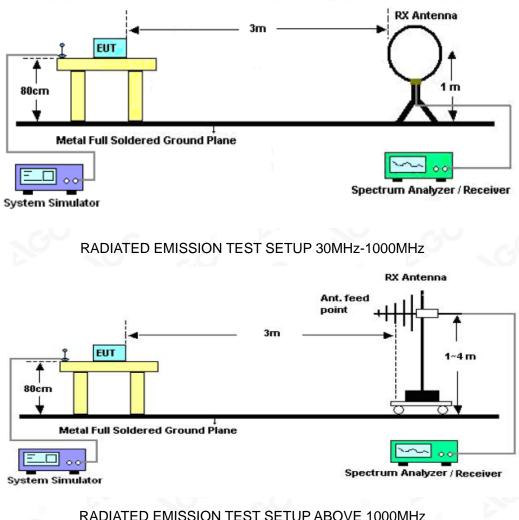
Receiver Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP



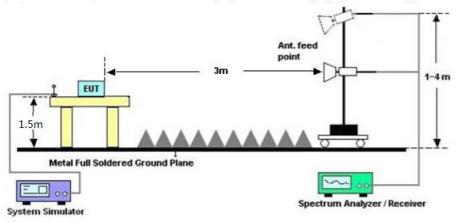


#### **10.2. TEST SETUP**

Radiated Emission Test-Setup Frequency Below 30MHz



#### RADIATED EMISSION TEST SETUP ABOVE 1000MHz





#### **10.3. LIMITS AND MEASUREMENT RESULT**

#### 15.209 Limit in the below table has to be followed

Frequencies (MHz)	Field Strength (micorvolts/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.

# 10.4. TEST RESULT

#### **RADIATED EMISSION BELOW 30MHZ**

No emission found between lowest internal used/generated frequencies to 30MHz.





EUT

1G

BH600

										1						10			× .		
Tempera	ture	:	25°C								Relati	ve ł	Humio	dity	55	5.4%	5				
Pressure	Э	ę	960	hPa		1		9	-	C <sub>r</sub> C	Test V	/olta	ige		N	orma	al Vo	oltag	je	~	2
Test Mod	de	I	Moc	le 4				0			Anten	na			H	orizc	onta				0
0	110			_	1	_	_	FCC P/	ART 15 E	B CLASS	B(Horizontal	0		_					7		1
	100	 																	-		
	90	 														+			-		
	80	 												1			+		-		
	70													 		+	+		-		
C M	60	 															+		-		
	§ 50	 																	F		
	5 40	-	_													-			-		
	30		<b>u</b> <sup>1</sup>											1. mar	man	منعه			-		
	20	$\rightarrow$	·	~	~	٨.,			<b>R</b> <sup>3</sup>	mak-use									-		
	10	 												l							

# **RADIATED EMISSION BELOW 1GHZ**

ANC Bluetooth Headphone

Model Name

Frequency[Hz]

100M

NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	52.3100	25.65	14.49	40.00	14.35	200	254	Horizontal
2	82.3800	21.81	10.17	40.00	18.19	200	211	Horizontal
3	147.3700	20.95	14.88	43.50	22.55	100	214	Horizontal
4	243.4000	21.10	14.80	46.00	24.90	100	56	Horizontal
5	404.4200	26.87	19.93	46.00	19.13	200	305	Horizontal
6	633.3400	31.37	24.88	46.00	14.63	100	189	Horizontal

**RESULT: PASS** 

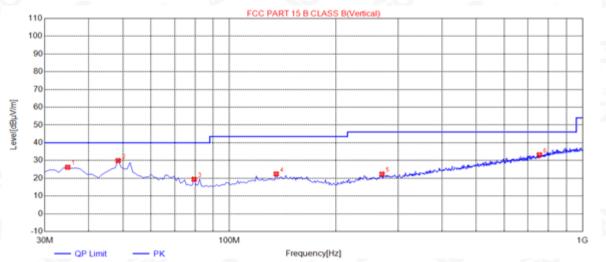
QP Limit





#### Report No.: AGC02169190603FE03 Page 42 of 70

EUT	ANC Bluetooth Headphone	Model Name	BH600
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 4	Antenna	Vertical



NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	34.8500	26.18	13.70	40.00	13.82	100	336	Vertical
2	48.4300	29.90	14.71	40.00	10.10	100	30	Vertical
3	79.4700	19.43	10.26	40.00	20.57	100	358	Vertical
4	135.7300	22.38	14.56	43.50	21.12	100	150	Vertical
5	270.5600	22.31	15.47	46.00	23.69	100	222	Vertical
6	754.5900	33.21	27.31	46.00	12.79	100	68	Vertical

# **RESULT: PASS**

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

2. All test modes had been pre-tested. The mode 4 is the worst case and recorded in the report.





### **RADIATED EMISSION ABOVE 1GHZ**

EUT	ANC Bluetooth Headphone	Model Name	BH600
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 1	Antenna	Horizontal

Frequency	Meter Reading	Factor	<b>Emission Level</b>	Limits	Margin	
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Value Type
4804.022	46.84	0.08	46.92	74.00	-27.08	peak
4804.022	42.51	0.08	42.59	54.00	-11.41	AVG
7206.033	38.77	2.21	40.98	74.00	-33.02	peak
7206.033	35.39	2.21	37.60	54.00	-16.40	AVG
69	.0			0	<i>c.</i> 0	
Remark:			0			
actor = Ante	enna Factor + C	able Loss -	Pre-amplifier.	0		

EUT	ANC Bluetooth Headphone	Model Name	BH600
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 1	Antenna	Vertical

Meter Reading	Factor	Emission Level	Limits	Margin	Value Ture
(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Value Type
50.47	0.08	50.55	74.00	-23.45	peak
48.70	0.08	48.78	54.00	-5.22	AVG
39.62	2.21	41.83	74.00	-32.17	peak
35.88	2.21	38.09	54.00	-15.91	AVG
	-0-	20			
		N	0	C.	0
	50.47 48.70 39.62 35.88	50.47      0.08        48.70      0.08        39.62      2.21        35.88      2.21	50.47      0.08      50.55        48.70      0.08      48.78        39.62      2.21      41.83	50.47      0.08      50.55      74.00        48.70      0.08      48.78      54.00        39.62      2.21      41.83      74.00        35.88      2.21      38.09      54.00	50.47      0.08      50.55      74.00      -23.45        48.70      0.08      48.78      54.00      -5.22        39.62      2.21      41.83      74.00      -32.17        35.88      2.21      38.09      54.00      -15.91





#### Report No.: AGC02169190603FE03 Page 44 of 70

ANC Bluetooth Headphone	Model Name	BH600
25°C	Relative Humidity	55.4%
960hPa	Test Voltage	Normal Voltage
Mode 2	Antenna	Horizontal
	25°C 960hPa	25°C Relative Humidity 960hPa Test Voltage

Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
50.69	0.14	50.83	74.00	-23.17	peak
49.11	0.14	49.25	54.00	-4.75	AVG
44.32	2.36	46.68	74.00	-27.32	peak
39.57	2.36	41.93	54.00	-12.07	AVG
	- <u>-</u>	4 69		8	
- 6	0		~ CY	- 6	0
enna Factor + Ca	ble Loss –	Pre-amplifier.		~0~	a.G
	(dBµV) 50.69 49.11 44.32 39.57	(dBµV)      (dB)        50.69      0.14        49.11      0.14        44.32      2.36        39.57      2.36	(dBµV)      (dB)      (dBµV/m)        50.69      0.14      50.83        49.11      0.14      49.25        44.32      2.36      46.68	(dBµV)      (dB)      (dBµV/m)      (dBµV/m)        50.69      0.14      50.83      74.00        49.11      0.14      49.25      54.00        44.32      2.36      46.68      74.00        39.57      2.36      41.93      54.00	(dBµV)      (dB)      (dBµV/m)      (dBµV/m)      (dB)        50.69      0.14      50.83      74.00      -23.17        49.11      0.14      49.25      54.00      -4.75        44.32      2.36      46.68      74.00      -27.32        39.57      2.36      41.93      54.00      -12.07

EUT	ANC Bluetooth Headphone	Model Name	BH600
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 2	Antenna	Vertical

		4				
Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4882.022	49.14	0.14	49.28	74.00	-24.72	🚩 peak
4882.022	46.33	0.14	46.47	54.00	-7.53	AVG
7323.033	40.00	2.36	42.36	74.00	-31.64	peak
7323.033	34.78	2.36	37.14	54.00	-16.86	AVG
0			24			
- Ci					0	
emark:	- G	0		. 6		C.
actor = Ante	enna Factor + Ca	ble Loss – I	Pre-amplifier.			





#### Report No.: AGC02169190603FE03 Page 45 of 70

ANC Bluetooth Headphone	Model Name	BH600
25°C	Relative Humidity	55.4%
960hPa	Test Voltage	Normal Voltage
Mode 3	Antenna	Horizontal
	25°C 960hPa	25°C Relative Humidity 960hPa Test Voltage

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Value Type
4960.022	48.54	0.22	48.76	74.00	-25.24	peak
4960.022	44.22	0.22	44.44	54.00	-9.56	AVG
7440.033	39.61	2.64	42.25	74.00	-31.75	peak
7440.033	35.02	2.64	37.66	54.00	-16.34	AVG
C.				0	8	
Remark:	- 6	8		- 07	- 6	Ø
actor = Ante	enna Factor + Ca	ble Loss –	Pre-amplifier.		< 0 <sup>-</sup>	- 6

EUT	ANC Bluetooth Headphone	Model Name	BH600
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 3	Antenna	Vertical

Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
51.21	0.22	51.43	74.00	-22.57	peak
48.66	0.22	48.88	54.00	-5.12	AVG
42.71	2.64	45.35	74.00	-28.65	peak
36.89	2.64	39.53	54.00	-14.47	AVG
	-00-	0			60
		100	C.	8	
	(dBµV) 51.21 48.66 42.71	(dBµV)      (dB)        51.21      0.22        48.66      0.22        42.71      2.64	(dBµV)      (dB)      (dBµV/m)        51.21      0.22      51.43        48.66      0.22      48.88        42.71      2.64      45.35	(dBµV)      (dB)      (dBµV/m)      (dBµV/m)        51.21      0.22      51.43      74.00        48.66      0.22      48.88      54.00        42.71      2.64      45.35      74.00	(dBµV)      (dB)      (dBµV/m)      (dBµV/m)      (dB)        51.21      0.22      51.43      74.00      -22.57        48.66      0.22      48.88      54.00      -5.12        42.71      2.64      45.35      74.00      -28.65

#### **RESULT: PASS**

#### Note:

Other emissions from 1G to 25 GHz are considered as ambient noise. No recording in the test report. 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 GFSK modulation is the worst case and recorded in the report.



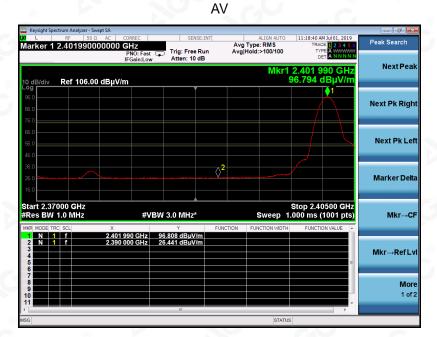


#### TEST RESULT FOR RESTRICTED BANDS REQUIREMENTS

EUT	ANC Bluetooth Headphone	Model Name	BH600
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 1	Antenna	Horizontal

ΡK





**RESULT: PASS** 





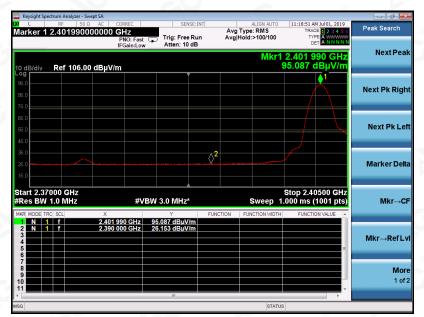
#### Report No.: AGC02169190603FE03 Page 47 of 70

ANC Bluetooth Headphone	Model Name	BH600
25°C	Relative Humidity	55.4%
960hPa	Test Voltage	Normal Voltage
Mode 1	Antenna	Vertical
2	5°C 60hPa	5°C Relative Humidity 60hPa Test Voltage

PK



#### AV



**RESULT: PASS** 

