

FCC Test Report

Report No.: AGC03118201201FE03

FCC ID : 2ANFH-AE

APPLICATION PURPOSE : Original Equipment

PRODUCT DESIGNATION: WIRELESS EARBUDS

BRAND NAME : ATRIX, NLD, Inteya

MODEL NAME

AtrixEarbuds, ETW025, E025, ETW021, ETW026,

ETW027, ETW028, ETW029

APPLICANT: HUIZHOU NEW LEADER INDUSTRY CO., LTD.

DATE OF ISSUE : Dec. 28, 2020

STANDARD(S) : FCC Part 15.247

REPORT VERSION : V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd

AGC Agen) oc



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REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	® /	Dec. 28, 2020	Valid	Initial Release

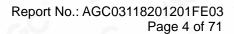
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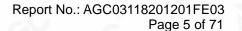
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1. VERIFICATION OF CONFORMITY

	THE OTHER PERSONS ASSESSED.	
Applicant	HUIZHOU NEW LEADER INDUSTRY CO., LTD.	
Address	BAIYUNSHAN ROAD, CHENJIANG TOWN, HUIZHOU, GUANGDONG, 516029, China	
Manufacturer	HUIZHOU NEW LEADER INDUSTRY CO., LTD.	
Address	BAIYUNSHAN ROAD, CHENJIANG TOWN, HUIZHOU, GUANGDONG, 516029, China	
Factory	HUIZHOU NEW LEADER INDUSTRY CO., LTD.	
Address	BAIYUNSHAN ROAD, CHENJIANG TOWN, HUIZHOU, GUANGDONG, 516029, China	
Product Designation WIRELESS EARBUDS		
Brand Name	ATRIX, NLD, Inteya	
Test Model	AtrixEarbuds	
eries Model ETW025, E025, ETW021, ETW026, ETW027, ETW028, ETW029		
Difference Description	All the same except for the model name and brand name.	
Date of test	Dec. 18, 2020 to Dec. 28, 2020	
Deviation No any deviation from the test method		
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.

Prepared By	Then Huony	
No No	Thea Huang Project Engineer	Dec. 28, 2020
Reviewed By	Max Zhang	
	Max Zhang Reviewer	Dec. 28, 2020
Approved By	Formerlies	
CC T	Forrest Lei Authorized Officer	Dec. 28, 2020

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2. GENERAL INFORMATION

2.1. PRODUCT DESCRIPTION

The EUT is designed as "WIRELESS EARBUDS". It is designed by way of utilizing the GFSK and π /4-DQPSK technology to achieve the system operation.

A major technical description of EUT is described as following

Operation Frequency	2.402 GHz to 2.480 GHz		
RF Output Power -5.473dBm (Max)			
Bluetooth Version	V 5.1		
Modulation	BR ⊠GFSK, EDR ⊠π /4-DQPSK, □8DPSK		
Number of channels	79		
Hardware Version	re Version ETW025-JL76-R/L-V1		
Software Version	oftware Version 2.1.3		
Antenna Designation Ceramic Antenna (Comply with requirements of the FCC part 15.203)			
Antenna Gain 4.11dBi			
Power Supply DC 3.7V by battery or DC 5V by adapter			

Note: The EUT comprises left and right channel headsets, both are the same, the right headset had been tested and recorded in this report as the worst case.

2.2. TABLE OF CARRIER FREQUENCYS

Frequency Band	Channel Number	Frequency
100 a.C.	0	2402 MHz
	6 _ 1	2403 MHz
	100	
SO GO	38	2440 MHz
2402~2480MHz	39	2441 MHz
C c	40	2442 MHz
	0 :	
	77	2479 MHz
2.C	78	2480 MHz

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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 multi slot 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 hopping sequence in data mode:

40, 21, 44, 23, 04, 15, 66, 56, 19, 78, 07, 28, 69, 55,

36, 45, 05, 13, 43, 74, 57, 35, 67, 76, 02, 34, 54, 63,

42, 11, 30, 06, 64, 25, 75, 48, 17, 33, 58, 01, 29, 14,

51, 72, 03, 31, 50, 61, 77, 18, 10, 47, 12, 68, 08, 49,

20, 00, 73, 09, 16, 60, 71, 41, 24, 53, 38, 26, 46, 37,

65, 32, 70, 52, 27, 59, 22, 62, 39

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.

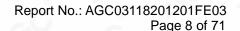
The LAP (lower address part) are the 24 LSB's of the 48 BD_ADDRESS. The BD_ADDRESS is an unambiguous number of every Bluetooth unit. The UAP (upper address part) are the 24MSB's of the 48BD_ADDRESS

The internal clock of a Bluetooth unit is derived from a free running clock which is never adjusted and is never turned off. For behavior action with other units only offset is 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 bits 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 the Sequence. This will be done at the beginning of every new transmission.

Regarding short transmissions the Bluetooth system has the following behavior:

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.

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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: 2ANFH-AE** 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.

2.10. 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%.

- 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 = ±0.8dB
- Uncertainty of spurious emissions, conducted, Uc = ±2.7dB
- Uncertainty of Occupied Channel Bandwidth: Uc = ±2 %
- Uncertainty of Dwell Time: Uc = ±2 %
- Uncertainty of Frequency: Uc = ±2 %

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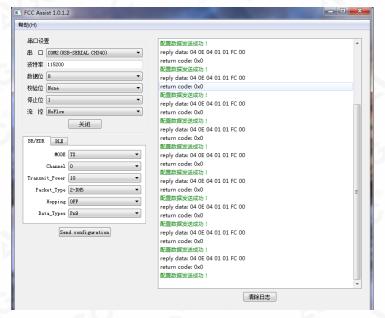
4. DESCRIPTION OF TEST MODES

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	Hopping mode GFSK		
8	Hopping mode π/4-DQPSK		

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



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5. SYSTEM TEST CONFIGURATION

5.1. CONFIGURATION OF EUT SYSTEM

Radiated Emission Configure:



Conducted Emission Configure:

EUT	5	AE

5.2. EQUIPMENT USED IN TESTED SYSTEM

Item	Equipment	Model No.	ID or Specification	Remark
1	WIRELESS EARBUDS	AtrixEarbuds	2ANFH-AE	EUT
2	Control Box	N/A	USB-TTL	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	Not applicable

Note: The EUT is powered by battery. The EUT can not use the BT function with charging

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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 Communication 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

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESCI	10096	May 15, 2020	May 14, 2021
EXA Signal Analyzer	Aglient	N9010A	MY53470504	Dec. 07, 2020	Dec.06, 2021
2.4GHz Filter	EM Electronics	2400-2500MHz	N/A	Mar. 23, 2020	Mar. 22, 2022
Attenuator	ZHINAN	E-002	N/A	N/A	N/A
Horn antenna	SCHWARZBECK	BBHA 9170	#768	Sep. 09, 2019	Sep. 08, 2021
Active loop antenna (9K-30MHz)	ZHINAN	ZN30900C	18051	May 22, 2020	May 21, 2022
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	May 17, 2019	May 16, 2021
Broadband Preamplifier	ETS LINDGREN	3117PA	00225134	Sep. 03,2020	Sep. 02,2022
ANTENNA	SCHWARZBECK	VULB9168	494	Jan. 09, 2019	Jan. 08, 2021
Test software	Tonscend	JS32-RE (Ver.2.5)	N/A	N/A	N/A

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7. PEAK OUTPUT POWER

7.1. MEASUREMENT PROCEDURE

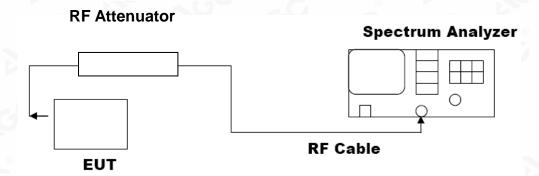
For peak power test:

- 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 ≥RBW.
- 5. Sweep: Auto.
- 6. Detector function: Peak.
- 7. Trace: Max hold.

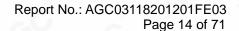
Allow trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. The indicated level is the peak output power, after any corrections for external attenuators and cables.

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

PEAK POWER TEST SETUP



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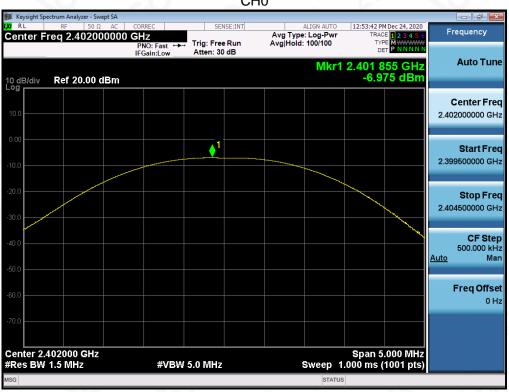




7.3. LIMITS AND MEASUREMENT RESULT

PEAK OUTPUT POWER MEASUREMENT RESULT			
FOR GFSK MOUDULATION			
Frequency (GHz)	Peak Power (dBm)	Applicable Limits (dBm)	Pass or Fail
2.402	-6.975	30	Pass
2.441	-6.044	30	Pass
2.480	-5.753	30	Pass

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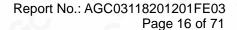
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PEAK OUTPUT POWER MEASUREMENT RESULT FOR Π/4-DQPSK MODULATION Frequency **Peak Power Applicable Limits** Pass or Fail (dBm) (GHz) (dBm) 2.402 -6.69321 **Pass** 2.441 -5.693 21 **Pass** 21 2.480 -5.473Pass

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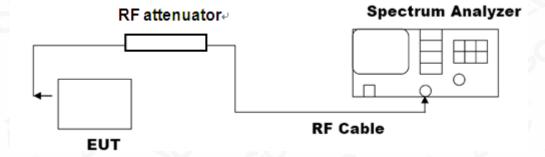
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8. 20DB BANDWIDTH

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)



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8.3. LIMITS AND MEASUREMENT RESULTS

MEASUF	REMENT RESULT FOR GF	SK MOUDULATION	
A Paral la la la	Measurement Result		
Applicable Limits	Test Data (MHz) Criteria		Criteria
N/A	Low Channel	0.956	PASS
	Middle Channel	0.950	PASS
	High Channel	0.950	PASS

TEST PLOT OF BANDWIDTH FOR LOW CHANNEL



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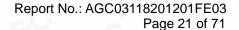
TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



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g/Inspection The test results

he test report.



 MEASUREMENT RESULT FOR [I /4-DQPSK MODULATION

 Measurement Result

 Test Data (MHz)
 Criteria

 Low Channel
 1.305
 PASS

 Middle Channel
 1.310
 PASS

 High Channel
 1.280
 PASS

TEST PLOT OF BANDWIDTH FOR LOW CHANNEL



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TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



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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.
- 3. 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

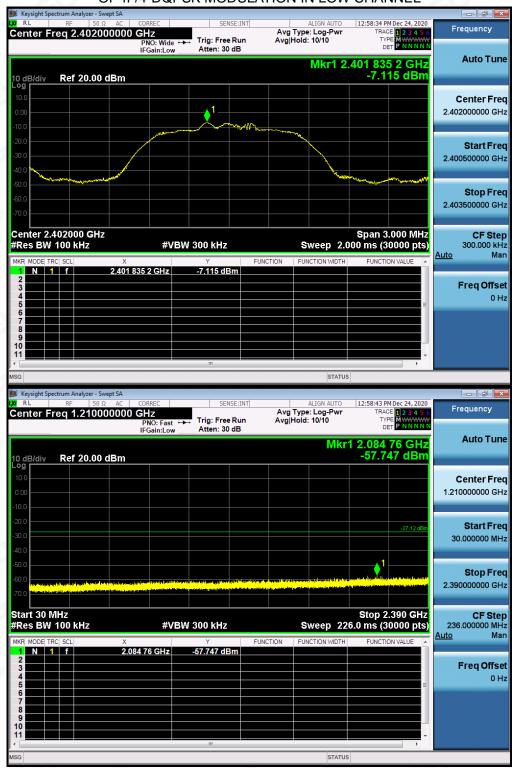
LIMITS AND MEASUREMENT RESULT			
Applicable Limite	Measurement Result		
Applicable Limits	Test Data	Criteria	
In any 100 kHz Bandwidth Outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency	At least -20dBc than the limit Specified on the BOTTOM 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	

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TEST RESULT FOR ENTIRE FREQUENCY RANGE

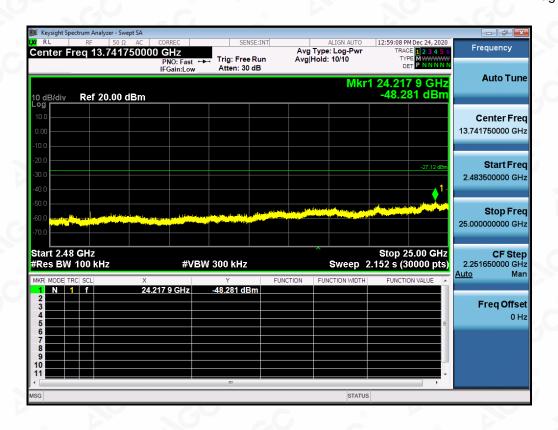
TEST PLOT OF OUT OF BAND EMISSIONS WITH THE WORST CASE OF π /4-DQPSK MODULATION IN LOW CHANNEL



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g/Inspection
The test results
the test report.





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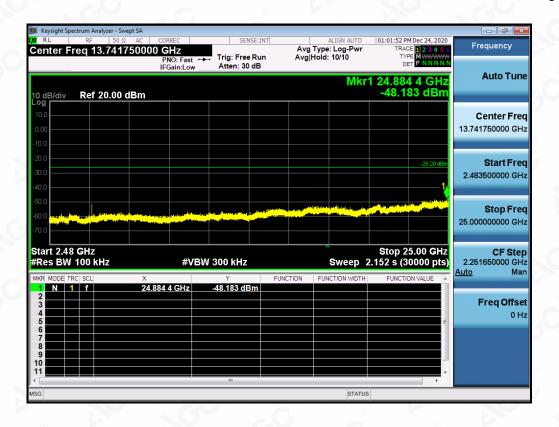
TEST PLOT OF OUT OF BAND EMISSIONS OF π /4-DQPSK MODULATION IN MIDDLE CHANNEL



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The test results the test report.





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TEST PLOT OF OUT OF BAND EMISSIONS OF π /4-DQPSK MODULATION IN HIGH CHANNEL



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Note: The π /4-DQPSK modulation is the worst case and only those data recorded in the report.

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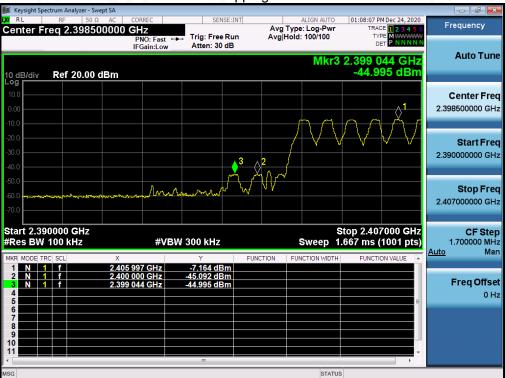
TEST RESULT FOR BAND EDGE

GFSK MODULATION IN LOW CHANNEL

Hopping off



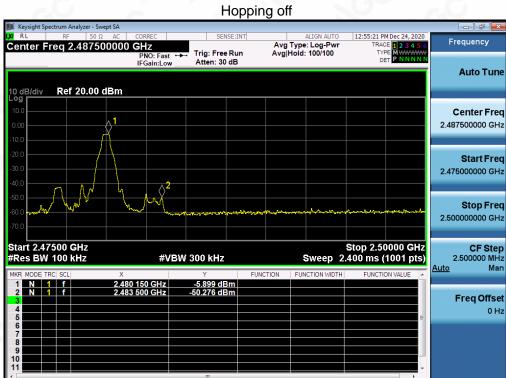




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GFSK MODULATION IN HIGH CHANNEL



RE RF 50Ω AC Conter Freq 2.487500000 GHz PNO: Fast → IFGain:Low Frequency Avg Type: Log-Pwr Avg|Hold: 100/100 **Auto Tune** Ref 20.00 dBm Center Freq 2.487500000 GHz Start Fred 2.475000000 GHz Stop Freq 2.500000000 GHz Stop 2.50000 GHz Sweep 2.400 ms (1001 pts) Start 2.47500 GHz #Res BW 100 kHz **CF Step** 2.500000 MHz #VBW 300 kHz <u>Auto</u> **Freq Offset**

Hopping on

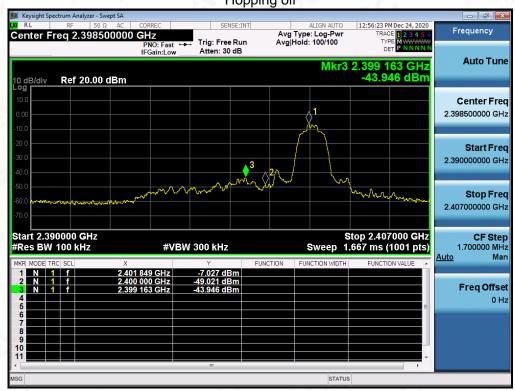
STATUS

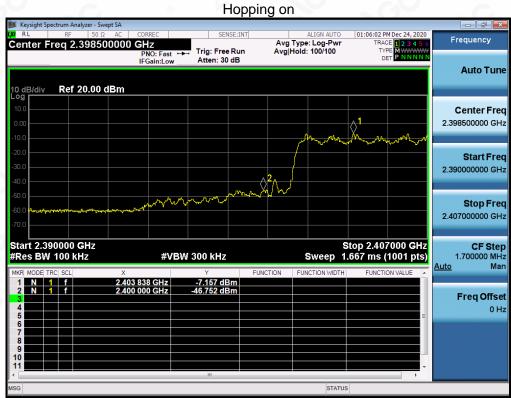
STATUS

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π /4-DQPSK MODULATION IN LOW CHANNEL Hopping off

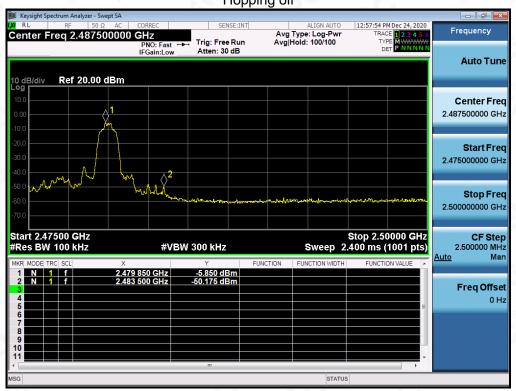




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π /4-DQPSK MODULATION IN HIGH CHANNEL Hopping off



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10. RADIATED EMISSION

10.1. MEASUREMENT PROCEDURE

- 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.
- 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.

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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

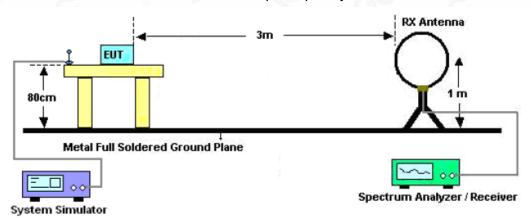
Receiver Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP

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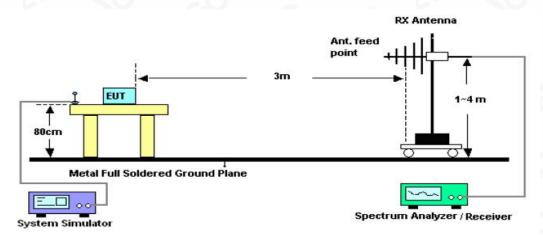


10.2. TEST SETUP

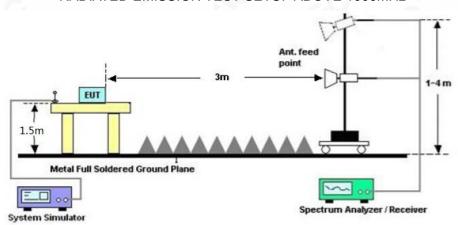
Radiated Emission Test-Setup Frequency Below 30MHz



RADIATED EMISSION TEST SETUP 30MHz-1000MHz



RADIATED EMISSION TEST SETUP ABOVE 1000MHz



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10.3. 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

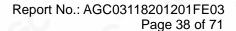
Note: All modes were tested for restricted band radiated emission, the test records reported below are the worst result compared to other modes.

10.4. 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.

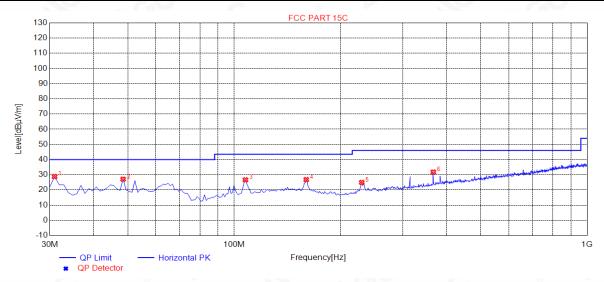
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RADIATED EMISSION BELOW 1GHz

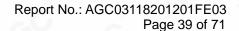
EUT	WIRELESS EARBUDS	Model Name	AtrixEarbuds
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 6	Antenna	Horizontal



NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	30.9700	28.81	10.02	40.00	11.19	100	221	Horizontal
2	48.4300	27.09	11.71	40.00	12.91	100	348	Horizontal
3	107.600	26.64	12.17	43.50	16.86	200	56	Horizontal
4	159.980	26.81	14.94	43.50	16.69	100	291	Horizontal
5	229.820	24.93	14.02	46.00	21.07	100	357	Horizontal
6	366.590	31.77	18.50	46.00	14.23	100	350	Horizontal

RESULT: PASS

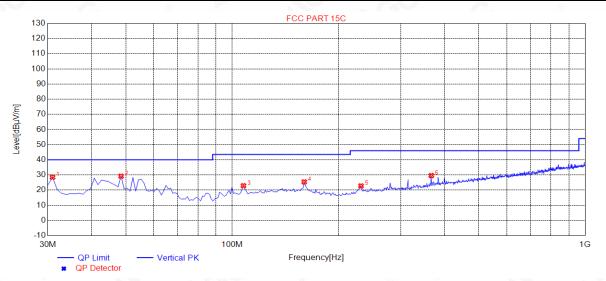
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/Inspection The test results



EUT	WIRELESS EARBUDS	Model Name	AtrixEarbuds
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 6	Antenna	Vertical



NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	30.9700	28.52	10.02	40.00	11.48	100	207	Vertical
2	48.4300	29.20	11.71	40.00	10.80	100	47	Vertical
3	107.600	22.91	12.17	43.50	20.59	100	124	Vertical
4	159.980	25.43	14.94	43.50	18.07	100	237	Vertical
5	231.760	22.78	14.17	46.00	23.22	100	284	Vertical
6	366.590	29.59	18.50	46.00	16.41	100	214	Vertical

RESULT: PASS

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

2. All test modes had been pre-tested. The mode 6 is the worst case and recorded in the report.

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RADIATED EMISSION ABOVE 1GHz

EUT	WIRELESS EARBUDS	Model Name	AtrixEarbuds
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 4	Antenna	Horizontal

	Mater Deading	Ганан	Eminaian Laval	Limette	Manain	
Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4804.000	46.28	0.08	46.36	74	-27.64	peak
4804.000	36.36	0.08	36.44	54	-17.56	AVG
7206.000	39.71	2.21	41.92	74	-32.08	peak
7206.000	32.29	2.21	34.5	54	-19.5	AVG
			(0)			
Remark:			8			
actor = Anter	na Factor + Cab	e Loss – Pre-	amplifier.	0		

EUT	WIRELESS EARBUDS	Model Name	AtrixEarbuds
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 4	Antenna	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBμV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4804.000	45.58	0.08	45.66	74	-28.34	peak
4804.000	35.62	0.08	35.7	54	-18.3	AVG
7206.000	39.49	2.21	41.7	74	-32.3	peak
7206.000	31.21	2.21	33.42	54	-20.58	AVG
	©				8	
					.C	
emark:						
actor = Anter	nna Factor + Cable	Loss – Pre-a	mplifier.	(8)		

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g/Inspection
The test results
the test report.

EUT	WIRELESS EARBUDS	Model Name	AtrixEarbuds
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 5	Antenna	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4882.000	47.87	0.14	48.01	74	-25.99	peak
4882.000	36.38	0.14	36.52	54	-17.48	AVG
7323.000	40.32	2.36	42.68	74	-31.32	peak
7323.000	33.34	2.36	35.7	54	-18.3	AVG
8		- (©		
	8				®	
emark:	- 6	(8)			- 0	·
actor = Anter	na Factor + Cable	e Loss – Pre-	amplifier.		10	- C

EUT	WIRELESS EARBUDS	Model Name	AtrixEarbuds
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)	Value Type
4882.000	47.71	0.14	47.85	74	-26.15	peak
4882.000	39.42	0.14	39.56	54	-14.44	AVG
7323.000	41.35	2.36	43.71	74	-30.29	peak
7323.000	33.19	2.36	35.55	54	-18.45	AVG
8	8		100	.0		
mark:	a.C	· (©				
ctor = Anter	na Factor + Cable	Loss – Pre-	amplifier.			

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EUT	WIRELESS EARBUDS	Model Name	AtrixEarbuds
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 Tree
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Value Type
4960.000	45.48	0.22	45.7	74	-28.3	peak
4960.000	36.52	0.22	36.74	54	-17.26	AVG
7440.000	39.66	2.64	42.3	74	-31.7	peak
7440.000	30.38	2.64	33.02	54	-20.98	AVG
@		_ (©		

EUT	WIRELESS EARBUDS	Model Name	AtrixEarbuds
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)	value Type
4960.000	45.79	0.22	46.01	74	-27.99	peak
4960.000	35.25	0.22	35.47	54	-18.53	AVG
7440.000	39.41	2.64	42.05	74	-31.95	peak
7440.000	30.46	2.64	33.1	54	-20.9	AVG
		GU	(6)	®		
mark:	(i)		100	. C	8	

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, Margin= Level -Limit.

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

All test modes had been tested. The π /4-DQPSK modulation is the worst case and recorded in the report.

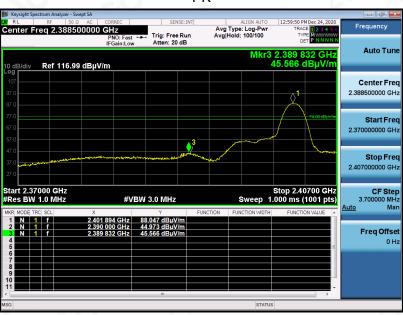
Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the Bedicated Pesting/Inspection Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the written authorization of AGE. The test results presented in the report apply only to the tested sample. Any objections to report issued by AGC should be submitted to AGC within 15day after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc@agc-cert.com.



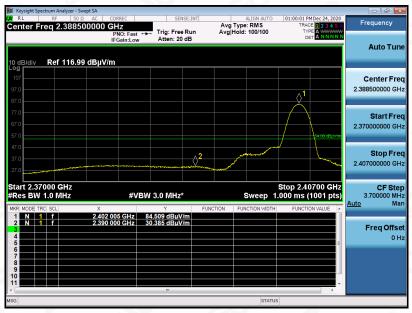
TEST RESULT FOR RESTRICTED BANDS REQUIREMENTS

EUT	WIRELESS EARBUDS	Model Name	AtrixEarbuds
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 4	Antenna	Horizontal

PΚ



ΑV



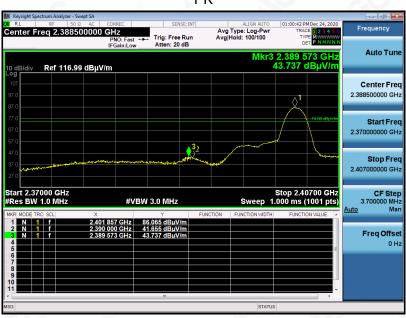
RESULT: PASS

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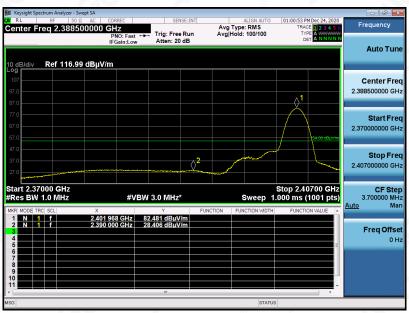


EUT	WIRELESS EARBUDS	Model Name	AtrixEarbuds
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 4	Antenna	Vertical

PK



ΑV



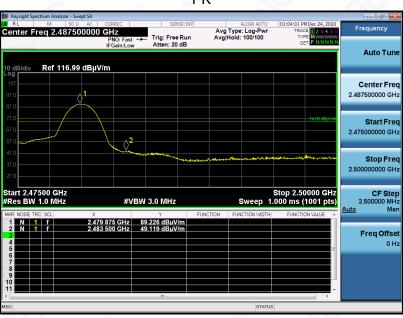
RESULT: PASS

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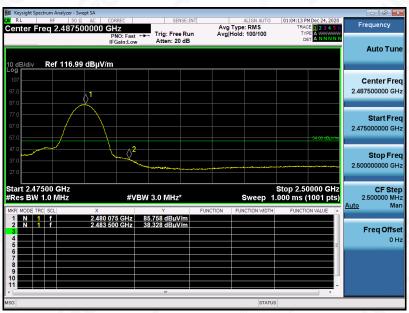


EUT	WIRELESS EARBUDS	Model Name	AtrixEarbuds
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 6	Antenna	Horizontal

PK



ΑV



RESULT: PASS

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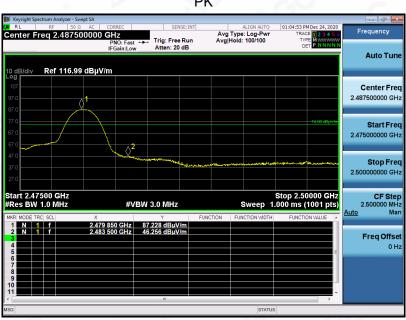
g/Inspection The test results

the test report.

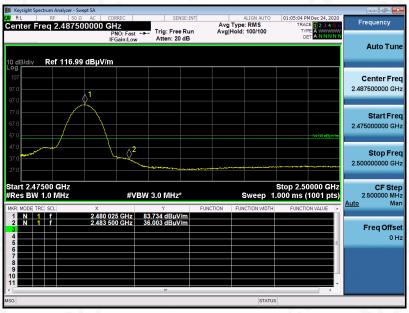


EUT	WIRELESS EARBUDS	Model Name	AtrixEarbuds
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 6	Antenna	Vertical





ΑV



RESULT: PASS

Note: The factor had been edited in the "Input Correction" of the Spectrum Analyzer. The π /4-DQPSK modulation is the worst case and recorded in the report.

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11. NUMBER OF HOPPING FREQUENCY

11.1. MEASUREMENT PROCEDURE

The EUT shall have its hopping function enabled. Use the following spectrum analyzer settings:

- 1. Span: The frequency band of operation. Depending on the number of channels the device supports, it may be necessary to divide the frequency range of operation across multiple spans, to allow the individual channels to be clearly seen.
- 2. RBW: To identify clearly the individual channels, set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller.
- 3. VBW RBW. Sweep: Auto. Detector function: Peak. Trace: Max hold.
- 4. Allow the trace to stabilize.

11.2. TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)

Same as described in section 8.2

11.3. MEASUREMENT EQUIPMENT USED

The same as described in section 6

11.4. LIMITS AND MEASUREMENT RESULT

TOTAL NO. OF	LIMIT (NO. OF CH)	MEASUREMENT (NO. OF CH)	RESULT
HOPPING CHANNEL	>=15	79	PASS

TEST PLOT FOR NO. OF TOTAL CHANNELS



Note: The GFSK modulation is the worst case and recorded in the report.

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12. TIME OF OCCUPANCY (DWELL TIME)

12.1. MEASUREMENT PROCEDURE

The EUT shall have its hopping function enabled. Use the following spectrum analyzer settings:

- 1. Span: Zero span, centered on a hopping channel.
- 2. RBW shall be ≤channel spacing and where possible RBW should be set >> 1 / T, where T is the expected dwell time per channel.
- 3. Sweep: As necessary to capture the entire dwell time per hopping channel; where possible use a video trigger and trigger delay so that the transmitted signal starts a little to the right of the start of the plot. The trigger level might need slight adjustment to prevent triggering when the system hops on an adjacent channel; a second plot might be needed with a longer sweep time to show two successive hops on a channel.
- 4. Detector function: Peak. Trace: Max hold.
- 5. Use the marker-delta function to determine the transmit time per hop.
- 6. Repeat the measurement using a longer sweep time to determine the number of hops over the period specified in the requirements. The sweep time shall be equal to, or less than, the period specified in the requirements. Determine the number of hops over the sweep time and calculate the total number of hops in the period specified in the requirements, using the following equation:

(Number of hops in the period specified in the requirements) = (number of hops on spectrum analyzer) \times (period specified in the requirements / analyzer sweep time)

7. The average time of occupancy is calculated from the transmit time per hop multiplied by the number of hops in the period specified in the requirements.

12.2. TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)

Same as described in section 8.2

12.3. MEASUREMENT EQUIPMENT USED

The same as described in section 6

12.4. LIMITS AND MEASUREMENT RESULT

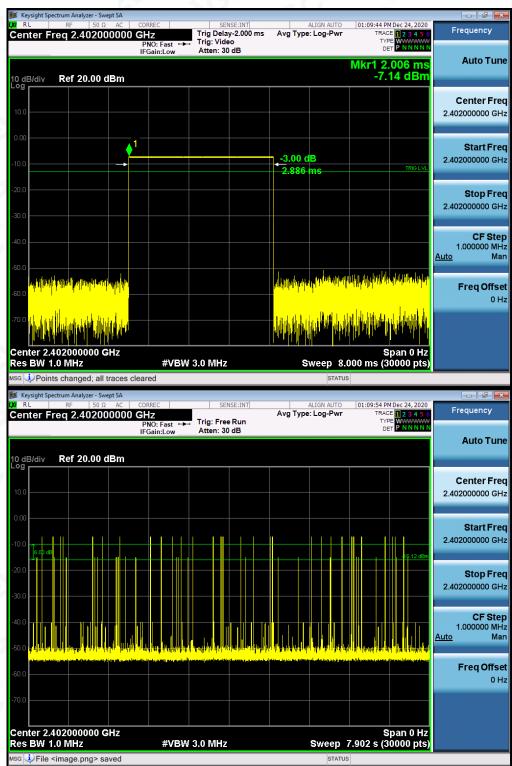
Channel	Time of Pulse for DH5 (ms)	Number of hops in the period specified in the requirements	Sweep Time (ms)	Limit (ms)
Low	2.886	31*4	357.864	400
Middle	2.887	32*4	369.536	400
High	2.886	33*4	380.952	400

Note: The π /4-DQPSK modulation is the worst case and recorded in the report.

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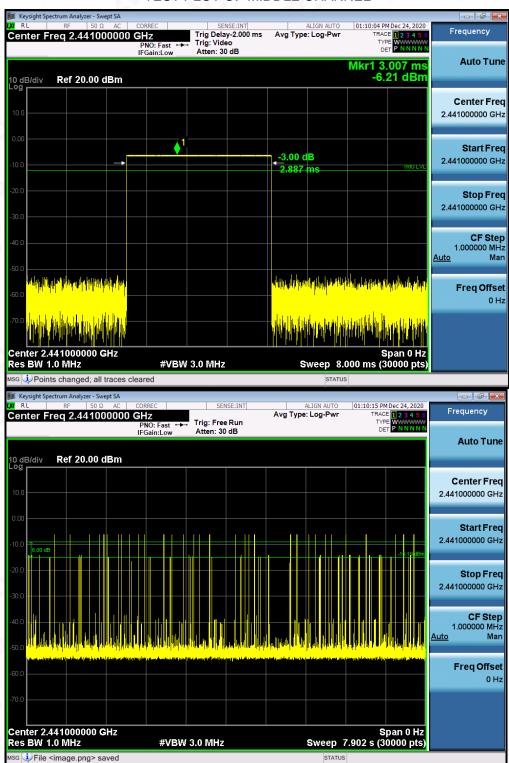
TEST PLOT OF LOW CHANNEL



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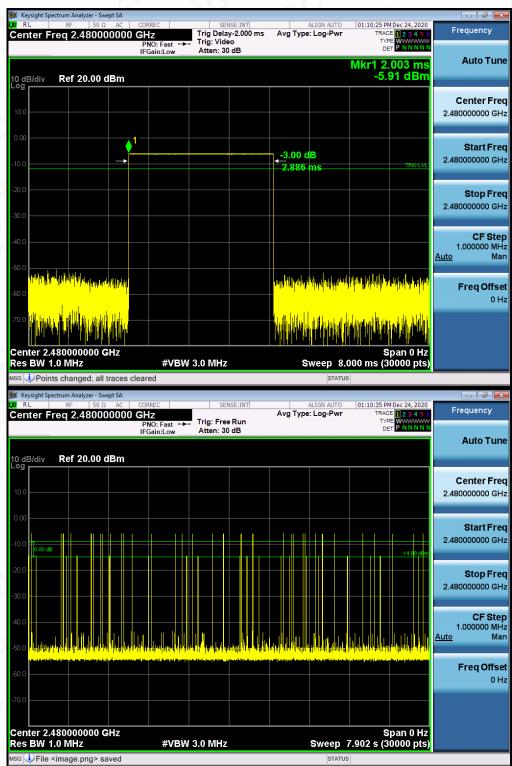
TEST PLOT OF MIDDLE CHANNEL



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TEST PLOT OF HIGH CHANNEL



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13. FREQUENCY SEPARATION

13.1. MEASUREMENT PROCEDURE

The EUT shall have its hopping function enabled. Use the following spectrum analyzer settings:

- 1. Span: Wide enough to capture the peaks of two adjacent channels.
- 2. RBW: Start with the RBW set to approximately 30% of the channel spacing; adjust as necessary to best identify the center of each individual channel.
- 3. Video (or average) bandwidth (VBW) ≥ RBW.
- 4. Sweep: Auto. e) Detector function: Peak. f) Trace: Max hold. g) Allow the trace to stabilize.

Use the marker-delta function to determine the separation between the peaks of the adjacent channels.

13.2. TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)

Same as described in section 6.2

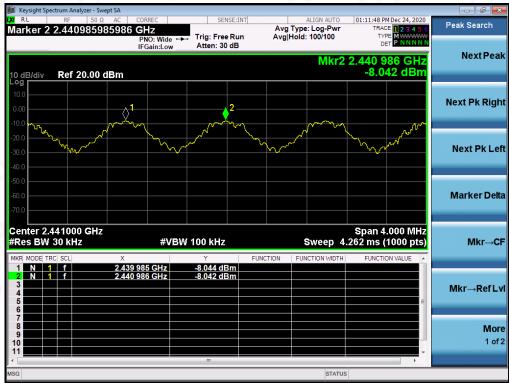
13.3. MEASUREMENT EQUIPMENT USED

The same as described in section 6.3

13.4. LIMITS AND MEASUREMENT RESULT

CHANNEL	CHANNEL SEPARATION	LIMIT	RESULT	
	MHz			
Hopping mode	1.001	20 dB BW	Pass	

TEST PLOT FOR FREQUENCY SEPARATION



Note: The GFSK modulation is the worst case and recorded in the report.

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