

FCC Test Report

Report No.: AGC01082190905FE03

FCC ID : 2AEN5-UP

APPLICATION PURPOSE : Original Equipment

PRODUCT DESIGNATION: TWS Bluetooth Headset

BRAND NAME : Urbanista

MODEL NAME : Urbanista Paris

APPLICANT: Urbanista AB

DATE OF ISSUE : Nov. 05, 2019

STANDARD(S) : FCC Part 15.247

REPORT VERSION: V1.0

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Tel: +86-755 2523 4088 E-mail: agc@agc-cert.com Service Hotline: 400 089 2118



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REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	1	Nov. 05, 2019	Valid	Initial Release

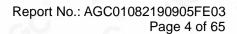




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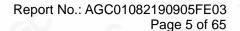
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1. VERIFICATION OF CONFORMITY

Urbanista AB	
Runebergsgatan 6, SE-114 29, STOCKHOLM, Sweden	
GuangZhou U&I Technology Company Limited	
4th Floor, 15th Building, Vtrek Innovation Industrial Park, No. 644, Shibei Road, Panyu District, Guangzhou, China 511430	
GuangZhou U&I Technology Company Limited	
4th Floor, 15th Building, Vtrek Innovation Industrial Park, No. 644, Shibei Road, Panyu District, Guangzhou, China 511430	
TWS Bluetooth Headset	
Urbanista	
Urbanista Paris	
Oct. 24, 2019 to Nov. 04, 2019	
None	
Normal	
Pass	
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	NINI	
	Nini Guo (Project Engineer)	Nov. 04, 2019
Reviewed By	Max Zhang	
	Max Zhang (Reviewer)	Nov. 05, 2019
Approved By	Forrest le	
	Forrest Lei (Authorized Officer)	Nov. 05, 2019



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2. GENERAL INFORMATION

2.1. PRODUCT DESCRIPTION

The EUT is designed as "TWS Bluetooth Headset". 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

	3		
Operation Frequency	2.402 GHz to 2.480GHz		
RF Output Power	4.964dBm(Max)		
Bluetooth Version	V 5.0		
Modulation	BR ⊠GFSK, EDR ⊠π /4-DQPSK, ⊠8DPSK BLE □GFSK 1Mbps □GFSK 2Mbps		
Number of channels	79		
Hardware Version	BS267RK-BT-V4		
Software Version	V4.8.3		
Antenna Designation	PCB antenna(Comply with requirements of the FCC part 15.203)		
Antenna Gain 0.8dBi			
Power Supply	DC 3.7V by battery		

Note: The EUT comprises left and right channel earphone, both are the same and have been tested, Only the test data of right earphone recorded in this report.

2.2. TABLE OF CARRIER FREQUENCYS

Frequency Band	Channel Number	Frequency
0	0	2402MHZ
	。 P 1	2403MHZ
	0 2: 5	
	38	2440 MHZ
2402~2480MHZ	39	2441 MHZ
	40	2442 MHZ
	77	2479 MHZ
	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 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.



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

This submittal(s) (test report) is intended for **FCC ID: 2AEN5-UP** 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.

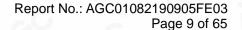
2.9. EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.



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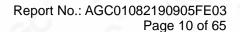


3. MEASUREMENT UNCERTAINTY

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 %







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 0	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.



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5. SYSTEM TEST CONFIGURATION

5.1. CONFIGURATION OF EUT SYSTEM

Radiated Emission Configure:

EUT

5.2 EQUIPMENT USED IN TESTED SYSTEM

Item	Equipment	Model No.	ID or Specification	Remark
1	TWS Bluetooth Headset	Urbanista Paris	2AEN5-UP	EUT

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	N/A

Note: The EUT can not use the BT function with charging



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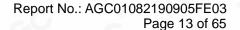
6. TEST FACILITY

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

TEST EQUIPMENT OF RADIATED EMISSION TEST

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. 26, 2019	Aug. 25, 2020
Horn antenna	SCHWARZBECK	BBHA 9170	#768	Sep. 09, 2019	Sep. 08, 2021
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. 15, 2019	Oct. 16, 2020
ANTENNA	SCHWARZBECK	VULB9168	494	Jan. 09, 2019	Jan. 08, 2021







7. PEAK OUTPUT POWER

7.1. MEASUREMENT PROCEDURE

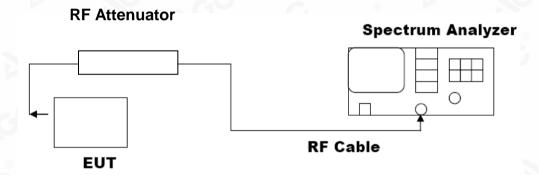
For peak power test:

- 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.

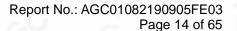
Allow trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. The indicated level is the peak output power, after any corrections for external attenuators and cables.

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

PEAK POWER TEST SETUP









7.3. LIMITS AND MEASUREMENT RESULT

PEAK OUTPUT POWER MEASUREMENT RESULT				
	FOR GFSK MOUL	DULATION		
Frequency (GHz)	Peak Power (dBm)	Applicable Limits (dBm)	Pass or Fail	
2.402	2.055	30	Pass	
2.441	1.966	30	Pass	
2.480	2.032	30	Pass	

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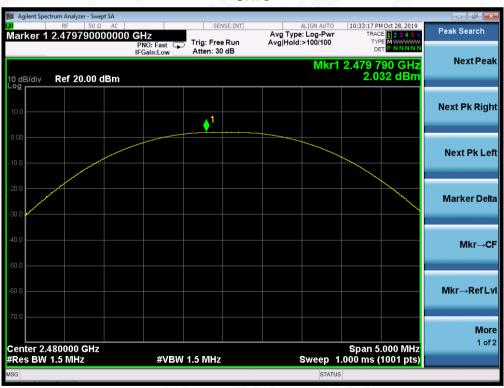
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CH39



CH78

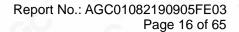




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PEAK OUTPUT POWER MEASUREMENT RESULT				
	FOR II /4-DQPSK N	MODULATION		
Frequency (GHz)	Peak Power (dBm)	Applicable Limits (dBm)	Pass or Fail	
2.402	4.336	30	Pass	
2.441	4.297	30	Pass	
2.480	4.460	30	Pass	

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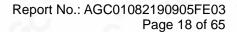




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	PEAK OUTPUT POWER MEA	ASUREMENT RESULT	
	FOR 8-DPSK MO	DULATION	
Frequency (GHz)	Peak Power (dBm)	Applicable Limits (dBm)	Pass or Fail
2.402	4.964	30	Pass
2.441	4.843	30	Pass
2.480	4.821	30	Pass

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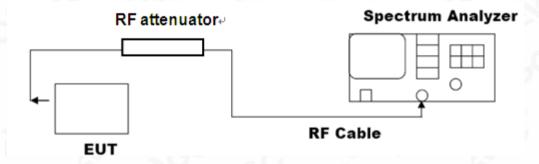
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8. 20DB BANDWIDTH

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)



8.3. LIMITS AND MEASUREMENT RESULTS

MEASURE	MENT RESULT FOR GF	SK MOUDULATION	
Measurement Result			ılt
Applicable Limits	Test Data	(MHz)	Criteria
N/A	Low Channel	0.9589	PASS
	Middle Channel	0.9586	PASS
	High Channel	0.9571	PASS



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TEST PLOT OF BANDWIDTH FOR LOW CHANNEL



TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



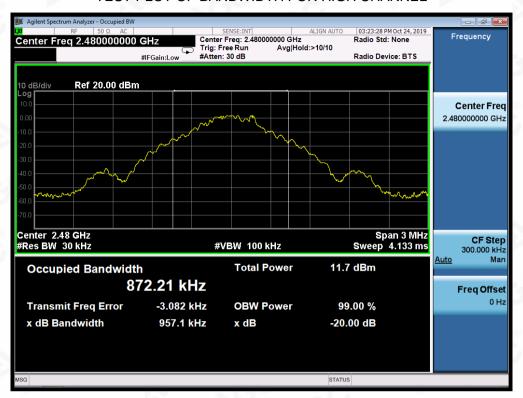


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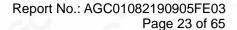


TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



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MEASUREM	MENT RESULT FOR ∏ /4-0	OQPSK MODULATIO	N	
Amuliaskia limita	Measurement Resu	lt		
Applicable Limits	Test Data (MHz)		Criteria	
N/A	Low Channel	1.333	PASS	
	Middle Channel	1.331	PASS	
	High Channel	1.331	PASS	

TEST PLOT OF BANDWIDTH FOR LOW CHANNEL





TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



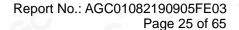
TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL





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MEASUREMENT RESULT FOR 8-DPSK MODULATION				
Annicola I imita		Measurement Resu	llt	
Applicable Limits	Test Data	(MHz)	Criteria	
N/A	Low Channel	1.297	PASS	
	Middle Channel	1.300	PASS	
	High Channel	1.302	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

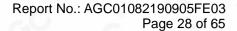
9.3. MEASUREMENT EQUIPMENT USED

The same as described in section 6

9.4. LIMITS AND MEASUREMENT RESULT

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



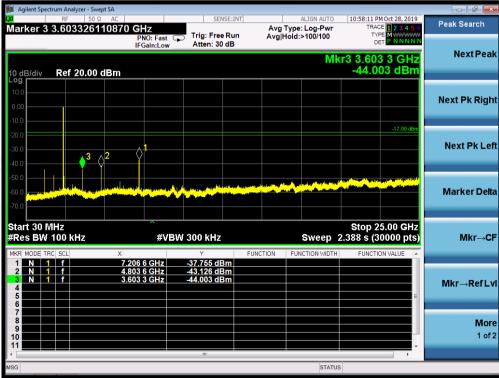




TEST RESULT FOR ENTIRE FREQUENCY RANGE

TEST PLOT OF OUT OF BAND EMISSIONS WITH THE WORST CASE OF 8-DPSK MODULATION IN LOW CHANNEL







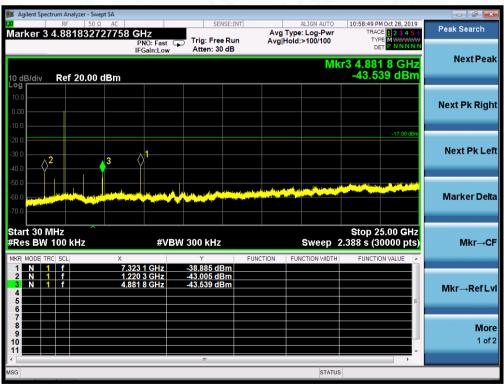
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Add: 2/F., Building 2,Sanwei Chaxi Industrial Park, Sanwei Community, Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China



TEST PLOT OF OUT OF BAND EMISSIONS OF 8-DPSK MODULATION IN MIDDLE CHANNEL







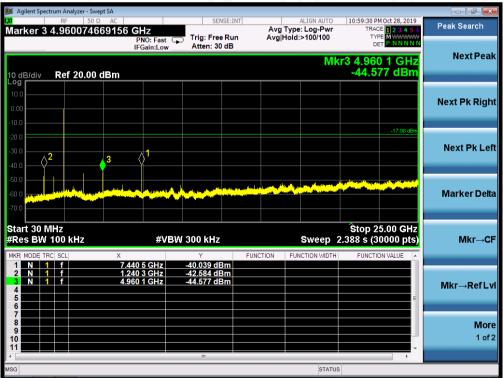
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TEST PLOT OF OUT OF BAND EMISSIONS OF 8-DPSK MODULATION IN HIGH CHANNEL





Note: The peak emissions without marker on the above plots are fundamental wave and need not to compare with the limit. The 8-DPSK modulation is the worst case and only those data recorded in the report.



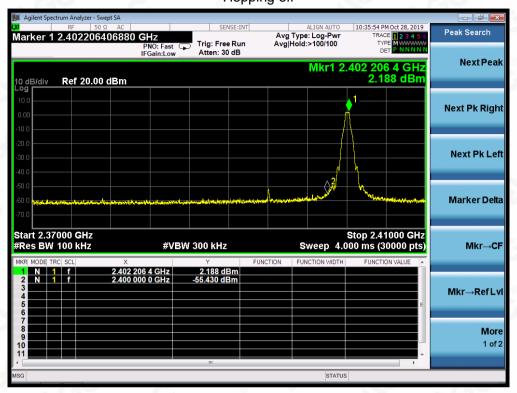
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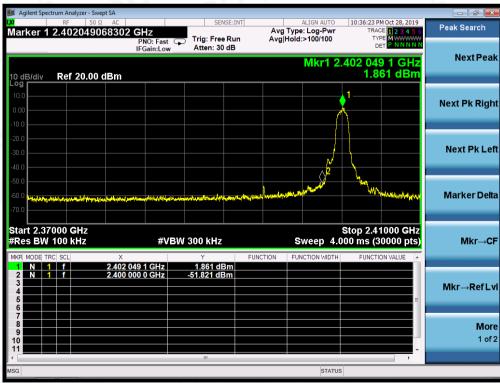


TEST RESULT FOR BAND EDGE

GFSK MODULATION IN LOW CHANNEL Hopping off



Hopping on



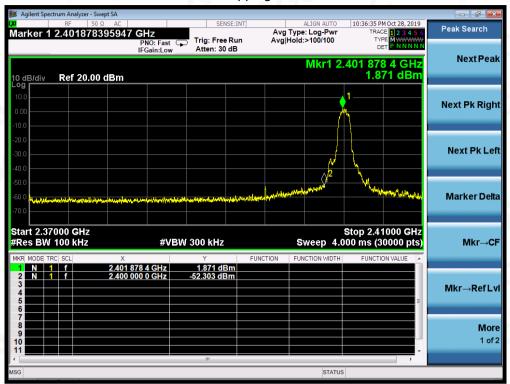


Attestation of Global Compliance(Shenzhen)Co.,Ltd.

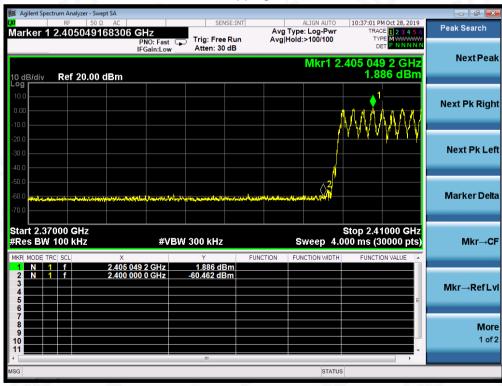
Add: 2/F., Building 2,Sanwei Chaxi Industrial Park, Sanwei Community, Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China



GFSK MODULATION IN HIGH CHANNEL Hopping off



Hopping on



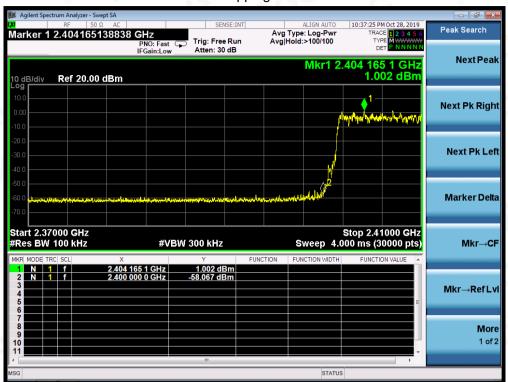


Attestation of Global Compliance(Shenzhen)Co.,Ltd.

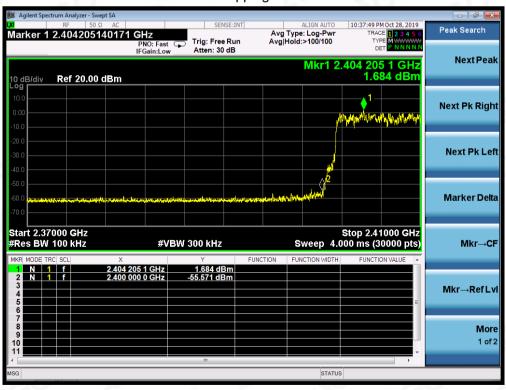
Add: 2/F., Building 2,Sanwei Chaxi Industrial Park, Sanwei Community, Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China



π /4-DQPSK MODULATION IN LOW CHANNEL Hopping off



Hopping on



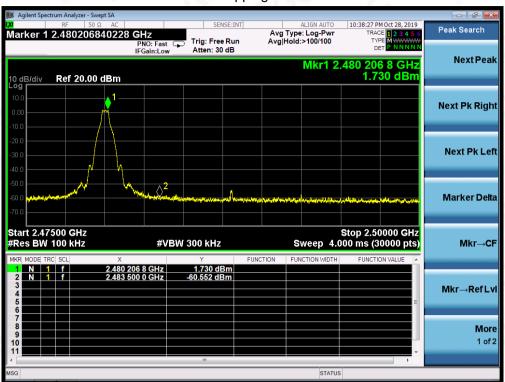


Attestation of Global Compliance(Shenzhen)Co.,Ltd.

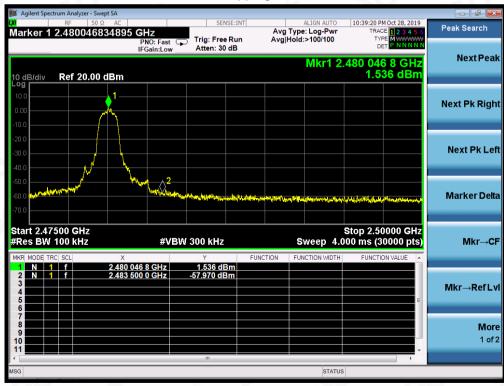
Add: 2/F., Building 2,Sanwei Chaxi Industrial Park, Sanwei Community, Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China



π /4-DQPSK MODULATION IN HIGH CHANNEL Hopping off



Hopping on



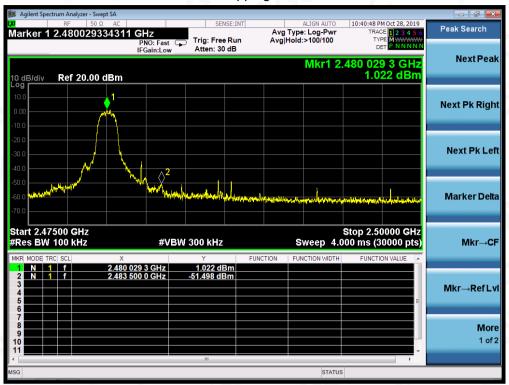


Attestation of Global Compliance(Shenzhen)Co.,Ltd.

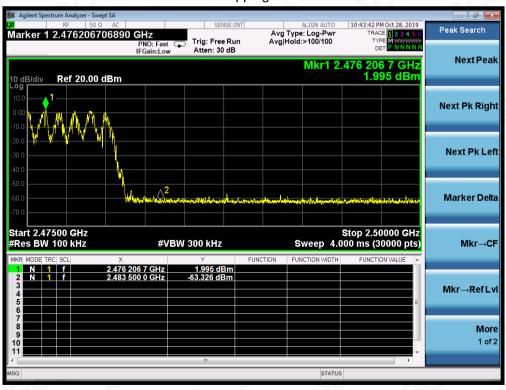
Add: 2/F., Building 2,Sanwei Chaxi Industrial Park, Sanwei Community, Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China



8-DPSK MODULATION IN LOW CHANNEL Hopping off



Hopping on





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