

# **FCC Test Report**

Report No.: AGC12134210302FE03

FCC ID	: 2AZA9-A201
APPLICATION PURPOSE	: Original Equipment
PRODUCT DESIGNATION	: Bluetooth Receiver
BRAND NAME	: esinkin
MODEL NAME	: A201
APPLICANT	: Shenzhen Yixunqi Technology Co., Ltd
DATE OF ISSUE	: Apr. 07, 2021
STANDARD(S)	: FCC Part 15.247
REPORT VERSION	: V1.0



nplianc



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 Attestation of Global Compliance(Shenzhen)Co., Ltd

 Attestation of Global Compliance(Shenzhen)Std & Tech Co., Ltd

 Tel: +86-755 2523 4088
 E-mail: agc@agc-cert.com

Web: http://cn.agc-cert.com/



## **REPORT REVISE RECORD**

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	© /	Apr. 07, 2021	Valid	Initial Release

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 Tel: +86-755 2523 4088
 E-mail: agc@agc-cert.com



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## **1. VERIFICATION OF CONFORMITY**

A 11 4		
Applicant	Shenzhen Yixunqi Technology Co., Ltd	
Address	Room 416, Comprehensive Building No.4 beside Dengxinkeng Industrial Zone, Jihua Road, Xinxue Community, Bantian Street, Longgang District, Shenzhen, China	
Manufacturer	Shenzhen Yixunqi Technology Co., Ltd	
Address	Room 416, Comprehensive Building No.4 beside Dengxinkeng Industrial Zone, Jihua Road, Xinxue Community, Bantian Street, Longgang District, Shenzhen, China	
Factory	Shenzhen Yixunqi Technology Co., Ltd	
Address	Room 416, Comprehensive Building No.4 beside Dengxinkeng Industrial Zone, Jihua Road, Xinxue Community, Bantian Street, Longgang District, Shenzhen, China	
Product Designation	Bluetooth Receiver	
Brand Name	esinkin	
Test Model	A201	
Date of test	Mar. 15, 2021 to Apr. 07, 2021	
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

Eddy Lin

Eddy Liu (Project Engineer)

Apr. 07, 2021

Max Zhans

**Reviewed By** 

Max Zhang (Reviewer)

Apr. 07, 2021

Approved By

Forrest Lei (Authorized Officer)

Apr. 07, 2021

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# 2. GENERAL INFORMATION

## 2.1. PRODUCT DESCRIPTION

The EUT is designed as "Bluetooth Receiver". 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 2.480 GHz	
RF Output Power	3.389dBm (Max)	
Bluetooth Version	V5.0	
Modulation	BR ⊠GFSK, EDR ⊠π /4-DQPSK, ⊠8DPSK BLE □GFSK 1Mbps □GFSK 2Mbps	
Number of channels	79	
Hardware Version	V1.5	
Software Version	V1.0	
Antenna Designation	Integral Antenna (Comply with requirements of the FCC part 15.203)	
Antenna Gain	0dBi	
Power Supply	DC 5V by adapter	
Note: The EUT doesn't support	BLE.	

## 2.2. TABLE OF CARRIER FREQUENCYS

Frequency Band	Channel Number	Frequency
	0	2402 MHz
0	64 .0	2403 MHz
G <sup>C</sup> C		
	38	2440 MHz
2402~2480MHz	39	2441 MHz
	40	2442 MHz
8	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 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: 2AZA9-A201** filing to comply with the FCC Part15.225 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  $y \pm U$ , 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 = ±3.1 dB
- Uncertainty of Radiated Emission below 1GHz, Uc = ±4.0 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:  $Uc = \pm 2 \%$

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 E-mail: agc@agc-cert.com
 Web: http://cn.agc-cert.com/



## **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.

Software Setting

BlueTest3			
Test Commands         RADIO STATUS FULL         TXSTART         TXDATA1         TXDATA2         TXDATA3         TXDATA4         RXSTART1         RXSTART2		2480	Close Help Execute Cold Reset Warm Reset
Test Results Save to file Browse C:\Users\Test\AppData\Loc Radio Test CFG PKT successfi	al\QTI Ltd\BlueTest3\t		C BER
Radio Test TXDATA1 successf Radio Test CFG PKT successf Radio Test TXDATA2 successf Radio Test CFG PKT successf Radio Test CFG PKT successf Radio Test CFG PKT successf	น ม ม ม ม ม ม ม ม ม ม		
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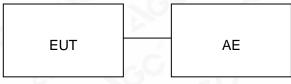
 Tel: +86-755 2523 4088
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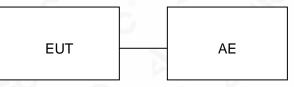
# **5. SYSTEM TEST CONFIGURATION**

**5.1. CONFIGURATION OF EUT SYSTEM** 

Radiated Emission Configure:



Conducted Emission Configure:



## 5.2. EQUIPMENT USED IN TESTED SYSTEM

ltem	Equipment	Model No.	ID or Specification	Remark
1	Bluetooth Receiver	A201	2AZA9-A201	EUT
2	Control board	N/A	DC 3.3V	AE
3	Smart phone	Mate 40	1.65m unshielded	AE

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

DESCRIPTION OF TEST	RESULT
Peak Output Power	Compliant
20 dB Bandwidth	Compliant
Conducted Spurious Emission	Compliant
Radiated Emission	Compliant
Number of Hopping Frequency	Compliant
Time of Occupancy	Compliant
Frequency Separation	Compliant
Conducted Emission	Compliant
	Peak Output Power 20 dB Bandwidth Conducted Spurious Emission Radiated Emission Number of Hopping Frequency Time of Occupancy Frequency Separation

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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 CONDUCTED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESPI	101206	May 15, 2020	May 14, 2021
LISN	R&S	ESH2-Z5	100086	Jul. 03, 2020	Jul. 02, 2021
Test software	R&S	ES-K1(Ver.V1.71)	N/A	N/A	N/A

## 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	Sep. 03, 2020	Sep. 02, 2022
Horn antenna	SCHWARZBECK	BBHA 9170	#768	Sep. 21, 2019	Sep. 20, 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. 08, 2020	Jan.07 2023
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

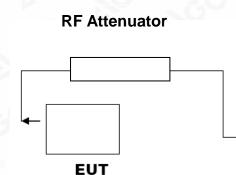
For peak power test:

- 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  $\geq$ RBW.
- 5. Sweep: Auto.
- 6. Detector function: Peak.
- 7. Trace: Max hold.

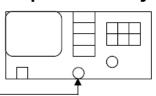
Allow trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. The indicated level is the peak output power, after any corrections for external attenuators and cables.

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

## PEAK POWER TEST SETUP



## Spectrum Analyzer



**RF** Cable

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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	1.398	(dBm) 21	Pass			
2.441	3.179	21	Pass			
2.480	3.389	21	Pass			

#### CH0



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10 dB/div

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Stop Freq

PEAK OUTPUT POWER MEASUREMENT RESULT FOR Π/4-DQPSK MODULATION					
Frequency (GHz)	Peak Power (dBm)	Applicable Limits (dBm)	Pass or Fail		
2.402	-0.960	21	Pass		
2.441	1.038	21	Pass		
2.480	1.218	21	Pass		

Frequency Avg Type: Log-Pwr Avg|Hold: 100/100 **Center Freq** 2.402000000 GHz Trig: Free Run Atten: 30 dB PNO: Fast IFGain:Low Auto Tune Mkr1 2.402 175 GHz -0.960 dBn Ref 20.00 dBm **Center Freq** 2.402000000 GHz ▲1 Start Freq 2.399500000 GHz

	ter 2.402	000 GHz	#\/B\A	(5.0 MHz		Sween 1	Span 5	.000 MHz 1001 pts)		
-70.0										0
-60.0										Freq Offs
-40.0									<u>Auto</u>	500.000 k M
-40.0										CF St
-30.0	and a second							Jongord	2.40	04500000 G

Edicated Fes Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the Bedicated Perton 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 AGC presented in the report apply only to the tested sample. Any objections to report issued by AGC should be submitted to AGC within 15days after the issues of the requiry of validity or verification of the test report should be addressed to AGC by agc@agc-cert.com. g/Inspection he test results Bf he test report.

#### CH0

#### Report No.: AGC12134210302FE03 Page 17 of 73





CH78

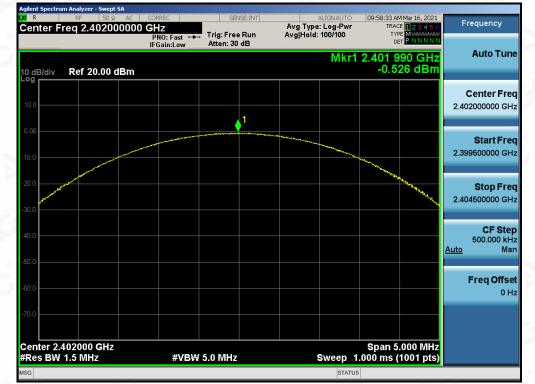


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#### Report No.: AGC12134210302FE03 Page 18 of 73

PEAK OUTPUT POWER MEASUREMENT RESULT FOR 8-DPSK MODULATION					
Frequency (GHz)	Peak Power (dBm)	Applicable Limits (dBm)	Pass or Fail		
2.402	-0.526	21	Pass		
2.441	1.404	21	Pass		
2.480	1.550	21	Pass		



CH0

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#### Report No.: AGC12134210302FE03 Page 19 of 73





CH78



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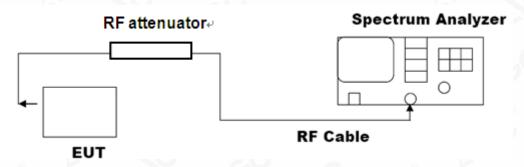


## 8. 20DB BANDWIDTH

## **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

MEASUREMENT RESULT FOR GFSK MOUDULATION						
Applicable Limite	Measurement Result					
Applicable Limits	Test Data	Criteria				
	Low Channel	0.953	PASS			
N/A	Middle Channel	0.946	PASS			
	High Channel	0.950	PASS			

#### 09:54:42 AM Mar 16, 2021 Radio Std: None Frequency Center Freq: 2.402000000 GHz 402000000 GH Avg|Hold>100/100 Trig: Free Run #Atten: 30 dB Radio Device: BTS Ref 20.00 dBm **Center Freq** 2.402000000 GHz Center 2.402 GHz #Res BW 30 kHz Span 3 MHz Sweep 3.2 ms **CF** Step #VBW 100 kHz 300.000 kH <u>Auto</u> Ma Occupied Bandwidth **Total Power** 8.76 dBm 869.29 kHz Freq Offset 0 Hz -13.462 kHz **Transmit Freq Error OBW Power** 99.00 % x dB Bandwidth 952.6 kHz x dB -20.00 dB

#### TEST PLOT OF BANDWIDTH FOR LOW CHANNEL

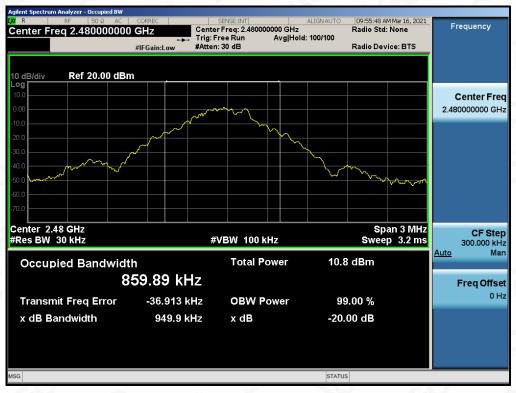
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#### TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL

#### TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL

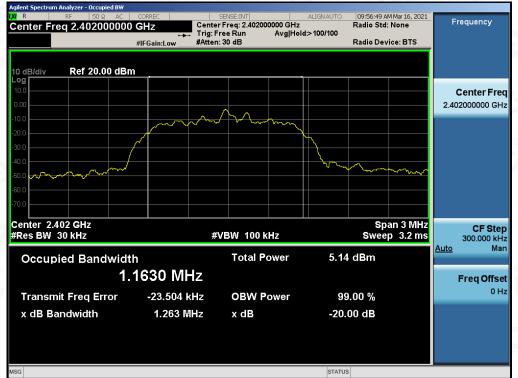


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MEASUREMENT RESULT FOR II /4-DQPSK MODULATION						
Angliaghta Limita		Measurement Result				
Applicable Limits	Test Data	Test Data (MHz)				
	Low Channel	1.263	PASS			
N/A	Middle Channel	1.235	PASS			
	High Channel	1.231	PASS			

#### 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

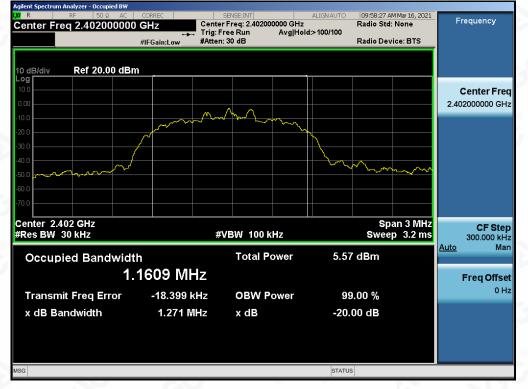


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MEASUREMENT RESULT FOR 8-DPSK MODULATION						
Measurement Result						
Applicable Limits	Test Dat	Test Data (MHz)				
Sec. 1	Low Channel	1.271	PASS			
N/A	Middle Channel	1.265	PASS			
	High Channel	1.261	PASS			

#### 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.
- 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

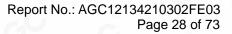
## 9.3. MEASUREMENT EQUIPMENT USED

The same as described in section 6

## 9.4. LIMITS AND MEASUREMENT RESULT

LIMITS AND MEA	SUREMENT RESULT			
Annlinghing 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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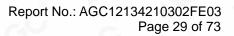




## TEST RESULT FOR ENTIRE FREQUENCY RANGE TEST PLOT OF OUT OF BAND EMISSIONS WITH THE WORST CASE OF GFSK MODULATION IN LOW CHANNEL



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Agilent Spectrum Analyzer - Swept SA					
K RF 50Ω AC	CORREC	SENSE:INT	ALIGN AUTO	10:01:05 AM Mar 16, 2021	Frequency
Center Freq 13.7417500	DU GHZ PNO: Fast ++++		Avg Type: Log-Pwr Avg Hold: 10/10	TRACE 1 2 3 4 5 6 TYPE MWWWW DET P N N N N N	,
		Atten: 30 dB		DET PNNNN	
			Mk	r1 2.557 8 GHz	Auto Tune
			IVIN	-46.794 dBm	
10 dB/div Ref 20.00 dBm				-40.734 dDm	
10.0					Center Freq
0.00					13.741750000 GHz
0.00					13.741750000 GHZ
-10.0					
-20.0				-22.09 dDm	Start Freq
-30.0					
					2.483500000 GHz
-40.0					
-50.0			. Marine and a she and an advantage		Oton Eror
-60.0 -60.0	and a state of the state of the state of the		and the second second		Stop Freq
-70.0					25.00000000 GHz
-70.0					
Start 2.48 GHz				Stop 25.00 GHz	CF Step
#Res BW 100 kHz	#VBW 3	00 kHz	Sweep	2.152 s (30000 pts)	2.251650000 GHz
					<u>Auto</u> Man
MKR MODE TRC SCL X	2.557 8 GHz -4	Y FUNCTIO	IN FUNCTION WIDTH	FUNCTION VALUE	
2	2.357 8 GHZ -4	0.794 uBiii			<b>E</b>
3					Freq Offset
4					0 Hz
6					
7					
9					
10					
11				×	
MSG			STATUS	\$	

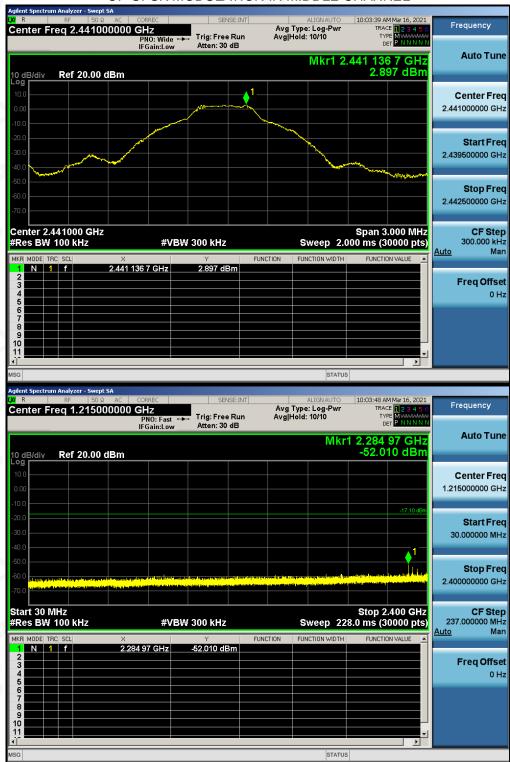
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 Attestation of Global Compliance(Shenzhen)Std & Tech Co., Ltd

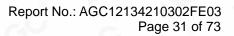
 Tel: +86-755 2523 4088
 E-mail: agc@agc-cert.com
 Web: http://cn.agc-cert.com/





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

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Agilent Spectrum Analyzer - Swept SA					
💢 R 🛛 RF 🛛 50 Ω AC	CORREC	SENSE:INT	ALIGN AUTO	10:04:13 AM Mar 16, 2021	Frequency
Center Freq 13.74175000	DO GHZ PNO: Fast +++ Tri		g Type: Log-Pwr   Hold: 10/10	TRACE 123456	
		ten: 30 dB	,,	TYPE MWWWWW DET PNNNNN	
			ML	r1 2.596 8 GHz	Auto Tune
			IVIN	-43.222 dBm	
10 dB/div Ref 20.00 dBm				-43.222 dbm	
10.0					Center Freq
					•
0.00					13.741750000 GHz
-10.0				-17.10 dBm	
-20.0				-17.10 08/1	Start Freq
-30.0					•
					2.483500000 GHz
-40.0					
-50.0			استلال و مر الحا		
-60.0	and the state of the second	and the state of the second		أتقاله المتعاد ومعطاه فالأ	Stop Freq
and the state of the					25.00000000 GHz
-70.0					
Start 2.48 GHz				Stop 25.00 GHz	CF Step
#Res BW 100 kHz	#VBW 300	) kH7	Sween 2	2.152 s (30000 pts)	2.251650000 GHz
			· ·		<u>Auto</u> Man
MKR MODE TRC SCL X		Y FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	
1 N 1 f 2	.596 8 GHz -43.	222 dBm			
3					Freq Offset
4					0 Hz
5					
7					
8					
10					
11				•	
MSG			STATUS		

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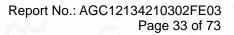
 Tel: +86-755 2523 4088
 E-mail: agc@agc-cert.com
 Web: http://cn.agc-cert.com/



Agilent Spectrum Analyzer - Swep		OTHOT INT		10:05:07 AM Mar 16, 2021	
Center Freq 2.4800	2 AC CORREC 00000 GHz	SENSE:INT	ALIGN AUTO Avg Type: Log-Pwr	TRACE 1 2 3 4 5 6	Frequency
•	PNO: Wide 🔸 IFGain:Low	' Trig: Free Run Atten: 30 dB	Avg Hold: 10/10	TYPE M WAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	
			Mkr1 2	479 975 6 GHz	Auto Tune
10 dB/div Ref 20.00	dBm			3.085 dBm	
Log		. 1			
10.0					Center Freq
0.00					2.480000000 GHz
-10.0			Marken and Mark		
-20.0					Start Freq
-30.0	- and -				2.478500000 GHz
-40.0				and the second second second second	
-50.0					Stop Freq
-60.0					2.481500000 GHz
-70.0					
Center 2.480000 GHz	2			Span 3.000 MHz	CF Step
#Res BW 100 kHz	#VBW	300 kHz	Sweep 2.0	100 ms (30000 pts)	300.000 kHz Auto Man
MKR MODE TRC SCL	×		JNCTION FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Man
1 N 1 f	2.479 975 6 GHz	3.085 dBm			En a Offensk
3 4					Freq Offset 0 Hz
5					0112
6 7					
8					
10					
MSG			STATUS		
Agilent Spectrum Analyzer - Swep					
<b>LX/</b> R RF 50 Ω	Ω AC CORREC	SENSE:INT	ALIGNAUTO Avg Type: Log-Pwr	10:05:16 AM Mar 16, 2021 TRACE 123456	Frequency
	2 AC CORREC 00000 GHz PN0: Fast ↔	Trig: Free Run		10:05:16 AM Mar 16, 2021 TRACE 1 2 3 4 5 6 TYPE Mwwwww DET P N N N N N	Frequency
<b>LX/</b> R RF 50 Ω	2 AC CORREC 00000 GHz		Avg Type: Log-Pwr Avg Hold: 10/10	TRACE 123456 TYPE MWWWW DET PNNNNN	Frequency Auto Tune
IXI         R         RF         50 \$           Center Freq 1.2150	2 AC CORREC 000000 GHz PN0: Fast +++ IFGain:Low	Trig: Free Run	Avg Type: Log-Pwr Avg Hold: 10/10	10:05:16 AM Mar 16, 2021 TRACE 12 3 4 5 6 TYPE MUNANNE DET PNNNNN 1 2.324 00 GHz -48.474 dBm	
IX         R         RF         50 G           Center Freq 1.2150           10 dB/div         Ref 20.00	2 AC CORREC 000000 GHz PN0: Fast +++ IFGain:Low	Trig: Free Run	Avg Type: Log-Pwr Avg Hold: 10/10	TRACE 123456 TYPE MWWWW DET PNNNNN 1 2.324 00 GHz	Auto Tune
IXI R         RF         50 G           Center Freq 1.2150           10 dB/div         Ref 20.00           10 dB/div         Ref 20.00	2 AC CORREC 000000 GHz PN0: Fast +++ IFGain:Low	Trig: Free Run	Avg Type: Log-Pwr Avg Hold: 10/10	TRACE 123456 TYPE MWWWW DET PNNNNN 1 2.324 00 GHz	Auto Tune Center Freq
IX         R         RF         50 G           Center Freq 1.2150           10 dB/div         Ref 20.00           10 0         0	2 AC CORREC 000000 GHz PN0: Fast +++ IFGain:Low	Trig: Free Run	Avg Type: Log-Pwr Avg Hold: 10/10	TRACE 123456 TYPE MWWWW DET PNNNNN 1 2.324 00 GHz	Auto Tune
XX         R         RF         50 G           Center Freq 1.2150           10 dB/div         Ref 20.00           10 0         0         0           10 0         0         0           10 0         0         0           10 0         0         0	2 AC CORREC 000000 GHz PN0: Fast +++ IFGain:Low	Trig: Free Run	Avg Type: Log-Pwr Avg Hold: 10/10	TRACE 123456 TYPE MWWWW DET PNNNNN 1 2.324 00 GHz	Auto Tune Center Freq
IX         RF         50.0           Center Freq 1.2150           10 dB/div         Ref 20.00           10 0	2 AC CORREC 000000 GHz PN0: Fast +++ IFGain:Low	Trig: Free Run	Avg Type: Log-Pwr Avg Hold: 10/10	TRACE []] 23 45 6 TYPE M	Auto Tune Center Freq 1.215000000 GHz
IXI         RF         50.0           Center Freq 1.2150           10 dB/div         Ref 20.00           10.0	2 AC CORREC 000000 GHz PN0: Fast +++ IFGain:Low	Trig: Free Run	Avg Type: Log-Pwr Avg Hold: 10/10	TRACE []] 23 45 6 TYPE M	Auto Tune Center Freq 1.215000000 GHz
IXI         RF         50.0           Center Freq 1.2150           IO         Ref 20.00	2 AC CORREC 000000 GHz PN0: Fast +++ IFGain:Low	Trig: Free Run	Avg Type: Log-Pwr Avg Hold: 10/10	TRACE []] 23 45 6 TYPE M	Auto Tune Center Freq 1.21500000 GHz Start Freq
IX         RF         50.0           Center Freq 1.2150           IO         Ref 20.00	2 AC CORREC 000000 GHz PN0: Fast +++ IFGain:Low	Trig: Free Run	Avg Type: Log-Pwr Avg Hold: 10/10	TRACE []] 23 45 6 TYPE M	Auto Tune Center Freq 1.21500000 GHz Start Freq 30.000000 MHz
IX         R         RF         50 G           Center Freq 1.2150           Io dB/div         Ref 20.00           Io d         Io d           Io d         Io d         Io d           Io d         Io d         Io d         Io d           Io d         Io d         Io d         Io d           Io d         Io d         Io d         Io d           Io d         Io d         Io d <thi< th=""><th>AC CORREC 00000 GHZ PNO: Fast →→ IFGain:Low dBm</th><th>Trig: Free Run Atten: 30 dB</th><th>Avg Type: Log-Pwr Avg Hold: 10/10 Mkr</th><th>TRACE []] 23 45 6 TYPE M</th><th>Auto Tune Center Freq 1.21500000 GHz Start Freq 30.000000 MHz</th></thi<>	AC CORREC 00000 GHZ PNO: Fast →→ IFGain:Low dBm	Trig: Free Run Atten: 30 dB	Avg Type: Log-Pwr Avg Hold: 10/10 Mkr	TRACE []] 23 45 6 TYPE M	Auto Tune Center Freq 1.21500000 GHz Start Freq 30.000000 MHz
IX         R         RF         50.0           Center Freq 1.2150           I0         B/div         Ref 20.00           10         Content of the second s	AC CORREC 00000 GHZ PN0: Fast +++ IFGain:Low dBm	Trig: Free Run Atten: 30 dB	Avg Type: Log-Pwr Avg Hold: 10/10	TRACE []] 23 45 6 TYPE M	Auto Tune Center Freq 1.21500000 GHz Start Freq 30.000000 MHz Stop Freq
IV         R         RF         50.0           Center Freq 1.2150           10 dB/div         Ref 20.00           100         0         0           100         0         0         0           100         0         0         0         0           100         0         0         0         0         0           100         0         0         0         0         0         0           100         <	AC CORREC 00000 GHZ PNO: Fast →→ IFGain:Low dBm	Trig: Free Run Atten: 30 dB	Avg Type: Log-Pwr Avg Hold: 10/10 Mkr	TRACE D 2 4 5 6 Type MAXMOUNT (1 2.3224 00 GHz -48.474 dBm -16.92 dBm -16.92 dBm -11.92	Auto Tune Center Freq 1.21500000 GHz Start Freq 30.000000 MHz Stop Freq 2.400000000 GHz CF Step
XX         RF         50 G           Center Freq 1.2150           10 dB/div         Ref 20.00           10 0         0           10 0         0           10 0         0           10 0         0           10 0         0           10 0         0           10 0         0           10 0         0           10 0         0           10 0         0           10 0         0           10 0         0           10 0         0           20 0         0           40 0         0           40 0         0           40 0         0           10 0         0           10 0         0           10 0         0           10 0         0           10 0         0           10 0         0           10 0         0           10 0         0           10 0         0           10 0         0           10 0         0           10 0         0           10 0           10 0         0	AC CORREC OOODO GH2 PNO: Fast IFGain:Low dBm	Trig: Free Run Atten: 30 dB	Avg Type: Log-Pwr Avg Hold: 10/10 Mkr	TRACE D 2 4 5 6 TYPE MAXMOUNT OFT PINNINN 1 2.324 00 GHz -48.474 dBm -16.92 dBm -16.92 dBm -1 -16.92 dBm -1 -16.92 dBm -1 -10 4 dBm	Auto Tune Center Freq 1.21500000 GHz Start Freq 30.000000 MHz Stop Freq 2.400000000 GHz CF Step 237.000000 MHz
IV         R         RF         50.0           Center Freq 1.2150         Image: Center Freq 1.2150         Image: Center Freq 1.2150           10         Image: Center Freq 1.2150         Image: Center Freq 1.2150           10         Image: Center Freq 1.2150         Image: Center Freq 1.2150           10         Image: Center Freq 1.2150         Image: Center Freq 1.2150           10         Image: Center Freq 1.2150         Image: Center Freq 1.2150           10         Image: Center Freq 1.2150         Image: Center Freq 1.2150           10         Image: Center Freq 1.2150         Image: Center Freq 1.2150           10         Image: Center Freq 1.2150         Image: Center Freq 1.2150           10         Image: Center Freq 1.2150         Image: Center Freq 1.2150           10         Image: Center Freq 1.2150         Image: Center Freq 1.2150           10         Image: Center Freq 1.2150         Image: Center Freq 1.2150           10         Image: Center Freq 1.2150         Image: Center Freq 1.2150           10         Image: Center Freq 1.2150         Image: Center Freq 1.2150           10         Image: Center Freq 1.2150         Image: Center Freq 1.2150           10         Image: Center Freq 1.2150         Image: Center Freq 1.2150           10         Image: Cente	AC CORREC OOODO GHZ PRO: Fast + IFGain:Low dBm 	Trig: Free Run Atten: 30 dB	Avg Type: Log-Pwr Avg Hold: 10/10 Mkr	TRACE D 2 4 5 6 Type MAXMOUNT (1 2.3224 00 GHz -48.474 dBm -16.92 dBm -16.92 dBm -11.92	Auto Tune Center Freq 1.21500000 GHz Start Freq 30.000000 MHz Stop Freq 2.400000000 GHz CF Step
IV         R         RF         50 G           Center Freq 1.2150           10 dB/div         Ref 20.00           -20 d	AC CORREC OOODO GHZ PRO: Fast + IFGain:Low dBm 	Trig: Free Run Atten: 30 dB	Avg Type: Log-Pwr Avg Hold: 10/10 Mkr	TRACE [] 2 3 4 5 6 Type MAXMOUNT OFF PARTICIPATION NAME 1 2.3224 00 GHz -48.474 dBm -16 92 dBm -16 92 dBm -1 -16 92 dBm -1 -16 92 dBm -1 -1 -16 92 dBm -1 -1 -1 -16 92 dBm -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1	Start Freq           30.00000 GHz           Start Freq           30.000000 MHz           Stop Freq           2.400000000 GHz           CF Step           237.000000 MHz           Auto           Man
IM         RF         SO G           Center Freq 1.2150         Center Freq 1.2150           10 dB/div         Ref 20.00           10 d         Center Freq 1.2150           10 dB/div         Ref 20.00           10 d         Center Freq 1.2150           10 dB/div         Ref 20.00           10 d         Center Freq 1.2150           10 dB/div         Ref 20.00           10 dB/div         Ref 20.00           20 0         Center Freq 1.2150           -20 0         Center Freq 1.2150           -40 0         Center Freq 1.2150           -20 0         Center Freq 1.2150           -40 0         Center Freq 1.2150           -20 0 <th>AC CORREC OOODO GHZ PRO: Fast + IFGain:Low dBm </th> <th>Trig: Free Run Atten: 30 dB</th> <th>Avg Type: Log-Pwr Avg Hold: 10/10 Mkr</th> <th>TRACE [] 2 3 4 5 6 Type MAXMOUNT OFF PARTICIPATION NAME 1 2.3224 00 GHz -48.474 dBm -16 92 dBm -16 92 dBm -1 -16 92 dBm -1 -16 92 dBm -1 -1 -16 92 dBm -1 -1 -1 -16 92 dBm -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1</th> <th>Auto Tune</th>	AC CORREC OOODO GHZ PRO: Fast + IFGain:Low dBm 	Trig: Free Run Atten: 30 dB	Avg Type: Log-Pwr Avg Hold: 10/10 Mkr	TRACE [] 2 3 4 5 6 Type MAXMOUNT OFF PARTICIPATION NAME 1 2.3224 00 GHz -48.474 dBm -16 92 dBm -16 92 dBm -1 -16 92 dBm -1 -16 92 dBm -1 -1 -16 92 dBm -1 -1 -1 -16 92 dBm -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1	Auto Tune
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IM         RF         50 G           Center Freq 1.2150           10 dB/div         Ref 20.00	AC CORREC OOODO GHZ PRO: Fast + IFGain:Low dBm 	Trig: Free Run Atten: 30 dB	Avg Type: Log-Pwr Avg Hold: 10/10 Mkr	TRACE [] 2 3 4 5 6 Type MAXMOUNT OFF PARTICIPATION NAME 1 2.3224 00 GHz -48.474 dBm -16 92 dBm -16 92 dBm -1 -16 92 dBm -1 -16 92 dBm -1 -1 -16 92 dBm -1 -1 -1 -16 92 dBm -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1	Auto Tune
IX         R         RF         50 G           Center Freq 1.2150           IO         Ref 20.00           IO         IO         IO           IO         Ref 20.00         IO           IO         IO         IO         IO           IOO         IOO         IOO         IOO         IOO           IOO         IOO         IOO	AC CORREC OOODO GHZ PRO: Fast + IFGain:Low dBm 	Trig: Free Run Atten: 30 dB	Avg Type: Log-Pwr Avg Hold: 10/10 Mkr	TRACE [] 2 3 4 5 6 Type MAXMOUNT OFF PARTICIPATION NAME 1 2.3224 00 GHz -48.474 dBm -16 92 dBm -16 92 dBm -1 -16 92 dBm -1 -16 92 dBm -1 -1 -16 92 dBm -1 -1 -1 -16 92 dBm -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1	Auto Tune
IM         RF         50 G           Center Freq 1.2150           Conter Freq 1.215	AC CORREC OOODO GHZ PRO: Fast + IFGain:Low dBm 	Trig: Free Run Atten: 30 dB	Avg Type: Log-Pwr Avg Hold: 10/10 Mkr	TRACE [] 2 3 4 5 6 Type MAXMOUNT OFF PARTICIPATION NAME 1 2.3224 00 GHz -48.474 dBm -16 92 dBm -16 92 dBm -1 -16 92 dBm -1 -16 92 dBm -1 -1 -16 92 dBm -1 -1 -1 -16 92 dBm -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1	Auto Tune
IX         R         RF         50 G           Center Freq 1.2150           IO         Ref 20.00           IO         IO         IO           IO         Ref 20.00         IO           IO         IO         IO         IO           IOO         IOO         IOO         IOO         IOO           IOO         IOO         IOO	AC CORREC OOODO GHZ PRO: Fast + IFGain:Low dBm 	Trig: Free Run Atten: 30 dB	Avg Type: Log-Pwr Avg Hold: 10/10 Mkr	TRACE [] 2 3 4 5 6 Type MAXMOUNT OFF PARTICIPATION NAME 1 2.3224 00 GHz -48.474 dBm -16 92 dBm -16 92 dBm -1 -16 92 dBm -1 -16 92 dBm -1 -1 -16 92 dBm -1 -1 -1 -16 92 dBm -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1	Auto Tune Center Freq 1.21500000 GHz Start Freq 30.000000 MHz Stop Freq 2.400000000 GHz CF Step 237.000000 MHz

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

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Agilent Spe	ctrum An	alyz		SA											
L <mark>XI</mark> R		RF	50 Ω		CORREC		SE	NSE:INT			ALIGN AUTO		M Mar 16, 2021	Ero	quency
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Note: The GFSK modulation is the worst case and only those data recorded in the report.

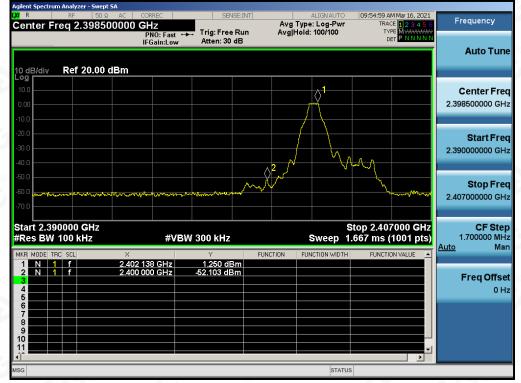
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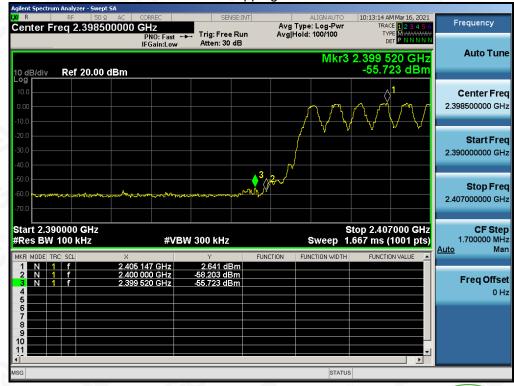
#### TEST RESULT FOR BAND EDGE

#### GFSK MODULATION IN LOW CHANNEL

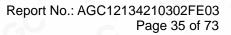
Hopping off



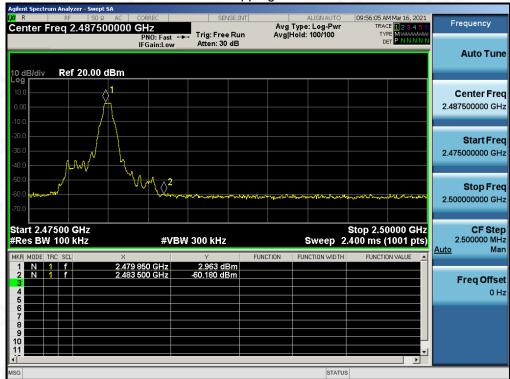
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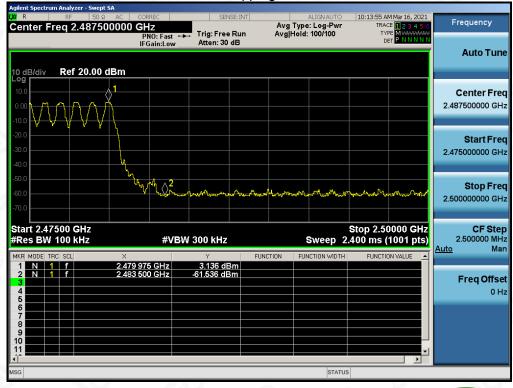




# GFSK MODULATION IN HIGH CHANNEL

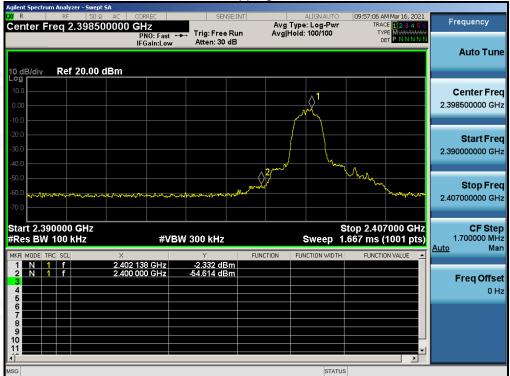
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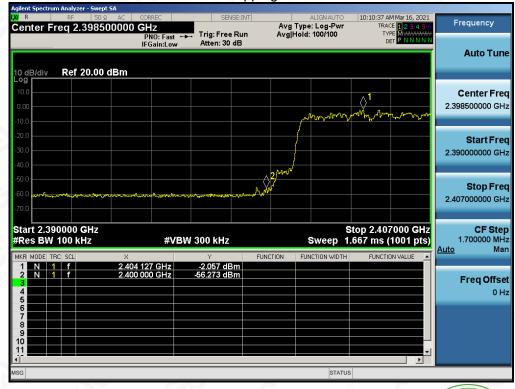




# $\pi$ /4-DQPSK MODULATION IN LOW CHANNEL

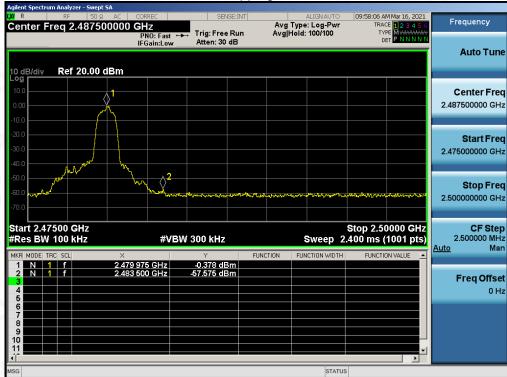
Hopping off

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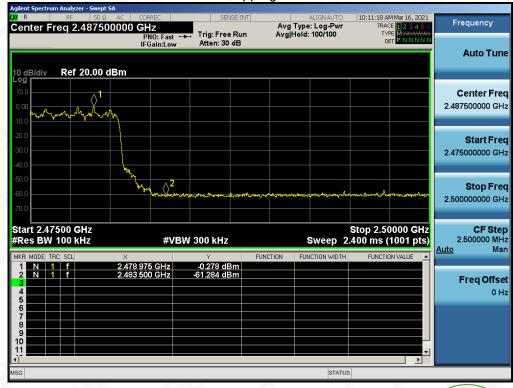




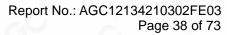
# $\pi~$ /4-DQPSK MODULATION IN HIGH CHANNEL

Hopping off

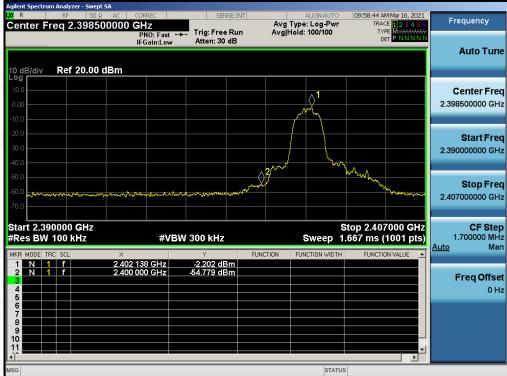
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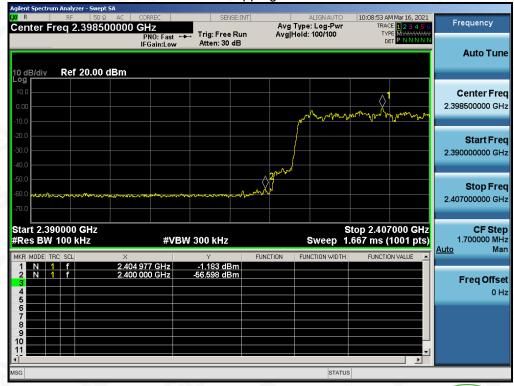




# 8-DPSK MODULATION IN LOW CHANNEL

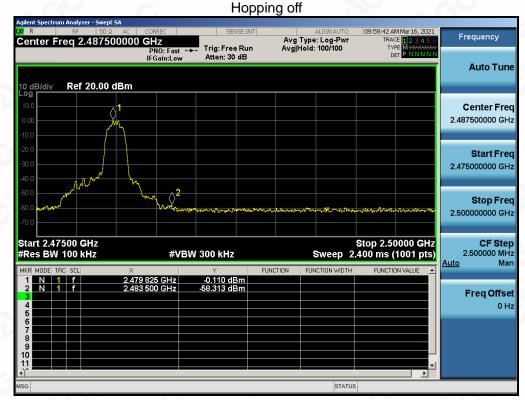
Hopping off

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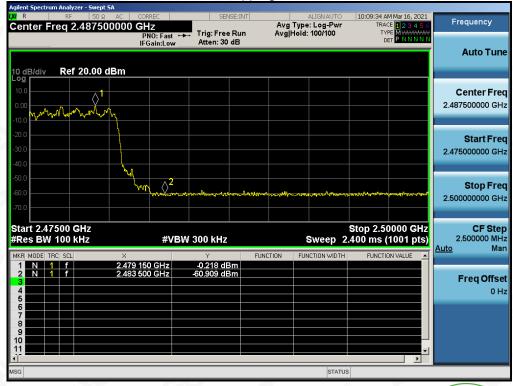
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# 8-DPSK MODULATION IN HIGH CHANNEL

Hopping on



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

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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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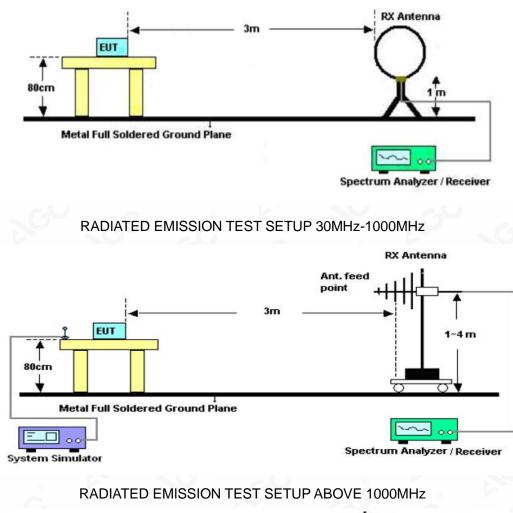
 Attestation of Global Compliance(Shenzhen)Std & Tech Co., Ltd

 Tel: +86-755 2523 4088
 E-mail: agc@agc-cert.com

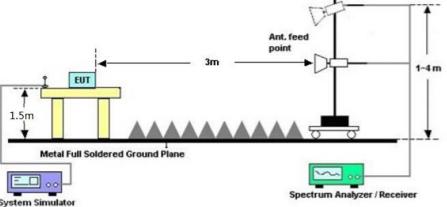


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#### **10.2. TEST SETUP**



Radiated Emission Test-Setup Frequency Below 30MHz



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Attestation of Global Compliance(Shenzhen)Co., Ltd Attestation of Global Compliance(Shenzhen)Std & Tech Co., Ltd Tel: +86-755 2523 4088 E-mail: agc@agc-cert.com Web: http://cn.agc-cert.com/

#### **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.

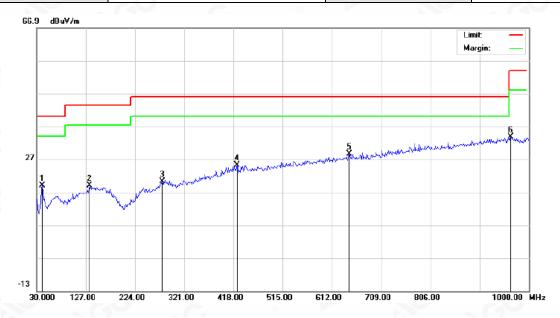
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## **RADIATED EMISSION BELOW 1GHz**

EUT	Bluetooth Receiver	Model Name	A201
Temperature	21.8°C	Relative Humidity	58%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 4	Antenna	Horizontal



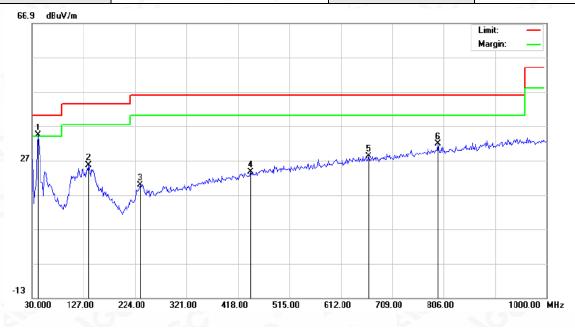
No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		41.3167	4.16	14.91	19.07	40.00	-20.93	peak
2		133.4667	0.15	18.82	18.97	43.50	-24.53	peak
3		277.3500	0.48	19.72	20.20	46.00	-25.80	peak
4		424.4667	1.74	23.47	25.21	46.00	-20.79	peak
5	*	645.9500	1.13	27.50	28.63	46.00	-17.37	peak
6		964.4333	1.65	32.25	33.90	54.00	-20.10	peak

# **RESULT: PASS**

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EUT	Bluetooth Receiver	Model Name	A201
Temperature	21.8°C	Relative Humidity	58%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 4	Antenna	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1	*	41.3167	19.54	14.91	34.45	40.00	-5.55	peak
2		136.7000	6.61	19.02	25.63	43.50	-17.87	peak
3		233.7000	2.27	17.58	19.85	46.00	-26.15	peak
4		442.2500	-0.21	23.83	23.62	46.00	-22.38	peak
5		663.7333	0.43	27.71	28.14	46.00	-17.86	peak
6		794.6833	1.58	30.29	31.87	46.00	-14.13	peak

## **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.

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### Report No.: AGC12134210302FE03 Page 46 of 73

# **RADIATED EMISSION ABOVE 1GHz**

EUT	Bluetooth Receiver	Model Name	A201
Temperature	21.8°C	Relative Humidity	58%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 1	Antenna	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4804.000	45.93	0.08	46.01	74	-27.99	peak
4804.000	37.54	0.08	37.62	54	-16.38	AVG
7206.000	40.27	2.21	42.48	74	-31.52	peak
7206.000	32.45	2.21	34.66	54	-19.34	AVG
				c.C		
			(R)			
emark:						

EUT	Bluetooth Receiver	Model Name	A201
Temperature	21.8°C	Relative Humidity	58%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 1	Antenna	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4804.000	44.58	0.08	44.66	74	-29.34	peak
4804.000	36.16	0.08	36.24	54	-17.76	AVG
7206.000	39.45	2.21	41.66	74	-32.34	peak
7206.000	30.13	2.21	32.34	54	-21.66	AVG
	8			50	G	
emark:	<u> </u>	e e				0
actor = Anter	nna Factor + Cabl	e Loss – Pre-a	mplifier.	8		. 6

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#### Report No.: AGC12134210302FE03 Page 47 of 73

EUT	Bluetooth Receiver	Model Name	A201
Temperature	21.8°C	Relative Humidity	58%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 2	Antenna	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4882.000	45.27	0.14	45.41	74	-28.59	peak
4882.000	38.48	0.14	38.62	54	-15.38	AVG
7323.000	41.25	2.36	43.61	74	-30.39	peak
7323.000	34.56	2.36	36.92	54	-17.08	AVG
0				®		
					0	

EUT	Bluetooth Receiver	Model Name	A201
Temperature	21.8°C	Relative Humidity	58%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 2	Antenna	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4882.000	45.93	0.14	46.07	74	-27.93	peak
4882.000	37.49	0.14	37.63	54	-16.37	AVG
7323.000	40.27	2.36	42.63	74	-31.37	peak
7323.000	31.45	2.36	33.81	54	-20.19	AVG
8						
C	8				C	R
emark:		8				<u> </u>
actor = Anter	nna Factor + Cable	loss – Pre-	amplifier			

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#### Report No.: AGC12134210302FE03 Page 48 of 73

EUT	Bluetooth Receiver	Model Name	A201
Temperature	21.8°C	Relative Humidity	58%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 3	Antenna	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4960.000	46.29	0.22	46.51	74	-27.49	peak
4960.000	38.25	0.22	38.47	54	-15.53	AVG
7440.000	41.07	2.64	43.71	74	-30.29	peak
7440.000	32.65	2.64	35.29	54	-18.71	AVG
8				0		
emark:	- 6	3		NO <sup>C</sup>	G	8
actor = Anter	nna Factor + Cable	Loss - Pre-	amplifier.			- G

EUT	Bluetooth Receiver	Model Name	A201
Temperature	21.8°C	Relative Humidity	58%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 3	Antenna	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4960.000	45.28	0.22	45.5	74	-28.5	peak
4960.000	38.14	0.22	38.36	54	-15.64	AVG
7440.000	41.06	2.64	43.7	74	-30.3	peak
7440.000	33.53	2.64	36.17	54	-17.83	AVG
		CC .	0	8		ΘΥ.
emark:	8			. Ci	8	

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

# **RESULT: PASS**

Note:

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

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

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

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

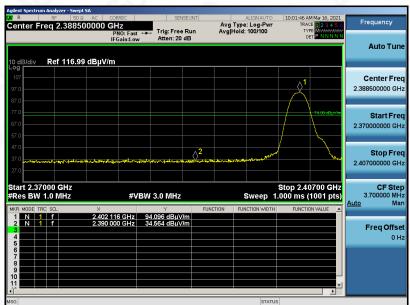
Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the Sedicated Pesting/Inspection Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the written 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 15days after the issuence of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc@agc-cert.com.



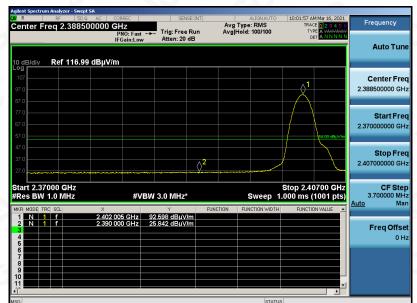
TEST RESOLTTOR RESTRICTED BANDS REQUIREMENTS				
EUT	Bluetooth Receiver	Model Name	A201	
Temperature	21.8°C	Relative Humidity	58%	
Pressure	960hPa	Test Voltage	Normal Voltage	
Test Mode	Mode 1	Antenna	Horizontal	

#### TEST RESULT FOR RESTRICTED BANDS REQUIREMENTS

ΡK



AV



#### **RESULT: PASS**

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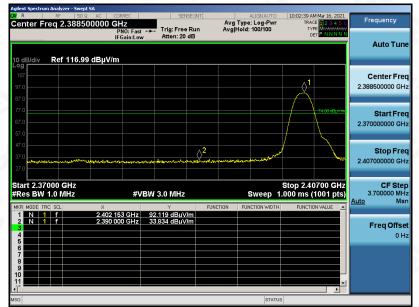
Attestation of Global Compliance(Shenzhen)Co., Ltd Attestation of Global Compliance(Shenzhen)Std & Tech Co., Ltd Tel: +86-755 2523 4088 E-mail: agc@agc-cert.com Web: http://cn.agc-cert.com/



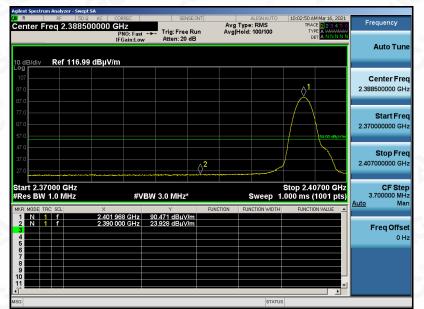
#### Report No.: AGC12134210302FE03 Page 50 of 73

EUT	Bluetooth Receiver	Model Name	A201
Temperature	21.8°C	Relative Humidity	58%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 1	Antenna	Vertical

PK



AV



**RESULT: PASS** 

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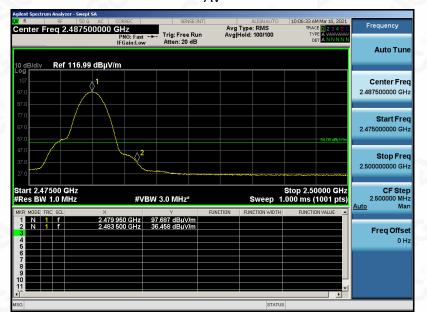


#### Report No.: AGC12134210302FE03 Page 51 of 73

EUT	Bluetooth Receiver	Model Name	A201
Temperature	21.8°C	Relative Humidity	58%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 3	Antenna	Horizontal

PK Frequency enter Freq 2.487500000 GHz Avg Type: Log-Pw Avg|Hold: 100/100 Trig: Free Run Atten: 20 dB PNO: Fast +++ IFGain:Low Auto Tun Ref 116.99 dBµV/m Center Fred 2.487500000 GH; Start Freq 2.475000000 GHz Stop Free 2.50000000 GH CF Step 2.500000 MH 2.47500 GHz BW 1.0 MHz #VBW 3.0 MHz Sween 2.479 800 GHz 99.407 dBµV/m 2.483 500 GHz 46.206 dBµV/m Freq Offse 0 H;





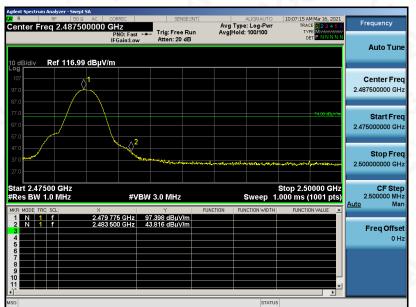
**RESULT: PASS** 

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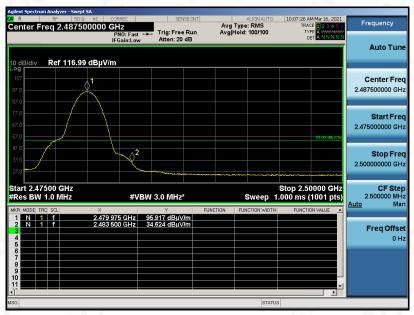
#### Report No.: AGC12134210302FE03 Page 52 of 73

EUT	Bluetooth Receiver	Model Name	A201
Temperature	21.8°C	Relative Humidity	58%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 3	Antenna	Vertical



PK

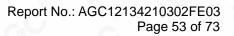
AV



#### **RESULT: PASS**

**Note**: The factor had been edited in the "Input Correction" of the Spectrum Analyzer. The GFSK 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  $\geq$  RBW. Sweep: Auto. Detector function: Peak. Trace: Max hold.

4. Allow the trace to stabilize.

#### **11.2. TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)**

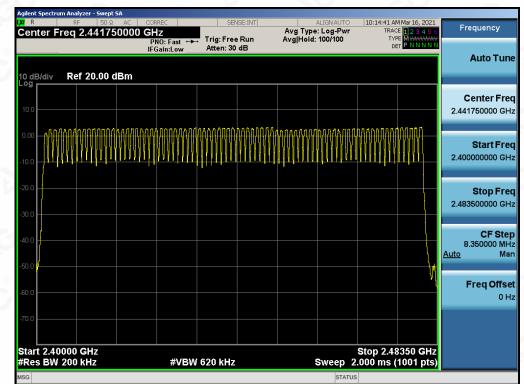
Same as described in section 8.2

#### **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  $\leq$  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	2.893	26*4	300.872	400
Middle	2.894	27*4	312.552	400
High	2.893	27*4	312.444	400

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

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#### 10:14:51 AM Mar 16, 2021 Frequency Trig Delay-2.000 ms Trig: Video Atten: 30 dB Center Freq 2.402000000 GHz Avg Type: Log-Pwr PNO: Fast IFGain:Low Auto Tune 2.317 ms 1.31 dBm Mkr' 10 dB/div Ref 20.00 dBm **Center Freq** 2.402000000 GHz -3.00 dB Start Fred 2.893 ms 2.40200000 GHz Stop Freq 2.402000000 GHz CF Step 1.000000 MHz <u>Auto</u> Man فاستعط لافاس والموال المواسلة الاعمر فسترك فرائدا ويروا والمراد الأطرار Freq Offset 0 Hz Center 2.402000000 GHz Res BW 1.0 MHz Span 0 Hz Sweep 8.000 ms (30000 pts) #VBW 3.0 MHz G 🗼 Points changed; all traces cleared STATUS 10:15:01 AM Mar 16, 2021 Center Freq 2.402000000 GHz Fast IFGain:Low Frequency Avg Type: Log-Pwr Trig: Free Run Atten: 30 dB TYPE W Auto Tune 10 dB/div Ref 20.00 dBm Center Frea 2.402000000 GHz Start Freq 2.402000000 GHz Stop Freq 2.40200000 GHz **CF** Step 1.000000 MHz Auto Mar **Freq Offset** 0 Hz Center 2.402000000 GHz Res BW 1.0 MHz Span 0 Hz Sweep 7.902 s (30000 pts) #VBW 3.0 MHz File <image.png> saved

## TEST PLOT OF LOW CHANNEL

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 Attestation of Global Compliance(Shenzhen)Co., Ltd

 Attestation of Global Compliance(Shenzhen)Std & Tech Co., Ltd

 Tel: +86-755 2523 4088
 E-mail: agc@agc-cert.com