

Shenzhen Zhongjian Nanfang Testing Co., Ltd.

Report No: CCISE191004501

FCC REPORT

Applicant: Baicells Technologies Co., Ltd.

Address of Applicant: 3F, Hui Yuan Development Building, No.1 Shangdi Information

Industry Base, Haidian Dist., Beijing, China

Equipment Under Test (EUT)

Product Name: USB Dongle

Model No.: u4G-UE1305

FCC ID: 2AG32U4GUE1305

Applicable standards: FCC CFR Title 47 Part 25 Subpart B(Section 25.149)

Date of sample receipt: 24 Jul., 2019

Date of Test: 24 Jul., to 20 Oct., 2019

Date of report issued: 21 Oct., 2019

Test Result: PASS *

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



Bruce Zhang Laboratory Manager

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the CCIS product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



Project No.: CCISE1910045



2 Version

Version No.	Date	Description		
00	21 Oct., 2019	Original		
Remark: Part of the report refers to module data, The module original FCC ID: 2AG32EM2148M.				

Tested by:

Carry Chen Date: 21 Oct., 2019

Test Engineer

Reviewed by: Date: 21 Oct., 2019

Project Engineer

Shenzhen Zhongjian Nanfang Testing Co., Ltd.
No. B-C, 1/F., Building 2, Laodong No.2 Industrial Park, Xixiang Road,
Bao'an District, Shenzhen, Guangdong, China

Telephone: +86 (0) 755 23118282 Fax: +86 (0) 755 23116366 Page 2 of 29



3 Contents

		Page
1 CC	OVER PAGE	1
2 VE	ERSION	2
3 C	ONTENTS	3
	EST SUMMARY	_
5 GI	ENERAL INFORMATION	5
5.1	CLIENT INFORMATION	5
5.2	GENERAL DESCRIPTION OF E.U.T	5
5.3	TEST MODE	
5.4	DESCRIPTION OF SUPPORT UNITS	6
5.5	MEASUREMENT UNCERTAINTY	
5.6	LABORATORY FACILITY	6
5.7	LABORATORY LOCATION	6
5.8	TEST INSTRUMENTS LIST	7
6 SY	YSTEM TEST CONFIGURATION	8
6.1	EUT CONFIGURATION	8
6.2	EUT Exercise	8
6.3	DESCRIPTION OF TEST MODES	8
6.4	CONDUCTED OUTPUT POWER	9
6.5	OCCUPY BANDWIDTH	12
6.6	Power Spectral Density	13
6.7	BAND EDGE	14
6.8	CONDUCTED SPURIOUS EMISSION	_
6.9	RADIATED SPURIOUS EMISSION METHOD	16
6.10	FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT	
6.11	FREQUENCY STABILITY V.S. VOLTAGE MEASUREMENT	21
7 TE	EST SETUP PHOTO	22
8 FI	IT CONSTRUCTIONAL DETAILS	23



4 Test Summary

Test Items	Section in CFR 47	Result
Output Power	25.149 (c)(4)(iii)	Pass
Modulation Characteristics	Part 2.1047	Pass*
6dB Emission Bandwidth 99% Occupied Bandwidth -26dB Bandwidth	25.149 (c)(4)(ii)(vii)	Pass*
Power Spectral Density	25.149 (c)(4)(iv)	Pass*
Band Edge	25.149 (c)(4)(v)(vi)(vii)	Pass*
Spurious Emission	25.149 (c)(4)(v)(vi)	Pass
Frequency stability vs. temperature	N/A	Pass*
Frequency stability vs. voltage	N/A	Pass*

All measurement data were performed in accordance with ANSI C63.26: 2015 and KDB 971168 D01v03r01 of test method.

Remark:

- 1. Pass*: please refer to the FCC ID: 2AG32EM2148M.
- 2. Pass: The EUT complies with the essential requirements in the standard.
- 3. N/A: Not Applicable.



5 General Information

5.1 Client Information

Applicant:	Baicells Technologies Co., Ltd.	
Address:	3F, Hui Yuan Development Building, No.1 Shangdi Information Industry Base, Haidian Dist., Beijing, China	
Manufacturer:	Baicells Technologies Co., Ltd.	
Address:	3F, Hui Yuan Development Building, No.1 Shangdi Information Industry Base, Haidian Dist., Beijing, China	

5.2 General Description of E.U.T.

Product Name:	USB Dongle	
Model No.:	u4G-UE1305	
Operation Frequency:	Band 53: 2483.5MHz~2495.0MHz	
Modulation technology:	QPSK, 16QAM	
Antenna Type:	External antenna ("N" type)	
Antenna gain:	3.0 dBi	

Test Channel:

Band53

5MHz		10MHz		
Channel:	Frequency (MHz)	Channel:	Frequency (MHz)	
Lowest	2486.0	Lowest	2488.5	
Middle	2489.0	Middle	2489.0	
Highest	2492.5	Highest	2490.0	



5.3 Test mode

Data mode (QPSK)	Keep the EUT in data communicating mode (QPSK). (5MHz, 10MHz)
Data mode (16QAM)	Keep the EUT in data communicating mode (16QAM).

Report No: CCISE191004501

5.4 Description of Support Units

N/A

5.5 Measurement Uncertainty

	-
Parameters	Expanded Uncertainty
Radiated Emission (9kHz ~ 30MHz)	±3.12 dB (k=2)
Radiated Emission (30MHz ~ 1000MHz)	±4.32 dB (k=2)
Radiated Emission (1GHz ~ 18GHz)	±5.38 dB (k=2)
Radiated Emission (18GHz ~ 40GHz)	±3.36 dB (k=2)

5.6 Laboratory Facility

The test facility is recognized, certified, or accredited by the following organizations:

● FCC - Designation No.: CN1211

Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been accredited as a testing laboratory by FCC(Federal Communications Commission). The test firm Registration No. is 727551.

■ ISED – CAB identifier.: CN0021

The 3m Semi-anechoic chamber of Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.

CNAS - Registration No.: CNAS L6048

Shenzhen Zhongjian Nanfang Testing Co., Ltd. is accredited to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L6048.

A2LA - Registration No.: 4346.01

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 General requirements for the competence of testing and calibration laboratories. The test scope can be found as below link: https://portal.a2la.org/scopepdf/4346-01.pdf

5.7 Laboratory Location

Shenzhen Zhongjian Nanfang Testing Co., Ltd.

Address: No. B-C, 1/F., Building 2, Laodong No.2 Industrial Park, Xixiang Road,

Bao'an District, Shenzhen, Guangdong, China Tel: +86-755-23118282, Fax: +86-755-23116366

Email: info@ccis-cb.com, Website: http://www.ccis-cb.com

Shenzhen Zhongjian Nanfang Testing Co., Ltd.
No. B-C, 1/F., Building 2, Laodong No.2 Industrial Park, Xixiang Road,
Bao'an District, Shenzhen, Guangdong, China
Telephone: +86 (0) 755 23118282 Fax: +86 (0) 755 23116366





5.8 Test Instruments list

Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)	
3m SAC	SAEMC	9(L)*6(W)* 6(H)	CCIS0001	07-22-2017	07-21-2020	
BiConiLog Antenna	SCHWARZBECK	VULB9163	CCIS0005	02-25-2019	02-24-2020	
Horn Antenna	SCHWARZBECK	BBHA9120D	CCIS0006	02-25-2019	02-24-2020	
Pre-amplifier (10kHz-1.3GHz)	HP	8447D	CCIS0003	02-25-2019	02-24-2020	
Pre-amplifier (1GHz-18GHz)	Compliance Direction Systems Inc.	PAP-1G18	CCIS0011	02-25-2019	02-24-2020	
Pre-amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	02-25-2019	02-24-2020	
Horn Antenna	ETS-LINDGREN	3160	GTS217	02-25-2019	02-24-2020	
Spectrum analyzer 9k-30GHz	Rohde & Schwarz	FSP30	CCIS0023	02-25-2019	02-24-2020	
Spectrum Analyzer 20Hz-26.5GHz	Agilent	N9020A	MY50510123	02-25-2019	02-24-2020	
EMI Test Receiver	Rohde & Schwarz	ESRP7	CCIS0167	02-25-2019	02-24-2020	
Loop antenna	Laplace instrument	RF300	EMC0701	02-25-2019	02-24-2020	
Coaxial Cable	CCIS	N/A	CCIS0016	02-25-2019	02-24-2020	
Coaxial Cable	CCIS	N/A	CCIS0017	02-25-2019	02-24-2020	
Coaxial cable	CCIS	N/A	CCIS0018	02-25-2019	02-24-2020	
Coaxial Cable	CCIS	N/A	CCIS0019	02-25-2019	02-24-2020	
Coaxial Cable	CCIS	N/A	CCIS0087	02-25-2019	02-24-2020	
Signal Generator	Rohde & Schwarz	SMR 20	CCIS0024	02-25-2019	02-24-2020	
Signal Generator	Rohde & Schwarz	SMX	CCIS0064	02-25-2019	02-24-2020	
Signal Analyzer	Rohde & Schwarz	FSIQ3	CCIS0088	02-25-2019	02-24-2020	



Report No: CCISE191004501

6 System test configuration

6.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the commission's requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

6.2 EUT Exercise

The EUT (Transmitter) was operated in the engineering mode to fix the Tx frequency which was for the purpose of the measurements.

6.3 Description of Test Modes

The EUT has been tested under operating condition.

EUT staying in continuous transmitting mode. Channel Low, Mid and High for each type band with rated data rate were chosen for full testing.

The field strength of spurious radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for three modes with power adaptor, earphone and Data cable. The worst-case H mode.



6.4 Conducted Output Power

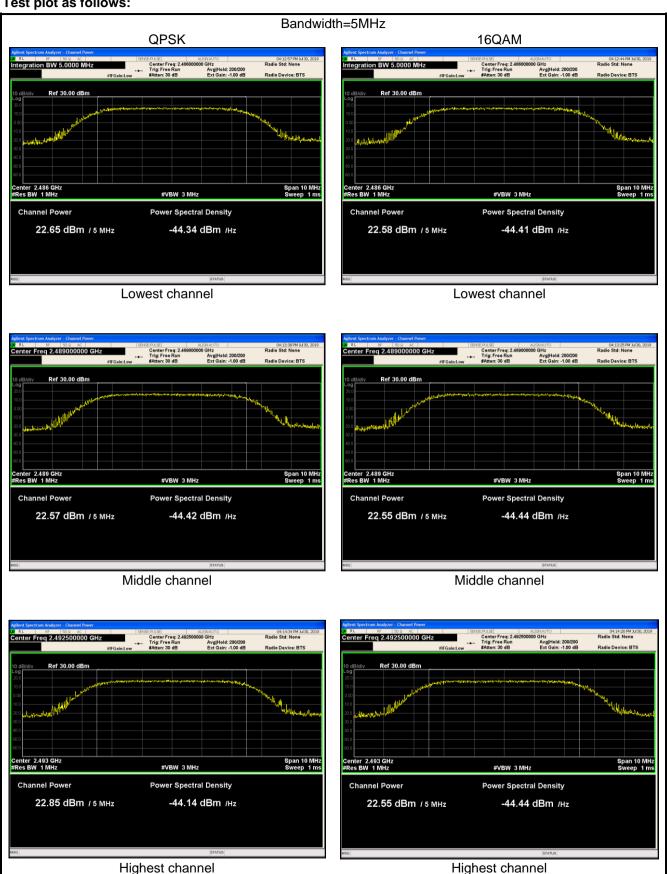
Test Requirement:	FCC Part 25 B Section 25.149 (c)(4)(iii)		
Test Method:	ANSI C63.26-2015 and KDB 971168		
Limit:	The maximum transmit power is no more than 1 W with a peak EIRP of no more than 6 dBw. EIRP Limit = $6 + 30 = 36$ dBm		
Test setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane		
Test Instruments:	Refer to section 5.8 for details		
Test mode:	Refer to section 5.3 for details		
Test results:	Passed		

Measurement Data:

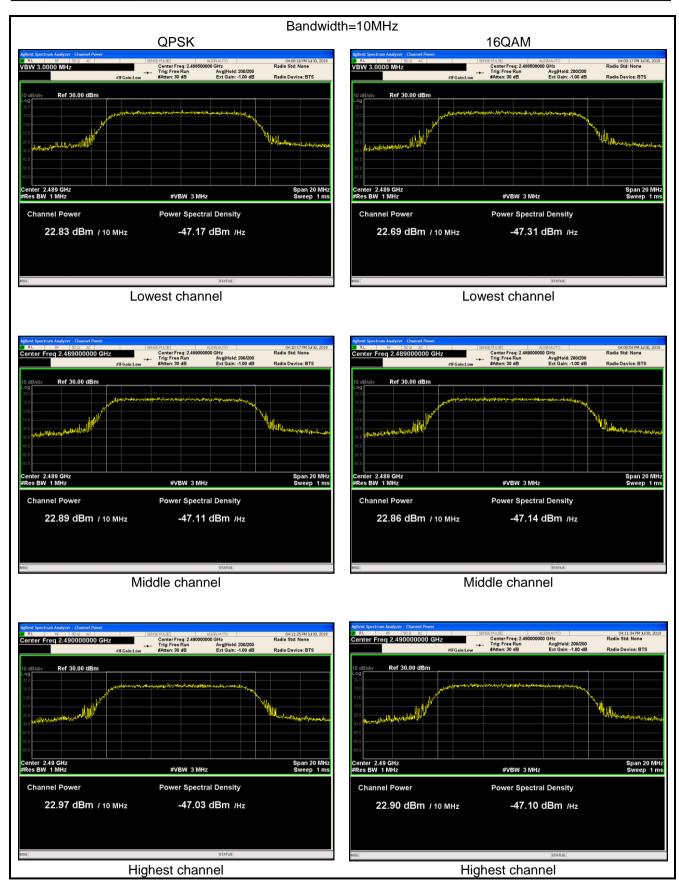
Bandwidth	Modulation	Frequency (MHz)	Output Power (dBm)	Output Power Limit(dBm)	Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Result
		2486.0	22.65	30.00	3	25.65	36.00	
	QPSK	2489.0	22.57	30.00	3	25.57	36.00	i
5.41.1		2492.5	22.85	30.00	3	25.85	36.00	
5MHz	16QAM	2486.0	22.58	30.00	3	25.58	36.00	
		2489.0	22.55	30.00	3	25.55	36.00	
		2492.5	22.55	30.00	3	25.55	36.00	Pass
		2488.5	22.83	30.00	3	25.83	36.00	
	QPSK	2489.0	22.89	30.00	3	25.89	36.00	
400411-		2490.0	22.97	30.00	3	25.97	36.00	
10MHz	16QAM	2488.5	22.69	30.00	3	25.69	36.00	
		2489.0	22.86	30.00	3	25.86	36.00	
		2490.0	22.90	30.00	3	25.90	36.00	
EIRP (dBm) = Average Power (dBm) + Antenna Gain (dBi).								



Test plot as follows:









6.5 Occupy Bandwidth

Test Requirement:	FCC Part 25 B Section 25.149 (c)(4)(ii)	
Test Method:	ANSI C63.26-2015 and KDB 971168	
Limit:	>500kHz	
Test setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane	
Test Instruments:	Refer to section 5.8 for details	
Test mode:	Refer to section 5.3 for details	
Test results:	Refer to the FCC ID: 2AG32EM2148M	



6.6 Power Spectral Density

Test Requirement:	FCC Part 25 B Section 25.149 (c)(4)(iv)	
Test Method:	C63.26-2015 and KDB 971168 D01v03r01	
Limit:	The maximum power spectral density conducted to the antenna is not greater than 8 dBm in any 3kHz band during any time interval of continuous transmission	
Test setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane	
Test Instruments:	Refer to section 5.8 for details	
Test mode:	Refer to section 5.3 for details	
Test results:	Refer to the FCC ID: 2AG32EM2148M	



6.7 Band Edge

Test Requirement:	FCC Part 25 B Section 25.149 (c)(4)(v)(vi)(vii)	
Test Method:	C63.26-2015 and KDB 971168 D01v03r01	
Limit:	Emissions below 2483.5 MHz are attenuated below the transmitter power (P) measured in watts by a factor of at least 40 + 10 log (P) dB at the channel edge at 2483.5 MHz, 43 + 10 log (P) dB at 5MHz from the channel edge, and 55 + 10 log (P) dB at X MHz from the channel edge where X is the greater of 6 MHz or the actual emission bandwidth. Emissions above 2495 MHz are attenuated below the transmitter power (P) measured in watts by a factor of at least 43 + 10 log (P) dB on all frequencies between the channel edge at 2495 MHz and XMHz from this channel edge and 55 + 10 log (P) dB on all frequencies more than X MHz from thischannel edge, where X is the greater of 6 MHz or the actual emission bandwidth.	
Test setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane	
Test Instruments:	Refer to section 5.8 for details	
Test mode:	Refer to section 5.3 for details	
Test results:	Refer to the FCC ID: 2AG32EM2148M	



6.8 Conducted Spurious Emission

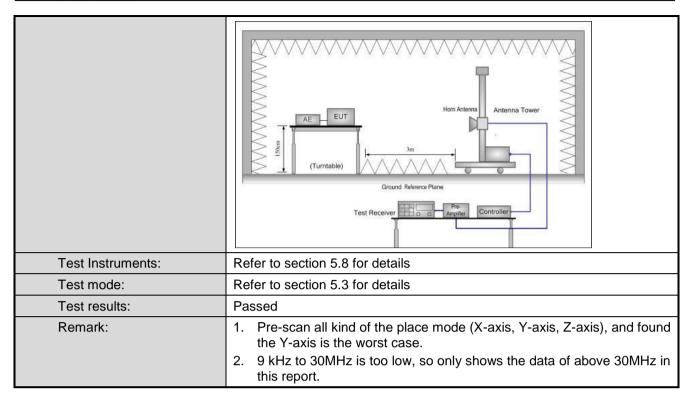
Test Requirement:	FCC Part 25 B Section 25.149 (c)(4)(v)(vi)
Test Method:	C63.26-2015 and KDB 971168 D01v03r01
Limit:	Emissions below 2483.5 MHz are attenuated below the transmitter power (P) measured in watts by a factor of at least 40 + 10 log (P) dB at the channel edge at 2483.5 MHz, 43 + 10 log (P) dB at 5MHz from the channel edge, and 55 + 10 log (P) dB at X MHz from the channel edge where X is the greater of 6 MHz or the actual emission bandwidth. Emissions above 2495 MHz are attenuated below the transmitter power (P) measured in watts by a factor of at least 43 + 10 log (P) dB on all frequencies between the channel edge at 2495 MHz and XMHz from this channel edge and 55 + 10 log (P) dB on all frequencies more than X MHz from thischannel edge, where X is the greater of 6 MHz or the actual emission bandwidth.
Test setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Refer to the FCC ID: 2AG32EM2148M



6.9 Radiated Spurious Emission Method

Test Requirement:	FCC Part 25 B Section 25.149 (c)(4)(v)(vi)
Test Method:	ANSI C63.26-2015 and KDB 971168
Limit:	Emissions below 2483.5 MHz are attenuated below the transmitter power (P) measured in watts by a factor of at least 40 + 10 log (P) dB at the channel edge at 2483.5 MHz, 43 + 10 log (P) dB at 5MHz from the channel edge, and 55 + 10 log (P) dB at X MHz from the channel edge where X is the greater of 6 MHz or the actual emission bandwidth.
	Emissions above 2495 MHz are attenuated below the transmitter power (P) measured in watts by a factor of at least 43 + 10 log (P) dB on all frequencies between the channel edge at 2495 MHz and XMHz from this channel edge and 55 + 10 log (P) dB on all frequencies more than X MHz from this channel edge, where X is the greater of 6 MHz or the actual emission bandwidth.
Test Procedure:	 The EUT was placed on the top of a rotating table 0.8m(below 1GHz)/1.5m(above 1GHz) above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasipeak or average method as specified and then reported in a data sheet.
Test setup:	Below 1GHz
	Camera Antenna Tower Ground Reference Plane Ground Reference Plane Signal Generator Amplifier
	Above 1GHz









Measurement Data (worst case):

Bandwidth=5MHz					
Frequency (MHz)	Spurious Emission		Limit (dDm)	Decult	
	Polarization	Level (dBm)	Limit (dBm)	Result	
	Lowest Channel				
4972.0	Vertical	-48.36			
7458.0	V	-41.25	05.00		
9944.0	V	-45.94		Pass	
4972.0	Horizontal	-46.59	-25.00	Fa55	
7458.0	Н	-44.17			
9944.0	Н	-43.79			
Middle Channel					
4978.0	Vertical	-48.88			
7467.0	V	-41.39			
9956.0	V	-45.04	25.00	Door	
4978.0	Horizontal	-46.94	-25.00 Pass	Fd55	
7467.0	Н	-44.67			
9956.0	Н	-43.07			
		Highest Channel			
4985.0	Vertical	-48.15			
7477.5	V	-41.13			
9970.0	V	-45.59	25.00	Page	
4985.0	Horizontal	-46.35	-25.00 Pass	Fd55	
7477.5	Н	-44.16			
9970.0	Н	-43.48			

Note:

^{1.} The emission levels of below 1 GHz are 20 dB lower than the limit so not show in this report.

For above 1 GHz, all test modes were performed, and just the worst case shown in the report.





Bandwidth=10MHz					
Frequency (MHz)	Spurious Emission		Line it (dDree)	Decult	
	Polarization	Level (dBm)	Limit (dBm)	Result	
		Lowest Channel			
4977.0	Vertical	-48.12			
7465.5	V	-41.39			
9954.0	V	-45.23	25.00	Dese	
4977.0	Horizontal	-46.72	-25.00	Pass	
7465.5	Н	-44.31			
9954.0	Н	-43.49			
	Middle Channel				
4978.0	Vertical	-48.35			
7467.0	V	-41.62			
9956.0	V	-45.34	25.00	Dese	
4978.0	Horizontal	-46.38		Pass	
7467.0	Н	-44.41			
9956.0	Н	-43.17			
		Highest Channel			
4980.0	Vertical	-48.43			
7470.0	V	-41.77			
9960.0	V	-45.77	-25.00 Pass	Door	
4980.0	Horizontal	-46.34		Pass	
7470.0	Н	-44.19			
9960.0	Н	-43.93			

Note:

^{3.} 4.

The emission levels of below 1 GHz are 20 dB lower than the limit so not show in this report. For above 1 GHz, all test modes were performed, and just the worst case shown in the report.



6.10 Frequency stability V.S. Temperature measurement

Test Requirement:	N/A
Test Method:	ANSI C63.26-2015
Limit:	N/A
Test setup:	Temperature Chamber Spectrum analyzer EUT Att.
	Variable Power Supply Note: Measurement setup for testing on Antenna connector
Test procedure:	 The equipment under test was connected to an external DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 25℃ operating frequency as reference frequency. Turn EUT off and set the chamber temperature to -30℃. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10℃ increased per stage until the highest temperature of +50℃ reached
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Refer to the FCC ID: 2AG32EM2148M
Remark:	All three channels of all modulations have been tested, but only the worst channel and the worst modulation show in this test item.



6.11 Frequency stability V.S. Voltage measurement

Test Requirement:	N/A
Test Method:	ANSI C63.26-2015
Limit:	N/A
Test setup:	Temperature Chamber
	Spectrum analyzer EUT Att. Variable Power Supply
Test procedure:	 Note: Measurement setup for testing on Antenna connector Set chamber temperature to 25°C. Use a variable DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency. Reduce the input voltage to specify extreme voltage variation (+/-15%) and endpoint, record the maximum frequency change.
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details, and all channels have been tested, only shows the worst channel data in this report.
Test results:	Refer to the FCC ID: 2AG32EM2148M
Remark:	All three channels of all modulations have been tested, but only the worst channel and the worst modulation show in this test item.