FCC Test Report

Report No.: AGC05278180601FE06

FCC ID	:	2AFZB-ZUMABKSAVZ
APPLICATION PURPOSE	:	Original Equipment
PRODUCT DESIGNATION	:	ZUS Universal HD Car Audio Adapter
BRAND NAME	:	ZUS
MODEL NAME	:	ZUMABKSAV
CLIENT	:	No NDA Inc
DATE OF ISSUE	:	Jul. 25, 2018
STANDARD(S)	:	FCC Part 15.239
REPORT VERSION	:	V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd

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REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Jul. 25, 2018	Valid	Original Report

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1. VERIFICATION OF CONFORMITY

Applicant	No NDA Inc
Address	320 Mountainview Avenue, Mountainview California, United States,94041
Manufacturer	WBE Industries(HUI-YANG)Co., Ltd.
Address	Gaotian Management District, Zhenlong Town, Huiyang District, Huizhou City, Guangdong Province, China
Product Designation	ZUS Universal HD Car Audio Adapter
Brand Name	ZUS
Test Model	ZUMABKSAV
Date of test	Jul. 19, 2018 to Jul. 25, 2018
Deviation	None
Condition of Test Sample	Normal
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 15.239.

Tested By

Max Zhang(Zhang Yi) Jul. 25, 2018

Reviewed By

Bart Xie(Xie Xiaobin) Jul. 25, 2018

Approved By

Forrest Lei(Lei Yonggang)
Authorized Officer Jul. 25, 2018

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2. GENERAL INFORMATION

2.1. PRODUCT DESCRIPTION

A major technical description of EUT is described as following

Operation Frequency	88.1MHz-106MHz
Field Strength(3m)	45.33dBuV/m(AV)@3m
Modulation	FM
Number of channels	180(Channel spacing 100kHz)
Hardware Version	3.0
Software Version	1.0
Antenna Designation	Integrated Antenna (Met 15.203 Antenna requirement)
Power Supply	DC 5V

NOTE: 1. About the EUT, please refer to User's Manual.

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3. MEASUREMENT UNCERTAINTY

Conducted measurement: +/- 3.18dB

Radiated measurement: +/- 3.91dB

4. DESCRIPTION OF TEST MODES

NO.	TEST MODE DESCRIPTION
1	Transmitting mode(Low channel)
2	Transmitting mode(Middle channel)
3	Transmitting mode(High channel)

Note:
1. For Radiated Emission, 3axis were chosen for testing for each applicable mode.
2. All the requirements have been tested by modulating the transmitter with a 2.5 kHz tone at a fixed level which set to the manufacturer's maximum rated input to the modulator.

5. SYSTEM TEST CONFIGURATION

5.1. EQUIPMENT USED IN EUT SYSTEM

Item	Equipment	Model No.	ID or Specification	Remark
1	ZUS Universal HD Car Audio Adapter	ZUMABSAV	2AFZB-ZUMABKSAVZ	EUT

5.2. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
15.209	Field Strength of Fundamental and Spurious Emission	Compliant
15.215	Bandwidth	Compliant
15.207	Line Conducted Emission	N/A

NOTE: N/A stands for not applicable. The device is only used in the car, so the conducted emission is not applicable.

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6. TEST FACILITY

Test Site	Attestation of Global Compliance (Shenzhen) Co., Ltd
Location	1-2F., Bldg.2, No.1-4, Chaxi Sanwei Technical Industrial Park, Gushu, Xixiang, Bao'an District B112-B113, Bldg.12, Baoan Bldg Materials Center, No.1 of Xixiang Inner Ring Road, Baoan District, Shenzhen 518012
NVLAP LAB CODE	600153-0
Designation Number	CN5028
FCC Test Firm Registration Number	682566
Description	Attestation of Global Compliance(Shenzhen) Co., Ltd is accredited by National Voluntary Laboratory Accreditation program, NVLAP Code 600153-0

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESCI	10096	Jun.12, 2018	Jun.11, 2019
EXA Signal Analyzer	Aglient	N9010A	MY53470504	Dec.08, 2017	Dec.07, 2018
Active loop antenna (9K-30MHz)	A.H.	SAS-562B	N/A	Mar.01, 2018	Feb.28, 2019
Audio analyzer	HP	8920B	US35010161	Jun.12, 2018	Jun.11, 2019
ANTENNA	SCHWARZBECK	VULB9168	D69250	Sep.28, 2017	Sep.27, 2018

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7. RADIATED EMISSION

7.1. MEASUREMENT PROCEDURE

1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 0.8 meter above ground and opposite the horn antenna. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions below 1GHz, use 120KHz RBW and VBW>=3RBW for QP reading.
7. 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.
8. Only the worst case is reported.

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

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

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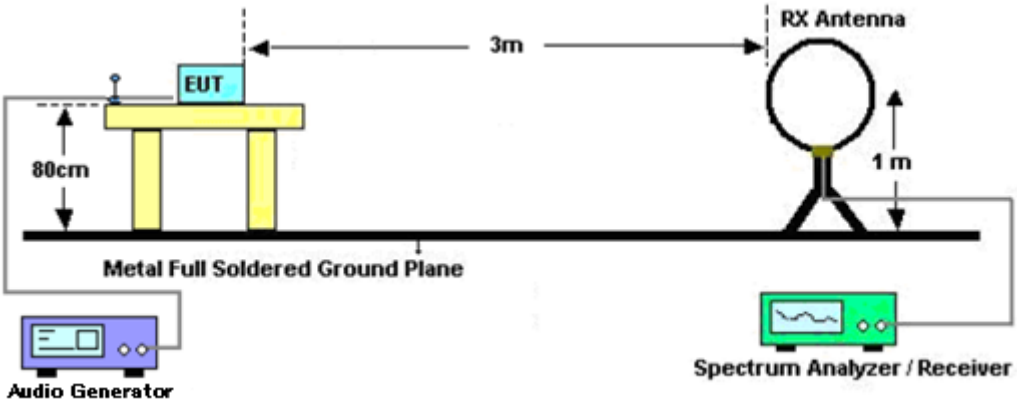
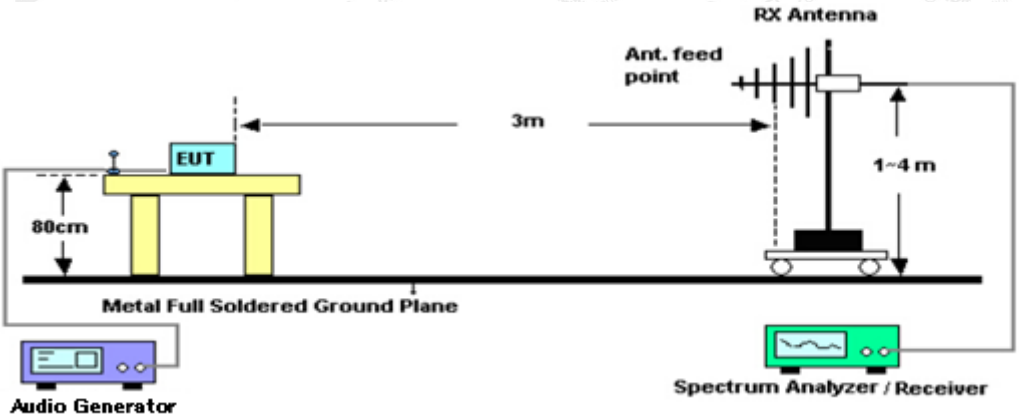
7.2. TEST SETUP

Radiated Emission Test-Setup Frequency Below 30MHz



RADIATED EMISSION TEST SETUP 30MHz-1000MHz



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7.3. TEST RESULT FOR FIELD STRENGTH OF FUNDAMENTAL

Frequency MHz	Polarization	Level dB(uV/m) PK	Limit dB(uV/m) PK	Margin dB	Pass/Fail	Detector
88.100	H	41.89	67.96	26.07	Pass	PK
88.100	V	46.36	67.96	21.60	Pass	PK
98.000	H	41.52	67.96	26.44	Pass	PK
98.000	V	45.87	67.96	22.09	Pass	PK
106.000	H	40.36	67.96	27.60	Pass	PK
106.000	V	44.68	67.96	23.28	Pass	PK
Frequency MHz	Polarization	Level dB(uV/m) AV	Limit dB(uV/m) AV	Margin dB	Pass/Fail	Detector
88.100	H	40.52	47.96	7.44	Pass	AV
88.100	V	45.33	47.96	2.63	Pass	AV
98.000	H	40.14	47.96	7.82	Pass	AV
98.000	V	44.85	47.96	3.11	Pass	AV
106.000	H	38.85	47.96	9.11	Pass	AV
106.000	V	43.29	47.96	4.67	Pass	AV

7.4. TEST RESULT FOR FIELD STRENGTH OF BAND EDGE EMISSION

Frequency MHz	Polarization	Level dB(uV/m) QP	Limit dB(uV/m) QP	Margin dB	Pass/Fail	Detector
88.000	H	34.72	40.00	5.28	Pass	QP
88.000	V	37.48	40.00	2.52	Pass	QP
108.000	H	29.41	43.50	14.09	Pass	QP
108.000	V	32.37	43.50	11.13	Pass	QP

Note: The above two frequencies are the worst case for the band edge emission test.

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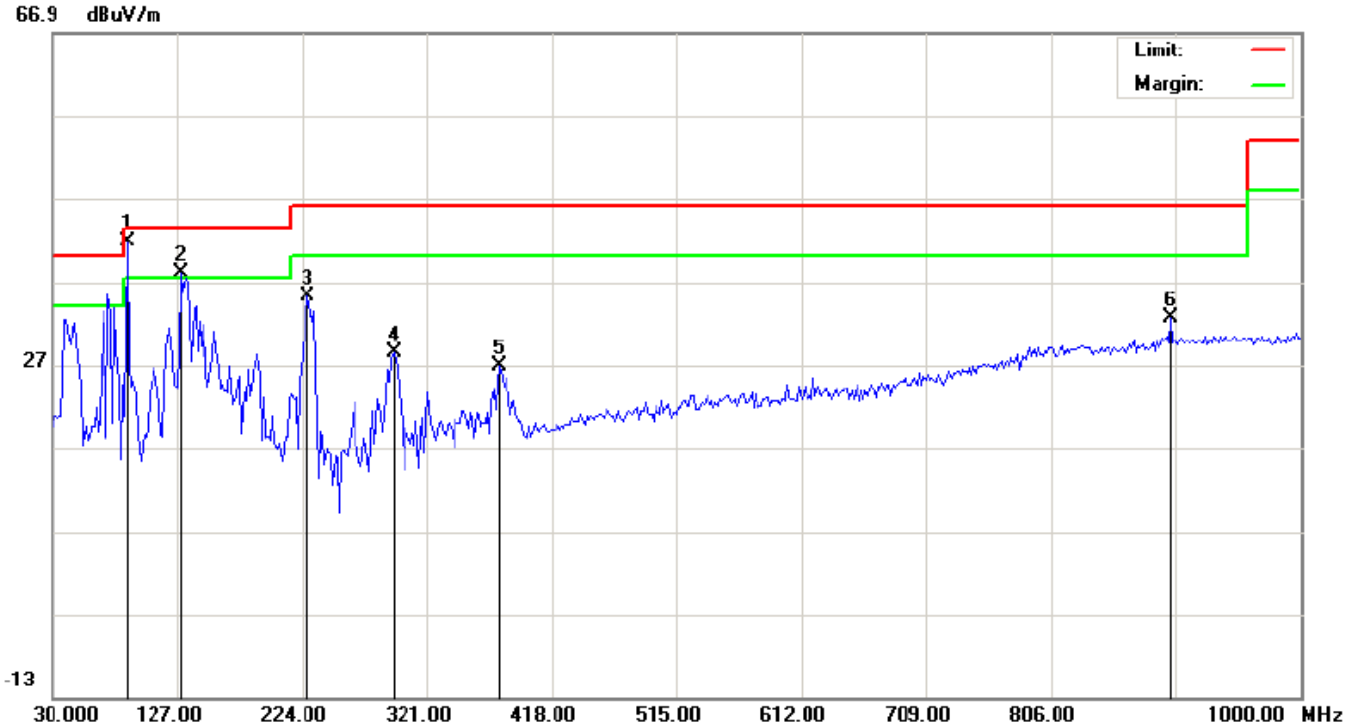
7.5. TEST RESULT FOR SPURIOUS EMISSION

RADIATED EMISSION BELOW 30MHz

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

RADIATED EMISSION BELOW 1GHZ-Horizontal



No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	88.1000	37.15	4.74	41.89						
2	!	130.2332	26.86	11.13	37.99	43.50	-5.51	peak			
3		228.8498	23.31	11.83	35.14	46.00	-10.86	peak			
4		295.1333	13.06	15.26	28.32	46.00	-17.68	peak			
5		377.5833	7.80	18.92	26.72	46.00	-19.28	peak			
6		899.7667	4.05	28.60	32.65	46.00	-13.35	peak			

RESULT: PASS

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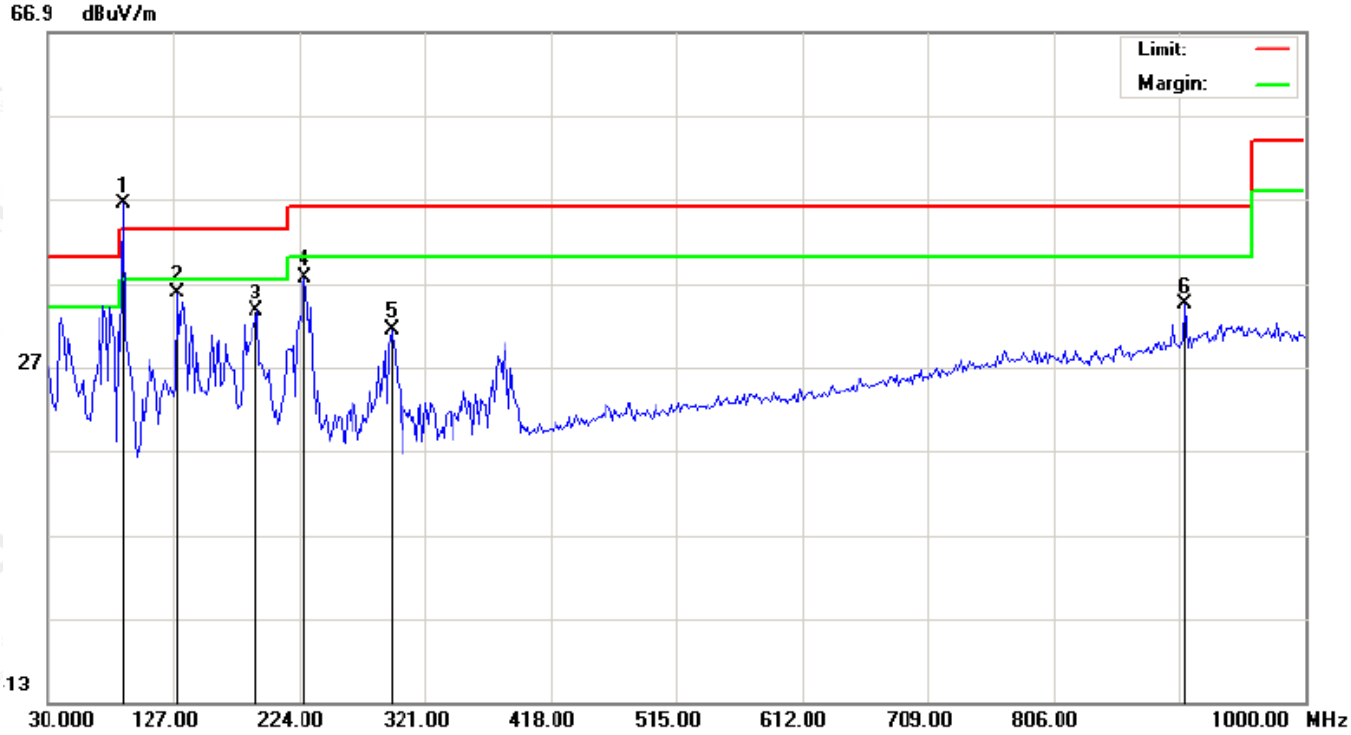
RADIATED EMISSION BELOW 1GHZ-Vertical



No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	88.1000	41.62	4.74	46.36						
2		130.2332	24.74	11.13	35.87	43.50	-7.63	peak			
3		191.6665	22.50	11.11	33.61	43.50	-9.89	peak			
4		228.8498	25.79	11.83	37.62	46.00	-8.38	peak			
5		295.1333	16.18	15.26	31.44	46.00	-14.56	peak			
6		907.8500	5.48	28.83	34.31	46.00	-11.69	peak			

RESULT: PASS

Note:

1. Factor=Antenna Factor + Cable loss - Amplifier gain, Margin=Measurement-Limit.
1. The “Factor” value can be calculated automatically by software of measurement system.
2. All test modes had been tested. The Low channel is the worst case and recorded in the report.

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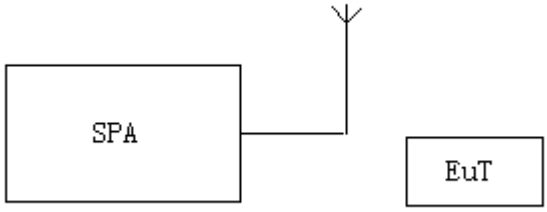
8. BANDWIDTH

8.1. MEASUREMENT PROCEDURE

1. Set the parameters of SPA as below:
   Centre frequency = Operation Frequency
   RBW=10KHz
   VBW=30KHz
   Span: 300kHz
   Sweep time: Auto
2. Set the EUT to continue transmitting mode. Allow the trace to stabilize. Use the “N dB down” function of SPA to define the bandwidth.
3. Record the plots and Reported.

8.2. TEST SETUP



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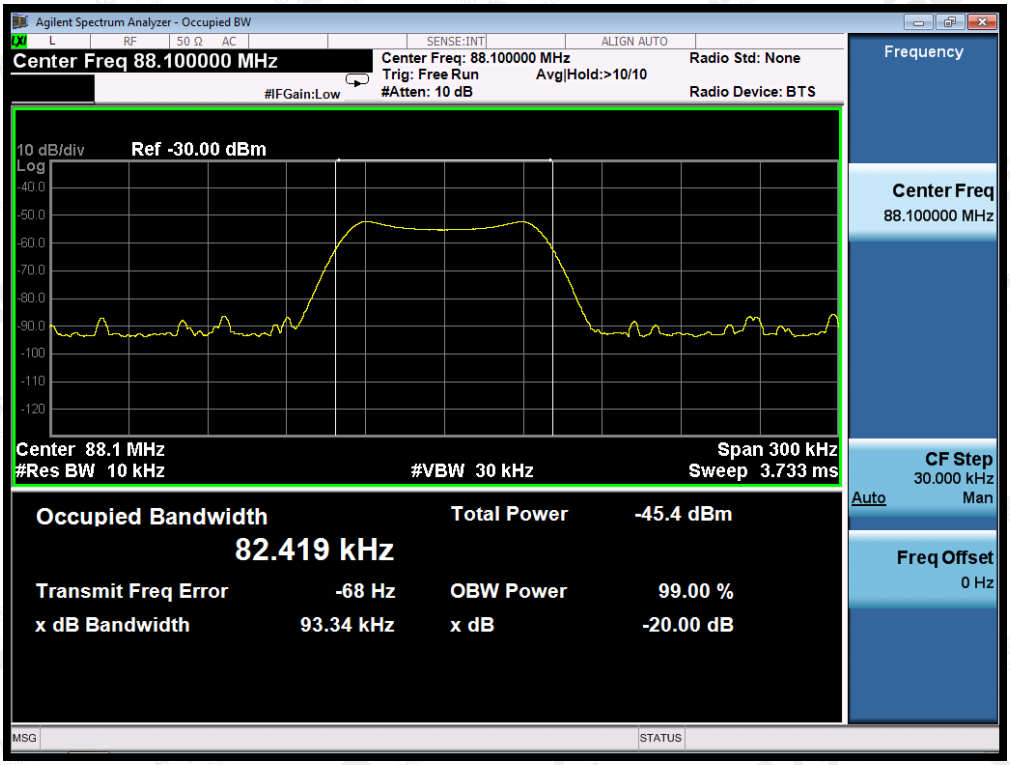
8.3. TEST RESULT

Channel	Channel Frequency(MHz)	-20dB bandwidth (kHz)	Limit(kHz)
Low	88.1	93.34	200
Middle	98.0	93.07	200
High	106.0	124.4	200

TEST PLOT OF BANDWIDTH FOR LOW CHANNEL



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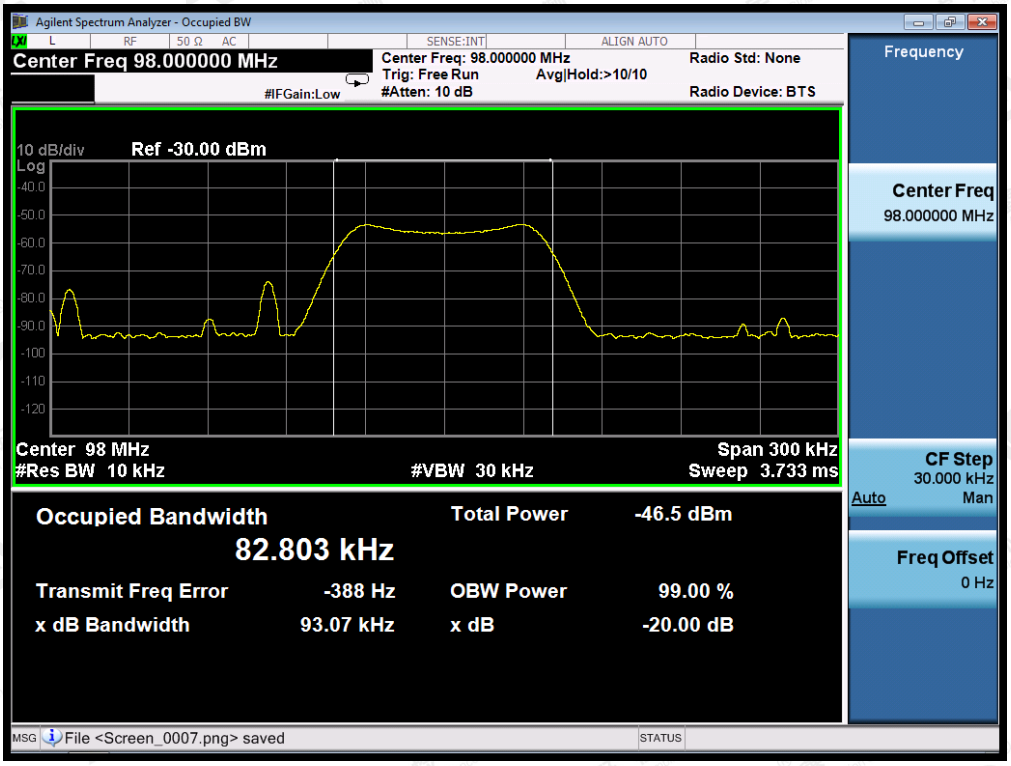
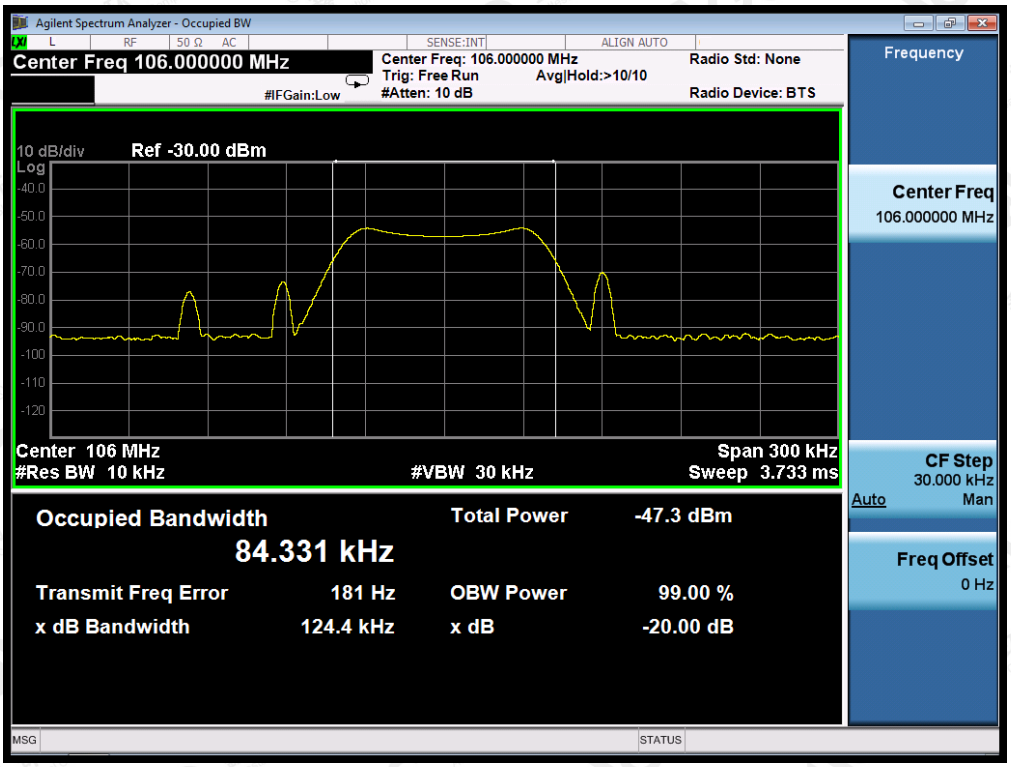
TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



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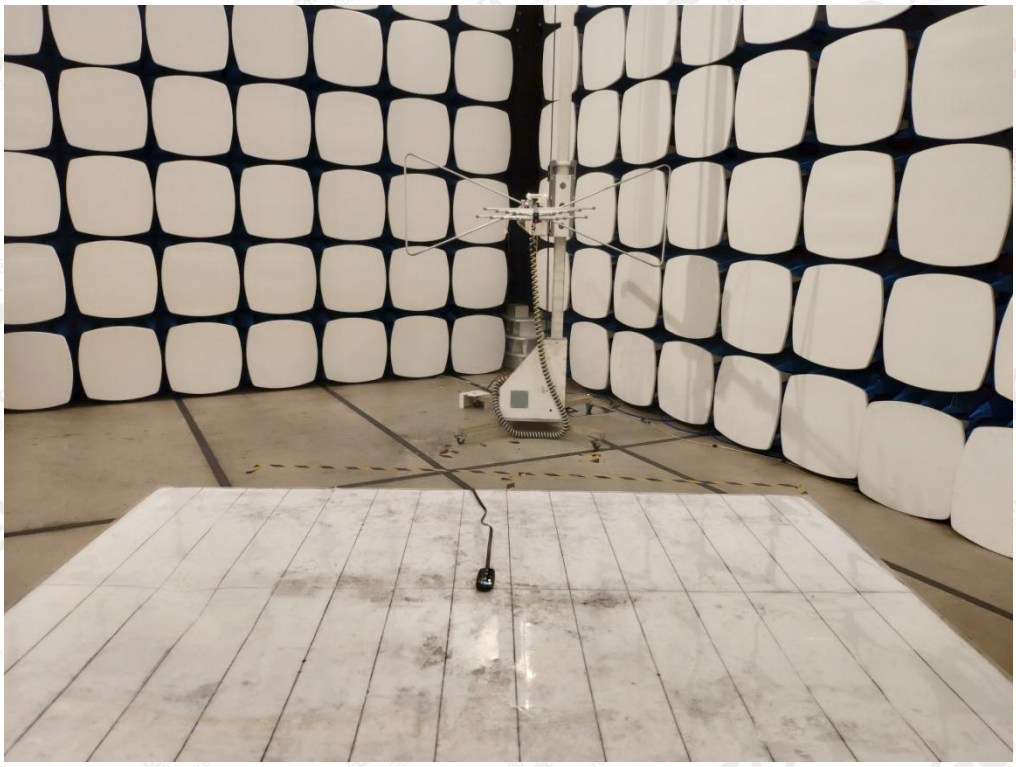
APPENDIX A: PHOTOGRAPHS OF TEST SETUP

RADIATED EMISSION TEST SETUP BELOW 1G



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