



RF TEST REPORT

FCC ID: 2BLA4-HX-901

Product Name : Carplay
Brand Name : HXDOTECFIN
Test Model : HX-901
Series Model : HX-902C, HX-901D, HX-701, HX-701C, HX-701D, HX-808, HX-1026
Applicant : Shenzhenshihuanxinkejiyouxiangongsi
Address : Room1515,Haianshidaigongyu
East,Shennandadao12069,Honghuayuanshequ,Nantou
Street,NanShan,ShenZhen, China
Manufacturer : Shenzhenshihuanxinkejiyouxiangongsi
Address : Room1515,Haianshidaigongyu
East,Shennandadao12069,Honghuayuanshequ,Nantou
Street,NanShan,ShenZhen, China
Date of Receipt : Sep. 09, 2024
Date of Test : Sep. 09, 2024~Sep. 20, 2024
Issued Date : Sep. 21, 2024
Report Version : V1.0
Test Sample : Engineering Sample No.: AiTDG-240909028-1
Standard(s) : FCC Part 15.239

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This device described above has been tested by Dongguan Yaxu (AiT) Technology Limited and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Reviewed by:

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REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Sep. 21, 2024	Valid	Initial Release

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1. GENERAL INFORMATION

Applicant	Shenzhenshihuanxinkejiyouxiangongsi
Address	Room1515,Haianshidaigongyu East,Shennandadao12069,Honghuayuanshequ,Nantou Street,NanShan,ShenZhen, China
Manufacturer	Shenzhenshihuanxinkejiyouxiangongsi
Address	Room1515,Haianshidaigongyu East,Shennandadao12069,Honghuayuanshequ,Nantou Street,NanShan,ShenZhen, China
Product Name:	Carplay
Brand Name:	HXDOTECFIN
Model No.:	HX-901
Series Model:	HX-901, HX-902C, HX-901D, HX-701, HX-701C, HX-701D, HX-808, HX-1026
Model Difference:	PCB board, structure and internal of these model(s) are the same, So no additional models were tested.
Power Supply	DC12-24V
Test Result	Pass

Note: For more details, refer to the user's manual of the EUT.

2. PRODUCT INFORMATION

2.1 PRODUCT TECHNICAL DESCRIPTION

A major technical description of EUT is described as following

Operation Frequency	88.1MHz-107.9MHz
Field Strength(3m)	63.60dBuV/m@3m Max.
Modulation	FM
Number of channels	201(Channel spacing 100kHz)
Hardware Version	N/A
Software Version	N/A
Antenna Type:	Spring Antenna
Antenna gain:	0dBi
Power Supply	DC12-24V from adapter

2.2 MEASUREMENT UNCERTAINTY

Conducted measurement: +/- 3.18dB

Radiated measurement: +/- 3.91dB

2.3 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. 3. Only the result of the worst case was recorded in the report, if no other cases.	

2.4 SUMMARY OF TEST RESULTS

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

Note:

1. EUT DC power supply.

3. TEST ENVIRONMENT

3.1. TEST FACILITY

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

CNAS- Registration No: L6177

Dongguan Yaxu (AiT) technology Limited is accredited to ISO/IEC 17025:2017 general Requirements for the competence of testing and calibration laboratories (CNAS-CL01 Accreditation Criteria for the competence of testing and calibration laboratories) on April 17, 2022

FCC-Registration No.: 703111 Designation Number: CN1313

Dongguan Yaxu (AiT) technology Limited has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

IC —Registration No.: 6819A CAB identifier: CN0122

The 3m Semi-anechoic chamber of Dongguan Yaxu (AiT) technology Limited has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 6819A

A2LA-Lab Cert. No.: 6317.01

Dongguan Yaxu (AiT) technology Limited has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

3.2 LIST OF EQUIPMENTS USED

No	Test Equipment	Manufacturer	Model No	Serial No	Cal. Date	Cal. Due Date
1	Spectrum Analyzer	R&S	FSV40	101470	2024.09.08	2025.09.07
2	EMI Measuring Receiver	R&S	ESR	101660	2024.09.08	2025.09.07
3	Low Noise Pre Amplifier	HP	HP8447E	1937A01855	2024.09.08	2025.09.07
4	Low Noise Pre Amplifier	Tsj	MLA-0120-A02-34	2648A04738	2024.09.08	2025.09.07
5	Passive Loop	ETS	6512	00165355	2024.09.08	2025.09.07
6	TRILOG Super Broadband test Antenna	SCHWARZBECK	VULB9160	9160-3206	2024.08.29	2026.08.28
7	Broadband Horn Antenna	SCHWARZBECK	BBHA9120D	452	2024.08.29	2026.08.28
8	SHF-EHF Horn Antenna 15-40GHz	SCHWARZBECK	BBHA9170	BBHA9170367d	2023.09.12	2026.09.11
9	EMI Test Receiver	R&S	ESCI	100124	2024.09.08	2025.09.07
10	LISN	Kyoritsu	KNW-242	8-837-4	2024.09.08	2025.09.07
11	Pro.Temp&Humi.chamber	MENTEK	MHP-150-1C	MAA08112501	2024.09.08	2025.09.07
12	RF Automatic Test system	MW	MW100-RFCB	21033016	2024.09.08	2025.09.07
13	Signal Generator	Agilent	N5182A	MY50143009	2024.09.08	2025.09.07
14	Wideband Radio communication tester	R&S	CMW500	1201.0002K50	2024.09.08	2025.09.07
15	RF Automatic Test system	MW	MW100-RFCB	21033016	2024.09.08	2025.09.07
16	DC power supply	ZHAOXIN	RXN-305D-2	28070002559	N/A	N/A
17	RE Software	EZ	EZ-EMC_RE	Ver.AIT-03A	N/A	N/A
18	CE Software	EZ	EZ-EMC_CE	Ver.AIT-03A	N/A	N/A
19	RF Software	MW	MTS 8310	2.0.0.0	N/A	N/A
20	temporary antenna connector(Note)	NTS	R001	N/A	N/A	N/A
21	Aglient	N9020A	M785556H02	21033028	2024.09.08	2025.09.07
22	Fliter-UHF	Microwave	N25155H9	21033029	2024.09.08	2025.09.07



Note: The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.

4. RADIATED EMISSION

4.1. 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 $\geq$ 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.

4.2. LIMIT

1. The field strength of any emissions within the permitted 200 kHz band shall not exceed 250 microvolts/meter at 3 meters. The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in § 15.35 for limiting peak emissions apply.
2. The field strength of any emissions radiated on any frequency outside of the specified 200 kHz band shall not exceed the general radiated emission limits in § 15.209.

§ 15.209:

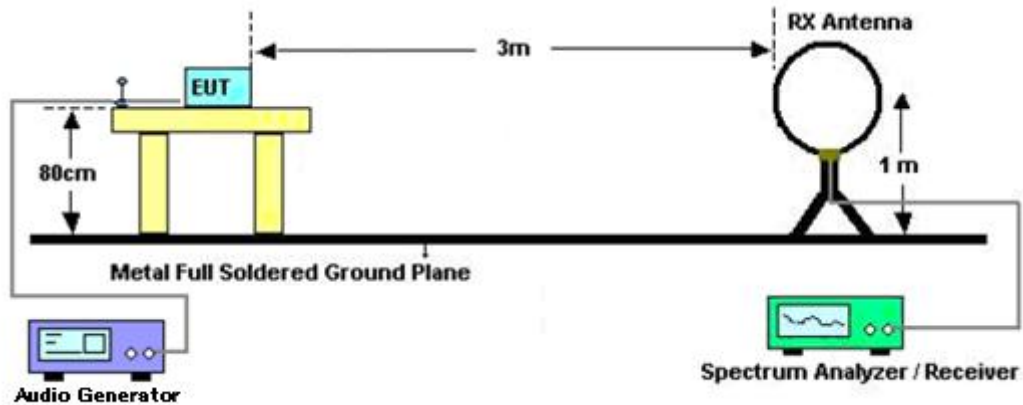
Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

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

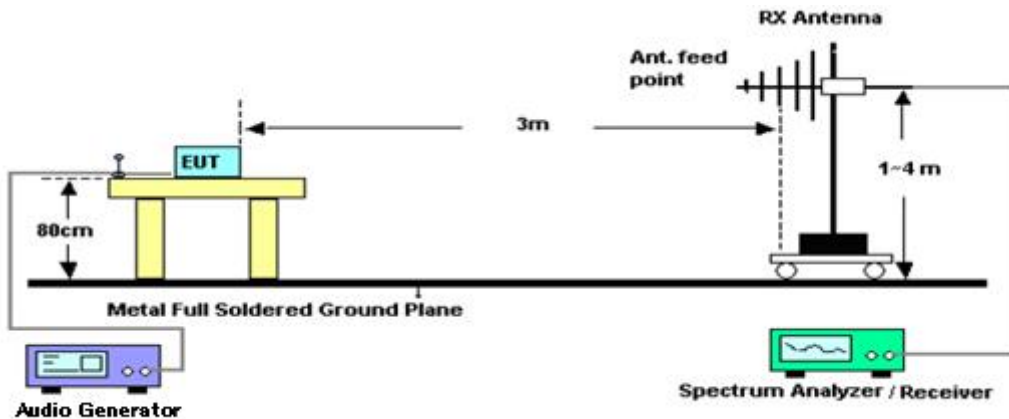
Receiver Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RBW 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RBW 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RBW 120KHz for QP

4.3. TEST SETUP

Radiated Emission Test-Setup Frequency Below 30MHz



RADIATED EMISSION TEST SETUP 30MHz-1000MHz



4.4. 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
88.1	H	62.39	67.96	-5.57	Pass	PEAK
88.1	V	62.05	67.96	-5.91	Pass	PEAK
98.1	H	63.60	67.96	-4.40	Pass	PEAK
98.1	V	63.58	67.96	-4.42	Pass	PEAK
107.9	H	63.36	67.96	-4.60	Pass	PEAK
107.9	V	61.97	67.96	-5.99	Pass	PEAK
Frequency MHz	Polarization	Level dB(uV/m) AV	Limit dB(uV/m) AV	Margin dB	Pass/Fail	Detector
88.1	H	42.66	47.96	-5.30	Pass	AV
88.1	V	41.05	47.96	-6.91	Pass	AV
98.1	H	42.98	47.96	-5.02	Pass	AV
98.1	V	42.02	47.96	-5.98	Pass	AV
107.9	H	42.82	47.96	-5.14	Pass	AV
107.9	V	41.46	47.96	-6.50	Pass	AV

4.5. 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
80.0	H	34.66	40.00	-5.34	Pass	QP
80.0	V	34.96	40.00	-5.04	Pass	QP
108.0	H	35.63	43.50	-7.87	Pass	QP
108.0	V	33.56	43.50	-9.94	Pass	QP

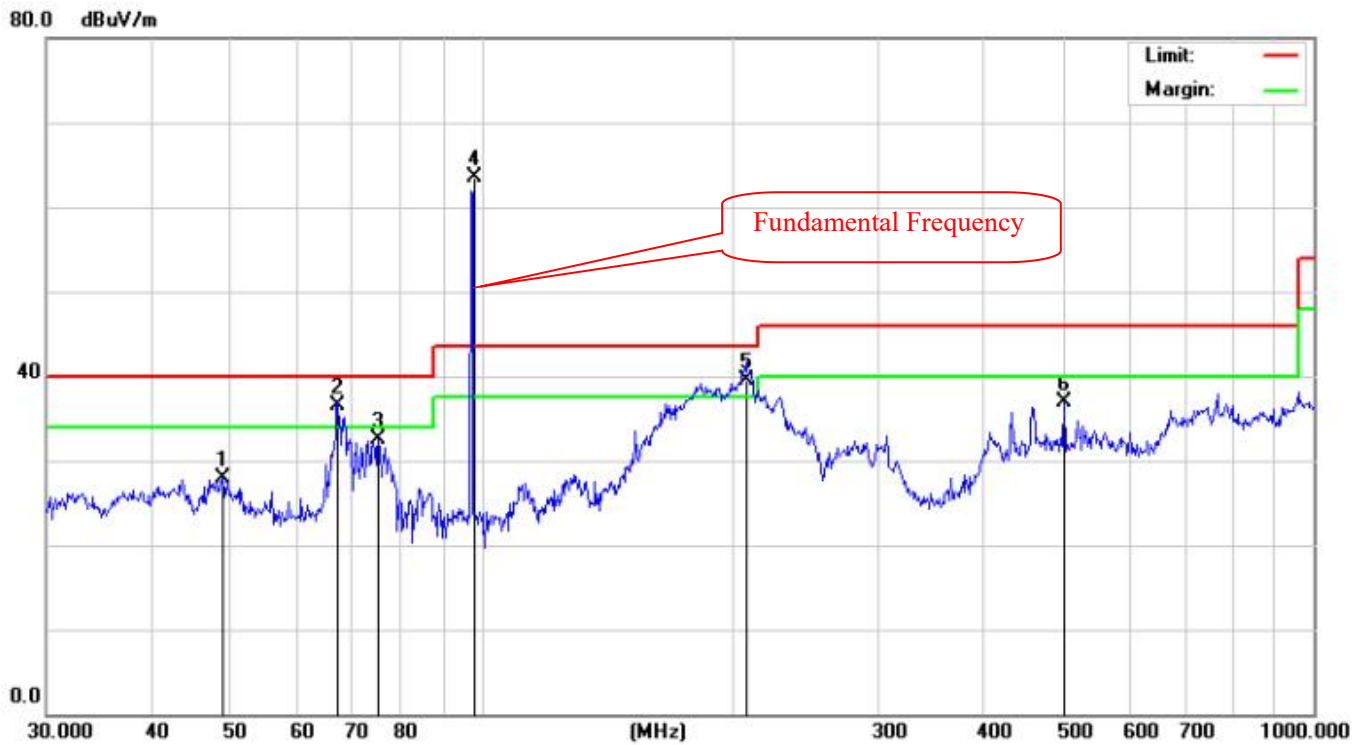
Note: The above two frequencies are the worst case for the band edge emission test.

4.6. TEST RESULT FOR SPURIOUS EMISSION

RADIATED EMISSION BELOW 30MHz

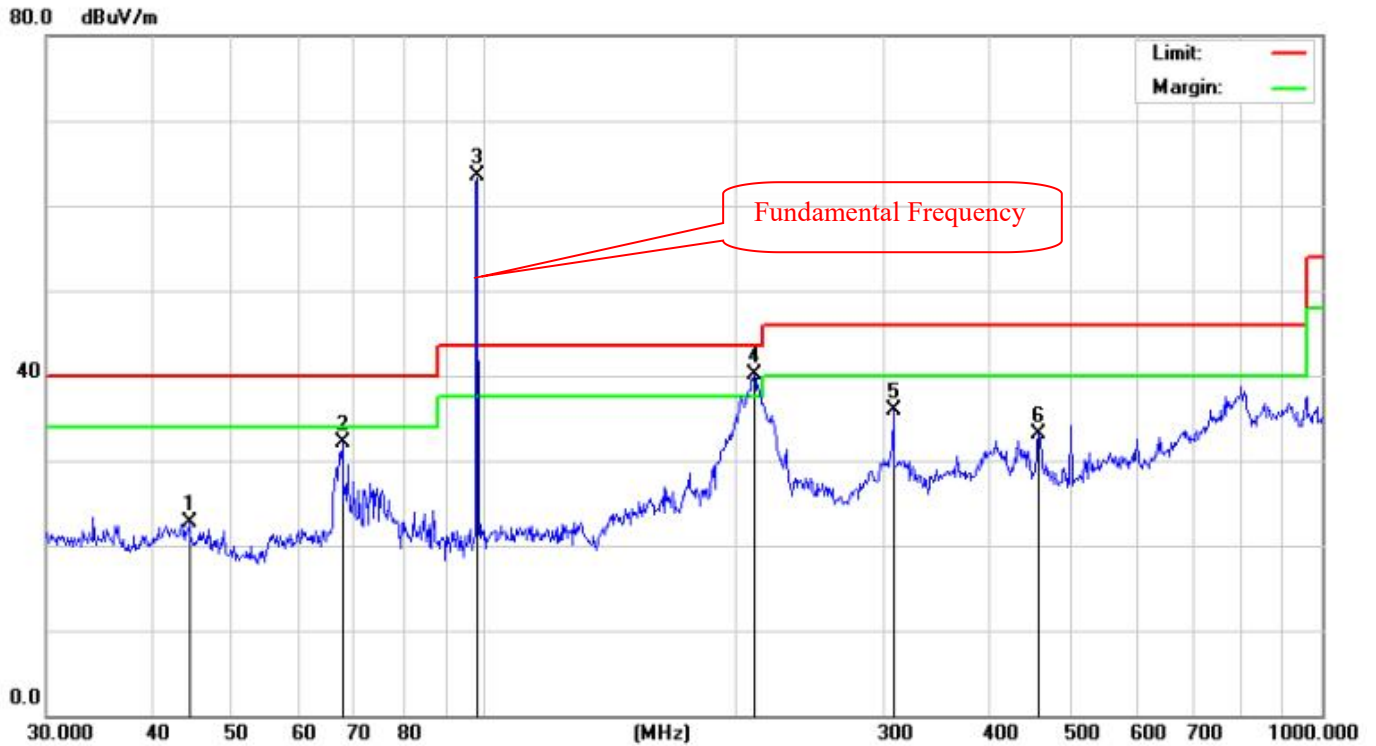
No emission found between lowest internal used/generated frequencies to 30MHz.

RADIATED EMISSION BELOW 1GHZ-Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	48.8429	25.13	2.72	27.85	40.00	-12.15	QP
2	67.2022	38.90	-2.46	36.44	40.00	-3.56	QP
3	75.1821	36.54	-4.00	32.54	40.00	-7.46	QP
4	98.1148	65.75	-2.15	63.60	67.96	-4.40	peak
5	207.8497	40.80	-1.23	39.57	43.50	-3.93	QP
6	501.1788	28.51	8.44	36.95	46.00	-9.05	QP

RADIATED EMISSION BELOW 1GHZ-Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	44.4307	21.31	1.38	22.69	40.00	-17.31	QP
2	67.6751	35.86	-3.72	32.14	40.00	-7.86	QP
3	98.1981	66.70	-3.12	63.58	67.96	-4.42	peak
4	210.0482	37.96	2.18	40.14	43.50	-3.36	QP
5	307.8312	33.61	2.23	35.84	46.00	-10.16	QP
6	459.1143	28.55	4.49	33.04	46.00	-12.96	QP

RESULT: PASS

Note:

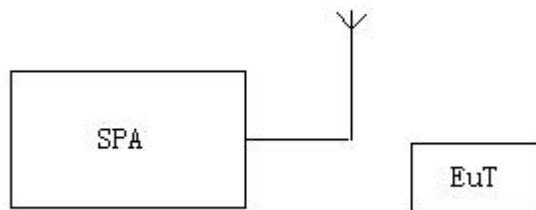
1. Factor=Antenna Factor + Cable loss - Amplifier gain, Margin=Measurement-Limit.
2. The "Factor" value can be calculated automatically by software of measurement system.
3. All test modes had been tested. The Low channel is the worst case and recorded in the report.

5. BANDWIDTH

5.1. MEASUREMENT PROCEDURE

1. Set the parameters of SPA as below:
Centre frequency = Operation Frequency
RBW=30KHz
VBW=100KHz
Span: 1MHz
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.

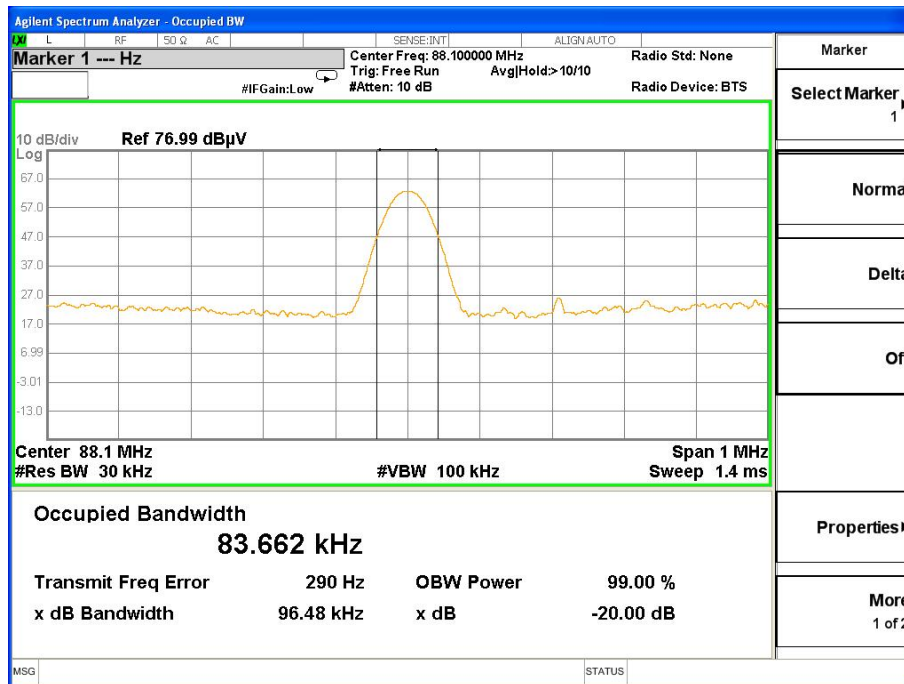
5.2. TEST SETUP



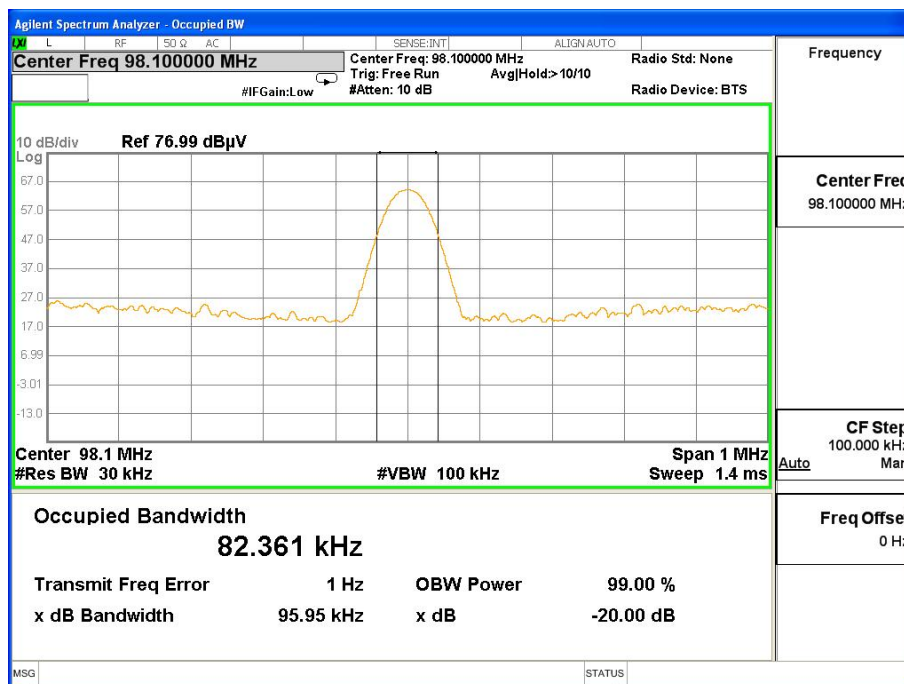
5.3. TEST RESULT

Channel	Channel Frequency(MHz)	-20dB bandwidth (kHz)	Limit(kHz)
Low	88.1	96.48	200
Middle	98.1	95.95	200
High	107.9	96.33	200

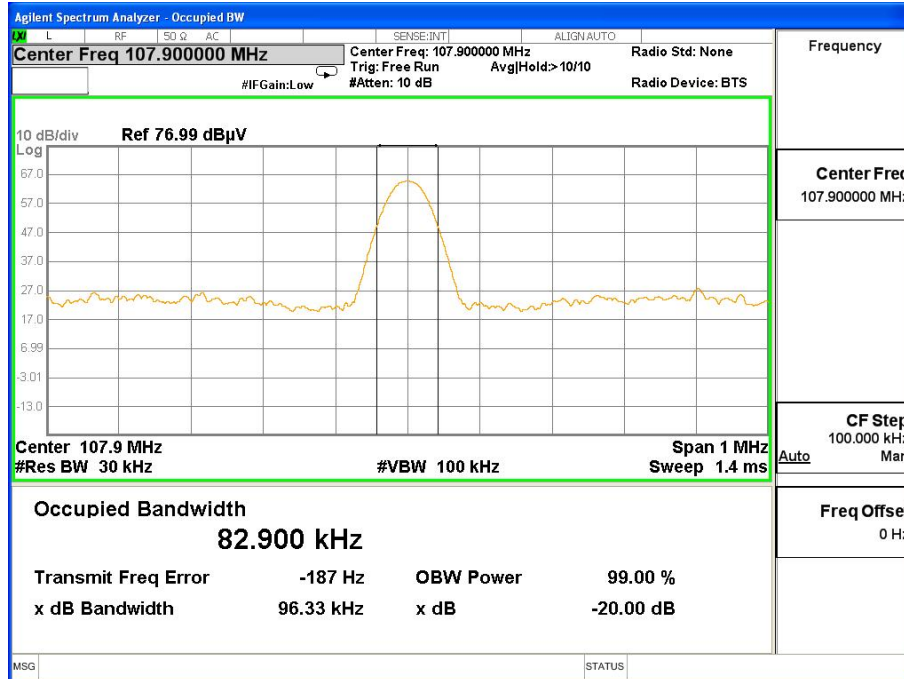
TEST PLOT OF BANDWIDTH FOR LOW CHANNEL



TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL





APPENDIX I: PHOTOGRAPHS OF TEST SETUP

Refer to the Report No.: Test Setup Photo

APPENDIX II: PHOTOGRAPHS OF TEST EUT

Refer to the Report No.: EUT Photo

-----END OF REPORT-----