

RF TEST REPORT

FCC ID: 2BGEN-F

Equipment : FM car transmitter
Brand Name : N/A
Model No : F4
Series Model : F2, F3, F5, F6, F7, F8, F9, F10, F11, F12, F13, F14, F15, F16, F17, F18, F19, F20, F21, F22, F23, F24, F25, F26, F27, F28, E4, E5, E6, B2, B3, B4, B5, B6, B7, B8, B9, A2, A3, A6, A7, A8, A9, C4, C5, C6, C8, S7, S8, S9, X1, X2, X3, X4, X5, X6, X7, X8, X9, Q1, Q2, Q3, Q4, Q5, Q6, Q7, Q8, Q9, Q10, Q11, Q12, Q13, Q14, Q15, Q16, Q17, P2, P3, P4, P5, P6, P7, P8, P9, P10, P18, P19, P20, P21, P22, P23, P24, P25, P26, Y2, Y3, Y4, Y5, Y6, Y7, Y8, Y9, Y10, Y11, Y12, Y13, Y14, Y15, Y16, Y17, Y18, Y19, Y20, Y2S, Y3S, Y4S, Y5S, Y6S, Y7S, Y8S, Y9S, Y10S, Y11S, Y12S, Y13S, Y14S, Y15S, Y16S, Y17S, Y18S, Y19S, Y20S
Applicant : Dongguan Qianshaoshao Electronic Technology Co., Ltd
Address : 5th Floor, No.4 Yanchang Road, Pingshan, Tangxia Town Dongguan Guangdong China
Manufacturer : Dongguan Qianshaoshao Electronic Technology Co., Ltd
Address : 5th Floor, No.4 Yanchang Road, Pingshan, Tangxia Town Dongguan Guangdong China
Date of Receipt : May 07, 2024
Date of Test : May 07, 2024 ~ May 14, 2024
Issued Date : May 14, 2024
Report Version : V1.0
Test Sample : AITSZ24050705001
Standard(s) : FCC Part 15.239

Lab: Guangdong Asia Hongke Test Technology Limited
Add: B1/F, Building 11, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Tel.: +86 0755-230967639 Fax.: +86 0755-230967639

This device described above has been tested by Guangdong Asia Hongke Test 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:

Leon Yi

Leon.yi

Approved by:

Sean She

Sean She





REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	May 14, 2024	Valid	Initial Release

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1. GENERAL INFORMATION

Applicant	Dongguan Qianshaoshao Electronic Technology Co., Ltd
Address	5th Floor, No.4 Yanchang Road, Pingshan, Tangxia Town Dongguan Guangdong China
Manufacturer	Dongguan Qianshaoshao Electronic Technology Co., Ltd
Address	5th Floor, No.4 Yanchang Road, Pingshan, Tangxia Town Dongguan Guangdong China
Product Name:	FM car transmitter
Brand Name:	N/A
Model No.:	F4
Series Model:	F2, F3, F5, F6, F7, F8, F9, F10, F11, F12, F13, F14, F15, F16, F17, F18, F19, F20, F21, F22, F23, F24, F25, F26, F27, F28, E4, E5, E6, B2, B3, B4, B5, B6, B7, B8, B9, A2, A3, A6, A7, A8, A9, C4, C5, C6, C8, S7, S8, S9, X1, X2, X3, X4, X5, X6, X7, X8, X9, Q1, Q2, Q3, Q4, Q5, Q6, Q7, Q8, Q9, Q10, Q11, Q12, Q13, Q14, Q15, Q16, Q17, P2, P3, P4, P5, P6, P7, P8, P9, P10, P18, P19, P20, P21, P22, P23, P24, P25, P26, Y2, Y3, Y4, Y5, Y6, Y7, Y8, Y9, Y10, Y11, Y12, Y13, Y14, Y15, Y16, Y17, Y18, Y19, Y20, Y2S, Y3S, Y4S, Y5S, Y6S, Y7S, Y8S, Y9S, Y10S, Y11S, Y12S, Y13S, Y14S, Y15S, Y16S, Y17S, Y18S, Y19S, Y20S
Model Difference:	For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
Input Power:	12~24Vdc 2.1A
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	100MHz-107.9MHz
Field Strength(3m)	32.01dBuV/m@3m Max.
Modulation	FM
Number of channels	80(Channel spacing 100kHz)
Hardware Version	N/A
Software Version	N/A
Antenna Type:	Spring Antenna
Antenna gain:	1.2dBi

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
15.239 (a)	Occupied 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:

FCC-Registration No.: 251906 Designation Number: CN1376

Guangdong Asia Hongke Test 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.: 31737 CAB identifier: CN0165

The 3m Semi-anechoic chamber of Guangdong Asia Hongke Test Technology Limited has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 31737

A2LA-Lab Cert. No.: 7133.01

Guangdong Asia Hongke Test 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	2023.09.02	2024.09.01
2	EMI Measuring Receiver	R&S	ESR	101660	2023.09.02	2024.09.01
3	Low Noise Pre Amplifier	HP	HP8447E	1937A01855	2023.09.02	2024.09.01
4	Low Noise Pre Amplifier	Tsj	MLA-0120-A02-34	2648A04738	2023.09.02	2024.09.01
5	Passive Loop	ETS	6512	00165355	2023.09.02	2024.09.01
6	TRILOG Super Broadband test Antenna	SCHWARZBECK	VULB9160	9160-3206	2021.08.29	2024.08.28
7	Broadband Horn Antenna	SCHWARZBECK	BBHA9120D	452	2021.08.29	2024.08.28
8	SHF-EHF Horn Antenna 15-40GHz	SCHWARZBECK	BBHA9170	BBHA9170367d	2021.11.24	2024.11.23
9	EMI Test Receiver	R&S	ESCI	100124	2023.09.02	2024.09.01
10	LISN	Kyoritsu	KNW-242	8-837-4	2023.09.02	2024.09.01
11	LISN	R&S	ESH3-Z2	0357.8810.54-101161-S2	2023.09.02	2024.09.01
12	Pro.Temp&Humi.chamber	MENTEK	MHP-150-1C	MAA08112501	2023.09.02	2024.09.01
13	RF Automatic Test system	MW	MW100-RFCB	21033016	2023.09.02	2024.09.01
14	Signal Generator	Agilent	N5182A	MY50143009	2023.09.02	2024.09.01
15	Wideband Radio communication tester	R&S	CMW500	1201.0002K50	2023.09.02	2024.09.01
16	RF Automatic Test system	MW	MW100-RFCB	21033016	2023.09.02	2024.09.01
17	DC power supply	ZHAOXIN	RXN-305D-2	28070002559	N/A	N/A
18	RE Software	EZ	EZ-EMC_RE	Ver.AIT-03A	N/A	N/A
19	CE Software	EZ	EZ-EMC_CE	Ver.AIT-03A	N/A	N/A
20	RF Software	MW	MTS 8310	2.0.0.0	N/A	N/A
21	temporary antenna connector(Note)	NTS	R001	N/A	N/A	N/A
22	Aglient	N9020A	M785556H02	21033028	2023.09.02	2024.09.01



23	Fliter-UHF	Microwave	N25155H9	21033029	2023.09.02	2024.09.01
24	Fliter-VHF	Microwave	N26460M5	21033029	2023.09.02	2024.09.01
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

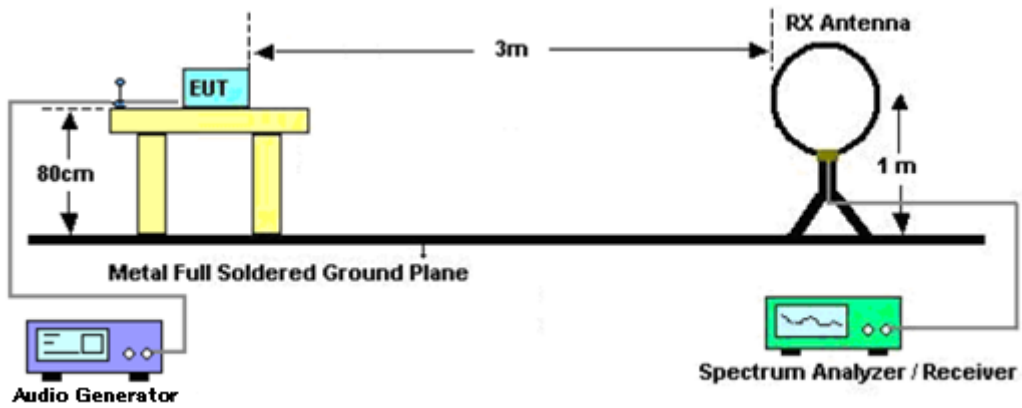
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 0.8 meter above ground and opposite the horn antenna. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power 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.

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

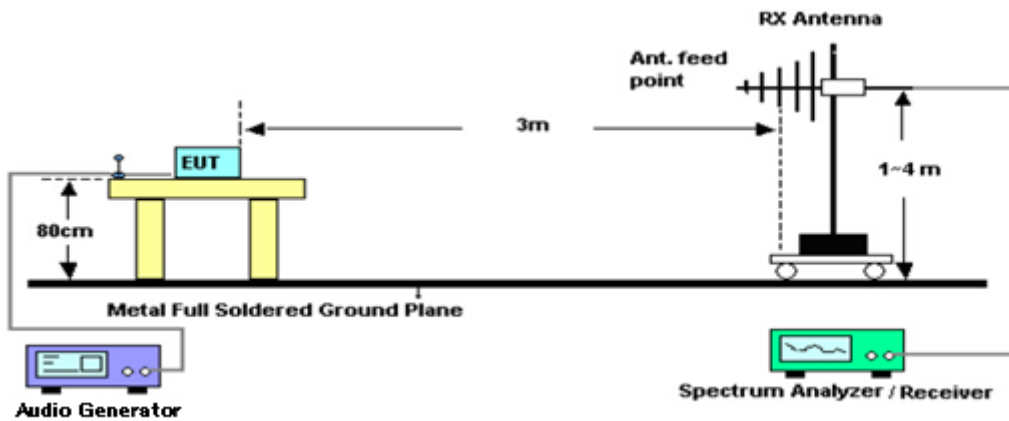
Receiver Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RBW 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RBW 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RBW 120KHz for QP

4.2. TEST SETUP

Radiated Emission Test-Setup Frequency Below 30MHz



RADIATED EMISSION TEST SETUP 30MHz-1000MHz



4.3. 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
100	H	27.63	67.96	40.33	Pass	PK
100	V	32.01	67.96	35.95	Pass	PK
103.9	H	26.55	67.96	41.41	Pass	PK
103.9	V	31.18	67.96	36.78	Pass	PK
107.9	H	26.16	67.96	41.8	Pass	PK
107.9	V	31.87	67.96	36.09	Pass	PK
Frequency MHz	Polarization	Level dB(uV/m) AV	Limit dB(uV/m) AV	Margin dB	Pass/Fail	Detector
100	H	27.54	47.96	20.42	Pass	AV
100	V	31.79	47.96	16.17	Pass	AV
103.9	H	26.46	47.96	21.5	Pass	AV
103.9	V	31.11	47.96	16.85	Pass	AV
107.9	H	26.07	47.96	21.89	Pass	AV
107.9	V	31.47	47.96	16.49	Pass	AV

4.4. 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
100	H	25.77	40	14.23	Pass	QP
100	V	24.21	40	15.79	Pass	QP
108	H	23.02	43.5	20.48	Pass	QP
108	V	21.26	43.5	22.24	Pass	QP

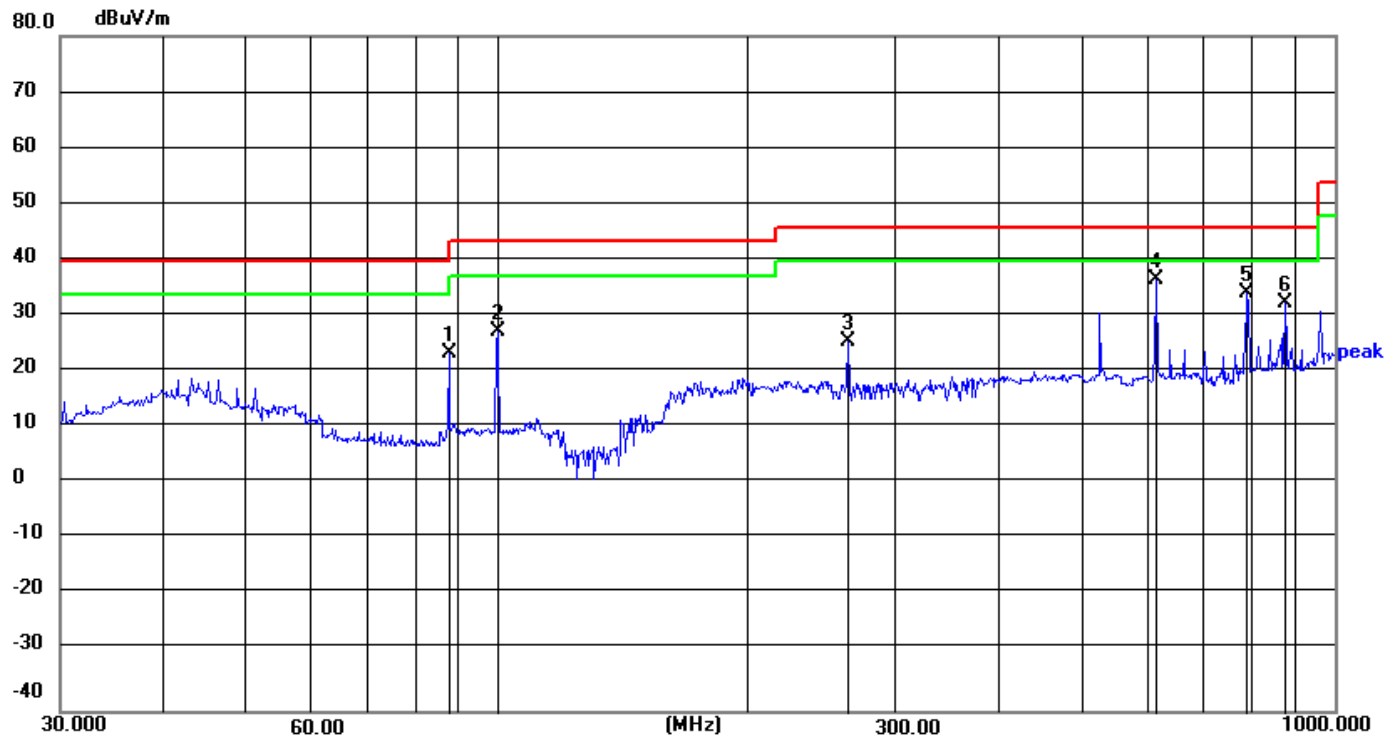
Note: The above two frequencies are the worst case for the band edge emission test.

4.5. TEST RESULT FOR SPURIOUS EMISSION

RADIATED EMISSION BELOW 30MHz

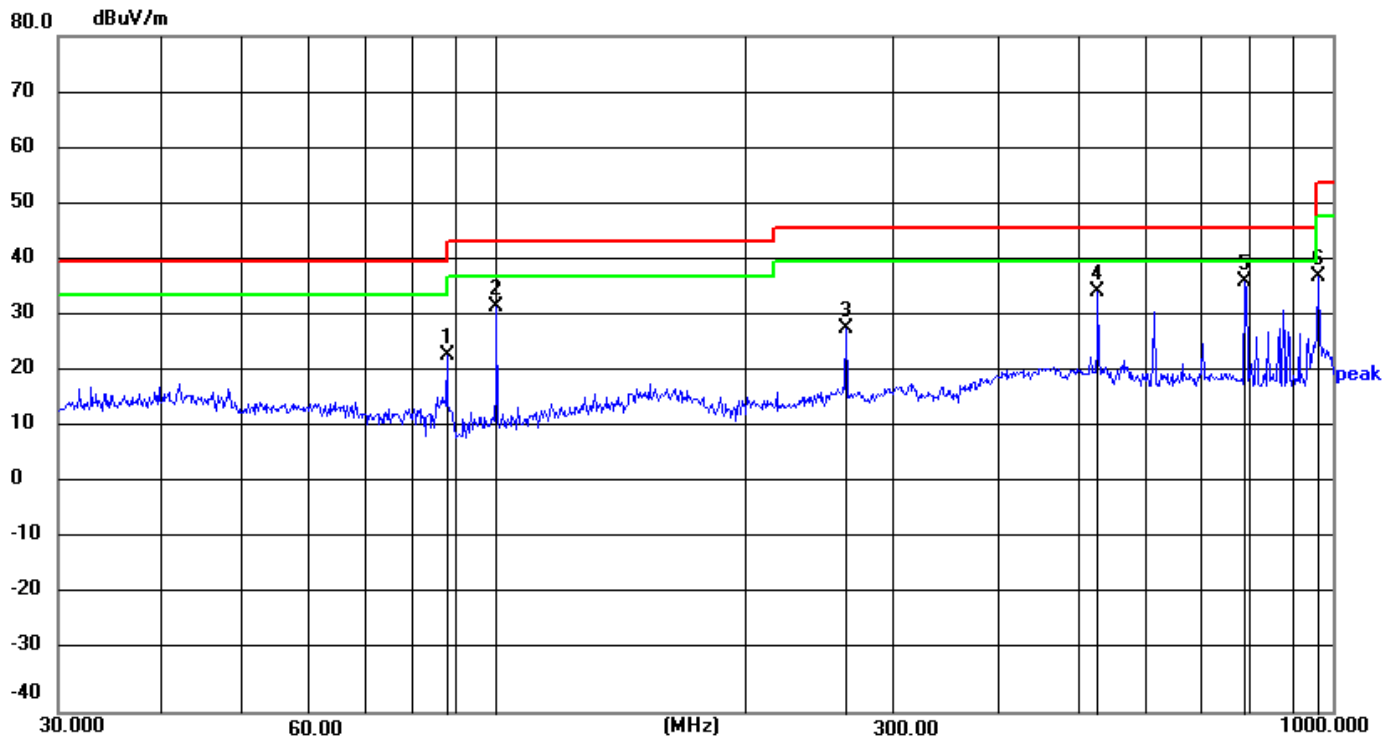
No emission found between lowest internal used/generated frequencies to 30MHz.

RADIATED EMISSION BELOW 1GHZ-Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	87.5096	44.57	-20.98	23.59	40.00	-16.41	peak
2	99.9826	47.95	-20.32	27.63	--	--	FUNDAMENTAL
3	262.5270	44.00	-18.11	25.89	46.00	-20.11	peak
4 *	612.4935	46.16	-9.44	36.72	46.00	-9.28	peak
5	787.5750	40.53	-6.20	34.33	46.00	-11.67	peak
6	875.2470	37.70	-5.11	32.59	46.00	-13.41	peak

RADIATED EMISSION BELOW 1GHZ-Vertical



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	87.4790	44.39	-20.98	23.41	40.00	-16.59	peak
2	100.2636	52.31	-20.30	32.01	--	--	FUNDAMENTAL
3	262.5270	46.40	-18.11	28.29	46.00	-17.71	peak
4	525.1060	46.72	-11.98	34.74	46.00	-11.26	peak
5 *	787.5750	42.74	-6.20	36.54	46.00	-9.46	peak
6	962.8373	40.77	-3.45	37.32	54.00	-16.68	peak

RESULT: PASS

Note:

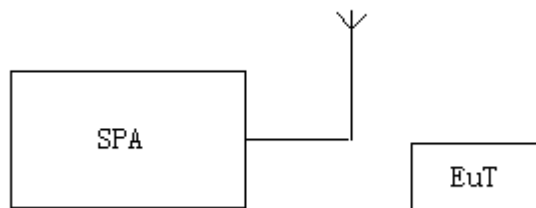
- 1.Factor=Antenna Factor + Cable loss - Amplifier gain, Margin=Measurement-Limit.
- 2.The "Factor" value can be calculated automatically by software of measurement system.
- 3.All test modes had been tested. The Low channel is the worst case and recorded in the report.

5. BANDWIDTH

8.1. MEASUREMENT PROCEDURE

1. Set the parameters of SPA as below:
Centre frequency = Operation Frequency
RBW=1KHz
VBW=3KHz
Span: 500kHz
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.

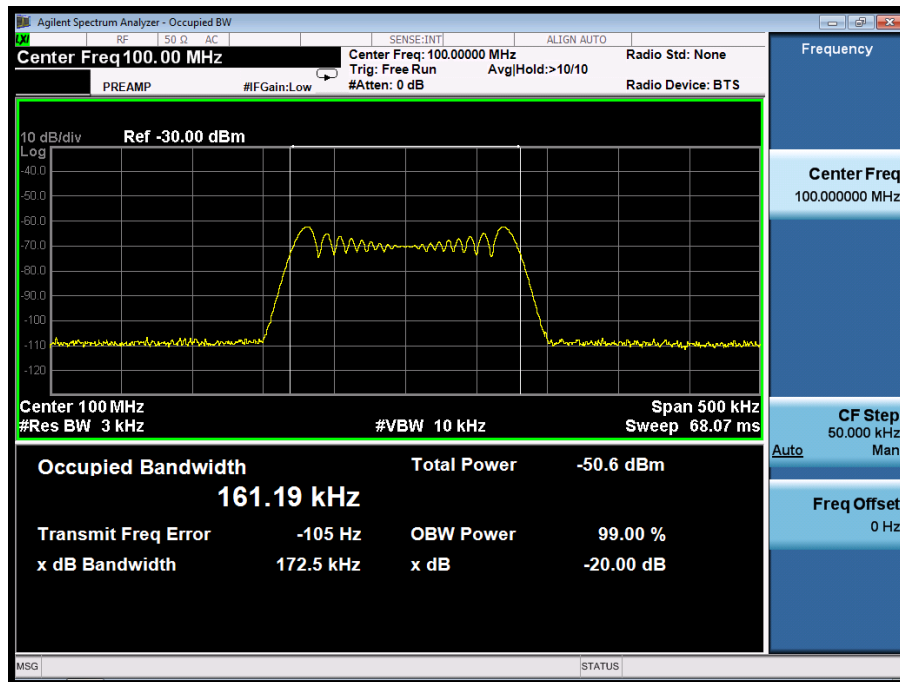
8.2. TEST SETUP



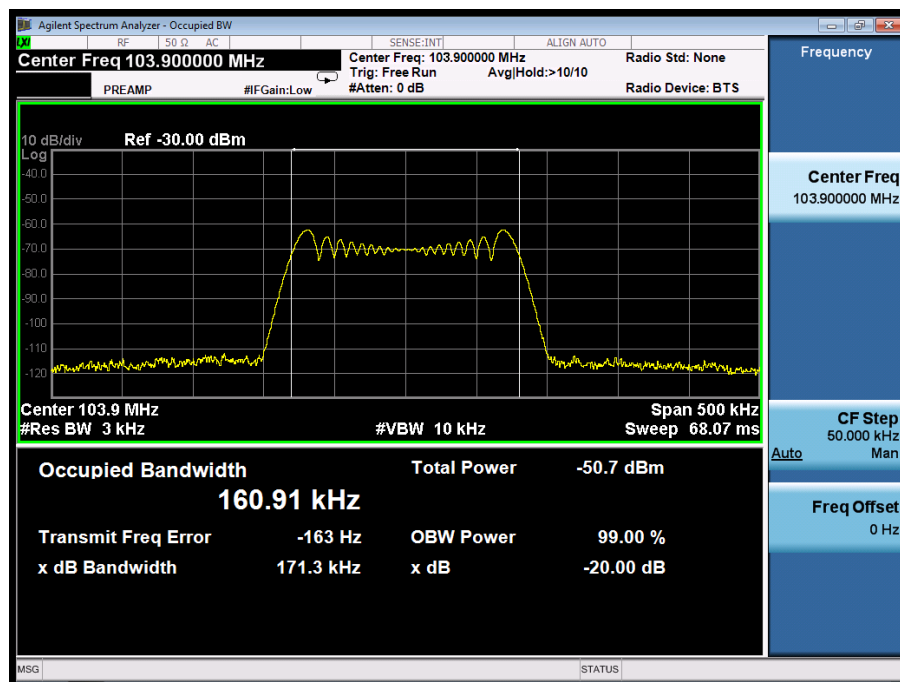
8.3. TEST RESULT

Channel	Channel Frequency(MHz)	-20dB bandwidth (kHz)	Occupied Bandwidth (kHz)	Limit(kHz)
Low	100	172.5	161.19	200
Middle	103.9	171.3	160.91	200
High	107.9	171.7	160.64	200

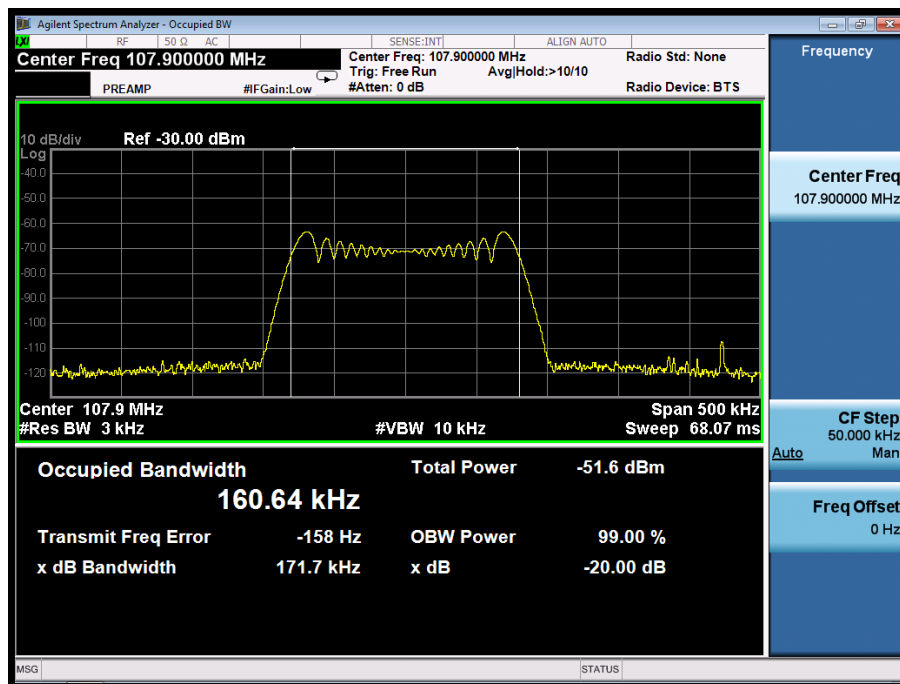
TEST PLOT OF BANDWIDTH FOR LOW CHANNEL



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-----