

FCC Test Report

Report No.: AGC09691211101FE04

FCC ID : 2ARN3-052101TX
APPLICATION PURPOSE : Original Equipment
PRODUCT DESIGNATION : Microphone
BRAND NAME : N/A
MODEL NAME : MRB-Tek TX, MRB-Tek Kit2, MRB-Tek Kit1, LINGO-TX,
BY-U5-TX, LINGO, LINGO-DUO, BY-U5 K2, BY-U5 K1
APPLICANT : Shenzhen Jiayz photo industrial ., Ltd
DATE OF ISSUE : Dec. 23, 2021
STANDARD(S) : FCC Part 15.236
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	/	Dec. 23, 2021	Valid	Initial Release

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TABLE OF CONTENTS

1. VERIFICATION OF CONFORMITY	5
2. GENERAL INFORMATION	6
2.1. PRODUCT DESCRIPTION	6
2.2. TEST METHODOLOGY	8
2.3. SPECIAL ACCESSORIES	9
2.4. EQUIPMENT MODIFICATIONS	9
2.5. ANTENNA REQUIREMENT	9
3. MEASUREMENT UNCERTAINTY	10
4. DESCRIPTION OF TEST MODES	11
5. SYSTEM TEST CONFIGURATION	12
5.1. CONFIGURATION OF EUT SYSTEM	12
5.2 EQUIPMENT USED IN TESTED SYSTEM	12
5.3. SUMMARY OF TEST RESULTS	12
6. TEST FACILITY	13
7. OUPUT POWER	14
7.1. TEST LIMIT	14
7.2. MEASUREMENT PROCEDURE	14
7.3. TEST SETUP	15
7.4. TEST RESULT	16
8. OCCUPIED BANDWIDTH	17
8.1. TEST LIMIT	17
8.2. MEASUREMENT PROCEDURE	17
8.3. TEST SET-UP	17
8.4. MEASUREMENT RESULTS	18
9. FREQUENCY STABILITY	28
9.1. TEST LIMIT	28
9.2. MEASUREMENT PROCEDURE	28
9.3. TEST SET-UP	29
9.4. TEST RESULT	29
10. EMISSIONS WITHIN THE BAND AND OUTSIDE THE BAND	39

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10.1. TEST LIMIT	39
10.2. MEASUREMENT PROCEDURE	39
10.3. TEST SETUP	40
10.4. TEST RESULT.....	42
11. LINE CONDUCTED EMISSION TEST	67
11.1. LIMITS OF LINE CONDUCTED EMISSION TEST.....	67
11.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST	67
11.3. PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST	68
11.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST.....	68
11.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST	69
APPENDIX A: PHOTOGRAPHS OF TEST SETUP	81
APPENDIX B: PHOTOGRAPHS OF EUT	81

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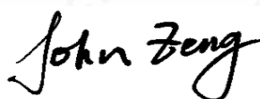
1. VERIFICATION OF CONFORMITY

Applicant	Shenzhen Jiayz photo industrial., Ltd
Address	A16 Building, Intelligent Terminal Industrial Park of Silicon Valley Power, Guanlan, Longhua District, Shenzhen, China
Manufacturer	Shenzhen Jiayz photo industrial., Ltd
Address	A16 Building, Intelligent Terminal Industrial Park of Silicon Valley Power, Guanlan, Longhua District, Shenzhen, China
Factory	Shenzhen Jiayz photo industrial., Ltd
Address	A16 Building, Intelligent Terminal Industrial Park of Silicon Valley Power, Guanlan, Longhua District, Shenzhen, China
Product Designation	Microphone
Brand Name	N/A
Test Model	MRB-Tek TX
Series Model	MRB-Tek Kit2, MRB-Tek Kit1, LINGO-TX, BY-U5-TX, LINGO, LINGO-DUO, BY-U5 K2, BY-U5 K1
Difference description	All the series models are the same as the test model except for the model names.
Date of test	Nov. 12, 2021 to Dec. 23, 2021
Deviation	No any deviation from the test method
Condition of Test Sample	Normal
Test Result	Pass
Report Template	AGCRT-US-LPAS/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 15.236.

Prepared By



John Zeng
(Project Engineer)

Dec. 23, 2021

Reviewed By



Calvin Liu
(Reviewer)

Dec. 23, 2021

Approved By



Max Zhang
(Authorized Officer)

Dec. 23, 2021

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2. GENERAL INFORMATION

2.1. PRODUCT DESCRIPTION

Operation Frequency	Group A: 556.710MHz -575.980MHz Group B: 576.390MHz -595.660MHz
Maximum Radiated Power	Group A: -0.383dBm Group B: -1.036dBm
Modulation	FM
Number of channels	Group A: 48 Group B: 48
Antenna Gain	0.02dBi
Antenna Designation	FPC Antenna (Met 15.203 Antenna requirement)
Hardware Version	V1.0
Software Version	V1.0
Power Supply	DC 3.7V by battery or DC 5V by adapter

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Channel list: Group A

Channel Number	Frequency (MHz)	Channel Number	Frequency (MHz)
1	556.710	25	566.550
2	557.120	26	566.960
3	557.530	27	567.370
4	557.940	28	567.780
5	558.350	29	568.190
6	558.760	30	568.600
7	559.170	31	569.010
8	559.580	32	569.420
9	559.990	33	569.830
10	560.400	34	570.240
11	560.810	35	570.650
12	561.220	36	571.060
13	561.630	37	571.470
14	562.040	38	571.880
15	562.450	39	572.290
16	562.860	40	572.700
17	563.270	41	573.110
18	563.680	42	573.520
19	564.090	43	573.930
20	564.500	44	574.340
21	564.910	45	574.750
22	565.320	46	575.160
23	565.730	47	575.570
24	566.140	48	575.980

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Channel list: Group B

Channel Number	Frequency (MHz)	Channel Number	Frequency (MHz)
1	576.390	25	586.230
2	576.800	26	586.640
3	577.210	27	587.050
4	577.620	28	587.460
5	578.030	29	587.870
6	578.440	30	588.280
7	578.850	31	588.690
8	579.260	32	589.100
9	579.670	33	589.510
10	580.080	34	589.920
11	580.490	35	590.330
12	580.900	36	590.740
13	581.310	37	591.150
14	581.720	38	591.560
15	582.130	39	591.970
16	582.540	40	592.380
17	582.950	41	592.790
18	583.360	42	593.200
19	583.770	43	593.610
20	584.180	44	594.020
21	584.590	45	594.430
22	585.000	46	594.840
23	585.410	47	595.250
24	585.820	48	595.660

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2.2. 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.

2.3. SPECIAL ACCESSORIES

Refer to section 5.2.

2.4. EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

2.5. 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 expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95%.

Item	Measurement Uncertainty
Uncertainty of Conducted Emission for AC Port	$U_c = \pm 3.1 \text{ dB}$
Uncertainty of Radiated Emission below 1GHz	$U_c = \pm 4.0 \text{ dB}$
Uncertainty of Radiated Emission above 1GHz	$U_c = \pm 4.8 \text{ dB}$
Uncertainty of total RF power, conducted	$U_c = \pm 0.8 \text{ dB}$
Uncertainty of spurious emissions, conducted	$U_c = \pm 2 \%$
Uncertainty of Occupied Channel Bandwidth	$U_c = \pm 2 \%$

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4. DESCRIPTION OF TEST MODES

NO.	TEST MODE DESCRIPTION
1	Group A TX mode at Low channel (CH01: 556.710MHz)-Low power
2	Group A TX mode at Low channel (CH01: 556.710MHz)-Middle power
3	Group A TX mode at Low channel (CH01: 556.710MHz)-High power
4	Group A TX mode at Middle channel (CH24: 566.140MHz)-Low power
5	Group A TX mode at Middle channel (CH24: 566.140MHz)-Middle power
6	Group A TX mode at Middle channel (CH24: 566.140MHz)-High power
7	Group A TX mode at High channel (CH48: 575.980MHz)-Low power
8	Group A TX mode at High channel (CH48: 575.980MHz)-Middle power
9	Group A TX mode at High channel (CH48: 575.980MHz)-High power
10	Group B TX mode at Low channel (CH01: 576.390MHz)-Low power
11	Group B TX mode at Low channel (CH01: 576.390MHz)-Middle power
12	Group B TX mode at Low channel (CH01: 576.390MHz)-High power
13	Group B TX mode at Middle channel (CH24: 585.820MHz)-Low power
14	Group B TX mode at Middle channel (CH24: 585.820MHz)-Middle power
15	Group B TX mode at Middle channel (CH24: 585.820MHz)-High power
16	Group B TX mode at High channel (CH48: 595.660MHz)-Low power
17	Group B TX mode at High channel (CH48: 595.660MHz)-Middle power
18	Group B TX mode at High channel (CH48: 595.660MHz)-High power

Note:

1. For Radiated Emission, 3axis were chosen for testing for each applicable mode.
2. For Conducted Test method, a temporary antenna connector is provided by the manufacture.
3. For battery operated equipment, the equipment tests are performed using a new battery.
4. All the requirements have been tested by modulating the transmitter with a 1 khz tone at a fixed level which set to the manufacturer's maximum rated input to the modulator.

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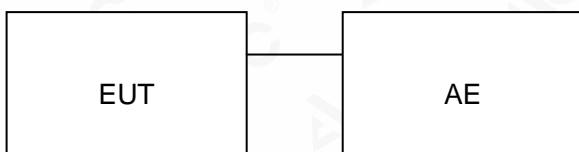
5. SYSTEM TEST CONFIGURATION

5.1. CONFIGURATION OF EUT SYSTEM

Radiated Emission Configure:



Conducted Emission Configure:



5.2 EQUIPMENT USED IN TESTED SYSTEM

Item	Equipment	Model No.	ID or Specification	Remark
1	Microphone	MRB-Tek TX	2ARN3-052101TX	EUT
2	Adapter	ZL-PCB0100020502000	DC 5V	AE

5.3. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.203	Antenna requirement	Compliant
§15.236(d)(1)	Maximum radiated power	Compliant
§15.236(f)(2)	Occupied bandwidth	Compliant
§15.236(f)(3)	Frequency stability	Compliant
§15.236(g)	Emissions within the band	Compliant
§15.236(g)	Emissions outside of this band	Compliant
15.207	Line Conducted Emission	Compliant

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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	ESCI	10096	May 15, 2021	May 14, 2022
LISN	R&S	ESH2-Z5	100086	Jun. 09, 2021	Jun. 08, 2022

TEST EQUIPMENT OF RADIATED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESCI	10096	May 15, 2021	May 14, 2022
EXA Signal Analyzer	Agilent	N9020A	MY52090123	Aug. 18, 2021	Aug. 17, 2022
Attenuator	Warriors	W13	11324	Sep. 03, 2020	Sep. 02, 2022
Horn antenna	ETS-LINDGREN	3117	00154520	Oct. 31, 2021	Oct. 30, 2023
Active loop antenna (9K-30MHz)	ZHINAN	ZN30900C	18051	May 22, 2020	May 21, 2022
Double-Ridged Waveguide Horn	ETS-LINDGREN	3117	00034609	Apr. 23, 2021	Apr. 22, 2022
Broadband Preamplifier	ETS-LINDGREN	3117PA	00225134	Sep. 03, 2020	Sep. 02, 2022
ANTENNA	SCHWARZBECK	VULB9168	494	Jan. 08, 2020	Jan. 07, 2023
Wireless communication tester	HP	8920B	US35010161	Sep. 02, 2021	Sep. 01, 2022
Test software	Tonscend	JS32-RE (Ver. 2.5)	N/A	N/A	N/A

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7. OUTPUT POWER

7.1. TEST LIMIT

The power may not exceed the following values.

470-608 MHz bands: 50 mW EIRP

7.2. MEASUREMENT PROCEDURE

☐ EIRP Test Method

1. The EUT was placed on the top of the turntable 0.8 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. $EIRP [dBm] = E[dB(\mu V)/m] - 95.3$
- 4.7dB shall be added as an upper bound on the field strength that would be observed on a test range with a ground plane for frequencies between 30MHz and 1000MHz, or an additional 6dB shall be added for frequencies below 30 MHz.

☒ Conducted Power Test Method

1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. $RBW \geq OBW$.
3. $VBW \geq 3 \times RBW$.
4. $Span \geq 2 \times OBW$.
5. Sweep time $\geq 10 \times (\text{number of points in sweep}) \times (\text{transmission symbol period})$
6. Detector function: Peak.
7. Trace: Max hold.
8. 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.

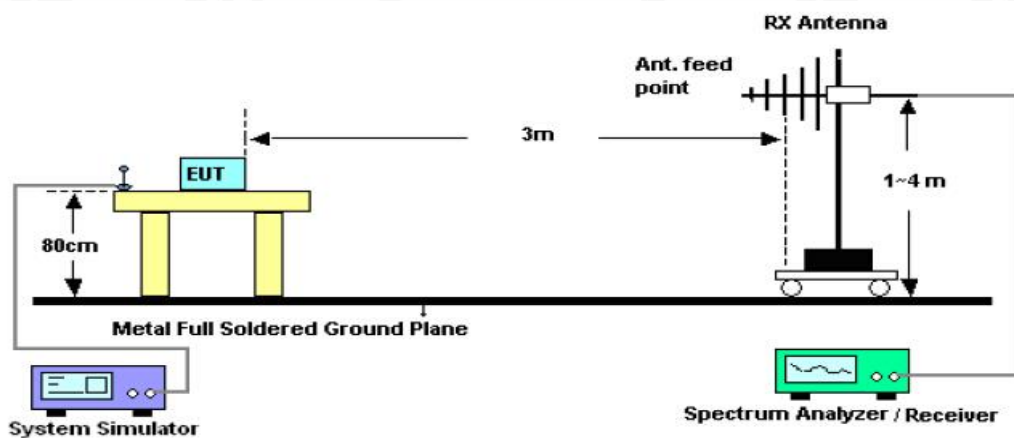
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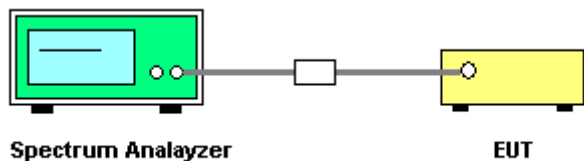


7.3. TEST SETUP

☐ EIRP Test Method



☒ Conducted Power Test Method



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7.4. TEST RESULT

Group A

Test Channel	Test power	Peak Power	Limit
(MHz)	--	(dBm)	(dBm)
556.710	Low power	-7.023	17
	Middle power	-0.503	17
	High power	-0.383	17
566.140	Low power	-6.260	17
	Middle power	-0.726	17
	High power	-0.684	17
575.980	Low power	-5.286	17
	Middle power	-1.029	17
	High power	-1.013	17

Group B

Test Channel	Test power	Peak Power	Limit
(MHz)	--	(dBm)	(dBm)
576.390	Low power	-5.231	17
	Middle power	-1.046	17
	High power	-1.036	17
585.820	Low power	-3.833	17
	Middle power	-1.337	17
	High power	-1.289	17
595.660	Low power	-2.029	17
	Middle power	-1.593	17
	High power	-1.508	17

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8. OCCUPIED BANDWIDTH

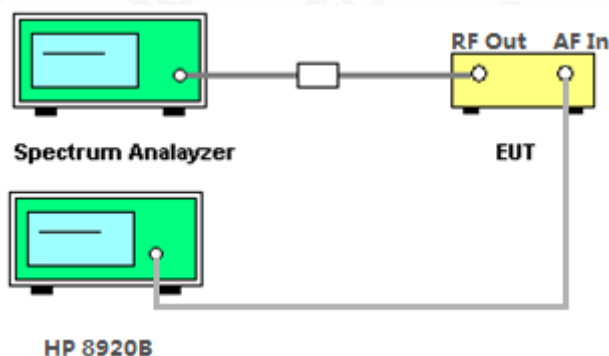
8.1. TEST LIMIT

The operating bandwidth shall not exceed 200 kHz.

8.2. MEASUREMENT PROCEDURE

1. For the occupied bandwidth measurements, the input signal shall be a 1 kHz tone. The level of the tone shall be set to the manufacturer's maximum rated input to the modulator.
2. Set the EUT Work on operation frequency.
3. Set Span = approximately 1.5 times the occupied bandwidth, centered on a 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.

8.3. TEST SET-UP



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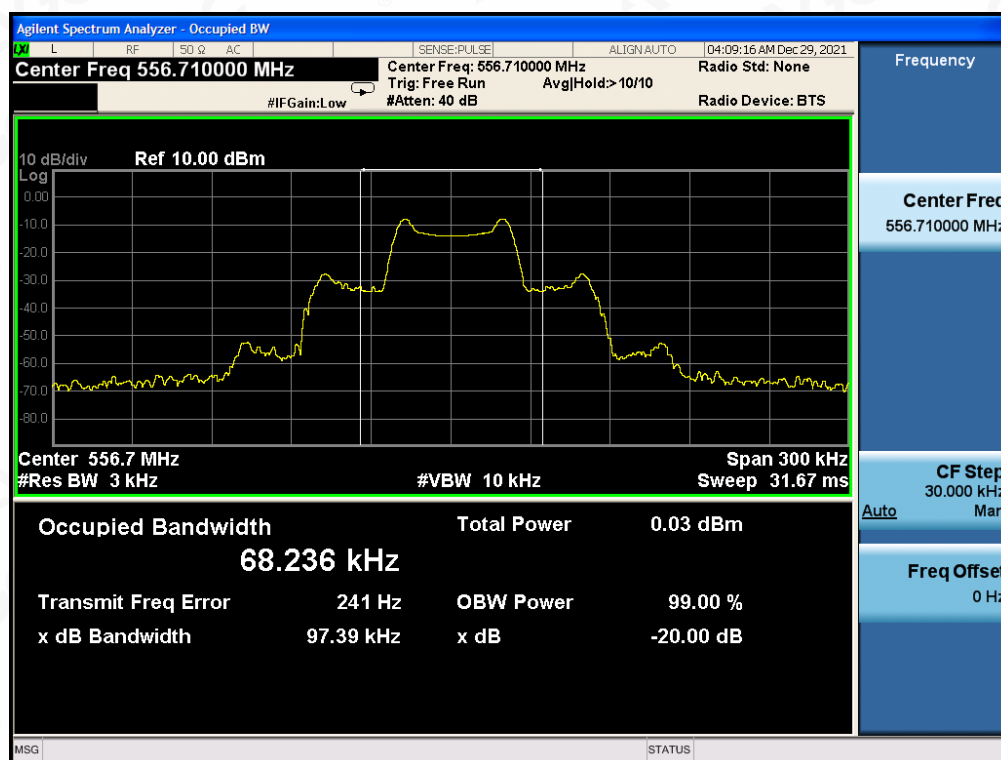


8.4. MEASUREMENT RESULTS

Group A

Test Channel	Test power	-20dBc EBW (kHz)	99% OBW (kHz)	Limit (kHz)
556.710MHz	Low power	97.39	68.236	200
	Middle power	71.61	63.997	200
	High power	74.67	64.900	200
566.140MHz	Low power	98.19	68.92	200
	Middle power	100.1	70.103	200
	High power	98.18	69.472	200
575.980MHz	Low power	101.3	72.605	200
	Middle power	102.9	71.753	200
	High power	78.14	71.469	200

TEST PLOT OF BANDWIDTH FOR 556.710MHz AT LOW POWER

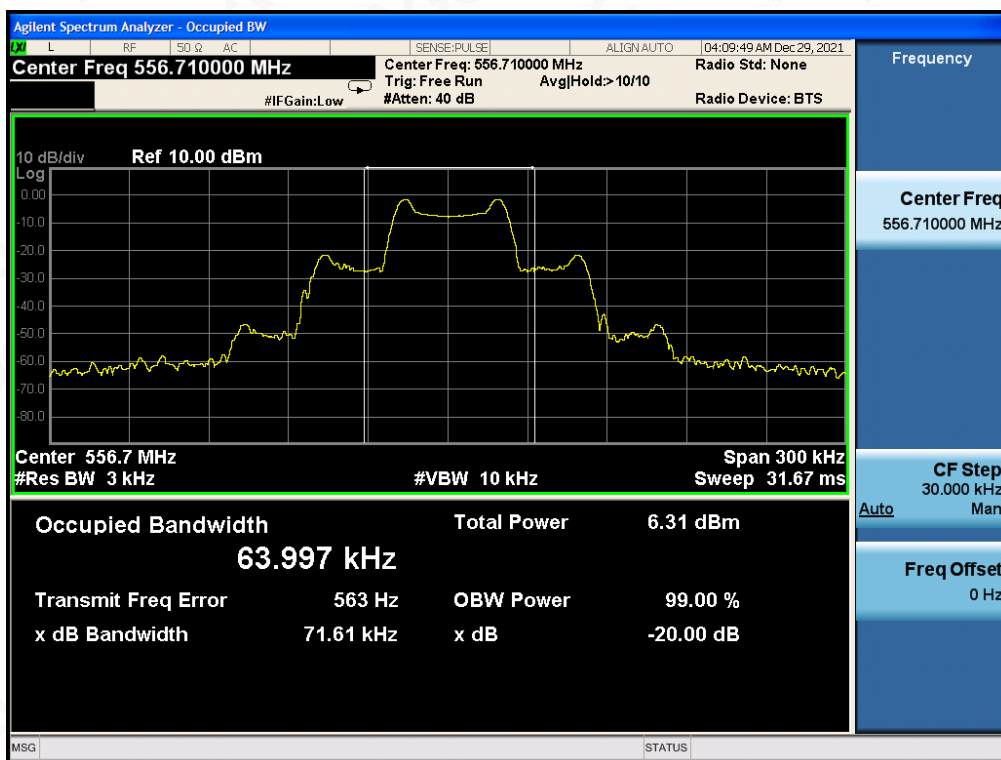


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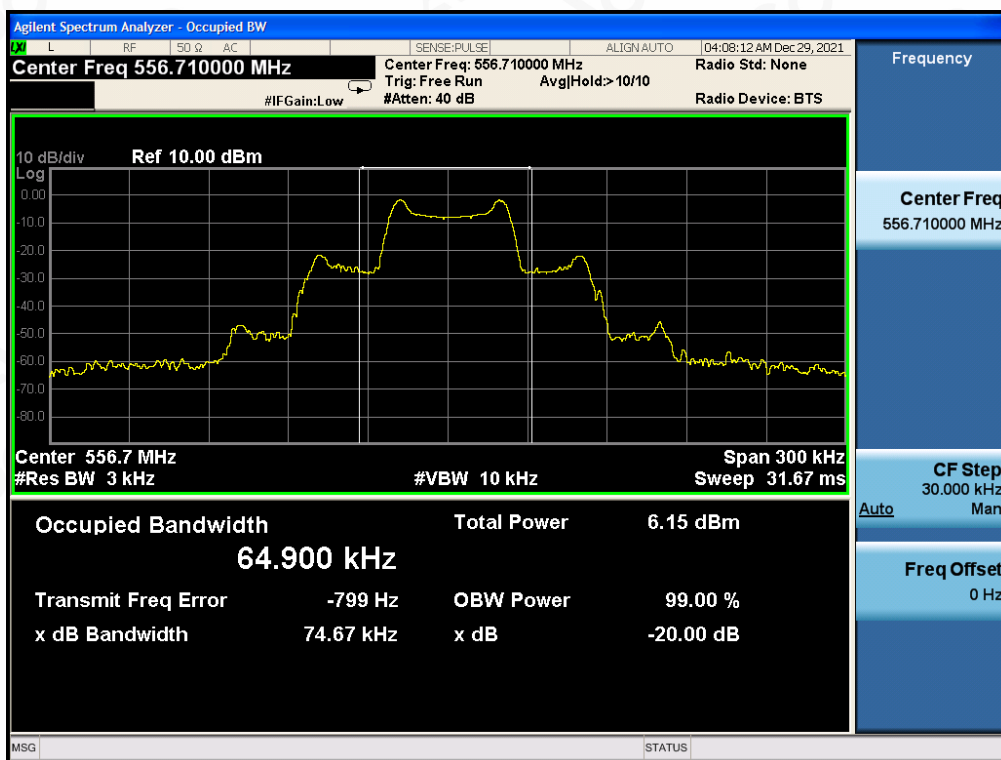
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TEST PLOT OF BANDWIDTH FOR 556.710MHz AT MIDDLEPOWER



TEST PLOT OF BANDWIDTH FOR 556.710MHz AT HIGH POWER

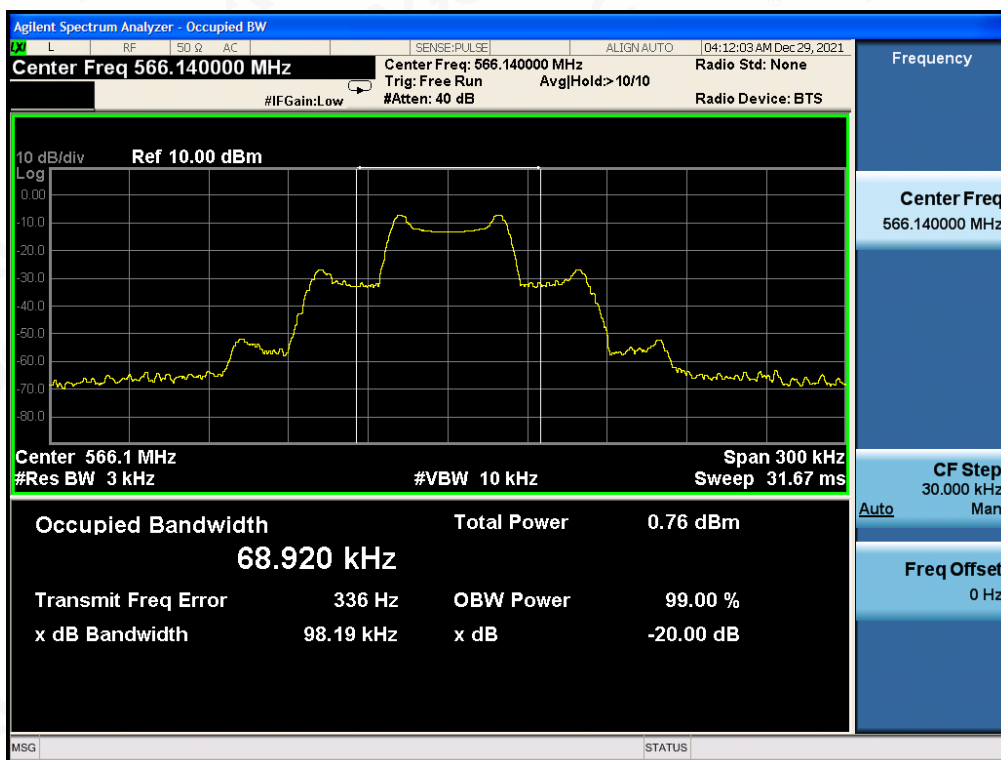


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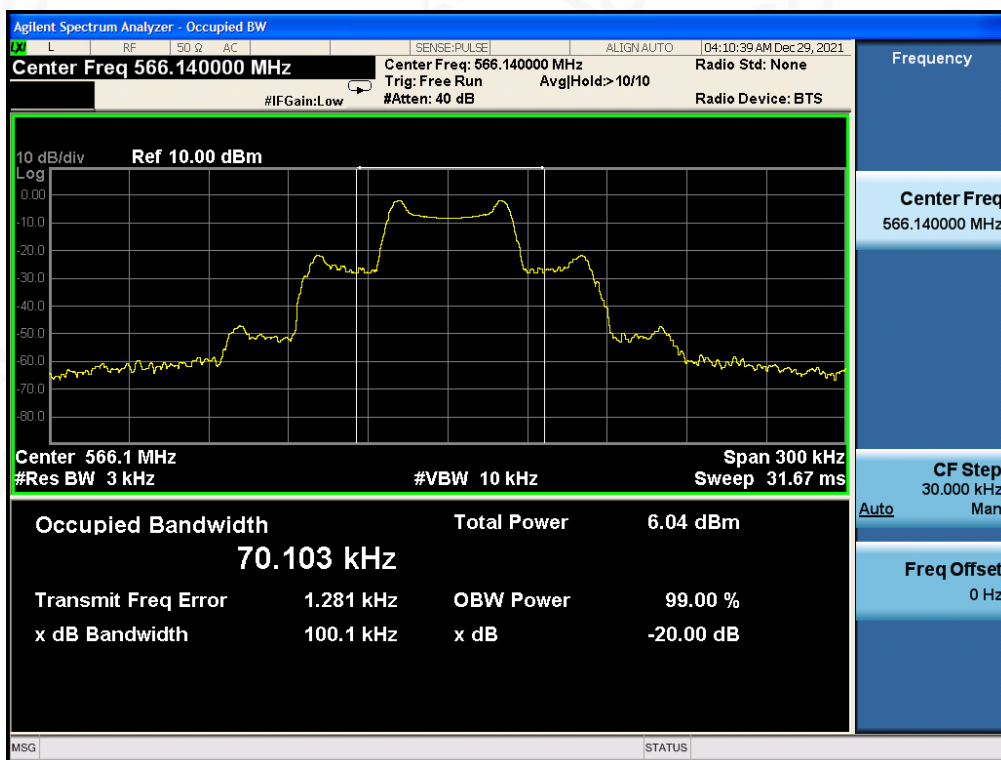
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TEST PLOT OF BANDWIDTH FOR 566.140MHz AT LOW POWER



TEST PLOT OF BANDWIDTH FOR 566.140MHz AT MIDDLE POWER

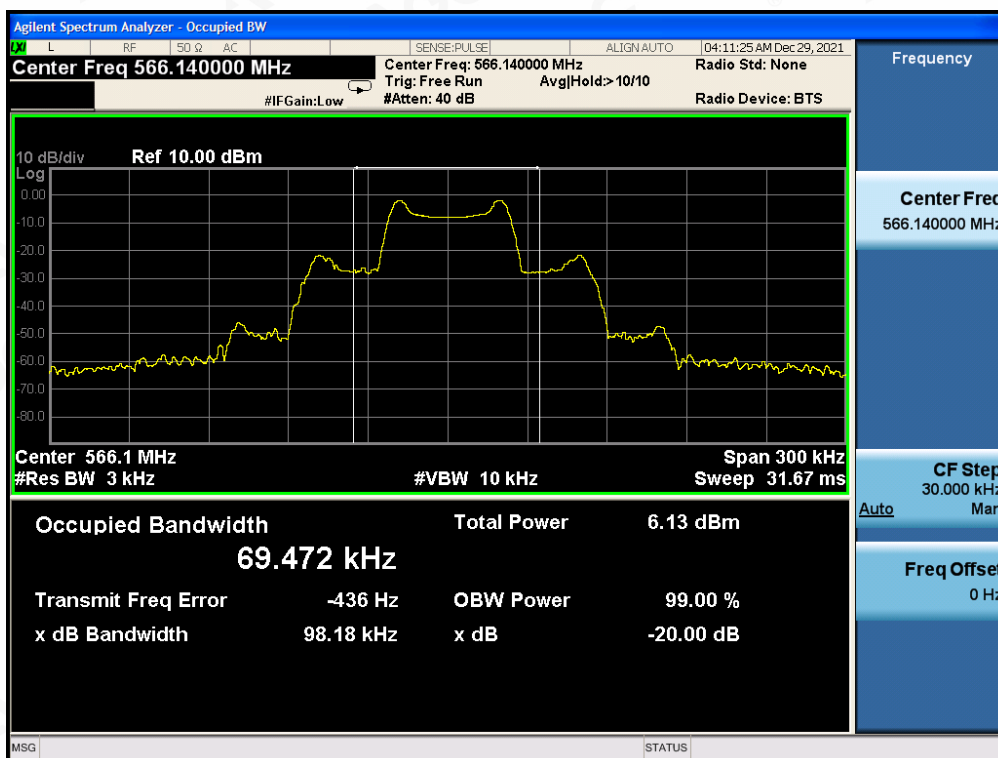


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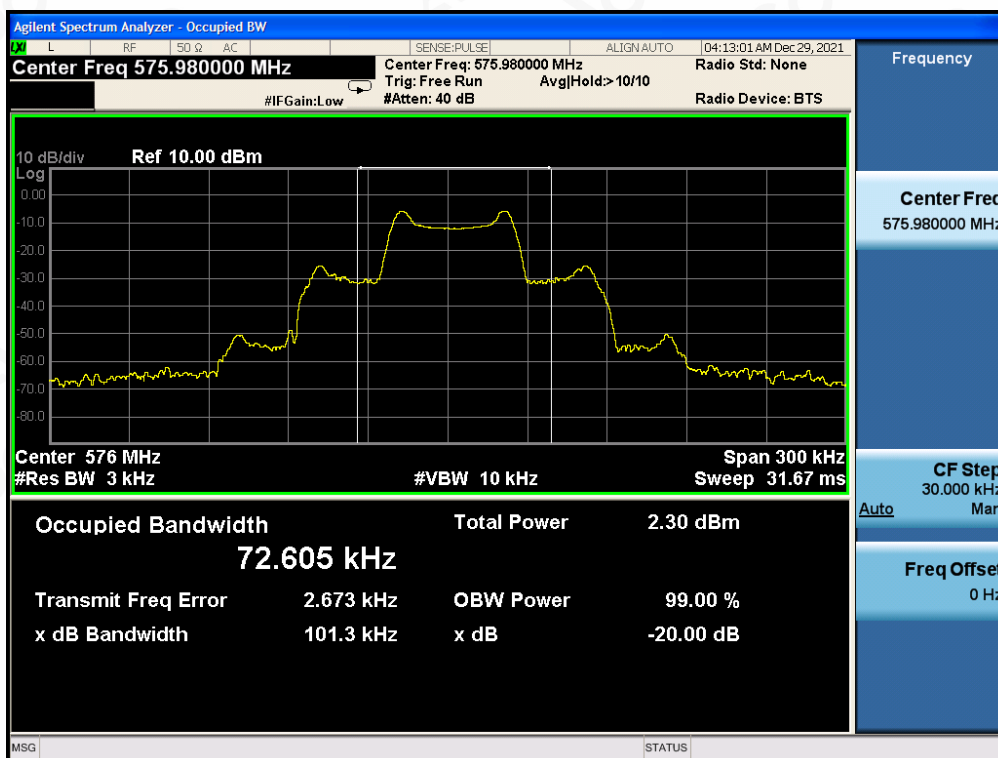
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TEST PLOT OF BANDWIDTH FOR 566.140MHz AT HIGH POWER



TEST PLOT OF BANDWIDTH FOR 575.980MHz AT LOW POWER

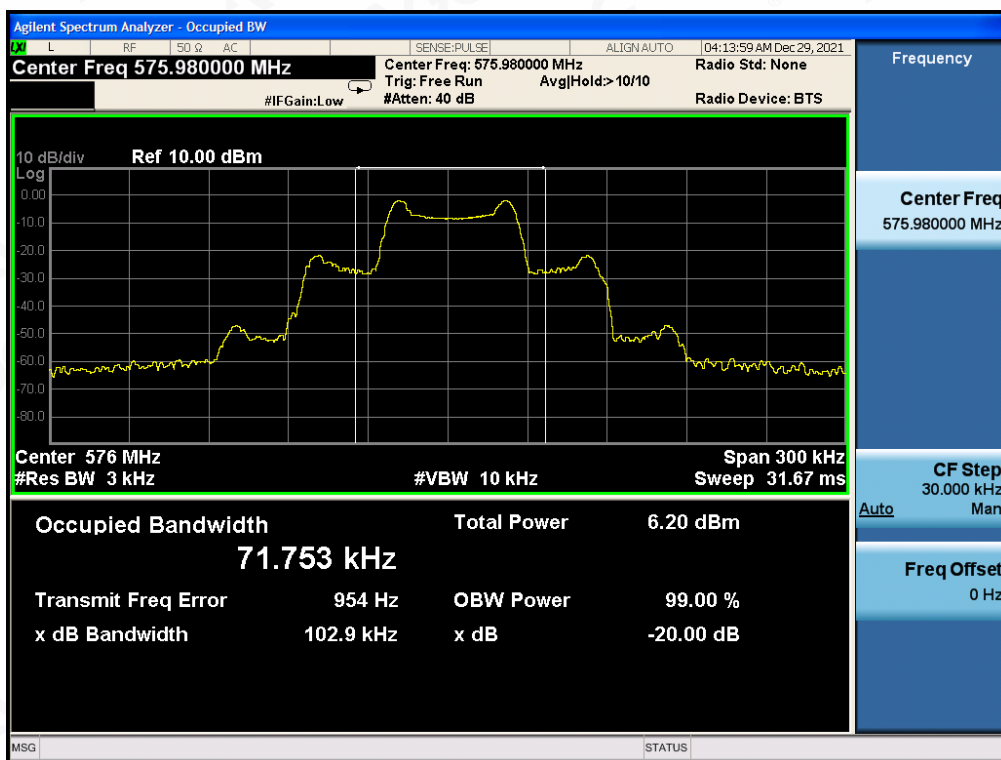


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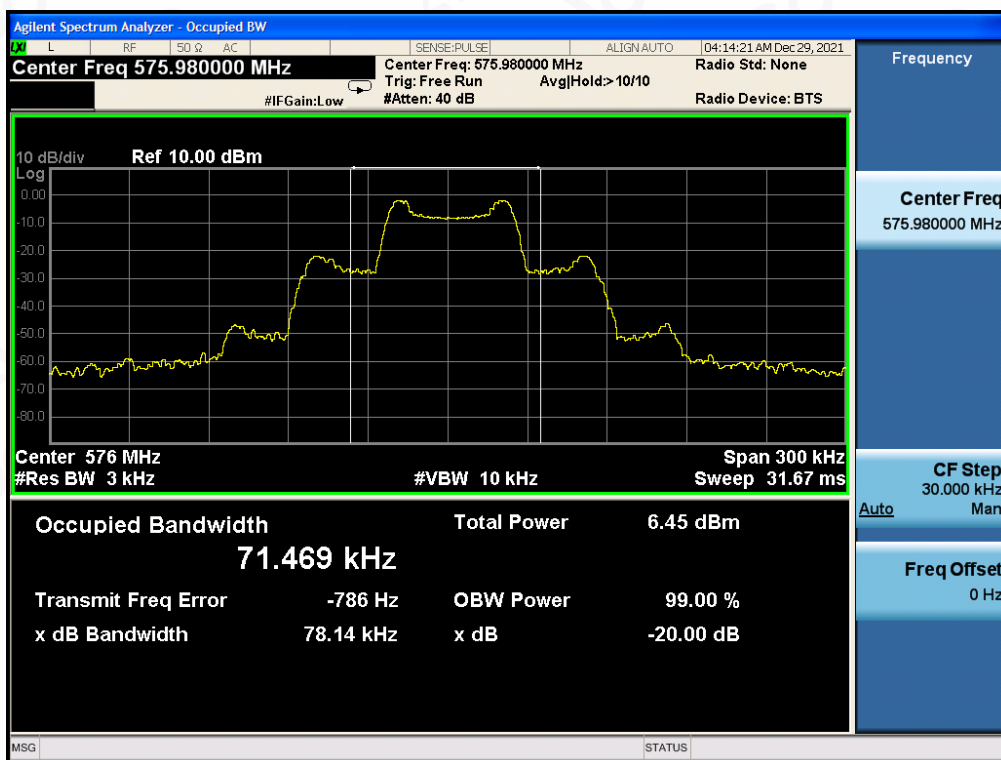
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TEST PLOT OF BANDWIDTH FOR 575.980MHz AT MIDDLEPOWER



TEST PLOT OF BANDWIDTH FOR 575.980MHz AT HIGH POWER



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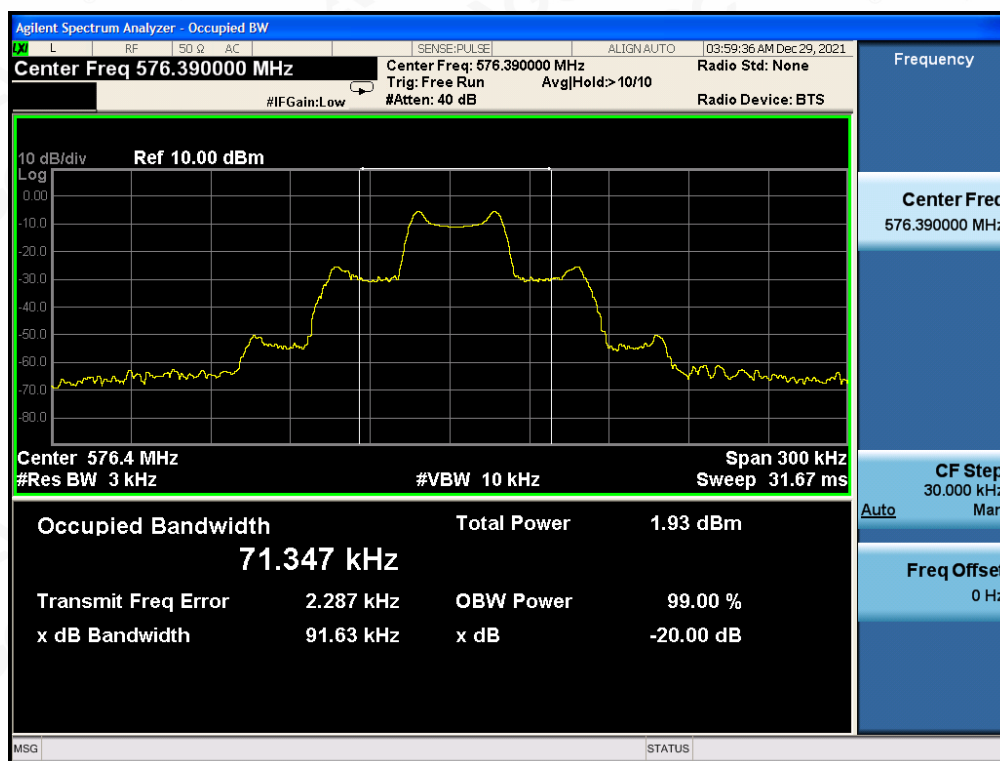
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Group B

Test Channel	Test power	-20dBc EBW (kHz)	99% OBW (kHz)	Limit (kHz)
556.51MHz	Low power	91.63	71.347	200
	Middle power	99.61	68.629	200
	High power	98.67	70.555	200
585.820MHz	Low power	46.09	63.227	200
	Middle power	70.32	63.797	200
	High power	48.89	64.167	200
595.660MHz	Low power	73.20	67.373	200
	Middle power	48.30	66.902	200
	High power	72.37	67.862	200

TEST PLOT OF BANDWIDTH FOR 576.390MHz AT LOW POWER

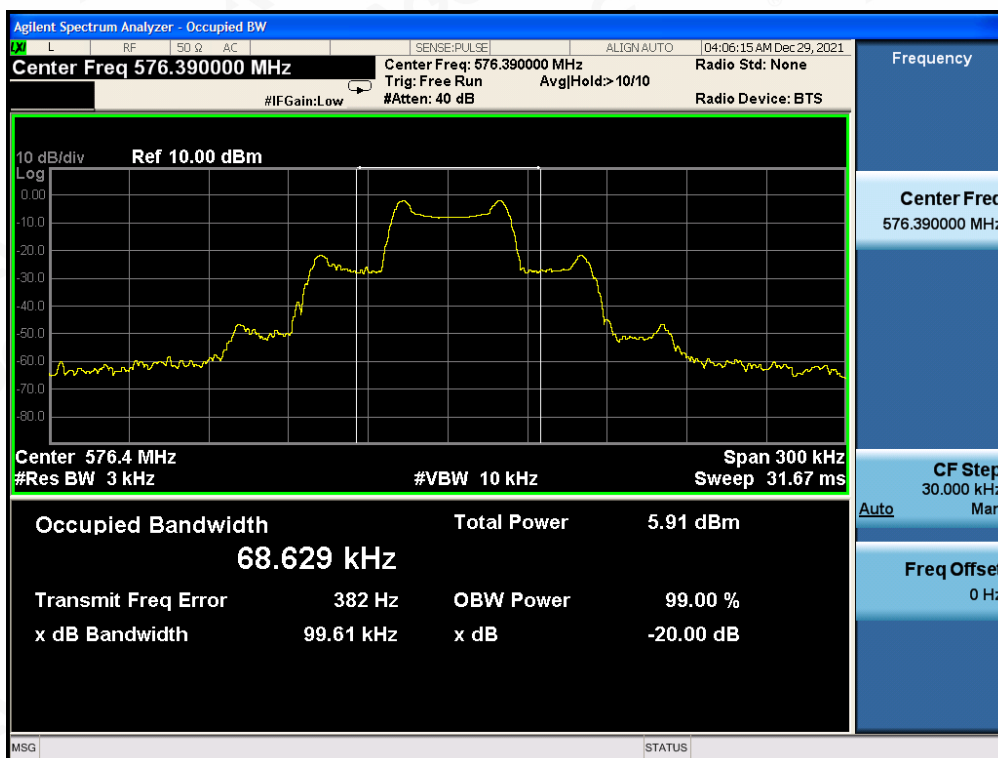


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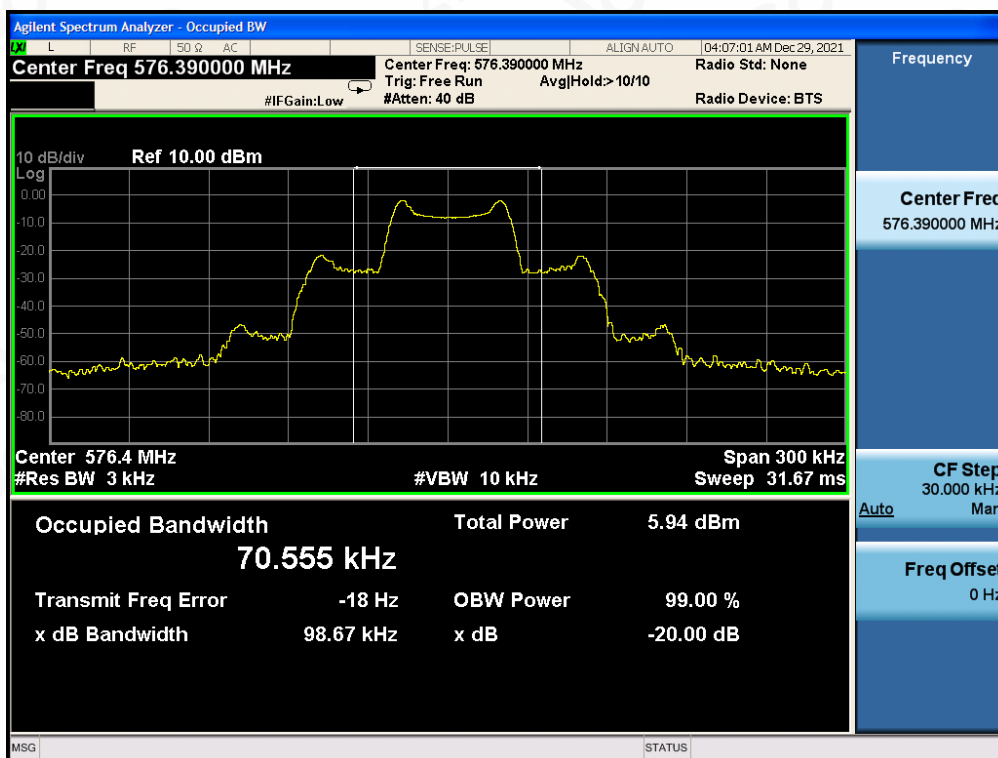
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TEST PLOT OF BANDWIDTH FOR 576.390MHz AT MIDDLEPOWER



TEST PLOT OF BANDWIDTH FOR 576.390MHz AT HIGH POWER

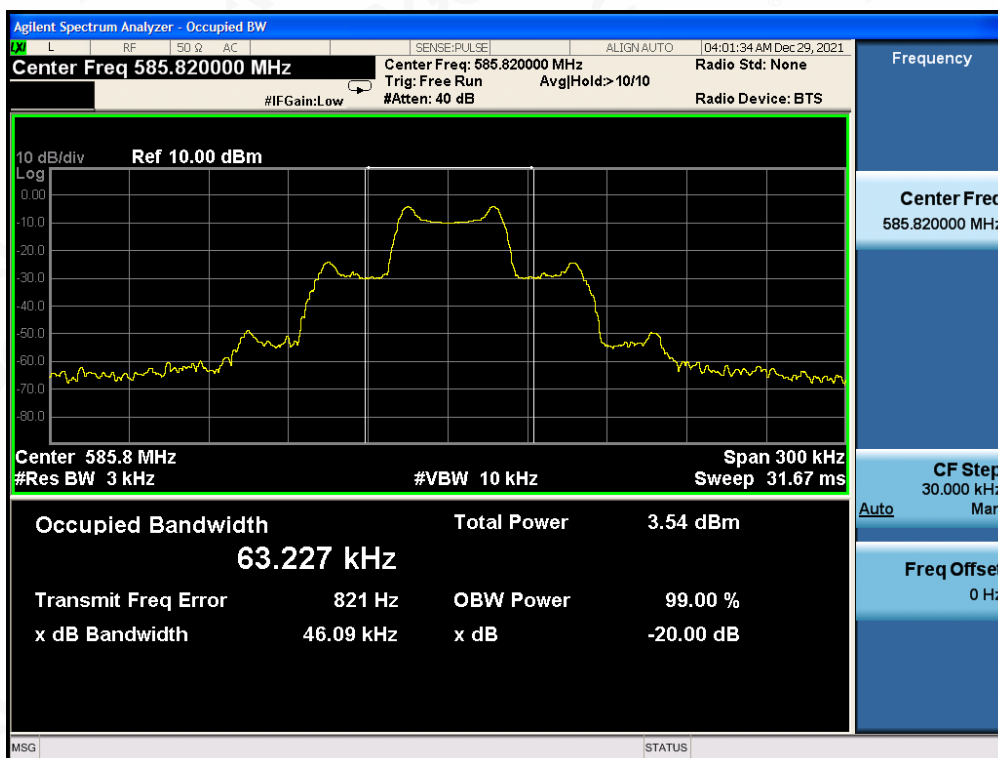


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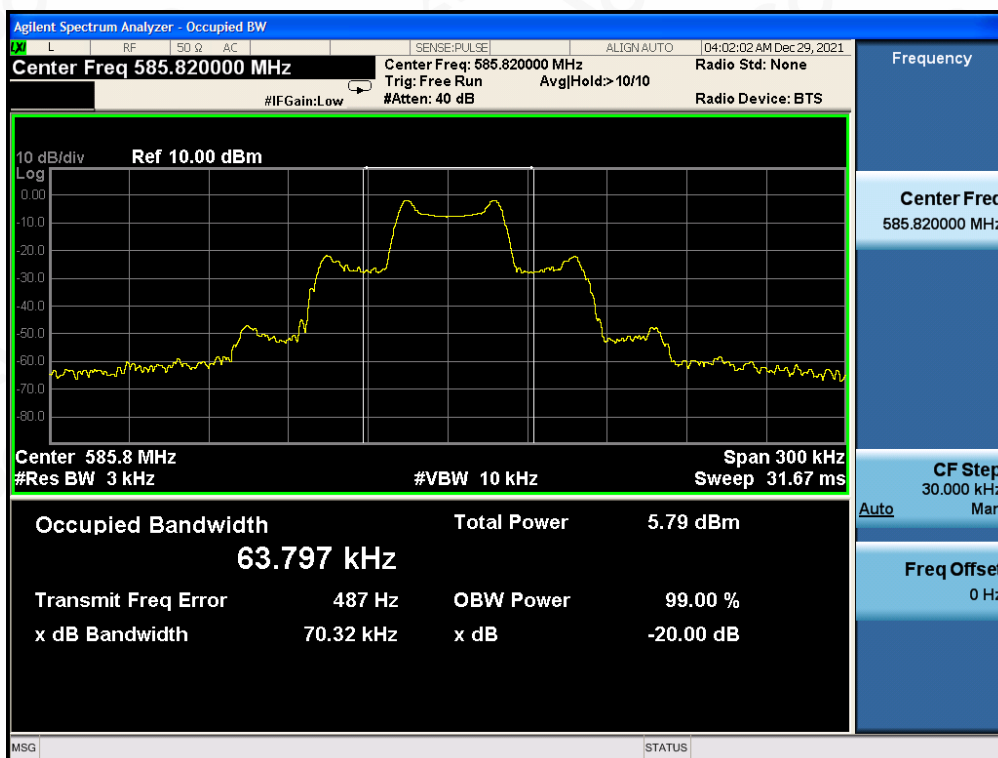
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TEST PLOT OF BANDWIDTH FOR 585.820MHz AT LOW POWER



TEST PLOT OF BANDWIDTH FOR 585.820MHz AT MIDDLE POWER

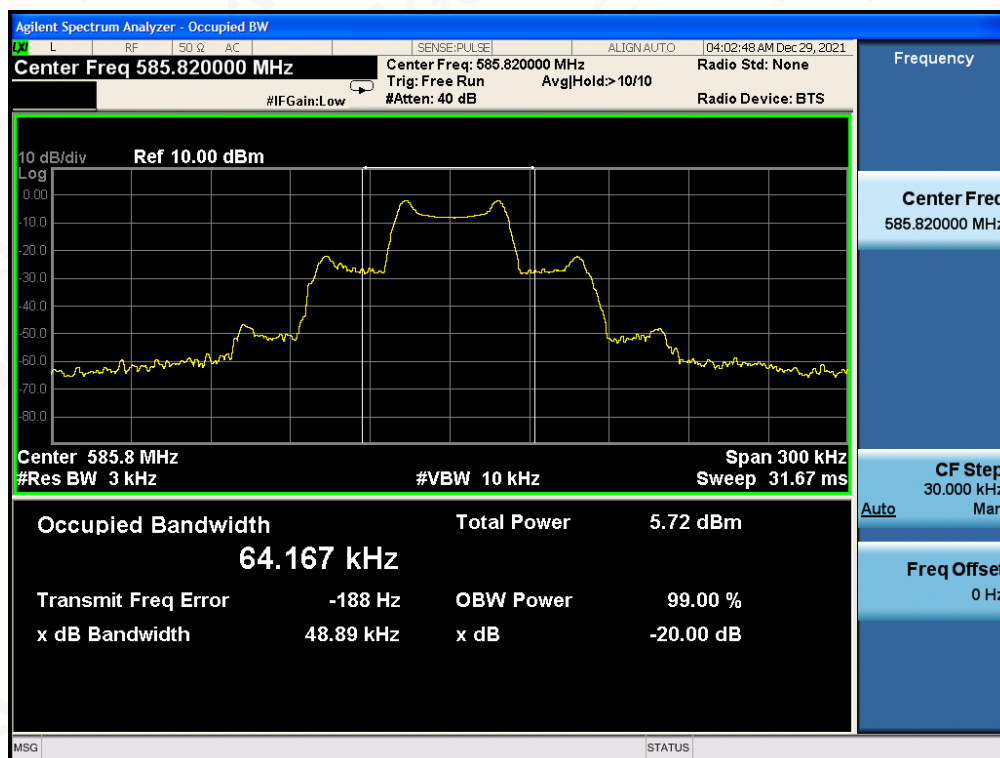


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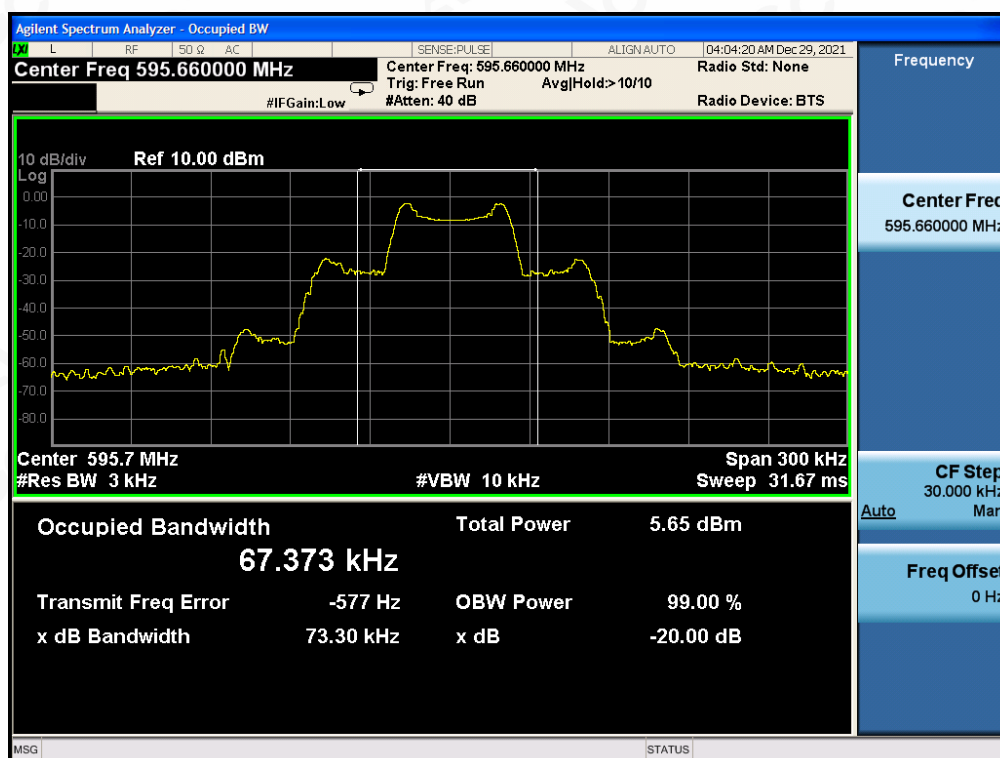
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TEST PLOT OF BANDWIDTH FOR 585.820MHz AT HIGH POWER



TEST PLOT OF BANDWIDTH FOR 595.660MHz AT LOW POWER

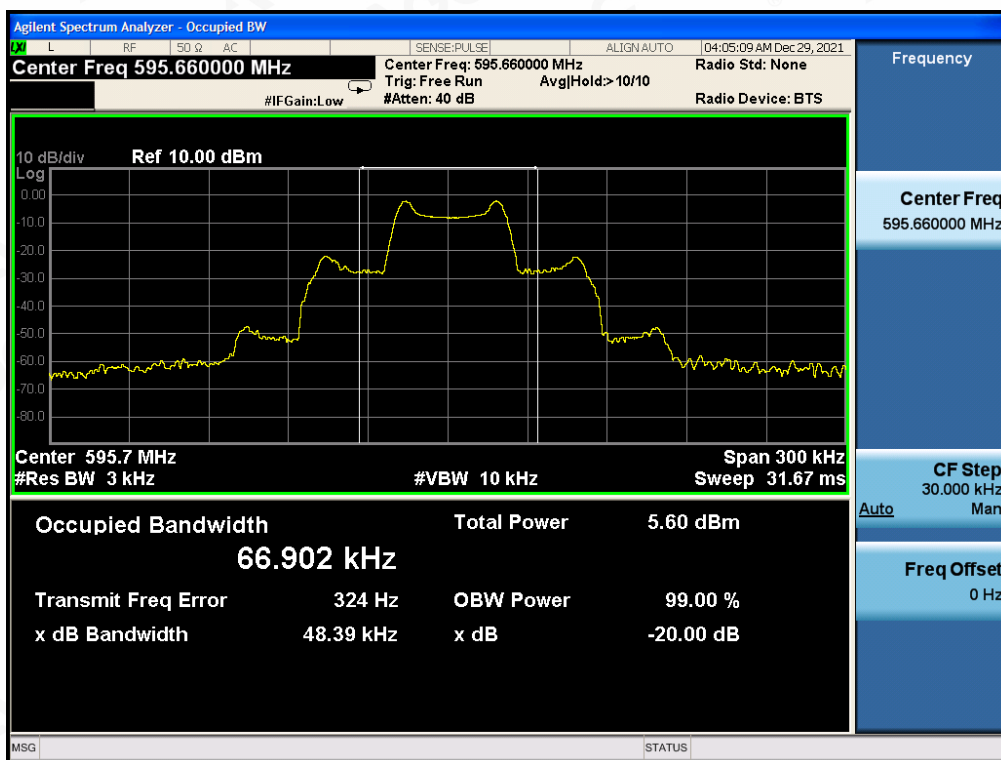


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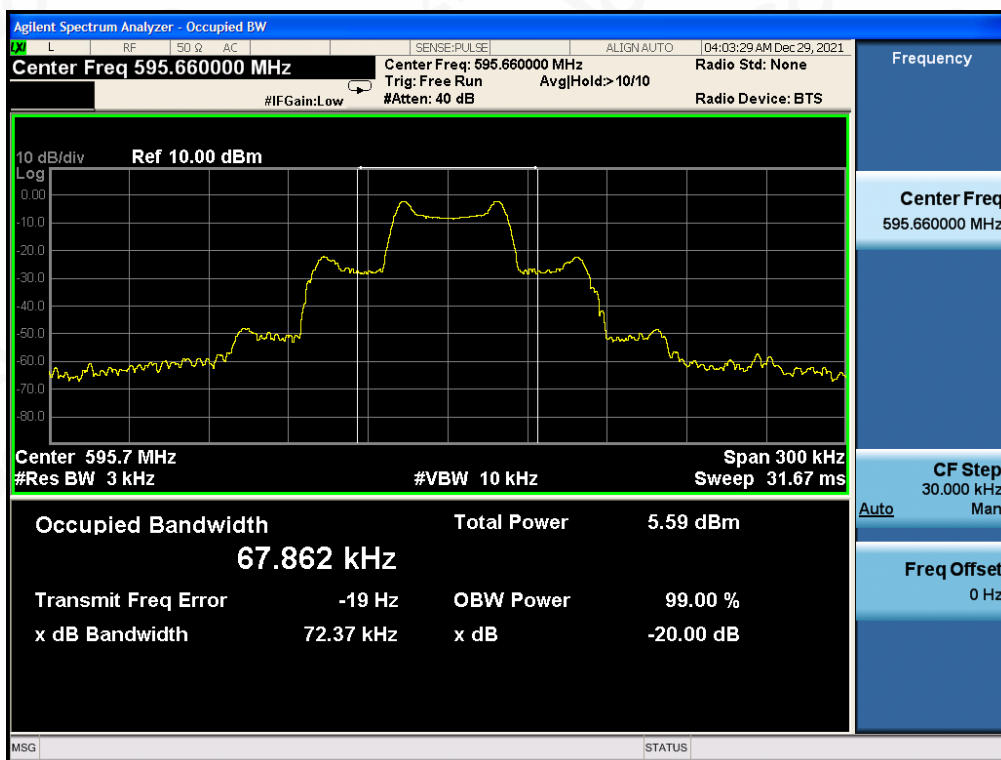
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TEST PLOT OF BANDWIDTH FOR 595.660MHz AT MIDDLEPOWER



TEST PLOT OF BANDWIDTH FOR 595.660MHz AT HIGH POWER



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9. FREQUENCY STABILITY

9.1. TEST LIMIT

The frequency tolerance of the carrier signal shall be maintained within $\pm 0.005\%$ of the operating frequency over a temperature variation of -30 degrees to $+50$ degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C.

9.2. MEASUREMENT PROCEDURE

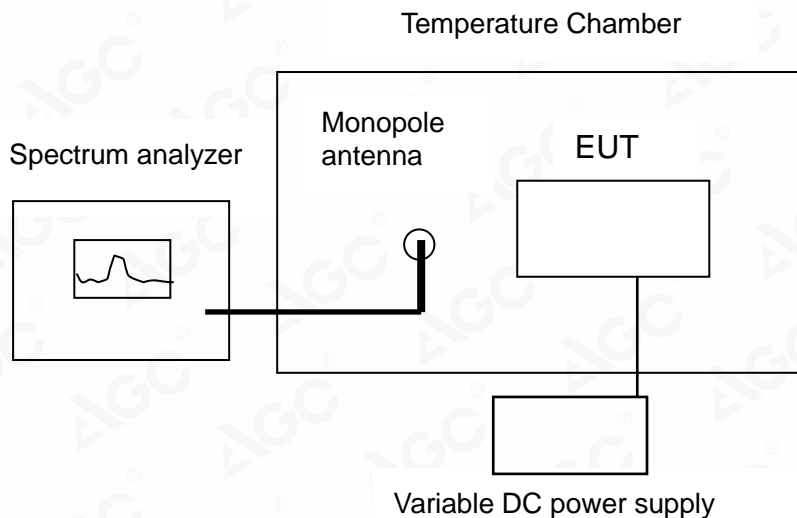
1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the EUT Work on the operation frequency.
3. Set SPA Centre Frequency = Operation Frequency, RBW= 1 KHz, VBW $\geq 3 \times$ RBW.
4. Set SPA Trace 1 Max hold, then View.
5. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value
6. Extreme temperature rule is $-30^{\circ}\text{C} \sim 50^{\circ}\text{C}$.

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9.3. TEST SET-UP



9.4. TEST RESULT

Group A

Test frequency: 556.710MHz-Low power

Voltage vs. Frequency Stability (Test Temperature: 20°C)

Voltage(V)	Measurement Frequency (MHz)	Max. Deviation (MHz)	Limit (MHz)	Conclusion
3.145	556.7156	0.0084	0.03	PASS
3.70	556.7184			
4.255	556.7175			

Temperature vs. Frequency Stability (Test Voltage: 3.7V)

Temperature	Measurement Frequency (MHz)	Max. Deviation (MHz)	Limit (MHz)	Conclusion
-30°C	556.7154	0.0081	0.03	PASS
-20°C	556.7152			
-10°C	556.7161			
0°C	556.7165			
10°C	556.7167			
20°C	556.7181			
30°C	556.7180			
40°C	556.7179			
50°C	556.7178			

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Test frequency: 556.710MHz-Middle power

Voltage vs. Frequency Stability (Test Temperature: 20°C)

Voltage(V)	Measurement Frequency (MHz)	Max. Deviation (MHz)	Limit (MHz)	Conclusion
3.145	556.7162	0.0086	0.03	PASS
3.70	556.7186			
4.255	556.7179			

Temperature vs. Frequency Stability (Test Voltage: 3.7V)

Temperature	Measurement Frequency (MHz)	Max. Deviation (MHz)	Limit (MHz)	Conclusion
-30°C	556.7165	0.0080	0.03	PASS
-20°C	556.7164			
-10°C	556.7168			
0°C	556.7169			
10°C	556.7174			
20°C	556.7175			
30°C	556.7176			
40°C	556.7180			
50°C	556.7173			

Test frequency: 556.710MHz-High power

Voltage vs. Frequency Stability (Test Temperature: 20°C)

Voltage(V)	Measurement Frequency (MHz)	Max. Deviation (MHz)	Limit (MHz)	Conclusion
3.145	556.7171	0.0088	0.03	PASS
3.70	556.7175			
4.255	556.7188			

Temperature vs. Frequency Stability (Test Voltage: 3.7V)

Temperature	Measurement Frequency (MHz)	Max. Deviation (MHz)	Limit (MHz)	Conclusion
-30°C	556.7174	0.0089	0.03	PASS
-20°C	556.7175			
-10°C	556.7171			
0°C	556.7172			
10°C	556.7185			
20°C	556.7184			
30°C	556.7188			
40°C	556.7187			
50°C	556.7189			

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Test frequency: 566.140MHz-Low power

Voltage vs. Frequency Stability (Test Temperature: 20°C)

Voltage(V)	Measurement Frequency (MHz)	Max. Deviation (MHz)	Limit (MHz)	Conclusion
3.145	566.1507	0.0118	0.03	PASS
3.70	566.1512			
4.255	566.1518			

Temperature vs. Frequency Stability (Test Voltage: 3.7V)

Temperature	Measurement Frequency (MHz)	Max. Deviation (MHz)	Limit (MHz)	Conclusion
-30°C	566.1519	0.0119	0.03	PASS
-20°C	566.1512			
-10°C	566.1515			
0°C	566.1508			
10°C	566.1509			
20°C	566.1507			
30°C	566.1511			
40°C	566.1514			
50°C	566.1506			

Test frequency: 566.140MHz-Middle power

Voltage vs. Frequency Stability (Test Temperature: 20°C)

Voltage(V)	Measurement Frequency (MHz)	Max. Deviation (MHz)	Limit (MHz)	Conclusion
3.145	566.1521	0.0125	0.03	PASS
3.70	566.1522			
4.255	566.1525			

Temperature vs. Frequency Stability (Test Voltage: 3.7V)

Temperature	Measurement Frequency (MHz)	Max. Deviation (MHz)	Limit (MHz)	Conclusion
-30°C	566.1515	0.0124	0.03	PASS
-20°C	566.1516			
-10°C	566.1512			
0°C	566.1519			
10°C	566.1521			
20°C	566.1524			
30°C	566.1522			
40°C	566.1517			
50°C	566.1518			

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Test frequency: 566.140MHz-High power

Voltage vs. Frequency Stability (Test Temperature: 20°C)

Voltage(V)	Measurement Frequency (MHz)	Max. Deviation (MHz)	Limit (MHz)	Conclusion
3.145	566.1511	0.0122	0.03	PASS
3.70	566.1516			
4.255	566.1522			

Temperature vs. Frequency Stability (Test Voltage: 3.7V)

Temperature	Measurement Frequency (MHz)	Max. Deviation (MHz)	Limit (MHz)	Conclusion
-30°C	566.1515	0.0125	0.03	PASS
-20°C	566.1517			
-10°C	566.1518			
0°C	566.1514			
10°C	566.1521			
20°C	566.1522			
30°C	566.1525			
40°C	566.1523			
50°C	566.1514			

Test frequency: 575.980MHz-Low power

Voltage vs. Frequency Stability (Test Temperature: 20°C)

Voltage(V)	Measurement Frequency (MHz)	Max. Deviation (MHz)	Limit (MHz)	Conclusion
3.145	575.9926	0.0136	0.03	PASS
3.70	575.9936			
4.255	575.9931			

Temperature vs. Frequency Stability (Test Voltage: 3.7V)

Temperature	Measurement Frequency (MHz)	Max. Deviation (MHz)	Limit (MHz)	Conclusion
-30°C	575.9926	0.0135	0.03	PASS
-20°C	575.9928			
-10°C	575.9924			
0°C	575.9934			
10°C	575.9932			
20°C	575.9935			
30°C	575.9919			
40°C	575.9922			
50°C	575.9921			

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Test frequency: 575.980MHz-Moddle power

Voltage vs. Frequency Stability (Test Temperature: 20°C)

Voltage(V)	Measurement Frequency (MHz)	Max. Deviation (MHz)	Limit (MHz)	Conclusion
3.145	575.9934	0.0141	0.03	PASS
3.70	575.9941			
4.255	575.9939			

Temperature vs. Frequency Stability (Test Voltage: 3.7V)

Temperature	Measurement Frequency (MHz)	Max. Deviation (MHz)	Limit (MHz)	Conclusion
-30°C	575.9934	0.0146	0.03	PASS
-20°C	575.9935			
-10°C	575.9938			
0°C	553.5139			
10°C	553.5141			
20°C	553.5145			
30°C	553.5146			
40°C	553.5140			
50°C	553.5135			

Test frequency: 575.980MHz-High power

Voltage vs. Frequency Stability (Test Temperature: 20°C)

Voltage(V)	Measurement Frequency (MHz)	Max. Deviation (MHz)	Limit (MHz)	Conclusion
3.145	575.9929	0.0139	0.03	PASS
3.70	575.9939			
4.255	575.9931			

Temperature vs. Frequency Stability (Test Voltage: 3.7V)

Temperature	Measurement Frequency (MHz)	Max. Deviation (MHz)	Limit (MHz)	Conclusion
-30°C	575.9917	0.0135	0.03	PASS
-20°C	575.9920			
-10°C	575.9932			
0°C	575.9935			
10°C	575.9921			
20°C	575.9925			
30°C	575.9928			
40°C	575.9934			
50°C	575.9935			

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Group B

Test frequency: 576.390MHz-Low power

Voltage vs. Frequency Stability (Test Temperature: 20°C)

Voltage(V)	Measurement Frequency (MHz)	Max. Deviation (MHz)	Limit (MHz)	Conclusion
3.145	576.3967	0.0084	0.03	PASS
3.70	576.3984			
4.255	576.3972			

Temperature vs. Frequency Stability (Test Voltage: 3.7V)

Temperature	Measurement Frequency (MHz)	Max. Deviation (MHz)	Limit (MHz)	Conclusion
-30°C	576.3954	0.0071	0.03	PASS
-20°C	576.3957			
-10°C	576.3959			
0°C	576.3958			
10°C	576.3971			
20°C	576.3965			
30°C	576.3968			
40°C	576.3964			
50°C	576.3962			

Test frequency: 576.390MHz-Middle power

Voltage vs. Frequency Stability (Test Temperature: 20°C)

Voltage(V)	Measurement Frequency (MHz)	Max. Deviation (MHz)	Limit (MHz)	Conclusion
3.145	576.3969	0.0078	0.03	PASS
3.70	576.3978			
4.255	576.3974			

Temperature vs. Frequency Stability (Test Voltage: 3.7V)

Temperature	Measurement Frequency (MHz)	Max. Deviation (MHz)	Limit (MHz)	Conclusion
-30°C	576.3965	0.0086	0.03	PASS
-20°C	576.3969			
-10°C	576.3986			
0°C	576.3984			
10°C	576.3985			
20°C	576.3972			
30°C	576.3971			
40°C	576.3968			
50°C	576.3970			

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Test frequency: 576.390MHz-High power

Voltage vs. Frequency Stability (Test Temperature: 20°C)

Voltage(V)	Measurement Frequency (MHz)	Max. Deviation (MHz)	Limit (MHz)	Conclusion
3.145	576.3966	0.0081	0.03	PASS
3.70	576.3981			
4.255	576.3975			

Temperature vs. Frequency Stability (Test Voltage: 3.7V)

Temperature	Measurement Frequency (MHz)	Max. Deviation (MHz)	Limit (MHz)	Conclusion
-30°C	576.3965	0.0082	0.03	PASS
-20°C	576.3969			
-10°C	576.3967			
0°C	576.3982			
10°C	576.3980			
20°C	576.3975			
30°C	576.3977			
40°C	576.3974			
50°C	576.3971			

Test frequency: 585.820MHz-Low power

Voltage vs. Frequency Stability (Test Temperature: 20°C)

Voltage(V)	Measurement Frequency (MHz)	Max. Deviation (MHz)	Limit (MHz)	Conclusion
3.145	585.8314	0.0123	0.03	PASS
3.70	585.8323			
4.255	585.8321			

Temperature vs. Frequency Stability (Test Voltage: 3.7V)

Temperature	Measurement Frequency (MHz)	Max. Deviation (MHz)	Limit (MHz)	Conclusion
-30°C	585.8316	0.0124	0.03	PASS
-20°C	585.8315			
-10°C	585.8319			
0°C	585.8318			
10°C	585.8320			
20°C	585.8321			
30°C	585.8324			
40°C	585.8322			
50°C	585.8317			

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Test frequency: 585.820MHz-Middle power

Voltage vs. Frequency Stability (Test Temperature: 20°C)

Voltage(V)	Measurement Frequency (MHz)	Max. Deviation (MHz)	Limit (MHz)	Conclusion
3.145	585.8315	0.0126	0.03	PASS
3.70	585.8321			
4.255	585.8326			

Temperature vs. Frequency Stability (Test Voltage: 3.7V)

Temperature	Measurement Frequency (MHz)	Max. Deviation (MHz)	Limit (MHz)	Conclusion
-30°C	585.8317	0.0124	0.03	PASS
-20°C	585.8324			
-10°C	585.8322			
0°C	585.8316			
10°C	585.8324			
20°C	585.8320			
30°C	585.8319			
40°C	585.8317			
50°C	585.8313			

Test frequency: 585.820MHz-High power

Voltage vs. Frequency Stability (Test Temperature: 20°C)

Voltage(V)	Measurement Frequency (MHz)	Max. Deviation (MHz)	Limit (MHz)	Conclusion
3.145	585.8317	0.0128	0.03	PASS
3.70	585.8328			
4.255	585.8312			

Temperature vs. Frequency Stability (Test Voltage: 3.7V)

Temperature	Measurement Frequency (MHz)	Max. Deviation (MHz)	Limit (MHz)	Conclusion
-30°C	585.8323	0.0127	0.03	PASS
-20°C	585.8314			
-10°C	585.8316			
0°C	585.8317			
10°C	585.8322			
20°C	585.8324			
30°C	585.8316			
40°C	585.8327			
50°C	585.8323			

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Test frequency: 595.660MHz-Low power

Voltage vs. Frequency Stability (Test Temperature: 20°C)

Voltage(V)	Measurement Frequency (MHz)	Max. Deviation (MHz)	Limit (MHz)	Conclusion
3.145	595.6684	0.0086	0.03	PASS
3.70	595.6686			
4.255	595.6681			

Temperature vs. Frequency Stability (Test Voltage: 3.7V)

Temperature	Measurement Frequency (MHz)	Max. Deviation (MHz)	Limit (MHz)	Conclusion
-30°C	595.6681	0.0088	0.03	PASS
-20°C	595.6684			
-10°C	595.6682			
0°C	595.6685			
10°C	595.6688			
20°C	595.6685			
30°C	595.6682			
40°C	595.6684			
50°C	595.6683			

Test frequency: 595.660MHz-Middle power

Voltage vs. Frequency Stability (Test Temperature: 20°C)

Voltage(V)	Measurement Frequency (MHz)	Max. Deviation (MHz)	Limit (MHz)	Conclusion
3.145	595.4684	0.0087	0.03	PASS
3.70	595.4687			
4.255	595.4686			

Temperature vs. Frequency Stability (Test Voltage: 3.7V)

Temperature	Measurement Frequency (MHz)	Max. Deviation (MHz)	Limit (MHz)	Conclusion
-30°C	595.4685	0.0087	0.03	PASS
-20°C	595.4684			
-10°C	595.4681			
0°C	595.4683			
10°C	595.4686			
20°C	595.4682			
30°C	595.4687			
40°C	595.4685			
50°C	595.4681			

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Test frequency: 595.660MHz-High power

Voltage vs. Frequency Stability (Test Temperature: 20°C)

Voltage(V)	Measurement Frequency (MHz)	Max. Deviation (MHz)	Limit (MHz)	Conclusion
3.145	595.4682	0.0089	0.03	PASS
3.70	595.4689			
4.255	595.4683			

Temperature vs. Frequency Stability (Test Voltage: 3.7V)

Temperature	Measurement Frequency (MHz)	Max. Deviation (MHz)	Limit (MHz)	Conclusion
-30°C	595.4684	0.0089	0.03	PASS
-20°C	595.4686			
-10°C	595.4681			
0°C	595.4682			
10°C	595.4683			
20°C	595.4684			
30°C	595.4687			
40°C	595.4689			
50°C	595.4682			

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10. EMISSIONS WITHIN THE BAND AND OUTSIDE THE BAND

10.1. TEST LIMIT

Emissions within the band from one megahertz below to one megahertz above the carrier frequency shall comply with the emission mask in §8.3 of ETSI EN 300 422-1 V1.4.2 (2011-08).

Emissions outside of this band shall comply with the limits specified in section 8.4 of ETSI EN 300 422-1 V1.4.2 (2011-08).

10.2. MEASUREMENT PROCEDURE

Emission outside the band:

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. $EIRP [dBm] = E[dB(\mu V)/m] - 95.2$

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	1000MHz~6000MHz/RB 1MHz for QP

Emission within the band:

- ☒ Method of Measurement for Analogue Systems in ETSI EN 300 422-1 Subclass 8.3.1
☐ Method of Measurement for Digital Systems in ETSI EN 300 422-1 Subclass 8.3.2

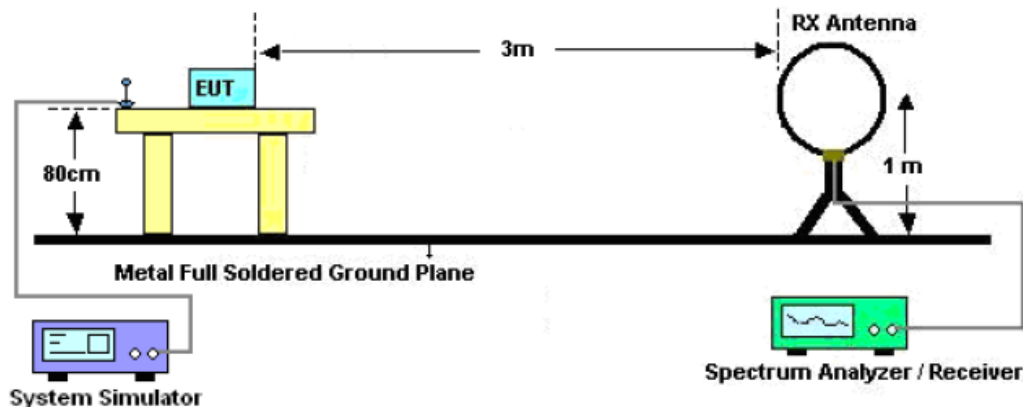
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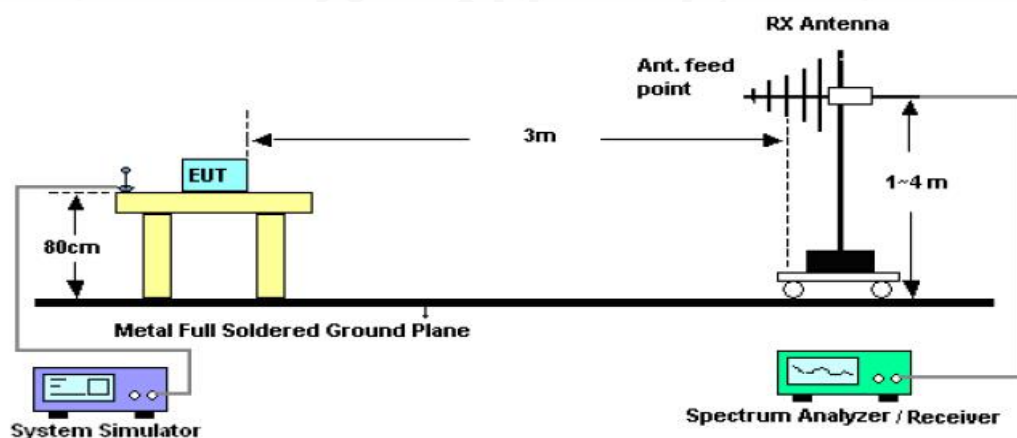


10.3. TEST SETUP

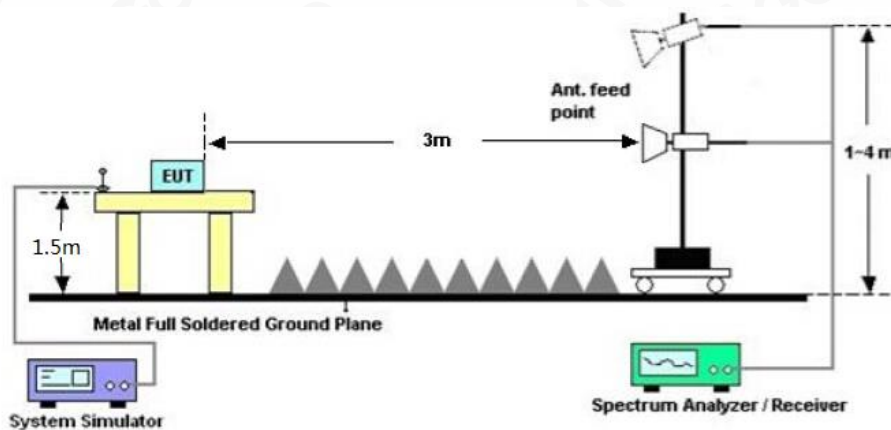
Emission outside the band Radiated Emission Test-Setup Frequency Below 30MHz



RADIATED EMISSION TEST SETUP 30MHz-1000MHz



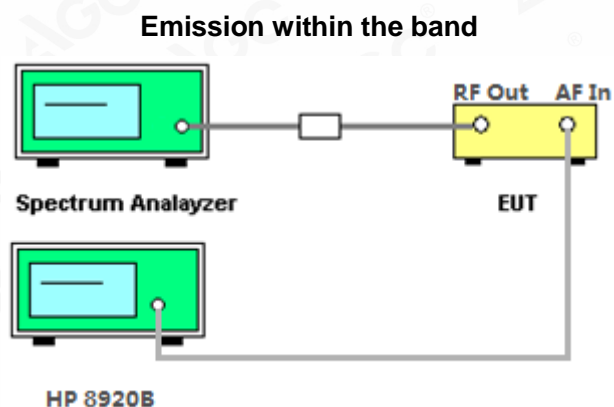
RADIATED EMISSION TEST SETUP ABOVE 1000MHz



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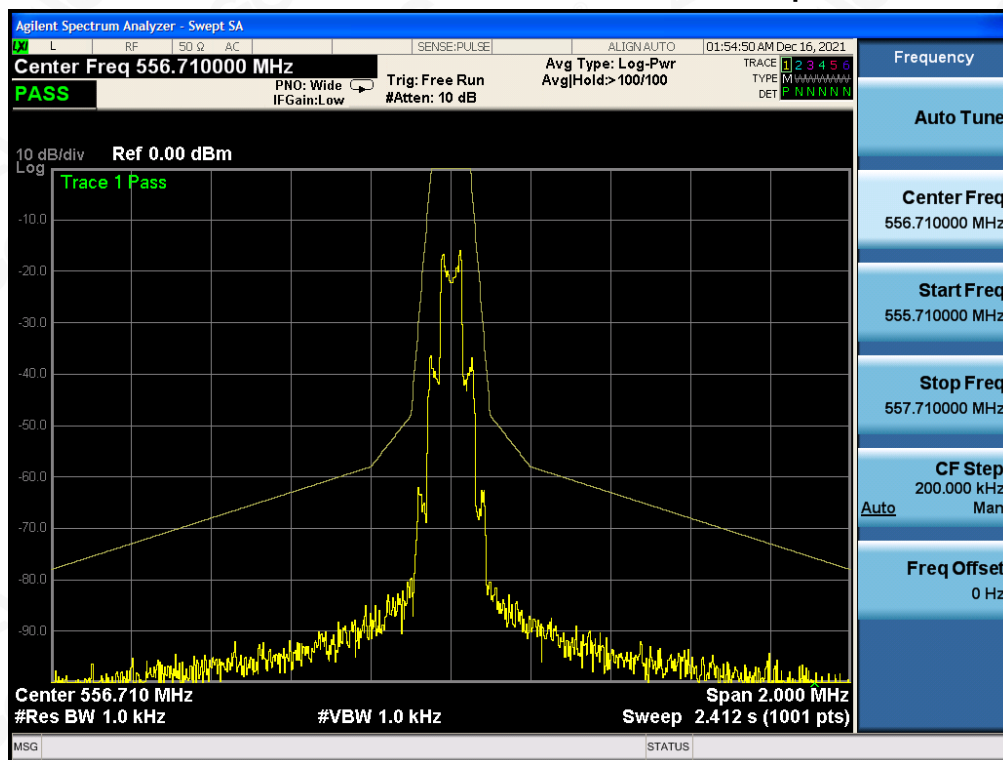
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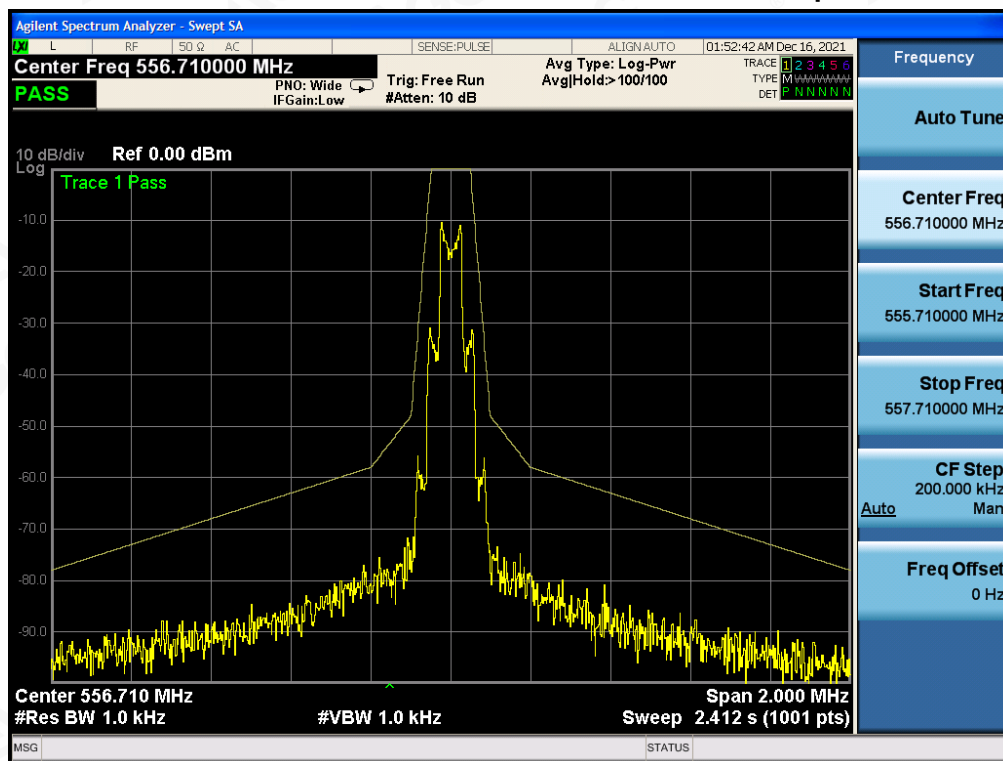
10.4. TEST RESULT

Group A

Emission within the band for 556.710MHz at low power



Emission within the band for 556.710MHz at middle power

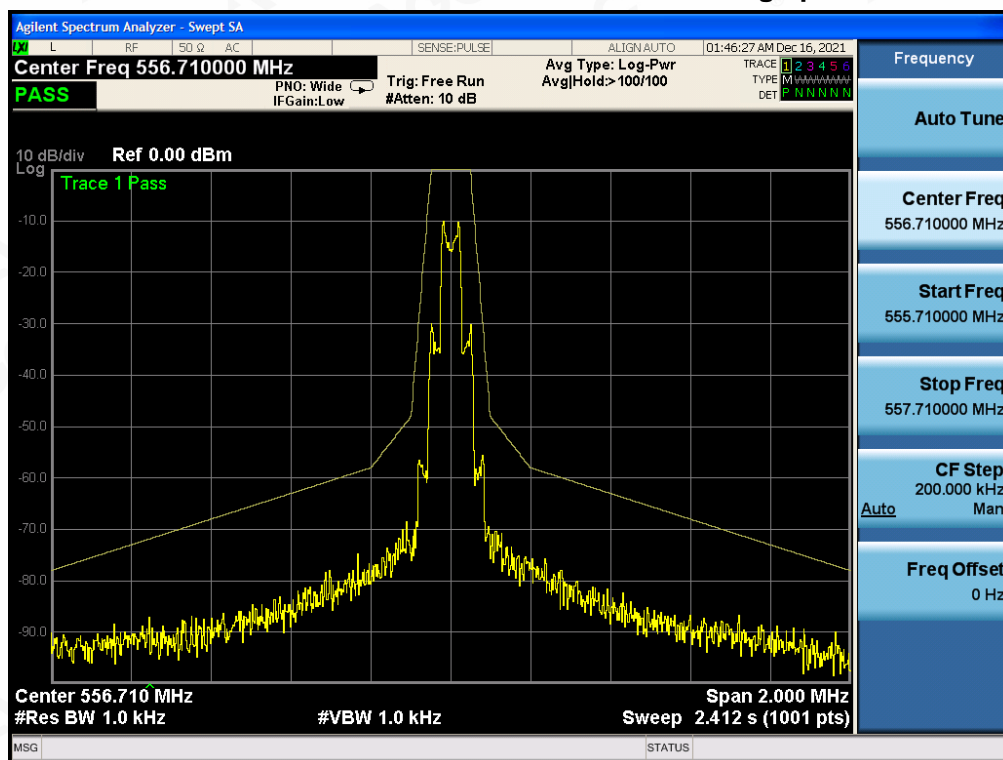


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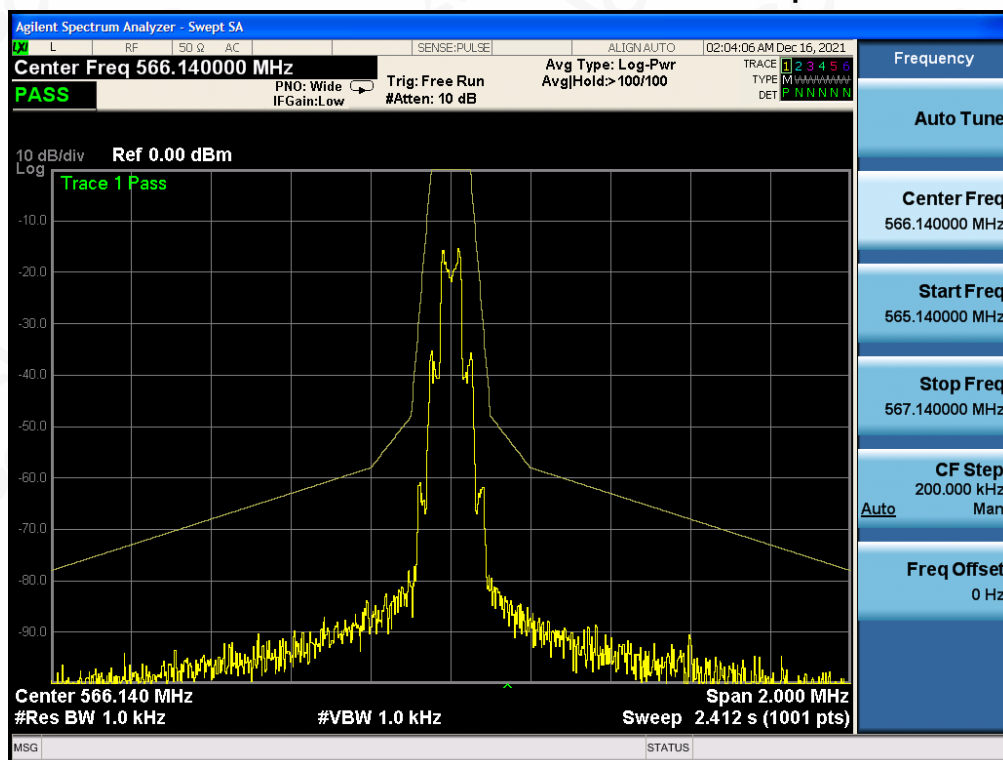
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Emission within the band for 556.710MHz at High power



Emission within the band for 566.140MHz at low power

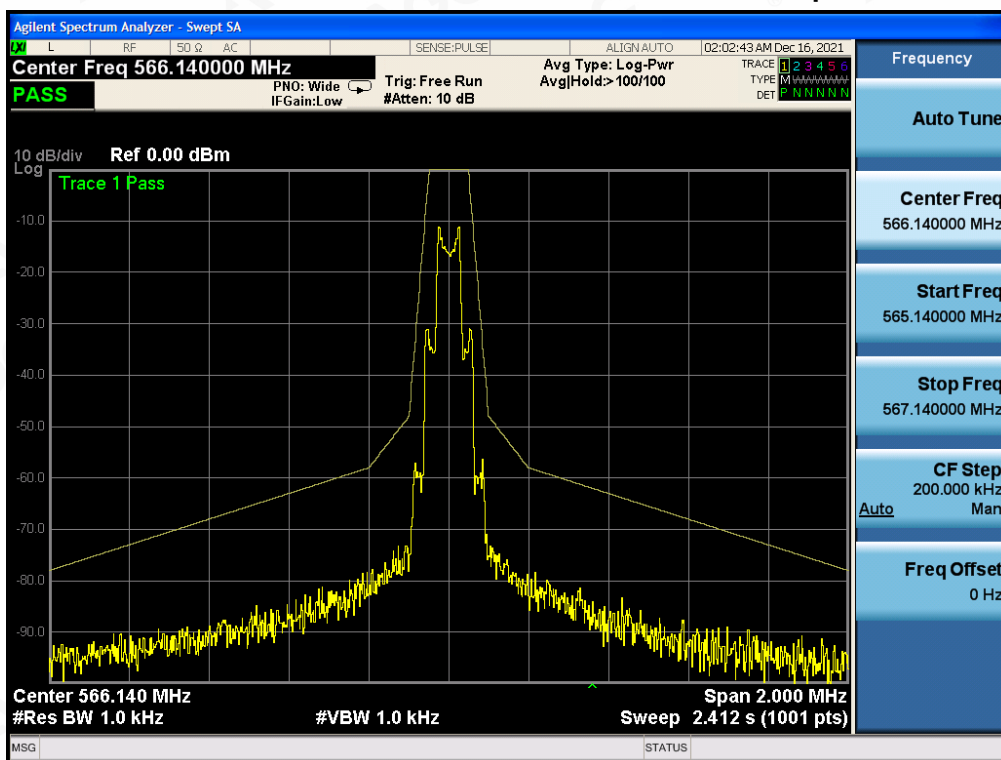


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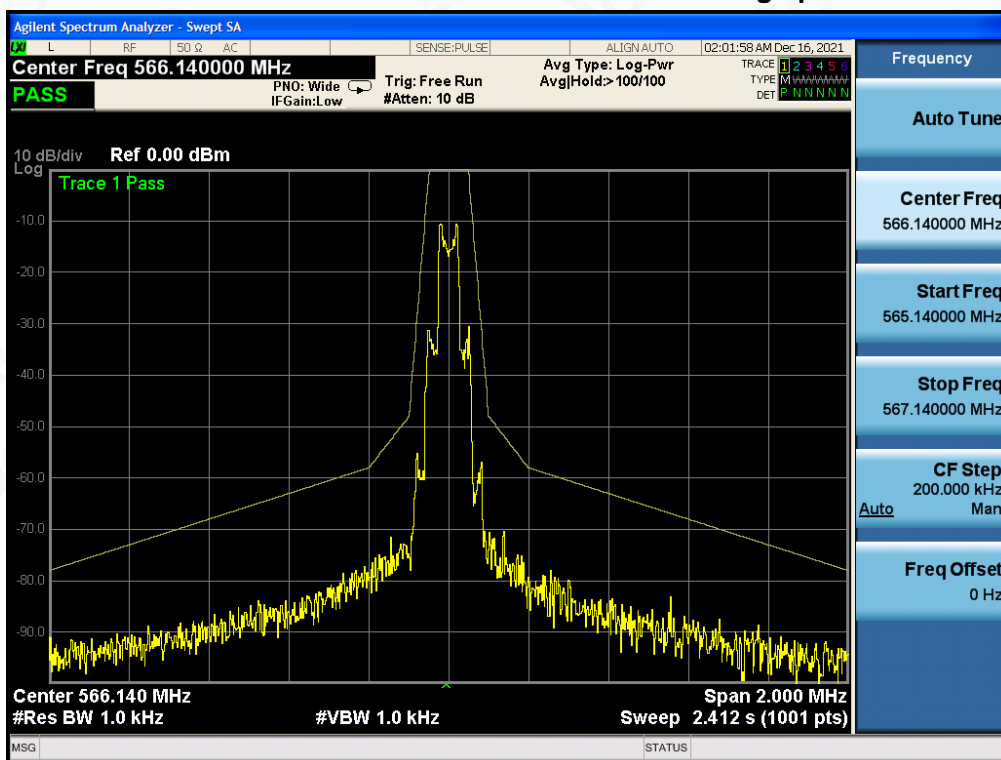
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Emission within the band for 566.140MHz at middle power



Emission within the band for 566.140MHz at High power

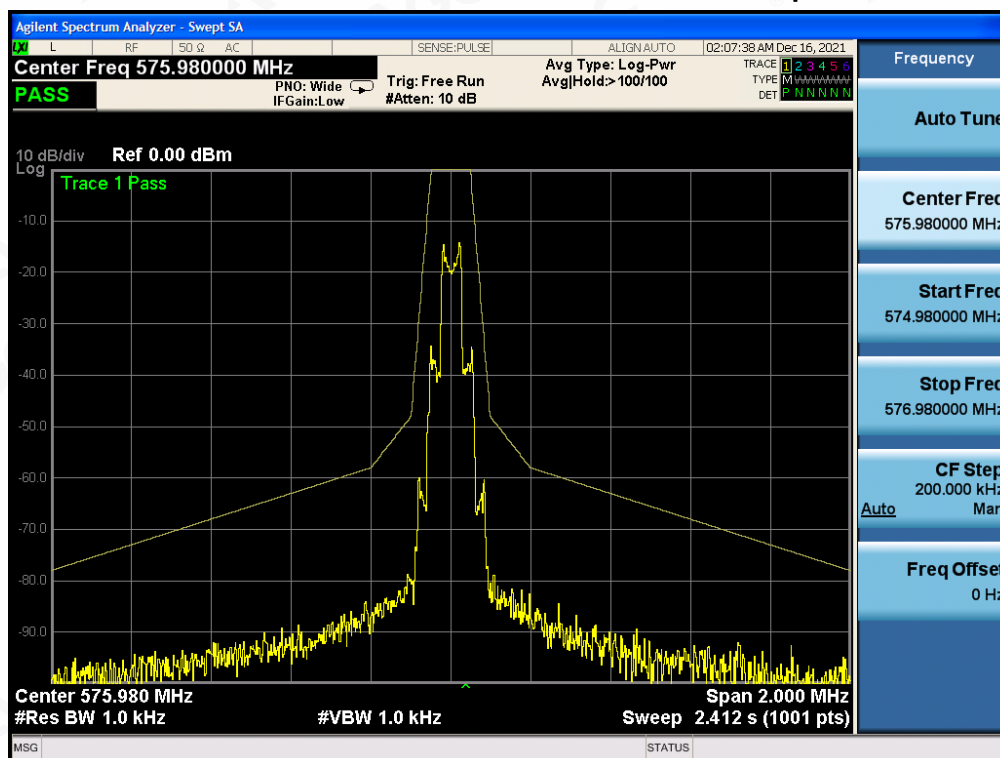


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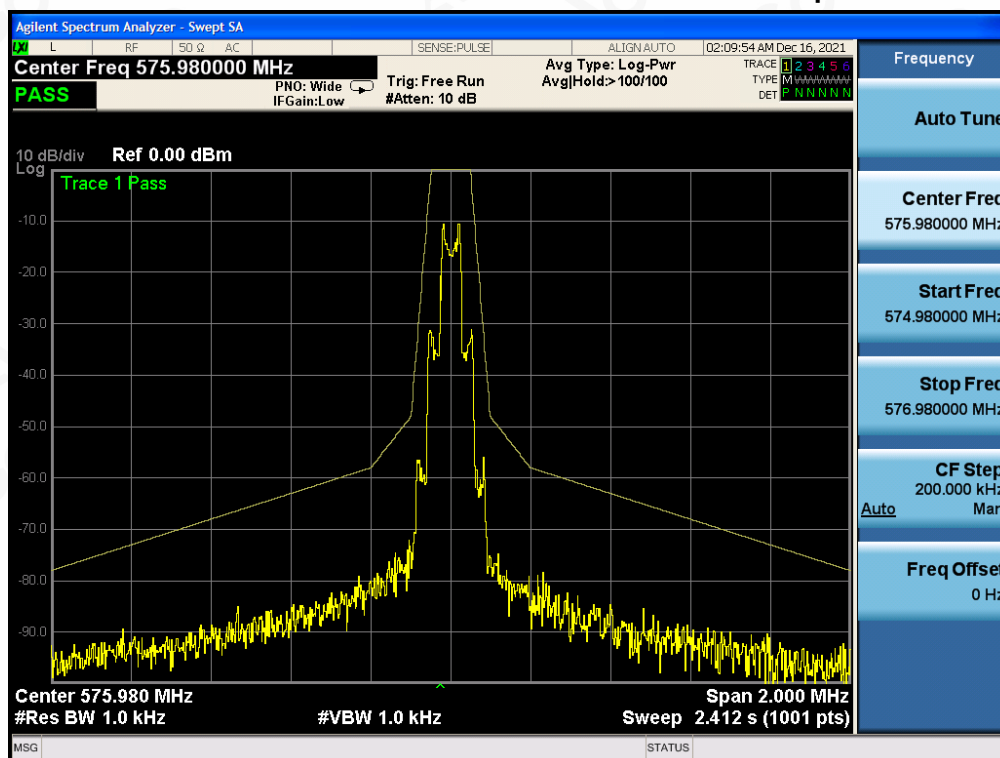
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Emission within the band for 575.980MHz at low power



Emission within the band for 575.980MHz at middle power

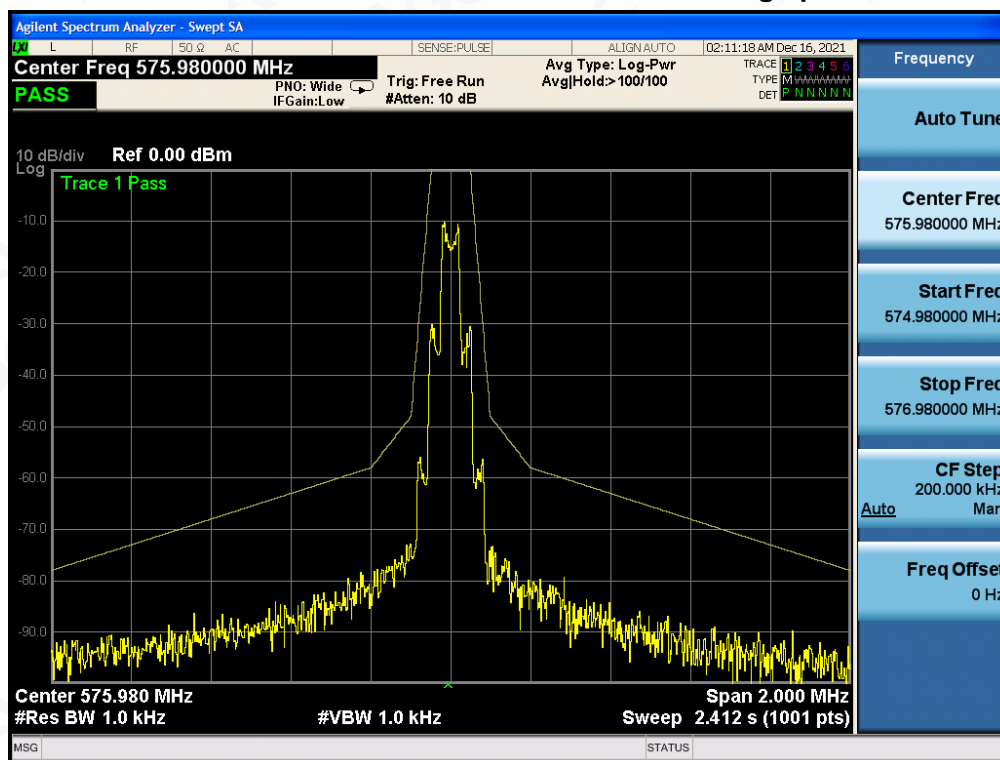


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Emission within the band for 575.980MHz at High power



Note:

- 1.The manufacturer declared that the channel bandwidth is 200KHz.
- 2.The carrier power is the ref level, and the factor had been edited in the “Input Correction” of the Spectrum Analyzer.

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