
FCC Test Report

Report No.: AGC13550220802FE04

FCC ID : 2A7ZRPWMAZ-Q1
APPLICATION PURPOSE : Original Equipment
PRODUCT DESIGNATION : Microphone
BRAND NAME : N/A
MODEL NAME : PWMAZ-Q1
APPLICANT : Shanghai Loostone Information Technology Co., Ltd.
DATE OF ISSUE : Sep. 15, 2022
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	/	Sep. 15, 2022	Valid	Initial Release

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1. VERIFICATION OF CONFORMITY

Applicant	Shanghai Loostone Information Technology Co., Ltd.
Address	7B-03, Second Floor, Building 7, No.351 Sizhuan Road, Sijng Town, Songjiang District, Shanghai China
Manufacturer	Shanghai Loostone Information Technology Co., Ltd.
Address	7B-03, Second Floor, Building 7, No.351 Sizhuan Road, Sijng Town, Songjiang District, Shanghai China
Product Designation	Microphone
Brand Name	N/A
Test Model	PWMAZ-Q1
Date of test	Aug. 31, 2022 to Sep. 15, 2022
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 

 Cool Cheng
 (Project Engineer) Sep. 15, 2022

Reviewed By 

 Calvin Liu
 (Reviewer) Sep. 15, 2022

Approved By 

 Max Zhang
 (Authorized Officer) Sep. 15, 2022

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2. GENERAL INFORMATION

2.1. PRODUCT DESCRIPTION

Operation Frequency	Group A: 657MHz-662MHz Group B: 657.5MHz-662.5MHz
Maximum Radiated Power	Group A: 8.431dBm Group B: 7.144dBm
Modulation	FM
Number of channels	Group A: 3 Group B: 3
Antenna Gain	2.87dBi
Antenna Designation	PCB Antenna (Met 15.203 Antenna requirement)
Hardware Version	Q1-MIC-1.1
Software Version	V1.0
Power Supply	DC 3.7V by battery

Channel list: Group A

Channel Number	Frequency (MHz)
1	657
2	660
3	662

Channel list: Group B

Channel Number	Frequency (MHz)
1	657.5
2	660.5
3	662.5

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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.

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	$U_c = \pm 2.9$ dB
Uncertainty of Radiated Emission below 1GHz	$U_c = \pm 3.8$ dB
Uncertainty of Radiated Emission above 1GHz	$U_c = \pm 4.9$ dB
Uncertainty of total RF power, conducted	$U_c = \pm 0.8$ 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: 657MHz)
2	Group A TX mode at Middle channel(CH02: 660MHz)
3	Group A TX mode at High channel(CH03: 662MHz)
4	Group B TX mode at Low channel(CH01: 657.5MHz)
5	Group B TX mode at Middle channel(CH02: 660.5MHz)
6	Group B TX mode at High channel(CH03: 662.5MHz)

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.

5. SYSTEM TEST CONFIGURATION

5.1. CONFIGURATION OF EUT SYSTEM

Radiated Emission Configure:



5.2 EQUIPMENT USED IN TESTED SYSTEM

Item	Equipment	Model No.	ID or Specification	Remark
1	Microphone	PWMAZ-Q1	2A7ZRPWMAZ-Q1	EUT

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	Not applicable

Note: Wireless function is not working when charging.

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 RADIATED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
Test Receiver	R&S	ESCI	10096	Mar. 28, 2022	Mar. 27, 2023
Signal Analyzer	Aglient	N9020A	MY52090123	Aug. 04, 2022	Aug. 03, 2023
Attenuator	ZHINAN	E-002	N/A	Aug. 04, 2022	Aug. 03, 2024
Double-Ridged Waveguide Horn	ETS	3117	00154520	Sep. 06, 2021	Sep. 05, 2023
Double-Ridged Waveguide Horn	ETS	3117	00034609	Apr. 23, 2021	Apr. 22, 2023
Active Loop Antenna (9K-30Mhz)	ZHINAN	ZN30900C	18051	Mar. 12, 2022	Mar. 11, 2024
Preamplifier Assembly	ETS	3117PA	00225134	Sep. 03, 2020	Sep. 02, 2022
Preamplifier Assembly	ETS	3117PA	00225134	Sep. 01, 2022	Sep. 02, 2024
Wideband Antenna	SCHWARZBECK	VULB9168	VULB9168-494	Jan. 08, 2021	Jan. 07, 2023
Wireless communication tester	HP	8920B	US35010161	Aug. 03, 2022	Aug. 02, 2023
Test software	Tonscend	JS32-RE (Ver. 2.5)	N/A	N/A	N/A

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7. OUPUT POWER

7.1. TEST LIMIT

The power may not exceed the following values.

657-663MHz bands: 20 mW EIRP

7.2. MEASUREMENT PROCEDURE

EIRP Test Method

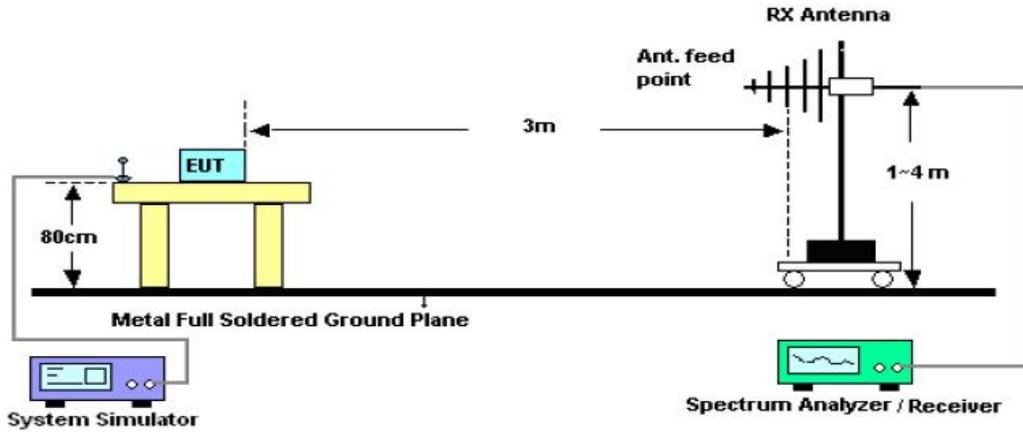
1. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
 2. Power on the EUT and all the supporting units. The turntable was rotated by 360 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

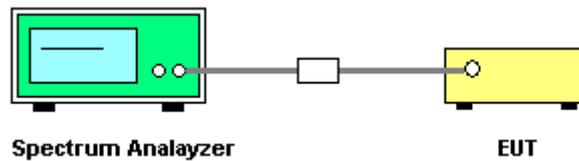
1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. $RBW \geq OBW$.
3. $VBW \geq 3 \times RBW$.
4. $Span \geq 2 \times OBW$.
5. $Sweep\ time \geq 10 \times (\text{number of points in sweep}) \times (\text{transmission symbol period})$
6. Detector function: Peak.
7. Trace: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

7.3. TEST SETUP

EIRP Test Method



Conducted Power Test Method



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7.4. TEST RESULT

Group A

Test Channel	Peak Power	Limit
(MHz)	(dBm)	(dBm)
657	8.431	13
660	8.319	13
662	8.341	13

Group B

Test Channel	Peak Power	Limit
(MHz)	(dBm)	(dBm)
657.5	7.144	13
660.5	7.070	13
662.5	7.012	13

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8. OCCUPIED BANDWIDTH

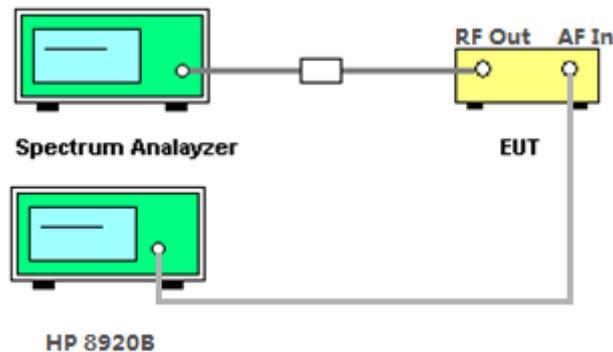
8.1. TEST LIMIT

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



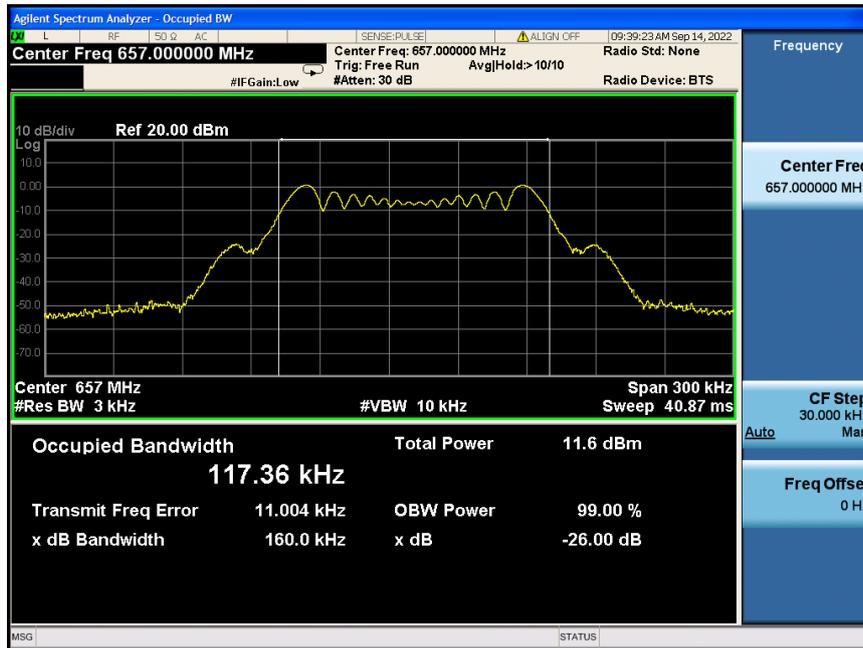
8.4. MEASUREMENT RESULTS

Group A

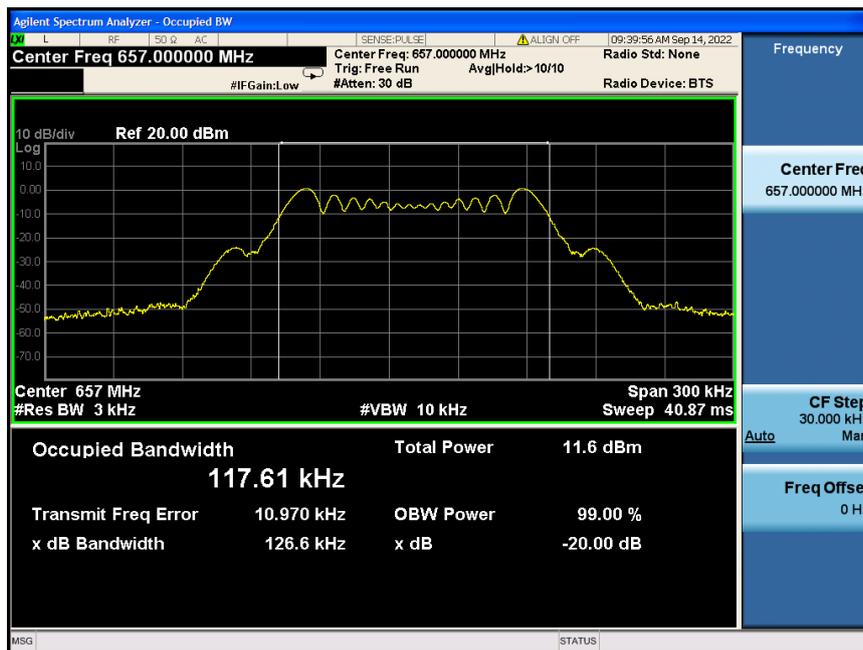
Test Channel (MHz)	-20dBc EBW (kHz)	99% OBW (kHz)	Limit (kHz)
657MHz	126.6	117.36	200
660MHz	126.4	117.14	200
662MHz	125.6	117.08	200

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TEST PLOT OF BANDWIDTH--99% OBW

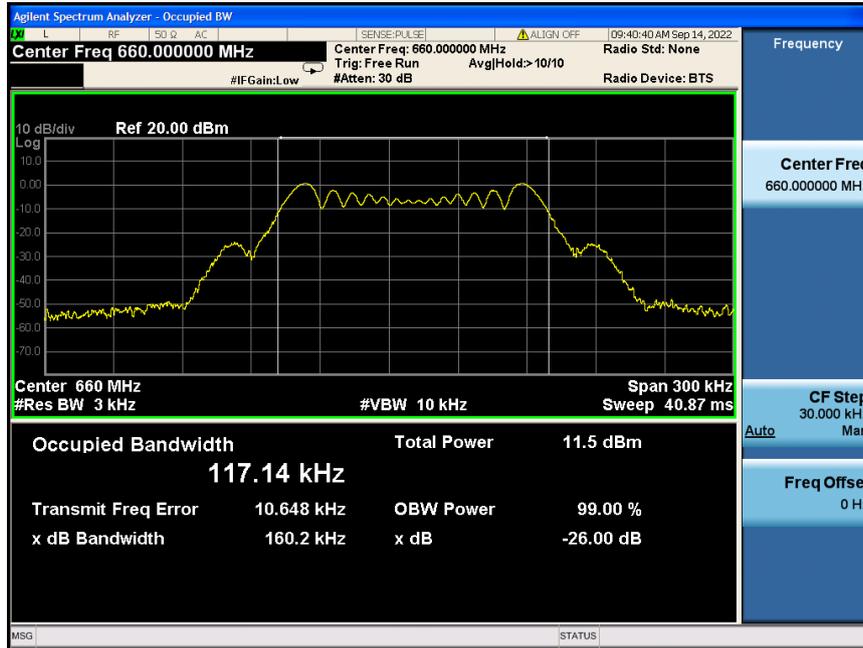


-20dBc EBW

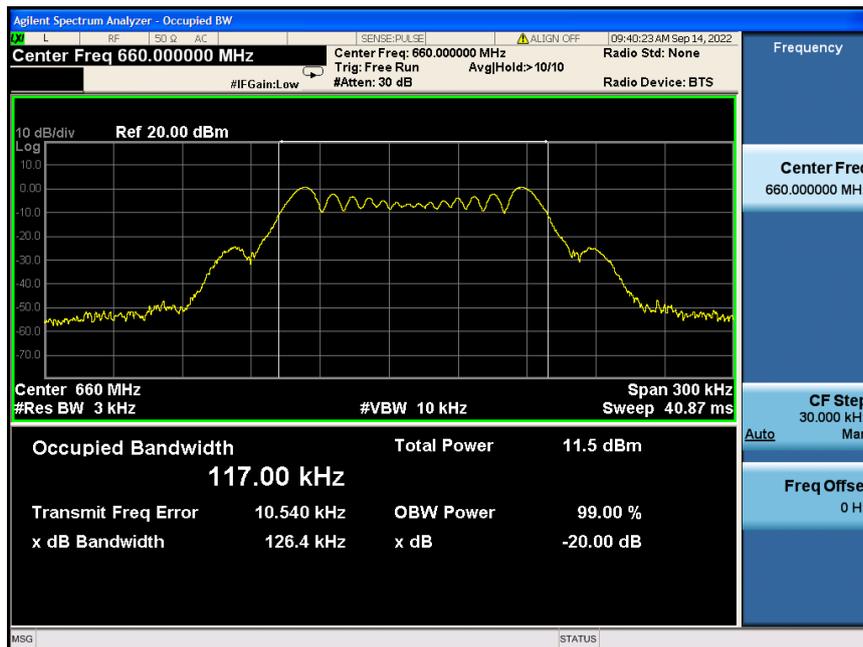


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TEST PLOT OF BANDWIDTH--99% OBW

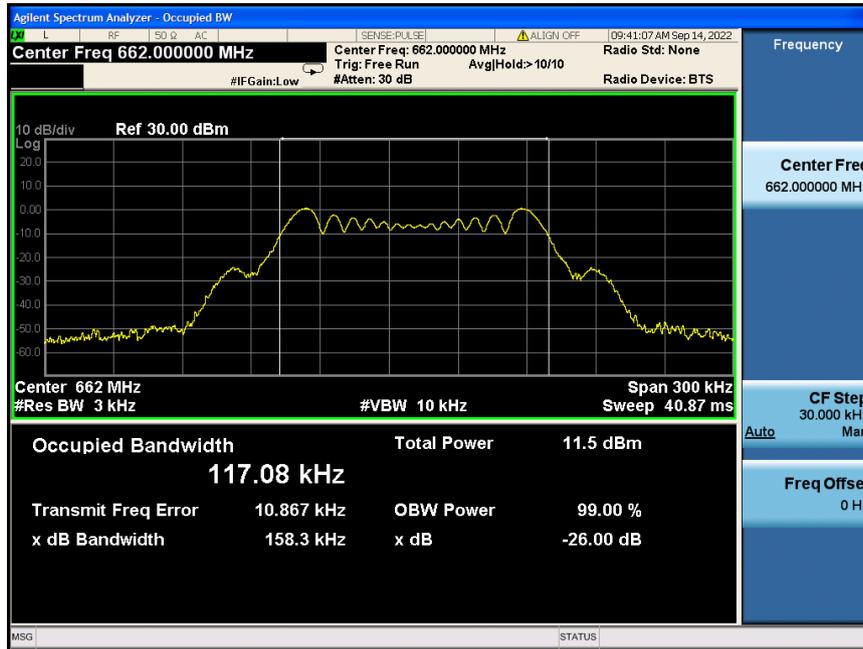


-20dBc EBW

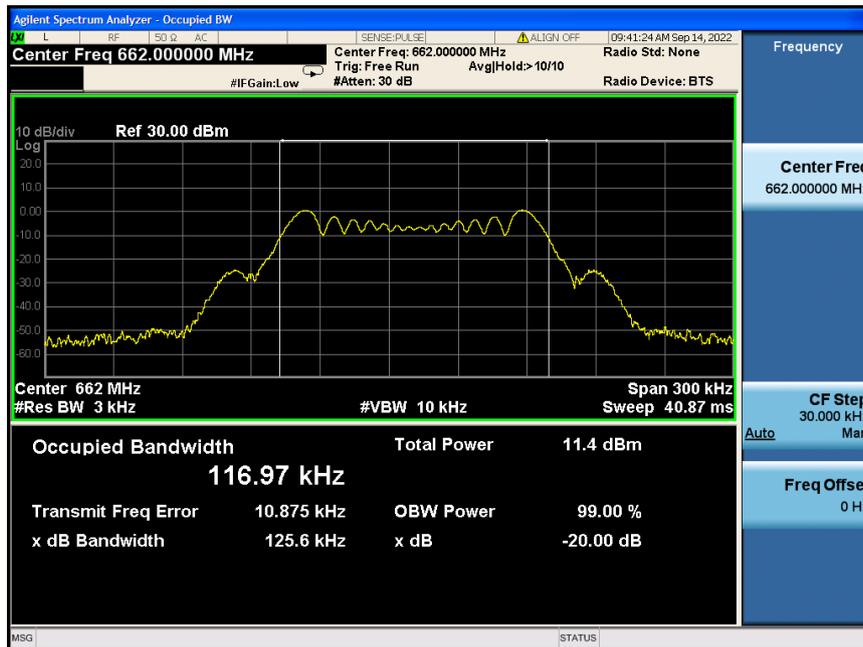


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TEST PLOT OF BANDWIDTH--99% OBW



-20dBc EBW

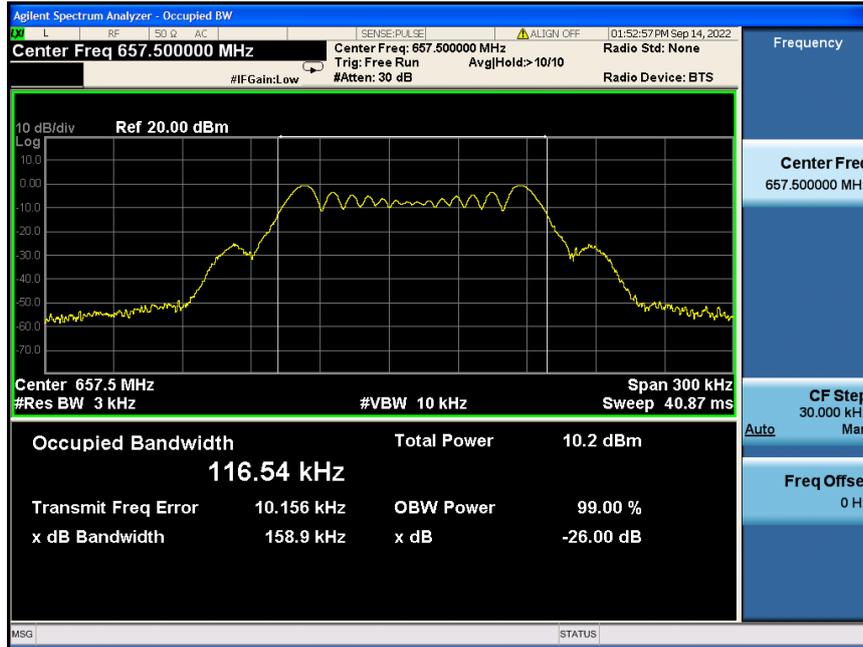


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Group B

Test Channel (MHz)	-20dBc EBW (kHz)	99% OBW (kHz)	Limit (kHz)
657.5MHz	125.5	116.54	200
660.5MHz	125.4	116.23	200
662.5MHz	125.6	116.31	200

Test Graphs of Occupied Bandwidth&-20dB Bandwidth

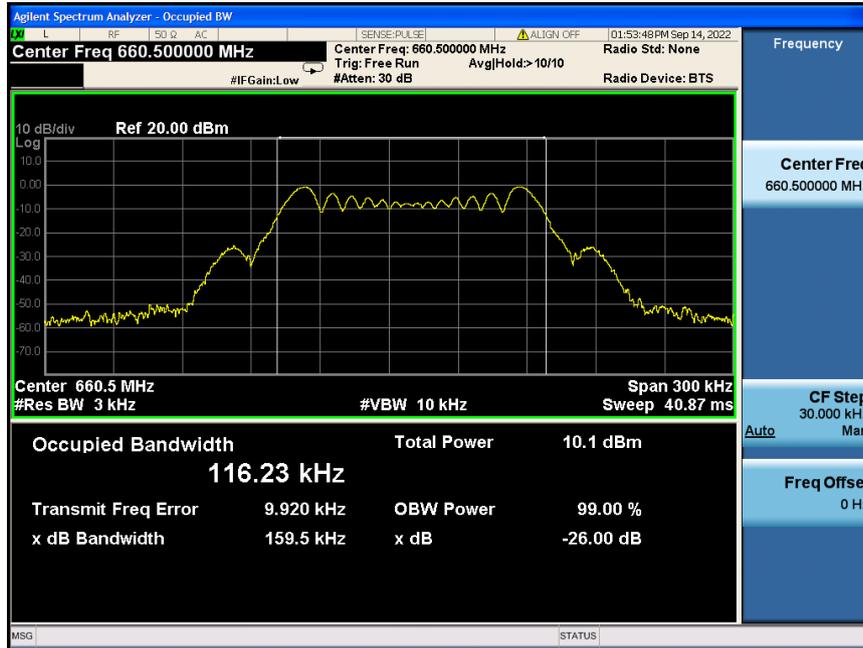


-20dBc EBW

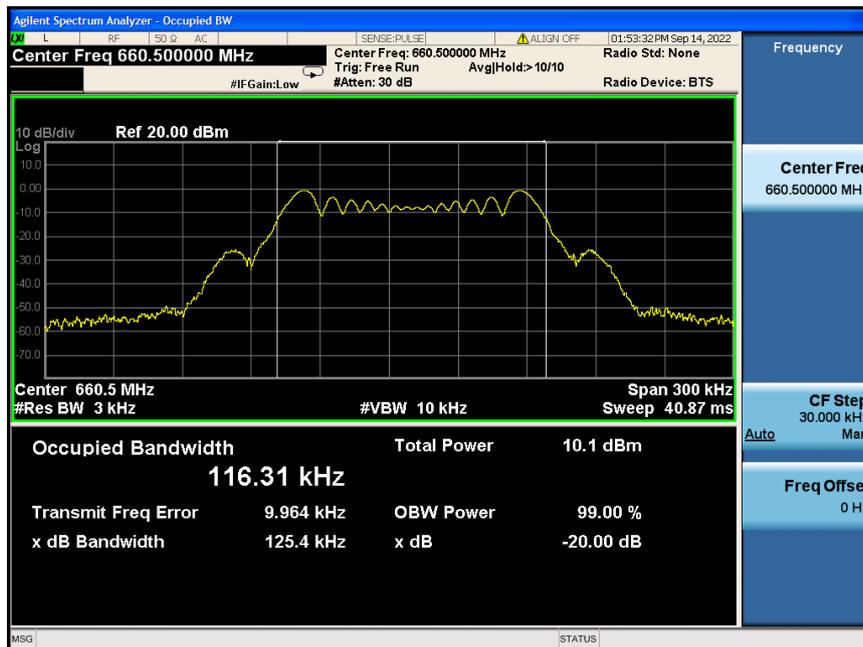


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TEST PLOT OF BANDWIDTH--99% OBW

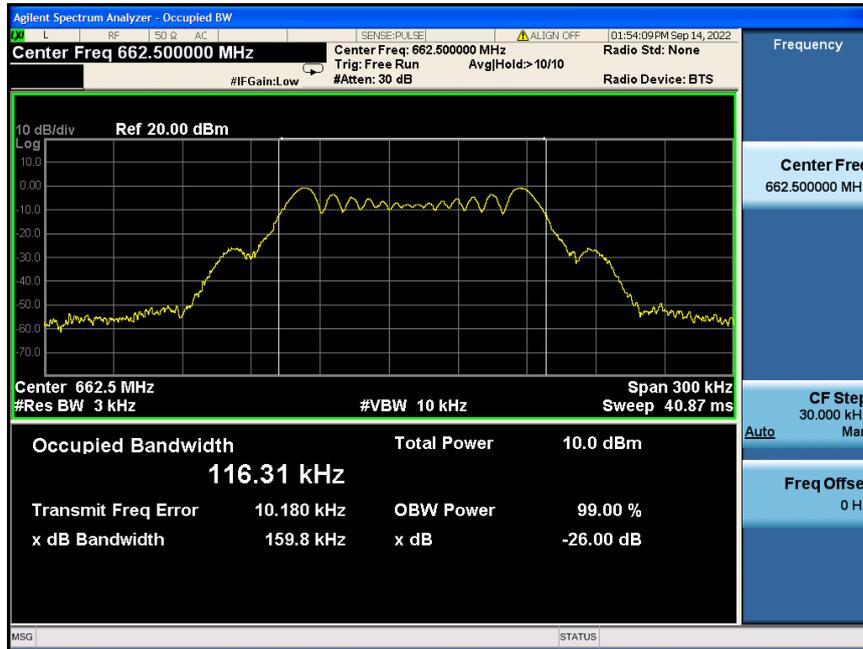


-20dBc EBW

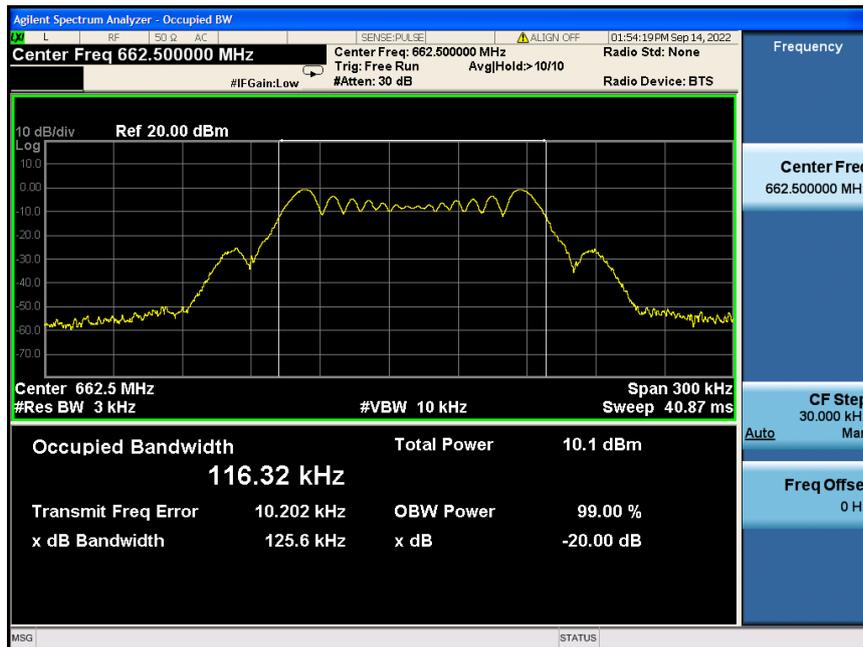


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TEST PLOT OF BANDWIDTH--99% OBW



-20dBc EBW



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9. FREQUENCY STABILITY

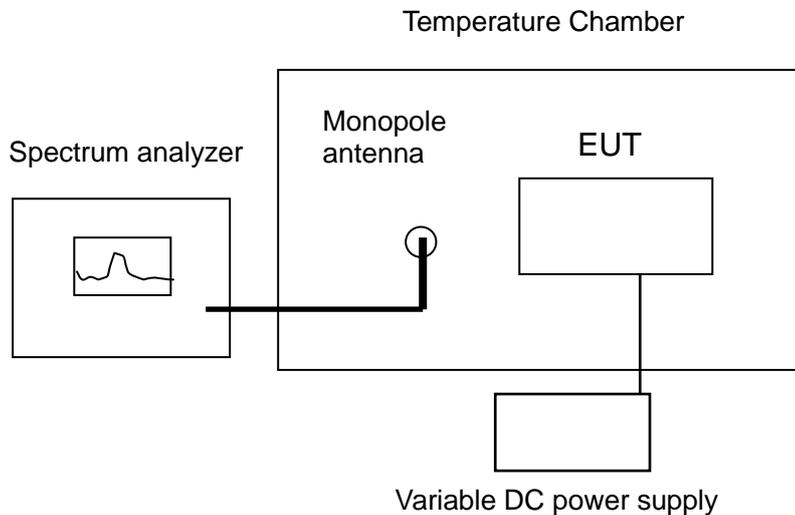
9.1. TEST LIMIT

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. For battery operated equipment, the equipment tests shall be performed using a new battery.

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. The f_c is declaring of channel frequency. Then the frequency error formula is $(f_c - f) / f_c \times 10^6$ ppm and the limit is less than ± 50 ppm.
7. Extreme temperature rule is $-30^\circ\text{C} \sim 50^\circ\text{C}$.

9.3. TEST SET-UP



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9.4. TEST RESULT

Group A

Operating frequency: 657MHz

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

Voltage(V)	Measurement Frequency (MHz)	Max. Deviation (ppm)	Limit(ppm)	Conclusion
3.33	657.0121	+20	±50	PASS
3.7	657.0133			
4.07	657.0118			

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

Temperature	Measurement Frequency (MHz)	Max. Deviation (ppm)	Limit(ppm)	Conclusion
-30°C	657.0120	+23	±50	PASS
-20°C	657.0127			
-10°C	657.0118			
0°C	657.0130			
10°C	657.0138			
20°C	657.0148			
30°C	657.0124			
40°C	657.0116			
50°C	657.0109			

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Test frequency: 660MHz

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

Voltage(V)	Measurement Frequency (MHz)	Max. Deviation (ppm)	Limit(ppm)	Conclusion
3.33	660.0129	+22	±50	PASS
3.7	660.0143			
4.07	660.0136			

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

Temperature	Measurement Frequency (MHz)	Max. Deviation (ppm)	Limit(ppm)	Conclusion
-30°C	660.0135	+23	±50	PASS
-20°C	660.0142			
-10°C	660.0134			
0°C	660.0128			
10°C	660.0153			
20°C	660.0141			
30°C	660.0137			
40°C	660.0128			
50°C	660.0145			

Test frequency: 662MHz

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

Voltage(V)	Measurement Frequency (MHz)	Max. Deviation (ppm)	Limit(ppm)	Conclusion
3.33	662.0195	+34	±50	PASS
3.7	662.0227			
4.07	662.0216			

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

Temperature	Measurement Frequency (MHz)	Max. Deviation (ppm)	Limit(ppm)	Conclusion
-30°C	662.0218	+37	±50	PASS
-20°C	662.0228			
-10°C	662.0234			
0°C	662.0242			
10°C	662.0235			
20°C	662.0221			
30°C	662.0236			
40°C	662.0209			
50°C	662.0230			

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Group B

Test frequency: 657.5MHz

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

Voltage(V)	Measurement Frequency (MHz)	Max. Deviation (ppm)	Limit(ppm)	Conclusion
3.33	657.506	+18	±50	PASS
3.7	657.501			
4.07	657.510			

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

Temperature	Measurement Frequency (MHz)	Max. Deviation (ppm)	Limit(ppm)	Conclusion
-30°C	657.502	+24	±50	PASS
-20°C	657.505			
-10°C	657.516			
0°C	657.508			
10°C	657.511			
20°C	657.504			
30°C	657.513			
40°C	657.510			
50°C	657.506			

Test frequency: 660.5MHz

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

Voltage(V)	Measurement Frequency (MHz)	Max. Deviation (ppm)	Limit(ppm)	Conclusion
3.33	660.5013	+2	±50	PASS
3.7	660.5008			
4.07	660.5015			

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

Temperature	Measurement Frequency (MHz)	Max. Deviation (ppm)	Limit(ppm)	Conclusion
-30°C	660.5012	+3	±50	PASS
-20°C	660.5010			
-10°C	660.5008			
0°C	660.5014			
10°C	660.5019			
20°C	660.5009			

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30°C	660.5005			
40°C	660.5010			
50°C	660.5003			

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Test frequency: 662.5MHz

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

Voltage(V)	Measurement Frequency (MHz)	Max. Deviation (ppm)	Limit(ppm)	Conclusion
3.33	662.5005	+2	±50	PASS
3.7	662.5009			
4.07	662.5013			

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

Temperature	Measurement Frequency (MHz)	Max. Deviation (ppm)	Limit(ppm)	Conclusion
-30°C	662.5002	+3	±50	PASS
-20°C	662.5006			
-10°C	662.5014			
0°C	662.5007			
10°C	662.5018			
20°C	662.5011			
30°C	662.5015			
40°C	662.5009			
50°C	662.5012			

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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(μV)/m] – 95.2

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

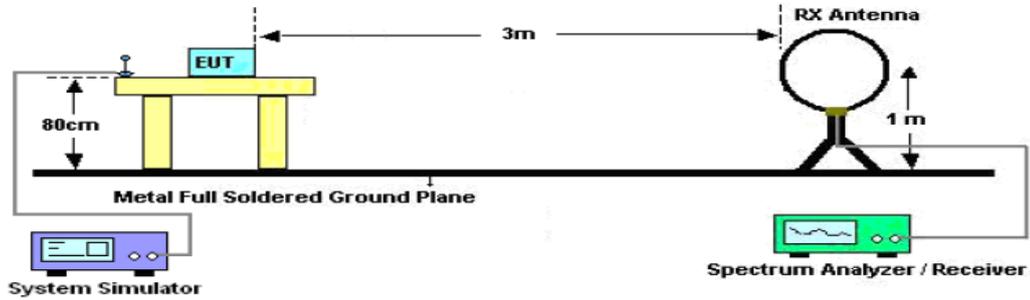
Spectrum Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP
Start ~Stop Frequency	1000MHz~6000MHz/RB 1MHz for QP

Emission within the band:

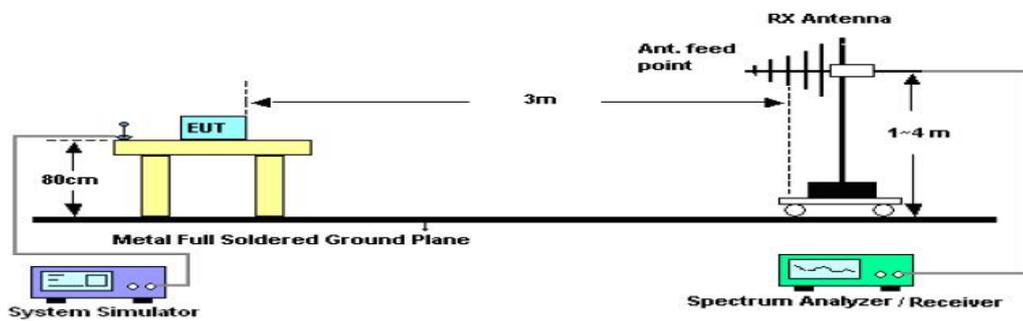
- Method of Measurement for Analogue Systems in ETSI EN 300 422-1 Subclass 8.3.1
 Method of Measurement for Digital Systems in ETSI EN 300 422-1 Subclass 8.3.2

10.3. TEST SETUP

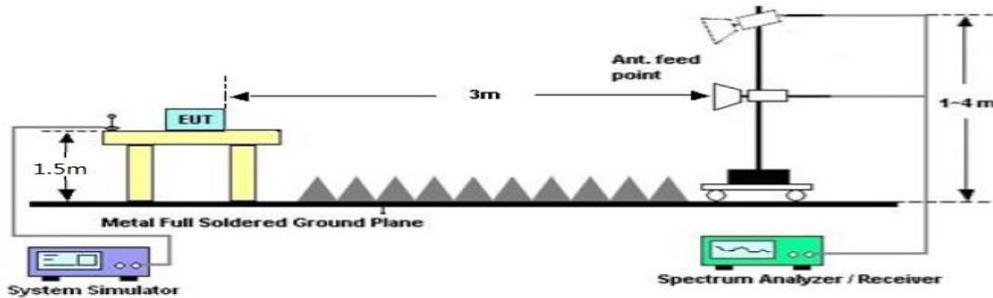
Emission outside the band Radiated Emission Test-Setup Frequency Below 30MHz



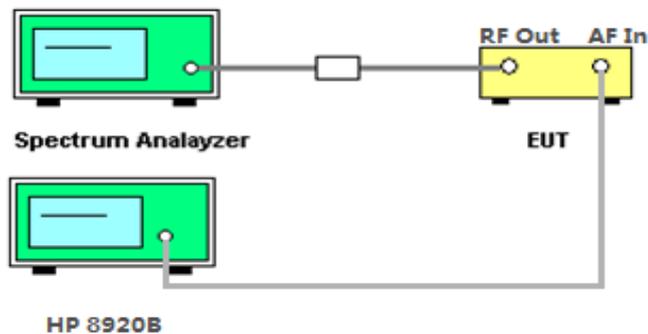
RADIATED EMISSION TEST SETUP 30MHz-1000MHz



RADIATED EMISSION TEST SETUP ABOVE 1000MHz



Emission within the band

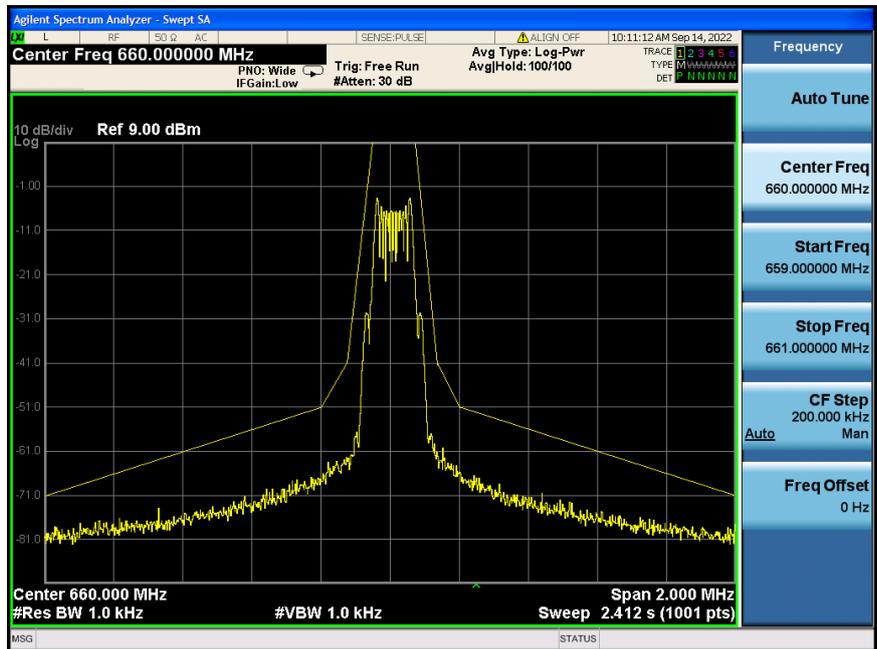
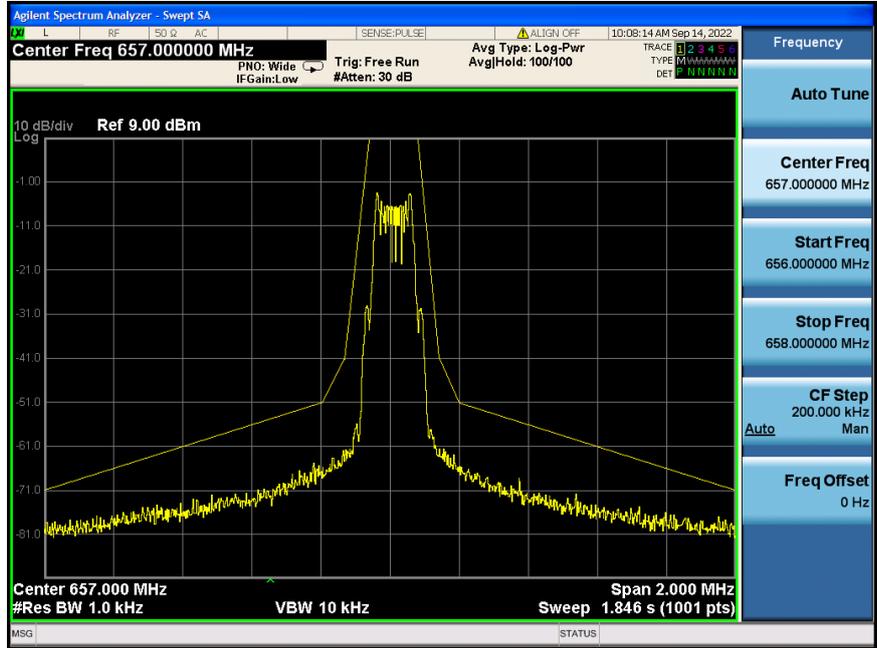


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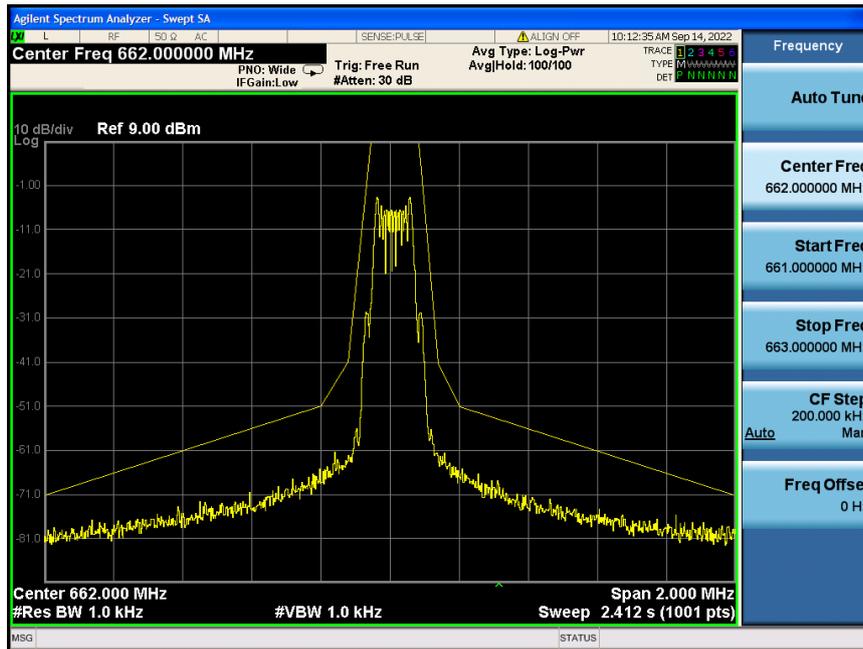
10.4. TEST RESULT

Group A

Emission within the band



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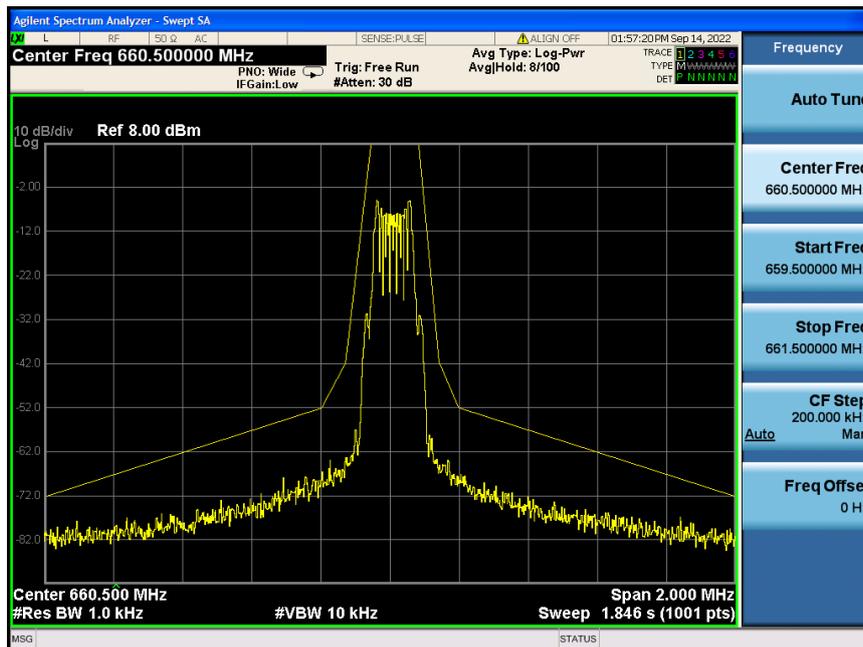
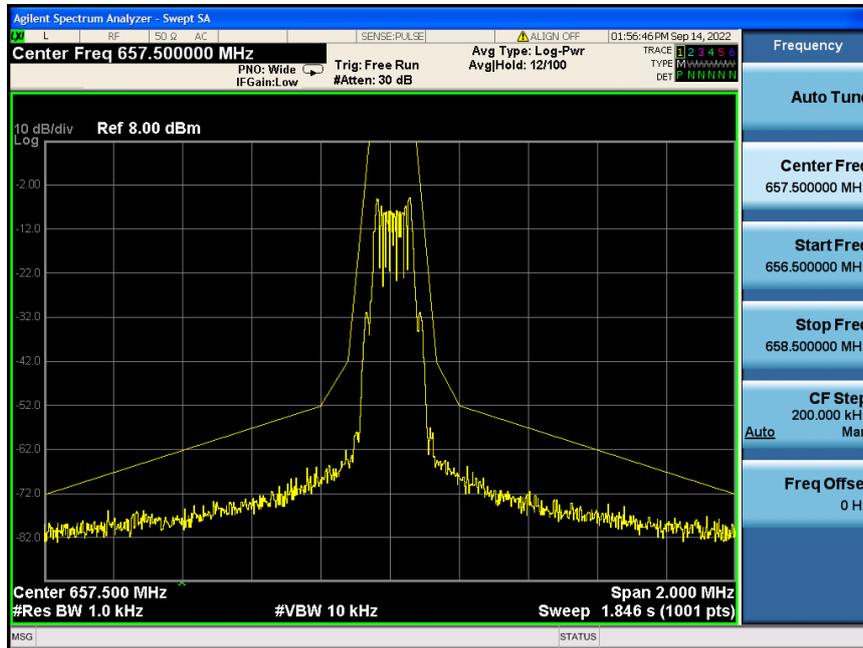
Note: 1. The manufacturer declared that the channel bandwidth is 200KHz.

2. The carrier power is the ref level, and the factor had been edited in the “Input Correction” of the Spectrum Analyzer.

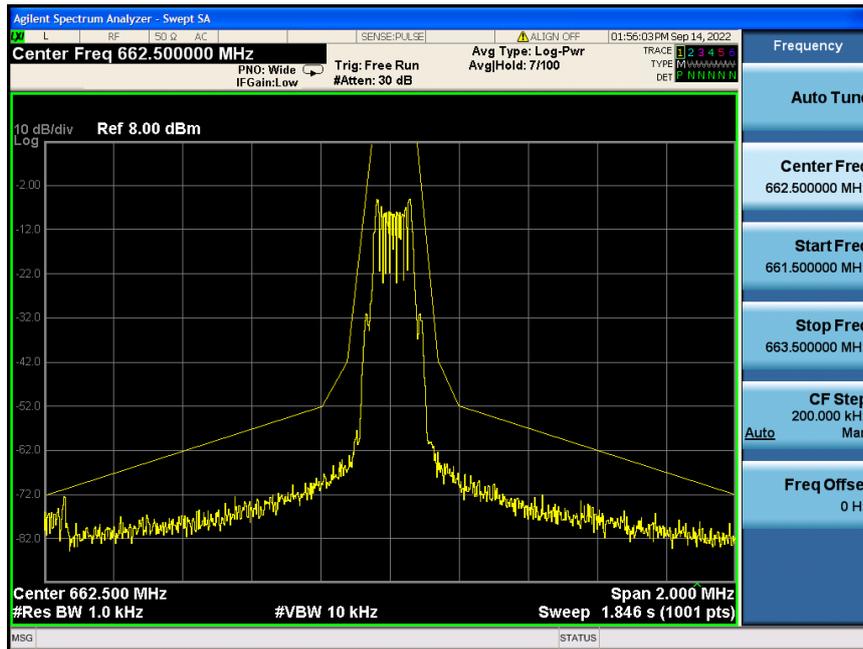
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Group B

Emission within the band



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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.

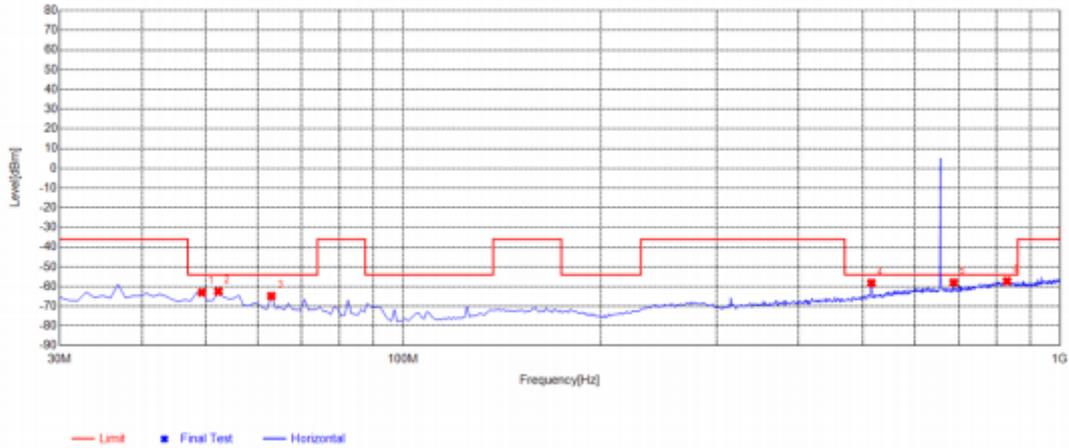
Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the “Dedicated Testing/Inspection Stamp” is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the written authorization of AGC. The test results presented in the report apply only to the tested sample. Any objections to report issued by AGC should be submitted to AGC within 15days after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc01@agccert.com.

Group A

CH01

Emission outside the band 30-1000MHz

EUT	Microphone	Model Name	PWMAZ-Q1
Temperature	24°C	Relative Humidity	66%
Pressure	985hPa	Test Voltage	Normal
Test Mode	Transmitting at 657MHz	Polarization	Horizontal

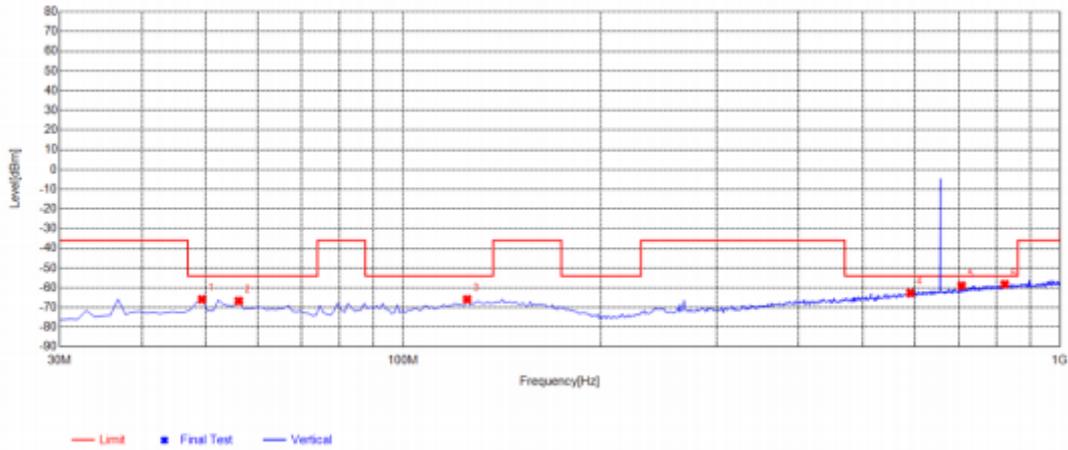


NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	49.4	-96.73	-62.99	-54.00	8.99	33.74	161	Horizontal
2	52.31	-95.48	-62.49	-54.00	8.49	32.99	136	Horizontal
3	62.98	-94.97	-64.85	-54.00	10.85	30.12	228	Horizontal
4	515.97	-95.08	-58.19	-54.00	4.19	36.89	194	Horizontal
5	688.63	-98.06	-57.97	-54.00	3.97	40.09	194	Horizontal
6	830.25	-100.53	-57.26	-54.00	3.26	43.27	9	Horizontal

RESULT: PASS

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EUT	Microphone	Model Name	PWMAZ-Q1
Temperature	24°C	Relative Humidity	66%
Pressure	985hPa	Test Voltage	Normal
Test Mode	Transmitting at 657MHz	Polarization	Vertical



NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	49.4	-95.61	-65.90	-54.00	11.90	29.71	115	Vertical
2	56.19	-97.48	-66.70	-54.00	12.70	30.78	215	Vertical
3	125.06	-99.25	-65.87	-54.00	11.87	33.38	182	Vertical
4	591.63	-101.15	-62.63	-54.00	8.63	38.52	98	Vertical
5	708.03	-99.53	-58.91	-54.00	4.91	40.62	215	Vertical
6	823.46	-100.76	-58.17	-54.00	4.17	42.59	341	Vertical

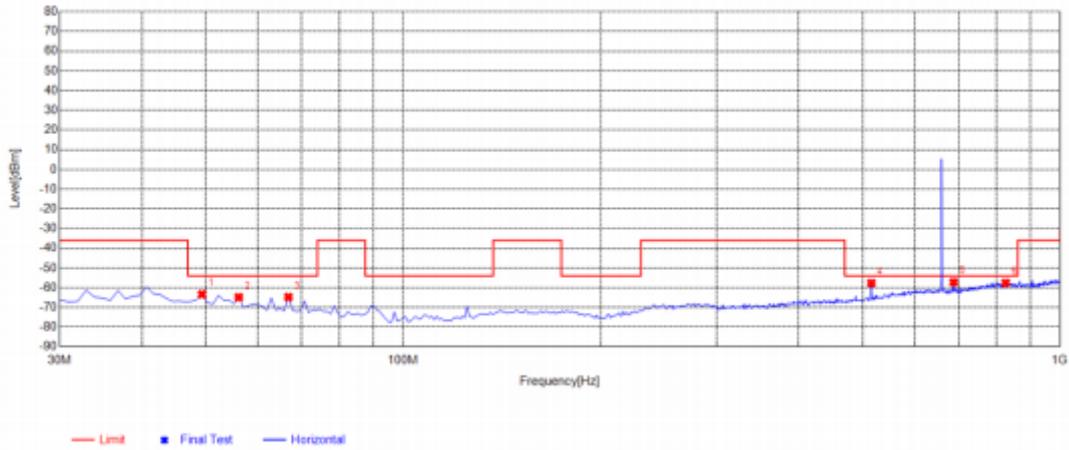
RESULT: PASS

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CH02

Emission outside the band 30-1000MHz

EUT	Microphone	Model Name	PWMAZ-Q1
Temperature	24°C	Relative Humidity	66%
Pressure	985hPa	Test Voltage	Normal
Test Mode	Transmitting at 660MHz	Polarization	Horizontal

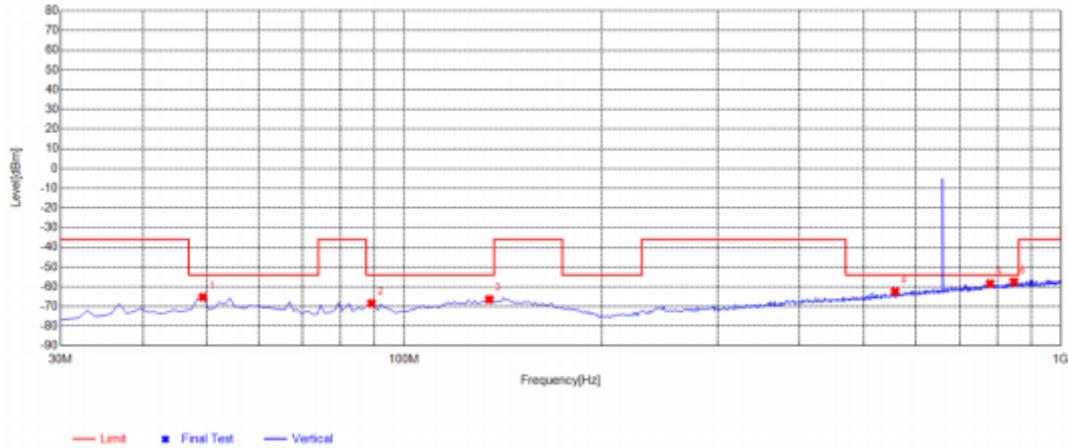


NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	49.4	-97.08	-63.34	-54.00	9.34	33.74	351	Horizontal
2	56.19	-96.75	-64.87	-54.00	10.87	31.88	1	Horizontal
3	66.86	-94.04	-64.77	-54.00	10.77	29.27	359	Horizontal
4	515.97	-94.60	-57.71	-54.00	3.71	36.89	192	Horizontal
5	688.63	-97.30	-57.21	-54.00	3.21	40.09	1	Horizontal
6	826.37	-100.89	-57.60	-54.00	3.60	43.29	359	Horizontal

RESULT: PASS

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EUT	Microphone	Model Name	PWMAZ-Q1
Temperature	24°C	Relative Humidity	66%
Pressure	985hPa	Test Voltage	Normal
Test Mode	Transmitting at 660MHz	Polarization	Vertical



NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	49.4	-94.97	-65.26	-54.00	11.26	29.71	158	Vertical
2	89.17	-96.63	-68.43	-54.00	14.43	28.20	42	Vertical
3	134.76	-100.44	-66.40	-54.00	12.40	34.04	58	Vertical
4	558.65	-100.23	-62.48	-54.00	8.48	37.75	175	Vertical
5	779.81	-100.37	-58.38	-54.00	4.38	41.99	327	Vertical
6	847.71	-100.31	-57.49	-54.00	3.49	42.82	33	Vertical

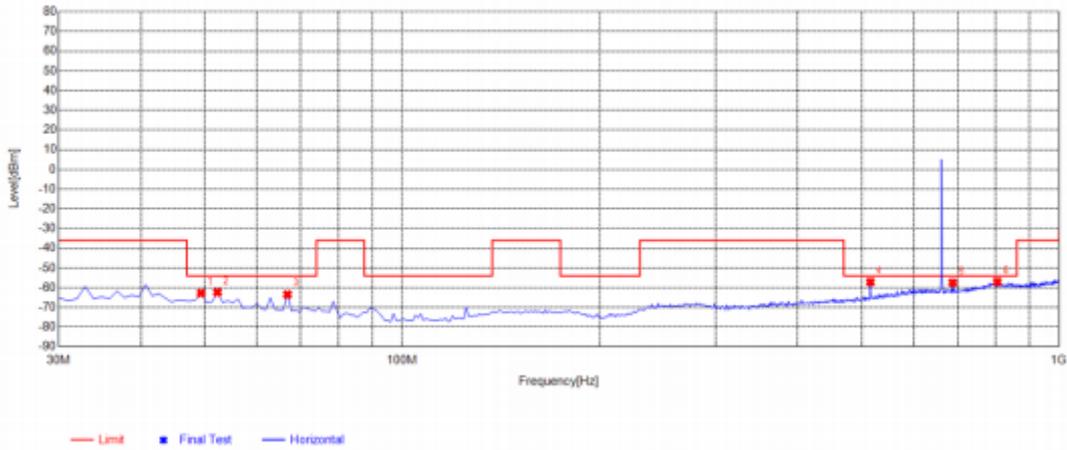
RESULT: PASS

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CH03

Emission outside the band 30-1000MHz

EUT	Microphone	Model Name	PWMAZ-Q1
Temperature	24°C	Relative Humidity	66%
Pressure	985hPa	Test Voltage	Normal
Test Mode	Transmitting at 662MHz	Polarization	Horizontal

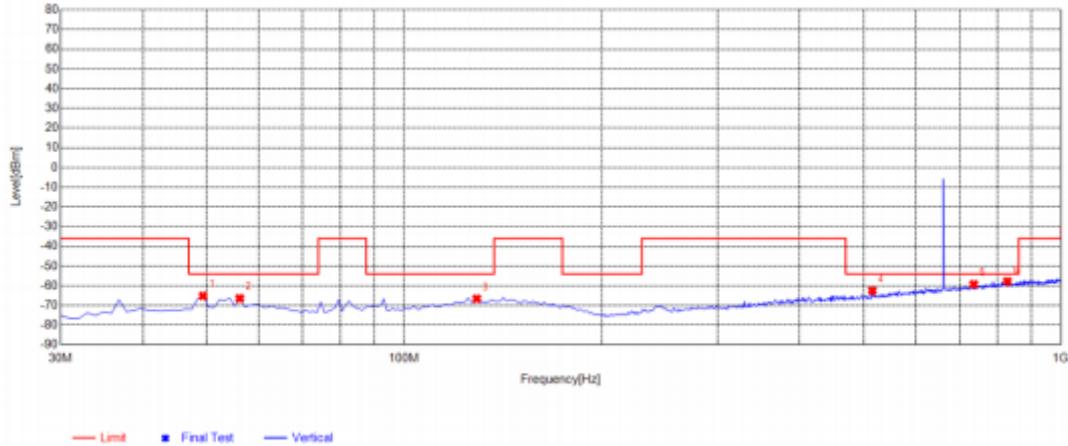


NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	49.4	-96.52	-62.78	-54.00	8.78	33.74	359	Horizontal
2	52.31	-95.31	-62.32	-54.00	8.32	32.99	293	Horizontal
3	66.86	-92.72	-63.45	-54.00	9.45	29.27	360	Horizontal
4	515.97	-94.00	-57.11	-54.00	3.11	36.89	200	Horizontal
5	688.63	-97.58	-57.49	-54.00	3.49	40.09	9	Horizontal
6	805.03	-100.40	-57.00	-54.00	3.00	43.40	125	Horizontal

RESULT: PASS

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EUT	Microphone	Model Name	PWMAZ-Q1
Temperature	24°C	Relative Humidity	66%
Pressure	985hPa	Test Voltage	Normal
Test Mode	Transmitting at 662MHz	Polarization	Vertical



NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	49.4	-94.86	-65.15	-54.00	11.15	29.71	157	Vertical
2	56.19	-97.15	-66.37	-54.00	12.37	30.78	65	Vertical
3	128.94	-100.21	-66.57	-54.00	12.57	33.64	341	Vertical
4	515.97	-99.27	-62.51	-54.00	8.51	36.76	182	Vertical
5	736.16	-100.40	-59.24	-54.00	5.24	41.16	224	Vertical
6	828.31	-100.44	-57.80	-54.00	3.80	42.64	308	Vertical

RESULT: PASS

Note: Factor=Antenna Factor + Cable loss, Margin=Limit-Level.

The “Factor” value can be calculated automatically by software of measurement system.

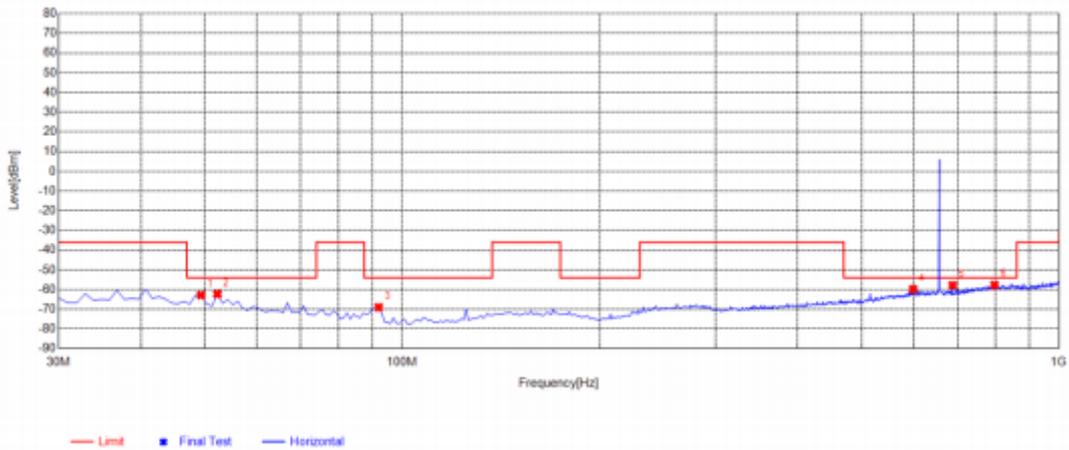
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Group B

CH01

Emission outside the band 30-1000MHz

EUT	Microphone	Model Name	PWMAZ-Q1
Temperature	24°C	Relative Humidity	66%
Pressure	985hPa	Test Voltage	Normal
Test Mode	Transmitting at 657.5MHz	Polarization	Horizontal

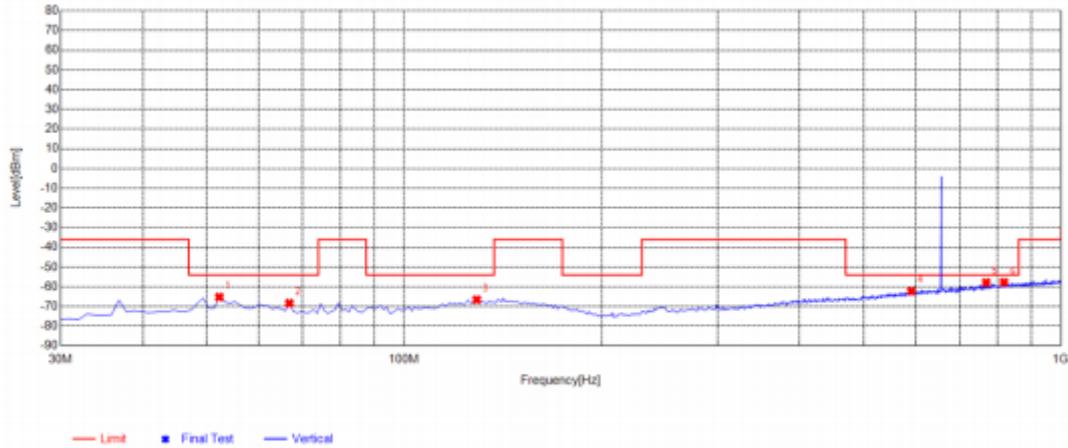


NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	49.4	-96.55	-62.81	-54.00	8.81	33.74	352	Horizontal
2	52.31	-95.28	-62.29	-54.00	8.29	32.99	1	Horizontal
3	92.08	-93.86	-69.02	-54.00	15.02	24.84	291	Horizontal
4	599.39	-99.68	-59.85	-54.00	5.85	39.83	155	Horizontal
5	688.63	-97.90	-57.81	-54.00	3.81	40.09	188	Horizontal
6	797.27	-101.04	-57.71	-54.00	3.71	43.33	291	Horizontal

RESULT: PASS

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EUT	Microphone	Model Name	PWMAZ-Q1
Temperature	24°C	Relative Humidity	66%
Pressure	985hPa	Test Voltage	Normal
Test Mode	Transmitting at 657.5MHz	Polarization	Vertical



NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	52.31	-95.38	-65.21	-54.00	11.21	30.17	299	Vertical
2	66.86	-97.32	-68.33	-54.00	14.33	28.99	40	Vertical
3	128.94	-100.21	-66.57	-54.00	12.57	33.64	48	Vertical
4	591.63	-100.71	-62.19	-54.00	8.19	38.52	220	Vertical
5	769.14	-99.64	-57.86	-54.00	3.86	41.78	185	Vertical
6	818.61	-100.29	-57.75	-54.00	3.75	42.54	7	Vertical

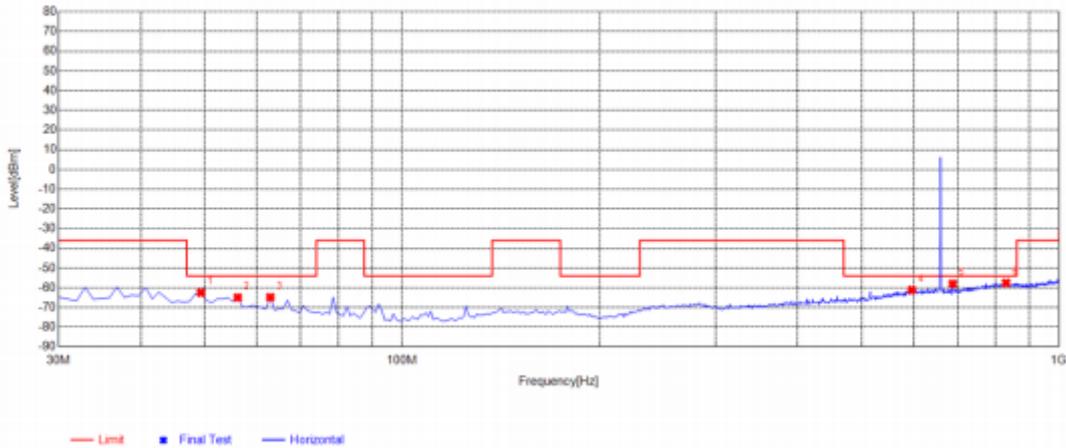
RESULT: PASS

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CH02

Emission outside the band 30-1000MHz

EUT	Microphone	Model Name	PWMAZ-Q1
Temperature	24°C	Relative Humidity	66%
Pressure	985hPa	Test Voltage	Normal
Test Mode	Transmitting at 660.5MHz	Polarization	Horizontal

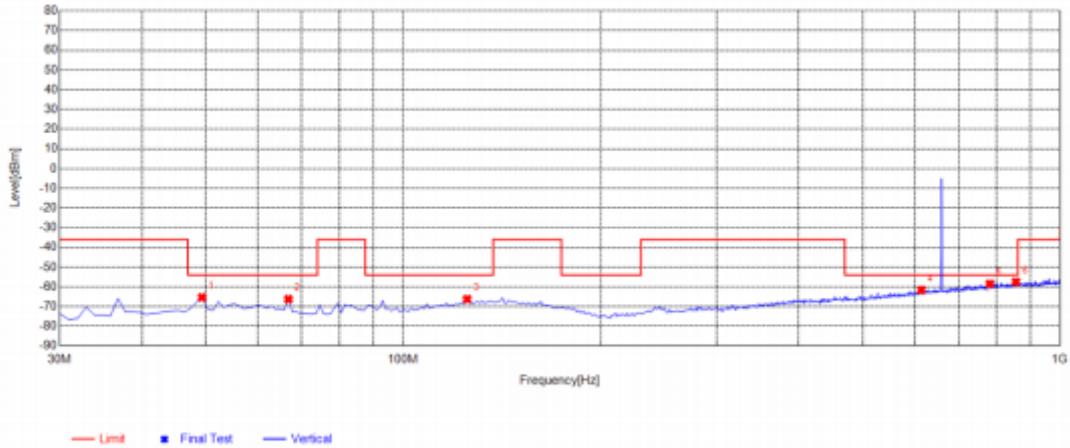


NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	49.4	-96.24	-62.50	-54.00	8.50	33.74	355	Horizontal
2	56.19	-96.83	-64.95	-54.00	10.95	31.88	246	Horizontal
3	62.98	-94.97	-64.85	-54.00	10.85	30.12	347	Horizontal
4	596.48	-100.83	-61.10	-54.00	7.10	39.73	170	Horizontal
5	688.63	-98.08	-57.99	-54.00	3.99	40.09	170	Horizontal
6	830.25	-100.84	-57.57	-54.00	3.57	43.27	280	Horizontal

RESULT: PASS

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EUT	Microphone	Model Name	PWMAZ-Q1
Temperature	24°C	Relative Humidity	66%
Pressure	985hPa	Test Voltage	Normal
Test Mode	Transmitting at 660.5MHz	Polarization	Vertical



NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	49.4	-95.06	-65.35	-54.00	11.35	29.71	266	Vertical
2	66.86	-95.23	-66.24	-54.00	12.24	28.99	28	Vertical
3	125.06	-99.61	-66.23	-54.00	12.23	33.38	61	Vertical
4	614.91	-100.58	-61.61	-54.00	7.61	38.97	28	Vertical
5	781.75	-100.54	-58.52	-54.00	4.52	42.02	351	Vertical
6	856.44	-100.38	-57.48	-54.00	3.48	42.90	359	Vertical

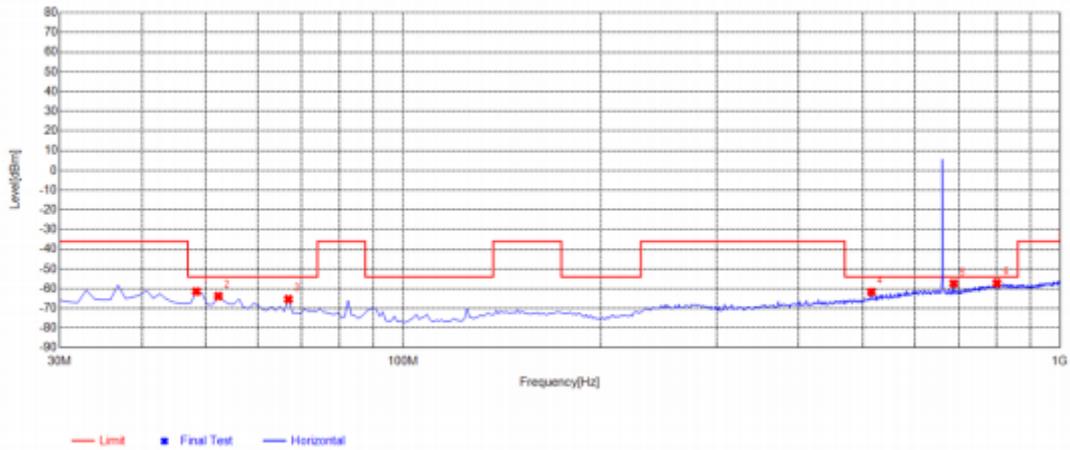
RESULT: PASS

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CH03

Emission outside the band 30-1000MHz

EUT	Microphone	Model Name	PWMAZ-Q1
Temperature	24°C	Relative Humidity	66%
Pressure	985hPa	Test Voltage	Normal
Test Mode	Transmitting at 662.5MHz	Polarization	Horizontal

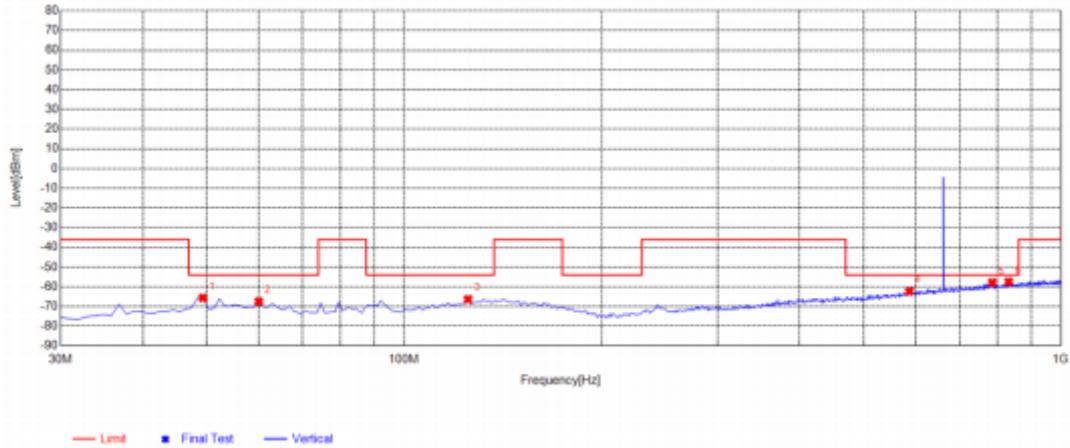


NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	48.43	-95.28	-61.41	-54.00	7.41	33.87	295	Horizontal
2	52.31	-96.78	-63.79	-54.00	9.79	32.99	153	Horizontal
3	66.86	-94.61	-65.34	-54.00	11.34	29.27	28	Horizontal
4	515.97	-98.55	-61.66	-54.00	7.66	36.89	169	Horizontal
5	688.63	-97.49	-57.40	-54.00	3.40	40.09	1	Horizontal
6	801.15	-100.62	-57.21	-54.00	3.21	43.41	19	Horizontal

RESULT: PASS

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EUT	Microphone	Model Name	PWMAZ-Q1
Temperature	24°C	Relative Humidity	66%
Pressure	985hPa	Test Voltage	Normal
Test Mode	Transmitting at 662.5MHz	Polarization	Vertical



NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	49.4	-95.33	-65.62	-54.00	11.62	29.71	40	Vertical
2	60.07	-98.87	-67.51	-54.00	13.51	31.36	224	Vertical
3	125.06	-99.69	-66.31	-54.00	12.31	33.38	324	Vertical
4	587.75	-100.70	-62.27	-54.00	8.27	38.43	308	Vertical
5	785.63	-99.94	-57.84	-54.00	3.84	42.10	15	Vertical
6	832.19	-100.11	-57.44	-54.00	3.44	42.67	166	Vertical

RESULT: PASS

Note: Factor=Antenna Factor + Cable loss, Margin=Limit-Level.

The “Factor” value can be calculated automatically by software of measurement system.

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Group A

Emission outside the band above 1000MHz

EUT	Microphone	Model Name	PWMAZ-Q1
Temperature	24°C	Relative Humidity	66%
Pressure	985hPa	Test Voltage	Normal
Test Mode	Transmitting at 657MHz	Polarization	Horizontal/Vertical

Frequency (MHz)	Meter Reading (dBm)	Factor (dB)	Emission Level (dBm)	Limits (dBm)	Margin (dB)	Value Type
1314.000	-38.64	-4.02	-42.66	-30	-12.66	Horizontal
1314.000	-36.82	-4.02	-40.84	-30	-10.84	Vertical
1971.000	-35.18	-1.95	-37.13	-30	-7.13	Horizontal
1971.000	-33.12	-1.95	-35.07	-30	-5.07	Vertical
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT	Microphone	Model Name	PWMAZ-Q1
Temperature	24°C	Relative Humidity	66%
Pressure	985hPa	Test Voltage	Normal
Test Mode	Transmitting at 660MHz	Polarization	Horizontal/Vertical

Frequency (MHz)	Meter Reading (dBm)	Factor (dB)	Emission Level (dBm)	Limits (dBm)	Margin (dB)	Value Type
1320.000	-37.27	-4.02	-41.29	-30	-11.29	Horizontal
1320.000	-34.57	-4.02	-38.59	-30	-8.59	Vertical
1980.000	-35.19	-1.95	-37.14	-30	-7.14	Horizontal
1980.000	-32.87	-1.95	-34.82	-30	-4.82	Vertical
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

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EUT	Microphone	Model Name	PWMAZ-Q1
Temperature	24°C	Relative Humidity	66%
Pressure	985hPa	Test Voltage	Normal
Test Mode	Transmitting at 662MHz	Polarization	Horizontal/Vertical

Frequency (MHz)	Meter Reading (dBm)	Factor (dB)	Emission Level (dBm)	Limits (dBm)	Margin (dB)	Value Type
1324.000	-39.53	-4.02	-43.55	-30	-13.55	Horizontal
1324.000	-36.19	-4.02	-40.21	-30	-10.21	Vertical
1986.000	-37.16	-1.95	-39.11	-30	-9.11	Horizontal
1986.000	-34.02	-1.95	-35.97	-30	-5.97	Vertical

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

RESULT: PASS

Note: Other emissions from 1G to 6 GHz are considered as ambient noise. No recording in the test report.

Factor = Antenna Factor + Cable loss - Amplifier gain, Margin=Emission Level-Limit.

The “Factor” value can be calculated automatically by software of measurement system.

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Group B

Emission outside the band above 1000MHz

EUT	Microphone	Model Name	PWMAZ-Q1
Temperature	24°C	Relative Humidity	66%
Pressure	985hPa	Test Voltage	Normal
Test Mode	Transmitting at 657.5MHz	Polarization	Horizontal/Vertical

Frequency (MHz)	Meter Reading (dBm)	Factor (dB)	Emission Level (dBm)	Limits (dBm)	Margin (dB)	Value Type
1315.000	-37.54	-4.02	-41.56	-30	-11.56	Horizontal
1315.000	-35.72	-4.02	-39.74	-30	-9.74	Vertical
1972.500	-33.61	-1.95	-35.56	-30	-5.56	Horizontal
1972.500	-31.67	-1.95	-33.62	-30	-3.62	Vertical
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT	Microphone	Model Name	PWMAZ-Q1
Temperature	24°C	Relative Humidity	66%
Pressure	985hPa	Test Voltage	Normal
Test Mode	Transmitting at 660.5MHz	Polarization	Horizontal/Vertical

Frequency (MHz)	Meter Reading (dBm)	Factor (dB)	Emission Level (dBm)	Limits (dBm)	Margin (dB)	Value Type
1321.000	-37.56	-4.02	-41.58	-30	-11.58	Horizontal
1321.000	-36.12	-4.02	-40.14	-30	-10.14	Vertical
1981.500	-34.07	-1.95	-36.02	-30	-6.02	Horizontal
1981.500	-32.77	-1.95	-34.72	-30	-4.72	Vertical
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

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EUT	Microphone	Model Name	PWMAZ-Q1
Temperature	24°C	Relative Humidity	66%
Pressure	985hPa	Test Voltage	Normal
Test Mode	Transmitting at 662.5MHz	Polarization	Horizontal/Vertical

Frequency (MHz)	Meter Reading (dBm)	Factor (dB)	Emission Level (dBm)	Limits (dBm)	Margin (dB)	Value Type
1325.000	-36.49	-4.02	-40.51	-30	-10.51	Horizontal
1325.000	-34.61	-4.02	-38.63	-30	-8.63	Vertical
1987.500	-33.76	-1.95	-35.71	-30	-5.71	Horizontal
1987.500	-31.89	-1.95	-33.84	-30	-3.84	Vertical

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

RESULT: PASS

Note: Other emissions from 1G to 6 GHz are considered as ambient noise. No recording in the test report.

Factor = Antenna Factor + Cable loss - Amplifier gain, Margin=Emission Level-Limit.

The “Factor” value can be calculated automatically by software of measurement system.

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11. LINE CONDUCTED EMISSION TEST

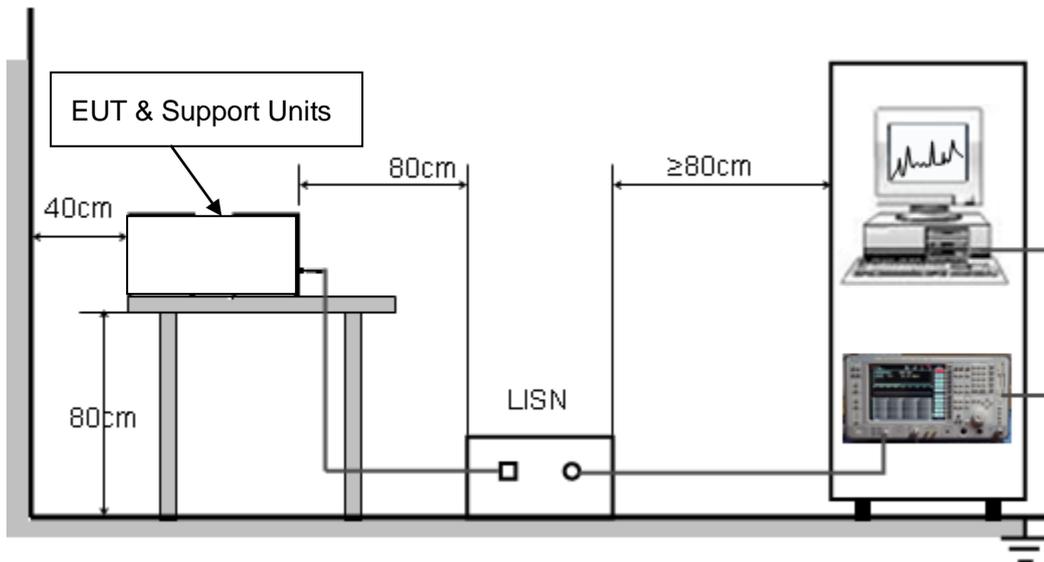
11.1. LIMITS OF LINE CONDUCTED EMISSION TEST

Frequency	Maximum RF Line Voltage	
	Q.P. (dB μ V)	Average (dB μ V)
150kHz~500kHz	66-56	56-46
500kHz~5MHz	56	46
5MHz~30MHz	60	50

Note: 1. The lower limit shall apply at the transition frequency.

2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

11.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST



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11.3. PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST

1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
2. Support equipment, if needed, was placed as per ANSI C63.10.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
4. All support equipment received AC120V/60Hz power from a LISN, if any.
5. The EUT received DC 5V power from adapter which received AC120V/60Hz power from a LISN.
6. The test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7. Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.
8. During the above scans, the emissions were maximized by cable manipulation.
9. The test mode(s) were scanned during the preliminary test.

Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

11.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST

1. EUT and support equipment was set up on the test bench as per step 2 of the preliminary test.
2. A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less -2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.
3. The test data of the worst case condition(s) was reported on the Summary Data page.

11.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST

N/A

Note: Wireless function is not working when charging

APPENDIX A: PHOTOGRAPHS OF TEST SETUP

Refer to the Report No.: AGC13550220802AP01

APPENDIX B: PHOTOGRAPHS OF EUT

Refer to the Report No.: AGC13550220802AP02

----END OF REPORT----

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Conditions of Issuance of Test Reports

1. All samples and goods are accepted by the Attestation of Global Compliance (Shenzhen) Co., Ltd. (the “Company”) solely for testing and reporting in accordance with the following terms and conditions. The company provides its services on the basis that such terms and conditions constitute express agreement between the company and any person, firm or company requesting its services (the “Clients”).
2. Any report issued by Company as a result of this application for testing services (the “Report”) shall be issued in confidence to the Clients and the Report will be strictly treated as such by the Company. It may not be reproduced either in its entirety or in part and it may not be used for advertising or other unauthorized purposes without the written consent of the Company. The Clients to whom the Report is issued may, however, show or send it, or a certified copy thereof prepared by the Company to its customer, supplier or other persons directly concerned. The Company will not, without the consent of the Clients, enter into any discussion or correspondence with any third party concerning the contents of the Report, unless required by the relevant governmental authorities, laws or court orders.
3. The Company shall not be called or be liable to be called to give evidence or testimony on the Report in a court of law without its prior written consent, unless required by the relevant governmental authorities, laws or court orders.
4. In the event of the improper use of the report as determined by the Company, the Company reserves the right to withdraw it, and to adopt any other additional remedies which may be appropriate.
5. Samples submitted for testing are accepted on the understanding that the Report issued cannot form the basis of, or be the instrument for, any legal action against the Company.
6. The Company will not be liable for or accept responsibility for any loss or damage however arising from the use of information contained in any of its Reports or in any communication whatsoever about its said tests or investigations.
7. Clients wishing to use the Report in court proceedings or arbitration shall inform the Company to that effect prior to submitting the sample for testing.
8. The Company is not responsible for recalling the electronic version of the original report when any revision is made to them. The Client assumes the responsibility to providing the revised version to any interested party who uses them.
9. Subject to the variable length of retention time for test data and report stored hereinto as otherwise specifically required by individual accreditation authorities, the Company will only keep the supporting test data and information of the test report for a period of six years. The data and information will be disposed of after the aforementioned retention period has elapsed. Under no circumstances shall we provide any data and information which has been disposed of after retention period. Under no circumstances shall we be liable for damage of any kind, including (but not limited to) compensatory damages, lost profits, lost data, or any form of special, incidental, indirect, consequential or punitive damages of any kind, whether based on breach of contract of warranty, tort (including negligence), product liability or otherwise, even if we are informed in advance of the possibility of such damages.

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