FCC TEST REPORT

FCC ID: 2BK9B-TX-1V2

Report No.	:	SSP24080005-1E
Applicant	:	Shenzhen Risheng Digital Technology Co., Ltd
Product Name	:	Wireless microphone
Model Name	:	TX-1V2
Test Standard	:	FCC Part 15.236
Date of Issue	:	2024-10-10

Shenzhen CCUT Quality Technology Co., Ltd.
1F, Building 35, Changxing Technology Industrial Park, Yutang Street, Guangming District, Shenzhen, Guangdong, China; (Tel.:+86-755-23406590 website: www.ccuttest.com)

Test Report Basic Information

Applicant.....:	Shenzhen Risheng Digital Technology Co., Ltd
Address of Applicant.....:	1811-1813, Building A, international Chamber of Commerce Building, No. 138 Fuhua 1st Road,Fu'an Community, Futian Street, Futian District, Shenzhen China
Manufacturer.....:	Shenzhen Risheng Digital Technology Co., Ltd
Address of Manufacturer.....:	1811-1813, Building A, international Chamber of Commerce Building, No. 138 Fuhua 1st Road,Fu'an Community, Futian Street, Futian District, Shenzhen China
Product Name.....:	Wireless microphone
Brand Name.....:	Risheng
Main Model.....:	TX-1V2
Series Models.....:	See section 1.1 (Page 5)
Test Standard.....:	FCC Part 15 Subpart C ANSI C63.4-2014 ANSI C63.10-2013
Date of Test .....:	2024-09-15 to 2024-09-19
Test Result.....:	PASS

Tested By .....:	Colin Chen (Colin Chen)	Shenzhen CCUT Quality Technology Co., Ltd. APPROVED
Reviewed By.....:	Lieber Ouyang (Lieber Ouyang)	
Authorized Signatory.....:	Lahm Peng (Lahm Peng)	

Note : This test report is limited to the above client company and the product model only. It may not be duplicated without prior permitted by Shenzhen CCUT Quality Technology Co., Ltd.. All test data presented in this test report is only applicable to presented test sample.

CONTENTS

Revision History

Revision	Issue Date	Description	Revised By
V1.0	2024-10-10	Initial Release	Lahm Peng

1. General Information

1.1 Product Information

Product Name:	Wireless microphone
Trade Name:	Risheng
Main Model:	TX-1V2
Series Models:	TX-338, TX-1088, TX-X2, TX-H2, TX-W258, TX-W458, TX-301, TX-401, TX-H3
Rated Voltage:	DC 1.5V by “AA"*2 battery
Test Sample No:	SSP24080005-1
Hardware Version:	V1.0
Software Version:	V1.0
Note 1: The test data is gathered from a production sample, provided by the manufacturer. Note 2: The color of appearance and model name of series models listed are different from the main model, but the circuit and the electronic construction are the same, declared by the manufacturer.	

Wireless Specification	
Operating Frequency:	657.1~662.5MHz
RF Output Power:	-0.235dBm (EIRP)
Quantity of Channel:	19
Channel Separation:	200kHz
Modulation:	FSK
Antenna Gain:	0dBi
Type of Antenna:	PCB Antenna
Type of Device:	☒ Portable Device ☐ Mobile Device ☐ Modular Device

1.2 Test Setup Information

List of Test Modes		
Test Mode	Description	Remark
TM1	Transmitting	657.1MHz /660.8MHz/662.5MHz
TM2	-	-
TM3	-	-

List and Details of Auxiliary Cable			
Description	Length (cm)	Shielded/Unshielded	With/Without Ferrite
-	-	-	-
-	-	-	-

List and Details of Auxiliary Equipment			
Description	Manufacturer	Model	Serial Number
-	-	-	-
-	-	-	-

List of Channels							
No. of Channel	Frequency (MHz)	No. of Channel	Frequency (MHz)	No. of Channel	Frequency (MHz)	No. of Channel	Frequency (MHz)
1	657.1	6	658.3	11	659.6	16	660.8
2	657.3	7	658.6	12	659.8	17	662.3
3	657.6	8	658.8	13	660.1	18	662.5
4	657.8	9	659.1	14	660.3	19	662.5
5	658.1	10	659.3	15	660.6	20	

1.3 Compliance Standards

Compliance Standards	
FCC Part 15 Subpart C	FEDERAL COMMUNICATIONS COMMISSION, RADIO FREQUENCY DEVICES, Intentional Radiators
All measurements contained in this report were conducted with all above standards	
According to standards for test methodology	
FCC Part 15 Subpart C	FEDERAL COMMUNICATIONS COMMISSION, RADIO FREQUENCY DEVICES, Intentional Radiators
ANSI C63.4-2014	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.
ANSI C63.10-2013	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
Maintenance of compliance is the responsibility of the manufacturer or applicant. Any modification of the product, which result is lowering the emission, should be checked to ensure compliance has been maintained.	

1.4 Test Facilities

Laboratory Name:	**Shenzhen CCUT Quality Technology Co., Ltd.** 1F, Building 35, Changxing Technology Industrial Park, Yutang Street, Guangming District, Shenzhen, Guangdong, China
CNAS Laboratory No.:	L18863
A2LA Certificate No.:	6893.01
FCC Registration No:	583813
ISED Registration No.:	CN0164
All measurement facilities used to collect the measurement data are located at 1F, Building 35, Changxing Technology Industrial Park, Yutang Street, Guangming District, Shenzhen, Guangdong, China.	

1.5 List of Measurement Instruments

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Conducted Emissions					
AMN	ROHDE&SCHWARZ	ENV216	101097	2024-08-07	2025-08-06
EMI Test Receiver	ROHDE&SCHWARZ	ESPI	100242	2024-08-07	2025-08-06
Test Cable	N/A	Cable 5	N/A	2024-08-07	2025-08-06
EMI Test Software	FARA	EZ-EMC	EMEC-3A1+	N/A	N/A
Radiated Emissions					
EMI Test Receiver	ROHDE&SCHWARZ	ESPI	100154	2024-08-07	2025-08-06
Spectrum Analyzer	KEYSIGHT	N9020A	MY48030972	2024-08-07	2025-08-06
Spectrum Analyzer	ROHDE&SCHWARZ	FSV40-N	101692	2024-08-07	2025-08-06
Amplifier	SCHWARZBECK	BBV 9743B	00251	2024-08-07	2025-08-06
Amplifier	HUABO	YXL0518-2.5-45	--	2024-08-07	2025-08-06
Amplifier	COM-MW	DLAN-18G-4G-02	10229104	2024-08-07	2025-08-06
Loop Antenna	DAZE	ZN30900C	21104	2024-08-03	2025-08-02
Broadband Antenna	SCHWARZBECK	VULB 9168	01320	2024-08-03	2025-08-02
Horn Antenna	SCHWARZBECK	BBHA 9120D	02553	2024-08-03	2025-08-02
Horn Antenna	COM-MW	ZLB7-18-40G-950	12221225	2024-08-03	2025-08-02
Attenuator	QUANJUDA	6dB	220731	2024-08-07	2025-08-06
Test Cable	N/A	Cable 1	N/A	2024-08-07	2025-08-06
Test Cable	N/A	Cable 2	N/A	2024-08-07	2025-08-06
Test Cable	N/A	Cable 3	N/A	2024-08-07	2025-08-06
Test Cable	N/A	Cable 4	N/A	2024-08-07	2025-08-06
Test Cable	N/A	Cable 8	N/A	2024-08-07	2025-08-06
Test Cable	N/A	Cable 9	N/A	2024-08-07	2025-08-06
EMI Test Software	FARA	EZ-EMC	FA-03A2 RE+	N/A	N/A
Conducted RF Testing					
RF Test System	MWRFTest	MW100-RFCB	220418SQS-37	2024-08-07	2025-08-06
Spectrum Analyzer	KEYSIGHT	N9020A	ATO-90521	2024-08-07	2025-08-06

1.6 Measurement Uncertainty

Test Item	Conditions	Uncertainty
Conducted Emissions	9kHz ~ 30MHz	±1.64 dB
Radiated Emissions	9kHz ~ 30MHz	±2.88 dB
	30MHz ~ 1GHz	±3.32 dB
	1GHz ~ 18GHz	±3.50 dB
	18GHz ~ 40GHz	±3.66 dB
Conducted Output Power	9kHz ~ 26GHz	±0.50 dB
Frequency Stability	9kHz ~ 26GHz	±0.16 ppm
Occupied Bandwidth	9kHz ~ 26GHz	±4.0 %
DC Voltage	DC 0~30V	±0.1 %
Temperature	-40~50℃	±0.3℃

2. Summary of Test Results

FCC Rule	Description of Test Item	Result
FCC Part 15.203	Antenna Requirement	Passed
FCC Part 15.207	Conducted Emissions	N/A
FCC Part 15.236(g)	Spurious Emissions	Passed
FCC Part15.236(d)(2)	Maximum Radiated Power	Passed
FCC Part 15.236(f)(2)	Emission Bandwidth	Passed
FCC Part 15.236(f)(3)	Frequency Stability	Passed
FCC Part 15.236(g)	Necessary Bandwidth	Passed
Passed: The EUT complies with the essential requirements in the standard Failed: The EUT does not comply with the essential requirements in the standard N/A: Not applicable		

3. Antenna Requirement

3.1 Standard and Limit

According to FCC Part 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

3.2 Test Result

This product has an PCB antenna, fulfill the requirement of this section.

4. Conducted Emissions

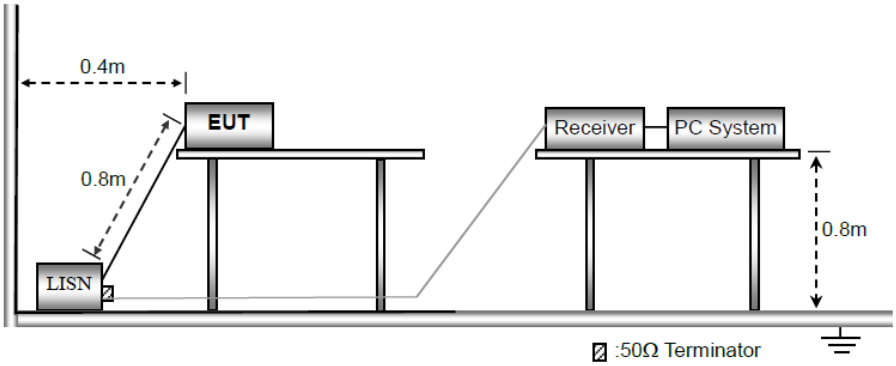
4.1 Standard and Limit

According to the rule FCC Part 15.207, Conducted emissions limit, the limit for a wireless device as below:

Frequency of Emission (MHz)	Conducted emissions (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50
Note 1: Decreases with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz Note 2: The lower limit applies at the band edges		

4.2 Test Procedure

Test is conducting under the description of ANSI C63.10 - 2013 section 6.2.



Test Setup Block Diagram

a) The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

b) The following is the setting of the receiver
Attenuation: 10dB
Start Frequency: 0.15MHz
Stop Frequency: 30MHz
IF Bandwidth: 9kHz

c) The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipment powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.

d) Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
e) I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

f) LISN is at least 80 cm from nearest part of EUT chassis.

g) For the actual test configuration, please refer to the related Item - photographs of the test setup.

4.3 Test Data and Results

Because the product power is supply through DC 1.5V by “AA"*2 battery, so not applicable.

5. Spurious Emissions

5.1 Standard and Limit

According to FCC Part 15.236(g), Emissions within the band from one megahertz below to one megahertz above the carrier frequency shall comply with the emission mask in section 8.3 of ETSI EN 300422-1 V1.4.2 (2011-08). Emission outside of this band shall comply with the limits specified in section 8.4 of ETSI EN 300422-1 V1.4.2 (2011-08).

Limits for Spurious Emissions

State	Frequency		
	47 MHz to 74 MHz 87,5 MHz to 137 MHz 174 MHz to 230 MHz 470 MHz to 862 MHz	Other Frequencies below 1 000 MHz	Frequencies above 1 000 MHz
Operation	4 nW	250 nW	1 µW
Standby	2 nW	2 nW	20 nW

5.2 Test Procedure

On a test site, the sample shall be placed at the specified height on a non-conducting support. The transmitter shall be operated at the power as specified under clause 8.2, delivered to the antenna (see clause 5.1.1).

Radiation of any spurious components shall be detected by the test antenna and receiver, over the frequency range specified below, excluding the 250 % (out of band region) band of frequencies centred on the channel on which the transmitter is intended to operate.

The measuring receiver, as defined in table 4, shall be tuned over the frequency range 25 MHz to 4 GHz for equipment operating on frequencies below 1 GHz or in the frequency range of 25 MHz to 12,75 GHz for equipment operating on frequencies above 1 GHz.

At each frequency at which a component is detected, the sample shall be rotated to obtain maximum response and the effective radiated power of that component determined by a substitution measurement.

The measurement shall be repeated with the test antenna in the orthogonal polarization plane.

If the transmitter allows for standby operation, the tests shall be repeated with the transmitter in standby mode

Reference bandwidth for measuring receiver

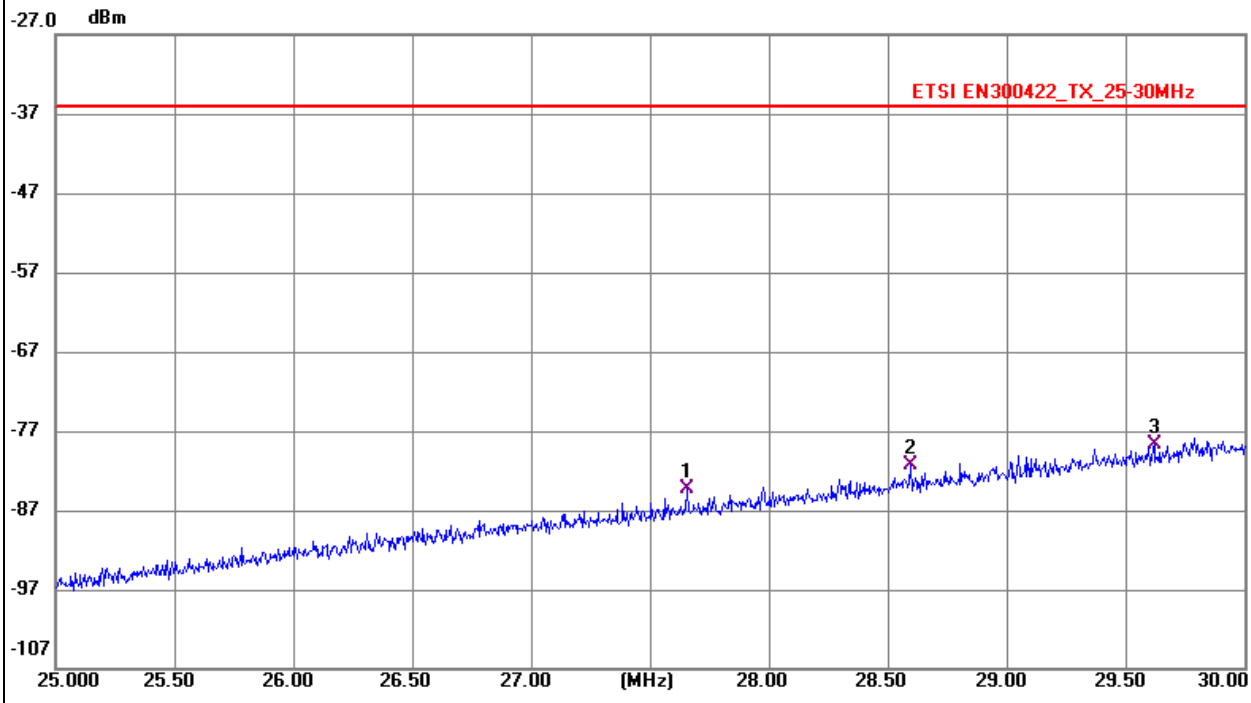
Frequency being measured	Measuring receiver bandwidth
25 MHz to 30 MHz	9 kHz to 10 kHz
30 MHz to 1 000 MHz	100 kHz to 120 kHz
> 1 000 MHz	1 MHz

5.3 Test Data and Results

Based on all tested data, the EUT complied with the FCC Part 15.236 standard limit for a wireless microphone device, and with the worst case as below:

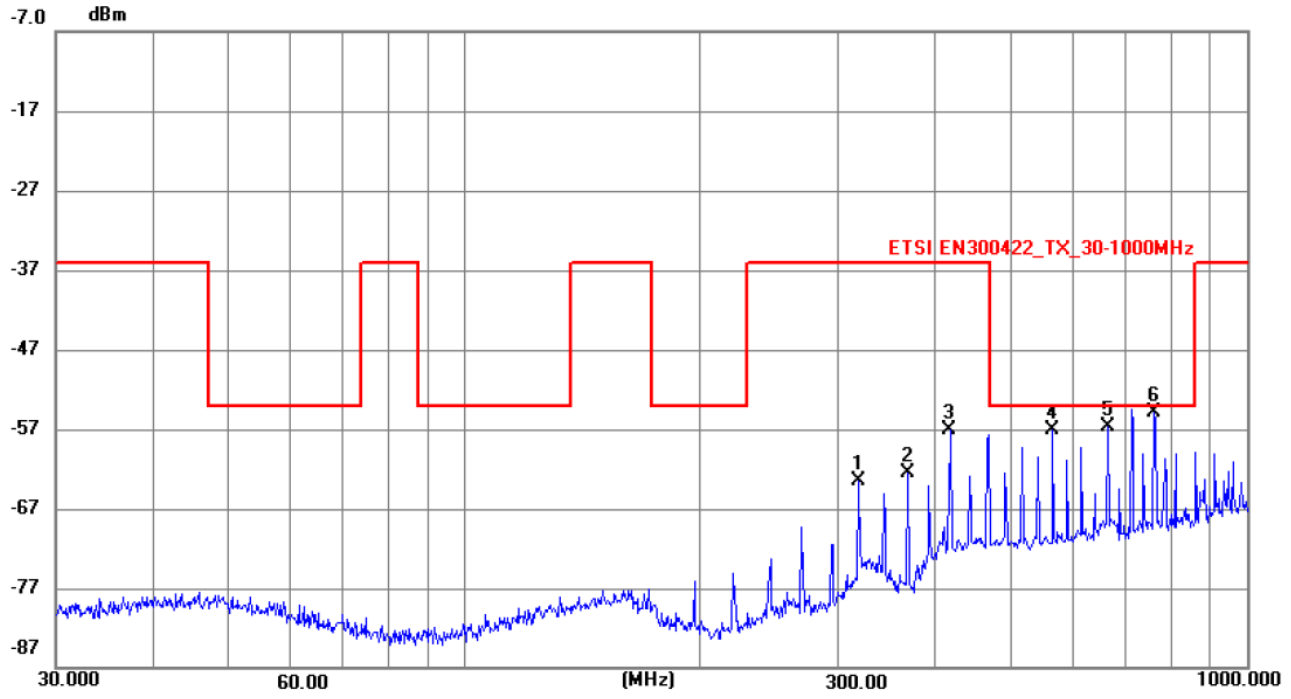
Remark: Level = Reading + Factor, Margin = Level - Limit

Radiated Emission Test Data (25MHz to 30 MHz)	
Tested Mode:	TM1
Test Antenna Polarization:	Horizontal
Remark:	



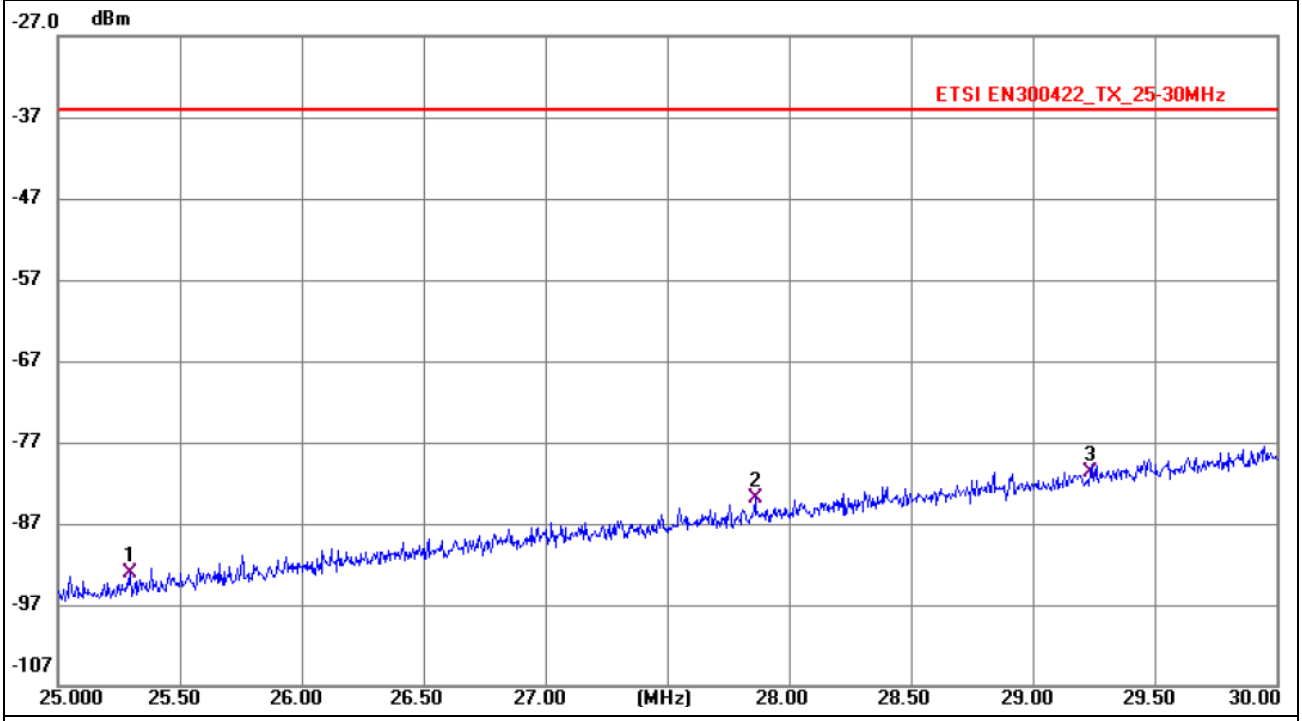
No.	Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	27.6550	-69.40	-14.96	-84.36	-36.00	-48.36	QP	100	160	P	
2	28.5950	-66.32	-14.99	-81.31	-36.00	-45.31	QP	100	91	P	
3 *	29.6200	-63.75	-15.00	-78.75	-36.00	-42.75	QP	100	81	P	

Radiated Emission Test Data (30MHz to 1GHz)	
Tested Mode:	TM1
Test Antenna Polarization:	Horizontal
Remark:	



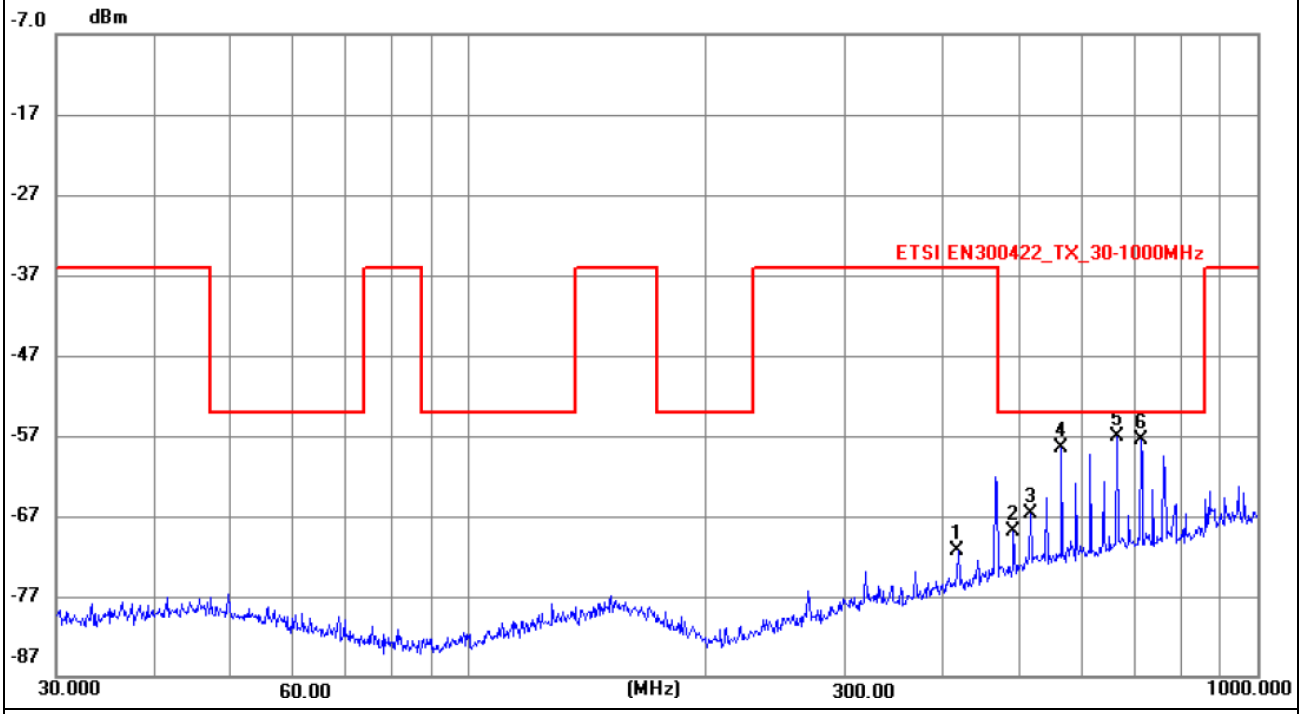
No.	Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	318.8170	-67.83	4.36	-63.47	-36.00	-27.47	peak	100	164	P	
2	368.1116	-67.51	4.97	-62.54	-36.00	-26.54	peak	100	95	P	
3	417.6409	-63.59	6.48	-57.11	-36.00	-21.11	peak	100	159	P	
4	564.6386	-66.26	9.24	-57.02	-54.00	-3.02	peak	100	257	P	
5	663.4728	-67.72	11.12	-56.60	-54.00	-2.60	peak	100	321	P	
6 *	760.7033	-67.55	12.64	-54.91	-54.00	-0.91	peak	100	78	P	

Radiated Emission Test Data (25MHz to 30 MHz)	
Tested Mode:	TM1
Test Antenna Polarization:	Vertical
Remark:	



No.	Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	25.2950	-78.29	-14.90	-93.19	-36.00	-57.19	QP	100	289	P	
2	27.8600	-69.00	-14.97	-83.97	-36.00	-47.97	QP	100	42	P	
3 *	29.2350	-65.69	-15.00	-80.69	-36.00	-44.69	QP	100	82	P	

Radiated Emission Test Data (30MHz to 1GHz)	
Tested Mode:	TM1
Test Antenna Polarization:	Vertical
Remark:	



No.	Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	417.6409	-77.75	6.48	-71.27	-36.00	-35.27	peak	100	194	P	
2	490.7445	-77.07	8.15	-68.92	-54.00	-14.92	peak	100	5	P	
3	515.4373	-75.26	8.53	-66.73	-54.00	-12.73	peak	100	147	P	
4	564.6386	-67.66	9.24	-58.42	-54.00	-4.42	peak	100	96	P	
5 *	663.4728	-68.28	11.12	-57.16	-54.00	-3.16	peak	100	248	P	
6	711.6734	-69.54	12.05	-57.49	-54.00	-3.49	peak	100	254	P	

Radiated Spurious Emission Test Data (Above 1GHz)

Frequency	Reading	Factor	Result	Limit	Margin	Polar
MHz	dBm	dB	dBm	dBm	dB	H/V
Lowest Channel (657.1MHz)						
1314.2	-40.06	-2.92	-42.98	-30.00	-12.98	H
1971.3	-48.19	3.39	-44.80	-30.00	-14.80	H
1314.2	-40.63	-2.92	-43.55	-30.00	-13.55	V
1971.3	-48.56	3.39	-45.17	-30.00	-15.17	V
Highest Channel (662.5MHz)						
1325	-39.20	-2.73	-41.93	-30.00	-11.93	H
1987.5	-47.38	3.67	-43.71	-30.00	-13.71	H
1325	-38.61	-2.73	-41.34	-30.00	-11.34	V
1987.5	-51.70	3.67	-48.03	-30.00	-18.03	V

Note 1: this EUT was tested in 3 orthogonal positions and the worst case position data was reported.

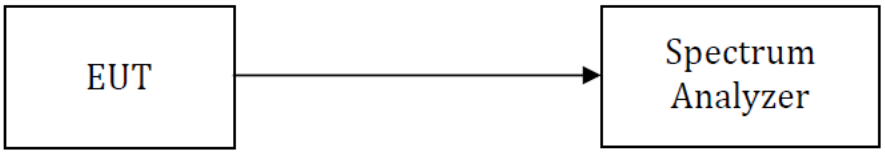
6. Maximum Radiated Power

6.1 Standard and Limit

According to FCC Part 15.236(d), The maximum radiated power shall not exceed the following values.
(1) In the bands allocated and assigned for broadcast television and in the 600 MHz service band: 50mW EIRP
(2) In the 600 MHz gourd band and the 600 MHz duplex gap: 20mW EIRP

6.2 Test Procedure

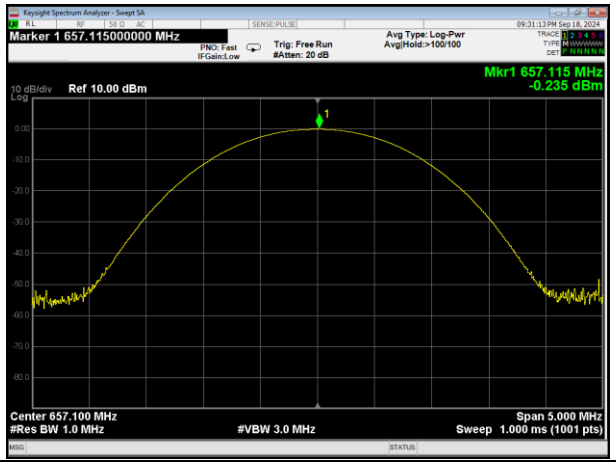
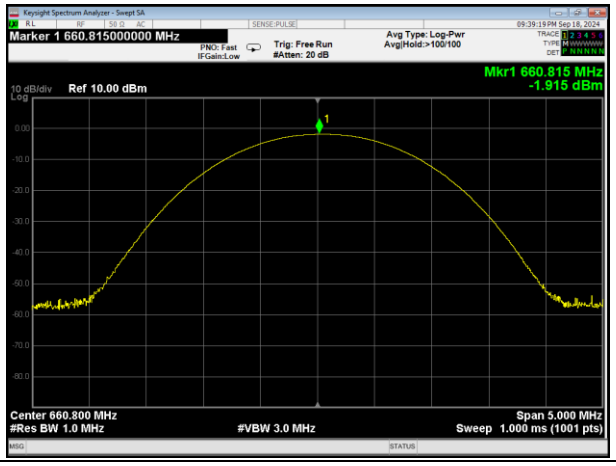
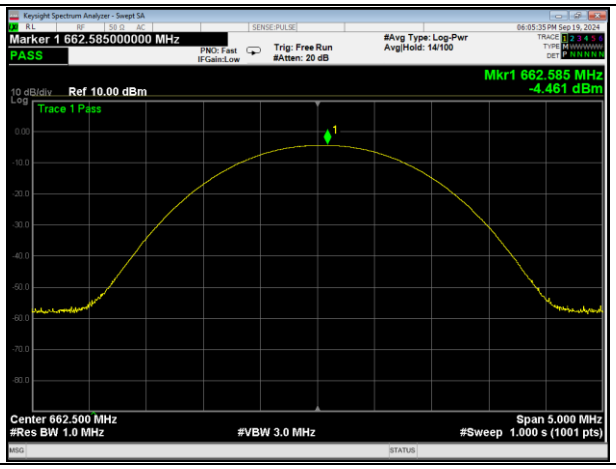
1) Remove the antenna from the EUT and connect to the spectrum analyzer via a low loss RF cable.
2) Set the spectrum analyzer to any one measured frequency within its operating range.
3) Set RBW = 1MHz, VBW = 3MHz, Sweep = Auto, Detector = Peak.
4) Measure the highest amplitude appearing on spectral display and mark the value.
5) Repeat the above procedures until all frequencies measured were complete.



Test Setup Block Diagram

6.3 Test Data and Results

Test Channel MHz	Conducted Output Power (dBm)	Gain (dBi)	ERP (dBm)	Limit (dBm)	Test Result
657.1	-0.235	0	-0.235	13	Pass
660.8	-1.915	0	-1.915	13	Pass
662.5	-4.461	0	-4.461	13	Pass

Test Plots of Conducted Output Power
657.1MHz

660.8MHz

662.5MHz


7. Occupied Bandwidth

7.1 Standard and Limit

According to FCC Part 15.236 (f)(2), One or more adjacent 25kHz segments within the assignable frequencies may be combined to form a channel whose maximum bandwidth shall not exceed 200kHz. The operating bandwidth shall not exceed 200kHz.

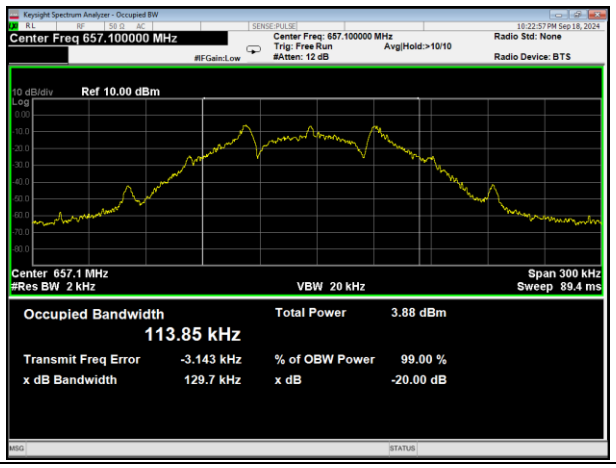
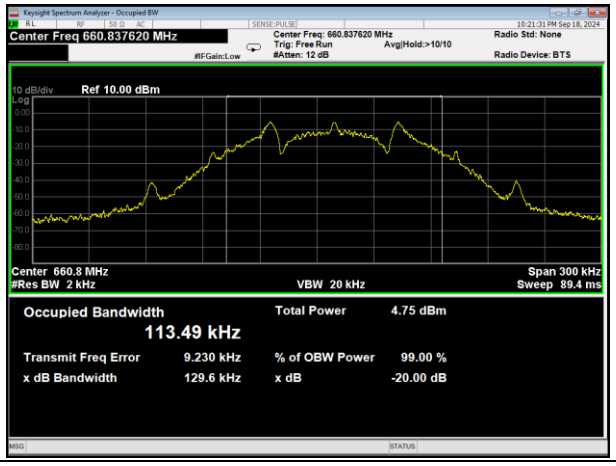
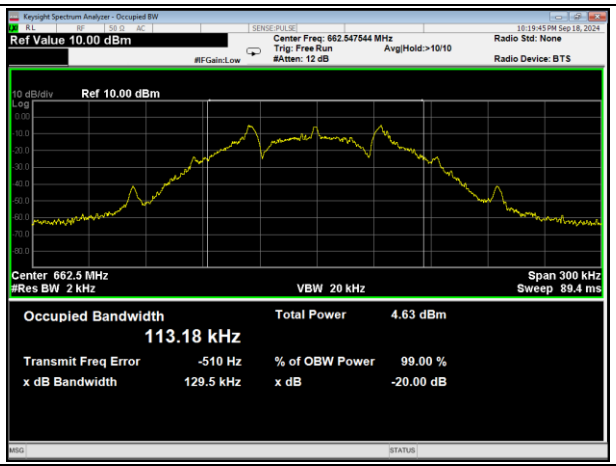
7.2 Test Procedure

According to the ANSI 63.10-2013, section 6.9, the emission bandwidth test method as follows.
1) Remove the antenna from the EUT and connect to the spectrum analyzer via a low loss RF cable.
2) Set the spectrum analyzer to any one measured frequency within its operating range.
3) Set RBW = 2kHz, VBW = 20kHz, Sweep = Auto.
4) Set a reference level on the measuring instrument equal to the highest peak value.
5) Measure the frequency difference of two frequencies that were attenuated 20dB from the reference level. Record the frequency difference as the emission bandwidth.
6) Repeat the above procedures until all frequencies measured were complete.
All the trace to stabilize, use the marker-to-peak function to set the marker to the peak of the emission, use the marker-delta function to measure and record the 20dB down and 99% bandwidth of the emission.

Test Setup Block Diagram

7.3 Test Data and Results

Test Frequency (MHz)	20dB Bandwidth (kHz)	99% Bandwidth (kHz)	Limit (kHz)	Test Result
657.1	129.7	113.85	200	Pass
660.8	129.6	113.49	200	Pass
662.5	129.5	113.18	200	Pass

Test Plots of Occupied Bandwidth
657.1MHz

660.8MHz

662.5MHz


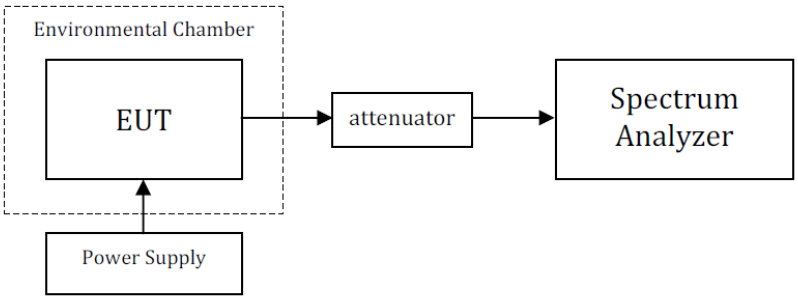
8. Frequency Stability

8.1 Standard and Limit

According to FCC Part 15.236(f)(3), The frequency tolerance of the carrier signal shall be maintained within +/-0.005% of the operating frequency over a temperature variation of -20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage form 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. Battery operated equipment shall be tested using a new battery.

8.2 Test Procedure

Test is conducting under the description of ANSI C63.10-2013 section 6.8.



Test Setup Block Diagram

8.3 Test Data and Results

Test Frequency: 657.1MHz, Limit: 50ppm			
Temperature (°C)	Power Supplied (VDC)	Frequency Error	
		Error (KHz)	Error (ppm)
50	3	3	4.6
40	3	3	4.6
30	3	5	7.6
20	3	4	6.1
10	3	3	4.6
0	3	3	4.6
-10	3	5	7.6
-20	3	5	7.6
20	2.7	2	3.0
	3.3	2	3.0

Test Frequency: 660.8MHz, Limit: 50ppm			
Temperature (°C)	Power Supplied (VDC)	Frequency Error	
		Error (KHz)	Error (ppm)
50	3	2	3.0
40	3	3	4.6
30	3	4	6.1
20	3	3	4.6
10	3	2	3.0
0	3	1	1.5
-10	3	3	4.6
-20	3	3	4.6
20	2.7	1	1.5
	3.3	1	1.5

Test Frequency: 662.5MHz, Limit: 50ppm			
Temperature (°C)	Power Supplied (VDC)	Frequency Error	
		Error (Hz)	Error (ppm)
50	3	4	6.1
40	3	3	4.6
30	3	5	7.6
20	3	3	4.6
10	3	5	7.6
0	3	4	6.1
-10	3	4	6.1
-20	3	5	7.6
20	2.7	2	3.0
	3.3	2	3.0

9. Necessary Bandwidth

9.1 Standard and Limit

According to FCC Part 15.236 (g), Emissions within the band from one megahertz below to one megahertz above the carrier frequency shall comply with the emission mask in section 8.3 of ETSI EN 300422-1 V1.4.2 (2011-08). Emission outside of this band shall comply with the limits specified in section 8.4 of ETSI EN 300422-1 V1.4.2 (2011-08).

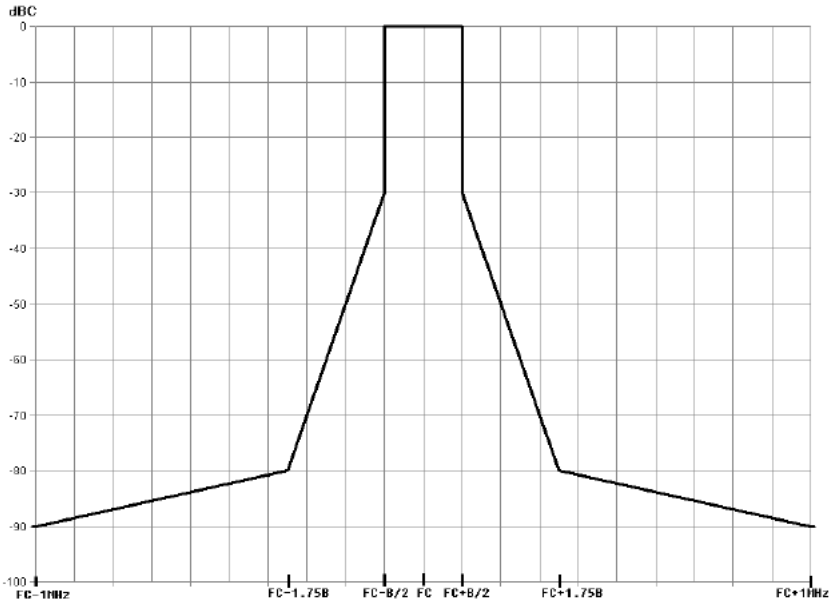


Figure 4: Spectrum mask for digital systems below 1 GHz

For the measurement uncertainty, see clause 10. The -90dBc point shall be ±1 MHz from fc measured with an average detector.

9.2 Test Procedure

The transmitter shall be modulated with the test signals defined in clause 7.1 of EN 300440-1. In any case the mask shall not be exceeded.

- Step 1: Measure the "Carrier Power" with the spectrum analyzer setup:

• Center Frequency = fc
• Span = Zero span
• Detector = RMS
• Trace Mode = Average
• RBW&VBW = 5 x B
• Sweep time ≥ 2 s

- Step 2: Measure the "Maximum Relative Level (dBc) at Specified Carrier Offsets" with the following spectrum analyzer setup:

• Center Frequency = fc
• Span ≥ 5 x B
• Detector = RMS
• Trace Mode = Peak Hold
• RBW&VBW = 1 kHz
• Sweep time ≥ 2 s

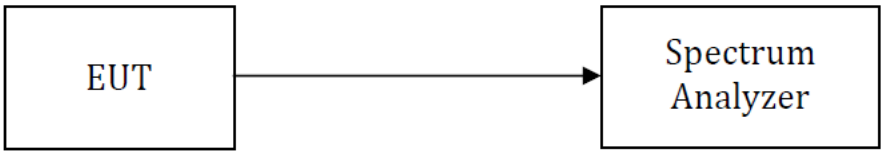
Limits: Mask shall not be exceeded.

- Step 3: Measure the "transmitter wide band noise floor":

The measurement of transmitter broad band noise floor shall be carried out according to clause 8.3.1.1.

• Start Frequency = fc + 1,75B and fc - 1 MHz below 1 GHz,
Start Frequency = fc + B and fc - 1 MHz above 1 GHz.
• Stop Frequency = fc + 1 MHz and fc - 1,75 B below 1 GHz,
Stop Frequency = fc + 1 MHz and fc -B above 1 GHz.
• Detector = RMS
• Trace Mode = Average
• RBW&VBW = 1 kHz
• Sweep time ≥ 2 s

Limits: Mask shall not be exceeded.

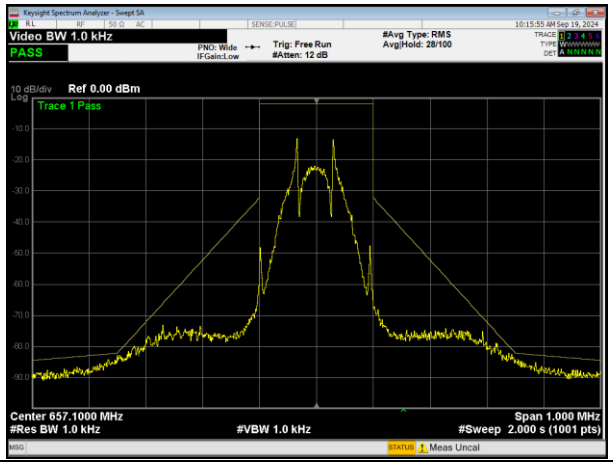


Test Setup Block Diagram

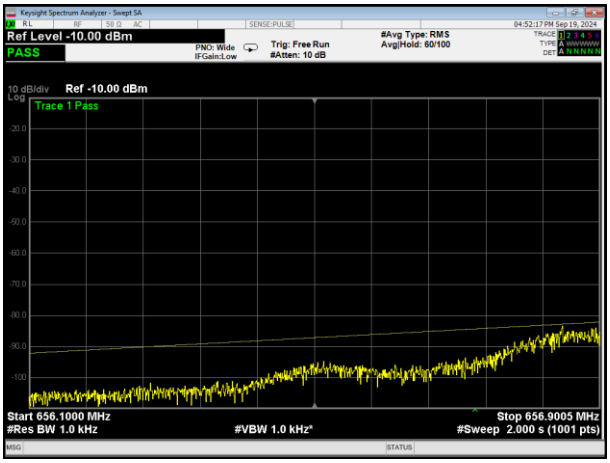
9.3 Test Data and Results

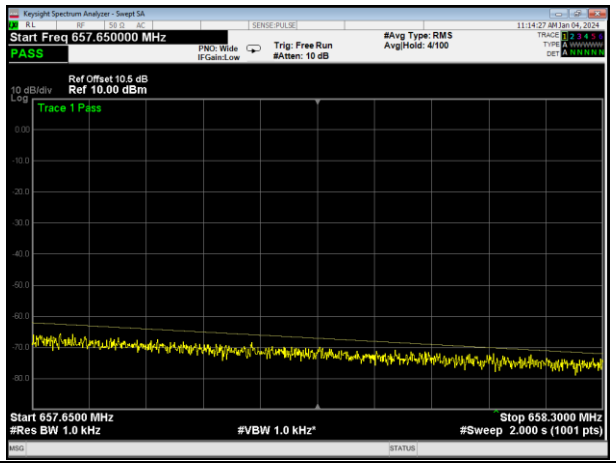
Test Frequency: 657.1MHz

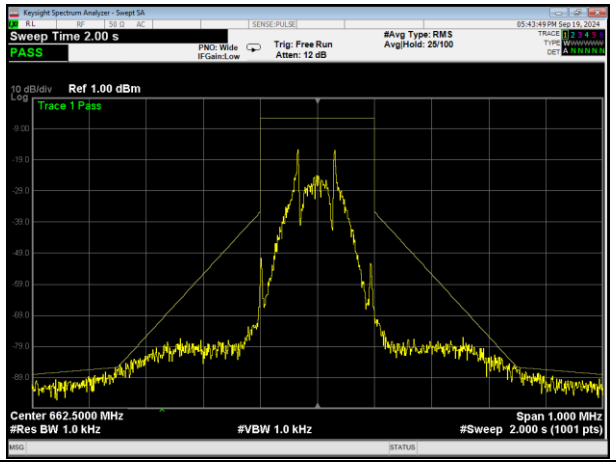
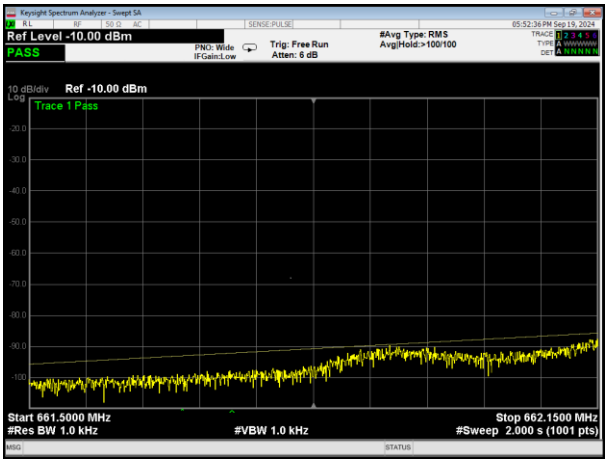
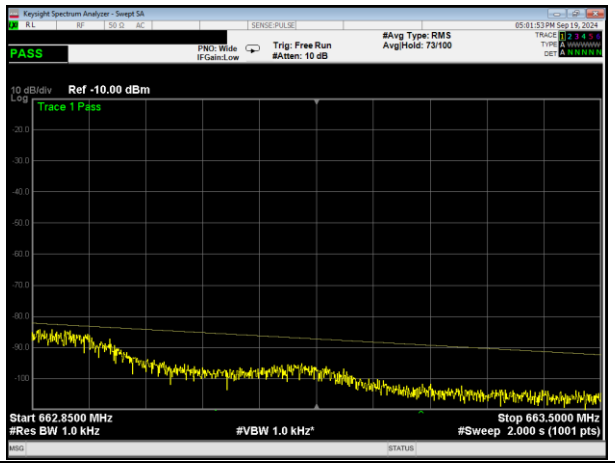
Mask



-90dBc Point





Test Frequency: 662.5MHz
Mask 
-90dBc Point    

******* END OF REPORT *******