FCC RADIO TEST REPORT

FCC ID: 2A695-WM1-2

Product： Wireless Microphone

Trade Name： KKX

Model Name： WM1-2

Family Model： N/A

Report No.： S22060202201002

Prepared for

Huizhou Shunhengtairun Trade Co., Ltd

Building2, Junkang garden, Lengshuikeng, Huinanavenue, Huichengdistrict, Huizhoucity, Guangdong, China

Prepared by

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TEST RESULT CERTIFICATION

Applicant's name ..... Huizhou Shunhengtairun Trade Co., Ltd

Address ..... Building2, Junkang garden, Lengshuikeng, Huinanavenue, Huichengdistrict, Huizhoucity, Guangdong, China

Manufacture's Name... Huizhou Shunhengtairun Trade Co., Ltd

Address ..... Building2, Junkang garden, Lengshuikeng, Huinanavenue, Huichengdistrict, Huizhoucity, Guangdong, China

Product description

Product name..... Wireless Microphone

Model and/or type reference WM1-2

Family Model..... N/A

Standards ..... FCC CFR47 Part 74

Test procedure ..... TIA-603-E: 2016 and KDB 206256 D01 Wireless Microphone Certification v02

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

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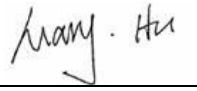
Date of Test.....:

Date (s) of performance of tests.....: 02 Jan. 2020 ~14 Jul. 2022

Date of Issue.....: 14 Jul. 2022

Test Result.....: **Pass**

Testing Engineer **:** 

(Mary Hu)

Authorized Signatory **:** 

(Alex Li)

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1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC CFR47 Part 74			
Standard Section	Test Item	Judgment	Remark
74.861(e)(1)(ii)	RF Output Power	PASS	
2.1047(a)	Modulation Characteristics	N/A	
2.1049(c)(1)	Occupied Bandwidth	PASS	
2.1053 & 74.861(e)(6)	Radiated Emissions	PASS	
2.1051	Spurious emissions at antenna terminals	PASS	
2.1055(a)(1)	Frequencies Stability	PASS	
74.861(e) (7)	Necessary bandwidth	PASS	

NOTE:

(1)" N/A" denotes test is not applicable in this Test Report

Requirement for Radio Equipment on Certification:

1. RF output Power

For transmitters, the power output shall be measured at the RF output terminals.

2. Modulation Characteristics

For Voice Modulated Communication Equipment, a curve or equivalent data showing the frequency response of the audio modulating circuit over a range of 100 to 5000Hz shall be submitted.

3. Occupied Bandwidth

For radiotelephone transmitter, other than single sideband or indenpent sideband transmitter, where modulated by a 2.5KHz tone at an input level 16 dB greater than that necessary to produce 50 percent modulation.

4. Spurious Emission at Antenna Terminals

The radio frequency voltage or power generated within the equipment and appearing on a spurious Frequency shall be checked at the equipment output terminal when properly loaded with a suitable artificial antenna.

5. Field Strength of Spurious Emission

Measurements shall be made to detect spurious emission that may be radiated directly from the cabinet, control circuits, power leads, or intermediate ciruit elements under normal condition of installation and operation.

6. Frequencies Tolerance

The frequency stability shall be measured with variation of ambient temperature.
The frequency stability shall be measured with variation of primary supply voltage.

1.1FACILITIES AND ACCREDITATIONS

All measurement facilities used to collect the measurement data are located at

1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street Bao'an District, Shenzhen 518126 P.R. China

The sites are constructed in conformance with the requirements of ANSI C63.7, TIA-603-E: 2016 and CISPR Publication 22.

Site Description		
CNAS-Lab.	:	The Laboratory has been assessed and proved to be in compliance with CNAS-CL01:2006 (identical to ISO/IEC 17025:2005) The Certificate Registration Number is L5516.
IC-Registration		The Certificate Registration Number is 9270A-1.
FCC- Accredited		Test Firm Registration Number: 463705. Designation Number: CN1184
A2LA-Lab.		The Certificate Registration Number is 4298.01 This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 General requirements for the competence of testing and calibration laboratories. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated 8 January 2009).
Name of Firm	:	Shenzhen NTEK Testing Technology Co., Ltd.
Site Location	:	1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen 518126 P.R. China.

1.1 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement **y** ± **U**，where expended uncertainty **U** is based on a standard uncertainty multiplied by a coverage factor of **k=2**，providing a level of confidence of approximately **95** %。

No.	Item	Uncertainty
1	Conducted Emission Test	±1.38dB
2	RF power,conducted	±0.16dB
3	Spurious emissions,conducted	±0.21dB
4	All emissions,radiated(<1G)	±4.68dB
5	All emissions,radiated(>1G)	±4.89dB
6	Temperature	±0.5°C
7	Humidity	±2%

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	Wireless Microphone
Trade Name	KKX
Model Name	WM1-2
Family Model	N/A
Model Difference	N/A
Product Description	The EUT is a Wireless Microphone Operation Frequency: 535 MHz~547MHz Modulation Type: 1/4π DQPSK Number Of Channel 16CH(Please see Note 2.) Antenna Designation: Please see Note 3. Antenna Gain (dBi) -2.31dBi
Channel List	Please refer to the Note 2.
Ratings	DC 5V from type c port or DC 3.7V from battery
Adapter	N/A
Battery	DC 3.7V 540mAh
Connecting I/O Port(s)	Please refer to the User's Manual
Hardware version	TX_VER:3
Software version	TX_0E9D

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

2.

Frequency list:

Channel	Frequency (MHz)
1	535
2	535.8
3	536.6
……	……
……	……
……	……
……	……
……	……
……	……
14	545.4
15	546.2
16	547

Note: fc=535MHz+(k-1)×0.8MHz k=1 to 16

3.

Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
A	N/A	N/A	Built-in UHF antenna	N/A	-2.31	Antenna

2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

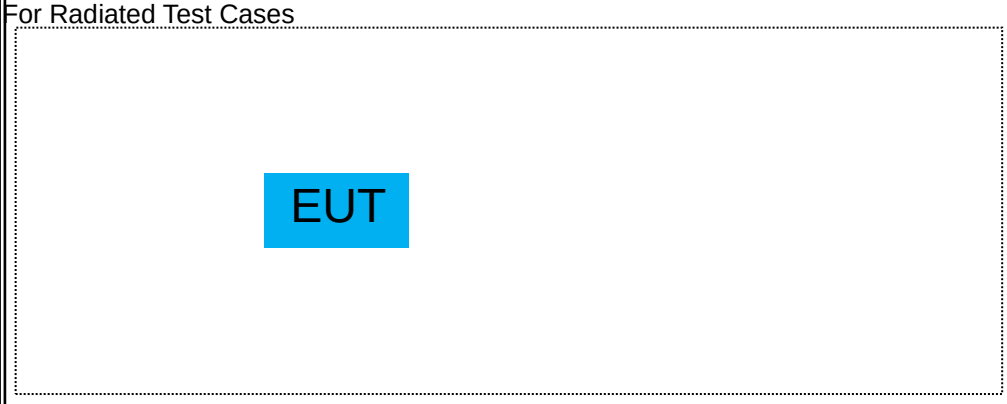
Pretest Mode	Description
Mode 1	TX(CH01/ CH08/ CH16)

For Radiated Emission	
Final Test Mode	Description
Mode 1	TX(CH01/ CH08/ CH16)

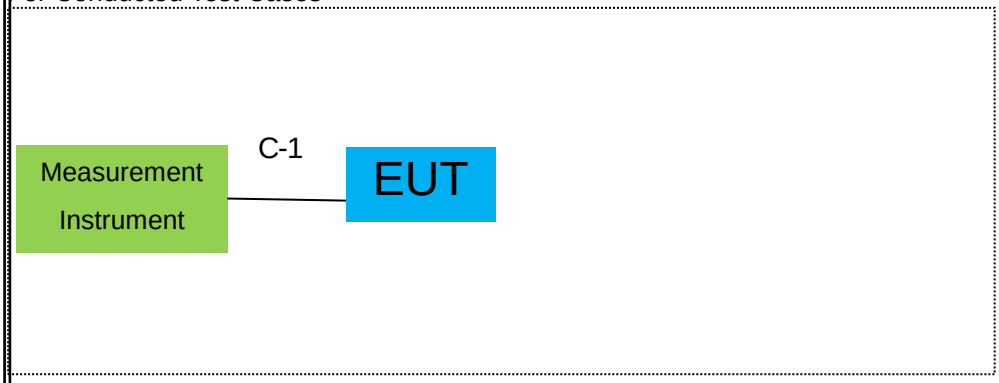
For Conduction Emission	
Final Test Mode	Description
Mode 1	TX(CH01/ CH08/ CH16)

2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

For Radiated Test Cases



For Conducted Test Cases



Note: EUT built-in battery-powered, the battery is fully-charged.

2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Brand	Model/Type No.	Series No.	Note
E-1	Wireless Microphone	KKX	WM1-2	N/A	EUT

Item	Cable Type	Shielded Type	Ferrite Core	Length
C-1	RF Cable	YES	NO	0.1m

Note:

(1) The support equipment was authorized by Declaration of Confirmation.
(2) For detachable type I/O cable should be specified the length in cm in『Length』column.

2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation Test equipment

	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Spectrum Analyzer	Aglient	E4407B	MY45108040	2022.03.30	2023.03.29	1 year
2	Spectrum Analyzer	Agilent	N9020A	MY49100060	2022.06.16	2023.06.15	1 year
3	Spectrum Analyzer	R&S	FSV40	101417	2022.06.16	2023.06.15	1 year
4	Test Receiver	R&S	ESPI7	101318	2022.04.06	2023.04.05	1 year
5	Bilog Antenna	TESEQ	CBL6111D	31216	2022.03.30	2023.03.29	1 year
6	50Ω Coaxial Switch	Anritsu	MP59B	6200983705	2020.05.11	2023.05.10	3 year
7	Horn Antenna	EM	EM-AH-10180	2011071402	2022.03.31	2023.03.30	1 year
8	Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	803	2021.11.07	2022.11.06	1 year
9	Amplifier	EMC	EMC051835SE	980246	2022.06.17	2023.06.16	1 year
10	Active Loop Antenna	SCHWARZBECK	FMZB 1519 B	055	2021.11.07	2022.11.06	1 year
11	Power Meter	DARE	RPR3006W	15I00041SNO84	2022.06.16	2023.06.15	1 year
12	Test Cable (9KHz-30MHz)	N/A	R-01	N/A	2022.06.17	2025.06.16	3 year
13	Test Cable (30MHz-1GHz)	N/A	R-02	N/A	2022.06.17	2025.06.16	3 year
14	High Test Cable(1G-40GHz)	N/A	R-03	N/A	2022.06.17	2025.06.16	3 year
15	High Test Cable(1G-40GHz)	N/A	R-04	N/A	2022.06.17	2025.06.16	3 year
16	Filter	TRILTHIC	2400MHz	29	2022.03.30	2023.03.29	1 year
17	temporary antenna connector (Note)	NTS	R001	N/A	N/A	N/A	N/A

Conduction Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Test Receiver	R&S	ESCI	101160	2022.04.06	2023.04.05	1 year
2	LISN	R&S	ENV216	101313	2022.04.06	2023.04.05	1 year
3	LISN	EMCO	3816/2	00042990	2022.04.06	2023.04.05	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2020.05.11	2023.05.10	3 year
5	Passive Voltage Probe	R&S	ESH2-Z3	100196	2020.05.11	2023.05.10	1 year
6	Absorbing clamp	R&S	MOS-21	100423	2021.08.04	2022.08.03	1 year

3. EMISSION TEST

3.1 RADIATED EMISSION MEASUREMENT

3.1.1 Applicable standard

According to FCC §74.861 (e) (6) (iii) and ANSI/TIA-603-E-2016 Section 2.2.12

3.1.2 Conformance limit

On any frequency removed from the operating frequency by more than 250 percent of the authorized bandwidth: at least 43 + 10log (mean output power in watts) dB.

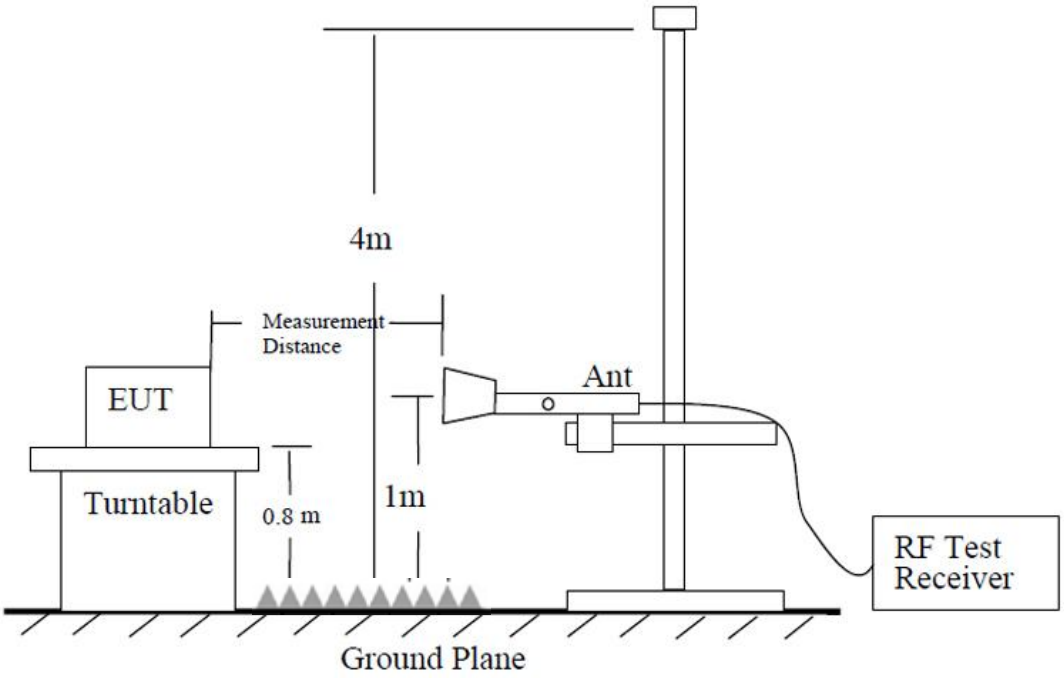
3.1.3 Measuring instruments

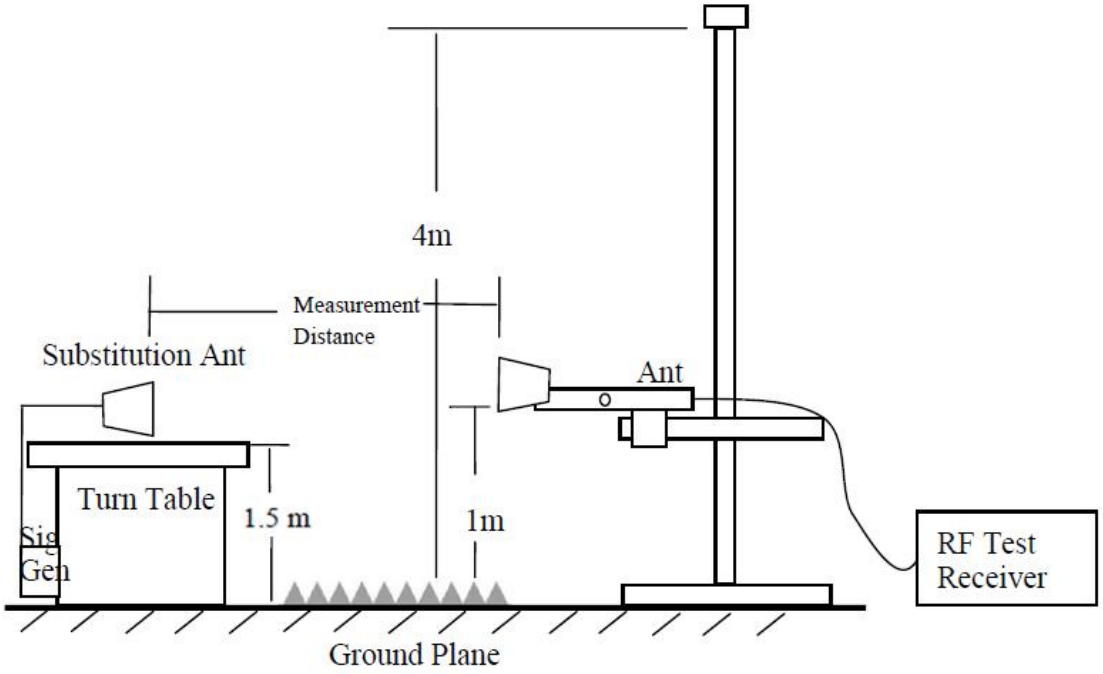
The Measuring equipment is listed in the section 6.3 of this test report.

3.1.4 Test configuration

According to the ANSI/TIA-603-E-2016 test method, The Receiver or Spectrum was scanned from 9 KHz to the 10th harmonic of the highest frequency generated within the equipment, which is the transmitted carrier that can be as high as 1910 MHz The resolution bandwidth is set as outlined in Part FCC §74.861 (e) (6) (iii).

3.1.5 Test setup





3.1.6 Test procedure

1. EUT was placed on a 0.8 meter(For frequency above 1G, EUT should be placed on 1.5m) high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The height of receiving antenna is 1.50 meter. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all transmit frequencies in three channels (High, Middle, Low) were measured with peak detector.
2. A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.
3. The EUT is then put into continuously transmitting mode at its maximum power level during the test.Set Test Receiver or Spectrum RBW=1MHz,VBW=3MHz, And the maximum value of the receiver should be recorded as (P_r).
4. The EUT shall be replaced by a substitution antenna. In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (SG Level) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded (P_r). The power of signal source (SG Level) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
5. A amplifier should be connected to the Signal Source output port. And the cable should be connect between the Amplifier and the Substitution Antenna. The cable loss (Cable Loss) ,the Substitution Antenna Gain should be recorded after test.

The measurement results are obtained as described below:

Power(EIRP)= SG Level- Cable Loss+ Antenna Gain

6. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power.

7. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP -2.15dBi.

3.1.7 Test results (between 9KHz – 30MHz)

EUT：	Wireless Microphone	Model Name. ：	WM1-2
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	N/A
Test Mode ：	N/A	Polarization :	--

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	N/A
--	--	--	--	N/A

NOTE:

1. Emission level in dBuV/m=20 log (uV/m)
2. Measurement was performed at an antenna to the closed point of EUT distance of meters.
3. For Frequency 9kHz~30MHz:
   Distance extrapolation factor =40log(Specific distance/ test distance)(dB);
   Limit line=Specific limits(dBuV) + distance extrapolation factor.
   For Frequency above 30MHz:
   Distance extrapolation factor =20log(Specific distance/ test distance)(dB);

3.1.8 Test results (between 30MHz– 1GHz)

EUT：	Wireless Microphone	Model Name ：	WM1-2
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	TX-CH 08		

Polar (H/V)	Frequency (MHz)	Power (dBm)	Cable loss (dB)	Antenna Factor (dB)	Absolute Level (dBm)	Limits (dBm)	Margin (dB)	Remark
V	94.4815	-60.87	0.24	28.67	-31.96	-13	-18.96	peak
V	170.124	-55.91	0.34	22.42	-33.15	-13	-20.15	peak
V	233.829	-55.81	0.37	24.47	-30.97	-13	-17.97	peak
V	298.041	-57.273	0.42	22.52	-34.333	-13	-21.333	peak
V	446.474	-67.84	0.46	29.29	-38.09	-13	-25.09	peak
V	758.793	-72.13	0.48	34.58	-37.07	-13	-24.07	peak
H	106.294	-59.51	0.26	26.55	-32.7	-13	-19.7	peak
H	168.303	-58.59	0.32	18.8	-39.47	-13	-26.47	peak
H	257.385	-61.2	0.35	24.5	-36.35	-13	-23.35	peak
H	311.052	-56.18	0.44	23.15	-32.59	-13	-19.59	peak
H	429.134	-64.59	0.45	27.86	-36.28	-13	-23.28	peak
H	580.323	-71.95	0.46	30.79	-40.7	-13	-27.7	peak

Remark:
Absolute Level= Power - Cable Loss+ Antenna Factor
Margin= Absolute Level - Limit

Note: TX-CH 08 is the worst case in the radiated spurious emission test with a frequency of 30MHz~1GHz.

3.1.9 Test results (above 1000 MHz)

EUT：	Wireless Microphone	Model Name ：	WM1-2
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	TX		

Polar (H/V)	Frequency (MHz)	Power (dBm)	Cable loss (dB)	Antenna Factor (dB)	Absolute Level (dBm)	Limits (dBm)	Margin (dB)	Detector Type
535								
V	1070.000	-13.02	1.24	-14.29	-26.07	-13	-13.07	peak
V	1605.000	-15.33	1.45	-12.58	-26.46	-13	-13.46	peak
H	1070.000	-18.44	1.24	-14.29	-31.49	-13	-18.49	peak
H	1605.000	-19.02	1.45	-12.58	-30.15	-13	-17.15	peak
540.6								
V	1081.200	-12.99	1.25	-14.66	-26.4	-13	-13.4	peak
V	1621.800	-12.23	1.46	-13.65	-24.42	-13	-11.42	peak
H	1081.200	-16.32	1.25	-14.66	-29.73	-13	-16.73	peak
H	1621.800	-14.52	1.46	-13.65	-26.71	-13	-13.71	peak
547								
V	1094.000	-18.09	1.27	-14.93	-31.75	-13	-18.75	peak
V	1641.000	-16.19	1.49	-11.2	-25.9	-13	-12.9	peak
H	1094.000	-13.11	1.27	-14.93	-26.77	-13	-13.77	peak
H	1641.000	-12.76	1.49	-11.2	-22.47	-13	-9.47	peak

Remark:
Absolute Level= Power + Cable Loss+ Antenna Factor
Margin= Absolute Level - Limit

4. RF OUTPUT POWER

4.1 Conducted Output Power

4.1.1 APPLIED PROCEDURES / LIMIT

Test requirement: FCC CFR47 Part 74 Section 74.861(e)(1)(ii)

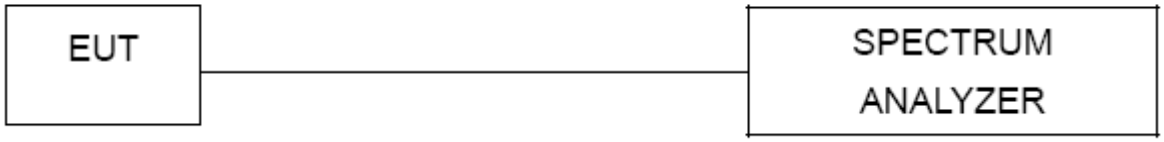
Limit: According to Part 74.861(e)(1)(ii), the output power shall not exceed 250mW (23.98 dBm).

4.1.2 TEST PROCEDURE

The maximum peak output power was measured with a spectrum analyzer connected to the antenna terminal (conducted measurement) while EUT was operating in normal situation.

Detector:	Peak (worst case)
Sweep time:	Auto /
Resolution bandwidth:	> emission bandwidth
Video bandwidth:	> resolution bandwidth
Span:	> 2 times emissions bandwidth
Trace mode:	Max. hold
EUT configuration:	Peak:
	Unmodulated carrier

4.1.3 TEST SETUP



4.1.4 EUT OPERATION CONDITIONS

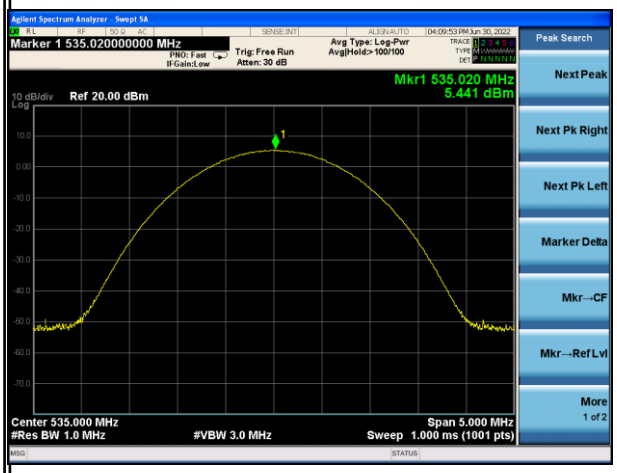
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

4.1.5 TEST RESULTS

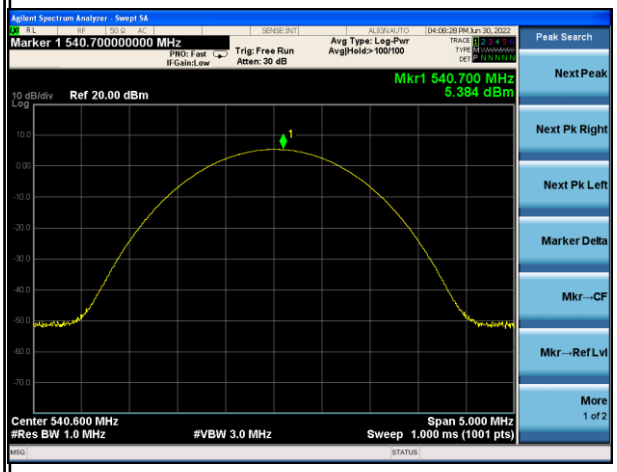
EUT：	Wireless Microphone	Model Name ：	WM1-2
Temperature：	25 ℃	Relative Humidity：	56%
Pressure：	1015 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	TX		

Test Channel	Frequency	Conducted Output Power (PK)	Cable loss	Maximum Conducted Output Power(PK)	LIMIT
	(MHz)	(dBm)	(dBm)	(dBm)	dBm
CH 01	535	5.441	1	6.441	23.98
CH 08	540.6	5.384	1	6.384	23.98
CH 16	547	5.222	1	6.222	23.98

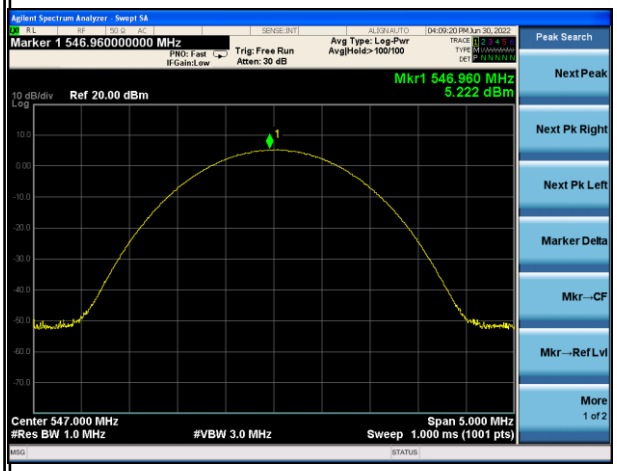
TX CH01



TX CH08



TX CH16



5. MODULATION CHARACTERISTICS

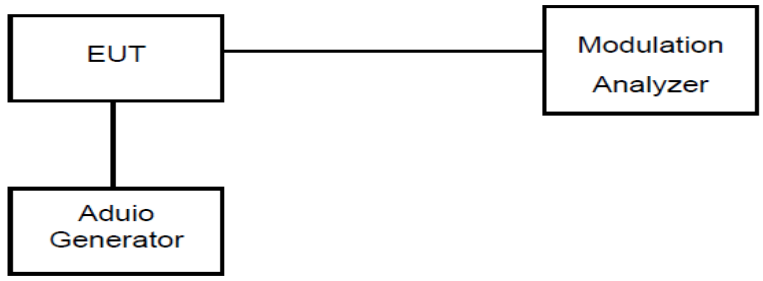
5.1 APPLIED PROCEDURES / LIMIT

Test requirement: FCC CFR47 Part 2 Section 2.1047(a)
Test method: According to ANSI/TIA-603-E 2016 section 2.2.3,
Requirement: According to Part 2.1047(a), for Voice Modulated Communication Equipment, the frequency response of the audio modulating circuit over a range of 100Hz to 5000Hz shall be measured.

5.2 TEST PROCEDURE

(a) Test Configuration
(b) Audio Frequency Response:
1) Apply a 1000 Hz tone and adjust the audio frequency generator to produce 20% of the rated system deviation.
2) Set the test receiver to measure rms deviation and record the deviation reading as DEVREF .
3) Set the audio frequency generator to the desired test frequency between 100 Hz and 5000 Hz.
4) Record the test receiver deviation reading as DEVFREQ .
5) Calculate the audio frequency response at the present frequency as:
audio frequency response =20lg(DEVFREQ/ DEVREF)
6) Repeat steps 4) through5) for all the desired test frequencies.
(c) Modulation Limiting:
1) Apply a 1000 Hz modulating signal to the transmitter from the audio frequency generator, and adjust the level to obtain 60% of full rated system deviation.
2) Measure both the instantaneous and steady-state deviation at and after the time of increasing the audio input level.
3) With the level from the audio frequency generator held constant at the level.
obtained in step e), slowly vary the audio frequency from 300 Hz to 3000Hz and observe the steady-state deviation. Record the maximum deviation.
4) Set the test receiver to measure peak negative deviation and repeat steps 1) through 3).
5) The values recorded in steps 3) and 4) are the modulation limiting.

TEST SETUP



5.3 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

5.4 TEST RESULTS

EUT：	Wireless Microphone	Model Name ：	WM1-2
Temperature：	25 ℃	Relative Humidity：	56%
Pressure：	1012 hPa	Test Voltage ：	N/A
Test Mode ：	N/A		

Note: Not applicable

6. OCCUPIED BANDWIDTH OF EMISSION

6.1 APPLIED PROCEDURES / LIMIT

Test requirement: FCC CFR47 Part 2 Section 2.1049©(1)

Limit: According to FCC 74.861 (e)(5), the frequency emission bandwidth shall not exceed 200 kHz.

Occupied bandwidth 99%. Other than single sideband or independent sideband transmitters - when modulated by a 2500 Hz tone at an input level 16 dB greater than that necessary to produce 50 percent modulation.

The input level shall be established at the frequency of maximum response of the audio modulating circuit.

6.2 TEST PROCEDURE

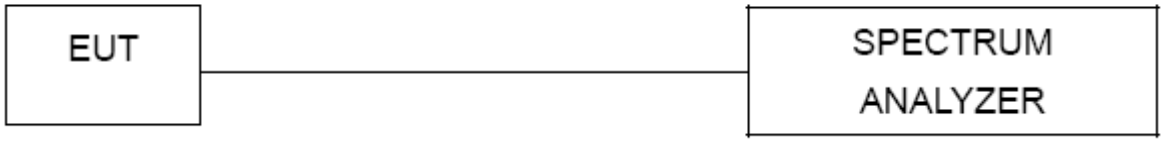
1. Check the calibration of the measuring instrument using either an internal calibrator or a knownsignal from an external generator.
2. Turn on the EUT and set it to any one convenient frequency within its operating range.

Detector:	Peak
Sweep time:	Auto /
Resolution bandwidth:	1 % to 5 % of the occupied bandwidth
Video bandwidth:	3 x resolution bandwidth
Span:	> 2 times emissions bandwidth
Analyzer function:	99% power occupied bandwidth function
Trace mode:	Max. hold
EUT configuration:	Modulated signal with max. frequency deviation

6.3 DEVIATION FROM STANDARD

No deviation.

6.4 TEST SETUP



6.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

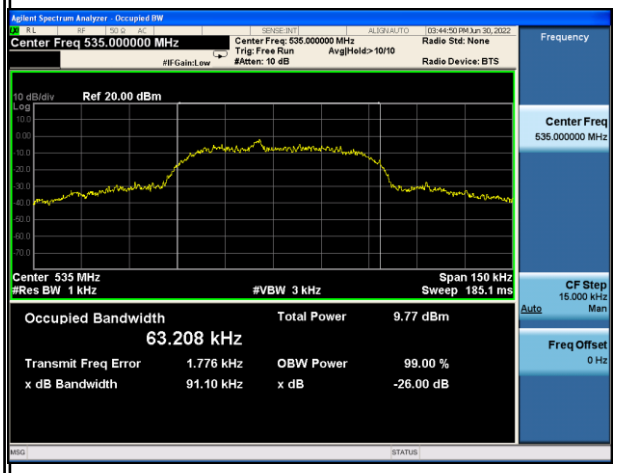
6.6 TEST RESULT

EUT：	Wireless Microphone	Model Name ：	WM1-2
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1012 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	TX		

Frequency	99% Bandwidth (2.5kHz tone)	Limit (kHz)	Result
535 MHz	63.208	200	PASS
540.6 MHz	63.528	200	PASS
547 MHz	63.387	200	PASS

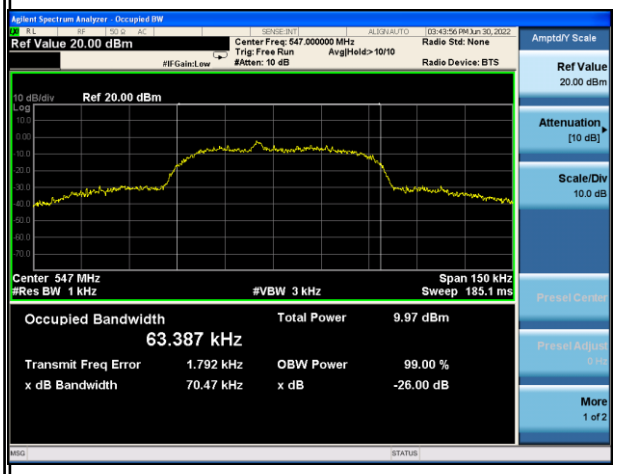
Test plot for 2.5 kHz

TX CH01



TX CH08

TX CH16



7. SPURIOUS EMISSIONS AT ANTENNA TERMINALS

Test requirement: FCC CFR47 Part 2 Section 2.1053

Test method: According to ANSI/TIA-603-E: 2016 section 2.2.13,

Limit: According to Part 74.861 (e)(6), the mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the following schedule:

(i) on any frequency removed from the operating frequency by more than 50 percent up to and including 100 percent of the authorized bandwidth: at least 25 dB.

(ii) on any frequency removed from the operating frequency by more than 100 percent up to and including 250 percent of the authorized bandwidth: at least 35 dB.

(iii) on any frequency removed from the operating frequency by more than 250 percent up to and the authorized bandwidth shall be attenuated below the un-modulated carrier by at least 43 + 10 Log (output power in watts)dB.

7.1 TEST PROCEDURE

1. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable.Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
2. Set the SA on Max-Hold Mode, and then keep the EUT in transmitting mode. Record all the signals from each channel until each one has been recorded.
3. Set the SA on View mode and then plot the result on SA screen.
4. Repeat above procedures until all frequencies measured were complete.

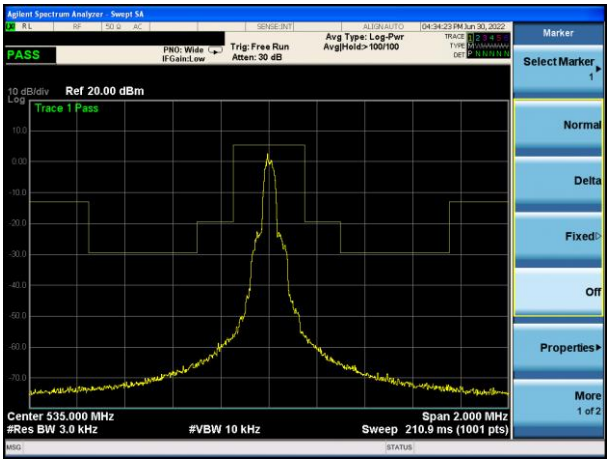
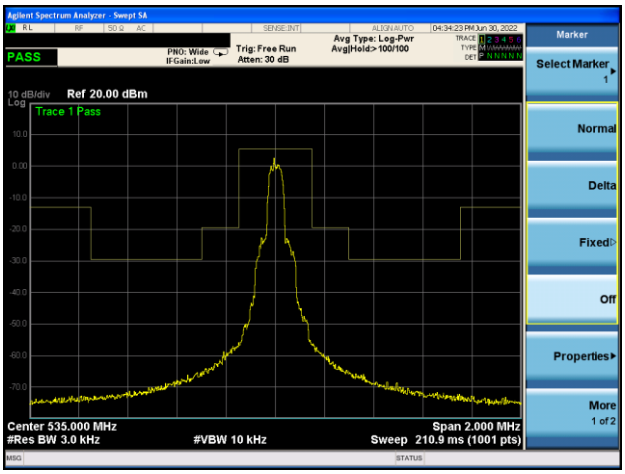
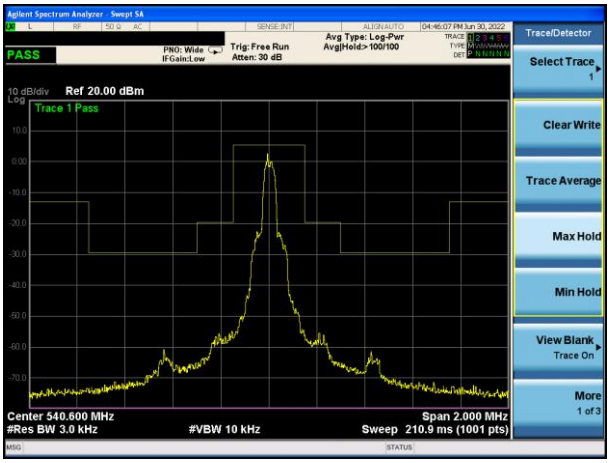
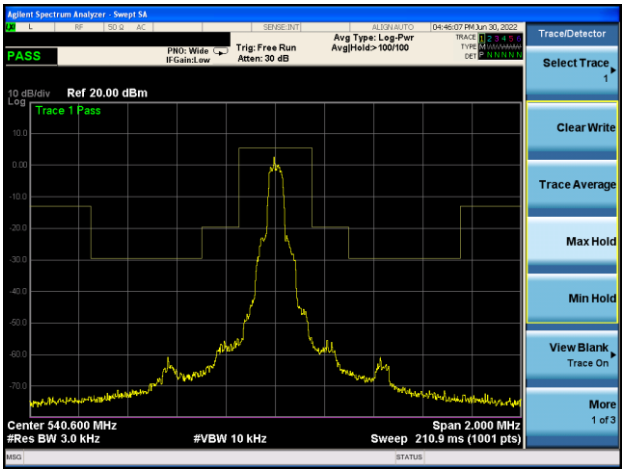
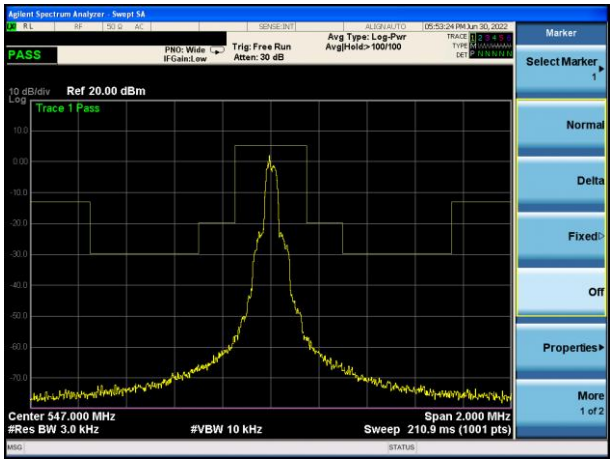
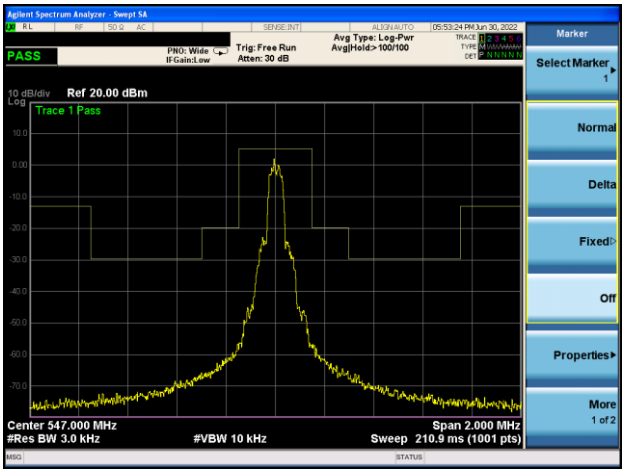
Detector:	Peak	
Sweep time:	Auto /	
Resolution bandwidth:	25 dBc and 35 dB-ccriteria:	1% of the authorized bandwidth
	$55+10\log_{10}(P_{MEAN}$ inWatts) dB - criteria	30 kHz
	$43+10\log_{10}(P_{MEAN}$ inWatts) dB - criteria	120 kHz /1 MHz
Video bandwidth:	3 x resolution bandwidth	
Span:	> 2 times emissions bandwidth	
Trace mode:	Max. hold	
EUT configuration:	Modulated signal with max. frequency deviation	

7.2 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

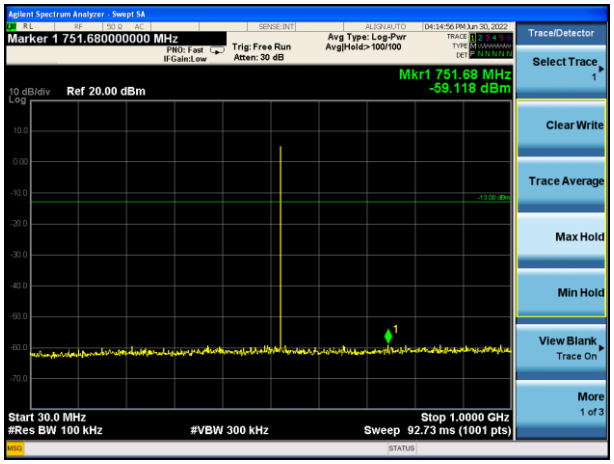
7.3 TEST RESULTS

EUT：	Wireless Microphone	Model Name ：	WM1-2
Temperature：	25 ℃	Relative Humidity：	56%
Pressure：	1012 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	TX		

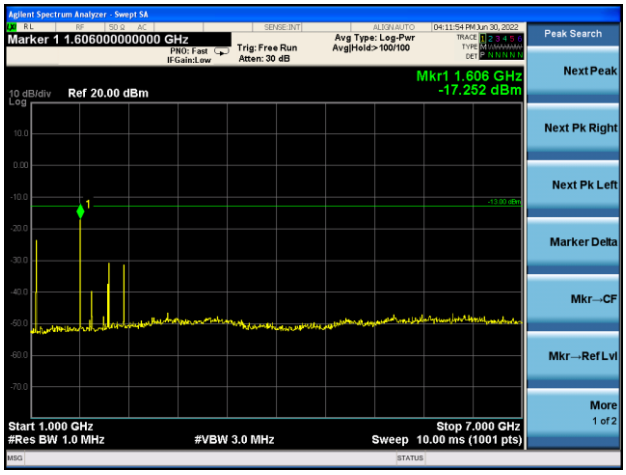
Test plot for 1 kHz	Test plot for 2.5 kHz
TX CH01	**TX CH01**
	
TX CH08	**TX CH08**
	
TX CH16	**TX CH16**
	

Conducted Spurious Emissions

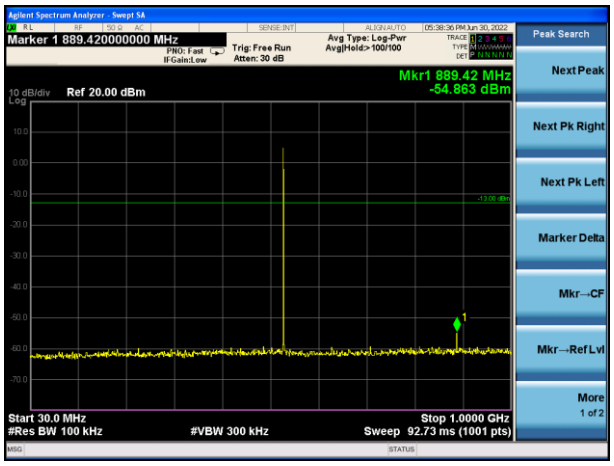
TX CH01(30MHz-1GHz)



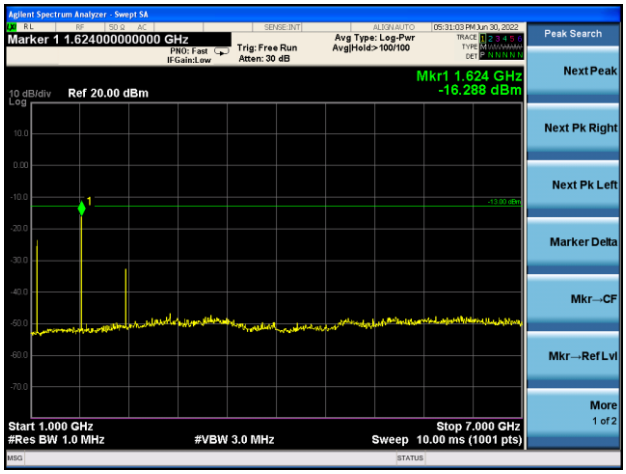
TX CH01(1GHz-7GHz)



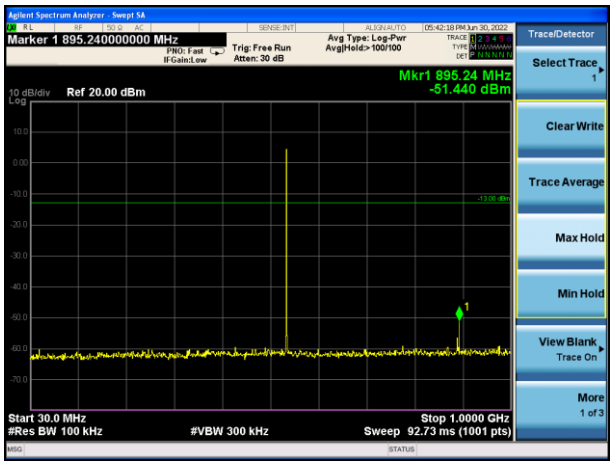
TX CH08(30MHz-1GHz)



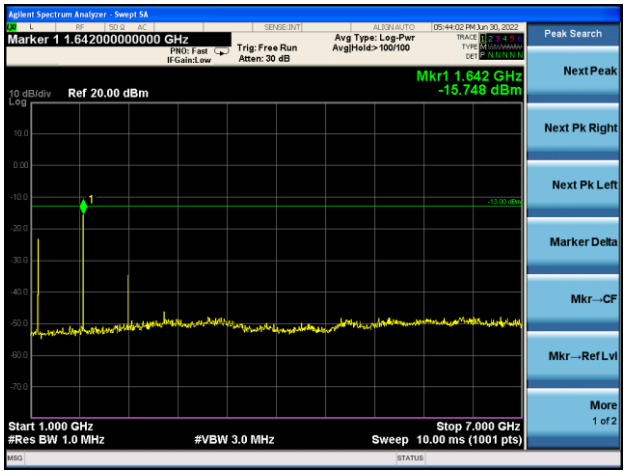
TX CH08(1GHz-7GHz)



TX CH16(30MHz-1GHz)



TX CH16(1GHz-7GHz)

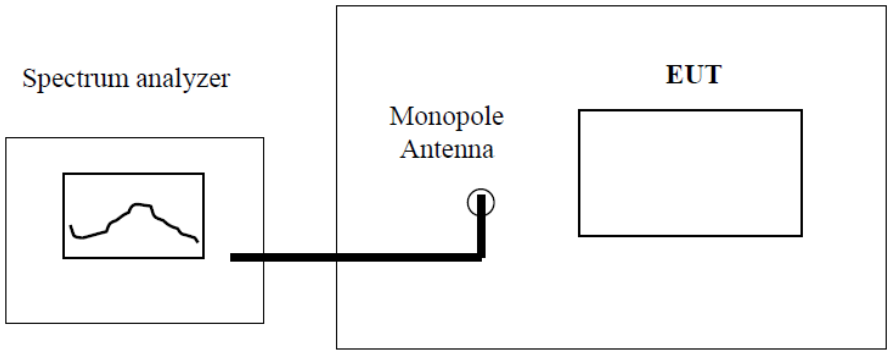


8. FREQUENCY STABILITY

8.1 STANDARD REQUIREMENT

Test requirement: FCC CFR47 Part 2 Section 2.1055(a)(a)
Test method: ANSI/TIA-603-E: 2016 section 2.2.2
Limit: According to FCC 74.86(e)(4), the frequency tolerance of the transmitter shall be 0.005 percent.

8.2 TEST CONFIGURATION



8.3 TEST PROCEDURE

A) Frequency stability versus input voltage

1 .An external variable DC power supply was connected to the battery terminals of the equipment under test.
2.For hand carried , battery powered equipment primary supply voltage was reduced to the battery operating end point as specified by the manufacturer. The output frequency was recorded for each battery voltage.

Detector:	Peak
Sweep time:	Auto /
Resolution bandwidth:	1 Hz / 10 Hz / 100 Hz
Video bandwidth:	3 x resolution bandwidth
Span:	wide enough to follow the frequency drift
Trace mode:	clear/write/view
EUT configuration:	CW signal or MC with measurement method description

B) Frequency stability versus environmental temperature

1. Setup the configuration per figure 1 for frequencies measured at an environmental chamber, Install new batteries in the EUT.
2. Turn on EUT and set SA center frequency to the EUT operation frequency, then set SA RBW to 30kHz, VBW to 100kHz and frequency span to 500 kHz. Record this frequency to be a reference.
3. Set the temperature of chamber to 50ºC. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize. While maintaining a constant temperature inside the chamber, turn the EUT on and measure the EUT operating frequency.
4. Repeat step 2 with a 10ºC decreased per stage until the lowest temperature -30ºC is measured, record all measurement frequencies.

8.4 TEST RESULT

a) Frequency stability versus input voltage

Power Supply	Reference Frequency (MHz)	Environment Temperature (ºC)	Frequency Measured	Frequency Tolerance (%)
DC 3.15V	535	20	535.069	0.0129%
DC 4.25V	535	20	535.067	0.0125%
DC 3.15V	540.6	20	540.613	0.0024%
DC 4.25V	540.6	20	540.615	0.0028%
DC 3.15V	547	20	547.033	0.0060%
DC 4.25V	547	20	547.039	0.0071%

b) Frequency stability versus environmental temperature

535MHz

Environment Temperature(ºC)	Power Supply	Frequency Deviation measured with time Elapse(30 minutes)	
		MHz	%
50	DC 3.7V	535.067	0.0125%
40	DC 3.7V	535.068	0.0127%
30	DC 3.7V	535.064	0.0120%
20	DC 3.7V	535.063	0.0118%
10	DC 3.7V	535.066	0.0123%
0	DC 3.7V	535.067	0.0125%
-10	DC 3.7V	535.064	0.0120%
-20	DC 3.7V	535.067	0.0125%
-30	DC 3.7V	535.062	0.0116%

540.6MHz

Environment Temperature(°C)	Power Supply	Frequency Deviation measured with time Elapse(30 minutes)	
		MHz	%
50	DC 3.7V	540.602	0.0004%
40	DC 3.7V	540.601	0.0002%
30	DC 3.7V	540.603	0.0006%
20	DC 3.7V	540.603	0.0006%
10	DC 3.7V	540.602	0.0004%
0	DC 3.7V	540.604	0.0007%
-10	DC 3.7V	540.605	0.0009%
-20	DC 3.7V	540.604	0.0007%
-30	DC 3.7V	540.605	0.0009%

547MHz

Environment Temperature(°C)	Power Supply	Frequency Deviation measured with time Elapse(30 minutes)	
		MHz	%
50	DC 3.7V	547.006	0.0011%
40	DC 3.7V	547.031	0.0057%
30	DC 3.7V	547.029	0.0053%
20	DC 3.7V	547.031	0.0057%
10	DC 3.7V	547.032	0.0059%
0	DC 3.7V	547.033	0.0060%
-10	DC 3.7V	547.031	0.0057%
-20	DC 3.7V	547.033	0.0060%
-30	DC 3.7V	547.031	0.0057%

9. NECESSARY BANDWIDTH (BN) FOR DIGITAL SYSTEMS

9.1 APPLIED PROCEDURES / LIMIT

Test requirement: FCC 74.861 (e)(7)

Figure 4 shows the spectrum mask for all analogue systems in the band. The -90 dBc point shall be ±1 MHz from fc measured with an average detector. To comply, a measured value shall fall below the mask limit as shown in figure 4.

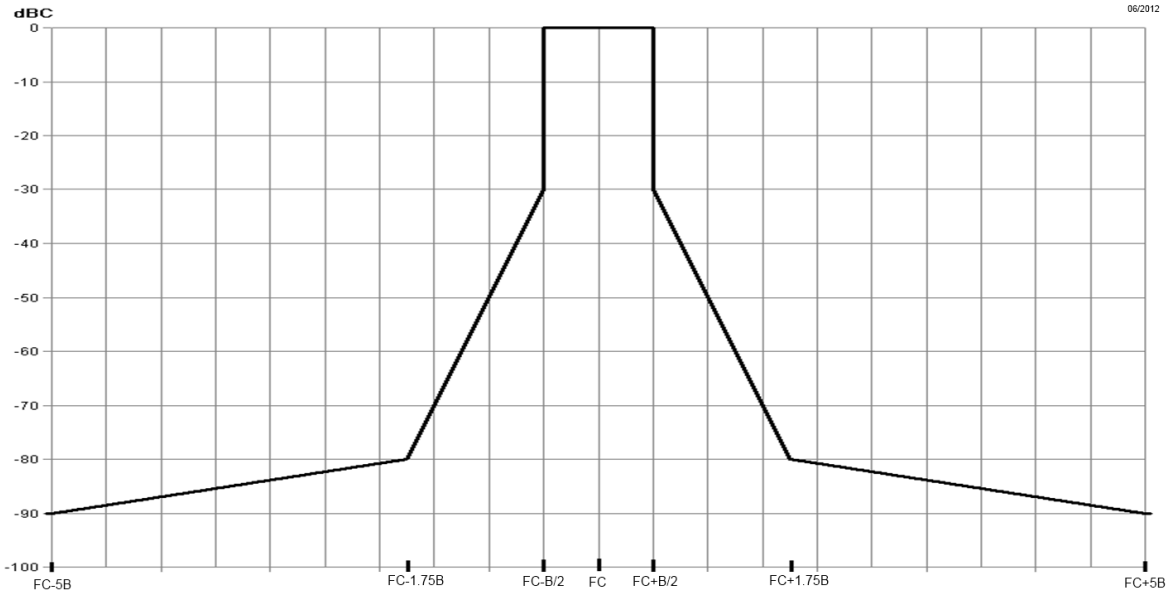


Figure 4: Spectrum mask for digital systems below 2 GHz

Note:The -90 dBc point shall be FC ±5B from fc measured with an averagedetector.

9.2 TEST PROCEDURE

- Spectrum mask below 1 GHz, see figure 4; for the spectrum mask above 1 GHz, see figure 5.
NOTE: This parameter also includes the limits for spectral components within the out-of-band region.
The transmitter shall be modulated with the test signals defined in clause 7.1.2. In any case the mask shall not be exceeded.
- Step 1: Measure the "Carrier Power" with the spectrum analyser setup:
• Centre Frequency = fc
• Span = Zero span
• Detector = RMS
• Trace Mode = Average
• RBW&VBW = 5 × B
• Sweep time ⩾ 2 s

- Step 2: Measure the "Maximum Relative Level (dBc) at Specified Carrier Offsets" with the following
spectrum analyser setup:
• Centre Frequency = fc
• Span ⩾ 5 × B
• Detector = RMS
• Trace Mode = Peak Hold

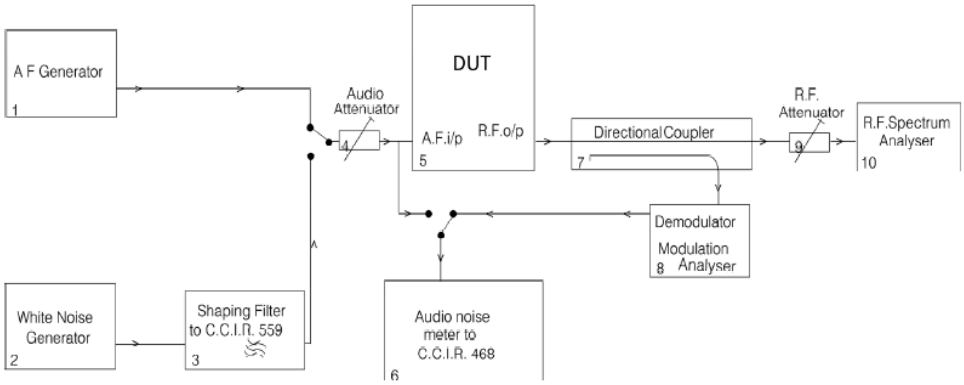
• RBW&VBW = 1 kHz
• Sweep time ⩾ 2 s

Limits:
- Step 3: Measure the "transmitter wide band noise floor":
The measurement of transmitter broad band noise floor shall be carried out according to EN 300422-1 clause 8.3.2.1.
- Step 3a: Measure the "lower frequency transmitter wide band noise floor":
- Start Frequency = fc - 5 × B
Stop Frequency = fc - 1,75 × B
- Detector = RMS
- Trace Mode = Average
- RBW&VBW = 1 kHz
- Sweep time = 2 s per 200 kHz
- Step 3b: Measure the "upper frequency transmitter wide band noise floor":
- Start Frequency = fc + 1,75 × B
Stop Frequency = fc + 5 × B
- Detector = RMS
- Trace Mode = Average
- RBW&VBW = 1 kHz
- Sweep time = 2 s per 200 kHz
Both spectrum ranges shall be measured.
Limits: The spectrum mask for digital systems shall not be exceeded. See figure 4 for systems operating below 2 GHz and figure 5 for systems operating above 2 GHz.

9.3 DEVIATION FROM STANDARD

No deviation.

9.4 TEST SETUP



NOTE: If the DUT incorporates ancillary coding or signalling channels, for example, pilot tone, etc. these should be switched on prior to measuring the transmitter RF output spectrum.

9.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

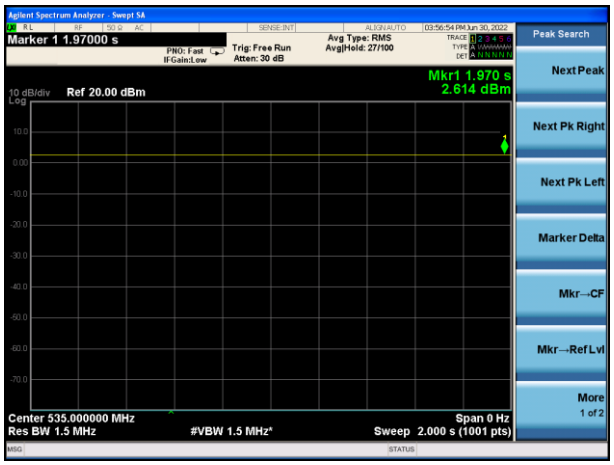
9.6 TEST RESULT

EUT：	Wireless Microphone	Model Name ：	WM1-2
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1012 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	TX		

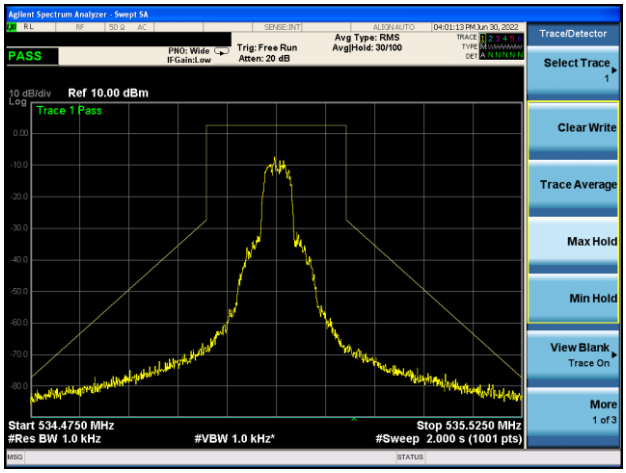
B=100kHz

535MHz Test Plot

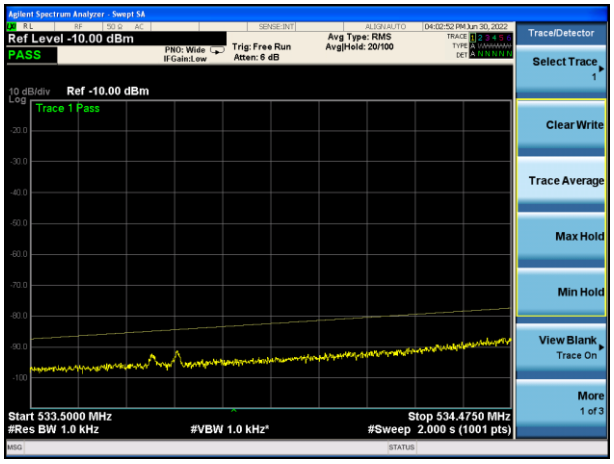
Step 1



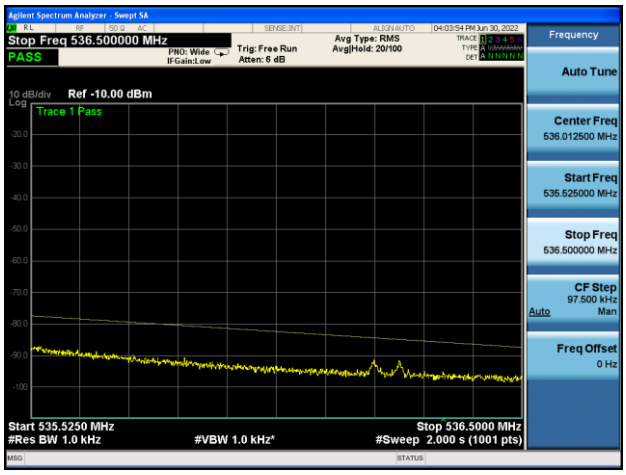
Step 2



Step 3a

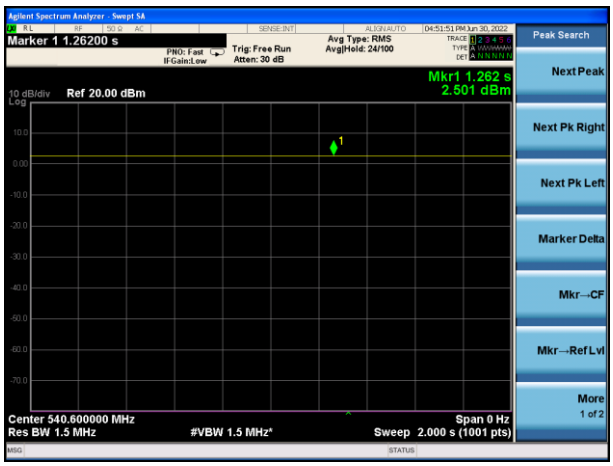


Step 3b

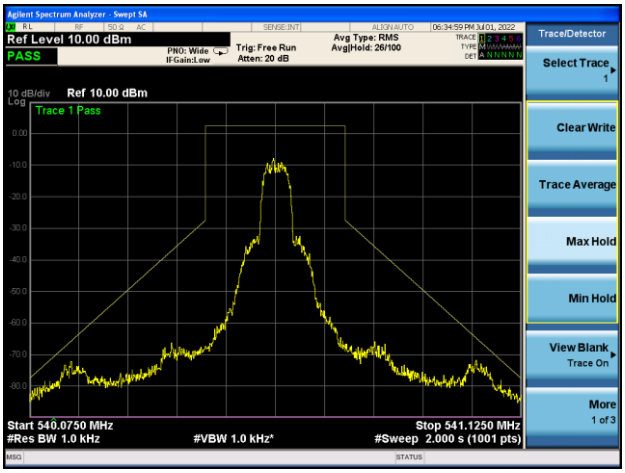


540.6MHz MHz Test Plot

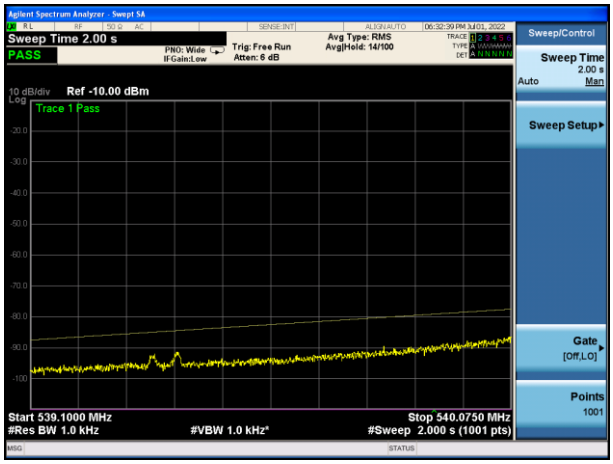
Step 1



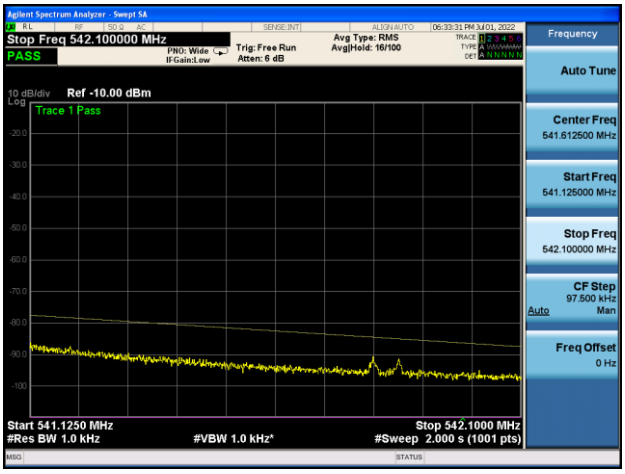
Step 2

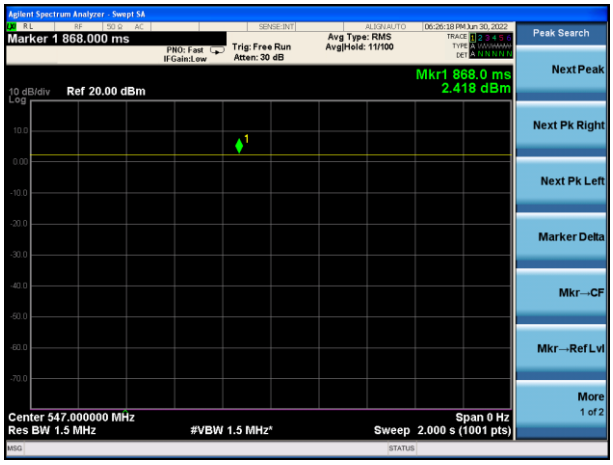
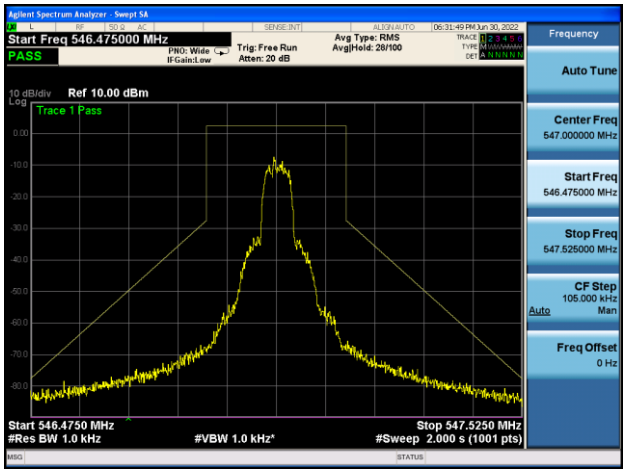
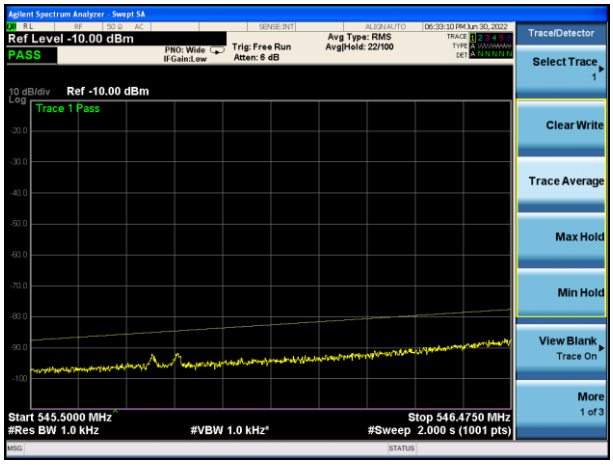
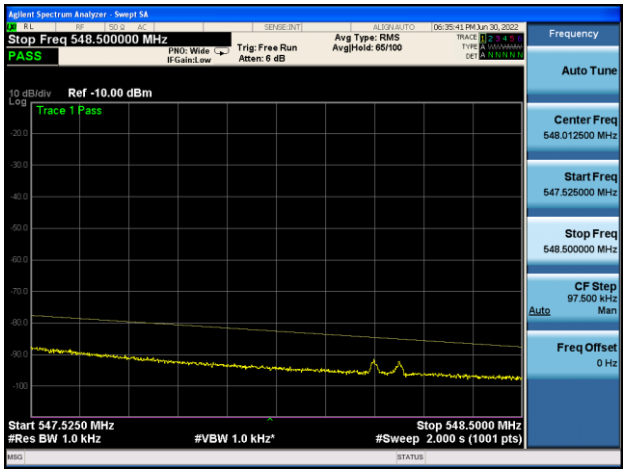


Step 3a



Step 3b



547MHz MHz Test Plot	
Step 1	**Step 2**
	
Step 3a	**Step 3b**
	

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