

FCC PART 15 SUBPART C TEST REPORT**FCC PART 15.236****Report Reference No.**..... : BSL24090099P01-R01**FCC ID**..... : 2AZNY-TW880**Compiled by**
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(position+printed name+signature)..: RF Manager/ Vivian Jiang**Date of issue**.....: December 2, 2024

Cindy Zheng

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Testing Laboratory Name.....: BSL Testing Co., Ltd.**Address**.....: 1/F, Building B, Xinshidai GR Park, Shiyan Street, Bao'an District,
Shenzhen, Guangdong, 518052, People's Republic of China**Applicant's name**.....: Fujian EastWest Lifewit Technology Co.,LTD**Address**.....: Room 1201-1205, Building 18, Second Phase of Innovation Park,
no.7, Wulongjiang Middle Avenue, Fuzhou High-tech Zone, Fuzhou,
Fujian Province**Test specification**..... :**Standard**.....: FCC Part 15.236
ANSI C63.10-2013**BSL Testing Co., Ltd. All rights reserved.**

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Equipment description.....: Wireless Microphone**Trade Mark**.....: N/A**Manufacturer**.....: EASTWEST ELECTRONIC COMMERCE CO.,LIMITED**Model/Type reference**.....: TW880**Listed Models**: TW881, TW882, TW883, TW884, TW885, TW886, TW887, TW888**Modulation**: FSK**Frequency**.....: From 538.2MHz to 598.8MHz**Ratings**.....: DC 3.0V from battery**Result**.....: PASS

TEST REPORT

Equipment under Test : **Wireless Microphone**

Model /Type : TW880

Listed Models : TW881, TW882, TW883, TW884, TW885, TW886, TW887, TW888

Model Declaration : All the models are electrical identical including the same software parameter and hardware design, same mechanical structure and design, the only difference is the model named different.

Applicant : **Fujian EastWest Lifewit Technology Co.,LTD**

Address : Room 1201-1205, Building 18, Second Phase of Innovation Park,
no.7, Wulongjiang Middle Avenue, Fuzhou High-tech Zone, Fuzhou,
Fujian Province

Manufacturer : **Fujian EastWest Lifewit Technology Co.,LTD**

Address : Room 1201-1205, Building 18, Second Phase of Innovation Park,
no.7, Wulongjiang Middle Avenue, Fuzhou High-tech Zone, Fuzhou,
Fujian Province

Test Result:	PASS
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The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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1 TEST STANDARDS

The tests were performed according to following standards:

[FCC Rules Part 15.236](#): Operation of wireless microphones in the bands 54–72 MHz, 76–88 MHz, 174–216 MHz, 470–608 MHz and 614–698 MHz.

[ANSI C63.10-2013](#): American National Standard for Testing Unlicensed Wireless Devices

2 SUMMARY

2.1 General Remarks

Date of receipt of test sample	:	October 29, 2024
Testing commenced on	:	October 29, 2024
Testing concluded on	:	December 2, 2024

2.2 Product Description

Product Description:	Wireless Microphone
Model/Type reference:	TW880
Listed Models:	TW881, TW882, TW883, TW884, TW885, TW886, TW887, TW888
Power supply:	DC 3.0V from battery (Two 1.5V AA batteries)
Adapter information:	N/A
Testing sample ID:	BSL24090099P01-R01-1# (Engineer sample), BSL24090099P01-R01-2# (Normal sample)
Hardware Version:	V1.0
Software Version:	V1.0
Modulation:	FSK
Operation frequency:	538.2-598.8MHz
Channel number:	96
Antenna type:	PCB antenna
Antenna gain:	3.0 dBi

2.3 Equipment Under Test

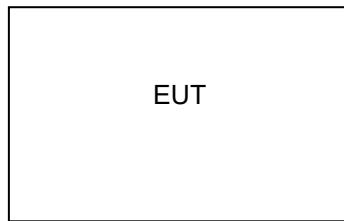
Power supply system utilised

Power supply voltage	:	<input type="radio"/> 230V / 50 Hz	<input type="radio"/> 120V / 60Hz
		<input type="radio"/> 12 V DC	<input type="radio"/> 24 V DC
		<input checked="" type="radio"/> Other (specified in blank below) DC 3.0V from battery	

2.4 Short description of the Equipment under Test (EUT)

This is a Wireless Microphone
For more details, refer to the user's manual of the EUT.

2.5 Block Diagram of Test Setup



2.6 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for the device filing to comply with Section 15.236 of the FCC Part 15, Subpart C Rules.

2.7 Modifications

No modifications were implemented to meet testing criteria.

2.8 Operation Frequency

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	538.2	37	561.0	73	585.0
2	538.8	38	561.6	74	585.6
3	539.4	39	562.2	75	586.2
4	540.0	40	562.8	76	586.8
5	540.6	41	563.4	77	587.4
6	541.2	42	564.0	78	588.0
7	541.8	43	564.6	79	588.6
8	542.4	44	565.2	80	589.2
9	543.0	45	565.8	81	589.8
10	543.6	46	566.4	82	590.4
11	544.2	47	567.0	83	591.0
12	544.8	48	567.6	84	591.6
13	545.4	49	569.4	85	592.2
14	546.0	50	570.0	86	592.8
15	546.6	51	570.6	87	593.4
16	547.2	52	571.2	88	594.0
17	547.8	53	571.8	89	594.6
18	548.4	54	572.4	90	595.2
19	549.0	55	573.0	91	595.8
20	549.6	56	573.6	92	596.4
21	550.2	57	574.2	93	597.0
22	550.8	58	574.8	94	597.6
23	551.4	59	575.4	95	598.2
24	552.0	60	576.0	96	598.8
25	553.8	61	576.6		
26	554.4	62	577.2		
27	555.0	63	577.8		
28	555.6	64	578.4		
29	556.2	65	579.0		
30	556.8	66	579.6		
31	557.4	67	580.2		
32	558.0	68	580.8		
33	558.6	69	581.4		
34	559.2	70	582.0		
35	559.8	71	582.6		
36	560.4	72	583.2		

Channel	Frequency
The lowest channel	538.2 MHz
The middle channel	569.4 MHz
The Highest channel	598.8 MHz

3 TEST ENVIRONMENT

3.1 Address of the test laboratory

BSL Testing Co., Ltd.

1/F, Building B, Xinshidai GR Park, Shiyan Street, Bao'an District, Shenzhen, Guangdong, 518052, People's Republic of China

3.2 Test Facility

FCC-Registration No.: 562200 Designation Number: CN1338

BSL Testing Co.,Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

Industry Canada Registration Number. Is: 11093A CAB identifier: CN0019

The Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing.

A2LA-Lab Cert. No.: 4707.01

BSL Testing Co.,Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.

The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.10 and CISPR 16-1-4:2010.

3.3 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Radiated Emission:

Temperature:	23 ° C
Humidity:	44 %
Atmospheric pressure:	950-1050mbar

AC Main Conducted testing:

Temperature:	24 ° C
Humidity:	47 %
Atmospheric pressure:	950-1050mbar

Conducted testing:

Temperature:	24 ° C
Humidity:	46 %
Atmospheric pressure:	950-1050mbar

3.4 Summary of measurement results

FCC Requirements		
FCC Part 15.207	Conducted Emission	N/A
FCC Part 15.236 (d)1	Conducted Peak Output Power	PASS
FCC Part 15.236 (f)2	Occupied bandwidth Emission	PASS
FCC Part 15.236 (f)3	Frequency Stability	PASS
FCC Part 15.236(g)/ 15.209	Radiated Emissions	PASS

Remark:

- 1.PASS: Test item meets the requirement.
- 2.Fail: Test item does not meet the requirement.
- 3.N/A: Test case does not apply to the test object.
- 4.The test result judgment is decided by the limit of test standard.

3.5 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to TR-100028-01 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 2 " and is documented in the BSL Testing Co., Ltd.quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for BSL Testing Co., Ltd.:

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	9KHz~30MHz	3.20 dB	(1)
Radiated Emission	30~1000MHz	4.10 dB	(1)
Radiated Emission	1~18GHz	4.32 dB	(1)
Radiated Emission	18-40GHz	5.54 dB	(1)
Conducted Disturbance	0.9KHz~30MHz	3.12 dB	(1)
Occupied Channel Bandwidth	/	5%	(1)
RF Frequency	/	0.082×10^{-7}	(1)
RF output power, conducted	/	0.73 dB	(1)
Unwanted Emission, conducted	/	1.6dB	(1)
AC Power Lines Conducted Emissions	/	2.72dB	(1)

- (1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3.6 Equipments Used during the Test

Conducted Emission					
Test Equipment	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
Shielding Room	ZhongYu Electron	7.3(L)x3.1(W)x2.9(H)	BSL252	2024-10-27	2025-10-26
EMI Test Receiver	R&S	ESCI 7	BSL552	2024-10-27	2025-10-26
Coaxial Switch	ANRITSU CORP	MP59B	BSL225	2024-10-27	2025-10-26
ENV216 2-L-V-NETZNACHB.DE	ROHDE&SCHWARZ	ENV216	BSL226	2024-10-27	2025-10-26
Coaxial Cable	BSL	N/A	BSL227	N/A	N/A
EMI Test Software	AUDIX	E3	N/A	N/A	N/A
Thermo meter	KTJ	TA328	BSL233	2024-10-27	2025-10-26
Absorbing clamp	Elektronik-Feinmechanik	MDS21	BSL229	2024-10-27	2025-10-26
LISN	R&S	ENV216	308	2024-10-27	2025-10-26
LISN	R&S	ENV216	314	2024-10-27	2025-10-26

Radiation Test equipment					
Test Equipment	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	BSL250	2024-10-27	2025-10-26
Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	BSL251	N/A	N/A
EMI Test Receiver	Rohde & Schwarz	ESU26	BSL203	2024-10-27	2025-10-26
BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	BSL214	2024-10-27	2025-10-26
Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120 D	BSL208	2024-10-27	2025-10-26
Horn Antenna	ETS-LINDGREN	3160	BSL217	2024-10-27	2025-10-26
EMI Test Software	AUDIX	E3	N/A	N/A	N/A
Coaxial Cable	BSL	N/A	BSL213	2024-10-27	2025-10-26
Coaxial Cable	BSL	N/A	BSL211	2024-10-27	2025-10-26
Coaxial cable	BSL	N/A	BSL210	2024-10-27	2025-10-26
Coaxial Cable	BSL	N/A	BSL212	2024-10-27	2025-10-26
Amplifier(100kHz-3GHz)	HP	8347A	BSL204	2024-10-27	2025-10-26
Amplifier(2GHz-20GHz)	HP	84722A	BSL206	2024-10-27	2025-10-26
Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	BSL218	2024-10-27	2025-10-26
Band filter	Amindeon	82346	BSL219	2024-10-27	2025-10-26
Power Meter	Anritsu	ML2495A	BSL540	2024-10-27	2025-10-26
Power Sensor	Anritsu	MA2411B	BSL541	2024-10-27	2025-10-26
Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	BSL575	2024-10-27	2025-10-26
Splitter	Agilent	11636B	BSL237	2024-10-27	2025-10-26



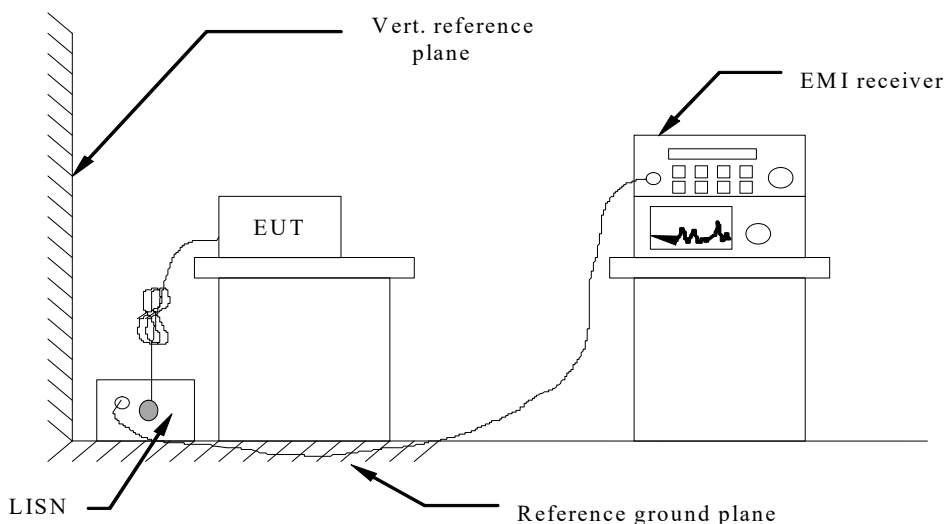
Loop Antenna	ZHINAN	ZN30900A	BSL534	2024-10-27	2025-10-26
Breitband hornantenne	SCHWARZBECK	BBHA 9170	BSL579	2024-10-27	2025-10-26
Amplifier	TDK	PA-02-02	BSL574	2024-10-27	2025-10-26
Amplifier	TDK	PA-02-03	BSL576	2024-10-27	2025-10-26
PSA Series Spectrum Analyzer	Rohde & Schwarz	FSP	BSL578	2024-10-27	2025-10-26

RF Conducted Test:					
Test Equipment	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
MXA Signal Analyzer	Agilent	N9020A	BSL566	2024-10-27	2025-10-26
EMI Test Receiver	R&S	ESCI 7	BSL552	2024-10-27	2025-10-26
Spectrum Analyzer	Agilent	E4440A	BSL533	2024-10-27	2025-10-26
MXG vector Signal Generator	Agilent	N5182A	BSL567	2024-10-27	2025-10-26
ESG Analog Signal Generator	Agilent	E4428C	BSL568	2024-10-27	2025-10-26
USB RF Power Sensor	DARE	RPR3006W	BSL569	2024-10-27	2025-10-26
RF Switch Box	Shongyi	RFSW3003328	BSL571	2024-10-27	2025-10-26
Programmable Constant Temp & Humi Test Chamber	WEWON	WHTH-150L-40-880	BSL572	2024-10-27	2025-10-26

4 TEST CONDITIONS AND RESULTS

4.1 AC Power Conducted Emission

TEST CONFIGURATION



TEST PROCEDURE

- 1 The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. 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 C63.10-2013.
- 2 Support equipment, if needed, was placed as per ANSI C63.10-2013
- 3 All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10-2013
- 4 The EUT received power from adapter, the adapter received AC120V/60Hz and AC 240V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
- 5 All support equipments received AC power from a second LISN, if any.
- 6 The EUT 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.

AC Power Conducted Emission Limit

For intentional device, according to § 15.207(a) AC Power Conducted Emission Limits is as following:

Frequency range (MHz)	Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

TEST RESULTS

The EUT is powered by the Battery, So this test item is not applicable for the EUT.

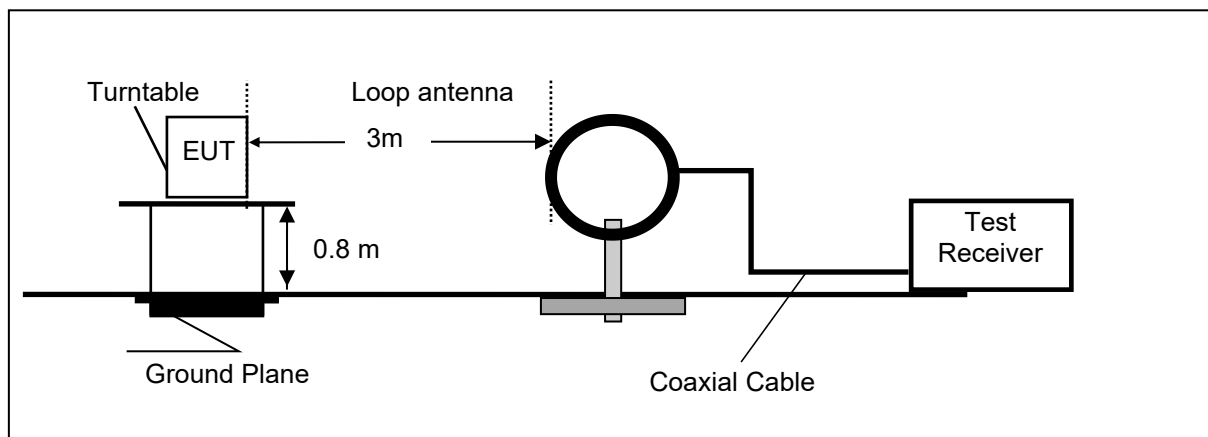
4.2 Radiated Emissions Test

Limit

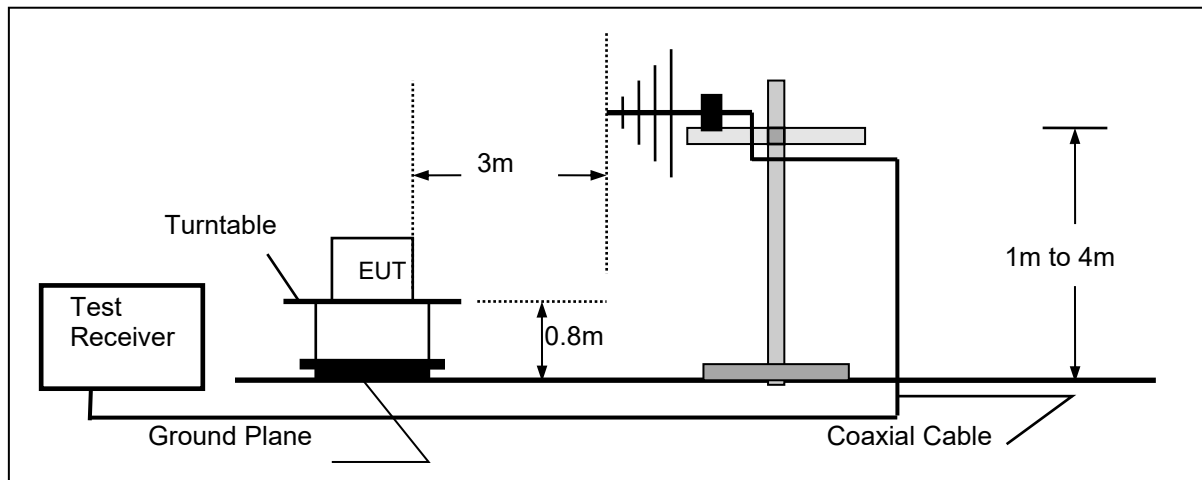
Emissions within the band from one mecahertz below to one mecahertz above the carrier frequencshall comply with the emission mask in S8.3 of ETSI EN 300 422-1 V1.4.2 (2011-08).Emissions outside of this band shall comply with the limits specified in section 8.4 of ETSI EN 300422-1 V1.4.2(2011-08)FCC Part15 (15.236), Subpart C

Test Configuration

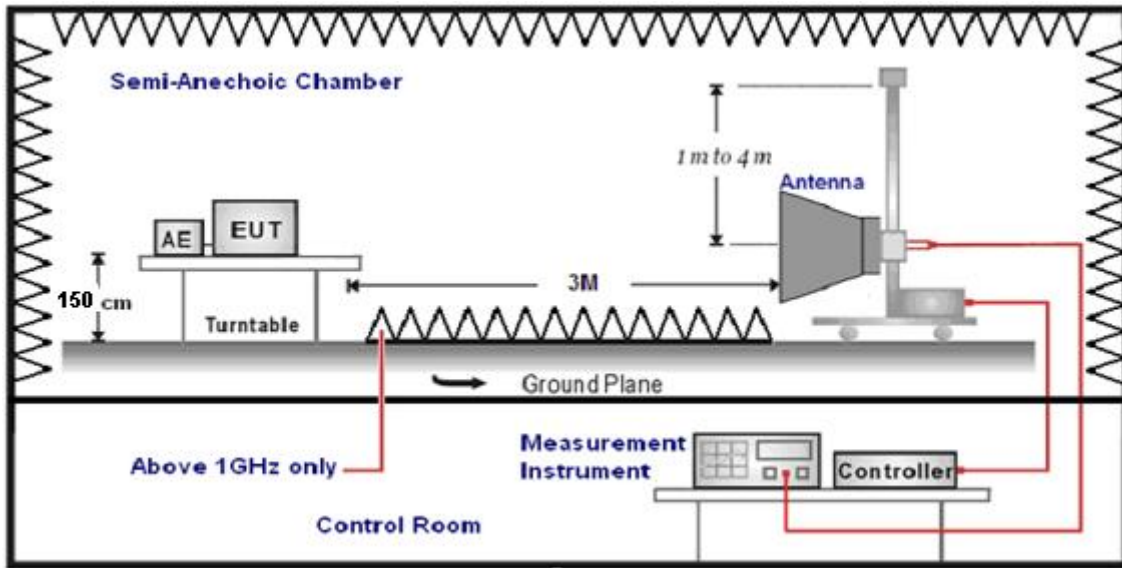
Frequency range 9 KHz – 30MHz



Frequency range 30MHz – 1000MHz



Frequency range above 1GHz-25GHz



TEST PROCEDURE

1. The EUT was placed on a turn table which is 0.8m above ground plane when testing frequency range 9 KHz –1GHz;the EUT was placed on a turn table which is 1.5m above ground plane when testing frequency range 1GHz – 25GHz.
2. Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0° to 360° to acquire the highest emissions from EUT.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measurements have been completed.
5. Radiated emission test frequency band from 9KHz to 25GHz.
6. The distance between test antenna and EUT as following table states:

Test Frequency range	Test Antenna Type	Test Distance
9KHz-30MHz	Active Loop Antenna	3
30MHz-1GHz	Ultra-Broadband Antenna	3
1GHz-18GHz	Double Ridged Horn Antenna	3
18GHz-25GHz	Horn Antenna	1

7. Setting test receiver/spectrum as following table states:

Test Frequency range	Test Receiver/Spectrum Setting	Detector
9KHz-150KHz	RBW=200Hz/VBW=3KHz, Sweep time=Auto	QP
150KHz-30MHz	RBW=9KHz/VBW=100KHz, Sweep time=Auto	QP
30MHz-1GHz	RBW=120KHz/VBW=1000KHz, Sweep time=Auto	QP
1GHz-40GHz	Peak Value: RBW=1MHz/VBW=3MHz, Sweep time=Auto Average Value: RBW=1MHz/VBW=10Hz, Sweep time=Auto	Peak

EUT Operation during Test

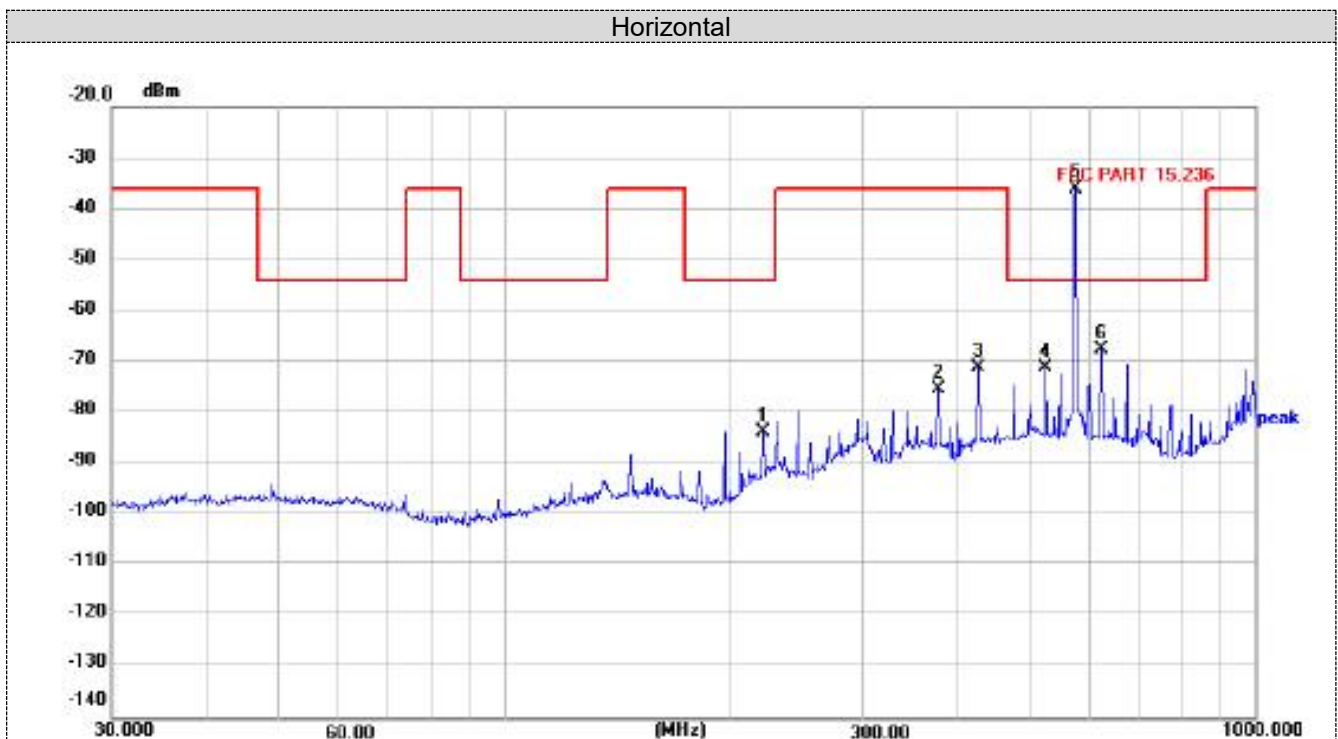
The EUT was programmed to be in continuously transmitting mode.

Below 1GHz Test Results: (Show only the worst test results)

All modes have been tested, and only the worst mode is recorded, the worst mode is 538.2MHz.

Test result

Temperature	23.7℃	Humidity	52.1%
Test Engineer	/	Configurations	TX

Measurement data:

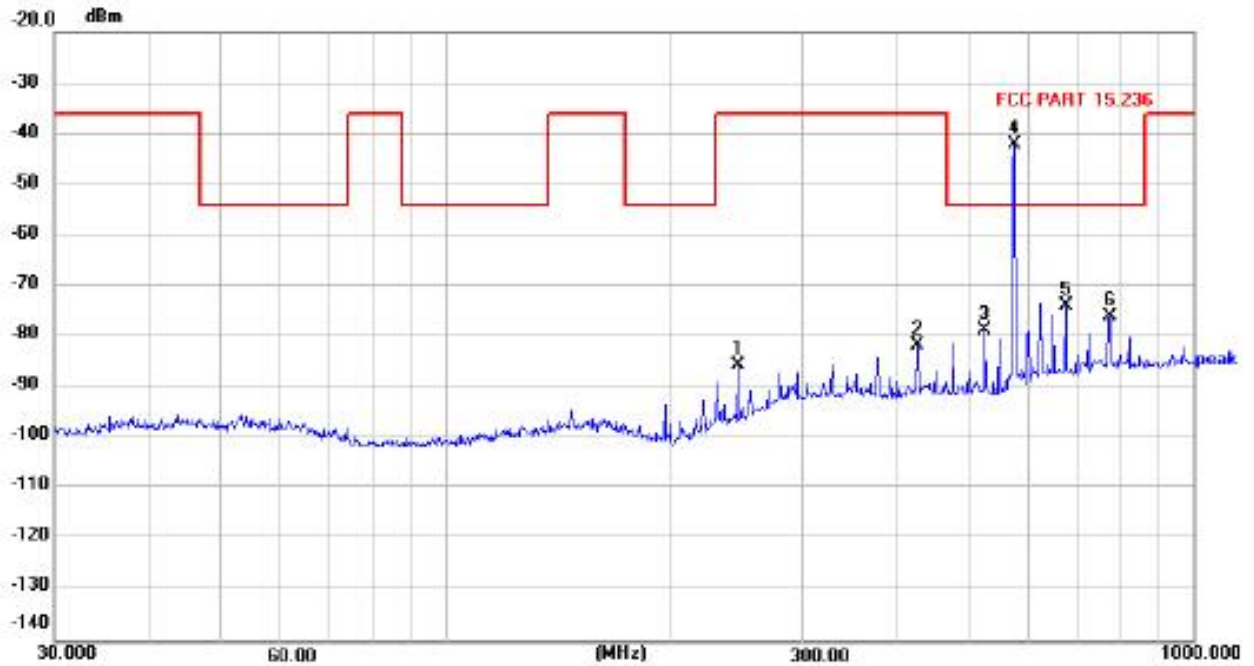
No.	Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector
1	221.3916	-64.59	-19.23	-83.82	-54.00	-29.82	peak
2	378.5842	-61.76	-13.63	-75.39	-36.00	-39.39	peak
3	428.0192	-58.72	-12.29	-71.01	-36.00	-35.01	peak
4	526.3967	-61.30	-9.94	-71.24	-54.00	-17.24	peak
5 *	576.6443	-27.66	-8.52	-36.18	-54.00	17.82	peak
6	625.0778	-60.05	-7.45	-67.50	-54.00	-13.50	peak

Note:1).Level (dBμV/m)= Reading (dBμV/m)+ Factor (dB/m)

2). Factor(dB/m)=Antenna Factor (dB/m) + Cable loss (dB) - Pre Amplifier gain (dB)

3). Margin(dB) = Limit (dBμV/m) - Level (dBμV/m)

Vertical



No.	Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector
1	245.9507	-68.12	-17.52	-85.64	-36.00	-49.64	peak
2	428.0192	-69.41	-12.29	-81.70	-36.00	-45.70	peak
3	526.3967	-68.68	-9.94	-78.62	-54.00	-24.62	peak
4 *	576.6443	-33.57	-8.52	-42.09	-54.00	11.91	peak
5	675.2078	-67.16	-6.78	-73.94	-54.00	-19.94	peak
6	774.1584	-70.99	-4.98	-75.97	-54.00	-21.97	peak

Note:1). Level (dBμV/m) = Reading (dBμV/m) + Factor (dB/m)

2). Factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) - Pre Amplifier gain (dB)

3). Margin (dB) = Limit (dBμV/m) - Level (dBμV/m)

Harmonics and Spurious Emissions Frequency Range (9 kHz-30MHz)

Frequency (MHz)	Level@3m (dBμV/m)	Limit@3m (dBμV/m)
--	--	--
--	--	--
--	--	--
--	--	--

Note:1. Emission Level=Reading+ Cable loss+ Antenna factor-Amp factor.

2. The emission levels are 20 dB below the limit value, which are not reported. It is deemed to comply with the requirement.

ABOVE 1GHz test results:

All modes have been tested, and only the worst mode is recorded.

Transmitting at 538.2MHz (lowest channel)						
Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBm)	(dB)	(dBm)	(dBm)	(dB)	
1076.4	-42.21	-5.81	-48.02	-30	-18.02	Horizontal
1076.4	-36.52	-5.81	-42.33	-30	-12.33	Vertical
1614.6	-32.21	-6.06	-38.27	-30	-8.27	Vertical
1614.6	-27.54	-5.81	-33.35	-30	-3.35	Horizontal
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; Level = Reading + Factor; Margin = Level-Limit.						

Transmitting at 569.4MHz (middle channel)						
Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBm)	(dB)	(dBm)	(dBm)	(dB)	
1138.8	-40.12	-5.81	-45.93	-30	-15.93	Horizontal
1138.8	-35.21	-5.81	-41.02	-30	-11.02	Vertical
1708.2	-31.14	-6.06	-37.20	-30	-7.20	Vertical
1708.2	-36.25	-5.81	-42.06	-30	-12.06	Horizontal
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; Level = Reading + Factor; Margin = Level-Limit.						

Transmitting at 598.8MHz (Highest channel)						
Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBm)	(dB)	(dBm)	(dBm)	(dB)	
1197.6	-38.56	-5.81	-44.37	-30	-14.37	Horizontal
1197.6	-34.32	-5.81	-40.13	-30	-10.13	Vertical
1796.4	-29.46	-6.06	-35.52	-30	-5.52	Vertical
1796.4	-26.42	-5.81	-32.23	-30	-2.23	Horizontal
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; Level = Reading + Factor; Margin = Level-Limit.						

Remark:

- (1) Measuring frequencies from 1 GHz to the 18 GHz.
- (2) "F" denotes fundamental frequency; "H" denotes spurious frequency; "E" denotes band edge frequency.
- (3) * denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
- (4) The emissions are attenuated more than 20dB below the permissible limits are not record in the report.
- (5) The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120KHz, 1 MHz for measuring above 1 GHz, below 30MHz was 10KHz. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for peak measurement with peak detector at frequency above 1GHz. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average measurement with peak detection at frequency above 1GHz.
- (6) When the test results of Peak Detected below the limits of Average Detected, the Average Detected is not need completed. For example: Top Channel at Fundamental 73.16dBuV/m(PK Value) <93.98(AV Limit), at harmonic 53.20 dBuV/m(PK Value) <54 dBuV/m(AV Limit), the Average Detected not need to completed.

4.3 Conducted Output Power

Limit

According to FCC 15.236(d)(1), for low power auxiliary station operating in the 470-608, and 614-698MHz bands, In the bands allocated and assigned for broadcast television and in the 600 MHz serviceband: 50 mW EIRP

Test Procedure

Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power sensor.

Test Configuration



Test Results

Test Channel	frequency (MHz)	Conducted Output Power (dBm)	Cable Loss (dBm)	ANT Gain (dBi)	EIRP (dBm)	Limit (dBm)	Result
CH01	538.2	0.865	1.0	3.0	4.865	17	PASS
CH49	569.4	0.752	1.0	3.0	4.752		PASS
CH96	598.8	0.961	1.0	3.0	4.961		PASS

Eirp=Conducted Output Power+Cable Loss+ANT Gain

4.4 Occupied Bandwidth Measurement

Limit

According to FCC 15.236(f)(2), The operating frequency within a permissible band of operation as defined in paragraph (c) must comply with the following requirements.

(1)The frequency selection shall be offset from the upper or lower band limits by 25 kHz or an integral multiple thereof.

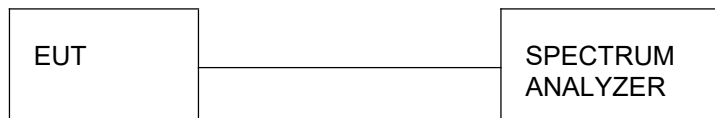
(2)One or more adjacent 25 kHz segments within the assignable frequencies may be combined to form a channel whose maximum bandwidth shall not exceed 200 kHz. The operating bandwidth shall not exceed 200kHz.

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 300 422-1 V1.4.2 (2011-08) (incorporated by reference, see § 15.38). Emissions outside this band shall comply with the limit specified at the edges of the ETSI mask.

Test Procedure

According to TIA-603 for additional Test Set-Up procedures, the occupied bandwidth of emission was measured with a Spectrum Analyzer connected to the antenna terminal while EUT was operating in 2.5kHz tone at an input level 16 dB greater than that necessary to produce 50 percent modulation. Then mark the -26dB Bandwidth and record it.

Test Configuration

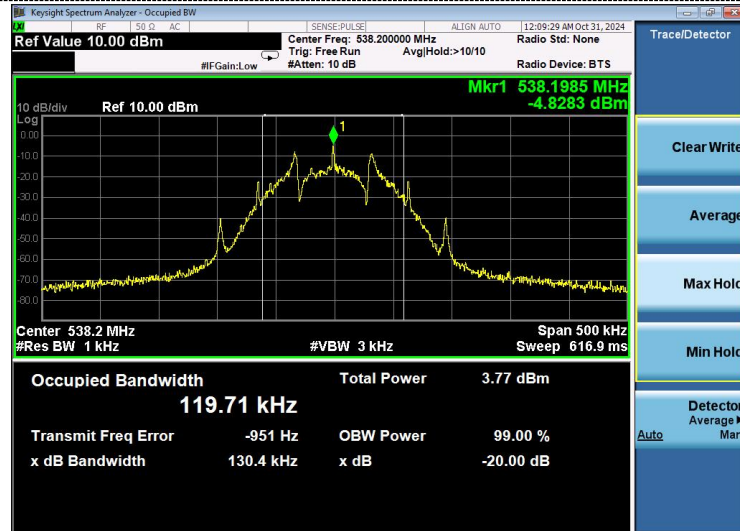


Test Results

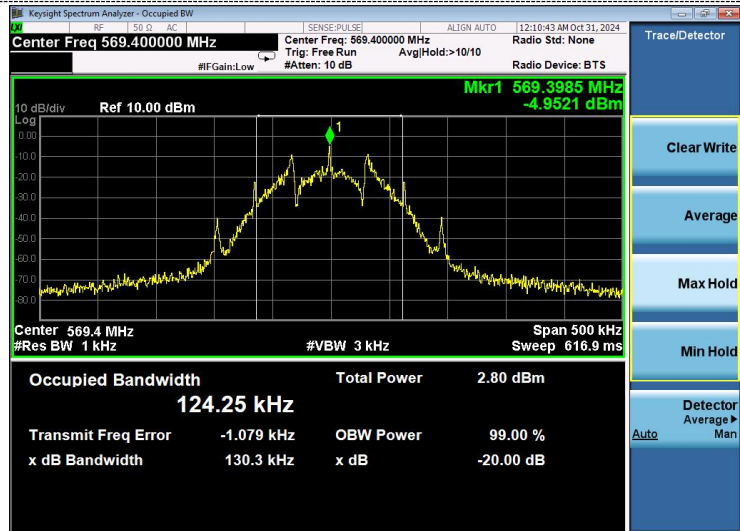
Test Channel	frequency (MHz)	-20Bandwidth (kHz)	99%Bandwidth (kHz)	Limit -20Bandwidth (kHz)	Result
CH01	538.2	130.4	119.71	200	PASS
CH49	569.4	130.3	124.25		PASS
CH96	598.8	130.1	120.09		PASS

Test plot as follows:

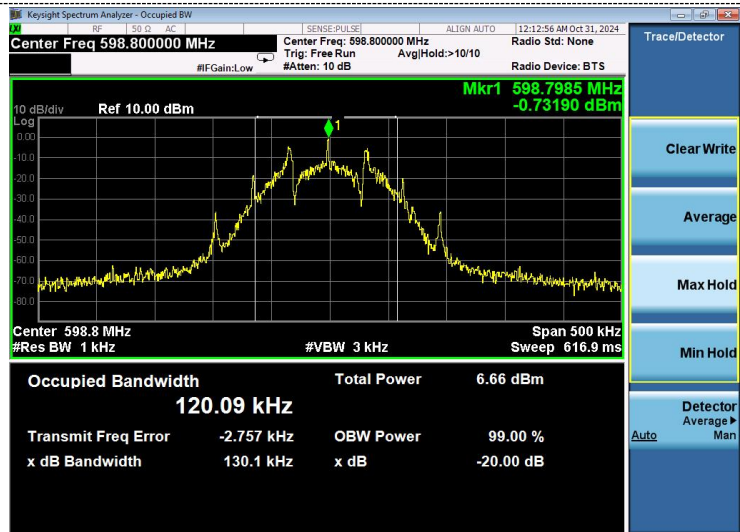
538.2 MHz



569.4 MHz



598.8 MHz



4.5 Necessary Bandwidth

Limit

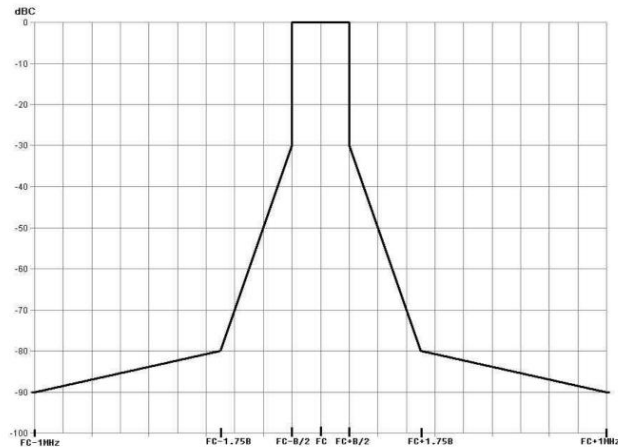


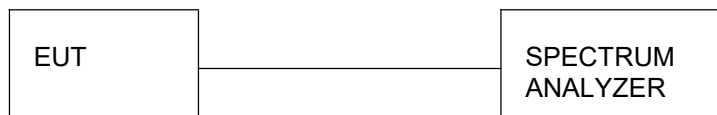
Figure 4: Spectrum mask for digital systems below 1 GHz

Standard Applicable

According to § 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 § 8.3 of ETSI EN 300 422-1 V1.4.2 (2011-08), Electromagnetic compatibility and Radio spectrum Matters (ERM); Wireless UHF Microphone s in the 25 MHz to 3GHz frequency range; Part 1: Technical characteristics and methods of measurement. 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).

According to ETSI EN 300 422-2 V2.1.1 section 8.3, the transmitter output spectrum shall be within the mask defined in the following figure.

Test Configuration



Test Procedure

NOTE 1: This parameter also includes the limits for spectral components within the out-of-band region.

Principal Spectrum Mask measuring method for digital transmitters:

- Spectrum mask below 1 GHz, see figure 4, for the spectrum mask above 1 GHz, see figure 5.

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 analyzer setup:

- Center Frequency = f_c
- Span = Zero span
- Detector = RMS
- Trace Mode = Average
- RBW & VBW = 5xB
- Sweep time $\geq 2s$

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

- Center Frequency = f_c
- Span $\geq 5B$
- Detector = RMS
- Trace Mode = Peak Hold
- RBW & VBW = 1 kHz
- Sweep time $\geq 2s$

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.

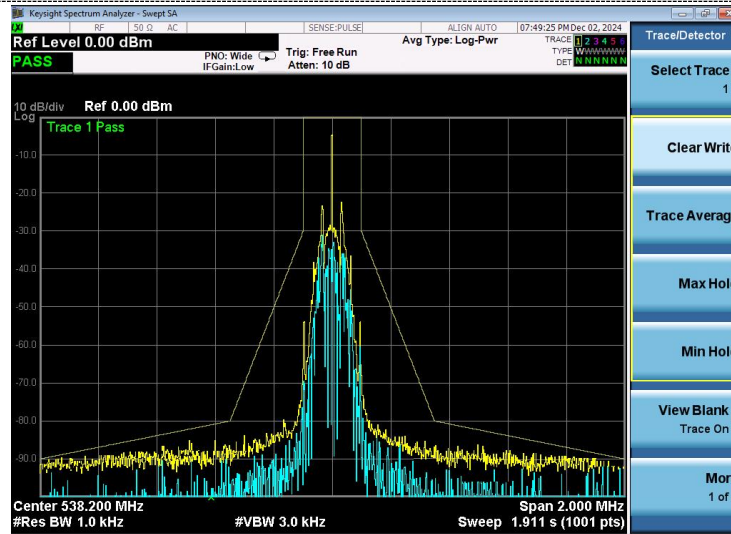
- Start Frequency = $f_c + 1,75B$ and $f_c - 1$ MHz below 1 GHz,
Start Frequency = $f_c + B$ and $f_c - 1$ MHz above 1 GHz.
- Stop Frequency = $f_c + 1$ MHz and $f_c - 1,75 B$ below 1 GHz,
Stop Frequency = $f_c + 1$ MHz and $f_c - B$ above 1 GHz.
- Detector = RMS
- Trace Mode = Average
- RBW & VBW =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

NOTE 2: Two spectrum ranges are to be measured!

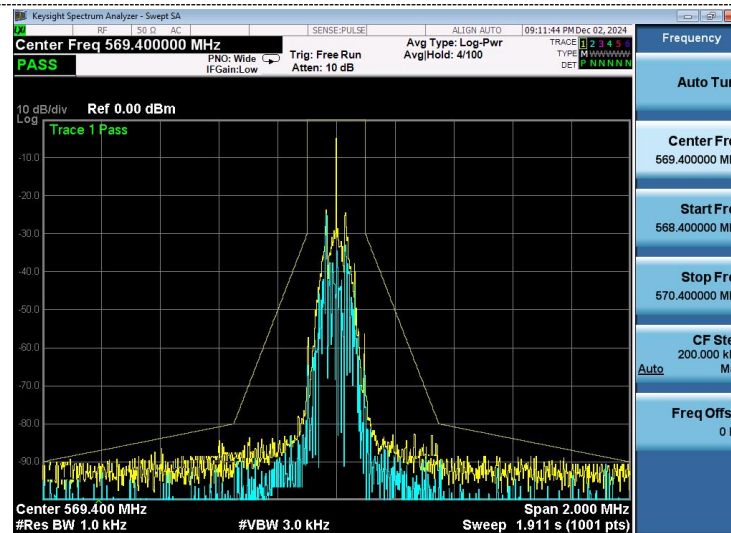
Limits: Mask shall not be exceeded.

Test Results

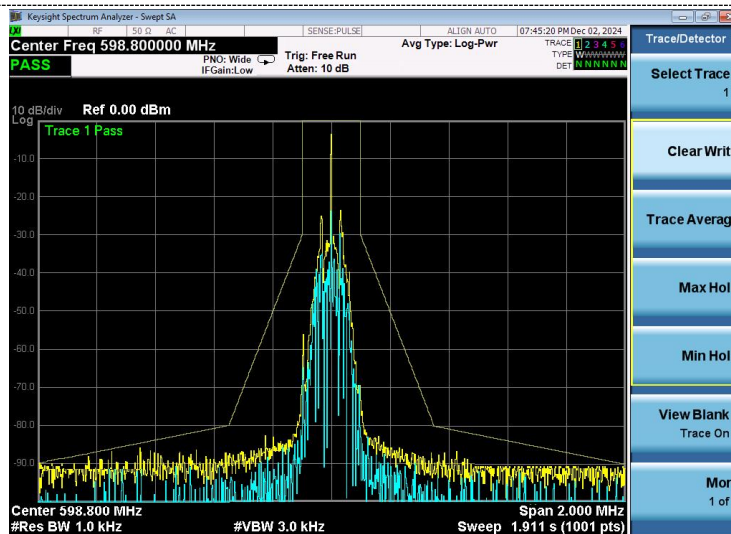
538.2MHz



569.4MHz



598.8MHz



4.6 Frequency Stability

Limit

±50ppm

Standard Applicable

According to FCC 15.236(f)(3), The frequency tolerance of the carrier signal shall be maintained within $\pm 0.005\%$ of the operating frequency over a temperature variation of -20°C to $+50^{\circ}\text{C}$ 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°C . Battery operated equipment shall be tested using a new battery.

Test Configuration



Test Procedure

1. Setup the configuration of the ambient temperature from -20°C to 50°C with sufficient time. And measure the different power of the EUT with an artificial power from highest to end point voltage.
2. Set frequency counter center frequency to the right frequency needs to be measured band.

Test Results

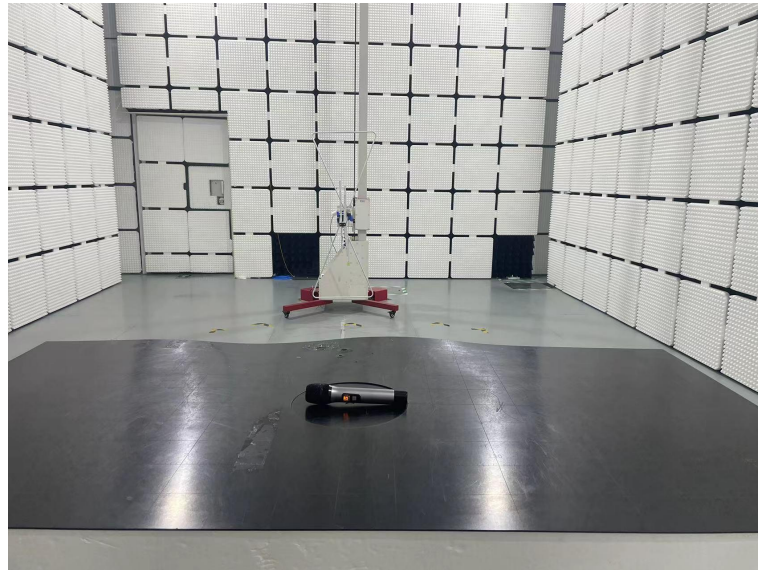
Note: All modes have been tested, and only the worst mode is recorded.

Test frequency	Test Conditions		Measure Frequency	Frequency Error		Limit	Result
(MHz)	Voltage (V)	Temperature (°C)	(MHz)	(MHz)	ppm	ppm	
538.2MHz	N	N	538.1975	-0.0025	-4.6	±50ppm	PASS
		L	538.1979	-0.0021	-3.9		
		H	538.1981	-0.0019	-3.5		
	L	N	538.1969	-0.0031	-5.8		
		L	538.1971	-0.0029	-5.4		
		H	538.1968	-0.0032	-5.9		
	H	N	538.1971	-0.0029	-5.4		
		L	538.1975	-0.0025	-4.6		
		H	538.1966	-0.0034	-6.3		

Test frequency	Test Conditions		Measure Frequency	Frequency Error		Limit	Result
(MHz)	Voltage (V)	Temperature (°C)	(MHz)	(MHz)	ppm	ppm	
569.4MHz	N	N	569.3985	-0.0015	-2.6	±50ppm	PASS
		L	569.3977	-0.0023	-4.0		
		H	569.3972	-0.0028	-4.9		
	L	N	569.3976	-0.0024	-4.2		
		L	569.3966	-0.0034	-6.0		
		H	569.3958	-0.0042	-7.4		
	H	N	569.3961	-0.0039	-6.8		
		L	569.3985	-0.0015	-2.6		
		H	569.3986	-0.0014	-2.5		

Test frequency	Test Conditions		Measure Frequency	Frequency Error		Limit	Result
(MHz)	Voltage (V)	Temperature (°C)	(MHz)	(MHz)	ppm	ppm	
598.8MHz	N	N	598.7988	-0.0012	-2.0	±50ppm	PASS
		L	598.7991	-0.0009	-1.5		
		H	598.7986	-0.0014	-2.3		
	L	N	598.7991	-0.0009	-1.5		
		L	598.7988	-0.0012	-2.0		
		H	598.7976	-0.0024	-4.0		
	H	N	598.7973	-0.0027	-4.5		
		L	598.7984	-0.0016	-2.7		
		H	598.7986	-0.0014	-2.3		

5 Test Setup Photos of the EUT



6 Photos of the EUT

Reference to the report ANNEX A of external photos and ANNEX B of internal photos.

******* End of Report *******