



FCC TEST REPORT

For

Shenzhen Lanbaosi Technology Co., Ltd.

Live microphone

Test Model: M-XZ111

Prepared for	:	Shenzhen Lanbaosi Technology Co., Ltd.
Address	:	13A301, Shen'ao Cultural Industry Park, Dafa Road, Bantian Street, Longgang District, Shenzhen, China
Prepared by	:	Shenzhen LCS Compliance Testing Laboratory Ltd.
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Date of receipt of test sample	:	January 13, 2022
Number of tested samples	:	1
Sample No	:	220110122A
Serial number	:	Prototype
Date of Test	:	January 13, 2022 ~ January 24, 2022
Date of Report	:	January 24, 2022



Scan code to check authenticity

**FCC TEST REPORT
FCC CFR 47 PART 74****Report Reference No. : LCS220110122AEA**

Date of Issue : January 24, 2022

Testing Laboratory Name : Shenzhen LCS Compliance Testing Laboratory Ltd.Address : 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei,
Shajing Street, Baoan District, Shenzhen, 518000, ChinaTesting Location/ Procedure : Full application of Harmonised standards ■
Partial application of Harmonised standards □
Other standard testing method □**Applicant's Name : Shenzhen Lanbaosi Technology Co., Ltd.**Address : 13A301, Shen'ao Cultural Industry Park, Dafa Road, Bantian Street,
Longgang District, Shenzhen, China**Test Specification**

Standard..... : FCC CFR 47 PART 74

Test Report Form No..... : LCSEMC-1.0

TRF Originator : Shenzhen LCS Compliance Testing Laboratory Ltd.

Master TRF : Dated 2011-03

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EUT Description. : Live microphone

Trade Mark..... : ENERGYBUS

Test Model : M-XZ111

Ratings : Input: DC 5V, 500mA
DC 3.7V by Rechargeable Li-ion Battery, 500mAhResult : **Positive****Compiled by:**

Ray Yang/ Administrator

Supervised by:

Jin Wang/ Technique principal

Approved by:

Gavin Liang/ Manager

**FCC -- TEST REPORT**

Test Report No. : LCS220110122AEA	<u>January 24, 2022</u> Date of issue
--	--

Test Model.....	: M-XZ111
EUT.....	: Live microphone
Applicant.....	: Shenzhen Lanbaosi Technology Co., Ltd.
Address.....	: 13A301, Shen'ao Cultural Industry Park, Dafa Road, Bantian Street, Longgang District, Shenzhen, China
Telephone.....	: /
Fax.....	: /
Manufacturer.....	: Shenzhen Lanbaosi Technology Co., Ltd.
Address.....	: 13A301, Shen'ao Cultural Industry Park, Dafa Road, Bantian Street, Longgang District, Shenzhen, China
Telephone.....	: /
Fax.....	: /
Factory.....	: Shenzhen Lanbaosi Technology Co., Ltd.
Address.....	: 13A301, Shen'ao Cultural Industry Park, Dafa Road, Bantian Street, Longgang District, Shenzhen, China
Telephone.....	: /
Fax.....	: /

Test Result	Positive
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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.



Revision History

Revision	Issue Date	Revision Content	Revised By
000	January 24, 2022	Initial Issue	--



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1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT	: Live microphone
Test Model	: M-XZ111
Hardware Version	: /
Software Version	: /
Power Supply	: Input: DC 5V, 500mA DC 3.7V by Rechargeable Li-ion Battery, 500mAh
Frequency Range	: 953.2MHz~958.6MHz
Channel Number	: 17
Modulation Type	: FM
Antenna Type	: Internal Antenna
Antenna Gain	: -5.0dBi
Extreme temp. Tolerance	: -30°C to +50°C



1.2. Host System Configuration List and Details

Manufacturer	Description	Model	Serial Number	Certificate
OPPO	Adapter	OP52KAUH	--	FCC

Note: The adapter is supplied by lab and only use tested.

1.3. External I/O Cable

I/O Port Description	Quantity	Cable
Microphone port	1	N/A
Audio input port	1	N/A
Type-C port	1	N/A

1.4. Description of Test Facility

NVLAP Accreditation Code is 600167-0.

FCC Designation Number is CN5024.

Test Firm Registration Number: 254912

CAB identifier is CN0071.

CNAS Registration Number is L4595.

Test Firm Registration Number: 254912.

The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.4:2014 and CISPR 16-1-4:2010 SVSWR requirement for radiated emission above 1GHz.



1.5. 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 CISPR 16 – 4 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements” and is documented in the LCS 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.

1.6. Measurement Uncertainty

Test Item		Frequency Range	Uncertainty	Note
Radiation Uncertainty	:	9KHz~30MHz	±3.10dB	(1)
		30MHz~200MHz	±2.96dB	(1)
		200MHz~1000MHz	±3.10dB	(1)
		1GHz~26.5GHz	±3.80dB	(1)
		26.5GHz~40GHz	±3.90dB	(1)
Conduction Uncertainty	:	150kHz~30MHz	±1.63dB	(1)
Power disturbance	:	30MHz~300MHz	±1.60dB	(1)

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

1.7. Description of Test Modes

The EUT has been tested under operating condition.

This test was performed with EUT in X, Y, Z position and the worst case was found when EUT in Y position.

The following operating modes were applied for the related test items. All test modes were tested, only the result of the worst case was recorded in the report.

Modulation Type	Test Channel	Test Frequency (MHz)	Test Channel	Test Frequency (MHz)
Channel (A)	1	953.2	11	956.8
	6	954.7	14	957.7
	10	955.9	17	958.6

1.8. Frequency of Channels

Channel B

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	953.2	7	955.0	13	957.4
2	953.5	8	955.3	14	957.7
3	953.8	9	955.6	15	958.0
4	954.1	10	955.9	16	958.3
5	954.4	11	956.8	17	958.6
6	954.7	12	957.1		



2. TEST METHODOLOGY

All measurements contained in this report were conducted with ANSI C63.26-2015: American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services

The radiated testing was performed at an antenna-to-EUT distance of 3 meters. All radiated and conducted emissions measurement was performed at Shenzhen LCS Compliance Testing Laboratory Ltd.

2.1. EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

2.2. EUT Exercise

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.

According to its specifications, the EUT must comply with the requirements of the Section FCC Rules Part 74.

2.3. General Test Procedures

2.3.1 Power Line Conducted Emissions(N/A)

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 6.2.1 of ANSI C63.4-2014 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using Quasi-peak and average detector modes.

2.3.2 Radiated Emissions

Please refer to radiated spurious emission.



3. SYSTEM TEST CONFIGURATION

3.1. Justification

The system was configured for testing in a continuous transmits condition.

3.2. EUT Exercise Software

The system was configured for testing in a continuous transmits condition and transmission frequency by switch button control.

3.3. Special Accessories

N/A

3.4. Block Diagram/Schematics

Please refer to the related document

3.5. Equipment Modifications

Shenzhen LCS Compliance Testing Laboratory Ltd. has not done any modification on the EUT.

3.6. Test Setup

Please refer to the test setup photo.



4. SUMMARY OF TEST RESULTS

Applied Standard: FCC Part 74		
FCC Rules	Description of Test	Result
FCC Part 74.861(d)(1) FCC Part 2.1046	Maximum Conducted Output Power	Compliant
FCC Part 74.861 (c) FCC Part 2.1049	Occupied Bandwidth	Compliant
FCC Part 74.861(d)(4)(i) 2.1053	Transmitter unwanted emissions(radiated or conducted)	Compliant
FCC CFR 47 Part 2.1055	Frequency Stability	Compliant
FCC Part 2.1049 FCC Part 2.1047	Modulation characteristic	Compliant
FCC Part 74.861(d)(4)(i) FCC Part 2.1049	Necessary bandwidth (BN)	Compliant



5. TEST RESULT

5.1. Transmitter output power

5.1.1. Description and Limits:

§ 74.861

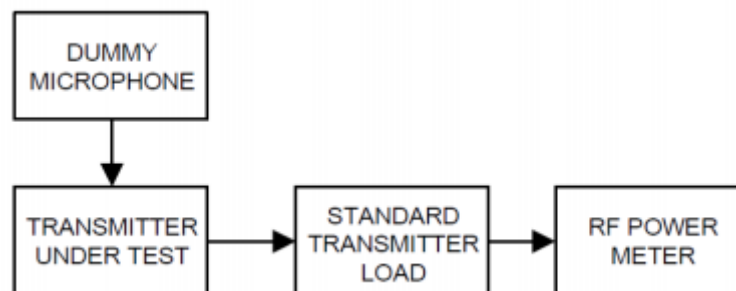
(a) Except as specified in paragraph (e) of this section, transmitter power is the power at the transmitter output terminals and delivered to the antenna, antenna transmission line, or any other impedance-matched, radio frequency load. For the purpose of this subpart, the transmitter power is the carrier power.

(d) For low power auxiliary stations operating in the bands other than those allocated for TV broadcasting, the following technical requirements are imposed.

(1) For all bands except the 1435-1525 MHz band, the maximum transmitter power which will be authorized is 1 watt. In the 1435-1525 MHz band, the maximum transmitter power which will be authorized is 250 milliwatts. Licensees may accept the manufacturer's power rating; however, it is the licensee's responsibility to observe specified power limits.

5.1.2. Measurement: ANSI C63.26

Test Setup Diagram:



5.1.3. Test result:

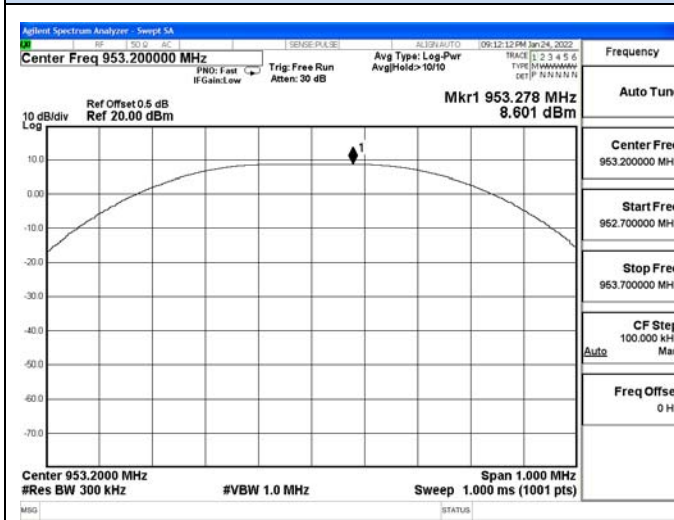
The EUT was programmed to be in continuously transmitting mode.



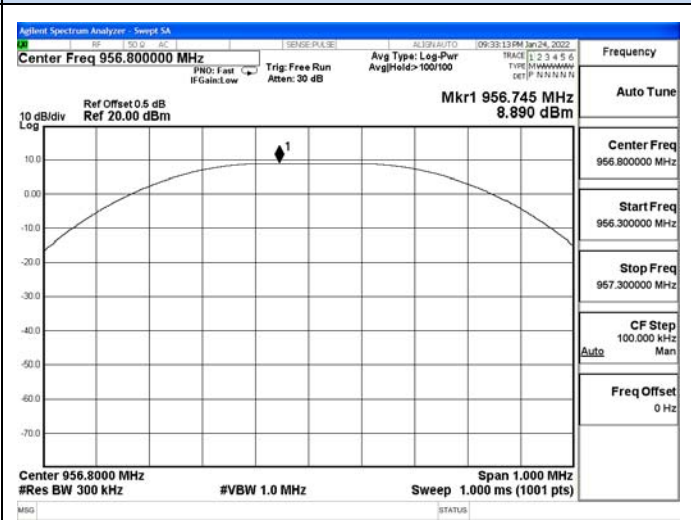
5.1.4. Test result

Test Mode	Channel	Frequency (MHz)	Measured Maximum Peak Power(dBm)	Measured Maximum Average Power(dBm)	Limits (dBm)	Verdict
GFSK(B)	1	953.2	8.601	/	30	PASS
	6	954.7	8.538	/		
	10	955.9	8.821	/		
	11	956.8	8.890	/	30	PASS
	14	957.7	8.949	/		
	17	958.6	8.658	/		

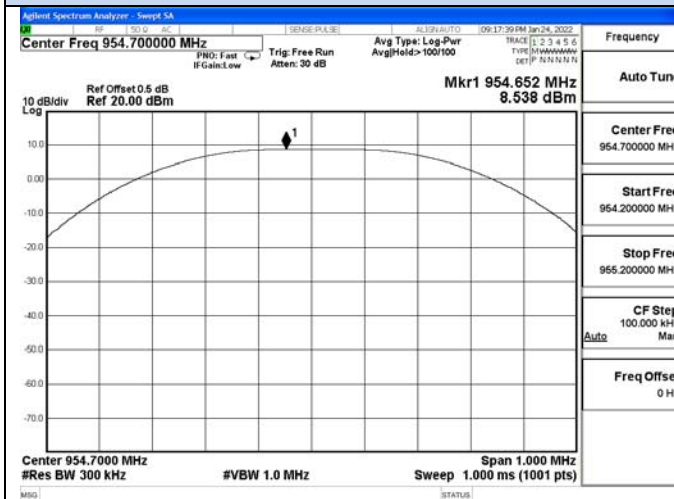
Maximum Peak Output Power



Maximum Peak Output Power

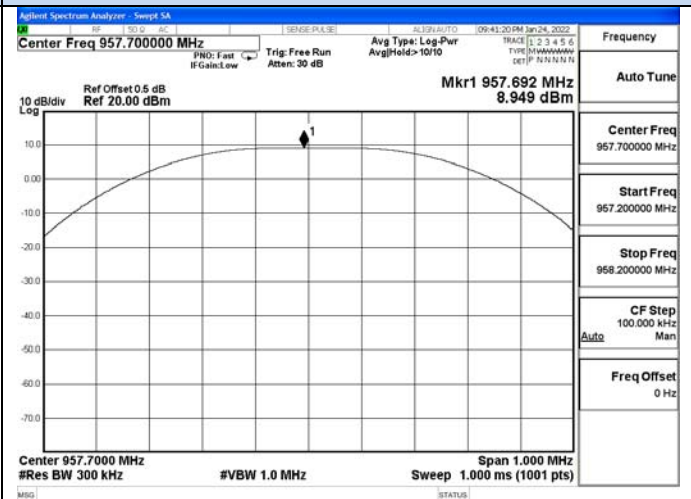


Channel 1 / 953.2 MHz

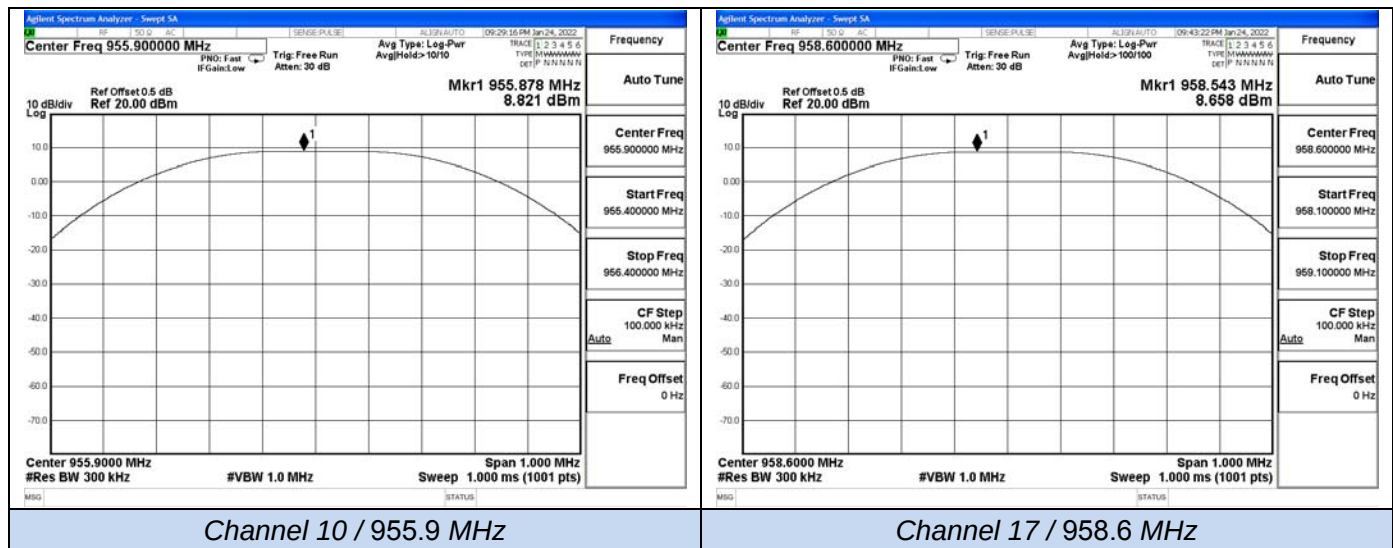


Channel 6 / 954.7 MHz

Channel 11 / 956.8 MHz



Channel 14 / 957.7 MHz





5.2. Occupied bandwidth and Emission Mask

5.2.1. Description:

§ 74.861

(c) Low power auxiliary transmitters not required to operate on specific carrier frequencies shall operate sufficiently within the authorized frequency band edges to insure the emission bandwidth falls entirely within the authorized band.

5.2.2. Measurement:

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

5.2.3. Result:

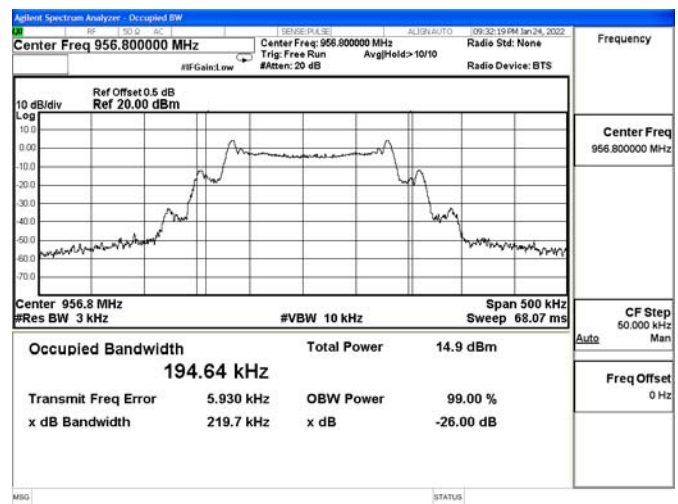
Channel	Frequency (MHz)	99% Bandwidth (KHz)	Lower Edge (MHz)	Upper Edge (MHz)	Limit (MHz)	Verdict
1	953.2	194.55	953.103	953.297	952.85~956.25	Pass
6	954.7	194.23	954.603	954.797	952.85~956.25	Pass
10	955.9	197.89	955.801	955.999	952.85~956.25	Pass
11	956.8	194.64	956.703	956.897	956.45~959.85	Pass
14	957.7	197.62	957.601	957.799	956.45~959.85	Pass
17	958.6	195.85	958.502	958.698	956.45~959.85	Pass



99% Bandwidth



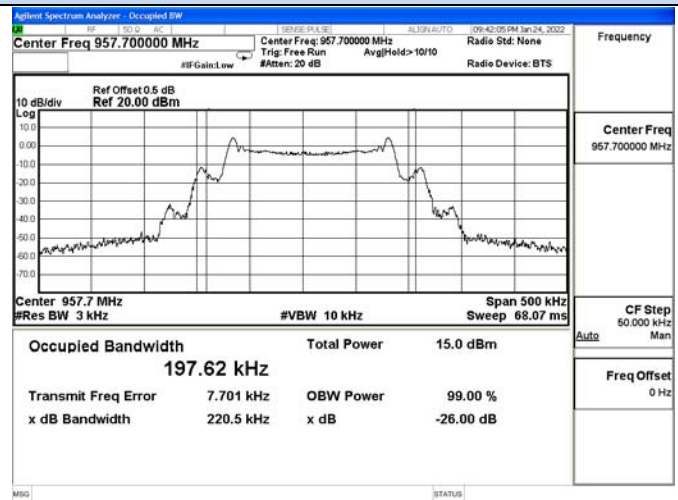
99% Bandwidth



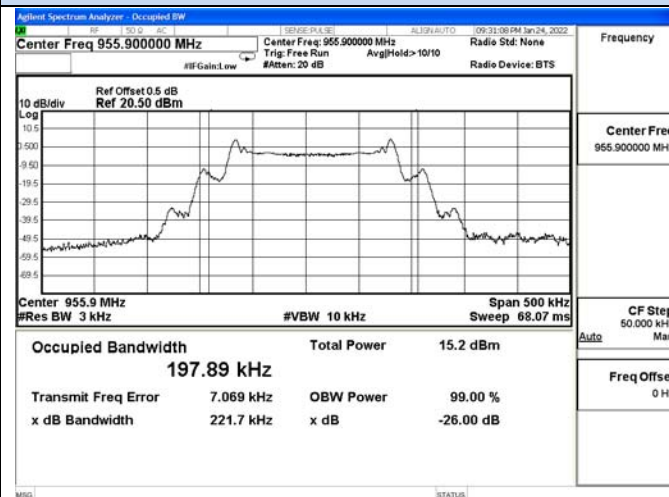
Channel 1 / 953.2 MHz



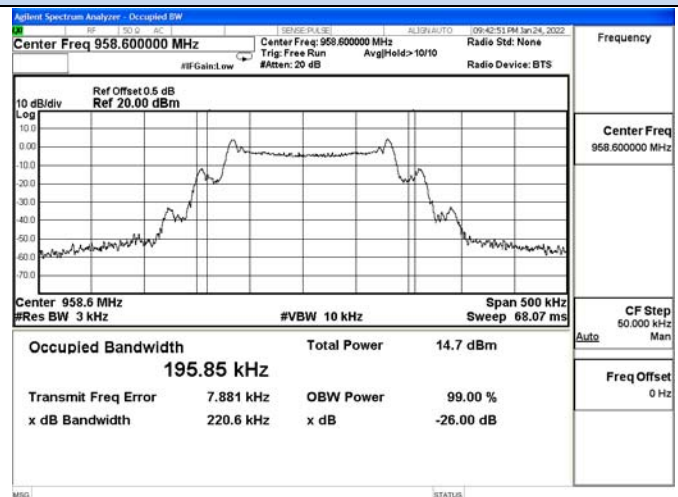
Channel 11 / 956.8 MHz



Channel 6 / 954.7 MHz



Channel 14 / 957.7 MHz



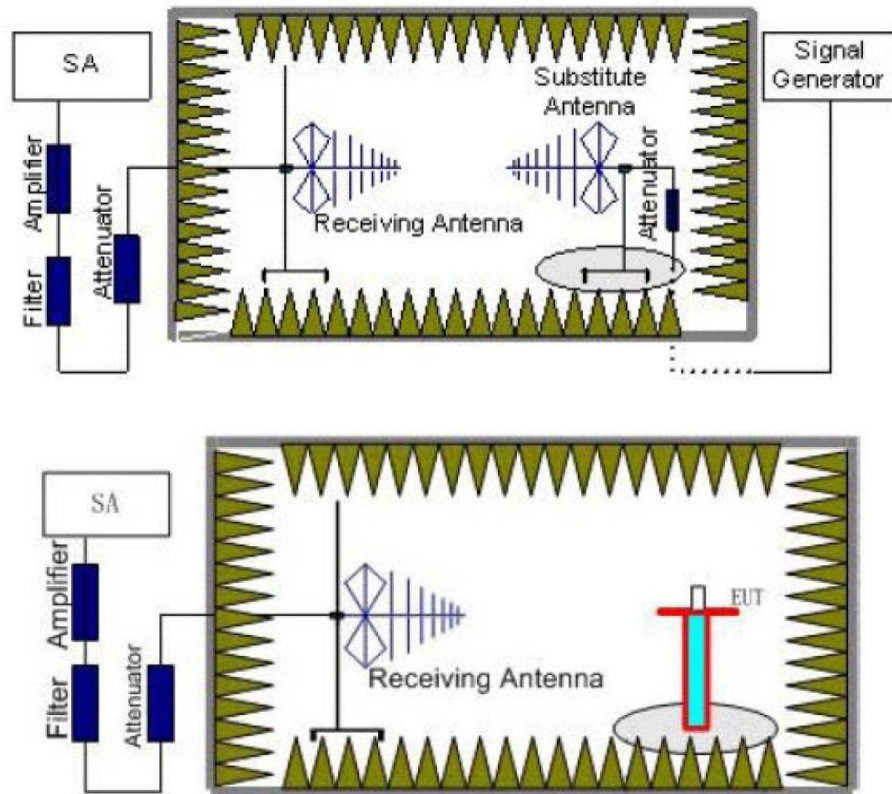
Channel 10 / 955.9 MHz

Channel 17 / 958.6 MHz

5.3. Radiated Field Strength of Spurious Emissions

5.3.1. Measurement description:

TEST CONFIGURATION



TEST PROCEDURE

1. EUT was placed on a 1.50 meter 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 m. 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 (P_{Mea}) 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 (P_{Mea}) 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 (P_{cl}), the Substitution Antenna Gain (G_a) and the Amplifier Gain (P_{Ag}) should be recorded after test.

The measurement results are obtained as described below:

$$\text{Power(EIRP)} = P_{\text{Mea}} - P_{\text{Ag}} - P_{\text{cl}} + G_a$$

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, $\text{ERP} = \text{EIRP} - 2.15\text{dBi}$.
8. In order to make sure test results more clearly, we set frequency range and sweep time for difference frequency range as follows table:

TEST LIMITS

FCC & IC (according to ETSI EN 300 422-1 V2.1.2 (2017-01))			
State	Max. spurious level		
	47 MHz to 74 MHz 87.5 MHz to 118 MHz 174 MHz to 230 MHz 470 MHz to 862	Other frequencies ≤ 1000 MHz	All frequencies > 1000 MHz
Operating	4.0 nW	250 nW	1.00 μW
Standby	2.0 nW	2.0 nW	20.0 nW

FCC & IC	
The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the following schedule:	
On any frequency removed from the operating frequency by more than 50 percent up to and including 100 percent of the	25 dB
On any frequency removed from the operating frequency by more than 100 percent up to and including 250 percent of	35 dB
On any frequency removed from the operating frequency by more than 250 percent of the authorized bandwidth: at least	$43 + 10\log_{10}$ (mean output power in watts) dB

5.3.2. Results for Radiated Emissions



Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Det.	Polarization
Channel 1 / 953.2 MHz							
69.4535	-77.32	-5.94	-83.26	-53.98	-29.28	PK	H
113.2739	-74.80	-5.83	-80.63	-53.98	-26.65	PK	H
312.0732	-73.81	-3.06	-76.87	-36.02	-40.85	PK	H
402.8677	-75.21	-3.26	-78.47	-36.02	-42.45	PK	H
471.8413	-74.35	-2.60	-76.95	-53.98	-22.97	PK	H
933.7814	-74.31	-1.41	-75.72	-36.02	-39.70	PK	H
1906.400	-52.67	-5.73	-58.40	-30.00	-28.40	PK	H
2859.600	-56.09	-3.11	-59.20	-30.00	-29.20	PK	H
3145.261	-53.96	-2.18	-56.14	-30.00	-26.14	PK	H
3843.307	-54.64	-2.00	-56.65	-30.00	-26.65	PK	H
4738.720	-53.73	-2.08	-55.81	-30.00	-25.81	PK	H
5961.206	-53.53	-0.85	-54.38	-30.00	-24.38	PK	H

Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Det.	Polarization
Channel 1 / 53.2 MHz							
60.9678	-77.73	-5.83	-83.55	-53.98	-29.57	PK	V
99.4078	-75.09	-6.05	-81.13	-53.98	-27.15	PK	V
332.2740	-74.31	-3.00	-77.31	-36.02	-41.29	PK	V
409.1613	-75.45	-3.16	-78.61	-36.02	-42.59	PK	V
741.6343	-72.43	-2.61	-75.04	-53.98	-21.06	PK	V
931.5119	-73.38	-1.41	-74.79	-36.02	-38.77	PK	V
1906.400	-52.26	-5.73	-57.99	-30.00	-27.99	PK	V
2859.600	-54.80	-3.03	-57.83	-30.00	-27.83	PK	V
2752.186	-54.20	-2.22	-56.43	-30.00	-26.43	PK	V
3729.390	-54.01	-2.03	-56.04	-30.00	-26.04	PK	V
4944.972	-51.99	-2.03	-54.02	-30.00	-24.02	PK	V
5952.248	-52.70	-0.85	-53.54	-30.00	-23.54	PK	V

Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Det.	Polarization
Channel 6 / 54.7 MHz							
67.4819	-77.42	-5.96	-83.38	-53.98	-29.40	PK	H
126.8760	-76.59	-5.98	-82.56	-53.98	-28.58	PK	H
271.0941	-75.83	-2.82	-78.64	-36.02	-42.62	PK	H
402.1931	-74.06	-3.03	-77.09	-36.02	-41.07	PK	H
511.8210	-73.15	-2.56	-75.71	-53.98	-21.73	PK	H
905.8238	-74.81	-1.41	-76.23	-36.02	-40.21	PK	H
1909.400	-51.10	-5.72	-56.82	-30.00	-26.82	PK	H
2864.100	-55.15	-3.10	-58.25	-30.00	-28.25	PK	H
3415.258	-52.36	-2.17	-54.53	-30.00	-24.53	PK	H
3654.739	-54.31	-2.05	-56.35	-30.00	-26.35	PK	H
4795.516	-52.76	-2.06	-54.82	-30.00	-24.82	PK	H
5718.280	-53.41	-0.85	-54.25	-30.00	-24.25	PK	H



Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Det.	Polarization
Channel 6 / 954.7 MHz							
72.2165	-77.92	-5.87	-83.79	-53.98	-29.81	PK	V
129.4794	-75.35	-6.01	-81.36	-53.98	-27.38	PK	V
310.2751	-74.01	-2.79	-76.80	-36.02	-40.78	PK	V
387.7805	-75.48	-3.02	-78.51	-36.02	-42.49	PK	V
806.8042	-72.70	-2.64	-75.34	-53.98	-21.36	PK	V
942.1703	-74.43	-1.59	-76.02	-36.02	-40.00	PK	V
1909.400	-52.33	-5.71	-58.03	-30.00	-28.03	PK	V
2864.100	-55.98	-3.03	-59.01	-30.00	-29.01	PK	V
2908.184	-53.84	-2.25	-56.09	-30.00	-26.09	PK	V
3690.556	-53.79	-2.06	-55.85	-30.00	-25.85	PK	V
4699.909	-53.37	-2.10	-55.47	-30.00	-25.47	PK	V
5544.520	-53.90	-0.79	-54.68	-30.00	-24.68	PK	V

Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Det.	Polarization
Channel 10 / 955.9 MHz							
68.5011	-76.29	-6.03	-82.32	-53.98	-28.34	PK	H
103.0756	-76.59	-6.04	-82.63	-53.98	-28.65	PK	H
315.2893	-75.31	-2.92	-78.23	-36.02	-42.21	PK	H
421.0202	-73.84	-3.12	-76.96	-36.02	-40.94	PK	H
802.0878	-73.16	-2.57	-75.73	-53.98	-21.75	PK	H
874.6454	-73.62	-1.43	-75.05	-36.02	-39.03	PK	H
1911.800	-52.73	-5.68	-58.40	-30.00	-28.40	PK	H
2867.700	-55.32	-3.06	-58.38	-30.00	-28.38	PK	H
2466.673	-53.95	-2.24	-56.18	-30.00	-26.18	PK	H
3949.305	-55.09	-2.08	-57.18	-30.00	-27.18	PK	H
4867.271	-52.30	-2.02	-54.31	-30.00	-24.31	PK	H
5694.657	-52.32	-0.80	-53.12	-30.00	-23.12	PK	H

Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Det.	Polarization
Channel 10 / 955.9 MHz							
63.8488	-78.04	-5.90	-83.93	-53.98	-29.95	PK	V
128.3281	-76.22	-5.79	-82.01	-53.98	-28.03	PK	V
270.7403	-73.89	-2.96	-76.85	-36.02	-40.83	PK	V
451.8297	-74.81	-3.28	-78.09	-36.02	-42.07	PK	V
522.5229	-73.18	-2.57	-75.75	-53.98	-21.77	PK	V
950.6780	-74.79	-1.45	-76.24	-36.02	-40.22	PK	V
1911.800	-51.98	-5.71	-57.69	-30.00	-27.69	PK	V
2867.700	-56.12	-3.03	-59.16	-30.00	-29.16	PK	V
3234.085	-52.93	-2.23	-55.17	-30.00	-25.17	PK	V
3834.574	-54.76	-2.09	-56.84	-30.00	-26.84	PK	V
4602.952	-53.08	-2.09	-55.17	-30.00	-25.17	PK	V
5718.397	-53.50	-0.83	-54.33	-30.00	-24.33	PK	V



Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Det.	Polarization
Channel 11 / 956.8 MHz							
67.5283	-76.32	-6.05	-82.37	-53.98	-28.39	PK	H
125.3994	-76.92	-5.89	-82.81	-53.98	-28.83	PK	H
337.7665	-75.41	-2.88	-78.29	-36.02	-42.27	PK	H
439.9579	-74.79	-3.20	-77.99	-36.02	-41.97	PK	H
747.8210	-74.17	-2.40	-76.57	-53.98	-22.59	PK	H
927.2631	-73.27	-1.50	-74.77	-36.02	-38.75	PK	H
1913.600	-52.21	-5.77	-57.98	-30.00	-27.98	PK	H
2870.400	-55.56	-3.11	-58.67	-30.00	-28.67	PK	H
3346.132	-52.85	-2.26	-55.11	-30.00	-25.11	PK	H
3701.268	-53.56	-2.06	-55.62	-30.00	-25.62	PK	H
4579.982	-52.02	-2.06	-54.07	-30.00	-24.07	PK	H
5585.222	-52.53	-0.85	-53.38	-30.00	-23.38	PK	H

Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Det.	Polarization
Channel 1 / 956.8 MHz							
50.6007	-77.88	-5.80	-83.68	-53.98	-29.70	PK	V
136.5799	-75.39	-6.04	-81.44	-53.98	-27.46	PK	V
332.4004	-74.42	-2.99	-77.41	-36.02	-41.39	PK	V
373.1028	-74.12	-3.18	-77.30	-36.02	-41.28	PK	V
542.9825	-72.69	-2.64	-75.34	-53.98	-21.36	PK	V
909.3039	-73.04	-1.63	-74.67	-36.02	-38.65	PK	V
1913.600	-51.50	-5.69	-57.19	-30.00	-27.19	PK	V
2870.400	-54.31	-3.11	-57.42	-30.00	-27.42	PK	V
2684.031	-52.51	-2.20	-54.71	-30.00	-24.71	PK	V
3882.875	-55.01	-2.04	-57.06	-30.00	-27.06	PK	V
4478.473	-53.94	-2.10	-56.04	-30.00	-26.04	PK	V
5928.816	-53.31	-0.85	-54.16	-30.00	-24.16	PK	V

Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Det.	Polarization
Channel 14 / 957.7 MHz							
50.8527	-76.80	-5.95	-82.76	-53.98	-28.78	PK	H
126.6196	-75.69	-6.07	-81.76	-53.98	-27.78	PK	H
302.9638	-73.78	-3.06	-76.84	-36.02	-40.82	PK	H
437.5272	-74.73	-3.05	-77.78	-36.02	-41.76	PK	H
742.7562	-74.41	-2.43	-76.84	-53.98	-22.86	PK	H
938.3783	-72.84	-1.57	-74.40	-36.02	-38.38	PK	H
1915.400	-51.63	-5.67	-57.29	-30.00	-27.29	PK	H
2873.100	-54.40	-3.03	-57.43	-30.00	-27.43	PK	H
2718.597	-53.58	-2.19	-55.78	-30.00	-25.78	PK	H
3980.411	-53.67	-2.02	-55.69	-30.00	-25.69	PK	H
4988.071	-52.90	-2.06	-54.96	-30.00	-24.96	PK	H
5811.003	-52.95	-0.82	-53.77	-30.00	-23.77	PK	H



Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Det.	Polarization
Channel 14 / 957.7 MHz							
67.9152	-78.26	-5.79	-84.05	-53.98	-30.07	PK	V
105.4716	-74.81	-6.07	-80.89	-53.98	-26.91	PK	V
347.5204	-75.76	-2.88	-78.64	-36.02	-42.62	PK	V
395.7737	-74.06	-3.15	-77.21	-36.02	-41.19	PK	V
727.6883	-73.56	-2.46	-76.02	-53.98	-22.04	PK	V
868.3249	-74.72	-1.59	-76.31	-36.02	-40.29	PK	V
1915.400	-52.07	-5.67	-57.74	-30.00	-27.74	PK	V
2873.100	-54.14	-3.04	-57.19	-30.00	-27.19	PK	V
3438.100	-53.91	-2.16	-56.08	-30.00	-26.08	PK	V
3937.519	-54.80	-2.10	-56.90	-30.00	-26.90	PK	V
4549.757	-52.03	-2.02	-54.05	-30.00	-24.05	PK	V
5613.950	-53.62	-0.77	-54.39	-30.00	-24.39	PK	V

Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Det.	Polarization
Channel 17 / 958.6 MHz							
54.6997	-78.04	-5.79	-83.83	-53.98	-29.85	PK	H
123.1778	-76.30	-5.93	-82.23	-53.98	-28.25	PK	H
240.0187	-74.79	-2.88	-77.67	-36.02	-41.65	PK	H
380.6773	-74.54	-3.15	-77.69	-36.02	-41.67	PK	H
477.6764	-72.72	-2.57	-75.30	-53.98	-21.32	PK	H
875.9329	-73.82	-1.39	-75.21	-36.02	-39.19	PK	H
1917.200	-53.01	-5.69	-58.70	-30.00	-28.70	PK	H
2875.800	-55.61	-3.06	-58.67	-30.00	-28.67	PK	H
2999.280	-53.85	-2.25	-56.10	-30.00	-26.10	PK	H
3866.750	-55.11	-2.06	-57.17	-30.00	-27.17	PK	H
4740.645	-53.66	-2.03	-55.70	-30.00	-25.70	PK	H
5726.657	-53.30	-0.82	-54.11	-30.00	-24.11	PK	H

Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Det.	Polarization
Channel 17 / 958.6 MHz							
64.4117	-76.50	-6.09	-82.59	-53.98	-28.61	PK	V
131.5497	-76.69	-5.79	-82.48	-53.98	-28.50	PK	V
269.8187	-75.48	-2.80	-78.28	-36.02	-42.26	PK	V
397.6484	-75.38	-3.13	-78.51	-36.02	-42.49	PK	V
647.1864	-73.34	-2.50	-75.83	-53.98	-21.85	PK	V
942.3289	-73.24	-1.69	-74.93	-36.02	-38.91	PK	V
1917.200	-52.12	-5.72	-57.84	-30.00	-27.84	PK	V
2875.800	-55.97	-3.09	-59.06	-30.00	-29.06	PK	V
2895.487	-52.82	-2.21	-55.02	-30.00	-25.02	PK	V
3809.732	-53.51	-2.05	-55.56	-30.00	-25.56	PK	V
4940.222	-52.99	-2.02	-55.01	-30.00	-25.01	PK	V
5685.375	-52.61	-0.79	-53.40	-30.00	-23.40	PK	V

Note: 1, All detected emissions are more than 20 dB below the limit, In addition to main frequency.

2, Factor = Antenna Factor + Cable Loss + Amplifier Factor

3, Emission Level = Reading level + Factor Margin = Emission Level - Limit



5.5.Frequency Stability

Test Method:FCC CFR 47 Part 2.1055

Test Procedure:

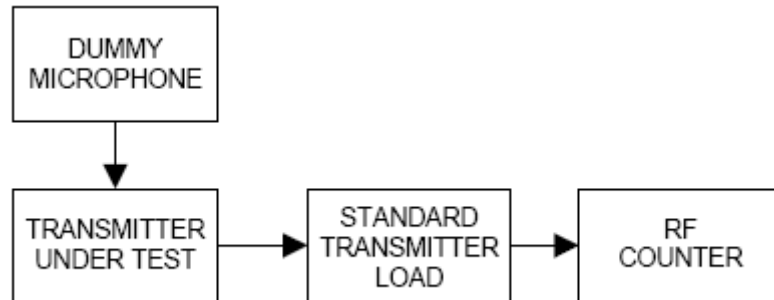
Frequency stability versus Environmental Temperature

The equipment under test was connected to an external DC power supply and the RF output was connected to a frequency counter via feed through attenuators.

The EUT was placed inside the temperature chamber. After the temperature stabilized for approximately 20 minutes, the frequency of the output signal was recorded from the counter.

Frequency Stability versus Input Voltage

At room temperature ($25 \pm 5^{\circ}\text{C}$), an external variable DC power supply was connected to the EUT. The frequency of the transmitter was measured for 115%, 100% and 85% of the nominal operating input voltage. For hand carried, battery powered equipment, reduce primary supply voltage to the battery operating end point which shall be specified by the manufacturer.





Test Result:

Assigned Frequency: 953.2 MHz		
Environment Temperature (°C)	Power Supplied (Vdc)	Measurement results
50	3.7	+2.92
40	3.7	+2.12
30	3.7	+2.64
20	3.7	+2.61
10	3.7	+2.41
0	3.7	+2.57
-10	3.7	+2.93
-20	3.7	+2.69
-30	3.7	+2.13
Environment Temperature (°C)	Power Supplied (Vdc)	Measurement results
25	3.7	+2.08
25	3.3	+2.28
25	4.2	+2.65

Assigned Frequency: 954.7 MHz		
Environment Temperature (°C)	Power Supplied (Vdc)	Measurement results
50	3.7	+2.26
40	3.7	+2.19
30	3.7	+2.69
20	3.7	+2.91
10	3.7	+2.65
0	3.7	+2.04
-10	3.7	+2.21
-20	3.7	+2.55
-30	3.7	+2.09
Environment Temperature (°C)	Power Supplied (Vdc)	Measurement results
25	3.7	+2.07
25	3.3	+2.08
25	4.2	+2.24



Assigned Frequency: 955.9 MHz		
Environment Temperature (°C)	Power Supplied (Vdc)	Measurement results
50	3.7	+2.69
40	3.7	+2.20
30	3.7	+2.53
20	3.7	+2.86
10	3.7	+2.31
0	3.7	+2.94
-10	3.7	+2.15
-20	3.7	+2.71
-30	3.7	+2.29
Environment Temperature (°C)	Power Supplied (Vdc)	Measurement results
25	3.7	+2.48
25	3.3	+2.83
25	4.2	+2.04

Assigned Frequency: 956.8 MHz		
Environment Temperature (°C)	Power Supplied (Vdc)	Measurement results
50	3.7	+2.92
40	3.7	+2.15
30	3.7	+2.53
20	3.7	+2.52
10	3.7	+2.33
0	3.7	+2.52
-10	3.7	+2.94
-20	3.7	+2.70
-30	3.7	+2.04
Environment Temperature (°C)	Power Supplied (Vdc)	Measurement results
25	3.7	+2.05
25	3.3	+2.33
25	4.2	+2.52



Assigned Frequency: 957.7 MHz		
Environment Temperature (°C)	Power Supplied (Vdc)	Measurement results
50	3.7	+2.31
40	3.7	+2.18
30	3.7	+2.65
20	3.7	+2.81
10	3.7	+2.77
0	3.7	+2.10
-10	3.7	+2.18
-20	3.7	+2.58
-30	3.7	+2.11
Environment Temperature (°C)	Power Supplied (Vdc)	Measurement results
25	3.7	+2.14
25	3.3	+2.05
25	4.2	+2.25

Assigned Frequency: 958.6 MHz		
Environment Temperature (°C)	Power Supplied (Vdc)	Measurement results
50	3.7	+2.72
40	3.7	+2.15
30	3.7	+2.59
20	3.7	+2.86
10	3.7	+2.36
0	3.7	+2.93
-10	3.7	+2.18
-20	3.7	+2.77
-30	3.7	+2.33
Environment Temperature (°C)	Power Supplied (Vdc)	Measurement results
25	3.7	+2.53
25	3.3	+2.79
25	4.2	+2.02

Battery end point: 3.7 Vdc

The results: The unit does meet the FCC requirements.



5.6.Modulation Characteristics

Test Method:FCC CFR 47 Part 2.1047 & TIA/EIA 603 E 2016:Land Mobile $\pi/4$ -DQPSK or PM Communications Equipment Measurement and Performance Standards

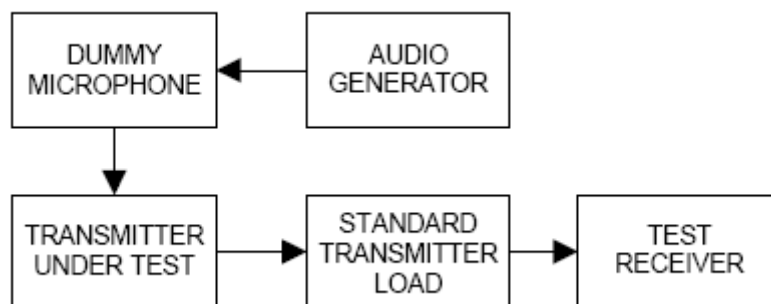
Requirements:

Test Procedure:

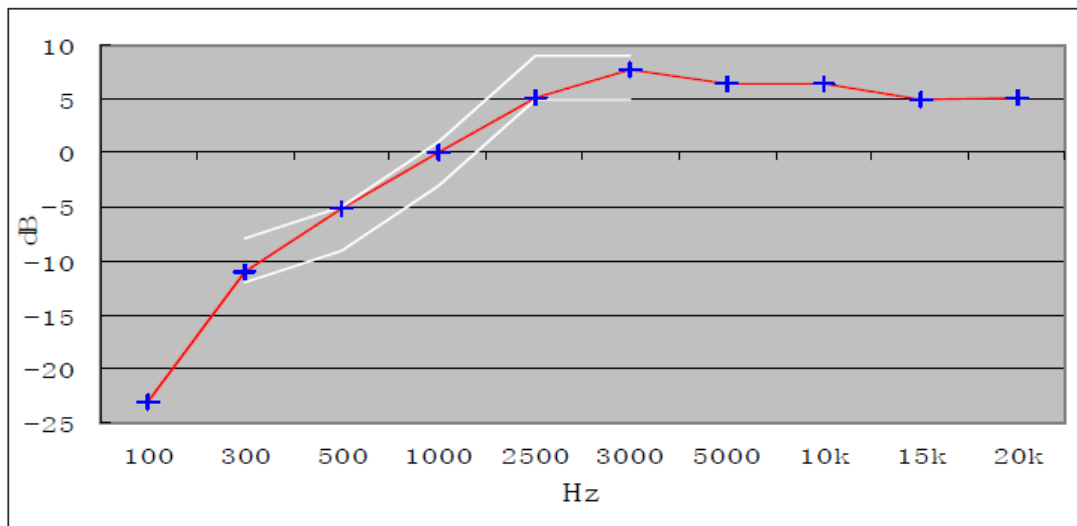
Audio Frequency Response

The RF output of the transceiver was connected to the input of FSP 30 with FM deviation module through sufficient attenuation so as not to overload the meter or distort the reading. An audio signal generator was connected to the audio input of microphone.

The audio signal input level was adjusted to obtain 20% of the maximum rated system deviation at 1 kHz, and recorded as DEV REF . With the audio signal generator level unchanged, set the generator frequency between 100 to 5000 Hz. The transmitter deviations (DEV FREQ) were measured and the audio frequency response was calculated as $20\log_{10} [\text{DEV FREQ} / \text{DEV REF}]$



The plot(s) of Audio Frequency Response is presented hereinafter as reference.



0dB=10mV at 1kHz (20% of the maximum rated system deviation).

Modulation Limiting

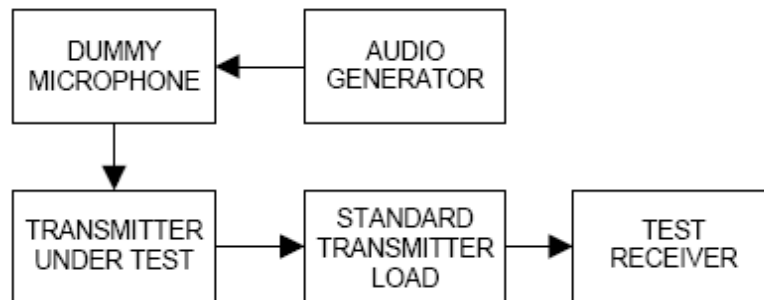
- Adjust the transmitter per the manufacturer's procedure for full rated system deviation.
- Set the test receiver to measure peak positive deviation. Set the audio bandwidth for ≤ 0.25 Hz to $\geq 15,000$ Hz. Turn the de-emphasis function off.
- Apply a **1000 Hz** modulating signal to the transmitter from the audio



frequency generator, and adjust the level to obtain **60% of full rated system deviation**.

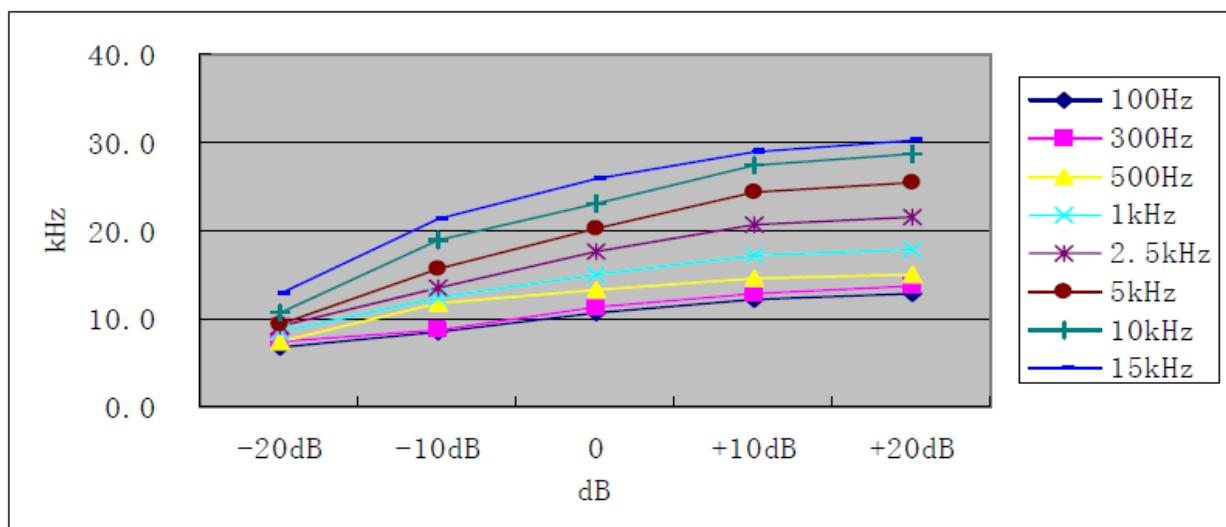
- d) Increase the level from the audio frequency generator by 20 dB in one step (rise time between the 10% and 90% points shall be 0.1 second maximum).
- e) Measure both the instantaneous and steady-state deviation at and after the time of increasing the audio input level.

With the level from the audio frequency generator held constant at the level obtained in step e), slowly vary the audio frequency from 100 to 15k Hz and observe the steady-state deviation. Record the maximum deviation.



Test at five different modulating frequencies (100Hz, 300Hz, 500Hz, 1kHz, 2.5kHz, 5kHz, 10kHz, 15kHz), the output level of the audio generator was varied up to 1V and the FM deviation level was recorded.

Positive peak deviation



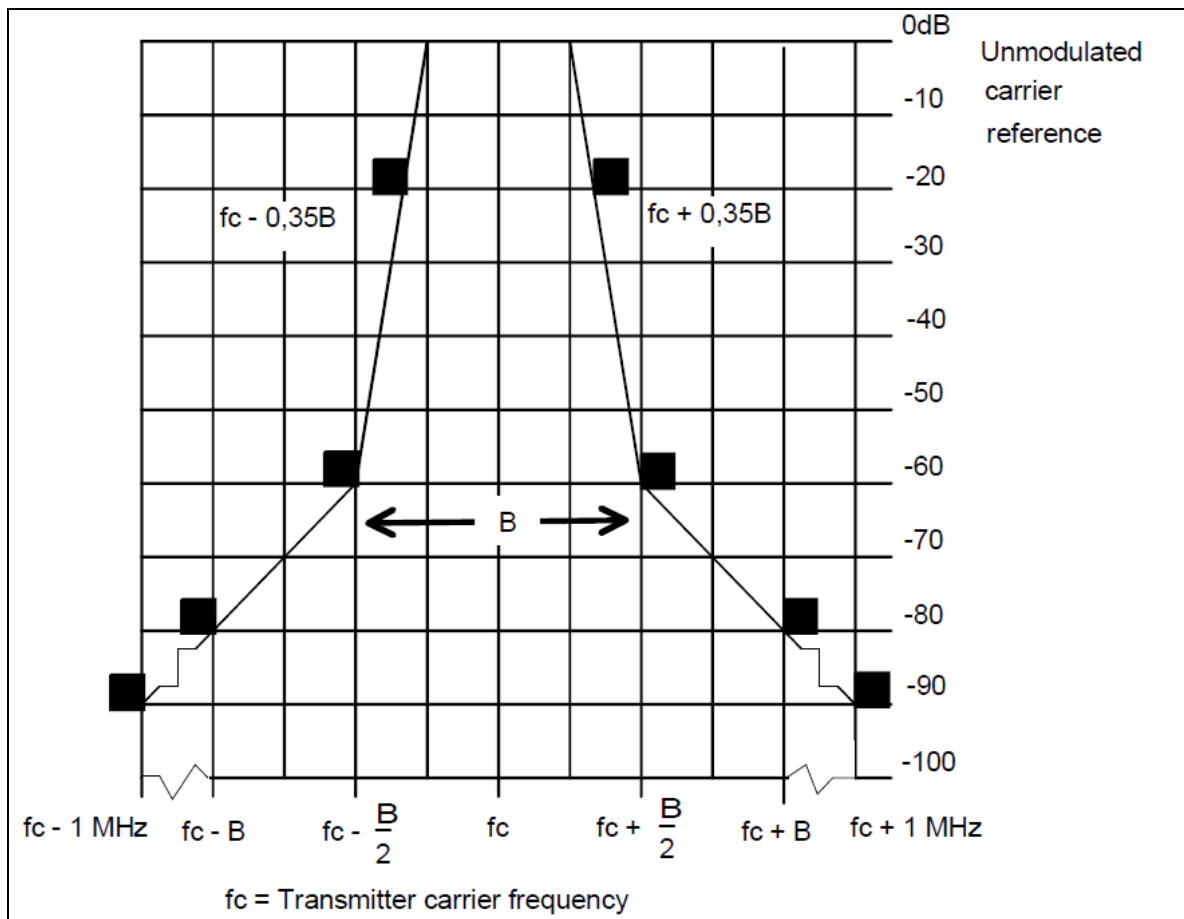


5.7.Necessary bandwidth (BN)

5.7.1.Measurement:

Measurement parameter	
Detector:	Peak - Quasi Peak / Average
Sweep time:	Auto
Resolution bandwidth:	1 kHz
Video bandwidth:	1 kHz
Span:	Fc-1MHz to fc+1MHz(2MHz)
Trace mode:	Max Hold

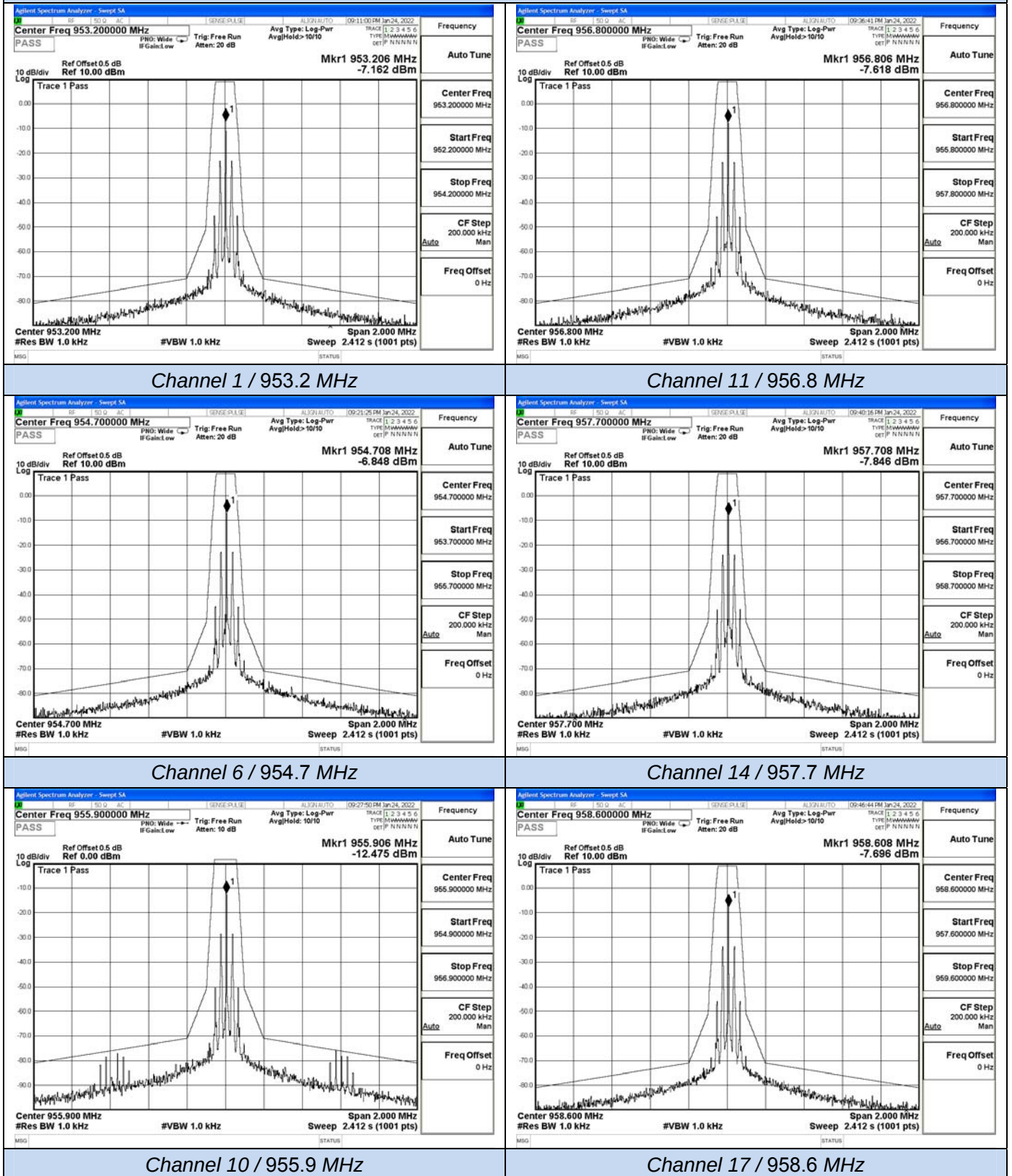
5.7.2.Limits:





5.7.3. Results:

Necessary bandwidth





6. LIST OF MEASURING EQUIPMENTS

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	MXA Signal Analyzer	Agilent	N9020A	MY49100060	2021-11-16	2022-11-15
2	DC Power Supply	Agilent	E3642A	N/A	2021-11-25	2022-11-24
3	Temperature & Humidity Chamber	GUANGZHOU GOGNWEN	GDS-100	70932	2021-10-07	2022-10-06
4	EMI Test Software	AUDIX	E3	/	N/A	N/A
5	3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	2021-06-21	2022-06-20
6	Positioning Controller	MF	MF7082	MF78020803	2021-06-21	2022-06-20
7	Active Loop Antenna	SCHWARZBECK	FMZB 1519B	00005	2021-07-25	2024-07-24
8	By-log Antenna	SCHWARZBECK	VULB9163	9163-470	2021-07-25	2024-07-24
9	Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-1925	2021-07-01	2024-06-30
10	EMI Test Receiver	R&S	ESR 7	101181	2021-06-21	2022-06-20
11	RS SPECTRUM ANALYZER	R&S	FSP40	100503	2021-11-16	2022-11-15
12	Broadband Preamplifier	/	BP-01M18G	P190501	2021-06-21	2022-06-20
13	EMI Test Receiver	R&S	ESPI	101840	2021-06-21	2022-06-20
14	Artificial Mains	R&S	ENV216	101288	2021-06-21	2022-06-20
15	10dB Attenuator	SCHWARZBECK	MTS-IMP-136	261115-001-0032	2021-06-21	2022-06-20
16	EMI Test Software	Farad	EZ	/	N/A	N/A



7. TEST SETUP PHOTOGRAPHS OF EUT

Please refer to separated files for Test Setup Photos of the EUT.

8. EXTERIOR PHOTOGRAPHS OF THE EUT

Please refer to separated files for External Photos of the EUT.

9. INTERIOR PHOTOGRAPHS OF THE EUT

Please refer to separated files for Internal Photos of the EUT.

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