S T S L A B

FCC TEST REPORT

Report No: STS1702140F01

Issued for

GuangZhou XinMai Electronics CO.,LTD

3 Floor, B Building,10 Number Nan bang sheng two road
Jinghu Street, Hua du district Guangzhou City, China

Product Name:	W-07-FS
Brand Name:	N/A
Model Name:	W-07-FS
Series Model:	W-8529D, W-8506D, W-8229D, W-8629D, W-8606D
FCC ID:	2ALVWW-07-FS
Test Standard:	FCC Part 74 Rules

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TEST RESULT CERTIFICATION

Applicant's name..... GuangZhou XinMai Electronics CO.,LTD

Address ..... 3 Floor, B Building,10 Number Nan bang sheng two road Jinghu Street, Hua du district Guangzhou City, China

Manufacture's Name ..... GuangZhou XinMai Electronics CO.,LTD

Address ..... 3 Floor, B Building,10 Number Nan bang sheng two road Jinghu Street, Hua du district Guangzhou City, China

Product description

Product name W-07-FS

Brand name ..... N/A

Model and/or type reference W-07-FS

Series Model W-8529D, W-8506D, W-8229D, W-8629D, W-8606D

Standards ..... FCC Part 74 Rules

Test procedure..... TIA/EIA 603

This device described above has been tested by BZT, 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 of performance of tests..... 27 Feb. 2017 ~14 Mar. 2017

Date of Issue ..... 14 Mar. 2017

Test Result..... Pass

Testing Engineer : (Sean she)

Technical Manager : (Tony liu)

Authorized Signatory : (Vita Li)

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Revision History

Rev.	Issue Date	Report NO.	Effect Page	Contents
00	14 Mar. 2017	STS1702140F01	ALL	Initial Issue

1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:
The EUT has been tested according to FCC CFR 47:
Part 2: Frequency Allocations and Radio Treaty Matters: General Rules and Regulations (10-1-05 Edition)
Part 74: Experimental Radio, Auxiliary, Special Broadcast and other program distributional services

Emission			
Standard	Item	Limit	Result
FCC 2.1053; 74.861(e)(b)	Radiated Spurious Emission	Refer to 74.861e(6)	PASS
FCC 2.1046 (a), 74.861(e)(1)	RF Output Power	250 mW	PASS
FCC 2.1047 (b), 74.861(e)(3)	Modulation Deviation	Refer to 74.861e(2)	PASS
FCC 2.1047 (a)	Audio Frequency Response	Refer to 2.1047(a)	PASS
FCC 74.861 (e)(5)	Occupied Bandwidth	< 200 KHz	PASS
FCC 74.861 (e)(6)(i) (ii); FCC 2.1049	Emission Mask	Refer to 74.861e(6)	PASS
2.1055(b); 74.861 e(4)	Frequency Stability vs. Temperature	Refer to 74.861e(4)	PASS
2.1055(a)(1); 74.861 e(4)	Frequency Stability vs. Voltage	Refer to 74.861e(4)	PASS

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

1.1 TEST FACTORY

BZT Testing Technology Co., Ltd
Add. : Buliding 17,Xinghua Road Xingwei industrial Park Fuyong,Baoan District,Shenzhen, Guangdong,China
FCC Registration No.: 701733

1.2 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	RF power,conducted	±0.70dB
2	Spurious emissions,conducted	±1.19dB
3	Spurious emissions,radiated((>1G)	±2.83dB
4	Spurious emissions,radiated(<1G)	±3.01dB
5	Temperature	±0.5°C
6	Humidity	±2%

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product:	W-07-FS
Brand Name:	N/A
Model Number:	W-07-FS
Series Model Name:	W-8529D, W-8506D, W-8229D, W-8629D, W-8606D
Series Model Difference description:	Only different in model name
Emission Bandwidth:	73.282KHz
Battery	Rated Voltage: 1.5*2V
Operation Frequency Range	202.75 MHz
Maximum Transmitter Power:	0.001029W(0.123dBm)
Modulation mode / type:	FM
Frequency Tolerance	0.001044%
Temperature Range:	-30℃-50℃
Test frequency	202.75 MHz
Software version number	V4.0
Hardware version number	V4.0

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
2. Note: The product has the same digital working characters when operating in both two digitized voice/data mode. So only one set of test results for digital modulation modes are provided in this test report.
3. Please refer to Appendix B for the photographs of the EUT. For more details, please refer to the User's manual of the EUT.
4. Table for Filed Antenna

Ant	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
1	N/A	W-07-FS	Internal Antenna	N/A	5	Antenna

The EUT antenna is Dipole Antenna. no antenna other than that furnished by the responsible party shall be used with the device.

Note:
In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test,please see the above listed frequency for testing.

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.

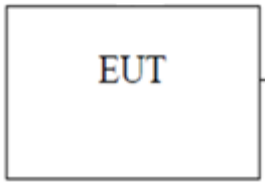
Pretest Mode	Description
Engineering mode	Keep the EUT in continuous transmitting by select channel and modulations

Note:

(1) Due to the different configuration and test, in this list only showe worse mode. The worst test data of the worse modeis reported by this report.

New battery is used during all test

2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



2.4 DESCRIPTION OF SUPPORT UNITS

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	Mfr/Brand	Model/Type No.	Series No.	Note
E-1	W-07-FS	N/A	W-07-FS	N/A	EUT

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.

(3) “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core”.

2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

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.

2.6 TEST EQUIPMENT

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Signal Analyzer	Agilent	N9020A	MY49100060	2016.10.23	2017.10.22
Signal Generator	Agilent	N5182A	MY46240556	2016.10.23	2017.10.22
Audio Generator	TRONSON	TAG-101	20030212	2016.10.23	2017.10.22
Spectrum Analyzer	Agilent	E4407B	MY50140340	2016.10.23	2017.10.22
Test Receiver	R&S	ESCI	101427	2016.10.23	2017.10.22
Bilog Antenna	TESEQ	CBL6111D	34678	2014.11.24	2017.11.23
Horn Antenna	Schwarzbeck	BBHA 9120D(1201)	9120D-1343	2015.03.05	2018.03.04
Horn Antenna	Schwarzbeck	BBHA 9170	9170-0741	2016.03.06	2019.03.05
50Ω Coaxial Switch	Anritsu	MP59B	6200264416	2016.10.23	2017.10.22
PreAmplifier	Agilent	8449B	60538	2016.10.23	2017.10.22
Loop Antenna	EMCO	6502	9003-2485	2016.03.06	2019.03.05
Attenuator	HP	215-05-20	DC-3G	2016.10.23	2017.10.22
RF Communications	HP	8920A	3438A05658	2016.10.23	2017.10.22
DC Power source	Zhaoxin	RXN-605D	20140807176	N.C.R	N.C.R
AC Power Source	APC	KDF-11010G	F214050035	N.C.R	N.C.R

3.TEST METHODOLOGY

3.1 GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirement in TIA/EIA 603. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.
Not Applicable (Since the EUT is powered by battery)

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in TIA/EIA 603.

3.2 DESCRIPTION OF TEST MODES

The EUT has been tested under engineering test mode condition and the EUT staying in continuous transmitting mode.

4. FCC PART 74 REQUIREMENTS

4.1 RADIATED SPURIOUS EMISSION

TEST LIMITS

According to CFR 47 section 74.861 e (6)(iii), the mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the following schedule:
The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least 43 + 10 log (P) dB.
It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10th harmonic.

The limit line is derived from 43 + 10log(P) dB below the transmitter power P(Watts)

= P(W) - [43 + 10log(P)] (dB)

= [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)

= -13dBm.

4.2 EMISSION MASK I

TEST LIMITS

a. - According to CFR 47 section 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:
(1) 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;
(2) 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;
(3) On any frequency removed from the operating frequency by more than 250 percent of the authorized bandwidth: at least 43+10log 10 *(mean output power in watts) dB;

4.3 EMISSION MASK II

TEST LIMITS

- According to ETSI EN 300 422-1 V1.5.1 Clause 8.3.1.2,

a. The transmitter output spectrum shall be within the mask defined in figure 3 where B is the declared channel bandwidth

TEST PROCEDURE

a. On a test site, the EUT shall be placed on a turntable and in the position closest to the normal use as declared by the user.
b. The test antenna shall be oriented initially for vertical polarization located 3m from the EUT to correspond to the transmitter.
c. The output of the antenna shall be connected to the measuring receiver and either a peak or quasi-peak detector was used for the measurement as indicated on the report. The detector selection is based on how close the emission level was approaching the limit.
d. The transmitter shall be switched on; if possible, without the modulation and the measurement receiver shall be tuned to the frequency of the transmitter under test.
e. The test antenna shall be raised and lowered through the specified range of height until the measuring receiver detects a maximum signal level.
f. The transmitter shall than be rotated through 360°in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
g The test antenna shall be raised and lowered again through the specified range of height until the measuring receiver detects a maximum signal level.
h The maximum signal level detected by the measuring receiver shall be noted.
i The measurement shall be repeated with the test antenna set to horizontal polarization.
j Replace the antenna with a proper Antenna (substitution antenna).
k The substitution antenna shall be oriented for vertical polarization and, if necessary, the length of the substitution antenna shall be adjusted to correspond to the frequency of transmitting.

l The substitution antenna shall be connected to a calibrated signal generator.

m If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.

n The test antenna shall be raised and lowered through the specified range of the height to ensure that the maximum signal is received.

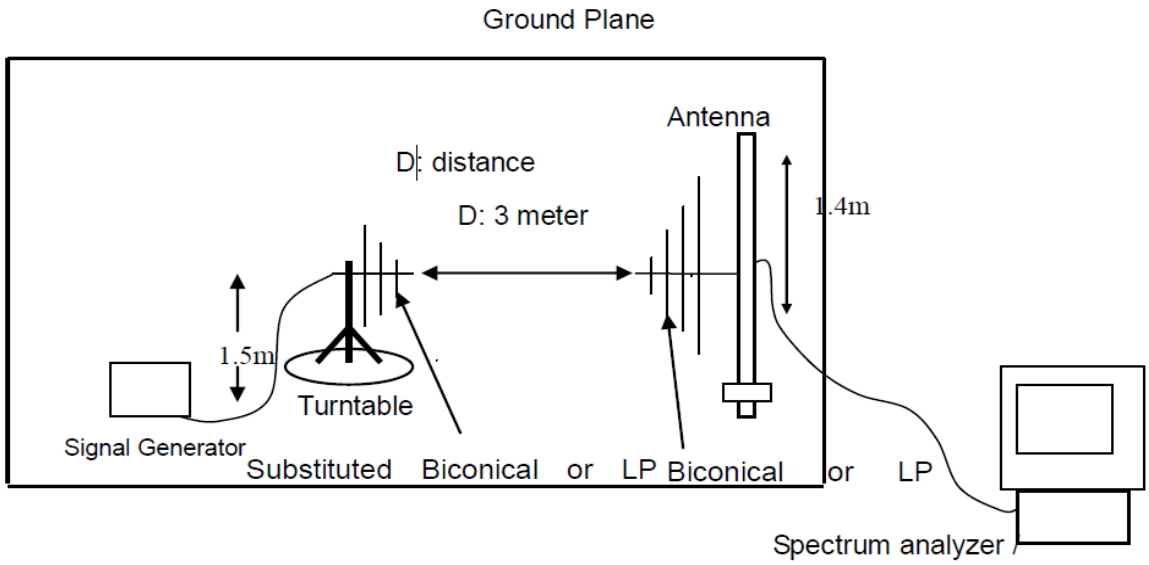
o The input signal to substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuation setting of the measuring receiver.

p The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.

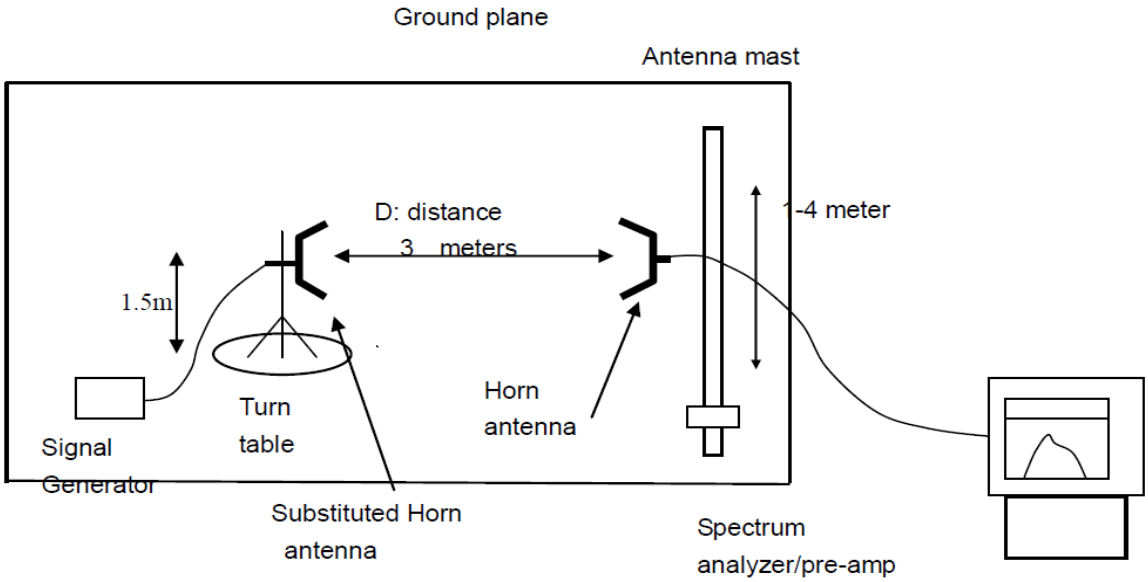
q The measurement shall be repeated with the test antenna and the substitution antenna oriented for horizontal polarization.

TEST CONFIGURATION

（A）Radiated Emission Test-Up Frequency Above 30MHz



（B）Radiated Emission Test-Up Frequency Above 1GHz

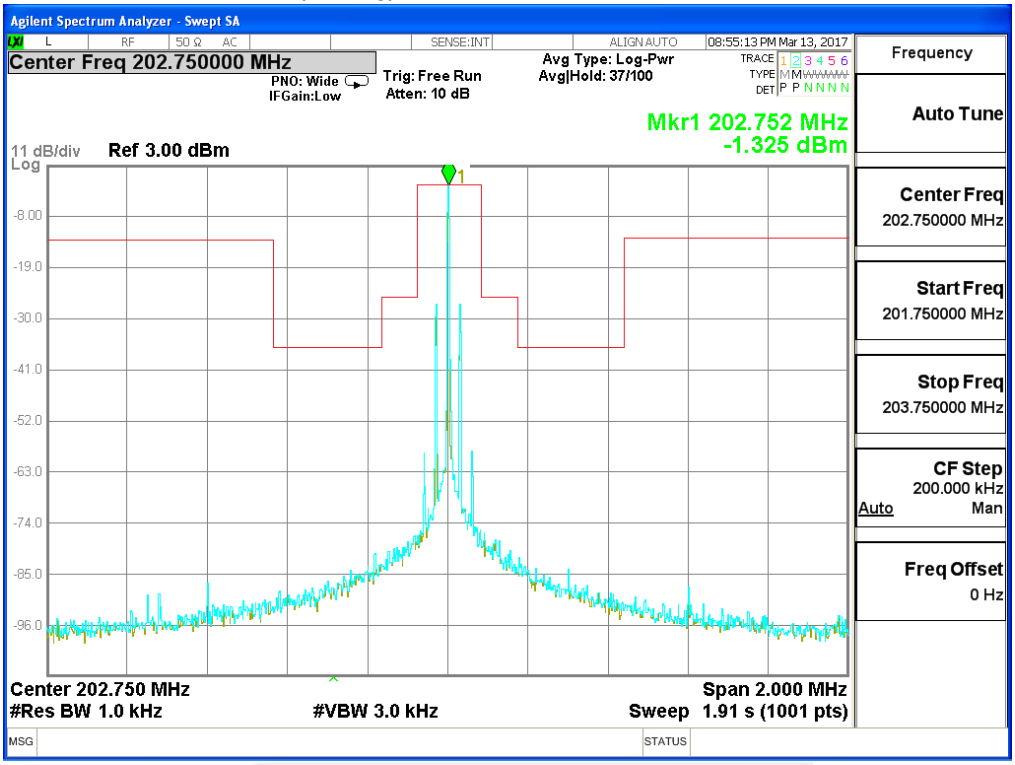


TEST RESULTS

(30-2500)MHz							
The Worst Test Results 202.75 MHz							
Frequency(MHz)	S G.Lev (dBm)	Ant(dBi)	Loss	PMea (dBm)	Limit （dBm）	Margin (dBm)	Polarity
405.52	-40.12	6.88	4.72	-37.96	-13.00	-24.96	H
608.27	-39.17	6.68	5.32	-37.81	-13.00	-24.81	H
811.04	-30.21	6.35	6.72	-30.58	-13.00	-17.58	H
405.57	-42.62	6.88	4.72	-40.46	-13.00	-27.46	V
608.29	-40.38	6.68	5.32	-39.02	-13.00	-26.02	V
811.05	-42.18	6.35	6.72	-42.55	-13.00	-29.55	V

Emission Mask I

FM (Analog) Emission Mask 202.75MHz



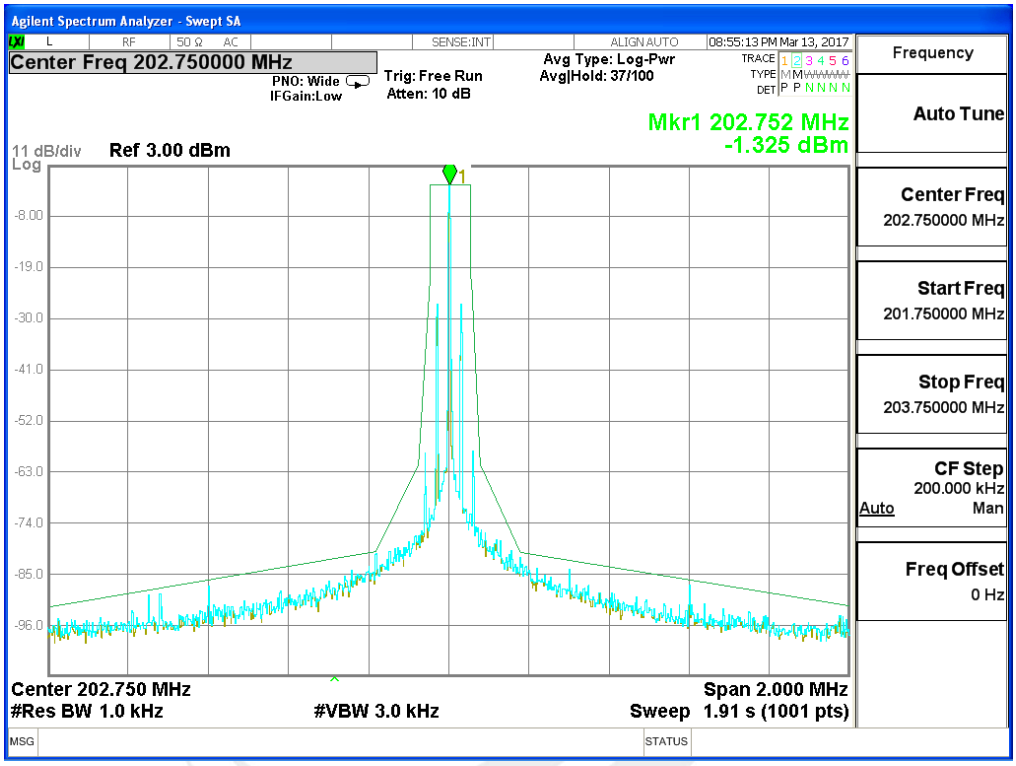
Emission Mask II

ETSI EN 300 422-1 V1.5.1 Clause 8.3.1.2 The Maximum Measurement of Necessary Bandwidth

Test Plot:

Frequency	Declared Bandwidth	B/2	0.35B
202.75 MHz	150K	75K	52.5K

202.75MHz

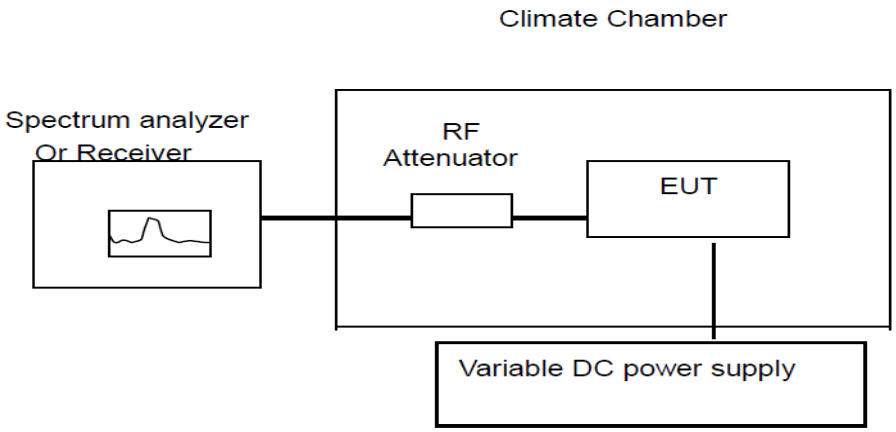


4.4 FREQUENCY STABILITY VS. TEMPERATURE & VOLTAGE

TEST LIMIT

According to CFR 47 section 74.861 e (4), the frequency tolerance of the transmitter shall be 0.005 percent.

TEST CONFIGURATION



TEST PROCEDURE

a The EUT 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. The DC leads and the RF output cable, exited the chamber through an opening made for that purpose.
After the temperature stabilized the frequency output was recorded form the counter.
An external variable DC power supply was connected to the battery terminals of the equipment under test.

b. 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.

TEST RESULTS

(1) Frequency stability versus input voltage (Supply Nominal voltage is DC 1.5*2V)
(2) Frequency stability versus input voltage (Supply battery operating end point which shall be specified by the manufacturer DC 2.6V)

Reference Frequency: 202.75MHz			
Power Supply	Environment Temperature (ºC)	Frequency Error (Hz)	Frequency Error (%)
2.7V, DC	20	2110	0.001041
3.0V, DC	20	2114	0.001043
3.3V, DC	20	2112	0.001042
End	20	2114	0.001043

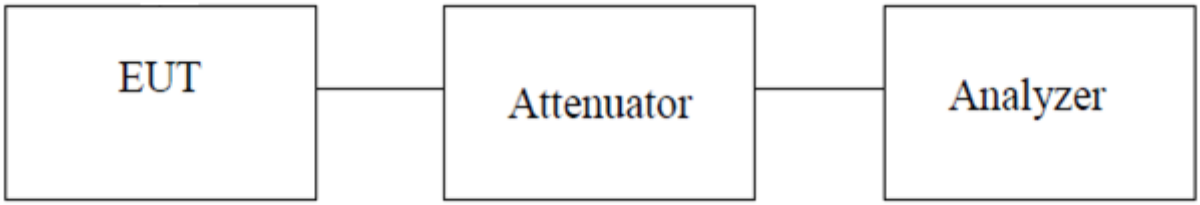
Reference Frequency: 202.75MHz				
Environment Temperature(ºC)	Frequency Deviation measured with time Elapse(30 minutes)			
	Frequency Error (Hz)	Frequency Error (%)	Limit (%)	Results
50	2113	0.001042	0.00500	PASS
40	2115	0.001043		
30	2111	0.001041		
20	2114	0.001043		
10	2112	0.001042		
0	2116	0.001044		
-10	2114	0.001043		
-20	2114	0.001043		
-30	2113	0.001042		

4.5 OCCUPIED BANDWIDTH

TEST LIMIT

According to CFR 47 section 74.861 e (5), the operating bandwidth shall no exceed 200 KHz. Near the carrier an emission mask is defined by the standard.

TEST CONFIGURATION



TEST PROCEDURE

a. The RF output of the transceiver was connected to the input of the spectrum analyzer through sufficient attenuation.
Set Occupied Bandwidth was measured with a occupied bandwidth function of the analyzer.

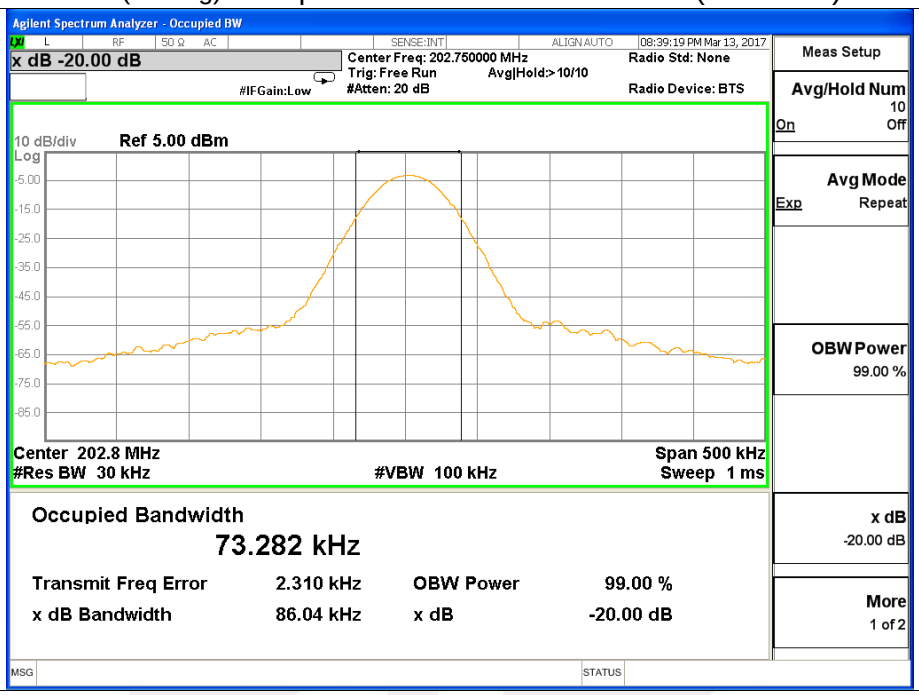
b. The near the carrier emissions are measured by normal power measurement function of the analyzer.

c. Set SPA Max hold. Mark peak, 99%.

TEST RESULT

Frequency	Occupied Bandwidth	Limit
202.8 MHz	73.282 KHz	200 KHz

FM (Analog) Occupied bandwidth of 202.75MHz (Maximum)



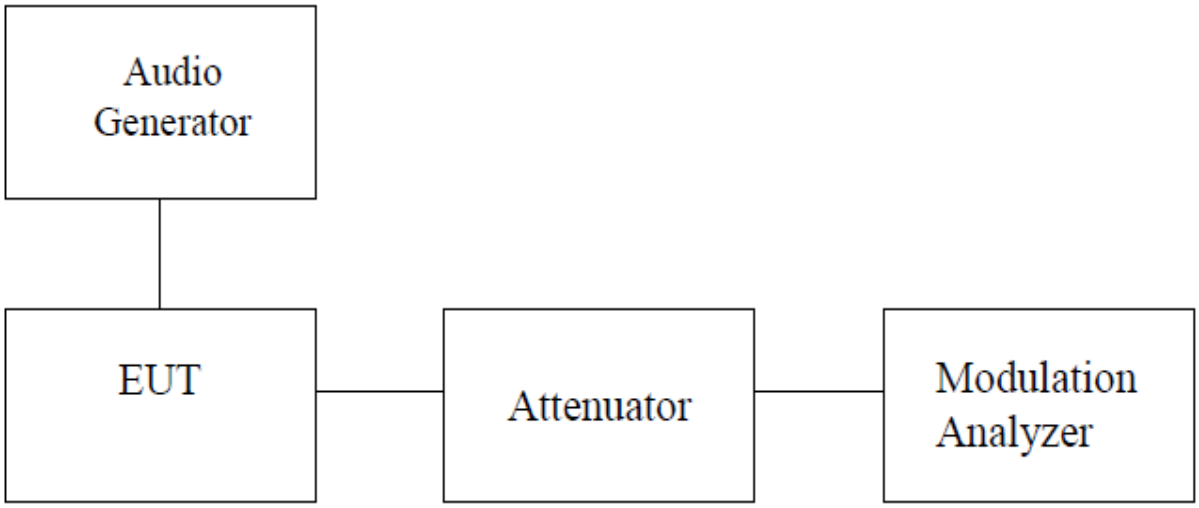
4.6 AUDIO FREQUENCY RESPONSE

TEST LIMIT

The audio frequency response is the degree of closeness to which the frequency deviation of the transmitter follows a prescribed characteristic.The frequency response of the audio modulation part is measured over a frequency range of 100 Hz to 5000 Hz.

According to CFR 47 section 74.861 e (1), any form of modulation may be used. A maximum deviation of ±75 KHz is permitted when frequency modulation is employed.

TEST CONFIGURATION



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TEST PROCEDURE

a. The audio frequency response is the degree of the closeness to which the frequency deviation of the transmitter follows prescribed characteristics.

b. The frequency response of the audio modulation part is measured over a frequency range of 100Hz to 5000 Hz.

c. For 1000 Hz tone reference signal the audio generator level is adjusted to get 20% of the rated system deviation.

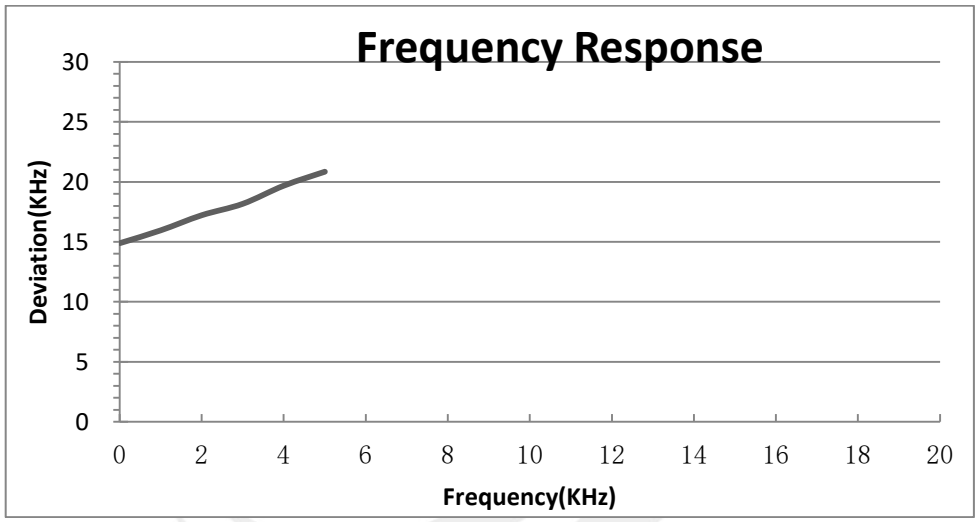
d. The deviations obtained over the frequency range from 100 HZ to 5000 Hz are recorded and compared with the reference deviation as follows:
Audio Frequency Response= 20 log (DEV freq/ Dev ref)

TEST RESULT

Audio Frequency Response:

202.75 MHz

Frequency(KHz)	Deviation(KHz)
0.01	14.89
1	15.95
2	17.21
3	18.16
4	19.67
5	20.83



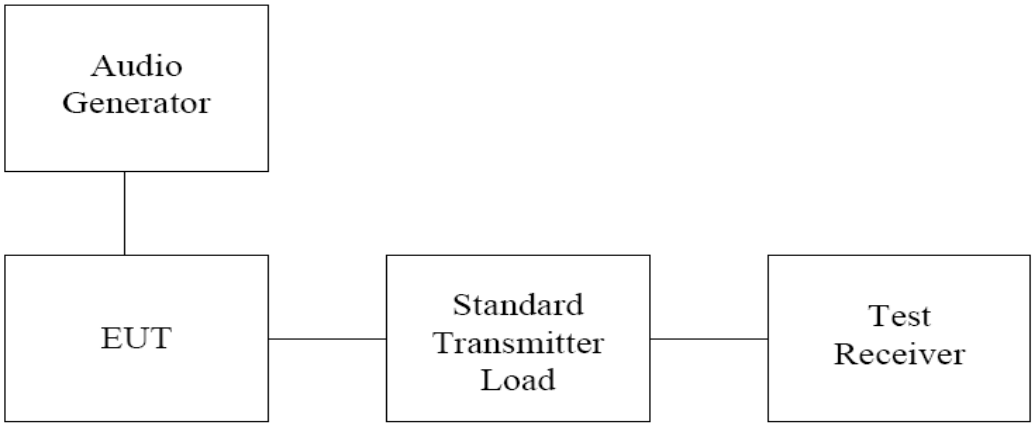
4.7 MODULATION DEVIATION

TEST LIMIT

According to CFR 47 section 2.1047 a, for Voice modulation communication equipment, the frequency response of the audio modulation circuit over a range of 100 to 5000 Hz shall be measured.

According to CFR 47 section 74.861 e (3), any form of modulation may be used. A maximum deviation of ±75 KHz is permitted when frequency modulation is employed.

TEST CONFIGURATION



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TEST PROCEDURE

a. Modulation limits is the transmitter circuit's ability to limit the transmitter form producing deviations in excess of rated system deviation.

b. The audio signal generator is connected to the audio input of the EUT with its full rating.

c. The modulation response is measured at certain modulation frequencies, related to 1000 Hz reference signal.

d. Tests are performed for positive and negative modulation.

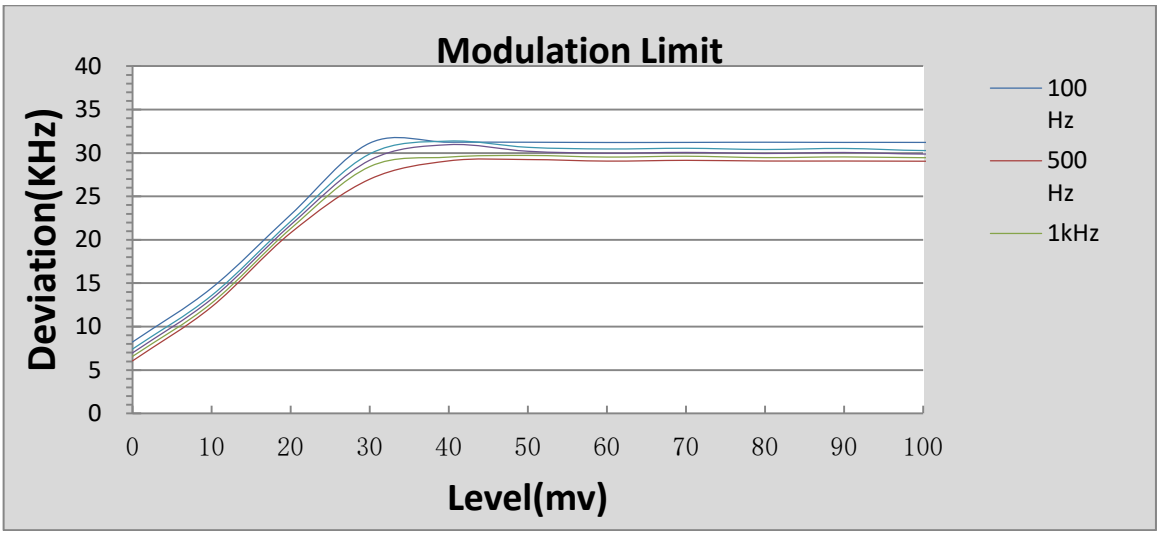
TEST RESULT

Modulation Deviation

202.75 MHz

Level(mv)	100Hz	500Hz	1kHz	2.5kHz	5kHz
0	8.23	6.07	6.56	6.98	7.42
10	14.45	12.29	12.70	13.19	13.59
20	22.90	20.81	21.29	21.72	22.13
30	31.15	26.99	28.44	29.17	29.91
40	31.25	29.10	29.54	30.96	31.39
50	31.25	29.25	29.73	30.20	30.67
60	31.22	29.07	29.54	29.98	30.48
70	31.23	29.16	29.64	30.07	30.56
80	31.25	29.08	29.48	29.95	30.42
90	31.23	29.08	29.56	30.06	30.54
100	31.23	29.06	29.47	29.88	30.30
110	31.17	29.05	29.53	29.98	30.39

Modulation Deviation



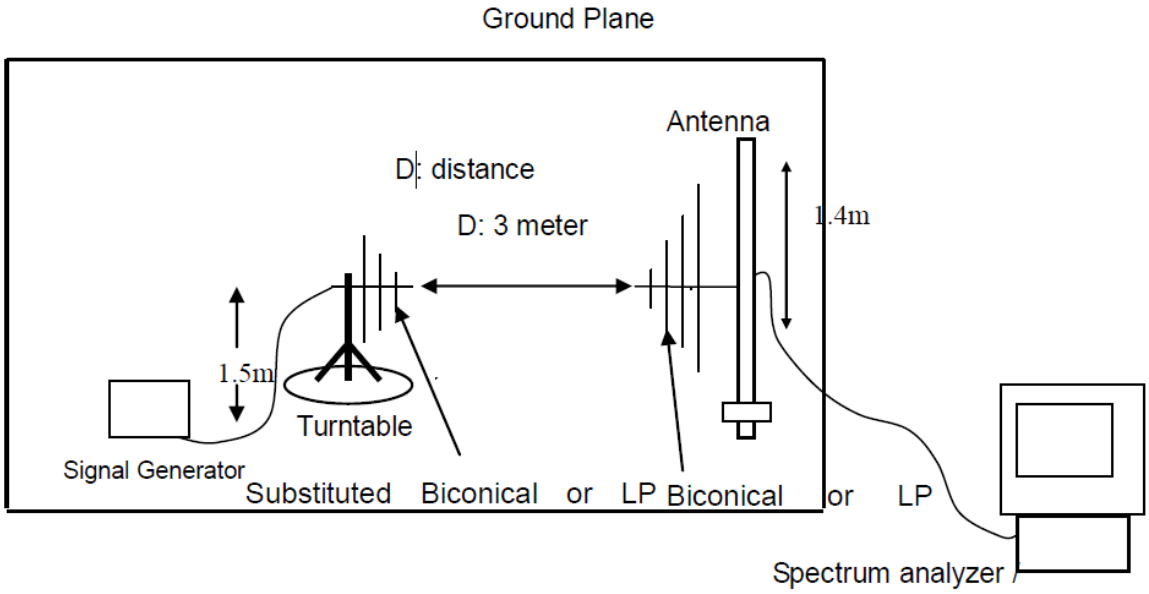
4.8 RF OUTPUT POWER

TEST LIMIT

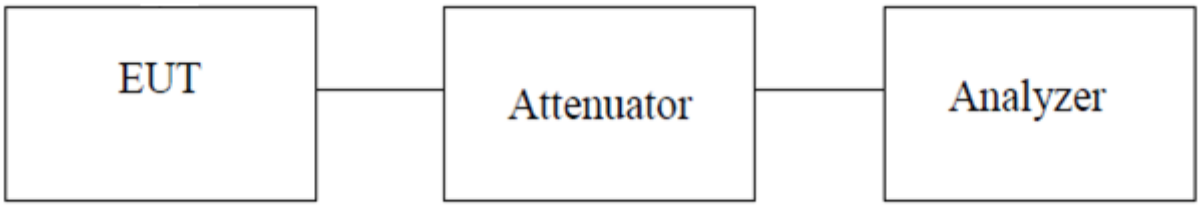
According to CFR 47 section 74.861 e (1), the power of the measured unmodulated carrier power at the output of the transmitter power amplifier (antenna input power) may not exceed the following:
(i) 54-72, 76-88, and 174-216 MHz bands: 50 mW EIRP
(ii) 470-608 and 614-698: 250 mW conducted power
(iii) 600 MHz duplex gap: 20 mW EIRP

TEST CONFIGURATION

Radiation



Conduction



TEST PROCEDURE(Radiation)

a. On a test site, the EUT shall be placed on a turntable and in the position closest to the normal use as declared by the user.
b. The test antenna shall be oriented initially for vertical polarization located 3m from the EUT to correspond to the transmitter.
c. The output of the antenna shall be connected to the measuring receiver and either a peak or quasi-peak detector was used for the measurement as indicated on the report. The detector selection is based on how close the emission level was approaching the limit.
d. The transmitter shall be switched on; if possible, without the modulation and the measurement receiver shall be tuned to the frequency of the transmitter under test.
e. The test antenna shall be raised and lowered through the specified range of height until the measuring receiver detects a maximum signal level.
f. The transmitter shall than be rotated through 360°in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
g The test antenna shall be raised and lowered again through the specified range of height until the measuring receiver detects a maximum signal level.

h The maximum signal level detected by the measuring receiver shall be noted.

i The measurement shall be repeated with the test antenna set to horizontal polarization.

j Replace the antenna with a proper Antenna (substitution antenna).

k The substitution antenna shall be oriented for vertical polarization and, if necessary, the length of the substitution antenna shall be adjusted to correspond to the frequency of transmitting.

l The substitution antenna shall be connected to a calibrated signal generator.

m If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.

n The test antenna shall be raised and lowered through the specified range of the height to ensure that the maximum signal is received.

o The input signal to substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuation setting of the measuring receiver.

p The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.

q The measurement shall be repeated with the test antenna and the substitution antenna oriented for horizontal polarization.

TEST PROCEDURE (Conduction)

a. The RF output of the transceiver was connected to the input of the spectrum analyzer through sufficient attenuation.

b. Set the RBW >20BW,VBW>3xRBW.

c. Detector = peak.

d Sweep time = auto couple.

e Trace mode = max hold.

f Allow trace to fully stabilize.

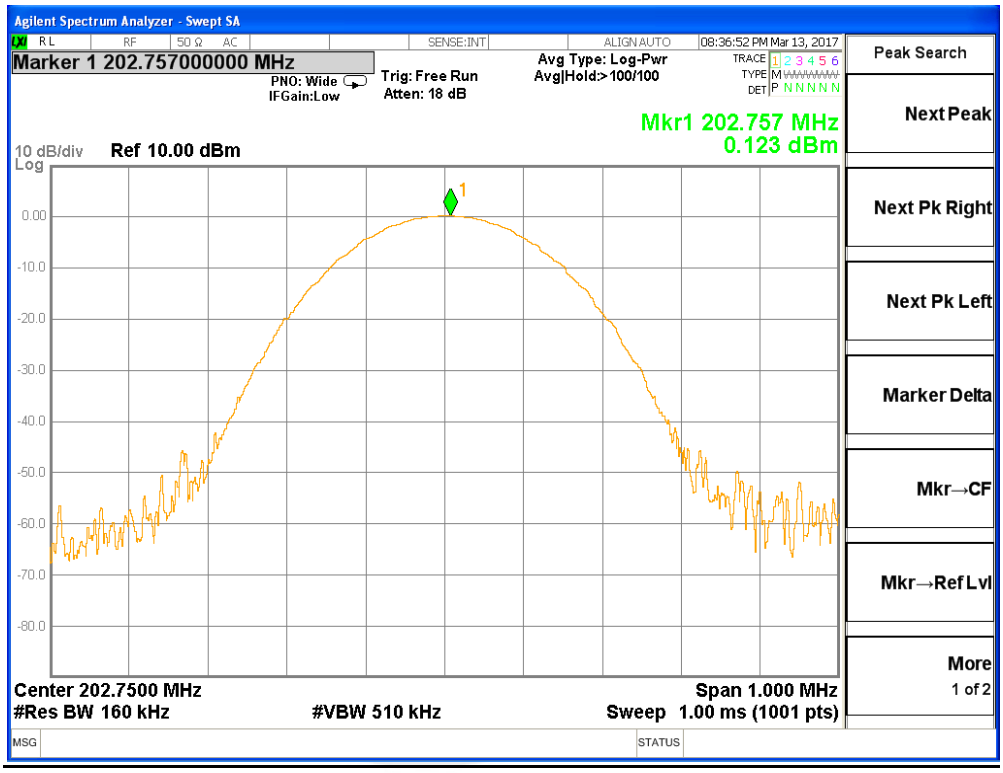
g Use the peak marker function to determine the maximum amplitude level.

TEST RESULT

Frequency Channel (MHz)	Output power (dBm)	Transmitter Power (mW)	Limits (mW)
202.7500	0.123dBm	1.029	50 mW EIRP

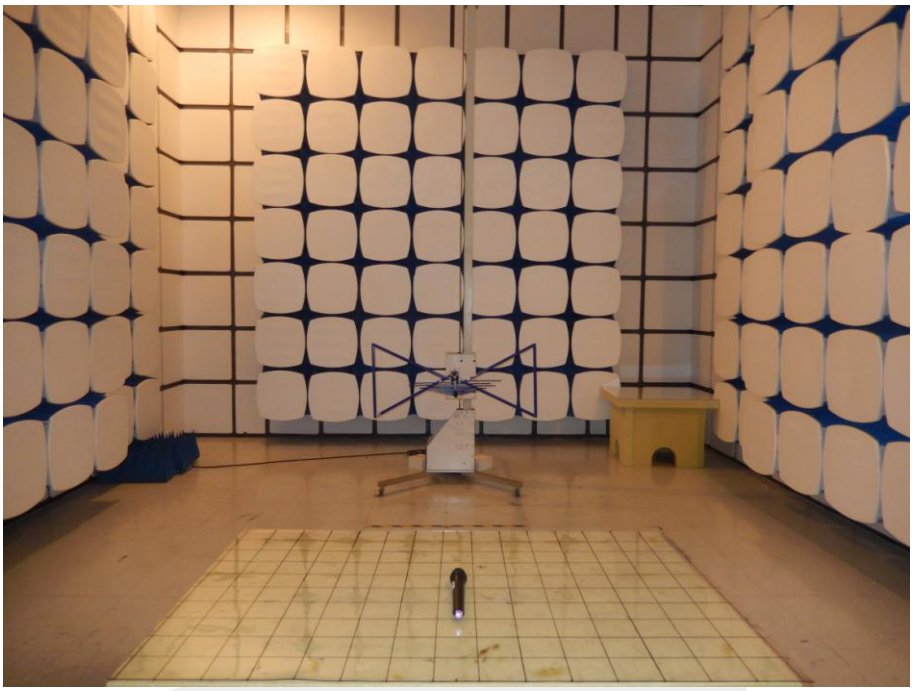
EIRP:0.123dBm +5dBi=5.123dBm
10^0.5123=3.25mW<50mW

202.75MHz

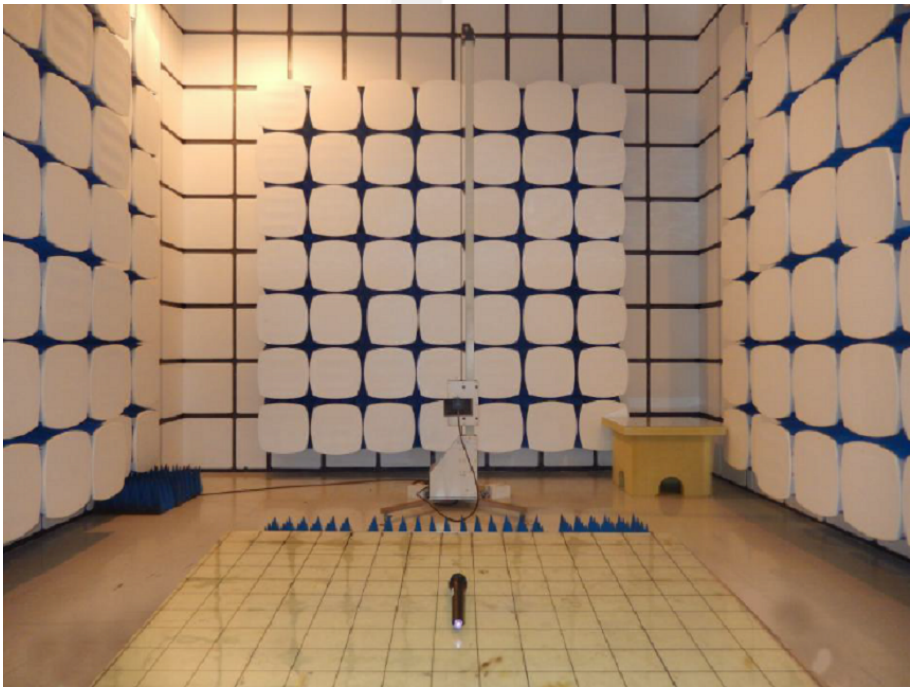


PHOTOS OF TEST SETUP

Radiated Measurement Photos
30MHz- 1GHz



1GHz- 2.03GHz



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