TCB

GRANT OF EQUIPMENT AUTHORIZATION

TCB

Certification
Issued Under the Authority of the
Federal Communications Commission
By:

MiCOM Labs
575 Boulder Court
Pleasanton, CA 94566

Date of Grant: 01/19/2021

Application Dated: 01/19/2021

PO FUNG ELECTRONIC(HK) INTERNATIOANL GROUP COMPANY
3/F FULOK BLDG 131-133 WING LOK ST
SHEUNG WAN,
Hong Kong

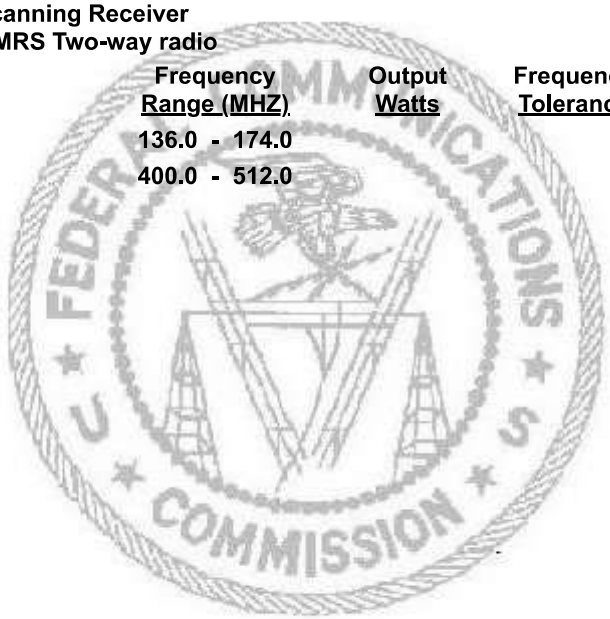
Attention: Peter Wang

NOT TRANSFERABLE

EQUIPMENT AUTHORIZATION is hereby issued to the named GRANTEE, and is VALID ONLY for the equipment identified hereon for use under the Commission's Rules and Regulations listed below.

FCC IDENTIFIER: 2AJGM-P11UV
Name of Grantee: PO FUNG ELECTRONIC(HK) INTERNATIOANL GROUP COMPANY
Equipment Class: Scanning Receiver
Notes: GMRS Two-way radio

Grant Notes	FCC Rule Parts	Frequency Range (MHZ)	Output Watts	Frequency Tolerance	Emission Designator
	15B	136.0 - 174.0			
	15B	400.0 - 512.0			



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FCC IDENTIFIER: 2AJGM-P11UV
Name of Grantee: PO FUNG ELECTRONIC(HK) INTERNATIOANL GROUP COMPANY
Equipment Class: Licensed Non-Broadcast Transmitter Held to Face
Notes: GMRS Two-way radio

Grant Notes	FCC Rule Parts	Frequency Range (MHZ)	Output Watts	Frequency Tolerance	Emission Designator
	95E	462.55 - 462.725	3.05	1.097 PM	11K0F3E
	95E	462.5625 - 462.7125	3.08	1.082 PM	11K0F3E
	95E	467.55 - 467.725	3.07	1.073 PM	11K0F3E
	95E	467.5625 - 467.7125	0.49	0.955 PM	11K0F3E

Output Power listed is ERP. This device is authorized to operate in the following radio services: GMRS (Part 95E). There must be an informational insert inside the box (product package) or the Users Manual must include information that clearly informs the consumer (buyer/owner) when the radio is transmitting on GMRS frequencies, The device with it's antenna must be installed to provide a separation distance of at least 2.5cm from all persons.This transmitter has been tested for SAR compliance in Push-to-Talk and body-worn operating configurations. Hand held and body-worn SAR compliance is limited to the specific antennas, belt-clips, holsters and accessories tested for this device. Users must be informed of the body-worn operating requirements for satisfying RF exposure compliance. The highest reported 50% duty cycle SAR levels for head and body-worn accessories exposure conditions are 0.79 W/kg and 1.53 W/kg respectively.

2AJGM-P11UV _Tune Up Procedure

Measurement Procedure:

1. Set the device to operational voltage and on a predefined channel in a special test mode.
2. The actual output power is measured at several power levels.
3. The gain factors of each individual device are adjusted until the target value is met. The appropriate gain control settings for each output power level are stored in each device individually (for each power level). The user has no possibility to change these settings later on.
4. The maximum gains of each individual device are adjusted and measured until the target value is met. The production target power with tolerance compiles with the maximum power in test report.

Rated RF power output:

Frequency(MHz)	Tune up power(dBm)
462.5625	34±1
462.6375	34±1
462.7125	34±1
462.5500	34±1
462.6500	34±1
462.7250	34±1
467.5500	34±1
467.6250	34±1
467.6500	34±1
467.7000	34±1
467.5626	26±1
467.6375	26±1
467.7215	26±1

Then these appropriate rated RF output power settings are stored in each device individually. The user has no possibility to change these settings later on, and during manufacturing each device will be individual calibrated. The measurement is done in fully calibrated setup, which is based on the base station simulator. Furthermore, the highest power level is verified afterwards in a call measurement on three channels(low, middle and high).

EUT PHOTO

Report No.: AGC02294201007AP01

PRODUCT DESIGNATION	:	Two-way radio
BRAND NAME	:	POFUNG, BAOFENG
MODEL NAME	:	P11UV, BF-UV11, GM-50,TH-88, AR-11X, UV11R, G-11UV
APPLICANT	:	PO FUNG ELECTRONIC(HK) INTERNATIOANL GROUP COMPANY
DATE OF ISSUE	:	Dec. 14, 2020
REPORT VERSION	:	V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd

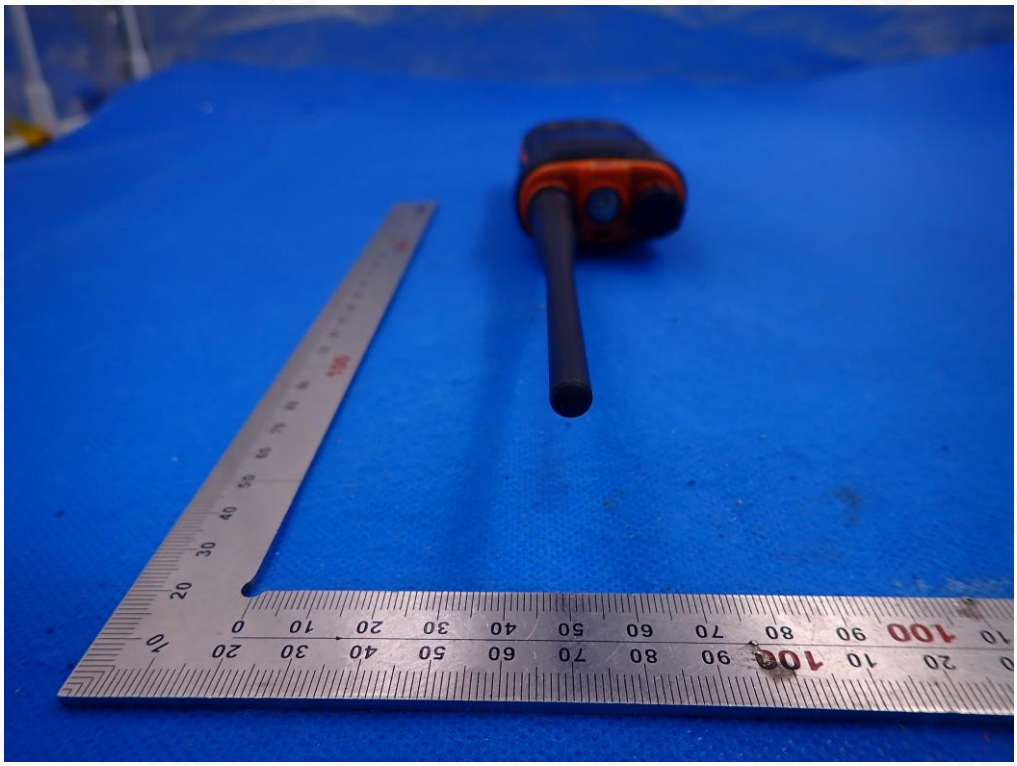
Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Dec. 14, 2020	Valid	Initial Release

PHOTO GRAPHS OF EUT

ALL VIEW OF EUT

TOP VIEW OF EUT

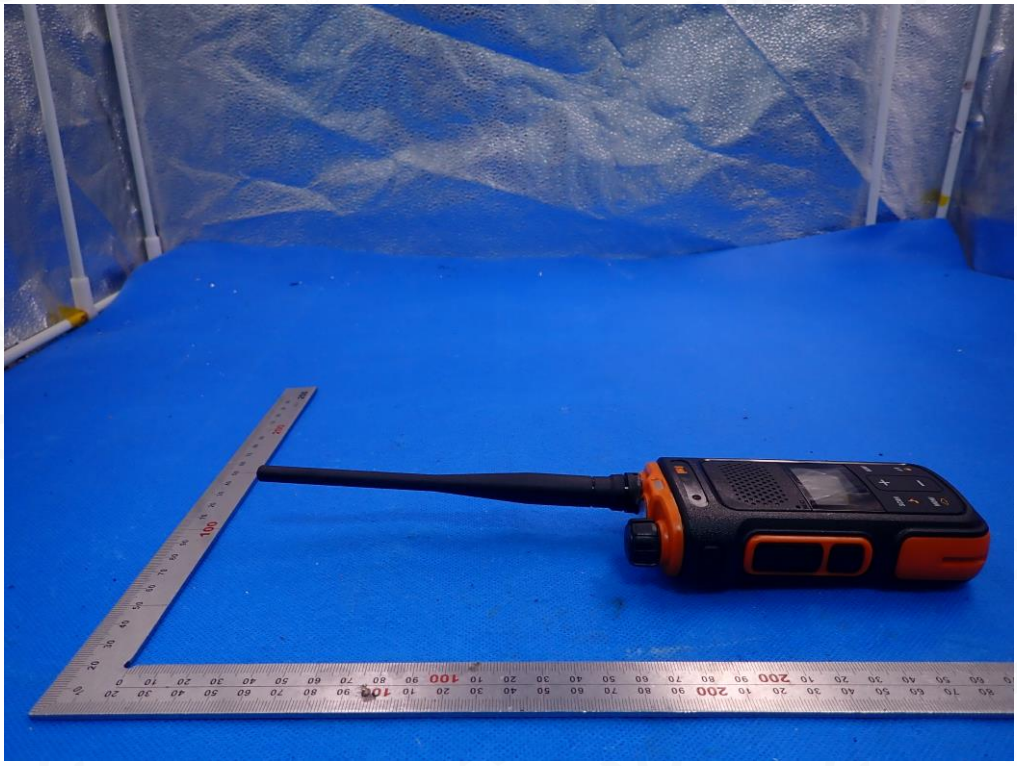


BOTTOM VIEW OF EUT

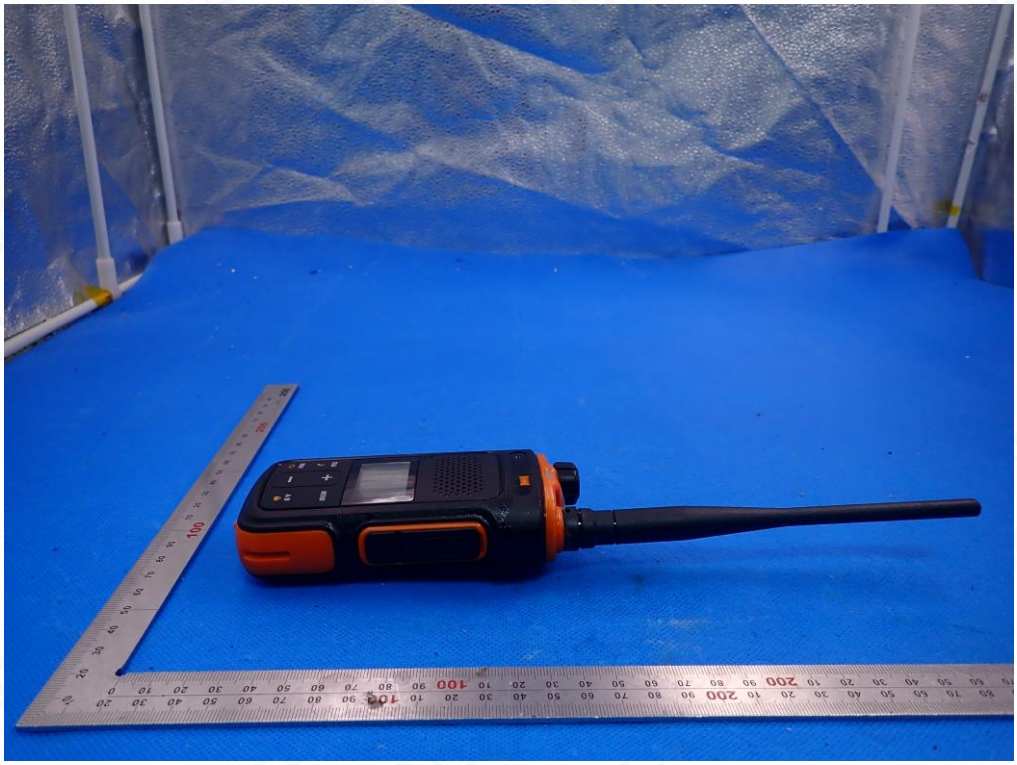
FRONT VIEW OF EUT

BACK VIEW OF EUT

LEFT VIEW OF EUT



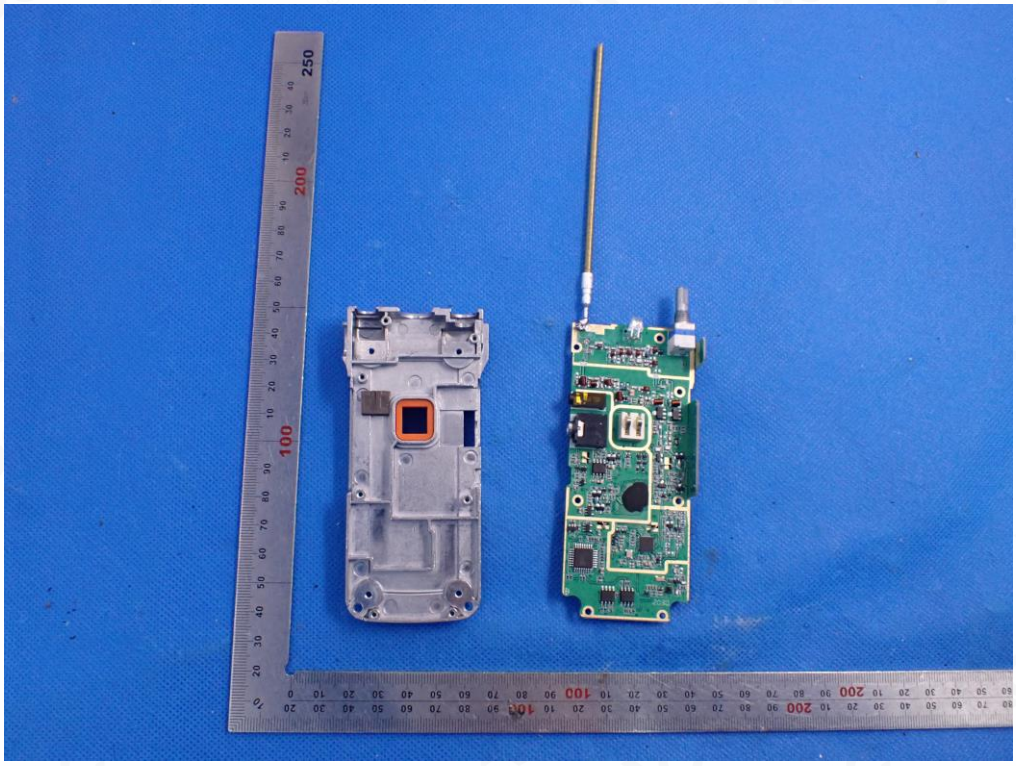
RIGHT VIEW OF EUT



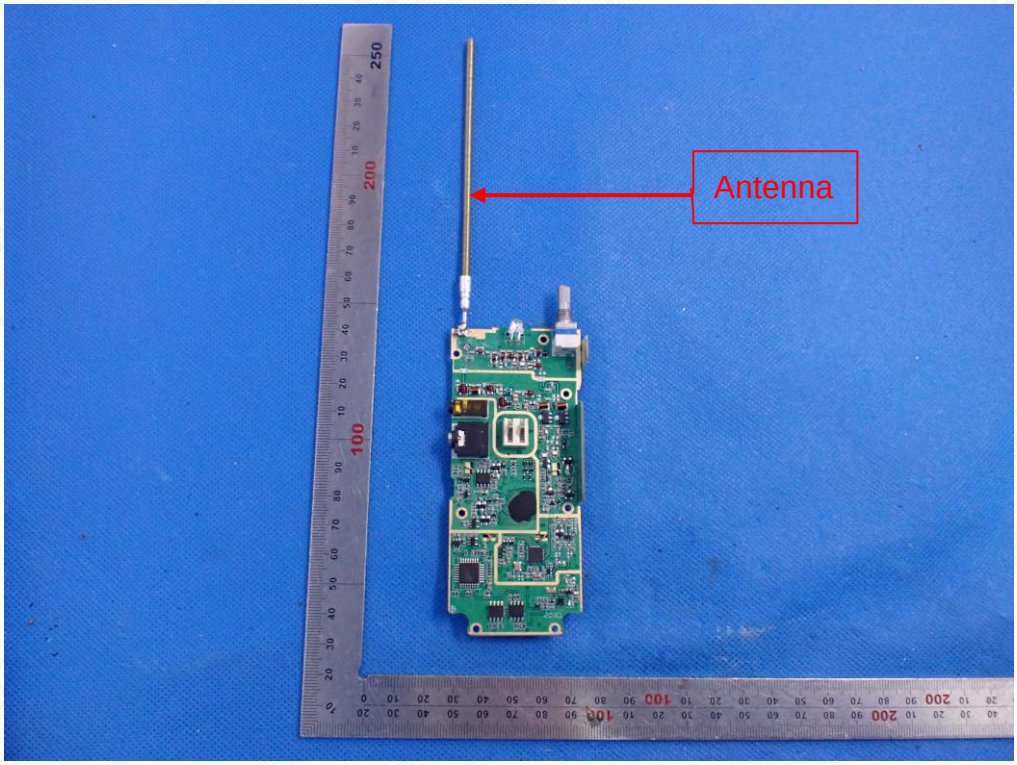
OPEN VIEW-1 OF EUT

OPEN VIEW-2 OF EUT

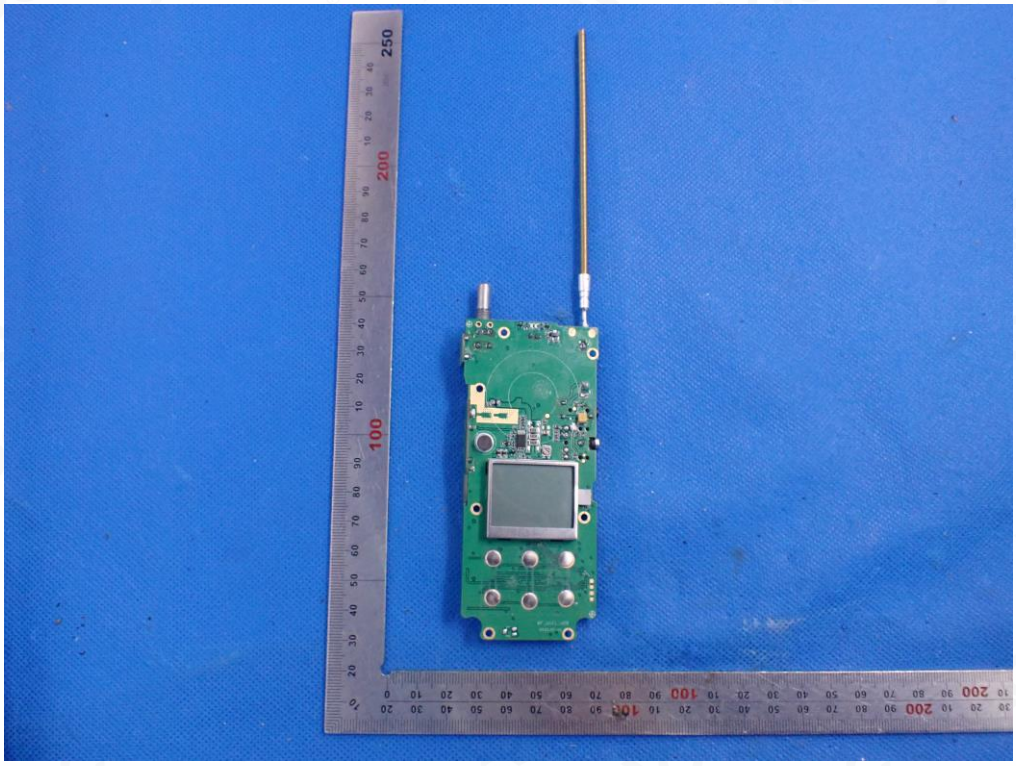
OPEN VIEW-3 OF EUT



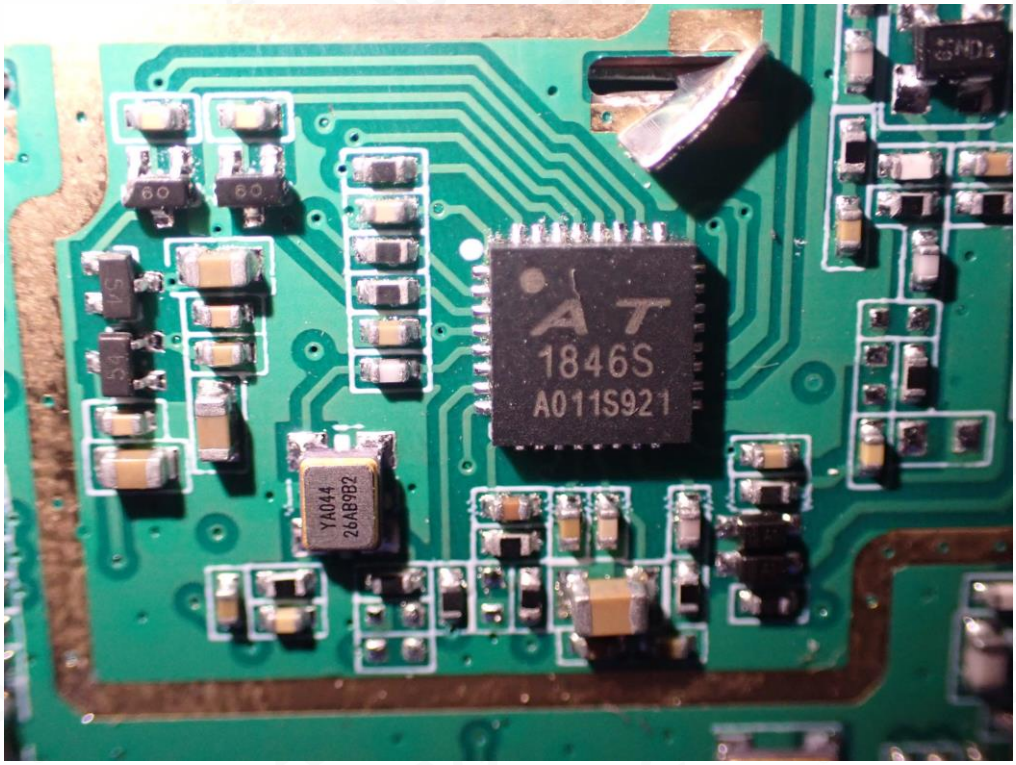
INTERNAL VIEW-1 OF EUT



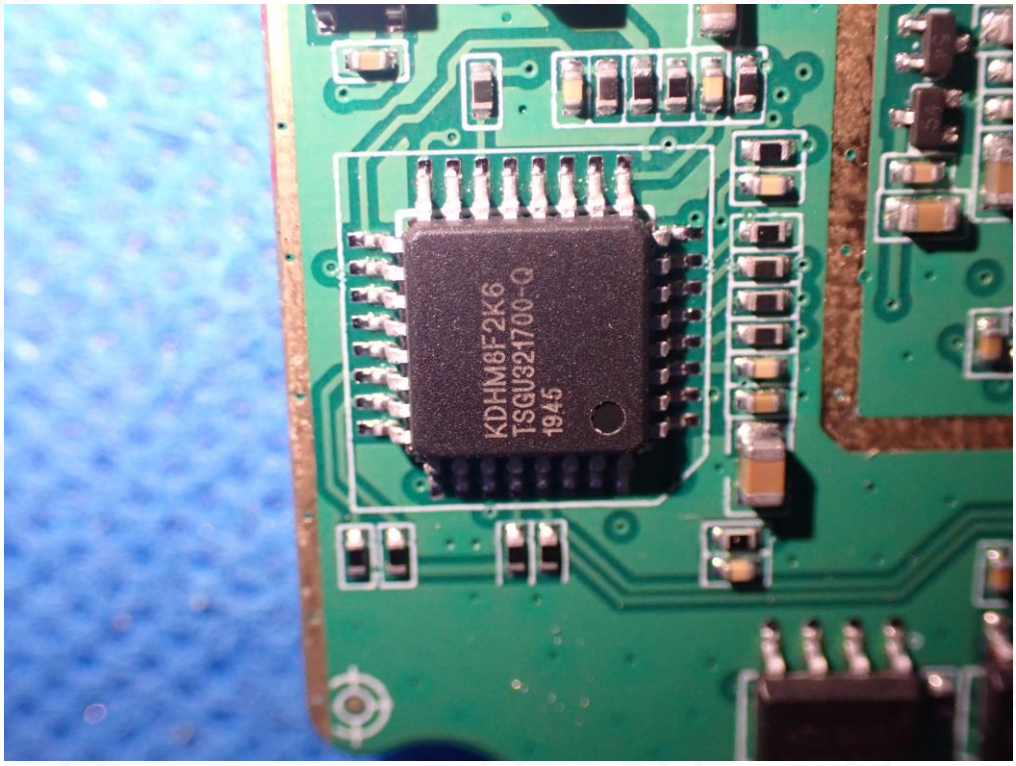
INTERNAL VIEW-2 OF EUT



INTERNAL VIEW-3 OF EUT



INTERNAL VIEW-4 OF EUT



---END OF REPORT---

Conditions of Issuance of Test Reports

1. All samples and goods are accepted by the Attestation of Global Compliance (Shenzhen) Co., Ltd (the "Company") solely for testing and reporting in accordance with the following terms and conditions. The company provides its services on the basis that such terms and conditions constitute express agreement between the company and any person, firm or company requesting its services (the "Clients").

2. Any report issued by Company as a result of this application for testing services (the "Report") shall be issued in confidence to the Clients and the Report will be strictly treated as such by the Company. It may not be reproduced either in its entirety or in part and it may not be used for advertising or other unauthorized purposes without the written consent of the Company. The Clients to whom the Report is issued may, however, show or send it, or a certified copy thereof prepared by the Company to its customer, supplier or other persons directly concerned. The Company will not, without the consent of the Clients, enter into any discussion or correspondence with any third party concerning the contents of the Report, unless required by the relevant governmental authorities, laws or court orders.

3.The Company shall not be called or be liable to be called to give evidence or testimony on the Report in a court of law without its prior written consent, unless required by the relevant governmental authorities, laws or court orders.

4. The non-CMA report issued by AGC is only permitted to be used by the client as internal reference use and shall not be used for public demonstration purpose.

5. In the event of the improper use of the report as determined by the Company, the Company reserves the right to withdraw it, and to adopt any other additional remedies which may be appropriate.

6. Samples submitted for testing are accepted on the understanding that the Report issued cannot form the basis of, or be the instrument for, any legal action against the Company.

7. The Company will not be liable for or accept responsibility for any loss or damage however arising from the use of information contained in any of its Reports or in any communication whatsoever about its said tests or investigations.

8.Clients wishing to use the Report in court proceedings or arbitration shall inform the Company to that effect prior to submitting the sample for testing.

9. The Company is not responsible for recalling the electronic version of the original report when any revision is made to them. The Client assumes the responsibility to providing the revised version to any interested party who uses them.

10. Subject to the variable length of retention time for test data and report stored hereinto as otherwise specifically required by individual accreditation authorities, the Company will only keep the supporting test data and information of the test report for a period of six years. The data and information will be disposed of after the aforementioned retention period has elapsed. Under no circumstances shall we provide any data and information which has been disposed of after retention period. Under no circumstances shall we be liable for damage of any kind, including (but not limited to) compensatory damages, lost profits, lost data, or any form of special, incidental, indirect, consequential or punitive damages of any kind, whether based on breach of contract of warranty, tort (including negligence), product liability or otherwise, even if we are informed in advance of the possibility of such damages.

FCC Test Report

Report No.:AGC02294201007FE10

FCC ID	:	2AJGM-P11UV
PRODUCT DESIGNATION	:	Two-way radio
BRAND NAME	:	POFUNG,BAOFENG
MODEL NAME	:	P11UV, BF-UV11, GM-50,TH-88, AR-11X, UV11R, G-11UV
APPLICANT	:	PO FUNG ELECTRONIC(HK) INTERNATIOANL GROUP COMPANY
DATE OF ISSUE	:	Dec. 14, 2020
STANDARD(S)	:	FCC Part 95 Rules
REPORT VERSION	:	V 1.0

*A*ttestation of *G*lobal Compliance (Shenzhen) Co., Ltd

Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Dec. 14, 2020	Valid	Initial release

VERIFICATION OF COMPLIANCE

Applicant	PO FUNG ELECTRONIC(HK) INTERNATIOANL GROUP COMPANY
Address	3/F FULOK BLDG 131-133 WING LOK ST SHEUNG WAN, Hong Kong
manufacturer	PO FUNG ELECTRONIC(HK) INTERNATIOANL GROUP COMPANY
Address	3/F FULOK BLDG 131-133 WING LOK ST SHEUNG WAN, Hong Kong
Factory	PO FUNG ELECTRONIC(HK) INTERNATIOANL GROUP COMPANY
Address	3/F FULOK BLDG 131-133 WING LOK ST SHEUNG WAN, Hong Kong
Product Designation	Two-way radio
Brand Name	POFUNG, BAOFENG
Test Model	P11UV
Series Model	BF-UV11, GM-50,TH-88, AR-11X, UV11R, G-11UV
Difference Description	All the same except the model name.
Deviation	No any deviation from the test method
Condition of Test Sample	Normal
Date of Test	Oct. 29, 2020~Dec. 09, 2020
Test Result	PASS
Report Template	AGCRT-US-PTT/RF

WE HEREBY CERTIFY THAT:

The above equipment was tested by Attestation of Global Compliance (Shenzhen) Co., Ltd. The data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in TIA/EIA 603-E. The sample tested as described in this report is in compliance with the FCC Rules Part 95 requirements. The test results of this report relate only to the tested sample identified in this report.

Prepared By

Donjon Huang
(Project Engineer)
Dec. 09, 2020

Reviewed By

Calvin Liu
(Reviewer)
Dec. 14, 2020

Approved By

Forrest Lei
Authorized Officer
Dec. 14, 2020

TABLE OF CONTENTS

1. GENERAL INFORMATION

1.1 PRODUCT DESCRIPTION

The EUT is a **Two-way radio** designed for voice communication. It is designed by way of utilizing the FM modulation achieves the system operating.

A major technical description of EUT is described as following:

Communication Type	Voice/Tone only
Product Designation	Two-way radio
Test Model	P11UV
Hardware Version	BF_UV11_V05
Software Version	v1.5
Modulation	FM
Channel Separation	12.5KHz
Emission Type	11K0F3E
Emission Bandwidth	10.57KHz
Maximum Transmitter Power	34.88dBm-3.5W 26.94dBm-0.5W
Rated Output power	3.5W/0.5W (It was fixed by the manufacturer, any individual can't arbitrarily change it.)
Antenna Designation	Inseparable
Antenna Gain	1.5dBi
Power Supply	DC 7.4V by battery
Limiting Voltage	DC 6.29V~8.51V
Operation Frequency Range and Channel	GMRS: 462.5500MHz-462.7250MHz(3.5W) 462.5625MHz-462.7125MHz(3.5W) 467.5500MHz-467.7250MHz(3.5W) 467.5625MHz-467.7125MHz(0.5W) Test Channel : 4, 11, 19 and 27 channel
Frequency Tolerance	1.097ppm

Channel List:

CH. No	CH. Freq	Power	CH. No	CH. Freq	Power
1	462.5625	3.5W	15	462.5500	3.5W
2	462.5875		16	462.5750	
3	462.6125		17	462.6000	
4	462.6375		18	462.6250	
5	462.6625		19	462.6500	
6	462.6875		20	462.6750	
7	462.7125		21	462.7000	
8	467.5625	0.5W	22	462.7250	
9	467.5875		23	467.5500	3.5W
10	467.6125		24	467.5750	
11	467.6375		25	467.6000	
12	467.6625		26	467.6250	
13	467.6875		27	467.6500	
14	467.7125		28	467.6750	
N/A			29	467.7000	
			30	467.7250	

1.2 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for FCC ID: **2AJGM-P11UV**, filing to comply with the FCC Part 95 requirements.

1.3 TEST METHODOLOGY.

FCC Part 95: Personal Radio Services
FCC Part 2: Frequency allocations and radio treaty matters, general rules and regulations.
TIA/EIA 603 E: March 2016: Land Mobile FM or PM Communications Equipment Measurement and Performance Standards.

1.4 ADDRESS OF THE TEST LABORATORY

Laboratory: Attestation of Global Compliance (Shenzhen) Co., Ltd

Address: 1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

1.5 TEST FACILITY

The test facility is recognized, certified, or accredited by the following organizations:

CNAS-Lab Code: L5488

Attestation of Global Compliance (Shenzhen) Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2017 General Requirements) for the Competence of Testing and Calibration Laboratories

A2LA-Lab Cert. No.: 5054.02

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

FCC-Registration No.: 975832

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files with Registration 975832.

IC-Registration No.: 24842

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the Certification and Engineering Bureau of Industry Canada. The acceptance letter from the IC is maintained in our files with Registration 24842.

1.6 SPECIAL ACCESSORIES

Not available for this EUT intended for grant.

1.7 EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

1.8 ANTENNA REQUIREMENT

This intentional radiator is designed with a permanently attached antenna of an antenna to ensure that no antenna other than that furnished by the responsible party shall be used with the device.
For more information of the antenna, please refer to the APPENDIX II: PHOTOGRAPHS OF EUT.

2. SYSTEM TEST CONFIGURATION

2.1 EUT CONFIGURATION

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

2.2 EUT EXERCISE

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

2.3 CONFIGURATION OF TESTED SYSTEM

Fig. 2-1 Configuration of Tested System

Table 2-1 Equipment Used in Tested System

Item	Equipment	Model No.	Identifier	Note
1	Two-way radio	P11UV	FCC ID: 2AJGM-P11UV	EUT
2	Adapter	480-10050-E.S	Input: AC 100-240V 50/60Hz, 0.25A Output:: DC 10V 0.5A	AE
3	Charger	N/A	Input: DC 10V 0.5A Output: DC 8.4V 0.5A	AE
4	Battery	BL-11UV	DC 7.4V 1500mA	AE
5	Back clip	N/A	N/A	AE

Note：The battery is full-charged during the test

2.4 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%.

- Uncertainty of Conducted Emission, Uc = ±3.2 dB
- Uncertainty of Radiated Emission below 1GHz, Uc = ±3.9 dB
- Uncertainty of Radiated Emission above 1GHz, Uc = ±4.8 dB
- Uncertainty of total RF power, conducted, Uc = ±0.8dB
- Uncertainty of spurious emissions, conducted, Uc = ±2.7dB
- Uncertainty of Occupied Channel Bandwidth: Uc = ±2 %
- Uncertainty of Frequency: Uc = ±2 %
- Uncertainty of FM deviation: Uc=±2 %
- Uncertainty of Audio Level: Uc=±0.98dB
- Uncertainty of Modulation Limiting: Uc=0.42 %
- Uncertainty of Transient Frequency Behavior: Uc=6.8%

3. SUMMARY OF TEST RESULTS

FCC 47 CFR Part 95 Test Cases			
Test Item	**Test Requirement**	**Test Method**	**Result**
Antenna Equipment	FCC CFR Part 95	N/A	PASS
Maximum Transmitter Power	FCC CFR Part 95.1767 FCC 47 CFR Part 2.1046(a)	ANSI/TIA-603-E-2016	PASS
Modulation Limit	FCC CFR Part 95.1775 FCC 47 CFR Part 2.1047(a)(b)	ANSI/TIA-603-E-2016	PASS
Audio Frequency Response	FCC CFR Part 95.1775 FCC 47 CFR Part 2.1047(a)	ANSI/TIA-603-E-2016	PASS
Audio Low Pass Filter Response	FCC 47 CFR Part 95.1775(e)	ANSI/TIA-603-E-2016	PASS
Emission Bandwidth	FCC CFR Part 95.1773 FCC 47 CFR Part 2.1049	ANSI/TIA-603-E-2016	PASS
Emission Mask	FCC CFR Part 95.1779	ANSI/TIA-603-E-2016	PASS
Transmitter Radiated Spurious Emission	FCC CFR Part 95.1779 FCC 47 CFR Part 2.1053	ANSI/TIA-603-E-2016	PASS
Spurious Emission On Antenna Port	FCC CFR Part 95.1779 FCC 47 CFR Part 2.1051	ANSI/TIA-603-E-2016	N/A
Frequency Stability	FCC CFR Part 95.1765 FCC 47 CFR Part 2.1055 (a)(1)	ANSI/TIA-603-E-2016	PASS

Note:

1) N/A: In this whole report not application.
2) The EUT is Integral Antenna.

LIST OF EQUIPMENTS USED

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESCI	10096	Jun. 09, 2020	Jun. 08, 2021
EXA Signal Analyzer	KEYSIGHT	N9020A	MY53300860	July 15, 2020	July 14, 2021
Horn antenna	SCHWARZBECK	BBHA9170	768	Oct. 09, 2019	Oct. 08, 2021
preamplifier	ETS	3117PA	00225134	Sep. 03, 2020	Sep. 02, 2022
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	May. 17, 2019	May. 16, 2021
Broadband Preamplifier	SCHWARZBECK	BBV9718	9718-205	Jun. 09, 2020	Jun. 08, 2021
Double-Ridged Waveguide Horn	ETS	3117	00154520	Oct. 26, 2019	Oct. 25, 2021
SIGNAL	AGILENT	E4421B	MY43351603	Jun. 09, 2020	Jun. 08, 2021
ANTENNA	SCHWARZBECK	VULB9168	VULB9168-494	Jan. 09, 2019	Jan. 08, 2021
ANTENNA	SCHWARZBECK	VULB9168	D69250	Sep.20, 2019	Sep.19, 2021
Modulation Domain Analyzer	HP	53310A	3121A02467	Aug. 26, 2020	Aug. 25, 2021
Small environmental tester	ESPEC	SH-242	93008290	Sep. 03, 2020	Sep. 02, 2022
RF Communication Test Set	HP	8920B	US35010161	Sep. 03, 2020	Sep. 02, 2021
Active loop antenna (9K-30MHz)	ZHINAN	ZN30900C	18051	Jun. 11, 2020	Jun. 10, 2021
Attenuator	Schaffner	58-30-33	ML030	Oct. 26, 2020	Oct. 25, 2021
RF Cable	R&S	1#	--	Each time	N/A
Fliter-UHF	Microwave	N25155M2	498705	May. 11, 2020	May. 10, 2021

Note: 8920B can generate audio modulation frequency.

4. DESCRIPTION OF TEST MODES

RF TEST MODES

The EUT (**Two-way radio**) has been tested under normal operating condition. (GMRS TX) are chosen for testing at each channel separation.

NO.	TEST MODE DESCRIPTION	CHANNEL SEPARATION
1	GMRS TX CHANNEL 4	12.5 kHz
2	GMRS TX CHANNEL 11	12.5 kHz
3	GMRS TX CHANNEL 19	12.5 kHz
4	GMRS TX CHANNEL 27	12.5 kHz

Note:

1. Only the result of the worst case was recorded in the report, if no other cases.
2. For Radiated Emission, 3axis were chosen for testing for each applicable mode.
3. Manufacturers use computer PC programming software to switch and operate frequency points, refer to the instructions for details

5. FREQUENCY TOLERANCE

5.1 PROVISIONS APPLICABLE

Standard Applicable [Part 95.1765]The carrier frequency stability is the ability of the transmitter to maintain an assigned carrier frequency.
FCC Part 95.1765,
GMRS: The carrier frequency of each GMRS transmitter transmitting an emission with an occupied bandwidth of 12.5 kHz or less must remain within 2.5 ppm
The carrier frequency of each GMRS transmitter transmitting an emission with an occupied bandwidth greater than 12.5 kHz must remain within 5 ppm

5.2 MEASUREMENT PROCEDURE

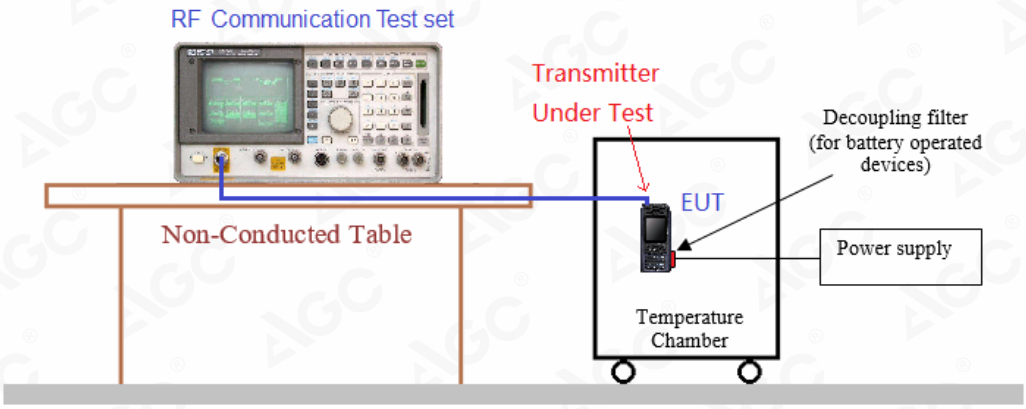
5.2.1 Frequency stability versus environmental temperature

1. Setup the configuration per figure 1 for frequencies measurement inside an environment chamber, Install new battery in the EUT.
2. Turn on EUT and set SA center frequency to the EUT radiated frequency. Set SA Resolution Bandwidth to 1KHz and Video Resolution Bandwidth to 1KHz and Frequency Span to 50KHz.Record this frequency as reference frequency.
3. Set the temperature of chamber to 50℃. 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 10℃ decreased per stage until the lowest temperature -30℃ is measured, record all measured frequencies on each temperature step.

5.2.2 Frequency stability versus input voltage

1. Setup the configuration per figure 1 for frequencies measured at temperature if it is within 15℃ to 25℃. Otherwise, an environment chamber set for a temperature of 20℃ shall be used. The EUT shall be powered by DC 7.4V.
2. Set SA center frequency to the EUT radiated frequency. Set SA Resolution Bandwidth to 1 KHz and Video Resolution Bandwidth to 1KHz. Record this frequency as reference frequency.
3. Supply the EUT primary voltage at the operating end point which is specified by manufacturer and record the frequency.

5.3 TEST SETUP BLOCK DIAGRAM



5.4TEST RESULT

(1) Frequency stability versus input voltage (Supply nominal voltage is 7.4V)

Environment Temperature (℃)	Power Supply	Reference Frequency				Limit:
	(V)	462.6375MHz	462.6500MHz	467.6375MHz	467.6500MHz	ppm
50	DC 7.4	0.659	0.653	0.780	0.760	±2.5for GMRS
40	DC 7.4	1.050	1.045	0.635	0.955	
30	DC 7.4	0.847	0.821	1.013	0.632	
20	DC 7.4	1.006	0.946	0.514	0.512	
10	DC 7.4	0.693	0.587	1.053	0.689	
0	DC 7.4	0.932	0.622	1.073	0.663	
-10	DC 7.4	0.970	0.652	0.908	0.753	
-20	DC 7.4	0.698	1.064	1.042	0.558	
-30	DC 7.4	0.933	1.093	0.640	0.551	
Result	Pass					

(2) Frequency stability versus input voltage (Battery limiting voltage is 6.29V)

Environment Temperature (℃)	Power Supply	Reference Frequency				Limit:
	(V)	462.6375MHz	462.6500MHz	467.6375MHz	467.6500MHz	ppm
50	DC 6.29	0.617	0.867	0.995	0.538	±2.5for GMRS
40	DC 6.29	0.605	0.782	0.988	0.347	
30	DC 6.29	1.072	0.590	0.620	0.961	
20	DC 6.29	0.566	1.097	0.742	0.462	
10	DC 6.29	0.643	0.827	0.511	0.770	
0	DC 6.29	0.550	0.926	1.055	0.822	
-10	DC 6.29	0.950	0.997	0.845	0.763	
-20	DC 6.29	1.082	0.516	0.731	0.564	
-30	DC 6.29	0.515	0.585	0.699	0.857	
Result	Pass					

(3) Frequency stability versus input voltage (Battery Fully Charged voltage is 8.51V)

Environment Temperature (℃)	Power Supply (V)	462.6375MHz	462.6500MHz	467.6375MHz	467.6500MHz	Limit: ppm
50	DC 8.51	0.931	0.642	1.062	0.854	±2.5for GMRS
40	DC 8.51	0.531	0.926	0.997	0.374	
30	DC 8.51	0.817	0.721	0.558	0.622	
20	DC 8.51	0.616	0.736	0.583	0.323	
10	DC 8.51	0.743	0.914	0.968	0.888	
0	DC 8.51	0.933	0.723	0.826	0.373	
-10	DC 8.51	1.021	0.523	1.002	0.932	
-20	DC 8.51	0.938	0.703	0.684	0.358	
-30	DC 8.51	0.761	0.545	0.675	0.808	
Result	Pass					

Note: 1.Battery terminal voltage is declared and specified by the manufacturer.
2. All test values are in "ppm"

6. EMISSION BANDWIDTH

6.1 PROVISIONS APPLICABLE

FCC Part 95.1773: GMRS:

(a) Main channels. The authorized bandwidth is 20 kHz for GMRS transmitters operating on any of the 462 MHz main channels, or any of the 467 MHz main channels.

(b) Interstitial channels. The authorized bandwidth is 20 kHz for GMRS transmitters operating on any of the 462 MHz interstitial channels, and is 12.5 kHz for GMRS transmitters operating on any of the 467 MHz interstitial channels.

Occupied Bandwidth: The EUT was connected to the audio signal generator and the spectrum analyzer via the main RF connector, and through an appropriate attenuator. The EUT was controlled to transmit its maximum power. Then the bandwidth of 99% power can be measured by the spectrum analyzer.

6.2 MEASUREMENT PROCEDURE

1). The EUT was modulated by 2.5 KHz Sine wave audio signal, The level of the audio signal employed is 16 dB greater than that necessary to produce 50% of rated system deviation. Rated system deviation is 2.5 kHz (12.5 kHz channel spacing).

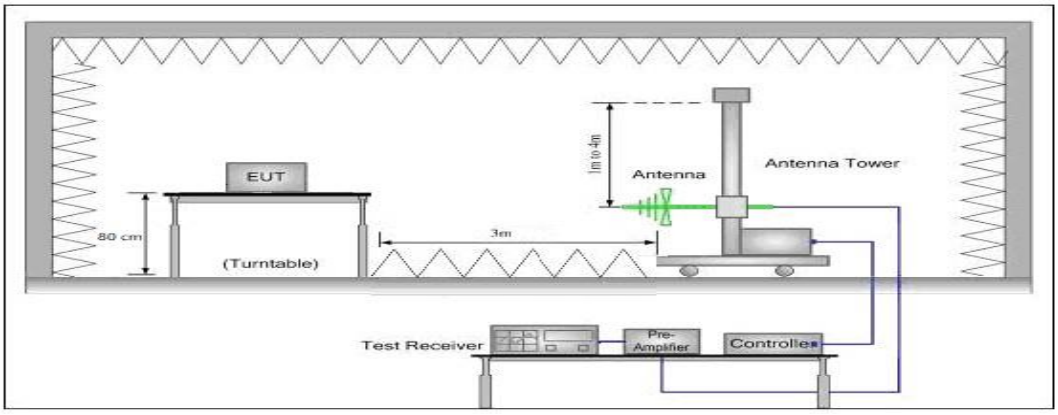
2). Set SPA Center Frequency = fundamental frequency, RBW=300Hz.VBW= 1KHz, Span =50 KHz.

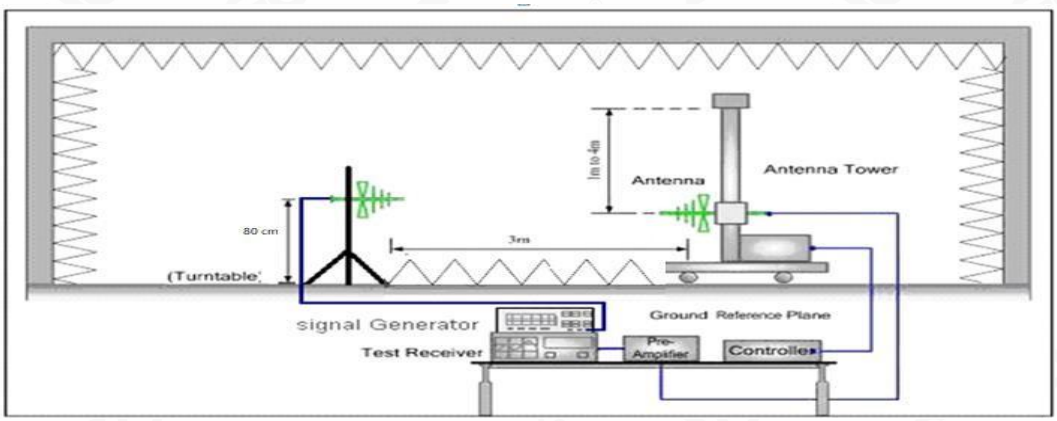
3). Set SPA Max hold. Mark peak, -26 dB.

6.3 TEST SETUP BLOCK DIAGRAM

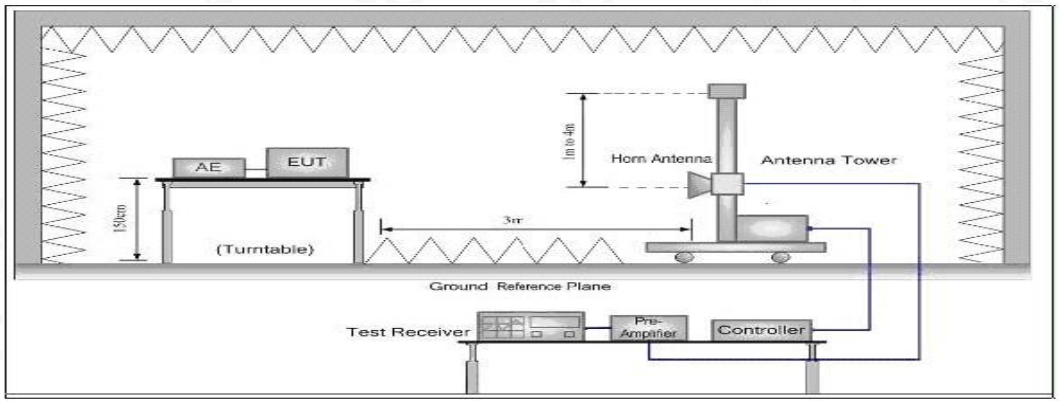
Radiation method:

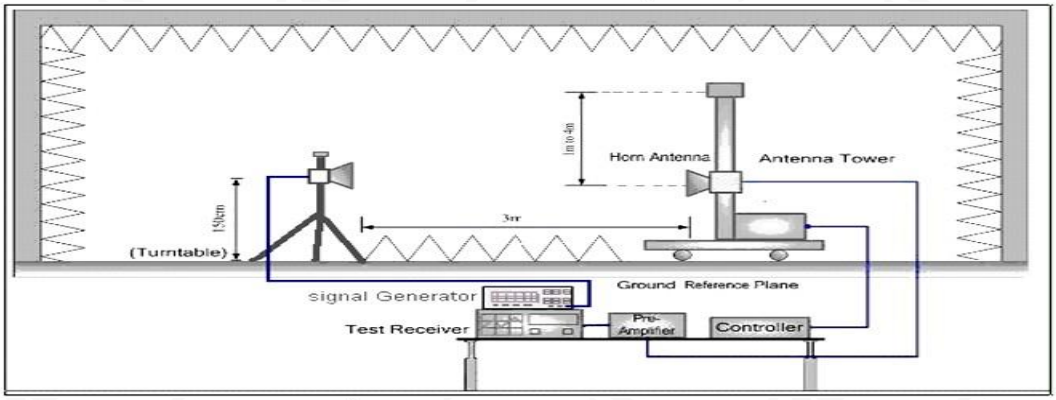
Radiated Below1GHz



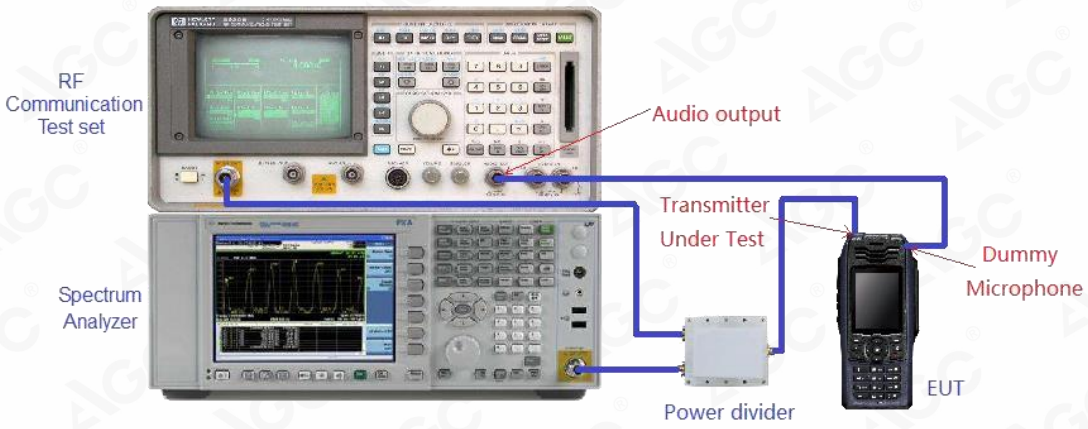


Radiated Above 1 GHz





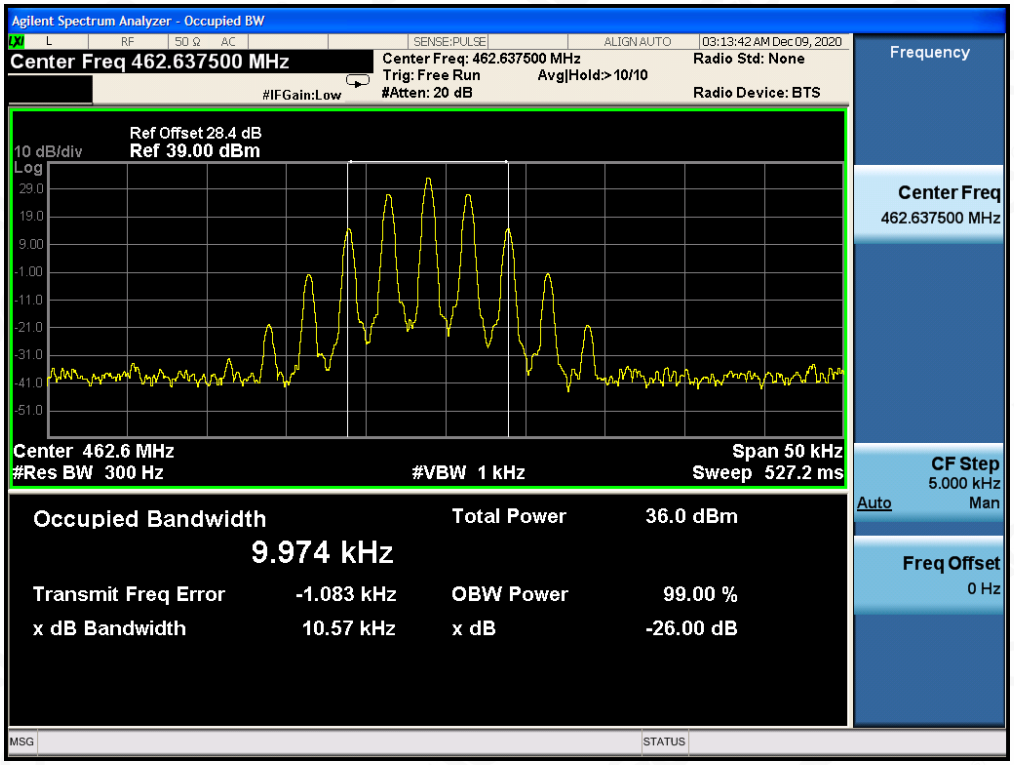
Conduction method:



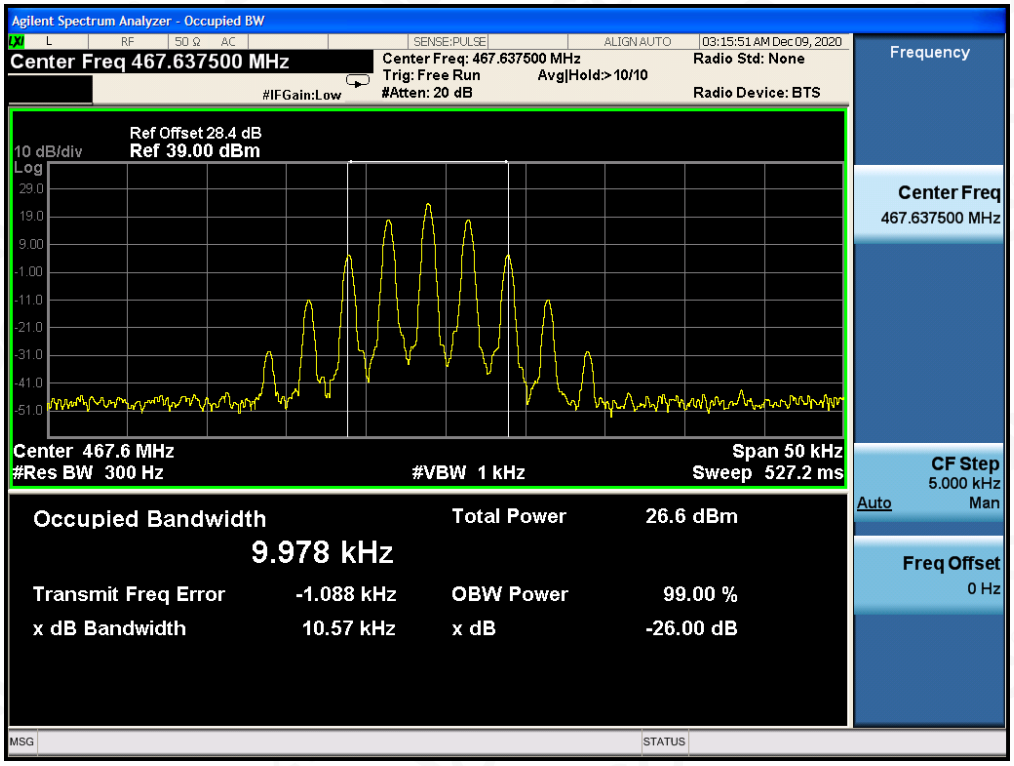
6.4 MEASUREMENT RESULT

Emission Bandwidth Measurement Result				
Operating Frequency	12.5 KHz Channel Separation			
	Occupied Bandwidth	Emission Bandwidth	Limits	Result
462.6375 MHz	9.974 KHz	10.57 KHz	20 KHz	Pass
467.6375 MHz	9.978 KHz	10.57 KHz	12.5KHz	Pass
462.6500 MHz	9.976 KHz	10.57 KHz	20 KHz	Pass
467.6500 MHz	9.978 KHz	10.57 KHz	20 KHz	Pass

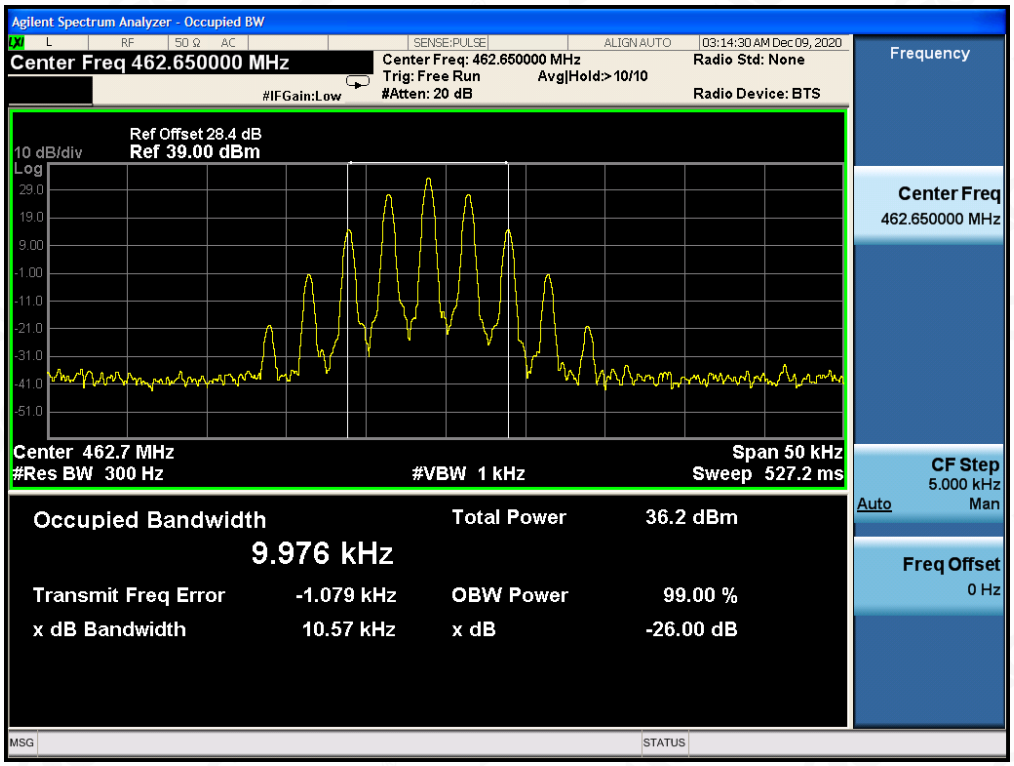
Occupied bandwidth of 462.6375MHz-3.5W



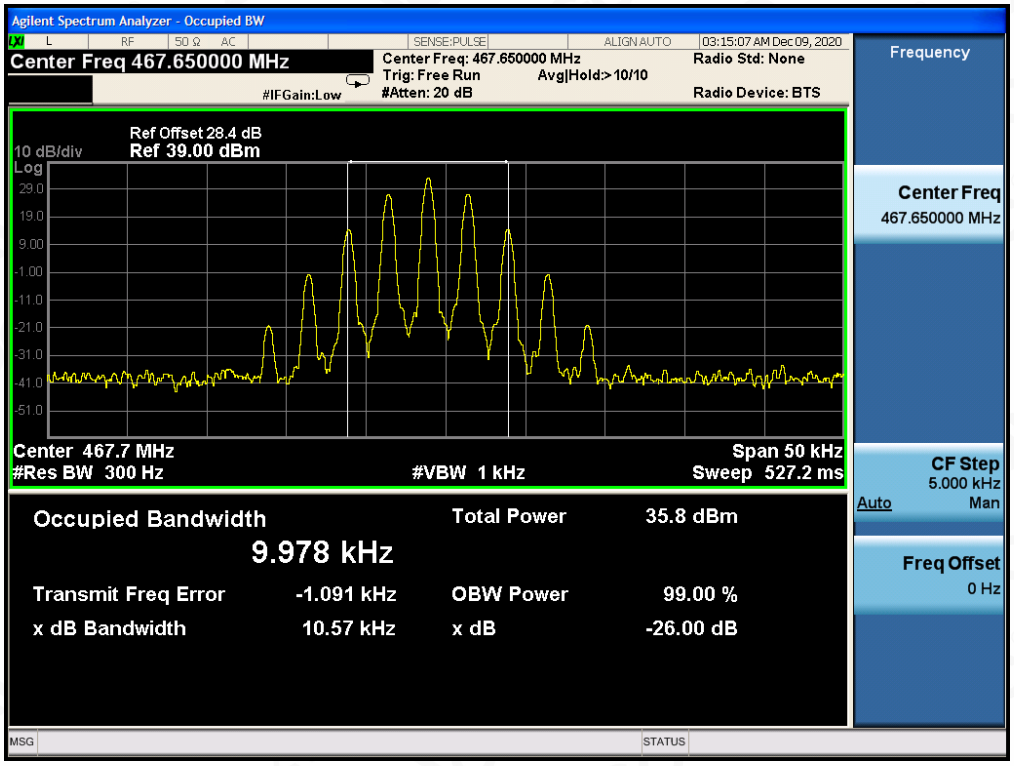
Occupied bandwidth of 467.6375MHz-0.5W



Occupied bandwidth of 462.6500MHz-3.5W



Occupied bandwidth of 467.6500MHz-3.5W



7. UNWANTED RADIATION

7.1 PROVISIONS APPLICABLE

Standard Applicable [FCC Part 95.1779]

According to FCC section 95.1779, the unwanted emission should be attenuated below TP by at least 43+10 log(Transmit Power) dB.

7.2 MEASUREMENT PROCEDURE

Each GMRS transmitter type must be designed to comply with the applicable unwanted emissions limits in this section.

(a)Emission masks. Emission masks applicable to transmitting equipment in the GMRS are defined by the requirements in the following table. The numbers in the attenuation requirements column refer to rule paragraph numbers under paragraph (b) of this section.

Emission types filter	Attenuation requirements
A1D, A3E, F1D, G1D, F2D, F3E, G3E with audio filter	(1), (2), (7)
A1D, A3E, F1D, G1D, F3E, G3E without audio filter	(3), (4), (7)
H1D, J1D, R1D, H3E, J3E, R2E	(5), (6), (7)

(1) Filtering noted for GMRS transmitters refers to the requirement in §95.1775(e).

(2) Unwanted emission power may be measured as either mean power or peak envelope power, provided that the transmitter output power is measured the same way.

(b) Attenuation requirements. The power of unwanted emissions must be attenuated below the transmitter output power in Watts (P) by at least:

(1) 25 dB (decibels) on any frequency removed from the center of the authorized bandwidth by more than 50% up to and including 100% of the authorized bandwidth.

(2) 35 dB on any frequency removed from the center of the authorized bandwidth by more than 100% up to and including 250% of the authorized bandwidth.

(3) 83 log (fd ÷ 5) dB on any frequency removed from the center of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 5 kHz up to and including 10 kHz.

(4) 116 log (fd ÷ 6.1) dB or 50 + 10 log (P) dB, whichever is the lesser attenuation, on any frequency removed from the center of the authorized bandwidth by a displacement frequency (fd in kHz), of more than 10 kHz up to and including 250% of the authorized bandwidth.

(5) 25 dB on any frequency removed from the center of the authorized bandwidth by more than 50% up to and including 150% of the authorized bandwidth.

(6) 35 dB on any frequency removed from the center of the authorized bandwidth by more than 150% up to and including 250% of the authorized bandwidth.

(7) 43 + 10 log (P) dB on any frequency removed from the center of the authorized bandwidth by more than 250%.

(1) EUT was placed on a 0.8 or 1.5 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 disturbance of the transmitter was maximized on the test receiver display by raising and lowering from 1m to 4m the receive antenna and by rotating through 360° the turntable. After the fundamental emission was maximized, a field strength measurement was made. The radiated emission measurements of all transmit frequencies in all channels 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 for above 1GHz and RBW=100kHz,VBW=300kHz for 30MHz to 1GHz, And the maximum value of the receiver should be recorded as (Pr).

(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 (PMea) 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 (Pr). The power of signal source (PMea) 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 (Pcl) ,the Substitution Antenna Gain (Ga) and the Amplifier Gain (PAg) should be recorded after test.

(6)The measurement results are obtained as described below: Power(EIRP)=PMea- PAg - Pcl - Ga The measurement results are amend as described below:
Power(EIRP)=PMea- Pcl - Ga

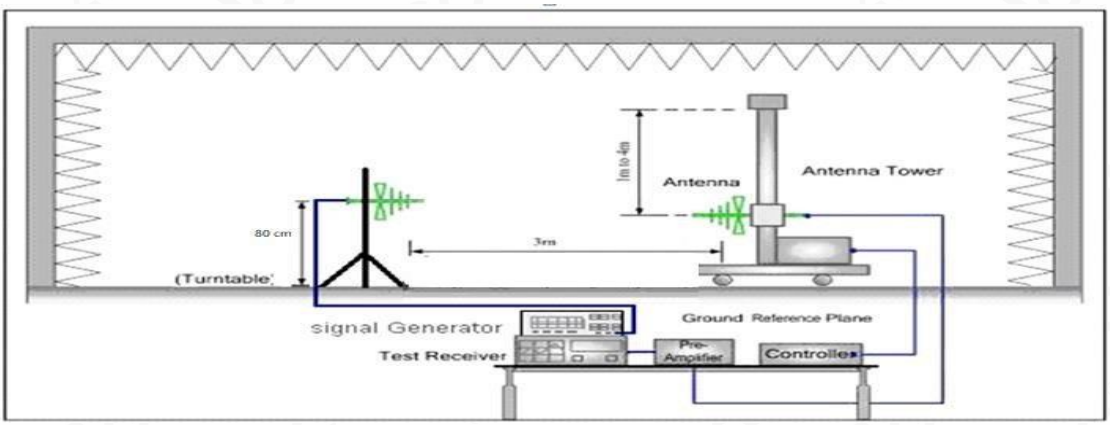
(7)This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power.
ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP-2.15dBi.

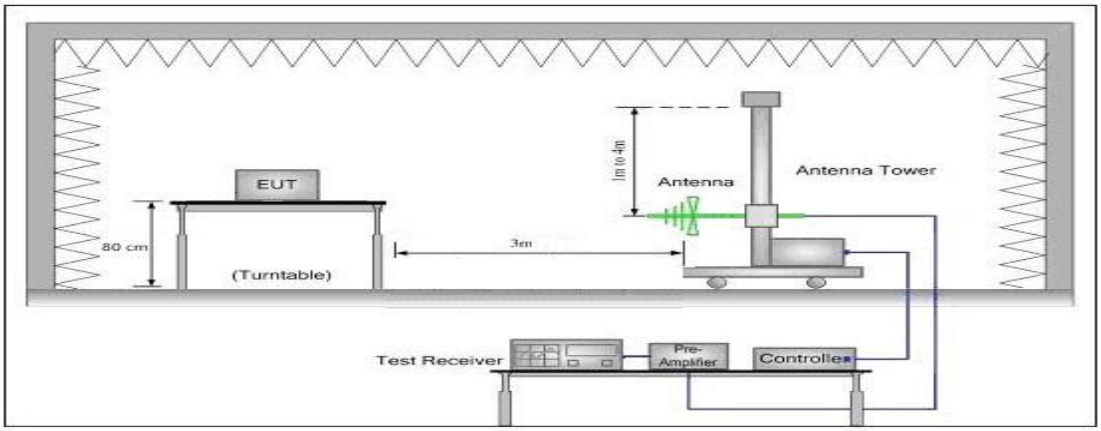
(8)Test the EUT in the lowest channel, the middle channel the Highest channel

7.3 TEST SETUP BLOCK DIAGRAM

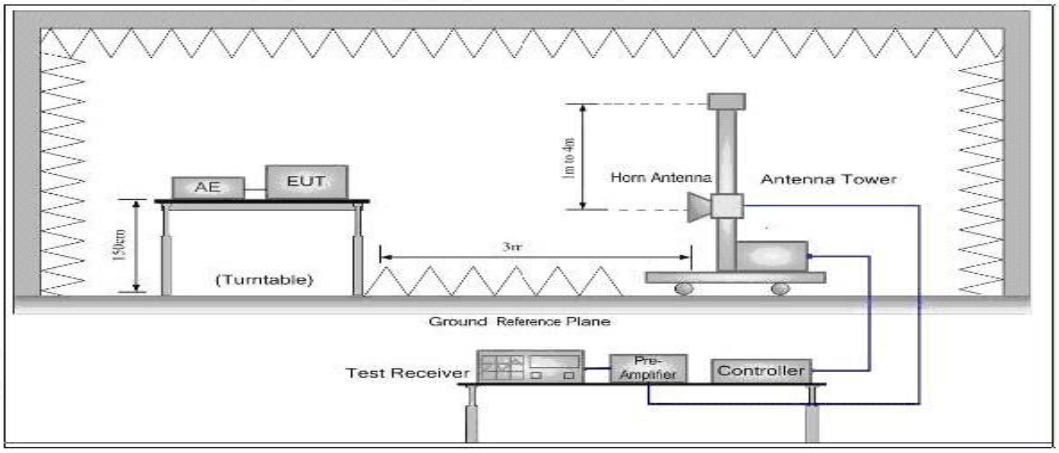
SUBSTITUTION METHOD: (Radiated Emissions)

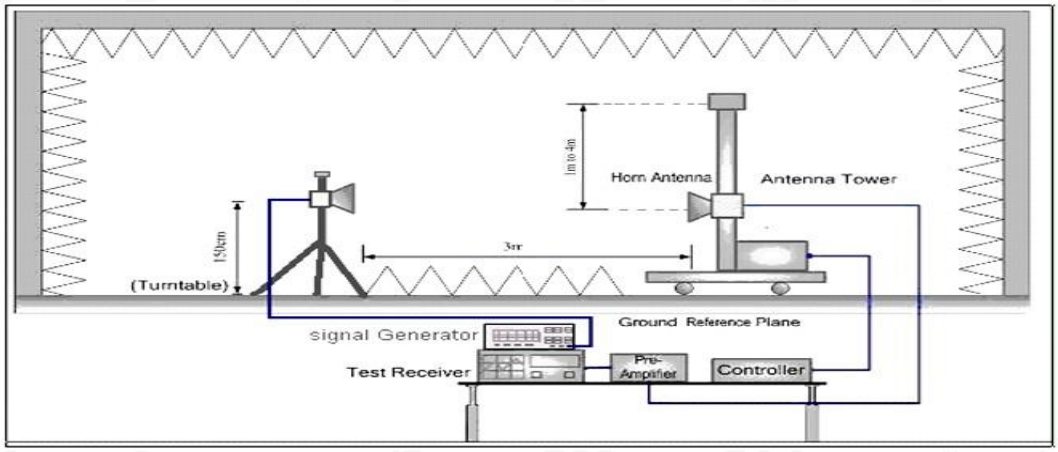
Radiated Below1GHz





Radiated Above 1 GHz



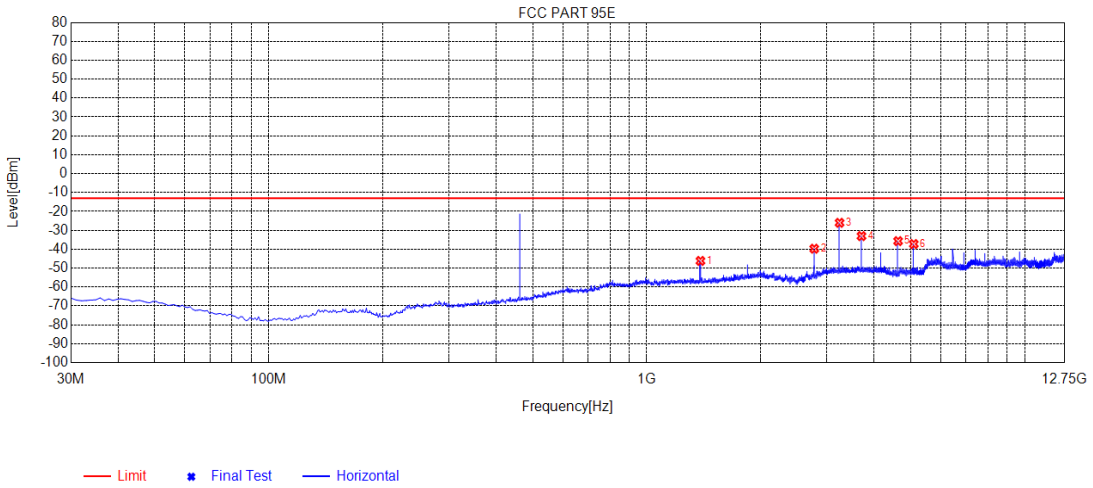


7.4 MEASUREMENT RESULTS:

the unwanted emission should be attenuated below TP by at least 43+10 log(Transmit Power) dB

Limit: At least 43+10 log (P) =43+10log (3.5) =46.01(dBc) 35.44-48.44= -13dBm
At least 43+10 log (P) =43+10log (0.5) =39.99(dBc) 26.99-39.99= -13dBm

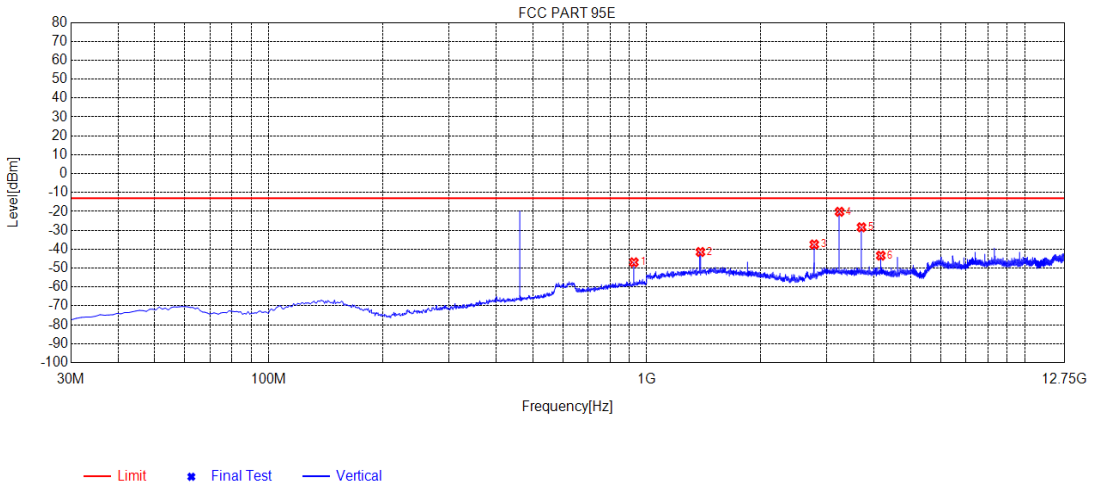
Measurement Result for 12.5 KHz Channel Separation @ 462.6375MHz-3.5W-Horizontal



NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	1387.7888	-42.73	-46.18	-13.00	33.18	-3.45	360	Horizontal
2	2775.6026	-40.90	-39.73	-13.00	26.73	1.17	9	Horizontal
3	3238.5989	-29.74	-26.03	-13.00	13.03	3.71	17	Horizontal
4	3701.5952	-37.46	-33.05	-13.00	20.05	4.41	341	Horizontal
5	4626.4126	-39.26	-35.71	-13.00	22.71	3.55	313	Horizontal
6	5089.4089	-41.91	-37.24	-13.00	24.24	4.67	227	Horizontal

RESULT: PASS

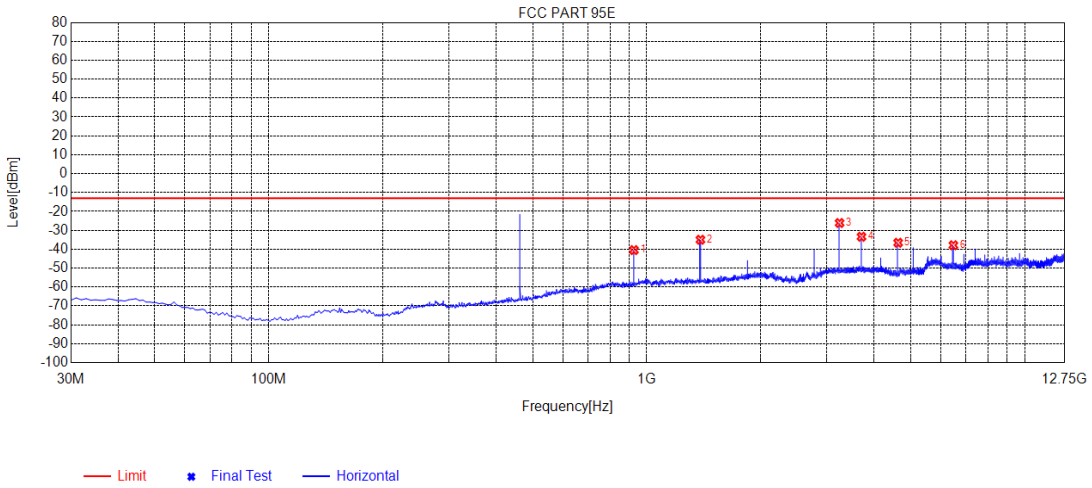
Measurement Result for 12.5 KHz Channel Separation @ 462.6375MHz-3.5W-Vertical



NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	925.3100	-90.50	-46.93	-13.00	33.93	43.57	313	Vertical
2	1387.7888	-42.88	-41.47	-13.00	28.47	1.41	258	Vertical
3	2775.6026	-38.76	-37.48	-13.00	24.48	1.28	359	Vertical
4	3238.5989	-23.33	-20.19	-13.00	7.19	3.14	286	Vertical
5	3701.5952	-31.54	-28.39	-13.00	15.39	3.15	341	Vertical
6	4163.4163	-46.61	-43.40	-13.00	30.40	3.21	351	Vertical

RESULT: PASS

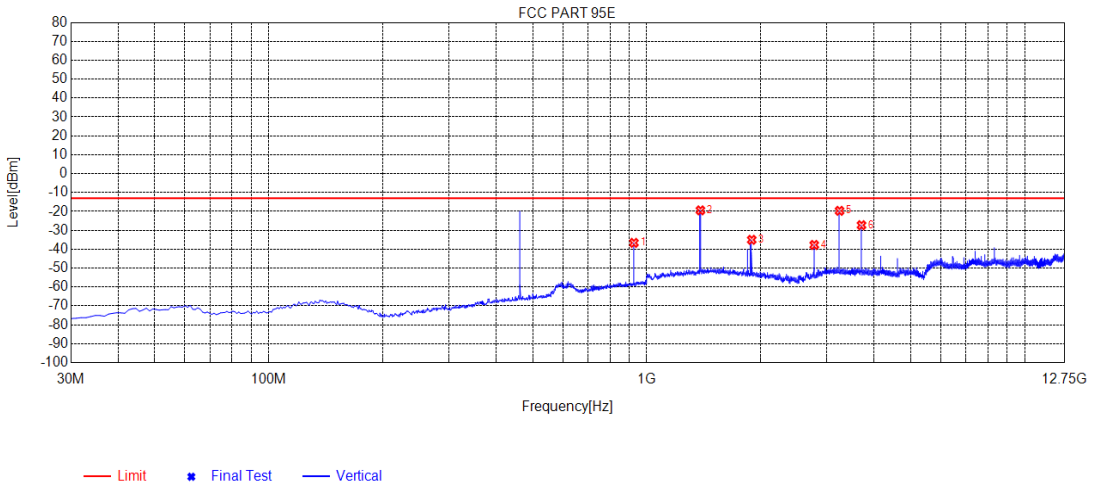
Measurement Result for 12.5 KHz Channel Separation @ 462.6500MHz-3.5W-Horizontal



NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	925.3100	-83.95	-40.46	-13.00	27.46	43.49	292	Horizontal
2	1387.7888	-31.54	-34.99	-13.00	21.99	-3.45	227	Horizontal
3	3238.5989	-29.83	-26.12	-13.00	13.12	3.71	19	Horizontal
4	3701.5952	-37.80	-33.39	-13.00	20.39	4.41	356	Horizontal
5	4626.4126	-40.13	-36.58	-13.00	23.58	3.55	292	Horizontal
6	6477.2227	-49.43	-37.90	-13.00	24.90	11.53	236	Horizontal

RESULT: PASS

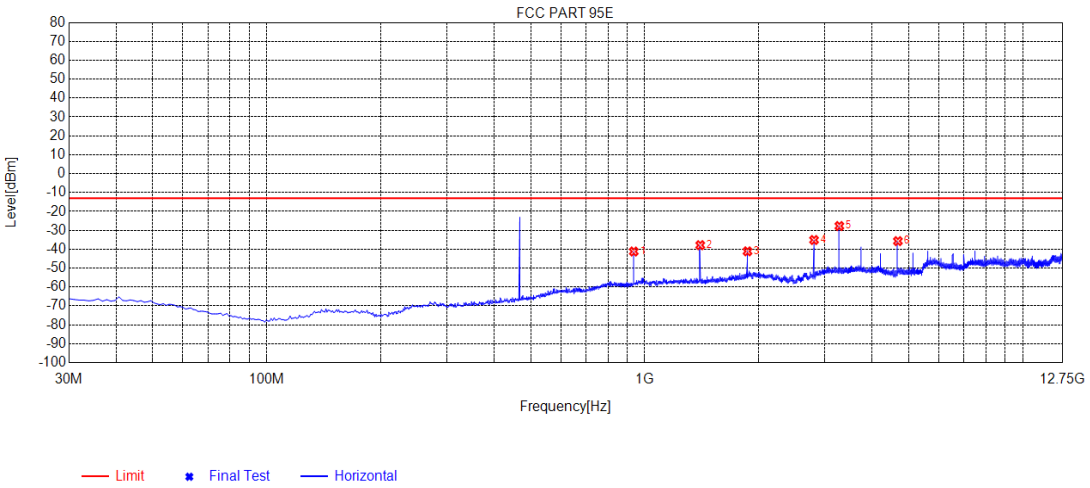
Measurement Result for 12.5 KHz Channel Separation @ 462.6500MHz-3.5W-Vertical



NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	925.3100	-80.21	-36.64	-13.00	23.64	43.57	351	Vertical
2	1387.7888	-20.84	-19.43	-13.00	6.43	1.41	306	Vertical
3	1896.6147	-35.80	-35.03	-13.00	22.03	0.77	99	Vertical
4	2775.6026	-39.01	-37.73	-13.00	24.73	1.28	351	Vertical
5	3238.5989	-22.82	-19.68	-13.00	6.68	3.14	297	Vertical
6	3701.5952	-30.43	-27.28	-13.00	14.28	3.15	325	Vertical

RESULT: PASS

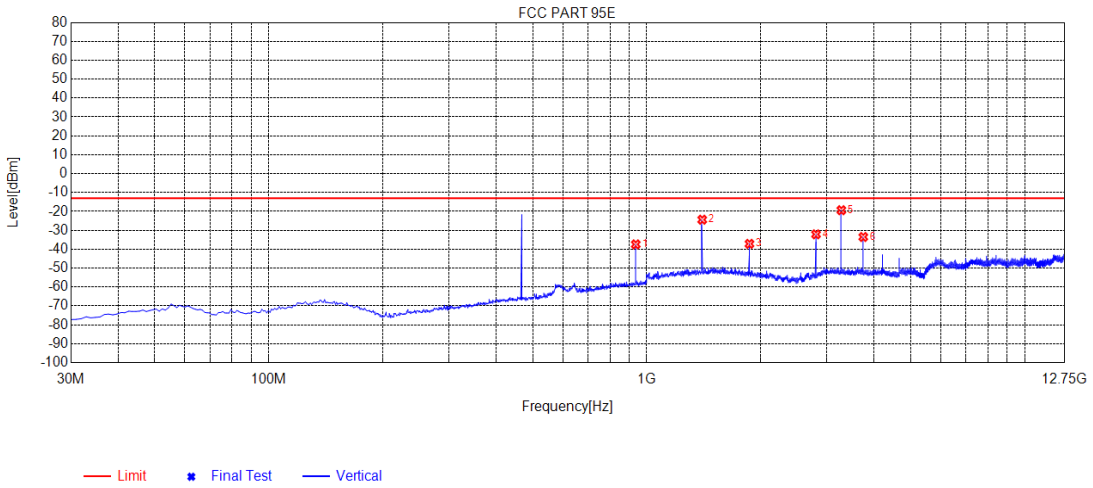
Measurement Result for 12.5 KHz Channel Separation @ 467.6500MHz-3.5W-Horizontal



NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	935.9800	-84.94	-41.22	-13.00	28.22	43.72	293	Horizontal
2	1403.0653	-34.45	-37.86	-13.00	24.86	-3.41	141	Horizontal
3	1870.7621	-40.69	-41.13	-13.00	28.13	-0.44	56	Horizontal
4	2806.1556	-36.58	-35.12	-13.00	22.12	1.46	346	Horizontal
5	3273.8524	-31.50	-27.72	-13.00	14.72	3.78	321	Horizontal
6	4676.9427	-39.29	-35.72	-13.00	22.72	3.57	302	Horizontal

RESULT: PASS

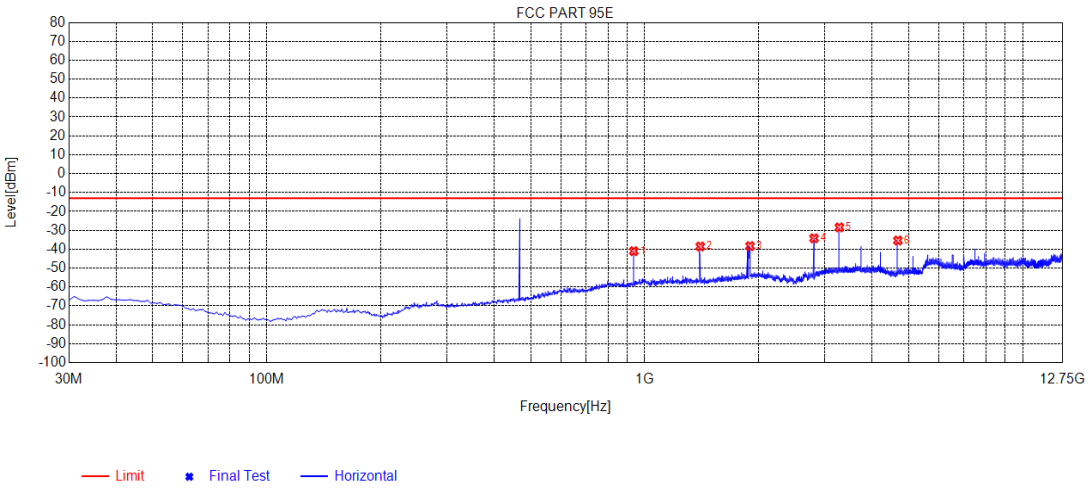
Measurement Result for 12.5 KHz Channel Separation @ 467.6500MHz-3.5W-Vertical



NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	935.9800	-81.10	-37.42	-13.00	24.42	43.68	341	Vertical
2	1403.0653	-25.89	-24.37	-13.00	11.37	1.52	303	Vertical
3	1870.7621	-38.00	-37.14	-13.00	24.14	0.86	142	Vertical
4	2806.1556	-33.65	-32.11	-13.00	19.11	1.54	10	Vertical
5	3273.8524	-22.49	-19.36	-13.00	6.36	3.13	275	Vertical
6	3741.5492	-36.69	-33.52	-13.00	20.52	3.17	323	Vertical

RESULT: PASS

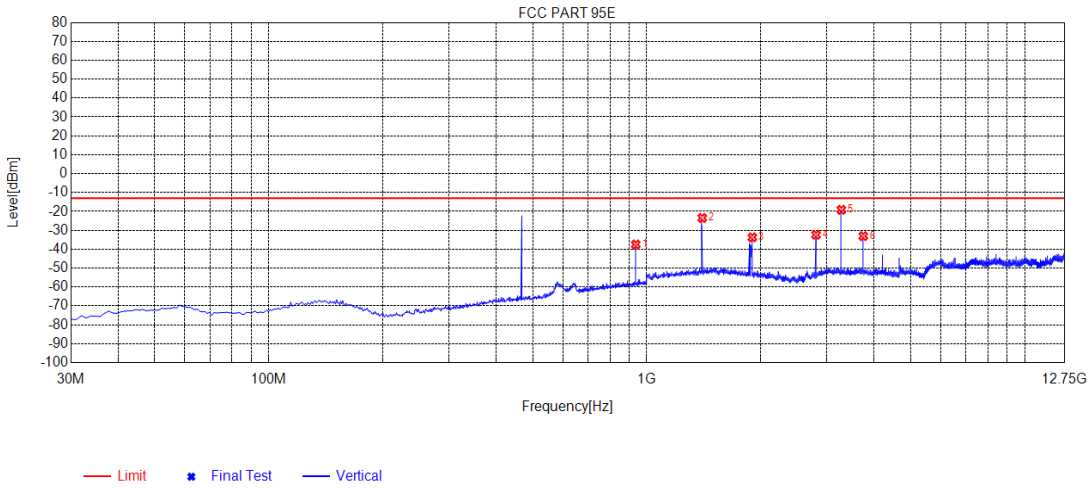
Measurement Result for 12.5 KHz Channel Separation @ 467.6375MHz-0.5W-Horizontal



NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	935.9800	-84.74	-41.02	-13.00	28.02	43.72	305	Horizontal
2	1403.0653	-35.16	-38.57	-13.00	25.57	-3.41	111	Horizontal
3	1900.1400	-38.14	-38.36	-13.00	25.36	-0.22	209	Horizontal
4	2806.1556	-35.70	-34.24	-13.00	21.24	1.46	9	Horizontal
5	3273.8524	-32.22	-28.44	-13.00	15.44	3.78	159	Horizontal
6	4676.9427	-38.96	-35.39	-13.00	22.39	3.57	296	Horizontal

RESULT: PASS

Measurement Result for 12.5 KHz Channel Separation @ 467.6375MHz-0.5W-Vertical



NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	935.9800	-81.18	-37.50	-13.00	24.50	43.68	351	Vertical
2	1403.0653	-24.98	-23.46	-13.00	10.46	1.52	304	Vertical
3	1903.6654	-34.48	-33.73	-13.00	20.73	0.75	209	Vertical
4	2806.1556	-33.92	-32.38	-13.00	19.38	1.54	341	Vertical
5	3273.8524	-22.29	-19.16	-13.00	6.16	3.13	285	Vertical
6	3741.5492	-36.25	-33.08	-13.00	20.08	3.17	313	Vertical

RESULT: PASS

Note:
1. Factor=Antenna Factor + Cable loss. (Below 1GHz)
2. Factor=Antenna Factor+ Cable loss-Pre-amplifier.(Above 1 GHz)
3. Margin=Limit- Level

7.5 EMISSION MASK PLOT

Standard Applicable [FCC Part 95.1779] GMRS: Unwanted emissions shall be attenuated below the unmodulated carrier power in accordance with the following:

(1) At least 25 dB (decibels) on any frequency removed from the center of the authorized bandwidth by more than 50 %up to and including 100% of the authorized bandwidth.

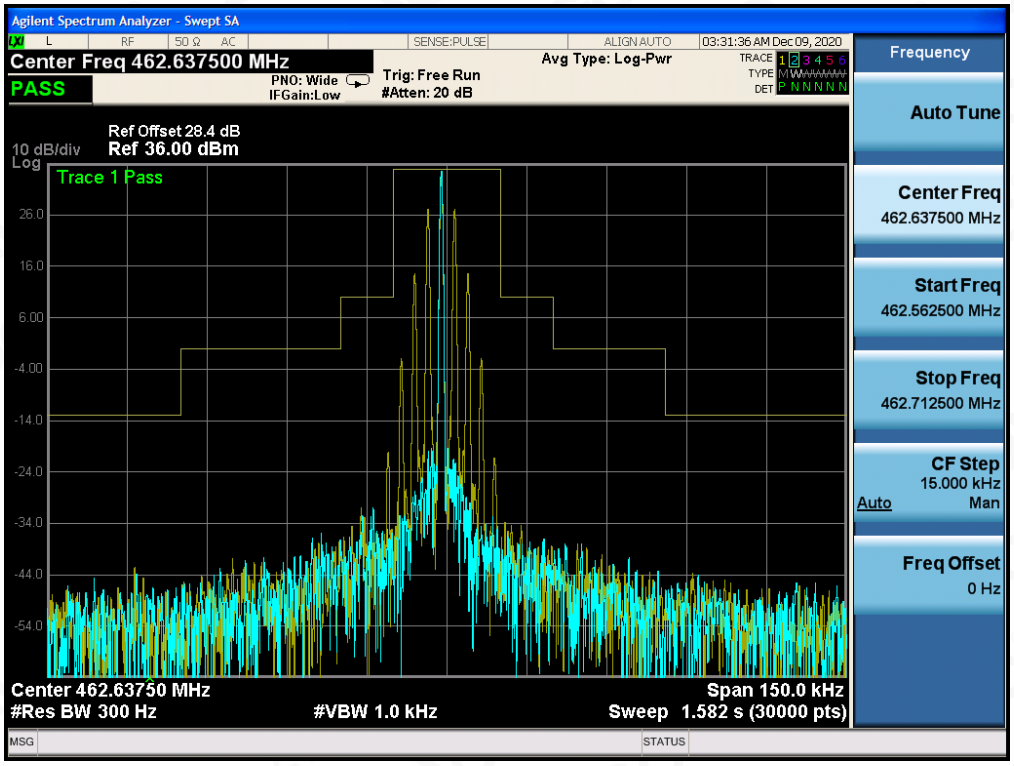
(2) At least 35 dB on any frequency removed from the center of the authorized bandwidth by more than 100 % up to and including 250 % of the authorized bandwidth.

(3) At least 43 + 10 log10 (T) dB on any frequency removed from the center of the authorized bandwidth by more than250 %.

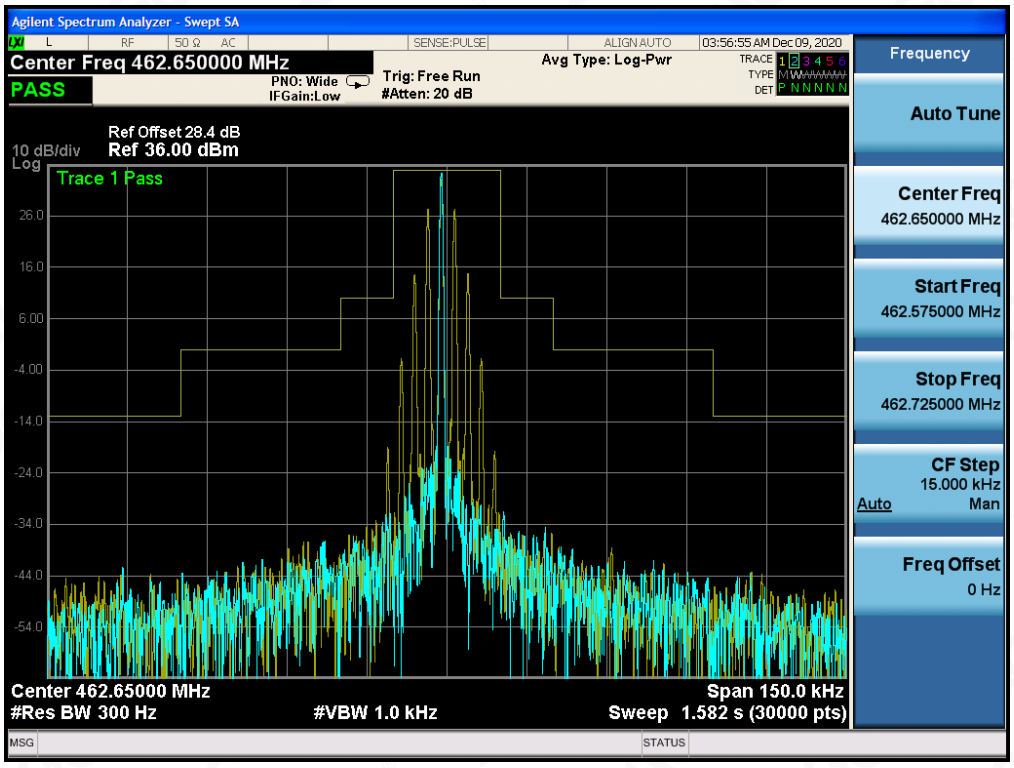
The detailed procedure employed for Emission Mask measurements are specified as following:

- The transmitter shall be modulated by a 2.5 kHz audio signal,
- The level of the audio signal employed is 16 dB greater than that necessary to produce 50% of rated system deviation. Rated system deviation is 2.5 kHz.

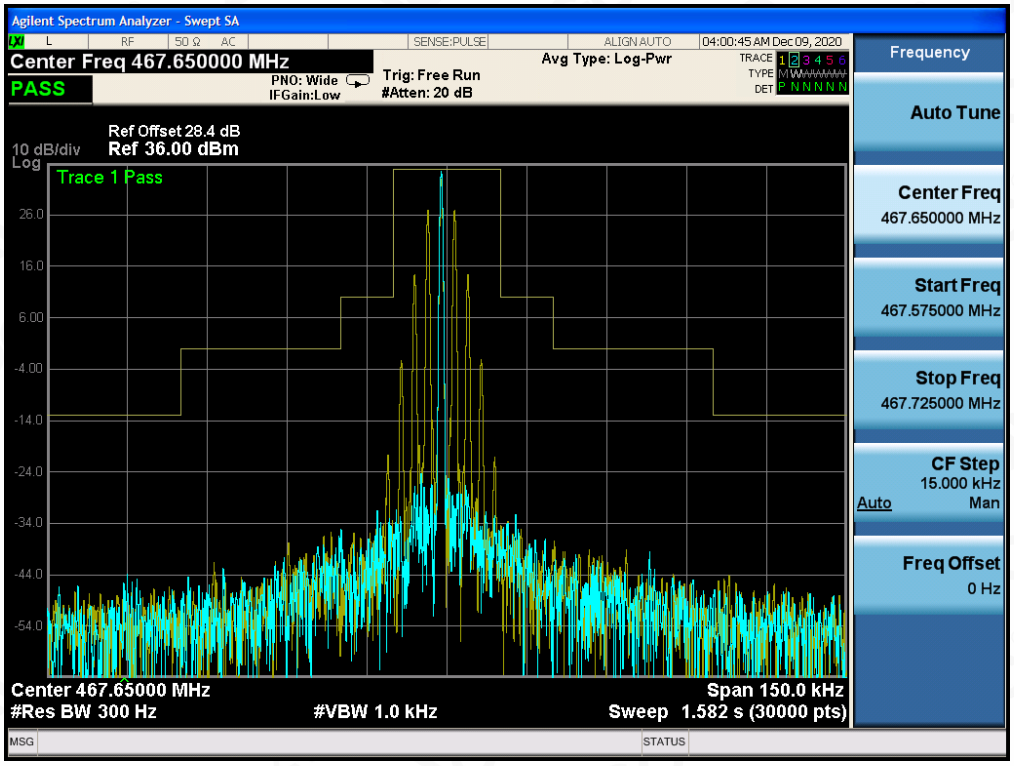
The Worst Emission Mask for channel 4 -3.5W-12.5K



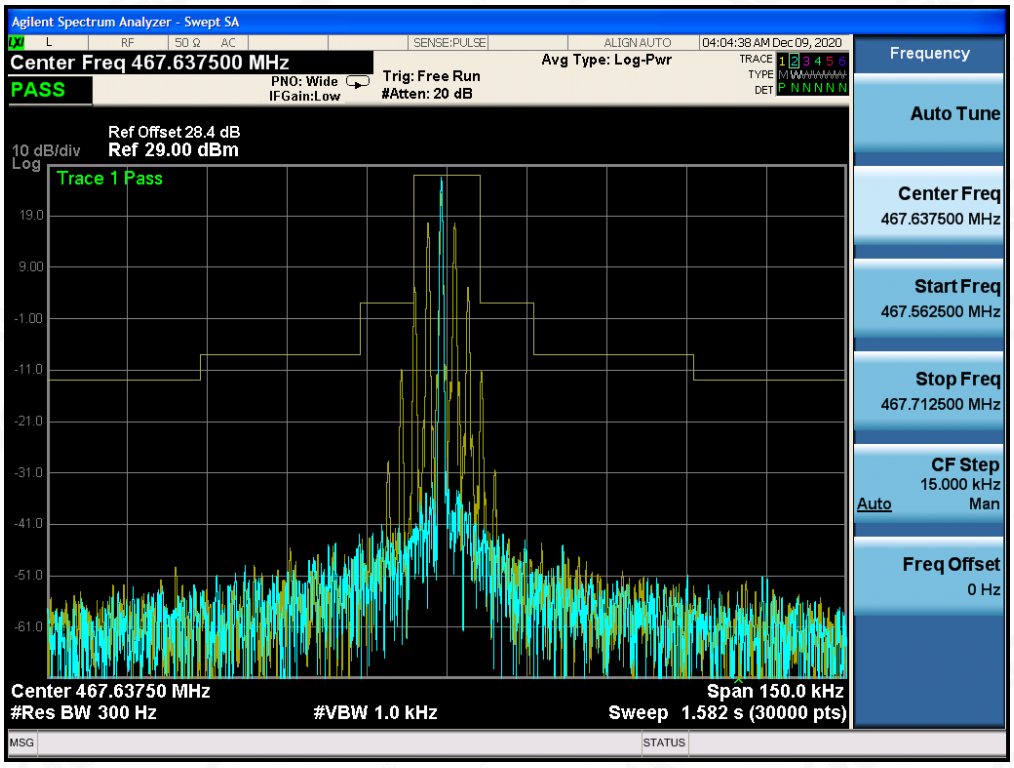
The Worst Emission Mask for channel 19-3.5W-12.5K



The Worst Emission Mask for channel 27 -3.5W-12.5K



The Worst Emission Mask for channel 11-0.5W-12.5K



8. AUDIO LOW PASS FILTER RESPONSE

8.1.PROVISIONS APPLICABLE

§95.1775 GMRS modulation requirements

Audio filter. Each GMRS transmitter type must include audio frequency low pass filtering, unless it complies with the applicable paragraphs of §95.1779 (without filtering).

The filter must be between the modulation limiter and the modulated stage of the transmitter.

At any frequency (f in kHz) between 3 and 20 kHz, the filter must have an attenuation of at least 60 log (f/3) dB more than the attenuation at 1 kHz. Above 20 kHz, it must have an attenuation of at least 50 dB more than the attenuation at 1 kHz

8.2.TEST PROCEDURE

(1) The DUT transmitter output port was connected to Modulation Analyzer.

(2) Path loss for the measurement included.

(3) Press 23.1SPCL on modulation analyzer to enable the external LO from SIgen.

(4) Set the Sigen frequency to Fc + 1.5MHz, RF output level to 0dBm without modulation.

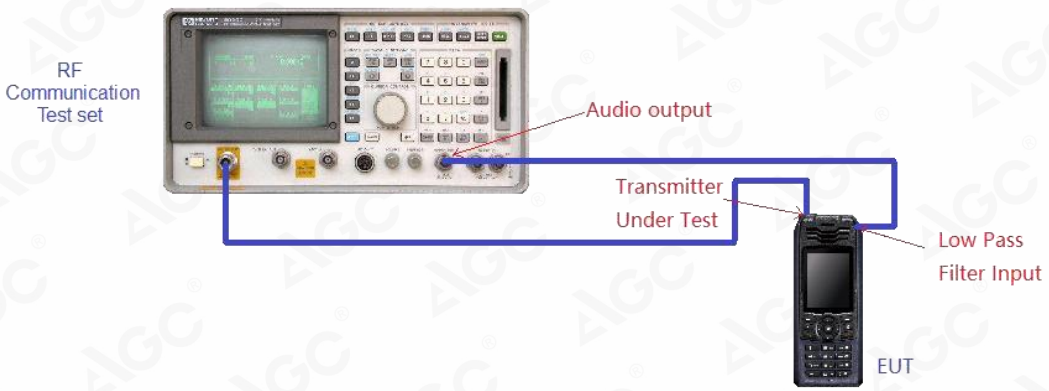
(5) Transmit the radio and set the audio analyzer to 1 kHz audio frequency and 60% of the maximum deviation.

(6) Up the amplitude by 20dB.

(7) On DSA, get the reference point to 0dB.

(8) Vary the frequency on audio analyzer from 3 kHz to 30 kHz, record the audio tone from DSA.

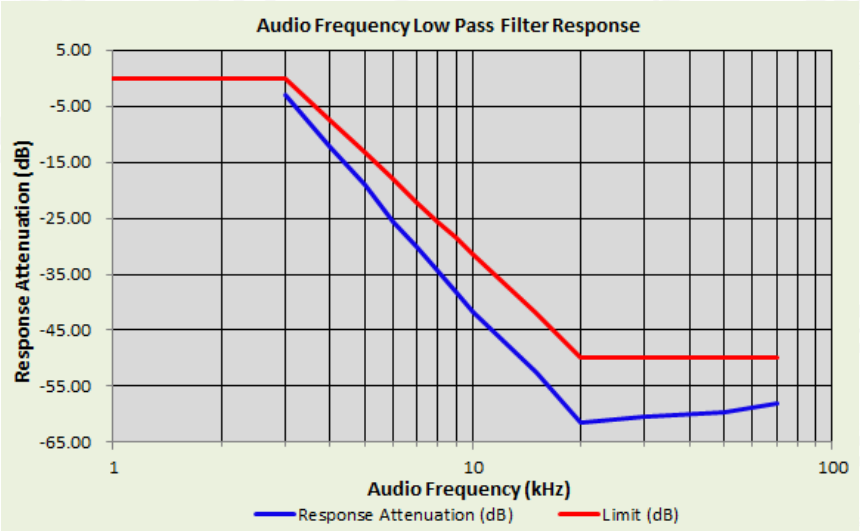
8.3 TEST CONFIGURATION



8.4 TEST RESULT

TEST CHANNEL: 11

Audio Frequency (kHz)	Response Attenuation (dB)	Limit (dB)
1	0	/
3	-2.96	0.00
4	-12.09	-7.50
5	-18.94	-13.31
6	-25.59	-18.06
7	-30.04	-22.08
8	-34.33	-25.56
9	-38.26	-28.63
10	-41.79	-31.37
15	-52.63	-41.94
20	-61.45	-50.00
30	-60.53	-50.00
50	-59.65	-50.00
70	-57.98	-50.00



Note: All the modes had been tested, but only the worst data recorded in the report.

9. MAXIMUMN TRANSMITTER POWER

9.1 PROVISIONS APPLICABLE

FCC Part 95.1767 For GMRS, the maximum permissible transmitter output power effective radiated power (e.r.p.) as follows.

This section contains transmitting power limits for GMRS stations. The maximum transmitting power depends on which channels are being used and the type of station.

(a)462/467 MHz main channels. The limits in this paragraph apply to stations transmitting on any of the 462 MHz main channels or any of the 467 MHz main channels. Each GMRS transmitter type must be capable of operating within the allowable power range. GMRS licensees are responsible for ensuring that their GMRS stations operate in compliance with these limits.

(1)The transmitter output power of mobile, repeater and base stations must not exceed 50 Watts.

(2)The transmitter output power of fixed stations must not exceed 15 Watts.

(b)462 MHz interstitial channels. The effective radiated power (ERP) of mobile, hand-held portable and base stations transmitting on the 462 MHz interstitial channels must not exceed 5 Watts.

(c)467 MHz interstitial channels. The effective radiated power (ERP) of hand-held portable units transmitting on the 467 MHz interstitial channels must not exceed 0.5 Watt. Each GMRS transmitter type capable of transmitting on these channels must be designed such that the ERP does not exceed 0.5 Watt.

9.2 TEST PROCEDURE

(1)EUT was placed on a 0.8 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 disturbance of the transmitter was maximized on the test receiver display by raising and lowering from 1m to 4m the receive antenna and by rotating through 360° the turntable. After the fundamental emission was maximized, a field strength measurement was made. The radiated emission measurements of all transmit frequencies in all channels 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=100kHz,VBW=300kHz for 30MHz to 1GHz, And the maximum value of the receiver should be recorded as (Pr).

(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 (PMea) 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 (Pr). The power of signal source (PMea) 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 (Pcl) ,the Substitution Antenna Gain (Ga) and the Amplifier Gain (PAg) should be recorded after test.

The measurement results are obtained as described below: Power(EIRP)=PMea- PAg - Pcl - Ga The measurement results are amend as described below:

Power(EIRP)=PMea- Pcl - Ga

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

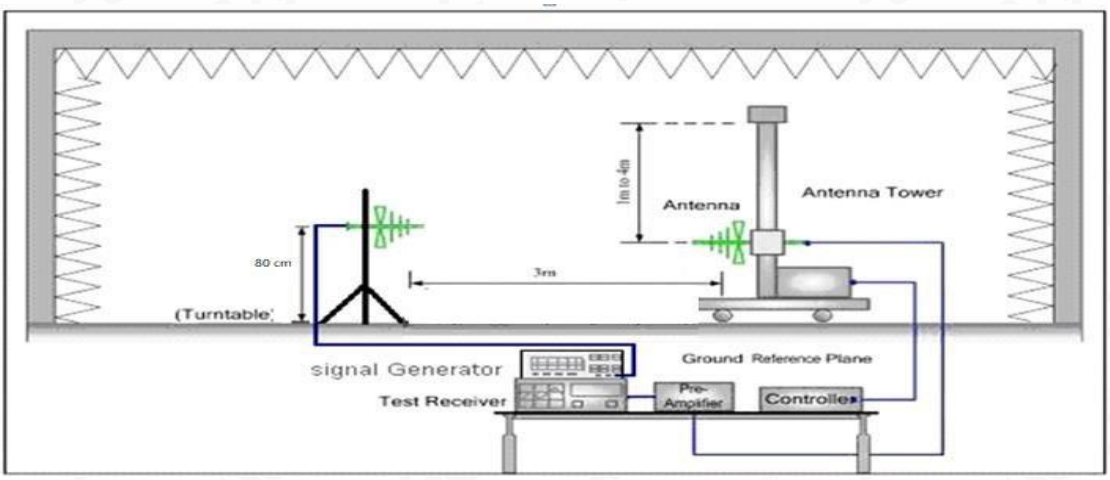
(7)ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP-2.15dBi.

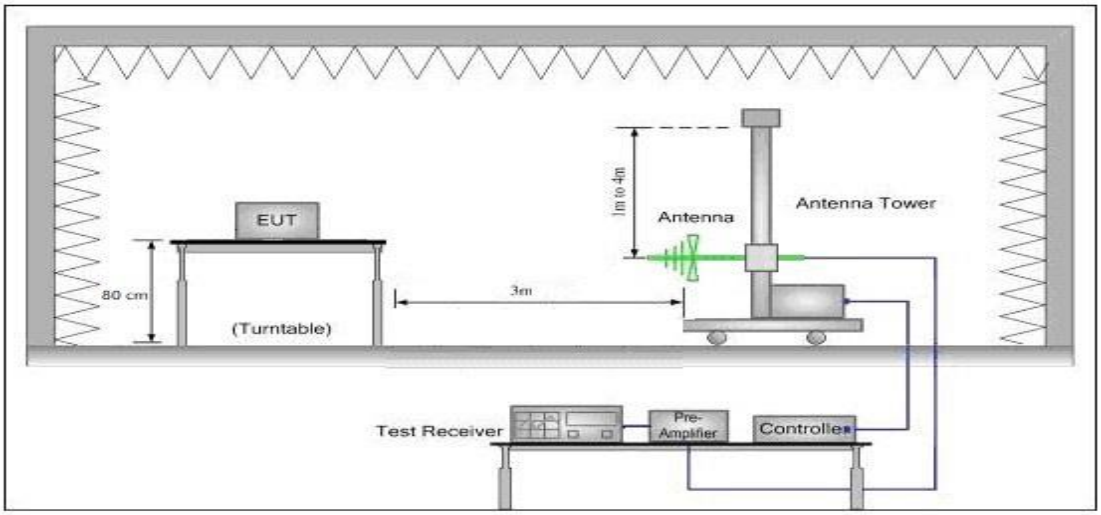
(8)Test the EUT in the lowest channel, the middle channel the Highest channel

9.3 TEST CONFIGURATION

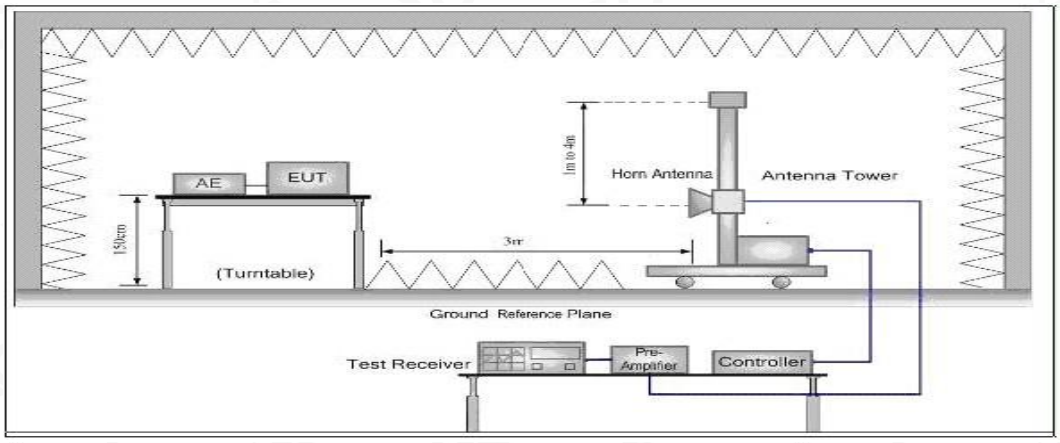
Effective Radiated Power

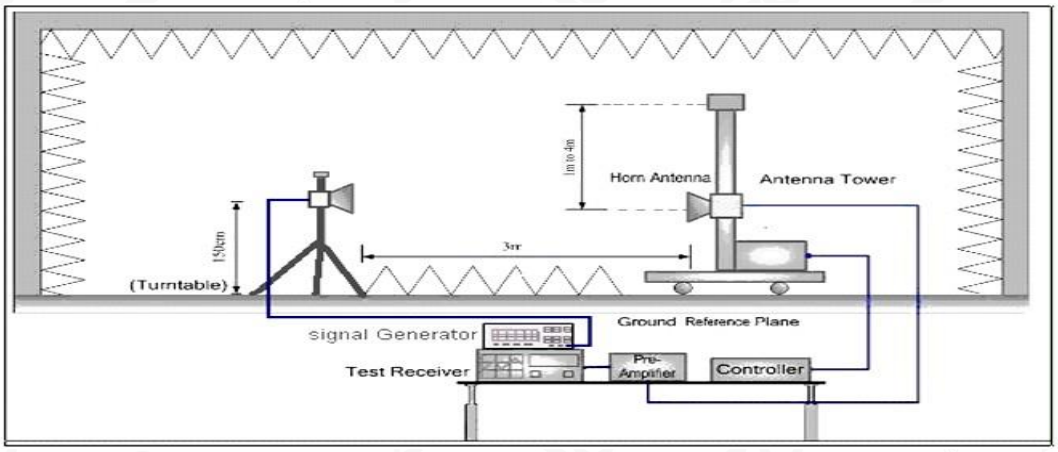
Radiated Below1GHz





Radiated Above 1 GHz





9.4 TEST RESULT

The maximum Power (CP) for UHF is

Analog: 3.5W/0.5W for 12.5 KHz Channel Separation

Calculation Formula: CP = R + A + L

***** Note:

CP: The final Conducted Power

R : The reading value from spectrum analyzer

A : The attenuation value of the used attenuator

L : The loss of all connection cables

ERP RESULT:

Frequency	Reading Level	Antenna	S.G.	Cable Loss	Ant.Gain	Emission Level	Emission Level	Limit	Margin
(MHz)	(dBuv/m)	Polarization	(dBm)	(dB)	(dBi)	(dBm)	(W)	(W)	(W)
ChannelSeparation:12.5KHz									
462.6375	103.89	V	28.66	0.38	6.6	34.88	3.08	5	1.92
462.6375	103.83	H	28.60	0.38	6.6	34.82	3.03	5	1.97
462.6500	103.86	V	28.63	0.38	6.6	34.85	3.05	50	46.95
462.6500	103.8	H	28.57	0.38	6.6	34.79	3.01	50	46.99
467.6500	103.88	V	28.65	0.38	6.6	34.87	3.07	50	46.93
467.6500	103.78	H	28.55	0.38	6.6	34.77	3.00	50	47.00
467.6375	95.95	V	20.72	0.38	6.6	26.94	0.49	0.5	0.01
467.6375	95.82	H	20.59	0.38	6.6	26.81	0.48	0.5	0.02

NOTE:

Calculation Formula:

Emission Level(dBm) = S.G.(dBm)- Cable Loss(dB)+ Ant.Gain(dBi)

The Ant. Gain including the correct factor 2.15.

Margin(dB) = Limit(dBm)- Emission Level(dBm)

10.SPURIOUS EMISSION ON ANTENNA PORT

10.1 PROVISIONS APPLICABLE

Please refer to FCC 47 CFR 2.1051, 2.1057 & 95.1779 for specification details.
Emissions shall be attenuated below the mean output power of the transmitter as follows:

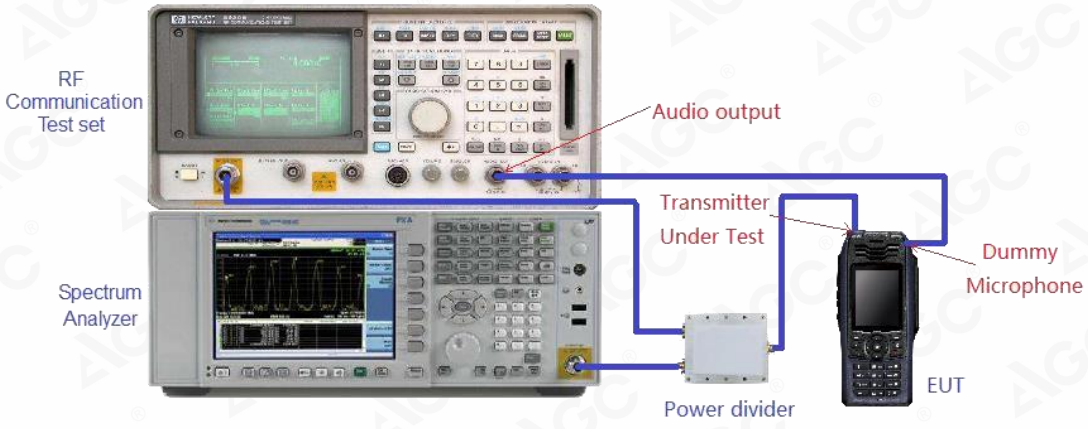
FCC Rules	Attenuation Limit (dBc)
§ 95.1779	At least 43 + 10 log (P) dB

43 +10 log (Pwatts)
Note: In general, the worse case attenuation requirement shown above was applied.
Calculation: Limit (dBm) =EL-43-10log10 (TP)
EL is the emission level of the Output Power expressed in dBm,
In this application, the EL is P(dBm)
Limit (dBm) = P(dBm)-43-10 log (Pwatts) = -13dBm

10.2 TEST PROCEDURE

1. The RF output of the EUT was connected to a spectrum analyzer through appropriate attenuation.
2. The resolution bandwidth of the spectrum analyzer was set to 100 kHz. Sufficient scans were taken to show any out of band emission up to 10th . Harmonic for the lower and the highest frequency range.
3. Set RBW 100 kHz, VBW 300 kHz in the frequency band 30MHz to 1GHz,while set RBW=1MHz.VBW=3MHz from the 1GHz to 10th Harmonic.
4. The audio input was set the unmodulated carrier, the resulting picture is print out for each channel separation.

10.3 TEST CONFIGURATION



10.4 TEST RESULT

Not applicable

Note: The product is a non-detachable antenna, no need to evaluate this test.

11. MODULATION CHARACTERISTICS

11.1 PROVISIONS APPLICABLE

According to [FCC Part 95.1775, Part 2.1047(a)], for Voice Modulation Communication Equipment, the frequency response of the audio modulation circuit over a range of 100 to 5000Hz shall be measured.

Part 95.1775(a) A GMRS unit that transmits emission type F3E must not exceed a peak frequency deviation of plus orminus 2.5 kHz, and the audio frequency response must not exceed 3.125 kHz.

Part 2.1047(a) A curve or equivalent data showing the frequency response of the audio modulating circuit over a range of100 to 5000Hz shall be submitted. For equipment required to have an audio low-pass filter, a curve showing thefrequency response of the filter, or of all circuitry installed between the modulation limiter and the modulated stage shallbe submitted.

11.2 MEASUREMENT METHOD

11.2.1 Modulation Limit

(1). Configure the EUT as shown in figure 1, adjust the audio input for 60% of rated system deviation at 1KHz using this level as a reference (0dB) and vary the input level from –20 to +20dB. Record the frequency deviation obtained as a function of the input level.

(2). Repeat step 1 with input frequency changing to 300, 1000, 1500 and 3000Hz in sequence.

11.2.2 Audio Frequency Response

Personal Radio Service stations that transmit voice emissions may also transmit audible or subaudible tones or other signals for the purpose of selective calling and/or receiver squelch activation. These tones and signals are ancillary to voice communications and are considered to be included within the voice emission types, e.g., A3E, F3E, and G3E.

(a) Tones that are audible (having a frequency higher than 300 Hertz), must last no longer than 15 seconds at one time.

(b) Tones that are subaudible (having a frequency of 300 Hertz or less), may be transmitted continuously during a communication session.

(1). Configure the EUT as shown in figure 1.

(2). Adjust the audio input for 20% of rated system deviation at 1 KHz using this level as a reference (0 dB).

(3). Vary the Audio frequency from 100 Hz to 10 KHz and record the frequency deviation.

(4). Audio Frequency Response = 20log10 (Deviation of test frequency/Deviation of 1 KHz reference).

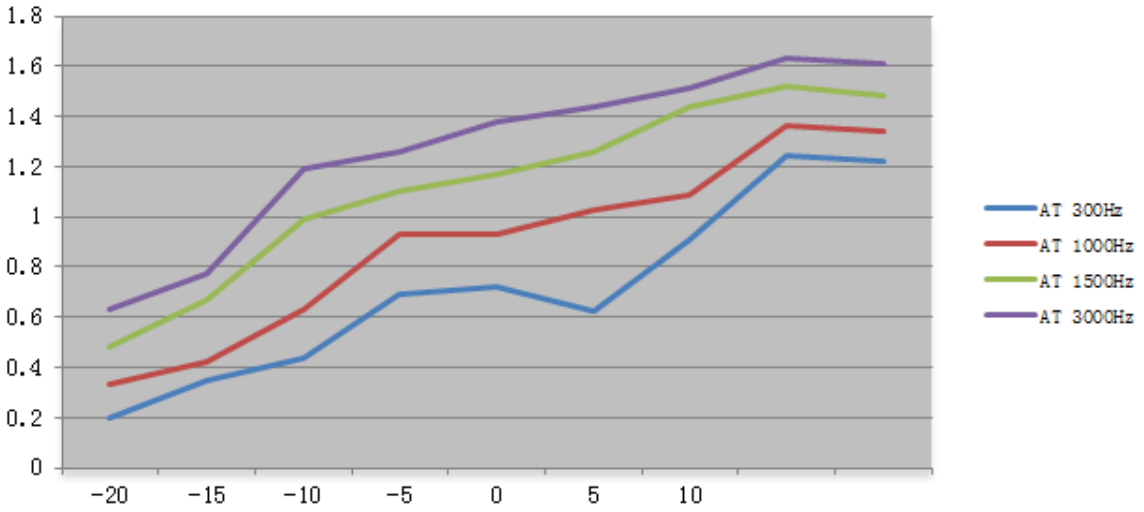
11.3 MEASUREMENT RESULT

TEST CHANNEL: 11

(A). MODULATION LIMIT:

462.6500MHz @ 12.5KHz Channel Separations-3.5W

Modulation Level (dB)	Peak Freq. Deviation At 300 Hz	Peak Freq. Deviation At 1000 Hz	Peak Freq. Deviation At 1500 Hz	Peak Freq. Deviation At 3000 Hz
-20	0.2	0.33	0.48	0.63
-15	0.35	0.42	0.67	0.77
-10	0.44	0.63	0.99	1.19
-5	0.69	0.93	1.1	1.26
0	0.72	0.93	1.17	1.38
+5	0.62	1.03	1.26	1.44
+10	0.91	1.09	1.44	1.51
+15	1.24	1.36	1.52	1.63
+20	1.22	1.34	1.48	1.61



Note: 1.All the modes had been tested, but only the worst data recorded in the report.

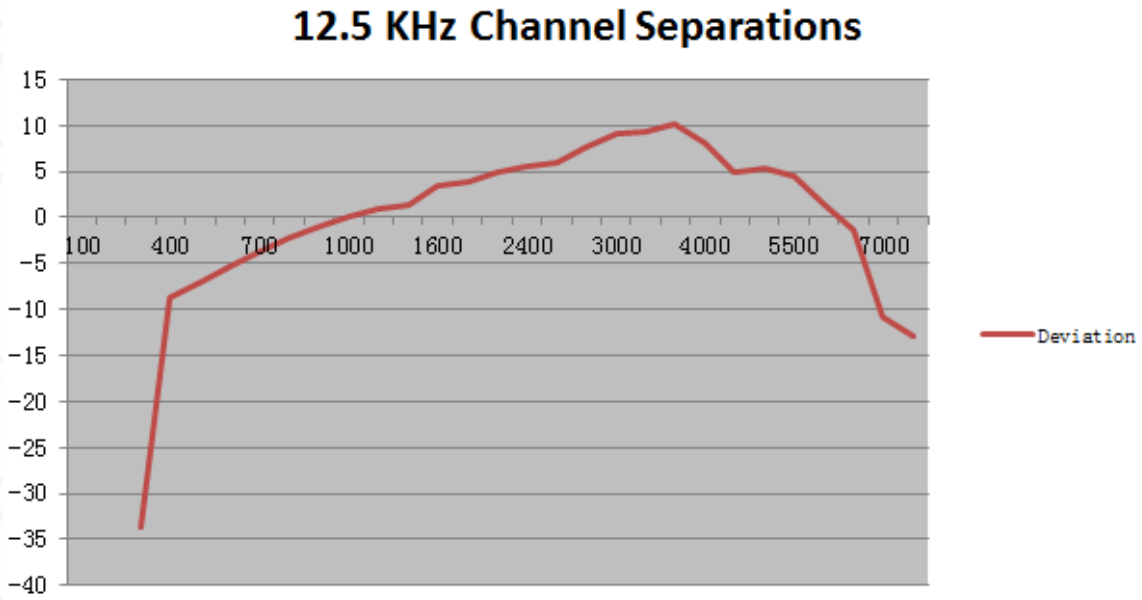
2. The data unit evaluated in this report is "KHz"

(B). AUDIO FREQUENCY RESPONSE:

462.6500MHz @ 12.5 KHz Channel Separations-3.5W

Frequency (Hz)	Deviation (KHz)	Audio Frequency Response(dB)
100	--	--
200	--	--
300	0.03	-33.56
400	0.52	-8.79
500	0.63	-7.12
600	0.78	-5.26
700	0.93	-3.74
800	1.11	-2.20
900	1.29	-0.89
1000	1.43	0.00
1200	1.58	0.87
1400	1.69	1.45
1600	2.11	3.38
1800	2.23	3.86
2000	2.53	4.96
2400	2.69	5.49
2500	2.82	5.90
2800	3.46	7.67
3000	4.05	9.04
3200	4.23	9.42
3600	4.63	10.20
4000	3.63	8.09
4500	2.54	4.99
5000	2.63	5.29
5500	2.41	4.53
6000	1.69	1.45
6500	1.22	-1.38
7000	0.41	-10.85
7500	0.32	-13.00
9000	--	--
10000	--	--
14000	--	--
18000	--	--
20000	--	--
30000	--	--

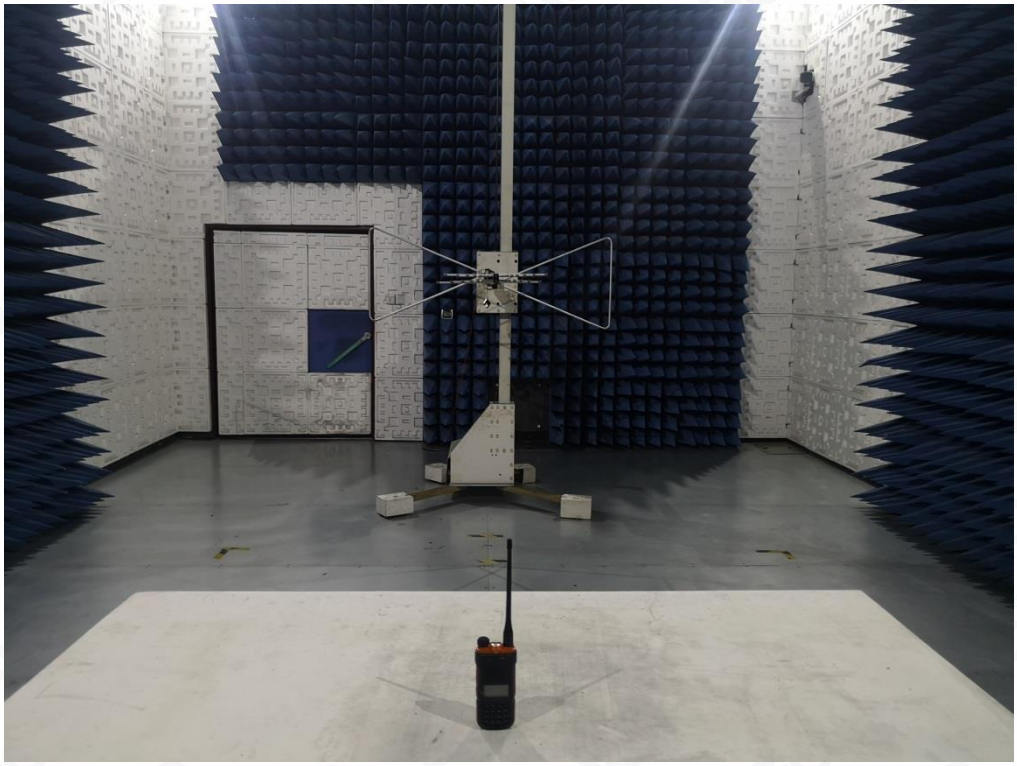
Frequency Response Result



Note: All the modes had been tested, but only the worst data recorded in the report.

APPENDIX I: PHOTOGRAPHS OF SETUP

RADIATED EMISSION TEST SETUP



RADIATED EMISSION ABOVE 1G TEST SETUP

CONDUCTED TEST SETUP

APPENDIX II: PHOTOGRAPHS OF EUT

Please refer to the project number: AGC02294201007AP01

----END OF REPORT----

Conditions of Issuance of Test Reports

1. All samples and goods are accepted by the Attestation of Global Compliance (Shenzhen) Co., Ltd (the "Company") solely for testing and reporting in accordance with the following terms and conditions. The company provides its services on the basis that such terms and conditions constitute express agreement between the company and any person, firm or company requesting its services (the "Clients").

2. Any report issued by Company as a result of this application for testing services (the "Report") shall be issued in confidence to the Clients and the Report will be strictly treated as such by the Company. It may not be reproduced either in its entirety or in part and it may not be used for advertising or other unauthorized purposes without the written consent of the Company. The Clients to whom the Report is issued may, however, show or send it, or a certified copy thereof prepared by the Company to its customer, supplier or other persons directly concerned. The Company will not, without the consent of the Clients, enter into any discussion or correspondence with any third party concerning the contents of the Report, unless required by the relevant governmental authorities, laws or court orders.

3.The Company shall not be called or be liable to be called to give evidence or testimony on the Report in a court of law without its prior written consent, unless required by the relevant governmental authorities, laws or court orders.

4. The non-CMA report issued by AGC is only permitted to be used by the client as internal reference use and shall not be used for public demonstration purpose.

5. In the event of the improper use of the report as determined by the Company, the Company reserves the right to withdraw it, and to adopt any other additional remedies which may be appropriate.

6. Samples submitted for testing are accepted on the understanding that the Report issued cannot form the basis of, or be the instrument for, any legal action against the Company.

7. The Company will not be liable for or accept responsibility for any loss or damage however arising from the use of information contained in any of its Reports or in any communication whatsoever about its said tests or investigations.

8.Clients wishing to use the Report in court proceedings or arbitration shall inform the Company to that effect prior to submitting the sample for testing.

9. The Company is not responsible for recalling the electronic version of the original report when any revision is made to them. The Client assumes the responsibility to providing the revised version to any interested party who uses them.

10. Subject to the variable length of retention time for test data and report stored hereinto as otherwise specifically required by individual accreditation authorities, the Company will only keep the supporting test data and information of the test report for a period of six years. The data and information will be disposed of after the aforementioned retention period has elapsed. Under no circumstances shall we provide any data and information which has been disposed of after retention period. Under no circumstances shall we be liable for damage of any kind, including (but not limited to) compensatory damages, lost profits, lost data, or any form of special, incidental, indirect, consequential or punitive damages of any kind, whether based on breach of contract of warranty, tort (including negligence), product liability or otherwise, even if we are informed in advance of the possibility of such damages.

FCC SAR TEST REPORT

Report No.: STS2011052H01

Issued for

PO FUNG ELECTRONIC(HK) INTERNATIOANL GROUP COMPANY

3/F FULOK BLDG 131-133 WING LOK ST SHEUNG WAN, Hong Kong

Product Name:	Two-way radio
Brand Name:	POFUNG, BAOFENG
Model Name:	P11UV
Series Model:	BF-UV11, GM-50, TH-88, AR-11X, UV11R, G-11UV
FCC ID:	2AJGM-P11UV
Test Standard:	ANSI/IEEE Std. C95.1
	FCC 47 CFR Part 2 (2.1093)
	IEEE 1528: 2013
Max. Report SAR (1g):	Face up : 0.788 W/kg
	Back side: 1.534 W/kg

ShenZhen STS Test Services Co.,Ltd.
A 1/F, Building B, Zhuoke Science Park, No.190 Chongqing Road, HepingShequ, Fuyong Sub-District, Bao'an District, Shenzhen, Guang Dong, China
TEL: +86-755 3688 6288 FAX: +86-755 3688 6277 E-mail:sts@stsapp.com

Test Report Certification

Applicant's name ..... :	PO FUNG ELECTRONIC(HK) INTERNATIOANL GROUP COMPANY
Address ..... :	3/F FULOK BLDG 131-133 WING LOK ST SHEUNG WAN, Hong Kong
Manufacture's Name ..... :	PO FUNG ELECTRONIC(HK) INTERNATIOANL GROUP COMPANY
Address ..... :	3/F FULOK BLDG 131-133 WING LOK ST SHEUNG WAN, Hong Kong

Product description

Product name ..... :	Two-way radio
Brand Name..... :	POFUNG, BAOFENG
Model name ..... :	P11UV
Series Model..... :	BF-UV11, GM-50, TH-88, AR-11X, UV11R, G-11UV
Standards ..... :	ANSI/IEEE Std. C95.1 IEEE 1528:2013 FCC 47 CFR Part 2 (2.1093)

The device was tested by Shenzhen STS Test Services Co., Ltd. in accordance with the measurement methods and procedures specified in KDB 865664 The test results in this report apply only to the tested sample of the stated device/equipment. Other similar device/equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Date of Test ..... :	
Date (s) of performance of tests ..... :	21 Dec. 2020
Date of Issue ..... :	24 Dec. 2020
Test Result..... :	**Pass**

Testing Engineer **:** Lemon Li

(Lemon Li)

Technical Manager **:** Sean She

(Sean She)

Authorized Signatory **:** Vita Li

(Vita Li)

Table of Contents

Revision History

Rev.	Issue Date	Report No.	Effect Page	Contents
00	24 Dec. 2020	STS2011052H01	ALL	Initial Issue
Note: **Format version** of the report -V01				

1. General Information

1.1 EUT Description

Equipment	Two-way radio			
Brand Name	POFUNG, BAOFENG			
Model name	P11UV			
Series Model	BF-UV11, GM-50, TH-88, AR-11X, UV11R, G-11UV			
Model Difference	All the same except the model name			
Device Category	Portable			
Product stage	Production unit			
RF Exposure Environment	Population/Uncontrolled			
Hardware Version	BF_UV11_V05			
Software Version	v1.5			
Frequency Range	Channel 1-7: 462.5625~462.7125 MHz Channel 8-14: 467.5625~467.7125 MHz Channel 15-22: 462.5500~462.7250 MHz Channel 23-30: 467.5500~467.7250 MHz			
Channel Spacing	12.5KHz			
Max. Reported SAR(1g):	With 50% duty cycle	Frequency(MHz)	Face up (W/kg)	Back Side (W/kg)
		462.6375	0.676	1.214
		462.6500	0.788	1.534
		467.6500	0.692	1.512
		467.6375	0.586	1.154
Modulation Type:	FM			
Antenna Specification:	Inseparable Antenna			
Note: 1. The EUT battery must be fully charged and checked periodically during the test to ascertain uniform power				

1.2 Test Environment

Ambient conditions in the SAR laboratory:

Items	Required
Temperature (℃)	18-25
Humidity (%RH)	30-70

1.3 Test Factory

ShenZhen STS Test Services Co.,Ltd.

A 1/F, Building B, Zhuoke Science Park, No.190 Chongqing Road, HepingShequ, Fuyong Sub-District, Bao'an District, Shenzhen, Guang Dong, China

FCC Registration No.: 625569

A2LA Certificate No.: 4338.01

IC Registration No.: 12108A

2. Test Standards and Limits

No.	Identity	Document Title
1	47 CFR Part 2	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
2	ANSI/IEEE Std. C95.1-1992	IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz
3	IEEE Std. 1528-2013	Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques
4	FCC KDB 447498 D01 v06	Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies
5	FCC KDB 865664 D01 v01r04	SAR Measurement 100 MHz to 6 GHz
6	FCC KDB 865664 D02 v01r02	RF Exposure Reporting
7	FCC KDB 643646 D001	SAR Test Reduction Considerations for Occupational PTT Radios

(A). Limits for Occupational/Controlled Exposure (W/kg)

Whole-Body	Partial-Body	Hands, Wrists, Feet and Ankles
0.4	8.0	20.0

(B). Limits for General Population/Uncontrolled Exposure (W/kg)

Whole-Body	Partial-Body	Hands, Wrists, Feet and Ankles
0.08	1.6	4.0

NOTE: Whole-Body SAR is averaged over the entire body, partial-body SAR is averaged over any 1 gram of tissue defined as a tissue volume in the shape of a cube. SAR for hands, wrists, feet and ankles is averaged over any 10 grams of tissue defined as a tissue volume in the shape of a cube.

Population/Uncontrolled Environments:

Are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure.

Occupational/Controlled Environments:

Are defined as locations where there is exposure that may be incurred by people who are aware of the potential for exposure, (i.e. as a result of employment or occupation).

NOTE

POPULATION/UNCONTROLLED EXPOSURE

PARTIAL BODY LIMIT

1.6 W/kg

3. SAR Measurement System

3.1 Definition of Specific Absorption Rate (SAR)

SAR is related to the rate at which energy is absorbed per unit mass in an object exposed to a radio field. The SAR distribution in a biological body is complicated and is usually carried out by experimental techniques or numerical modeling. The standard recommends limits for two tiers of groups, occupational/controlled and general population/uncontrolled, based on a person's awareness and ability to exercise control over his or her exposure. In general, occupational/controlled exposure limits are higher than the limits for general population/uncontrolled.

The SAR definition is the time derivative (rate) of the incremental energy (dW) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dv) of a given density (ρ). The equation description is as below:

$$SAR = \frac{d}{dt}\left(\frac{dW}{dm}\right) = \frac{d}{dt}\left(\frac{dW}{\rho dv}\right)$$

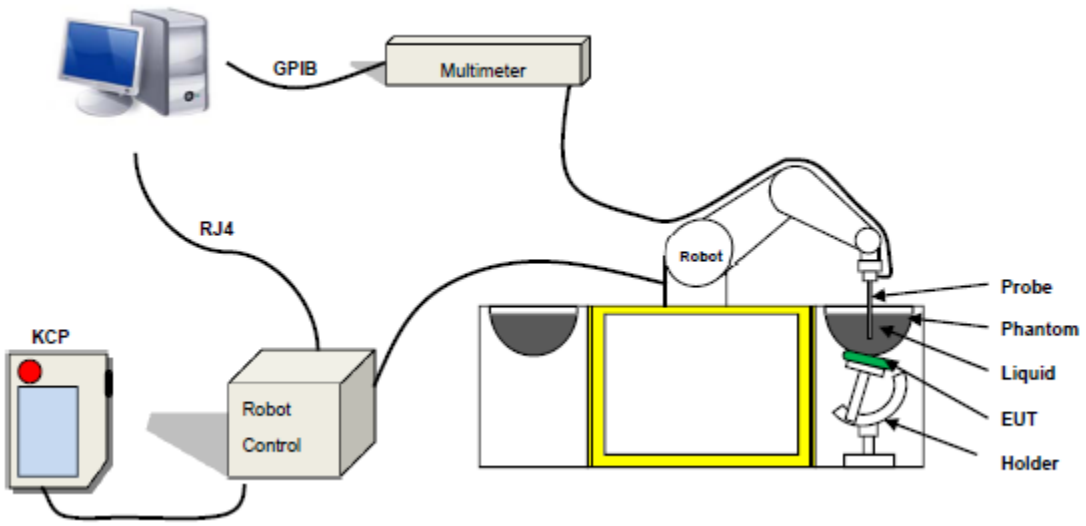
SAR is expressed in units of Watts per kilogram (W/kg) SAR measurement can be related to the electrical field in the tissue by

$$SAR = \frac{\sigma E^2}{\rho}$$

Where: σ is the conductivity of the tissue,
ρ is the mass density of the tissue and E is the RMS electrical field strength.

3.2 SAR System

MVG SAR System Diagram:



COMOSAR is a system that is able to determine the SAR distribution inside a phantom of human being according to different standards. The COMOSAR system consists of the following items:

- Main computer to control all the system
- 6 axis robot
- Data acquisition system
- Miniature E-field probe
- Phone holder
- Head simulating tissue

The following figure shows the system.

The EUT under test operating at the maximum power level is placed in the phone holder, under the phantom, which is filled with head simulating liquid. The E-Field probe measures the electric field inside the phantom. The Open SAR software computes the results to give a SAR value in a 1g or 10g mass.

3.2.1 Probe

For the measurements the Specific Dosimetric E-Field Probe SN 41/18 EPGO334 with following specifications is used

- Probe Length: 330 mm
- Length of Individual Dipoles: 2 mm
- Maximum external diameter: 8 mm
- Probe Tip External Diameter: 2.5 mm
- Distance between dipole/probe extremity: 1 mm
- Dynamic range: 0.01-100 W/kg
- Probe linearity: 3%
- Axial Isotropy: < 0.10 dB
- Spherical Isotropy: < 0.10 dB
- Calibration range: 450 MHz to 6 GHz for head & body simulating liquid.
- Angle between probe axis (evaluation axis) and surface normal line: less than 30°

Figure 1-MVG COMOSAR Dosimetric E field Dipole

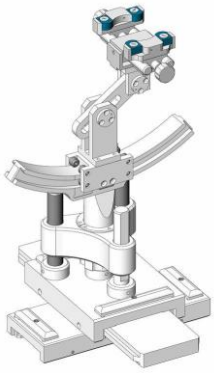
3.2.2 Phantom

For the measurements the Specific Anthropomorphic Mannequin (SAM) defined by the IEEE SCC-34/SC2 group is used. The phantom is a polyurethane shell integrated in a wooden table. The thickness of the phantom amounts to 2mm +/- 0.2mm. It enables the dosimetric evaluation of left and right phone usage and includes an additional flat phantom part for the simplified performance check. The phantom set-up includes a cover, which prevents the evaporation of the liquid.

Figure-SN 32/14 SAM115

Figure-SN 32/14 SAM116

3.2.3 Device Holder



The SAR in the phantom is approximately inversely proportional to the square of the distance between the source and the liquid surface. For a source at 5 mm distance, a positioning uncertainty of ± 0.5 mm would produce a SAR uncertainty of ± 20 %. Accurate device positioning is therefore crucial for accurate and repeatable measurements. The positions in which the devices must be measured are defined by the standards.

4. Tissue Simulating Liquids

4.1 Simulating Liquids Parameter Check

The head tissue dielectric parameters recommended by the IEEE SCC-34/SC-2 in P1528 have been incorporated in the following table. These head parameters are derived from planar layer models simulating the highest expected SAR for the dielectric properties and tissue thickness variations in a human head. Other head and body tissue parameters that have not been specified in P1528 are derived from the tissue dielectric parameters computed from the 4-Cole-Cole equations described in Reference [12] and extrapolated according to the head parameters specified in P1528.

Frequency (MHz)	Bactericide	DGBE	HEC	NaCl	Sucrose	1,2-Propanediol	X100	Water	Conductivity	Permittivity
	%	%	%	%	%	%	%	%	σ	εr
450	0.19		0.98	3.95	56.32			38.56	0.85	43.4
750	/	/	/	0.79	/	64.81	/	34.40	0.97	41.8
835	/	/	/	0.79	/	64.81	/	34.40	0.97	41.8
900	/	/	/	0.79	/	64.81	/	34.40	0.97	41.8
1800	/	13.84	/	0.35	/	/	30.45	55.36	1.38	41.0
1900	/	13.84	/	0.35	/	/	30.45	55.36	1.38	41.0
2000	/	7.99	/	0.16	/	/	19.97	71.88	1.55	41.1
2450	/	7.99	/	0.16	/	/	19.97	71.88	1.88	40.3
2600	/	7.99	/	0.16	/	/	19.97	71.88	1.88	40.3

Tissue dielectric parameters for head and body phantoms				
Frequency	ε_r		σ S/m	
	Head	Body	Head	Body
300	45.3	58.2	0.87	0.92
450	43.5	56.7	0.87	0.94
900	41.5	55.0	0.97	1.05
1450	40.5	54.0	1.20	1.30
1800	40.0	53.3	1.40	1.52
2450	39.2	52.7	1.80	1.95
3000	38.5	52.0	2.40	2.73
5800	35.3	48.2	5.27	6.00

LIQUID MEASUREMENT RESULTS

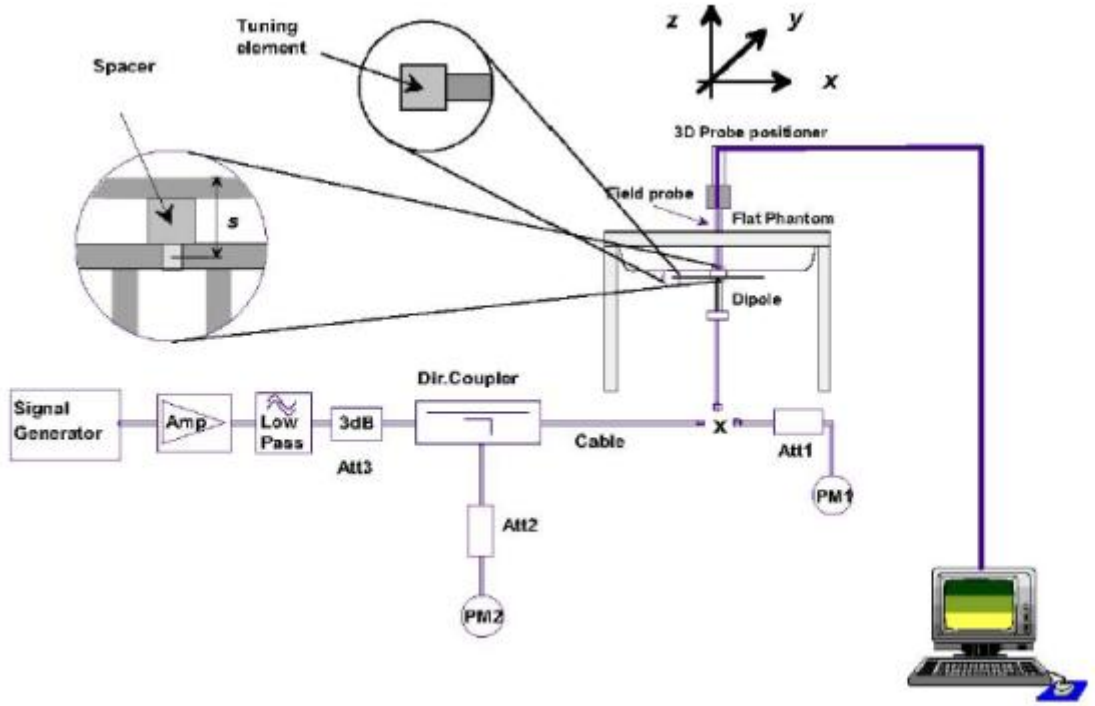
Date	Ambient		Simulating Liquid		Parameters	Target	Measured	Deviation %	Limited %
	Temp. [°C]	Humidity %	Frequency	Temp. [°C]					
2020-12-21	22.2	51	450 MHz	22.0	Permittivity	43.5	43.62	0.28	±5
					Conductivity	0.87	0.89	2.30	±5

5. SAR System Validation

5.1 Validation System

Each MVG system is equipped with one or more system validation kits. These units, together with the predefined measurement procedures within the MVG software, enable the user to conduct the system performance check and system validation. System kit includes a dipole, and dipole device holder.

The system check verifies that the system operates within its specifications. It's performed daily or before every SAR measurement. The system check uses normal SAR measurement in the flat section of the phantom with a matched dipole at a specified distance. The system validation setup is shown as below.



5.2 Validation Result

Comparing to the original SAR value provided by MVG, the validation data should be within its specification of 10 %.

Freq.(MHz)	Power(mW)	Tested Value (W/Kg)	Normalized SAR (W/kg)	Target(W/Kg)	Tolerance(%)	Date
450	100	0.454	4.54	4.58	-0.87	2020-12-21

Note:

1. The tolerance limit of System validation ±10%.
2. The dipole input power (forward power) was 100 mW.
3. The results are normalized to 1 W input power.

6. SAR Evaluation Procedures

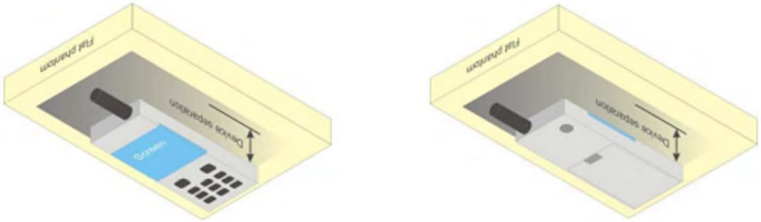
The procedure for assessing the average SAR value consists of the following steps:
The following steps are used for each test position
- Establish a call with the maximum output power with a base station simulator. The connection between the mobile and the base station simulator is established via air interface
- Measurement of the local E-field value at a fixed location. This value serves as a reference value for calculating a possible power drift.
- Measurement of the SAR distribution with a grid of 8 to 16mm * 8 to16 mm and a constant distance to the inner surface of the phantom. Since the sensors cannot directly measure at the inner phantom surface, the values between the sensors and the inner phantom surface are extrapolated. With these values the area of the maximum SAR is calculated by an interpolation scheme.
- Around this point, a cube of 30 * 30 * 30 mm or 32 * 32 * 32 mm is assessed by measuring 5 or 8 * 5 or 8*4 or 5 mm. With these data, the peak spatial-average SAR value can be calculated.

Area Scan& Zoom Scan:

First Area Scan is used to locate the approximate location(s) of the local peak SAR value(s). The measurement grid within an Area Scan is defined by the grid extent, grid step size and grid offset. Next, in order to determine the EM field distribution in a three-dimensional spatial extension, Zoom Scan is required. The Zoom Scan is performed around the highest E-field value to determine the averaged SAR -distribution over 10 g. Area scan and zoom scan resolution setting follows KDB 865664 D01v01r01 quoted below.
When the 1-g SAR of the highest peak is within 2 dB of the SAR limit, additional zoom scans are required for other peaks within 2 dB of the highest peak that have not been included in any zoom scan to ensure there is no increase in SAR.

7. EUT Test Position

This EUT was tested in Front Face and Rear Face.
Body-worn Position Conditions:
Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in KDB Publication 447498 D01 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. When the same wireless transmission configuration is used for testing body-worn accessory and hotspot mode SAR, respectively, in voice and data mode, SAR results for the most conservative *test separation distance* configuration may be used to support both SAR conditions. When the *reported* SAR for a body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest *reported* SAR configuration for that wireless mode and frequency band should be repeated for the body-worn accessory with a headset attached to the handset.



8. Uncertainty

8.1 Measurement Uncertainty

The following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in IEEE 1528: 2013.This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Uncertainty Component	Tol (+- %)	Prob. Dist.	Div.	Ci (1g)	Ci (10g)	1g Ui (+-%)	10g Ui (+-%)	vi
Measurement System								
Probe calibration	5.831	N	1	1	1	5.83	5.83	∞
Axial Isotropy	0.695	R	$\sqrt{3}$	√0.5	√0.5	0.28	0.28	∞
Hemispherical Isotropy	1.045	R	$\sqrt{3}$	√0.5	√0.5	0.43	0.43	∞
Boundary effect	1.0	R	$\sqrt{3}$	1	1	0.58	0.58	∞
Linearity	0.685	R	$\sqrt{3}$	1	1	0.40	0.40	∞
System detection limits	1.0	R	$\sqrt{3}$	1	1	0.58	0.58	∞
Modulation response	3.0	R	$\sqrt{3}$	1	1	1.73	1.73	∞
Readout Electronics	0.021	N	1	1	1	0.021	0.021	∞
Response Time	0	R	$\sqrt{3}$	1	1	0	0	∞
Integration Time	1.4	R	$\sqrt{3}$	1	1	0.81	0.81	∞
RF ambient conditions-Noise	3.0	R	$\sqrt{3}$	1	1	1.73	1.73	∞
RF ambient conditions-reflections	3.0	R	$\sqrt{3}$	1	1	1.73	1.73	∞
Probe positioner mechanical tolerance	1.4	R	$\sqrt{3}$	1	1	0.81	0.81	∞
Probe positioning with respect to phantom shell	1.4	R	$\sqrt{3}$	1	1	0.81	0.81	∞
Post-processing	2.3	R	$\sqrt{3}$	1	1	1.33	1.33	∞
Test sample Related								
Test sample positioning	2.6	N	1	1	1	2.6	2.6	∞
Device holder uncertainty	3	N	1	1	1	3	3	∞
SAR drift measurement	5	R	$\sqrt{3}$	1	1	2.89	2.89	∞
SAR scaling	5	R	$\sqrt{3}$	1	1	2.89	2.89	∞
Phantom and tissue parameters								
Phantom uncertainty(shape and thickness uncertainty)	4	R	$\sqrt{3}$	1	1	2.31	2.31	∞
Uncertainty in SAR correction for deviations in permittivity and conductivity	1.9	N	1	1	0.84	1.90	1.60	∞
Liquid conductivity(temperature uncertainty)	2.5	R	$\sqrt{3}$	0.78	0.71	1.13	1.02	∞
Liquid conductivity(measured)	4	N	1	0.78	0.71	3.12	2.84	M
Liquid permittivity(temperature uncertainty)	2.5	R	$\sqrt{3}$	0.23	0.26	0.33	0.38	∞
Liquid permittivity(measured)	5	N	1	0.23	0.26	1.15	1.30	M
Combined Standard Uncertainty		RSS				9.79	9.59	
Expanded Uncertainty (95% Confidence interval)		K=2				19.58	19.18	

8.2 System validation Uncertainty

Uncertainty Component	Tol (+- %)	Prob. Dist.	Div.	Ci (1g)	Ci (10g)	1g Ui (+-%)	10g Ui (+-%)	vi
Measurement System								
Probe calibration	5.831	N	1	1	1	5.83	5.83	∞
Axial Isotropy	0.695	R	$\sqrt{3}$	1	1	0.40	0.40	∞
Hemispherical Isotropy	1.045	R	$\sqrt{3}$	0	0	0.00	0.00	∞
Boundary effect	1.0	R	$\sqrt{3}$	1	1	0.58	0.58	∞
Linearity	0.685	R	$\sqrt{3}$	1	1	0.40	0.40	∞
System detection limits	1.0	R	$\sqrt{3}$	1	1	0.58	0.58	∞
Modulation response	3.0	R	$\sqrt{3}$	0	0	0.00	0.00	∞
Readout Electronics	0.021	N	1	1	1	0.021	0.021	∞
Response Time	0.0	R	$\sqrt{3}$	0	0	0.00	0.00	∞
Integration Time	1.4	R	$\sqrt{3}$	0	0	0.00	0.00	∞
RF ambient conditions-Noise	3.0	R	$\sqrt{3}$	1	1	1.73	1.73	∞
RF ambient conditions-reflections	3.0	R	$\sqrt{3}$	1	1	1.73	1.73	∞
Probe positioner mechanical tolerance	1.4	R	$\sqrt{3}$	1	1	0.81	0.81	∞
Probe positioning with respect to phantom shell	1.4	R	$\sqrt{3}$	1	1	0.81	0.81	∞
Post-Processing	2.3	R	$\sqrt{3}$	1	1	1.33	1.33	∞
System validation source								
Deviation of experimental dipole from numerical dipole	5.0	N	1	1	1	5.00	5.00	∞
Input power and SAR drift measurement	5.0	R	$\sqrt{3}$	1	1	2.89	2.89	∞
Other source contribution Uncertainty	2.0	R	$\sqrt{3}$	1	1	1.15	1.15	∞
Phantom and set-up								
Phantom uncertainty(shape and thickness uncertainty)	4.0	R	$\sqrt{3}$	1	1	2.31	2.31	∞
Uncertainty in SAR correction for deviations in permittivity and conductivity	1.9	N	1	1	0.84	1.90	1.60	∞
Liquid conductivity(temperature uncertainty)	2.5	R	$\sqrt{3}$	0.78	0.71	1.13	1.02	∞
Liquid conductivity(measured)	4	N	1	0.78	0.71	3.12	2.84	M
Liquid permittivity(temperature uncertainty)	2.5	R	$\sqrt{3}$	0.23	0.26	0.33	0.38	∞
Liquid permittivity(measured)	5	N	1	0.23	0.26	1.15	1.30	M
Combined Standard Uncertainty		RSS				9.718	9.517	
Expanded Uncertainty (95% Confidence interval)		K=2				19.44	19.04	

9. Conducted Power Measurement

Test Result

Frequency(MHz)	Conducted power(dBm)	Tune up power(dBm)
462.5625	34.80	34±1
462.6375	34.88	34±1
462.7125	34.82	34±1
462.5500	34.81	34±1
462.6500	34.85	34±1
462.7250	34.78	34±1
467.5500	34.76	34±1
467.6250	34.80	34±1
467.6500	34.87	34±1
467.7000	34.75	34±1
467.5675	26.81	26±1
467.6375	26.94	26±1
467.7215	26.90	26±1

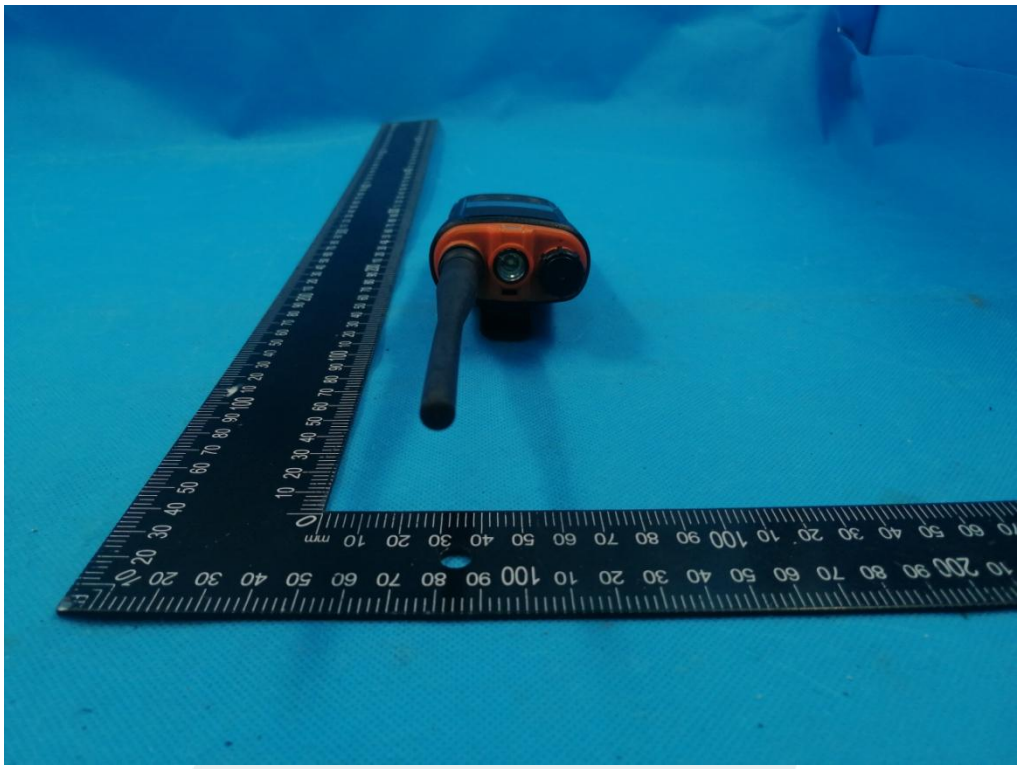
10. EUT And Test Setup Photo

10.1 EUT Photo

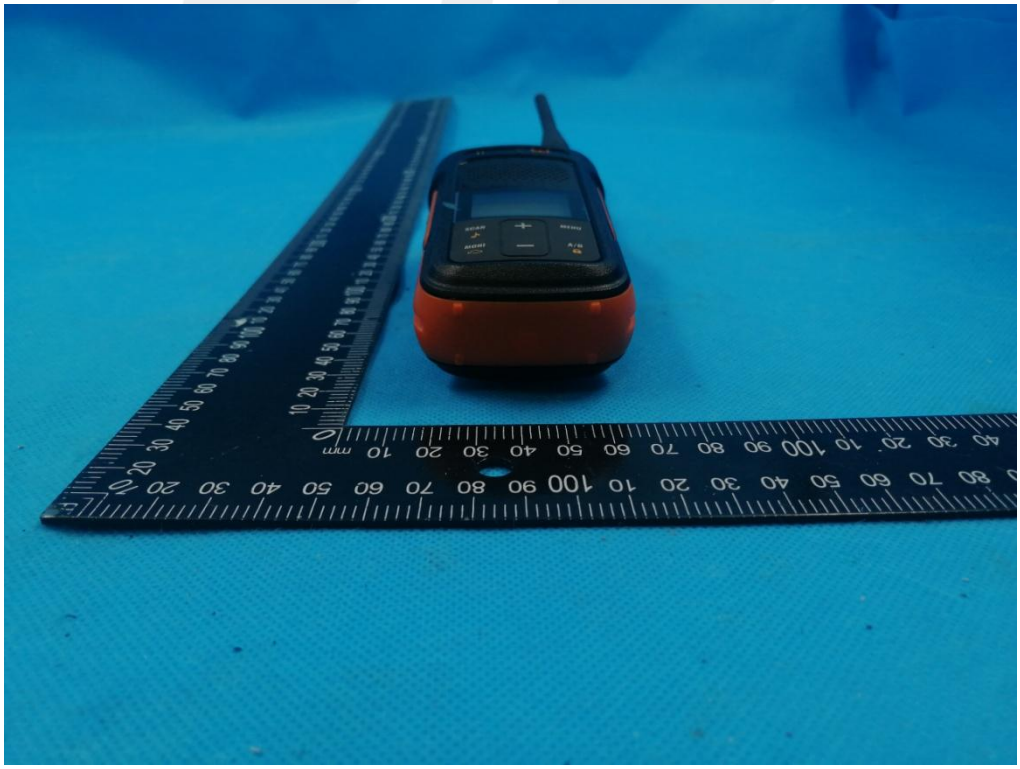
Front side

Back side

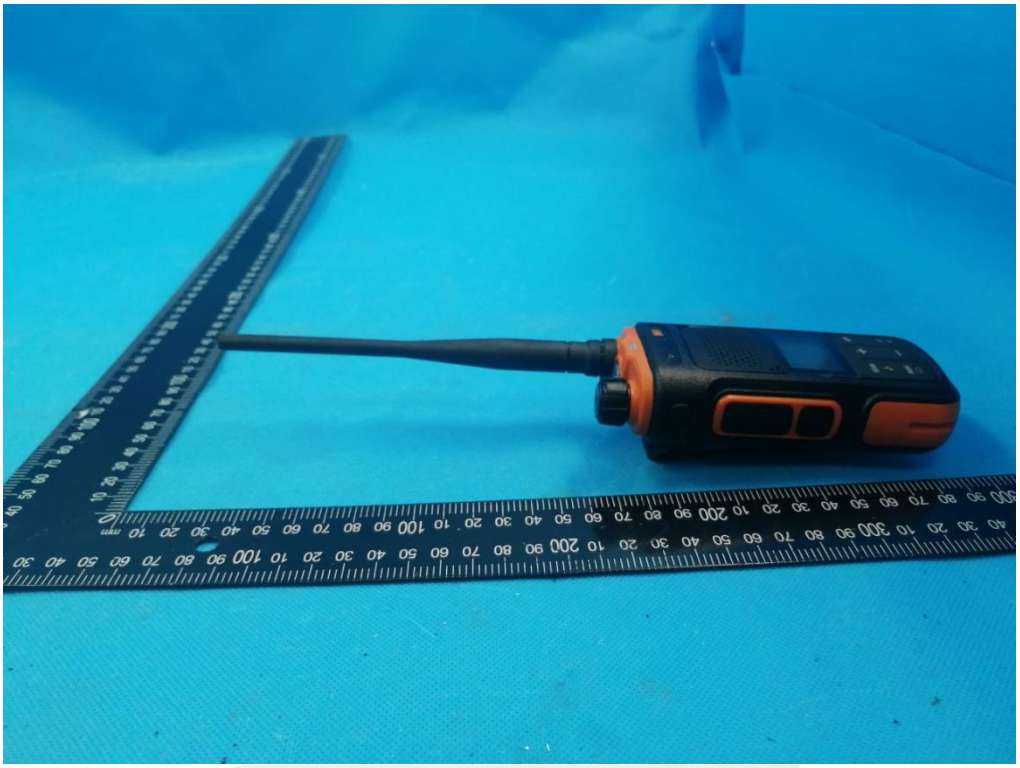
Top Edge



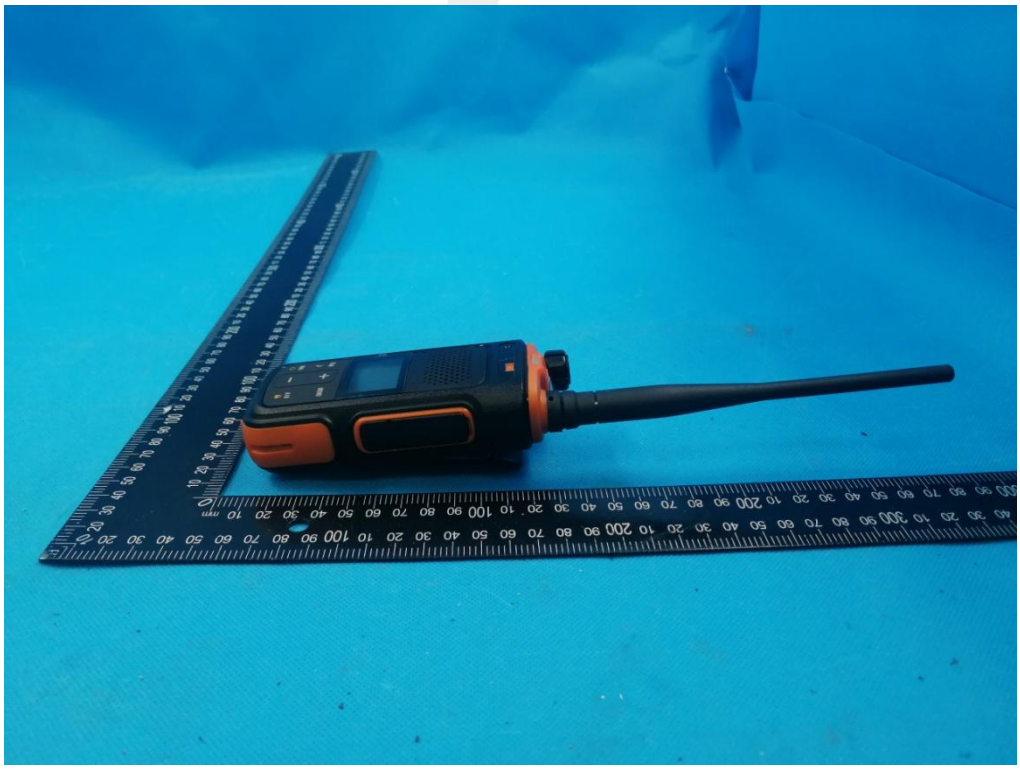
Bottom Edge



Left Edge



Right Edge

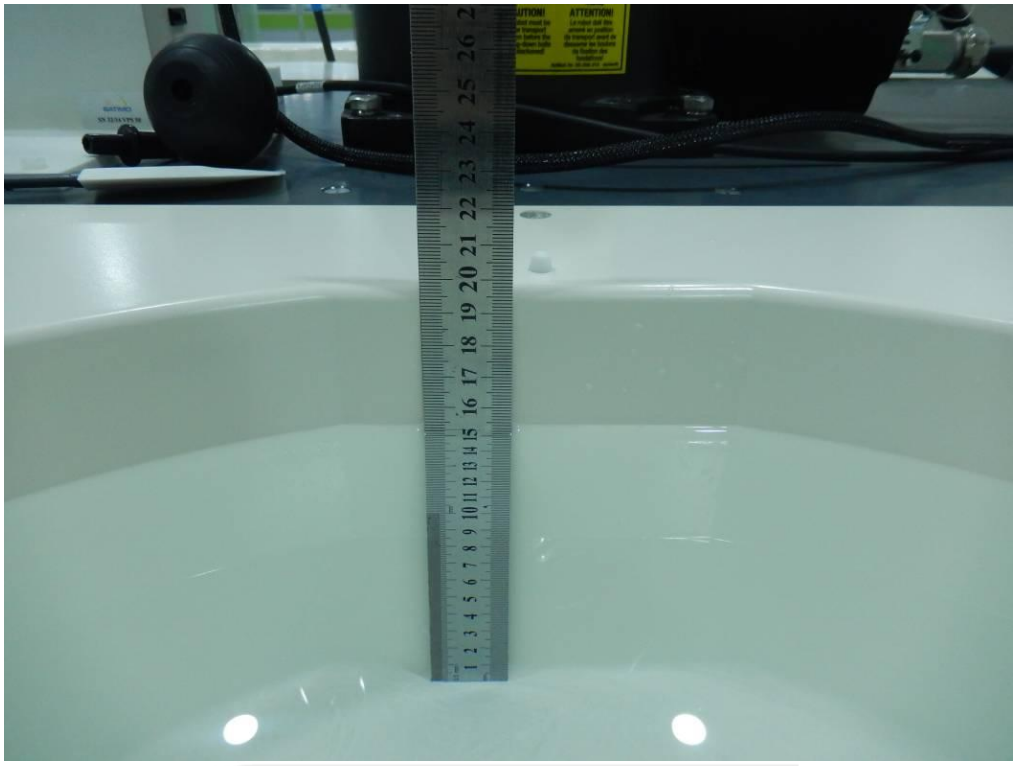


10.2 Setup Photo

Face up (separation distance is 25mm)

Body Back side (separation distance is 0mm)

Liquid depth (15 cm)



11. SAR Result Summary

Summary of Measurement Result

Phantom Configurations	Frequency (MHz)	Power Drift(%)	SAR 1g with 100% duty cycle (W/Kg)	SAR 1g with 50% duty cycle (W/Kg)	Max. Tune-up Power (dBm)	Meas. output Power (dBm)	Scaling SAR (W/Kg)	Meas. No.
Face up	462.6375	3.94	1.315	0.658	35	34.88	0.676	-
Face up	462.6500	0.28	1.521	0.761	35	34.85	0.788	1
Face up	467.6500	-0.34	1.343	0.672	35	34.87	0.692	-
Face up	467.6375	-1.97	1.156	0.578	27	26.94	0.586	-
Back side	462.6375	-2.14	2.361	1.181	35	34.88	1.214	-
Back side	462.6500	1.79	2.964	1.482	35	34.85	1.534	2
Back side	467.6500	2.38	2.934	1.467	35	34.87	1.512	-
Back side	467.6375	0.80	2.275	1.138	27	26.94	1.154	-

First Repeated SAR

Phantom Configurations	Frequency (MHz)	Power Drift(%)	SAR 1g with 100% duty cycle (W/Kg)	SAR 1g with 50% duty cycle (W/Kg)	Max. Tune-up Power (dBm)	Meas. output Power (dBm)	Scaling SAR (W/Kg)	Meas. No.
Back side	462.6375	-0.02	2.338	1.159	35	34.88	1.191	-
Back side	462.6500	-0.01	2.805	1.393	35	34.85	1.442	-
Back side	467.6500	1.66	2.817	1.402	35	34.87	1.445	-
Back side	467.6375	-0.67	2.237	1.119	27	26.94	1.135	-

Second Repeated SAR

Phantom Configurations	Frequency (MHz)	Power Drift(%)	SAR 1g with 100% duty cycle (W/Kg)	SAR 1g with 50% duty cycle (W/Kg)	Max. Tune-up Power (dBm)	Meas. output Power (dBm)	Scaling SAR (W/Kg)	Meas. No.
Back side	462.6375	1.28	2.307	1.154	35	34.88	1.186	-
Back side	462.6500	-1.00	2.775	1.388	35	34.85	1.437	-
Back side	467.6500	0.54	2.799	1.400	35	34.87	1.443	-
Back side	467.6375	-1.12	2.228	1.114	27	26.94	1.129	-

Repeated SAR measurement

Phantom Configurations	Frequency (MHz)	Original Measured SAR 1g(mW/g)	1 st Repeated SAR 1g	Ratio	Original Measured SAR 1g(mW/g)	2nd Repeated SAR 1g	Ratio
Back side	462.6375	2.361	2.318	1.019	2.361	2.307	1.023
Back side	462.6500	2.964	2.785	1.064	2.964	2.775	1.068
Back side	467.6500	2.934	2.804	1.046	2.934	2.799	1.048
Back side	467.6375	2.275	2.237	1.017	2.275	2.228	1.021

Note:

1. Per KDB 865664 D01,for each frequency band ,repeated SAR measurement is required only when the measured SAR is≥0.8W/Kg.
2. Per KDB 865664 D01,if the ratio of largest to smallest SAR for the original and first repeated measurement is≤1.2 and the measured SAR＜1.45W/Kg, only one repeated measurement is required.
3. Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is＞1.20 or when the original or repeated measurement is ≥ 1.45W/Kg
4. The ratio is the difference in percentage between original and repeated measured SAR.

12. Equipment List

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibrated Until
450MHz Dipole	MVG	SID450	SN 30/14 DIP0G450-330	2020.07.14	2023.07.13
E-Field Probe	MVG	SSE2	SN 41/18 EPGO334	2020.07.14	2021.07.13
Dielectric Probe Kit	MVG	SCLMP	SN 32/14 OCPG67	2020.11.24	2021.11.23
Antenna	MVG	ANTA3	SN 07/13 ZNTA52	N/A	N/A
Phantom1	MVG	SAM	SN 32/14 SAM115	N/A	N/A
Phantom2	MVG	SAM	SN 32/14 SAM116	N/A	N/A
Phone holder	MVG	N/A	SN 32/14 MSH97	N/A	N/A
Laptop holder	MVG	N/A	SN 32/14 LSH29	N/A	N/A
Attenuator	Agilent	99899	DC-18GHz	N/A	N/A
Directional coupler	Narda	4226-20	3305	N/A	N/A
Network Analyzer	Agilent	8753ES	US38432810	2020.10.12	2021.10.11
Multi Meter	Keithley	Multi Meter 2000	4050073	2020.10.10	2021.10.09
Signal Generator	Agilent	N5182A	MY50140530	2020.10.10	2021.10.09
Wireless Communication Test Set	Agilent	8960-E5515C	MY48360751	2020.10.10	2021.10.09
Wireless Communication Test Set	R&S	CMW500	117239	2020.10.10	2021.10.09
Power Amplifier	DESAY	ZHL-42W	9638	2020.10.12	2021.10.11
Power Meter	R&S	NRP	100510	2020.10.10	2021.10.09
Power Meter	Agilent	E4418B	GB43312526	2020.10.10	2021.10.09
Power Sensor	R&S	NRP-Z11	101919	2020.10.10	2021.10.09
Power Sensor	Agilent	E9301A	MY41497725	2020.10.10	2021.10.09
Temperature hygrometer	SuWei	SW-108	N/A	2020.10.12	2021.10.11
Thermograph	Elitech	RC-4	S/N EF7176501537	2020.10.12	2021.10.11

Note:
Per KDB 865664 D01, Dipole SAR Validation Verification, STS LAB has adopted 3 years calibration intervals. On annual basis, every measurement dipole has been evaluated and is in compliance with the following criteria:
1. There is no physical damage on the dipole
2. System validation with specific dipole is within 10% of calibrated value
Return-loss in within 20% of calibrated measurement

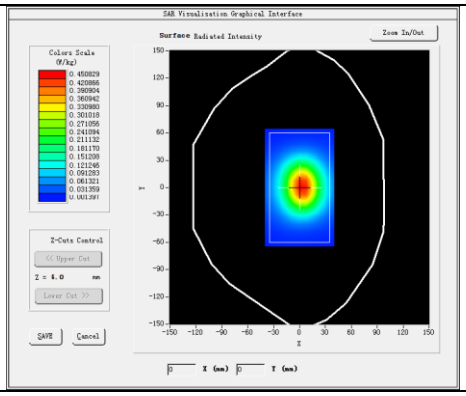
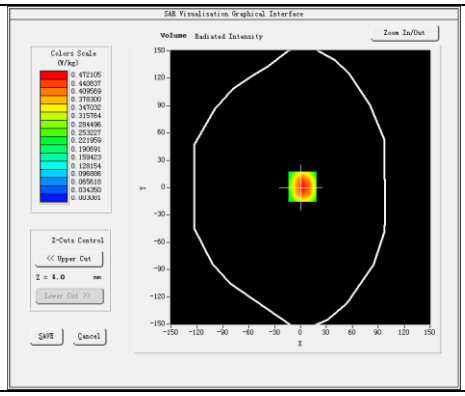
Appendix A. System Validation Plots

System Performance Check Data (450MHz)

Type: Phone measurement (Complete)
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 2020-12-21

Experimental conditions.

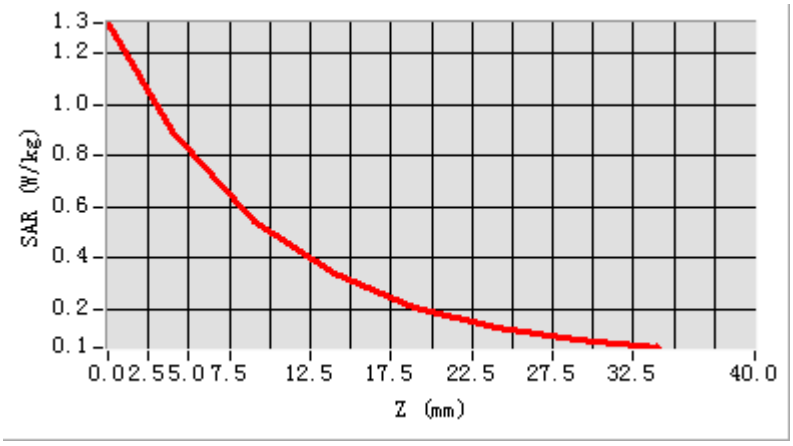
Probe	
Phantom	Validation plane
Device Position	-
Band	450MHz
Channels	-
Signal	CW
Frequency (MHz)	450MHz
Relative permittivity	43.62
Conductivity (S/m)	0.89
Power drift (%)	0.47
Probe	SN 41/18 EPGO334
ConvF:	1.42
Crest factor:	1:1

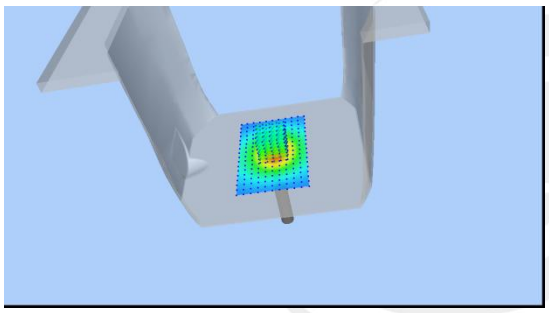
SURFACE SAR	VOLUME SAR
	

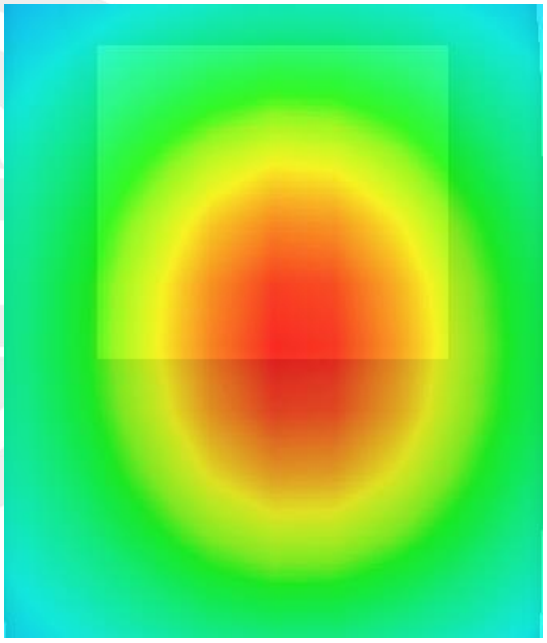
Maximum location: X=2.00, Y=0.00

SAR 10g (W/Kg)	0.309354
SAR 1g (W/Kg)	0.454277

Z Axis Scan


1.3
1.2
1.0
0.8
0.6
0.4
0.2
0.1
SAR (W/kg)
0.0 2.5 5.0 7.5 12.5 17.5 22.5 27.5 32.5 40.0
Z (mm)





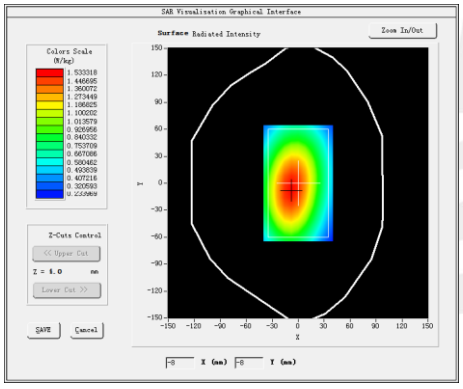
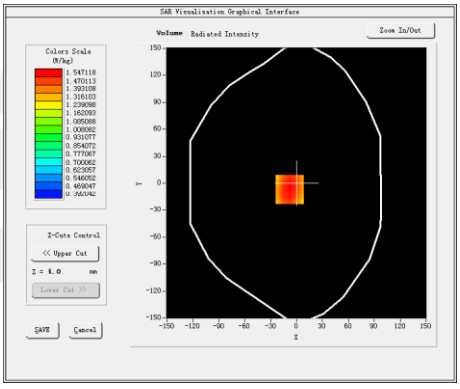
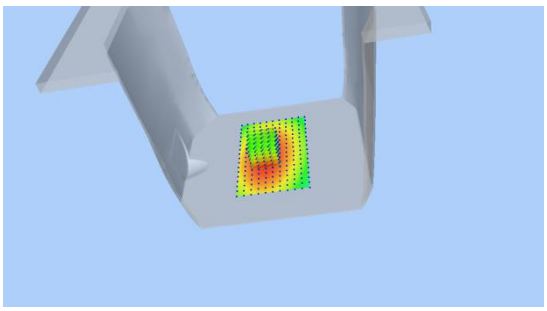
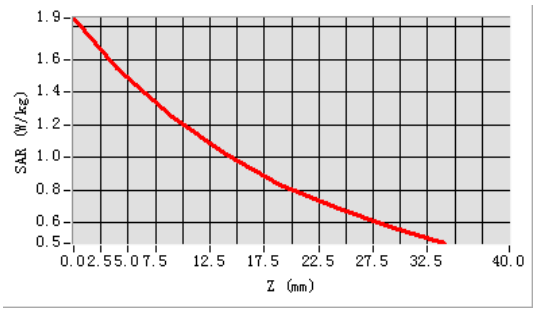
Appendix B. SAR Test Plots

Plot 1: DUT: Two-way radio; EUT Model: P11UV

Test Date	2020-12-21
Probe	SN 41/18 EPGO334
ConvF	1.42
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm, Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Face up
Signal	Crest factor: 1.0
Frequency (MHz)	462.6500
Relative permittivity (real part)	43.62
Conductivity (S/m)	0.89

Maximum location: X=-8.00, Y=-7.00
SAR Peak: 1.85 W/kg

SAR 10g (W/Kg)	1.186508
SAR 1g (W/Kg)	1.521389

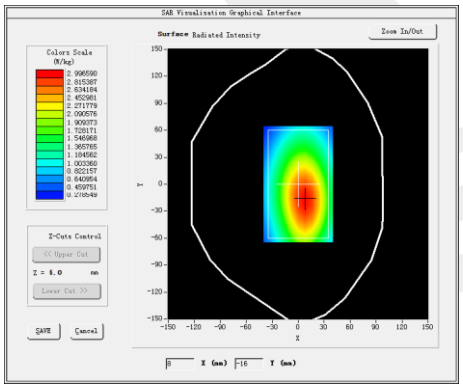
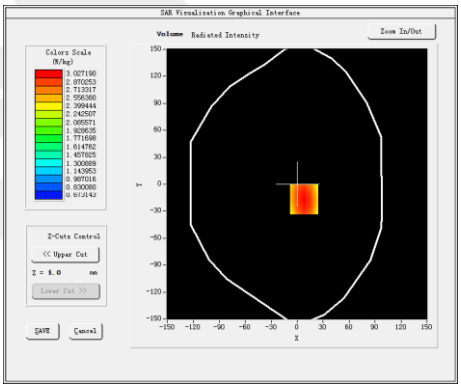
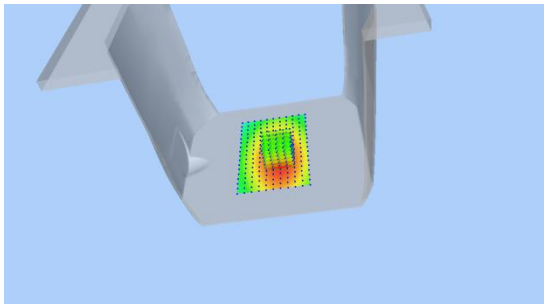
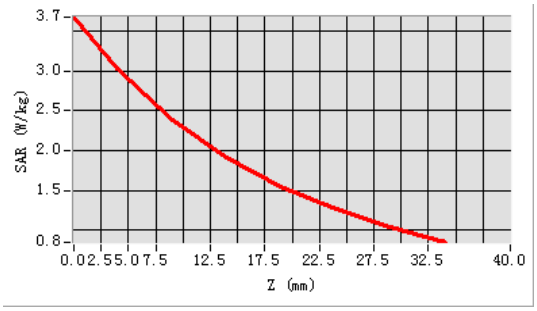
SURFACE SAR	VOLUME SAR
	
3D screen shot	**Z Axis Scan**
	

Plot 2: DUT: Two-way radio; EUT Model: P11UV

Test Date	2020-12-21
Probe	SN 41/18 EPGO334
ConvF	1.45
Area Scan	dx=8mm dy=8mm, h= 5.00 mm
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm, Complete/ndx=8mm dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Back side
Signal	Crest factor: 1.0
Frequency (MHz)	462.6500
Relative permittivity (real part)	43.62
Conductivity (S/m)	0.89

Maximum location: X=8.00, Y=-17.00
SAR Peak: 3.68 W/kg

SAR 10g (W/Kg)	2.259504
SAR 1g (W/Kg)	2.964236

SURFACE SAR	VOLUME SAR
	
3D screen shot	**Z Axis Scan**
	

Appendix C. Probe Calibration and Dipole Calibration Report

Refer the appendix Calibration Report.

※※※※※END OF THE REPORT※※※※※