FCC Part 95 RF TEST REPORT

For

AdVantage Industries

AD-T388 Walkie Talkie

Model No.: AD-T388

Prepared for	:	AdVantage Industries
Address	:	3540 109th Street, Des Moines, lowa 50322, USA
Prepared by	:	Shenzhen LCS Compliance Testing Laboratory Ltd.
Address	:	1/F., Xingyuan Industrial Park, Tongda Road, Bao'an Avenue, Bao'an District, Shenzhen, Guangdong, China
Date of receipt of test sample	:	July 08, 2013
Number of tested samples	:	1
Serial number	:	Prototype
Date of Test	:	July 08, 2013 – July 30, 2013
Date of Report	:	July 30, 2013

FCC Part 95 RF TEST REPORT
FCC CFR 47 PART 2 AND PART 95

Report Reference No.	**:**	**LCS130708223TF**
Date of Issue	:	July 30, 2013
Testing Laboratory Name.....	**:**	**Shenzhen LCS Compliance Testing Laboratory Ltd.**
Address	:	1/F., Xingyuan Industrial Park, Tongda Road, Bao'an Avenue, Bao'an District, Shenzhen, Guangdong, China
Testing Location/ Procedure.....	:	Full application of Harmonised standards ■ Partial application of Harmonised standards □ Other standard testing method □
Applicant's Name.....	**:**	**AdVantage Industries**
Address	:	3540 109th Street, Des Moines, lowa 50322, USA
Test Specification		
Standard	:	TIA-603-D, FCC CFR 47 PART 2 AND PART 95
Test Report Form No.....	**:**	LCSEMC-1.0
TRF Originator	:	Shenzhen LCS Compliance Testing Laboratory Ltd.
Master TRF	:	Dated 2011-03

Test Item Description.	**:**	**AD-T388 Walkie Talkie**
Trade Mark	:	N/A
Model/ Type reference.....	:	AD-T388
Ratings	:	DC 6.0V by 4*AAA batteries
Result	:	**Positive**

Compiled by:	**Supervised by:**	**Approved by:**
Ada Liang	Fox Zhang	Gavin Liang
Ada Liang/ File administrators	Fox Zhang/ Technique principal	Gavin Liang/ Manager

FCC -- TEST REPORT

Test Report No. : LCS130708223TF	July 30, 2013 Date of issue

Type / Model.....	: AD-T388
EUT.....	: AD-T388 Walkie Talkie
Applicant.....	**: AdVantage Industries**
Address.....	: 3540 109th Street, Des Moines, lowa 50322, USA
Telephone.....	: /
Fax.....	: /
Manufacturer.....	**: Sellers Union Co.**
Address.....	: 19F NO.1 Ningbo Research Dev., 399 Juxian Rd., National, Ningbo, China
Telephone.....	: /
Fax.....	: /
Factory.....	**: Sellers Union Co.**
Address.....	: 19F NO.1 Ningbo Research Dev., 399 Juxian Rd., National, Ningbo, China
Telephone.....	: /
Fax.....	: /

Test Result	Positive

The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT	:	AD-T388 Walkie Talkie
Test Model	:	AD-T388
Power Supply	:	DC 6.0V by 4*AAA batteries
Operating Frequency	:	462.5625MHz ~ 462.7125MHz(GMRS 1~7 channel) 467.5625MHz ~ 467.7125MHz(FRS 8~14channel) 462.5500MHz ~ 462.7250MHz(GMRS 15~22 channel)
Number of Channels	:	22
Channel Spacing	:	25KHz
Type Of Modulation	:	FM-F3E
Antenna Description	:	Bulit-in Antenna, Antenna Gain: 0dBi
RF Output Power	:	GMRS: <0.5W FRS: <0.5W
Test Channel	:	Channel 5 GMRS Mode 462.6625MHz Channel 12 FRS Mode 467.6625MHz

1.2. Host System Configuration List and Details

Manufacturer	Description	Model	Serial Number	Certificate
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1.3. External I/O Cable

I/O Port Description	Quantity	Cable
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1.4. Description of Test Facility

Site Description EMC Lab. :

Accredited by CNAS, June 04, 2010

The Certificate Registration Number. is L4595.

Accredited by FCC, July 14, 2011

The Certificate Registration Number. is 899208.

Accredited by Industry Canada, May. 02, 2011

The Certificate Registration Number. is 9642A-1

1.5. Statement of The Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. To CISPR 16 – 4 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements” and is documented in the LCS quality system acc. To DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

1.6. Measurement Uncertainty

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

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

1.7. Test environment

All tests were performed under the following environmental conditions:

Condition	**Minimum value**	**Maximum value**
Barometric pressure	86kPa	106kPa
Temperature	15°C	30°C
Relative Humidity	20 %	75 %
Power supply range	±5% of rated voltages	

2. TEST METHODOLOGY

All tests and measurements indicated in this document were performed in accordance with FCC CFR 47 part 2 and part 95.

Applicable Standards: TIA-603-D, ANSI C63.4-2003.The radiated testing was performed at an antenna-to-EUT distance of 3 meters. All radiated and conducted emissions measurement was performed at Shenzhen LCS Compliance Testing Laboratory Ltd..

2.1. EUT Configuration

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

2.2. Objective

This type approval report is prepared on behalf of **AdVantage Industries** in accordance with FCC CFR 47 part 2 and part 95.

The objective is to determine compliance with FCC rules.

2.3. General Test Procedures

2.3.1 Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using Quasi-peak and average detector modes.

2.3.2 Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.4

2.4. Test Mode

Channel List:

Channel	Frequency(MHz)	Channel	Frequency(MHz)
1	462.5625	12	467.6625
2	462.5875	13	467.6875
3	462.6125	14	467.7125
4	462.6375	15	462.5500
5	462.6625	16	462.5750
6	462.6875	17	462.6000
7	462.7125	18	462.6250
8	467.5625	19	462.6500
9	467.5875	20	462.6750
10	467.6125	21	462.7000
11	467.6375	22	462.7250

The following operating modes were applied for the related test items.

The EUT received DC 6V power from 4*AAA batteries which are new and full power.

All test modes were tested, only the result of the worst case was recorded in the report.

The following channels were chose for full testing:

Channel 5 GMRS Mode 462.6625MHz

Channel 12 FRS Mode 467.6625MHz

3. SYSTEM TEST CONFIGURATION

3.1. Justification

The EUT had been tested under operating condition. EUT staying in continuous transmitting mode.

3.2. EUT Exercise Software

N/A.

3.3. Special Accessories

N/A.

3.4. Block Diagram/Schematics

Please refer to the related document

3.5. Equipment Modifications

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

3.6. Test Setup

Please refer to the test setup photo.

4. SUMMARY OF TEST RESULTS

Test detailed items/section required by FCC rules and results are as below:

No.	Section in CFR 47	Description	Result
1	2.1046, 95.639	RF Output Power	Pass
2	2.1047, 95.637	Modulation Characteristics	Pass
3	2.1049, 95.633, 95.635	Occupied Bandwidth And Emission Mask	Pass
4	2.1051, 95.635	Radiated Spurious Emission	Pass
5	2.1055, 95.621, 95.626	Frequency Stability	Pass

5. TEST RESUL

5.1. RF OUTPUT POWER

5.1.1. Standard Applicable

Per FCC §2.1046 and §95.639(d): No FRS unit, under any condition of modulation, shall exceed 0.500 W effective radiated power (ERP).

Per FCC §2.1046 and§95.639(a)GMRS transmitter, under any condition of modulation, shall exceed 50 W Carrier power (average TP during one un-modulated RF cycle) when transmitting emission type A1D, F1D, G1D, A3E, F3E or G3E.

5.1.2. Measuring Instruments

Please refer to section 6 of equipments list in this report.

5.1.3. Test Procedures

1) On a test site, the EUT shall be place at 1.6m height on a wooden turntable, and in the position closest to normal use as declared by the applicant.

2) The test antenna shall be oriented initially for vertical polarization located 3m from EUT to correspond to the frequency of the transmitter.

3) The output of the test antenna shall be connected to the measuring receiver and the quasi-peak detector is used for the measurement.

4) The transmitter shall be switched on , if possible, without modulation and the measuring receiver shall be tuned to the frequency of the transmitter under test.

5) The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.

6) The transmitter shall then the rotated through 360 ° in the horizontal plane, until a maximum signal level is detected by the measuring receiver.

7) The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.

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

9) The transmitter shall be replaced by a tuned dipole (substitution antenna).

10) The substitution antenna shall be oriented for vertical polarization and the length of the substitution antenna shall be adjusted to correspond to the frequency of the transmitter.

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

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

13) The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver

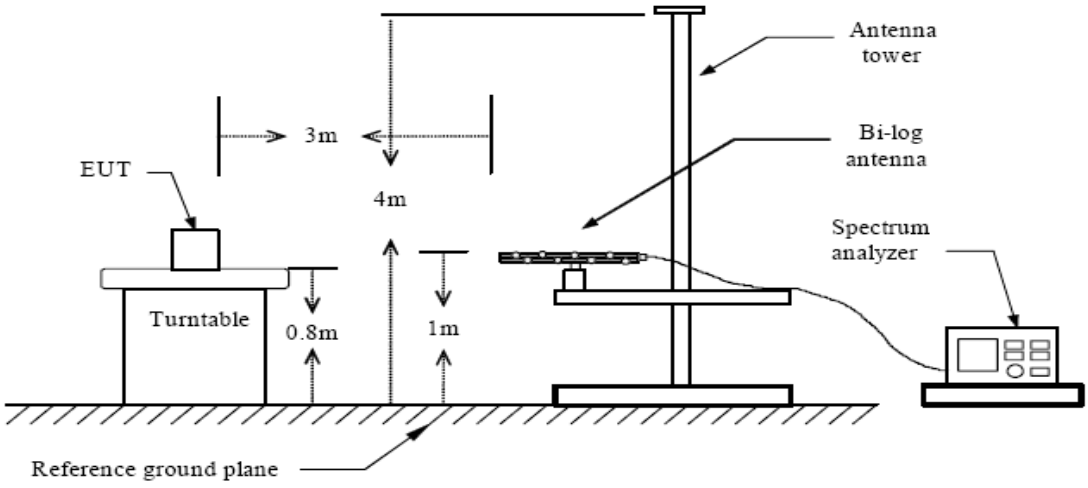
14) The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring received, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuator setting of the measuring receiver.

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

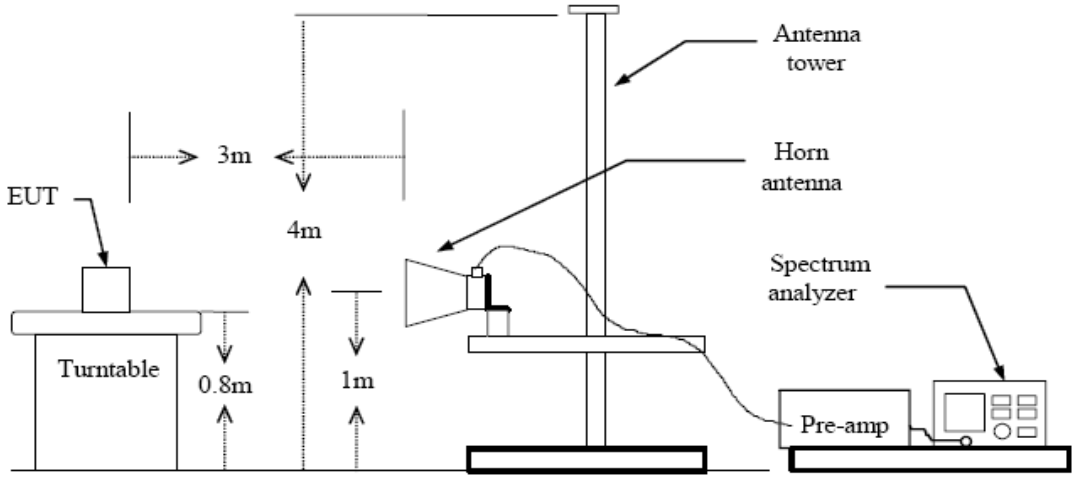
16) The measurement shall be repeated with the test antenna and the substitution antenna orientated for horizontal polarization.

17) The measure of the ERP is the larger of the two levels recorded, at the input to the substitution antenna, corrected the gain of the substitution antenna if necessary.

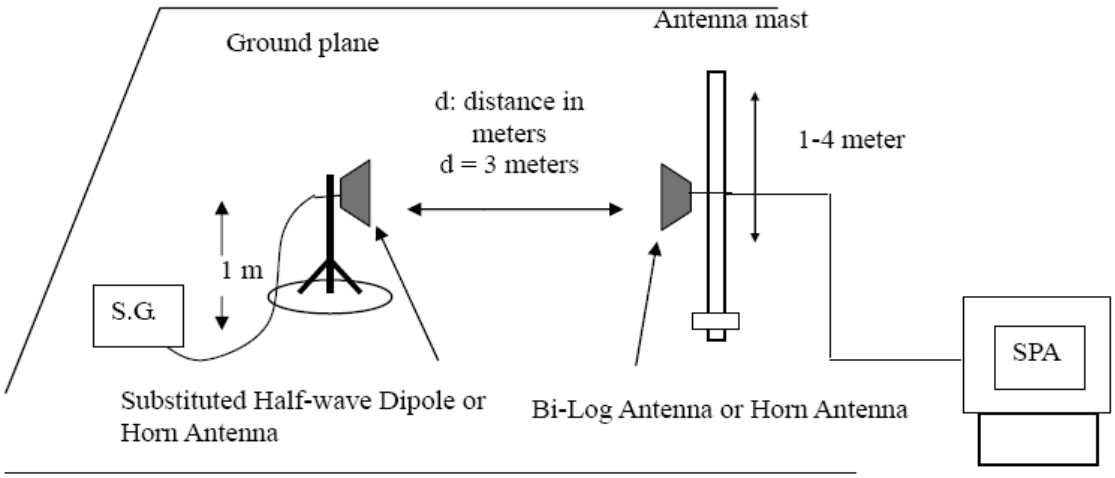
For radiated spurious emissions below 1GHz:



For radiated spurious emissions above 1GHz:



Substituted Method



5.1.4. Test Results

Temperature	25℃	Humidity	60%
ATM Pressure:	101.4kPa	Test Engineer	Leo

Channel	Channel Description	Frequency (MHz)	Effective Radiated Power		Limit (W)	Margin (W)
			dBm	W		
1	GMRS	462.5625	26.31	0.4276	50	49.5724
2		462.5875	26.34	0.4305	50	49.5695
3		462.6125	26.29	0.4256	50	49.5744
4		462.6375	26.36	0.4325	50	49.5675
5		462.6625	**26.41**	0.4375	50	49.5625
6		462.6875	26.35	0.4315	50	49.5685
7		462.7125	26.37	0.4335	50	49.5665
8	FRS	467.5625	26.33	0.4295	0.5	0.0705
9		467.5875	26.34	0.4305	0.5	0.0695
10		467.6125	26.31	0.4276	0.5	0.0724
11		467.6375	26.32	0.4315	0.5	0.0685
12		467.6625	**26.35**	0.4355	0.5	0.0645
13		467.6875	26.33	0.4295	0.5	0.0705
14		467.7125	26.24	0.4207	0.5	0.0793
15	GMRS	462.5500	26.27	0.4236	50	49.5764
16		462.5750	26.21	0.4178	50	49.5822
17		462.6000	26.30	0.4266	50	49.5734
18		462.6250	26.34	0.4305	50	49.5695
19		462.6500	26.29	0.4256	50	49.5744
20		462.6750	26.35	0.4315	50	49.5685
21		462.7000	26.33	0.4295	50	49.5705
22		462.7250	26.32	0.4285	50	49.5715

Test Result: Pass

5.2. Modulation Characteristics

5.2.1. Standard Applicable

Per FCC §2.1047 and §95.637(a): A GMRS transmitter that transmits emission type F3E must not exceed a peak frequency deviation of plus or minus 5 kHz. A FRS unit that transmits emission type F3E must not exceed a peak frequency deviation of plus or minus 2.5 kHz, and the audio frequency response must not exceed 3.125 kHz .

Each GMRS transmitter, except a mobile station transmitter with a power output of 2.5 W or less, must automatically prevent a greater than normal audio level from causing over-modulation. The transmitter also must include audio frequency low pass filtering, unless it complies with the applicable paragraphs of § 95.631 (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 10 (f/3) dB greater than the attenuation at 1 kHz. Above 20 kHz, it must have an attenuation of at least 50 dB greater than the attenuation at 1 kHz.

5.2.2. Measuring Instruments

Please refer to section 6 of equipments list in this report.

5.2.3. Test Procedures

5.2.3.1. Modulation Limit

1) Configure the EUT as shown in figure 1. Set the frequency of the audio signal generator to 500Hz and adjust the level from 47dBSPL to 137dBSPL.

2) Record the maximum value of plus or minus peak frequency deviation.

3) Repeat the above procedure with frequency 1000Hz, 2500Hz & 3125Hz.

5.2.3.2. Audio Frequency Response

1) Configure the EUT as shown in figure 1. Set the audio signal generator frequency to the sound pressure level 86dBSPL at the microphone of the EUT.

2) The frequency of the audio signal generator is changed from 300Hz to 5kHz.

3) Record the frequency deviation.

5.2.3.3. Audio Low Pass Filter Response

1) Connect the audio signal generator to the input of the post limiter low pass filter and the dB meter to the output of the post limiter low pass filter.

2) Apply a 1000 Hz tone from the audio signal generator and adjust the level per manufacturer's specifications. Record the dB level of the 1000 Hz tone as LEV_{REF}.

3) Set the audio signal generator to the desired test frequency between 3000 Hz and the upper low pass filter limit. Record the dB level at the test frequency as LEV_{FREQ}.

4) Calculate the audio frequency response at the test frequency as: low pass filter response = $LEV_{FREQ} - LEV_{REF}$.

5) Repeat the above procedure for all the desired test frequencies.

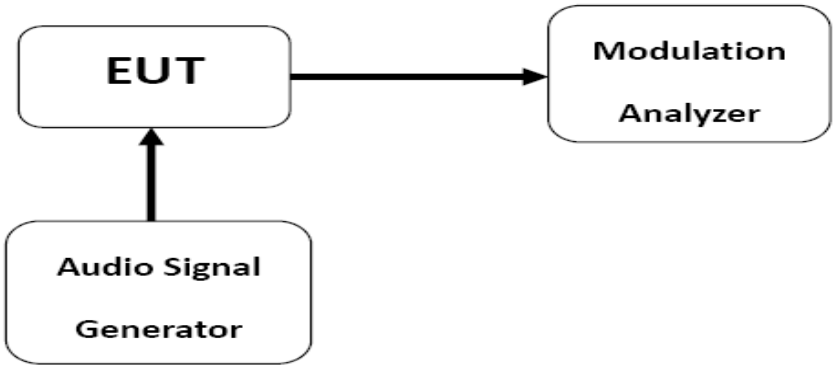


Figure 1 Modulation Characteristics Measurement Configuration

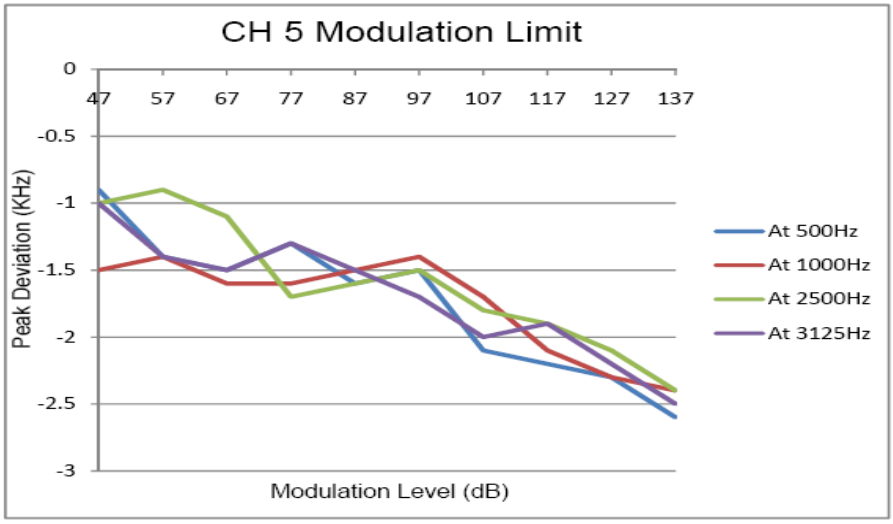
5.2.4. Test Results

Temperature	25℃	Humidity	60%
ATM Pressure:	101.4kPa	Test Engineer	Leo

Test Result of Modulation Limit

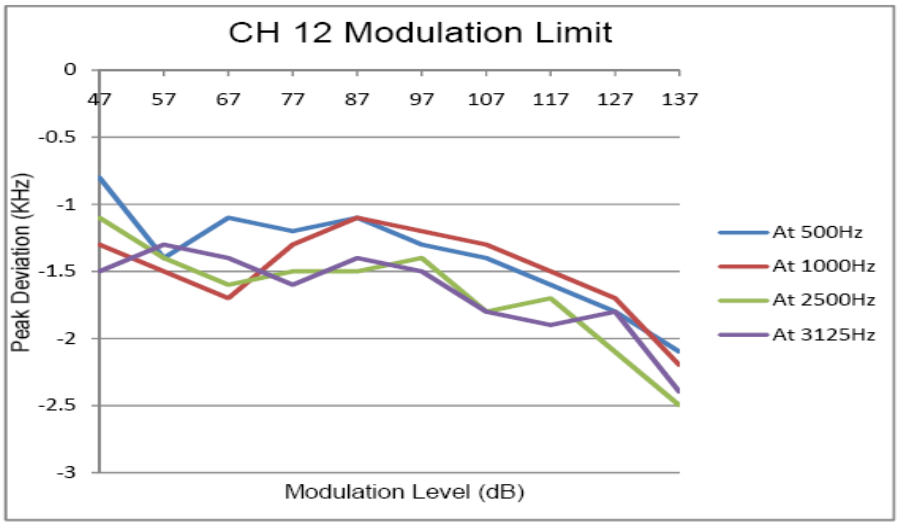
CH 5:

Modulation Input (dBSPL)	Peak Freq. Deviation (KHz) At 500Hz	Peak Freq. Deviation (KHz) At 1000Hz	Peak Freq. Deviation (KHz) At 2500Hz	Peak Freq. Deviation (KHz) At 3125Hz
47	-0.9	-1.5	-1.0	-1.0
57	-1.4	-1.4	-0.9	-1.4
67	-1.5	-1.6	-1.1	-1.5
77	-1.3	-1.6	-1.7	-1.3
87	-1.6	-1.5	-1.6	-1.5
97	-1.5	-1.4	-1.5	-1.7
107	-2.1	-1.7	-1.8	-2.0
117	-2.2	-2.1	-1.9	-1.9
127	-2.3	-2.3	-2.1	-2.2
137	-2.6	-2.4	-2.4	-2.5



CH 12:

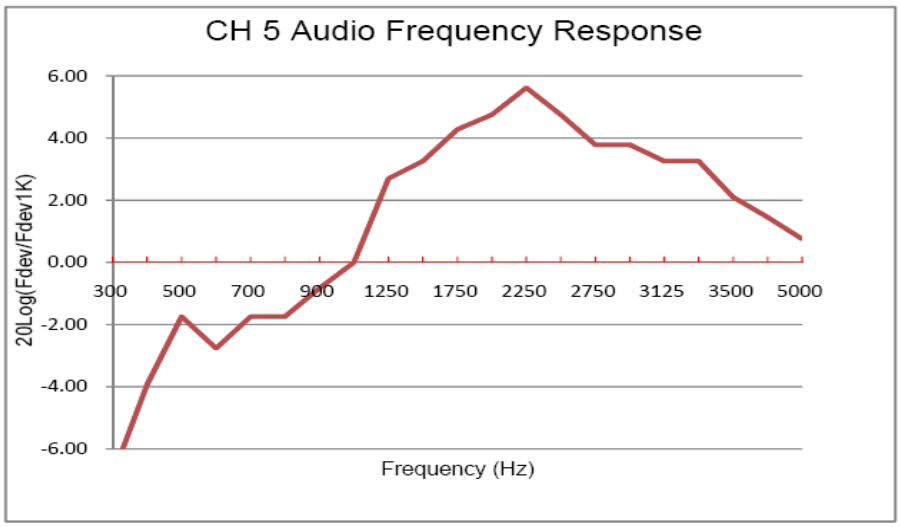
Modulation Input (dBSPL)	Peak Freq. Deviation (KHz) At 500Hz	Peak Freq. Deviation (KHz) At 1000Hz	Peak Freq. Deviation (KHz) At 2500Hz	Peak Freq. Deviation (KHz) At 3125Hz
47	-0.8	-1.3	-1.1	-1.5
57	-1.4	-1.5	-1.4	-1.3
67	-1.1	-1.7	-1.6	-1.4
77	-1.2	-1.3	-1.5	-1.6
87	-1.1	-1.1	-1.5	-1.4
97	-1.3	-1.2	-1.4	-1.5
107	-1.4	-1.3	-1.8	-1.8
117	-1.6	-1.5	-1.7	-1.9
127	-1.8	-1.7	-2.1	-1.8
137	-2.1	-2.2	-2.5	-2.4



Test Result of Audio Frequency Response

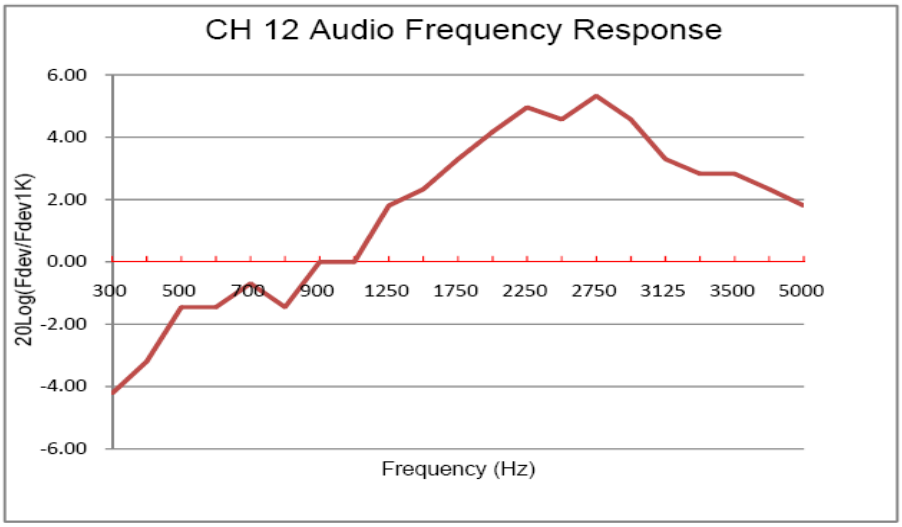
CH 5:

Frequency(Hz)	Deviation(KHz)	20Log(Fdev/Fdev at 1K)
300	0.5	-6.85
400	0.7	-3.93
500	0.9	-1.74
600	0.8	-2.77
700	0.9	-1.74
800	0.9	-1.74
900	1.0	-0.83
1000	1.1	0.00
1250	1.5	2.69
1500	1.6	3.25
1750	1.8	4.28
2000	1.9	4.75
2250	2.1	5.62
2500	1.9	4.75
2750	1.7	3.78
3000	1.7	3.78
3125	1.6	3.25
3250	1.6	3.25
3500	1.4	2.09
4000	1.3	1.45
5000	1.2	0.76



CH 12:

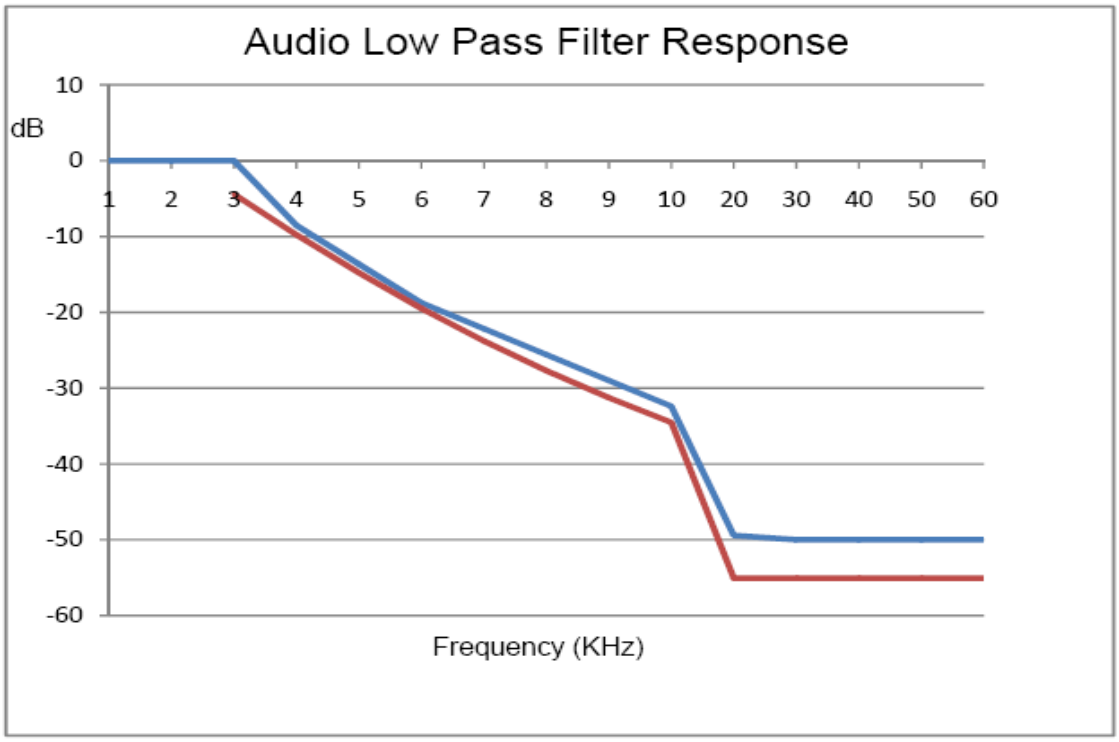
Frequency(Hz)	Deviation(KHz)	20Log(Fdev/Fdev at 1K)
300	0.8	-4.22
400	0.9	-3.19
500	1.1	-1.45
600	1.1	-1.45
700	1.2	-0.70
800	1.1	-1.45
900	1.3	0.00
1000	1.3	0.00
1250	1.6	1.80
1500	1.7	2.33
1750	1.9	3.30
2000	2.1	4.17
2250	2.3	4.96
2500	2.2	4.57
2750	2.4	5.33
3000	2.2	4.57
3125	1.9	3.30
3250	1.8	2.83
3500	1.8	2.83
4000	1.7	2.33
5000	1.6	1.80



Test Result of Audio Low Pass Filter Response

CH 5 For GMRS

Frequency(KHz)	Response	Limit
1	/	0.00
2	/	0.00
3	-4.39	0.00
4	-9.76	-8.52
5	-14.78	-13.64
6	-19.48	-18.75
7	-23.78	-22.16
8	-27.70	-25.57
9	-31.26	-28.98
10	-34.53	-32.39
20	-55.07	-49.43
30	-55.07	-50.00
40	-55.07	-50.00
50	-55.07	-50.00
60	-55.07	-50.00



5.3. Occupied Bandwidth And Emission Mask

5.3.1. Standard Applicable

According to §95.633(c) , the authorized bandwidth for emission type F3E or F2D transmitted by a FRS unit is 12.5 kHz. The authorized bandwidth for emission type F1D, G1D, F3E or G3E is 20 kHz.

The power of each unwanted emission shall be less than TP as specified in the applicable paragraphs listed in 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 log 10 (T) dB on any frequency removed from the center of the authorized bandwidth by more than 250%.

5.3.2. Measuring Instruments

Please refer to section 6 of equipments list in this report.

5.3.3. Test Procedures

1) Setup the configuration per the following setup block diagram.
2) Set EUT as normal operation
3) Set SPA Center Frequency = fundamental frequency, RBW,VBW= 300Hz, Span =100 KHz.
4) Set the level of audio signal generator to obtain 16 dB greater than required for 50% modulation.
5) Set SPA to show 2 traces and separately record the unmodulated mode and modulated mode of the EUT.

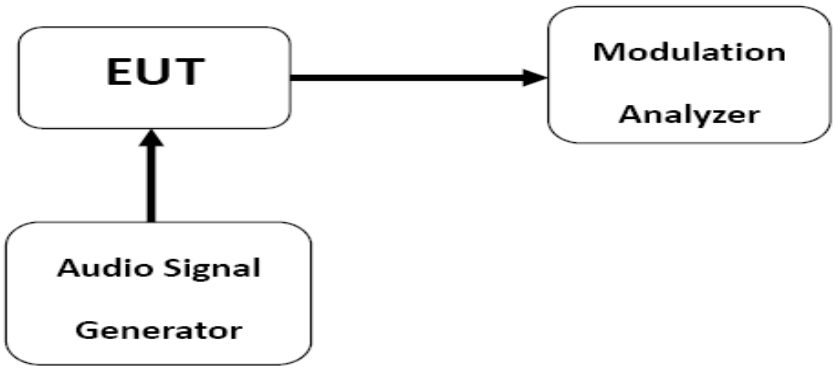


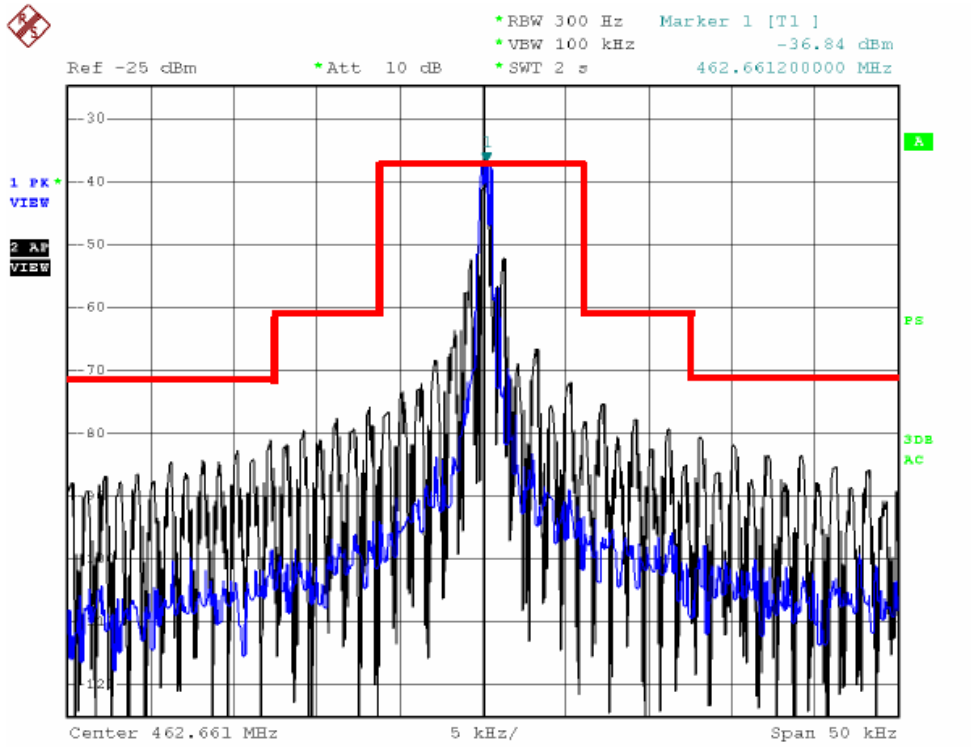
Figure 1 Modulation Characteristics Measurement Configuration

5.3.4. Test Results

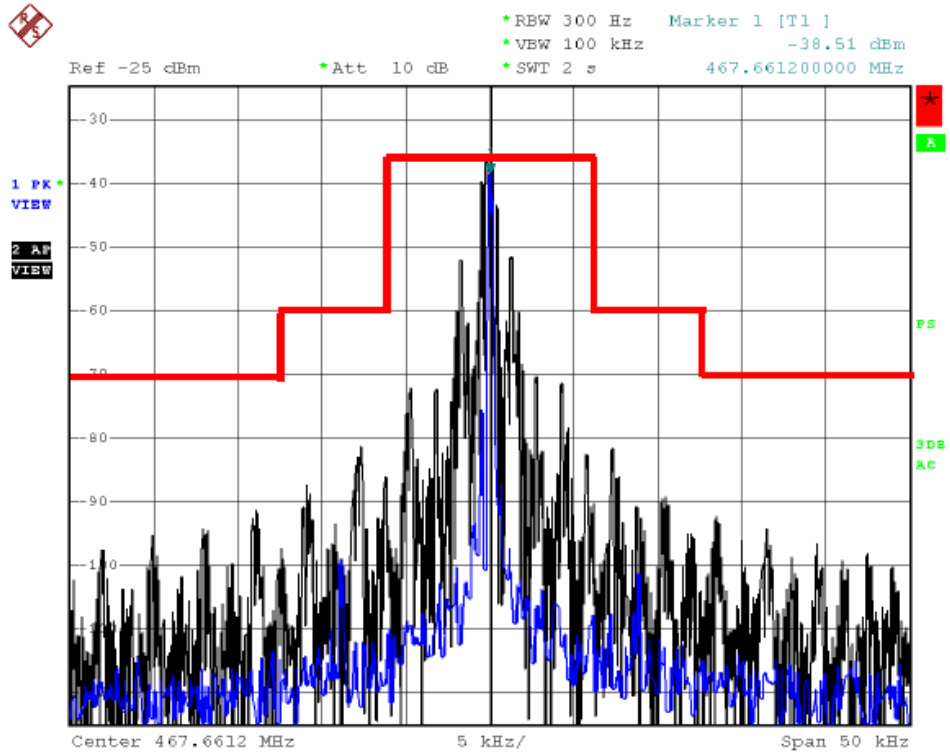
Temperature	25℃	Humidity	60%
ATM Pressure:	101.4kPa	Test Engineer	Leo

The test plots as follow:

CH5



CH12



5.4. Spurious Emission

5.4.1. Standard Applicable

According to FCC section 95.635(b7).the unwanted emission should be attenuated below TP by at least 43+10log(Transmit Power)dB .

5.4.2. Measuring Instruments

Please refer to section 6 of equipments list in this report.

5.4.3. Test Procedures

1) On a test site, the EUT shall be place at 1.6m height on a wooden turntable, and in the position closest to normal use as declared by the applicant.

2) The test antenna shall be oriented initially for vertical polarization located 3m from EUT to correspond to the frequency of the transmitter.

3) The output of the test antenna shall be connected to the measuring receiver and the quasi-peak detector is used for the measurement.

4) The transmitter shall be switched on , if possible, without modulation and the measuring receiver shall be tuned to the frequency of the transmitter under test.

5) The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.

6) The transmitter shall then the rotated through 360 ° in the horizontal plane, until a maximum signal level is detected by the measuring receiver.

7) The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.

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

9) The transmitter shall be replaced by a tuned dipole (substitution antenna).

10) The substitution antenna shall be oriented for vertical polarization and the length of the substitution antenna shall be adjusted to correspond to the frequency of the transmitter.

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

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

13) The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver

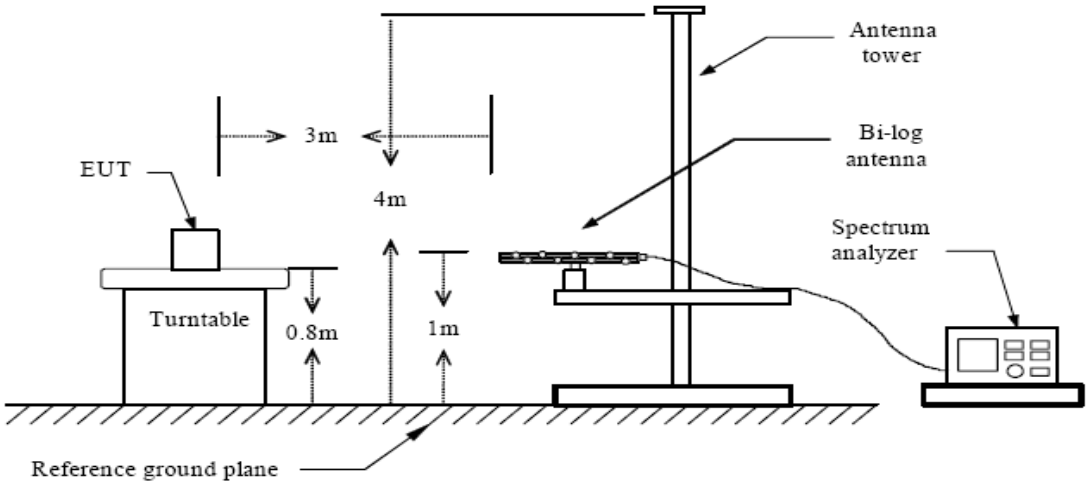
14) The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring received, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuator setting of the measuring receiver.

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

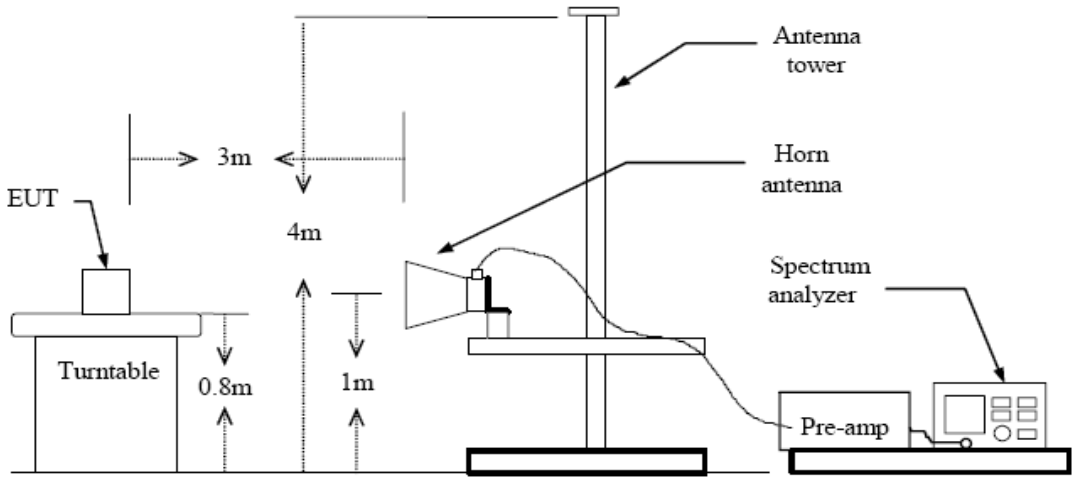
16) The measurement shall be repeated with the test antenna and the substitution antenna orientated for horizontal polarization.

17) The measure of the ERP is the larger of the two levels recorded, at the input to the substitution antenna, corrected the gain of the substitution antenna if necessary.

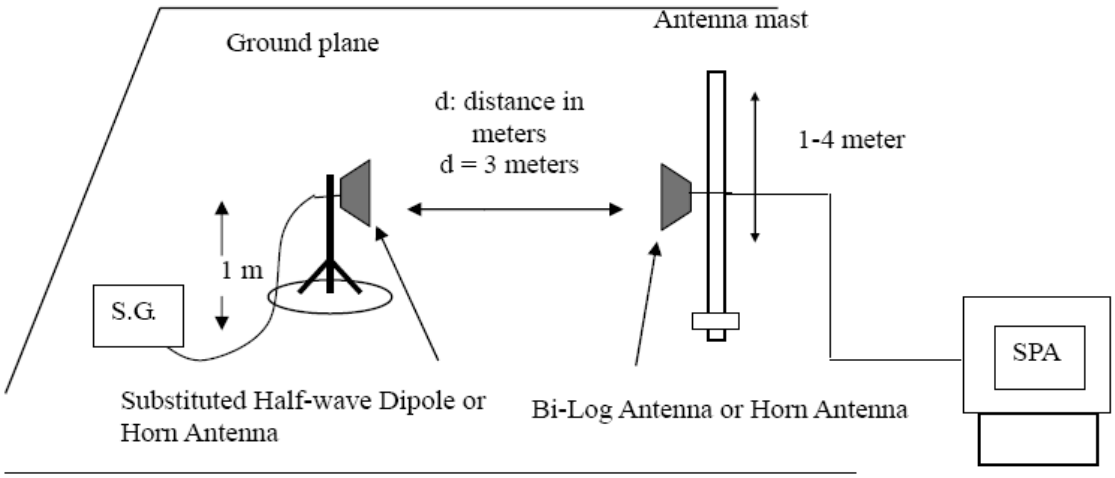
For radiated spurious emissions below 1GHz:



For radiated spurious emissions above 1GHz:



Substituted Method



5.4.4. Test Results

Temperature	25℃	Humidity	60%
ATM Pressure:	101.4kPa	Test Engineer	Leo

Test Result of Tx spurious Emissions(CH 5)

Frequency (MHz)	Effective Radiated Power (dBm)	Channel Max. Power(dBm)	Spurious Attenuation(dBc)	Limit (dBc)	Margin (dB)
233.89	-36.51	26.41	62.92	39.41	-23.51
694.36	-39.64	26.41	66.05	39.41	-26.64
923.67	-20.73	26.41	47.14	39.41	-7.73
1155.38	-27.44	26.41	53.85	39.41	-14.44
1390.49	-29.31	26.41	55.72	39.41	-16.31
1619.29	-31.57	26.41	57.98	39.41	-18.57
2312.92	-27.63	26.41	54.04	39.41	-14.63
2775.99	-29.51	26.41	55.92	39.41	-16.51
3703.56	-25.67	26.41	52.08	39.41	-12.67
4166.51	-31.35	26.41	57.76	39.41	-18.35

Test Result of Tx spurious Emissions(CH 12)

Frequency (MHz)	Effective Radiated Power (dBm)	Channel Max. Power(dBm)	Spurious Attenuation(dBc)	Limit (dBc)	Margin (dB)
232.72	-35.52	26.39	61.91	39.39	-22.52
703.99	-41.76	26.39	68.15	39.39	-28.76
934.65	-22.87	26.39	49.26	39.39	-9.87
1170.57	-25.11	26.39	51.50	39.39	-12.11
1405.06	-28.79	26.39	55.18	39.39	-15.79
1638.43	-30.13	26.39	56.52	39.39	-17.13
2336.81	-30.29	26.39	56.68	39.39	-17.29
2808.69	-27.22	26.39	53.61	39.39	-14.22
3741.25	-28.22	26.39	54.61	39.39	-15.22
4209.34	-30.71	26.39	57.10	39.39	-17.71

5.5. Frequency Stability

5.5.1. Standard Applicable

According to FCC Section 95.627, the frequency stability shall be measured with variation of ambient temperature from －30℃ to +50℃ centigrade. Each FRS unit must be maintained within a frequency tolerance of 0.00025%.

According to FCC Section 95.621, the frequency stability shall be measured with variation of ambient temperature from －30℃ to +50℃ centigrade Each GMRS transmitter for mobile station, small base station and control station operation must be maintained within a frequency tolerance of 0.0005%.

5.5.2. Test Procedures

5.5.2.1. 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.

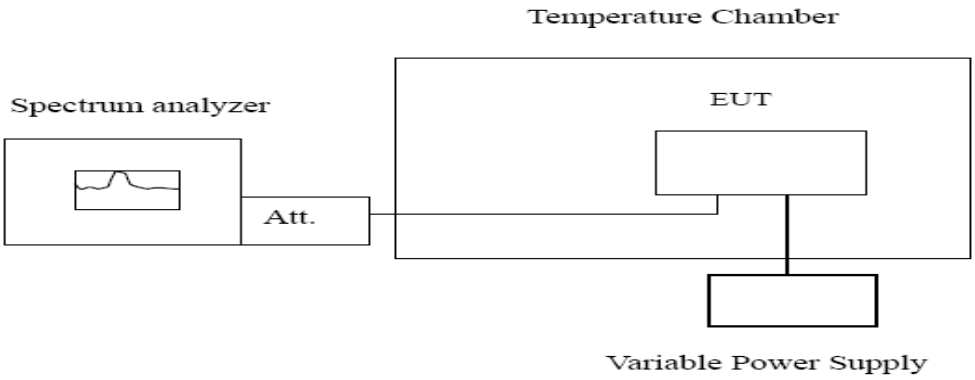
5.5.2.2. Frequency stability versus input voltage

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.
Install new battery in the EUT.

2). Set SA center frequency to the EUT radiated frequency. Set SA Resolution Bandwidth to 1KHz and Video Resolution Bandwidth to 1KHz. Record this frequency as reference frequency.

3). For battery operated only device, supply the EUT primary voltage at the operating end point

which is specified by manufacturer and record the frequency.



5.5.3. Test Results

Pass

Test result of frequency stability versus environmental temperature

The test data as follow:

The Test Result For CH 5, TX=462.66250MHz				
Temperature (℃)	**Frequency (MHz)**	**Measured (MHz)**	**Deviation (%)**	**Limit (%)**
-20	462.66250	462.66271	0.0000454	0.0005
-10	462.66250	462.66265	0.0000324	0.0005
0	462.66250	462.66263	0.0000281	0.0005
+10	462.66250	462.66259	0.0000195	0.0005
+20	462.66250	462.66244	-0.0000130	0.0005
+30	462.66250	462.66237	-0.0000281	0.0005
+40	462.66250	462.66231	-0.0000411	0.0005
+50	462.66250	462.66225	-0.0000540	0.0005

The Test Result For CH 12, TX=467.66250MHz				
Temperature (℃)	Frequency (MHz)	Measured (MHz)	Deviation (%)	Limit (%)
-20	467.66250	467.66268	0.0000385	0.00025
-10	467.66250	467.66261	0.0000235	0.00025
0	467.66250	467.66243	-0.0000150	0.00025
+10	467.66250	467.66238	-0.0000257	0.00025
+20	467.66250	467.66233	-0.0000364	0.00025
+30	467.66250	467.66229	-0.0000449	0.00025
+40	467.66250	467.66223	-0.0000577	0.00025
+50	467.66250	467.66219	-0.0000663	0.00025

Test worst result of frequency stability versus input voltage

Input Voltage (Vdc)	Frequency (MHz)	Measured (MHz)	Deviation (%)	Limit (%)
3.5	462.66250	462.66221	-0.0000627	0.0005
3.5	467.66250	467.66219	-0.0000663	0.00025

Note: This EUT meets the frequency stability requirement for a FRS: +/- 2.5ppm over temp range of -20 degrees C to +50 degrees C. It also meets the GMRS frequency stability requirements: +/- 5ppm over the temp range –20 degrees C to +50 degrees C.

6. LIST OF MEASURING EQUIPMENTS

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Cal Date	Due Date
EMC Receiver	R&S	ESCS 30	100174	9kHz – 2.75GHz	June 18,2013	June 17,2014
Signal analyzer	Agilent	E4448A(External mixers to 40GHz)	US44300469	9kHz~40GHz	July 16,2013	July 15,2014
LISN	MESS Tec	NNB-2/16Z	99079	9KHz-30MHz	June 18,2013	June 17,2014
LISN (Support Unit)	EMCO	3819/2NM	9703-1839	9KHz-30MHz	June 18,2013	June 17,2014
RF Cable-CON	UTIFLEX	3102-26886-4	CB049	9KHz-30MHz	June 18,2013	June 17,2014
ISN	SCHAFFNER	ISN ST08	21653	9KHz-30MHz	June 18,2013	June 17,2014
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30M-1GHz 3m	June 18,2013	June 17,2014
Amplifier	SCHAFFNER	COA9231A	18667	9kHz-2GHzz	June 18,2013	June 17,2014
Amplifier	Agilent	8449B	3008A02120	1GHz-26.5GHz	July 16,2013	July 15,2014
Amplifier	MITEQ	AMF-6F-260400	9121372	26.5GHz-40GHz	July 16,2013	July 15,2014
Spectrum Analyzer	Agilent	E4407B	MY41440292	9k-26.5GHz	July 16,2013	July 15,2014
Loop Antenna	R&S	HFH2-Z2	860004/001	9k-30MHz	June 18,2013	June 17,2014
By-log Antenna	SCHWARZBECK	VULB9163	9163-470	30MHz-1GHz	June 10,2013	June 09,2014
Horn Antenna	EMCO	3115	6741	1GHz-18GHz	June 10,2013	June 09,2014
RF Cable-R03m	Jye Bao	RG142	CB021	30MHz-1GHz	June 18,2013	June 17,2014
RF Cable-HIGH	SUHNER	SUCOFLEX 106	03CH03-HY	1GHz-40GHz	June 18,2013	June 17,2014
Spectrum Meter	R&S	FSP 30	100023	9kHz-30GHz	July 16,2013	July 15,2014
Power Meter	R&S	NRVS	100444	DC-40GHz	June 18,2013	June 17,2014
Power Sensor	R&S	NRV-Z51	100458	DC-30GHz	June 18,2013	June 17,2014
Power Sensor	R&S	NRV-Z32	10057	30MHz-6GHz	June 18,2013	June 17,2014
AC Power Source	HPC	HPA-500E	HPA-9100024	AC 0~300V	June 18,2013	June 17,2014
DC power Soure	GW	GPC-6030D	C671845	DC 1V-60V	June 18,2013	June 17,2014
Temperature & Humidity Chamber	Giant Force	GTH-225-20-S	MAB0103-00	N/A	June 18,2013	June 17,2014
RF CABLE-1m	JYE Bao	RG142	CB034-1m	20MHz-7GHz	June 18,2013	June 17,2014
RF CABLE-2m	JYE Bao	RG142	CB)35-2m	20MHz-1GHz	June 18,2013	June 17,2014
Vector signal Generator	R&S	SMU200A	102098	100kHz~6GHz	June 18,2013	June 17,2014
Signal Generator	R&S	SMR40	10016	10MHz~40GHz	July 16,2013	July 15,2014
Anritu	Agilent	8920B	--	N/A	July 18,2013	July 17,2014
Note: All equipment through GRGT EST calibration						

7. MANUFACTURER/ APPROVAL HOLDER DECLARATION

The following identical model(s):

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Belong to the tested device:

Product description : AD-T388 Walkie Talkie

Model name : AD-T388

Remark: No additional models were tested.

----------THE END OF REPORT----------