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RADIO TEST REPORT

Report No: STS1803153W01

Issued for

Guangdong Samzuk Technology Development Co, Ltd

High-Tech Zone Xingong Avenue East Heyuan, China

Product Name:	Intercom
Brand Name:	SAMCOM
Model Name:	FTAN30AA
Series Model:	FTAN10AA, FTAN10AB, FTAN10AC, FTAN20AA, FTAN20AB, FTAN20AC, FTAN30AB, FTAN30AC.
FCC ID:	2AIOQ-FTAN30AA
Test Standard:	FCC Part 95

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TEST REPORT CERTIFICATION

Applicant's name : Guangdong Samzuk Technology Development Co, Ltd

Address : High-Tech Zone Xinggong Avenue East Heyuan, China

Manufacture's Name..... : Guangdong Samzuk Technology Development Co, Ltd

Address : High-Tech Zone Xinggong Avenue East Heyuan, China

Product description

Product name : Intercom

Brand name : **SAMCOM**

model Name : FTAN30AA

Series model..... : FTAN10AA,FTAN10AB,FTAN10AC,FTAN20AA,FTAN20AB, FTAN20AC,FTAN30AB,FTAN30AC.

Test Standards : FCC Part 95

Test procedure : TIA 603D:2010

This device described above has been tested by STS, the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Date of Test.....

Date of performance of tests 14 Mar. 2018 ~ 17 Mar. 2018

Date of Issue..... 22 Mar. 2018

Test Result..... **Pass**

Testing Engineer :

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Sean she

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Authorized Signatory :

Vita Li

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Revision History

Rev.	Issue Date	Report NO.	Effect Page	Contents
00	22 Mar. 2018	STS1803153W01	ALL	Initial Issue





1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part 95			
Standard Section	Test Item	Judgment	Remark
FCC Part 95.567& FCC Part 95.1767	Transmitter Output Power and Effective Radiated Power (e.r.p)	PASS	--
FCC Part 95.573& FCC Part 95.1773	Authorized Bandwidth	PASS	--
FCC Part 95.579& FCC Part 95.1779	Emission Mask	PASS	--
FCC Part 95.579& FCC Part 95.1779	Transmitter Radiated Spurious Emission	PASS	--
FCC Part 95.579& FCC Part 95.1779	Spurious Emission On Antenna Port	PASS	--
FCC Part 95.565& FCC Part 95.1765	Frequency Stability	PASS	--
FCC Part 95.575& FCC Part 95.1775	AUDIO LOW PASS FILTER RESPONSE	PASS	--
FCC Part 95.575& FCC Part 95.1775	Audio Frequency Response	PASS	--
FCC Part 95.575& FCC Part 95.1775	Modulation Requirements	PASS	--

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

(2) All tests are according to TIA 603D:2010



1.1 TEST FACTORY

Shenzhen STS Test Services Co., Ltd.
Add. : 1/F., Building B, Zhuoke Science Park, No.190, Chongqing Road,
Fuyong Street, Bao'an District, Shenzhen, Guangdong, China
CNAS Registration No.: L7649; FCC Registration No.: 625569
IC Registration No.: 12108A; A2LA Certificate No.: 4338.01;

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately **95 %**.

No.	Item	Uncertainty
1	Conducted Emission (9KHz-150KHz)	$\pm 2.88\text{dB}$
2	Conducted Emission (150KHz-30MHz)	$\pm 2.67\text{dB}$
3	RF power,conducted	$\pm 0.71\text{dB}$
4	Spurious emissions,conducted	$\pm 0.63\text{dB}$
5	All emissions,radiated(<1G) 30MHz-200MHz	$\pm 2.83\text{dB}$
6	All emissions,radiated(<1G) 200MHz-1000MHz	$\pm 2.94\text{dB}$
8	All emissions,radiated(>1G)	$\pm 3.03\text{dB}$



2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product Name	Intercom	
Brand Name	SAMCOM	
Model Name	FTAN30AA	
Series Model	FTAN10AA, FTAN10AB, FTAN10AC, FTAN20AA, FTAN20AB, FTAN20AC, FTAN30AB, FTAN30AC.	
Model Difference	Only different model names, colors and appearance	
Operation Frequency Range:	GMRS	462.5500MHz~462.7250MHz
Modulation Type	GMRS	FM
emission types	GMRS	10K9F3E
Adapter	Power supply and ADP(rating): Input: AC 100V-240V, 50/60Hz, 200mA Output: DC 5.0V, 1000mA	
Battery	Battery(rating): Rated Voltage: 3.7V Capacity :2200mAh	
Hardware version number	Ver A	
Software version number	V 1.0	
Connecting I/O Port(s)	Please refer to the User's Manual	

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

2. Table for filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
1	SAMCOM	FTAN30AA	Integral Antenna	N/A	2.0	Antenna



3. Channel List

Channel	Frequency	Model
15	462.5500	GMRS
16	462.5750	GMRS
17	462.6000	GMRS
18	462.6250	GMRS
19	462.6500	GMRS
20	462.6750	GMRS
21	462.7000	GMRS
22	462.7250	GMRS

4. Test channel

Operation Mode	Channel Separation (kHz)	Test Channel	Test Frequency (MHz)
GMRS	25	CH19	462.6500



2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	GMRS CH19 TX Mode

	For Radiated Emission
Final Test Mode	Description
Mode 1	GMRS CH19 TX Mode

2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

During test, Keep EUT is in continuous transmission mode, Both open button and closed button have been tested, The two keys were tested to assess and only record the worst case in the report(Open botton).

E-1
EUT



2.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Serial No.	Note

Item	Shielded Type	Ferrite Core	Length	Note

Note:

- (1)The support equipment was authorized by Declaration of Confirmation.
- (2)For detachable type I/O cable should be specified the length in cm in 『Length』 column.



2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Test Receiver	R&S	ESCI	101427	2017.10.15	2018.10.14
Bilog Antenna	TESEQ	CBL6111D	34678	2017.10.30	2018.10.29
Horn Antenna	Schwarzbeck	BBHA 9120D(1201)	9120D-1343	2017.10.27	2018.10.26
Loop Antenna	EMCO	6502	9003-2485	N/A	N/A
Pre-mpplier (0.1M-3GHz)	EM	EM330	60538	2017.10.28	2018.10.27
PreAmplifier (1G-26.5GHz)	Agilent	8449B	60538	2017.10.15	2018.10.14
Low frequency cable	EM	R01	N/A	2018.03.11	2019.03.10
Low frequency cable	EM	R06	N/A	2018.03.11	2019.03.10
High frequency cable	SCHWARZBECK	AK9515H	SN-96286/9628 7	2018.03.11	2019.03.10
Semi-anechoic chamber	Changling	966	N/A	2018.03.11	2019.03.10
Signal Analyzer	Agilent	N9020A	MY49100060	2018.03.08	2019.03.07
RF COMMUNICATION TEST SET	HP	N8920A	348A05658	2017.10.15	2018.10.14

Note: The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.



3. FIELD STRENGTHS AND RADIATED SPURIOUS EMISSION

3.1 RADIATED EMISSION LIMITS

In measuring unwanted emissions, the spectrum shall be investigated from 30 MHz or the lowest radio frequency signal generated in the equipment, whichever is lower, without going below 9 kHz, up to at least the frequency given below:

(a) If the equipment operates below 10 GHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

(b) If the equipment operates at or above 10 GHz: to the fifth harmonic of the highest fundamental frequency or to 100 GHz, whichever is lower.

Particular attention should be paid to harmonics and sub-harmonics of the carrier frequency, as well as to those frequencies removed from the carrier by multiples of the oscillator frequency. Radiation at the frequencies of multiplier stages should also be checked.

The amplitude of spurious emissions attenuated more than 20 dB below the permissible value need not be reported.

$43 + 10 \log (P_{\text{watts}})$

Calculation: Limit (dBm) = EL - 43 - 10 log₁₀ (TP)

Notes: 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) = -13 dBm

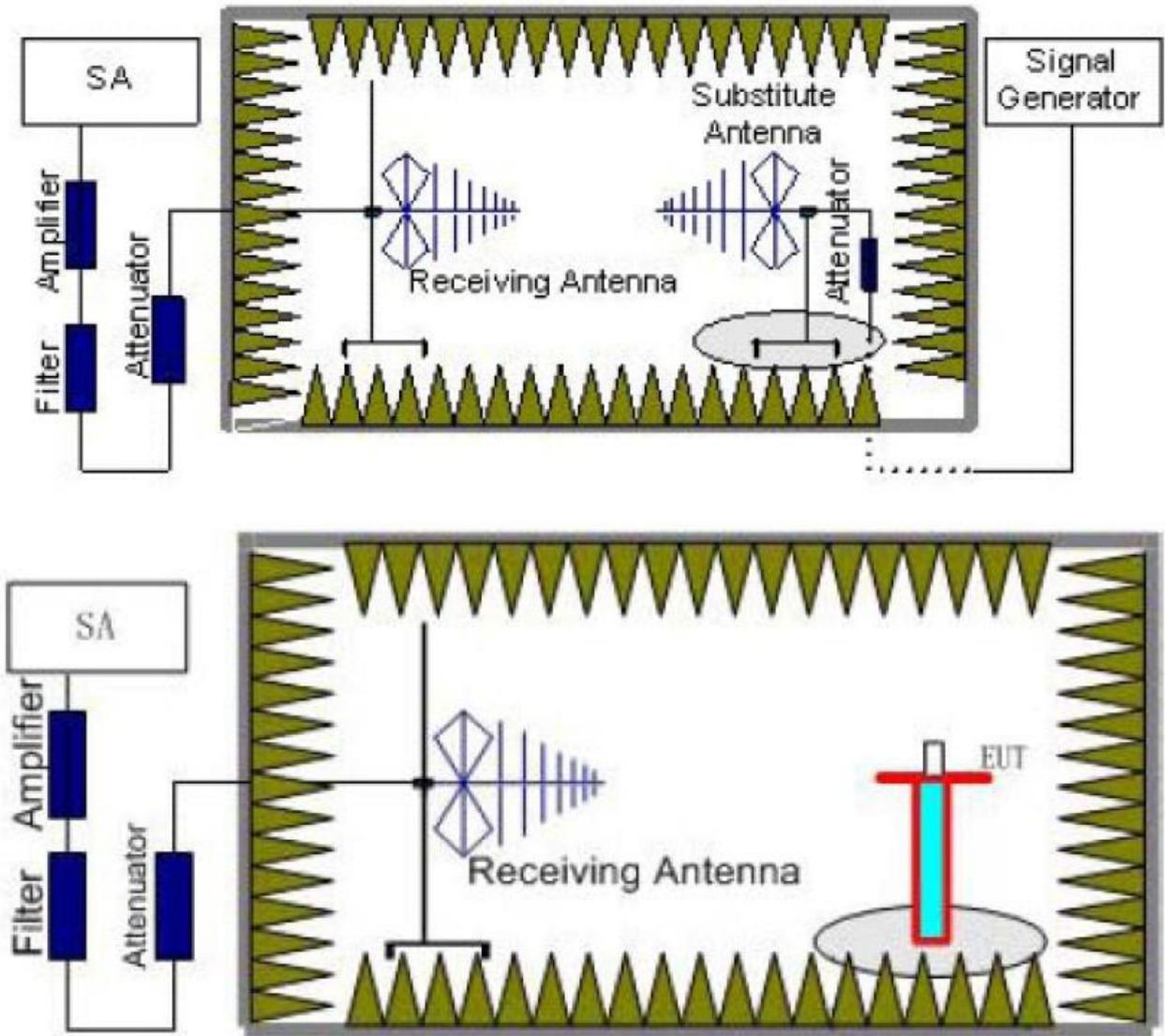
Spectrum Parameter	Setting
Detector	Peak
Attenuation	Auto
Start Frequency	30 MHz
Stop Frequency	10th carrier harmonic



3.2 TEST PROCEDURE

1. EUT was placed on a 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 height of receiving antenna is 1.0 m. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all transmit frequencies in three channels 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 BW=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 (P_{Mea}) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded (Pr). The power of signal source (P_{Mea}) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
5. A amplifier should be connected to the Signal Source output port. And the cable should be connect between the Amplifier and the Substitution Antenna. The cable loss (Pcl), the Substitution Antenna Gain (Ga) and the Amplifier Gain (PAg) should be recorded after test. The measurement results are obtained as described below:
We used signal generator which signal level can up to 33dBm, so we not used power Amplifier for substitution test; The measurement results are amend as described below:
Power(ERP)= $P_{Mea} - P_{cl} + G_a$

3.3 TEST SETUP



3.4 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.



3.5 TEST RESULT

Temperature :	26 °C	Relative Humidity :	60%
Phase :	N/A	Test Mode :	Mode 1

462.65MHz-GMRS								
Frequency	Measured Amplitude	Cable Loss	Antenna gain	Corrected Factor	Corrected Amplitude	Limit	Margin	RX Antenna
								Polar
(MHz)	(dBm)	(dB)	(dB)	(dB)	(dBm)	(dBm)	(dB)	(H/V)
49.0138	-68.39	1.71	16.61	14.90	-53.49	-13	-40.49	H
49.0138	-68.23	1.71	16.61	14.90	-53.33	-13	-40.33	V
316.623	-65.29	2.89	18.23	15.34	-49.95	-13	-36.95	H
316.623	-65.39	2.89	18.23	15.34	-50.05	-13	-37.05	V
925.300	-62.99	4.12	19.56	15.44	-47.55	-13	-34.55	H
925.300	-62.86	4.12	19.56	15.44	-47.42	-13	-34.42	V
1387.95	-68.29	6.83	21.26	14.43	-53.86	-13	-40.86	H
1387.95	-68.37	6.83	21.26	14.43	-53.94	-13	-40.94	V
2746.3123	-68.94	7.95	28.35	20.40	-48.54	-13	-35.54	H
2746.3123	-68.95	7.95	28.35	20.40	-48.55	-13	-35.55	V
4212.2468	-67.61	8.12	30.29	22.17	-45.44	-13	-32.44	H
4212.2468	-67.89	8.12	30.29	22.17	-45.72	-13	-32.72	V

4. SPURIOUS EMISSION ON ANTENNA PORT

4.1 APPLIED PROCEDURES / LIMIT

43 + 10 log (Pwatts)

Calculation: Limit (dBm) =EL-43-10log10 (TP)

Notes: 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) = -13 dBm

4.2 TEST PROCEDURE

1. The EUT was modulated by 2.5kHz sine wave audio signal; the level of the audio signal employed is 16dB greater than that necessary to produce 50% of rated system deviation. Rated system deviation is 2.5kHz and 5kHz).

2. Spectrum set as follow:

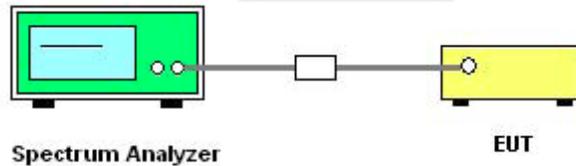
Centre frequency = fundamental frequency, span=50kHz,

RBW=100Hz, VBW=300Hz, Sweep = auto,Detector function = peak, Trace = max hold

3. Set 99% Occupied Bandwidth and 26dB Occupied Bandwidth

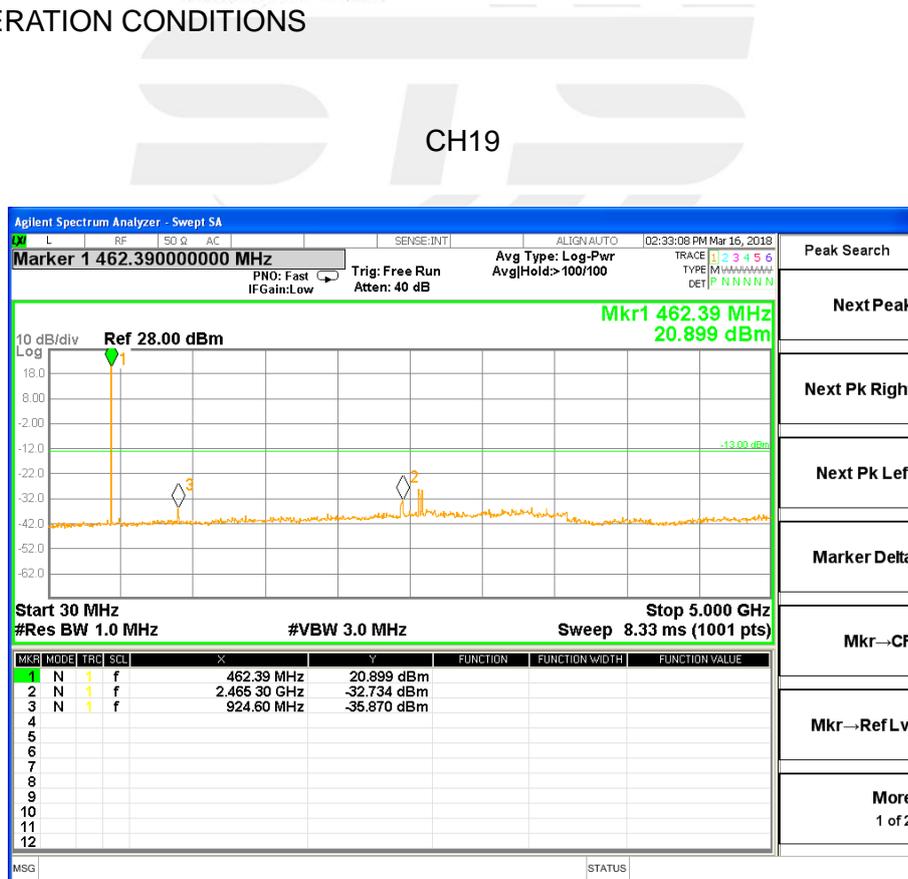
4. Measure and record the results in the test report.

4.3 TEST SETUP



4.4 EUT OPERATION CONDITIONS

TX mode.



5. BANDWIDTH TEST

5.1 APPLIED PROCEDURES / LIMIT

FRS:

The authorized bandwidth for an FRS unit is 12.5 kHz..

GMRS:

The authorized bandwidth is 4 kHz for emission types H1D, J1D, R1D, H3E, J3E and R3E; 8 kHz for emission types A1D and A3E; and 20 kHz for emission types F1D, G1D, F3E, G3E and F2D.

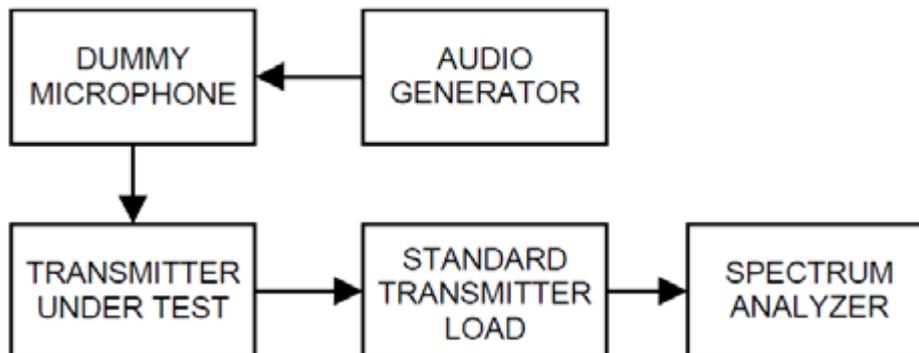
GMRS/FRS:

The authorized bandwidth is 8 kHz for emission types A1D, A2B, A2D, and A3E; 20 kHz for emission types F1D, F2B, F2D, F3E, and G3E

5.2 TEST PROCEDURE

1. The EUT was modulated by 2.5kHz sine wave audio signal; the level of the audio signal employed is 16dB greater than that necessary to produce 50% of rated system deviation. Rated system deviation is 2.5kHz and 5kHz).
2. Spectrum set as follow:
Centre frequency = fundamental frequency, span=50kHz,
RBW=100Hz, VBW=300Hz, Sweep = auto, Detector function = peak, Trace = max hold
3. Set 99% Occupied Bandwidth and 26dB Occupied Bandwidth
4. Measure and record the results in the test report.

5.3 TEST SETUP



5.4 EUT OPERATION CONDITIONS

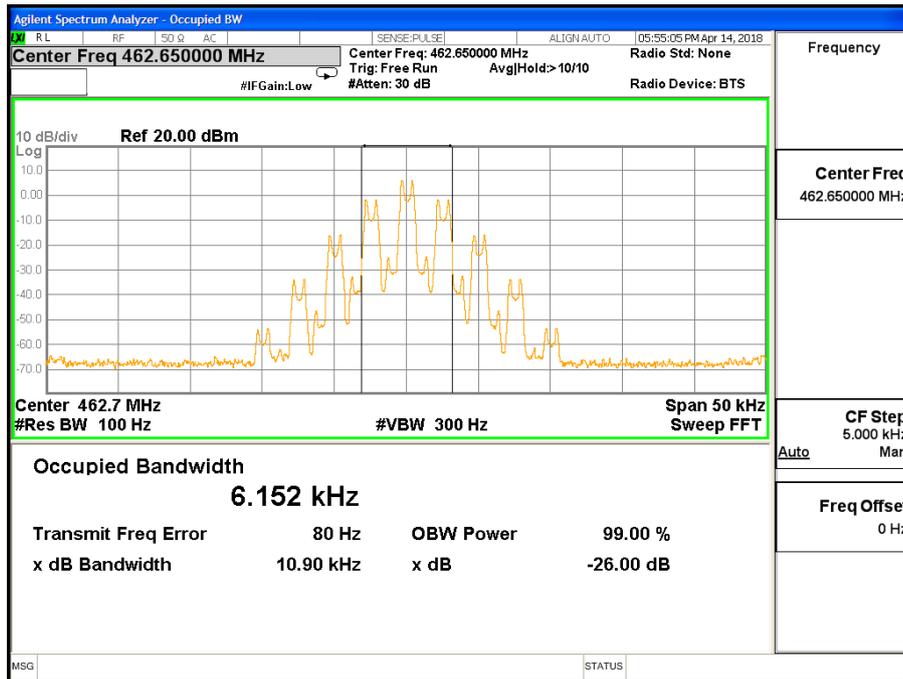
TX mode.



5.5 TEST RESULTS

Operation Mode	Test Channel	Occupied Bandwidth(KHz)		Limit(kHz)	Result
		99%	26dB		
GMRS	CH19	6.152	10.90	≤20	Pass

CH19





6. TRANSMITTER OUTPUT POWER AND EFFECTIVE RADIATED POWER (E.R.P)

6.1 APPLIED PROCEDURES / LIMIT

FRS:

The maximum permissible transmitted ERP of the equipment under any operating conditions shall not exceed 0.5 W

GMRS:

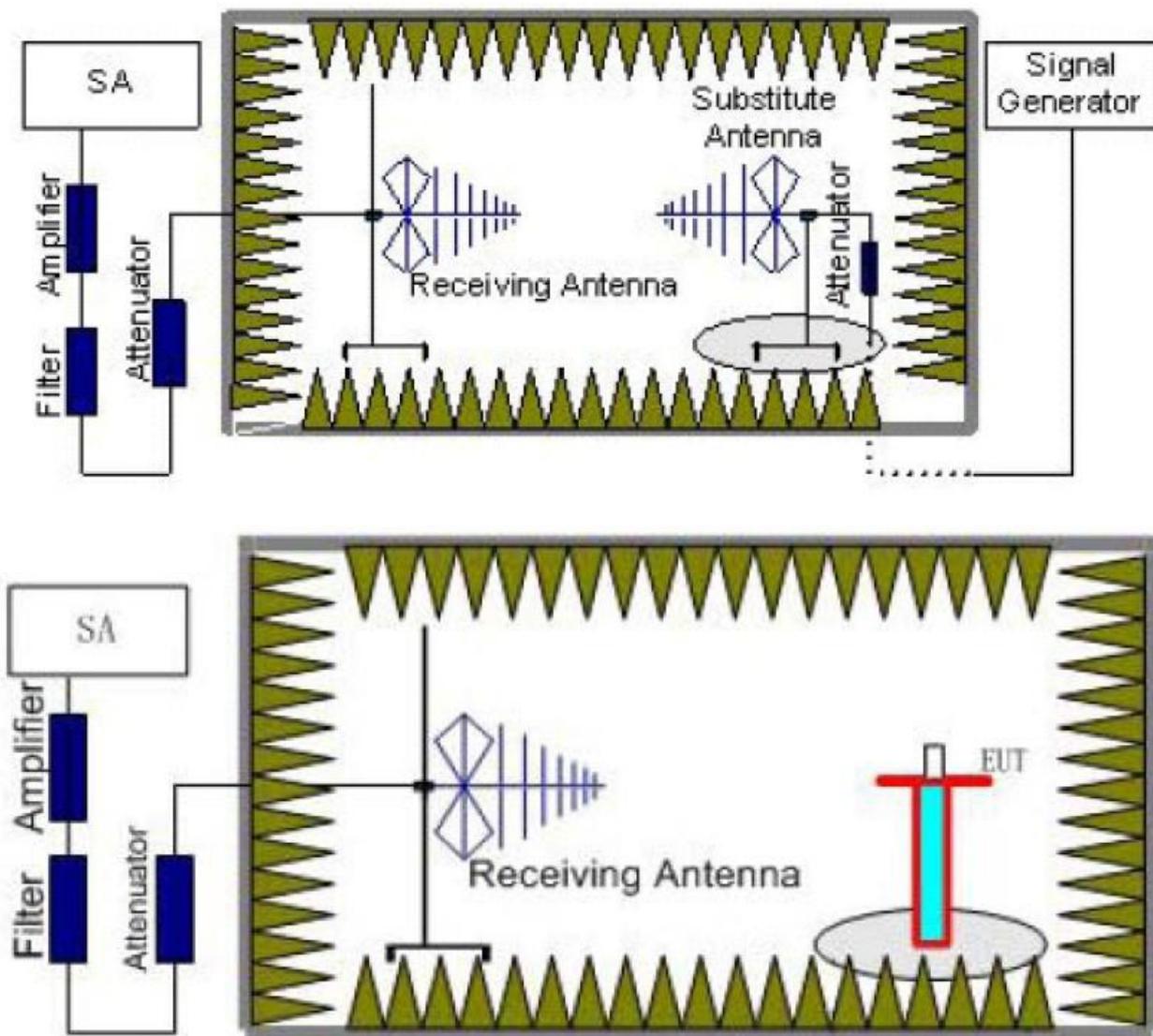
GMRS transmitter ERP shall not exceed 5.0 W

6.2 TEST PROCEDURE

1. EUT was placed on a 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 height of receiving antenna is 1.0 m. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all transmit frequencies in three channels 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 BW=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 (P_{Mea}) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded (Pr). The power of signal source (P_{Mea}) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
5. A amplifier should be connected to the Signal Source output port. And the cable should be connect between the Amplifier and the Substitution Antenna. The cable loss (Pcl), the Substitution Antenna Gain (Ga) and the Amplifier Gain (PAg) should be recorded after test. The measurement results are obtained as described below:
$$\text{Power(EIRP)} = P_{Mea} - P_{Ag} - P_{cl} + G_a$$

We used signal generator which signal level can up to 33dBm, so we not used power Amplifier for substitution test; The measurement results are amend as described below:
$$\text{Power(EIRP)} = P_{Mea} - P_{cl} + G_a$$
6. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power
7. ERP can be calculated from EIRP by subtracting the gain of the dipole, $ERP = EIRP - 2.15\text{dBi}$

6.3 TEST SETUP



6.4 TEST RESULTS

Operation Mode	Test Channel	polarity	Measured ERP (dBm)	Limit (dBm)	Result
GMRS	CH19	Horizontal	23.22	36.99	Pass
		Vertical	22.17	36.99	Pass

7. EMISSION MASK

7.1 APPLIED PROCEDURES / LIMIT

FRS:

- 25 dB, measured with a bandwidth of 300 Hz, in the band 6.25 kHz to 12.5 kHz removed from the channel centre frequency;
- 35 dB, measured with a bandwidth of 300 Hz, in the band 12.5 kHz to 31.25 kHz removed from the channel centre frequency; and
- 43 dB + 10 log₁₀ (transmitter power in watts) dB, measured with a bandwidth of 30 kHz for frequencies beyond 31.25 kHz removed from the channel centre frequency.

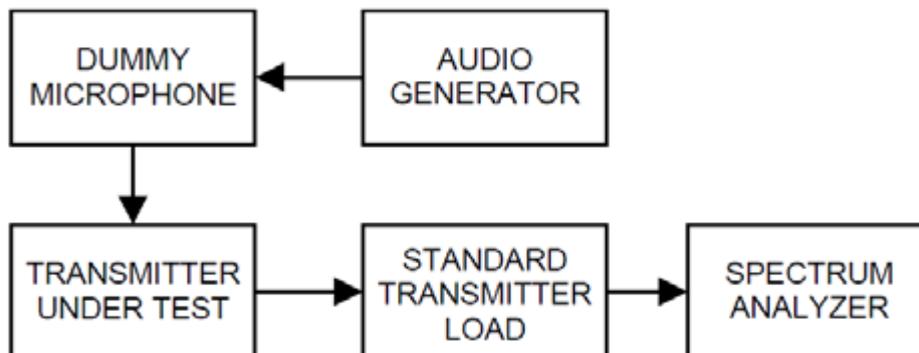
GMRS:

- 25 dB, measured with a bandwidth of 300 Hz, on any frequency removed from the centre frequency of the authorized bandwidth by more than 50%, up to and including 100% of the authorized bandwidth;
- 35 dB, measured with a bandwidth of 300 Hz, on any frequency removed from the centre frequency of the authorized bandwidth by more than 100%, up to and including 250% of the authorized bandwidth; and
- 43 dB + 10 log₁₀ p dB, measured with a bandwidth of at least 30 kHz, on any frequency removed from the centre frequency of the authorized bandwidth by more than 250% of the authorized bandwidth.

7.2 TEST PROCEDURE

1. Connect the equipment as illustrated
2. Spectrum set as follow:
Centre frequency = fundamental frequency, span=125kHz for 12.5kHz channel spacing,
RBW=300Hz, VBW=1000Hz, Sweep = auto,
Detector function = peak, Trace = max hold
3. Key the transmitter, and set the level of the unmodulated carrier to a full scale reference line. This is the 0dB reference for the measurement
4. Modulate the transmitter with a 2500 Hz sine wave at an input level 16 dB greater than that necessary to produce 50% of rated system deviation(Rated system deviation is 2.5 kHz for 12.5kHz channel spacing). The input level shall be established at the frequency of maximum response of the audio modulating circuit. Transmitters employing digital modulation techniques that bypass the limiter and the audio low-pass filter shall be modulated as specified by the manufacturer
5. Measure and record the results in the test report

7.3 TEST SETUP



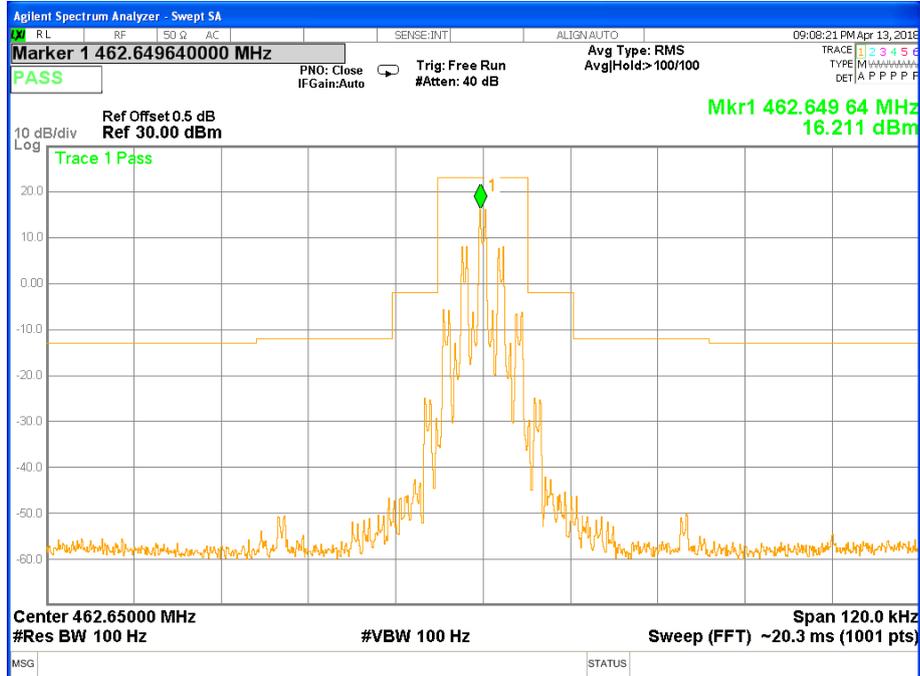
7.4 EUT OPERATION CONDITIONS

TX mode.



7.5 TEST RESULT

CH19



8. FREQUENCY STABILITY

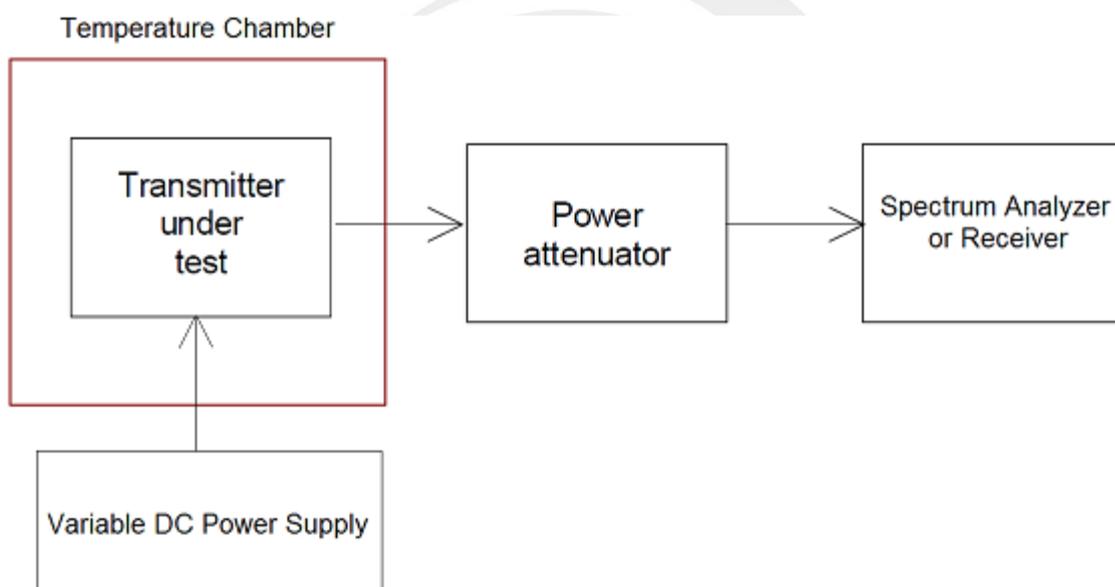
8.1 APPLIED PROCEDURES / LIMIT

The carrier frequency stability shall be better than ± 5 ppm

8.2 TEST PROCEDURE

1. The frequency stability shall be measured with variation of ambient temperature from -30°C to $+50^{\circ}\text{C}$
2. For battery powered equipment, the frequency stability shall be measured with reducing primary supply voltage to the battery operating end point, which is specified by the manufacture.
3. Vary primary supply voltage from 3.06V to 4.14V.
4. The EUT was set in the climate chamber and connected to an external DC power supply. The RF output was directly connected to Spectrum Analyzer. The coupling loss of the additional cables was recorded and taken in account for all the measurements. After temperature stabilization (approx. 20 min for each stage), the frequency for the lower, the middle and the highest frequency range was recorded. For Frequency stability Vs. Voltage the EUT was connected to a DC power supply and the voltage was adjusted in the required ranges. The result was recorded

8.3 TEST SETUP



8.4 EUT OPERATION CONDITIONS

TX mode.



8.5 TEST RESULT

GMRS				
Test conditions		Frequency error (ppm)	Limit (ppm)	Result
Voltage(V)	Temp(°C)	CH19	±2.5	Pass
3.7V	-30	-0.62		
	-20	-0.52		
	-10	-0.51		
	0	-0.43		
	10	-0.21		
	20	-0.03		
	30	-0.06		
	40	-0.09		
	50	-0.12		
3.33	20	-0.15		
4.07	20	-0.29		

9. MODULATION LIMIT

9.1 APPLIED PROCEDURES / LIMIT

FRS:

The peak frequency deviation shall not exceed ± 2.5 kHz

GMRS:

For emission types F1D, G1D, G3E, F3E or F2D, the peak frequency deviation shall not exceed ± 5 kHz

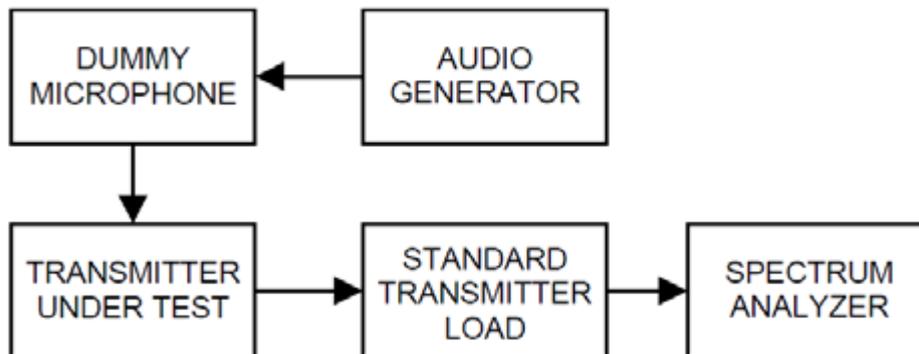
GMRS/FRS:

For emission types F1D, F2B, F2D, or F3E, the peak frequency deviation shall not exceed ± 5 kHz.

9.2 TEST PROCEDURE

1. Connect the equipment as illustrated.
2. Adjust the transmitter per the manufacturer's procedure for full rated system deviation
3. Set the test receiver to measure peak positive deviation. Set the audio bandwidth for ≤ 0.25 Hz to $\geq 15,000$ Hz. Turn the de-emphasis function off
4. Apply a 1000 Hz modulating signal to the transmitter from the audio frequency generator, and adjust the level to obtain 60% of full rated system deviation, this level is as a reference (0dB) and vary the input level from -20 to $+20$ dB.
5. Measure both the instantaneous and steady-state deviation at and after the time of increasing the audio input level
6. Repeat step 4-5 with input frequency changing to 300Hz, 1000Hz, 1500Hz, 2500Hz and 3000Hz in sequence.

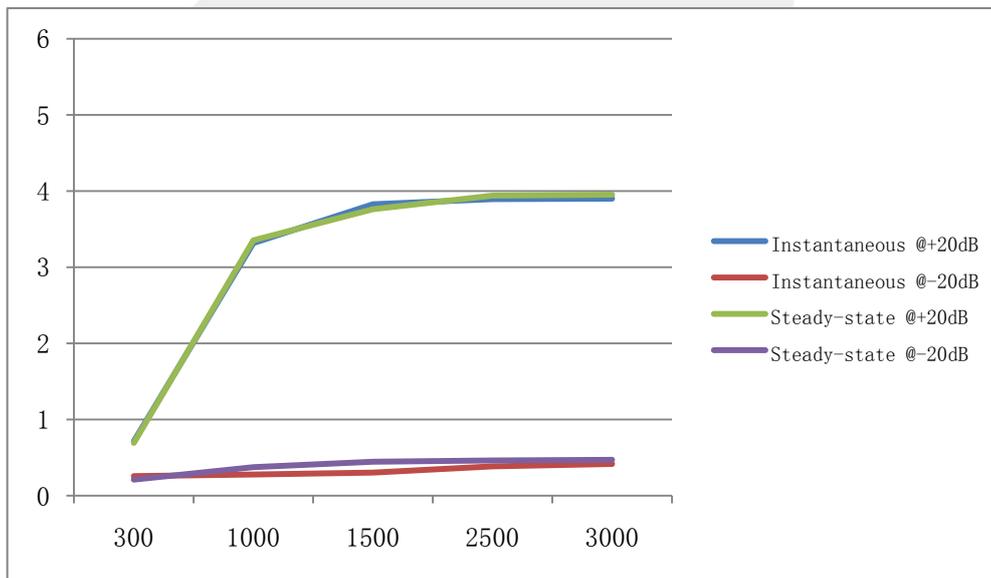
9.3 TEST SETUP





9.4 TEST RESULT

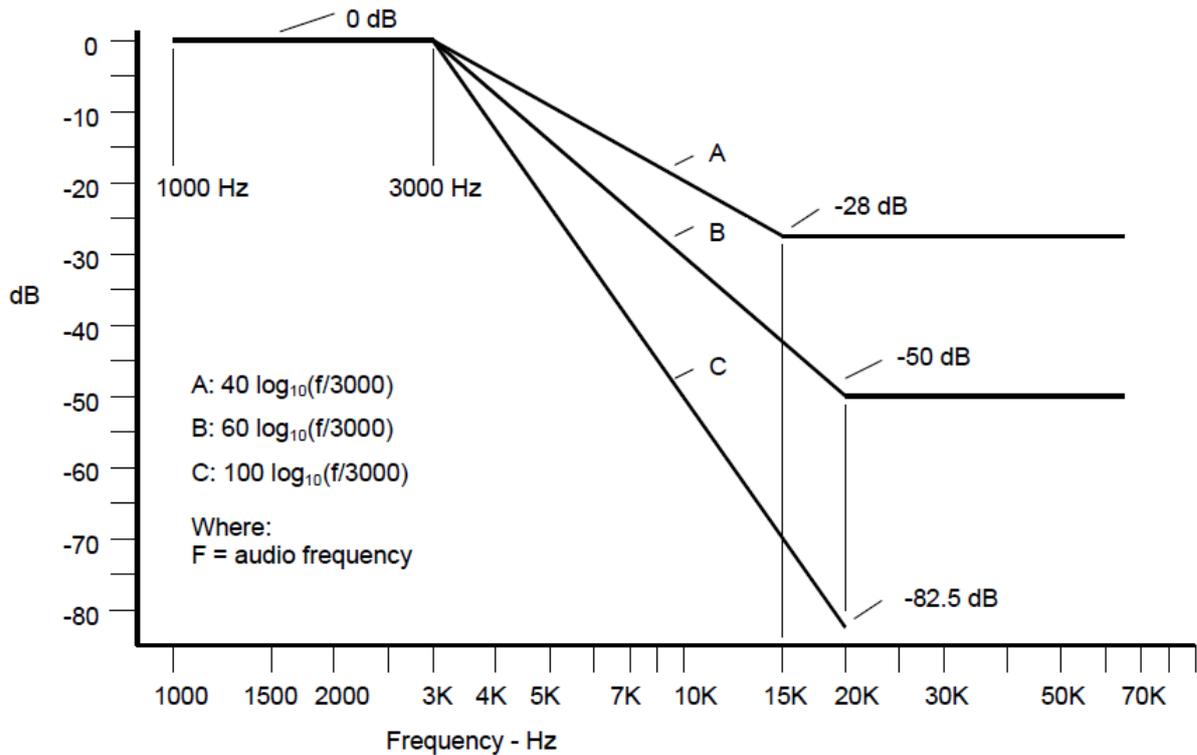
GMRS CH19						
Audio Frequency (Hz)	Instantaneous		Steady-state		Limit (kHz)	Result
	Deviation (@+20dB) (kHz)	Deviation (@-20dB) (kHz)	Deviation (@+20dB) (kHz)	Deviation (@-20dB) (kHz)		
300	0.715	0.257	0.693	0.211	±5	Pass
1000	3.318	0.279	3.354	0.375		
1500	3.826	0.303	3.763	0.446		
2500	3.893	0.385	3.941	0.463		
3000	3.901	0.418	3.952	0.471		



10. AUDIO LOW PASS FILTER RESPONSE

10.1 APPLIED PROCEDURES / LIMIT

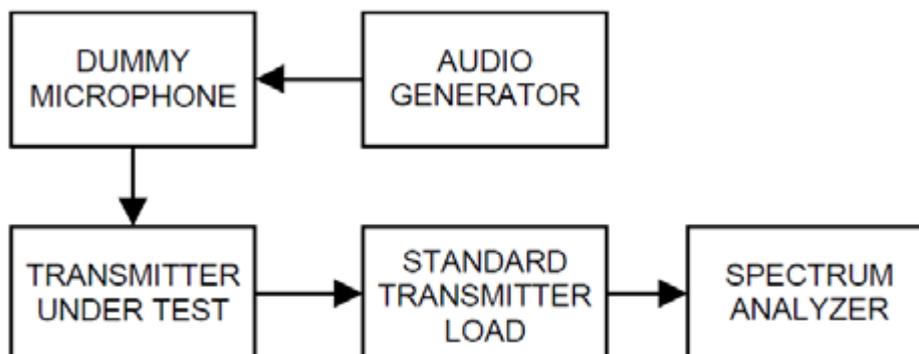
The filter must be between the modulation limiter and the modulated stage of the transmitter. At any frequency (f in kHz) between 3 and 20 kHz, the filter must have an attenuation of at least $60 \log_{10}(f/3)$ dB greater than the attenuation at 1 kHz. Above 20 kHz, it must have an attenuation of at least 50 dB greater than the attenuation at 1 kHz



10.2 TEST PROCEDURE

1. Configure the EUT as shown in figure
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 = $LEV_{FREQ} - LEV_{REF}$

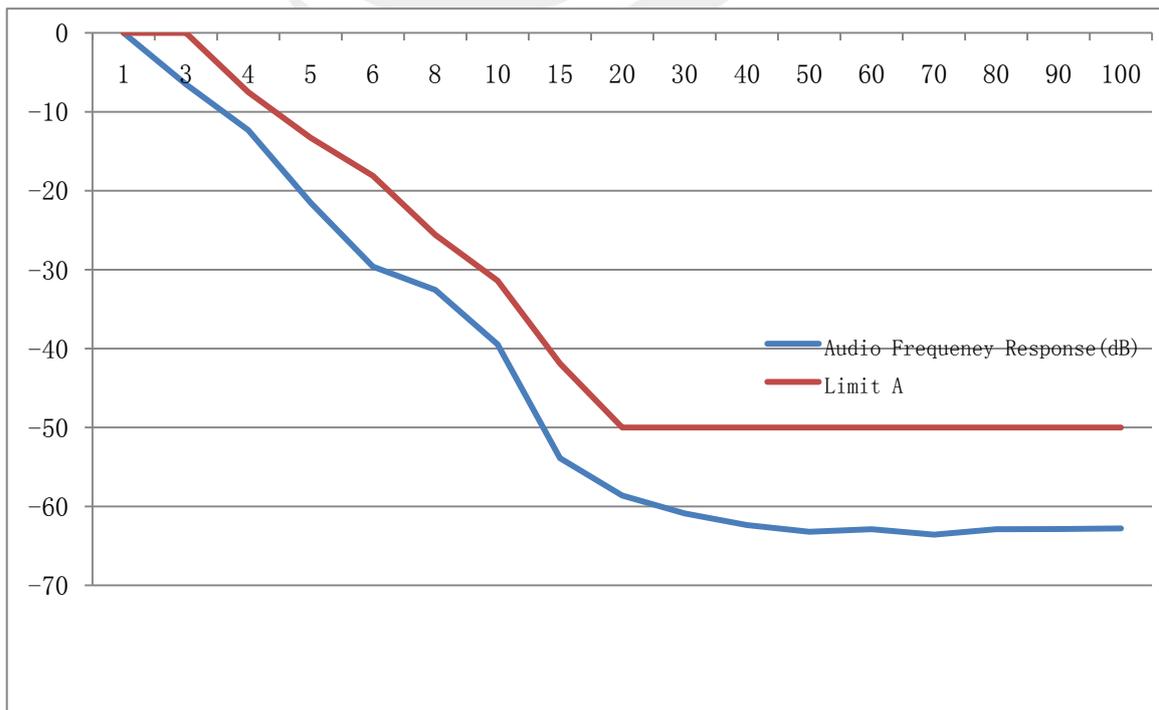
10.3 TEST SETUP





10.4 TEST RESULT

Operation Mode	Audio Frequency (KHz)	Response Attenuation (dB)	Limit	Result
GMRS	1	0	0	Pass
	3	-6.52	0	
	4	-12.32	-7.5	
	5	-21.52	-13.3	
	6	-29.61	-18.1	
	8	-32.56	-25.6	
	10	-39.46	-31.4	
	15	-53.89	-41.9	
	20	-58.62	-50	
	30	-60.89	-50	
	40	-62.35	-50	
	50	-63.21	-50	
	60	-62.89	-50	
	70	-63.58	-50	
	80	-62.89	-50	
	90	-62.86	-50	
	100	-62.78	-50	

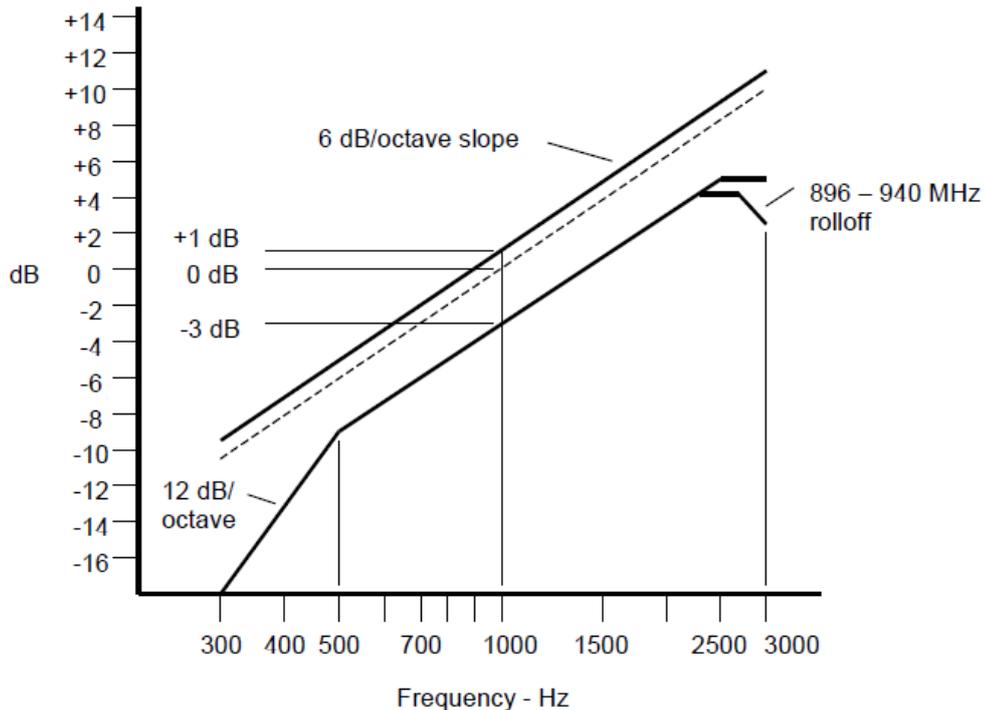


11. AUDIO FREQUENCY RESPONSE

11.1 APPLIED PROCEDURES / LIMIT

FCC Part 95.637(a), FCC Part 2.1047(a):

Voice modulated communication equipment. A curve or equivalent data showing the frequency response of the audio modulating circuit over a range of 100 to 5000 Hz shall be submitted. For equipment required to have an audio low-pass filter, a curve showing the frequency response of the filter or of all circuitry installed between the modulation limiter and the modulated stage shall be submitted.

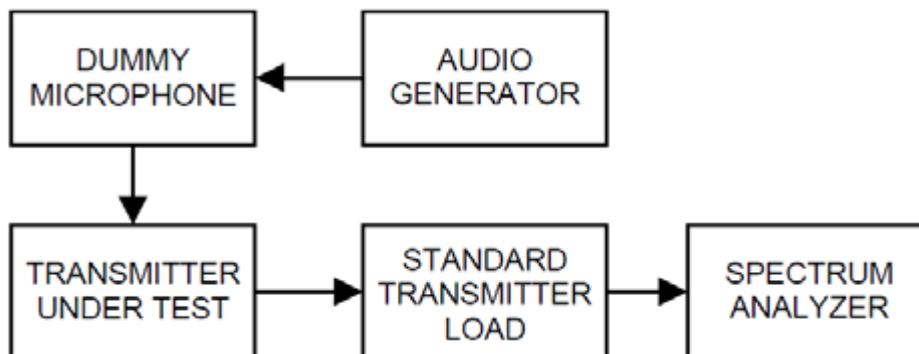


An additional 6 dB per octave attenuation is allowed from 2500 Hz to 3000 Hz in equipment operating in the 25 MHz to 869 MHz range

11.2 TEST PROCEDURE

1. Configure the EUT as shown in figure
2. Adjust the audio input for 20% of rated system deviation at 1kHz using this level as a reference.
3. Vary the Audio frequency from 300Hz to 3 kHz and record the frequency deviation.
4. Audio Frequency Response = $20 \log_{10} (V_{FREQ}/V_{REF})$.

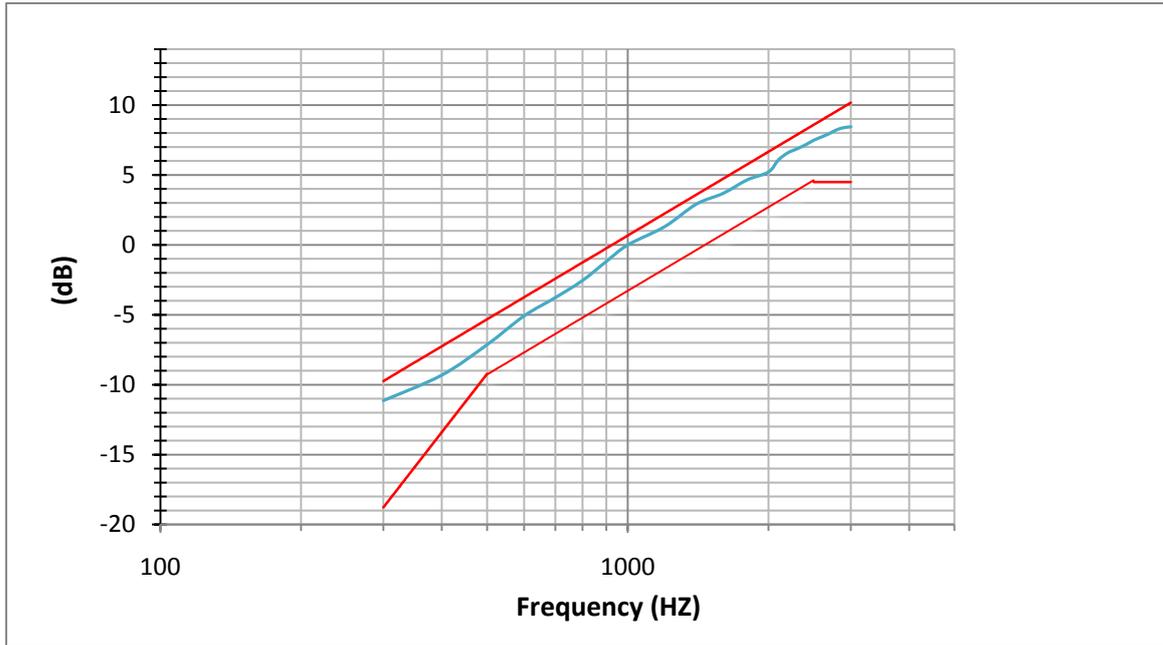
11.3 TEST SETUP





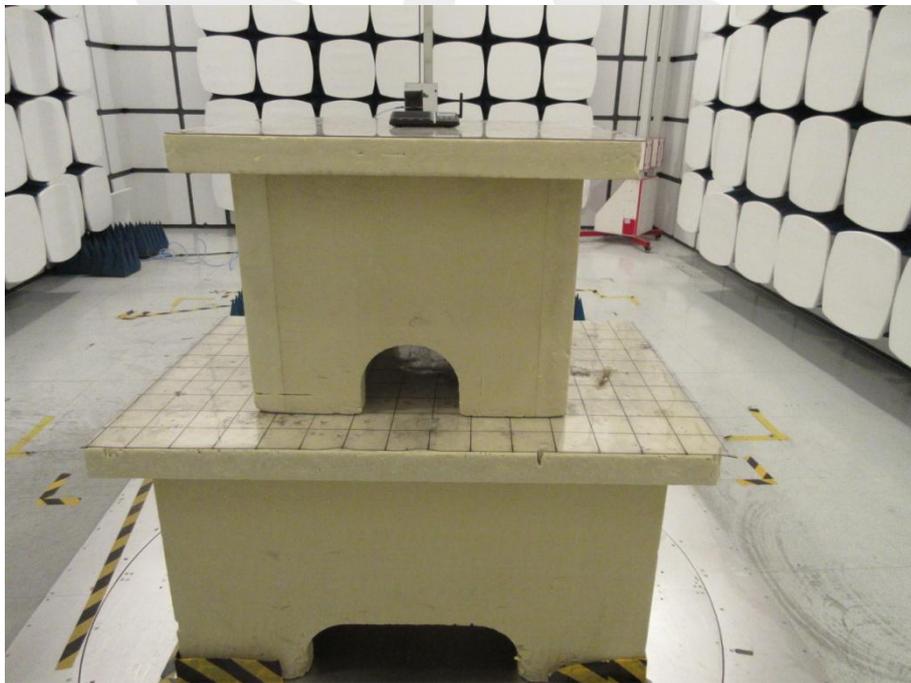
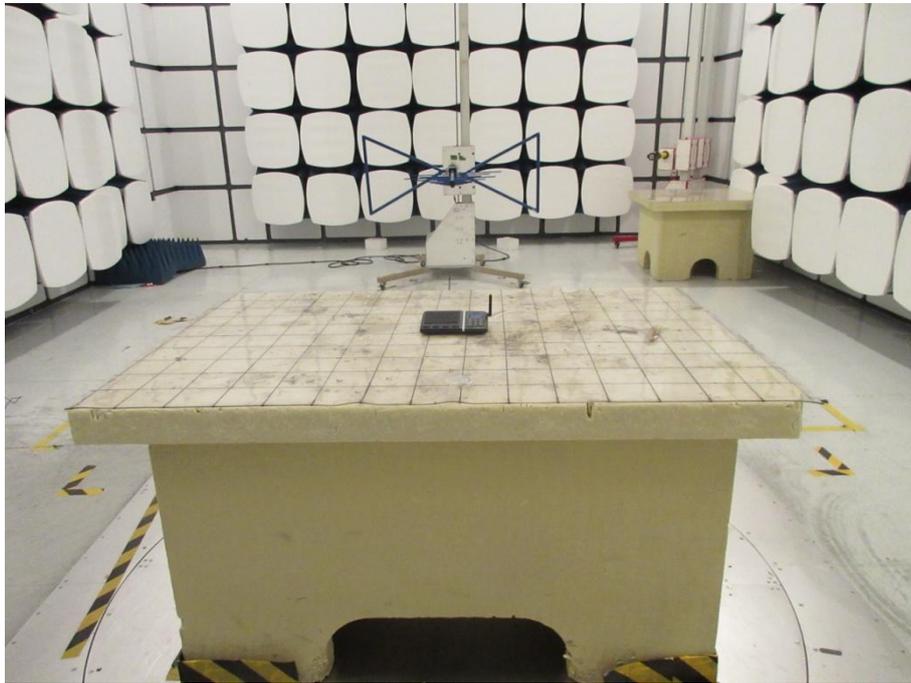
11.4 TEST RESULT

GMRS		Result
Audio Frequency	Audio Frequency Response	
(Hz)	(dB)	
300	-11.14	
400	-9.32	
500	-7.14	
600	-5.08	
700	-3.77	
800	-2.55	
900	-1.18	
1000	0.00	
1200	1.31	
1400	2.91	
1600	3.69	
1800	4.65	
2000	5.22	
2100	6.08	
2200	6.59	
2300	6.87	
2400	7.16	
2500	7.49	
2600	7.73	
2700	7.97	
2800	8.24	
2900	8.39	
3000	8.45	



APPENDIX 1- PHOTOS OF TEST SETUP

Radiated Measurement Photos



*****END OF THE REPORT*****