



SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch

198 Kezhu Road, Sciencetech Park, Guangzhou Economic & Technological
Development District, Guangzhou, China 510663

Telephone: +86 (0) 20 82155555
Fax: +86 (0) 20 82075059
Email: ee.guangzhou@sgs.com

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1 Cover Page

TEST REPORT

Application No.: GZEM1801000520BA(SHEM1712008361CR)
Applicant: XI'AN FENGYU INFORMATION TECHNOLOGIES CO., LTD.
Address of Applicant: No.10, Zhangba 5th road, Yanta, Xi'an, Shanxi China.
Manufacturer: XI'AN FENGYU INFORMATION TECHNOLOGIES CO., LTD.
Address of Manufacturer: No.10, Zhangba 5th road, Yanta, Xi'an, Shanxi China.
Factory: XI'AN FENGYU INFORMATION TECHNOLOGIES CO., LTD.
Address of Factory: No.10, Zhangba 5th road, Yanta, Xi'an, Shanxi China.
Equipment Under Test (EUT):
EUT Name: Mi Walkie-Talkie
Model No.: A102
FCC ID: 2AORCA102
Standard(s) : 47 CFR Part 95, Subpart B
Date of Receipt: 2017-12-08
Date of Test: 2017-12-27 to 2018-01-18
Date of Issue: 2018-01-29

Test Result:	Pass*
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* In the configuration tested, the EUT complied with the standards specified above.



Kobe Jian
Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or Interna

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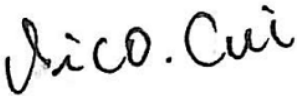


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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2018-01-29		Original

Authorized for issue by:				
Tested By		 Vico_Cui / Project Engineer		2018-01-29 Date
Checked By		 Ricky_Liu / Reviewer		2018-01-29 Date



2 Test Summary

Radio Spectrum Technical Requirement				
Item	Standard	Method	Requirement	Result
Antenna Requirement	47 CFR Part 95, Subpart B	N/A	47 CFR Part 95, Subpart B 95.587(b)	Pass

Radio Spectrum Matter Part				
Item	Standard	Method	Requirement	Result
Frequency Stability	47 CFR Part 95, Subpart B	ANSI/TIA-603-D:2010	47 CFR FCC Part95.565 & FCC Part2.1055;	Pass
Effective Radiated Power (ERP)	47 CFR Part 95, Subpart B	ANSI/TIA-603-D:2010	47 CFR FCC Part95.567 & FCC Part2.1046;	Pass
Occupied Bandwidth	47 CFR Part 95, Subpart B	ANSI/TIA-603-D:2010	47 CFR FCC Part 95.573 FCC Part2.1049;	Pass
Emission Mask	47 CFR Part 95, Subpart B	ANSI/TIA-603-D:2010	47 CFR FCC Part 95.579 FCC Part2.1049;	Pass
Modulation characteristics	47 CFR Part 95, Subpart B	ANSI/TIA-603-D:2010	47 CFR FCC Part 95.575 & FCC Part2.1047;	Pass
Radiated Spurious Emissions	47 CFR Part 95, Subpart B	ANSI/TIA-603-D:2010	47 CFR FCC Part 95.579 & FCC Part2.1053;	Pass



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4 General Information

4.1 Details of E.U.T.

Trade Mark:	MI					
Product Description:	Family Radio Service(FRS)					
Power supply:	DC 3.7V by Lithium ion rechargeable batteries (2600mAh) High Voltage: 4.2V; Low Voltage: 3.5V Fully charged battery during the testing.					
Modulation Type:	FM					
Emission Type:	F3E					
Channel Separation:	12.5KHz					
Antenna Type:	Integral					
Operation Frequency:	462.5625MHz ~ 462.7125 MHz (1~7 channel) 467.5625 MHz ~ 467.7125 MHz (8~14 channel) 462.5500 MHz ~ 462.7250 MHz (15~22 channel)					
Channel Information:	Channel	Frequency (MHz)	Description	Channel	Frequency (MHz)	Description
	1	462.5625	FRS	12	467.6625	FRS
	2	462.5875	FRS	13	467.6875	FRS
	3	462.6125	FRS	14	467.7125	FRS
	4	462.6375	FRS	15	462.5500	FRS
	5	462.6625	FRS	16	462.5750	FRS
	6	462.6875	FRS	17	462.6000	FRS
	7	462.7125	FRS	18	462.6250	FRS
	8	467.5625	FRS	19	462.6500	FRS
	9	467.5875	FRS	20	462.6750	FRS
	10	467.6125	FRS	21	462.7000	FRS
	11	467.6375	FRS	22	462.7250	FRS
Antenna Type	Integral Antenna					
Antenna Gain	1 dBi					

4.2 Description of Support Units

The EUT has been tested independent unit.

4.3 Test Channel

Channel	Frequency
1	462.5625MHz
8	467.5625MHz
22	462.7250MHz



4.4 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	7.25 x 10 ⁻⁸
2	Timeout	2s
3	Duty cycle	0.37%
4	Occupied Bandwidth	3%
5	RF conducted power	0.75dB
6	RF power density	2.84dB
7	Conducted Spurious emissions	0.75dB
8	RF Radiated power	4.5dB (Below 1GHz) 4.8dB (Above 1GHz)
9	Radiated Spurious emission test	4.2dB (Below 30MHz) 4.4dB (30MHz-1GHz) 4.6dB (1GHz-18GHz) 5.2dB (Above 18GHz)
10	Temperature test	1°C
11	Humidity test	3%
12	Supply voltages	1.5%
13	Time	3%

4.5 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou Branch EMC Laboratory,
198 Kezhu Road, Sciencetech Park, Guangzhou Economic & Technology Development District,
Guangzhou, China 510663

Tel: +86 20 82155555 Fax: +86 20 82075059

No tests were sub-contracted.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None



4.8 Test Facility

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

- **NVLAP (Lab Code: 200611-0)**

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

- **ACMA**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our NVLAP accreditation.

- **SGS UK(Certificate No.: 32), SGS-TUV SAARLAND and SGS-FIMKO**

Have approved SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory as a supplier of EMC TESTING SERVICES and SAFETY TESTING SERVICES.

- **CNAS (Lab Code: L0167)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been assessed and in compliance with CNAS-CL01:2006 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2005 General Requirements) for the Competence of Testing Laboratories.

- **FCC Recognized Accredited Test Firm(Registration No.: 486818)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been accredited and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Designation Number: CN5016, Test Firm Registration Number: 486818, Jul 13, 2017.

- **Industry Canada (Registration No.: 4620B-1)**

The 3m/10m Alternate Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd., has been registered by Certification and Engineering of Industry Canada for radio equipment testing with Registration No. 4620B-1.

- **VCCI (Registration No.: R-2460, C-2584, G-449 and T-1179)**

The 10m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services Co. Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-2460, C-2584, G-449 and T-1179 respectively.

- **CBTL (Lab Code: TL129)**

SGS-CSTC Standards Technical Services Co., Ltd., E&E Laboratory has been assessed and fully comply with the requirements of ISO/IEC 17025:2005, the Basic Rules, IECEE 01 and Rules of procedure IECEE 02, and the relevant IECEE CB-Scheme Operational documents.



5 Equipment List

Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Conducted Emission at AC Power Line					
EMI test receiver	R&S	ESR7	SHEM162-1	2017-12-20	2018-12-19
LISN	Schwarzbeck	NSLK8127	SHEM061-1	2017-12-20	2018-12-19
LISN	EMCO	3816/2	SHEM019-1	2017-12-20	2018-12-19
Pulse limiter	R&S	ESH3-Z2	SHEM029-1	2017-12-20	2018-12-19
CE test Cable	/	CE01	/	2017-12-26	2018-12-25
Conducted Test					
Spectrum Analyzer	R&S	FSP-30	SHEM002-1	2017-12-20	2018-12-19
Spectrum Analyzer	Agilent	N9020A	SHEM181-1	2017-09-26	2018-09-25
Power meter	R&S	NRP	SHEM057-1	2017-12-26	2018-12-25
Power Sensor	R&S	NRP-Z22	SHEM136-1	2017-07-22	2018-07-21
Power Sensor	R&S	NRP-Z91	SHEM057-2	2017-12-26	2018-12-25
Signal Generator	R&S	SMR40	SHEM058-1	2017-07-03	2018-07-02
Signal Generator	Agilent	N5182A	SHEM182-1	2017-09-26	2018-09-25
Communication Tester	R&S	CMW270	SHEM183-1	2017-10-22	2018-10-21
Switcher	Tonscend	JS0806	SHEM184-1	2017-09-26	2018-09-25
Splitter	Anritsu	MA1612A	SHEM185-1	/	/
Coupler	e-meca	803-S-1	SHEM186-1	/	/
High-low Temp Cabinet	Suzhou Zhihe	TL-40	SHEM087-1	2017-09-26	2018-09-25
AC Power Stabilizer	WOCEN	6100	SHEM045-1	2017-12-26	2018-12-25
DC Power Supply	QJE	QJ30003SII	SHEM046-1	2017-12-26	2018-12-25
Conducted test Cable	/	RF01, RF 02	/	2017-12-26	2018-12-25
Radiated Test					
EMI test receiver	R&S	ESU40	SHEM051-1	2017-12-20	2018-12-19
Spectrum Analyzer	R&S	FSP-30	SHEM002-1	2017-12-20	2018-12-19
Loop Antenna (9kHz-30MHz)	Schwarzbeck	FMZB1519	SHEM135-1	2017-04-10	2020-04-09
Antenna (25MHz-2GHz)	Schwarzbeck	VULB9168	SHEM048-1	2017-02-28	2020-02-27
Antenna (25MHz-3GHz)	Schwarzbeck	HL562	SHEM010-1	2017-02-28	2020-02-27
Horn Antenna (1-8GHz)	Schwarzbeck	HF906	SHEM009-1	2017-10-24	2020-10-23
Horn Antenna (1-18GHz)	Schwarzbeck	BBHA9120D	SHEM050-1	2017-01-14	2020-01-13
Horn Antenna (14-40GHz)	Schwarzbeck	BBHA 9170	SHEM049-1	2017-12-03	2020-12-02
Pre-amplifier (9kHz-2GHz)	CLAVIIO	BDLNA-0001-412010	SHEM164-1	2017-08-22	2018-08-21
Pre-amplifier (1-18GHz)	CLAVIIO	BDLNA-0118-352810	SHEM050-2	2017-08-22	2018-08-21
High-amplifier (14-40GHz)	Schwarzbeck	10001	SHEM049-2	2017-12-20	2018-12-19
Band filter	LORCH	9BRX-875/X150-SR	SHEM156-1	/	/
Band filter	LORCH	13BRX-1950/X500-SR	SHEM083-2	/	/
Band filter	LORCH	5BRX-2400/X200-SR	SHEM155-1	/	/
Band filter	LORCH	5BRX-5500/X1000-SR	SHEM157-2	/	/
High pass Filter	Wainwright	WHK3.0/18G-100SS	SHEM157-1	/	/
High pass Filter	Wainwright	WHKS1700-3SS	SHEM157-3	/	/
Semi/Fully Anechoic	ST	11*6*6M	SHEM078-2	2017-07-22	2020-07-21
RE test Cable	/	RE01, RE02, RE06	/	2017-12-26	2018-12-25

6 Radio Spectrum Technical Requirement

6.1 Antenna Requirement

6.1.1 Test Requirement:

47 CFR Part 95, Subpart B 95.587(b)

6.1.2 Conclusion

95.587(b) Requirement:

The antenna of each FRS transmitter type must meet the following requirements.

- (1) The antenna must be a non-removable integral part of the FRS transmitter type.
- (2) The gain of the antenna must not exceed that of a half-wave dipole antenna.
- (3) The antenna must be designed such that the electric field of the emitted waves is vertically polarized when the unit is operated in the normal orientation.

EUT Antenna:

The antenna is Integral Antenna and no consideration of replacement. The best gain of the antenna is 1dBi.

Antenna location:



7 Radio Spectrum Matter Test Results

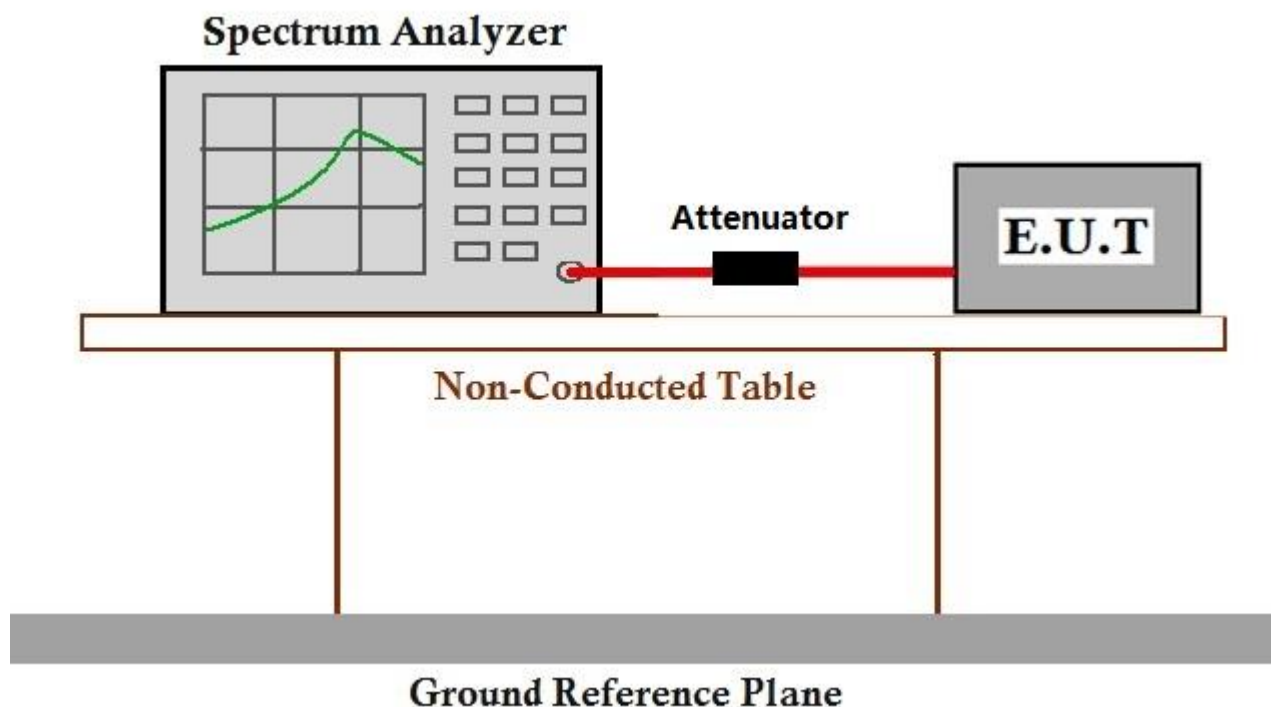
7.1 Frequency Stability

Test Requirement 47 CFR FCC Part 95.565 & FCC Part 2.1055;
Test Method: ANSI/TIA-603-D:2010
Limit: For FCC Part 95.565:
Each FRS transmitter type must be designed such that the carrier frequencies remain within ± 2.5 parts-per-million of the channel center frequencies specified in §95.563 during normal operating conditions.

7.1.1 E.U.T. Operation

Operating Environment:
Temperature: 24.8 °C Humidity: 49.2 % RH Atmospheric Pressure: 1020 mbar
Test mode: a: Tx mode, Keep the EUT in transmitting mode.

7.1.2 Test Setup Diagram





7.1.3 Measurement Procedure and Data

Assigned Frequency(MHz)	Temperature (°C)	Voltage (V)	Measured Frequency(MHz)	Frequency Deviation (ppm)	Limit (ppm)
Channel 1 462.5625	-30	VN	462.5632	0.6486	2.5
	-20		462.5629	0.8647	2.5
	-10		462.5631	0.4324	2.5
	0		462.5626	0.2162	2.5
	+10		462.5627	0.4324	2.5
	+20		462.5629	0.8647	2.5
	+30		462.5632	1.0809	2.5
	+40		462.5634	0.4324	2.5
	+50		462.5631	0.8647	2.5
	TN	VL	462.5627	0.4324	2.5
	TN	VH	462.5629	0.8647	2.5
Channel 8 467.5625	-30	VN	467.5636	1.2833	2.5
	-20		467.5632	0.4278	2.5
	-10		467.5628	0.6416	2.5
	0		467.5626	0.2139	2.5
	+10		467.5628	0.6416	2.5
	+20		467.5633	1.2833	2.5
	+30		467.5636	1.0694	2.5
	+40		467.5639	1.4971	2.5
	+50		467.5637	1.2833	2.5
	TN	VL	467.5628	0.6416	2.5
	TN	VH	467.5631	1.2833	2.5
Channel 22 462.7250	-30	VN	462.7256	1.2967	2.5
	-20		462.7259	1.0806	2.5
	-10		462.7257	1.5128	2.5
	0		462.7254	0.8644	2.5
	+10		462.7253	0.6483	2.5
	+20		462.7256	1.2967	2.5
	+30		462.7257	1.5128	2.5
	+40		462.7261	1.0806	2.5
	+50		462.7260	0.6483	2.5
	TN	VL	462.7254	0.8644	2.5
	TN	VH	462.7254	0.8644	2.5
Remark: The EUT just work in such extreme Temperature: - 20°C~60°C, and extreme Voltage: 3.5VDC~4.2VDC. Nominal Voltage: 3.7VDC Nominal Temperature: 20°C VN: Normal Voltage ; VL: Low Voltage; VH: High Voltage;TN: Normal Temperature; It will give the operation guidance to the customer in user manual. The unit does meet the FCC requirements.					

7.2 Effective Radiated Power (ERP)

Test Requirement	47 CFR FCC Part95.567 & FCC Part2.1046;
Test Method:	ANSI/TIA-603-D:2010
Measurement Distance:	3m
Limit:	Test instrumentation resolution bandwidth 100 kHz (30 MHz - 1000 MHz) For FCC Part 95.567: Each FRS transmitter type must be designed such that the effective radiated power (ERP) on channels 8 through 14 does not exceed 0.5 Watts and the ERP on channels 1 through 7 and 15 through 22 does not exceed 2.0 Watts.

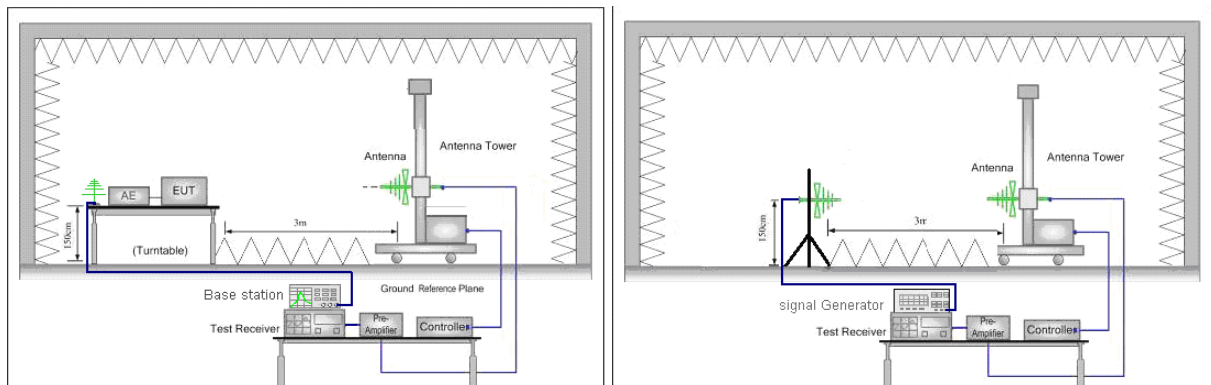
7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 24.8 °C Humidity: 49.3 % RH Atmospheric Pressure: 1020 mbar

Test mode: a: Tx mode, Keep the EUT in transmitting mode.

7.2.2 Test Setup Diagram



7.2.3 Measurement Procedure and Data

- 1) EUT was placed on a 1.5 meter high non-conductive table at a 3 meter test distance from the receive antenna. The height of receiving antenna is 1.5 m. The test setup refers to figure 1 above.
- 2) Detected emissions were maximized at each frequency by rotating the table and adjusting the receiving antenna polarization. The radiated emission measurements of all transmit frequencies in three channels (High, Middle, Low) were measured with peak detector.
- 3) The EUT is then put into continuously transmitting mode at its maximum power level during the test. And the maximum value of the receiver should be recorded.
- 4) The EUT shall be replaced by a substitution antenna the test setup refers to figure 2 above.
- 5) In the chamber, a 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 is applied to the input of the substitution antenna, and adjusts the level of the signal generator output until the value of the receiver reach the previously recorded. The Power of signal source (P_g) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
- 6) The test results are attain as described below:

$$\text{Power(EIRP)} = P_g - \text{Cable loss} + \text{Antenna Gain}$$

$$\text{ERP} = \text{EIRP} - 2.15\text{dB}$$



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Test result:

Operation Mode	Freq (MHz)	Channel No.	Antenna Pol.	Pg (dBm)	Cable Loss (dB)	Antenna Gain (dBi)	ERP (dBm)	Limit (dBm)
FRS	462.5625	1	V	19.33	1.47	7.34	23.05	33.01
			H	18.86	1.47	7.34	22.58	
	467.5625	8	V	18.31	1.49	7.42	22.09	26.99
			H	17.97	1.49	7.42	21.75	
	462.7250	22	V	18.92	1.47	7.34	22.64	33.01
			H	18.49	1.47	7.34	22.21	

Remark: ERP=Pg - Cable loss + Antenna Gain - 2.15



7.3 Occupied Bandwidth

Test Requirement 47 CFR FCC Part 95.573;

Test Method: ANSI/TIA-603-D:2010

Limit: For FCC Part 95.567:

Each FRS transmitter type must be designed such that the occupied bandwidth does not exceed 12.5 kHz.

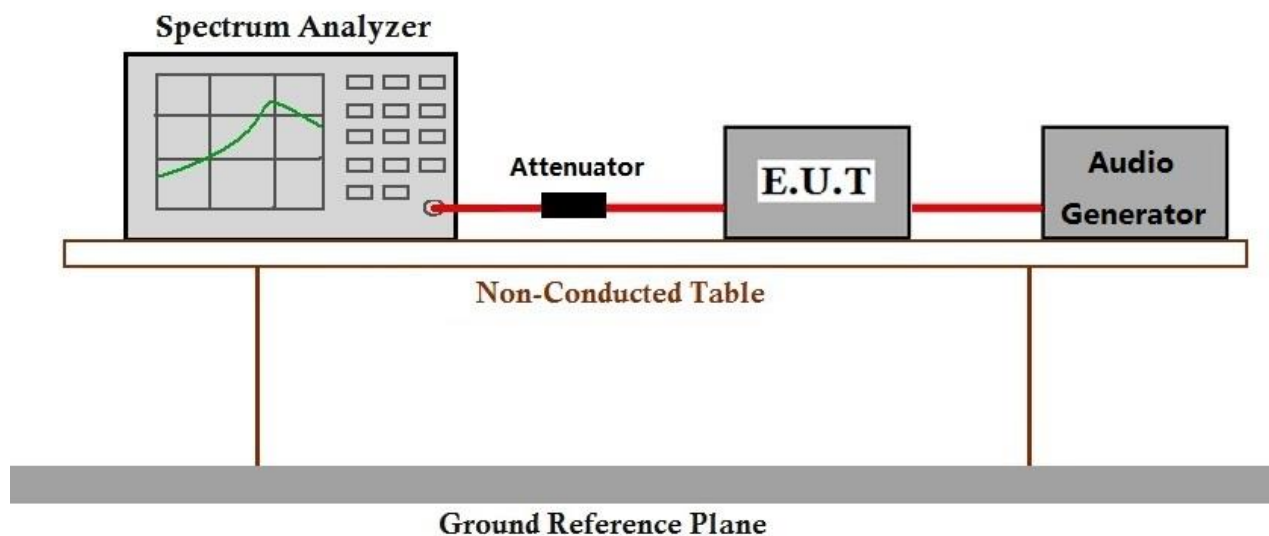
7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 24.8 °C Humidity: 49.2 % RH Atmospheric Pressure: 1020 mbar

Test mode: a: Tx mode, Keep the EUT in transmitting mode.

7.3.2 Test Setup Diagram

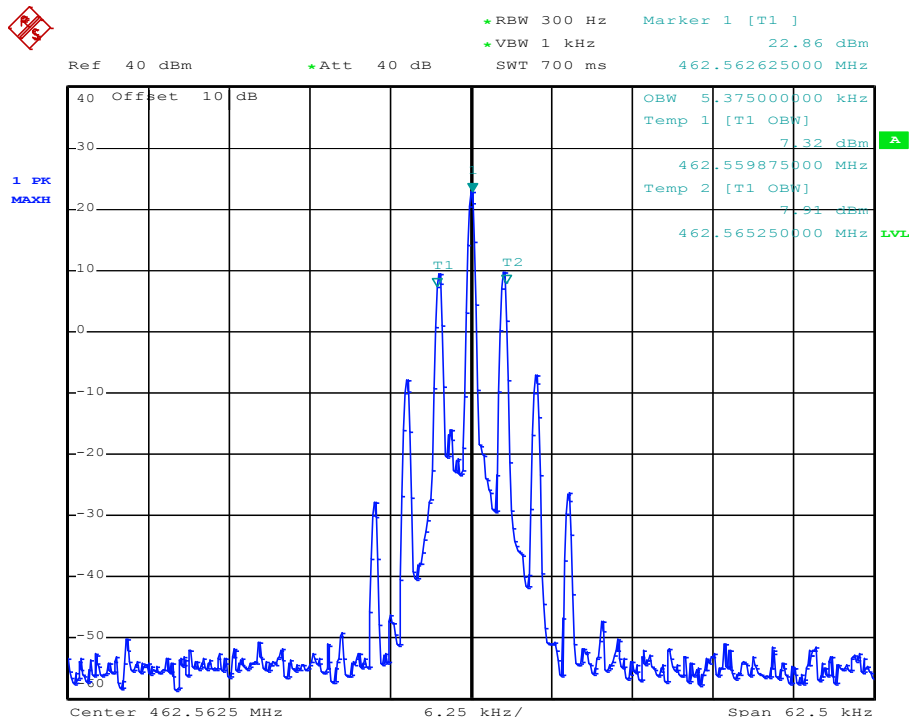




7.3.3 Measurement Procedure and Data

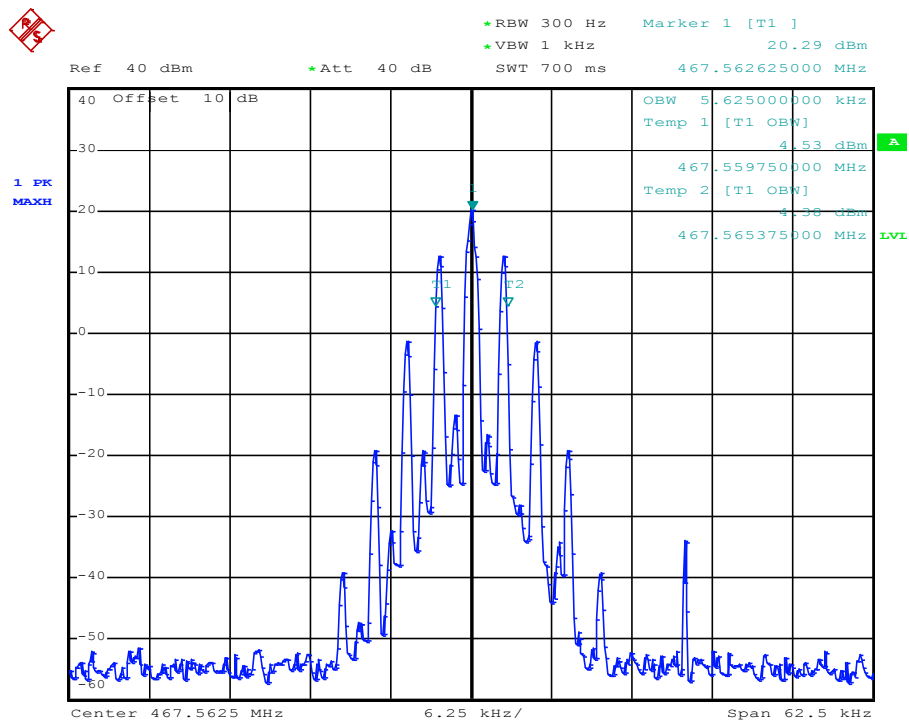
Channel 1 462.5625MHz FRS

The occupied Bandwidth is measured to be 5.375KHz for FRS.



Channel 8 467.5625MHz FRS

The occupied Bandwidth is measured to be 5.625KHz for FRS.





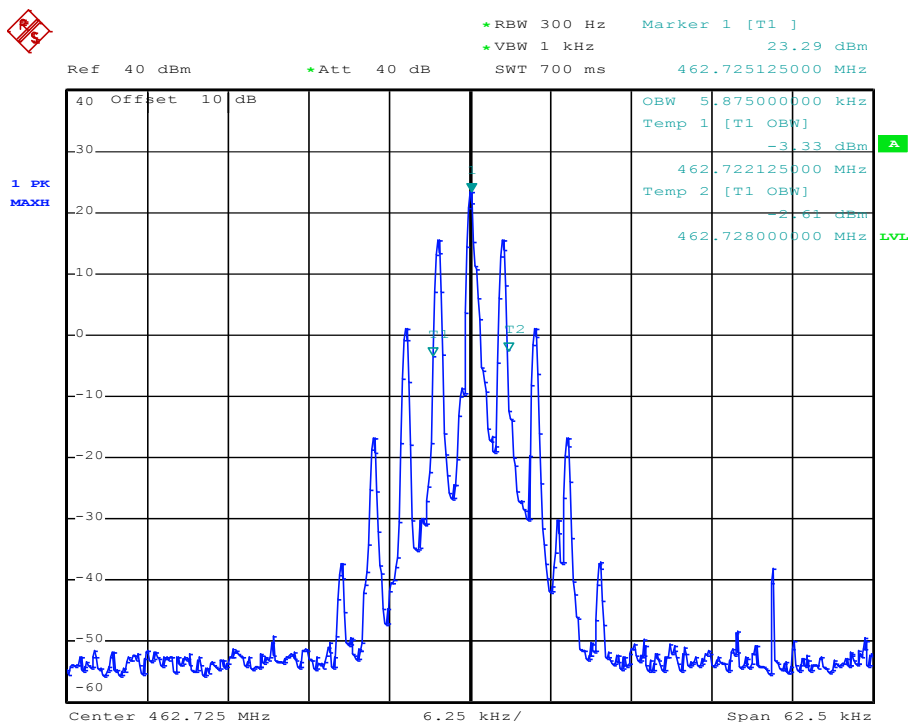
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Channel 22 462.7250MHz FRS

The occupied Bandwidth is measured to be 5.625KHz for FRS.





7.4 Modulation characteristics

Test Requirement 47 CFR FCC Part 95.575 & FCC Part 2.1047;

Test Method: ANSI/TIA-603-D:2010

Limit: For FCC Part 95.575:

Each FRS transmitter type must be designed such that the peak frequency deviation does not exceed 2.5 kHz, and the highest audio frequency contributing substantially to modulation must not exceed 3.125 kHz.

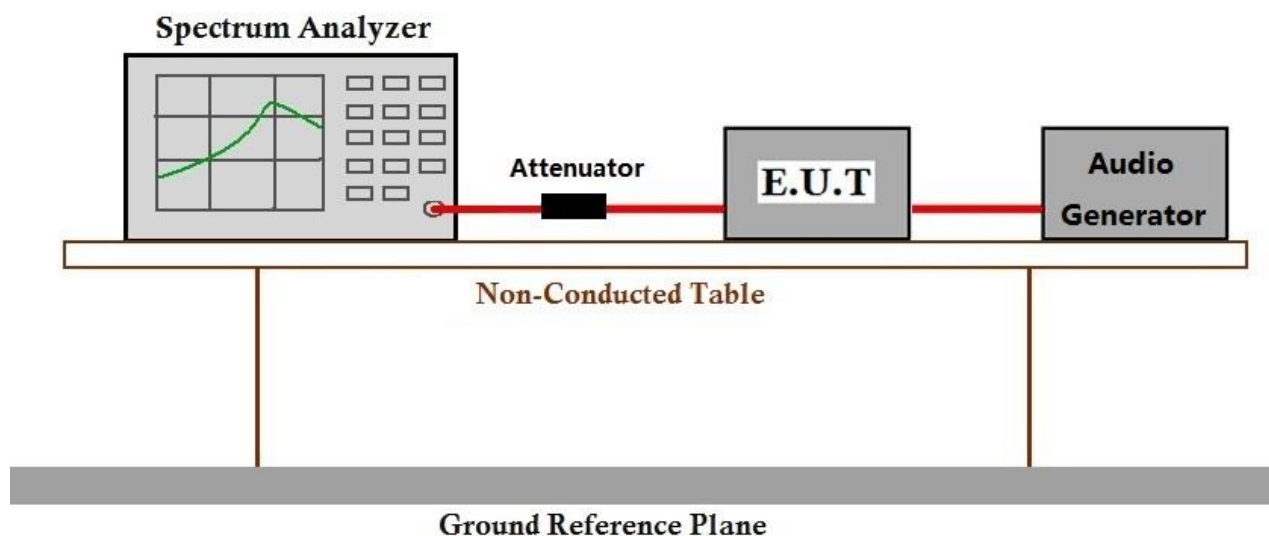
7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 24.8 °C Humidity: 49.2 % RH Atmospheric Pressure: 1020 mbar

Test mode: a: Tx mode, Keep the EUT in transmitting mode.

7.4.2 Test Setup Diagram



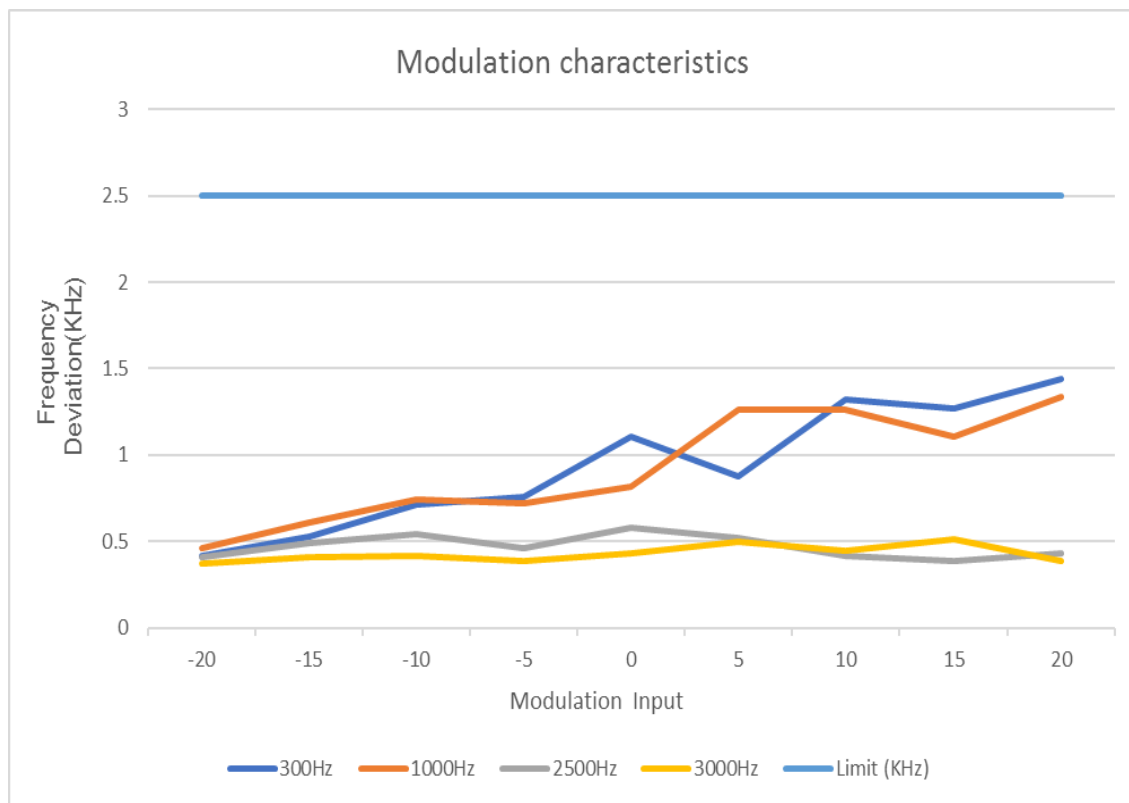


7.4.3 Measurement Procedure and Data

Channel 1

a. Frequency deviation:

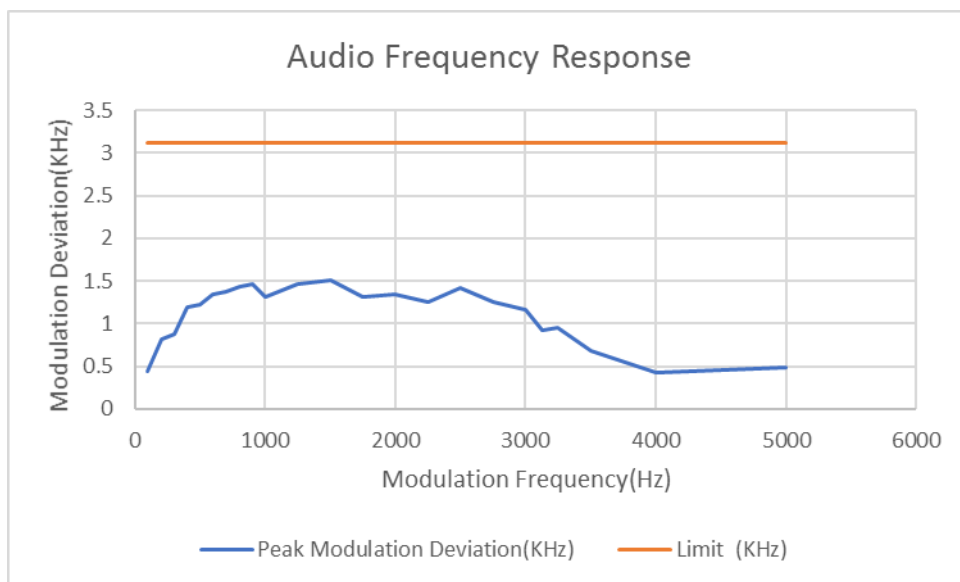
Channel 1: 462.5625MHz FRS					
Modulation Input(dB)	Peak Frequency Deviation(KHz) at 300Hz	Peak Frequency Deviation(KHz) at 1000Hz	Peak Frequency Deviation(KHz) at 2500Hz	Peak Frequency Deviation(KHz) at 3000Hz	Limit (KHz)
-20	0.42	0.46	0.41	0.37	2.50
-15	0.53	0.61	0.49	0.41	2.50
-10	0.71	0.74	0.54	0.42	2.50
-5	0.76	0.72	0.46	0.39	2.50
0	1.11	0.82	0.58	0.43	2.50
5	0.88	1.26	0.52	0.50	2.50
10	1.32	1.26	0.42	0.45	2.50
15	1.27	1.11	0.39	0.51	2.50
20	1.44	1.34	0.43	0.39	2.50





b. Audio Frequency Response

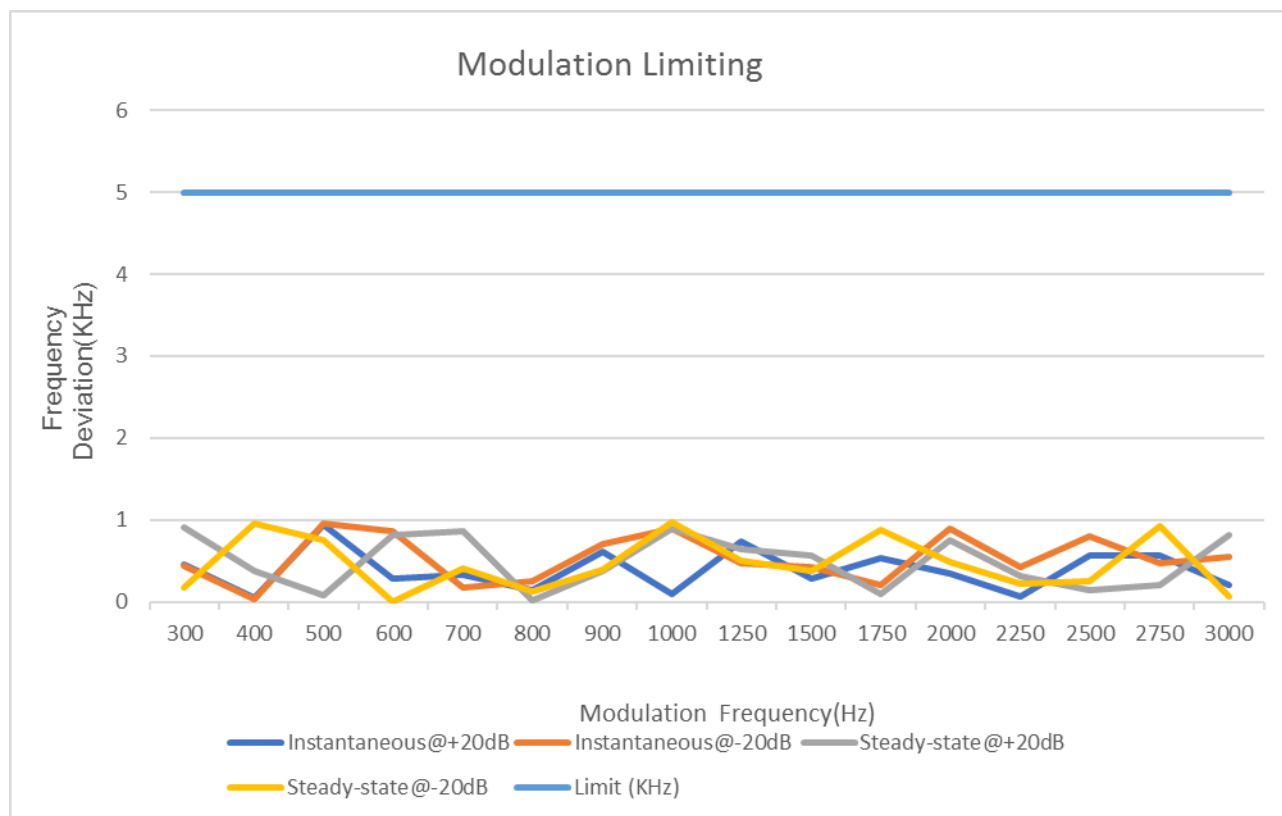
Modulation Frequency(Hz)	Peak Modulation Deviation(KHz)	Limit (KHz)
100	0.44	3.125
200	0.82	3.125
300	0.88	3.125
400	1.19	3.125
500	1.22	3.125
600	1.34	3.125
700	1.37	3.125
800	1.43	3.125
900	1.46	3.125
1000	1.32	3.125
1250	1.46	3.125
1500	1.51	3.125
1750	1.31	3.125
2000	1.35	3.125
2250	1.25	3.125
2500	1.42	3.125
2750	1.26	3.125
3000	1.16	3.125
3125	0.93	3.125
3250	0.76	3.125
3500	0.38	3.125
4000	0.42	3.125
5000	0.49	3.125





c. Modulation Limiting

Modulation Frequency(Hz)	Instantaneous		Steady-state		Limit (KHz)
	Deviation (@+20dB) (KHz)	Deviation (@-20dB) (KHz)	Deviation (@+20dB) (KHz)	Deviation (@-20dB) (KHz)	
300	0.45	0.44	0.91	0.17	5
400	0.05	0.03	0.38	0.95	5
500	0.94	0.96	0.08	0.75	5
600	0.29	0.86	0.82	0.00	5
700	0.33	0.18	0.86	0.41	5
800	0.15	0.26	0.02	0.12	5
900	0.61	0.70	0.38	0.39	5
1000	0.10	0.90	0.89	0.97	5
1250	0.73	0.47	0.65	0.50	5
1500	0.28	0.42	0.56	0.38	5
1750	0.53	0.21	0.09	0.88	5
2000	0.34	0.90	0.76	0.49	5
2250	0.07	0.42	0.31	0.22	5
2500	0.57	0.80	0.15	0.26	5
2750	0.56	0.47	0.20	0.92	5
3000	0.21	0.55	0.82	0.07	5

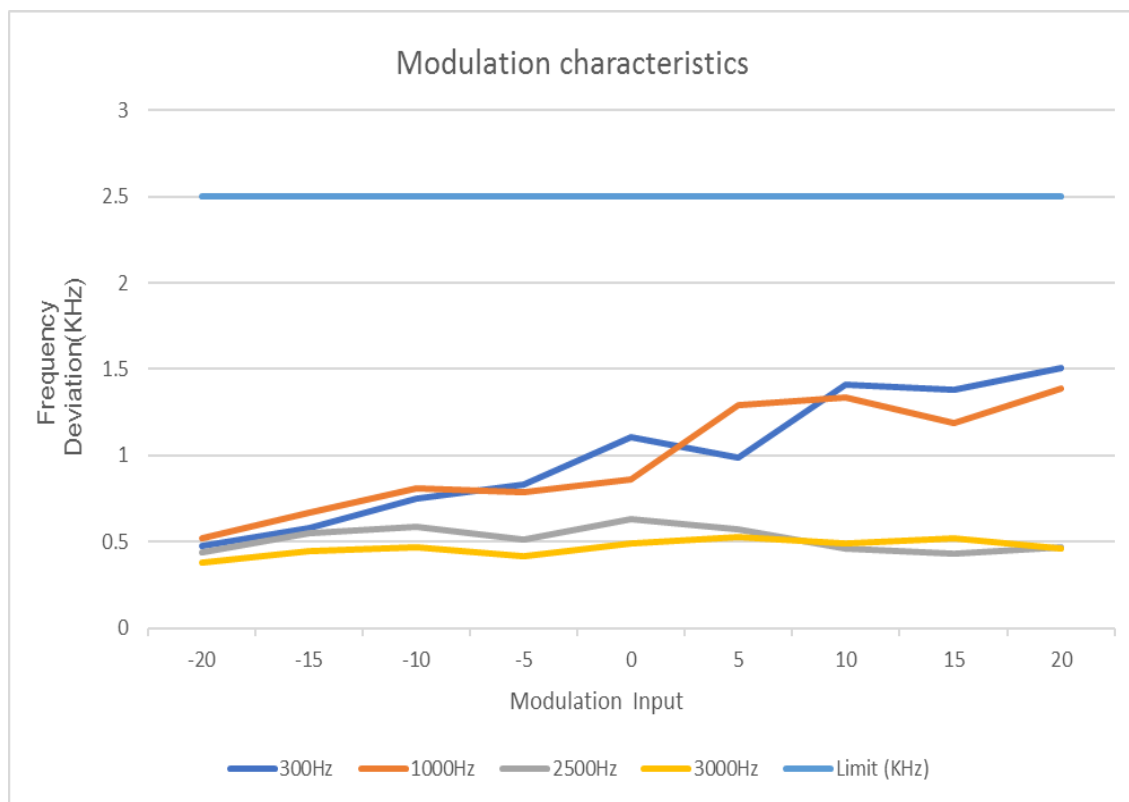




Channel 8:

a. Frequency deviation:

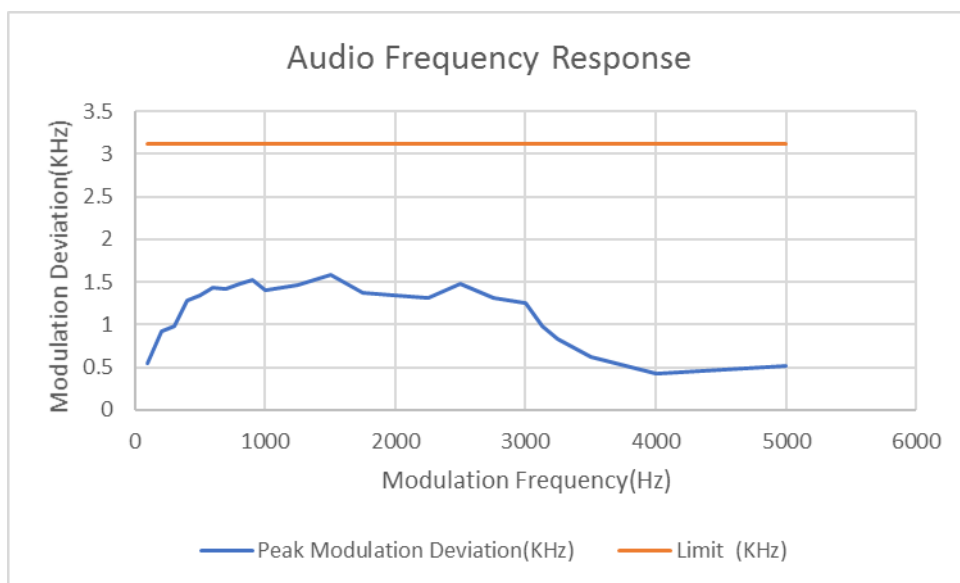
Channel 8: 467.5625MHz FRS					
Modulation Input(dB)	Peak Frequency Deviation(KHz) at 300Hz	Peak Frequency Deviation(KHz) at 1000Hz	Peak Frequency Deviation(KHz) at 2500Hz	Peak Frequency Deviation(KHz) at 3000Hz	Limit (KHz)
-20	0.48	0.52	0.44	0.38	2.50
-15	0.58	0.67	0.55	0.45	2.50
-10	0.75	0.81	0.59	0.47	2.50
-5	0.83	0.79	0.51	0.42	2.50
0	1.11	0.86	0.63	0.49	2.50
5	0.99	1.29	0.57	0.53	2.50
10	1.41	1.34	0.46	0.49	2.50
15	1.38	1.19	0.43	0.52	2.50
20	1.51	1.39	0.47	0.46	2.50





b. Audio Frequency Response

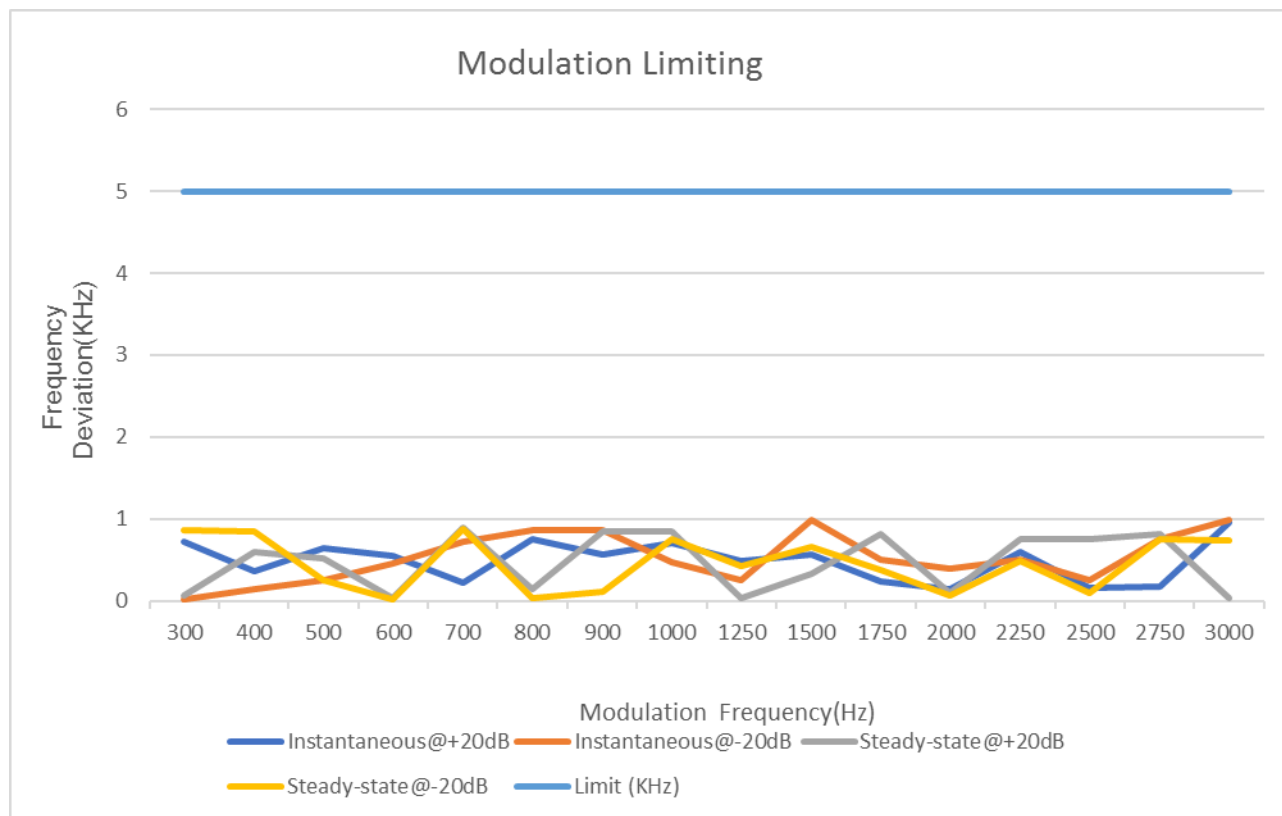
Modulation Frequency(Hz)	Peak Modulation Deviation(KHz)	Limit (KHz)
100	0.55	3.125
200	0.93	3.125
300	0.99	3.125
400	1.29	3.125
500	1.35	3.125
600	1.44	3.125
700	1.42	3.125
800	1.48	3.125
900	1.52	3.125
1000	1.41	3.125
1250	1.46	3.125
1500	1.59	3.125
1750	1.37	3.125
2000	1.34	3.125
2250	1.31	3.125
2500	1.48	3.125
2750	1.32	3.125
3000	1.26	3.125
3125	0.99	3.125
3250	0.83	3.125
3500	0.42	3.125
4000	0.43	3.125
5000	0.52	3.125





c. Modulation Limiting

Modulation Frequency(Hz)	Instantaneous		Steady-state		Limit (KHz)
	Deviation (@+20dB) (KHz)	Deviation (@-20dB) (KHz)	Deviation (@+20dB) (KHz)	Deviation (@-20dB) (KHz)	
300	0.72	0.02	0.06	0.86	5
400	0.36	0.15	0.59	0.85	5
500	0.65	0.26	0.52	0.26	5
600	0.55	0.45	0.04	0.02	5
700	0.22	0.72	0.90	0.88	5
800	0.75	0.86	0.14	0.03	5
900	0.56	0.86	0.84	0.11	5
1000	0.70	0.47	0.84	0.75	5
1250	0.49	0.25	0.03	0.43	5
1500	0.56	0.99	0.33	0.66	5
1750	0.24	0.50	0.81	0.38	5
2000	0.15	0.40	0.09	0.07	5
2250	0.60	0.50	0.75	0.49	5
2500	0.16	0.26	0.76	0.09	5
2750	0.17	0.76	0.82	0.75	5
3000	0.96	0.99	0.03	0.74	5

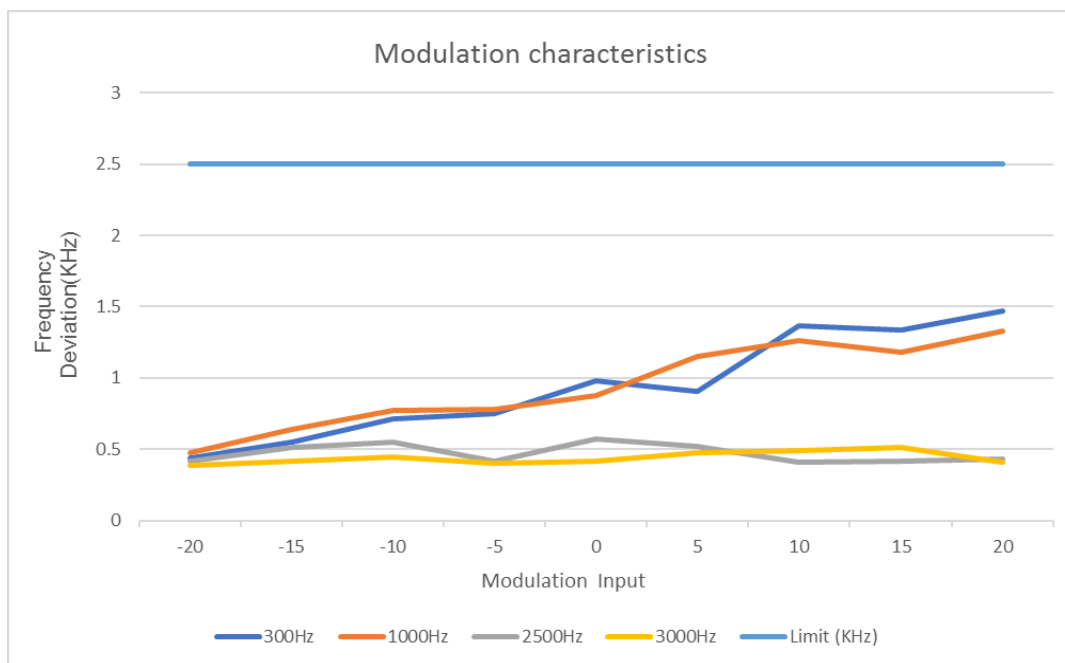




Channel 22:

a. Frequency deviation:

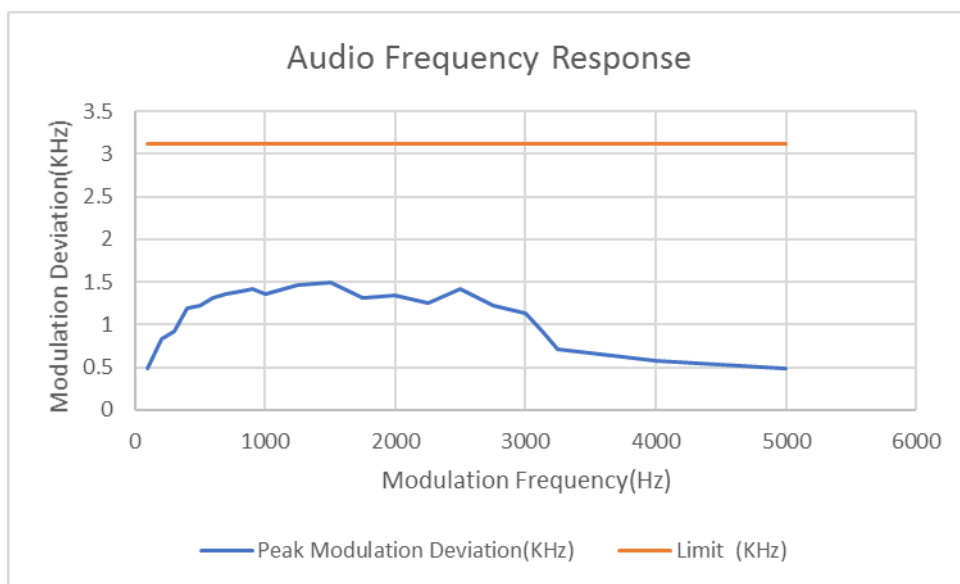
Channel 22: 462.7250MHz FRS					
Modulation Input(dB)	Peak Frequency Deviation(KHz) at 500Hz	Peak Frequency Deviation(KHz) at 1000Hz	Peak Frequency Deviation(KHz) at 2500Hz	Peak Frequency Deviation(KHz) at 3125Hz	Limit (KHz)
-20	0.44	0.48	0.42	0.39	2.50
-15	0.55	0.64	0.51	0.42	2.50
-10	0.71	0.77	0.55	0.45	2.50
-5	0.75	0.78	0.42	0.40	2.50
0	0.98	0.88	0.57	0.42	2.50
5	0.91	1.15	0.52	0.48	2.50
10	1.37	1.26	0.41	0.49	2.50
15	1.34	1.18	0.42	0.51	2.50
20	1.47	1.33	0.43	0.41	2.50





b. Audio Frequency Response

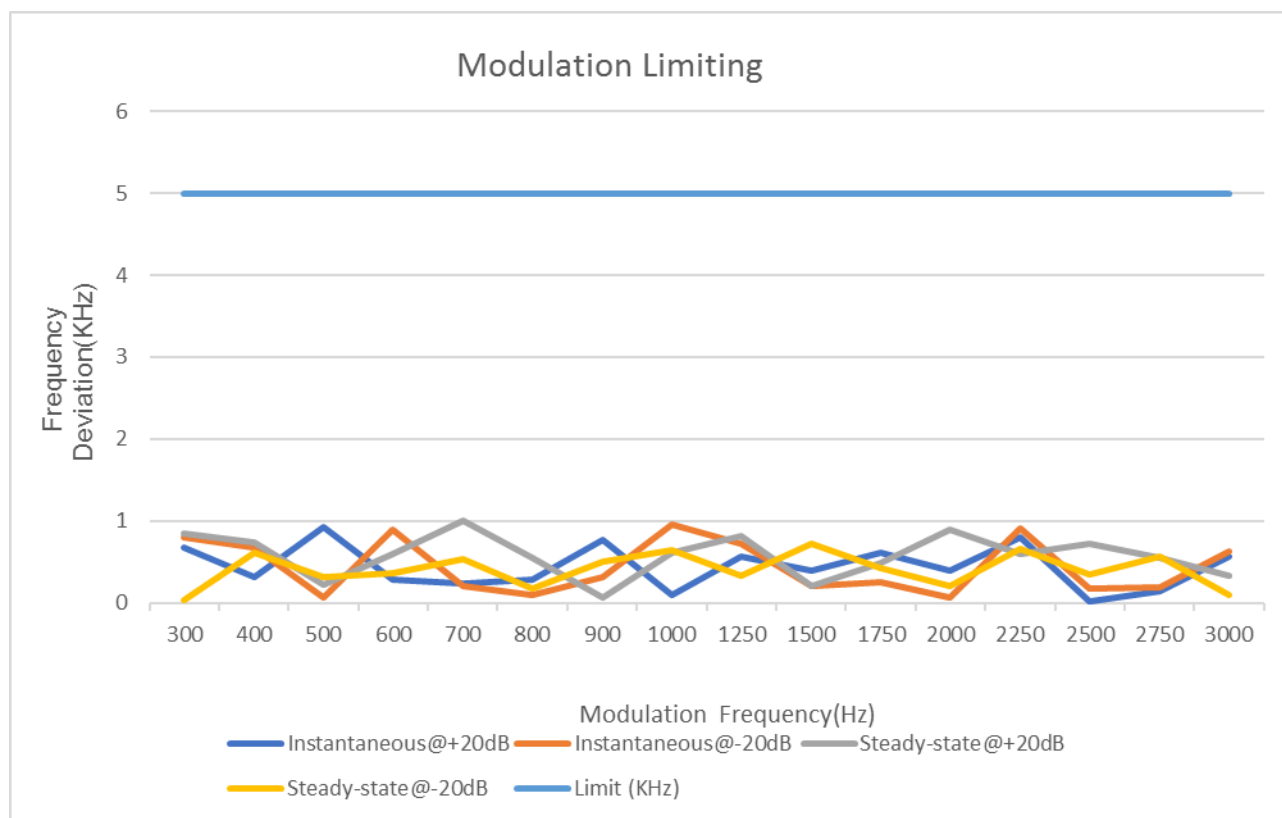
Modulation Frequency(Hz)	Peak Modulation Deviation(KHz)	Limit (KHz)
100	0.48	3.125
200	0.83	3.125
300	0.92	3.125
400	1.19	3.125
500	1.22	3.125
600	1.32	3.125
700	1.36	3.125
800	1.39	3.125
900	1.42	3.125
1000	1.36	3.125
1250	1.47	3.125
1500	1.49	3.125
1750	1.31	3.125
2000	1.34	3.125
2250	1.26	3.125
2500	1.42	3.125
2750	1.23	3.125
3000	1.14	3.125
3125	0.92	3.125
3250	0.71	3.125
3500	0.46	3.125
4000	0.48	3.125
5000	0.49	3.125





c. Modulation Limiting

Modulation Frequency(Hz)	Instantaneous		Steady-state		Limit (KHz)
	Deviation (@+20dB) (KHz)	Deviation (@-20dB) (KHz)	Deviation (@+20dB) (KHz)	Deviation (@-20dB) (KHz)	
300	0.67	0.80	0.84	0.03	5
400	0.32	0.67	0.73	0.62	5
500	0.92	0.07	0.22	0.31	5
600	0.28	0.89	0.60	0.36	5
700	0.24	0.21	1.00	0.53	5
800	0.28	0.09	0.55	0.17	5
900	0.77	0.32	0.06	0.51	5
1000	0.09	0.96	0.62	0.64	5
1250	0.57	0.72	0.81	0.33	5
1500	0.40	0.20	0.20	0.72	5
1750	0.62	0.26	0.49	0.42	5
2000	0.40	0.07	0.90	0.21	5
2250	0.80	0.91	0.59	0.66	5
2500	0.01	0.18	0.72	0.35	5
2750	0.14	0.19	0.55	0.57	5
3000	0.57	0.63	0.33	0.09	5



7.5 Radiated Unwanted Emissions & Emission Mask

Test Requirement 47 CFR FCC Part 95.579 & FCC Part 2.1053;

Test Method: ANSI/TIA-603-D:2010

Measurement Distance: 3m

Resolution bandwidth = 10 kHz for spurious emissions below 1 GHz, and 1 MHz for spurious emissions above 1 GHz.

Video Bandwidth = 300 kHz for spurious emissions below 1 GHz, and 3 MHz for spurious emissions above 1 GHz.

Limit:

For FCC Part 95.579 & RSS-210 E.2.5:

Each FRS transmitter type must be designed to satisfy the applicable unwanted emissions limits in this paragraph.

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

(1) 25 dB (decibels) in the frequency band 6.25 kHz to 12.5 kHz removed from the channel center frequency.

(2) 35 dB in the frequency band 12.5 kHz to 31.25 kHz removed from the channel center frequency.

(3) $43 + 10 \log (P)$ dB in any frequency band removed from the channel center frequency by more than 31.25 kHz.

(b) Measurement bandwidths. The power of unwanted emissions in the frequency bands specified in paragraphs (a)(1) and (2) of this section is measured with a reference bandwidth of 300 Hz. The power of unwanted emissions in the frequency range specified in paragraph (a)(3) is measured with a reference bandwidth of at least 30 kHz.

(c) Measurement conditions. The requirements in this section apply to each FRS transmitter type both with and without the connection of permitted attachments, such as an external speaker, microphone and/or power cord.

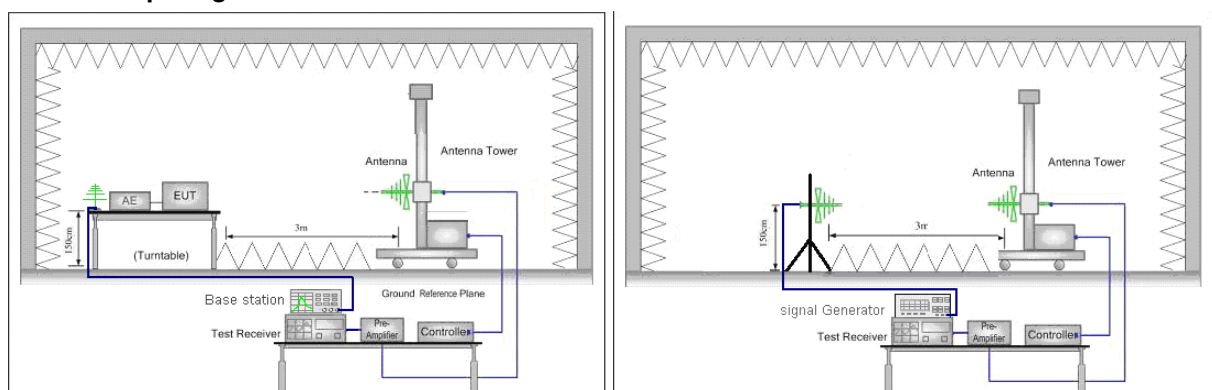
7.5.1 E.U.T. Operation

Operating Environment:

Temperature: 23.1 °C Humidity: 48 % RH Atmospheric Pressure: 1020 mbar

Test mode: a: Tx mode, Keep the EUT in transmitting mode.

7.5.2 Test Setup Diagram





7.5.3 Measurement Procedure and Data

- 1) EUT was placed on a 1.5meter high non – conductive table at a 3 meter test distance from the receive antenna. The height of receiving antenna is 1.5 m. The test setup refers to figure 1 above.
- 2) The EUT is then put into continuously transmitting mode at its maximum power level during the test. And the maximum value of the receiver should be recorded.
- 3) The EUT shall be replaced by a substitution antenna the test setup refers to figure 2 above.
- 4) In the chamber, a 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 is applied to the input of the substitution antenna, and adjusts the level of the signal generator output until the value of the receiver reach the previously recorded. The Power of signal source (P_g) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
- 5) The test results are attain as described below:
$$\text{Power(EIRP)} = P_g - \text{Cable loss} + \text{Antenna Gain}$$
$$\text{EIRP} = \text{ERP} + 2.15\text{dB}$$
- 6) This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15dBi)
- 7) The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, only the test worst case mode is recorded in the report.
- 8) Repeat above procedures until all frequencies measured was complete.
- 9) Scan from 9kHz to 5GHz, the disturbance below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.



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Test result:

Channel 1; Frequency= 462.5625MHz;

Mark	Frequency (MHz)	ERP/EIRP (dBm)	Limit (dBm)	Over Limit (dB)	Detector	Polarization
1	925.125	-32.64	-13	-19.64	peak	Horizontal
2	1387.688	-38.16	-13	-25.16	peak	Horizontal
3	1850.25	-38.62	-13	-25.62	peak	Horizontal
4	2312.813	-40.44	-13	-27.44	peak	Horizontal
1	925.125	-28.05	-13	-15.05	peak	Vertical
2	1387.688	-33.44	-13	-20.44	peak	Vertical
3	1850.25	-33.41	-13	-20.41	peak	Vertical
4	2312.813	-37.37	-13	-24.37	peak	Vertical

Channel 8; Frequency= 467.5625MHz;

Mark	Frequency (MHz)	ERP/EIRP (dBm)	Limit (dBm)	Over Limit (dB)	Detector	Polarization
1	935.125	-36.12	-13	-22.6	peak	Horizontal
2	1402.688	-40.02	-13	-25.31	peak	Horizontal
3	1870.25	-48.14	-13	-27.54	peak	Horizontal
4	2337.813	-49.52	-13	-25.21	peak	Horizontal
1	935.125	-27.84	-13	-14.32	peak	Vertical
2	1402.688	-32.84	-13	-18.13	peak	Vertical
3	1870.25	-39.52	-13	-18.92	peak	Vertical
4	2337.813	-43.59	-13	-19.28	peak	Vertical

Channel 22; Frequency= 462.7250MHz;

Mark	Frequency (MHz)	ERP/EIRP (dBm)	Limit (dBm)	Over Limit (dB)	Detector	Polarization
1	925.45	-35.62	-13	-22.62	peak	Horizontal
2	1388.175	-40.4	-13	-27.4	peak	Horizontal
3	1850.9	-40.31	-13	-27.31	peak	Horizontal
4	2313.625	-40.87	-13	-27.87	peak	Horizontal
1	925.45	-27.69	-13	-14.69	peak	Vertical
2	1388.175	-32.83	-13	-19.83	peak	Vertical
3	1850.9	-32.03	-13	-19.03	peak	Vertical
4	2313.625	-34.43	-13	-21.43	peak	Vertical



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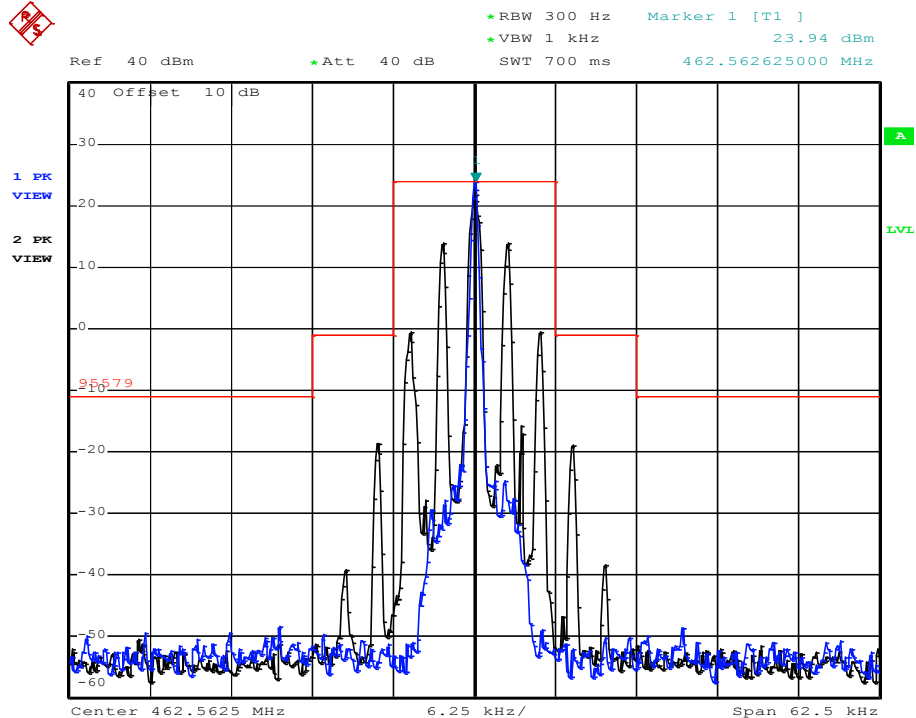
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Emission Mask:

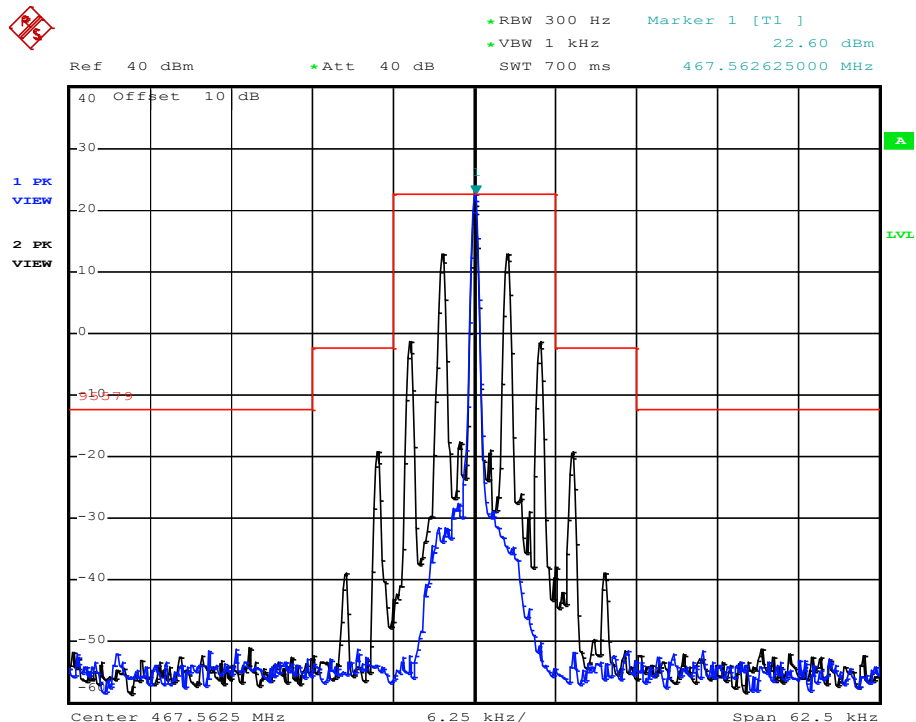
Channel 1 462.5625MHz FRS

The occupied Bandwidth is measured to be 5.375KHz for FRS.



Channel 8 467.5625MHz FRS

The occupied Bandwidth is measured to be 5.625KHz for FRS.





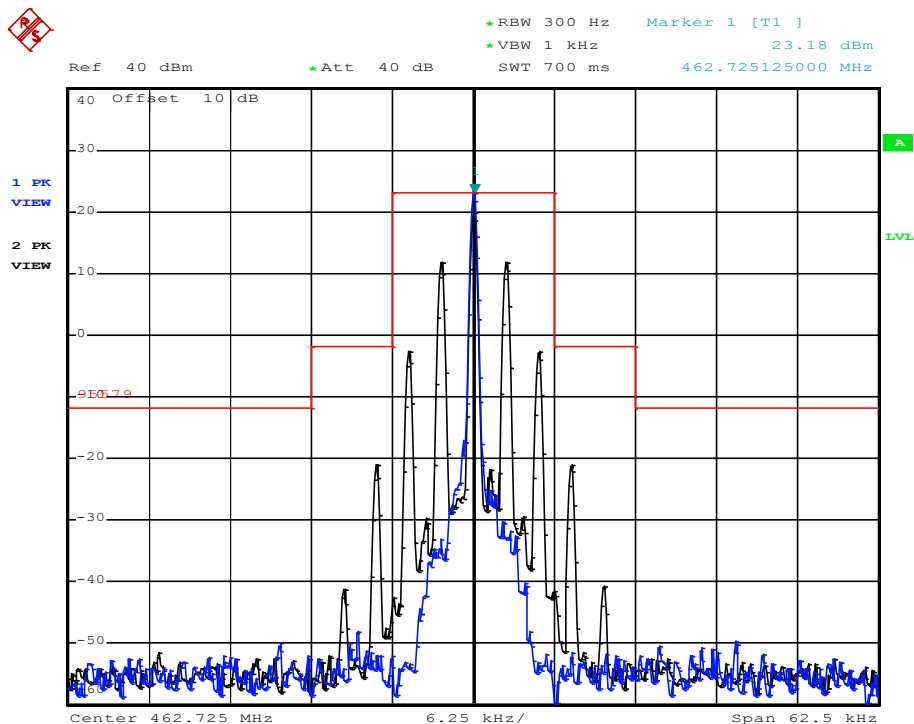
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Channel 22 462.7250MHz FRS

The occupied Bandwidth is measured to be 5.625KHz for FRS.





8 Test Setup Photographs

Refer to the <Test Setup photos>.

9 EUT Constructional Details

Refer to the < External Photos > & < Internal Photos >.

- End of the Report -